

# FCC Test Report

Report No.: RWAY202300051E

**Applicant:** Shenzhen Youmi Intelligent Technology Co., Ltd.

**Address:** 406-407 Jinqi Zhigu Building, 4/F, 1 Tangling Road, Nanshan District, Shenzhen City, China

**Product Name:** Smart phone

**Product Model:** PA3NB15PA

**Multiple Models:** PA2310GBB

**Trade Mark:** UMIDIGI

**FCC ID:** 2ATZ4-A15PT

**Standards:** FCC CFR Title 47 Part 2, 22H, 24E, 27

**Test Date:** 2023-12-02~2023-12-20

**Test Result:** Complied

**Issue Date:** 2024-02-04

**Reviewed by:**

*Frank Yin*

**Approved by:**

*Jacob Kong*

Frank Yin  
Project Engineer

Jacob Kong  
Manager

**Prepared by:**

World Alliance Testing and Certification (Shenzhen) Co., Ltd

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## Revision History

Version No.	Issued Date	Description
00	2024-02-04	Original

# Contents

<b>1</b>	<b>General Information .....</b>	<b>4</b>
1.1	Client Information .....	4
1.2	Product Description of EUT .....	4
1.3	Related Submittal(s)/Grant(s).....	4
1.4	Measurement Uncertainty .....	5
1.5	Laboratory Location.....	5
1.6	Test Methodology .....	5
<b>2</b>	<b>Description of Measurement.....</b>	<b>6</b>
2.1	Test Frequency of Low/Middle/High Channels.....	6
2.2	Test Configuration for LTE bands .....	6
2.3	Test Auxiliary Equipment .....	7
2.4	Test Setup.....	8
2.5	Test Procedure.....	10
2.6	Measurement Method.....	11
2.7	Measurement Equipment .....	12
<b>3</b>	<b>Test Results .....</b>	<b>13</b>
3.1	Test Summary.....	13
3.2	Limit.....	14
3.3	RF Conducted Test Data .....	19
3.3.1	RF Output Power&ERP/EIRP .....	19
3.3.2	Peak-to-average ratio (PAR) .....	31
3.3.3	26dB and 99% Bandwidth .....	35
3.3.4	Conducted Spurious Emissions.....	39
3.3.5	Out of band emission, Band Edge.....	39
3.3.6	FREQUENCY STABILITY .....	40
3.4	Radiated Spurious emission Test Data.....	48
<b>4</b>	<b>Test Setup Photo.....</b>	<b>57</b>
<b>5</b>	<b>E.U.T Photo.....</b>	<b>58</b>

# 1 General Information

## 1.1 Client Information

Applicant:	Shenzhen Youmi Intelligent Technology Co., Ltd.
Address:	406-407 Jinqi Zhigu Building, 4/F, 1 Tangling Road, Nanshan District, Shenzhen City, China
Manufacturer:	Shenzhen Youmi Intelligent Technology Co., Ltd.
Address:	406-407 Jinqi Zhigu Building, 4/F, 1 Tangling Road, Nanshan District, Shenzhen City, China

## 1.2 Product Description of EUT

The EUT is Smart phone that contains Classic Bluetooth(BDR/EDR), BLE, 2.4G/5G WLAN, GSM/GPRS/WCDMA/LTE and NFC radios, this report covers the full testing of the GSM/GPRS/WCDMA/LTE radios.

Sample Serial number	2Z-2 for CE&RE test, 2Z-1 for RF test conducted test (assigned by WATC)				
Sample Received Date	2023-11-16				
Sample Status	Good Condition				
Frequency Range	Band	TX Frequency (MHz)	RX Frequency (MHz)	Max. Conducted Power (dBm)	Antenna Gain# (dBi)
Maximum Conducted Power	GSM850	824-849	869-894	33.11	-4.65
Antenna Gain	PCS1900	1850-1910	1920-1980	29.65	0.76
	WCDMA B2	1850-1910	1920-1980	22.94	0.76
	WCDMA B5	824-849	869-894	22.84	-4.65
	LTE B2	1850-1910	1920-1980	23.54	0.76
	LTE B5	824-849	869-894	23.42	-4.65
	LTE B7	2500-2570	2620-2690	22.01	-0.54
	LTE B12	699-716	729-746	23.91	-6.53
	LTE B41	2535-2655	2535-2655	22.00	-0.54
Modulation Technology	QPSK, 16QAM				
Power Supply	DC 3.87V from battery or 5V/9V/12V/15V/20V/11V from adapter				
Adapter Information	Model: HJ-PD66W-US Input: AC 100-240V~50/60Hz, 1.5A Output: DC 5.0V, 3.0A 15.0W or DC 9.0V 3.0A 27.0W or DC 12.0V 3.0A 36.0W or DC 15.0V 3.0A 45.0W or DC 20.0V 3.25A 65.0W or DC 11.0V 6.0A 66.0W MAX				
Modification	Sample No Modification by the test lab				

## 1.3 Related Submittal(s)/Grant(s)

FCC Part 15, Subpart C, Equipment Class: DSS, FCC ID: 2ATZ4-A15PT
FCC Part 15, Subpart C, Equipment Class: DTS, FCC ID: 2ATZ4-A15PT
FCC Part 15, Subpart C, Equipment Class: DXX, FCC ID: 2ATZ4-A15PT
FCC Part 15, Subpart E, Equipment Class: NII, FCC ID: 2ATZ4-A15PT

## 1.4 Measurement Uncertainty

Parameter		Expanded Uncertainty (Confidence of 95%(U = 2Uc(y)))
Emissions, Radiated	Below 30MHz	±2.78dB
	Below 1GHz	±4.84dB
	Above 1GHz	±5.44dB
Emissions, Conducted		1.75dB
Conducted Power		0.74dB
Frequency Error		150Hz
Bandwidth		0.34%
<p><b>Note 1:</b> The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.</p> <p><b>Note 2:</b> The Decision Rule is based on simple acceptance with ISO Guide 98-4:2012 Clause 8.2 (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)</p>		

## 1.5 Laboratory Location

World Alliance Testing and Certification (Shenzhen) Co., Ltd

No. 1002, East Block, Laobing Building, Xingye Road 3012, Xixiang street, Bao'an District, Shenzhen, Guangdong, People's Republic of China

Tel: +86-755-29691511, Email: [qa@watc.com.cn](mailto:qa@watc.com.cn)

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 463912, the FCC Designation No. : CN5040.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0160.

## 1.6 Test Methodology

FCC CFR Title 47 Part 2, 22H, 24E, 27

ANSI C63.26-2015

FCC KDB 971168 D01 Power Meas License Digital Systems v03r01

FCC KDB 412172 D01 Determining ERP and EIRP v01r01

## 2 Description of Measurement

### 2.1 Test Frequency of Low/Middle/High Channels

Band	Bandwidth (MHz)	Low Channel (MHz)	Middle Channel (MHz)	High Channel (MHz)
GSM850	0.2	824.2	836.6	848.8
PCS1900	0.2	1850.2	1880	1909.8
WCDMA B2	4.8	1852.4	1880	1907.6
WCDMA B5	4.8	826.4	836.6	846.6
LTE B2	1.4	1850.7	1880	1909.3
	3	1851.5	1880	1908.5
	5	1852.5	1880	1907.5
	10	1855	1880	1905
	15	1857.5	1880	1902.5
	20	1860	1880	1900
LTE B5	1.4	824.7	836.5	848.3
	3	825.5	836.5	847.5
	5	826.5	836.5	846.5
	10	829	836.5	844
LTE B7	5	2502.5	2535	2567.5
	10	2505	2535	2565
	15	2507.5	2535	2562.5
	20	2510	2535	2560
LTE B12	1.4	699.7	707.5	715.3
	3	700.5	707.5	714.5
	5	701.5	707.5	713.5
	10	704	707.5	711
LTE B41	5	2537.5	2595	2652.5
	10	2540	2595	2650
	15	2542.5	2595	2647.5
	20	2545	2595	2645

### 2.2 Test Configuration for LTE bands

Test Items	Band	Bandwidth (MHz)						Modulation		RB#			Test Channel		
		1.4	3	5	10	15	20	QPSK	16QAM	1	Half	Full	L	M	H
RF Output Power ERP/EIRP	2	√	√	√	√	√	√	√	√	√	√	√	√	√	√
	5	√	√	√	√	-	-	√	√	√	√	√	√	√	√
	7	-	-	√	√	√	√	√	√	√	√	√	√	√	√
	12	√	√	√	√	-	-	√	√	√	√	√	√	√	√
	41	-	-	√	√	√	√	√	√	√	√	√	√	√	√
Peak-to-Average Ratio	2						√	√	√	√		√	√	√	√
	5				√	-	-	√	√	√		√	√	√	√
	7	-	-				√	√	√	√		√	√	√	√
	12				√	-	-	√	√	√		√	√	√	√
	41	-	-				√	√	√	√		√	√	√	√
26dB and 99% Bandwidth	2	√	√	√	√	√	√	√	√			√		√	
	5	√	√	√	√	-	-	√	√			√		√	
	7	-	-	√	√	√	√	√	√			√		√	
	12	√	√	√	√	-	-	√	√			√		√	
	41	-	-	√	√	√	√	√	√			√		√	

Band Edge	2	√	√	√	√	√	√	√	√			√	√		√
	5	√	√	√	√	-	-	√	√			√	√		√
	7	-	-	√	√	√	√	√	√			√	√		√
	12	√	√	√	√	-	-	√	√			√	√		√
	41	-	-	√	√	√	√	√	√			√	√		√
Conducted Spurious Emission	2	√	√	√	√	√	√	√				√	√	√	√
	5	√	√	√	√	-	-	√				√	√	√	√
	7	-	-	√	√	√	√	√				√	√	√	√
	12	√	√	√	√	-	-	√				√	√	√	√
	41	-	-	√	√	√	√	√				√	√	√	√
Frequency Stability	2				√			√	√			√	√		√
	5				√	-	-	√	√			√		√	
	7	-	-		√			√	√			√	√		√
	12				√	-	-	√	√			√	√		√
	41	-	-		√			√	√			√	√		√
Radiated Spurious Emission	2	√						√		√			√	√	√
	5	√				-	-	√		√			√	√	√
	7	-	-	√				√		√			√	√	√
	12	√				-	-	√		√			√	√	√
	41	-	-	√				√		√			√	√	√

Note:

1. "√" means the configuration was chosen for testing
2. "-" means the not support the bandwidth

#### Worst-Case Configuration:

For radiated emissions, EUT was investigated in three orthogonal orientation, the worst-case orientation was recorded in report

For radiated emissions, measurement was investigated from 30MHz to 10 times of fundamental, the worst case bandwidth, RB size and modulation test data was recorded.

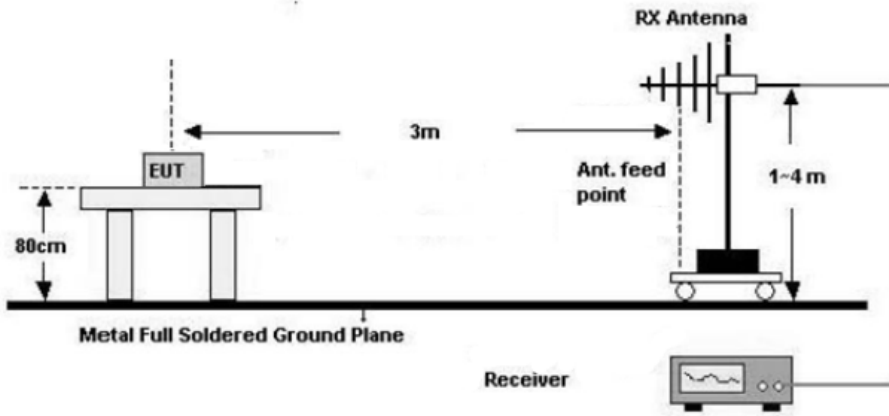
## 2.3 Test Auxiliary Equipment

Manufacturer	Description	Model	Serial Number
/	/	/	/

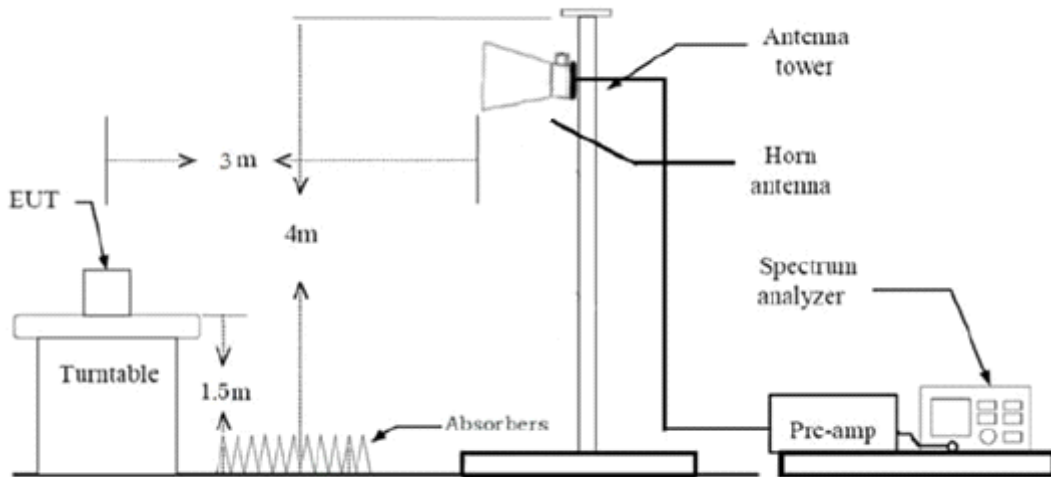
## 2.4 Test Setup

### 1) Radiated emission measurement:

30MHz-1GHz (3m SAC)



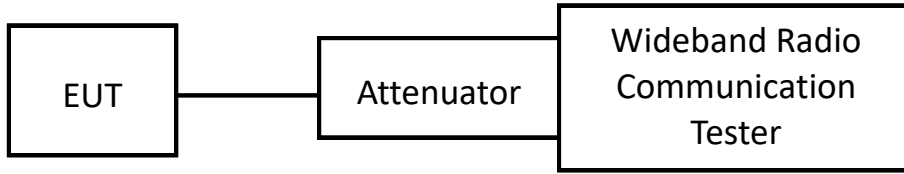
Above 1GHz (3m FAC)



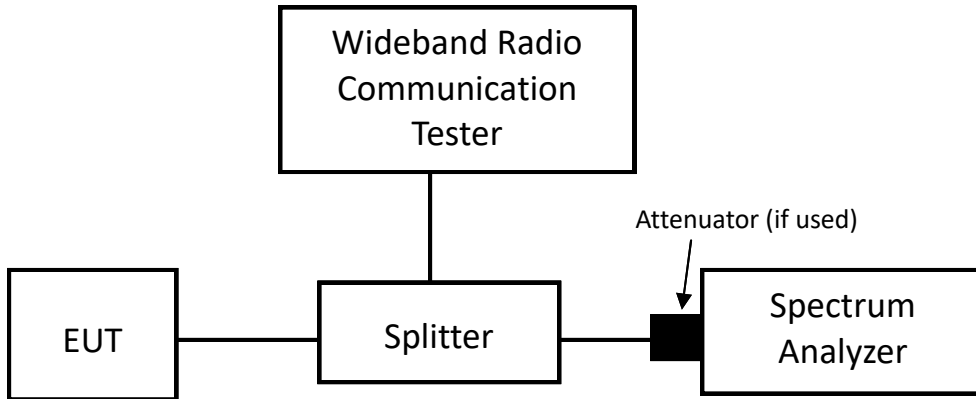


2) RF Conducted Test

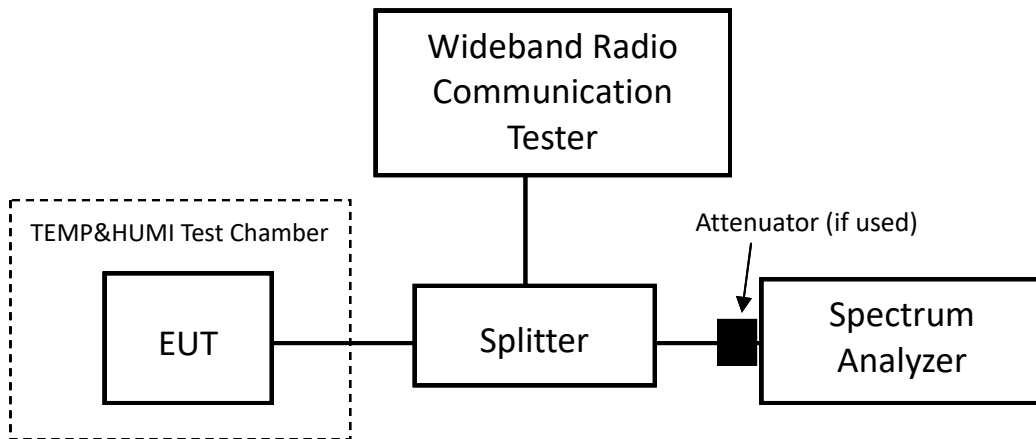
For RF Output Power test



For Bandwidth/Band edge/ PAR/Conducted spurious emissions Test



For Frequency Stability test



## 2.5 Test Procedure

### **Radiated Emission Procedure:**

#### **a) For 30MHz-1GHz:**

1. The EUT was placed on the tabletop of a rotating table 0.8 m the ground at a 3 m semi anechoic chamber. The measurement distance from the EUT to the receiving antenna is 3 m.
2. EUT works in each mode of operation that needs to be tested. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations.

#### **b) For above 1GHz:**

1. The EUT was placed on the tabletop of a rotating table 1.5 m the ground at a 3 m fully anechoic room. The measurement distance from the EUT to the receiving antenna is 3 m.
2. EUT works in each mode of operation that needs to be tested, and having the EUT continuously working. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations.
3. Open the test software to control the test antenna and test turntable. Perform the test, save the test results, and export the test data.

### **RF Conducted Test:**

1. The antenna port of EUT was connected to the RF port of the test equipment (Wideband Radio Communication Tester or Spectrum analyzer) through Attenuator and RF cable.
2. The cable assembly insertion loss (including Splitter, attenuator and cable loss) was entered as an offset in the power meter. Note: Actual cable loss was unavailable at the time of testing, therefore the loss used was assumed as worst case. This was later verified to be true by laboratory. ( if the RF cable provided by client, the cable loss declared by client)
3. The EUT is keeping in continuous transmission mode and tested in all modulation modes.

## 2.6 Measurement Method

Description of Test	Measurement Method
RF Output Power	ANSI C63.26-2015 section 5.2
ERP/EIRP	ANSI C63.26-2015 section 5.2.5.5
Peak-to-Average Ratio	ANSI C63.26-2015 section 5.2.3.4
26dB and 99% Bandwidth	ANSI C63.26-2015 section 5.4
Band Edge	ANSI C63.26-2015 section 5.7.3
Conducted Spurious Emissions	ANSI C63.26-2015 section 5.7.4
Frequency Stability	ANSI C63.26-2015 section 5.6
Radiated Spurious Emissions	ANSI C63.26-2015 section 5.5.4

## 2.7 Measurement Equipment

Manufacturer	Description	Model	Management No.	Calibration Date	Calibration Due Date
<b>Radiated Emission Test</b>					
R&S	EMI test receiver	ESR3	102758	2023/7/3	2024/7/2
ROHDE& SCHWARZ	SPECTRUM ANALYZER	FSV40-N	101608	2023/7/3	2024/7/2
SONOMA INSTRUMENT	Low frequency amplifier	310	186014	2023/7/12	2024/7/11
COM-POWER	preamplifier	PAM-118A	18040152	2023/8/21	2024/8/20
COM-POWER	Amplifier	PAM-840A	461306	2023/8/8	2024/8/7
ETS	Passive Loop Antenna	6512	29604	2023/7/7	2024/7/6
SCHWARZBECK	Log - periodic wideband antenna	VULB 9163	9163-872	2023/7/7	2024/7/6
Astro Antenna Ltd	Horn antenna	AHA-118S	3015	2023/7/6	2024/7/5
Ducommun technologies	Horn Antenna	ARH-4223-02	1007726-03	2023/7/10	2024/7/9
Ducommun technologies	Horn Antenna	ARH-2823-02	1007726-03	2023/7/10	2024/7/9
N/A	Coaxial Cable	N/A	NO.9	2023/8/8	2024/8/7
N/A	Coaxial Cable	N/A	NO.10	2023/8/8	2024/8/7
N/A	Coaxial Cable	N/A	NO.11	2023/8/8	2024/8/7
Audix	Test Software	E3	191218 V9	/	/
<b>RF Conducted Test</b>					
ROHDE& SCHWARZ	SPECTRUM ANALYZER	FSV40	101419	2023/9/12	2024/9/11
HP	Power Splitter	11667A	1610A	2023/7/26	2024/7/25
ROHDE& SCHWARZ	WIDEBAND RADIO COMMUNICATION TESTER	CMW500	116218	2023/9/12	2024/9/11
BACL	TEMP&HUMI Test Chamber	BTH-150	30022	2023/7/12	2024/7/11
FLUKE	Digital Multimeter	15B+	N/A	2023/7/12	2024/7/11

Note: All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or International standards.

## 3 Test Results

### 3.1 Test Summary

FCC Rules	Description of Test	Result
FCC§2.1046; § 22.913; § 24.232; §27.50	RF Output Power	Compliance
FCC§ 2.1047	Modulation Characteristics	Compliance
FCC§ 2.1049; § 22.905; § 22.917; § 24.238; §27.53;	26dB and 99% Bandwidth	Compliance
FCC§ 2.1051; § 22.917; § 24.238; §27.53	Conducted Spurious Emissions	Compliance
FCC§ 22.917; § 24.238; §27.53	Out of band emission, Band Edge	Compliance
FCC§ 2.1055; § 22.355; § 24.235; §27.54	Frequency stability	Compliance
FCC§ 2.1053; § 22.917; § 24.238; §27.53	Radiated Spurious Emissions	Compliance

### 3.2 Limit

Test items	Limit																																
RF Output Power	<p><b>FCC §22.913:</b></p> <p>(a)(5) The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7watts.</p> <p>(d) Power measurement. Measurement of the ERP of Cellular base transmitters and repeaters must be made using an average power measurement technique. The peak-to average ratio (PAR) of the transmission must not exceed 13 dB. Power measurements for base transmitters and repeaters must be made in accordance with either of the following:</p> <p>(1) A Commission-approved average power technique (see FCC Laboratory's Knowledge Database); or</p> <p>(2) For purposes of this section, peak transmit power must be measured over an 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.</p>																																
Unwanted Emissions  (Out of band emission and spurious)	<p><b>FCC §22.917:</b></p> <p>(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least <math>43 + 10 \log(P)</math> dB.</p> <p>(b) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a reference bandwidth as follows:</p> <p>(1) In the spectrum below 1 GHz, instrumentation should employ a reference bandwidth of 100 kHz or greater. 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. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy, provided that the measured power is integrated over the full required reference bandwidth (i.e., 100 kHz or 1 percent of emission bandwidth, as specified). 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.</p> <p>(2) In the spectrum above 1 GHz, instrumentation should employ a reference bandwidth of 1 MHz</p>																																
Frequency stability	<p><b>FCC §22.355:</b></p> <p>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.</p> <div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> <p style="text-align: center; font-size: small;">Table C-1—Frequency Tolerance for Transmitters in the Public Mobile Services</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Frequency range (MHz)</th> <th style="text-align: center;">Base, fixed (ppm)</th> <th style="text-align: center;">Mobile &gt;3 watts (ppm)</th> <th style="text-align: center;">Mobile ≤3 watts (ppm)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">25 to 50</td> <td style="text-align: center;">20.0</td> <td style="text-align: center;">20.0</td> <td style="text-align: center;">50.0</td> </tr> <tr> <td style="text-align: center;">50 to 450</td> <td style="text-align: center;">5.0</td> <td style="text-align: center;">5.0</td> <td style="text-align: center;">50.0</td> </tr> <tr> <td style="text-align: center;">450 to 512</td> <td style="text-align: center;">2.5</td> <td style="text-align: center;">5.0</td> <td style="text-align: center;">5.0</td> </tr> <tr> <td style="text-align: center;">821 to 896</td> <td style="text-align: center;">1.5</td> <td style="text-align: center;">2.5</td> <td style="text-align: center;">2.5</td> </tr> <tr> <td style="text-align: center;">928 to 929</td> <td style="text-align: center;">5.0</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td style="text-align: center;">929 to 960</td> <td style="text-align: center;">1.5</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">n/a</td> </tr> <tr> <td style="text-align: center;">2110 to 2220</td> <td style="text-align: center;">10.0</td> <td style="text-align: center;">n/a</td> <td style="text-align: center;">n/a</td> </tr> </tbody> </table> </div>	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
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																														

Test items	Limit
RF Output Power	<p><b>FCC §24.232:</b></p> <p>(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.</p> <p>(d) Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of § 24.51. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.</p>
<p>Unwanted Emissions</p> <p>(Out of band emission and spurious)</p>	<p><b>FCC §24.238:</b></p> <p>The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service.</p> <p>(a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least <math>43 + 10 \log(P)</math> dB.</p> <p>(b) Measurement procedure. Compliance with these rules 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 block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). 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.</p> <p>(c) Alternative out of band emission limit. Licensees in this service may establish an alternative out of band emission limit to be used at specified band edge(s) in specified geographical areas, in lieu of that set forth in this section, pursuant to a private contractual arrangement of all affected licensees and applicants. In this event, each party to such contract shall maintain a copy of the contract in their station files and disclose it to prospective assignees or transferees and, upon request, to the FCC.</p> <p>(d) Interference caused by out of band emissions. If any emission from a transmitter operating in this service results in interference to users of another radio service, the FCC may require a greater attenuation of that emission than specified in this section.</p>
Frequency stability	<p><b>FCC §24.235:</b></p> <p>The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.</p>

Test items	Limit
RF Output Power	<p><b>FCC §27.50:</b></p> <p>(a)(3) Mobile and portable stations.</p> <p>(i) For mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz 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 or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth. For mobile and portable stations using time division duplexing (TDD) technology, the duty cycle must not exceed 38 percent in the 2305-2315 MHz and 2350-2360 MHz bands. Mobile and portable stations using FDD technology are restricted to transmitting in the 2305-2315 MHz band. Power averaging shall not include intervals in which the transmitter is off.</p> <p>(ii) Mobile and portable stations are not permitted to transmit in the 2315-2320 MHz and 2345-2350 MHz bands.</p> <p>(iii) Automatic transmit power control. Mobile and portable stations transmitting in the 2305-2315 MHz band or in the 2350-2360 MHz band must employ automatic transmit power control when operating so the stations operate with the minimum power necessary for successful communications.</p> <p>(iv) Prohibition on external vehicle-mounted antennas. The use of external vehicle-mounted antennas for mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band is prohibited.</p> <p>(b)(10) Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.</p> <p>(c)(10) Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.</p> <p>(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.</p> <p>(h) The following power limits shall apply in the BRS and EBS:            (2) Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.</p>



<p>Unwanted Emissions  (Out of band emission and spurious)</p>	<p><b>FCC §27.53:</b></p> <p>(a) For operations in the 2305-2320 MHz band and the 2345-2360 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power P (with averaging performed only during periods of transmission) within the licensed band(s) of operation, in watts, by the following amounts:</p> <p>(4) For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:</p> <p>(i) By a factor of not less than: <math>43 + 10 \log (P)</math> dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than <math>55 + 10 \log (P)</math> dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than <math>61 + 10 \log (P)</math> dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than <math>67 + 10 \log (P)</math> dB on all frequencies between 2328 and 2337 MHz;</p> <p>(ii) By a factor of not less than <math>43 + 10 \log (P)</math> dB on all frequencies between 2300 and 2305 MHz, <math>55 + 10 \log (P)</math> dB on all frequencies between 2296 and 2300 MHz, <math>61 + 10 \log (P)</math> dB on all frequencies between 2292 and 2296 MHz, <math>67 + 10 \log (P)</math> dB on all frequencies between 2288 and 2292 MHz, and <math>70 + 10 \log (P)</math> dB below 2288 MHz;</p> <p>(iii) By a factor of not less than <math>43 + 10 \log (P)</math> dB on all frequencies between 2360 and 2365 MHz, and not less than <math>70 + 10 \log (P)</math> dB above 2365 MHz.</p> <p>(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:</p> <p>(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 <math>43 + 10 \log (P)</math> dB;</p> <p>(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 <math>43 + 10 \log (P)</math> dB;</p> <p>(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than <math>76 + 10 \log (P)</math> dB in a 6.25 kHz band segment, for base and fixed stations;</p> <p>(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than <math>65 + 10 \log (P)</math> dB in a 6.25 kHz band segment, for mobile and portable stations;</p> <p>(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;</p> <p>(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.</p>
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	<p>(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to <math>-70</math> dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and <math>-80</math> dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.</p> <p>(g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least <math>43 + 10 \log (P)</math> dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.</p> <p>(h) AWS emission limits          (1) <i>General protection levels.</i> 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 <math>43 + 10 \log_{10} (P)</math> dB.</p> <p>(m)(4) For mobile digital stations, the attenuation factor shall be not less than <math>40 + 10 \log (P)</math> dB on all frequencies between the channel edge and 5 megahertz from the channel edge, <math>43 + 10 \log (P)</math> dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and <math>55 + 10 \log (P)</math> dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than <math>43 + 10 \log (P)</math> dB on all frequencies between 2490.5 MHz and 2496 MHz and <math>55 + 10 \log (P)</math> 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.</p>
Frequency stability	<p><b>FCC §27.54:</b></p> <p>The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.</p>

### 3.3 RF Conducted Test Data

<b>Test Date:</b>	2023-11-30~2023-12-02	<b>Test By:</b>	Ryan Zhang
<b>Environment condition:</b>	Temperature: 24.5°C; Relative Humidity: 48%; ATM Pressure: 101kPa		

#### 3.3.1 RF Output Power&ERP/EIRP

##### Cellular Band

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				ERP(dBm)				Limit (dBm)
			1	2	3	4	1	2	3	4	
			slot	slots	slots	slots	slot	slots	slots	slots	
GSM	L	824.2	33.06	/	/	/	25.76	/	/	/	38.45
	M	836.6	33.11	/	/	/	25.81	/	/	/	38.45
	H	848.8	33.08	/	/	/	25.78	/	/	/	38.45
GPRS	L	824.2	33.04	32.25	30.52	29.53	25.74	24.95	23.22	22.23	38.45
	M	836.6	33.09	32.31	30.63	29.64	25.79	25.01	23.33	22.34	38.45
	H	848.8	33.09	32.34	30.71	29.72	25.79	25.04	23.41	22.42	38.45

Mode	Test Mode	3GPP Sub Test	Average Output Power (dBm)			ERP(dBm)		
			Low	Mid	High	Low	Mid	High
WCDMA (Band 5)	RMC12.2k		22.84	22.73	22.61	15.54	15.43	15.31
	HSDPA	1	19.45	19.68	19.66	12.15	12.38	12.36
		2	19.51	19.75	19.74	12.21	12.45	12.44
		3	19.58	19.83	19.82	12.28	12.53	12.52
		4	19.60	19.90	19.84	12.30	12.60	12.54
	HSUPA	1	19.46	20.14	19.30	12.16	12.84	12.00
		2	19.53	20.20	19.38	12.23	12.90	12.08
		3	19.60	20.26	19.40	12.30	12.96	12.10
		4	19.63	20.34	19.45	12.33	13.04	12.15
		5	19.69	20.39	19.49	12.39	13.09	12.19
	HSPA+	1	19.77	20.38	19.51	12.47	13.08	12.21

Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBd) - Cable loss(dB)

For GSM850 / WCDMA Band5: Antenna Gain = -4.65dBd = -6.8dBd (0dBd=2.15dBd)

For 700-960MHz, Cable Loss=0.5dB\* (provided by the applicant)

Limit: ERP ≤ 38.45dBm

**PCS Band**

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				ERP(dBm)				Limit (dBm)
			1	2	3	4	1	2	3	4	
			slot	slots	slots	slots	slot	slots	slots	slots	
GSM	512	1850.2	29.65	/	/	/	29.61	/	/	/	33
	661	1880.0	29.57	/	/	/	29.53	/	/	/	33
	810	1909.8	29.58	/	/	/	29.54	/	/	/	33
GPRS	512	1850.2	29.58	28.91	27.30	26.25	29.54	28.87	27.26	26.21	33
	661	1880.0	29.50	28.76	27.06	26.01	29.46	28.72	27.02	25.97	33
	810	1909.8	29.55	28.74	26.96	25.89	29.51	28.7	26.92	25.85	33

Mode	Test Mode	3GPP Sub Test	Average Output Power (dBm)			EIRP (dBm)		
			Low	Mid	High	Low	Mid	High
			WCDMA (Band 2)	RMC12.2k		22.94	22.79	22.83
HSDPA	1	20.72		20.30	20.33	20.68	20.26	20.29
	2	20.79		20.35	20.37	20.75	20.31	20.33
	3	20.82		20.40	20.41	20.78	20.36	20.37
	4	20.89		20.47	20.43	20.85	20.43	20.39
HSUPA	1	19.26		20.03	20.07	19.22	19.99	20.03
	2	19.34		20.10	20.14	19.30	20.06	20.10
	3	19.38		20.13	20.19	19.34	20.09	20.15
	4	19.40		20.16	20.27	19.36	20.12	20.23
	5	19.47		20.20	20.31	19.43	20.16	20.27
HSPA+	1	19.51		20.34	20.30	19.47	20.30	20.26

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi) - Cable loss(dB)

For PCS1900 / WCDMA Band2: Antenna Gain = 0.76dBi

For 1700-2000MHz, Cable Loss=0.8dB\*(provided by the applicant)

Limit: EIRP ≤ 33dBm

**LTE Band 2**

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
1.4	QPSK	RB1#0	22.98	22.94	22.99	22.94	22.90	22.95
		RB1#3	22.92	22.87	22.94	22.88	22.83	22.90
		RB1#5	22.96	22.93	23.00	22.92	22.89	22.96
		RB3#0	23.27	23.21	23.25	23.23	23.17	23.21
		RB3#3	23.32	23.23	23.28	23.28	23.19	23.24
		RB6#0	22.38	22.21	22.27	22.34	22.17	22.23
	16QAM	RB1#0	22.29	22.19	22.36	22.25	22.15	22.32
		RB1#3	22.21	22.12	22.31	22.17	22.08	22.27
		RB1#5	22.31	22.22	22.38	22.27	22.18	22.34
		RB3#0	22.65	22.66	22.48	22.61	22.62	22.44
		RB3#3	22.65	22.69	22.51	22.61	22.65	22.47
		RB6#0	21.54	21.56	21.63	21.50	21.52	21.59
3.0	QPSK	RB1#0	22.98	22.95	22.96	22.94	22.91	22.92
		RB1#8	22.98	22.92	23.00	22.94	22.88	22.96
		RB1#14	22.95	22.89	22.95	22.91	22.85	22.91
		RB6#0	22.35	22.34	22.30	22.31	22.30	22.26
		RB6#9	22.32	22.31	22.33	22.28	22.27	22.29
		RB15#0	22.51	22.52	22.50	22.47	22.48	22.46
	16QAM	RB1#0	22.28	22.81	22.36	22.24	22.77	22.32
		RB1#8	22.29	22.77	22.37	22.25	22.73	22.33
		RB1#14	22.28	22.71	22.38	22.24	22.67	22.34
		RB6#0	21.61	21.71	21.65	21.57	21.67	21.61
		RB6#9	21.58	21.67	21.70	21.54	21.63	21.66
		RB15#0	21.89	21.85	21.76	21.85	21.81	21.72
5.0	QPSK	RB1#0	23.25	23.18	23.19	23.21	23.14	23.15
		RB1#13	23.26	23.18	23.25	23.22	23.14	23.21
		RB1#24	23.18	23.13	23.21	23.14	23.09	23.17
		RB15#0	22.64	22.64	22.59	22.60	22.60	22.55
		RB15#10	22.62	22.56	22.59	22.58	22.52	22.55
		RB25#0	22.64	22.54	22.64	22.60	22.50	22.60
	16QAM	RB1#0	22.85	22.50	22.37	22.81	22.46	22.33
		RB1#13	22.83	22.49	22.44	22.79	22.45	22.40
		RB1#24	22.80	22.50	22.40	22.76	22.46	22.36
		RB15#0	21.94	21.94	21.96	21.90	21.90	21.92
		RB15#10	21.88	21.88	21.95	21.84	21.84	21.91
		RB25#0	21.99	21.94	22.01	21.95	21.90	21.97

10.0	QPSK	RB1#0	23.32	23.34	23.42	23.28	23.30	23.38
		RB1#25	23.15	23.11	23.14	23.11	23.07	23.10
		RB1#49	23.27	23.17	23.24	23.23	23.13	23.20
		RB25#0	22.65	22.69	22.81	22.61	22.65	22.77
		RB25#25	22.67	22.56	22.60	22.63	22.52	22.56
		RB50#0	22.71	22.70	22.77	22.67	22.66	22.73
	16QAM	RB1#0	22.58	23.10	22.80	22.54	23.06	22.76
		RB1#25	22.41	22.93	22.56	22.37	22.89	22.52
		RB1#49	22.60	23.05	22.64	22.56	23.01	22.60
		RB25#0	22.07	22.08	22.12	22.03	22.04	22.08
		RB25#25	22.11	21.94	21.97	22.07	21.90	21.93
		RB50#0	22.05	21.98	22.06	22.01	21.94	22.02
15.0	QPSK	RB1#0	23.30	23.37	23.36	23.26	23.33	23.32
		RB1#38	23.29	23.21	23.28	23.25	23.17	23.24
		RB1#74	23.32	23.19	23.18	23.28	23.15	23.14
		RB36#0	22.52	22.67	22.77	22.48	22.63	22.73
		RB36#39	22.64	22.46	22.46	22.60	22.42	22.42
		RB75#0	22.61	22.62	22.64	22.57	22.58	22.60
	16QAM	RB1#0	22.71	22.94	23.20	22.67	22.90	23.16
		RB1#38	22.70	22.87	23.13	22.66	22.83	23.09
		RB1#74	22.71	22.92	23.10	22.67	22.88	23.06
		RB36#0	21.83	21.91	22.01	21.79	21.87	21.97
		RB36#39	21.96	21.74	21.76	21.92	21.70	21.72
		RB75#0	21.92	21.85	21.93	21.88	21.81	21.89
20.0	QPSK	RB1#0	23.30	23.42	23.22	23.26	23.38	23.18
		RB1#50	23.27	23.23	23.33	23.23	23.19	23.29
		RB1#99	23.34	23.22	23.09	23.30	23.18	23.05
		RB50#0	22.70	22.84	22.76	22.66	22.80	22.72
		RB50#50	22.93	22.68	22.56	22.89	22.64	22.52
		RB100#0	22.77	22.76	22.68	22.73	22.72	22.64
	16QAM	RB1#0	22.85	22.80	23.10	22.81	22.76	23.06
		RB1#50	22.83	22.63	23.08	22.79	22.59	23.04
		RB1#99	22.83	22.70	22.97	22.79	22.66	22.93
		RB50#0	21.99	22.11	22.03	21.95	22.07	21.99
		RB50#50	22.22	21.98	21.89	22.18	21.94	21.85
		RB100#0	22.11	22.03	21.95	22.07	21.99	21.91

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi) - Cable Loss(dB)

For Band2: Antenna Gain = 0.76dBi

Cable Loss=0.8dB\*(provided by the applicant)

Limit: EIRP ≤ 33dBm

**LTE Band 5**

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			ERP(dBm)		
			Low	Mid	High	Low	Mid	High
1.4	QPSK	RB1#0	23.20	22.76	22.31	15.90	15.46	15.01
		RB1#3	23.22	22.70	22.27	15.92	15.40	14.97
		RB1#5	23.29	22.79	22.42	15.99	15.49	15.12
		RB3#0	23.38	23.04	22.63	16.08	15.74	15.33
		RB3#3	23.37	23.05	22.71	16.07	15.75	15.41
		RB6#0	22.57	22.08	21.73	15.27	14.78	14.43
	16QAM	RB1#0	22.37	22.16	21.63	15.07	14.86	14.33
		RB1#3	22.32	22.08	21.57	15.02	14.78	14.27
		RB1#5	22.38	22.19	21.74	15.08	14.89	14.44
		RB3#0	22.72	22.34	22.02	15.42	15.04	14.72
		RB3#3	22.73	22.34	22.06	15.43	15.04	14.76
		RB6#0	21.71	21.42	20.92	14.41	14.12	13.62
3.0	QPSK	RB1#0	23.26	22.74	22.44	15.96	15.44	15.14
		RB1#8	23.31	22.79	22.33	16.01	15.49	15.03
		RB1#14	23.34	22.81	22.44	16.04	15.51	15.14
		RB6#0	22.58	22.08	21.66	15.28	14.78	14.36
		RB6#9	22.66	22.18	21.81	15.36	14.88	14.51
		RB15#0	22.66	22.31	21.92	15.36	15.01	14.62
	16QAM	RB1#0	22.41	22.15	21.63	15.11	14.85	14.33
		RB1#8	22.37	22.18	21.60	15.07	14.88	14.30
		RB1#14	22.37	22.24	21.75	15.07	14.94	14.45
		RB6#0	21.76	21.43	20.94	14.46	14.13	13.64
		RB6#9	21.68	21.53	21.04	14.38	14.23	13.74
		RB15#0	21.92	21.63	21.30	14.62	14.33	14.00
5.0	QPSK	RB1#0	23.44	22.92	22.91	16.14	15.62	15.61
		RB1#13	23.48	23.02	22.59	16.18	15.72	15.29
		RB1#24	23.36	23.10	22.60	16.06	15.80	15.30
		RB15#0	22.82	22.36	22.14	15.52	15.06	14.84
		RB15#10	22.66	22.51	22.12	15.36	15.21	14.82
		RB25#0	22.66	22.49	22.10	15.36	15.19	14.80
	16QAM	RB1#0	22.85	22.25	21.91	15.55	14.95	14.61
		RB1#13	22.76	22.39	21.72	15.46	15.09	14.42
		RB1#24	22.66	22.42	21.76	15.36	15.12	14.46
		RB15#0	21.99	21.67	21.38	14.69	14.37	14.08
		RB15#10	21.80	21.86	21.46	14.50	14.56	14.16

		RB25#0	21.89	21.80	21.47	14.59	14.50	14.17
10.0	QPSK	RB1#0	23.54	23.10	23.23	16.24	15.80	15.93
		RB1#25	23.33	22.91	23.01	16.03	15.61	15.71
		RB1#49	22.96	23.32	22.61	15.66	16.02	15.31
		RB25#0	22.86	22.30	22.72	15.56	15.00	15.42
		RB25#25	22.45	22.63	22.07	15.15	15.33	14.77
		RB50#0	22.63	22.49	22.45	15.33	15.19	15.15
	16QAM	RB1#0	22.80	22.22	23.02	15.50	14.92	15.72
		RB1#25	22.52	22.20	22.53	15.22	14.90	15.23
		RB1#49	22.33	22.47	22.49	15.03	15.17	15.19
		RB25#0	22.00	21.73	22.01	14.70	14.43	14.71
		RB25#25	21.65	22.02	21.38	14.35	14.72	14.08
		RB50#0	21.84	21.86	21.73	14.54	14.56	14.43
<p>Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBd) - Cable Loss(dB)            For Band5: Antenna Gain = -4.65dBi = -6.8dBd (0dBd=2.15dBi)            Cable Loss=0.5dB* (provided by the applicant)            Limit: ERP ≤ 34.77dBm</p>								



**LTE Band 7**

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
5.0	QPSK	RB1#0	21.02	21.51	21.45	19.68	20.17	20.11
		RB1#13	21.12	21.56	21.51	19.78	20.22	20.17
		RB1#24	21.15	21.50	21.50	19.81	20.16	20.16
		RB15#0	20.38	20.85	20.82	19.04	19.51	19.48
		RB15#10	20.50	20.85	20.85	19.16	19.51	19.51
		RB25#0	20.49	20.81	20.87	19.15	19.47	19.53
	16QAM	RB1#0	20.19	21.03	20.79	18.85	19.69	19.45
		RB1#13	20.30	21.05	20.83	18.96	19.71	19.49
		RB1#24	20.32	21.00	20.80	18.98	19.66	19.46
		RB15#0	19.73	20.12	20.16	18.39	18.78	18.82
		RB15#10	19.79	20.09	20.18	18.45	18.75	18.84
		RB25#0	19.79	20.06	20.20	18.45	18.72	18.86
10.0	QPSK	RB1#0	21.00	21.56	21.54	19.66	20.22	20.20
		RB1#25	21.04	21.50	21.41	19.70	20.16	20.07
		RB1#49	21.26	21.56	21.54	19.92	20.22	20.20
		RB25#0	20.43	20.90	20.80	19.09	19.56	19.46
		RB25#25	20.56	20.86	20.71	19.22	19.52	19.37
		RB50#0	20.55	20.88	20.67	19.21	19.54	19.33
	16QAM	RB1#0	20.91	20.94	20.51	19.57	19.60	19.17
		RB1#25	20.89	20.86	20.33	19.55	19.52	18.99
		RB1#49	21.08	20.92	20.52	19.74	19.58	19.18
		RB25#0	19.80	20.19	19.93	18.46	18.85	18.59
		RB25#25	19.93	20.15	19.87	18.59	18.81	18.53
		RB50#0	19.86	20.16	19.89	18.52	18.82	18.55
15.0	QPSK	RB1#0	21.01	21.48	21.50	19.67	20.14	20.16
		RB1#38	21.22	21.52	21.45	19.88	20.18	20.11
		RB1#74	21.32	21.50	21.45	19.98	20.16	20.11
		RB36#0	20.36	20.76	20.51	19.02	19.42	19.17
		RB36#39	20.56	20.75	20.53	19.22	19.41	19.19
		RB75#0	20.49	20.80	20.40	19.15	19.46	19.06
	16QAM	RB1#0	20.48	21.11	20.97	19.14	19.77	19.63
		RB1#38	20.62	21.11	20.94	19.28	19.77	19.60
		RB1#74	20.71	21.06	21.00	19.37	19.72	19.66
		RB36#0	19.65	20.03	19.72	18.31	18.69	18.38
		RB36#39	19.84	19.99	19.68	18.50	18.65	18.34

		RB75#0	19.78	20.01	19.69	18.44	18.67	18.35
20.0	QPSK	RB1#0	21.04	21.90	22.00	19.70	20.56	20.66
		RB1#50	21.75	21.97	21.98	20.41	20.63	20.64
		RB1#99	21.79	21.90	22.01	20.45	20.56	20.67
		RB50#0	21.01	21.37	21.42	19.67	20.03	20.08
		RB50#50	21.19	21.32	21.17	19.85	19.98	19.83
		RB100#0	21.04	21.32	21.13	19.70	19.98	19.79
	16QAM	RB1#0	21.02	21.71	21.50	19.68	20.37	20.16
		RB1#50	21.19	21.75	21.50	19.85	20.41	20.16
		RB1#99	21.26	21.66	21.28	19.92	20.32	19.94
		RB50#0	20.26	20.64	20.44	18.92	19.30	19.10
		RB50#50	20.43	20.58	20.64	19.09	19.24	19.30
		RB100#0	20.33	20.60	20.56	18.99	19.26	19.22
	<p>Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi) - Cable Loss(dB)            For Band7: Antenna Gain = -0.54dBi            Cable Loss=0.8dB*(provided by the applicant)            Limit: EIRP ≤ 33dBm</p>							

**LTE Band 12**

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			ERP(dBm)		
			Low	Mid	High	Low	Mid	High
1.4	QPSK	RB1#0	23.42	23.53	23.57	14.24	14.35	14.39
		RB1#3	23.29	23.45	23.55	14.11	14.27	14.37
		RB1#5	23.46	23.52	23.59	14.28	14.34	14.41
		RB3#0	23.68	23.83	23.87	14.50	14.65	14.69
		RB3#3	23.70	23.81	23.91	14.52	14.63	14.73
		RB6#0	22.70	22.73	22.88	13.52	13.55	13.70
	16QAM	RB1#0	22.69	22.95	22.87	13.51	13.77	13.69
		RB1#3	22.59	22.83	22.84	13.41	13.65	13.66
		RB1#5	22.76	22.97	22.93	13.58	13.79	13.75
		RB3#0	23.18	23.16	23.27	14.00	13.98	14.09
		RB3#3	23.17	23.16	23.22	13.99	13.98	14.04
		RB6#0	20.42	20.64	20.63	11.24	11.46	11.45
3.0	QPSK	RB1#0	23.47	23.55	23.57	14.29	14.37	14.39
		RB1#8	23.51	23.48	23.53	14.33	14.30	14.35
		RB1#14	23.54	23.49	23.54	14.36	14.31	14.36
		RB6#0	22.82	22.90	22.99	13.64	13.72	13.81
		RB6#9	22.88	22.93	23.03	13.70	13.75	13.85
		RB15#0	23.08	23.08	23.22	13.90	13.90	14.04
	16QAM	RB1#0	22.89	22.87	23.50	13.71	13.69	14.32
		RB1#8	22.88	22.84	23.41	13.70	13.66	14.23
		RB1#14	22.99	22.92	23.40	13.81	13.74	14.22
		RB6#0	20.47	20.55	20.78	11.29	11.37	11.60
		RB6#9	20.63	20.54	20.76	11.45	11.36	11.58
		RB15#0	20.58	20.81	20.85	11.40	11.63	11.67
5.0	QPSK	RB1#0	23.61	23.84	23.82	14.43	14.66	14.64
		RB1#13	23.76	23.81	23.84	14.58	14.63	14.66
		RB1#24	23.74	23.78	23.83	14.56	14.60	14.65
		RB15#0	23.14	23.23	23.24	13.96	14.05	14.06
		RB15#10	23.18	23.23	23.32	14.00	14.05	14.14
		RB25#0	23.19	23.25	23.27	14.01	14.07	14.09
	16QAM	RB1#0	23.03	23.02	23.00	13.85	13.84	13.82
		RB1#13	23.11	22.98	23.04	13.93	13.80	13.86
		RB1#24	23.16	22.99	22.98	13.98	13.81	13.80
		RB15#0	20.73	20.83	20.88	11.55	11.65	11.70
		RB15#10	20.76	20.82	20.91	11.58	11.64	11.73

		RB25#0	20.78	20.92	20.95	11.60	11.74	11.77
10.0	QPSK	RB1#0	23.74	23.81	23.81	14.56	14.63	14.63
		RB1#25	23.69	23.62	23.67	14.51	14.44	14.49
		RB1#49	23.80	23.80	23.85	14.62	14.62	14.67
		RB25#0	23.24	23.34	23.22	14.06	14.16	14.04
		RB25#25	23.28	23.29	23.30	14.10	14.11	14.12
		RB50#0	23.34	23.35	23.29	14.16	14.17	14.11
	16QAM	RB1#0	23.01	23.72	23.28	13.83	14.54	14.10
		RB1#25	22.95	23.63	23.13	13.77	14.45	13.95
		RB1#49	23.11	23.70	23.28	13.93	14.52	14.10
		RB25#0	20.90	20.92	20.83	11.72	11.74	11.65
		RB25#25	20.97	20.95	20.95	11.79	11.77	11.77
		RB50#0	20.90	20.92	20.85	11.72	11.74	11.67
<p>Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBd) - Cable Loss(dB)            For Band12: Antenna Gain = -6.53dBi = -8.68dBd (0dBd=2.15dBi)            Cable Loss=0.5dB* (provided by the applicant)            Limit: ERP ≤ 34.77dBm</p>								

**LTE Band 41**

Bandwidth (MHz)	Modulation	RB size/ RB Offset	Conducted Average Output Power (dBm)			EIRP(dBm)		
			Low	Mid	High	Low	Mid	High
5.0	QPSK	RB1#0	21.45	21.78	21.80	20.11	20.44	20.46
		RB1#13	21.50	21.81	21.83	20.16	20.47	20.49
		RB1#24	21.49	21.73	21.79	20.15	20.39	20.45
		RB15#0	20.80	21.18	21.16	19.46	19.84	19.82
		RB15#10	20.81	21.16	21.08	19.47	19.82	19.74
		RB25#0	20.87	21.21	21.14	19.53	19.87	19.80
	16QAM	RB1#0	20.73	21.15	21.30	19.39	19.81	19.96
		RB1#13	20.80	21.21	21.30	19.46	19.87	19.96
		RB1#24	20.79	21.13	21.25	19.45	19.79	19.91
		RB15#0	20.04	20.50	20.45	18.70	19.16	19.11
		RB15#10	20.07	20.49	20.42	18.73	19.15	19.08
		RB25#0	20.23	20.58	20.42	18.89	19.24	19.08
10.0	QPSK	RB1#0	21.55	21.87	21.89	20.21	20.53	20.55
		RB1#25	21.61	21.90	21.82	20.27	20.56	20.48
		RB1#49	21.67	21.83	21.81	20.33	20.49	20.47
		RB25#0	20.85	21.20	21.21	19.51	19.86	19.87
		RB25#25	20.95	21.19	21.12	19.61	19.85	19.78
		RB50#0	20.96	21.23	21.23	19.62	19.89	19.89
	16QAM	RB1#0	20.73	21.30	21.35	19.39	19.96	20.01
		RB1#25	20.78	21.32	21.29	19.44	19.98	19.95
		RB1#49	20.86	21.29	21.26	19.52	19.95	19.92
		RB25#0	20.20	20.59	20.49	18.86	19.25	19.15
		RB25#25	20.31	20.60	20.39	18.97	19.26	19.05
		RB50#0	20.27	20.59	20.47	18.93	19.25	19.13
15.0	QPSK	RB1#0	21.49	21.84	21.86	20.15	20.50	20.52
		RB1#38	21.63	21.82	21.86	20.29	20.48	20.52
		RB1#74	21.72	21.77	21.76	20.38	20.43	20.42
		RB36#0	20.65	20.96	21.11	19.31	19.62	19.77
		RB36#39	20.83	20.94	21.04	19.49	19.60	19.70
		RB75#0	20.75	20.99	21.11	19.41	19.65	19.77
	16QAM	RB1#0	20.74	21.36	21.35	19.40	20.02	20.01
		RB1#38	20.77	21.35	21.31	19.43	20.01	19.97
		RB1#74	20.88	21.36	21.21	19.54	20.02	19.87
		RB36#0	19.93	20.37	20.35	18.59	19.03	19.01
RB36#39		20.11	20.35	20.24	18.77	19.01	18.90	

		RB75#0	20.07	20.32	20.33	18.73	18.98	18.99
20.0	QPSK	RB1#0	21.39	21.75	21.95	20.05	20.41	20.61
		RB1#50	21.64	21.87	22.00	20.30	20.53	20.66
		RB1#99	21.69	21.70	21.82	20.35	20.36	20.48
		RB50#0	20.90	21.28	21.28	19.56	19.94	19.94
		RB50#50	21.09	21.23	21.15	19.75	19.89	19.81
		RB100#0	20.96	21.21	21.18	19.62	19.87	19.84
	16QAM	RB1#0	20.80	21.05	21.41	19.46	19.71	20.07
		RB1#50	20.94	21.12	21.44	19.60	19.78	20.10
		RB1#99	21.04	21.01	21.28	19.70	19.67	19.94
		RB50#0	20.18	20.61	20.57	18.84	19.27	19.23
		RB50#50	20.39	20.59	20.46	19.05	19.25	19.12
		RB100#0	20.29	20.56	20.47	18.95	19.22	19.13
	<p>Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi) - Cable Loss(dB)            For Band 41: Antenna Gain = -0.54 dBi            Cable Loss=0.8dB* (provided by the applicant)            Limit: EIRP≤33dBm</p>							

### 3.3.2 Peak-to-average ratio (PAR)

**Cellular Band**

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	9.48	13
	Middle	9.51	13
	High	9.65	13
GPRS	Low	9.86	13
	Middle	9.74	13
	High	9.74	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC	Low	2.55	13
	Middle	3.30	13
	High	3.74	13
HSDPA	Low	5.57	13
	Middle	6.52	13
	High	5.25	13
HSUPA	Low	5.62	13
	Middle	6.58	13
	High	5.42	13
HSPA+	Low	5.54	13
	Middle	5.63	13
	High	5.29	13

**PCS Band**

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	9.48	13
	Middle	9.51	13
	High	9.62	13
GPRS	Low	9.74	13
	Middle	9.80	13
	High	9.80	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC	Low	3.16	13
	Middle	3.01	13
	High	3.16	13
HSDPA	Low	4.70	13
	Middle	4.78	13
	High	5.16	13
HSUPA	Low	6.35	13
	Middle	5.57	13
	High	5.54	13
HSPA+	Low	6.21	13
	Middle	5.78	13
	High	5.64	13



**LTE Band 2 20MHz Bandwidth**

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.28	4.79	4.42	13	Pass
QPSK (100RB Size)	4.91	5.20	5.00	13	Pass
16QAM (1RB Size)	5.36	5.86	4.99	13	Pass
16QAM (100RB Size)	5.77	6.10	6.30	13	Pass

**LTE Band 5 10MHz Bandwidth**

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.72	4.96	4.16	13	Pass
QPSK (50RB Size)	5.52	5.74	5.53	13	Pass
16QAM (1RB Size)	4.94	5.97	5.14	13	Pass
16QAM (50RB Size)	6.40	6.76	6.28	13	Pass

**LTE Band 7 20MHz Bandwidth**

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.26	4.36	2.75	13	Pass
QPSK (100RB Size)	4.88	5.07	4.60	13	Pass
16QAM (1RB Size)	4.90	5.84	3.45	13	Pass
16QAM (100RB Size)	5.67	5.75	5.81	13	Pass

**LTE Band 12 10MHz Bandwidth**

<b>Modulation</b>	<b>Low channel (dB)</b>	<b>Middle channel (dB)</b>	<b>High channel (dB)</b>	<b>PAR Limit (dB)</b>	<b>Result</b>
QPSK (1RB Size)	2.96	2.13	1.86	13	Pass
QPSK (50RB Size)	5.23	5.22	4.95	13	Pass
16QAM (1RB Size)	3.79	3.08	3.39	13	Pass
16QAM (50RB Size)	5.80	6.12	5.89	13	Pass

**LTE Band 41 20MHz Bandwidth**

<b>Modulation</b>	<b>Low channel (dB)</b>	<b>Middle channel (dB)</b>	<b>High channel (dB)</b>	<b>PAR Limit (dB)</b>	<b>Result</b>
QPSK (1RB Size)	8.81	8.69	8.55	13	Pass
QPSK (100RB Size)	8.99	9.48	9.06	13	Pass
16QAM (1RB Size)	9.88	9.30	9.41	13	Pass
16QAM (100RB Size)	9.98	10.26	9.96	13	Pass

### 3.3.3 26dB and 99% Bandwidth

#### Cellular Band

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
GSM(GMSK)	836.6	0.246	0.321

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC	836.6	4.166	4.715
HSDPA	836.6	4.176	4.745
HSUPA	836.6	4.186	4.695

#### PCS Band

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
GSM(GMSK)	1880.0	0.239	0.29

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC	1880.0	4.176	4.735
HSDPA	1880.0	4.186	4.725
HSUPA	1880.0	4.186	4.695

**LTE Band 2**

Bandwidth	Modulation	Middle channel	
		OBW (MHz)	26dB EBW (MHz)
1.4 MHz	QPSK	1.108	1.308
	16QAM	1.090	1.278
3 MHz	QPSK	2.683	2.916
	16QAM	2.683	2.940
5 MHz	QPSK	4.511	4.940
	16QAM	4.511	4.900
10 MHz	QPSK	8.942	9.680
	16QAM	8.942	9.640
15 MHz	QPSK	13.533	14.700
	16QAM	13.533	14.640
20 MHz	QPSK	17.964	19.200
	16QAM	18.044	19.440

**LTE Band 5**

Bandwidth	Modulation	Middle channel	
		OBW (MHz)	26dB EBW (MHz)
1.4 MHz	QPSK	1.102	1.302
	16QAM	1.090	1.272
3 MHz	QPSK	2.683	2.916
	16QAM	2.683	2.952
5 MHz	QPSK	4.491	4.900
	16QAM	4.511	4.940
10 MHz	QPSK	8.942	9.640
	16QAM	8.942	9.560

**LTE Band 7**

Bandwidth	Modulation	Middle channel	
		OBW (MHz)	26dB EBW (MHz)
5 MHz	QPSK	4.511	4.960
	16QAM	4.511	4.940
10 MHz	QPSK	8.942	9.600
	16QAM	8.942	9.600
15 MHz	QPSK	13.533	14.640
	16QAM	13.473	14.640
20 MHz	QPSK	17.884	19.200
	16QAM	17.964	19.200

**LTE Band 12**

Bandwidth	Modulation	Middle channel	
		OBW (MHz)	26dB EBW (MHz)
1.4 MHz	QPSK	1.102	1.272
	16QAM	1.096	1.284
3 MHz	QPSK	2.683	2.928
	16QAM	2.683	2.964
5 MHz	QPSK	4.511	4.920
	16QAM	4.511	4.920
10 MHz	QPSK	8.942	9.520
	16QAM	8.942	9.600

**LTE Band 41**

Bandwidth	Modulation	Middle channel	
		OBW (MHz)	26dB EBW (MHz)
5 MHz	QPSK	4.511	4.960
	16QAM	4.511	5.040
10 MHz	QPSK	8.942	9.560
	16QAM	8.942	9.560
15 MHz	QPSK	13.473	14.520
	16QAM	13.533	14.880
20 MHz	QPSK	17.884	19.360
	16QAM	17.884	19.200

Note: Test Plots of 26dB and 99% bandwidth please refer Appendix A

### 3.3.4 Conducted Spurious Emissions

Band	Result	Limit	Verdict
GSM850	Refer test plot	Refer test plot	Pass
PCS1900	Refer test plot	Refer test plot	Pass
WCDMA B2	Refer test plot	Refer test plot	Pass
WCDMA B4	Refer test plot	Refer test plot	Pass
LTE B2	Refer test plot	Refer test plot	Pass
LTE B5	Refer test plot	Refer test plot	Pass
LTE B7	Refer test plot	Refer test plot	Pass
LTE B12	Refer test plot	Refer test plot	Pass
LTE B41	Refer test plot	Refer test plot	Pass

Note: Test Plots of Conducted Spurious Emissions please refer Appendix B

### 3.3.5 Out of band emission, Band Edge

Band	Result	Limit	Verdict
GSM850	Refer test plot	Refer test plot	Pass
PCS1900	Refer test plot	Refer test plot	Pass
WCDMA B2	Refer test plot	Refer test plot	Pass
WCDMA B4	Refer test plot	Refer test plot	Pass
LTE B2	Refer test plot	Refer test plot	Pass
LTE B5	Refer test plot	Refer test plot	Pass
LTE B7	Refer test plot	Refer test plot	Pass
LTE B12	Refer test plot	Refer test plot	Pass
LTE B41	Refer test plot	Refer test plot	Pass

Note: Test Plots of Band Edge please refer Appendix C

### 3.3.6 FREQUENCY STABILITY

#### Cellular Band

#### GSM Mode

Middle Channel, $f_o = 836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.87	11	0.013	2.5
-20		9	0.011	2.5
-10		-5	-0.006	2.5
0		-1	-0.001	2.5
10		2	0.002	2.5
20		-6	-0.007	2.5
30		6	0.007	2.5
40		2	0.002	2.5
50		6	0.007	2.5
20	3.45	-12	-0.014	2.5
	4.45	9	0.011	2.5

#### WCDMA Mode

Middle Channel, $f_o = 836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.87	-19	-0.023	2.5
-20		-11	-0.013	2.5
-10		-9	-0.011	2.5
0		-2	-0.002	2.5
10		-11	-0.013	2.5
20		1	0.001	2.5
30		-14	-0.017	2.5
40		2	0.002	2.5
50		-5	-0.006	2.5
20	3.45	-13	-0.016	2.5
	4.45	-15	-0.018	2.5



**PCS Band  
GSM Mode**

Temperature (°C)	Power Supplied (V <sub>DC</sub> )	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	F <sub>L</sub> Limit (MHz)	F <sub>H</sub> Limit (MHz)
-30	3.87	1850.035	1909.983	1850	1910
-20		1850.039	1909.992	1850	1910
-10		1850.035	1909.982	1850	1910
0		1850.038	1909.988	1850	1910
10		1850.039	1909.949	1850	1910
20		1850.042	1909.997	1850	1910
30		1850.017	1909.003	1850	1910
40		1850.018	1909.928	1850	1910
50		1850.075	1909.977	1850	1910
20		3.45	1850.087	1909.993	1850
	4.45	1850.013	1909.897	1850	1910

**WCDMA Mode**

Temperature (°C)	Power Supplied (V <sub>DC</sub> )	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	F <sub>L</sub> Limit (MHz)	F <sub>H</sub> Limit (MHz)
-30	3.87	1850.052	1909.984	1850	1910
-20		1850.041	1909.976	1850	1910
-10		1850.020	1910.000	1850	1910
0		1850.015	1909.980	1850	1910
10		1850.042	1909.945	1850	1910
20		1850.046	1909.979	1850	1910
30		1850.023	1909.996	1850	1910
40		1850.032	1909.932	1850	1910
50		1850.037	1909.990	1850	1910
20		3.45	1850.079	1909.973	1850
	4.45	1850.000	1909.920	1850	1910

**LTE:**

**QPSK:**

**Band 2**

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V <sub>DC</sub> )	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	F <sub>L</sub> Limit (MHz)	F <sub>H</sub> Limit (MHz)
-30	3.87	1850.026	1909.999	1850	1910
-20		1850.018	1909.998	1850	1910
-10		1850.026	1909.999	1850	1910
0		1850.027	1909.995	1850	1910
10		1850.008	1909.988	1850	1910
20		1850.003	1909.988	1850	1910
30		1850.011	1909.979	1850	1910
40		1850.013	1909.979	1850	1910
50		1850.023	1909.982	1850	1910
20		3.45	1850.013	1909.979	1850
	4.45	1850.015	1909.989	1850	1910

**Band 5**

10.0 MHz Middle Channel, f <sub>o</sub> =836.5MHz				
Temperature (°C)	Voltage Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.87	103.925	0.124	2.5
-20		109.638	0.131	2.5
-10		108.499	0.130	2.5
0		101.603	0.121	2.5
10		108.127	0.129	2.5
20		106.710	0.128	2.5
30		108.900	0.130	2.5
40		116.514	0.139	2.5
50		109.871	0.131	2.5
20		3.45	118.175	0.141
	4.45	113.948	0.136	2.5

**Band 7**

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V <sub>DC</sub> )	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	F <sub>L</sub> Limit (MHz)	F <sub>H</sub> Limit (MHz)
-30	3.87	2500.014	2569.991	2500	2570
-20		2500.017	2569.974	2500	2570
-10		2500.008	2569.979	2500	2570
0		2500.002	2569.979	2500	2570
10		2500.015	2569.992	2500	2570
20		2500.029	2569.978	2500	2570
30		2500.013	2569.977	2500	2570
40		2500.020	2569.986	2500	2570
50		2500.028	2569.999	2500	2570
20		3.45	2500.008	2569.975	2500
	4.45	2500.006	2569.992	2500	2570

**Band 12**

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V <sub>DC</sub> )	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	F <sub>L</sub> Limit (MHz)	F <sub>H</sub> Limit (MHz)
-30	3.87	699.013	715.996	699	716
-20		699.002	715.986	699	716
-10		699.024	715.981	699	716
0		699.019	715.987	699	716
10		699.003	715.998	699	716
20		699.008	715.988	699	716
30		699.005	715.977	699	716
40		699.017	715.978	699	716
50		699.017	715.994	699	716
20		3.45	699.017	715.991	699
	4.45	699.016	715.976	699	716

**Band 41**

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V <sub>DC</sub> )	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	F <sub>L</sub> Limit (MHz)	F <sub>H</sub> Limit (MHz)
-30	3.87	2535.014	2654.982	2535	2655
-20		2535.015	2654.983	2535	2655
-10		2535.008	2654.989	2535	2655
0		2535.006	2654.986	2535	2655
10		2535.018	2654.970	2535	2655
20		2535.015	2654.973	2535	2655
30		2535.028	2654.980	2535	2655
40		2535.019	2654.978	2535	2655
50		2535.026	2654.974	2535	2655
20		3.45	2535.015	2654.988	2535
	4.45	2535.009	2654.994	2535	2655

**16QAM:**

**Band 2**

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V <sub>DC</sub> )	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	F <sub>L</sub> Limit (MHz)	F <sub>H</sub> Limit (MHz)
-30	3.87	1850.029	1909.998	1850	1910
-20		1850.014	1909.111	1850	1910
-10		1850.029	1909.978	1850	1910
0		1850.005	1909.985	1850	1910
10		1850.013	1909.971	1850	1910
20		1850.016	1909.976	1850	1910
30		1850.026	1909.972	1850	1910
40		1850.021	1909.998	1850	1910
50		1850.017	1909.996	1850	1910
20	3.45	1850.020	1909.975	1850	1910
	4.45	1850.029	1909.991	1850	1910

**Band 5**

10.0 MHz Middle Channel, f <sub>0</sub> =836.5MHz				
Temperature (°C)	Voltage Supplied (V <sub>DC</sub> )	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.87	103.249	0.123	2.5
-20		114.319	0.137	2.5
-10		103.804	0.124	2.5
0		112.869	0.135	2.5
10		116.597	0.139	2.5
20		115.274	0.138	2.5
30		103.555	0.124	2.5
40		103.267	0.123	2.5
50		111.182	0.133	2.5
20	3.45	107.179	0.128	2.5
	4.45	103.72	0.124	2.5

**Band 7:**

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V <sub>DC</sub> )	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	F <sub>L</sub> Limit (MHz)	F <sub>H</sub> Limit (MHz)
-30	3.87	2500.013	2569.999	2500	2570
-20		2500.025	2569.971	2500	2570
-10		2500.024	2569.853	2500	2570
0		2500.012	2569.972	2500	2570
10		2500.027	2569.988	2500	2570
20		2500.015	2569.977	2500	2570
30		2500.016	2569.975	2500	2570
40		2500.003	2569.979	2500	2570
50		2500.017	2569.982	2500	2570
20		3.45	2500.009	2569.971	2500
	4.45	2500.015	2569.983	2500	2570

**Band 12:**

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V <sub>DC</sub> )	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	F <sub>L</sub> Limit (MHz)	F <sub>H</sub> Limit (MHz)
-30	3.87	699.007	715.987	699	716
-20		699.024	715.981	699	716
-10		699.017	715.992	699	716
0		699.030	715.998	699	716
10		699.019	715.971	699	716
20		699.018	715.992	699	716
30		699.002	715.990	699	716
40		699.011	715.984	699	716
50		699.003	715.972	699	716
20		3.45	699.025	715.998	699
	4.45	699.017	715.997	699	716

**Band 41:**

10 MHz Bandwidth					
Temperature (°C)	Power Supplied (V <sub>DC</sub> )	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	F <sub>L</sub> Limit (MHz)	F <sub>H</sub> Limit (MHz)
-30	3.87	2535.973	2654.973	2535	2655
-20		2535.988	2654.976	2535	2655
-10		2535.997	2654.974	2535	2655
0		2535.984	2654.989	2535	2655
10		2535.971	2654.977	2535	2655
20		2535.977	2654.977	2535	2655
30		2535.988	2654.976	2535	2655
40		2535.985	2654.972	2535	2655
50		2535.971	2654.998	2535	2655
20		3.45	2535.972	2654.975	2535
	4.45	2535.992	2654.990	2535	2655

### 3.4 Radiated Spurious emission Test Data

<b>Test Date:</b>	2023-12-20	<b>Test By:</b>	Luke Li
<b>Environment condition:</b>	Temperature: 23°C; Relative Humidity:55%; ATM Pressure: 101kPa		

Frequency (MHz)	Reading level (dBμV)	Polar (H/V)	Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	EIRP CF	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)	Remark
GSM 850									
Low Channel									
1648.4	61.48	Horizontal	-2.55	58.93	-95.2	-36.27	-13	-23.27	Peak
1648.4	60.25	Vertical	-2.55	57.7	-95.2	-37.5	-13	-24.5	Peak
2472.6	73.4	Horizontal	-1.76	71.64	-95.2	-23.56	-13	-10.56	Peak
2472.6	71.86	Vertical	-1.76	70.1	-95.2	-25.1	-13	-12.1	Peak
3296.8	56.86	Horizontal	-1.85	55.01	-95.2	-40.19	-13	-27.19	Peak
3296.8	57.77	Vertical	-1.85	55.92	-95.2	-39.28	-13	-26.28	Peak
Middle Channel									
1673.2	62.1	Horizontal	-2.46	59.64	-95.2	-35.56	-13	-22.56	Peak
1673.2	60.46	Vertical	-2.46	58	-95.2	-37.2	-13	-24.2	Peak
2509.8	74.48	Horizontal	-1.74	72.74	-95.2	-22.46	-13	-9.46	Peak
2509.8	72.69	Vertical	-1.74	70.95	-95.2	-24.25	-13	-11.25	Peak
3346.4	55.89	Horizontal	-1.8	54.09	-95.2	-41.11	-13	-28.11	Peak
3346.4	56.82	Vertical	-1.8	55.02	-95.2	-40.18	-13	-27.18	Peak
High Channel									
1697.6	62.69	Horizontal	-2.37	60.32	-95.2	-34.88	-13	-21.88	Peak
1697.6	61.37	Vertical	-2.37	59	-95.2	-36.2	-13	-23.2	Peak
2546.4	75.85	Horizontal	-1.77	74.08	-95.2	-21.12	-13	-8.12	Peak
2546.4	74.39	Vertical	-1.77	72.62	-95.2	-22.58	-13	-9.58	Peak
3395.2	56.29	Horizontal	-1.75	54.54	-95.2	-40.66	-13	-27.66	Peak
3395.2	57.15	Vertical	-1.75	55.4	-95.2	-39.8	-13	-26.8	Peak



Frequency (MHz)	Reading level (dB $\mu$ V)	Polar (H/V)	Corrected Factor (dB/m)	Corrected Amplitude (dB $\mu$ V/m)	EIRP CF	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)	Remark
PCS 1900									
Low Channel									
3700.4	57.77	Horizontal	-1.58	56.19	-95.2	-39.01	-13	-26.01	Peak
3700.4	57.1	Vertical	-1.58	55.52	-95.2	-39.68	-13	-26.68	Peak
5550.6	65.72	Horizontal	1.72	67.44	-95.2	-27.76	-13	-14.76	Peak
5550.6	67.06	Vertical	1.72	68.78	-95.2	-26.42	-13	-13.42	Peak
Middle Channel									
3760	59.41	Horizontal	-1.75	57.66	-95.2	-37.54	-13	-24.54	Peak
3760	58.76	Vertical	-1.75	57.01	-95.2	-38.19	-13	-25.19	Peak
5640	66.02	Horizontal	1.91	67.93	-95.2	-27.27	-13	-14.27	Peak
5640	66.44	Vertical	1.91	68.35	-95.2	-26.85	-13	-13.85	Peak
High Channel									
3819.6	62.98	Horizontal	-1.89	61.09	-95.2	-34.11	-13	-21.11	Peak
3819.6	60.48	Vertical	-1.89	58.59	-95.2	-36.61	-13	-23.61	Peak
5729.4	66.52	Horizontal	2.04	68.56	-95.2	-26.64	-13	-13.64	Peak
5729.4	67.86	Vertical	2.04	69.9	-95.2	-25.3	-13	-12.3	Peak

Frequency (MHz)	Reading level (dBμV)	Polar (H/V)	Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	EIRP CF	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)	Remark
WCDMA 1900									
Low Channel									
3704.8	57.85	Horizontal	-1.59	56.26	-95.2	-38.94	-13	-25.94	Peak
3704.8	57.03	Vertical	-1.59	55.44	-95.2	-39.76	-13	-26.76	Peak
5557.2	60.97	Horizontal	1.75	62.72	-95.2	-32.48	-13	-19.48	Peak
5557.2	62.01	Vertical	1.75	63.76	-95.2	-31.44	-13	-18.44	Peak
Middle Channel									
3760	59.5	Horizontal	-1.75	57.75	-95.2	-37.45	-13	-24.45	Peak
3760	58.77	Vertical	-1.75	57.02	-95.2	-38.18	-13	-25.18	Peak
5640	60.98	Horizontal	1.91	62.89	-95.2	-32.31	-13	-19.31	Peak
5640	62.23	Vertical	1.91	64.14	-95.2	-31.06	-13	-18.06	Peak
High Channel									
3815.2	61.03	Horizontal	-1.89	59.14	-95.2	-36.06	-13	-23.06	Peak
3815.2	60.61	Vertical	-1.89	58.72	-95.2	-36.48	-13	-23.48	Peak
5722.8	61.6	Horizontal	2.03	63.63	-95.2	-31.57	-13	-18.57	Peak
5722.8	62.62	Vertical	2.03	64.65	-95.2	-30.55	-13	-17.55	Peak

Frequency (MHz)	Reading level (dBμV)	Polar (H/V)	Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	EIRP CF	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)	Remark
WCDMA 850									
Low Channel									
1652.8	50.22	Horizontal	-2.52	47.7	-95.2	-47.5	-13	-34.5	Peak
1652.8	49.43	Vertical	-2.52	46.91	-95.2	-48.29	-13	-35.29	Peak
2479.2	55.65	Horizontal	-1.75	53.9	-95.2	-41.3	-13	-28.3	Peak
2479.2	54.97	Vertical	-1.75	53.22	-95.2	-41.98	-13	-28.98	Peak
3305.6	56.47	Horizontal	-1.84	54.63	-95.2	-40.57	-13	-27.57	Peak
3305.6	57.55	Vertical	-1.84	55.71	-95.2	-39.49	-13	-26.49	Peak
Middle Channel									
1673.2	51.05	Horizontal	-2.46	48.59	-95.2	-46.61	-13	-33.61	Peak
1673.2	50.18	Vertical	-2.46	47.72	-95.2	-47.48	-13	-34.48	Peak
2509.8	56.5	Horizontal	-1.75	54.75	-95.2	-40.45	-13	-27.45	Peak
2509.8	55.72	Vertical	-1.75	53.97	-95.2	-41.23	-13	-28.23	Peak
3346.4	56.33	Horizontal	-1.8	54.53	-95.2	-40.67	-13	-27.67	Peak
3346.4	57.34	Vertical	-1.8	55.54	-95.2	-39.66	-13	-26.66	Peak
High Channel									
1693.2	51.81	Horizontal	-2.39	49.42	-95.2	-45.78	-13	-32.78	Peak
1693.2	50.95	Vertical	-2.39	48.56	-95.2	-46.64	-13	-33.64	Peak
2539.8	57.42	Horizontal	-1.76	55.66	-95.2	-39.54	-13	-26.54	Peak
2539.8	56.79	Vertical	-1.76	55.03	-95.2	-40.17	-13	-27.17	Peak
3386.4	56.78	Horizontal	-1.75	55.03	-95.2	-40.17	-13	-27.17	Peak
3386.4	57.65	Vertical	-1.75	55.9	-95.2	-39.3	-13	-26.3	Peak

Frequency (MHz)	Reading level (dBμV)	Polar (H/V)	Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	EIRP CF	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)	Remark
LTE Band 2									
Low Channel									
3701.4	57.01	Horizontal	-1.58	55.43	-95.2	-39.77	-13	-26.77	Peak
3701.4	56.38	Vertical	-1.58	54.8	-95.2	-40.4	-13	-27.4	Peak
5552.1	58.41	Horizontal	1.72	60.13	-95.2	-35.07	-13	-22.07	Peak
5552.1	59.24	Vertical	1.72	60.96	-95.2	-34.24	-13	-21.24	Peak
Middle Channel									
3760	58.64	Horizontal	-1.75	56.89	-95.2	-38.31	-13	-25.31	Peak
3760	58.13	Vertical	-1.75	56.38	-95.2	-38.82	-13	-25.82	Peak
5640	58.39	Horizontal	1.91	60.3	-95.2	-34.9	-13	-21.9	Peak
5640	59.02	Vertical	1.91	60.93	-95.2	-34.27	-13	-21.27	Peak
High Channel									
3818.6	60.56	Horizontal	-1.9	58.66	-95.2	-36.54	-13	-23.54	Peak
3818.6	59.6	Vertical	-1.9	57.7	-95.2	-37.5	-13	-24.5	Peak
5727.9	59.36	Horizontal	2.04	61.4	-95.2	-33.8	-13	-20.8	Peak
5727.9	60.09	Vertical	2.04	62.13	-95.2	-33.07	-13	-20.07	Peak

Frequency (MHz)	Reading level (dB $\mu$ V)	Polar (H/V)	Corrected Factor (dB/m)	Corrected Amplitude (dB $\mu$ V/m)	EIRP CF	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)	Remark
LTE B5									
Low Channel									
1649.4	49.33	Horizontal	-2.54	46.79	-95.2	-48.41	-13	-35.41	Peak
1649.4	49.9	Vertical	-2.54	47.36	-95.2	-47.84	-13	-34.84	Peak
2474.1	55.74	Horizontal	-1.77	53.97	-95.2	-41.23	-13	-28.23	Peak
2474.1	54.94	Vertical	-1.77	53.17	-95.2	-42.03	-13	-29.03	Peak
3298.8	56.75	Horizontal	-1.85	54.9	-95.2	-40.3	-13	-27.3	Peak
3298.8	57.51	Vertical	-1.85	55.66	-95.2	-39.54	-13	-26.54	Peak
Middle Channel									
1673	49.75	Horizontal	-2.46	47.29	-95.2	-47.91	-13	-34.91	Peak
1673	50.36	Vertical	-2.46	47.9	-95.2	-47.3	-13	-34.3	Peak
2509.5	56.43	Horizontal	-1.75	54.68	-95.2	-40.52	-13	-27.52	Peak
2509.5	55.61	Vertical	-1.75	53.86	-95.2	-41.34	-13	-28.34	Peak
3346	55.61	Horizontal	-1.8	53.81	-95.2	-41.39	-13	-28.39	Peak
3346	56.32	Vertical	-1.8	54.52	-95.2	-40.68	-13	-27.68	Peak
High Channel									
1696.6	50.53	Horizontal	-2.39	48.14	-95.2	-47.06	-13	-34.06	Peak
1696.6	51.14	Vertical	-2.39	48.75	-95.2	-46.45	-13	-33.45	Peak
2544.9	57.95	Horizontal	-1.76	56.19	-95.2	-39.01	-13	-26.01	Peak
2544.9	57.11	Vertical	-1.76	55.35	-95.2	-39.85	-13	-26.85	Peak
3393.2	56.69	Horizontal	-1.75	54.94	-95.2	-40.26	-13	-27.26	Peak
3393.2	57.24	Vertical	-1.75	55.49	-95.2	-39.71	-13	-26.71	Peak

Frequency (MHz)	Reading level (dB $\mu$ V)	Polar (H/V)	Corrected Factor (dB/m)	Corrected Amplitude (dB $\mu$ V/m)	EIRP CF	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)	Remark
LTE Band 7									
Low Channel									
5005	57.96	Horizontal	1.22	59.18	-95.2	-36.02	-25	-11.02	Peak
5005	58.78	Vertical	1.22	60	-95.2	-35.2	-25	-10.2	Peak
7507.5	57.09	Horizontal	3.23	60.32	-95.2	-34.88	-25	-9.88	Peak
7507.5	57.01	Vertical	3.23	60.24	-95.2	-34.96	-25	-9.96	Peak
Middle Channel									
5070	58.06	Horizontal	1.37	59.43	-95.2	-35.77	-25	-10.77	Peak
5070	58.87	Vertical	1.37	60.24	-95.2	-34.96	-25	-9.96	Peak
7605	57.53	Horizontal	3.31	60.84	-95.2	-34.36	-25	-9.36	Peak
7605	57.29	Vertical	3.31	60.6	-95.2	-34.6	-25	-9.6	Peak
High Channel									
5135	58.45	Horizontal	1.53	59.98	-95.2	-35.22	-25	-10.22	Peak
5135	59.24	Vertical	1.53	60.77	-95.2	-34.43	-25	-9.43	Peak
7702.5	58.09	Horizontal	3.8	61.89	-95.2	-33.31	-25	-8.31	Peak
7702.5	58.09	Vertical	3.8	61.89	-95.2	-33.31	-25	-8.31	Peak

Frequency (MHz)	Reading level (dB $\mu$ V)	Polar (H/V)	Corrected Factor (dB/m)	Corrected Amplitude (dB $\mu$ V/m)	EIRP CF	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)	Remark
LTE B12									
Low Channel									
1399.4	53.11	Horizontal	-3.95	49.16	-95.2	-46.04	-13	-33.04	Peak
1399.4	52.39	Vertical	-3.95	48.44	-95.2	-46.76	-13	-33.76	Peak
2099.1	52.9	Horizontal	-2.76	50.14	-95.2	-45.06	-13	-32.06	Peak
2099.1	53.44	Vertical	-2.76	50.68	-95.2	-44.52	-13	-31.52	Peak
2798.8	51.82	Horizontal	-1.39	50.43	-95.2	-44.77	-13	-31.77	Peak
2798.8	52.52	Vertical	-1.39	51.13	-95.2	-44.07	-13	-31.07	Peak
Middle Channel									
1415	53.45	Horizontal	-3.86	49.59	-95.2	-45.61	-13	-32.61	Peak
1415	52.52	Vertical	-3.86	48.66	-95.2	-46.54	-13	-33.54	Peak
2122.5	52.42	Horizontal	-2.69	49.73	-95.2	-45.47	-13	-32.47	Peak
2122.5	53.13	Vertical	-2.69	50.44	-95.2	-44.76	-13	-31.76	Peak
2830	52.48	Horizontal	-1.43	51.05	-95.2	-44.15	-13	-31.15	Peak
2830	53.16	Vertical	-1.43	51.73	-95.2	-43.47	-13	-30.47	Peak
High Channel									
1430.6	54.66	Horizontal	-3.78	50.88	-95.2	-44.32	-13	-31.32	Peak
1430.6	53.83	Vertical	-3.78	50.05	-95.2	-45.15	-13	-32.15	Peak
2145.9	53.82	Horizontal	-2.62	51.2	-95.2	-44	-13	-31	Peak
2145.9	54.65	Vertical	-2.62	52.03	-95.2	-43.17	-13	-30.17	Peak
2861.2	54.53	Horizontal	-1.5	53.03	-95.2	-42.17	-13	-29.17	Peak
2861.2	55.16	Vertical	-1.5	53.66	-95.2	-41.54	-13	-28.54	Peak

Frequency (MHz)	Reading level (dBμV)	Polar (H/V)	Corrected Factor (dB/m)	Corrected Amplitude (dBμV/m)	EIRP CF	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)	Remark
LTE Band 41									
Low Channel									
5075	60.56	Horizontal	1.37	61.93	-95.2	-33.27	-25	-8.27	Peak
5075	61.73	Vertical	1.37	63.1	-95.2	-32.1	-25	-7.1	Peak
7612.5	57.35	Horizontal	3.31	60.66	-95.2	-34.54	-25	-9.54	Peak
7612.5	56.08	Vertical	3.31	59.39	-95.2	-35.81	-25	-10.81	Peak
Middle Channel									
5190	60.11	Horizontal	1.67	61.78	-95.2	-33.42	-25	-8.42	Peak
5190	61.41	Vertical	1.67	63.08	-95.2	-32.12	-25	-7.12	Peak
7785	57.24	Horizontal	3.81	61.05	-95.2	-34.15	-25	-9.15	Peak
7785	56.18	Vertical	3.81	59.99	-95.2	-35.21	-25	-10.21	Peak
High Channel									
5305	61.77	Horizontal	1.45	63.22	-95.2	-31.98	-25	-6.98	Peak
5305	63.18	Vertical	1.45	64.63	-95.2	-30.57	-25	-5.57	Peak
7957.5	58.9	Horizontal	4.05	62.95	-95.2	-32.25	-25	-7.25	Peak
7957.5	57.87	Vertical	4.05	61.92	-95.2	-33.28	-25	-8.28	Peak

Remark:

Corrected Amplitude= Reading level + corrected Factor

Corrected Factor = Antenna factor + Cable loss – Amplifier gain

Margin = Corrected Reading – Limit

According to ANSI C63.26-2.15 section 5.2.7:

$EIRP (dBm) = E (dB\mu V/m) + 20\log(D) - 104.8$ ; where D is the measurement distance (in the far field region) in m.

Test was performed on 3meters distance, so

Corrected Reading = Corrected Amplitude +  $20\log(3) - 104.8$

= Corrected Amplitude - 95.2

The emission levels of other frequencies that were lower than the limit 20dB, not show in test report.



## 4 Test Setup Photo

Please refer to the attachment RWAY202300051E Test Setup photo.

## 5 E.U.T Photo

Please refer to the attachment RWAY202300051 External photo and RWAY202300051 Internal photo.

**---End of Report---**