FCC 47 CFR PART 15 SUBPART C
ISED RSS-210 ISSUE 9

CERTIFICATION TEST REPORT

For

Motion Detector

MODEL NUMBER: 5AT2S9

FCC ID: 2AB2Q5AT2S9
IC: 10256A-5AT2S9

REPORT NUMBER: 4789349851.1-2

ISSUE DATE: January 20, 2020

Prepared for

LEEDARSON LIGHTING CO., LTD.
Xingtai Industrial Zone, Economic Development Zone, Changtai County,
Zhangzhou City, Fujian Province, P.R.China

Prepared by

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Test Result: PASS

*For the detail, please refer to page 11.

Revision History

Rev.	Issue Date	Revisions	Revised By
V0	01/20/2020	Initial Issue	

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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name:	LEEDARSON LIGHTING CO., LTD.
Address:	Xingtai Industrial Zone, Economic Development Zone, Changtai County, Zhangzhou City, Fujian Province, P.R China

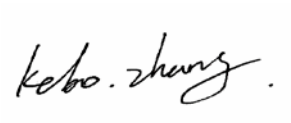
Manufacturer Information

Company Name:	LEEDARSON LIGHTING CO., LTD.
Address:	Xingtai Industrial Zone, Economic Development Zone, Changtai County, Zhangzhou City, Fujian Province, P.R China

EUT Name:	Motion Detector
Model:	5AT2S9
Sample Status:	Normal
Sample Received Date:	Jan 14, 2020
Date of Tested:	Jan 14~21, 2020

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	PASS
ISED RSS-210 Issue 9	PASS
ISED RSS-GEN Issue 5	PASS

Prepared By:



Kebo Zhang
Project Engineer

Checked By:

Shawn Wen
Laboratory Leader

Approved By:

Stephen Guo
Laboratory Manager

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2013, ISED RSS-210 Issue 9 and RSS-GEN Issue 5

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. **IAS (Lab Code: TL-702)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has demonstrated compliance with ISO/IEC Standard 17025:2005, General requirements for the competence of testing and calibration laboratories **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

Note 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.

Note 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.

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 recognized 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
Uncertainty for Conduction emission test	2.90dB
Uncertainty for Radiation Emission test(include Fundamental emission) (9KHz-30MHz)	2.2dB
Uncertainty for Radiation Emission test(include Fundamental emission) (30MHz-1GHz)	4.52dB
Uncertainty for Radiation Emission test (1GHz to 26GHz)(include Fundamental emission)	5.04dB(1-6GHz)
	5.30dB (6GHz-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.	

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

Equipment	Motion Detector	
Model Name	5AT2S9	
Data Rates/Modulation	908.4 MHz:40kbps/FSK	
	908.42 MHz:9.6kbps/FSK	
	916.0 MHz:100kbps/GFSK	
Transmit Channel Tested:	Channel ID	Channel Frequency(MHz)
	1	908.40
	2	908.42
	3	916.00
Power Supply	DC 3V	

5.2. MAXIMUM EMISSIONS FIELD STRENGTH

Operation Frequency (MHz)	Number of Transmit Chains (NTX)	Channel Number	Max. Emissions Field Strength (dBμV/m)
908.4-916	1	[1~3]	92.66

5.3. THE WORSE CASE POWER SETTING PARAMETER

The Worse Case Power Setting Parameter under 908.4~916MHz				
Test Software		UartAssis		
Modulation Type	Transmit Antenna Number	Test Software Setting Value		
		916MHz	908.42MHz	908.4MHz
FSK&GFSK	1	13(raw)	13(raw)	13(raw)

Note:
1. raw is the test software setting description provide by customer.
2. All tests executed under maximum input levels.

5.4. 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 3V
	VH	N/A

Note: VL= Lower Extreme Test Voltage
VN= Nominal Voltage
VH= Upper Extreme Test Voltage
TN= Normal Temperature

5.5. TEST CHANNEL CONFIGURATION

Test Mode	Test Channel Number	Test Channel
Z-wave	CH 1, CH 2, CH 3/ Low, Middle, High	908.4MHz, 908.42MHz, 916MHz

5.6. DESCRIPTION OF AVAILABLE ANTENNAS

Ant.	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)
1	908.4~916	Monopole antenna	0.26

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name
1	Laptop	ThinkPad	T460S
2	USB to Serial Conversion board	N/A	N/A

I/O CABLES

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

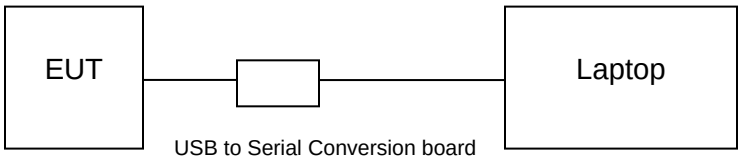
ACCESSORY

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

TEST SETUP

The EUT can work in an engineer mode with a software through a table PC.

SETUP DIAGRAM FOR TESTS



5.8. MEASURING INSTRUMENT AND SOFTWARE USED

Conducted Emissions						
Instrument						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☑	EMI Test Receiver	R&S	ESR3	101961	Dec.05,2019	Dec.05,2020
☑	Two-Line V-Network	R&S	ENV216	101983	Dec.05,2019	Dec.05,2020
☑	Artificial Mains Networks	Schwarzbeck	NSLK 8126	8126465	Dec.05,2019	Dec.05,2020
Software						
Used	Description		Manufacturer	Name	Version	
☑	Test Software for Conducted disturbance		Farad	EZ-EMC	Ver. UL-3A1	
Radiated Emissions						
Instrument						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☑	MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Dec.06,2019	Dec.06,2020
☑	Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	Sep.17, 2018	Sep.17, 2021
☑	Preamplifier	HP	8447D	2944A09099	Dec.05,2019	Dec.05,2020
☑	EMI Measurement Receiver	R&S	ESR26	101377	Dec.05,2019	Dec.05,2020
☑	Horn Antenna	TDK	HRN-0118	130939	Sep.17, 2018	Sep.17, 2021
☑	High Gain Horn Antenna	Schwarzbeck	BBHA-9170	691	Aug.11, 2018	Aug.11, 2021
☑	Preamplifier	TDK	PA-02-0118	TRS-305-00066	Dec.05,2019	Dec.05,2020
☑	Preamplifier	TDK	PA-02-2	TRS-307-00003	Dec.05,2019	Dec.05,2020
☑	Loop antenna	Schwarzbeck	1519B	00008	Jan.07, 2019	Jan.07, 2022
Software						
Used	Description		Manufacturer	Name	Version	
☑	Test Software for Radiated disturbance		Farad	EZ-EMC	Ver. UL-3A1	

6. SUMMARY OF TEST RESULTS

Summary of Test Results			
Clause	Test Items	FCC/IC Rules	Test Results
1	20dB Bandwidth	FCC Part 15.215(c)	Pass
2	99%dB Bandwidth	RSS-Gen Clause 6.7	Pass
3	TX Spurious Emission	FCC 15.249 (a)(d)(e) FCC 15.209 FCC 15.205 RSS-GEN Clause 8.9 RSS-GEN Clause 8.10	Pass
4	Conducted Emission Test for AC Power Port	FCC 15.207 RSS-GEN Clause 8.8	N/A
5	Antenna Requirement	FCC Part 15.203 RSS-GEN Clause 6.8	Pass
"N/A" denotes test is not applicable in this test report.			

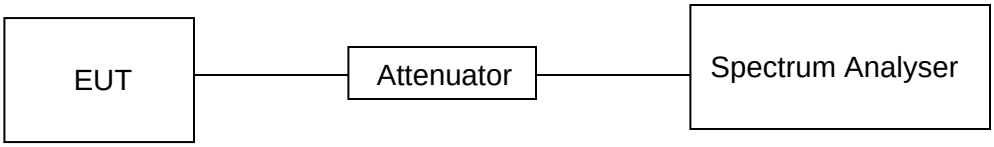
7. ANTENNA PORT TEST RESULTS

7.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only

TEST SETUP

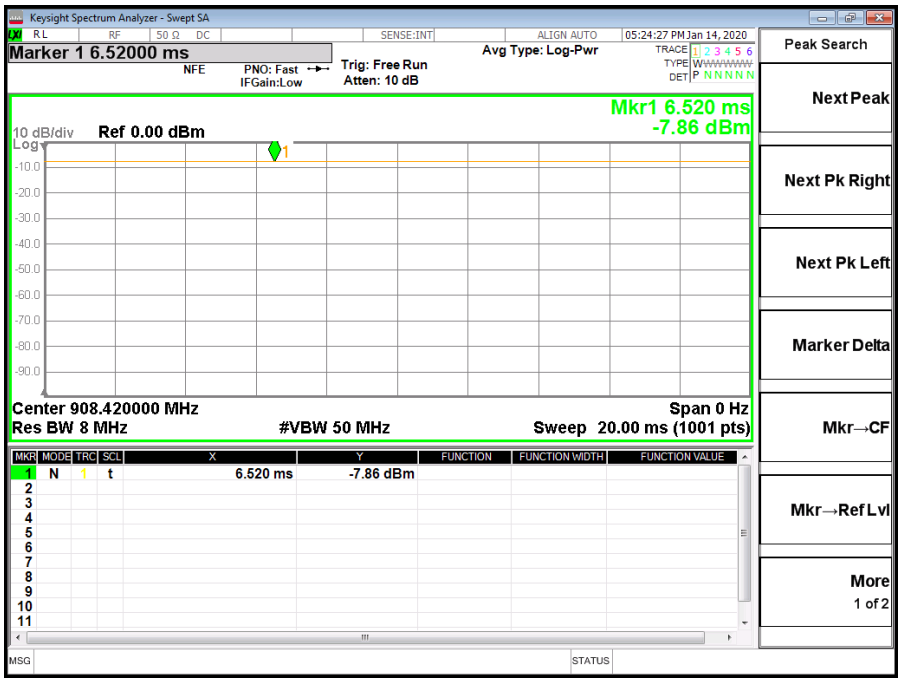


RESULTS

Test Channel	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (db)	minimum VBW 1/T (KHz)
MID	1	1	1	100%	0	0.01

Note: Duty Cycle Correction Factor=10log(1/x).
Where: x is Duty Cycle (Linear)
Where: T is On Time (transmit duration)
All test modes have been tested and the results are the same, so only one mode test data record in this report.

ON TIME AND DUTY CYCLE MID



7.2. 20 dB AND 99% BANDWIDTH

LIMITS

FCC Part15 (15.249) , Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.215(c)	Bandwidth	for reporting purposes only	902-928 MHz
RSS-Gen Clause 6.6	99% Bandwidth	N/A	902-928MHz

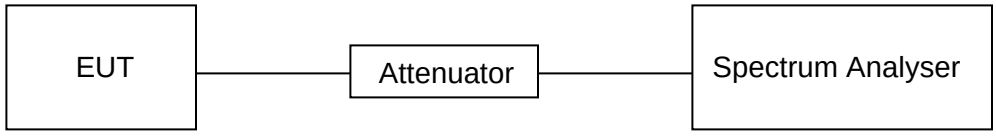
TEST PROCEDURE

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	1% to 5% of the occupied bandwidth
VBW	≥ 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 20 dB relative to the maximum level measured in the fundamental emission.

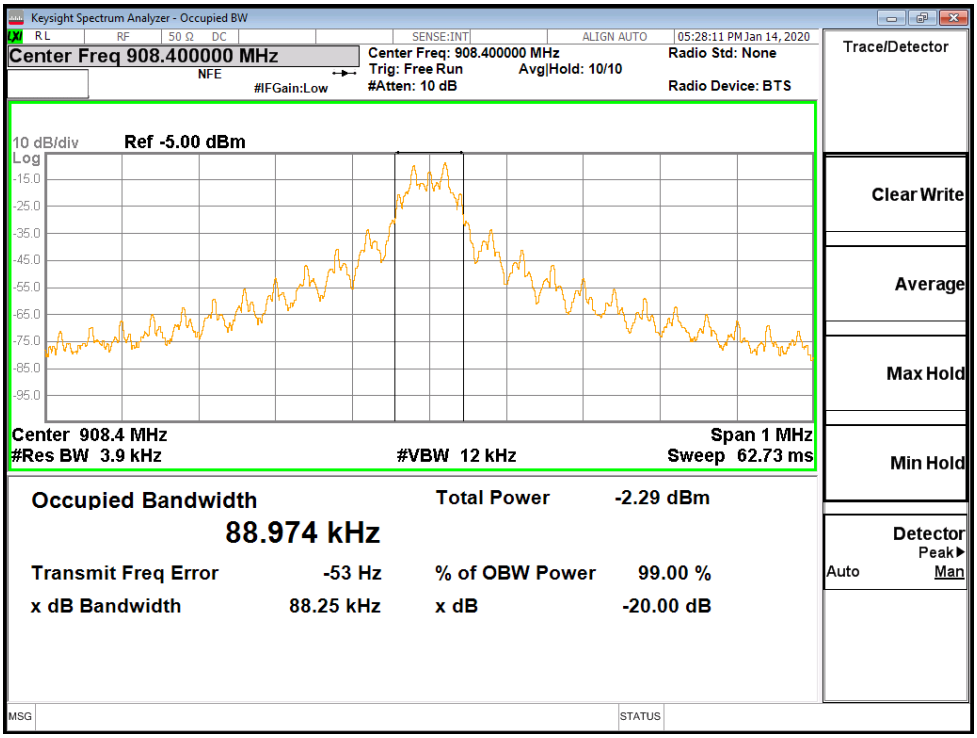
TEST SETUP



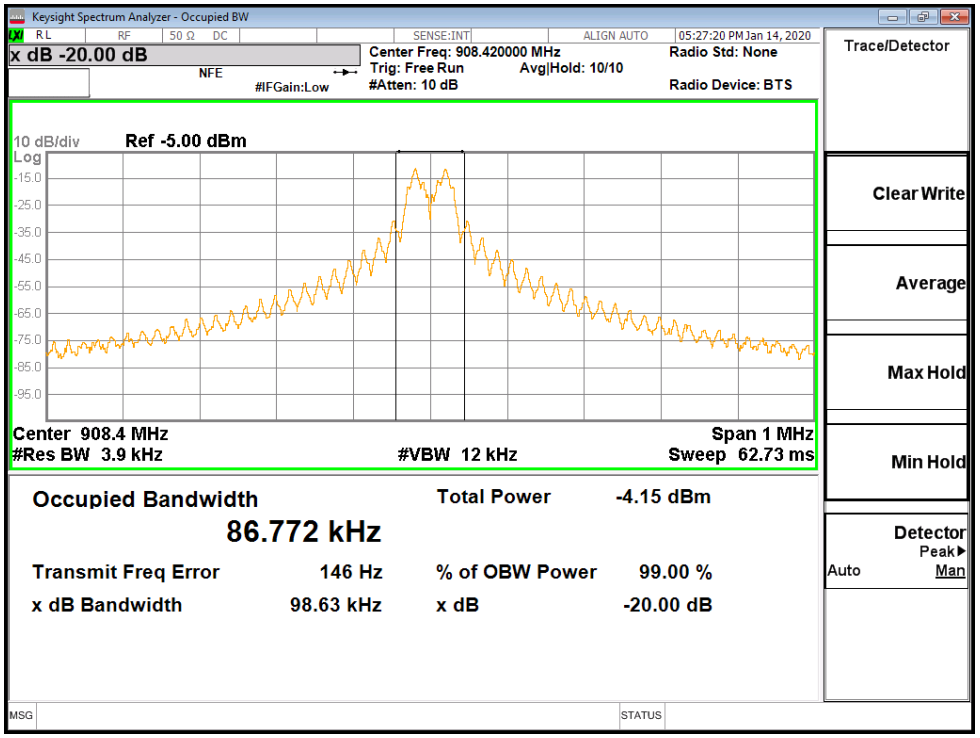
RESULTS

Channel	20dB bandwidth (KHz)	99% bandwidth (KHz)	Result
Low	88.25	88.974	Pass
Middle	98.63	86.772	Pass
High	123.7	114.51	Pass

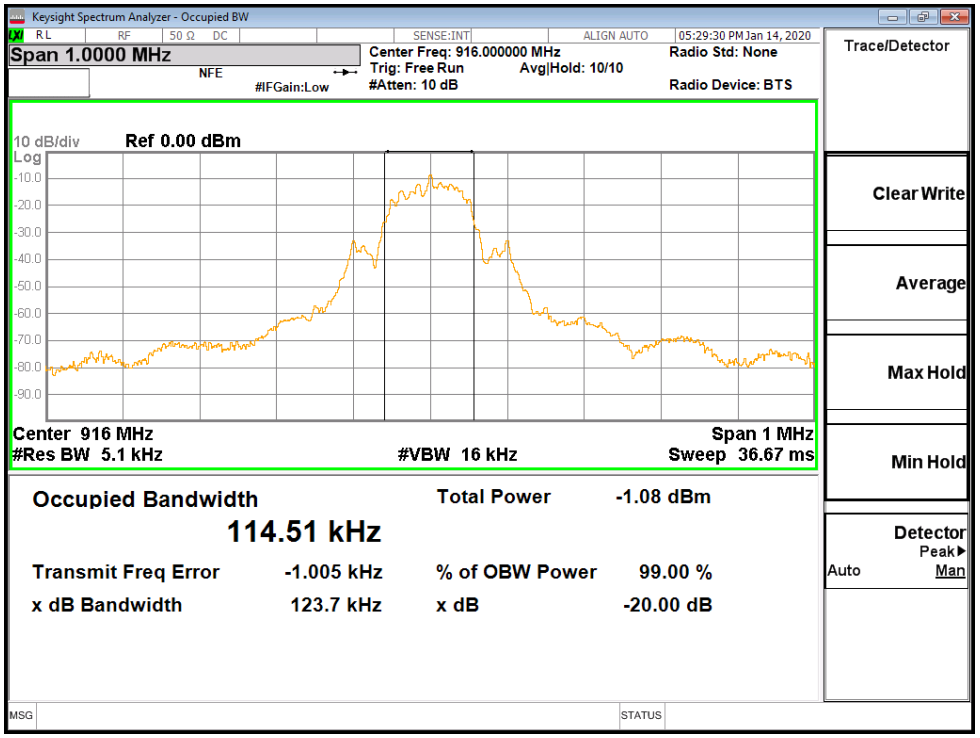
BANDWIDTH LOW CH



BANDWIDTH MID CH



BANDWIDTH HIGH CH



8. RADIATED TEST RESULTS

8.1. LIMITS AND PROCEDURE

LIMITS

Please refer to FCC §15.205 and §15.209
Please refer to FCC §15.249 (a)(d)(e)
RSS-210 Issue 9 Clause Annex B B.10
Please refer to ISED RSS-GEN Clause 8.9 and Clause 8.10

The field strength of emissions from intentional radiators operated within these frequency bands			
Frequency (MHz)	Field strength of Fundamental	Field strength of Harmonics	Distance (m)
902 - 928	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
2400 – 2483.5	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
5725 – 5875	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3

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.

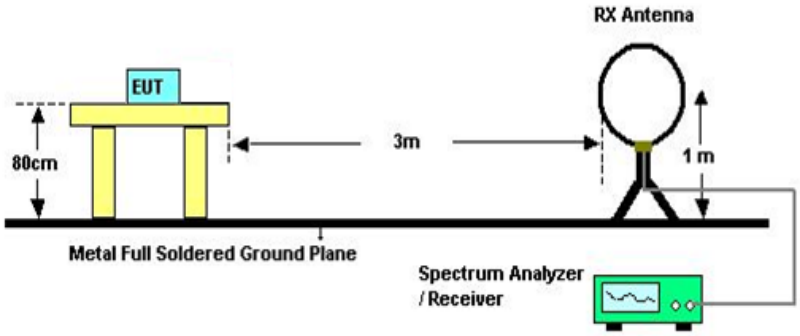
Radiation Disturbance Test Limit for FCC (Above 1GHz)

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

About Restricted bands of operation please refer to RSS-Gen section 8.10 and FCC §15.205 (a)

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 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.

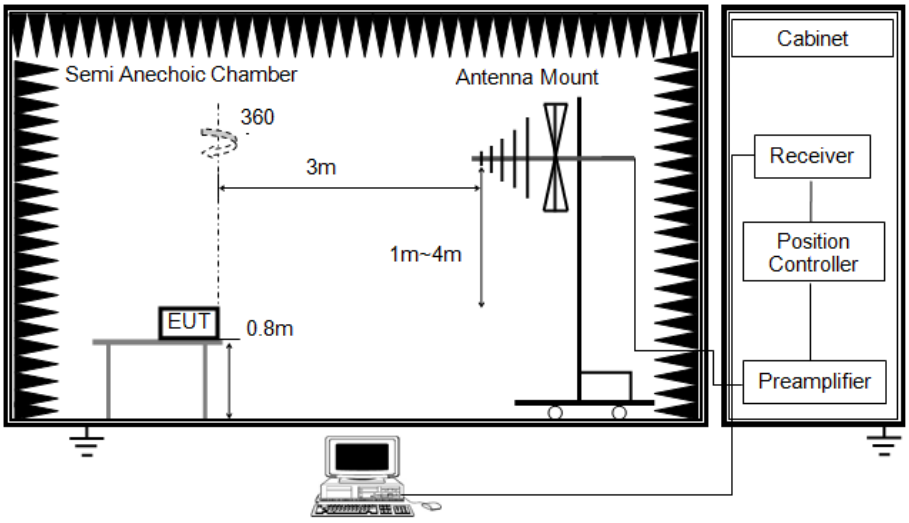
5. Measurement = Reading Level + Correct Factor

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)

8. Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30m open are test site. 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.

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.

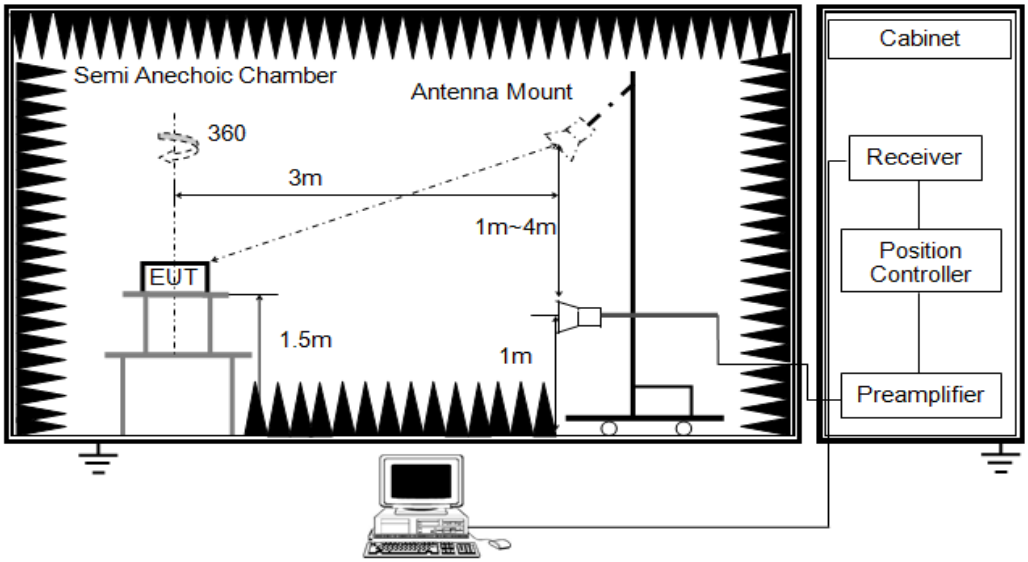
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

5. Measurement = Reading Level + Correct Factor

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)

ABOVE 1G



The setting of the spectrum analyser

RBW	1M MHz
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.

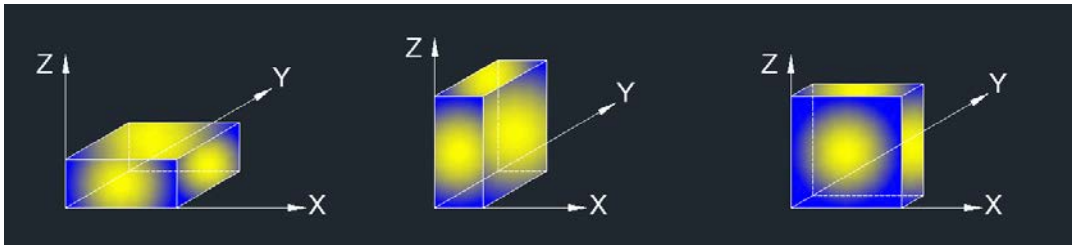
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

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 average power measurement, set the detector to AVG, while maintaining all of the other instrument settings, if the duty cycle of the EUT is less than 98%, the Duty Cycle Correction Factor shall be added to the measured emission levels. For the Duty Cycle and Correction Factor please refer to clause 7.1.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)

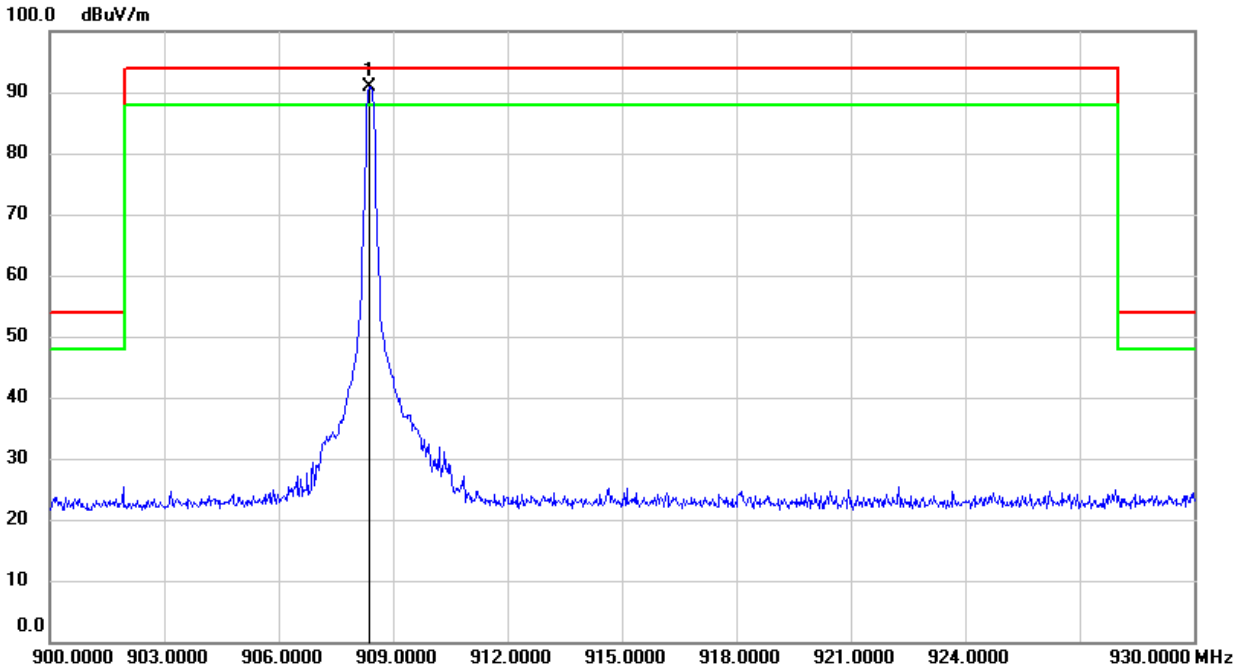
X axis, Y axis, Z axis positions:



Note 1: 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.

8.2. FIELD STRENGTH OF INTENTIONAL EMISSIONS

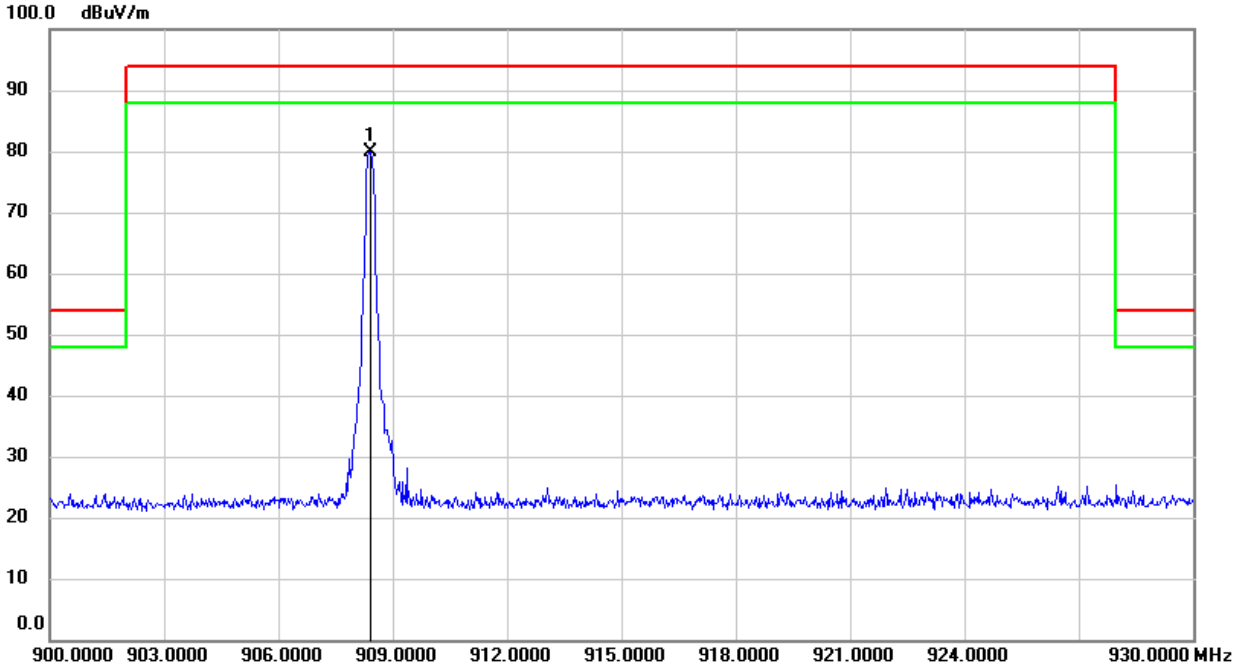
FIELD STRENGTH OF INTENTIONAL EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	908.4000	94.89	-4.12	90.77	94.00	-3.23	QP

Note: 1. Measurement = Reading Level + Correct Factor.
2. QP detector.

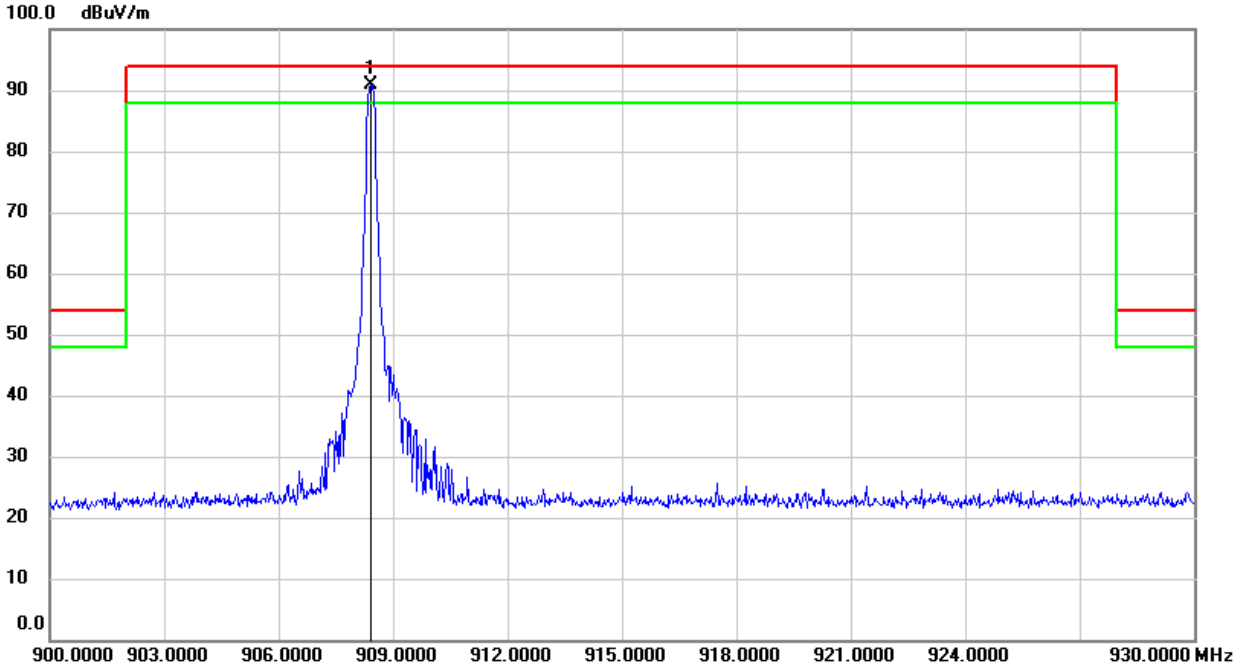
FIELD STRENGTH OF INTENTIONAL EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	908.4000	83.91	-4.12	79.79	94.00	-14.21	QP

Note: 1. Measurement = Reading Level + Correct Factor.
2. QP detector.

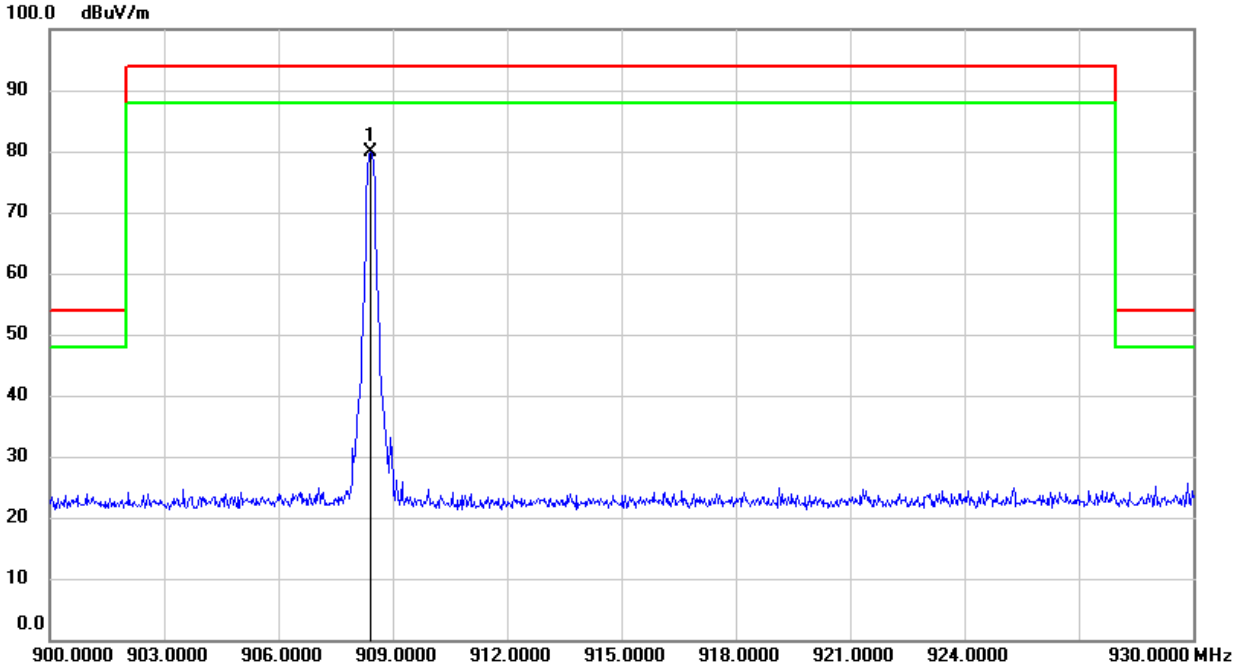
FIELD STRENGTH OF INTENTIONAL EMISSIONS (MIDDLE CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	908.4200	94.93	-4.12	90.81	94.00	-3.19	QP

Note: 1. Measurement = Reading Level + Correct Factor.
2. QP detector.

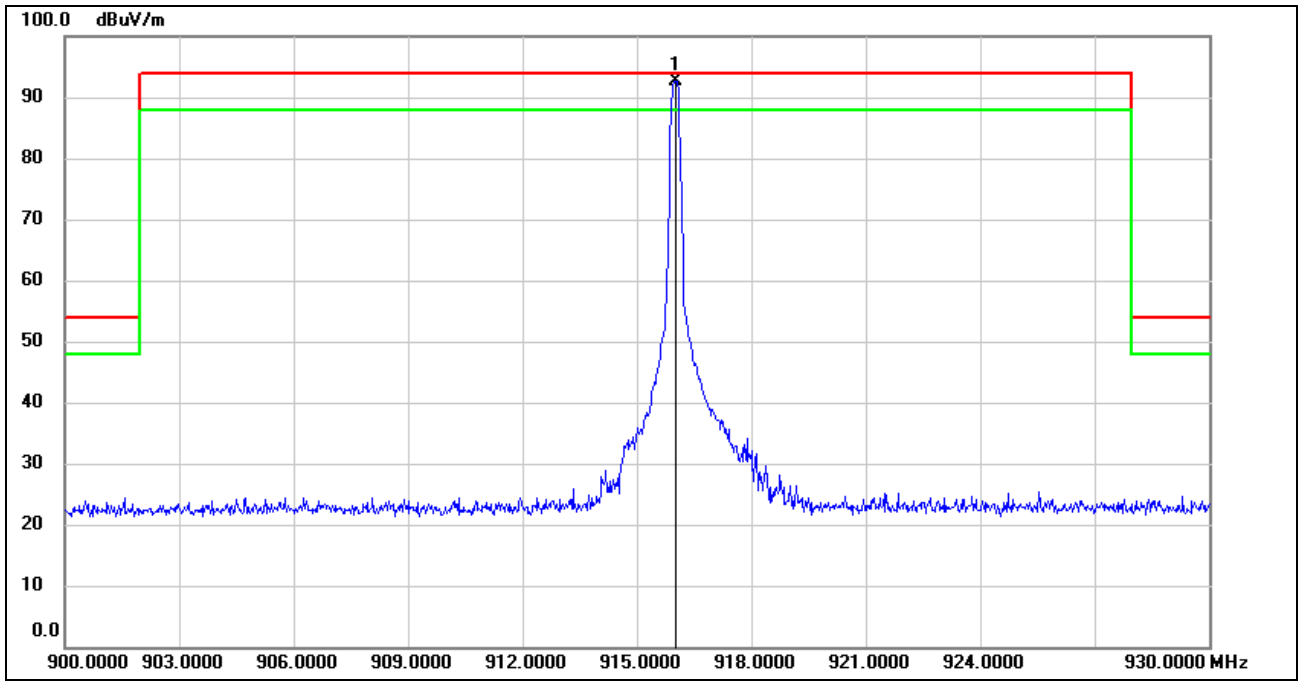
FIELD STRENGTH OF INTENTIONAL EMISSIONS (MIDDLE CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	908.4200	83.90	-4.12	79.78	94.00	-14.22	QP

Note: 1. Measurement = Reading Level + Correct Factor.
2. QP detector.

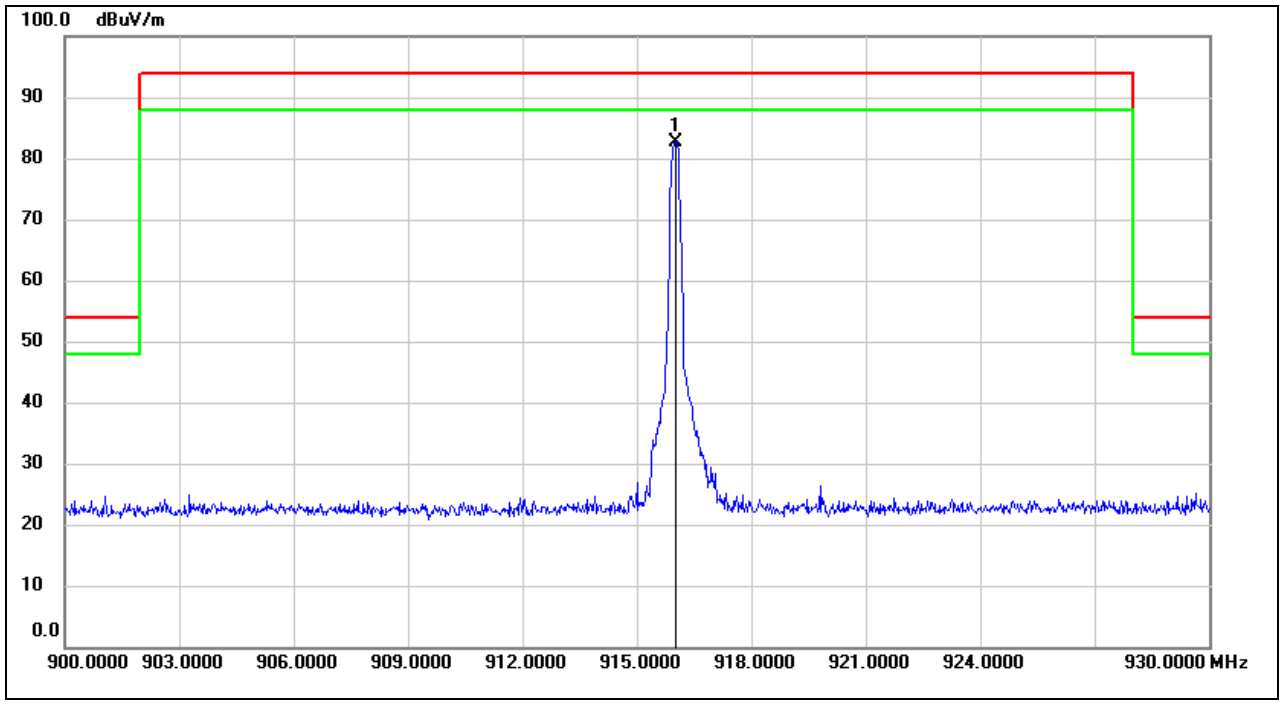
FIELD STRENGTH OF INTENTIONAL EMISSIONS (HIGH CHANNEL, HORIZONTAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	916.0000	96.67	-4.01	92.66	94.00	-1.34	QP

Note: 1. Measurement = Reading Level + Correct Factor.
2. QP detector.

FIELD STRENGTH OF INTENTIONAL EMISSIONS (HIGH CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	916.0000	86.67	-4.01	82.66	94.00	-11.34	QP

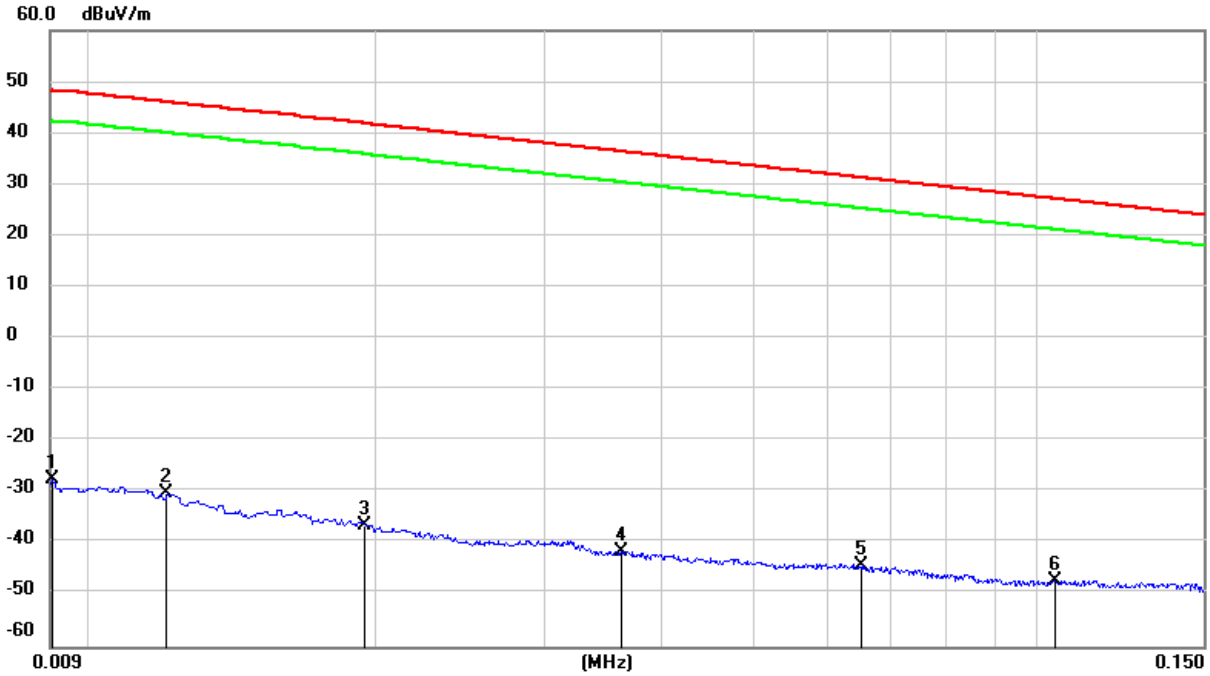
Note: 1. Measurement = Reading Level + Correct Factor.
2. QP detector.

8.3. SPURIOUS EMISSIONS BELOW 30M

SPURIOUS EMISSIONS

(HIGH CHANNEL, LOOP ANTENNA FACE ON TO THE EUT, WORST-CASE CONFIGURATION)

9kHz~ 150kHz



No.	Frequency	Reading	Correct	FCC Result	FCC Limit	ISED Result	ISED Limit	Margin	Remark
	(MHz)	(dBuA)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuA/m)	(dBuA/m)	(dB)	
1	0.0091	73.79	-101.33	-27.54	48.28	-79.04	-3.22	-75.82	peak
2	0.0120	71.16	-101.39	-30.23	46.02	-81.73	-5.48	-76.25	peak
3	0.0194	64.89	-101.35	-36.46	41.84	-87.96	-9.66	-78.30	peak
4	0.0362	60.01	-101.42	-41.41	36.43	-92.91	-15.07	-77.84	peak
5	0.0651	57.22	-101.54	-44.32	31.33	-95.82	-20.17	-75.65	peak
6	0.1044	54.56	-101.78	-47.22	27.23	-98.72	-24.27	-74.45	peak

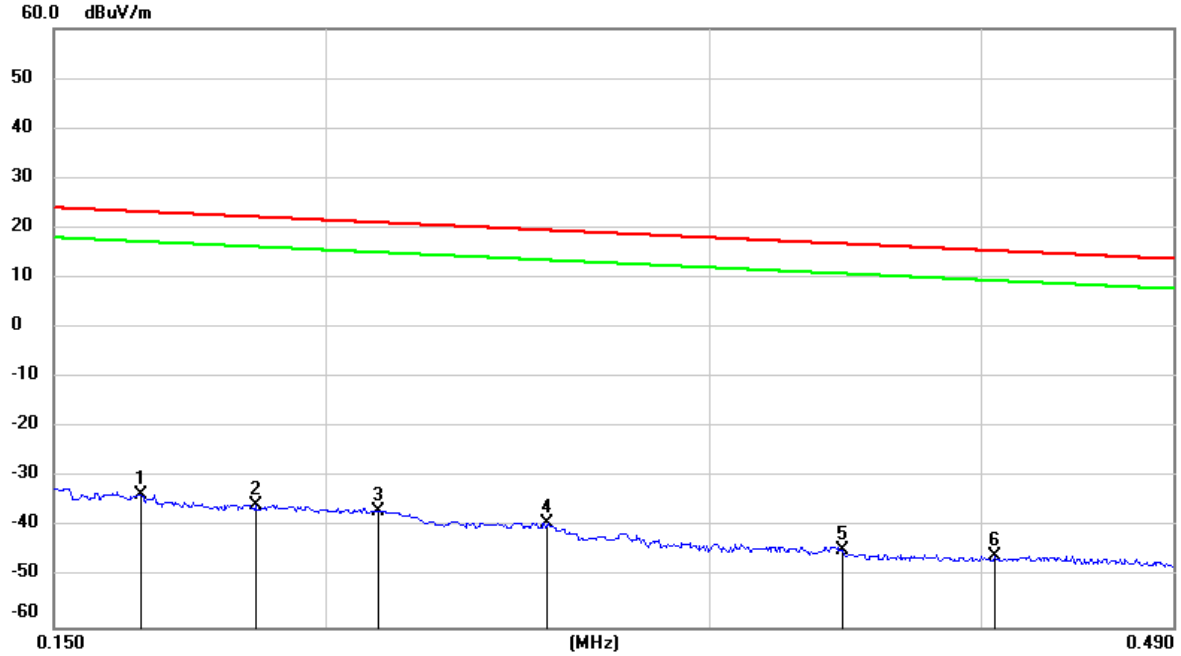
Note: 1. Measurement = Reading Level + Correct Factor.

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.

4. dBuA/m = dBuV/m -20log10(120π) = dBuV/m – 51.5.

150kHz ~ 490kHz



No.	Frequency	Reading	Correct	FCC Result	FCC Limit	ISED Result	ISED Limit	Margin	Remark
	(MHz)	(dBuA)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuA/m)	(dBuA/m)	(dB)	
1	0.1645	68.25	-101.66	-33.41	23.28	-84.91	-28.22	-56.69	peak
2	0.1857	66.20	-101.70	-35.50	22.23	-87.0	-29.27	-57.73	peak
3	0.2114	65.06	-101.73	-36.67	21.10	-88.17	-30.40	-57.77	peak
4	0.2530	62.64	-101.80	-39.16	19.54	-90.66	-31.96	-58.70	peak
5	0.3452	57.49	-101.90	-44.41	16.84	-95.91	-34.66	-61.25	peak
6	0.4060	56.15	-101.96	-45.81	15.43	-97.31	-36.07	-61.24	peak

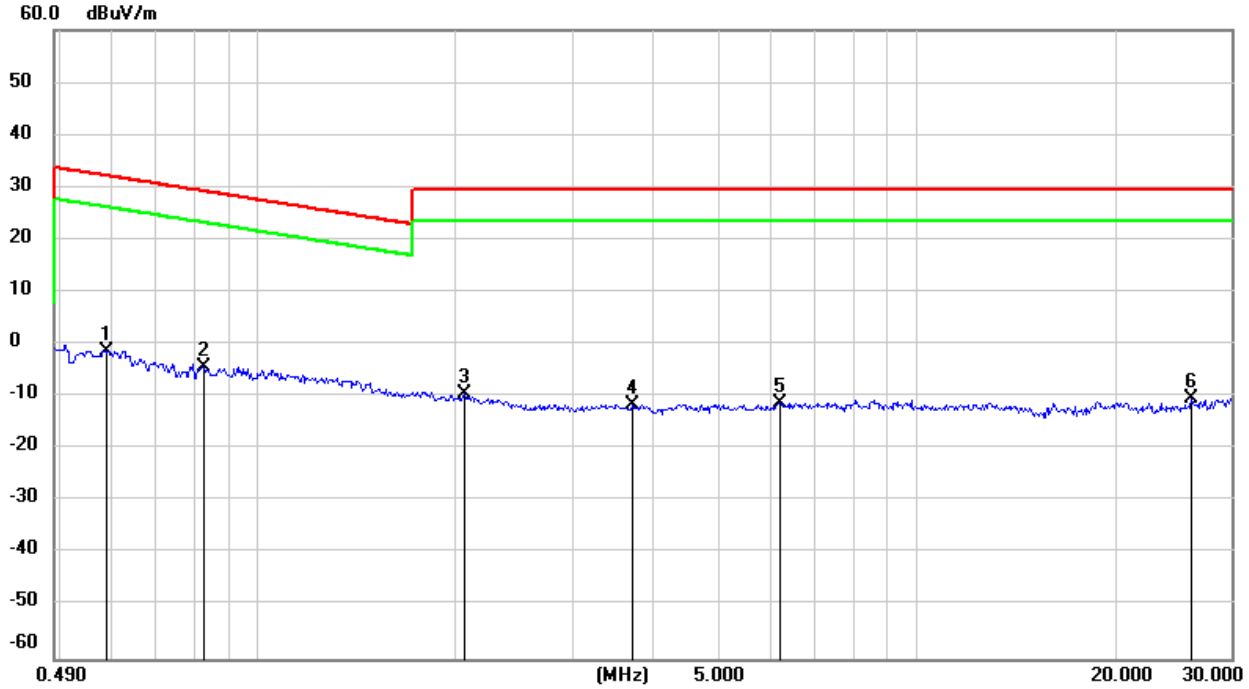
Note: 1. Measurement = Reading Level + Correct Factor.

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.

4. dBuA/m = dBuV/m -20log10(120π) = dBuV/m – 51.5.

490kHz ~ 30MHz



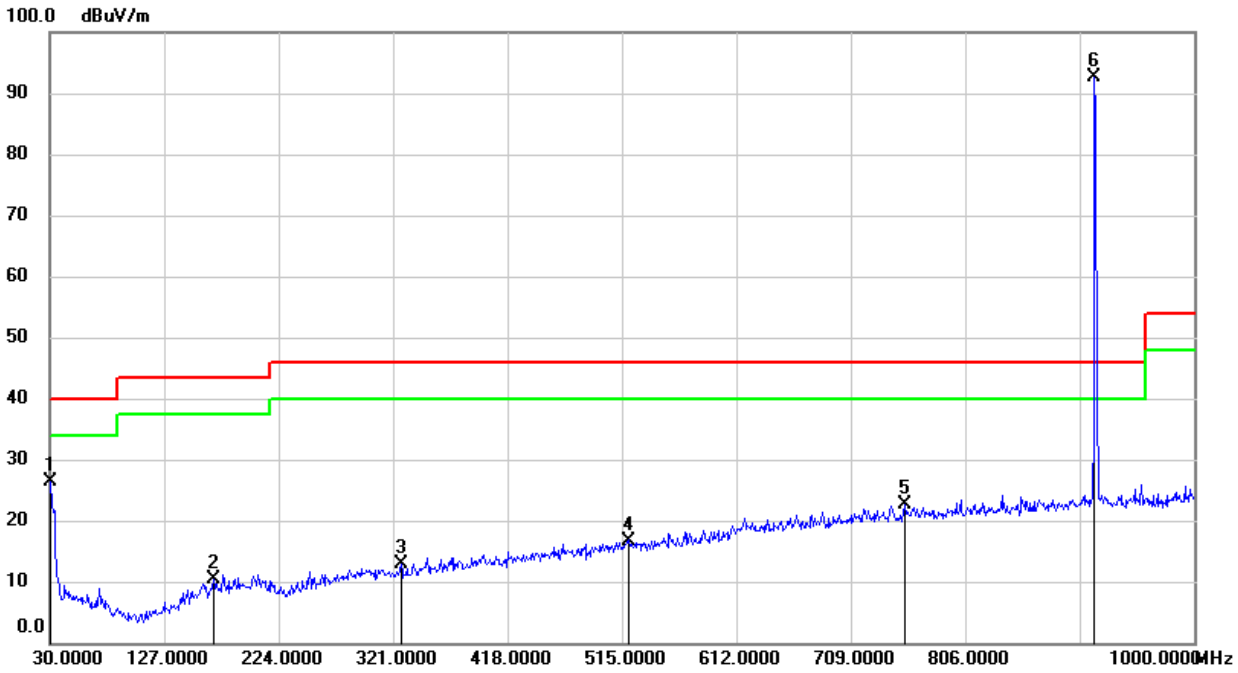
No.	Frequency	Reading	Correct	FCC Result	FCC Limit	ISED Result	ISED Limit	Margin	Remark
	(MHz)	(dBuA)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuA/m)	(dBuA/m)	(dB)	
1	0.5897	60.85	-62.08	-1.23	32.19	-52.73	-19.31	-33.42	peak
2	0.8263	57.84	-62.16	-4.32	29.26	-55.82	-22.24	-33.58	peak
3	2.0598	52.26	-61.81	-9.55	29.54	-61.05	-21.96	-39.09	peak
4	3.7065	49.87	-61.41	-11.54	29.54	-63.04	-21.96	-41.08	peak
5	6.2149	50.20	-61.32	-11.12	29.54	-62.62	-21.96	-40.66	peak
6	26.1047	49.98	-60.34	-10.36	29.54	-61.86	-21.96	-39.90	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.
4. dBuA/m = dBuV/m -20log10(120π) = dBuV/m – 51.5.

Note: All the modes had been tested, but only the worst data recorded in the report.

8.4. SPURIOUS EMISSIONS BELOW 1 GHz

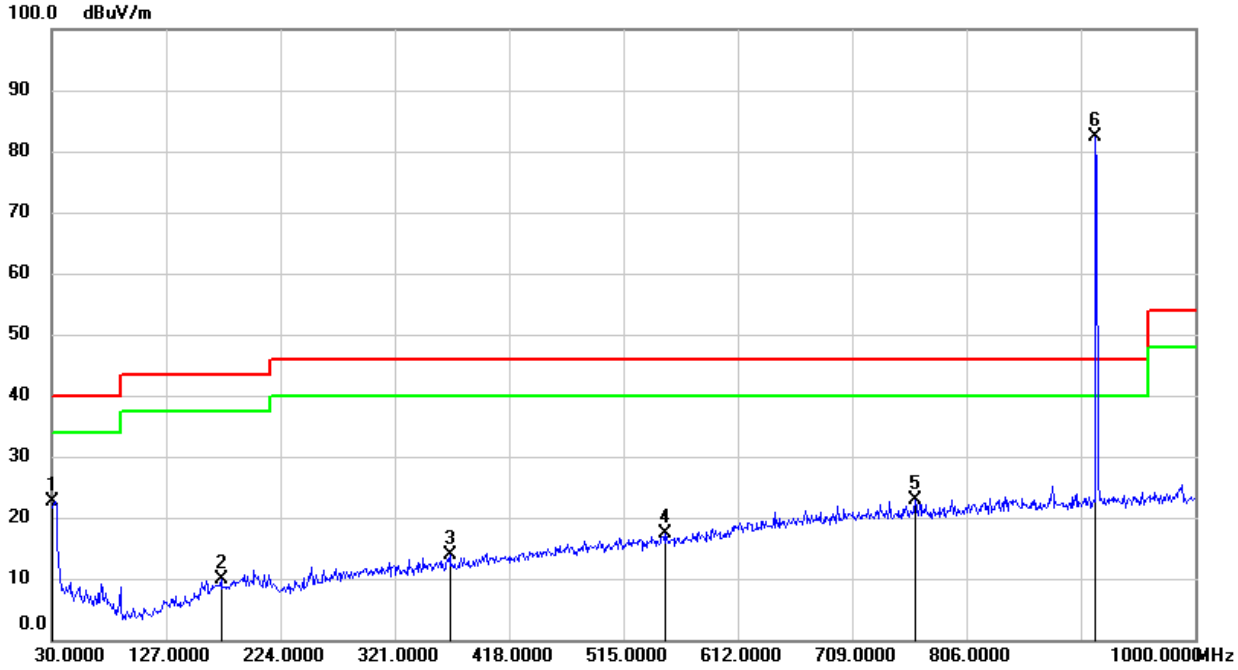
SPURIOUS EMISSIONS BELOW 1GHZ (WORST-CASE HIGH CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	30.9700	43.50	-17.08	26.42	40.00	-13.58	QP
2	168.7100	27.40	-17.05	10.35	43.50	-33.15	QP
3	327.7900	26.82	-13.92	12.90	46.00	-33.10	QP
4	520.8200	27.16	-10.41	16.75	46.00	-29.25	QP
5	754.5900	28.85	-6.26	22.59	46.00	-23.41	QP
6	915.6100	96.58	-4.02	92.56	/	/	Fundamental

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
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 BELOW 1GHz (WORST-CASE HIGH CHANNEL, VERTICAL)



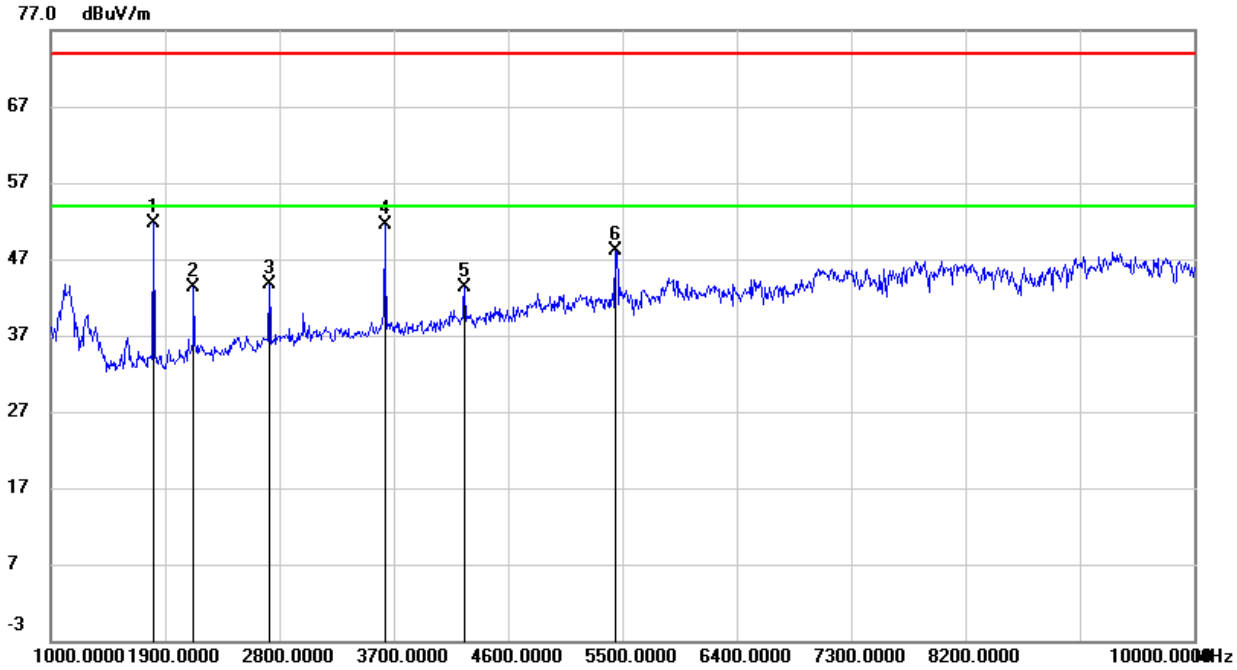
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	30.0000	39.58	-16.94	22.64	40.00	-17.36	QP
2	173.5600	26.97	-17.15	9.82	43.50	-33.68	QP
3	367.5600	27.13	-13.23	13.90	46.00	-32.10	QP
4	550.8900	27.34	-9.89	17.45	46.00	-28.55	QP
5	762.3500	28.86	-6.06	22.80	46.00	-23.20	QP
6	915.6100	86.48	-4.02	82.46	/	/	Fundamental

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
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 the modes had been tested, but only the worst data recorded in the report.

8.5. SPURIOUS EMISSIONS 1 ~ 10GHz

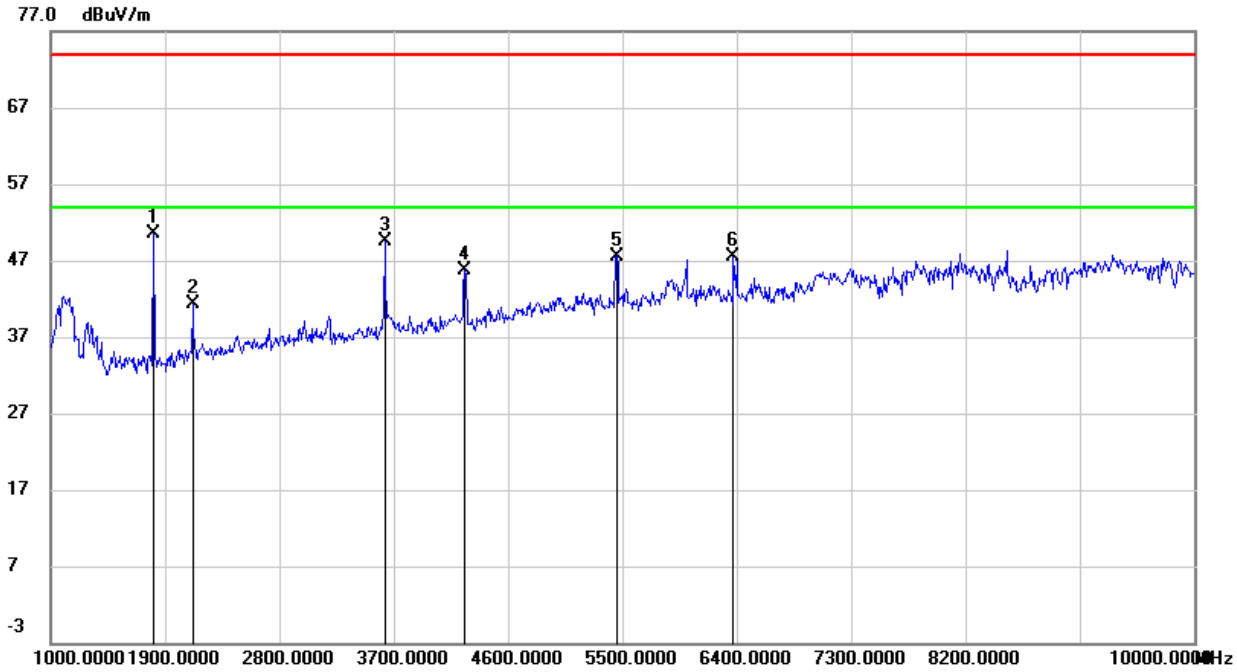
HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1810.000	62.43	-10.71	51.72	74.00	-22.28	peak
2	2125.000	53.24	-9.95	43.29	74.00	-30.71	peak
3	2719.000	51.54	-7.74	43.80	74.00	-30.20	peak
4	3628.000	56.15	-4.69	51.46	74.00	-22.54	peak
5	4258.000	46.20	-2.95	43.25	74.00	-30.75	peak
6	5446.000	46.39	1.66	48.05	74.00	-25.95	peak

Note: 1. Result = Reading + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

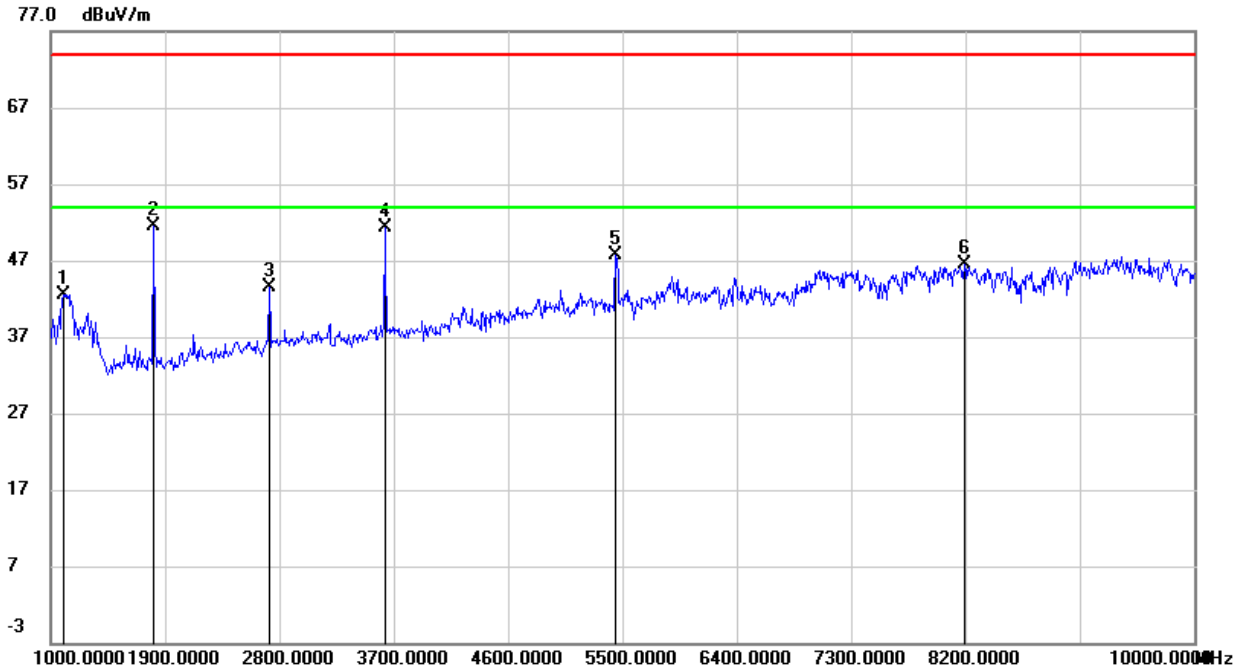
HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1810.000	61.13	-10.71	50.42	74.00	-23.58	peak
2	2116.000	51.25	-9.98	41.27	74.00	-32.73	peak
3	3628.000	54.24	-4.69	49.55	74.00	-24.45	peak
4	4258.000	48.66	-2.95	45.71	74.00	-28.29	peak
5	5455.000	45.82	1.78	47.60	74.00	-26.40	peak
6	6373.000	43.87	3.57	47.44	74.00	-26.56	peak

Note: 1. Result = Reading + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

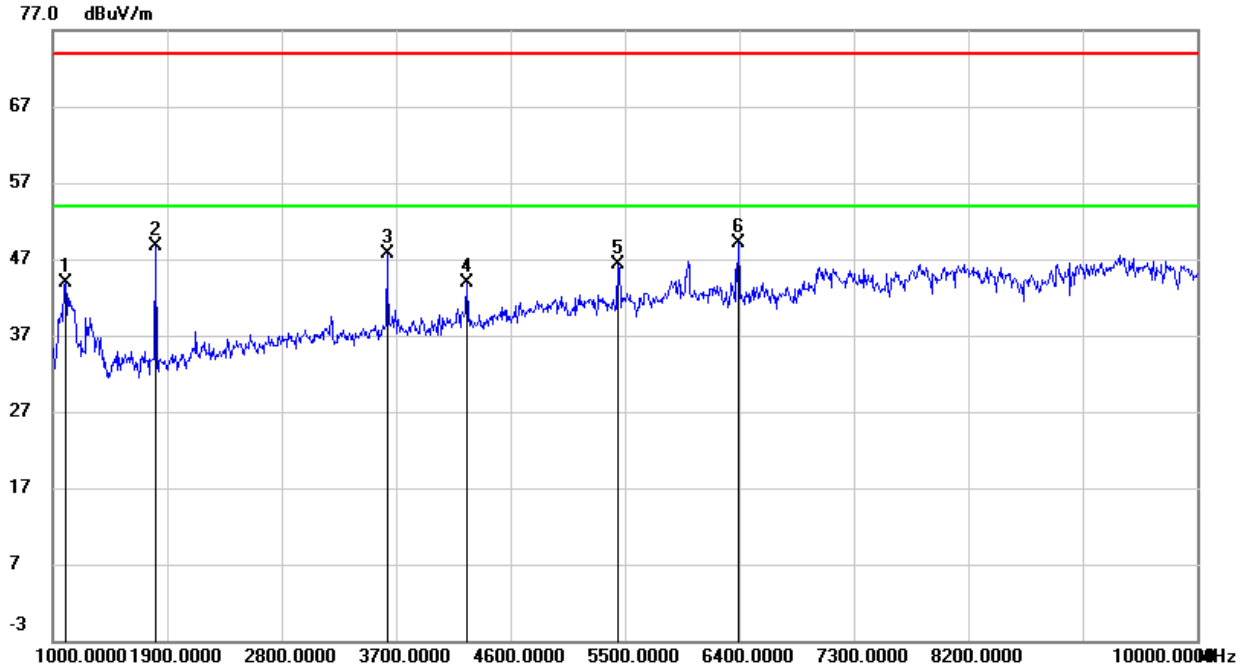
HARMONICS AND SPURIOUS EMISSIONS (MIDDLE CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1099.000	56.67	-14.17	42.50	74.00	-31.50	peak
2	1810.000	62.22	-10.71	51.51	74.00	-22.49	peak
3	2719.000	51.33	-7.74	43.59	74.00	-30.41	peak
4	3628.000	56.02	-4.69	51.33	74.00	-22.67	peak
5	5446.000	46.11	1.66	47.77	74.00	-26.23	peak
6	8191.000	38.60	7.86	46.46	74.00	-27.54	peak

Note: 1. Result = Reading + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

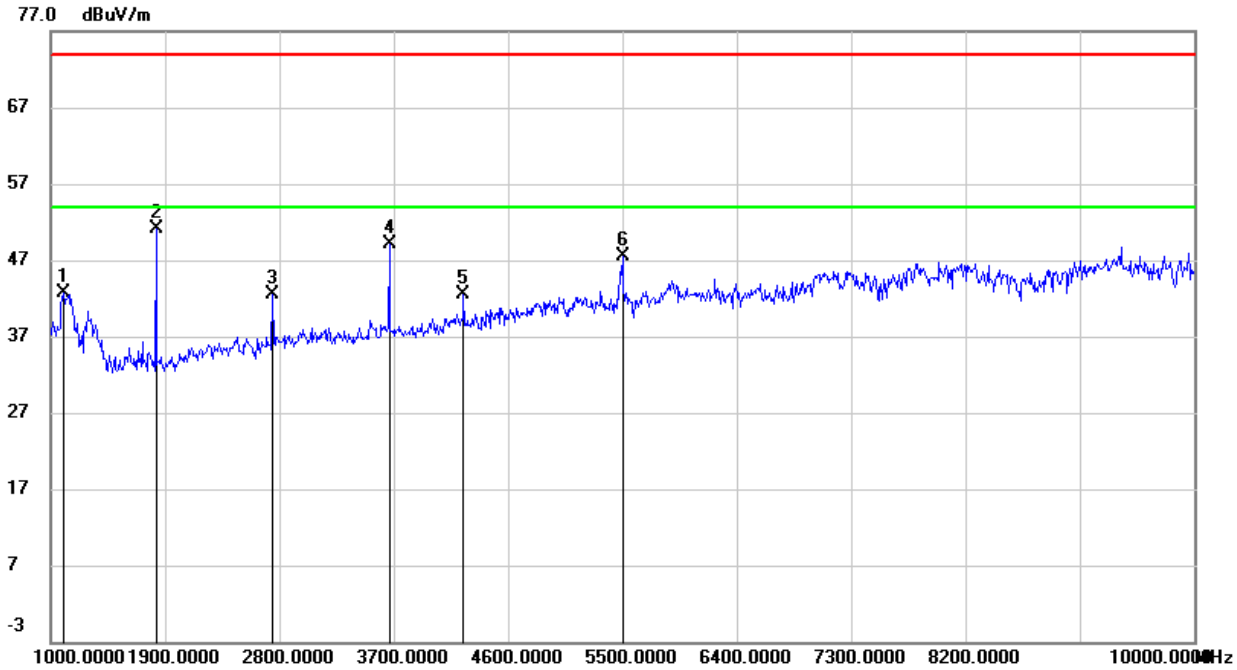
HARMONICS AND SPURIOUS EMISSIONS (MIDDLE CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1099.000	58.01	-14.17	43.84	74.00	-30.16	peak
2	1810.000	59.50	-10.71	48.79	74.00	-25.21	peak
3	3628.000	52.40	-4.69	47.71	74.00	-26.29	peak
4	4258.000	46.81	-2.95	43.86	74.00	-30.14	peak
5	5446.000	44.64	1.66	46.30	74.00	-27.70	peak
6	6391.000	45.43	3.63	49.06	74.00	-24.94	peak

Note: 1. Result = Reading + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

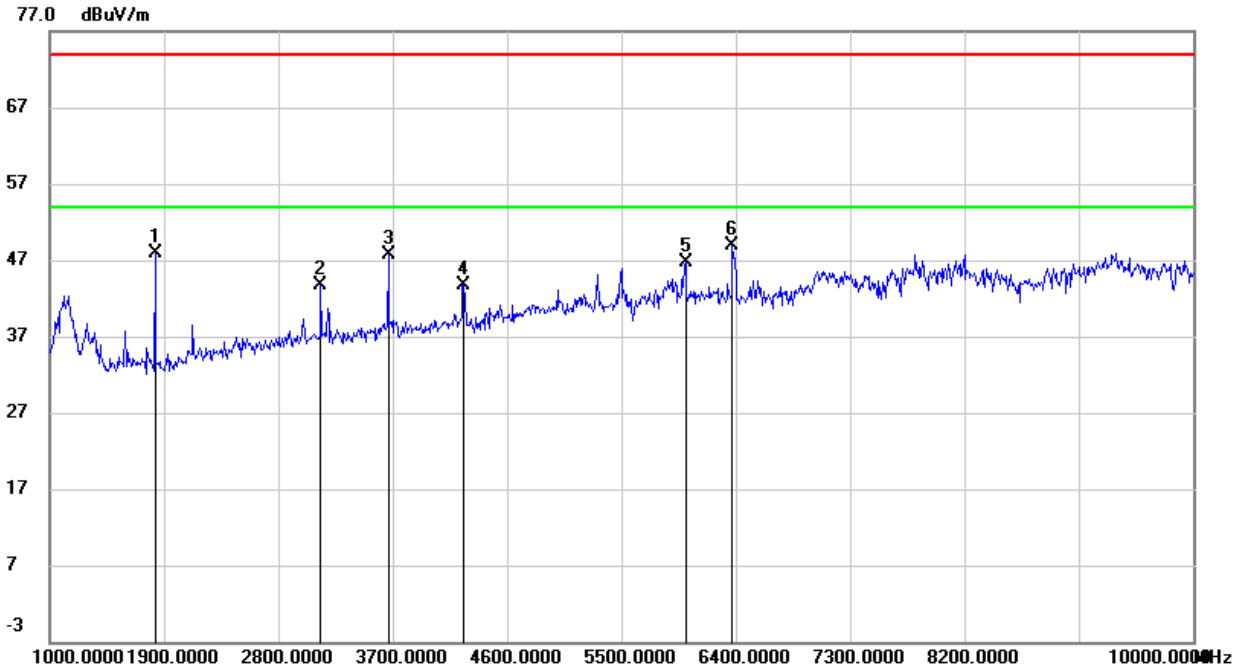
HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1099.000	56.85	-14.17	42.68	74.00	-31.32	peak
2	1828.000	61.70	-10.69	51.01	74.00	-22.99	peak
3	2746.000	50.13	-7.55	42.58	74.00	-31.42	peak
4	3664.000	53.58	-4.40	49.18	74.00	-24.82	peak
5	4249.000	45.41	-2.91	42.50	74.00	-31.50	peak
6	5500.000	45.13	2.37	47.50	74.00	-26.50	peak

Note: 1. Result = Reading + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1828.000	58.53	-10.69	47.84	74.00	-26.16	peak
2	3133.000	49.41	-5.77	43.64	74.00	-30.36	peak
3	3664.000	52.11	-4.40	47.71	74.00	-26.29	peak
4	4258.000	46.62	-2.95	43.67	74.00	-30.33	peak
5	6004.000	44.03	2.61	46.64	74.00	-27.36	peak
6	6373.000	45.43	3.57	49.00	74.00	-25.00	peak

Note: 1. Result = Reading + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

9. 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.

RESULTS

Complies

END OF REPORT