REPORT No .: SZ18040206W01

TEST REPORT

APPLICANT	:	Vaultek Safe, Inc.
PRODUCT NAME	:	SL20/SL20i safe
MODEL NAME	:	SL20-BK/SL20-WT/SL20-TG/SL20-CM SL20i-BK/SL20i-WT/SL20i-TG/SL20i-CM
BRAND NAME	:	Vaultek
FCC ID	:	2AONI-SLIDER-20I01
STANDARD(S)	:	47 CFR Part 15 Subpart C
TEST DATE	:	2018-05-02 to 2018-05-03
ISSUE DATE	:	2018-05-16

Tested by: Su Hang

Su Hang (Test Engineer)

Approved by: Peng Huarui

Peng Huarui (Supervisor)

MORLAB

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DIRECTORY

Change History		
Issue	**Date**	**Reason for change**
1.0	2018-05-16	First edition

1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Vaultek Safe, Inc.
Applicant Address:	37 N Orange Ave.Suite 800B Orlando, FL 32801
Manufacturer:	Jeritech Electronics, Ltd.
Manufacturer Address:	Guannanyong Industrial Estate, Shiqi Town, Panyu, GuangZhou, China

1.2. Equipment Under Test (EUT) Description

Product Name:	SL20/SL20i safe
Serial No:	(N/A, marked #1 by test site)
Hardware Version:	R10
Software Version:	R10
Modulation Type:	GFSK
Operating Frequency Range:	The frequency range used is 2402MHz - 2480MHz (40 channels, at intervals of 2MHz);
Bluetooth Version:	Bluetooth 4.0 LE
Antenna Type:	PCB Antenna
Antenna Gain:	3.0 dBi

Note 1: According to the certificate holder, they declared that the models: SL20-BK, SL20-WT, SL20-TG, SL20-CM, SL20i-BK, SL20i-WT, SL20i-TG, SL20i-CM only the models and colors are different, the substrate is the same. The same is true of the material used. The main measuring model is SL20-BK, only the results for SL20-BK were recorded in this report.

Note 2: The EUT contains Bluetooth Module operating at 2.4GHz ISM band; the frequencies is F(MHz)=2402+2*n (0<=n<=39). The lowest, middle, highest channel numbers of the Bluetooth Module used and tested in this report are separately 0 (2402MHz), 19 (2440MHz) and 39 (2480MHz).

Note 3: The EUT connected to the serial port of the computer with a serial communication cable, we use the dedicated software to control the EUT continuous transmission.

Note 4: For a more detailed description, please refer to Specification or User's Manual supplied by applicant and/or manufacturer.

1.3. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart C for the EUT FCC ID Certification:

No	Identity	Document Title
1	47 CFR Part 15 (10-1-15 Edition)	Radio Frequency Devices

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Test Date	Test Engineer	Result
1	15.203	Antenna Requirement	N/A	N/A	PASS
2	15.247(b)	Peak Output Power	May 03, 2018	Su Hang	PASS
3	15.247(a)	Bandwidth	May 03, 2018	Su Hang	PASS
4	15.247(d)	Conducted S purious E mission and Band Edge	May 03, 2018	Su Hang	PASS
5	15.247(e)	Power spectral density (PSD)	May 03, 2018	Su Hang	PASS
6	15.247(d)	Restricted Frequency Bands	May 03, 2018	Wu Junke	PASS
7	15.207	Conducted Emission	May 03, 2018	Wu Junke	PASS
8	15.209, 15.247(d)	Radiated Emission	May 03, 2018	Wu Junke	PASS
Note 1: The tests were performed according to the method of measurements prescribed in ANSIC63.10-2013 and KDB558074 D01 v04 (04/05/2017).					

1.4. Environmental Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 - 35
Relative Humidity (%):	30 -60
Atmospheric Pressure (kPa):	86-106

2. 47 CFR Part 15C Requirements

2.1. Antenna requirement

2.1.1. Applicable Standard

According to FCC 15.203, an intentional radiator shall be designed to ensure that no antenna other than that f urnished by the r esponsible par ty s hall be u sed w ith th e dev ice. The us e of a permanently attac hed a ntenna or o f an antenn a that us es a uni que c oupling to t he intentional radiator shall be considered sufficient to comply with the provisions of this section.

2.1.2. Result: Compliant

The EUT has a permanently and irreplaceable attached antenna. Please refer to the EUT internal photos.

2.2. Peak Output Power

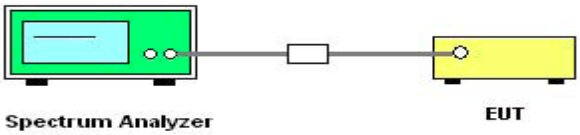
2.2.1. Requirement

According to FCC section 15.247(b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: The maximum peak conducted output power of the intentional radiator shall not exceed 1 Watt.

2.2.2. Test Description

The measured output power w as calculated by the r eading of the spectrum anal yzer and calibration.

A. Test Setup:



The EUT (Equipment under the test) is coupled to the Spectrum analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading, all test result in Spectrum analyzer.

B. Equipments List:

Please refer ANNEX A (1.5).

2.2.3. Test procedure

The measured output power was calculated by the reading of the spectrum analyzer and calibration. Following is the test procedure for Peak Output Power test on the spectrum analyzer：

a) Set analyzer center frequency to channel center frequency.

b) Set the RBW to1MHz
c) Set VBW to 3MHz
d) Set span to 3MHz
e) Sweep time to auto couple.
f) Detector = peak.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use peak marker function to determine the peak amplitude level.

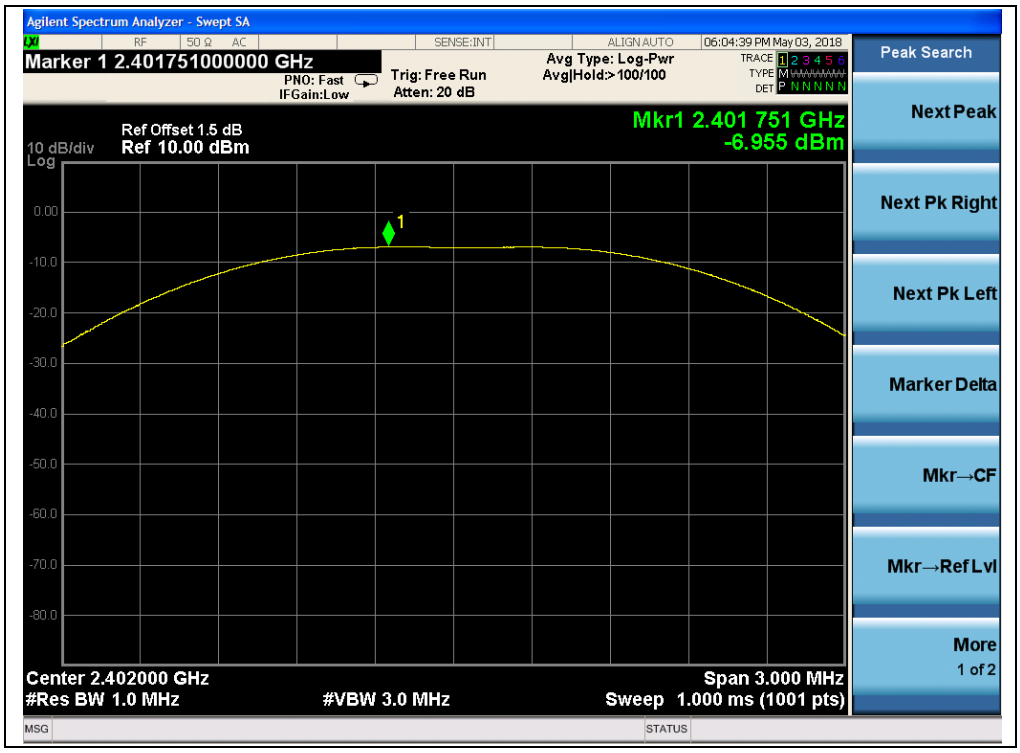
2.2.4. Test Result

The lowest, middle and highest channels are selected to perform testing to verify the conducted RF output peak power of the Module.

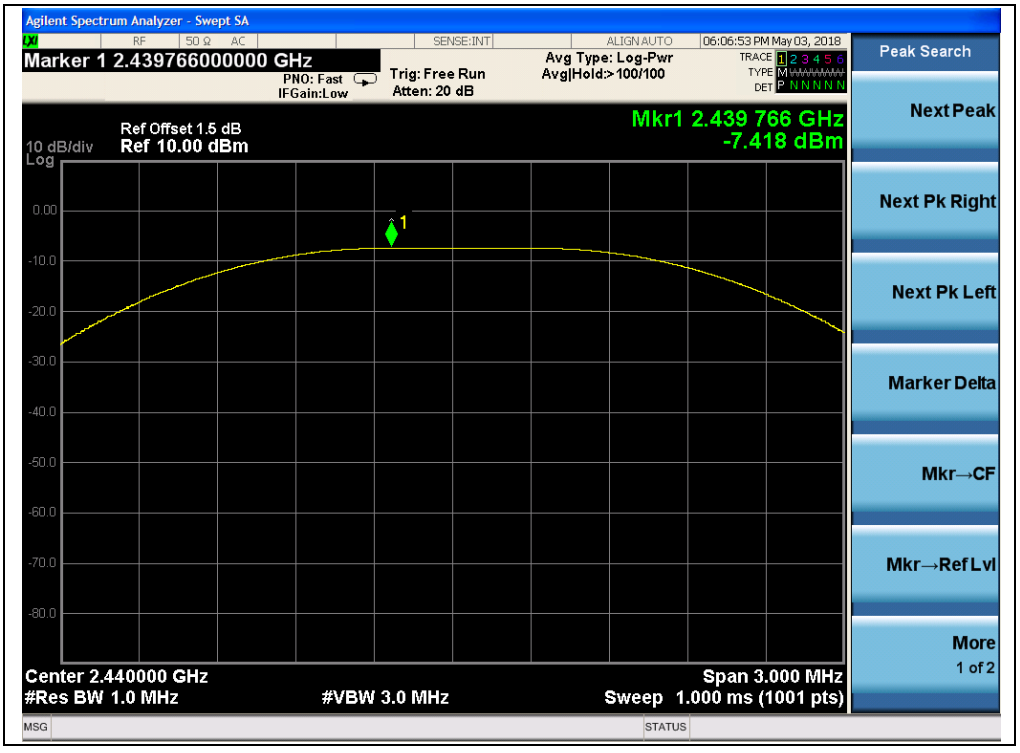
A. Test Verdict:

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
0	2402	-6.96	0.00020	30	1	PASS
19	2440	-7.42	0.00018			PASS
39	2480	-8.19	0.00015			PASS

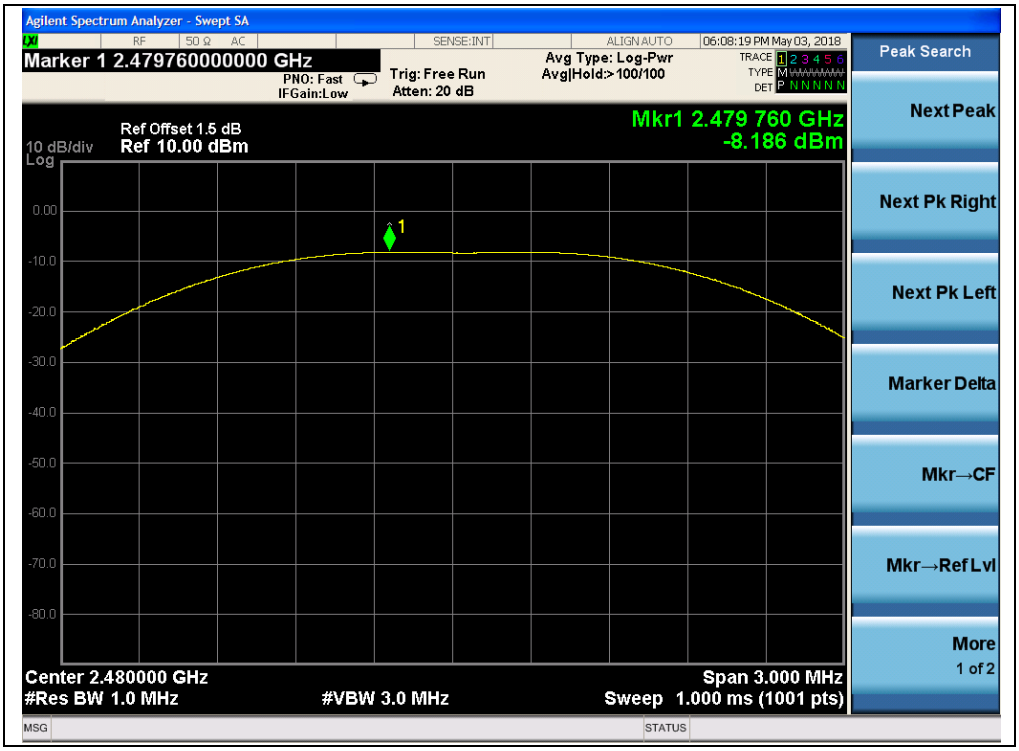
B. Test Plots:



(Channel 0, 2402MHz)



(Channel 19, 2440MHz)



(Channel 39, 2480MHz)

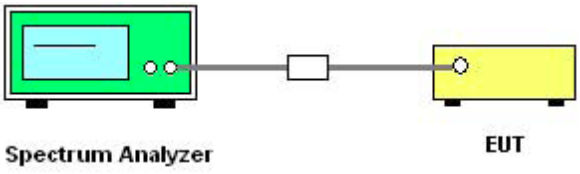
2.3. 6dB Bandwidth

2.3.1. Requirement

According to FCC section 15.247(a) (2), Systems using digital modulation techniques 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.

2.3.2. Test Description

A. Test Set:



The EUT is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW.

B. Equipments List:

Please refer ANNEX A(1.5).

2.3.3. Test procedure

The steps for the first option are as follows:
（1）Set analyzer center frequency to channel center frequency.
a) Set RBW = 100 kHz.
b) Set the VBW=300 kHz.
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.

（2）The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described in 11.8.1 (i.e., RBW = 100 kHz,VBW ≥ 3 × RBW, and peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be ≥6 dB.

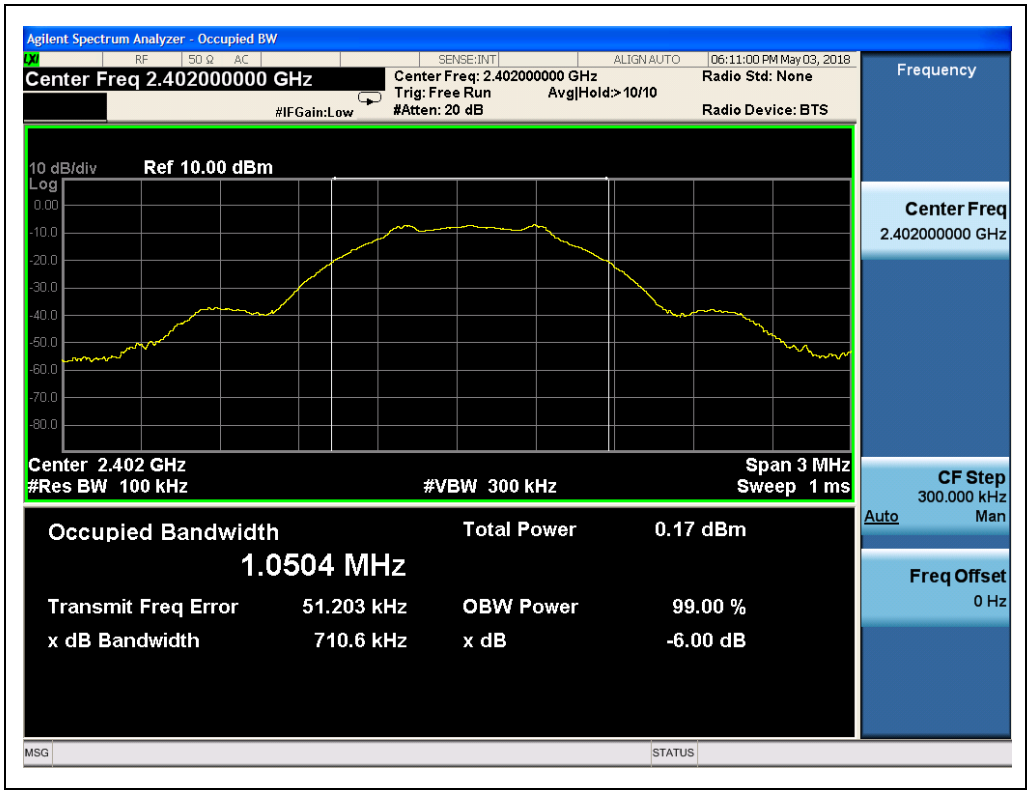
2.3.4. Test Result

The lowest, middle and highest channels are selected to perform testing to record the 6 dB bandwidth of the module.

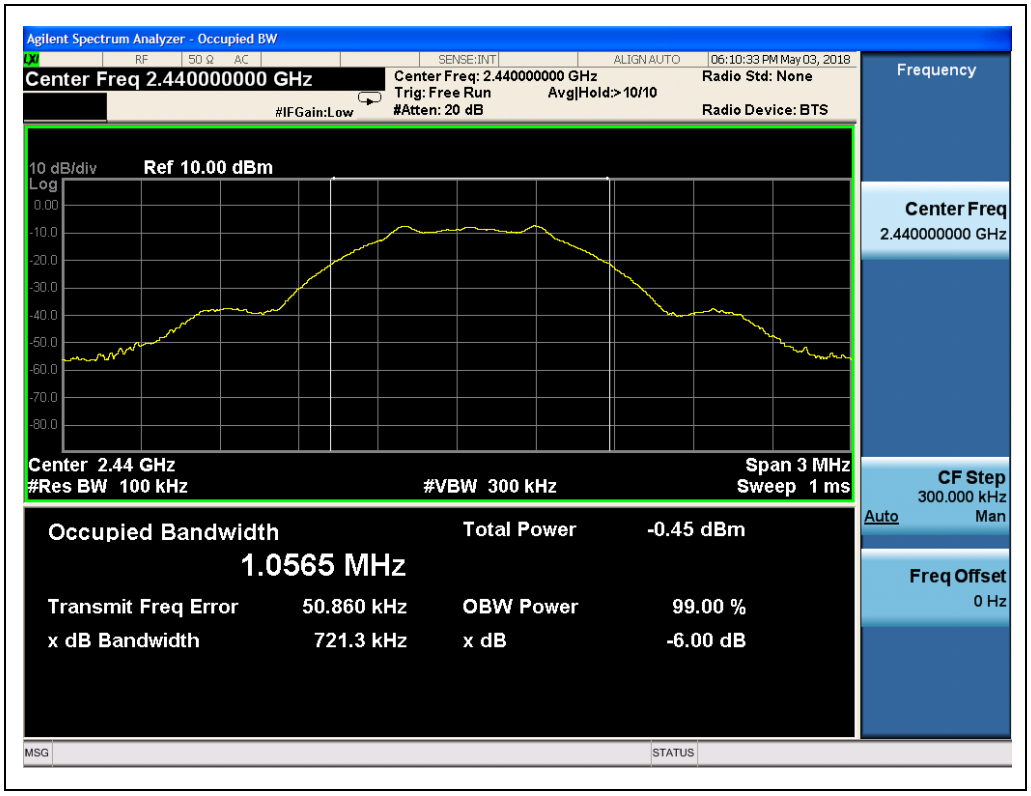
A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
0	2402	0.7106	≥500	PASS
19	2440	0.7213	≥500	PASS
39	2480	0.7257	≥500	PASS

B. Test Plots:



(Channel 0, 2402MHz)



(Channel 19, 2440 MHz)

(Channel 39, 2480MHz)

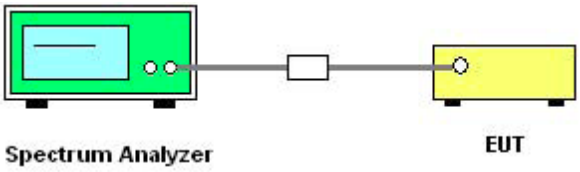
2.4. Conducted Spurious Emissions and Band Edge

2.4.1. Requirement

According to FCC section 15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

2.4.2. Test Description

A. Test Set:



The EUT is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW.

B. Equipments List:

Please refer ANNEX A (1.5).

2.4.3. Test Result

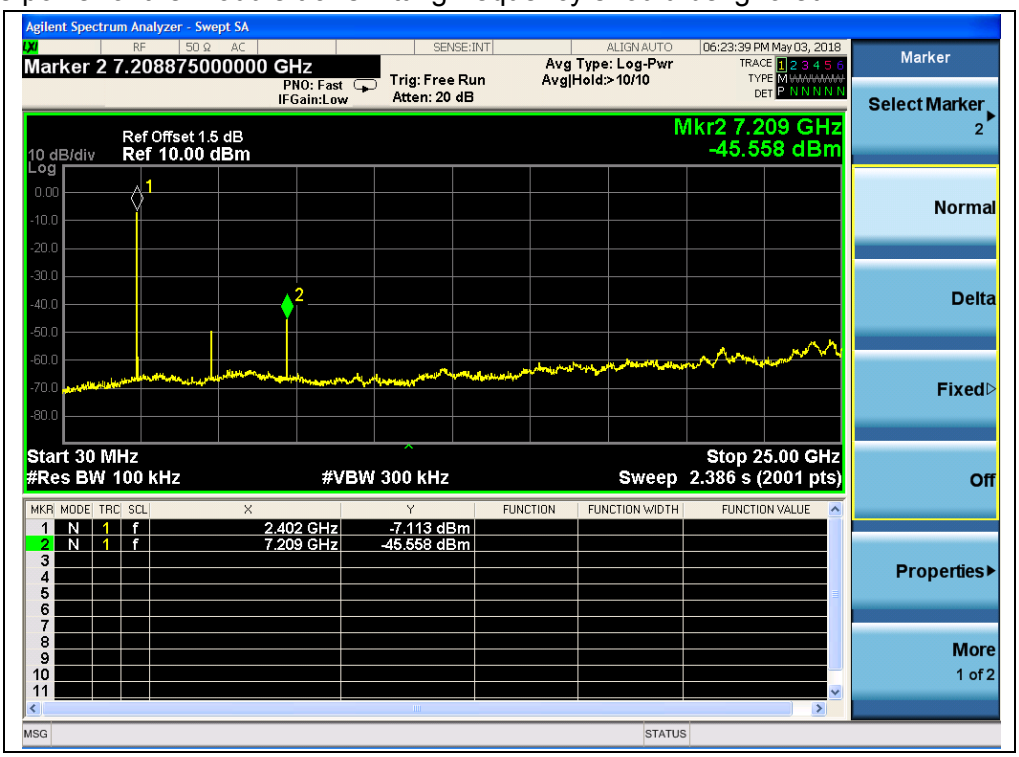
The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions.

A. Test Verdict:

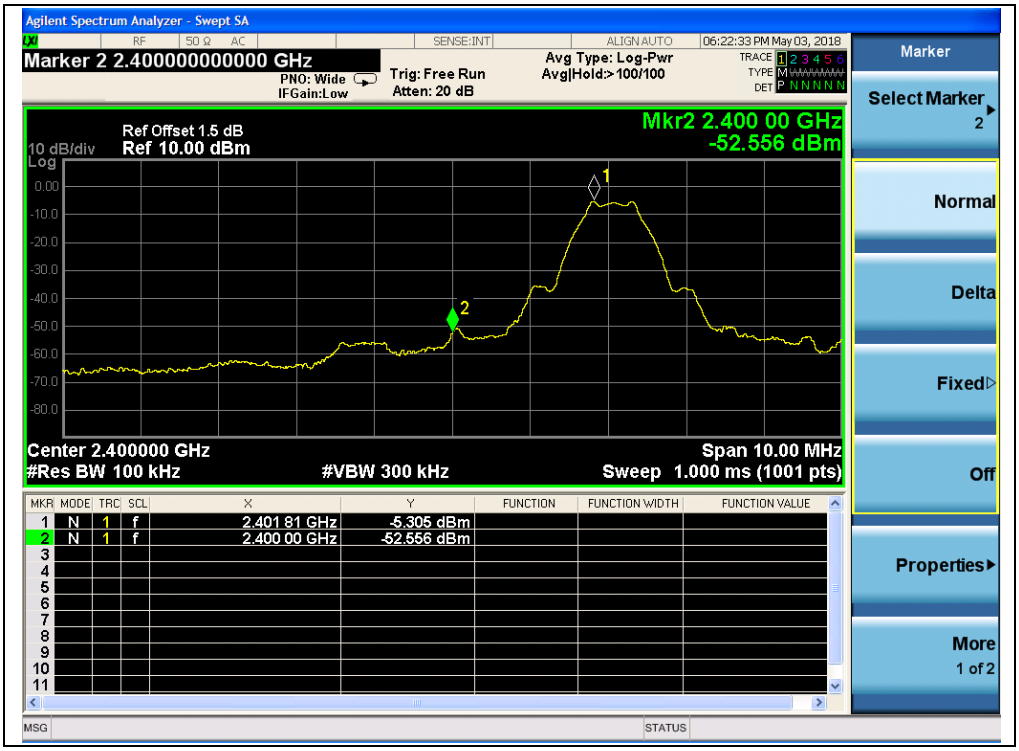
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
0	2402	-45.56	-7.11	-27.11	PASS
19	2440	-45.08	-7.20	-27.20	PASS
39	2480	-45.78	-6.86	-26.86	PASS

B. Test Plots:

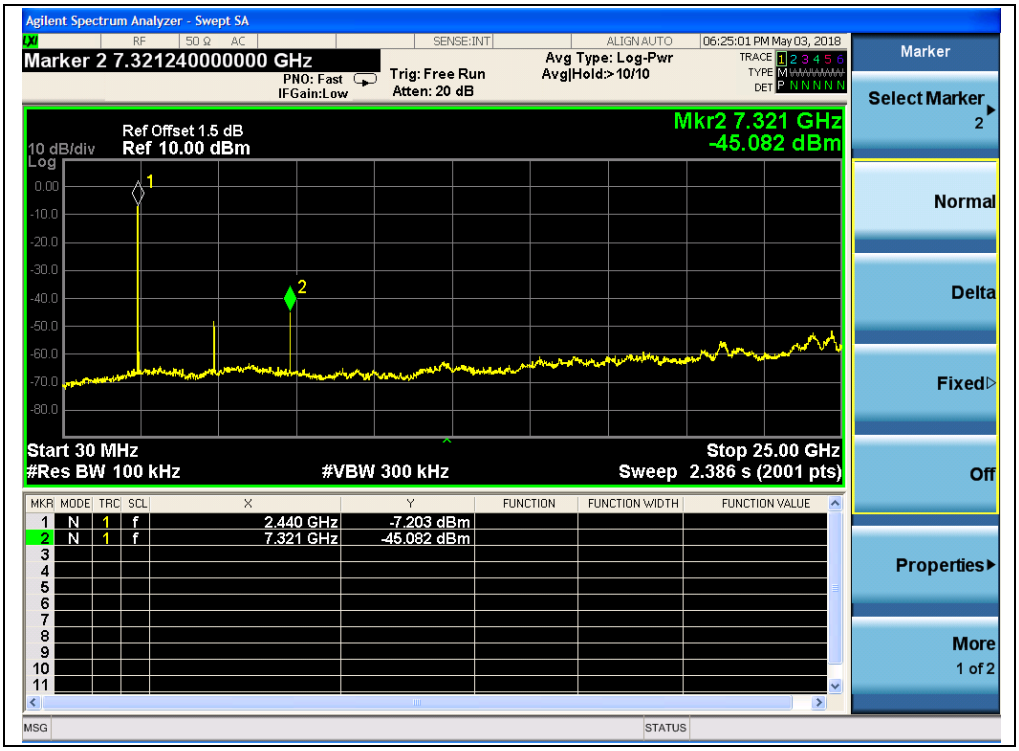
Note: Tthe power of the Module transmitting frequency should be ignored.



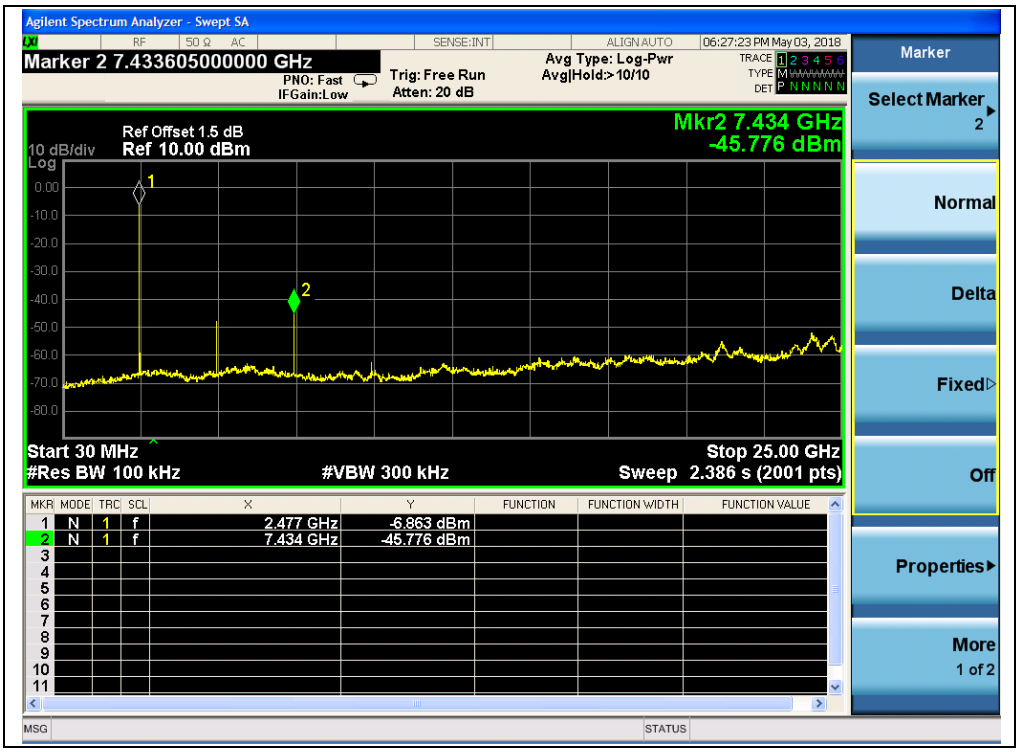
(Channel = 0, 30MHz to 25GHz)



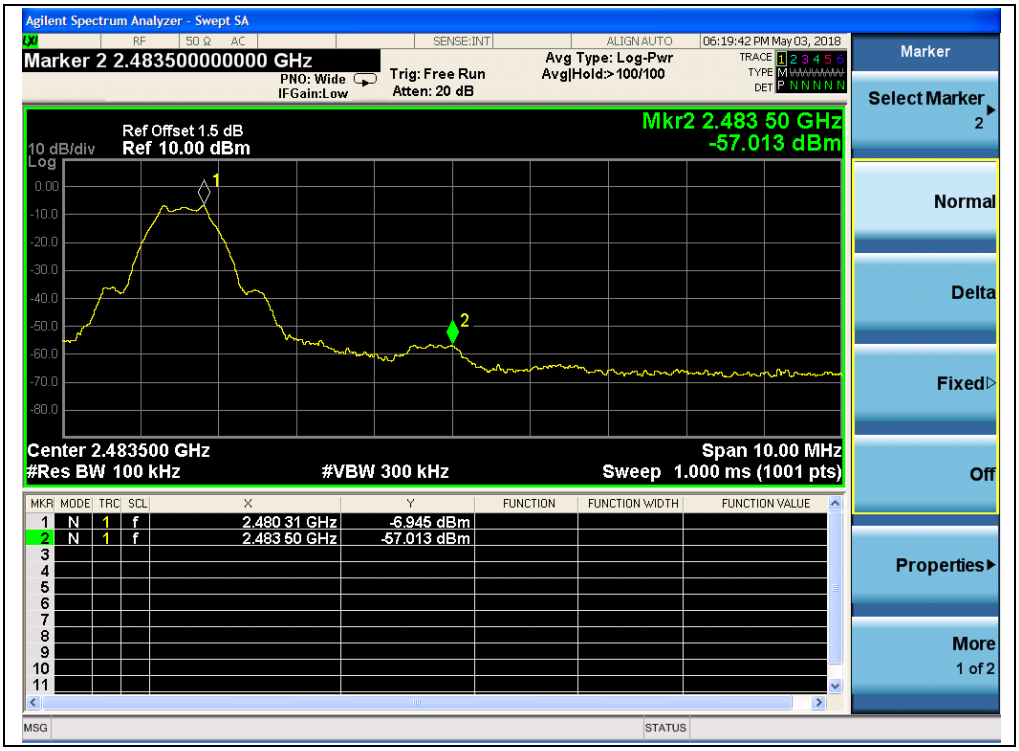
(Band Edge, Channel = 0)



(Channel = 19, 30MHz to 25GHz)



(Channel = 39, 30MHz to 25GHz)



(Band Edge, Channel = 39)

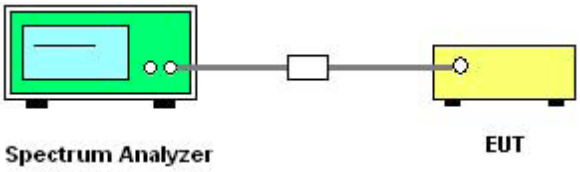
2.5. Power spectral density (PSD)

2.5.1. Requirement

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dB min any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

2.5.2. Test Description

A. Test Set:



The EUT is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

B. Equipments List:

Please refer ANNEX A (1.5).

2.5.3. Test procedure

The measured power spectral density was calculated by the reading of the spectrum analyzer and calibration. Following is the test procedure for PSD test:

a) Set analyzer center frequency to channel center frequency.
b) Set the span to 1.5 times DTS
c) Set the RBW to 3 kHz
d) Set the VBW to 10 kHz
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.

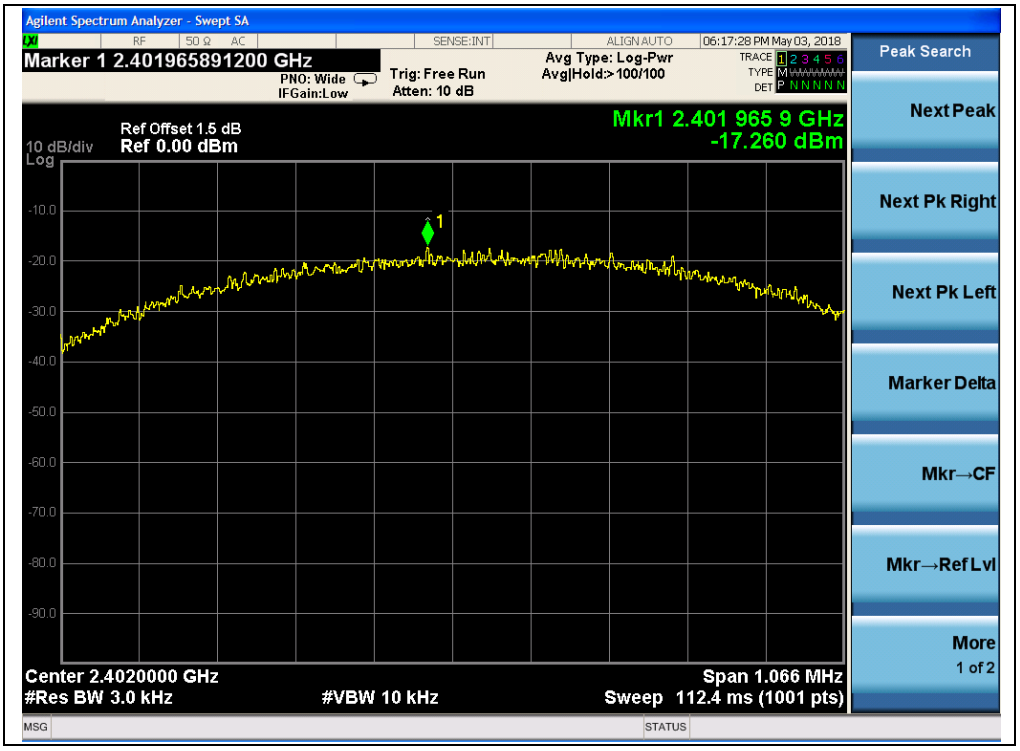
2.5.4. Test Result

The lowest, middle and highest channels are tested.

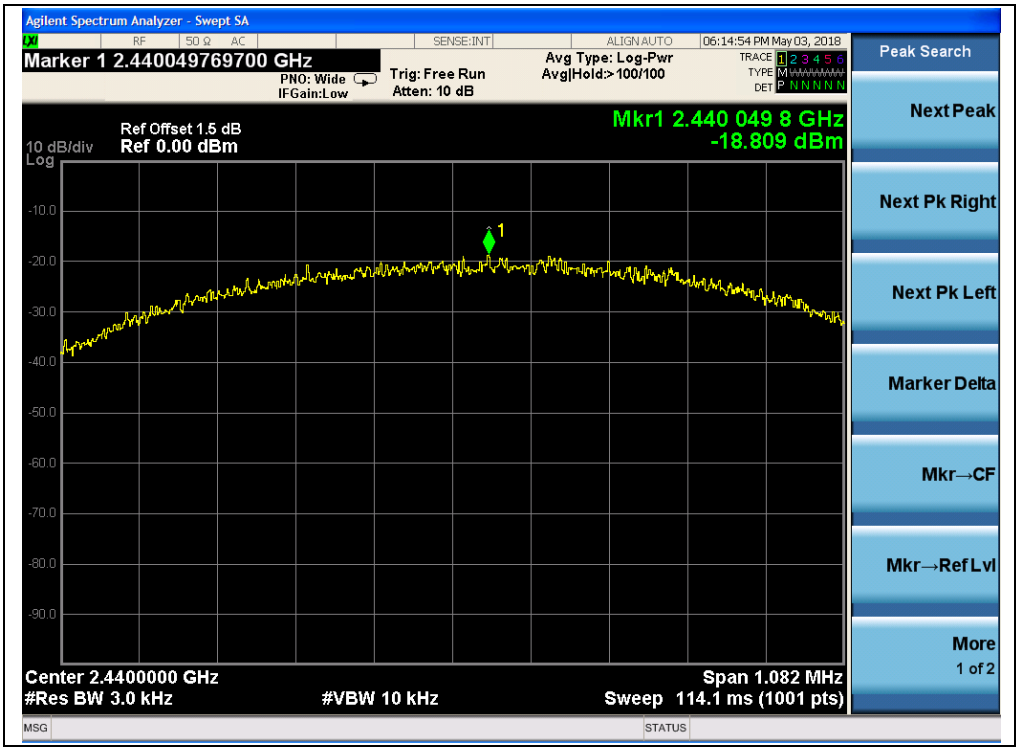
A. Test Verdict:

Power spectral density (dBm/3kHz)				
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
0	2402	-17.26	8	PASS
19	2440	-18.81	8	PASS
39	2480	-19.30	8	PASS
Measurement uncertainty: ±1.3dB				

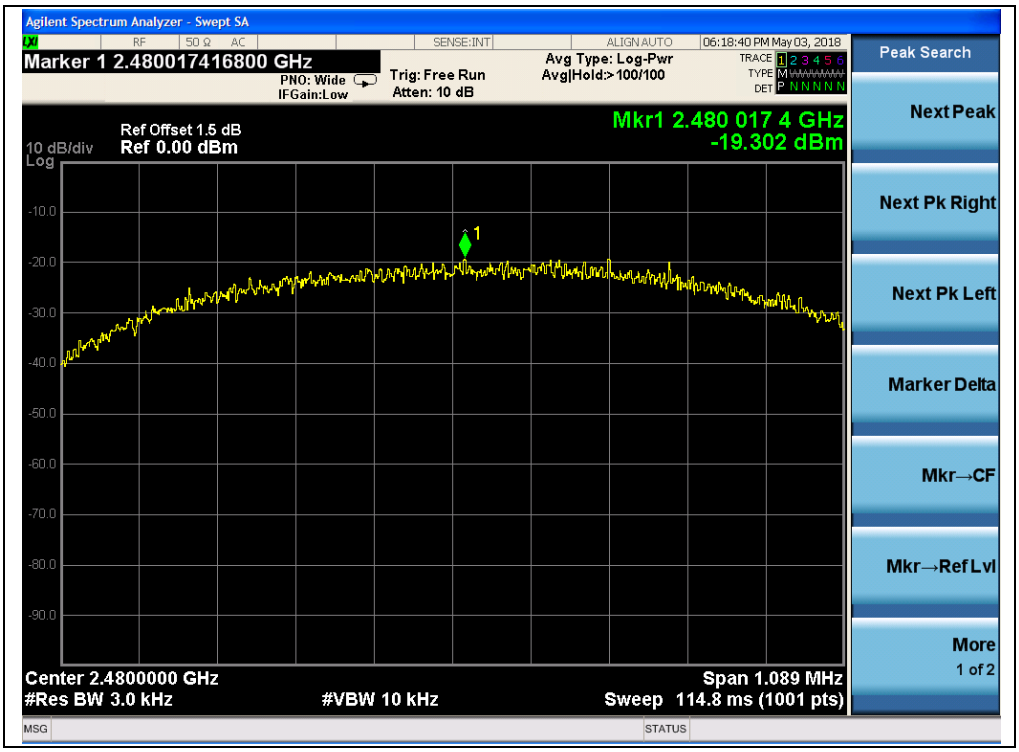
B. Test Plots:



(Channel = 0, 2402MHz)



(Channel = 19, 2440MHz)



(Channel = 39, 2480MHz)

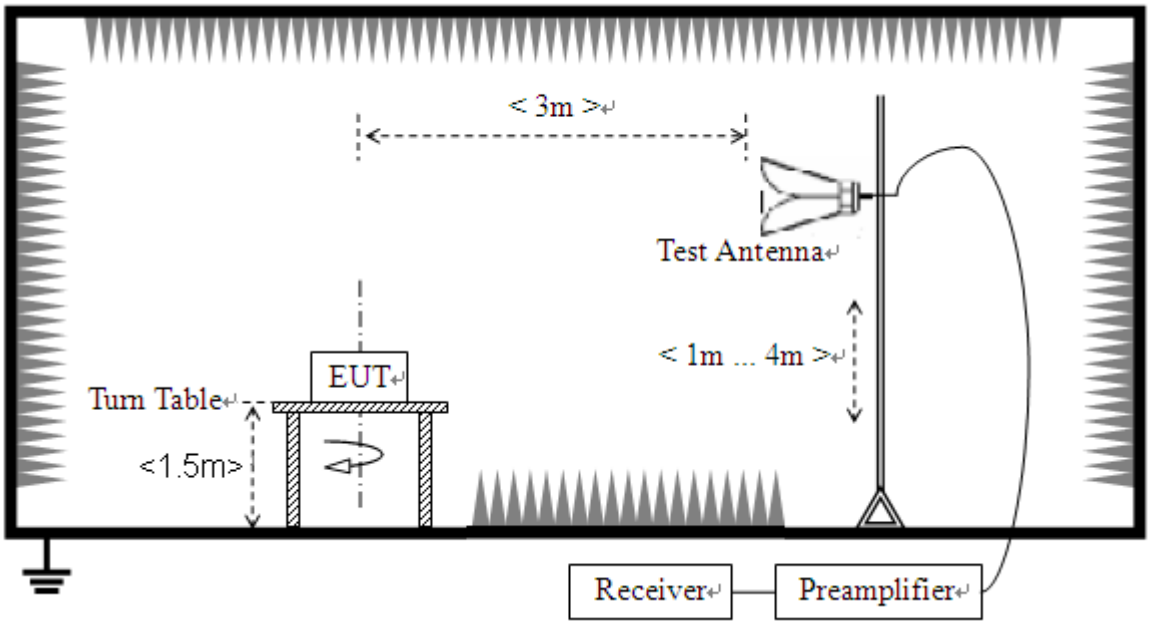
2.6. Restricted Frequency Bands

2.6.1. Requirement

According to FCC section 15.247(d), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in 15.205(a), must also comply with the radiated emission limits specified in 15.209(a).

2.6.2. Test Description

A. Test Setup



The EUT is located in a 3m Semi-Anechoic Chamber; the antenna factors, cable loss and so on of the site as factors are calculated to correct the reading.

For the Test Antenna:

Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength.

B. Equipments List:

Please refer ANNEX A(1.5).

2.6.3. Test Result

The lowest and highest channels are tested to verify the Restricted Frequency Bands.

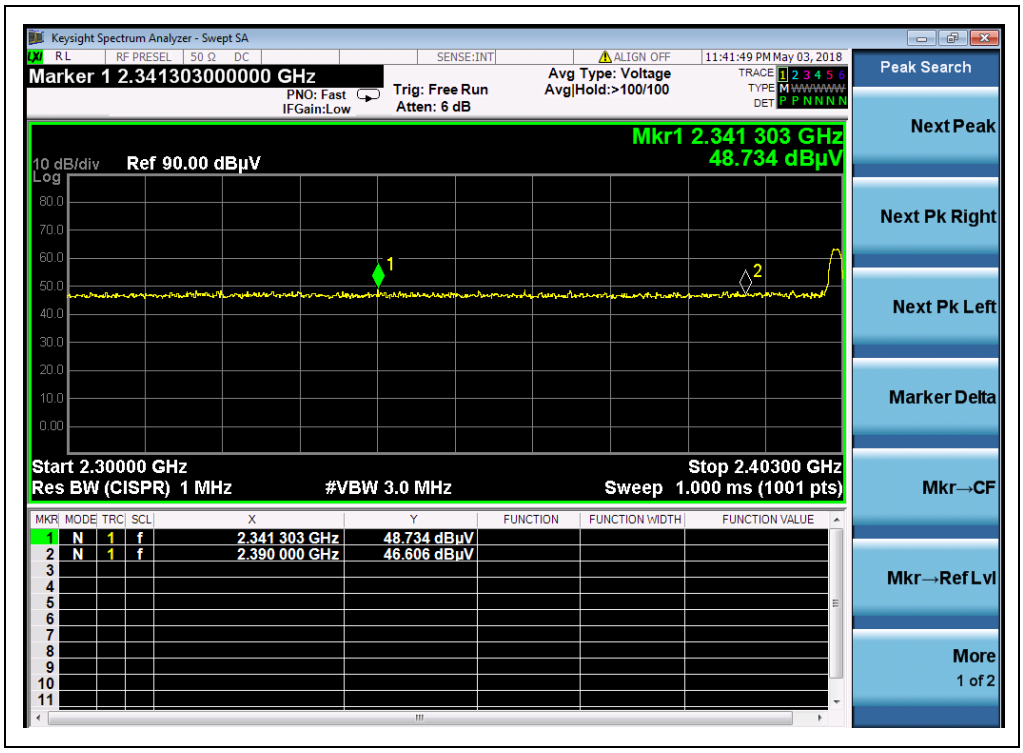
The measurement results are obtained as below:
$E\ [dB\mu V/m] = U_R + A_T + A_{Factor}\ [dB]$; $A_T = L_{Cable\ loss}\ [dB] - G_{preamp}\ [dB]$
A_T: Total correction Factor except Antenna
U_R: Receiver Reading
G_{preamp}: Preamplifier Gain
A_{Factor}: Antenna Factor at 3m

Note: Restricted Frequency Bands were performed when antenna was at vertical and horizontal polarity, and only the worse test condition (vertical) was recorded in this test report.

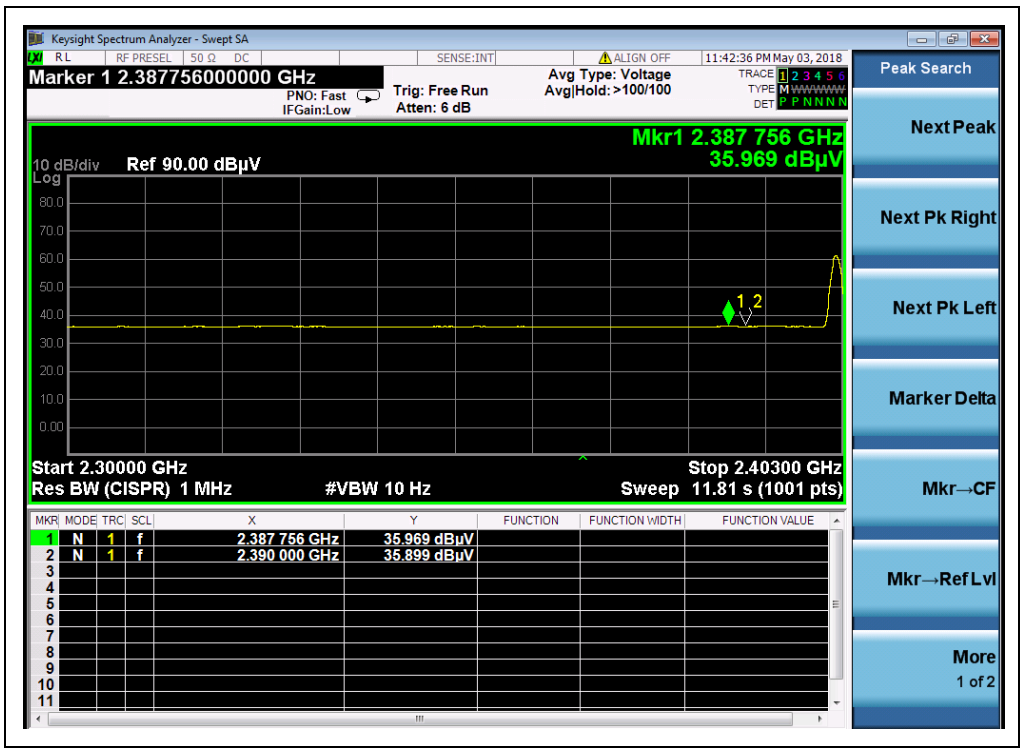
A. Test Verdict:

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
0	2341.30	PK	48.73	-33.63	32.56	47.66	74	PASS
0	2387.76	AV	35.97	-33.63	32.56	34.90	54	PASS
39	2490.13	PK	49.27	-33.18	32.50	48.59	74	PASS
39	2483.77	AV	35.80	-33.18	32.50	35.12	54	PASS

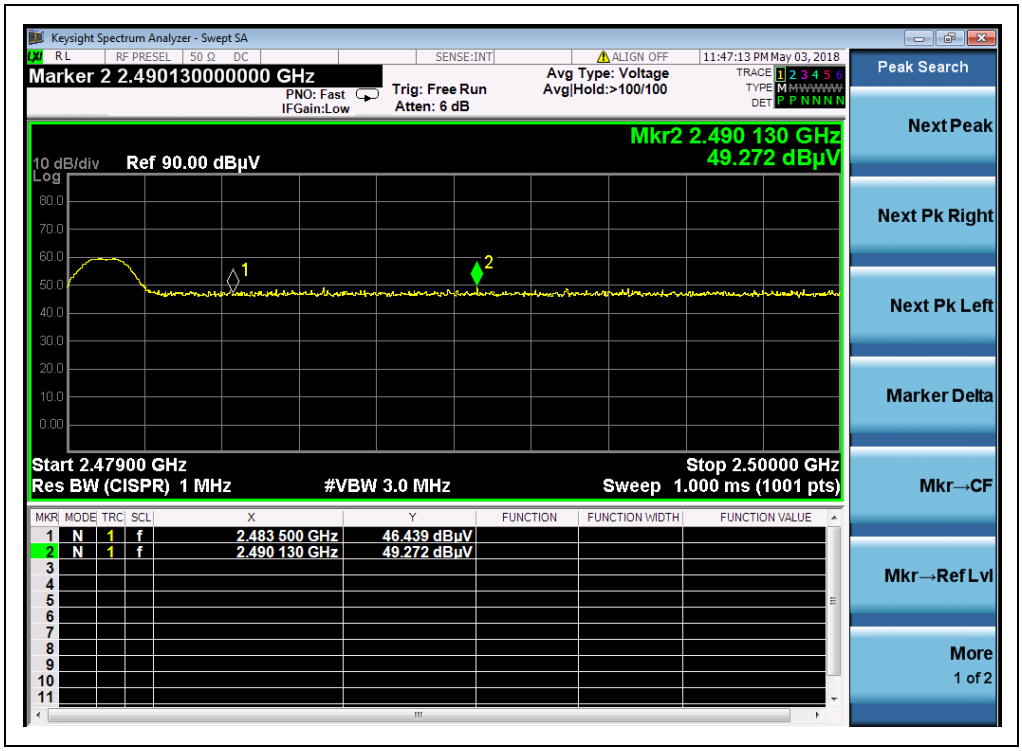
B. Test Plots:



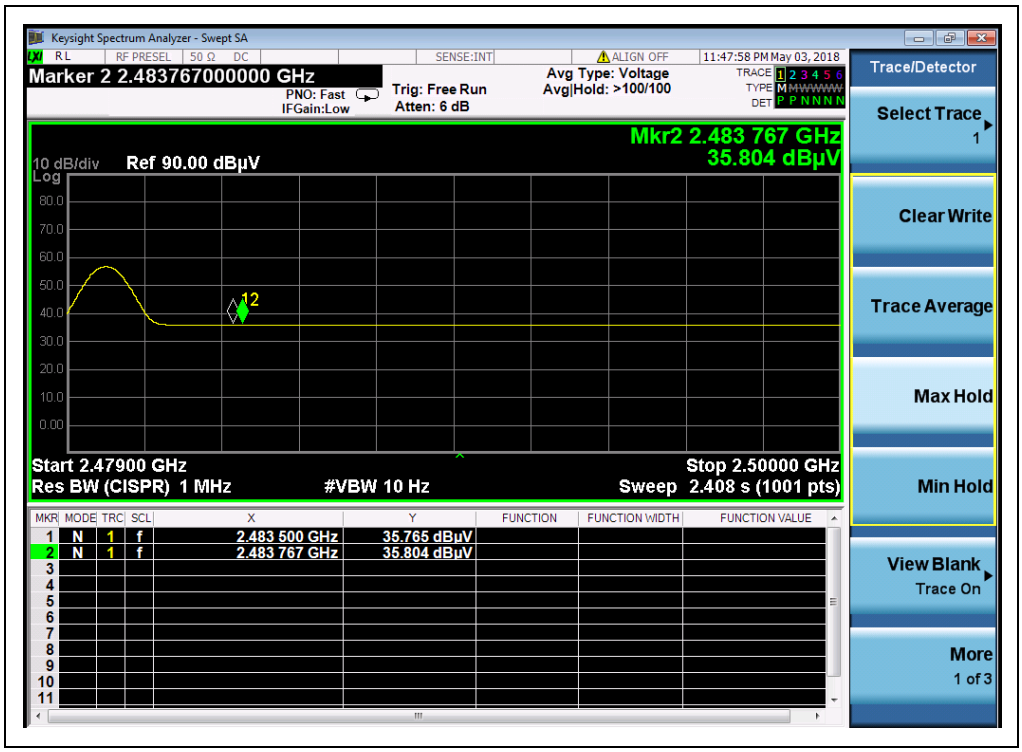
(Channel = 0, PEAK)



(Channel = 0, AVG)



(Channel = 39, PEAK)



(Channel = 39, AVG)

2.7. Conducted Emission

2.7.1. Requirement

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

Frequency r ange (MHz)	Conducted Limit (dBμV)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

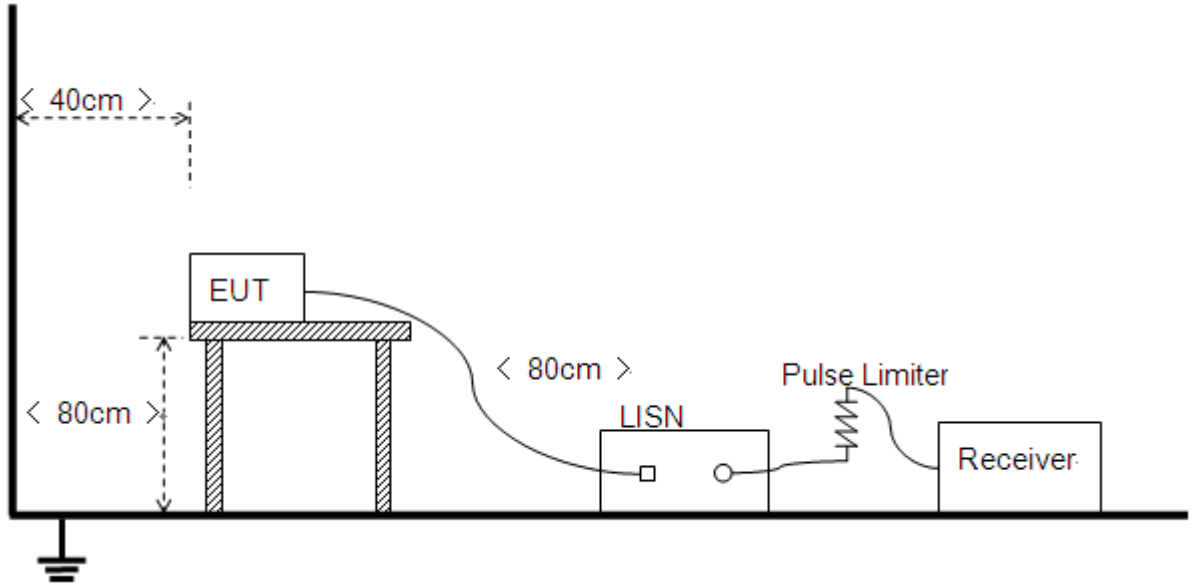
NOTE:

(a) The lower limit shall apply at the band edges.

(b) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

2.7.2. Test Description

A. Test Setup:



The T able-top E UT w as pl aced u pon a non -metallic tabl e 0.8m abov e the hor izontal m etal reference g round pl ane. E UT w as c onnected t o LIS N and LIS N w as c onnected t o r eference Ground Plane. EUT was 80cm from LISN. The set-up and tes t methods were according to A NSI C63.10: 2013.

B. Equipments List:

Please reference ANNEX A(1.5).

2.7.3. Test Result

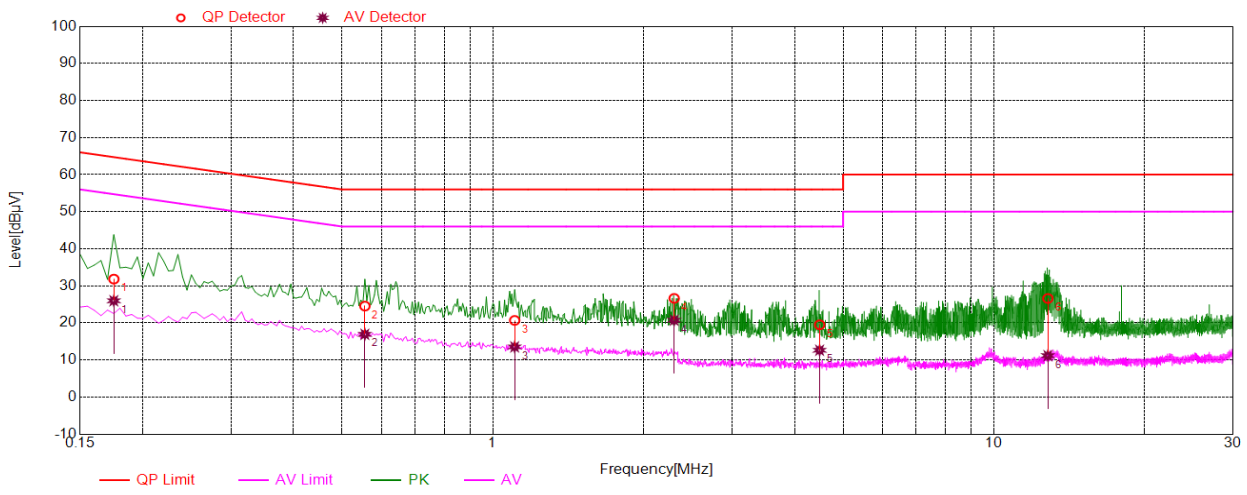
The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Refer to recorded points and plots below.

A. Test setup:

The EUT configuration of the emission tests is EUT + Link.

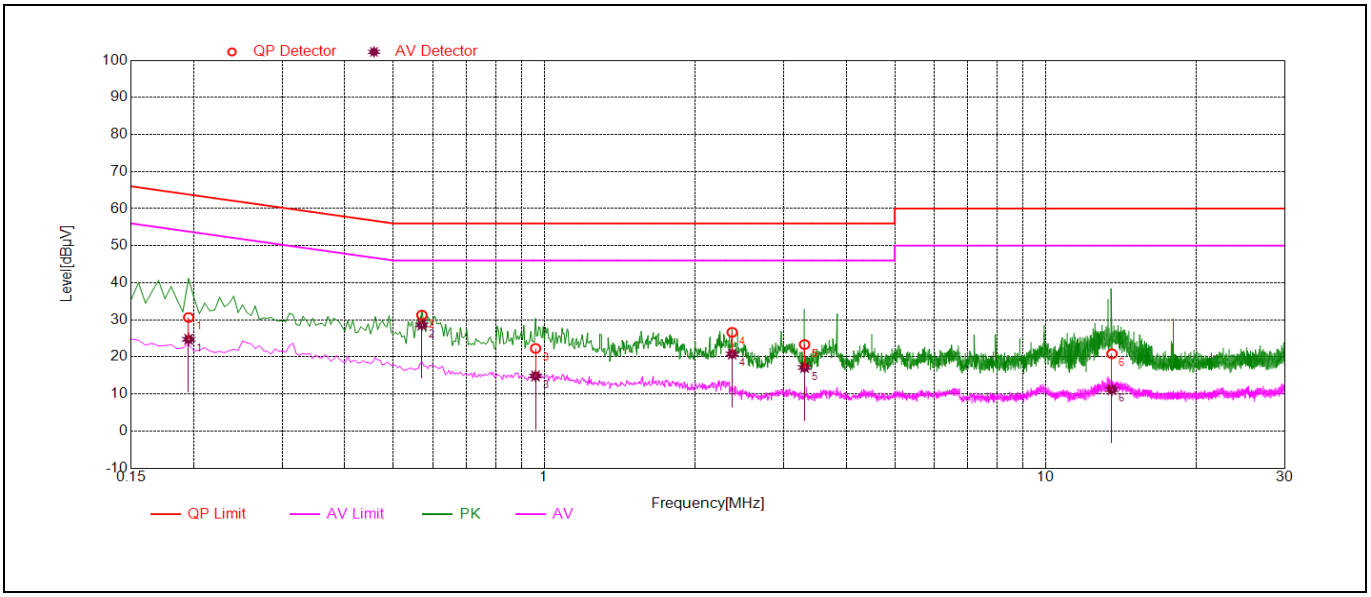
Note: The test voltage is AC 120V/60Hz.

B. Test Plots:



(L Phase)

NO.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.18	31.82	25.98	64.72	54.72	Line	PASS
2	0.55	24.55	16.93	56.00	46.00		PASS
3	1.05	20.68	13.53	56.00	46.00		PASS
4	2.30	26.62	20.73	56.00	46.00		PASS
5	4.49	19.50	12.63	56.00	46.00		PASS
6	12.82	26.59	11.16	60.00	50.00		PASS



(N Phase)

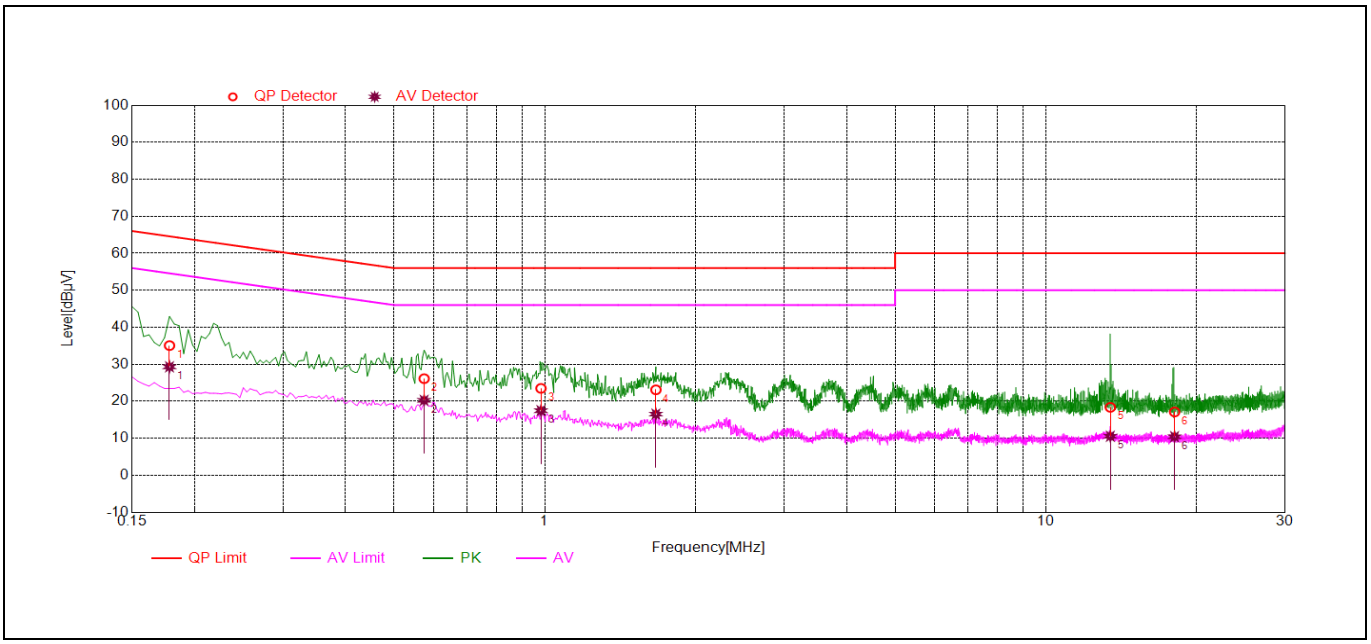
NO.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.20	30.64	24.74	63.82	53.82	Neutral	PASS
2	0.57	31.29	28.63	56.00	46.00		PASS
3	0.96	22.30	14.85	56.00	46.00		PASS
4	2.37	26.64	20.78	56.00	46.00		PASS
5	3.30	23.34	17.14	56.00	46.00		PASS
6	13.56	20.84	11.17	60.00	50.00		PASS

C. Test setup:

The EUT configuration of the emission tests is EUT + Link.

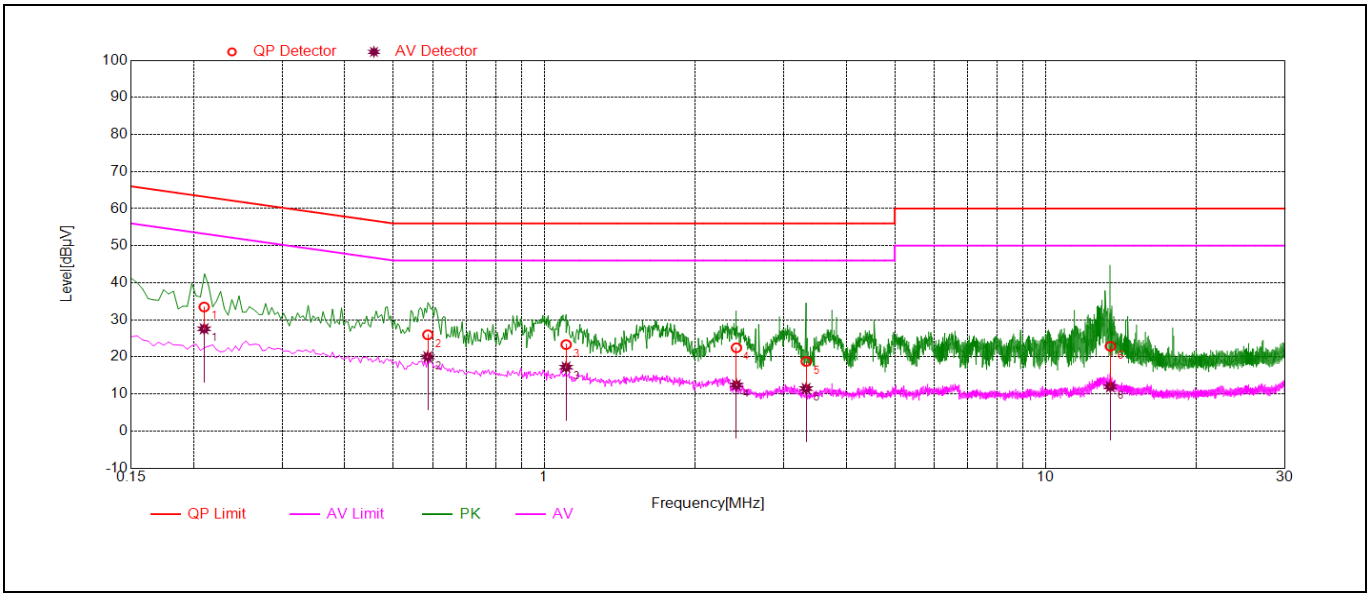
Note: The test voltage is AC 240V/60Hz.

D. Test Plots:



(L Phase)

NO.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.18	35.05	29.32	64.58	54.58	Line	PASS
2	0.57	26.12	20.25	56.00	46.00		PASS
3	0.98	23.49	17.46	56.00	46.00		PASS
4	1.67	23.11	16.53	56.00	46.00		PASS
5	13.45	18.36	10.55	60.00	50.00		PASS
6	18.08	17.12	10.42	60.00	50.00		PASS



(N Phase)

NO.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.21	33.47	27.57	63.22	53.22	Neutral	PASS
2	0.59	25.97	20.02	56.00	46.00		PASS
3	1.11	23.33	17.22	56.00	46.00		PASS
4	2.42	22.47	12.42	56.00	46.00		PASS
5	3.33	18.78	11.46	56.00	46.00		PASS
6	13.46	22.87	11.94	60.00	50.00		PASS

2.8. Radiated Emission

2.8.1. Requirement

According to FCC section 15.247(d), radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
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

Note:

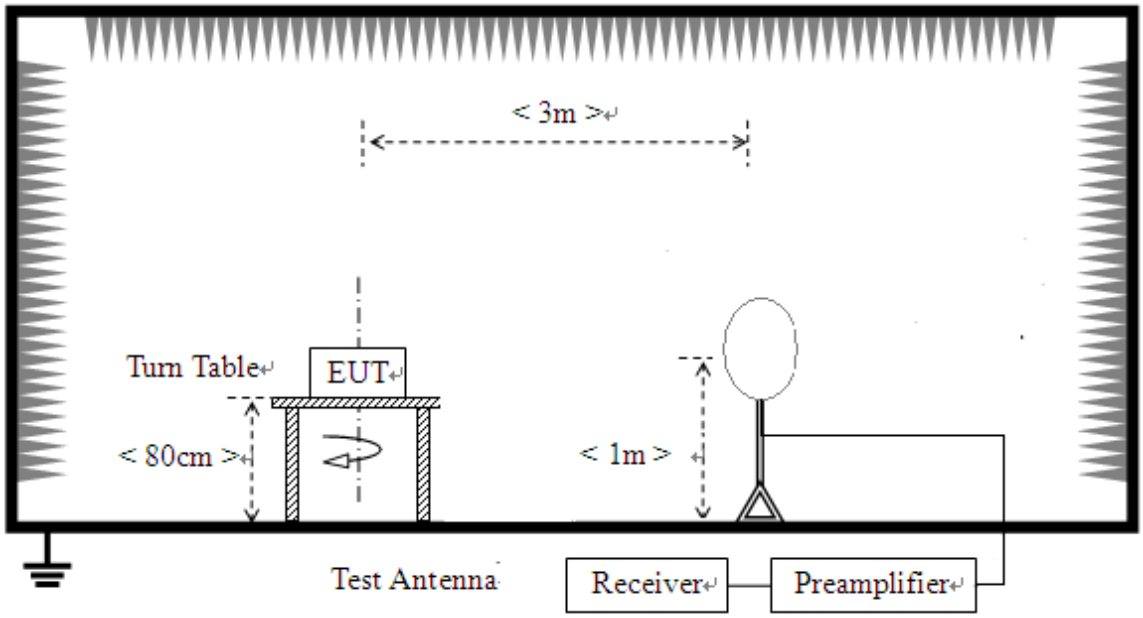
1. For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.
2. For above 1000MHz, limit field strength of harmonics: 54dB uV/m@3m (AV) and 74dBuV/m@3m (PK)

In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a)(above table)

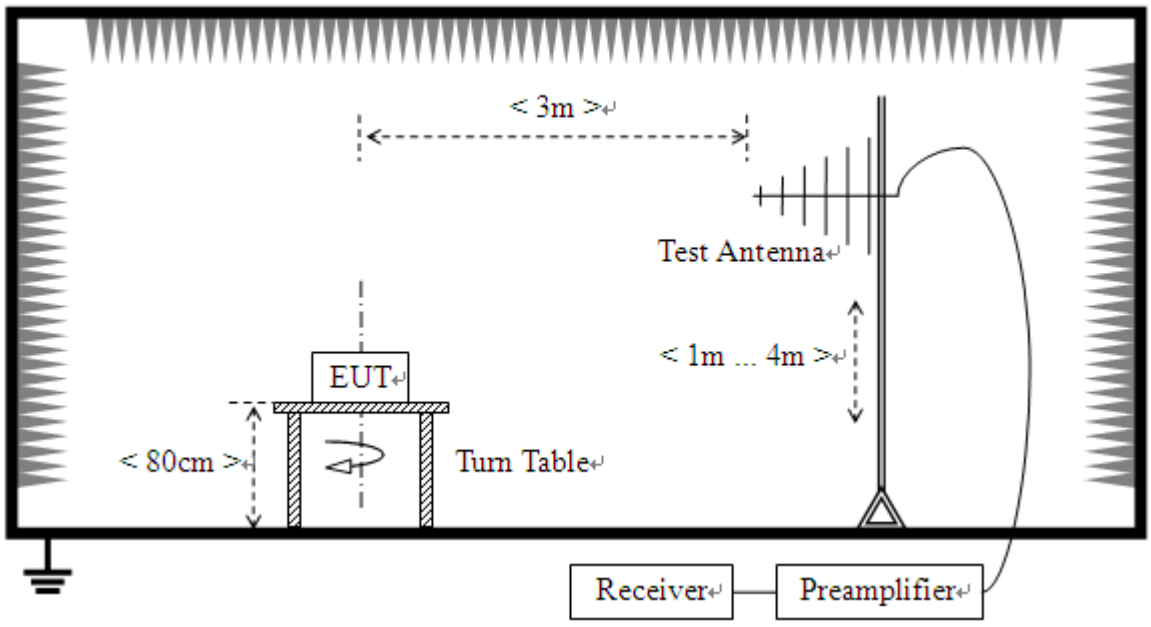
2.8.2. Test Description

A. Test Setup:

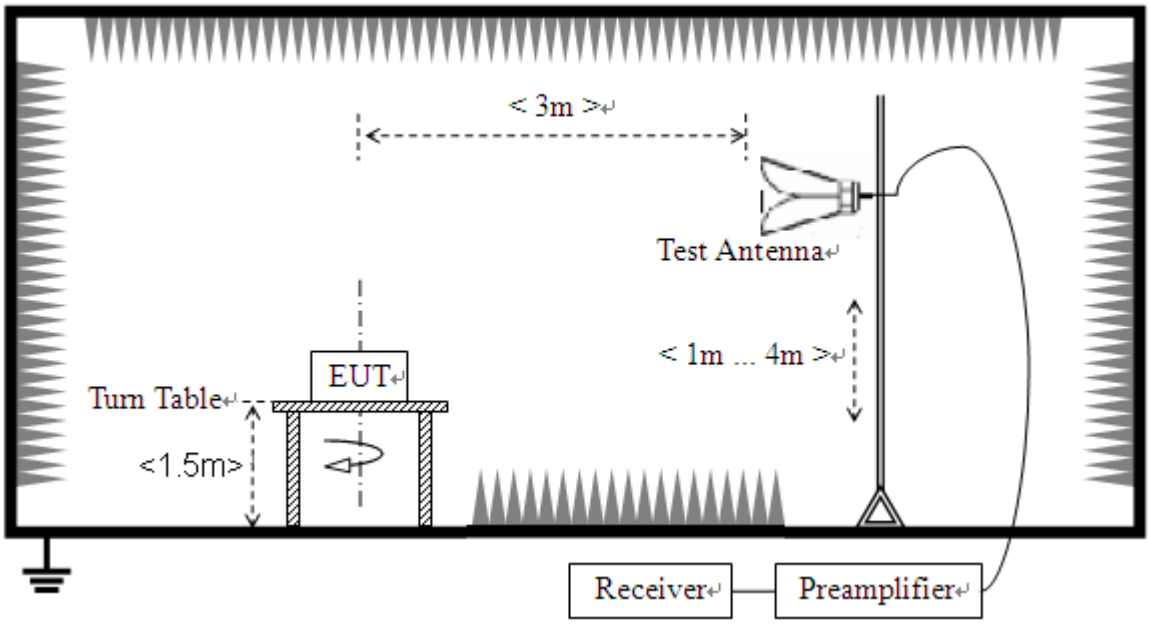
1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to1GHz



3) For radiated emissions above 1GHz



The R F abs orbing m aterial us ed o n the r eference gr ound pl ane and on the tur ntable hav e a maximum height (thickness) of 30 cm (12 in) and have a minimum-rated attenuation of 20 dB at all frequencies from 1 GHz to 18 G Hz. Test site have a m inimum area of t he ground plane covered with RF absorbing material as specified in Figure 6 of ANSI C63.4: 2014.

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.10:2013. For radiated emissions below or equal to 1GHz, The EUT was set-up on insulator 80cm above the Ground Plane, For radiated emissions above 1GHz, The EUT was s et-up on i nsulator 150c m ab ove the Ground P lane. The s et-up and tes t m ethods w ere according to ANSI C63.10:2013.

The EUT is located in a 3m Semi-Anechoic Chamber; the antenna factors, cable loss and so on of the site as factors are calculated to correct the reading.

For the Test Antenna:

(a) In the frequency range of 9kHz to 30MHz, magnetic field is measured with Loop Test Antenna. The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.
(b) In the fr equency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Place the test antenna at 3m away from area of the EUT, while keeping the tes t anten na ai med at the s ource of em issions at eac h fr equency of s ignificant

emissions, with polarization oriented for maximum response. The test antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final test antenna elevation shall be that which maximizes the emissions. The test antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane. The emission levels at both horizontal and vertical polarizations should be tested.

B. Equipments List:

Please reference ANNEX A(1.5).

2.8.3. Test Result

According to ANSI C63.10, because of peak detection will yield amplitudes equal to or greater than amplitudes measured with the quasi-peak (or average) detector, the measurement data from a spectrum analyzer peak detector will represent the worst-case results, if the peak measured value complies with the quasi-peak limit, it is unnecessary to perform an quasi-peak measurement.

The measurement results are obtained as below:

$E\ [dB\mu V/m] = U_R + A_T + A_{Factor}\ [dB]$; $A_T = L_{Cable\ loss}\ [dB] - G_{preamp}\ [dB]$

A_T: Total correction Factor except Antenna

U_R: Receiver Reading

G_{preamp}: Preamplifier Gain

A_{Factor}: Antenna Factor at 3m

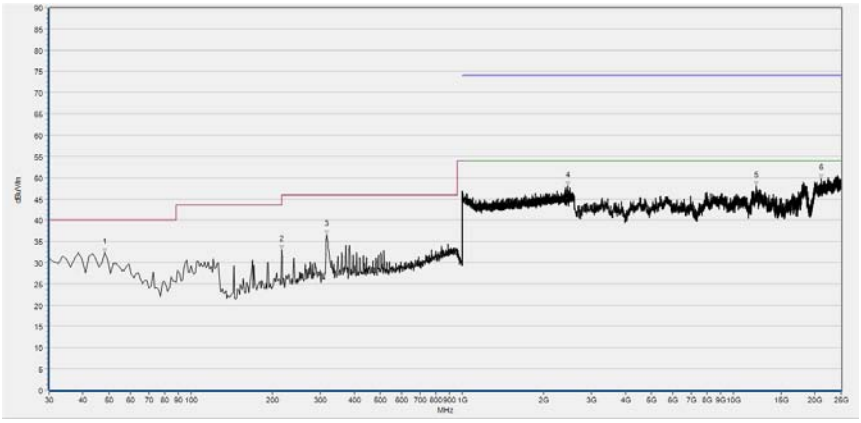
During the test, the total correction Factor A_T and A_{Factor} were built in test software.

Note1: All radiated emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Note2: For the frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

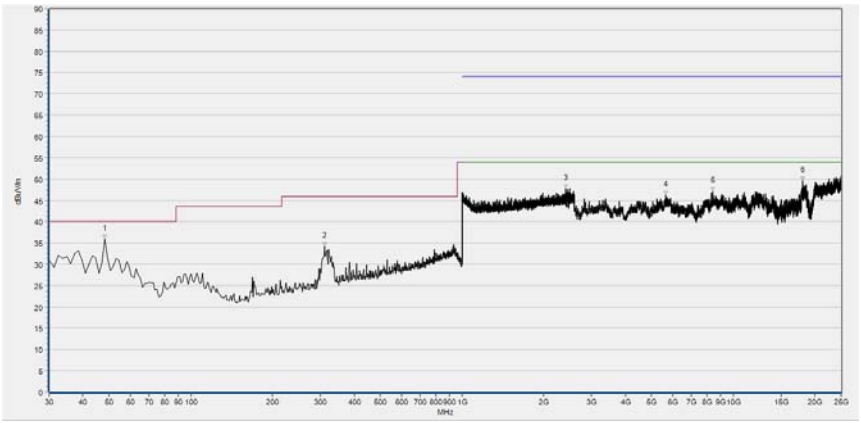
Note3: For the frequency, which started from 25GHz to 40GHz, was pre-scanned and the result which was 10dB lower than the limit was not recorded.

Plots for Channel = 0



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
48.210	32.31	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
215.745	32.99	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
316.508	36.57	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2448.259	48.11	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12148.209	48.14	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
21089.471	49.72	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

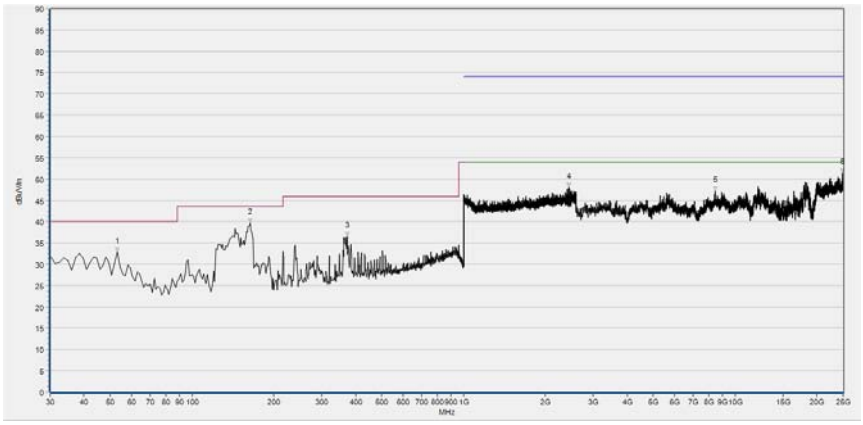
(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
48.210	35.79	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
311.652	34.21	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2413.685	47.70	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5646.954	46.22	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8416.912	47.05	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
17981.415	49.65	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

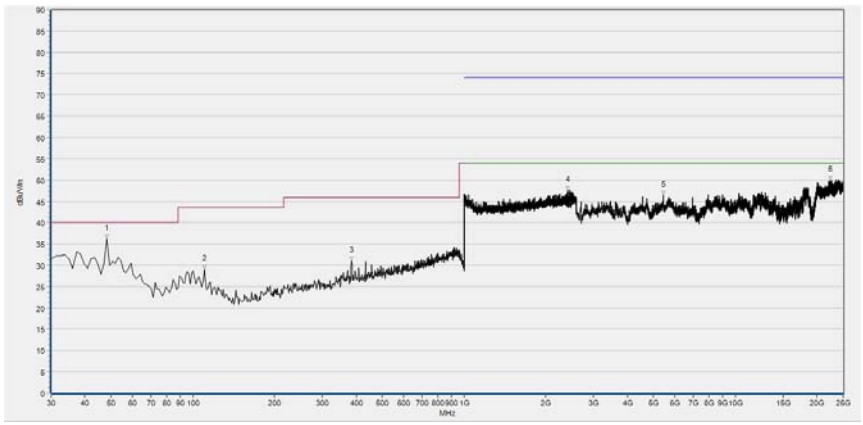
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 19



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
53.066	32.92	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
163.542	39.75	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
372.353	36.48	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2447.619	48.07	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8461.720	47.28	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
24804.474	51.37	N/A	32.57	74.00	N/A	54.00	Horizontal	PASS

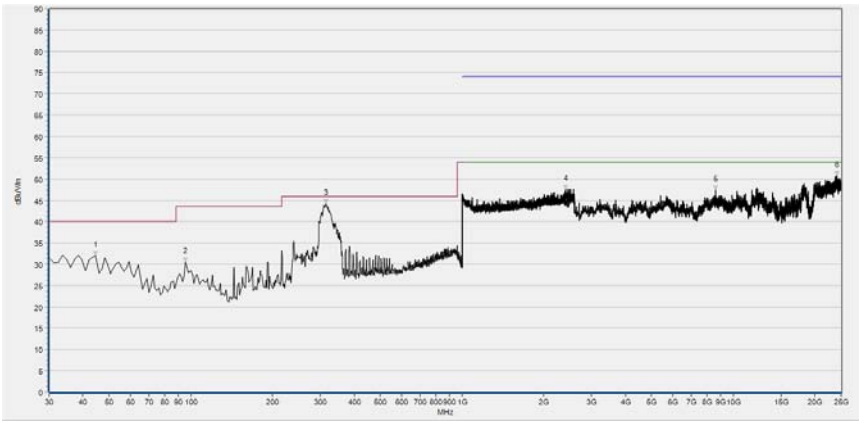
(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
48.210	36.23	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
110.125	29.06	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
384.493	30.97	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2404.722	47.52	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5435.134	46.45	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
22450.009	49.98	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

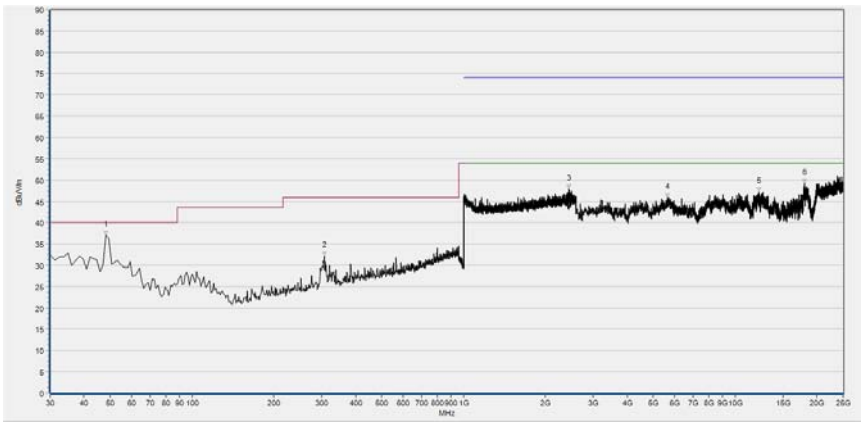
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 39



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
44.568	32.06	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
95.557	30.50	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
314.080	44.17	N/A	31.85	N/A	46.00	N/A	Horizontal	PASS
2416.246	47.54	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8612.439	47.45	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
24144.572	50.79	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
48.210	36.52	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
306.796	32.18	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2446.979	47.99	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5642.881	45.90	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12201.164	47.32	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
17993.635	49.21	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

Annex A Test Uncertainty

Where r elevant, the fol lowing m easurement unc ertainty l evels hav e been es timated for tes t performed on the EUT as specified in CISPR 16-1-2:

Test items	Uncertainty
Peak Output Power	±2.22dB
Power spectral density (PSD)	±2.22dB
Bandwidth	±5%
Conducted Spurious Emission	±2.77 dB
Restricted Frequency Bands	±5%
Radiated Emission	±2.95dB
Conducted Emission	±2.44dB

This uncertainty represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2

Annex B Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

Company Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Department:	Morlab Laboratory
Address:	FL.3, B uilding A , Fei Yang S cience P ark, N o.8 LongC hang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Responsible Test Lab Manager:	Mr. Su Feng
Telephone:	+86 755 36698555
Facsimile:	+86 755 36698525

2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory
Address:	FL.3, B uilding A , Fei Yang S cience P ark, N o.8 LongC hang Road, B lock 67, B aoAn D istrict, S henZhen, G uangDong Province, P. R. China

3. Facilities and Accreditations

All measurement facilities used to collect the measurement data are located at FL. 3, Building A, FeiYang Science Park, Block 67, BaoAn District, Shenzhen, 518101 P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.10-2013 and CISPR Publication 22; the FCC designation number is CN1192.

4. Test Equipments Utilized

4.1 Conducted Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
Power Splitter	NW521	1506A	Weinschel	2017.05.24	2018.05.23
Attenuator 1	(N/A.)	10dB	Resnet	2017.05.24	2018.05.23
Attenuator 2	(N/A.)	3dB	Resnet	2017.05.24	2018.05.23
EXA Signal Analzyer	MY53470836	N9010A	Agilent	2017.12.03	2018.12.02
RF cable (30MHz-26GHz)	CB01	RF01	Morlab	N/A	N/A
Coaxial cable	CB02	RF02	Morlab	N/A	N/A
SMA connector	CN01	RF03	HUBER-SUHNER	N/A	N/A

4.2 Conducted Emission Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
Receiver	MY56400093	N9038A	KEYSIGHT	2017.07.13	2018.07.12
LISN	812744	NSLK 8127	Schwarzbeck	2018.05.08	2019.05.07
Pulse Limiter (20dB)	9391	VTSD 9561-D	Schwarzbeck	2018.05.08	2019.05.07
Coaxial cable(BNC) (30MHz-26GHz)	CB01	EMC01	Morlab	N/A	N/A

4.3 Auxiliary Test Equipment

Equipment Name	Model No.	Brand Name	Manufacturer	Cal.Date	Cal. Due
Computer	T430i	Think Pad	Lenovo	N/A	N/A

4.4 List of Software Used

Description	Manufacturer	Software Version
Test system	Tonscend	V2.6
Power Panel	Agilent	V3.8
MORLAB EMCR V1.2	MORLAB	V 1.0

4.5 Radiated Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
Receiver	MY54130016	N9038A	Agilent	2018.05.08	2019.05.07
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2018.05.08	2019.05.07
Test Antenna - Horn	9170C-531	BBHA9170	Schwarzbeck	2017.09.13	2018.09.12
Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2018.03.03	2019.03.02
Test Antenna - Horn	01774	BBHA 9120D	Schwarzbeck	2017.09.13	2018.09.12
Coaxial cable (N male) (9KHz-30MHz)	CB04	EMC04	Morlab	N/A	N/A
Coaxial cable (N male) (30MHz-26GHz)	CB02	EMC02	Morlab	N/A	N/A
Coaxial cable (N male) (30MHz-26GHz)	CB03	EMC03	Morlab	N/A	N/A
1-18GHz pre-Amplifier	MA02	TS-PR18	Rohde& Schwarz	2018.05.08	2019.05.07
18-26.5GHz pre-Amplifier	MA03	TS-PR18	Rohde& Schwarz	2018.05.08	2019.05.07
Anechoic Chamber	N/A	9m*6m*6m	CRT	2017.11.19	2020.11.18

END OF REPORT