FCC Test Report
FCC ID: 2BNW9-PR01

Applicant:	Shenzhen Rawpic Photoelectric Technology Co., Ltd
Address:	Room 401, Building 18, Longwangmiao Industrial Zone, Baishixia East District, Fuyong Street, Bao an District, Shenzhen City, Guangdong Province, China
Manufacturer:	Shenzhen Rawpic Photoelectric Technology Co., Ltd
Address:	Room 401, Building 18, Longwangmiao Industrial Zone, Baishixia East District, Fuyong Street, Bao an District, Shenzhen City, Guangdong Province, China
EUT:	4G Sentinel Monitoring
Trade Mark:	/
Model Number:	PR01 PR02, PR03, PR19, PR05, PR06, PR07, PR08, PR09, PR10, PR11, PR12, PR13, PR20, PR15, PR16, PR17, PR18, DC22, DC23
Date of Receipt:	May. 23, 2025
Test Date:	May. 23, 2025 - Jun. 09, 2025
Date of Report:	Jun. 09, 2025
Prepared By:	Shenzhen DL Testing Technology Co., Ltd.
Address:	101-201, Comprehensive Building, Tongzhou Electronics Longgang Factory Area, No.1 Baolong Fifth Road, Baolong Community, Baolong Street, Longgang District, Shenzhen, China
Applicable Standards:	FCC Part 2 Subpart J, Part 22 Subpart H, Part 24 Subpart E, Part 27 FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01 ANSI C63.26:2015, ANSI/TIA-603-E-2016
Test Result:	Pass
Report Number:	DLE-250523039R

Prepared (Test Engineer):	Randy Xie
Reviewer (Supervisor):	Jack Bu
Approved (Manager):	Jade Yang

This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Shenzhen DL Testing Technology Co., Ltd.

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1. TEST SUMMARY

Test Items	FCC Test Requirement	Result
Peak to Average Radio	§22.913 §24.232 §27.50	PASS
Conducted Output Power	§2.1046	PASS
99% & -26 dB Occupied Bandwidth	§2.1049	PASS
Frequency Stability	§2.1055 §22.355 §24.235 §27.54	PASS
Conducted Out of Band Emissions	§22.917 §24.238 §27.53	PASS
Band Edge	§22.917 §24.238 §27.53	PASS
Transmitter Radiated Power (EIPR/ERP)	§2.1046 §22.913 §24.232 §27.50	PASS
Radiated Out of Band Emissions	§22.917 §24.238 §27.53	PASS

2. GENERAL PRODUCT INFORMATION

2.1. Description of Device (EUT)

Product Name:	4G Sentinel Monitoring
Trademark	/
Model No.:	PR01 PR02, PR03, PR19, PR05, PR06, PR07, PR08, PR09, PR10, PR11, PR12, PR13, PR20, PR15, PR16, PR17, PR18, DC22, DC23
Test Model:	PR01
S/N:	0001
Model Difference	All models are same as the samples except model name and appearance, they have the same structure and circuit.
Operation Frequency:	LTE Band 5: Tx: 824.00 - 849.00MHz; Rx: 869.00 - 894.00MHz LTE Band 7: Tx: 2500.00 -2570.00MHz; Rx:2620.00 - 2690.00MHz
Modulation technology:	LTE Mode with QPSK,16QAM
Antenna Type:	Internal Antenna
Antenna gain:	LTE Band 5: -0.18dBi LTE Band 7:2.56dBi
Power supply:	DC 5V from USB
LTE Category	1
Hardware Version	HV01
Software Version	SV01

Note:

1.For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.The EUT's all information provided by client.

2.2. Product Function

Refer to Technical Construction Form and User Manual.

2.3. Independent Operation Modes

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

Test modes		
Band	Radiated	Conducted
LTE Band 5	Bandwidth:(MHz)1.4/3/5/10MHz Modulation: QPSK/16QAM RB:1/100%	Bandwidth:(MHz)1.4/3/5/10MHz Modulation: QPSK/16QAM RB:1/100%
LTE Band 7	Bandwidth:(MHz) 5/10/15/20MHz Modulation: QPSK/16QAM RB:1/50/100%	Bandwidth:(MHz) 5/10/15/20MHz Modulation: QPSK/16QAM RB:1/50/100%

Note1: for LTE mode, if the bandwidth is different, the test frequency is changed.

3. TEST SITES

3.1. Test Facilities

Site Description

Name of Firm : Shenzhen DL Testing Technology Co., Ltd.
101-201, Comprehensive Building, Tongzhou Electronics

Site Location : Longgang Factory Area, No.1 Baolong Fifth Road, Baolong Community, Baolong Street, Longgang District, Shenzhen, China

FCC Test Firm Registration Number: 854456
Designation Number: CN1307
IC Registered No.: 27485
CAB ID.: CN0118

3.2. 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** %。

No.	Item	Uncertainty
1	Conducted Emission Test	±1.38dB
2	RF power, conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%
8	Bandwidth	±0.2MHz
9	Frequency Stability	±0.02MHz

3.3. List of Test and Measurement Instruments

3.3.1. For conducted emission at the mains terminals test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
843 Shielded Room	YIHENG	843 Room	843	Nov. 05, 2023	Nov. 04, 2026
EMI Receiver	R&S	ESR	101421	Nov. 01, 2024	Oct. 31, 2025
LISN	R&S	ENV216	102417	Nov. 01, 2024	Oct. 31, 2025
843 Cable 1#	ChengYu	CE Cable	001	Nov. 01, 2024	Oct. 31, 2025
843 Cable 1#	FUJIKURA	843C1#	001	Nov. 01, 2024	Oct. 31, 2025

3.3.2. For radiated test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Spectrum Analyzer (9kHz-26.5GHz)	Agilent	E4408B	MY50140780	Nov. 01, 2024	Oct. 31, 2025
Test Receiver(9kHz-7GHz)	R&S	ESRP7	101393	Nov. 01, 2024	Oct. 31, 2025
Bilog Antenna (30MHz-1GHz)	R&S	VULB9162	00311	Nov. 01, 2024	Oct. 31, 2025
Bilog Antenna (30MHz-1GHz)	R&S	VULB9162	00306	Nov. 01, 2024	Oct. 31, 2025
Horn Antenna(1GHz-18GHz)	Schwarzbeck	BBHA9120D	02139	Nov. 01, 2024	Oct. 31, 2025
Horn Antenna(1GHz-18GHz)	Schwarzbeck	BBHA9120D	02133	Nov. 01, 2024	Oct. 31, 2025
Horn Antenna(18GHz-40GHz)	A.H. Systems	SAS-574	588	Nov. 01, 2024	Oct. 31, 2025
Horn Antenna(18GHz-40GHz)	A.H. Systems	SAS-574	585	Nov. 01, 2024	Oct. 31, 2025
Amplifier(9KHz-6GHz)	Schwarzbeck	BBV9743B	00153	Nov. 01, 2024	Oct. 31, 2025
Amplifier(1GHz-18GHz)	EMEC	EM01G8GA	00270	Nov. 01, 2024	Oct. 31, 2025
Amplifier(18GHz-40GHz)	Quanjuda	DLE-161	97	Nov. 01, 2024	Oct. 31, 2025
Loop Antenna(9KHz-30MHz)	Schwarzbeck	FMZB1519B	00014	Nov. 01, 2024	Oct. 31, 2025
RF cables1(9kHz-1GHz)	ChengYu	966	004	Nov. 01, 2024	Oct. 31, 2025
RF cables2(1GHz-40GHz)	ChengYu	966	003	Nov. 01, 2024	Oct. 31, 2025
Antenna connector	Florida RF Labs	N/A	RF 01#	Nov. 01, 2024	Oct. 31, 2025
Power probe	KEYSIGHT	U2021XA	MY55210018	Nov. 01, 2024	Oct. 31, 2025
Signal Analyzer	Agilent	N9020A	MY55370280	Nov. 01, 2024	Oct. 31, 2025
Test Receiver	R&S	ESU 40	100376	Nov. 01, 2024	Oct. 31, 2025
D.C. Power Supply	LongWei	PS-305D	010964729	Nov. 01, 2024	Oct. 31, 2025
Signal Amplifier	DAZE	ZN3380B	11235	Nov. 01, 2024	Oct. 31, 2025
High Pass filter	KANGMAI	WHKX1.0/1.5G-10SS	40	Nov. 01, 2024	Oct. 31, 2025
Filter	COM-MW	ZBSF-C836.5-25-X	BCTC042	Nov. 01, 2024	Oct. 31, 2025
Filter	COM-MW	ZBSF-C1747.5-75-X2	BCTC045	Nov. 01, 2024	Oct. 31, 2025
Filter	COM-MW	ZBSF-C1880-60-X2	BCTC047	Nov. 01, 2024	Oct. 31, 2025
Splitter	Agilent	11435B	1125162	Nov. 01, 2024	Oct. 31, 2025
RF CONDUCTED TEST					
System Simulator	Agilent	E5515C	GB43130252	Nov. 01, 2024	Oct. 31, 2025
Spectrum Analyzer	Agilent	N9020A	MY45108040	Nov. 01, 2024	Oct. 31, 2025
DC Power Supply	LongWei	PS-305D	010965682	Nov. 01, 2024	Oct. 31, 2025
Constant temperature and humidity box	GF	GTH-800-40-2P	MAA9906-012	Nov. 01, 2024	Oct. 31, 2025
Universal radio communication tester	R&S	CMW500	115295	Nov. 01, 2024	Oct. 31, 2025

4. TEST SET-UP

4.1. Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

4.2. Block Diagram of Test Set-up

System Diagram of Connections between EUT and Simulators

4.3. Test Environment:

Ambient conditions in the test laboratory:

Items	Actual
Temperature (℃)	21~23
Humidity (%RH)	50~65

5. EMISSION TEST RESULTS

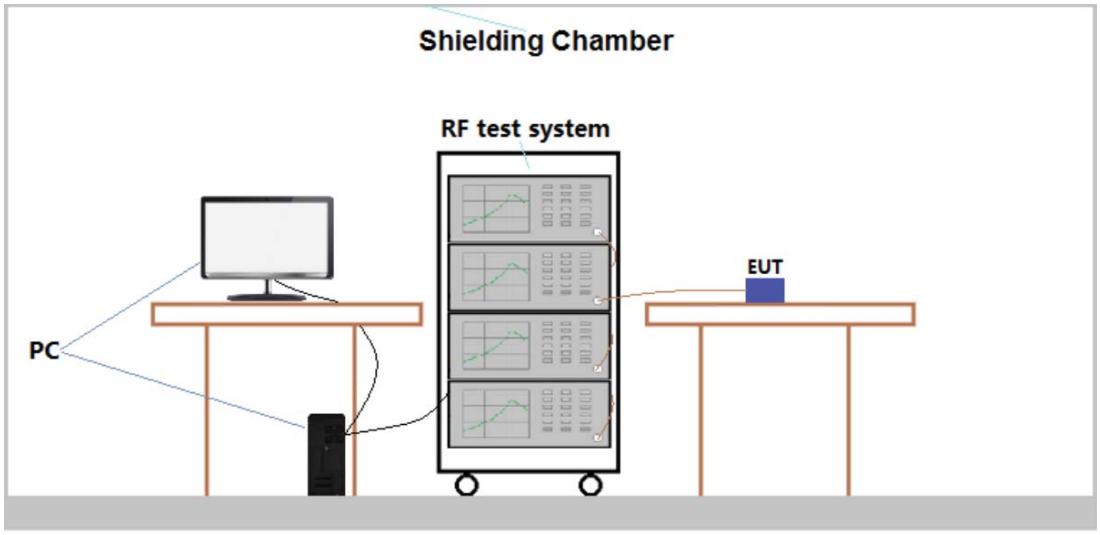
5.1. Conducted RF Output Power

5.1.1. Limit

CFR 47, Section FCC §2.1046 and IC RSS-Gen Issue 5 6.12.

5.1.2. Test Setup

The EUT, which is powered by the adapter, is coupled to the CMW500 and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power.



5.1.3. Test Result

Here the lowest, middle and highest channels are selected to perform testing to verify the conducted RF output power of the EUT.

The conducted power tables are as follows:

Average Conducted Power						
Band	LTE Band 5			Channel/Frequency (MHz)		
Bandwidth	Modulation	RB size	RB offset	20407/824.7	20525/836.5	20643/848.3
1.4MHz	QPSK	1	0.00	22.80	22.78	22.81
		1	3.00	22.64	21.96	22.67
		1	5.00	22.42	22.49	22.54
		3	0.00	22.46	22.67	22.46
		3	2.00	22.56	22.22	22.51
		3	3.00	22.65	22.63	22.58
		6	0.00	22.13	22.12	22.42
	16QAM	1	0.00	22.22	22.42	21.99
		1	2.00	22.62	22.46	22.34
		1	5.00	22.48	22.28	22.62
		3	0.00	22.67	22.50	22.31
		3	1.00	22.59	22.65	22.58
		3	3.00	22.60	22.55	22.67
		6	0.00	21.93	22.49	22.50
Bandwidth	Modulation	RB size	RB offset	20415/825.5	20525/836.5	20635/847.5
3MHz	QPSK	1	0.00	22.42	22.50	22.66
		1	7.00	22.42	22.34	22.16
		1	14.00	22.05	22.47	22.40
		8	0.00	22.04	22.30	21.92
		8	4.00	22.42	22.25	22.43
		8	7.00	22.11	22.41	22.38
		15	0.00	22.45	22.42	22.75
	16QAM	1	0.00	22.63	22.64	22.18
		1	8.00	22.10	22.01	22.26
		1	14.00	21.99	22.63	22.73
		8	0.00	22.63	22.14	22.62
		8	4.00	22.31	22.67	22.42
		8	7.00	22.14	22.58	22.59
		15	0.00	22.49	22.49	22.35
Bandwidth	Modulation	RB size	RB offset	20425/826.5	20525/836.5	20625/846.5
5MHz	QPSK	1	0.00	22.52	22.56	22.61
		1	12.00	22.21	22.31	22.04
		1	24.00	22.59	22.53	22.67
		12	0.00	22.47	21.92	22.27
		12	6.00	22.04	21.94	22.14
		12	13.00	22.38	22.68	22.40
		25	0.00	22.18	22.68	22.01
	16QAM	1	0.00	22.53	22.59	22.09
		1	12.00	21.96	22.28	22.31
		1	24.00	22.54	22.47	22.05
		12	0.00	22.47	22.61	22.10
		12	6.00	22.30	22.73	22.24
		12	13.00	22.53	22.50	22.00
		25	0.00	22.27	22.62	22.14

Average Conducted Power						
Band	LTE Band 5			Channel/Frequency (MHz)		
Bandwidth	Modulation	RB size	RB offset	20450/829	20525/836.5	20600/844
10MHz	QPSK	1	0.00	22.51	22.61	22.58
		1	24.00	22.22	22.34	22.42
		1	49.00	22.02	22.29	22.52
		25	0.00	22.21	22.14	22.10
		25	12.00	22.38	21.92	22.56
		25	25.00	22.51	22.53	22.10
		50	0.00	22.05	22.13	22.30
	16QAM	1	0.00	21.94	22.09	22.60
		1	24.00	22.62	22.55	22.59
		1	49.00	22.04	22.30	22.39

Note: Measurement Uncertainty: ±2.6 dB.

Average Conducted Power(dBm)						
Band	LTE Band 7			Channel/Frequency (MHz)		
Bandwidth	Modulation	RB size	RB offset	20775/2502.5	21100/2535.0	21425/2567.5
5MHz	QPSK	1	0	22.68	22.84	22.74
		1	12	22.32	22.37	22.23
		1	24	22.44	22.44	22.47
		12	0	22.50	21.41	21.56
		12	6	22.61	21.46	21.57
		12	13	22.53	21.46	21.54
		25	0	22.53	21.43	21.56
	16QAM	1	0	22.54	22.46	21.72
		1	12	21.90	21.83	22.02
		1	24	22.49	22.46	21.74
		12	0	22.55	22.50	22.52
		12	6	22.68	22.54	21.59
		12	13	22.59	22.53	21.55
		25	0	22.53	22.43	21.58
Bandwidth	Modulation	RB size	RB offset	20800/2505.0	21100/2535.0	21400/2565.0
10MHz	QPSK	1	0	22.61	22.59	22.49
		1	24	22.69	22.59	22.60
		1	49	22.55	22.44	22.50
		25	0	21.48	21.51	21.62
		25	12	21.54	21.48	21.56
		25	25	21.58	21.51	21.56
		50	0	21.46	21.48	21.57
	16QAM	1	0	21.78	21.56	21.46
		1	24	21.86	21.67	21.62
		1	49	21.70	21.56	21.55

Average Conducted Power(dBm)						
Band	LTE Band 7			Channel/Frequency (MHz)		
Bandwidth	Modulation	RB size	RB offset	20825/2507.5	21100/2535.0	21375/2562.5
15MHz	QPSK	1	0	22.62	22.51	22.39
		1	38	21.89	21.78	22.11
		1	74	22.46	22.35	22.44
		38	0	21.61	21.70	21.72
		38	18	21.64	21.63	21.64
		38	37	21.58	21.61	21.59
		75	0	21.62	21.68	21.64
	16QAM	1	0	21.48	21.49	21.35
		1	38	21.71	21.78	21.87
		1	74	21.27	21.47	21.42
Bandwidth	Modulation	RB size	RB offset	20850/2510.0	21100/2535.0	21350/2560.0
20MHz	QPSK	1	0	22.37	22.33	22.25
		1	49	21.68	21.63	21.61
		1	99	22.25	22.21	22.29
		50	0	21.40	21.52	21.55
		50	25	21.50	21.49	21.51
		50	50	21.34	21.54	21.36
		100	0	21.39	21.52	21.45
	16QAM	1	0	21.46	21.17	21.27
		1	49	21.73	21.55	21.58
		1	99	21.18	21.18	21.28

Note: Measurement Uncertainty: ±2.6 dB.

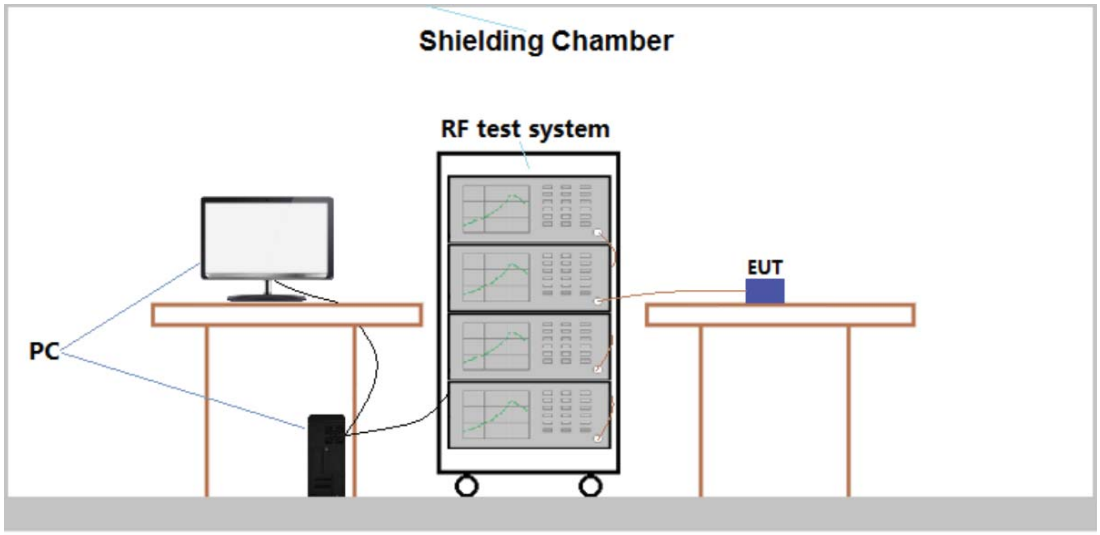
5.2. -26dB and 99% Occupied Bandwidth

5.2.1. Limit

CFR 47, Section FCC §2.1049 and IC RSS-Gen Issue 5 6.7.

5.2.2. Test Setup

The EUT, which is powered by the adapter, is coupled to the Spectrum Analyzer (SA) and the System Simulator (SS) with Attenuators through the Power Splitter; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. The EUT is commanded by the SS to operate at the maximum output power.



5.2.3. Test Result

Pass, the table and plot please see annex.

5.3. Peak to Average Radio

5.3.1. Limit

FCC

-§22.913(d) Measurement of the ERP of Cellular base transmitters and repeaters must be made using an average power measurement technique. The peak-to-average ratio (PAR) of the transmission must not exceed 13 dB.

-§24.232(d), power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

- §27.50(d)(5), power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (d)(6) of this section. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

IC

- RSS-130 Issue 2

4.6.1, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1 %of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

-RSS-132 Issue 4

5.4, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1 %of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

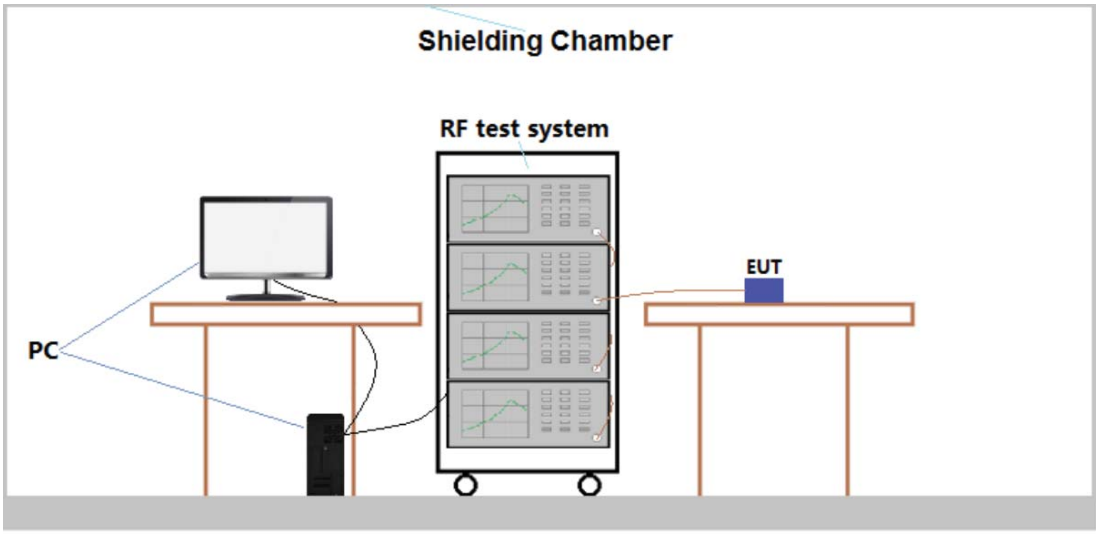
-RSS-133 Issue 7

6.4, the transmitter's peak-to-average power ratio (PAPR) shall not exceed 13 dB for more than 0.1 % of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

-RSS-139 Issue 4

5.5, the peak to average power ratio (PAPR) of the equipment shall not exceed 13 dB for more than 0.1 % of the time, using a signal that corresponds to the highest PAPR during periods of continuous transmission.

5.3.2. Test Setup



5.3.3. Test Procedure

The test follows section 5.2.3.4 of ANSI C63.26-2015.
See instrumentation-specific application literature for further guidance regarding use of the CCDF capability.
The following guidelines are offered for performing a CCDF measurement.
a. Set resolution/measurement bandwidth ≥ OBW or specified reference bandwidth.
b. Set the number of counts to a value that stabilizes the measured CCDF curve.
c. Set the measurement interval as follows:
1) For continuous transmissions, set to greater of [10 x (number of points in sweep) x (transmission symbol period)] or 1 ms.
2) For burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize. Set the measurement interval to a time that is less than or equal to the burst duration.
3) If there are several carriers in a single antenna port, the peak power shall be determined for each individual carrier (by disabling the other carriers while measuring the required carrier) and the total peak power calculated from the sum of the individual carrier peak powers.
d. Record the maximum PAPR level associated with a probability of 0.1 %.
e. The peak power level is calculated form the sum of the PAPR value from step d) to the measured average power.

5.3.4. Test Result

Pass, the table and plot please see annex.

5.4. Frequency Stability

5.4.1. Limit

FCC

-§ 2.1055 (a), § 2.1055 (d) & following:

-§22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table of this section.

For Mobile devices operating in the 824 to 849 MHz band at a power level less than or equal to 3 Watts, the limit specified in Table C-1 is +/- 2.5 ppm.

-§24.235, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

-§27.54, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

For Mobile devices operating in the 809 to 824 MHz band at a power level 2 Watts or less, the limit specified in Table is +/- 2.5 ppm.

IC

- RSS-Gen Issue 5

6.11, for licensed devices, the following measurement conditions apply:

a. at the temperatures of -30°C (-22°F), +20°C (+68°F) and +50°C (+122°F), and at the manufacturer's rated supply voltage

- RSS-130 Issue 2

4.5, the transmitter frequency stability limit shall be determined as follows:

For equipment that is capable of transmitting numerous channels simultaneously for different applications (e.g. LTE and narrowband – internet of things (IoT)), the occupied bandwidth shall be the bandwidth representing the sum of the occupied bandwidths of these channels.

The frequency stability shall be sufficient to ensure that the occupied bandwidth remains within each frequency block range when tested at the temperature and supply voltage variations specified in RSS-Gen.

-RSS-132 Issue 4

5.3, the frequency stability shall be sufficient to ensure that the occupied bandwidth stays within each of the sub-bands when tested at the temperature and supply voltage variations specified in RSS-Gen.

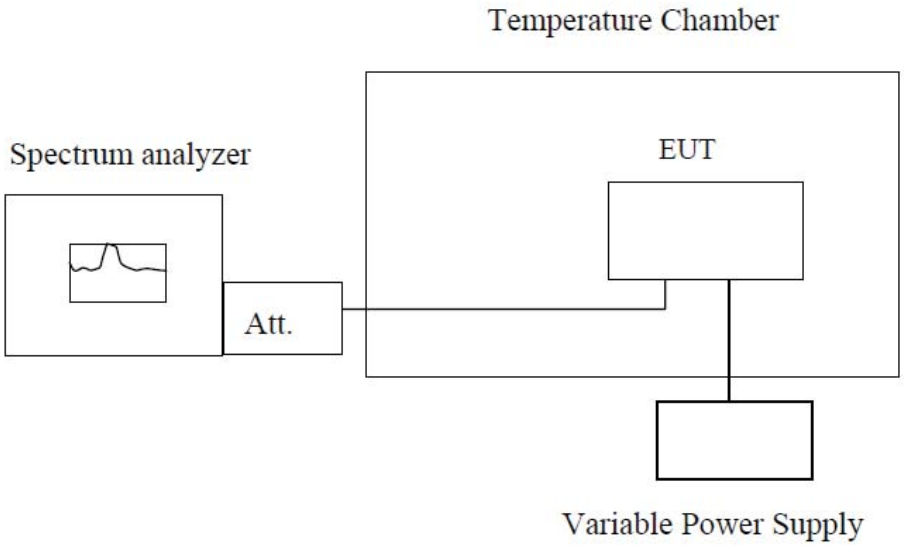
-RSS-133 Issue 7

6.3, the carrier frequency shall not depart from the reference frequency, in excess of ±2.5 ppm for mobile stations and ±1.0 ppm for base stations.

-RSS-139 Issue 4

5.4, the frequency stability shall be sufficient to ensure that the occupied bandwidth stays within the operating frequency block or frequency block group when tested to the temperature and supply voltage variations specified in RSS-Gen.

5.4.2. Test Setup



Note : Measurement setup for testing on Antenna connector

The EUT, which is powered by the DC Power Supply directly, is located in the Temperature Chamber.

The EUT is commanded by the System Simulator (SS) to operate at the maximum output power

5.4.3. Test Result

Tested the result of ± 10% of normal voltage

which are specified by the applicant; the normal temperature here used is 25℃. The frequency

deviation limit of 850MHz band is ±2.5ppm.

For LTE mode, only test the max bandwidth.

The table and plot please see next page.

Test Conditions			Frequency Deviation			Result
Band	Power(Vdc)	Temperature(℃)	Frequency Error(Hz)	ppm	Limit ppm	
LTE Band 5 Bandwidth 10MHz QPSK Middle channel 836.5MHz	3.7	-40	72	0.0861	±2.5	PASS
	3.7	-30	83	0.0992		
	3.7	-20	44	0.0526		
	3.7	-10	77	0.0921		
	3.7	0	22	0.0263		
	3.7	10	48	0.0574		
	3.7	20	72	0.0861		
	3.7	30	64	0.0765		
	3.7	40	79	0.0944		
	3.7	50	52	0.0622		
	3.7	60	78	0.0932		
	3.7	70	52	0.0622		
	3.7	80	63	0.0753		
	4.10	25	78	0.0932		
	3.7	25	52	0.0622		
	3.33	25	99	0.1172		
LTE Band 5 Bandwidth 10MHz 16QAM Middle channel 836.5MHz	3.7	-40	77	0.0921	±2.5	PASS
	3.7	-30	67	0.0801		
	3.7	-20	59	0.0705		
	3.7	-10	62	0.0741		
	3.7	0	54	0.0646		
	3.7	10	67	0.0801		
	3.7	20	63	0.0753		
	3.7	30	58	0.0693		
	3.7	40	63	0.0753		
	3.7	50	78	0.0932		
	3.7	60	52	0.0622		
	3.7	70	73	0.0873		
	3.7	80	66	0.0789		
	4.10	25	56	0.0669		
	3.7	25	82	0.0980		
	3.33	25	98	0.1184		

Note: Measurement Uncertainty: ±20Hz.

Test Conditions			Frequency Deviation			Result
Band	Power(Vdc)	Temperature(℃)	Frequency Error(Hz)	ppm	Limit	
LTE Band 7 Bandwidth 20MHz QPSK Middle channel 2535.0MHz	3.7	-40	78	0.0308	±2.5	PASS
	3.7	-30	97	0.0383		
	3.7	-20	67	0.0264		
	3.7	-10	76	0.0300		
	3.7	0	34	0.0134		
	3.7	10	35	0.0138		
	3.7	20	86	0.0339		
	3.7	30	43	0.0170		
	3.7	40	78	0.0308		
	3.7	50	78	0.0308		
	3.7	60	43	0.0170		
	3.7	70	78	0.0308		
	3.7	80	65	0.0256		
	4.25	25	112	0.0442		
	3.7	25	68	0.0268		
	3.34	25	65	0.0256		
LTE Band 7 Bandwidth 20MHz 16QAM Middle channel 2535.0MHz	3.7	-40	64	0.0252	±2.5	PASS
	3.7	-30	45	0.0178		
	3.7	-20	78	0.0308		
	3.7	-10	32	0.0126		
	3.7	0	76	0.0300		
	3.7	10	86	0.0339		
	3.7	20	43	0.0170		
	3.7	30	78	0.0308		
	3.7	40	67	0.0264		
	3.7	50	53	0.0209		
	3.7	60	75	0.0296		
	3.7	70	54	0.0213		
	3.7	80	75	0.0296		
	4.25	25	123	0.0485		
	3.7	25	67	0.0264		
	3.34	25	78	0.0308		

Note: Measurement Uncertainty: ±20Hz.

5.5. Conducted Spurious Emissions

5.5.1. Limit

FCC

-§22.917(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10log(P) dB.

-§24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

-§27.53(c)(2), on any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB.

-§27.53(g), the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB.

-§27.53(h)(1), for operations in the 1 695-1 710 MHz, 1 710-1 755 MHz, 1 755-1 780 MHz, 1 915-1 920 MHz, 1 995-2 000 MHz, 2 000-2 020 MHz, 2 110-2 155 MHz, 2 155-2 180 MHz, and 2 180-2 200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.

-§27.53(m)(4), for mobile digital stations, the attenuation factor shall be not less than 40 + 10 log10 (P) dBon all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log10 (P) dBon all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log10 (P) dBon all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log10 (P) dB on all frequencies between 2 490.5 MHz and 2 496 MHz and 55 + 10 log10 (P) dB at or below 2 490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2 495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

IC

- RSS-130 Issue 2

4.7.1, the unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dB W), by at least 43 + 10 log10 p (watts), dB. However, in the 100 kHz band immediately outside of the equipment’s frequency block range, a resolution bandwidth of 30 kHz may be employed.

4.7.2, In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

a) The power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHzand 793-806 MHz shall be attenuated below the transmitter power, P (dB W), by at least:

(i) 76 + 10 log10 p (watts), dB, for base and fixed equipment, and

(ii) 65 + 10 log10 p (watts), dB, for mobile and portable equipment.

b) The e.i.r.p. in the band 1 559-1 610 MHz shall not exceed -70 dB W/MHz for wideband signal and -80 dB W for discrete emission with bandwidth less than 700 Hz.

- RSS-132 Issue 4

5.5, Equipment shall meet the unwanted emission limits specified below.

(i) In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1 % of the occupied bandwidth shall be attenuated below the transmitter output power P (dB W) by at least 43 + 10 log(p) dB.

(ii) After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated below the transmitter output power P (dB W) by at least 43 + 10 log(p) dB. If the measurement is performed using 1 % of the occupied bandwidth, power integration over 100 kHz is required.

- RSS-133 Issue 7

6.5, Equipment shall comply with the limits in (i) and (ii) below.

(i) In the 1.0 MHz bands immediately outside and adjacent to the equipment’s operating frequency block, the emission power per any 1 % of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dB W) by at least 43 + 10 log10 p(watts).

(ii) After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dB W) by at least 43 + 10 log10 p(watts). If the measurement is performed using 1 % of the emission bandwidth, power integration over 1.0 MHz is required.

- RSS-139 Issue 4

5.6, Unwanted emissions shall be measured in terms of average values.
For all equipment, the TRP or total conducted power (sum of conducted power across all antenna connectors) of the unwanted emissions outside the frequency block or frequency block group shall not exceed the limits shown in table 6.

Table 6: Unwanted emission limits

Offset from the edge of the frequency block or frequency block group	Unwanted emission limit
≤1 MHz	-13 dB m/(1% of OB)*
>1 MHz	-13 dB m

* OB is the occupied bandwidth

Table 4: Unwanted emission limits for fixed station, base station and fixed subscriber equipment

Offset from the edge of the frequency block or frequency block group (MHz)	Unwanted emission limit
≤1	-13 dB m/(1% of OB*)
>1	-13 dB m/MHz

* OB is the occupied bandwidth

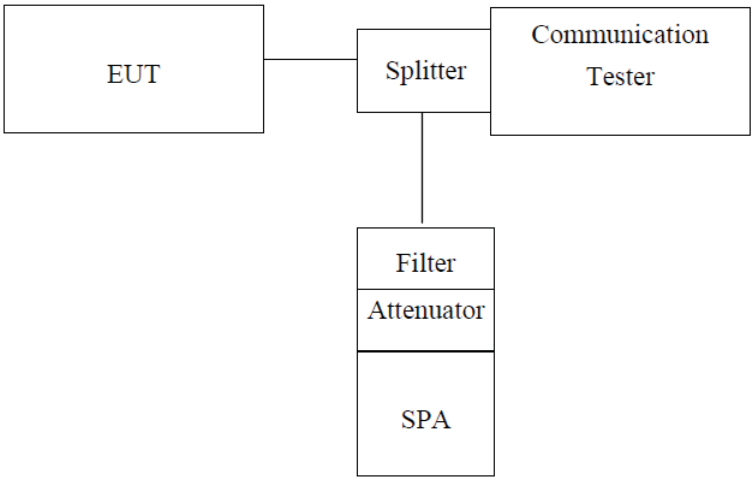
Table 5: Unwanted emission limits for subscriber equipment other than fixed subscriber equipment

Offset from the edge of the frequency block or frequency block group (MHz)	Unwanted emission limit
0-1	-10 dB m/(2% of OB*)
1-5	-10 dB m/MHz
5-X**	-13 dB m/MHz
≥X	-25 dB m/MHz

* OB is the occupied bandwidth
** X is 6 MHz or the equipment occupied bandwidth, whichever is greater

In addition to complying with the limits in table 5, subscriber equipment other than fixed subscriber equipment shall not exceed -13 dBm/MHz on all frequencies between 2 490.5 MHz and 2 496 MHz,and -25 dBm/MHzat or below 2 490.5 MHz.

5.5.2. Test Setup



Note: *Measurement setup for testing on Antenna connector*

5.5.3. Measurement Procedure

The test follows section 5.7 of ANSI C63.26-2015.

1. Start frequency was set to 9 kHz and stop frequency was set to at least 10* the fundamental frequency.

2. Detector = RMS.

3. Trace mode = Max hold.

4. Sweep time = Auto couple.

5. The trace was allowed to stabilize.

6. Please see notes below for RBW and VBW settings.

7. For plots showing conducted spurious emissions from 9 kHz to 26 ㎓, all path loss of wide frequency range was investigated and compensated to spectrum analyzer as TDF function.

5.5.4. Test Result

The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the out of band emissions.

For LTE mode, the plot only show the min and max bandwidth's data.

Pass, the table and plot please see annex.

5.6. Conducted Out of Band Emissions

5.6.1. Limit

FCC

-§22.917(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10log(P) dB.

-§24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

-§27.53(c)(2), on any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB.

-§27.53(c)(4), on all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log(P) dB in a 6.25 kHz band segment, for mobile and portable stations;

-§27.53 (f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and −80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

-§27.53(g), the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB.

-§27.53(h)(1), for operations in the 1 695-1 710 MHz, 1 710-1 755 MHz, 1 755-1 780 MHz, 1 915-1 920 MHz, 1 995-2 000 MHz, 2 000-2 020 MHz, 2 110-2 155 MHz, 2 155-2 180 MHz, and 2 180-2 200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.

-§27.53(m)(4), for mobile digital stations, the attenuation factor shall be not less than 40 + 10 log10 (P) dBon all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log10 (P) dBon all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log10 (P) dBon all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log10 (P) dB on all frequencies between 2 490.5 MHz and 2 496 MHz and 55 + 10 log10 (P) dB at or below 2 490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2 495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

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- RSS-130 Issue 2

4.7.1, the unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dB W), by at least 43 + 10 log10 p (watts), dB. However, in the 100 kHz band immediately outside of the equipment’s frequency block range, a resolution bandwidth of 30 kHz may be employed.

4.7.2, In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

a) The power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHzand 793-806 MHz shall be attenuated below the transmitter power, P (dB W), by at least:

(i) 76 + 10 log10 p (watts), dB, for base and fixed equipment, and

(ii) 65 + 10 log10 p (watts), dB, for mobile and portable equipment.

) The e.i.r.p. in the band 1 559-1 610 MHz shall not exceed -70 dB W/MHz for wideband signal and -80 dB W for discrete emission with bandwidth less than 700 Hz.

- RSS-132 Issue 4

5.5, Equipment shall meet the unwanted emission limits specified below.

(i) In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1 % of the occupied bandwidth shall be attenuated below the transmitter output power P (dB W) by at least 43 + 10 log(p) dB.

(ii) After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated below the transmitter output power P (dB W) by at least

43 + 10 log(p) dB. If the measurement is performed using 1 % of the occupied bandwidth, power integration over 100 kHz is required.

- RSS-133 Issue 7

6.5, Equipment shall comply with the limits in (i) and (ii) below.

(i) In the 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1 % of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dB W) by at least 43 + 10 log10 p(watts).
(ii) After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dB W) by at least 43 + 10 log10 p(watts). If the measurement is performed using 1 % of the emission bandwidth, power integration over 1.0 MHz is required.

- RSS-139 Issue 4

5.6, Unwanted emissions shall be measured in terms of average values.
For all equipment, the TRP or total conducted power (sum of conducted power across all antenna connectors) of the unwanted emissions outside the frequency block or frequency block group shall not exceed the limits shown in table 6.

Offset from the edge of the frequency block or frequency block group	Unwanted emission limits
≤1 MHz	-13 dBm/(1% of OB*)
>1 MHz	-13 dBm/MHz

*OB is the occupied bandwidth.

Table 4: Unwanted emission limits for fixed station, base station and fixed subscriber equipment

Offset from the edge of the frequency block or frequency block group (MHz)	Unwanted emission limit
≤1	-13 dB m/(1% of OB*)
>1	-13 dB m/MHz

* OB is the occupied bandwidth

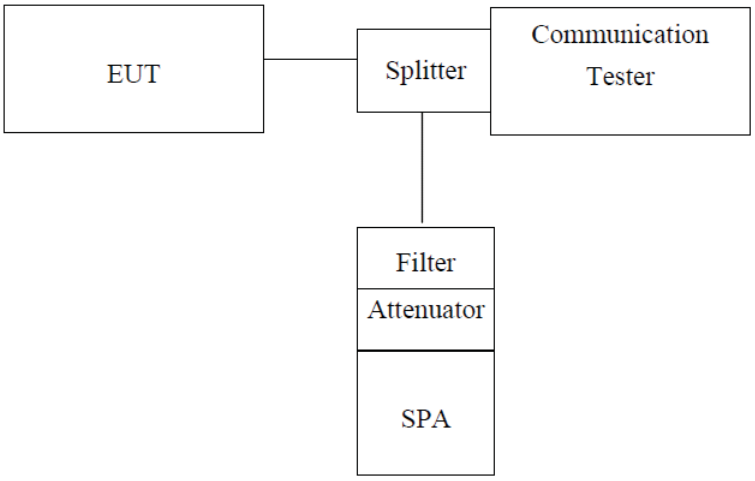
Table 5: Unwanted emission limits for subscriber equipment other than fixed subscriber equipment

Offset from the edge of the frequency block or frequency block group (MHz)	Unwanted emission limit
0-1	-10 dB m/(2% of OB*)
1-5	-10 dB m/MHz
5-X**	-13 dB m/MHz
≥X	-25 dB m/MHz

* OB is the occupied bandwidth
** X is 6 MHz or the equipment occupied bandwidth, whichever is greater

In addition to complying with the limits in table 5, subscriber equipment other than fixed subscriber equipment shall not exceed -13 dBm/MHz on all frequencies between 2 490.5 MHz and 2 496 MHz,and -25 dBm/MHzat or below 2 490.5 MHz.

5.6.2. Test Setup



Note: *Measurement setup for testing on Antenna connector*

5.6.3. Measurement Procedure

The test follows section 5.7 of ANSI C63.26-2015.

a. Span was set large enough so as to capture all out of band emissions near the band edge.
b. RBW ≥ 1 % of OBW
c. VBW ≥ 3 x RBW.
d. Detector = RMS.
e. Trace mode = Average.
f. Sweep time = Auto.
g. The trace was allowed to stabilize.
h. All path loss of frequency range was investigated and compensated to spectrum analyzer as TDF function.

5.6.4. Test Result

The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the out of band emissions.

Pass, the table and plot please see annex.

5.7. Transmitter Power (EIRP/ERP)

5.7.1. Limit

FCC

-§22.913(a)(5), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

-§24.232(c), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

-§27.50(b)(9), control stations and mobile stations transmitting in the 746-757 MHz, 776-788 MHz, and 805–806 MHz bands and fixed stations transmitting in the 787-788 MHz and 805-806 MHz bands are limited to 30 watts ERP.

-§27.50(c)(9), control and mobile stations in the 698–746 MHz band are limited to 30 watts ERP.

-§27.50(c)(10), portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

-§27.50(d)(4), fixed, mobile, and portable (hand-held) stations operating in the 1 710-1 755 MHz band and mobile and portable stations operating in the 1 695-1 710 MHz and 1 755-1 780 MHz bands are limited to 1 watt EIRP.

-§27.50(h)(2), Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

IC

- RSS-130 Issue 2

4.6.3, the e.r.p. shall not exceed 30 watts for mobile equipment and outdoor fixed subscriber equipment. The e.r.p. shall not exceed 3 watts for portable equipment and indoor fixed subscriber equipment.

For base and fixed equipment other than fixed subscriber equipment, refer to SRSP-518 for the e.i.r.p. limits.

-RSS-132 Issue 4

5.4, the transmitter output power shall be measured in terms of average power. The equivalent radiated power (e.r.p.) shall not exceed 7 watts for mobile equipment and 3 watts for portable equipment.

The effective isotropic radiated power (e.i.r.p.) shall not exceed the limits specified in SRSP-503 for base station equipment.

-RSS-133 Issue 7

6.4, the equivalent isotropically radiated power (e.i.r.p.) for transmitters shall not exceed the limits given in SRSP-510. Mobile stations and hand-held portables are limited to 2 watts maximum e.i.r.p. The equipment shall employ means to limit the power to the minimum necessary for successful communication.

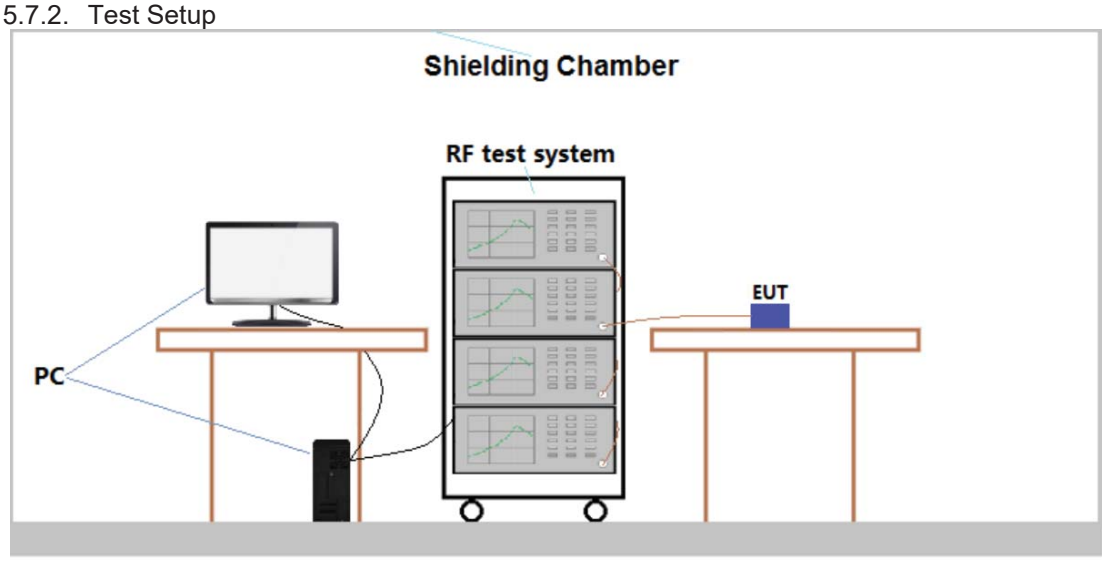
-RSS-139 Issue 4

5.5, The maximum output power of the equipment shall comply with the limits specified below. In the tables, maximum power refers to the equivalent isotropically radiated power (e.i.r.p.) or total radiated power (TRP), measured in terms of average values.

Table 3: Maximum power of equipment in the band 1 710-1 780 MHz

Equipment type	Maximum power
Fixed station and base station	30 dB m e.i.r.p./ channel bandwidth
Subscriber equipment	30 dB m e.i.r.p./ channel bandwidth

5.7.2. Test Setup



5.7.3. Measurement Procedure

ERP in frequency below 1GHz, the ERP was calculated as follows:

ERP = S.G. output (dBm) + Antenna Gain (dBi) -2.15

EIRP in frequency above 1GHz the EIRP was calculated as follows:

EIRP = S.G. output (dBm) + Antenna Gain (dBi)

5.7.4. Test Result

Pass,

ERP Power dBm (dBm)						
Band	LTE Band 5			Channel/Frequency (MHz)		
Bandwidth	Modulation	RB size	RB offset	20407/824.7	20525/836.5	20643/848.3
1.4MHz	QPSK	1	0.00	20.47	20.45	20.48
		1	3.00	20.31	19.63	20.34
		1	5.00	20.09	20.16	20.21
		3	0.00	20.13	20.34	20.13
		3	2.00	20.23	19.89	20.18
		3	3.00	20.32	20.30	20.25
		6	0.00	19.80	19.79	20.09
	16QAM	1	0.00	19.89	20.09	19.66
		1	2.00	20.29	20.13	20.01
		1	5.00	20.15	19.95	20.29
		3	0.00	20.34	20.17	19.98
		3	1.00	20.26	20.32	20.25
		3	3.00	20.27	20.22	20.34
		6	0.00	19.60	20.16	20.17
Bandwidth	Modulation	RB size	RB offset	20415/825.5	20525/836.5	20635/847.5
3MHz	QPSK	1	0.00	20.09	20.17	20.33
		1	7.00	20.09	20.01	19.83
		1	14.00	19.72	20.14	20.07
		8	0.00	19.71	19.97	19.59
		8	4.00	20.09	19.92	20.10
		8	7.00	19.78	20.08	20.05
		15	0.00	20.12	20.09	20.42
	16QAM	1	0.00	20.30	20.31	19.85
		1	8.00	19.77	19.68	19.93
		1	14.00	19.66	20.30	20.40
		8	0.00	20.30	19.81	20.29
		8	4.00	19.98	20.34	20.09
		8	7.00	19.81	20.25	20.26
		15	0.00	20.16	20.16	20.02
Bandwidth	Modulation	RB size	RB offset	20425/826.5	20525/836.5	20625/846.5
5MHz	QPSK	1	0.00	20.19	20.23	20.28
		1	12.00	19.88	19.98	19.71
		1	24.00	20.26	20.20	20.34
		12	0.00	20.14	19.59	19.94
		12	6.00	19.71	19.61	19.81
		12	13.00	20.05	20.35	20.07
		25	0.00	19.85	20.35	19.68
	16QAM	1	0.00	20.20	20.26	19.76
		1	12.00	19.63	19.95	19.98
		1	24.00	20.21	20.14	19.72
		12	0.00	20.14	20.28	19.77
		12	6.00	19.97	20.40	19.91
		12	13.00	20.20	20.17	19.67
		25	0.00	19.94	20.29	19.81

ERP Power dBm (dBm)						
Band	LTE Band 5			Channel/Frequency (MHz)		
Bandwidth	Modulation	RB size	RB offset	20450/829	20525/836.5	20600/844
10MHz	QPSK	1	0.00	20.18	20.28	20.25
		1	24.00	19.89	20.01	20.09
		1	49.00	19.69	19.96	20.19
		25	0.00	19.88	19.81	19.77
		25	12.00	20.05	19.59	20.23
		25	25.00	20.18	20.20	19.77
		50	0.00	19.72	19.80	19.97
	16QAM	1	0.00	19.61	19.76	20.27
		1	24.00	20.29	20.22	20.26
		1	49.00	19.71	19.97	20.06

Note: Measurement Uncertainty: ±2.6 dB.

EIRP Power dBm (dBm)						
Band	LTE Band 7			Channel/Frequency (MHz)		
Bandwidth	Modulation	RB size	RB offset	20775/2502.5	21100/2535.0	21425/2567.5
5MHz	QPSK	1	0	25.24	25.40	25.30
		1	12	24.88	24.93	24.79
		1	24	25.00	25.00	25.03
		12	0	25.06	23.97	24.12
		12	6	25.17	24.02	24.13
		12	13	25.09	24.02	24.10
		25	0	25.09	23.99	24.12
	16QAM	1	0	25.10	25.02	24.28
		1	12	24.46	24.39	24.58
		1	24	25.05	25.02	24.30
		12	0	25.11	25.06	25.08
		12	6	25.24	25.10	24.15
		12	13	25.15	25.09	24.11
		25	0	25.09	24.99	24.14
Bandwidth	Modulation	RB size	RB offset	20800/2505.0	21100/2535.0	21400/2565.0
10MHz	QPSK	1	0	25.17	25.15	25.05
		1	24	25.25	25.15	25.16
		1	49	25.11	25.00	25.06
		25	0	24.04	24.07	24.18
		25	12	24.10	24.04	24.12
		25	25	24.14	24.07	24.12
		50	0	24.02	24.04	24.13
	16QAM	1	0	24.34	24.12	24.02
		1	24	24.42	24.23	24.18
		1	49	24.26	24.12	24.11

EIRP Power dBm (dBm)						
Band	LTE Band 7			Channel/Frequency (MHz)		
Bandwidth	Modulation	RB size	RB offset	20825/2507.5	21100/2535.0	21375/2562.5
15MHz	QPSK	1	0	25.18	25.07	24.95
		1	38	24.45	24.34	24.67
		1	74	25.02	24.91	25.00
		38	0	24.17	24.26	24.28
		38	18	24.20	24.19	24.20
		38	37	24.14	24.17	24.15
		75	0	24.18	24.24	24.20
	16QAM	1	0	24.04	24.05	23.91
		1	38	24.27	24.34	24.43
		1	74	23.83	24.03	23.98
Bandwidth	Modulation	RB size	RB offset	20850/2510.0	21100/2535.0	21350/2560.0
20MHz	QPSK	1	0	24.93	24.89	24.81
		1	49	24.24	24.19	24.17
		1	99	24.81	24.77	24.85
		50	0	23.96	24.08	24.11
		50	25	24.06	24.05	24.07
		50	50	23.90	24.10	23.92
		100	0	23.95	24.08	24.01
	16QAM	1	0	24.02	23.73	23.83
		1	49	24.29	24.11	24.14
		1	99	23.74	23.74	23.84

5.8. Radiated Out of Band Emissions

5.8.1. Limit

FCC

-§22.917(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10log(P) dB.

-§24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

-§27.53(c)(2), on any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB.

-§27.53(f), For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70dB W/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80dB W EIRP for discrete emissions of less than 700Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

-§27.53(g), the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB.

-§27.53(h)(1), for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.

-§27.53(m)(4), for mobile digital stations, the attenuation factor shall be not less than 40 + 10 log10 (P) dBon all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log10 (P) dBon all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log10 (P) dBon all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log10 (P) dB on all frequencies between 2 490.5 MHz and 2 496 MHz and 55 + 10 log10 (P) dB at or below 2 490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2 495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

IC

- RSS-130 Issue 2

4.7.1, the unwanted emissions in any 100 kHz bandwidth on any frequency outside the low frequency edge and the high frequency edge of each frequency block range(s), shall be attenuated below the transmitter power, P (dB W), by at least 43 + 10 log10 p (watts), dB. However, in the 100 kHz band immediately outside of the equipment’s frequency block range, a resolution bandwidth of 30 kHz may be employed.

4.7.2, In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:

a) The power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHzand 793-806 MHz shall be attenuated below the transmitter power, P (dB W), by at least:

(i) 76 + 10 log10 p (watts), dB, for base and fixed equipment, and

(ii) 65 + 10 log10 p (watts), dB, for mobile and portable equipment.

b) The e.i.r.p. in the band 1 559-1 610 MHz shall not exceed -70 dB W/MHz for wideband signal and -80 dB W for discrete emission with bandwidth less than 700Hz.

- RSS-132 Issue 4

5.5, Equipment shall meet the unwanted emission limits specified below.

(i) In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1 % of the occupied bandwidth shall be attenuated below the transmitter output power P (dB W) by at least 43 + 10 log(p) dB.

(ii) After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated below the transmitter output power P (dB W) by at least43 + 10 log(p) dB. If the measurement is performed using 1 % of the occupied bandwidth, power integration over 100 kHz is required.

- RSS-133 Issue 7

6.5, Equipment shall comply with the limits in (i) and (ii) below.

(i) In the 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1 % of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dB W) by at least 43 + 10 log10 p(watts).
(ii) After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dB W) by at least 43 + 10 log10 p(watts). If the measurement is performed using 1 % of the emission bandwidth, power integration over 1.0 MHz is required.
- RSS-139 Issue 4
5.6, Unwanted emissions shall be measured in terms of average values.
For all equipment, the TRP or total conducted power (sum of conducted power across all antenna connectors) of the unwanted emissions outside the frequency block or frequency block group shall not exceed the limits shown in table 6.

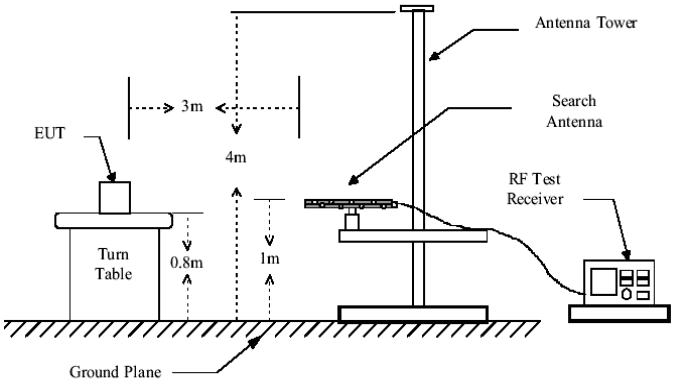
Table 6: Unwanted emission limits

Offset from the edge of the frequency block or frequency block group	Unwanted emission limit
≤1 MHz	-13 dB m/(1% of OB)*
>1 MHz	-13 dB m

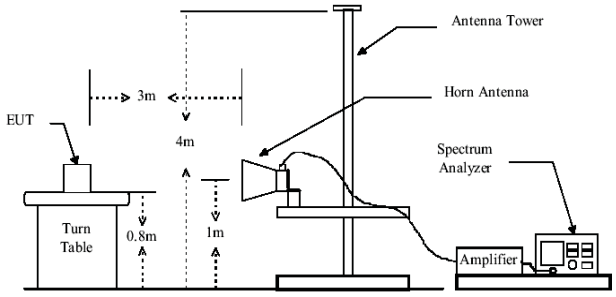
* OB is the occupied bandwidth

5.8.2. Test Setup

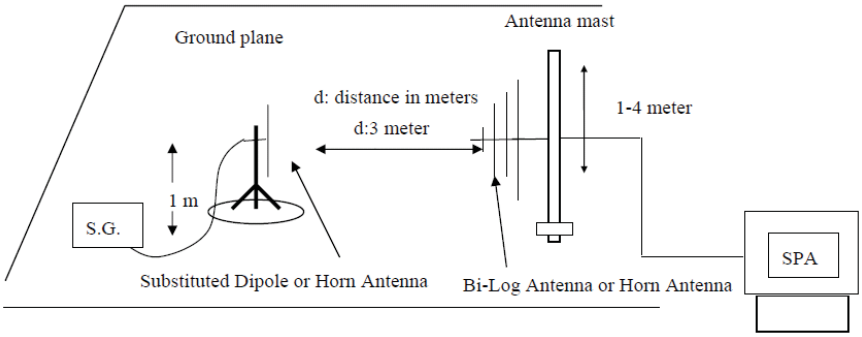
Below 1GHz



Above 1GHz



Substituted method:



5.8.3. Measurement Procedure

The EUT was placed on a non-conductive, The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations. all test in Full-Anechoic Chamber.

The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method.

The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.

EIRP (Level)= S.G. output (dBm) + Antenna Gain(dBi) – Cable Loss (dB)

Note: Measurement Uncertainty: ±3.6 dB.

The data show only the worst results, and the other results are very low and not shown in the report.

5.8.4. Test Result

Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Level (dBm)		
LTE BAND 5 1.4MHz Lowest	87.75	Vertical	-75.00	3.35	0.38	-72.03	-13	PASS
	3700.40	Vertical	-45.90	7.76	3.75	-41.89		
	5550.60	Vertical	-47.01	9.84	4.94	-42.11		
	7400.80	Vertical	-39.48	10.21	5.32	-34.59		
	9251.00	Vertical	-42.85	11.36	6.02	-37.51		
	11101.20	Vertical	-44.39	14.52	6.68	-36.55		
LTE BAND 5 1.4MHz Middle	88.62	Vertical	-75.00	3.35	0.38	-72.03	-13	PASS
	3760.00	Vertical	-47.23	7.76	3.75	-43.22		
	5640.00	Vertical	-46.81	9.84	4.94	-41.91		
	7520.00	Vertical	-42.46	10.21	5.32	-37.57		
	9400.00	Vertical	-41.88	11.36	6.02	-36.54		
	11280.00	Vertical	-45.80	14.52	6.68	-37.96		
LTE BAND 5 1.4MHz Highest	88.53	Vertical	-74.96	3.35	0.38	-71.99	-13	PASS
	3819.60	Vertical	-46.81	7.79	3.53	-42.55		
	5729.40	Vertical	-41.30	9.88	5.02	-36.44		
	7639.20	Vertical	-37.53	10.25	5.54	-32.82		
	9549.00	Vertical	-44.36	11.38	6.16	-39.14		
	11458.80	Vertical	-46.76	14.56	6.72	-38.92		
LTE BAND 5 3MHz Lowest	87.67	Vertical	-74.95	3.35	0.38	-71.98	-13	PASS
	3700.40	Vertical	-45.86	7.76	3.75	-41.85		
	5550.60	Vertical	-46.98	9.84	4.94	-42.08		
	7400.80	Vertical	-39.46	10.21	5.32	-34.57		
	9251.00	Vertical	-42.82	11.36	6.02	-37.48		
	11101.20	Vertical	-44.36	14.52	6.68	-36.52		
LTE BAND 5 3MHz Middle	88.58	Vertical	-75.08	3.35	0.38	-72.11	-13	PASS
	3760.00	Vertical	-47.28	7.76	3.75	-43.27		
	5640.00	Vertical	-46.86	9.84	4.94	-41.96		
	7520.00	Vertical	-42.51	10.21	5.32	-37.62		
	9400.00	Vertical	-41.92	11.36	6.02	-36.58		
	11280.00	Vertical	-45.84	14.52	6.68	-38.00		
LTE BAND 5 3MHz Highest	88.57	Vertical	-75.04	3.35	0.38	-72.07	-13	PASS
	3819.60	Vertical	-46.86	7.79	3.53	-42.60		
	5729.40	Vertical	-41.15	9.88	5.02	-36.29		
	7639.20	Vertical	-37.40	10.25	5.54	-32.69		
	9549.00	Vertical	-44.20	11.38	6.16	-38.98		
	11458.80	Vertical	-46.60	14.56	6.72	-38.76		

Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Level (dBm)		
LTE BAND 5 5MHz Lowest	87.74	Vertical	-74.56	3.35	0.38	-71.59	-13	PASS
	3700.40	Vertical	-45.62	7.76	3.75	-41.61		
	5550.60	Vertical	-46.72	9.84	4.94	-41.82		
	7400.80	Vertical	-39.27	10.21	5.32	-34.38		
	9251.00	Vertical	-42.60	11.36	6.02	-37.26		
	11101.20	Vertical	-44.12	14.52	6.68	-36.28		
LTE BAND 5 5MHz Middle	88.58	Vertical	-74.56	3.35	0.38	-71.59	-13	PASS
	3760.00	Vertical	-46.94	7.76	3.75	-42.93		
	5640.00	Vertical	-46.54	9.84	4.94	-41.64		
	7520.00	Vertical	-42.21	10.21	5.32	-37.32		
	9400.00	Vertical	-41.63	11.36	6.02	-36.29		
	11280.00	Vertical	-45.52	14.52	6.68	-37.68		
LTE BAND 5 5MHz Highest	88.74	Vertical	-74.52	3.35	0.38	-71.55	-13	PASS
	3819.60	Vertical	-46.54	7.79	3.53	-42.28		
	5729.40	Vertical	-41.06	9.88	5.02	-36.20		
	7639.20	Vertical	-37.31	10.25	5.54	-32.60		
	9549.00	Vertical	-44.09	11.38	6.16	-38.87		
	11458.80	Vertical	-46.49	14.56	6.72	-38.65		
LTE BAND 5 10MHz Lowest	87.55	Vertical	-74.59	3.35	0.38	-71.62	-13	PASS
	3700.40	Vertical	-45.64	7.76	3.75	-41.63		
	5550.60	Vertical	-46.73	9.84	4.94	-41.83		
	7400.80	Vertical	-39.28	10.21	5.32	-34.39		
	9251.00	Vertical	-42.62	11.36	6.02	-37.28		
	11101.20	Vertical	-44.14	14.52	6.68	-36.30		
LTE BAND 5 10MHz Middle	88.62	Vertical	-74.66	3.35	0.38	-71.69	-13	PASS
	3760.00	Vertical	-47.00	7.76	3.75	-42.99		
	5640.00	Vertical	-46.59	9.84	4.94	-41.69		
	7520.00	Vertical	-42.28	10.21	5.32	-37.39		
	9400.00	Vertical	-41.69	11.36	6.02	-36.35		
	11280.00	Vertical	-45.58	14.52	6.68	-37.74		
LTE BAND 5 10MHz Highest	88.57	Vertical	-74.62	3.35	0.38	-71.65	-13	PASS
	3819.60	Vertical	-46.59	7.79	3.53	-42.33		
	5729.40	Vertical	-40.93	9.88	5.02	-36.07		
	7639.20	Vertical	-37.20	10.25	5.54	-32.49		
	9549.00	Vertical	-43.95	11.38	6.16	-38.73		
	11458.80	Vertical	-46.33	14.56	6.72	-38.49		

Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Level (dBm)		
LTE BAND 7 5MHz Lowest	87.89	Vertical	-75.65	3.35	0.38	-72.68	-13	PASS
	5005.00	Vertical	-46.28	7.76	3.75	-42.27		
	7507.50	Vertical	-47.42	9.84	4.94	-42.52		
	10010.00	Vertical	-39.81	10.21	5.32	-34.92		
	12512.50	Vertical	-43.22	11.36	6.02	-37.88		
	15015.00	Vertical	-44.76	14.52	6.68	-36.92		
LTE BAND 7 5MHz Middle	87.87	Vertical	-75.65	3.35	0.38	-72.68	-13	PASS
	5070.00	Vertical	-47.63	7.76	3.75	-43.62		
	7605.00	Vertical	-47.23	9.84	4.94	-42.33		
	10140.00	Vertical	-42.83	10.21	5.32	-37.94		
	12675.00	Vertical	-42.24	11.36	6.02	-36.90		
	15210.00	Vertical	-46.18	14.52	6.68	-38.34		
LTE BAND 7 5MHz Highest	88.87	Vertical	-75.61	3.35	0.38	-72.64	-13	PASS
	5135.00	Vertical	-47.23	7.79	3.53	-42.97		
	7702.50	Vertical	-41.67	9.88	5.02	-36.81		
	10270.00	Vertical	-37.86	10.25	5.54	-33.15		
	12837.50	Vertical	-44.73	11.38	6.16	-39.51		
	15405.00	Vertical	-47.17	14.56	6.72	-39.33		
LTE BAND 7 10MHz Lowest	87.53	Vertical	-75.65	3.35	0.38	-72.68	-13	PASS
	5010.00	Vertical	-46.28	7.76	3.75	-42.27		
	7515.00	Vertical	-47.09	9.84	4.94	-42.19		
	10020.00	Vertical	-39.55	10.21	5.32	-34.66		
	12525.00	Vertical	-42.93	11.36	6.02	-37.59		
	15030.00	Vertical	-44.47	14.52	6.68	-36.63		
LTE BAND7 10MHz Middle	88.23	Vertical	-75.22	3.35	0.38	-72.25	-13	PASS
	5070.00	Vertical	-47.37	7.76	3.75	-43.36		
	7605.00	Vertical	-46.95	9.84	4.94	-42.05		
	10140.00	Vertical	-42.59	10.21	5.32	-37.70		
	12675.00	Vertical	-42.01	11.36	6.02	-36.67		
	15210.00	Vertical	-45.93	14.52	6.68	-38.09		
LTE BAND 7 10MHz Highest	88.23	Vertical	-75.18	3.35	0.38	-72.21	-13	PASS
	5130.00	Vertical	-46.95	7.79	3.53	-42.69		
	7695.00	Vertical	-41.24	9.88	5.02	-36.38		
	10260.00	Vertical	-37.48	10.25	5.54	-32.77		
	12825.00	Vertical	-44.29	11.38	6.16	-39.07		
	15390.00	Vertical	-46.68	14.56	6.72	-38.84		

Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Level (dBm)		
LTE BAND 7 15MHz Lowest	87.12	Vertical	-75.26	3.35	0.38	-72.29	-13	PASS
	5015.00	Vertical	-46.06	7.76	3.75	-42.05		
	7522.50	Vertical	-47.18	9.84	4.94	-42.28		
	10030.00	Vertical	-39.62	10.21	5.32	-34.73		
	12537.50	Vertical	-43.00	11.36	6.02	-37.66		
	15045.00	Vertical	-44.55	14.52	6.68	-36.71		
LTE BAND 7 15MHz Middle	88.87	Vertical	-75.26	3.35	0.38	-72.29	-13	PASS
	5070.00	Vertical	-47.39	7.76	3.75	-43.38		
	7605.00	Vertical	-46.98	9.84	4.94	-42.08		
	10140.00	Vertical	-42.61	10.21	5.32	-37.72		
	12675.00	Vertical	-42.03	11.36	6.02	-36.69		
	15210.00	Vertical	-45.96	14.52	6.68	-38.12		
LTE BAND 7 15MHz Highest	88.29	Vertical	-75.22	3.35	0.38	-72.25	-13	PASS
	5125.00	Vertical	-46.98	7.79	3.53	-42.72		
	7687.50	Vertical	-41.46	9.88	5.02	-36.60		
	10250.00	Vertical	-37.67	10.25	5.54	-32.96		
	12812.50	Vertical	-44.52	11.38	6.16	-39.30		
	15375.00	Vertical	-46.93	14.56	6.72	-39.09		
LTE BAND 7 20MHz Lowest	87.81	Vertical	-75.26	3.35	0.38	-72.29	-13	PASS
	5020.00	Vertical	-46.31	7.76	3.75	-42.30		
	7530.00	Vertical	-47.12	9.84	4.94	-42.22		
	10040.00	Vertical	-39.57	10.21	5.32	-34.68		
	12550.00	Vertical	-42.95	11.36	6.02	-37.61		
	15060.00	Vertical	-44.50	14.52	6.68	-36.66		
LTE BAND 7 20MHz Middle	88.56	Vertical	-75.31	3.35	0.38	-72.34	-13	PASS
	5070.00	Vertical	-47.42	7.76	3.75	-43.41		
	7605.00	Vertical	-47.01	9.84	4.94	-42.11		
	10140.00	Vertical	-42.64	10.21	5.32	-37.75		
	12675.00	Vertical	-42.05	11.36	6.02	-36.71		
	15210.00	Vertical	-45.99	14.52	6.68	-38.15		
LTE BAND 7 20MHz Highest	88.22	Vertical	-75.27	3.35	0.38	-72.30	-13	PASS
	5120.00	Vertical	-47.01	7.79	3.53	-42.75		
	7680.00	Vertical	-41.29	9.88	5.02	-36.43		
	10240.00	Vertical	-37.52	10.25	5.54	-32.81		
	12800.00	Vertical	-44.34	11.38	6.16	-39.12		
	15360.00	Vertical	-46.75	14.56	6.72	-38.91		

6. PHOTOGRAPHS OF TEST SET-UP

Please see setup photo.

7. PHOTOGRAPHS OF THE EUT

Please see external photo and internal photo.

※※※※※ **END OF REPORT** ※※※※※