



FCC Test Report

FCC ID: 2BVL9-BY-2401A

Applicant: Shenzhen Boyuan Technology Co., LTD

Address: Room 710, Baoyunda R&D Complex Building, Fuhua Community, Xixiang Sub-district, Bao'an District, Shenzhen City

Manufacturer: Shenzhen Boyuan Technology Co., LTD

Address: Room 710, Baoyunda R&D Complex Building, Fuhua Community, Xixiang Sub-district, Bao'an District, Shenzhen City

Product Name: Smart Tablet

Trade Mark: N/A

Model Number: BY-2401A, BY-2501A, BY-2501P, BY-2501F, BY-2501R, M5-2401A, M5-2501A, A8-2401A, A8-2501A

Date of Receipt: Jan. 05, 2026

Test Date: Jan. 05, 2026 - Apr. 18, 2026

Date of Report: Apr. 18, 2026

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 CFR Title 47 Part22 Subpart H
FCC CFR Title 47 Part24 Subpart E
FCC CFR Title 47 Part27
ANSI/ TIA/ EIA-603-E-2016
FCC KDB 971168 D01 Power Meas. License Digital Systems v03v01
ANSI C63.26:2015

Test Result: Pass

Report Number: DLE-260127043R

Prepared (Test Engineer): Ken Tan

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	Test Requirement	Result
Conducted RF Output Power	2.1046	PASS
Peak to Average Ratio	22.355 24.235,27.54	PASS
99% & -26 dB Occupied Bandwidth	2.1049, 22.917 24.238,	PASS
Frequency Stability	2.1055, 22.355 24.235, 27.54	PASS
Conducted Out of Band Emissions	2.1051,2.1057 22.917, 24.238 27.53(m)	PASS
Band Edge	2.1051,2.1057 22.917, 24.238 27.53(m)	PASS
Transmitter Radiated Power (EIPR/ERP)	22.913, 24.232 27.50(h)(2)	PASS
Radiated Out of Band Emissions	2.1053,2.1057 22.917, 24.238 27.53(m)	PASS



2. GENERAL PRODUCT INFORMATION

2.1. Description of Device (EUT)

Product Name:	Smart Tablet
Trade Mark:	N/A
Model Number:	BY-2401A, BY-2501A, BY-2501P, BY-2501F, BY-2501R, M5-2401A, M5-2501A, A8-2401A, A8-2501A
Test Model:	BY-2401A
Model Difference	All models are same as the samples except model name and color, they have the same structure and circuit.
Operation Frequency:	LTE Band 2: Tx: 1850.00 - 1910.00MHz; Rx: 1930.00 - 1990.00MHz 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 2: 1.21dBi, LTE Band 5: 1.25dBi, LTE Band 7: 1.39dBi
Power supply:	DC 3.8V from battery DC 5V/9V from charger
LTE Category	1
Hardware Version	1.0
Software Version	1.0

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 2	Bandwidth:(MHz)1.4/3/5/10/15/20MHz Modulation: QPSK/16QAM RB:1/50%/100%	Bandwidth:(MHz)1.4/3/5/10/15/20MHz Modulation: QPSK/16QAM RB:1/50%/100%
LTE Band 5	Bandwidth:(MHz)1.4/3/5/10MHz Modulation: QPSK/16QAM RB:1/50%/100%	Bandwidth:(MHz)1.4/3/5/10/15/20MHz Modulation: QPSK/16QAM RB:1/50%/100%
LTE Band7	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%

Test Channel(MHz)			
Band	Low	Middle	High
LTE Band 2	1850.7	1880	1909.3
LTE Band 5	824.7	836.5	848.3
LTE Band 7	2502.5	2535	2567.6

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

2: we pretest all voltage, only the DC 3.8V was worst mode, and the data show in the report.

3: 16QAM only supports a bandwidth of 5 MHz. For bandwidths greater than 5 MHz, only 1 RB or 1 RB + 25 RBs shall be tested.

3. TEST SITES

3.1. Test Facilities

Site Description

Name of Firm : Shenzhen DL Testing Technology Co., Ltd.

101-201, Comprehensive Building, Tongzhou Electronics Longgang Factory

Site Location : 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 $y \pm U$, where expanded 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	$\pm 1.38\text{dB}$
2	RF power,conducted	$\pm 0.16\text{dB}$
3	Spurious emissions,conducted	$\pm 0.21\text{dB}$
4	All emissions,radiated(<1G)	$\pm 4.68\text{dB}$
5	All emissions,radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^{\circ}\text{C}$
7	Humidity	$\pm 2\%$



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	ChengYu	843 Room	843	Nov. 05, 2023	Nov. 04, 2026
EMI Receiver	R&S	ESR	101421	Oct. 25, 2025	Oct. 24, 2026
LISN	R&S	ENV216	102417	Oct. 25, 2025	Oct. 24, 2026
843 Cable 1#	ChengYu	CE Cable	001	Oct. 25, 2025	Oct. 24, 2026
843 Cable 1#	FUJIKURA	843C1#	001	Oct. 25, 2025	Oct. 24, 2026

3.3.2. For radiated test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Spectrum Analyzer (9kHz-26.5GHz)	Agilent	E4408B	MY50140780	Oct. 25, 2025	Oct. 24, 2026
Test Receiver (9kHz-7GHz)	R&S	ESRP7	101393	Oct. 25, 2025	Oct. 24, 2026
Bilog Antenna (30MHz-1GHz)	R&S	VULB9162	00306	Oct. 25, 2025	Oct. 24, 2026
Horn Antenna (1GHz-18GHz)	Schwarzbeck	BBHA9120D	02139	Oct. 25, 2025	Oct. 24, 2026
Horn Antenna (18GHz-40GHz)	A.H. Systems	SAS-574	588	Oct. 25, 2025	Oct. 24, 2026
Amplifier (9KHz-6GHz)	Schwarzbeck	BBV9743B	00153	Oct. 25, 2025	Oct. 24, 2026
Amplifier (1GHz-18GHz)	EMEC	EM01G8GA	00270	Oct. 25, 2025	Oct. 24, 2026
Amplifier(18GHz-40GHz)	Quanjuda	DLE-161	97	Oct. 25, 2025	Oct. 24, 2026
Loop Antenna(9KHz-30MHz)	Schwarzbeck	FMZB1519B	00014	Oct. 25, 2025	Oct. 24, 2026
RF cables1 (9kHz-1GHz)	ChengYu	966	004	Oct. 25, 2025	Oct. 24, 2026
RF cables2 (1GHz-40GHz)	ChengYu	966	003	Oct. 25, 2025	Oct. 24, 2026
Antenna connector	Florida RF Labs	N/A	RF 01#	Oct. 25, 2025	Oct. 24, 2026
Power probe	KEYSIGHT	U2021XA	MY55210018	Oct. 25, 2025	Oct. 24, 2026
Signal Analyzer	Agilent	N9020A	MY55370280	Oct. 25, 2025	Oct. 24, 2026
Test Receiver	R&S	ESU 40	100376	Oct. 25, 2025	Oct. 24, 2026
D.C. Power Supply	LongWei	PS-305D	010964729	Oct. 25, 2025	Oct. 24, 2026
Signal Amplifier	DAZE	ZN3380B	11235	Oct. 25, 2025	Oct. 24, 2026
High Pass filter	KANGMAI	WHKX1.0/1.5G-10SS	40	Oct. 25, 2025	Oct. 24, 2026
Filter	COM-MW	ZBSF-C836.5-25-X	BCTC042	Oct. 25, 2025	Oct. 24, 2026
Filter	COM-MW	ZBSF-C1747.5-75-X2	BCTC045	Oct. 25, 2025	Oct. 24, 2026
Filter	COM-MW	ZBSF-C1880-60-X2	BCTC047	Oct. 25, 2025	Oct. 24, 2026
Splitter	Agilent	11435B	1125162	Oct. 25, 2025	Oct. 24, 2026

RF CONDUCTED TEST

System Simulator	Agilent	E5515C	GB43130252	Oct. 25, 2025	Oct. 24, 2026
Spectrum Analyzer	Agilent	N9020A	MY45108040	Oct. 25, 2025	Oct. 24, 2026
DC Power Supply	LongWei	PS-305D	010965682	Oct. 25, 2025	Oct. 24, 2026
Constant temperature and humidity box	GF	GTH-800-40-2P	MAA9906-012	Oct. 25, 2025	Oct. 24, 2026
Universal radio communication tester	R&S	CMW500	115295	Oct. 25, 2025	Oct. 24, 2026



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

EUT

4.3. Test Environment:

Ambient conditions in the test laboratory:

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



5. EMISSION TEST RESULTS

5.1. Conducted RF Output Power

5.1.1. Limit

According to FCC section 2.1046(a), FCC part22.913(a), FCC part22.50(a) and FCC part 24.232(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

5.1.2. 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.

5.1.3. Test Result

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

Pass, the table and plot please see annex.

The conducted power tables are as follows:



Average Conducted Power						
Band	LTE Band 2			Channel/Frequency (MHz)		
Bandwidth	Modulation	RB size	RB offset	18607/1850.7	18900/1880	19193/1909.3
1.4MHz	QPSK	1	0.00	22.77	22.71	22.83
		1	3.00	22.01	22.28	22.32
		1	5.00	22.05	22.36	22.30
		3	0.00	21.99	22.31	22.30
		3	2.00	22.00	22.33	22.27
		3	3.00	22.00	22.36	22.24
		6	0.00	21.01	21.33	21.36
	16QAM	1	0.00	22.10	22.06	22.89
		1	3.00	21.98	22.43	22.22
		1	5.00	22.08	22.41	22.68
		3	0.00	22.18	22.37	22.58
		3	2.00	22.22	22.39	22.55
		3	3.00	22.21	22.22	22.34
		6	0.00	21.27	21.03	21.27
Bandwidth	Modulation	RB size	RB offset	18615/1851.5	18900/1880	19185/1908.5
3MHz	QPSK	1	0.00	22.18	22.31	22.33
		1	7.00	22.21	22.50	22.46
		1	14.00	22.13	22.43	22.21
		8	0.00	22.26	22.42	22.41
		8	4.00	22.23	22.47	22.45
		8	7.00	22.22	22.49	22.40
		15	0.00	21.18	21.43	21.45
	16QAM	1	0.00	22.47	22.34	22.56
		1	7.00	22.57	22.52	22.02
		1	14.00	22.51	22.47	22.50
		8	0.00	22.38	22.52	22.42
		8	4.00	22.45	22.58	22.48
		8	7.00	22.46	22.36	22.27
		15	0.00	22.25	22.15	22.17
Bandwidth	Modulation	RB size	RB offset	18625/1852.5	18900/1880	19175/1907.5
5MHz	QPSK	1	0.00	22.30	22.27	22.35
		1	12.00	22.35	22.51	22.44
		1	24.00	22.15	22.56	22.36
		12	0.00	22.20	22.27	22.21
		12	6.00	22.26	22.44	22.36
		12	13.00	22.15	22.40	22.35
		25	0.00	21.13	21.34	21.26
	16QAM	1	0.00	22.63	22.50	22.40
		1	12.00	22.63	22.63	22.58



		1	24.00	22.51	22.01	22.52
		12	0.00	22.19	22.48	22.41
		12	6.00	22.32	22.06	22.48
		12	13.00	22.16	22.44	22.31
		25	0.00	21.32	21.26	21.12

Average Conducted Power						
Band	LTE Band 2			Channel/Frequency (MHz)		
Bandwidth	Modulation	RB size	RB offset	18650/1855	18900/1880	19150/1905
10MHz	QPSK	1	0.00	22.16	21.96	22.67
		1	24.00	21.98	22.31	22.13
		1	49.00	22.58	22.36	22.22
		25	0.00	21.89	21.93	22.59
		25	12.00	22.18	22.22	22.04
		25	25.00	22.62	22.17	22.01
		50	0.00	21.21	20.99	21.83
	16QAM	1	0.00	22.34	22.07	21.98
		1	24.00	22.23	22.37	22.45
		1	49.00	21.89	22.45	22.49
Bandwidth	Modulation	RB size	RB offset	18675/1857.5	18900/1880	19125/1902.5
15MHz	QPSK	1	0.00	22.10	21.94	22.05
		1	37.00	22.48	22.12	22.08
		1	74.00	22.44	22.53	22.34
		36	0.00	22.01	22.13	22.13
		36	18.00	21.84	22.42	22.46
		36	38.00	22.56	22.48	22.14
		75	0.00	21.64	21.21	21.08
	16QAM	1	0.00	22.36	22.11	22.17
		1	38.00	22.06	21.98	22.19
		1	74.00	22.01	22.03	22.55
Bandwidth	Modulation	RB size	RB offset	18700/1860	18900/1880	19100/1900
20MHz	QPSK	1	0.00	22.15	22.59	22.50
		1	49.00	22.54	22.44	21.94
		1	99.00	22.45	22.18	22.21
		50	0.00	22.53	22.44	22.54
		50	25.00	21.72	22.24	22.53
		50	50.00	22.31	22.28	21.96
		100	0.00	21.65	21.84	21.63
	16QAM	1	0.00	22.16	21.74	22.31
		1	49.00	22.57	22.55	22.60
		1	99.00	22.53	22.48	22.25

Note: Measurement Uncertainty: ± 2.6 dB.



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	22.79	22.76	22.82
		1	3.00	22.63	21.94	22.68
		1	5.00	22.42	22.47	22.55
		3	0.00	22.46	22.65	22.47
		3	2.00	22.55	22.20	22.52
		3	3.00	22.64	22.61	22.59
		6	0.00	22.13	22.10	22.43
	16QAM	1	0.00	22.22	22.40	22.00
		1	2.00	22.61	22.44	22.35
		1	5.00	22.47	22.26	22.63
		3	0.00	22.73	22.48	22.32
		3	1.00	22.65	22.63	22.59
		3	3.00	22.66	22.37	22.52
		6	0.00	22.00	22.31	22.35
Bandwidth	Modulation	RB size	RB offset	20415/825.5	20525/836.5	20635/847.5
3MHz	QPSK	1	0.00	22.02	21.98	22.17
		1	7.00	22.42	22.32	22.17
		1	14.00	22.05	22.45	22.41
		8	0.00	22.04	22.28	21.93
		8	4.00	22.42	22.23	22.44
		8	7.00	22.11	22.39	22.39
		15	0.00	22.45	22.40	22.76
	16QAM	1	0.00	22.62	22.62	22.19
		1	8.00	22.10	21.99	22.27
		1	14.00	21.99	22.61	22.74
		8	0.00	22.69	22.12	22.63
		8	4.00	22.38	22.65	22.43
		8	7.00	22.21	22.40	22.44
		15	0.00	22.55	22.31	22.20
Bandwidth	Modulation	RB size	RB offset	20425/826.5	20525/836.5	20625/846.5
5MHz	QPSK	1	0.00	21.92	22.34	22.42
		1	12.00	22.21	22.29	22.05
		1	24.00	22.58	22.51	22.68
		12	0.00	22.46	21.90	22.28
		12	6.00	22.04	21.92	22.15
		12	13.00	22.38	22.66	22.41
		25	0.00	22.18	22.66	22.02
	16QAM	1	0.00	22.52	22.57	22.10
		1	12.00	21.96	22.26	22.32



		1	24.00	22.53	22.45	22.06
		12	0.00	22.53	22.59	22.11
		12	6.00	22.37	22.71	22.25
		12	13.00	22.59	22.32	21.85
		25	0.00	22.34	22.44	21.99

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	22.11	22.19	22.19
		1	24.00	22.22	22.32	22.43
		1	49.00	22.02	22.27	22.53
		25	0.00	22.21	22.12	22.11
		25	12.00	22.38	21.90	22.57
		25	25.00	22.50	22.51	22.11
		50	0.00	22.05	22.11	22.31
	16QAM	1	0.00	21.94	22.07	22.61
		1	24.00	22.61	22.53	22.60
		1	49.00	22.04	22.28	22.40

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	22.35	22.32	22.33
		1	12	22.69	22.62	22.72
		1	24	22.32	22.32	22.33
		12	0	21.36	21.28	21.45
		12	6	21.47	21.33	21.44
		12	13	21.38	21.28	21.41
		25	0	21.41	21.28	21.42
	16QAM	1	0	21.42	21.31	21.61
		1	12	21.73	21.73	21.90
		1	24	21.39	21.28	21.59
		12	0	20.52	20.39	20.43
		12	6	20.63	20.43	20.42
		12	13	20.58	20.24	20.24
		25	0	20.46	20.18	20.34
Bandwidth	Modulation	RB size	RB offset	20800/2505.0	21100/2535.0	21400/2565.0
10MHz	QPSK	1	0	22.45	22.45	22.40
		1	24	22.48	22.45	22.58
		1	49	22.38	22.28	22.44
		25	0	21.31	21.41	21.54
		25	12	21.41	21.33	21.47
		25	25	21.42	21.35	21.44
		50	0	21.33	21.34	21.47
	16QAM	1	0	21.63	21.41	21.34
		1	24	21.72	21.53	21.55
		1	49	21.56	21.41	21.43



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	22.39	22.36	22.42
		1	38	22.67	22.64	22.80
		1	74	22.24	22.18	22.38
		38	0	21.42	21.64	21.57
		38	18	21.51	21.51	21.56
		38	37	21.47	21.44	21.50
		75	0	21.46	21.53	21.57
	16QAM	1	0	21.52	21.19	21.32
		1	38	21.79	21.51	21.64
		1	74	21.36	21.15	21.28
Bandwidth	Modulation	RB size	RB offset	20850/2510.0	21100/2535.0	21350/2560.0
20MHz	QPSK	1	0	22.18	22.22	22.13
		1	49	22.51	22.44	22.53
		1	99	22.13	22.04	22.20
		50	0	21.21	21.37	21.49
		50	25	21.38	21.31	21.45
		50	50	21.18	21.37	21.29
		100	0	21.26	21.36	21.42
	16QAM	1	0	21.16	21.10	21.28
		1	49	21.46	21.42	21.59
		1	99	20.98	21.09	21.27

Note: Measurement Uncertainty: ± 2.6 dB.



5.2. -26dB and 99% Occupied Bandwidth

5.2.1. Limit

According to FCC section 2.1049 and FCC part 22.99 and FCC part 24.131, the occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.

Occupied bandwidth is also known as the 99% emission bandwidth,

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 50 Ohm; 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 1.

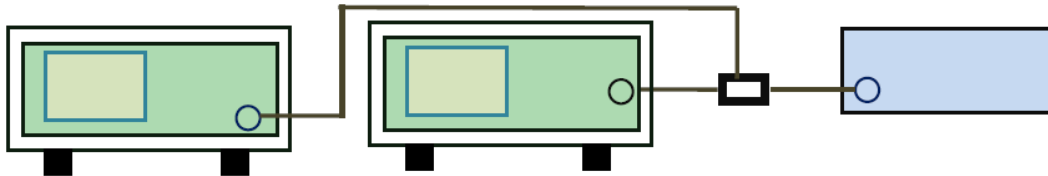


5.3. Peak to Average Ratio

5.3.1. Limit

According to FCC section 27.50(d)(5), 22.99, 24.131 the peak to average ratio(PAR) of the transmission may not exceed 13dB.

5.3.2. Test Setup



5.3.3. Test Procedure

According with KDB 971168 v02r02

1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW > Emission bandwidth of signal
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

5.3.4. Test Result

Pass, the table and plot please see annex 1.



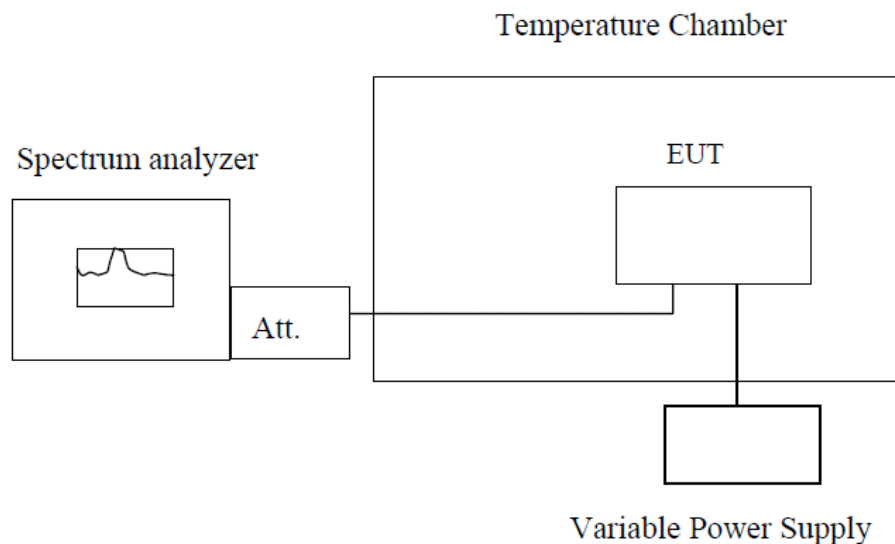
5.4. Frequency Stability

5.4.1. Limit

According to FCC section 22.355 and FCC section 24.235, FCC section 27.54 the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block. According to FCC section 2.1055, the test conditions are:

- (a) The temperature is varied from -40°C to $+80^{\circ}\text{C}$ at intervals of not more than 10°C .
- (b) For hand carried battery powered equipment, the primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacture. The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided.

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

The nominal, highest and lowest extreme voltages are separately 3.8VDC, 4.18VDC and 3.42VDC

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

deviation limit of 850MHz band is $\pm 2.5\text{ppm}$, and 1900MHz is $\pm 1\text{ppm}$

For LTE mode, only test the max bandwidth.



Test Conditions			Frequency Deviation			Result
Band	Power(Vdc)	Temperature(°C)	Frequency Error(Hz)	ppm	Limit	
LTE Band 2 Bandwidth 20MHz QPSK Middle channel 1880MHz	3.80	-40	69	0.0367	±1	PASS
	3.80	-30	36	0.0191		
	3.80	-20	73	0.0388		
	3.80	-10	62	0.0330		
	3.80	0	61	0.0324		
	3.80	10	43	0.0229		
	3.80	20	65	0.0346		
	3.80	30	92	0.0489		
	3.80	40	76	0.0404		
	3.80	50	65	0.0346		
	3.80	60	56	0.0298		
	3.80	70	58	0.0309		
	3.80	80	72	0.0383		
	4.18	25	59	0.0314		
	3.80	25	68	0.0362		
	3.42	25	108	0.0574		
LTE Band 2 Bandwidth 20MHz 16QAM Middle channel 1880MHz	3.80	-40	68	0.0362	±1	PASS
	3.80	-30	63	0.0335		
	3.80	-20	76	0.0404		
	3.80	-10	78	0.0415		
	3.80	0	53	0.0282		
	3.80	10	67	0.0356		
	3.80	20	88	0.0468		
	3.80	30	66	0.0351		
	3.80	40	53	0.0282		
	3.80	50	79	0.0420		
	3.80	60	55	0.0293		
	3.80	70	63	0.0335		
	3.80	80	41	0.0218		
	4.18	25	68	0.0362		
	3.80	25	41	0.0218		
	3.42	25	97	0.0516		



Test Conditions			Frequency Deviation			Result
Band	Power(Vdc)	Temperature(°C)	Frequency Error(Hz)	ppm	Limit	
LTE Band 5 Bandwidth 10MHz QPSK Middle channel 836.5MHz	3.80	-40	66	0.0789	±2.5	PASS
	3.80	-30	48	0.0574		
	3.80	-20	46	0.0550		
	3.80	-10	37	0.0442		
	3.80	0	66	0.0789		
	3.80	10	72	0.0861		
	3.80	20	39	0.0466		
	3.80	30	63	0.0753		
	3.80	40	35	0.0418		
	3.80	50	57	0.0681		
	3.80	60	72	0.0861		
	3.80	70	45	0.0538		
	3.80	80	86	0.1028		
	4.18	25	33	0.0395		
	3.80	25	84	0.1004		
	3.42	25	45	0.0538		
LTE Band 5 Bandwidth 10MHz 16QAM Middle channel 836.5MHz	3.80	-40	36	0.0430	±2.5	PASS
	3.80	-30	64	0.0765		
	3.80	-20	66	0.0789		
	3.80	-10	65	0.0777		
	3.80	0	82	0.0980		
	3.80	10	56	0.0669		
	3.80	20	23	0.0275		
	3.80	30	62	0.0741		
	3.80	40	47	0.0562		
	3.80	50	83	0.0992		
	3.80	60	56	0.0669		
	3.80	70	75	0.0897		
	3.80	80	47	0.0562		
	4.18	25	83	0.0992		
	3.80	25	42	0.0502		
	3.42	25	88	0.1052		

Note: Measurement Uncertainty: ±20Hz.



Test Conditions			Frequency Deviation			Result
Band	Power(Vdc)	Temperature(°C)	Frequency Error(Hz)	ppm	Limit	
LTE Band 7 Bandwidth 20MHz QPSK Middle channel 2535.0MHz	3.80	-40	78	0.0308	±2.5	PASS
	3.80	-30	93	0.0367		
	3.80	-20	62	0.0245		
	3.80	-10	74	0.0292		
	3.80	0	35	0.0138		
	3.80	10	33	0.0130		
	3.80	20	83	0.0327		
	3.80	30	47	0.0185		
	3.80	40	75	0.0296		
	3.80	50	73	0.0288		
	3.80	60	45	0.0178		
	3.80	70	73	0.0288		
	3.80	80	62	0.0245		
	4.18	25	113	0.0446		
	3.80	25	62	0.0245		
	3.42	25	63	0.0249		
LTE Band 7 Bandwidth 20MHz 16QAM Middle channel 2535.0MHz	3.80	-40	66	0.0260	±2.5	PASS
	3.80	-30	47	0.0185		
	3.80	-20	73	0.0288		
	3.80	-10	38	0.0150		
	3.80	0	72	0.0284		
	3.80	10	89	0.0351		
	3.80	20	47	0.0185		
	3.80	30	72	0.0284		
	3.80	40	66	0.0260		
	3.80	50	52	0.0205		
	3.80	60	77	0.0304		
	3.80	70	58	0.0229		
	3.80	80	77	0.0304		
	4.18	25	102	0.0402		
	3.80	25	66	0.0260		
	3.42	25	75	0.0296		

Note: Measurement Uncertainty: ±20Hz.

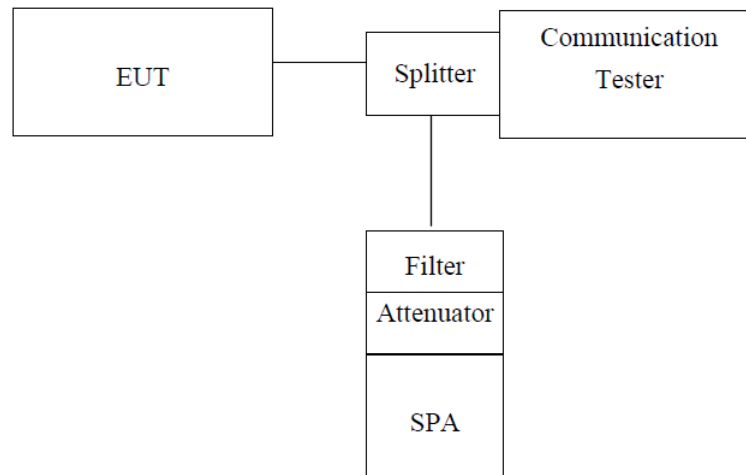


5.5. Conducted Spurious Emissions

5.5.1. Limit

According to FCC section 22.917(a) and FCC section 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. This calculated to be -13dBm.

5.5.2. Test Setup



Note: Measurement setup for testing on Antenna connector

5.5.3. Measurement Procedure

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

For the out of band:

Start(MHz)	Stop(MHz)	RBW(KHz)
0.009	0.15	1
0.15	30	10
30	1000	100
1000	26000	1000

Limit = -13dBm

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 1.

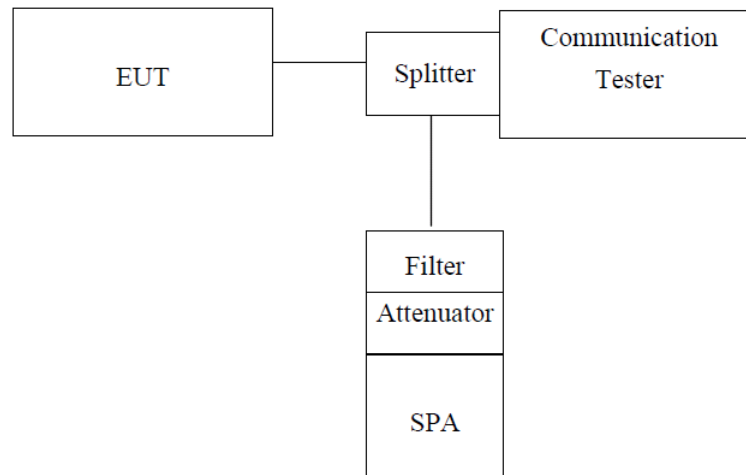


5.6. Conducted Out of Band Emissions

5.6.1. Limit

According to FCC section 22.917(b) and FCC section 24.238(b), 27.53(g)(h) in the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth (26dB emission bandwidth) of the fundamental emission of the transmitter may be employed.

5.6.2. Test Setup



Note: Measurement setup for testing on Antenna connector

5.6.3. Measurement Procedure

The EUT, which is powered by the adapter, is coupled to the Spectrum Analyzer and the System Simulator 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 System Simulator to operate at the maximum output power i.e. Power Control Level (PCL) = 5 and Power Class = 4. A call is established between the EUT and the System Simulator.

RBW is set to 3KHz, $VBW \geq 3 \times RBW$ for GSM 850, GSM 1900

RBW is set to 51KHz, $VBW \geq 3 \times RBW$ for WCDMA Band 5, WCDMA Band 2

RBW is set to 15KHz, $VBW \geq 3 \times RBW$ for LTE Band 2, LTE Band 4, LTE Band 5 (1.4MHz),

RBW is set to 30KHz, $VBW \geq 3 \times RBW$ for LTE Band 2, LTE Band 4, LTE Band 5 (3MHz),

RBW is set to 51KHz, $VBW \geq 3 \times RBW$ for LTE Band 2, LTE Band 4, LTE Band 5 (5MHz),

RBW is set to 100KHz, $VBW \geq 3 \times RBW$ for LTE Band 2, LTE Band 4, LTE Band 5 (10MHz),

RBW is set to 150KHz, $VBW \geq 3 \times RBW$ for LTE Band 2, LTE Band 4 (15MHz).

RBW is set to 200KHz, $VBW \geq 3 \times RBW$ for LTE Band 2, LTE Band 4 (20MHz)

RBW is set to 50KHz, $VBW \geq 3 \times RBW$ for LTE Band 7 (5MHz).

RBW is set to 100KHz, $VBW \geq 3 \times RBW$ for LTE Band 7 (10MHz).

RBW is set to 200KHz, $VBW \geq 3 \times RBW$ for LTE Band 7 (15MHz/20MHz)

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 1.

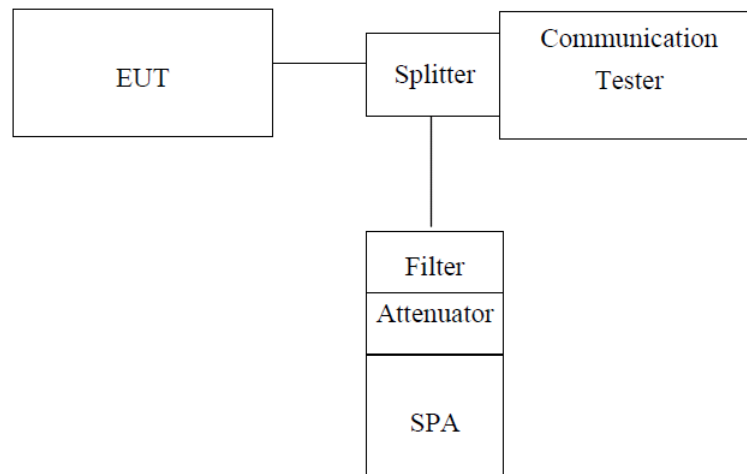


5.7. Transmitter Radiated Power (EIRP/ERP)

5.7.1. Limit

According to FCC section 22.913, the Effective Radiated Power (ERP) of mobile transmitters and auxiliary test transmitters must not exceed 7Watts, and FCC section 24.232, FCC section 27.50 the broadband PCS mobile station is limited to 2 Watts e.i.r.p. peak power.

5.7.2. Test Setup



Note: Measurement setup for testing on Antenna connector

5.7.3. Measurement Procedure

Subclause 5.2.5.5 of ANSIC63.26-2015 is applicable, along with the following provisions. For personal/portable radios utilizing an integral antenna, the factor L_c is typically negligible. However, in a fixed station transmit system that utilizes a long cable run between the transmitter and the transmitting antenna, this factor can be significant. The minimum cable loss should be used in this equation. The relevant equation for determining the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:

$$\text{ERP or EIRP} = P_{\text{Meas}} + G_T - L_c$$

where:

ERP or EIRP = effective radiated power or equivalent isotropically radiated power, respectively (expressed in the same units as P_{Meas} , typically dBm);

P_{Meas}

measured transmitter output power, in dBm;

G_T

= gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

L_c

= signal attenuation in the connecting cable between the transmitter and antenna, in dB.

ERP in frequency band 824.00 - 849.00MHz It is calculated directly using $\text{EIRP} = \text{Conducted Output Power} + \text{Antenna Gain} - 2.15$,

EIRP in frequency band 1850.00 - 1910.00MHz, 2500.00 - 2570.00MHz It is calculated directly using $\text{EIRP} = \text{Conducted Output Power} + \text{Antenna Gain}$.

5.7.4. Test Result

Pass,



EIRP Power dBm								
Band	LTE Band 2			Channel/Frequency (MHz)				
Bandwidth	Modulation	RB size	RB offset	18607/1850.7	18900/1880	19193/1909.3	Limit	Result
1.4MHz	QPSK	1	0	23.98	23.92	24.04	33.00	Pass
		1	3	23.22	23.49	23.53	33.00	Pass
		1	5	23.26	23.57	23.51	33.00	Pass
		3	0	23.20	23.52	23.51	33.00	Pass
		3	2	23.21	23.54	23.48	33.00	Pass
		3	3	23.21	23.57	23.45	33.00	Pass
		6	0	22.22	22.54	22.57	33.00	Pass
	16QAM	1	0	23.31	23.27	24.10	33.00	Pass
		1	3	23.19	23.64	23.43	33.00	Pass
		1	5	23.29	23.62	23.89	33.00	Pass
		3	0	23.39	23.58	23.79	33.00	Pass
		3	2	23.43	23.60	23.76	33.00	Pass
		3	3	23.42	23.43	23.55	33.00	Pass
		6	0	22.48	22.24	22.48	33.00	Pass
Bandwidth	Modulation	RB size	RB offset	18615/1851.5	18900/1880	19185/1908.5	Limit	Result
3MHz	QPSK	1	0	23.39	23.52	23.54	33.00	Pass
		1	7	23.42	23.71	23.67	33.00	Pass
		1	14	23.34	23.64	23.42	33.00	Pass
		8	0	23.47	23.63	23.62	33.00	Pass
		8	4	23.44	23.68	23.66	33.00	Pass
		8	7	23.43	23.70	23.61	33.00	Pass
		15	0	22.39	22.64	22.66	33.00	Pass
	16QAM	1	0	23.68	23.55	23.77	33.00	Pass
		1	7	23.78	23.73	23.23	33.00	Pass
		1	14	23.72	23.68	23.71	33.00	Pass
		8	0	23.59	23.73	23.63	33.00	Pass
		8	4	23.66	23.79	23.69	33.00	Pass
		8	7	23.67	23.57	23.48	33.00	Pass
		15	0	23.46	23.36	23.38	33.00	Pass
Bandwidth	Modulation	RB size	RB offset	18625/1852.5	18900/1880	19175/1907.5	Limit	Result
5MHz	QPSK	1	0	23.51	23.48	23.56	33.00	Pass
		1	12	23.56	23.72	23.65	33.00	Pass
		1	24	23.36	23.77	23.57	33.00	Pass
		12	0	23.41	23.48	23.42	33.00	Pass
		12	6	23.47	23.65	23.57	33.00	Pass
		12	13	23.36	23.61	23.56	33.00	Pass
		25	0	22.34	22.55	22.47	33.00	Pass
	16QAM	1	0	23.84	23.71	23.61	33.00	Pass
		1	12	23.84	23.84	23.79	33.00	Pass
		1	24	23.72	23.22	23.73	33.00	Pass
		12	0	23.40	23.69	23.62	33.00	Pass
		12	6	23.53	23.27	23.69	33.00	Pass
		12	13	23.37	23.65	23.52	33.00	Pass
		25	0	22.53	22.47	22.33	33.00	Pass



EIRP Power dBm								
Band	LTE Band 2			Channel/Frequency (MHz)				
Bandwidth	Modulation	RB size	RB offset	18650/1855	18900/1880	19150/1905	Limit	Result
10MHz	QPSK	1	0	23.37	23.17	23.88	33.00	Pass
		1	24	23.19	23.52	23.34	33.00	Pass
		1	49	23.79	23.57	23.43	33.00	Pass
		25	0	23.10	23.14	23.80	33.00	Pass
		25	12	23.39	23.43	23.25	33.00	Pass
		25	25	23.83	23.38	23.22	33.00	Pass
		50	0	22.42	22.20	23.04	33.00	Pass
	16QAM	1	0	23.55	23.28	23.19	33.00	Pass
		1	24	23.44	23.58	23.66	33.00	Pass
		1	49	23.10	23.66	23.70	33.00	Pass
Bandwidth	Modulation	RB size	RB offset	18675/1857.5	18900/1880	19125/1902.5	Limit	Result
15MHz	QPSK	1	0	23.31	23.15	23.26	33.00	Pass
		1	37	23.69	23.33	23.29	33.00	Pass
		1	74	23.65	23.74	23.55	33.00	Pass
		36	0	23.22	23.34	23.34	33.00	Pass
		36	18	23.05	23.63	23.67	33.00	Pass
		36	38	23.77	23.69	23.35	33.00	Pass
		75	0	22.85	22.42	22.29	33.00	Pass
	16QAM	1	0	23.57	23.32	23.38	33.00	Pass
		1	38	23.27	23.19	23.40	33.00	Pass
		1	74	23.22	23.24	23.76	33.00	Pass
Bandwidth	Modulation	RB size	RB offset	18700/1860	18900/1880	19100/1900	Limit	Result
20MHz	QPSK	1	0	23.36	23.80	23.71	33.00	Pass
		1	49	23.75	23.65	23.15	33.00	Pass
		1	99	23.66	23.39	23.42	33.00	Pass
		50	0	23.74	23.65	23.75	33.00	Pass
		50	25	22.93	23.45	23.74	33.00	Pass
		50	50	23.52	23.49	23.17	33.00	Pass
		100	0	22.86	23.05	22.84	33.00	Pass
	16QAM	1	0	23.37	22.95	23.52	33.00	Pass
		1	49	23.78	23.76	23.81	33.00	Pass
		1	99	23.74	23.69	23.46	33.00	Pass

Note: Measurement Uncertainty: ± 2.6 dB.



ERP Power dBm								
Band	LTE Band 5			Channel/Frequency (MHz)				
Bandwidth	Modulation	RB size	RB offset	20407/824.7	20525/836.5	20643/848.3	Limit	Result
1.4MHz	QPSK	1	0.00	21.89	21.86	21.92	38.45	Pass
		1	3.00	21.73	21.04	21.78	38.45	Pass
		1	5.00	21.52	21.57	21.65	38.45	Pass
		3	0.00	21.56	21.75	21.57	38.45	Pass
		3	2.00	21.65	21.30	21.62	38.45	Pass
		3	3.00	21.74	21.71	21.69	38.45	Pass
		6	0.00	21.23	21.20	21.53	38.45	Pass
	16QAM	1	0.00	21.32	21.50	21.10	38.45	Pass
		1	2.00	21.71	21.54	21.45	38.45	Pass
		1	5.00	21.57	21.36	21.73	38.45	Pass
		3	0.00	21.83	21.58	21.42	38.45	Pass
		3	1.00	21.75	21.73	21.69	38.45	Pass
		3	3.00	21.76	21.47	21.62	38.45	Pass
		6	0.00	21.10	21.41	21.45	38.45	Pass
Bandwidth	Modulation	RB size	RB offset	20415/825.5	20525/836.5	20635/847.5	Limit	Result
3MHz	QPSK	1	0.00	21.12	21.08	21.27	38.45	Pass
		1	7.00	21.52	21.42	21.27	38.45	Pass
		1	14.00	21.15	21.55	21.51	38.45	Pass
		8	0.00	21.14	21.38	21.03	38.45	Pass
		8	4.00	21.52	21.33	21.54	38.45	Pass
		8	7.00	21.21	21.49	21.49	38.45	Pass
		15	0.00	21.55	21.50	21.86	38.45	Pass
	16QAM	1	0.00	21.72	21.72	21.29	38.45	Pass
		1	8.00	21.20	21.09	21.37	38.45	Pass
		1	14.00	21.09	21.71	21.84	38.45	Pass
		8	0.00	21.79	21.22	21.73	38.45	Pass
		8	4.00	21.48	21.75	21.53	38.45	Pass
		8	7.00	21.31	21.50	21.54	38.45	Pass
		15	0.00	21.65	21.41	21.30	38.45	Pass
Bandwidth	Modulation	RB size	RB offset	20425/826.5	20525/836.5	20625/846.5	Limit	Result
5MHz	QPSK	1	0.00	21.02	21.44	21.52	38.45	Pass
		1	12.00	21.31	21.39	21.15	38.45	Pass
		1	24.00	21.68	21.61	21.78	38.45	Pass
		12	0.00	21.56	21.00	21.38	38.45	Pass
		12	6.00	21.14	21.02	21.25	38.45	Pass
		12	13.00	21.48	21.76	21.51	38.45	Pass
		25	0.00	21.28	21.76	21.12	38.45	Pass
	16QAM	1	0.00	21.62	21.67	21.20	38.45	Pass
		1	12.00	21.06	21.36	21.42	38.45	Pass
		1	24.00	21.63	21.55	21.16	38.45	Pass
		12	0.00	21.63	21.69	21.21	38.45	Pass
		12	6.00	21.47	21.81	21.35	38.45	Pass
		12	13.00	21.69	21.42	20.95	38.45	Pass
		25	0.00	21.44	21.54	21.09	38.45	Pass



ERP Power dBm								
Band	LTE Band 5			Channel/Frequency (MHz)				
Bandwidth	Modulation	RB size	RB offset	20450/829	20525/836.5	20600/844	Limit	Result
10MHz	QPSK	1	0.00	21.21	21.29	21.29	38.45	Pass
		1	24.00	21.32	21.42	21.53	38.45	Pass
		1	49.00	21.12	21.37	21.63	38.45	Pass
		25	0.00	21.31	21.22	21.21	38.45	Pass
		25	12.00	21.48	21.00	21.67	38.45	Pass
		25	25.00	21.60	21.61	21.21	38.45	Pass
		50	0.00	21.15	21.21	21.41	38.45	Pass
	16QAM	1	0.00	21.04	21.17	21.71	38.45	Pass
		1	24.00	21.71	21.63	21.70	38.45	Pass
		1	49.00	21.14	21.38	21.50	38.45	Pass

Note: Measurement Uncertainty: ± 2.6 dB.



EIRP Power dBm								
Band	LTE Band 7			Channel/Frequency (MHz)				
Bandwidth	Modulation	RB size	RB offset	20775/2502.5	21100/2535.0	21425/2567.5	Limit	Result
5MHz	QPSK	1	0	23.74	23.71	23.72	33.00	Pass
		1	12	24.08	24.01	24.11	33.00	Pass
		1	24	23.71	23.71	23.72	33.00	Pass
		12	0	22.75	22.67	22.84	33.00	Pass
		12	6	22.86	22.72	22.83	33.00	Pass
		12	13	22.77	22.67	22.80	33.00	Pass
		25	0	22.80	22.67	22.81	33.00	Pass
	16QAM	1	0	22.81	22.70	23.00	33.00	Pass
		1	12	23.12	23.12	23.29	33.00	Pass
		1	24	22.78	22.67	22.98	33.00	Pass
		12	0	21.91	21.78	21.82	33.00	Pass
		12	6	22.02	21.82	21.81	33.00	Pass
		12	13	21.97	21.63	21.63	33.00	Pass
		25	0	21.85	21.57	21.73	33.00	Pass
Bandwidth	Modulation	RB size	RB offset	20800/2505.0	21100/2535.0	21400/2565.0	Limit	Result
10MHz	QPSK	1	0	23.84	23.84	23.79	33.00	Pass
		1	24	23.87	23.84	23.97	33.00	Pass
		1	49	23.77	23.67	23.83	33.00	Pass
		25	0	22.70	22.80	22.93	33.00	Pass
		25	12	22.80	22.72	22.86	33.00	Pass
		25	25	22.81	22.74	22.83	33.00	Pass
		50	0	22.72	22.73	22.86	33.00	Pass
	16QAM	1	0	23.02	22.80	22.73	33.00	Pass
		1	24	23.11	22.92	22.94	33.00	Pass
		1	49	22.95	22.80	22.82	33.00	Pass
Bandwidth	Modulation	RB size	RB offset	20825/2507.5	21100/2535.0	21375/2562.5	Limit	Result
15MHz	QPSK	1	0	23.78	23.75	23.81	33.00	Pass
		1	38	24.06	24.03	24.19	33.00	Pass
		1	74	23.63	23.57	23.77	33.00	Pass
		38	0	22.81	23.03	22.96	33.00	Pass
		38	18	22.90	22.90	22.95	33.00	Pass
		38	37	22.86	22.83	22.89	33.00	Pass
		75	0	22.85	22.92	22.96	33.00	Pass
	16QAM	1	0	22.91	22.58	22.71	33.00	Pass
		1	38	23.18	22.90	23.03	33.00	Pass
		1	74	22.75	22.54	22.67	33.00	Pass



EIRP Power dBm								
Band	LTE Band 7			Channel/Frequency (MHz)				
Bandwidth	Modulation	RB size	RB offset	20850/2510.0	21100/2535.0	21350/2560.0	Limit	Result
20MHz	QPSK	1	0	23.57	23.61	23.52	33.00	Pass
		1	49	23.90	23.83	23.92	33.00	Pass
		1	99	23.52	23.43	23.59	33.00	Pass
		50	0	22.60	22.76	22.88	33.00	Pass
		50	25	22.77	22.70	22.84	33.00	Pass
		50	50	22.57	22.76	22.68	33.00	Pass
		100	0	22.65	22.75	22.81	33.00	Pass
	16QAM	1	0	22.55	22.49	22.67	33.00	Pass
		1	49	22.85	22.81	22.98	33.00	Pass
		1	99	22.37	22.48	22.66	33.00	Pass

Note: Measurement Uncertainty: ± 2.6 dB.



5.8. Radiated Out of Band Emissions

5.8.1. Limit

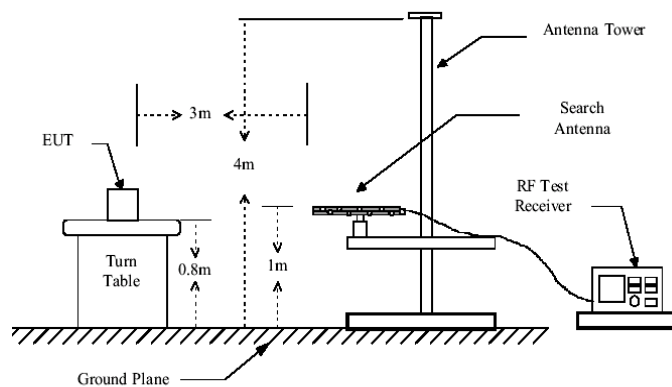
According to FCC section 22.917(a) and section 24.238(a), 27.53(g) the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power

(P) by a factor of at least $43 + 10 \cdot \log(P)$ dB. This calculated to be -13dBm.

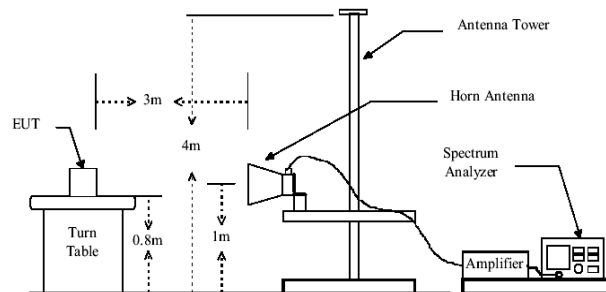
The spurious emission with frequency band 1900 according to FCC section 2.1057.

5.8.2. Test Setup

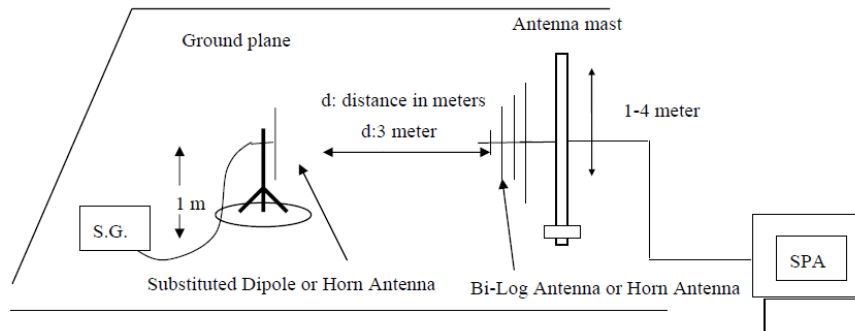
Below 1GHz



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.

$EIRP \text{ (Level)} = S.G. \text{ output (dBm)} + \text{Antenna Gain(dBi)} - \text{Cable Loss (dB)}$

Note: Measurement Uncertainty: $\pm 3.6 \text{ dB}$.

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 2 1.4MHz Lowest	87.15	Vertical	-75.39	3.35	0.38	-72.42	-13	PASS
	3701.40	Vertical	-45.74	7.76	3.75	-41.73		
	5552.10	Vertical	-47.57	9.84	4.94	-42.67		
	7402.80	Vertical	-39.37	10.21	5.32	-34.48		
	9253.50	Vertical	-42.13	11.36	6.02	-36.79		
	11104.20	Vertical	-44.77	14.52	6.68	-36.93		
LTE BAND 2 1.4MHz Middle	88.27	Vertical	-75.49	3.35	0.38	-72.52	-13	PASS
	3760.00	Vertical	-47.76	7.76	3.75	-43.75		
	5640.00	Vertical	-46.55	9.84	4.94	-41.65		
	7520.00	Vertical	-42.27	10.21	5.32	-37.38		
	9400.00	Vertical	-41.66	11.36	6.02	-36.32		
	11280.00	Vertical	-45.28	14.52	6.68	-37.44		
LTE BAND 2 1.4MHz Highest	88.21	Vertical	-75.07	3.35	0.38	-72.10	-13	PASS
	3819.60	Vertical	-46.58	7.79	3.53	-42.32		
	5729.40	Vertical	-41.31	9.88	5.02	-36.45		
	7639.20	Vertical	-37.47	10.25	5.54	-32.76		
	9549.00	Vertical	-44.20	11.38	6.16	-38.98		
	11458.80	Vertical	-46.58	14.56	6.72	-38.74		
LTE BAND 2 3MHz Lowest	87.33	Vertical	-75.07	3.35	0.38	-72.10	-13	PASS
	3700.40	Vertical	-45.77	7.76	3.75	-41.76		
	5550.60	Vertical	-46.16	9.84	4.94	-41.26		
	7400.80	Vertical	-39.18	10.21	5.32	-34.29		
	9251.00	Vertical	-42.05	11.36	6.02	-36.71		
	11101.20	Vertical	-44.60	14.52	6.68	-36.76		
LTE BAND 2 3MHz Middle	88.32	Vertical	-74.50	3.35	0.38	-71.53	-13	PASS
	3760.00	Vertical	-47.32	7.76	3.75	-43.31		
	5640.00	Vertical	-46.55	9.84	4.94	-41.65		
	7520.00	Vertical	-42.44	10.21	5.32	-37.55		
	9400.00	Vertical	-41.29	11.36	6.02	-35.95		
	11280.00	Vertical	-45.66	14.52	6.68	-37.82		
LTE BAND 2 3MHz Highest	88.45	Vertical	-74.23	3.35	0.38	-71.26	-13	PASS
	3819.60	Vertical	-46.56	7.79	3.53	-42.30		
	5729.40	Vertical	-41.77	9.88	5.02	-36.91		
	7639.20	Vertical	-37.29	10.25	5.54	-32.58		
	9549.00	Vertical	-44.44	11.38	6.16	-39.22		
	11458.80	Vertical	-46.88	14.56	6.72	-39.04		





Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Level (dBm)		
LTE BAND 2 5MHz Lowest	87.54	Vertical	-74.28	3.35	0.38	-71.31	-13	PASS
	3700.40	Vertical	-45.28	7.76	3.75	-41.27		
	5550.60	Vertical	-46.77	9.84	4.94	-41.87		
	7400.80	Vertical	-39.29	10.21	5.32	-34.40		
	9251.00	Vertical	-42.33	11.36	6.02	-36.99		
	11101.20	Vertical	-44.55	14.52	6.68	-36.71		
LTE BAND 2 5MHz Middle	88.76	Vertical	-74.39	3.35	0.38	-71.42	-13	PASS
	3760.00	Vertical	-47.55	7.76	3.75	-43.54		
	5640.00	Vertical	-46.44	9.84	4.94	-41.54		
	7520.00	Vertical	-42.28	10.21	5.32	-37.39		
	9400.00	Vertical	-41.34	11.36	6.02	-36.00		
	11280.00	Vertical	-45.77	14.52	6.68	-37.93		
LTE BAND 2 5MHz Highest	88.56	Vertical	-74.23	3.35	0.38	-71.26	-13	PASS
	3819.60	Vertical	-46.07	7.79	3.53	-41.81		
	5729.40	Vertical	-41.48	9.88	5.02	-36.62		
	7639.20	Vertical	-37.56	10.25	5.54	-32.85		
	9549.00	Vertical	-44.09	11.38	6.16	-38.87		
	11458.80	Vertical	-46.18	14.56	6.72	-38.34		
LTE BAND 2 10MHz Lowest	87.23	Vertical	-74.39	3.35	0.38	-71.42	-13	PASS
	3700.40	Vertical	-45.13	7.76	3.75	-41.12		
	5550.60	Vertical	-46.45	9.84	4.94	-41.55		
	7400.80	Vertical	-39.37	10.21	5.32	-34.48		
	9251.00	Vertical	-42.70	11.36	6.02	-37.36		
	11101.20	Vertical	-44.45	14.52	6.68	-36.61		
LTE BAND 2 10MHz Middle	88.56	Vertical	-74.32	3.35	0.38	-71.35	-13	PASS
	3760.00	Vertical	-47.76	7.76	3.75	-43.75		
	5640.00	Vertical	-46.56	9.84	4.94	-41.66		
	7520.00	Vertical	-42.38	10.21	5.32	-37.49		
	9400.00	Vertical	-41.15	11.36	6.02	-35.81		
	11280.00	Vertical	-45.45	14.52	6.68	-37.61		
LTE BAND 2 10MHz Highest	88.54	Vertical	-74.01	3.35	0.38	-71.04	-13	PASS
	3819.60	Vertical	-46.45	7.79	3.53	-42.19		
	5729.40	Vertical	-41.31	9.88	5.02	-36.45		
	7639.20	Vertical	-37.45	10.25	5.54	-32.74		
	9549.00	Vertical	-44.55	11.38	6.16	-39.33		
	11458.80	Vertical	-46.70	14.56	6.72	-38.86		



Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Level (dBm)		
LTE BAND 2 15MHz Lowest	87.41	Vertical	-74.08	3.35	0.38	-71.11	-13	PASS
	3700.40	Vertical	-45.55	7.76	3.75	-41.54		
	5550.60	Vertical	-46.44	9.84	4.94	-41.54		
	7400.80	Vertical	-39.39	10.21	5.32	-34.50		
	9251.00	Vertical	-42.44	11.36	6.02	-37.10		
	11101.20	Vertical	-44.25	14.52	6.68	-36.41		
LTE BAND 2 15MHz Middle	88.14	Vertical	-74.12	3.35	0.38	-71.15	-13	PASS
	3760.00	Vertical	-46.33	7.76	3.75	-42.32		
	5640.00	Vertical	-46.28	9.84	4.94	-41.38		
	7520.00	Vertical	-42.13	10.21	5.32	-37.24		
	9400.00	Vertical	-41.49	11.36	6.02	-36.15		
	11280.00	Vertical	-45.33	14.52	6.68	-37.49		
LTE BAND 2 15MHz Highest	88.62	Vertical	-74.50	3.35	0.38	-71.53	-13	PASS
	3819.60	Vertical	-46.67	7.79	3.53	-42.41		
	5729.40	Vertical	-41.76	9.88	5.02	-36.90		
	7639.20	Vertical	-37.14	10.25	5.54	-32.43		
	9549.00	Vertical	-44.35	11.38	6.16	-39.13		
	11458.80	Vertical	-46.06	14.56	6.72	-38.22		
LTE BAND 2 20MHz Lowest	87.53	Vertical	-74.39	3.35	0.38	-71.42	-13	PASS
	3700.40	Vertical	-45.55	7.76	3.75	-41.54		
	5550.60	Vertical	-46.30	9.84	4.94	-41.40		
	7400.80	Vertical	-39.34	10.21	5.32	-34.45		
	9251.00	Vertical	-42.28	11.36	6.02	-36.94		
	11101.20	Vertical	-44.13	14.52	6.68	-36.29		
LTE BAND 2 20MHz Middle	88.65	Vertical	-74.72	3.35	0.38	-71.75	-13	PASS
	3760.00	Vertical	-46.24	7.76	3.75	-42.23		
	5640.00	Vertical	-46.33	9.84	4.94	-41.43		
	7520.00	Vertical	-42.30	10.21	5.32	-37.41		
	9400.00	Vertical	-41.76	11.36	6.02	-36.42		
	11280.00	Vertical	-45.77	14.52	6.68	-37.93		
LTE BAND 2 20MHz Highest	88.34	Vertical	-74.39	3.35	0.38	-71.42	-13	PASS
	3819.60	Vertical	-46.24	7.79	3.53	-41.98		
	5729.40	Vertical	-41.34	9.88	5.02	-36.48		
	7639.20	Vertical	-37.45	10.25	5.54	-32.74		
	9549.00	Vertical	-44.28	11.38	6.16	-39.06		
	11458.80	Vertical	-46.66	14.56	6.72	-38.82		



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	87.45	Vertical	-74.08	3.35	0.38	-71.11	-13	PASS
	3700.40	Vertical	-45.28	7.76	3.75	-41.27		
	5550.60	Vertical	-46.77	9.84	4.94	-41.87		
	7400.80	Vertical	-39.07	10.21	5.32	-34.18		
	9251.00	Vertical	-42.38	11.36	6.02	-37.04		
	11101.20	Vertical	-44.26	14.52	6.68	-36.42		
LTE BAND 5 1.4MHz Middle	88.21	Vertical	-74.50	3.35	0.38	-71.53	-13	PASS
	3760.00	Vertical	-47.79	7.76	3.75	-43.78		
	5640.00	Vertical	-46.33	9.84	4.94	-41.43		
	7520.00	Vertical	-42.38	10.21	5.32	-37.49		
	9400.00	Vertical	-41.66	11.36	6.02	-36.32		
	11280.00	Vertical	-45.38	14.52	6.68	-37.54		
LTE BAND 5 1.4MHz Highest	88.77	Vertical	-74.39	3.35	0.38	-71.42	-13	PASS
	3819.60	Vertical	-46.17	7.79	3.53	-41.91		
	5729.40	Vertical	-41.56	9.88	5.02	-36.70		
	7639.20	Vertical	-37.61	10.25	5.54	-32.90		
	9549.00	Vertical	-44.33	11.38	6.16	-39.11		
	11458.80	Vertical	-46.55	14.56	6.72	-38.71		
LTE BAND 5 3MHz Lowest	87.98	Vertical	-74.39	3.35	0.38	-71.42	-13	PASS
	3700.40	Vertical	-45.66	7.76	3.75	-41.65		
	5550.60	Vertical	-46.38	9.84	4.94	-41.48		
	7400.80	Vertical	-39.14	10.21	5.32	-34.25		
	9251.00	Vertical	-42.77	11.36	6.02	-37.43		
	11101.20	Vertical	-44.35	14.52	6.68	-36.51		
LTE BAND 5 3MHz Middle	88.78	Vertical	-75.11	3.35	0.38	-72.14	-13	PASS
	3760.00	Vertical	-47.18	7.76	3.75	-43.17		
	5640.00	Vertical	-46.37	9.84	4.94	-41.47		
	7520.00	Vertical	-42.15	10.21	5.32	-37.26		
	9400.00	Vertical	-41.20	11.36	6.02	-35.86		
	11280.00	Vertical	-45.57	14.52	6.68	-37.73		
LTE BAND 5 3MHz Highest	88.67	Vertical	-74.08	3.35	0.38	-71.11	-13	PASS
	3819.60	Vertical	-46.55	7.79	3.53	-42.29		
	5729.40	Vertical	-41.18	9.88	5.02	-36.32		
	7639.20	Vertical	-37.66	10.25	5.54	-32.95		
	9549.00	Vertical	-44.60	11.38	6.16	-39.38		
	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 5 5MHz Lowest	87.66	Vertical	-74.45	3.35	0.38	-71.48	-13	PASS
	3700.40	Vertical	-45.17	7.76	3.75	-41.16		
	5550.60	Vertical	-46.75	9.84	4.94	-41.85		
	7400.80	Vertical	-39.57	10.21	5.32	-34.68		
	9251.00	Vertical	-42.77	11.36	6.02	-37.43		
	11101.20	Vertical	-44.28	14.52	6.68	-36.44		
LTE BAND 5 5MHz Middle	88.32	Vertical	-74.71	3.35	0.38	-71.74	-13	PASS
	3760.00	Vertical	-46.77	7.76	3.75	-42.76		
	5640.00	Vertical	-46.50	9.84	4.94	-41.60		
	7520.00	Vertical	-42.33	10.21	5.32	-37.44		
	9400.00	Vertical	-41.36	11.36	6.02	-36.02		
	11280.00	Vertical	-45.44	14.52	6.68	-37.60		
LTE BAND 5 5MHz Highest	88.32	Vertical	-74.10	3.35	0.38	-71.13	-13	PASS
	3819.60	Vertical	-46.66	7.79	3.53	-42.40		
	5729.40	Vertical	-41.14	9.88	5.02	-36.28		
	7639.20	Vertical	-37.46	10.25	5.54	-32.75		
	9549.00	Vertical	-44.17	11.38	6.16	-38.95		
	11458.80	Vertical	-46.35	14.56	6.72	-38.51		
LTE BAND 5 10MHz Lowest	87.23	Vertical	-74.72	3.35	0.38	-71.75	-13	PASS
	3700.40	Vertical	-45.33	7.76	3.75	-41.32		
	5550.60	Vertical	-46.48	9.84	4.94	-41.58		
	7400.80	Vertical	-39.58	10.21	5.32	-34.69		
	9251.00	Vertical	-42.59	11.36	6.02	-37.25		
	11101.20	Vertical	-44.38	14.52	6.68	-36.54		
LTE BAND 5 10MHz Middle	88.21	Vertical	-74.21	3.35	0.38	-71.24	-13	PASS
	3760.00	Vertical	-46.44	7.76	3.75	-42.43		
	5640.00	Vertical	-46.45	9.84	4.94	-41.55		
	7520.00	Vertical	-42.26	10.21	5.32	-37.37		
	9400.00	Vertical	-41.07	11.36	6.02	-35.73		
	11280.00	Vertical	-45.55	14.52	6.68	-37.71		
LTE BAND 5 10MHz Highest	88.15	Vertical	-74.61	3.35	0.38	-71.64	-13	PASS
	3819.60	Vertical	-46.44	7.79	3.53	-42.18		
	5729.40	Vertical	-41.56	9.88	5.02	-36.70		
	7639.20	Vertical	-37.47	10.25	5.54	-32.76		
	9549.00	Vertical	-44.43	11.38	6.16	-39.21		
	11458.80	Vertical	-46.19	14.56	6.72	-38.35		



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	-74.39	3.35	0.38	-71.42	-13	PASS
	5005.00	Vertical	-45.28	7.76	3.75	-41.27		
	7507.50	Vertical	-46.46	9.84	4.94	-41.56		
	10010.00	Vertical	-39.14	10.21	5.32	-34.25		
	12512.50	Vertical	-42.05	11.36	6.02	-36.71		
	15015.00	Vertical	-44.10	14.52	6.68	-36.26		
LTE BAND 7 5MHz Middle	87.87	Vertical	-74.22	3.35	0.38	-71.25	-13	PASS
	5070.00	Vertical	-46.45	7.76	3.75	-42.44		
	7605.00	Vertical	-46.29	9.84	4.94	-41.39		
	10140.00	Vertical	-42.18	10.21	5.32	-37.29		
	12675.00	Vertical	-41.45	11.36	6.02	-36.11		
	15210.00	Vertical	-45.35	14.52	6.68	-37.51		
LTE BAND 7 5MHz Highest	88.87	Vertical	-74.45	3.35	0.38	-71.48	-13	PASS
	5135.00	Vertical	-46.55	7.79	3.53	-42.29		
	7702.50	Vertical	-41.41	9.88	5.02	-36.55		
	10270.00	Vertical	-37.34	10.25	5.54	-32.63		
	12837.50	Vertical	-44.15	11.38	6.16	-38.93		
	15405.00	Vertical	-46.59	14.56	6.72	-38.75		
LTE BAND 7 10MHz Lowest	87.53	Vertical	-73.10	3.35	0.38	-70.13	-13	PASS
	5010.00	Vertical	-45.26	7.76	3.75	-41.25		
	7515.00	Vertical	-46.44	9.84	4.94	-41.54		
	10020.00	Vertical	-38.56	10.21	5.32	-33.67		
	12525.00	Vertical	-42.36	11.36	6.02	-37.02		
	15030.00	Vertical	-43.10	14.52	6.68	-35.26		
LTE BAND 7 10MHz Middle	88.23	Vertical	-74.40	3.35	0.38	-71.43	-13	PASS
	5070.00	Vertical	-46.44	7.76	3.75	-42.43		
	7605.00	Vertical	-46.55	9.84	4.94	-41.65		
	10140.00	Vertical	-42.36	10.21	5.32	-37.47		
	12675.00	Vertical	-41.21	11.36	6.02	-35.87		
	15210.00	Vertical	-45.56	14.52	6.68	-37.72		
LTE BAND 7 10MHz Highest	88.23	Vertical	-74.53	3.35	0.38	-71.56	-13	PASS
	5130.00	Vertical	-46.13	7.79	3.53	-41.87		
	7695.00	Vertical	-41.56	9.88	5.02	-36.70		
	10260.00	Vertical	-37.78	10.25	5.54	-33.07		
	12825.00	Vertical	-44.76	11.38	6.16	-39.54		
	15390.00	Vertical	-46.28	14.56	6.72	-38.44		



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	-74.22	3.35	0.38	-71.25	-13	PASS
	5015.00	Vertical	-45.40	7.76	3.75	-41.39		
	7522.50	Vertical	-46.33	9.84	4.94	-41.43		
	10030.00	Vertical	-39.39	10.21	5.32	-34.50		
	12537.50	Vertical	-42.14	11.36	6.02	-36.80		
	15045.00	Vertical	-43.77	14.52	6.68	-35.93		
LTE BAND 7 15MHz Middle	88.87	Vertical	-74.40	3.35	0.38	-71.43	-13	PASS
	5070.00	Vertical	-46.17	7.76	3.75	-42.16		
	7605.00	Vertical	-46.25	9.84	4.94	-41.35		
	10140.00	Vertical	-42.59	10.21	5.32	-37.70		
	12675.00	Vertical	-41.45	11.36	6.02	-36.11		
	15210.00	Vertical	-45.58	14.52	6.68	-37.74		
LTE BAND 7 15MHz Highest	88.29	Vertical	-74.28	3.35	0.38	-71.31	-13	PASS
	5125.00	Vertical	-46.17	7.79	3.53	-41.91		
	7687.50	Vertical	-40.26	9.88	5.02	-35.40		
	10250.00	Vertical	-37.37	10.25	5.54	-32.66		
	12812.50	Vertical	-43.20	11.38	6.16	-37.98		
	15375.00	Vertical	-46.56	14.56	6.72	-38.72		
LTE BAND 7 20MHz Lowest	87.81	Vertical	-74.12	3.35	0.38	-71.15	-13	PASS
	5020.00	Vertical	-45.28	7.76	3.75	-41.27		
	7530.00	Vertical	-46.33	9.84	4.94	-41.43		
	10040.00	Vertical	-39.45	10.21	5.32	-34.56		
	12550.00	Vertical	-42.28	11.36	6.02	-36.94		
	15060.00	Vertical	-43.46	14.52	6.68	-35.62		
LTE BAND 7 20MHz Middle	88.56	Vertical	-74.14	3.35	0.38	-71.17	-13	PASS
	5070.00	Vertical	-46.46	7.76	3.75	-42.45		
	7605.00	Vertical	-46.55	9.84	4.94	-41.65		
	10140.00	Vertical	-42.17	10.21	5.32	-37.28		
	12675.00	Vertical	-41.90	11.36	6.02	-36.56		
	15210.00	Vertical	-45.33	14.52	6.68	-37.49		
LTE BAND 7 20MHz Highest	88.22	Vertical	-75.22	3.35	0.38	-72.25	-13	PASS
	5120.00	Vertical	-44.14	7.79	3.53	-39.88		
	7680.00	Vertical	-42.75	9.88	5.02	-37.89		
	10240.00	Vertical	-36.27	10.25	5.54	-31.56		
	12800.00	Vertical	-43.77	11.38	6.16	-38.55		
	15360.00	Vertical	-45.45	14.56	6.72	-37.61		



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 *****