



CFR 47 FCC PART 15 SUBPART C

TEST REPORT

For

Key

MODEL NUMBER: H60105-01

PROJECT NUMBER: 4790347140

REPORT NUMBER: 4790347140-1

FCC ID: 2AYR9H60105-01

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Prepared for

YADEA TECHNOLOGY GROUP CO., LTD.

Prepared by

UL-CCIC COMPANY LIMITED

No. 2, Chengwan Road, Suzhou Industrial Park, People's Republic of China

Tel: +86 512 6808 6400

Fax: +86 512 6808 4099

Website: www.ul.com



Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V0	06/25/2025	Initial Issue	



Summary of Test Results			
Clause	Test Items	FCC/IC Rules	Test Results
1	Transmitter Timeout	CFR 47 FCC §15.231 (a) (1)	Pass
2	20 dB Bandwidth and 99 % Occupied Bandwidth	CFR 47 FCC §15.231 (c)	Pass
3	Radiated Emission	CFR 47 FCC §15.231 (b)(e) CFR 47 FCC §15.205 and §15.209	Pass
4	Conducted Emission Test for AC Power Port	CFR 47 FCC §15.207	N/A (See Note 1)
5	Antenna Requirement	CFR 47 FCC §15.203	Pass

Note1: The product was powered by battery, so this test item is no need to test.
Note 2: 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.



TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	5
2. TEST METHODOLOGY	6
3. FACILITIES AND ACCREDITATION	6
4. CALIBRATION AND UNCERTAINTY	7
4.1. <i>MEASURING INSTRUMENT CALIBRATION</i>	<i>7</i>
4.2. <i>MEASUREMENT UNCERTAINTY.....</i>	<i>7</i>
5. EQUIPMENT UNDER TEST	8
5.1. <i>DESCRIPTION OF EUT</i>	<i>8</i>
5.2. <i>MAXIMUM FIELD STRENGTH.....</i>	<i>8</i>
5.3. <i>TEST CHANNEL CONFIGURATION.....</i>	<i>8</i>
5.4. <i>DESCRIPTION OF AVAILABLE ANTENNAS.....</i>	<i>9</i>
5.5. <i>TEST ENVIRONMENT</i>	<i>9</i>
5.6. <i>DESCRIPTION OF TEST SETUP</i>	<i>10</i>
5.7. <i>MEASURING INSTRUMENT AND SOFTWARE USED</i>	<i>11</i>
6. ANTENNA PORT TEST RESULTS.....	12
6.1. <i>ON TIME AND DUTY CYCLE.....</i>	<i>12</i>
6.2. <i>TANSMITTER TIMEOUT.....</i>	<i>15</i>
6.3. <i>20dB BANDWIDTH</i>	<i>18</i>
7. RADIATED TEST RESULTS.....	20
7.1. <i>FIELD STRENGTH OF INTENTIONAL EMISSIONS.....</i>	<i>27</i>
7.2. <i>SPURIOUS EMISSIONS (1~6GHz).....</i>	<i>29</i>
7.3. <i>SPURIOUS EMISSIONS (0.03~1 GHz).....</i>	<i>31</i>
7.4. <i>SPURIOUS EMISSIONS BELOW 30M</i>	<i>33</i>
8. ANTENNA REQUIREMENTS.....	36



1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name: YADEA TECHNOLOGY GROUP CO., LTD.
Address: Dongsheng Road, Dacheng Industrial Zone, Anzhen, Xishan District Wuxi, China

Manufacturer Information

Company Name: YADEA TECHNOLOGY GROUP CO., LTD.
Address: Dongsheng Road, Dacheng Industrial Zone, Anzhen, Xishan District Wuxi, China

Factory Information

Company Name: Wuhan Hekang Power Technology CO., LTD
Address: No.6, Fozuling 3rd Road, Donghu Development Zone, Wuhan, Hubei, China

EUT Description

Product Name: Key
Model Name: H60105-01
Additional No.: /
Sample Number: 4445104
Data of Receipt Sample: Nov. 29, 2021
Test Date: Apr. 25, 2022 ~ Jun. 25, 2023

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

Prepared By:

Tom Tang

Reviewed By:

Leon Wu

Tom Tang
Project Engineer

Leon Wu
Senior Engineer Project

Authorized By:

Chris Zhong

Chris Zhong
Laboratory Leader



2. TEST METHODOLOGY

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

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	<p>A2LA (Certificate No.: 4829.01) UL-CCIC COMPANY LIMITED has been assessed and proved to be in compliance with A2LA.</p> <p>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.</p> <p>IC (IC Designation No.: 25056; CAB No.: CN0073) 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.</p>
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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	3.1dB
Radiation Emission test (include Fundamental emission) (9kHz-30MHz)	3.4dB
Radiation Emission test (include Fundamental emission) (30MHz-1GHz)	3.4dB
Radiation Emission test (1GHz to 26GHz) (include Fundamental emission)	3.9dB (1GHz-18GHz)
	4.2dB (18GHz-26.5GHz)
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

EUT Name	Key	
EUT Description	The device is a key.	
Model	H60105-01	
Series Model	B308-xx-yyy (xx=00~99; yyy=000~999, "XX" denotes different country, "yyy" denotes different color.)	
Model Difference	Their electrical circuit design, layout, components used and internal wiring are identical, only the color and model name is different. We select "AAABBB" as the representative model for compliance test.	
Product Description	Operation Frequency	433.92 MHz
	Modulation Type	ASK
Power Supply	Battery	DC 3V

5.2. MAXIMUM FIELD STRENGTH

Frequency (MHz)	Max AVG field strength (dB μ V/m)
433.9370	70.23

5.3. TEST CHANNEL CONFIGURATION

Test Mode	Frequency
ASK	433.92 MHz



5.4. DESCRIPTION OF AVAILABLE ANTENNAS

Frequency (MHz)	Antenna Type	Antenna Gain (dBi)
433.92	PCB antenna	0

5.5. TEST ENVIRONMENT

Environment Parameter	Selected Values During Tests	
Relative Humidity	55 ~ 65%	
Atmospheric Pressure:	101kPa	
Temperature	TN	20 ~ 30°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



5.6. 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
4	/	/	/	/	/

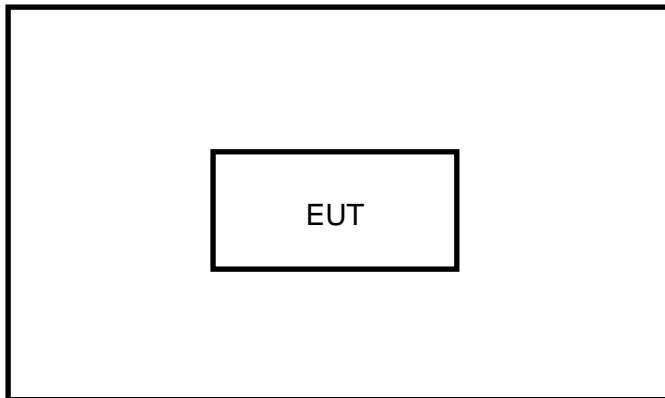
ACCESSORIES

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

TEST SETUP

1. A fully charged battery was used for all tests.
2. The test sample can be into a transmission mode through the power on.

SETUP DIAGRAM FOR TESTS





5.7. MEASURING INSTRUMENT AND SOFTWARE USED

Conducted Emissions (Instrument)							
Used	Equipment	Manufacturer	Model No.	Serial No.	Upper Last Cal.	Last Cal.	Next Cal.
<input checked="" type="checkbox"/>	EMI Test Receiver	R&S	ESR3	126700	2021-12-20	2022-12-19	2023-12-18
<input checked="" type="checkbox"/>	Two-Line V-Network	R&S	ENV216	126701	2021-12-04	2022-12-03	2023-12-02
<input checked="" type="checkbox"/>	Artificial Mains Networks	R&S	ENY81	126712	2021-10-12	2022-10-09	2023-10-08
Software							
Used	Description		Manufacturer	Name	Version		
<input checked="" type="checkbox"/>	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.
<input checked="" type="checkbox"/>	Spectrum Analyzer	Keysight	N9010B	155727	2022-04-09	2023-04-08	2024-04-07
	EMI test receiver	R&S	ESR7	222993	2022-04-09	2023-04-08	2024-04-07
<input checked="" type="checkbox"/>	EMI test receiver	R&S	ESR26	126703	2021-12-04	2022-12-03	2023-12-02
<input checked="" type="checkbox"/>	Receiver Antenna (9kHz-30MHz)	Schwarzbeck	FMZB 1513	155456	2018-06-15	2021-06-03	2024-06-02
<input checked="" type="checkbox"/>	Receiver Antenna (30MHz-1GHz)	SunAR RF Motion	JB1	177821	2019-01-19	2022-01-18	2025-01-17
<input checked="" type="checkbox"/>	Receiver Antenna (1GHz-18GHz)	R&S	HF907	126705	2019-01-27	2022-02-28	2025-02-27
<input checked="" type="checkbox"/>	Receiver Antenna (18GHz-26.5GHz)	ETS	3160-10	155565	2019-01-05	2021-07-15	2024-07-14
<input checked="" type="checkbox"/>	Pre-amplification (To 18GHz)	Compliance Direction System Inc.	PAP-1G18-50	178825	2022-03-01	2023-02-16	2024-02-15
<input checked="" type="checkbox"/>	Pre-amplification (To 26.5GHz)	R&S	SCU-26D	135391	2021-12-04	2022-12-03	2023-12-02
Software							
Used	Description		Manufacturer	Name	Version		
<input checked="" type="checkbox"/>	Test Software for Radiated disturbance		Tonscend	TS+	Ver. 2.5		
	Test Software for Radiated disturbance		Chinese-EMC	RE_RSE	Ver. 3.03		
Other instruments							
Used	Equipment	Manufacturer	Model No.	Serial No.	Upper Last Cal.	Last Cal.	Next Cal.
<input checked="" type="checkbox"/>	Spectrum Analyzer	Keysight	N9010B	155368	2022-04-09	2023-04-08	2024-04-07

6. ANTENNA PORT TEST RESULTS

6.1. ON TIME AND DUTY CYCLE

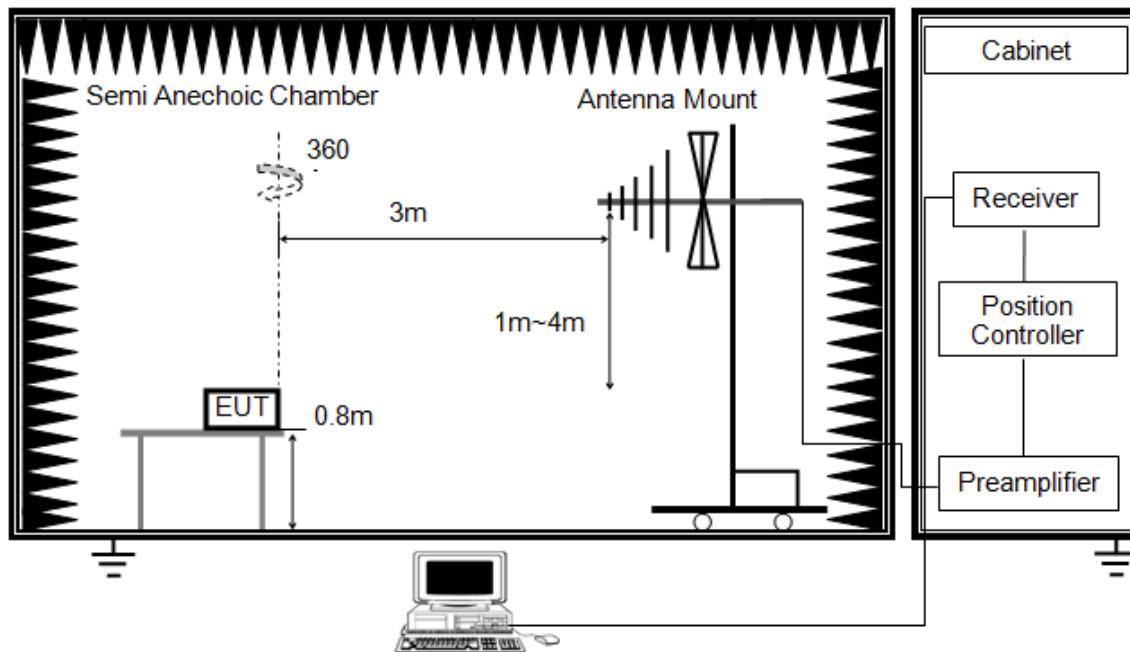
LIMITS

None; for reporting purposes only

PROCEDURE

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

TEST SETUP



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



TEST ENVIRONMENT

Temperature	20°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	DC 3V

RESULTS

On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (db)
100	100	1	100%	0

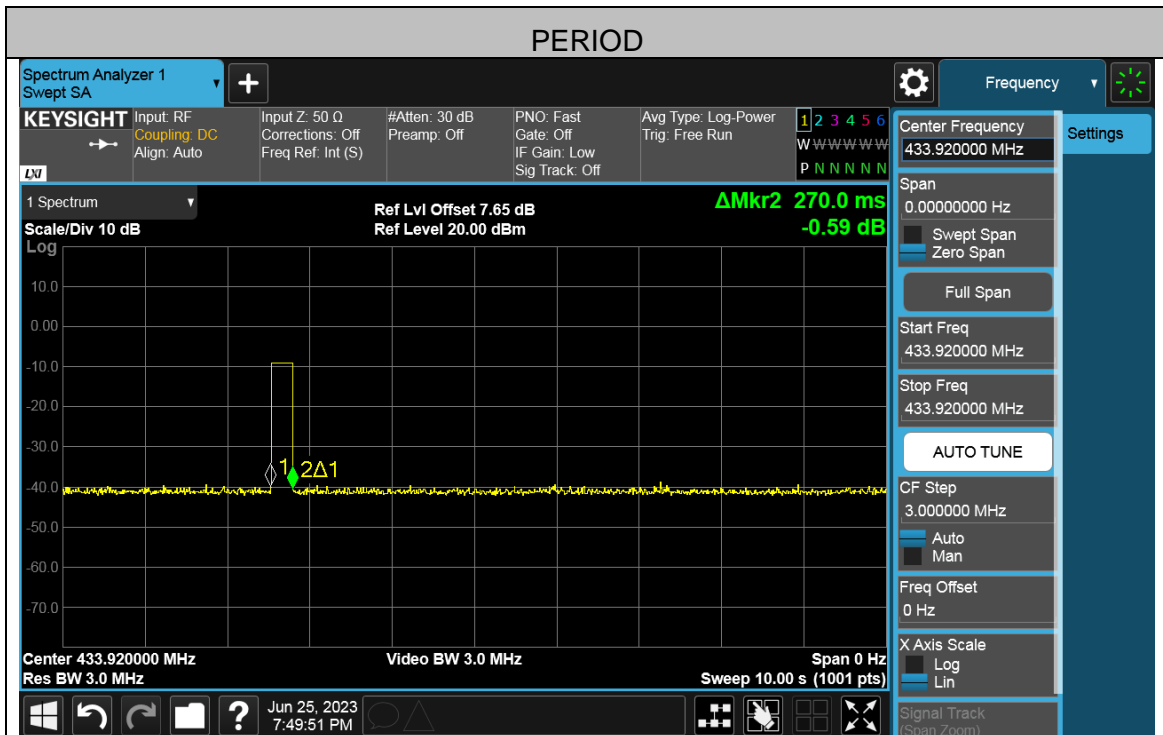
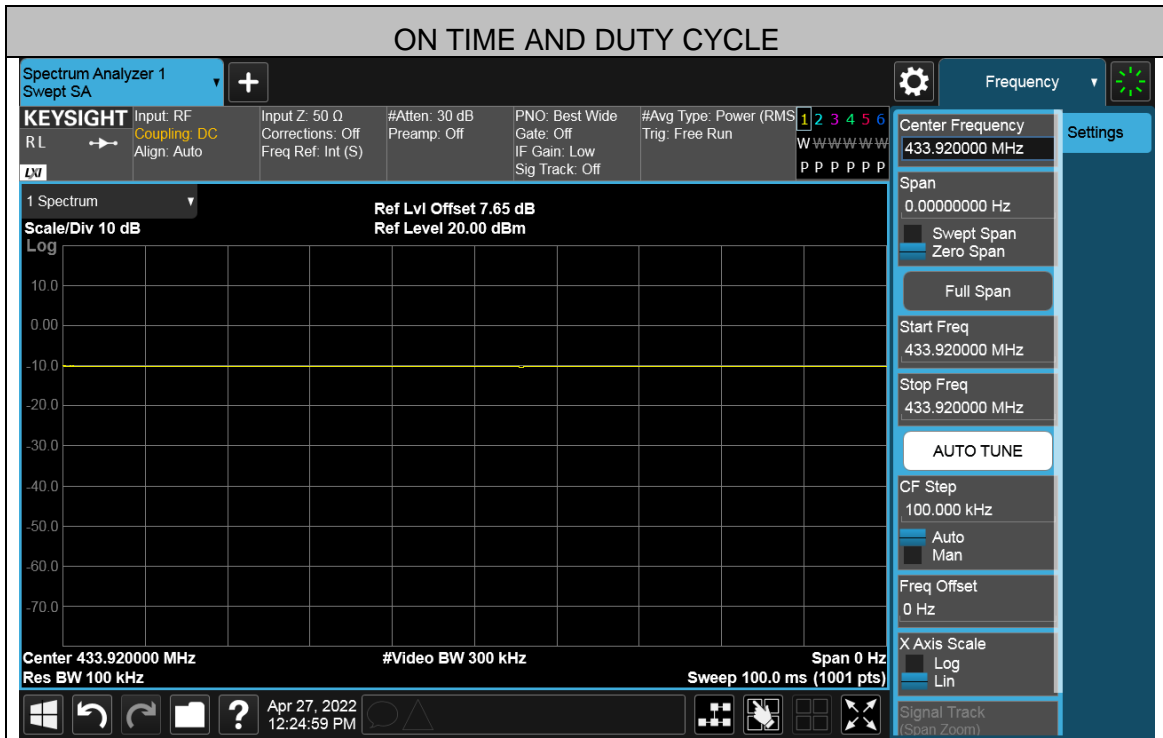
Note:

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.



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

Note: All test mode had been tested, only the worst data record in the report.



6.2. TRANSMITTER TIMEOUT

LIMITS

CFR 47 §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.

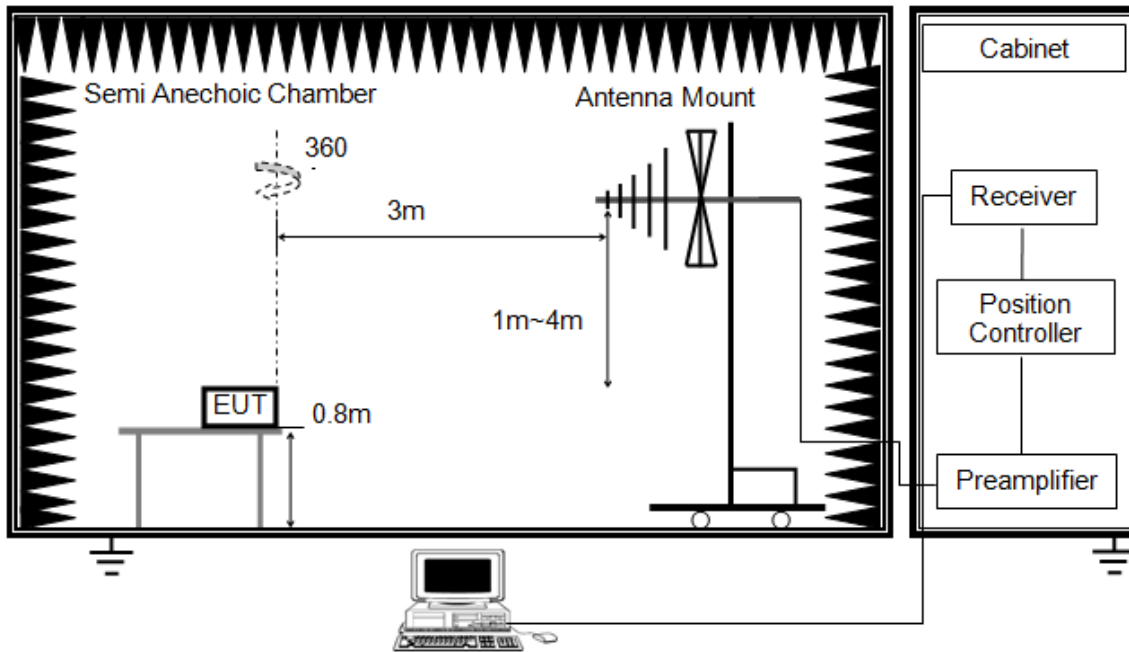
Devices shall comply with the following for momentary operation:

- a. A manually operated transmitter shall be equipped with a push-to-operate switch and be under manual control at all times during transmission. When released, the transmitter shall cease transmission within no more than 5 seconds of being released.
- b. A transmitter that has been activated automatically shall cease transmission within 5 seconds of activation.
- c. Periodic transmissions at regular, predetermined intervals are not permitted, except as specified in Section A.1.4. However, polling or supervision transmissions that determine system integrity of transmitters used in security or safety applications are permitted, provided the total duration of transmission does not exceed 2 seconds per hour for each transmitter.
- d. Intentional radiators used for radio control during emergencies involving fire, security of goods (e.g. burglar alarms), and safety-of-life, when activated to signal an alarm, may operate during the interval of the alarm condition.

TEST PROCEDURE

FCC Reference:	CFR 47 FCC §15.231(a)
Test Method Used:	The EUT transmitter was activated and monitored using a spectrum analyser for a period of 10 seconds.

TEST SETUP



- a. Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz.
- b. Use a video trigger with the trigger level set to enable triggering only on full pulses.
- c. Set 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.

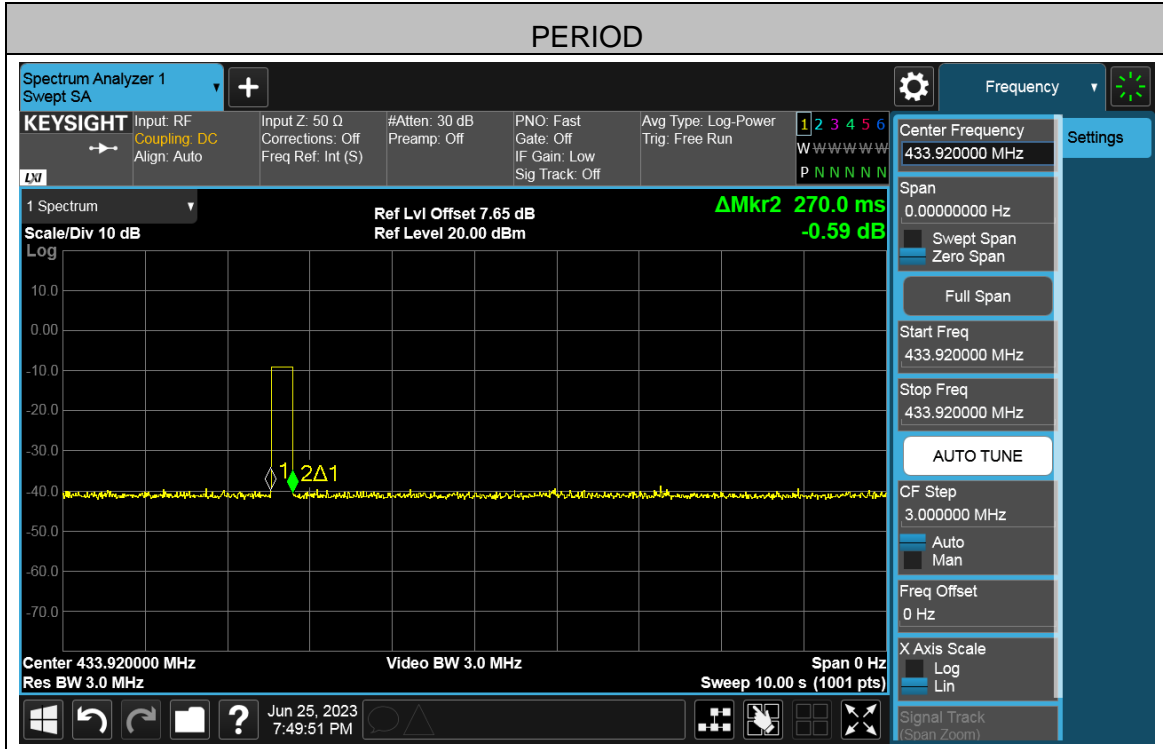
TEST ENVIRONMENT

Temperature	20°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	DC 3V



RESULTS

Manually transmitting mode			
Deactivation Time (seconds)	Limit (seconds)	Margin (seconds)	Result
0.27	5.000	4.73	PASS



6.3. 20dB BANDWIDTH

LIMITS

CFR 47 FCC §15.231 (c)

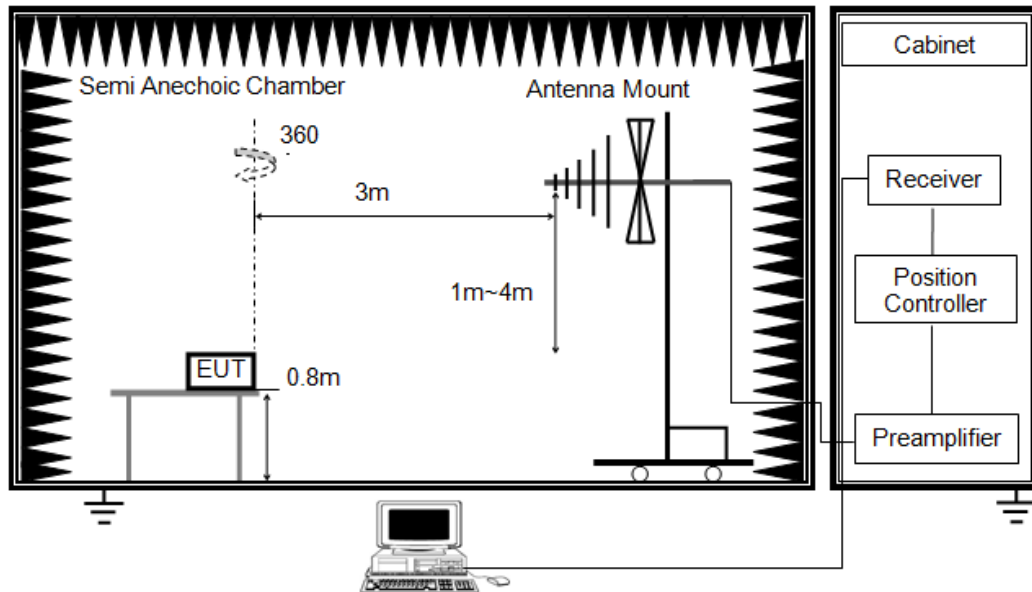
The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5 % of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

So, the limit calculated as: $0.0025 * 433.92 \text{ MHz} = 1.0848 \text{ MHz}$

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% to 5% of the OBW and VBW is set $3 * \text{RBW}$.



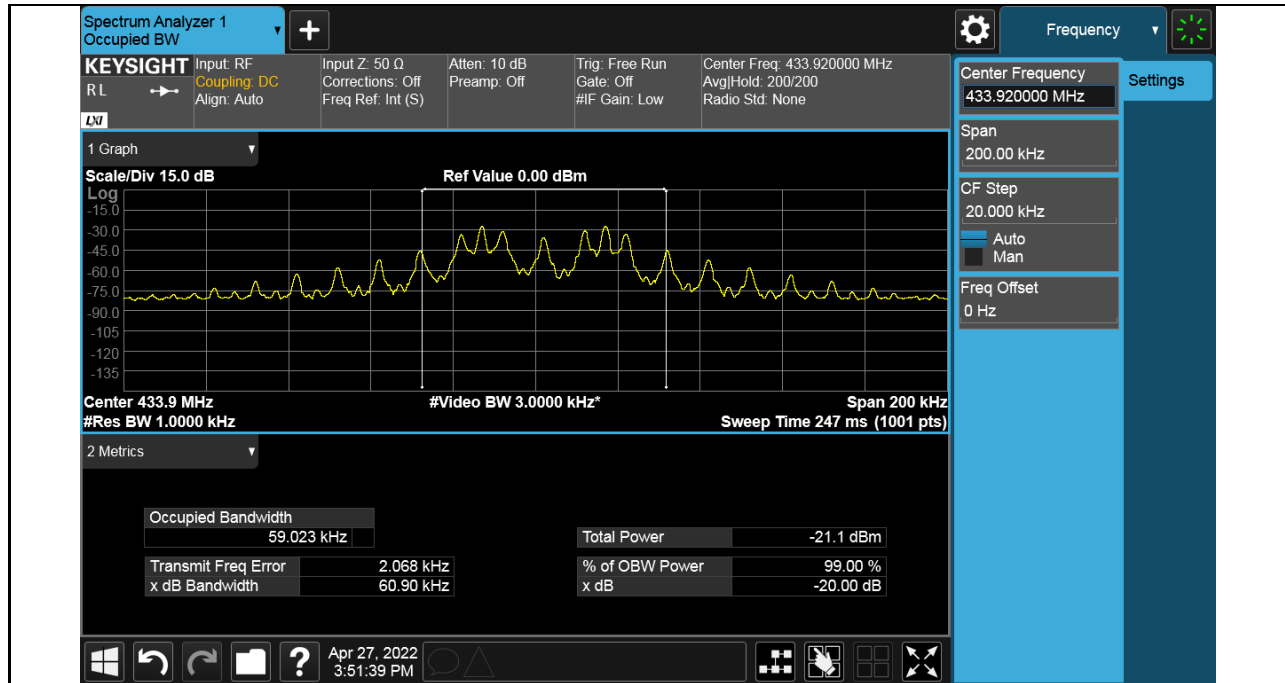
TEST ENVIRONMENT

Temperature	20°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	DC 3V

RESULTS

20 dB Bandwidth (MHz)	Limit (MHz)	Result
0.06090	1.0848	Pass

Test Graphs:





7. RADIATED TEST RESULTS

LIMITS

CFR 47 FCC §15.231 (b)(e)

CFR 47 FCC §15.205 and §15.209

- 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] = Lim_{lower} + ΔF [(Lim_{upper} – Lim_{lower}) / (f_{upper} – f_{lower})]
where ΔF = f_c – 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 = 80.83 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)

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:

$$\text{Limit } [\mu\text{V/m}] = \text{Lim}_{\text{lower}} + \Delta F [(\text{Lim}_{\text{upper}} - \text{Lim}_{\text{lower}}) / (f_{\text{upper}} - f_{\text{lower}})]$$

where $\Delta F = f_c - f_{\text{lower}} = 433.92 - 260 = 173.92$

$$\begin{aligned} \text{Limit} &= 1500 + 173.92 * [(5000 - 1500) / (470 - 260)] \\ &= 1500 + 173.92 * [3500 / 210] \\ &= 4398.7 \mu\text{V/m} \end{aligned}$$

$$\begin{aligned} \text{dB}\mu\text{V/m} &= 20 * \log (\mu\text{V/m}) \\ &= 20 * \log (4398.7) \end{aligned}$$

$$\text{Average Limit at 433.92 MHz} = 72.87 \text{ dB}\mu\text{V/m}$$

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.



4. Radiation Disturbance Test Limit for FCC (Class B) (9 kHz-1 GHz)

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

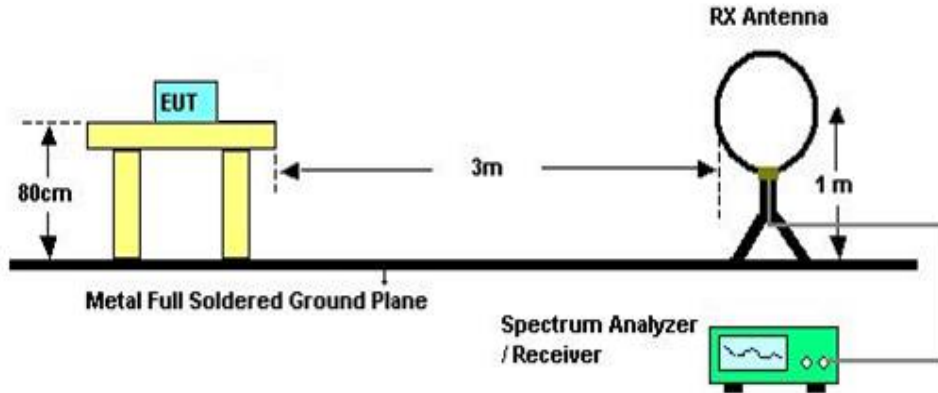
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
¹ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	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: ¹Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

²Above 38.6c

TEST SETUP AND PROCEDURE

Below 30MHz

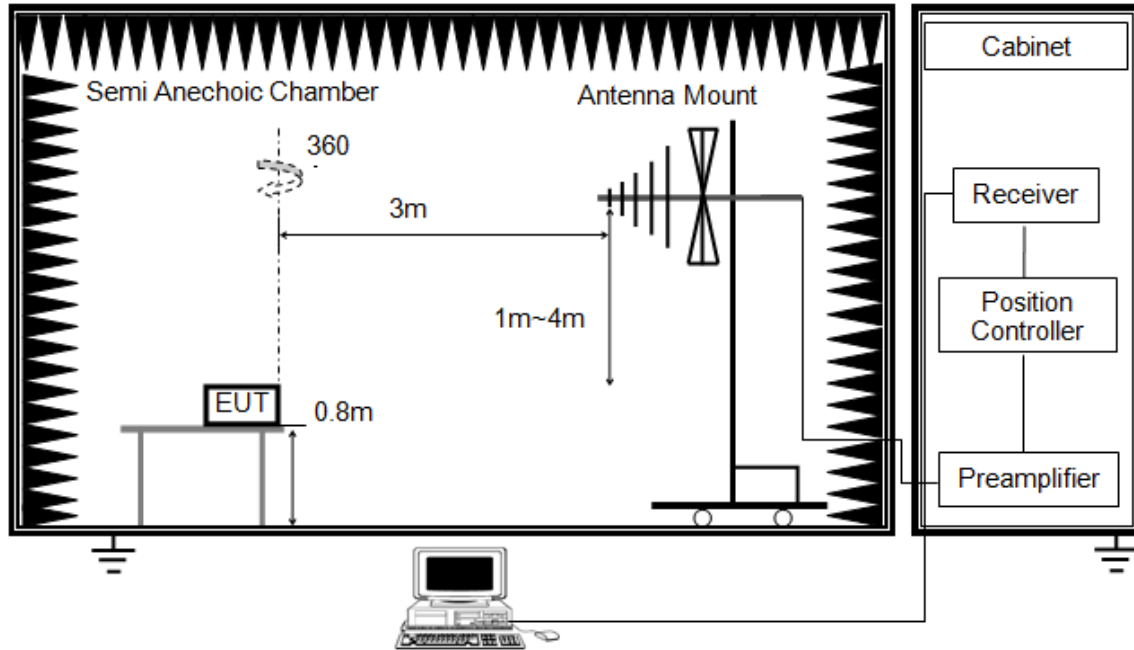


The setting of the spectrum analyser

RBW	200 Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz)
VBW	200 Hz (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

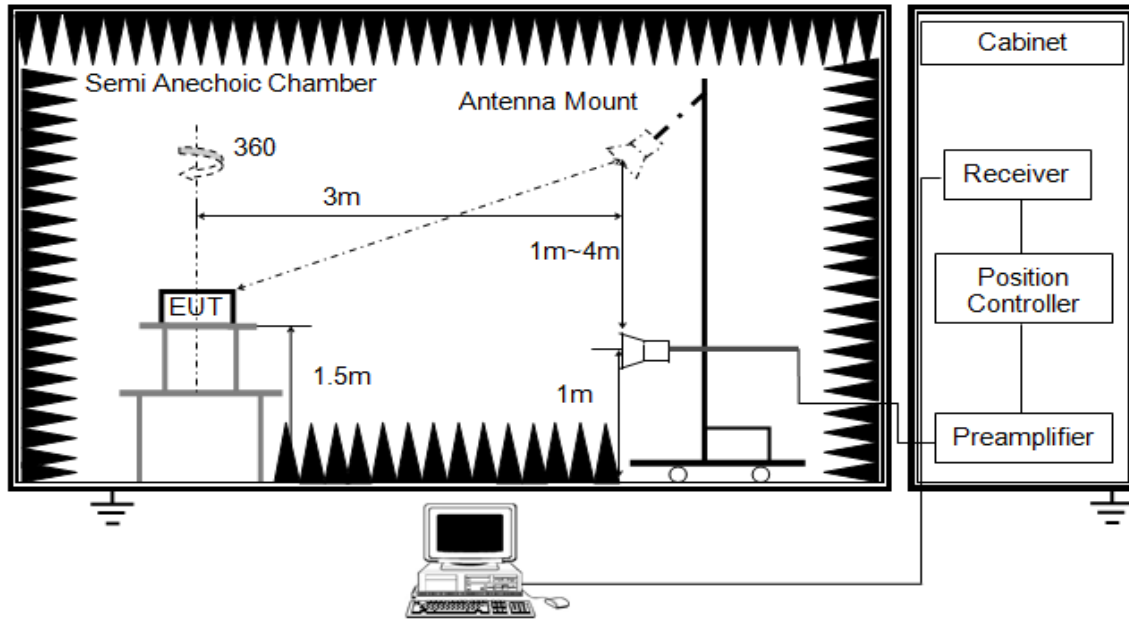


The setting of the spectrum analyser

RBW	120 kHz
VBW	300 kHz
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

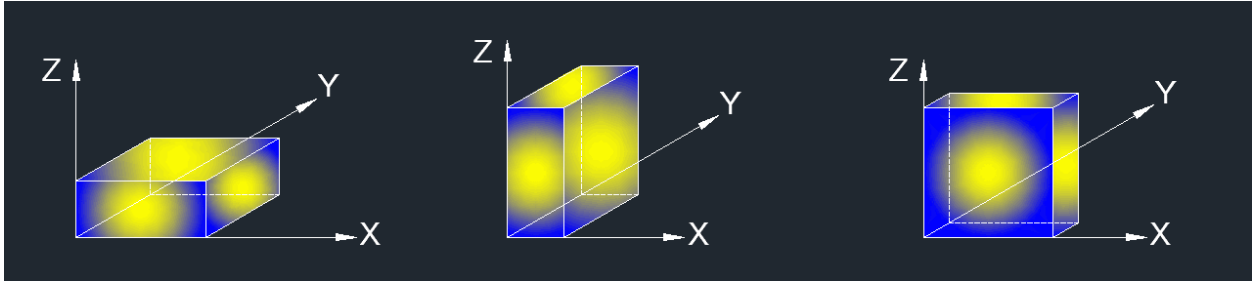


The setting of the spectrum analyser

RBW	1 MHz
VBW	PEAK: 3MHz 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 6.1. 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 in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

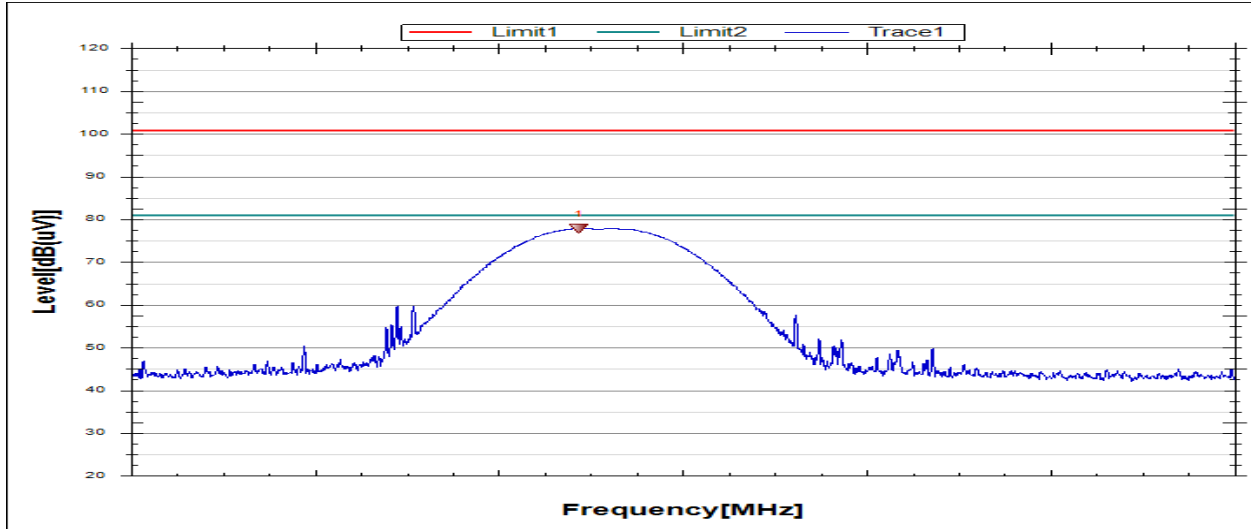
TEST ENVIRONMENT

Temperature	20°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	DC 3V



7.1. FIELD STRENGTH OF INTENTIONAL EMISSIONS

FIELD STRENGTH OF INTENTIONAL EMISSIONS (HORIZONTAL)

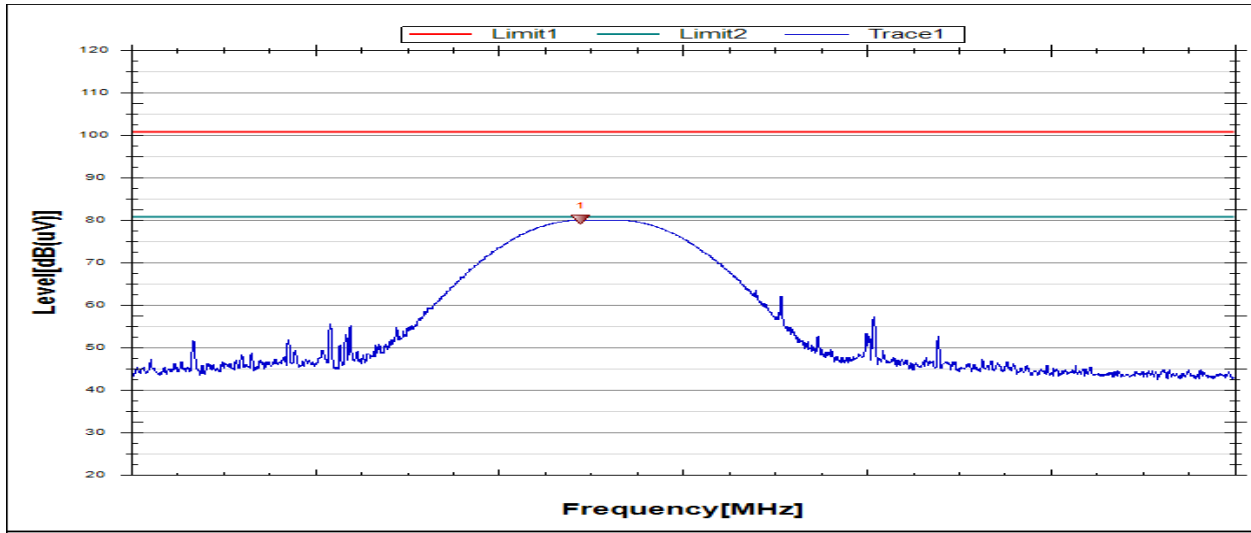


No.	Frequency	Reading Level	Correct Factor	PK Result	Duty Correction Factor	AV Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	433.9055	53.56	24.28	77.84	/	/	100.83	-22.99	peak
		/	/	/	0	77.84	80.83	-2.99	average

- Note: 1. Measurement = Reading Level + Correct Factor.
 2. Peak: Peak detector.
 3. Peak: Average Result = Peak Result + Duty Correction Factor.



FIELD STRENGTH OF INTENTIONAL EMISSIONS (VERTICAL)



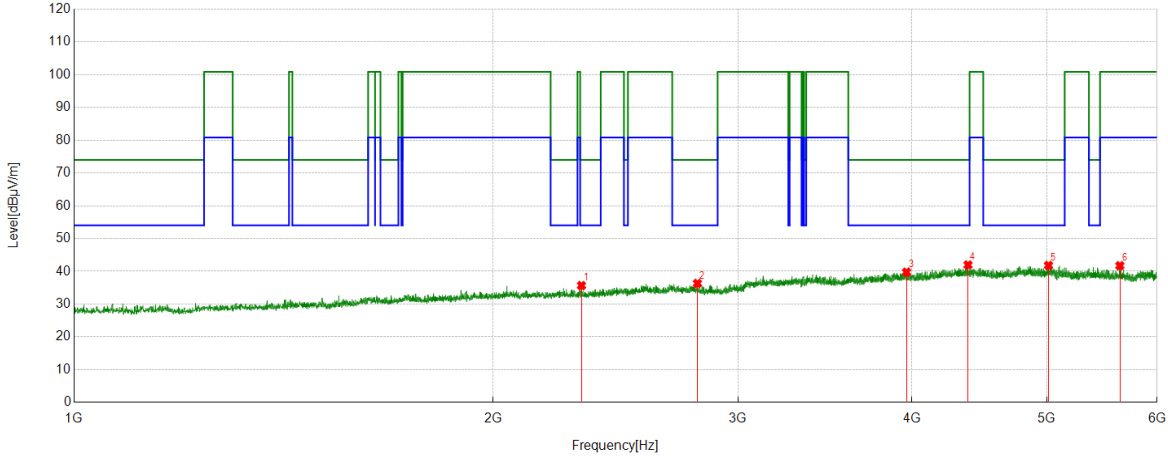
No.	Frequency	Reading Level	Correct Factor	PK Result	Duty Correction Factor	AV Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	433.907	55.8	24.28	80.08	/	/	100.83	-20.75	peak
		/	/	/	0	80.08	80.83	-0.75	average

- Note: 1. Measurement = Reading Level + Correct Factor.
 2. Peak: Peak detector.
 3. Peak: Average Result = Peak Result + Duty Correction Factor.



7.2. SPURIOUS EMISSIONS (1~6GHz)

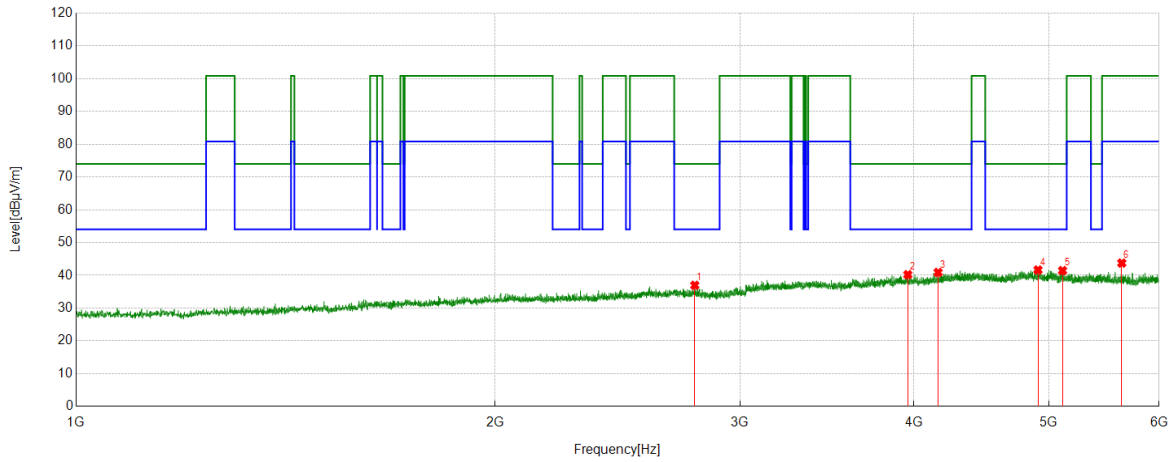
HARMONICS AND SPURIOUS EMISSIONS (HORIZONTAL)



No.	Frequency	Reading Level	Correct Factor	PK Result	Duty Correction Factor	AV Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	2315.1315	51.83	-16.16	35.67	/	/	74.00	-38.33	peak
		/	/	/	0	36.23	54.00	-18.33	average
2	2804.6805	50.12	-13.80	36.32	/	/	74.00	-37.68	peak
		/	/	/	0	39.22	54.00	-17.68	average
3	3963.7964	46.93	-7.17	39.76	/	/	74.00	-34.24	peak
		/	/	/	0	39.44	54.00	-34.24	average
4	4388.3388	48.01	-6.06	41.95	/	/	74.00	-32.05	peak
		/	/	/	0	41.15	54.00	-12.05	average
5	5013.4013	46.70	-4.90	41.80	/	/	74.00	-32.20	peak
		/	/	/	0	39.56	54.00	-12.20	average
6	5641.4641	45.89	-4.17	41.72	/	/	100.83	-59.11	peak
		/	/	/	0	41.72	80.83	-39.11	average

- Note: 1. Measurement = Reading Level + Correct Factor.
 2. Peak: Peak detector.
 3. Average Result = Peak Result + Duty Correction Factor.
 4. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

HARMONICS AND SPURIOUS EMISSIONS (VERTICAL)

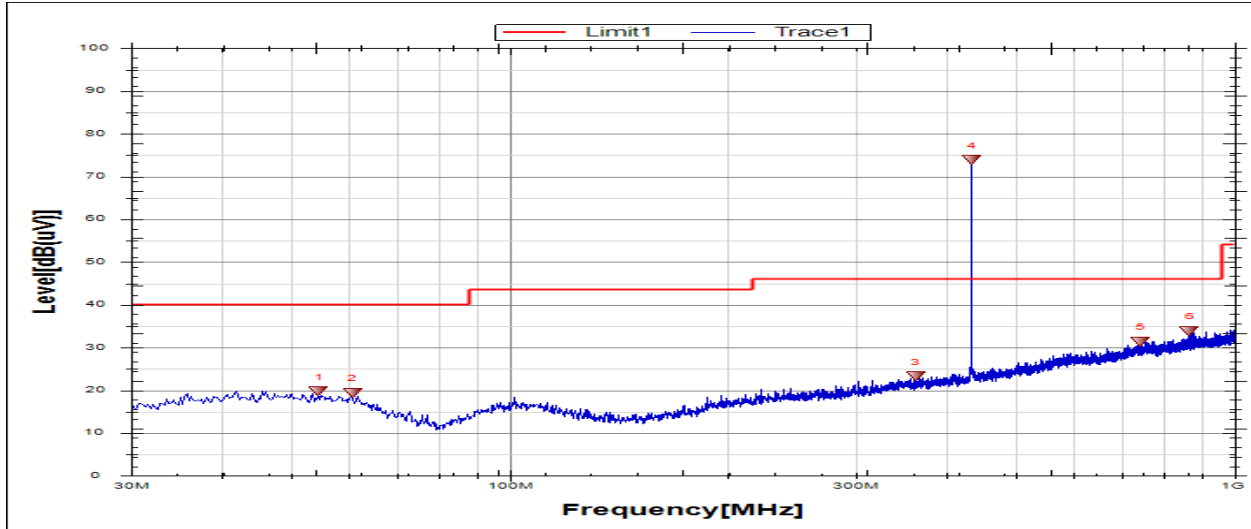


No.	Frequency	Reading Level	Correct Factor	PK Result	Duty Correction Factor	AV Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	2783.1783	50.45	-13.49	36.96	/	/	74.00	-37.04	peak
		/	/	/	0	36.96	54.00	-17.04	average
2	3959.2959	47.42	-7.21	40.21	/	/	74.00	-33.79	peak
		/	/	/	0	40.21	54.00	-13.79	average
3	4162.8163	48.06	-7.18	40.88	/	/	74.00	-33.12	peak
		/	/	/	0	40.88	54.00	-13.12	average
4	4910.8911	46.74	-5.10	41.64	/	/	74.00	-32.36	peak
		/	/	/	0	41.64	54.00	-12.36	average
5	5114.4114	46.22	-4.77	41.45	/	/	74.00	-32.55	peak
		/	/	/	0	41.45	54.00	-12.55	average
6	5640.9641	47.90	-4.16	43.74	/	/	100.83	-57.09	peak
		/	/	/	0	43.74	80.83	-37.09	average

- Note: 1. Measurement = Reading Level + Correct Factor.
 2. Peak: Peak detector.
 3. Average Result = Peak Result + Duty Correction Factor.
 4. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 5. No burst found in Restricted bands.

7.3. SPURIOUS EMISSIONS (0.03~1 GHz)

SPURIOUS EMISSIONS (HORIZONTAL)

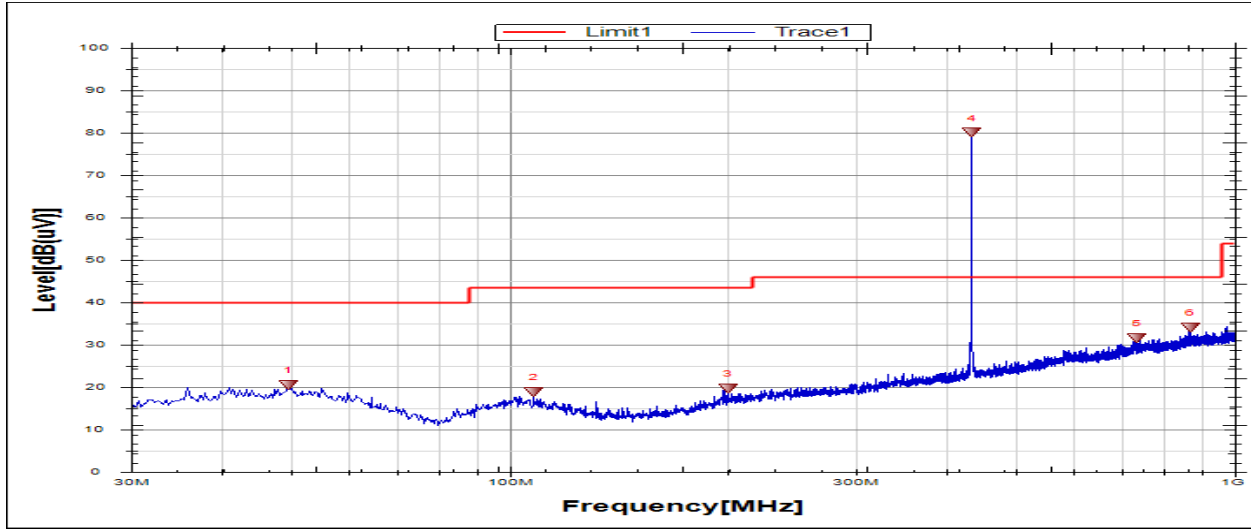


No.	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	54.4987	-0.68	20.4	19.72	40	-20.28	peak
2	60.5627	-0.07	19.46	19.39	40	-20.61	peak
3	363.0363	-0.09	23.32	23.23	46	-22.77	peak
4 (fundamental frequency)	433.8641	49.59	24.28	73.87	/	/	peak
5	741.9165	1.51	29.9	31.41	46	-14.59	peak
6	867.8057	2.87	31.02	33.89	46	-12.11	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 (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	49.4049	-0.42	20.97	20.55	40.0	-19.45	peak
2	107.8621	0.49	18.53	19.02	43.5	-24.48	peak
3	199.7927	1.06	18.78	19.84	43.5	-23.66	peak
4 (fundamental frequency)	433.8641	55.82	24.28	80.10	/	/	peak
5	733.1843	2.05	29.59	31.64	46.0	-14.36	peak
6	868.0483	3.11	31.02	34.13	46	-11.87	peak

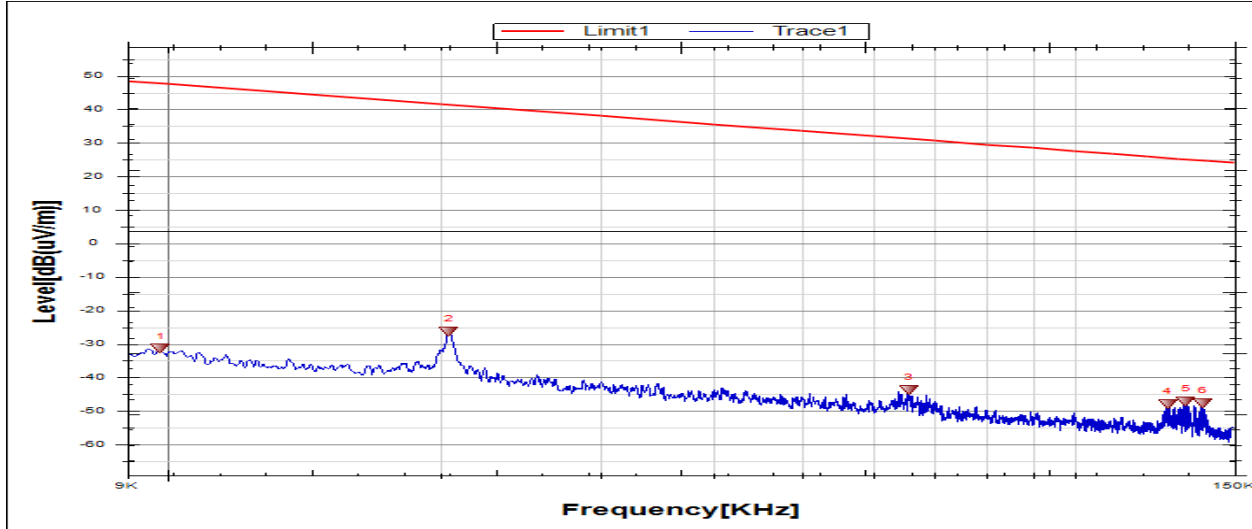
Note: 1. Result Level = Read Level + Correct Factor.
 2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
 3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

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

7.4. SPURIOUS EMISSIONS BELOW 30M

SPURIOUS EMISSIONS (Face-on)

9kHz ~ 150kHz

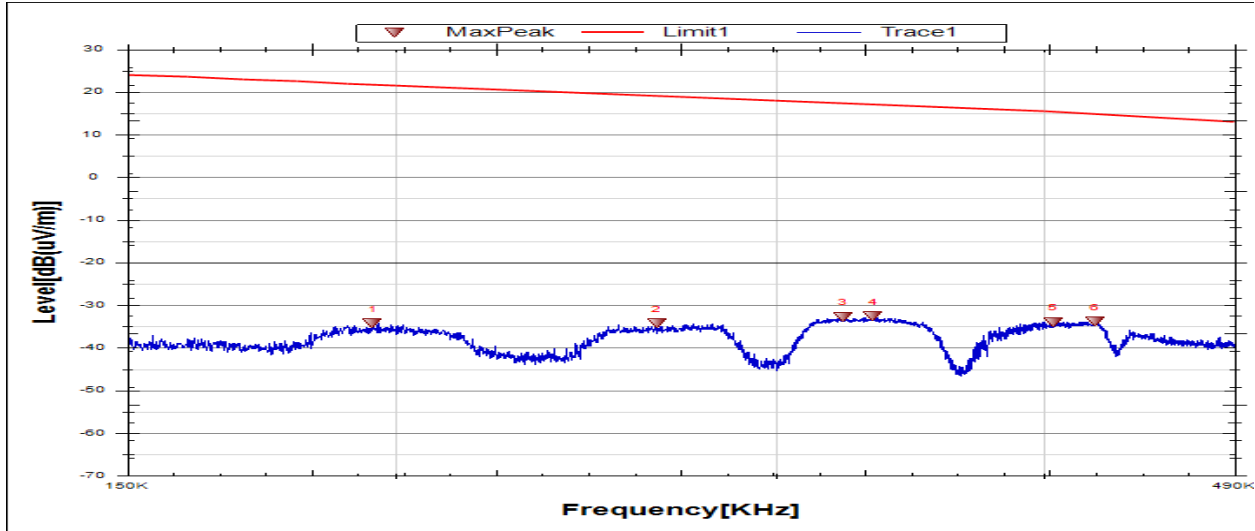


No.	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0098	30.52	-61.91	-31.39	47.78	-79.17	peak
2	0.0204	35.60	-61.81	-26.21	41.44	-67.65	peak
3	0.0656	18.02	-61.76	-43.74	31.30	-75.04	peak
4	0.1265	13.88	-61.82	-47.94	25.57	-73.51	peak
5	0.1327	14.67	-61.83	-47.16	25.15	-72.31	peak
6	0.1384	14.13	-61.83	-47.70	24.78	-72.48	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



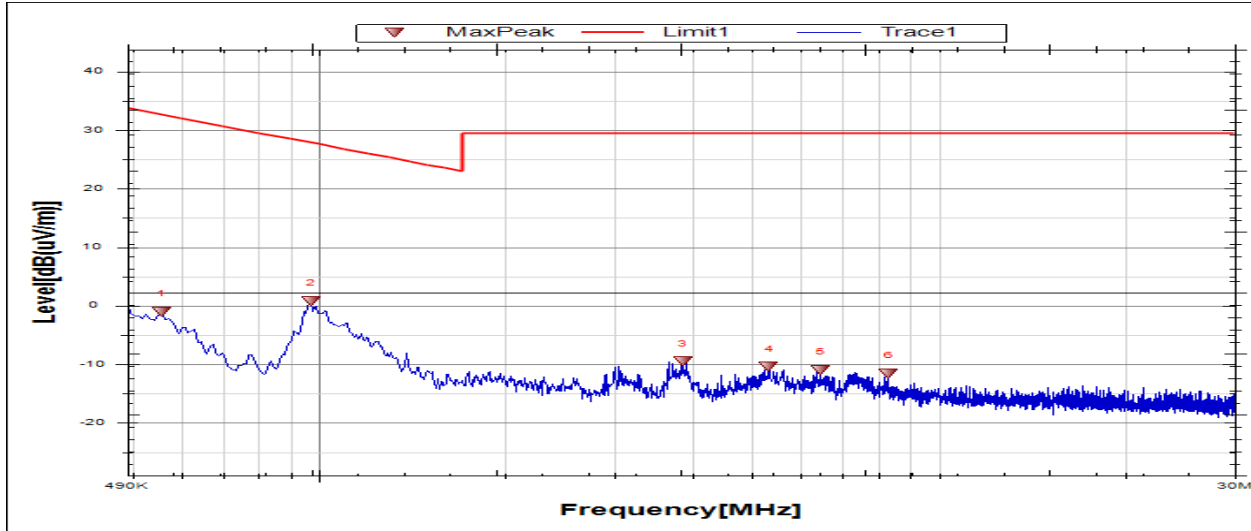
150kHz ~ 490kHz



No.	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1950	27.59	-61.86	-34.27	21.80	-56.07	peak
2	0.2641	27.60	-61.89	-34.29	19.32	-53.61	peak
3	0.3224	29.13	-61.91	-32.78	17.50	-50.28	peak
4	0.3329	29.26	-61.90	-32.64	17.24	-49.88	peak
5	0.4036	27.90	-61.88	-33.98	15.46	-49.44	peak
6	0.4220	27.99	-61.88	-33.89	14.95	-48.84	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 (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.5564	20.91	-21.87	-0.96	32.74	-33.70	peak
2	0.9696	22.71	-21.85	0.86	27.88	-27.02	peak
3	3.8622	12.30	-21.74	-9.44	29.54	-38.98	peak
4	5.3232	11.41	-21.77	-10.36	29.54	-39.90	peak
5	6.4449	10.84	-21.74	-10.9	29.54	-40.44	peak
6	8.2970	10.19	-21.70	-11.51	29.54	-41.05	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.



8. 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