Report No.: 170609011GZU-001
Issued: 2017-07-21

TEST REPORT

Applicant Name & Address	:	L'Image Home Products Inc. 1175 Place du Frère André, Montreal, QC, H3B 3X9
Sample Description		
Product	:	Wireless linkable LED wall light
ID	:	2AE6Q30310684
Model No.	:	30310684
Electrical Rating	:	4.5V DC (3 X 1.5V / AA battery); 1W
Date Received	:	09 June 2017
Date Test Conducted	:	09 June 2017 to 30 June 2017
Test standards	:	**47 CFR PART 15 Subpart C: 2016 section 15.249**
Test Result	:	Pass
Conclusion	:	The submitted samples complied with the above rules/standards.
Remark	:	TRF No.: FCC Part 15.249-b Effective date: 14 December 2016

**********End of Page**********

Prepared and Checked By:

Paul Pang
Project Engineer
Intertek Guangzhou

Approved By:

Helen Ma ***Signature***
Helen Ma
Team Leader
Intertek Guangzhou
21 July 2017 Date

Intertek Testing Services Shenzhen Ltd. Guangzhou Branch
Block E, No.7-2 Guang Dong Software Science Park, Caipin Road, Guangzhou Science City, GETDD Guangzhou, China
Tel / Fax: 86-20-8213 9688/86-20-3205 7538

CONTENT

1.0 Summary of Test

TEST	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.

2.0 General Description

2.1 Product Description

Operating Frequency 2404 MHz to 2478 MHz

Type of Modulation: GFSK

Number of Channels 76 Channels

Channel Separation: 1 MHz

Antenna Type Integral

Antenna gain: -0.5 dBi

Function: Wireless linkable LED wall light with 2.4GHz emit 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 36: 2440 MHz and highest channel 75: 2478 MHz.

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

19	2422	46	2449	73	2476
20	2423	47	2450	74	2477
21	2424	48	2451	75	2478
22	2425	49	2452		
23	2426	50	2453		
24	2427	51	2454		
25	2428	52	2455		
26	2429	53	2456		
27	2430	54	2457		

2.2 Related Submittal(s) Grants

This is an application for certification of:
DXT- Part 15 Low Power Transceiver, RX Verified.

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

2.3 Test Methodology

Radiated emission measurements was performed according to the procedures in ANSI C63.10:2013. Radiated emission measurement was performed in semi-anechoic chamber. 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 of the tests are performed at:
Intertek Testing Services Shenzhen Ltd. Guangzhou Branch
Block E, No.7-2 Guang Dong Software Science Park, Caipin Road, Guangzhou Science City, GETDD Guangzhou, China.

This test facility and site measurement data have been fully placed on FCC file, test firm registration number is 549654.

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. During testing, the EUT was manipulated to produce worst case emissions. It was powered by 3 X 1.5V / 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

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.

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:

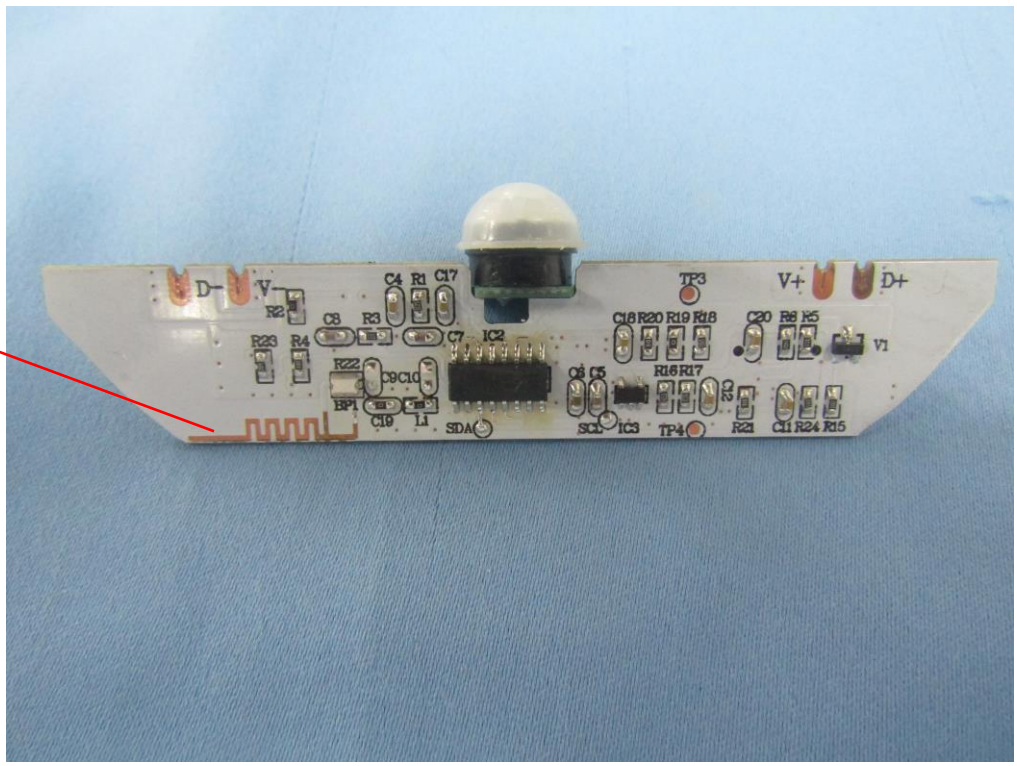
Standard requirement

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

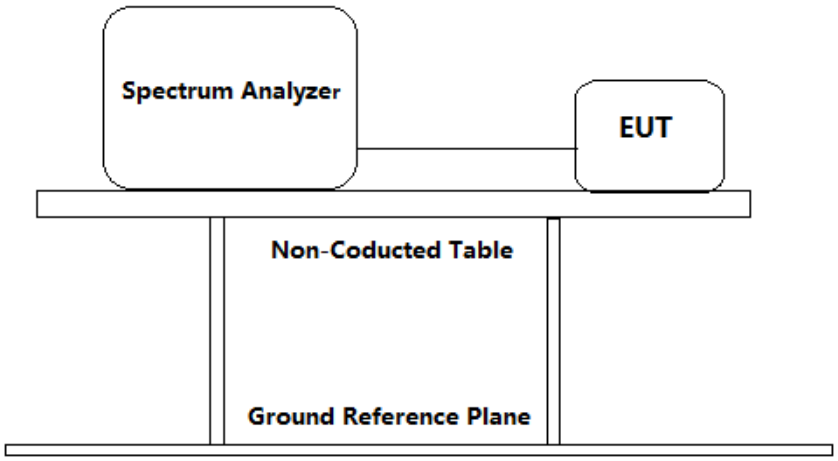
The antenna is an integral antenna and no consideration of replacement. The best case gain of the antenna is -0.5 dBi.



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.

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.

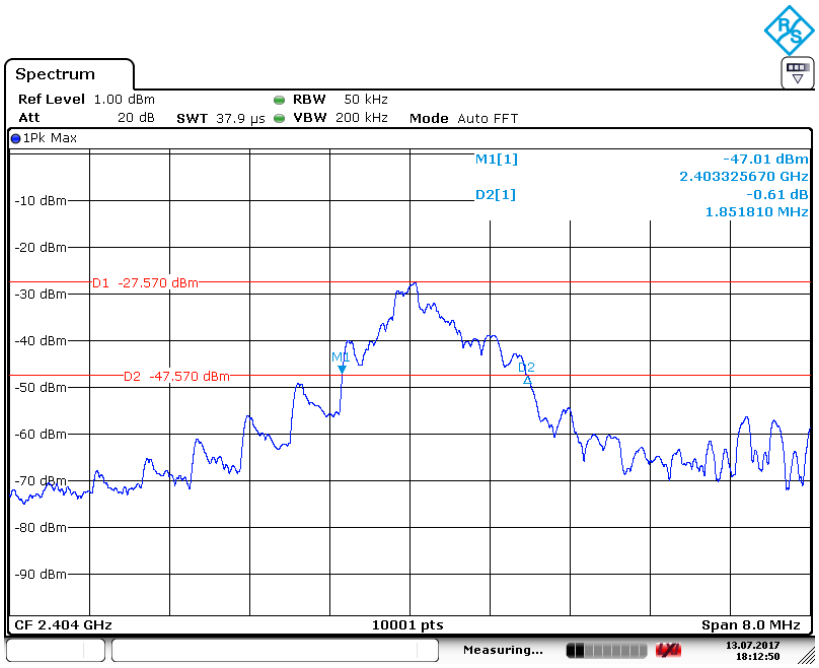
20 dB bandwidth:

Channel No.	Frequency (MHz)	Measured 20 dB bandwidth (kHz)	Limit (kHz)	Result
0	2404	1851.810	/	Pass
19	2440	4345.600		Pass
39	2478	4641.500		Pass

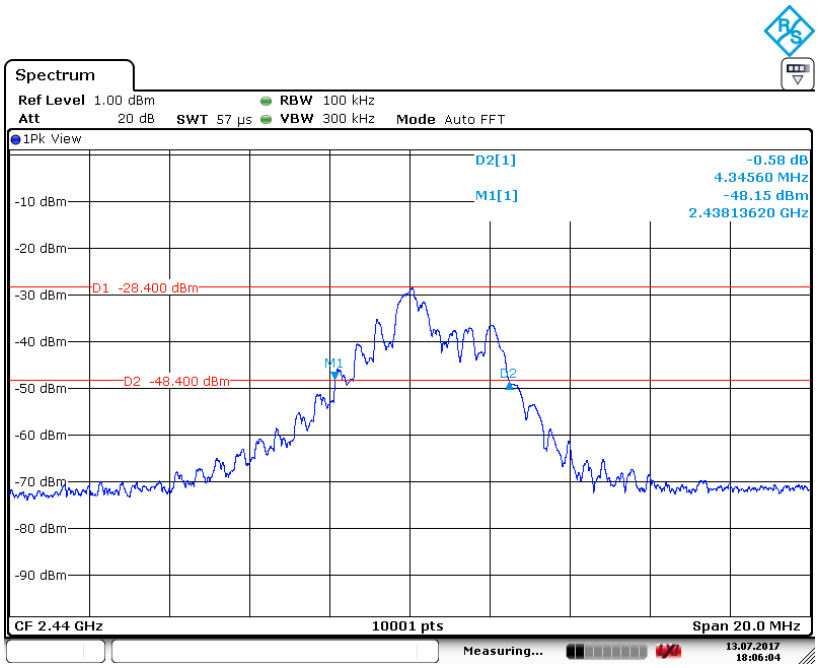
20dB bandwidth:

Result plot as follows:

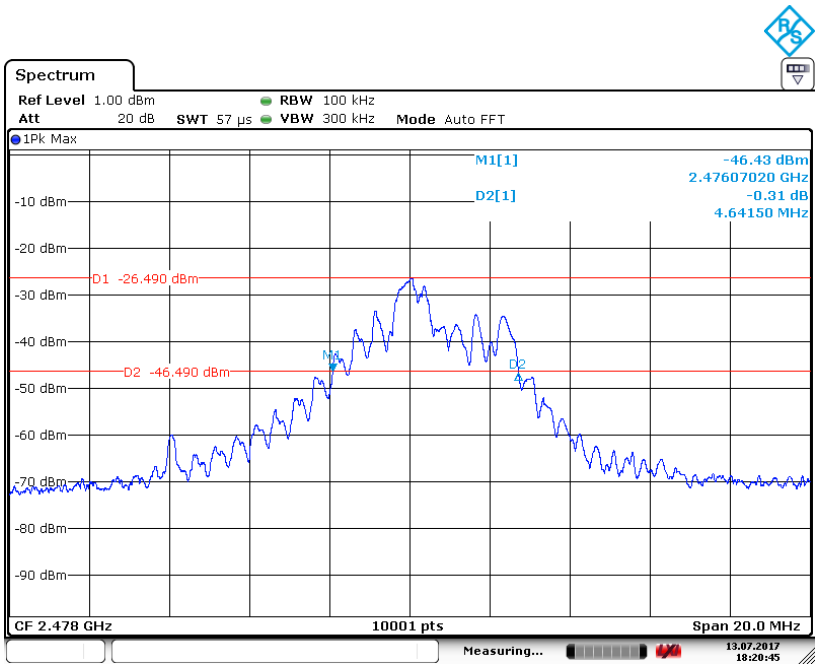
Lowest channel (2.404 GHz):



Middle Channel (2.440 GHz):



Highest Channel (2.478 GHz):



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
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 =2.817ms

Effective period of the cycle =0.649 ms

DC =0.649/2.817=0.2304 or 23.04%

Therefore, the averaging factor is found by 20lg0.2304=-12.75

2440MHz

The duration of one cycle =2.790ms

Effective period of the cycle =0.644ms

DC =0.644/2.790=0.2308 or 23.08%

Therefore, the averaging factor is found by 20lg0.2308=-12.73

2478MHz

The duration of one cycle =2.804ms

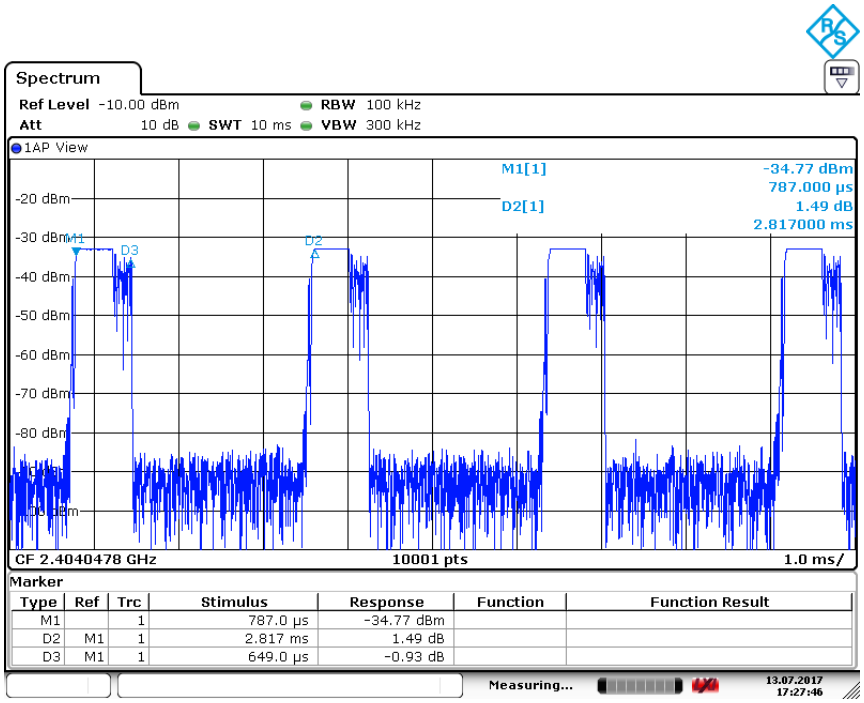
Effective period of the cycle =0.645ms

DC =0.645/2.804=0.2300 or 23%

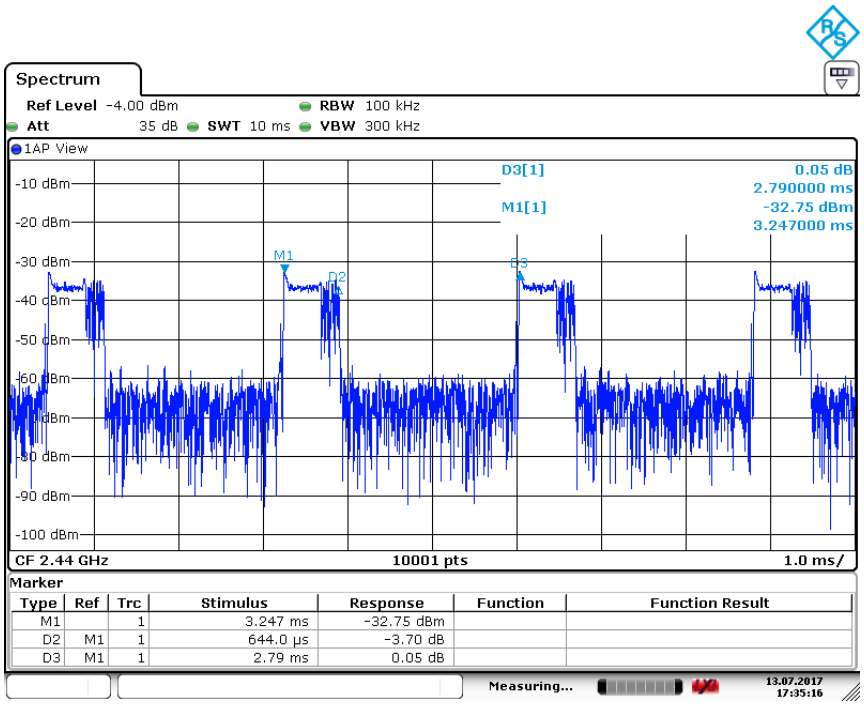
Therefore, the averaging factor is found by 20lg0.23=-12.76

Please refer to below plots for more details.

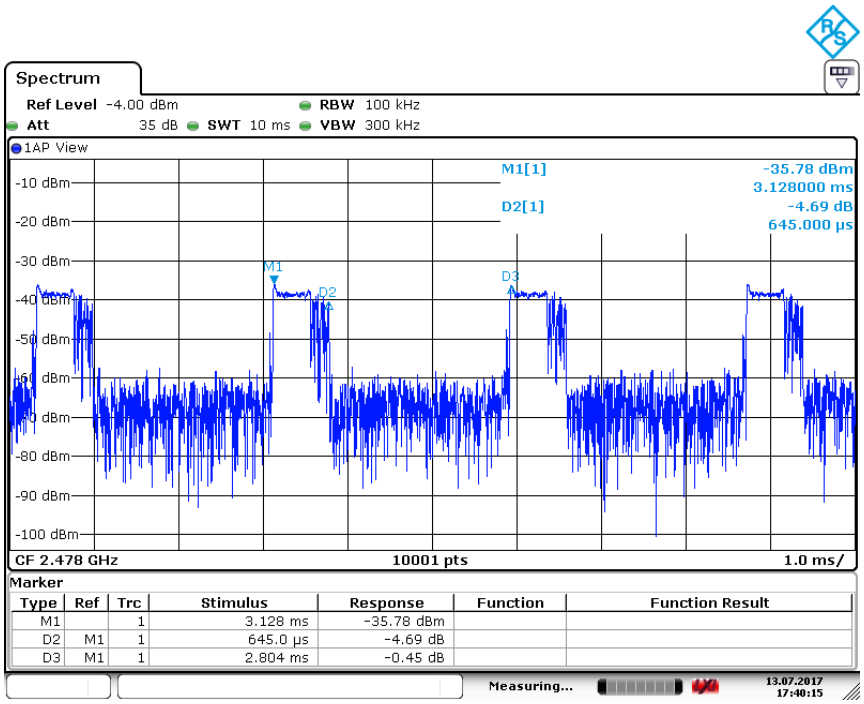
2404MHz



2440MHz



2478MHz


Spectrum
Ref Level -4.00 dBm
RBW 100 kHz
Att 35 dB SWT 10 ms VBW 300 kHz
1AP View
M1[1] -35.78 dBm
3.128000 ms
D2[1] -4.69 dB
645.000 µs
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
-90 dBm
-100 dBm
M1
D2
D3
CF 2.478 GHz
10001 pts
1.0 ms/
Marker
Type Ref Trc Stimulus Response Function Function Result
M1 1 3.128 ms -35.78 dBm
D2 M1 1 645.0 µs -4.69 dB
D3 M1 1 2.804 ms -0.45 dB
Measuring...
13.07.2017
17:40:15

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

Where:

RA = Receiver Amplitude (including preamplifier) in dBµV

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

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

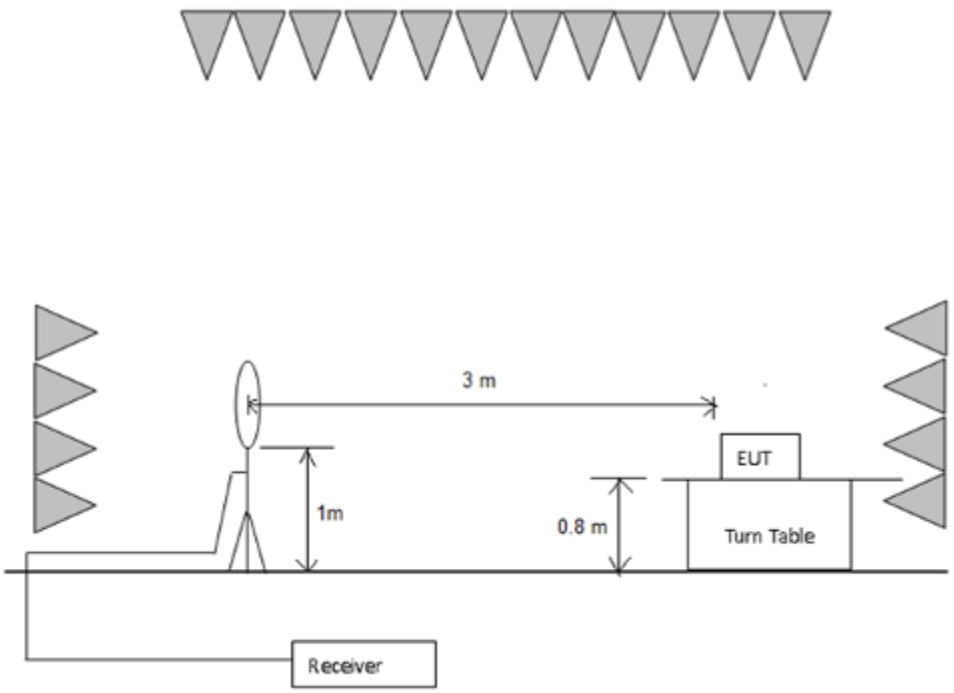
FS = 62 + (-20) + (-10) = 32 dBµV/m

Section 15.205 Restricted bands of operation.

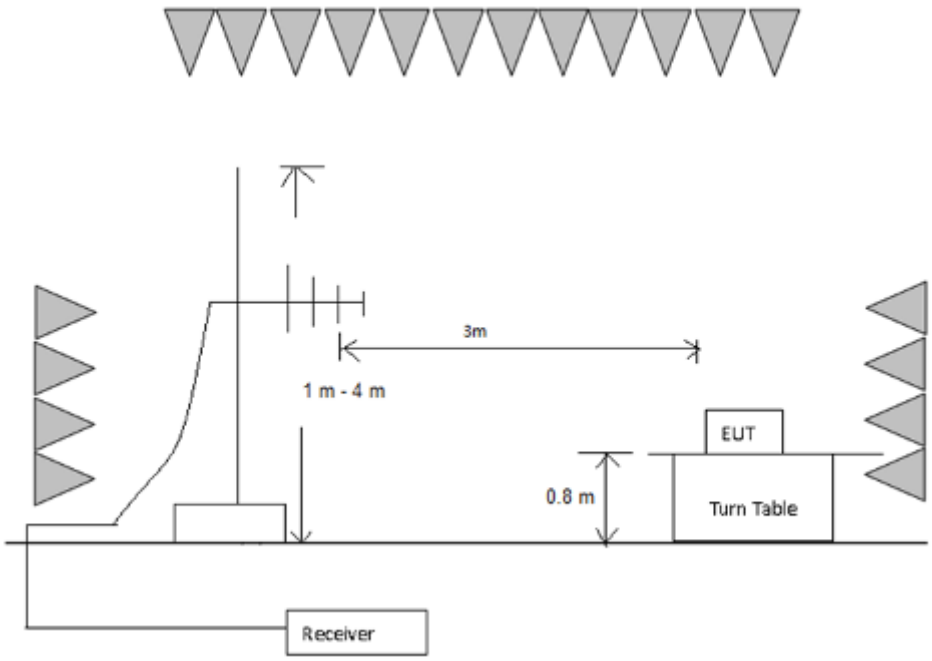
MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 -	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.69525	960 - 1240	7.25 - 7.75
4.125 - 4.128	16.80425 -	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	16.80475	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	25.5 - 25.67	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	37.5 - 38.25	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	73 - 74.6	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	74.8 - 75.2	2200 - 2300	14.47 - 14.5
8.291 - 8.294	108 - 121.94	2310 - 2390	15.35 - 16.2
8.362 - 8.366	123 - 138	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	149.9 - 150.05	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.52475 -	3260 - 3267	23.6 - 24.0
12.29 - 12.293	156.52525	3332 - 3339	31.2 - 31.8
12.51975 -	156.7 - 156.9	3345.8 - 3358	36.43 - 36.5
12.52025	162.0125 - 167.17	3600 - 4400	
12.57675 -	167.72 - 173.2		
12.57725	240 - 285		
13.36 - 13.41	322 - 335.4		

Test Configuration:

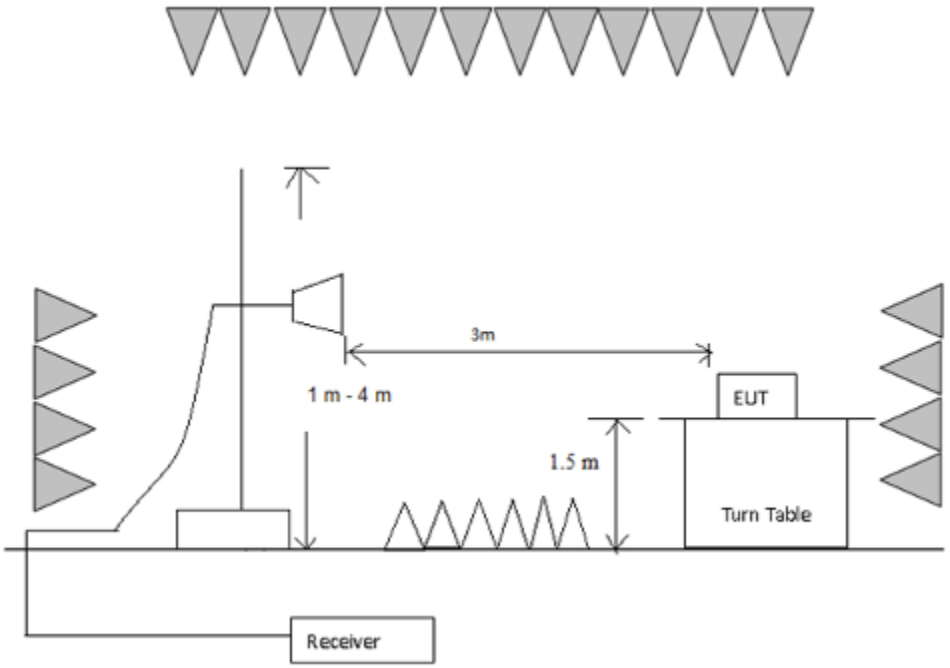
1) 9 kHz to 30 MHz emissions:



2) 30 MHz to 1 GHz emissions:



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. 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

Antenna Polarization	Frequency [MHz]	Measured Net at 3m [dB(μV/m)]	Limit at 3m [dB(μV/m)]
Horizontal	109.520	17.600	40.0
Horizontal	231.640	20.900	47.0
Horizontal	536.720	27.500	47.0
Vertical	50.120	18.600	40.0
Vertical	194.040	18.200	40.0
Vertical	435.440	25.500	47.0

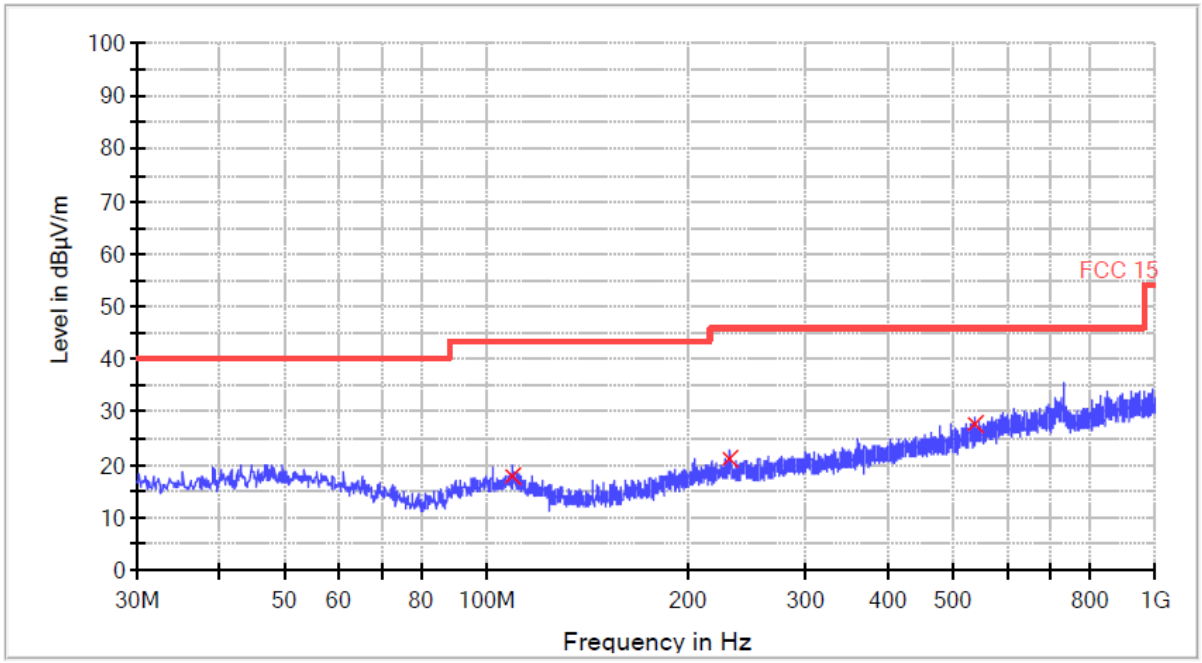
Operation Frequency: 2440MHz

Antenna Polarization	Frequency [MHz]	Measured Net at 3m [dB(μV/m)]	Limit at 3m [dB(μV/m)]
Horizontal	42.360	19.000	40.0
Horizontal	95.360	18.900	40.0
Horizontal	479.240	25.900	47.0
Vertical	50.240	17.500	40.0
Vertical	107.720	16.600	40.0
Vertical	429.040	25.100	47.0

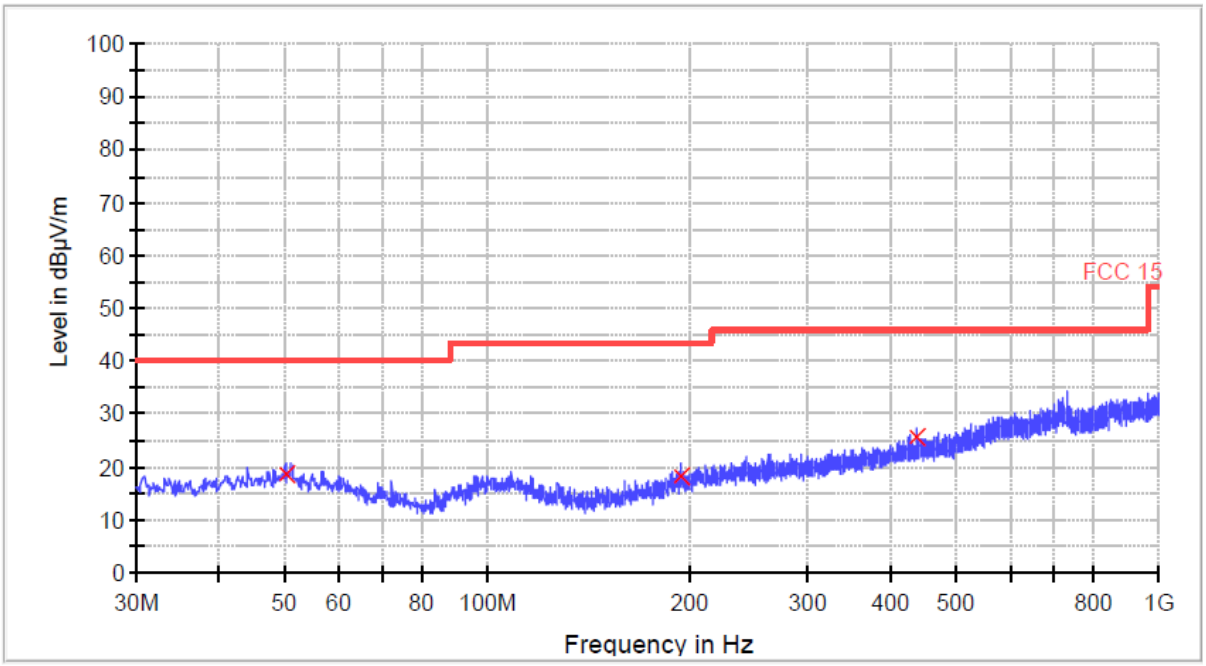
Operation Frequency: 2478MHz

Antenna Polarization	Frequency [MHz]	Measured Net at 3m [dB(μV/m)]	Limit at 3m [dB(μV/m)]
Horizontal	54.600	17.800	40.0
Horizontal	243.760	20.300	47.0
Horizontal	438.120	24.500	47.0
Vertical	53.520	18.200	40.0
Vertical	110.280	16.500	40.0
Vertical	461.760	24.500	47.0

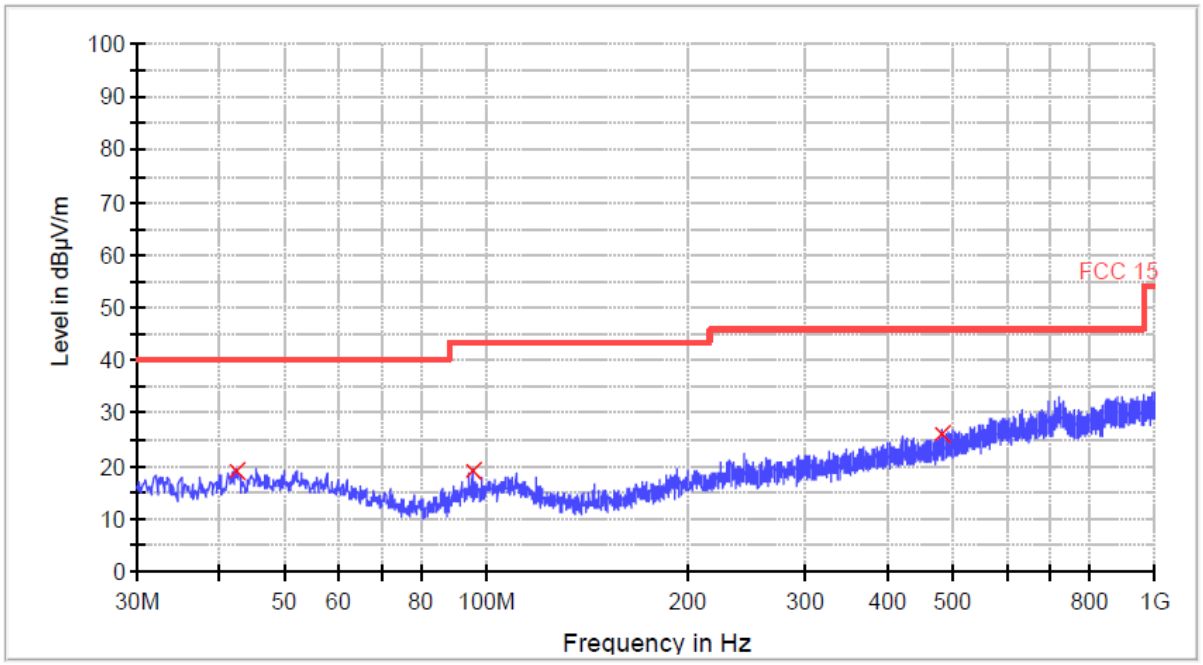
Test Curve:
Operation Frequency: 2404MHz
Horizontal:



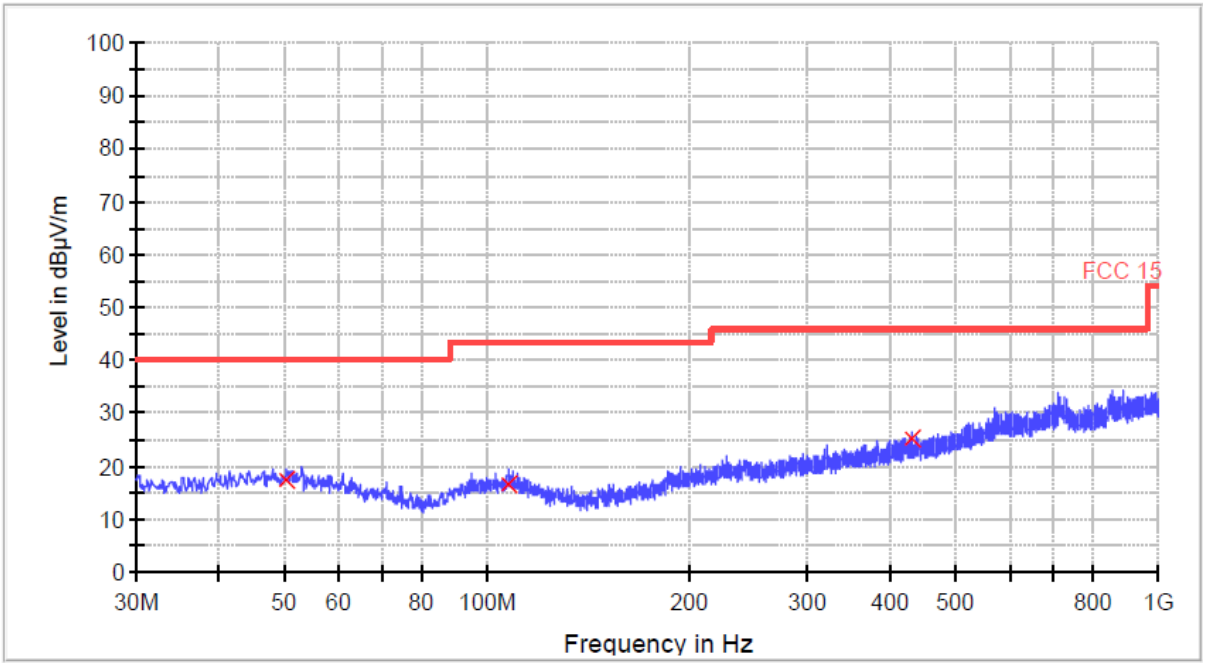
Vertical:



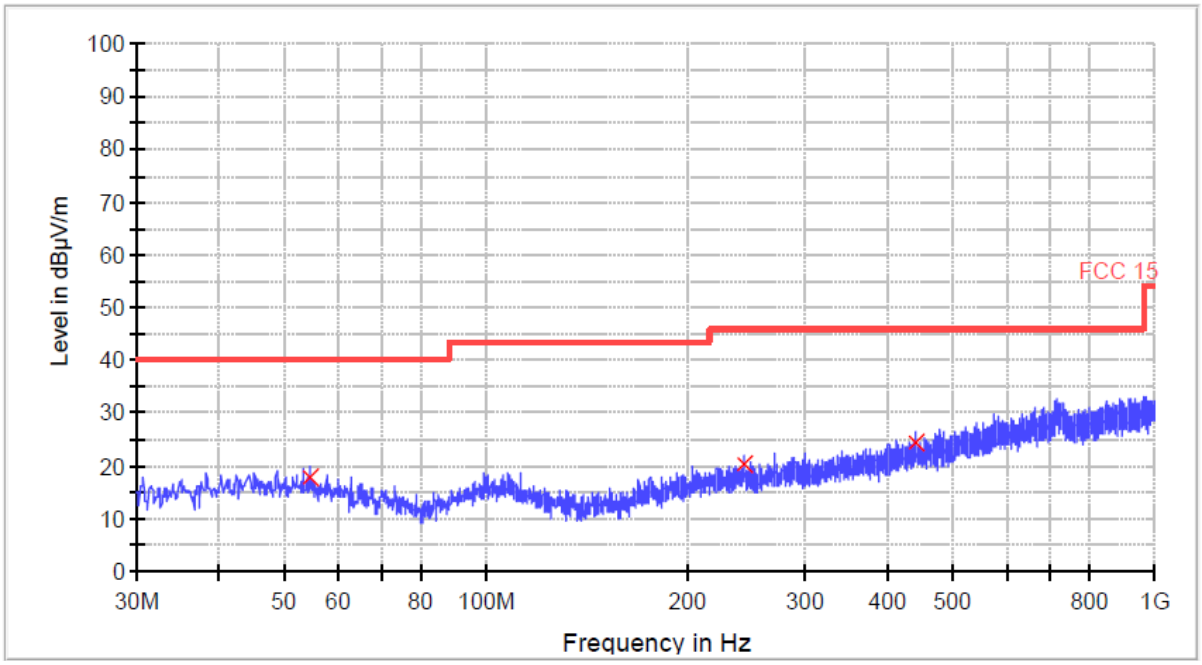
Operation Frequency: 2440MHz
Horizontal:



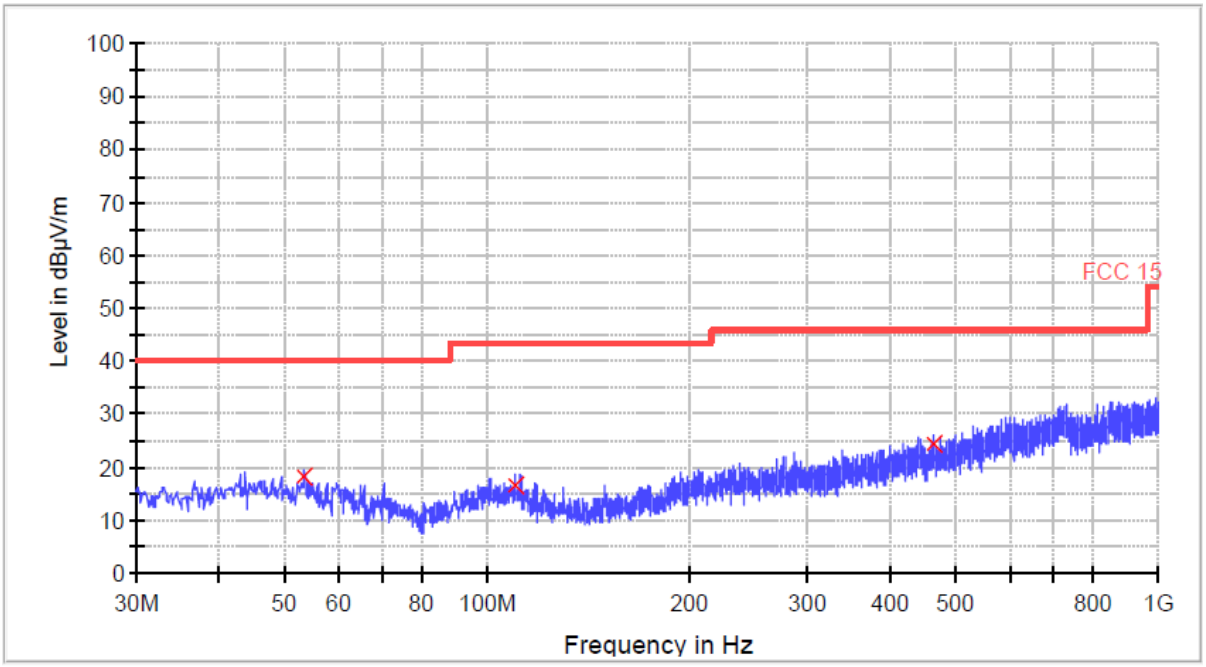
Vertical:



Operation Frequency: 2478MHz
Horizontal:



Vertical:



Radiated Emissions (Above 1GHz)

Operation Frequency: 2404MHz:

Polarization	Frequency (MHz)	PK Reading (dBµV)	Correction Factor (dB)	PK Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	2403.820	107.108	-8.900	98.208	114.000	-15.792
Horizontal	4808.000	59.556	-2.900	56.656	74.000	-17.344
Horizontal	7211.600	52.844	5.500	58.344	74.000	-15.656
Horizontal	9617.200	46.500	7.000	53.500	74.000	-20.500
Vertical	2403.800	97.076	-8.900	88.176	114.000	-25.824
Vertical	4806.400	62.943	-2.900	60.043	74.000	-13.957
Vertical	7211.600	51.344	5.500	56.844	74.000	-17.156
Vertical	9615.600	50.048	7.000	57.048	74.000	-16.952

Polarization	Frequency (MHz)	PK Reading (dBµV)	Correction Factor (dB)	AV Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	2403.820	98.208	-12.750	85.458	94.000	-8.542
Horizontal	4808.000	56.656	-12.750	43.906	54.000	-10.094
Horizontal	7211.600	58.344	-12.750	45.594	54.000	-8.406
Horizontal	9617.200	53.500	-12.750	40.750	54.000	-13.250
Vertical	2403.800	88.176	-12.750	75.426	94.000	-18.574
Vertical	4806.400	60.043	-12.750	47.293	54.000	-6.707
Vertical	7211.600	56.844	-12.750	44.094	54.000	-9.906
Vertical	9615.600	57.048	-12.750	44.298	54.000	-9.702

Operation Frequency: 2440MHz:

Polarization	Frequency (MHz)	PK Reading (dBµV)	Correction Factor (dB)	PK Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	2440.320	103.258	-8.800	94.458	114.000	-19.542
Horizontal	4879.200	62.492	-2.700	59.792	74.000	-14.208
Horizontal	7320.400	48.037	6.100	54.137	74.000	-19.863
Horizontal	9760.000	46.927	7.300	54.227	74.000	-19.773
Vertical	2440.000	98.296	-8.800	89.496	114.000	-24.504
Vertical	4879.200	67.239	-2.700	64.539	74.000	-9.461
Vertical	7318.800	47.306	6.100	53.406	74.000	-20.594
Vertical	9760.000	47.771	7.300	55.071	74.000	-18.929

Polarization	Frequency (MHz)	PK Reading (dBµV)	Correction Factor (dB)	AV Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	2440.320	94.458	-12.730	81.728	94.000	-12.272
Horizontal	4879.200	59.792	-12.730	47.062	54.000	-6.938
Horizontal	7320.400	54.137	-12.730	41.407	54.000	-12.593
Horizontal	9760.000	54.227	-12.730	41.497	54.000	-12.503
Vertical	2440.000	89.496	-12.730	76.766	94.000	-17.234
Vertical	4879.200	64.539	-12.730	51.809	54.000	-2.191
Vertical	7318.800	53.406	-12.730	40.676	54.000	-13.324
Vertical	9760.000	55.071	-12.730	42.341	54.000	-11.659

Operation Frequency: 2478MHz:

Polarization	Frequency (MHz)	PK Reading (dBµV)	Correction Factor (dB)	PK Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	2477.860	91.738	-8.600	83.138	114.000	-30.862
Horizontal	4956.000	64.598	-2.500	62.098	74.000	-11.902
Horizontal	7434.400	52.974	6.800	59.774	74.000	-14.226
Horizontal	9911.200	47.274	7.700	54.974	74.000	-19.026
Vertical	2478.340	90.836	-8.600	82.236	114.000	-31.764
Vertical	4956.000	61.651	-2.500	59.151	74.000	-14.849
Vertical	7432.800	49.969	6.800	56.769	74.000	-17.231
Vertical	9913.200	46.100	7.800	53.900	74.000	-20.100

Polarization	Frequency (MHz)	PK Reading (dBµV)	Correction Factor (dB)	AV Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	2477.860	83.138	-12.760	70.378	94.000	-23.622
Horizontal	4956.000	62.098	-12.760	49.338	54.000	-4.662
Horizontal	7434.400	59.774	-12.760	47.014	54.000	-6.986
Horizontal	9911.200	54.974	-12.760	42.214	54.000	-11.786
Vertical	2478.340	82.236	-12.760	69.476	94.000	-24.524
Vertical	4956.000	59.151	-12.760	46.391	54.000	-7.609
Vertical	7432.800	56.769	-12.760	44.009	54.000	-9.991
Vertical	9913.200	53.900	-12.760	41.140	54.000	-12.860

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.

4.4 Band Edges Requirement

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

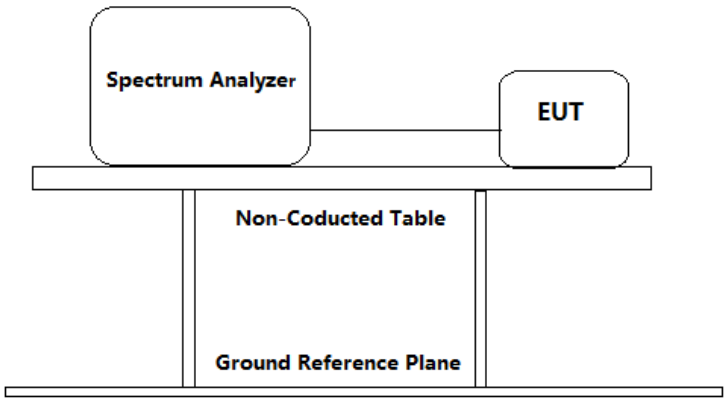
(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in§ 15.209, whichever is the lesser attenuation.

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 and the highest channels were selected for the final test as listed below.

Test Configuration:



Test result

Operation Frequency: 2404MHz:

Polarization	Frequency (MHz)	PK Reading (dBµV)	Correction Factor (dB)	PK Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	2399.120	80.907	-8.900	72.007	74.000	-1.993
Horizontal	2484.840	46.762	-8.600	38.162	74.000	-35.838
Vertical	2399.880	73.820	-8.900	64.920	74.000	-9.080
Vertical	2503.160	46.189	-8.500	37.689	74.000	-36.311

Polarization	Frequency (MHz)	AV Reading (dBµV)	Correction Factor (dB)	AV Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	2399.120	54.900	-8.900	46.000	54.000	-8.000
Horizontal	2484.840	33.000	-8.600	24.400	54.000	-29.600
Vertical	2399.880	45.400	-8.900	36.500	54.000	-17.500
Vertical	2503.160	31.700	-8.500	23.200	54.000	-30.800

Operation Frequency: 2478MHz:

Polarization	Frequency (MHz)	PK Reading (dBµV)	Correction Factor (dB)	PK Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	2398.680	47.489	-8.900	38.589	74.000	-35.411
Horizontal	2526.900	65.180	-8.400	56.780	74.000	-17.220
Vertical	2399.360	45.261	-8.900	36.361	74.000	-37.639
Vertical	2491.280	67.583	-8.500	59.083	74.000	-14.917

Polarization	Frequency (MHz)	AV Reading (dBµV)	Correction Factor (dB)	AV Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	2398.680	32.000	-8.900	23.100	54.000	-30.900
Horizontal	2526.900	29.700	-8.400	21.300	54.000	-32.700
Vertical	2399.360	33.000	-8.900	24.100	54.000	-29.900
Vertical	2491.280	29.800	-8.500	21.300	54.000	-32.700

Notes:

1. AT frequencies equal to or less than 1000MHz, quasi-peak detector was used, above 1000MHz, Peak and AV 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.

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	2017/9/8	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	2017/10/21	1Y
SA016-22	Climatic Test Chamber	C7-1500	Vötsch	2017/10/21	1Y
SA012-74	Digital Multimeter	FLUKE175	FLUKE	2017/10/13	1Y
EM010-01	Regulated DC Power supply	PAB-3003A	GUANHUA	N/A	1Y
SA040-22	Regulated DC Power supply	IT6721	ITECH	2017/9/18	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

Conducted emission at the mains terminals

Equipment No.	Equipment	Model	Manufacturer	Cal. Due date (YYYY-MM-DD)	Calibration Interval
EM080-05	EMI receiver	ESCI	R&S	2018/7/24	1Y
EM006-05	LISN	ENV216	R&S	2018/6/4	1Y
EM006-06	LISN	ENV216	R&S	2017/9/18	1Y
EM006-06-01	Coaxial cable	/	R&S	2018/4/6	1Y
EM004-04	EMC shield Room	8m×3m×3m	Zhongyu	2018/1/23	1Y

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