RF TEST REPORT

Test item	:	Wireless Adapter Card
Model No.	:	DWAM82-DB
Order No.	:	1011-01170
Date of receipt	:	2010-11-04
Test duration	:	2010-11-29 ~ 2010-12-09
Date of issue	:	2010-12-15
Use of report	:	FCC Original Grant

Applicant : LG Electronics USA.
1000 Sylvan Avenue Englewood Cliffs, New Jersey, United States

Test laboratory : Digital EMC Co., Ltd.
683-3, Yubang-Dong, Cheoin-Gu, Yongin-Si, Kyunggi-Do, 449-080, Korea

Test specification	:	FCC Part 15.247 Subpart C
Test environment	:	See appended test report
Test result	:	☒ Pass ☐ Fail

Tested by:	Witnessed by:	Reviewed by:
Engineer D.C.Cha	N/A	Technical Director Harvey Sung

CONTENTS

1. Equipment information

1.1 Equipment description

FCC Equipment Class	Digital Transmission System (DTS)
Equipment type	Wireless Adapter Card
Equipment model name	DWAM82-DB
Equipment add model name	N/A
Equipment serial no.	Identical prototype
Frequency band	5736 ~ 5814 MHz Note
Modulation type	QPSK
Antenna type	Internal Type: PCB Antenna (Max. peak gain: 3 dBi)
Power Supply	DC 5 V AC-DC Adapter: AC 120V 60Hz

Note : This device supports this band only. This device does not support 2.4 GHz band.

1.2 Ancillary equipment

Equipment	Model No.	Serial No.	Manufacturer	Note
-	-	-	-	-
-	-	-	-	-

2. Information about test items

2.1 Test mode

This device was tested in continuous transmitting mode at maximum power.

Test Case 1	EUT
Test Case 2	-

2.2 Auxiliary equipment

Equipment	Model No.	Serial No.	Manufacturer	Note
Notebook	HP520	CND73824M9	HP	-
Jig Board	N/A	N/A	LG	-
-	-	-	-	-

2.3 Tested frequency

	TX Frequency (MHz)	RX Frequency (MHz)
Lowest Channel	5736	5736
Middle Channel	5762	5762
Highest Channel	5814	5814

2.4 Tested environment

Temperature	:	20 ~ 22 °C
Relative humidity content	:	38 ~ 55 % R.H.
Details of power supply	:	DC 5 V AC-DC Adapter: AC 120V 60Hz

2.5 EMI Suppression Device(s)/Modifications

EMI suppression device(s) added and/or modifications made during testing
→ None

3. Test Report

3.1 Summary of tests

FCC Part Section(s)	Parameter	Limit (Using in 5725 ~ 5850 MHz)	Test Condition	Status Note 1
I. Test Items				
15.247(a)	6 dB Bandwidth	> 500 kHz	Conducted	**C**
15.247(b)	Transmitter Output Power	< 1Watt		**C**
15.247(d)	Out of Band Emissions / Band Edge	20dBc in any 100kHz BW		**C**
15.247(e)	Transmitter Power Spectral Density	< 8dBm / 3kHz		**C**
15.205 15.209	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	<FCC 15.209 Limits	Radiated	**C** Note.2
15.207	AC Conducted Emissions	<FCC 15.207 Limits	AC Line Conducted	**C**
15.203	Antenna Requirements	FCC 15.203	-	**C**

Note 1: **C**=Comply **NC**=Not Comply **NT**=Not Tested **NA**=Not Applicable

Note 2: This test item was performed in each axis. and the worst case data were reported.

The sample was tested according to the following specification:
ANSI C-63.4-2003

3.2 Transmitter requirements

3.2.1 6 dB Bandwidth

- Procedure:

The bandwidth at 6 dB below the highest inband spectral density was measured with a spectrum analyzer connected to the antenna terminal at the highest, middle and the lowest available channels.
After the trace being stable, Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 6dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level.
The marker-delta reading at this point is the 6 dB bandwidth of the emission.

The spectrum analyzer is set to:
Center frequency = the highest, middle and the lowest Frequencies
Span = 50 MHz (Greater than EBW)
RBW = 100 kHz
VBW = ≥ RBW
Trace = max hold
Sweep = auto
Detector function = peak

- Measurement Data: Comply

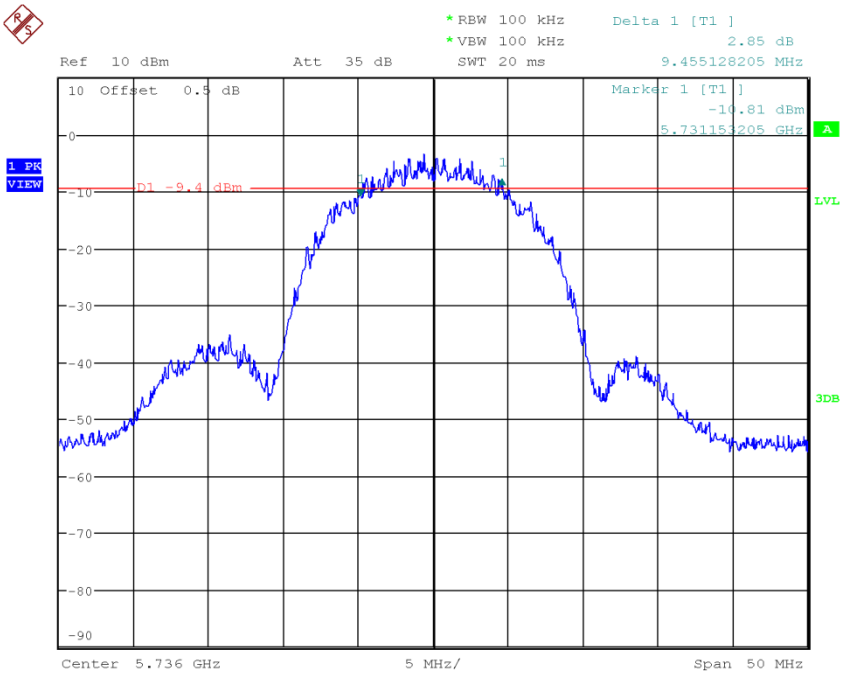
Test Mode	Frequency	Test Results (MHz)
Antenna A	Lowest	9.455
	Middle	9.856
	Highest	9.776
Antenna B	Lowest	9.535
	Middle	9.375
	Highest	9.455

Note 1: See next pages for actual measured spectrum plots.

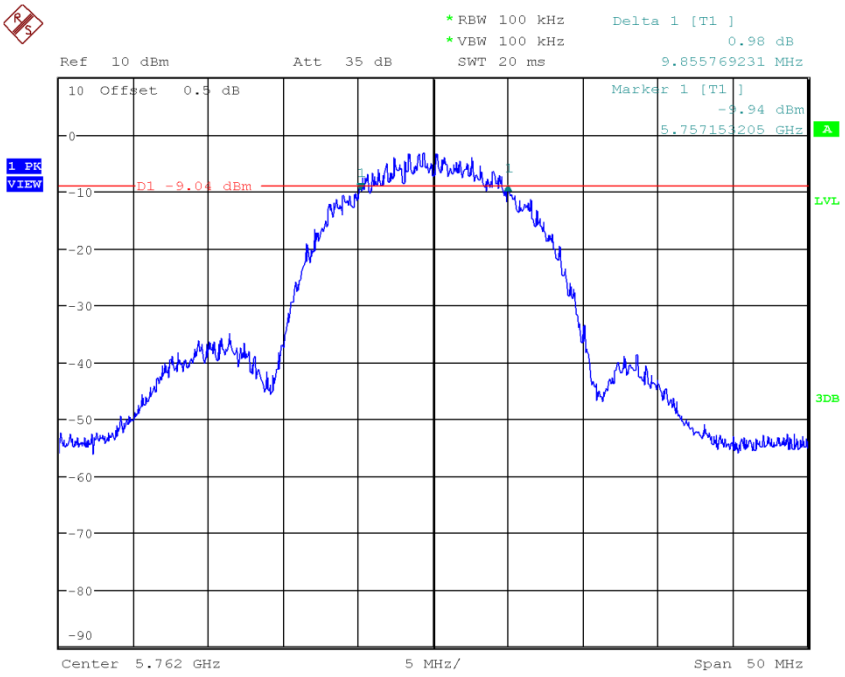
- **Minimum Standard:**

The minimum 6 dB bandwidth shall be at least 500 kHz

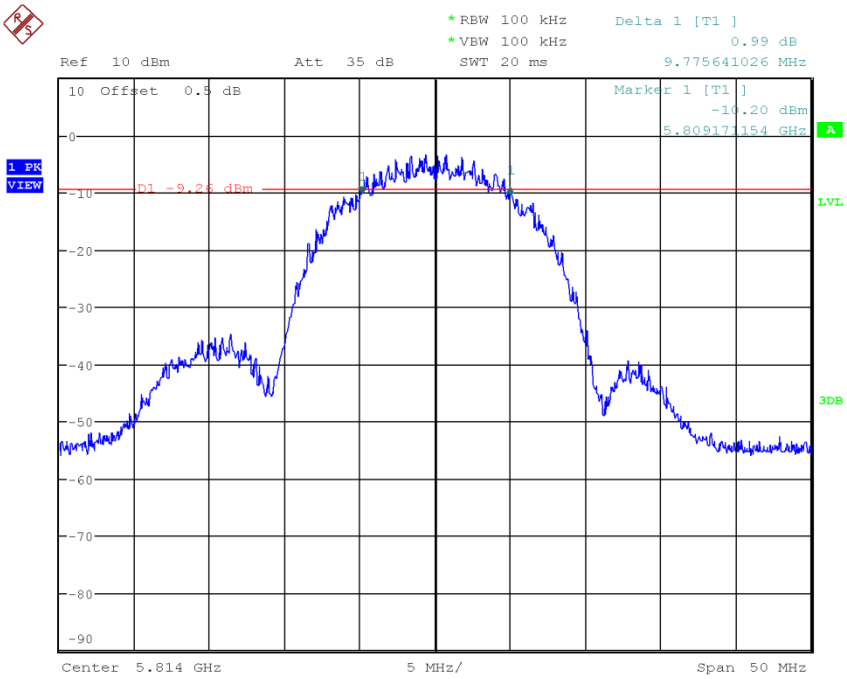
6 dB Bandwidth Test Mode: Antenna A & Lowest Frequency



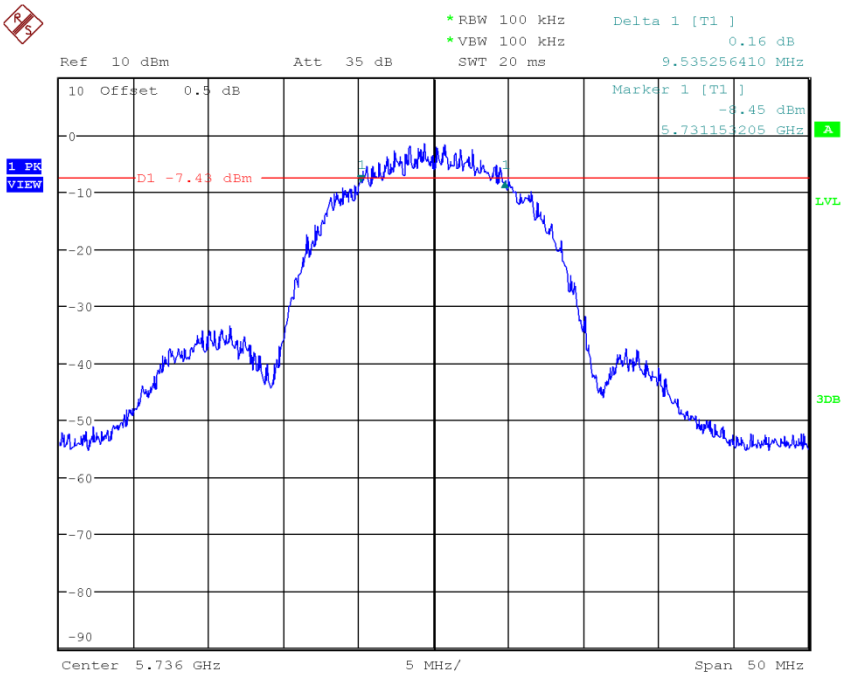
6 dB Bandwidth Test Mode: Antenna A & Middle Frequency



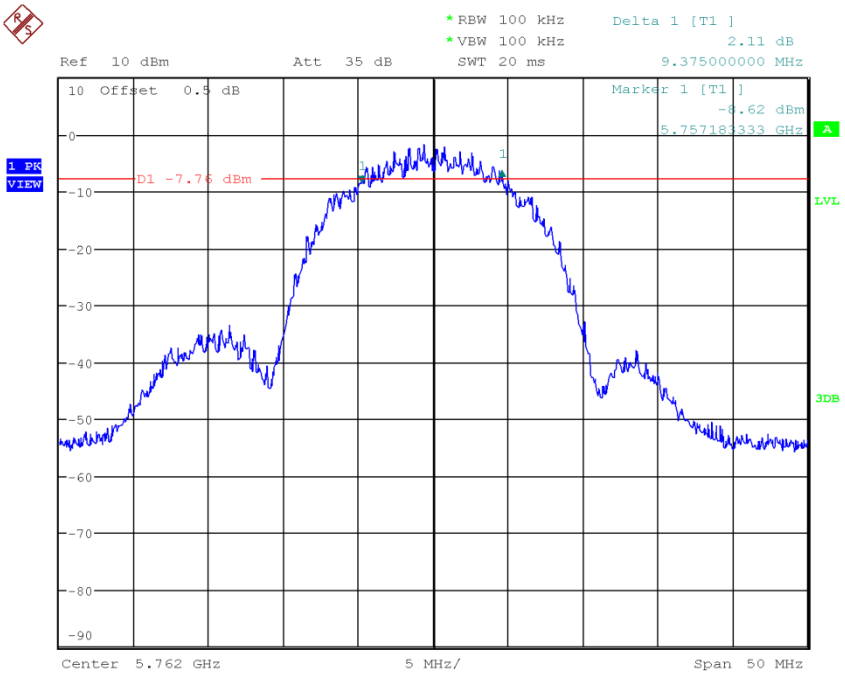
6 dB Bandwidth Test Mode: Antenna A & Highest Frequency



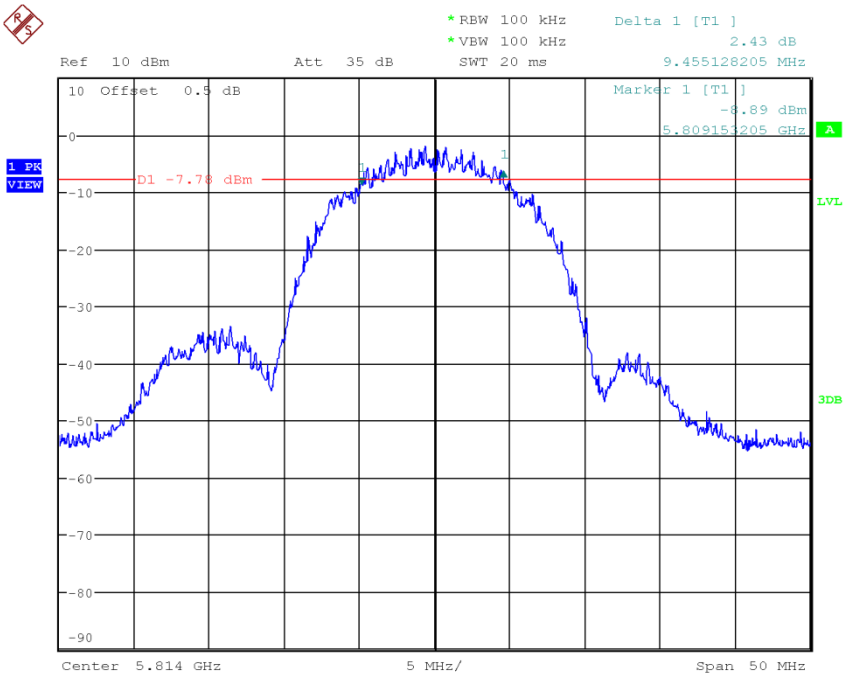
6 dB Bandwidth Test Mode: Antenna B & Lowest Frequency



6 dB Bandwidth Test Mode: Antenna B & Middle Frequency



6 dB Bandwidth Test Mode: Antenna B & Highest Frequency



3.2.2 Peak Output Power

- Test Procedure: Power Output Option 1
The Transmitter antenna terminal is connected to the input of a RF peak power sensor.

- **Measurement Data: Comply**

Test Mode	Frequency	Test Results	
		dBm	W
Antenna A	Lowest	7.207	0.0053
	Middle	**7.339**	**0.0054**
	Highest	7.125	0.0052
Antenna B	Lowest	7.830	0.0061
	Middle	7.300	0.0054
	Highest	**8.840**	**0.0077**

Minimum Standard:	< 1W

3.2.3 Out of Band Emissions / Band Edge

- Procedure:

The bandwidth at 20dB down from the highest inband spectral density is measured with a spectrum analyzer connected to the antenna terminal at the highest, middle and the lowest available channels.
After the trace being stable, Use the marker-to-peak function to measure 20 dB down both sides of the intentional emission.

For Band-edge testing the spectrum analyzer is set to:
Tested frequency = the highest and the lowest Frequencies
Center frequency = 5725 MHz, 5850 MHz
Span = 100MHz Detector function = peak
RBW = 1% of the span VBW = 100 kHz
Trace = max hold Sweep = auto

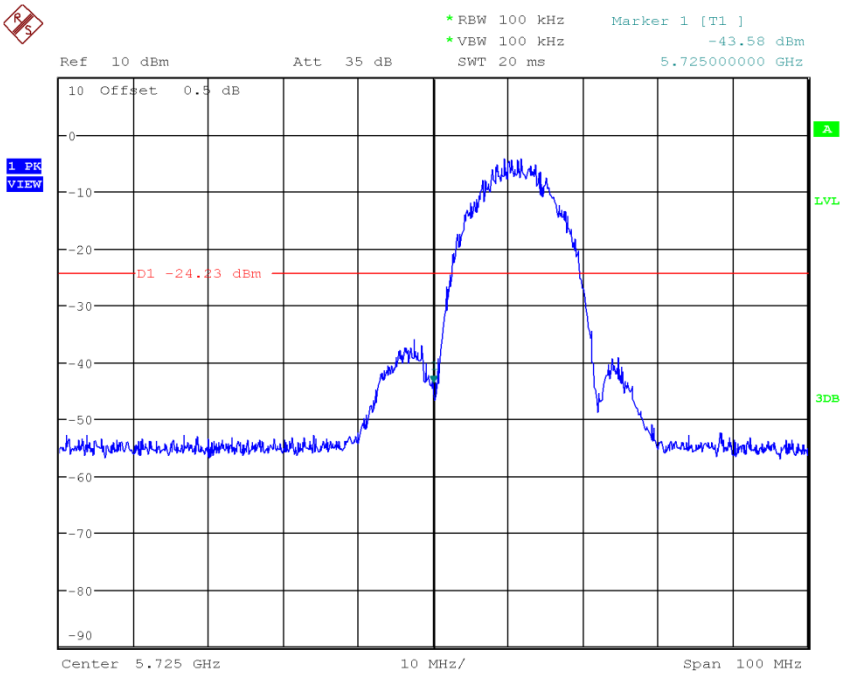
For spurious testing the spectrum analyzer is set to:
Tested frequency = the highest, middle and the lowest Frequencies
RBW = 100 kHz VBW = 100 kHz
Detector function = peak Sweep = auto
Trace = max hold

- Measurement Data: Comply

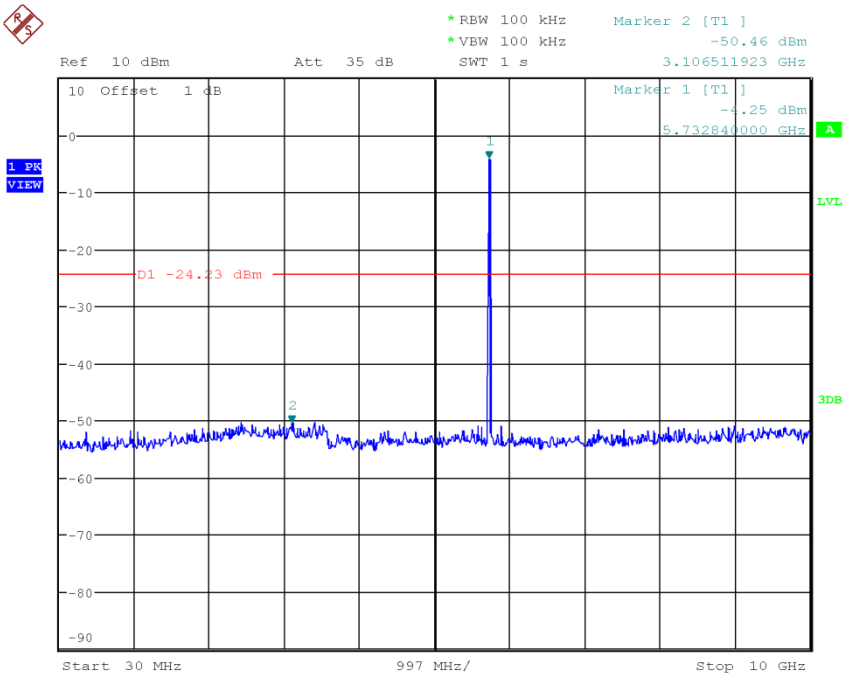
- All conducted emission in any 100 kHz bandwidth outside of the spread spectrum band was at least 30dB lower than the highest inband spectral density. Therefore the applying equipment meets the requirement.
  Note 1: See next pages for actual measured spectrum plots.

Minimum Standard:	> 20 dBc

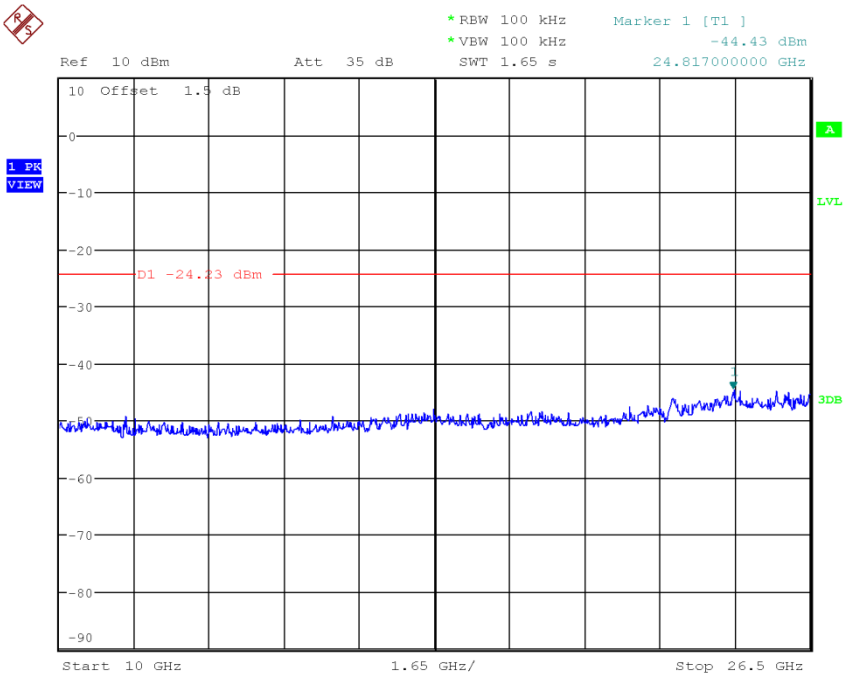
Low Band-edge at 20 dB blow Test Mode: Antenna A



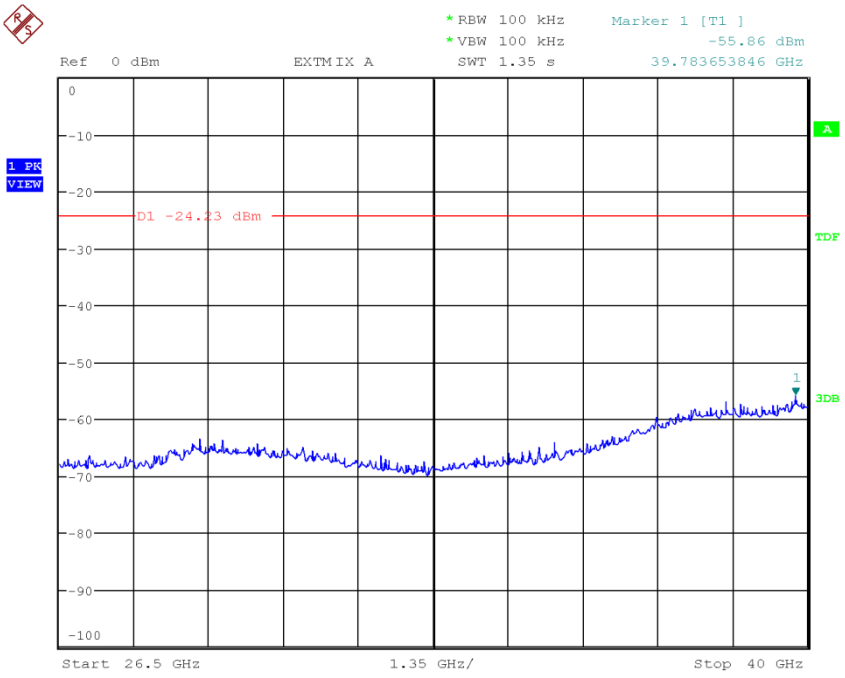
30MHz ~ 10GHz Conducted Spurious Emissions Test Mode: Antenna A & Lowest Frequency



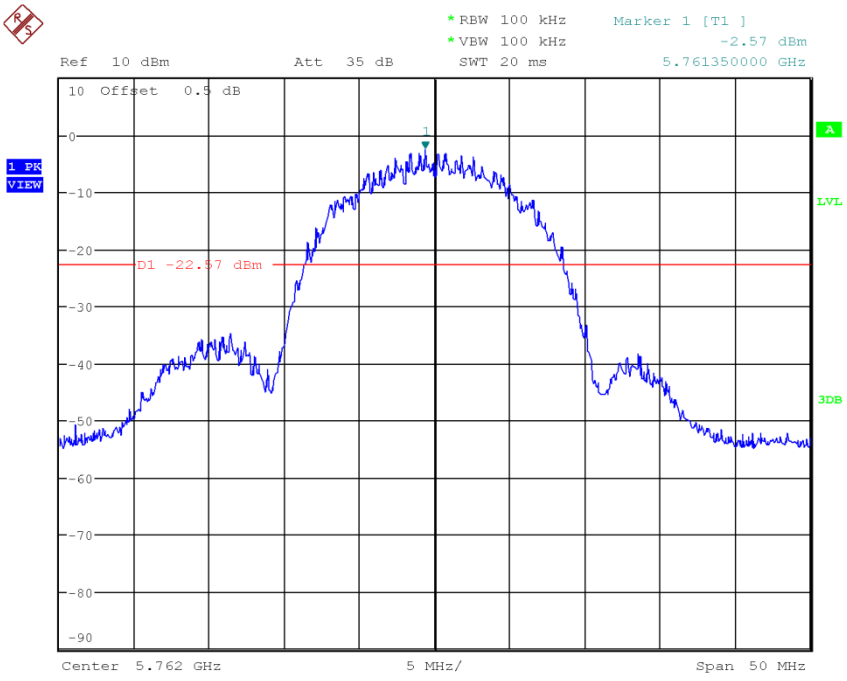
10GHz ~ 26.5GHz Conducted Spurious Emissions Test Mode: Antenna A & Lowest Frequency



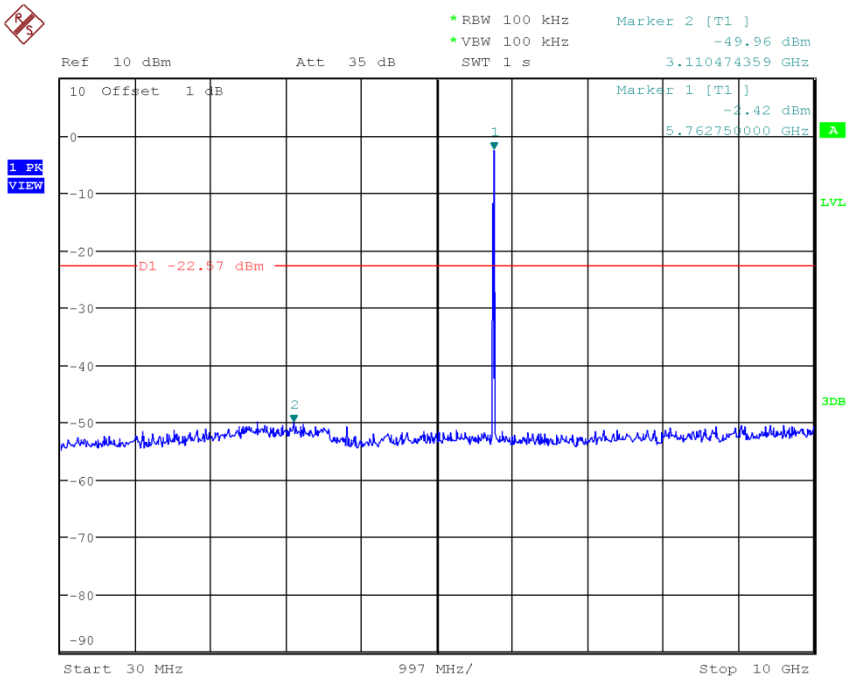
26.5GHz ~ 40GHz Conducted Spurious Emissions Test Mode: Antenna A & Lowest Frequency



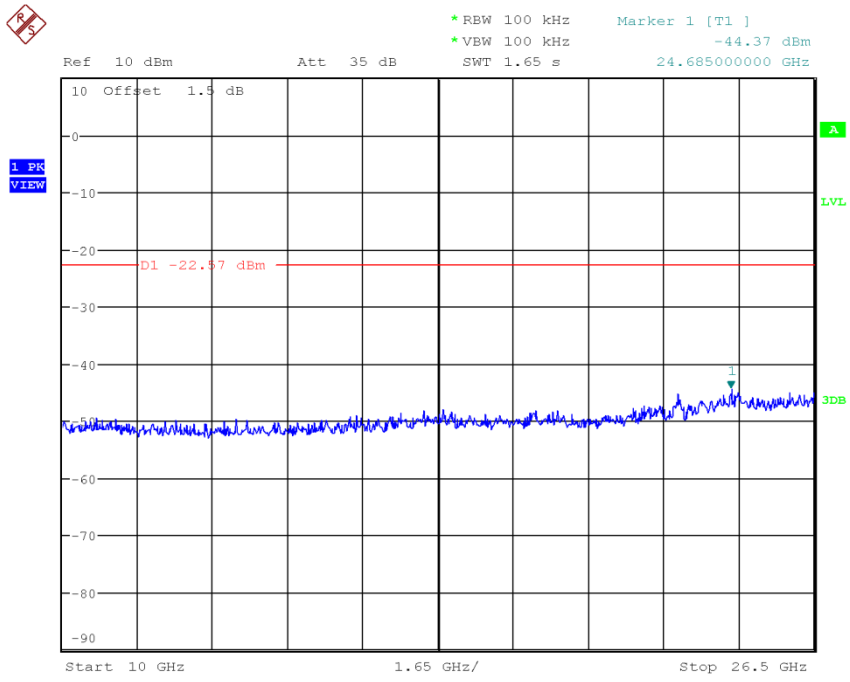
Reference for limit Test Mode: Antenna A & Middle Frequency



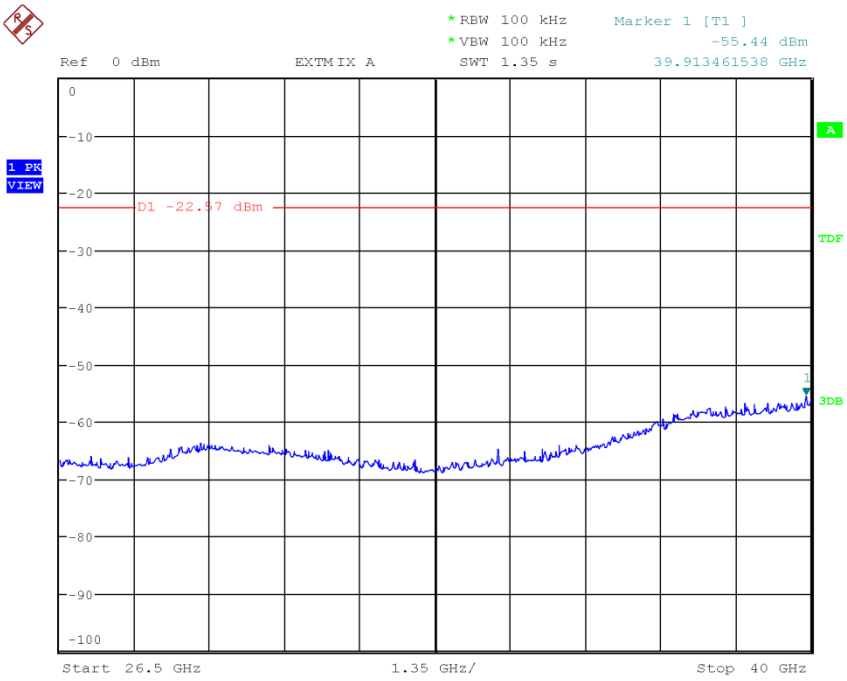
30MHz ~ 10GHz Conducted Spurious Emissions Test Mode: Antenna A & Middle Frequency



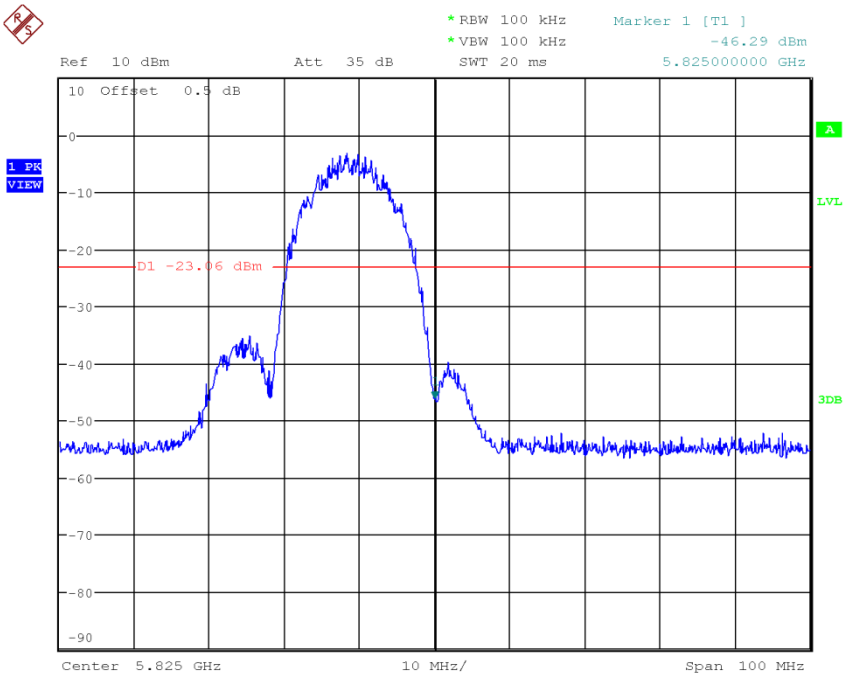
10GHz ~ 26.5GHz Conducted Spurious Emissions Test Mode: Antenna A & Middle Frequency



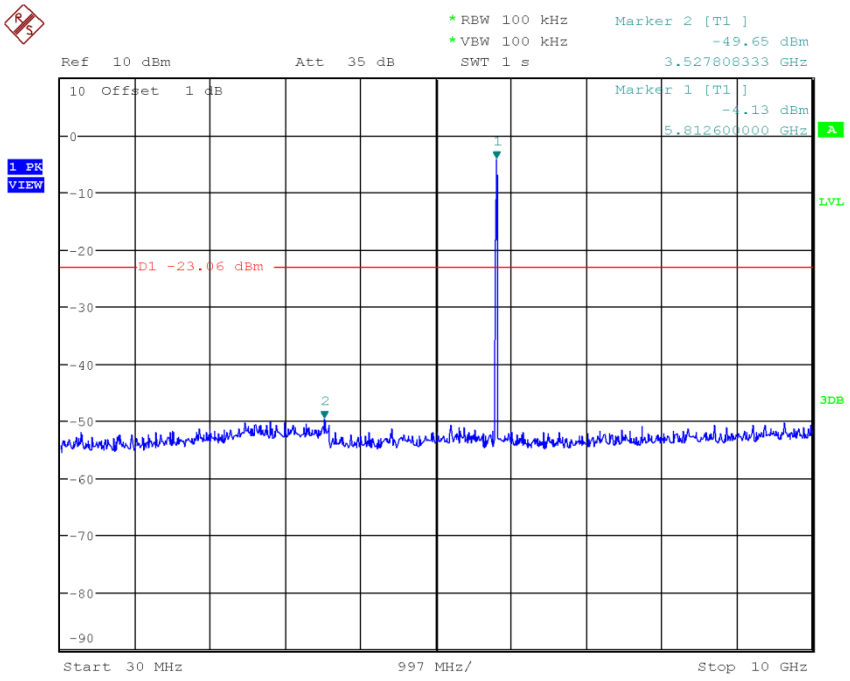
26.5GHz ~ 40GHz Conducted Spurious Emissions Test Mode: Antenna A & Middle Frequency



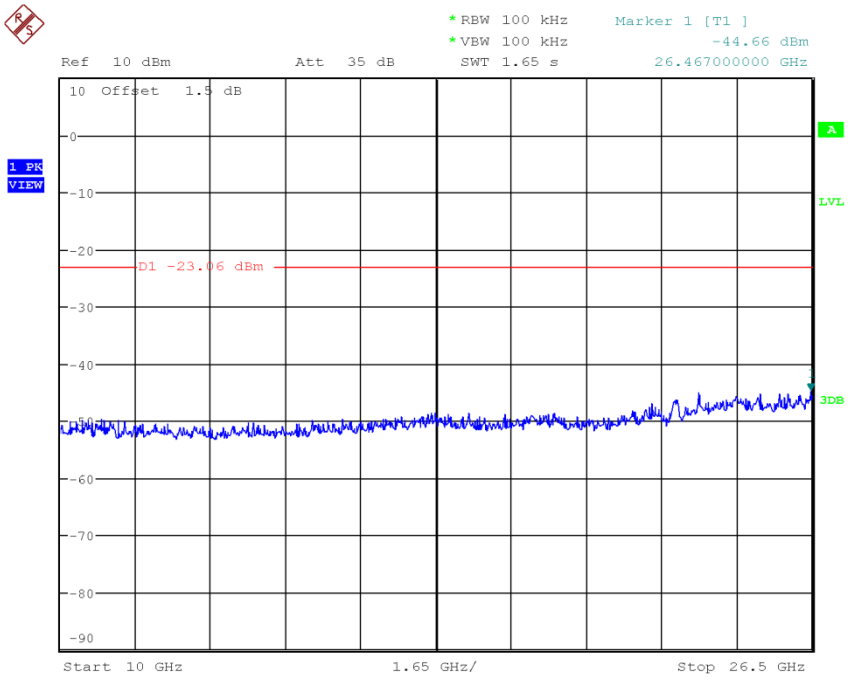
High Band-edge at 20 dB blow Test Mode: Antenna A & Highest Frequency



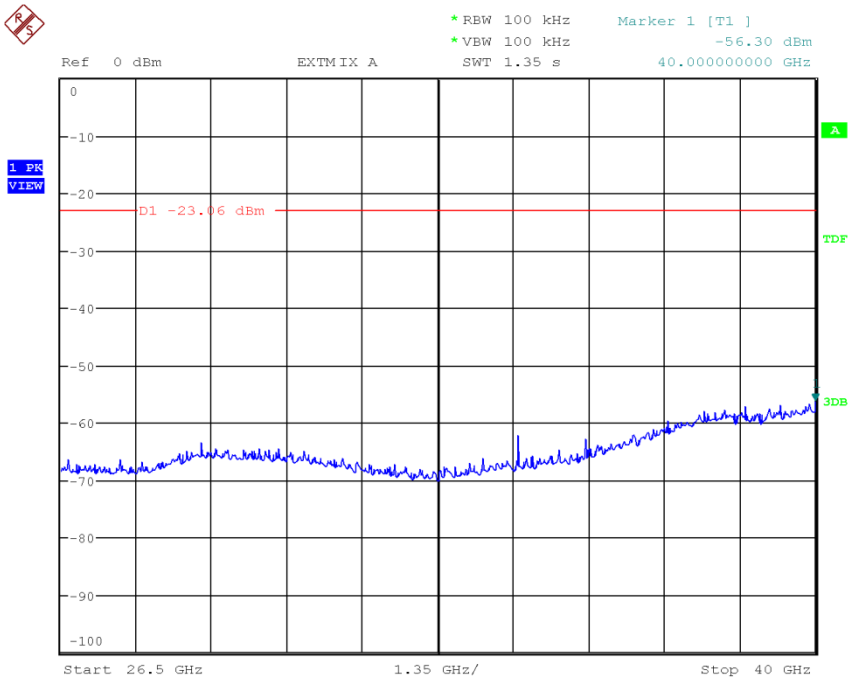
30MHz ~ 10GHz Conducted Spurious Emissions Test Mode: Antenna A & Highest Frequency



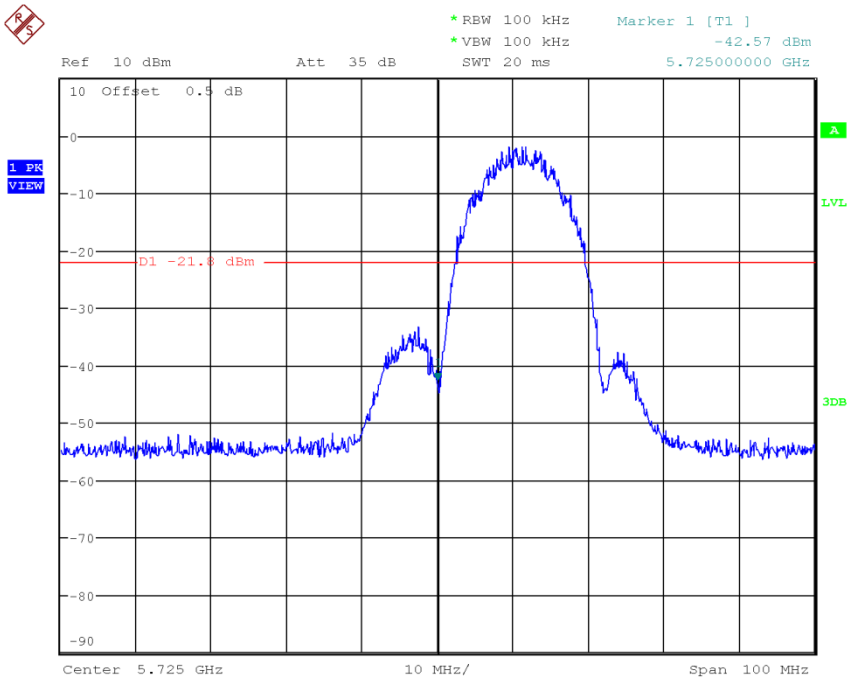
10GHz ~ 26.5GHz Conducted Spurious Emissions Test Mode: Antenna A & Highest Frequency



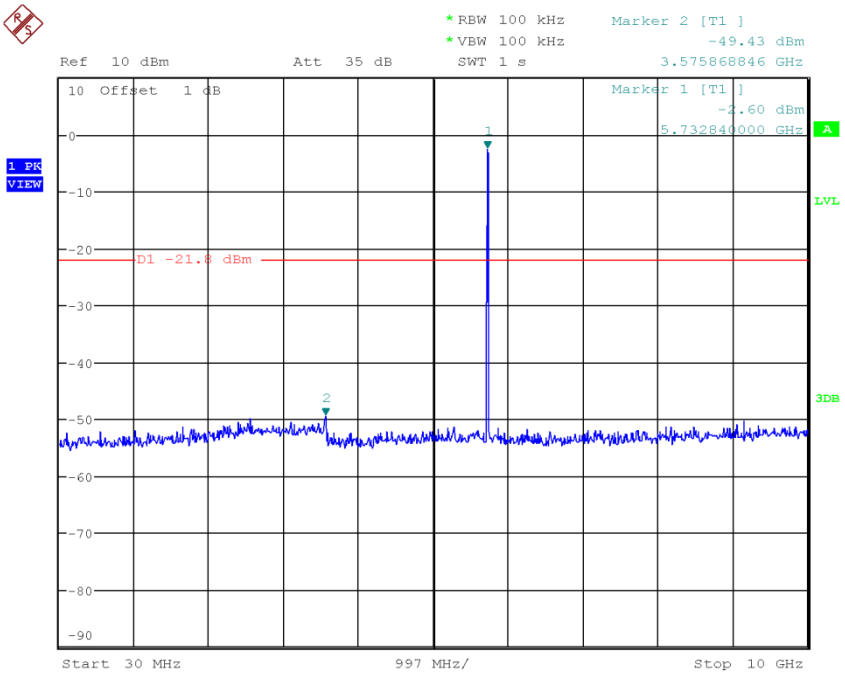
26.5GHz ~ 40GHz Conducted Spurious Emissions Test Mode: Antenna A & Highest Frequency



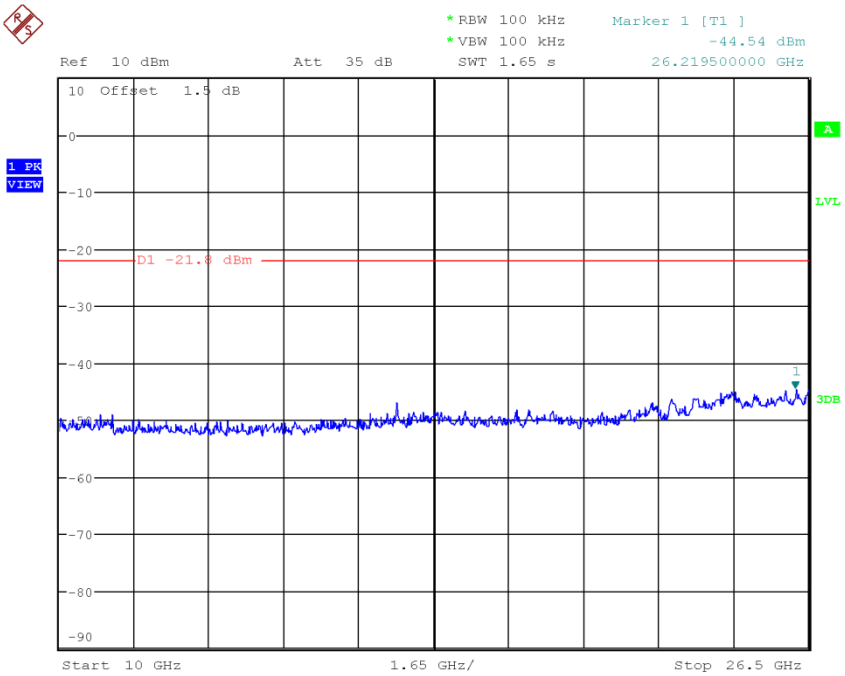
Low Band-edge at 20 dB blow Test Mode: Antenna B



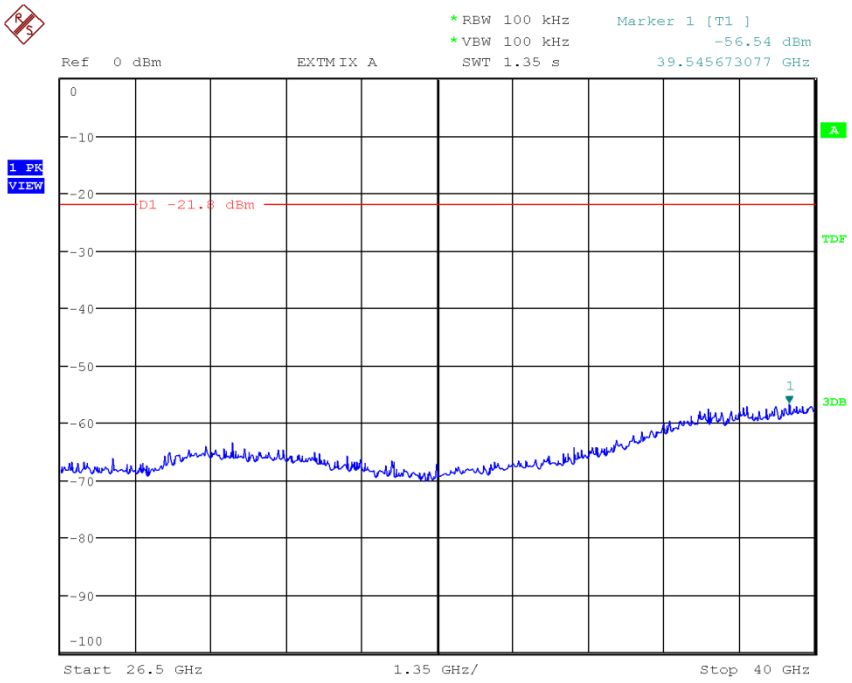
30MHz ~ 10GHz Conducted Spurious Emissions Test Mode: Antenna B & Lowest Frequency



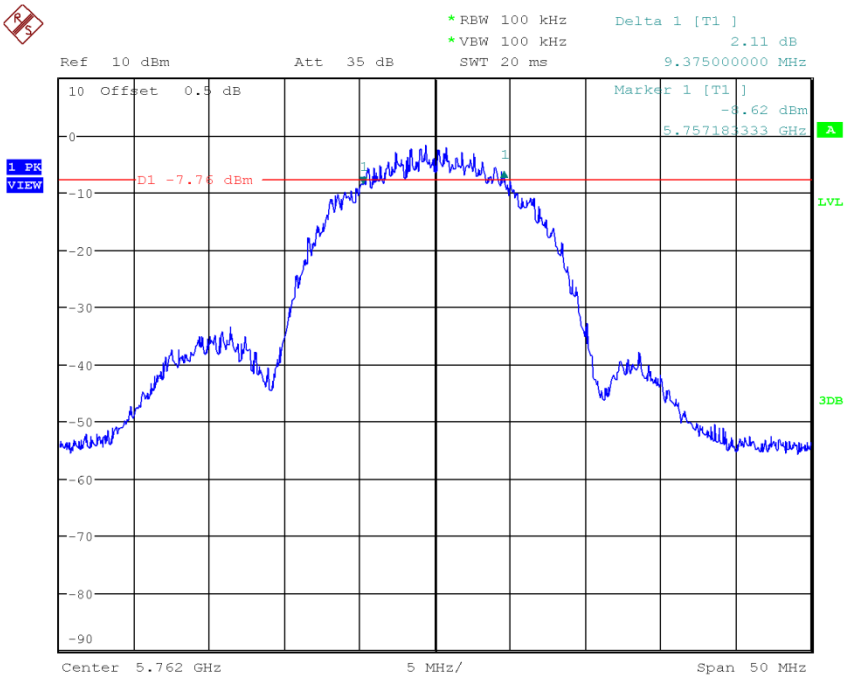
10GHz ~ 26.5GHz Conducted Spurious Emissions Test Mode: Antenna B & Lowest Frequency



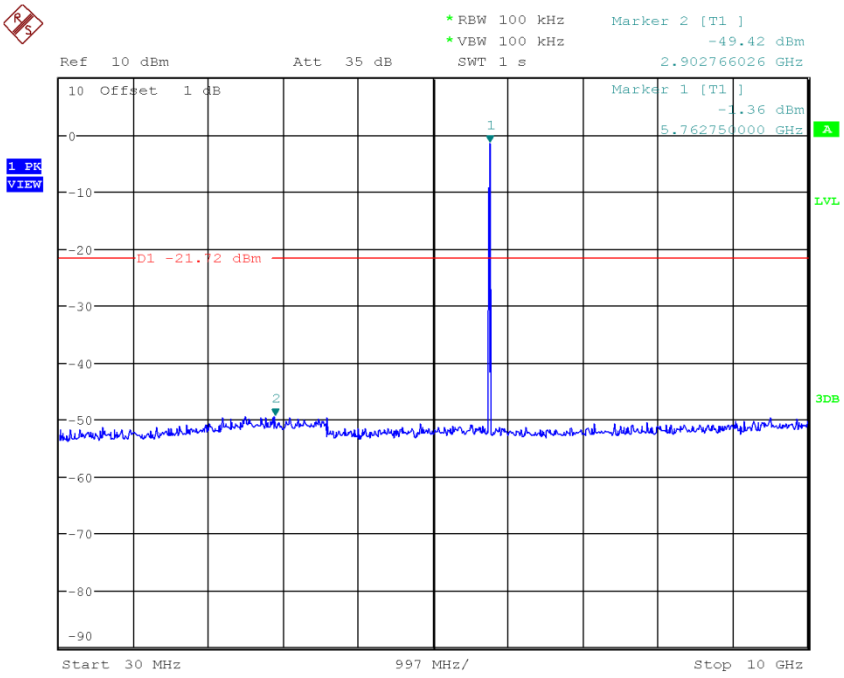
26.5GHz ~ 40GHz Conducted Spurious Emissions Test Mode: Antenna B & Lowest Frequency



Reference for limit Test Mode: Antenna B & Middle Frequency



30MHz ~ 10GHz Conducted Spurious Emissions Test Mode: Antenna B & Middle Frequency



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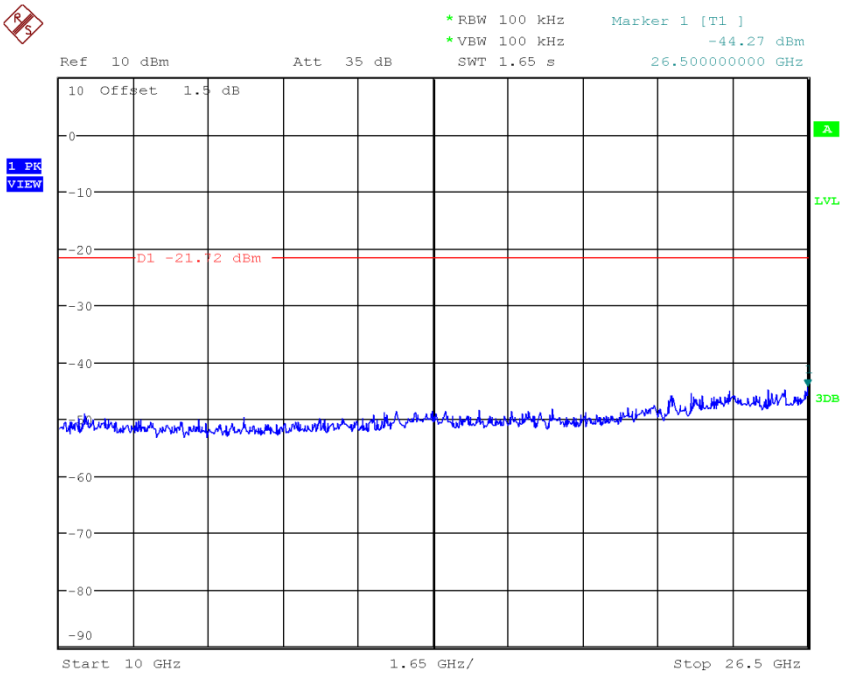
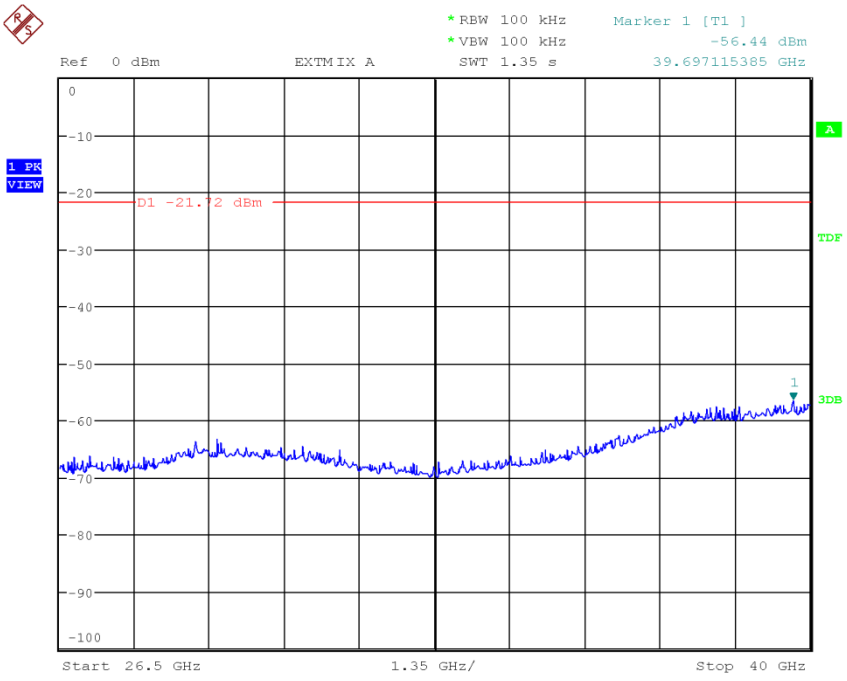
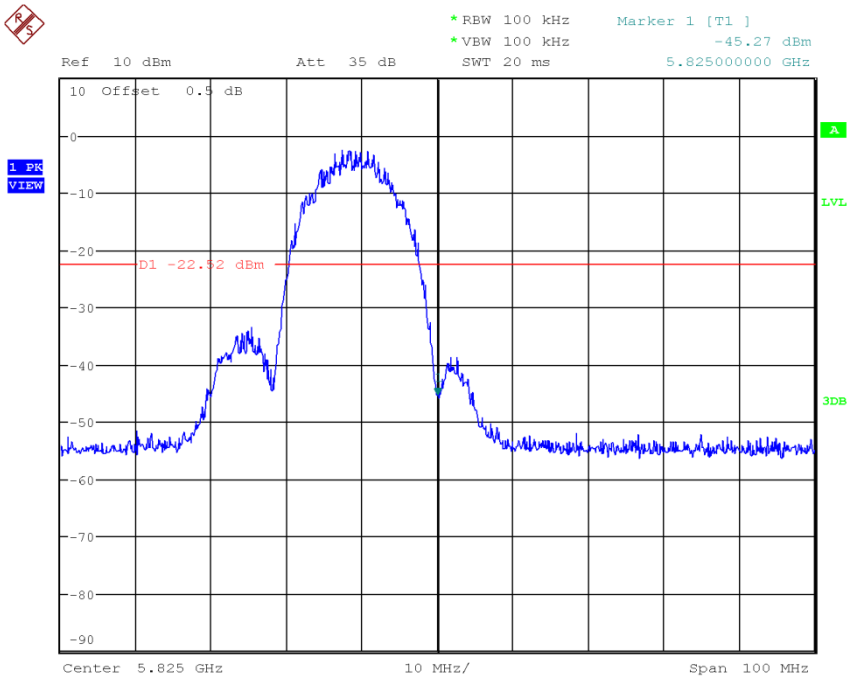
10GHz ~ 26.5GHz Conducted Spurious Emissions Test Mode: Antenna B & Middle Frequency



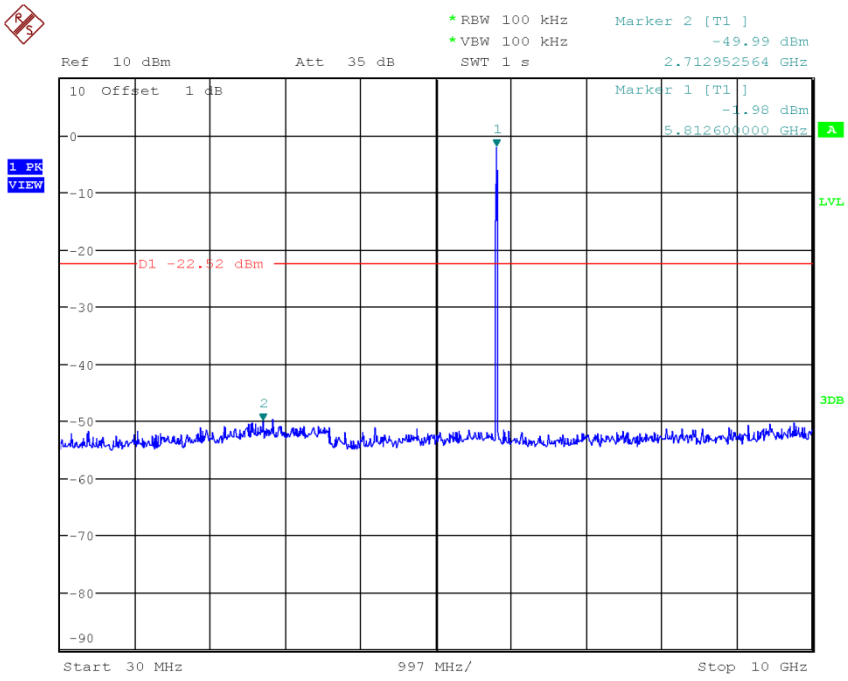
26.5GHz ~ 40GHz Conducted Spurious Emissions Test Mode: Antenna B & Middle Frequency



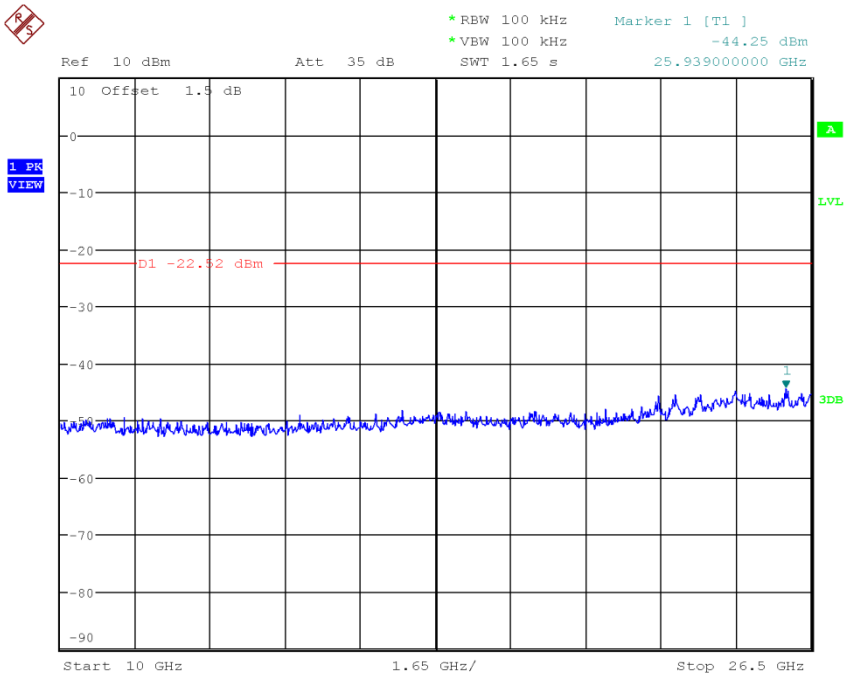
High Band-edge at 20 dB blow Test Mode: Antenna B & Highest Frequency



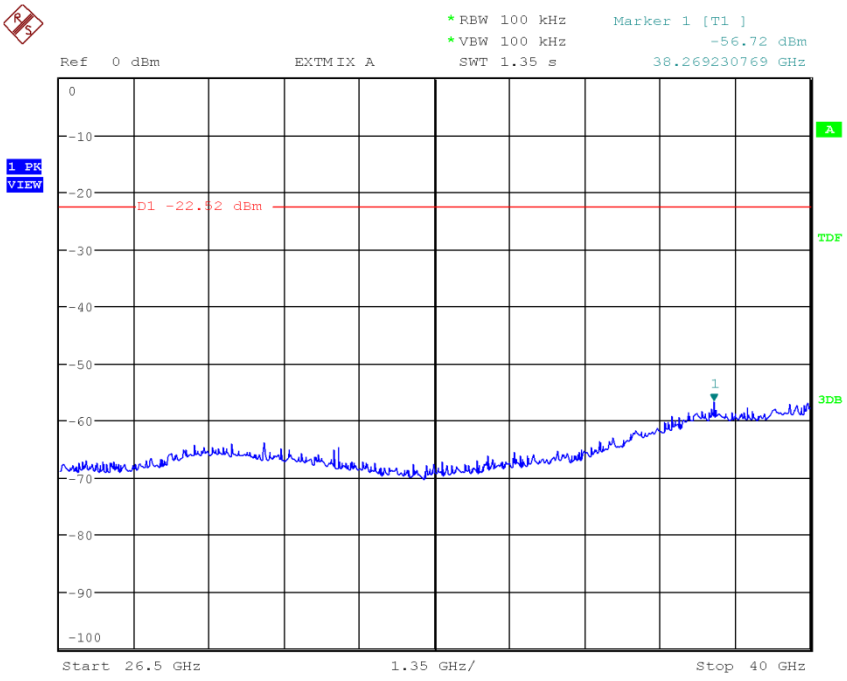
30MHz ~ 10GHz Conducted Spurious Emissions Test Mode: Antenna B & Highest Frequency



10GHz ~ 26.5GHz Conducted Spurious Emissions Test Mode: Antenna B & Highest Frequency



26.5GHz ~ 40GHz Conducted Spurious Emissions Test Mode: Antenna B & Highest Frequency



3.2.4 Out of band Emission – Radiated

- Procedure:

The EUT was placed on a 0.8m high wooden table inside a shielded enclosure. An antenna was placed near the EUT and measurements of frequencies and amplitudes of field strengths were recorded for reference during final measurements. For final radiated testing, measurements were performed in OATS. Measurements were performed with the EUT oriented in 3 orthogonal axis and rotated 360 degrees to determine worst-case orientation for maximum emissions.

The spectrum analyzer is set to:
Tested frequency = Low, Middle, High Frequencies
Frequency Range = 30 MHz ~ 10th harmonic.
RBW and VBW = 1. Frequency range: 30MHz ~ 1GHz
RBW = 120KHz / VBW = ≥ RBW
2. Frequency range: 1GHz ~ 10th harmonics
Peak mode: RBW = 1MHz / VBW = ≥ RBW
Average mode: RBW = 1MHz / VBW = 10Hz
Detector function = Peak Sweep = auto
Trace = max hold

- Measurement Data: Comply

Note 1: See next pages for actual measured spectrum plots and data.

- Minimum Standard:

▪ FCC Part 15.209(a) and (b)

Frequency (MHz)	Limit (uV/m) @ 3m
30 ~ 88	100 **
88 ~ 216	150 **
216 ~ 960	200 **
Above 960	500

** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88MHz, 174-216MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

▪ FCC Part 15.205 (a): Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	MHz	GHz	GHz
0.009 ~ 0.110	8.41425 ~ 8.41475	108 ~ 121.94	1300 ~ 1427	3600 ~ 4400	14.47 ~ 14.5
0.495 ~ 0.505	12.29 ~ 12.293	123 ~ 138	1435 ~ 1626.5	4.5 ~ 5.15	15.35 ~ 16.2
2.1735 ~ 2.1905	12.51975 ~	149.9 ~ 150.05	1645.5 ~ 1646.5	5.35 ~ 5.46	17.7 ~ 21.4
4.125 ~ 4.128	12.52025	156.52475 ~	1660 ~ 1710	7.25 ~ 7.75	22.01 ~ 23.12
4.17725 ~ 4.17775	12.57675 ~	156.52525	1718.8 ~ 1722.2	8.025 ~ 8.5	23.6 ~ 24.0
4.20725 ~ 4.20775	12.57725	156.7 ~ 156.9	2200 ~ 2300	9.0 ~ 9.2	31.2 ~ 31.8
6.215 ~ 6.218	13.36 ~ 13.41	162.0125 ~ 167.17	2310 ~ 2390	9.3 ~ 9.5	36.43 ~ 36.5
6.26775 ~ 6.26825	16.42 ~ 16.423	167.72 ~ 173.2	2483.5 ~ 2500	10.6 ~ 12.7	Above 38.6
6.31175 ~ 6.31225	16.69475 ~	240 ~ 285	2655 ~ 2900	13.25 ~ 13.4	
8.291 ~ 8.294	16.69525	322 ~ 335.4	3260 ~ 3267		
8.362 ~ 8.366	16.80425 ~	399.90 ~ 410	3332 ~ 3339		
8.37625 ~ 8.38675	16.80475	608 ~ 614	3345.8 ~ 3358		
	25.5 ~ 25.67	960 ~ 1240			
	37.5 ~ 38.25				
	73 ~ 74.6				
	74.8 ~ 75.2				

▪ FCC Part 15.205(b): The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

30MHz ~ 1GHz Radiated Spurious Emissions & Antenna A

▪ Lowest Channel

Frequency (MHz)	ANT Pol	The worst case EUT Position	Reading(dBuV)	T.F (dB/m)	Result(dBuV/m)	Limit(dBuV/m)	Margin(dB)
			QP		QP	QP	QP
285.560	H	X axis	46.47	-4.27	42.20	46.00	3.80
-	-	-	-	-	-	-	-

▪ Middle Channel

Frequency (MHz)	ANT Pol	The worst case EUT Position	Reading(dBuV)	T.F (dB/m)	Result(dBuV/m)	Limit(dBuV/m)	Margin(dB)
			QP		QP	QP	QP
214.614	H	Y axis	46.67	-7.12	39.55	43.50	3.95
-	-	-	-	-	-	-	-

▪ Highest Channel

Frequency (MHz)	ANT Pol	The worst case EUT Position	Reading(dBuV)	T.F (dB/m)	Result(dBuV/m)	Limit(dBuV/m)	Margin(dB)
			QP		QP	QP	QP
285.623	H	Z axis	45.62	-4.27	41.35	46.00	4.65
-	-	-	-	-	-	-	-

Note.

1. No other spurious and harmonic emissions were detected at a level greater than 10dB below limit.
2. Above listed point data is the worst case data.
3. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

30MHz ~ 1GHz Radiated Spurious Emissions & Antenna B

▪ Lowest Channel

Frequency (MHz)	ANT Pol	The worst case EUT Position	Reading(dBuV)	T.F (dB/m)	Result(dBuV/m)	Limit(dBuV/m)	Margin(dB)
			QP		QP	QP	QP
214.671	H	Y axis	47.15	-7.12	40.03	43.50	3.47
-	-	-	-	-	-	-	-

▪ Middle Channel

Frequency (MHz)	ANT Pol	The worst case EUT Position	Reading(dBuV)	T.F (dB/m)	Result(dBuV/m)	Limit(dBuV/m)	Margin(dB)
			QP		QP	QP	QP
286.542	H	Z axis	46.50	-4.22	42.28	46.00	3.72
-	-	-	-	-	-	-	-

▪ Highest Channel

Frequency (MHz)	ANT Pol	The worst case EUT Position	Reading(dBuV)	T.F (dB/m)	Result(dBuV/m)	Limit(dBuV/m)	Margin(dB)
			QP		QP	QP	QP
214.667	H	Y axis	47.61	-7.12	40.49	43.50	3.01
-	-	-	-	-	-	-	-

Note.

1. No other spurious and harmonic emissions were detected at a level greater than 10dB below limit.
2. Above listed point data is the worst case data.
3. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

1GHz ~ 40GHz Radiated Spurious Emissions & Antenna A

▪ Lowest Frequency

Frequency (GHz)	ANT Pol	The worst case EUT Position	Reading(dBuV)		T.F (dB/m)	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
			PK	AV		PK	AV	PK	AV	PK	AV
11.472	H	Y axis	43.92	29.53	16.99	60.91	46.52	74.00	54.00	13.09	7.48
11.472	V	Y axis	43.56	29.49	16.99	60.55	46.48	74.00	54.00	13.45	7.52
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

▪ Middle Channel

Frequency (GHz)	ANT Pol	The worst case EUT Position	Reading(dBuV)		T.F (dB/m)	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
			PK	AV		PK	AV	PK	AV	PK	AV
11.523	H	X axis	44.05	29.53	16.94	60.99	46.47	74.00	54.00	13.01	7.53
11.523	V	X axis	43.64	29.32	16.94	60.58	46.26	74.00	54.00	13.42	7.74
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

▪ Highest Channel

Frequency (GHz)	ANT Pol	The worst case EUT Position	Reading(dBuV)		T.F (dB/m)	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
			PK	AV		PK	AV	PK	AV	PK	AV
11.628	H	Z axis	43.52	29.08	17.07	60.59	46.15	74.00	54.00	13.41	7.85
11.629	V	X axis	43.59	29.21	17.07	60.66	46.28	74.00	54.00	13.34	7.72
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

Note.

1. No other spurious and harmonic emissions were detected greater than listed emissions above table
2. Above listed point data is the worst case data.
3. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

1GHz ~ 40GHz Radiated Spurious Emissions & Antenna B

▪ Lowest Frequency

Frequency (GHz)	ANT Pol	The worst case EUT Position	Reading(dBuV)		T.F (dB/m)	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
			PK	AV		PK	AV	PK	AV	PK	AV
11.474	H	Z axis	43.90	29.86	16.99	60.89	46.85	74.00	54.00	13.11	7.15
11.473	V	X axis	43.85	29.79	16.99	60.84	46.78	74.00	54.00	13.16	7.22
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

▪ Middle Channel

Frequency (GHz)	ANT Pol	The worst case EUT Position	Reading(dBuV)		T.F (dB/m)	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
			PK	AV		PK	AV	PK	AV	PK	AV
11.520	H	X axis	44.68	29.93	16.94	61.62	46.87	74.00	54.00	12.38	7.13
11.525	V	Z axis	44.67	29.73	16.94	61.61	46.67	74.00	54.00	12.39	7.33
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

▪ Highest Channel

Frequency (GHz)	ANT Pol	The worst case EUT Position	Reading(dBuV)		T.F (dB/m)	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
			PK	AV		PK	AV	PK	AV	PK	AV
11.628	H	X axis	44.26	29.74	17.07	61.33	46.81	74.00	54.00	12.67	7.19
11.626	V	X axis	44.35	29.75	17.07	61.42	46.82	74.00	54.00	12.58	7.18
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

Note.

1. No other spurious and harmonic emissions were detected greater than listed emissions above table
2. Above listed point data is the worst case data.
3. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

3.2.5 Transmitter Power Spectral Density

- Procedure:

The transmitter output is connected to a spectrum analyzer. Locate and zoom in on emission peak within the passband. The maximum level in a 3 kHz bandwidth is measured with the spectrum analyzer using RBW = 3 kHz and VBW > RBW, sweep time= (Span/3 KHz).
The transmitter output power was measured with power output option #1.

The spectrum analyzer is set to:
Center frequency = the highest, middle and the lowest Frequencies
Span = 300 KHz
RBW = 3 KHz
VBW = ≥ RBW
Trace = max hold
Detector function = peak
Sweep = 100 S

- Measurement Data: Comply

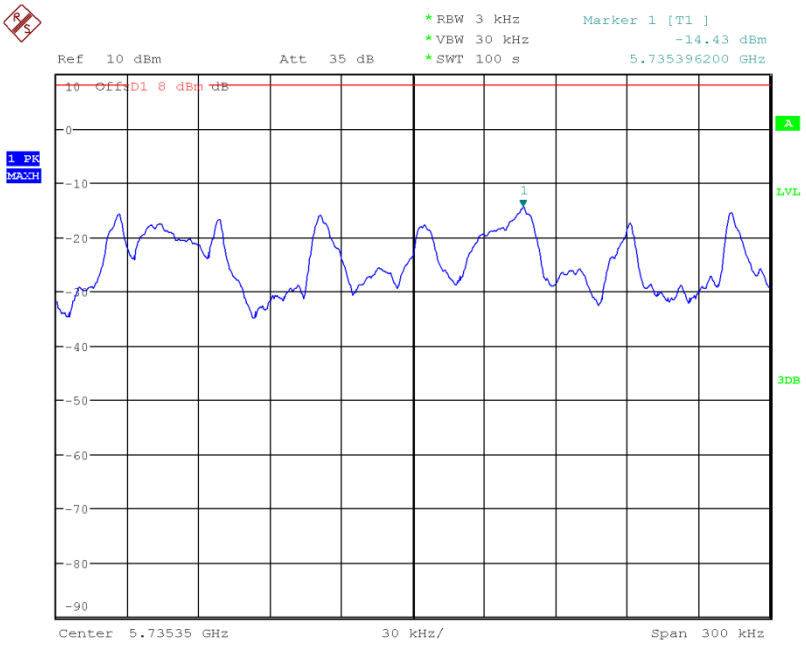
Test Mode	Frequency	Test Results (dBm)
Antenna A	Lowest	-14.43
	Middle	-13.48
	Highest	-13.44
Antenna B	Lowest	-12.54
	Middle	-12.93
	Highest	-11.35

Note 1: See next pages for actual measured spectrum plots.

- Minimum Standard:

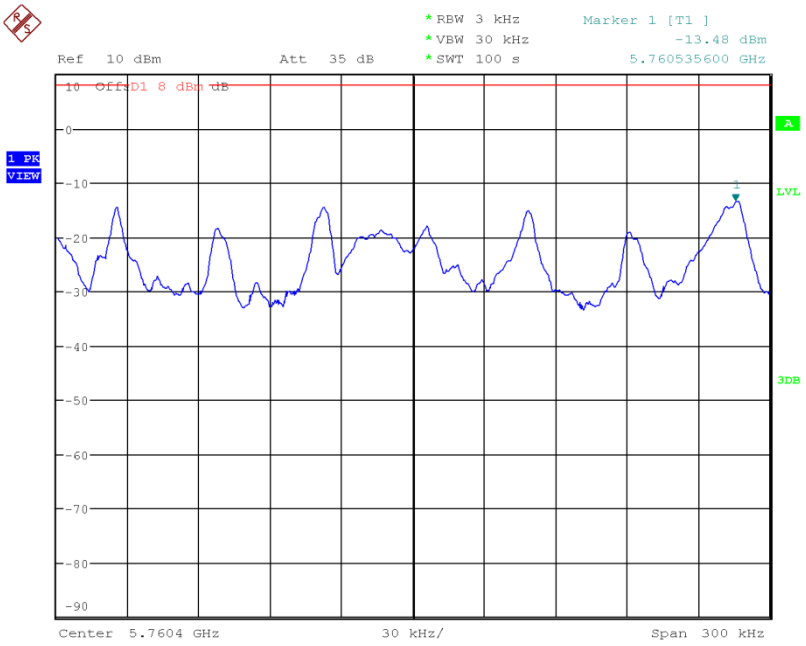
The transmitter power density average over 1-second interval shall not be greater than 8 dBm in any 3kHz BW.

Transmitter Power Spectral Density Test Mode: Antenna A & Lowest Frequency



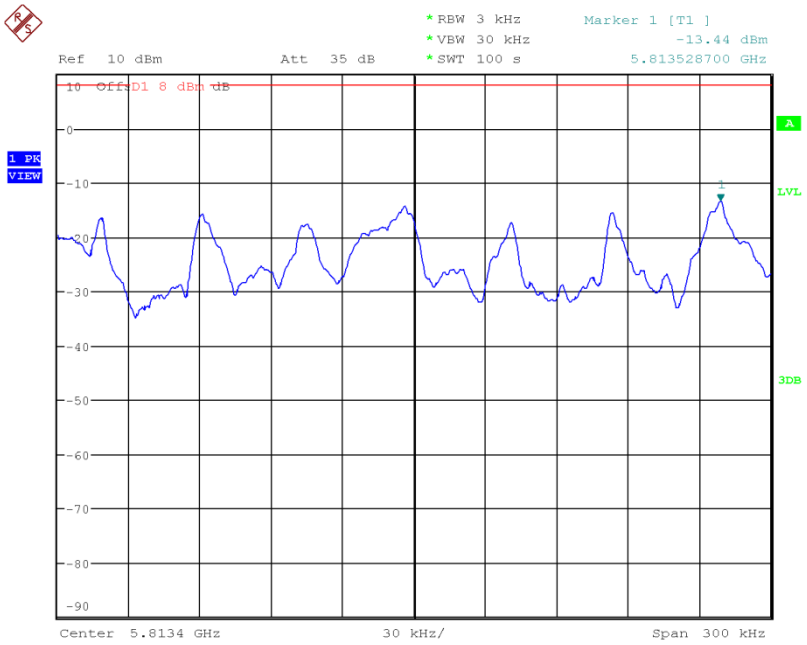
Date: 6.DEC.2010 15:11:14

Transmitter Power Spectral Density Test Mode: Antenna A & Middle Frequency

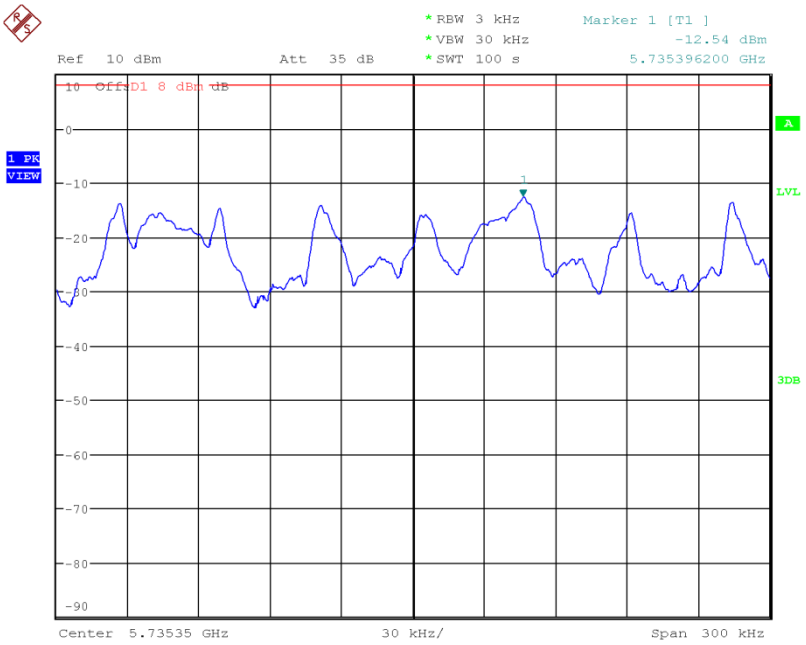


Date: 6.DEC.2010 15:15:59

Transmitter Power Spectral Density Test Mode: Antenna A & Highest Frequency

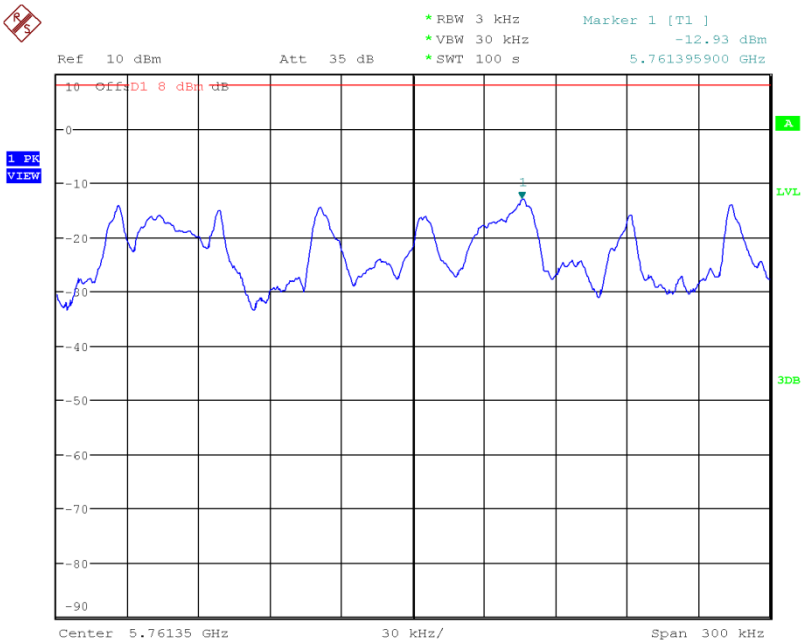


Transmitter Power Spectral Density Test Mode: Antenna B & Lowest Frequency



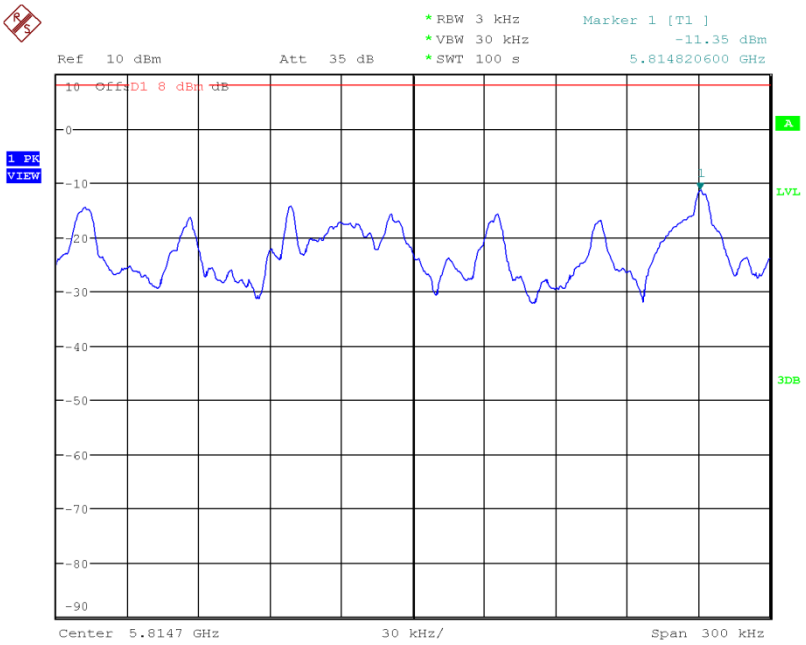
Date: 6.DEC.2010 16:17:30

Transmitter Power Spectral Density Test Mode: Antenna B & Middle Frequency



Date: 6.DEC.2010 16:20:22

Transmitter Power Spectral Density Test Mode: Antenna B & Highest Frequency



Date: 6.DEC.2010 16:37:05

3.2.6 AC Conducted Emissions

- Procedure:

The conducted emissions are measured in the shielded room with a spectrum analyzer in peak hold. Emissions closest to the limit are measured in the quasi-peak mode (QP) and average mode (AV) with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation and Exerciser operation. The highest emissions relative to the limit are listed.

- Measurement Data: Comply

Note 1: See next pages for actual measured spectrum plots and data.

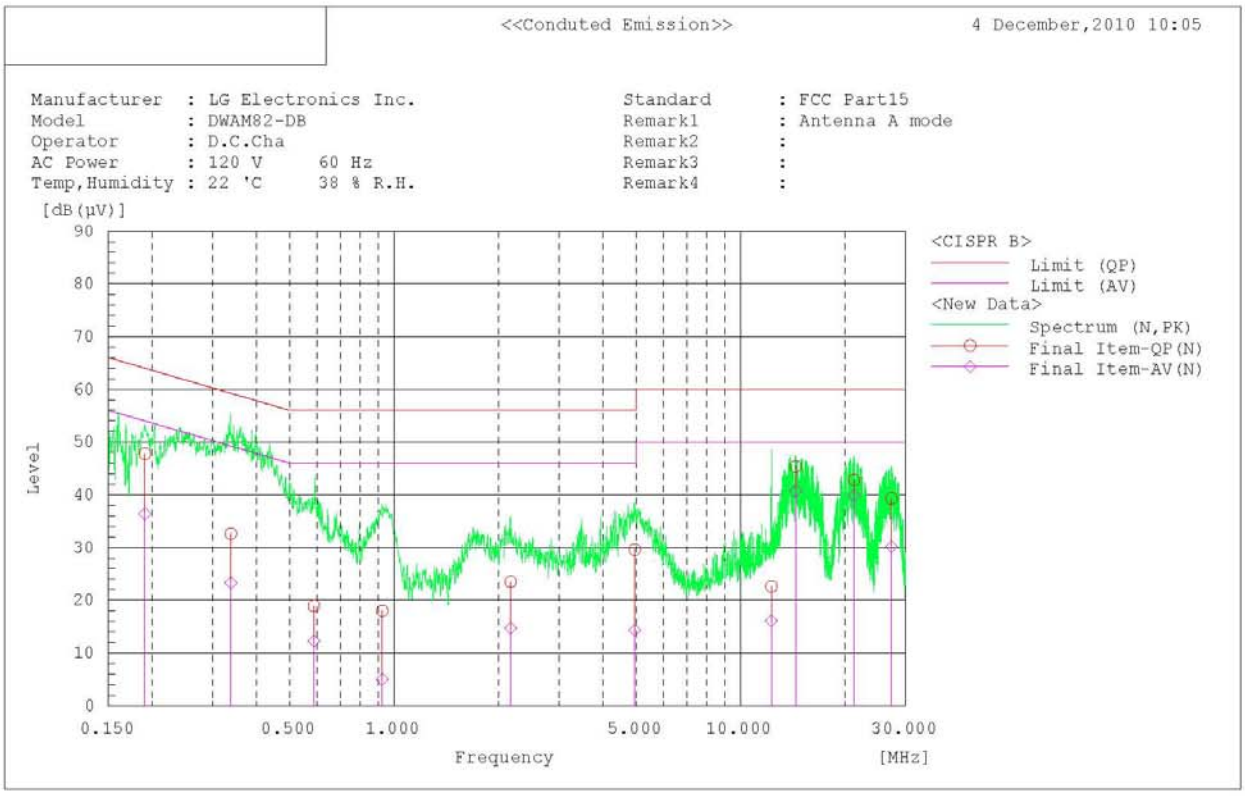
- Minimum Standard: FCC Part 15.207(a)/EN 55022

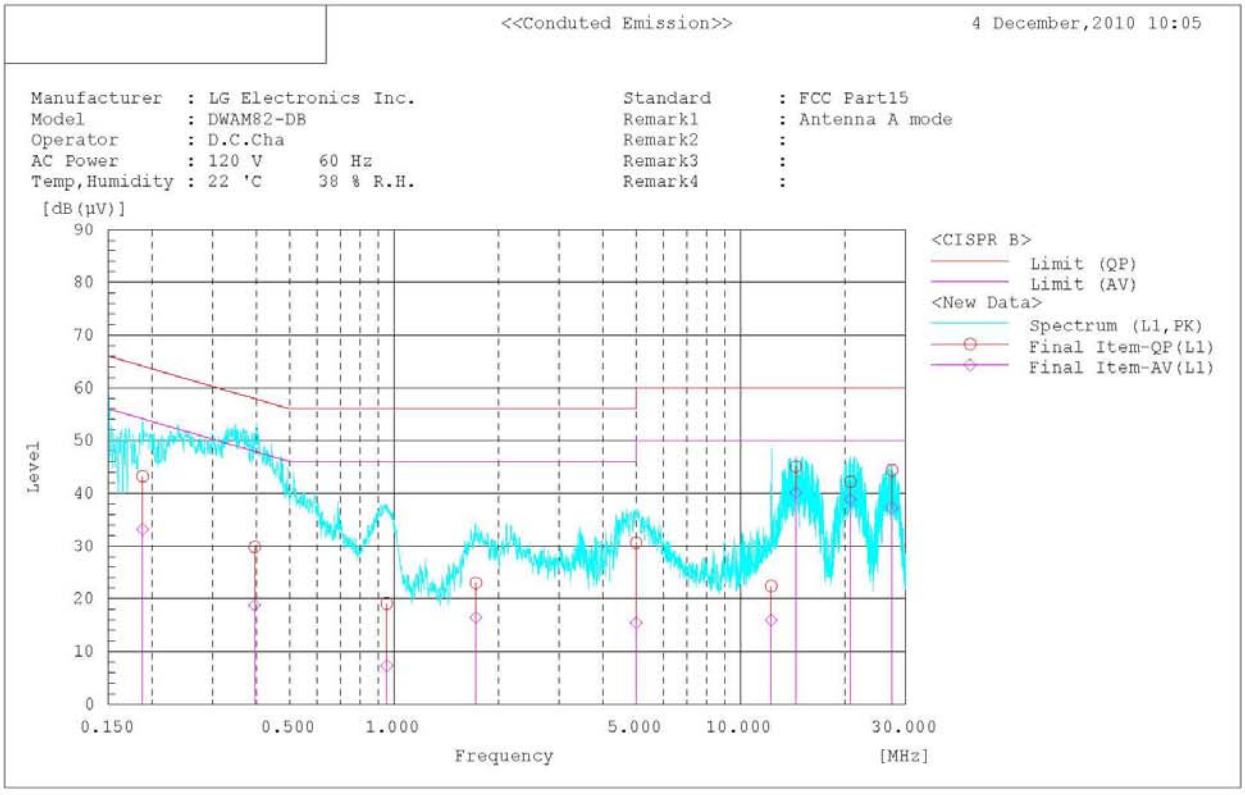
Frequency Range (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 ~ 0.5	66 to 56 *	56 to 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50

* Decreases with the logarithm of the frequency

AC Line Conducted Emissions (Graph)

Test Mode: Antenna A





AC Line Conducted Emissions (Data List)

Test Mode: Antenna A

<<Conduted Emission>>

4 December,2010 10:05

Standard : FCC Part15
Manufacturer : LG Electronics Inc.
Model : DWAM82-DB
Operator : D.C.Cha
AC Power : 120 V 60 Hz
Temp,Humidity : 22 'C 38 % R.H.
Remark1 : Antenna A mode
Remark2 :
Remark3 :
Remark4 :

Final Result

--- N Phase ---

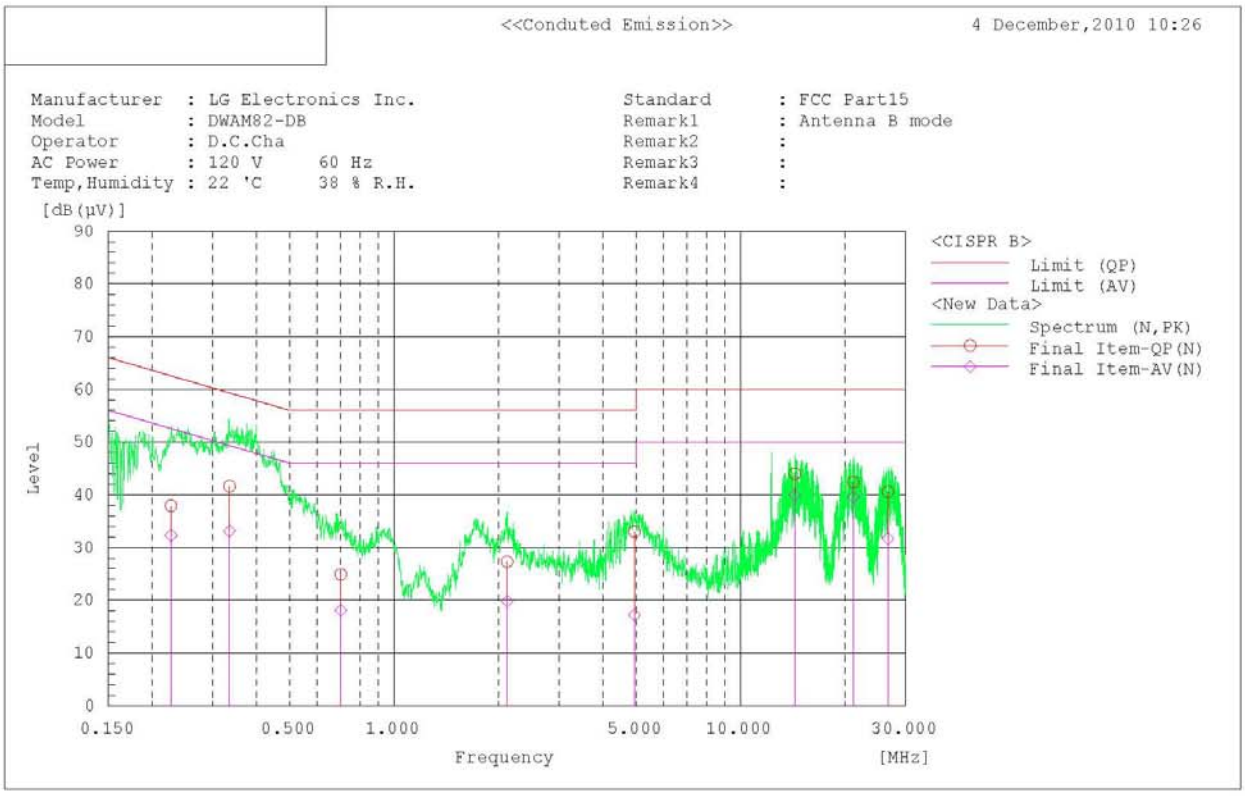
No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV	Remark
	[MHz]	[dB(µV)]	[dB(µV)]	[dB]	[dB(µV)]	[dB(µV)]	[dB(µV)]	[dB(µV)]	[dB]	[dB]	
1	0.191	47.7	36.3	0.1	47.8	36.4	64.0	54.0	16.2	17.6	
2	0.338	32.5	23.2	0.1	32.6	23.3	59.3	49.3	26.7	26.0	
3	0.587	18.8	12.2	0.1	18.9	12.3	56.0	46.0	37.1	33.7	
4	0.924	17.9	4.9	0.1	18.0	5.0	56.0	46.0	38.0	41.0	
5	2.169	23.3	14.5	0.2	23.5	14.7	56.0	46.0	32.5	31.3	
6	4.951	29.3	14.0	0.3	29.6	14.3	56.0	46.0	26.4	31.7	
7	12.275	21.9	15.4	0.7	22.6	16.1	60.0	50.0	37.4	33.9	
8	14.441	44.6	40.0	0.8	45.4	40.8	60.0	50.0	14.6	9.2	
9	21.255	41.5	38.5	1.3	42.8	39.8	60.0	50.0	17.2	10.2	
10	27.265	37.6	28.5	1.7	39.3	30.2	60.0	50.0	20.7	19.8	

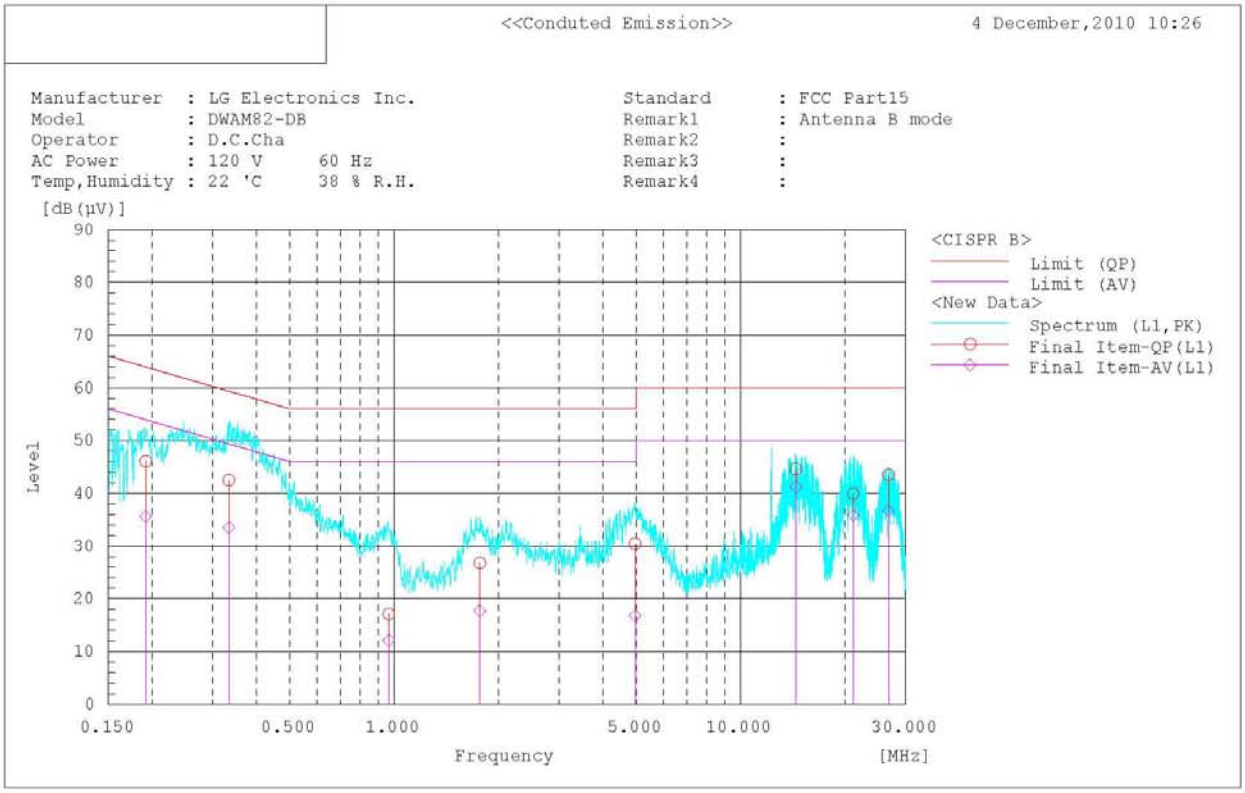
--- L1 Phase ---

No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV	Remark
	[MHz]	[dB(µV)]	[dB(µV)]	[dB]	[dB(µV)]	[dB(µV)]	[dB(µV)]	[dB(µV)]	[dB]	[dB]	
1	0.188	42.9	32.9	0.3	43.2	33.2	64.1	54.1	20.9	20.9	
2	0.396	29.5	18.5	0.3	29.8	18.8	57.9	47.9	28.1	29.1	
3	0.952	18.8	7.0	0.3	19.1	7.3	56.0	46.0	36.9	38.7	
4	1.724	22.7	16.1	0.3	23.0	16.4	56.0	46.0	33.0	29.6	
5	5.000	30.1	14.9	0.5	30.6	15.4	56.0	46.0	25.4	30.6	
6	12.266	21.6	15.1	0.8	22.4	15.9	60.0	50.0	37.6	34.1	
7	14.438	44.2	39.2	0.9	45.1	40.1	60.0	50.0	14.9	9.9	
8	20.744	41.0	37.6	1.2	42.2	38.8	60.0	50.0	17.8	11.2	
9	27.354	42.8	35.6	1.6	44.4	37.2	60.0	50.0	15.6	12.8	

AC Line Conducted Emissions (Graph)

Test Mode: Antenna B





AC Line Conducted Emissions (Data List)

Test Mode: Antenna B

<<Conduted Emission>>

4 December,2010 10:26

Standard : FCC Part15
Manufacturer : LG Electronics Inc.
Model : DWAM82-DB
Operator : D.C.Cha
AC Power : 120 V 60 Hz
Temp,Humidity : 22 'C 38 % R.H.
Remark1 : Antenna B mode
Remark2 :
Remark3 :
Remark4 :

Final Result

--- N Phase ---

No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV	Remark
	[MHz]	[dB(μV)]	[dB(μV)]	[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]	
1	0.227	37.8	32.2	0.1	37.9	32.3	62.6	52.6	24.7	20.3	
2	0.335	41.5	33.0	0.1	41.6	33.1	59.3	49.3	17.7	16.2	
3	0.702	24.8	18.0	0.1	24.9	18.1	56.0	46.0	31.1	27.9	
4	2.120	27.1	19.6	0.2	27.3	19.8	56.0	46.0	28.7	26.2	
5	4.944	32.7	16.9	0.3	33.0	17.2	56.0	46.0	23.0	28.8	
6	14.337	43.2	39.1	0.8	44.0	39.9	60.0	50.0	16.0	10.1	
7	21.153	41.1	38.3	1.3	42.4	39.6	60.0	50.0	17.6	10.4	
8	26.638	38.9	30.0	1.7	40.6	31.7	60.0	50.0	19.4	18.3	

--- L1 Phase ---

No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV	Remark
	[MHz]	[dB(μV)]	[dB(μV)]	[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]	
1	0.192	45.8	35.3	0.3	46.1	35.6	63.9	53.9	17.8	18.3	
2	0.334	42.2	33.2	0.3	42.5	33.5	59.4	49.4	16.9	15.9	
3	0.965	16.8	11.8	0.3	17.1	12.1	56.0	46.0	38.9	33.9	
4	1.769	26.5	17.4	0.3	26.8	17.7	56.0	46.0	29.2	28.3	
5	4.963	29.9	16.3	0.5	30.4	16.8	56.0	46.0	25.6	29.2	
6	14.439	43.7	40.3	0.9	44.6	41.2	60.0	50.0	15.4	8.8	
7	21.158	38.6	34.5	1.3	39.9	35.8	60.0	50.0	20.1	14.2	
8	26.743	41.9	35.0	1.6	43.5	36.6	60.0	50.0	16.5	13.4	

3.2.7 Antenna Requirements

- Procedure:

Describe how the EUT complies with the requirement that either its antenna is permanently attached, or that it employs a unique antenna connector, for every antenna proposed for use with the EUT.

- Conclusion: Comply

The antenna is PCB pattern antenna on the module. (Refer to Internal Photo file.)

- Minimum Standard:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions.

APPENDIX

TEST EQUIPMENT FOR TESTS

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment.

	Type	Manufacturer	Model	Cal.Due.Date (dd/mm/yy)	Next.Due.Date (dd/mm/yy)	S/N
☒	Spectrum Analyzer	Agilent	E4440A	30/09/10	30/09/11	MY45304199
☒	Spectrum Analyzer	Rohde Schwarz	FSQ26	25/02/10	25/02/11	200445
☐	Spectrum Analyzer(RE)	H.P	8563E	04/10/10	04/10/11	3551A04634
☐	Power Meter	H.P	EPM-442A	01/07/10	01/07/11	GB37170413
☐	Power Sensor	H.P	8481A	01/07/10	01/07/11	3318A96332
☒	Wideband Power Sensor	Rohde Schwarz	NRP-Z81	01/07/10	01/07/11	100418
☐	Power Divider	Agilent	11636B	05/10/10	05/10/11	56471
☐	Power Splitter	Anritsu	K241B	05/10/10	05/10/11	020611
☐	Power Splitter	Anritsu	K241B	01/07/10	01/07/11	017060
☐	Frequency Counter	H.P	5342A	01/07/10	01/07/11	2119A04450
☐	TEMP & HUMIDITY Chamber	JISCO	KR-100/J-RHC2	04/10/10	04/10/11	30604493/021031
☒	Digital Multimeter	H.P	34401A	12/03/10	12/03/11	3146A13475, US36122178
☐	Multifunction Synthesizer	HP	8904A	11/10/10	11/10/11	3633A08404
☒	Signal Generator	Rohde Schwarz	SMR20	12/03/10	12/03/11	101251
☐	Signal Generator	H.P	ESG-3000A	01/07/10	01/07/11	US37230529
☐	Vector Signal Generator	Rohde Schwarz	SMJ100A	11/01/10	11/01/11	100148
☐	Vector Signal Generator	Rohde Schwarz	SMBV100A	23/02/10	23/02/11	255571
☐	Audio Analyzer	H.P	8903B	02/07/10	02/07/11	3011A09448
☐	Modulation Analyzer	H.P	8901B	01/07/10	01/07/11	3028A03029
☐	8960 Series 10 Wireless Comms. Test Set	Agilent	E5515C	02/07/10	02/07/11	GB43461134
☐	Universal Radio communication Tester	Rohde Schwarz	CMU 200	12/03/10	12/03/11	106760
☐	Bluetooth Tester	TESCOM	TC-3000B	01/07/10	01/07/11	3000B000268
☐	Thermo hygrometer	BODYCOM	BJ5478	28/01/10	28/01/11	090205-3
☒	Thermo hygrometer	BODYCOM	BJ5478	28/01/10	28/01/11	090205-2
☐	Thermo hygrometer	BODYCOM	BJ5478	28/01/10	28/01/11	090205-4
☐	AC Power supply	DAEKWANG	5KVA	12/03/10	12/03/11	20060321-1
☒	DC Power Supply	HP	6622A	12/03/10	12/03/11	3448A03760
☐	DC Power Supply	HP	6633A	12/03/10	12/03/11	3524A06634
☐	DC Power Supply	Protek	PWS-3010D	04/10/10	04/10/11	4072702
☐	BAND Reject Filter	Microwave Circuits	N0308372	05/10/10	05/10/11	3125-01DC0352
☐	BAND Reject Filter	Wainwright	WRCG1750	05/10/10	05/10/11	2
☐	High-Pass Filter	ANRITSU	MP526D	04/10/10	04/10/11	M27756
☐	High-pass filter	Wainwright	WHNX2.1	N/A	N/A	1
☒	High-pass filter	Wainwright	WHNX3.0	N/A	N/A	9
☐	High-pass filter	Wainwright	WHNX5.0	N/A	N/A	8
☒	High-Pass Filter	Wainwright	WHKX8.5	N/A	N/A	1
☐	Tunable Notch Filter	Wainwright	WRCT800.0 /960.0-0.2/40-8SSK	N/A	N/A	32
☐	Tunable Notch Filter	Wainwright	WRCD1700.0 /2000.0-0.2/40-10SSK	N/A	N/A	53
☐	Tunable Notch Filter	Wainwright	WRCT1900.0/ 2200.0-5/40-10SSK	N/A	N/A	30
☒	HORN ANT	ETS	3115	04/10/10	04/10/11	21097
☐	HORN ANT	ETS	3115	14/07/10	14/07/11	6419
☒	HORN ANT	A.H.Systems	SAS-574	10/06/09	10/06/11	154
☐	HORN ANT	A.H.Systems	SAS-574	10/06/09	10/06/11	155

	Type	Manufacturer	Model	Cal.Due.Date (dd/mm/yy)	Next.Due.Date (dd/mm/yy)	S/N
☒	HORN ANT	SCHWARZBECK	BBHA9120A	13/04/10	13/04/11	322
☐	Dipole Antenna	Schwarzbeck	VHA9103	29/11/10	29/11/11	2116
☐	Dipole Antenna	Schwarzbeck	VHA9103	29/11/10	29/11/11	2117
☐	Dipole Antenna	Schwarzbeck	UHA9105	29/11/10	29/11/11	2261
☐	Dipole Antenna	Schwarzbeck	UHA9105	29/11/10	29/11/11	2262
☐	LOOP Antenna	ETS	6502	29/10/10	29/10/11	3471
☐	Coaxial Fixed Attenuators	Agilent	8491B	01/07/10	01/07/11	MY39260700
☐	Attenuator (3dB)	WEINSCHEL	56-3	05/10/10	05/10/11	Y2342
☐	Attenuator (3dB)	WEINSCHEL	56-3	05/10/10	05/10/11	Y2370
☐	Attenuator (10dB)	WEINSCHEL	23-10-34	01/10/10	01/10/11	BP4386
☐	Attenuator (10dB)	WEINSCHEL	23-10-34	11/01/10	11/01/11	BP4387
☐	Attenuator (10dB)	WEINSCHEL	31696	05/10/10	05/10/11	446
☐	Attenuator (10dB)	WEINSCHEL	31696	05/10/10	05/10/11	408
☐	Attenuator (20dB)	WEINSCHEL	86-20-11	05/10/10	05/10/11	432
☐	Attenuator (30dB)	JFW	50FH-030-300	12/03/10	12/03/11	060320-1
☐	Attenuator (40dB)	WEINSCHEL	57-40-33	01/10/10	01/10/11	NN837
☐	Termination	H.P	HP-909D	02/07/10	02/07/11	02750
☐	Termination	H.P	HP-909D	02/07/10	02/07/11	02702
☐	Type N Coaxial CIRCULATOR	NOVA MICROWAVE	0088CAN	01/07/10	01/07/11	788
☐	Type N Coaxial CIRCULATOR	NOVA MICROWAVE	0185CAN	01/07/10	01/07/11	790
☐	Type N Coaxial CIRCULATOR	NOVA MICROWAVE	0215CAN	01/07/10	01/07/11	112
☒	Amplifier (30dB)	Agilent	8449B	23/04/10	23/04/11	3008A01590
☐	Amplifier (30dB)	H.P	8449B	13/05/10	13/05/11	3008A00370
☐	Amplifier	EMPOWER	BBS3Q7ELU	04/10/10	04/10/11	1020
☐	RF Power Amplifier	OPHIRRF	5069F	01/07/10	01/07/11	1006
☐	EMI TEST RECEIVER	R&S	ESU	29/01/10	29/01/11	100014
☐	BILOG ANTENNA	SCHAFFNER	CBL6112B	14/07/10	14/07/11	2737
☐	Amplifier (22dB)	H.P	8447E	29/01/10	29/01/11	2945A02865
☒	EMI TEST RECEIVER	R&S	ESCI	12/05/10	12/05/11	100364
☒	LOG-PERIODIC ANT.	Schwarzbeck	UHALP 9108 A-1	07/10/09	07/10/11	1098
☒	BICONICAL ANT.	Schwarzbeck	VHA 9103	06/10/09	06/10/11	91031946
☐	LOG-PERIODIC ANT.	Schwarzbeck	UHALP9108A	07/07/10	07/07/11	590
☒	Low Noise Pre Amplifier	TSJ	MLA-100K01-B01-2	12/03/10	12/03/11	1252741
☐	Low Noise Pre Amplifier	TSJ	MLA-00108-B02-36	08/02/10	08/02/11	1518831
☐	Amplifier (25dB)	Agilent	8447D	12/03/10	12/03/11	2944A10144
☐	Amplifier (25dB)	Agilent	8447D	01/07/10	01/07/11	2648A04922
☒	Spectrum Analyzer(CE)	H.P	8591E	12/03/10	12/03/11	3649A05889
☒	LISN	Kyoritsu	KNW-407	29/01/10	29/01/11	8-317-8
☒	LISN	Kyoritsu	KNW-242	29/01/10	29/01/11	8-654-15
☒	CVCF	NF Electronic	4420	12/03/10	12/03/11	304935/337980
☒	50 ohm Terminator	HME	CT-01	12/01/10	12/01/11	N/A
☒	RFI/FIELD Intensity Meter	Kyoritsu	KNM-2402	02/07/10	02/07/11	4N-170-3