

FCC Test Report

Report No.: RWAY202300045E

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: PG2309GBA

Multiple Models: N/A

Trade Mark: UMIDIGI

FCC ID: 2ATZ4-G65GA

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

Test Date: 2023-11-29~2024-02-28

Test Result: Complied

Issue Date: 2024-03-11

Reviewed by:

Frank Yin

Approved by

Jacob Kong

Frank Yin

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Revision History

Version No.	Issued Date	Description
00	2024-03-11	Original

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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, NFC, GSM/GPRS/EGPRS/WCDMA/LTE and 5G NR radios, this report covers the full testing of the GSM/GPRS/EGPRS/WCDMA/LTE radios.

Sample Serial number	2W-1 for CE&RE test, 2W-2 for RF test conducted test (assigned by WATC)				
Sample Received Date	2023-11-15				
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	34.44	-4.02
Antenna Gain	PCS1900	1850-1910	1920-1980	31.38	1.15
	WCDMA B2	1850-1910	1920-1980	23.30	1.15
	WCDMA B5	824-849	869-894	23.08	-4.02
	LTE B2	1850-1910	1920-1980	23.21	1.15
	LTE B5	824-849	869-894	23.03	-4.02
	LTE B12	699-716	729-746	23.05	-4.55
	LTE B13	777-787	746-756	22.81	-3.69
	LTE B41	2496-2690	2496-2690	24.70	0.47
Modulation Technology	GMSK, 8PSK, BPSK, QPSK, 16QAM, 64QAM				
Power Supply	DC5V from adapter or DC3.87 V from battery				
Adapter 1 Information	Model: HJ-0502000W2-US Input: AC 100-240V~50/60Hz, 0.3A Output: DC 5V, 2A				
Adapter 2 Information	Model: HF-0502000U Input: AC 100-240V~50/60Hz, 0.3A Output: DC 5.0V, 2A				
Modification	Sample No Modification by the test lab				

1.3 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%

Note 1: 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.

Note 2: 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.)

1.4 Related Submittal(s)/Grant(s)

FCC Part 15, Subpart C, Equipment Class: DTS, FCC ID: 2ATZ4-G65GA
 FCC Part 15, Subpart C, Equipment Class: DXX, FCC ID: 2ATZ4-G65GA
 FCC Part 15, Subpart C, Equipment Class: DSS, FCC ID: 2ATZ4-G65GA
 FCC Part 15, Subpart E, Equipment Class: NII, FCC ID: 2ATZ4-G65GA

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

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 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 B13	5	779.5	782	784.5
	10	/	782	/
LTE B41	5	2498.5	2593	2687.5
	10	2501	2593	2685
	15	2503.5	2593	2682.5
	20	2506	2593	2680

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.

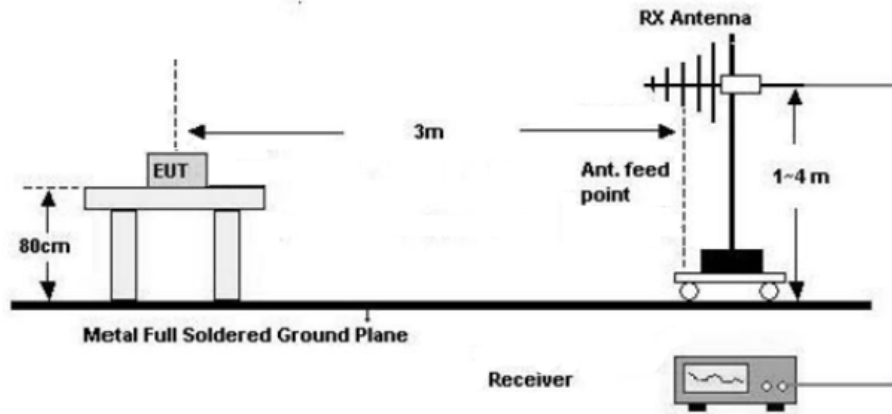
2.3 Test Auxiliary Equipment

Manufacturer	Description	Model	Serial Number
/	/	/	/

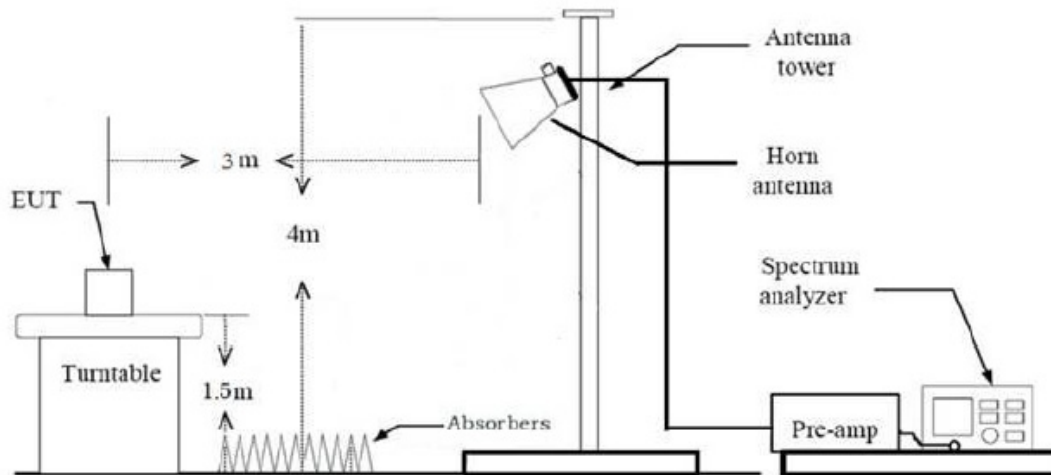
2.4 Test Setup

1) Radiated emission measurement:

30MHz-1GHz (3m SAC)

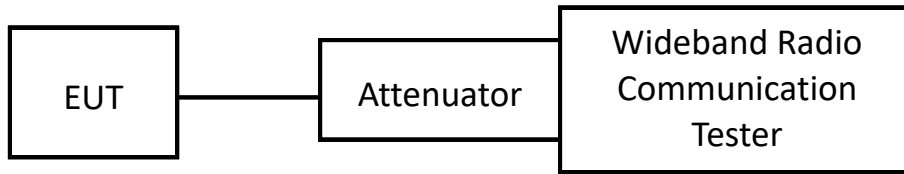


Above 1GHz (3m FAC)

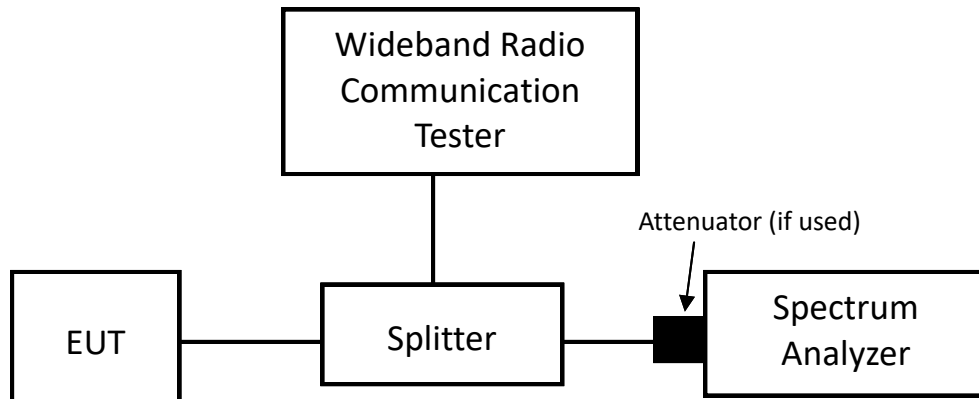


2) RF Conducted Test

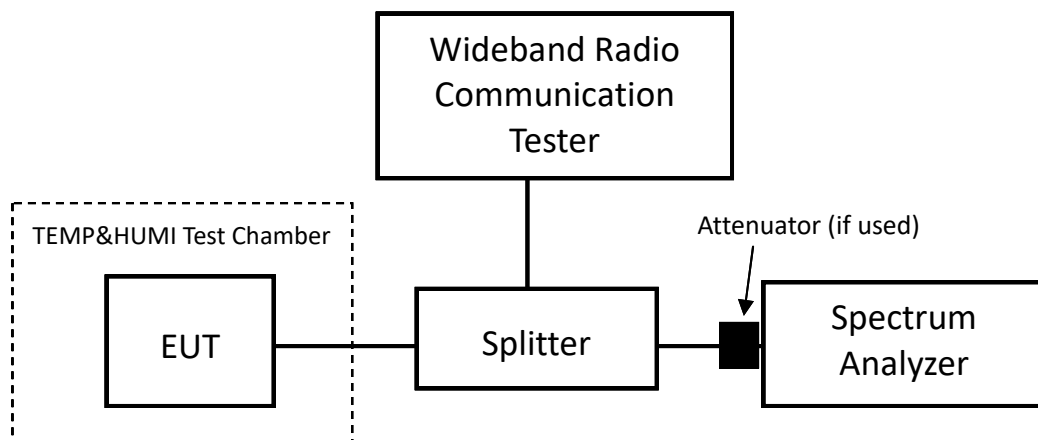
For RF Output Power test



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 of 10 or 10.5dB (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 a 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
AC Line Conducted Emission Test					
ROHDE& SCHWARZ	EMI TEST RECEIVER	ESR	101817	2023/7/3	2024/7/2
R&S	LISN	ENV216	101748	2023/8/1	2024/7/30
N/A	Coaxial Cable	NO.12	N/A	2023/7/3	2024/7/2
Farad	Test Software	EZ-EMC	Ver. EMEC-3A1	/	/
Radiated Emission Test					
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	/	/
RF Conducted Test					
R&S	Spectrum Analyzer	FSV40-N	101608	2023/7/3	2024/7/2
R&S	Sepctrum Analyzer	FSU	200982	2023/10/25	2024/10/24
zhuoxiang	Coaxial Cable	SMA-178	211002	Each time	N/A
Mini-Circuits	Power Splitter	ZFRSC-183-S+	S F448201619	Each time	N/A
R&S	Wideband Radio Communication Tester	CMW500	143458	2023/3/31	2024/3/30
BACL	TEMP&HUMI Test Chamber	BTH-150-40	30174	2023/3/31	2024/3/30
UNI-T	Multimeter	UT39A+	C210582554	2023/9/28	2024/9/27
ZHAOXIN	DC Power Supply	RXN-6010D	21R6010D091 2386	N/A	N/A

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	FCC §22.913: (a)(5) The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7watts. (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: (1) A Commission-approved average power technique (see FCC Laboratory's Knowledge Database); or (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.																																
Unwanted Emissions (Out of band emission and spurious)	FCC §22.917: (a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. (b) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a reference bandwidth as follows: (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. (2) In the spectrum above 1 GHz, instrumentation should employ a reference bandwidth of 1 MHz																																
Frequency stability	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><caption>Table C-1—Frequency Tolerance for Transmitters in the Public Mobile Services</caption><tr><th>Frequency range (MHz)</th><th>Base, fixed (ppm)</th><th>Mobile >3 watts (ppm)</th><th>Mobile ≤3 watts (ppm)</th></tr><tr><td>25 to 50</td><td>20.0</td><td>20.0</td><td>50.0</td></tr><tr><td>50 to 450</td><td>5.0</td><td>5.0</td><td>50.0</td></tr><tr><td>450 to 512</td><td>2.5</td><td>5.0</td><td>5.0</td></tr><tr><td>821 to 896</td><td>1.5</td><td>2.5</td><td>2.5</td></tr><tr><td>928 to 929</td><td>5.0</td><td>n/a</td><td>n/a</td></tr><tr><td>929 to 960</td><td>1.5</td><td>n/a</td><td>n/a</td></tr><tr><td>2110 to 2220</td><td>10.0</td><td>n/a</td><td>n/a</td></tr></table>	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	FCC §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. (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.
Unwanted Emissions (Out of band emission and spurious)	FCC §24.238: The rules in this section govern the spectral characteristics of emissions in the Broadband Personal Communications Service. (a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. (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. (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. (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.
Frequency stability	FCC §24.235: The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test items	Limit
RF Output Power	FCC §27.50: (a)(3) Mobile and portable stations. (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. (ii) Mobile and portable stations are not permitted to transmit in the 2315-2320 MHz and 2345-2350 MHz bands. (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. (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. (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. (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. (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. (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.

Unwanted Emissions (Out of band emission and spurious)	FCC §27.53: (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: (4) For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands: (i) By a factor of not less than: $43 + 10 \log (P)$ 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 $55 + 10 \log (P)$ dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than $61 + 10 \log (P)$ dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than $67 + 10 \log (P)$ dB on all frequencies between 2328 and 2337 MHz; (ii) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2300 and 2305 MHz, $55 + 10 \log (P)$ dB on all frequencies between 2296 and 2300 MHz, $61 + 10 \log (P)$ dB on all frequencies between 2292 and 2296 MHz, $67 + 10 \log (P)$ dB on all frequencies between 2288 and 2292 MHz, and $70 + 10 \log (P)$ dB below 2288 MHz; (iii) By a factor of not less than $43 + 10 \log (P)$ dB on all frequencies between 2360 and 2365 MHz, and not less than $70 + 10 \log (P)$ dB above 2365 MHz. (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.
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	(f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation. (g) For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed. (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 $43 + 10 \log_{10} (P)$ dB. (m)(4) For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.
Frequency stability	FCC §27.54: The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

3.3 RF Conducted Test Data

Test Date:	2023.11.29~2024.02.28	Test By:	Ryan Zhang
Environment condition:	Temperature: 24.5~25°C; Relative Humidity: 48~49%; ATM Pressure: 101kPa		

3.3.1 RF Output Power&ERP/EIRP

Cellular Band

Test Mode	Conducted Peak Output Power(dBm)			Maximum ERP (dBm)	ERP Limit (dBm)
	Lowest Channel	Middle Channel	Highest Channel		
GSM	34.2	34.33	34.44	27.77	38.45
GPRS 1 Slot	34.13	34.29	33.85	27.62	38.45
GPRS 2 Slots	33.64	33.75	33.81	27.14	38.45
GPRS 3 Slots	30.52	30.34	30.1	23.85	38.45
GPRS 4 Slots	28.97	28.76	28.49	22.3	38.45
EDGE 1 Slot	27.02	26.99	26.86	20.35	38.45
EDGE 2 Slots	25.93	25.92	25.76	19.26	38.45
EDGE 3 Slots	24	23.93	23.88	17.33	38.45
EDGE 4 Slots	23	22.9	22.77	16.33	38.45

Test Mode	Conducted Average Output Power(dBm)			Maximum ERP (dBm)	ERP Limit (dBm)
	Lowest Channel	Middle Channel	Highest Channel		
WCDMA R99	23.03	23.08	23.02	16.41	38.45
HSDPA Subtest 1	20.45	20.28	20.42	13.78	38.45
HSDPA Subtest 2	20.49	20.36	20.47	13.82	38.45
HSDPA Subtest 3	20.55	20.42	20.54	13.88	38.45
HSDPA Subtest 4	20.57	20.48	20.61	13.94	38.45
HSUPA Subtest 1	20.21	20.26	20.08	13.59	38.45
HSUPA Subtest 2	20.25	20.3	20.13	13.63	38.45
HSUPA Subtest 3	20.32	20.37	20.16	13.7	38.45
HSUPA Subtest 4	20.38	20.45	20.23	13.78	38.45
HSUPA Subtest 5	20.42	20.49	20.27	13.82	38.45
HSPA+ Subtest 1	20.48	20.52	20.29	13.85	38.45

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

For GSM850 / WCDMA Band5: Antenna Gain = -4.02dBi = -6.17dBd (0dBd=2.15dBi)

Cable Loss=0.5dB[#] (provided by the applicant)

PCS Band

Test Mode	Conducted Peak Output Power(dBm)			Maximum EIRP (dBm)	EIRP Limit (dBm)
	Lowest Channel	Middle Channel	Highest Channel		
GSM	31.38	31.1	31.07	32.53	33
GPRS 1 Slot	30.6	30.77	30.93	32.08	33
GPRS 2 Slots	30.78	30.67	30.5	31.93	33
GPRS 3 Slots	26.66	26.79	26.1	27.94	33
GPRS 4 Slots	25	25.13	25.01	26.28	33
EDGE 1 Slot	25.65	25.52	25.2	26.8	33
EDGE 2 Slots	24.59	24.48	24.22	25.74	33
EDGE 3 Slots	22.59	22.53	22.2	23.74	33
EDGE 4 Slots	21.6	21.48	21.23	22.75	33

Test Mode	Conducted Average Output Power(dBm)			Maximum EIRP (dBm)	EIRP Limit (dBm)
	Lowest Channel	Middle Channel	Highest Channel		
WCDMA R99	23.3	23.12	22.8	24.45	33
HSDPA Subtest 1	20.87	20.28	20.09	22.02	33
HSDPA Subtest 2	20.9	20.33	20.12	22.05	33
HSDPA Subtest 3	20.92	20.41	20.18	22.07	33
HSDPA Subtest 4	21	20.43	20.21	22.15	33
HSUPA Subtest 1	20.51	20.27	19.89	21.66	33
HSUPA Subtest 2	20.55	20.34	19.91	21.7	33
HSUPA Subtest 3	20.63	20.36	19.99	21.78	33
HSUPA Subtest 4	20.69	20.41	20.05	21.84	33
HSUPA Subtest 5	20.76	20.45	20.12	21.91	33
HSPA+ Subtest 1	20.78	20.49	20.18	21.93	33

Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi)

For PCS1900 / WCDMA Band2: Antenna Gain = 1.15dBi

LTE Band 2

Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum EIRP(dBm)	EIRP Limit(dBm)
		Lowest Channel	Middle Channel	Highest Channel		
1.4MHz QPSK	RB1#0	23.06	22.99	22.72	24.29	33
	RB1#3	23.05	22.97	22.68		
	RB1#5	23.06	22.98	22.71		
	RB3#0	23.12	22.97	22.75		
	RB3#3	23.14	22.96	22.71		
	RB6#0	22.07	22	21.75		
1.4MHz 16QAM	RB1#0	22.13	22.04	21.9	23.35	33
	RB1#3	22.13	22.06	21.88		
	RB1#5	22.14	22.03	21.89		
	RB3#0	22.13	22.16	21.76		
	RB3#3	22.13	22.2	21.72		
	RB6#0	21.12	21.12	20.9		
3MHz QPSK	RB1#0	23.02	23.03	22.75	24.18	33
	RB1#8	22.94	22.94	22.65		
	RB1#14	23.01	23.01	22.68		
	RB6#0	22.04	22	21.82		
	RB6#9	22.05	22	21.76		
	RB15#0	22.09	21.97	21.78		
3MHz 16QAM	RB1#0	22.19	22.6	21.97	23.75	33
	RB1#8	22.08	22.49	21.84		
	RB1#14	22.15	22.52	21.92		
	RB6#0	21.13	21.17	20.92		
	RB6#9	21.12	21.11	20.89		
	RB15#0	21.23	21.13	20.83		
5MHz QPSK	RB1#0	23.18	23.13	22.94	24.33	33
	RB1#13	23.11	23.08	22.85		
	RB1#24	23.16	23.07	22.83		
	RB15#0	22.19	22.04	21.85		
	RB15#10	22.17	22.03	21.8		
	RB25#0	22.15	22.03	21.86		
5MHz 16QAM	RB1#0	22.2	22	22.23	23.38	33
	RB1#13	22.16	21.95	22.08		
	RB1#24	22.18	21.95	22.03		
	RB15#0	21.26	21.18	20.93		
	RB15#10	21.26	21.14	20.9		
	RB25#0	21.23	21.15	20.94		
10MHz QPSK	RB1#0	23.16	23.13	22.92	24.31	33
	RB1#25	23.11	23.06	22.92		
	RB1#49	23.09	23.02	22.79		

	RB25#0	22.16	22.06	21.9		
	RB25#25	22.14	22.08	21.9		
	RB50#0	22.17	22.09	21.95		
10MHz 16QAM	RB1#0	22.65	22.34	21.95	23.81	33
	RB1#25	22.66	22.27	21.95		
	RB1#49	22.61	22.3	21.92		
	RB25#0	21.24	21.15	21.07		
	RB25#25	21.21	21.13	21.04		
	RB50#0	21.19	21.11	21		
15MHz QPSK	RB1#0	23.16	23.15	23	24.31	33
	RB1#38	23.07	23.07	22.87		
	RB1#74	23.07	22.97	22.9		
	RB36#0	22.14	22.08	21.92		
	RB36#39	22.08	22.04	21.88		
	RB75#0	22.11	22.05	21.92		
15MHz 16QAM	RB1#0	22.44	22.59	22.51	23.74	33
	RB1#38	22.33	22.48	22.47		
	RB1#74	22.31	22.31	22.31		
	RB36#0	21.2	21.09	20.99		
	RB36#39	21.13	21.05	20.93		
	RB75#0	21.18	21.08	20.99		
20MHz QPSK	RB1#0	23.15	23.21	22.97	24.36	33
	RB1#50	23.11	23.08	22.94		
	RB1#99	23.08	22.98	22.79		
	RB50#0	22.19	22.11	22.03		
	RB50#50	22.12	22.03	21.98		
	RB100#0	22.14	22.09	21.97		
20MHz 16QAM	RB1#0	22.83	22.53	22.27	23.98	33
	RB1#50	22.75	22.44	22.2		
	RB1#99	22.74	22.21	22.05		
	RB50#0	21.22	21.12	21.07		
	RB50#50	21.14	21.05	21		
	RB100#0	21.21	21.13	21.08		
Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi)						
For LTE Band2: Antenna Gain = 1.15dBi						

LTE Band 5

Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum ERP (dBm)	ERP Limit (dBm)
		Lowest Channel	Middle Channel	Highest Channel		
1.4MHz QPSK	RB1#0	22.79	22.91	22.82	16.25	38.45
	RB1#3	22.74	22.87	22.77		
	RB1#5	22.78	22.92	22.82		
	RB3#0	22.77	22.89	22.86		
	RB3#3	22.75	22.88	22.86		
	RB6#0	21.78	21.88	21.85		
1.4MHz 16QAM	RB1#0	21.79	22.03	21.84	15.36	38.45
	RB1#3	21.76	21.98	21.8		
	RB1#5	21.78	22.02	21.84		
	RB3#0	21.95	21.86	21.88		
	RB3#3	21.98	21.89	21.89		
	RB6#0	20.82	20.94	20.78		
3MHz QPSK	RB1#0	22.78	22.88	22.79	16.21	38.45
	RB1#8	22.74	22.81	22.84		
	RB1#14	22.75	22.81	22.8		
	RB6#0	21.81	21.9	21.94		
	RB6#9	21.8	21.85	21.82		
	RB15#0	21.8	21.86	21.84		
3MHz 16QAM	RB1#0	21.83	22.48	21.97	15.81	38.45
	RB1#8	21.77	22.47	21.97		
	RB1#14	21.79	22.46	21.94		
	RB6#0	20.77	20.98	20.95		
	RB6#9	20.74	20.94	20.85		
	RB15#0	20.84	20.97	20.78		
5MHz QPSK	RB1#0	22.85	23.03	22.92	16.36	38.45
	RB1#13	22.79	22.96	22.92		
	RB1#24	22.82	22.95	22.92		
	RB15#0	21.88	21.97	21.91		
	RB15#10	21.85	21.91	21.82		
	RB25#0	21.84	21.94	21.91		
5MHz 16QAM	RB1#0	21.95	21.89	22.23	15.56	38.45
	RB1#13	21.9	21.87	22.23		
	RB1#24	21.87	21.89	22.22		
	RB15#0	20.9	21.02	20.97		
	RB15#10	20.9	20.93	20.85		
	RB25#0	20.88	21	20.89		
10MHz QPSK	RB1#0	22.91	22.85	22.92	16.3	38.45
	RB1#25	22.81	22.97	22.9		
	RB1#49	22.85	22.93	22.86		
	RB25#0	21.87	21.97	21.89		
	RB25#25	21.86	21.92	21.85		

	RB50#0	21.88	21.93	21.85		
10MHz 16QAM	RB1#0	22.05	21.91	22.6	15.93	38.45
	RB1#25	22	21.99	22.5		
	RB1#49	22.03	21.93	22.48		
	RB25#0	20.91	21.08	20.93		
	RB25#25	20.89	21	20.88		
	RB50#0	20.86	20.96	20.87		
Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBd) - Cable loss(dB) For LTE Band5: Antenna Gain = -4.02dBi = -6.17dBd (0dBd=2.15dBi) Cable Loss=0.5dB [#] (provided by the applicant)						

LTE Band 12

Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum ERP (dBm)	ERP Limit (dBm)
		Lowest Channel	Middle Channel	Highest Channel		
1.4MHz QPSK	RB1#0	22.93	22.91	22.87	15.8	34.77
	RB1#3	22.9	22.87	22.81		
	RB1#5	22.91	22.9	22.86		
	RB3#0	23	22.88	22.88		
	RB3#3	22.99	22.88	22.84		
	RB6#0	21.96	21.9	21.88		
1.4MHz 16QAM	RB1#0	21.97	21.92	21.99	14.9	34.77
	RB1#3	21.95	21.91	21.95		
	RB1#5	21.98	21.94	21.98		
	RB3#0	22.02	22.08	21.87		
	RB3#3	22.01	22.1	21.85		
	RB6#0	20.93	20.94	20.9		
3MHz QPSK	RB1#0	22.95	22.94	22.85	15.75	34.77
	RB1#8	22.89	22.88	22.83		
	RB1#14	22.9	22.87	22.81		
	RB6#0	21.96	21.96	21.92		
	RB6#9	22	21.89	21.83		
	RB15#0	21.97	21.9	21.82		
3MHz 16QAM	RB1#0	22.03	22.54	22.02	15.34	34.77
	RB1#8	21.96	22.48	21.96		
	RB1#14	21.95	22.44	21.95		
	RB6#0	20.92	21.04	20.9		
	RB6#9	20.94	20.96	20.85		
	RB15#0	21.03	20.99	20.79		
5MHz QPSK	RB1#0	23.05	22.98	22.95	15.85	34.77
	RB1#13	23.01	23	22.91		
	RB1#24	22.97	23.04	22.95		
	RB15#0	22	22.05	21.94		
	RB15#10	22.01	21.96	21.88		
	RB25#0	22	22.01	21.92		
5MHz 16QAM	RB1#0	22.13	21.88	22.25	15.05	34.77
	RB1#13	22.03	21.91	22.22		
	RB1#24	22.04	21.91	22.2		
	RB15#0	21.05	21.09	20.96		
	RB15#10	21.06	21	20.89		
	RB25#0	21.04	21.04	20.92		
10MHz QPSK	RB1#0	23.05	22.97	22.99	15.85	34.77
	RB1#25	22.94	22.98	22.92		
	RB1#49	22.97	22.93	22.89		
	RB25#0	21.99	22.05	21.97		
	RB25#25	21.92	21.97	21.93		

	RB50#0	21.98	22.04	21.95		
10MHz 16QAM	RB1#0	22.07	22.16	22.03	14.96	34.77
	RB1#25	21.99	22.15	21.94		
	RB1#49	22	22.1	21.93		
	RB25#0	21.04	21.06	21.04		
	RB25#25	21.04	21.02	21.01		
	RB50#0	20.98	21	20.96		
Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBd) - Cable loss(dB) For LTE Band12: Antenna Gain = -4.55dBi = -6.7dBd (0dBd=2.15dBi) Cable Loss=0.5dB [#] (provided by the applicant)						

LTE Band 13

Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum ERP (dBm)	ERP Limit (dBm)
		Lowest Channel	Middle Channel	Highest Channel		
5MHz QPSK	RB1#0	22.75	22.75	22.77	16.47	34.77
	RB1#13	22.65	22.78	22.79		
	RB1#24	22.71	22.81	22.75		
	RB15#0	21.68	21.71	21.77		
	RB15#10	21.7	21.69	21.75		
	RB25#0	21.67	21.7	21.77		
5MHz 16QAM	RB1#0	21.77	21.6	22.08	15.74	34.77
	RB1#13	21.68	21.63	22.06		
	RB1#24	21.77	21.69	22.02		
	RB15#0	20.85	20.96	20.92		
	RB15#10	20.89	20.89	20.87		
	RB25#0	20.84	20.91	20.91		
10MHz QPSK	RB1#0	/	22.72	/	16.41	34.77
	RB1#25	/	22.75	/		
	RB1#49	/	22.72	/		
	RB25#0	/	21.65	/		
	RB25#25	/	21.72	/		
	RB50#0	/	21.66	/		
10MHz 16QAM	RB1#0	/	21.76	/	15.46	34.77
	RB1#25	/	21.8	/		
	RB1#49	/	21.76	/		
	RB25#0	/	20.88	/		
	RB25#25	/	20.93	/		
	RB50#0	/	20.82	/		
Note: ERP(dBm) = Conducted Power(dBm) + Antenna Gain(dBd) - Cable loss(dB) For LTE Band12: Antenna Gain = -3.69dBi = -5.84dBd (0dBd=2.15dBi) Cable Loss=0.5dB [#] (provided by the applicant)						

LTE Band 41:

Test Bandwidth & Modulation	Resource Block & RB offset	Conducted Average Output Power(dBm)			Maximum EIRP (dBm)	EIRP Limit (dBm)
		Lowest Channel	Middle Channel	Highest Channel		
5MHz QPSK	RB1#0	24.41	23.51	24.25	24.08	33
	RB1#13	24.33	23.49	24.25		
	RB1#24	24.35	23.53	24.28		
	RB15#0	24.24	23.53	24.35		
	RB15#10	24.18	23.5	24.29		
	RB25#0	24.23	23.54	24.31		
5MHz 16QAM	RB1#0	24.22	23.63	24.38	24.09	33
	RB1#13	24.14	23.58	24.41		
	RB1#24	24.12	23.53	24.42		
	RB15#0	24.17	23.6	24.33		
	RB15#10	24.15	23.55	24.31		
	RB25#0	24.26	23.59	24.31		
10MHz QPSK	RB1#0	24.21	23.58	24.15	23.89	33
	RB1#25	24.11	23.56	24.12		
	RB1#49	24.06	23.6	24.17		
	RB25#0	24.21	23.52	24.21		
	RB25#25	24.11	23.52	24.19		
	RB50#0	24.14	23.53	24.22		
10MHz 16QAM	RB1#0	24.4	23.79	24.08	24.07	33
	RB1#25	24.24	23.72	24.03		
	RB1#49	24.22	23.8	24.08		
	RB25#0	24.19	23.51	24.26		
	RB25#25	24.15	23.52	24.27		
	RB50#0	24.17	23.52	24.26		
15MHz QPSK	RB1#0	24.3	23.55	24.09	23.97	33
	RB1#38	24.14	23.57	24.12		
	RB1#74	24.1	23.6	24.18		
	RB36#0	24.14	23.5	24.17		
	RB36#39	24.05	23.51	24.19		
	RB75#0	24.06	23.5	24.2		
15MHz 16QAM	RB1#0	24.38	23.78	24.05	24.05	33
	RB1#38	24.29	23.78	24.06		
	RB1#74	24.22	23.79	24.11		
	RB36#0	24.19	23.49	24.19		
	RB36#39	24.11	23.49	24.19		
	RB75#0	24.13	23.48	24.19		
20MHz QPSK	RB1#0	24.18	23.5	24.12	23.89	33
	RB1#50	24.01	23.55	24.17		
	RB1#99	23.98	23.55	24.22		
	RB50#0	24.17	23.55	24.22		
	RB50#50	24.03	23.55	24.21		

	RB100#0	24.09	23.55	24.2		
20MHz 16QAM	RB1#0	24.27	23.54	24.54	24.37	33
	RB1#50	24.12	23.54	24.62		
	RB1#99	24.03	23.58	24.7		
	RB50#0	24.2	23.6	24.23		
	RB50#50	24.05	23.61	24.22		
	RB100#0	24.13	23.57	24.25		
	Note: EIRP(dBm) = Conducted Power(dBm) + Antenna Gain(dBi) - Cable loss(dB) For LTE Band41: Antenna Gain = 0.47dBi Cable Loss=0.8dB [#] (provided by the applicant)					

3.3.2 Peak-to-average ratio (PAR)

Cellular Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	4.52	13
	Middle	3.18	13
	High	3.75	13
EGPRS	Low	4.47	13
	Middle	4.25	13
	High	3.66	13

Test Mode	Peak-to-average Ratio(dB)			Limit (dB)
	Lowest Channel	Middle Channel	Highest Channel	
WCDMA R99	3.22	3.22	3.25	13
HSDPA	3.33	4.75	3.59	13
HSUPA	5.77	5.91	4.99	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	4.41	13
	Middle	3.77	13
	High	3.52	13
EGPRS	Low	4.45	13
	Middle	4.39	13
	High	3.89	13

Test Mode	Peak-to-average Ratio(dB)			Limit (dB)
	Lowest Channel	Middle Channel	Highest Channel	
WCDMA R99	2.52	3.1	3.01	13
HSDPA	4.41	4.52	3.51	13
HSUPA	5.01	5.83	5.88	13

LTE Band 2 20MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	3.3	4.84	3.91	13	Pass
QPSK (100RB Size)	4.52	4.93	5.13	13	Pass
16QAM (1RB Size)	4.06	5.59	4.9	13	Pass
16QAM (100RB Size)	5.39	5.88	6	13	Pass

LTE Band 5 10MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	5.65	4.67	6.17	13	Pass
QPSK (50RB Size)	5.13	5.51	5.36	13	Pass
16QAM (1RB Size)	6.12	5.57	7.13	13	Pass
16QAM (50RB Size)	6.09	6.38	6.43	13	Pass

LTE Band 12 10MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.32	5.19	5.51	13	Pass
QPSK (50RB Size)	5.07	5.39	5.19	13	Pass
16QAM (1RB Size)	5.07	5.88	6.52	13	Pass
16QAM (50RB Size)	6.17	6.23	6.2	13	Pass

LTE Band 13 10MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	/	4.64	/	13	Pass
QPSK (50RB Size)	/	5.04	/	13	Pass
16QAM (1RB Size)	/	5.59	/	13	Pass
16QAM (50RB Size)	/	6.06	/	13	Pass

LTE Band 41 20MHz Bandwidth

Modulation	Low channel (dB)	Middle channel (dB)	High channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	8.17	8.87	8.29	13	Pass
QPSK (100RB Size)	8.52	8.78	8.38	13	Pass
16QAM (1RB Size)	8.35	9.16	8.55	13	Pass
16QAM (100RB Size)	8.96	9.33	8.75	13	Pass

3.3.3 26dB and 99% Bandwidth

Cellular Band

Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Low Channel	Middle channel	High Channel	Low Channel	Middle Channel	High Channel
GSM	0.245	0.245	0.246	0.314	0.316	0.317
EDGE	0.243	0.241	0.242	0.306	0.308	0.307

Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Low Channel	Middle channel	High Channel	Low Channel	Middle Channel	High Channel
WCDMA R99	4.146	4.146	4.126	4.705	4.695	4.685
HSDPA	4.156	4.146	4.126	4.685	4.685	4.685
HSUPA	4.156	4.156	4.146	4.695	4.695	4.685

PCS Band

Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Low Channel	Middle channel	High Channel	Low Channel	Middle Channel	High Channel
GSM	0.244	0.245	0.244	0.305	0.309	0.306
EDGE	0.246	0.246	0.246	0.31	0.311	0.309

Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Low Channel	Middle channel	High Channel	Low Channel	Middle Channel	High Channel
WCDMA R99	4.166	4.146	4.136	4.755	4.705	4.705
HSDPA	4.156	4.146	4.146	4.725	4.695	4.695
HSUPA	4.166	4.156	4.146	4.705	4.685	4.685

LTE Band 2:

Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Low Channel	Middle channel	High Channel	Low Channel	Middle Channel	High Channel
1.4MHz QPSK	1.102	1.096	1.102	1.314	1.302	1.32
1.4MHz 16QAM	1.102	1.096	1.096	1.326	1.326	1.284
3MHz QPSK	2.683	2.695	2.683	2.928	2.892	2.916
3MHz 16QAM	2.683	2.683	2.683	2.916	2.928	2.904
5MHz QPSK	4.511	4.511	4.511	5.040	5.000	5.000
5MHz 16QAM	4.511	4.511	4.511	5.020	5.020	4.960
10MHz QPSK	8.942	8.942	8.942	9.760	9.680	9.680
10MHz 16QAM	8.942	8.942	8.942	9.680	9.680	9.680
15MHz QPSK	13.413	13.473	13.533	14.880	14.640	14.880
15MHz 16QAM	13.533	13.533	13.533	14.820	14.760	14.880
20MHz QPSK	17.964	17.884	17.964	19.200	19.280	19.360
20MHz 16QAM	17.964	17.884	17.964	19.360	19.360	19.360

LTE Band 5:

Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Low Channel	Middle channel	High Channel	Low Channel	Middle Channel	High Channel
1.4MHz QPSK	1.096	1.102	1.102	1.296	1.314	1.290
1.4MHz 16QAM	1.096	1.090	1.096	1.320	1.284	1.296
3MHz QPSK	2.683	2.683	2.683	2.904	2.892	2.916
3MHz 16QAM	2.683	2.683	2.671	2.928	2.916	2.904
5MHz QPSK	4.511	4.491	4.491	5.000	5.020	4.940
5MHz 16QAM	4.511	4.531	4.491	4.980	4.980	4.980
10MHz QPSK	8.942	8.942	8.902	9.720	9.640	9.600
10MHz 16QAM	8.942	8.942	8.942	9.560	9.720	9.640

LTE Band 12:

Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Low Channel	Middle channel	High Channel	Low Channel	Middle Channel	High Channel
1.4MHz QPSK	1.096	1.102	1.096	1.314	1.284	1.290
1.4MHz 16QAM	1.096	1.096	1.102	1.284	1.302	1.320
3MHz QPSK	2.695	2.683	2.683	2.904	2.904	2.928
3MHz 16QAM	2.683	2.683	2.683	2.928	2.928	2.904
5MHz QPSK	4.511	4.511	4.491	4.980	5.020	4.960
5MHz 16QAM	4.471	4.531	4.491	4.980	5.000	5.000
10MHz QPSK	8.942	8.942	8.942	9.720	9.640	9.640
10MHz 16QAM	8.942	8.942	8.942	9.600	9.720	9.720

LTE Band 13:

Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Low Channel	Middle channel	High Channel	Low Channel	Middle Channel	High Channel
5MHz QPSK	4.511	4.491	4.511	5.020	4.980	5.020
5MHz 16QAM	4.511	4.511	4.511	5.000	5.020	5.020
10MHz QPSK	/	8.942	/	/	9.640	/
10MHz 16QAM	/	8.942	/	/	9.680	/

LTE Band 41

Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
	Low Channel	Middle channel	High Channel	Low Channel	Middle Channel	High Channel
5MHz QPSK	4.511	4.511	4.515	5.760	5.340	4.891
5MHz 16QAM	4.531	4.511	4.531	5.260	5.200	5.680
10MHz QPSK	8.942	8.942	8.942	9.880	9.680	10.440
10MHz 16QAM	8.972	8.942	8.982	9.638	9.600	9.640
15MHz QPSK	13.473	13.473	13.533	14.820	14.940	14.640
15MHz 16QAM	13.502	13.533	13.533	14.544	14.700	15.900
20MHz QPSK	18.044	17.884	17.964	19.280	19.760	20.320
20MHz 16QAM	18.044	18.044	17.964	19.520	19.680	19.680

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 B12	Refer test plot	Refer test plot	Pass
LTE B13	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 B12	Refer test plot	Refer test plot	Pass
LTE B13	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

Test Modulation:	GMSK		Test Channel:	836.6	MHz
Test Item	Temperature (°C)	Voltage (V _{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.87	10	0.012	2.5
	-20	3.87	7	0.008	2.5
	-10	3.87	-5	-0.006	2.5
	0	3.87	1	0.001	2.5
	10	3.87	3	0.004	2.5
	20	3.87	-5	-0.006	2.5
	30	3.87	6	0.007	2.5
	40	3.87	3	0.004	2.5
	50	3.87	6	0.007	2.5
Frequency Stability vs. Voltage	20	3.35	-9	-0.011	2.5
	20	4.4	10	0.012	2.5

Test Modulation:	8PSK		Test Channel:	836.6	MHz
Test Item	Temperature (°C)	Voltage (V _{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.87	11	0.013	2.5
	-20	3.87	17	0.020	2.5
	-10	3.87	16	0.019	2.5
	0	3.87	7	0.008	2.5
	10	3.87	9	0.011	2.5
	20	3.87	6	0.007	2.5
	30	3.87	6	0.007	2.5
	40	3.87	8	0.010	2.5
	50	3.87	15	0.018	2.5
Frequency Stability vs. Voltage	20	3.35	2	0.002	2.5
	20	4.4	3	0.004	2.5

WCDMA Mode

Test Modulation:	WCDMA R99		Test Channel:	836.6	MHz
Test Item	Temperature (°C)	Voltage (V _{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.87	-17	-0.020	2.5
	-20	3.87	-9	-0.011	2.5
	-10	3.87	-11	-0.013	2.5
	0	3.87	-2	-0.002	2.5
	10	3.87	-8	-0.010	2.5
	20	3.87	-3	-0.004	2.5
	30	3.87	-12	-0.014	2.5
	40	3.87	1	0.001	2.5
	50	3.87	-2	-0.002	2.5
Frequency Stability vs. Voltage	20	3.35	-10	-0.012	2.5
	20	4.4	-19	-0.023	2.5

**PCS Band
GSM Mode**

Test Mode:	GMSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.87	1850.039	1850.000	1909.989	1910.000
	-20	3.87	1850.039	1850.000	1909.990	1910.000
	-10	3.87	1850.043	1850.000	1909.983	1910.000
	0	3.87	1850.035	1850.000	1909.990	1910.000
	10	3.87	1850.035	1850.000	1909.944	1910.000
	20	3.87	1850.050	1850.000	1909.996	1910.000
	30	3.87	1850.019	1850.000	1909.001	1910.000
	40	3.87	1850.023	1850.000	1909.926	1910.000
	50	3.87	1850.066	1850.000	1909.984	1910.000
Frequency Stability vs. Voltage	20	3.35	1850.088	1850.000	1909.988	1910.000
	20	4.4	1850.020	1850.000	1909.906	1910.000

Test Mode:	8PSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.87	1850.015	1850.000	1909.979	1910.000
	-20	3.87	1850.018	1850.000	1909.992	1910.000
	-10	3.87	1850.017	1850.000	1909.992	1910.000
	0	3.87	1850.011	1850.000	1909.992	1910.000
	10	3.87	1850.019	1850.000	1909.978	1910.000
	20	3.87	1850.031	1850.000	1909.991	1910.000
	30	3.87	1850.013	1850.000	1909.996	1910.000
	40	3.87	1850.000	1850.000	1909.974	1910.000
	50	3.87	1850.023	1850.000	1909.973	1910.000
Frequency Stability vs. Voltage	20	3.35	1850.002	1850.000	1909.992	1910.000
	20	4.4	1850.014	1850.000	1909.979	1910.000

WCDMA Mode

Test Mode:	WCDMA R99	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.87	1850.056	1850.000	1909.976	1910.000
	-20	3.87	1850.033	1850.000	1909.983	1910.000
	-10	3.87	1850.015	1850.000	1909.990	1910.000
	0	3.87	1850.017	1850.000	1909.980	1910.000
	10	3.87	1850.039	1850.000	1909.953	1910.000
	20	3.87	1850.055	1850.000	1909.978	1910.000
	30	3.87	1850.016	1850.000	1909.994	1910.000
	40	3.87	1850.038	1850.000	1909.931	1910.000
	50	3.87	1850.043	1850.000	1909.989	1910.000
Frequency Stability vs. Voltage	20	3.35	1850.079	1850.000	1909.967	1910.000
	20	4.4	1850.004	1850.000	1909.916	1910.000

LTE:

QPSK:

Band 2:

Test Mode:	20M QPSK	Test Channel: Lowest for Lower Edge, Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.87	1850.125	1850.000	1909.882	1910.000
	-20	3.87	1850.116	1850.000	1909.866	1910.000
	-10	3.87	1850.103	1850.000	1909.899	1910.000
	0	3.87	1850.117	1850.000	1909.860	1910.000
	10	3.87	1850.116	1850.000	1909.871	1910.000
	20	3.87	1850.120	1850.000	1909.853	1910.000
	30	3.87	1850.114	1850.000	1909.882	1910.000
	40	3.87	1850.120	1850.000	1909.865	1910.000
	50	3.87	1850.126	1850.000	1909.867	1910.000
Frequency Stability vs. Voltage	20	3.35	1850.134	1850.000	1909.842	1910.000
	20	4.4	1850.117	1850.000	1909.870	1910.000

Band 5:

Test Modulation:	10 MHz QPSK		Test Channel:	836.5	MHz
Test Item	Temperature (°C)	Voltage (V _{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.87	3.55	0.004	2.5
	-20	3.87	-9.16	-0.011	2.5
	-10	3.87	6.42	0.008	2.5
	0	3.87	-6.77	-0.008	2.5
	10	3.87	-11.73	-0.014	2.5
	20	3.87	5.07	0.006	2.5
	30	3.87	11.45	0.014	2.5
	40	3.87	-8.23	-0.010	2.5
	50	3.87	9.64	0.012	2.5
Frequency Stability vs. Voltage	20	3.35	4.51	0.005	2.5
	20	4.4	10.11	0.012	2.5

Band 12:

Test Mode:	20M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.87	699.077	699.00	715.864	716.00
	-20	3.87	699.070	699.00	715.880	716.00
	-10	3.87	699.193	699.00	715.918	716.00
	0	3.87	699.179	699.00	715.890	716.00
	10	3.87	699.091	699.00	715.913	716.00
	20	3.87	699.044	699.00	715.869	716.00
	30	3.87	699.121	699.00	715.858	716.00
	40	3.87	699.036	699.00	715.935	716.00
	50	3.87	699.036	699.00	715.843	716.00
Frequency Stability vs. Voltage	20	3.35	699.167	699.00	715.904	716.00
	20	4.4	699.043	699.00	715.972	716.00

Band 13:

Test Mode:	20M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.87	777.068	777.00	786.911	787.00
	-20	3.87	777.181	777.00	786.947	787.00
	-10	3.87	777.132	777.00	786.960	787.00
	0	3.87	777.193	777.00	786.846	787.00
	10	3.87	777.054	777.00	786.806	787.00
	20	3.87	777.119	777.00	786.913	787.00
	30	3.87	777.054	777.00	786.985	787.00
	40	3.87	777.102	777.00	786.830	787.00
	50	3.87	777.176	777.00	786.929	787.00
Frequency Stability vs. Voltage	20	3.35	777.174	777.00	786.891	787.00
	20	4.4	777.020	777.00	786.955	787.00

Band 41:

Test Mode:	20M QPSK	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.87	2496.096	2496.00	2689.915	2690
	-20	3.87	2496.003	2496.00	2689.911	2690
	-10	3.87	2496.031	2496.00	2689.916	2690
	0	3.87	2496.142	2496.00	2689.901	2690
	10	3.87	2496.143	2496.00	2689.839	2690
	20	3.87	2496.090	2496.00	2689.853	2690
	30	3.87	2496.021	2496.00	2689.825	2690
	40	3.87	2496.180	2496.00	2689.827	2690
	50	3.87	2496.037	2496.00	2689.916	2690
Frequency Stability vs. Voltage	20	3.35	2496.050	2496.00	2689.853	2690
	20	4.4	2496.190	2496.00	2689.883	2690

16QAM:

Band 2:

Test Mode:	20M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.87	1850.112	1850.000	1909.878	1910.000
	-20	3.87	1850.124	1850.000	1909.879	1910.000
	-10	3.87	1850.101	1850.000	1909.875	1910.000
	0	3.87	1850.117	1850.000	1909.888	1910.000
	10	3.87	1850.108	1850.000	1909.879	1910.000
	20	3.87	1850.107	1850.000	1909.879	1910.000
	30	3.87	1850.117	1850.000	1909.893	1910.000
	40	3.87	1850.116	1850.000	1909.886	1910.000
	50	3.87	1850.110	1850.000	1909.865	1910.000
Frequency Stability vs. Voltage	20	3.35	1850.124	1850.000	1909.881	1910.000
	20	4.4	1850.087	1850.000	1909.865	1910.000

Band 5:

Test Modulation:	10 MHz 16QAM		Test Channel:	836.5	MHz
Test Item	Temperature (°C)	Voltage (V _{DC})	Frequency Error		Limit
			(Hz)	(ppm)	(ppm)
Frequency Stability vs. Temperature	-30	3.87	-14.2	-0.017	2.5
	-20	3.87	5.82	0.007	2.5
	-10	3.87	5.42	0.006	2.5
	0	3.87	9.49	0.011	2.5
	10	3.87	-5.79	-0.007	2.5
	20	3.87	7.21	0.009	2.5
	30	3.87	-6.95	-0.008	2.5
	40	3.87	9.4	0.011	2.5
	50	3.87	11.84	0.014	2.5
Frequency Stability vs. Voltage	20	3.35	9.82	0.012	2.5
	20	4.4	7	0.008	2.5

Band 12:

Test Mode:	20M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.87	699.001	699.00	715.983	716.00
	-20	3.87	699.097	699.00	715.993	716.00
	-10	3.87	699.175	699.00	715.803	716.00
	0	3.87	699.193	699.00	715.985	716.00
	10	3.87	699.114	699.00	715.866	716.00
	20	3.87	699.183	699.00	715.926	716.00
	30	3.87	699.100	699.00	715.985	716.00
	40	3.87	699.149	699.00	715.971	716.00
	50	3.87	699.053	699.00	715.987	716.00
Frequency Stability vs. Voltage	20	3.35	699.115	699.00	715.825	716.00
	20	4.4	699.178	699.00	715.941	716.00

Band 13:

Test Mode:	20M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.87	777.122	777.00	786.873	787.00
	-20	3.87	777.088	777.00	786.882	787.00
	-10	3.87	777.059	777.00	786.980	787.00
	0	3.87	777.101	777.00	786.909	787.00
	10	3.87	777.105	777.00	786.859	787.00
	20	3.87	777.154	777.00	786.917	787.00
	30	3.87	777.092	777.00	786.904	787.00
	40	3.87	777.073	777.00	786.960	787.00
	50	3.87	777.178	777.00	786.946	787.00
Frequency Stability vs. Voltage	20	3.35	777.076	777.00	786.940	787.00
	20	4.4	777.035	777.00	786.867	787.00

Band 41:

Test Mode:	20M 16QAM	Test Channel: Lowest for Lower Edge,Highest for Upper Edge				
Test Item	Temperature (°C)	Voltage (V _{DC})	Lower Edge (MHz)		Upper Edge (MHz)	
			Result	Limit	Result	Limit
Frequency Stability vs. Temperature	-30	3.87	2496.025	2496.00	2689.996	2690
	-20	3.87	2496.179	2496.00	2689.814	2690
	-10	3.87	2496.153	2496.00	2689.958	2690
	0	3.87	2496.167	2496.00	2689.909	2690
	10	3.87	2496.061	2496.00	2689.806	2690
	20	3.87	2496.157	2496.00	2689.810	2690
	30	3.87	2496.043	2496.00	2689.980	2690
	40	3.87	2496.194	2496.00	2689.863	2690
	50	3.87	2496.174	2496.00	2689.853	2690
Frequency Stability vs. Voltage	20	3.35	2496.109	2496.00	2689.815	2690
	20	4.4	2496.031	2496.00	2689.955	2690

3.4 Radiated Spurious emission Test Data

Test Date:	2024-01-22	Test By:	Bard Huang
Environment condition:	Temperature: 24.5°C; Relative Humidity:51.2%; ATM Pressure: 101.7kPa		

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	63.77	Horizontal	-2.55	61.22	-95.2	-33.98	-13	-20.98	Peak
1648.4	62.07	Vertical	-2.55	59.52	-95.2	-35.68	-13	-22.68	Peak
2472.6	67.08	Horizontal	-1.76	65.32	-95.2	-29.88	-13	-16.88	Peak
2472.6	69.88	Vertical	-1.76	68.12	-95.2	-27.08	-13	-14.08	Peak
3296.8	64.78	Horizontal	-1.85	62.93	-95.2	-32.27	-13	-19.27	Peak
3296.8	64.48	Vertical	-1.85	62.63	-95.2	-32.57	-13	-19.57	Peak
Middle Channel									
1673.2	64.60	Horizontal	-2.46	62.14	-95.2	-33.06	-13	-20.06	Peak
1673.2	62.90	Vertical	-2.46	60.44	-95.2	-34.76	-13	-21.76	Peak
2509.8	68.03	Horizontal	-1.74	66.29	-95.2	-28.91	-13	-15.91	Peak
2509.8	71.03	Vertical	-1.74	69.29	-95.2	-25.91	-13	-12.91	Peak
3346.4	65.72	Horizontal	-1.8	63.92	-95.2	-31.28	-13	-18.28	Peak
3346.4	65.62	Vertical	-1.8	63.82	-95.2	-31.38	-13	-18.38	Peak
High Channel									
1697.6	65.63	Horizontal	-2.37	63.26	-95.2	-31.94	-13	-18.94	Peak
1697.6	64.13	Vertical	-2.37	61.76	-95.2	-33.44	-13	-20.44	Peak
2546.4	69.41	Horizontal	-1.77	67.64	-95.2	-27.56	-13	-14.56	Peak
2546.4	71.91	Vertical	-1.77	70.14	-95.2	-25.06	-13	-12.06	Peak
3395.2	67.08	Horizontal	-1.75	65.33	-95.2	-29.87	-13	-16.87	Peak
3395.2	66.58	Vertical	-1.75	64.83	-95.2	-30.37	-13	-17.37	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
PCS 1900									
Low Channel									
3700.4	44.43	Horizontal	-1.58	42.85	-95.2	-52.35	-13	-39.35	Peak
3700.4	44.83	Vertical	-1.58	43.25	-95.2	-51.95	-13	-38.95	Peak
5550.6	51.73	Horizontal	1.72	53.45	-95.2	-41.75	-13	-28.75	Peak
5550.6	49.23	Vertical	1.72	50.95	-95.2	-44.25	-13	-31.25	Peak
Middle Channel									
3760	45.33	Horizontal	-1.75	43.58	-95.2	-51.62	-13	-38.62	Peak
3760	45.73	Vertical	-1.75	43.98	-95.2	-51.22	-13	-38.22	Peak
5640	52.40	Horizontal	1.91	54.31	-95.2	-40.89	-13	-27.89	Peak
5640	50.40	Vertical	1.91	52.31	-95.2	-42.89	-13	-29.89	Peak
High Channel									
3819.6	46.36	Horizontal	-1.89	44.47	-95.2	-50.73	-13	-37.73	Peak
3819.6	47.56	Vertical	-1.89	45.67	-95.2	-49.53	-13	-36.53	Peak
5729.4	54.13	Horizontal	2.04	56.17	-95.2	-39.03	-13	-26.03	Peak
5729.4	52.43	Vertical	2.04	54.47	-95.2	-40.73	-13	-27.73	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	41.84	Horizontal	-1.59	40.25	-95.2	-54.95	-13	-41.95	Peak
3704.8	43.64	Vertical	-1.59	42.05	-95.2	-53.15	-13	-40.15	Peak
5557.2	39.81	Horizontal	1.75	41.56	-95.2	-53.64	-13	-40.64	Peak
5557.2	41.31	Vertical	1.75	43.06	-95.2	-52.14	-13	-39.14	Peak
Middle Channel									
3760	43.93	Horizontal	-1.75	42.18	-95.2	-53.02	-13	-40.02	Peak
3760	44.13	Vertical	-1.75	42.38	-95.2	-52.82	-13	-39.82	Peak
5640	39.90	Horizontal	1.91	41.81	-95.2	-53.39	-13	-40.39	Peak
5640	41.40	Vertical	1.91	43.31	-95.2	-51.89	-13	-38.89	Peak
High Channel									
3815.2	49.76	Horizontal	-1.89	47.87	-95.2	-47.33	-13	-34.33	Peak
3815.2	50.56	Vertical	-1.89	48.67	-95.2	-46.53	-13	-33.53	Peak
5722.8	39.42	Horizontal	2.03	41.45	-95.2	-53.75	-13	-40.75	Peak
5722.8	40.12	Vertical	2.03	42.15	-95.2	-53.05	-13	-40.05	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	44.55	Horizontal	-2.52	42.03	-95.2	-53.17	-13	-40.17	Peak
1652.8	43.55	Vertical	-2.52	41.03	-95.2	-54.17	-13	-41.17	Peak
2479.2	36.37	Horizontal	-1.75	34.62	-95.2	-60.58	-13	-47.58	Peak
2479.2	37.37	Vertical	-1.75	35.62	-95.2	-59.58	-13	-46.58	Peak
3305.6	37.77	Horizontal	-1.84	35.93	-95.2	-59.27	-13	-46.27	Peak
3305.6	37.17	Vertical	-1.84	35.33	-95.2	-59.87	-13	-46.87	Peak
Middle Channel									
1673.2	44.70	Horizontal	-2.46	42.24	-95.2	-52.96	-13	-39.96	Peak
1673.2	43.20	Vertical	-2.46	40.74	-95.2	-54.46	-13	-41.46	Peak
2509.8	37.54	Horizontal	-1.75	35.79	-95.2	-59.41	-13	-46.41	Peak
2509.8	38.64	Vertical	-1.75	36.89	-95.2	-58.31	-13	-45.31	Peak
3346.4	36.82	Horizontal	-1.8	35.02	-95.2	-60.18	-13	-47.18	Peak
3346.4	37.02	Vertical	-1.8	35.22	-95.2	-59.98	-13	-46.98	Peak
High Channel									
1693.2	43.65	Horizontal	-2.39	41.26	-95.2	-53.94	-13	-40.94	Peak
1693.2	44.35	Vertical	-2.39	41.96	-95.2	-53.24	-13	-40.24	Peak
2539.8	35.31	Horizontal	-1.76	33.55	-95.2	-61.65	-13	-48.65	Peak
2539.8	35.51	Vertical	-1.76	33.75	-95.2	-61.45	-13	-48.45	Peak
3386.4	39.28	Horizontal	-1.75	37.53	-95.2	-57.67	-13	-44.67	Peak
3386.4	38.88	Vertical	-1.75	37.13	-95.2	-58.07	-13	-45.07	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	43.63	Horizontal	-1.58	42.05	-95.2	-53.15	-13	-40.15	Peak
3701.4	44.43	Vertical	-1.58	42.85	-95.2	-52.35	-13	-39.35	Peak
5552.1	47.13	Horizontal	1.72	48.85	-95.2	-46.35	-13	-33.35	Peak
5552.1	47.43	Vertical	1.72	49.15	-95.2	-46.05	-13	-33.05	Peak
Middle Channel									
3760	48.63	Horizontal	-1.75	46.88	-95.2	-48.32	-13	-35.32	Peak
3760	49.33	Vertical	-1.75	47.58	-95.2	-47.62	-13	-34.62	Peak
5640	45.90	Horizontal	1.91	47.81	-95.2	-47.39	-13	-34.39	Peak
5640	45.20	Vertical	1.91	47.11	-95.2	-48.09	-13	-35.09	Peak
High Channel									
3818.6	56.47	Horizontal	-1.9	54.57	-95.2	-40.63	-13	-27.63	Peak
3818.6	57.37	Vertical	-1.9	55.47	-95.2	-39.73	-13	-26.73	Peak
5727.9	45.92	Horizontal	2.04	47.96	-95.2	-47.24	-13	-34.24	Peak
5727.9	45.82	Vertical	2.04	47.86	-95.2	-47.34	-13	-34.34	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 B5									
Low Channel									
1649.4	54.36	Horizontal	-2.54	51.82	-95.2	-43.38	-13	-30.38	Peak
1649.4	52.76	Vertical	-2.54	50.22	-95.2	-44.98	-13	-31.98	Peak
2474.1	42.49	Horizontal	-1.77	40.72	-95.2	-54.48	-13	-41.48	Peak
2474.1	41.19	Vertical	-1.77	39.42	-95.2	-55.78	-13	-42.78	Peak
3298.8	43.98	Horizontal	-1.85	42.13	-95.2	-53.07	-13	-40.07	Peak
3298.8	43.58	Vertical	-1.85	41.73	-95.2	-53.47	-13	-40.47	Peak
Middle Channel									
1673	55.60	Horizontal	-2.46	53.14	-95.2	-42.06	-13	-29.06	Peak
1673	54.40	Vertical	-2.46	51.94	-95.2	-43.26	-13	-30.26	Peak
2509.5	54.64	Horizontal	-1.75	52.89	-95.2	-42.31	-13	-29.31	Peak
2509.5	55.94	Vertical	-1.75	54.19	-95.2	-41.01	-13	-28.01	Peak
3346	49.22	Horizontal	-1.8	47.42	-95.2	-47.78	-13	-34.78	Peak
3346	48.42	Vertical	-1.8	46.62	-95.2	-48.58	-13	-35.58	Peak
High Channel									
1696.6	53.64	Horizontal	-2.39	51.25	-95.2	-43.95	-13	-30.95	Peak
1696.6	51.74	Vertical	-2.39	49.35	-95.2	-45.85	-13	-32.85	Peak
2544.9	39.21	Horizontal	-1.77	37.44	-95.2	-57.76	-13	-44.76	Peak
2544.9	40.91	Vertical	-1.77	39.14	-95.2	-56.06	-13	-43.06	Peak
3393.2	41.88	Horizontal	-1.75	40.13	-95.2	-55.07	-13	-42.07	Peak
3393.2	41.08	Vertical	-1.75	39.33	-95.2	-55.87	-13	-42.87	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 B12									
Low Channel									
1399.4	55.64	Horizontal	-3.95	51.69	-95.2	-43.51	-13	-30.51	Peak
1399.4	55.44	Vertical	-3.95	51.49	-95.2	-43.71	-13	-30.71	Peak
2099.1	48.71	Horizontal	-2.76	45.95	-95.2	-49.25	-13	-36.25	Peak
2099.1	47.51	Vertical	-2.76	44.75	-95.2	-50.45	-13	-37.45	Peak
2798.8	41.55	Horizontal	-1.39	40.16	-95.2	-55.04	-13	-42.04	Peak
2798.8	41.45	Vertical	-1.39	40.06	-95.2	-55.14	-13	-42.14	Peak
Middle Channel									
1415	56.62	Horizontal	-3.86	52.76	-95.2	-42.44	-13	-29.44	Peak
1415	55.82	Vertical	-3.86	51.96	-95.2	-43.24	-13	-30.24	Peak
2122.5	49.04	Horizontal	-2.69	46.35	-95.2	-48.85	-13	-35.85	Peak
2122.5	47.94	Vertical	-2.69	45.25	-95.2	-49.95	-13	-36.95	Peak
2830	41.26	Horizontal	-1.43	39.83	-95.2	-55.37	-13	-42.37	Peak
2830	41.56	Vertical	-1.43	40.13	-95.2	-55.07	-13	-42.07	Peak
High Channel									
1430.6	58.00	Horizontal	-3.78	54.22	-95.2	-40.98	-13	-27.98	Peak
1430.6	56.50	Vertical	-3.78	52.72	-95.2	-42.48	-13	-29.48	Peak
2145.9	50.16	Horizontal	-2.62	47.54	-95.2	-47.66	-13	-34.66	Peak
2145.9	50.46	Vertical	-2.62	47.84	-95.2	-47.36	-13	-34.36	Peak
2861.2	43.79	Horizontal	-1.5	42.29	-95.2	-52.91	-13	-39.91	Peak
2861.2	43.29	Vertical	-1.5	41.79	-95.2	-53.41	-13	-40.41	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 B13									
Low Channel									
1559	43.79	Horizontal	-3.16	40.63	-95.2	-54.57	-40	-14.57	Peak
1559	44.09	Vertical	-3.16	40.93	-95.2	-54.27	-40	-14.27	Peak
2338.5	41.64	Horizontal	-1.77	39.87	-95.2	-55.33	-13	-42.33	Peak
2338.5	42.14	Vertical	-1.77	40.37	-95.2	-54.83	-13	-41.83	Peak
3118	38.56	Horizontal	-1.88	36.68	-95.2	-58.52	-13	-45.52	Peak
3118	39.76	Vertical	-1.88	37.88	-95.2	-57.32	-13	-44.32	Peak
High Channel									
1569	45.61	Horizontal	-3.08	42.53	-95.2	-52.67	-40	-12.67	Peak
1569	45.91	Vertical	-3.08	42.83	-95.2	-52.37	-40	-12.37	Peak
2353.5	41.61	Horizontal	-1.75	39.86	-95.2	-55.34	-13	-42.34	Peak
2353.5	43.01	Vertical	-1.75	41.26	-95.2	-53.94	-13	-40.94	Peak
3138	39.96	Horizontal	-1.88	38.08	-95.2	-57.12	-13	-44.12	Peak
3138	41.36	Vertical	-1.88	39.48	-95.2	-55.72	-13	-42.72	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									
4997	45.09	Horizontal	1.19	46.28	-95.2	-48.92	-25	-23.92	Peak
4997	47.29	Vertical	1.19	48.48	-95.2	-46.72	-25	-21.72	Peak
7495.5	53.23	Horizontal	3.21	56.44	-95.2	-38.76	-25	-13.76	Peak
7495.5	52.13	Vertical	3.21	55.34	-95.2	-39.86	-25	-14.86	Peak
Middle Channel									
5186	45.18	Horizontal	1.65	46.83	-95.2	-48.37	-25	-23.37	Peak
5186	46.78	Vertical	1.65	48.43	-95.2	-46.77	-25	-21.77	Peak
7779	52.47	Horizontal	3.78	56.25	-95.2	-38.95	-25	-13.95	Peak
7779	51.37	Vertical	3.78	55.15	-95.2	-40.05	-25	-15.05	Peak
High Channel									
5375	47.14	Horizontal	1.42	48.56	-95.2	-46.64	-25	-21.64	Peak
5375	48.34	Vertical	1.42	49.76	-95.2	-45.44	-25	-20.44	Peak
8062.5	53.72	Horizontal	4.09	57.81	-95.2	-37.39	-25	-12.39	Peak
8062.5	53.12	Vertical	4.09	57.21	-95.2	-37.99	-25	-12.99	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 RWAY202300045E Test Setup photo.

5 E.U.T Photo

Please refer to the attachment RWAY202300045 External photo and RWAY202300045 Internal photo.

---End of Report---