

FCC & IC Test Report

No. 160502874SHA-006

Applicant : RAE Systems Inc.
3775 N. 1st St., San Jose, California USA 95134.

Manufacturer : RAE Systems Inc.
3775 N. 1st St., San Jose, California USA 95134.

Product Name : AreaRAE Pro, AreaRAE Plus

Type/Model : PGM-6560D(AreaRAE Pro),
PGM-6520D(AreaRAE Plus)

TEST RESULT : PASS

SUMMARY

The equipment complies with the requirements according to the following standard(s) or specification:

47CFR Part 15 (2014): Radio Frequency Devices (Subpart C)

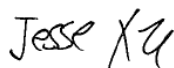
ANSI C63.10 (2013): American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

RSS-247 Issue 1 (May 2015): Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

RSS-Gen Issue 4 (December 2014): General Requirements for Compliance of Radio Apparatus

Date of issue: June 08, 2016

Prepared by:



Jesse Xu (*Project Engineer*)

Reviewed by:



Daniel Zhao (*Reviewer*)



Description of Test Facility

Name: Intertek Testing Service Limited Shanghai
Address: Building No.86, 1198 Qinzhou Road(North), Shanghai 200233, P.R.
China

FCC Registration Number: 236597
IC Assigned Code: 2402B-1

Name of contact: Jonny Jing
Tel: 86 21 61278271
Fax: 86 21 54262353

Content

SUMMARY.....	1
1 GENERAL INFORMATION	5
1.1 Description of Client.....	5
1.2 Identification of the EUT.....	5
1.3 Technical Specification.....	6
2 TEST SPECIFICATIONS.....	7
2.1 Standards or specification	7
2.2 Mode of operation during the test.....	7
2.3 Test software list	7
2.4 Test peripherals list	7
2.5 Instrument list	8
2.6 Test Summary	9
3 MINIMUM 6dB BANDWIDTH	10
3.1 Limit.....	10
3.2 Test Configuration	10
3.3 Test Procedure and test setup.....	10
3.4 Test Protocol	11
4 MAXIMUM CONDUCTED OUTPUT POWER	13
4.1 Test limit	13
4.2 Test Configuration	13
4.3 Test procedure and test setup.....	14
4.4 Test protocol	15
5 POWER SPECTRUM DENSITY	16
5.1 Test limit	16
5.2 Test Configuration	16
5.3 Test procedure and test setup.....	17
5.4 Test Protocol	18
6 EMISSION OUTSIDE THE FREQUENCY BAND.....	20
6.1 Test limit	20
6.2 Test Configuration	20
6.3 Test procedure and test setup.....	20
6.4 Test Protocol	22
7 RADIATED EMISSIONS IN RESTRICTED FREQUENCY BANDS.....	29
7.1 Test limit	29
7.2 Test Configuration	29
7.3 Test procedure and test setup.....	30
7.4 Test Protocol	31
8 POWER LINE CONDUCTED EMISSION	36
8.1 Limit.....	36
8.2 Test configuration	36
8.3 Test procedure and test set up.....	37
8.4 Test protocol	38
9 OCCUPIED BANDWIDTH.....	40
9.1 Test limit	40
9.2 Test Configuration	40



9.3 Test procedure and test setup40
9.4 Test protocol41

1 GENERAL INFORMATION

1.1 Description of Client

Applicant : RAE Systems Inc.
3775 N. 1st St., San Jose, California USA 95134.

Name of contact : James Pan

Tel : 408-9528217

Fax : 408-952-8487

Email : Jungsyng.Pan@Honeywell.com

Manufacturer : RAE Systems Inc.
3775 N. 1st St., San Jose, California USA 95134.

1.2 Identification of the EUT

Product Name : AreaRAE Pro, AreaRAE Plus

Type/model : PGM-6560D(AreaRAE Pro),
PGM-6520D(AreaRAE Plus)

FCC ID : SU3-6560D

IC : 20969-6560D

1.3 Technical Specification

Operation Frequency	: 2412~2462 MHz;
Band	
Type of Modulation	: CCK,BPSK,QPSK
EUT Modes of Modulation	: IEEE 802.11b
Channel Number	: 11 channels
Description of EUT	: The EUT is a wireless device with BLE,WIFI,Mesh, and freewave 915MHz function.The freewave module has got the certificate. Among this report, only Wi-Fi function was assessed. We tested the 2412CH , 2437CH and 2462CH and listed the worst data in this report. Only different between PGM-6560D and PGM-6520D is the gas detector.
Antenna	: Dipole Omni, 4.9dBi
Rating	: Switching Adapter supply: Model: EA11001A-120 Input: AC 100-240V, 50/60Hz, 2.5A Output: DC 12V, 7.5A Built-in battery 7.2V internal battery: 1900mAH, 3.7V
Declared Temperature range	: -20°C ~ 60°C
Category of EUT	: Class B
EUT type	: <input checked="" type="checkbox"/> Table top <input type="checkbox"/> Floor standing
Software applied	: SSCOM3.2
Sample received date	: April 08, 2016
Date of test	: April 10, 2016 ~May 25, 2016

2 TEST SPECIFICATIONS

2.1 Standards or specification

47CFR Part 15 (2014)
 RSS-247 Issue 1 (May 2015)
 RSS-Gen Issue 4 (December 2014)
 ANSI C63.10 (2013)
 KDB 558074 (v03r03)

2.2 Mode of operation during the test

While testing transmitting mode of EUT, the internal modulation and continuously transmission was applied.

2.3 Test software list

Test Items	Software	Manufacturer	Version
Conducted emission	ESxS-K1	R&S	V2.1.0
Radiated emission	ES-K1	R&S	V1.71

2.4 Test peripherals list

Item No.	Name	Band and Model	Description
PC	HP ProBook 6450b	HP	-

2.5 Test software setting:

The power level setting for 802.11b is used with SSCOM3.2 software offered by the client. The lowest, middle and highest channel were tested as representatives. After this pre-scan, we choose the following table of the data rate as the worst case.

Freq. Band	Modulation	Worst case data rate
2400-2483.5MHz	802.11b	1Mbps

2.6 Instrument list

Equipment	Type	Manu.	Internal no.	Cal. Date	Due date
Test Receiver	ESCS 30	R&S	EC 2107	2015-10-21	2016-10-20
Test Receiver	ESIB 26	R&S	EC 3045	2015-10-20	2016-10-19
Test Receiver	ESCI 7	R&S	EC4501	2015-12-29	2016-12-28
Spectrum Analyzer	N9010	Agilent	EC4890	2015-10-21	2016-10-20
Spectrum Analyzer	E4446	Agilent	/	2015-10-21	2016-10-20
Power meter	ML 2495A	Anritsu	EC 4895	2015-10-21	2016-10-20
A.M.N.	ESH2-Z5	R&S	EC 3119	2016-1-9	2017-1-8
Bilog Antenna	CBL 6112D	TESEQ	EC 4206	2016-5-15	2017-5-14
Horn antenna	HF 906	R&S	EC 3049	2016-5-12	2017-5-11
Pre-amplifier	Pre-amp 18	R&S	EC 3222	2016-4-11	2017-4-10
Pre-amplifier	Tpa0118-40	R&S	EC 4792-2	2016-4-11	2017-4-10
Log-period antenna	AT 1080	AR	EC 3044-7	2016-5-21	2017-5-20
Biconical antenna	3109PX	ETS	EC3564	2014-8-25	2015-8-24
Semi-anechoic chamber	-	Albatross project	EC 3048	2016-5-20	2017-5-19
Shielded room	-	Zhongyu	EC 2838	2016-1-12	2017-1-11
Shielded room	-	Zhongyu	EC 2839	2016-1-12	2017-1-11
High Pass Filter	WHKX 1.0/15G-10SS	Wainwright	EC4297-1	2016-2-1	2017-1-31
High Pass Filter	WHKX 2.8/18G-12SS	Wainwright	EC4297-2	2016-2-1	2017-1-31
High Pass Filter	WHKX 7.0/1.8G-8SS	Wainwright	EC4297-3	2016-2-1	2017-1-31
Band Reject Filter	WRCGV 2400/2483-2390/2493-35/10SS	Wainwright	EC4297-4	2016-2-1	2017-1-31
MXG Analog Signal Generator	N5181A	KEYSIGHT	EC5338-2	2015-11-7	2016-11-6
MXG Vector Signal Generator	N51812B	KEYSIGHT	EC5175	2015-12-30	2016-12-29
Power sensor	U2021XA	KEYSIGHT	EC5338-1	2015-10-2	2016-10-1
PXA Signal Analyzer	N9030A	KEYSIGHT	EC5338	2015-11-18	2016-11-17

2.7 Test Summary

This report applies to tested sample only. The test results have been compared directly with the limits, and the measurement uncertainty is recorded. This report shall not be reproduced in part without written approval of Intertek Testing Service Shanghai Limited.

TEST ITEM	FCC REFERENCE	IC REFERENCE	RESULT
Minimum 6dB Bandwidth & Occupied bandwidth	15.247(a)(2)	RSS-247 Issue 1 Annex 5.2	Pass
Maximum peak output power	15.247(b)	RSS-247 Issue 1 Annex 5.4	Pass
Power spectrum density	15.247(e)	RSS-247 Issue 1 Annex 5.2	Pass
Radiated emission	15.205 & 15.209	RSS-Gen Issue 4 Clause 8.9	Pass
Emission outside the frequency band	15.247(d)	RSS-247 Issue 1 Annex 5.5	Pass
Power line conducted emission	15.207	RSS-Gen Issue 4 Clause 8.8	Pass
Occupied bandwidth	-	RSS-Gen Issue 4 Clause 6.6	Tested

Notes: 1: NA =Not Applicable

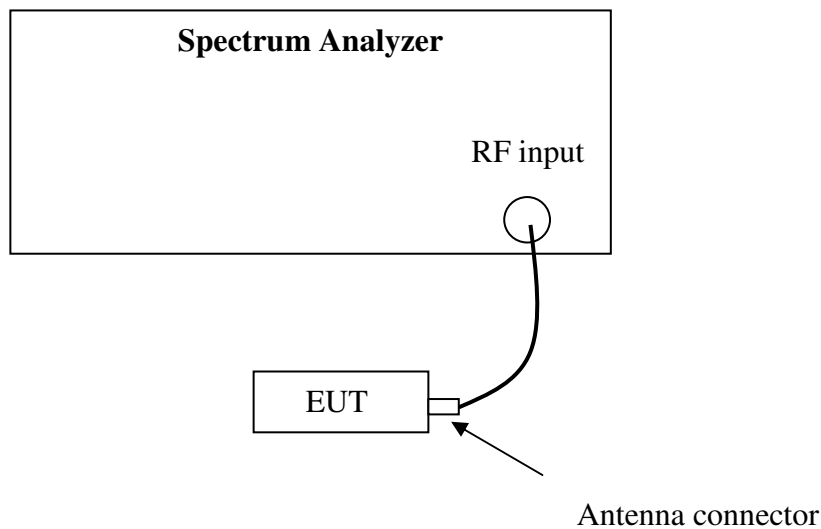
3 Minimum 6dB Bandwidth

Test result: Pass

3.1 Limit

For systems using digital modulation techniques that may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz and 5725 - 5850 MHz bands, the minimum 6 dB bandwidth shall be at least 500 kHz.

3.2 Test Configuration



3.3 Test Procedure and test setup

The minimum 6dB bandwidth per FCC §15.247(a)(2) is measured using the Spectrum Analyzer according to DTS test procedure of “KDB558074 D01 DTS Meas Guidance v03r03” for compliance to FCC 47CFR 15.247 requirements (clause 8.2).

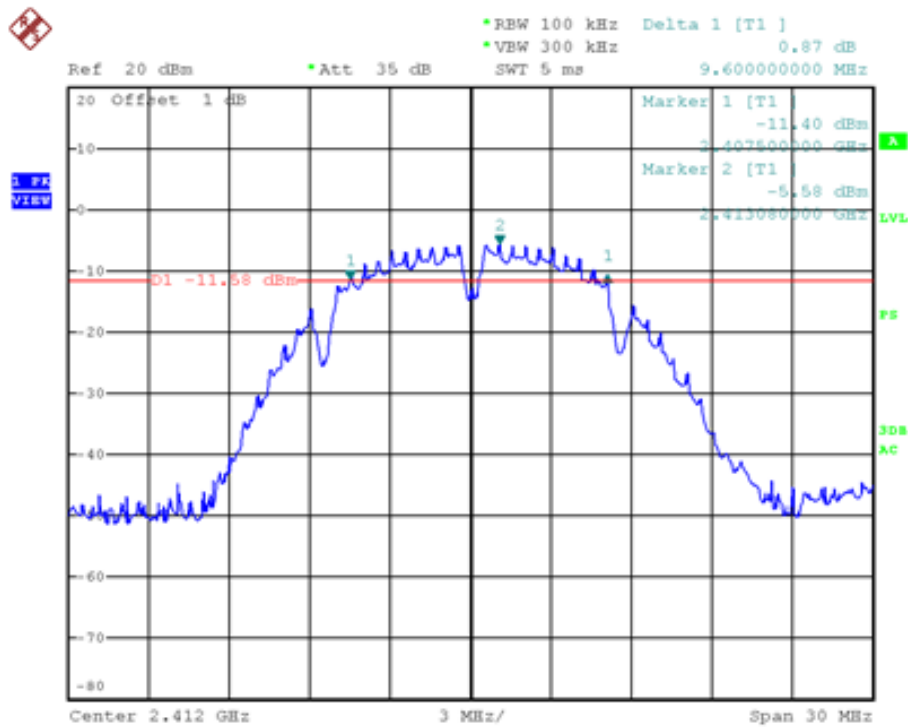
- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

3.4 Test Protocol

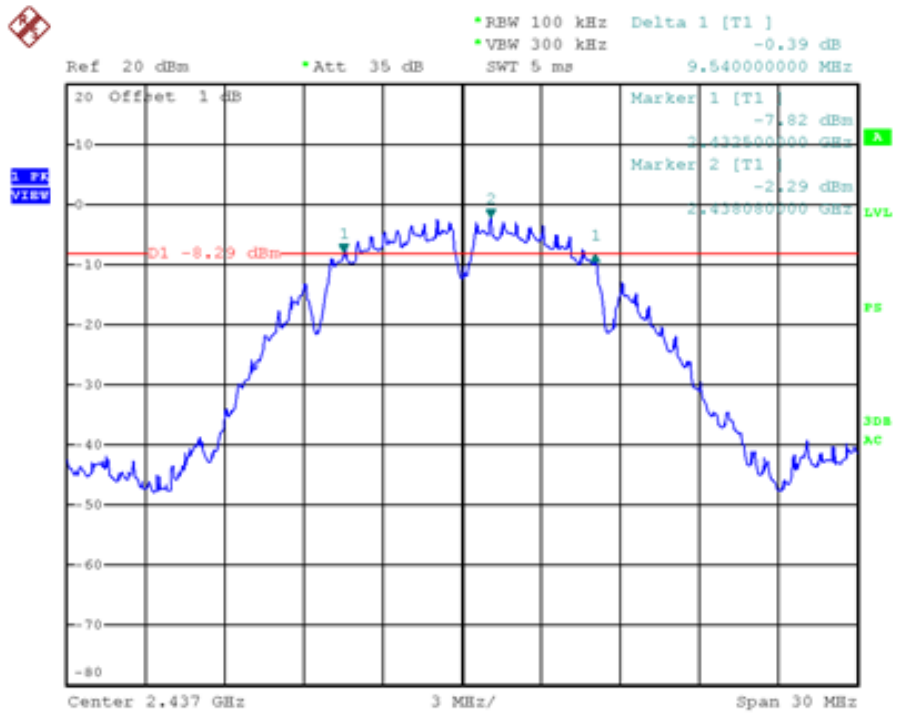
Temperature: 24 °C
Relative Humidity: 52 %

Mode	Frequency (MHz)	Minimum 6dB Bandwidth (MHz)			Limits (MHz)
		Port0	Port 1	Port 2	
-	2412	9.60	-	-	> 0.5
	2437	9.54	-	-	> 0.5
	2462	9.60	-	-	> 0.5

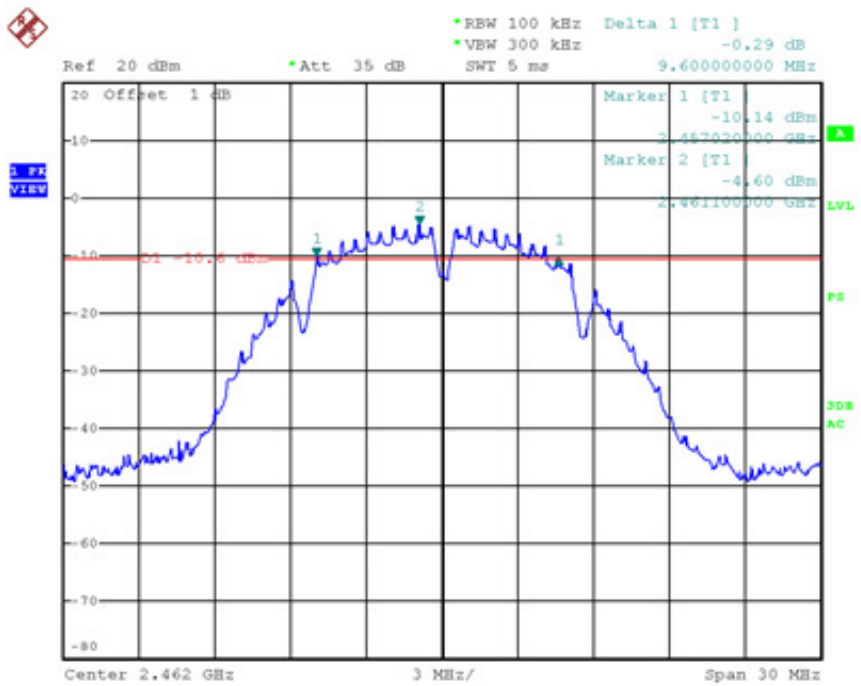
Channel L



Channel M



Channel H



4 Maximum Conducted Output power

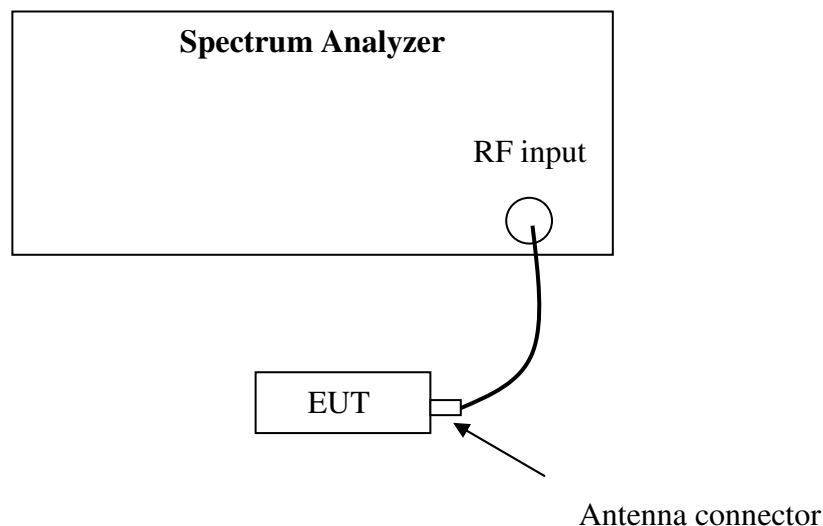
Test result: Pass

4.1 Test limit

- For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt
- For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts
- For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt (EIRP: 4 watt).

If the transmitting antenna of directional gain greater than 6dBi is used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. If there have a beam forming type, the limit should be the minimum of 30dBm and $30 + (6 - \text{antenna gain} - \text{beam forming gain})$.

4.2 Test Configuration



4.3 Test procedure and test setup

The EUT was tested according to DTS test procedure of “KDB558074 D01 DTS Meas Guidance v03r03” for compliance to FCC 47CFR 15.247 requirements (clause 9.1.2).

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

4.4 Test protocol

Temperature: 24 °C
Relative Humidity: 52 %

Mode	Frequency (MHz)	Reading (dBm)			Total Power (dBm)	Limit (dBm)
		Port0	Port 1	Port 2		
-	2412	12.08	-	-	12.08	30
	2437	12.33	-	-	12.33	30
	2462	12.45	-	-	12.45	30

The maximum EIRP of the EUT = 12.45dBm +4.9dBi = 17.35dBm = 54.32mW which is lower than the EIRP limit of RSS-247.

Note:

Reading port x (mW) = $10^{(\text{reading port x (dBm)}/10)}$
x = 0, 1, 2.

Total Power (mW) = reading port 0 (mW) + reading port 1 (mW) + reading port 2 (mW)

Total power (dBm) = $10 * \log(\text{Total power (mW)})$

5 Power spectrum density

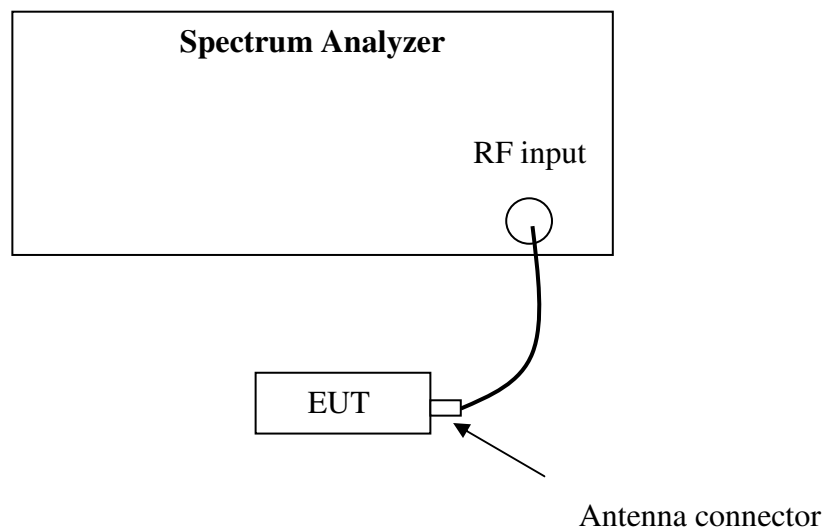
Test result: Pass

5.1 Test limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

If the transmitting antenna of directional gain greater than 6dBi is used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi. If there have a beam forming type, the limit should be the minimum of 8dBm/MHz and $8 + (6 - \text{antenna gain} - \text{beam forming gain})$.

5.2 Test Configuration



5.3 Test procedure and test setup

The power output per FCC §15.247(e) was tested according to DTS test procedure of “KDB558074 D01 DTS Meas Guidance v03r02” (clause 10.2) for compliance to FCC 47CFR 15.247 requirements.

- a) Set analyzer center frequency to DTS channel center frequency.
- b) Set the span to 1.5 times the *DTS bandwidth*.
- c) Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- d) Set the VBW $\geq 3 \times \text{RBW}$.
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum amplitude level within the RBW.
- j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

5.4 Test Protocol

Temperature: 24 °C
Relative Humidity: 52 %

Mode	Frequency (MHz)	PSD (dBm)			Total PSD (dBm)	Limit (dBm)
		Port 0	Port 1	Port 2		
-	2412	-5.12	-	-	-5.12	8
	2437	-2.59	-	-	-2.59	8
	2462	-4.84	-	-	-4.84	8

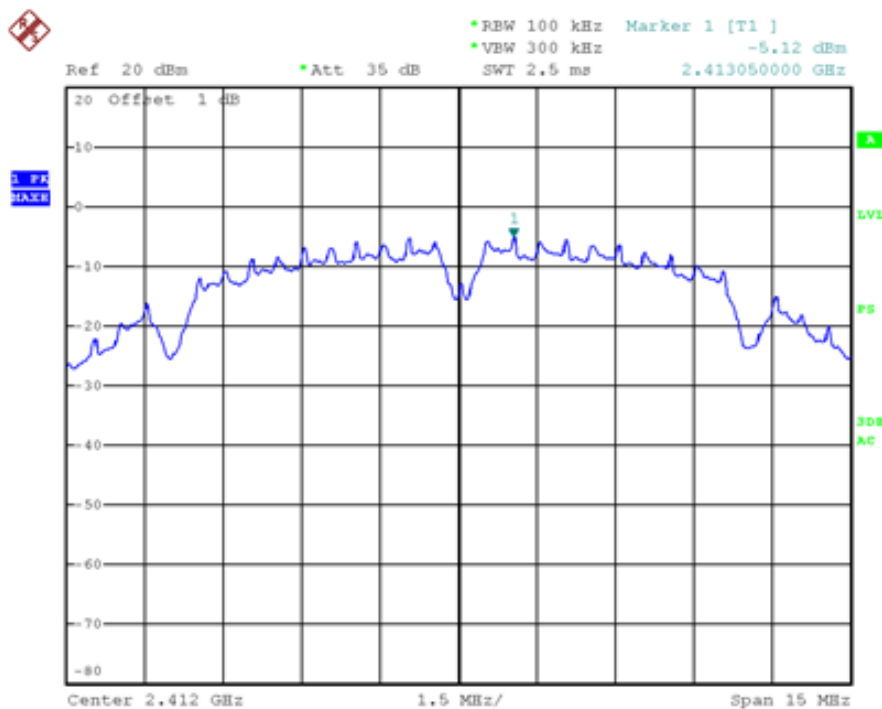
Note 1:

$$\text{PSD port } x \text{ (mW)} = 10^{(\text{PSD port } x \text{ (dBm)}/10)}; x = 0, 1, 2.$$

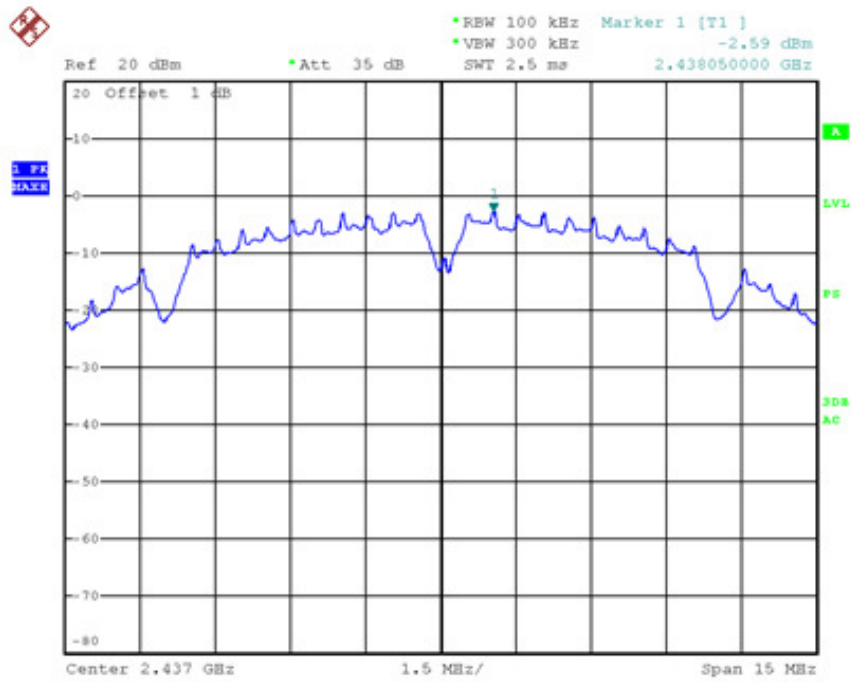
$$\text{Total PSD (mW)} = \text{PSD port 0 (mW)} + \text{PSD port 1 (mW)} + \text{PSD port 2 (mW)}$$

$$\text{Total PSD (dBm)} = 10 * \log(\text{Total PSD (mW)})$$

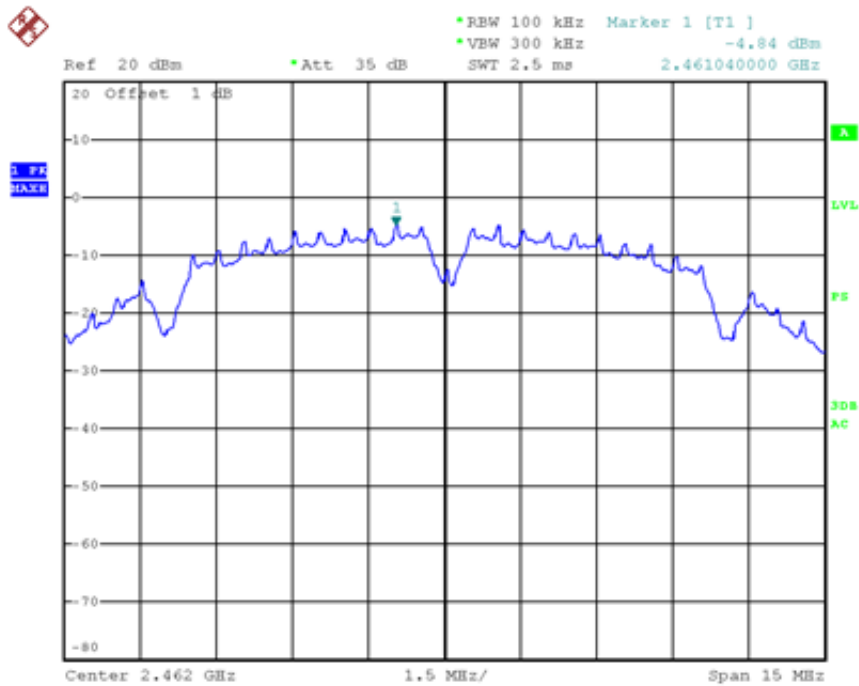
Channel L



Channel M



Channel H



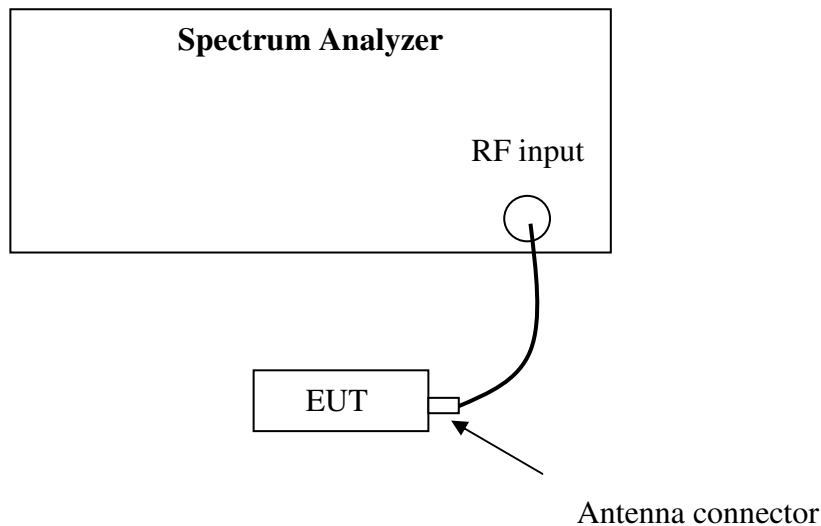
6 Emission outside the frequency band

Test result: Pass

6.1 Test limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.

6.2 Test Configuration



6.3 Test procedure and test setup

The EUT was tested according to DTS test procedure of "KDB558074 D01 DTS Meas Guidance v03r03" (clause 11.0) for compliance to FCC 47CFR 15.247 requirements.

Reference level measurement

Establish a reference level by using the following procedure:

- a) Set instrument center frequency to DTS channel center frequency.
- b) Set the span to ≥ 1.5 times the *DTS bandwidth*.
- c) Set the RBW = 100 kHz.
- d) Set the VBW $\geq 3 \times$ RBW.
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.

- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum PSD level.

Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

Emission level measurement

- a) Set the center frequency and span to encompass frequency range to be measured.
- b) Set the RBW = 100 kHz.
- c) Set the VBW $\geq 3 \times$ RBW.
- d) Detector = peak.
- e) Sweep time = auto couple.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use the peak marker function to determine the maximum amplitude level.

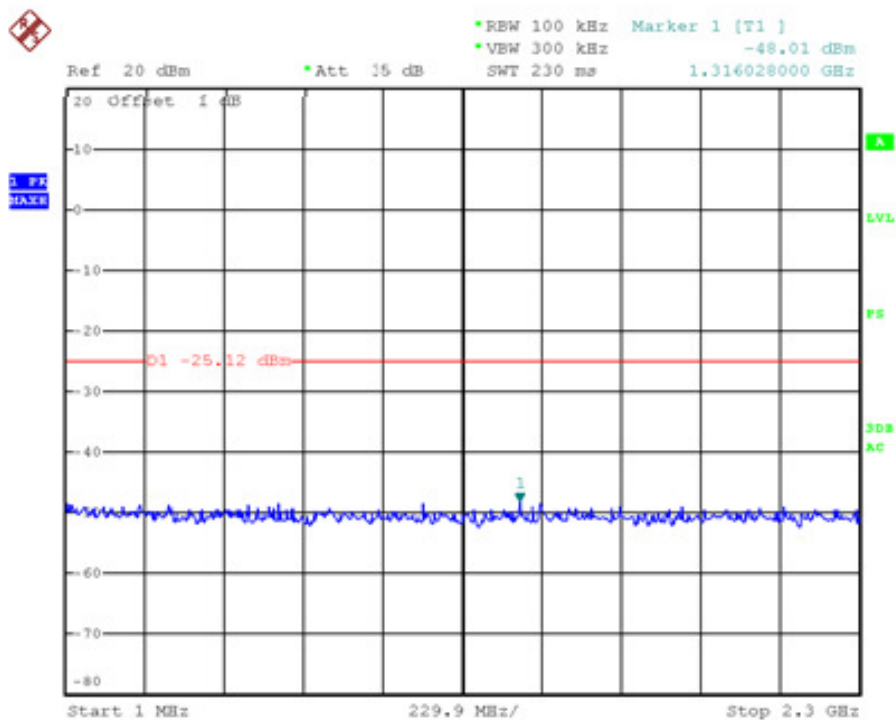
Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements specified in 11.1 a) or 11.1 b). Report the three highest emissions relative to the limit.

6.4 Test Protocol

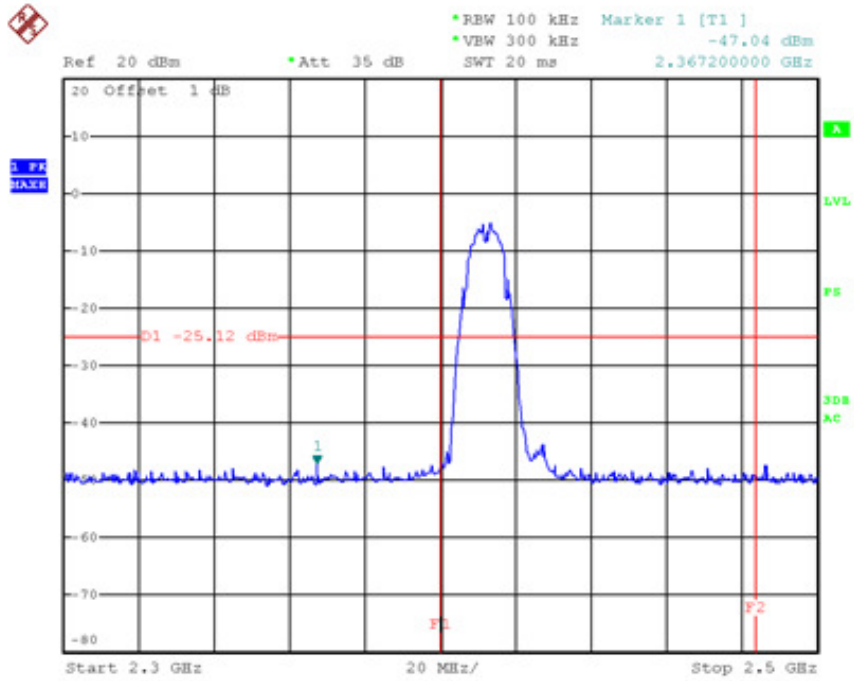
Temperature: 24 °C
Relative Humidity: 52 %

Mode	Frequency (MHz)	Results	Limits (dB)
-	2412	Pass	≥20
	2437	Pass	≥20
	2462	Pass	≥20

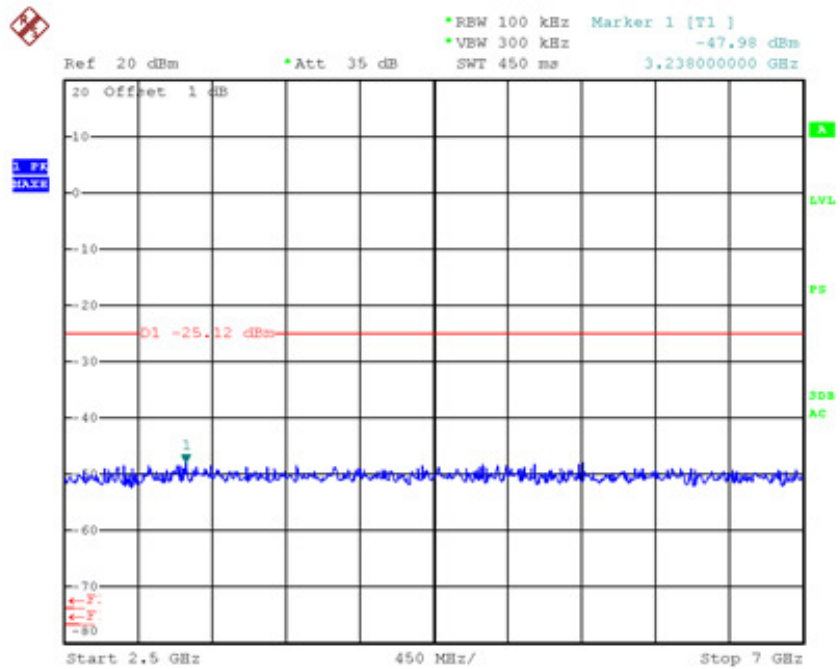
Channel L - 1MHz ~ 2.3GHz



Channel L – 2.3GHz ~ 2.5GHz



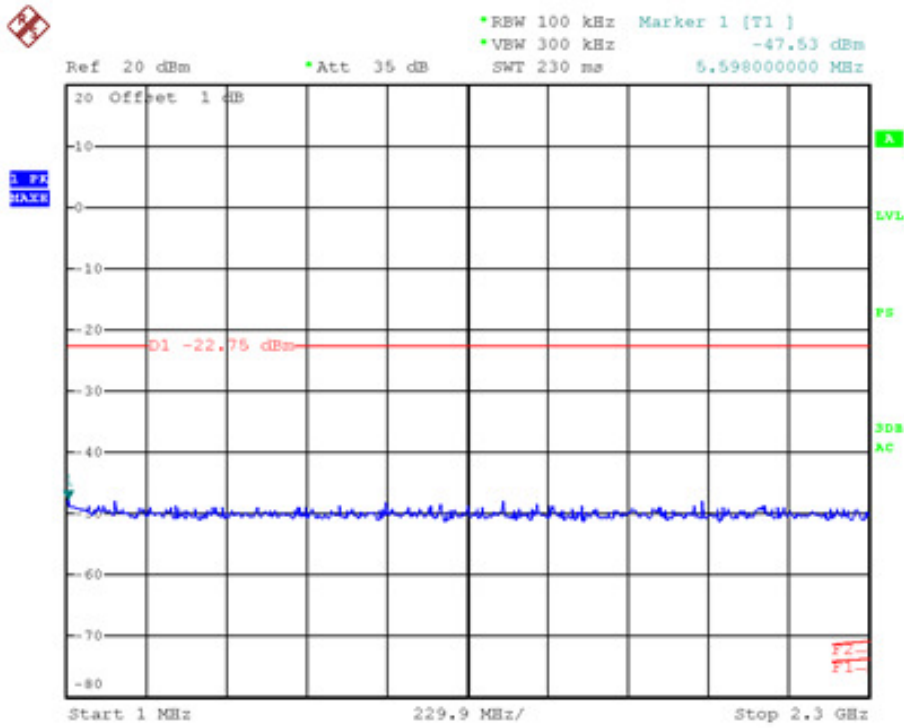
Channel L – 2.5GHz ~ 7GHz



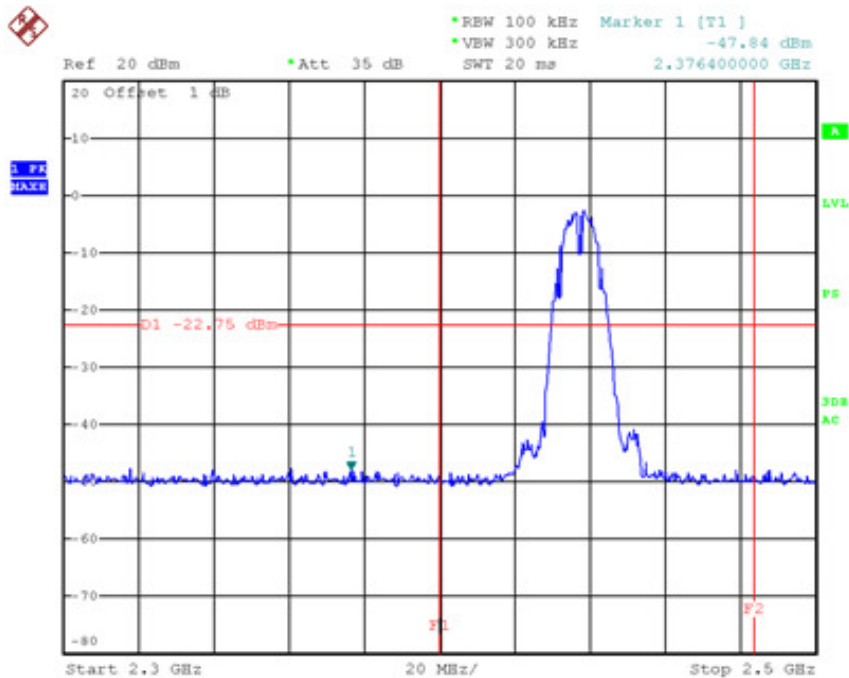
Channel L – 7GHz ~ 25GHz



Channel M - 1MHz ~ 2.3GHz

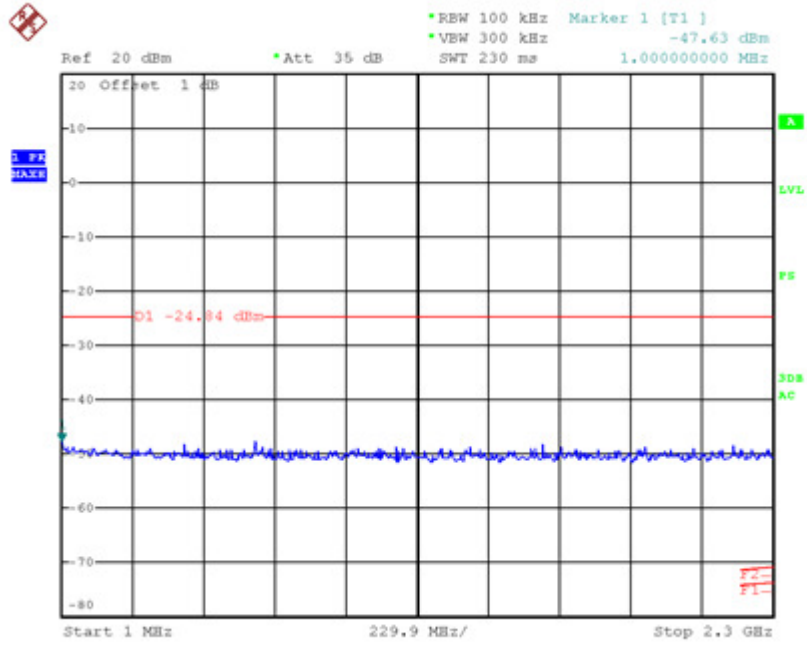


Channel M – 2.3GHz ~ 2.5GHz

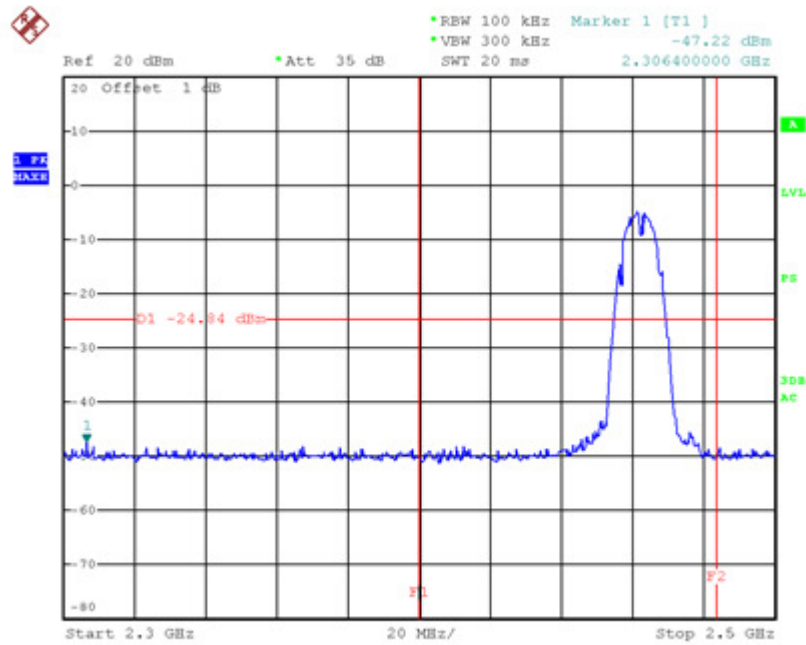


Channel M – 2.5GHz ~ 7GHz

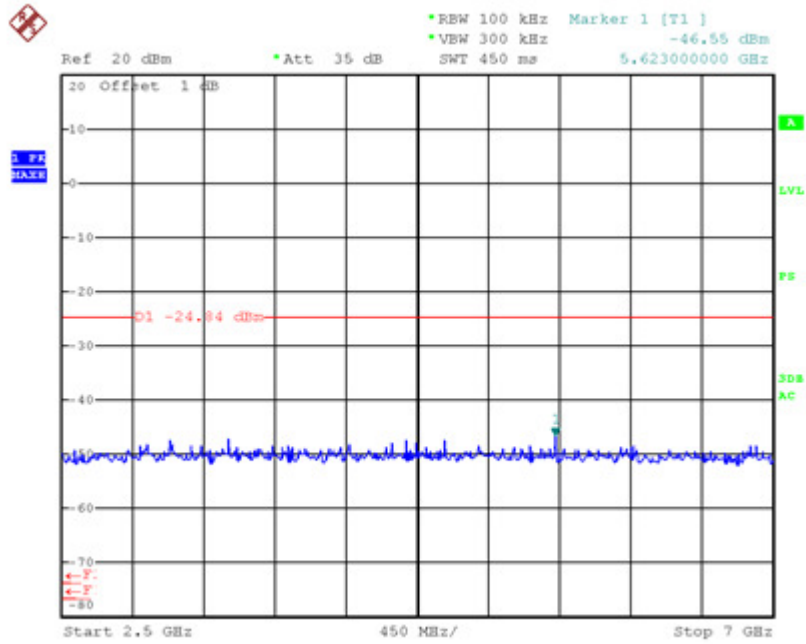
Channel H - 1MHz ~ 2.3GHz



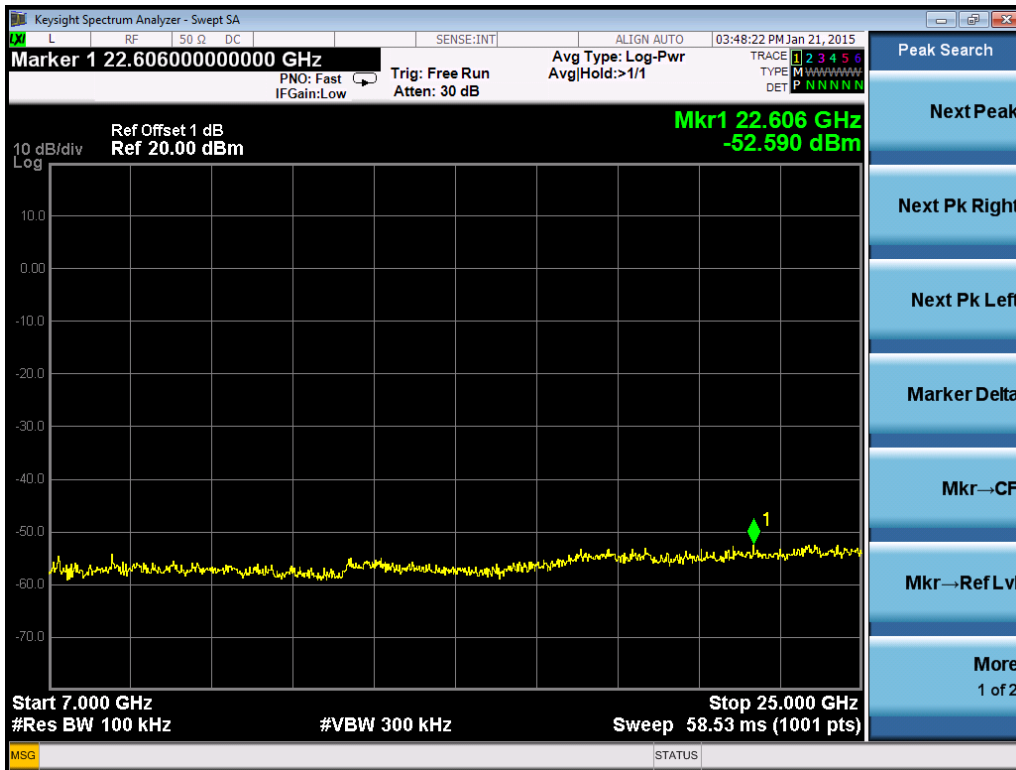
Channel H - 2.3GHz ~ 2.5GHz



Channel H – 2.5GHz ~ 7GHz



Channel H – 7GHz ~ 25GHz



7 Radiated Emissions in restricted frequency bands

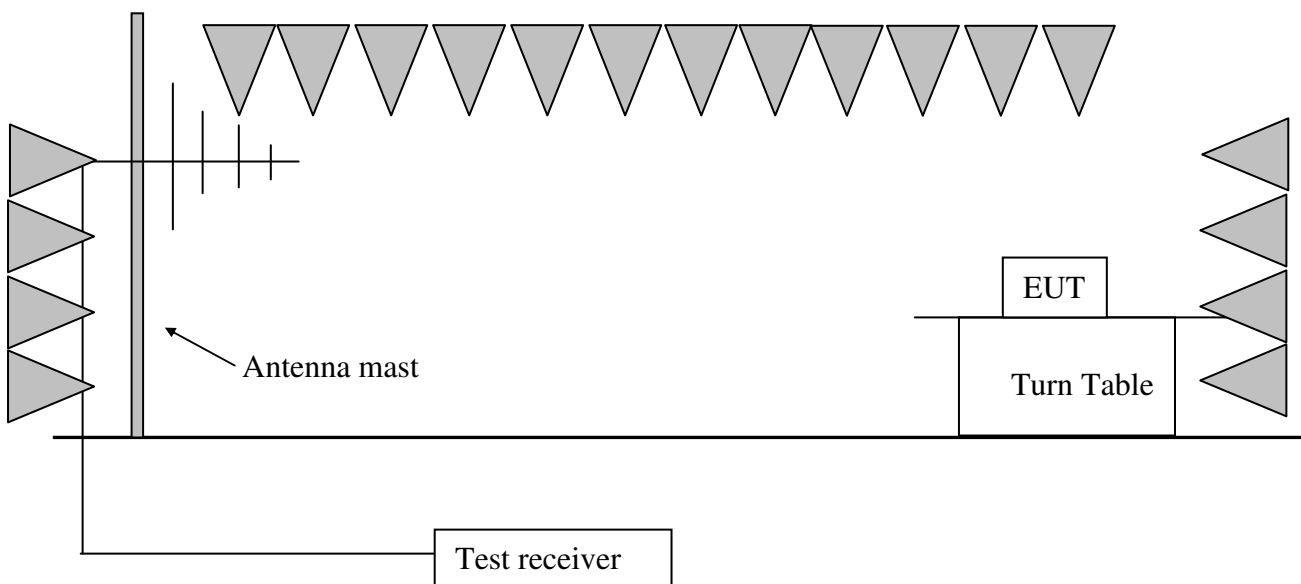
Test result: Pass

7.1 Test limit

The 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) showed as below:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
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

7.2 Test Configuration



7.3 Test procedure and test setup

The measurement was applied in a semi-anechoic chamber. While testing for spurious emission higher than 1GHz, if applied, the pre-amplifier would be equipped just at the output terminal of the antenna.

Tabletop devices shall be placed on a nonconducting platform with nominal top surface dimensions 1 m by 1.5 m. For emissions testing at or below 1 GHz, the table height shall be 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height shall be 1.5 m.

The turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on an antenna mast. The antenna moved up and down between from 1 meter to 4 meters to find out the maximum emission level.

The EUT was tested according to DTS test procedure of KDB558074 D01 DTS “Meas Guidance v03r03” for compliance to FCC 47CFR 15.247 requirements.

The radiated emission was measured using the Spectrum Analyzer with the resolutions bandwidth set as:

RBW = 300 Hz, VBW = 1 kHz (9 kHz~150 kHz);
RBW = 10 kHz, VBW = 30 kHz (150 kHz~30MHz);
RBW = 100 kHz, VBW = 300 kHz (30MHz~1GHz for PK)
RBW = 1MHz, VBW = 3MHz (>1GHz for PK);
RBW = 1MHz, VBW = 10Hz (>1GHz for AV);

Remark:

1. Factor= Antenna Factor + Cable Loss (-Amplifier, is employed)
2. Measured level= Original Receiver Reading + Factor
3. Margin = Limit – Measured level
4. If the PK measured level is lower than AV limit, the AV test can be elided.

Example:

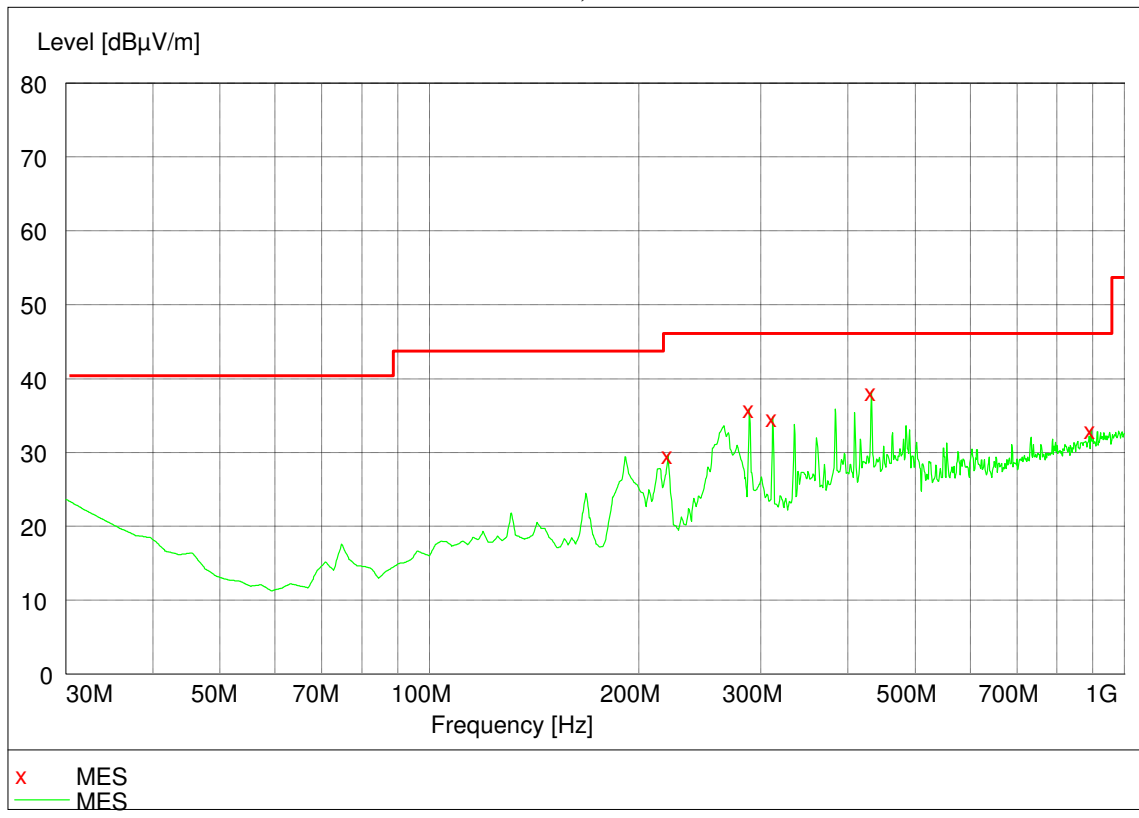
Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,
Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10dBuV.
Then Factor = 30.20 + 2.00 – 32.00 = 0.20dB/m;
Measured level = 10dBuV + 0.20dB/m = 10.20dBuV/m
Assuming limit = 54dBuV/m,
Measured level = 10.20dBuV/m, then Margin = 54 - 10.20 = 43.80dBuV/m.

7.4 Test Protocol

Temperature: 24 °C
Relative Humidity: 52 %

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

30MHz~1GHz, Horizontal

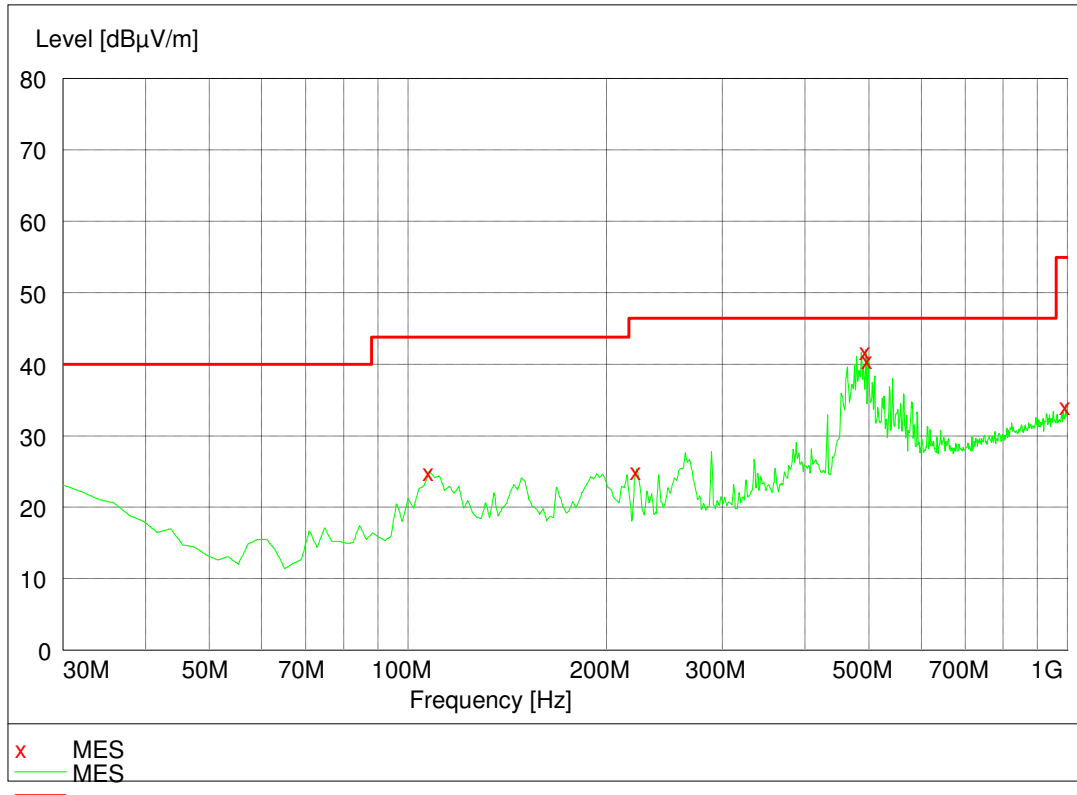


Test data:

Frequency (MHz)	Emission level (dBµV/m)	Limits (dBµV/m)	Margin (dBµV/m)	Azimuth (Degrees)	Height (cm)	Polarization (H/V)
30.00	*	40.00	*	180	100	H
80.54	*	40.00	*	180	100	H
285.53	36.00	46.00	10.00	270	200	H
317.69	*	46.00	*	270	400	H
422.64	38.15	46.00	7.85	270	200	H
665.65	*	46.00	*	270	400	H

Note: * means the emission level 10dB lower than the relevant limit.

30MHz~1GHz, Vertical



Test data:

Frequency (MHz)	Emission level (dBµV/m)	Limits (dBµV/m)	Margin (dBµV/m)	Azimuth (Degrees)	Height (cm)	Polarization (H/V)
32.00	*	40.00	*	180	100	V
49.08	*	40.00	*	180	100	V
50.11	*	40.00	*	270	200	V
317.69	*	46.00	*	270	400	V
492.64	40.92	46.00	5.08	270	200	V
665.65	*	46.00	*	270	400	V

Note: * means the emission level 15dB lower than the relevant limit.

Test data:

CH	Antenna	Frequency (MHz)	Corrected Reading (dBuV/m)	Correct Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	2412.60	102.10	34.10	Fundamental	/	PK
	H	276.25	39.40	14.60	46.00	6.60	QP
	H	299.70	37.40	15.40	46.00	8.60	QP
	H	345.20	35.90	16.60	46.00	10.10	QP
	V	276.25	36.00	14.60	43.50	7.50	QP
	V	345.20	39.00	16.60	46.00	7.00	QP
	H	2389.36	61.76	34.20	74.00	12.24	PK
	H	2389.36	38.74	34.20	54.00	15.26	AV
	H	4824.05	51.30	-3.60	74.00	22.70	PK
M	H	2437.55	102.25	34.20	Fundamental	/	PK
	H	276.25	39.40	14.60	46.00	6.60	QP
	H	299.70	37.40	15.40	46.00	8.60	QP
	H	345.20	35.90	16.60	46.00	10.10	QP
	V	276.25	36.00	14.60	43.50	7.50	QP
	V	345.20	39.00	16.60	46.00	7.00	QP
	H	4874.16	52.50	-3.50	74.00	21.50	PK
H	H	2462.90	102.48	34.40	Fundamental	/	PK
	H	276.25	39.40	14.60	46.00	6.60	QP
	H	299.70	37.40	15.40	46.00	8.60	QP
	H	345.20	35.90	16.60	46.00	10.10	QP
	V	276.25	36.00	14.60	43.50	7.50	QP
	V	345.20	39.00	16.60	46.00	7.00	QP
	H	2488.70	65.49	34.80	74.00	8.51	PK
	H	2488.70	37.50	34.80	54.00	16.50	AV
	H	4924.14	51.90	-3.30	74.00	22.10	PK

Test mode: with BLE connected
Test data:

CH	Antenna	Frequency (MHz)	Corrected Reading (dBuV/m)	Correct Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	H	2412.60	102.10	34.10	Fundamental	/	PK
	H	276.25	42.00	14.60	46.00	4.00	QP
	H	299.70	42.40	15.40	46.00	3.60	QP
	H	345.20	35.90	16.60	46.00	10.10	QP
	V	276.25	36.00	14.60	43.50	7.50	QP
	V	345.20	39.00	16.60	46.00	7.00	QP
	H	2389.36	63.44	34.20	74.00	10.56	PK
	H	2389.36	40.74	34.20	54.00	13.26	AV
	H	4824.05	51.30	-3.60	74.00	22.70	PK
M	H	2437.55	102.25	34.20	Fundamental	/	PK
	H	276.25	39.40	14.60	46.00	6.60	QP
	H	299.70	37.40	15.40	46.00	8.60	QP
	H	345.20	35.90	16.60	46.00	10.10	QP
	V	276.25	36.00	14.60	43.50	7.50	QP
	V	345.20	39.00	16.60	46.00	7.00	QP
	H	4874.16	52.50	-3.50	74.00	21.50	PK
H	H	2462.90	102.48	34.40	Fundamental	/	PK
	H	276.25	39.40	14.60	46.00	6.60	QP
	H	299.70	37.40	15.40	46.00	8.60	QP
	H	345.20	35.90	16.60	46.00	10.10	QP
	V	276.25	36.00	14.60	43.50	7.50	QP
	V	345.20	39.00	16.60	46.00	7.00	QP
	H	2488.70	63.28	34.80	74.00	10.72	PK
	H	2488.70	39.50	34.80	54.00	14.50	AV
	H	4924.14	51.90	-3.30	74.00	22.10	PK

- Remark: 1. For fundamental emission, no amplifier is employed.
2. Correct Factor = Antenna Factor + Cable Loss (-Amplifier, is employed)
3. Corrected Reading = Original Receiver Reading + Correct Factor
4. Margin = limit – Corrected Reading
5. If the PK reading is lower than AV limit, the AV test can be elided.
6. The emission was conducted from 30MHz to 25GHz.

Example: Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,
Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10dBuV.
Then Correct Factor = 30.20 + 2.00 – 32.00 = 0.20dB/m; Corrected Reading =
10dBuV + 0.20dB/m = 10.20dBuV/m
Assuming limit = 54dBuV/m, Corrected Reading = 10.20dBuV/m, then Margin = 54 -
10.20 = 43.80dBuV/m

8 Power line conducted emission

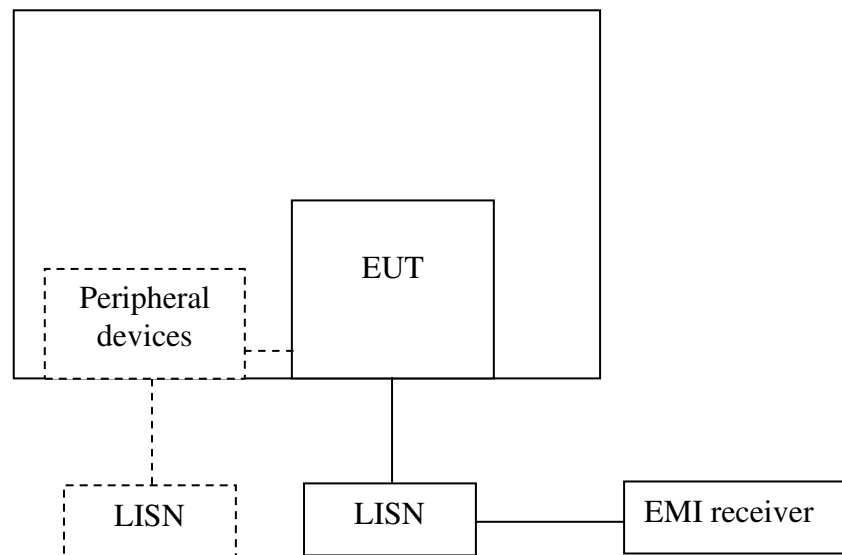
Test result: Pass

8.1 Limit

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	QP	AV
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.

8.2 Test configuration



For table top equipment, wooden support is 0.8m height table

For floor standing equipment, wooden support is 0.1m height rack.

8.3 Test procedure and test set up

Measured levels of ac power-line conducted emission shall be the emission voltages from the voltage probe, where permitted, or across the 50 Ω LISN port (to which the EUT is connected), where permitted, terminated into a 50 Ω measuring instrument. All emission voltage and current measurements shall be made on each current-carrying conductor at the plug end of the EUT power cord by the use of mating plugs and receptacles on the LISN, if used. Equipment shall be tested with power cords that are normally supplied or recommended by the manufacturer and that have electrical and shielding characteristics that are the same as those cords normally supplied or recommended by the manufacturer. For those measurements using a LISN, the 50 Ω measuring port is terminated by a measuring instrument having 50 Ω input impedance. All other ports are terminated in 50 Ω loads.

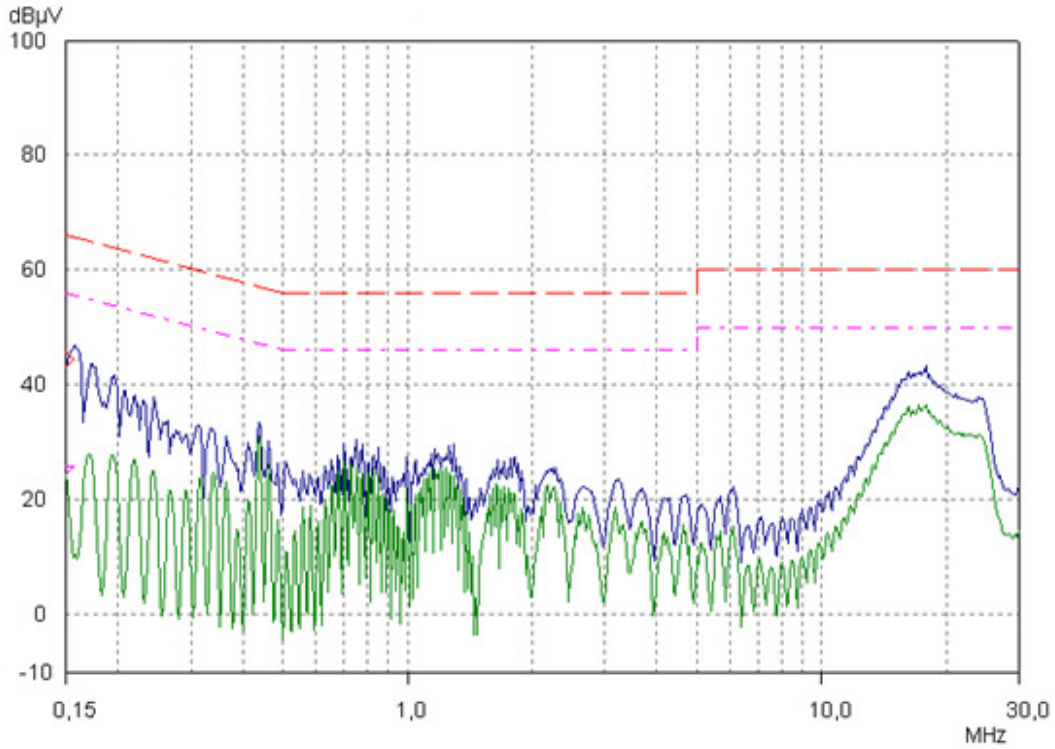
Tabletop devices shall be placed on a platform of nominal size 1 m by 1.5 m, raised 80 cm above the reference ground plane. The vertical conducting plane or wall of an RF-shielded (screened) room shall be located 40 cm to the rear of the EUT. Floor-standing devices shall be placed either directly on the reference ground-plane or on insulating material as described in ANSI C63.4. All other surfaces of tabletop or floor-standing EUTs shall be at least 80 cm from any other grounded conducting surface, including the case or cases of one or more LISNs.

The bandwidth of the test receiver is set at 9 kHz.

8.4 Test protocol

Temperature: 24 °C
Relative Humidity: 52 %

L line

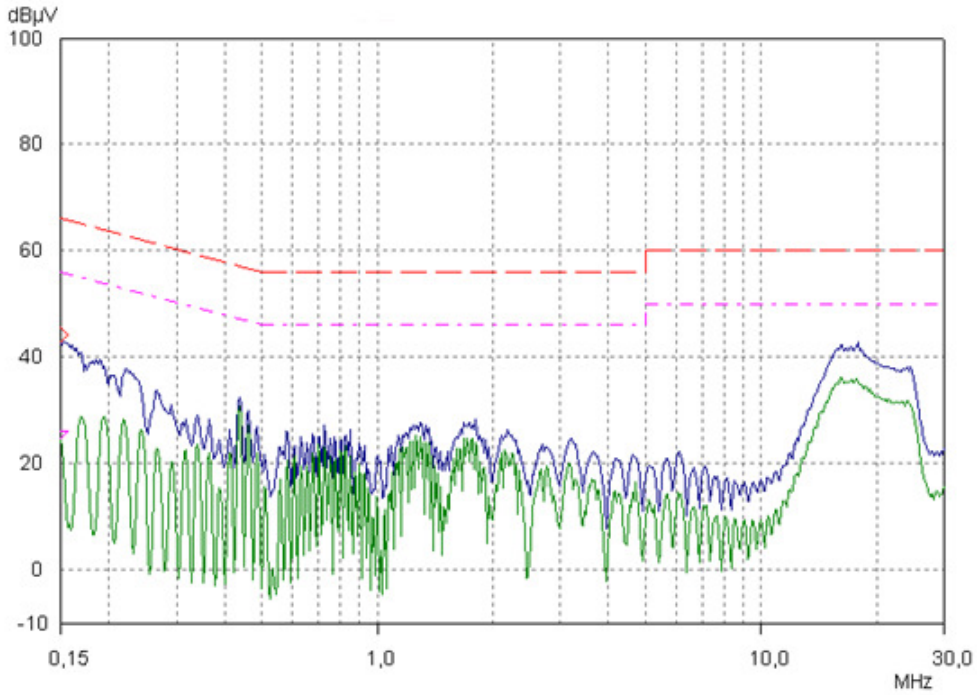


Test Data:

Frequency (MHz)	Quasi-peak			Average		
	level dB(µV)	Limit dB(µV)	Margin (dB)	level dB(µV)	limit dB(µV)	Margin (dB)
0.45	*	56.85	*	*	46.85	*
0.55	*	56.00	*	*	46.00	*
0.72	*	56.00	*	*	46.00	*
16.86	*	60.00	*	*	50.00	*
21.45	*	60.00	*	*	50.00	*
28.56	*	60.00	*	*	50.00	*

Note: * means the emission level 10dB lower than the relevant limit.

N line



Test Data:

Frequency (MHz)	Quasi-peak			Average		
	level dB(µV)	Limit dB(µV)	Margin (dB)	level dB(µV)	limit dB(µV)	Margin (dB)
0.54	42.93	56.00	13.07	31.74	46.00	14.26
0.78	40.29	56.00	15.71	27.94	46.00	18.06
17.90	42.97	60.00	17.03	29.08	50.00	20.92
*	*	*	*	*	*	*
*	*	*	*	*	*	*
*	*	*	*	*	*	*

Note: * means the emission level 10dB lower than the relevant limit.

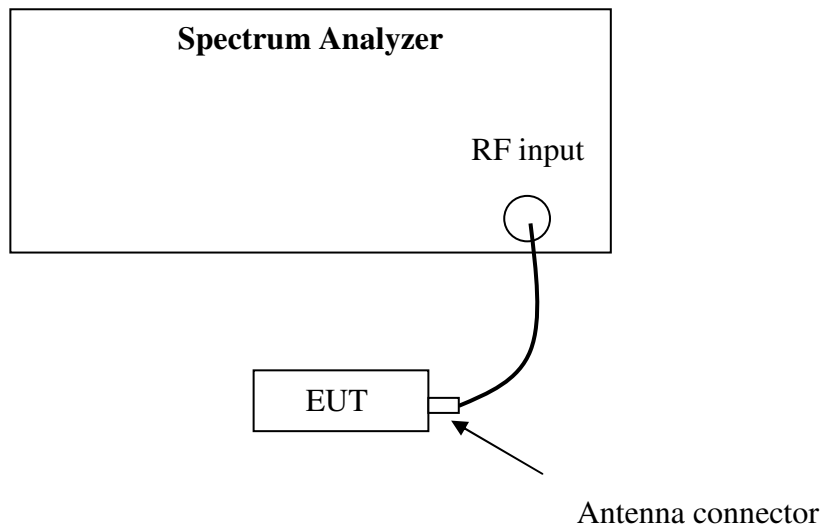
9 Occupied Bandwidth

Test Status: Tested

9.1 Test limit

None

9.2 Test Configuration



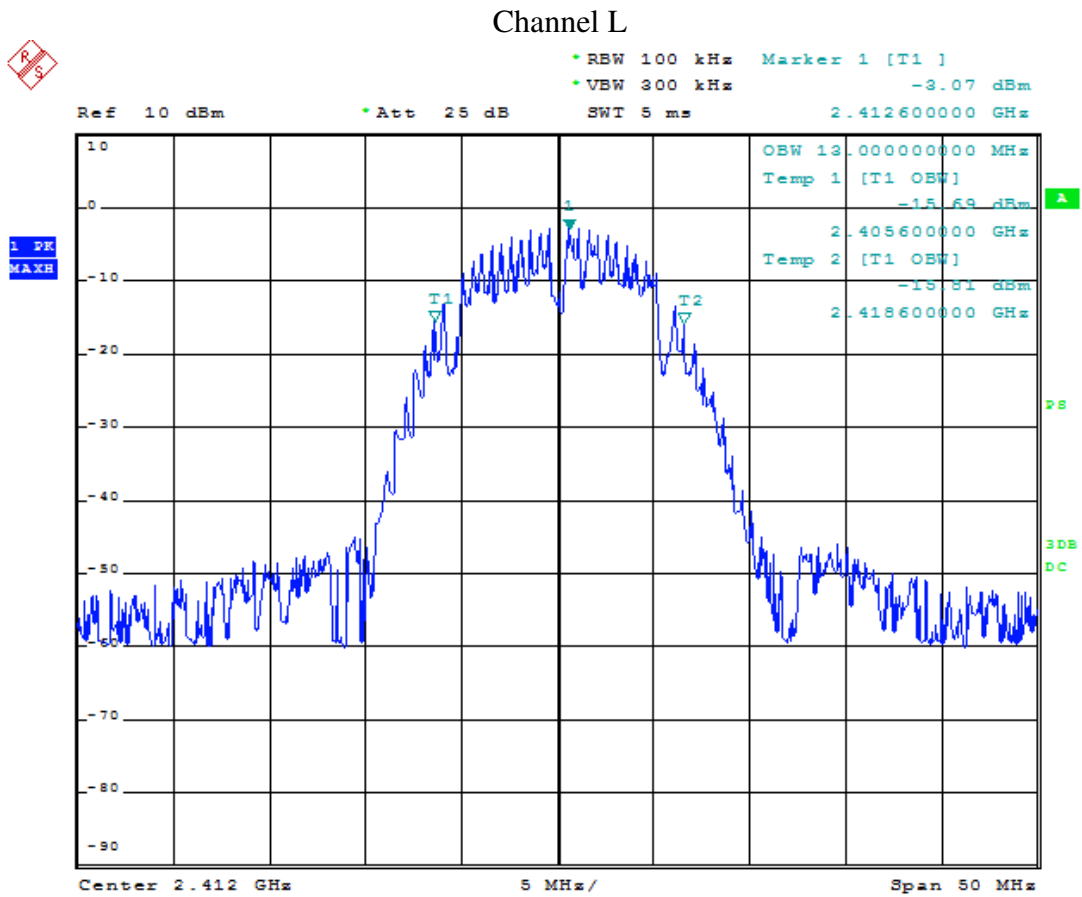
9.3 Test procedure and test setup

The occupied bandwidth per RSS-Gen Issue 4 Clause 6.6 was measured using the Spectrum Analyzer.

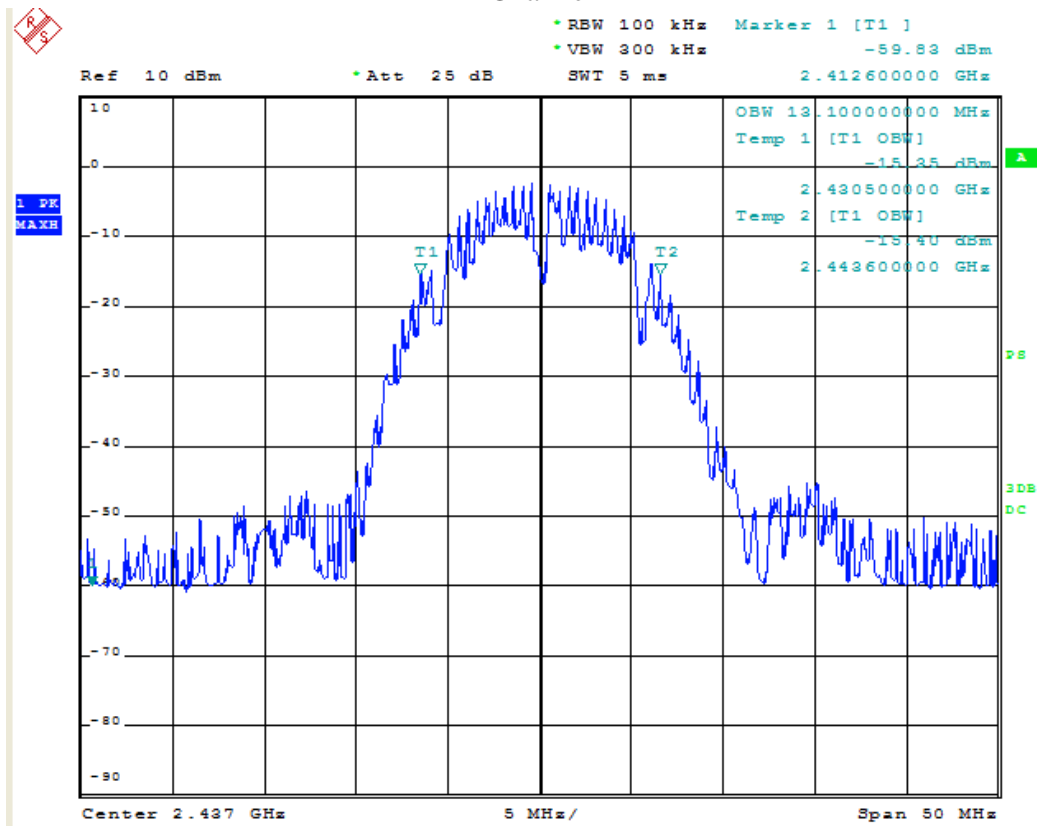
9.4 Test protocol

Temperature : 24 °C
Relative Humidity : 52 %

Mode	Frequency (MHz)	99% Bandwidth (MHz)		
		Port0	Port 1	Port 2
-	2412	13.00	-	-
	2437	13.10	-	-
	2462	13.20	-	-



Channel M



Channel H

