



TEST REPORT

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
www.kctl.co.kr

Report No.:
KR20-SPF0031-A
Page (1) of (293)

KCTL
1. Client

- Name : Samsung Electronics Co., Ltd.
- Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
- Date of Receipt : 2020-05-22

2. Use of Report : Certification

- 3. Name of Product and Model : Mobile phone**
- Model Number : SM-M515F/DSN
 - Manufacturer and Country of Origin : Samsung Electronics Co., Ltd. / VIETNAM

4. FCC ID : A3LSMM515F
5. Date of Test : 2020-06-11 ~ 2020-07-10
6. Location of Test : ☒ Permanent Testing Lab ☐ On Site Testing (Address: Address of testing location)
7. Test Standards : IEEE 1528-2013, ANSI/IEEE C95.1, KDB Publication
8. Test Results : Refer to the test result in the test report

Affirmation	Tested by	Technical Manager
	Name : Kyoungwoo Min (Signature)	Name : Jongwon Ma (Signature)

2020-07-27

KCTL Inc.

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REPORT REVISION HISTORY

Date	Revision	Page No
2020-07-23	Originally issued	-
2020-07-27	- Updated Report	-
	2. Device information Section 2.2, 2.4.2, 2.7 and 2.8.	6, 9, 13, 14
	10. System Verification Section 10.2.	76
	11. SAR Test Results(WCDMA II) Section 11.3 and 11.4.	86, 92
	12. Simultaneous Transmission Analysis Section 12.2, Appendix C and Appendix D.	97 ~ 101, 270, 271

Note: The Report No. KR20-SPF0031 is superseded by the report No. KR20-SPF0031-A

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CONTENTS

1.	General information.....	4
2.	Device information	5
3.	#LTE Information	16
4.	Specific Absorption Rate	18
5.	SAR Measurement Procedures.....	19
6.	SAR Measurement Configurations.....	20
7.	RF Exposure Limits	24
8.	FCC SAR General Measurement Procedures.....	25
9.	RF Average Conducted Output Power.....	32
10.	System Verification	74
11.	SAR Test Results	77
12.	Simultaneous Transmission	96
13.	SAR Measurement Variability.....	108
14.	Measurement Uncertainty.....	109
15.	Test Equipment Information	110
16.	Test System Verification Results	112
17.	Test Results	125
	Appendixes List.....	173
	Appendix A. Calibration certificate	174
	Appendix B. SAR Tissue Specification.....	268
	Appendix C. #Antenna Location & Distance	269
	Appendix D. EUT Photo	271
	Appendix E. Test Setup Photo.....	275
	Appendix F. Power Reduction Verification	288
	End of test report	293

1. General information

Client : Samsung Electronics Co., Ltd.

Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677,
Rep. of Korea

Manufacturer : Samsung Electronics Co., Ltd.

Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677,
Rep. of Korea

Factory : SAMSUNG ELECTRONICS VIETNAM CO.,LTD.

Address : YenPhong 1 - I.P YenTrung Commune, YenPhong Dist., Bac Ninh Province,
Vietnam

Contact Person : Donghyun Jo/ dh.jo@samsung.com

Laboratory : KCTL Inc.

Address : 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea

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 Industry Canada Registration No. : 8035A
 KOLAS No.: KT231

1.1 Report Overview

This report details the results of testing carried out on the samples listed in section 2, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this test report is used in any configuration other than that detailed in the test report, the manufacturer must ensure the new configuration complies with all relevant standards and certification requirements. Any mention of KCTL Inc. Wireless lab or testing done by KCTL Inc. Wireless lab made in connection with the distribution or use of the tested product must be approved in writing by KCTL Inc. Wireless lab.

KCTL Inc. 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea TEL: 82-31-285-0894 FAX: 82-505-299-8311 www.kctl.co.kr	Report No.: KR20-SPF0031-A Page (5) of (293)	
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2. Device information

2.1 Basic description

Product Name		Mobile phone		
Product Model Number		SM-M515F/DSN		
Product Manufacturer		Samsung Electronics Co., Ltd.		
Product Serial Number	Radiation	R38N602TCJZ		
		R38N602TD1A		
		R38N602V1PN		
		R38N602TRML		
		R38N503A1ZJ		
		R38N602X0GE		
		R38N601774X		
	WWAN Conduction	R38N503ADAZ		
	WLAN Conduction	R38N503AA4V		
Device Overview		Band & Mode	Operating Modes	Tx Frequency (MHz)
		GSM/GPRS/EDGE 850	Voice/Data	824.2 ~ 848.8
		GSM/GPRS/EDGE 1900	Voice/Data	1 850.2 ~ 1 909.8
		WCDMA Band II	Voice/Data	1 852.4 ~ 1 907.6
		WCDMA Band IV	Voice/Data	1 712.4 ~ 1 752.6
		WCDMA Band V	Voice/Data	826.4 ~ 846.6
		LTE Band 2	Voice/Data	1 850.7 ~ 1 909.3
		LTE Band 4	Voice/Data	1 710.7 ~ 1 754.3
		LTE Band 5	Voice/Data	824.7 ~ 848.3
		LTE Band 12	Voice/Data	699.7 ~ 715.3
		LTE Band 17	Voice/Data	706.5 ~ 713.5
		LTE Band 26	Voice/Data	814.7 ~ 848.3
		LTE Band 41	Voice/Data	2 498.5 ~ 2 687.5
		LTE Band 66	Voice/Data	1 710.7 ~ 1 779.3
		2.4 GHz WLAN	Voice/Data	2 412.0 ~ 2 472.0
		U-NII-1	Voice/Data	5 180.0 ~ 5 240.0
		U-NII-2A	Voice/Data	5 260.0 ~ 5 320.0
		U-NII-2C	Voice/Data	5 500.0 ~ 5 720.0
		U-NII-3	Voice/Data	5 745.0 ~ 5 825.0
		Bluetooth	Data	2 402.0 ~ 2 480.0
TDWR Information		5.60 GHz~ 5.65 GHz band (TDWR) is supported by the device.		

2.2 Summary of SAR Test Results

Band	Equipment Class	Highest Reported			
		1g SAR (W/kg)			10g SAR (W/kg)
		Head	Body-Worn	Hotspot	Phablet
GSM/GPRS/EDGE 850	PCE	0.28	0.36	0.53	N/A
GSM/GPRS/EDGE 1900	PCE	0.23	0.45	1.07	N/A
WCDMA Band II	PCE	0.36	0.61	0.98	3.28
WCDMA Band IV	PCE	0.20	0.17	0.51	N/A
WCDMA Band V	PCE	0.26	0.32	0.53	N/A
LTE Band 2	PCE	0.34	0.56	1.11	N/A
LTE Band 4	PCE	N/A	N/A	N/A	N/A
LTE Band 5	PCE	0.23	0.31	0.54	N/A
LTE Band 12	PCE	0.13	0.25	0.32	N/A
LTE Band 17	PCE	N/A	N/A	N/A	N/A
LTE Band 26	PCE	0.20	0.29	0.44	N/A
LTE Band 41	PCE	0.68	0.33	1.10	3.18
LTE Band 66	PCE	0.31	0.41	0.84	N/A
2.4GHz WLAN	DTS	1.28	0.17	0.31	N/A
U-NII-1	NII	N/A	N/A	N/A	N/A
U-NII-2A	NII	0.60	0.43	N/A	1.32
U-NII-2C	NII	0.54	0.54	N/A	1.70
U-NII-3	NII	0.51	0.35	0.99	N/A
Bluetooth	DSS	0.42	N/A	N/A	N/A
Simultaneous SAR per KDB 690783 D01v01r03		1.56	1.09	1.55	2.96

2.3 Power Reduction for SAR

This device utilizes a power reduction mechanism for some wireless modes and bands for SAR compliance under portable hotspot conditions, under some conditions when the device is being used in close proximity to the user's hand, and when headphones are inserted. All hotspot SAR evaluations for this device were performed at the maximum allowed output power when hotspot is enabled. FCC KDB Publication 616217 D04v01r02 Section 6 was used as a guideline for selecting SAR test distances for this device when being used in phablet use conditions. Detailed descriptions of the power reduction mechanism are included in the operational description.

This device uses an independent fixed level power reduction mechanism for WLAN operations during VoWiFi held to ear scenarios. Per FCC Guidance, the held-to-ear exposure conditions were evaluated at reduced power according to the Head SAR positions described in IEEE 1528-2013. Detailed descriptions of the power reduction mechanism are included in the operational description.

2.4 #Maximum Tune-up power

This device operates using the following maximum output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB Publication 447498 D01v06.

2.4.1 Maximum 2G/3G/4G Output Power

Band	Mode	Output Power (dBm)		
		Target	Max. Allowed	SAR Test
GSM 850	GSM Voice	33.50	34.50	Yes
	GPRS 1 TX	33.50	34.50	No
	GPRS 2 TX	30.50	31.50	Yes
	GPRS 3 TX	28.50	29.50	No
	GPRS 4 TX	27.00	28.00	No
	EGPRS 1 TX	27.00	28.00	No
	EGPRS 2 TX	24.50	25.50	No
	EGPRS 3 TX	23.00	24.00	No
	EGPRS 4 TX	21.50	22.50	No
GSM 1900	GSM Voice	30.50	31.50	Yes
	GPRS 1 TX	30.50	31.50	No
	GPRS 2 TX	29.00	30.00	Yes
	GPRS 3 TX	25.50	26.50	No
	GPRS 4 TX	25.50	26.50	No
	EGPRS 1 TX	25.50	26.50	No
	EGPRS 2 TX	24.00	25.00	No
	EGPRS 3 TX	22.00	23.00	No
	EGPRS 4 TX	21.50	22.50	No

Band	Mode	Output Power (dBm)		
		Target	Max. Allowed	SAR Test
WCDMA Band II	RMC	23.50	24.50	Yes
	HSDPA	20.00	21.00	No
	HSUPA	20.00	21.00	No
	DC-HSDPA	20.00	21.00	No
WCDMA Band IV	RMC	23.50	24.50	Yes
	HSDPA	21.50	22.50	No
	HSUPA	22.00	23.00	No
	DC-HSDPA	22.00	23.00	No
WCDMA Band V	RMC	24.30	25.30	Yes
	HSDPA	23.30	24.30	No
	HSUPA	23.30	24.30	No
	DC-HSDPA	23.30	24.30	No
LTE Band 2		23.00	24.00	Yes
LTE Band 4		23.50	24.50	*No
LTE Band 5		24.00	25.00	Yes
LTE Band 12		23.50	24.50	Yes
LTE Band 17		23.50	24.50	*No
LTE Band 26		24.00	25.00	Yes
LTE Band 41		24.00	25.00	Yes
LTE Band 66		23.50	24.50	Yes

Notes:

LTE Band 4 Measured Results

SAR for LTE Band 4 (Frequency range: 1 710.7 ~ 1 754.3 MHz) is covered by LTE Band 66 (Frequency range: 1 710.7 ~ 1 779.3 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 17 Measured Results

SAR for LTE Band 17 (Frequency range: 706.5 ~ 713.5 MHz) is covered by LTE Band 12 (Frequency range: 699.7 ~ 715.3 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

2.4.2 Reduced 2G/3G/4G Output Power – Grip Sensor, Earjack, Hotspot

Band	Mode	Output Power (dBm)		
		Target	Max. Allowed	SAR Test
WCDMA Band II (Hotspot, Grip Sensor, Earjack)	RMC	22.00	23.00	Yes
	HSDPA	19.50	20.50	No
	HSUPA	19.00	20.00	No
	DC-HSDPA	19.00	20.00	No
WCDMA Band IV (Hotspot, Grip Sensor, Earjack)	RMC	21.50	22.50	Yes
	HSDPA	20.50	21.50	No
	HSUPA	20.50	21.50	No
	DC-HSDPA	20.50	21.50	No
LTE Band 4 (Hotspot, Grip Sensor, Earjack)		21.50	22.50	*No
LTE Band 41 (Hotspot)		20.00	21.00	Yes
LTE Band 41 (Grip Sensor, Earjack)		21.00	22.00	Yes
LTE Band 66 (Hotspot, Grip Sensor, Earjack)		22.50	23.50	Yes

Notes:

LTE Band 4 Measured Results

SAR for LTE Band 4 (Frequency range: 1 710.7 ~ 1 754.3 MHz) is covered by LTE Band 66 (Frequency range: 1 710.7 ~ 1 779.3 MHz) due to overlapping frequency range, low maximum tune-up limit and same channel bandwidth.

2.4.3 Maximum WLAN and Bluetooth Output Power

Band	Mode	Channel	Output Power (dB m)		
			Target	Max. Allowed	SAR Test
WLAN 2.4 GHz	802.11b	1 ~ 11	18.50	19.50	Yes
		12	8.00	9.00	
		13	2.00	3.00	
	802.11g	1 ~ 11	17.50	18.50	No
		12	8.00	9.00	
		13	2.00	3.00	
	802.11n(HT20)	1 ~ 11	17.50	18.50	No
		12	8.00	9.00	
		13	2.00	3.00	
Band	Mode	Channel	Output Power (dB m)		
			Target	Max. Allowed	SAR Test
U-NII-1	802.11a	All Channel	14.00	15.00	No
	802.11n(HT20)	All Channel	14.00	15.00	No
	802.11n(HT40)	All Channel	13.50	14.50	No
	802.11ac(VHT20)	All Channel	14.00	15.00	No
	802.11ac(VHT40)	All Channel	13.50	14.50	No
	802.11ac(VHT80)	All Channel	12.00	13.00	No
U-NII-2A	802.11a	All Channel	14.00	15.00	Yes
	802.11n(HT20)	All Channel	14.00	15.00	No
	802.11n(HT40)	All Channel	13.00	14.00	No
	802.11ac(VHT20)	All Channel	14.00	15.00	No
	802.11ac(VHT40)	All Channel	13.00	14.00	No
	802.11ac(VHT80)	All Channel	12.00	13.00	No
U-NII-2C	802.11a	All Channel	14.50	15.50	No
	802.11n(HT20)	All Channel	14.50	15.50	No
	802.11n(HT40)	All Channel	14.50	15.50	Yes
	802.11ac(VHT20)	All Channel	14.50	15.50	No
	802.11ac(VHT40)	All Channel	14.50	15.50	No
	802.11ac(VHT80)	All Channel	13.00	14.00	No
U-NII-3	802.11a	All Channel	14.00	15.00	Yes
	802.11n(HT20)	All Channel	14.00	15.00	No
	802.11n(HT40)	All Channel	13.50	14.50	No
	802.11ac(VHT20)	All Channel	14.00	15.00	No
	802.11ac(VHT40)	All Channel	13.50	14.50	No
	802.11ac(VHT80)	All Channel	12.00	13.00	No

Band	Mode	Channel	Output Power (dB m)		
			Target	Max. Allowed	SAR Test
Bluetooth	BDR(GFSK)	0	10.00	11.00	Yes
		39	11.00	12.00	
		78	9.00	10.00	
	EDR ($\pi/4$ DQPSK) EDR(8DPSK)	0	8.50	9.50	No
		39	10.00	11.00	
		78	8.00	9.00	
	LE(GFSK)	0	4.00	5.00	No
		19	6.00	7.00	
		39	5.00	6.00	

2.4.4 Reduced WLAN Output Power (RCV)

Band	Mode	Channel	Output Power (dB m)		
			Target	Max. Allowed	SAR Test
U-NII-1	802.11a	All Channel	9.00	10.00	No
	802.11n(HT20)	All Channel	9.00	10.00	No
	802.11n(HT40)	All Channel	9.50	10.50	No
	802.11ac(VHT20)	All Channel	9.00	10.00	No
	802.11ac(VHT40)	All Channel	9.50	10.50	No
	802.11ac(VHT80)	All Channel	9.50	10.50	No
U-NII-2A	802.11a	All Channel	9.00	10.00	No
	802.11n(HT20)	All Channel	9.00	10.00	No
	802.11n(HT40)	All Channel	9.50	10.50	No
	802.11ac(VHT20)	All Channel	9.00	10.00	No
	802.11ac(VHT40)	All Channel	9.50	10.50	No
	802.11ac(VHT80)	All Channel	9.50	10.50	Yes
U-NII-2C	802.11a	All Channel	10.00	11.00	No
	802.11n(HT20)	All Channel	10.00	11.00	No
	802.11n(HT40)	All Channel	10.50	11.50	No
	802.11ac(VHT20)	All Channel	10.00	11.00	No
	802.11ac(VHT40)	All Channel	10.50	11.50	No
	802.11ac(VHT80)	All Channel	10.50	11.50	Yes
U-NII-3	802.11a	All Channel	9.00	10.00	No
	802.11n(HT20)	All Channel	9.00	10.00	No
	802.11n(HT40)	All Channel	10.00	11.00	Yes
	802.11ac(VHT20)	All Channel	9.00	10.00	No
	802.11ac(VHT40)	All Channel	10.00	11.00	No
	802.11ac(VHT80)	All Channel	9.00	10.00	No

2.5 #DUT Antenna Locations

The overall dimensions of this device are > 9 x 5 cm. A diagram showing the location of the device antennas can be found in Appendix C. Since the diagonal dimension of this device is > 160 mm and < 200 mm, it is considered a "Phablet".

Mode	Device Edge for SAR Testing (Front View)					
	Front	Rear	Left Edge	Right Edge	Top	Bottom
GPRS 850	Yes	Yes	Yes	Yes	No	Yes
GPRS 1900	Yes	Yes	Yes	Yes	No	Yes
WCDMA Band II	Yes	Yes	Yes	Yes	No	Yes
WCDMA Band IV	Yes	Yes	Yes	Yes	No	Yes
WCDMA Band V	Yes	Yes	Yes	Yes	No	Yes
LTE Band 2	Yes	Yes	Yes	Yes	No	Yes
LTE Band 5	Yes	Yes	Yes	Yes	No	Yes
LTE Band 12	Yes	Yes	Yes	Yes	No	Yes
LTE Band 26	Yes	Yes	Yes	Yes	No	Yes
LTE Band 41	Yes	Yes	Yes	No	Yes	No
LTE Band 66	Yes	Yes	Yes	Yes	No	Yes
2.4 GHz WLAN	Yes	Yes	No	Yes	Yes	No
5 GHz WLAN	Yes	Yes	No	Yes	Yes	No
Bluetooth	Yes	Yes	No	Yes	Yes	No

Note: Particular DUT edges were not required to be evaluated for Hotspot SAR or Phablet SAR if the edges were greater than 2.5 cm from the transmitting antenna according to FCC KDB Publication 941225 D06v02r01 and FCC KDB Publication 648474 D04v01r03. The antenna document shows the distances between the transmit antennas and the edges of the device. When Hotspot mode is enabled, U-NII-1, U-NII-2A, U-NII-2C operations is disabled.

2.6 Near Field Communications (NFC) Antenna

This DUT has NFC operations. The NFC antenna is integrated into the device for the model. Therefore, all SAR test were performed with the device which already incorporates the NFC antenna. A diagram showing the location of the NFC antenna can be found in Appendix C.

2.7 #Simultaneous Transmission Configurations

According to FCC KDB 447498 D01v06, transmitters are considered to be transmitting simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds.

This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis according to FCC KDB Publication 447498 D01v06 4.3.2 procedures.

No	Scenario	RF Exposure Condition			
		Head	Body-Worn	Hotspot	Phablet
1	GSM Voice + WLAN 2.4 GHz	Yes	Yes	No	Yes
2	GSM Voice + WLAN 5 GHz	Yes	Yes	No	Yes
3	GSM Voice + 2.4 GHz Bluetooth	Yes	Yes	No	Yes
4	GSM Voice + 2.4 GHz Bluetooth + WLAN 5 GHz	No	No	No	No
5	WCDMA + WLAN 2.4 GHz	Yes	Yes	Yes	Yes
6	WCDMA + WLAN 5 GHz	Yes	Yes	Yes	Yes
7	WCDMA + 2.4 GHz Bluetooth	Yes	Yes	Yes	Yes
8	WCDMA + 2.4 GHz Bluetooth + WLAN 5 GHz	No	No	No	No
9	LTE + WLAN 2.4 GHz	Yes	Yes	Yes	Yes
10	LTE + WLAN 5 GHz	Yes	Yes	Yes	Yes
11	LTE + 2.4 GHz Bluetooth	Yes	Yes	Yes	Yes
12	LTE + 2.4 GHz Bluetooth + WLAN 5 GHz	No	No	No	No
13	GPRS/EDGE + WLAN 2.4 GHz	Yes	Yes	Yes	Yes
14	GPRS/EDGE + WLAN 5 GHz	Yes	Yes	Yes	Yes
15	GPRS/EDGE + 2.4 GHz Bluetooth	Yes	Yes	Yes	Yes
16	GPRS/EDGE + 2.4 GHz Bluetooth + WLAN 5 GHz	No	No	No	No

Notes:

- It does not to transmit simultaneously the Bluetooth and 2.4 GHz & 5 GHz WLAN.
- It is to use the Bluetooth and 2.4 GHz WLAN same antenna path.
- WLAN Hotspot is supported for 2.4 GHz and UNII-3 of 5 GHz WLAN.
- This device supports Bluetooth Tethering.
- This device supports VoLTE.
- This device supports VoWIFI.
- 5 GHz Hotspot mode is only supported for the UNII-3, therefore U-NII-1, U-NII-2A, U-NII-2C were not evaluated for Hotspot mode conditions.

2.8 Miscellaneous SAR Test Considerations

(A) WIFI/BT

Since U-NII-1 and U-NII-2A bands have the same maximum output power and the highest reported SAR for U-NII-2A is less than 1.2 W/kg, SAR is not required for U-NII-1 band according to FCC KDB publication 248227 D01v02r02.

Since Wireless Router operations are not allowed by the chipset firmware using U-NII-1, U-NII-2A & U-NII-2C WIFI, only 2.4GHz and U-NII-3 WIFI Hotspot SAR tests and combinations are considered for SAR with respect to Wireless Router configurations according to FCC KDB 941225 D06v02r01.

Per FCC KDB Publication 648474 D04v01r03, this device is considered a “phablet” since the diagonal dimension is greater than 160mm and less than 200mm. Phablet SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR > 1.2 W/kg. Because wireless router operations are not supported for U-NII-1, U-NII-2A & U-NII-2C WLAN, phablet SAR tests were performed. Phablet SAR was not evaluated for 2.4 GHz WLAN, Bluetooth, and U-NII-3 WLAN operations since wireless router 1g SAR was < 1.2 W/kg.

Per FCC KDB 447498 D01v06, the 1g SAR exclusion threshold for distances < 50 mm is defined by the following equation:

$$\frac{\text{Max Power of Channel(mW)}}{\text{Test Separation Distance(mm)}} \times \sqrt{\text{Frequency(GHz)}} \leq 3.0(1\text{g} - \text{SAR}), 7.5(10\text{g} - \text{SAR})$$

Mode	Position	Frequency	Maximum Allowed Power	Separation Distance	≤ 3.0 Not Required	≤ 7.5 Not Required
		MHz	mW	mm	1g-SAR	10g-SAR
Bluetooth	Head	2 441.0	16	5	5.0	N/A
	Body-Worn	2 441.0	16	15	1.7	N/A
	Hotspot	2 441.0	16	10	2.5	N/A
	Phablet	2 441.0	16	5	N/A	5.0
Bluetooth LE	Head	2 440.0	5	5	1.6	N/A
	Body-Worn	2 440.0	5	15	0.5	N/A
	Hotspot	2 440.0	5	10	0.8	N/A
	Phablet	2 440.0	5	5	N/A	1.6

Formulas round separation distance to nearest mm and power to nearest mW before calculating thresholds or exemption values.

(B) Licensed Transmitter(s)

GSM/GPRS/EDGE DTM is not supported for US bands. Therefore, the GSM Voice modes in this report do not transmit simultaneously with GPRS/EDGE Data.

This device is only capable of QPSK HSUPA in the uplink. Therefore, no additional SAR tests are required beyond that described for devices with HSUPA in KDB 941225 D01v03r01.

This device supports LTE capabilities with overlapping transmission frequency ranges. When the

supported frequency range of an LTE Band falls completely within an LTE band with a larger transmission frequency range, both LTE bands have the same target power (or the band with the larger transmission frequency range has a higher target power), and both LTE bands share the same transmission path and signal characteristics, SAR was only assessed for the band with the larger transmission frequency range.

LTE SAR for the higher modulations and lower bandwidths were not tested since the maximum average output power of all required channels and configurations was not more than 0.5 dB higher than the highest bandwidth and the reported LTE SAR for the highest bandwidth was less than 1.45 W/kg for all configurations according to FCC KDB 941225 D05v02r04.

2.9 SAR Test Methods and Procedures

The tests documented in this report were performed in accordance with IEEE 1528-2013 and the following published KDB procedures:

- IEEE 1528-2013
- 248227 D01 802.11 Wi-Fi SAR v02r02
- 447498 D01 General RF Exposure Guidance v06
- 616217 D04 SAR for laptop and tablets v01r02 (Proximity Sensor)
- 648474 D04 Handset SAR v01r03
- 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04
- 865664 D02 RF Exposure Reporting v01r02
- 941225 D01 3G SAR Procedures v03r01
- 941225 D05 SAR for LTE Devices v02r05
- 941225 D06 Hotspot Mode v02r01
- 941225 D05A LTE Rel. 10 KDB Inquiry Sheet v01r02
- October 2014 TCB Workshop Notes (Other LTE Considerations)
- October 2016 TCB Workshop Notes (Bluetooth Duty Factor)
- April 2019 TCB Workshop Notes (Tissue Simulation Liquids)

3. #LTE Information

LTE Information					
Form Factor	Portable Handset				
Frequency Range of each LTE transmission band	LTE Band 2 (1 850.7 ~ 1 909.3 MHz) LTE Band 4 (1 710.7 ~ 1 754.3 MHz) LTE Band 5 (824.7 ~ 848.3 MHz) LTE Band 12 (699.7 ~ 715.3 MHz) LTE Band 17 (706.5 ~ 713.5 MHz) LTE Band 26 (814.7 ~ 848.3 MHz) LTE Band 41 (2 498.5 ~ 2 687.5 MHz) LTE Band 66 (1 710.7 ~ 1 779.3 MHz)				
Channel Bandwidths	LTE Band 2: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz LTE Band 4: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz LTE Band 5: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz LTE Band 12: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz LTE Band 17: 5 MHz, 10 MHz LTE Band 26: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz LTE Band 41: 5 MHz, 10 MHz, 15 MHz, 20 MHz LTE Band 66: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz				
Channel Numbers and Frequencies (MHz)	Low	Low-Mid	Mid	Mid-High	High
LTE Band 2: 1.4 MHz	1 850.7 (18 607)		1 880.0 (18 900)		1 909.3 (19 193)
LTE Band 2: 3 MHz	1 851.5 (18 615)		1 880.0 (18 900)		1 908.5 (19 185)
LTE Band 2: 5 MHz	1 852.5 (18 625)		1 880.0 (18 900)		1 907.5 (19 175)
LTE Band 2: 10 MHz	1 855.0 (18 650)		1 880.0 (18 900)		1 905.0 (19 150)
LTE Band 2: 15 MHz	1 857.5 (18 675)		1 880.0 (18 900)		1 902.5 (19 125)
LTE Band 2: 20 MHz	1 860.0 (18 700)		1 880.0 (18 900)		1 900.0 (19 100)
LTE Band 4: 1.4 MHz	1 710.7 (19 957)		1 732.5 (20 175)		1 754.3 (20 393)
LTE Band 4: 3 MHz	1 711.5 (19 965)		1 732.5 (20 175)		1 753.5 (20 385)
LTE Band 4: 5 MHz	1 712.5 (19 975)		1 732.5 (20 175)		1 752.5 (20 375)
LTE Band 4: 10 MHz	1 715.0 (20 000)		1 732.5 (20 175)		1 750.0 (20 350)
LTE Band 4: 15 MHz	1 717.5 (20 025)		1 732.5 (20 175)		1 747.5 (20 325)
LTE Band 4: 20 MHz	1 720.0 (20 050)		1 732.5 (20 175)		1 745.0 (20 300)
LTE Band 5: 1.4 MHz	824.7 (20 407)		836.5 (20 525)		848.3 (20 643)
LTE Band 5: 3 MHz	825.5 (20 415)		836.5 (20 525)		847.5 (20 635)
LTE Band 5: 5 MHz	826.5 (20 425)		836.5 (20 525)		846.5 (20 625)
LTE Band 5: 10 MHz	829.0 (20 450)		836.5 (20 525)		844.0 (20 600)
LTE Band 12: 1.4 MHz	699.7 (23 017)		707.5 (23 095)		715.3 (23 173)
LTE Band 12: 3 MHz	700.5 (23 025)		707.5 (23 095)		714.5 (23 655)
LTE Band 12: 5 MHz	701.5 (23 035)		707.5 (23 095)		713.5 (23 155)
LTE Band 12: 10 MHz	704.0 (23 060)		707.5 (23 095)		711.0 (23 130)

KCTL Inc. 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea TEL: 82-31-285-0894 FAX: 82-505-299-8311 www.kctl.co.kr	Report No.: KR20-SPF0031-A Page (17) of (293)	
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Channel Numbers and Frequencies (MHz)	Low	Low-Mid	Mid	Mid-High	High
LTE Band 17: 5 MHz	706.5 (23 755)		710.0 (23 790)		713.5 (23 825)
LTE Band 17: 10 MHz	709.0 (23 780)		710.0 (23 790)		711.0 (23 800)
LTE Band 26: 1.4 MHz	814.7 (26 697)		831.5 (26 865)		848.3 (27 033)
LTE Band 26: 3 MHz	815.5 (26 705)		831.5 (26 865)		847.5 (27 025)
LTE Band 26: 5 MHz	816.5 (26 715)		831.5 (26 865)		846.5 (27 015)
LTE Band 26: 10 MHz	819.0 (26 740)		831.5 (26 865)		844.0 (26 990)
LTE Band 26: 15 MHz	821.5 (26 765)		831.5 (26 865)		841.5 (26 965)
LTE Band 41: 5 MHz	2 506.0 (39 750)	2 549.5 (40 185)	2 593.0 (40 620)	2 636.5 (41 055)	2 680.0 (41 490)
LTE Band 41: 10 MHz	2 506.0 (39 750)	2 549.5 (40 185)	2 593.0 (40 620)	2 636.5 (41 055)	2 680.0 (41 490)
LTE Band 41: 15 MHz	2 506.0 (39 750)	2 549.5 (40 185)	2 593.0 (40 620)	2 636.5 (41 055)	2 680.0 (41 490)
LTE Band 41: 20 MHz	2 506.0 (39 750)	2 549.5 (40 185)	2 593.0 (40 620)	2 636.5 (41 055)	2 680.0 (41 490)
LTE Band 66: 1.4 MHz	1 710.7 (131 979)		1 745.0 (132 322)		1 779.3 (132 665)
LTE Band 66: 3 MHz	1 711.5 (131 987)		1 745.0 (132 322)		1 778.5 (132 657)
LTE Band 66: 5 MHz	1 712.5 (131 997)		1 745.0 (132 322)		1 777.5 (132 647)
LTE Band 66: 10 MHz	1 715.0 (132 022)		1 745.0 (132 322)		1 775.0 (132 622)
LTE Band 66: 15 MHz	1 717.5 (132 047)		1 745.0 (132 322)		1 772.5 (132 597)
LTE Band 66: 20 MHz	1 720.0 (132 072)		1 745.0 (132 322)		1 770.0 (132 572)
UE Category	UL:11, DL:5				
Modulations Supported in UL	QPSK, 16QAM, 64QAM				
LTE MPR Permanently implemented per 3GPP TS 36.101 section 6.2.3 ~ 6.2.5?(manufacturer attestation to be provided)	YES				
A-MPR(Additional MPR) disabled for SAR Testing?	YES				
LTE Carrier Aggregation Possible Combinations	This device not supports LTE CA aggregation.				
LTE Additional Information	The following LTE Release 10 Features are not supported: Relay, HetNet, Enhanced MIMO, eICIC, WIFI Offloading, MDH, eMBMS, Cross-Carrier Scheduling, Enhanced SC-FDMA.				

4. Specific Absorption Rate

4.1 Introduction

The SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational / controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

4.2 SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

$$SAR = \frac{d}{dt} \left(\frac{dW}{dm} \right) = \frac{d}{dt} \left(\frac{dW}{\rho dv} \right)$$

SAR is expressed in units of Watts per kilogram (W/kg)

SAR measurement can be either related to the temperature elevation in tissue by

$$SAR = C \left(\frac{\delta T}{\delta t} \right)$$

Where: C is the specific heat capacity, δT is the temperature rise and δt is the exposure duration, or related to the electrical field in the tissue by

$$SAR = \frac{\sigma |E|^2}{\rho}$$

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength. However for evaluating SAR of low power transmitter, electrical field measurement is typically applied.

5. SAR Measurement Procedures

5.1 SAR Scan Procedures

Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The Minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 1.4 mm. This distance cannot be smaller than the Distance of sensor calibration points to probe tip as defined in the probe properties.

Step 2: Area Scan & Zoom Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot and Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly. Area Scan & Zoom Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04.

			≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5 mm ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2)$ mm 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location			30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area} , Δy_{Area}			≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
			When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	
Maximum zoom scan spatial resolution: Δx_{Zoom} , Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ 1.5 · $\Delta z_{Zoom}(n-1)$ mm	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see IEEE Std 1528-2013 for details.

* When zoom scan is required and the reported SAR from the area scan based 1-g SAR estimation procedures of KDB Publication 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

Step 3: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

6. SAR Measurement Configurations

6.1 Ear Reference Point

Figure 1 shows the front, back and side views of the SAM phantom. The “M” is the reference point for the center of the mouth, “LE” is the left ear reference point (ERP), and “RE” is the right ERP. The ERPs are 15 mm posterior to the entrance to the Ear canal (EEC) along the B-M line (Back-Mouth), as shown in Figure 1. The plane Passing, through the two ear canals and M is defined as the Reference Plane. The line N-F (Neck – Front) is perpendicular to the reference plane and passing through the LE (or RE) is called the Reference Pivoting Line. Both N-F and B-M lines are marked on the external phantom shell to facilitate handset positioning.

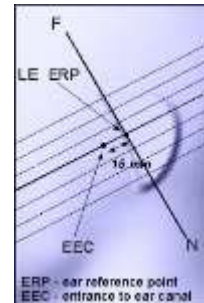


Figure 1
Close-Up Side view of ERP

6.2 Handset Reference Points

Two imaginary lines on the handset were established: the vertical centerline and the horizontal line. The test device was placed in a normal operating position with the acoustic output located along the “vertical centerline” on the front of the device aligned to the “ear reference point” (See Figure 3). The acoustic output was then located at the same level as the center of the ear reference point. The test device was positioned so that the “vertical centerline” was bisecting the front surface of the handset at its top and bottom edges, positioning the “ear reference point” on the outer surface of the both the left and right head phantoms on the ear reference point.



Figure 2
Front, back and side view of SAM Twin Phantom

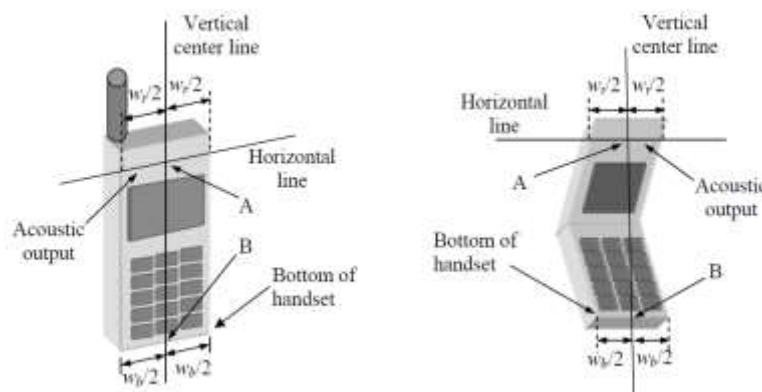


Figure 3
Handset Vertical Center & Horizontal Line Reference Points

6.3 Device Holder

The device holder is made out of low-loss POM material having the following dielectric parameters: relative permittivity $\epsilon = 3$ and loss tangent $\delta = 0.02$.

6.4 Positioning for Cheek/Touch

1. The test device was positioned with the device close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 4), such that the plane defined by the vertical center line and the horizontal line of the phone is approximately parallel to the sagittal plane of the phantom.



Figure 4: Front, Side and Top View of Cheek Position

2. The handset was translated towards the phantom along the line passing through RE & LE until the handset touches the pinna.
3. While maintaining the handset in this plane, the handset was rotated around the LE-RE line until the vertical centerline was in the reference plane.
4. The phone was then rotated around the vertical centerline until the phone (horizontal line) was symmetrical with respect to the line NF.
5. While maintaining the vertical centerline in the reference plane, keeping point A on the line passing through RE and LE, and maintaining the device contact with the ear, the device was rotated about the NF line until any point on the handset made contact with a phantom point below the ear (cheek) (See Figure 5).

6.5 Positioning for Ear / 15° Tilt

With the test device aligned in the “Cheek Position”:

1. While maintaining the orientation of the phone, the phone was retracted parallel to the reference plane far enough to enable a rotation of the phone by 15 degrees.
2. The phone was then rotated around the horizontal line by 15 degrees.
3. While maintaining the orientation of the phone, the phone was moved parallel to the reference plane until any part of the handset touched the head. (In this position, point A was located on the line RE-LE). The tilted position is obtained when the contact is on the pinna. If the contact was at any location other than the pinna, the angle of the phone would then be reduced. In this situation, the tilted position was obtained when any part of the phone was in contact of the ear as well as a second part of the phone was in contact with the head (see Figure 5).



Figure 5: Front, Side and Top View of Ear/ 15° Tilt



Figure 6: Side view w/ relevant markings

6.6 Body-Worn Accessory Configurations

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 7). Per FCC KDB Publication 648474 D04v01r03, Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB Publication 447498 D01v06 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is $> 1.2 \text{ W/kg}$, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

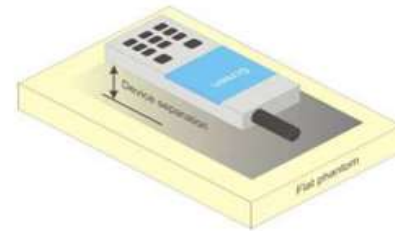


Figure 7
Sample Body-Worn Diagram

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used. Test position spacing was documented. Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom in head fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

6.7 Wireless Router Configurations

Some battery-operated handsets have the capability to transmit and receive user data through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06v02r01 where SAR test considerations for handsets ($L \times W \geq 9 \text{ cm} \times 5 \text{ cm}$) are based on a composite test separation distance of 10 mm from the front, back and edges of the device containing transmitting antennas within 2.5 cm of their edges, determined from general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WIFI transmitter according to FCC KDB Publication 447498 D01v06 procedures. The "Portable Hotspot" feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

6.8 Phablet Configurations

For smart phones with a display diagonal dimension > 150 mm or an overall diagonal dimension > 160 mm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, the phablets procedures outlined in KDB Publication 648474 D04v01r03 should be applied to evaluate SAR compliance. A device marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance. In addition to the normally required head and body-worn accessory SAR test procedures required for handsets, the UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna ≤ 25 mm from that surface or edge, in direct contact with the phantom, for 10g SAR. The UMPC mini-tablet 1g SAR at 5 mm is not required. When hotspot mode applies, 10g SAR is required only for the surfaces and edges with hotspot mode 1g SAR > 1.2 W/kg.

6.9 Proximity Sensor Considerations

This device uses a power reduction mechanism to reduce output powers in certain use conditions when the device is used close to the user's body.

When the device's antenna is within a certain distance of the user, the sensor activates and reduces the maximum allowed output power. However, the sensor is not active when the device is moved beyond the sensor triggering distance and the maximum output power is no longer limited. Therefore, additional evaluation is needed in the vicinity of the triggering distance to ensure SAR is compliant when the device is allowed to operate at a non-reduced output power level. FCC KDB Publication 616217 D04v01r02 Section 6 was used as a guideline for selecting SAR test distances for this device at these additional test positions.

7. RF Exposure Limits

UNCONTROLLED ENVIRONMENTS are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

CONTROLLED ENVIRONMENTS are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Partial Peak SAR ¹⁾ (Partial)	1.60 mW/g	8.00 mW/g
Partial Average SAR ²⁾ (Whole Body)	0.08 mW/g	0.40 mW/g
Partial Peak SAR ³⁾ (Hands/Feet/Ankle/Wrist)	4.00 mW/g	20.00 mW/g

- 1) The spatial Peak value of the SAR averaged over any 1g gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.
- 2) The spatial Average value of the SAR averaged over the whole body.
- 3) The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

8. FCC SAR General Measurement Procedures

8.1 Measured and Reported SAR

Per FCC KDB Publication 447498 D01v06, When SAR is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance. For simultaneous transmission, the measured aggregate SAR must be scaled according to the sum of the differences between the maximum tune-up tolerance and actual power used to test each transmitter. When SAR is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as reported SAR. Test highest reported SAR results are identified on the grant of equipment authorization according to procedures in KDB 690783 D01v01r03.

8.2 3G SAR Test Reduction Procedure

In FCC KDB Publication 941225 D01v03r01, certain transmission modes within a frequency band and wireless mode evaluated for SAR are defined as primary modes. The equivalent modes considered for SAR test reduction are denoted as secondary modes. When the maximum output power including tune-up tolerance specified for production units in a secondary mode is ≤ 0.25 dB higher than the primary mode or when the highest reported SAR of the primary mode, scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode, is ≤ 1.2 W/kg, SAR measurements are not required for the secondary mode. These criteria are referred to as the 3G SAR test reduction procedure. When the 3G SAR test reduction procedure is not satisfied, SAR measurements are additionally required for the secondary mode.

8.3 Procedures Used to Establish RF Signal for SAR

The following procedures are according to FCC KDB Publication 941225 D01v03r01 "3G SAR Measurement Procedures."

The device is placed into a simulated call using a base station simulator in a RF shielded chamber. Establishing connections in this manner ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. Devices under test are evaluated prior to testing, with a fully charged battery and were configured to operate at maximum output power. In order to verify that the device is tested throughout the SAR test at maximum output power, the SAR measurement system measures a "point SAR" at an arbitrary reference point at the start and end of the 1 gram SAR evaluation, to assess for any power drifts during the evaluation. If the power drift deviates by more than 5%, the SAR test and drift measurements are repeated.

8.4 SAR Measurement Conditions for UMTS

8.4.1 Output Power Verification

Maximum output power is verified on the High, Middle and Low channels according to the general descriptions in sec. 5.2 of 3GPP TS 34.121, using the appropriate RMC with TPC (transmit power control) set to all "1s" or applying the required inner loop power control procedures to maintain maximum output power while HSUPA is active. Results for all applicable physical channel configurations (DPCCH, DPDCHn and spreading codes, HS-DPCCH etc) are tabulated in this test report. All configurations that are not supported by the DUT or cannot be measured due to technical or equipment limitations are identified.

8.4.2 Head SAR Measurements

SAR for next to the ear head exposure is measured using a 12.2 kbps RMC with TPC bits configured to all "1's". The 3G SAR test reduction procedure is applied to AMR configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for 12.2 kbps AMR in 3.4 kbps SRB (signaling radio bearer) using the highest reported SAR configuration in 12.2 kbps RMC for head exposure.

8.4.3 Body SAR measurements

SAR for body exposure configurations is measured using the 12.2kbps RMC with the TPC bits all "1s". the 3G SAR test reduction procedure is applied to other spreading codes and multiple DPDCHn configurations supported by the handset with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured using and applicable RMC configuration with the corresponding spreading code or DPDCHn, for the highest reported SAR configuration in 12.2kbps RMC.

8.4.4 SAR Measurements with Rel. 5 HSDPA

The 3G SAR test reduction procedure is applied to HSDPA body configurations with 12.2 kbps RMC as the primary mode. Otherwise, Body SAR for HSDPA is measured using and FRC with H-SET 1 in Sub-test and a 12.2 kbps RMC without HSDPA. Handsets with both HSDPA and HSUPA are tested according to release 6 HSPA test procedures. 8.4.5 SAR Measurement with Rel.6 HSUPA The 3G SAR test Reduction Procedure is applied to HSPA (HSUPA/HSDPA with RMC) body configurations with 12.2 kbps RMC as the primary mode. Otherwise, Body SAR for HSPA is measured with E-DCH Sub-test 5, Using H-Set 1 and QPSK for FRC and a 12.2kbps RMC configured in Test Loop Mode 1 and Power Control algorithm 2, according to the highest reported body SAR configuration in 12.2 kbps RMC without HSPA. When VOIP applies to head exposure, the 3G SAR test reduction procedure is applied with 12.2 kbps RMC as the primary mode; otherwise, the same HSPA configuration used for body SAR measurements are applied to head exposure testing.

8.4.5 SAR Measurements with Rel. 6 HSUPA

The 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) body configurations with 12.2 kbps RMC as the primary mode. Otherwise, Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 and power control algorithm 2, according to the highest reported body SAR configuration in 12.2 kbps RMC without HSPA.

8.4.6 SAR Measurements with Rel. 8 DC-HSDPA

SAR is required for Rel. 8 DC-HSDPA when SAR is required for Rel. 5 HSDPA; otherwise, the 3G SAR test reduction procedure is applied to DC-HSDPA with 12.2 kbps RMC as the primary mode. Power is measured for DC-HSDPA according to the H-Set 12, FRC configuration in Table C.8.1.12 of 3GPP TS 34.121-1 to determine SAR test reduction. A primary and a secondary serving HS-DSCH Cell are required to perform the power measurement and for the results to be acceptable

8.5 SAR Measurement Conditions for LTE

LTE modes are tested according to FCC KDB 941225 D05v02r05 publication. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluation SAR [4]. The R&S CMW500 or Anritsu MT8820C simulators are used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

8.5.1 Spectrum Plots for RB Configurations

A properly configured base station simulator was used for SAR tests and power measurements. Therefore, spectrum plots for RB configurations were not required to be included in this report.

8.5.2 MPR

MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36. 101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.

8.5.3 A-MPR

A-MPR (Additional MPR) has been disabled for all SAR tests by setting NS=01 on the base station simulator

8.5.4 Required RB Size and RB offsets for SAR testing

According to FCC KDB 941225 D05v02r05

1. Per sec 4.2.1, SAR is required for QPSK 1 RB Allocation for the largest bandwidth
 - a. The required channel and offset combination with the highest maximum output power is required for SAR.
 - b. When the reported SAR is ≤ 0.8 W/Kg, testing of the remaining RB offset configurations and required test channels is not required. Otherwise, SAR is required for the remaining required test channels using the RB offset configuration with highest output power for that channel.
 - c. When the reported SAR for a required test channel is > 1.45 W/kg, SAR is required for all RB offset configurations for that channel
2. Per Sec 4.2.2, SAR is required for 50% RB allocation using the largest bandwidth following the same procedures outlined in Sec 4.2.1.
3. Per Sec. 4.2.3, QPSK SAR is not required for the 100% allocation when the highest maximum output power for the 100% allocation is less than the highest maximum output power of the 1 RB and 50% RB allocations and the reported SAR for the 1 RB and 50% RB allocations is < 0.8 W/kg.
4. Per Sec. 4.2.4 and 4.3, SAR test for higher order modulations and lower bandwidths configurations are not required when the conducted power of the required test configurations determined by Sec. 4.2.1 through 4.2.3 is less than or equal to 1/2 dB higher than the equivalent configuration using QPSK modulation and when the QPSK SAR for those configurations is < 1.45 W/Kg.

8.5.5 LTE(TDD) Considerations

According to KDB 941225 D05v02r05, for Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.

SAR was tested with the highest transmission duty factor (63.33 %) using Uplink-downlink configuration 0 and Special sub-frame configuration 6.

LTE TDD Band supports 3GPP TS 36.211 section 4.2 for Type 2 Frame and Table 4.2-2 for uplink-downlink configurations and Table 4.2-1 for Special sub frame configurations.

Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS)

Special subframe configuration n	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	$6592 \cdot T_s$	$(1+X) \cdot 2192 \cdot T_s$	$(1+X) \cdot 2560 \cdot T_s$	$7680 \cdot T_s$	$(1+X) \cdot 2192 \cdot T_s$	$(1+X) \cdot 2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$	$(2+X) \cdot 2192 \cdot T_s$	$(2+X) \cdot 2560 \cdot T_s$	$7680 \cdot T_s$	$(2+X) \cdot 2192 \cdot T_s$	$(2+X) \cdot 2560 \cdot T_s$
5	$6592 \cdot T_s$			$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$	$13152 \cdot T_s$	$12800 \cdot T_s$	-	-	-
9	$13168 \cdot T_s$			-	-	-
10	$13168 \cdot T_s$			-	-	-

Table 4.2-2: Uplink-downlink configurations

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

Calculated Duty Cycle – Extended cyclic prefix in uplink x (Ts) x # of S + # of U

Example for calculated Duty Cycle for Uplink-Downlink Configuration 0:

Calculated Duty Cycle = $(5120 \times [1/(15000 \times 2048)] \times 2 + 0.006)/0.01 = 63.33 \%$

Ts = 1/(15000 x 2048) seconds

8.6 SAR Testing with 802.11 Transmitters

The normal network operating configurations are not suitable for measuring the SAR of 802.11 a/b/g transmitters. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure the results are consistent and reliable.

8.6.1 General Device Setup

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters. A periodic duty factor is required for current generation SAR systems to measure SAR. When 802.11 frame gaps are accounted for in the transmission, a maximum transmission duty factor of 92 – 96% is typically achievable in most test mode configurations. A minimum transmission duty factor of 85% is required to avoid certain hardware and device implementation issues related to wide range SAR scaling. The reported SAR is scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

8.6.2 U-NII-1 and U-NII-2A

For devices that operate in both U-NII-1 and U-NII-2A bands, when the same maximum output power is specified for both bands, SAR measurement using OFDM SAR test procedures is not required for U-NII-1 unless the highest reported SAR for U-NII-2A is > 1.2 W/kg. When different maximum output powers is not required unless the highest reported SAR for the U-NII band with the higher maximum output power, adjusted by the ratio of lower to higher specified maximum output power for the two bands, is > 1.2 W/kg. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

8.6.3 U-NII-2C and U-NII-3

The frequency range covered by U-NII-2C and U-NII-3 is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. When Terminal Doppler Weather Radar (TDWR) restriction applies, the channels at 5.60 – 5.65 GHz in U-NII-2C band must be disabled with acceptable mechanisms and documented in the equipment certification. Unless band gap channels are permanently disabled, SAR must be considered for these channels. When band gap channels are disabled, each band is tested independently according to the normally required OFDM SAR measurement and probe calibration frequency point requirements.

8.6.4 Initial Test Position Procedure

For exposure conditions with multiple test positions, such as handset operating next to the ear, devices with hotspot mode or UMPC mini-tablet, procedures for initial test position can be applied. Using the transmission mode determined by the DSSS procedure or initial test configuration, area scans are measured for all positions in an exposure condition. The test position with the highest extrapolated (peak) SAR is used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg, no additional testing for the remaining test positions is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured.

8.6.5 2.4 GHz SAR Test Requirement

SAR is measured for 2.4 GHz 802.11b DSSS using either the fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following.

- 1) When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
- 2) When the reported SAR is > 0.8 W/kg, SAR is required for that position using the next highest measured output power channel; i.e., all channels require testing.

2.4 GHz 802.11g/n OFDM are additionally evaluated for SAR if highest reported SAR for 802.11b, adjusted by the ratio of the OFDM to DSSS specified maximum output power, is > 1.2 W/kg. When SAR is required for OFDM modes in 2.4 GHz band, the Initial Test Configuration Procedures should be followed.

8.6.6 OFDM Transmission Mode and SAR Test Channel Selection

For the 2.4 GHz and 5 GHz band, when the same maximum output power was specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration with the largest channel bandwidth, lowest order modulation and lowest data rate. When the maximum output power of a channel is the same for equivalent OFDM configurations; for example, 802.11a, 802.11n and 802.11ac or 802.11g and 802.11n with the same channel band width, modulation and data rate etc., the lower order 802.11 mode i.e., 802.11a, then 802.11n and 802.11ac or 802.11g then 802.11n, is used for SAR measurement. When maximum output power are the same for multiple test channels, either according to the default or additional power measurement requirements, SAR is measured using the channel closest to the middle of the frequency band or aggregated band. When there are multiple channels with the same maximum output power, SAR is measured using the higher number channel.

8.6.7 Initial Test Configuration Procedure

For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration is determined for each frequency band and aggregated band, according to the transmission mode with the highest maximum output power specified for SAR measurements. When the same maximum output power is specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration(s) with the largest channel bandwidth, lowest order modulation, and lowest data rate. If the average RF output powers of the highest identical transmission modes are within 0.25 dB of each other, mid channel of the transmission mode with highest average RF output power is the initial test channel. Otherwise, the channel of the transmission mode with the highest average RF output conducted power will be the initial test configuration.

When the reported SAR is ≤ 0.8 W/kg, no additional measurements on other test channels are required. Otherwise, SAR is evaluated using the subsequent highest average RF output channel until the reported SAR result is ≤ 1.2 W/kg or all channels are measured. When there are multiple untested channels having the same subsequent highest average RF output power, the channel with higher frequency from the lowest 802.11 mode is considered for SAR measurements.

8.6.8 Subsequent Test Configuration Procedures

For OFDM configurations in each frequency band and aggregated band, SAR is evaluated for initial test configuration using the fixed test position or the initial test position procedure. When the highest reported SAR (for the initial test configuration), adjusted by the ratio of the specified maximum output power of the subsequent test configuration to initial test configuration, is ≤ 1.2 W/kg, no additional SAR tests for the subsequent test configurations are required. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

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9. RF Average Conducted Output Power**9.1 GSM Average Conducted Output Power (Maximum Average Power)**

Maximum Burst-Average Output Power (dB m)										
Band	Channel	GSM	GPRS (GMSK)				EGPRS (8-PSK)			
		Voice	1Tx	2Tx	3Tx	4Tx	1Tx	2Tx	3Tx	4Tx
GSM 850	128	33.85	33.87	30.88	28.58	27.29	26.94	24.63	23.12	21.76
	190	33.41	33.43	30.43	28.22	27.00	26.96	24.56	23.15	21.79
	251	33.39	33.40	30.41	28.10	26.88	26.65	24.36	22.94	21.56
GSM 1900	512	30.94	30.95	29.35	25.77	25.55	25.97	24.27	22.40	21.63
	661	30.88	30.91	29.08	25.50	25.38	25.75	24.01	22.15	21.29
	810	30.66	30.68	29.01	25.56	25.33	25.72	23.98	22.10	21.32

Maximum Frame-Average Output Power (dB m)										
Band	Channel	GSM	GPRS (GMSK)				EGPRS (8-PSK)			
		Voice	1Tx	2Tx	3Tx	4Tx	1Tx	2Tx	3Tx	4Tx
GSM 850	128	24.82	24.84	24.86	24.32	24.28	17.91	18.61	18.86	18.75
	190	24.38	24.40	24.41	23.96	23.99	17.93	18.54	18.89	18.78
	251	24.36	24.37	24.39	23.84	23.87	17.62	18.34	18.68	18.55
GSM 1900	512	21.91	21.92	23.33	21.51	22.54	16.94	18.25	18.14	18.62
	661	21.85	21.88	23.06	21.24	22.37	16.72	17.99	17.89	18.28
	810	21.63	21.65	22.99	21.30	22.32	16.69	17.96	17.84	18.31
GSM 850	Frame	25.47	25.47	25.48	25.24	24.99	18.97	19.48	19.74	19.49
GSM 1900	Avg, Target	22.47	22.47	23.98	22.24	23.49	17.47	18.98	18.74	19.49

9.2 WCDMA Average Conducted Output Power (Maximum Average Power)

Band	Mode	Average Conducted Power (dB m)			3GPP MPR [dB]
		Channel			
		9 262	9 400	9 538	
WCDMA Band II	RMC	23.25	23.51	23.47	-
	HSDPA-Subtest 1	20.86	20.74	20.69	0
	HSDPA-Subtest 2	20.23	20.18	20.13	0
	HSDPA-Subtest 3	19.62	19.51	19.63	0.5
	HSDPA-Subtest 4	19.52	19.36	19.32	0.5
	HSUPA-Subtest 1	20.92	20.88	20.82	0
	HSUPA-Subtest 2	18.25	18.00	18.01	2
	HSUPA-Subtest 3	18.26	18.01	18.00	1
	HSUPA-Subtest 4	18.15	18.04	17.99	2
	HSUPA-Subtest 5	20.92	20.78	20.87	0
	DC-HSDPA-Subtest 1	19.99	20.81	20.82	0
	DC-HSDPA-Subtest 2	20.93	20.84	20.81	0
	DC-HSDPA-Subtest 3	20.43	20.25	20.25	0.5
	DC-HSDPA-Subtest 4	20.44	20.29	20.25	0.5

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
www.kctl.co.kr

Report No.:
KR20-SPF0031-A
Page (33) of (293)



Band	Mode	Average Conducted Power (dB m)			3GPP MPR [dB]
		Channel			
		1 312	1 412	1 513	
WCDMA Band IV	RMC	23.35	23.32	22.94	-
	HSDPA-Subtest 1	22.06	22.24	21.84	0
	HSDPA-Subtest 2	21.48	21.31	21.12	0
	HSDPA-Subtest 3	19.75	19.55	19.51	0.5
	HSDPA-Subtest 4	19.65	19.54	19.50	0.5
	HSUPA-Subtest 1	22.21	22.29	21.88	0
	HSUPA-Subtest 2	20.21	20.25	19.98	2
	HSUPA-Subtest 3	19.67	19.56	19.54	1
	HSUPA-Subtest 4	20.18	20.13	19.74	2
	HSUPA-Subtest 5	22.22	22.28	21.90	0
	DC-HSDPA-Subtest 1	22.68	22.29	21.78	0
	DC-HSDPA-Subtest 2	22.16	22.14	21.81	0
	DC-HSDPA-Subtest 3	20.14	20.13	19.83	0.5
	DC-HSDPA-Subtest 4	20.07	20.14	19.77	0.5

Band	Mode	Average Conducted Power (dB m)			3GPP MPR [dB]
		Channel			
		4 132	4 183	4 233	
WCDMA Band V	RMC	24.66	24.59	24.45	-
	HSDPA-Subtest 1	23.57	23.48	23.43	0
	HSDPA-Subtest 2	23.02	22.87	22.82	0
	HSDPA-Subtest 3	21.46	21.37	21.35	0.5
	HSDPA-Subtest 4	21.39	21.32	21.30	0.5
	HSUPA-Subtest 1	23.71	23.58	23.47	0
	HSUPA-Subtest 2	21.68	21.63	21.57	2
	HSUPA-Subtest 3	22.65	22.63	22.54	1
	HSUPA-Subtest 4	21.58	21.51	21.47	2
	HSUPA-Subtest 5	23.73	23.65	23.64	0
	DC-HSDPA-Subtest 1	23.63	23.57	23.51	0
	DC-HSDPA-Subtest 2	23.64	23.53	23.48	0
	DC-HSDPA-Subtest 3	22.13	22.02	21.92	0.5
	DC-HSDPA-Subtest 4	22.12	22.02	21.91	0.5

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
www.kctl.co.kr

Report No.:
KR20-SPF0031-A
Page (34) of (293)



9.3 WCDMA Average Conducted Output Power (Reduced Average Power) (Hotspot, Grip Sensor, Earjack)

Band	Mode	Average Conducted Power (dB m)			3GPP MPR [dB]
		Channel			
		9 262	9 400	9 538	
WCDMA Band II	RMC	22.69	22.59	22.57	-
	HSDPA-Subtest 1	19.58	19.45	19.39	0
	HSDPA-Subtest 2	19.00	18.80	18.79	0
	HSDPA-Subtest 3	18.23	18.14	18.04	0.5
	HSDPA-Subtest 4	18.29	18.12	18.03	0.5
	HSUPA-Subtest 1	19.64	19.54	19.51	0
	HSUPA-Subtest 2	17.23	17.03	17.08	2
	HSUPA-Subtest 3	17.22	17.02	17.08	1
	HSUPA-Subtest 4	17.20	17.03	17.10	2
	HSUPA-Subtest 5	19.66	19.52	19.54	0
	DC-HSDPA-Subtest 1	18.66	19.51	19.49	0
	DC-HSDPA-Subtest 2	19.67	19.55	19.50	0
	DC-HSDPA-Subtest 3	19.11	18.98	18.97	0.5
	DC-HSDPA-Subtest 4	19.10	19.00	19.03	0.5

Band	Mode	Average Conducted Power (dB m)			3GPP MPR [dB]
		Channel			
		1 312	1 412	1 513	
WCDMA Band IV	RMC	21.66	21.73	21.38	-
	HSDPA-Subtest 1	20.56	20.71	20.34	0
	HSDPA-Subtest 2	19.95	20.08	19.81	0
	HSDPA-Subtest 3	18.74	18.57	18.51	0.5
	HSDPA-Subtest 4	18.61	18.53	18.50	0.5
	HSUPA-Subtest 1	20.81	20.80	20.42	0
	HSUPA-Subtest 2	18.68	18.78	18.42	2
	HSUPA-Subtest 3	18.13	18.10	18.05	1
	HSUPA-Subtest 4	18.45	18.56	18.15	2
	HSUPA-Subtest 5	20.76	20.80	20.40	0
	DC-HSDPA-Subtest 1	20.70	20.79	20.29	0
	DC-HSDPA-Subtest 2	20.59	20.55	20.31	0
	DC-HSDPA-Subtest 3	18.61	18.54	18.52	0.5
	DC-HSDPA-Subtest 4	18.54	18.53	18.51	0.5

9.4 LTE Average Conducted Output Power (Maximum Average Power)

9.4.1 LTE Band 2

Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				18 700	18 900	19 100	
				1 860.0 MHz	1 880.0 MHz	1 900.0 MHz	
20 MHz	QPSK	1	0	23.36	23.37	23.27	0
		1	49	23.35	23.29	23.20	0
		1	99	23.26	23.32	23.10	0
		50	0	22.32	22.39	22.31	1
		50	24	22.34	22.38	22.26	1
		50	50	22.25	22.37	22.22	1
		100	0	22.30	22.35	22.31	1
	16QAM	1	0	22.62	22.40	22.16	1
		1	49	22.72	22.29	22.10	1
		1	99	22.61	22.33	22.09	1
		50	0	21.43	21.43	21.54	2
		50	24	21.48	21.46	21.51	2
		50	50	21.40	21.51	21.39	2
		100	0	21.43	21.45	21.49	2
	64QAM	1	0	21.65	21.67	21.60	2
		1	49	21.74	21.57	21.40	2
		1	99	21.73	21.62	21.45	2
		50	0	20.51	20.38	20.42	3
		50	24	20.46	20.49	20.43	3
		50	50	20.31	20.47	20.37	3
		100	0	20.42	20.45	20.48	3

KCTL Inc.

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Suwon-si, Gyeonggi-do, 16677, Korea
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www.kctl.co.kr

Report No.:
KR20-SPF0031-A
Page (36) of (293)



Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				18 675	18 900	19 125	
				1 857.5 MHz	1 880.0 MHz	1 902.5 MHz	
15 MHz	QPSK	1	0	23.26	23.31	23.10	0
		1	36	23.27	23.30	23.16	0
		1	74	23.28	23.31	23.00	0
		36	0	22.28	22.25	22.19	1
		36	18	22.32	22.35	22.17	1
		36	37	22.24	22.36	22.13	1
		75	0	22.30	22.31	22.20	1
	16QAM	1	0	22.65	22.54	22.38	1
		1	36	22.73	22.55	22.38	1
		1	74	22.66	22.61	22.22	1
		36	0	21.43	21.41	21.34	2
		36	18	21.47	21.44	21.31	2
		36	37	21.41	21.45	21.28	2
		75	0	21.42	21.45	21.33	2
	64QAM	1	0	21.66	21.64	21.50	2
		1	36	21.66	21.54	21.68	2
		1	74	21.68	21.66	21.58	2
		36	0	20.47	20.41	20.42	3
		36	18	20.61	20.49	20.44	3
		36	37	20.46	20.58	20.38	3
		75	0	20.55	20.47	20.42	3

KCTL Inc.

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Report No.:
KR20-SPF0031-A
Page (37) of (293)



Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				18 650	18 900	19 150	
				1 855.0 MHz	1 880.0 MHz	1 905.0 MHz	
10 MHz	QPSK	1	0	23.34	23.33	23.13	0
		1	25	23.30	23.29	23.15	0
		1	49	23.34	23.37	23.05	0
		25	0	22.12	22.13	22.00	1
		25	12	22.16	22.26	22.03	1
		25	25	22.16	22.17	22.05	1
		50	0	22.14	22.18	22.03	1
	16QAM	1	0	22.78	22.75	22.23	1
		1	25	22.68	22.62	22.21	1
		1	49	22.80	22.66	22.06	1
		25	0	21.95	21.91	21.88	2
		25	12	21.96	21.94	21.87	2
		25	25	21.99	21.93	21.85	2
		50	0	21.92	21.97	21.84	2
	64QAM	1	0	21.73	21.74	20.46	2
		1	25	21.63	21.70	20.46	2
		1	49	21.82	21.67	21.33	2
		25	0	20.43	20.47	20.33	3
		25	12	20.53	20.49	20.36	3
		25	25	20.46	20.47	20.37	3
		50	0	20.51	20.46	20.32	3

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65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
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Report No.:
KR20-SPF0031-A
Page (38) of (293)



Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				18 625	18 900	19 175	
				1 852.5 MHz	1 880.0 MHz	1 907.5 MHz	
5 MHz	QPSK	1	0	23.31	23.26	23.07	0
		1	12	23.37	23.37	23.17	0
		1	24	23.37	23.35	23.00	0
		12	0	22.38	22.39	22.16	1
		12	7	22.41	22.39	22.16	1
		12	13	22.40	22.38	22.13	1
		25	0	22.09	22.02	22.01	1
	16QAM	1	0	22.69	22.57	22.50	1
		1	12	22.79	22.68	22.54	1
		1	24	22.76	22.62	22.43	1
		12	0	21.47	21.47	21.41	2
		12	7	21.55	21.47	21.40	2
		12	13	21.52	21.48	21.33	2
		25	0	21.55	21.46	21.28	2
	64QAM	1	0	21.62	21.63	21.53	2
		1	12	21.71	21.52	21.46	2
		1	24	21.68	21.52	21.44	2
		12	0	20.59	20.48	20.40	3
		12	7	20.60	20.51	20.43	3
		12	13	20.57	20.47	20.43	3
		25	0	20.48	20.47	20.35	3

Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				18 615	18 900	19 185	
				1 851.5 MHz	1 880.0 MHz	1 908.5 MHz	
3 MHz	QPSK	1	0	23.22	23.21	23.03	0
		1	8	23.34	23.27	23.06	0
		1	14	23.23	23.26	23.06	0
		8	0	22.30	22.34	22.10	1
		8	4	22.27	22.31	22.16	1
		8	7	22.27	22.29	22.06	1
		15	0	22.31	22.31	22.15	1
	16QAM	1	0	22.62	22.49	22.08	1
		1	8	22.68	22.53	22.04	1
		1	14	22.62	22.48	22.00	1
		8	0	21.46	21.45	21.24	2
		8	4	21.47	21.46	21.32	2
		8	7	21.45	21.42	21.20	2
		15	0	21.50	21.40	21.24	2
	64QAM	1	0	21.65	21.66	21.53	2
		1	8	21.79	21.57	21.55	2
		1	14	21.65	21.59	21.47	2
		8	0	20.62	20.48	20.40	3
		8	4	20.62	20.57	20.45	3
		8	7	20.61	20.50	20.34	3
		15	0	20.54	20.40	20.32	3

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
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Report No.:
KR20-SPF0031-A
Page (40) of (293)



Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				18 607	18 900	19 193	
				1 850.7 MHz	1 880.0 MHz	1 909.3 MHz	
1.4 MHz	QPSK	1	0	23.30	23.33	23.08	0
		1	3	23.35	23.37	23.00	0
		1	5	23.24	23.30	23.07	0
		3	0	23.29	23.34	23.09	0
		3	1	23.37	23.35	23.12	0
		3	3	23.28	23.36	23.09	0
		6	0	22.32	22.19	22.06	1
	16QAM	1	0	22.26	22.38	22.25	1
		1	3	22.37	22.47	22.34	1
		1	5	22.23	22.37	22.24	1
		3	0	22.42	22.61	22.19	1
		3	1	22.41	22.68	22.27	1
		3	3	22.41	22.64	22.19	1
		6	0	21.36	21.33	21.06	2
	64QAM	1	0	21.63	21.68	21.43	2
		1	3	21.70	21.74	21.50	2
		1	5	21.59	21.62	21.43	2
		3	0	21.62	21.55	21.36	2
		3	1	21.64	21.55	21.40	2
		3	3	21.67	21.53	21.35	2
		6	0	20.51	20.44	20.22	3

9.4.2 LTE Band 5

Band width	Modulation	RB Size	RB offset	Maximum Average Power		MPR
				20 525		
				836.5 MHz		
10 MHz	QPSK	1	0	23.97		0
		1	25	23.93		0
		1	49	23.81		0
		25	0	23.57		1
		25	12	23.53		1
		25	25	23.52		1
		50	0	23.51		1
	16QAM	1	0	23.73		1
		1	25	23.74		1
		1	49	23.64		1
		25	0	22.08		2
		25	12	22.13		2
		25	25	22.02		2
		50	0	22.09		2
	64QAM	1	0	22.38		2
		1	25	22.40		2
		1	49	22.36		2
		25	0	21.76		3
		25	12	21.72		3
		25	25	21.68		3
		50	0	21.70		3

10 MHz Bandwidths does not support at least three non-overlapping channels in certain channel bandwidths. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing per KDB 941225 D05 SAR for LTE Devices.

Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				20 425	20 525	20 625	
				826.5 MHz	836.5 MHz	846.5 MHz	
5 MHz	QPSK	1	0	23.98	24.02	23.81	0
		1	12	24.00	23.96	23.80	0
		1	24	23.94	23.97	23.73	0
		12	0	23.53	23.58	23.38	1
		12	7	23.54	23.53	23.41	1
		12	13	23.49	23.52	23.36	1
		25	0	23.50	23.50	23.31	1
	16QAM	1	0	23.85	23.74	23.65	1
		1	12	23.83	23.78	23.59	1
		1	24	23.74	23.72	23.61	1
		12	0	22.64	22.63	22.48	2
		12	7	22.59	22.61	22.51	2
		12	13	22.54	22.62	22.53	2
		25	0	22.66	22.62	22.46	2
	64QAM	1	0	22.67	22.67	22.45	2
		1	12	22.70	22.65	22.54	2
		1	24	22.59	22.69	22.50	2
		12	0	21.63	21.63	21.41	3
		12	7	21.58	21.61	21.42	3
		12	13	21.55	21.64	21.40	3
		25	0	21.54	21.52	21.36	3

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
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Report No.:
KR20-SPF0031-A
Page (42) of (293)



Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				20 415	20 525	20 635	
				825.5 MHz	836.5 MHz	847.5 MHz	
3 MHz	QPSK	1	0	23.97	23.96	23.83	0
		1	8	23.91	23.92	23.81	0
		1	14	23.92	23.96	23.76	0
		8	0	23.47	23.50	23.37	1
		8	4	23.49	23.53	23.36	1
		8	7	23.42	23.50	23.35	1
		15	0	23.53	23.51	23.34	1
	16QAM	1	0	23.81	23.73	23.27	1
		1	8	23.77	23.72	23.24	1
		1	14	23.76	23.67	23.23	1
		8	0	22.61	22.59	22.42	2
		8	4	22.59	22.62	22.41	2
		8	7	22.59	22.60	22.41	2
		15	0	22.70	22.60	22.33	2
	64QAM	1	0	22.58	22.65	22.40	2
		1	8	22.68	22.68	22.56	2
		1	14	22.61	22.65	22.54	2
		8	0	21.56	21.60	21.39	3
		8	4	21.57	21.68	21.43	3
		8	7	21.56	21.58	21.35	3
		15	0	21.55	21.50	21.42	3

Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				20 407	20 525	20 643	
				824.7 MHz	836.5 MHz	848.3 MHz	
1.4 MHz	QPSK	1	0	23.99	23.92	23.74	0
		1	3	24.03	23.98	23.79	0
		1	5	23.95	23.87	23.71	0
		3	0	24.00	23.98	23.74	0
		3	1	24.07	24.03	23.85	0
		3	3	24.02	24.03	23.77	0
		6	0	23.41	23.40	23.24	1
	16QAM	1	0	23.54	23.63	23.20	1
		1	3	23.60	23.74	23.23	1
		1	5	23.51	23.68	23.17	1
		3	0	23.75	23.55	23.32	1
		3	1	23.76	23.65	23.34	1
		3	3	23.73	23.55	23.35	1
		6	0	22.54	22.45	22.29	2
	64QAM	1	0	22.59	22.63	22.31	2
		1	3	22.71	22.70	22.55	2
		1	5	22.63	22.63	22.32	2
		3	0	22.60	22.58	22.41	2
		3	1	22.65	22.62	22.36	2
		3	3	22.55	22.61	22.42	2
		6	0	21.47	21.45	21.23	3

9.4.3 LTE Band 12

Band width	Modulation	RB Size	RB offset	Maximum Average Power		MPR
				23 095		
				707.5 MHz		
10 MHz	QPSK	1	0	24.21		0
		1	25	23.93		0
		1	49	23.83		0
		25	0	23.08		1
		25	12	23.00		1
		25	25	22.89		1
		50	0	22.95		1
	16QAM	1	0	23.43		1
		1	25	23.29		1
		1	49	23.24		1
		25	0	22.10		2
		25	12	22.06		2
		25	25	21.98		2
		50	0	22.04		2
	64QAM	1	0	22.48		2
		1	25	22.12		2
		1	49	22.14		2
		25	0	21.11		3
		25	12	21.07		3
		25	25	21.02		3
		50	0	21.06		3

10 MHz Bandwidths does not support at least three non-overlapping channels in certain channel bandwidths. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing per KDB 941225 D05 SAR for LTE Devices.

Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				23 035	23 095	23 155	
				701.5 MHz	707.5 MHz	713.5 MHz	
5 MHz	QPSK	1	0	24.19	24.07	23.80	0
		1	12	24.05	23.87	23.82	0
		1	24	24.05	23.87	23.74	0
		12	0	23.10	22.96	22.78	1
		12	7	23.14	22.95	22.89	1
		12	13	23.12	22.88	22.83	1
		25	0	23.09	22.91	22.70	1
	16QAM	1	0	23.38	23.42	23.26	1
		1	12	23.32	23.21	23.35	1
		1	24	23.42	23.26	23.24	1
		12	0	22.26	22.04	21.87	2
		12	7	22.24	22.05	22.06	2
		12	13	22.20	22.01	21.95	2
		25	0	22.18	22.01	21.84	2
	64QAM	1	0	22.46	22.40	22.17	2
		1	12	22.41	22.21	22.04	2
		1	24	22.32	22.09	22.10	2
		12	0	21.26	21.13	20.90	3
		12	7	21.24	21.11	21.03	3
		12	13	21.19	21.02	20.97	3
		25	0	21.21	21.03	20.85	3

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
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Report No.:
KR20-SPF0031-A
Page (44) of (293)



Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				23 025	23 095	23 655	
				700.5 MHz	707.5 MHz	714.5 MHz	
3 MHz	QPSK	1	0	24.15	23.92	23.92	0
		1	8	24.14	23.84	23.86	0
		1	14	24.06	23.90	23.89	0
		8	0	23.19	22.93	22.89	1
		8	4	23.18	22.95	22.91	1
		8	7	23.07	22.87	22.92	1
		15	0	23.08	22.92	22.96	1
	16QAM	1	0	23.48	23.32	23.30	1
		1	8	23.49	23.30	23.15	1
		1	14	23.32	23.10	23.25	1
		8	0	22.35	22.08	22.10	2
		8	4	22.38	22.13	22.08	2
		8	7	22.25	22.01	22.05	2
		15	0	22.22	22.02	22.05	2
	64QAM	1	0	22.48	22.27	22.19	2
		1	8	22.48	22.13	22.28	2
		1	14	22.31	22.15	22.11	2
		8	0	21.40	21.07	21.02	3
		8	4	21.40	21.06	21.08	3
		8	7	21.20	20.99	21.06	3
		15	0	21.21	20.98	20.99	3

Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				23 017	23 095	23 173	
				699.7 MHz	707.5 MHz	715.3 MHz	
1.4 MHz	QPSK	1	0	23.78	23.79	23.66	0
		1	3	23.88	23.91	23.87	0
		1	5	23.79	23.81	23.72	0
		3	0	23.84	23.84	23.74	0
		3	1	23.88	23.87	23.67	0
		3	3	23.86	23.80	23.67	0
		6	0	22.84	22.85	22.74	1
	16QAM	1	0	23.14	23.22	23.05	1
		1	3	23.21	23.28	23.13	1
		1	5	23.07	23.01	23.13	1
		3	0	22.98	22.99	22.84	1
		3	1	22.95	22.99	22.96	1
		3	3	22.92	22.97	22.87	1
		6	0	22.05	22.03	21.91	2
	64QAM	1	0	22.18	22.12	22.09	2
		1	3	22.19	22.20	22.12	2
		1	5	22.14	22.10	21.97	2
		3	0	22.04	22.07	22.03	2
		3	1	22.15	22.10	22.05	2
		3	3	22.05	22.03	21.94	2
		6	0	20.92	20.90	20.84	3

9.4.4 LTE Band 26

Band width	Modulation	RB Size	RB offset	Maximum Average Power	MPR
				26 865	
				831.5 MHz	
15 MHz	QPSK	1	0	24.04	0
		1	36	24.01	0
		1	74	23.89	0
		36	0	23.12	1
		36	18	23.10	1
		36	37	22.99	1
		75	0	23.01	1
	16QAM	1	0	23.21	1
		1	36	23.25	1
		1	74	23.12	1
		36	0	22.17	2
		36	18	22.16	2
		36	37	22.14	2
		75	0	22.15	2
	64QAM	1	0	22.14	2
		1	36	22.07	2
		1	74	22.19	2
		36	0	21.12	3
		36	18	21.13	3
		36	37	21.06	3
		75	0	21.09	3

15 MHz Bandwidths does not support at least three non-overlapping channels in certain channel bandwidths. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing per KDB 941225 D05 SAR for LTE Devices.

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
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Report No.:
KR20-SPF0031-A
Page (46) of (293)



Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				26 740	26 865	26 990	
				819.0 MHz	831.5 MHz	844.0 MHz	
10 MHz	QPSK	1	0	23.94	24.04	24.03	0
		1	25	23.88	24.03	24.01	0
		1	49	23.95	23.93	23.88	0
		25	0	22.96	23.09	23.09	1
		25	12	23.14	23.10	23.08	1
		25	25	23.07	23.09	23.01	1
		50	0	23.13	23.08	23.09	1
	16QAM	1	0	23.59	23.22	23.22	1
		1	25	23.53	23.25	23.08	1
		1	49	23.58	23.14	23.06	1
		25	0	22.13	22.29	22.26	2
		25	12	22.20	22.26	22.26	2
		25	25	22.18	22.20	22.17	2
		50	0	22.20	22.19	22.21	2
	64QAM	1	0	22.05	22.13	22.32	2
		1	25	22.13	22.14	22.15	2
		1	49	22.18	22.19	22.15	2
		25	0	21.03	21.07	21.09	3
		25	12	21.10	21.02	21.10	3
		25	25	21.02	21.02	21.09	3
		50	0	21.07	21.03	21.10	3

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
www.kctl.co.kr

Report No.:
KR20-SPF0031-A
Page (47) of (293)



Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				26 715	26 865	27 015	
				816.5 MHz	831.5 MHz	846.5 MHz	
5 MHz	QPSK	1	0	24.03	24.03	24.08	0
		1	12	24.05	23.99	24.09	0
		1	24	23.98	24.03	24.02	0
		12	0	22.99	23.10	23.07	1
		12	7	22.98	23.12	23.05	1
		12	13	22.95	23.06	23.09	1
		25	0	22.99	23.11	23.04	1
	16QAM	1	0	22.96	23.40	23.17	1
		1	12	22.94	23.37	23.11	1
		1	24	22.90	23.36	23.13	1
		12	0	22.10	22.20	22.17	2
		12	7	22.12	22.18	22.17	2
		12	13	22.02	22.13	22.13	2
		25	0	22.14	22.11	22.20	2
	64QAM	1	0	22.09	22.22	22.12	2
		1	12	22.12	22.18	22.17	2
		1	24	21.98	22.16	22.17	2
		12	0	20.99	21.08	21.02	3
		12	7	21.10	21.15	21.11	3
		12	13	21.01	21.06	21.06	3
		25	0	20.99	21.03	21.02	3

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
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Report No.:
KR20-SPF0031-A
Page (48) of (293)



Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				26 705	26 865	27 025	
				815.5 MHz	831.5 MHz	847.5 MHz	
3 MHz	QPSK	1	0	23.94	24.02	23.98	0
		1	8	23.89	24.06	23.98	0
		1	14	23.90	24.01	23.93	0
		8	0	22.94	23.03	23.04	1
		8	4	23.02	23.07	23.06	1
		8	7	22.96	23.04	23.01	1
		15	0	22.97	23.02	23.07	1
	16QAM	1	0	23.53	23.23	23.10	1
		1	8	23.56	23.24	23.06	1
		1	14	23.55	23.17	23.02	1
		8	0	22.24	22.13	22.22	2
		8	4	22.29	22.18	22.23	2
		8	7	22.23	22.10	22.15	2
		15	0	22.07	22.15	22.16	2
	64QAM	1	0	22.10	22.24	22.10	2
		1	8	22.10	22.12	22.23	2
		1	14	22.01	22.20	22.12	2
		8	0	21.01	21.02	21.05	3
		8	4	21.03	21.03	21.07	3
		8	7	20.99	21.08	21.09	3
		15	0	20.98	21.05	21.05	3

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Suwon-si, Gyeonggi-do, 16677, Korea
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Report No.:
KR20-SPF0031-A
Page (49) of (293)



Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				26 697	26 865	27 033	
				814.7 MHz	831.5 MHz	848.3 MHz	
1.4 MHz	QPSK	1	0	23.85	24.00	23.93	0
		1	3	23.88	24.09	24.00	0
		1	5	23.80	24.00	23.91	0
		3	0	23.86	23.95	24.02	0
		3	1	23.93	24.03	24.06	0
		3	3	23.85	23.96	24.00	0
		6	0	22.89	22.97	22.90	1
	16QAM	1	0	22.96	23.05	23.11	1
		1	3	23.00	23.08	23.17	1
		1	5	22.97	23.05	23.09	1
		3	0	23.09	23.24	23.04	1
		3	1	23.17	23.27	23.13	1
		3	3	23.05	23.24	23.03	1
		6	0	21.90	22.05	22.11	2
	64QAM	1	0	22.03	21.99	22.12	2
		1	3	22.04	22.21	22.18	2
		1	5	21.99	22.08	22.11	2
		3	0	21.95	22.07	22.05	2
		3	1	22.06	22.13	22.12	2
		3	3	21.97	22.04	22.09	2
		6	0	20.91	20.93	21.00	3

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Report No.:
KR20-SPF0031-A
Page (50) of (293)

**9.4.5 LTE Band 41**

Band width	Modulation	RB Size	RB offset	Maximum Average Power					MPR
				39 750	40 185	40 620	41 055	41 490	
				2 506.0 MHz	2 549.5 MHz	2 593.0 MHz	2 636.5 MHz	2 680.0 MHz	
20 MHz	QPSK	1	0	23.18	23.64	24.45	24.19	23.70	0
		1	49	23.11	23.65	24.24	24.06	23.56	0
		1	99	23.27	23.74	24.44	23.77	23.47	0
		50	0	22.27	22.73	23.46	23.17	22.78	1
		50	24	22.27	22.78	23.40	23.10	22.73	1
		50	50	22.25	22.83	23.44	23.13	22.74	1
		100	0	22.35	22.74	23.36	23.09	22.73	1
	16QAM	1	0	22.30	22.42	22.83	23.05	22.53	1
		1	49	22.23	22.42	22.78	23.05	22.34	1
		1	99	22.40	22.50	22.92	22.86	22.25	1
		50	0	21.28	21.74	22.35	22.21	21.97	2
		50	24	21.42	21.77	22.44	22.12	21.74	2
		50	50	21.36	21.85	22.39	22.10	21.71	2
		100	0	21.36	21.71	22.47	22.12	21.71	2
	64QAM	1	0	21.35	21.48	22.10	21.99	21.63	2
		1	49	21.25	21.43	22.11	21.78	21.55	2
		1	99	21.37	21.55	22.27	21.66	21.50	2
		50	0	20.68	20.95	21.57	21.38	20.81	3
		50	24	20.76	20.93	21.68	21.20	20.72	3
		50	50	20.74	20.98	21.66	21.31	20.76	3
		100	0	20.74	20.91	21.68	21.23	20.75	3

Band width	Modulation	RB Size	RB offset	Maximum Average Power					MPR
				39 750	40 185	40 620	41 055	41 490	
				2 506.0 MHz	2 549.5 MHz	2 593.0 MHz	2 636.5 MHz	2 680.0 MHz	
15 MHz	QPSK	1	0	23.22	23.71	24.24	24.18	23.79	0
		1	36	23.20	23.75	24.19	24.05	23.68	0
		1	74	23.29	23.72	24.31	23.99	23.50	0
		36	0	22.28	22.73	23.32	23.17	22.75	1
		36	18	22.32	22.76	23.41	23.03	22.64	1
		36	37	22.29	22.68	23.39	23.08	22.68	1
		75	0	22.28	22.74	23.48	23.07	22.68	1
	16QAM	1	0	22.38	22.64	23.17	23.31	22.72	1
		1	36	22.38	22.69	23.18	23.21	22.61	1
		1	74	22.52	22.65	23.24	23.14	22.52	1
		36	0	21.33	21.82	22.42	22.25	21.81	2
		36	18	21.39	21.82	22.46	22.19	21.72	2
		36	37	21.39	21.79	22.45	22.12	21.74	2
		75	0	21.38	21.80	22.51	22.12	21.74	2
	64QAM	1	0	21.01	21.50	22.23	22.08	21.71	2
		1	36	21.02	21.46	22.20	22.00	21.69	2
		1	74	21.03	21.44	22.24	21.83	21.60	2
		36	0	20.62	20.90	21.90	21.44	20.84	3
		36	18	20.75	20.92	21.89	21.41	20.71	3
		36	37	20.72	20.85	21.85	21.27	20.62	3
		75	0	20.69	20.72	21.90	21.25	20.78	3

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Report No.:
KR20-SPF0031-A
Page (51) of (293)



Band width	Modulation	RB Size	RB offset	Maximum Average Power					MPR
				39 750	40 185	40 620	41 055	41 490	
				2 506.0 MHz	2 549.5 MHz	2 593.0 MHz	2 636.5 MHz	2 680.0 MHz	
10 MHz	QPSK	1	0	23.21	23.78	24.35	24.21	23.73	0
		1	25	23.14	23.75	24.39	24.05	23.58	0
		1	49	23.30	23.74	24.42	24.02	23.56	0
		25	0	22.18	22.28	22.83	22.67	22.31	1
		25	12	22.11	22.23	22.99	22.64	22.19	1
		25	25	22.09	22.21	22.86	22.56	22.21	1
		50	0	22.01	22.23	22.86	22.61	22.15	1
	16QAM	1	0	22.38	22.69	22.98	23.33	22.74	1
		1	25	22.32	22.63	23.06	23.22	22.57	1
		1	49	22.53	22.67	23.10	23.20	22.52	1
		25	0	21.27	21.70	22.34	22.22	21.75	2
		25	12	21.45	21.70	22.43	22.13	21.67	2
		25	25	21.39	21.70	22.48	22.12	21.61	2
		50	0	21.34	21.75	22.46	22.10	21.72	2
	64QAM	1	0	21.23	21.57	22.12	21.98	21.77	2
		1	25	21.21	21.49	22.22	21.85	21.62	2
		1	49	21.33	21.44	22.24	21.82	21.60	2
		25	0	20.67	20.95	21.53	21.33	20.74	3
		25	12	20.70	20.96	21.69	21.34	20.77	3
		25	25	20.76	20.90	21.67	21.30	20.75	3
		50	0	20.68	20.92	21.66	21.26	20.87	3

Band width	Modulation	RB Size	RB offset	Maximum Average Power					MPR
				39 750	40 185	40 620	41 055	41 490	
				2 506.0 MHz	2 549.5 MHz	2 593.0 MHz	2 636.5 MHz	2 680.0 MHz	
5 MHz	QPSK	1	0	23.08	23.73	24.29	24.11	23.59	0
		1	12	23.11	23.70	24.42	24.16	23.57	0
		1	24	23.16	23.70	24.40	24.19	23.50	0
		12	0	22.14	22.70	23.37	23.08	22.68	1
		12	7	22.18	22.71	23.45	23.09	22.65	1
		12	13	22.20	22.71	23.44	23.09	22.63	1
		25	0	22.19	22.67	23.45	23.05	22.61	1
	16QAM	1	0	22.47	22.74	23.39	23.33	22.67	1
		1	12	22.48	22.72	23.58	23.33	22.60	1
		1	24	22.57	22.75	23.45	23.25	22.55	1
		12	0	21.20	21.71	22.39	22.09	21.68	2
		12	7	21.22	21.71	22.44	22.12	21.66	2
		12	13	21.26	21.72	22.47	22.07	21.64	2
		25	0	21.33	21.74	22.44	22.11	21.68	2
	64QAM	1	0	21.17	21.42	22.12	21.93	21.51	2
		1	12	21.17	21.43	22.21	21.89	21.66	2
		1	24	21.32	21.40	22.23	21.91	21.45	2
		12	0	20.61	20.85	21.53	21.34	20.58	3
		12	7	20.67	20.89	21.66	21.35	20.61	3
		12	13	20.71	20.84	21.63	21.25	20.60	3
		25	0	20.72	20.84	21.66	21.24	20.55	3

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Report No.:
KR20-SPF0031-A
Page (52) of (293)

**9.4.6 LTE Band 66**

Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				132 072	132 322	132 572	
				1 720.0 MHz	1 745.0 MHz	1 770.0 MHz	
20 MHz	QPSK	1	0	23.51	23.43	23.74	0
		1	49	23.32	23.23	23.62	0
		1	99	23.18	23.41	23.73	0
		50	0	22.45	22.34	22.76	1
		50	24	22.36	22.37	22.73	1
		50	50	22.32	22.41	22.74	1
		100	0	22.26	22.32	22.74	1
	16QAM	1	0	22.97	22.76	22.93	1
		1	49	22.70	22.62	22.90	1
		1	99	22.69	22.79	22.91	1
		50	0	21.54	21.49	21.87	2
		50	24	21.46	21.47	21.86	2
		50	50	21.40	21.50	21.84	2
		100	0	21.41	21.52	21.84	2
	64QAM	1	0	21.95	21.85	22.05	2
		1	49	21.82	21.78	21.95	2
		1	99	21.69	21.67	21.82	2
		50	0	20.63	20.61	20.73	3
		50	24	20.49	20.45	20.55	3
		50	50	20.47	20.41	20.57	3
		100	0	20.48	20.42	20.58	3

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Report No.:
KR20-SPF0031-A
Page (53) of (293)



Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				132 047	132 322	132 597	
				1 717.5 MHz	1 745.0 MHz	1 772.5 MHz	
15 MHz	QPSK	1	0	23.51	23.45	23.83	0
		1	36	23.31	23.25	23.77	0
		1	74	23.21	23.35	23.80	0
		36	0	22.36	22.24	22.74	1
		36	18	22.34	22.34	22.70	1
		36	37	22.21	22.32	22.79	1
		75	0	22.37	22.28	22.71	1
	16QAM	1	0	22.92	22.68	22.95	1
		1	36	22.95	22.48	22.95	1
		1	74	22.91	22.61	22.98	1
		36	0	21.53	21.44	21.85	2
		36	18	21.48	21.49	21.84	2
		36	37	21.38	21.44	21.94	2
		75	0	21.47	21.43	21.79	2
	64QAM	1	0	21.98	21.86	22.22	2
		1	36	21.71	21.69	22.22	2
		1	74	21.74	21.81	22.12	2
		36	0	20.68	20.52	21.02	3
		36	18	20.60	20.57	21.01	3
		36	37	20.55	20.62	21.13	3
		75	0	20.62	20.47	20.96	3

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Report No.:
KR20-SPF0031-A
Page (54) of (293)



Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				132 022	132 322	132 622	
				1 715.0 MHz	1 745.0 MHz	1 775.0 MHz	
10 MHz	QPSK	1	0	23.43	23.42	23.76	0
		1	25	23.27	23.26	23.77	0
		1	49	23.27	23.32	23.74	0
		25	0	22.37	22.33	22.73	1
		25	12	22.41	22.34	22.86	1
		25	25	22.38	22.35	22.83	1
		50	0	22.41	22.32	22.72	1
	16QAM	1	0	22.95	22.60	22.78	1
		1	25	22.97	22.47	22.83	1
		1	49	22.96	22.49	22.82	1
		25	0	21.54	21.50	21.92	2
		25	12	21.56	21.53	21.93	2
		25	25	21.53	21.54	21.99	2
		50	0	21.45	21.49	21.90	2
	64QAM	1	0	21.88	21.77	22.17	2
		1	25	21.80	21.83	22.20	2
		1	49	21.73	21.75	22.09	2
		25	0	20.57	20.51	20.97	3
		25	12	20.59	20.52	21.06	3
		25	25	20.55	20.50	21.06	3
		50	0	20.58	20.52	20.98	3

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Report No.:
KR20-SPF0031-A
Page (55) of (293)



Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				131 997	132 322	132 647	
				1 712.5 MHz	1 745.0 MHz	1 777.5 MHz	
5 MHz	QPSK	1	0	23.53	23.26	23.86	0
		1	12	23.44	23.25	23.87	0
		1	24	23.40	23.29	23.86	0
		12	0	22.44	22.30	22.82	1
		12	7	22.48	22.32	22.86	1
		12	13	22.32	22.29	22.84	1
		25	0	22.35	22.33	22.84	1
	16QAM	1	0	22.44	22.72	22.99	1
		1	12	22.41	22.68	22.98	1
		1	24	22.31	22.73	22.95	1
		12	0	21.62	21.46	22.00	2
		12	7	21.61	21.49	21.97	2
		12	13	21.44	21.46	21.95	2
		25	0	21.46	21.42	21.92	2
	64QAM	1	0	21.90	21.70	22.26	2
		1	12	21.79	21.62	22.23	2
		1	24	21.65	21.77	22.07	2
		12	0	20.72	20.54	21.12	3
		12	7	20.75	20.48	21.12	3
		12	13	20.61	20.58	21.00	3
		25	0	20.50	20.46	21.04	3

Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				131 987	132 322	132 657	
				1 711.5 MHz	1 745.0 MHz	1 778.5 MHz	
3 MHz	QPSK	1	0	23.41	23.27	23.75	0
		1	8	23.39	23.26	23.74	0
		1	14	23.37	23.27	23.76	0
		8	0	22.43	22.26	22.82	1
		8	4	22.43	22.27	22.87	1
		8	7	22.40	22.29	22.81	1
		15	0	22.46	22.28	22.83	1
	16QAM	1	0	22.94	22.51	22.98	1
		1	8	22.98	22.49	22.94	1
		1	14	22.92	22.49	22.93	1
		8	0	21.75	21.35	21.94	2
		8	4	21.77	21.40	21.96	2
		8	7	21.71	21.36	21.94	2
		15	0	21.56	21.40	21.91	2
	64QAM	1	0	21.83	21.63	22.23	2
		1	8	21.77	21.66	22.14	2
		1	14	21.95	21.59	22.10	2
		8	0	20.69	20.52	21.06	3
		8	4	20.73	20.54	21.08	3
		8	7	20.75	20.54	21.01	3
		15	0	20.67	20.43	21.04	3

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65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
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Report No.:
KR20-SPF0031-A
Page (57) of (293)



Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				131 979	132 322	132 665	
				1 710.7 MHz	1 745.0 MHz	1 779.3 MHz	
1.4 MHz	QPSK	1	0	23.28	23.20	23.76	0
		1	3	23.39	23.28	23.82	0
		1	5	23.29	23.20	23.73	0
		3	0	23.35	23.22	23.85	0
		3	1	23.39	23.34	23.95	0
		3	3	23.39	23.25	23.87	0
		6	0	22.28	22.10	22.65	1
	16QAM	1	0	22.49	22.31	22.95	1
		1	3	22.56	22.36	22.95	1
		1	5	22.47	22.30	22.96	1
		3	0	22.65	22.57	22.93	1
		3	1	22.68	22.67	22.95	1
		3	3	22.59	22.57	22.94	1
		6	0	21.40	21.32	21.87	2
	64QAM	1	0	21.84	21.54	22.14	2
		1	3	21.84	21.76	22.16	2
		1	5	21.65	21.68	22.08	2
		3	0	21.78	21.55	22.10	2
		3	1	21.77	21.59	22.02	2
		3	3	21.71	21.55	21.97	2
		6	0	20.55	20.37	20.89	3

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Report No.:
KR20-SPF0031-A
Page (58) of (293)



9.5 LTE Average Conducted Output Power (Reduced Average Power)

9.5.1 LTE Band 41 (Hotspot)

Band width	Modulation	RB Size	RB offset	Maximum Average Power					MPR
				39 750	40 185	40 620	41 055	41 490	
				2 506.0 MHz	2 549.5 MHz	2 593.0 MHz	2 636.5 MHz	2 680.0 MHz	
20 MHz	QPSK	1	0	19.04	19.40	19.97	19.87	19.43	0
		1	49	19.01	19.42	19.93	19.68	19.23	0
		1	99	19.00	19.44	20.01	19.48	19.19	0
		50	0	19.10	19.56	20.00	19.89	19.52	0
		50	24	19.14	19.57	20.13	19.79	19.44	0
		50	50	19.08	19.55	20.07	19.76	19.38	0
		100	0	19.13	19.52	20.15	19.78	19.37	0
	16QAM	1	0	19.19	19.23	19.63	20.03	19.29	0
		1	49	19.12	19.22	19.57	19.85	19.14	0
		1	99	19.17	19.28	19.66	19.59	19.05	0
		50	0	19.18	19.60	20.09	19.96	19.50	0
		50	24	19.28	19.56	20.21	19.85	19.45	0
		50	50	19.20	19.63	20.23	19.83	19.40	0
		100	0	19.29	19.54	20.24	19.84	19.44	0
	64QAM	1	0	19.11	19.12	19.37	19.44	19.18	0
		1	49	19.01	19.11	19.33	19.26	19.16	0
		1	99	19.04	19.12	19.50	19.06	19.15	0
		50	0	19.05	19.14	19.71	19.79	19.25	0
		50	24	19.01	19.10	19.87	19.74	19.13	0
		50	50	19.06	19.15	19.85	19.69	19.09	0
		100	0	19.03	19.06	19.85	19.69	19.13	0

Band width	Modulation	RB Size	RB offset	Maximum Average Power					MPR
				39 750	40 185	40 620	41 055	41 490	
				2 506.0 MHz	2 549.5 MHz	2 593.0 MHz	2 636.5 MHz	2 680.0 MHz	
15 MHz	QPSK	1	0	19.04	19.51	19.97	19.89	19.53	0
		1	36	19.01	19.53	19.92	19.74	19.39	0
		1	74	19.07	19.48	20.00	19.64	19.29	0
		36	0	19.04	19.50	20.07	19.87	19.48	0
		36	18	19.08	19.56	20.16	19.79	19.39	0
		36	37	19.05	19.44	20.10	19.74	19.38	0
		75	0	19.02	19.45	20.11	19.69	19.36	0
	16QAM	1	0	19.37	19.42	19.96	20.17	19.47	0
		1	36	19.31	19.52	19.92	19.99	19.39	0
		1	74	19.38	19.55	20.02	19.85	19.29	0
		36	0	19.10	19.67	20.09	19.97	19.53	0
		36	18	19.24	19.64	20.23	19.88	19.44	0
		36	37	19.25	19.58	20.20	19.87	19.47	0
		75	0	19.14	19.57	20.20	19.86	19.43	0
	64QAM	1	0	19.01	19.08	19.32	19.42	19.15	0
		1	36	19.03	19.06	19.32	19.22	19.14	0
		1	74	19.02	19.07	19.49	19.10	19.16	0
		36	0	19.03	19.08	19.70	19.71	19.26	0
		36	18	19.04	19.08	19.83	19.63	19.13	0
		36	37	19.00	19.02	19.87	19.61	19.14	0
		75	0	19.00	19.08	19.84	19.69	19.16	0

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Report No.:
KR20-SPF0031-A
Page (59) of (293)



Band width	Modulation	RB Size	RB offset	Maximum Average Power					MPR
				39 750	40 185	40 620	41 055	41 490	
				2 506.0 MHz	2 549.5 MHz	2 593.0 MHz	2 636.5 MHz	2 680.0 MHz	
10 MHz	QPSK	1	0	19.03	19.52	19.96	19.89	19.51	0
		1	25	19.05	19.54	20.07	19.76	19.34	0
		1	49	19.07	19.45	20.11	19.65	19.28	0
		25	0	19.05	19.53	20.04	19.87	19.53	0
		25	12	19.15	19.57	20.16	19.79	19.37	0
		25	25	19.12	19.52	20.07	19.74	19.38	0
		50	0	19.15	19.54	20.15	19.74	19.37	0
	16QAM	1	0	19.34	19.55	19.77	20.14	19.53	0
		1	25	19.33	19.55	19.87	20.03	19.35	0
		1	49	19.38	19.51	19.91	19.89	19.24	0
		25	0	19.18	19.60	20.11	19.95	19.47	0
		25	12	19.26	19.57	20.26	19.87	19.39	0
		25	25	19.25	19.55	20.22	19.88	19.39	0
		50	0	19.28	19.54	20.24	19.83	19.41	0
	64QAM	1	0	19.01	19.13	19.30	19.38	19.21	0
		1	25	19.05	19.12	19.46	19.25	19.15	0
		1	49	19.04	19.11	19.47	19.16	19.14	0
		25	0	19.02	19.15	19.73	19.76	19.31	0
		25	12	19.04	19.13	19.85	19.70	19.19	0
		25	25	19.02	19.09	19.86	19.69	19.15	0
		50	0	19.00	19.06	19.85	19.68	19.13	0

Band width	Modulation	RB Size	RB offset	Maximum Average Power					MPR
				39 750	40 185	40 620	41 055	41 490	
				2 506.0 MHz	2 549.5 MHz	2 593.0 MHz	2 636.5 MHz	2 680.0 MHz	
5 MHz	QPSK	1	0	19.02	19.49	20.00	19.75	19.33	0
		1	12	19.03	19.49	20.11	19.80	19.28	0
		1	24	19.13	19.45	20.04	19.76	19.20	0
		12	0	19.07	19.56	20.05	19.80	19.40	0
		12	7	19.02	19.56	20.11	19.82	19.39	0
		12	13	19.10	19.54	20.12	19.78	19.35	0
		25	0	19.10	19.51	20.12	19.74	19.34	0
	16QAM	1	0	19.44	19.59	20.17	20.14	19.46	0
		1	12	19.45	19.59	20.30	20.13	19.43	0
		1	24	19.45	19.57	20.22	20.08	19.33	0
		12	0	19.12	19.58	20.16	19.82	19.40	0
		12	7	19.12	19.58	20.28	19.86	19.43	0
		12	13	19.18	19.56	20.25	19.84	19.38	0
		25	0	19.24	19.62	20.19	19.86	19.40	0
	64QAM	1	0	20.48	19.04	19.30	19.32	19.11	0
		1	12	20.46	19.02	19.36	19.26	19.19	0
		1	24	20.60	19.01	19.41	19.27	19.12	0
		12	0	19.92	19.07	19.70	19.69	19.10	0
		12	7	19.00	19.12	19.84	19.72	19.12	0
		12	13	19.00	19.06	19.82	19.68	19.07	0
		25	0	19.03	19.07	19.87	19.70	19.12	0

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Suwon-si, Gyeonggi-do, 16677, Korea
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Report No.:
KR20-SPF0031-A
Page (60) of (293)

**9.5.2 LTE Band 41 (Grip Sensor, Earjack)**

Band width	Modulation	RB Size	RB offset	Maximum Average Power					MPR
				39 750	40 185	40 620	41 055	41 490	
				2 506.0 MHz	2 549.5 MHz	2 593.0 MHz	2 636.5 MHz	2 680.0 MHz	
20 MHz	QPSK	1	0	21.34	21.50	21.68	21.80	21.62	0
		1	49	21.15	21.47	21.67	21.57	21.53	0
		1	99	21.19	21.56	21.85	21.44	21.42	0
		50	0	21.29	21.62	21.80	21.83	21.82	0
		50	24	21.36	21.59	21.94	21.75	21.69	0
		50	50	21.33	21.65	21.92	21.73	21.57	0
		100	0	21.35	21.57	21.92	21.76	21.61	0
	16QAM	1	0	21.40	21.64	21.77	21.88	21.87	0
		1	49	21.41	21.59	21.73	21.69	21.68	0
		1	99	21.43	21.64	21.88	21.50	21.57	0
		50	0	21.39	21.72	21.79	21.19	21.13	0
		50	24	21.48	21.66	21.91	21.05	21.04	0
		50	50	21.47	21.69	21.90	21.00	21.01	0
		100	0	21.46	21.64	21.88	21.05	21.02	0
	64QAM	1	0	21.08	21.26	21.74	21.18	21.09	0
		1	49	21.05	21.22	21.78	21.09	21.11	0
		1	99	21.05	21.30	21.94	21.02	21.01	0
		50	0	20.40	20.73	20.94	20.57	20.15	1
		50	24	20.48	20.65	20.88	20.48	20.02	1
		50	50	20.42	20.69	20.82	20.42	20.01	1
		100	0	20.47	20.63	20.78	20.45	20.04	1

Band width	Modulation	RB Size	RB offset	Maximum Average Power					MPR
				39 750	40 185	40 620	41 055	41 490	
				2 506.0 MHz	2 549.5 MHz	2 593.0 MHz	2 636.5 MHz	2 680.0 MHz	
15 MHz	QPSK	1	0	21.09	21.43	21.52	21.63	21.48	0
		1	36	21.08	21.35	21.58	21.42	21.32	0
		1	74	21.12	21.47	21.69	21.25	21.28	0
		36	0	21.21	21.52	21.62	21.64	21.50	0
		36	18	21.26	21.46	21.89	21.62	21.36	0
		36	37	21.27	21.54	21.81	21.68	21.44	0
		75	0	21.26	21.49	21.87	21.69	21.41	0
	16QAM	1	0	21.34	21.51	21.62	21.79	21.78	0
		1	36	21.26	21.49	21.57	21.61	21.51	0
		1	74	21.29	21.51	21.80	21.42	21.49	0
		36	0	21.22	21.67	21.70	21.04	21.05	0
		36	18	21.39	21.53	21.74	20.87	21.03	0
		36	37	21.28	21.50	21.82	20.81	21.05	0
		75	0	21.40	21.48	21.79	20.90	21.02	0
	64QAM	1	0	21.04	21.18	21.66	21.07	21.07	0
		1	36	21.07	21.12	21.67	21.01	21.00	0
		1	74	21.07	21.24	21.83	20.97	21.02	0
		36	0	20.31	20.64	20.97	20.41	20.08	1
		36	18	20.35	20.55	20.92	20.35	20.05	1
		36	37	20.23	20.49	20.84	20.28	20.08	1
		75	0	20.31	20.54	20.82	20.36	20.00	1

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Report No.:
KR20-SPF0031-A
Page (61) of (293)



Band width	Modulation	RB Size	RB offset	Maximum Average Power					MPR
				39 750	40 185	40 620	41 055	41 490	
				2 506.0 MHz	2 549.5 MHz	2 593.0 MHz	2 636.5 MHz	2 680.0 MHz	
10 MHz	QPSK	1	0	21.14	21.32	21.51	21.74	21.51	0
		1	25	21.09	21.30	21.61	21.39	21.34	0
		1	49	21.11	21.43	21.68	21.26	21.27	0
		25	0	21.10	21.55	21.72	21.75	21.49	0
		25	12	21.19	21.51	21.85	21.61	21.37	0
		25	25	21.19	21.57	21.84	21.56	21.38	0
		50	0	21.19	21.50	21.81	21.71	21.42	0
	16QAM	1	0	21.30	21.53	21.71	21.82	21.77	0
		1	25	21.25	21.39	21.60	21.61	21.53	0
		1	49	21.29	21.57	21.75	21.43	21.50	0
		25	0	21.20	21.54	21.73	21.02	21.06	0
		25	12	21.33	21.54	21.83	20.95	21.08	0
		25	25	21.36	21.55	21.82	20.87	21.09	0
		50	0	21.36	21.51	21.75	21.00	21.06	0
	64QAM	1	0	21.02	21.15	21.69	21.10	21.09	0
		1	25	21.01	21.14	21.67	20.93	21.00	0
		1	49	21.01	21.20	21.79	20.99	21.09	0
		25	0	20.21	20.58	20.99	20.42	20.08	1
		25	12	20.32	20.54	20.93	20.36	20.07	1
		25	25	20.26	20.52	20.87	20.22	20.04	1
		50	0	20.30	20.52	20.81	20.27	20.04	1

Band width	Modulation	RB Size	RB offset	Maximum Average Power					MPR
				39 750	40 185	40 620	41 055	41 490	
				2 506.0 MHz	2 549.5 MHz	2 593.0 MHz	2 636.5 MHz	2 680.0 MHz	
5 MHz	QPSK	1	0	21.17	21.47	21.68	21.59	21.46	0
		1	12	21.17	21.46	21.80	21.58	21.51	0
		1	24	21.23	21.45	21.80	21.59	21.34	0
		12	0	21.24	21.53	21.78	21.71	21.54	0
		12	7	21.27	21.54	21.89	21.73	21.56	0
		12	13	21.32	21.50	21.90	21.71	21.51	0
		25	0	21.33	21.54	21.88	21.72	21.55	0
	16QAM	1	0	21.36	21.61	21.75	21.68	21.68	0
		1	12	21.38	21.62	21.85	21.70	21.72	0
		1	24	21.42	21.59	21.86	21.66	21.55	0
		12	0	21.31	21.53	21.73	20.95	21.13	0
		12	7	21.32	21.57	21.79	20.98	21.12	0
		12	13	21.36	21.54	21.81	20.93	21.08	0
		25	0	21.40	21.57	21.80	21.01	21.16	0
	64QAM	1	0	21.14	21.24	21.76	21.00	21.19	0
		1	12	21.09	21.22	21.87	20.97	21.19	0
		1	24	21.07	21.20	21.90	21.00	21.08	0
		12	0	20.38	20.66	20.83	20.46	20.42	1
		12	7	20.41	20.65	20.71	20.46	20.40	1
		12	13	20.41	20.62	20.66	20.43	20.36	1
		25	0	20.45	20.66	20.61	20.44	20.39	1

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9.5.3 LTE Band 66 (Hotspot, Grip Sensor, Earjack)

Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				132 072	132 322	132 572	
				1 720.0 MHz	1 745.0 MHz	1 770.0 MHz	
20 MHz	QPSK	1	0	22.50	22.37	22.77	0
		1	49	22.25	22.23	22.61	0
		1	99	22.18	22.41	22.68	0
		50	0	22.46	22.35	22.76	0
		50	24	22.37	22.39	22.73	0
		50	50	22.31	22.40	22.73	0
		100	0	22.31	22.32	22.71	0
	16QAM	1	0	22.91	22.78	22.96	0
		1	49	22.73	22.66	22.95	0
		1	99	22.69	22.83	22.93	0
		50	0	21.55	21.45	21.90	1
		50	24	21.47	21.49	21.90	1
		50	50	21.42	21.50	21.89	1
		100	0	21.44	21.49	21.90	1
	64QAM	1	0	22.18	21.85	22.26	1
		1	49	21.78	21.84	22.34	1
		1	99	21.87	22.03	22.37	1
		50	0	20.72	20.61	21.07	2
		50	24	20.54	20.59	21.06	2
		50	50	20.59	20.65	21.13	2
		100	0	20.57	20.72	21.04	2

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Report No.:
KR20-SPF0031-A
Page (63) of (293)



Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				132 047	132 322	132 597	
				1 717.5 MHz	1 745.0 MHz	1 772.5 MHz	
15 MHz	QPSK	1	0	22.54	22.44	22.75	0
		1	36	22.28	22.21	22.81	0
		1	74	22.21	22.34	22.84	0
		36	0	22.41	22.27	22.72	0
		36	18	22.33	22.28	22.72	0
		36	37	22.21	22.30	22.77	0
		75	0	22.35	22.33	22.72	0
	16QAM	1	0	22.93	22.69	22.98	0
		1	36	23.00	22.48	22.97	0
		1	74	22.93	22.60	22.93	0
		36	0	21.54	21.46	21.84	1
		36	18	21.47	21.44	21.85	1
		36	37	21.37	21.43	21.93	1
		75	0	21.50	21.41	21.86	1
	64QAM	1	0	22.12	21.76	22.38	1
		1	36	21.81	21.85	22.31	1
		1	74	21.81	22.00	22.38	1
		36	0	20.74	20.66	21.13	2
		36	18	20.72	20.66	21.12	2
		36	37	20.59	20.68	21.24	2
		75	0	20.69	20.59	21.11	2

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Report No.:
KR20-SPF0031-A
Page (64) of (293)



Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				132 022	132 322	132 622	
				1 715.0 MHz	1 745.0 MHz	1 775.0 MHz	
10 MHz	QPSK	1	0	22.47	22.36	22.68	0
		1	25	22.26	22.26	22.68	0
		1	49	22.28	22.30	22.73	0
		25	0	22.42	22.28	22.78	0
		25	12	22.34	22.33	22.89	0
		25	25	22.37	22.33	22.81	0
		50	0	22.35	22.33	22.77	0
	16QAM	1	0	22.95	22.64	22.85	0
		1	25	22.94	22.42	22.86	0
		1	49	22.98	22.54	22.88	0
		25	0	21.54	21.54	21.94	1
		25	12	21.49	21.53	21.99	1
		25	25	21.48	21.53	21.92	1
		50	0	21.49	21.48	21.95	1
	64QAM	1	0	22.10	21.92	22.29	1
		1	25	21.78	21.67	22.25	1
		1	49	21.80	21.88	22.31	1
		25	0	20.68	20.54	21.08	2
		25	12	20.66	20.61	21.17	2
		25	25	20.62	20.65	21.18	2
		50	0	20.63	20.59	21.08	2

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Report No.:
KR20-SPF0031-A
Page (65) of (293)



Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				131 997	132 322	132 647	
				1 712.5 MHz	1 745.0 MHz	1 777.5 MHz	
5 MHz	QPSK	1	0	22.52	22.24	22.83	0
		1	12	22.46	22.21	22.83	0
		1	24	22.36	22.26	22.85	0
		12	0	22.46	22.31	22.90	0
		12	7	22.48	22.34	22.84	0
		12	13	22.30	22.27	22.80	0
		25	0	22.35	22.35	22.90	0
	16QAM	1	0	22.47	22.68	22.96	0
		1	12	22.47	22.73	22.91	0
		1	24	22.32	22.70	22.96	0
		12	0	21.56	21.48	21.98	1
		12	7	21.60	21.50	21.98	1
		12	13	21.43	21.46	21.93	1
		25	0	21.47	21.40	21.92	1
	64QAM	1	0	22.02	21.85	22.41	1
		1	12	21.89	21.73	22.23	1
		1	24	21.83	21.78	22.34	1
		12	0	20.81	20.63	21.23	2
		12	7	20.81	20.68	21.25	2
		12	13	20.71	20.65	21.16	2
		25	0	20.63	20.54	21.10	2

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Report No.:
KR20-SPF0031-A
Page (66) of (293)



Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				131 987	132 322	132 657	
				1 711.5 MHz	1 745.0 MHz	1 778.5 MHz	
3 MHz	QPSK	1	0	22.37	22.26	22.74	0
		1	8	22.38	22.20	22.76	0
		1	14	22.38	22.26	22.77	0
		8	0	22.46	22.25	22.83	0
		8	4	22.46	22.28	22.85	0
		8	7	22.41	22.27	22.78	0
		15	0	22.40	22.28	22.85	0
	16QAM	1	0	22.95	22.48	22.93	0
		1	8	22.98	22.47	22.90	0
		1	14	22.92	22.44	22.90	0
		8	0	21.78	21.36	21.94	1
		8	4	21.79	21.41	21.95	1
		8	7	21.70	21.36	21.91	1
		15	0	21.60	21.41	22.00	1
	64QAM	1	0	21.87	21.73	22.32	1
		1	8	21.93	21.69	22.40	1
		1	14	21.92	21.86	22.24	1
		8	0	20.76	20.62	21.18	2
		8	4	20.89	20.61	21.25	2
		8	7	20.81	20.66	21.20	2
		15	0	20.70	20.59	21.14	2

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65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
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Report No.:
KR20-SPF0031-A
Page (67) of (293)



Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				131 979	132 322	132 665	
				1 710.7 MHz	1 745.0 MHz	1 779.3 MHz	
1.4 MHz	QPSK	1	0	22.39	22.24	22.66	0
		1	3	22.45	22.29	22.73	0
		1	5	22.39	22.28	22.68	0
		3	0	22.44	22.41	22.78	0
		3	1	22.51	22.37	22.87	0
		3	3	22.48	22.23	22.85	0
		6	0	22.38	22.18	22.69	0
	16QAM	1	0	22.51	22.47	22.87	0
		1	3	22.62	22.53	22.93	0
		1	5	22.50	22.44	22.87	0
		3	0	22.71	22.44	22.90	0
		3	1	22.86	22.49	22.91	0
		3	3	22.83	22.46	22.93	0
		6	0	21.51	21.55	21.76	0
	64QAM	1	0	21.96	21.66	22.32	0
		1	3	21.87	21.75	22.39	0
		1	5	21.86	21.67	22.20	0
		3	0	21.93	21.58	22.22	0
		3	1	21.92	21.67	22.29	0
		3	3	21.88	21.67	22.19	0
		6	0	20.69	20.55	21.15	1

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
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Report No.:
KR20-SPF0031-A
Page (68) of (293)



9.6 WLAN Average Conducted Output Power

Band	Freq. [MHz]	Channel	Mode		
			802.11b	802.11g	802.11n
WLAN 2.4 GHz	2 412.0	1	19.31	17.48	17.24
	2 437.0	6	19.01	17.15	16.99
	2 462.0	11	19.31	17.67	17.53
	2 467.0	12	8.66	7.79	7.66
	2 472.0	13	2.86	2.34	2.11

Band	Freq. [MHz]	Channel	Mode		
			802.11a	802.11n	802.11ac
WLAN 5 GHz (20 MHz)	5 180.0	36	13.97	13.71	13.61
	5 200.0	40	14.70	14.49	14.49
	5 220.0	44	14.78	14.12	14.32
	5 240.0	48	14.17	14.03	14.03
	5 260.0	52	13.59	13.45	13.50
	5 280.0	56	13.79	13.61	13.63
	5 300.0	60	14.19	14.07	14.05
	5 320.0	64	14.50	14.40	14.36
	5 500.0	100	14.88	14.83	14.68
	5 600.0	120	15.22	15.09	15.11
	5 620.0	124	15.41	15.30	15.35
	5 720.0	144	14.84	14.68	14.70
	5 745.0	149	14.22	13.77	13.72
	5 785.0	157	14.72	14.32	14.31
	5 825.0	165	14.71	14.29	14.37

Band	Freq. [MHz]	Channel	Mode	
			802.11n	802.11ac
WLAN 5 GHz (40 MHz)	5 190.0	38	13.67	13.78
	5 230.0	46	13.90	14.02
	5 270.0	54	13.13	12.98
	5 310.0	62	13.88	13.82
	5 510.0	102	14.68	14.60
	5 590.0	118	14.61	14.61
	5 630.0	126	15.00	14.41
	5 710.0	142	14.51	14.55
	5 755.0	151	13.86	13.83
	5 795.0	159	14.11	14.16

Band	Freq. [MHz]	Channel	Mode
			802.11ac
WLAN 5 GHz (80 MHz)	5 210.0	42	12.01
	5 290.0	58	11.45
	5 530.0	106	13.12
	5 610.0	122	12.83
	5 690.0	138	12.91
	5 775.0	155	11.71

Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02:

- Power measurements were performed for the transmission mode configuration with the highest maximum output power specified for production units.
- For transmission modes with the same maximum output power specification, powers were measured for the largest channel bandwidth, lowest order modulation and lowest data rate.
- For transmission modes with identical maximum specified output power, channel bandwidth, modulation and data rates, power measurements were required for all identical configurations.
- For each transmission mode configuration, powers were measured for the highest and lowest channels; and at the mid-band channel(s) when there were at least 3 channels supported. For configurations with multiple mid-band channels, due to an even number of channels, both channels were measured.

Power Measurement Setup



KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
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Report No.:
KR20-SPF0031-A
Page (70) of (293)



9.7 WLAN Average Conducted Output Power(Reduced Average Power)(RCV)

Band	Freq. [MHz]	Channel	Mode		
			802.11a	802.11n	802.11ac
WLAN 5 GHz (20 MHz)	5 180.0	36	8.89	8.78	8.75
	5 200.0	40	9.66	9.54	9.53
	5 220.0	44	9.84	9.63	9.61
	5 240.0	48	9.25	9.13	9.16
	5 260.0	52	8.67	8.58	8.58
	5 280.0	56	8.82	8.68	8.67
	5 300.0	60	9.34	9.15	9.11
	5 320.0	64	9.63	9.49	9.50
	5 500.0	100	10.02	9.87	9.84
	5 600.0	120	10.34	10.34	10.22
	5 620.0	124	10.89	10.70	10.66
	5 720.0	144	10.22	10.12	10.08
	5 745.0	149	9.63	9.37	9.23
	5 785.0	157	9.93	9.40	9.38
	5 825.0	165	9.80	9.12	9.49

Band	Freq. [MHz]	Channel	Mode	
			802.11n	802.11ac
WLAN 5 GHz (40 MHz)	5 190.0	38	9.90	9.93
	5 230.0	46	10.02	10.10
	5 270.0	54	9.31	9.28
	5 310.0	62	10.06	10.03
	5 510.0	102	10.97	10.94
	5 590.0	118	11.01	11.01
	5 630.0	126	11.38	11.42
	5 710.0	142	10.95	10.93
	5 755.0	151	10.47	10.38
	5 795.0	159	10.79	10.77

Band	Freq. [MHz]	Channel	Mode
			802.11ac
WLAN 5 GHz (80 MHz)	5 210.0	42	10.05
	5 290.0	58	9.47
	5 530.0	106	11.12
	5 610.0	122	10.84
	5 690.0	138	10.93
	5 775.0	155	9.84

9.8 Bluetooth Average Conducted Output Power

Mode	Freq. [MHz]	Channel	Conducted Powers
			(dBm)
BDR_DH1 (1 Mbps)	2 402.0	0	10.10
	2 441.0	39	11.41
	2 480.0	78	9.23
BDR_2-DH1 (2 Mbps)	2 402.0	0	8.91
	2 441.0	39	10.28
	2 480.0	78	8.06
EDR_3-DH1 (3 Mbps)	2 402.0	0	9.01
	2 441.0	39	10.27
	2 480.0	78	8.02
LE (1 Mbps 37)	2 402.0	0	4.35
	2 440.0	19	6.72
	2 480.0	39	5.53
LE (2 Mbps 37)	2 402.0	0	4.32
	2 440.0	19	6.74
	2 480.0	39	5.61

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9.9 Wireless Band Duty Cycle

Wireless Bands	Frequency Bands	Mode	Duty Cycle (%)
GSM	850 1900	Voice, GPRS(GMSK), EGPRS(8PSK)	Voice: 12.5
			(E)GPRS 1Tx : 12.5
			(E)GPRS 2Tx : 25.0
			(E)GPRS 3Tx : 37.5
			(E)GPRS 4Tx : 50.0
WCDMA	Band II	RMC, HSDPA, HSUPA, DC-HSDPA	100
	Band IV		
	Band V		
LTE	FDD Band 2	QPSK, 16QAM, 64QAM	100
	FDD Band 5		
	FDD Band 12		
	FDD Band 26		
	FDD Band 66		
	TDD Band 41		63.33
WLAN	2.4 GHz	802.11b	99.00
	U-NII-2A	802.11ac(VHT80)	89.82
		802.11a	97.50
	U-NII-2C	802.11ac(VHT80)	89.82
		802.11n(HT40)	94.80
	U-NII-3	802.11n(HT40)	94.80
		802.11a	97.50

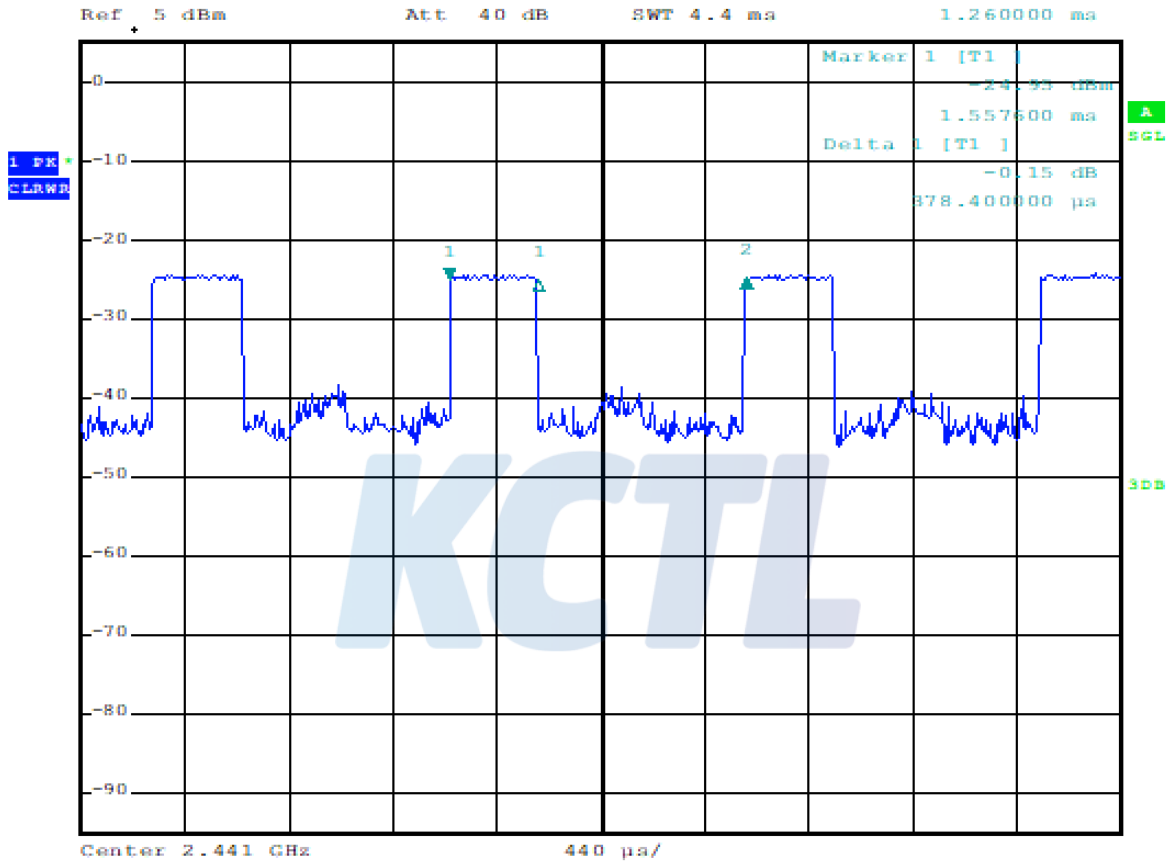
KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
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Report No.:
KR20-SPF0031-A
Page (73) of (293)

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Wireless Bands	Frequency Bands		Mode		Duty Cycle (%)	
	Mode	Packet	On Time (ms)	On-Off Time (ms)	Duty Cycle (%)	Duty Cycle Compensate Factor
Bluetooth	BDR(GFSK)	DH1	378.40	1.26	0.300	3.333



10. System Verification

10.1 Tissue Verification

The dielectric properties for this Tissue Simulant Liquids were measured by using the SPEAG Model DAK3.5 Dielectric Probe in conjunction with Agilent E5071B Network Analyzer (300 kHz – 8 500 MHz). The Conductivity (σ) and Permittivity (ρ) are listed in Table 1. For the SAR measurement given in this report. The temperature variation of the Tissue Simulant Liquids was $(22 \pm 2) ^\circ\text{C}$.

Freq. (MHz)	Limit/Measured		Permittivity (ρ)	Conductivity (σ)	Temp. ($^\circ\text{C}$)
750.0	Recommended Limit		$41.90 \pm 5 \%$ (39.81 ~ 44.00)	$0.89 \pm 5 \%$ (0.85 ~ 0.93)	22 ± 2
	Measured	2020-06-13	42.05	0.90	20.37
850.0	Recommended Limit		$41.50 \pm 5 \%$ (39.43 ~ 43.58)	$0.92 \pm 5 \%$ (0.87 ~ 0.97)	22 ± 2
	Measured	2020-06-11	40.49	0.92	20.24
850.0	Recommended Limit		$41.50 \pm 5 \%$ (39.43 ~ 43.58)	$0.92 \pm 5 \%$ (0.87 ~ 0.97)	22 ± 2
	Measured	2020-06-22	41.02	0.93	20.91
1 750.0	Recommended Limit		$40.07 \pm 5 \%$ (38.07 ~ 42.07)	$1.37 \pm 5 \%$ (1.30 ~ 1.44)	22 ± 2
	Measured	2020-06-27	39.11	1.35	20.96
1 900.0	Recommended Limit		$40.00 \pm 5 \%$ (38.00 ~ 42.00)	$1.40 \pm 5 \%$ (1.33 ~ 1.47)	22 ± 2
	Measured	2020-06-25	38.82	1.45	20.87
1 900.0	Recommended Limit		$40.00 \pm 5 \%$ (38.00 ~ 42.00)	$1.40 \pm 5 \%$ (1.33 ~ 1.47)	22 ± 2
	Measured	2020-06-29	38.82	1.44	20.77
2 450.0	Recommended Limit		$39.20 \pm 5 \%$ (37.24 ~ 41.16)	$1.80 \pm 5 \%$ (1.71 ~ 1.89)	22 ± 2
	Measured	2020-06-24	38.89	1.78	20.93
2 600.0	Recommended Limit		$39.00 \pm 5 \%$ (37.05 ~ 40.95)	$1.96 \pm 5 \%$ (1.86 ~ 2.06)	22 ± 2
	Measured	2020-07-08	40.38	1.90	20.92
2 600.0	Recommended Limit		$39.00 \pm 5 \%$ (37.05~40.95)	$1.96 \pm 5 \%$ (1.86~2.06)	22 ± 2
	Measured	2020-07-09	38.18	2.02	20.97
2 600.0	Recommended Limit		$39.00 \pm 5 \%$ (37.05~40.95)	$1.96 \pm 5 \%$ (1.86~2.06)	22 ± 2
	Measured	2020-07-10	39.44	1.97	21.11
5 300.0	Recommended Limit		$35.90 \pm 5 \%$ (34.11 ~ 37.70)	$4.76 \pm 5 \%$ (4.52 ~ 5.00)	22 ± 2
	Measured	2020-06-24	37.04	4.58	21.37
5 600.0	Recommended Limit		$35.50 \pm 5 \%$ (33.73 ~ 37.28)	$5.07 \pm 5 \%$ (4.82 ~ 5.32)	22 ± 2
	Measured	2020-06-23	36.43	4.89	21.11
5 800.0	Recommended Limit		$35.30 \pm 5 \%$ (33.54 ~ 37.07)	$5.27 \pm 5 \%$ (5.01 ~ 5.53)	22 ± 2
	Measured	2020-06-23	36.08	5.09	21.11

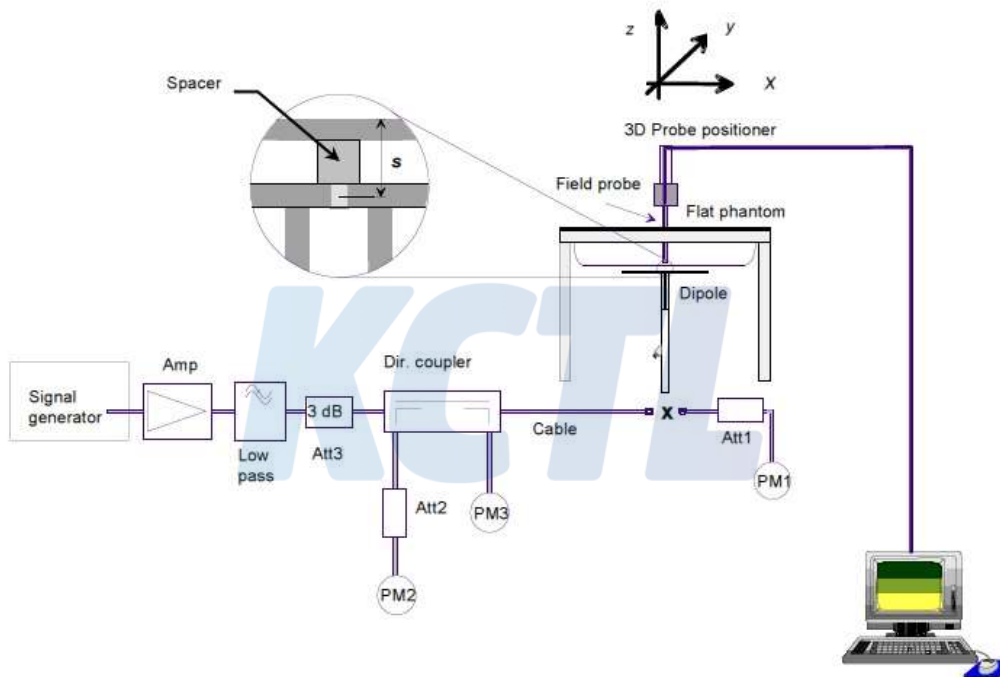
<Table 1. Measurement result Tissue electric parameters>

10.2 Test System Verification

The microwave circuit arrangement for system verification is sketched below picture.

The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within $\pm 10\%$ from the target SAR values. The tests were conducted on the same days as the measurement of the EUT. The obtained results from the system accuracy verification are displayed in the Table 2.

During the tests, the ambient temperature of the laboratory was in the range $(22 \pm 2) ^\circ\text{C}$, the relative humidity was in the range $(50 \pm 20)\%$ and the liquid depth Above the ear/grid reference points was above 15 cm in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.



Verification Kit	Probe S/N	Frequency (MHz)	Tissue Type	Limit/Measured (Normalized to 1 W)	
D750V3 SN: 1183	EX3DV4 SN: 7541	750.0	HSL	Recommended Limit 1g (Normalized)	8.19 ± 5 % (7.37 ~ 9.01)
				Measured 2020-06-13	8.48
D850V2 SN: 1006	EX3DV4 SN: 7541	850.0	HSL	Recommended Limit 1g (Normalized)	9.95 ± 5 % (8.96 ~ 10.95)
				Measured 2020-06-11	10.56
D850V2 SN: 1006	EX3DV4 SN: 7541	850.0	HSL	Recommended Limit 1g (Normalized)	9.95 ± 5 % (8.96 ~ 10.95)
				Measured 2020-06-22	10.08
D1750V2 SN: 1072	EX3DV4 SN: 7541	1 750.0	HSL	Recommended Limit 1g (Normalized)	36.50 ± 5 % (32.85 ~ 40.15)
				Measured 2020-06-27	35.96
D1900V2 SN: 5d160	EX3DV4 SN: 3697	1 900.0	HSL	Recommended Limit 1g (Normalized)	39.40 ± 10 % (35.46 ~ 43.34)
				Measured 2020-06-25	40.80
				Recommended Limit 10g (Normalized)	20.50 ± 10 % (18.45 ~ 22.55)
				Measured 2020-06-25	20.60
D1900V2 SN: 5d160	EX3DV4 SN: 3697	1 900.0	HSL	Recommended Limit 1g (Normalized)	39.40 ± 10 % (35.46 ~ 43.34)
				Measured 2020-06-29	39.96
D2450V2 SN: 895	EX3DV4 SN: 7541	2 450.0	HSL	Recommended Limit 1g (Normalized)	51.30 ± 5 % (46.17 ~ 56.43)
				Measured 2020-06-24	50.00
D2600V2 SN: 1050	EX3DV4 SN: 7541	2 600.0	HSL	Recommended Limit 1g (Normalized)	56.20 ± 5 % (50.58 ~ 61.82)
				Measured 2020-07-08	56.20
D2600V2 SN: 1050	EX3DV4 SN: 3697	2 600.0	HSL	Recommended Limit 1g (Normalized)	56.20 ± 10 % (50.58~61.82)
				Measured 2020-07-09	56.20
				Recommended Limit 10g (Normalized)	25.30 ± 10 % (22.77~27.83)
				Measured 2020-07-09	24.30
D2600V2 SN: 1050	EX3DV4 SN: 3697	2 600.0	HSL	Recommended Limit 1g (Normalized)	56.20 ± 10 % (50.58~61.82)
				Measured 2020-07-10	54.60
				Recommended Limit 10g (Normalized)	25.30 ± 10 % (22.77~27.83)
				Measured 2020-07-10	23.70
D5GHzV2 SN: 1134	EX3DV4 SN: 3697	5 300.0	HSL	Recommended Limit 1g (Normalized)	82.30 ± 10 % (74.07 ~ 90.53)
				Measured 2020-06-24	80.60
				Recommended Limit 10g (Normalized)	23.20 ± 10 % (20.88 ~ 25.52)
				Measured 2020-06-24	22.80
D5GHzV2 SN: 1134	EX3DV4 SN: 3697	5 600.0	HSL	Recommended Limit 1g (Normalized)	84.10 ± 10 % (75.69 ~ 92.51)
				Measured 2020-06-23	81.20
				Recommended Limit 10g (Normalized)	23.80 ± 10 % (21.42 ~ 26.18)
				Measured 2020-06-23	22.80
D5GHzV2 SN: 1134	EX3DV4 SN: 3697	5 800.0	HSL	Recommended Limit 1g (Normalized)	81.50 ± 10 % (73.35 ~ 89.65)
				Measured 2020-06-23	78.80

<Table 2. System Verification Result>

11. SAR Test Results

11.1 Standalone Head SAR Test Results

GSM 850 Band									
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
Voice	Right Cheek	0	836.6	33.41	34.50	1.285	0.215	0.276	1
	Right Tilt	0	836.6	33.41	34.50	1.285	0.125	0.161	
	Left Cheek	0	836.6	33.41	34.50	1.285	0.185	0.238	
	Left Tilt	0	836.6	33.41	34.50	1.285	0.102	0.131	
GPRS 2Tx	Right Cheek	0	836.6	30.43	31.50	1.279	0.197	0.252	
	Right Tilt	0	836.6	30.43	31.50	1.279	0.106	0.136	
	Left Cheek	0	836.6	30.43	31.50	1.279	0.172	0.220	
	Left Tilt	0	836.6	30.43	31.50	1.279	0.102	0.130	

GSM 1900 Band									
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
Voice	Right Cheek	0	1 880.0	30.88	31.50	1.153	0.103	0.119	
	Right Tilt	0	1 880.0	30.88	31.50	1.153	0.071	0.082	
	Left Cheek	0	1 880.0	30.88	31.50	1.153	0.137	0.158	
	Left Tilt	0	1 880.0	30.88	31.50	1.153	0.121	0.140	
GPRS 2Tx	Right Cheek	0	1 880.0	29.08	30.00	1.236	0.138	0.171	
	Right Tilt	0	1 880.0	29.08	30.00	1.236	0.099	0.123	
	Left Cheek	0	1 880.0	29.08	30.00	1.236	0.189	0.234	2
	Left Tilt	0	1 880.0	29.08	30.00	1.236	0.166	0.205	

WCDMA Band II									
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
RMC	Right Cheek	0	1 880.0	23.51	24.50	1.256	0.202	0.254	
	Right Tilt	0	1 880.0	23.51	24.50	1.256	0.133	0.167	
	Left Cheek	0	1 880.0	23.51	24.50	1.256	0.286	0.359	3
	Left Tilt	0	1 880.0	23.51	24.50	1.256	0.224	0.281	

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
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Report No.:
KR20-SPF0031-A
Page (78) of (293)

**WCDMA Band IV**

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
RMC	Right Cheek	0	1732.4	23.32	24.50	1.312	0.118	0.155	
	Right Tilt	0	1732.4	23.32	24.50	1.312	0.062	0.081	
	Left Cheek	0	1732.4	23.32	24.50	1.312	0.153	0.201	4
	Left Tilt	0	1732.4	23.32	24.50	1.312	0.103	0.135	

WCDMA Band V

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
RMC	Right Cheek	0	836.6	24.59	25.30	1.178	0.218	0.257	5
	Right Tilt	0	836.6	24.59	25.30	1.178	0.122	0.144	
	Left Cheek	0	836.6	24.59	25.30	1.178	0.210	0.247	
	Left Tilt	0	836.6	24.59	25.30	1.178	0.130	0.153	

LTE Band 2

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
QPSK 20M 1RB 0Offset	Right Cheek	0	1 880.0	23.37	24.00	1.156	0.209	0.242	
QPSK 20M 50RB 0Offset	Right Cheek	0	1 880.0	22.39	23.00	1.151	0.149	0.171	
QPSK 20M 1RB 0Offset	Right Tilt	0	1 880.0	23.37	24.00	1.156	0.125	0.145	
QPSK 20M 50RB 0Offset	Right Tilt	0	1 880.0	22.39	23.00	1.151	0.090	0.103	
QPSK 20M 1RB 0Offset	Left Cheek	0	1 880.0	23.37	24.00	1.156	0.292	0.338	6
QPSK 20M 50RB 0Offset	Left Cheek	0	1 880.0	22.39	23.00	1.151	0.213	0.245	
QPSK 20M 1RB 0Offset	Left Tilt	0	1 880.0	23.37	24.00	1.156	0.196	0.227	
QPSK 20M 50RB 0Offset	Left Tilt	0	1 880.0	22.39	23.00	1.151	0.155	0.178	

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
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Report No.:
KR20-SPF0031-A
Page (79) of (293)

**LTE Band 5**

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
QPSK 10M 1RB 0Offset	Right Cheek	0	836.5	23.97	25.00	1.268	0.179	0.227	7
QPSK 10M 25RB 0Offset	Right Cheek	0	836.5	23.57	24.00	1.104	0.162	0.179	
QPSK 10M 1RB 0Offset	Right Tilt	0	836.5	23.97	25.00	1.268	0.092	0.117	
QPSK 10M 25RB 0Offset	Right Tilt	0	836.5	23.57	24.00	1.104	0.085	0.094	
QPSK 10M 1RB 0Offset	Left Cheek	0	836.5	23.97	25.00	1.268	0.144	0.183	
QPSK 10M 25RB 0Offset	Left Cheek	0	836.5	23.57	24.00	1.104	0.129	0.142	
QPSK 10M 1RB 0Offset	Left Tilt	0	836.5	23.97	25.00	1.268	0.092	0.116	
QPSK 10M 25RB 0Offset	Left Tilt	0	836.5	23.57	24.00	1.104	0.074	0.082	

LTE Band 12

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
QPSK 10M 1RB 0Offset	Right Cheek	0	707.5	24.21	24.50	1.069	0.121	0.129	8
QPSK 10M 25RB 0Offset	Right Cheek	0	707.5	23.08	23.50	1.102	0.108	0.119	
QPSK 10M 1RB 0Offset	Right Tilt	0	707.5	24.21	24.50	1.069	0.064	0.069	
QPSK 10M 25RB 0Offset	Right Tilt	0	707.5	23.08	23.50	1.102	0.054	0.059	
QPSK 10M 1RB 0Offset	Left Cheek	0	707.5	24.21	24.50	1.069	0.117	0.125	
QPSK 10M 25RB 0Offset	Left Cheek	0	707.5	23.08	23.50	1.102	0.097	0.107	
QPSK 10M 1RB 0Offset	Left Tilt	0	707.5	24.21	24.50	1.069	0.074	0.079	
QPSK 10M 25RB 0Offset	Left Tilt	0	707.5	23.08	23.50	1.102	0.063	0.069	

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
www.kctl.co.kr

Report No.:
KR20-SPF0031-A
Page (80) of (293)

**LTE Band 26**

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
QPSK 15M 1RB 0Offset	Right Cheek	0	831.5	24.04	25.00	1.247	0.158	0.197	9
QPSK 15M 36RB 0Offset	Right Cheek	0	831.5	23.12	24.00	1.225	0.154	0.189	
QPSK 15M 1RB 0Offset	Right Tilt	0	831.5	24.04	25.00	1.247	0.086	0.108	
QPSK 15M 36RB 0Offset	Right Tilt	0	831.5	23.12	24.00	1.225	0.080	0.097	
QPSK 15M 1RB 0Offset	Left Cheek	0	831.5	24.04	25.00	1.247	0.125	0.156	
QPSK 15M 36RB 0Offset	Left Cheek	0	831.5	23.12	24.00	1.225	0.117	0.143	
QPSK 15M 1RB 0Offset	Left Tilt	0	831.5	24.04	25.00	1.247	0.077	0.096	
QPSK 15M 36RB 0Offset	Left Tilt	0	831.5	23.12	24.00	1.225	0.073	0.089	

LTE Band 41

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
QPSK 20M 1RB 0Offset	Right Cheek	0	2 593.0	24.45	25.00	1.135	0.573	0.650	
QPSK 20M 1RB 99Offset	Right Cheek	0	2 506.0	23.27	25.00	1.489	0.340	0.506	
QPSK 20M 1RB 99Offset	Right Cheek	0	2 549.5	23.74	25.00	1.337	0.480	0.642	
QPSK 20M 1RB 0Offset	Right Cheek	0	2 636.5	24.19	25.00	1.205	0.327	0.394	
QPSK 20M 1RB 0Offset	Right Cheek	0	2 680.0	23.70	25.00	1.349	0.506	0.683	10
QPSK 20M 50RB 0Offset	Right Cheek	0	2 593.0	23.46	24.00	1.132	0.442	0.501	
QPSK 20M 1RB 0Offset	Right Tilt	0	2 593.0	24.45	25.00	1.135	0.135	0.153	
QPSK 20M 50RB 0Offset	Right Tilt	0	2 593.0	23.46	24.00	1.132	0.104	0.118	
QPSK 20M 1RB 0Offset	Left Cheek	0	2 593.0	24.45	25.00	1.135	0.170	0.193	
QPSK 20M 50RB 0Offset	Left Cheek	0	2 593.0	23.46	24.00	1.132	0.126	0.143	
QPSK 20M 1RB 0Offset	Left Tilt	0	2 593.0	24.45	25.00	1.135	0.049	0.056	
QPSK 20M 50RB 0Offset	Left Tilt	0	2 593.0	23.46	24.00	1.132	0.035	0.039	

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
www.kctl.co.kr

Report No.:
KR20-SPF0031-A
Page (81) of (293)

**LTE Band 66**

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
QPSK 20M 1RB 0Offset	Right Cheek	0	1 770.0	23.74	24.50	1.191	0.205	0.244	
QPSK 20M 50RB 0Offset	Right Cheek	0	1 770.0	22.76	23.50	1.186	0.178	0.211	
QPSK 20M 1RB 0Offset	Right Tilt	0	1 770.0	23.74	24.50	1.191	0.122	0.145	
QPSK 20M 50RB 0Offset	Right Tilt	0	1 770.0	22.76	23.50	1.186	0.100	0.118	
QPSK 20M 1RB 0Offset	Left Cheek	0	1 770.0	23.74	24.50	1.191	0.263	0.313	11
QPSK 20M 50RB 0Offset	Left Cheek	0	1 770.0	22.76	23.50	1.186	0.199	0.236	
QPSK 20M 1RB 0Offset	Left Tilt	0	1 770.0	23.74	24.50	1.191	0.199	0.237	
QPSK 20M 50RB 0Offset	Left Tilt	0	1 770.0	22.76	23.50	1.186	0.153	0.181	

2.4 GHz WLAN

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
802.11b	Right Cheek	0	2 462.0	19.31	19.50	1.045	1.010	0.512	0.540	
	Right Tilt	0	2 462.0	19.31	19.50	1.045	1.010	0.553	0.584	
	Left Cheek	0	2 462.0	19.31	19.50	1.045	1.010	1.090	1.150	
	Left Cheek	0	2 412.0	19.31	19.50	1.045	1.010	1.000	1.055	
	Left Tilt	0	2 462.0	19.31	19.50	1.045	1.010	1.200	1.266	
	Left Tilt	0	2 412.0	19.31	19.50	1.045	1.010	1.110	1.171	
	Left Tilt	0	2 437.0	19.01	19.00	0.998	1.010	1.060	1.068	
	Repeated SAR Test									
	Left Tilt	0	2 462.0	19.31	19.50	1.045	1.010	1.210	1.277	12

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
www.kctl.co.kr

Report No.:
KR20-SPF0031-A
Page (82) of (293)

**NII**

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
802.11ac (VHT80)	Right Cheek	0	5 290.0	9.47	10.50	1.268	1.113	0.196	0.277	
	Right Tilt	0	5 290.0	9.47	10.50	1.268	1.113	0.269	0.380	
	Left Cheek	0	5 290.0	9.47	10.50	1.268	1.113	0.292	0.412	
	Left Tilt	0	5 290.0	9.47	10.50	1.268	1.113	0.423	0.597	13
802.11ac (VHT80)	Right Cheek	0	5 530.0	11.12	11.50	1.091	1.113	0.224	0.272	
	Right Tilt	0	5 530.0	11.12	11.50	1.091	1.113	0.305	0.371	
	Left Cheek	0	5 530.0	11.12	11.50	1.091	1.113	0.316	0.384	
	Left Tilt	0	5 530.0	11.12	11.50	1.091	1.113	0.442	0.537	14
802.11n (HT40)	Right Cheek	0	5 795.0	10.79	11.00	1.050	1.055	0.274	0.303	
	Right Tilt	0	5 795.0	10.79	11.00	1.050	1.055	0.373	0.413	
	Left Cheek	0	5 795.0	10.79	11.00	1.050	1.055	0.342	0.379	
	Left Tilt	0	5 795.0	10.79	11.00	1.050	1.055	0.458	0.507	15

Bluetooth

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
BDR_DH1	Right Cheek	0	2 441.0	11.41	12.00	1.146	3.333	0.056	0.213	
	Right Tilt	0	2 441.0	11.41	12.00	1.146	3.333	0.057	0.216	
	Left Cheek	0	2 441.0	11.41	12.00	1.146	3.333	0.110	0.420	v
	Left Tilt	0	2 441.0	11.41	12.00	1.146	3.333	0.108	0.412	

11.2 Standalone Body-Worn SAR Test Results

GSM 850 Band									
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
Voice	Front	15	836.6	33.41	34.50	1.285	0.203	0.261	17
	Rear	15	836.6	33.41	34.50	1.285	0.282	0.362	
GPRS 2x	Front	15	836.6	30.43	31.50	1.279	0.173	0.221	
	Rear	15	836.6	30.43	31.50	1.279	0.248	0.317	

GSM 1900 Band									
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
Voice	Front	15	1 880.0	30.88	31.50	1.153	0.215	0.248	
	Rear	15	1 880.0	30.88	31.50	1.153	0.285	0.329	
GPRS 2x	Front	15	1 880.0	29.08	30.00	1.236	0.294	0.363	
	Rear	15	1 880.0	29.08	30.00	1.236	0.367	0.454	

WCDMA Band II									
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
RMC	Grip Sensor Off								
	Front	15	1 880.0	23.51	24.50	1.256	0.484	0.608	19
	Rear	17	1 880.0	23.51	24.50	1.256	0.403	0.506	
	Grip Sensor On								
	Rear	15	1 880.0	22.59	23.00	1.099	0.497	0.546	

WCDMA Band IV									
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
RMC	Grip Sensor Off								
	Front	15	1732.4	23.32	24.50	1.312	0.126	0.165	
	Rear	17	1732.4	23.32	24.50	1.312	0.108	0.142	
	Grip Sensor On								
	Rear	15	1732.4	21.73	22.50	1.194	0.141	0.168	20

WCDMA Band V									
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
RMC	Front	15	836.6	24.59	25.30	1.178	0.204	0.240	
	Rear	15	836.6	24.59	25.30	1.178	0.274	0.323	

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
www.kctl.co.kr

Report No.:
KR20-SPF0031-A
Page (84) of (293)

**LTE Band 2**

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
QPSK 20M 1RB 0Offset	Front	15	1 880.0	23.37	24.00	1.156	0.352	0.407	
QPSK 20M 50RB 0Offset	Front	15	1 880.0	22.39	23.00	1.151	0.259	0.298	
QPSK 20M 1RB 0Offset	Rear	15	1 880.0	23.37	24.00	1.156	0.480	0.555	22
QPSK 20M 50RB 0Offset	Rear	15	1 880.0	22.39	23.00	1.151	0.359	0.413	

LTE Band 5

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
QPSK 10M 1RB 0Offset	Front	15	836.5	23.97	25.00	1.268	0.161	0.204	
QPSK 10M 25RB 0Offset	Front	15	836.5	23.57	24.00	1.104	0.144	0.159	
QPSK 10M 1RB 0Offset	Rear	15	836.5	23.97	25.00	1.268	0.248	0.314	23
QPSK 10M 25RB 0Offset	Rear	15	836.5	23.57	24.00	1.104	0.221	0.244	

LTE Band 12

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
QPSK 10M 1RB 0Offset	Front	15	707.5	24.21	24.50	1.069	0.128	0.137	
QPSK 10M 25RB 0Offset	Front	15	707.5	23.08	23.50	1.102	0.107	0.118	
QPSK 10M 1RB 0Offset	Rear	15	707.5	24.21	24.50	1.069	0.232	0.248	24
QPSK 10M 25RB 0Offset	Rear	15	707.5	23.08	23.50	1.102	0.198	0.218	

LTE Band 26

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
QPSK 15M 1RB 0Offset	Front	15	831.5	24.04	25.00	1.247	0.159	0.198	
QPSK 15M 36RB 0Offset	Front	15	831.5	23.12	24.00	1.225	0.136	0.167	
QPSK 15M 1RB 0Offset	Rear	15	831.5	24.04	25.00	1.247	0.236	0.294	25
QPSK 15M 36RB 0Offset	Rear	15	831.5	23.12	24.00	1.225	0.214	0.262	

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
www.kctl.co.kr

Report No.:
KR20-SPF0031-A
Page (85) of (293)

**LTE Band 41**

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
QPSK 20M 1RB 0Offset	Front	15	2 593.0	24.45	25.00	1.135	0.068	0.078	
QPSK 20M 50RB 0Offset	Front	15	2 593.0	23.46	24.00	1.132	0.052	0.059	
QPSK 20M 1RB 99Offset	Rear	15	2 593.0	24.45	25.00	1.135	0.287	0.326	26
QPSK 20M 50RB 24Offset	Rear	15	2 593.0	23.46	24.00	1.132	0.280	0.317	

LTE Band 66

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
Grip Sensor Off									
QPSK 20M 1RB 0Offset	Front	15	1 770.0	23.74	24.50	1.191	0.239	0.285	
QPSK 20M 50RB 0Offset	Front	15	1 770.0	22.76	23.50	1.186	0.195	0.231	
QPSK 20M 1RB 0Offset	Rear	17	1 770.0	23.74	24.50	1.191	0.281	0.335	
QPSK 20M 50RB 0Offset	Rear	17	1 770.0	22.76	23.50	1.186	0.290	0.344	
Grip Sensor On									
QPSK 20M 1RB 0Offset	Rear	15	1 770.0	22.77	23.50	1.183	0.337	0.399	
QPSK 20M 50RB 0Offset	Rear	15	1 770.0	22.76	23.50	1.186	0.348	0.413	27

2.4 GHz WLAN

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
802.11b	Front	15	2 462.0	19.31	19.50	1.045	1.010	0.095	0.100	
	Rear	15	2 462.0	19.31	19.50	1.045	1.010	0.164	0.173	28

NII

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
802.11a	Front	15	5 320.0	14.50	15.00	1.122	1.026	0.057	0.066	
	Rear	15	5 320.0	14.50	15.00	1.122	1.026	0.369	0.425	29
802.11n (HT40)	Front	15	5 630.0	15.00	15.50	1.122	1.055	0.072	0.086	
	Rear	15	5 630.0	15.00	15.50	1.122	1.055	0.452	0.535	30
802.11a	Front	15	5 785.0	14.72	15.00	1.067	1.026	0.068	0.075	
	Rear	15	5 785.0	14.72	15.00	1.067	1.026	0.322	0.352	31

11.3 Standalone Hotspot SAR Test Results

GSM 850 Band									
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
GPRS 2Tx	Front	10	836.6	30.43	31.50	1.279	0.177	0.226	32
	Rear	10	836.6	30.43	31.50	1.279	0.417	0.534	
	Left	10	836.6	30.43	31.50	1.279	0.105	0.134	
	Right	10	836.6	30.43	31.50	1.279	0.250	0.320	
	Bottom	10	836.6	30.43	31.50	1.279	0.151	0.193	

GSM 1900 Band										
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Plot No.	
GPRS 2Tx	Front	10	1 880.0	29.08	30.00	1.236	0.531	0.656	33	
	Rear	10	1 880.0	29.08	30.00	1.236	0.714	0.882		
	Rear	10	1 850.2	29.35	30.00	1.161	0.662	0.769		
	Rear	10	1 909.8	29.01	30.00	1.256	0.855	1.074		
	Left	10	1 880.0	29.08	30.00	1.236	0.339	0.419		
	Right	10	1 880.0	29.08	30.00	1.236	0.086	0.107		
	Bottom	10	1 880.0	29.08	30.00	1.236	0.601	0.743		
	Repeated SAR Test									
	Rear	10	1 909.8	29.01	30.00	1.256	0.824	1.035		

WCDMA Band II										
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.	
RMC	Front	10	1 880.0	22.59	23.00	1.099	0.711	0.781		
	Front	10	1 852.4	22.69	23.00	1.074	0.731	0.785		
	Front	10	1 907.6	22.57	23.00	1.104	0.618	0.682		
	Rear	10	1 880.0	22.59	23.00	1.099	0.851	0.935		
	Rear	10	1 852.4	22.69	23.00	1.074	0.872	0.937		
	Rear	10	1 907.6	22.57	23.00	1.104	0.756	0.835		
	Left	10	1 880.0	22.59	23.00	1.099	0.491	0.540		
	Right	10	1 880.0	22.59	23.00	1.099	0.157	0.173		
	Bottom	10	1 880.0	22.59	23.00	1.099	0.891	0.979	34	
	Bottom	10	1 852.4	22.69	23.00	1.074	0.821	0.882		
	Bottom	10	1 907.6	22.57	23.00	1.104	0.841	0.929		
	Repeated SAR Test									
	Bottom	10	1 880.0	22.59	23.00	1.099	0.881	0.968		

Note:

Hotspot mode supports power reduction. When the measured SAR is scaled to the maximum tune-up limit, the adjusted SAR is > 1.2 W/kg. Therefore, Phablet 10g SAR testing is required for this band.

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
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Report No.:
KR20-SPF0031-A
Page (87) of (293)

**WCDMA Band IV**

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
RMC	Front	10	1732.4	21.73	22.50	1.194	0.297	0.355	
	Rear	10	1732.4	21.73	22.50	1.194	0.303	0.362	
	Left	10	1732.4	21.73	22.50	1.194	0.296	0.353	
	Right	10	1732.4	21.73	22.50	1.194	0.111	0.133	
	Bottom	10	1732.4	21.73	22.50	1.194	0.425	0.507	35

WCDMA Band V

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
RMC	Front	10	836.6	24.59	25.30	1.178	0.194	0.228	
	Rear	10	836.6	24.59	25.30	1.178	0.451	0.531	36
	Left	10	836.6	24.59	25.30	1.178	0.139	0.164	
	Right	10	836.6	24.59	25.30	1.178	0.317	0.373	
	Bottom	10	836.6	24.59	25.30	1.178	0.186	0.219	

LTE Band 2

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
QPSK 20M 1RB 0Offset	Front	10	1 880.0	23.37	24.00	1.156	0.655	0.757	
QPSK 20M 50RB 0Offset	Front	10	1 880.0	22.39	23.00	1.151	0.485	0.558	
QPSK 20M 1RB 0Offset	Rear	10	1 880.0	23.37	24.00	1.156	0.927	1.072	
QPSK 20M 1RB 0Offset	Rear	10	1 860.0	23.36	24.00	1.159	0.957	1.109	37
QPSK 20M 1RB 0Offset	Rear	10	1 900.0	23.27	24.00	1.183	0.824	0.975	
QPSK 20M 50RB 0Offset	Rear	10	1 880.0	22.39	23.00	1.151	0.633	0.728	
QPSK 20M 100RB 0Offset	Rear	10	1 880.0	22.35	23.00	1.161	0.631	0.733	
QPSK 20M 1RB 0Offset	Left	10	1 880.0	23.37	24.00	1.156	0.455	0.526	
QPSK 20M 50RB 0Offset	Left	10	1 880.0	22.39	23.00	1.151	0.337	0.388	
QPSK 20M 1RB 0Offset	Right	10	1 880.0	23.37	24.00	1.156	0.125	0.145	
QPSK 20M 50RB 0Offset	Right	10	1 880.0	22.39	23.00	1.151	0.088	0.101	
QPSK 20M 1RB 0Offset	Bottom	10	1 880.0	23.37	24.00	1.156	0.815	0.942	
QPSK 20M 1RB 0Offset	Bottom	10	1 860.0	23.36	24.00	1.159	0.750	0.869	
QPSK 20M 1RB 0Offset	Bottom	10	1 900.0	23.27	24.00	1.183	0.792	0.937	
QPSK 20M 50RB 0Offset	Bottom	10	1 880.0	22.39	23.00	1.151	0.626	0.720	
QPSK 20M 100RB 0Offset	Bottom	10	1 880.0	22.35	23.00	1.161	0.633	0.735	

Repeated SAR Test

QPSK 20M 1RB 0Offset	Rear	10	1 860.0	23.36	24.00	1.159	0.916	1.061	
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Report No.:
KR20-SPF0031-A
Page (88) of (293)

**LTE Band 5**

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
QPSK 10M 1RB 0Offset	Front	10	836.5	23.97	25.00	1.268	0.152	0.193	
QPSK 10M 25RB 0Offset	Front	10	836.5	23.57	24.00	1.104	0.153	0.169	
QPSK 10M 1RB 0Offset	Rear	10	836.5	23.97	25.00	1.268	0.422	0.535	38
QPSK 10M 25RB 0Offset	Rear	10	836.5	23.57	24.00	1.104	0.420	0.464	
QPSK 10M 1RB 0Offset	Left	10	836.5	23.97	25.00	1.268	0.112	0.142	
QPSK 10M 25RB 0Offset	Left	10	836.5	23.57	24.00	1.104	0.097	0.108	
QPSK 10M 1RB 0Offset	Right	10	836.5	23.97	25.00	1.268	0.267	0.338	
QPSK 10M 25RB 0Offset	Right	10	836.5	23.57	24.00	1.104	0.233	0.257	
QPSK 10M 1RB 0Offset	Bottom	10	836.5	23.97	25.00	1.268	0.152	0.193	
QPSK 10M 25RB 0Offset	Bottom	10	836.5	23.57	24.00	1.104	0.139	0.153	

LTE Band 12

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
QPSK 10M 1RB 0Offset	Front	10	707.5	24.21	24.50	1.069	0.117	0.125	
QPSK 10M 25RB 0Offset	Front	10	707.5	23.08	23.50	1.102	0.098	0.108	
QPSK 10M 1RB 0Offset	Rear	10	707.5	24.21	24.50	1.069	0.296	0.316	39
QPSK 10M 25RB 0Offset	Rear	10	707.5	23.08	23.50	1.102	0.256	0.282	
QPSK 10M 1RB 0Offset	Left	10	707.5	24.21	24.50	1.069	0.114	0.122	
QPSK 10M 25RB 0Offset	Left	10	707.5	23.08	23.50	1.102	0.093	0.102	
QPSK 10M 1RB 0Offset	Right	10	707.5	24.21	24.50	1.069	0.207	0.221	
QPSK 10M 25RB 0Offset	Right	10	707.5	23.08	23.50	1.102	0.178	0.196	
QPSK 10M 1RB 0Offset	Bottom	10	707.5	24.21	24.50	1.069	0.097	0.104	
QPSK 10M 25RB 0Offset	Bottom	10	707.5	23.08	23.50	1.102	0.084	0.092	

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Suwon-si, Gyeonggi-do, 16677, Korea
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Report No.:
KR20-SPF0031-A
Page (89) of (293)

**LTE Band 26**

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
QPSK 15M 1RB 0Offset	Front	10	831.5	24.04	25.00	1.247	0.143	0.178	
QPSK 15M 36RB 0Offset	Front	10	831.5	23.12	24.00	1.225	0.129	0.158	
QPSK 15M 1RB 0Offset	Rear	10	831.5	24.04	25.00	1.247	0.354	0.442	40
QPSK 15M 36RB 0Offset	Rear	10	831.5	23.12	24.00	1.225	0.329	0.403	
QPSK 15M 1RB 0Offset	Left	10	831.5	24.04	25.00	1.247	0.118	0.147	
QPSK 15M 36RB 0Offset	Left	10	831.5	23.12	24.00	1.225	0.098	0.120	
QPSK 15M 1RB 0Offset	Right	10	831.5	24.04	25.00	1.247	0.264	0.329	
QPSK 15M 36RB 0Offset	Right	10	831.5	23.12	24.00	1.225	0.228	0.279	
QPSK 15M 1RB 0Offset	Bottom	10	831.5	24.04	25.00	1.247	0.140	0.175	
QPSK 15M 36RB 0Offset	Bottom	10	831.5	23.12	24.00	1.225	0.133	0.163	

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LTE Band 41									
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
QPSK 20M 1RB 99Offset	Front	10	2 593.0	20.01	21.00	1.256	0.152	0.191	
QPSK 20M 50RB 24Offset	Front	10	2 593.0	20.13	21.00	1.222	0.098	0.119	
QPSK 20M 1RB 99Offset	Rear	10	2 593.0	20.01	21.00	1.256	0.550	0.691	
QPSK 20M 1RB 0Offset	Rear	10	2 506.0	19.04	21.00	1.570	0.570	0.895	
QPSK 20M 1RB 99Offset	Rear	10	2 549.5	19.44	21.00	1.432	0.522	0.748	
QPSK 20M 1RB 0Offset	Rear	10	2 636.5	19.87	21.00	1.297	0.627	0.813	
QPSK 20M 1RB 0Offset	Rear	10	2 680.0	19.43	21.00	1.435	0.749	1.075	
QPSK 20M 50RB 24Offset	Rear	10	2 593.0	20.13	21.00	1.222	0.542	0.662	
QPSK 20M 50RB 24Offset	Rear	10	2 506.0	19.14	21.00	1.535	0.619	0.950	
QPSK 20M 50RB 24Offset	Rear	10	2 549.5	19.57	21.00	1.390	0.568	0.789	
QPSK 20M 50RB 0Offset	Rear	10	2 636.5	19.89	21.00	1.291	0.665	0.859	
QPSK 20M 50RB 0Offset	Rear	10	2 680.0	19.52	21.00	1.406	0.781	1.098	41
QPSK 20M 100RB 0Offset	Rear	10	2 593.0	20.15	21.00	1.216	0.728	0.885	
QPSK 20M 1RB 99Offset	Left	10	2 593.0	20.01	21.00	1.256	0.365	0.458	
QPSK 20M 50RB 24Offset	Left	10	2 593.0	20.13	21.00	1.222	0.360	0.440	
QPSK 20M 1RB 99Offset	Top	10	2 593.0	20.01	21.00	1.256	0.034	0.043	
QPSK 20M 50RB 24Offset	Top	10	2 593.0	20.13	21.00	1.222	0.025	0.030	

Note:

Hotspot mode supports power reduction. When the measured SAR is scaled to the maximum tune-up limit, the adjusted SAR is > 1.2 W/kg. Therefore, Phablet 10g SAR testing is required for this band.

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
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Report No.:
KR20-SPF0031-A
Page (91) of (293)

**LTE Band 66**

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
QPSK 20M 1RB 0Offset	Front	10	1 770.0	22.77	23.50	1.183	0.575	0.680	
QPSK 20M 50RB 0Offset	Front	10	1 770.0	22.76	23.50	1.186	0.457	0.542	
QPSK 20M 1RB 0Offset	Rear	10	1 770.0	22.77	23.50	1.183	0.688	0.814	
QPSK 20M 1RB 0Offset	Rear	10	1 720.0	22.50	23.50	1.259	0.448	0.564	
QPSK 20M 1RB 0Offset	Rear	10	1 745.0	22.37	23.50	1.297	0.417	0.541	
QPSK 20M 50RB 0Offset	Rear	10	1 770.0	22.76	23.50	1.186	0.706	0.837	42
QPSK 20M 50RB 0Offset	Rear	10	1 720.0	22.46	23.50	1.271	0.478	0.607	
QPSK 20M 50RB 0Offset	Rear	10	1 745.0	22.35	23.50	1.306	0.458	0.598	
QPSK 20M 100RB 0Offset	Rear	10	1 770.0	22.71	23.50	1.199	0.689	0.826	
QPSK 20M 1RB 0Offset	Left	10	1 770.0	22.77	23.50	1.183	0.566	0.670	
QPSK 20M 50RB 0Offset	Left	10	1 770.0	22.76	23.50	1.186	0.455	0.540	
QPSK 20M 1RB 0Offset	Right	10	1 770.0	22.77	23.50	1.183	0.203	0.240	
QPSK 20M 50RB 0Offset	Right	10	1 770.0	22.76	23.50	1.186	0.156	0.185	
QPSK 20M 1RB 0Offset	Bottom	10	1 770.0	22.77	23.50	1.183	0.477	0.564	
QPSK 20M 50RB 0Offset	Bottom	10	1 770.0	22.76	23.50	1.186	0.435	0.516	

2.4 GHz WLAN

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
802.11b	Front	10	2 462.0	19.31	19.50	1.045	1.010	0.197	0.208	
	Rear	10	2 462.0	19.31	19.50	1.045	1.010	0.295	0.311	43
	Right	10	2 462.0	19.31	19.50	1.045	1.010	0.126	0.133	
	Top	10	2 462.0	19.31	19.50	1.045	1.010	0.223	0.235	

NII

Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	Plot No.
802.11a	Front	10	5 785.0	14.72	15.00	1.067	1.026	0.121	0.132	
	Rear	10	5 785.0	14.72	15.00	1.067	1.026	0.403	0.441	
	Right	10	5 785.0	14.72	15.00	1.067	1.026	0.052	0.057	
	Top	10	5 785.0	14.72	15.00	1.230	1.055	0.712	0.924	
	Top	10	5 745.0	14.22	15.00	1.230	1.055	0.766	0.994	44
	Top	10	5 825.0	14.71	15.00	1.230	1.055	0.611	0.793	

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11.4 Standalone Phablet SAR Test Results

WCDMA Band II									
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 10 g SAR (W/kg)	Scaled 10 g SAR (W/kg)	Plot No.
RMC	Grip Sensor Off								
	Front	3	1 880.0	23.51	24.50	1.256	0.991	1.245	
	Rear	17	1 880.0	23.51	24.50	1.256	0.270	0.339	
	Left	0	1 880.0	23.51	24.50	1.256	2.000	2.512	
	Left	0	1 852.4	23.25	24.50	1.334	1.800	2.400	
	Left	0	1 907.6	23.47	24.50	1.268	2.020	2.561	
	Right	0	1 880.0	23.51	24.50	1.256	0.183	0.230	
	Bottom	11	1 880.0	23.51	24.50	1.256	0.364	0.457	
	Grip Sensor On								
	Front	0	1 880.0	22.59	23.00	1.099	1.680	1.846	
	Rear	0	1 880.0	22.59	23.00	1.099	2.980	3.275	45
	Rear	0	1 852.4	22.69	23.00	1.074	2.840	3.050	
	Rear	0	1 907.6	22.57	23.00	1.104	2.940	3.246	
	Bottom	0	1 880.0	22.59	23.00	1.099	1.720	1.890	
	Repeated SAR Test								
	Rear	0	1 880.0	22.59	23.00	1.099	2.870	3.154	

LTE Band 41									
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 10 g SAR (W/kg)	Scaled 10 g SAR (W/kg)	Plot No.
Grip Sensor Off									
QPSK 20M 1RB 0Offset	Front	0	2 593.0	24.45	25.00	1.135	0.541	0.614	
QPSK 20M 50RB 0Offset	Front	0	2 593.0	23.46	24.00	1.132	0.403	0.456	
QPSK 20M 1RB 0Offset	Rear	14	2 593.0	24.45	25.00	1.135	0.287	0.326	
QPSK 20M 50RB 0Offset	Rear	14	2 593.0	23.46	24.00	1.132	0.278	0.315	
QPSK 20M 1RB 0Offset	Left	9	2 593.0	24.45	25.00	1.135	0.684	0.776	
QPSK 20M 50RB 0Offset	Left	9	2 593.0	23.46	24.00	1.132	0.517	0.585	
QPSK 20M 1RB 0Offset	Top	0	2 593.0	24.45	25.00	1.135	0.009	0.011	
QPSK 20M 50RB 0Offset	Top	0	2 593.0	23.46	24.00	1.132	0.020	0.023	

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LTE Band 41									
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 10 g SAR (W/kg)	Scaled 10 g SAR (W/kg)	Plot No.
Grip Sensor On									
QPSK 20M 1RB 0Offset	Rear	0	2 506.0	21.34	22.00	1.164	2.710	3.155	
QPSK 20M 1RB 99Offset	Rear	0	2 549.5	21.56	22.00	1.107	2.470	2.733	
QPSK 20M 1RB 99Offset	Rear	0	2 593.0	21.85	22.00	1.035	2.440	2.526	
QPSK 20M 1RB 0Offset	Rear	0	2 636.5	21.80	22.00	1.047	2.600	2.723	
QPSK 20M 1RB 0Offset	Rear	0	2 680.0	21.62	22.00	1.091	2.880	3.143	
QPSK 20M 50RB 24Offset	Rear	0	2 506.0	21.36	22.00	1.159	2.740	3.175	46
QPSK 20M 50RB 50Offset	Rear	0	2 549.5	21.65	22.00	1.084	2.560	2.775	
QPSK 20M 50RB 24Offset	Rear	0	2 593.0	21.94	22.00	1.014	2.500	2.535	
QPSK 20M 50RB 0Offset	Rear	0	2 636.5	21.83	22.00	1.040	2.690	2.797	
QPSK 20M 50RB 0Offset	Rear	0	2 680.0	21.82	22.00	1.042	2.990	3.117	
QPSK 20M 100RB 0Offset	Rear	0	2 593.0	21.92	22.00	1.019	2.470	2.516	
QPSK 20M 1RB 0Offset	Left	0	2 506.0	21.34	22.00	1.164	2.170	2.526	
QPSK 20M 1RB 99Offset	Left	0	2 549.5	21.56	22.00	1.107	2.000	2.213	
QPSK 20M 1RB 99Offset	Left	0	2 593.0	21.85	22.00	1.035	1.930	1.998	
QPSK 20M 1RB 0Offset	Left	0	2 636.5	21.80	22.00	1.047	2.040	2.136	
QPSK 20M 1RB 0Offset	Left	0	2 680.0	21.62	22.00	1.091	2.290	2.499	
QPSK 20M 50RB 24Offset	Left	0	2 506.0	21.36	22.00	1.159	2.150	2.491	
QPSK 20M 50RB 50Offset	Left	0	2 549.5	21.65	22.00	1.084	2.060	2.233	
QPSK 20M 50RB 24Offset	Left	0	2 593.0	21.94	22.00	1.014	1.990	2.018	
QPSK 20M 50RB 0Offset	Left	0	2 636.5	21.83	22.00	1.040	2.090	2.173	
QPSK 20M 50RB 0Offset	Left	0	2 680.0	21.82	22.00	1.042	2.350	2.449	
QPSK 20M 100RB 0Offset	Left	0	2 593.0	21.92	22.00	1.019	2.030	2.068	
Repeated SAR Test									
QPSK 20M 50RB 24Offset	Rear	0	2 506.0	21.36	22.00	1.159	2.570	2.978	

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NII										
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 10 g SAR (W/kg)	Scaled 10 g SAR (W/kg)	Plot No.
802.11a	Front	0	5 320.0	14.50	15.00	1.122	1.026	0.339	0.390	
	Rear	0	5 320.0	14.50	15.00	1.122	1.026	0.842	0.969	
	Right	0	5 320.0	14.50	15.00	1.122	1.026	0.206	0.237	
	Top	0	5 320.0	14.50	15.00	1.122	1.026	1.150	1.323	47
802.11n (HT40)	Front	0	5 630.0	15.00	15.50	1.122	1.055	0.307	0.363	
	Rear	0	5 630.0	15.00	15.50	1.122	1.055	0.973	1.152	
	Right	0	5 630.0	15.00	15.50	1.122	1.055	0.061	0.072	
	Top	0	5 630.0	15.00	15.50	1.122	1.055	1.440	1.704	48

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2013, and FCC KDB Publication 447498 D01v06.
2. All modes of operation were investigated, and worst-case results are reported.
3. Battery is fully charged for all readings and the standard batteries are the only options.
4. Liquid tissue depth was at least 15 cm.
5. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
6. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v06.
7. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 15 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.
8. Per FCC KDB Publication 648474 D04v01r03, body-worn SAR was evaluated without a headset connected to the device. Since the standalone reported body-worn SAR was ≤ 1.2 W/kg, no additional body-worn SAR evaluations using a headset cable were required.
9. This device utilizes power reduction for some wireless modes, as outlined in Section 1.3. The maximum output power allowed for each transmitter and exposure condition was evaluated for SAR compliance based on expected use conditions and simultaneous transmission scenarios.

GSM Notes:

1. Body-Worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.
2. This device supports GSM VOIP in the head and body-worn configurations; therefore GPRS was additionally evaluated for head and body-worn compliance.
3. Justification for reduced test configurations per KDB Publication 941225 D01v03r01 and October 2013 TCB Workshop Notes: The source-based frame-averaged output power was evaluated for all GPRS/EDGE slot configurations. The configuration with the highest target frame averaged output power was evaluated for hotspot SAR. When the maximum frame-averaged powers are equivalent across two or more slots (within 0.25 dB), the configuration with the most number of time slots was tested.
4. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). Since the maximum output power variation across the required test channels is not $> \frac{1}{2}$ dB, the middle channel was used for testing.

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
www.kctl.co.kr

Report No.:
KR20-SPF0031-A
Page (95) of (293)

**WCDMA Notes:**

1. UMTS mode in was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v03r01. AMR and HSPA SAR was not required per the 3G Test Reduction Procedure in KDB Publication 941225 D01v03r01.
2. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg for 1g evaluations then testing at the other channels is not required for such test configuration(s).

LTE Notes:

1. Justification Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB, and 50% RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel.
2. When the reported SAR is > 0.8 W/kg, testing for other Channels is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
3. Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are > 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
4. Testing for 16-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
5. Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.
6. A-MPR was disabled for all SAR tests by setting NS=01 and MCC=001 on the base station simulator.
7. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).
8. TDD LTE was tested using UL-DL configuration 0 with 6 UL sub frames and 2S sub-frames using extended cyclic prefix only and special sub frame configuration 6. SAR tests were performed at maximum output power and worst-case transmission duty factor in extended cyclic prefix. Per 3GPP 36.211 Sec. 4, the duty factor using extended cyclic prefix is 0.633(cf=1.58).
9. For LTE bands that do not support at least three non-overlapping channels in certain channel bandwidths, test the available non-overlapping channels instead. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing; therefore, the requirement for H, M and L channels may not fully apply.

WLAN & Bluetooth Notes:

1. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 2.4GHz WIFI operations, the highest measured maximum output power channel for DSSS was selected for SAR measurement. SAR for OFDM modes (2.4GHz 802.11g/n) was not required due to the maximum allowed powers and the highest reported DSSS SAR.
2. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools. The reported SAR was scaled to the 100% transmission duty factor to determine compliance.
3. When the same transmission mode configurations have the same maximum output power on the same channel for the 802.11 a/g/n/ac modes, the channel in the lower order/sequence 802.11 mode (i.e. a, g, n then ac) is selected.
4. When the specified maximum output power is the same for both UNII Band1 and UNII Band 2A, begins SAR measurement in UNII band 2A; and if the highest reported SAR for UNII band 2A is ≤ 1.2 W/kg, SAR is not required for UNII band1 > 1.2 W/kg, both bands should be tested independently for SAR.
5. When the maximum reported 1g averaged SAR is ≤ 0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg for 1g evaluations or all test channels were measured.

12. Simultaneous Transmission

The following procedures adopted from FCC KDB Publication 447498 D01v06 are applicable to devices with built in unlicensed transmitters such as 802.11 and Bluetooth devices which may simultaneously transmit with the licensed transmitter.

This device contains transmitters that may operate simultaneously. Therefore, simultaneous transmission analysis is required. Per FCC KDB Publication 447498 D01v06 4.3.2 and IEEE 1528-2013 Section 6.3.4.1.2, simultaneous transmission SAR test exclusion may be applied when the sum of the 1g or 10g SAR for all the simultaneous transmitting antennas in a specific a physical test configuration is within SAR limits. The different test positions in an exposure condition may be considered collectively to determine SAR test exclusion according to the sum of 1g or 10g SAR.

12.1 Estimated SAR

When standalone SAR is not required to be measured, per FCC KDB 447498 D01v06 4.3.2 b), the following equation must be used to estimate the standalone 1g or 10g SAR for simultaneous transmission assessment involving that transmitter.

$$\text{Estimated SAR} = \frac{\sqrt{f(\text{GHz})}}{7.5} \times \frac{(\text{Max Power of channel, mW})}{\text{Min. Separation Distance, mm}}$$

Mode	Position	Frequency	Maximum Allowed Power	Separation Distance	Estimated 1g SAR
		MHz	mW	mm	W/kg
Bluetooth	Body-worn	2 441.0	16	15	0.222
	Hotspot	2 441.0	16	10	0.333

Note:

- Bluetooth SAR was not required to be measured per FCC KDB Publication 447498 D01v06.
- Estimated SAR results were used in the above table to determine simultaneous transmission SAR test exclusion.

12.2 Simultaneous Transmission Analysis

Exposure Condition /Position		licensed	WLAN		Bluetooth	Summation		
			2.4 GHz	5 GHz				
		[①]	[②]	[③]	[④]	[①+②]	[①+③]	[①+④]
GSM/GPRS 850 Band								
Head	Right Cheek	0.276	0.540	0.303	0.213	0.816	0.579	0.489
	Right Tilt	0.161	0.584	0.413	0.216	0.745	0.574	0.377
	Left Cheek	0.238	1.150	0.412	0.420	1.388	0.650	0.658
	Left Tilt	0.131	1.277	0.597	0.412	1.408	0.728	0.543
Body-Worn	Front	0.261	0.100	0.086	0.222	0.361	0.347	0.483
	Rear	0.362	0.173	0.535	0.222	0.535	0.897	0.584
Hotspot	Front	0.226	0.208	0.132	0.333	0.434	0.358	0.559
	Rear	0.534	0.311	0.441	0.333	0.845	0.975	0.867
	Left	0.134	-	-	0.333	0.134	0.314	0.467
	Right	0.320	0.133	0.057	0.333	0.453	0.377	0.653
	Top	-	0.235	0.994	0.333	0.235	0.994	0.333
	Bottom	0.193	-	-	0.333	0.193	0.193	0.526
GSM/GPRS 1900 Band								
Head	Right Cheek	0.171	0.540	0.303	0.213	0.711	0.474	0.384
	Right Tilt	0.123	0.584	0.413	0.216	0.707	0.536	0.339
	Left Cheek	0.234	1.150	0.412	0.420	1.384	0.646	0.654
	Left Tilt	0.205	1.277	0.597	0.412	1.482	0.802	0.617
Body-Worn	Front	0.363	0.100	0.086	0.222	0.463	0.449	0.585
	Rear	0.454	0.173	0.535	0.222	0.627	0.989	0.676
Hotspot	Front	0.656	0.208	0.132	0.333	0.864	0.788	0.989
	Rear	1.074	0.311	0.441	0.333	1.385	1.515	1.407
	Left	0.419	-	-	0.333	0.419	0.419	0.752
	Right	0.107	0.133	0.057	0.333	0.240	0.164	0.440
	Top	-	0.235	0.994	0.333	0.235	0.994	0.333
	Bottom	0.743	-	-	0.333	0.743	0.743	1.076

KCTL Inc. 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea TEL: 82-31-285-0894 FAX: 82-505-299-8311 www.kctl.co.kr	Report No.: KR20-SPF0031-A Page (98) of (293)	
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Exposure Condition /Position		licensed	WLAN		Bluetooth	Summation		
			2.4 GHz	5 GHz		[①+②]	[①+③]	[①+④]
		[①]	[②]	[③]	[④]			
WCDMA Band II								
Head	Right Cheek	0.254	0.540	0.303	0.213	0.794	0.557	0.467
	Right Tilt	0.167	0.584	0.413	0.216	0.751	0.580	0.383
	Left Cheek	0.359	1.150	0.412	0.420	1.509	0.771	0.779
	Left Tilt	0.281	1.277	0.597	0.412	1.558	0.878	0.693
Body-Worn	Front	0.608	0.100	0.086	0.222	0.708	0.694	0.83
	Rear	0.546	0.173	0.535	0.222	0.719	1.081	0.768
Hotspot	Front	0.785	0.208	0.132	0.333	0.993	0.917	1.118
	Rear	0.937	0.311	0.441	0.333	1.248	1.378	1.270
	Left	0.540	-	-	0.333	0.540	0.540	0.873
	Right	0.173	0.133	0.057	0.333	0.306	0.230	0.506
	Top	-	0.235	0.994	0.333	0.235	0.994	0.333
	Bottom	0.979	-	-	0.333	0.979	0.979	1.312
Phablet	Front	1.846	N/A	0.390	N/A	N/A	2.236	N/A
	Rear	3.275	N/A	1.152	N/A	N/A	4.427	N/A
	Left	2.561	N/A	-	N/A	N/A	2.561	N/A
	Right	0.230	N/A	0.237	N/A	N/A	0.467	N/A
	Top	-	N/A	1.704	N/A	N/A	1.704	N/A
	Bottom	1.890	N/A	-	N/A	N/A	1.890	N/A
WCDMA Band IV								
Head	Right Cheek	0.155	0.540	0.303	0.213	0.695	0.458	0.368
	Right Tilt	0.081	0.584	0.413	0.216	0.665	0.494	0.297
	Left Cheek	0.201	1.150	0.412	0.420	1.351	0.613	0.621
	Left Tilt	0.135	1.277	0.597	0.412	1.412	0.732	0.547
Body-Worn	Front	0.165	0.100	0.086	0.222	0.265	0.251	0.387
	Rear	0.168	0.173	0.535	0.222	0.341	0.703	0.390
Hotspot	Front	0.355	0.208	0.132	0.333	0.563	0.487	0.688
	Rear	0.362	0.311	0.441	0.333	0.673	0.803	0.695
	Left	0.353	-	-	0.333	0.353	0.353	0.686
	Right	0.133	0.133	0.057	0.333	0.266	0.190	0.466
	Top	-	0.235	0.994	0.333	0.235	0.994	0.333
	Bottom	0.507	-	-	0.333	0.507	0.507	0.84

Exposure Condition /Position		licensed	WLAN		Bluetooth	Summation		
			2.4 GHz	5 GHz				
		【①】	【②】	【③】	【④】	【①+②】	【①+③】	【①+④】
WCDMA Band V								
Head	Right Cheek	0.257	0.540	0.303	0.213	0.797	0.560	0.470
	Right Tilt	0.144	0.584	0.413	0.216	0.728	0.557	0.360
	Left Cheek	0.247	1.150	0.412	0.420	1.397	0.659	0.667
	Left Tilt	0.153	1.277	0.597	0.412	1.430	0.750	0.565
Body-Worn	Front	0.240	0.100	0.086	0.222	0.340	0.326	0.462
	Rear	0.323	0.173	0.535	0.222	0.496	0.858	0.545
Hotspot	Front	0.228	0.208	0.132	0.333	0.436	0.360	0.561
	Rear	0.531	0.311	0.441	0.333	0.842	0.972	0.864
	Left	0.164	-	-	0.333	0.164	0.164	0.497
	Right	0.373	0.133	0.057	0.333	0.506	0.430	0.706
	Top	-	0.235	0.994	0.333	0.235	0.994	0.333
	Bottom	0.219	-	-	0.333	0.219	0.219	0.552
LTE Band 2								
Head	Right Cheek	0.242	0.540	0.303	0.213	0.782	0.545	0.455
	Right Tilt	0.145	0.584	0.413	0.216	0.729	0.558	0.361
	Left Cheek	0.338	1.150	0.412	0.420	1.488	0.750	0.758
	Left Tilt	0.227	1.277	0.597	0.412	1.504	0.824	0.639
Body-Worn	Front	0.407	0.100	0.086	0.222	0.507	0.493	0.629
	Rear	0.555	0.173	0.535	0.222	0.728	1.090	0.777
Hotspot	Front	0.757	0.208	0.132	0.333	0.965	0.889	1.090
	Rear	1.109	0.311	0.441	0.333	1.420	1.550	1.442
	Left	0.526	-	-	0.333	0.526	0.526	0.859
	Right	0.145	0.133	0.057	0.333	0.278	0.202	0.478
	Top	-	0.235	0.994	0.333	0.235	0.994	0.333
	Bottom	0.942	-	-	0.333	0.942	0.942	1.275
LTE Band 5								
Head	Right Cheek	0.227	0.540	0.303	0.213	0.767	0.530	0.440
	Right Tilt	0.117	0.584	0.413	0.216	0.701	0.530	0.333
	Left Cheek	0.183	1.150	0.412	0.420	1.333	0.595	0.603
	Left Tilt	0.116	1.277	0.597	0.412	1.393	0.713	0.528
Body-Worn	Front	0.204	0.100	0.086	0.222	0.304	0.290	0.426
	Rear	0.314	0.173	0.535	0.222	0.487	0.849	0.536
Hotspot	Front	0.193	0.208	0.132	0.333	0.401	0.325	0.526
	Rear	0.535	0.311	0.441	0.333	0.846	0.976	0.868
	Left	0.142	-	-	0.333	0.142	0.142	0.475
	Right	0.338	0.133	0.057	0.333	0.471	0.395	0.671
	Top	-	0.235	0.994	0.333	0.235	0.994	0.333
	Bottom	0.193	-	-	0.333	0.193	0.193	0.526

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
www.kctl.co.kr

Report No.:
KR20-SPF0031-A
Page (100) of (293)



Exposure Condition /Position		licensed	WLAN		Bluetooth	Summation		
			2.4 GHz	5 GHz				
		[①]	[②]	[③]	[④]	[①+②]	[①+③]	[①+④]
LTE Band 12								
Head	Right Cheek	0.129	0.540	0.303	0.213	0.669	0.432	0.342
	Right Tilt	0.069	0.584	0.413	0.216	0.653	0.482	0.285
	Left Cheek	0.125	1.150	0.412	0.420	1.275	0.537	0.545
	Left Tilt	0.079	1.277	0.597	0.412	1.356	0.676	0.491
Body-Worn	Front	0.137	0.100	0.086	0.222	0.237	0.223	0.359
	Rear	0.248	0.173	0.535	0.222	0.421	0.783	0.470
Hotspot	Front	0.125	0.208	0.132	0.333	0.333	0.257	0.458
	Rear	0.316	0.311	0.441	0.333	0.627	0.757	0.649
	Left	0.122	-	-	0.333	0.122	0.122	0.455
	Right	0.221	0.133	0.057	0.333	0.354	0.278	0.554
	Top	-	0.235	0.994	0.333	0.235	0.994	0.333
	Bottom	0.104	-	-	0.333	0.104	0.104	0.437
LTE Band 26								
Head	Right Cheek	0.197	0.540	0.303	0.213	0.737	0.500	0.410
	Right Tilt	0.108	0.584	0.413	0.216	0.692	0.521	0.324
	Left Cheek	0.156	1.150	0.412	0.420	1.306	0.568	0.576
	Left Tilt	0.096	1.277	0.597	0.412	1.373	0.693	0.508
Body-Worn	Front	0.198	0.100	0.086	0.222	0.298	0.284	0.420
	Rear	0.294	0.173	0.535	0.222	0.467	0.829	0.516
Hotspot	Front	0.178	0.208	0.132	0.333	0.386	0.310	0.511
	Rear	0.442	0.311	0.441	0.333	0.753	0.883	0.775
	Left	0.147	-	-	0.333	0.147	0.147	0.480
	Right	0.329	0.133	0.057	0.333	0.462	0.386	0.662
	Top	-	0.235	0.994	0.333	0.235	0.994	0.333
	Bottom	0.175	-	-	0.333	0.175	0.175	0.508

Exposure Condition /Position		licensed	WLAN		Bluetooth	Summation		
			2.4 GHz	5 GHz				
		【①】	【②】	【③】	【④】	【①+②】	【①+③】	【①+④】
LTE Band 41								
Head	Right Cheek	0.683	0.540	0.303	0.213	1.223	0.986	0.896
	Right Tilt	0.153	0.584	0.413	0.216	0.737	0.566	0.369
	Left Cheek	0.193	1.150	0.412	0.420	1.343	0.605	0.613
	Left Tilt	0.056	1.277	0.597	0.412	1.333	0.653	0.468
Body-Worn	Front	0.078	0.100	0.086	0.222	0.178	0.164	0.300
	Rear	0.326	0.173	0.535	0.222	0.499	0.861	0.548
Hotspot	Front	0.191	0.208	0.132	0.333	0.399	0.323	0.524
	Rear	1.098	0.311	0.441	0.333	1.409	1.539	1.431
	Left	0.458	-	-	0.333	0.458	0.458	0.791
	Right	-	0.133	0.057	0.333	0.133	0.057	0.333
	Top	0.043	0.235	0.994	0.333	0.278	1.037	0.376
	Bottom	-	-	-	0.333	-	-	0.333
Phablet	Front	0.614	N/A	0.390	N/A	N/A	1.004	N/A
	Rear	3.175	N/A	1.152	N/A	N/A	4.327	N/A
	Left	2.526	N/A	-	N/A	N/A	2.526	N/A
	Right	-	N/A	0.237	N/A	N/A	0.237	N/A
	Top	0.023	N/A	1.704	N/A	N/A	1.727	N/A
	Bottom	-	N/A	-	N/A	N/A	-	N/A
LTE Band 66								
Head	Right Cheek	0.244	0.540	0.303	0.213	0.784	0.547	0.457
	Right Tilt	0.145	0.584	0.413	0.216	0.729	0.558	0.361
	Left Cheek	0.313	1.150	0.412	0.420	1.463	0.725	0.733
	Left Tilt	0.237	1.277	0.597	0.412	1.514	0.834	0.649
Body-Worn	Front	0.285	0.100	0.086	0.222	0.385	0.371	0.507
	Rear	0.413	0.173	0.535	0.222	0.586	0.948	0.635
Hotspot	Front	0.680	0.208	0.132	0.333	0.888	0.812	1.013
	Rear	0.837	0.311	0.441	0.333	1.148	1.278	1.170
	Left	0.670	-	-	0.333	0.670	0.670	1.003
	Right	0.240	0.133	0.057	0.333	0.373	0.297	0.573
	Top	-	0.235	0.994	0.333	0.235	0.994	0.333
	Bottom	0.564	-	-	0.333	0.564	0.564	0.897

Notes: Simultaneous transmission SAR test exclusion considerations

- Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneously transmitting antenna. When the sum of 1-g or 10-g SAR of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit, SAR test exclusion applies to that simultaneous transmission configuration. Per KDB Publication 447498 D01v06.
- When the sum of SAR1g of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit (SAR1g 1.6 W/kg), the SPLSR procedures is not required. When the sum of SAR1g is greater than the SAR limit (SAR1g 1.6 W/kg), SAR test exclusion is determined by the SPLSR.

12.3 SAR to Peak Location Separation Ratio Analysis

The simultaneous transmitting antennas in each operating mode and exposure condition combination are considered one pair at a time to determine the SPLSR. When SAR is measured for both antennas in the pair, the peak location separation distance is computed by the following formula.

$$\text{Peak Location Separation Distance} = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2}$$

Where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the area or zoom scans.

When standalone test exclusion applies, SAR is estimated; the peak location is assumed to be at the feed-point or geometric center of the antenna. Due to curvatures on the SAM phantom, when SAR is estimated for one of the antennas in an antenna pair, the measured peak SAR location will be translated onto the test device to determine the peak location separation for the antenna pair.

The SPLSR is determined by the following formula.

$$\text{SPLSR} = \frac{(\text{SAR}_1 + \text{SAR}_2)^{1.5}}{R_i}$$

Where SAR₁ and SAR₂ are the highest reported or estimated SAR for each antenna in the pair, and R_i is the separation distance between the peak SAR locations for the antenna pair in mm.

When the SPLSR is ≤ 0.04, ≤ 0.10 (10g) the simultaneous transmission SAR is not required. Otherwise, the enlarged zoom scan and volume scan post-processing procedures will be performed.

12.3.1 Maximum Simultaneous Transmission Analysis

Exposure Condition /Position		licensed	WLAN	Worst Summation	SPLSR or Volume Scan (Yes / No)
			5 GHz		
		【①】	【②】	【①+②】	
WCDMA Band II					
Phablet (10g SAR)	Front	1.846	0.390	2.236	No
	Rear	3.275	1.152	4.427	Yes
	Left	2.561	-	2.561	No
	Right	0.230	0.237	0.467	No
	Top	-	1.704	1.704	No
	Bottom	1.890	-	1.890	No
LTE Band 41					
Phablet (10g SAR)	Front	0.614	0.390	1.004	No
	Rear	3.175	1.152	4.327	Yes
	Left	2.526	-	2.526	No
	Right	-	0.237	0.237	No
	Top	0.023	1.704	1.727	No
	Bottom	-	-	-	No

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12.3.2 SPLSR Analysis

RF Exposure Condition	Mode	SAR Value (W/kg)	Coordinates			Peak Location Separation Distance (mm)	SPLSR Result	Simultaneous Transmission SAR Test
			X	Y	Z			
Extremity (10g SAR)	LTE Band 2	3.275	-52.0	71.0	-207	154.0	0.060	Not Required (SPLSR < 0.10),
	5 GHz WLAN	1.152	-17.0	-79.0	-208			

RF Exposure Condition	Mode	SAR Value (W/kg)	Coordinates			Peak Location Separation Distance (mm)	SPLSR Result	Simultaneous Transmission SAR Test
			X	Y	Z			
Extremity (10g SAR)	LTE Band 41	3.175	-62.4	-54.2	-208	51.7	0.174	Required Volume Scan (SPLSR > 0.10),
	5 GHz WLAN	1.152	-17.0	-79.0	-208			

12.3.3 Volume Scan Analysis**LTE Band 41 Enlarge Zoom Scan**

RF Exposure Condition	Mode	EUT Position	Distance (mm)	Freq. (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Measured 10 g SAR (W/kg)	Scaled 10 g SAR (W/kg)
Extremity	QPSK 20M 50RB 24 offset	Rear	0	2 506.0	21.36	22.00	1.159	2.480	2.874

Test Laboratory: KCTL Inc.

File Name: [1.LTE Band 41_Phablet.da53:0](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602WXRJ

Communication System: UID 0, LTE Band 41 (0); Frequency: 2506 MHz; Duty Cycle: 1:1.58016
Medium parameters used (interpolated): $f = 2506$ MHz; $\sigma = 1.893$ S/m; $\epsilon_r = 39.733$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

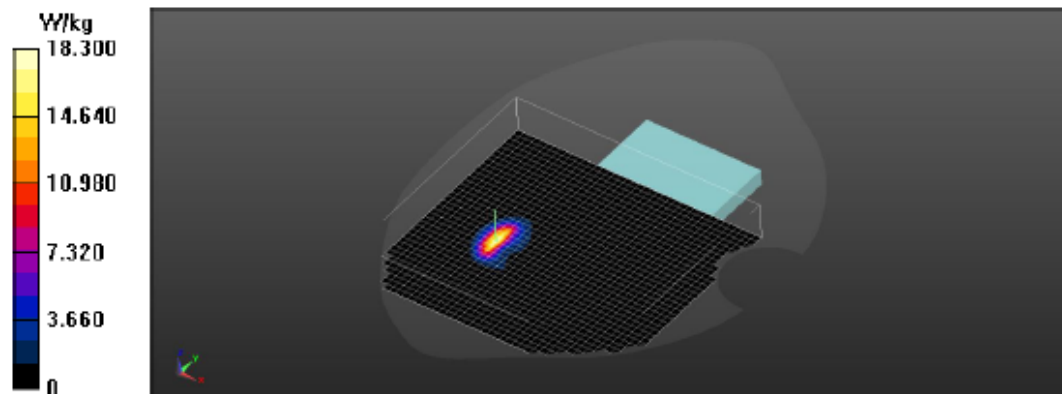
DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(6.78, 6.78, 6.78) @ 2506 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Right_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1975
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/LTE Band 41_QPSK_20MHz_50RB_24offset_CH39750_Rear_0 mm/Volume Scan (41x37x7): Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 82.24 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 27.7 W/kg
SAR(1 g) = 7.62 W/kg; SAR(10 g) = 2.48 W/kg
Total Absorbed Power = 0.0491 W

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 18.3 W/kg



5 GHz WLAN Enlarge Zoom Scan

RF Exposure Condition	Mode	EUT Position	Distance (mm)	Freq. (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Duty Factor	Measured 10 g SAR (W/kg)	Scaled 10 g SAR (W/kg)
Extremity	802.11n40	Rear	0	5 630.0	15.00	15.50	1.122	1.055	1.090	1.290

Test Laboratory: KCTL Inc.

File Name: [6. 5.6G 802.11n HT40 Phablet.da53:3](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602TCJZ

Communication System: UID 0, 5G WLAN (0); Frequency: 5630 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5630$ MHz; $\sigma = 4.921$ S/m; $\epsilon_r = 36.369$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(4.42, 4.42, 4.42) @ 5630 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Right_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1975
- Measurement SW: DASY52, Version 52.10 (4);

Configuration 4/802.11 n_HT40_CH126_Rear_0 mm/Volume Scan (41x37x7): Measurement

grid: dx=4mm, dy=4mm, dz=1.4mm

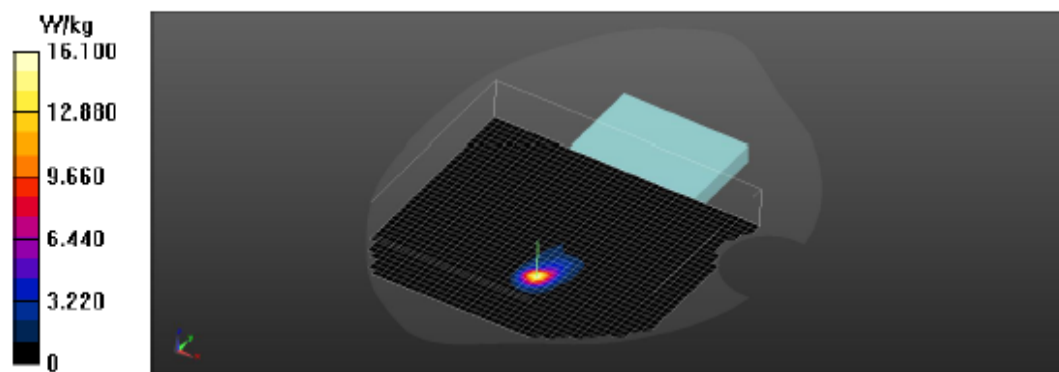
Reference Value = 9.500 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 29.7 W/kg

SAR(1 g) = 4.75 W/kg; SAR(10 g) = 1.09 W/kg

Total Absorbed Power = 0.0196 W

Maximum value of SAR (measured) = 16.1 W/kg



KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
www.kctl.co.kr

Report No.:
KR20-SPF0031-A
Page (107) of (293)

KCTL**Volume Scan SUM– Rear Position**

RF Exposure Condition	Band	Scaling Factor	Measured 10 g SAR (W/kg)	SUM Scaled 10 g SAR (W/kg)
Extremity	LTE Band 41	1.159	2.480	2.960
	5 GHz WLAN	1.184	1.090	

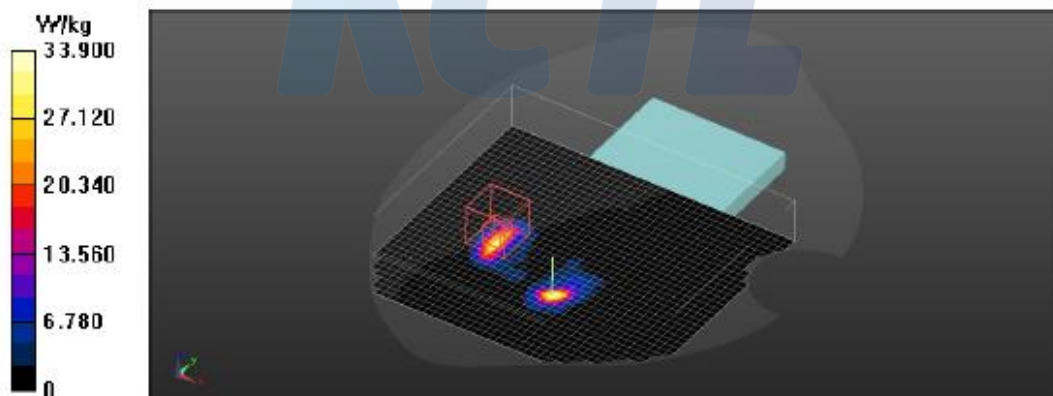
Multi-Band Average SAR**Multi-Band Configurations:**

DASY Configuration for Configuration 4/802.11 n_HT40_CH126_Rear_0 mm/Volume Scan:

DASY Configuration for Configuration/LTE Band
41_QPSK_20MHz_50RB_24offset_CH39750_Rear_0 mm/Volume Scan:

Multi Band Result:

SAR(1 g) = 9.07 W/kg; SAR(10 g) = 2.96 W/kg
Maximum value of SAR (interpolated) = 33.9 W/kg



13. SAR Measurement Variability

Per FCC KDB Publication 865664 D01v01r04, SAR measurement variability was assessed for each frequency band, which was determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media were required for SAR measurements in a frequency band, the variability measurement procedures were applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. These additional measurements were repeated after the completion of all measurements requiring the same head or body tissue equivalent medium in a frequency band. The test device was returned to ambient conditions (normal room temperature) with the battery fully charged before it was re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR Measurement Variability was assessed using the following procedures for each frequency band:

- 1) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg.
- 2) **When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.**
- 3) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
- 4) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

RF Exposure Conditions	Band	Mode	Frequency (MHz)	EUT Position	Separation Distance (mm)	Measured 1 g SAR (W/kg)	Repeated 1g SAR (W/kg)	Ratio
Head	2.4GHz WLAN	802.11b	2 462.0	Left Tilt	0	1.200	1.210	1.01
Hotspot	GSM 1900 Band	GPRS 2Tx	1 909.8	Rear	10	0.855	0.824	1.04
	WCDMA Band II	RMC	1 880.0	Bottom	10	0.891	0.881	1.01
	LTE Band 2	QPSK 20M 1RB 0Offset	1 860.0	Rear	10	0.957	0.916	1.04

RF Exposure Conditions	Band	Mode	Frequency (MHz)	EUT Position	Separation Distance (mm)	Measured 10 g SAR (W/kg)	Repeated 10g SAR (W/kg)	Ratio
Phablet	WCDMA Band II	RMC	1 880.0	Rear	0	2.980	2.870	1.04
	LTE Band 41	QPSK 20M 50RB 24Offset	2 506.0	Rear	0	2.740	2.570	1.07

14. Measurement Uncertainty

Per KDB 865664 D01 SAR measurement 100MHz to 6GHz, when the highest measured 1-g SAR within a frequency band is $< 1.5 \text{ W/kg}$ and the measured 10-g SAR within a frequency band is $< 3.75 \text{ W/kg}$. The expanded SAR measurement uncertainty must be $\leq 30\%$, for a confidence interval of $k = 2$. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Standard 1528-2013 is not required in SAR reports submitted for equipment approval. For this device, the highest measured 1-g SAR is less 1.5 W/kg and highest measured 10-g SAR is less 3.75 W/kg . Therefore, the measurement uncertainty table is not required in this report.

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15. Test Equipment Information

Test Platform	SPEAG DASY5 System			
Version	DASY52: 52.10.4.1527 / SEMCAD: 14.6.14 (7483)			
Location	KCTL Inc, 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, Korea			
Manufacture	SPEAG			
Hardware Reference				
Equipment	Model	Serial Number	Date of Calibration	Due date of next Calibration
Shield Room	-	8F - 3	-	-
Shield Room	-	8F - 4	-	-
DASY6 Robot	TX90XL speag	F/18/0004968/A/001	-	-
DASY6 Robot	TX60 Lspeag	F/19/0007289/A/001	-	-
Phantom	Twin SAM Phantom	1974	-	-
Phantom	Twin SAM Phantom	1975	-	-
Phantom	Twin SAM Phantom	1983	-	-
Phantom	Twin SAM Phantom	1984	-	-
Mounting Device	Mounting Device	-	-	-
DAE	DAE4	1567	2020-03-20	2021-03-20
DAE	DAE4	1587	2019-07-16	2020-07-16
Probe	EX3DV4	3697	2020-03-26	2021-03-26
Probe	EX3DV4	7541	2019-07-22	2020-07-22
ESG Vector Signal Generator	E4438C	MY42080845	2020-03-12	2021-03-12
Dual Power Meter	EPM-442A	GB37480680	2020-05-12	2021-05-12
Power Sensor	8481H	2703A11902	2020-05-12	2021-05-12
Power Sensor	8481H	3318A18090	2020-05-12	2021-05-12
Attenuator	8491A	21552	2020-05-12	2021-05-12
Attenuator	8491A	35934	2020-05-12	2021-05-12
Attenuator	8491A	35560	2020-05-12	2021-05-12
Power Amplifier	AMP2027	10010	2020-05-12	2021-05-12
Dual Directional Coupler	778D-012	50136	2020-05-12	2021-05-12
Dual Directional Coupler	772D	2839A160504	2020-05-12	2021-05-12
Low Pass Filter	NLP-1000+	VUU79701846	2020-05-12	2021-05-12
Low Pass Filter	VLF-3000+	31831	2020-05-12	2021-05-12
Low Pass Filter	VLF-6000+	31838	2020-05-12	2021-05-12
Dipole Validation Kits	D750V3	1183	2018-09-03	2020-09-03
Dipole Validation Kits	D850V2	1006	2020-04-21	2022-04-21
Dipole Validation Kits	D1750V2	1072	2020-04-20	2022-04-20

KCTL Inc. 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea TEL: 82-31-285-0894 FAX: 82-505-299-8311 www.kctl.co.kr	Report No.: KR20-SPF0031-A Page (111) of (293)	
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Equipment	Model	Serial Number	Date of Calibration	Due date of next Calibration
Dipole Validation Kits	D1900V2	5d160	2020-04-22	2022-04-22
Dipole Validation Kits	D2450V2	895	2018-07-24	2020-07-24
Dipole Validation Kits	D2600V2	1050	2018-07-26	2020-07-26
Dipole Validation Kits	D5GHzV2	1134	2020-05-20	2022-05-20
Network Analyzer	E5071B	MY42403524	2020-02-27	2021-02-27
Dielectric Assessment Kit	DAK-3.5	1078	2020-05-19	2021-05-19
Humidity/Temp	MHB-382SD	46307	2020-03-27	2021-03-27
Humidity/Temp.	MHB-382SD	46301	2020-03-27	2021-03-27
Spectrum Analyzer	FSP7	100289	2020-01-03	2021-01-03
Wideband Radio Communication Tester	CMW500	137524	2020-05-11	2021-05-11
Wideband Radio Communication Tester	CMW500	168683	2020-04-06	2021-04-06

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16. Test System Verification Results

Date: 6/13/2020

Test Laboratory: KCTL Inc.

File Name: [750 MHz Verification Input Power 250 mW 2020-06-13.da53:0](#)**DUT: Dipole 750 MHz D750V3, Type: D750V3, Serial: D750V3 - SN:1183**

Communication System: UID 0, CW (0); Frequency: 750 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 750$ MHz; $\sigma = 0.9$ S/m; $\epsilon_r = 42.052$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(10.41, 10.41, 10.41) @ 750 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/750 MHz Verification Input Power 250 mW 2020-06-13/Area Scan (7x15x1):

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 2.79 W/kg

Configuration/750 MHz Verification Input Power 250 mW 2020-06-13/Zoom Scan**(5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 58.04 V/m; Power Drift = 0.06 dB

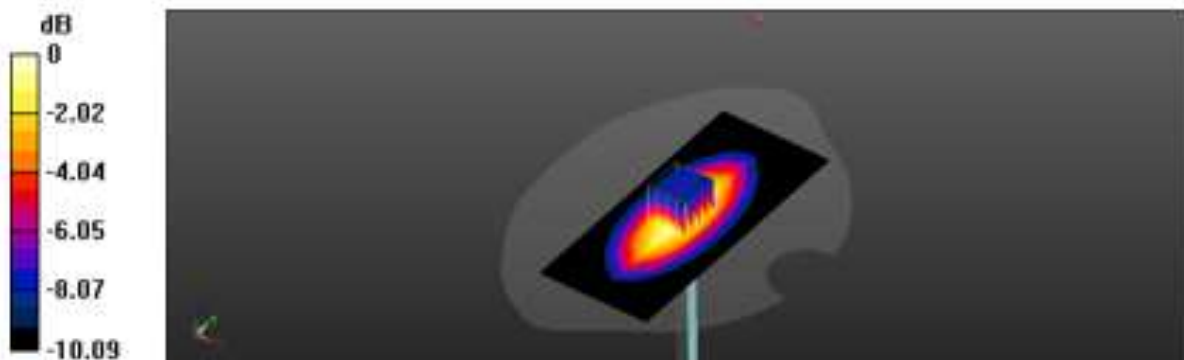
Peak SAR (extrapolated) = 3.23 W/kg

SAR(1 g) = 2.12 W/kg; SAR(10 g) = 1.41 W/kg

Smallest distance from peaks to all points 3 dB below = 18.7 mm

Ratio of SAR at M2 to SAR at M1 = 65.9%

Maximum value of SAR (measured) = 2.85 W/kg



0 dB = 2.85 W/kg = 4.55 dBW/kg

Date: 6/11/2020

Test Laboratory: KCTL Inc.

File Name: [850 MHz Verification Input Power 250 mW 2020-06-11.da53:0](#)**DUT: Dipole 850 MHz D850V2, Type: D850V2, Serial: D850V2 - SN:1006**

Communication System: UID 0, CW (0); Frequency: 850 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 850$ MHz; $\sigma = 0.923$ S/m; $\epsilon_r = 40.493$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(9.87, 9.87, 9.87) @ 850 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/850 MHz Verification Input Power 250 mW 2020-06-11 2/Area Scan (7x15x1):

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 3.38 W/kg

Configuration/850 MHz Verification Input Power 250 mW 2020-06-11 2/Zoom Scan**(5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 63.23 V/m; Power Drift = 0.10 dB

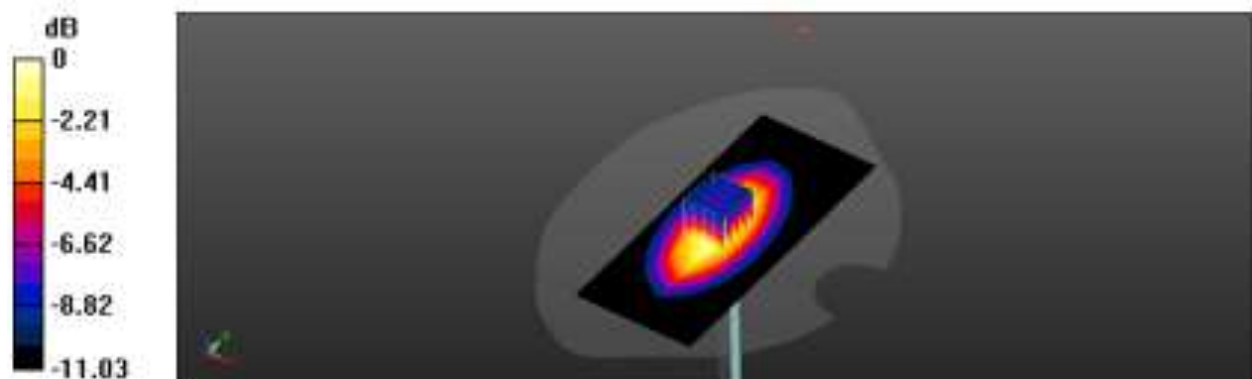
Peak SAR (extrapolated) = 4.11 W/kg

SAR(1 g) = 2.64 W/kg; SAR(10 g) = 1.71 W/kg

Smallest distance from peaks to all points 3 dB below = 16.7 mm

Ratio of SAR at M2 to SAR at M1 = 64.1%

Maximum value of SAR (measured) = 3.59 W/kg



0 dB = 3.59 W/kg = 5.55 dBW/kg

Date: 6/22/2020

Test Laboratory: KCTL Inc.

File Name: [850 MHz Verification Input Power 250 mW 2020-06-22.da53:0](#)**DUT: Dipole 850 MHz D850V2, Type: D850V2, Serial: D850V2 - SN:1006**

Communication System: UID 0, CW (0); Frequency: 850 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 850$ MHz; $\sigma = 0.93$ S/m; $\epsilon_r = 41.021$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(9.87, 9.87, 9.87) @ 850 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/850 MHz Verification Input Power 250 mW 2020-06-22/Area Scan (7x15x1):

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 3.40 W/kg

Configuration/850 MHz Verification Input Power 250 mW 2020-06-22/Zoom Scan**(5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 63.20 V/m; Power Drift = -0.00 dB

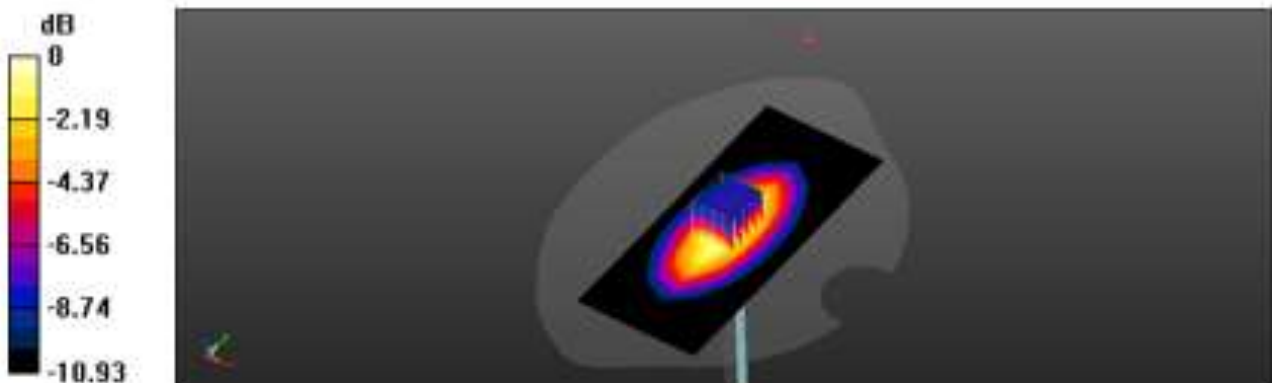
Peak SAR (extrapolated) = 3.91 W/kg

SAR(1 g) = 2.52 W/kg; SAR(10 g) = 1.64 W/kg

Smallest distance from peaks to all points 3 dB below = 16.1 mm

Ratio of SAR at M2 to SAR at M1 = 64.5%

Maximum value of SAR (measured) = 3.43 W/kg



0 dB = 3.43 W/kg = 5.35 dBW/kg

Date: 6/27/2020

Test Laboratory: KCTL Inc.

File Name: [1750 MHz Verification Input Power 250 mW 2020-06-27.da52:0](#)**DUT: Dipole 1750 MHz D1750V2, Type: D1750V2, Serial: D1750V2 - SN:1072**

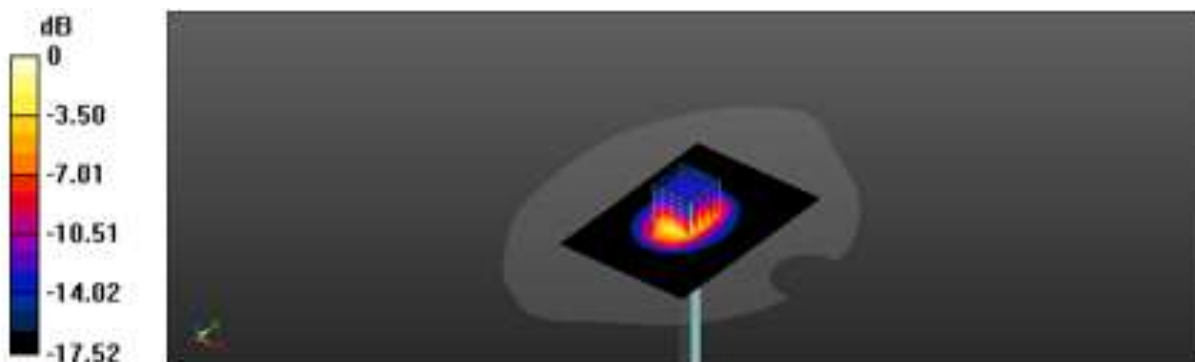
Communication System: UID 0, CW (0); Frequency: 1750 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 1750$ MHz; $\sigma = 1.347$ S/m; $\epsilon_r = 39.105$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(8.61, 8.61, 8.61) @ 1750 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

System Performance Check (without Area Scan)/1750 MHz Verification Input Power 250 mW 2020-06-27/Area Scan (8x11x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 12.4 W/kg

System Performance Check (without Area Scan)/1750 MHz Verification Input Power 250 mW 2020-06-27/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 101.5 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 17.4 W/kg
SAR(1 g) = 8.99 W/kg; SAR(10 g) = 4.72 W/kg
Smallest distance from peaks to all points 3 dB below = 11.2 mm
Ratio of SAR at M2 to SAR at M1 = 51.4%
Maximum value of SAR (measured) = 14.3 W/kg



0 dB = 14.3 W/kg = 11.55 dBW/kg

Date: 6/25/2020

Test Laboratory: KCTL Inc.

File Name: [1900 MHz Verification Input Power 250 mW 2020-06-25.da52:0](#)**DUT: Dipole 1900 MHz D1900V2, Type: D1900V2, Serial: D1900V2 - SN:5d160**

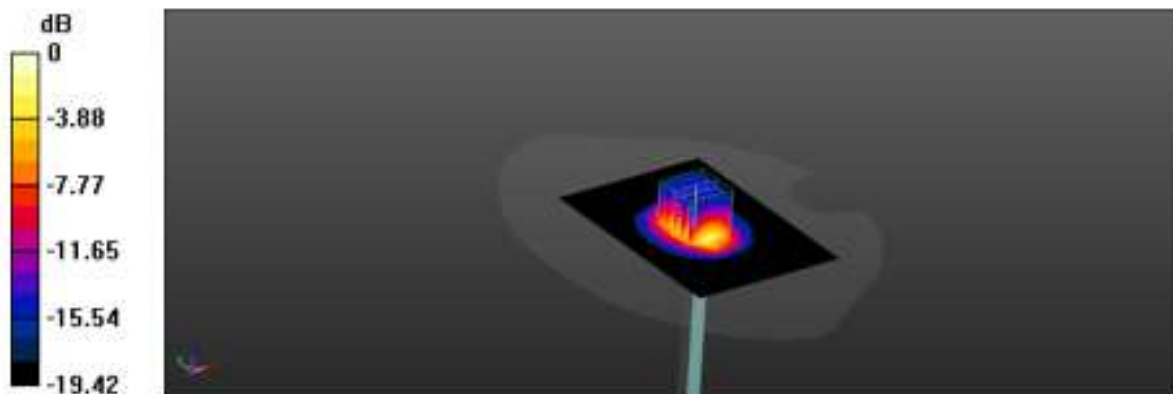
Communication System: UID 0, CW (0); Frequency: 1900 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 1900$ MHz; $\sigma = 1.454$ S/m; $\epsilon_r = 38.821$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(7.57, 7.57, 7.57) @ 1900 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Left_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1974
- Measurement SW: DASY52, Version 52.10 (4);

System Performance Check (without Area Scan)/1900 MHz Verification Input Power 250 mW 2020-06-25/Area Scan (8x11x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 14.2 W/kg

System Performance Check (without Area Scan)/1900 MHz Verification Input Power 250 mW 2020-06-25/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 105.9 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 19.6 W/kg
SAR(1 g) = 10.2 W/kg; SAR(10 g) = 5.15 W/kg
Smallest distance from peaks to all points 3 dB below = 10.7 mm
Ratio of SAR at M2 to SAR at M1 = 51.3%
Maximum value of SAR (measured) = 16.2 W/kg



0 dB = 16.2 W/kg = 12.10 dBW/kg

Date: 6/29/2020

Test Laboratory: KCTL Inc.

File Name: [1900 MHz Verification Input Power 250 mW 2020-06-29.da52:0](#)**DUT: Dipole 1900 MHz D1900V2, Type: D1900V2, Serial: D1900V2 - SN:5d160**

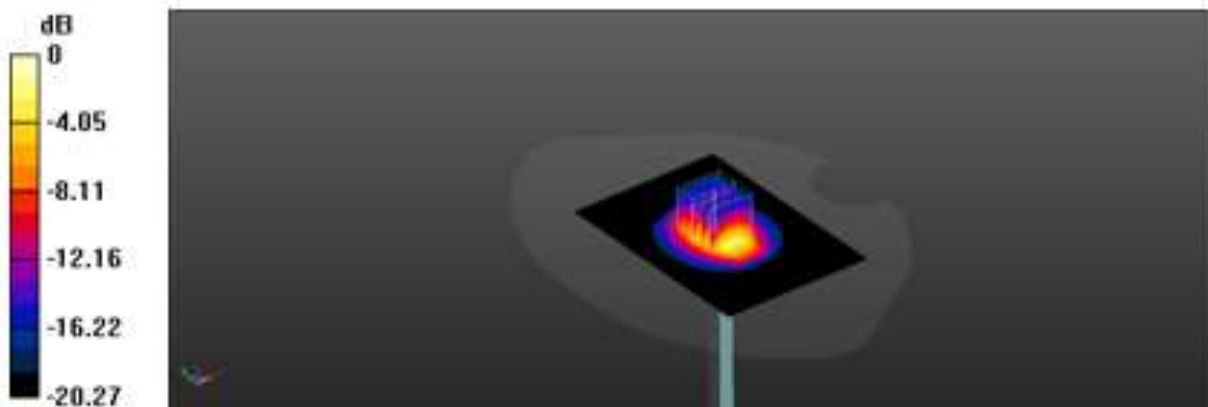
Communication System: UID 0, CW (0); Frequency: 1900 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 1900$ MHz; $\sigma = 1.443$ S/m; $\epsilon_r = 38.817$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(7.57, 7.57, 7.57) @ 1900 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Left_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1974
- Measurement SW: DASY52, Version 52.10 (4);

System Performance Check (without Area Scan)/1900 MHz Verification Input Power 250 mW 2020-06-29/Area Scan (8x11x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 12.2 W/kg

System Performance Check (without Area Scan)/1900 MHz Verification Input Power 250 mW 2020-06-29/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 109.4 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 19.4 W/kg
SAR(1 g) = 9.99 W/kg; SAR(10 g) = 5.05 W/kg
Smallest distance from peaks to all points 3 dB below = 11.2 mm
Ratio of SAR at M2 to SAR at M1 = 50.7%
Maximum value of SAR (measured) = 15.8 W/kg



0 dB = 15.8 W/kg = 11.99 dBW/kg

Date: 6/24/2020

Test Laboratory: KCTL Inc.

File Name: [2450 MHz Verification Input Power 100 mW 2020-06-24.da53:0](#)**DUT: Dipole 2450 MHz D2450V2, Type: D2450V2, Serial: D2450V2 - SN:895**

Communication System: UID 0, CW (0); Frequency: 2450 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 2450$ MHz; $\sigma = 1.775$ S/m; $\epsilon_r = 38.887$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(7.58, 7.58, 7.58) @ 2450 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Right; Type: QD 000 P41 Ax; Serial: 1984
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/2450 MHz Verification Input Power 100 mW 2020-06-24/Area Scan (8x11x1):

Measurement grid: dx=12mm, dy=12mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 6.86 W/kg

Configuration/2450 MHz Verification Input Power 100 mW 2020-06-24/Zoom Scan**(7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 72.93 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 11.9 W/kg

SAR(1 g) = 5 W/kg; SAR(10 g) = 2.19 W/kg

Smallest distance from peaks to all points 3 dB below = 9 mm

Ratio of SAR at M2 to SAR at M1 = 41.3%

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 8.97 W/kg



0 dB = 8.97 W/kg = 9.53 dBW/kg

Date: 7/8/2020

Test Laboratory: KCTL Inc.

File Name: [2600 MHz Verification Input Power 100 mW 2020-07-08.da53:0](#)**DUT: Dipole 2600 MHz D2600V2, Type: D2600V2, Serial: D2600V2 - SN:1050**Communication System: UID 0, CW (0); Frequency: 2600 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 2600$ MHz; $\sigma = 1.898$ S/m; $\epsilon_r = 40.379$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(7.51, 7.51, 7.51) @ 2600 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Right; Type: QD 000 P41 Ax; Serial: 1984
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/2600 MHz Verification Input Power 100 mW 2020-07-08/Area Scan (8x11x1):

Measurement grid: dx=12mm, dy=12mm

Maximum value of SAR (measured) = 7.90 W/kg

Configuration/2600 MHz Verification Input Power 100 mW 2020-07-08/Zoom Scan**(7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 73.24 V/m; Power Drift = 0.04 dB

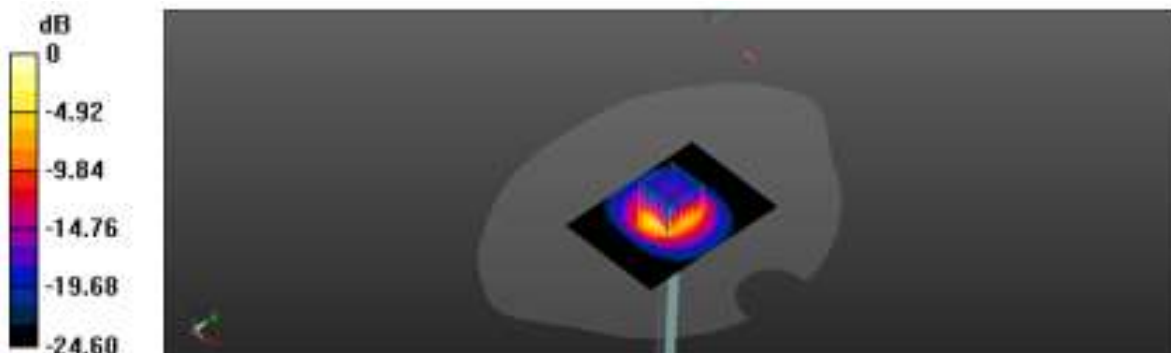
Peak SAR (extrapolated) = 13.0 W/kg

SAR(1 g) = 5.62 W/kg; SAR(10 g) = 2.49 W/kg

Smallest distance from peaks to all points 3 dB below = 9 mm

Ratio of SAR at M2 to SAR at M1 = 43%

Maximum value of SAR (measured) = 10.0 W/kg



0 dB = 10.0 W/kg = 10.00 dBW/kg

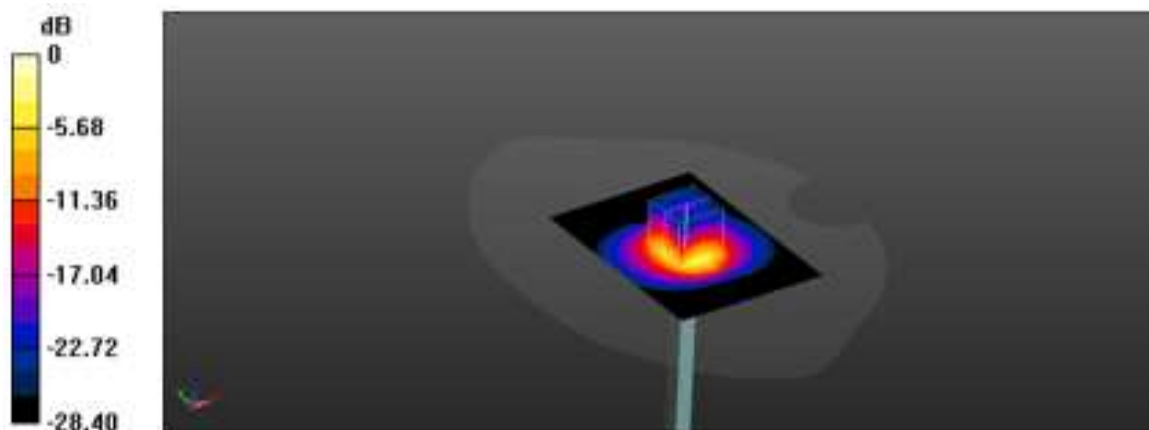
Date: 7/9/2020

Test Laboratory: KCTL Inc.

File Name: [2600 MHz Verification Input Power 100 mW 2020-07-09.da52:0](#)**DUT: Dipole 2600 MHz D2600V2, Type: D2600V2, Serial: D2600V2 - SN:1050**Communication System: UID 0, CW (0); Frequency: 2600 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 2600$ MHz; $\sigma = 2.02$ S/m; $\epsilon_r = 38.176$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(6.78, 6.78, 6.78) @ 2600 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Right_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1975
- Measurement SW: DASY52, Version 52.10 (4);

System Performance Check (without Area Scan)/2600 MHz Verification Input Power 100 mW 2020-07-09/Area Scan (9x12x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 8.07 W/kg**System Performance Check (without Area Scan)/2600 MHz Verification Input Power 100 mW 2020-07-09/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 69.66 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 13.2 W/kg
SAR(1 g) = 5.62 W/kg; SAR(10 g) = 2.43 W/kg
Smallest distance from peaks to all points 3 dB below = 9.5 mm
Ratio of SAR at M2 to SAR at M1 = 41%
Maximum value of SAR (measured) = 10.1 W/kg

0 dB = 10.1 W/kg = 10.04 dBW/kg

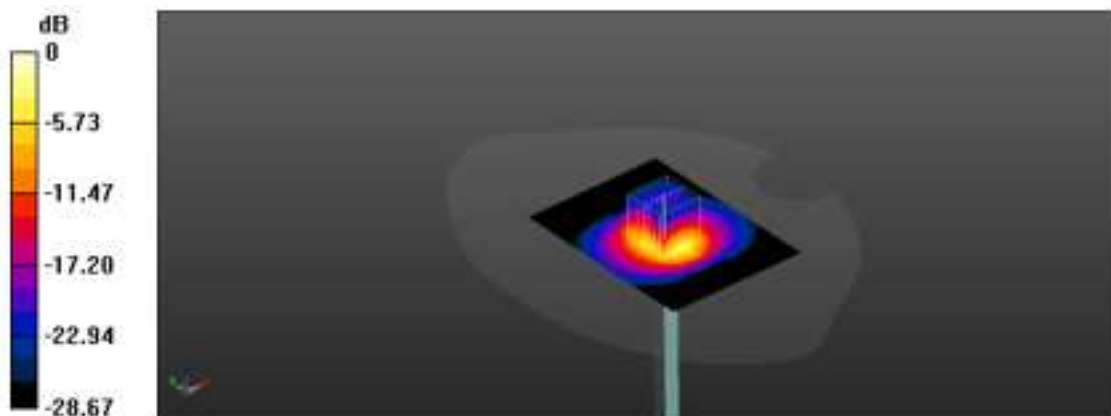
Date: 7/10/2020

Test Laboratory: KCTL Inc.

File Name: [2600 MHz Verification Input Power 100 mW 2020-07-10.da52:0](#)**DUT: Dipole 2600 MHz D2600V2, Type: D2600V2, Serial: D2600V2 - SN:1050**Communication System: UID 0, CW (0); Frequency: 2600 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 2600$ MHz; $\sigma = 1.973$ S/m; $\epsilon_r = 39.441$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(6.78, 6.78, 6.78) @ 2600 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Right_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1975
- Measurement SW: DASY52, Version 52.10 (4);

System Performance Check (without Area Scan)/2600 MHz Verification Input Power 100 mW 2020-07-10/Area Scan (9x12x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 9.05 W/kg**System Performance Check (without Area Scan)/2600 MHz Verification Input Power 100 mW 2020-07-10/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 69.89 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 12.8 W/kg
SAR(1 g) = 5.46 W/kg; SAR(10 g) = 2.37 W/kg
Smallest distance from peaks to all points 3 dB below = 9 mm
Ratio of SAR at M2 to SAR at M1 = 41.4%
Maximum value of SAR (measured) = 9.73 W/kg

0 dB = 9.73 W/kg = 9.88 dBW/kg

Date: 6/24/2020

Test Laboratory: KCTL Inc.

File Name: [5300 MHz Verification Input Power 100 mW 2020-06-24.da52:0](#)**DUT: Dipole D5GHzV2, Type: D5GHzV2, Serial: D5GHzV2 - SN:1134**

Communication System: UID 0, CW (0); Frequency: 5300 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 5300$ MHz; $\sigma = 4.581$ S/m; $\epsilon_r = 37.043$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(4.65, 4.65, 4.65) @ 5300 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Right_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1975
- Measurement SW: DASY52, Version 52.10 (4);

System Performance Check (without Area Scan)/5300 MHz Verification Input Power 100 mW 2020-06-24/Area Scan (11x15x1): Measurement grid: dx=10mm, dy=10mm[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 16.4 W/kg

System Performance Check (without Area Scan)/5300 MHz Verification Input Power 100 mW 2020-06-24/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 66.94 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 40.1 W/kg

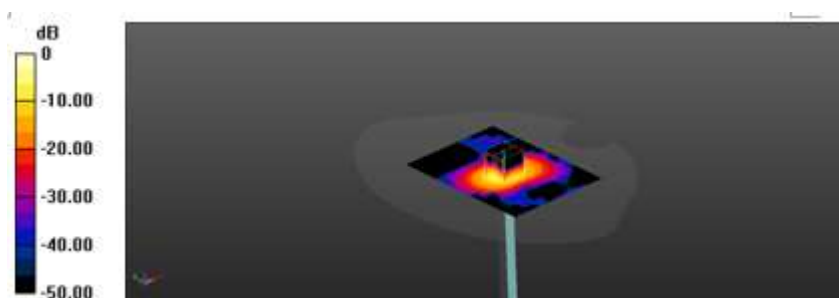
SAR(1 g) = 8.06 W/kg; SAR(10 g) = 2.28 W/kg

Smallest distance from peaks to all points 3 dB below = 7.5 mm

Ratio of SAR at M2 to SAR at M1 = 58.3%

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 22.3 W/kg



0 dB = 22.3 W/kg = 13.48 dBW/kg

Date: 6/23/2020

Test Laboratory: KCTL Inc.

File Name: [5600 MHz Verification Input Power 100 mW 2020-06-23.da52:0](#)**DUT: Dipole D5GHzV2, Type: D5GHzV2, Serial: D5GHzV2 - SN:1134**

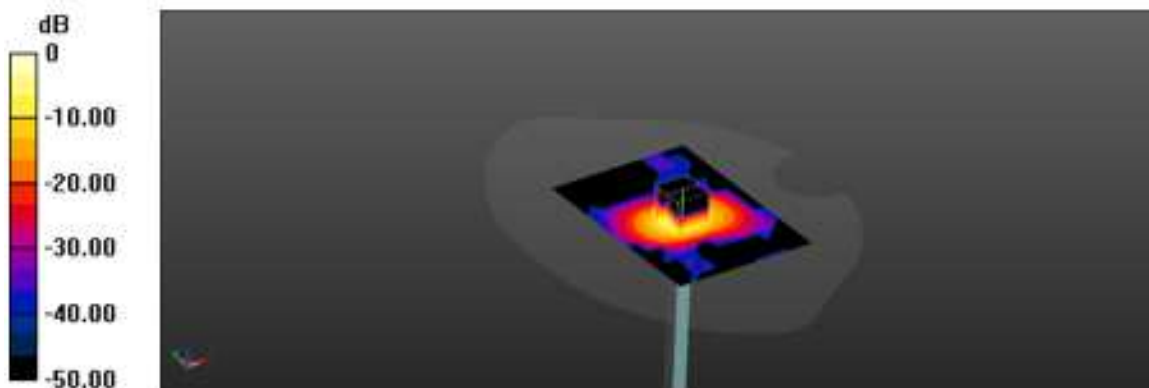
Communication System: UID 0, CW (0); Frequency: 5600 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 5600$ MHz; $\sigma = 4.889$ S/m; $\epsilon_r = 36.425$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(4.42, 4.42, 4.42) @ 5600 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Right_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1975
- Measurement SW: DASY52, Version 52.10 (4);

System Performance Check (without Area Scan)/5600 MHz Verification Input Power 100 mW 2020-06-23/Area Scan (11x15x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 16.9 W/kg

System Performance Check (without Area Scan)/5600 MHz Verification Input Power 100 mW 2020-06-23/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 64.34 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 40.1 W/kg
SAR(1 g) = 8.12 W/kg; SAR(10 g) = 2.28 W/kg
Smallest distance from peaks to all points 3 dB below = 7.9 mm
Ratio of SAR at M2 to SAR at M1 = 58.2%
Maximum value of SAR (measured) = 22.1 W/kg



0 dB = 22.1 W/kg = 13.44 dBW/kg

Date: 6/23/2020

Test Laboratory: KCTL Inc.

File Name: [5800 MHz Verification Input Power 100 mW 2020-06-23.da52:0](#)**DUT: Dipole D5GHzV2, Type: D5GHzV2, Serial: D5GHzV2 - SN:1134**

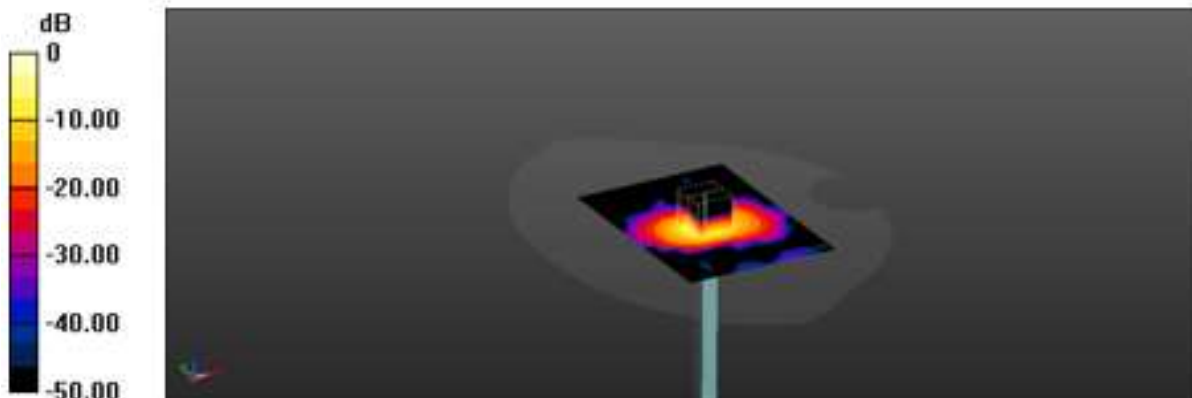
Communication System: UID 0, CW (0); Frequency: 5800 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 5800$ MHz; $\sigma = 5.093$ S/m; $\epsilon_r = 36.084$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(4.37, 4.37, 4.37) @ 5800 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Right_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1975
- Measurement SW: DASY52, Version 52.10 (4);

System Performance Check (without Area Scan)/5800 MHz Verification Input Power 100 mW 2020-06-23/Area Scan (11x15x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 16.3 W/kg

System Performance Check (without Area Scan)/5800 MHz Verification Input Power 100 mW 2020-06-23/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 62.74 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 38.8 W/kg
SAR(1 g) = 7.88 W/kg; SAR(10 g) = 2.21 W/kg
Smallest distance from peaks to all points 3 dB below = 7.9 mm
Ratio of SAR at M2 to SAR at M1 = 58.1%
Maximum value of SAR (measured) = 21.4 W/kg



0 dB = 21.4 W/kg = 13.30 dBW/kg

17. Test Results

1)

Date: 6/22/2020

Test Laboratory: KCTL Inc.

File Name: [1.GSM850 Head.da53:0](#)**DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602V1PN**

Communication System: UID 0, GSM850 (0); Frequency: 836.6 MHz; Duty Cycle: 1:8.30042

Medium parameters used: $f = 836.6$ MHz; $\sigma = 0.92$ S/m; $\epsilon_r = 41.132$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(9.87, 9.87, 9.87) @ 836.6 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/GSM850_Voice_CH190_Right Cheek/Area Scan (8x13x1): Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.251 W/kg

Configuration/GSM850_Voice_CH190_Right Cheek/Zoom Scan (5x5x7)/Cube 0: Measurement

grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.437 V/m; Power Drift = -0.07 dB

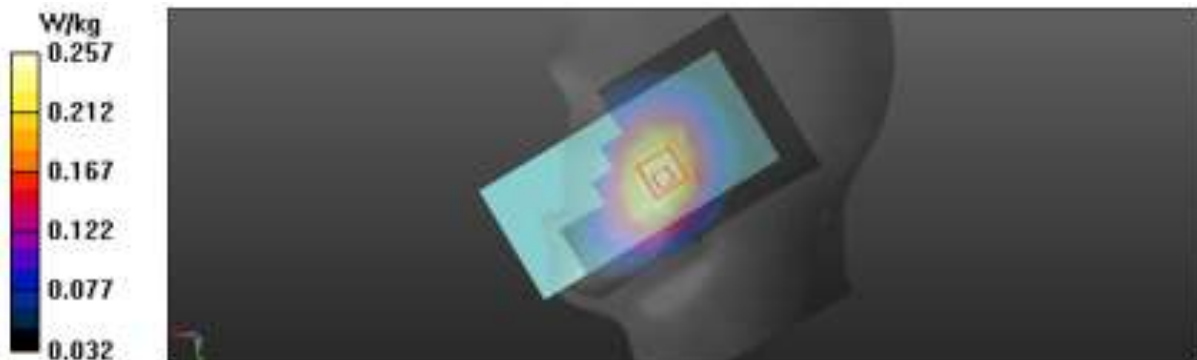
Peak SAR (extrapolated) = 0.283 W/kg

SAR(1 g) = 0.215 W/kg; SAR(10 g) = 0.164 W/kg

Smallest distance from peaks to all points 3 dB below: Larger than measurement grid

Ratio of SAR at M2 to SAR at M1 = 75.7%

Maximum value of SAR (measured) = 0.257 W/kg



2)

Date: 6/25/2020

Test Laboratory: KCTL Inc.

File Name: [1.GSM1900 Head.da53:1](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602TCJZ

Communication System: UID 0, GSM 1900_2TX (0); Frequency: 1880 MHz; Duty Cycle: 1:4.14954

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.436$ S/m; $\epsilon_r = 38.859$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(7.57, 7.57, 7.57) @ 1880 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Left_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1974
- Measurement SW: DASY52, Version 52.10 (4);

Configuration 2/GSM1900_GPRS 2Tx_CH661_Left Cheek/Area Scan (10x13x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.255 W/kg

Configuration 2/GSM1900_GPRS 2Tx_CH661_Left Cheek/Zoom Scan (6x6x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.678 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 0.309 W/kg

SAR(1 g) = 0.189 W/kg; SAR(10 g) = 0.113 W/kg

Smallest distance from peaks to all points 3 dB below = 14.8 mm

Ratio of SAR at M2 to SAR at M1 = 64%

Maximum value of SAR (measured) = 0.259 W/kg



3)

Date: 6/25/2020

Test Laboratory: KCTL Inc.

File Name: [4.WCDMA FDD II Head.da53:1](#)**DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602TCJZ**

Communication System: UID 0, W-CDMA 1900 (Band 2) (0); Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.436$ S/m; $\epsilon_r = 38.859$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(7.57, 7.57, 7.57) @ 1880 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Left_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1974
- Measurement SW: DASY52, Version 52.10 (4);

Configuration 2/WCDMA FDD II_CH9400_Left Cheek/Area Scan (10x13x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.385 W/kg

Configuration 2/WCDMA FDD II_CH9400_Left Cheek/Zoom Scan (6x6x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.49 V/m; Power Drift = -0.08 dB

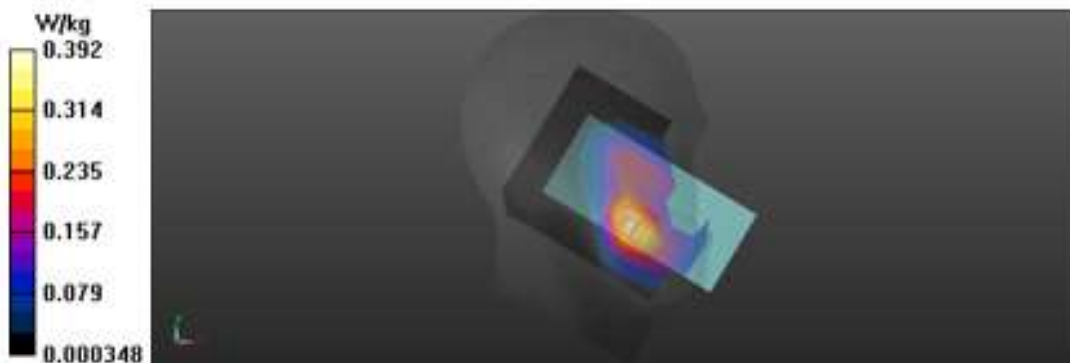
Peak SAR (extrapolated) = 0.480 W/kg

SAR(1 g) = 0.286 W/kg; SAR(10 g) = 0.171 W/kg

Smallest distance from peaks to all points 3 dB below = 14.9 mm

Ratio of SAR at M2 to SAR at M1 = 59.1%

Maximum value of SAR (measured) = 0.392 W/kg



4)

Date: 6/27/2020

Test Laboratory: KCTL Inc.

File Name: [1.WCDMA FDD IV Head.da53:1](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602V1PN

Communication System: UID 0, W-CDMA 1750 (Band 4) (0); Frequency: 1732.4 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1732.4$ MHz; $\sigma = 1.336$ S/m; $\epsilon_r = 39.187$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(8.61, 8.61, 8.61) @ 1732.4 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration 2/WCDMA FDD IV_CH1412_Left Cheek/Area Scan (10x13x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.195 W/kg

Configuration 2/WCDMA FDD IV_CH1412_Left Cheek/Zoom Scan (6x6x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.801 V/m; Power Drift = 0.09 dB

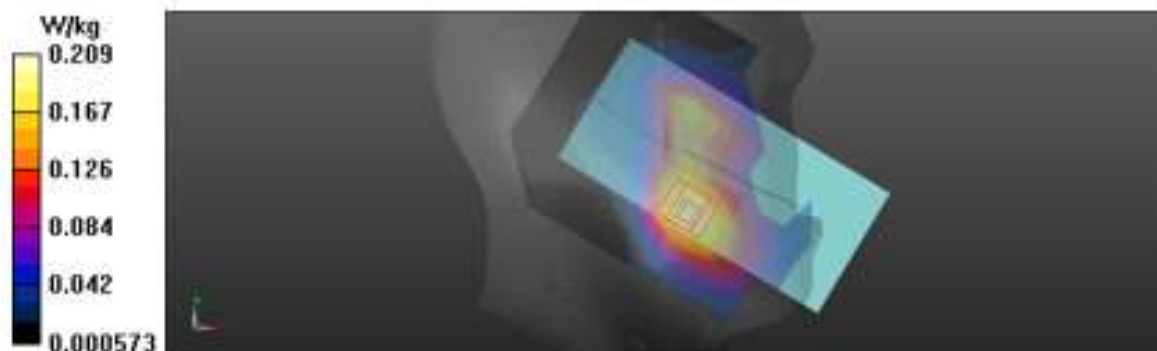
Peak SAR (extrapolated) = 0.248 W/kg

SAR(1 g) = 0.153 W/kg; SAR(10 g) = 0.099 W/kg

Smallest distance from peaks to all points 3 dB below = 16.9 mm

Ratio of SAR at M2 to SAR at M1 = 61.6%

Maximum value of SAR (measured) = 0.209 W/kg



5)

Date: 6/22/2020

Test Laboratory: KCTL Inc.

File Name: [1.WCDMA Band 5 Head.da53:0](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602TRML

Communication System: UID 0, LTE Band 5 (0); Frequency: 836.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 836.5$ MHz; $\sigma = 0.921$ S/m; $\epsilon_r = 41.123$; $\rho = 1000$ kg/m³
 Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(9.87, 9.87, 9.87) @ 836.5 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/WCDMA Band 5_CH4183_Right Cheek/Area Scan (8x13x1): Measurement grid:
 dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.248 W/kg

Configuration/WCDMA Band 5_CH4183_Right Cheek/Zoom Scan (6x6x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.374 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.282 W/kg

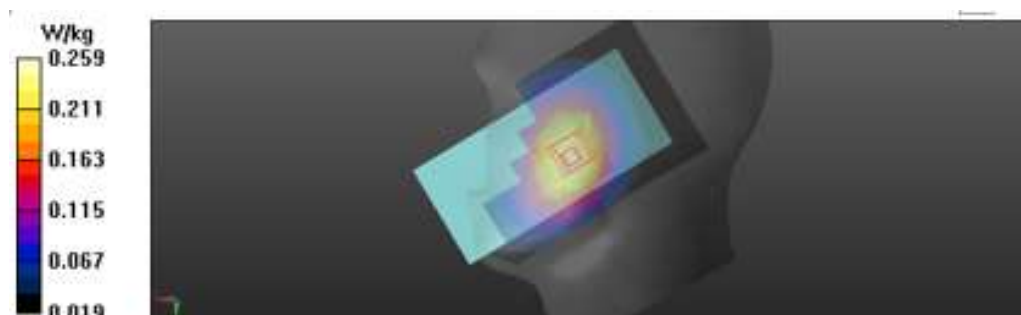
SAR(1 g) = 0.218 W/kg; SAR(10 g) = 0.168 W/kg

Smallest distance from peaks to all points 3 dB below = 23.7 mm

Ratio of SAR at M2 to SAR at M1 = 76.1%

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.259 W/kg



6)

Date: 6/29/2020

Test Laboratory: KCTL Inc.

File Name: 1.LTE Band 2 QPSK 20 MHz Head.da53:1

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602TCJZ

Communication System: UID 0, LTE Band 2 (0); Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.424$ S/m; $\epsilon_r = 38.807$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(7.57, 7.57, 7.57) @ 1880 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Left_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1974
- Measurement SW: DASY52, Version 52.10 (4);

Configuration 2/LTE Band 2_QPSK_20 MHz_1RB_0offset_CH18900_Left Cheek/Area Scan

(10x13x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.409 W/kg

Configuration 2/LTE Band 2_QPSK_20 MHz_1RB_0offset_CH18900_Left Cheek/Zoom Scan

(5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 12.72 V/m; Power Drift = -0.15 dB

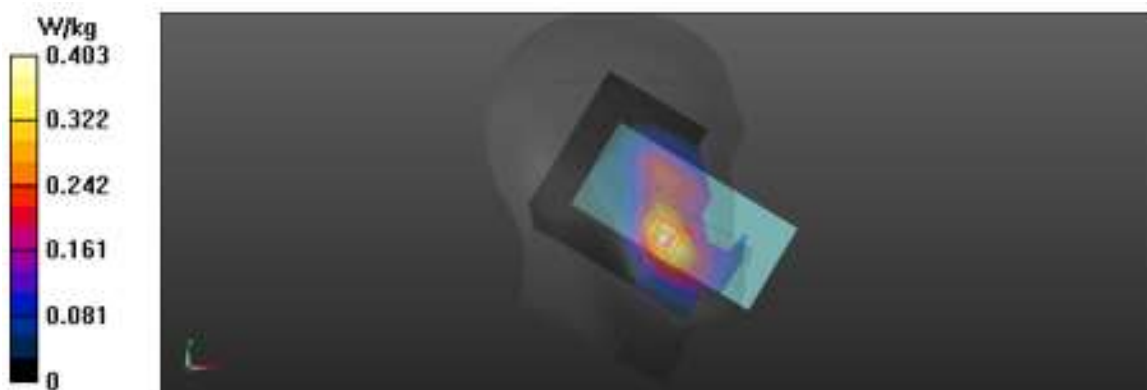
Peak SAR (extrapolated) = 0.477 W/kg

SAR(1 g) = 0.292 W/kg; SAR(10 g) = 0.175 W/kg

Smallest distance from peaks to all points 3 dB below = 14.3 mm

Ratio of SAR at M2 to SAR at M1 = 61.9%

Maximum value of SAR (measured) = 0.403 W/kg



7)

Date: 6/11/2020

Test Laboratory: KCTL Inc.

File Name: [1.LTE Band 5 QPSK 10 MHz Head.da53:0](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N503A1ZJ

Communication System: UID 0, LTE Band 5 (0); Frequency: 836.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 836.5$ MHz; $\sigma = 0.913$ S/m; $\epsilon_r = 40.65$; $\rho = 1000$ kg/m³
 Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(9.87, 9.87, 9.87) @ 836.5 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/LTE Band 5_QPSK_10MHz_1RB_0offset_CH20525_Right Cheek/Area Scan (8x12x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.216 W/kg

Configuration/LTE Band 5_QPSK_10MHz_1RB_0offset_CH20525_Right Cheek/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.229 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.236 W/kg

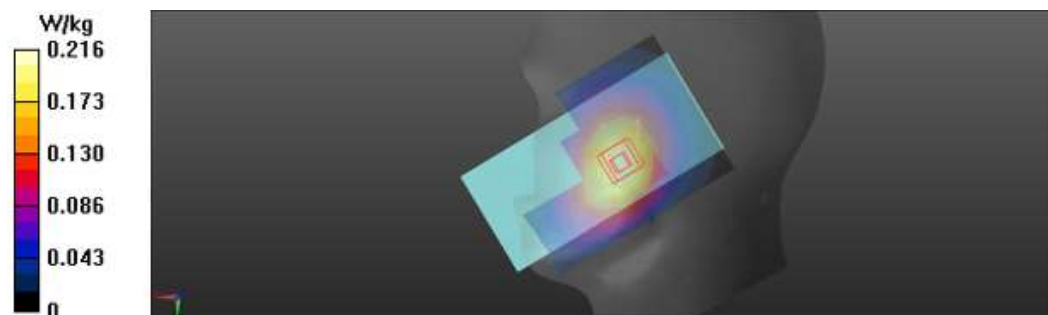
SAR(1 g) = 0.179 W/kg; SAR(10 g) = 0.135 W/kg

Smallest distance from peaks to all points 3 dB below = 24.7 mm

Ratio of SAR at M2 to SAR at M1 = 75.6%

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.214 W/kg



8)

Date: 6/13/2020

Test Laboratory: KCTL Inc.

File Name: 1.LTE Band 12 QPSK 10 MHz Head.da53:0

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N503A1ZJ

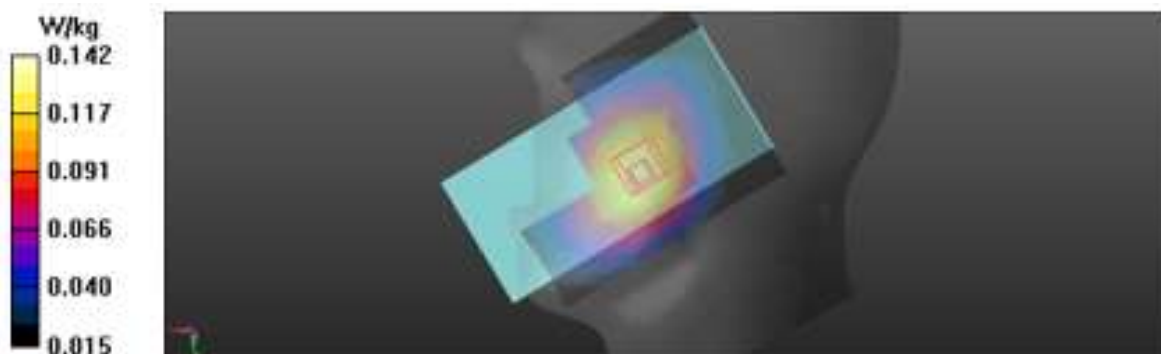
Communication System: UID 0, LTE Band 12 (0); Frequency: 707.5 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 707.5 \text{ MHz}$; $\sigma = 0.895 \text{ S/m}$; $\epsilon_r = 43.381$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(10.41, 10.41, 10.41) @ 707.5 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/LTE Band 12_QPSK_10MHz_1RB_0offset_CH23095_Right Cheek/Area Scan (8x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (measured) = 0.133 W/kg

Configuration/LTE Band 12_QPSK_10MHz_1RB_0offset_CH23095_Right Cheek/Zoom Scan (6x6x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
 Reference Value = 4.252 V/m; Power Drift = 0.18 dB
 Peak SAR (extrapolated) = 0.153 W/kg
SAR(1 g) = 0.121 W/kg; SAR(10 g) = 0.096 W/kg
 Smallest distance from peaks to all points 3 dB below = 28.5 mm
 Ratio of SAR at M2 to SAR at M1 = 79.6%
 Maximum value of SAR (measured) = 0.142 W/kg



9)

Date: 6/11/2020

Test Laboratory: KCTL Inc.

File Name: 1.LTE Band 26 QPSK 15 MHz Head.da53:0

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N503A1ZJ

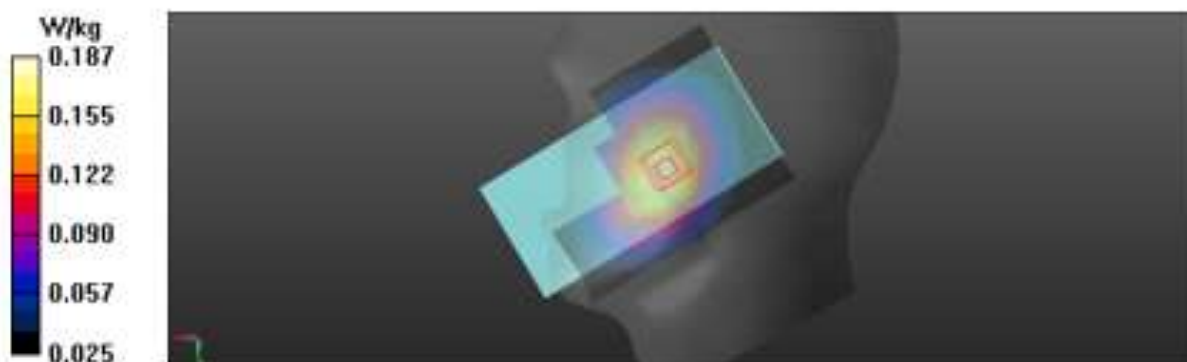
Communication System: UID 0, LTE Band 26 (0); Frequency: 831.5 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 831.5 \text{ MHz}$; $\sigma = 0.909 \text{ S/m}$; $\epsilon_r = 40.724$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(9.87, 9.87, 9.87) @ 831.5 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/LTE Band 26_QPSK_15MHz_1RB_0offset_CH26865_Right Cheek/Area Scan (8x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (measured) = 0.191 W/kg

Configuration/LTE Band 26_QPSK_15MHz_1RB_0offset_CH26865_Right Cheek/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
 Reference Value = 4.812 V/m; Power Drift = -0.07 dB
 Peak SAR (extrapolated) = 0.205 W/kg
SAR(1 g) = 0.158 W/kg; SAR(10 g) = 0.121 W/kg
 Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
 Ratio of SAR at M2 to SAR at M1 = 78.1%
 Maximum value of SAR (measured) = 0.187 W/kg



10)

Date: 7/8/2020

Test Laboratory: KCTL Inc.

File Name: [1.LTE Band 41 Head.da53:0](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602X0GE

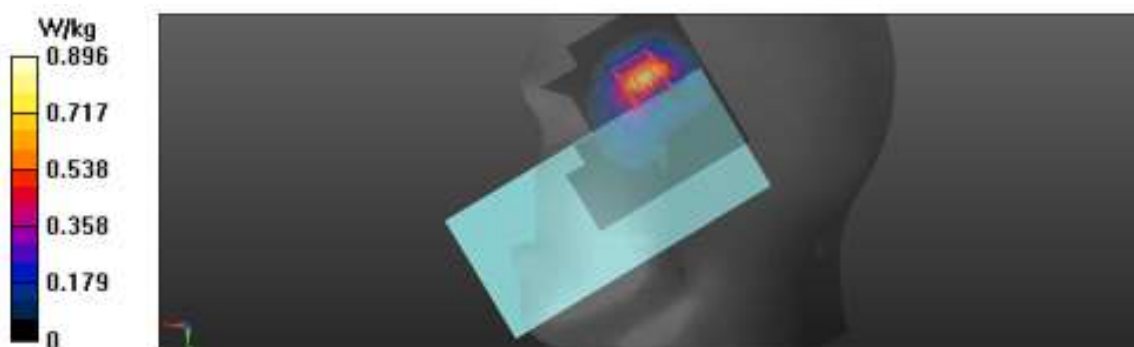
Communication System: UID 0, LTE Band 41 (0); Frequency: 2680 MHz; Duty Cycle: 1:1.58016
 Medium parameters used: $f = 2680$ MHz; $\sigma = 1.991$ S/m; $\epsilon_r = 40.079$; $\rho = 1000$ kg/m³
 Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(7.51, 7.51, 7.51) @ 2680 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Right; Type: QD 000 P41 Ax; Serial: 1984
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/LTE Band 41_QPSK_20MHz_1RB_0offset_CH41490_Right Cheek/Area Scan (9x9x1): Measurement grid: dx=12mm, dy=12mm
 Maximum value of SAR (measured) = 0.865 W/kg

Configuration/LTE Band 41_QPSK_20MHz_1RB_0offset_CH41490_Right Cheek/Zoom Scan (7x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
 Reference Value = 2.720 V/m; Power Drift = -0.19 dB
 Peak SAR (extrapolated) = 1.38 W/kg
SAR(1 g) = 0.506 W/kg; SAR(10 g) = 0.200 W/kg
 Smallest distance from peaks to all points 3 dB below = 5.1 mm
 Ratio of SAR at M2 to SAR at M1 = 43.5%
 Maximum value of SAR (measured) = 0.896 W/kg



11)

Date: 6/27/2020

Test Laboratory: KCTL Inc.

File Name: [4.LTE Band 66 QPSK 20 MHz Head.da53:1](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N601774X

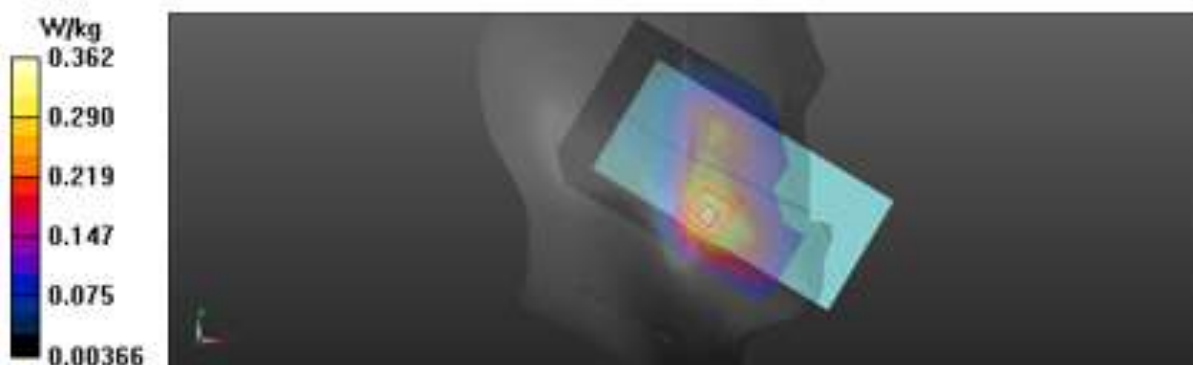
Communication System: UID 0, LTE Band 66 (0); Frequency: 1770 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 1770$ MHz; $\sigma = 1.362$ S/m; $\epsilon_r = 39.028$; $\rho = 1000$ kg/m³
 Phantom section: Left Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(8.61, 8.61, 8.61) @ 1770 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration 2/LTE Band 66_QPSK_20 MHz_1RB_0offset_CH132572_Left Cheek/Area Scan (8x11x1): Measurement grid: dx=15mm, dy=15mm
 Maximum value of SAR (measured) = 0.348 W/kg

Configuration 2/LTE Band 66_QPSK_20 MHz_1RB_0offset_CH132572_Left Cheek/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
 Reference Value = 11.47 V/m; Power Drift = 0.11 dB
 Peak SAR (extrapolated) = 0.435 W/kg
SAR(1 g) = 0.263 W/kg; SAR(10 g) = 0.166 W/kg
 Smallest distance from peaks to all points 3 dB below = 14.1 mm
 Ratio of SAR at M2 to SAR at M1 = 62.7%
 Maximum value of SAR (measured) = 0.362 W/kg



12)

Date: 6/24/2020

Test Laboratory: KCTL Inc.

File Name: [1.2.4G WLAN Head.da53:1](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602V1PN

Communication System: UID 0, 2.4G WLAN (0); Frequency: 2462 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2462$ MHz; $\sigma = 1.786$ S/m; $\epsilon_r = 38.851$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(7.58, 7.58, 7.58) @ 2462 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Right; Type: QD 000 P41 Ax; Serial: 1984
- Measurement SW: DASY52, Version 52.10 (4);

Configuration 2/802.11b_CH11_Left Tilt 2/Area Scan (9x9x1): Measurement grid: dx=12mm, dy=12mm

Maximum value of SAR (measured) = 2.07 W/kg

Configuration 2/802.11b_CH11_Left Tilt 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 20.27 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 3.33 W/kg

SAR(1 g) = 1.21 W/kg; SAR(10 g) = 0.494 W/kg

Smallest distance from peaks to all points 3 dB below = 8 mm

Ratio of SAR at M2 to SAR at M1 = 36.3%

Maximum value of SAR (measured) = 2.40 W/kg



13)

Date: 6/24/2020

Test Laboratory: KCTL Inc.

File Name: [1. 5.3G 802.11ac VHT80 Head.da53:1](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602TCJZ

Communication System: UID 0, 5GWLAN (0); Frequency: 5290 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 5290$ MHz; $\sigma = 4.57$ S/m; $\epsilon_r = 37.048$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(4.65, 4.65, 4.65) @ 5290 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Right_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1975
- Measurement SW: DASY52, Version 52.10 (4);

Configuration 2/802.11 ac_VHT80_CH58_Left Tilt/Area Scan (13x15x1): Measurement grid:
 dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.969 W/kg

Configuration 2/802.11 ac_VHT80_CH58_Left Tilt/Zoom Scan (9x10x7)/Cube 0: Measurement
 grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 2.678 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 2.00 W/kg

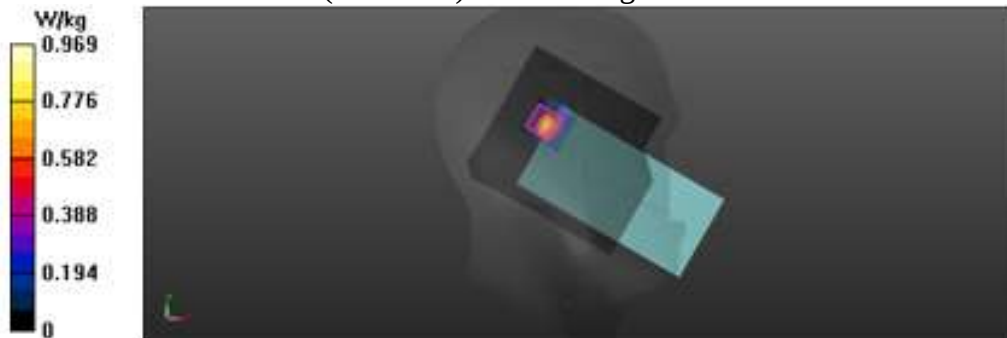
SAR(1 g) = 0.423 W/kg; SAR(10 g) = 0.107 W/kg

Smallest distance from peaks to all points 3 dB below = 6.5 mm

Ratio of SAR at M2 to SAR at M1 = 60.3%

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.17 W/kg



14)

Date: 6/23/2020

Test Laboratory: KCTL Inc.

File Name: [4. 5.6G 802.11ac VHT80 Head.da53:1](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602TCJZ

Communication System: UID 0, 5GWLAN (0); Frequency: 5530 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 5530$ MHz; $\sigma = 4.824$ S/m; $\epsilon_r = 36.556$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(4.51, 4.51, 4.51) @ 5530 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Right_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1975
- Measurement SW: DASY52, Version 52.10 (4);

Configuration 2/802.11 ac_VHT80_CH106_Left Tilt/Area Scan (13x15x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.28 W/kg

Configuration 2/802.11 ac_VHT80_CH106_Left Tilt/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 4.014 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 2.13 W/kg

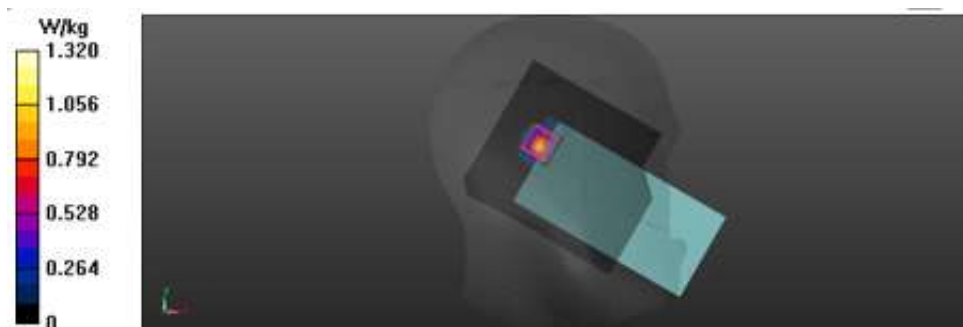
SAR(1 g) = 0.442 W/kg; SAR(10 g) = 0.113 W/kg

Smallest distance from peaks to all points 3 dB below = 5.7 mm

Ratio of SAR at M2 to SAR at M1 = 57.5%

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.32 W/kg



15)

Date: 6/23/2020

Test Laboratory: KCTL Inc.

File Name: [1. 5.8G 802.11n HT40 Head.da53:1](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602TCJZ

Communication System: UID 0, 5GWLAN (0); Frequency: 5795 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 5795 \text{ MHz}$; $\sigma = 5.099 \text{ S/m}$; $\epsilon_r = 36.11$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(4.37, 4.37, 4.37) @ 5795 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Right_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1975
- Measurement SW: DASY52, Version 52.10 (4);

Configuration 2/802.11 n_HT40_CH159_Left Tilt/Area Scan (13x15x1): Measurement grid:
 $dx=10\text{mm}$, $dy=10\text{mm}$

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.44 W/kg

Configuration 2/802.11 n_HT40_CH159_Left Tilt/Zoom Scan (8x8x7)/Cube 0: Measurement
 grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 0 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 2.40 W/kg

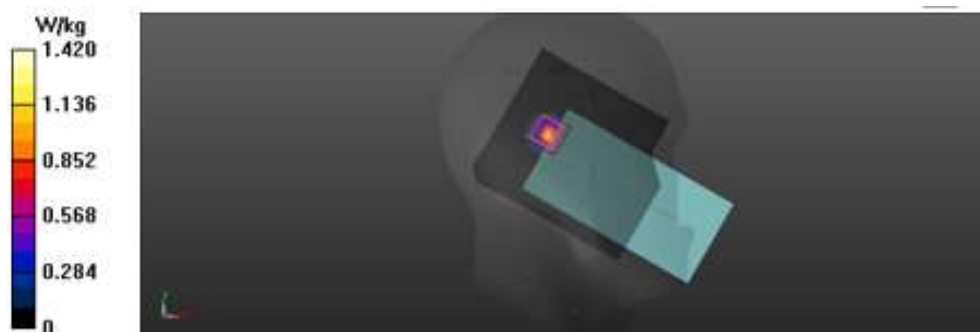
SAR(1 g) = 0.458 W/kg; SAR(10 g) = 0.111 W/kg

Smallest distance from peaks to all points 3 dB below = 5.4 mm

Ratio of SAR at M2 to SAR at M1 = 55.8%

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.42 W/kg



16)

Date: 6/24/2020

Test Laboratory: KCTL Inc.

File Name: [1.Blurtooth Head.da53:1](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602V1PN

Communication System: UID 0, Bluetooth (0); Frequency: 2441 MHz; Duty Cycle: 1:3.33273
 Medium parameters used (interpolated): $f = 2441$ MHz; $\sigma = 1.764$ S/m; $\epsilon_r = 38.901$; $\rho = 1000$ kg/m³
 Phantom section: Left Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(7.58, 7.58, 7.58) @ 2441 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Right; Type: QD 000 P41 Ax; Serial: 1984
- Measurement SW: DASY52, Version 52.10 (4);

Configuration 2/Bluetooth_GFSK_DH1_CH39_Left Cheek/Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.211 W/kg

Configuration 2/Bluetooth_GFSK_DH1_CH39_Left Cheek/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.195 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 0.304 W/kg

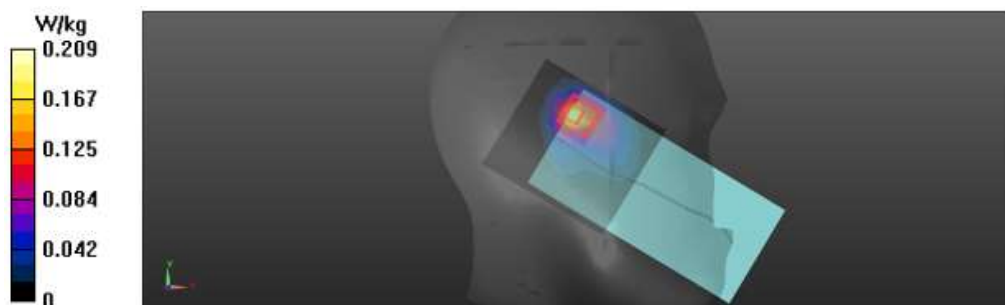
SAR(1 g) = 0.110 W/kg; SAR(10 g) = 0.049 W/kg

Smallest distance from peaks to all points 3 dB below = 9.1 mm

Ratio of SAR at M2 to SAR at M1 = 36.2%

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.209 W/kg



17)

Date: 6/22/2020

Test Laboratory: KCTL Inc.

File Name: [2.GSM850 Body.da53:0](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602V1PN

Communication System: UID 0, GSM850 (0); Frequency: 836.6 MHz; Duty Cycle: 1:8.30042

Medium parameters used: $f = 836.6$ MHz; $\sigma = 0.92$ S/m; $\epsilon_r = 41.132$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(9.87, 9.87, 9.87) @ 836.6 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/GSM850_Voice_CH190_Rear_15 mm/Area Scan (7x12x1): Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.345 W/kg

Configuration/GSM850_Voice_CH190_Rear_15 mm/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 19.66 V/m; Power Drift = -0.16 dB

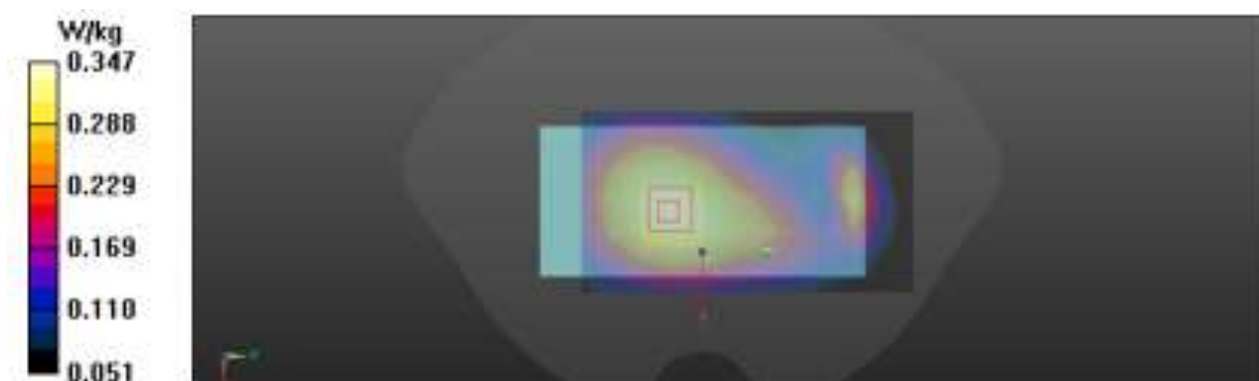
Peak SAR (extrapolated) = 0.383 W/kg

SAR(1 g) = 0.282 W/kg; SAR(10 g) = 0.212 W/kg

Smallest distance from peaks to all points 3 dB below: Larger than measurement grid

Ratio of SAR at M2 to SAR at M1 = 73.7%

Maximum value of SAR (measured) = 0.347 W/kg



18)

Date: 6/25/2020

Test Laboratory: KCTL Inc.

File Name: [2.GSM1900 Body.da53:0](#)**DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602TCJZ**Communication System: UID 0, GSM 1900_2TX (0); Frequency: 1880 MHz; Duty Cycle:
1:4.14954Medium parameters used: $f = 1880$ MHz; $\sigma = 1.436$ S/m; $\epsilon_r = 38.859$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(7.57, 7.57, 7.57) @ 1880 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Left_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1974
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/GSM1900_GPRS 2Tx_CH661_Rear_15 mm/Area Scan (9x9x1): Measurement
grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.498 W/kg

Configuration/GSM1900_GPRS 2Tx_CH661_Rear_15 mm/Zoom Scan (5x6x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.54 V/m; Power Drift = 0.05 dB

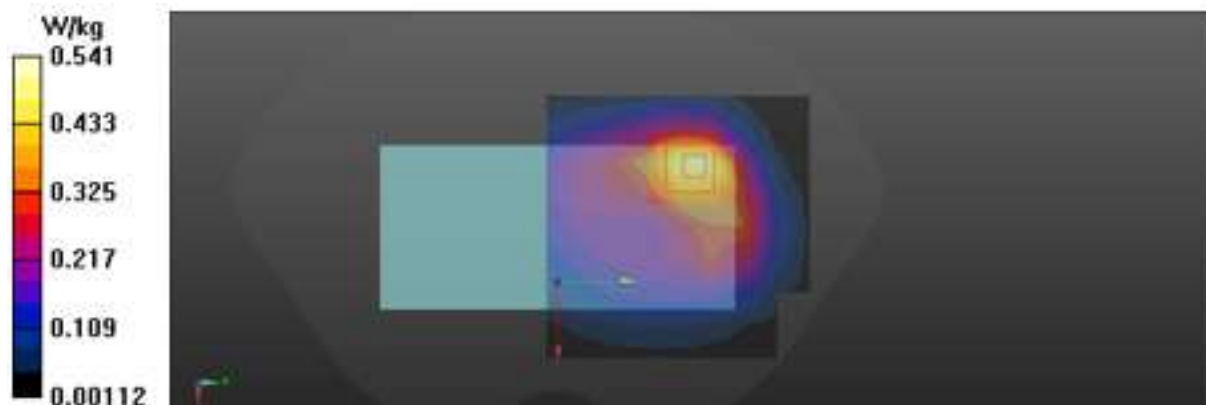
Peak SAR (extrapolated) = 0.648 W/kg

SAR(1 g) = 0.367 W/kg; SAR(10 g) = 0.206 W/kg

Smallest distance from peaks to all points 3 dB below = 17 mm

Ratio of SAR at M2 to SAR at M1 = 55.4%

Maximum value of SAR (measured) = 0.541 W/kg



19)

Date: 6/25/2020

Test Laboratory: KCTL Inc.

File Name: [5.WCDMA FDD II Body.da53:0](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602TCJZ

Communication System: UID 0, W-CDMA 1900 (Band 2) (0); Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.436 \text{ S/m}$; $\epsilon_r = 38.859$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(7.57, 7.57, 7.57) @ 1880 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Left_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1974
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/WCDMA FDD II_CH9400_Front_15 mm/Area Scan (9x8x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.707 W/kg

Configuration/WCDMA FDD II_CH9400_Front_15 mm/Zoom Scan (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 13.83 V/m; Power Drift = -0.07 dB

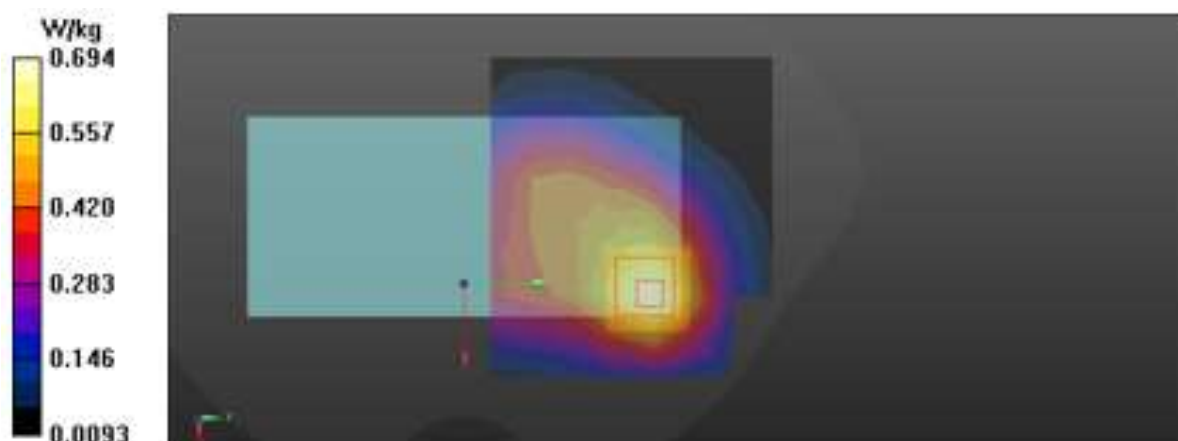
Peak SAR (extrapolated) = 0.830 W/kg

SAR(1 g) = 0.484 W/kg; SAR(10 g) = 0.289 W/kg

Smallest distance from peaks to all points 3 dB below: Larger than measurement grid

Ratio of SAR at M2 to SAR at M1 = 57.2%

Maximum value of SAR (measured) = 0.694 W/kg



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20)

Date: 6/27/2020

Test Laboratory: KCTL Inc.

File Name: [2.WCDMA FDD IV Body.da53:0](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602V1PN

Communication System: UID 0, W-CDMA 1750 (Band 4) (0); Frequency: 1732.4 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1732.4$ MHz; $\sigma = 1.336$ S/m; $\epsilon_r = 39.187$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(8.61, 8.61, 8.61) @ 1732.4 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/WCDMA FDD IV_CH1412_Rear_15 mm_Sensor On/Area Scan (9x9x1):

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.190 W/kg

Configuration/WCDMA FDD IV_CH1412_Rear_15 mm_Sensor On/Zoom Scan (6x6x7)/Cube

0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.525 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.254 W/kg

SAR(1 g) = 0.141 W/kg; SAR(10 g) = 0.083 W/kg

Smallest distance from peaks to all points 3 dB below = 17.2 mm

Ratio of SAR at M2 to SAR at M1 = 54.1%

Maximum value of SAR (measured) = 0.207 W/kg



21)

Date: 6/22/2020

Test Laboratory: KCTL Inc.

File Name: [2.WCDMA Band 5 Body.da53:0](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602TRML

Communication System: UID 0, W-CDMA 850 (Band 5) (0); Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 836.6 \text{ MHz}$; $\sigma = 0.92 \text{ S/m}$; $\epsilon_r = 41.132$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(9.87, 9.87, 9.87) @ 836.6 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/WCDMA Band 5_CH4183_Rear_15 mm/Area Scan (7x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (measured) = 0.329 W/kg

Configuration/WCDMA Band 5_CH4183_Rear_15 mm/Zoom Scan (5x5x7)/Cube 0:

Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 19.52 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.373 W/kg

SAR(1 g) = 0.274 W/kg; SAR(10 g) = 0.205 W/kg

Smallest distance from peaks to all points 3 dB below: Larger than measurement grid

Ratio of SAR at M2 to SAR at M1 = 73.3%

Maximum value of SAR (measured) = 0.338 W/kg



22)

Date: 6/29/2020

Test Laboratory: KCTL Inc.

File Name: 2.LTE Band 2 QPSK 20 MHz Body.da53:0

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602TCJZ

Communication System: UID 0, LTE Band 2 (0); Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.424$ S/m; $\epsilon_r = 38.807$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(7.57, 7.57, 7.57) @ 1880 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Left_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1974
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/LTE Band 2_QPSK_20 MHz_1RB_0offset_CH18900_Rear_15 mm/Area Scan

(9x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.678 W/kg

Configuration/LTE Band 2_QPSK_20 MHz_1RB_0offset_CH18900_Rear_15 mm/Zoom Scan

(5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 13.11 V/m; Power Drift = -0.00 dB

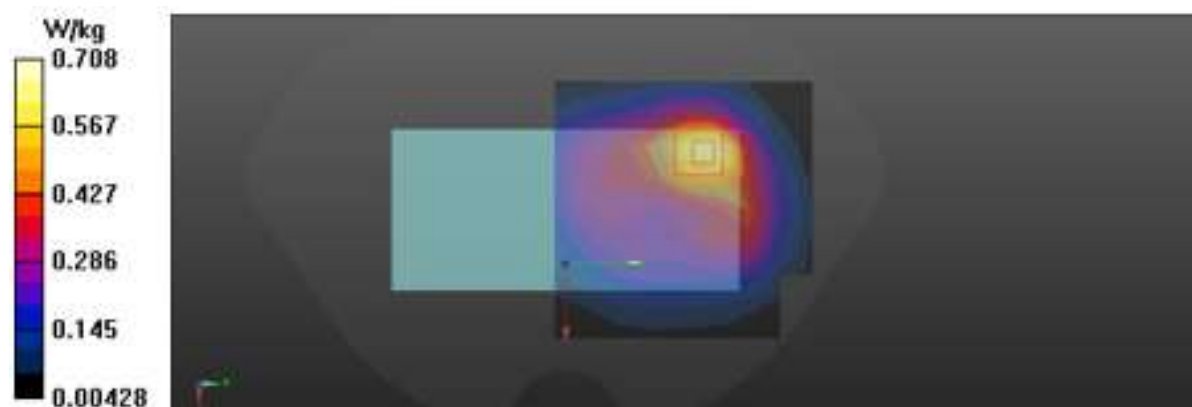
Peak SAR (extrapolated) = 0.839 W/kg

SAR(1 g) = 0.480 W/kg; SAR(10 g) = 0.273 W/kg

Smallest distance from peaks to all points 3 dB below = 17.2 mm

Ratio of SAR at M2 to SAR at M1 = 56.3%

Maximum value of SAR (measured) = 0.708 W/kg



23)

Date: 6/11/2020

Test Laboratory: KCTL Inc.

File Name: [2.LTE Band 5 QPSK 10 MHz Body.da53:0](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N503A1ZJ

Communication System: UID 0, LTE Band 5 (0); Frequency: 836.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 836.5$ MHz; $\sigma = 0.913$ S/m; $\epsilon_r = 40.65$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(9.87, 9.87, 9.87) @ 836.5 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/LTE Band 5_QPSK_10MHz_1RB_0offset_CH20525_Rear_15 mm/Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.306 W/kg

Configuration/LTE Band 5_QPSK_10MHz_1RB_0offset_CH20525_Rear_15 mm/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 18.56 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 0.337 W/kg

SAR(1 g) = 0.248 W/kg; SAR(10 g) = 0.186 W/kg

Smallest distance from peaks to all points 3 dB below: Larger than measurement grid

Ratio of SAR at M2 to SAR at M1 = 73.7%

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.305 W/kg



24)

Date: 6/13/2020

Test Laboratory: KCTL Inc.

File Name: 2.LTE Band 12 QPSK 10 MHz Body.da53:0

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N503A1ZJ

Communication System: UID 0, LTE Band 12 (0); Frequency: 707.5 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 707.5 \text{ MHz}$; $\sigma = 0.895 \text{ S/m}$; $\epsilon_r = 43.381$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(10.41, 10.41, 10.41) @ 707.5 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/LTE Band 12_QPSK_10MHz_1RB_0offset_CH23095_Rear_15 mm/Area Scan (7x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (measured) = 0.279 W/kg

Configuration/LTE Band 12_QPSK_10MHz_1RB_0offset_CH23095_Rear_15 mm/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
 Reference Value = 18.42 V/m; Power Drift = -0.10 dB
 Peak SAR (extrapolated) = 0.306 W/kg
SAR(1 g) = 0.232 W/kg; SAR(10 g) = 0.181 W/kg
 Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
 Ratio of SAR at M2 to SAR at M1 = 76.4%
 Maximum value of SAR (measured) = 0.280 W/kg



25)

Date: 6/11/2020

Test Laboratory: KCTL Inc.

File Name: 2.LTE Band 26 QPSK 15 MHz Body.da53:0

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N503A1ZJ

Communication System: UID 0, LTE Band 26 (0); Frequency: 831.5 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 831.5 \text{ MHz}$; $\sigma = 0.909 \text{ S/m}$; $\epsilon_r = 40.724$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(9.87, 9.87, 9.87) @ 831.5 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/LTE Band 26_QPSK_15MHz_1RB_0offset_CH26865_Rear_15 mm/Area Scan

(7x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (measured) = 0.286 W/kg

Configuration/LTE Band 26_QPSK_15MHz_1RB_0offset_CH26865_Rear_15 mm/Zoom Scan

(5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 18.15 V/m; Power Drift = 0.03 dB

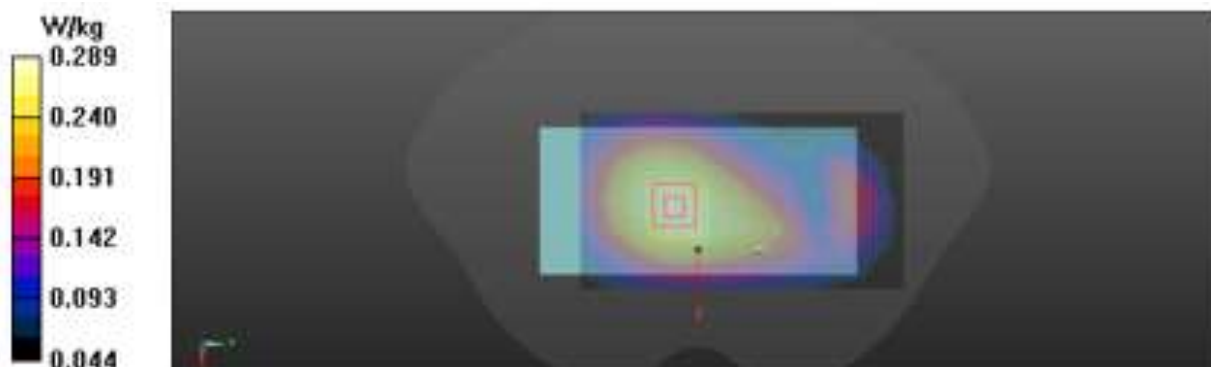
Peak SAR (extrapolated) = 0.319 W/kg

SAR(1 g) = 0.236 W/kg; SAR(10 g) = 0.178 W/kg

Smallest distance from peaks to all points 3 dB below: Larger than measurement grid

Ratio of SAR at M2 to SAR at M1 = 74.1%

Maximum value of SAR (measured) = 0.289 W/kg



26)

Date: 7/8/2020

Test Laboratory: KCTL Inc.

File Name: [2.LTE Band 41 Body.da53:0](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602X0GE

Communication System: UID 0, LTE Band 41 (0); Frequency: 2593 MHz; Duty Cycle: 1:1.58016
 Medium parameters used (interpolated): $f = 2593 \text{ MHz}$; $\sigma = 1.89 \text{ S/m}$; $\epsilon_r = 40.429$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(7.51, 7.51, 7.51) @ 2593 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Right; Type: QD 000 P41 Ax; Serial: 1984
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/LTE Band 41_QPSK_20MHz_1RB_99offset_CH40620_Rear_15 mm/Area Scan (10x9x1): Measurement grid: dx=12mm, dy=12mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.462 W/kg

Configuration/LTE Band 41_QPSK_20MHz_1RB_99offset_CH40620_Rear_15 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.21 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.673 W/kg

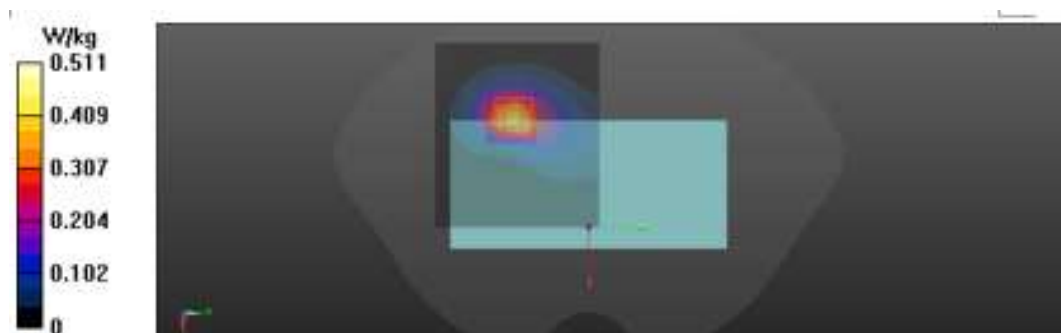
SAR(1 g) = 0.287 W/kg; SAR(10 g) = 0.130 W/kg

Smallest distance from peaks to all points 3 dB below = 10.2 mm

Ratio of SAR at M2 to SAR at M1 = 41.9%

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.511 W/kg



27)

Date: 6/27/2020

Test Laboratory: KCTL Inc.

File Name: 5.LTE Band 66 QPSK 20 MHz Body.da53:0

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N601774X

Communication System: UID 0, LTE Band 66 (0); Frequency: 1770 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 1770$ MHz; $\sigma = 1.362$ S/m; $\epsilon_r = 39.028$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(8.61, 8.61, 8.61) @ 1770 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/LTE Band 66_QPSK_20 MHz_50RB_0offset_CH132572_Rear_15 mm_Sensor On/Area Scan (9x8x1): Measurement grid: dx=15mm, dy=15mm
 Maximum value of SAR (measured) = 0.469 W/kg

Configuration/LTE Band 66_QPSK_20 MHz_50RB_0offset_CH132572_Rear_15 mm_Sensor On/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
 Reference Value = 12.12 V/m; Power Drift = -0.05 dB
 Peak SAR (extrapolated) = 0.624 W/kg
SAR(1 g) = 0.348 W/kg; SAR(10 g) = 0.203 W/kg
 Smallest distance from peaks to all points 3 dB below = 17.6 mm
 Ratio of SAR at M2 to SAR at M1 = 54.8%
 Maximum value of SAR (measured) = 0.506 W/kg



28)

Date: 6/24/2020

Test Laboratory: KCTL Inc.

File Name: [2.24G WLAN Body.da53:0](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602V1PN

Communication System: UID 0, 2.4G WLAN (0); Frequency: 2462 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2462 \text{ MHz}$; $\sigma = 1.786 \text{ S/m}$; $\epsilon_r = 38.851$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(7.58, 7.58, 7.58) @ 2462 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Right; Type: QD 000 P41 Ax; Serial: 1984
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/802.11b_CH11_Rear_15 mm/Area Scan (11x11x1): Measurement grid: dx=12mm, dy=12mm

Maximum value of SAR (measured) = 0.272 W/kg

Configuration/802.11b_CH11_Rear_15 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.538 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 0.361 W/kg

SAR(1 g) = 0.164 W/kg; SAR(10 g) = 0.081 W/kg

Smallest distance from peaks to all points 3 dB below = 13.4 mm

Ratio of SAR at M2 to SAR at M1 = 45%

Maximum value of SAR (measured) = 0.274 W/kg



29)

Date: 6/24/2020

Test Laboratory: KCTL Inc.

File Name: [2. 5.3G 802.11a Body.da53:0](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602TCJZ

Communication System: UID 0, 5GWLAN (0); Frequency: 5320 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5320$ MHz; $\sigma = 4.603$ S/m; $\epsilon_r = 37.035$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(4.65, 4.65, 4.65) @ 5320 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Right_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1975
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/802.11 a_CH64_Rear_15 mm/Area Scan (11x9x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 0.875 W/kg

Configuration/802.11 a_CH64_Rear_15 mm/Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 0 V/m; Power Drift = 0.00 dB

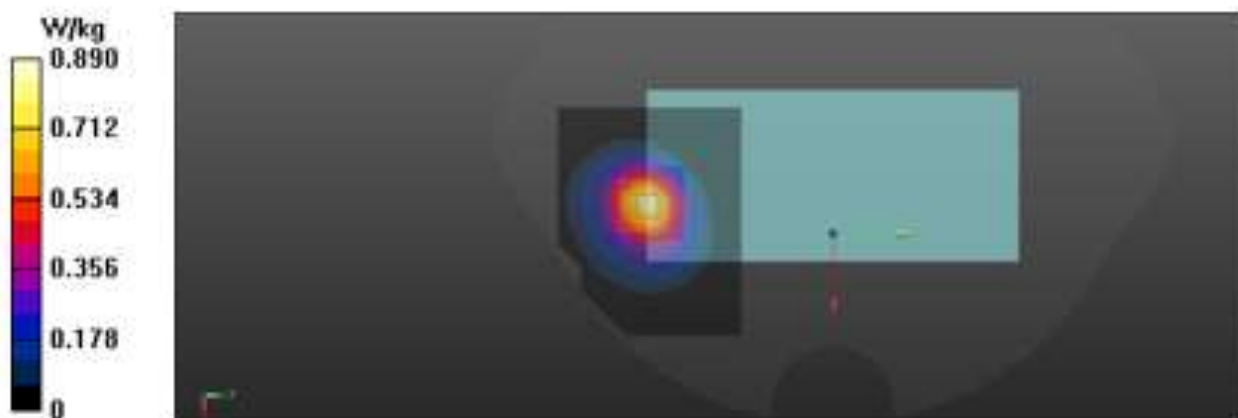
Peak SAR (extrapolated) = 1.48 W/kg

SAR(1 g) = 0.369 W/kg; SAR(10 g) = 0.139 W/kg

Smallest distance from peaks to all points 3 dB below = 12.5 mm

Ratio of SAR at M2 to SAR at M1 = 61.1%

Maximum value of SAR (measured) = 0.890 W/kg



30)

Date: 6/23/2020

Test Laboratory: KCTL Inc.

File Name: [5. 5.6G 802.11n HT40 Body.da53:0](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602TCJZ

Communication System: UID 0, 5GWLAN (0); Frequency: 5630 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5630$ MHz; $\sigma = 4.921$ S/m; $\epsilon_r = 36.369$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(4.42, 4.42, 4.42) @ 5630 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Right_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1975
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/802.11 n_HT40_CH126_Rear_15 mm/Area Scan (11x9x1): Measurement grid:

dx=10mm, dy=10mm

Maximum value of SAR (measured) = 1.05 W/kg

Configuration/802.11 n_HT40_CH126_Rear_15 mm/Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 16.97 V/m; Power Drift = 0.04 dB

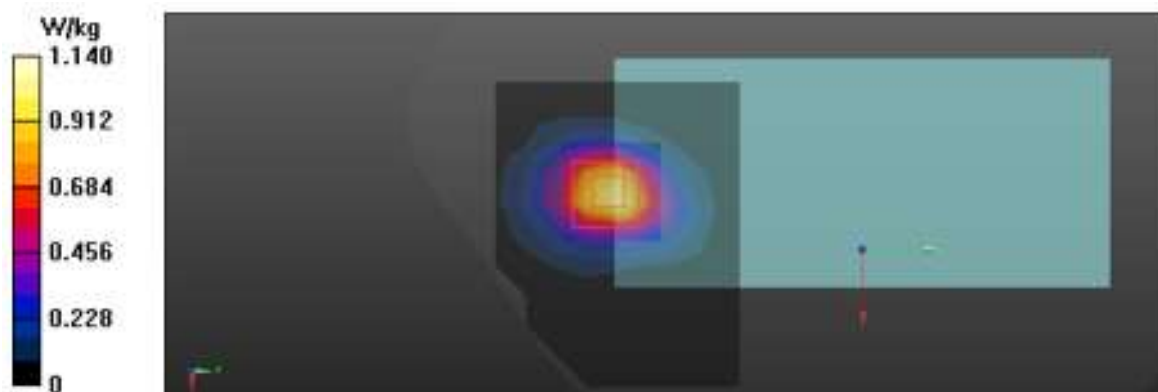
Peak SAR (extrapolated) = 2.01 W/kg

SAR(1 g) = 0.452 W/kg; SAR(10 g) = 0.160 W/kg

Smallest distance from peaks to all points 3 dB below = 10.5 mm

Ratio of SAR at M2 to SAR at M1 = 57.3%

Maximum value of SAR (measured) = 1.14 W/kg



31)

Date: 6/23/2020

Test Laboratory: KCTL Inc.

File Name: [2. 5.8G 802.11a Body.da53:0](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602TCJZ

Communication System: UID 0, 5GWLAN (0); Frequency: 5785 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 5785 \text{ MHz}$; $\sigma = 5.084 \text{ S/m}$; $\epsilon_r = 36.096$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(4.37, 4.37, 4.37) @ 5785 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Right_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1975
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/802.11 a_CH157_Rear_15 mm/Area Scan (11x9x1): Measurement grid:
 $dx=10\text{mm}$, $dy=10\text{mm}$

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.839 W/kg

Configuration/802.11 a_CH157_Rear_15 mm/Zoom Scan (9x9x7)/Cube 0: Measurement grid:
 $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$

Reference Value = 2.415 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 1.41 W/kg

SAR(1 g) = 0.322 W/kg; SAR(10 g) = 0.115 W/kg

Smallest distance from peaks to all points 3 dB below = 11.2 mm

Ratio of SAR at M2 to SAR at M1 = 56.3%

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.881 W/kg



32)

Date: 6/22/2020

Test Laboratory: KCTL Inc.

File Name: [3.GSM850_Hotspot.da53:0](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602V1PN

Communication System: UID 0, GSM850_2TX (0); Frequency: 836.6 MHz; Duty Cycle: 1:4.14954

Medium parameters used: $f = 836.6 \text{ MHz}$; $\sigma = 0.92 \text{ S/m}$; $\epsilon_r = 41.132$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(9.87, 9.87, 9.87) @ 836.6 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/GSM850_GPRS 2Tx_CH190_Rear_10 mm/Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.493 W/kg

Configuration/GSM850_GPRS 2Tx_CH190_Rear_10 mm/Zoom Scan (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 20.85 V/m; Power Drift = -0.04 dB

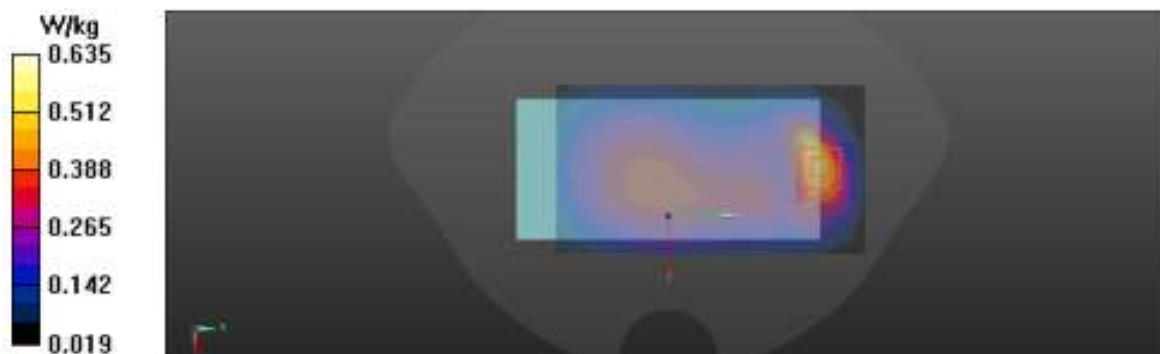
Peak SAR (extrapolated) = 0.810 W/kg

SAR(1 g) = 0.417 W/kg; SAR(10 g) = 0.227 W/kg

Smallest distance from peaks to all points 3 dB below = 9.6 mm

Ratio of SAR at M2 to SAR at M1 = 53.1%

Maximum value of SAR (measured) = 0.635 W/kg



33)

Date: 6/25/2020

Test Laboratory: KCTL Inc.

File Name: [3.GSM1900 Hotspot.da53:0](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602TCJZ

Communication System: UID 0, GSM 1900_2TX (0); Frequency: 1909.8 MHz; Duty Cycle: 1:4.14954

Medium parameters used (interpolated): $f = 1909.8$ MHz; $\sigma = 1.463$ S/m; $\epsilon_r = 38.791$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(7.57, 7.57, 7.57) @ 1909.8 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Left_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1974
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/GSM1900_GPRS 2Tx_CH810_Rear_10 mm/Area Scan (9x9x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.21 W/kg

Configuration/GSM1900_GPRS 2Tx_CH810_Rear_10 mm/Zoom Scan (6x6x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 13.76 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 1.55 W/kg

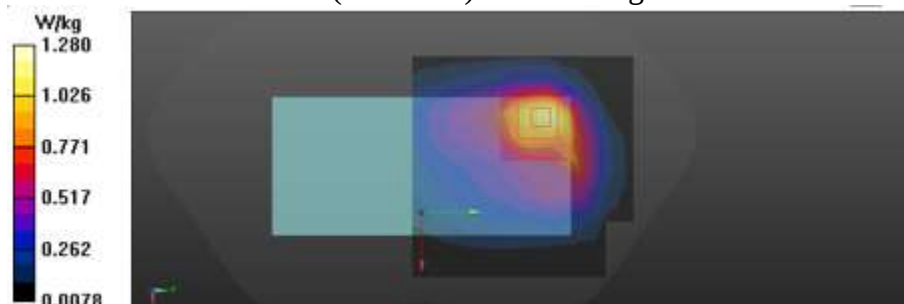
SAR(1 g) = 0.855 W/kg; SAR(10 g) = 0.470 W/kg

Smallest distance from peaks to all points 3 dB below = 15.8 mm

Ratio of SAR at M2 to SAR at M1 = 54.5%

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.28 W/kg



34)

Date: 6/25/2020

Test Laboratory: KCTL Inc.

File Name: [6.WCDMA FDD II_Hotspot.da53:2](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602TCJZ

Communication System: UID 0, W-CDMA 1900 (Band 2) (0); Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.436 \text{ S/m}$; $\epsilon_r = 38.859$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(7.57, 7.57, 7.57) @ 1880 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Left_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1974
- Measurement SW: DASY52, Version 52.10 (4);

Configuration 3/WCDMA FDD II_CH9400_Bottom_10 mm/Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.06 W/kg

Configuration 3/WCDMA FDD II_CH9400_Bottom_10 mm/Zoom Scan (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 28.15 V/m; Power Drift = -0.07 dB

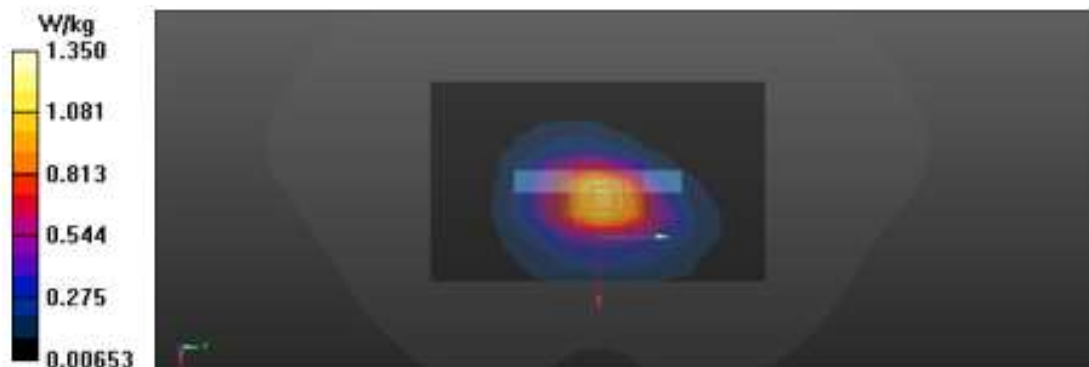
Peak SAR (extrapolated) = 1.62 W/kg

SAR(1 g) = 0.891 W/kg; SAR(10 g) = 0.488 W/kg

Smallest distance from peaks to all points 3 dB below = 12.9 mm

Ratio of SAR at M2 to SAR at M1 = 54.7%

Maximum value of SAR (measured) = 1.35 W/kg



35)

Date: 6/27/2020

Test Laboratory: KCTL Inc.

File Name: [3.WCDMA FDD IV Hotspot.da53:2](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602V1PN

Communication System: UID 0, W-CDMA 1750 (Band 4) (0); Frequency: 1732.4 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1732.4$ MHz; $\sigma = 1.336$ S/m; $\epsilon_r = 39.187$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(8.61, 8.61, 8.61) @ 1732.4 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration 3/WCDMA FDD IV_CH1412_Bottom_10 mm/Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.636 W/kg

Configuration 3/WCDMA FDD IV_CH1412_Bottom_10 mm/Zoom Scan (7x8x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 22.36 V/m; Power Drift = -0.06 dB

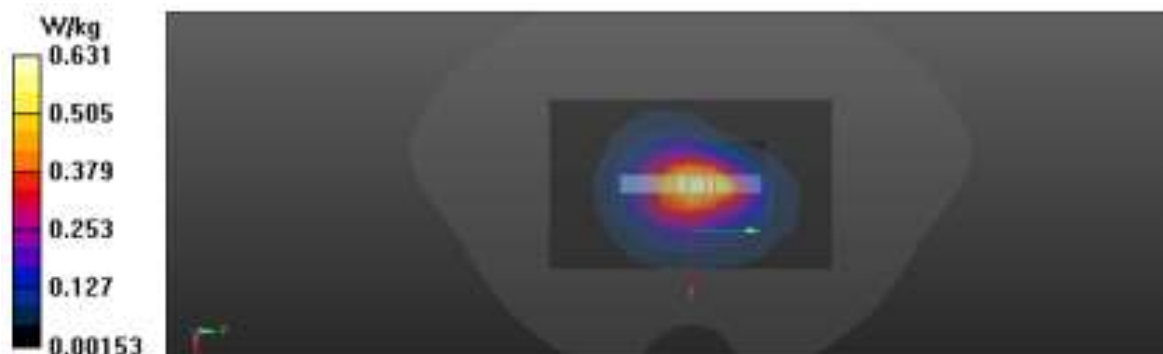
Peak SAR (extrapolated) = 0.783 W/kg

SAR(1 g) = 0.425 W/kg; SAR(10 g) = 0.238 W/kg

Smallest distance from peaks to all points 3 dB below = 11.6 mm

Ratio of SAR at M2 to SAR at M1 = 54.4%

Maximum value of SAR (measured) = 0.631 W/kg



36)

Date: 6/22/2020

Test Laboratory: KCTL Inc.

File Name: [3.WCDMA Band 5_Hotspot.da53:0](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602TRML

Communication System: UID 0, W-CDMA 850 (Band 5) (0); Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 836.6 \text{ MHz}$; $\sigma = 0.92 \text{ S/m}$; $\epsilon_r = 41.132$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(9.87, 9.87, 9.87) @ 836.6 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/WCDMA Band 5_CH4183_Rear_10 mm/Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.486 W/kg

Configuration/WCDMA Band 5_CH4183_Rear_10 mm/Zoom Scan (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 21.69 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.890 W/kg

SAR(1 g) = 0.451 W/kg; SAR(10 g) = 0.244 W/kg

Smallest distance from peaks to all points 3 dB below = 9.7 mm

Ratio of SAR at M2 to SAR at M1 = 53%

Maximum value of SAR (measured) = 0.686 W/kg



36)

37)

Date: 6/29/2020

Test Laboratory: KCTL Inc.

File Name: 3.LTE Band 2 QPSK 20 MHz Hotspot.da53:0

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602TCJZ

Communication System: UID 0, LTE Band 2 (0); Frequency: 1860 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1860$ MHz; $\sigma = 1.412$ S/m; $\epsilon_r = 38.823$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(7.57, 7.57, 7.57) @ 1860 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Left_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1974
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/LTE Band 2_QPSK_20 MHz_1RB_0offset_CH18700_Rear_10 mm/Area Scan

(9x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.33 W/kg

Configuration/LTE Band 2_QPSK_20 MHz_1RB_0offset_CH18700_Rear_10 mm/Zoom Scan

(6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 15.55 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 1.70 W/kg

SAR(1 g) = 0.957 W/kg; SAR(10 g) = 0.526 W/kg

Smallest distance from peaks to all points 3 dB below = 14.4 mm

Ratio of SAR at M2 to SAR at M1 = 55.9%

Maximum value of SAR (measured) = 1.43 W/kg



38)

Date: 6/11/2020

Test Laboratory: KCTL Inc.

File Name: [3.LTE Band 5 QPSK 10 MHz Hotspot.da53:0](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N503A1ZJ

Communication System: UID 0, LTE Band 5 (0); Frequency: 836.5 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 836.5$ MHz; $\sigma = 0.913$ S/m; $\epsilon_r = 40.65$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(9.87, 9.87, 9.87) @ 836.5 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/LTE Band 5_QPSK_10MHz_1RB_0offset_CH20525_Rear_10 mm/Area Scan (7x12x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.488 W/kg

Configuration/LTE Band 5_QPSK_10MHz_1RB_0offset_CH20525_Rear_10 mm/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 20.57 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.830 W/kg

SAR(1 g) = 0.422 W/kg; SAR(10 g) = 0.229 W/kg

Smallest distance from peaks to all points 3 dB below = 10.1 mm

Ratio of SAR at M2 to SAR at M1 = 52.6%

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.661 W/kg



39)

Date: 6/13/2020

Test Laboratory: KCTL Inc.

File Name: 3.LTE Band 12 QPSK 10 MHz Hotspot.da53:0

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N503A1ZJ

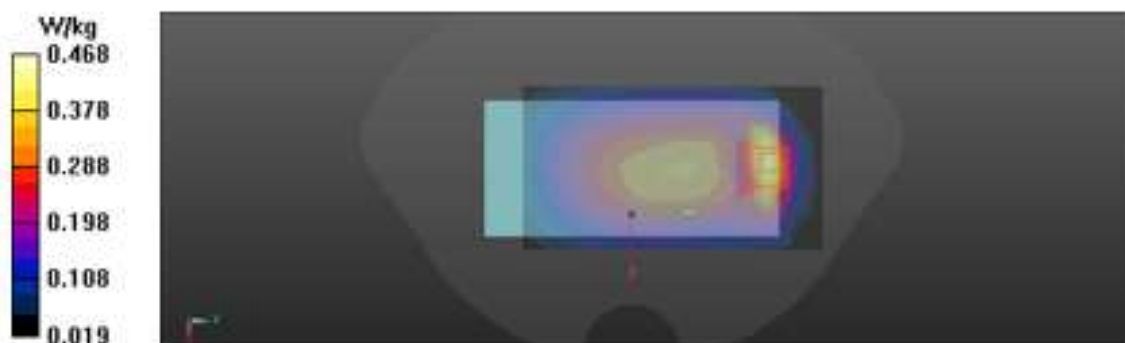
Communication System: UID 0, LTE Band 12 (0); Frequency: 707.5 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 707.5 \text{ MHz}$; $\sigma = 0.895 \text{ S/m}$; $\epsilon_r = 43.381$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(10.41, 10.41, 10.41) @ 707.5 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/LTE Band 12_QPSK_10MHz_1RB_0offset_CH23095_Rear_10 mm/Area Scan (7x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (measured) = 0.459 W/kg

Configuration/LTE Band 12_QPSK_10MHz_1RB_0offset_CH23095_Rear_10 mm/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
 Reference Value = 19.24 V/m; Power Drift = -0.03 dB
 Peak SAR (extrapolated) = 0.590 W/kg
SAR(1 g) = 0.296 W/kg; SAR(10 g) = 0.168 W/kg
 Smallest distance from peaks to all points 3 dB below = 11.2 mm
 Ratio of SAR at M2 to SAR at M1 = 49.4%
 Maximum value of SAR (measured) = 0.468 W/kg



40)

Date: 6/11/2020

Test Laboratory: KCTL Inc.

File Name: 3.LTE Band 26 QPSK 15 MHz Hotspot.da53:0

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N503A1ZJ

Communication System: UID 0, LTE Band 26 (0); Frequency: 831.5 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 831.5 \text{ MHz}$; $\sigma = 0.909 \text{ S/m}$; $\epsilon_r = 40.724$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(9.87, 9.87, 9.87) @ 831.5 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/LTE Band 26_QPSK_15MHz_1RB_0offset_CH26865_Rear_10 mm/Area Scan

(7x12x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (measured) = 0.467 W/kg

Configuration/LTE Band 26_QPSK_15MHz_1RB_0offset_CH26865_Rear_10 mm/Zoom Scan

(5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 20.12 V/m; Power Drift = 0.01 dB

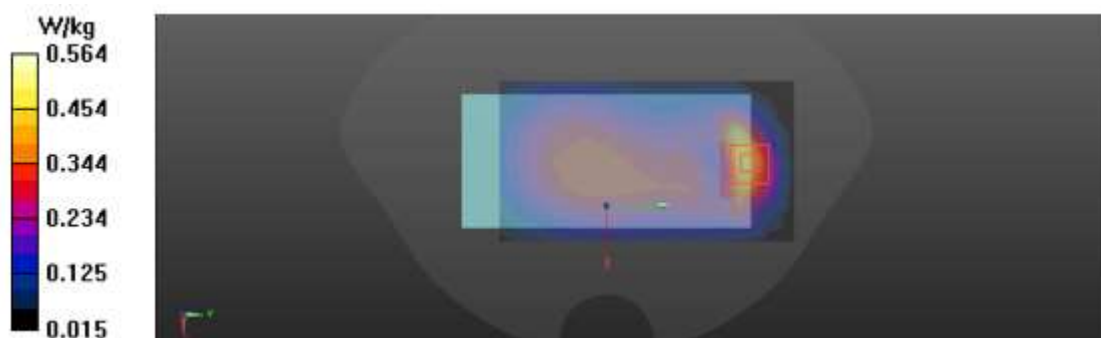
Peak SAR (extrapolated) = 0.692 W/kg

SAR(1 g) = 0.354 W/kg; SAR(10 g) = 0.192 W/kg

Smallest distance from peaks to all points 3 dB below = 10.1 mm

Ratio of SAR at M2 to SAR at M1 = 51%

Maximum value of SAR (measured) = 0.564 W/kg



41)

Date: 7/8/2020

Test Laboratory: KCTL Inc.

File Name: [3.LTE Band 41 Hotspot.da53:0](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602X0GE

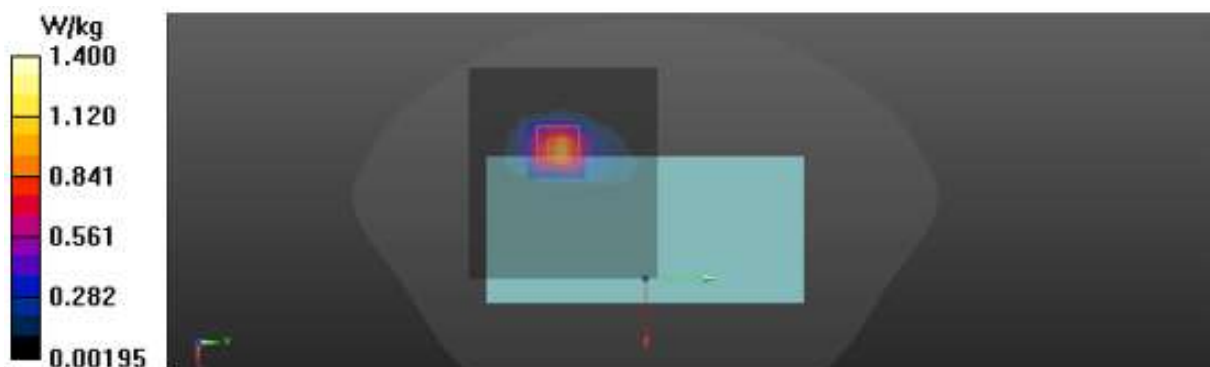
Communication System: UID 0, LTE Band 41 (0); Frequency: 2680 MHz; Duty Cycle: 1:1.58016
 Medium parameters used: $f = 2680$ MHz; $\sigma = 1.991$ S/m; $\epsilon_r = 40.079$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(7.51, 7.51, 7.51) @ 2680 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Right; Type: QD 000 P41 Ax; Serial: 1984
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/LTE Band 41_QPSK_20MHz_50RB_0offset_CH41490_Rear_10 mm/Area Scan (10x9x1): Measurement grid: dx=12mm, dy=12mm
 Maximum value of SAR (measured) = 0.942 W/kg

Configuration/LTE Band 41_QPSK_20MHz_50RB_0offset_CH41490_Rear_10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
 Reference Value = 21.43 V/m; Power Drift = 0.10 dB
 Peak SAR (extrapolated) = 1.84 W/kg
SAR(1 g) = 0.781 W/kg; SAR(10 g) = 0.318 W/kg
 Smallest distance from peaks to all points 3 dB below = 8 mm
 Ratio of SAR at M2 to SAR at M1 = 44.1%
 Maximum value of SAR (measured) = 1.40 W/kg



42)

Date: 6/27/2020

Test Laboratory: KCTL Inc.

File Name: [6.LTE Band 66 QPSK 20 MHz Hotspot.da53:0](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N601774X

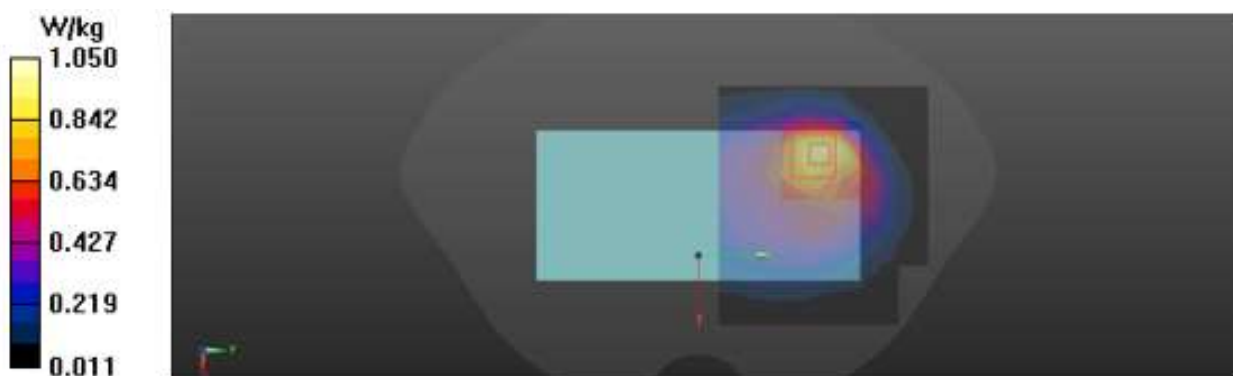
Communication System: UID 0, LTE Band 66 (0); Frequency: 1770 MHz; Duty Cycle: 1:1
 Medium parameters used: $f = 1770$ MHz; $\sigma = 1.362$ S/m; $\epsilon_r = 39.028$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(8.61, 8.61, 8.61) @ 1770 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/LTE Band 66_QPSK_20 MHz_50RB_0offset_CH132572_Rear_10 mm/Area Scan (9x8x1): Measurement grid: dx=15mm, dy=15mm
 Maximum value of SAR (measured) = 0.921 W/kg

Configuration/LTE Band 66_QPSK_20 MHz_50RB_0offset_CH132572_Rear_10 mm/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
 Reference Value = 14.66 V/m; Power Drift = 0.07 dB
 Peak SAR (extrapolated) = 1.33 W/kg
SAR(1 g) = 0.706 W/kg; SAR(10 g) = 0.396 W/kg
 Smallest distance from peaks to all points 3 dB below = 14.8 mm
 Ratio of SAR at M2 to SAR at M1 = 52.3%
 Maximum value of SAR (measured) = 1.05 W/kg



43)

Date: 6/24/2020

Test Laboratory: KCTL Inc.

File Name: [3.24G WLAN Hotspot.da53:0](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602V1PN

Communication System: UID 0, 2.4G WLAN (0); Frequency: 2462 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2462$ MHz; $\sigma = 1.786$ S/m; $\epsilon_r = 38.851$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7541; ConvF(7.58, 7.58, 7.58) @ 2462 MHz; ; Calibrated: 7/22/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/16/2019
- Phantom: Twin-SAM V8.0_Right; Type: QD 000 P41 Ax; Serial: 1984
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/802.11b_CH11_Rear_10 mm/Area Scan (11x11x1): Measurement grid: dx=12mm, dy=12mm

Maximum value of SAR (measured) = 0.488 W/kg

Configuration/802.11b_CH11_Rear_10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.537 V/m; Power Drift = -0.02 dB

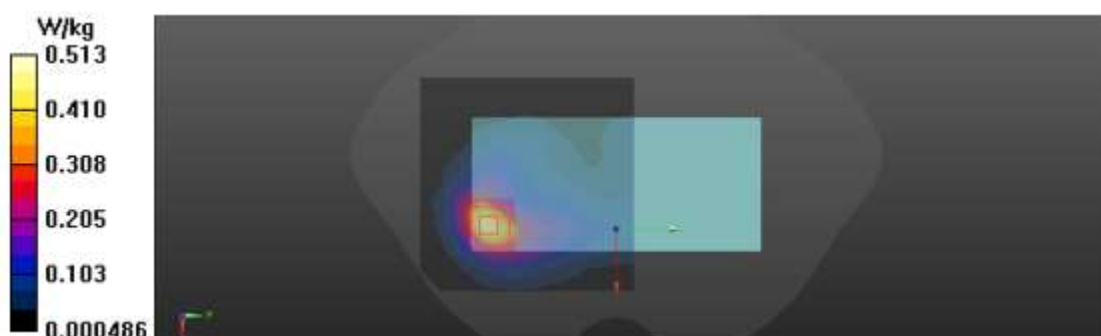
Peak SAR (extrapolated) = 0.671 W/kg

SAR(1 g) = 0.295 W/kg; SAR(10 g) = 0.138 W/kg

Smallest distance from peaks to all points 3 dB below = 11.4 mm

Ratio of SAR at M2 to SAR at M1 = 42.9%

Maximum value of SAR (measured) = 0.513 W/kg



44)

Date: 6/23/2020

Test Laboratory: KCTL Inc.

File Name: [3. 5.8G 802.11a Hotspot.da53:2](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602TCJZ

Communication System: UID 0, 5GWLAN (0); Frequency: 5745 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 5745$ MHz; $\sigma = 5.041$ S/m; $\epsilon_r = 36.148$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(4.37, 4.37, 4.37) @ 5745 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Right_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1975
- Measurement SW: DASY52, Version 52.10 (4);

Configuration 3/802.11 a_CH149_Top_10 mm/Area Scan (8x12x1): Measurement grid:
 dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.92 W/kg

Configuration 3/802.11 a_CH149_Top_10 mm/Zoom Scan (8x8x7)/Cube 0: Measurement grid:
 dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 20.00 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 3.64 W/kg

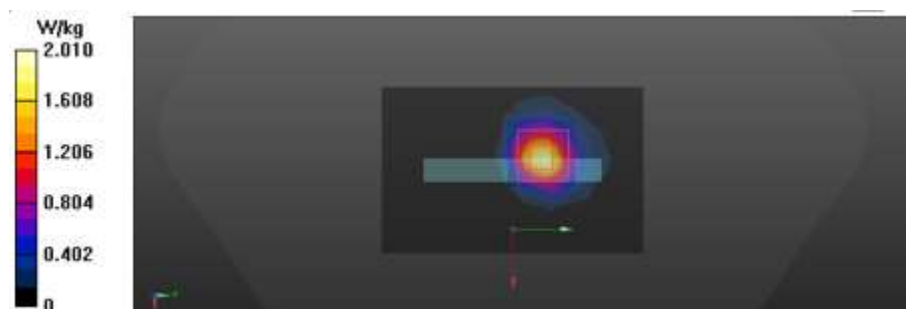
SAR(1 g) = 0.766 W/kg; SAR(10 g) = 0.240 W/kg

Smallest distance from peaks to all points 3 dB below = 9.1 mm

Ratio of SAR at M2 to SAR at M1 = 56.9%

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 2.01 W/kg



45)

Date: 6/25/2020

Test Laboratory: KCTL Inc.

File Name: [7.WCDMA FDD II_Phablet.da53:0](#)**DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602TCJZ**

Communication System: UID 0, W-CDMA 1900 (Band 2) (0); Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.436$ S/m; $\epsilon_r = 38.859$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(7.57, 7.57, 7.57) @ 1880 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Left_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1974
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/WCDMA FDD II_CH9400_Rear_0 mm/Area Scan (9x9x1): Measurement grid:
dx=15mm, dy=15mm

Maximum value of SAR (measured) = 9.81 W/kg

Configuration/WCDMA FDD II_CH9400_Rear_0 mm/Zoom Scan (5x6x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.197 V/m; Power Drift = 0.14 dB

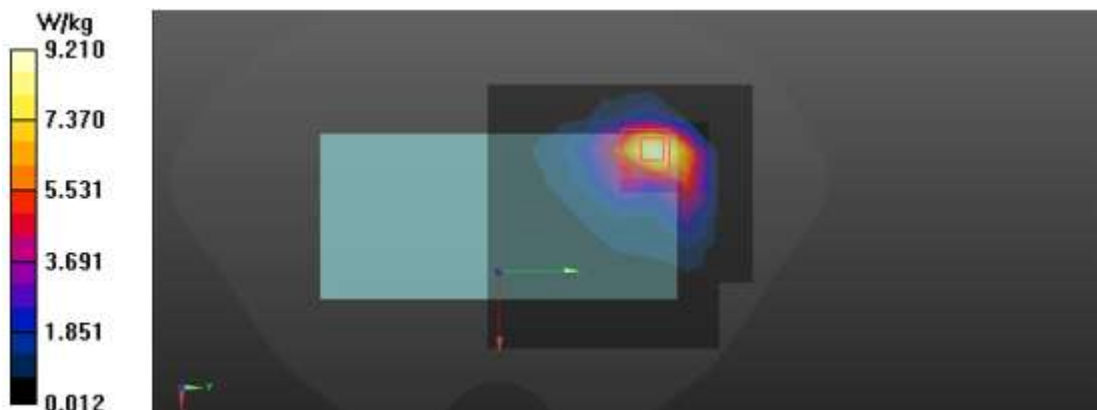
Peak SAR (extrapolated) = 14.8 W/kg

SAR(1 g) = 6.22 W/kg; SAR(10 g) = 2.98 W/kg

Smallest distance from peaks to all points 3 dB below = 8.2 mm

Ratio of SAR at M2 to SAR at M1 = 49.9%

Maximum value of SAR (measured) = 9.21 W/kg



46)

Date: 7/9/2020

Test Laboratory: KCTL Inc.

File Name: [1.LTE Band 41 Phablet.da53:0](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602WXRJ

Communication System: UID 0, LTE Band 41 (0); Frequency: 2506 MHz; Duty Cycle: 1:1.58016
 Medium parameters used (interpolated): $f = 2506$ MHz; $\sigma = 1.901$ S/m; $\epsilon_r = 38.47$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(6.78, 6.78, 6.78) @ 2506 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Right_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1975
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/LTE Band 41_QPSK_20MHz_50RB_24offset_CH39750_Rear_0 mm/Area Scan (10x9x1): Measurement grid: dx=12mm, dy=12mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 12.0 W/kg

Configuration/LTE Band 41_QPSK_20MHz_50RB_24offset_CH39750_Rear_0 mm/Zoom Scan (7x9x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 79.86 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 30.3 W/kg

SAR(1 g) = 8.5 W/kg; SAR(10 g) = 2.74 W/kg

Smallest distance from peaks to all points 3 dB below = 5 mm

Ratio of SAR at M2 to SAR at M1 = 37.9%

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 20.9 W/kg



47)

Date: 6/24/2020

Test Laboratory: KCTL Inc.

File Name: [3. 5.3G 802.11a Phablet.da53:2](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602TCJZ

Communication System: UID 0, 5GWLAN (0); Frequency: 5320 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5320$ MHz; $\sigma = 4.603$ S/m; $\epsilon_r = 37.035$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697; ConvF(4.65, 4.65, 4.65) @ 5320 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Right_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1975
- Measurement SW: DASY52, Version 52.10 (4);

Configuration 3/802.11 a_CH64_Top_0 mm/Area Scan (8x12x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 15.5 W/kg

Configuration 3/802.11 a_CH64_Top_0 mm/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 0 V/m; Power Drift = 0.00 dB

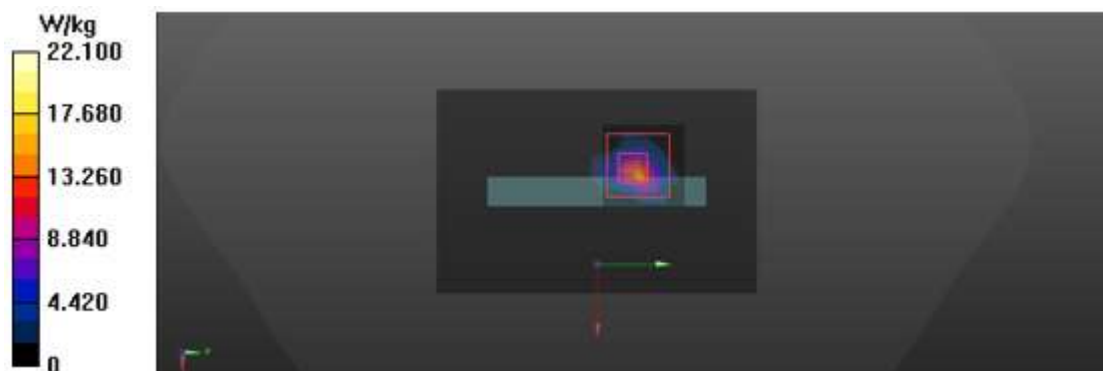
Peak SAR (extrapolated) = 49.8 W/kg

SAR(1 g) = 6.3 W/kg; SAR(10 g) = 1.15 W/kg

Smallest distance from peaks to all points 3 dB below = 4 mm

Ratio of SAR at M2 to SAR at M1 = 54.9%

Maximum value of SAR (measured) = 22.1 W/kg



48)

Date: 6/23/2020

Test Laboratory: KCTL Inc.

File Name: [6. 5.6G 802.11n HT40 Phablet.da53:2](#)

DUT: SM-M515F/DSN, Type: Mobile Phone, Serial: R38N602TCJZ

Communication System: UID 0, 5GWLAN (0); Frequency: 5630 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5630$ MHz; $\sigma = 4.921$ S/m; $\epsilon_r = 36.369$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697;ConvF(4.42, 4.42, 4.42) @ 5630 MHz; Calibrated: 3/26/2020
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1567; Calibrated: 3/20/2020
- Phantom: Back_Right_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1975
- Measurement SW: DASY52, Version 52.10 (4);

Configuration 3/802.11 n_HT40_CH126_Top_0 mm/Area Scan (8x12x1): Measurement grid:

dx=10mm, dy=10mm

Maximum value of SAR (measured) = 20.4 W/kg

Configuration 3/802.11 n_HT40_CH126_Top_0 mm/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 67.65 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 69.5 W/kg

SAR(1 g) = 8.25 W/kg; SAR(10 g) = 1.44 W/kg

Smallest distance from peaks to all points 3 dB below = 4 mm

Ratio of SAR at M2 to SAR at M1 = 52.8%

Maximum value of SAR (measured) = 30.5 W/kg

