FCC 47 CFR PART 15 SUBPART C
Canada RSS-247 Issue2
Canada RSS-Gen Issue4
TEST REPORT

For

Product Name: YI Horizon VR180 Camera

Brand Name: YI

Model No.: YVR.1117

Series Model.:N/A

FCC ID: 2AFIB-YVR1117

IC: 20436-YVR1117

Test Report Number:

C171023R02-RPB1

Issued for

Shanghai Xiaoyi Technology Co., Ltd.

16F，Building 1 , No. 515, Huanke Road, Shanghai, China

Issued by

Compliance Certification Services Inc.

Kun shan Laboratory

**No.10 Weiye Rd., Innovation park, Eco&Tec,
Development Zone, Kunshan City, Jiangsu, China**

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TESTING CERT #2541.01

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Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	April 2, 2018	C171023R02-RPB1	ALL	N/A
01	May 25, 2018	C171023R02-RPB1	P4；P5；P6；P8；P10；P11；P17-P19；P22；P28；P36；P46	Modify Antenna gain and EIRP; Add the ISED standard in section 3 and all section of test items; Put the plots of duty cycle.
02	June 1, 2018	C171023R02-RPB1	P5	Delete the ant gain of 5GHz.

1 TEST RESULT CERTIFICATION

Product Name:	YI Horizon VR180 Camera
Trade Name:	YI
Model Name:	YVR.1117
Series Model:	N/A
Applicant Discrepancy:	Initial
Device Category:	Mobile unit
Date of Test:	March 1, 2018~March 30, 2018
Applicant:	**Shanghai Xiaoyi Technology Co., Ltd.** 16F，Building 1 , No. 515, Huanke Road, Shanghai, China
Manufacturer:	**Shanghai Xiaoyi Technology Co., Ltd.** 16F，Building 1 , No. 515, Huanke Road, Shanghai, China
Application Type:	Certification

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
FCC 47 CFR Part 15 Subpart C	No non-compliance noted
Canada RSS-247 Issue 2	No non-compliance noted
Canada RSS-Gen Issue 4	No non-compliance noted

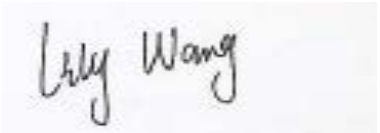
The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10:2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209, 15.247 and IC Rules RSS-247 Issue2, RSS-Gen Issue4.

The test results of this report relate only to the tested sample EUT identified in this report.

Approved by:

Jeff.Fang
RF Manager
Compliance Certification Services Inc.

Tested by:



Lily.Wang
Test Engineer
Compliance Certification Services Inc.

2 EUT DESCRIPTION

Product Name:	YI Horizon VR180 Camera	
Trade Name:	YI	
Model Name:	YVR.1117	
Series Model:	N/A	
Model Discrepancy:	N/A	
Power Adapter:	DC 5V Battery: Model: U344378P(1ICP4/43/78) 3.85V⎓1800mAh 6.93Wh Charging Limit Voltage: 4.4V	
Frequency Range:	Bluetooth:2402 ~ 2480 MHz	
Peak output Power:	Bluetooth LE4.1: 8.72dBm	
Peak e.i.r.p:	Bluetooth LE4.1: 11.49dBm	
Average output Power:	Bluetooth LE4.1: 8.32dBm	
Average e.i.r.p:	Bluetooth LE4.1: 11.09dBm	
Channel Spacing	Bluetooth LE4.1: 2MHz	
Modulation type:	Bluetooth LE4.1: GFSK	
Transmit Data Rate:	Bluetooth LE4.1: 1 Mbps	
Number of Channels:	Bluetooth LE4.1: 40 Channels	
Antenna Specification:	FPC Antenna	
Antenna Specification:		Gain(dBi)
		2.4G
	Antenna 1	2.77
	Antenna 2	1.22

Remark:

1.The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.

2.This submittal(s) (test report) is intended for ***FCC ID: 2AFIB-YVR1117*** filing to comply with Section 15.207, 15.209 and 15.247 of the FCC Part 15, Subpart C Rules.

3.This submittal(s) (test report) is intended for ***IC : 20436-YVR1117*** filing to comply with IC rules RSS-247 Issue2, RSS-Gen Issue4.

3 TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, 15.207, 15.209 and 15.247 and IC RSS-247 Issue2, RSS-Gen Issue4.

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 EXERCISEEUT

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.247 under the FCC Rules Part 15 Subpart C and RSS-247 Issue2, RSS-Gen Issue4 under the IC Rules..

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10 2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

Under 1GHz

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.4 & 6.5 of ANSI C63.10:2013.

Above 1GHz

The EUT is placed on a turn table, which is 1.5 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.6 of ANSI C63.10:2013.

3.4 TEST Mode

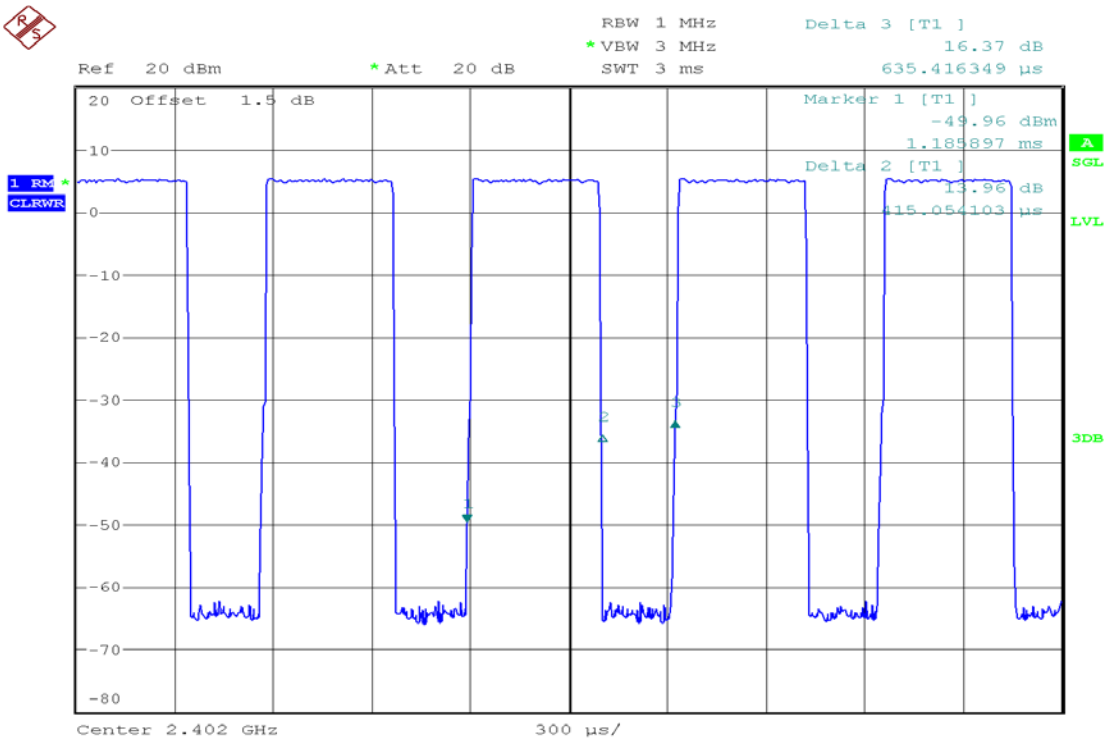
Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel	Antenna
6dB Bandwidth	GFSK	1 Mbps	0/19/39	1
99% Bandwidth	GFSK	1 Mbps	0/19/39	1
Peak Output Power	GFSK	1 Mbps	0/19/39	1
Power Spectral Density	GFSK	1 Mbps	0/19/39	1
Conducted Band Edges and Spurious Emission	GFSK	1 Mbps	0/19/39	1
Radiated Band Edges and Spurious Emission	GFSK	1 Mbps	0/19/39	1
AC Conducted Emission	CTX	-	-	-

Remark1: For radiated test cases below 1 GHz, the worst mode data rate channel 39 was reported only, because this data rate has the highest RF output power at preliminary tests.

3.5 Duty cycle

Configuration	Duty Cycle (%)	VBW
BLE4.1	65.32	3kHz



3.6 RESTRICTED BANDS OF OPERATIONS

FCC

Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

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 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])
13.36 - 13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

IC

Except as shown RSS-Gen 8.10, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	GHz
0.090-0.110	74.8-75.2	9.0-9.2
2.1735-2.1905	108-138	9.3-9.5
3.020-3.026	156.52475-156.52525	10.6-12.7
4.125-4.128	156.7-156.9	13.25-13.4
4.17725-4.17775	240-285	14.47-14.5
4.20725-4.20775	322-335.4	15.35-16.2
5.677-5.683	399.9-410	17.7-21.4
6.215-6.218	608-614	22.01-23.12
6.26775-6.26825	960-1427	23.6-24.0
6.31175-6.31225	1435-1626.5	31.2-31.8
8.291-8.294	1645.5-1646.5	36.43-36.5
8.362-8.366	1660-1710	Above 38.6
8.37625-8.38675	1718.8-1722.2	
8.41425-8.41475	2200-2300	
12.29-12.293	2310-2390	
12.51975-12.52025	2655-2900	
12.57675-12.57725	3260-3267	
13.36-13.41	3332-3339	
16.42-16.423	3345.8-3358	
16.69475-16.69525	3500-4400	
16.80425-16.80475	4500-5150	
25.5-25.67	5350-5460	
37.5-38.25	7250-7750	
73-74.6	8025-8500	

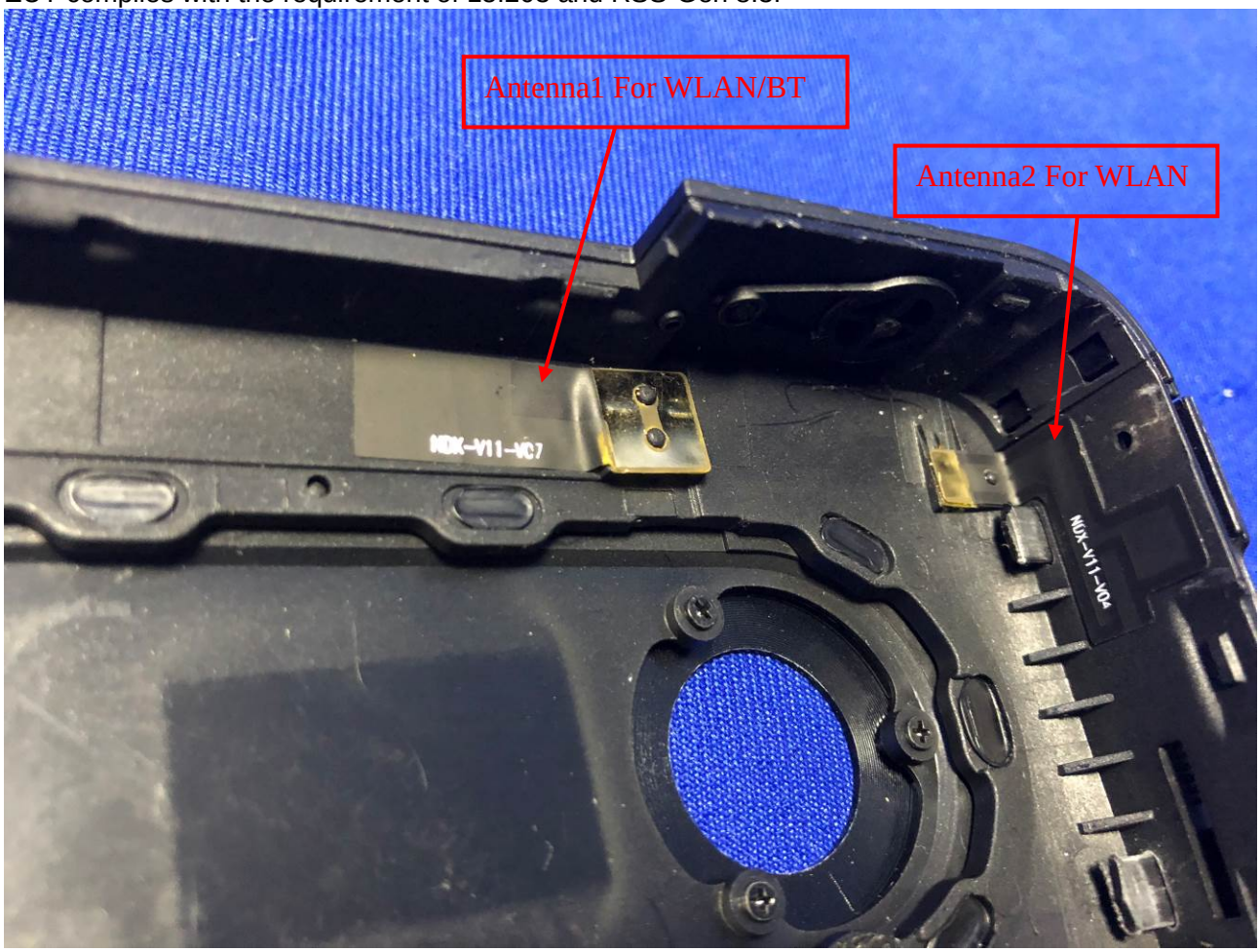
* Certain frequency bands listed in Table 6 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to the devices are set out in the 200- and 300-series of RSSs, such as RSS-210 and RSS-310, which contain the requirements that apply to licence-exempt radio apparatus.

3.7 Antenna Description

According to FCC 47 CFR 15.203 and RSS-Gen 8.3

“an intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached or an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section”

As the photo below, the EUT use a unique coupling to the intentional radiator attached antenna, so the EUT complies with the requirement of 15.203 and RSS-Gen 8.3.



4 INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards. facilities and accreditations

5 FACILITIES AND ACCREDITATIONS

5.1 FACILTIES

All measurement facilities used to collect the measurement data are located at
CCS China Kunshan Lab at 10#Weiye Rd, Innovation Park Eco. & Tec. Development Zone Kunshan city JiangSu, (215300), CHINA.

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

5.3 LABORATORY ACCREDITATIONS AND LISTING

FCC –Designation Number: CN1172.

Compliance Certification Services Inc. Kun shan Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Designation Number: CN1172.

Also the test facilities are listed with Industry Canada, Laboratory Division, 2324E-1 for 10m chamber, 2324E-2 for 3m chamber.

5.4 TABLE OF ACCREDITATIONS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

Taiwan	TAF
USA	A2LA

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	Industry Canada
Japan	VCCI
Taiwan	BSMI
USA	FCC

Copies of granted accreditation certificates are available for downloading from our web site, http:///www.ccsrf.com

5.5 LIST OF MEASURING EQUIPMENT

Conducted Emissions Test Site					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Data**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	MY44020154	2017-9-4	2018-9-3
Spectrum Analyzer	RS	FSU26	200789	2017-7-20	2018-7-19
Power meter	Anritsu	ML2495A	1445010	2017-4-26	2018-4-25
Power sensor	Anritsu	MA2411B	1339220	2017-4-26	2018-4-25
Power SPLITTER	Mini-Circuits	ZN2PD-9G	SF078500430	N.C.R	N.C.R
DC Power Supply	AGILENT	E3632A	MY50340053	N.C.R	N.C.R
Cable	N/A	Cable-05	N/A	2017-4-26	2018-4-25
Cable	N/A	Cable-06	N/A	2017-4-26	2018-4-25
6dB Attenuator	N/A	N/A	N/A	2017-4-26	2018-4-25
Temp. / Humidity Gauge	Anymetre	TH603	CCS007	2017-10-24	2018-10-23
Test Software			EZ-EMC		

Conducted Emission					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
EMI TEST RECEIVER	R&S	ESCI	100781	2018-2-26	2019-2-25
V (V-LISN)	SCHWARZBECK	NNLK 8129	8129-143	2017-10-29	2018-10-28
TWO-LINE V-NETWORK	R&S	ENV216	101604	2017-10-29	2018-10-28
Pulse LIMITER	R&S	ESH3-Z2	100524	2017-12-27	2018-12-26
Cable	Thermax	Cable-02	14	2017-12-27	2018-12-26
Test Software			EZ-EMC		

977 Chamber					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Data**	**Calibration Due**
Spectrum Analyzer	Agilent	E4446A	MY44020154	2017-9-4	2018-9-3
Spectrum Analyzer	RS	FSU26	200789	2017-7-20	2018-7-19
EMI Test Receiver	R&S	ESCI	101378	2017-12-26	2018-12-25
Amplifier	COM-POWER	PAM-840A	461332	2017-11-29	2018-11-28
Amplifier	MITEQ	JS41-00101800-32-10P	1675713	2017-7-20	2018-7-19
Broad-Band Horn Antenna	SCHWARZBECK	BBHA 9170	9170-515	2018-2-26	2019-2-25
Bilog Antenna	Sunol	JB1	A062604	2017-5-27	2018-5-26
Bilog Antenna	Sunol	JB1	A110204-1	2017-5-27	2018-5-26
Loop Antenna	Hengweiyi	39501C	2014012	2018-1-4	2019-1-3
Horn-antenna	SCHWARZBECK	9120D	D:266	2018-2-26	2019-2-25
Horn-antenna	SCHWARZBECK	9120D	D:267	2017-11-5	2018-11-4
Turn Table	CT	CT123	4165	N.C.R	N.C.R
Antenna Tower	CT	CTERG23	3256	N.C.R	N.C.R
Controller	CT	CT1OO	95637	N.C.R	N.C.R
Cable	REBES MICROWAVE	Cable-93	N/A	2017-10-29	2018-10-28
Cable	REBES MICROWAVE	Cable-94	N/A	2017-10-29	2018-10-28
Cable	REBES MICROWAVE	Cable-95	N/A	2017-10-29	2018-10-28
Cable	N/A	Cable-03	N/A	2017-4-26	2018-4-25
Cable	N/A	Cable-04	N/A	2017-4-26	2018-4-25
2.4G Filter	N/A	N/A	N/A	2017-4-26	2018-4-25
Filter 5150MHz-5350MHz	N/A	N/A	N/A	2017-4-26	2018-4-25
Filter 5725MHz-5850MHz	N/A	N/A	N/A	2017-4-26	2018-4-25
Test Software			EZ-EMC		

Remark: *Each piece of equipment is scheduled for calibration once a year.*

5.6 SETUP CONFIGURATION

See test photographs attached in Setup photo for the actual connections between EUT and support equipment.

5.7 SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	FCC ID
N/A	N/A	N/A	N/A	N/A	N/A

Remark:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

6 FCC PART 15.247 REQUIREMENTS

6.1 PEAK POWER

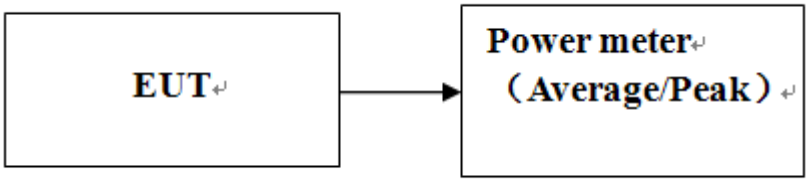
Limit of peak output power

The maximum peak output power of the intentional radiator shall not exceed the following:

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

According to RSS-247 section 5.4, For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1W. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e)

Test Configuration



Remark: *Each piece of equipment is scheduled for calibration once a year.*

Test Procedure

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance v04.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

Test Results

No non-compliance noted

Test RESULTS

BLE4.1 GFSK Modulation 1Mbps mode

Test mode:	Bluetooth LE4.1	**Temperature:**	23℃
Test By:	Lily.Wang	**Test Date:**	2018-3-10

Channel	**Frequency (MHz)**	**Transmit Data Rate**	**Peak Output Power (dBm)**	**Limit (dBm)**	**Peak e.i.r.p (dBm)**	**Limit (dBm)**	**Result**
00	2402	1Mbps	7.00	30.00	9.77	36.02	PASS
19	2440	1Mbps	8.17		10.94		PASS
39	2480	1Mbps	8.72		11.49		PASS

Channel	**Frequency (MHz)**	**Transmit Data Rate**	**Average Output Power (dBm)**	**Average e.i.r.p (dBm)**
00	2402	1Mbps	6.55	9.32
19	2440	1Mbps	7.72	10.49
39	2480	1Mbps	8.32	11.09

Remark:1.Duty factor has been offseted with cableloss

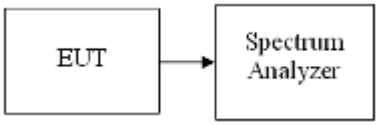
6.2 PEAK POWER SPECTRAL DENSITY

Limit

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

According to RSS-247 section 5.2, The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

Test Configuration



Test Procedure

1. The testing follows Measurement Procedure 10.2 Method PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.

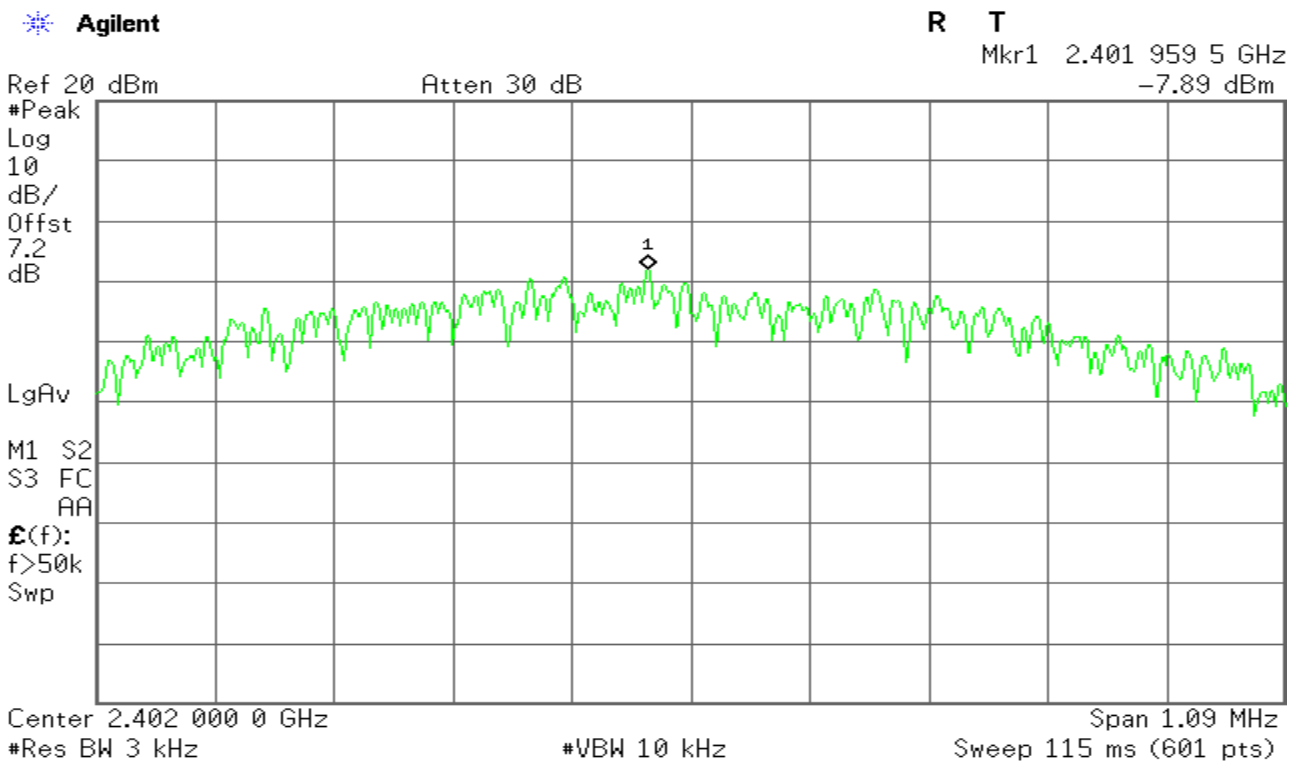
Test Results of power Spectral Density

Test mode:	Bluetooth LE4.1	Temperature:	23℃
Test By:	Lily.Wang	Test Date:	2018-3-10

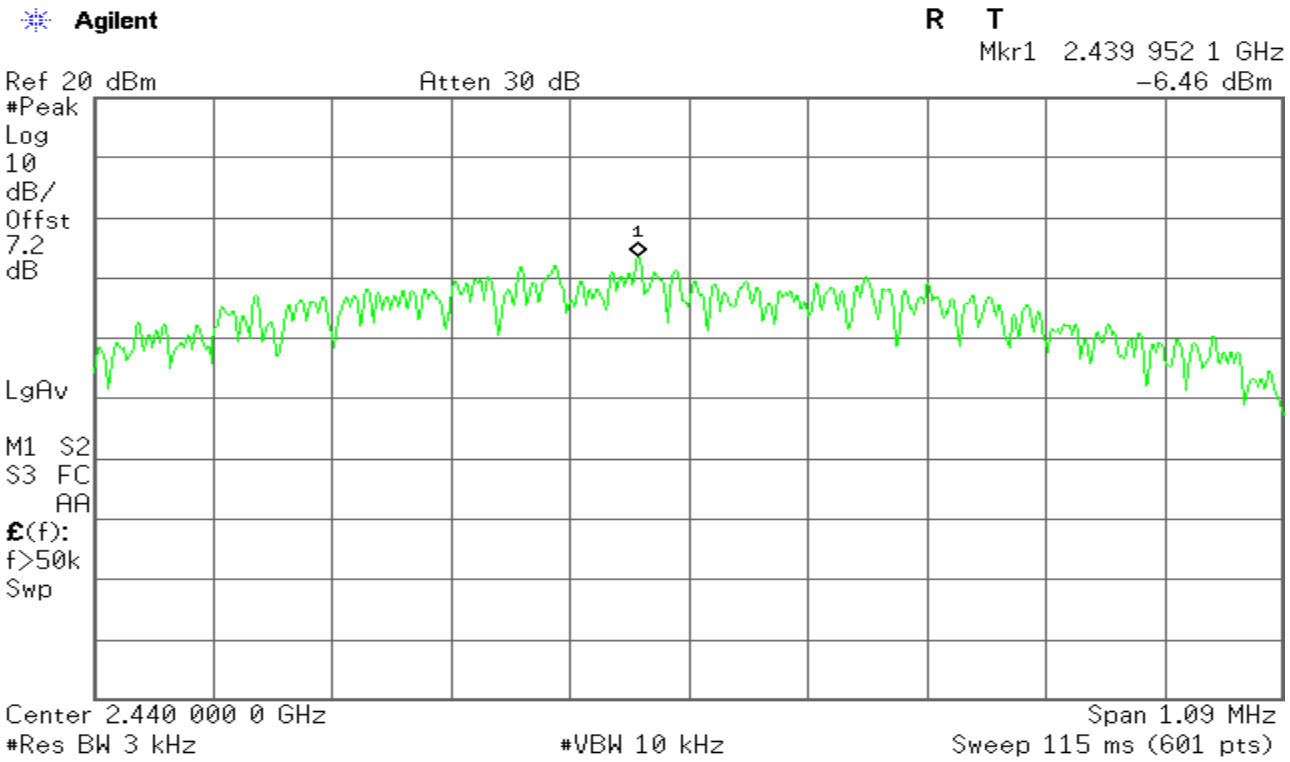
Channel	Frequency (MHz)	PSD/3kHz (dBm)	Limit (dBm)	Result
00	2402	-7.89	8	PASS
19	2440	-6.46		PASS
39	2480	-6.03		PASS

Test Plot of power Spectral Density

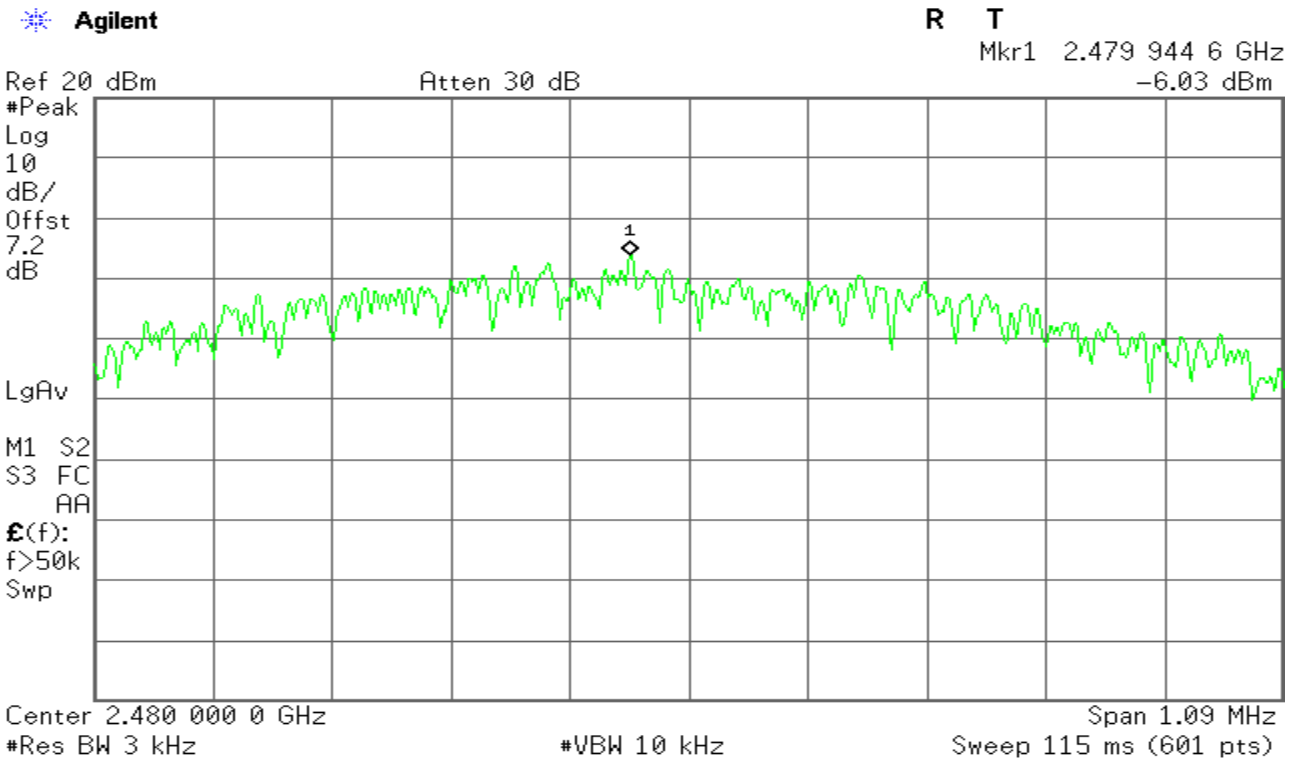
Channel 00



Channel 19



Channel 39



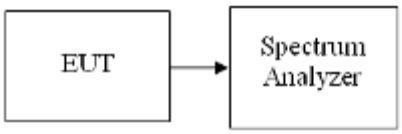
6.3 6dB Bandwidth Measurement

Limit of 6dB Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

According to RSS-247 section 5.2, DTSs include systems that employ digital modulation techniques resulting in spectral characteristics similar to direct sequence systems. The following applies to the bands 902-928 MHz and 2400-2483.5 MHz: The minimum 6 dB bandwidth shall be 500 kHz

Test Configuration



Test Procedure

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. Measure and record the results in the test report.

Test Results of Bandwidth

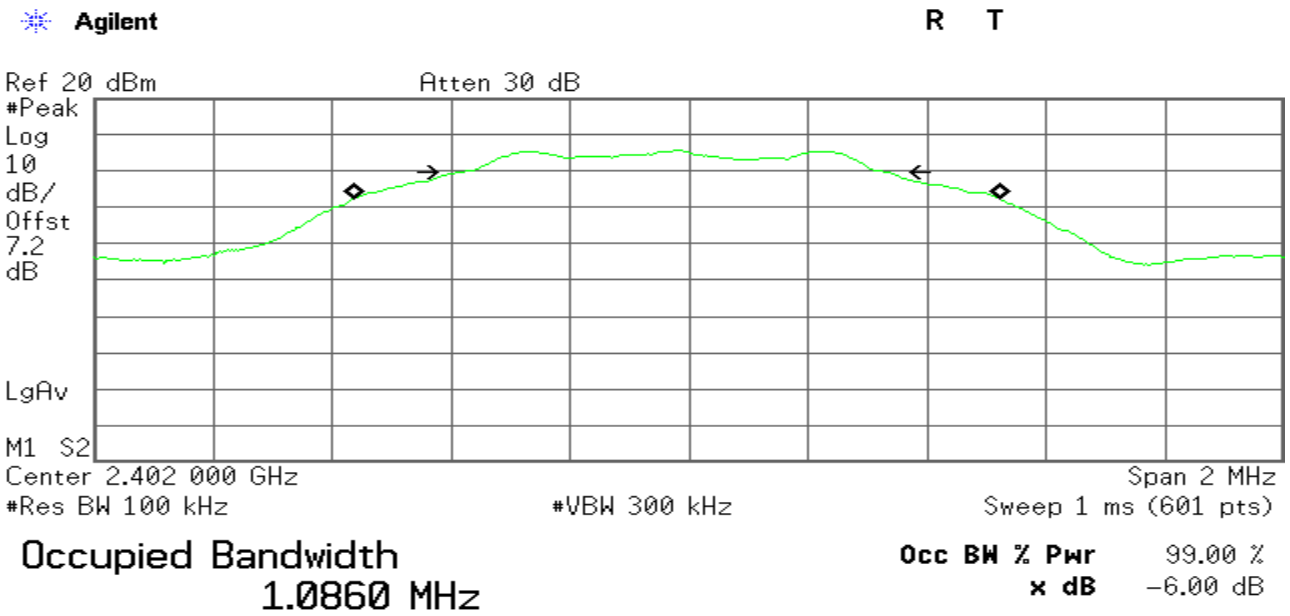
No non-compliance noted

Test mode:	Bluetooth LE4.1	Temperature:	23℃
Test By:	Lily.Wang	Test Date:	2018-3-10

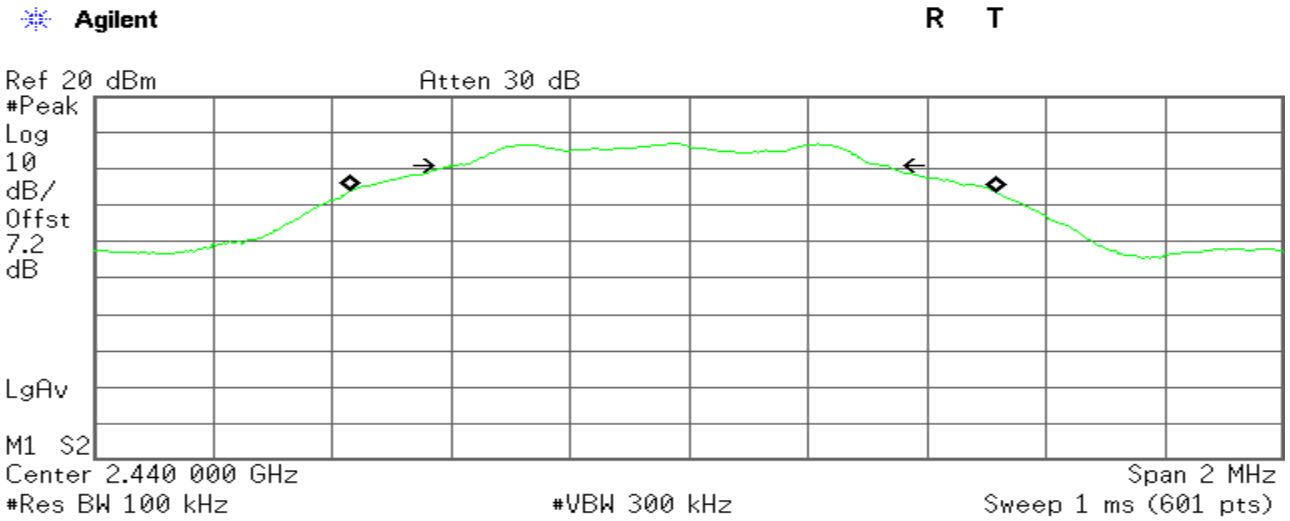
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	6dB Bandwidth Limit (MHz)	Result
00	2402	0.724	0.5	Pass
19	2440	0.719	0.5	Pass
39	2480	0.711	0.5	Pass

Test Plot

Channel 00

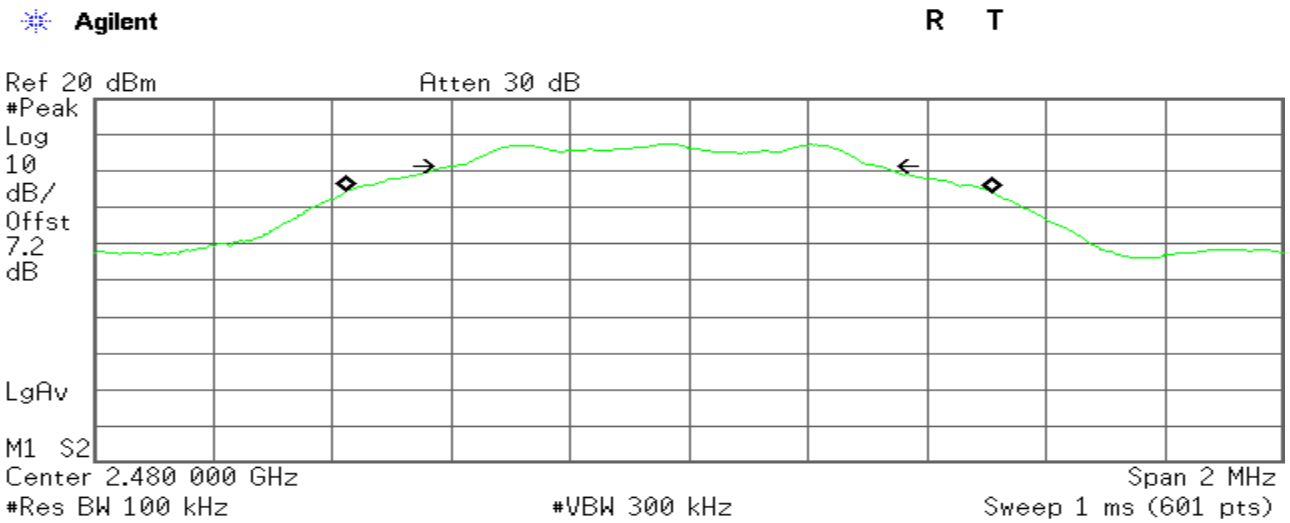


Channel 19



Transmit Freq Error −26.440 kHz
x dB Bandwidth 718.586 kHz

Channel 39



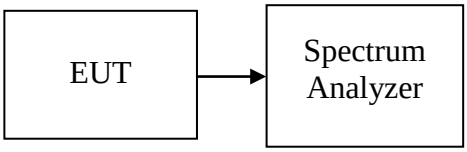
Transmit Freq Error −33.616 kHz
x dB Bandwidth 711.084 kHz

6.4 99% bandwidth measurement

LIMIT

None; for reporting purposes only
RSS-Gen 6.6

Test Configuration



TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The RBW shall be in the range of 1% to 5%of the occupied bandwidth and VBW shall be approximately 3x RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

TEST RESULTS

No non-compliance noted

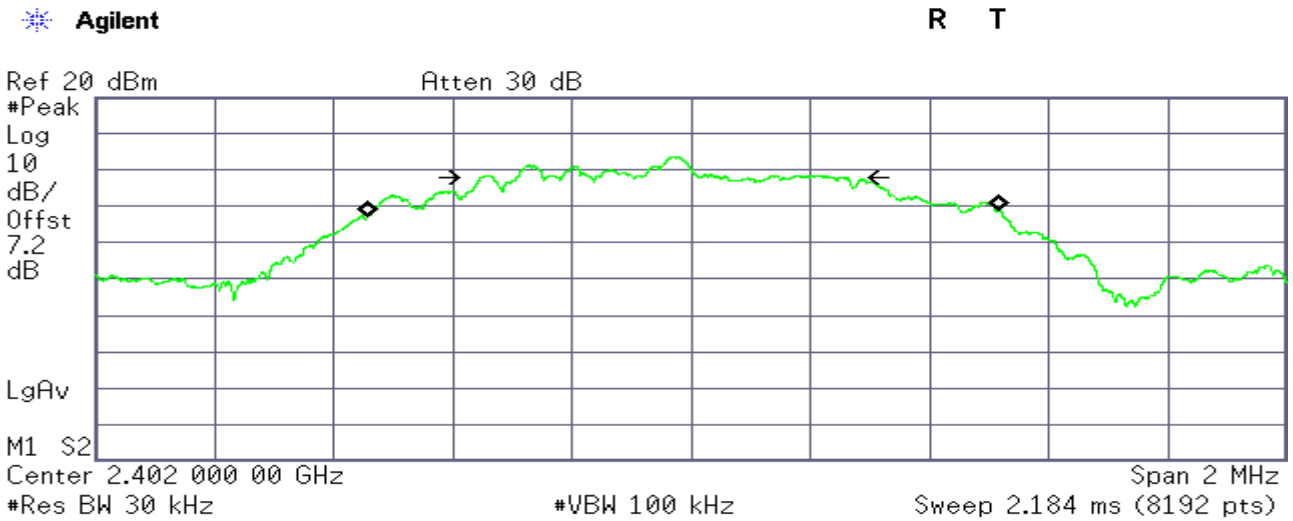
Test Data

Test mode:	Bluetooth LE4.1	**Temperature:**	23℃
Test By:	Lily.Wang	**Test Date:**	2018-3-10

Channel	**Frequency (MHz)**	**99% Bandwidth (MHz)**	**Result**
00	2402	1.0613	Pass
19	2440	1.0588	Pass
39	2480	1.0612	Pass

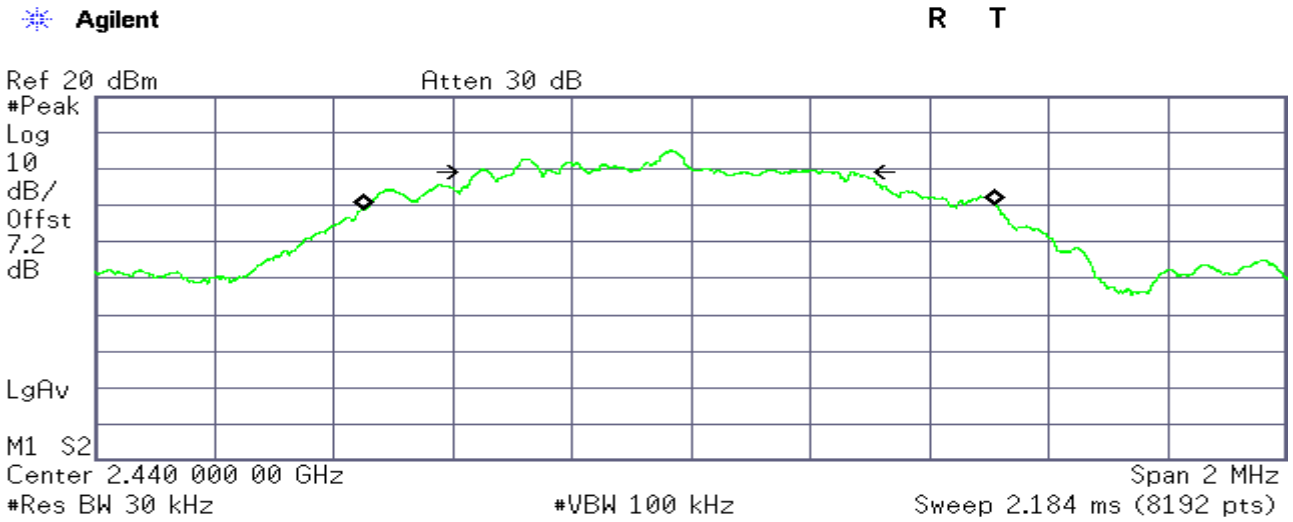
Test Plot

Channel 00



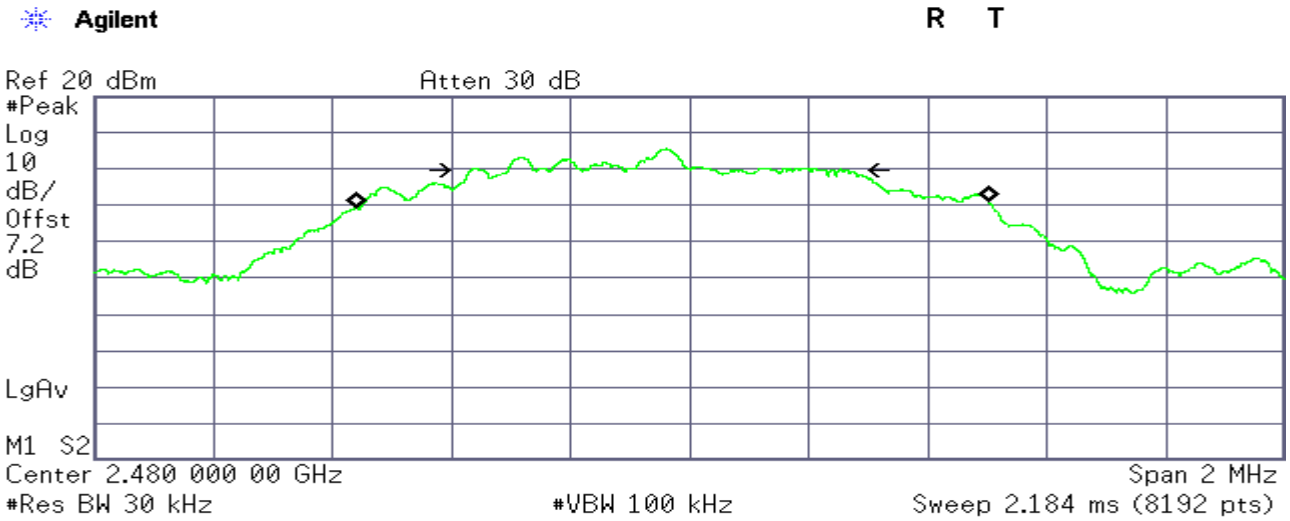
Transmit Freq Error −13.255 kHz
x dB Bandwidth 616.962 kHz

Channel 19



Transmit Freq Error −19.144 kHz
x dB Bandwidth 631.275 kHz

Channel 39



Occupied Bandwidth
1.0612 MHz

Occ BW % Pwr 99.00 %
x dB -6.00 dB

Transmit Freq Error -27.489 kHz
x dB Bandwidth 633.269 kHz

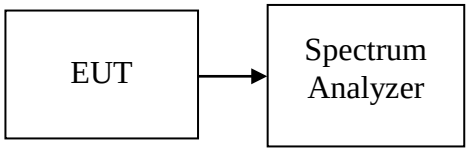
6.5 Conducted Band Edges and Spurious Emission Measurement

LIMIT

According to §15.247(d), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. 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) (see Section 15.205(c)).

According to RSS-247 section 5.5, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

Test Configuration



TEST PROCEDURE

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation or measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

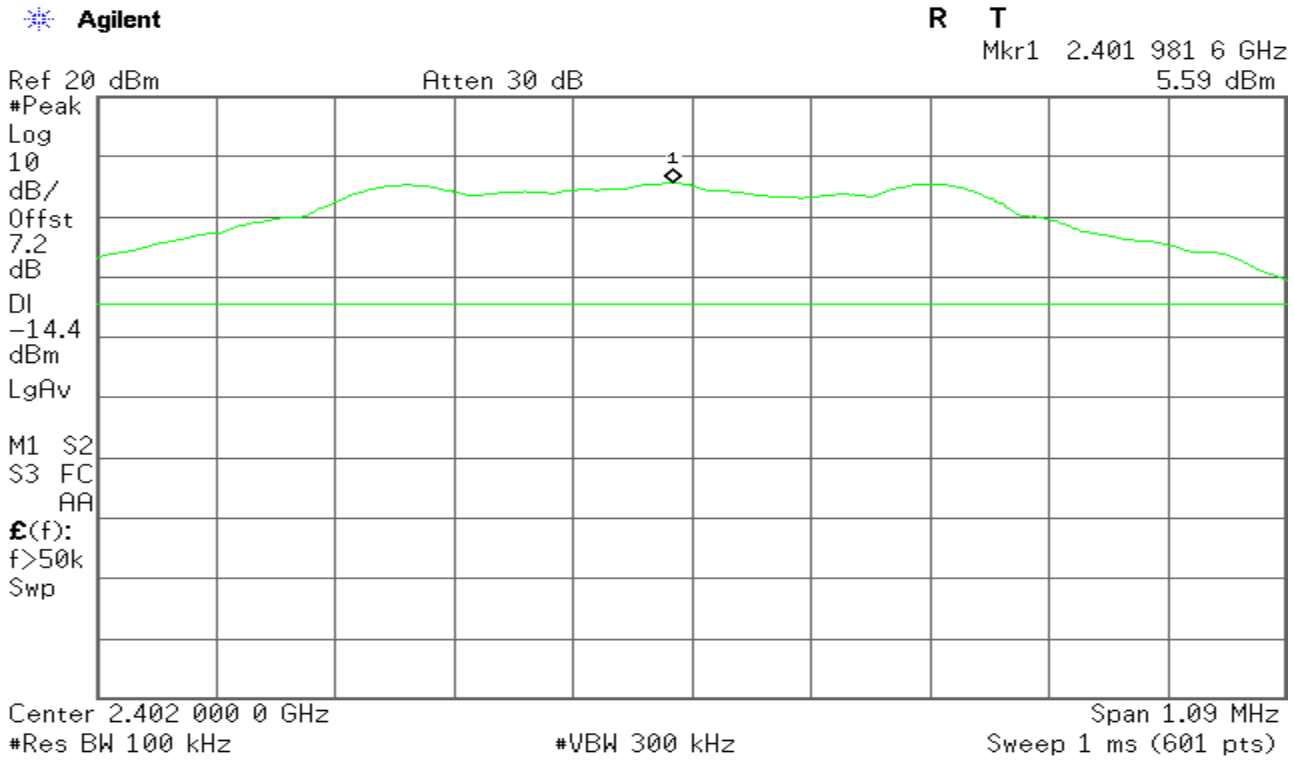
Measurements are made over the 30MHz to 40GHz range with the transmitter set to the lowest, middle, and highest channels.

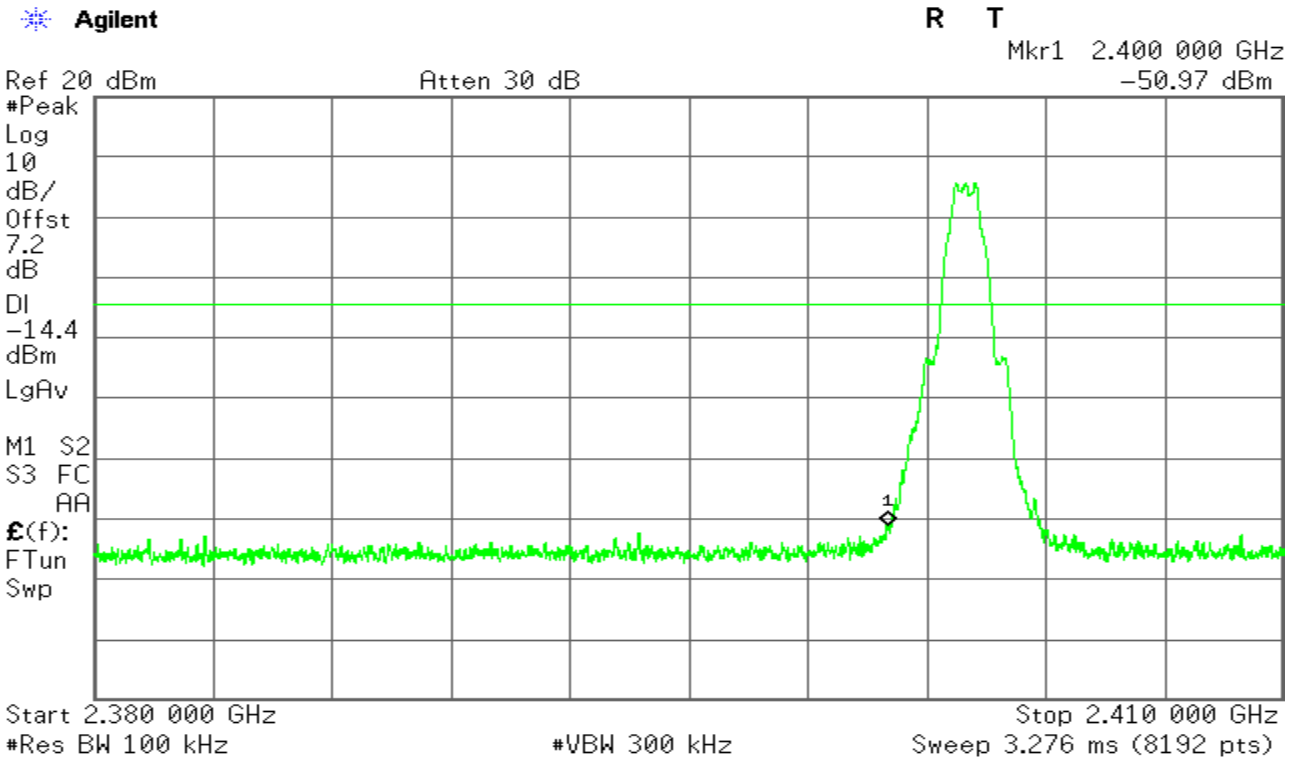
TEST RESULTSD

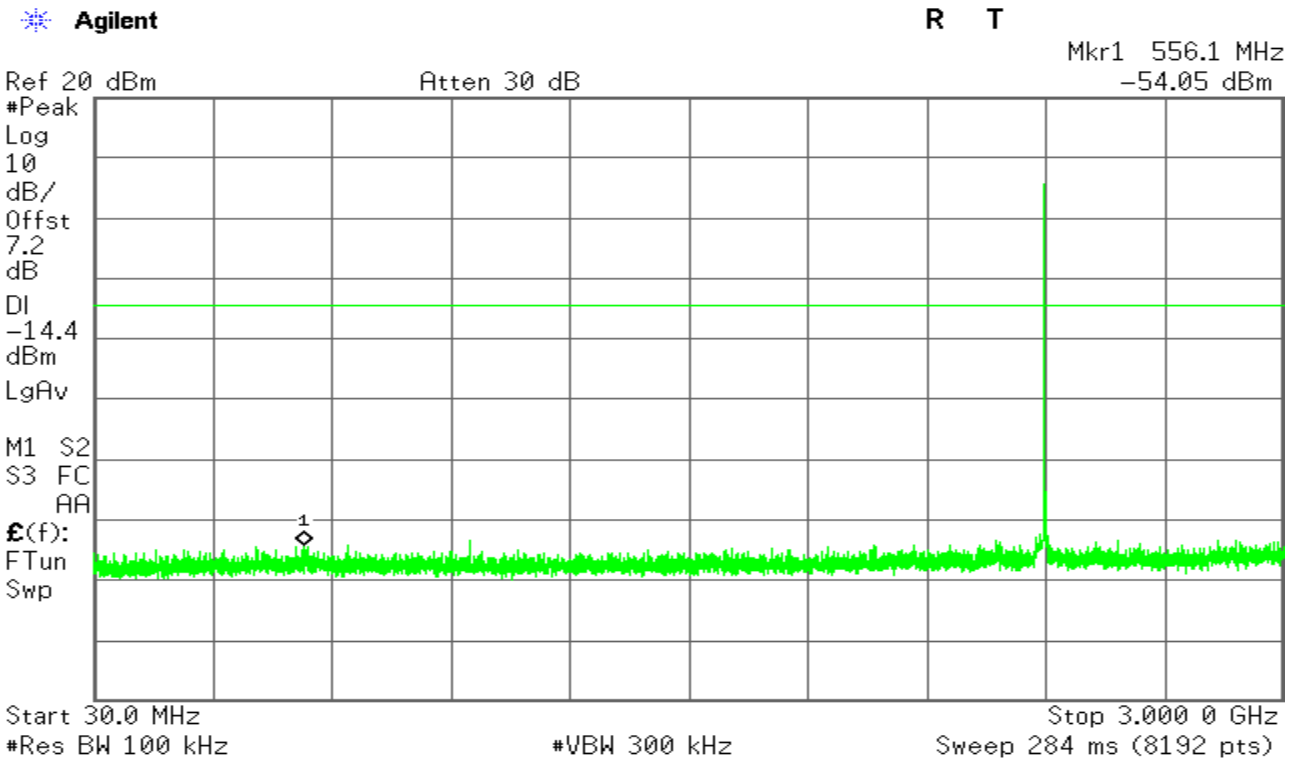
No non-compliance noted

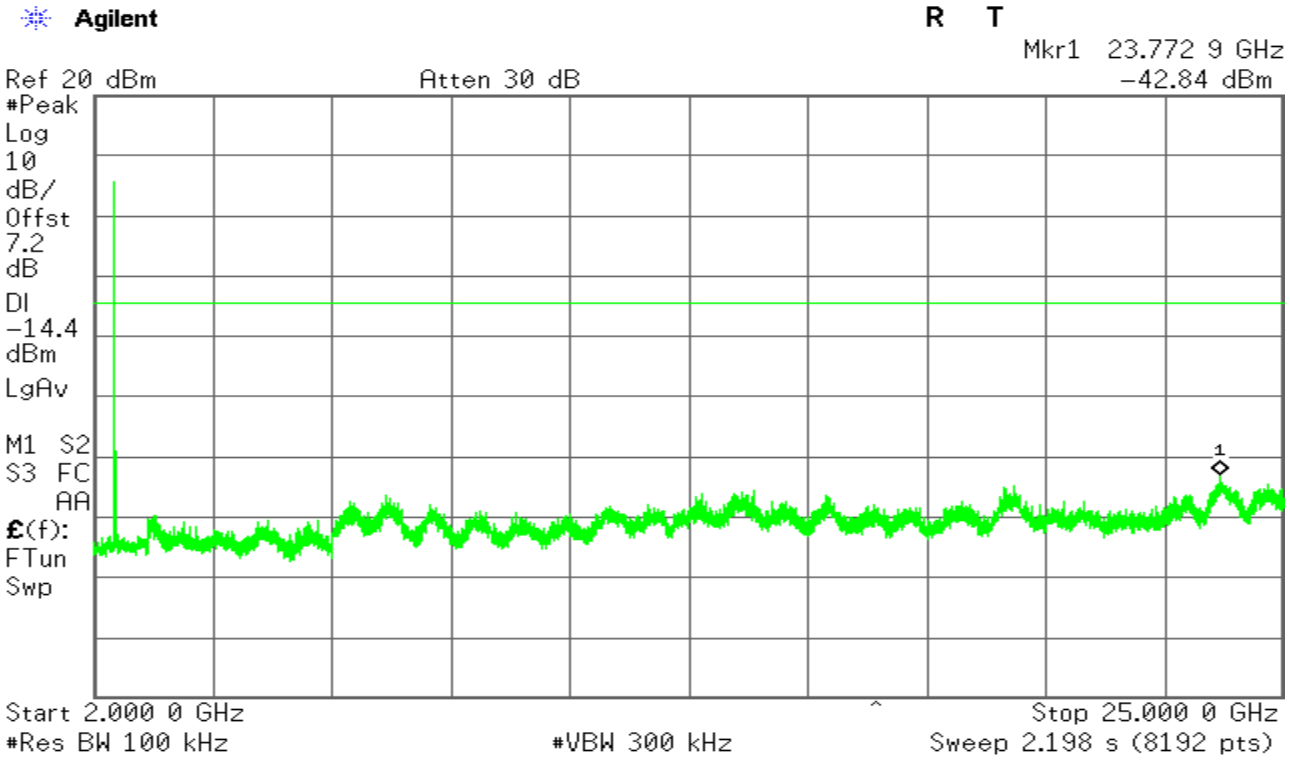
Test Plot
OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

CH Low

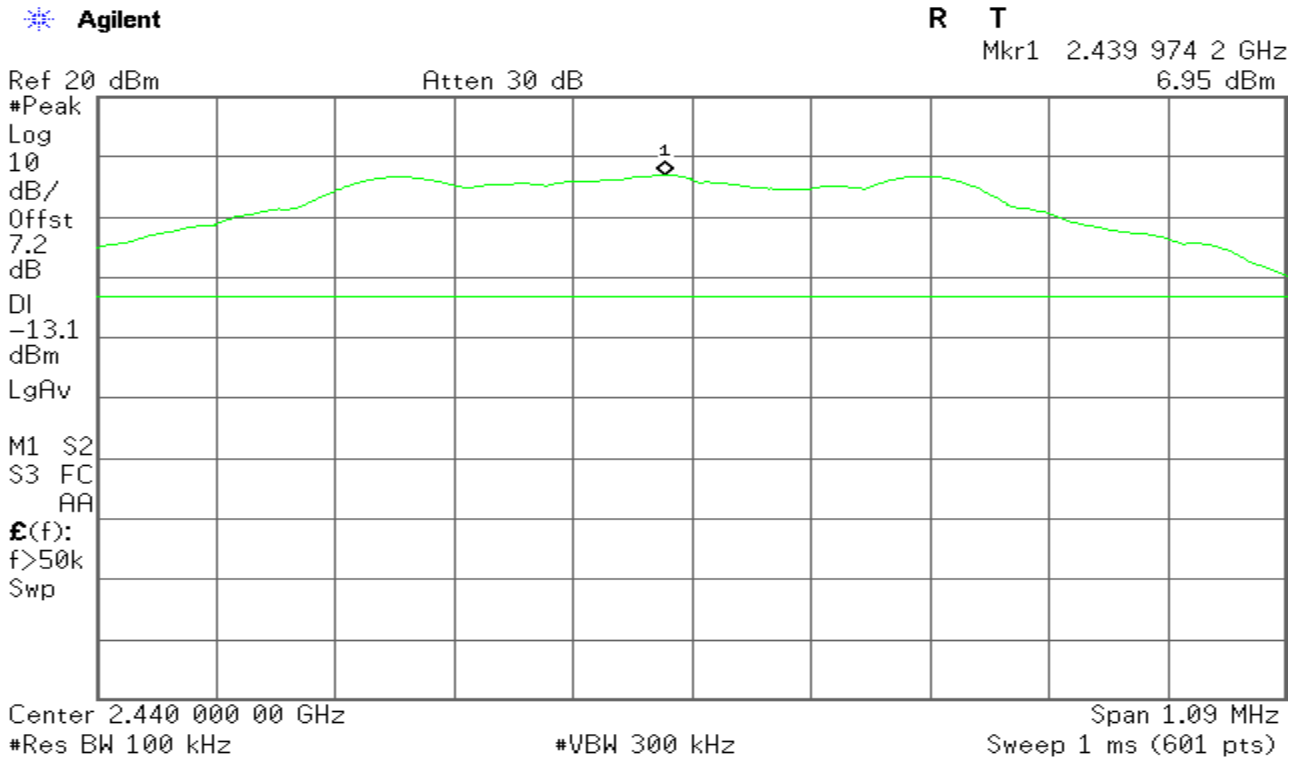


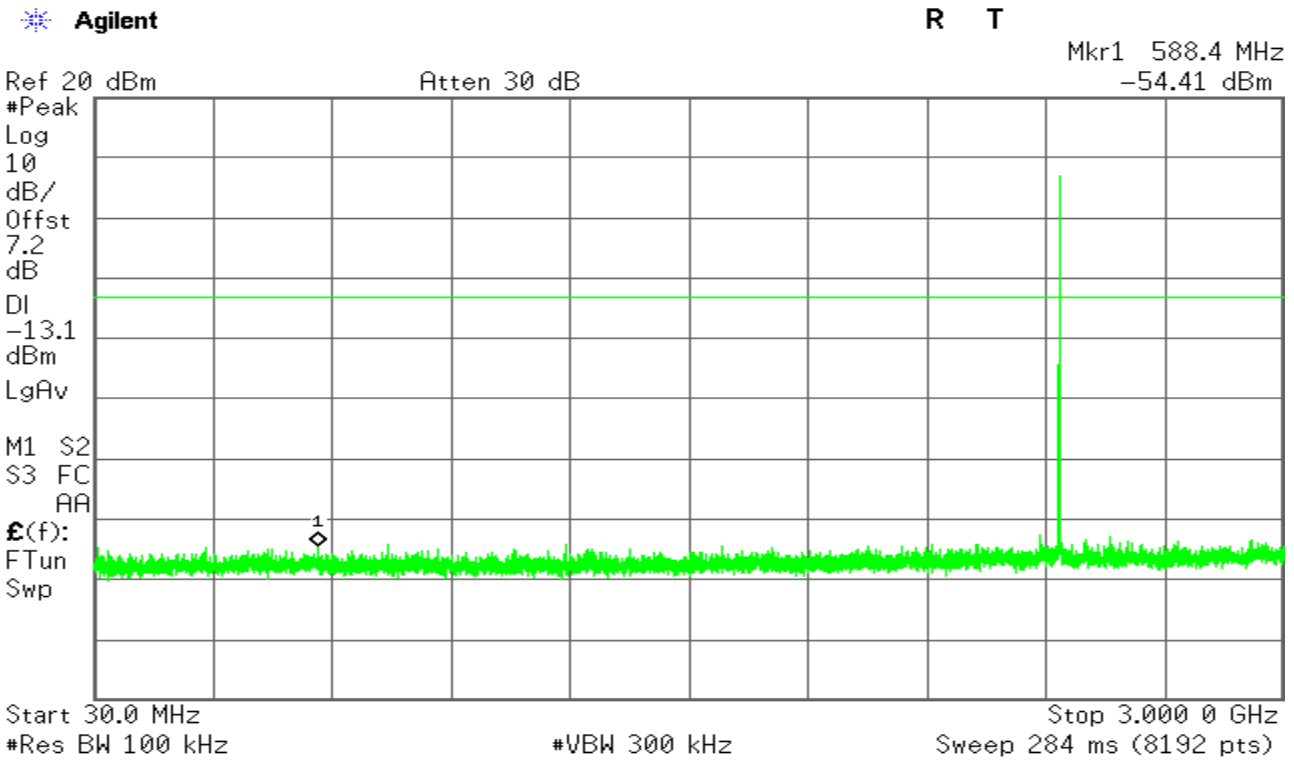


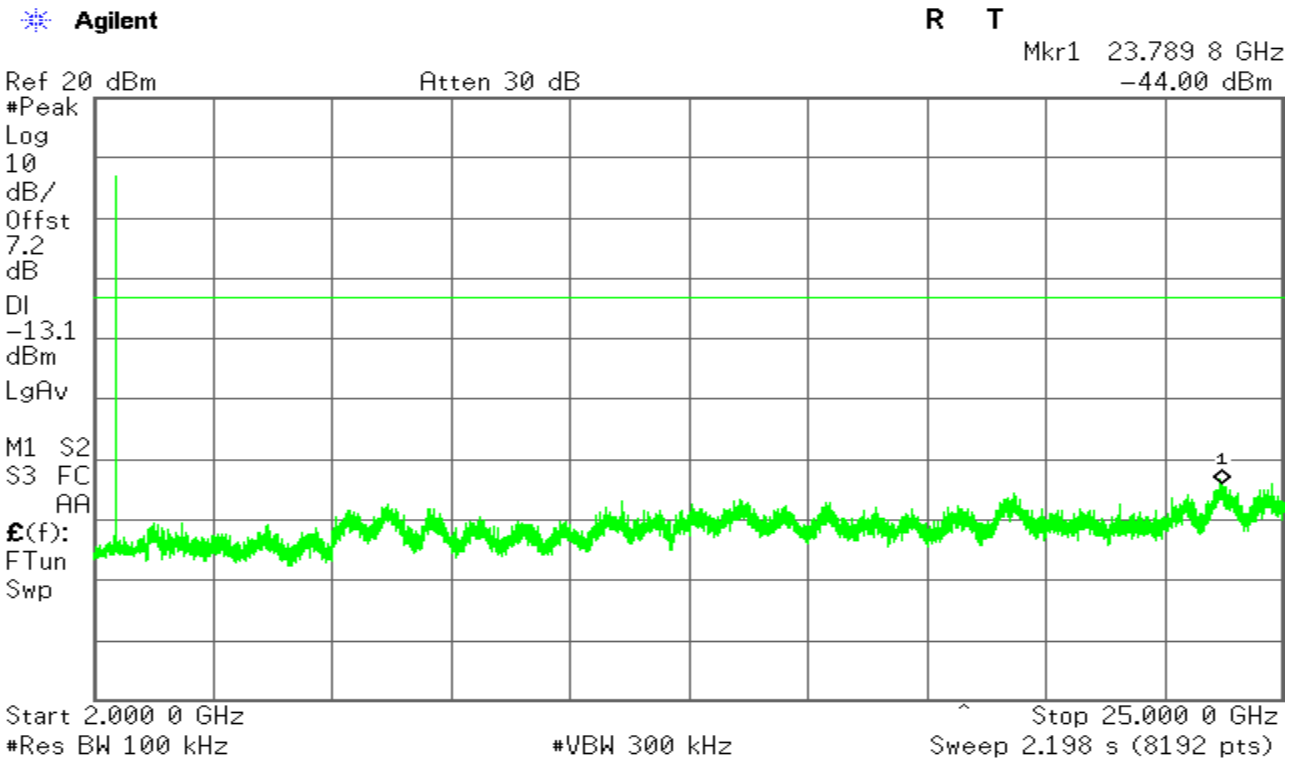




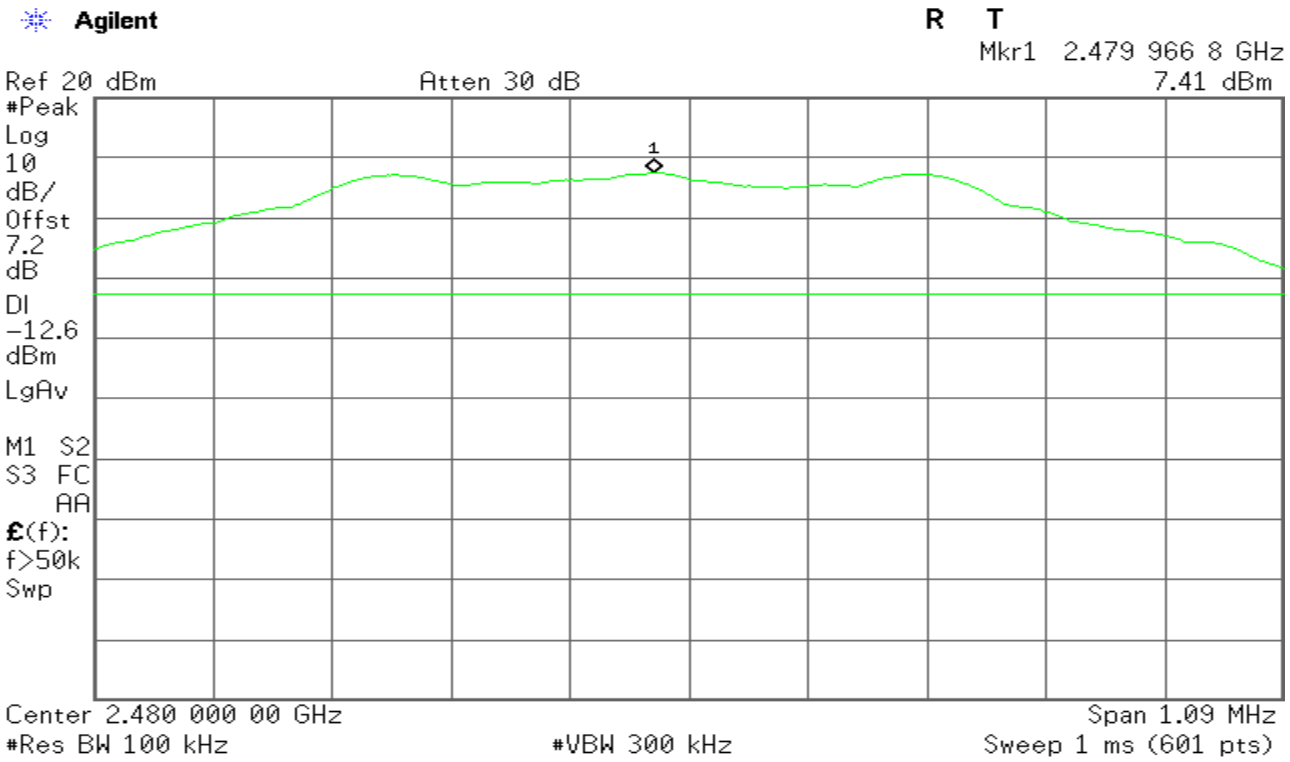
CH Mid

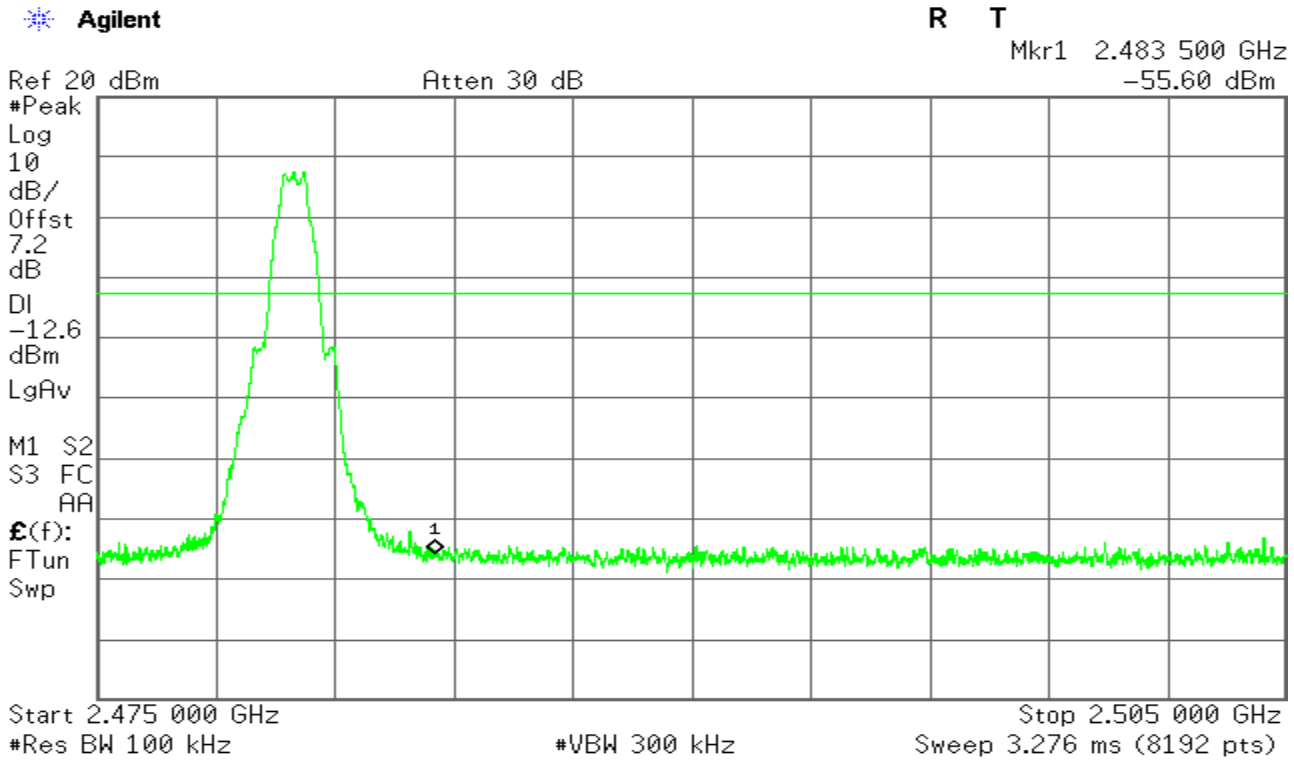


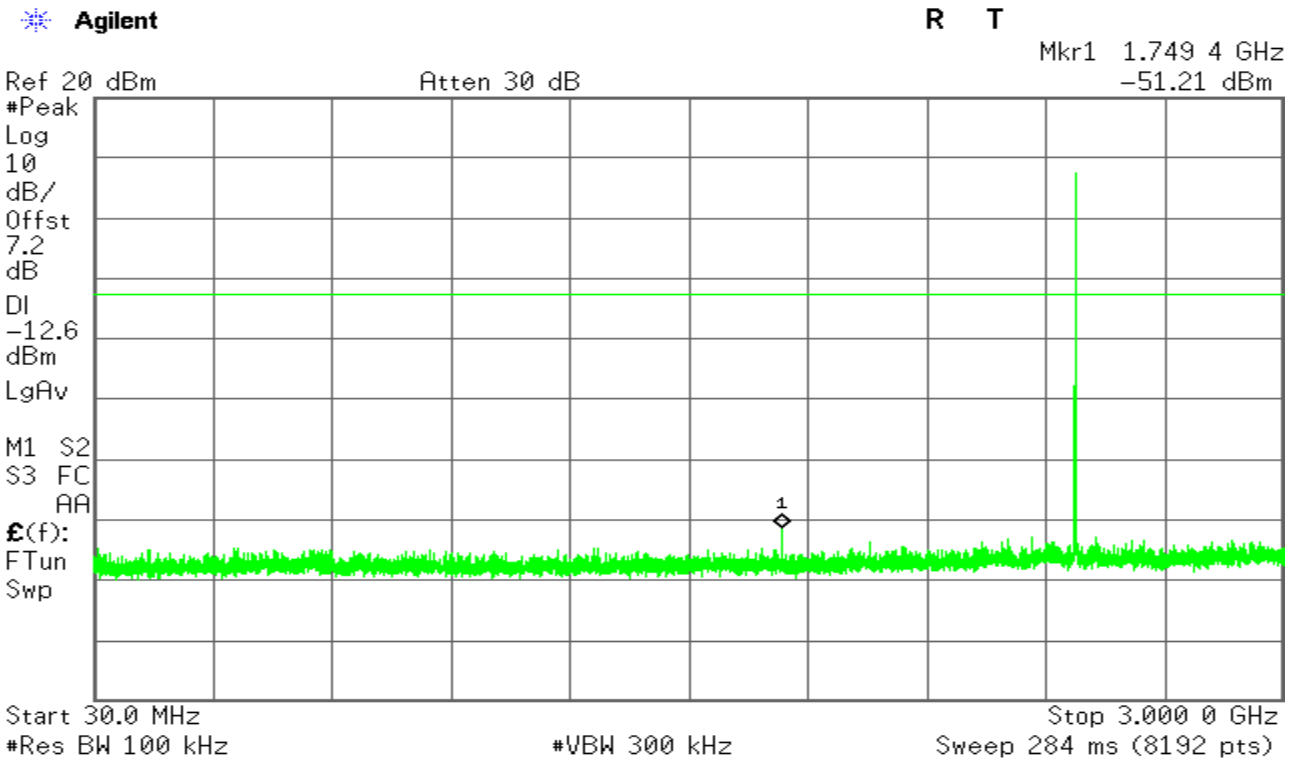


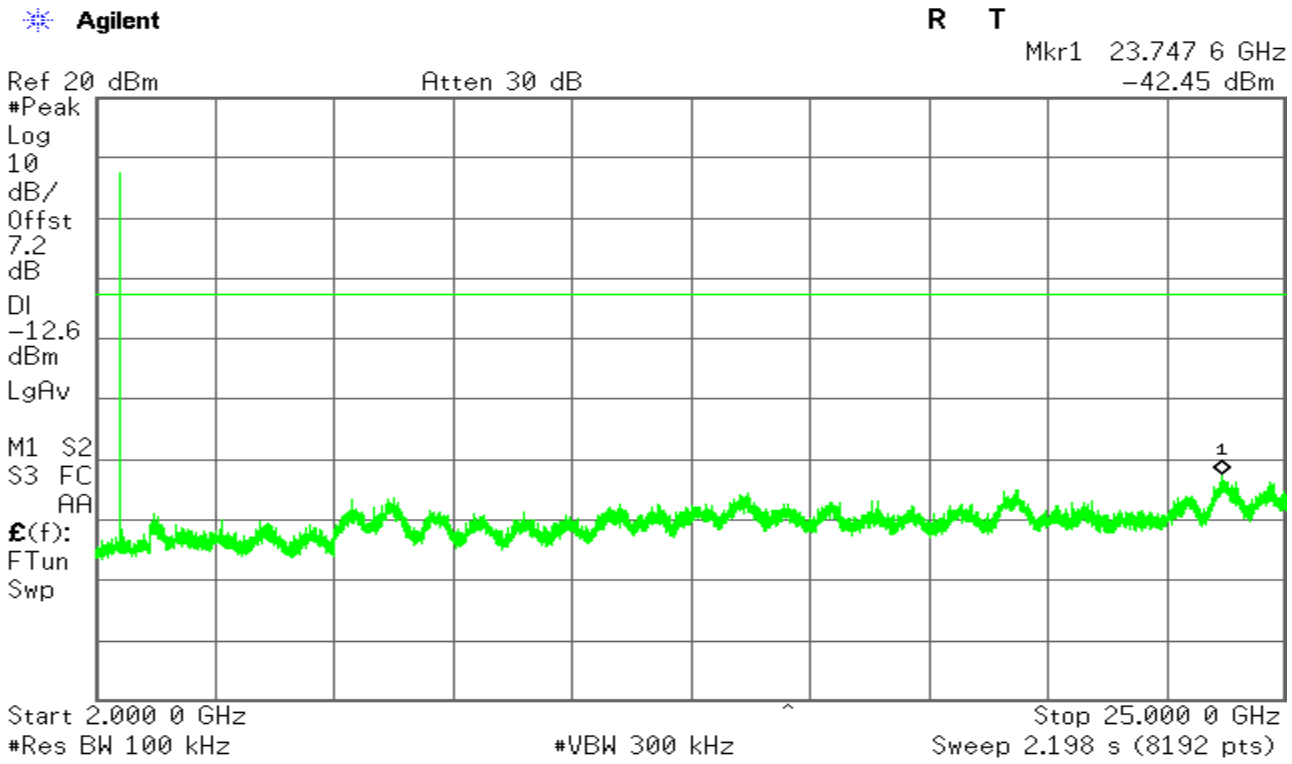


CH High









6.6 Radiated Band Edge and Spurious Emission Measurement

LIMIT

Radiated emissions from 9 kHz to 25 GHz were measured according to the methods defines in ANSI C63.10-2013. The EUT was placed above the ground plane, 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions

1. According to §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:

FREQUENCIES(MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE(meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Remark: *Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.*

2.In the emission table above, the tighter limit applies at the band edges.

Frequency (MHz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

3.According to RSS-Gen section 8.9, Except when the requirements applicable to a given device state otherwise, emissions from licence-exempt transmitters shall comply with the field strength limits shown in Table below. Additionally, the level of any transmitter emission shall not exceed the level of the transmitter's fundamental emission.

Frequency	Electric Field Strength (μV/m)	Magnetic Field Strength (H-Field) (μA/m)	Measurement Distance (metres)
9-490 kHz	2,400/F (F in kHz)	2,400/377F (F in kHz)	300
490-1,705 kHz	24,000/F (F in kHz)	24,000/377F (F in kHz)	30
1,705-30 MHz	30	N/A	30

Note: The emission limits for the bands 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector. Transmitting devices are not permitted in restricted frequency bands unless stated otherwise in the relevant RSS. 2.In the emission table above, the tighter limit applies at the band edges.

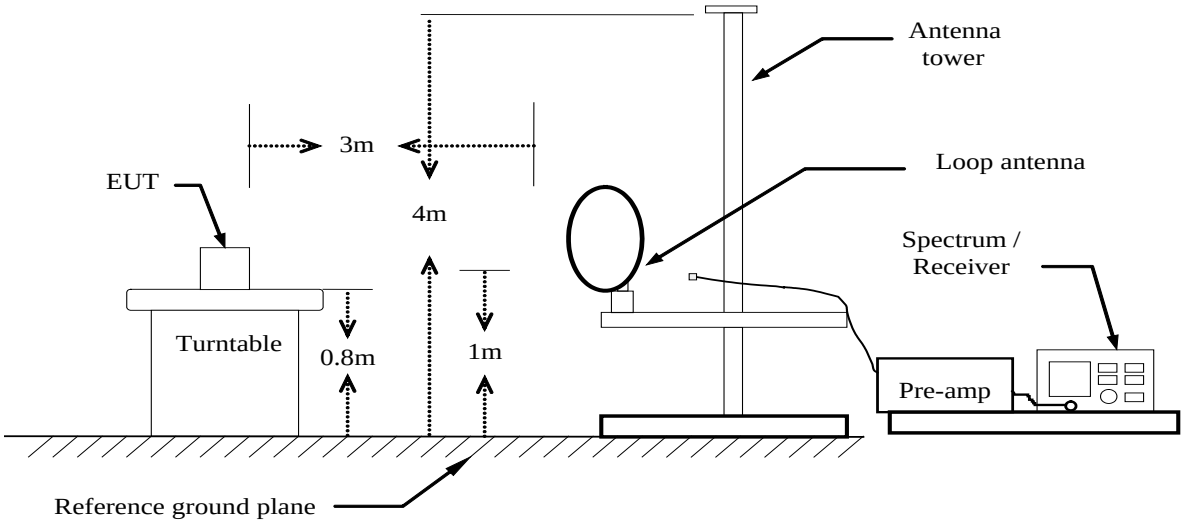
Frequency (MHz)	Field Strength (μv/m at 3 metres)
30-88	100
88-216	150
216-960	200
Above 960*	500

* Unless otherwise specified, for all frequencies greater than 1 GHz, the radiated emission limits for licence-exempt radio apparatus stated in applicable RSSs (including RSS-Gen) are based on measurements using a linear average detector function having a minimum resolution bandwidth of 1 MHz. If an average limit is specified for the EUT, then the peak emission shall also be measured with instrumentation properly adjusted for such factors as pulse desensitization to ensure the peak emission is less than 20 dB above the average limit.

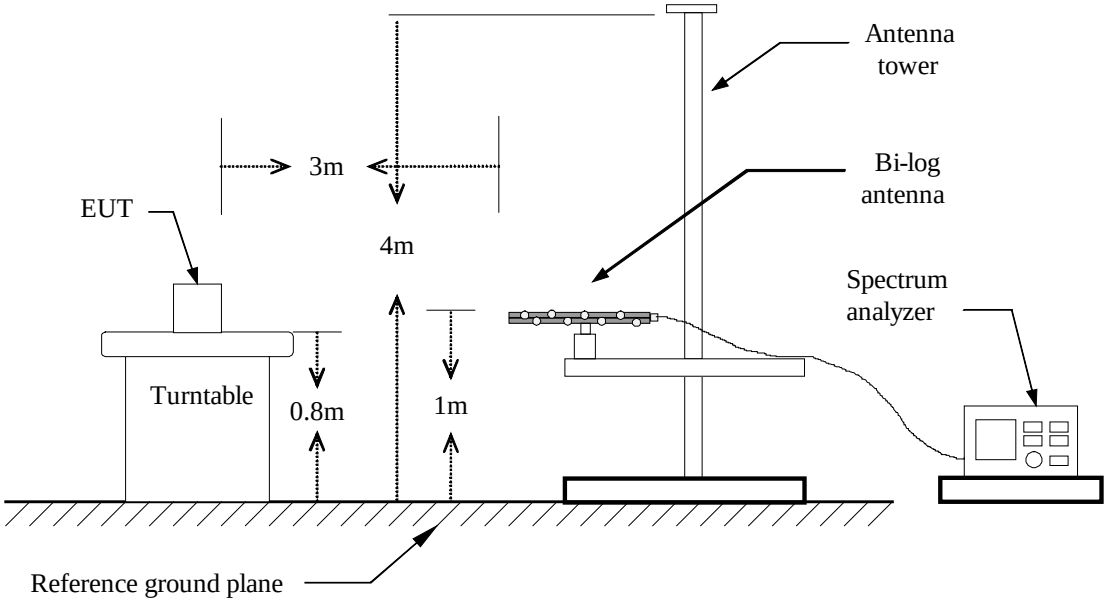
Note:Transmitting devices are not permitted in restricted frequency bands unless stated otherwise in the specific RSS.

Test Configuration

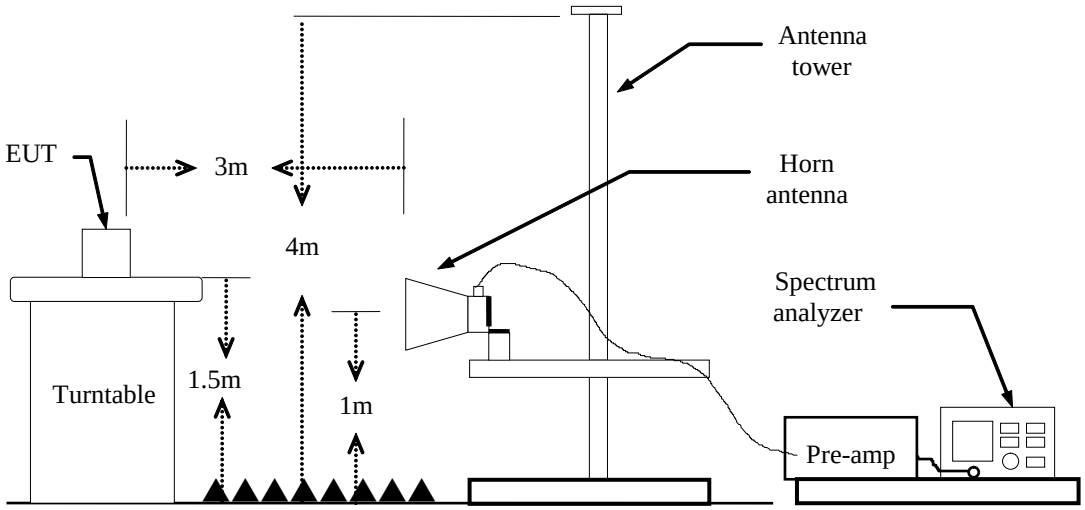
Below 30MHz



Below 1 GHz



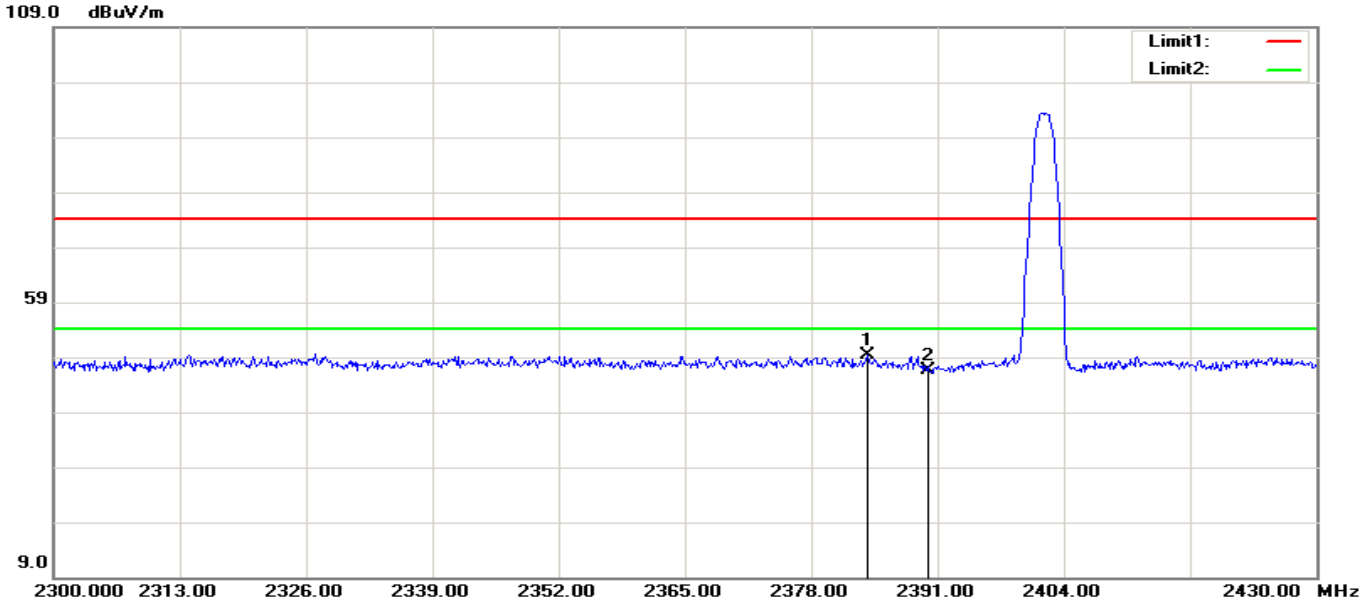
Above 1 GHz



TEST PROCEDURE

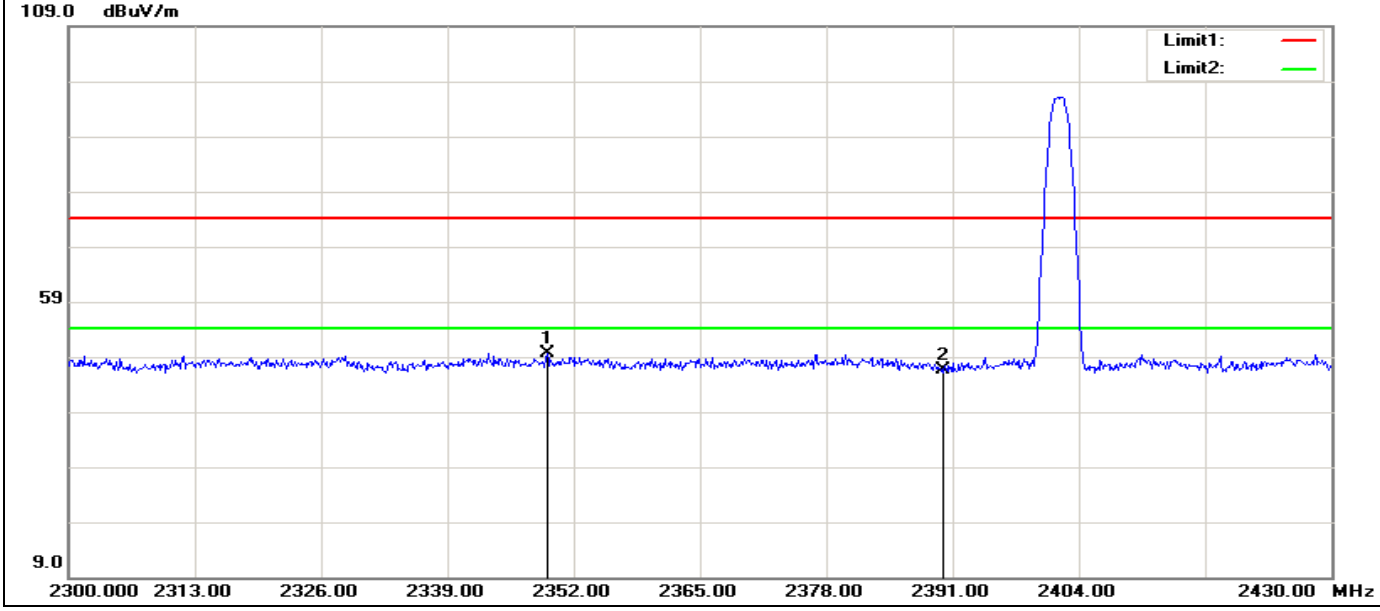
1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v04.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT is placed on a turntable above ground plane, which is 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
7. Use the following spectrum analyzer settings:
(1) Span shall wide enough to fully capture the emission being measured;
(2) Set RBW=100 kHz for f < 1 GHz; VBW =3 RBW; Sweep = auto; Detector function = peak; Trace = max hold;
(3) Set RBW = 1 MHz, VBW= 3MHz for f >1 GHz for peak measurement.
For average measurement:
• VBW = 10 Hz, when duty cycle is no less than 98 percent.
• VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

RESTRICTED BANDEDGE (BLE4.1 on Channel 0, Horizontal)



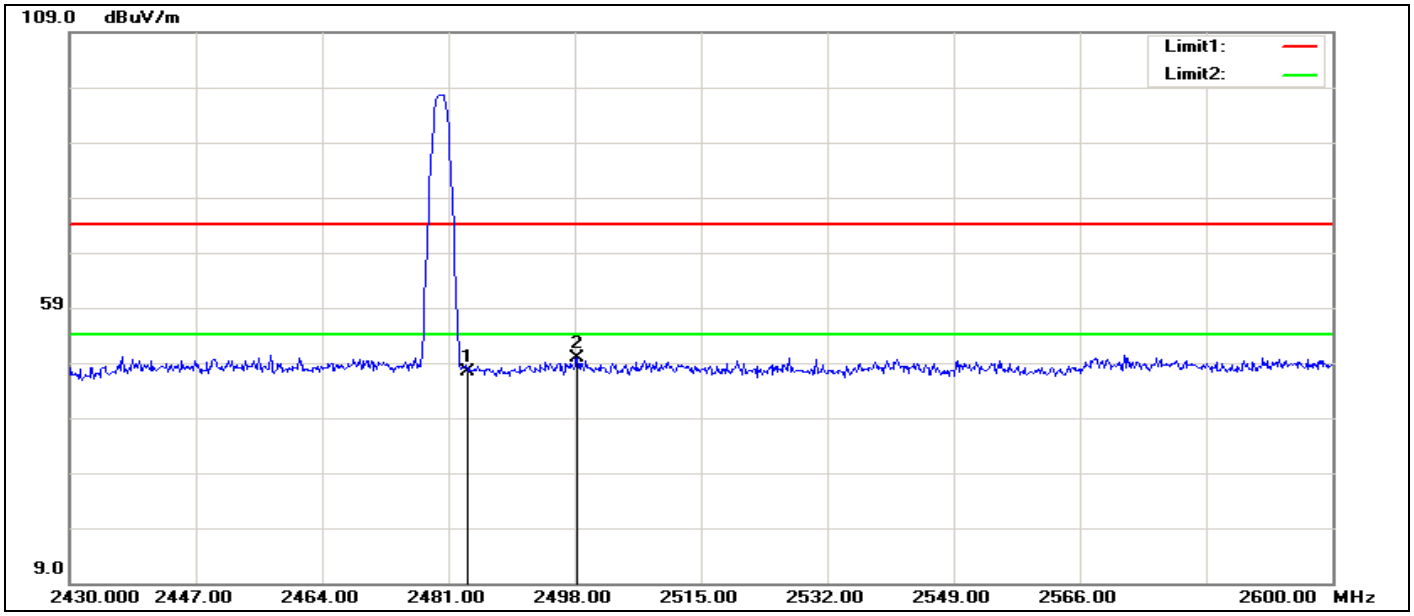
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2383.720	56.89	-7.59	49.30	74.00	-24.70	100	360	peak
2	2390.000	54.19	-7.57	46.62	74.00	-27.38	100	176	peak

RESTRICTED BANDEDGE (BLE4.1 on Channel 0, Vertical)



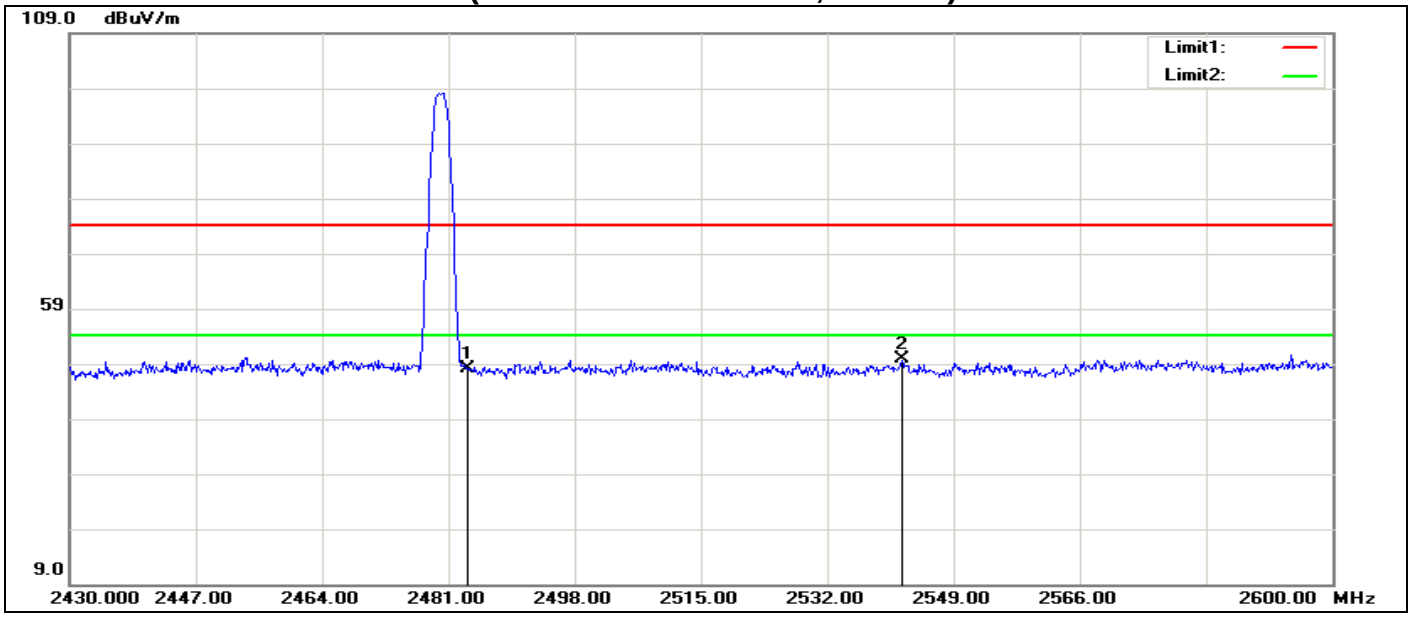
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2349.270	57.23	-7.71	49.52	74.00	-24.48	100	252	peak
2	2390.000	54.16	-7.57	46.59	74.00	-27.41	100	150	peak

RESTRICTED BANDEDGE (BLE4.1 on Channel 39, Horizontal)



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2483.500	54.71	-7.26	47.45	74.00	-26.55	100	35	peak
2	2498.340	57.12	-7.22	49.90	74.00	-24.10	100	352	peak

RESTRICTED BANDEDGE (BLE4.1 on Channel 39, Vertical)



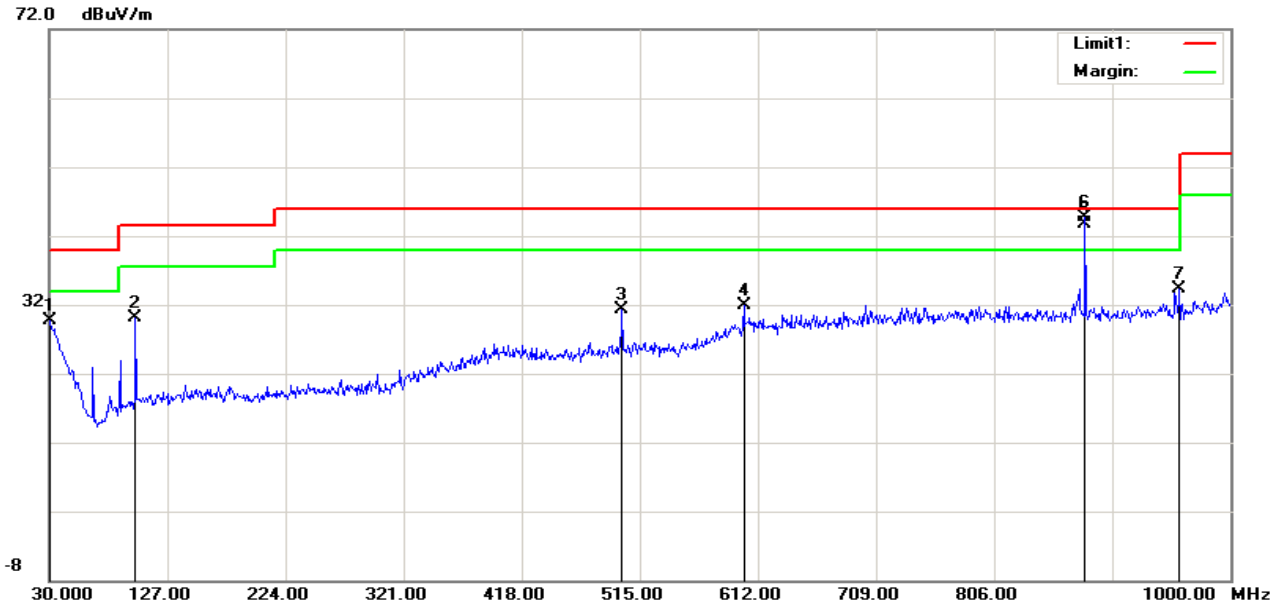
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	2483.500	55.41	-7.26	48.15	74.00	-25.85	100	231	peak
2	2542.030	56.83	-7.09	49.74	74.00	-24.26	100	360	peak

Test Result of Radiated Emission

Below 30MHz and above 18GHz. The measured value have enough margin over 20dB than the limit, therefore they are not reported.

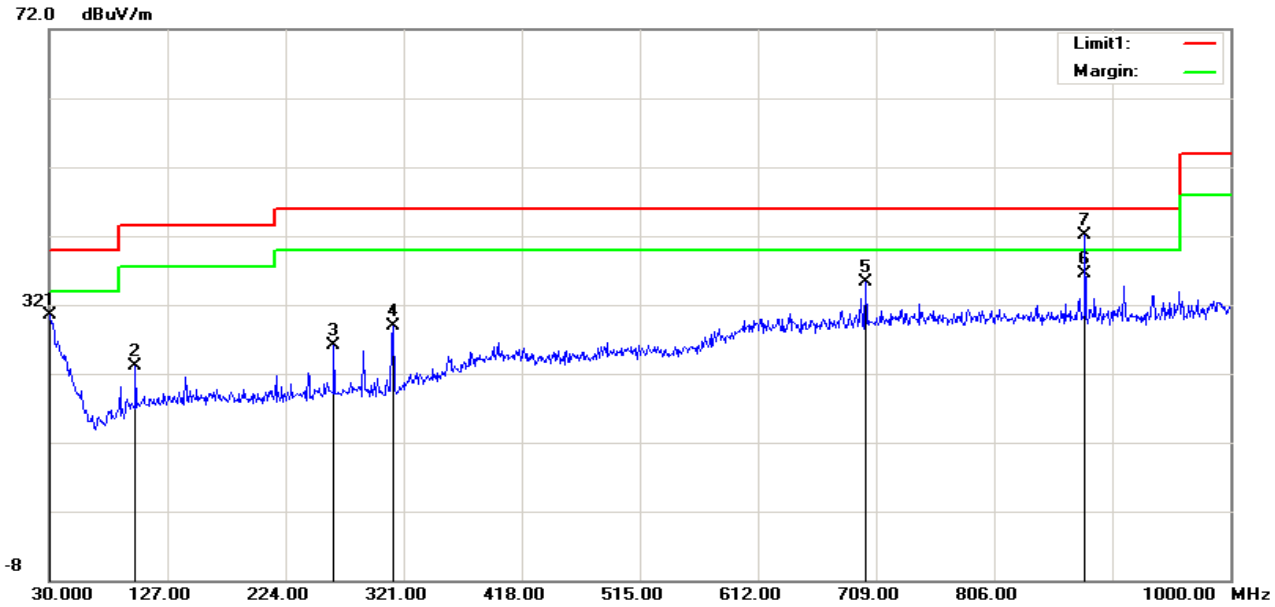
30MHz-1GHz

Operation Mode:	Normal Link	**Test Date:**	2018-3-19
Temperature:	25°C	**Tested by:**	Lily.Wang
Humidity:	48% RH	**Polarity:**	Hor.



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	30.9700	6.25	23.45	29.70	40.00	-10.30	100	340	peak
2	100.8100	16.63	13.54	30.17	43.50	-13.33	100	142	peak
3	500.4500	9.59	21.80	31.39	46.00	-14.61	100	227	peak
4	600.3600	7.28	24.67	31.95	46.00	-14.05	100	111	peak
5	879.8980	17.31	26.35	43.66	46.00	-2.34	100	237	QP
6	880.6900	18.41	26.35	44.76	46.00	-1.24	100	326	peak
7	958.2900	7.36	26.86	34.22	46.00	-11.78	100	325	peak

Operation Mode:	Normal Link	Test Date:	2018-3-19
Temperature:	25°C	Tested by:	Lily.Wang
Humidity:	48% RH	Polarity:	Ver.



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	30.9700	7.00	23.45	30.45	40.00	-9.55	100	87	peak
2	100.8100	9.58	13.54	23.12	43.50	-20.38	200	337	peak
3	263.7700	10.63	15.48	26.11	46.00	-19.89	100	48	peak
4	312.2700	12.36	16.62	28.98	46.00	-17.02	100	95	peak
5	700.2700	9.88	25.52	35.40	46.00	-10.60	100	48	peak
6	879.8630	10.10	26.35	36.45	46.00	-9.55	100	5	QP
7	880.6900	15.67	26.35	42.02	46.00	-3.98	100	56	peak

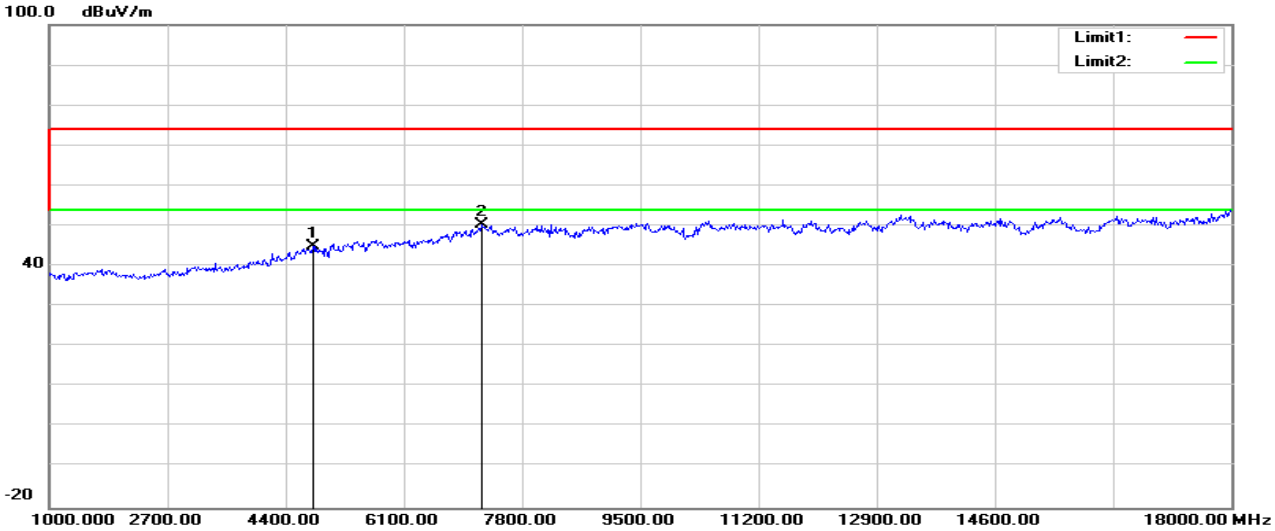
Notes:

1. *Mea surements above show only up to maximum emissions noted, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
2. *Radiated emissions measured in frequency range from 9 KHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown " --- " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.*

Above 1 GHz

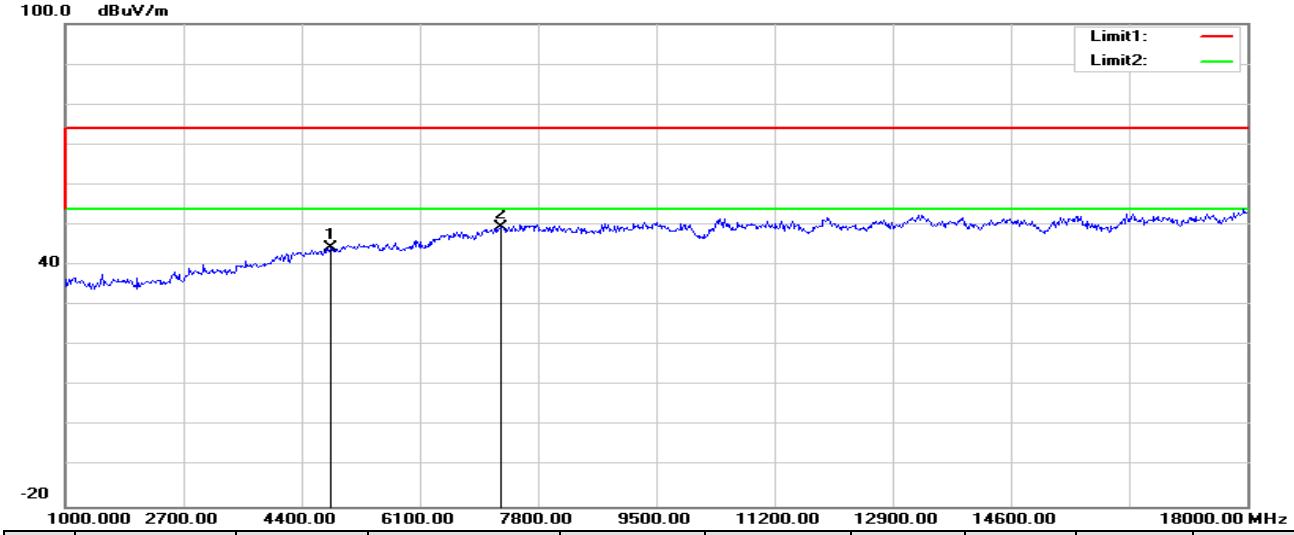
Operation Mode:	Bluetooth LE4.1	**Test Date:**	2018-3-19
Test Channel:	CH00	**Tested by:**	Lily.Wang
Temperature:	25°C	**Polarity:**	Ver. / Hor.

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4791.000	45.47	-0.41	45.06	74.00	-28.94	100	126	peak
2	7222.000	45.39	5.10	50.49	74.00	-23.51	100	144	peak

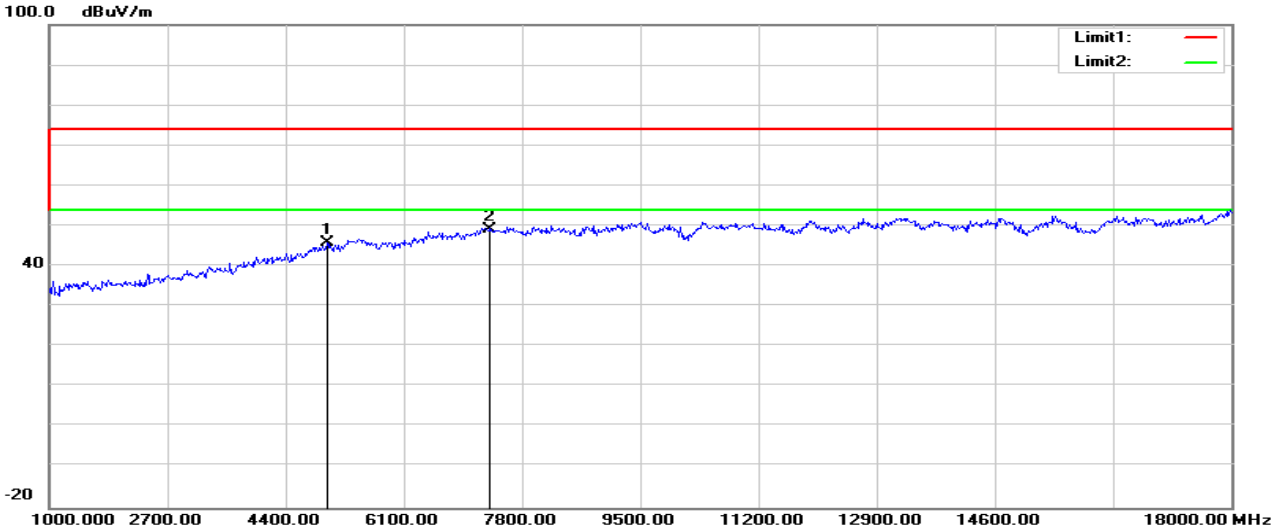
Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4825.000	44.71	-0.28	44.43	74.00	-29.57	100	325	peak
2	7273.000	44.13	5.28	49.41	74.00	-24.59	100	7	peak

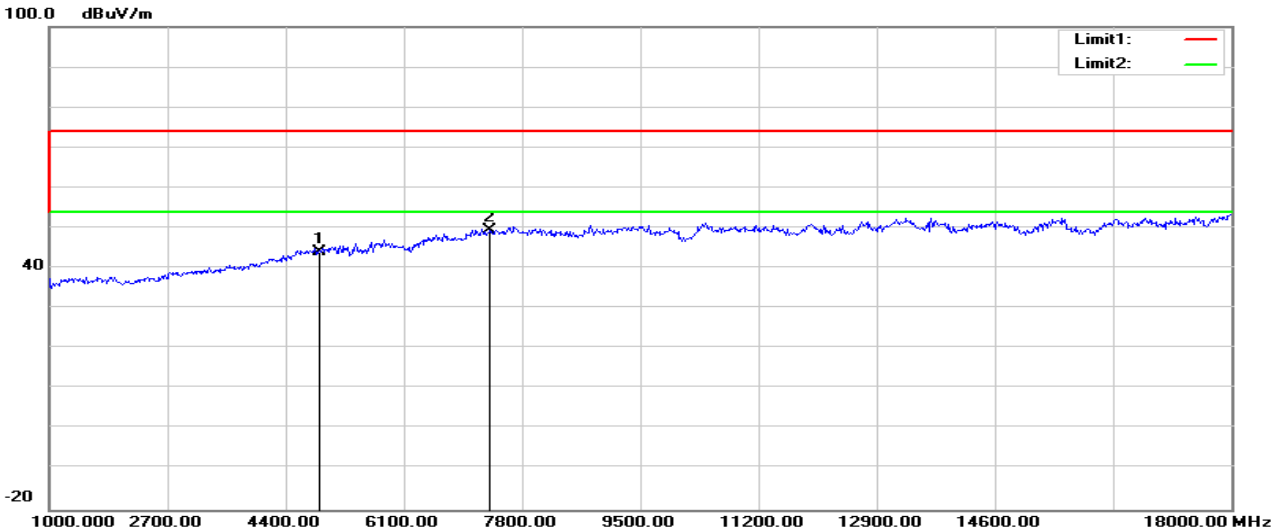
Operation Mode:	Bluetooth LE4.1	**Test Date:**	2018-3-19
Test Channel:	CH19	**Tested by:**	Lily.Wang
Temperature:	25°C	**Polarity:**	Ver. / Hor.

Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4995.000	45.43	0.35	45.78	74.00	-28.22	100	125	peak
2	7341.000	43.78	5.52	49.30	74.00	-24.70	100	255	peak

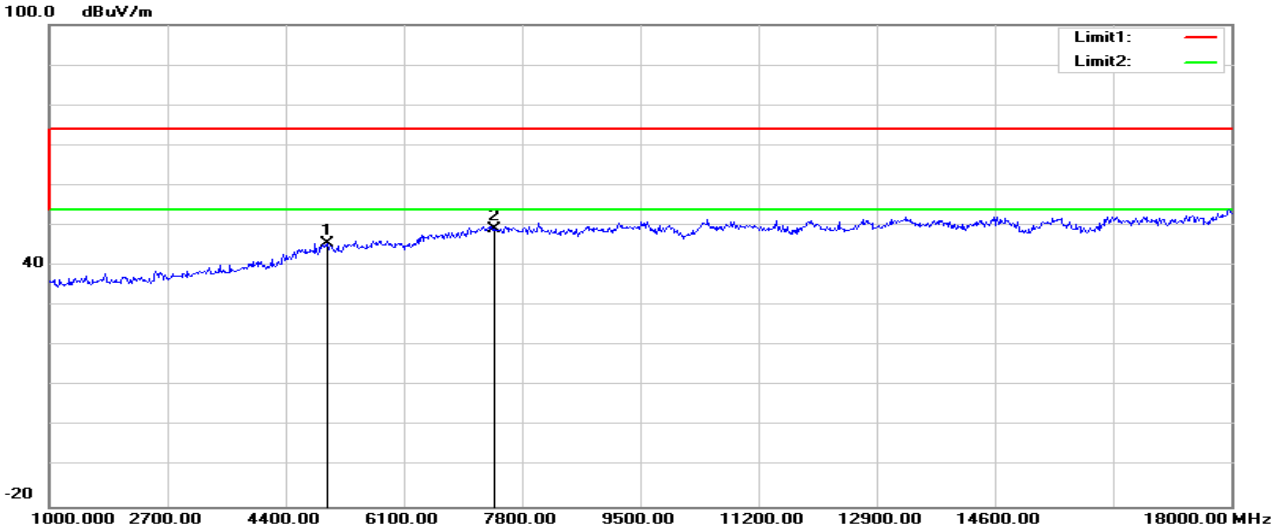
Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	4891.000	43.96	-0.04	43.92	74.00	-30.08	100	163	peak
2	7341.000	43.80	5.52	49.32	74.00	-24.68	100	179	peak

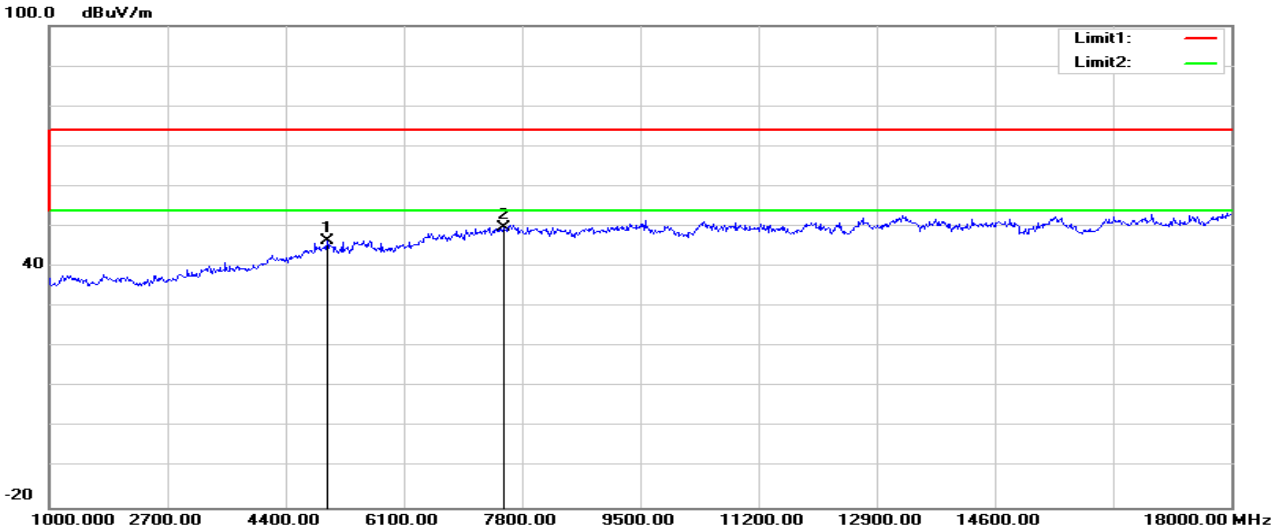
Operation Mode:	Bluetooth LE4.1	**Test Date:**	2018-3-19
Test Channel:	CH39	**Tested by:**	Lily.Wang
Temperature:	25°C	**Polarity:**	Ver. / Hor.

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	4995.000	45.33	0.35	45.68	74.00	-28.32	100	8	peak
2	7409.000	43.52	5.77	49.29	74.00	-24.71	100	252	peak

Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Height	Degree	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg.)	
1	4995.000	46.17	0.35	46.52	74.00	-27.48	100	0	peak
2	7528.000	43.53	6.07	49.60	74.00	-24.40	100	235	peak

6.7 POWERLINE CONDUCTED EMISSIONS

LIMIT

For an intentional radiator which 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 or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

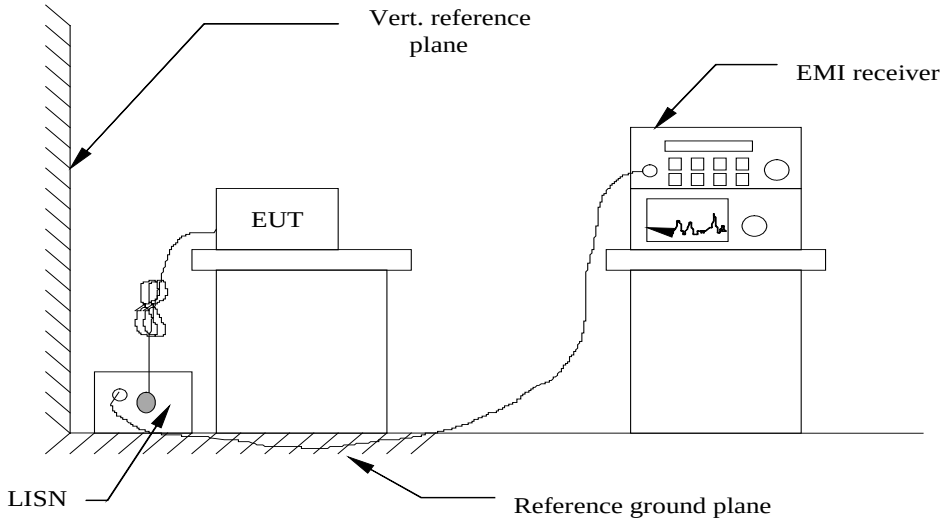
Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

According to RSS-Gen 8.8, a radio apparatus that is designed to be connected to the public utility (AC) power line shall ensure that the radio frequency voltage, which is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz-30 MHz, shall not exceed the limits in Table below.

Frequency (MHz)	Conducted limit (dBμV)	
	Quasi-Peak	Average**
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* The level decreases linearly with the logarithm of the frequency.
** A linear average detector is required.

Test Configuration



See test photographs attached in Setup photo for the actual connections between EUT and support equipment.

TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

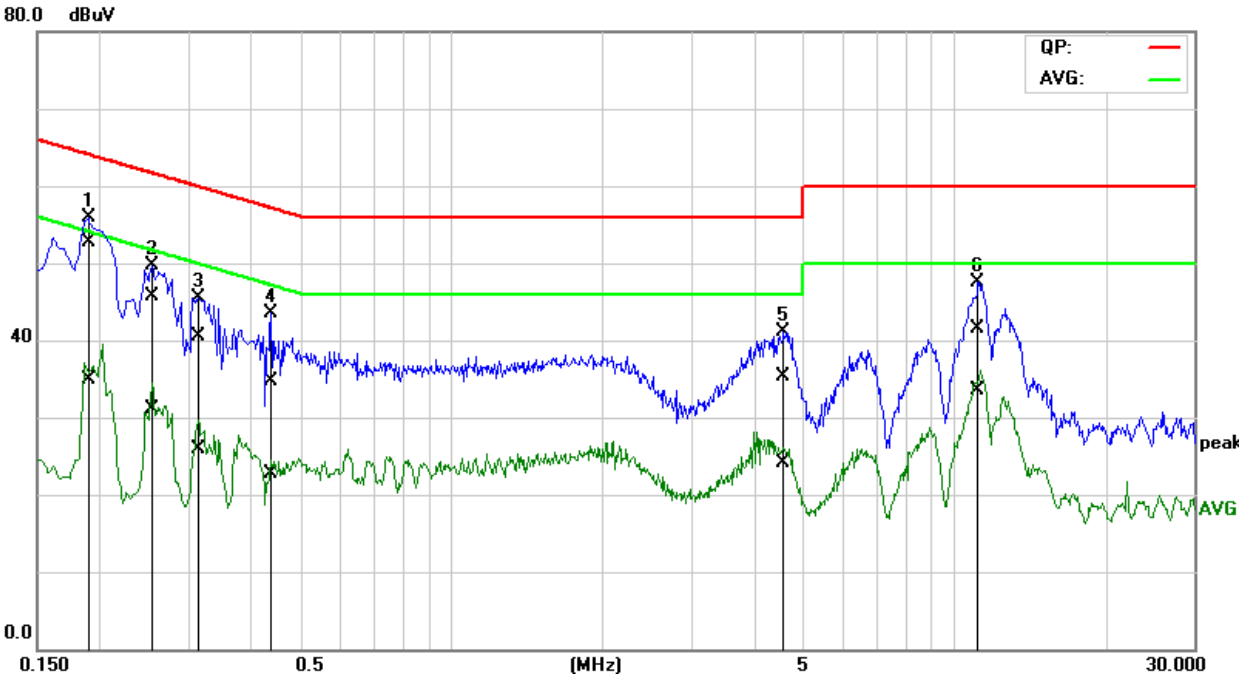
TEST RESULTS

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Test Data

Job No.:	C171023R02	Date:	2018/3/1
Model No.:	YVR.1117	Time:	9:20:13
Standard:	FCC Class B	Temp.(C)/Hum.(%):	22(C)/48%
Test item:	Conduction test	Test By:	Lily.Wang
Line:	L1	Test Voltage:	AC 120V/60Hz
Model:		Description:	

L1

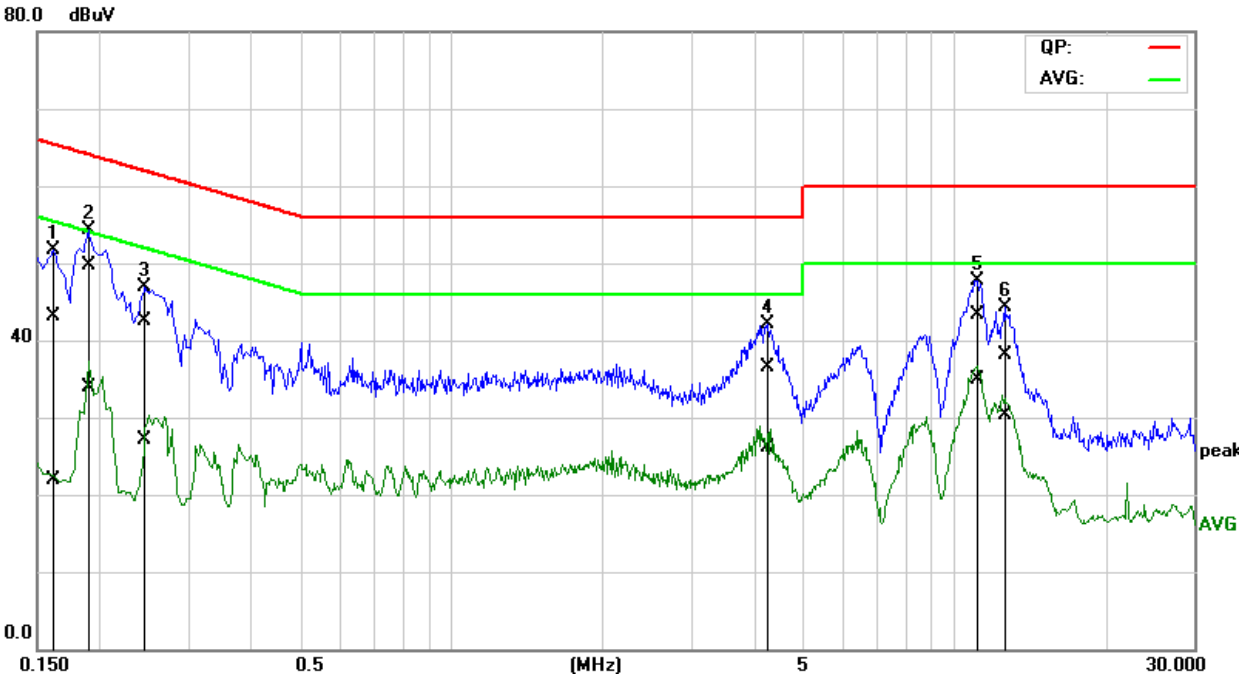


No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1*	0.1868	32.61	14.79	20.09	52.70	34.88	64.18	54.18	-11.48	-19.30	Pass
2	0.2514	25.63	11.04	20.14	45.77	31.18	61.71	51.71	-15.94	-20.53	Pass
3	0.3114	20.29	5.86	20.14	40.43	26.00	59.93	49.93	-19.50	-23.93	Pass
4	0.4340	14.48	2.56	20.15	34.63	22.71	57.18	47.18	-22.55	-24.47	Pass
5	4.5565	14.96	3.81	20.38	35.34	24.19	56.00	46.00	-20.66	-21.81	Pass
6	11.1748	20.62	12.77	20.80	41.42	33.57	60.00	50.00	-18.58	-16.43	Pass

Note: 1. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).

Job No.:	C171023R02	Date:	2018/3/1
Model No.:	YVR.1117	Time:	9:26:04
Standard:	FCC Class B	Temp.(C)/Hum.(%):	22(C)/48%
Test item:	Conduction test	Test By:	Lily.Wang
Line:	L2	Test Voltage:	AC 120V/60Hz
Model:		Description:	

L2



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1*	0.1607	22.97	1.88	20.07	43.04	21.95	65.43	55.43	-22.39	-33.48	Pass
2	0.1887	29.57	13.77	20.09	49.66	33.86	64.09	54.09	-14.43	-20.23	Pass
3	0.2460	22.44	6.92	20.13	42.57	27.05	61.89	51.89	-19.32	-24.84	Pass
4	4.2656	16.22	5.75	20.33	36.55	26.08	56.00	46.00	-19.45	-19.92	Pass
5	11.0549	22.54	14.18	20.76	43.30	34.94	60.00	50.00	-16.70	-15.06	Pass
6	12.6476	17.25	9.52	20.77	38.02	30.29	60.00	50.00	-21.98	-19.71	Pass

Note: 1. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).

*Re*mark:

1.The measuring frequencies range between 0.15 MHz and 30 MHz.

2.The emissions measured in the frequency range between 0.15 MHz and 30MHz were made with an instrument using Quasi-peak detector and Average detector.

3."---" denotes the emission level was or more than 2dB below the Average limit, and no re-check was made.

4.The IF bandwidth of SPA between 0.15MHz and 30MHz was 10KHz. The IF bandwidth of Test Receiver between 0.15MHz and 30MHz was 9kHz.

END OF REPORT