FCC RF TEST REPORT

ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

FOR

Outdoor LoRa Gateway

ISSUED TO
Shenzhen RAKwireless Technology Co., Ltd.

Room 506, Bldg B, New Compark, Pingshan First Road, Taoyuan Street, XiLi town Nanshan District, Shenzhen, China

Report No.:	BL-SZ1920035-501
EUT Name:	Outdoor LoRa Gateway
Model Name:	RAK7240 (refer section 2.4)
Brand Name:	RAK
Test Standard:	47 CFR Part 2 (10-1-17 Edition)
	47 CFR Part 22 (10-1-17 Edition)
	47 CFR Part 24 (10-1-17 Edition)
	47 CFR Part 27 (10-1-17 Edition)
FCC ID:	2AF6B-RAK724X
Test Conclusion:	Pass
Test Date:	Feb. 19, 2019 ~ Feb. 27, 2019
Date of Issue:	Apr. 15, 2019

Tested by: _____
Heng Aiping
(Engineer)
Date Apr. 15, 2019

Approved by: _____
Wei Yanquan
(Chief Engineer)
Date Apr. 15, 2019

NOTE: This test report of test results only related to testing samples, which can be duplicated completely for the legal use with the approval of the applicant; it shall not be reproduced except in full, without the written approval of Shenzhen BALUN Technology Co., Ltd. Any objections should be raised within thirty days from the date of issue. To validate the report, please contact us.

Block B, 1st FL,Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong, P. R. China 518055
TEL: +86-755-66850100, FAX: +86-755-61824271
Email: qc@baluntek.com
www.baluntek.com

Revision History

Version	Issue Date	Revisions Content
Rev. 01	Apr. 03, 2019	Initial Issue
Rev. 02	Apr. 15, 2019	Updated antenna information and antenna gain

TABLE OF CONTENTS

1 ADMINISTRATIVE DATA (GENERAL INFORMATION)

1.1 Identification of the Testing Laboratory

Company Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China.
Phone Number	+86 755 6685 0100

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China.
Accreditation Certificate	The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 11524A-1. The laboratory is a testing organization accredited by FCC as an accredited testing laboratory. The designation number is CN1196. The laboratory is a testing organization accredited by American Association for Laboratory Accreditation(A2LA) according to ISO/IEC 17025. The accreditation certificate number is 4344.01. The laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6791.
Description	All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055

1.3 Laboratory Condition

Ambient Temperature	20 °C to 35 °C
Ambient Relative Humidity	30 % to 60 %
Ambient Pressure	98 kPa to 102 kPa

1.4 Announce

(1) The test report reference to the report template version v4.7.

(2) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.

(3) The test report is invalid if there is any evidence and/or falsification.

(4) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.

(5) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.

(6) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	Shenzhen RAKwireless Technology Co., Ltd.
Address	Room 506, Bldg B, New Compark, Pingshan First Road, Taoyuan Street, XiLi town Nanshan District, Shenzhen, China

2.2 Manufacturer Information

Manufacturer	Shenzhen RAKwireless Technology Co., Ltd.
Address	Room 506, Bldg B, New Compark, Pingshan First Road, Taoyuan Street, XiLi town Nanshan District, Shenzhen, China

2.3 Factory Information

Factory	N/A
Address	N/A

2.4 General Description for Equipment under Test (EUT)

EUT Name	Outdoor LoRa Gateway
Model Name Under Test	RAK7240
Series Model Name	RAK7249
Description of Model name differentiation	All models are same with electrical parameters and internal circuit structure, but only different on enclosure.
Hardware Version	VA
Software Version	1.1.0024_Release
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.5 Technical Information

All Network and Wireless connectivity for EUT	3G Network WCDMA Band 2/4/5/8 4G Network FDD LTE Band 2/4/5/12/13 WIFI 802.11b, 802.11g and 802.11n (HT20/40) GPS, Lora
About the Product	The equipment is Outdoor LoRa Gateway, intended for used with information technology equipment.

The requirement for the following technical information of the EUT was tested in this report:

Operating Bands	WCDMA Band 2/4/5 FDD LTE Band 2/4/5/12/13	
Modulation Type	WCDMA	QPSK
	HSDPA/ HSUPA	QPSK
		16QAM
	LTE	QPSK
		16QAM
TX Frequency Range	WCDMA Band 2: 1850 MHz ~ 1910 MHz WCDMA Band 4: 1710 MHz ~ 1755 MHz WCDMA Band 5: 824 MHz ~ 849 MHz FDD LTE Band 2: 1850 MHz ~ 1910 MHz FDD LTE Band 4: 1710 MHz ~ 1755 MHz FDD LTE Band 5: 824 MHz ~ 849 MHz FDD LTE Band 12: 699 MHz ~ 716 MHz FDD LTE Band 13: 777 MHz ~ 787 MHz	
Rx Frequency Range	WCDMA Band 2: 1930 MHz ~ 1990 MHz WCDMA Band 4: 2110 MHz ~ 2155 MHz WCDMA Band 5: 869 MHz ~ 894 MHz FDD LTE Band 2: 1930 MHz ~ 1990 MHz FDD LTE Band 4: 2110 MHz ~ 2155 MHz FDD LTE Band 5: 869 MHz ~ 894 MHz FDD LTE Band 12: 729 MHz ~ 746 MHz FDD LTE Band 13: 746 MHz ~ 756 MHz	
Power Class	WCDMA Band 2: 3 WCDMA Band 4: 3 WCDMA Band 5: 3 FDD LTE Band 2: 3 FDD LTE Band 4: 3 FDD LTE Band 5: 3 FDD LTE Band 12: 3 FDD LTE Band 13: 3	
Antenna Type	Fiberglass Antenna	
Antenna Gain	WCDMA Band 5; FDD LTE Band 5/B12/B13: 1 dBi WCDMA Band 2/4; FDD LTE Band 2/4: 3 dBi	

The Max RF Output Power (EIRP/ERP)	WCDMA Band 2: 25.74 dBm WCDMA Band 4: 26.08 dBm WCDMA Band 5: 27.07 dBm FDD LTE Band 2: 27.99 dBm FDD LTE Band 4: 27.80 dBm FDD LTE Band 5: 27.05 dBm FDD LTE Band 12: 22.47 dBm FDD LTE Band 13: 24.65 dBm

Note 1: The EUT information are declared by manufacturer. For more detailed features description, please refer to the manufacturer's specifications or user's manual.

3 SUMMARY OF TEST RESULTS

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 2 (10-1-17 Edition)	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
2	47 CFR Part 22 Subpart H (10-1-17 Edition)	Cellular Radiotelephone Service
3	47 CFR Part 24 Subpart E (10-1-17 Edition)	Broadband PCS
4	47 CFR Part 27 (10-1-17 Edition)	Miscellaneous Wireless Communications Services
5	ANSI/TIA-603-E-2016	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
6	KDB 971168 D01 v03r01	Measurement Guidance for Certification of Licensed Digital Transmitters

3.2 Test Verdict

No.	Test Description	FCC Part No.	Test Result	Test Verdict
1	Conducted RF Output Power	2.1046	Reporting only (ANNEX A.1)	Pass
2	Effective (Isotropic) Radiated Power	2.1046 22.913 24.232 27.50	ANNEX A.1	Pass
3	Peak to Average Radio	2.1046 24.232(d) 27.50(d)	ANNEX A.2	Pass Note 1
4	Occupied Bandwidth	2.1049 22.917 24.238 27.53	ANNEX A.3	Pass Note 1
5	Frequency Stability	2.1055 22.355 24.235 27.54	ANNEX A.4	Pass Note 1
6	Spurious Emission at Antenna Terminals	2.1051 22.917 24.238 27.53	ANNEX A.5	Pass Note 1
7	Band Edge	2.1051 22.917 24.238 27.53	ANNEX A.6	Pass Note 1
8	Field Strength of Spurious Radiation	2.1053 22.917 24.238 27.53	ANNEX A.7	Pass

Note 1:
Because the RF module installed in the EUT is electronically and mechanically identical to the original certified module in the test report No. R1805A0249-R1 & R1805A0249-R2 & R1805A0249-R3 (FCC ID: XMR201807EG95NA) (which was issued by TA Technology (Shanghai) Co., Ltd. on Jul. 04, 2018), so just cabinet radiation test of Conducted RF Output Power & Effective Radiated Power & Field Strength of Spurious Radiation were retested in this report. Other test items please refer to the No. R1805A0249-R1 & R1805A0249-R2 & R1805A0249-R3 (FCC ID: XMR201807EG95NA) (which was issued by TA Technology (Shanghai) Co., Ltd. on Jul. 04, 2018).
Note 2:
Both model RAK7240 and model RAK7249 were tested, but the report only showed the data of the worst model, and model RAK7240 has the worst data.

4 GENERAL TEST CONFIGURATIONS

4.1 Test Environments

During the measurement, the environmental conditions were within the listed ranges:

Test Voltage of the EUT	NV (Normal Voltage)	48 V
	LV (Low Voltage)	42 V
	HV (High Voltage)	57 V
Test Temperature of the EUT	NT (Normal Temperature)	+25 °C
	LT (Low Temperature)	-20 °C
	HT (High Temperature)	+55 °C

4.2 Test Equipment List

Description	Manufacturer	Model	Serial No.	Software /Firmware Version	Cal. Date	Cal. Due
Conducted Test System						
Test Software 1	R&S	CMUgo	N/A	V2.0.1	N/A	N/A
Test Software 2	R&S	CMWRun	N/A	V1.8.9	N/A	N/A
Test Software 3	BALUN	BL410R	N/A	V2.1.1.384	N/A	N/A
Universal Radio Communication Tester	R&S	CMU 200	119280	V5.13	2019.02.28	2020.02.27
Wideband Radio Communication Tester	R&S	CMW 500	127794	V3.5.137	2018.06.15	2019.06.14
Wideband Radio Communication Tester	R&S	CMW 500	120598	V3.5.137	2019.02.28	2020.02.27
Spectrum Analyzer	R&S	FSV-30	103118	2.30.SP1	2018.06.15	2019.06.14
Spectrum Analyzer	Agilent	E4440A	MY45304434	A.11.21	2018.11.01	2019.10.31
Spectrum Analyzer	Agilent	E4440A	MY46181663	A.11.21	2018.11.01	2019.10.31
Temperature Chamber	AHK	SP20	1412	N/A	2018.06.15	2019.06.14
DC Power Supply	ITECH	IT6863A	600014010687210020	N/A	2018.06.14	2019.06.13
Power Sensor	Agilent	E9304A H18	MY41497164	N/A	2018.11.01	2019.10.31
Power Splitter	KMW	DCPD-LDC	1305003215	N/A	N/A	N/A
Attenuator (20 dB)	KMW	ZA-S1-201	110617091	N/A	N/A	N/A
Attenuator (6 dB)	KMW	ZA-S1-61	1305003189	N/A	N/A	N/A
Radiated Test System						

Description	Manufacturer	Model	Serial No.	Software /Firmware Version	Cal. Date	Cal. Due
Test Software	BALUN	BL410_E	N/A	V16.921	N/A	N/A
Test Antenna-Bi-Log (30 MHz-3 GHz)	Schwarzbeck	VULB 9163	9163-624	N/A	2017.07.22	2019.07.21
Test Antenna-Horn(1-18 GHz)	Schwarzbeck	BBHA 9120D	9120D-1600	N/A	2018.07.11	2020.07.10
Test Antenna-Horn(18-40 GHz)	A-INFO	LB-180400KF	J211060273	N/A	2019.01.05	2021.01.04
Anechoic Chamber	RAINFORD	9m*6m*6m	N/A	N/A	2017.02.21	2020.02.20
Shielded Enclosure	ChangNing	CN-130701	130703	N/A	N/A	N/A
EMI Receiver	KEYSIGHT	N9038A	MY53220118	A.14.16	2018.11.07	2019.11.06
Spectrum Analyzer	R&S	FSV-30	103118	2.30.SP1	2018.06.15	2019.06.14
Wideband Radio Communication Tester	R&S	CMW 500	121551	V3.2.73	2018.05.07	2019.05.06

4.3 Test Configurations

Test Items	Test Mode	Test Channel		
		LCH	MCH	HCH
Effective (Isotropic) Radiated Power	WCDMA Band 2	v	v	v
	WCDMA Band 4	v	v	v
	WCDMA Band 5	v	v	v
	HSDPA Band 2	v	v	v
	HSDPA Band 4	v	v	v
	HSDPA Band 5	v	v	v
	HSUPA Band 2	v	v	v
	HSUPA Band 4	v	v	v
	HSUPA Band 5	v	v	v
Field Strength of Spurious Radiation	WCDMA Band 2	v	v	v
	WCDMA Band 4	v	v	v
	WCDMA Band 5	v	v	v
Note 1: The mark “v” means that this configuration is chosen for testing.				

Test Mode	UL Channel	UL Channel No.	UL Frequency (MHz)
WCDMA Band 2	Low Channel	9262	1852.4
	Middle Channel	9400	1880.0
	High Channel	9538	1907.6
WCDMA Band 4	Low Channel	1312	1712.4
	Middle Channel	1412	1732.4
	High Channel	1513	1752.6
WCDMA Band 5	Low Channel	4132	826.4
	Middle Channel	4182	836.4
	High Channel	4233	846.6

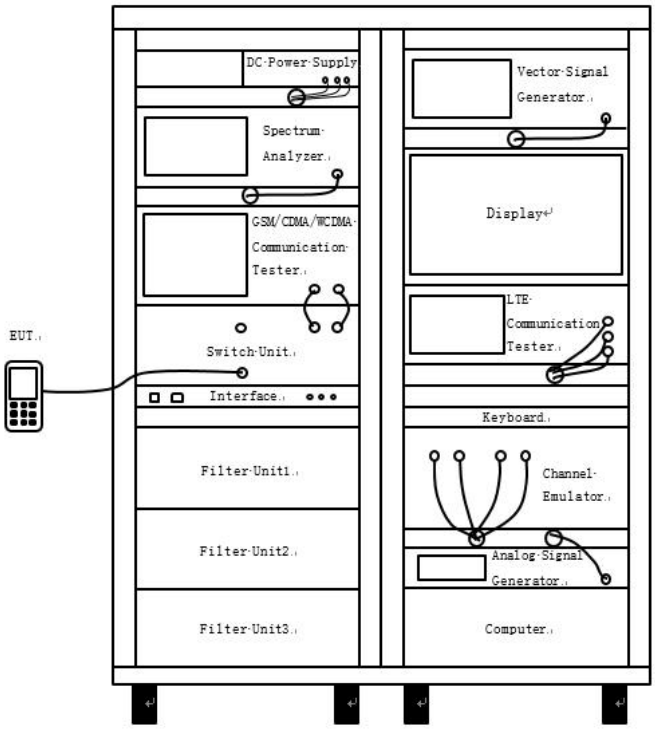
LTE Band	Bandwidth (MHz)						Modulation Type		RB#			Test Channel		
	1.4	3	5	10	15	20	QPSK	16-QAM	1	Half	Full	LCH	MCH	HCH
Effective (Isotropic) Radiated Power														
2	v	v	v	v	v	v	v	v	v	--	v	v	v	v
4	v	v	v	v	v	v	v	v	v	--	v	v	v	v
5	v	v	v	v	n	n	v	v	v	--	v	v	v	v
12	v	v	v	v	n	n	v	v	v	--	v	v	v	v
13	n	n	v	v	n	n	v	v	v	--	v	v	v	v
Field Strength of Spurious Radiation														
2	v	v	v	v	v	v	v	--	v	--	--	--	v	--
4	v	v	v	v	v	v	v	--	v	--	--	--	v	--
5	v	v	v	v	n	n	v	--	v	--	--	--	v	--
12	v	v	v	v	n	n	v	--	v	--	--	--	v	--
13	n	n	v	v	n	n	v	--	v	--	--	--	v	--
Note 1: The mark “v” means that this configuration is chosen for testing. Note 2: The mark “n” means that this bandwidth is not supported.														

Test Mode	UL Channel	Channel Bandwidth (MHz)	UL Channel No.	UL Frequency (MHz)
LTE Band 2	Low Range	1.4	18607	1850.7
		3	18615	1851.5
		5	18625	1852.5
		10	18650	1855
		15	18675	1857.5
		20	18700	1860
	Middle Range	1.4/3/5/10/15/20	18900	1880
	High Range	1.4	19193	1909.3
		3	19185	1908.5
		5	19175	1907.5
		10	19150	1905
		15	19125	1902.5
		20	19100	1900
LTE Band 4	Low Range	1.4	19957	1710.7
		3	19965	1711.5
		5	19975	1712.5
		10	20000	1715
		15	20025	1717.5
		20	20050	1720
	Middle Range	1.4/3/5/10/15/20	20175	1732.5
	High Range	1.4	20393	1754.3
		3	20385	1753.5
		5	20375	1752.5
		10	20350	1750
		15	20325	1747.5
		20	20300	1745
LTE Band 5	Low Range	1.4	20407	824.7
		3	20415	825.5
		5	20425	826.5
		10	20450	829
	Middle Range	1.4/3/5/10	20525	836.5
	High Range	1.4	20643	848.3
		3	20635	847.5
		5	20625	846.5
		10	20600	844
LTE Band 12	Low Range	1.4	23017	699.7
		3	23025	700.5
		5	23035	701.5
		10	23060	704
	Middle Range	1.4/3/5/10	23095	707.5
	High Range	1.4	23173	715.3
		3	23165	714.5
		5	23155	713.5
		10	23130	711

Test Mode	UL Channel	Channel Bandwidth (MHz)	UL Channel No.	UL Frequency (MHz)
LTE Band 13	Low Range	5	23205	779.2
		10	23230	782
	Middle Range	5/10	23230	782
	High Range	5	23255	784.5
		10	23230	782

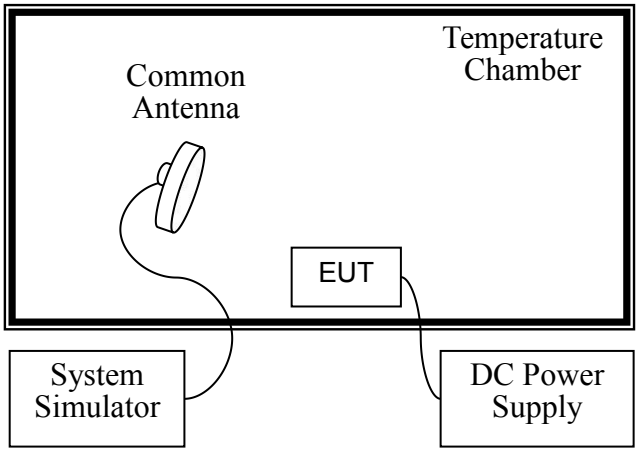
4.4 Test Setup

4.4.1 For Antenna Port Test



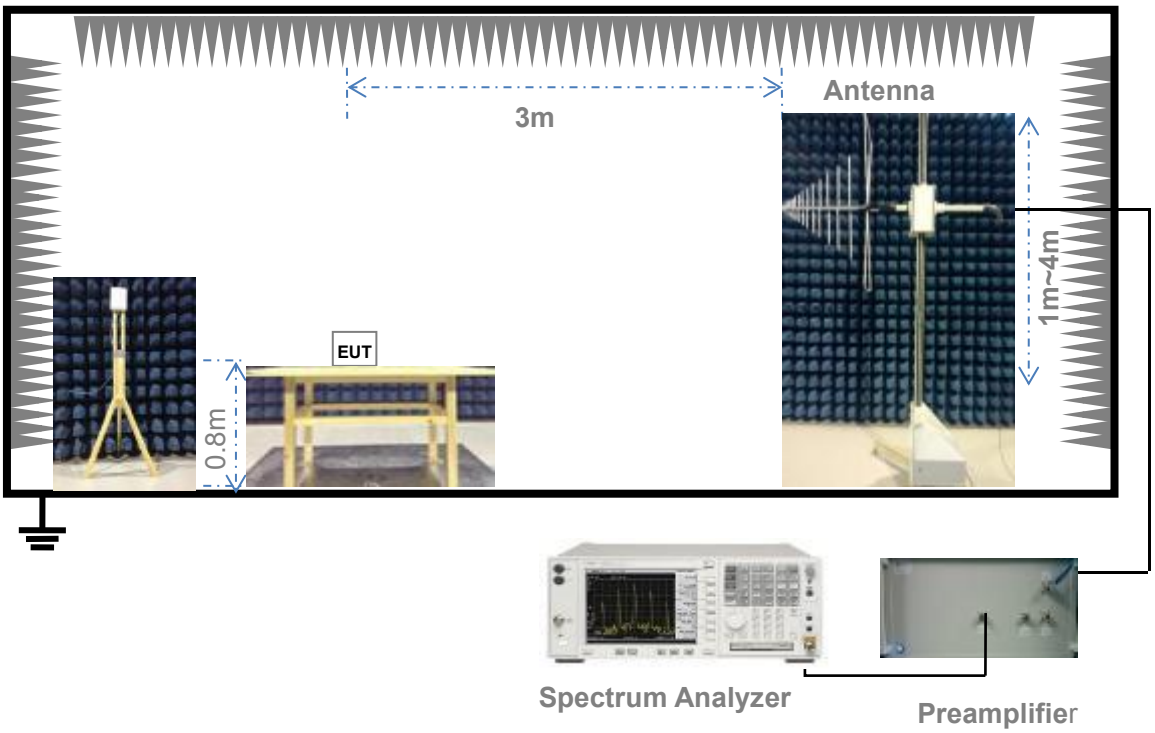
(Diagram 1)

4.4.2 For Frequency Stability Test



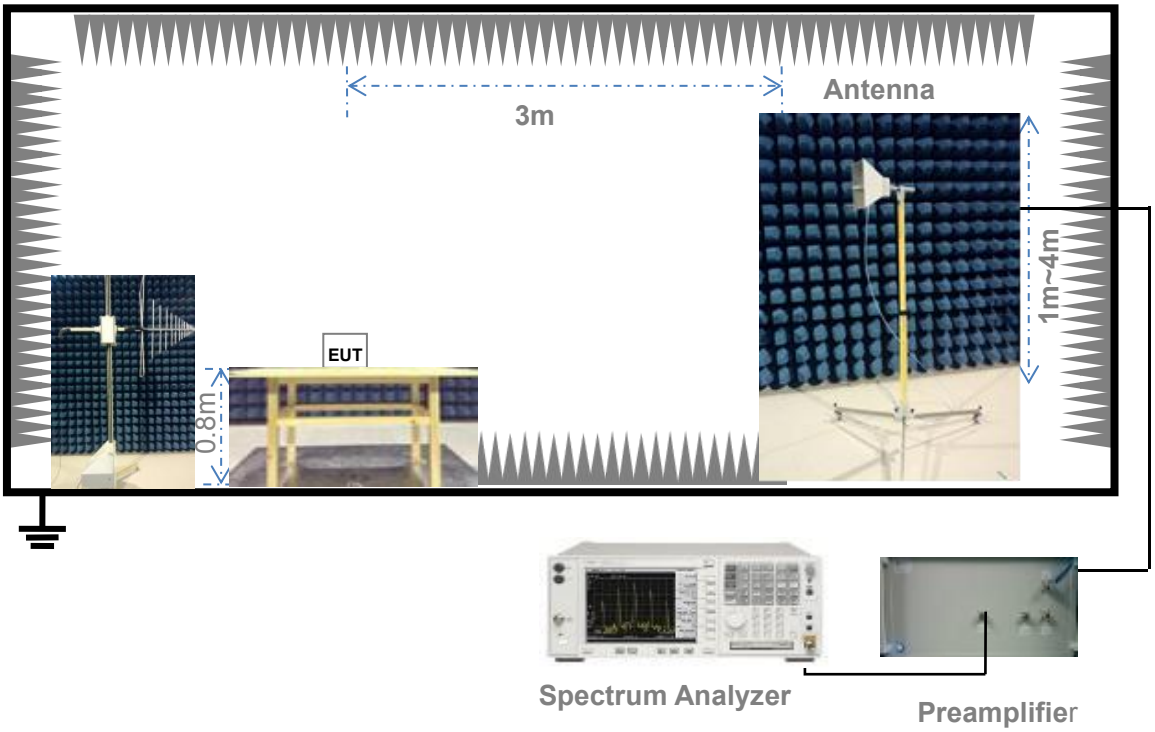
(Diagram 2)

4.4.3 For Radiated Test (30 MHz ~ 1 GHz)



(Diagram 3)

4.4.4 For Radiated Test (Above 1 GHz)



(Diagram 4)

5 TEST ITEMS

5.1 Transmitter Radiated Power (EIRP/ERP)

5.1.1 Limit

FCC § 2.1046 & 22.913(a) & 24.232(c) & 27.50(a) & 27.50(b) & 27.50(c) & 27.50(d) & 27.50(h)

According to FCC section 22.913(a) (5), the Effective Radiated Power (ERP) of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC section 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.

According to FCC section 27.50(a) (3), for mobile and portable stations transmitting in the 2305-2315MHz band or the 2350-2360MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, except that for mobile and portable stations compliant with 3GPP LTE standards.

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

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

FCC section 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.

(7) Fixed, mobile, and portable (hand-held) stations operating in the 2000-2020 MHz band are limited to 2 watts EIRP.

And FCC section 27.50(h) (2), for 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 section 4.4.1 (Diagram 1) test setup description is used for conducted test, and the section 4.4.3 and 4.4.4 (Diagram 3, 4) test setup description is used for radiated test. The photo of test setup please refer to ANNEX B.

5.1.3 Test Procedure

Description of the Conducted Output Power Measurement

The EUT is coupled to the SS with attenuator through power splitter; the RF load attached to EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading. A system simulator is used to establish communication with the EUT, and its parameters are set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported.

The relevant equation for determining the conducted measured value is:

Conducted Output Power Value (dBm) = Measured Value (dBm) + Path Loss (dB)

where:
Conducted Output Power Value = final conducted measured value in the conducted power test, in dBm;
Measured Value = measured conducted power received by spectrum analyzer or power meter, in dBm;
Path Loss = signal attenuation in the connecting cable between the transmitter and spectrum analyzer or power meter, including external cable loss, in dB;

During the test, the data of Path Loss (dB) is added in the spectrum analyzer or power meter, so Measured Value (dBm) is the final values which contains the data of Path Loss (dB).

For example:

In the conducted output power test, when measured value for GSM850 is 24.7 dBm, and path loss is 8.5 dB, then final conducted output power value is:

Conducted Output Power Value (dBm) = 24.7 dBm + 8.5 dB = 33.2 dBm

Description of the Transmitter Radiated Power Measurement

In many cases, the RF output power limits for licensed digital transmission devices is specified in terms of effective radiated power (ERP) or equivalent isotropic radiated power (EIRP). Typically, ERP is specified when the operating frequency is less than or equal to 1 GHz and EIRP is specified when the operating frequency is greater than 1 GHz. Both are determined by adding the transmit antenna gain to the conducted RF output power with the primary difference between the two being that when determining the ERP, the transmit antenna gain is referenced to a dipole antenna (i.e., dBd) whereas when determining the EIRP, the transmit antenna gain is referenced to an isotropic antenna (dBi).

Final measurement calculation as below:

The relevant equation for determining the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:

$ERP/EIRP = P_{Meas} + GT - LC$

where:
ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as P_{Meas}, typically dBW or dBm);
P_{Meas} = measured transmitter output power or PSD, in dBm or dBW;
GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);
dBd (ERP)=dBi (EIRP) -2.15 dB
LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

For devices utilizing multiple antennas, KDB 662911 provides guidance for determining the effective array transmit antenna gain term to be used in the above equation.

For example:
In the EIRP test, when P_{Meas} value for GSM1900 is 30.2 dBm, LC is 0.6 dB, and GT is -3.4 dB, then final EIRP value is:
EIRP for GSM1900 = 30.2 dBm - 3.4 dBi - 0.6 dB = 26.2 dBm

The relevant equation for determining the ERP/EIRP from the radiated RF output power is:
ERP/EIRP (dBm) = SA Read Value (dBm) + Correction Factor (dB)

where:
ERP/EIRP = effective or equivalent radiated power, in dBm;
SA Read Value = measured transmitter power received by EMI receiver or spectrum analyzer, in dBm;
Correction Factor = total correction factor including cable loss, in dB;

During the test, the data of Correction Factor (dB) is added in the EMI receiver or spectrum analyzer, so SA Read Value (dBm) is the final values which contains the data of Correction Factor (dB).

For example:

In the ERP test, when SA read value for GSM850 is 21dBm, and correction factor is 8dB, then final ERP value for GSM850 is:

ERP (dBm) = 21dBm + 8dB = 29dBm

5.1.4 Test Result

Please refer to ANNEX A.1.

5.2 Peak to Average Ratio

5.2.1 Limit

FCC § 2.1046 & 24.232(d) & 27.50(d)

In addition, when the transmitter power is measured in terms of average value, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

According to FCC section 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 24.232 (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of § 24.51. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

FCC section 24.232(e), peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms equivalent voltage. The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, sensitivity, etc., so as to obtain a true peak measurement for the emission in question over the full bandwidth of the channel.

According to FCC section 27.50(d) (5), in measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13dB.

5.2.2 Test Setup

The section 4.4.1 (Diagram 1) test setup description is used for this test. The photo of test setup please refer to ANNEX B.

5.2.3 Test Procedure

Here the lowest, middle and highest channels are selected to perform testing to verify the peak-to-average ratio.

According to KDB 971168 D01, there is CCDF procedure for PAPR:

a) Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;

b) Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;

c) Set the number of counts to a value that stabilizes the measured CCDF curve;

d) Set the measurement interval as follows:

1) for continuous transmissions, set to 1 ms,

2) for burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.

e) Record the maximum PAPR level associated with a probability of 0.1%.

Alternate procedure for PAPR:

Use one of the procedures presented in 4.1 to measure the total peak power and record as P_{Pk}. Use one of the applicable procedures presented 4.2 to measure the total average power and record as P_{Avg}. Both the peak and average power levels must be expressed in the same logarithmic units (e.g., dBm). Determine the PAPR from:

PAPR (dB) = P_{Pk} (dBm) - P_{Avg} (dBm).

5.2.4 Test Result

Please refer to ANNEX A.2.

5.3 Occupied Bandwidth

5.3.1 Limit

FCC § 2.1049

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.

Many of the individual rule parts specify a relative OBW in lieu of the 99% OBW. In such cases, the OBW is defined as the width of the signal between two points, one below the carrier center frequency and on above the carrier center frequency, outside of which all emissions are attenuated by at least X dB below the transmitter power, where the value of X is typically specified as 26.

5.3.2 Test Setup

The section 4.4.1 (Diagram 1) test setup description is used for this test. The photo of test setup please refer to ANNEX B.

5.3.3 Test Procedure

The following procedure shall be used for measuring power bandwidth.

a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (i.e., two to five times the anticipated OBW).

b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.

c) Set the reference level of the instrument as required to keep the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope must be at least 10log (OBW / RBW) below the reference level.

d) NOTE—Steps a) through c) may require iteration to adjust within the specified tolerances.

e) For -26 dB OBW, the dynamic range of the spectrum analyzer at the selected RBW shall be at least 10dB below the target “-X dB down” requirement, e.g. -26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be 36dB below the reference value.

f) Set the detection mode to peak, and the trace mode to max hold.

g) For 99% OBW, use the 99 % power bandwidth function of the spectrum analyzer (if available) and report the measured bandwidth.

If the instrument does not have a 99 % power bandwidth function, the trace data points are to be recovered and directly summed in linear power terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99 % power bandwidth is the difference between these two frequencies.

h) For -26 dB OBW, determine the reference value: Set the EUT to transmit a modulated signal. Allow the trace to

stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).

Determine the “-X dB down amplitude” as equal to (reference value -X). Alternatively, this calculation can be performed by the analyzer by using the marker-delta function.

Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below “-X dB down amplitude” determined in step g). If a marker is below this “-X dB down amplitude” value it shall be placed as close as possible to this value. The OBW is the positive frequency difference between the two markers.

i) The OBW shall be reported by providing plot(s) of the measuring instrument display. The frequency and amplitude axes and scale shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

j) Change variable modulations, coding, or channel bandwidth settings, then repeat above test procedures.

5.3.4 Test Result

Please refer to ANNEX A.3.

5.4 Frequency Stability

5.4.1 Limit

FCC § 2.1055 & 22.355 & 24.235 & 27.54

FCC § 2.1055

The frequency stability shall be measured with variation of ambient temperature as follows:

(1) The temperature is varied from -30°C to +50°C.

(2) Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10°C through the range.

The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than carried battery equipment.

(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating and point which shall be specified by the manufacture.

(3) 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.

FCC § 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 § 24.235

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

FCC § 27.54

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

5.4.2 Test Setup

The section 4.4.2 (Diagram 2) test setup description is used for this test. The photo of test setup please refer to ANNEX B.

5.4.3 Test Procedure

1. The EUT is placed in a temperature chamber.

2. The temperature is set to 25°C and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured.

3. The temperature is increased by not more than 10 degrees, allowed to stabilize and soak, and then repeat the frequency error measurement.

4. Repeat procedure 3 until +50°C and -30°C is reached.

5. Change supply voltage, and repeat measurement until extreme voltage is reached.

5.4.4 Test Result

Please refer to ANNEX A.4.

5.5 Spurious Emission at Antenna Terminals

5.5.1 Limit

FCC § 2.1051 & 22.917(a) & 24.238(a) & 27.53(a) & 27.53(c) & 27.53(g) & 27.53(h) & 27.53(m)

In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

FCC § 22.917(a) & 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 is calculated to be -13 dBm.

FCC § 27.53(a) (4)

For mobile and portable stations operating in the 2305-2315MHz and 2350-2360MHz bands:

(1)By a factor of not less than: 43 + 10 log (P) dB on all frequencies between 2305 and 2320MHz and on all frequencies between 2345 and 2360MHz that are outside the licensed band(s) of operation, not less than 55 + 10 log (P) dB on all frequencies between 2320 and 2324MHz and on all frequencies between 2341 and 2345MHz, not less than 61 + 10 log (P) dB on all frequencies between 2324 and 2328MHz and on all frequencies between 2337 and 2341MHz, and not less than 67 + 10 log (P) dB on all frequencies between 2328 and 2337MHz.

(2)By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305MHz, 55 + 10 log (P) dB on all frequencies between 2296 and 2300MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292MHz, and 70 + 10 log (P) dB below 2288MHz.

(3)By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365MHz, and not less than 70 + 10 log (P) dB above 2365MHz.

FCC § 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 § 27.53(g)

For operations in the 600MHz band and the 698-746MHz 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 kHz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

FCC § 27.53(h) (1)

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.

FCC § 27.53(m) (4)

For mobile digital stations (BRS and EBS stations), the attenuation factor shall be not less than:

• 40+10logP dB (−10 dBm, 100 nW) on all frequencies between the channel edge and 5 MHz from the channel edge.

• 43+10logP dB (−13 dBm, 50 nW) on all frequencies between 5 MHz and X MHz from the channel edge,

• 55+10logP dB (−25 dBm, 3 nW) on all frequencies more than X MHz from the channel edge, where X is the greater of 6 MHz or the actual emission bandwidth (26 dB).

In addition, the attenuation factor shall not be less that 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

The section 4.4.1 (Diagram 1) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

5.5.3 Test Procedure

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 + 10 log(P) dB. Compliance with these provisions is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency blocks a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

1. The EUT is coupled to the system simulator and spectrum analyzer; the RF load attached to EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

2. CMW500 is used to establish communication with the EUT, and its parameters are set to force the EUT transmitting at maximum output power.

3. The RF output of the transmitter is connected to the input of the spectrum analyzer through sufficient attenuation.

4. Spurious emissions are tested with 0.001MHz RBW for frequency less than 150kHz, 0.01MHz RBW for frequency less than 30MHz, 0.1MHz RBW for frequency less than 1GHz, and 1MHz RBW for frequency above 1GHz. And sweep point number are at least 401, referring to following formula.

Sweep point number = Span/RBW

VBW=3*RBW

Detector Mode=mean or average power

5. Record the frequencies and levels of spurious emissions.

5.5.4 Test Result

Please refer to ANNEX A.5.

5.6 Band Edge

5.6.1 Limit

FCC § 2.1051 & 22.917(a) & 24.238(a) & 27.53(a) & 27.53(c) & 27.53(g) & 27.53(h) & 27.53(m)

In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

FCC § 22.917(a) & 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 is calculated to be -13 dBm.

FCC § 27.53(a) (4)

For mobile and portable stations operating in the 2305-2315MHz and 2350-2360MHz bands:

(1)By a factor of not less than: 43 + 10 log (P) dB on all frequencies between 2305 and 2320MHz and on all frequencies between 2345 and 2360MHz that are outside the licensed band(s) of operation, not less than 55 + 10 log (P) dB on all frequencies between 2320 and 2324MHz and on all frequencies between 2341 and 2345MHz, not less than 61 + 10 log (P) dB on all frequencies between 2324 and 2328MHz and on all frequencies between 2337 and 2341MHz, and not less than 67 + 10 log (P) dB on all frequencies between 2328 and 2337MHz.

(2)By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305MHz, 55 + 10 log (P) dB on all frequencies between 2296 and 2300MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292MHz, and 70 + 10 log (P) dB below 2288MHz.

(3)By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365MHz, and not less than 70 + 10 log (P) dB above 2365MHz.

FCC § 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 § 27.53(g)

For operations in the 600MHz band and the 698-746MHz 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 kHz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

FCC § 27.53(h) (1)

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.

FCC § 27.53(m) (4)

For mobile digital stations (BRS and EBS stations), the attenuation factor shall be not less than:

• 40+10logP dB (−10 dBm, 100 nW) on all frequencies between the channel edge and 5 MHz from the channel edge.

• 43+10logP dB (−13 dBm, 50 nW) on all frequencies between 5 MHz and X MHz from the channel edge,

• 55+10logP dB (−25 dBm, 3 nW) on all frequencies more than X MHz from the channel edge, where X is the greater of 6 MHz or the actual emission bandwidth (26 dB).

In addition, the attenuation factor shall not be less that 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

The section 4.4.1 (Diagram 1) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

5.6.3 Test Procedure

The EUT, which is powered by the Battery, 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.

1.The EUT is coupled to the system simulator and spectrum analyzer; the RF load attached to EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

2. CMW500 is used to establish communication with the EUT, and its parameters are set to force the EUT transmitting at maximum output power.

3. The RF output of the transmitter is connected to the input of the spectrum analyzer through sufficient attenuation.

4. The center of the spectrum analyzer was set to block edge frequency.

5. Band edge are tested with 1%*cBW (RBW), and sweep point number referred to following formula.

Sweep point number = 2*Span/RBW

VBW=3RBW

6. Record the frequencies and levels of spurious emissions.

5.6.4 Test Result

Please refer to ANNEX A.6.

5.7 Field Strength of Spurious Radiation

5.7.1 Limit

FCC § 2.1053 & 22.917(a) & 24.238(a) & 27.53(a) & 27.53(c) & 27.53(g) & 27.53(h) & 27.53(m)

FCC § 22.917(a) & 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 is calculated to be -13 dBm.

FCC § 27.53(a) (4)

For mobile and portable stations operating in the 2305-2315MHz and 2350-2360MHz bands:

(1)By a factor of not less than: 43 + 10 log (P) dB on all frequencies between 2305 and 2320MHz and on all frequencies between 2345 and 2360MHz that are outside the licensed band(s) of operation, not less than 55 + 10 log (P) dB on all frequencies between 2320 and 2324MHz and on all frequencies between 2341 and 2345MHz, not less than 61 + 10 log (P) dB on all frequencies between 2324 and 2328MHz and on all frequencies between 2337 and 2341MHz, and not less than 67 + 10 log (P) dB on all frequencies between 2328 and 2337MHz.

(2)By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305MHz, 55 + 10 log (P) dB on all frequencies between 2296 and 2300MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292MHz, and 70 + 10 log (P) dB below 2288MHz.

(3)By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365MHz, and not less than 70 + 10 log (P) dB above 2365MHz.

FCC § 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 § 27.53(g)

For operations in the 600MHz band and the 698-746MHz 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 kHz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

FCC § 27.53(h) (1)

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.

FCC § 27.53(m) (4)

For mobile digital stations (BRS and EBS stations), the attenuation factor shall be not less than:

• 40+10logP dB (−10 dBm, 100 nW) on all frequencies between the channel edge and 5 MHz from the channel edge.

• 43+10logP dB (−13 dBm, 50 nW) on all frequencies between 5 MHz and X MHz from the channel edge,

• 55+10logP dB (−25 dBm, 3 nW) on all frequencies more than X MHz from the channel edge, where X is the greater of 6 MHz or the actual emission bandwidth (26 dB).

In addition, the attenuation factor shall not be less that 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.

5.7.2 Test Setup

The section 4.4.3 and 4.4.4 (Diagram 3, 4) test setup description was used for this test. The photo of test setup please refer to ANNEX B.

5.7.3 Test Procedure

1. On a test site, the EUT shall be placed at 80cm height on a turn table, and in the position close to normal use as declared by the applicant.

2. The test antenna shall be oriented initially for vertical polarization located 3 m from EUT to correspond to the fundamental frequency of the transmitter.

3. The output of the test antenna shall be connected to the measuring receiver and the peak detector is used for the measurement.

4. During the measurement of the EUT, the resolution bandwidth was to 1 MHz and the average bandwidth was set to 1 MHz.

5. The transmitter shall be switched on; the measuring receiver shall be tuned to the frequency of the transmitter under test.

6. The test antenna shall be raised and lowered through the specified range of height until the maximum signal level is detected by the measuring receiver.

7. The transmitter shall be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.

8. The test antenna shall be raised and lowered again through the specified range of height until the maximum signal level is detected by the measuring receiver.

9. The maximum signal level detected by the measuring receiver shall be noted.

10. The EUT was replaced by half-wave dipole (824 ~ 849 MHz) or horn antenna (1 850 ~ 1 910 MHz) connected to a signal generator.

11. In necessary, the input attenuator setting on the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.

12. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.

13. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring received, which is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.

14. The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.

15. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.

Final measurement calculation as below:

The relevant equation for determining the ERP/EIRP from the radiated RF output power is:

ERP/EIRP (dBm) = SA Read Value (dBm) + Correction Factor (dB)

where:
ERP/EIRP = effective or equivalent radiated power, in dBm;
SA Read Value = measured transmitter power received by EMI receiver or spectrum analyzer, in dBm;
Correction Factor = total correction factor including cable loss, in dB;

During the test, the data of Correction Factor (dB) is added in the EMI receiver or spectrum analyzer, so SA Read Value (dBm) is the final values which contains the data of Correction Factor (dB).

For example:

In the ERP test, when SA read value for GSM850 is 21dBm, and correction factor is 8dB, then final ERP value for GSM850 is:

ERP (dBm) = 21dBm + 8dB = 29dBm

5.7.4 Test Result

Please refer to ANNEX A.7.

ANNEX A TEST RESULTS

A.1 Transmitter Radiated Power

A.1.1 Transmitter Conducted Output Power

WCDMA Mode Test Data

Test Band	Test Channel	Conducted Output Power (dBm)	Conducted Output Power (W)
WCDMA Band 2	LCH	23.84	0.242
	MCH	23.97	0.249
	HCH	23.83	0.242
HSDPA Band 2	LCH	23.01	0.200
	MCH	23.06	0.202
	HCH	22.92	0.196
HSUPA Band 2	LCH	22.76	0.189
	MCH	22.76	0.189
	HCH	22.74	0.188

Test Band	Test Channel	Conducted Output Power (dBm)	Conducted Output Power (W)
WCDMA Band 4	LCH	23.83	0.242
	MCH	24.02	0.252
	HCH	23.78	0.239
HSDPA Band 4	LCH	23.74	0.237
	MCH	23.79	0.239
	HCH	23.47	0.222
HSUPA Band 4	LCH	23.60	0.229
	MCH	23.64	0.231
	HCH	23.26	0.212

Test Band	Test Channel	Conducted Output Power (dBm)	Conducted Output Power (W)
WCDMA Band 5	LCH	23.34	0.216
	MCH	23.57	0.228
	HCH	23.69	0.234
HSDPA Band 5	LCH	23.33	0.215
	MCH	23.37	0.217
	HCH	23.56	0.227
HSUPA Band 5	LCH	23.19	0.208
	MCH	23.23	0.210
	HCH	23.46	0.222

Note 1: For the HSDPA and HSUPA mode, all subtests were tested and just the worst data were recorded in this table.

HSDPA Conducted Output Power

Band	Channel	Conducted Output Average Power							
		Subtest1		Subtest2		Subtest3		Subtest4	
		(dBm)	(W)	(dBm)	(W)	(dBm)	(W)	(dBm)	(W)
HSDPA Band 2	LCH	22.89	0.195	23.01	0.200	22.50	0.178	22.50	0.178
	MCH	23.06	0.202	23.06	0.202	22.57	0.181	22.58	0.181
	HCH	22.88	0.194	22.92	0.196	22.48	0.177	22.46	0.176
HSDPA Band 4	LCH	23.62	0.230	23.74	0.237	23.24	0.211	23.23	0.210
	MCH	23.76	0.238	23.79	0.239	23.32	0.215	23.30	0.214
	HCH	23.45	0.221	23.47	0.222	23.00	0.200	22.99	0.199
HSDPA Band 5	LCH	23.25	0.211	23.33	0.215	22.88	0.194	22.91	0.195
	MCH	23.35	0.216	23.37	0.217	22.96	0.198	22.90	0.195
	HCH	23.46	0.222	23.56	0.227	23.07	0.203	23.07	0.203

HSUPA Conducted Output Power

Band	Channel	Conducted Output Average Power									
		Subtest1		Subtest2		Subtest3		Subtest4		Subtest5	
		(dBm)	(W)	(dBm)	(W)	(dBm)	(W)	(dBm)	(W)	(dBm)	(W)
HSUPA Band 2	LCH	22.76	0.189	21.50	0.141	21.62	0.145	21.80	0.151	22.75	0.188
	MCH	22.58	0.181	21.44	0.139	21.85	0.153	22.40	0.174	22.76	0.189
	HCH	22.74	0.188	21.53	0.142	21.67	0.147	22.60	0.182	22.70	0.186
HSUPA Band 4	LCH	23.60	0.229	21.88	0.154	22.86	0.193	22.46	0.176	23.48	0.223
	MCH	23.64	0.231	21.92	0.156	22.83	0.192	22.45	0.176	23.51	0.224
	HCH	23.26	0.212	21.55	0.143	22.63	0.183	22.23	0.167	23.24	0.211
HSUPA Band 5	LCH	22.97	0.198	21.84	0.153	22.30	0.170	22.02	0.159	23.19	0.208
	MCH	23.16	0.207	21.34	0.136	22.31	0.170	21.82	0.152	23.23	0.210
	HCH	22.90	0.195	21.59	0.144	22.56	0.180	22.16	0.164	23.46	0.222

LTE Mode Test Data

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output Power (dBm)	Conducted Output Power (W)
LTE Band2					
1.4 MHz	LCH	QPSK	RB1#0	24.07	0.255
			RB1#3	24.00	0.251
			RB1#5	23.94	0.248
			RB3#0	23.83	0.242
			RB3#2	23.86	0.243
			RB3#3	23.90	0.245
			RB6#0	22.92	0.196
		16-QAM	RB1#0	22.67	0.185
			RB1#3	22.65	0.184
			RB1#5	22.59	0.182
			RB3#0	22.50	0.178
			RB3#2	22.55	0.180
			RB3#3	22.71	0.187
			RB6#0	21.79	0.151
	MCH	QPSK	RB1#0	23.77	0.238
			RB1#3	23.88	0.244
			RB1#5	23.83	0.242
			RB3#0	23.79	0.239
			RB3#2	23.82	0.241
			RB3#3	23.77	0.238
			RB6#0	22.88	0.194
		16-QAM	RB1#0	22.81	0.191
			RB1#3	22.81	0.191
			RB1#5	22.30	0.170
			RB3#0	22.64	0.184
			RB3#2	22.75	0.188
			RB3#3	22.68	0.185
			RB6#0	21.62	0.145
	HCH	QPSK	RB1#0	23.59	0.229
			RB1#3	24.11	0.258
			RB1#5	23.79	0.239
			RB3#0	23.80	0.240
			RB3#2	23.98	0.250
			RB3#3	23.90	0.245
			RB6#0	22.80	0.191
		16-QAM	RB1#0	22.85	0.193
			RB1#3	23.01	0.200
			RB1#5	22.75	0.188
			RB3#0	23.03	0.201
			RB3#2	23.03	0.201
			RB3#3	22.94	0.197

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output Power (dBm)	Conducted Output Power (W)
LTE Band2					
			RB6#0	22.08	0.161
3 MHz	LCH	QPSK	RB1#0	23.79	0.239
			RB1#7	23.62	0.230
			RB1#14	23.72	0.236
			RB8#0	22.72	0.187
			RB8#4	22.85	0.193
			RB8#7	22.79	0.190
			RB15#0	22.80	0.191
		16-QAM	RB1#0	22.68	0.185
			RB1#7	22.50	0.178
			RB1#14	22.62	0.183
			RB8#0	21.58	0.144
			RB8#4	21.61	0.145
			RB8#7	21.93	0.156
			RB15#0	21.90	0.155
	MCH	QPSK	RB1#0	23.84	0.242
			RB1#7	23.79	0.239
			RB1#14	23.89	0.245
			RB8#0	22.85	0.193
			RB8#4	22.86	0.193
			RB8#7	22.93	0.196
			RB15#0	22.92	0.196
		16-QAM	RB1#0	22.78	0.190
			RB1#7	22.52	0.179
			RB1#14	22.58	0.181
			RB8#0	21.99	0.158
			RB8#4	22.01	0.159
			RB8#7	21.97	0.157
			RB15#0	22.02	0.159
	HCH	QPSK	RB1#0	23.60	0.229
			RB1#7	23.50	0.224
			RB1#14	23.79	0.239
			RB8#0	22.84	0.192
			RB8#4	22.86	0.193
			RB8#7	22.81	0.191
			RB15#0	22.92	0.196
		16-QAM	RB1#0	22.69	0.186
			RB1#7	22.50	0.178
			RB1#14	22.84	0.192
			RB8#0	21.75	0.150
			RB8#4	21.67	0.147
			RB8#7	21.76	0.150

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output Power (dBm)	Conducted Output Power (W)
LTE Band2					
			RB15#0	21.88	0.154
5 MHz	LCH	QPSK	RB1#0	23.79	0.239
			RB1#13	23.64	0.231
			RB1#24	23.63	0.231
			RB12#0	22.79	0.190
			RB12#6	22.79	0.190
			RB12#13	22.84	0.192
			RB25#0	22.86	0.193
		16-QAM	RB1#0	22.46	0.176
			RB1#13	22.34	0.171
			RB1#24	22.43	0.175
			RB12#0	21.63	0.146
			RB12#6	21.63	0.146
			RB12#13	21.70	0.148
			RB25#0	21.86	0.153
	MCH	QPSK	RB1#0	23.39	0.218
			RB1#13	23.55	0.226
			RB1#24	23.67	0.233
			RB12#0	22.84	0.192
			RB12#6	22.84	0.192
			RB12#13	22.92	0.196
			RB25#0	22.93	0.196
		16-QAM	RB1#0	22.67	0.185
			RB1#13	22.33	0.171
			RB1#24	22.76	0.189
			RB12#0	21.88	0.154
			RB12#6	21.94	0.156
			RB12#13	21.93	0.156
			RB25#0	21.96	0.157
	HCH	QPSK	RB1#0	23.55	0.226
			RB1#13	23.70	0.234
			RB1#24	23.71	0.235
			RB12#0	22.73	0.187
			RB12#6	22.68	0.185
			RB12#13	22.81	0.191
			RB25#0	22.76	0.189
		16-QAM	RB1#0	22.47	0.177
			RB1#13	22.12	0.163
			RB1#24	22.12	0.163
			RB12#0	21.79	0.151
			RB12#6	21.67	0.147
			RB12#13	21.75	0.150

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output Power (dBm)	Conducted Output Power (W)
LTE Band2					
			RB25#0	21.81	0.152
10 MHz	LCH	QPSK	RB1#0	23.75	0.237
			RB1#25	23.88	0.244
			RB1#49	23.66	0.232
			RB25#0	22.87	0.194
			RB25#13	22.94	0.197
			RB25#25	22.84	0.192
			RB50#0	22.81	0.191
		16-QAM	RB1#0	23.24	0.211
			RB1#25	22.79	0.190
			RB1#49	22.46	0.176
			RB25#0	21.85	0.153
			RB25#13	22.01	0.159
			RB25#25	21.91	0.155
			RB50#0	21.87	0.154
	MCH	QPSK	RB1#0	23.87	0.244
			RB1#25	23.83	0.242
			RB1#49	23.64	0.231
			RB25#0	22.85	0.193
			RB25#13	22.86	0.193
			RB25#25	22.84	0.192
			RB50#0	22.84	0.192
		16-QAM	RB1#0	22.53	0.179
			RB1#25	22.54	0.179
			RB1#49	22.65	0.184
			RB25#0	21.85	0.153
			RB25#13	22.08	0.161
			RB25#25	22.01	0.159
			RB50#0	21.72	0.149
	HCH	QPSK	RB1#0	23.71	0.235
			RB1#25	23.80	0.240
			RB1#49	23.64	0.231
			RB25#0	22.83	0.192
			RB25#13	22.76	0.189
			RB25#25	22.72	0.187
			RB50#0	22.73	0.187
		16-QAM	RB1#0	22.77	0.189
			RB1#25	22.78	0.190
			RB1#49	22.57	0.181
			RB25#0	21.77	0.150
			RB25#13	21.74	0.149
			RB25#25	21.89	0.155

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output Power (dBm)	Conducted Output Power (W)
LTE Band2					
			RB50#0	21.84	0.153
15 MHz	LCH	QPSK	RB1#0	23.76	0.238
			RB1#38	23.89	0.245
			RB1#74	23.60	0.229
			RB36#0	22.84	0.192
			RB36#19	22.85	0.193
			RB36#39	22.72	0.187
			RB75#0	22.78	0.190
		16-QAM	RB1#0	23.23	0.210
			RB1#38	23.19	0.208
			RB1#74	22.69	0.186
			RB36#0	21.78	0.151
			RB36#19	21.80	0.151
			RB36#39	21.66	0.147
			RB75#0	21.75	0.150
	MCH	QPSK	RB1#0	23.53	0.225
			RB1#38	23.56	0.227
			RB1#74	23.43	0.220
			RB36#0	22.81	0.191
			RB36#19	22.85	0.193
			RB36#39	22.76	0.189
			RB75#0	22.78	0.190
		16-QAM	RB1#0	22.64	0.184
			RB1#38	22.68	0.185
			RB1#74	22.44	0.175
			RB36#0	21.83	0.152
			RB36#19	21.87	0.154
			RB36#39	21.76	0.150
			RB75#0	21.78	0.151
	HCH	QPSK	RB1#0	23.48	0.223
			RB1#38	23.44	0.221
			RB1#74	23.55	0.226
			RB36#0	22.75	0.188
			RB36#19	22.76	0.189
			RB36#39	22.79	0.190
			RB75#0	22.79	0.190
		16-QAM	RB1#0	23.17	0.207
			RB1#38	23.86	0.243
			RB1#74	23.87	0.244
			RB36#0	21.75	0.150
			RB36#19	21.81	0.152
			RB36#39	21.74	0.149

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output Power (dBm)	Conducted Output Power (W)
LTE Band2					
			RB75#0	21.78	0.151
20 MHz	LCH	QPSK	RB1#0	23.52	0.225
			RB1#50	23.92	0.247
			RB1#99	23.37	0.217
			RB50#0	22.75	0.188
			RB50#25	22.77	0.189
			RB50#50	22.65	0.184
			RB100#0	22.65	0.184
		16-QAM	RB1#0	22.72	0.187
			RB1#50	23.01	0.200
			RB1#99	22.27	0.169
			RB50#0	21.93	0.156
			RB50#25	21.76	0.150
			RB50#50	21.65	0.146
			RB100#0	21.76	0.150
	MCH	QPSK	RB1#0	23.85	0.243
			RB1#50	24.16	0.261
			RB1#99	23.95	0.248
			RB50#0	22.85	0.193
			RB50#25	22.76	0.189
			RB50#50	22.76	0.189
			RB100#0	22.80	0.191
		16-QAM	RB1#0	22.63	0.183
			RB1#50	22.56	0.180
			RB1#99	22.03	0.160
			RB50#0	21.93	0.156
			RB50#25	21.85	0.153
			RB50#50	21.75	0.150
			RB100#0	21.91	0.155
	HCH	QPSK	RB1#0	23.65	0.232
			RB1#50	23.97	0.249
			RB1#99	23.35	0.216
			RB50#0	22.58	0.181
			RB50#25	22.80	0.191
			RB50#50	22.64	0.184
			RB100#0	22.74	0.188
		16-QAM	RB1#0	22.19	0.166
			RB1#50	22.44	0.175
			RB1#99	22.57	0.181
			RB50#0	21.46	0.140
			RB50#25	21.73	0.149
			RB50#50	21.60	0.145

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output Power (dBm)	Conducted Output Power (W)
LTE Band2					
			RB100#0	21.63	0.146

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output Power (dBm)	Conducted Output Power (W)
LTE Band4					
1.4 MHz	LCH	QPSK	RB1#0	23.61	0.230
			RB1#3	23.63	0.231
			RB1#5	23.59	0.229
			RB3#0	23.67	0.233
			RB3#2	23.62	0.230
			RB3#3	23.58	0.228
			RB6#0	22.66	0.185
		16-QAM	RB1#0	22.50	0.178
			RB1#3	22.49	0.177
			RB1#5	22.45	0.176
			RB3#0	22.44	0.175
			RB3#2	22.41	0.174
			RB3#3	22.38	0.173
			RB6#0	21.46	0.140
	MCH	QPSK	RB1#0	23.36	0.217
			RB1#3	23.56	0.227
			RB1#5	23.52	0.225
			RB3#0	23.69	0.234
			RB3#2	23.64	0.231
			RB3#3	23.69	0.234
			RB6#0	22.72	0.187
		16-QAM	RB1#0	22.57	0.181
			RB1#3	22.35	0.172
			RB1#5	22.24	0.167
			RB3#0	22.47	0.177
			RB3#2	22.57	0.181
			RB3#3	22.54	0.179
			RB6#0	21.39	0.138
	HCH	QPSK	RB1#0	23.37	0.217
			RB1#3	23.55	0.226
			RB1#5	23.41	0.219
			RB3#0	23.47	0.222
			RB3#2	23.61	0.230
			RB3#3	23.53	0.225
			RB6#0	22.56	0.180
		16-QAM	RB1#0	22.51	0.178
			RB1#3	22.56	0.180
			RB1#5	22.56	0.180
			RB3#0	22.62	0.183
			RB3#2	22.61	0.182
			RB3#3	22.70	0.186
			RB6#0	21.75	0.150

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output Power (dBm)	Conducted Output Power (W)
LTE Band4					
3 MHz	LCH	QPSK	RB1#0	23.73	0.236
			RB1#7	23.59	0.229
			RB1#14	23.58	0.228
			RB8#0	22.74	0.188
			RB8#4	22.68	0.185
			RB8#7	22.64	0.184
			RB15#0	22.64	0.184
		16-QAM	RB1#0	22.47	0.177
			RB1#7	22.34	0.171
			RB1#14	22.57	0.181
			RB8#0	21.66	0.147
			RB8#4	21.70	0.148
			RB8#7	21.80	0.151
			RB15#0	21.60	0.145
	MCH	QPSK	RB1#0	23.62	0.230
			RB1#7	23.44	0.221
			RB1#14	23.48	0.223
			RB8#0	22.68	0.185
			RB8#4	22.70	0.186
			RB8#7	22.77	0.189
			RB15#0	22.78	0.190
		16-QAM	RB1#0	22.66	0.185
			RB1#7	22.46	0.176
			RB1#14	22.54	0.179
			RB8#0	21.53	0.142
			RB8#4	21.46	0.140
			RB8#7	21.61	0.145
			RB15#0	21.55	0.143
	HCH	QPSK	RB1#0	23.46	0.222
			RB1#7	23.39	0.218
			RB1#14	23.62	0.230
			RB8#0	22.51	0.178
			RB8#4	22.54	0.179
			RB8#7	22.50	0.178
			RB15#0	22.59	0.182
		16-QAM	RB1#0	22.65	0.184
			RB1#7	22.18	0.165
			RB1#14	22.36	0.172
			RB8#0	21.29	0.135
			RB8#4	21.51	0.142
			RB8#7	21.63	0.146
			RB15#0	21.53	0.142

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output Power (dBm)	Conducted Output Power (W)
LTE Band4					
5 MHz	LCH	QPSK	RB1#0	23.57	0.228
			RB1#13	23.56	0.227
			RB1#24	23.48	0.223
			RB12#0	22.76	0.189
			RB12#6	22.69	0.186
			RB12#13	22.74	0.188
			RB25#0	22.74	0.188
		16-QAM	RB1#0	22.31	0.170
			RB1#13	22.04	0.160
			RB1#24	21.98	0.158
			RB12#0	21.68	0.147
			RB12#6	21.69	0.148
			RB12#13	21.66	0.147
			RB25#0	21.82	0.152
	MCH	QPSK	RB1#0	23.53	0.225
			RB1#13	23.58	0.228
			RB1#24	23.61	0.230
			RB12#0	22.71	0.187
			RB12#6	22.82	0.191
			RB12#13	22.87	0.194
			RB25#0	22.69	0.186
		16-QAM	RB1#0	22.68	0.185
			RB1#13	22.71	0.187
			RB1#24	22.79	0.190
			RB12#0	21.58	0.144
			RB12#6	21.57	0.144
			RB12#13	21.65	0.146
			RB25#0	21.81	0.152
	HCH	QPSK	RB1#0	23.65	0.232
			RB1#13	23.48	0.223
			RB1#24	23.67	0.233
			RB12#0	22.64	0.184
			RB12#6	22.54	0.179
			RB12#13	22.56	0.180
			RB25#0	22.61	0.182
		16-QAM	RB1#0	22.36	0.172
			RB1#13	22.20	0.166
			RB1#24	22.38	0.173
			RB12#0	21.37	0.137
			RB12#6	21.59	0.144
			RB12#13	21.63	0.146
			RB25#0	21.60	0.145

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output Power (dBm)	Conducted Output Power (W)
LTE Band4					
10 MHz	LCH	QPSK	RB1#0	23.88	0.244
			RB1#25	23.54	0.226
			RB1#49	23.60	0.229
			RB25#0	22.77	0.189
			RB25#13	22.68	0.185
			RB25#25	22.64	0.184
			RB50#0	22.74	0.188
		16-QAM	RB1#0	22.63	0.183
			RB1#25	22.38	0.173
			RB1#49	22.55	0.180
			RB25#0	21.72	0.149
			RB25#13	21.63	0.146
			RB25#25	21.56	0.143
			RB50#0	21.69	0.148
	MCH	QPSK	RB1#0	23.57	0.228
			RB1#25	23.59	0.229
			RB1#49	23.35	0.216
			RB25#0	22.65	0.184
			RB25#13	22.73	0.187
			RB25#25	22.75	0.188
			RB50#0	22.70	0.186
		16-QAM	RB1#0	22.44	0.175
			RB1#25	22.37	0.173
			RB1#49	22.19	0.166
			RB25#0	21.64	0.146
			RB25#13	21.70	0.148
			RB25#25	21.72	0.149
			RB50#0	21.67	0.147
	HCH	QPSK	RB1#0	23.74	0.237
			RB1#25	23.59	0.229
			RB1#49	23.73	0.236
			RB25#0	22.69	0.186
			RB25#13	22.63	0.183
			RB25#25	22.61	0.182
			RB50#0	22.60	0.182
		16-QAM	RB1#0	22.68	0.185
			RB1#25	22.50	0.178
			RB1#49	22.58	0.181
			RB25#0	21.82	0.152
			RB25#13	21.76	0.150
			RB25#25	21.75	0.150
			RB50#0	21.60	0.145

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output Power (dBm)	Conducted Output Power (W)
LTE Band4					
15 MHz	LCH	QPSK	RB1#0	23.64	0.231
			RB1#38	23.53	0.225
			RB1#74	23.89	0.245
			RB36#0	22.66	0.185
			RB36#19	22.63	0.183
			RB36#39	22.66	0.185
			RB75#0	22.65	0.184
		16-QAM	RB1#0	22.57	0.181
			RB1#38	22.38	0.173
			RB1#74	22.65	0.184
			RB36#0	21.59	0.144
			RB36#19	21.61	0.145
			RB36#39	21.60	0.145
			RB75#0	21.62	0.145
	MCH	QPSK	RB1#0	23.51	0.224
			RB1#38	23.69	0.234
			RB1#74	23.37	0.217
			RB36#0	22.64	0.184
			RB36#19	22.80	0.191
			RB36#39	22.72	0.187
			RB75#0	22.69	0.186
		16-QAM	RB1#0	22.59	0.182
			RB1#38	22.62	0.183
			RB1#74	22.09	0.162
			RB36#0	21.74	0.149
			RB36#19	21.79	0.151
			RB36#39	21.69	0.148
			RB75#0	21.66	0.147
	HCH	QPSK	RB1#0	23.65	0.232
			RB1#38	23.58	0.228
			RB1#74	23.29	0.213
			RB36#0	22.80	0.191
			RB36#19	22.66	0.185
			RB36#39	22.52	0.179
			RB75#0	22.72	0.187
		16-QAM	RB1#0	23.28	0.213
			RB1#38	23.04	0.201
			RB1#74	23.06	0.202
			RB36#0	21.71	0.148
			RB36#19	21.60	0.145
			RB36#39	21.56	0.143
			RB75#0	21.69	0.148

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output Power (dBm)	Conducted Output Power (W)
LTE Band4					
20 MHz	LCH	QPSK	RB1#0	23.33	0.215
			RB1#50	23.39	0.218
			RB1#99	23.62	0.230
			RB50#0	22.62	0.183
			RB50#25	22.71	0.187
			RB50#50	22.73	0.187
			RB100#0	22.76	0.189
		16-QAM	RB1#0	22.69	0.186
			RB1#50	22.96	0.198
			RB1#99	22.15	0.164
			RB50#0	21.63	0.146
			RB50#25	21.86	0.153
			RB50#50	21.87	0.154
			RB100#0	21.74	0.149
	MCH	QPSK	RB1#0	23.87	0.244
			RB1#50	24.11	0.258
			RB1#99	23.72	0.236
			RB50#0	22.83	0.192
			RB50#25	22.86	0.193
			RB50#50	22.71	0.187
			RB100#0	22.77	0.189
		16-QAM	RB1#0	23.18	0.208
			RB1#50	22.82	0.191
			RB1#99	22.12	0.163
			RB50#0	21.70	0.148
			RB50#25	21.78	0.151
			RB50#50	21.64	0.146
			RB100#0	21.73	0.149
	HCH	QPSK	RB1#0	23.60	0.229
			RB1#50	23.44	0.221
			RB1#99	23.30	0.214
			RB50#0	22.96	0.198
			RB50#25	22.71	0.187
			RB50#50	22.56	0.180
			RB100#0	22.73	0.187
		16-QAM	RB1#0	22.21	0.166
			RB1#50	22.07	0.161
			RB1#99	22.24	0.167
			RB50#0	21.68	0.147
			RB50#25	21.54	0.143
			RB50#50	21.30	0.135
			RB100#0	21.59	0.144

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output Power (dBm)	Conducted Output Power (W)
LTE Band5					
1.4 MHz	LCH	QPSK	RB1#0	23.59	0.229
			RB1#3	23.78	0.239
			RB1#5	23.34	0.216
			RB3#0	23.41	0.219
			RB3#2	23.49	0.223
			RB3#3	23.34	0.216
			RB6#0	22.49	0.177
		16-QAM	RB1#0	22.36	0.172
			RB1#3	22.24	0.167
			RB1#5	22.14	0.164
			RB3#0	22.20	0.166
			RB3#2	22.29	0.169
			RB3#3	22.27	0.169
			RB6#0	21.52	0.142
	MCH	QPSK	RB1#0	23.42	0.220
			RB1#3	23.57	0.228
			RB1#5	23.42	0.220
			RB3#0	23.37	0.217
			RB3#2	23.41	0.219
			RB3#3	23.38	0.218
			RB6#0	22.42	0.175
		16-QAM	RB1#0	22.42	0.175
			RB1#3	22.44	0.175
			RB1#5	22.06	0.161
			RB3#0	22.18	0.165
			RB3#2	22.29	0.169
			RB3#3	22.24	0.167
			RB6#0	21.24	0.133
	HCH	QPSK	RB1#0	23.46	0.222
			RB1#3	23.54	0.226
			RB1#5	23.41	0.219
			RB3#0	23.59	0.229
			RB3#2	23.60	0.229
			RB3#3	23.53	0.225
			RB6#0	22.53	0.179
		16-QAM	RB1#0	22.46	0.176
			RB1#3	22.62	0.183
			RB1#5	22.62	0.183
			RB3#0	22.84	0.192
			RB3#2	22.80	0.191
			RB3#3	22.69	0.186
			RB6#0	21.64	0.146

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output Power (dBm)	Conducted Output Power (W)
LTE Band5					
3 MHz	LCH	QPSK	RB1#0	23.44	0.221
			RB1#7	23.49	0.223
			RB1#14	23.56	0.227
			RB8#0	22.59	0.182
			RB8#4	22.56	0.180
			RB8#7	22.46	0.176
			RB15#0	22.42	0.175
		16-QAM	RB1#0	22.57	0.181
			RB1#7	22.15	0.164
			RB1#14	22.24	0.167
			RB8#0	21.26	0.134
			RB8#4	21.52	0.142
			RB8#7	21.44	0.139
			RB15#0	21.44	0.139
	MCH	QPSK	RB1#0	23.35	0.216
			RB1#7	23.34	0.216
			RB1#14	23.43	0.220
			RB8#0	22.56	0.180
			RB8#4	22.61	0.182
			RB8#7	22.61	0.182
			RB15#0	22.58	0.181
		16-QAM	RB1#0	22.29	0.169
			RB1#7	22.17	0.165
			RB1#14	22.14	0.164
			RB8#0	21.45	0.140
			RB8#4	21.39	0.138
			RB8#7	21.66	0.147
			RB15#0	21.49	0.141
	HCH	QPSK	RB1#0	23.64	0.231
			RB1#7	23.34	0.216
			RB1#14	23.52	0.225
			RB8#0	22.75	0.188
			RB8#4	22.68	0.185
			RB8#7	22.57	0.181
			RB15#0	22.72	0.187
		16-QAM	RB1#0	22.76	0.189
			RB1#7	22.43	0.175
			RB1#14	22.46	0.176
			RB8#0	21.40	0.138
			RB8#4	21.50	0.141
			RB8#7	21.30	0.135
			RB15#0	21.38	0.137

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output Power (dBm)	Conducted Output Power (W)
LTE Band5					
5 MHz	LCH	QPSK	RB1#0	23.40	0.219
			RB1#13	23.46	0.222
			RB1#24	23.32	0.215
			RB12#0	22.42	0.175
			RB12#6	22.53	0.179
			RB12#13	22.54	0.179
			RB25#0	22.37	0.173
		16-QAM	RB1#0	22.14	0.164
			RB1#13	22.21	0.166
			RB1#24	22.02	0.159
			RB12#0	21.45	0.140
			RB12#6	21.38	0.137
			RB12#13	21.58	0.144
			RB25#0	21.58	0.144
	MCH	QPSK	RB1#0	23.19	0.208
			RB1#13	23.32	0.215
			RB1#24	23.21	0.209
			RB12#0	22.59	0.182
			RB12#6	22.54	0.179
			RB12#13	22.62	0.183
			RB25#0	22.50	0.178
		16-QAM	RB1#0	22.30	0.170
			RB1#13	21.98	0.158
			RB1#24	21.93	0.156
			RB12#0	21.51	0.142
			RB12#6	21.31	0.135
			RB12#13	21.33	0.136
			RB25#0	21.51	0.142
	HCH	QPSK	RB1#0	23.49	0.223
			RB1#13	23.88	0.244
			RB1#24	23.66	0.232
			RB12#0	22.68	0.185
			RB12#6	22.76	0.189
			RB12#13	22.69	0.186
			RB25#0	22.64	0.184
		16-QAM	RB1#0	22.46	0.176
			RB1#13	22.18	0.165
			RB1#24	22.04	0.160
			RB12#0	21.39	0.138
			RB12#6	21.48	0.141
			RB12#13	21.44	0.139
			RB25#0	21.57	0.144

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output Power (dBm)	Conducted Output Power (W)
LTE Band5					
10 MHz	LCH	QPSK	RB1#0	23.51	0.224
			RB1#25	23.38	0.218
			RB1#49	23.29	0.213
			RB25#0	22.38	0.173
			RB25#13	22.44	0.175
			RB25#25	22.48	0.177
			RB50#0	22.45	0.176
		16-QAM	RB1#0	22.25	0.168
			RB1#25	22.42	0.175
			RB1#49	22.28	0.169
			RB25#0	21.36	0.137
			RB25#13	21.51	0.142
			RB25#25	21.55	0.143
			RB50#0	21.51	0.142
	MCH	QPSK	RB1#0	23.30	0.214
			RB1#25	23.35	0.216
			RB1#49	23.40	0.219
			RB25#0	22.50	0.178
			RB25#13	22.52	0.179
			RB25#25	22.39	0.173
			RB50#0	22.35	0.172
		16-QAM	RB1#0	22.17	0.165
			RB1#25	22.47	0.177
			RB1#49	22.17	0.165
			RB25#0	21.61	0.145
			RB25#13	21.53	0.142
			RB25#25	21.49	0.141
			RB50#0	21.26	0.134
	HCH	QPSK	RB1#0	23.34	0.216
			RB1#25	23.90	0.245
			RB1#49	23.50	0.224
			RB25#0	22.51	0.178
			RB25#13	22.72	0.187
			RB25#25	22.63	0.183
			RB50#0	22.59	0.182
		16-QAM	RB1#0	22.31	0.170
			RB1#25	22.51	0.178
			RB1#49	22.56	0.180
			RB25#0	21.36	0.137
			RB25#13	21.82	0.152
			RB25#25	21.59	0.144
			RB50#0	21.50	0.141

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output Power (dBm)	Conducted Output Power (W)
LTE Band12					
1.4 MHz	LCH	QPSK	RB1#0	23.16	0.207
			RB1#3	23.28	0.213
			RB1#5	23.28	0.213
			RB3#0	23.06	0.202
			RB3#2	23.16	0.207
			RB3#3	23.14	0.206
			RB6#0	22.17	0.165
		16-QAM	RB1#0	22.10	0.162
			RB1#3	22.07	0.161
			RB1#5	21.98	0.158
			RB3#0	21.80	0.151
			RB3#2	21.81	0.152
			RB3#3	22.00	0.158
			RB6#0	21.06	0.128
	MCH	QPSK	RB1#0	22.81	0.191
			RB1#3	22.85	0.193
			RB1#5	22.88	0.194
			RB3#0	23.08	0.203
			RB3#2	23.18	0.208
			RB3#3	23.13	0.206
			RB6#0	22.11	0.163
		16-QAM	RB1#0	21.77	0.150
			RB1#3	21.52	0.142
			RB1#5	21.43	0.139
			RB3#0	21.60	0.145
			RB3#2	21.91	0.155
			RB3#3	21.85	0.153
			RB6#0	20.82	0.121
	HCH	QPSK	RB1#0	23.05	0.202
			RB1#3	23.33	0.215
			RB1#5	23.20	0.209
			RB3#0	23.41	0.219
			RB3#2	23.15	0.207
			RB3#3	23.34	0.216
			RB6#0	22.41	0.174
		16-QAM	RB1#0	22.28	0.169
			RB1#3	22.26	0.168
			RB1#5	22.25	0.168
			RB3#0	22.67	0.185
			RB3#2	22.43	0.175
			RB3#3	22.40	0.174
			RB6#0	21.11	0.129

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output Power (dBm)	Conducted Output Power (W)
LTE Band12					
3 MHz	LCH	QPSK	RB1#0	23.07	0.203
			RB1#7	23.17	0.207
			RB1#14	23.08	0.203
			RB8#0	22.21	0.166
			RB8#4	22.34	0.171
			RB8#7	22.03	0.160
			RB15#0	22.09	0.162
		16-QAM	RB1#0	21.57	0.144
			RB1#7	21.90	0.155
			RB1#14	21.91	0.155
			RB8#0	20.95	0.124
			RB8#4	20.90	0.123
			RB8#7	20.91	0.123
			RB15#0	20.99	0.126
	MCH	QPSK	RB1#0	23.02	0.200
			RB1#7	22.95	0.197
			RB1#14	22.98	0.199
			RB8#0	22.15	0.164
			RB8#4	22.16	0.164
			RB8#7	22.20	0.166
			RB15#0	22.22	0.167
		16-QAM	RB1#0	21.74	0.149
			RB1#7	21.80	0.151
			RB1#14	21.72	0.149
			RB8#0	21.02	0.126
			RB8#4	21.03	0.127
			RB8#7	20.99	0.126
			RB15#0	21.16	0.131
	HCH	QPSK	RB1#0	23.23	0.210
			RB1#7	23.11	0.205
			RB1#14	23.17	0.207
			RB8#0	22.22	0.167
			RB8#4	22.18	0.165
			RB8#7	22.31	0.170
			RB15#0	22.34	0.171
		16-QAM	RB1#0	22.22	0.167
			RB1#7	22.00	0.158
			RB1#14	22.21	0.166
			RB8#0	21.48	0.141
			RB8#4	21.04	0.127
			RB8#7	21.16	0.131
			RB15#0	20.90	0.123

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output Power (dBm)	Conducted Output Power (W)
LTE Band12					
5 MHz	LCH	QPSK	RB1#0	23.01	0.200
			RB1#13	23.06	0.202
			RB1#24	22.87	0.194
			RB12#0	22.13	0.163
			RB12#6	22.12	0.163
			RB12#13	22.07	0.161
			RB25#0	22.05	0.160
		16-QAM	RB1#0	21.84	0.153
			RB1#13	21.82	0.152
			RB1#24	21.67	0.147
			RB12#0	20.87	0.122
			RB12#6	21.09	0.129
			RB12#13	20.96	0.125
			RB25#0	20.87	0.122
	MCH	QPSK	RB1#0	22.81	0.191
			RB1#13	22.99	0.199
			RB1#24	23.05	0.202
			RB12#0	21.99	0.158
			RB12#6	22.05	0.160
			RB12#13	21.92	0.156
			RB25#0	22.01	0.159
		16-QAM	RB1#0	22.03	0.160
			RB1#13	21.94	0.156
			RB1#24	21.83	0.152
			RB12#0	20.84	0.121
			RB12#6	20.94	0.124
			RB12#13	20.95	0.124
			RB25#0	20.96	0.125
	HCH	QPSK	RB1#0	23.01	0.200
			RB1#13	23.23	0.210
			RB1#24	23.22	0.210
			RB12#0	22.17	0.165
			RB12#6	22.20	0.166
			RB12#13	22.10	0.162
			RB25#0	22.12	0.163
		16-QAM	RB1#0	21.99	0.158
			RB1#13	22.24	0.167
			RB1#24	21.41	0.138
			RB12#0	21.11	0.129
			RB12#6	20.98	0.125
			RB12#13	21.05	0.127
			RB25#0	21.10	0.129

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output Power (dBm)	Conducted Output Power (W)
LTE Band12					
10 MHz	LCH	QPSK	RB1#0	22.99	0.199
			RB1#25	23.09	0.204
			RB1#49	22.90	0.195
			RB25#0	22.02	0.159
			RB25#13	21.96	0.157
			RB25#25	22.10	0.162
			RB50#0	22.01	0.159
		16-QAM	RB1#0	21.89	0.155
			RB1#25	22.36	0.172
			RB1#49	21.89	0.155
			RB25#0	20.87	0.122
			RB25#13	20.95	0.124
			RB25#25	20.99	0.126
			RB50#0	21.05	0.127
	MCH	QPSK	RB1#0	22.74	0.188
			RB1#25	23.02	0.200
			RB1#49	23.05	0.202
			RB25#0	22.06	0.161
			RB25#13	22.02	0.159
			RB25#25	22.00	0.158
			RB50#0	22.02	0.159
		16-QAM	RB1#0	21.68	0.147
			RB1#25	21.77	0.150
			RB1#49	21.84	0.153
			RB25#0	20.98	0.125
			RB25#13	20.95	0.124
			RB25#25	20.91	0.123
			RB50#0	20.94	0.124
	HCH	QPSK	RB1#0	23.03	0.201
			RB1#25	23.56	0.227
			RB1#49	23.12	0.205
			RB25#0	21.94	0.156
			RB25#13	22.29	0.169
			RB25#25	22.10	0.162
			RB50#0	22.13	0.163
		16-QAM	RB1#0	22.01	0.159
			RB1#25	22.03	0.160
			RB1#49	22.15	0.164
			RB25#0	21.00	0.126
			RB25#13	21.27	0.134
			RB25#25	21.14	0.130
			RB50#0	21.04	0.127

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output Power (dBm)	Conducted Output Power (W)
LTE Band13					
5 MHz	LCH	QPSK	RB1#0	23.25	0.211
			RB1#13	23.28	0.213
			RB1#24	23.39	0.218
			RB12#0	22.59	0.182
			RB12#6	22.36	0.172
			RB12#13	22.44	0.175
			RB25#0	22.44	0.175
		16-QAM	RB1#0	21.91	0.155
			RB1#13	21.66	0.147
			RB1#24	21.95	0.157
			RB12#0	21.55	0.143
			RB12#6	21.23	0.133
			RB12#13	21.31	0.135
			RB25#0	21.54	0.143
	MCH	QPSK	RB1#0	23.08	0.203
			RB1#13	23.28	0.213
			RB1#24	23.42	0.220
			RB12#0	22.46	0.176
			RB12#6	22.42	0.175
			RB12#13	22.49	0.177
			RB25#0	22.33	0.171
		16-QAM	RB1#0	22.49	0.177
			RB1#13	22.40	0.174
			RB1#24	22.34	0.171
			RB12#0	21.38	0.137
			RB12#6	21.35	0.136
			RB12#13	21.51	0.142
			RB25#0	21.28	0.134
	HCH	QPSK	RB1#0	23.30	0.214
			RB1#13	23.54	0.226
			RB1#24	23.55	0.226
			RB12#0	22.44	0.175
			RB12#6	22.62	0.183
			RB12#13	22.57	0.181
			RB25#0	22.50	0.178
		16-QAM	RB1#0	22.28	0.169
			RB1#13	22.42	0.175
			RB1#24	22.23	0.167
			RB12#0	21.19	0.132
			RB12#6	21.55	0.143
			RB12#13	21.50	0.141
			RB25#0	21.44	0.139

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	Conducted Output Power (dBm)	Conducted Output Power (W)
LTE Band13					
10 MHz	MCH	QPSK	RB1#0	23.39	0.218
			RB1#25	23.29	0.213
			RB1#49	23.61	0.230
			RB25#0	22.29	0.169
			RB25#13	22.39	0.173
			RB25#25	22.64	0.184
			RB50#0	22.47	0.177
		16-QAM	RB1#0	22.27	0.169
			RB1#25	22.41	0.174
			RB1#49	23.07	0.203
			RB25#0	21.33	0.136
			RB25#13	21.47	0.140
			RB25#25	21.54	0.143
			RB50#0	21.35	0.136

A.1.2 Transmitter Radiated Output Power (EIRP/ERP)

WCDMA Mode Test Data

Test Band	Test Channel	EIRP (dBm)	EIRP (W)	Limit (W)	Verdict
WCDMA Band 2	LCH	25.43	0.35	2.00	Pass
	MCH	24.91	0.31	2.00	Pass
	HCH	25.74	0.37	2.00	Pass
HSDPA Band 2	LCH	24.65	0.29	2.00	Pass
	MCH	24.55	0.29	2.00	Pass
	HCH	24.76	0.30	2.00	Pass
HSUPA Band 2	LCH	23.98	0.25	2.00	Pass
	MCH	23.84	0.24	2.00	Pass
	HCH	23.95	0.25	2.00	Pass

Test Band	Test Channel	EIRP (dBm)	EIRP (W)	Limit (W)	Verdict
WCDMA Band 4	LCH	26.08	0.41	1.00	Pass
	MCH	24.71	0.30	1.00	Pass
	HCH	24.87	0.31	1.00	Pass
HSDPA Band 4	LCH	24.97	0.31	1.00	Pass
	MCH	24.05	0.25	1.00	Pass
	HCH	23.95	0.25	1.00	Pass
HSUPA Band 4	LCH	23.21	0.21	1.00	Pass
	MCH	23.45	0.22	1.00	Pass
	HCH	23.16	0.21	1.00	Pass

Test Band	Test Channel	ERP (dBm)	ERP (W)	Limit (W)	Verdict
WCDMA Band 5	LCH	24.68	0.29	7.00	Pass
	MCH	25.81	0.38	7.00	Pass
	HCH	27.07	0.51	7.00	Pass
HSDPA Band 5	LCH	24.01	0.25	7.00	Pass
	MCH	25.19	0.33	7.00	Pass
	HCH	26.51	0.45	7.00	Pass
HSUPA Band 5	LCH	23.95	0.25	7.00	Pass
	MCH	24.12	0.26	7.00	Pass
	HCH	24.89	0.31	7.00	Pass

Note 1: For the HSDPA and HSUPA mode, all subtests were tested and just the worst data were recorded in this table.

LTE Mode Test Data

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	EIRP (dBm)	EIRP (W)	Limit (W)	Verdict
LTE BAND2							
1.4 MHz	LCH	QPSK	RB1#0	26.89	0.49	2.00	Pass
			RB6#0	27.45	0.56	2.00	Pass
		16-QAM	RB1#0	27.86	0.61	2.00	Pass
			RB6#0	27.67	0.58	2.00	Pass
	MCH	QPSK	RB1#0	27.84	0.61	2.00	Pass
			RB6#0	27.56	0.57	2.00	Pass
		16-QAM	RB1#0	26.97	0.50	2.00	Pass
			RB6#0	27.34	0.54	2.00	Pass
	HCH	QPSK	RB1#0	27.34	0.54	2.00	Pass
			RB6#0	27.03	0.50	2.00	Pass
		16-QAM	RB1#0	26.57	0.45	2.00	Pass
			RB6#0	27.18	0.52	2.00	Pass
3 MHz	LCH	QPSK	RB1#0	26.35	0.43	2.00	Pass
			RB15#0	26.21	0.42	2.00	Pass
		16-QAM	RB1#0	25.67	0.37	2.00	Pass
			RB15#0	26.14	0.41	2.00	Pass
	MCH	QPSK	RB1#0	26.28	0.42	2.00	Pass
			RB15#0	26.10	0.41	2.00	Pass
		16-QAM	RB1#0	25.34	0.34	2.00	Pass
			RB15#0	25.49	0.35	2.00	Pass
	HCH	QPSK	RB1#0	25.63	0.37	2.00	Pass
			RB15#0	25.76	0.38	2.00	Pass
		16-QAM	RB1#0	26.05	0.40	2.00	Pass
			RB15#0	26.18	0.41	2.00	Pass
5 MHz	LCH	QPSK	RB1#0	27.56	0.57	2.00	Pass
			RB25#0	26.87	0.49	2.00	Pass
		16-QAM	RB1#0	26.78	0.48	2.00	Pass
			RB25#0	27.13	0.52	2.00	Pass
	MCH	QPSK	RB1#0	27.99	0.63	2.00	Pass
			RB25#0	27.64	0.58	2.00	Pass
		16-QAM	RB1#0	26.85	0.48	2.00	Pass
			RB25#0	27.45	0.56	2.00	Pass
	HCH	QPSK	RB1#0	27.86	0.61	2.00	Pass
			RB25#0	27.38	0.55	2.00	Pass
		16-QAM	RB1#0	27.41	0.55	2.00	Pass
			RB25#0	26.09	0.41	2.00	Pass
10 MHz	LCH	QPSK	RB1#0	26.59	0.46	2.00	Pass
			RB50#0	26.40	0.44	2.00	Pass
		16-QAM	RB1#0	25.98	0.40	2.00	Pass
			RB50#0	26.14	0.41	2.00	Pass
	MCH	QPSK	RB1#0	26.77	0.48	2.00	Pass
			RB50#0	25.73	0.37	2.00	Pass

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	EIRP (dBm)	EIRP (W)	Limit (W)	Verdict
LTE BAND2							
		16-QAM	RB1#0	26.32	0.43	2.00	Pass
			RB50#0	26.01	0.40	2.00	Pass
	HCH	QPSK	RB1#0	26.05	0.40	2.00	Pass
			RB50#0	26.71	0.47	2.00	Pass
		16-QAM	RB1#0	25.84	0.38	2.00	Pass
			RB50#0	25.78	0.38	2.00	Pass
15 MHz	LCH	QPSK	RB1#0	26.78	0.48	2.00	Pass
			RB75#0	26.91	0.49	2.00	Pass
		16-QAM	RB1#0	25.76	0.38	2.00	Pass
			RB75#0	27.65	0.58	2.00	Pass
	MCH	QPSK	RB1#0	26.76	0.47	2.00	Pass
			RB75#0	26.90	0.49	2.00	Pass
		16-QAM	RB1#0	26.86	0.49	2.00	Pass
			RB75#0	27.61	0.58	2.00	Pass
	HCH	QPSK	RB1#0	27.03	0.50	2.00	Pass
			RB75#0	27.05	0.51	2.00	Pass
		16-QAM	RB1#0	26.89	0.49	2.00	Pass
			RB75#0	26.94	0.49	2.00	Pass
20 MHz	LCH	QPSK	RB1#0	26.20	0.42	2.00	Pass
			RB100#0	26.64	0.46	2.00	Pass
		16-QAM	RB1#0	26.76	0.47	2.00	Pass
			RB100#0	26.67	0.46	2.00	Pass
	MCH	QPSK	RB1#0	26.56	0.45	2.00	Pass
			RB100#0	26.55	0.45	2.00	Pass
		16-QAM	RB1#0	26.43	0.44	2.00	Pass
			RB100#0	26.42	0.44	2.00	Pass
	HCH	QPSK	RB1#0	26.33	0.43	2.00	Pass
			RB100#0	26.08	0.41	2.00	Pass
		16-QAM	RB1#0	26.59	0.46	2.00	Pass
			RB100#0	26.46	0.44	2.00	Pass

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	EIRP (dBm)	EIRP (W)	Limit (W)	Verdict
LTE BAND4							
1.4 MHz	LCH	QPSK	RB1#0	26.57	0.45	1.00	Pass
			RB6#0	26.92	0.49	1.00	Pass
		16-QAM	RB1#0	26.56	0.45	1.00	Pass
			RB6#0	27.24	0.53	1.00	Pass
	MCH	QPSK	RB1#0	27.04	0.51	1.00	Pass
			RB6#0	27.34	0.54	1.00	Pass
		16-QAM	RB1#0	27.55	0.57	1.00	Pass
			RB6#0	27.36	0.54	1.00	Pass
	HCH	QPSK	RB1#0	26.82	0.48	1.00	Pass
			RB6#0	26.64	0.46	1.00	Pass
		16-QAM	RB1#0	26.98	0.50	1.00	Pass
			RB6#0	26.85	0.48	1.00	Pass
3 MHz	LCH	QPSK	RB1#0	27.63	0.58	1.00	Pass
			RB15#0	26.92	0.49	1.00	Pass
		16-QAM	RB1#0	27.80	0.60	1.00	Pass
			RB15#0	27.60	0.58	1.00	Pass
	MCH	QPSK	RB1#0	27.33	0.54	1.00	Pass
			RB15#0	27.61	0.58	1.00	Pass
		16-QAM	RB1#0	27.08	0.51	1.00	Pass
			RB15#0	27.26	0.53	1.00	Pass
	HCH	QPSK	RB1#0	27.37	0.55	1.00	Pass
			RB15#0	27.06	0.51	1.00	Pass
		16-QAM	RB1#0	27.18	0.52	1.00	Pass
			RB15#0	27.58	0.57	1.00	Pass
5 MHz	LCH	QPSK	RB1#0	27.15	0.52	1.00	Pass
			RB25#0	27.24	0.53	1.00	Pass
		16-QAM	RB1#0	27.71	0.59	1.00	Pass
			RB25#0	26.95	0.50	1.00	Pass
	MCH	QPSK	RB1#0	27.20	0.52	1.00	Pass
			RB25#0	27.01	0.50	1.00	Pass
		16-QAM	RB1#0	26.79	0.48	1.00	Pass
			RB25#0	27.33	0.54	1.00	Pass
	HCH	QPSK	RB1#0	27.71	0.59	1.00	Pass
			RB25#0	27.26	0.53	1.00	Pass
		16-QAM	RB1#0	26.78	0.48	1.00	Pass
			RB25#0	27.03	0.51	1.00	Pass
10 MHz	LCH	QPSK	RB1#0	27.35	0.54	1.00	Pass
			RB50#0	27.33	0.54	1.00	Pass
		16-QAM	RB1#0	25.80	0.38	1.00	Pass
			RB50#0	26.87	0.49	1.00	Pass
	MCH	QPSK	RB1#0	27.49	0.56	1.00	Pass
			RB50#0	26.81	0.48	1.00	Pass
		16-QAM	RB1#0	27.55	0.57	1.00	Pass

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	EIRP (dBm)	EIRP (W)	Limit (W)	Verdict
LTE BAND4							
			RB50#0	27.13	0.52	1.00	Pass
	HCH	QPSK	RB1#0	27.52	0.57	1.00	Pass
			RB50#0	27.49	0.56	1.00	Pass
		16-QAM	RB1#0	27.03	0.50	1.00	Pass
			RB50#0	27.69	0.59	1.00	Pass
15 MHz	LCH	QPSK	RB1#0	27.68	0.59	1.00	Pass
			RB75#0	26.82	0.48	1.00	Pass
		16-QAM	RB1#0	25.75	0.38	1.00	Pass
			RB75#0	26.78	0.48	1.00	Pass
	MCH	QPSK	RB1#0	27.42	0.55	1.00	Pass
			RB75#0	27.22	0.53	1.00	Pass
		16-QAM	RB1#0	27.59	0.57	1.00	Pass
			RB75#0	26.91	0.49	1.00	Pass
	HCH	QPSK	RB1#0	27.65	0.58	1.00	Pass
			RB75#0	27.02	0.50	1.00	Pass
		16-QAM	RB1#0	27.59	0.57	1.00	Pass
			RB75#0	27.05	0.51	1.00	Pass
20 MHz	LCH	QPSK	RB1#0	27.53	0.57	1.00	Pass
			RB100#0	27.45	0.56	1.00	Pass
		16-QAM	RB1#0	26.58	0.45	1.00	Pass
			RB100#0	27.53	0.57	1.00	Pass
	MCH	QPSK	RB1#0	27.31	0.54	1.00	Pass
			RB100#0	26.60	0.46	1.00	Pass
		16-QAM	RB1#0	27.08	0.51	1.00	Pass
			RB100#0	27.37	0.55	1.00	Pass
	HCH	QPSK	RB1#0	27.06	0.51	1.00	Pass
			RB100#0	26.88	0.49	1.00	Pass
		16-QAM	RB1#0	27.17	0.52	1.00	Pass
			RB100#0	26.77	0.48	1.00	Pass

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	ERP (dBm)	ERP (W)	Limit (W)	Verdict
LTE BAND5							
1.4 MHz	LCH	QPSK	RB1#0	26.65	0.46	7.00	Pass
			RB6#0	26.09	0.41	7.00	Pass
		16-QAM	RB1#0	27.05	0.51	7.00	Pass
			RB6#0	26.91	0.49	7.00	Pass
	MCH	QPSK	RB1#0	26.75	0.47	7.00	Pass
			RB6#0	26.18	0.41	7.00	Pass
		16-QAM	RB1#0	26.45	0.44	7.00	Pass
			RB6#0	26.76	0.47	7.00	Pass
	HCH	QPSK	RB1#0	26.45	0.44	7.00	Pass
			RB6#0	27.00	0.50	7.00	Pass
		16-QAM	RB1#0	26.10	0.41	7.00	Pass
			RB6#0	26.82	0.48	7.00	Pass
3 MHz	LCH	QPSK	RB1#0	25.49	0.35	7.00	Pass
			RB15#0	25.79	0.38	7.00	Pass
		16-QAM	RB1#0	24.40	0.28	7.00	Pass
			RB15#0	25.93	0.39	7.00	Pass
	MCH	QPSK	RB1#0	25.93	0.39	7.00	Pass
			RB15#0	25.47	0.35	7.00	Pass
		16-QAM	RB1#0	26.37	0.43	7.00	Pass
			RB15#0	25.88	0.39	7.00	Pass
	HCH	QPSK	RB1#0	26.11	0.41	7.00	Pass
			RB15#0	25.58	0.36	7.00	Pass
		16-QAM	RB1#0	26.08	0.41	7.00	Pass
			RB15#0	25.99	0.40	7.00	Pass
5 MHz	LCH	QPSK	RB1#0	26.31	0.43	7.00	Pass
			RB25#0	25.88	0.39	7.00	Pass
		16-QAM	RB1#0	26.85	0.48	7.00	Pass
			RB25#0	25.97	0.40	7.00	Pass
	MCH	QPSK	RB1#0	26.39	0.44	7.00	Pass
			RB25#0	26.35	0.43	7.00	Pass
		16-QAM	RB1#0	26.53	0.45	7.00	Pass
			RB25#0	26.29	0.43	7.00	Pass
	HCH	QPSK	RB1#0	25.97	0.40	7.00	Pass
			RB25#0	26.12	0.41	7.00	Pass
		16-QAM	RB1#0	26.70	0.47	7.00	Pass
			RB25#0	26.40	0.44	7.00	Pass
10 MHz	LCH	QPSK	RB1#0	25.99	0.40	7.00	Pass
			RB50#0	26.18	0.41	7.00	Pass
		16-QAM	RB1#0	24.30	0.27	7.00	Pass
			RB50#0	26.09	0.41	7.00	Pass
	MCH	QPSK	RB1#0	25.84	0.38	7.00	Pass
			RB50#0	26.09	0.41	7.00	Pass
		16-QAM	RB1#0	25.42	0.35	7.00	Pass

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	ERP (dBm)	ERP (W)	Limit (W)	Verdict
LTE BAND5							
			RB50#0	25.67	0.37	7.00	Pass
	HCH	QPSK	RB1#0	25.35	0.34	7.00	Pass
			RB50#0	26.19	0.42	7.00	Pass
		16-QAM	RB1#0	25.98	0.40	7.00	Pass
			RB50#0	25.36	0.34	7.00	Pass

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	ERP (dBm)	ERP (W)	Limit (W)	Verdict
LTE BAND12							
1.4 MHz	LCH	QPSK	RB1#0	21.63	0.15	3.00	Pass
			RB6#0	21.80	0.15	3.00	Pass
		16-QAM	RB1#0	21.85	0.15	3.00	Pass
			RB6#0	21.80	0.15	3.00	Pass
	MCH	QPSK	RB1#0	21.40	0.14	3.00	Pass
			RB6#0	21.15	0.13	3.00	Pass
		16-QAM	RB1#0	21.41	0.14	3.00	Pass
			RB6#0	20.90	0.12	3.00	Pass
	HCH	QPSK	RB1#0	21.21	0.13	3.00	Pass
			RB6#0	21.28	0.13	3.00	Pass
		16-QAM	RB1#0	20.95	0.12	3.00	Pass
			RB6#0	21.76	0.15	3.00	Pass
3 MHz	LCH	QPSK	RB1#0	20.96	0.12	3.00	Pass
			RB15#0	20.23	0.11	3.00	Pass
		16-QAM	RB1#0	20.15	0.10	3.00	Pass
			RB15#0	21.01	0.13	3.00	Pass
	MCH	QPSK	RB1#0	20.69	0.12	3.00	Pass
			RB15#0	20.57	0.11	3.00	Pass
		16-QAM	RB1#0	20.41	0.11	3.00	Pass
			RB15#0	20.22	0.11	3.00	Pass
	HCH	QPSK	RB1#0	20.31	0.11	3.00	Pass
			RB15#0	20.51	0.11	3.00	Pass
		16-QAM	RB1#0	20.48	0.11	3.00	Pass
			RB15#0	20.90	0.12	3.00	Pass
5 MHz	LCH	QPSK	RB1#0	20.72	0.12	3.00	Pass
			RB25#0	20.57	0.11	3.00	Pass
		16-QAM	RB1#0	21.45	0.14	3.00	Pass
			RB25#0	21.11	0.13	3.00	Pass
	MCH	QPSK	RB1#0	20.91	0.12	3.00	Pass
			RB25#0	20.63	0.12	3.00	Pass
		16-QAM	RB1#0	20.98	0.13	3.00	Pass
			RB25#0	20.79	0.12	3.00	Pass
	HCH	QPSK	RB1#0	20.46	0.11	3.00	Pass
			RB25#0	21.06	0.13	3.00	Pass
		16-QAM	RB1#0	20.74	0.12	3.00	Pass
			RB25#0	21.14	0.13	3.00	Pass
10 MHz	LCH	QPSK	RB1#0	22.33	0.17	3.00	Pass
			RB50#0	22.33	0.17	3.00	Pass
		16-QAM	RB1#0	21.47	0.14	3.00	Pass
			RB50#0	21.80	0.15	3.00	Pass
	MCH	QPSK	RB1#0	21.97	0.16	3.00	Pass
			RB50#0	21.81	0.15	3.00	Pass
		16-QAM	RB1#0	22.47	0.18	3.00	Pass

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	ERP (dBm)	ERP (W)	Limit (W)	Verdict
LTE BAND12							
			RB50#0	22.33	0.17	3.00	Pass
	HCH	QPSK	RB1#0	21.72	0.15	3.00	Pass
			RB50#0	21.68	0.15	3.00	Pass
		16-QAM	RB1#0	21.57	0.14	3.00	Pass
			RB50#0	21.79	0.15	3.00	Pass

Test BW	Test Channel	Test Mode	Test RB (Size#Offset)	ERP (dBm)	ERP (W)	Limit (W)	Verdict
LTE BAND13							
5 MHz	LCH	QPSK	RB1#0	24.10	0.26	3.00	Pass
			RB25#0	24.57	0.29	3.00	Pass
		16-QAM	RB1#0	23.82	0.24	3.00	Pass
			RB25#0	24.32	0.27	3.00	Pass
	MCH	QPSK	RB1#0	24.34	0.27	3.00	Pass
			RB25#0	23.84	0.24	3.00	Pass
		16-QAM	RB1#0	23.96	0.25	3.00	Pass
			RB25#0	24.09	0.26	3.00	Pass
	HCH	QPSK	RB1#0	24.64	0.29	3.00	Pass
			RB25#0	24.65	0.29	3.00	Pass
		16-QAM	RB1#0	24.13	0.25	3.00	Pass
			RB25#0	24.11	0.26	3.00	Pass
10 MHz	MCH	QPSK	RB1#0	23.65	0.23	3.00	Pass
			RB50#0	23.80	0.24	3.00	Pass
		16-QAM	RB1#0	23.61	0.23	3.00	Pass
			RB50#0	23.58	0.23	3.00	Pass

A.2 Peak to Average Ratio

Note: The Peak to Average Ratio please refer to the Report No. R1805A0249-R1 & R1805A0249-R2 & R1805A0249-R3 (FCC ID: XMR201807EG95NA) (which was issued by TA Technology (Shanghai) Co., Ltd. on Jul. 04, 2018), **Section 5.5 Peak-to-Average Power Ratio (PAPR).**

A.3 Occupied Bandwidth

Note: The Occupied Bandwidth please refer to the Report No. R1805A0249-R1 & R1805A0249-R2 & R1805A0249-R3 (FCC ID: XMR201807EG95NA) (which was issued by TA Technology (Shanghai) Co., Ltd. on Jul. 04, 2018), **Section 5.3 Occupied Bandwidth.**

A.4 Frequency Stability

Note: The Frequency Stability please refer to the Report No. R1805A0249-R1 & R1805A0249-R2 & R1805A0249-R3 (FCC ID: XMR201807EG95NA) (which was issued by TA Technology (Shanghai) Co., Ltd. on Jul. 04, 2018), **Section 5.6 Frequency Stability.**

A.5 Spurious Emission at Antenna Terminals

Note: The Spurious Emission at Antenna Terminals please refer to the Report No. R1805A0249-R1 & R1805A0249-R2 & R1805A0249-R3 (FCC ID: XMR201807EG95NA) (which was issued by TA Technology (Shanghai) Co., Ltd. on Jul. 04, 2018), **Section 5.7 Spurious Emission at Antenna Terminals.**

A.6 Band Edge

Note: The Band Edge please refer to the Report No. R1805A0249-R1 & R1805A0249-R2 & R1805A0249-R3 (FCC ID: XMR201807EG95NA) (which was issued by TA Technology (Shanghai) Co., Ltd. on Jul. 04, 2018), **Section 5.4 Band Edge Compliance.**

A.7 Field Strength of Spurious Radiation

Note 1: The frequencies of verdict which are marked by "N/A" should be ignored because they are UE carrier frequency.

Note 2: Test plots please refer to the document “Annex No.: BL-SZ1920035-501 Data Part 1.pdf”.

WCDMA Mode Test Verdict

Test Band	Test Channel	Refer to Plot[Note3]	Verdict
WCDMA Band 2	LCH	1.1	Pass
	MCH	1.2	Pass
	HCH	1.3	Pass
WCDMA Band 4	LCH	2.1	Pass
	MCH	2.2	Pass
	HCH	2.3	Pass
WCDMA Band 5	LCH	3.1	Pass
	MCH	3.2	Pass
	HCH	3.3	Pass

LTE Mode Test Verdict

Test Band	Test Bandwidth	Test Channel	Test Mode	Test RB (Size#Offset)	Refer to Plot[Note3]	Verdict
Band 2	1.4 MHz	MCH	QPSK	RB1#0	4.1	Pass
	3 MHz	MCH	QPSK	RB1#0	4.2	Pass
	5 MHz	MCH	QPSK	RB1#0	4.3	Pass
	10 MHz	MCH	QPSK	RB1#0	4.4	Pass
	15 MHz	MCH	QPSK	RB1#0	4.5	Pass
	20 MHz	MCH	QPSK	RB1#0	4.6	Pass
Band 4	1.4 MHz	MCH	QPSK	RB1#0	5.1	Pass
	3 MHz	MCH	QPSK	RB1#0	5.2	Pass
	5 MHz	MCH	QPSK	RB1#0	5.3	Pass
	10 MHz	MCH	QPSK	RB1#0	5.4	Pass
	15 MHz	MCH	QPSK	RB1#0	5.5	Pass
	20 MHz	MCH	QPSK	RB1#0	5.6	Pass
Band 5	1.4 MHz	MCH	QPSK	RB1#0	6.1	Pass
	3 MHz	MCH	QPSK	RB1#0	6.2	Pass
	5 MHz	MCH	QPSK	RB1#0	6.3	Pass
	10 MHz	MCH	QPSK	RB1#0	6.4	Pass
Band 12	1.4 MHz	MCH	QPSK	RB1#0	7.1	Pass
	3 MHz	MCH	QPSK	RB1#0	7.2	Pass
	5 MHz	MCH	QPSK	RB1#0	7.3	Pass
	10 MHz	MCH	QPSK	RB1#0	7.4	Pass
Band 13	5 MHz	MCH	QPSK	RB1#0	8.1	Pass
	10 MHz	MCH	QPSK	RB1#0	8.2	Pass

ANNEX B TEST SETUP PHOTOS

Please refer to the document “BL-SZ1920035-AR.PDF”.

ANNEX C EUT EXTERNAL PHOTOS

Please refer to the document “BL-SZ1920035-AW.PDF”.

ANNEX D EUT INTERNAL PHOTOS

Please refer to the document “BL-SZ1920035-AI.PDF”.

--END OF REPORT--