



FCC Test Report

FCC ID: 2BD2Q-CUSTOS

Applicant: Vernte Technologies

Address: 5214 Diamond heights Blvd, San Francisco, California, USA (94131)

Manufacturer: Zhongshan Saier Intelligent Technology Co., Ltd

Address: Area A, Floor 4, NO.1 Factory Building, NO.77 Huanzhou North Road, Tanzhou Town, Zhongshan City, Guangdong, China

EUT: Custos Smart Headphones

Trade Mark: Vernte

Model Number: Custos

Date of Receipt: Jan. 14, 2024

Test Date: Jan. 14, 2024 - Jan. 28, 2024

Date of Report: Jan. 28, 2024

Prepared By: Shenzhen DL Testing Technology Co., Ltd.

Address: 101-201, Building C, Shuanghuan, No.8, Baoqing Road, Baolong Industrial Zone, Baolong Street, Longgang District, Shenzhen, Guangdong, 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 v03r01
ANSI C63.26:2015

Test Result: Pass

Report Number: DL-20240128005E

Prepared (Test Engineer): Pxing Huang

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.

**TABLE OF CONTENTS**

Test Report Declaration	Page
1. TEST SUMMARY	3
2. GENERAL PRODUCT INFORMATION	4
2.1. Description of Device (EUT)	4
2.2. Product Function.....	4
2.3. Independent Operation Modes.....	5
3. TEST SITES	6
3.1. Test Facilities	6
3.2. Measurement Uncertainty	6
3.3. List of Test and Measurement Instruments	7
4. TEST SET-UP	8
4.1. Principle of Configuration Selection.....	8
4.2. Block Diagram of Test Set-up.....	8
4.3. Test Environment:	8
5. EMISSION TEST RESULTS.....	9
5.1. Conducted RF Output Power.....	9
5.2. -26dB and 99% Occupied Bandwidth.....	17
5.3. Peak to Average Ratio.....	18
5.4. Frequency Stability.....	19
5.5. Conducted Spurious Emissions	29
5.6. Conducted Out of Band Emissions.....	31
5.7. Transmitter Radiated Power (EIRP/ERP)	33
5.8. Radiated Out of Band Emissions	43
6. PHOTOGRAPHS OF TEST SET-UP	59
7. PHOTOGRAPHS OF THE EUT	59

**1. TEST SUMMARY**

Test Items	Test Requirement	Result
Peak to Average Ratio	2.1046 24.232 (band 2) 22.913 (band 5) 27.50(d) (band 7, band 12, band 17)	PASS
99% & -26 dB Occupied Bandwidth	2.1049	PASS
Frequency Stability	2.1055 22.355(band 5) 24.235 (band 2) 27.54 (band 4, band 7, band 12, band 17)	PASS
Conducted Out of Band Emissions	2.1051,2.1057 22.917 (band 5) 24.238(band 2) 27.53(m) (band 7) 27.53(g) (band 12) 27.53(c) (band 17)	PASS
Band Edge	2.1051,2.1057 22.917 (band 5) 24.238(band 2) 27.53(m) (band 7) 27.53(g) (band 12) 27.53(c) (band 17)	PASS
Transmitter Radiated Power (EIPR/ERP)	2.1046 24.232 (band 2) 22.913 (band 5) 27.50(h) (band 7) 27.50(c) (band 12) 27.50(b) (band 17)	PASS
Radiated Out of Band Emissions	2.1051,2.1057 22.917 (band 5) 24.238(band 2) 27.53(m) (band 7) 27.53(g) (band 12) 27.53(c) (band 17)	PASS



2. GENERAL PRODUCT INFORMATION

2.1. Description of Device (EUT)

Product Name:	Custos Smart Headphones
Trademark	Vernte
Model No.:	Custos
Test Model:	Custos
Model Difference	N/A
Operation Frequency:	GSM 850: Tx: 824.20 - 848.80MHz; Rx: 869.20 - 893.80MHz GSM1900: Tx: 1850.20 - 1909.80MHz; Rx: 1930.20 - 1989.80MHz WCDMA Band 2: Tx: 1850.00 - 1910.00MHz; Rx: 1930.00 - 1990.00MHz WCDMA Band 5: Tx: 824.00 - 849.00MHz; Rx: 869.00 - 894.00MHz 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 LTE Band 12: Tx: 699.00 - 716.00MHz; Rx: 729.00 - 746.00MHz LTE Band 17: Tx: 704.00 - 716.00MHz; Rx: 734.00 - 746.00MHz
Modulation technology:	GSM/GPRS Mode with GMSK, EDGE Mode with 8PSK Modulation WCDMA Mode with BPSK Modulation HSDPA Mode with QPSK, 16QAM Modulation HSUPA Mode with QPSK, 16QAM Modulation LTE Mode with QPSK, 16QAM
Antenna Type:	Internal Antenna
Antenna gain:	GSM850: 0.7dBi, GSM1900: 1.2dBi, WCDMA Band 2: 1.2dBi WCDMA Band 4: 1.0dBi, WCDMA Band 5: 0.7dBi LTE Band 2: 1.2dBi, LTE Band 5: 0.7dBi, LTE Band 7: 1.6dBi, LTE Band 12: 0.6dBi, LTE Band 17: 0.6dBi
Power supply:	DC 3.7V from battery DC 5V from charger
LTE Category	4
Hardware Version	---
Software Version	---

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
GSM	GSM/GPRS/EGPRS	GSM/GPRS/EGPRS
WCDMA	RMC/ HSDPA/ HSUPA	RMC/ HSDPA/ HSUPA
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%
LTE Band12	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 Band17	Bandwidth:(MHz) 5/10MHz Modulation: QPSK/16QAM RB:1/50%/100%	Bandwidth:(MHz) 5/10MHz Modulation: QPSK/16QAM RB:1/50%/100%

Test Channel(MHz)			
Band	Low	Middle	High
GSM850	824.20	836.60	848.80
GSM1900	1850.20	1880.00	1909.80
WCDMA Band 2	1852.4	1880	1907.6
WCDMA Band 5	826.4	836.6	846.6
LTE Band 2	1850.7	1880	1909.3
LTE Band 5	824.7	836.5	848.3
LTE Band 7	2502.5	2535	2567.5
LTE Band12	699.7	707.5	715.3
LTE Band17	706.5	708	713.5

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. TEST SITES

3.1. Test Facilities

Site Description

Name of Firm : Shenzhen DL Testing Technology Co., Ltd.
101-201, Building C, Shuanghuan, No.8, Baoqing Road, Baolong
Site Location : Industrial Zone, Baolong Street, Longgang District, Shenzhen,
Guangdong, 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	$\pm 2\%$
8	Bandwidth	$\pm 0.2\text{MHz}$
9	Frequency Stability	$\pm 0.02\text{MHz}$



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	Sep. 20, 2022	Sep. 19, 2025
EMI Receiver	R&S	ESR	101421	Nov. 05, 2023	Nov. 04, 2024
LISN	R&S	ENV216	102417	Nov. 05, 2023	Nov. 04, 2024
843 Cable 1#	ChengYu	CE Cable	001	Nov. 05, 2023	Nov. 04, 2024
843 Cable 1#	FUJIKURA	843C1#	001	Nov. 05, 2023	Nov. 04, 2024

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. 05, 2023	Nov. 04, 2024
Test Receiver (9kHz-7GHz)	R&S	ESRP7	101393	Nov. 05, 2023	Nov. 04, 2024
Bilog Antenna (30MHz-1GHz)	R&S	VULB9162	00306	Nov. 05, 2023	Nov. 04, 2024
Horn Antenna (1GHz-18GHz)	Schwarzbeck	BBHA9120D	02139	Nov. 05, 2023	Nov. 04, 2024
Horn Antenna (18GHz-40GHz)	A.H. Systems	SAS-574	588	Nov. 05, 2023	Nov. 04, 2024
Amplifier (9KHz-6GHz)	Schwarzbeck	BBV9743B	00153	Nov. 05, 2023	Nov. 04, 2024
Amplifier (1GHz-18GHz)	EMEC	EM01G8GA	00270	Nov. 05, 2023	Nov. 04, 2024
Amplifier(18GHz-40GHz)	Quanjuda	DLE-161	97	Nov. 05, 2023	Nov. 04, 2024
Loop Antenna(9KHz-30MHz)	Schwarzbeck	FMZB1519B	00014	Nov. 05, 2023	Nov. 04, 2024
RF cables1 (9kHz-1GHz)	ChengYu	966	004	Nov. 05, 2023	Nov. 04, 2024
RF cables2 (1GHz-40GHz)	ChengYu	966	003	Nov. 05, 2023	Nov. 04, 2024
Antenna connector	Florida RF Labs	N/A	RF 01#	Nov. 05, 2023	Nov. 04, 2024
Power probe	KEYSIGHT	U2021XA	MY55210018	Nov. 05, 2023	Nov. 04, 2024
Signal Analyzer	Agilent	N9020A	MY55370280	Nov. 05, 2023	Nov. 04, 2024
Test Receiver	R&S	ESU 40	100376	Nov. 05, 2023	Nov. 04, 2024
D.C. Power Supply	LongWei	PS-305D	010964729	Nov. 05, 2023	Nov. 04, 2024
Signal Amplifier	DAZE	ZN3380B	11235	Nov. 05, 2023	Nov. 04, 2024
High Pass filter	KANGMAI	WHKX1.0/1.5G-10SS	40	Nov. 05, 2023	Nov. 04, 2024
Filter	COM-MW	ZBSF-C836.5-25-X	BCTC042	Nov. 05, 2023	Nov. 04, 2024
Filter	COM-MW	ZBSF-C1747.5-75-X2	BCTC045	Nov. 05, 2023	Nov. 04, 2024
Filter	COM-MW	ZBSF-C1880-60-X2	BCTC047	Nov. 05, 2023	Nov. 04, 2024
Splitter	Agilent	11435B	1125162	Nov. 05, 2023	Nov. 04, 2024
RF CONDUCTED TEST					
System Simulator	Agilent	E5515C	GB43130252	Nov. 05, 2023	Nov. 04, 2024
Spectrum Analyzer	Agilent	N9020A	MY45108040	Nov. 05, 2023	Nov. 04, 2024
DC Power Supply	LongWei	PS-305D	010965682	Nov. 05, 2023	Nov. 04, 2024
Constant temperature and humidity box	GF	GTH-800-40-2P	MAA9906-012	Nov. 05, 2023	Nov. 04, 2024
Universal radio communication tester	R&S	CMW500	115295	Nov. 05, 2023	Nov. 04, 2024



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), 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 § 2.1033(c)(8). The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

FCC part 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.

FCC part 22.913(a) (5), The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

FCC part 27.50 (b) (10), Portable stations (hand-held devices) transmitting in the 746–757 MHz, 776–788 MHz, and 805–806 MHz bands are limited to 3 watts ERP.

FCC part 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.

FCC part 27.50 (d) (4), Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band and mobile and portable stations operating in the 1695–1710 MHz and 1755–1780 MHz bands are limited to 1 watt EIRP. Fixed stations operating in the 1710–1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

FCC part 27.50(h) (2), for BRS and EBS: 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.

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 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.

5.1.3. 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(dBm)						
Band	GSM850			PCS1900		
Channel	128	190	251	512	661	810
Frequency	824.20	836.60	848.80	1850.20	1880.00	1909.80
GSM	32.91	32.95	32.94	30.09	30.83	30.28
GPRS (GMSK, 1 TX slot)	32.96	33.02	32.97	30.05	30.77	30.29
GPRS (GMSK, 2 TX slot)	32.05	32.12	32.07	29.47	29.18	28.79
GPRS (GMSK, 3 TX slot)	29.70	29.80	29.66	27.50	27.15	27.07
GPRS (GMSK, 4 TX slot)	28.42	28.48	28.26	26.32	25.98	26.02
EGPRS(8PSK, 1 TX slot)	32.93	32.99	33.06	30.01	29.89	29.44
EGPRS(8PSK, 2 TX slot)	32.86	32.91	32.93	29.92	29.80	29.27
EGPRS(8PSK, 3 TX slot)	31.51	31.16	31.39	29.60	29.51	28.93
EGPRS(8PSK, 4 TX slot)	28.24	28.59	28.18	29.35	29.22	28.64

Average Conducted Power(dBm)						
Band	WCDMA Band 2			WCDMA Band 5		
Frequency	1852.4	1880.0	1907.6	826.4	836.6	846.6
RMC 12.2Kbps	22.18	22.26	22.37	22.81	22.88	22.38
RMC 64kbps	21.90	21.79	22.97	21.60	21.98	21.37
RMC 144kbps	22.70	20.89	21.40	21.81	21.95	21.60
RMC 384kbps	20.44	22.38	20.86	21.91	26.76	22.81
HSDPA Subtest-1	22.25	22.35	22.41	21.82	21.67	22.15
HSDPA Subtest-2	21.76	21.83	22.02	21.37	20.67	21.47
HSDPA Subtest-3	20.46	20.90	20.55	22.15	22.40	21.43
HSDPA Subtest-4	20.66	20.90	20.90	22.26	22.06	22.42
HSUPA Subtest-1	20.66	22.09	22.13	22.55	23.72	22.77
HSUPA Subtest-2	22.09	22.26	22.36	21.53	21.79	21.65
HSUPA Subtest-3	20.46	20.97	20.95	21.51	22.57	21.80
HSUPA Subtest-4	22.23	22.30	22.39	22.71	21.89	21.30
HSUPA Subtest-5	20.55	21.69	21.93	21.86	21.21	22.29



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	22.08	22.40	22.53
		1	2	22.28	22.57	22.68
		1	5	22.08	22.37	22.49
		6	0	20.83	21.07	21.19
	16QAM	1	0	20.83	21.41	21.01
		1	2	21.00	21.59	21.19
		1	5	20.79	21.43	20.95
		6	0	19.75	19.91	20.07
Bandwidth	Modulation	RB size	RB offset	18615/1851.5	18900/1880	19185/1908.5
3MHz	QPSK	1	0	22.24	22.42	22.53
		1	7	22.60	22.78	23.06
		1	14	22.24	22.42	22.58
		15	0	20.85	21.05	21.19
	16QAM	1	0	21.13	21.19	21.57
		1	7	21.64	21.60	21.92
		1	14	21.21	21.19	21.49
		15	0	19.40	19.66	19.98
Bandwidth	Modulation	RB size	RB offset	18625/1852.5	18900/1880	19175/1907.5
5MHz	QPSK	1	0	21.77	22.01	22.21
		1	13	22.32	22.50	22.76
		1	24	21.88	22.02	22.18
		25	0	20.59	20.83	20.93
	16QAM	1	0	20.87	20.92	20.97
		1	13	21.41	21.47	21.52
		1	24	21.01	20.92	20.95
		25	0	19.39	19.51	19.64



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	21.84	22.06	22.33
		1	25	22.12	22.29	22.42
		1	49	21.95	22.14	22.22
		50	0	20.72	20.84	20.91
	16QAM	1	0	20.81	20.80	21.32
		1	25	21.05	21.04	21.41
		1	49	20.96	20.93	21.19
		50	0	19.44	19.59	19.64
Bandwidth	Modulation	RB size	RB offset	18675/1857.5	18900/1880	19125/1902.5
15MHz	QPSK	1	0	21.79	21.96	22.32
		1	38	22.25	22.45	22.62
		1	74	21.96	22.09	22.20
		75	0	20.73	20.87	20.91
	16QAM	1	0	20.69	20.79	20.97
		1	38	21.23	21.36	21.43
		1	74	20.87	20.83	20.77
		75	0	19.46	19.54	19.64
Bandwidth	Modulation	RB size	RB offset	18700/1860	18900/1880	19100/1900
20MHz	QPSK	1	0	21.55	21.80	21.96
		1	38	22.17	22.29	22.54
		1	74	21.71	21.87	21.95
		75	0	20.71	20.71	20.87
	16QAM	1	0	20.43	20.60	20.69
		1	38	21.08	21.00	21.24
		1	74	20.65	20.62	20.65
		75	0	19.44	19.44	19.66

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	22.32	22.54	22.48
		1	2	22.64	22.68	22.57
		1	5	22.34	22.40	22.44
		6	0	21.20	21.16	21.17
	16QAM	1	0	21.17	21.55	20.95
		1	2	21.33	21.71	21.09
		1	5	21.11	21.51	20.91
		6	0	20.11	20.00	19.95
Bandwidth	Modulation	RB size	RB offset	20415/825.5	20525/836.5	20635/847.5
3MHz	QPSK	1	0	22.48	22.45	22.56
		1	7	22.85	22.72	22.98
		1	14	22.38	22.40	22.53
		15	0	21.11	21.15	21.15
	16QAM	1	0	21.40	21.24	21.57
		1	7	21.79	21.61	21.89
		1	14	21.47	21.20	21.41
		15	0	19.68	19.71	19.90
Bandwidth	Modulation	RB size	RB offset	20425/826.5	20525/836.5	20625/846.5
5MHz	QPSK	1	0	22.34	22.37	22.49
		1	13	22.84	22.80	23.00
		1	24	22.37	22.36	22.42
		25	0	21.17	21.20	21.21
	16QAM	1	0	21.53	21.31	21.27
		1	13	21.96	22.13	21.83
		1	24	21.51	21.28	21.20
		25	0	19.84	19.84	19.92
Bandwidth	Modulation	RB size	RB offset	20450/829	20525/836.5	20600/844
10MHz	QPSK	1	0	22.40	22.48	22.48
		1	25	22.57	22.76	22.60
		1	49	22.37	22.50	22.42
		50	0	21.12	21.27	21.27
	16QAM	1	0	21.16	21.47	21.51
		1	25	21.35	21.76	21.56
		1	49	21.13	21.53	21.31
		50	0	19.87	19.99	20.04

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	22.34	22.11	22.16
		1	12	22.84	22.60	22.81
		1	24	22.38	22.05	22.23
		25	0	20.83	20.79	20.83
	16QAM	1	0	20.85	21.17	20.92
		1	12	21.52	21.65	21.61
		1	24	20.87	21.04	20.99
		25	0	19.33	19.33	19.28
Bandwidth	Modulation	RB size	RB offset	20800/2505.0	21100/2535.0	21400/2565.0
10MHz	QPSK	1	0	22.31	22.29	22.31
		1	24	22.50	22.41	22.51
		1	49	22.31	22.10	22.42
		50	0	20.87	20.83	20.90
	16QAM	1	0	21.08	20.89	21.17
		1	24	21.28	21.07	21.41
		1	49	21.08	20.65	21.23
		50	0	19.41	19.36	19.37
Bandwidth	Modulation	RB size	RB offset	20825/2507.5	21100/2535.0	21375/2562.5
15MHz	QPSK	1	0	22.19	22.17	22.10
		1	37	22.66	22.66	22.74
		1	74	22.17	21.86	22.32
		75	0	20.79	20.82	20.86
	16QAM	1	0	21.02	20.79	20.53
		1	37	21.75	21.23	21.34
		1	74	20.90	20.44	20.73
		75	0	19.25	19.22	19.36
Bandwidth	Modulation	RB size	RB offset	20850/2510.0	21100/2535.0	21350/2560.0
20MHz	QPSK	1	0	21.95	21.96	21.75
		1	25	22.50	22.47	22.51
		1	50	21.87	21.65	22.04
		100	0	20.74	20.71	20.74
	16QAM	1	0	20.73	20.53	20.34
		1	25	21.22	20.99	20.99
		1	50	20.65	20.23	20.52
		100	0	19.24	19.21	19.25

Note: Measurement Uncertainty: ± 2.6 dB.



Average Conducted Power						
Band	LTE Band 12			Channel/Frequency (MHz)		
Bandwidth	Modulation	RB size	RB offset	23017/699.1	23095/707.5	23173/715.3
1.4MHz	QPSK	1	0	22.56	22.21	22.33
		1	2	22.69	22.44	22.50
		1	5	22.52	22.23	22.26
		6	0	21.37	21.23	21.22
	16QAM	1	0	21.32	21.27	21.60
		1	2	21.47	21.42	21.68
		1	5	21.26	21.17	21.49
		6	0	20.37	20.37	20.19
Bandwidth	Modulation	RB size	RB offset	23025/700.5	23095/707.5	23165/714.5
3MHz	QPSK	1	0	22.56	22.31	22.34
		1	7	22.71	22.58	22.70
		1	14	22.44	22.28	22.43
		15	0	21.30	21.25	21.20
	16QAM	1	0	21.67	21.31	21.57
		1	7	21.96	21.60	21.91
		1	14	21.66	21.30	21.56
		15	0	20.14	20.04	20.16
Bandwidth	Modulation	RB size	RB offset	23035/701.5	23095/707.5	23155/713.5
5MHz	QPSK	1	0	22.44	22.19	22.32
		1	13	22.81	22.72	22.47
		1	24	22.34	22.20	22.29
		25	0	21.37	21.26	21.22
	16QAM	1	0	21.73	21.35	21.21
		1	13	22.17	21.83	21.68
		1	24	21.62	21.36	21.21
		25	0	20.26	20.12	20.07
Bandwidth	Modulation	RB size	RB offset	23060/704	23095/707.5	23130/711
10MHz	QPSK	1	0	22.40	22.30	22.36
		1	25	22.49	22.41	22.47
		1	49	22.30	22.27	22.36
		50	0	21.36	21.33	21.17
	16QAM	1	0	21.56	21.31	21.58
		1	25	21.70	21.43	21.70
		1	49	21.48	21.23	21.55
		50	0	20.20	20.22	20.08

Note: Measurement Uncertainty: ± 2.6 dB.



Average Conducted Power						
Band	LTE Band 17			Channel/Frequency (MHz)		
Bandwidth	Modulation	RB size	RB offset	23205/779.5	23230/782	23255/784.5
5MHz	QPSK	1	0	22.12	22.13	22.02
		1	2	22.57	22.53	22.56
		1	5	21.94	22.06	22.01
		6	0	21.07	21.12	20.99
	16QAM	1	0	21.26	21.13	21.39
		1	2	21.62	21.58	21.76
		1	5	21.16	21.05	21.33
		6	0	19.95	20.02	19.88
Bandwidth	Modulation	RB size	RB offset	23205/779.5	23230/782	23255/784.5
10MHz	QPSK	1	0	/	22.64	/
		1	25	/	22.76	/
		1	49	/	22.57	/
		50	0	/	21.77	/
	16QAM	1	0	/	21.83	/
		1	25	/	22.03	/
		1	49	/	21.81	/
		50	0	/	20.79	/



5.2. -26dB and 99% Occupied Bandwidth

5.2.1. Limit

According to FCC section 2.1049

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 Ratio

5.3.1. Limit

According to FCC section 2.1046

FCC Part 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 13dB.

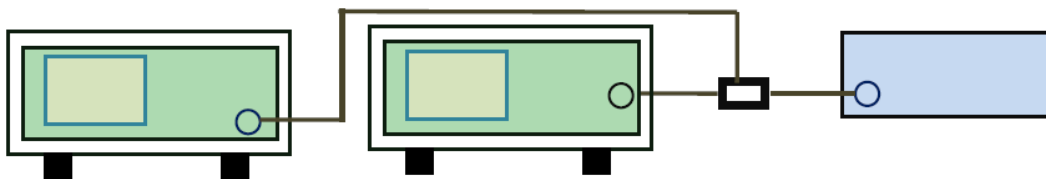
FCC Part 22.913 (d)

Power measurement. 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 13dB.

FCC Part 27.50 (d) (5)

Equipment employed must be authorized in accordance with the provisions of § 24.51. 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 13dB.

5.3.2. Test Setup



5.3.3. Test Procedure

According with KDB 971168 v03r01

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.



5.4. Frequency Stability

5.4.1. Limit

FCC section 24.235: The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

FCC section 22.355: Except as otherwise provided in this part, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table C–1 of this section.

Table C–1—Frequency Tolerance for Transmitters in the Public Mobile Services

Frequency range (MHz)	Base, fixed (ppm)	Mobile >3 watts (ppm)	Mobile ≤3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929	5.0	n/a	n/a
929 to 960	1.5	n/a	n/a
2110 to 2220	10.0	n/a	n/a

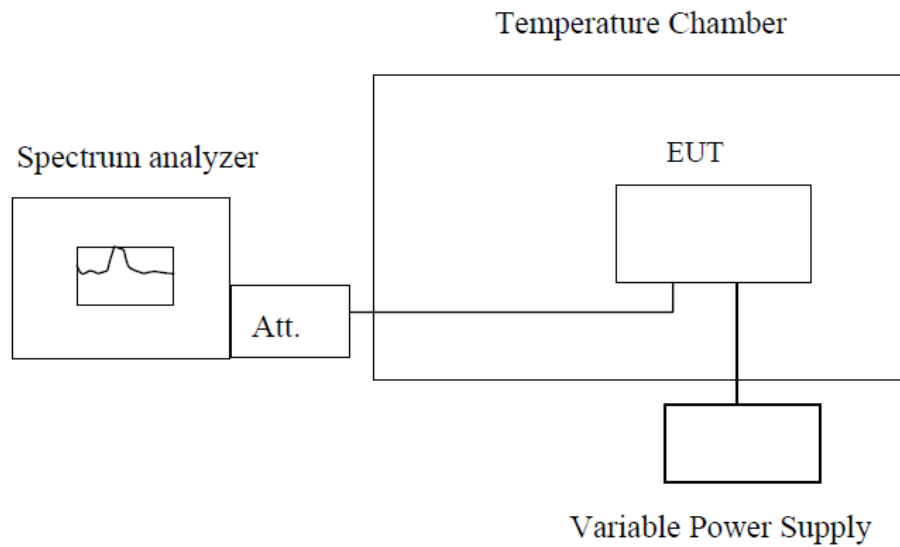
FCC section 27.54: The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

According to FCC section 2.1055, the test conditions are:

- (a) The temperature is varied from -40°C to +80°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 3.7VDC, 4.26VDC and 3.15VDC 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.

The table and plot please see next page.



Test Conditions			Frequency Deviation			Result
Band	Power(Vdc)	Temperature(°C)	Frequency Error(Hz)	ppm	Limit	
GSM850 Middle channel 836.0MHz	3.70	-40	54	0.0646	±2.5	PASS
	3.70	-30	34	0.0407		
	3.70	-20	23	0.0275		
	3.70	-10	34	0.0407		
	3.70	0	98	0.1172		
	3.70	10	67	0.0801		
	3.70	20	75	0.0897		
	3.70	30	46	0.0550		
	3.70	40	76	0.0909		
	3.70	50	55	0.0658		
	3.70	60	78	0.0933		
	3.70	70	46	0.0550		
	3.70	80	35	0.0419		
	4.26	25	117	0.1400		
	3.70	25	65	0.0778		
	3.15	25	86	0.1029		
EGPRS850 Middle channel 836.0MHz	3.70	-40	77	0.0921	±2.5	PASS
	3.70	-30	85	0.1017		
	3.70	-20	63	0.0754		
	3.70	-10	48	0.0574		
	3.70	0	75	0.0897		
	3.70	10	67	0.0801		
	3.70	20	87	0.1041		
	3.70	30	53	0.0634		
	3.70	40	39	0.0467		
	3.70	50	65	0.0778		
	3.70	60	76	0.0909		
	3.70	70	87	0.1041		
	3.70	80	65	0.0778		
	4.26	25	123	0.1471		
	3.70	25	56	0.0670		
	3.15	25	67	0.0801		



Test Conditions			Frequency Deviation			Result
Band	Power(Vdc)	Temperature(°C)	Frequency Error(Hz)	ppm	Limit	
GSM1900 Middle channel 1880.0MHz	3.70	-40	54	0.0287	±2.5	PASS
	3.70	-30	74	0.0394		
	3.70	-20	87	0.0463		
	3.70	-10	56	0.0298		
	3.70	0	56	0.0298		
	3.70	10	73	0.0388		
	3.70	20	47	0.0250		
	3.70	30	83	0.0441		
	3.70	40	55	0.0293		
	3.70	50	43	0.0229		
	3.70	60	57	0.0303		
	3.70	70	45	0.0239		
	3.70	80	98	0.0521		
	4.26	25	131	0.0697		
	3.70	25	69	0.0367		
	3.15	25	88	0.0468		
EGPRS1900 Middle channel 1880.0MHz	3.70	-40	77	0.0410	±2.5	PASS
	3.70	-30	69	0.0367		
	3.70	-20	56	0.0298		
	3.70	-10	78	0.0415		
	3.70	0	67	0.0356		
	3.70	10	65	0.0346		
	3.70	20	87	0.0463		
	3.70	30	43	0.0229		
	3.70	40	58	0.0309		
	3.70	50	79	0.0420		
	3.70	60	66	0.0351		
	3.70	70	86	0.0457		
	3.70	80	67	0.0356		
	4.26	25	127	0.0676		
	3.70	25	67	0.0356		
	3.15	25	69	0.0367		



Test Conditions			Frequency Deviation			Result
Band	Power(Vdc)	Temperature(°C)	Frequency Error(Hz)	ppm	Limit	
WCDMA Band 2 Middle channel 1880MHz	3.70	-40	42	0.0502	±2.5	PASS
	3.70	-30	50	0.0598		
	3.70	-20	27	0.0323		
	3.70	-10	64	0.0765		
	3.70	0	74	0.0885		
	3.70	10	71	0.0849		
	3.70	20	34	0.0406		
	3.70	30	28	0.0335		
	3.70	40	84	0.1004		
	3.70	50	77	0.0920		
	3.70	60	76	0.0908		
	3.70	70	86	0.1028		
	3.70	80	77	0.0920		
	4.26	25	129	0.1542		
	3.70	25	81	0.0968		
	3.15	25	90	0.1076		
WCDMA Band 5 Middle channel 836.6MHz	3.70	-40	80	0.0956	±2.5	PASS
	3.70	-30	93	0.1112		
	3.70	-20	40	0.0478		
	3.70	-10	76	0.0908		
	3.70	0	57	0.0681		
	3.70	10	79	0.0944		
	3.70	20	81	0.0968		
	3.70	30	55	0.0657		
	3.70	40	131	0.1566		
	3.70	50	33	0.0394		
	3.70	60	89	0.1064		
	3.70	70	54	0.0645		
	3.70	80	86	0.1028		
	4.26	25	171	0.2044		
	3.70	25	85	0.1016		
	3.15	25	100	0.1195		



Test Conditions			Frequency Deviation			Result
Band	Power(Vdc)	Temperature(°C)	Frequency Error(Hz)	ppm	Limit	
LTE Band 2 Bandwidth 20MHz QPSK Middle channel 1880MHz	3.70	-40	72	0.0383	±1	PASS
	3.70	-30	36	0.0191		
	3.70	-20	86	0.0457		
	3.70	-10	75	0.0399		
	3.70	0	67	0.0356		
	3.70	10	56	0.0298		
	3.70	20	75	0.0399		
	3.70	30	107	0.0569		
	3.70	40	83	0.0441		
	3.70	50	77	0.0410		
	3.70	60	56	0.0298		
	3.70	70	66	0.0351		
	3.70	80	84	0.0447		
	4.26	25	63	0.0335		
	3.70	25	71	0.0378		
	3.15	25	185	0.0984		
LTE Band 2 Bandwidth 20MHz 16QAM Middle channel 1880MHz	3.70	-40	90	0.0479	±1	PASS
	3.70	-30	73	0.0388		
	3.70	-20	80	0.0426		
	3.70	-10	51	0.0271		
	3.70	0	76	0.0404		
	3.70	10	89	0.0473		
	3.70	20	41	0.0218		
	3.70	30	57	0.0303		
	3.70	40	44	0.0234		
	3.70	50	61	0.0324		
	3.70	60	59	0.0314		
	3.70	70	27	0.0144		
	3.70	80	73	0.0388		
	4.26	25	28	0.0149		
	3.70	25	101	0.0537		
	3.15	25	90	0.0479		



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	3.70	-40	69	0.0825	±2.5	PASS
	3.70	-30	44	0.0526		
	3.70	-20	52	0.0622		
	3.70	-10	40	0.0478		
	3.70	0	69	0.0825		
	3.70	10	78	0.0932		
	3.70	20	40	0.0478		
	3.70	30	76	0.0909		
	3.70	40	38	0.0454		
	3.70	50	59	0.0705		
	3.70	60	79	0.0944		
	3.70	70	51	0.0610		
	3.70	80	88	0.1052		
	4.26	25	44	0.0526		
	3.70	25	92	0.1100		
	3.15	25	50	0.0598		
LTE Band 5 Bandwidth 10MHz 16QAM Middle channel 836.5MHz	3.70	-40	38	0.0454	±2.5	PASS
	3.70	-30	71	0.0849		
	3.70	-20	74	0.0885		
	3.70	-10	67	0.0801		
	3.70	0	93	0.1112		
	3.70	10	62	0.0741		
	3.70	20	22	0.0263		
	3.70	30	73	0.0873		
	3.70	40	51	0.0610		
	3.70	50	99	0.1184		
	3.70	60	61	0.0729		
	3.70	70	83	0.0992		
	3.70	80	46	0.0550		
	4.26	25	90	0.1076		
	3.70	25	48	0.0574		
	3.15	25	92	0.1100		

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	3.70	-40	78	0.0308	±2.5	PASS
	3.70	-30	103	0.0406		
	3.70	-20	72	0.0284		
	3.70	-10	77	0.0304		
	3.70	0	42	0.0166		
	3.70	10	42	0.0166		
	3.70	20	90	0.0355		
	3.70	30	49	0.0193		
	3.70	40	78	0.0308		
	3.70	50	83	0.0327		
	3.70	60	47	0.0185		
	3.70	70	87	0.0343		
	3.70	80	72	0.0284		
	4.26	25	114	0.0450		
	3.70	25	77	0.0304		
	3.15	25	68	0.0268		
LTE Band 7 Bandwidth 20MHz 16QAM Middle channel 2535.0MHz	3.70	-40	72	0.0284	±2.5	PASS
	3.70	-30	47	0.0185		
	3.70	-20	83	0.0327		
	3.70	-10	40	0.0158		
	3.70	0	82	0.0323		
	3.70	10	94	0.0371		
	3.70	20	44	0.0174		
	3.70	30	82	0.0323		
	3.70	40	68	0.0268		
	3.70	50	61	0.0241		
	3.70	60	78	0.0308		
	3.70	70	59	0.0233		
	3.70	80	85	0.0335		
	4.26	25	131	0.0517		
	3.70	25	76	0.0300		
	3.15	25	86	0.0339		

Note: Measurement Uncertainty: ±20Hz.



Test Conditions			Frequency Deviation			Result
Band	Power(Vdc)	Temperature(°C)	Frequency Error(Hz)	ppm	Limit	
LTE Band 12 Bandwidth 10MHz QPSK Middle channel 707.5MHz	3.70	-40	49	0.0693	±2.5	PASS
	3.70	-30	64	0.0905		
	3.70	-20	43	0.0608		
	3.70	-10	33	0.0466		
	3.70	0	49	0.0693		
	3.70	10	41	0.0580		
	3.70	20	23	0.0325		
	3.70	30	44	0.0622		
	3.70	40	46	0.0650		
	3.70	50	72	0.1018		
	3.70	60	24	0.0339		
	3.70	70	56	0.0792		
	3.70	80	43	0.0608		
	4.26	25	117	0.1654		
	3.70	25	46	0.0650		
	3.15	25	82	0.1159		
LTE Band 12 Bandwidth 10MHz 16QAM Middle channel 707.5MHz	3.70	-40	62	0.0876	±2.5	PASS
	3.70	-30	36	0.0509		
	3.70	-20	33	0.0466		
	3.70	-10	52	0.0735		
	3.70	0	26	0.0367		
	3.70	10	32	0.0452		
	3.70	20	60	0.0848		
	3.70	30	20	0.0283		
	3.70	40	35	0.0495		
	3.70	50	54	0.0763		
	3.70	60	73	0.1032		
	3.70	70	49	0.0693		
	3.70	80	30	0.0424		
	4.26	25	116	0.1640		
	3.70	25	53	0.0749		
	3.15	25	40	0.0565		

Note: Measurement Uncertainty: ±20Hz.



Test Conditions			Frequency Deviation			Result
Band	Power(Vdc)	Temperature(°C)	Frequency Error(Hz)	ppm	Limit	
LTE Band 17 Bandwidth 10MHz QPSK Middle channel 708MHz	3.70	-40	78	0.0997	±2.5	PASS
	3.70	-30	66	0.0844		
	3.70	-20	81	0.1036		
	3.70	-10	46	0.0588		
	3.70	0	41	0.0524		
	3.70	10	60	0.0767		
	3.70	20	84	0.1074		
	3.70	30	54	0.0691		
	3.70	40	60	0.0767		
	3.70	50	51	0.0652		
	3.70	60	26	0.0332		
	3.70	70	65	0.0831		
	3.70	80	95	0.1215		
	4.26	25	118	0.1509		
	3.70	25	82	0.1049		
	3.15	25	95	0.1215		
LTE Band 17 Bandwidth 10MHz 16QAM Middle channel 708MHz	3.70	-40	87	0.1044	±2.5	PASS
	3.70	-30	69	0.0910		
	3.70	-20	52	0.0709		
	3.70	-10	91	0.1226		
	3.70	0	68	0.0940		
	3.70	10	80	0.0977		
	3.70	20	72	0.0864		
	3.70	30	93	0.1262		
	3.70	40	66	0.0887		
	3.70	50	78	0.1065		
	3.70	60	48	0.0562		
	3.70	70	99	0.1259		
	3.70	80	77	0.0875		
	4.26	25	142	0.1752		
	3.70	25	94	0.1161		
	3.15	25	96	0.1198		

Note: Measurement Uncertainty: ±20Hz.



5.5. Conducted Spurious Emissions

5.5.1. Limit

According to FCC section 22.917(a), Out of band emissions. 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.

FCC section 24.238(a), Out of band emissions. 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.

FCC section 27.53 (c)
For operations in the 746–758 MHz band and the 776–788 MHz band, the power of any emission outside the 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, in accordance with the following:

- (1) On any frequency outside the 746–758 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;
- (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;
- (3) On all frequencies between 763–775 MHz and 793–805 MHz, by a factor not less than $76 + 10 \log(P)$ dB in a 6.25 kHz band segment, for base and fixed stations;
- (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;
- (5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;
- (6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

FCC section 27.53 (g)

For operations in the 600 MHz band and the 698–746 MHz band, 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. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

FCC section 27.53 (h)

AWS emission limits:

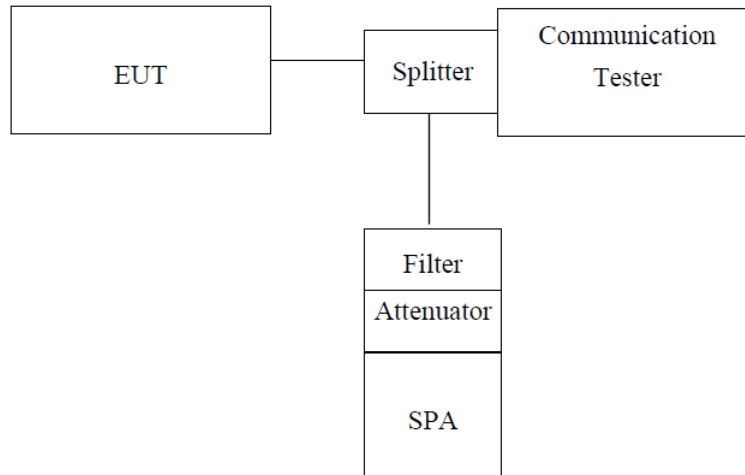
- (1) General protection levels. Except as otherwise specified below, for operations in the 1695–1710 MHz, 1710–1755 MHz, 1755–1780 MHz, 1915–1920 MHz, 1995–2000 MHz, 2000–2020 MHz, 2110–2155 MHz, 2155–2180 MHz, and 2180–2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB.
- (2) Additional protection levels. Notwithstanding the foregoing paragraph (h)(1) of this section:
 - (i) Operations in the 2180–2200 MHz band are subject to the out-of-band emission requirements set forth in § 27.1134 for the protection of federal government operations operating in the 2200–2290 MHz band.
 - (ii) For operations in the 2000–2020 MHz band, the power of any emissions below 2000 MHz shall be attenuated below the transmitter power (P) in watts by at least $70 + 10 \log_{10}(P)$ dB.
 - (iii) For operations in the 1915–1920 MHz band, the power of any emission between 1930–1995 MHz shall be attenuated below the transmitter power (P) in watts by at least $70 + 10 \log_{10}(P)$ dB.
 - (iv) For operations in the 1995–2000 MHz band, the power of any emission between 2005–2020 MHz shall be attenuated below the transmitter power (P) in watts by at least $70 + 10 \log_{10}(P)$ dB.

FCC section 27.53 (m) (4)

For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log(P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log(P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log(P)$ dB on 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 than $43 + 10 \log(P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log(P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 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.



5.5.2. Test Setup



Note: Measurement setup for testing on Antenna connector

5.5.3. Measurement Procedure

The testing according to FCC KDB 971168 D01 v03r01 Section 6.0 and ANSI C63.26 2015 Section 5.72, FCC Part 22.917, 24.238, 27.53

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

According to FCC section 22.917(a), Out of band emissions. 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.

FCC section 24.238(a), Out of band emissions. 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.

FCC section 27.53 (c)

For operations in the 746–758 MHz band and the 776–788 MHz band, the power of any emission outside the 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, in accordance with the following:

- (1) On any frequency outside the 746–758 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;
- (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;
- (3) On all frequencies between 763–775 MHz and 793–805 MHz, by a factor not less than $76 + 10 \log(P)$ dB in a 6.25 kHz band segment, for base and fixed stations;
- (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;
- (5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;
- (6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

FCC section 27.53 (g)

For operations in the 600 MHz band and the 698–746 MHz band, 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. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

FCC section 27.53 (h)

AWS emission limits:

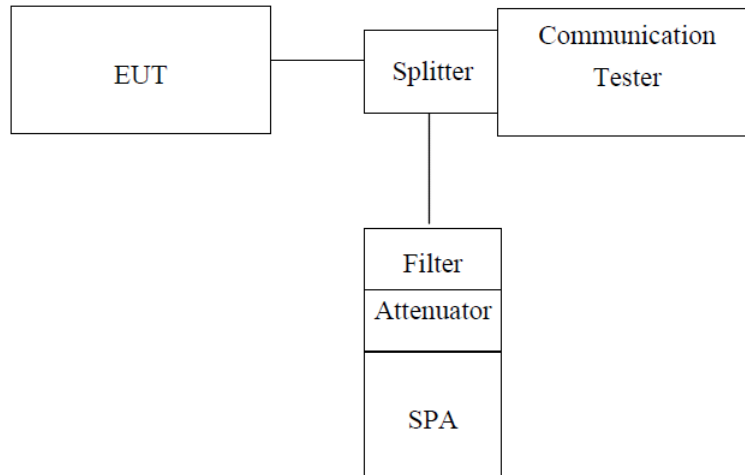
- (1) General protection levels. Except as otherwise specified below, for operations in the 1695–1710 MHz, 1710–1755 MHz, 1755–1780 MHz, 1915–1920 MHz, 1995–2000 MHz, 2000–2020 MHz, 2110–2155 MHz, 2155–2180 MHz, and 2180–2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB.
- (2) Additional protection levels. Notwithstanding the foregoing paragraph (h)(1) of this section:
 - (i) Operations in the 2180–2200 MHz band are subject to the out-of-band emission requirements set forth in § 27.1134 for the protection of federal government operations operating in the 2200–2290 MHz band.
 - (ii) For operations in the 2000–2020 MHz band, the power of any emissions below 2000 MHz shall be attenuated below the transmitter power (P) in watts by at least $70 + 10 \log_{10}(P)$ dB.
 - (iii) For operations in the 1915–1920 MHz band, the power of any emission between 1930–1995 MHz shall be attenuated below the transmitter power (P) in watts by at least $70 + 10 \log_{10}(P)$ dB.
 - (iv) For operations in the 1995–2000 MHz band, the power of any emission between 2005–2020 MHz shall be attenuated below the transmitter power (P) in watts by at least $70 + 10 \log_{10}(P)$ dB.

FCC section 27.53 (m) (4)

For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log(P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log(P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log(P)$ dB on 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 than $43 + 10 \log(P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log(P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 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.



5.6.2. Test Setup



Note: Measurement setup for testing on Antenna connector

5.6.3. Measurement Procedure

The testing according to FCC KDB 971168 D01 v03r01 Section 6.0 and ANSI C63.26 2015 Section 5.72, FCC Part 22.917, 24.238, 27.53

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 Radiated Power (EIRP/ERP)

5.7.1. Limit

According to FCC section 2.1046(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 § 2.1033(c)(8). The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.

FCC part 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.

FCC part 22.913(a) (5), The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

FCC part 27.50 (b) (10), Portable stations (hand-held devices) transmitting in the 746–757 MHz, 776–788 MHz, and 805–806 MHz bands are limited to 3 watts ERP.

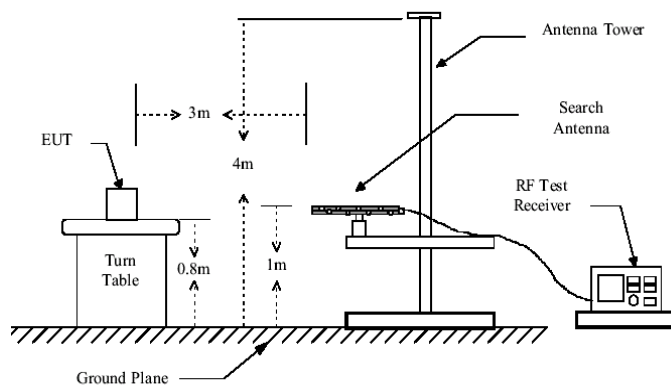
FCC part 27.50 (c) (10), Portable stations (hand-held devices) in the 600 MHz uplink band and the 698–746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

FCC part 27.50 (d) (4), Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band and mobile and portable stations operating in the 1695–1710 MHz and 1755–1780 MHz bands are limited to 1 watt EIRP. Fixed stations operating in the 1710–1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

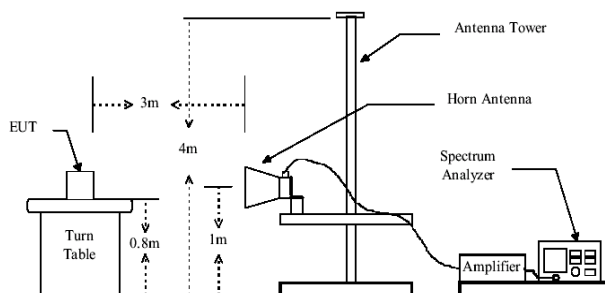
FCC part 27.50(h) (2), for BRS and EBS: Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

5.7.2. Test Setup

Below 1GHz

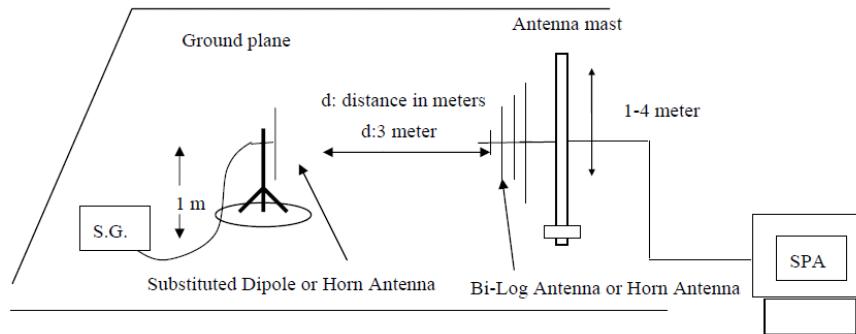


Above 1GHz





Substituted method:



5.7.3. Measurement Procedure

The EUT was placed on a non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer. All tests were conducted in a Full-Anechoic Chamber.

During the measurement, the EUT was in communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated.

ERP in frequency band 824.2 – 848.80.8 MHz were measured using a substitution method. The EUT was replaced by a dipole antenna connected to the S.G. output; the S.G. output was recorded and ERP was calculated as follows:

EIRP in frequency band 1850.2 – 1909.8 MHz were measured using a substitution method. The EUT was replaced by a horn antenna connected to the S.G. output; the S.G. output was recorded and EIRP was calculated as follows:

$$\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable Loss (dB)} - 2.15$$

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

5.7.4. Test Result

Pass, the table and plot please see annex.



EUT mode	Channel	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Result
GSM 850	Lowest	V	15.51	19.33	2.52	30.17	38.45	Pass
		H	15.37	19.33	2.52	30.03		
	Middle	V	15.33	19.50	2.60	30.08	38.45	Pass
		H	15.46	19.50	2.60	30.21		
	Highest	V	15.91	19.94	2.71	30.99	38.45	Pass
		H	15.44	19.94	2.71	30.52		
EGPRS850	Lowest	V	15.31	19.33	2.52	29.97	38.45	Pass
		H	15.40	19.33	2.52	30.06		
	Middle	V	15.36	19.50	2.60	30.11	38.45	Pass
		H	15.41	19.50	2.60	30.16		
	Highest	V	15.97	19.94	2.71	31.05	38.45	Pass
		H	15.51	19.94	2.71	30.59		
EUT mode	Channel	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Result
GSM1900	Lowest	V	16.66	15.68	1.65	30.69	33.00	Pass
		H	16.60	15.68	1.65	30.63		
	Middle	V	16.62	15.70	1.67	30.65	33.00	Pass
		H	16.51	15.70	1.67	30.54		
	Highest	V	16.28	15.70	1.71	30.27	33.00	Pass
		H	16.59	15.70	1.71	30.58		
EGPRS1900	Lowest	V	16.55	15.68	1.65	30.58	33.00	Pass
		H	16.49	15.68	1.65	30.52		
	Middle	V	16.52	15.70	1.67	30.55	33.00	Pass
		H	16.50	15.70	1.67	30.53		
	Highest	V	16.38	15.70	1.71	30.37	33.00	Pass
		H	16.73	15.70	1.71	30.72		



EUT mode	Channel	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Result
WCDMA Band 2	Lowest	V	4.24	19.33	1.65	21.92	33.00	Pass
		H	4.40	19.33	1.65	22.08		
	Middle	V	4.60	19.50	1.67	22.43	33.00	Pass
		H	4.43	19.50	1.67	22.26		
	Highest	V	4.21	19.94	1.71	22.44	33.00	Pass
		H	4.13	19.94	1.71	22.36		

EUT mode	Channel	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Result
WCDMA Band 5	Lowest	V	10.84	15.68	2.52	21.85	38.45	Pass
		H	11.90	15.68	2.52	22.91		
	Middle	V	11.46	15.70	2.60	22.41	38.45	Pass
		H	11.35	15.70	2.60	22.30		
	Highest	V	11.19	15.70	2.71	22.03	38.45	Pass
		H	11.00	15.70	2.71	21.84		



EUT mode	Channel	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Result
LTE BAND 2 1.4MHz QPSK	Lowest	V	5.55	19.35	2.54	22.36	33.00	Pass
		H	5.63	19.35	2.54	22.44		
	Middle	V	5.88	19.51	2.62	22.77	33.00	Pass
		H	5.33	19.51	2.62	22.22		
	Highest	V	5.75	19.96	2.69	23.02	33.00	Pass
		H	5.71	19.96	2.69	22.98		
LTE BAND 2 3MHz QPSK	Lowest	V	5.44	19.35	2.54	22.25	33.00	Pass
		H	5.53	19.35	2.54	22.34		
	Middle	V	5.36	19.51	2.62	22.25	33.00	Pass
		H	5.22	19.51	2.62	22.11		
	Highest	V	5.63	19.96	2.69	22.90	33.00	Pass
		H	5.62	19.96	2.69	22.89		
LTE BAND 2 5MHz QPSK	Lowest	V	5.63	19.35	2.54	22.44	33.00	Pass
		H	5.72	19.35	2.54	22.53		
	Middle	V	5.56	19.51	2.62	22.45	33.00	Pass
		H	5.41	19.51	2.62	22.30		
	Highest	V	5.53	19.96	2.69	22.80	33.00	Pass
		H	5.50	19.96	2.69	22.77		
LTE BAND 2 10MHz QPSK	Lowest	V	5.44	19.35	2.54	22.25	33.00	Pass
		H	5.52	19.35	2.54	22.33		
	Middle	V	5.77	19.51	2.62	22.66	33.00	Pass
		H	5.22	19.51	2.62	22.11		
	Highest	V	5.64	19.96	2.69	22.91	33.00	Pass
		H	5.60	19.96	2.69	22.87		
LTE BAND 2 15MHz QPSK	Lowest	V	5.33	19.35	2.54	22.14	33.00	Pass
		H	5.42	19.35	2.54	22.23		
	Middle	V	5.25	19.51	2.62	22.14	33.00	Pass
		H	5.11	19.51	2.62	22.00		
	Highest	V	5.52	19.96	2.69	22.79	33.00	Pass
		H	5.51	19.96	2.69	22.78		
LTE BAND 2 20MHz QPSK	Lowest	V	5.52	19.35	2.54	22.33	33.00	Pass
		H	5.61	19.35	2.54	22.42		
	Middle	V	5.45	19.51	2.62	22.34	33.00	Pass
		H	5.30	19.51	2.62	22.19		
	Highest	V	5.72	19.96	2.69	22.99	33.00	Pass
		H	5.69	19.96	2.69	22.96		



EUT mode	Channel	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Result
LTE BAND 2 1.4MHz 16QAM	Lowest	V	5.35	19.35	2.54	22.16	33.00	Pass
		H	5.43	19.35	2.54	22.24		
	Middle	V	6.25	19.51	2.62	23.14	33.00	Pass
		H	5.14	19.51	2.62	22.03		
	Highest	V	5.55	19.96	2.69	22.82	33.00	Pass
		H	5.51	19.96	2.69	22.78		
LTE BAND 2 3MHz 16QAM	Lowest	V	5.25	19.35	2.54	22.06	33.00	Pass
		H	5.34	19.35	2.54	22.15		
	Middle	V	6.12	19.51	2.62	23.01	33.00	Pass
		H	5.03	19.51	2.62	21.92		
	Highest	V	5.43	19.96	2.69	22.70	33.00	Pass
		H	5.42	19.96	2.69	22.69		
LTE BAND 2 5MHz 16QAM	Lowest	V	5.43	19.35	2.54	22.24	33.00	Pass
		H	5.52	19.35	2.54	22.33		
	Middle	V	5.34	19.51	2.62	22.23	33.00	Pass
		H	6.19	19.51	2.62	23.08		
	Highest	V	5.63	19.96	2.69	22.90	33.00	Pass
		H	5.60	19.96	2.69	22.87		
LTE BAND 2 10MHz 16QAM	Lowest	V	4.94	19.33	2.52	21.75	33.00	Pass
		H	5.09	19.33	2.52	21.90		
	Middle	V	5.34	19.50	2.60	22.24	33.00	Pass
		H	5.18	19.50	2.60	22.08		
	Highest	V	5.61	19.94	2.71	22.84	33.00	Pass
		H	5.54	19.94	2.71	22.77		
LTE BAND 2 15MHz 16QAM	Lowest	V	4.94	19.33	2.52	21.75	33.00	Pass
		H	5.09	19.33	2.52	21.90		
	Middle	V	5.34	19.50	2.60	22.24	33.00	Pass
		H	5.18	19.50	2.60	22.08		
	Highest	V	5.61	19.94	2.71	22.84	33.00	Pass
		H	5.54	19.94	2.71	22.77		
LTE BAND 2 20MHz 16QAM	Lowest	V	5.02	19.33	2.52	21.83	33.00	Pass
		H	5.18	19.33	2.52	21.99		
	Middle	V	5.43	19.50	2.60	22.33	33.00	Pass
		H	5.27	19.50	2.60	22.17		
	Highest	V	5.71	19.94	2.71	22.94	33.00	Pass
		H	5.64	19.94	2.71	22.87		



EUT mode	Channel	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Result
LTE BAND 5 1.4MHz QPSK	Lowest	V	10.85	15.68	1.65	22.73	38.45	Pass
		H	10.86	15.68	1.65	22.74		
	Middle	V	10.38	15.70	1.67	22.26	38.45	Pass
		H	10.27	15.70	1.67	22.15		
	Highest	V	10.04	15.70	1.71	21.88	38.45	Pass
		H	10.85	15.70	1.71	22.69		
LTE BAND 5 3MHz QPSK	Lowest	V	10.66	15.68	1.65	22.54	38.45	Pass
		H	10.71	15.68	1.65	22.59		
	Middle	V	10.22	15.70	1.67	22.10	38.45	Pass
		H	10.13	15.70	1.67	22.01		
	Highest	V	10.90	15.70	1.71	22.74	38.45	Pass
		H	10.68	15.70	1.71	22.52		
LTE BAND 5 5MHz QPSK	Lowest	V	10.75	15.68	1.65	22.63	38.45	Pass
		H	10.79	15.68	1.65	22.67		
	Middle	V	10.31	15.70	1.67	22.19	38.45	Pass
		H	10.21	15.70	1.67	22.09		
	Highest	V	10.79	15.70	1.71	22.63	38.45	Pass
		H	10.76	15.70	1.71	22.60		
LTE BAND 5 10MHz QPSK	Lowest	V	10.74	15.68	1.65	22.62	38.45	Pass
		H	10.79	15.68	1.65	22.67		
	Middle	V	10.30	15.70	1.67	22.18	38.45	Pass
		H	10.22	15.70	1.67	22.10		
	Highest	V	10.96	15.70	1.71	22.80	38.45	Pass
		H	10.76	15.70	1.71	22.60		
LTE BAND 5 1.4MHz 16QAM	Lowest	V	10.94	15.68	1.65	22.82	38.45	Pass
		H	10.96	15.68	1.65	22.84		
	Middle	V	10.48	15.70	1.67	22.36	38.45	Pass
		H	10.37	15.70	1.67	22.25		
	Highest	V	10.15	15.70	1.71	21.99	38.45	Pass
		H	10.94	15.70	1.71	22.78		
LTE BAND 5 3MHz 16QAM	Lowest	V	10.76	15.68	1.65	22.64	38.45	Pass
		H	10.81	15.68	1.65	22.69		
	Middle	V	10.32	15.70	1.67	22.20	38.45	Pass
		H	10.21	15.70	1.67	22.09		
	Highest	V	10.99	15.70	1.71	22.83	38.45	Pass
		H	10.78	15.70	1.71	22.62		
LTE BAND 5 5MHz 16QAM	Lowest	V	10.85	15.68	1.65	22.73	38.45	Pass
		H	10.90	15.68	1.65	22.78		
	Middle	V	10.41	15.70	1.67	22.29	38.45	Pass
		H	10.31	15.70	1.67	22.19		
	Highest	V	10.07	15.70	1.71	21.91	38.45	Pass
		H	10.86	15.70	1.71	22.70		
LTE BAND 5 10MHz 16QAM	Lowest	V	10.77	15.68	1.65	22.65	38.45	Pass
		H	10.82	15.68	1.65	22.70		
	Middle	V	10.33	15.70	1.67	22.21	38.45	Pass
		H	10.22	15.70	1.67	22.10		
	Highest	V	11.09	15.70	1.71	22.93	38.45	Pass
		H	10.86	15.70	1.71	22.70		



EUT mode	Channel	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Result
LTE BAND 7 5MHz QPSK	Lowest	V	5.47	19.35	2.54	22.28	33.00	Pass
		H	5.55	19.35	2.54	22.36		
	Middle	V	6.40	19.51	2.62	23.29	33.00	Pass
		H	5.23	19.51	2.62	22.12		
	Highest	V	5.67	19.96	2.69	22.94	33.00	Pass
		H	5.63	19.96	2.69	22.90		
LTE BAND 7 10MHz QPSK	Lowest	V	5.34	19.35	2.54	22.15	33.00	Pass
		H	5.45	19.35	2.54	22.26		
	Middle	V	5.26	19.51	2.62	22.15	33.00	Pass
		H	5.12	19.51	2.62	22.01		
	Highest	V	5.55	19.96	2.69	22.82	33.00	Pass
		H	5.54	19.96	2.69	22.81		
LTE BAND 7 15MHz QPSK	Lowest	V	5.45	19.35	2.54	22.26	33.00	Pass
		H	5.54	19.35	2.54	22.35		
	Middle	V	5.38	19.51	2.62	22.27	33.00	Pass
		H	5.22	19.51	2.62	22.11		
	Highest	V	5.65	19.96	2.69	22.92	33.00	Pass
		H	5.62	19.96	2.69	22.89		
LTE BAND 7 20MHz QPSK	Lowest	V	5.47	19.35	2.54	22.28	33.00	Pass
		H	5.55	19.35	2.54	22.36		
	Middle	V	5.40	19.51	2.62	22.29	33.00	Pass
		H	5.29	19.51	2.62	22.18		
	Highest	V	5.68	19.96	2.69	22.95	33.00	Pass
		H	5.68	19.96	2.69	22.95		
LTE BAND 7 5MHz 16QAM	Lowest	V	5.29	19.35	2.54	22.10	33.00	Pass
		H	5.39	19.35	2.54	22.20		
	Middle	V	5.21	19.51	2.62	22.10	33.00	Pass
		H	5.07	19.51	2.62	21.96		
	Highest	V	5.49	19.96	2.69	22.76	33.00	Pass
		H	5.73	19.96	2.69	23.00		
LTE BAND 7 10MHz 16QAM	Lowest	V	5.40	19.35	2.54	22.21	33.00	Pass
		H	5.49	19.35	2.54	22.30		
	Middle	V	5.32	19.51	2.62	22.21	33.00	Pass
		H	5.18	19.51	2.62	22.07		
	Highest	V	5.60	19.96	2.69	22.87	33.00	Pass
		H	5.57	19.96	2.69	22.84		
LTE BAND 7 15MHz 16QAM	Lowest	V	5.30	19.35	2.54	22.11	33.00	Pass
		H	5.40	19.35	2.54	22.21		
	Middle	V	5.22	19.51	2.62	22.11	33.00	Pass
		H	5.08	19.51	2.62	21.97		
	Highest	V	5.50	19.96	2.69	22.77	33.00	Pass
		H	5.49	19.96	2.69	22.76		
LTE BAND 7 20MHz 16QAM	Lowest	V	5.40	19.35	2.54	22.21	33.00	Pass
		H	5.49	19.35	2.54	22.30		
	Middle	V	5.32	19.51	2.62	22.21	33.00	Pass
		H	5.18	19.51	2.62	22.07		
	Highest	V	5.62	19.96	2.69	22.89	33.00	Pass
		H	5.57	19.96	2.69	22.84		



EUT mode	Channel	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Result
LTE BAND 12 1.4MHz QPSK	Lowest	V	7.43	19.35	2.54	22.09	34.77	Pass
		H	7.51	19.35	2.54	22.17		
	Middle	V	7.35	19.51	2.62	22.09	34.77	Pass
		H	7.19	19.51	2.62	21.93		
	Highest	V	7.62	19.96	2.69	22.74	34.77	Pass
		H	7.58	19.96	2.69	22.70		
LTE BAND 12 3MHz QPSK	Lowest	V	7.30	19.35	2.54	21.96	34.77	Pass
		H	7.41	19.35	2.54	22.07		
	Middle	V	7.22	19.51	2.62	21.96	34.77	Pass
		H	7.08	19.51	2.62	21.82		
	Highest	V	7.51	19.96	2.69	22.63	34.77	Pass
		H	7.50	19.96	2.69	22.62		
LTE BAND12 5MHz QPSK	Lowest	V	7.41	19.35	2.54	22.07	34.77	Pass
		H	7.50	19.35	2.54	22.16		
	Middle	V	7.34	19.51	2.62	22.08	34.77	Pass
		H	7.18	19.51	2.62	21.92		
	Highest	V	7.60	19.96	2.69	22.72	34.77	Pass
		H	7.57	19.96	2.69	22.69		
LTE BAND 12 10MHz QPSK	Lowest	V	7.42	19.35	2.54	22.08	34.77	Pass
		H	7.50	19.35	2.54	22.16		
	Middle	V	7.35	19.51	2.62	22.09	34.77	Pass
		H	7.24	19.51	2.62	21.98		
	Highest	V	7.63	19.96	2.69	22.75	34.77	Pass
		H	7.60	19.96	2.69	22.72		
LTE BAND 12 1.4MHz 16QAM	Lowest	V	7.09	19.35	2.54	21.75	34.77	Pass
		H	7.25	19.35	2.54	21.91		
	Middle	V	7.22	19.51	2.62	21.96	34.77	Pass
		H	7.08	19.51	2.62	21.82		
	Highest	V	7.50	19.96	2.69	22.62	34.77	Pass
		H	7.74	19.96	2.69	22.86		
LTE BAND 12 3MHz 16QAM	Lowest	V	7.35	19.35	2.54	22.01	34.77	Pass
		H	7.44	19.35	2.54	22.10		
	Middle	V	7.27	19.51	2.62	22.01	34.77	Pass
		H	7.13	19.51	2.62	21.87		
	Highest	V	7.55	19.96	2.69	22.67	34.77	Pass
		H	7.52	19.96	2.69	22.64		
LTE BAND 12 5MHz 16QAM	Lowest	V	7.25	19.35	2.54	21.91	34.77	Pass
		H	7.35	19.35	2.54	22.01		
	Middle	V	7.17	19.51	2.62	21.91	34.77	Pass
		H	7.03	19.51	2.62	21.77		
	Highest	V	7.45	19.96	2.69	22.57	34.77	Pass
		H	7.44	19.96	2.69	22.56		
LTE BAND 12 10MHz 16QAM	Lowest	V	7.35	19.35	2.54	22.01	34.77	Pass
		H	7.44	19.35	2.54	22.10		
	Middle	V	7.27	19.51	2.62	22.01	34.77	Pass
		H	7.13	19.51	2.62	21.87		
	Highest	V	7.57	19.96	2.69	22.69	34.77	Pass
		H	7.52	19.96	2.69	22.64		



EUT mode	Channel	Antenna Pol.	S.G. output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Result
LTE BAND 17 5MHz QPSK	Lowest	V	7.40	19.35	2.54	22.06	34.77	Pass
		H	7.48	19.35	2.54	22.14		
	Middle	V	7.32	19.51	2.62	22.06	34.77	Pass
		H	6.16	19.51	2.62	20.90		
	Highest	V	7.60	19.96	2.69	22.72	34.77	Pass
		H	7.56	19.96	2.69	22.68		
LTE BAND 17 10MHz QPSK	Middle	V	7.19	19.51	2.62	21.93	34.77	Pass
		H	7.05	19.51	2.62	21.79		
LTE BAND 17 5MHz 16QAM	Lowest	V	7.22	19.35	2.54	21.88	34.77	Pass
		H	7.32	19.35	2.54	21.98		
	Middle	V	7.14	19.51	2.62	21.88	34.77	Pass
		H	7.00	19.51	2.62	21.74		
	Highest	V	7.42	19.96	2.69	22.54	34.77	Pass
		H	7.65	19.96	2.69	22.77		
LTE BAND 17 10MHz 16QAM	Middle	V	7.25	19.51	2.62	21.99	34.77	Pass
		H	7.11	19.51	2.62	21.85		



5.8. Radiated Out of Band Emissions

5.8.1. Limit

According to FCC section 22.917(a), Out of band emissions. 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.

FCC section 24.238(a), Out of band emissions. 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.

FCC section 27.53 (c)
For operations in the 746–758 MHz band and the 776–788 MHz band, the power of any emission outside the 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, in accordance with the following:

- (1) On any frequency outside the 746–758 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;
- (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;
- (3) On all frequencies between 763–775 MHz and 793–805 MHz, by a factor not less than $76 + 10 \log(P)$ dB in a 6.25 kHz band segment, for base and fixed stations;
- (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;
- (5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;
- (6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

FCC section 27.53 (g)

For operations in the 600 MHz band and the 698–746 MHz band, 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. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

FCC section 27.53 (h)

AWS emission limits:

- (1) General protection levels. Except as otherwise specified below, 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 $43 + 10 \log_{10}(P)$ dB.
- (2) Additional protection levels. Notwithstanding the foregoing paragraph (h)(1) of this section:
 - (i) Operations in the 2180–2200 MHz band are subject to the out-of-band emission requirements set forth in § 27.1134 for the protection of federal government operations operating in the 2200–2290 MHz band.
 - (ii) For operations in the 2000–2020 MHz band, the power of any emissions below 2000 MHz shall be attenuated below the transmitter power (P) in watts by at least $70 + 10 \log_{10}(P)$ dB.
 - (iii) For operations in the 1915–1920 MHz band, the power of any emission between 1930–1995 MHz shall be attenuated below the transmitter power (P) in watts by at least $70 + 10 \log_{10}(P)$ dB.
 - (iv) For operations in the 1995–2000 MHz band, the power of any emission between 2005–2020 MHz shall be attenuated below the transmitter power (P) in watts by at least $70 + 10 \log_{10}(P)$ dB.

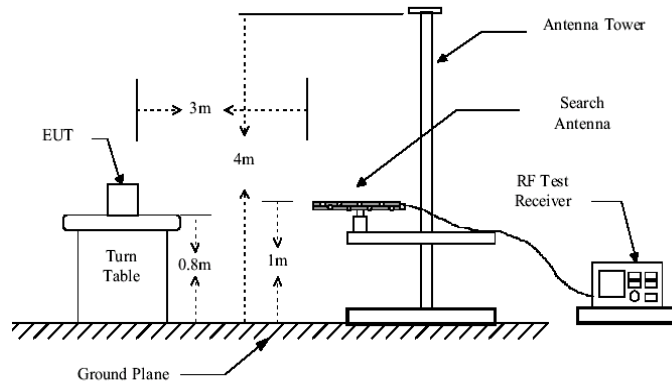
FCC section 27.53 (m) (4)

For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log(P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log(P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log(P)$ dB on 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 than $43 + 10 \log(P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log(P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 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.

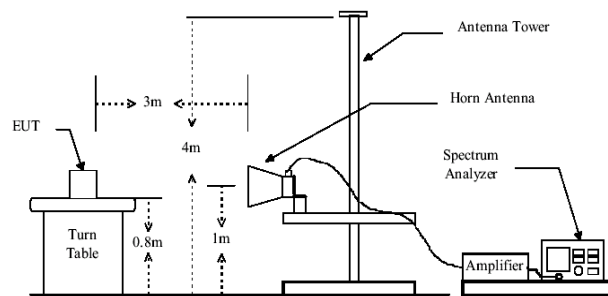


5.8.2. Test Setup

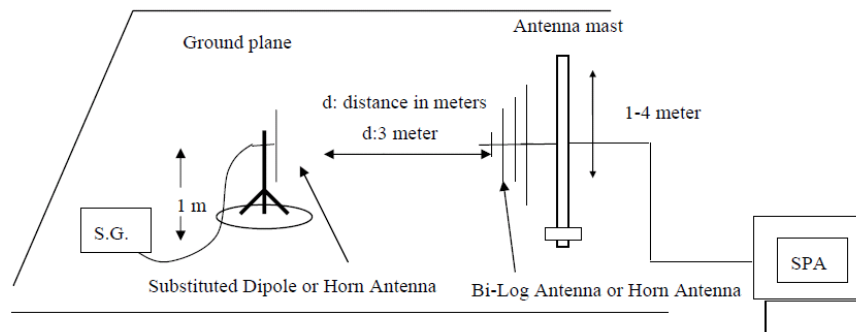
Below 1GHz



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)		
GSM850 Lowest	87.53	Vertical	-74.94	3.35	0.38	-71.97	-13	PASS
	1648.40	Vertical	-45.87	7.76	3.75	-41.86		
	2472.60	Vertical	-46.97	9.84	4.94	-42.07		
	3296.80	Vertical	-39.46	10.21	5.32	-34.57		
	4121.00	Vertical	-42.81	11.36	6.02	-37.47		
	4945.20	Vertical	-44.34	14.52	6.68	-36.50		
GSM850 Middle	88.46	Vertical	-74.94	3.35	0.38	-71.97	-13	PASS
	1673.20	Vertical	-47.18	7.76	3.75	-43.17		
	2509.80	Vertical	-46.78	9.84	4.94	-41.88		
	3346.40	Vertical	-42.42	10.21	5.32	-37.53		
	4183.00	Vertical	-41.84	11.36	6.02	-36.50		
	5019.60	Vertical	-45.77	14.52	6.68	-37.93		
GSM850 Highest	88.65	Vertical	-74.90	3.35	0.38	-71.93	-13	PASS
	1697.60	Vertical	-46.78	7.79	3.53	-42.52		
	2546.40	Vertical	-41.29	9.88	5.02	-36.43		
	3395.20	Vertical	-37.51	10.25	5.54	-32.80		
	4244.00	Vertical	-44.31	11.38	6.16	-39.09		
	5092.80	Vertical	-46.73	14.56	6.72	-38.89		



Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Level (dBm)		
GSM1900 Lowest	87.54	Vertical	-74.51	3.35	0.38	-71.54	-13	PASS
	3700.40	Vertical	-45.61	7.76	3.75	-41.60		
	5550.60	Vertical	-46.71	9.84	4.94	-41.81		
	7400.80	Vertical	-39.23	10.21	5.32	-34.34		
	9251.00	Vertical	-42.57	11.36	6.02	-37.23		
	11101.20	Vertical	-44.09	14.52	6.68	-36.25		
GSM1900 Middle	88.70	Vertical	-74.51	3.35	0.38	-71.54	-13	PASS
	3760.00	Vertical	-46.91	7.76	3.75	-42.90		
	5640.00	Vertical	-46.52	9.84	4.94	-41.62		
	7520.00	Vertical	-42.19	10.21	5.32	-37.30		
	9400.00	Vertical	-41.60	11.36	6.02	-36.26		
	11280.00	Vertical	-45.51	14.52	6.68	-37.67		
GSM1900 Highest	88.76	Vertical	-74.47	3.35	0.38	-71.50	-13	PASS
	3819.60	Vertical	-46.52	7.79	3.53	-42.26		
	5729.40	Vertical	-41.04	9.88	5.02	-36.18		
	7639.20	Vertical	-37.28	10.25	5.54	-32.57		
	9549.00	Vertical	-44.06	11.38	6.16	-38.84		
	11458.80	Vertical	-46.47	14.56	6.72	-38.63		



Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Level (dBm)		
WCDMA BAND 2 Lowest	87.15	Vertical	-74.07	3.35	0.38	-71.10	-13	PASS
	3704.80	Vertical	-45.33	7.76	3.75	-41.32		
	5557.20	Vertical	-46.43	9.84	4.94	-41.53		
	7409.60	Vertical	-39.00	10.21	5.32	-34.11		
	9262.00	Vertical	-42.33	11.36	6.02	-36.99		
	11114.40	Vertical	-43.83	14.52	6.68	-35.99		
WCDMA BAND 2 Middle	88.27	Vertical	-74.07	3.35	0.38	-71.10	-13	PASS
	3760.00	Vertical	-46.64	7.76	3.75	-42.63		
	5640.00	Vertical	-46.24	9.84	4.94	-41.34		
	7520.00	Vertical	-41.94	10.21	5.32	-37.05		
	9400.00	Vertical	-41.35	11.36	6.02	-36.01		
	11280.00	Vertical	-45.23	14.52	6.68	-37.39		
WCDMA BAND 2 Highest	88.21	Vertical	-74.03	3.35	0.38	-71.06	-13	PASS
	3815.20	Vertical	-46.24	7.79	3.53	-41.98		
	5722.80	Vertical	-40.80	9.88	5.02	-35.94		
	7630.40	Vertical	-37.06	10.25	5.54	-32.35		
	9538.00	Vertical	-43.80	11.38	6.16	-38.58		
	11445.60	Vertical	-46.18	14.56	6.72	-38.34		



Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Level (dBm)		
WCDMA BAND 5 Lowest	87.15	Vertical	-74.16	3.35	0.38	-71.19	-13	PASS
	1652.80	Vertical	-45.38	7.76	3.75	-41.37		
	2479.20	Vertical	-46.48	9.84	4.94	-41.58		
	3305.60	Vertical	-39.04	10.21	5.32	-34.15		
	4132.00	Vertical	-42.37	11.36	6.02	-37.03		
	4958.40	Vertical	-43.88	14.52	6.68	-36.04		
WCDMA BAND 5 Middle	88.27	Vertical	-74.16	3.35	0.38	-71.19	-13	PASS
	1673.20	Vertical	-46.69	7.76	3.75	-42.68		
	2509.80	Vertical	-46.29	9.84	4.94	-41.39		
	3346.40	Vertical	-41.99	10.21	5.32	-37.10		
	4183.00	Vertical	-41.40	11.36	6.02	-36.06		
	5019.60	Vertical	-45.28	14.52	6.68	-37.44		
WCDMA BAND 5 Highest	88.21	Vertical	-74.12	3.35	0.38	-71.15	-13	PASS
	1693.20	Vertical	-46.29	7.79	3.53	-42.03		
	2539.80	Vertical	-40.84	9.88	5.02	-35.98		
	3386.40	Vertical	-37.10	10.25	5.54	-32.39		
	4233.00	Vertical	-43.85	11.38	6.16	-38.63		
	5079.60	Vertical	-46.23	14.56	6.72	-38.39		



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	-74.56	3.35	0.38	-71.59	-13	PASS
	3701.40	Vertical	-45.63	7.76	3.75	-41.62		
	5552.10	Vertical	-46.74	9.84	4.94	-41.84		
	7402.80	Vertical	-39.25	10.21	5.32	-34.36		
	9253.50	Vertical	-42.60	11.36	6.02	-37.26		
	11104.20	Vertical	-44.12	14.52	6.68	-36.28		
LTE BAND 2 1.4MHz Middle	88.27	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	-46.55	9.84	4.94	-41.65		
	7520.00	Vertical	-42.22	10.21	5.32	-37.33		
	9400.00	Vertical	-41.63	11.36	6.02	-36.29		
	11280.00	Vertical	-45.53	14.52	6.68	-37.69		
LTE BAND 2 1.4MHz Highest	88.21	Vertical	-74.52	3.35	0.38	-71.55	-13	PASS
	3819.60	Vertical	-46.55	7.79	3.53	-42.29		
	5729.40	Vertical	-41.07	9.88	5.02	-36.21		
	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 2 3MHz Lowest	87.33	Vertical	-74.56	3.35	0.38	-71.59	-13	PASS
	3700.40	Vertical	-45.63	7.76	3.75	-41.62		
	5550.60	Vertical	-46.42	9.84	4.94	-41.52		
	7400.80	Vertical	-39.00	10.21	5.32	-34.11		
	9251.00	Vertical	-42.32	11.36	6.02	-36.98		
	11101.20	Vertical	-43.82	14.52	6.68	-35.98		
LTE BAND 2 3MHz Middle	88.32	Vertical	-74.15	3.35	0.38	-71.18	-13	PASS
	3760.00	Vertical	-46.69	7.76	3.75	-42.68		
	5640.00	Vertical	-46.28	9.84	4.94	-41.38		
	7520.00	Vertical	-41.98	10.21	5.32	-37.09		
	9400.00	Vertical	-41.40	11.36	6.02	-36.06		
	11280.00	Vertical	-45.28	14.52	6.68	-37.44		
LTE BAND 2 3MHz Highest	88.45	Vertical	-74.11	3.35	0.38	-71.14	-13	PASS
	3819.60	Vertical	-46.28	7.79	3.53	-42.02		
	5729.40	Vertical	-40.84	9.88	5.02	-35.98		
	7639.20	Vertical	-37.10	10.25	5.54	-32.39		
	9549.00	Vertical	-43.84	11.38	6.16	-38.62		
	11458.80	Vertical	-46.23	14.56	6.72	-38.39		



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	-74.19	3.35	0.38	-71.22	-13	PASS
	3700.40	Vertical	-45.41	7.76	3.75	-41.40		
	5550.60	Vertical	-46.50	9.84	4.94	-41.60		
	7400.80	Vertical	-39.07	10.21	5.32	-34.18		
	9251.00	Vertical	-42.39	11.36	6.02	-37.05		
	11101.20	Vertical	-43.89	14.52	6.68	-36.05		
LTE BAND 2 5MHz Middle	88.76	Vertical	-74.19	3.35	0.38	-71.22	-13	PASS
	3760.00	Vertical	-46.71	7.76	3.75	-42.70		
	5640.00	Vertical	-46.31	9.84	4.94	-41.41		
	7520.00	Vertical	-42.00	10.21	5.32	-37.11		
	9400.00	Vertical	-41.42	11.36	6.02	-36.08		
	11280.00	Vertical	-45.31	14.52	6.68	-37.47		
LTE BAND 2 5MHz Highest	88.56	Vertical	-74.15	3.35	0.38	-71.18	-13	PASS
	3819.60	Vertical	-46.31	7.79	3.53	-42.05		
	5729.40	Vertical	-40.86	9.88	5.02	-36.00		
	7639.20	Vertical	-37.12	10.25	5.54	-32.41		
	9549.00	Vertical	-43.86	11.38	6.16	-38.64		
	11458.80	Vertical	-46.26	14.56	6.72	-38.42		
LTE BAND 2 10MHz Lowest	87.23	Vertical	-74.19	3.35	0.38	-71.22	-13	PASS
	3700.40	Vertical	-45.66	7.76	3.75	-41.65		
	5550.60	Vertical	-46.45	9.84	4.94	-41.55		
	7400.80	Vertical	-39.02	10.21	5.32	-34.13		
	9251.00	Vertical	-42.34	11.36	6.02	-37.00		
	11101.20	Vertical	-43.84	14.52	6.68	-36.00		
LTE BAND 2 10MHz Middle	88.56	Vertical	-74.24	3.35	0.38	-71.27	-13	PASS
	3760.00	Vertical	-46.74	7.76	3.75	-42.73		
	5640.00	Vertical	-46.34	9.84	4.94	-41.44		
	7520.00	Vertical	-42.03	10.21	5.32	-37.14		
	9400.00	Vertical	-41.44	11.36	6.02	-36.10		
	11280.00	Vertical	-45.34	14.52	6.68	-37.50		
LTE BAND 2 10MHz Highest	88.54	Vertical	-74.20	3.35	0.38	-71.23	-13	PASS
	3819.60	Vertical	-46.34	7.79	3.53	-42.08		
	5729.40	Vertical	-40.89	9.88	5.02	-36.03		
	7639.20	Vertical	-37.14	10.25	5.54	-32.43		
	9549.00	Vertical	-43.89	11.38	6.16	-38.67		
	11458.80	Vertical	-46.29	14.56	6.72	-38.45		



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	-74.01	3.35	0.38	-71.04	-13	PASS
	3700.40	Vertical	-45.34	7.76	3.75	-41.33		
	5550.60	Vertical	-46.43	9.84	4.94	-41.53		
	7400.80	Vertical	-39.01	10.21	5.32	-34.12		
	9251.00	Vertical	-42.33	11.36	6.02	-36.99		
	11101.20	Vertical	-43.82	14.52	6.68	-35.98		
LTE BAND 2 15MHz Middle	88.14	Vertical	-74.08	3.35	0.38	-71.11	-13	PASS
	3760.00	Vertical	-46.64	7.76	3.75	-42.63		
	5640.00	Vertical	-46.24	9.84	4.94	-41.34		
	7520.00	Vertical	-41.94	10.21	5.32	-37.05		
	9400.00	Vertical	-41.36	11.36	6.02	-36.02		
	11280.00	Vertical	-45.24	14.52	6.68	-37.40		
LTE BAND 2 15MHz Highest	88.62	Vertical	-74.04	3.35	0.38	-71.07	-13	PASS
	3819.60	Vertical	-46.24	7.79	3.53	-41.98		
	5729.40	Vertical	-40.80	9.88	5.02	-35.94		
	7639.20	Vertical	-37.06	10.25	5.54	-32.35		
	9549.00	Vertical	-43.79	11.38	6.16	-38.57		
	11458.80	Vertical	-46.19	14.56	6.72	-38.35		
LTE BAND 2 20MHz Lowest	87.53	Vertical	-74.05	3.35	0.38	-71.08	-13	PASS
	3700.40	Vertical	-45.32	7.76	3.75	-41.31		
	5550.60	Vertical	-46.41	9.84	4.94	-41.51		
	7400.80	Vertical	-39.00	10.21	5.32	-34.11		
	9251.00	Vertical	-42.31	11.36	6.02	-36.97		
	11101.20	Vertical	-43.81	14.52	6.68	-35.97		
LTE BAND 2 20MHz Middle	88.65	Vertical	-74.05	3.35	0.38	-71.08	-13	PASS
	3760.00	Vertical	-46.62	7.76	3.75	-42.61		
	5640.00	Vertical	-46.22	9.84	4.94	-41.32		
	7520.00	Vertical	-41.92	10.21	5.32	-37.03		
	9400.00	Vertical	-41.34	11.36	6.02	-36.00		
	11280.00	Vertical	-45.22	14.52	6.68	-37.38		
LTE BAND 2 20MHz Highest	88.34	Vertical	-74.01	3.35	0.38	-71.04	-13	PASS
	3819.60	Vertical	-46.22	7.79	3.53	-41.96		
	5729.40	Vertical	-40.78	9.88	5.02	-35.92		
	7639.20	Vertical	-37.04	10.25	5.54	-32.33		
	9549.00	Vertical	-43.77	11.38	6.16	-38.55		
	11458.80	Vertical	-46.17	14.56	6.72	-38.33		



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	-74.12	3.35	0.38	-71.15	-13	PASS
	3700.40	Vertical	-45.37	7.76	3.75	-41.36		
	5550.60	Vertical	-46.46	9.84	4.94	-41.56		
	7400.80	Vertical	-39.03	10.21	5.32	-34.14		
	9251.00	Vertical	-42.35	11.36	6.02	-37.01		
	11101.20	Vertical	-43.85	14.52	6.68	-36.01		
LTE BAND 5 1.4MHz Middle	88.21	Vertical	-74.12	3.35	0.38	-71.15	-13	PASS
	3760.00	Vertical	-46.67	7.76	3.75	-42.66		
	5640.00	Vertical	-46.27	9.84	4.94	-41.37		
	7520.00	Vertical	-41.96	10.21	5.32	-37.07		
	9400.00	Vertical	-41.38	11.36	6.02	-36.04		
	11280.00	Vertical	-45.27	14.52	6.68	-37.43		
LTE BAND 5 1.4MHz Highest	88.77	Vertical	-74.08	3.35	0.38	-71.11	-13	PASS
	3819.60	Vertical	-46.27	7.79	3.53	-42.01		
	5729.40	Vertical	-40.82	9.88	5.02	-35.96		
	7639.20	Vertical	-37.08	10.25	5.54	-32.37		
	9549.00	Vertical	-43.82	11.38	6.16	-38.60		
	11458.80	Vertical	-46.22	14.56	6.72	-38.38		
LTE BAND 5 3MHz Lowest	87.98	Vertical	-74.07	3.35	0.38	-71.10	-13	PASS
	3700.40	Vertical	-45.33	7.76	3.75	-41.32		
	5550.60	Vertical	-46.43	9.84	4.94	-41.53		
	7400.80	Vertical	-39.01	10.21	5.32	-34.12		
	9251.00	Vertical	-42.32	11.36	6.02	-36.98		
	11101.20	Vertical	-43.82	14.52	6.68	-35.98		
LTE BAND 5 3MHz Middle	88.78	Vertical	-74.20	3.35	0.38	-71.23	-13	PASS
	3760.00	Vertical	-46.72	7.76	3.75	-42.71		
	5640.00	Vertical	-46.32	9.84	4.94	-41.42		
	7520.00	Vertical	-42.01	10.21	5.32	-37.12		
	9400.00	Vertical	-41.42	11.36	6.02	-36.08		
	11280.00	Vertical	-45.31	14.52	6.68	-37.47		
LTE BAND 5 3MHz Highest	88.67	Vertical	-74.16	3.35	0.38	-71.19	-13	PASS
	3819.60	Vertical	-46.32	7.79	3.53	-42.06		
	5729.40	Vertical	-40.86	9.88	5.02	-36.00		
	7639.20	Vertical	-37.12	10.25	5.54	-32.41		
	9549.00	Vertical	-43.87	11.38	6.16	-38.65		
	11458.80	Vertical	-46.27	14.56	6.72	-38.43		



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	-73.68	3.35	0.38	-70.71	-13	PASS
	3700.40	Vertical	-45.09	7.76	3.75	-41.08		
	5550.60	Vertical	-46.18	9.84	4.94	-41.28		
	7400.80	Vertical	-38.80	10.21	5.32	-33.91		
	9251.00	Vertical	-42.10	11.36	6.02	-36.76		
	11101.20	Vertical	-43.59	14.52	6.68	-35.75		
LTE BAND 5 5MHz Middle	88.32	Vertical	-73.68	3.35	0.38	-70.71	-13	PASS
	3760.00	Vertical	-46.39	7.76	3.75	-42.38		
	5640.00	Vertical	-46.00	9.84	4.94	-41.10		
	7520.00	Vertical	-41.71	10.21	5.32	-36.82		
	9400.00	Vertical	-41.14	11.36	6.02	-35.80		
	11280.00	Vertical	-44.99	14.52	6.68	-37.15		
LTE BAND 5 5MHz Highest	88.32	Vertical	-73.64	3.35	0.38	-70.67	-13	PASS
	3819.60	Vertical	-46.00	7.79	3.53	-41.74		
	5729.40	Vertical	-40.58	9.88	5.02	-35.72		
	7639.20	Vertical	-36.87	10.25	5.54	-32.16		
	9549.00	Vertical	-43.56	11.38	6.16	-38.34		
	11458.80	Vertical	-45.95	14.56	6.72	-38.11		
LTE BAND 5 10MHz Lowest	87.23	Vertical	-73.71	3.35	0.38	-70.74	-13	PASS
	3700.40	Vertical	-45.11	7.76	3.75	-41.10		
	5550.60	Vertical	-46.19	9.84	4.94	-41.29		
	7400.80	Vertical	-38.81	10.21	5.32	-33.92		
	9251.00	Vertical	-42.12	11.36	6.02	-36.78		
	11101.20	Vertical	-43.61	14.52	6.68	-35.77		
LTE BAND 5 10MHz Middle	88.21	Vertical	-73.78	3.35	0.38	-70.81	-13	PASS
	3760.00	Vertical	-46.45	7.76	3.75	-42.44		
	5640.00	Vertical	-46.05	9.84	4.94	-41.15		
	7520.00	Vertical	-41.78	10.21	5.32	-36.89		
	9400.00	Vertical	-41.20	11.36	6.02	-35.86		
	11280.00	Vertical	-45.05	14.52	6.68	-37.21		
LTE BAND 5 10MHz Highest	88.15	Vertical	-73.74	3.35	0.38	-70.77	-13	PASS
	3819.60	Vertical	-46.05	7.79	3.53	-41.79		
	5729.40	Vertical	-40.64	9.88	5.02	-35.78		
	7639.20	Vertical	-36.92	10.25	5.54	-32.21		
	9549.00	Vertical	-43.62	11.38	6.16	-38.40		
	11458.80	Vertical	-46.00	14.56	6.72	-38.16		



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	-73.95	3.35	0.38	-70.98	-25	PASS
	5005.00	Vertical	-45.23	7.76	3.75	-41.22		
	7507.50	Vertical	-46.32	9.84	4.94	-41.42		
	10010.00	Vertical	-38.92	10.21	5.32	-34.03		
	12512.50	Vertical	-42.23	11.36	6.02	-36.89		
	15015.00	Vertical	-43.73	14.52	6.68	-35.89		
LTE BAND 7 5MHz Middle	87.87	Vertical	-73.91	3.35	0.38	-70.94	-25	PASS
	5070.00	Vertical	-46.54	7.76	3.75	-42.53		
	7605.00	Vertical	-46.13	9.84	4.94	-41.23		
	10140.00	Vertical	-41.84	10.21	5.32	-36.95		
	12675.00	Vertical	-41.27	11.36	6.02	-35.93		
	15210.00	Vertical	-45.13	14.52	6.68	-37.29		
LTE BAND 7 5MHz Highest	88.87	Vertical	-73.87	3.35	0.38	-70.90	-25	PASS
	5135.00	Vertical	-46.13	7.79	3.53	-41.87		
	7702.50	Vertical	-40.71	9.88	5.02	-35.85		
	10270.00	Vertical	-36.98	10.25	5.54	-32.27		
	12837.50	Vertical	-43.70	11.38	6.16	-38.48		
	15405.00	Vertical	-46.08	14.56	6.72	-38.24		
LTE BAND 7 10MHz Lowest	87.53	Vertical	-73.08	3.35	0.38	-70.11	-25	PASS
	5010.00	Vertical	-44.72	7.76	3.75	-40.71		
	7515.00	Vertical	-45.79	9.84	4.94	-40.89		
	10020.00	Vertical	-38.48	10.21	5.32	-33.59		
	12525.00	Vertical	-41.75	11.36	6.02	-36.41		
	15030.00	Vertical	-43.24	14.52	6.68	-35.40		
LTE BAND 7 10MHz Middle	88.23	Vertical	-73.97	3.35	0.38	-71.00	-25	PASS
	5070.00	Vertical	-46.57	7.76	3.75	-42.56		
	7605.00	Vertical	-46.17	9.84	4.94	-41.27		
	10140.00	Vertical	-41.88	10.21	5.32	-36.99		
	12675.00	Vertical	-41.30	11.36	6.02	-35.96		
	15210.00	Vertical	-45.17	14.52	6.68	-37.33		
LTE BAND 7 10MHz Highest	88.23	Vertical	-73.93	3.35	0.38	-70.96	-25	PASS
	5130.00	Vertical	-46.17	7.79	3.53	-41.91		
	7695.00	Vertical	-40.74	9.88	5.02	-35.88		
	10260.00	Vertical	-37.01	10.25	5.54	-32.30		
	12825.00	Vertical	-43.74	11.38	6.16	-38.52		
	15390.00	Vertical	-46.12	14.56	6.72	-38.28		



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	-73.65	3.35	0.38	-70.68	-17	PASS
	5015.00	Vertical	-45.08	7.76	3.75	-41.07		
	7522.50	Vertical	-46.16	9.84	4.94	-41.26		
	10030.00	Vertical	-38.79	10.21	5.32	-33.90		
	12537.50	Vertical	-42.08	11.36	6.02	-36.74		
	15045.00	Vertical	-43.58	14.52	6.68	-35.74		
LTE BAND 7 15MHz Middle	88.87	Vertical	-73.65	3.35	0.38	-70.68	-17	PASS
	5070.00	Vertical	-46.37	7.76	3.75	-42.36		
	7605.00	Vertical	-45.97	9.84	4.94	-41.07		
	10140.00	Vertical	-41.70	10.21	5.32	-36.81		
	12675.00	Vertical	-41.13	11.36	6.02	-35.79		
	15210.00	Vertical	-44.98	14.52	6.68	-37.14		
LTE BAND 7 15MHz Highest	88.29	Vertical	-73.61	3.35	0.38	-70.64	-17	PASS
	5125.00	Vertical	-45.97	7.79	3.53	-41.71		
	7687.50	Vertical	-40.57	9.88	5.02	-35.71		
	10250.00	Vertical	-36.87	10.25	5.54	-32.16		
	12812.50	Vertical	-43.55	11.38	6.16	-38.33		
	15375.00	Vertical	-45.92	14.56	6.72	-38.08		
LTE BAND 7 20MHz Lowest	87.81	Vertical	-73.62	3.35	0.38	-70.65	-17	PASS
	5020.00	Vertical	-45.06	7.76	3.75	-41.05		
	7530.00	Vertical	-46.14	9.84	4.94	-41.24		
	10040.00	Vertical	-38.77	10.21	5.32	-33.88		
	12550.00	Vertical	-42.07	11.36	6.02	-36.73		
	15060.00	Vertical	-43.56	14.52	6.68	-35.72		
LTE BAND 7 20MHz Middle	88.56	Vertical	-73.82	3.35	0.38	-70.85	-17	PASS
	5070.00	Vertical	-46.47	7.76	3.75	-42.46		
	7605.00	Vertical	-46.07	9.84	4.94	-41.17		
	10140.00	Vertical	-41.80	10.21	5.32	-36.91		
	12675.00	Vertical	-41.23	11.36	6.02	-35.89		
	15210.00	Vertical	-45.08	14.52	6.68	-37.24		
LTE BAND 7 20MHz Highest	88.22	Vertical	-73.78	3.35	0.38	-70.81	-17	PASS
	5120.00	Vertical	-46.07	7.79	3.53	-41.81		
	7680.00	Vertical	-40.67	9.88	5.02	-35.81		
	10240.00	Vertical	-36.93	10.25	5.54	-32.22		
	12800.00	Vertical	-43.65	11.38	6.16	-38.43		
	15360.00	Vertical	-46.02	14.56	6.72	-38.18		



Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Level (dBm)		
LTE BAND 12 1.4MHz Lowest	87.18	Vertical	-74.00	3.35	0.38	-71.03	-13	PASS
	1398.20	Vertical	-45.28	7.76	3.75	-41.27		
	2097.30	Vertical	-46.38	9.84	4.94	-41.48		
	2796.40	Vertical	-38.97	10.21	5.32	-34.08		
	3495.50	Vertical	-42.28	11.36	6.02	-36.94		
	4194.60	Vertical	-43.78	14.52	6.68	-35.94		
LTE BAND 12 1.4MHz Middle	88.32	Vertical	-74.00	3.35	0.38	-71.03	-13	PASS
	1415.00	Vertical	-46.60	7.76	3.75	-42.59		
	2122.50	Vertical	-46.19	9.84	4.94	-41.29		
	2830.00	Vertical	-41.90	10.21	5.32	-37.01		
	3537.50	Vertical	-41.31	11.36	6.02	-35.97		
	4245.00	Vertical	-45.18	14.52	6.68	-37.34		
LTE BAND 12 1.4MHz Highest	88.11	Vertical	-73.96	3.35	0.38	-70.99	-13	PASS
	1430.60	Vertical	-46.19	7.79	3.53	-41.93		
	2145.90	Vertical	-40.76	9.88	5.02	-35.90		
	2861.20	Vertical	-37.02	10.25	5.54	-32.31		
	3576.50	Vertical	-43.75	11.38	6.16	-38.53		
	4291.80	Vertical	-46.14	14.56	6.72	-38.30		
LTE BAND 12 3MHz Lowest	87.32	Vertical	-74.02	3.35	0.38	-71.05	-13	PASS
	1401.00	Vertical	-45.30	7.76	3.75	-41.29		
	2101.50	Vertical	-46.40	9.84	4.94	-41.50		
	2802.00	Vertical	-38.98	10.21	5.32	-34.09		
	3502.50	Vertical	-42.29	11.36	6.02	-36.95		
	4203.00	Vertical	-43.79	14.52	6.68	-35.95		
LTE BAND 12 3MHz Middle	88.21	Vertical	-74.04	3.35	0.38	-71.07	-13	PASS
	1415.00	Vertical	-46.62	7.76	3.75	-42.61		
	2122.50	Vertical	-46.23	9.84	4.94	-41.33		
	2830.00	Vertical	-41.92	10.21	5.32	-37.03		
	3537.50	Vertical	-41.34	11.36	6.02	-36.00		
	4245.00	Vertical	-45.22	14.52	6.68	-37.38		
LTE BAND 12 3MHz Highest	88.76	Vertical	-74.01	3.35	0.38	-71.04	-13	PASS
	1429.00	Vertical	-46.23	7.79	3.53	-41.97		
	2143.50	Vertical	-40.78	9.88	5.02	-35.92		
	2858.00	Vertical	-37.04	10.25	5.54	-32.33		
	3572.50	Vertical	-44.17	11.38	6.16	-38.95		
	4287.00	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 12 5MHz Lowest	87.18	Vertical	-74.17	3.35	0.38	-71.20	-13	PASS
	1403.00	Vertical	-45.39	7.76	3.75	-41.38		
	2104.50	Vertical	-46.49	9.84	4.94	-41.59		
	2806.00	Vertical	-39.06	10.21	5.32	-34.17		
	3507.50	Vertical	-42.38	11.36	6.02	-37.04		
	4209.00	Vertical	-43.88	14.52	6.68	-36.04		
LTE BAND 12 5MHz Middle	88.32	Vertical	-74.17	3.35	0.38	-71.20	-13	PASS
	1415.00	Vertical	-46.71	7.76	3.75	-42.70		
	2122.50	Vertical	-46.30	9.84	4.94	-41.40		
	2830.00	Vertical	-42.00	10.21	5.32	-37.11		
	3537.50	Vertical	-41.41	11.36	6.02	-36.07		
	4245.00	Vertical	-45.28	14.52	6.68	-37.44		
LTE BAND 12 5MHz Highest	88.11	Vertical	-74.13	3.35	0.38	-71.16	-13	PASS
	1427.00	Vertical	-46.30	7.79	3.53	-42.04		
	2140.50	Vertical	-40.85	9.88	5.02	-35.99		
	2854.00	Vertical	-37.11	10.25	5.54	-32.40		
	3567.50	Vertical	-43.85	11.38	6.16	-38.63		
	4281.00	Vertical	-46.25	14.56	6.72	-38.41		
LTE BAND 12 10MHz Lowest	87.32	Vertical	-74.19	3.35	0.38	-71.22	-13	PASS
	1408.00	Vertical	-45.41	7.76	3.75	-41.40		
	2112.00	Vertical	-46.51	9.84	4.94	-41.61		
	2816.00	Vertical	-39.07	10.21	5.32	-34.18		
	3520.00	Vertical	-42.39	11.36	6.02	-37.05		
	4224.00	Vertical	-43.89	14.52	6.68	-36.05		
LTE BAND 12 10MHz Middle	88.21	Vertical	-74.21	3.35	0.38	-71.24	-13	PASS
	1415.00	Vertical	-46.73	7.76	3.75	-42.72		
	2122.50	Vertical	-46.34	9.84	4.94	-41.44		
	2830.00	Vertical	-42.02	10.21	5.32	-37.13		
	3537.50	Vertical	-41.44	11.36	6.02	-36.10		
	4245.00	Vertical	-45.32	14.52	6.68	-37.48		
LTE BAND 12 10MHz Highest	88.76	Vertical	-74.18	3.35	0.38	-71.21	-13	PASS
	1422.00	Vertical	-46.34	7.79	3.53	-42.08		
	2133.00	Vertical	-40.87	9.88	5.02	-36.01		
	2844.00	Vertical	-37.13	10.25	5.54	-32.42		
	3555.00	Vertical	-43.87	11.38	6.16	-38.65		
	4266.00	Vertical	-46.29	14.56	6.72	-38.45		



Band	Frequency (MHz)	Spurious Emission					Limit (dBm)	Result
		Polarization	S.G. output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Level (dBm)		
LTE BAND 17 5MHz Lowest	87.18	Vertical	-74.08	3.35	0.38	-71.11	-13	PASS
	1559.00	Vertical	-45.33	7.76	3.75	-41.32		PASS
	2338.50	Vertical	-46.43	9.84	4.94	-41.53		PASS
	3118.00	Vertical	-39.01	10.21	5.32	-34.12		
	3897.50	Vertical	-42.33	11.36	6.02	-36.99		
	4677.00	Vertical	-43.83	14.52	6.68	-35.99		
LTE BAND 17 5MHz Middle	88.32	Vertical	-74.08	3.35	0.38	-71.11	-13	PASS
	1564.00	Vertical	-46.65	7.76	3.75	-42.64		PASS
	2346.00	Vertical	-46.24	9.84	4.94	-41.34		PASS
	3128.00	Vertical	-41.95	10.21	5.32	-37.06		
	3910.00	Vertical	-41.36	11.36	6.02	-36.02		
	4692.00	Vertical	-45.23	14.52	6.68	-37.39		
LTE BAND 17 5MHz Highest	88.11	Vertical	-74.04	3.35	0.38	-71.07	-13	PASS
	1569.00	Vertical	-46.24	7.79	3.53	-41.98		PASS
	2353.50	Vertical	-40.80	9.88	5.02	-35.94		PASS
	3138.00	Vertical	-37.07	10.25	5.54	-32.36		
	3922.50	Vertical	-43.80	11.38	6.16	-38.58		
	4707.00	Vertical	-46.19	14.56	6.72	-38.35		
LTE BAND 17 10MHz Middle	88.21	Vertical	-74.12	3.35	0.38	-71.15	-13	PASS
	1564.00	Vertical	-46.67	7.76	3.75	-42.66		PASS
	2346.00	Vertical	-46.28	9.84	4.94	-41.38		PASS
	3128.00	Vertical	-41.97	10.21	5.32	-37.08		
	3910.00	Vertical	-41.39	11.36	6.02	-36.05		
	4692.00	Vertical	-45.27	14.52	6.68	-37.43		



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 *******