REPORT No .: SZ18080241W07

TEST REPORT

APPLICANT	:	Flaircomm Microelectronics,Inc.
PRODUCT NAME	:	Bluetooth Module BT5.0
MODEL NAME	:	FLC-BTM702IQ2D
BRAND NAME	:	Flairmicro
FCC ID	:	P4I - BTM702D
STANDARD(S)	:	47 CFR Part 15 Subpart C
TEST DATE	:	2018-07-11 to 2018-09-26
ISSUE DATE	:	2018-09-27

Tested by: Su Hang

Su Hang (Test Engineer)

Approved by: Peng Huarui

Peng Huarui (Supervisor)

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Change History		
Issue	**Date**	**Reason for change**
1.0	2018-09-27	First edition

1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Flaircomm Microelectronics,Inc.
Applicant Address:	7F,Guomai Building,116 East JiangBin Ave,Fuzhou,Fujian,China
Manufacturer:	Flaircomm Microelectronics,Inc.
Manufacturer Address:	7F,Guomai Building,116 East JiangBin Ave,Fuzhou,Fujian,China

1.2. Equipment Under Test (EUT) Description

Product Name:	Bluetooth Module BT5.0
Serial No:	(N/A, marked #1 by test site)
Hardware Version:	V1.0
Software Version:	V1.0
Modulation Type:	GFSK
Bluetooth Version:	Bluetooth LE
Operating Frequency Range:	The frequency range used is 2402MHz - 2480MHz (40 channels, at intervals of 2MHz)
Antenna Type:	PCB Antenna
Antenna Gain:	0 dBi

Note 1: The Bluetooth version of EUT is Bluetooth 5.0 LE and only supports 1M PHY.

Note 2: This test report is updated from report SZ18080241W05 (FCC ID: FLC-BTM702IQ2C), based on the original model FLC-BTM702IQ2C, the model FLC-BTM702IQ2D in this report only difference is that with a shielding case, FLCBTM702IQ2C is without shielding case. The changes only affect the test results of Restricted Frequency Bands and Radiated Emission.

Note 3: 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 4: 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 5: For a more detailed description, please refer to Specification or User's Manual supplied by the 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 (Bluetooth, 2.4GHz ISM band radiators) for the EUT FCC ID Certification:

No	Identity	Document Title
1	47 CFR Part 15	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$_{Note1}$
2	15.247(b)	Peak Output Power	Jul 11, 2018	Su Hang	PASS$_{Note1}$
3	15.247(a)	Bandwidth	Jul 11, 2018	Su Hang	PASS$_{Note1}$
4	15.247(d)	Conducted S purious E mission and Band Edge	Sep 26, 2018	Su Hang	PASS$_{Note1}$
5	15.247(e)	Power spectral density (PSD)	Jul 11, 2018	Su Hang	PASS$_{Note1}$
6	15.207	Conducted Emission	N/A	N/A	N/A$_{Note3}$
7	15.247(d)	Restricted Frequency Bands	Sep 20, 2018	Gao Jianrou	PASS
8	15.209, 15.247(d)	Radiated Emission	Sep 20, 2018	Gao Jianrou	PASS

Note 1: The test results of these test items in this report refer to the test report (Report No.: SZ18080241W05).

Note 2: The tests were performed according to the method of measurements prescribed in ANSIC63.10-2013 and KDB558074 D01 v05.

Note 3: Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines.

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 u nique c oupling to t he i ntentional 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

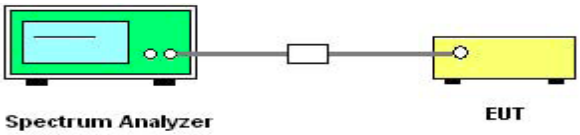
2.2.1. Requirement

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.

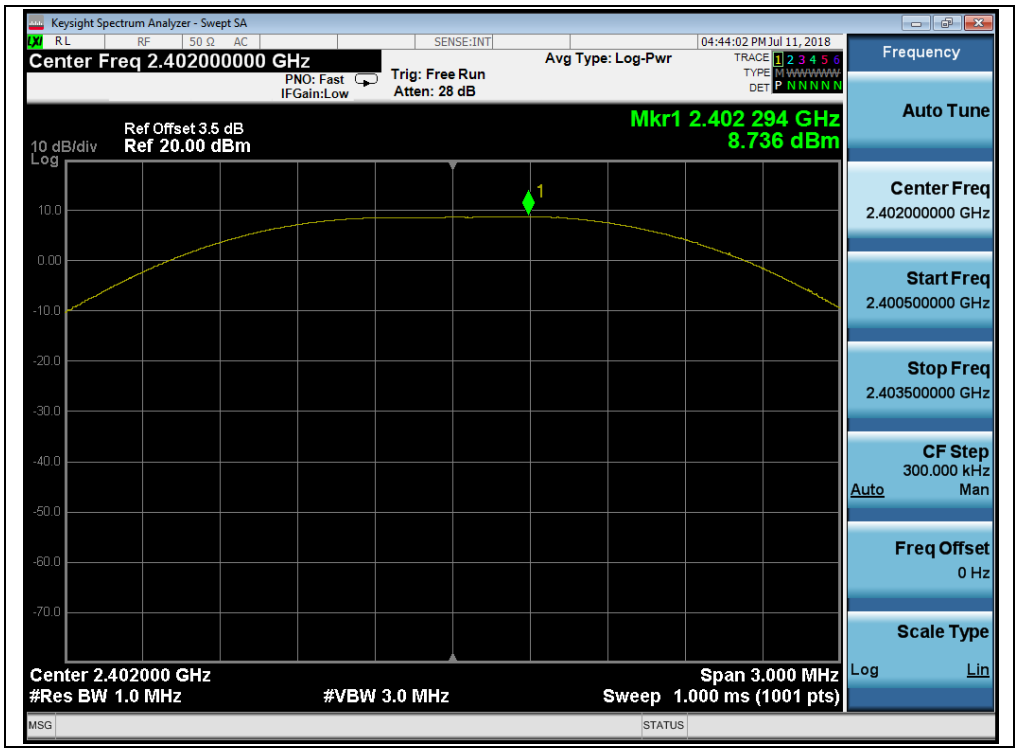
2.2.4. Test Result

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

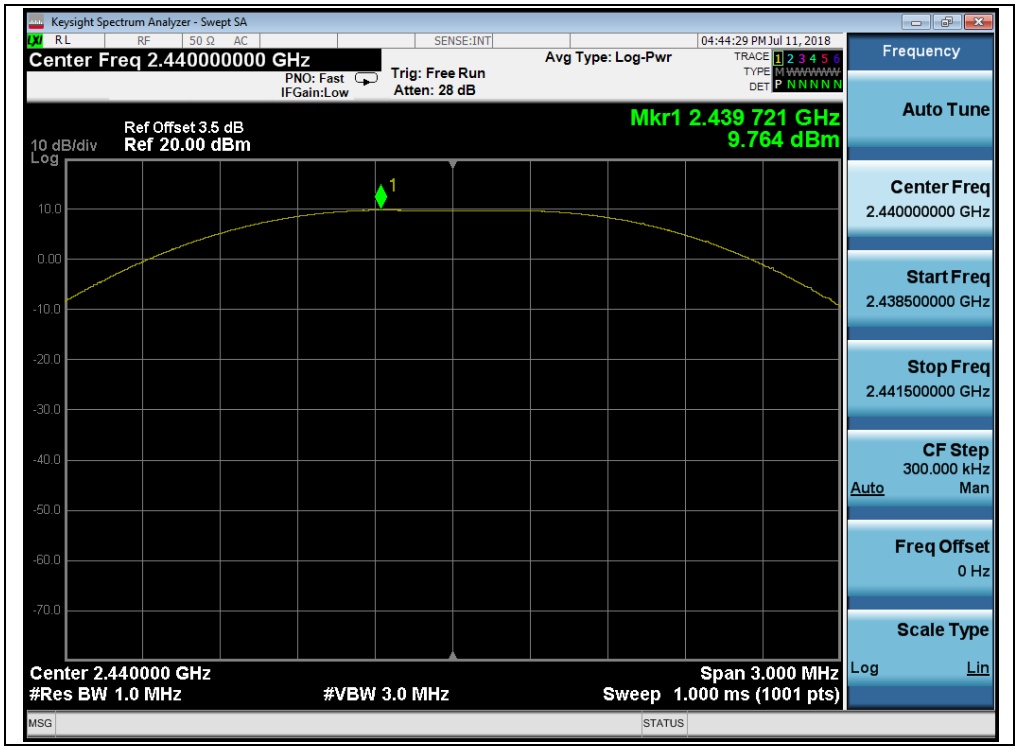
A. Test Verdict:

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
0	2402	8.74	0.007	30	1	PASS
19	2440	9.76	0.009			PASS
39	2480	10.21	0.010			PASS

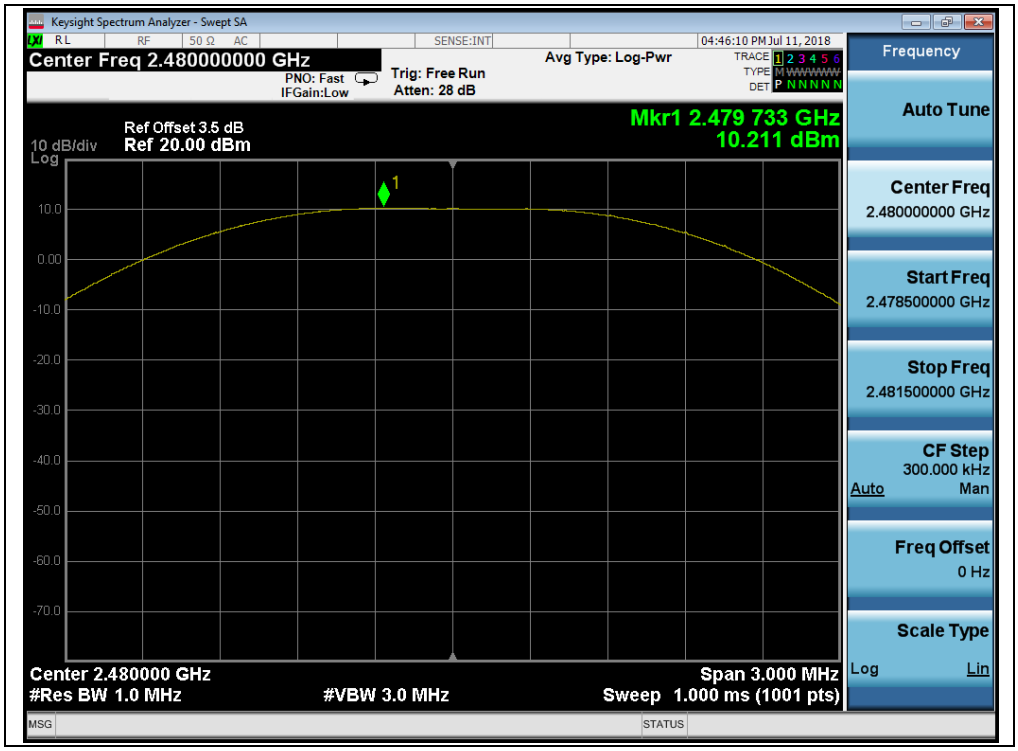
B. Test Plots:



(Channel 0, 2402MHz)



(Channel 19, 2440MHz)



(Channel 39, 2480MHz)

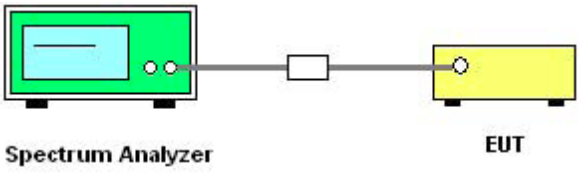
2.3. 6dB Bandwidth

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.

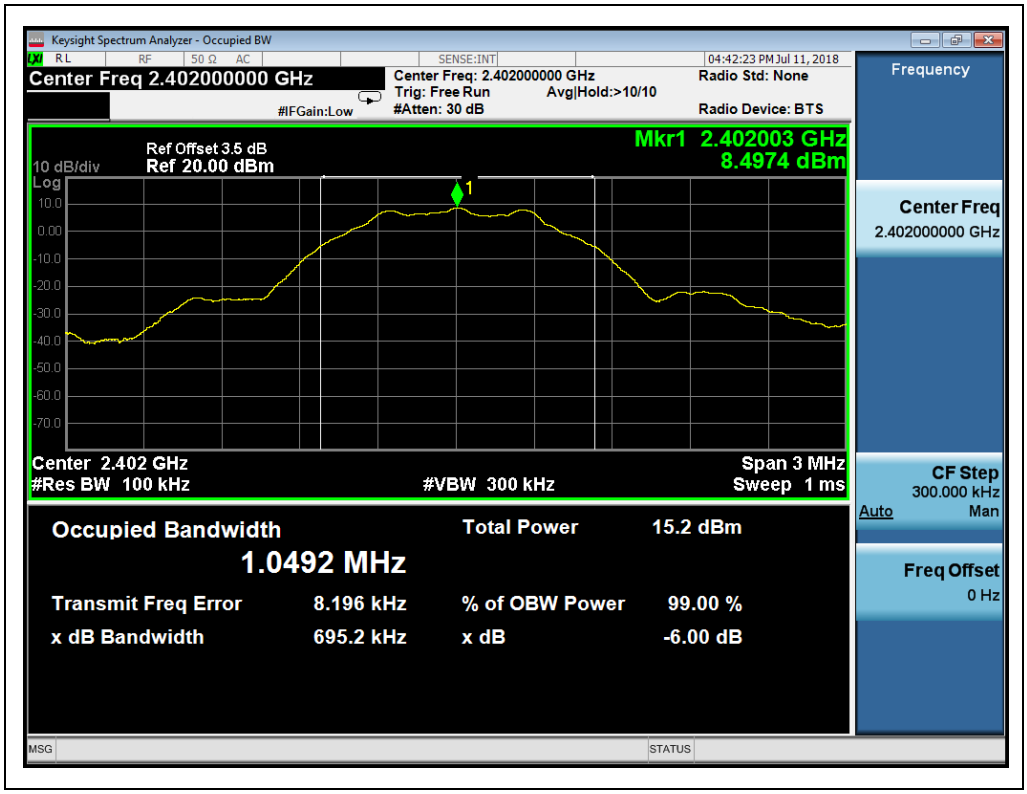
2.3.4. Test Result

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

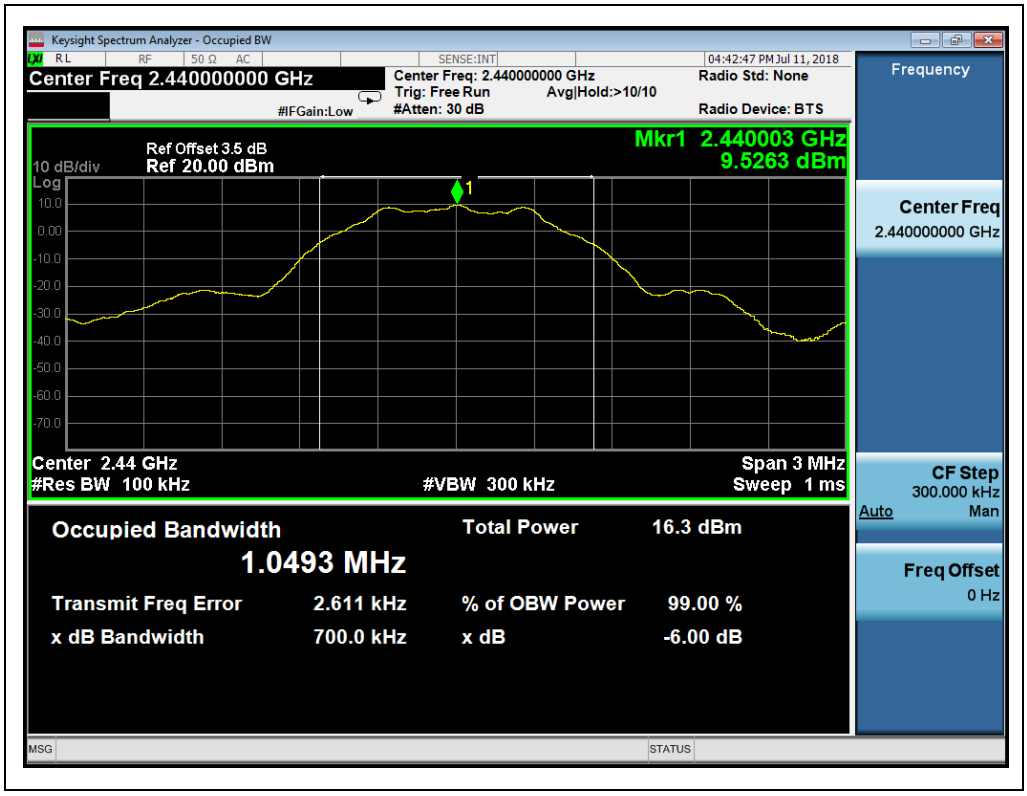
A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
0	2402	0.6952	≥500	PASS
19	2440	0.7000	≥500	PASS
39	2480	0.6970	≥500	PASS

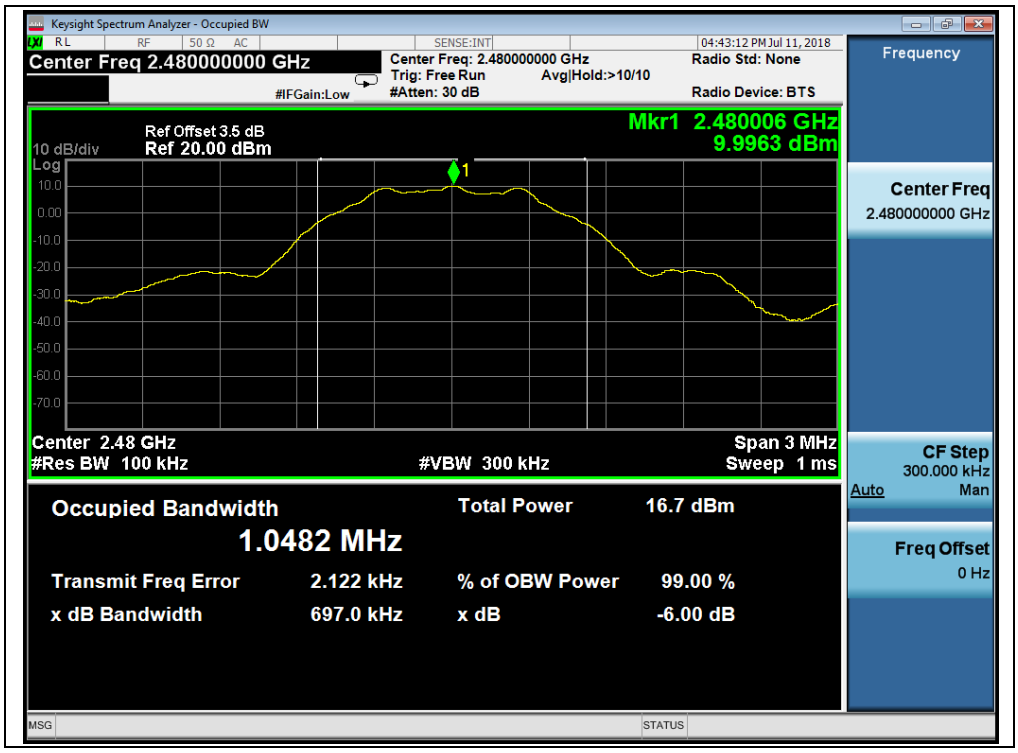
B. Test Plots:



(Channel 0, 2402MHz)



(Channel 19, 2440 MHz)



(Channel 39, 2480MHz)

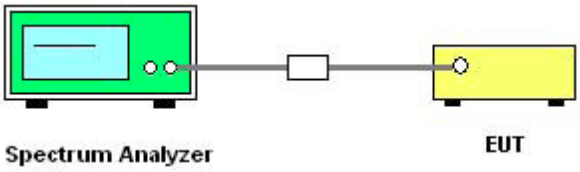
2.4. Conducted Spurious Emissions and Band Edge

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

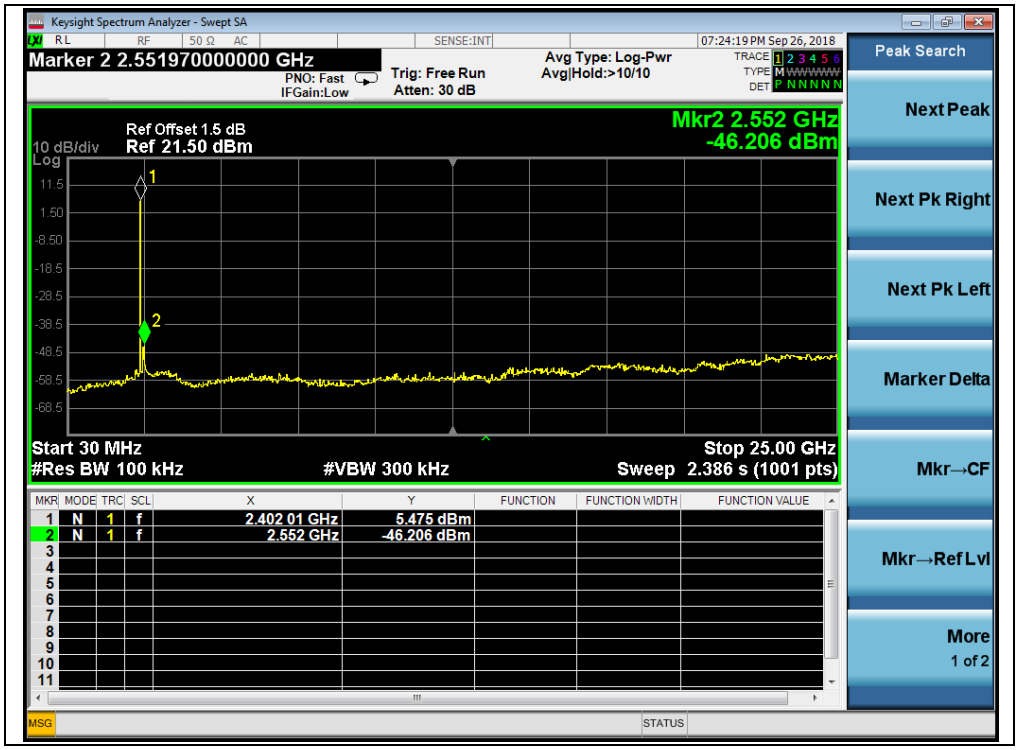
The m easurement fr equency r ange i s fr om 30M Hz to the 10th har monic of the fundam ental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions.

A. Test Verdict:

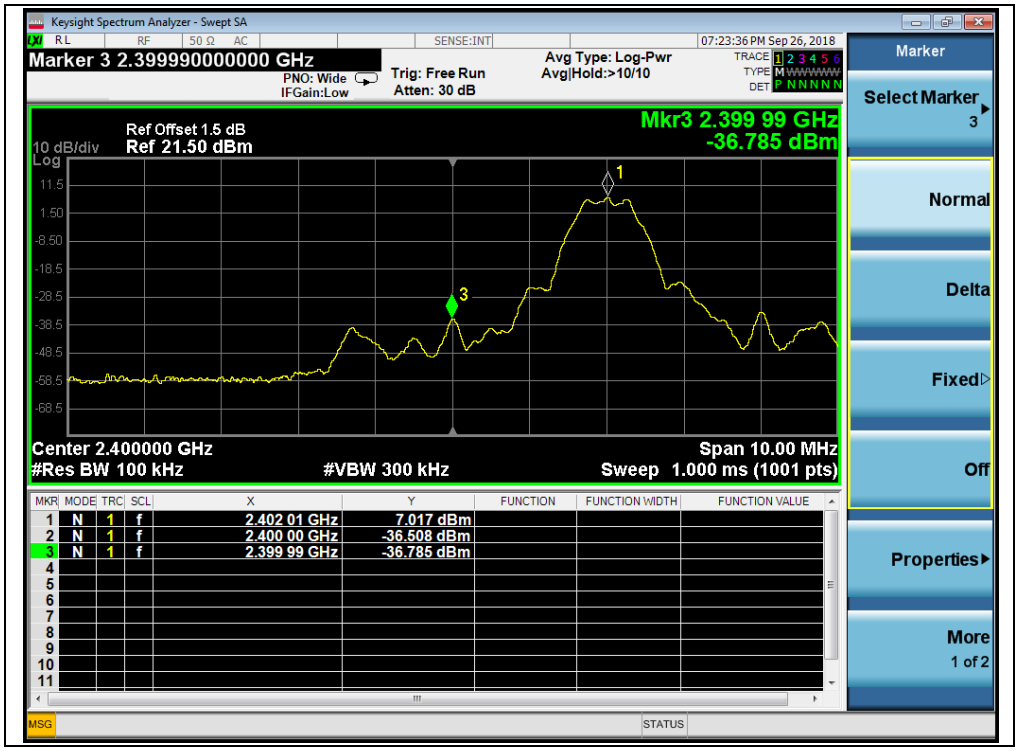
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
0	2402	-46.21	5.48	-14.52	PASS
19	2440	-49.05	6.25	-13.75	PASS
39	2480	-47.30	6.50	-13.50	PASS

B. Test Plots:

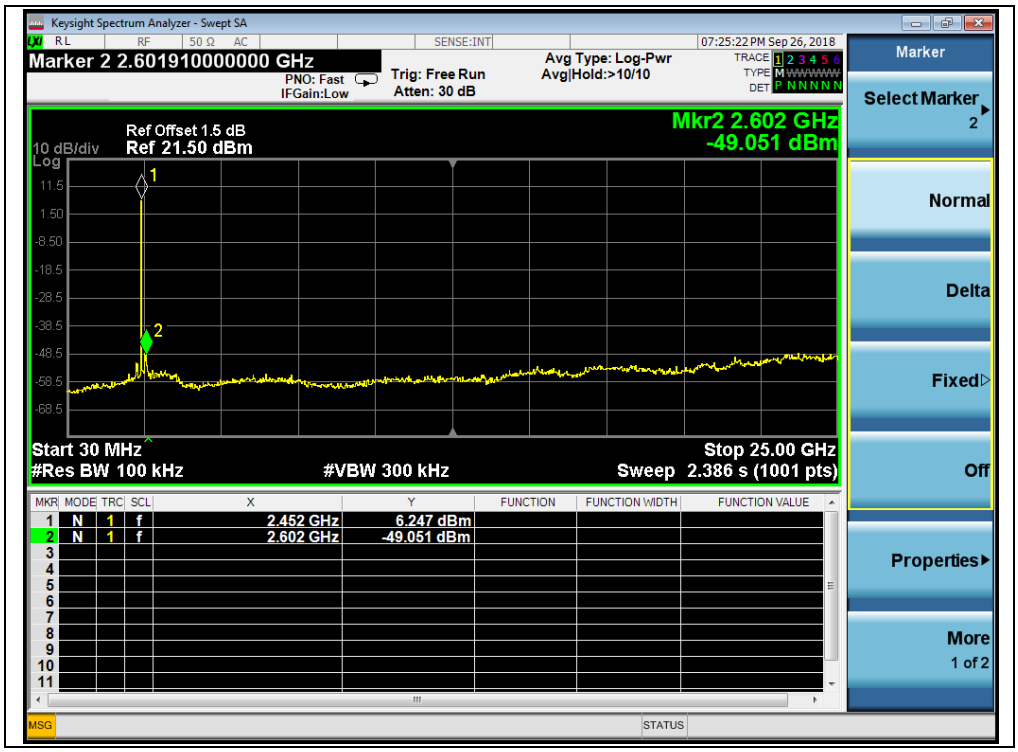
Note: the power of the Module transmitting frequency should be ignored.



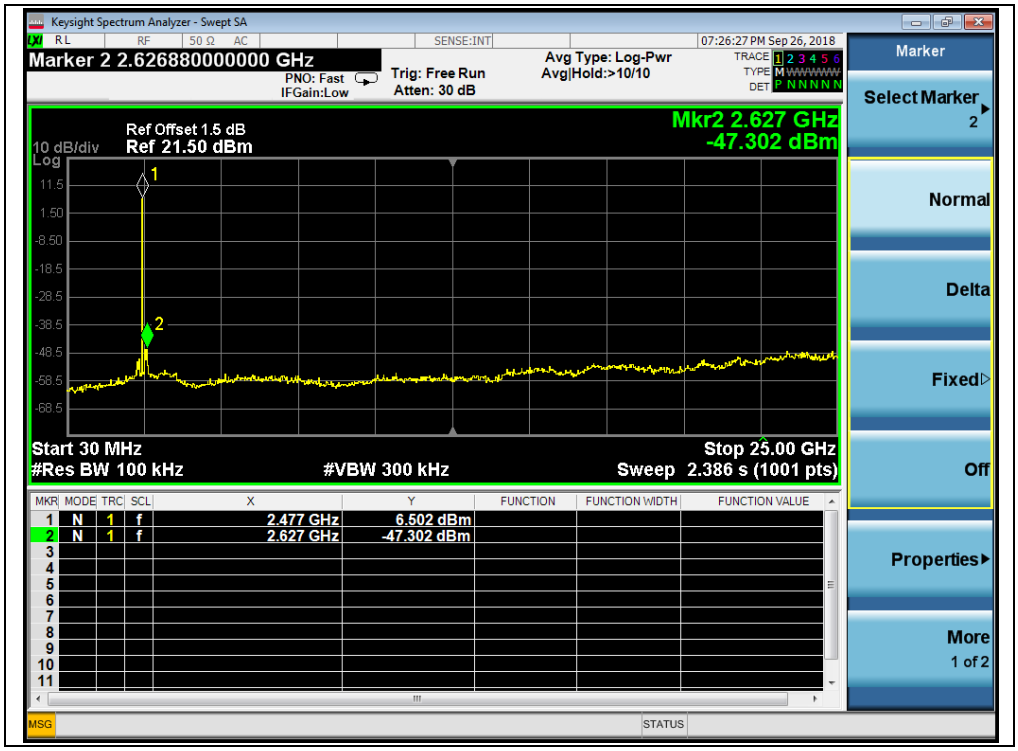
(Channel = 0, 30MHz to 25GHz)



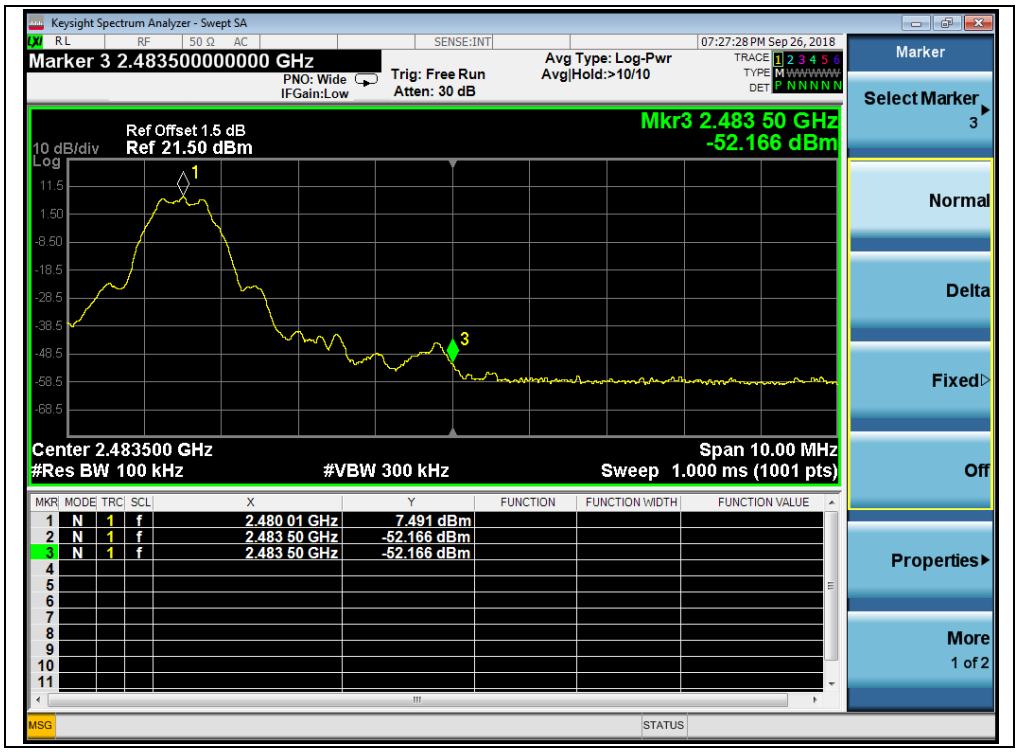
(Band Edge, Channel = 0)



(Channel = 19, 30MHz to 25GHz)



(Channel = 39, 30MHz to 25GHz)



(Band Edge, Channel = 39)

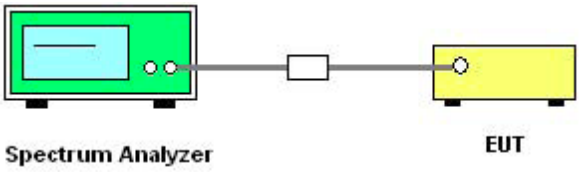
2.5. Power spectral density (PSD)

2.5.1. Requirement

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna s hall n ot be gr eater than 8dB m i n any 3 kHz band dur ing any ti me i nterval 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.

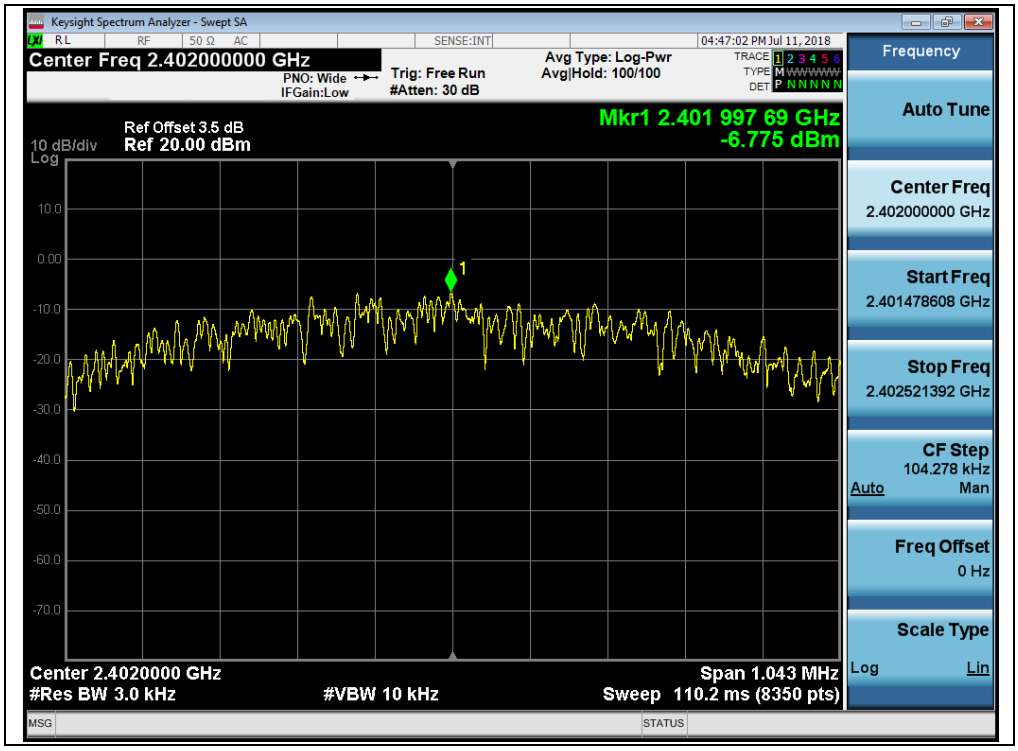
2.5.4. Test Result

The lowest, middle and highest channels are tested.

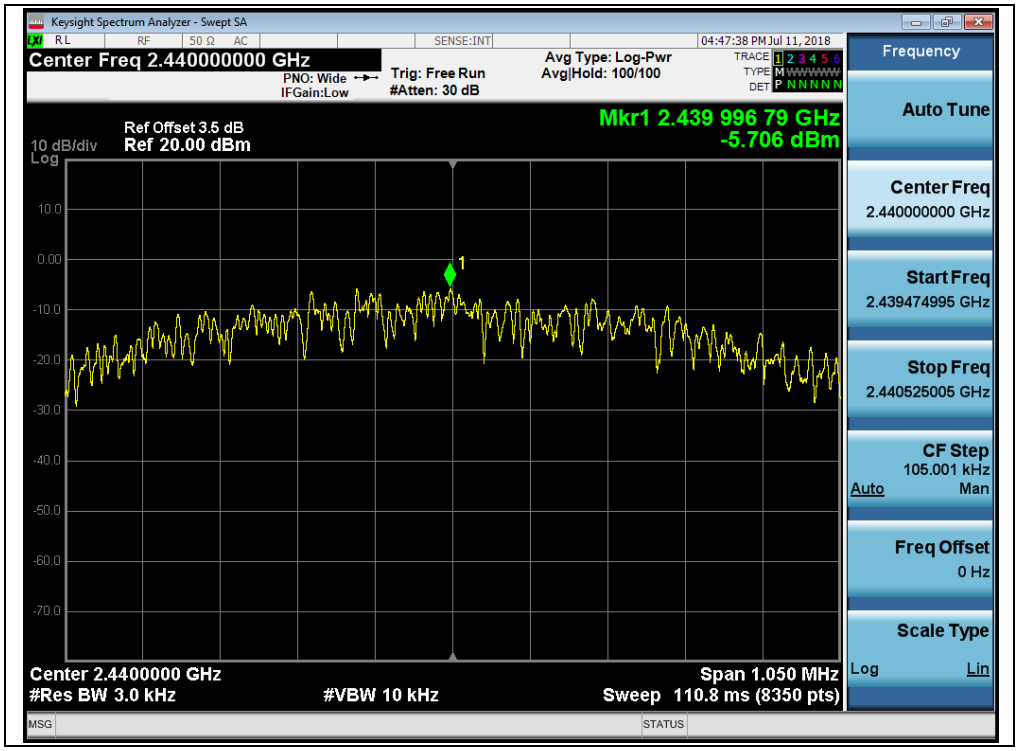
A. Test Verdict:

Spectral power density (dBm/3kHz)				
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
0	2402	-6.78	8	PASS
19	2440	-5.71	8	PASS
39	2480	-5.16	8	PASS
Measurement uncertainty: ±1.3dB				

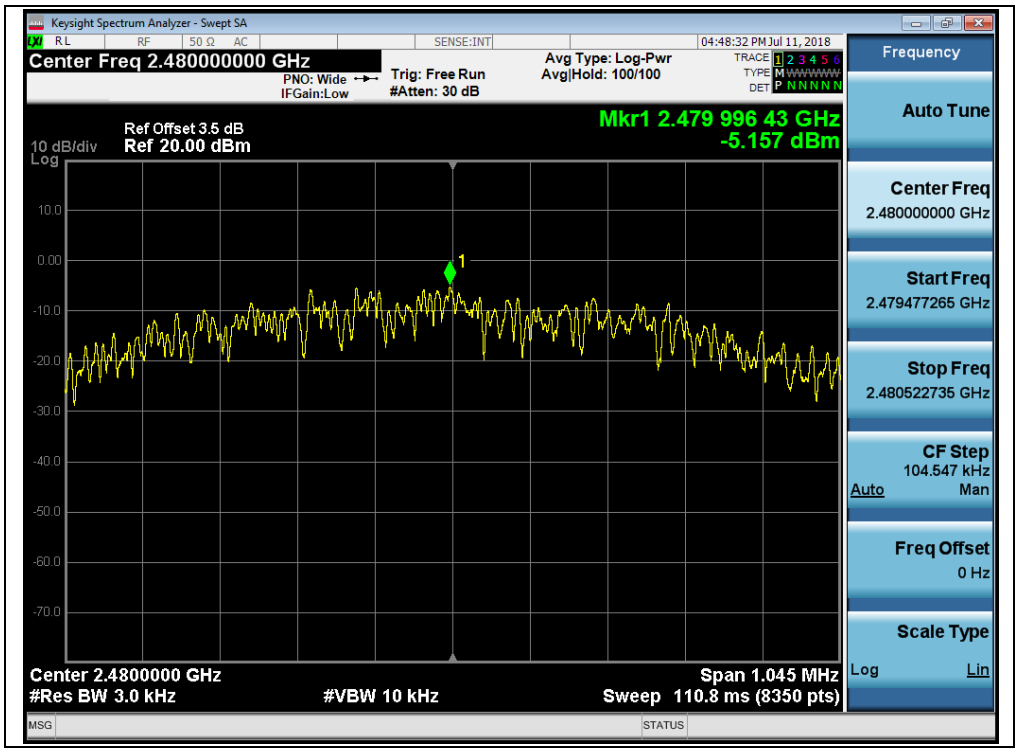
B. Test Plots:



(Channel = 0, 2402MHz)



(Channel = 19, 2440MHz)



(Channel = 39, 2480MHz)

2.6. Conducted Emission

2.6.1. 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

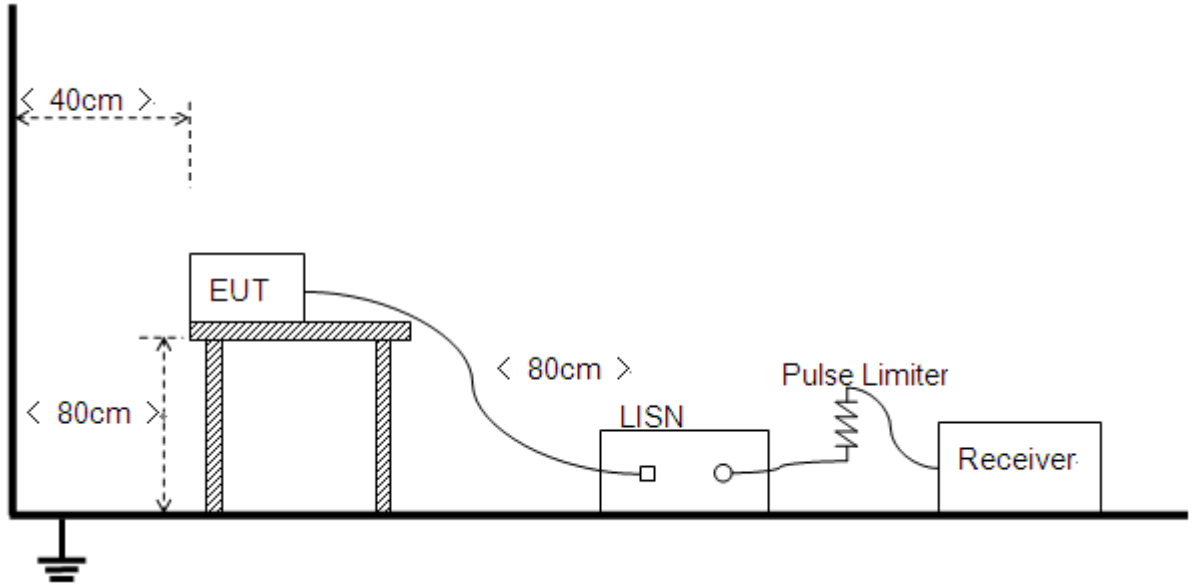
NOTE:

(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.

2.6.2. 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 refer ANNEX A(1.5).

2.6.3. Test Result

This test case does not apply this kind of EUT.

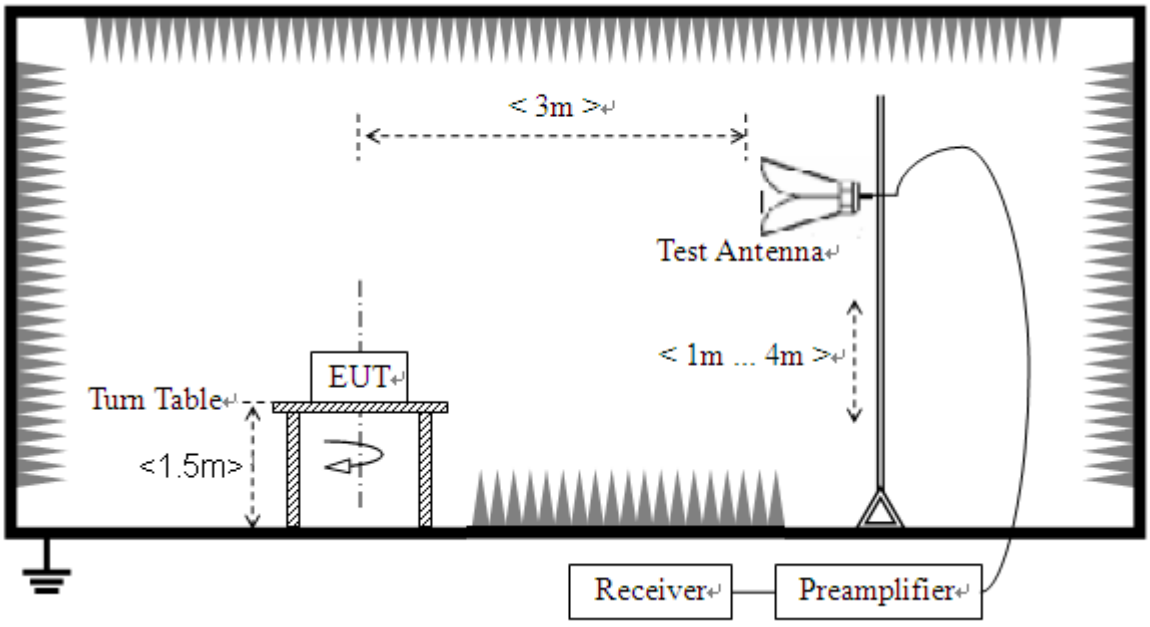
2.7. Restricted Frequency Bands

2.7.1. 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).

2.7.2. 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).

2.7.3. 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:

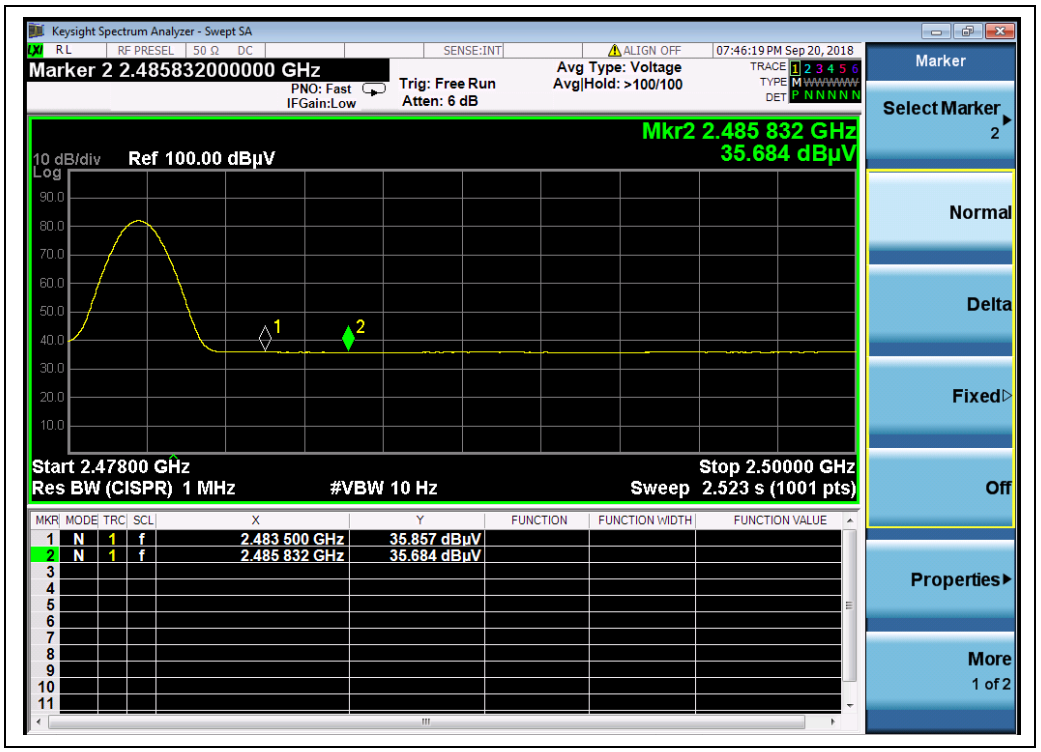
Channel	Frequency (MHz)	Detector	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV						
0	2340.04	PK	48.53	-29.67	32.56	51.42	74	PASS
0	2390.00	AV	35.83	-29.67	32.56	38.72	54	PASS
39	2484.27	PK	46.59	-29.67	32.56	49.48	74	PASS
39	2483.50	AV	35.86	-29.67	32.56	38.75	54	PASS

B. Test Plots:

(Channel = 0, PEAK)

(Channel = 0, AVG)

(Channel = 39, PEAK)



(Channel = 39, AVG)

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.

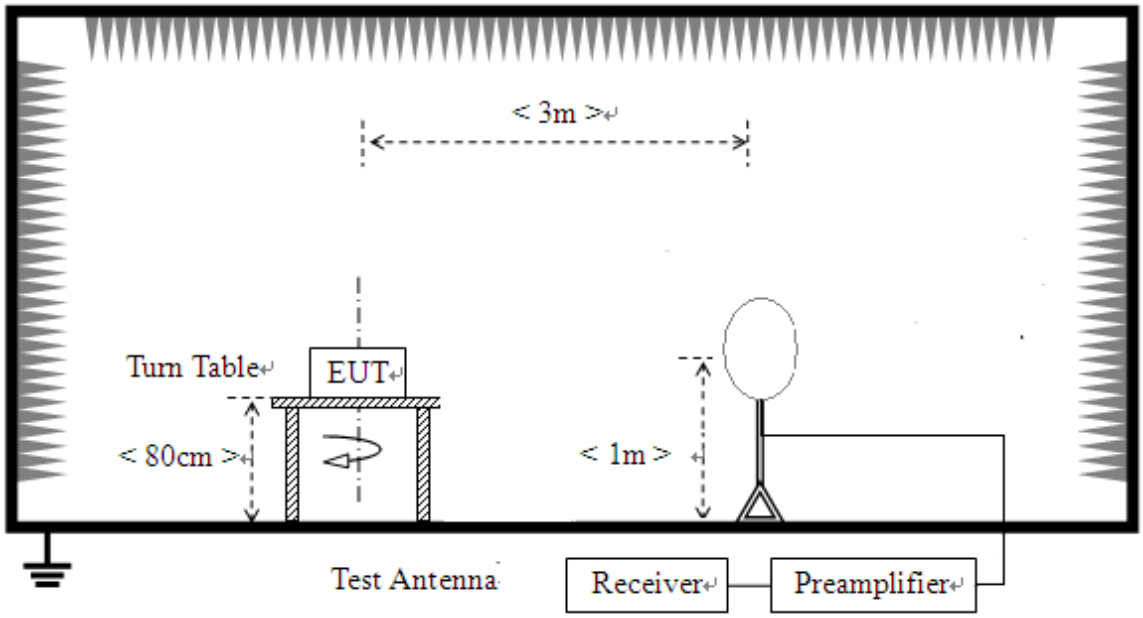
2. For above 1000MHz, limit field strength of harmonics: 54dB uV/m@3m (AV) and 74dBuV/m@3m (PK)

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)

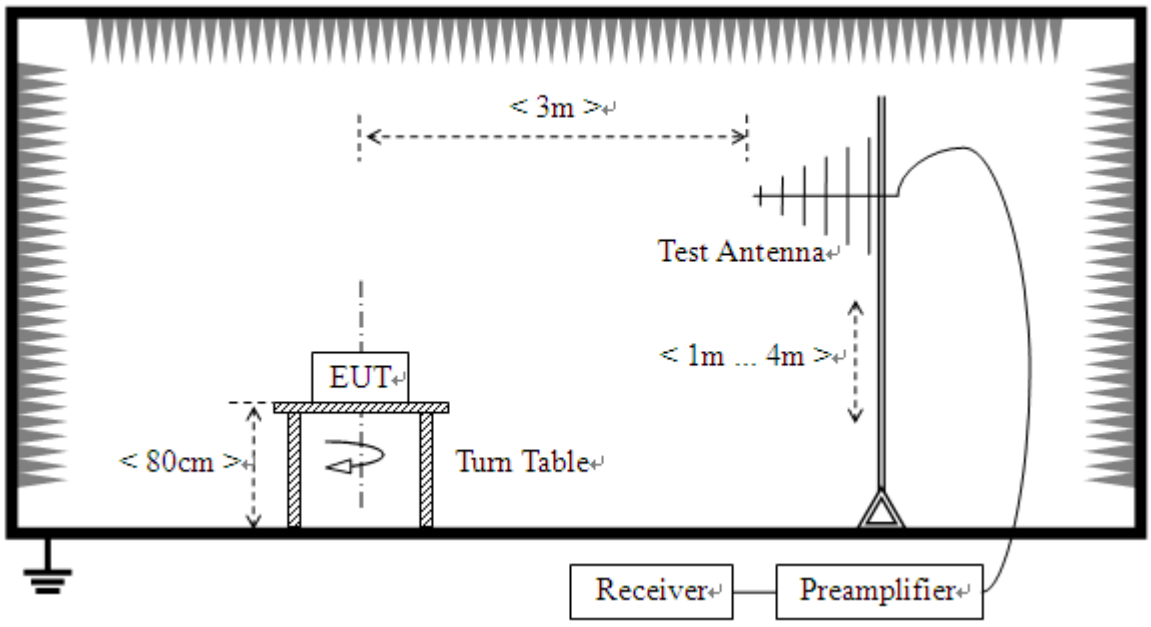
2.8.2. Test Description

A. Test Setup:

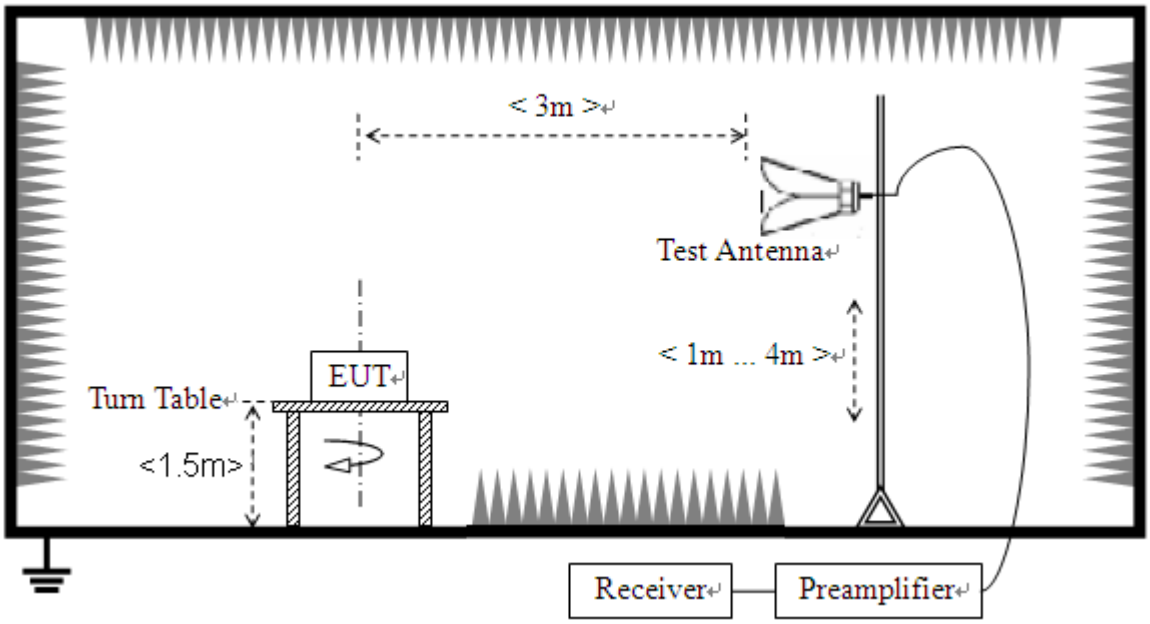
1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to1GHz



3) For radiated emissions above 1GHz



The RF absorbing material used on the reference ground plane and on the turntable have 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 GHz. Test site have a minimum area of the 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 set-up on insulator 150cm above the Ground Plane. The set-up and test methods were 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 frequency 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 test antenna aimed at the source of emissions at each frequency of significant

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 refer 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

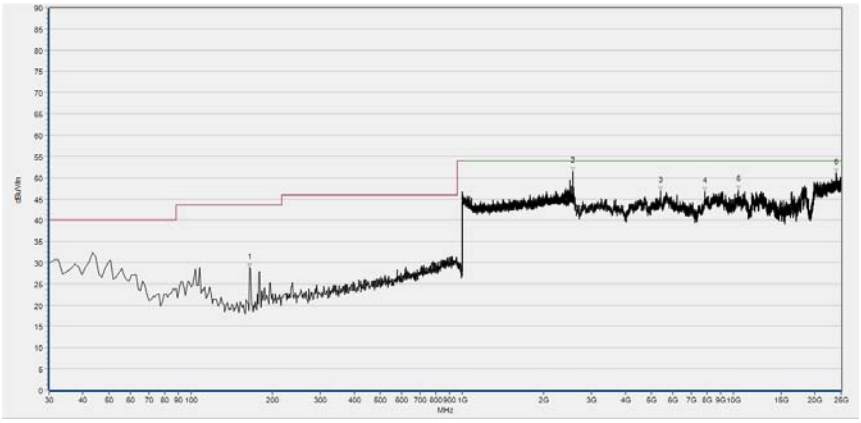
During the test, the total correction Factor A_T and A_{Factor} were built in test software.

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.

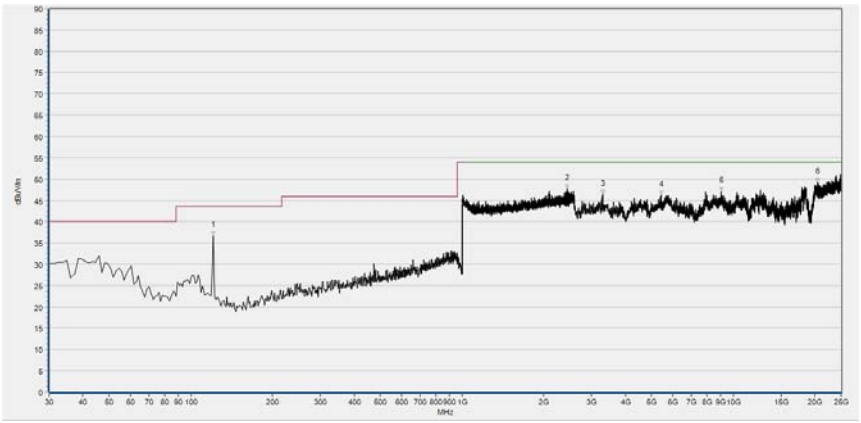
Note3: For the frequency, which started from 25GHz to 40GHz, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

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
164.756	28.83	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
2557.743	51.38	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5398.472	46.91	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
7871.067	46.71	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10433.279	47.16	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
23896.090	51.18	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

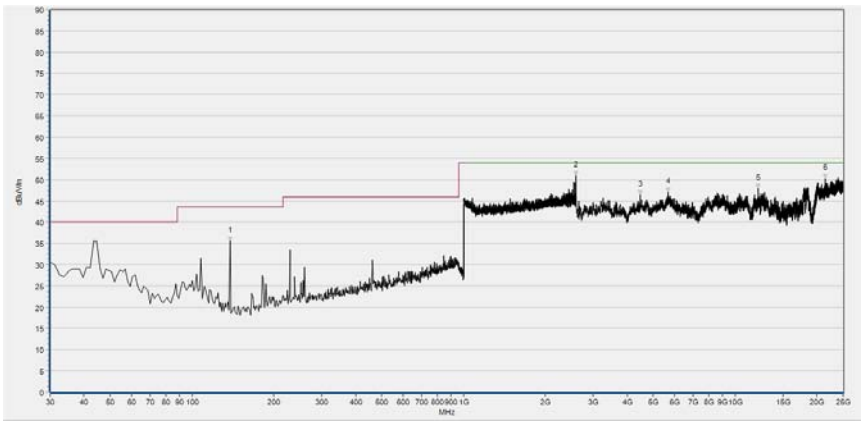
(Antenna Horizontal, 30MHz to 25GHz)



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
121.051	36.68	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
2446.979	47.72	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3300.636	46.46	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5414.766	46.23	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
9032.006	47.11	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
20519.185	49.28	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

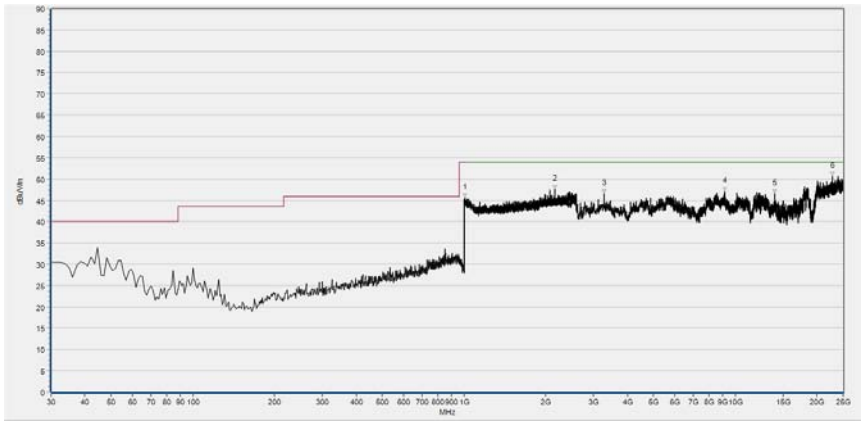
(Antenna Vertical, 30MHz to 25GHz)

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
138.048	35.60	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
2596.158	50.88	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4473.795	46.41	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5667.321	47.11	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12193.017	47.92	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
21456.083	50.35	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

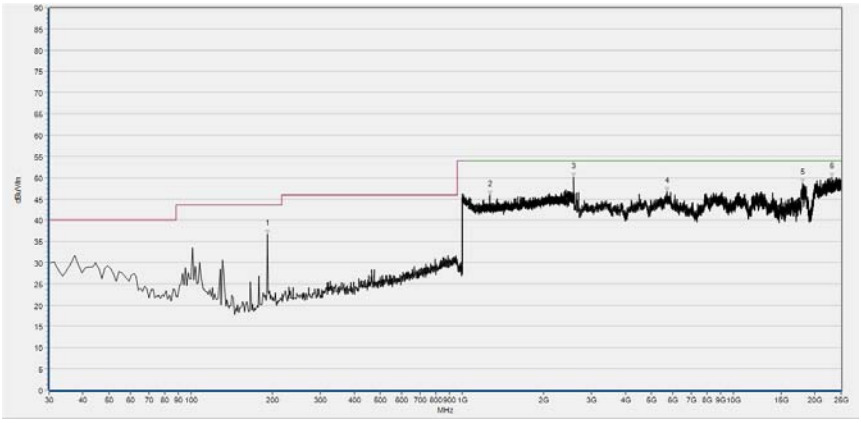
(Antenna Horizontal, 30MHz to 25GHz)



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
1005.762	45.52	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2165.906	47.58	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3284.343	46.51	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
9141.989	47.09	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
14013.857	46.52	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
22857.356	50.61	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

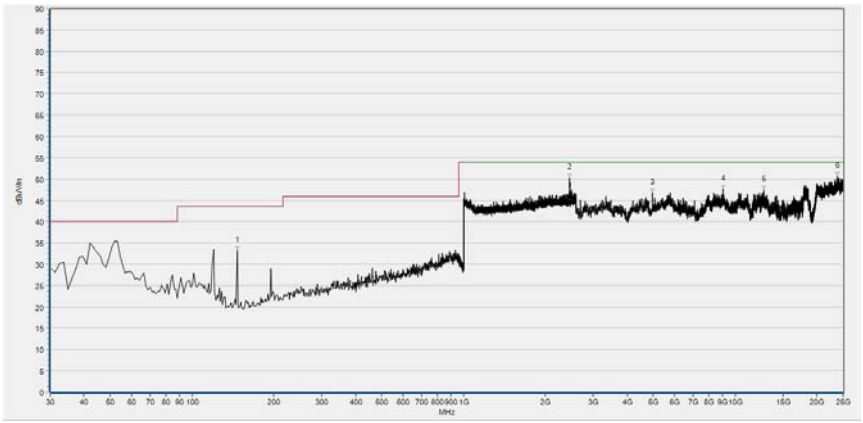
(Antenna Vertical, 30MHz to 25GHz)

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
191.464	36.67	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1265.066	45.97	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2583.994	50.07	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5691.762	46.76	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
17993.635	48.70	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
23158.793	50.07	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
146.546	33.19	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
2461.705	50.21	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4958.538	46.77	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
9056.447	47.65	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12747.009	47.50	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
23855.356	50.62	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 estimated 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, the test firm registration number is 226174.

4. Test Equipments Utilized

4.1 Conducted Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
Power Splitter	NW521	1506A	Weinschel	2018.04.17	2019.04.16
Attenuator 1	(N/A.)	10dB	Resnet	2018.04.17	2019.04.16
Attenuator 2	(N/A.)	3dB	Resnet	2018.04.17	2019.04.16
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	2018.05.08	2019.05.07
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

4.3Auxiliary 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	2018.08.04	2019.08.03
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2018.05.18	2019.05.17
Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2018.03.03	2019.03.02
Test Antenna – Horn	01774	BBHA 9120D	Schwarzbeck	2018.08.06	2019.08.05
Test Antenna – Horn	BBHA9170 #774	BBHA9170	Schwarzbeck	2018.08.02	2019.08.01
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