

FCC PART 15B, CLASS B TEST REPORT

For

Kangaroo Media Inc

20865 Ch de la Cote nord, suite 101, Boisbriand, Quebec, J7E 4H5, Canada

FCC ID: 2ATRP-RA0B210S

Report Type: Original Report	Product Type: FM Walkie Talkie
Report Number: RSZ190612005-00A	
Report Date: 2019-07-15	
Reviewed By: RF Engineer	Jacob Kong 
Prepared By: Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn	

Note: This report must not be used by the customer to claim product certification, approval, or endorsement by A2LA* or any agency of the Federal Government. * This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk “*”.

The information marked # is provided by the applicant, the laboratory is not responsible for its authenticity.

TABLE OF CONTENTS

GENERAL INFORMATION.....	3
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	3
OBJECTIVE	3
RELATED SUBMITTAL(S)/GRANT(S).....	3
TEST METHODOLOGY	3
MEASUREMENT UNCERTAINTY	4
TEST FACILITY	4
SYSTEM TEST CONFIGURATION.....	5
DESCRIPTION OF TEST CONFIGURATION	5
EUT EXERCISE SOFTWARE	5
SPECIAL ACCESSORIES.....	5
EQUIPMENT MODIFICATIONS	5
SUPPORT EQUIPMENT LIST AND DETAILS	5
EXTERNAL I/O CABLE.....	5
BLOCK DIAGRAM OF TEST SETUP	6
SUMMARY OF TEST RESULTS	7
TEST EQUIPMENT LIST	8
FCC §15.109 - RADIATED SPURIOUS EMISSIONS	9
APPLICABLE STANDARD	9
EUT SETUP	9
EMI TEST RECEIVER SETUP.....	10
TEST PROCEDURE	10
CORRECTED AMPLITUDE & MARGIN CALCULATION	10
TEST RESULTS SUMMARY	10
TEST DATA	11
FCC §15.111 - ANTENNA POWER CONDUCTION LIMITS FOR RECEIVERS.....	21
APPLICABLE STANDARD	21
EUT SETUP	21
TEST PROCEDURE	21
TEST DATA	21
FCC §15.121 - COMPLIANCE FOR SCANNING RECEIVER.....	23
APPLICABLE STANDARD	23
EUT SETUP	23
TEST PROCEDURE	23
TEST RESULTS SUMMARY	23
TEST DATA	24
RESULT	24

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	FM Walkie Talkie
Model	RA0B210S
Voltage Range	DC 4*1.5V AAA battery
Highest operating frequency	2480 MHz
Date of Test	2019/06/17~2019/07/14
Sample serial number	190612005
Received date	2019/06/12
Sample/EUT Status	Good condition

Objective

This test report is prepared on behalf of *Kangaroo Media Inc* in accordance with Part 2-Subpart J, Part 15-Subparts A, B of the Federal Communication Commissions rules.

The objective of the manufacturer is to determine the compliance of the EUT with FCC Part 15 B.

Related Submittal(s)/Grant(s)

FCC Part 15.247 DSS&DTS submissions with FCC ID: 2ATRP-RA0B210S.

Test Methodology

All measurements contained in this report were conducted with 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.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR 16-4-2:2011, the expanded combined standard uncertainty of test at Bay Area Compliance Laboratories Corp. (Shenzhen) is shown as below. And the uncertainty will be taken into consideration for the test data recorded in the report

Parameter		uncertainty
Emissions, radiated	Below 1GHz	$\pm 4.75\text{dB}$
	Above 1GHz	$\pm 4.88\text{dB}$

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 342867, the FCC Designation No.: CN1221.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062B.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a manufacturer testing fashion.

EUT operation mode 1: Receiving

EUT operation mode 2: Scanning

EUT Exercise Software

No exercise software was used.

Special Accessories

No special accessory.

Equipment Modifications

No modification was made to the EUT tested.

Support Equipment List and Details

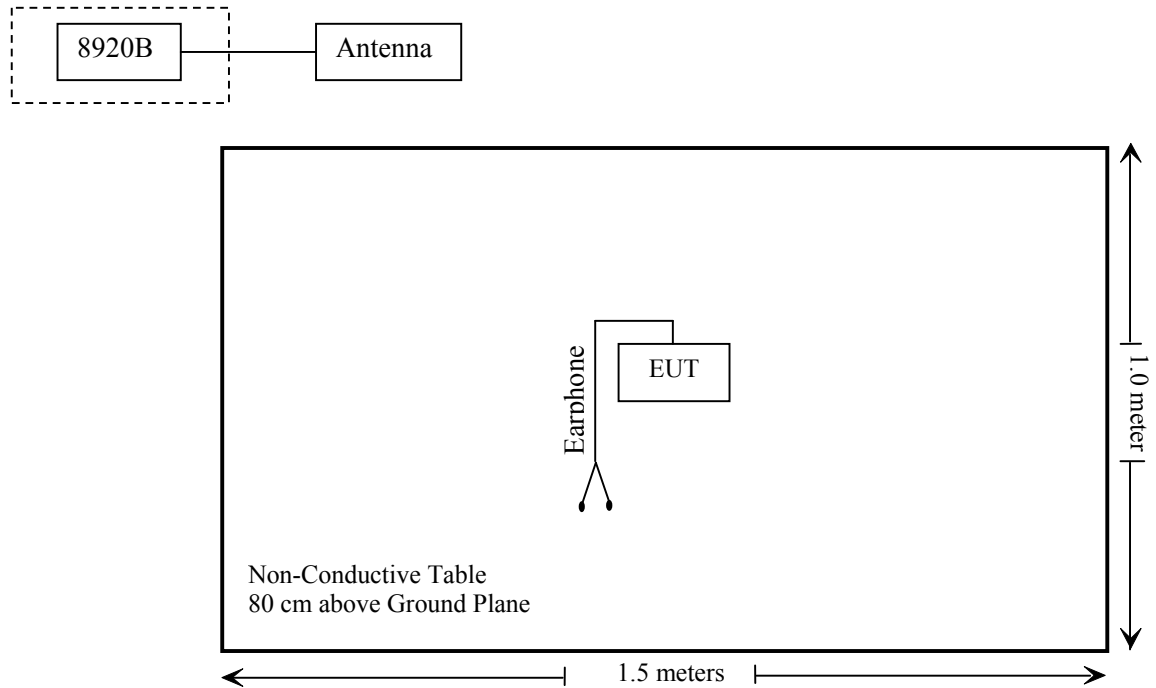
Manufacturer	Description	Model	Serial Number
Un-known	Earphone	Un-known	known
HP Agilent	RF communication test set	8920B	3325U00859

External I/O Cable

Cable Description	Length (m)	From/Port	To
N/A	N/A	N/A	N/A

Block Diagram of Test Setup

For Radiated Emissions:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§15.107	AC Line Conducted Emissions	Not Applicable
§15.109	Radiated Spurious Emissions	Compliance
§15.111	Antenna power conduction limits for receivers	Compliance
§15.121	Compliance for Scanning Receiver	Compliance

Note: Not Applicable: The EUT is powered by battery only.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
A.H. System	Horn Antenna	SAS-200/571	135	2018-09-01	2021-08-31
Rohde & Schwarz	Signal and Spectrum Analyzer	FSV40-N	102259	2019-06-22	2020-06-22
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2017-12-22	2020-12-21
COM-POWER	Pre-amplifier	PA-122	181919	2018-11-12	2019-11-12
Sonoma Instrument	Amplifier	310N	186238	2018-11-12	2019-11-12
Rohde & Schwarz	EMI Test Receiver	ESR	1316.3003K03-101746-zn	2018-07-11	2019-07-11
Ducommun technologies	RF Cable	UFA147A-2362-100100	MFR64639231029-003	2018-11-12	2019-11-12
Ducommun technologies	RF Cable	104PEA	218124002	2018-11-12	2019-11-12
Ducommun Technologies	RF Cable	RG-214	1	2019-05-21	2019-11-19
Ducommun Technologies	RF Cable	RG-214	2	2018-11-12	2019-11-12
Rohde & Schwarz	Auto test software	EMC 32	V9.10	NCR	NCR
COM-POWER	Dipole Antenna	AD-100	721027	NCR	NCR
HP Agilent	RF communication test set	8920B	3325U00859	2019-01-15	2020-01-15
RF Conducted Test					
WEINSCHL	10dB Attenuator	5324	AU 3842	Each Time	
Rohde & Schwarz	Spectrum Analyzer	FSU26	200120	2019-03-02	2020-03-01

* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

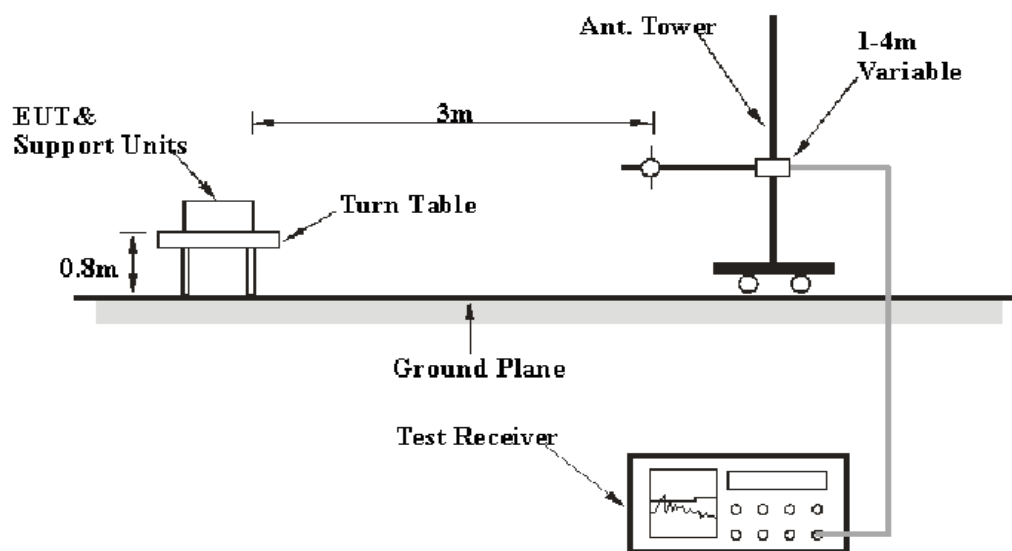
FCC §15.109 - RADIATED SPURIOUS EMISSIONS

Applicable Standard

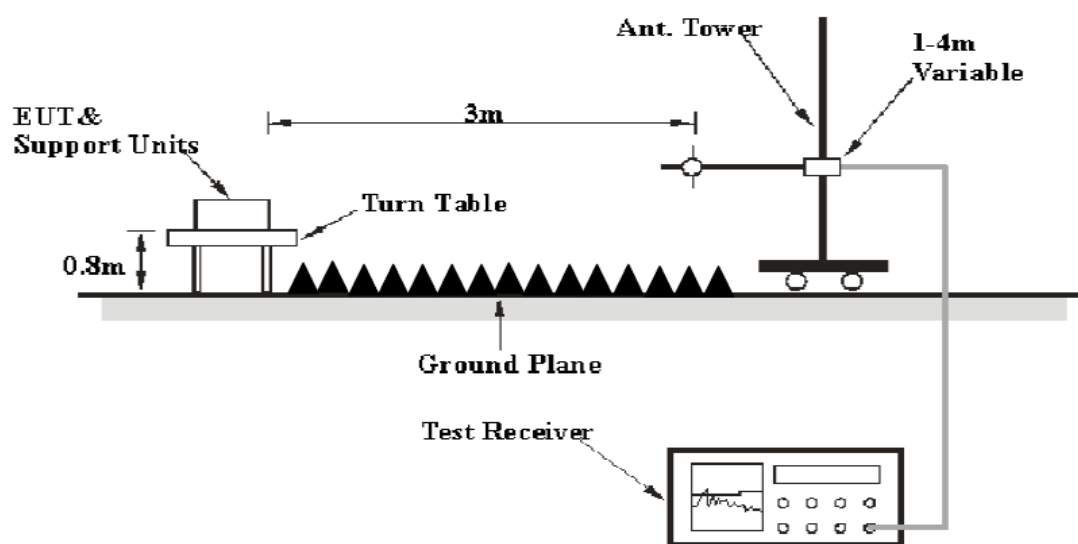
FCC §15.109

EUT Setup

Below 1GHz:



Above 1GHz:



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2014. The specification used was the FCC Part 15.109 Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 12.5 GHz.

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

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

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detector mode from 30 MHz to 1 GHz and PK and average detector modes for frequencies above 1 GHz.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

Test Results Summary

According to the data in the following table, the EUT complied with the FCC §15.109 Class B,

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level is in compliance with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

In BACL, $U_{(Lm)}$ is less than U_{cispr} , if L_m is less than L_{lim} , it implies that the EUT complies with the limit.

Test Data

Environmental Conditions

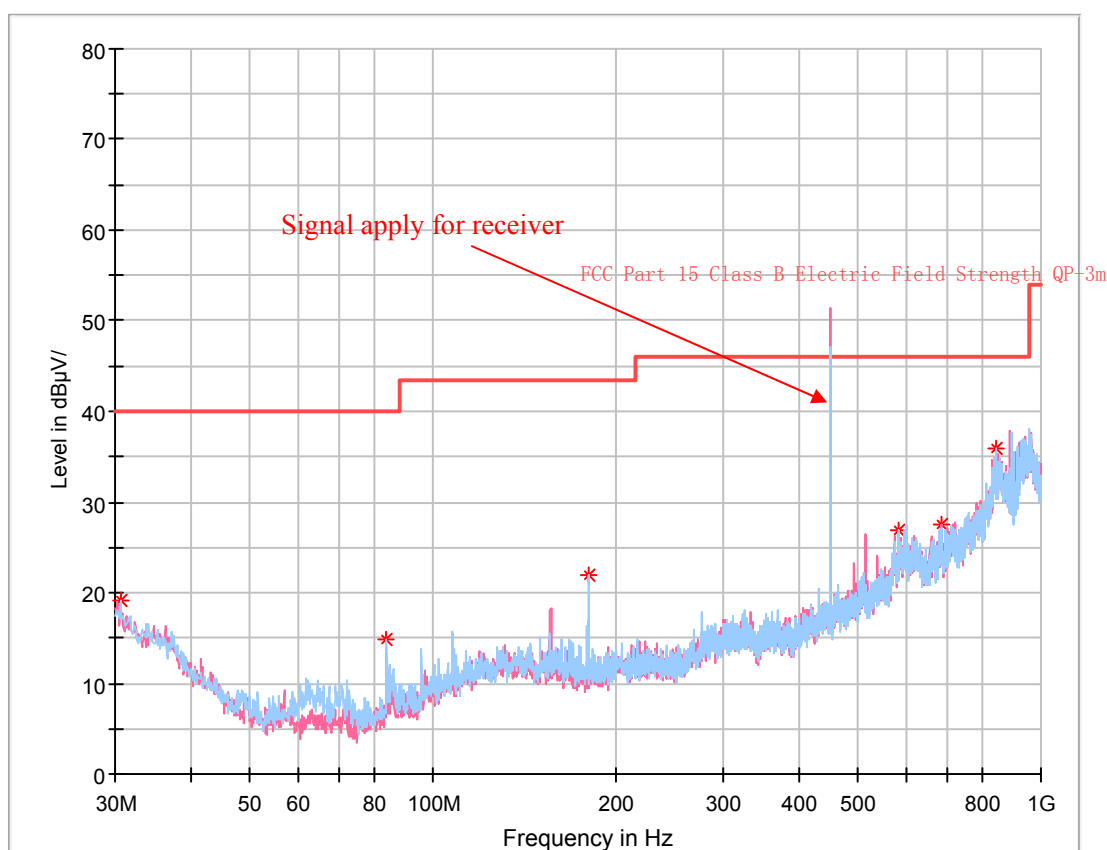
Temperature:	24~25 °C
Relative Humidity:	51~52 %
ATM Pressure:	101.0 kPa

The testing was performed by Andy Yu on 2019-06-17 and Curry Xiang on 2019-07-14.

EUT Operation Mode 1: Receiving

Receiving frequency: 450.0125 MHz

30 MHz~1 GHz:



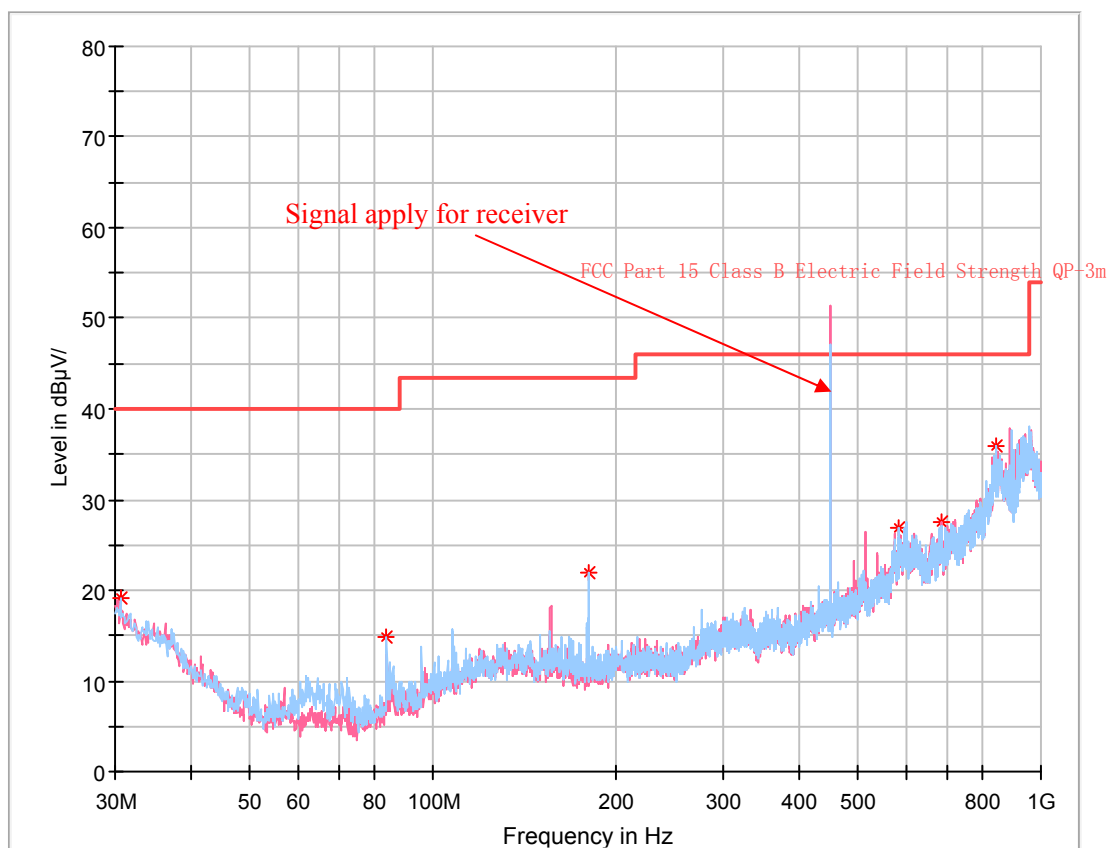
Frequency (MHz)	Corrected Amplitude (dB μ V/m)	Antenna height (cm)	Antenna Polarity	Turntable position (degree)	Correction Factor (dB/m)	Limit (dB μ V/m)	Margin (dB)
30.606250	19.12	300.0	H	266.0	-8.0	40.00	20.88
83.956250	14.86	202.0	H	77.0	-19.6	40.00	25.14
180.107500	21.84	102.0	H	285.0	-15.2	43.50	21.66
584.961250	26.83	202.0	H	322.0	-2.7	46.00	19.17
684.022500	27.59	300.0	V	349.0	-2.0	46.00	18.41
840.920000	35.91	300.0	H	95.0	6.0	46.00	10.09

1 GHz – 12.5 GHz:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dB μ V/m)	FCC Part 15B	
	Reading (dB μ V)	PK/QP/Ave.		Height (m)	Polar (H / V)			Limit (dB μ V/m)	Margin (dB)
1039.63	42.90	PK	187	2.4	H	-6.08	36.82	74	37.18
1039.63	30.10	Ave.	187	2.4	H	-6.08	24.02	54	29.98
1039.63	42.98	PK	213	1.0	H	-6.08	36.90	74	37.10
1039.63	29.55	Ave.	213	1.0	H	-6.08	23.47	54	30.53
2106.90	42.41	PK	328	1.7	H	-0.81	41.60	74	32.40
2106.90	29.83	Ave.	328	1.7	H	-0.81	29.02	54	24.98
2106.90	43.12	PK	113	2.3	H	-0.81	42.31	74	31.69
2106.90	29.08	Ave.	113	2.3	H	-0.81	28.27	54	25.73

Receiving frequency: 460MHz

30 MHz~1 GHz:



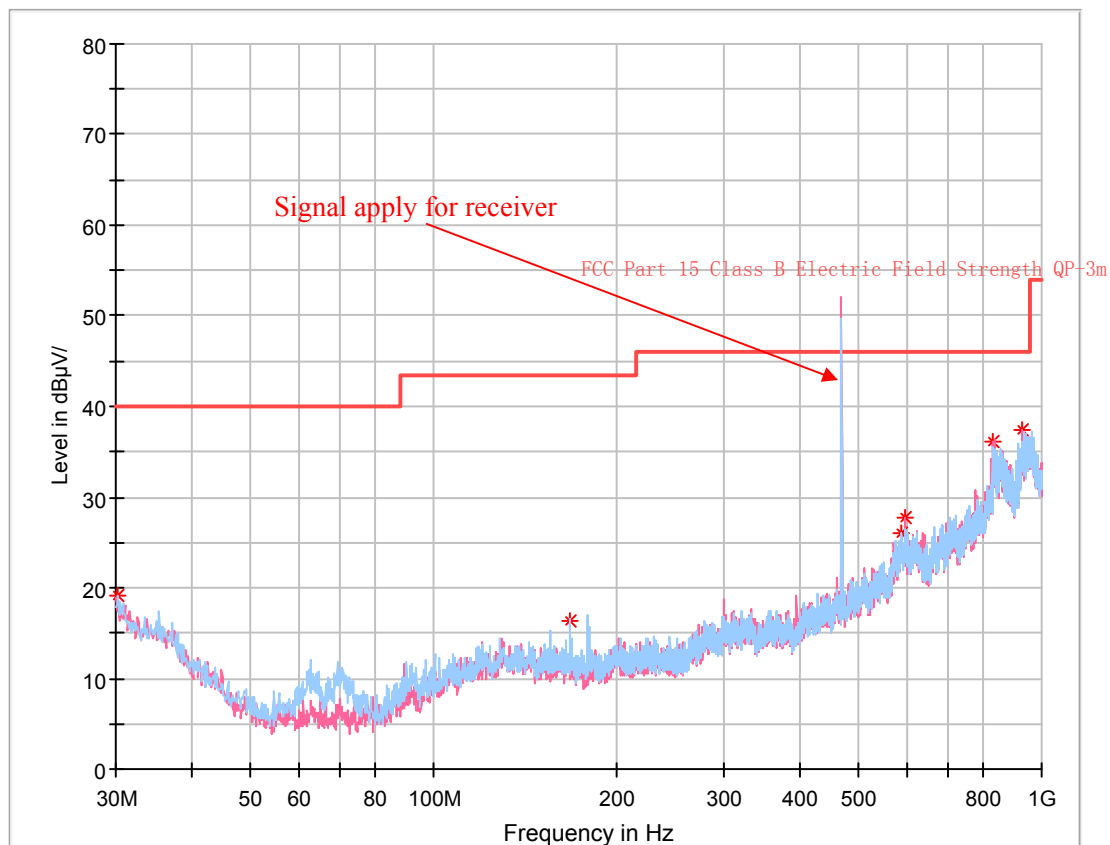
Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna height (cm)	Antenna Polarity	Turntable position (degree)	Correction Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
30.242500	19.11	300.0	H	344.0	-7.8	40.00	20.89
167.982500	16.30	102.0	H	94.0	-14.8	43.50	27.20
587.022500	25.95	300.0	H	214.0	-2.6	46.00	20.05
596.722500	27.69	102.0	V	280.0	-1.8	46.00	18.31
828.916250	36.12	202.0	V	322.0	4.8	46.00	9.88
927.492500	37.50	202.0	V	209.0	7.3	46.00	8.50

1 GHz – 12.5 GHz:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBuV/m)	FCC Part 15B	
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H / V)			Limit (dBuV/m)	Margin (dB)
1241.36	43.05	PK	345	1.4	H	-4.58	38.47	74	35.53
1241.36	29.24	Ave.	345	1.4	H	-4.58	24.66	54	29.34
1241.36	42.74	PK	268	2.1	H	-4.58	38.16	74	35.84
1241.36	28.27	Ave.	268	2.1	H	-4.58	23.69	54	30.31
1986.34	42.82	PK	346	2.2	H	-1.29	41.53	74	32.47
1986.34	28.72	Ave.	346	2.2	H	-1.29	27.43	54	26.57
1986.34	42.20	PK	70	1.3	H	-1.29	40.91	74	33.09
1986.34	29.84	Ave.	70	1.3	H	-1.29	28.55	54	25.45

Receiving frequency: 469.09875MHz

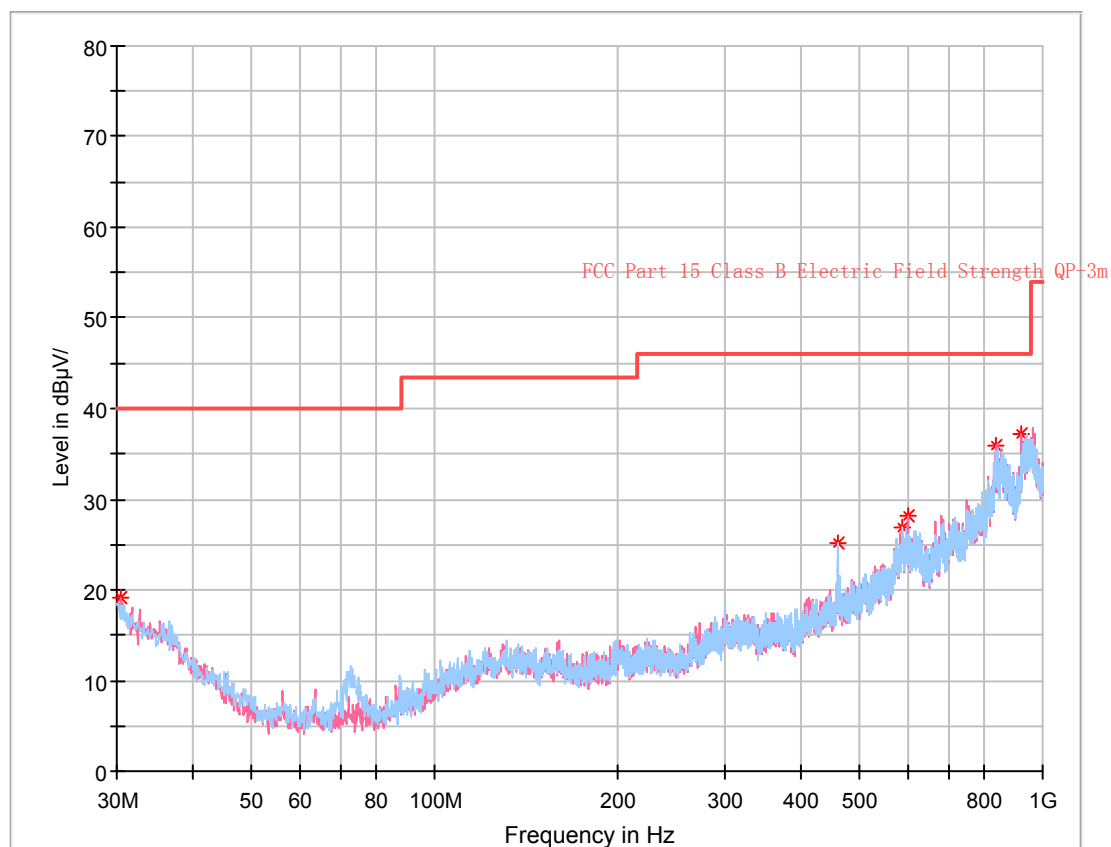
30 MHz~1 GHz:



Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna height (cm)	Antenna Polarity	Turntable position (degree)	Correction Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
30.242500	19.11	300.0	H	344.0	-7.8	40.00	20.89
167.982500	16.30	102.0	H	94.0	-14.8	43.50	27.20
587.022500	25.95	300.0	H	214.0	-2.6	46.00	20.05
596.722500	27.69	102.0	V	280.0	-1.8	46.00	18.31
828.916250	36.12	202.0	V	322.0	4.8	46.00	9.88
927.492500	37.50	202.0	V	209.0	7.3	46.00	8.50

1 GHz – 12.5 GHz:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBuV/m)	FCC Part 15B	
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H / V)			Limit (dBuV/m)	Margin (dB)
1216.40	43.19	PK	268	1.2	H	-4.78	38.41	74	35.59
1216.40	29.81	Ave.	268	1.2	H	-4.78	25.03	54	28.97
1216.40	41.78	PK	339	2.5	H	-4.78	37.00	74	37.00
1216.40	29.28	Ave.	339	2.5	H	-4.78	24.50	54	29.50
2043.16	43.22	PK	336	2.1	H	-1.19	42.03	74	31.97
2043.16	30.11	Ave.	336	2.1	H	-1.19	28.92	54	25.08
2043.16	43.06	PK	264	2.4	H	-1.19	41.87	74	32.13
2043.16	29.01	Ave.	264	2.4	H	-1.19	27.82	54	26.18

*EUT Operation Mode 2: Scanning***30 MHz~1 GHz:**

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna height (cm)	Antenna Polarity	Turntable position (degree)	Correction Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
460.437500	25.26	102.0	H	0.0	-8.0	46.00	20.74
588.841250	26.84	102.0	H	0.0	-2.4	46.00	19.16
598.662500	28.28	102.0	V	167.0	-1.7	46.00	17.72
30.485000	19.09	102.0	V	202.0	-7.9	40.00	20.91
836.676250	35.81	102.0	V	255.0	5.6	46.00	10.19
924.825000	37.29	202.0	V	158.0	7.0	46.00	8.71

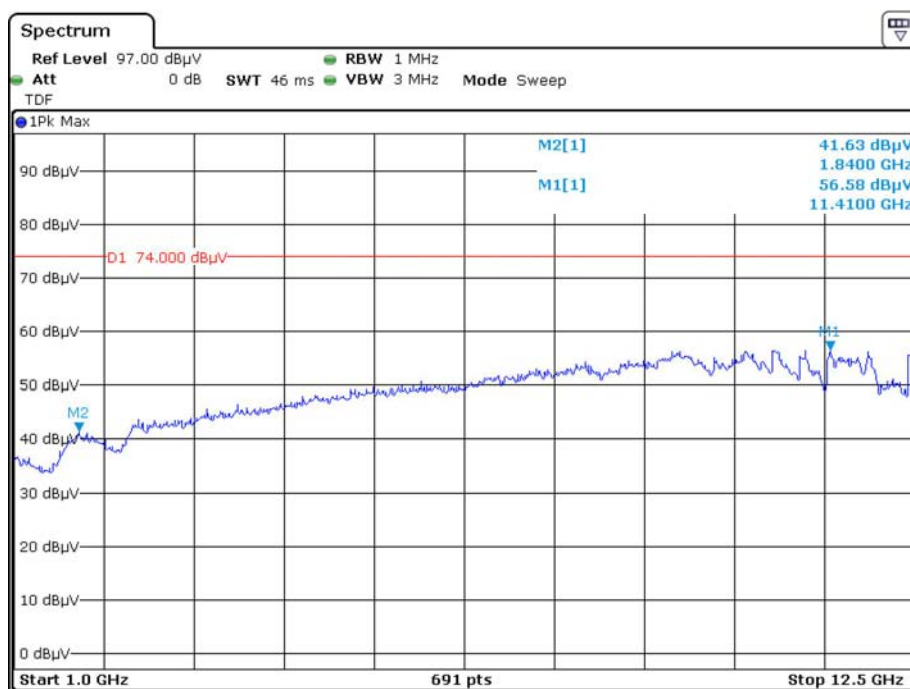
1 GHz – 12.5 GHz:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dBuV/m)	FCC Part 15B	
	Reading (dBμV)	PK/QP/Ave.		Height (m)	Polar (H / V)			Limit (dBuV/m)	Margin (dB)
1154.30	42.63	PK	123	1.4	H	-5.08	37.55	74	36.45
1154.30	30.45	Ave.	123	1.4	H	-5.08	25.37	54	28.63
1154.30	42.04	PK	61	1.7	H	-5.08	36.96	74	37.04
1154.30	29.47	Ave.	61	1.7	H	-5.08	24.39	54	29.61
1893.20	42.84	PK	60	1.5	H	-1.60	41.24	74	32.76
1893.20	29.03	Ave.	60	1.5	H	-1.60	27.43	54	26.57
1893.20	41.55	PK	188	2.1	H	-1.60	39.95	74	34.05
1893.20	29.75	Ave.	188	2.1	H	-1.60	28.15	54	25.85

Note:

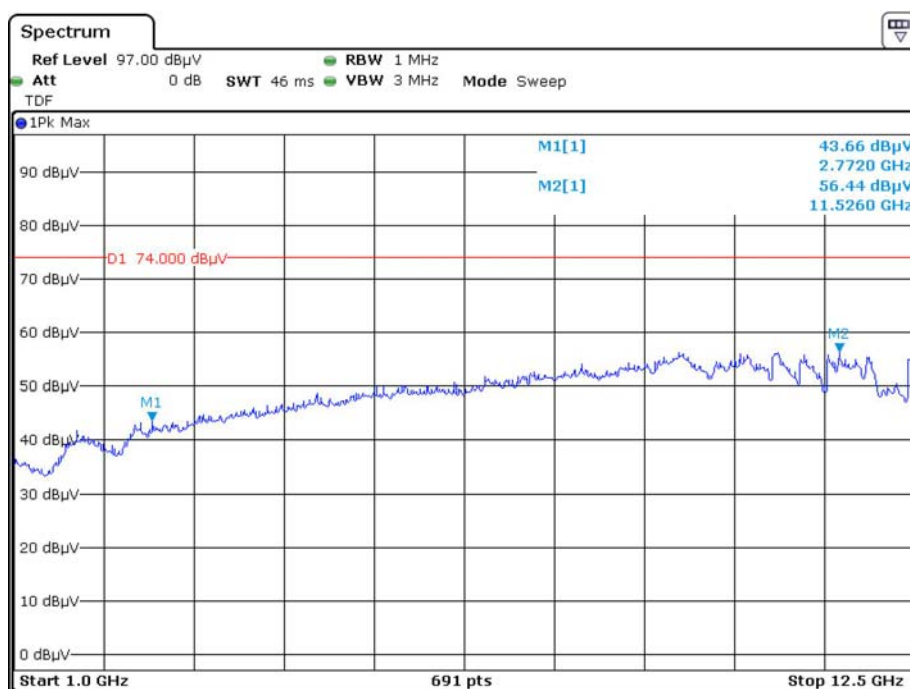
- 1) Correction Factor=Antenna factor (RX) + cable loss – amplifier factor
- 2) Corrected Amplitude = Correction Factor + Reading
- 3) Margin = Limit - Corrected Amplitude

Pre-scan for peak
Horizontal – Peak (1-12.5 GHz)



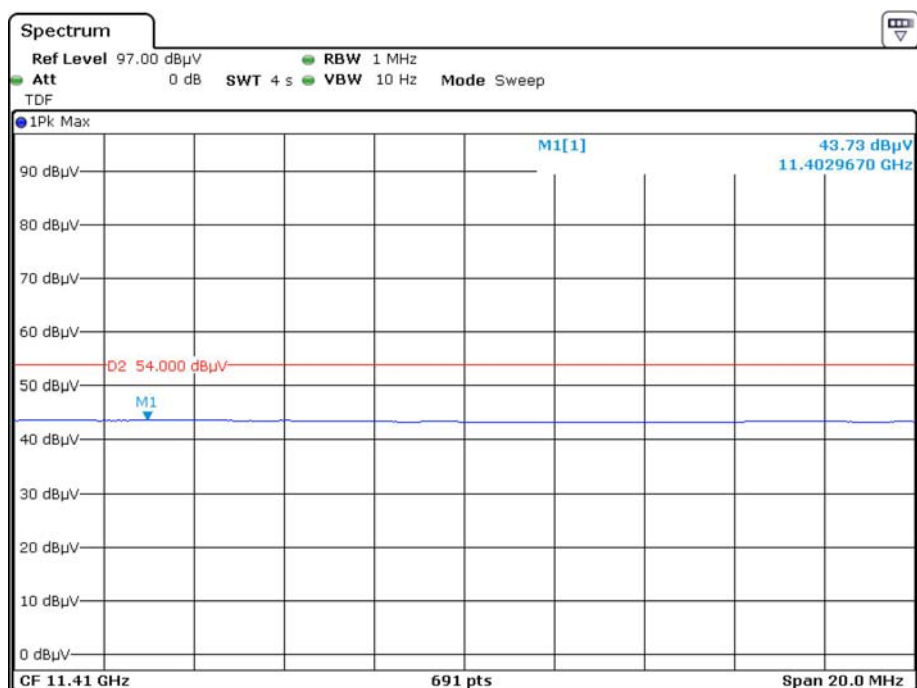
Date: 14.JUL.2019 20:10:09

Vertical - Peak (1-12.5 GHz)



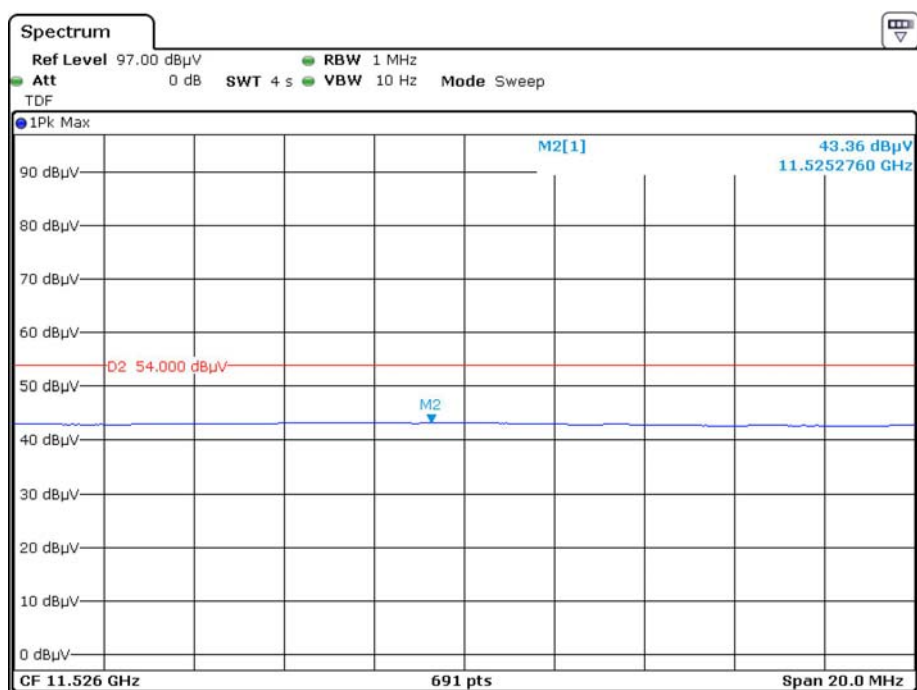
Date: 14.JUL.2019 20:12:19

Horizontal – Average



Date: 14.JUL.2019 20:10:55

Vertical - Average



Date: 14.JUL.2019 20:13:40

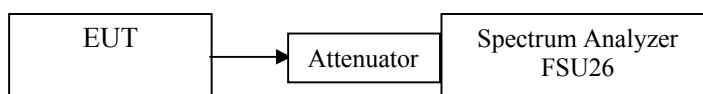
FCC §15.111 - ANTENNA POWER CONDUCTION LIMITS FOR RECEIVERS

Applicable Standard

FCC §15.111

EUT Setup

For FCC §15.111(a) Antenna power conducted emission test



Test Procedure

- 1) Connected the EUT as shown in the above block diagram.
- 2) Turn on the EUT, and set the EUT on scanning mode and receiving mode.
- 3) Wait the trace stably and use the peak function to find the maximum emission detected.
- 4) Check with the limit

Test Data

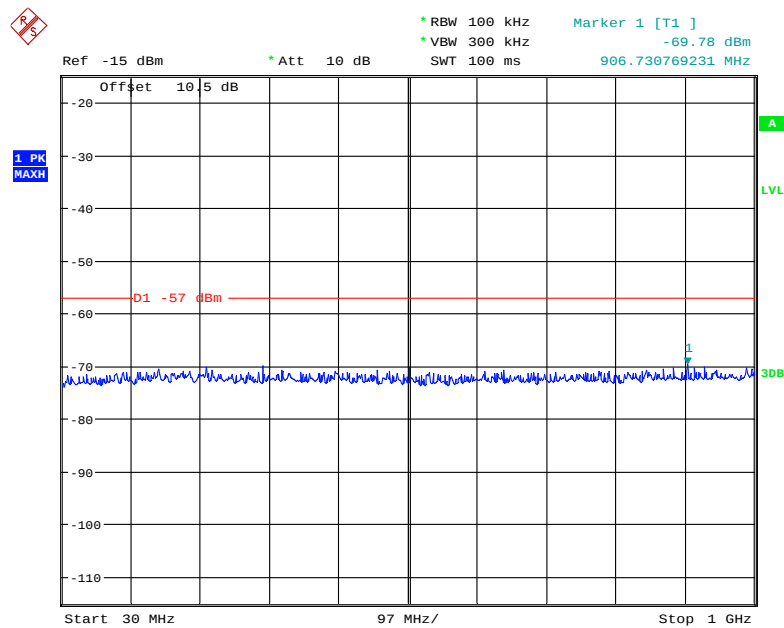
Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Kieron Luo on 2019-07-14.

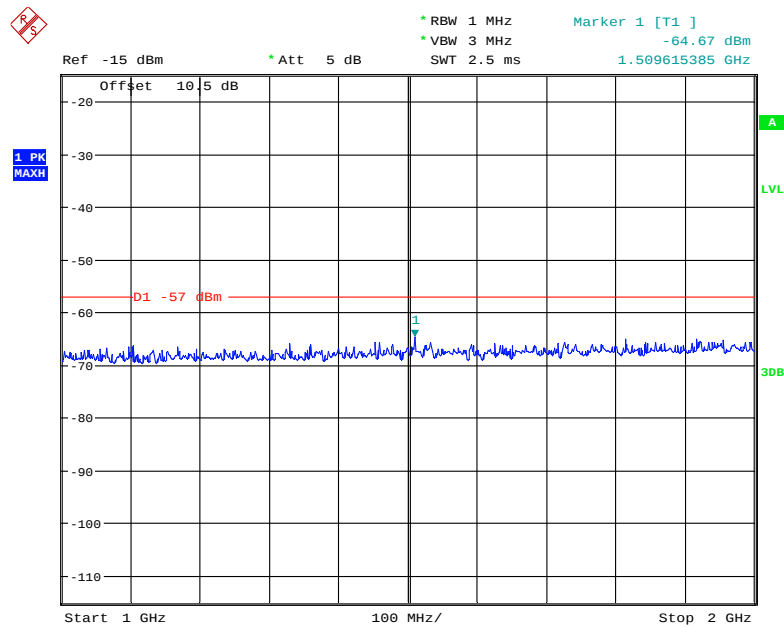
Test mode: Scanning (worst case)

30MHz~1GHz



Date: 14.JUL.2019 17:21:05

1GHz~2GHz



Date: 14.JUL.2019 17:21:27

FCC §15.121 - COMPLIANCE FOR SCANNING RECEIVER

Applicable Standard

FCC §15.121

EUT Setup

For FCC §15.121(b) Scanning Receiver Cellular Band Rejection Test



Test Procedure

- 5) Connected the EUT as shown in the above block diagram.
- 6) Apply a RF signal to the receiver input port at lowest, middle and highest channel frequencies of receiver operation band.
- 7) Adjust the audio output level of the receiver to it's rated value with the distortion less than 10%.
- 8) 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.
- 9) Select the lowest or worse-case sensitivity level for all of the bands as the reference sensitivity.
- 10) 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.
- 11) Set the receiver in a scanning mode and allow it to scan through it's preset frequencies.
- 12) 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.
- 13) 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.

Test Results Summary

Comply with FCC 121(a):

- Please refer to the technical informations or the attestation letter conforming compliance with this requirement.

Comply with FCC 121(b):

- Please refer to the following Scanning Receiver Cellular Band Rejection Test Result.

Comply with FCC 121(c):

- Not applicable.

Comply with FCC 121(d):

- Please refer to the User Manual.

Comply with FCC 121(e):

– This Scanning Receiver is not assembled from kits or marketed in kit form.

Comply with FCC 121(f):

–Please refer to the User Manual.

Test Data

For FCC §15.121(b) Scanning Receiver Cellular Band Rejection

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

The testing was performed by Kieron Luo on 2019-07-14.

EUT Operation Mode: Scanning+Receiving Mode

Scanning Receiver Cellular Band Rejection Test Data:

Frequency Band (MHz)	Test Frequencies of Cellular Band (MHz)	Spurious Value of Cellular Frequencies for 12 dB SINAD (dBm)	Reference Sensitivity for 12 dB SINAD (dBm)	Rejection Ratio (dB)	Rejection Ratio Limit (dB)
450–470	824.5, 836.0, 848.5, 869.1, 881.5, 893.5	> -42.6	-116.8	< -74.2	< -38.0

Note: Rejection Ratio = Reference Sensitivity - Spurious Value

Result

Compliance with the requirements specified in Part 15.121 for scanning receiver

******* END OF REPORT *******