TEST REPORT

CSA Group Korea Ltd. 155, Osan-Ro, Mohyeon-eup, Cheoin-Gu, Yongin-Si, Gyeonggi-Do 16885 Republic of Korea www.csagroup.org	Report No.: CSA-26-R-0019 Page (1) of (42)	CSA GROUP™

1. **Report No.** : CSA-26-R-0019
2. **Customer**
   - ◦ Name : Hangil Control
   - ◦ Address : 47, Geumo-daero 16-gil, Gumi-si, Gyeongsangbuk-do, Republic of Korea
3. **Use of Report** : FCC Original Grant
4. **Product Name / Model Name** : Industrial Radio Remote Transmitter / HCT-2216

   FCC ID : 2BVUUHCT-2216

5. **FCC Regulation(s):** FCC Part 15 Subpart C 247

   Test Method used:

6. **Date of Test** : 2026-04-20 to 2026-04-30
7. **Location of Test** : ■ Permanent Testing Lab □ On Site Testing
   (Address: 155, Osan-Ro, Mohyeon-eup, Cheoin-Gu, Yongin-Si, Gyeonggi-Do 16885 Republic of Korea)
8. **Testing Environment** : See appended test report.
9. **Test Result** : Refer to the test result in the test report

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

Affirmation	Tested by Name : Sungjung Kim (Signature)	Technical Manager Name : Changwin Lee (Signature)

2026-05-21

CSA Group Korea Ltd.

REPORT REVISION HISTORY

Date	Revision	Page No
2026-05-21	Originally issued	-

General remarks for test reports

Statement concerning the uncertainty of the measurement systems used for the tests
(may be required by the product standard or client)

☐ **Internal procedure used for type testing through which traceability of the measuring uncertainty has been established:**

Procedure number, issue date and title:
Calculations leading to the reported values are on file with the testing laboratory that conducted the testing.

☒ **Statement not required by the standard or client used for type testing**

Contents

1. General Information

1.1. Applicant information

Applicant:	Hangil Control
Address:	47, Geumo-daero 16-gil, Gumi-si, Gyeongsangbuk-do, Republic of Korea
Telephone:	+82-054-464-4711
Fax:	+82-054-464-4711
E-mail:	kimjg8089@naver.com
Contact name:	Kim, Ju-Han

Manufacturer:	Hangil Control
Address:	47, Geumo-daero 16-gil, Gumi-si, Gyeongsangbuk-do, Republic of Korea
Telephone:	+82-054-464-4711
Fax:	+82-054-464-4711
E-mail:	kimjg8089@naver.com
Contact name:	Kim, Ju-Han

1.2. Laboratory information

Address

CSA Group Korea Ltd. (Yongin Lab.)

155, Osan-Ro, Mohyeon-eup, Cheoin-Gu, Yongin-Si, Gyeonggi-Do 16885 Republic of Korea

Telephone Number: +82-2-6371-6600

Test Firm Registration Number : 249858

1.3 Description of EUT

Product	Industrial Radio Remote Transmitter
Model Name	HCT-2216
Serial Number	Identical prototype
Power Supply	DC 3.7 V
Frequency Range	902 MHz ~ 928 MHz
Number of Channels	248 (Channel Spacing 100 kHz)
Antenna Type	Internal Antenna
Antenna Gain	-0.22 dBi

1.4 Declaration by the manufacturer

- N/A

1.5 Test Equipment List

Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N
Spectrum Analyzer	ROHDE & SCHWARZ	FSV40	25/10/03	26/10/03	101404
Signal Generator	ROHDE & SCHWARZ	SMB100B	25/10/03	26/10/03	105988
Highpass Filter	Wainwright Instruments	WHKX12-935-1000-15000-40SS	25/12/06	26/12/06	103
Attenuator	Centric RF	10dB	25/12/06	26/12/06	110
Digital thermometer/hygrometer	SATO	PC-5410TRH	25/12/05	26/12/05	545509
EMI TEST RECEIVER	ROHDE & SCHWARZ	ESW44	24/04/24	25/04/24	103091
			25/04/24	26/04/24	
Signal Conditioning Unit	ROHDE & SCHWARZ	SCU 01	24/04/24	25/04/24	10029
			25/04/24	26/04/24	
Amplifier	TESTEK	TK-PA18H	24/04/25	25/04/25	240132-L
			25/04/25	26/04/25	
TRILOG Broadband Antenna	SCHWARZBECK	VULB 9168	24/12/05	26/12/05	01755
HORN ANTENNA	ROHDE & SCHWARZ	HF907	25/10/10	26/10/10	103259
Active Loop Antenna	ROHDE & SCHWARZ	HFH2-Z2E	24/04/27	26/04/27	101198
			26/04/27	28/04/27	
Amplifier	TESTEK	TK-PA18H	25/10/13	26/10/13	240142-L
ATTENUATOR	PASTERNACK	PE7390-6	24/04/24	25/04/24	N/A
			25/04/24	26/04/24	
Digital thermometer/hygrometer	SATO	PC-5410TRH	24/12/05	26/12/05	545511
EMI TEST RECEIVER	ROHDE & SCHWARZ	ESCI	26/03/27	27/03/27	101041
TWO-LINE V-NETWORK	ROHDE & SCHWARZ	ENV216	25/04/22	26/04/22	101156
			26/04/22	27/04/22	

1.6 Summary of Test Results

FCC Part Section(s)	Parameter	Limit (Using in 2400~ 2483.5MHz)	Test Condition	Status Note 1
15.247(a)	Carrier Frequency Separation	>= 25 kHz or >= 20 dB BW, whichever is greater.	Conducted	C
	Number of Hopping Frequencies	= 50 hops, if 20 dB BW < 250kHz >= 25 hops, if 20 dB BW >= 250kHz		C
	20 dB Bandwidth	< 500 kHz		C
	Dwell Time	=< 0.4 seconds		C
15.247(b)	Transmitter Output Power	=< 1 Watt , if CHs >= 50 =< 0.25 W, if CHs >= 25, < 50		C
15.247(d)	Unwanted Emissions (Conducted)	The radiated emission to any 100 kHz of out-band shall be at least 20 dB below the highest in-band spectral density.		C
				C
15.247(d) 15.205, 15.209	Radiated Spurious Emissions	FCC 15.209 Limits	Radiated	C Note.2
15.207	AC Conducted Emissions	FCC 15.207 Limits	AC Line Conducted	NA Note.3
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.

Semi anechoic chamber registration Number : 249858

Note 3: This product operates on battery power only.

1.7 Conclusion of worst-case and operation mode

The field strength of spurious emission was measured in three orthogonal EUT positions.

(X-axis, Y-axis, Z-axis)

Tested frequency information,

- Hopping Function: Enable

	TX Frequency(MHz)	RX Frequency(MHz)
Hopping Band	902.44 ~ 927.14	902.44 ~ 927.14

- Hopping Function: Disable

	TX Frequency(MHz)	RX Frequency(MHz)
Lowest Channel	902.44	902.44
Middle Channel	915.24	915.24
Highest Channel	927.14	927.14

Operation test setup for EUT

- Test Software Version: EUT self-operation
- Power setting: Default

1.8 Measurement Uncertainty

The measurement uncertainties shown below were calculated in accordance with requirements of ANSI C63.4-2014 and ANSI C63.10-2020, C63.10-2020/Cor 1-2023. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95 % level of confidence.

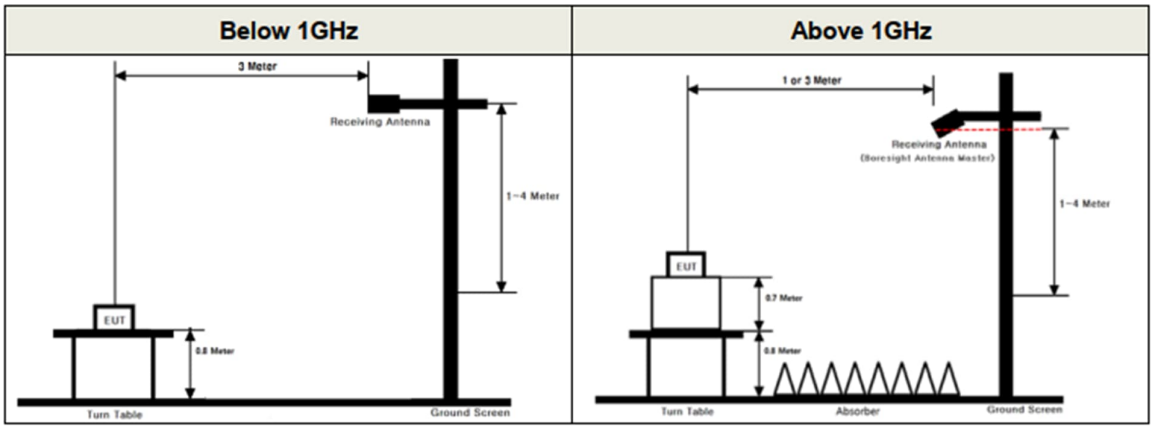
Parameter	Measurement uncertainty
Antenna-port conducted emission	0.94 dB (The confidence level is about 95 %, k = 2)
AC power-line conducted emission	3.00 dB (The confidence level is about 95 %, k = 2)
Radiated emission (1 GHz Below)	5.82 dB (The confidence level is about 95 %, k = 2)
Radiated emission (1 GHz ~ 18 GHz)	5.02 dB (The confidence level is about 95 %, k = 2)

2. Radiated Spurious Emissions and Conducted Spurious Emission

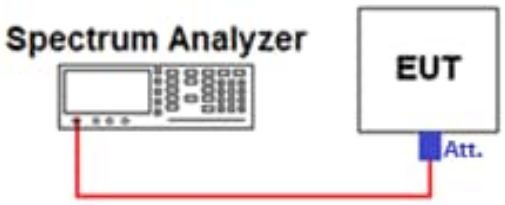
2.1. Test Setup

Radiated Measurement

The diagram below shows the test setup that is utilized to make the measurements for emission from 9 kHz to 10 GHz Emissions.



▪Conducted Measurement



2.2. Limit

Part 15.247(d), Part 15.205, Part 15.209

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of Part 15.247 the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

- Part 15.209: General requirements

Frequency (MHz)	Limit (uV/m)	Measurement Distance (meter)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 ~ 88	100 **	3
88 ~ 216	150 **	3
216 ~ 960	200 **	3
Above 960	500	3

** 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, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

- Part 15.205(a): Restricted band of operation

MHz	MHz	MHz	MHz	GHz	GHz
0.009 ~ 0.110	8.41425 ~ 8.41475	108 ~ 121.94	1 300 ~ 1 427	4.5 ~ 5.15	14.47 ~ 14.5
0.495 ~ 0.505	12.29 ~ 12.293	123 ~ 138	1 435 ~ 1 626.5	5.35 ~ 5.46	15.35 ~ 16.2
2.1735 ~ 2.1905	12.51975 ~ 12.52025	149.9 ~ 150.05	1 645.5 ~ 1 646.5	7.25 ~ 7.75	17.7 ~ 21.4
4.125 ~ 4.128	12.57675 ~ 12.57725	156.52475 ~ 156.52525	1 660 ~ 1 710	8.025 ~ 8.5	22.01 ~ 23.12
4.17725 ~ 4.17775	13.36 ~ 13.41	156.7 ~ 156.9	1 718.8 ~ 1 722.2	9.0 ~ 9.2	23.6 ~ 24.0
4.20725 ~ 4.20775	16.42 ~ 16.423	162.0125 ~ 167.17	2 200 ~ 2 300	9.3 ~ 9.5	31.2 ~ 31.8
6.215 ~ 6.218	16.69475 ~ 16.69525	167.72 ~ 173.2	2 310 ~ 2 390	10.6 ~ 12.7	36.43 ~ 36.5
6.26775 ~ 6.26825	16.80425 ~ 16.80475	240 ~ 285	2 483.5 ~ 2 500	13.25 ~ 13.4	Above 38.6
6.31175 ~ 6.31225	25.5 ~ 25.67	322 ~ 335.4	2 655 ~ 2 900		
8.291 ~ 8.294	37.5 ~ 38.25	399.90 ~ 410	3 260 ~ 3 267		
8.362 ~ 8.366	73 ~ 74.6	608 ~ 614	3 332 ~ 3 339		
8.37625 ~ 8.38675	74.8 ~ 75.2	960 ~ 1240	3 345.8 ~ 3 358		
			3 600 ~ 4 400		

2.3. Test Procedures

2.3.1. Test Procedures for Radiated Spurious Emissions

1. The EUT is placed on a non-conductive table. For emission measurements at or below 1 GHz, the table height is 80 cm. For emission measurements above 1 GHz, the table height is 1.5 m. The table was rotated 360 degrees to determine the position of the highest radiation.
2. During performing radiated emission below 1 GHz, the EUT was set 3 meters away from the interference receiving antenna, which was mounted on the top of a variable-height antenna tower. During performing radiated emission above 1 GHz, the EUT was set 1 or 3 meter away from the interference-receiving antenna.
3. For measurements above 1GHz absorbers are placed on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1 GHz, the absorbers are removed.
4. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
5. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.
6. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
7. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Measurement Instrument Setting

- Frequencies less than or equal to 1 000 MHz

The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for

Quasi-peak detection (QP) at frequency below 1 GHz.

- Frequencies above 1 000 MHz

Peak Measurement

RBW = 1 MHz, VBW = 3 MHz, Detector = Peak, Sweep time = Auto, Trace mode = Max Hold until the trace stabilizes

Average Measurement > 1GHz

RBW = 1MHz, VBW = Reduce the video bandwidth until no significant variations in the displayed signal are observed in subsequent traces, provided the video bandwidth is no less than 1 Hz. (Actual VBW setting: 30Hz) Detector = Peak, Sweep Time = Auto, Trace Mode = Max Hold until the trace stabilizes

2.3.2. Test Procedures for Conducted Spurious Emissions

1.The transmitter output was connected to the spectrum analyzer.
2.The reference level of the fundamental frequency was measured with the spectrum analyzer using RBW = 100 kHz,
VBW = 300 kHz.
3. The conducted spurious emission was tested each ranges were set as below.

Frequency range: 9 kHz ~ 30 MHz
RBW = 100 kHz, VBW = 300 kHz, SWEEP TIME = AUTO, DETECTOR = PEAK, TRACE = MAX HOLD, SWEEP POINT : 10001

Frequency range: 30 MHz ~ 10 GHz
RBW = 100 kHz, VBW = 300 kHz, SWEEP TIME = AUTO, DETECTOR = PEAK, TRACE = MAX HOLD, SWEEP POINT : 10001

LIMIT LINE = 20 dB below of the reference level of above measurement procedure Step 2. (RBW = 100 kHz, VBW = 300 kHz)

2.4. Test Results

2.4.1. Radiated Emission

9 kHz ~ 10 GHz Data

▪ Lowest Channel

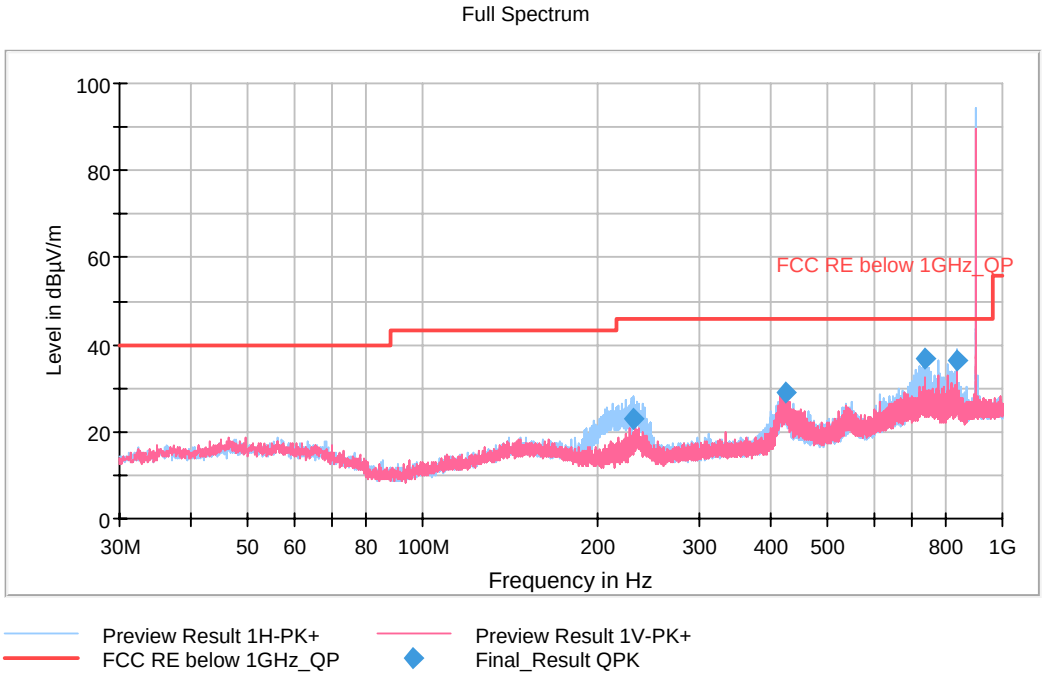
Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	D.C.F. (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
230.52	H	X	QP	44.85	-21.82	N/A	23.03	46.00	22.97
422.47	H	X	QP	42.84	-13.79	N/A	29.05	46.00	16.95
735.94	H	X	QP	39.44	-2.71	N/A	36.73	46.00	9.27
838.50	H	X	QP	32.75	3.53	N/A	36.28	46.00	9.72
1 804.60	V	X	PK	63.24	-14.09	N/A	49.15	74.00	24.85
1 804.60	V	X	AV	52.03	-14.09	N/A	37.94	54.00	16.06
2 707.30	V	X	PK	69.35	-11.76	N/A	57.59	74.00	16.41
2 707.30	V	X	AV	59.11	-11.76	N/A	47.35	54.00	6.65
3 609.55	V	X	PK	64.88	-7.95	N/A	56.93	74.00	17.07
3 609.55	V	X	AV	54.05	-7.95	N/A	46.10	54.00	7.90
5 414.50	V	X	PK	58.25	-1.77	N/A	56.48	74.00	17.52
5 414.50	V	X	AV	47.13	-1.77	N/A	45.36	54.00	8.64

Note.

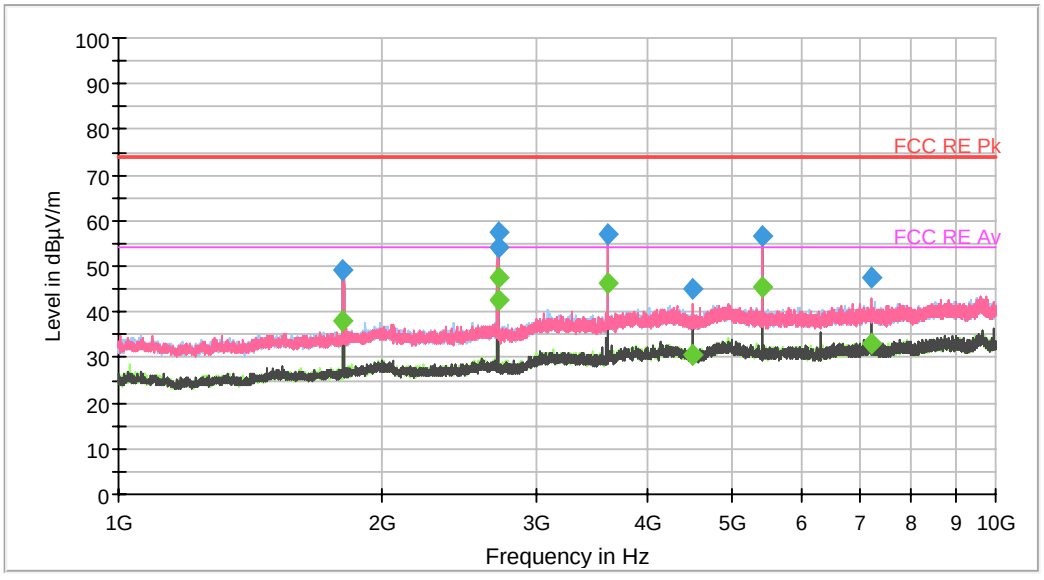
1. No other spurious and harmonic emissions were reported greater than listed emissions above table.
2. Above listed point data is the worst case data.
3. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F+ DCF / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,
   DCF = Duty Cycle Correction Factor
4. EUT had its hopping function disabled at the highest, middle and the lowest available channels.

▪ Lowest Channel

30M ~ 1GHz



1GHz ~ 10GHz



▪ Middle Channel

Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	D.C.F. (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
49.62	H	X	QP	32.88	-19.58	N/A	13.30	40.00	26.70
191.94	H	X	QP	40.36	-22.11	N/A	18.25	43.50	25.25
229.87	H	X	QP	46.01	-21.93	N/A	24.08	46.00	21.92
417.41	H	X	QP	38.18	-14.10	N/A	24.08	46.00	21.92
787.25	H	X	QP	35.81	0.41	N/A	36.22	46.00	9.78
1 830.25	V	X	PK	62.72	-13.59	N/A	49.13	74.00	24.87
1 830.25	V	X	AV	51.33	-13.59	N/A	37.74	54.00	16.26
2 745.55	V	X	PK	70.45	-11.66	N/A	58.79	74.00	15.21
2 745.55	V	X	AV	60.03	-11.66	N/A	48.37	54.00	5.63
3 660.85	V	X	PK	64.58	-7.65	N/A	56.93	74.00	17.07
3 660.85	V	X	AV	53.91	-7.65	N/A	46.26	54.00	7.74
5 491.45	V	X	PK	60.68	-1.80	N/A	58.88	74.00	15.12
5 491.45	V	X	AV	50.05	-1.80	N/A	48.25	54.00	5.75

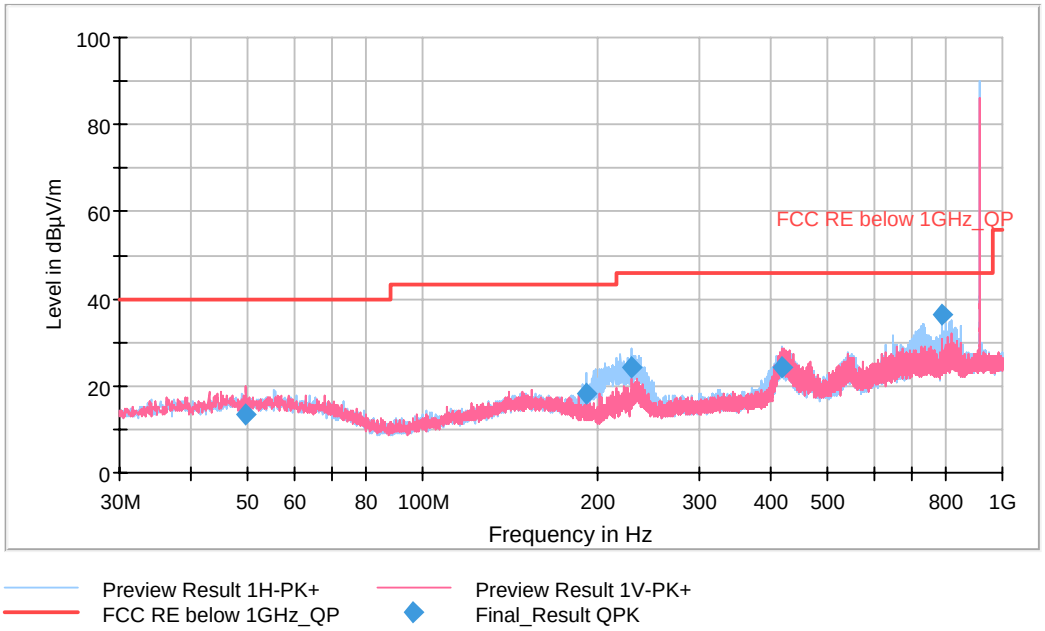
Note.

1. No other spurious and harmonic emissions were reported 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+ DCF / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,
   DCF = Duty Cycle Correction Factor
4. EUT had its hopping function disabled at the highest, middle and the lowest available channels.

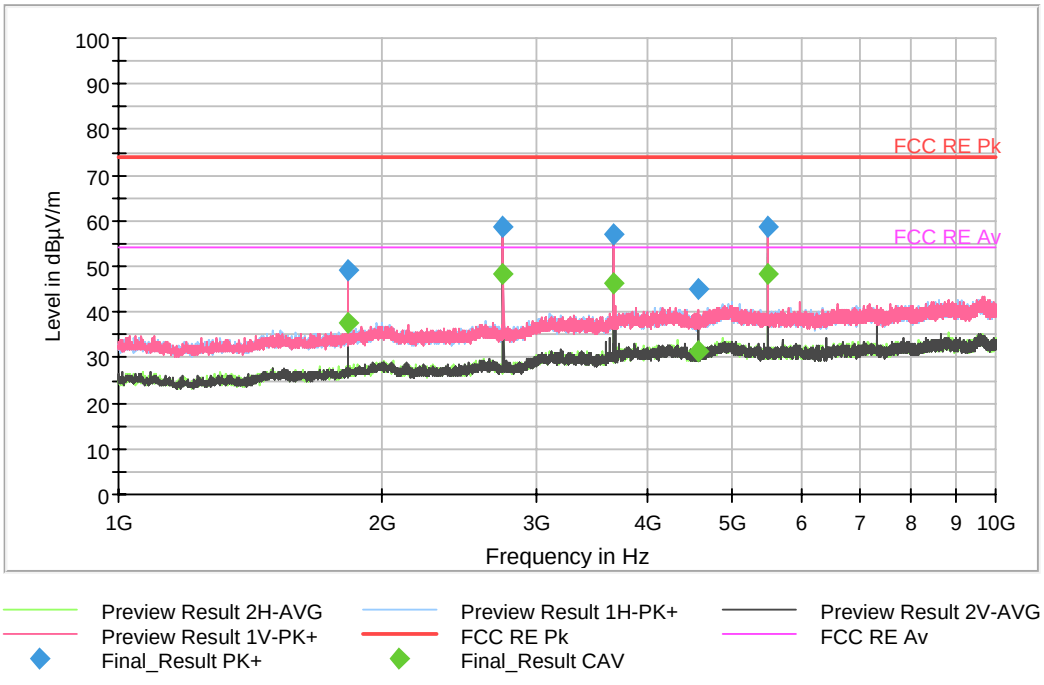
▪ Middle Channel

30M ~ 1GHz

Full Spectrum



1GHz ~ 10GHz



▪ Highest Channel

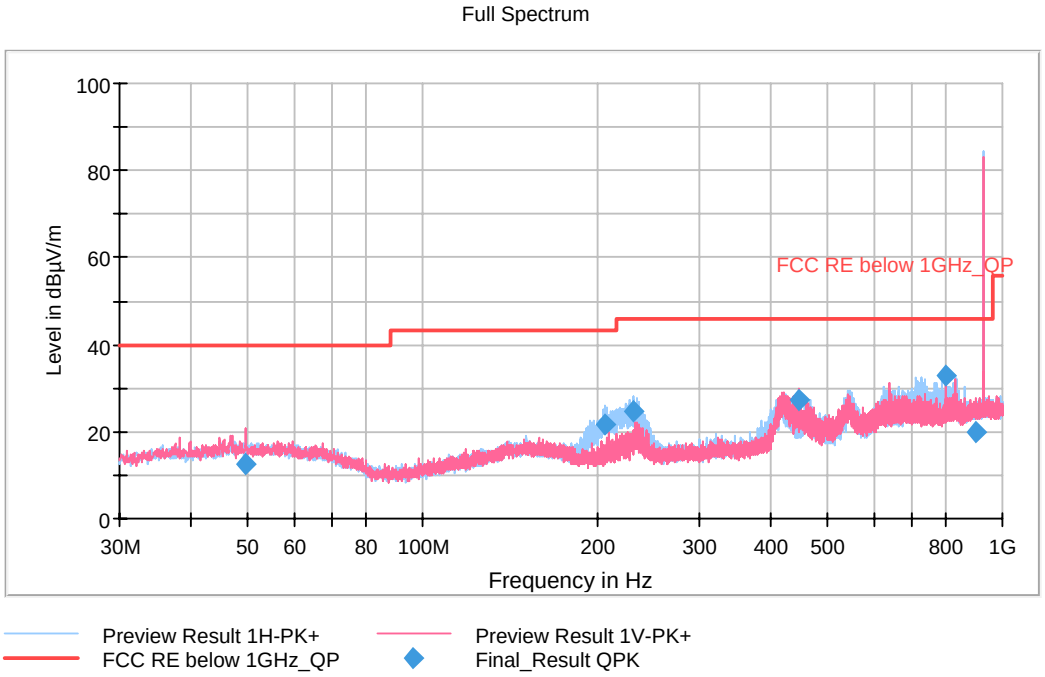
Frequency (MHz)	ANT Pol	The worst case EUT Position (Axis)	Detector Mode	Reading (dBuV)	T.F (dB/m)	D.C.F. (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
49.56	H	X	QP	32.22	-19.59	N/A	12.63	40.00	27.37
206.43	H	X	QP	44.32	-22.68	N/A	21.64	43.50	21.86
231.65	H	X	QP	46.17	-21.64	N/A	24.53	46.00	21.47
447.15	H	X	QP	39.88	-12.78	N/A	27.10	46.00	18.90
799.16	H	X	QP	31.75	1.14	N/A	32.89	46.00	13.11
899.82	H	X	QP	12.79	7.26	N/A	20.05	46.00	25.95
1 854.10	H	X	PK	63.32	-13.23	N/A	50.09	74.00	23.91
1 854.10	H	X	AV	52.25	-13.23	N/A	39.02	54.00	14.98
2 781.10	V	X	PK	71.62	-11.57	N/A	60.05	74.00	13.95
2 781.10	V	X	AV	61.12	-11.57	N/A	49.55	54.00	4.45
3 708.10	V	X	PK	62.24	-7.46	N/A	54.78	74.00	19.22
3 708.10	V	X	AV	50.50	-7.46	N/A	43.04	54.00	10.96
5 562.55	V	X	PK	52.14	-1.64	N/A	50.50	74.00	23.50
5 562.55	V	X	AV	45.41	-1.64	N/A	43.77	54.00	10.23

Note.

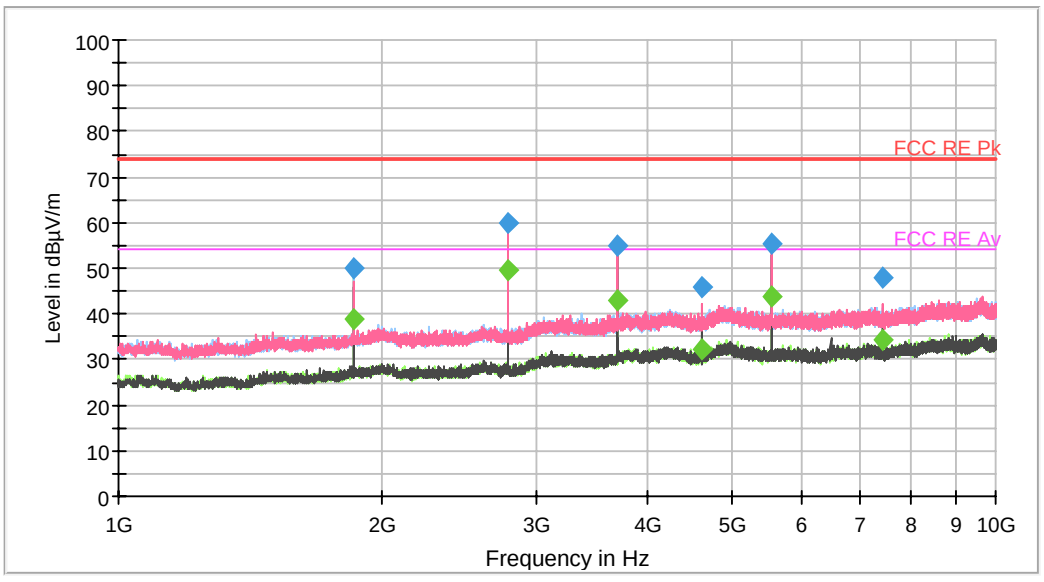
1. No other spurious and harmonic emissions were reported greater than listed emissions above table.
2. Above listed point data is the worst case data.
3. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F+ DCF / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,
   DCF = Duty Cycle Correction Factor
4. EUT had its hopping function disabled at the highest, middle and the lowest available channels.

▪ Highest Channel

30M ~ 1GHz

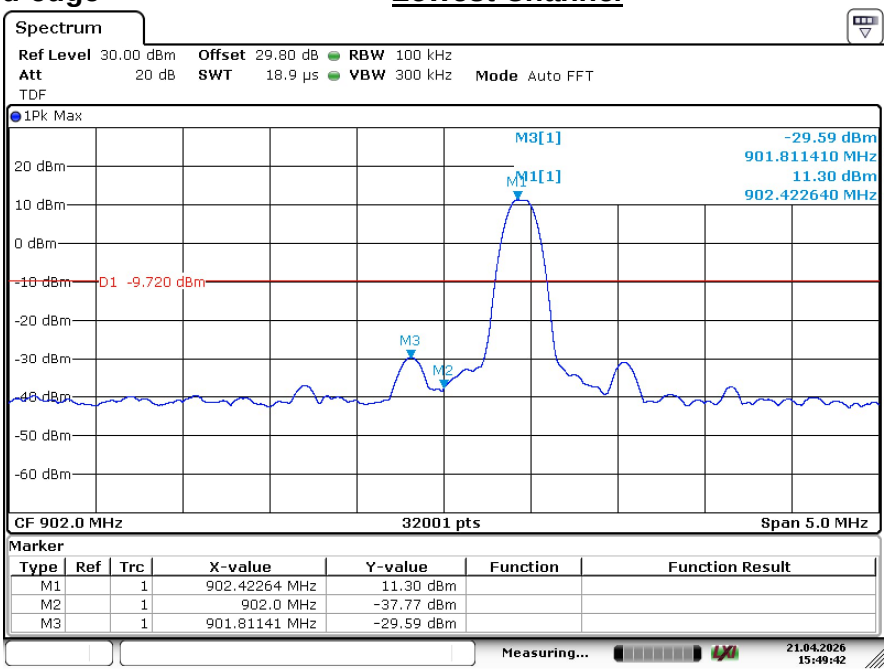


1GHz ~ 10GHz



2.4.2. Conducted Spurious Emissions

Low Band-edge ***Lowest Channel***



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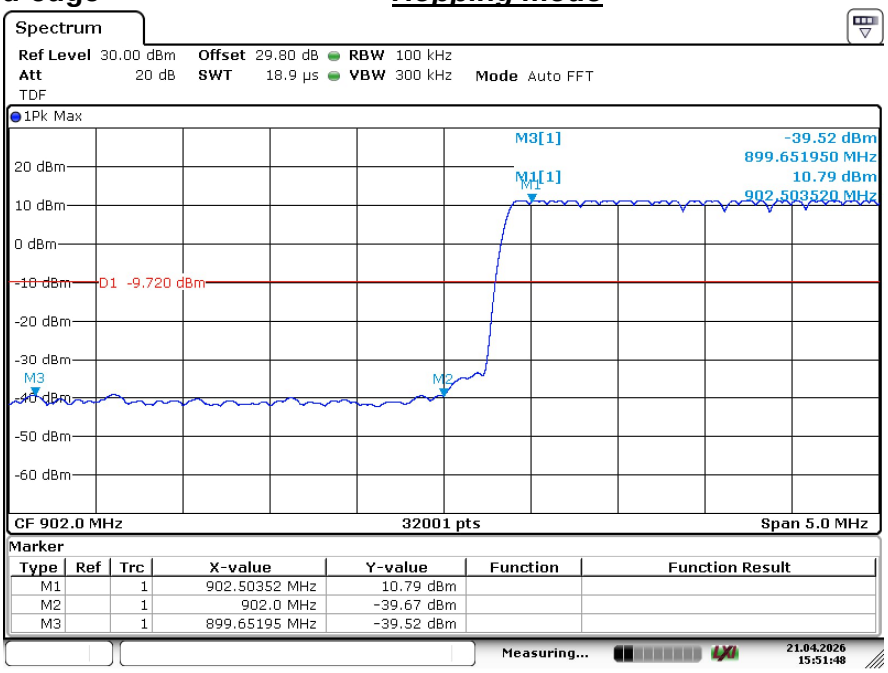
Low Band-edge ***Hopping mode***



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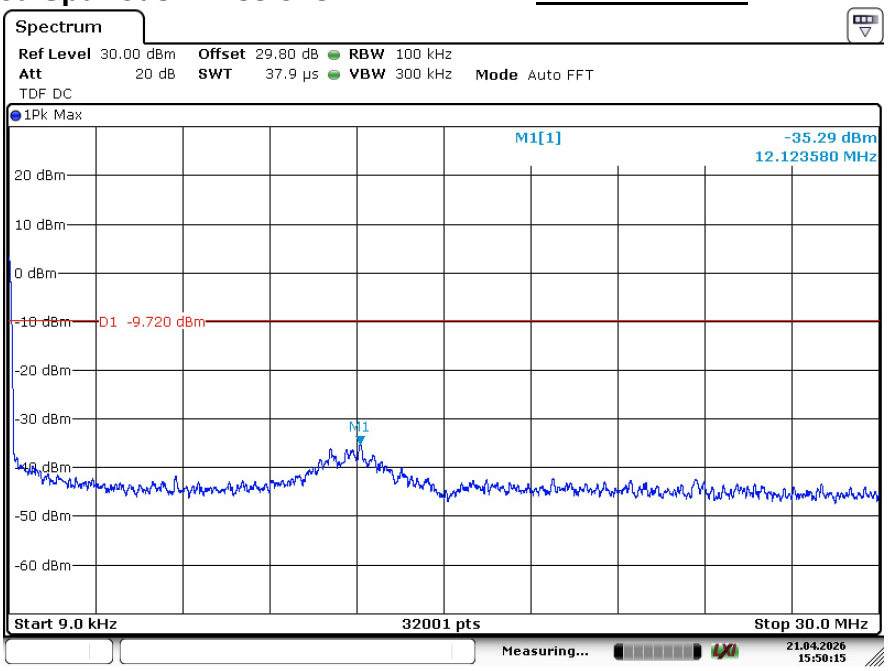
Conducted Spurious Emissions

Lowest Channel



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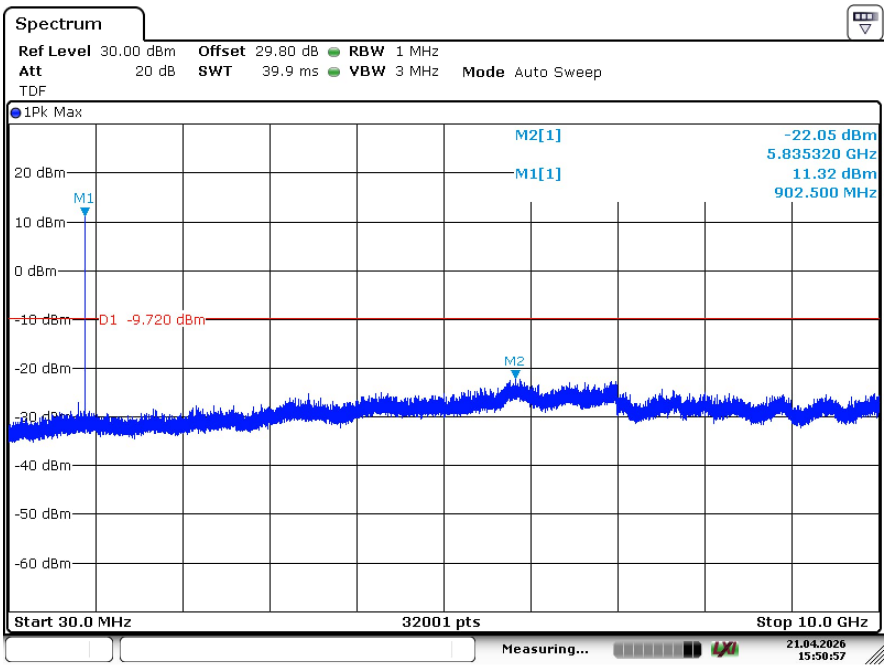

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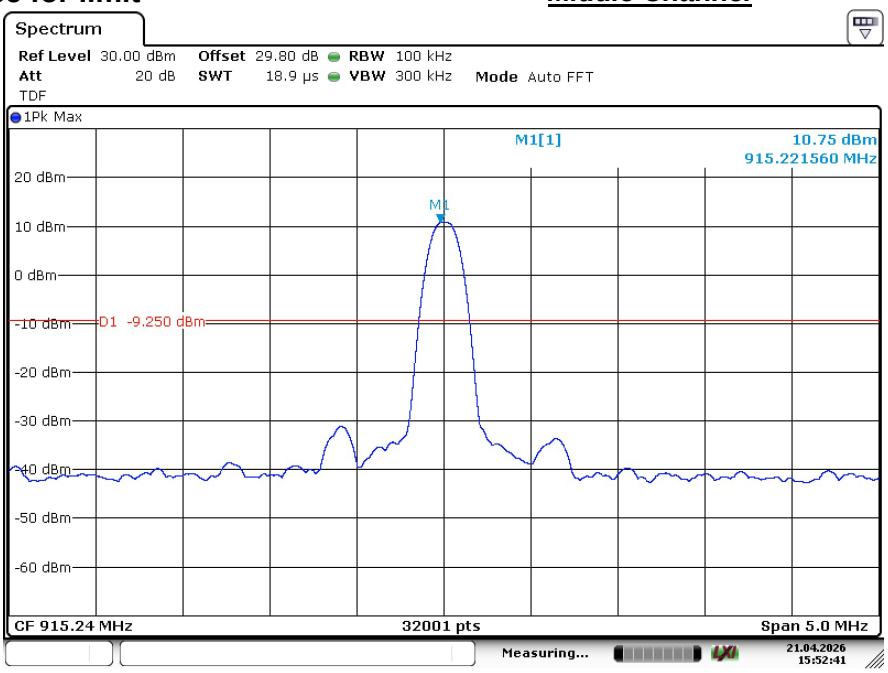
Reference for limit

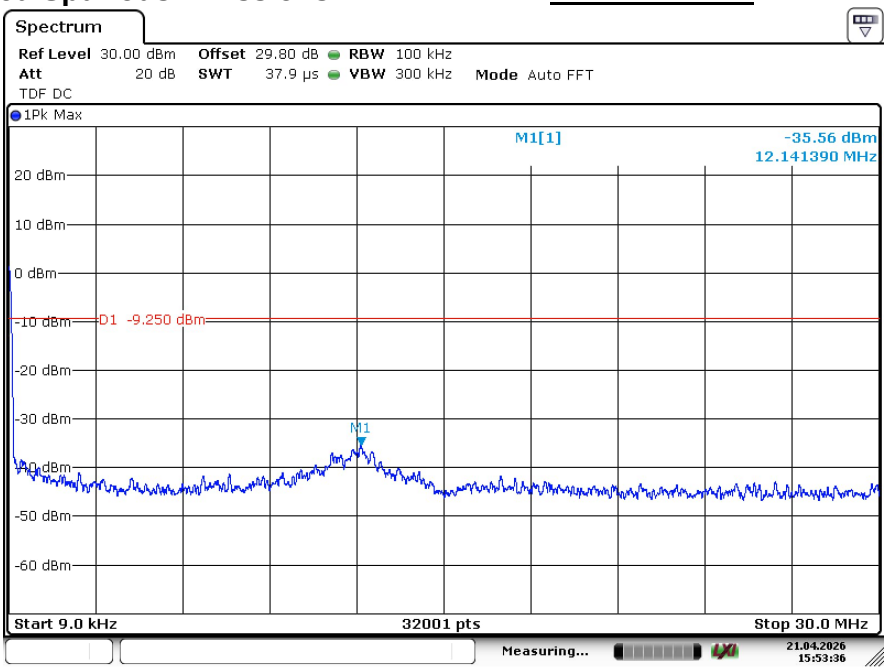
Middle Channel



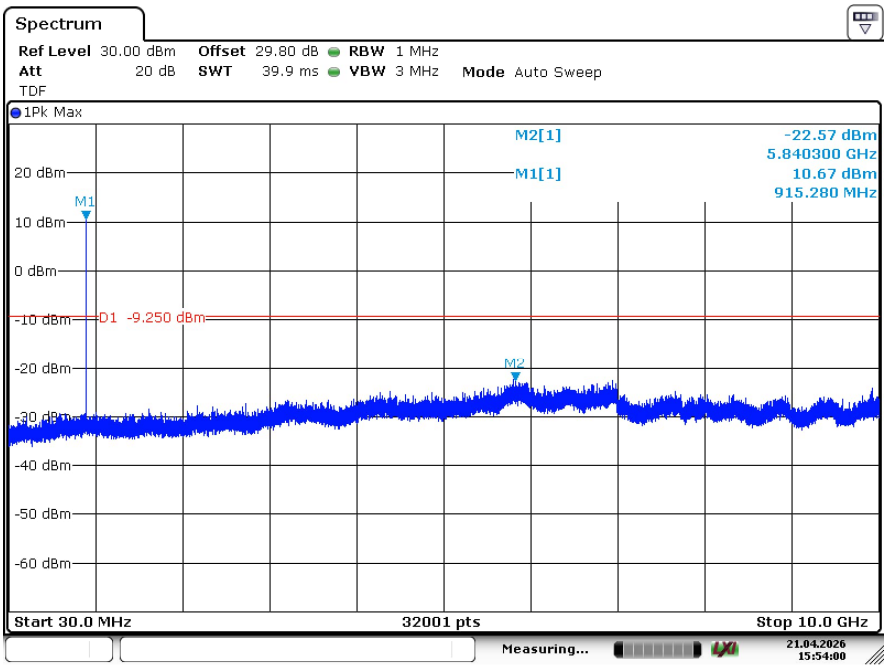
Date: 21.APR.2026 15:52:42

Conducted Spurious Emissions

Middle Channel

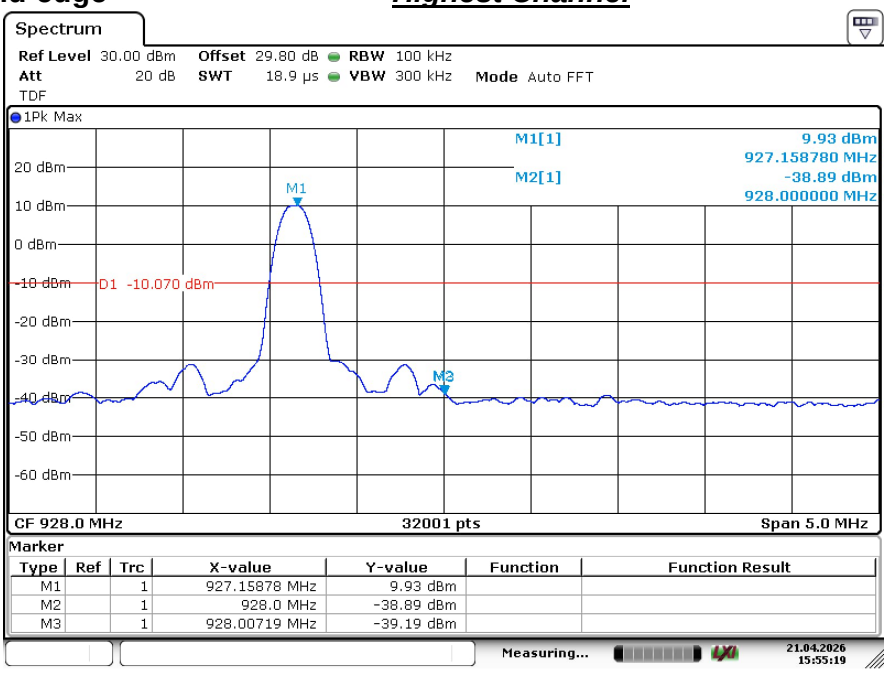


Date: 21.APR.2026 15:53:36



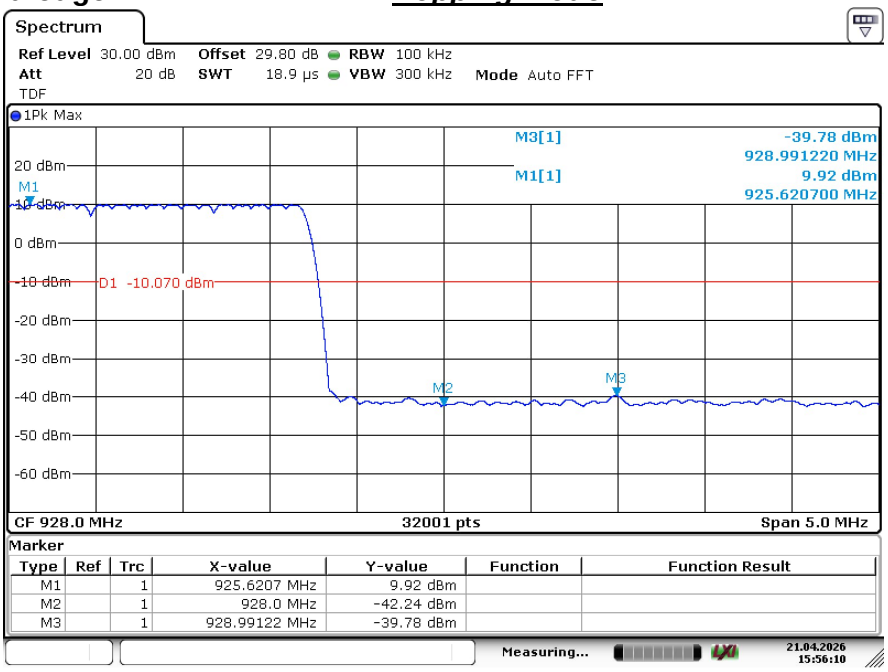
Date: 21.APR.2026 15:54:00

High Band-edge ***Highest Channel***



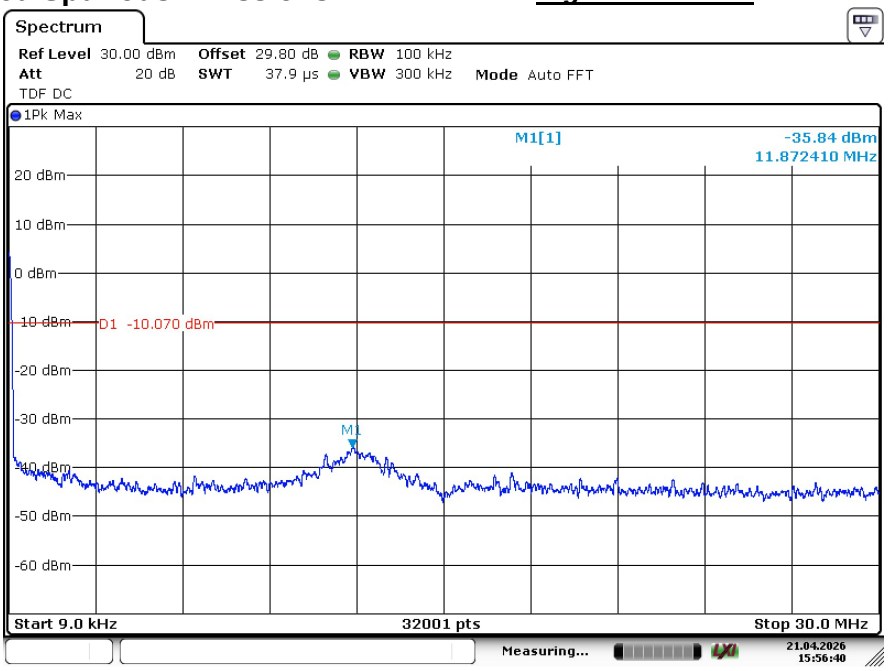
Date: 21.APR.2026 15:55:20

High Band-edge ***Hopping mode***

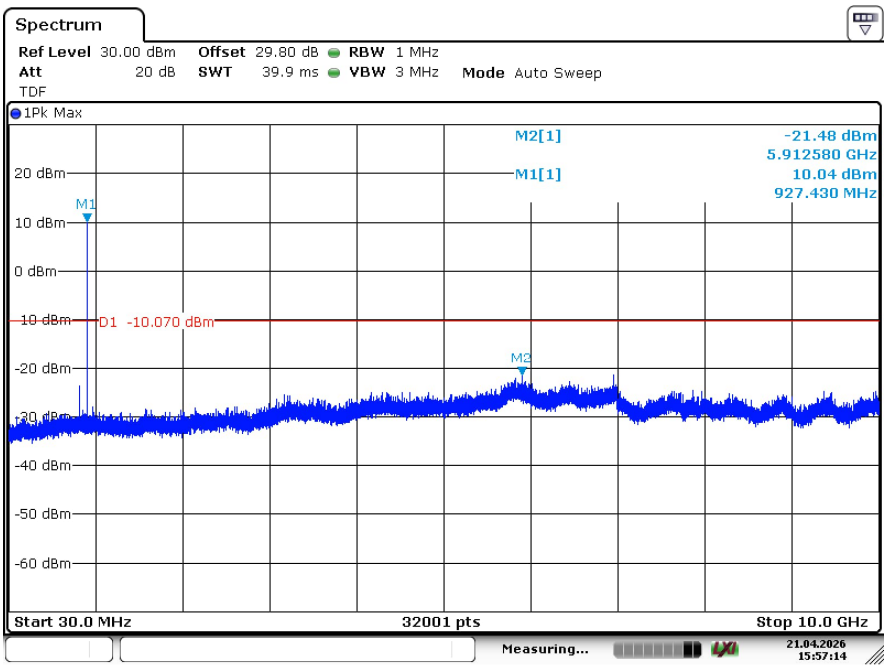


Date: 21.APR.2026 15:56:10

Conducted Spurious Emissions ***Highest Channel***



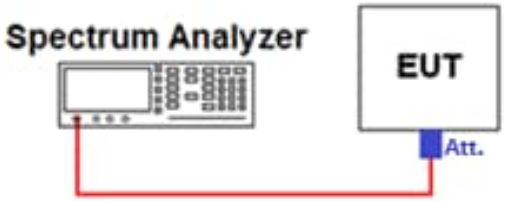
Date: 21.APR.2026 15:56:40



Date: 21.APR.2026 15:57:15

3. Carrier Frequency Separation

3.1. Test Setup



3.2. Limit

Limit : ≥ 25 kHz or ≥ 20 dB BW whichever is greater.

3.3 Test Procedure :

The carrier frequency separation was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function enabled.

After the trace being stable, the reading value between the peaks of the adjacent channels using the marker-delta function was recorded as the measurement results.

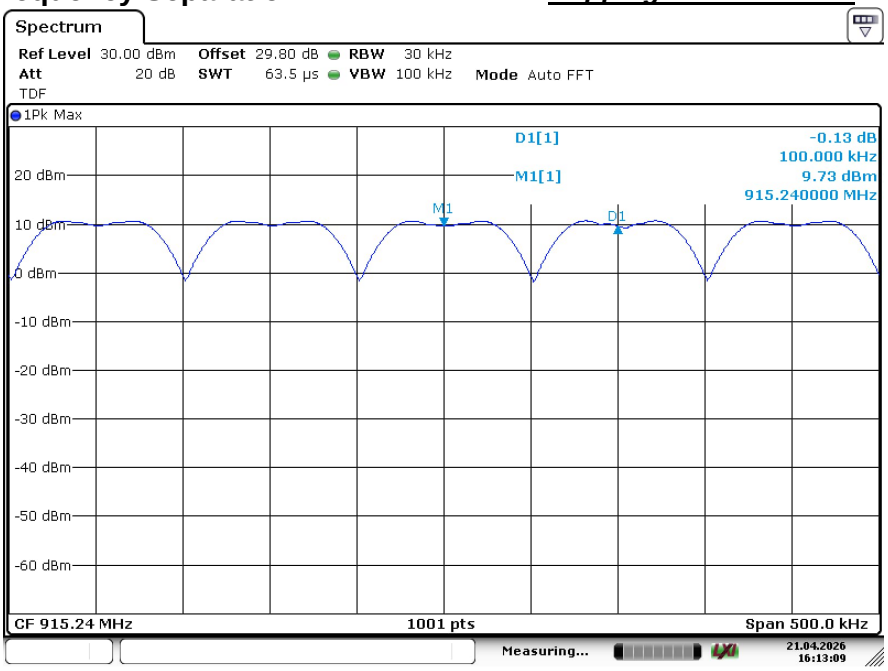
The spectrum analyzer is set to :
Span = wide enough to capture the peaks of two adjacent channels
RBW = Start with the RBW set to approximately 30 % of the channel spacing; adjust as necessary to best identify the center of each individual channel.
VBW ≥ RBW Sweep = auto
Detector function = peak Trace = max hold

3.4 Test Results :

Hopping Mode	Peak of center channel (MHz)	Peak of adjacent Channel (MHz)	Test Result (kHz)
Enable	**915.24**	**915.34**	**100**

Carrier Frequency Separation

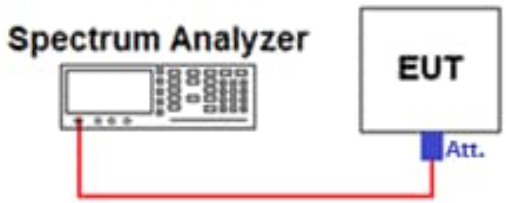
Hopping Mode : Enable



Date: 21.APR.2026 16:13:10

4. Number of Hopping Frequencies

4.1. Test Setup



4.2. Limit

Limit: >= 50 hops

4.3 Test Procedure :

The number of hopping frequencies was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function enabled.

To get higher resolution, two frequency ranges for FH mode within the 902 ~ 928 MHz were examined.

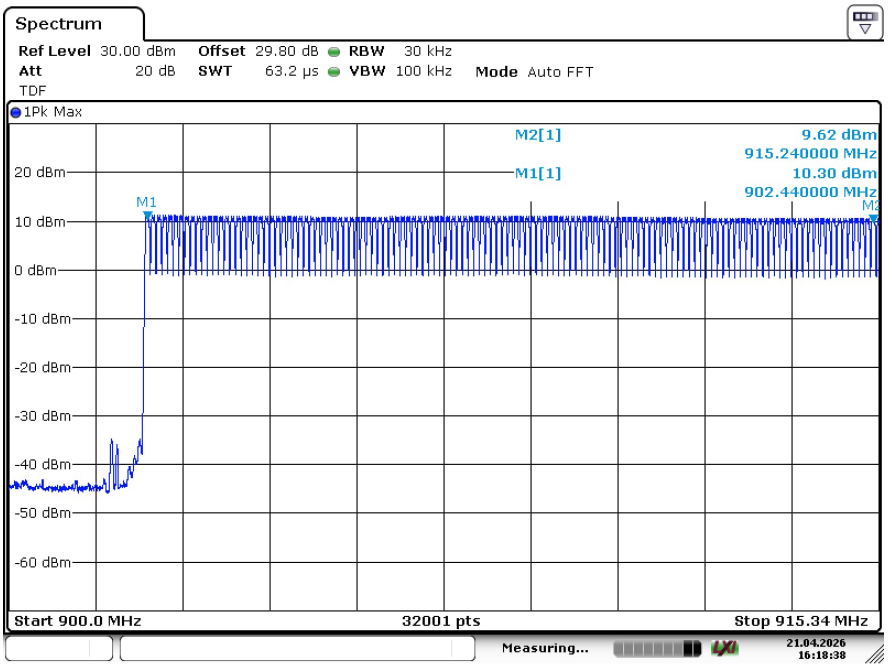
The spectrum analyzer is set to :
Span = 34.5 MHz Start Frequency = 897.75 MHz, Stop Frequency = 932.25 MHz
RBW = To identify clearly the individual channels, set the RBW to less than 30 % of the channel spacing or the 20 dB bandwidth, whichever is smaller.
VBW ≥ RBW Sweep = auto
Detector function = peak Trace = max hold

4.4 Test Results :

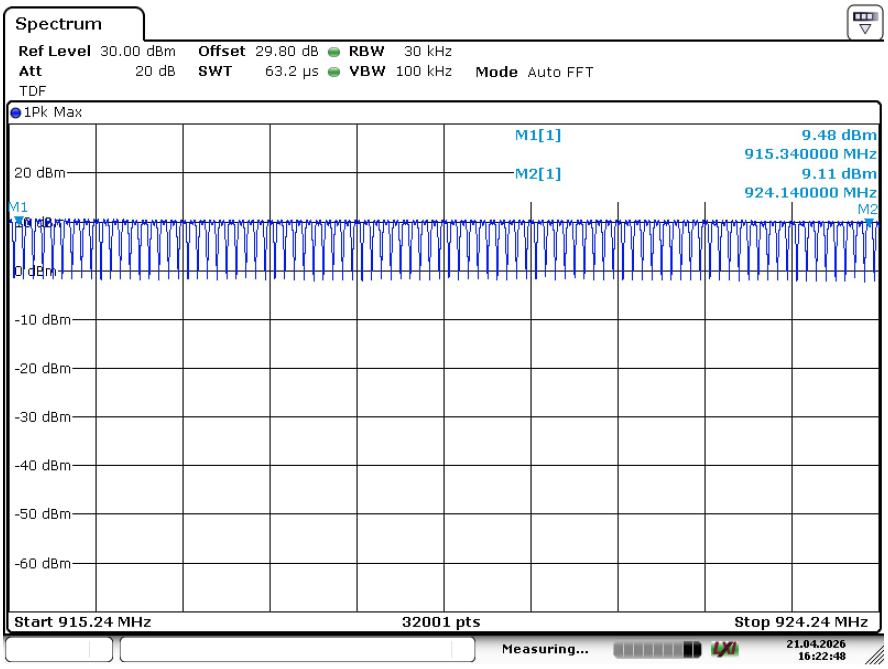
Hopping mode	Test Result (Total Hops)
Enable	248

Number of Hopping Frequencies

Hopping Mode : Enable



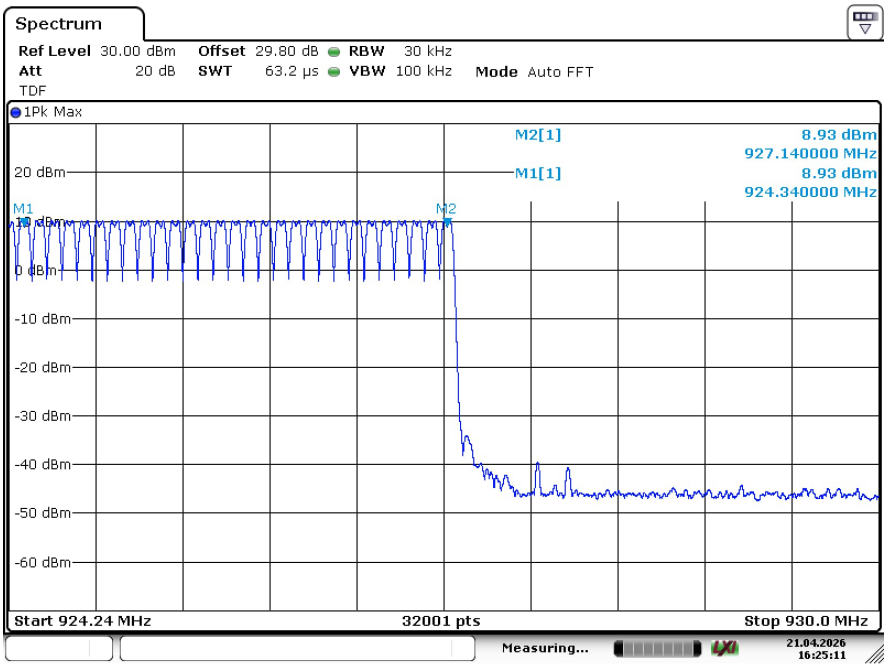
Date: 21.APR.2026 16:18:38



Date: 21.APR.2026 16:22:49

Number of Hopping Frequencies

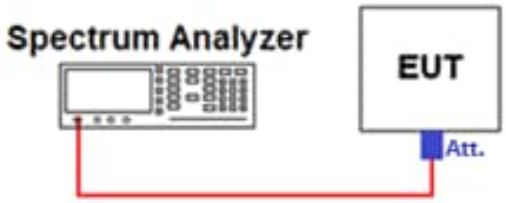
Hopping Mode : Enable



Date: 21.APR.2026 16:25:12

5. 20dBc BW

5.1. Test Setup



5.2. Limit

For frequency hopping systems operating in the 902-928 MHz band : if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

5.3. Test Procedure

1. The 20 dB bandwidth were measured with a spectrum analyzer connected to RF antenna Connector (conducted measurement) while EUT was operating in transmit mode. The analyzer center frequency was set to the EUT carrier frequency, using the analyzer.

2. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using below setting:

RBW = 1 % to 5 % of the 20 dB BW

VBW ≥ 3 × RBW

Span = between two times and five times the 20 dB bandwidth

Sweep = auto

Detector function = peak

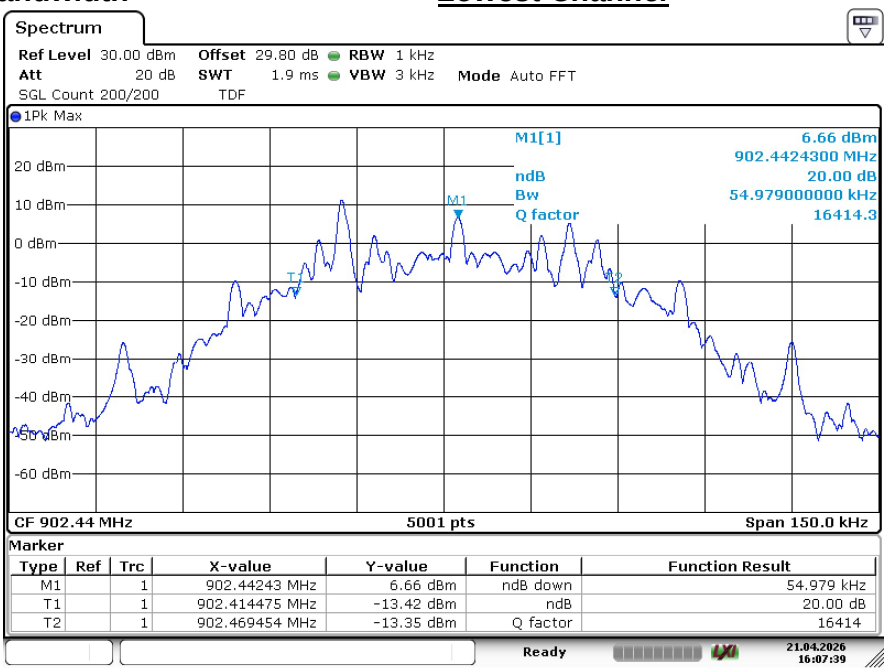
Trace = max hold

5.4. Test Results

Frequency (MHz)	Tested Channel	20 dBc BW (kHz)
910.2	Lowest	54.98
915.0	Middle	56.75
920.0	Highest	54.98

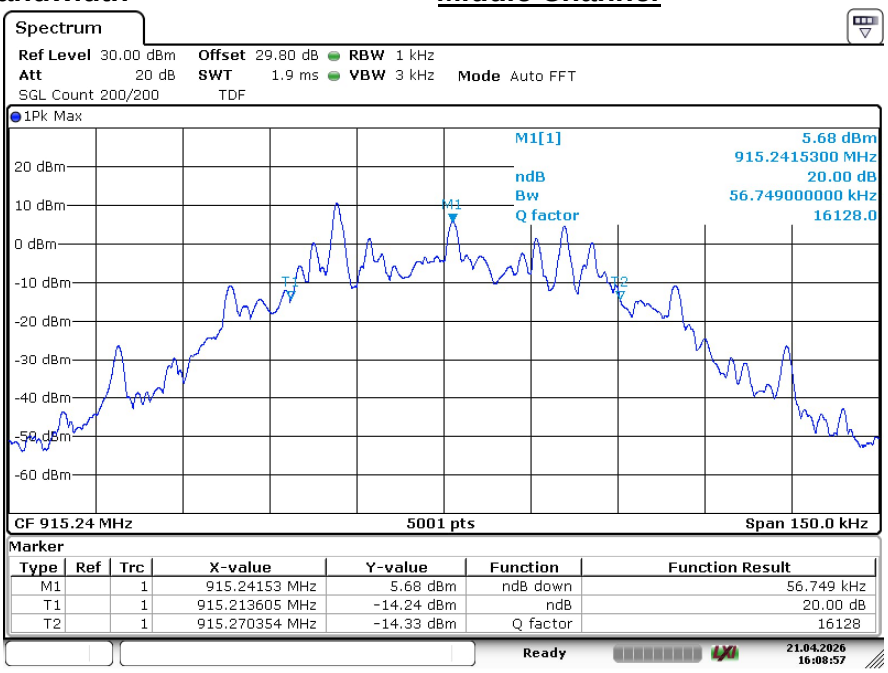
Note 1 : See next pages for actual measured spectrum plots.

20dBc Bandwidth ***Lowest Channel***



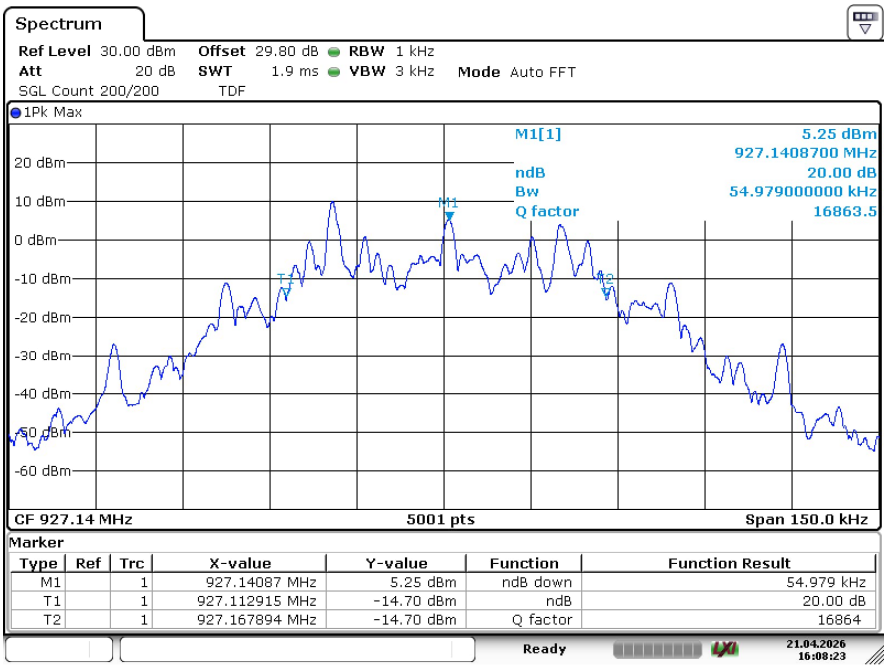
Date: 21.APR.2026 16:07:39

20dBc Bandwidth ***Middle Channel***



Date: 21.APR.2026 16:08:57

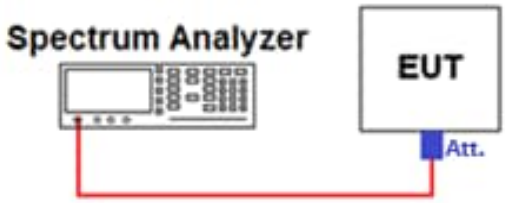
20dBc Bandwidth ***Highest Channel***



Date: 21.APR.2026 16:08:23

6. Time of Occupancy (Dwell Time)

6.1. Test Setup



6.2. Limit

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

6.3. Test Procedure

The dwell time was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function enabled.

The spectrum analyzer is set to :

Center frequency = 915.25 MHz Span = zero

RBW = 100 kHz (RBW shall be $\leq$ channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel)

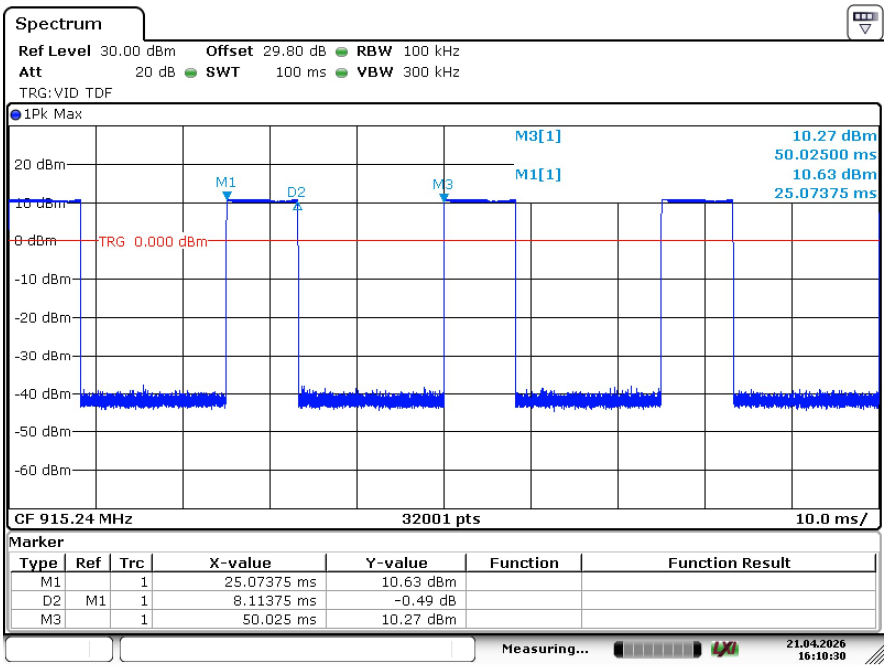
VBW $\geq$ RBW Detector function = peak

Trace = max hold

6.4. Test Results

Channel Frequency (MHz)	Length (ms)	Number	Dwell Time (ms)
915.24	8.114	4	32.50

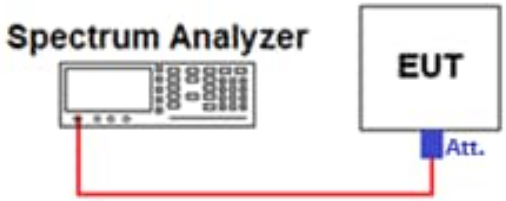
Length & Period



Date: 21.APR.2026 16:10:30

7. Maximum Peak Output Power Measurement

7.1. Test Setup



7.2. Limit

The maximum peak output power of the intentional radiator shall not exceed the following :

1. §15.247(b)(2), For frequency hopping systems operating in the 902 - 928 MHz band : 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels,

7.3. Test Procedure

1. The RF power output was measured with a Spectrum analyzer connected to the RF Antenna connector (conducted measurement) while EUT was operating in transmit mode at the appropriate center frequency, A spectrum analyzer was used to record the shape of the transmit signal.

2. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using ;

RBW ≥ 20 dB BW

VBW ≥ RBW

Sweep = auto

Detector function = peak

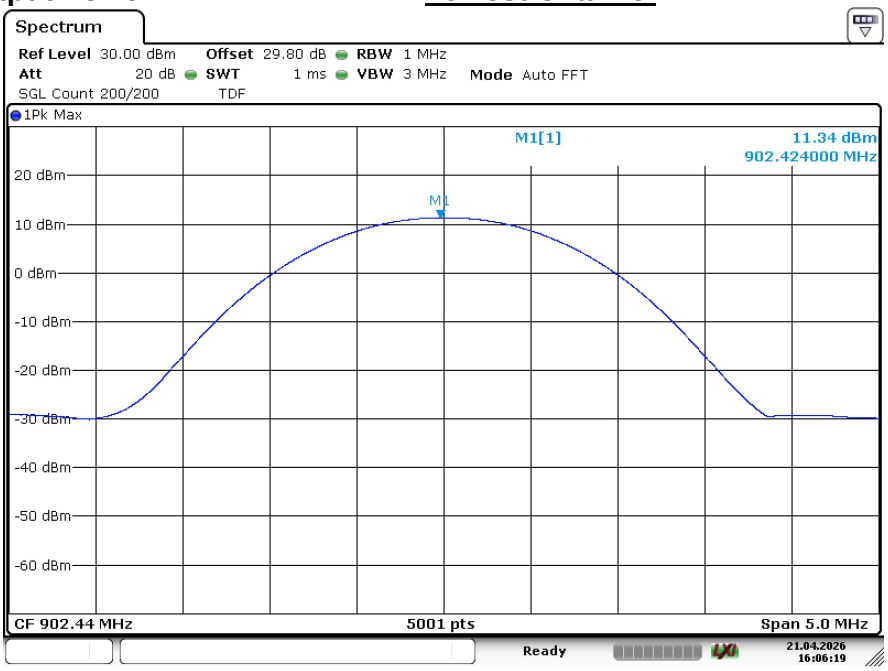
Trace = max hold

7.4. Test Results

Tested Channel	Peak Output Power	
	dBm	mW
Lowest	11.34	13.614
Middle	10.74	11.858
Highest	10.07	10.162

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

Peak Output Power ***Lowest Channel***



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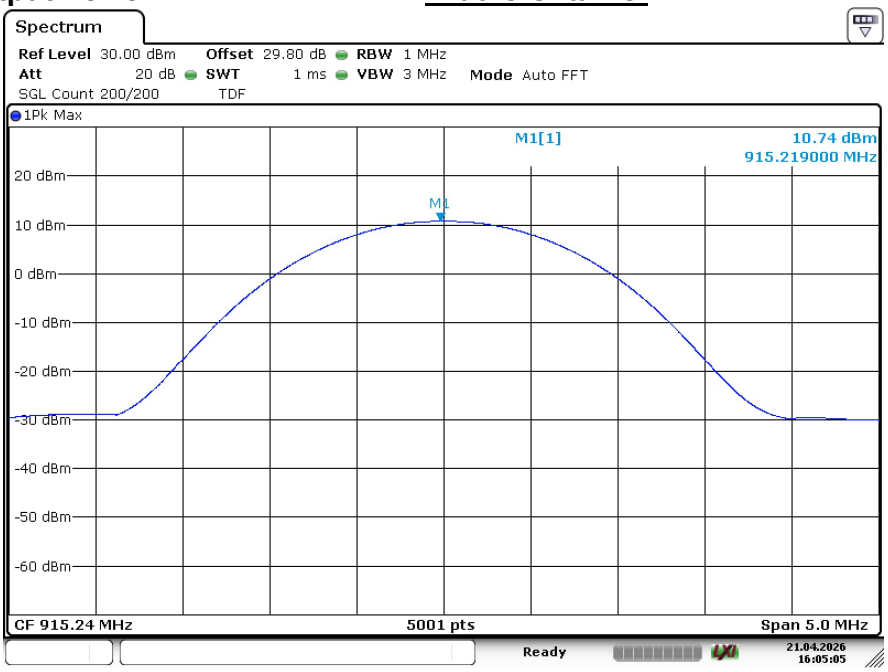
Peak Output Power ***Middle Channel***



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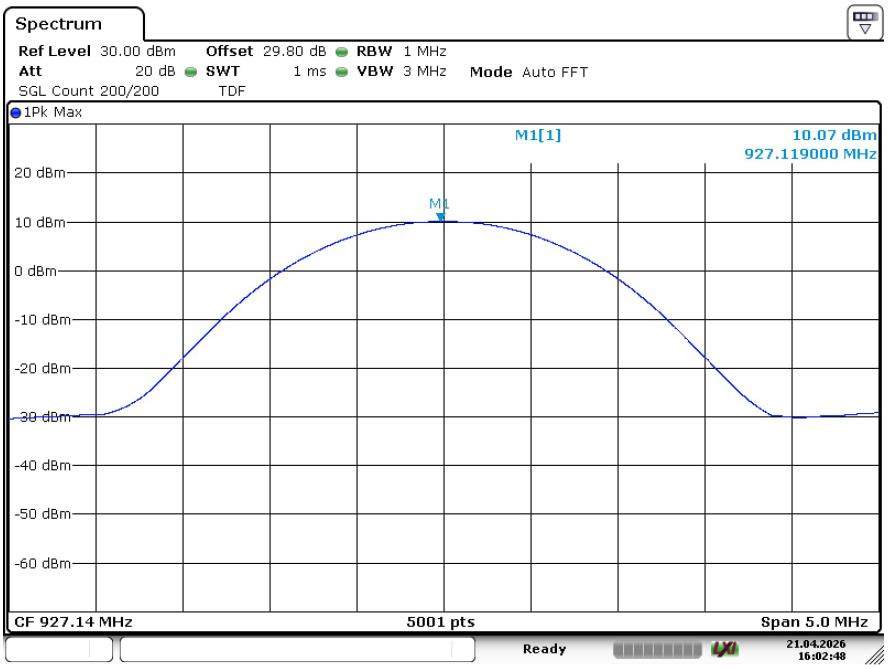
Peak Output Power ***Highest Channel***



Date: 21.APR.2026 16:02:48

8. Transmitter AC Power Line Conducted Emission

8.1. Test Setup

See test photo graphs for the actual connections between EUT and support equipment.

8.2. Limit

According to §15.207(a) for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 uH/50 ohm line impedance stabilization network(LISN).

Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequency ranges.

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

8.3. Test Procedures

Conducted emissions from the EUT were measured according to the dictates of ANSI C63.4:2003

1. The test procedure is performed in a 6.5 m × 3.5 m × 3.5 m (L × W × H) shielded room. The EUT along with its peripherals were placed on a 1.0 m (W) × 1.5 m (L) and 0.8 m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.
2. The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room.
3. All peripherals were connected to the second LISN and the chassis ground also bounded to the horizontal ground plane of shielded room.
4. The excess power cable between the EUT and the LISN was bundled. The power cables of peripherals were unbundled. All connecting cables of EUT and peripherals were moved to find the maximum emission.

8.4. Test Results

- N/A

9. Antenna Requirement

9.1 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.

9.2 Conclusion : Comply

The internal antennas of this EUT are permanently attached.

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 antennaor of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions.

- END.