FCC Test Report

Report No.: AGC02931240601FE01

FCC ID		2AWYH-M2U
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Mobile Radio
BRAND NAME	:	Rugged Radios
MODEL NAME	:	M2-U
APPLICANT	:	Rugged Radios
DATE OF ISSUE	:	May 21, 2025
STANDARD(S)	:	FCC Part 15 Subpart B
REPORT VERSION	:	V1.0

*A*ttestation of *G*lobal *C*ompliance (Shenzhen) Co., Ltd

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Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	May 21, 2025	Valid	Initial Release

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1. General Information

Applicant	Rugged Radios
Address	509 Traffic Way, Arroyo Grande, CA 93420, United States
Manufacturer	Rugged Radios
Address	509 Traffic Way, Arroyo Grande, CA 93420, United States
Factory	Rugged Radios
Address	509 Traffic Way, Arroyo Grande, CA 93420, United States
Product Designation	Mobile Radio
Brand Name	Rugged Radios
Test Model	M2-U
Series Model(s)	N/A
Difference Description	N/A
Date of receipt of test item	Jun. 11, 2024
Date of Test	Jun. 11, 2024~May 15, 2025
Deviation from Standard	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Test Report Form No	AGCTR-ER-FCC-CSR-V1.0

Note: The test results of this report relate only to the tested sample identified in this report.

Prepared By	Jack Gui (Project Engineer)	May 21. 2025
Reviewed By	Bibo Zhang (Reviewer)	May 21. 2025
Approved By	Angela Li (Authorized Officer)	May 21. 2025

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2. Product Information

2.1 Product Technical Description

Housing Type	Plastic and metal
Receive Frequency Range	400-480MHz (Scanning Receiver)
Highest Operating Frequency	☒Greater than 108MHz ☐Less than 108MHz
Equipment Type	Table-Top
Hardware Version	V1.2
Software Version	V1.38
Power Supply	DC 13.8V from DC power supply

I/O Port Information (☒Applicable ☐Not Applicable)

I/O Port of EUT			
I/O Port Type	Q'TY	Cable	Tested with
Antenna Port	2	0	2
Hand microphone Port	1	1	1

2.2 Auxiliary Surrounding Description

The Following Peripheral Devices and Interface Cables Were Connected During the Measurement:

☒ Test Accessories Come From The Laboratory

No.	Equipment	Model No.	Manufacturer	Specification Information	Cable
1	Load Antenna	HG-E10	Amphenol	Terminator DC -3G 50W	--

☒ Test Accessories Come From The Manufacturer

No.	Equipment	Model No.	Manufacturer	Specification Information	Cable
1	Hand microphone	N/A	N/A	N/A	0.8m unshielded

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2.2 Test Methodology

The tests were performed according to following standards:

No.	Identity	Document Title
1	FCC 47 CFR Part 15	Radio Frequency Devices
2	ANSI C63.4-2014	American National Standard for Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

2.3 Description of Test Modes

No.	Test Mode	Remark
1	Scanning mode	Worst
2	Scanning stopped/Receiving at low channel of 400 MHz to 480 MHz	--
3	Scanning stopped/Receiving at middle channel of 400 MHz to 480 MHz	--
4	Scanning stopped/Receiving at high channel of 400 MHz to 480 MHz	--

Note: Only the result of the worst case was recorded in the report.

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3. Test Environment

3.1 Address of The Test Laboratory

Laboratory: Attestation of Global Compliance (Shenzhen) Co., Ltd.

Address: 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

3.2 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L5488

Attestation of Global Compliance (Shenzhen) Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.: 5054.02

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 975832

Attestation of Global Compliance (Shenzhen) 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 with Registration 975832.

IC-Registration No.: 24842 (CAB identifier: CN0063)

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Certification and Engineering Bureau of Industry Canada. The acceptance letter from the IC is maintained in our files with Registration 24842.

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3.3 Environmental Conditions

	Normal Conditions
Temperature range (℃)	15 - 35
Relative humidity range	20 % - 75 %
Pressure range (kPa)	86 - 106

3.4 Measurement Uncertainty

The reported uncertainty of measurement y ±U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

Item	Measurement Uncertainty
Uncertainty of Radiated Emission below 1GHz	U_c = ±3.9 dB
Uncertainty of Radiated Emission above 1GHz	U_c = ±4.9 dB

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3.5 List of Equipment Used

● Radiated Emission							
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
☐	AGC-EM-E046	EMI Test Receiver	R&S	ESCI	10096	2024-02-01	2025-01-31
☐	AGC-EM-E046	EMI Test Receiver	R&S	ESCI	10096	2025-01-14	2026-01-13
☒	AGC-EM-E116	EMI Test Receiver	R&S	ESCI	100034	2024-05-24	2025-05-23
☒	AGC-EM-E061	Spectrum Analyzer	Agilent	N9010A	MY53470504	2024-05-28	2025-05-27
☒	AGC-EM-E001	Wideband Antenna	SCHWARZBECK	VULB9168	D69250	2023-05-11	2025-05-10
☒	AGC-EM-E029	Broadband Ridged Horn Antenna	ETS	3117	00034609	2024-05-24	2025-05-23
☒	AGC-EM-E146	Pre-amplifier	ETS	3117-PA	00246148	2024-07-24	2026-07-23

● Test Software					
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Version Information
☒	AGC-EM-S004	RE Test System	Tonscend	TS^+ Ver2.1(JS32-RE)	4.0.0.0
☐	AGC-EM-S003	RE Test System	FARA	EZ-EMC	V.RA-03A
☒	AGC-EM-S001	CE Test System	R&S	ES-K1	V1.71

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4. Summary of Test Results

Item	FCC Rules	Description Of Test	Class/Severity	Result
1	Section 15.107	Radiated Emission	Class B	Pass
2	Section 15.109	Conducted Emission	Not applicable	Pass
3	§15.111	Antenna Conducted Power for Receivers	/	Pass
4	§15.121(b)	Scanning receivers and frequency converters used with scanning receivers	/	Pass

Note: The device under test is a DC power supply device, and the conducted disturbance test is not applicable.

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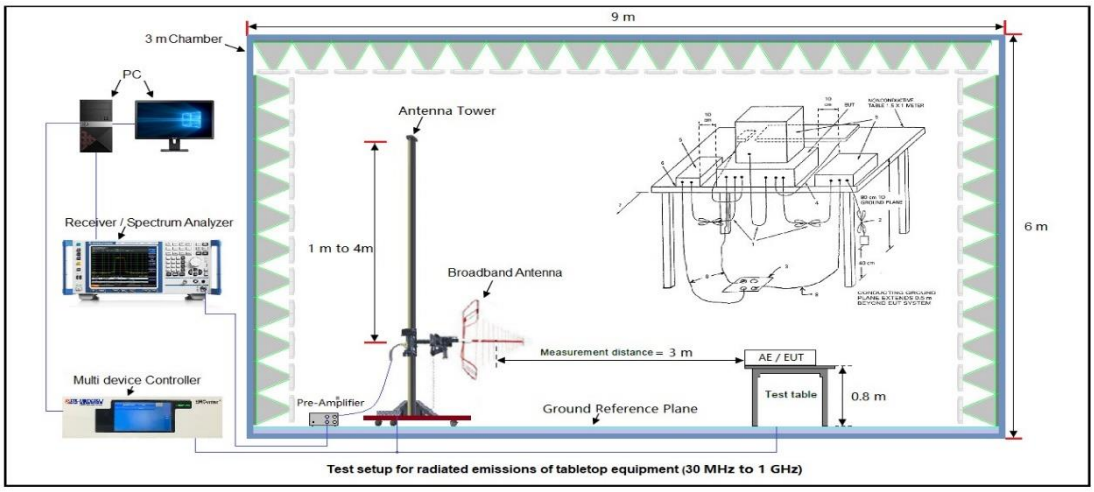
5. Radiated Emission Measurements

5.1 Provisions Applicable

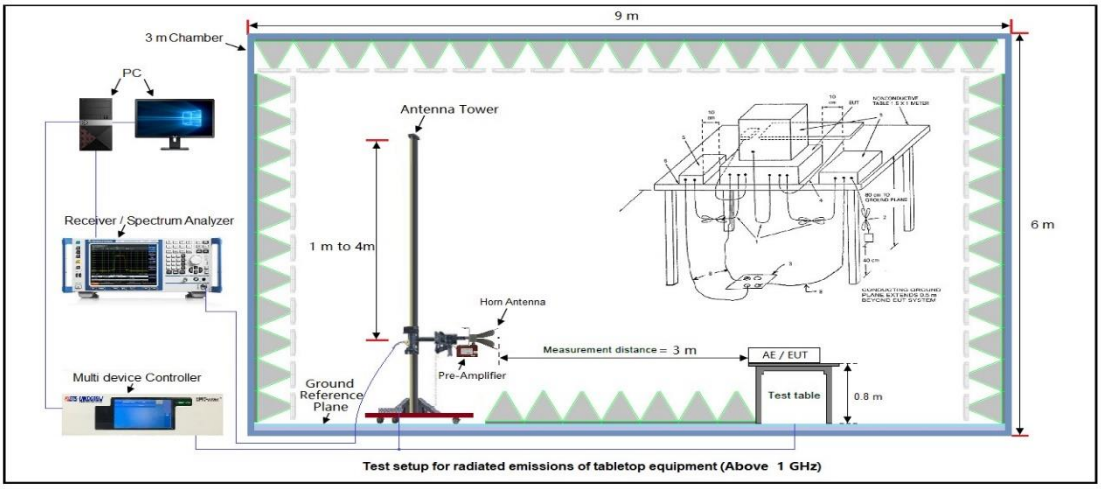
FCC CFR Title 47 Part 15 Subpart B Section 15.109:

Frequency Range	Class B Limit (dBuV/m @3m)	Class A Limit (dBuV/m @3m)	Value
30MHz-88MHz	40.00	50.00	Quasi-peak
88MHz-216MHz	43.50	53.50	Quasi-peak
216MHz-960MHz	46.00	56.00	Quasi-peak
960MHz-1GHz	54.00	64.00	Quasi-peak
Above 1GHz	54.00	60.00	Average
	74.00	80.00	Peak

5.2 Measurement Setup



Radiated Emission Measurements Test Setup for 30MHz to 1GHz



Radiated Emission Measurements Test Setup for above 1GHz

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5.3 Measurement Procedure

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2. Support equipment, if needed, was placed as per ANSI C63.4.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
4. The EUT received power by AC 120V/60Hz.
5. The antenna was placed at 3 meter away from the EUT as stated in FCC Part 15. The antenna connected to the Analyzer via a cable and at times a pre-amplifier would be used.
6. The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
7. The test mode(s) were scanned during the test:
8. Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and Q.P./Peak reading is presented. For emissions below 1GHz, use 120KHz RBW and VBW>=3RBW for QP reading.
9. For emissions above 1GHz, use 1MHz RBW and 3MHz VBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
10. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
11. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
12. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
13. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.
14. The test data of the worst case condition (mode 1) was reported on the following Data page.

EMI Test Receiver Setup:

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	Ave.

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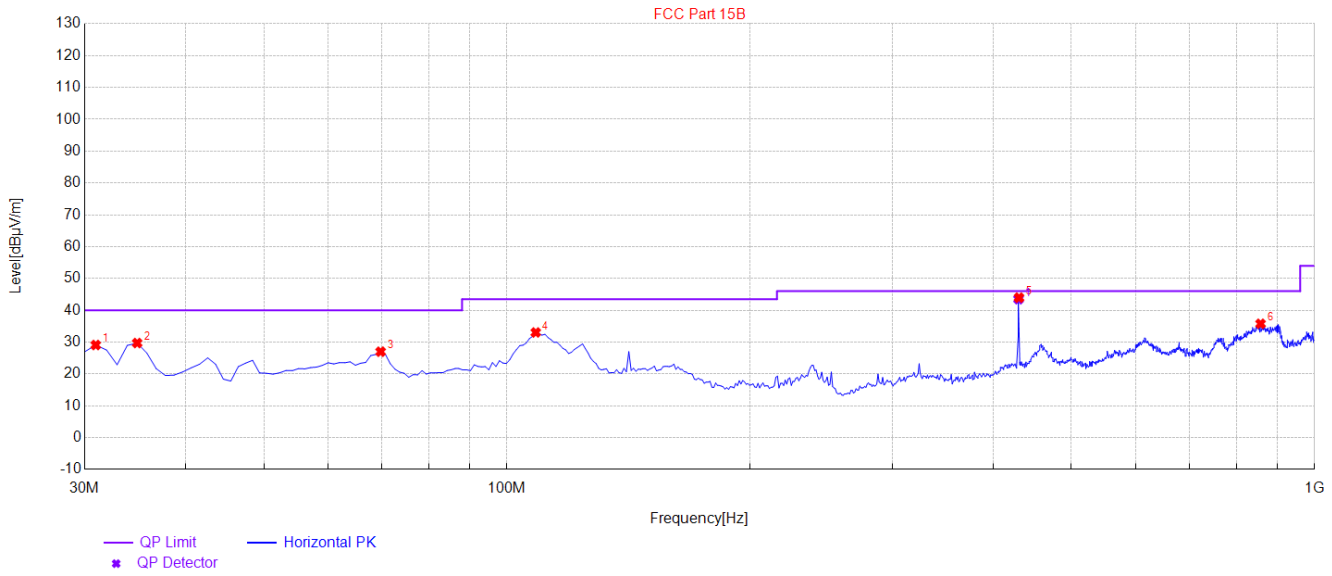
5.4 Measurement Resul

Radiated Emission 30MHz-1GHz Test Result			
Test Mode	Mode 1	Polarity:	Horizontal



Suspected Data List

NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	30.97	29.10	13.00	40.00	10.90	100	278	Horizontal
2	34.85	29.73	11.82	40.00	10.27	100	10	Horizontal
3	69.77	27.00	14.73	40.00	13.00	100	315	Horizontal
4	108.57	33.04	16.62	43.50	10.46	100	208	Horizontal
5	430.61	43.98	19.05	46.00	2.02	100	151	Horizontal
6	857.41	35.77	29.93	46.00	10.23	100	5	Horizontal

Final Data List

NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	430.0200	19.05	43.49	46.00	2.51	270	180	Horizontal

RESULT: PASS

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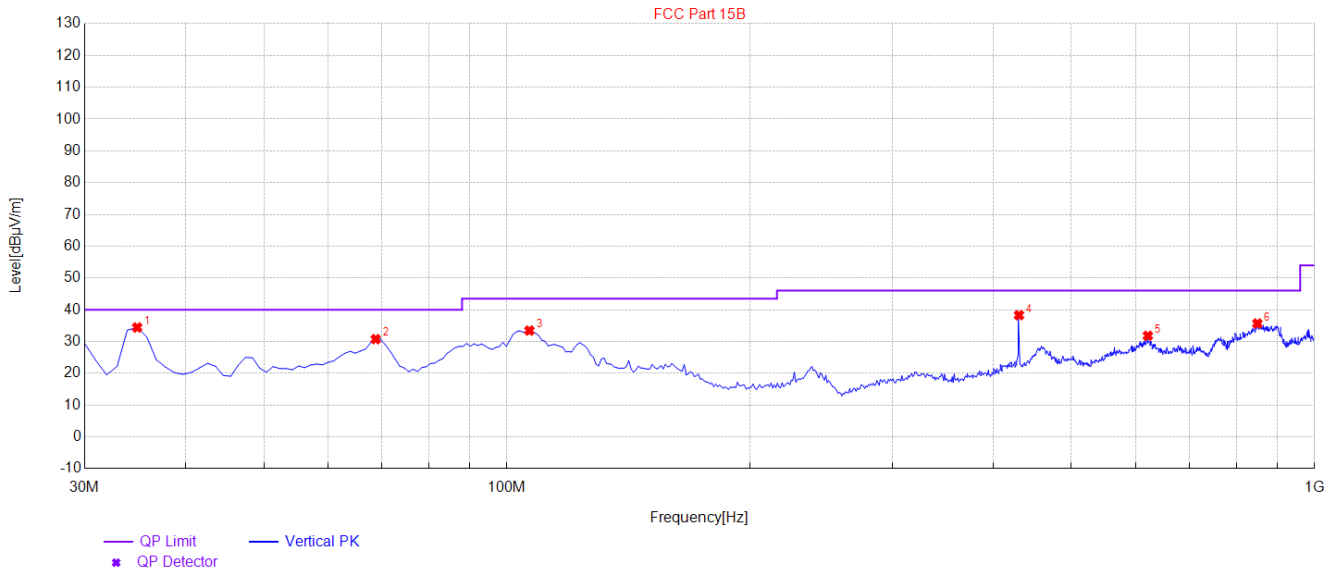
Radiated Emission 30MHz-1GHz Test Result			
Test Mode	Mode 1	Polarity:	Vertical



Final Data List

NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	34.85	34.43	11.82	40.00	5.57	100	207	Vertical
2	68.8	30.76	15.04	40.00	9.24	100	187	Vertical
3	106.63	33.46	16.73	43.50	10.04	100	175	Vertical
4	430.61	38.29	19.05	46.00	7.71	100	175	Vertical
5	621.7	31.82	25.68	46.00	14.18	100	360	Vertical
6	849.65	35.68	29.68	46.00	10.32	100	199	Vertical

RESULT: PASS

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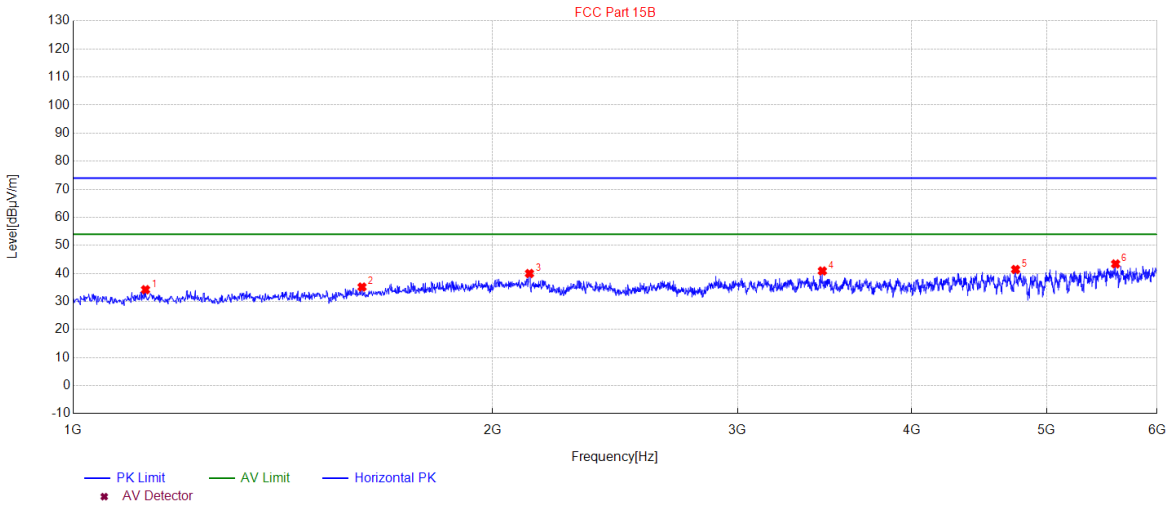
Radiated Emission Above1GHz Test Result			
Test Mode	Mode 1	Polarity:	Horizontal



Final Data List

NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1127.0254	34.20	-18.14	74.00	39.80	100	180	Horizontal
2	1612.1224	35.15	-16.61	74.00	38.85	100	270	Horizontal
3	2126.2252	39.98	-13.10	74.00	34.02	100	260	Horizontal
4	3450.4901	40.87	-10.77	74.00	33.13	100	240	Horizontal
5	4748.7498	41.40	-7.83	74.00	32.60	100	330	Horizontal
6	5602.9206	43.38	-6.58	74.00	30.62	100	30	Horizontal

RESULT: PASS

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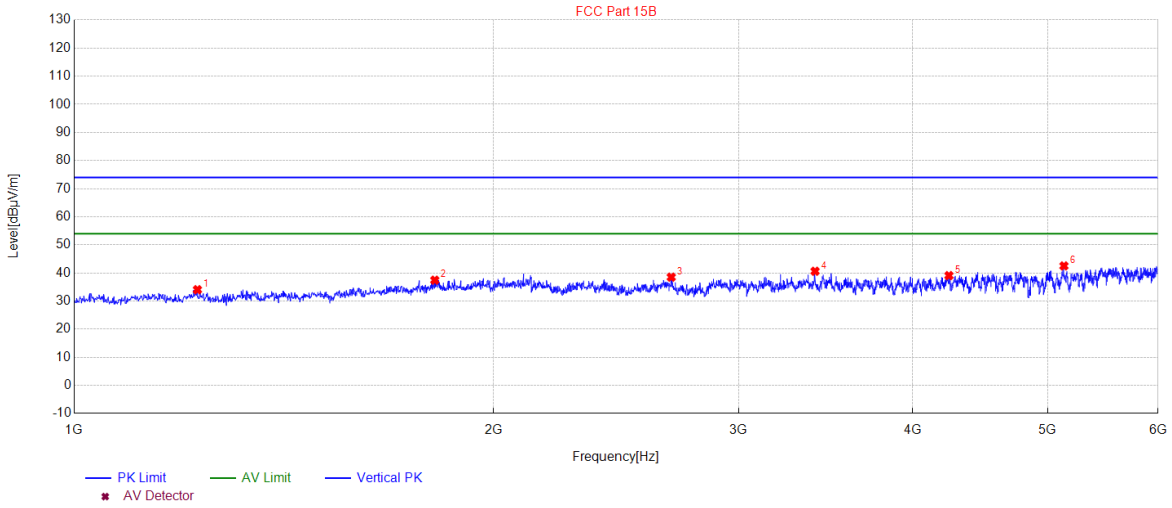
Radiated Emission Above1GHz Test Result			
Test Mode	Mode 1	Polarity:	Vertical



Final Data List

NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1226.0452	34.05	-17.98	74.00	39.95	100	180	Vertical
2	1815.163	37.44	-14.94	74.00	36.56	100	240	Vertical
3	2683.3367	38.51	-12.12	74.00	35.49	100	30	Vertical
4	3403.4807	40.61	-10.90	74.00	33.39	100	300	Vertical
5	4246.6493	39.07	-8.94	74.00	34.93	100	310	Vertical
6	5135.8272	42.51	-7.53	74.00	31.49	100	280	Vertical

RESULT: PASS

Note:

1. Factor=Antenna Factor + Cable loss - Amplifier gain, Margin= Limit-Measurement.
2. The “Factor” value can be calculated automatically by software of measurement system.

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6. Conducted Emission Measurements

6.1 Provisions Applicable

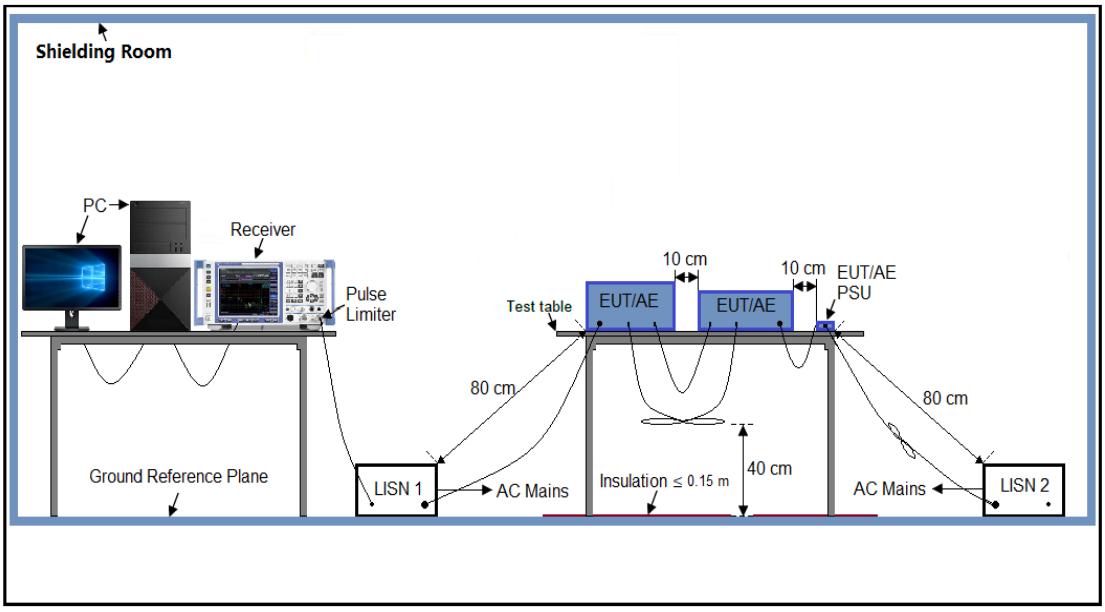
FCC CFR Title 47 Part 15 Subpart B Section 15.107:
For Class B Limits:

Frequency	Maximum RF Line Voltage	
	Q.P. (dBμV)	Average (dBμV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

For Class A Limits:

Frequency	Maximum RF Line Voltage	
	Q.P. (dBμV)	Average (dBμV)
150kHz~500kHz	79	66
500kHz~30MHz	73	60

6.2 Measurement Setup



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6.3 Measurement Procedure

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2. Support equipment, if needed, was placed as per ANSI C63.4.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
4. The EUT received AC 120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipment received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.
9. The test data of the worst case condition (Mode 1) was reported on the following Data page.

6.4 Measurement Result

Not applicable

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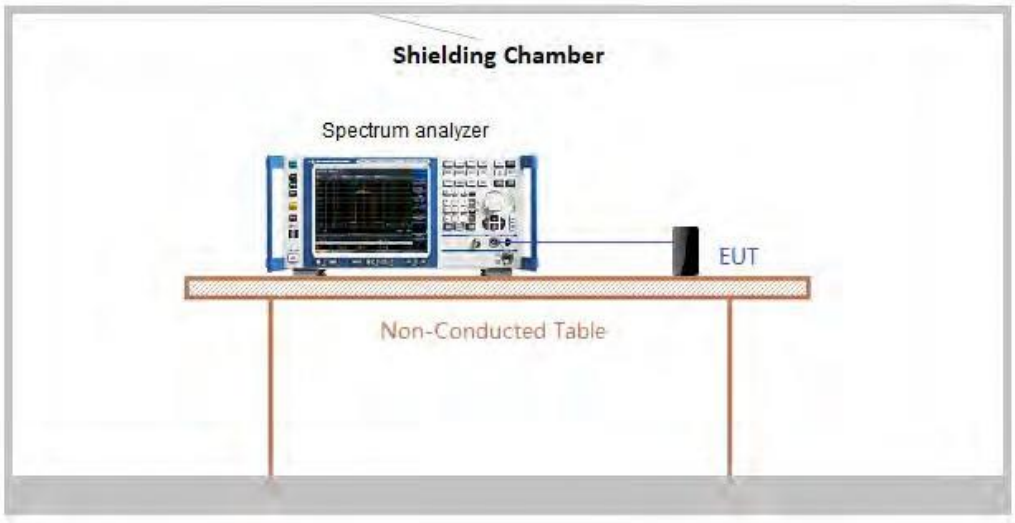
7. Antenna Conducted Power for Receivers

7.1 Provisions Applicable

The antenna conducted power of the receiver as defined in §15.111 shall not exceed the values given in the following tables

Frequency Range	9 KHz to 2GHz
Limit	2.0 nW (-57 dBm)

7.2 Measurement Setup



7.3 Measurement Procedure

1. The receiver antenna terminal connected to a spectrum analyzer.
2. Receiver set as follow:

Frequency range	RBW (kHz)	VBW (kHz)
9 kHz ~ 150 kHz	1	3
150 kHz ~ 30 MHz	10	30
30 MHz ~ 1000 MHz	100	300
1000 MHz ~ 3000 MHz	1000	3000

3. The test data of the worst case condition (mode 1) was reported on the following Data page.

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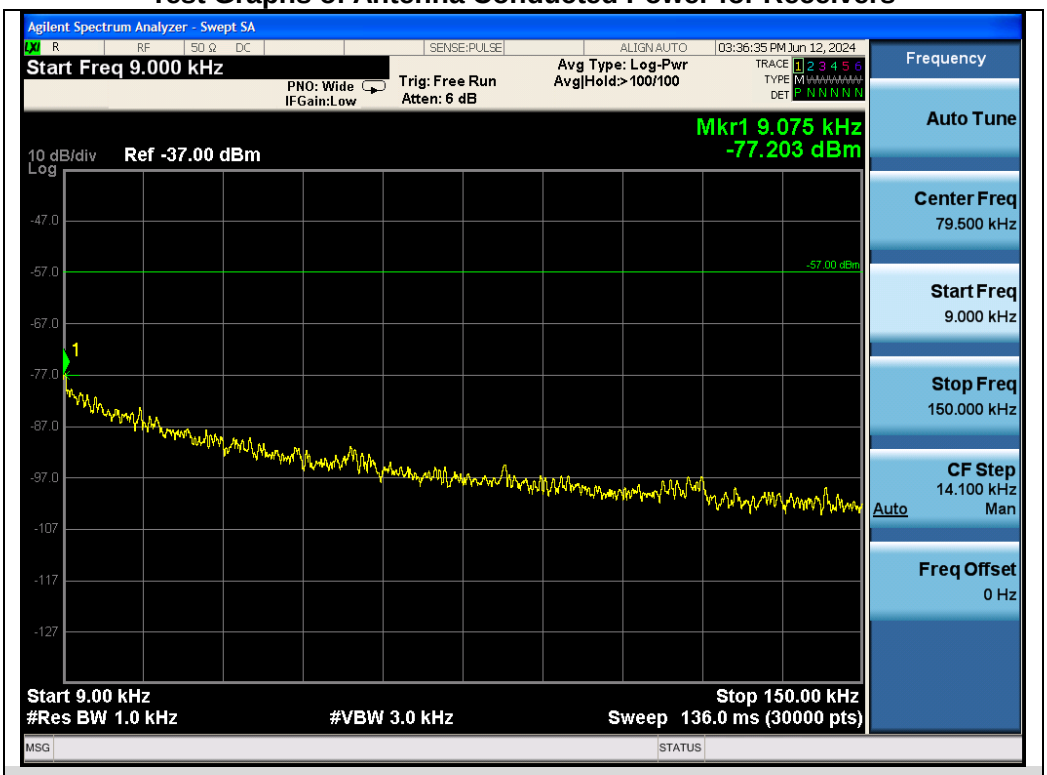
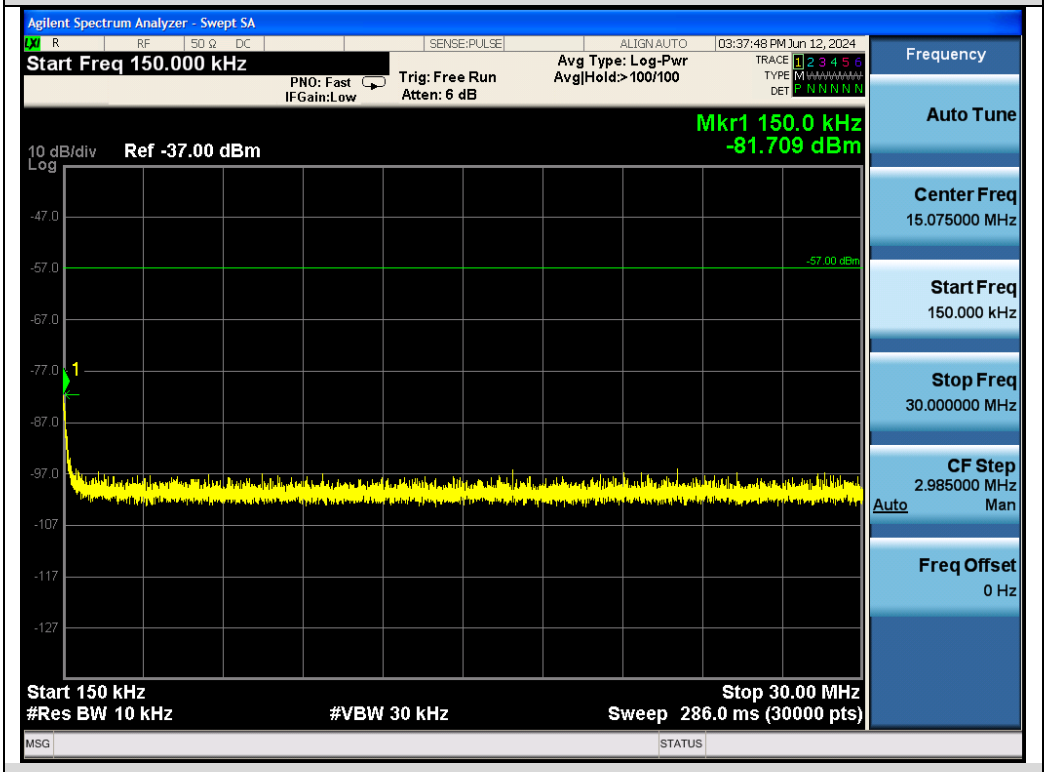
7.4 Measurement Result

Test Graphs of Antenna Conducted Power for Receivers



Test_Graph_RX_FrequencyRange_9kHz-150kHz



Test_Graph_RX_FrequencyRange_150kHz-30MHz

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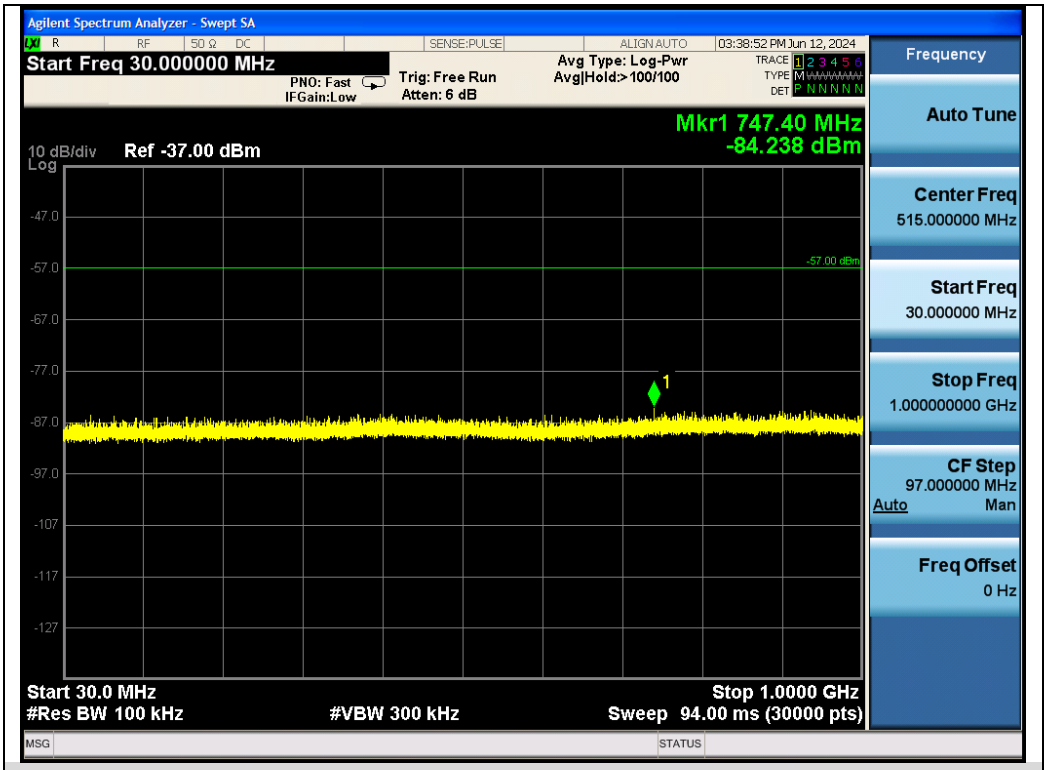
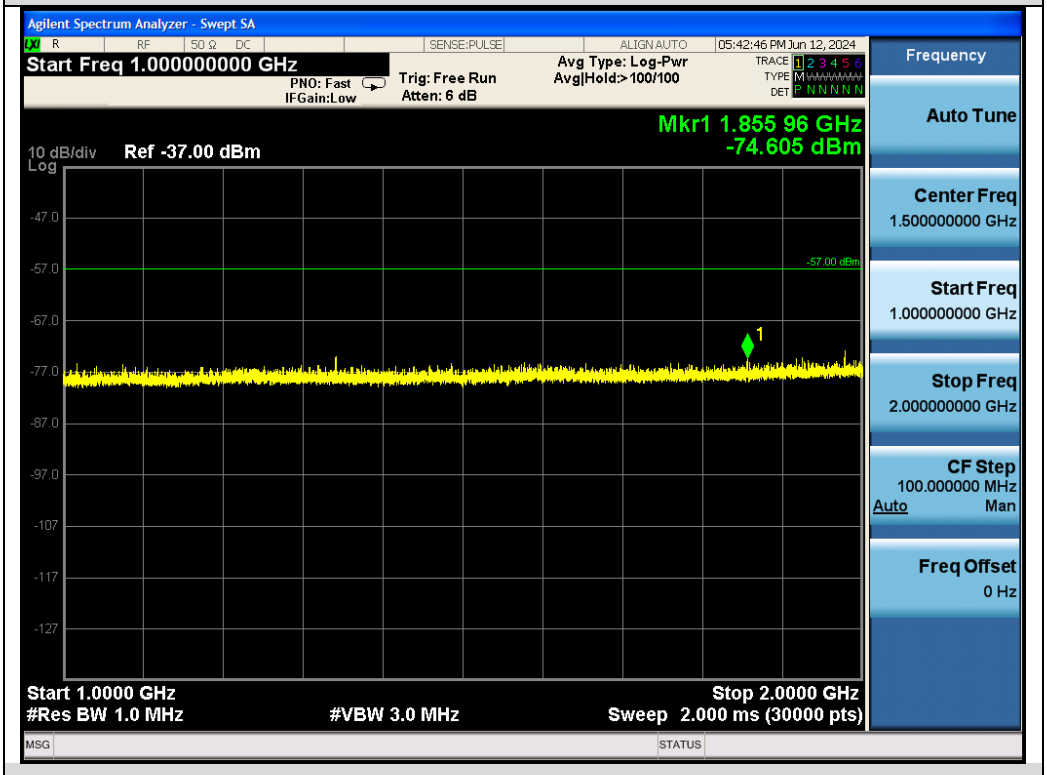


Test_Graph_RX_FrequencyRange_30MHz-1GHz



Test_Graph_RX_FrequencyRange_1GHz-2GHz

RESULT: PASS

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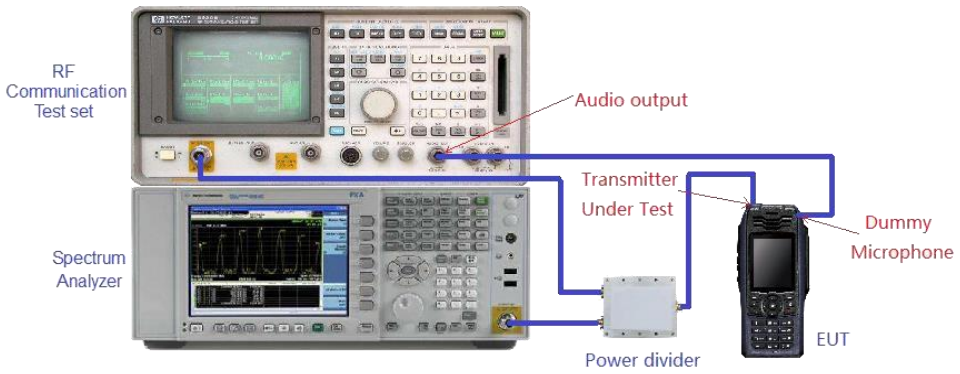
8. Scanning Receivers and Frequency Converters Used with Scanning Receivers

8.1 Provisions Applicable

Except as provided in paragraph (c) of this section, scanning receivers shall reject any signals from the Cellular Radiotelephone Service frequency bands that are 38 dB or lower based upon a 12 dB SINAD measurement, which is considered the threshold where a signal can be clearly discerned from any interference that may be present.

8.2 Measurement Setup



8.3 Measurement Procedure

1) Connected the EUT as shown in the above block diagram.
2) Apply a RF signal to the receiver input port at lowest, middle and highest channel frequencies of receiver operation band.
3) Adjust the audio output level of the receiver to it's rated value with the distortion less than 10%.
4) Adjust the RF Signal Generator Output Power to produce 12 dB SINAD without the audio output power dropping by more than 3 dB.This output level of the RF SG at each channel frequency is the sensitivity of the receiver.
5) Select the lowest or worse-case sensitivity level for all of the bands as the reference sensitivity.
6) Adjust the RF Signal Generator output to a level of +60 dB above the reference sensitivity obtained in step 5) and its frequency to the frequency points in the cellular band.
7) Set the Receiver squelch to threshold, the signal required to open the squelch must be lower than the reference sensitivity level.
8) Set the receiver in a scanning mode and allow it to scan through it's complete receiving range.
9) If the receiver unsquelched or stopped on any frequency, receiving at this frequency, then adjust the signal generator output level until 12 dB SINAD is produced, this level is the spurious value and the difference between the reference sensitivity and the spurious value is the rejection ratio and must be at least 38dB.
10) Repeat above procedure at the frequencies 824.5, 836.0, and 848.5 MHz for the mobile band, and 869.1, 881.5, and 893.5MHz for the cellular base band.

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8.4 Measurement Result

Scanning Frequency Band (MHz)	Test Frequency of Cellular Band (MHz)	Spurious Value of Cellular Frequency (dBm)	Reference Sensitivity (dBm)	Measurement Result (dB)	Limit (dB)
400-480	824.5/836.0/848.5	>-45	-107	<-62	<-38
400-480	869.1/881.5/893.5	>-45	-107	<-62	<-38

Note:

1. Measurement Result = Rejection Ratio
2. Reference Sensitivity is the recorded value when the signal-to-noise ratio is 12dB.
3. Measurement Result = Reference Sensitivity- Spurious Value.

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Appendix I: Photographs of Test Setup

Refer to the Report No.: AGC02931240601AP03

Appendix II: Photographs of Test EUT

Refer to the Report No.: AGC02931240601AP02

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Conditions of Issuance of Test Reports

1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the “Company”) solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the “Clients”).
2. Any report issued by Company as a result of this application for testing services (the “Report”) shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.
3.The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
6. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.
7.Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.
8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.
9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

-----End of Report-----

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