

RF TEST REPORT

Report No.: SET2021-10252

Product Name: 915MHz Module

FCC ID: 2A2X4MMJ051B015

Model No. : MMJ05-1B-015

Applicant: SHENZHEN STAR INSTRUMENT CO.,LTD.

Address: Star industrial Park Baolong industrial City,Longgang District,Shenzhen, China.

Dates of Testing: 08/11/2021 — 09/10/2021

Issued by: CCIC Southern Testing Co., Ltd.

Lab Location: Electronic Testing Building, No. 43 Shahe Road, Xili Street, Nanshan District, Shenzhen, Guangdong, China.

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Test Report

Product Name.....: 915MHz Module

Applicant.....: SHENZHEN STAR INSTRUMENT CO.,LTD.

Applicant Address.....: Star industrial Park Baolong industrial City,Longgang District, Shenzhen, China.

Manufacturer.....: SHENZHEN STAR INSTRUMENT CO.,LTD.

Manufacturer Address: Star industrial Park Baolong industrial City,Longgang District, Shenzhen, China.

Test Standards.....: 47 CFR Part 15 Subpart C: Radio Frequency Devices
ANSI C63.10:2013: American National Standard for
Testing Unlicensed Wireless Devices

Test Result: PASS

Tested by: Robin Luo 2021.09.10
Robin Luo, Test Engineer

Reviewed by: Chris You 2021.09.10
Chris You, Senior Engineer

Approved by: Shuangwen Zhang 2021.09.10
Shuangwen Zhang, Manager

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Change History		
Issue	Date	Reason for change
1.0	2021.09.10	First edition

1. General Information

1.1. EUT Description

EUT Type	915MHz Module
Power Supply	DC 5V
Frequency Range	902MHz~928MHz
Operating Frequency Range	903.2MHz~927.2MHz
Number of channel	41
Modulation Type	LoRa
Data Rate	$\geq 1.7\text{kbps}$
Antenna Type	PCB Antenna
Antenna Gain	2.0dBi

1.2. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart C (ISM band radiators) for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 15 Subpart C 2017	Radio Frequency Devices
2	ANSI C63.10 2013	American National Standard for Testing Unlicensed Wireless Devices

Test detailed items/section required by FCC rules and results are as below:

No.	Standard(s) Section	Description	Result
	FCC		
1	15.203	Antenna Requirement	PASS
2	15.247(b)	Peak Output Power	PASS
3	15.247(a)	Bandwidth	PASS
4	15.247(e)	Power Spectral Density	PASS
5	15.247(d)	Conducted Band Edges	PASS
6	15.207	Conducted Emission	PASS
7	15.209	Radiated Band Edges and Spurious Emission	PASS

Note : The test of Radiated Emission was performed according to the method of measurements prescribed in ANSI C63.10 2013.

1.3. Description of Test Mode

Channel	Frequency(MHz)	Channel	Frequency(MHz)
0	903.2	25	918.2
1	903.8	26	918.8
2	904.4	27	919.4
3	905	28	920
4	905.6	29	920.6
5	906.2	30	921.2
6	906.8	31	921.8
7	907.4	32	922.4
8	908	33	923
9	908.6	34	923.6
10	909.2	35	924.2
11	909.8	36	924.8
12	910.4	37	925.4
13	911	38	926
14	911.6	39	926.6
15	912.2	40	927.2
16	912.8		
17	913.4		
18	914		
19	914.6		
20	915.2		
21	915.8		
22	916.4		
23	917		
24	917.6		

Test channel: 0channel, 20 channel, 40channel

1.4. Facilities and Accreditations

1.4.1. Facilities

FCC-Registration No.: CN1283

CCIC Southern Testing Co., Ltd EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Designation Number: CN1283, valid time is until April 19th, 2023.

ISED Registration: 11185A-1

CAB identifier: CN0064

CCIC Southern Testing Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A-1 on Aug. 04, 2016, valid time is until April 20th, 2023

A2LA Code: 5721.01

CCIC-SET is a third party testing organization accredited by A2LA according to ISO/IEC 17025. The accreditation certificate number is 5721.01.

1.4.2. Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15 - 35
Relative Humidity (%):	30 -60
Atmospheric Pressure (kPa):	86KPa-106KPa

2. 47 CFR Part 15C Requirements

2.1. Antenna requirement

2.1.1. Applicable Standard

According 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.

And according to FCC 47 CFR Section 15.247(c), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

2.1.2. Antenna Information

No.	EUT	Working Frequency	Ant. Type	Gain(dBi)
1	915MHz Module	903.2MHz~927.2MHz	PCB	2.0

2.1.3. Result: comply

2.2. Peak Output Power

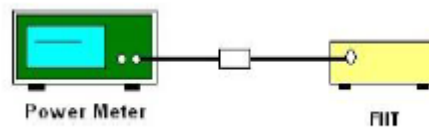
2.2.1. Limit of Peak Output Power

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt.

2.2.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.2.3. Test Setup



2.2.4. Test Procedures

1. The testing follows ANSI C63.10-2013 Clause 7.8.5
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power with cable loss and record the results in the test report.
5. Measure and record the results in the test report.

2.2.5. Test Result of Output Power

Channel	Frequency (MHz)	Output Peak Power (dBm)	Limit (dBm)	Verdict
0	903.2	14.667	30	PASS
20	915.2	14.797		PASS
40	927.2	14.985		PASS

2.3. 6dB Bandwidth

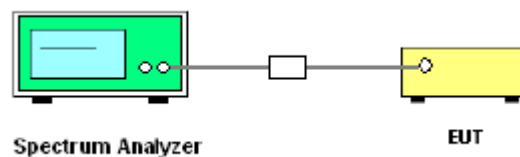
2.3.1. Definition

Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

2.3.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.3.3. Test Setup



2.3.4. Test Procedure

1. The testing follows ANSI C63.10-2013 Clause 6.9.2
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure and record the results in the test report.

2.3.5. Test Results of 6dB Bandwidth

Channel	Frequency (MHz)	6dB Bandwidth (kHz)	limit	Result
0	903.2	638.5	> 500	Pass
20	915.2	641.6	> 500	Pass
40	927.2	638.9	> 500	Pass

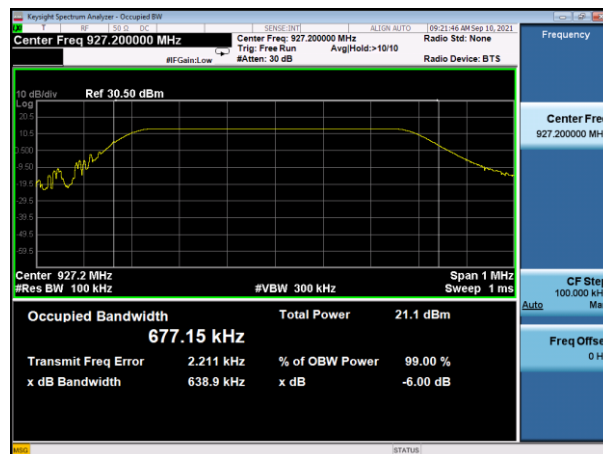
2.3.6. Test Results (plots) of Bandwidth



0 channel



20 channel



40 channel

2.4. Power Spectral Density

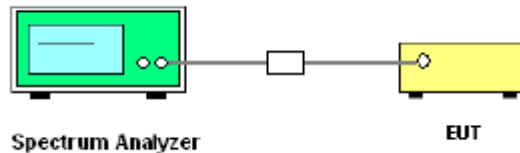
2.4.1. Definition

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

2.4.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.4.3. Test Setup



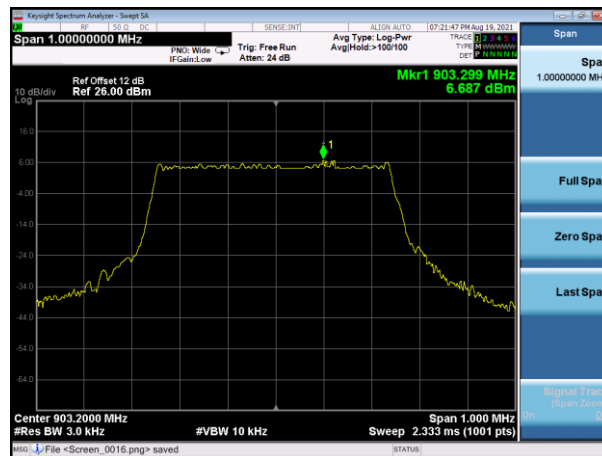
2.4.4. Test Procedure

1. The testing follows ANSI C63.10-2013 Clause 6.9.2
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure and record the results in the test report.

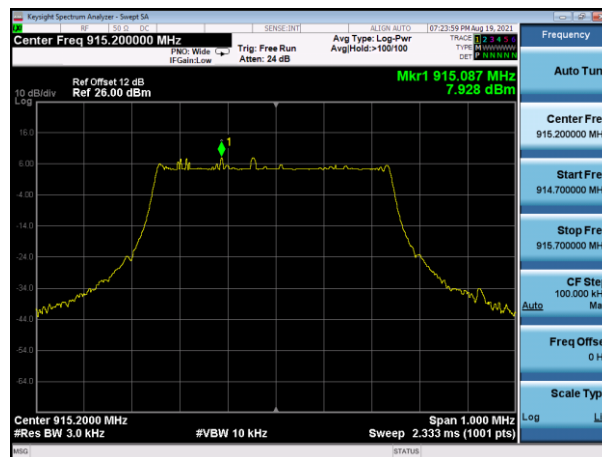
2.4.5. Test Results of Power Spectral Density

Channel	Frequency (MHz)	Power Spectral Density (dBm/3KHz)	Limit	Result
0	903.2	6.687	8dBm/3KHz	Pass
20	915.2	7.928	8dBm/3KHz	Pass
40	927.2	7.139	8dBm/3KHz	Pass

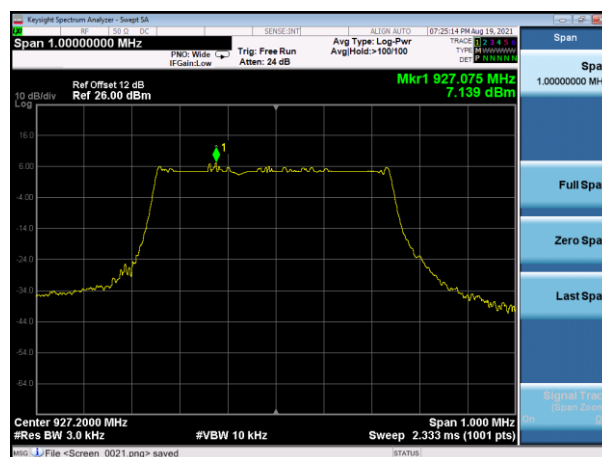
2.4.6. Test Results (plots) of Bandwidth



0 channel



20 channel



40 channel

2.5. Conducted Band Edges

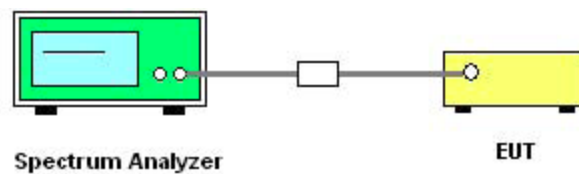
2.5.1. Limit of Conducted Band Edges

All harmonics/spurious must be at least 20 dB down from the highest emission level within the authorized band.

2.5.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

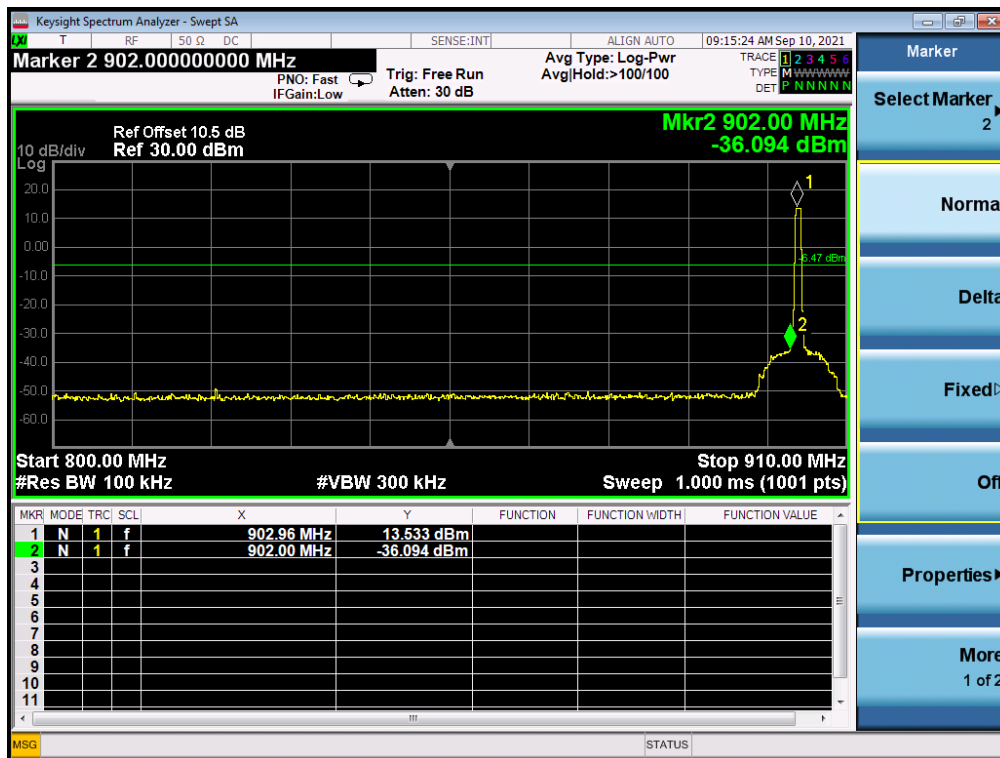
2.5.3. Test Setup



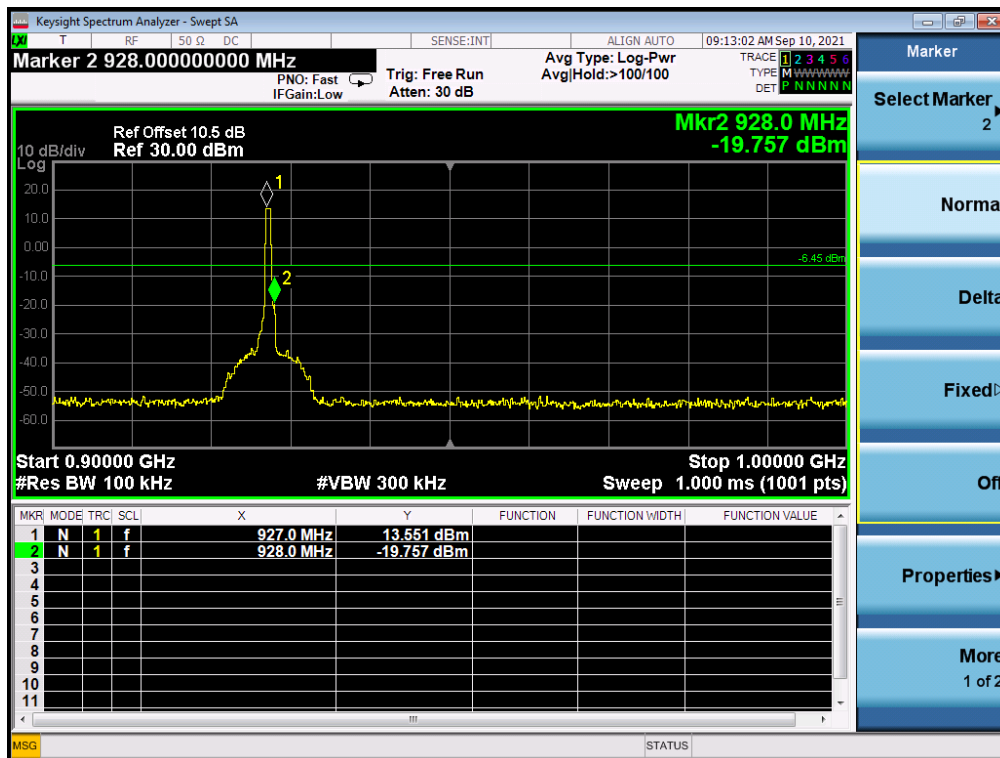
2.5.4. Test Procedure

1. The testing follows FCC KDB558074 D01 v05r02.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.
The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

2.9.3. Test Results of Conducted Emission



903.2MHz



927.2MHz

2.6. Conducted Emission

2.6.1. Limit of Conducted Emission

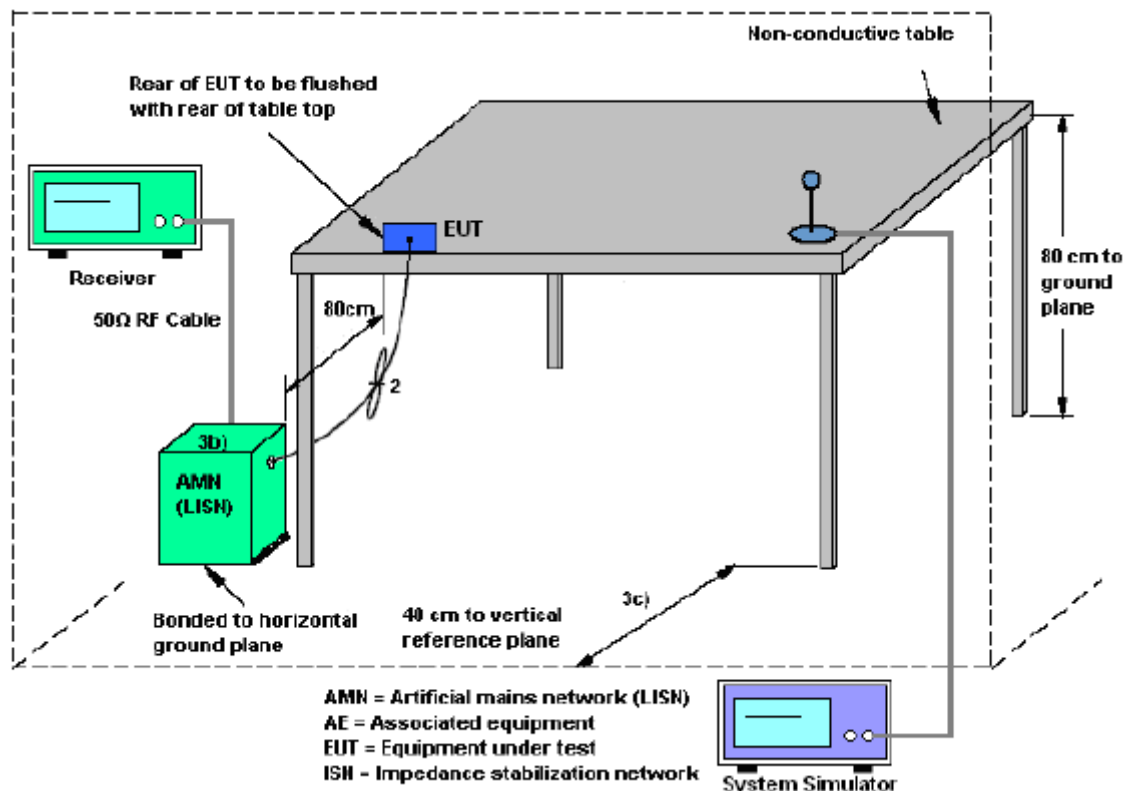
For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency range (MHz)	Conducted Limit (dB μ V)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
0.50 - 30	60	50

2.6.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

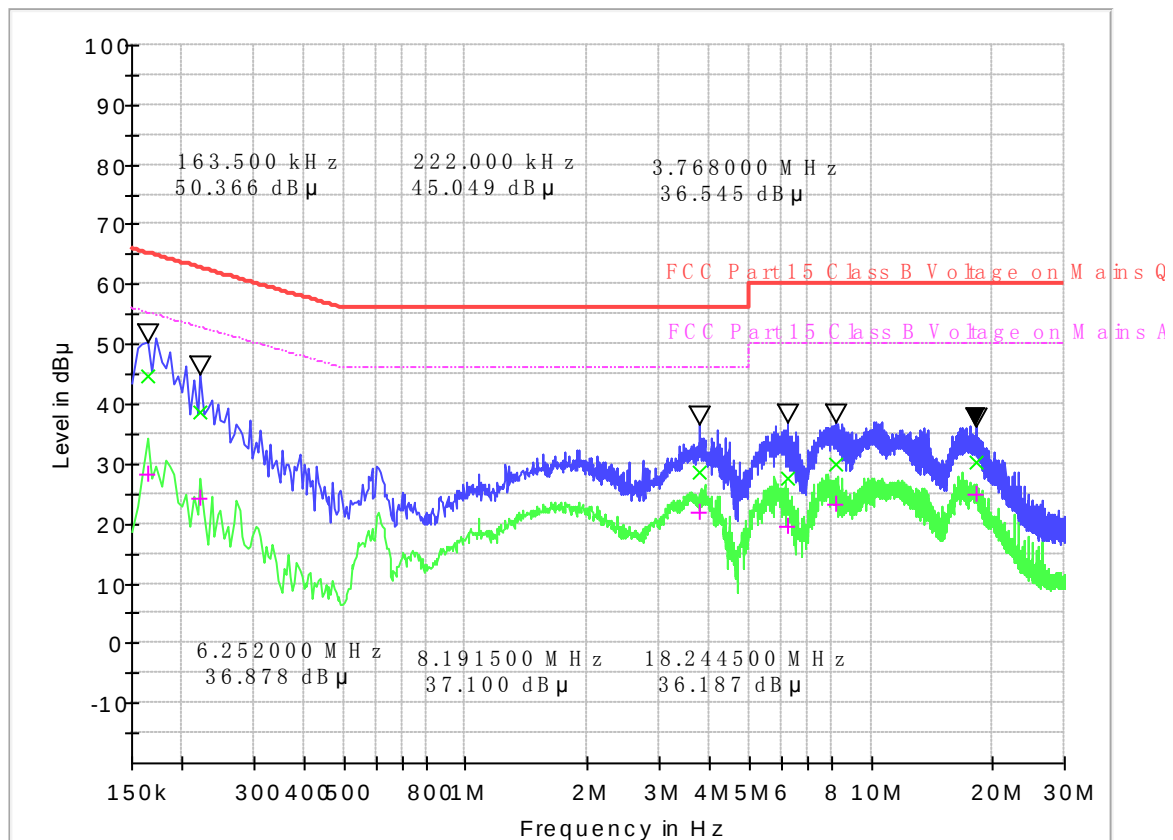
2.6.3. Test Setup



2.6.4. Test Procedures

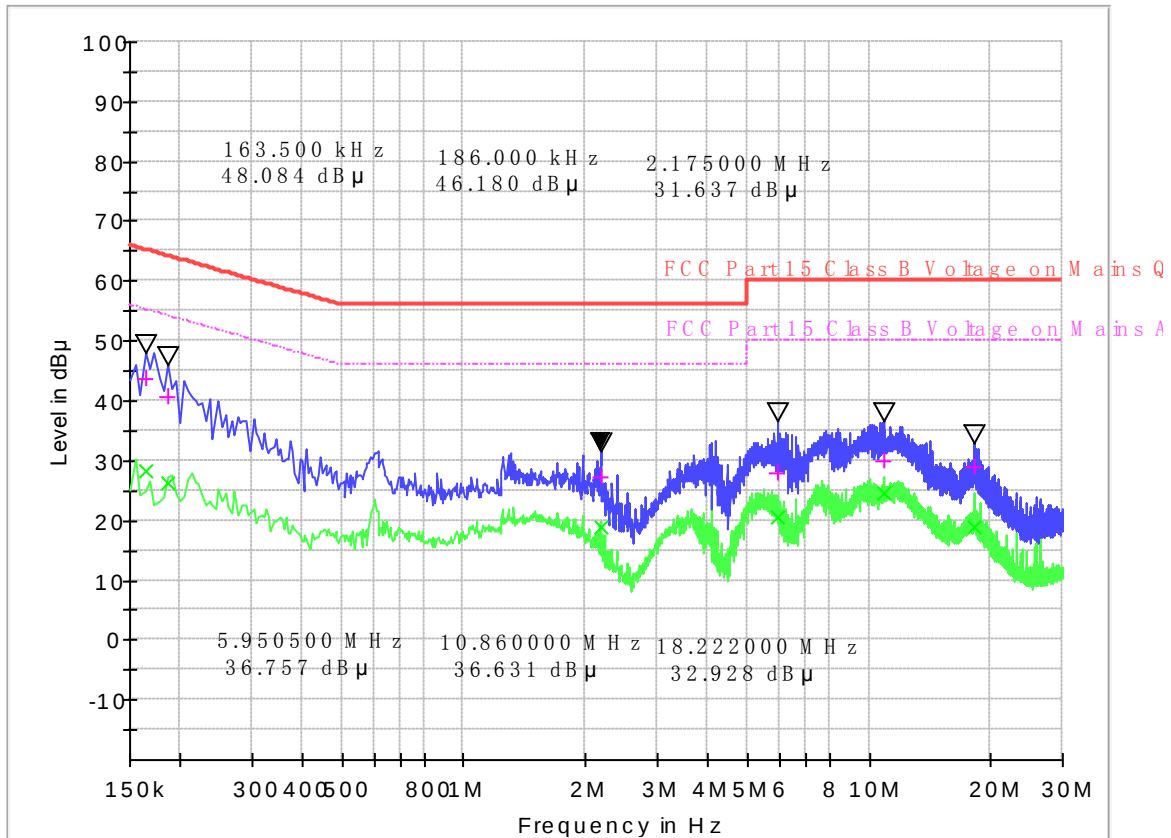
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 micrometry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

2.9.4. Test Results of Conducted Emission



(Plot A: L Phase)

Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Cabel Loss (dB)	Corr. (dB)	Margin - QPK	Limit - QPK	Margin - AV	Limit - AV (dB μ V)
0.163500	44.69	28.27	0.1	10.1	20.59	65.3	27.01	55.3
0.222000	38.50	24.23	0.1	10.1	24.24	62.7	28.51	52.7
3.768000	28.62	21.99	0.1	10.1	27.38	56.0	24.01	46.0
6.252000	27.64	19.50	0.1	10.1	32.36	60.0	30.50	50.0
8.191500	30.10	23.15	0.2	10.2	29.90	60.0	26.85	50.0
18.244500	30.13	24.95	0.2	10.2	29.87	60.0	25.05	50.0



(Plot B: N Phase)

Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Cabel Loss (dB)	Corr. (dB)	Margin - QPK	Limit - QPK	Margin - AV	Limit - AV (dB μ V)
0.163500	43.77	28.15	0.1	10.1	21.51	65.3	27.13	55.3
0.186000	40.61	26.37	0.1	10.1	23.60	64.2	27.84	54.2
2.175000	27.28	18.97	0.1	10.1	28.72	56.0	27.03	46.0
5.950500	27.87	20.61	0.1	10.1	32.13	60.0	29.39	50.0
10.860000	29.80	24.44	0.2	10.2	30.20	60.0	25.56	50.0
18.222000	28.88	18.96	0.2	10.2	31.12	60.0	31.04	50.0

Note: Correction factor=Cabel loss+ attenuation factor
attenuation factor=10dB
Test Result: PASS

2.7. Radiated Band Edges and Spurious Emission

2.7.1. Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

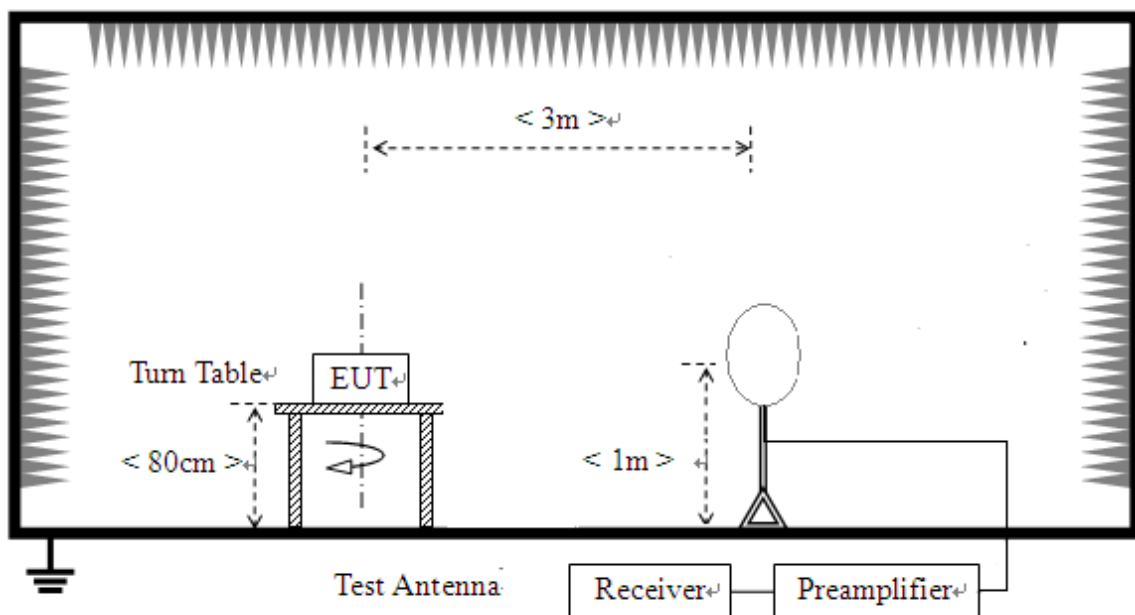
Frequency (MHz)	Field Strength ($\mu\text{V/m}$)	Measurement Distance (m)
0.009 - 0.490	$2400/F(\text{kHz})$	300
0.490 - 1.705	$24000/F(\text{kHz})$	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

2.7.2. Measuring Instruments

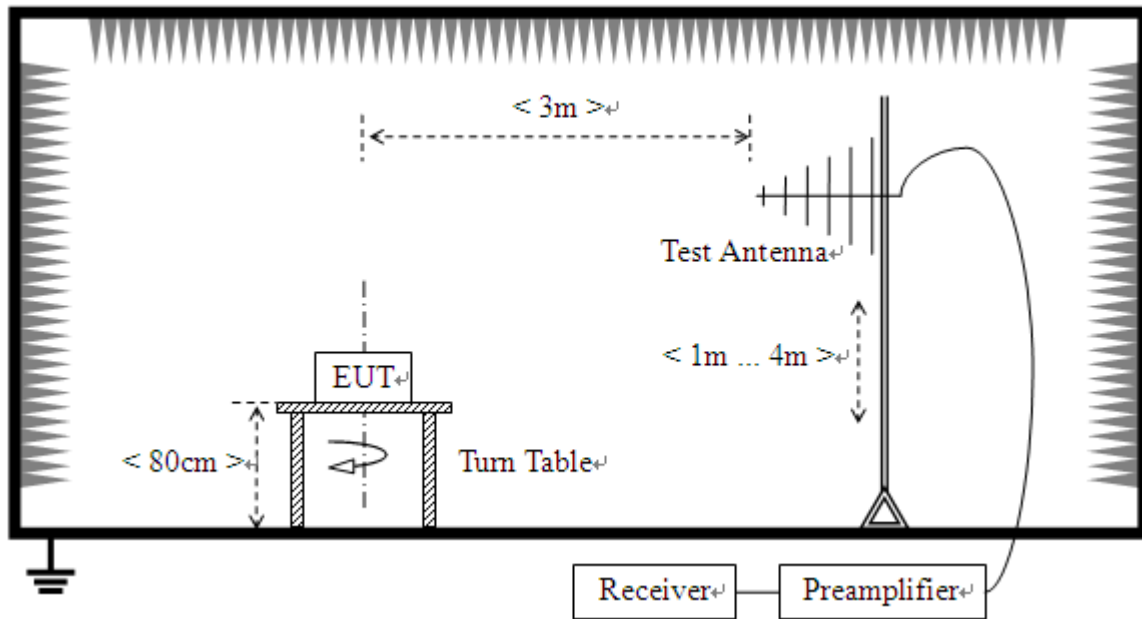
The measuring equipment is listed in the section 3 of this test report.

2.7.3. Test Setup

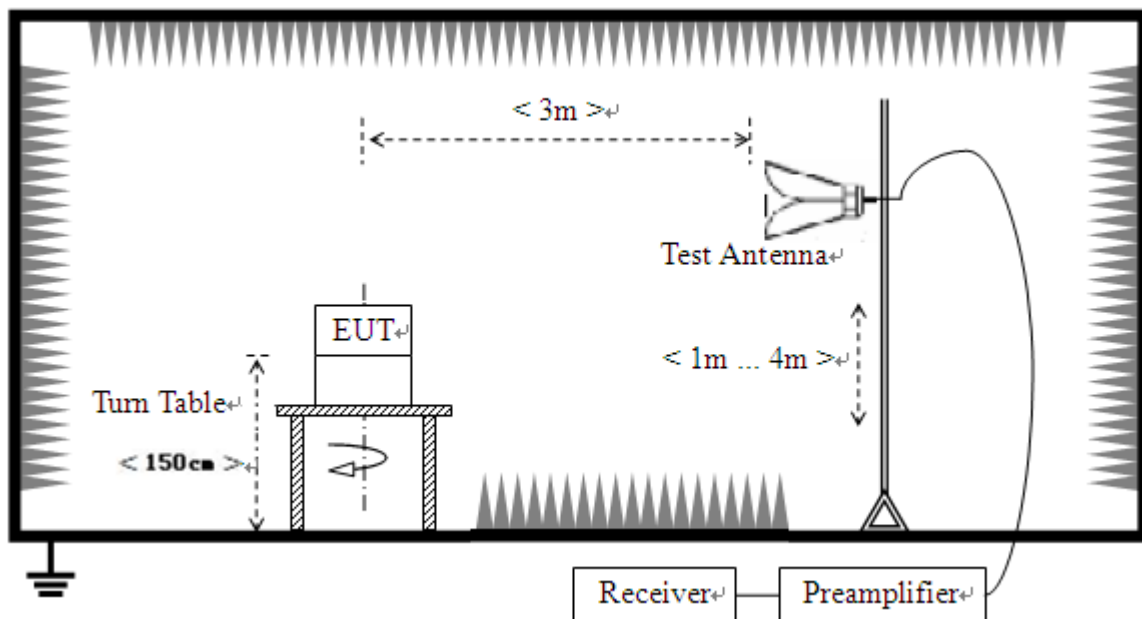
- 1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to 1GHz



3) For radiated emissions above 1GHz



2.7.1. Test Procedure

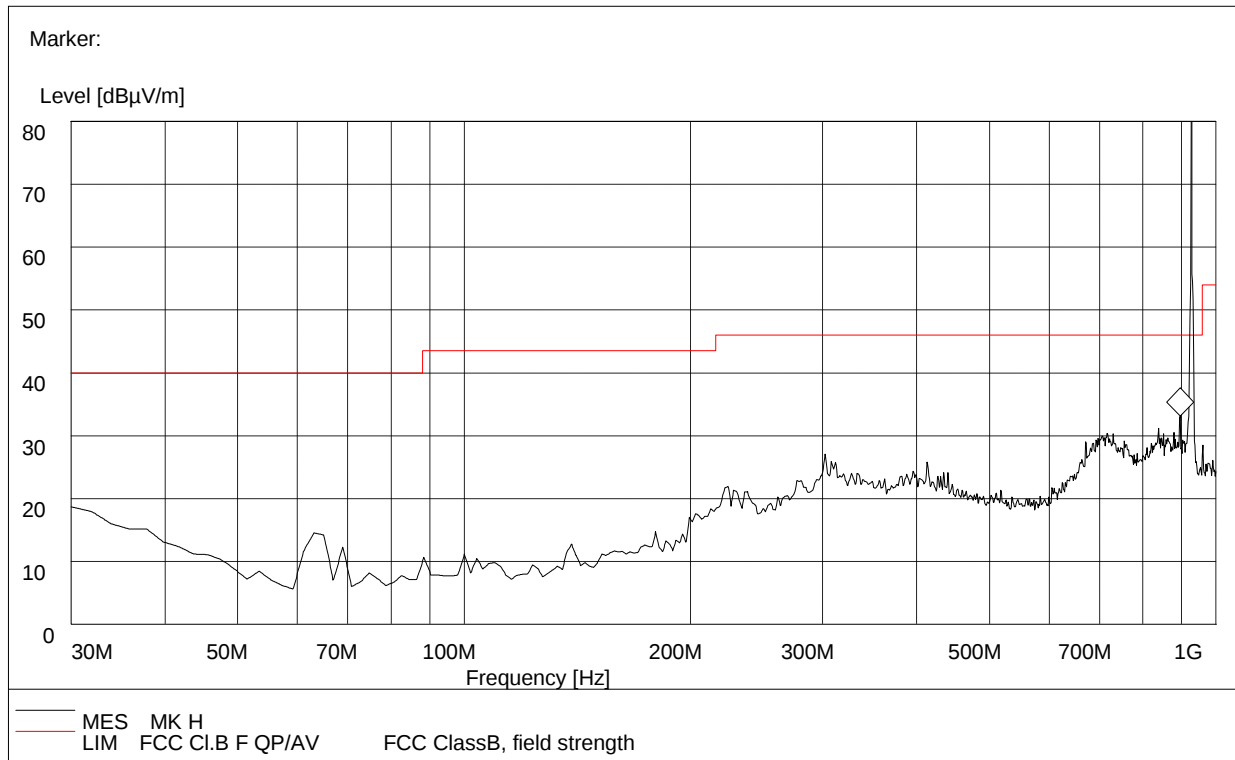
1. The EUT was placed on a turntable with 0.8m below 1GHz 1.5m above 1GHz above the ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. For each suspected emission, the EUT was arranged to its worst case and 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 to comply with the guidelines.
4. Set to the maximum power setting and enable the EUT transmit continuously.
5. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 kHz for $f < 1 \text{ GHz}$, RBW=1MHz for $f > 1\text{GHz}$; $\text{VBW} \geq \text{RBW}$; Sweep = auto; Detector function = peak; Trace = max hold for peak
 - (3) For average measurement: use duty cycle correction factor method per 15.35(c).
 Duty cycle = On time/100 milliseconds
 On time = $N_1 * L_1 + N_2 * L_2 + \dots + N_{n-1} * L_{N_{n-1}} + N_n * L_n$
 Where N_1 is number of type 1 pulses, L_1 is length of type 1 pulses, etc.
 Average Emission Level = Peak Emission Level + $20 * \log(\text{Duty cycle})$
6. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
7. Device under transmit mode and filter the fundamental .
8. The worst mode CH40 TX reported only for below 1GHz.

2.7.2. Test Results of Radiated Band Edge and Spurious Emission

For 9 KHz to 30MHz

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

For 30MHz to 1000MHz

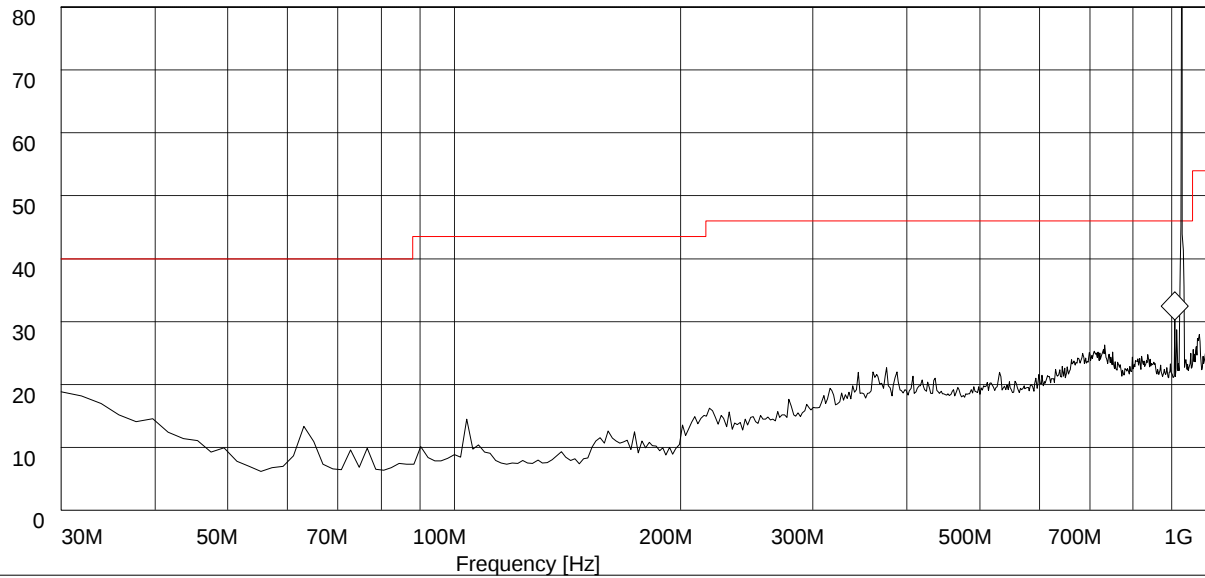


Frequency (MHz)	QuasiPeak (dB μ V/m)	Bandwidth (kHz)	Cor. Factor	Antenna height (cm)	Limit (dB μ V/m)	Antenna	Verdict
896.97	33.02	120.000	28.87	100.0	46.0	Horizontal	Pass

(30MHz to 1GHz, Antenna Horizontal)

Marker:

Level [dB μ V/m]



— MES MK V
 — LIM FCC Cl.B F QP/AV FCC ClassB, field strength

Frequency (MHz)	QuasiPeak (dB μ V/m)	Bandwidth (kHz)	Cor. Factor	Antenna height (cm)	Limit (dB μ V/m)	Antenna	Verdict
908.63	29.84	120.000	27.82	120.0	46.0	Vertical	Pass

(30MHz to 1GHz, Antenna Vertical)

Note: The fundamental wave can be ignored.

Bandedge and Above 1GHz Data:

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (0CH_903.2MHz)

No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	902.00	56.38	PK	74.00	-17.62	1.60	320.00	47.73	8.65
2	902.00	47.36	AV	54.00	-6.64	1.60	320.00	38.71	8.65
3	1806.40	37.49	PK	74.00	-36.51	1.60	320.00	26.32	11.17
4	1806.40	26.89	AV	54.00	-27.11	1.60	320.00	15.72	11.17
5	2709.60	40.61	PK	74.00	-33.39	1.60	320.00	24.61	16.00
6	2709.60	30.42	AV	54.00	-23.58	1.60	320.00	14.42	16.00
7	3612.80	44.1	PK	74.00	-29.90	1.60	320.00	24.96	19.14
8	3612.80	33.53	AV	54.00	-20.47	1.60	320.00	14.39	19.14

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (0CH_903.2MHz)

No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	902.00	55.87	PK	74.00	-18.13	1.80	180.00	47.22	8.65
2	902.00	46.59	AV	54.00	-7.41	1.80	180.00	37.94	8.65
3	1806.40	38.03	PK	74.00	-35.97	1.80	180.00	26.86	11.17
4	1806.40	26.8	AV	54.00	-27.20	1.80	180.00	15.63	11.17
5	2709.60	41.3	PK	74.00	-32.70	1.80	360.00	25.30	16.00
6	2709.60	30.05	AV	54.00	-23.95	1.80	360.00	14.05	16.00
7	3612.80	43.85	PK	74.00	-30.15	1.80	320.00	24.71	19.14
8	3612.80	33.49	AV	54.00	-20.51	1.80	320.00	14.35	19.14

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (20CH_915.2MHz)

No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	1830.40	40.61	PK	74.00	-33.39	1.00	100.00	30.19	10.42
2	1830.40	30.88	AV	54.00	-23.12	1.00	100.00	20.46	10.42
3	2745.60	44.46	PK	74.00	-29.54	1.00	100.00	28.06	16.40
4	2745.60	30.87	AV	54.00	-23.13	1.00	100.00	14.44	16.43
5	3660.80	45.52	PK	74.00	-28.48	1.00	100.00	27.40	18.12
6	3660.80	33.86	AV	54.00	-20.14	1.00	100.00	15.71	18.15

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (20CH_915.2MHz)

No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	1830.40	47.54	PK	74.00	-26.46	1.00	360.00	37.22	10.32
2	1830.40	38.41	AV	54.00	-15.59	1.00	360.00	28.08	10.33
3	2745.60	40.72	PK	74.00	-33.28	1.00	360.00	24.78	15.94
4	2745.60	30.2	AV	54.00	-23.80	1.00	360.00	14.22	15.98
5	3660.80	46.76	PK	74.00	-27.24	1.00	360.00	27.46	19.30
6	3660.80	33.94	AV	54.00	-20.06	1.00	360.00	14.53	19.41

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M (40CH_927.2MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	928.00	55.94	PK	74.00	-18.06	1.50	40.00	47.13	8.81
2	928.00	46.41	AV	54.00	-7.59	1.50	40.00	37.60	8.81
3	1854.40	37.38	PK	74.00	-36.62	2.00	180.00	26.62	10.76
4	1854.40	26.93	AV	54.00	-27.07	2.00	180.00	16.14	10.79
5	2781.60	41.46	PK	74.00	-32.54	2.00	180.00	25.07	16.39
6	2781.60	31.18	AV	54.00	-22.82	2.00	180.00	14.79	16.39
7	3708.80	44.13	PK	74.00	-29.87	2.00	180.00	23.29	20.84
8	3708.80	33.33	AV	54.00	-20.67	2.00	180.00	12.47	20.86

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M (40CH_927.2MHz)

No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Correction Factor (dB/m)
1	928.00	58.57	PK	74.00	-15.43	2.00	150.00	49.76	8.81
2	928.00	47.65	AV	54.00	-6.35	2.00	150.00	38.84	8.81
3	1854.40	37.25	PK	74.00	-36.75	2.00	150.00	29.12	8.13
4	1854.40	26.94	AV	54.00	-27.06	2.00	150.00	18.79	8.15
5	2781.60	41.47	PK	74.00	-32.53	2.00	150.00	29.65	11.82
6	2781.60	31.26	AV	54.00	-22.74	2.00	150.00	19.38	11.88
7	3708.80	44.71	PK	74.00	-29.29	2.00	150.00	28.32	16.39
8	3708.80	33.41	AV	54.00	-20.59	2.00	150.00	17.01	16.40

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

3. List of measuring equipment

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI TEST RECEIVER	KEYSIGHT	N9038A	A141202036	2020.09.21	2021.09.20
2	Power Meter	R&S	NRP-Z31	102872	2021.04.26	2022.04.25
3	TURNTABLE	ETS	2088	2149	N/A	N/A
4	ANTENNA MAST	ETS	2075	2346	N/A	N/A
5	EMI TEST Software	R&S	ESK1	N/A	N/A	N/A
6	Horn antenna (18GHz~26.5GHz)	AR	AT4003A	325306	2020.09.16	2022.09.15
7	Amplifier 30M~1GHz	MILMEGA	80RF1000-100 04	A140101634	2021.01.26	2022.01.25
8	Amplifier 1G~18GHz	MILMEGA	AS0104R-800/ 400	A160302517	2021.01.26	2022.01.25
9	High pass filter	Compliance Direction systems	BSU-6	34202	2020.11.10	2021.11.09
10	Horn Antenna	R&S	HF906	A0304225	2019.04.17	2022.04.16
11	Horn Antenna	R&S	ESIB7	A0501375	2020.06.24	2022.06.22
12	ULTRA-BROADBAND ANTENNA	SCHWARZBECK	VULB9160	A0805560	2019.05.24	2022.05.23
13	Passive Loop Antenna	R&S	HFH2-Z2	100047	2019.04.26	2022.04.25
14	Temperature chamber	TABAI	PS-232	A8708054	2020.10.30	2021.10.29
15	Spectrum Analyzer	KEYSIGHT	N9030A	A160702554	2021.04.26	2022.04.25
16	Power Supply	R&S	ESIB26	A0304218	2021.01.04	2022.01.03

**** END OF REPORT ****