L’Image Home Products Inc.

TEST REPORT

SCOPE OF WORK
EMC TESTING–30310684

REPORT NUMBER
171124081GZU-001

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FCC Part 15.249-c

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Applicant Name & Address	:	L'Image Home Products Inc. 1175 Place du Frère André, Montreal, QC, H3B 3X9
Manufacturing Site	:	ZhongShan Winstar Electrical Co., LTD SanDun industry district MinZhong Town ZhongShan City GuangDong China
Intertek Report No:		171124081GZU-001
FCC ID:		2AE6Q3031068401

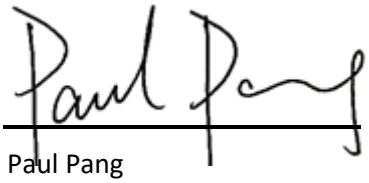
Test standards

47 CFR FCC PART 15 Subpart C: 2016 section 15.249

Sample Description

Product	:	Wireless linkable LED wall light
Model No.	:	30310684
Electrical Rating	:	4.5V DC (3 X 1.5V / AA battery); 1W
Serial No.		Not Labeled
Date Received	:	24 November 2017
Date Test Conducted	:	24 November 2017 to 08 December 2017

Prepared and Checked By



Paul Pang

Project Engineer

Intertek Guangzhou

Approved By:

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Team Leader

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CONTENT

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1.0 TEST RESULT SUMMARY

Test Item	Test Requirement	Test Method	Result
Antenna Requirement	FCC PART 15 C Section 15.203	FCC PART 15 C Section 15.203	PASS
Occupied Bandwidth	FCC PART 15 C section 15.215(c)	ANSI C63.10: Clause 6.9	PASS
Radiated Emission	FCC PART 15 C section 15.249 (a), (d)	ANSI C63.10: Clause 6.4, 6.5 & 6.6	PASS
Band Edges Measurement	FCC PART 15 C section 15.249 (d)	ANSI C63.10: Clause 6.10	PASS
Conducted Emissions at Mains Terminals	FCC PART 15 C section 15.207	ANSI C63.10: Clause 6.2	N/A

Remark:
N/A: not applicable. Refer to the relative section for the details.
EUT: In this whole report EUT means Equipment Under Test.
Tx: In this whole report Tx (or tx) means Transmitter.
Rx: In this whole report Rx (or rx) means Receiver.
RF: In this whole report RF means Radio Frequency.
ANSI C63.10: the detail version is ANSI C63.10:2013 in the whole report.

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2.0 General Description

2.1 Product Description

Operating Frequency:	2404 MHz to 2478 MHz
Type of Modulation:	GFSK
Number of Channels:	75 Channels
Channel Separation:	1 MHz
Antenna Type:	Integral
Antenna Gain:	-0.5 dBi
Function:	Wireless linkable LED wall light with 2.4GHz transiver function
Power Supply:	4.5V DC (3 X 1.5V / AA battery)
Power cord:	N/A

EUT modulation and data packet during test:

The EUT has been tested on the Modulation of GFSK with 1 Mbps data rate.

EUT channels and frequencies list:

Test frequencies are lowest channel 0: 2404 MHz, middle channel 19: 2440 MHz and highest channel 39: 2478 MHz.

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2404	27	2430	53	2456
2	2405	28	2431	54	2457
3	2406	29	2432	55	2458
4	2407	30	2433	56	2459
5	2408	31	2434	57	2460
6	2409	32	2435	58	2461
7	2410	33	2436	59	2462
8	2411	34	2437	60	2463
9	2412	35	2438	61	2464
10	2413	36	2439	62	2465
11	2414	37	2440	63	2466
12	2415	38	2441	64	2467
13	2416	39	2442	65	2468
14	2417	40	2443	66	2469
15	2418	41	2444	67	2470
16	2419	42	2445	68	2471
17	2420	43	2446	69	2472
18	2421	44	2447	70	2473
19	2422	45	2448	71	2474
20	2423	46	2449	72	2475
21	2424	47	2450	73	2476

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22	2425	48	2451	74	2477
23	2426	49	2452	75	2478
24	2427	50	2453	/	/
25	2428	51	2454	/	/
26	2429	52	2455	/	/

2.2 Related Submittal(s) Grants

This is an application for certification of:
DXX- Part 15 Low Power Communications Device Transmitter.

Remaining portions are subject to the following procedures:
1. Receiver portion: exempt from technical requirement of this Part.
2. Lighting function: Verification procedure

2.3 Test Methodology

Radiated emission measurements were performed according to the procedures in ANSI C63.10. Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans and final tests were performed in the semi-anechoic chamber to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise.

2.4 Test Facility

All tests were performed at:
Room102/104, No 203, KeZhu Road, Science City, GETDD Guangzhou, China

A2LA Certificate Number 0078.10
Intertek Testing Services Shenzhen Ltd. Guangzhou Branch is accredited by A2LA and Listed in FCC website. FCC accredited test labs may perform both Certification testing under Parts 15 and 18 and Declaration of Conformity testing.

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3.0 System Test Configuration

3.1 Justification

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. It was powered by 3 X 1.5V dc / AA battery.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. The spurious emissions more than 20 dB below the permissible value are not reported.

For an intentional radiator, the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to at least the frequency shown in the following table:

Frequency range of radiated emission measurements

Lowest frequency generated in the device	Upper frequency range of measurement
9 kHz to below 10 GHz	10th harmonic of highest fundamental frequency or to 40 GHz, whichever is lower
At or above 10 GHz to below 30 GHz	5th harmonic of highest fundamental frequency or to 100 GHz, whichever is lower
At or above 30 GHz	5th harmonic of highest fundamental frequency or to 200 GHz, whichever is lower, unless otherwise specified

Number of fundamental frequencies to be tested in EUT transmit band

Frequency range in which device operates	Number of frequencies	Location in frequency range of operation
1 MHz or less	1	Middle
1 MHz to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle and 1 near bottom

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3.2 EUT Exercising Software

N/A

3.3 Special Accessories

No special accessories used.

3.4 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	20 dB Bandwidth	2.3%
2	Carrier Frequencies Separated	2.3%
3	Maximum Peak Conducted Output Power	1.5
4	Out of Band Conducted Emissions	1.5
5	Radiated Emissions	4.7 dB (25 MHz-1 GHz)
		4.8 dB (1 GHz-18 GHz)
6	Conducted Emissions at Mains Terminals	2.58
7	Temperature	0.5 °C
8	Humidity	0.4 %
9	Time	1.2%

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT.
Measurement uncertainty is calculated in accordance with ETSI TR 100 028-2001.
The measurement uncertainty is given with a confidence of 95%, k=2.

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

Uncertainty and Compliance – Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value

3.5 Equipment Modification

Any modifications installed previous to testing by L'Image Home Products Inc. will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Guangzhou Branch.

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3.6 Support Equipment List and Description

The tests were conducted with the special engineering sample which is prepared by the applicant.

4.0 Measurement Results

4.1 Antenna Requirement

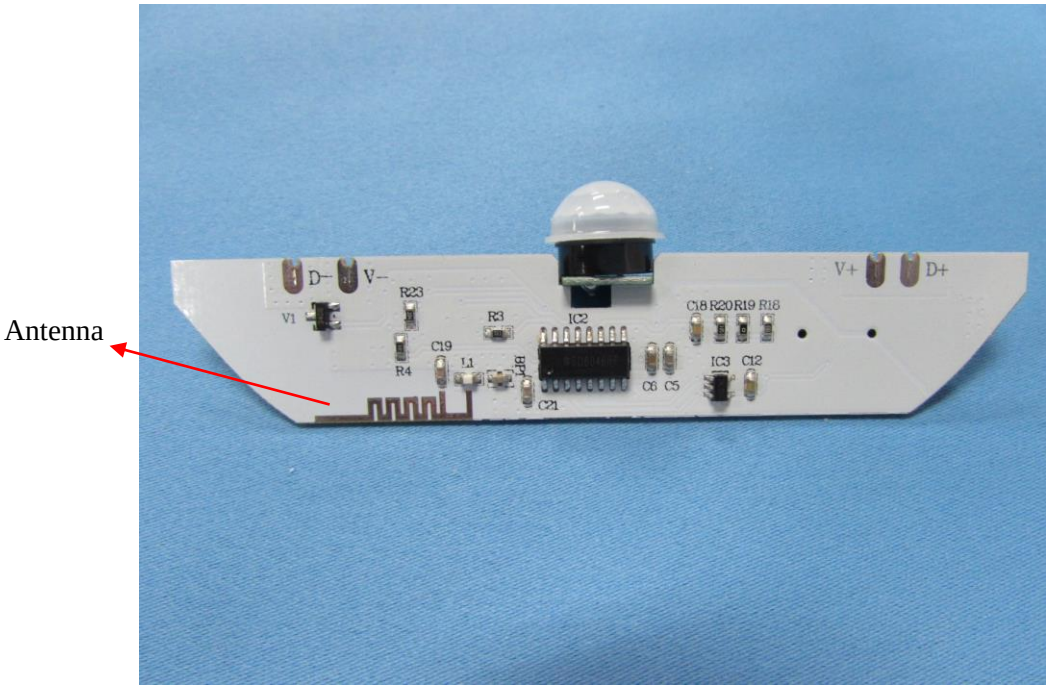
Standard requirement:

15.203 requirement:

For intentional device. According to 15.203 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.

EUT Antenna

The antenna is an integral antenna and no consideration of replacement. The best case gain of the antenna is -0.5 dBi.



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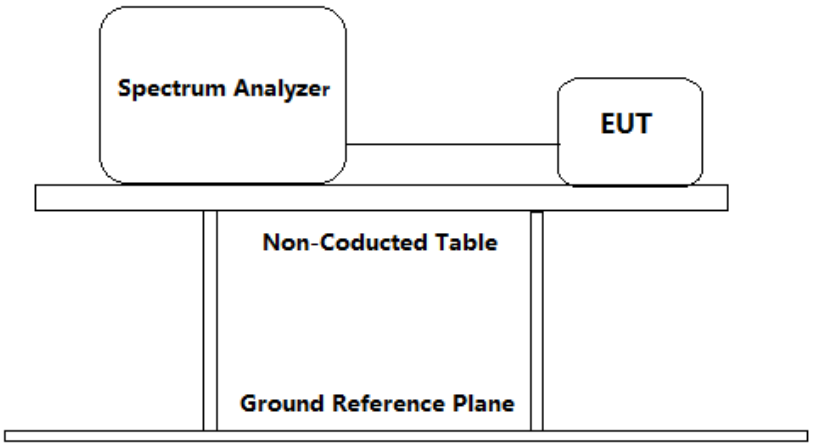
4.2 Occupied Bandwidth

Test Requirement:	FCC PART 15 C section 15.215(c) (c) Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated
Test Method:	ANSI C63.10: Clause 6.9
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). The highest, middle and the lowest channels were selected for the final test as listed below.

Test Configuration:



Test Procedure:

The transmitter was operated at its maximum carrier power measured under normal test conditions.

a) The instrument center frequency was set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer was between 1.5 times and 5.0 times the OBW(20 dB Bandwidth).
b) The nominal IF filter bandwidth (3 dB RBW) was in the range of 1% to 5% of the OBW, and VBW was approximately three times the RBW.
c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope was more than [10 log (OBW/RBW)] below the reference level.

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d) Step a) through step c) might require iteration to adjust within the specified range.
e) The dynamic range of the instrument at the selected RBW was more than 10 dB below the target “−20 dB down” requirement; that is, if the requirement calls for measuring the −20 dB OBW, the instrument noise floor at the selected RBW was at least 30 dB below the reference value.
f) Peak detection and max hold mode (until the trace stabilizes) was used.
g) Used the 20dB bandwidth function of the instrument and reported the measured bandwidth.
h) The occupied bandwidth was reported by providing plot(s) of the measuring instrument display; the plot axes and the scale units per division was clearly labeled. Tabular data was reported in addition to the plot(s).

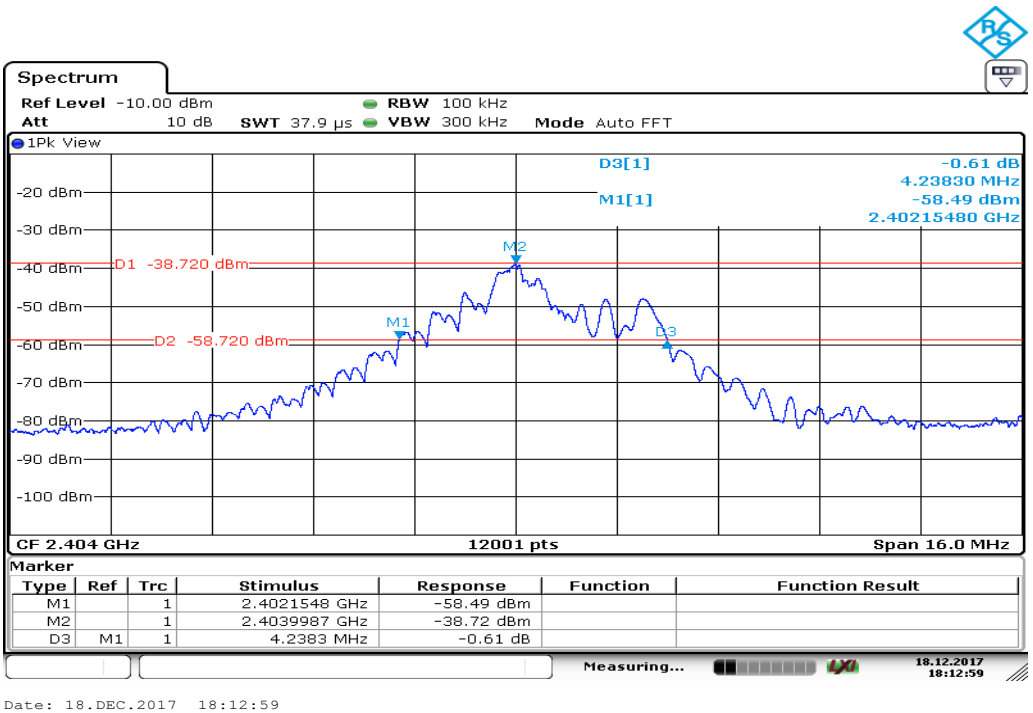
Used Test Equipment List
Spectrum Analyzer. Refer to Clause 5 Test Equipment List for details.

20 dB bandwidth:

Channel No.	Frequency (MHz)	Measured 20dB bandwidth (kHz)	Limit (kHz)	Result
0	2404	4238.3	/	Pass
19	2440	4994.3		Pass
39	2478	5530.2		Pass

Result plot as follows:

Lowest Channel(2.404 GHz):



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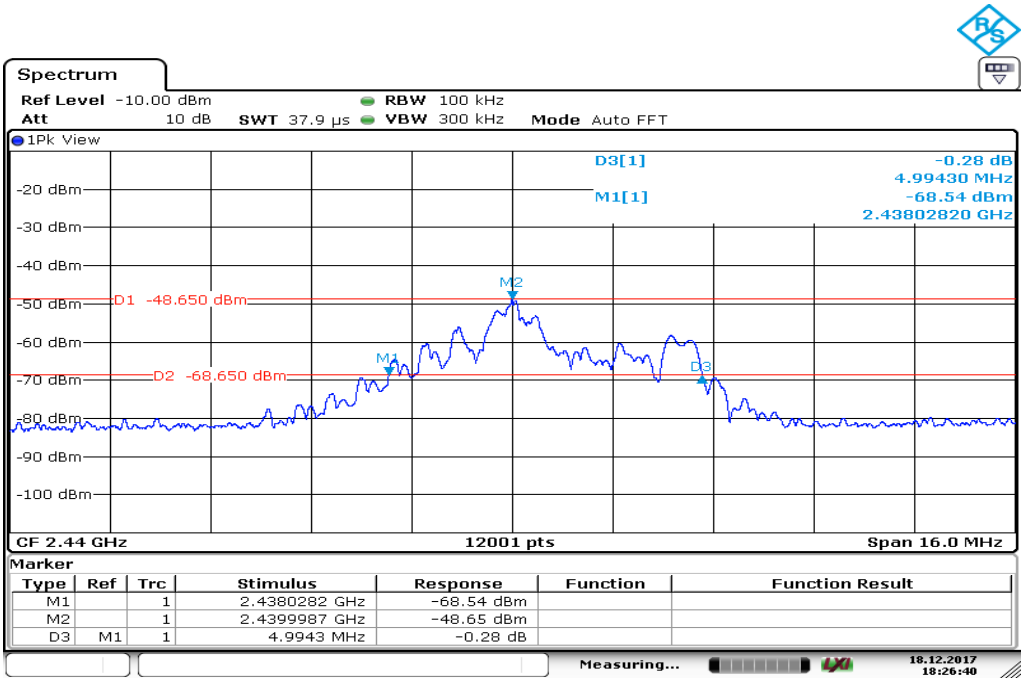
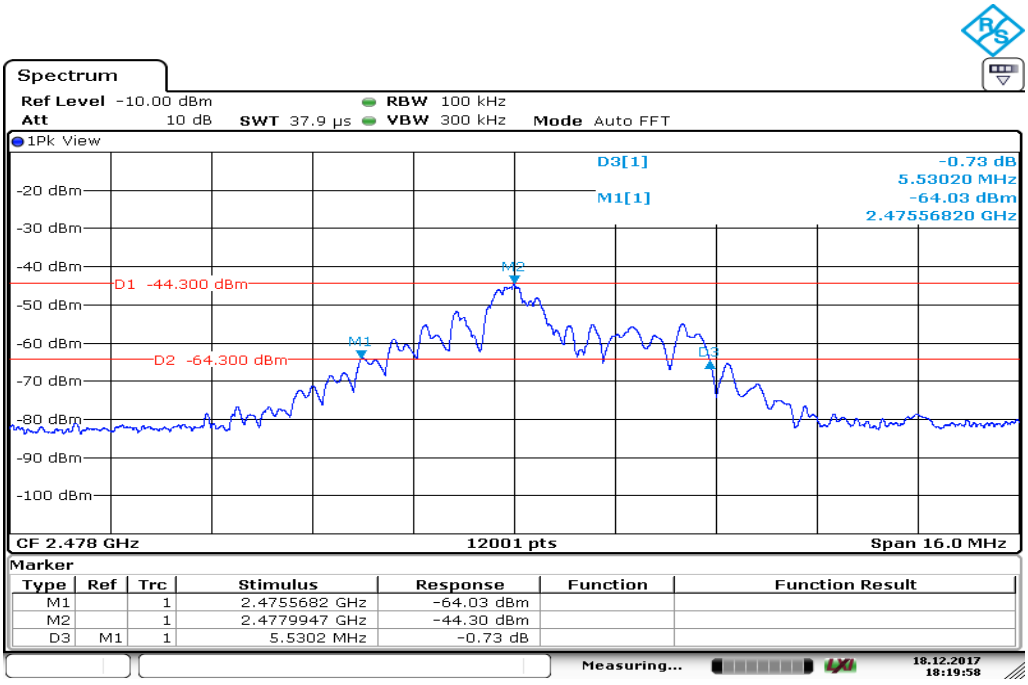
Middle Channel(2.440 GHz):



Date: 18.DEC.2017 18:26:40

Highest Channel(2.478 GHz):



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4.3 Radiated Emission

Test Requirement: FCC PART 15 C section 15.249 (a), (d)

(a) Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (dBμV/m @ 3m)	Field Strength of Harmonics (dBμV/m @ 3m)
902 to 928	94.0	54.0
2400 to 2483.5	94.0	54.0
5725 to 5875	94.0	54.0

Note: The limits shown in the above table are based on measurements using an average detector, except for the fundamental emission in the frequency band 902-928 MHz, which is based on measurements using a CISPR quasi-peak detector.

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in§ 15.209, whichever is the lesser attenuation.

Test Method: ANSI C63.10: Clause 6.4, 6.5 and 6.6

Test Status: Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). The lowest, middle and the lowest channels were selected for the final test as listed below.

Test site: Measurement Distance: 3m (Semi-Anechoic Chamber)

Limit: The field strength of radiated emission outside of the specified frequency bands, except for harmonics at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Field Strength (dBμV/m @ 3m)
30-88	40.0
88-216	43.5
216-960	46.0
Above 960	54.0

Detector: For Peak and Quasi-Peak value:
200 Hz for 9 kHz to 150 kHz
9 kHz for 150 kHz to 30 MHz
120 kHz for 30 MHz to 1GHz
RBW = 1 MHz for f ≥ 1 GHz
VBW ≥ RBW
Sweep = auto

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Detector function = peak for f ≥ 1 GHz, QP for f < 1 GHz
Trace = max hold

According 15.35(c), when the field strength (or envelope power) is not constant or it is in pulses, and an average detector is specified to be used, the value of field strength or power shall be determined by averaging over one complete pulse train, including blanking intervals within the pulse train, as long as the pulse train does not exceed 0.1 seconds. In cases where the pulse train exceeds 0.1 second, the average value of field strength or output power shall be determined during a 0.1 second interval during which the field strength or power is at its maximum value.

The average correction factor was computed by analyzing the on time in 100ms over one complete pulse train. Analysis of the remote transmitter on time in one complete pulse train, therefore the average value of fundamental frequency was: Average = Peak value + 20log (Duty cycle), where the duty factor is calculated from following formula:

2404MHz

The duration of one cycle =8.10ms

Effective period of the cycle =0.41ms

DC =0.41/8.10=0.05062 or 5.062%

Therefore, the averaging factor is found by 20lg(5.062)=-25.91

2440MHz

The duration of one cycle =8.09ms

Effective period of the cycle =0.44ms

DC =0.44/8.09=0.05439 or 5.439%

Therefore, the averaging factor is found by 20lg(5.062)=-25.29

2478MHz

The duration of one cycle =8.09ms

Effective period of the cycle =0.44ms

DC =0.44/8.09=0.05439 or 5.439%

Therefore, the averaging factor is found by 20lg(5.062)=-25.29

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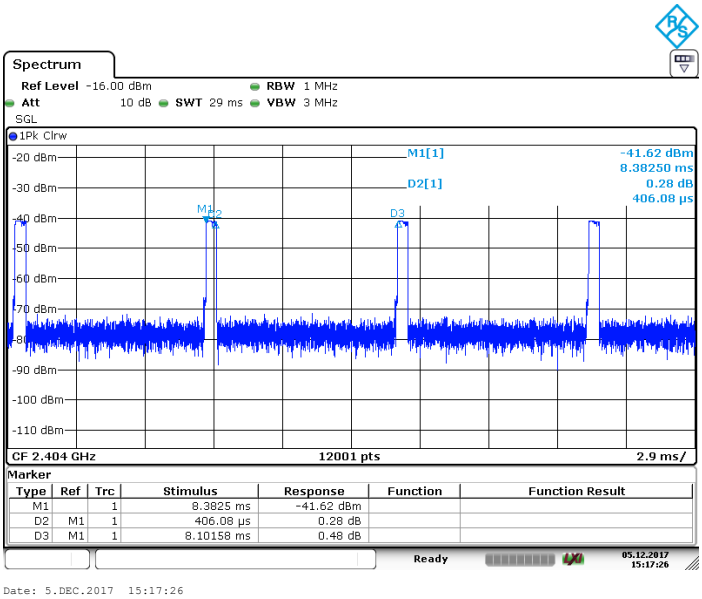
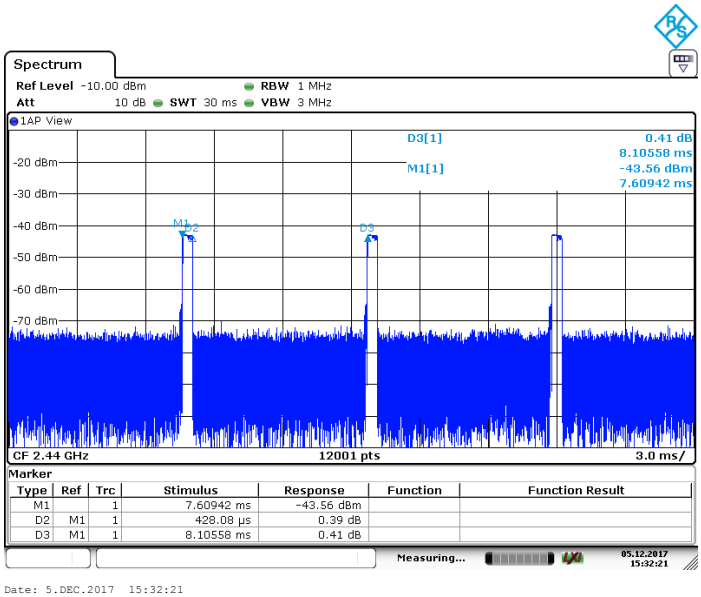
Please refer to below plots for more details.

2404MHz



2440MHz



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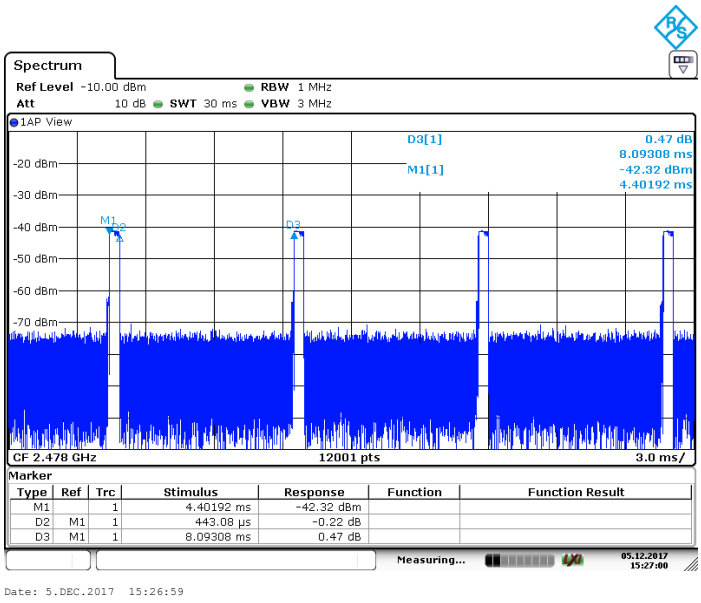
2478MHz



Field Strength Calculation:	The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below: FS = RA + AF + CF - AG + PD + AV FS = RA + Correct Factor + AV FS = Field Strength in dBµV/m RA = Receiver Amplitude (including preamplifier) in dBµV
Where:	AF = Antenna Factor in dB CF = Cable Attenuation Factor in dB AG = Amplifier Gain in dB PD = Pulse Desensitization in dB AV = Average Factor in –dB Correct Factor = AF + CF – AG + PD

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:
FS = RA + AF + CF - AG + PD + AV
Assume a receiver reading of 62.0 dBµV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB, and the resultant average factor was -10 dB. The net field strength for comparison to the appropriate emission limit is 32 dBµV/m.
RA = 62.0 dBµV

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AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
PD = 0 dB
AV = -10 dB
Correct Factor = 7.4 + 1.6 – 29.0 + 0 = -20 dB
FS = 62 + (-20) + (-10) = 32 dBµV/m

Section 15.205 Restricted bands of operation.

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
10.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	
13.36 - 13.41	322 - 335.4		

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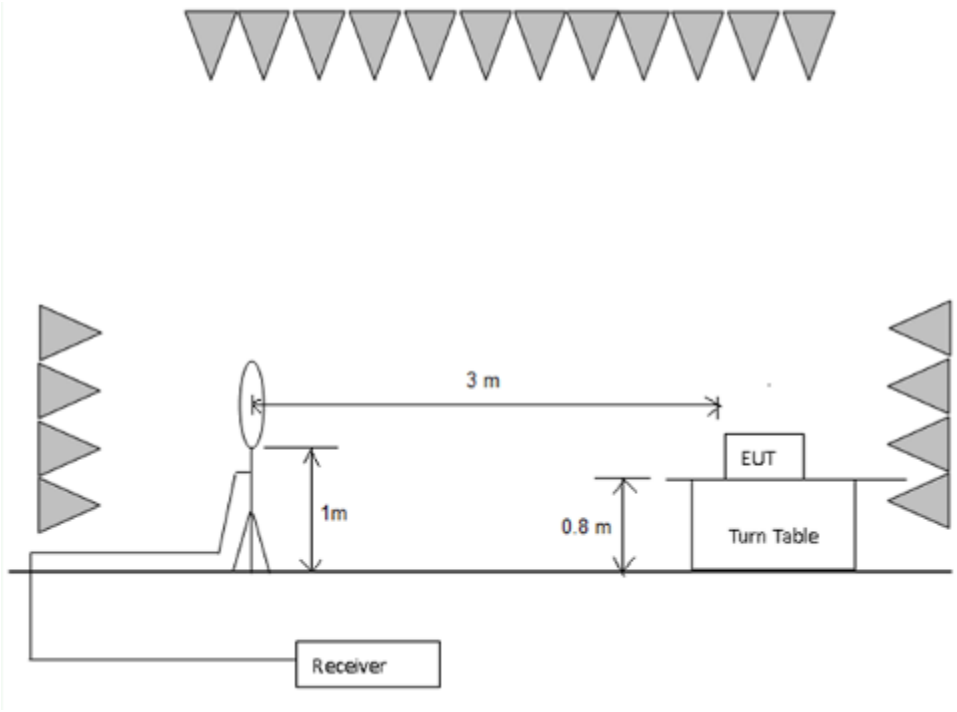
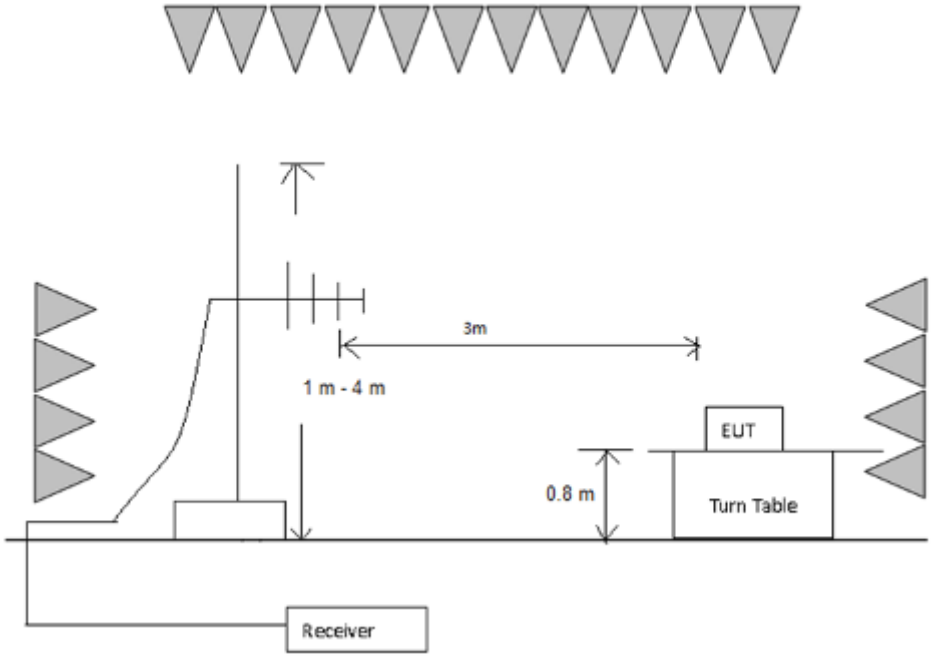
Test Configuration:

1) 9 kHz to 30 MHz emissions:



2) 30 MHz to 1 GHz emissions:



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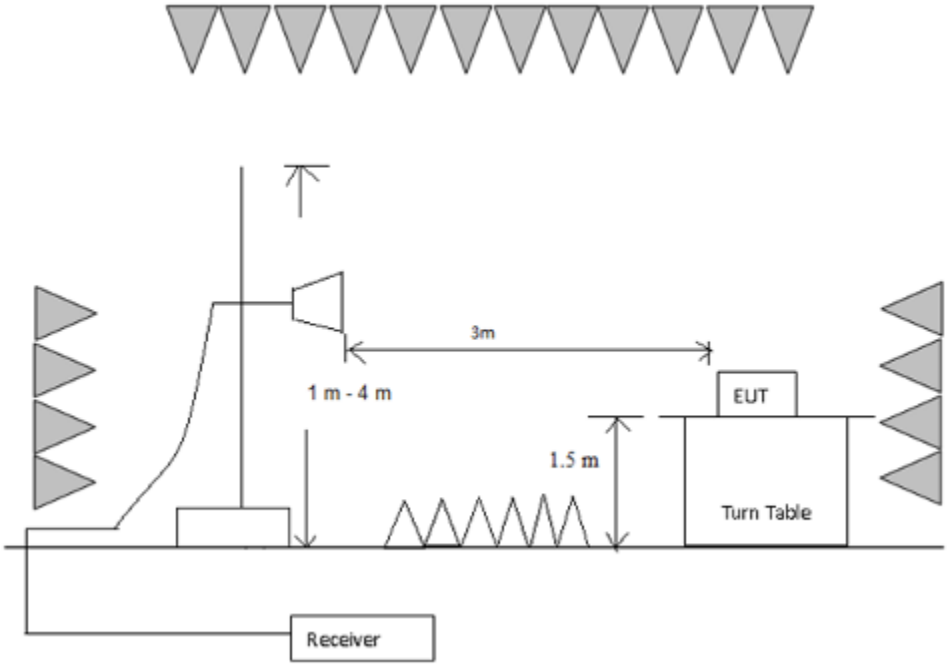
3) 1 GHz to 40 GHz emissions:



Test Procedure:

1) 9 kHz to 30 MHz emissions:

For testing performed with the loop antenna. The centre of the loop was positioned 1 m above the ground and positioned with its plane vertical at the special distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane.

2) 30 MHz to 1 GHz emissions:

For testing performed with the bi-log type antenna. The measurement is performed with the EUT rotated 360º, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

3) 1 GHz to 25 GHz emissions:

Test site with RF absorbing material covering the ground plane that met the site validation criterion called out in CISPR 16-1-4:2007 was used to perform radiated emission test above 1 GHz.

For testing performed with the horn antenna. The measurement is performed with the EUT rotated 360º, the antenna height scanned between 1m and 4m, and the antenna rotated to repeat the measurement for both the horizontal and vertical antenna polarizations.

4) The receiver was scanned from 9 kHz to 25 GHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

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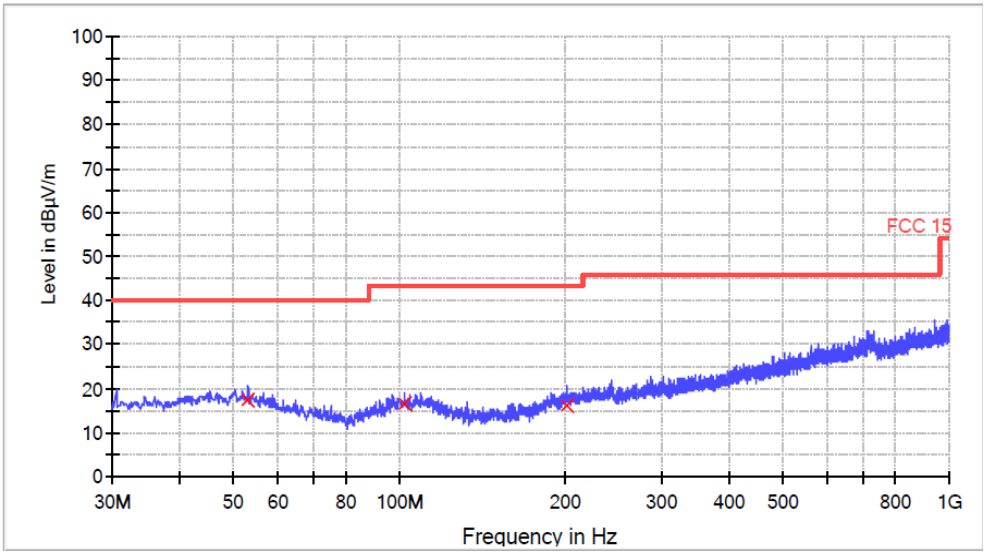
The worst case emissions were reported.

Used Test Equipment List:
3m Semi-Anechoic Chamber, EMI Test Receiver (9 kHz~7 GHz), Signal and Spectrum Analyzer (10 Hz~40 GHz), Loop antenna (9 kHz-30 MHz). TRILOG Super Broadband test Antenna(30 MHz-3 GHz） (RX), Bouble-Ridged Waveguide Horn Antenna (800 MHz-18 GHz)(RX) and High Frequency Antenna & preamplifier(18 GHz~26.5 GHz) (RX). Refer to Clause 5 Test Equipment List for details.

9 kHz~30 MHz Field Strength of Unwanted Emissions. Quasi-Peak Measurement
The measurements with active loop antenna were greater than 20dB below the limit, so the test data were not recorded in the test report.

Radiated Emissions (Below 1GHz)

Operation Frequency: 2404MHz
Horizontal



QP

Frequency (MHz)	Quasi Peak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
53.040000	17.4	120.000	H	13.8	22.6	40.0
102.040000	16.6	120.000	H	12.4	26.9	43.5
201.680000	16.2	120.000	H	12.4	27.3	43.5

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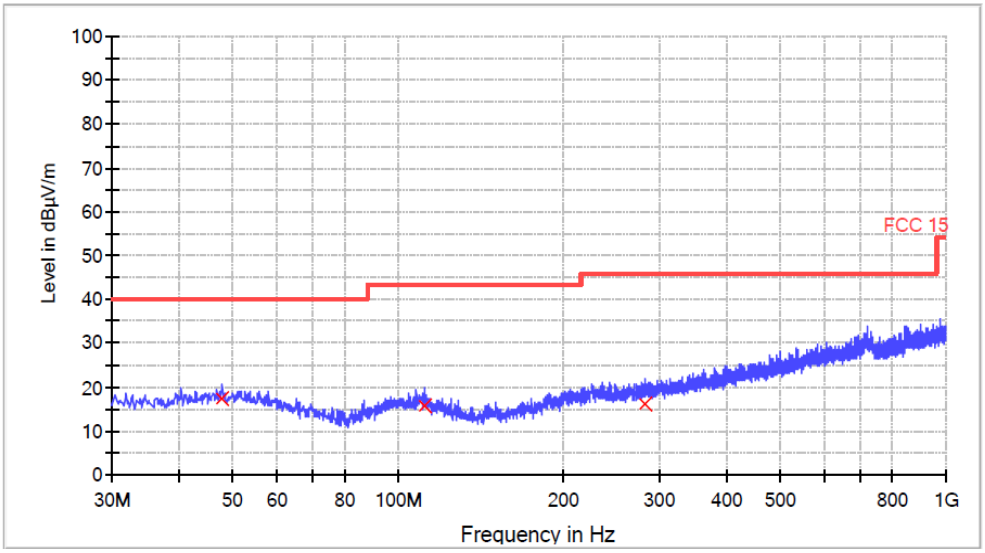
Vertical



QP

Frequency (MHz)	Quasi Peak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
47.840000	17.5	120.000	V	14.3	22.5	40.0
111.840000	15.5	120.000	V	12.1	28.0	43.5
282.440000	16.0	120.000	V	14.5	30.0	46.0

1. Corr. (dB) = Antenna Factor (dB) + Cable Loss (dB)
2. Quasi Peak (dBµV/m) = Corr. (dB) + Read Level (dBµV)
3. Margin (dB) = Limit QPK (dBµV/m) –Quasi Peak (dBµV/m)

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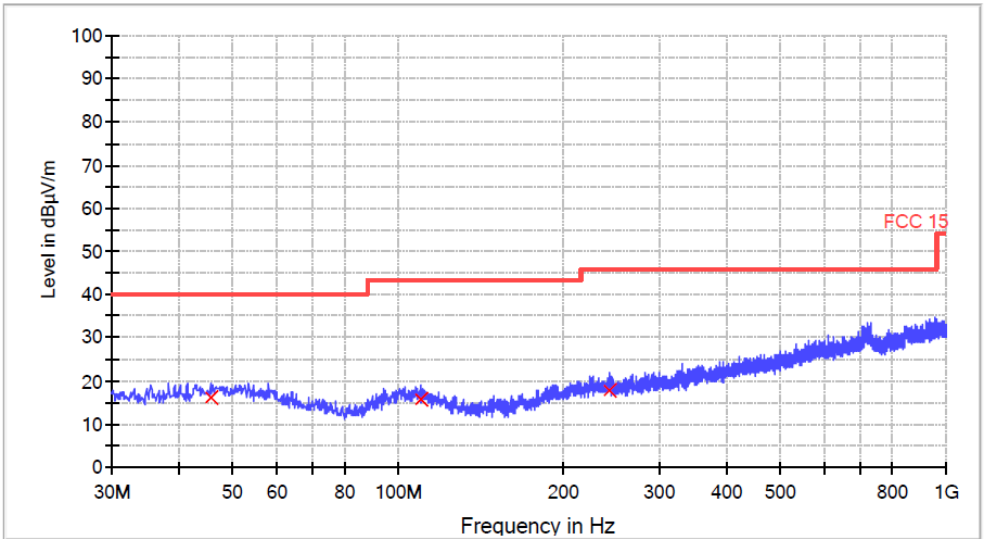
Operation Frequency: 2440MHz
Horizontal

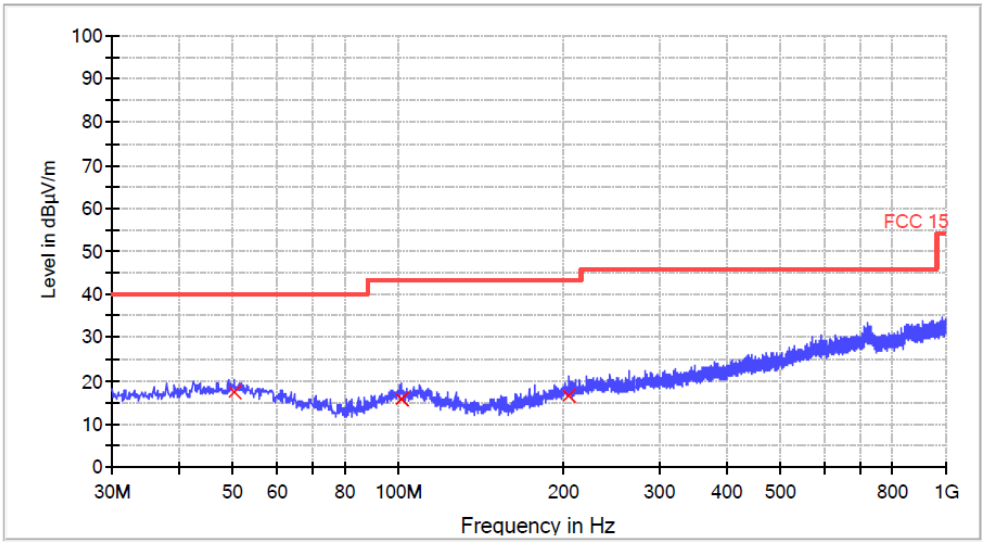


QP

Frequency (MHz)	Quasi Peak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)	Comment
45.640000	16.2	120.000	H	14.2	23.8	40.0	
109.920000	15.5	120.000	H	12.4	28.0	43.5	
243.400000	17.7	120.000	H	13.4	28.3	46.0	

TEST REPORT

Vertical



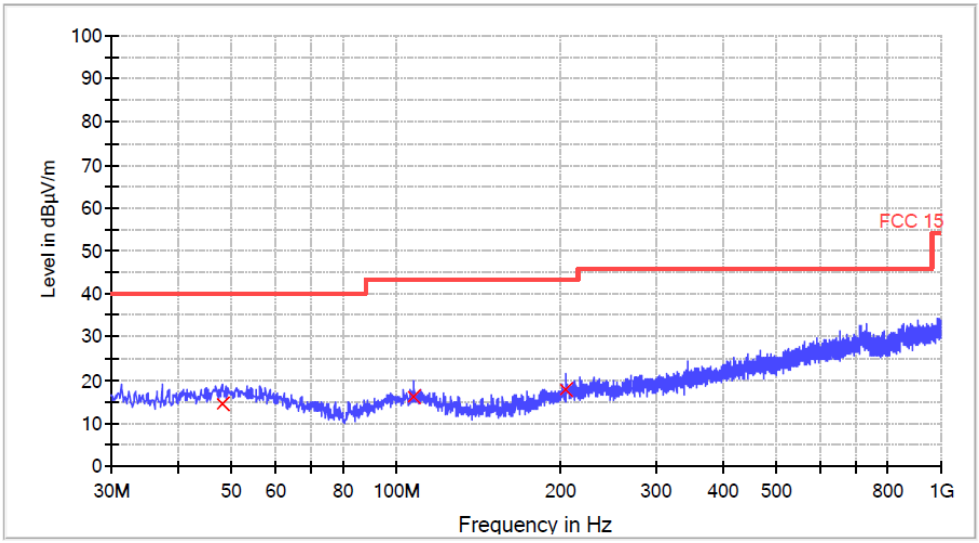
QP

Frequency (MHz)	Quasi Peak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
50.240000	17.5	120.000	V	14.2	22.5	40.0
101.280000	15.9	120.000	V	12.4	27.6	43.5
204.480000	16.3	120.000	V	12.4	27.2	43.5

1. Corr. (dB) = Antenna Factor (dB) + Cable Loss (dB)
2. Quasi Peak (dBµV/m) = Corr. (dB) + Read Level (dBµV)
3. Margin (dB) = Limit QPK (dBµV/m) –Quasi Peak (dBµV/m)

TEST REPORT

Operation Frequency: 2478MHz
Horizontal

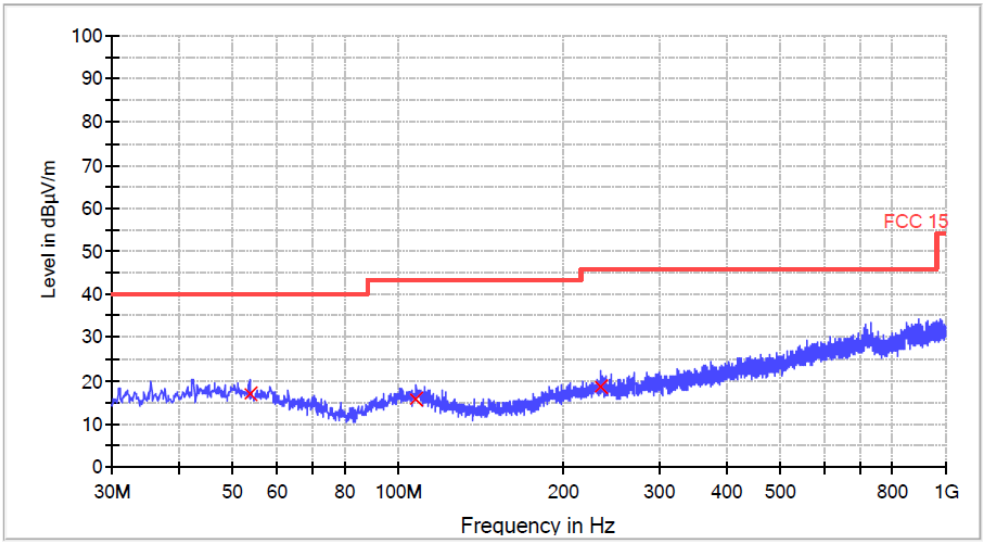


QP

Frequency (MHz)	Quasi Peak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
47.960000	14.6	120.000	H	14.3	25.4	40.0
107.960000	16.1	120.000	H	12.4	27.4	43.5
204.720000	17.7	120.000	H	12.5	25.8	43.5

TEST REPORT

Vertical



QP

Frequency (MHz)	Quasi Peak (dBµV/m)	Bandwidth (kHz)	Pol	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV/m)
53.640000	17.1	120.000	V	13.7	22.9	40.0
108.080000	15.8	120.000	V	12.4	27.7	43.5
234.560000	18.4	120.000	V	13.2	27.6	46.0

1. Corr. (dB) = Antenna Factor (dB) + Cable Loss (dB)
2. Quasi Peak (dBµV/m) = Corr. (dB) + Read Level (dBµV)
3. Margin (dB) = Limit QPK (dBµV/m) –Quasi Peak (dBµV/m)

TEST REPORT

Radiated Emissions (Above 1GHz)

Operation Frequency: 2404MHz:

Polarization	Frequency (MHz)	PK Reading (dBµV)	Correction Factor (dB)	PK Net at 3m (dBµV/m)	PK Limit at 3m (dBµV/m)	(PK)Margin (dB)	Average Limit at 3m (dBµV/m)
Horizontal	2403.750	94.8	-8.9	85.9	114.0	-28.1	94.0
Horizontal	4808.000	53.4	-2.9	50.5	74.0	-23.5	54.0
Horizontal	7240.700	41.2	5.7	46.9	74.0	-27.1	54.0
Horizontal	10766.500	38.6	9.6	48.2	74.0	-25.8	54.0
Vertical	2404.100	89.0	-8.9	80.1	114.0	-33.9	94.0
Vertical	4808.000	55.3	-2.9	52.4	74.0	-21.6	54.0
Vertical	7653.800	42.6	5.7	48.3	74.0	-25.7	54.0
Vertical	11320.700	41.1	9.6	50.7	74.0	-23.3	54.0

Operation Frequency: 2440MHz:

Polarization	Frequency (MHz)	PK Reading (dBµV)	Correction Factor (dB)	PK Net at 3m (dBµV/m)	PK Limit at 3m (dBµV/m)	(PK)Margin (dB)	Average Limit at 3m (dBµV/m)
Horizontal	2440.000	92.8	-8.8	84.0	114.0	-30.0	94.0
Horizontal	4879.400	55.5	-2.7	52.8	74.0	-21.2	54.0
Horizontal	7737.100	40.7	7.1	47.8	74.0	-26.2	54.0
Horizontal	11623.300	41.6	8.4	50.0	74.0	-24.0	54.0
Vertical	2439.800	85.9	-8.8	77.1	114.0	-36.9	94.0
Vertical	4879.400	55.5	-2.7	52.8	74.0	-21.2	54.0
Vertical	7514.400	39.8	7.1	46.9	74.0	-27.1	54.0
Vertical	10275.200	39.5	8.4	47.9	74.0	-26.1	54.0

Operation Frequency: 2478MHz:

Polarization	Frequency (MHz)	PK Reading (dBµV)	Correction Factor (dB)	PK Net at 3m (dBµV/m)	PEAK Limit at 3m (dBµV/m)	(PK)Margin (dB)	AV Limit at 3m (dBµV/m)
Horizontal	2477.950	90.9	-8.6	82.3	114.0	-31.7	94.0
Horizontal	4955.900	59.9	-2.5	57.4	74.0	-16.6	54.0
Horizontal	7276.400	41.6	5.9	47.5	74.0	-26.5	54.0
Horizontal	10407.800	40.8	8.6	49.4	74.0	-24.6	54.0
Vertical	2477.750	84.1	-8.6	75.5	114.0	-38.5	94.0
Vertical	4955.900	53.9	-2.5	51.4	74.0	-22.6	54.0
Vertical	7684.400	41.0	5.9	46.9	74.0	-27.1	54.0
Vertical	11322.400	42.2	8.6	50.8	74.0	-23.2	54.0

TEST REPORT

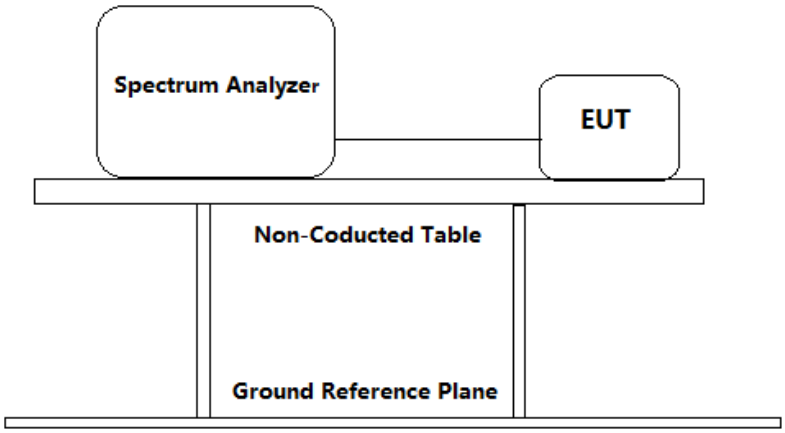
Polarization	Frequency (MHz)	AV Reading (dBµV)	Correction Factor (dB)	AV Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	2478.000	-	-8.6	-	94.0	-
Horizontal	4955.900	34.6	-2.5	32.1	54.0	-21.9
Horizontal	7276.400	-	5.9	-	54.0	-
Horizontal	10407.800	-	8.6	-	54.0	-
Vertical	2478.300	-	-8.6	-	94.0	-
Vertical	4955.900	-	-2.5	-	54.0	-
Vertical	7684.400	-	5.9	-	54.0	-
Vertical	11322.400	-	8.6	-	54.0	-

Notes:
1. AT frequencies equal to or less than 1000MHz, quasi-peak detector was used, above 1000MHz, Peak detector was used.
2. All measurements were made at 3 meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. When Peak emission level was below AV limit, the AV emission level did not be recorded.

4.3 Band Edges Requirement

Test Requirement:	FCC PART 15 C section 15.249 (d) (d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in§ 15.209, whichever is the lesser attenuation.
Frequency Band:	2400 MHz to 2483.5 MHz
Test Method:	ANSI C63.10: Clause 6.10
Test Status:	Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture). The lowest, middle and the highest channels were selected for the final test as listed below.
Test Configuration:	

TEST REPORT



Used Test Equipment List:
3m Semi-Anechoic Chamber, EMI Test Receiver (9 kHz~7 GHz), Signal and Spectrum Analyzer (10 Hz~40 GHz), Loop antenna (9 kHz-30 MHz). TRILOG Super Broadband test Antenna(30 MHz-3 GHz）(RX), Bouble-Ridged Waveguide Horn Antenna (800 MHz-18 GHz)(RX) and High Frequency Antenna & preamplifier(18 GHz~26.5 GHz) (RX). Refer to Clause 5 Test Equipment List for details.

TEST REPORT

Test result with plots as follows:

Operation Frequency: 2404MHz

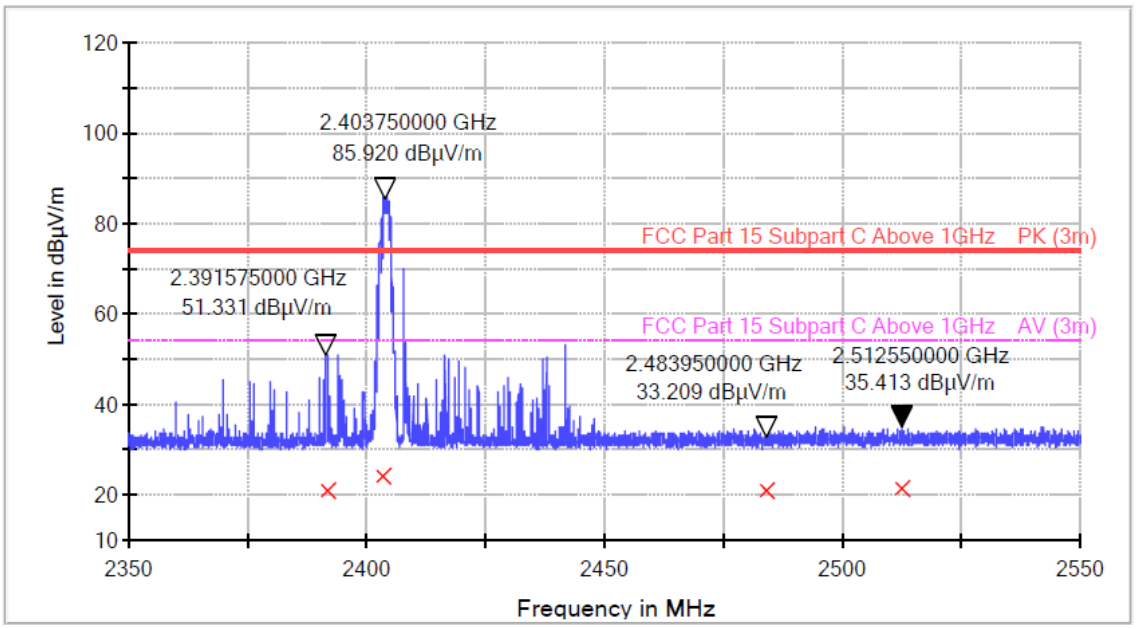
Polarization	Frequency (MHz)	PK Reading (dBμV)	Correction Factor (dB)	PK Net at 3m (dBμV/m)	PK Limit at 3m (dBμV/m)	(PK)Margin (dB)
Horizontal	2391.575	60.231	-8.900	51.331	74.000	-22.669
Horizontal	2512.550	43.913	-8.500	35.413	74.000	-38.587
Vertical	2399.800	63.980	-8.900	55.080	74.000	-18.920
Vertical	2536.850	43.855	-8.400	35.455	74.000	-38.545

Polarization	Frequency (MHz)	AV Reading (dBμV)	Correction Factor (dB)	AV Net at 3m (dBμV/m)	AV Limit at 3m (dBμV/m)	(AV)Margin (dB)
Horizontal	2391.575	-	-8.900	-	54.000	-
Horizontal	2512.550	-	-8.400	-	54.000	-
Vertical	2399.800	38.070	-8.900	29.170	54.000	-24.830
Vertical	2536.850	-	-8.500	-	54.000	-

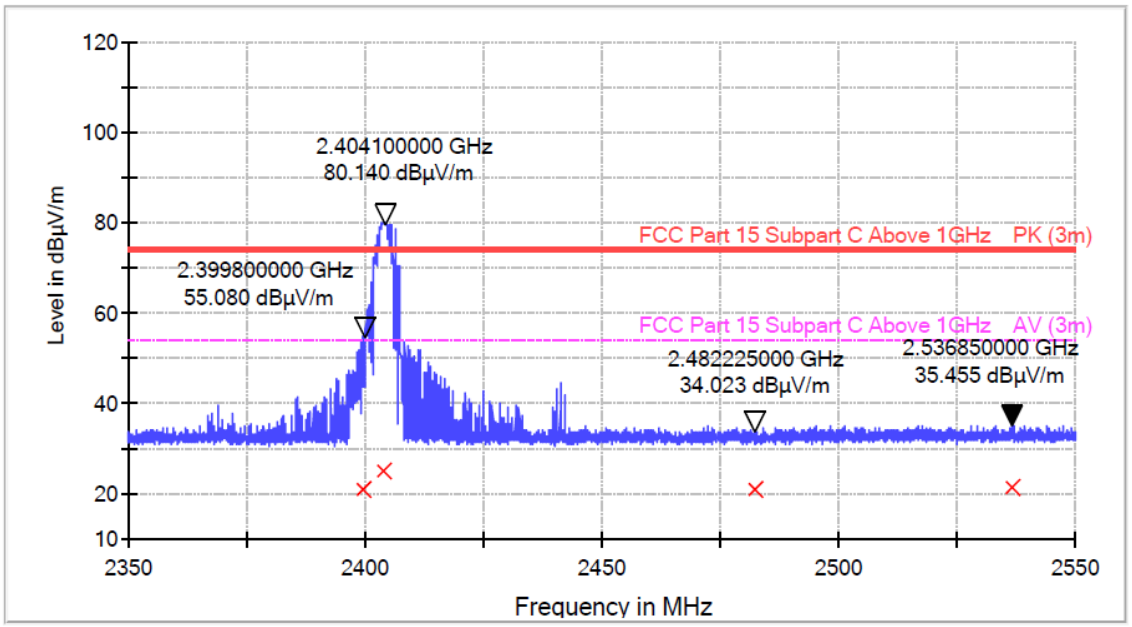
Remark: When Peak emission level was below AV limit, the AV emission level did not be recorded.

TEST REPORT

Horizontal



Vertical



TEST REPORT

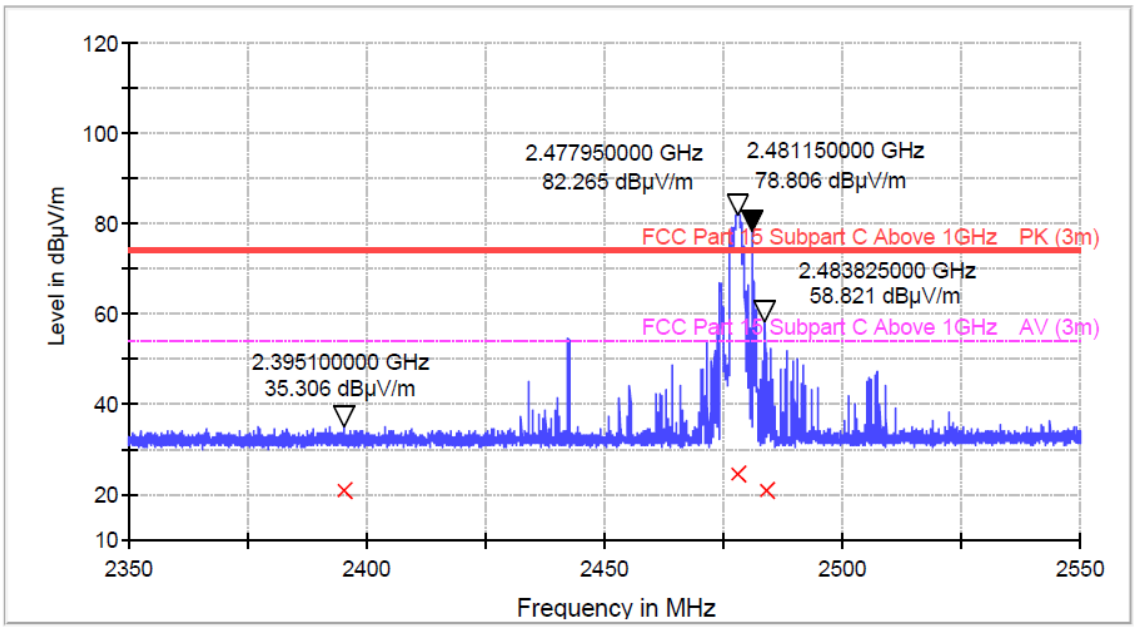
Highest Channel (2.478 GHz):

Polarization	Frequency (MHz)	PK Reading (dBµV)	Correction Factor (dB)	PK Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	2395.100	44.206	-8.900	35.306	74.000	-38.694
Horizontal	2483.825	67.421	-8.600	58.821	74.000	-15.179
Vertical	2391.375	43.289	-8.900	34.389	74.000	-39.611
Vertical	2518.825	61.836	-8.500	53.336	74.000	-20.664

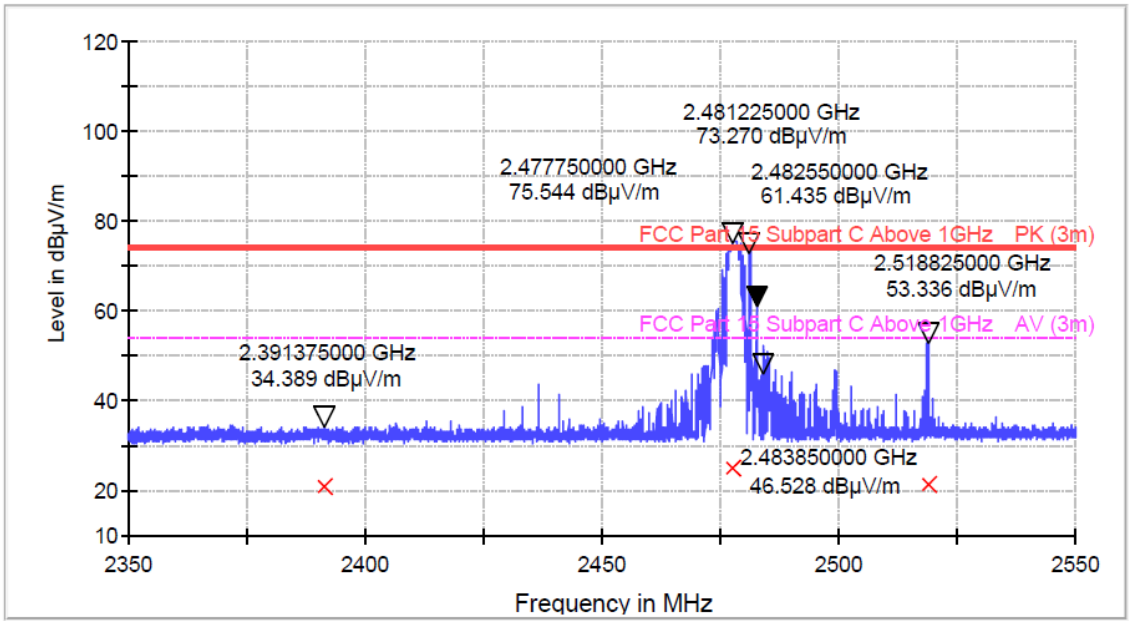
Polarization	Frequency (MHz)	AV Reading (dBµV)	Correction Factor (dB)	AV Net at 3m (dBµV/m)	AV Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	2395.100	-	-8.900	-	54.000	-
Horizontal	2483.825	42.131	-8.600	33.531	54.000	-20.469
Vertical	2391.375	-	-8.900	-	54.000	-
Vertical	2518.800	-	-8.500	-	54.000	-

TEST REPORT

Horizontal



Vertical



Peak Measurement

Band-edge compliance is determined by applying marker-delta method, i.e (Band-edge Plot).

The Peak resultant field strength meets the general radiated emission AV limit 54dBµv/m in 15.209, so it complies with the requirement.

TEST REPORT

5.0 Test Equipment List

Radiated Emission/Radio

Equipment No.	Equipment	Model	Manufacturer	Cal. Due date (MM-DD-YYYY)	Calibration Interval
EM030-04	3m Semi-Anechoic Chamber	9×6×6 m^3	ETS•LINDGREN	2018/5/1	1Y
EM031-02	EMI Test Receiver (9 kHz~7 GHz)	R&S ESR7	R&S	2018/3/27	1Y
EM031-03	Signal and Spectrum Analyzer (10 Hz~40 GHz)	R&S FSV40	R&S	2018/5/18	1Y
EM011-04	Loop antenna (9 kHz-30 MHz)	HFH2-Z2	R&S	2018/6/14	1Y
EM061-03	TRILOG Super Broadband test Antenna (30 MHz-1.5 GHz）(TX)	VULB 9161	SCHWARZBECK	2018/6/7	1Y
EM033-01	TRILOG Super Broadband test Antenna(30 MHz-3 GHz）(RX)	VULB 9163	SCHWARZBECK	19/9/2018	1Y
EM033-02	Bouble-Ridged Waveguide Horn Antenna (800 MHz-18 GHz)(RX)	R&S HF907	R&S	2018/6/7	1Y
EM033-03	High Frequency Antenna & preamplifier(18 GHz~26.5 GHz) (RX)	R&S SCU-26	R&S	2018/5/4	1Y
EM033-04	High Frequency Antenna & preamplifier (26 GHz-40 GHz)	R&S SCU-40	R&S	2018/5/4	1Y
EM031-02-01	Coaxial cable(9 kHz-1 GHz)	N/A	R&S	2018/5/18	1Y
EM033-02-02	Coaxial cable(1 GHz-18 GHz)	N/A	R&S	2018/5/18	1Y
EM033-04-02	Coaxial cable(18 GHz~40 GHz)	N/A	R&S	2018/5/25	1Y
EM031-01	Signal Generator (9 kHz~6 GHz)	SMB100A	R&S	2018/8/1	1Y
EM085-02	Signal Generator (10MHz-40GHz)	68369B	Wiltron	2018/5/31	1Y
EM040-01	Band Reject/Notch Filter	WRHFV	Wainwright	N/A	1Y
EM040-02	Band Reject/Notch Filter	WRCGV	Wainwright	N/A	1Y
EM040-03	Band Reject/Notch Filter	WRCGV	Wainwright	N/A	1Y
EM022-03	2.45 GHz Filter	BRM50702	Micro-Tronics	2018/5/9	1Y
SA016-16	Programmable Temperature & Humidity Test Chamber	MHU-800LJ	TERCHY	2018/10/15	1Y
SA016-22	Climatic Test Chamber	C7-1500	Vötsch	2018/10/27	1Y
SA012-74	Digital Multimeter	FLUKE175	FLUKE	2018/10/15	1Y
EM010-01	Regulated DC Power supply	PAB-3003A	GUANHUA	N/A	1Y
SA040-22	Regulated DC Power supply	IT6721	ITECH	2018/9/14	1Y
EM084-06	Audio Analyzer	8903B	HP	2018/4/3	1Y
EM084-07	Modulation Analyzer	8901B	HP	2018/6/15	1Y
EM045-01-01	EMC32 software (RE/RS)	V10.01.00	R&S	N/A	N/A
EM045-01-09	EMC32 software (328/893)	V9.26.01	R&S	N/A	N/A

**********End of the test report**********