CFR 47 FCC PART 15 SUBPART C

CERTIFICATION TEST REPORT

For

Weather station LCD-USA Version

MODEL NUMBER: AFT 77 A1, MBö-320042

FCC ID: 2AJ9O-AFT77A1

REPORT NUMBER: 4788874188.1-1

ISSUE DATE: February 27, 2019

Prepared for

Lidl US, LLC
3500 S. Clark Street Arlington Virginia United States

Prepared by

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Revision History

Rev.	Issue Date	Revisions	Revised By
V0	02/27/2019	Initial Issue	

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Summary of Test Results			
Clause	Test Items	FCC Rules	Test Results
1	Transmitter Timeout	CFR 47 FCC 15.231 (a) (1)	PASS
2	20dB Bandwidth	CFR 47 FCC 15.231 (c)	PASS
3	Radiated emission	CFR 47 FCC 15.231 (b)/15.205/15.209	PASS
4	Antenna Requirement	FCC Part 15.203	Pass

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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name:	Lidl US, LLC
Address:	3500 S. Clark Street Arlington Virginia United States

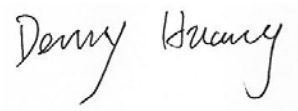
Manufacturer Information

Company Name:	Putian Yijia Electronic Co.,Ltd
Address:	The west of Lihan Avenue Hanjiang District,Putian,Fujian,China

EUT Name:	Weather station LCD-USA Version
Brand:	/
Model:	AFT 77 A1, MBö-320042
Model Difference:	All the same except for the model name.
Sample Status:	Normal
Sample ID:	192087442
Sample Received Date:	February 18, 2019
Date of Tested:	February 19, 2019 ~ February 26, 2019

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

Tested By:



Denny Huang
Engineer Project Associate

Checked By:

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Laboratory Leader

Approved By:

Stephen Guo

Laboratory Manager

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2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10-2013, CFR 47 FCC Part 2, CFR 47 FCC Part 15 and KDB414788 D01 Radiated Test Site v01r01.

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	**A2LA (Certificate No.: 4102.01)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA. **FCC (FCC Designation No.: CN1187)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's Delcaration of Conformity (DoC) and Certification rules **IC(Company No.: 21320)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with ISED. The Company Number is 21320. **VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793. Facility Name: Chamber D, the VCCI registration No. is G-20019 and R-20004 Shielding Room B , the VCCI registration No. is C-20012 and T-20011

Note:

1. All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China
2. The test anechoic chamber in UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch 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.
3. For below 30MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. And these measurements below 30MHz had been correlated to measurements performed on an OFS.

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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	3.62dB
Radiation Emission test(include Fundamental emission) (9kHz-30MHz)	2.2dB
Radiation Emission test(include Fundamental emission) (30MHz-1GHz)	4.00dB
Radiation Emission test (1GHz to 26GHz)(include Fundamental emission)	5.78dB (1GHz-18Gz)
	5.23dB (18GHz-26Gz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

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5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

EUT Name	Weather station LCD-USA Version
EUT Description	The EUT is controller.
Model	AFT 77 A1
Series Model	MBö-320042
Model Difference	All the same except for the model name.
Operation Frequency	433.92MHz
Modulation Type	FSK
Battery	DC 1.5V (AA)*2

5.2. TEST CHANNEL CONFIGURATION

Test Mode	Frequency
FSK	433.92MHz

5.3. TEST ENVIRONMENT

Environment Parameter	Selected Values During Tests	
Relative Humidity	55 ~ 65%	
Atmospheric Pressure:	1025Pa	
Temperature	TN	23 ~ 28°C
Voltage :	VL	N/A
	VN	DC 3.0V
	VH	N/A

Note: VL= Lower Extreme Test Voltage
VN= Nominal Voltage, DC 3V via Battery
VH= Upper Extreme Test Voltage
TN= Normal Temperature

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5.4. DESCRIPTION OF AVAILABLE ANTENNAS

Frequency (MHz)	Antenna Type	Antenna Gain (dBi)
433.92	Coil Antenna	0

5.5. WORST-CASE CONFIGURATIONS

Mode
FSK

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5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	P/N
1	/	/	/	/

I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	/	/	/	/	/

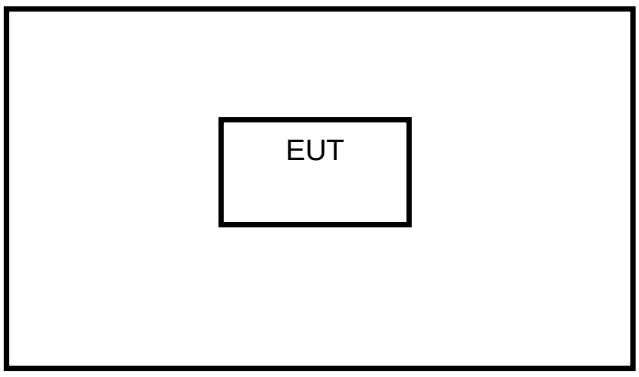
ACCESSORY

Item	Accessory	Brand Name	Model Name	Description
1	/	/	/	/

TEST SETUP

1. A new battery was used for all tests.
2. The test sample will enter transmit mode after power on.
3. The EUT has two operation modes:
   Mode 1: Manually transmitting mode
   Mode 2: Automatically periodic transmitting mode
   All the RF parameters of the transmit signal for the two modes are the same, so we only recorded the worst case data in the report.
4. The EUT has 3 channels: CH1, CH2 and CH3, the RF parameters of each channel are the same, the only difference is the silent period in mode 2.

SETUP DIAGRAM FOR TEST



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5.7. MEASURING INSTRUMENT AND SOFTWARE USED

Radiated Emissions						
Instrument						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☑	MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Dec.10,2018	Dec.10,2019
☑	Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	Sep.17,2018	Sep.17,2021
☑	Preamplifier	HP	8447D	2944A09099	Dec.10,2018	Dec.10,2019
☑	EMI Measurement Receiver	R&S	ESR26	101377	Dec.10,2018	Dec.10,2019
☑	Horn Antenna	TDK	HRN-0118	130939	Sep.17,2018	Sep.17,2021
☑	High Gain Horn Antenna	Schwarzbeck	BBHA-9170	691	Aug.18,2018	Aug.18,2021
☑	Preamplifier	TDK	PA-02-0118	TRS-305-00066	Dec.10,2018	Dec.10,2019
☑	Preamplifier	TDK	PA-02-2	TRS-307-00003	Dec.10,2018	Dec.10,2019
☑	Loop antenna	Schwarzbeck	1519B	00008	Jan.17, 2019	Jan.17,2022
Software						
Used	Description		Manufacturer	Name		Version
☑	Test Software for Radiated disturbance		Farad	EZ-EMC		Ver. UL-3A1
Other instruments						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☑	Spectrum Analyzer	Keysight	N9020A	MY49100060	Dec.10,2018	Dec.10,2019

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6. ANTENNA PORT TEST RESULTS

6.1. ON TIME AND DUTY CYCLE

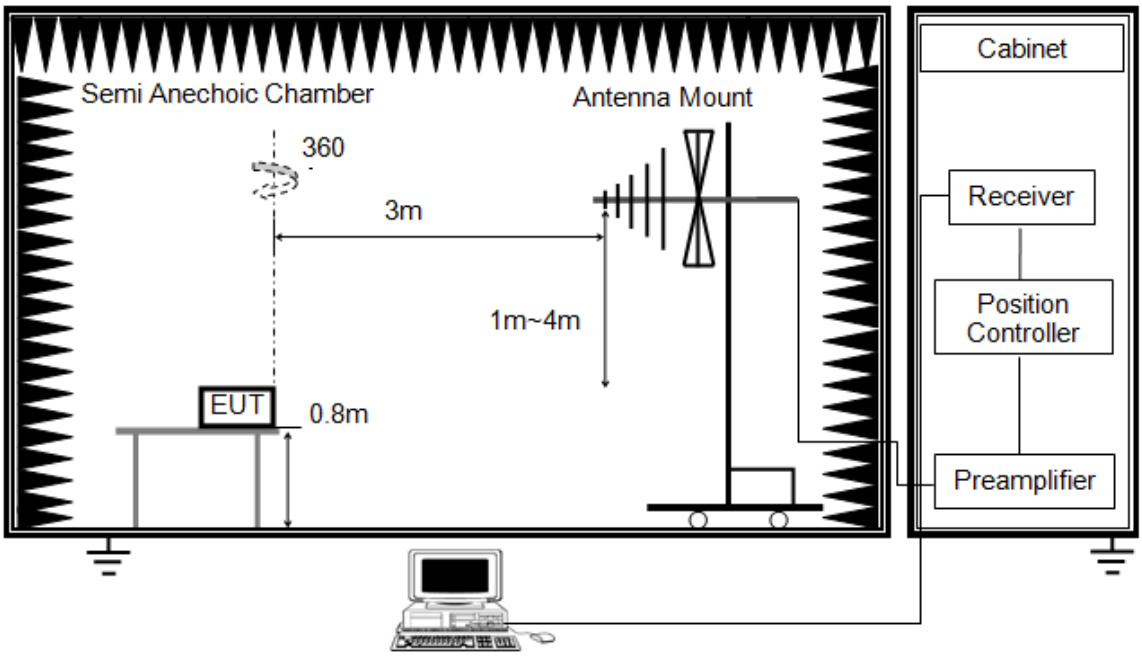
LIMITS

None; for reporting purposes only

PROCEDURE

FCC Reference:	CFR 47 Part 15.35(c)
Test Method Used:	ANSI C63.10 Section 7.5

TEST SETUP



a. Set RBW of spectrum analyzer to 100KHz and VBW to 300KHz.
b. Use a video trigger with the trigger level set to enable triggering only on full pulses.
c. Sweep Time is at least a 100 ms.
d. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
e. Measure the maximum time duration of one single pulse.

TEST ENVIRONMENT

Temperature	23.7°C	Relative Humidity	68%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.0V

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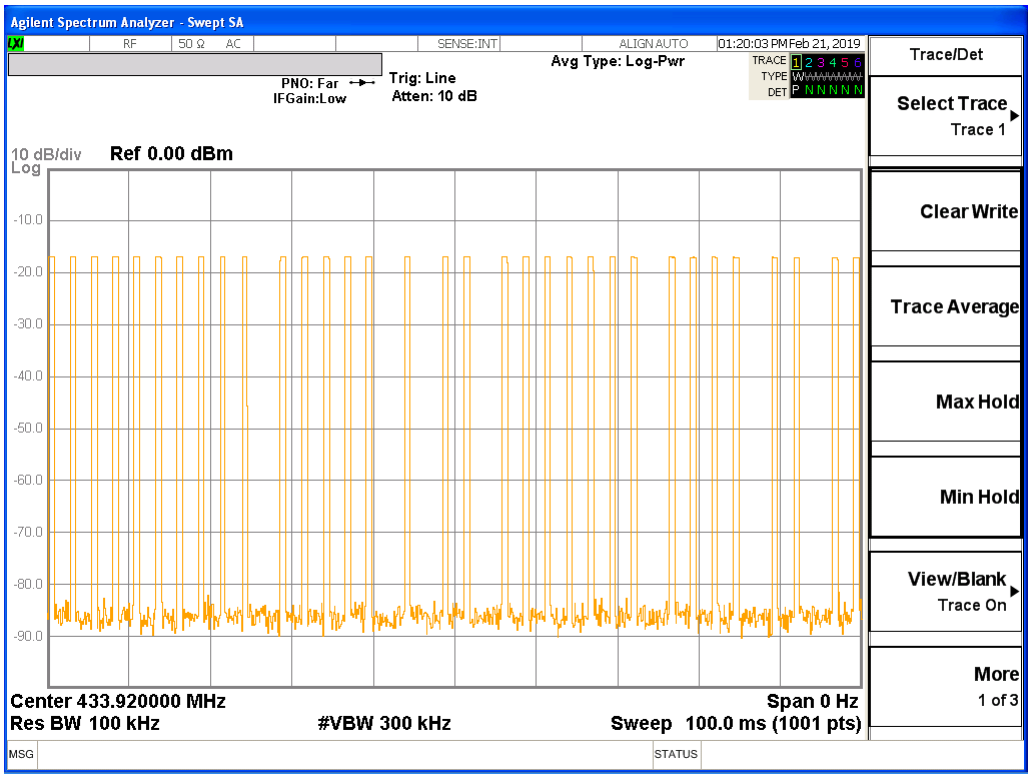
RESULTS

	On Time (ms)	Times	Total Ton times (ms)
Ton	0.61	33	20.13

Total Ton times (ms)	Period (ms)	Duty Cycle (Linear)	Duty Cycle Correction Factor
20.13	100	0.2013	-13.92

Note: Duty Cycle Correction Factor=20log(x).
Where: x is Duty Cycle

Ton - 1



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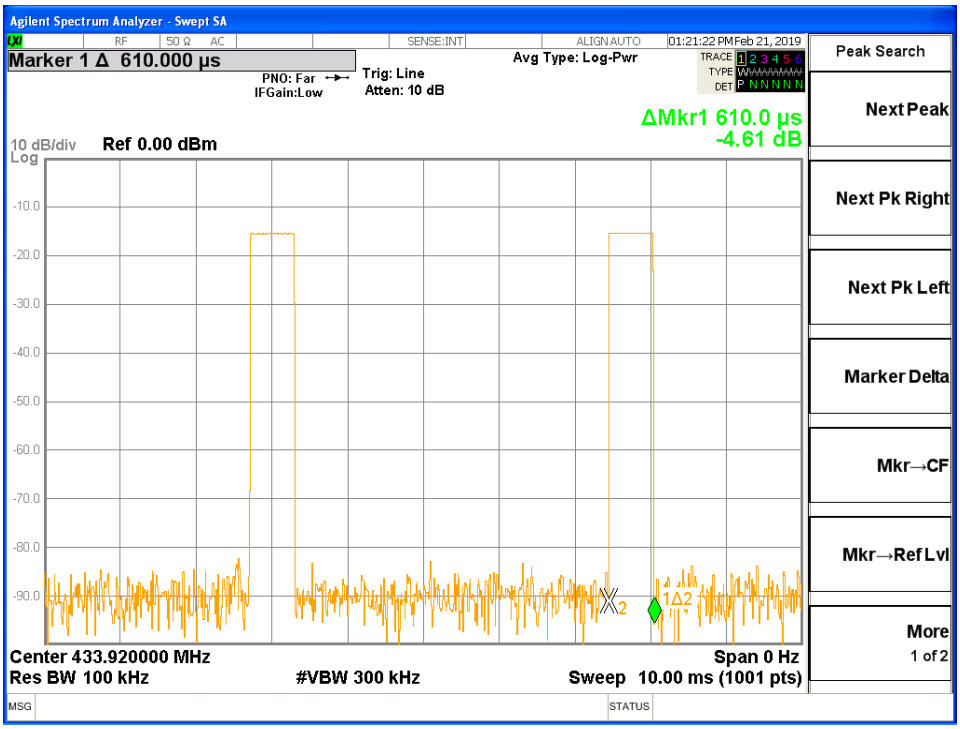
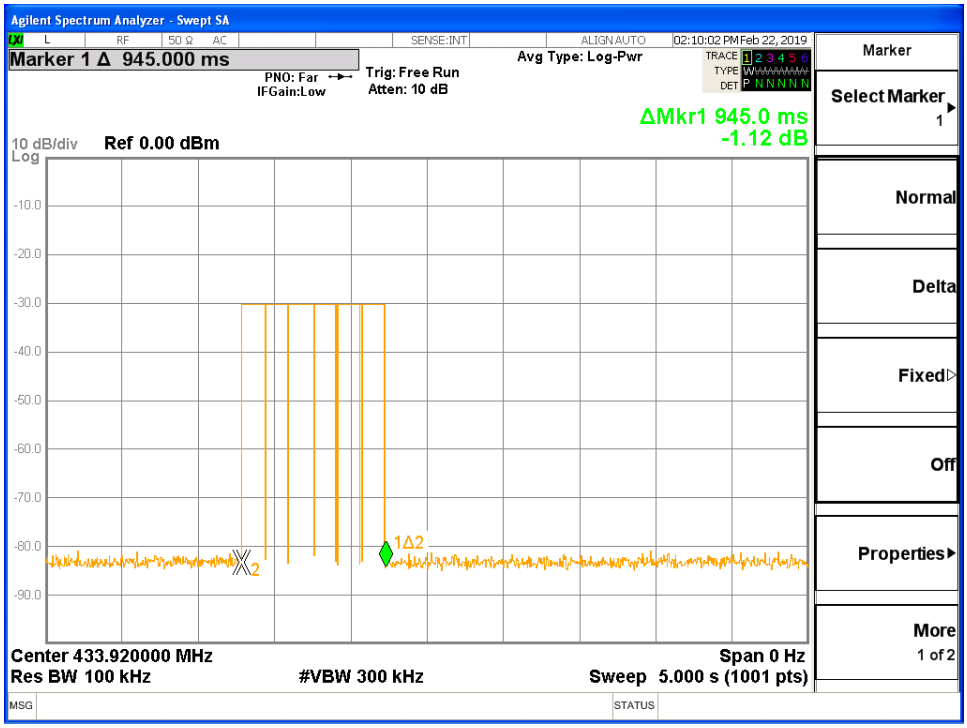
Ton - 2



Period



Note: Because the transmit period of the EUT already exceed 100ms, so 100ms was used for calculated.

Note: All the modes has been tested, only the worst (mode 2, CH1) data record in the report.

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6.2. TRANSMITTER TIMEOUT

LIMITS

CFR 47 Part 15.231(a):

A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

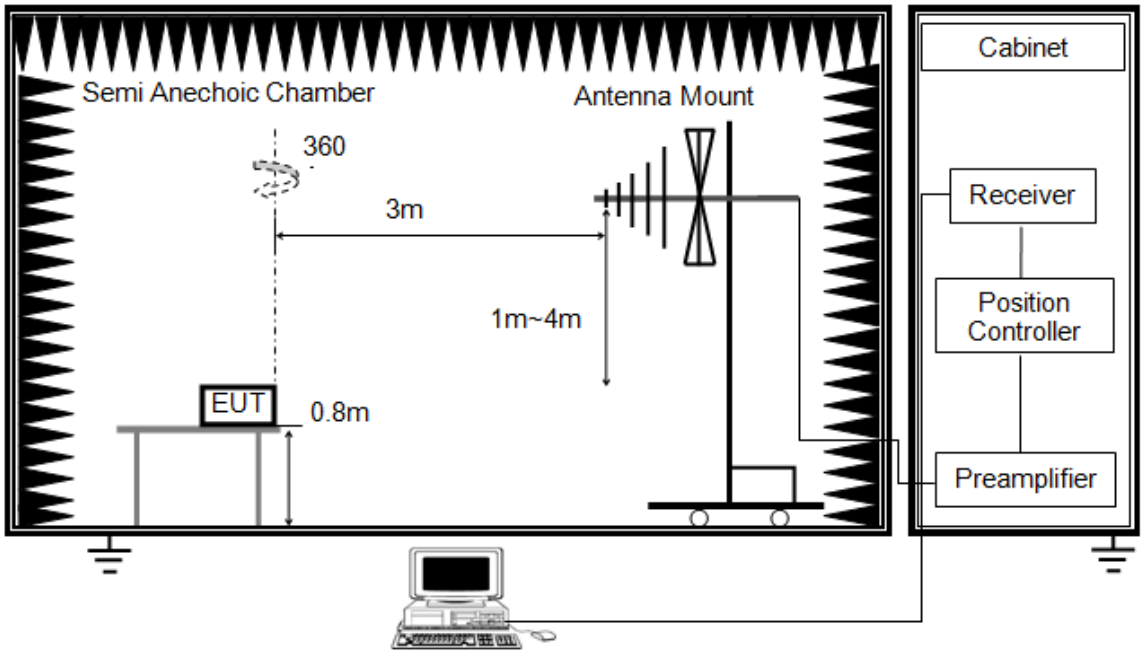
CFR 47 Part 15.231(e):

Devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

TEST PROCEDURE

FCC Reference:	CFR 47 Part 15.231(a)
Test Method Used:	The EUT transmitter was activated and monitored using a spectrum analyser for a period of 10 seconds.
FCC Reference:	CFR 47 FCC Part 15.231(e)
Test Method Used:	The duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

TEST SETUP



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For CFR 47 Part 15.231(a):

a. Set RBW of spectrum analyzer to 100KHz and VBW to 300KHz.
b. Use a video trigger with the trigger level set to enable triggering only on full pulses.
c. Sew Sweep Time to 10 s.
d. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
e. Measure the maximum time duration of one single pulse.

For CFR 47 Part 15.231(e):

a. Set RBW of spectrum analyzer to 100KHz and VBW to 300KHz.
b. Use a video trigger with the trigger level set to enable triggering only on full pulses.
c. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
d. Measure the maximum time duration of one single pulse.

TEST ENVIRONMENT

Temperature	23.7°C	Relative Humidity	68%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.0V

RESULTS

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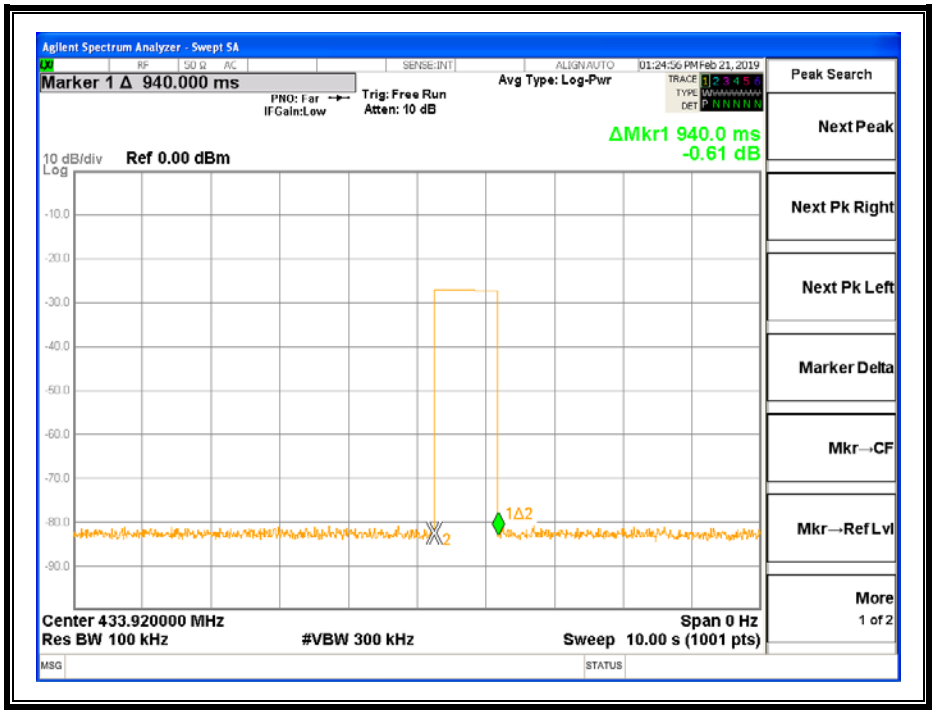
Manually transmitting mode			
Deactivation Time (seconds)	Limit (seconds)	Margin (seconds)	Result
0.94	5.000	4.06	PASS



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

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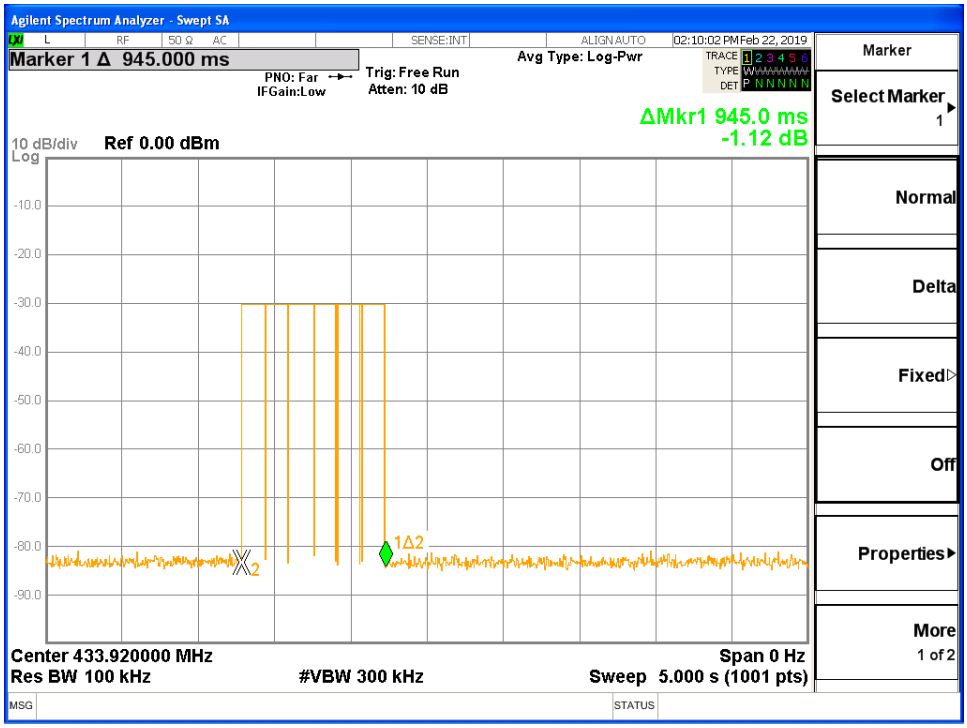
Automatically periodic transmitting mode						
Chanel	On Time (ms)	Limit (S)	On Time*30 (s)	Period (s)	OFF Time (s)	Limit (S)
CH 1	945	1	28.35	49.315	48.37	10
CH 2	945	1	28.35	52.815	51.87	10
CH 3	945	1	28.35	55.755	54.81	10

CH 1 Test Plot - 1



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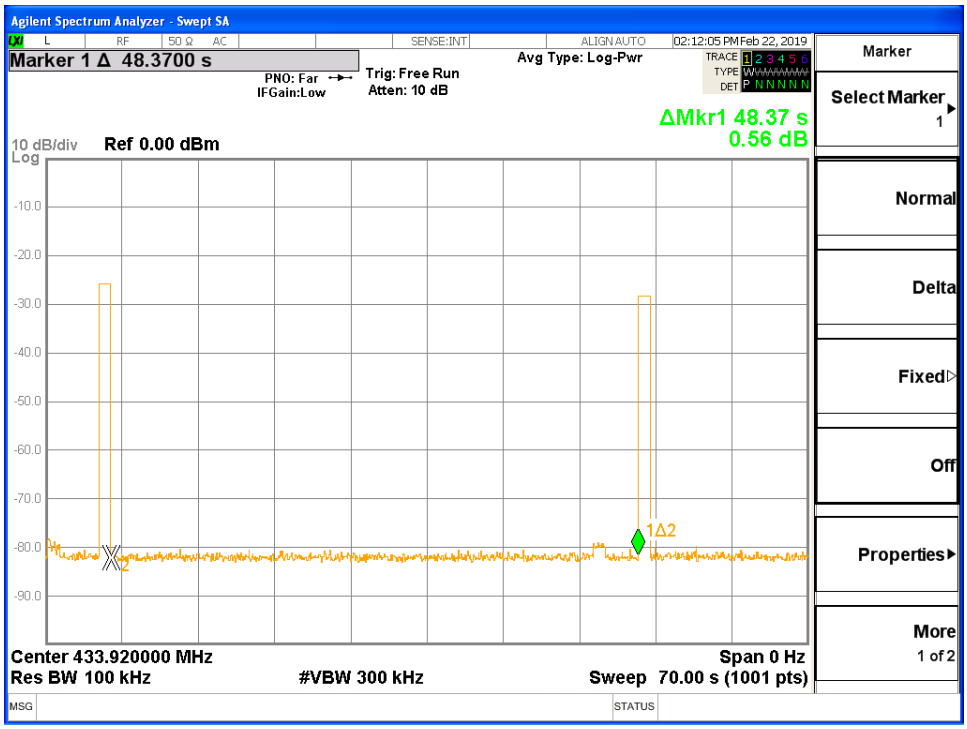
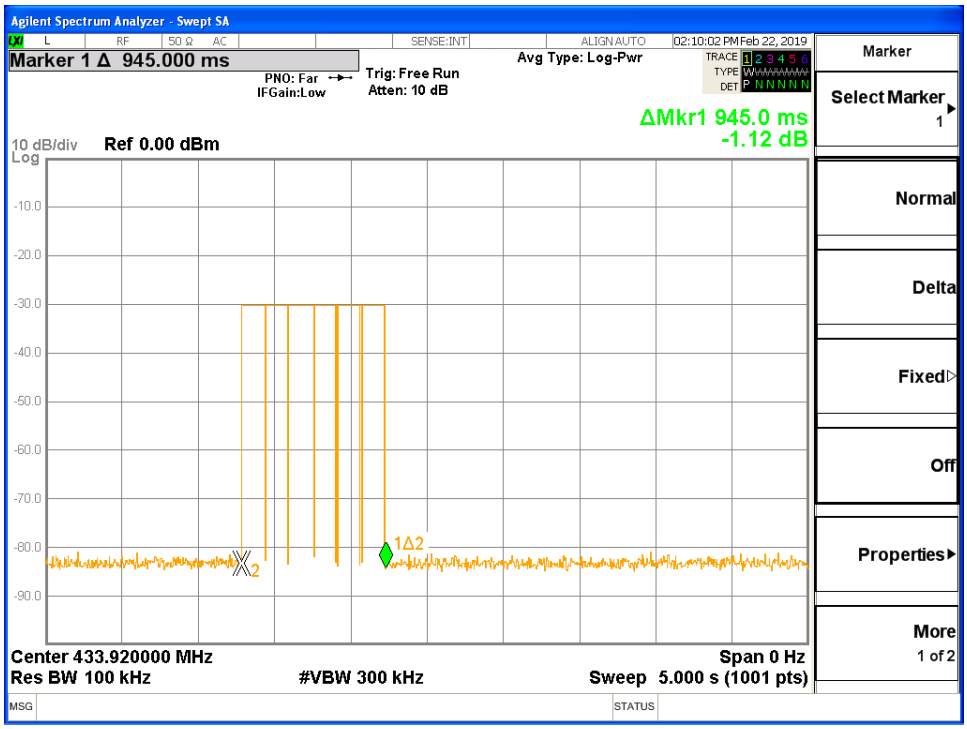
CH 1 Test Plot – 2



CH 2 Test Plot - 1



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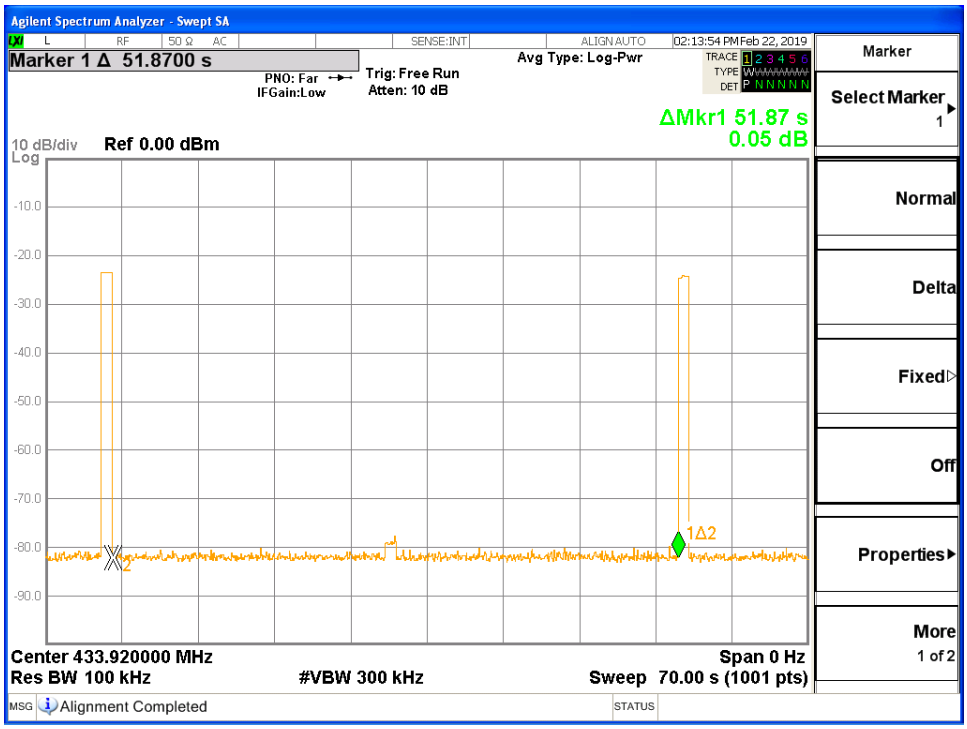
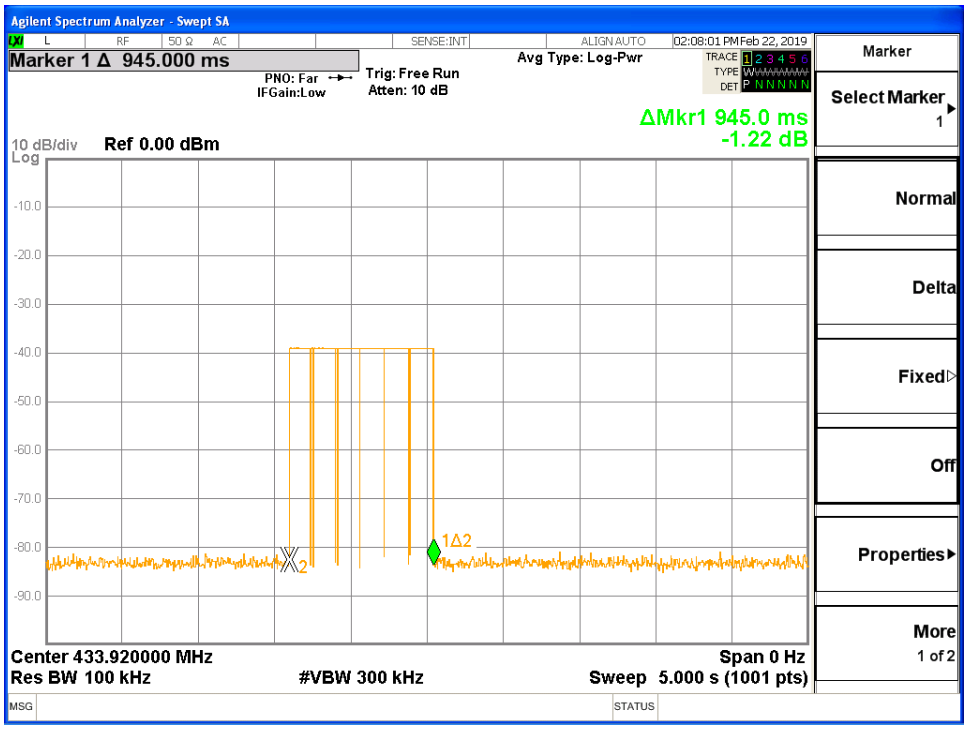
CH 2 Test Plot - 2



CH 3 Test Plot - 1



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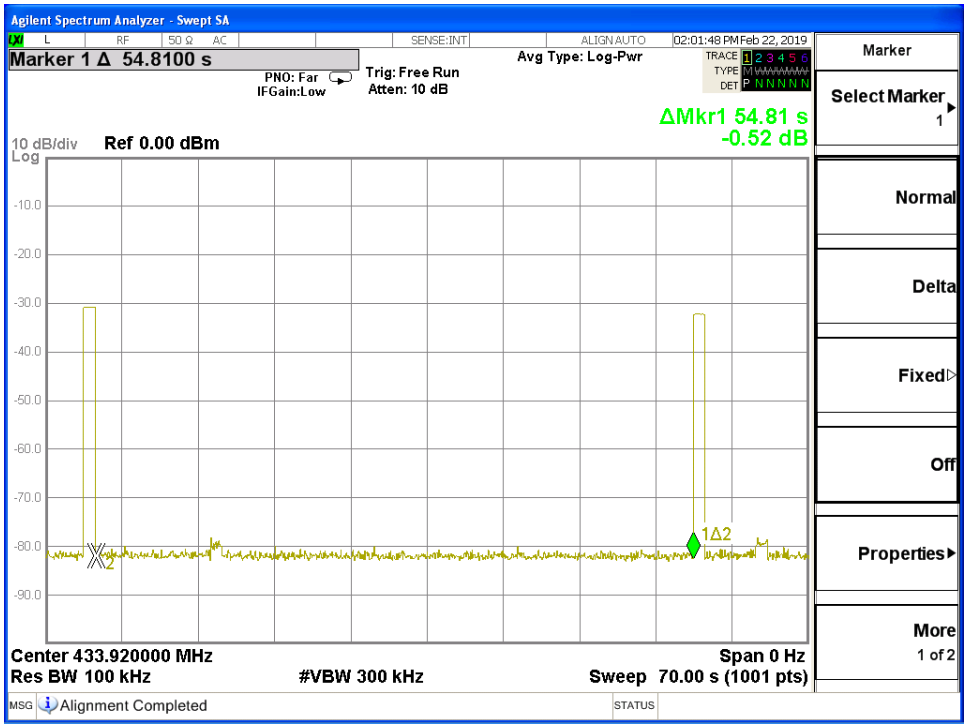
CH 3 Test Plot - 2



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

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6.3. 20dB BANDWIDTH

LIMITS

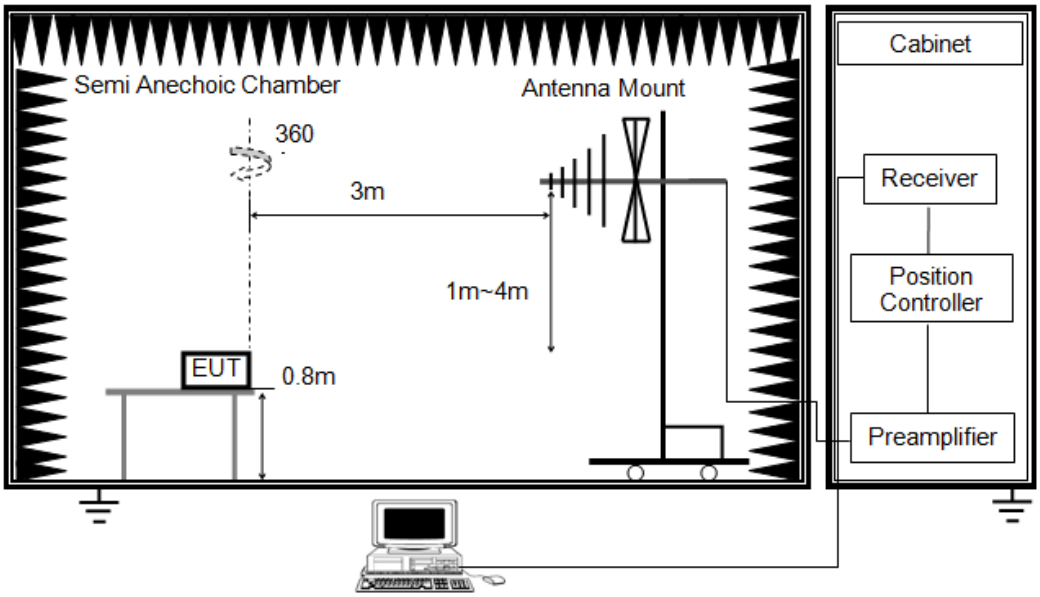
1. The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz.

2. The limit has been calculated as: 0.0025 * 433.92 MHz = 1.0848 MHz

TEST PROCEDURE

FCC Reference:	CFR 47 Part 15.231(c)
Test Method Used:	ANSI C63.10 Section 6.9.2

TEST SETUP



1. 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.

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

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

4. Set the spectrum analyzer in the following setting as:
RBW is set to 1 kHz and VBW is set 3 kHz.

TEST ENVIRONMENT

Temperature	23.7°C	Relative Humidity	68%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.0V

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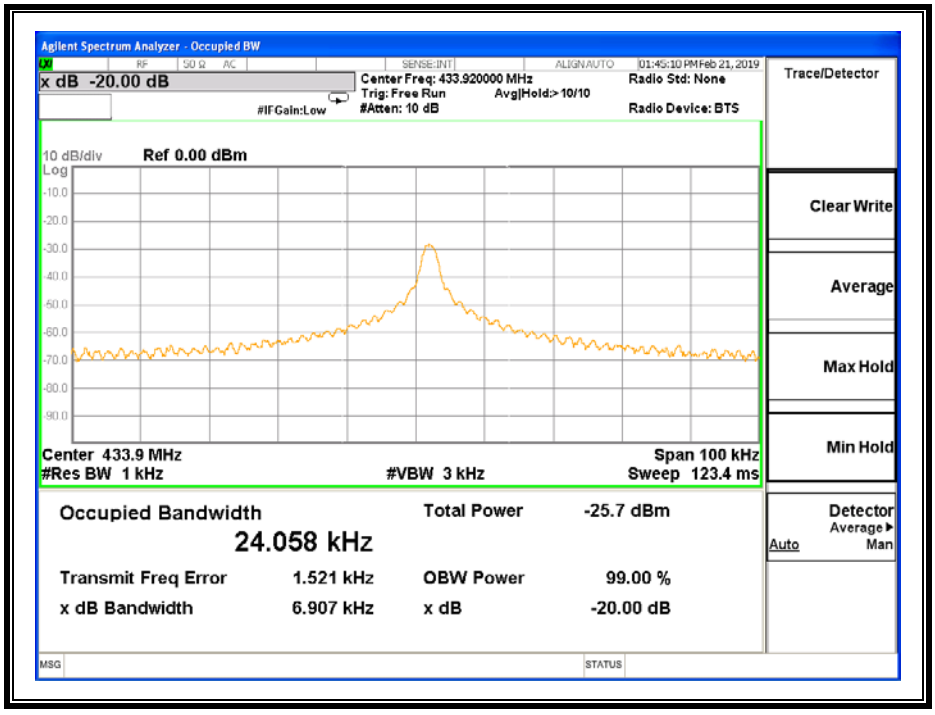
RESULTS

Transmitter 20 dB Bandwidth (MHz)	Limit (MHz)	Result
0.006907	1.0848	Pass



Note: All the modes has been tested, only the worst (mode 2, CH1) data record in the report.

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6.4. RADIATED EMISSION

LIMITS

1. In addition to the provisions of §15.205, the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental frequency (MHz)	Field strength of fundamental (microvolts/meter)	Field strength of spurious emissions (microvolts/meter)
40.66-40.70	2,250	225
70-130	1,250	125
130-174	[1]1,250 to 3,750	[1]125 to 375
174-260	3,750	375
260-470	[1]3,750 to 12,500	[1]375 to 1,250
Above 470	12,500	1,250

Note:
1. To obtain the average limit at the test frequency the values given in the table of FCC part 15.231(b) have to be linear interpolated and then converted to dBµV/m. The limit at 260 MHz is 3750 µV/m and at 470 MHz it is 12500 µV/m. Limit at 433.92 MHz is calculated as shown in ANSI C63.10 Section 7.6.2:

Limit [µV/m] = Limlower + ΔF [(Limupper – Limlower) / ($f$upper – $f$lower)]
where ΔF = fc – $f$lower = 433.92 – 260 = 173.92

Limit = 3750 + 173.92 * [(12500 – 3750) / (470 -260)]
= 3750 + 173.92 * [8750 / 210]
= 10996.7 µV/m

dBµV/m = 20 * log (µV/m)
= 20 * log (10996.7)

Average Limit at 433.92 MHz = 80.8 dBµV/m

2. If the average limit is specified for the EUT, the peak limit is 20 dB above the average limit as specified in FCC 15.35 (b)

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2. Please refer to CFR 47 FCC part 15.231(e)

Fundamental frequency (MHz)	Field strength of fundamental (microvolts/meter)	Field strength of spurious emission (microvolts/meter)
40.66-40.70	1,000	100
70-130	500	50
130-174	500 to 1,500[1]	50 to 150[1]
174-260	1,500	150
260-470	1,500 to 5,000[1]	150 to 500[1]
Above 470	5,000	500

Note:
1. To obtain the average limit at the test frequency the values given in the table of FCC part 15.231(b) have to be linear interpolated and then converted to dBµV/m. The limit at 260 MHz is 3750 µV/m and at 470 MHz it is 12500 µV/m. Limit at 433.92 MHz is calculated as shown in ANSI C63.10 Section 7.6.2:

Limit [µV/m] = Limlower + ΔF [(Limupper – Limlower) / ($f$upper – $f$lower)]
where ΔF = fc – $f$lower = 433.92 – 260 = 173.92

Limit = 1500 + 173.92 * [(5000 – 1500) / (470 -260)]
= 1500 + 173.92 * [3500 / 210]
= 4398.7 µV/m

dBµV/m = 20 * log (µV/m)
= 20 * log (4398.7)

Average Limit at 433.92 MHz = 72.87 dBµV/m

If the average limit is specified for the EUT, the peak limit is 20 dB above the average limit as specified in FCC 15.35 (b)

3. Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (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

**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., §§15.231 and 15.241.

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4. 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).
Note: (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.

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

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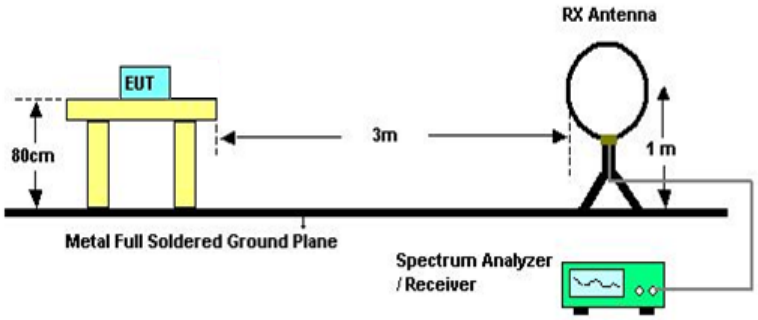
TEST PROCEDURE

FCC Reference:	CFR 47 Parts 15.231(b) / 15.209
Test Method Used:	ANSI C63.10 Sections 6.3 and 6.5

TEST SETUP

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 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 variable 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 and average 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 and average detector and reported.

7. Although these tests were performed other than open field sites, adequate comparison measurements were confirmed against 30m open field sites. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

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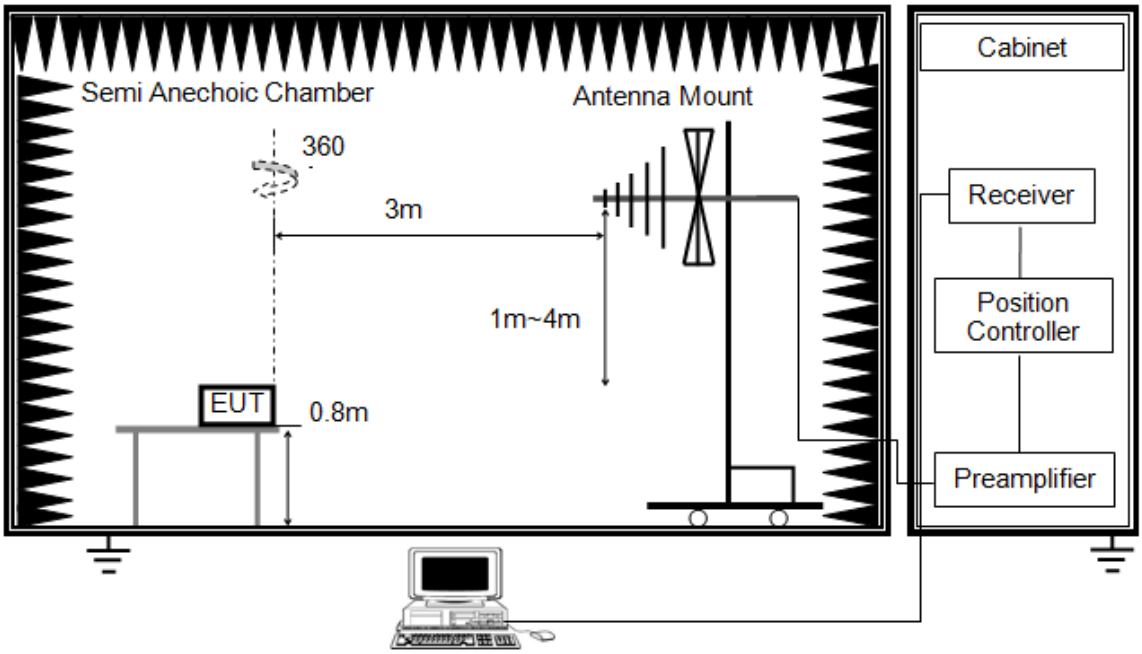
Below 1G



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 80cm 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 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.

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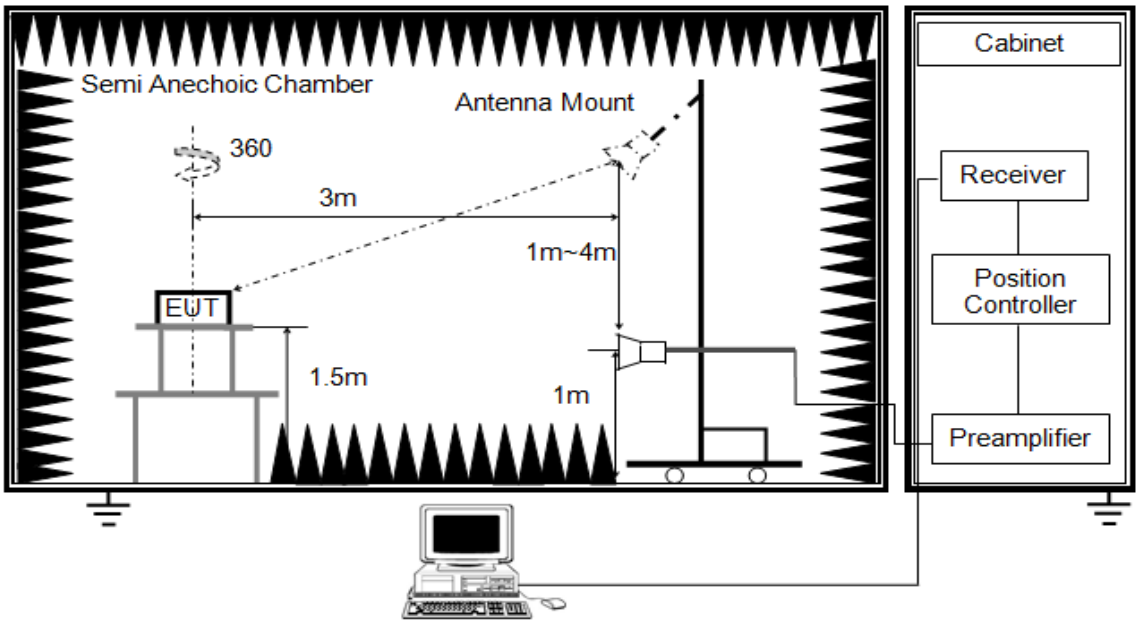
ABOVE 1G



RBW	1M
VBW	3M
Sweep	Auto
Detector	Peak For Average see note 6
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. Average Value=Peak Value + Duty Correction Factor

For the Duty Cycle and Correction Factor please refer to clause 6.1.ON TIME AND DUTY CYCLE.

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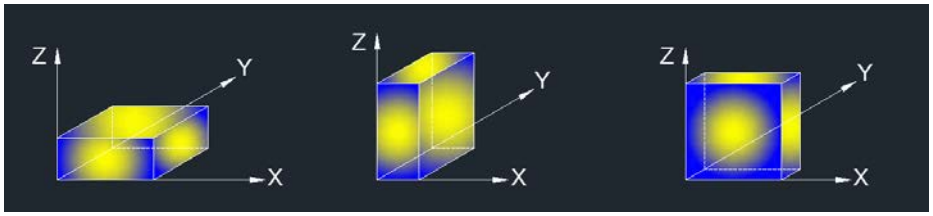
RESULTS

X axis, Y axis, Z axis positions:



Note: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

Note: For the manually transmitting mode, the limit is 80.8 dBµV/m; for automatically periodic transmitting mode the limit is 72.87 dBµV/m. Because all the RF parameters of the two modes are the same, so if the mode 2 complies with AV limit, mode 1 is deemed to comply with AV limit.

TEST ENVIRONMENT

Temperature	23.3°C	Relative Humidity	63%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.0V

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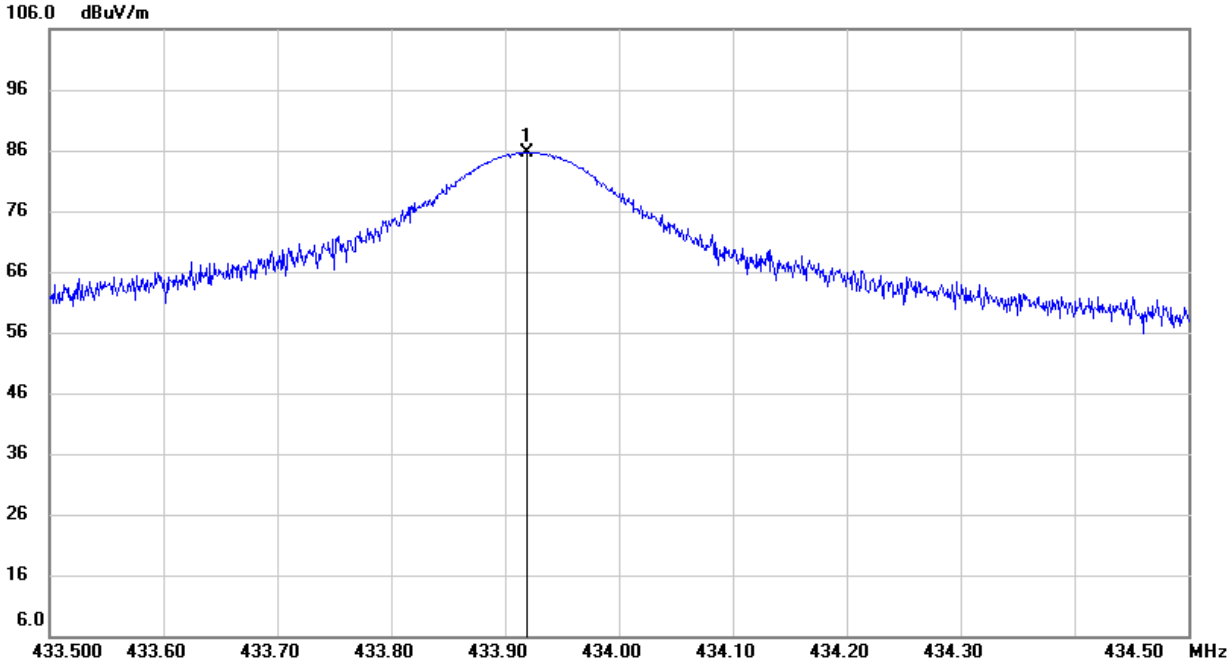
6.4.1. FUNDAMENTAL FIELD STRENGTH

HORIZONTAL



Frequency	Reading	Correct	Peak Result	Average Result	Limit	Margin	Remark
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
433.9190	96.97	-11.33	85.64	-	92.87	-7.23	peak
433.9190	96.97	-11.33	-	71.72	72.87	-1.15	Average

Note: 1. Peak Result = Reading+ Correct Factor
2. Average Result= Peak Result+ Duty Correction Factor

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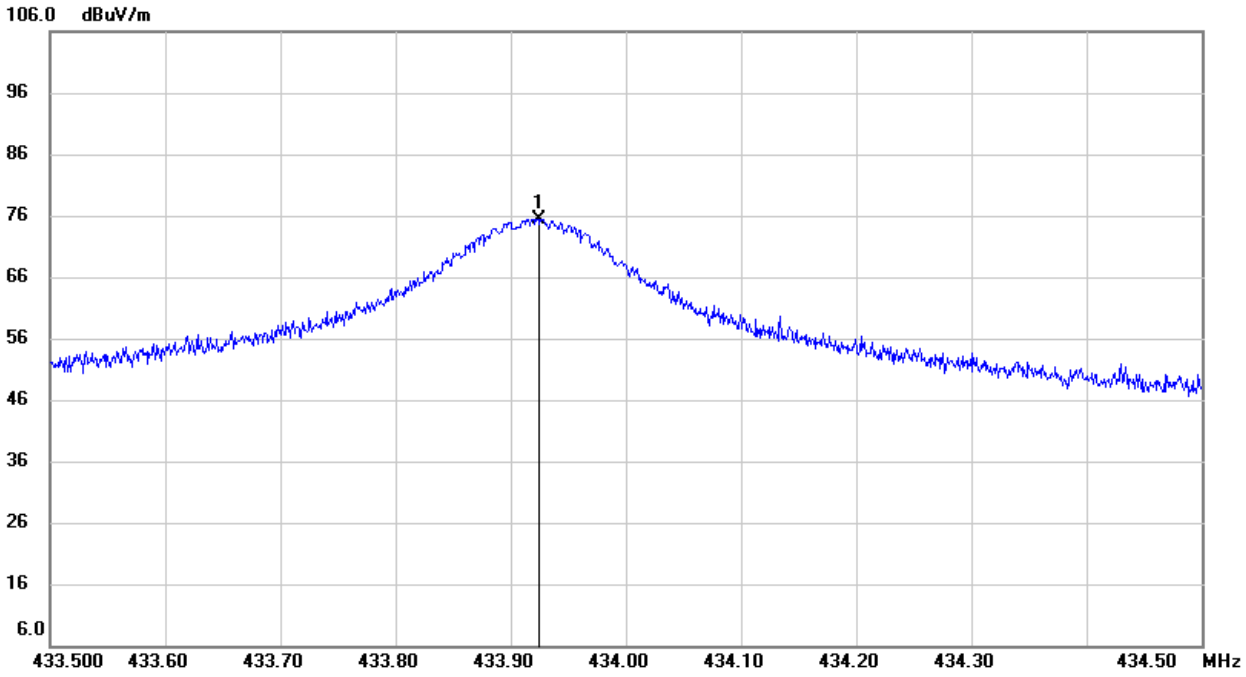
VERTICAL



Frequency	Reading	Correct	Peak Result	Average Result	Limit	Margin	Remark
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
433.9240	86.70	-11.33	75.37	-	92.87	-17.50	peak
433.9240	86.70	-11.33	-	61.45	72.87	-11.42	Average

Note: 1. Peak Result = Reading+ Correct Factor
2. Average Result= Peak Result+ Duty Correction Factor

Note: All the modes has been tested, only the worst (mode 2, CH1) data record in the report.

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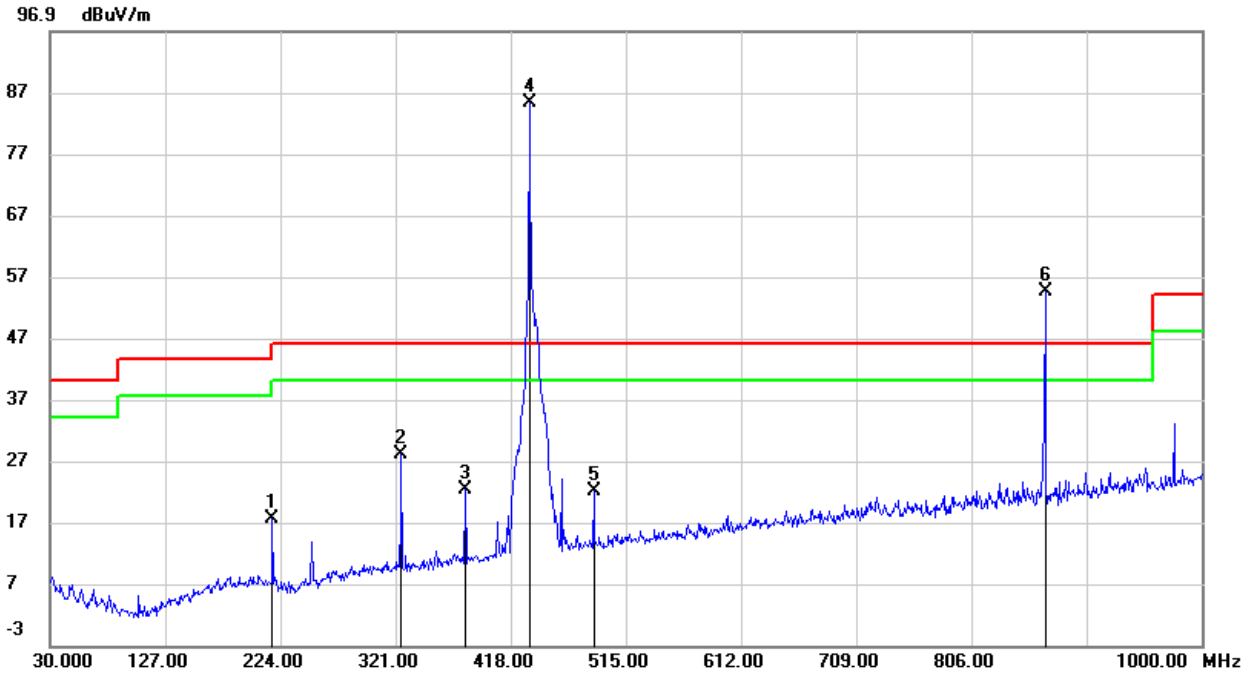
6.4.2. SPURIOUS EMISSIONS BELOW 1G

SPURIOUS EMISSIONS (HORIZONTAL)



No.	Frequency	Reading	Correct	Peak Result	Average Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	217.2100	33.88	-16.38	17.50	-	46.00	-28.50	QP
2	325.8500	41.29	-13.23	28.06	-	46.00	-17.94	QP
3	380.1700	34.49	-12.30	22.19	-	46.00	-23.81	QP
4	433.5200	96.63	-11.33	85.30	-	92.87	-7.57	peak
5	487.8400	32.29	-10.32	21.97	-	46.00	-24.03	QP
6(2th harmonic)	868.0800	58.67	-4.12	54.55	-	72.87	-18.32	peak
	868.0800	58.67	-4.12	-	40.63	52.87	-12.24	Average

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.
4. Mark 4 is the fundamental frequency, Mark 6 is 2th harmonic.
5. Peak Result = Reading+ Correct Factor
6. Average Result= Peak Result+ Duty Correction Factor
7. For the average value of the fundamental frequency(Mark 4), please refer to clause 6.4.1.

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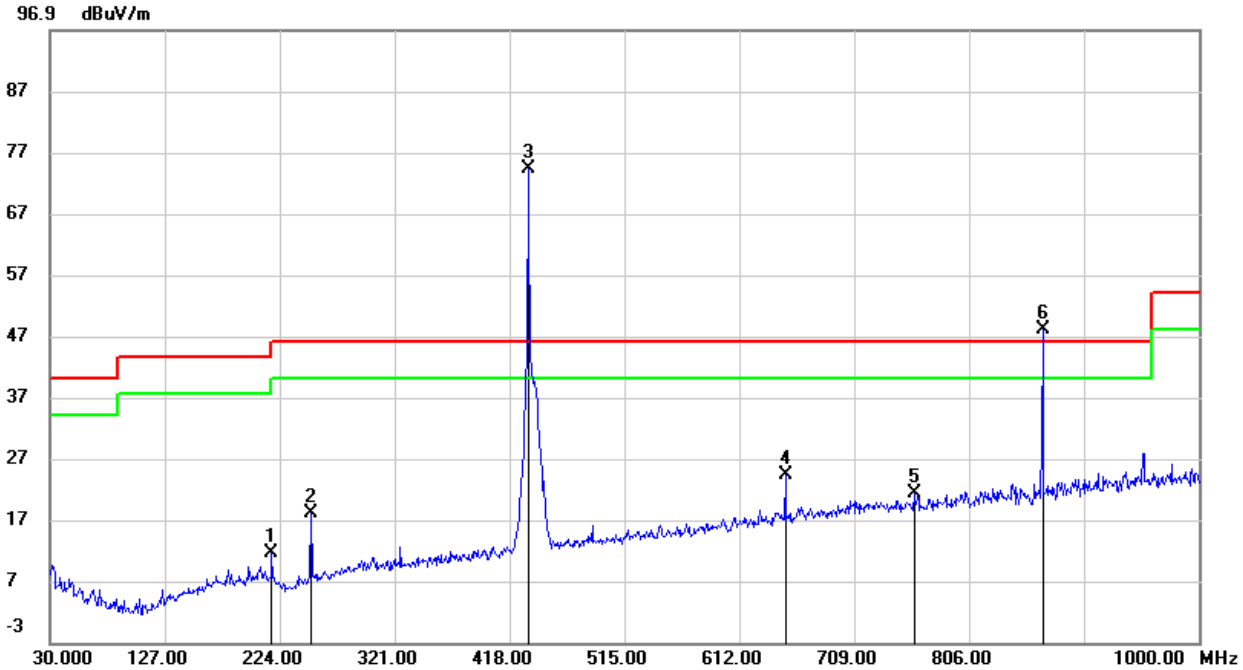
SPURIOUS EMISSIONS (VERTICAL)



No.	Frequency	Reading	Correct	Peak Result	Average Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	217.2100	27.92	-16.38	11.54	-	46.00	-34.46	QP
2	250.1900	33.90	-15.76	18.14	-	46.00	-27.86	QP
3	433.5200	85.59	-11.33	74.26	-	92.87	-18.61	peak
4	650.8000	31.54	-7.22	24.32	-	46.00	-21.68	QP
5	759.4400	26.74	-5.37	21.37	-	46.00	-24.63	QP
6(2th harmonic)	868.0800	52.03	-4.12	47.91	-	72.87	-24.96	peak
	868.0800	52.03	-4.12	-	33.99	52.87	-18.88	Average

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.
4. Mark 3 is the fundamental frequency, Mark 6 is 2th harmonic.
5. Peak Result = Reading+ Correct Factor
6. Average Result= Peak Result+ Duty Correction Factor
7. For the average value of the fundamental frequency(Mark 3), please refer to clause 6.4.1.

Note: All the modes has been tested, only the worst (mode 2, CH1) data record in the report.

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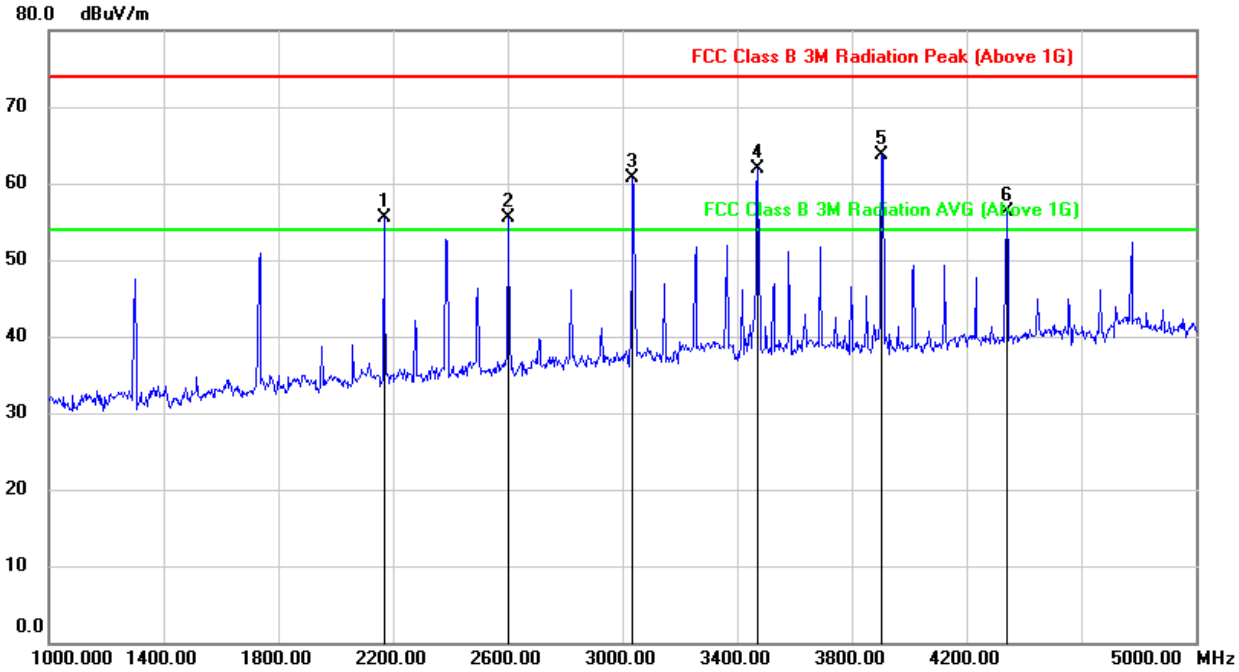
6.4.3. SPURIOUS EMISSIONS ABOVE 1G

HARMONICS AND SPURIOUS EMISSIONS (HORIZONTAL)



No.	Frequency	Reading	Correct	Peak Result	Average Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	dBuV/m)	(dBuV/m)	(dB)	
1(5th harmonic)	2168.000	65.5	-9.94	55.56	-	72.87	-17.31	peak
				-	41.64	52.87	-11.23	average
2(6th harmonic)	2600.000	64.19	-8.61	55.58	-	72.87	-17.29	peak
				-	41.66	52.87	-11.21	average
3(7th harmonic)	3036.000	66.66	-6.04	60.62	-	72.87	-12.25	peak
				-	46.70	52.87	-6.17	average
4(8th harmonic)	3472.000	67.46	-5.49	61.97	-	72.87	-10.9	peak
				-	48.05	52.87	-4.82	average
5(9th harmonic)	3904.000	67.84	-4.17	63.67	-	72.87	-9.2	peak
				-	49.75	52.87	-3.12	average
6(10th harmonic)	4340.000	59.55	-3.17	56.38	-	72.87	-16.49	peak
				-	42.46	52.87	-10.41	average

Note: 1. Peak Result = Reading+ Correct Factor
2. Average Result= Peak Result+ Duty Correction Factor
3. No burst found in Restricted bands.

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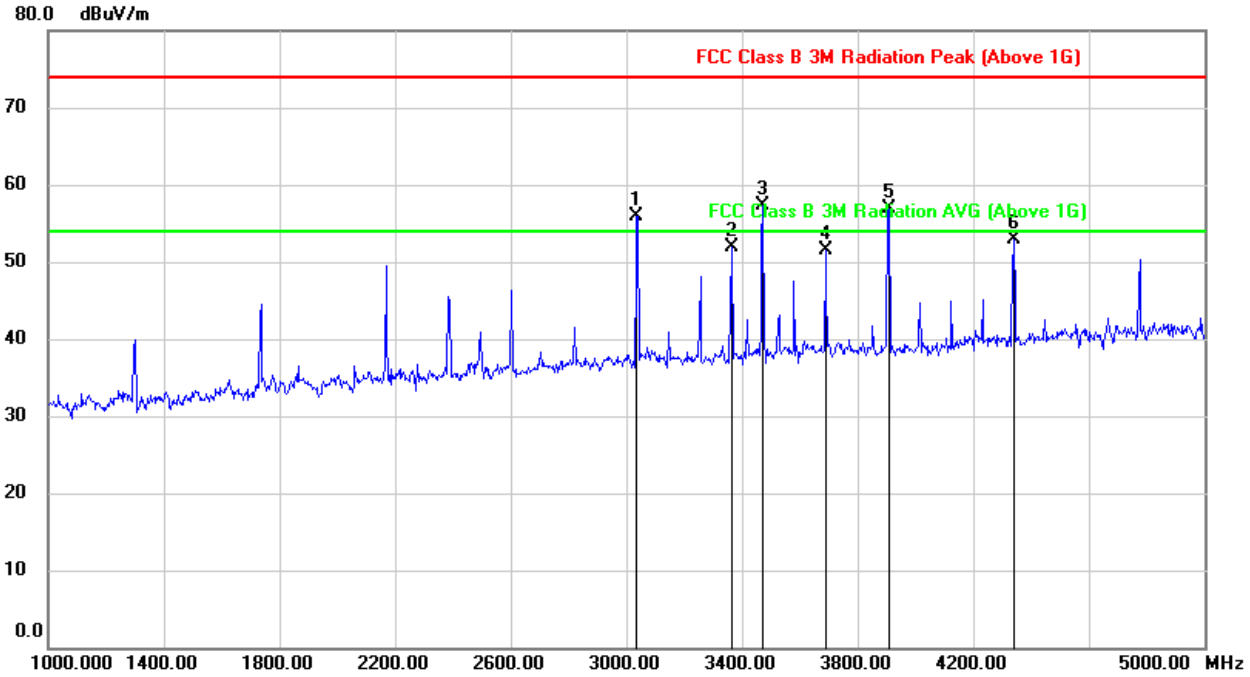
HARMONICS AND SPURIOUS EMISSIONS (VERTICAL)



No.	Frequency	Reading	Correct	Peak Result	Average Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	dBuV/m)	(dBuV/m)	(dB)	
1(7th harmonic)	3036	62.03	-6.04	55.99	-	72.87	-16.88	peak
				-	42.07	52.87	-10.8	average
2	3364	57.6	-5.68	51.92	-	74.00	-22.08	peak
3(8th harmonic)	3472	62.86	-5.49	57.37	-	72.87	-15.5	peak
				-	43.45	52.87	-9.42	average
4	3688	55.64	-4.14	51.5	-	72.87	-22.50	peak
5(9th harmonic)	3908	61.04	-4.16	56.88	-	72.87	-15.99	peak
				-	42.96	52.87	-9.91	average
6(10th harmonic)	4340	56.07	-3.17	52.9	-	72.87	-19.97	peak
				-	38.98	52.87	-13.89	average

Note: 1. Peak Result = Reading+ Correct Factor
2. Average Result= Peak Result+ Duty Correction Factor
3. No burst found in Restricted bands.

Note: All the modes has been tested, only the worst (mode 2, CH1) data record in the report.

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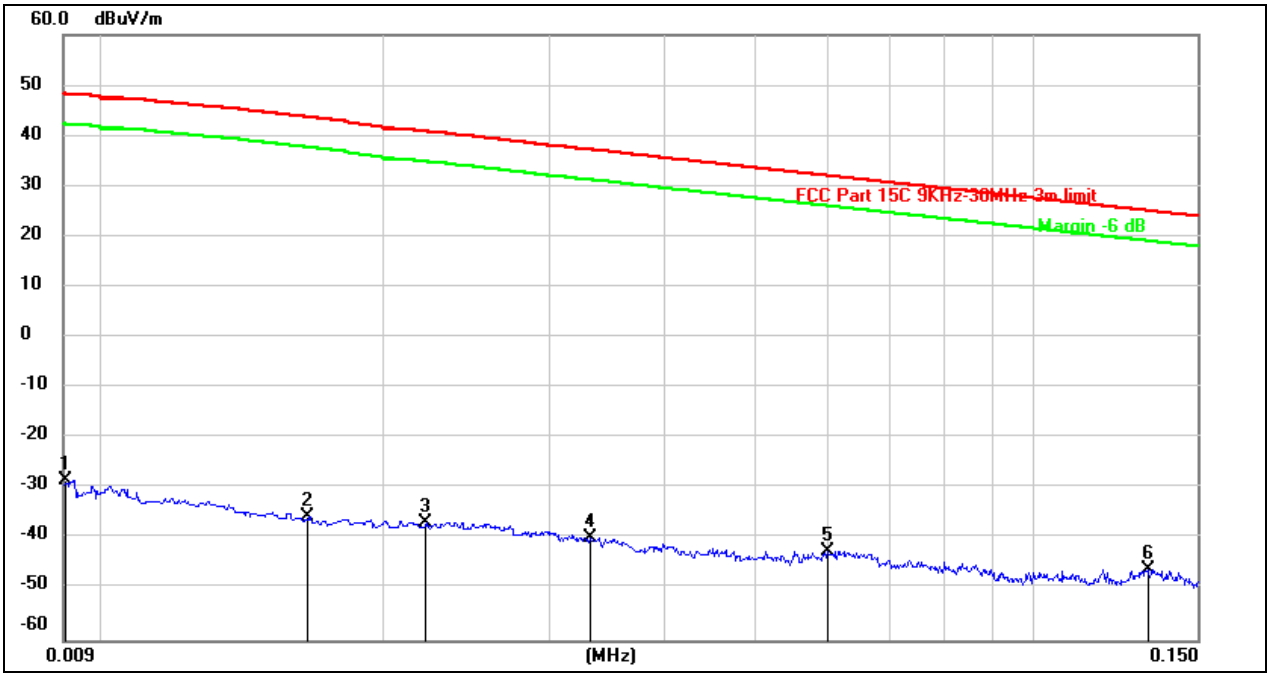
6.4.4. SPURIOUS EMISSIONS BELOW 30M

SPURIOUS EMISSIONS (HORIZONTAL)

9kHz~ 150kHz



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.0091	73.08	-101.33	-28.25	48.29	-76.54	peak
2	0.0165	65.84	-101.37	-35.53	43.69	-79.22	peak
3	0.0221	64.63	-101.35	-36.72	40.84	-77.56	peak
4	0.0331	61.74	-101.40	-39.66	37.29	-76.95	peak
5	0.0600	59.17	-101.52	-42.35	32.04	-74.39	peak
6	0.1324	55.67	-101.69	-46.02	25.17	-71.19	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.

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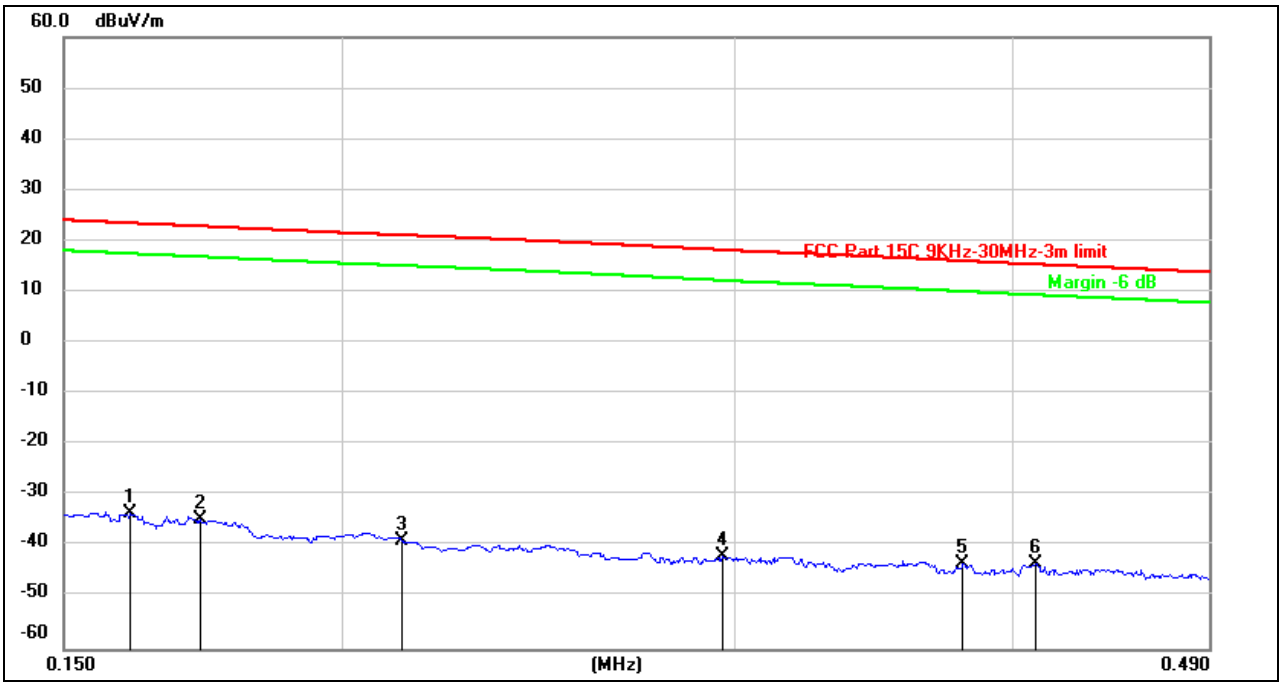
0.15MHz ~ 0.49MHz



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.1607	68.11	-101.65	-33.54	23.48	-57.02	peak
2	0.1728	67.00	-101.67	-34.67	22.86	-57.53	peak
3	0.2127	62.95	-101.74	-38.79	21.13	-59.92	peak
4	0.2963	59.96	-101.85	-41.89	18.19	-60.08	peak
5	0.3800	58.52	-101.94	-43.42	16.06	-59.48	peak
6	0.4097	58.52	-101.97	-43.45	15.37	-58.82	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.

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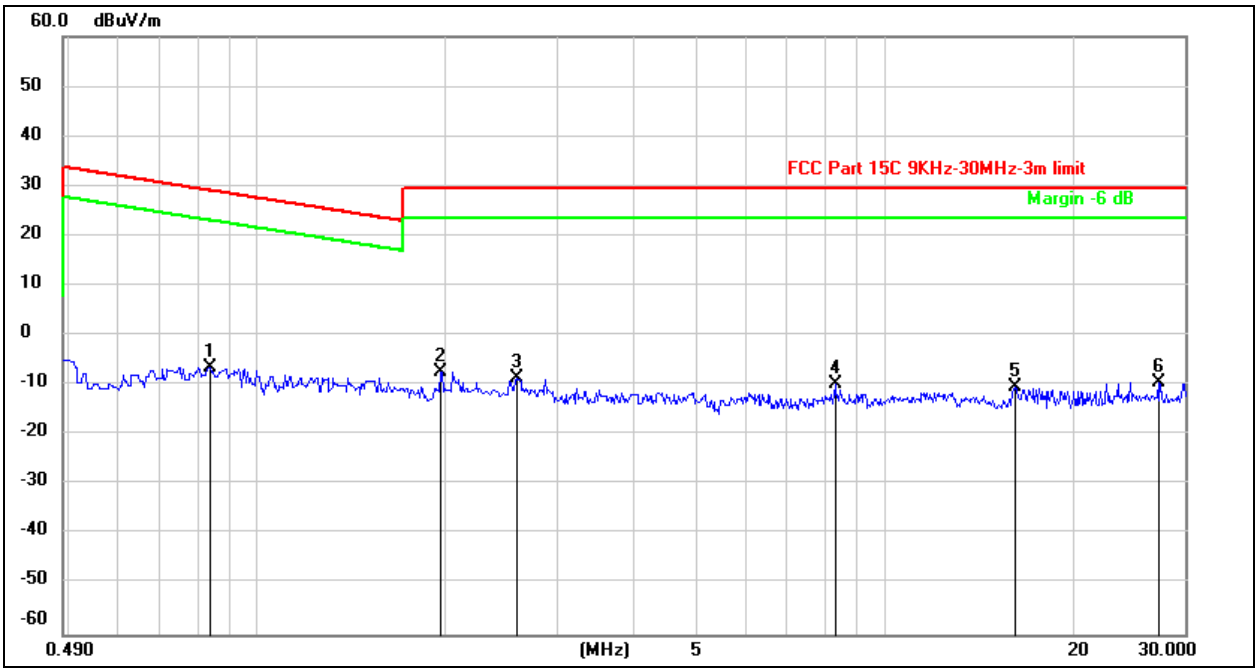
0.49MHz ~ 30MHz



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.8400	55.71	-62.17	-6.46	29.13	-35.59	peak
2	1.9522	54.61	-61.84	-7.23	29.54	-36.77	peak
3	2.5935	53.11	-61.68	-8.57	29.54	-38.11	peak
4	8.3397	51.19	-61.03	-9.84	29.54	-39.38	peak
5	16.1598	50.61	-60.97	-10.36	29.54	-39.90	peak
6	27.1966	50.81	-60.24	-9.43	29.54	-38.97	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.

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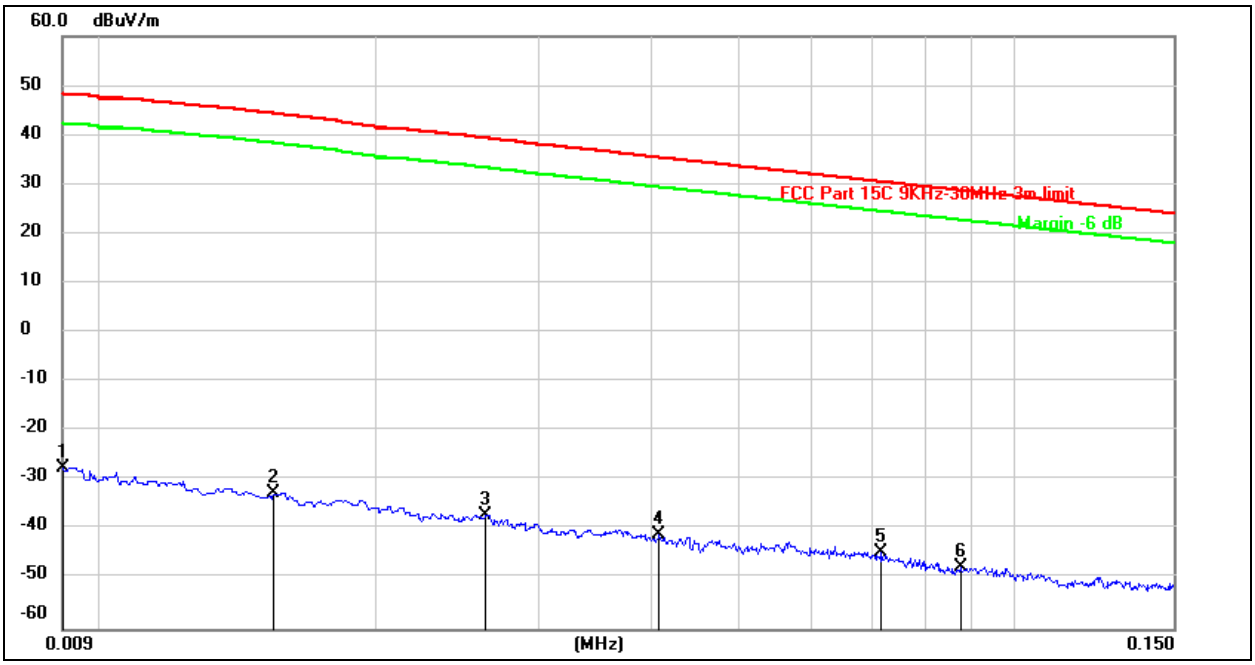
SPURIOUS EMISSIONS (VERTICAL)

9kHz~ 150kHz



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.0090	73.84	-101.32	-27.48	48.37	-75.85	peak
2	0.0154	68.89	-101.37	-32.48	44.35	-76.83	peak
3	0.0263	64.34	-101.37	-37.03	39.36	-76.39	peak
4	0.0408	60.46	-101.44	-40.98	35.40	-76.38	peak
5	0.0714	56.91	-101.57	-44.66	30.54	-75.20	peak
6	0.0874	54.04	-101.69	-47.65	28.78	-76.43	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.

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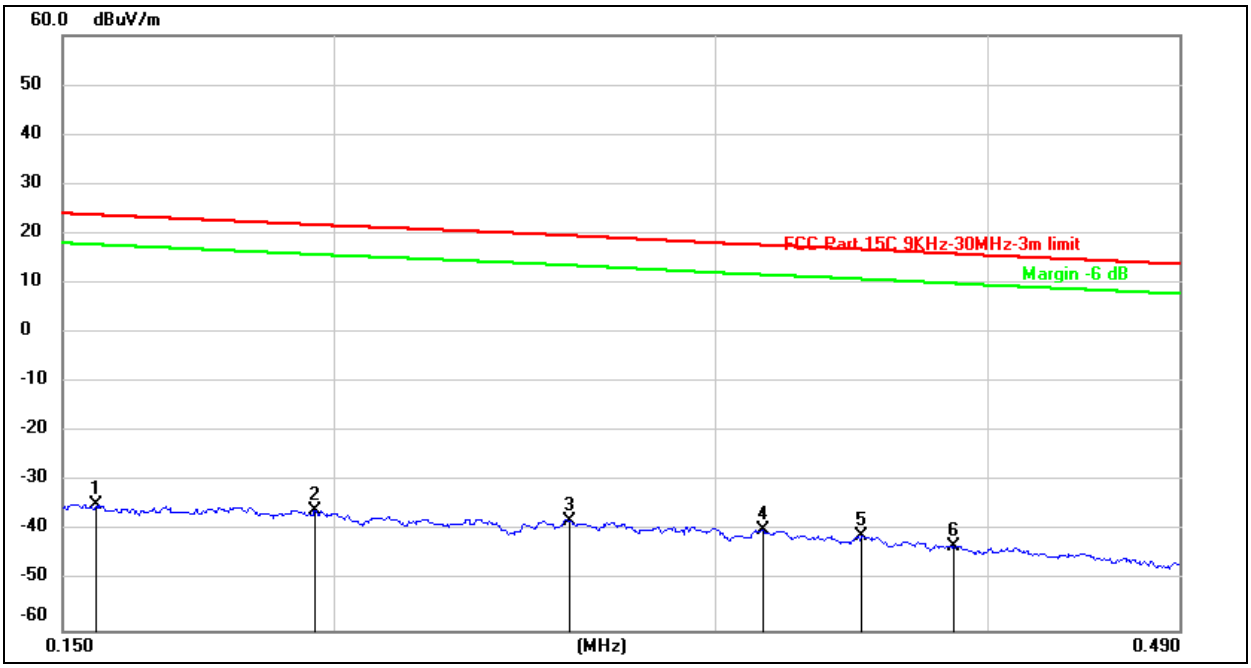
0.15MHz~ 0.49MHz



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.1556	67.02	-101.65	-34.63	23.77	-58.40	peak
2	0.1960	65.87	-101.71	-35.84	21.76	-57.60	peak
3	0.2565	63.89	-101.80	-37.91	19.59	-57.50	peak
4	0.3150	62.16	-101.87	-39.71	17.68	-57.39	peak
5	0.3497	61.00	-101.91	-40.91	16.82	-57.73	peak
6	0.3860	58.92	-101.94	-43.02	15.91	-58.93	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.

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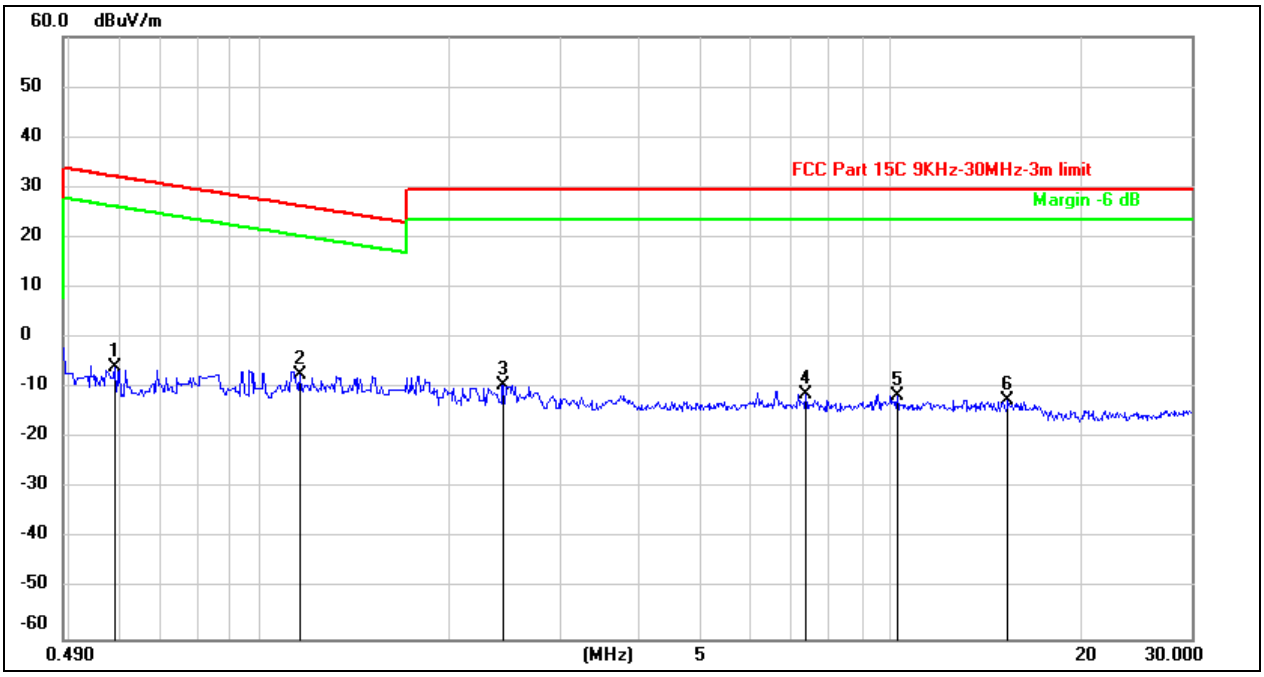
0.49MHz ~ 30MHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.5917	56.35	-62.08	-5.73	32.17	-37.90	peak
2	1.1627	54.83	-62.20	-7.37	26.30	-33.67	peak
3	2.4384	52.31	-61.72	-9.41	29.54	-38.95	peak
4	7.3658	50.06	-61.16	-11.10	29.54	-40.64	peak
5	10.2576	49.36	-60.81	-11.45	29.54	-40.99	peak
6	15.3628	48.45	-61.01	-12.56	29.54	-42.10	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.

Note: All the modes has been tested, only the worst (mode 2, CH1) data record in the report.

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7. 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

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