CFR 47 FCC PART 15 SUBPART C

TEST REPORT

For

Seura Outdoor Entertainment

MODEL NUMBER: SHD2-43

FCC ID: 2AVE3SHD2-43A

PROJECT NUMBER: 4789257350

REPORT NUMBER: 4789257350-1

ISSUE DATE: Mar. 27, 2020

Prepared for

PAN International (USA)

Prepared by

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Revision History

Rev.	Issue Date	Revisions	Revised By
V0	02/26/2020	Initial Issue	

Summary of Test Results			
Clause	**Test Items**	**FCC/IC Rules**	**Test Results**
1	6dB Bandwidth	FCC Part 15.247 (a) (2)	Pass
2	Peak Conducted Output Power	FCC Part 15.247 (b) (3)	Pass
3	Power Spectral Density	FCC Part 15.247 (e)	Pass
4	Conducted Bandedge and Spurious Emission	FCC Part 15.247 (d)	Pass
5	Radiated Bandedge and Spurious Emission	FCC Part 15.247 (d) FCC Part 15.209 FCC Part 15.205	Pass
6	Conducted Emission Test For AC Power Port	FCC Part 15.207	Pass
7	Antenna Requirement	FCC Part 15.203	Pass
Remark: The measurement result for the sample received is <Pass> according to < ANSI C63.10-2013, FCC CFR 47 Part 2, FCC CFR 47 Part 15C> when <Accuracy Method> decision rule is applied.			

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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name:	PAN International (USA)
Address:	48008 Fremont Blvd Fremont, CA 94538 United States

Manufacturer Information

Company Name:	PAN International (USA)
Address:	48008 Fremont Blvd Fremont, CA 94538 United States

EUT Description

EUT Name:	Seura Outdoor Entertainment
Model:	SHD2-43
Sample Status:	Normal
Sample Received Date:	Dec. 25, 2019
Date of Tested:	Dec. 26, 2019 ~ Mar 27, 2020

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 FCC PART 15 SUBPART C	PASS

Tested By:

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Reviewed By:

Chris Zhong

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Senior Project Engineer

Authorized By:

Scholl Zhang

Scholl Zhang
Laboratory Leader

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with KDB 558074 D01 15.247 Meas Guidance v05r02, KDB 414788 D01 Radiated Test Site v01r01, CFR 47 FCC Part 2, CFR 47 FCC Part 15, ANSI C63.10-2013.

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	**A2LA (Certificate No.: 4829.01)** **UL-CCIC COMPANY LIMITED has been assessed and proved to be in compliance with A2LA.** **FCC (FCC Designation No.: CN1247)** **UL-CCIC COMPANY LIMITED has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules.** **IC (IC Designation No.: 25056)** **UL-CCIC COMPANY LIMITED has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules.**

Note 1: All tests measurement facilities use to collect the measurement data are located at No. 2, Chengwan Road, Suzhou Industrial Park, Suzhou 215122, People's Republic of China

Note 2: For below 30MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. These measurements below 30MHz had been correlated to measurements performed on an OFS.

Note 3: The test anechoic chamber in UL-CCIC COMPANY LIMITED had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognize national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Uncertainty
Conduction emission	3.00dB
Radiation Emission test(include Fundamental emission) (9kHz-30MHz)	3.32dB
Radiation Emission test(include Fundamental emission) (30MHz-1GHz)	3.27dB
Radiation Emission test (1GHz to 26GHz)(include Fundamental emission)	3.80dB (1GHz-18Gz)
	4.11dB (18GHz-26.5Gz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

Equipment	Seura Outdoor Entertainment		
Model Name	SHD2-43		
Product Description	Operation Frequency	2402 MHz ~ 2480 MHz	
	Modulation Type		Data Rate
	GFSK		1Mbps
Power Supply	AC 120V		
Bluetooth Version	LE		
Hardware Version	V1.0		

5.2. MAXIMUM OUTPUT POWER

Bluetooth Mode	Frequency (MHz)	Channel Number	Max Output Power(dBm)
BLE	2402-2480	0-39[40]	1.73

5.3. CHANNEL LIST

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	11	2424	22	2446	33	2468
1	2404	12	2426	23	2448	34	2470
2	2406	13	2428	24	2450	35	2472
3	2408	14	2430	25	2452	36	2474
4	2410	15	2432	26	2454	37	2476
5	2412	16	2434	27	2456	38	2478
6	2414	17	2436	28	2458	39	2480
7	2416	18	2438	29	2460		
8	2418	19	2440	30	2462		
9	2420	20	2442	31	2464		
10	2422	21	2444	32	2468		

5.4. TEST CHANNEL CONFIGURATION

Test Mode	Test Channel		Frequency
GFSK	Low Channel	CH 0	2402MHz
	Middle Channel	CH 19	2440MHz
	High Channel	CH 39	2480MHz

5.5. THE WORSE CASE CONFIGURATIONS

The Worse Case Power Setting Parameter under 2400 ~ 2483.5MHz Band				
Test Software		Tera Term & QRCT		
Modulation Type	Transmit Antenna Number	Test Channel		
		CH 00	CH 19	CH 39
GFSK	1	37	37	37

5.6. DESCRIPTION OF AVAILABLE ANTENNAS

Ant.	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)
1	2402-2480	Patch Antenna	2.99

Test Mode	Transmit and Receive Mode	Description
BLE	☒1TX, 1RX	ANT 1 can be used as transmitting/receiving antenna.

5.7. THE WORSE CASE CONFIGURATIONS

For the product, there is only one transmission antenna, so only the worst data for the antenna1 is recorded in the report.

Worst-case data rates as provided by the client were:

Bluetooth Mode	Modulation Technology	Modulation Type	Data Rate (Mbps)
BLE	DTS	GFSK	1Mbit/s

5.8. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	P/N
1	Laptop	ThinkPad	E550c	N/A

I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	RS232	USB	USB to RS232	1	N/A
2	HDMI	HDMI	HDMI Cable	1	N/A
3	LAN	LAN	LAN	1	N/A
4	USB	USB	USB	1	N/A

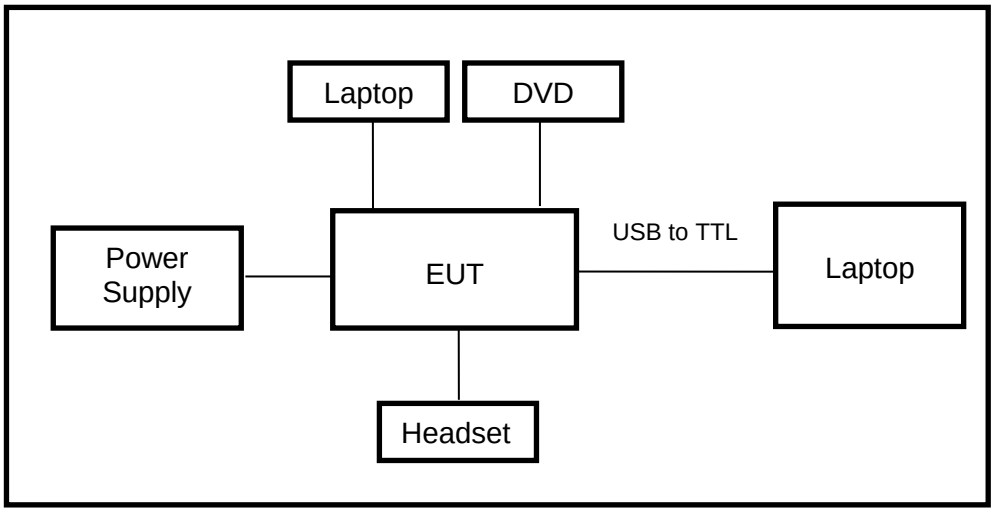
ACCESSORIES

Item	Accessory	Brand Name	Model Name	Description
1	Headset	Logitech	H111	N/A
2	DVD	Philips	DVP3690K/93	N/A
3	Laptop	ThinkPad	E580	N/A
4	Laptop	ThinkPad	E550c	N/A

TEST SETUP

The EUT can work in engineering mode with a software through a Laptop.

SETUP DIAGRAM FOR TESTS



6. MEASURING INSTRUMENT AND SOFTWARE USED

Conducted Emissions (Instrument**)**							
Used	Equipment	Manufacturer	Model No.	Serial No.	Upper Last Cal.	Last Cal.	Next Cal.
☑	EMI Test Receiver	R&S	ESR3	126700	2018-12-13	2019-12-12	2020-12-11
☑	Two-Line V-Network	R&S	ENV216	126701	2018-12-13	2019-12-12	2020-12-11
☑	Artificial Mains Networks	R&S	ENY81	126711	2018-12-13	2019-12-12	2020-12-11
Software							
Used	Description		Manufacturer		Name	Version	
☑	Test Software for Conducted disturbance		R&S		EMC32	Ver. 9.25	
Radiated Emissions (Instrument**)**							
Used	Equipment	Manufacturer	Model No.	Serial No.	Upper Last Cal.	Last Cal.	Next Cal.
☑	Spectrum Analyzer	Keysight	N9010B	MY57110128	2018-05-30	2019-05-29	2020-05-28
☑	EMI test receiver	R&S	ESR26	1267603	2018-12-13	2019-12-12	2020-12-11
☑	Receiver Antenna (9kHz-30MHz)	Schwarzbeck	FMZB 1513	513-265	2018-06-17	2019-06-16	2020-06-15
☑	Receiver Antenna (30MHz-1GHz)	SunAR RF Motion	JB1	126704	N/A	2019-01-28	2022-01-27
☑	Receiver Antenna (1GHz-18GHz)	R&S	HF907	126705	2019-01-26	2020-01-25	2021-01-24
☑	Receiver Antenna (18GHz-26.5GHz)	Schwarzbeck	BBHA9170	126706	2019-02-06	2020-02-05	2021-02-04
☑	Pre-amplification (To 1GHz)	R&S	SCU-03D	134666	2019-02-06	2020-02-05	2021-02-04
☑	Pre-amplification (To 18GHz)	Compliance Direction System Inc.	PAP-1G18-50	14140-13467	2019-03-18	2020-03-17	2021-03-16
☑	Pre-amplification (To 26.5GHz)	R&S	SCU-26D	134668	2019-02-06	2020-02-05	2021-02-04
☑	Band Reject Filter	Wainwright	WRCJV8-2350-2400-2483.5-2533.5-40SS	1	2018-05-30	2019-05-29	2020-05-28
☑	Highpass Filter	Wainwright	WHKX10-2700-3000-18000-40SS	2	2018-05-30	2019-05-29	2020-05-28
Software							
Used	Description		Manufacturer		Name	Version	
☑	Test Software for Radiated disturbance		Tonscend		JS32	V1.0	
Other instruments							
Used	Equipment	Manufacturer	Model No.	Serial No.	Upper Last Cal.	Next Cal.	
☑	Spectrum Analyzer	Keysight	N9010B	MY57110128	2018-05-30	2019-05-29	2020-05-28

7. MEASUREMENT METHODS

No.	Test Item	KDB Name	Section
1	6dB Bandwidth	KDB 558074 D01 15.247 Meas Guidance v05r02	8.2
2	Peak Output Power	KDB 558074 D01 15.247 Meas Guidance v05r02	8.3.1.3/8.3.2.3
3	Power Spectral Density	KDB 558074 D01 15.247 Meas Guidance v05r02	8.4
4	Out-of-band emissions in non-restricted bands	KDB 558074 D01 15.247 Meas Guidance v05r02	8.5
5	Out-of-band emissions in restricted bands	KDB 558074 D01 15.247 Meas Guidance v05r02	8.6
6	Band-edge	KDB 558074 D01 15.247 Meas Guidance v05r02	8.7
7	Conducted Emission Test For AC Power Port	ANSI C63.10-2013	6.2

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

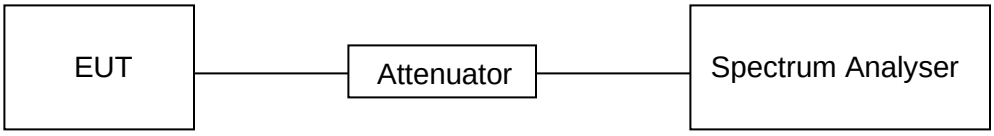
LIMITS

None; for reporting purposes only

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method

TEST SETUP



TEST ENVIRONMENT

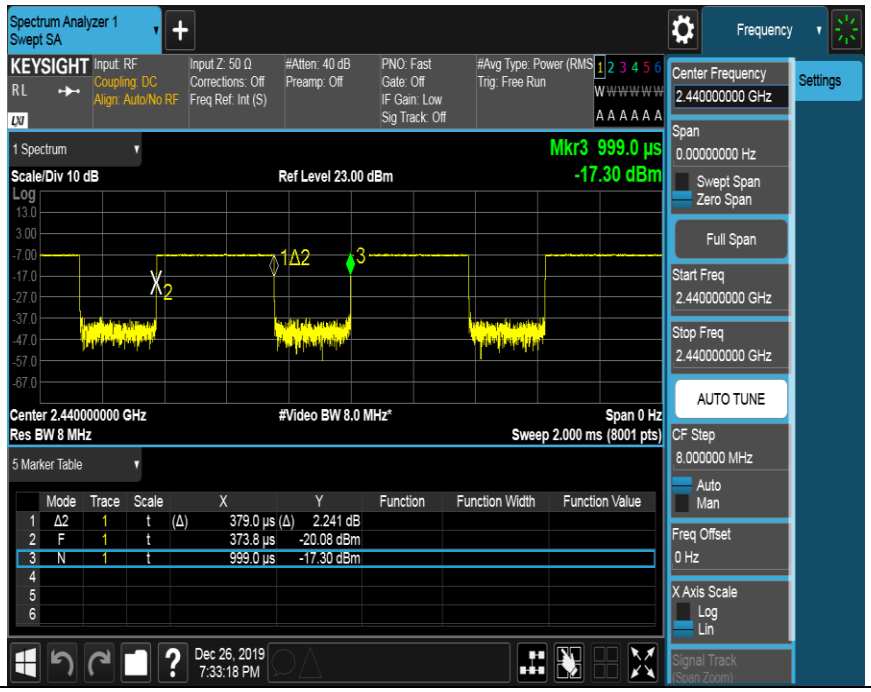
Temperature	20°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V

RESULTS

Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (db)	1/T Minimum VBW (KHz)	Final setting For VBW (KHz)
BLE	0.379	0.6252	0.6062	60.62%	2.17	2.64	3

Note:
Duty Cycle Correction Factor=10log (1/x).
Where: x is Duty Cycle (Linear)
Where: T is On Time
If that calculated VBW is not available on the analyzer then the next higher value should be used.

BLE ON TIME AND DUTY CYCLE MID CH (WORSE CASE)



8.2. 6 dB DTS BANDWIDTH

LIMITS

FCC Part15 (15.247) Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.247(a)(2)	6dB Bandwidth	>= 500KHz	2400-2483.5

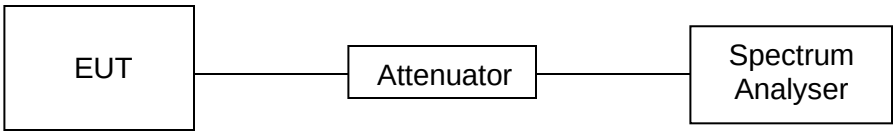
TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	For 6 dB Bandwidth :100K
VBW	For 6dB Bandwidth : ≥3 × RBW
Trace	Max hold
Sweep	Auto couple

Allow the trace to stabilize and 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.

TEST SETUP



TEST ENVIRONMENT

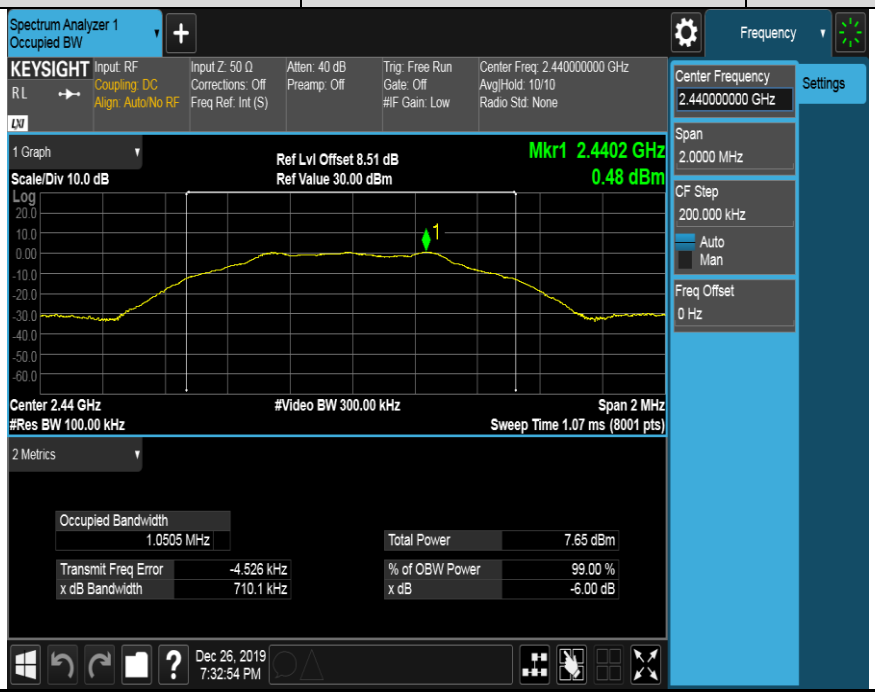
Temperature	20°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V

RESULTS

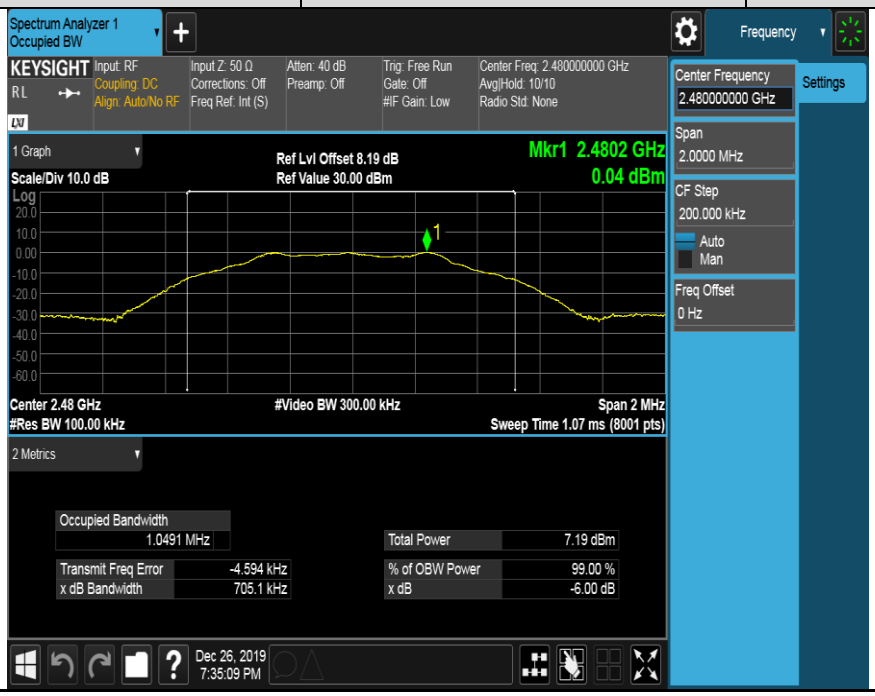
Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
CH00	2402	0.7060	500	Pass
CH19	2440	0.7101	500	Pass
CH39	2480	0.7051	500	Pass

Test Mode	Test Channel	Verdict
BLE	CH00	PASS

Test Mode	Test Channel	Verdict
BLE	CH19	PASS



Test Mode	Test Channel	Verdict
BLE	CH39	PASS



8.3. PEAK CONDUCTED OUTPUT POWER

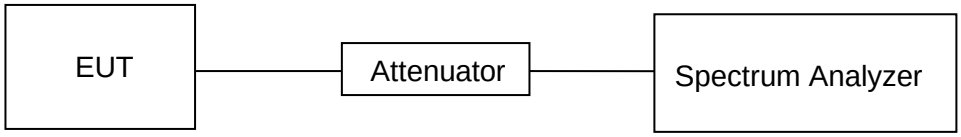
LIMITS

CFR 47 FCC Part15 (15.247) Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC 15.247(b)(3)	Peak Output Power	1 watt or 30dBm (See note1)	2400-2483.5
Note: 1. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.			

TEST PROCEDURE

Refer to the subclause 8.3.1.1of KDB558074 and the subclause 11.9.1.1 of ANSI C63.10.
Place the EUT on the table and set it in the transmitting mode.
Allow trace to fully stabilize and use peak marker function to determine the peak amplitude level.

TEST SETUP



TEST ENVIRONMENT

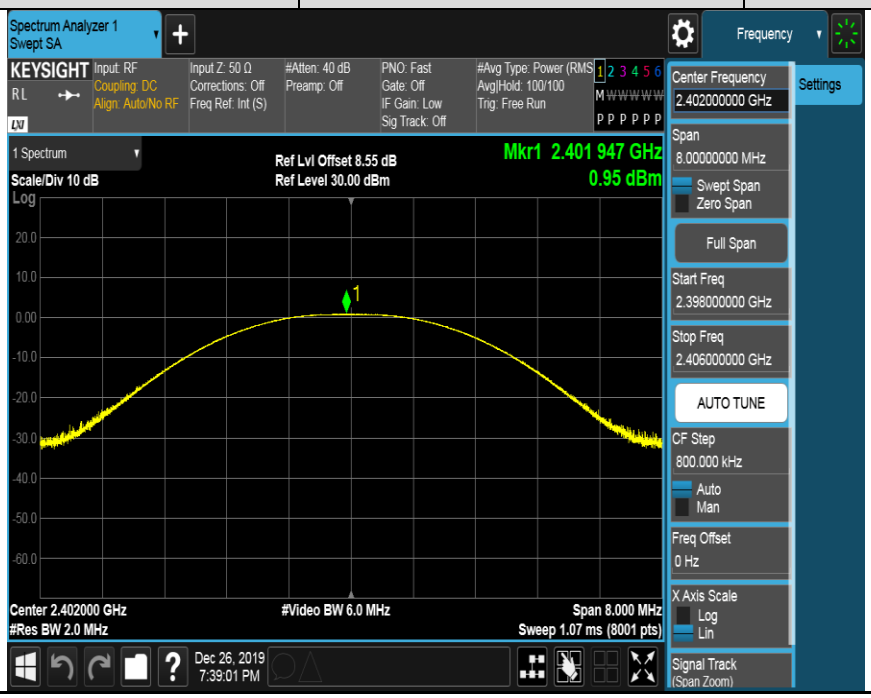
Temperature	20°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V

RESULTS

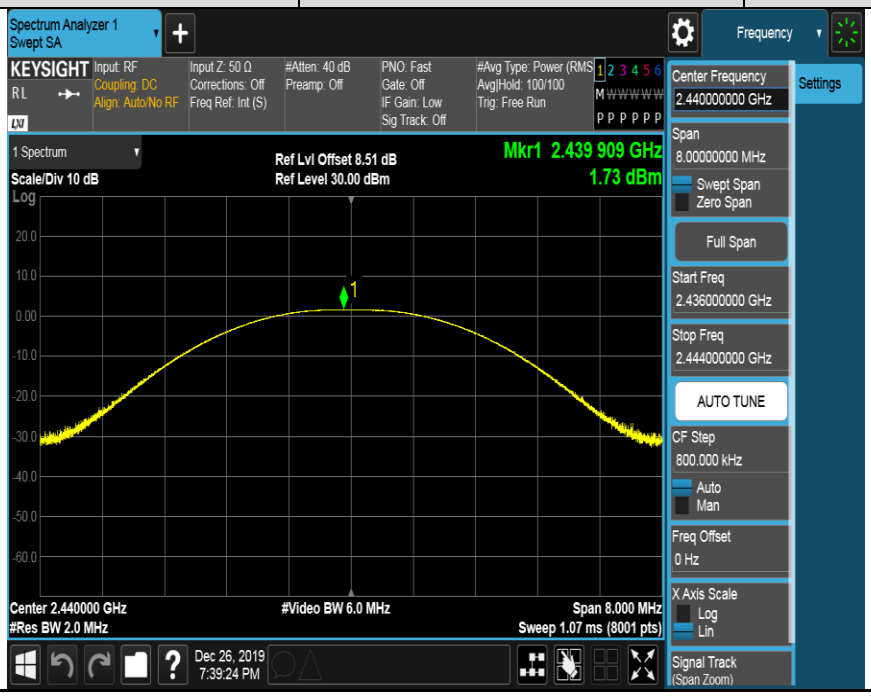
Test Channel	Frequency (MHz)	Maximum Conducted Output Power(PK) (dBm)	Result
CH00	2402	0.95	PASS
CH19	2440	1.73	PASS
CH39	2480	1.28	PASS

Test Graphs:

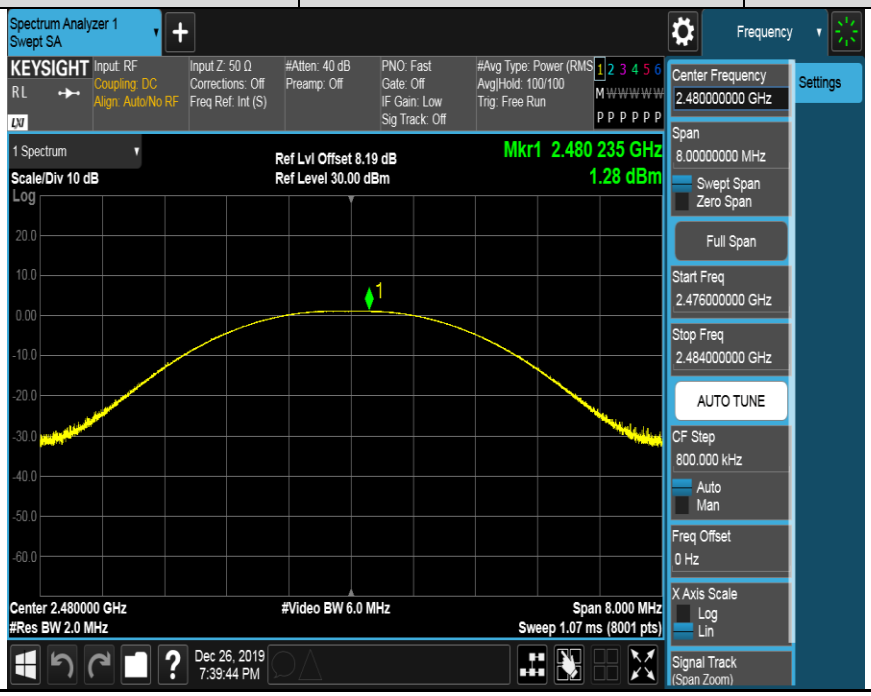
Test Mode	Test Channel	Verdict
BLE	CH00	PASS



Test Mode	Test Channel	Verdict
BLE	CH19	PASS



Test Mode	Test Channel	Verdict
BLE	CH39	PASS



8.4. POWER SPECTRAL DENSITY

LIMITS

CFR 47 FCC Part15 (15.247) Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC §15.247 (e)	Power Spectral Density	8 dBm/3 kHz (See note1)	2400-2483.5
Note: 1. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.			

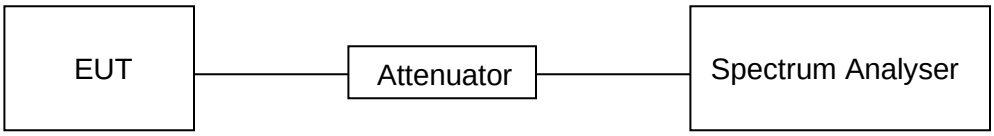
TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	3 kHz ≤ RBW ≤100 kHz
VBW	≥3 × RBW
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

Allow trace to fully stabilize and use the peak marker function to determine the maximum amplitude level within the RBW.
If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

TEST SETUP



TEST ENVIRONMENT

Temperature	20°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V

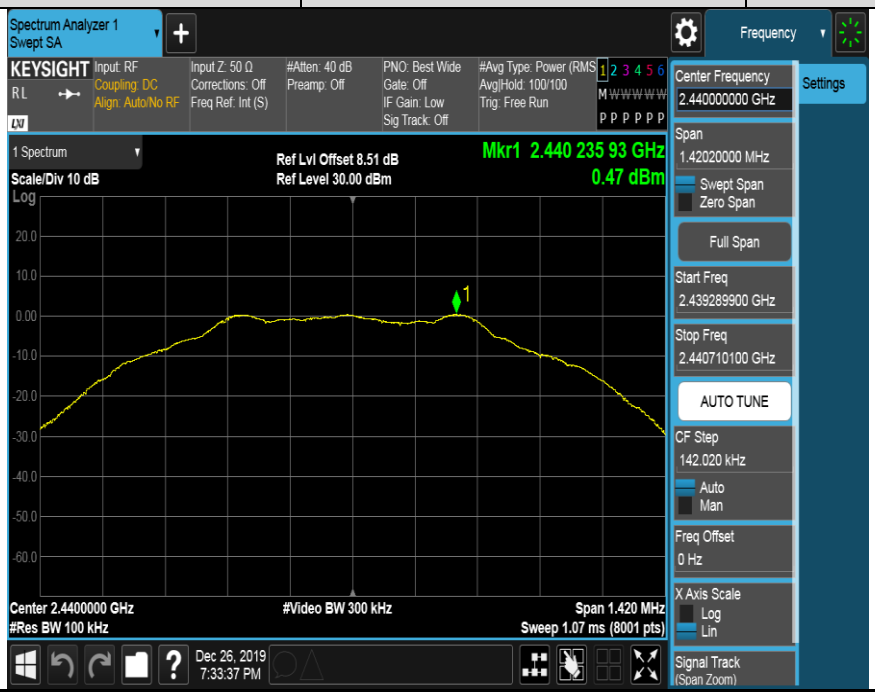
RESULTS

Test Channel	Frequency (MHz)	Power Spectral Density (dBm/100kHz)	Limit (dBm/3kHz)	Result
CH00	2402 MHz	-0.31	8	PASS
CH19	2440 MHz	0.47	8	PASS
CH39	2480 MHz	0.03	8	PASS

Test Graphs:

Test Mode	Test Channel	Verdict
BLE	CH00	PASS

Test Mode	Test Channel	Verdict
BLE	CH19	PASS



Test Mode	Test Channel	Verdict
BLE	CH39	PASS

8.5. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

LIMITS

CFR 47 FCC Part15 (15.247) Subpart C		
Section	Test Item	Limit
CFR 47 FCC §15.247 (d)	Conducted Bandedge and Spurious Emissions	at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power

TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

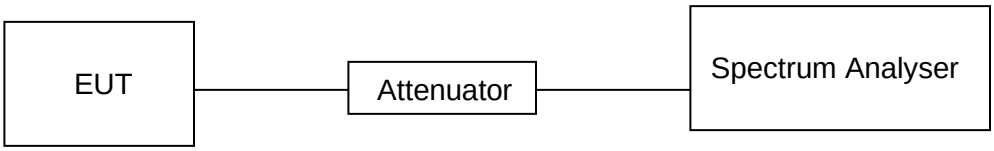
Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	100K
VBW	≥3 × RBW
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

Use the peak marker function to determine the maximum PSD level.

Span	Set the center frequency and span to encompass frequency range to be measured
Detector	Peak
RBW	100K
VBW	≥3 × RBW
measurement points	≥span/RBW
Trace	Max hold
Sweep time	Auto couple.

Use the peak marker function to determine the maximum amplitude level**.**

TEST SETUP



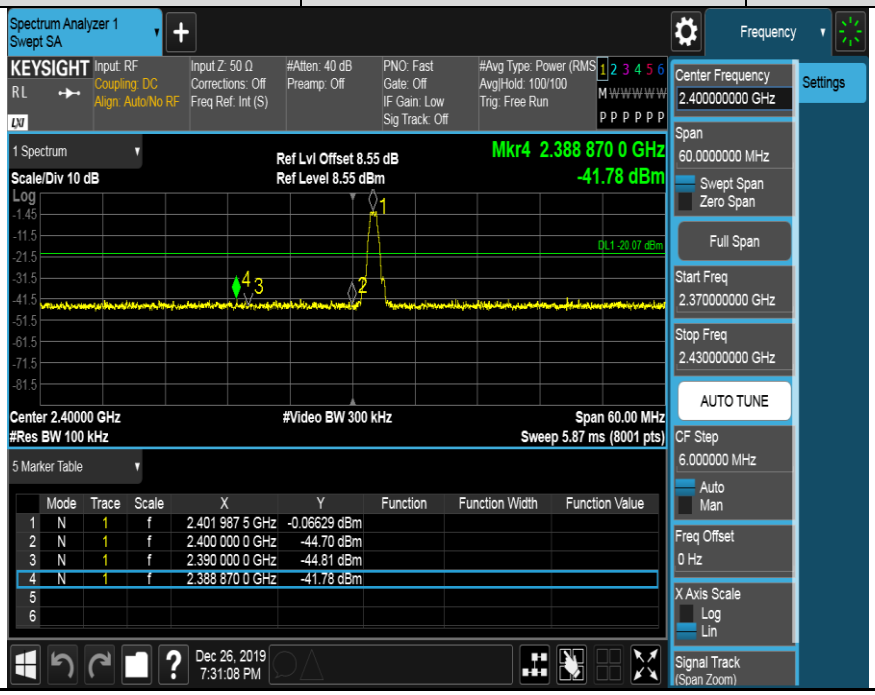
TEST ENVIRONMENT

Temperature	20°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V

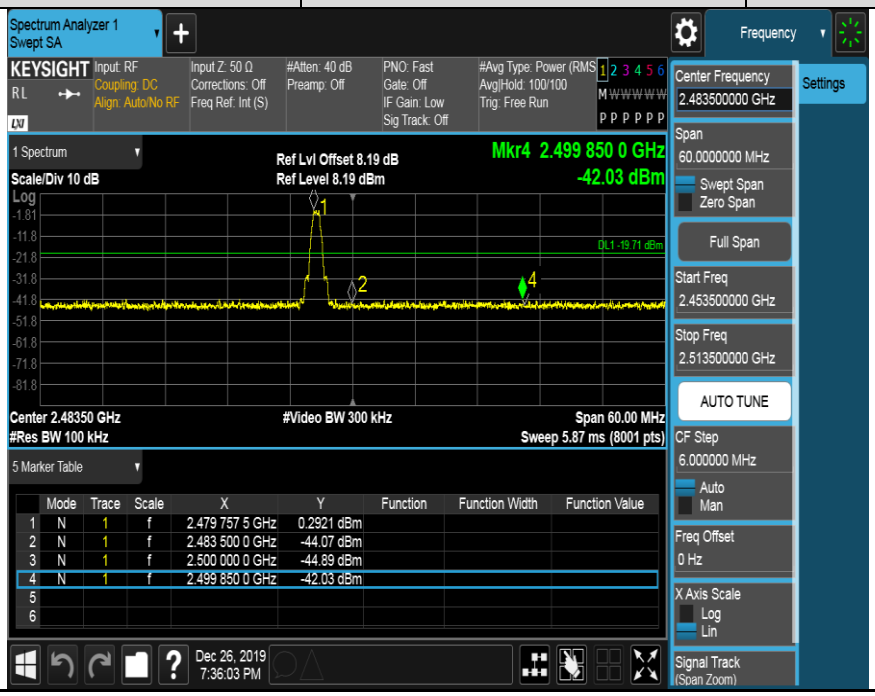
Part I: Conducted Bandedge

RESULTS

Test Mode	Test Channel	Verdict
BLE	CH00	PASS



Test Mode	Test Channel	Verdict
BLE	CH39	PASS

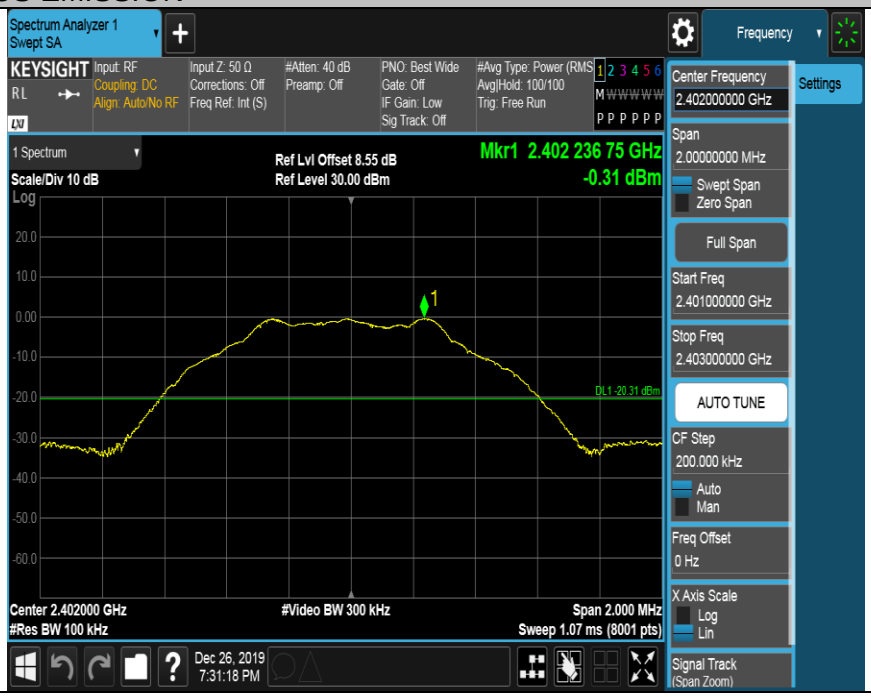


Part II: Conducted Emission

Test Plots

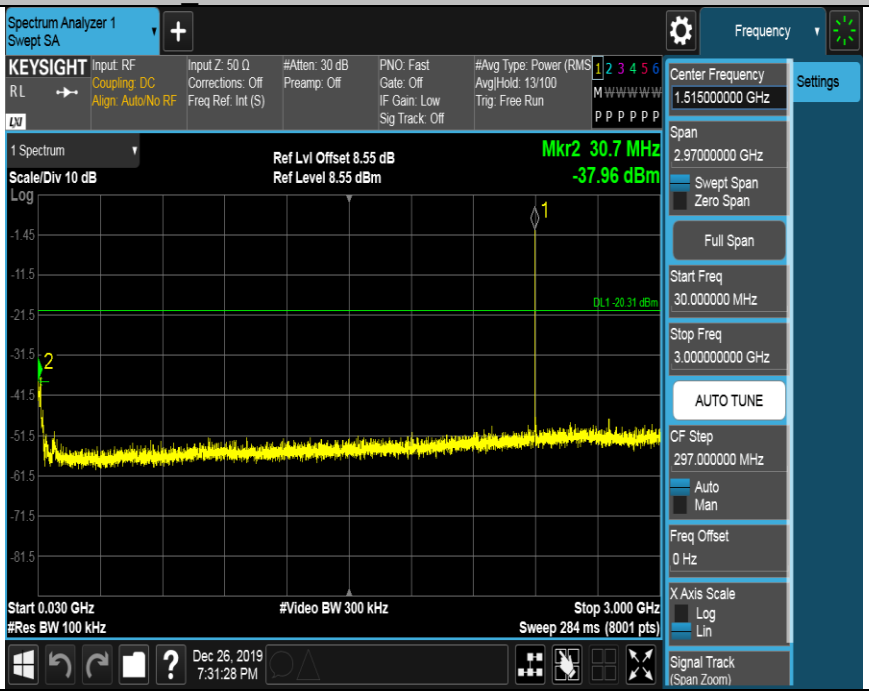
Test Mode	Channel	Verdict
BLE	CH00	PASS

LCH SPURIOUS EMISSION

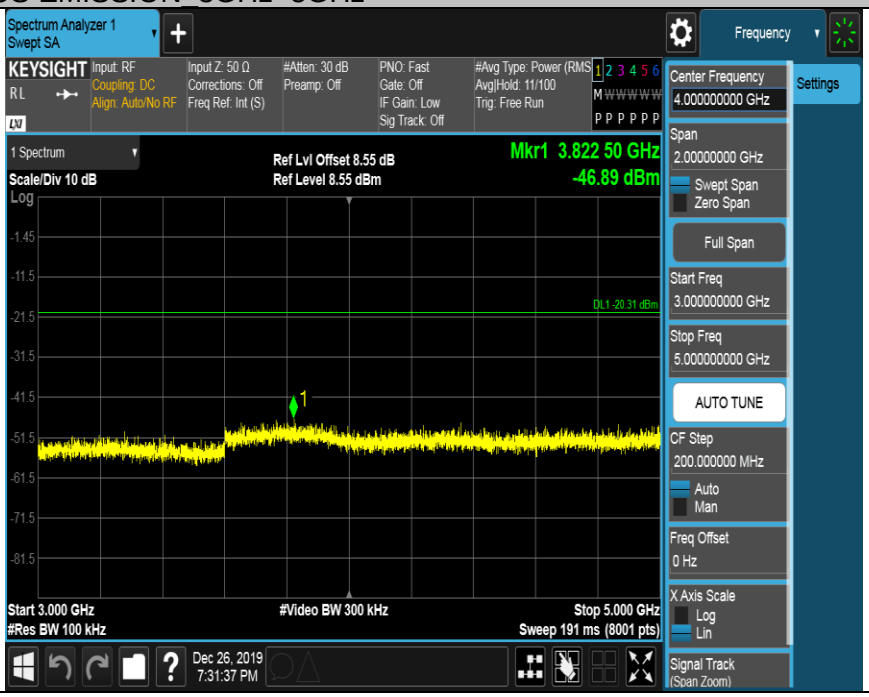


Puw test Plot

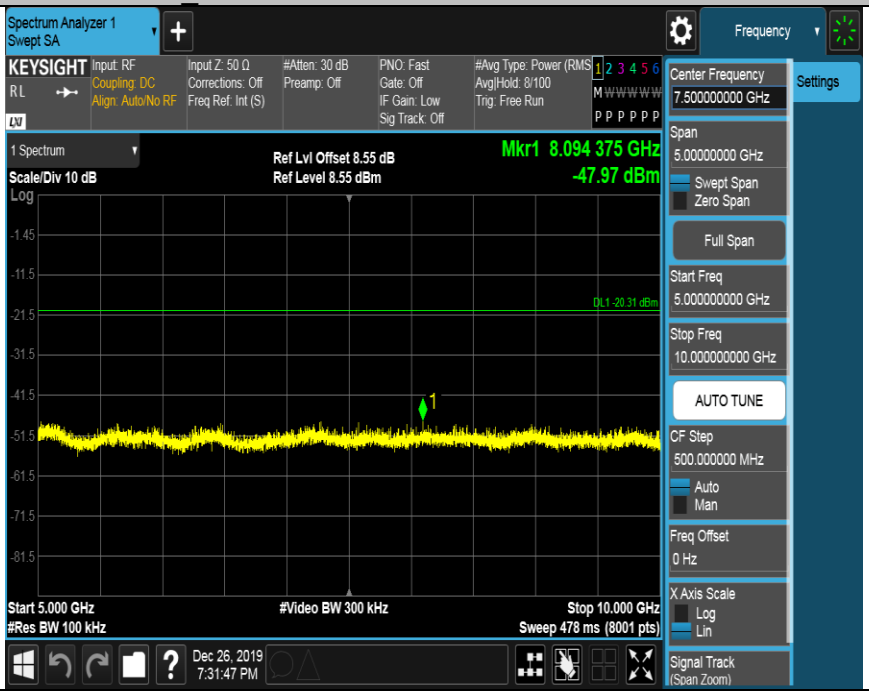
LCH SPURIOUS EMISSION_30MHz~3GHz



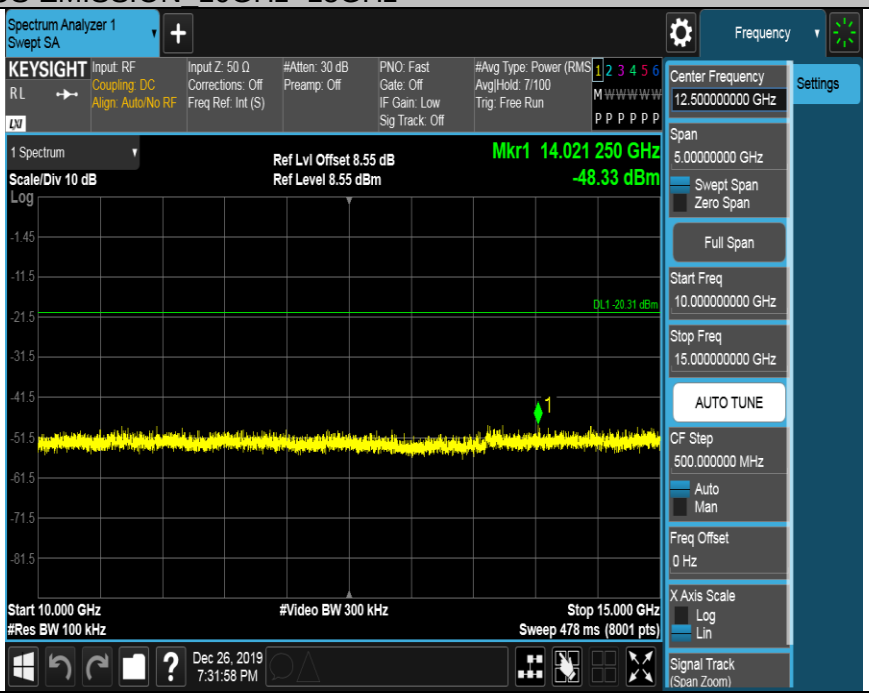
LCH SPURIOUS EMISSION_3GHz~5GHz

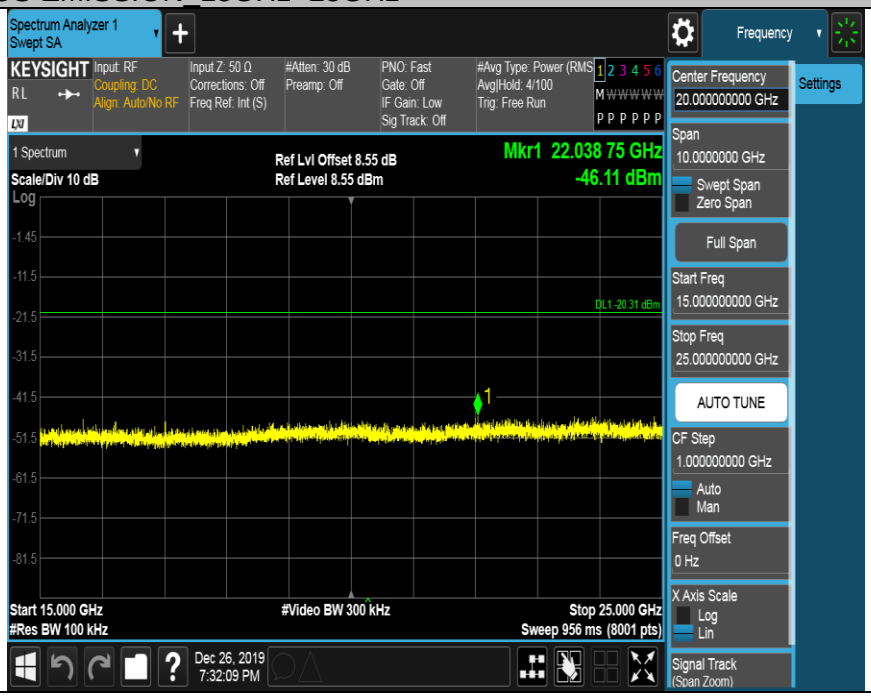


LCH SPURIOUS EMISSION_5GHz~10GHz



LCH SPURIOUS EMISSION_10GHz~15GHz



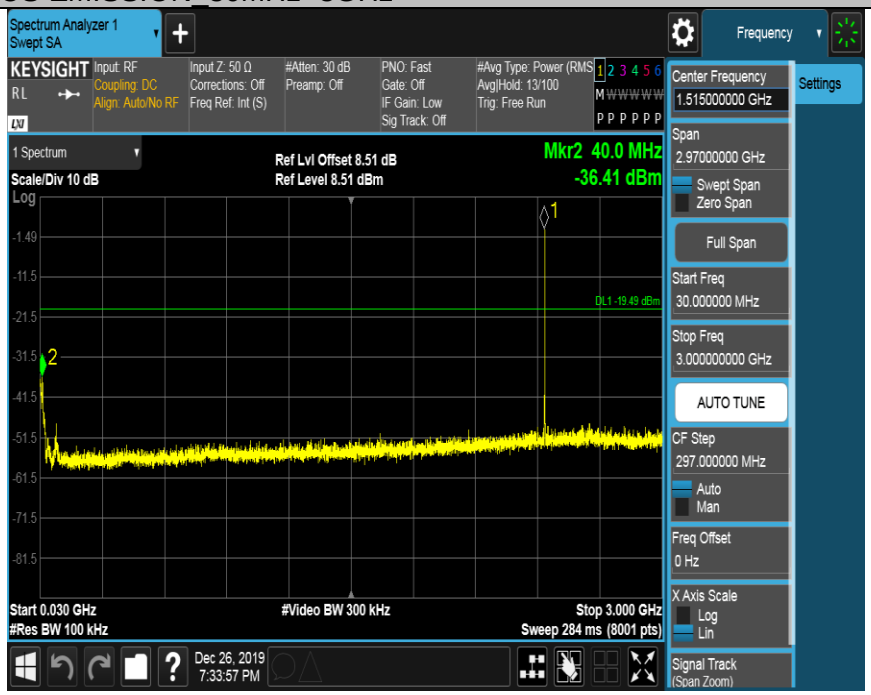
LCH SPURIOUS EMISSION_15GHz~25GHz


Test Mode	Channel	Verdict
BLE	CH19	PASS

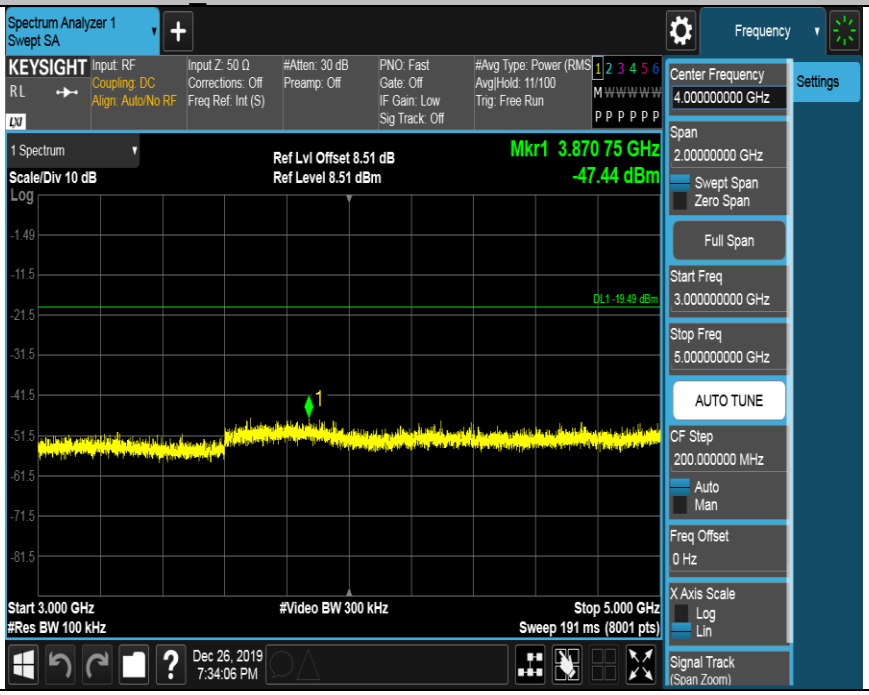
MCH SPURIOUS EMISSION

Puw test Plot

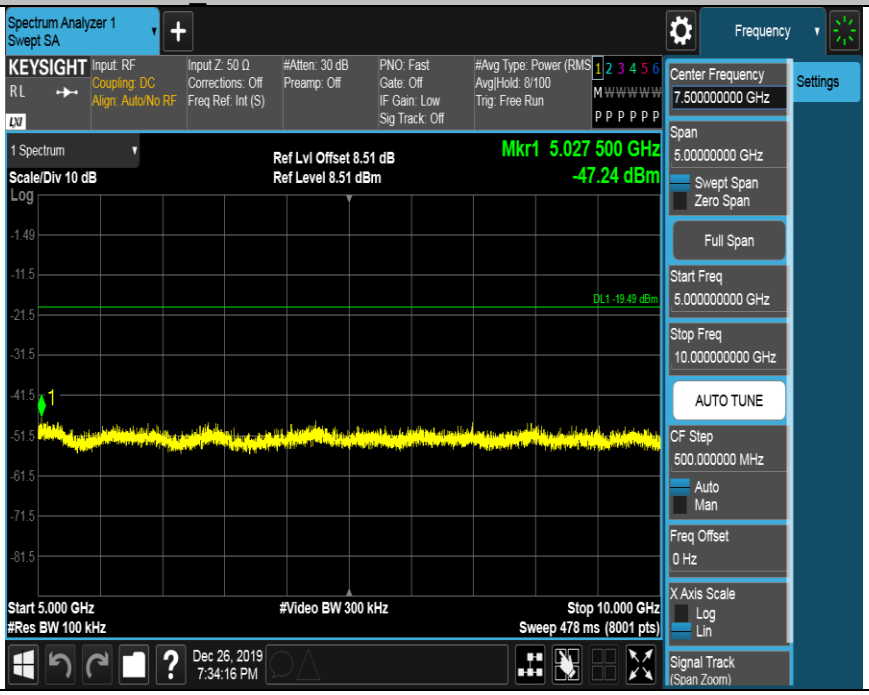
MCH SPURIOUS EMISSION_30MHz~3GHz



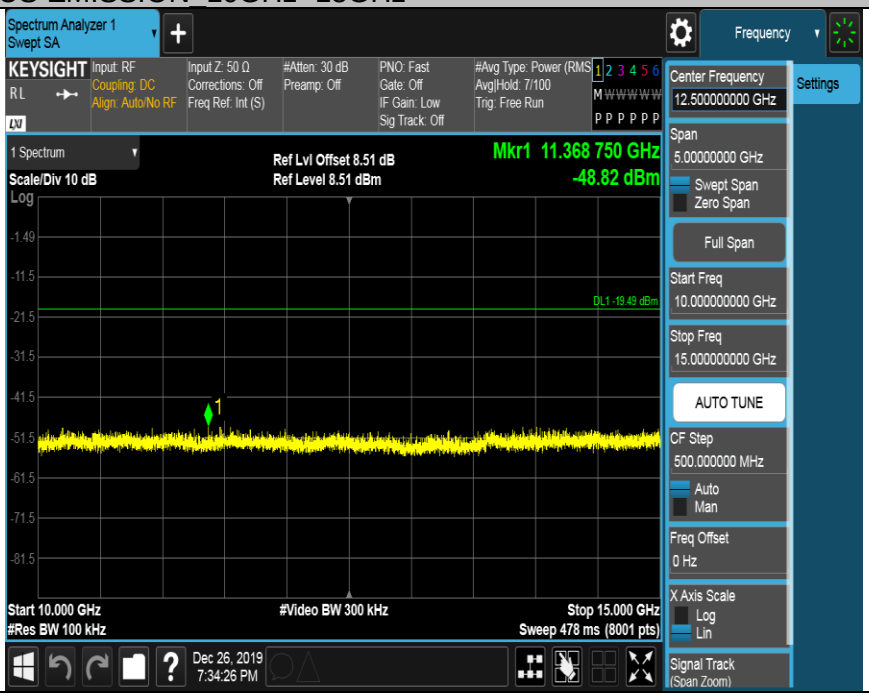
MCH SPURIOUS EMISSION_3GHz~5GHz



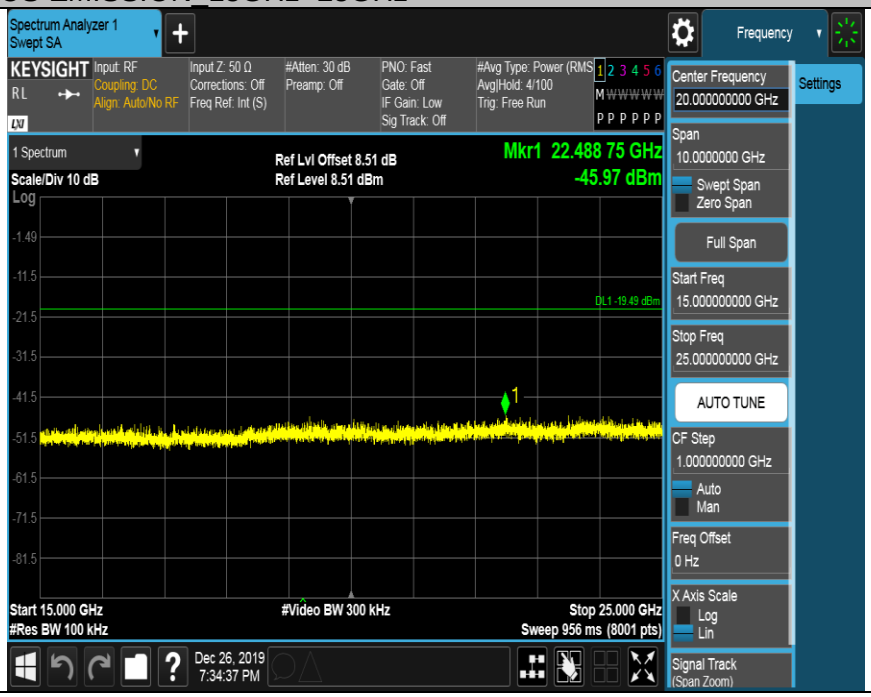
MCH SPURIOUS EMISSION_5GHz~10GHz



MCH SPURIOUS EMISSION_10GHz~15GHz



MCH SPURIOUS EMISSION_15GHz~25GHz

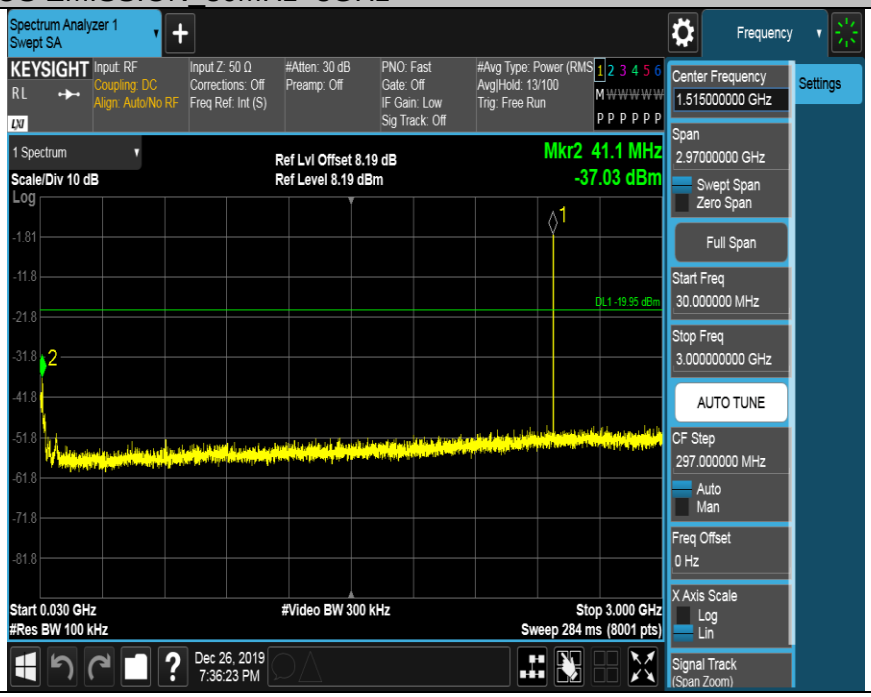


Test Mode	Channel	Verdict
BLE	CH39	PASS

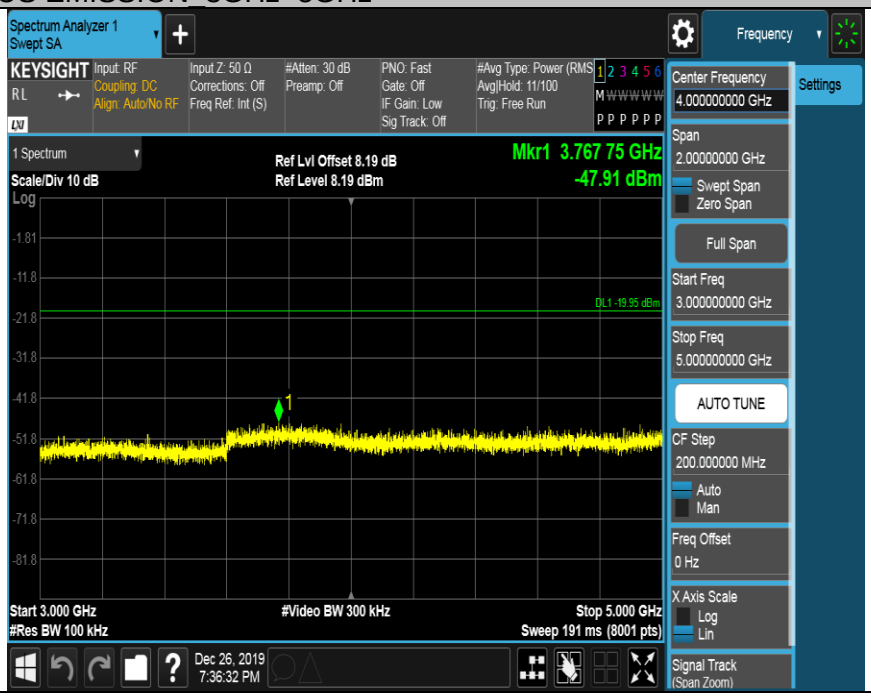
HCH SPURIOUS EMISSION

Puw test Plot

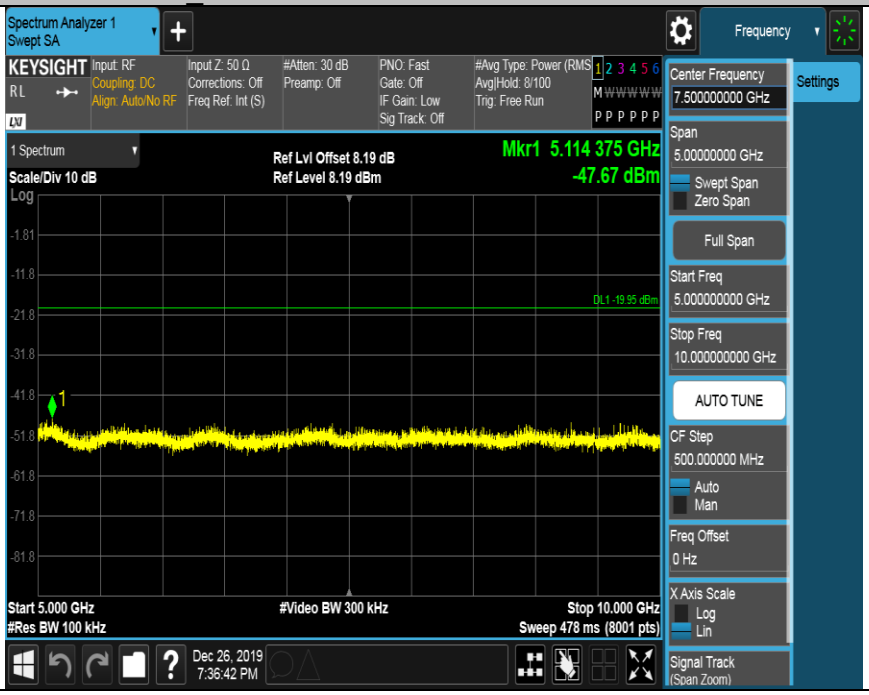
HCH SPURIOUS EMISSION_30MHz~3GHz



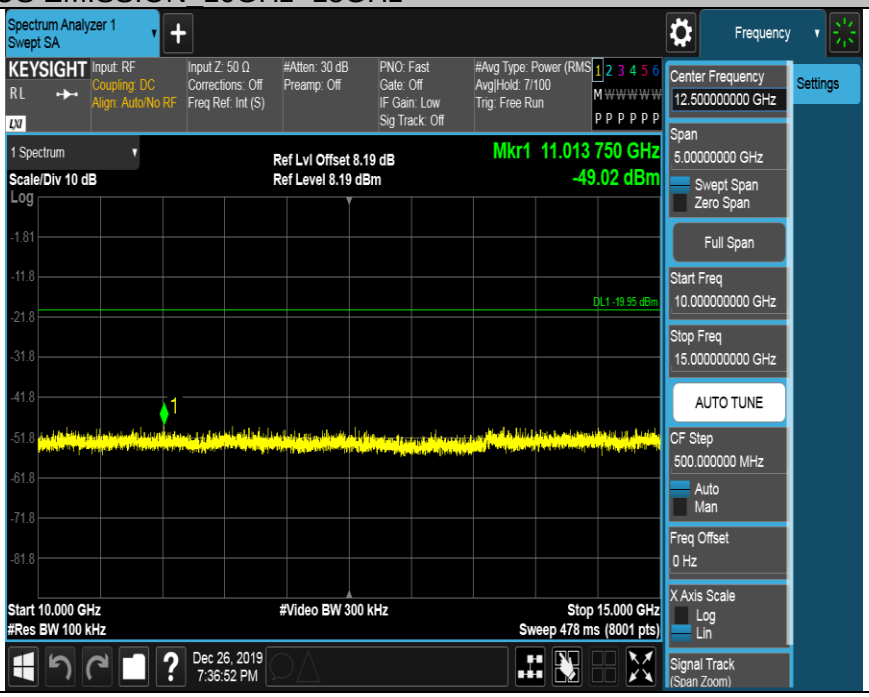
HCH SPURIOUS EMISSION 3GHz~5GHz



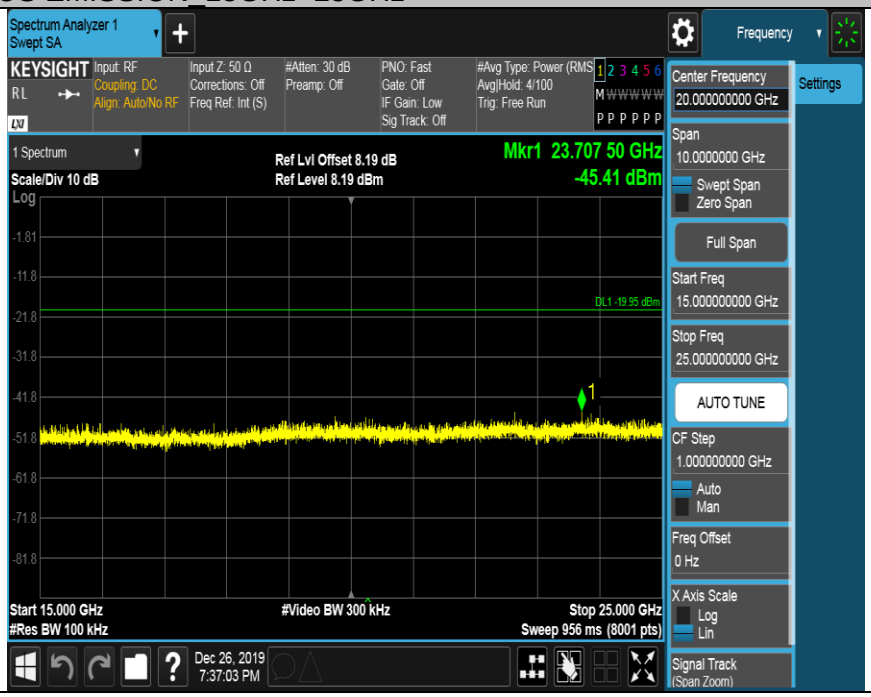
HCH SPURIOUS EMISSION_5GHz~10GHz



HCH SPURIOUS EMISSION_10GHz~15GHz



HCH SPURIOUS EMISSION_15GHz~25GHz



9. RADIATED TEST RESULTS

LIMITS

Please refer to CFR 47 FCC §15.205 and §15.209

Radiation Disturbance Test Limit for FCC (Class B)(9KHz-1GHz)

Frequency (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
960~1000	500	3

Note: 1) At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

(2) At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). This paragraph (f) shall not apply to Access BPL devices operating below 30 MHz.

Radiation Disturbance Test Limit for FCC (Above 1G)

Frequency (MHz)	dB(uV/m) (at 3 meters)	
	Peak	Average
Above 1000	74	54

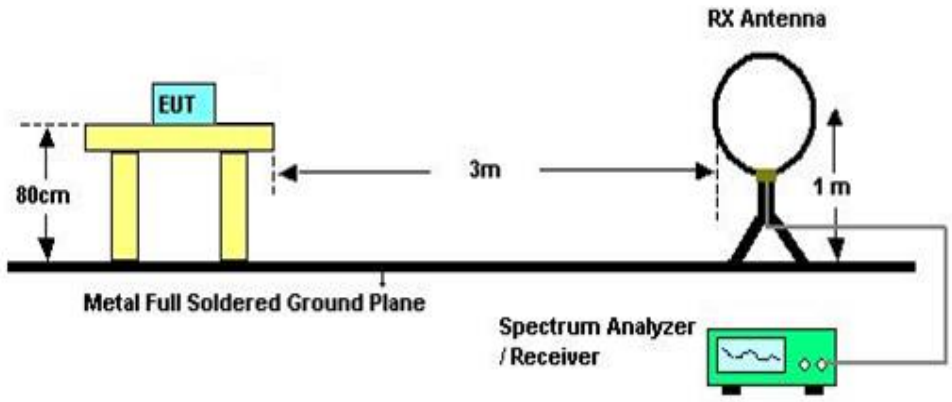
FCC Restricted bands of operation:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[1]0.495-0.505	16.69475-16.69525	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	2690-2900	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			

Note: [1]Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2]Above 38.6c

TEST SETUP AND PROCEDURE

Below 30MHz



The setting of the spectrum analyser

RBW	200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz)
VBW	200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz)
Sweep	Auto
Detector	Peak/QP/ Average
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013

2. The EUT was arranged to its worst case and then 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. Both Horizontal, Face-on and Face-off polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 0.8 meter above ground.

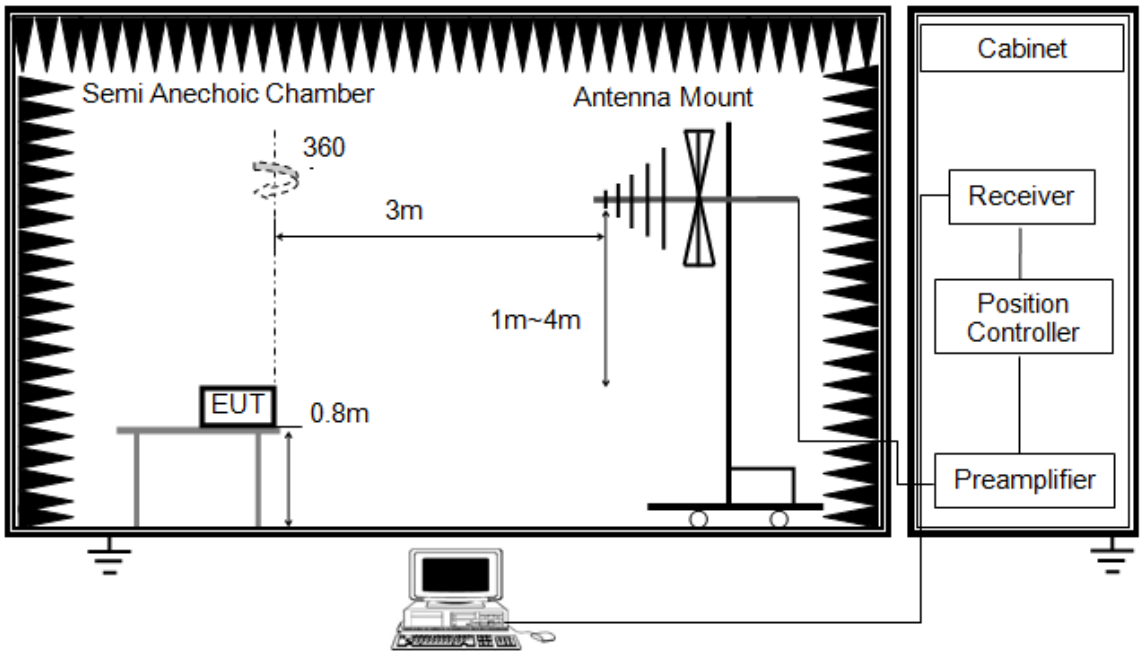
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a 1m height antenna tower.

5. The radiated emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector

6. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. 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. For the actual test configuration, please refer to the related item in this test report (Photographs of the Test Configuration)

Below 1G



The setting of the spectrum analyser

RBW	120K
VBW	300K
Sweep	Auto
Detector	Peak/QP
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.

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. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

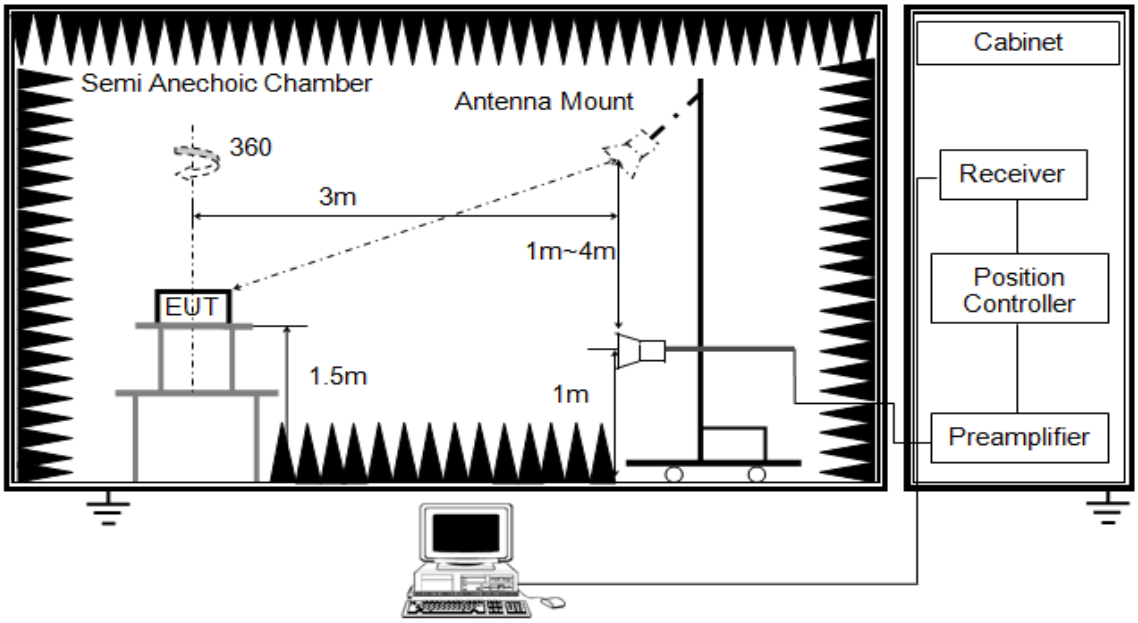
3. The EUT was placed on a turntable with 0.8 meter above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a 1m height antenna tower.

5. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. 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.

6. For the actual test configuration, please refer to the related item in this test report (Photographs of the Test Configuration)

ABOVE 1G



The setting of the spectrum analyser

RBW	1M
VBW	PEAK: 3M AVG: see note 6
Sweep	Auto
Detector	Peak
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.

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. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 1.5m above ground.

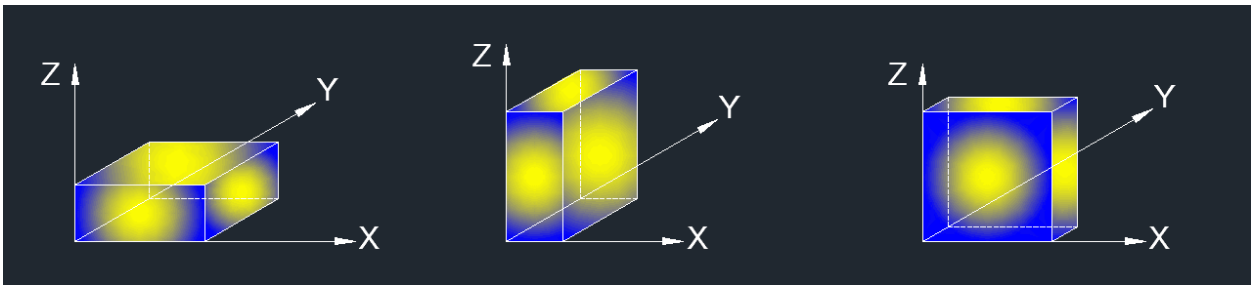
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

5. For measurement above 1GHz, the emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the limit specified in Section 15.209.

6. For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 8.1.ON TIME AND DUTY CYCLE.

7. For the actual test configuration, please refer to the related item in this test report (Photographs of the Test Configuration)

X axis, Y axis, Z axis positions:



Note: For all radiated test, EUT can only work in one axis(Z axis), so only this case (Z axis) data recorded in the report.

TEST ENVIRONMENT

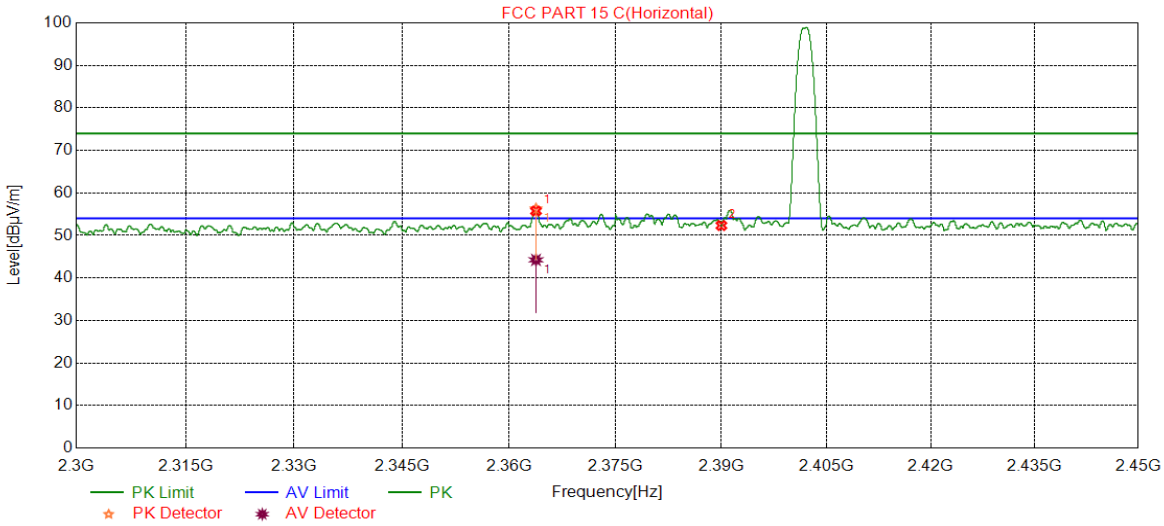
Temperature	20°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V

9.1. RESTRICTED BANDEDGE

Test Result Table

Test Mode	Channel	Puw(dBm)	Verdict
BLE	CH00	<Limit	PASS
	CH39	<Limit	PASS

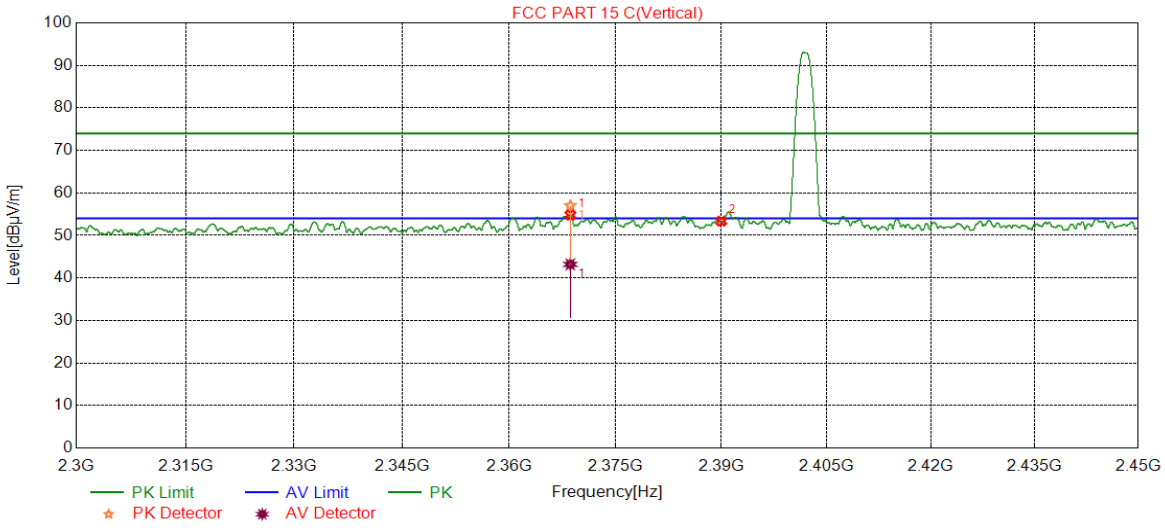
RESTRICTED BANDEDGE (CH00, HORIZONTAL)



No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	2363.7767	42.47	13.78	56.25	74.00	-17.75	peak
	2363.7767	30.47	13.78	44.25	54.00	-9.75	average
2	2390.0000	38.23	14.09	52.32	74.00	-21.68	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

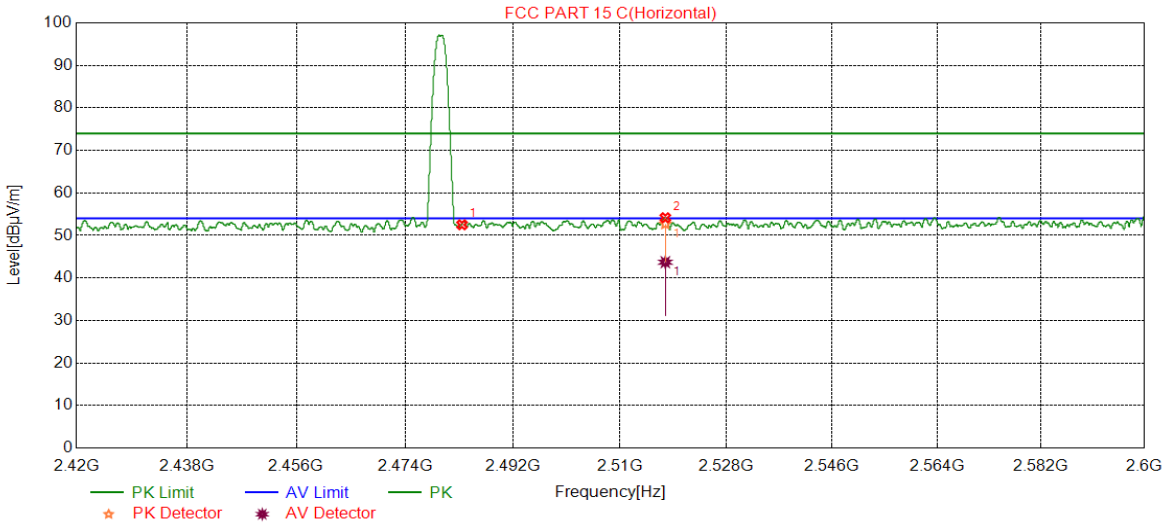
RESTRICTED BANDEDGE (CH00, VERTICAL)



No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	2368.6097	43.19	13.83	57.02	74.00	-16.98	peak
		29.36	13.83	43.19	54.00	-10.81	average
2	2390.0000	39.27	14.09	53.36	74.00	-20.64	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

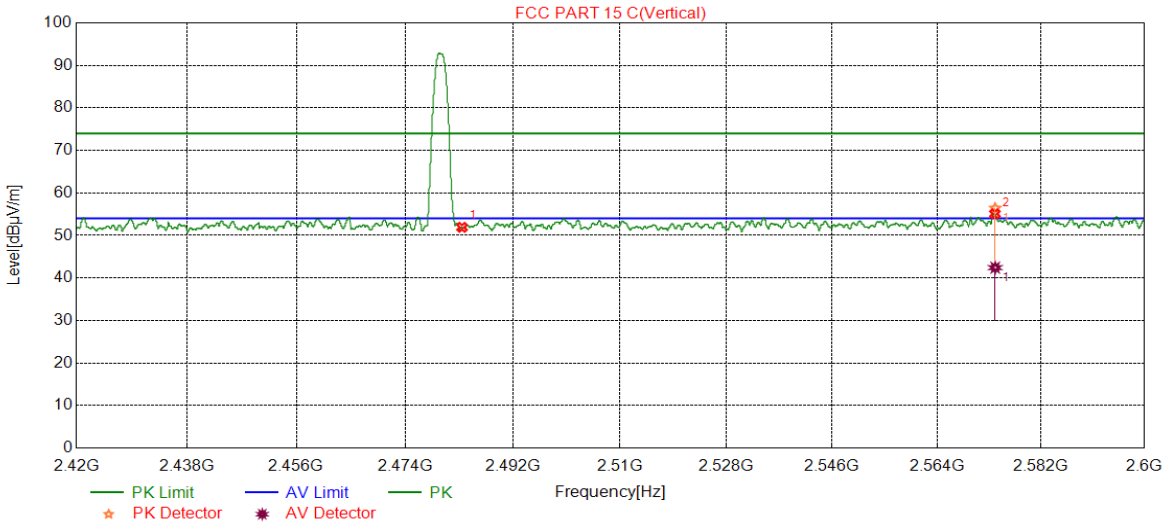
RESTRICTED BANDEDGE (CH39, HORIZONTAL)



No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.5000	38.62	13.88	52.50	74.00	-21.50	peak
2	2517.6418	38.43	14.27	52.70	74.00	-21.30	peak
		29.43	14.27	43.70	54.00	-10.30	average

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

RESTRICTED BANDEDGE (CH39, VERTICAL)

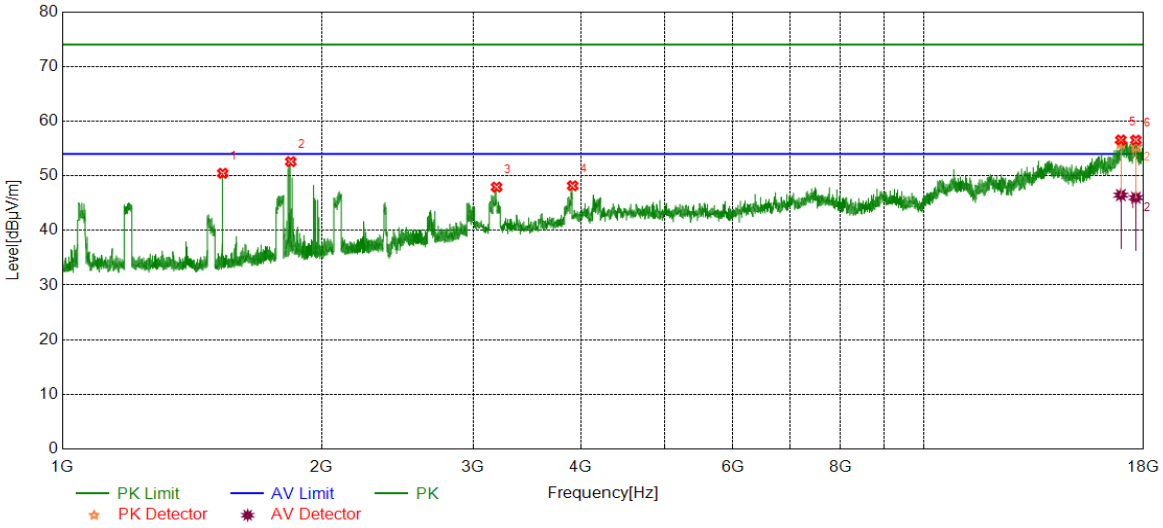


No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.5000	38.03	13.88	51.91	74.00	-22.09	peak
2	2574.0373	41.97	14.43	56.40	74.00	-17.60	peak
		27.99	14.43	42.42	54.00	-11.58	average

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

9.2. SPURIOUS EMISSIONS (1~18GHz)

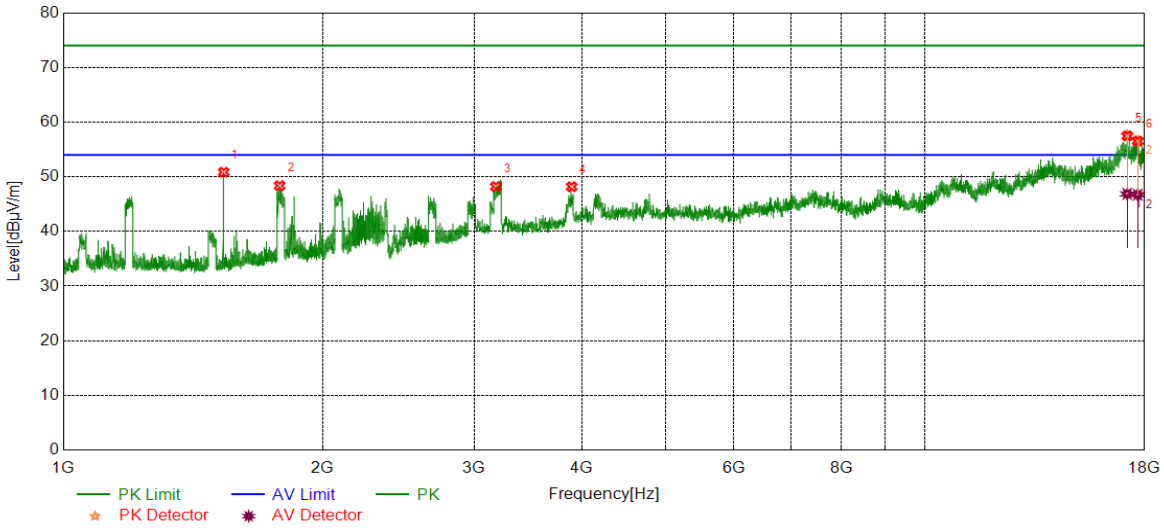
HARMONICS AND SPURIOUS EMISSIONS (CH00, HORIZONTAL)



No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	1535.8170	56.14	-5.68	50.46	74.00	-23.54	peak
2	1842.1053	56.44	-3.85	52.59	74.00	-21.41	peak
3	3193.1491	45.95	1.98	47.93	74.00	-26.07	peak
4	3913.2392	44.32	3.85	48.17	74.00	-25.83	peak
5	16936.7421	36.14	19.72	55.86	74.00	-18.14	peak
		26.75	19.72	46.47	54.00	-7.53	average
6	17632.4541	35.93	19.33	55.26	74.00	-18.74	peak
		26.67	19.33	46.00	54.00	-8.00	average

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. For below 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band Reject Filter losses.
5. For above 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.
6. Proper operation of the transmitter prior to adding the filter to the measurement chain.
7. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

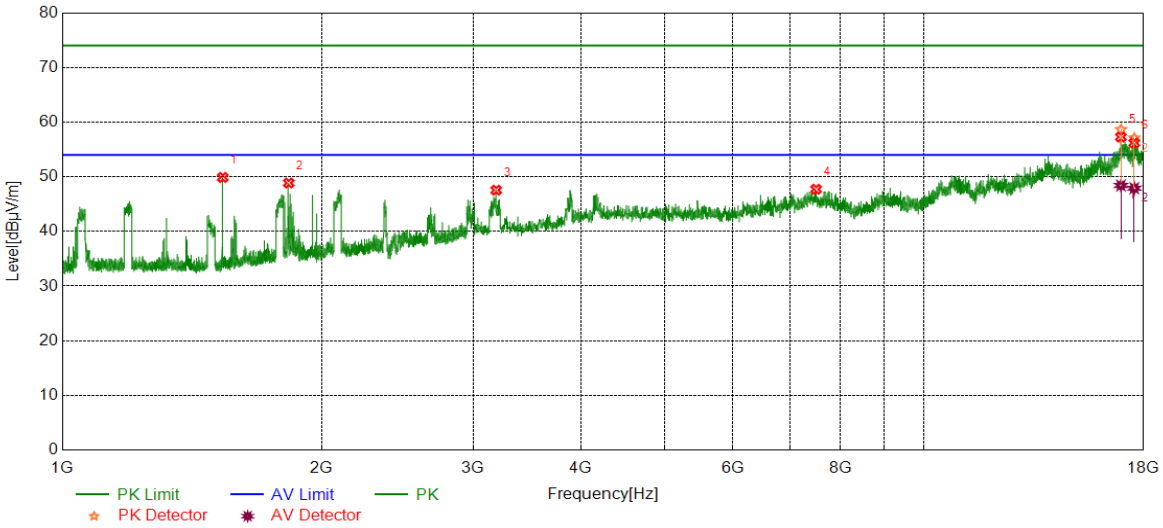
HARMONICS AND SPURIOUS EMISSIONS (CH00, VERTICAL)



No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	1535.8170	56.51	-5.68	50.83	74.00	-23.17	peak
2	1783.3479	52.30	-3.94	48.36	74.00	-25.64	peak
3	3178.1473	45.98	2.22	48.20	74.00	-25.80	peak
4	3892.6116	44.32	3.85	48.17	74.00	-25.83	peak
5	17182.3978	37.98	19.58	57.56	74.00	-16.44	peak
		27.29	19.58	46.87	54.00	-7.13	average
6	17669.9587	36.9	19.70	56.60	74.00	-17.40	peak
		27.02	19.70	46.72	54.00	-7.28	average

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. For below 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band Reject Filter losses.
5. For above 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.
6. Proper operation of the transmitter prior to adding the filter to the measurement chain.
7. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

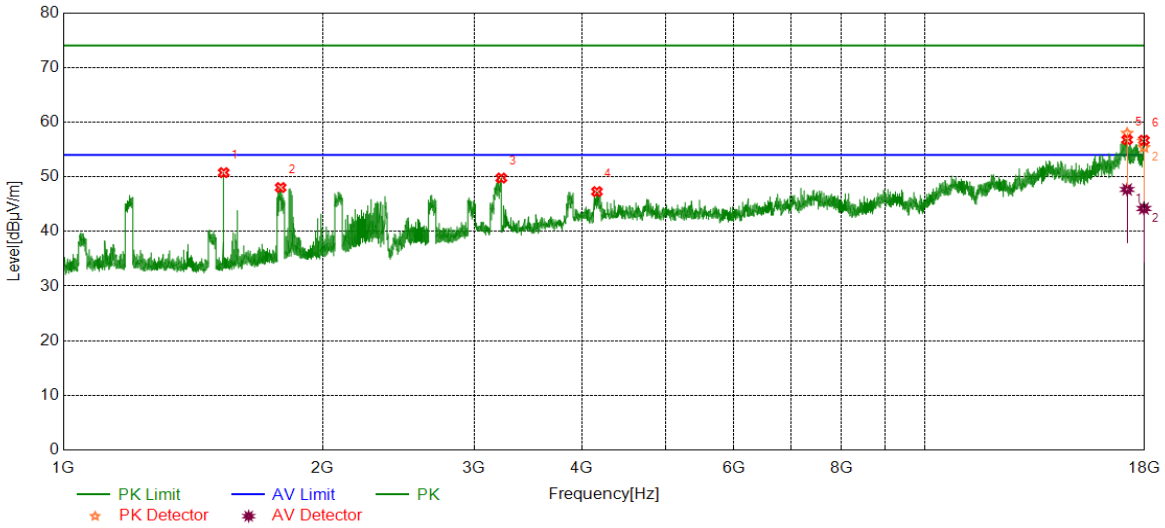
HARMONICS AND SPURIOUS EMISSIONS (CH19, HORIZONTAL)



No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	1535.8170	55.56	-5.68	49.88	74.00	-24.12	peak
2	1832.1040	52.74	-3.88	48.86	74.00	-25.14	peak
3	3189.3987	45.51	2.04	47.55	74.00	-26.45	peak
4	7500.5626	38.56	9.16	47.72	74.00	-26.28	peak
5	16940.4926	38.57	20.08	58.65	74.00	-15.35	peak
		28.33	20.08	48.41	54.00	-5.59	average
6	17557.4447	37.86	19.23	57.09	74.00	-16.91	peak
		28.68	19.23	47.91	54.00	-6.09	average

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. For below 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band Reject Filter losses.
5. For above 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.
6. Proper operation of the transmitter prior to adding the filter to the measurement chain.
7. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

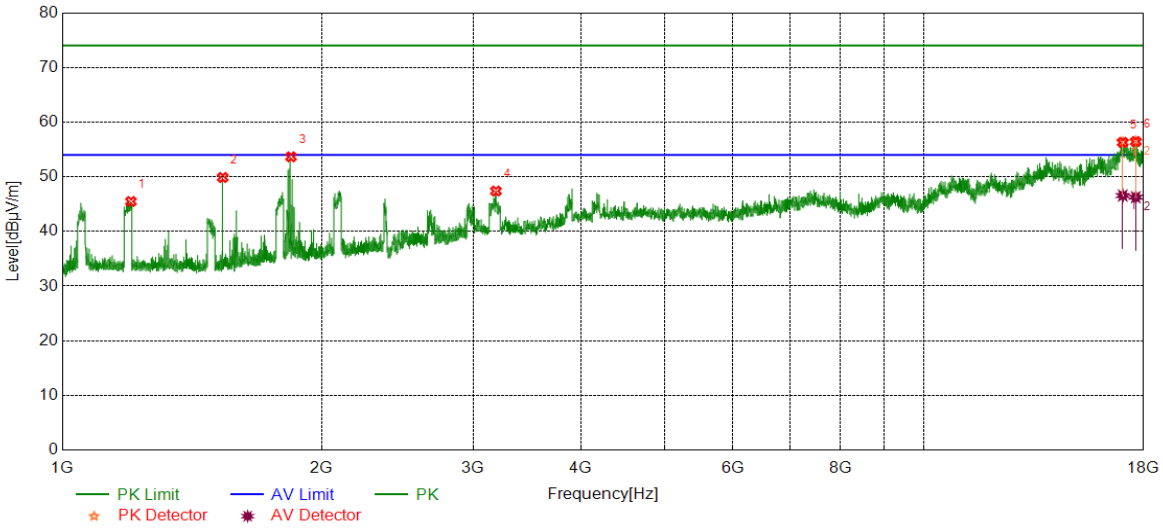
HARMONICS AND SPURIOUS EMISSIONS (CH19, VERTICAL)



No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	1535.8170	56.44	-5.68	50.76	74.00	-23.24	peak
2	1788.0985	52.00	-3.97	48.03	74.00	-25.97	peak
3	3225.0281	48.01	1.76	49.77	74.00	-24.23	peak
4	4164.5206	42.61	4.68	47.29	74.00	-26.71	peak
5	17176.7721	38.42	19.54	57.96	74.00	-16.04	peak
		28.14	19.54	47.68	54.00	-6.32	average
6	17966.2458	36.94	18.43	55.37	74.00	-18.63	peak
		25.76	18.43	44.19	54.00	-9.81	average

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. For below 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band Reject Filter losses.
5. For above 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.
6. Proper operation of the transmitter prior to adding the filter to the measurement chain.
7. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

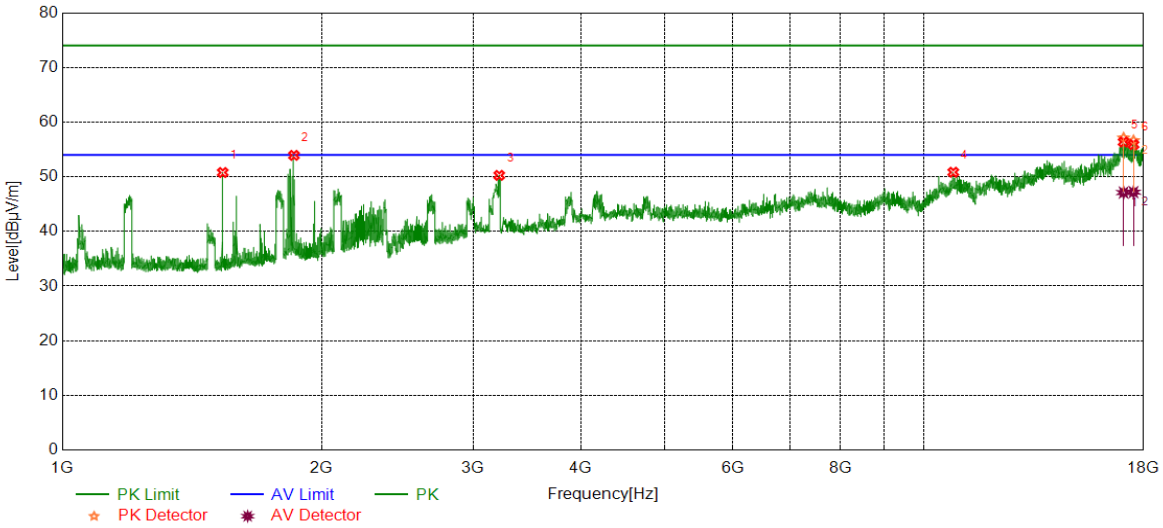
HARMONICS AND SPURIOUS EMISSIONS (CH39, HORIZONTAL)



No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	1201.7752	51.03	-5.55	45.48	74.00	-28.52	peak
2	1535.8170	55.55	-5.68	49.87	74.00	-24.13	peak
3	1843.3554	57.47	-3.82	53.65	74.00	-20.35	peak
4	3187.5234	45.32	2.07	47.39	74.00	-26.61	peak
5	17023.0029	36.13	20.18	56.31	74.00	-17.69	peak
		26.39	20.18	46.57	54.00	-7.43	average
6	17626.8284	37.36	19.09	56.45	74.00	-17.55	peak
		27.18	19.09	46.27	54.00	-7.73	average

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. For below 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band Reject Filter losses.
5. For above 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.
6. Proper operation of the transmitter prior to adding the filter to the measurement chain.
7. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

HARMONICS AND SPURIOUS EMISSIONS (CH39, VERTICAL)

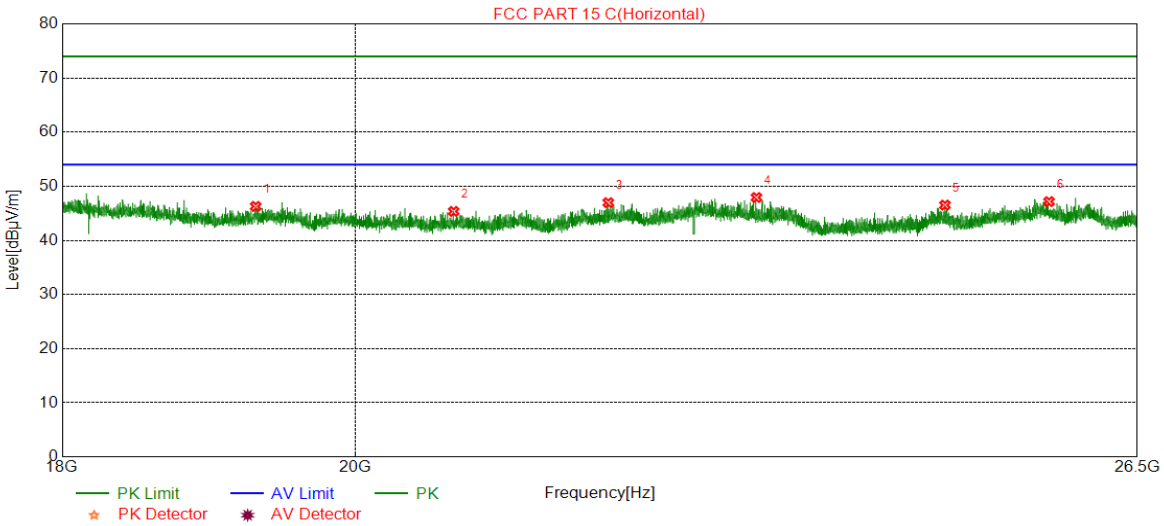


No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	1535.8170	56.46	-5.68	50.78	74.00	-23.22	peak
2	1857.8572	57.53	-3.61	53.92	74.00	-20.08	peak
3	3215.6520	48.45	1.81	50.26	74.00	-23.74	peak
4	10821.6027	38.12	12.71	50.83	74.00	-23.17	peak
5	17060.5076	36.58	20.52	57.10	74.00	-16.90	peak
		26.59	20.52	47.11	54.00	-6.89	average
6	17519.9400	36.72	19.89	56.61	74.00	-17.39	peak
		27.30	19.89	47.19	54.00	-6.81	average

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. For below 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for Band Reject Filter losses.
5. For above 3GHz part, Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for HPF losses.
6. Proper operation of the transmitter prior to adding the filter to the measurement chain.
7. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

9.3. SPURIOUS EMISSIONS (18~26GHz)

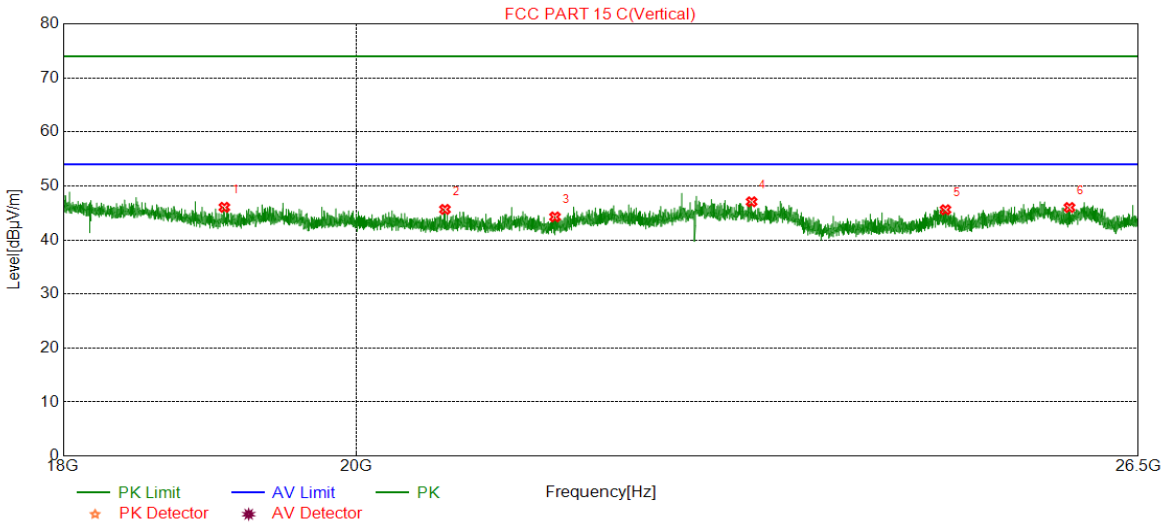
SPURIOUS EMISSIONS (CH19, WORST-CASE CONFIGURATION, HORIZONTAL)



No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	19298.0798	47.16	-0.88	46.28	74.00	-27.72	peak
2	20722.8223	46.22	-0.87	45.35	74.00	-28.65	peak
3	21908.6909	46.93	0.04	46.97	74.00	-27.03	peak
4	23108.1608	46.98	0.94	47.92	74.00	-26.08	peak
5	24730.1230	46.78	-0.26	46.52	74.00	-27.48	peak
6	25673.7174	46.02	1.14	47.16	74.00	-26.84	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

SPURIOUS EMISSIONS (CH19, WORST-CASE CONFIGURATION, VERTICAL)



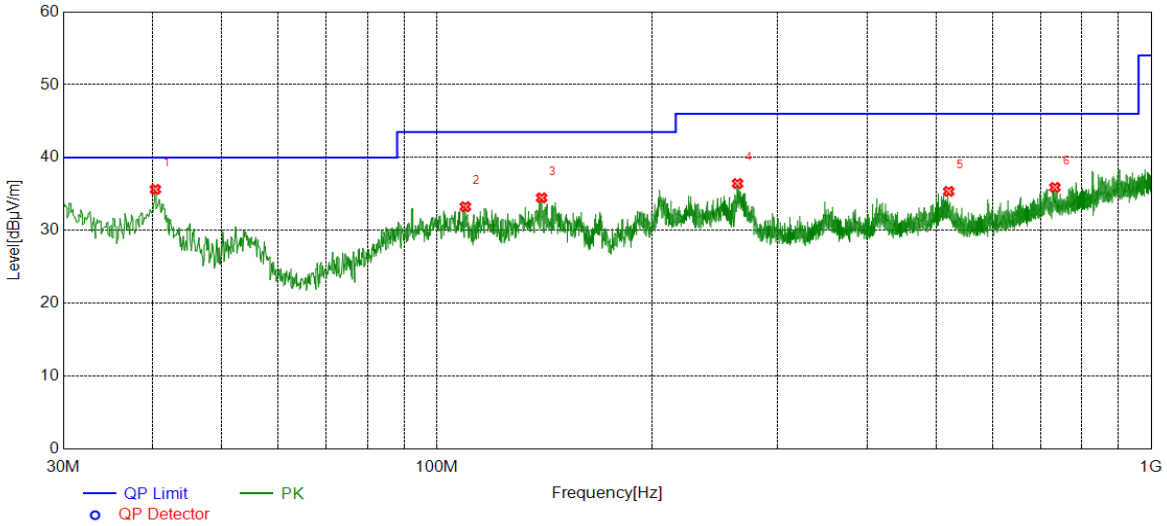
No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	19074.5075	47.11	-1.07	46.04	74.00	-27.96	peak
2	20650.5651	46.47	-0.82	45.65	74.00	-28.35	peak
3	21484.4985	44.79	-0.53	44.26	74.00	-29.74	peak
4	23059.7060	46.00	1.06	47.06	74.00	-26.94	peak
5	24725.8726	45.86	-0.27	45.59	74.00	-28.41	peak
6	25853.9354	44.57	1.43	46.00	74.00	-28.00	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

Note: All constructions and test modes have been tested, only the worst data record in the report

9.4. SPURIOUS EMISSIONS (0.03 ~ 1 GHz)

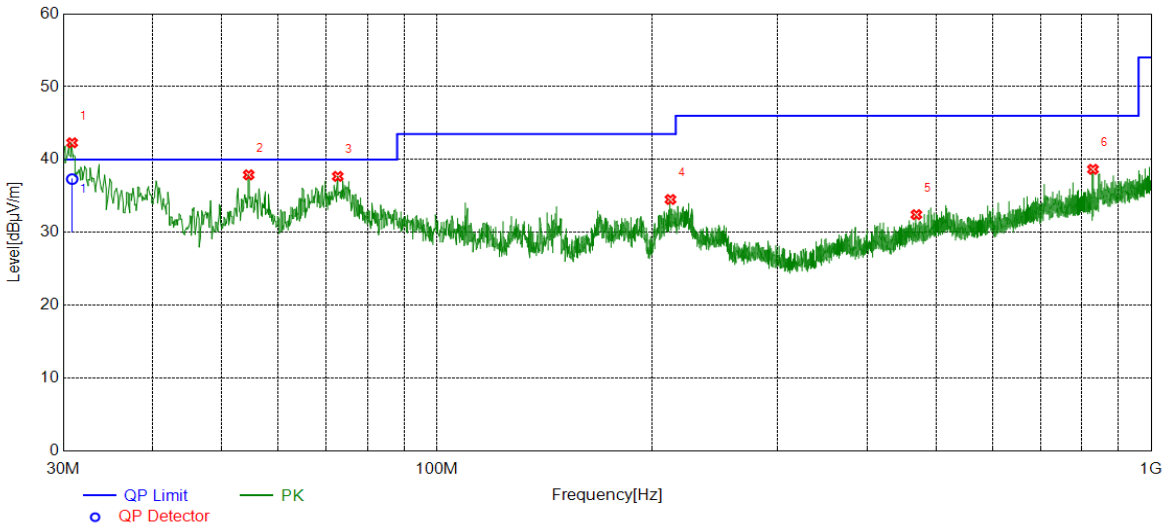
SPURIOUS EMISSIONS (CH19, WORST-CASE CONFIGURATION, HORIZONTAL)



No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	40.3800	15.10	20.53	35.63	40.00	-4.37	peak
2	109.6450	14.74	18.51	33.25	43.50	-10.25	peak
3	140.2030	14.55	19.92	34.47	43.50	-9.03	peak
4	263.5994	17.11	19.32	36.43	46.00	-9.57	peak
5	520.7721	9.46	25.90	35.36	46.00	-10.64	peak
6	733.2233	6.96	28.94	35.90	46.00	-10.10	peak

Note: 1. Result Level = Read Level + Correct Factor.
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

SPURIOUS EMISSIONS (CH19, WORST-CASE CONFIGURATION, VERTICAL)



No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	30.8731	15.71	26.59	42.30	40.00	2.30	peak
		10.73	26.59	37.32	40.00	-2.68	QP
2	54.5435	23.60	14.30	37.90	40.00	-2.10	peak
3	72.6843	23.06	14.63	37.69	40.00	-2.31	peak
4	212.3782	16.34	18.18	34.52	43.50	-8.98	peak
5	469.1629	7.60	24.84	32.44	46.00	-13.56	peak
6	828.8749	8.50	30.16	38.66	46.00	-7.34	peak

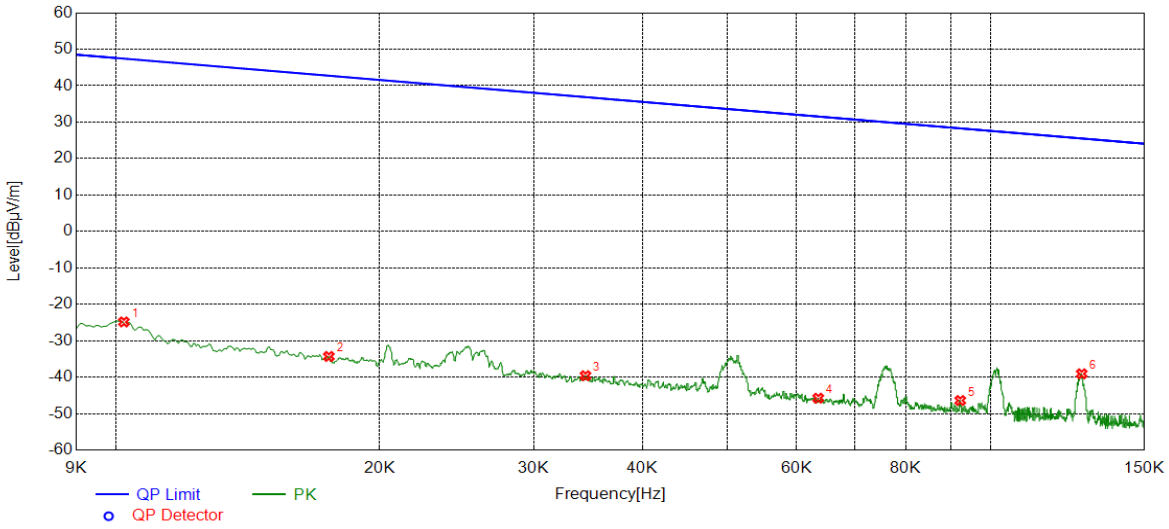
Note: 1. Result Level = Read Level + Correct Factor.
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

Note: All constructions and test modes have been tested, only the worst data record in the report.

9.5. SPURIOUS EMISSIONS BELOW 30M

SPURIOUS EMISSIONS (CH19, WORST-CASE CONFIGURATION, Face-on)

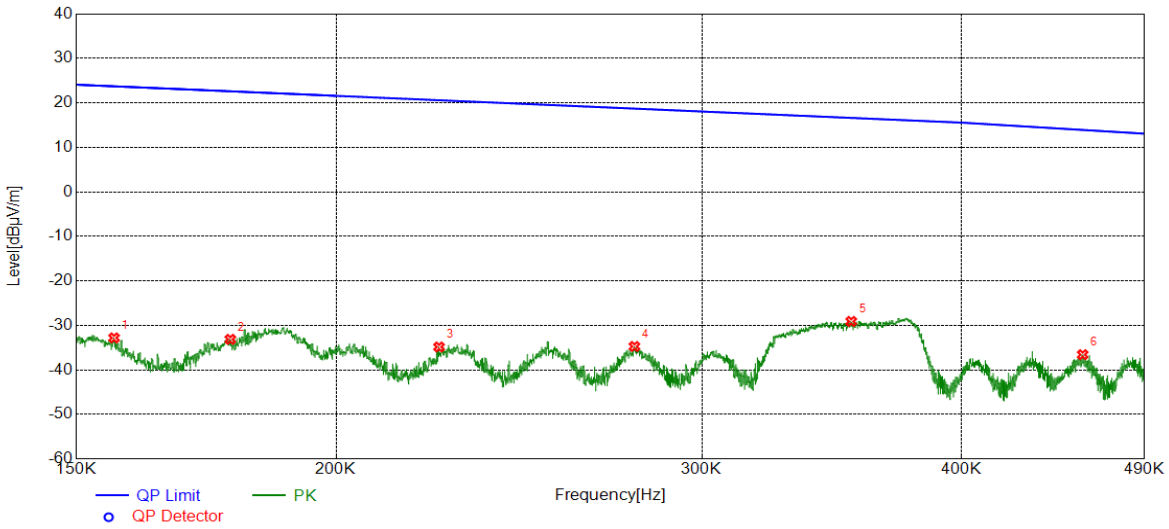
9kHz ~ 150kHz



No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.0102	36.41	-61.25	-24.84	47.45	-72.29	peak
2	0.0175	26.71	-61.03	-34.32	42.73	-77.05	peak
3	0.0344	21.45	-61.05	-39.60	36.86	-76.46	peak
4	0.0635	15.60	-61.37	-45.77	31.55	-77.32	peak
5	0.0923	14.66	-61.07	-46.41	28.30	-74.71	peak
6	0.1271	22.10	-61.18	-39.08	25.53	-64.61	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.
3. All 3 polarizations(Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report

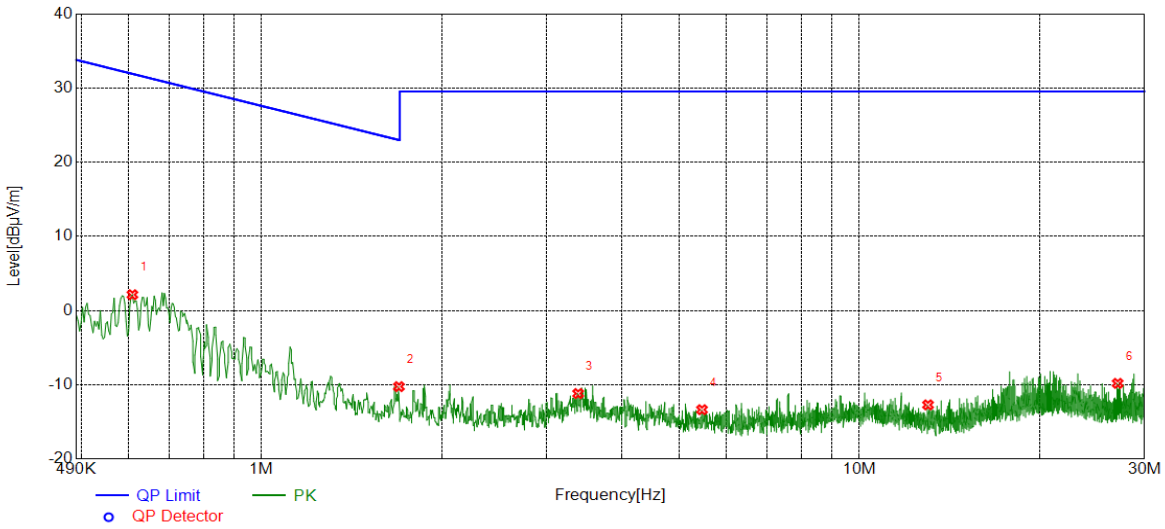
150kHz ~ 490kHz



No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.1564	28.62	-61.42	-32.80	23.72	-56.52	peak
2	0.1779	28.18	-61.31	-33.13	22.60	-55.73	peak
3	0.2242	26.22	-61.07	-34.85	20.59	-55.44	peak
4	0.2784	26.19	-60.92	-34.73	18.71	-53.44	peak
5	0.3540	31.75	-60.85	-29.10	16.62	-45.72	peak
6	0.4575	24.19	-60.76	-36.57	13.92	-50.49	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.
3. All 3 polarizations(Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report

490kHz ~ 30MHz



No.	Frequency	Reading Level	Correct Factor	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.6081	22.90	-20.76	2.14	31.92	-29.78	peak
2	1.6971	10.13	-20.38	-10.25	23.01	-33.26	peak
3	3.3852	9.24	-20.42	-11.18	29.54	-40.72	peak
4	5.4541	6.89	-20.25	-13.36	29.54	-42.90	peak
5	13.0242	6.52	-19.23	-12.71	29.54	-42.25	peak
6	27.0458	8.30	-18.11	-9.81	29.54	-39.35	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.
3. All 3 polarizations(Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report

Note: All constructions and test modes and channels have been tested, only the worst data record in the report.

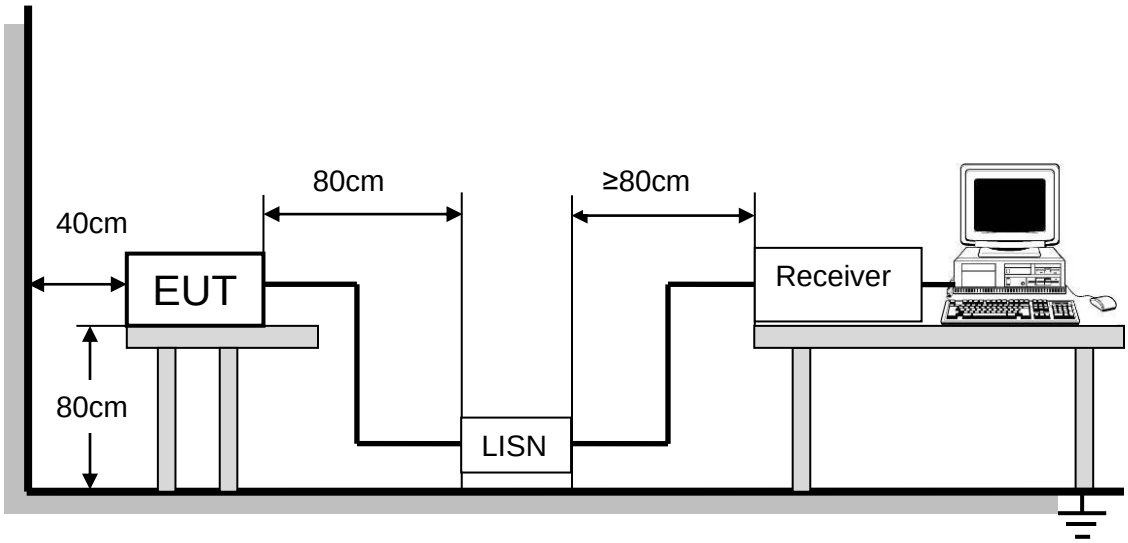
10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

Please refer to CFR 47 FCC §15.207 (a)

FREQUENCY (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

TEST SETUP AND PROCEDURE



The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 7 and 13 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 mode. The bandwidth of EMI test receiver is set at 9kHz.

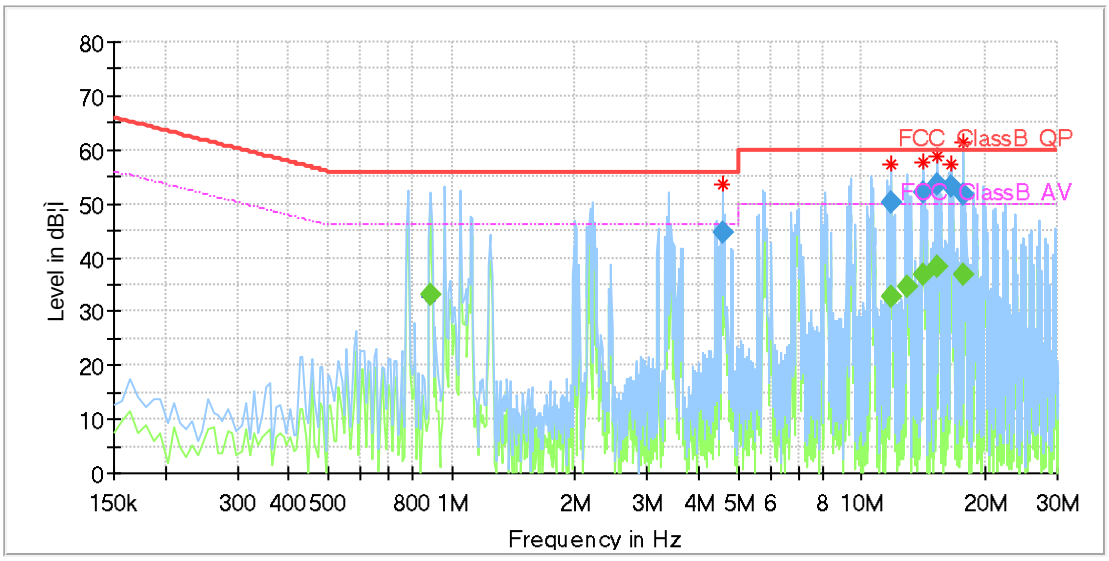
The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

TEST ENVIRONMENT

Temperature	20°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V

TEST RESULTS

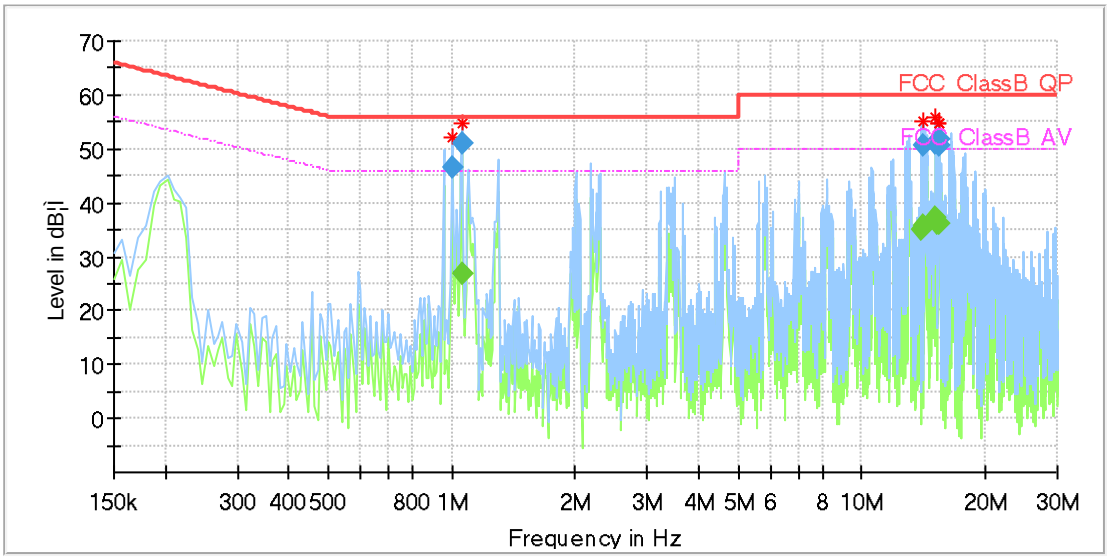
LINE N RESULTS (MID CHANNEL, WORST-CASE CONFIGURATION)



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.888788	---	33.14	46.00	12.86	1000.0	9.000	N	OFF	9.8
4.590188	44.74	---	56.00	11.26	1000.0	9.000	N	OFF	9.8
11.754188	---	32.83	50.00	17.17	1000.0	9.000	N	OFF	9.9
11.754188	50.31	---	60.00	9.69	1000.0	9.000	N	OFF	9.9
12.925800	---	34.71	50.00	15.29	1000.0	9.000	N	OFF	9.8
14.134725	52.06	---	60.00	7.94	1000.0	9.000	N	OFF	9.8
14.134725	---	36.91	50.00	13.09	1000.0	9.000	N	OFF	9.8
15.298875	---	38.45	50.00	11.55	1000.0	9.000	N	OFF	9.7
15.343650	53.61	---	60.00	6.39	1000.0	9.000	N	OFF	9.7
16.574963	53.27	---	60.00	6.73	1000.0	9.000	N	OFF	9.8
17.716725	---	36.87	50.00	13.13	1000.0	9.000	N	OFF	9.8
17.716725	51.54	---	60.00	8.46	1000.0	9.000	N	OFF	9.8

LINE L RESULTS (MID CHANNEL, WORST-CASE CONFIGURATION)



Final_Result

Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
1.000725	46.51	---	56.00	9.49	1000.0	9.000	L1	OFF	9.8
1.060425	---	26.68	46.00	19.32	1000.0	9.000	L1	OFF	9.7
1.060425	50.89	---	56.00	5.11	1000.0	9.000	L1	OFF	9.7
13.948163	---	35.02	50.00	14.98	1000.0	9.000	L1	OFF	9.8
14.179500	---	35.88	50.00	14.12	1000.0	9.000	L1	OFF	9.8
14.194425	50.73	---	60.00	9.27	1000.0	9.000	L1	OFF	9.8
15.179475	51.01	---	60.00	8.99	1000.0	9.000	L1	OFF	9.8
15.186938	---	37.24	50.00	12.76	1000.0	9.000	L1	OFF	9.8
15.321263	---	36.06	50.00	13.94	1000.0	9.000	L1	OFF	9.8
15.380963	50.48	---	60.00	9.52	1000.0	9.000	L1	OFF	9.8
15.380963	---	36.16	50.00	13.84	1000.0	9.000	L1	OFF	9.8
15.448125	51.92	---	60.00	8.08	1000.0	9.000	L1	OFF	9.8

Note: All the test modes have been tested, only the worst data record in the report.

11. ANTENNA REQUIREMENTS

APPLICABLE REQUIREMENTS

Please refer to FCC §15.203
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Please refer to FCC §15.247(b)(4)
The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RESULTS

Complies

END OF REPORT