



Test Report No.: RF200106W008-6



# FCC TEST REPORT (PART 27)

Applicant:	Xiaomi Communications Co., Ltd.
Address:	#019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 10085

Manufacturer or Supplier:	Xiaomi Communications Co., Ltd.
Address:	#019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China, 10085
Product:	Mobile Phone
Brand Name:	Redmi
Model Name:	M2003J6A1G
FCC ID:	2AFZZJ6A1G
Date of tests:	Jan. 07, 2020 ~ Feb. 29, 2020

The tests have been carried out according to the requirements of the following standard:

- FCC Part 27, Subpart C, L     ANSI/TIA/EIA-603- D
- FCC Part 2                       ANSI/TIA/EIA-603-E     ANSI C63.26-2015

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Prepared by Alex Chen Engineer / Mobile Department	Approved by Luke Lu Manager / Mobile Department
Date: Feb. 29, 2020	Date: Feb. 29, 2020

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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF200106W008-6	Original release	Feb. 29, 2020

## 1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 27 & Part 2		
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT
2.1046 27.50(d)(4)	Maximum Peak Output Power	Compliance
2.1055 27.54	Frequency Stability	Compliance
2.1049 27.53(h)	Occupied Bandwidth	Compliance
27.50(d)(5)	Peak to average ratio	Compliance
27.53(h)	Band Edge Measurements	Compliance
2.1051 27.53(h)	Conducted Spurious Emissions	Compliance
2.1053 27.53(h)	Radiated Spurious Emissions	Compliance

### 1.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	UNCERTAINTY
Frequency Stability	± 76.97Hz
Radiated emissions & Radiated Power (30MHz~1GMHz)	±4.98dB
Radiated emissions & Radiated Power (1GMHz ~6GMHz)	±4.70dB
Radiated emissions (6GMHz ~18GMHz)	±4.60dB
Radiated emissions (18GMHz ~40GMHz)	±4.12dB
Conducted emissions	±4.01dB
Occupied Channel Bandwidth	±43.58KHz
Conducted Output power	±2.06dB
Band Edge Measurements	±4.70dB
Peak to average ratio	±0.76dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



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## 1.2 TEST SITE AND INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Feb. 26,20	Feb. 25,21
EXA Signal Analyzer	KEYSIGHT	N9010A-526	MY54510322	Feb. 26,20	Feb. 25,21
Bilog Antenna	ETS-LINDGREN	3143B	00161965	Feb. 26,20	Feb. 25,21
Horn Antenna (1GHz-18GHz)	ETS-LINDGREN	3117	00168692	Nov. 30, 19	Nov. 29, 20
Horn Antenna (18GHz-40GHz)	N/A	QWH-SL-18-40 -K-SG/QMS-00 361	15433	Nov. 21, 19	Nov. 20, 20
Radio Communication Analyzer	ANRITSU	MT8820C	6201465426	Feb. 26,20	Feb. 25,21
Signal Pre-Amplifier	EMSI	EMC 9135	980249	Jul. 08,19	Jul. 09,20
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	Jul. 08,19	Jul. 09,20
Signal Pre-Amplifier	EMSI	EMC 184045B	980259	Jul. 08,19	Jul. 09,20
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	Euroshieldpn- CT0001143-1216	Feb. 26,20	Feb. 25,21
Test Software	E3	V 9.160323	N/A	N/A	N/A
Test Software	ADT	ADT_Radiated V7.6.15.9.2	N/A	N/A	N/A
10dB Attenuator	JFW/USA	50HF-010-SM A	1505	Jul. 08,19	Jul. 09,20
Power Meter	Anritsu	ML2495A	1506002	Feb. 26,20	Feb. 25,21
Power Sensor	Anritsu	MA2411B	1339352	Feb. 26,20	Feb. 25,21
Humid & Temp Programmable Tester	Juyi	ITH-120-45-CP -AR	IAA1504-001	Jul. 08,19	Jul. 09,20
MXG Analog Microvave Signal Generator	KEYSIGHT	N5183A	MY50143024	Feb. 26,20	Feb. 25,21
Power Divider	MCLI/USA	PS2-15	24880	Jul. 09,19	Jul. 08,20

- NOTE:**
1. The calibration interval of the above test instruments is 12 months or 24 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
  2. The test was performed in 3m Semi-anechoic Chamber and RF Oven Room.
  3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.
  4. The FCC Site Registration No. is 525120; The Designation No. is CN1171.

## 2 GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	Mobile Phone	
<b>BRAND NAME</b>	Redmi	
<b>MODEL NAME</b>	M2003J6A1G	
<b>POWER SUPPLY</b>	5V/9V/10V/12Vdc (adapter or host equipment) 3.87Vdc (Li-ion, battery)	
<b>MODULATION TECHNOLOGY</b>	<b>WCDMA</b>	BPSK, QPSK
	<b>LTE</b>	QPSK, 16QAM, 64QAM
<b>FREQUENCY RANGE</b>	<b>WCDMA IV</b>	1712.4MHz ~ 1752.6MHz
	<b>LTE Band 4 Channel Bandwidth: 1.4MHz</b>	1710.7MHz ~ 1754.3MHz
	<b>LTE Band 4 Channel Bandwidth: 3MHz</b>	1711.5MHz ~ 1753.5MHz
	<b>LTE Band 4 Channel Bandwidth: 5MHz</b>	1712.5MHz ~ 1752.5MHz
	<b>LTE Band 4 Channel Bandwidth: 10MHz</b>	1715.0MHz ~ 1750.0MHz
	<b>LTE Band 4 Channel Bandwidth: 15MHz</b>	1717.5MHz ~ 1747.5MHz
	<b>LTE Band 4 Channel Bandwidth: 20MHz</b>	1720.0MHz ~ 1745.0MHz
<b>EMISSION DESIGNATOR</b>	<b>WCDMA IV</b>	4M16F9W
	<b>LTE Band 4 Channel Bandwidth: 1.4MHz</b>	QPSK: 1M09G7D
		16QAM: 1M09W7D
		64QAM: 1M09W7D
	<b>LTE Band 4 Channel Bandwidth: 3MHz</b>	QPSK: 2M69G7D
		16QAM: 2M68W7D
		64QAM: 2M68W7D
	<b>LTE Band 4 Channel Bandwidth: 5MHz</b>	QPSK: 4M49G7D
		16QAM: 4M48W7D
		64QAM: 4M47W7D
	<b>LTE Band 4 Channel Bandwidth: 10MHz</b>	QPSK: 8M96G7D
		16QAM: 8M96W7D
64QAM: 8M96W7D		



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<b>EMISSION DESIGNATOR</b>	<b>LTE Band 4 Channel Bandwidth: 15MHz</b>	QPSK: 13M4G7D
		16QAM: 13M4W7D
		64QAM: 13M4W7D
	<b>LTE Band 4 Channel Bandwidth: 20MHz</b>	QPSK: 17M9G7D
		16QAM: 17M9W7D
		64QAM: 17M9W7D
<b>MAX. ERP/EIRP POWER</b>	<b>WCDMA IV</b>	156mw
	<b>LTE Band 4 Channel Bandwidth: 1.4MHz</b>	152mw
	<b>LTE Band 4 Channel Bandwidth: 3MHz</b>	150mw
	<b>LTE Band 4 Channel Bandwidth: 5MHz</b>	150mw
	<b>LTE Band 4 Channel Bandwidth: 10MHz</b>	150mw
	<b>LTE Band 4 Channel Bandwidth: 15MHz</b>	151mw
	<b>LTE Band 4 Channel Bandwidth: 20MHz</b>	152mw
<b>ANTENNA TYPE</b>	Main Antenna(ANT 0): Fixed Internal Antenna 0 with -0.9dBi gain for WCDMA IV/LTE B4	
<b>IMEI CODE</b>	86590904	
<b>HW VERSION</b>	P1.1	
<b>SW VERSION</b>	MIUI 11	
<b>ACCESSORY DEVICE</b>	Refer to user's manual	

**NOTE:**

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.





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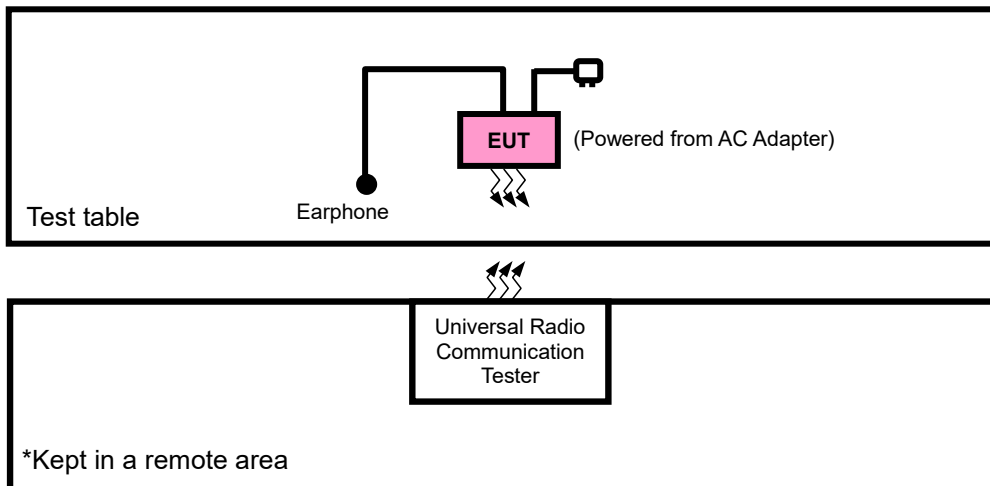
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**List of Accessory:**

<b>ACCESSORIES</b>	<b>BRAND</b>	<b>MODEL</b>	<b>MANUFACTURER</b>	<b>SPECIFICATION</b>
AC Adapter 1	MI	MDY-11-EQ	HUIZHOU BYD ELECTRONIC CO., LTD.	I/P: 100 - 240Vac, 600mA, O/P: 5Vdc, 3000mA/9V,2230mA/12V,1670mA/10V, 2250mA
AC Adapter 2	MI	MDY-11-EQ	Jiangsu Chenyang Electron Co., Ltd.	I/P: 100 - 240Vac, 600mA, O/P: 5Vdc, 3000mA/9V,2230mA/12V,1670mA/10V, 2250mA
Battery	MI	BN55	SUNWODA	Rating :3.87Vdc, 4920mAh, Li-ion, Y
USB Cable 1	MI	H73312	Weihai HongLin Technology Group Co., Ltd.	1.0 meter, non-shielded cable, without ferrite core
USB Cable 2	MI	L73312	Luxshare Precision Industry Co., Ltd.	1.0 meter, non-shielded cable, without ferrite core

## 2.2 CONFIGURATION OF SYSTEM UNDER TEST

### FOR RADIATION EMISSION TEST





### 2.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	DC source	LONG WEI	PS-6403D	010934269	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	DC Line: Unshielded, Detachable 1.8m

**NOTE:**

1. All power cords of the above support units are non shielded (1.8m).

### 2.4 DESCRIPTION OF TEST MODES

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports. The worst case in ERP/EIRP and radiated emission was found when positioned on X-plane for WCDMA /LTE. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	DESCRIPTION
A	EUT + Adapter + USB Cable with WCDMA or LTE link
B	EUT + Battery with WCDMA or LTE link

#### WCDMA MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
B	EIRP	1312 to 1513	1312, 1413, 1513	WCDMA
B	FREQUENCY STABILITY	1312 to 1513	1312, 1513	WCDMA
B	OCCUPIED BANDWIDTH	1312 to 1513	1312, 1413, 1513	WCDMA
B	BAND EDGE	1312 to 1513	1312, 1513	WCDMA
B	PEAK TO AVERAGE RATIO	1312 to 1513	1312, 1413, 1513	WCDMA
B	CONDCUDED EMISSION	1312 to 1513	1312, 1413, 1513	WCDMA
A	RADIATED EMISSION	1312 to 1513	1312, 1413, 1513	WCDMA

**LTE BAND 4**

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE	
B	EIRP	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset	
		19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset	
		19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset	
		20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset	
		20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset	
		20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset	
B	FREQUENCY STABILITY	19957 to 20393	19957, 20393	1.4MHz	QPSK	1 RB / 0 RB Offset	
		19965 to 20385	19965, 20385	3MHz	QPSK	1 RB / 0 RB Offset	
		19975 to 20375	19975, 20375	5MHz	QPSK	1 RB / 0 RB Offset	
		20000 to 20350	20000, 20350	10MHz	QPSK	1 RB / 0 RB Offset	
		20025 to 20325	20025, 20325	15MHz	QPSK	1 RB / 0 RB Offset	
		20050 to 20300	20050, 20300	20MHz	QPSK	1 RB / 0 RB Offset	
B	OCCUPIED BANDWIDTH	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM, 64QAM	6 RB / 0 RB Offset	
		19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM, 64QAM	15 RB / 0 RB Offset	
		19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset	
		20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset	
		20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM, 64QAM	75 RB / 0 RB Offset	
		20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM, 64QAM	100 RB / 0 RB Offset	
B	PEAK TO AVERAGE RATIO	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset	
		19965 to 20385	19965, 20175, 20385	3MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset	
		19975 to 20375	19975, 20175, 20375	5MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset	
		20000 to 20350	20000, 20175, 20350	10MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset	
		20025 to 20325	20025, 20175, 20325	15MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset	
		20050 to 20300	20050, 20175, 20300	20MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset	
B	BAND EDGE	19957 to 20393	19957	1.4MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset	
			20393	1.4MHz	QPSK, 16QAM, 64QAM	6 RB / 0 RB Offset	
		19965 to 20385	19965	3MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset	
			20385	3MHz	QPSK, 16QAM, 64QAM	15 RB / 0 RB Offset	
		19975 to 20375	19975	5MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset	
			20375	5MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset	
		20000 to 20350	20000	10MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset	
			20350	10MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset	
							1 RB / 5 RB Offset
							1 RB / 14 RB Offset
							1 RB / 24 RB Offset
							1 RB / 49 RB Offset

B	BAND EDGE	20025 to 20325	20025	15MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset 75 RB / 0 RB Offset		
			20325	15MHz	QPSK, 16QAM, 64QAM	1 RB / 74 RB Offset 75 RB / 0 RB Offset		
		20050 to 20300	20050	20MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset 100 RB / 0 RB Offset		
			20300	20MHz	QPSK, 16QAM, 64QAM	1 RB / 99 RB Offset 100 RB / 0 RB Offset		
		B	CONDCUDED EMISSION	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK	1 RB / 0 RB Offset
				19965 to 20385	19965, 20175, 20385	3MHz	QPSK	1 RB / 0 RB Offset
19975 to 20375	19975, 20175, 20375			5MHz	QPSK	1 RB / 0 RB Offset		
20000 to 20350	20000, 20175, 20350			10MHz	QPSK	1 RB / 0 RB Offset		
20025 to 20325	20025, 20175, 20325			15MHz	QPSK	1 RB / 0 RB Offset		
20050 to 20300	20050, 20175, 20300			20MHz	QPSK	1 RB / 0 RB Offset		
A	RADIATED EMISSION	19957 to 20393	19957, 20175, 20393	1.4MHz	QPSK	1 RB / 0 RB Offset		
		19965 to 20385	20175	3MHz	QPSK	1 RB / 0 RB Offset		
		19975 to 20375	20175	5MHz	QPSK	1 RB / 0 RB Offset		
		20000 to 20350	20175,	10MHz	QPSK	1 RB / 0 RB Offset		
		20025 to 20325	20175	15MHz	QPSK	1 RB / 0 RB Offset		
		20050 to 20300	20175	20MHz	QPSK	1 RB / 0 RB Offset		

**Note:** This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

**TEST CONDITION:**

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
EIRP	23deg. C, 70%RH	DC 3.87V By Battery	Star Le
FREQUENCY STABILITY	23deg. C, 70%RH	DC 3.6V/3.87V/4.45V	Harris Wang
OCCUPIED BANDWIDTH	23deg. C, 70%RH	DC 3.87V By Battery	Harris Wang
PEAK TO AVERAGE RATIO	23deg. C, 70%RH	DC 3.87V By Battery	Harris Wang
BAND EDGE	23deg. C, 70%RH	DC 3.87V By Battery	Harris Wang
CONDCUDED EMISSION	23deg. C, 70%RH	DC 3.87V By Battery	Harris Wang
RADIATED EMISSION	23deg. C, 70%RH	DC 5/9/10/12V By Adapter	Star Le



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## 2.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC 47 CFR Part 2**

**FCC 47 CFR Part 27**

**KDB 971168 D01 Power Meas License Digital Systems v03r01**

**ANSI/TIA/EIA-603-D**

**ANSI/TIA/EIA-603-E**

**ANSI C63.26-2015**

**NOTE:** All test items have been performed and recorded as per the above standards.



### 3 TEST TYPES AND RESULTS

#### 3.1 OUTPUT POWER MEASUREMENT

##### 3.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.

##### 3.1.2 TEST PROCEDURES

###### EIRP / ERP MEASUREMENT:

Per KDB 971168 D01 Power Meas License Digital Systems v03r01 or subclause 5.2.5.5 of ANSI C63.26-2015, the relevant equation for determining the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:

$$\text{ERP or EIRP} = P_{\text{Meas}} + G_{\text{T}} - L_{\text{C}}$$

Where:

ERP or EIRP = effective radiated power or equivalent isotropically radiated power, respectively

(expressed in the same units as  $P_{\text{Meas}}$ , typically dBW or dBm);

$P_{\text{Meas}}$  = measured transmitter output power or PSD, in dBm or dBW;

$G_{\text{T}}$  = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

$L_{\text{C}}$  = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

###### CONDUCTED POWER MEASUREMENT:

- a. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
- b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

### 3.1.3 TEST SETUP

EIRP MEASUREMENT:

CONDUCTED POWER MEASUREMENT:



### 3.1.4 TEST RESULTS

**AVERAGE CONDUCTED OUTPUT POWER (dBm)**

Band	WCDMA IV			WCDMA IV
	1312	1413	1513	Max. Tune-up Power
TX Channel	1312	1413	1513	Max. Tune-up Power
Rx Channel	1537	1638	1738	
Frequency	1712.4	1732.6	1752.6	
RMC 12.2K	22.82	22.81	22.75	24.00
HSDPA Subtest-1	21.78	21.74	21.67	22.50
HSDPA Subtest-2	21.75	21.71	21.64	22.50
HSDPA Subtest-3	21.31	21.27	21.20	22.50
HSDPA Subtest-4	21.27	21.23	21.16	22.50
DC-HSDPA Subtest-1	21.75	21.70	21.55	22.50
DC-HSDPA Subtest-2	21.72	21.67	21.61	22.50
DC-HSDPA Subtest-3	21.27	21.22	21.17	22.50
DC-HSDPA Subtest-4	21.24	21.20	21.14	22.50
HSUPA Subtest-1	21.76	21.72	21.65	22.50
HSUPA Subtest-2	19.83	19.79	19.72	21.50
HSUPA Subtest-3	20.79	20.75	20.68	22.00
HSUPA Subtest-4	19.81	19.77	19.70	21.50
HSUPA Subtest-5	21.75	21.71	21.64	22.50
HSPA+ Subtest-1	19.43	19.38	19.32	21.00



LTE Band 4								
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	Max. Tune-up (dBm)
		Channel		Low CH 20050	Mid CH 20175	High CH 20300		
		Frequency (MHz)		Frequency 1720 MHz	Frequency 1732.5 MHz	Frequency 1745 MHz		
20M	QPSK	1	0	22.71	22.54	22.52	0	24
		1	50	22.67	22.50	22.48	0	24
		1	99	22.46	22.29	22.27	0	24
		50	0	21.77	21.60	21.58	1	23
		50	25	21.68	21.51	21.49	1	23
		50	50	21.57	21.40	21.38	1	23
		100	0	21.64	21.47	21.45	1	23
	16QAM	1	0	22.02	21.85	21.83	1	23
		1	50	21.98	21.81	21.79	1	23
		1	99	21.81	21.64	21.62	1	23
		50	0	20.83	20.66	20.64	2	22
		50	25	20.64	20.47	20.45	2	22
		50	50	20.57	20.40	20.38	2	22
		100	0	20.60	20.43	20.41	2	22
	64QAM	1	0	20.92	20.75	20.73	2	22
		1	50	20.88	20.71	20.69	2	22
		1	99	20.72	20.55	20.53	2	22
		50	0	19.82	19.65	19.63	3	21
		50	25	19.64	19.47	19.45	3	21
		50	50	19.56	19.39	19.37	3	21
		100	0	19.60	19.43	19.41	3	21



Test Report No.: RF200106W008-6

BW	MCS Index	Channel		Low CH 20025	Mid CH 20175	High CH 20325	3GPP MPR	Max. Tune-up
		Frequency (MHz)		Frequency 1717.5 MHz	Frequency 1732.5 MHz	Frequency 1747.5 MHz		
15M	QPSK	1	0	22.70	22.50	22.44	0	24
		1	37	22.63	22.47	22.42	0	24
		1	74	22.44	22.28	22.23	0	24
		36	0	21.71	21.55	21.57	1	23
		36	19	21.67	21.49	21.44	1	23
		36	39	21.49	21.33	21.36	1	23
		75	0	21.63	21.43	21.42	1	23
	16QAM	1	0	21.99	21.84	21.77	1	23
		1	37	21.94	21.76	21.77	1	23
		1	74	21.75	21.62	21.59	1	23
		36	0	20.81	20.58	20.63	2	22
		36	19	20.56	20.43	20.40	2	22
		36	39	20.54	20.34	20.36	2	22
		75	0	20.59	20.38	20.33	2	22
	64QAM	1	0	20.86	20.72	20.69	2	22
		1	37	20.86	20.64	20.64	2	22
		1	74	20.66	20.47	20.51	2	22
		36	0	19.81	19.63	19.55	3	21
		36	19	19.57	19.39	19.39	3	21
		36	39	19.54	19.38	19.33	3	21
		75	0	19.58	19.35	19.40	3	21



Test Report No.: RF200106W008-6

BW	MCS Index	Channel		Low CH 20000	Mid CH 20175	High CH 20350	3GPP MPR	Max. Tune-up
		Frequency (MHz)		Frequency 1715 MHz	Frequency 1732.5 MHz	Frequency 1750 MHz		
10M	QPSK	1	0	22.63	22.50	22.47	0	24
		1	24	22.65	22.42	22.47	0	24
		1	49	22.38	22.25	22.22	0	24
		25	0	21.74	21.54	21.56	1	23
		25	12	21.66	21.44	21.44	1	23
		25	25	21.51	21.32	21.36	1	23
		50	0	21.63	21.45	21.37	1	23
	16QAM	1	0	21.95	21.77	21.77	1	23
		1	24	21.95	21.75	21.77	1	23
		1	49	21.79	21.57	21.57	1	23
		25	0	20.77	20.58	20.62	2	22
		25	12	20.62	20.39	20.44	2	22
		25	25	20.49	20.36	20.33	2	22
		50	0	20.58	20.35	20.40	2	22
	64QAM	1	0	20.84	20.71	20.68	2	22
		1	24	20.85	20.65	20.67	2	22
		1	49	20.70	20.48	20.48	2	22
		25	0	19.76	19.57	19.61	3	21
		25	12	19.63	19.45	19.37	3	21
		25	25	19.51	19.31	19.31	3	21
		50	0	19.59	19.37	19.39	3	21

BW	MCS Index	Channel		Low CH 19975	Mid CH 20175	High CH 20375	3GPP MPR	Max. Tune-up
		Frequency (MHz)		Frequency 1712.5 MHz	Frequency 1732.5 MHz	Frequency 1752.5 MHz		
5M	QPSK	1	0	22.66	22.47	22.47	0	24
		1	12	22.65	22.42	22.46	0	24
		1	24	22.41	22.21	22.26	0	24
		12	0	21.73	21.55	21.53	1	23
		12	6	21.60	21.50	21.44	1	23
		12	13	21.53	21.35	21.37	1	23
		25	0	21.58	21.45	21.40	1	23
	16QAM	1	0	21.95	21.80	21.81	1	23
		1	12	21.90	21.79	21.74	1	23
		1	24	21.79	21.56	21.60	1	23
		12	0	20.75	20.60	20.56	2	22
		12	6	20.58	20.45	20.39	2	22
		12	13	20.50	20.35	20.36	2	22
		25	0	20.54	20.36	20.36	2	22
	64QAM	1	0	20.85	20.70	20.71	2	22
		1	12	20.80	20.69	20.63	2	22
		1	24	20.64	20.54	20.51	2	22
		12	0	19.78	19.60	19.55	3	21
		12	6	19.56	19.46	19.43	3	21
		12	13	19.52	19.34	19.29	3	21
		25	0	19.54	19.41	19.38	3	21

BW	MCS Index	Channel		Low CH 19965	Mid CH 20175	High CH 20385	3GPP MPR	Max. Tune-up
		Frequency (MHz)		Frequency 1711.5 MHz	Frequency 1732.5 MHz	Frequency 1753.5 MHz		
3M	QPSK	1	0	22.65	22.52	22.46	0	24
		1	7	22.60	22.45	22.46	0	24
		1	14	22.40	22.22	22.22	0	24
		8	0	21.70	21.55	21.56	1	23
		8	3	21.60	21.49	21.43	1	23
		8	7	21.49	21.39	21.36	1	23
		15	0	21.60	21.42	21.37	1	23
	16QAM	1	0	21.94	21.84	21.81	1	23
		1	7	21.93	21.76	21.75	1	23
		1	14	21.79	21.56	21.61	1	23
		8	0	20.75	20.62	20.59	2	22
		8	3	20.61	20.41	20.43	2	22
		8	7	20.55	20.33	20.33	2	22
		15	0	20.54	20.35	20.39	2	22
	64QAM	1	0	20.91	20.73	20.65	2	22
		1	7	20.83	20.63	20.63	2	22
		1	14	20.71	20.49	20.51	2	22
		8	0	19.77	19.63	19.56	3	21
		8	3	19.62	19.39	19.44	3	21
		8	7	19.48	19.35	19.32	3	21
		15	0	19.58	19.35	19.40	3	21

BW	MCS Index	Channel		Low CH 19957	Mid CH 20175	High CH 20393	3GPP MPR	Max. Tune-up
		Frequency (MHz)		Frequency 1710.7 MHz	Frequency 1732.5 MHz	Frequency 1754.3 MHz		
1.4M	QPSK	1	0	22.63	22.50	22.47	0	24
		1	2	22.64	22.44	22.46	0	24
		1	5	22.44	22.22	22.22	0	24
		3	0	22.71	22.52	22.56	0	24
		3	1	22.67	22.49	22.41	0	24
		3	3	22.52	22.32	22.32	0	24
	16QAM	6	0	21.63	21.41	21.43	1	23
		1	0	21.97	21.78	21.78	1	23
		1	2	21.96	21.73	21.77	1	23
		1	5	21.76	21.56	21.61	1	23
		3	0	21.79	21.61	21.59	1	23
		3	1	21.56	21.46	21.40	1	23
	64QAM	3	3	21.53	21.35	21.37	1	23
		6	0	20.54	20.41	20.36	2	22
		1	0	20.85	20.70	20.71	2	22
		1	2	20.80	20.69	20.64	2	22
		1	5	20.70	20.47	20.51	2	22
		3	0	20.74	20.59	20.55	2	22
		3	1	20.58	20.45	20.39	2	22
		3	3	20.51	20.31	20.36	2	22
		6	0	19.56	20.38	20.36	3	21



Test Report No.: RF200106W008-6

## EIRP

### WCDMA IV

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
1313	1712.6	22.82	-0.90	21.92	<b>155.60</b>	1
1450	1740.0	22.81	-0.90	21.91	155.24	1
1512	1752.4	22.78	-0.90	21.88	154.17	1

- REMARKS:** 1. EIRP Output Power (dBm) = SPA LVL (dBm) + Correction Factor (dB).  
2. Correction factor (dB) = Free Space Loss + Antenna Factor + Cable Loss

**LTE BAND 4**

**CHANNEL BANDWIDTH: 1.4MHz QPSK**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T-Lc</sub> (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19957	1710.7	22.71	-0.90	21.81	<b>151.71</b>	1
20175	1732.5	22.52	-0.90	21.62	145.21	1
20393	1754.3	22.56	-0.90	21.66	146.55	1

**CHANNEL BANDWIDTH: 1.4MHz 16QAM**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T-Lc</sub> (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19957	1710.7	21.97	-0.90	21.07	127.94	1
20175	1732.5	21.78	-0.90	20.88	122.46	1
20393	1754.3	21.78	-0.90	20.88	122.46	1

**CHANNEL BANDWIDTH: 1.4MHz 64QAM**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T-Lc</sub> (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19957	1710.7	20.85	-0.90	19.95	98.86	1
20175	1732.5	20.70	-0.90	19.80	95.50	1
20393	1754.3	20.71	-0.90	19.81	95.72	1



**CHANNEL BANDWIDTH: 3MHz QPSK**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19965	1711.5	22.65	-0.90	21.75	<b>149.62</b>	1
20175	1732.5	22.52	-0.90	21.62	145.21	1
20385	1753.5	22.46	-0.90	21.56	143.22	1

**CHANNEL BANDWIDTH: 3MHz 16QAM**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19965	1711.5	21.94	-0.90	21.04	127.06	1
20175	1732.5	21.84	-0.90	20.94	124.17	1
20385	1753.5	21.81	-0.90	20.91	123.31	1

**CHANNEL BANDWIDTH: 3MHz 64QAM**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19965	1711.5	20.91	-0.90	20.01	100.23	1
20175	1732.5	20.71	-0.90	19.81	95.72	1
20385	1753.5	20.65	-0.90	19.75	94.41	1

**CHANNEL BANDWIDTH: 5MHz QPSK**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19975	1712.5	22.66	-0.90	21.76	<b>149.97</b>	1
20175	1732.5	22.47	-0.90	21.57	143.55	1
20375	1752.5	22.47	-0.90	21.57	143.65	1

**CHANNEL BANDWIDTH: 5MHz 16QAM**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19975	1712.5	21.95	-0.90	21.05	127.35	1
20175	1732.5	21.80	-0.90	20.90	123.03	1
20375	1752.5	21.81	-0.90	20.91	123.31	1

**CHANNEL BANDWIDTH: 5MHz 64QAM**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
19975	1712.5	20.85	-0.90	19.95	98.86	1
20175	1732.5	20.70	-0.90	19.80	95.50	1
20375	1752.5	20.71	-0.90	19.81	95.72	1

**CHANNEL BANDWIDTH: 10MHz QPSK**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
18650	1715.0	22.65	-0.90	21.75	<b>149.62</b>	1
18900	1732.5	22.50	-0.90	21.60	144.54	1
19150	1750.0	22.47	-0.90	21.57	143.55	1

**CHANNEL BANDWIDTH: 10MHz 16QAM**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20000	1715.0	21.95	-0.90	21.05	127.35	1
20175	1732.5	21.77	-0.90	20.87	122.18	1
20350	1750.0	21.77	-0.90	20.87	122.18	1

**CHANNEL BANDWIDTH: 10MHz 64QAM**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20000	1715.0	20.85	-0.90	19.95	98.86	1
20175	1732.5	20.71	-0.90	19.81	95.72	1
20350	1750.0	20.68	-0.90	19.78	95.06	1

**CHANNEL BANDWIDTH: 15MHz QPSK**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20025	1717.5	22.70	-0.90	21.80	<b>151.36</b>	1
20175	1732.5	22.50	-0.90	21.60	144.54	1
20325	1747.5	22.44	-0.90	21.54	142.56	1

**CHANNEL BANDWIDTH: 15MHz 16QAM**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20025	1717.5	21.99	-0.90	21.09	128.53	1
20175	1732.5	21.84	-0.90	20.94	124.17	1
20325	1747.5	21.77	-0.90	20.87	122.18	1

**CHANNEL BANDWIDTH: 15MHz 64QAM**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20025	1717.5	20.86	-0.90	19.96	99.08	1
20175	1732.5	20.72	-0.90	19.82	95.94	1
20325	1747.5	20.69	-0.90	19.79	95.28	1

**CHANNEL BANDWIDTH: 20MHz QPSK**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20050	1720.0	22.71	-0.90	21.81	<b>151.71</b>	1
20175	1732.5	22.54	-0.90	21.64	145.88	1
20300	1745.0	22.52	-0.90	21.62	145.21	1

**CHANNEL BANDWIDTH: 20MHz 16QAM**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20050	1720.0	22.02	-0.90	21.12	129.42	1
20175	1732.5	21.85	-0.90	20.95	124.45	1
20300	1745.0	21.83	-0.90	20.93	123.88	1

**CHANNEL BANDWIDTH: 20MHz 64QAM**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	EIRP (dBm)	EIRP (mW)	Limit (W)
20050	1720.0	20.92	-0.90	20.02	100.46	1
20175	1732.5	20.75	-0.90	19.85	96.61	1
20300	1745.0	20.73	-0.90	19.83	96.16	1

**REMARKS:** 1. EIRP Output Power (dBm) = SPA LVL (dBm) + Correction Factor (dB).  
 2. Correction factor (dB) = Free Space Loss + Antenna Factor + Cable Loss

### 3.2 FREQUENCY STABILITY MEASUREMENT

#### 3.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

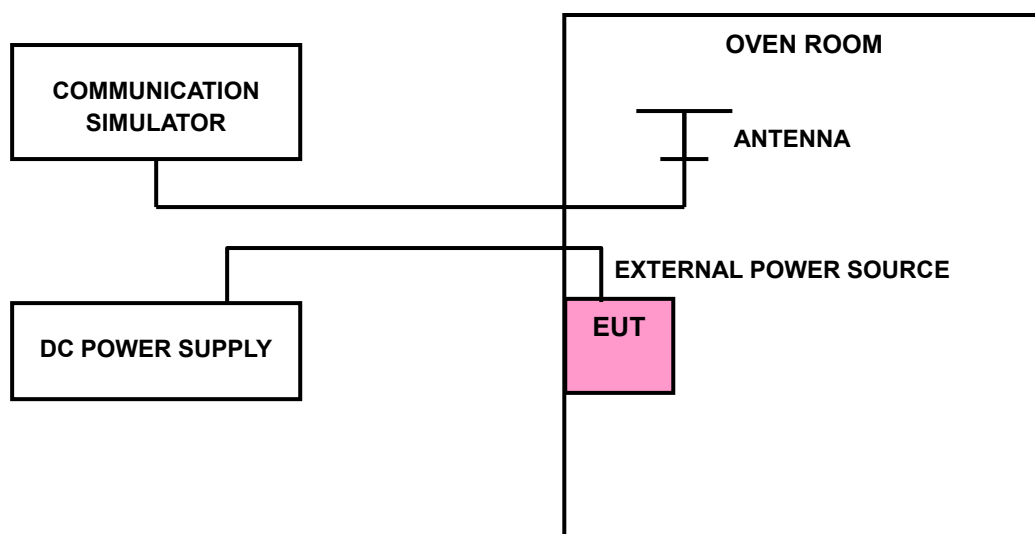
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

#### 3.2.2 TEST PROCEDURE

- a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the  $\pm 0.5^{\circ}\text{C}$  during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

**NOTE:** The frequency error was recorded frequency error from the communication simulator.

#### 3.2.3 TEST SETUP



### 3.2.4 TEST RESULTS

#### WCDMA BAND IV

##### FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
V <sub>nor</sub>	0.0021	0.0021	2.5
V <sub>min</sub>	-0.0025	-0.0021	2.5
V <sub>max</sub>	0.0025	0.0021	2.5

**NOTE:** The applicant defined the normal working voltage of the battery is from V<sub>min</sub> to V<sub>dcc</sub>.

##### FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
-30	-0.0119	-0.0120	2.5
-20	-0.0101	-0.0107	2.5
-10	-0.0085	-0.0080	2.5
0	-0.0078	-0.0074	2.5
10	-0.0053	-0.0048	2.5
20	-0.0040	-0.0039	2.5
30	-0.0040	-0.0029	2.5
40	-0.0015	-0.0015	2.5
50	-0.0004	-0.0005	2.5

**LTE BAND 4**

**FREQUENCY ERROR VS. VOLTAGE**

VOLTAGE (Volts)	1.4MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V <sub>nor</sub>	0.0020	0.0024	2.5
V <sub>min</sub>	-0.0031	-0.0030	2.5
V <sub>max</sub>	0.0021	0.0021	2.5

**NOTE:** The applicant defined the normal working voltage of the battery is from V<sub>min</sub> to V<sub>dc</sub>.

**FREQUENCY ERROR vs. TEMPERATURE.**

TEMP. (°C)	1.4MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0120	-0.0119	2.5
-20	-0.0103	-0.0106	2.5
-10	-0.0084	-0.0080	2.5
0	-0.0078	-0.0073	2.5
10	-0.0049	-0.0053	2.5
20	-0.0039	-0.0040	2.5
30	-0.0034	-0.0039	2.5
40	-0.0019	-0.0022	2.5
50	-0.0002	-0.0004	2.5



**FREQUENCY ERROR VS. VOLTAGE**

VOLTAGE (Volts)	3MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V <sub>nor</sub>	0.0021	0.0021	2.5
V <sub>min</sub>	-0.0021	-0.0025	2.5
V <sub>max</sub>	0.0018	0.0018	2.5

**NOTE:** The applicant defined the normal working voltage of the battery is from V<sub>min</sub> to V<sub>dc</sub>.

**FREQUENCY ERROR vs. TEMPERATURE.**

TEMP. (°C)	3MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0121	-0.0113	2.5
-20	-0.0108	-0.0103	2.5
-10	-0.0085	-0.0080	2.5
0	-0.0077	-0.0075	2.5
10	-0.0053	-0.0052	2.5
20	-0.0043	-0.0040	2.5
30	-0.0038	-0.0034	2.5
40	-0.0020	-0.0019	2.5
50	-0.0005	-0.0005	2.5

**FREQUENCY ERROR VS. VOLTAGE**

VOLTAGE (Volts)	5MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V <sub>nor</sub>	0.0021	0.0024	2.5
V <sub>min</sub>	-0.0023	-0.0030	2.5
V <sub>max</sub>	0.0021	0.0021	2.5

**NOTE:** The applicant defined the normal working voltage of the battery is from V<sub>min</sub> to V<sub>dcc</sub>.

**FREQUENCY ERROR vs. TEMPERATURE.**

TEMP. (°C)	5MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0114	-0.0111	2.5
-20	-0.0107	-0.0106	2.5
-10	-0.0082	-0.0080	2.5
0	-0.0077	-0.0073	2.5
10	-0.0046	-0.0053	2.5
20	-0.0043	-0.0037	2.5
30	-0.0029	-0.0025	2.5
40	-0.0018	-0.0020	2.5
50	-0.0005	-0.0005	2.5

**FREQUENCY ERROR VS. VOLTAGE**

VOLTAGE (Volts)	10MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V <sub>nor</sub>	0.0024	0.0023	2.5
V <sub>min</sub>	-0.0030	-0.0031	2.5
V <sub>max</sub>	0.0025	0.0025	2.5

**NOTE:** The applicant defined the normal working voltage of the battery is from V<sub>min</sub> to V<sub>dc</sub>.

**FREQUENCY ERROR vs. TEMPERATURE.**

TEMP. (°C)	10MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0117	-0.0118	2.5
-20	-0.0101	-0.0107	2.5
-10	-0.0086	-0.0081	2.5
0	-0.0075	-0.0073	2.5
10	-0.0049	-0.0047	2.5
20	-0.0044	-0.0042	2.5
30	-0.0036	-0.0028	2.5
40	-0.0016	-0.0019	2.5
50	-0.0002	-0.0006	2.5

**FREQUENCY ERROR VS. VOLTAGE**

VOLTAGE (Volts)	15MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V <sub>nor</sub>	0.0026	0.0023	2.5
V <sub>min</sub>	-0.0031	-0.0030	2.5
V <sub>max</sub>	0.0024	0.0026	2.5

**NOTE:** The applicant defined the normal working voltage of the battery is from V<sub>min</sub> to V<sub>dc</sub>.

**FREQUENCY ERROR vs. TEMPERATURE.**

TEMP. (°C)	15MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0121	-0.0115	2.5
-20	-0.0098	-0.0099	2.5
-10	-0.0081	-0.0080	2.5
0	-0.0076	-0.0075	2.5
10	-0.0053	-0.0050	2.5
20	-0.0039	-0.0040	2.5
30	-0.0029	-0.0039	2.5
40	-0.0020	-0.0016	2.5
50	-0.0006	-0.0003	2.5

**FREQUENCY ERROR VS. VOLTAGE**

VOLTAGE (Volts)	20MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V <sub>nor</sub>	0.0025	0.0025	2.5
V <sub>min</sub>	-0.0031	-0.0030	2.5
V <sub>max</sub>	0.0026	0.0023	2.5

**NOTE:** The applicant defined the normal working voltage of the battery is from V<sub>min</sub> to V<sub>dc</sub>.

**FREQUENCY ERROR vs. TEMPERATURE.**

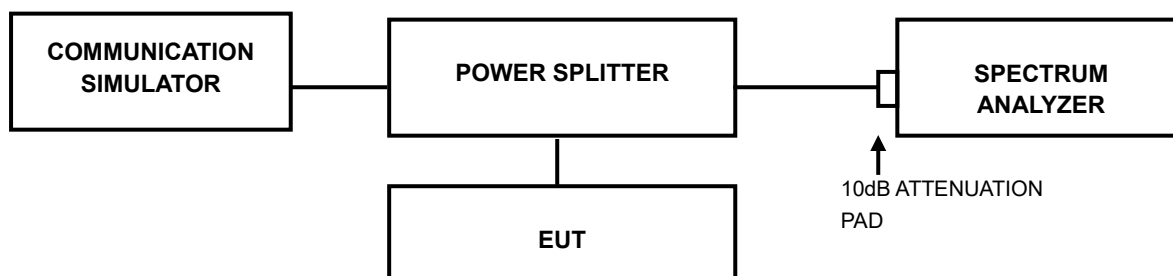
TEMP. (°C)	20MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0115	-0.0116	2.5
-20	-0.0108	-0.0096	2.5
-10	-0.0082	-0.0081	2.5
0	-0.0075	-0.0076	2.5
10	-0.0046	-0.0054	2.5
20	-0.0042	-0.0042	2.5
30	-0.0033	-0.0024	2.5
40	-0.0022	-0.0017	2.5
50	-0.0005	-0.0002	2.5

### 3.3 OCCUPIED BANDWIDTH MEASUREMENT

#### 3.3.1 LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

#### 3.3.2 TEST SETUP



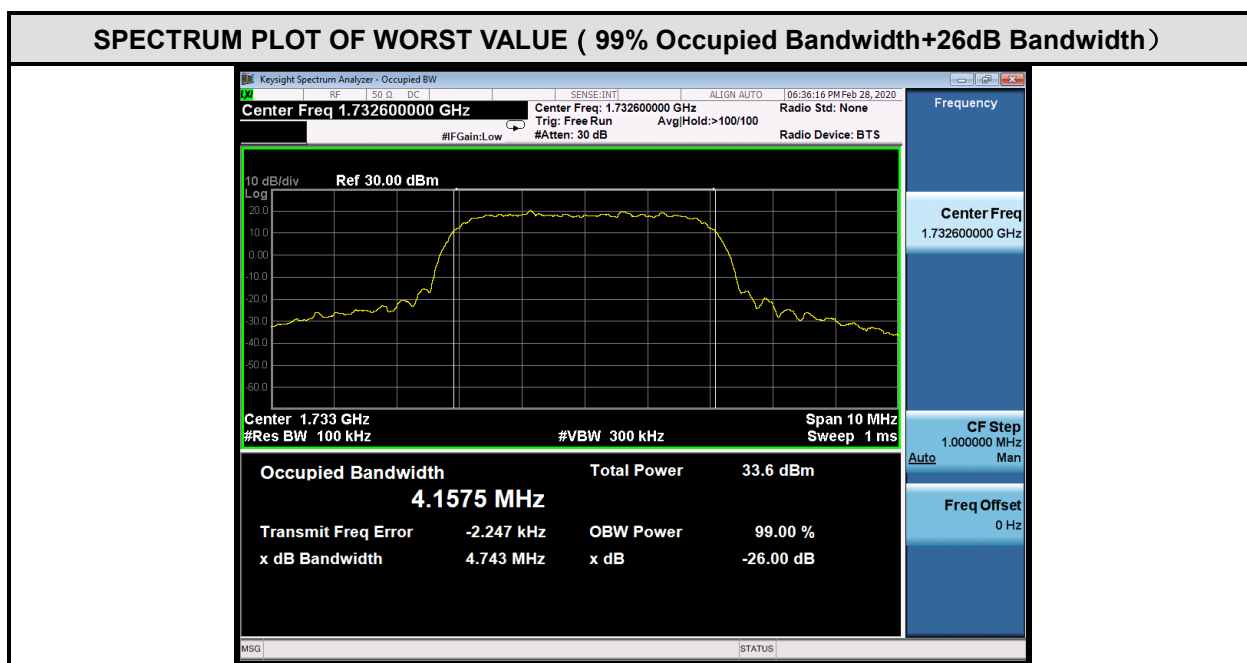
#### 3.3.3 TEST PROCEDURES

- The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

### 3.3.4 TEST RESULTS

#### WCDMA BAND IV

Channel	FREQ. (MHz)	99% Occupied Bandwidth (MHz)	Channel	FREQ. (MHz)	26dB Bandwidth (MHz)
		WCDMA			WCDMA
1312	1712.40	4.1523	1312	1712.40	4.739
1413	1732.60	4.1575	1413	1732.60	4.743
1513	1752.60	4.1533	1513	1752.60	4.751



**LTE BAND 4**

CHANNEL BANDWIDTH: 1.4MHz				
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)		
		QPSK	16QAM	64QAM
19957	1710.7	1.08	1.08	1.08
20175	1732.5	1.08	1.09	1.09
20393	1754.3	1.09	1.09	1.09
CHANNEL	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
19957	1710.7	1.22	1.22	1.21
20175	1732.5	1.23	1.23	1.23
20393	1754.3	1.23	1.23	1.23





**LTE BAND 4**

CHANNEL BANDWIDTH: 3MHz				
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)		
		QPSK	16QAM	64QAM
19965	1711.5	2.68	2.68	2.68
20175	1732.5	2.69	2.68	2.68
20385	1753.5	2.69	2.68	2.68
CHANNEL	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
19965	1711.5	2.91	2.96	2.95
20175	1732.5	2.96	2.95	2.95
20385	1753.5	2.96	2.95	2.92



**LTE BAND 4**

CHANNEL BANDWIDTH: 5MHz				
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)		
		QPSK	16QAM	64QAM
19975	1712.5	4.49	4.48	4.46
20175	1732.5	4.48	4.48	4.46
20375	1752.5	4.47	4.48	4.47
CHANNEL	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
19975	1712.5	4.91	4.89	4.88
20175	1732.5	4.89	4.89	4.86
20375	1752.5	4.86	4.89	4.89



**LTE BAND 4**

CHANNEL BANDWIDTH: 10MHz				
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)		
		QPSK	16QAM	64QAM
20000	1715	8.96	8.95	8.96
20175	1732.5	8.95	8.96	8.95
20350	1750	8.95	8.95	8.95
CHANNEL	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
20000	1715	9.66	9.66	9.66
20175	1732.5	9.73	9.67	9.71
20350	1750	9.78	9.62	9.64



**LTE BAND 4**

CHANNEL BANDWIDTH: 15MHz				
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)		
		QPSK	16QAM	64QAM
20025	1717.5	13.35	13.39	13.37
20175	1732.5	13.39	13.39	13.38
20325	1747.5	13.38	13.38	13.36
CHANNEL	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
20025	1717.5	14.40	14.36	14.37
20175	1732.5	14.44	14.41	14.32
20325	1747.5	14.56	14.44	14.40



**LTE BAND 4**

CHANNEL BANDWIDTH: 20MHz				
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)		
		QPSK	16QAM	64QAM
20050	1720	17.87	17.87	17.91
20175	1732.5	17.88	17.94	17.93
20300	1745	17.90	17.89	17.90
CHANNEL	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
20050	1720	19.34	19.28	19.15
20175	1732.5	19.12	19.24	19.08
20300	1745	19.25	19.23	19.12

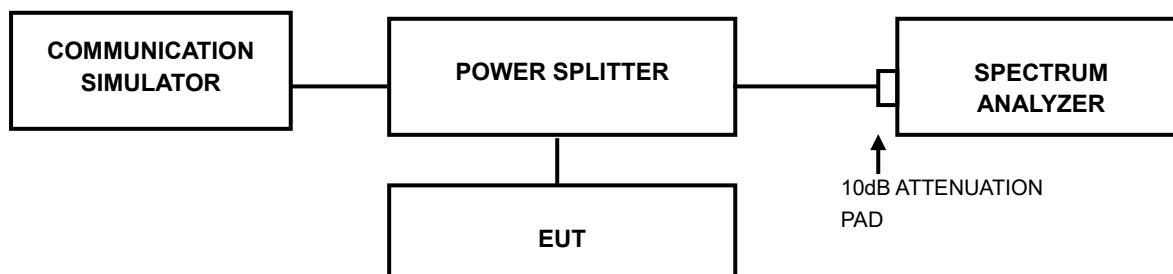


### 3.4 PEAK TO AVERAGE RATIO

#### 3.4.1 LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT

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

#### 3.4.2 TEST SETUP



#### 3.4.3 TEST PROCEDURES

1. Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

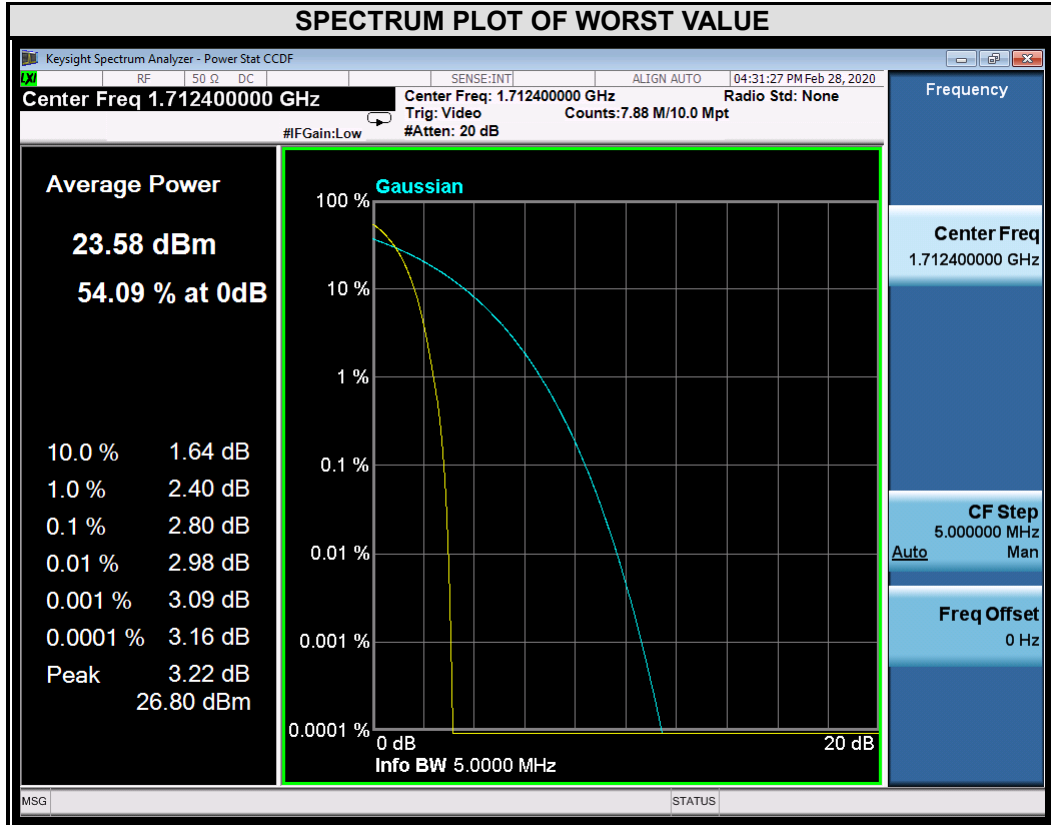


Test Report No.: RF200106W008-6

### 3.4.4 TEST RESULTS

#### WCDMA Band IV

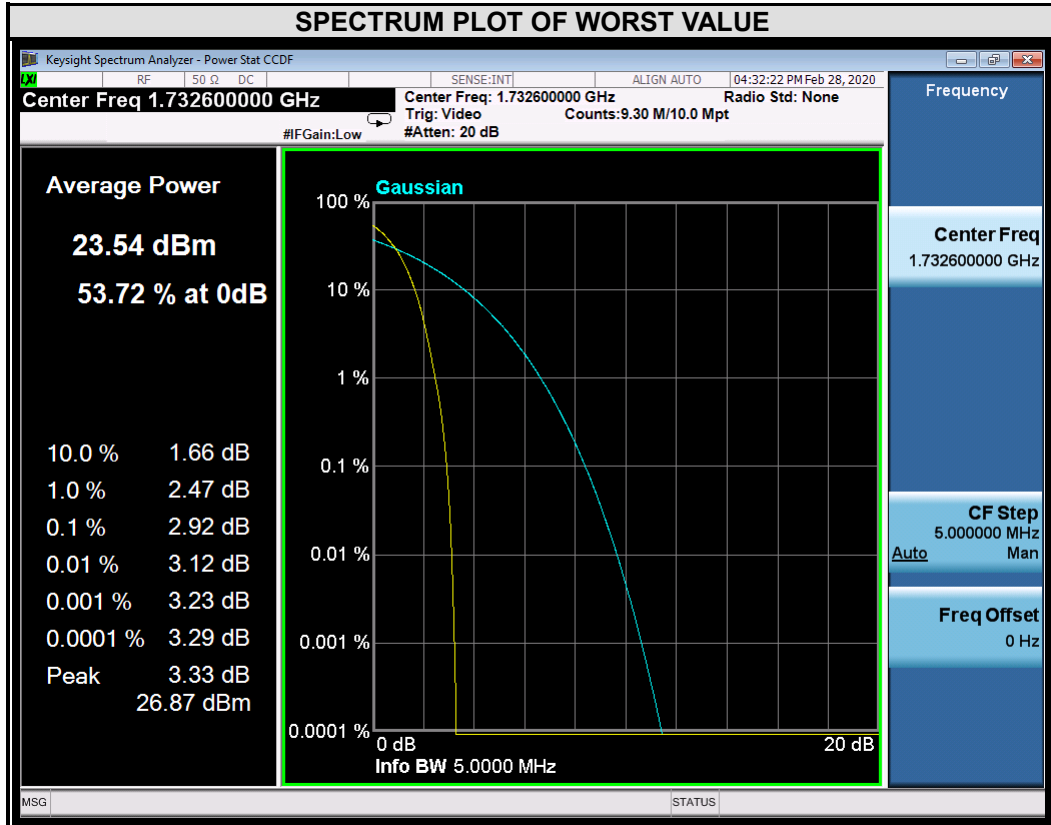
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
1312	1712.4	2.80





Test Report No.: RF200106W008-6

CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
1413	1732.6	2.92

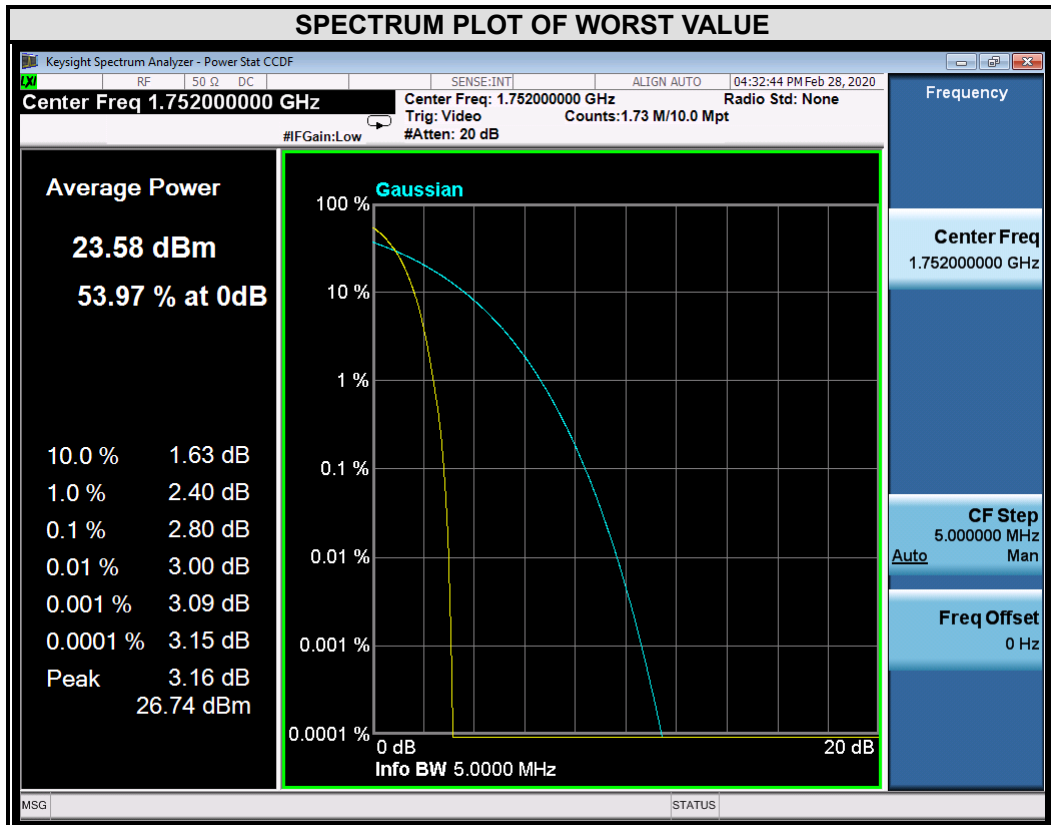






Test Report No.: RF200106W008-6

CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
1513	1752.6	2.80

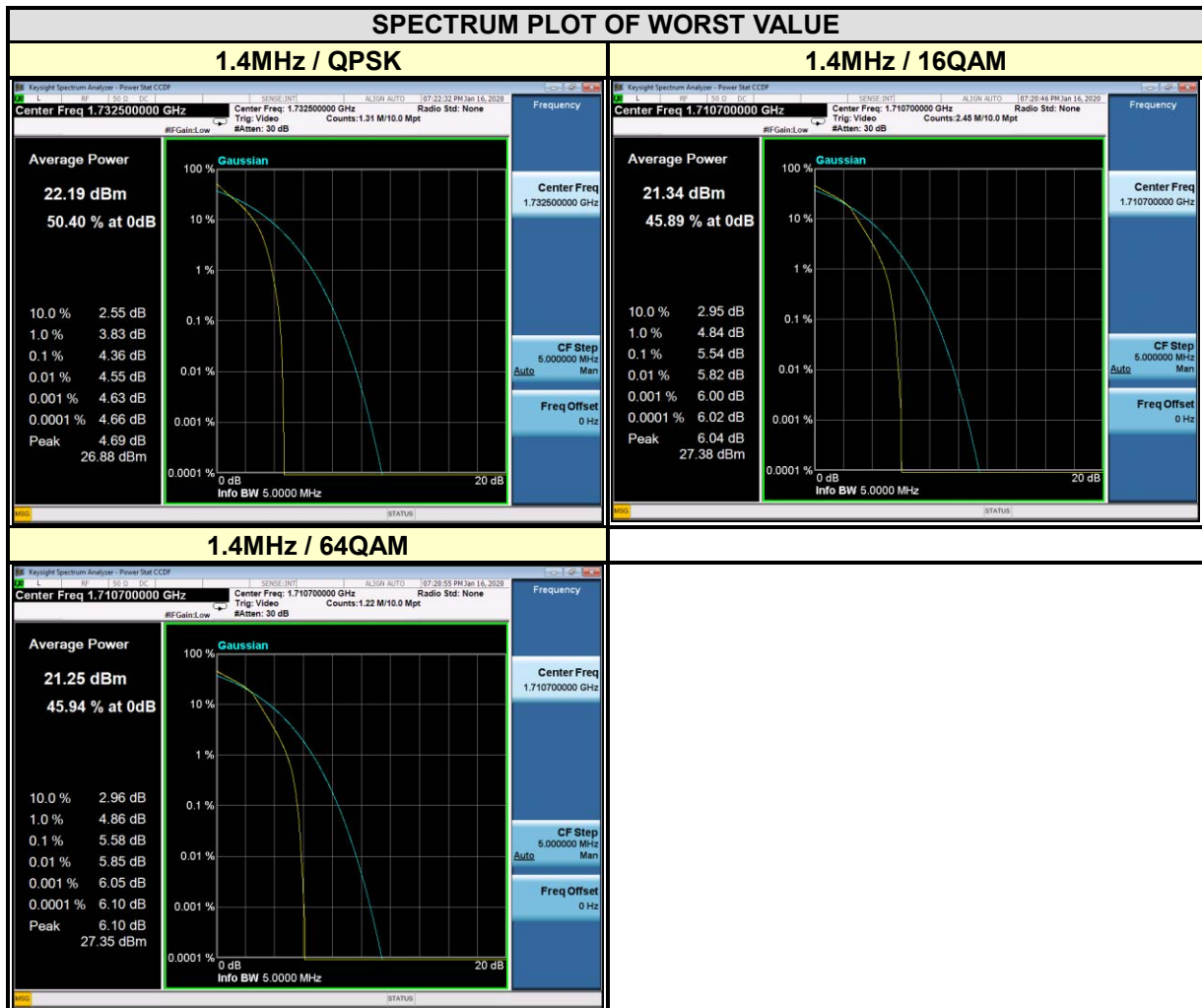




Test Report No.: RF200106W008-6

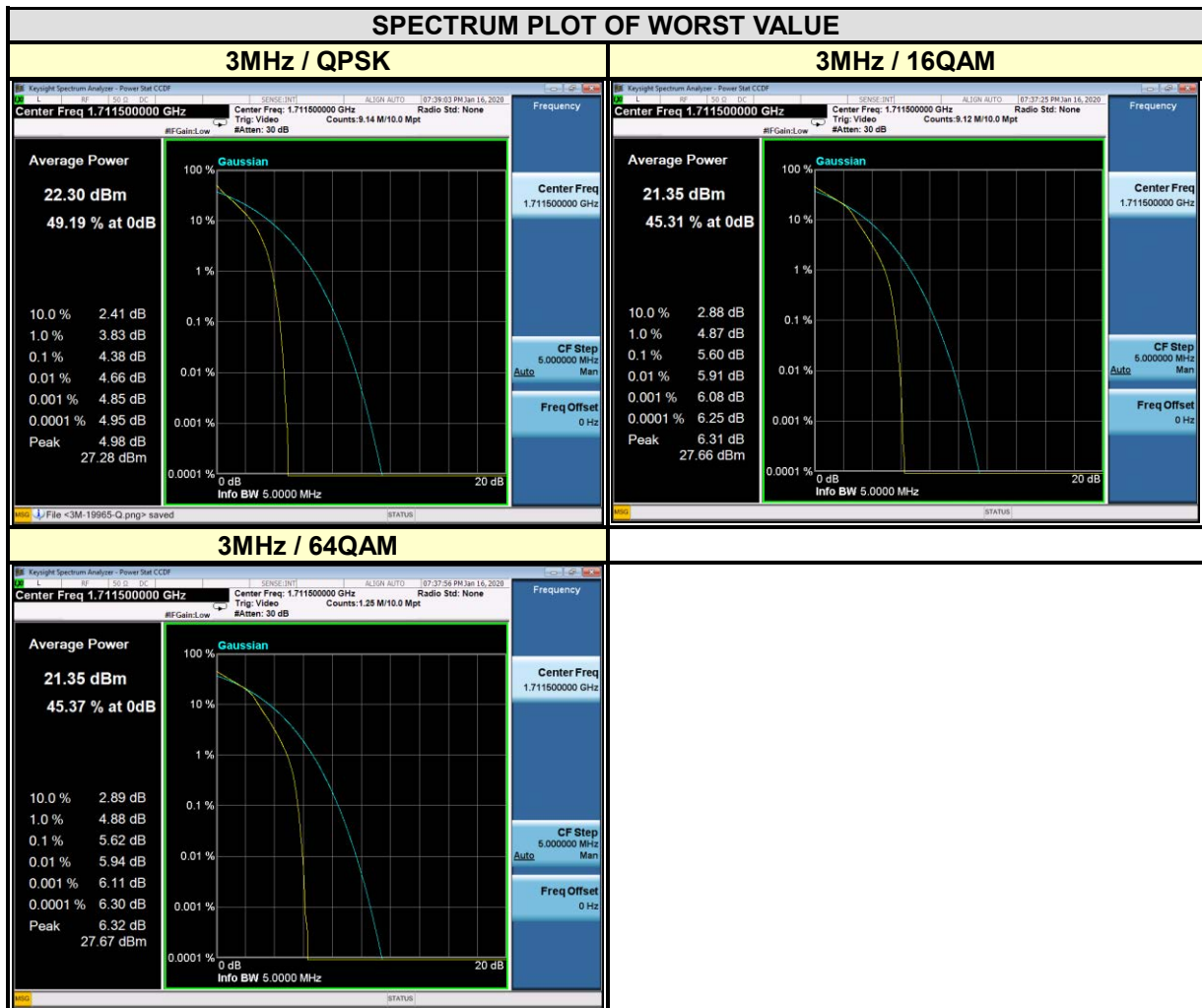
LTE BAND 4

CHANNEL BANDWIDTH: 1.4MHz				
CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)		
		QPSK	16QAM	64QAM
19957	1710.7	4.41	5.54	5.58
20175	1732.5	4.36	5.47	5.47
20393	1754.3	4.18	5.25	5.28



**LTE BAND 4**

CHANNEL BANDWIDTH: 3MHz				
CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)		
		QPSK	16QAM	64QAM
19965	1711.5	4.38	5.60	5.62
20175	1732.5	4.28	5.50	5.54
20385	1753.5	4.17	5.33	5.34

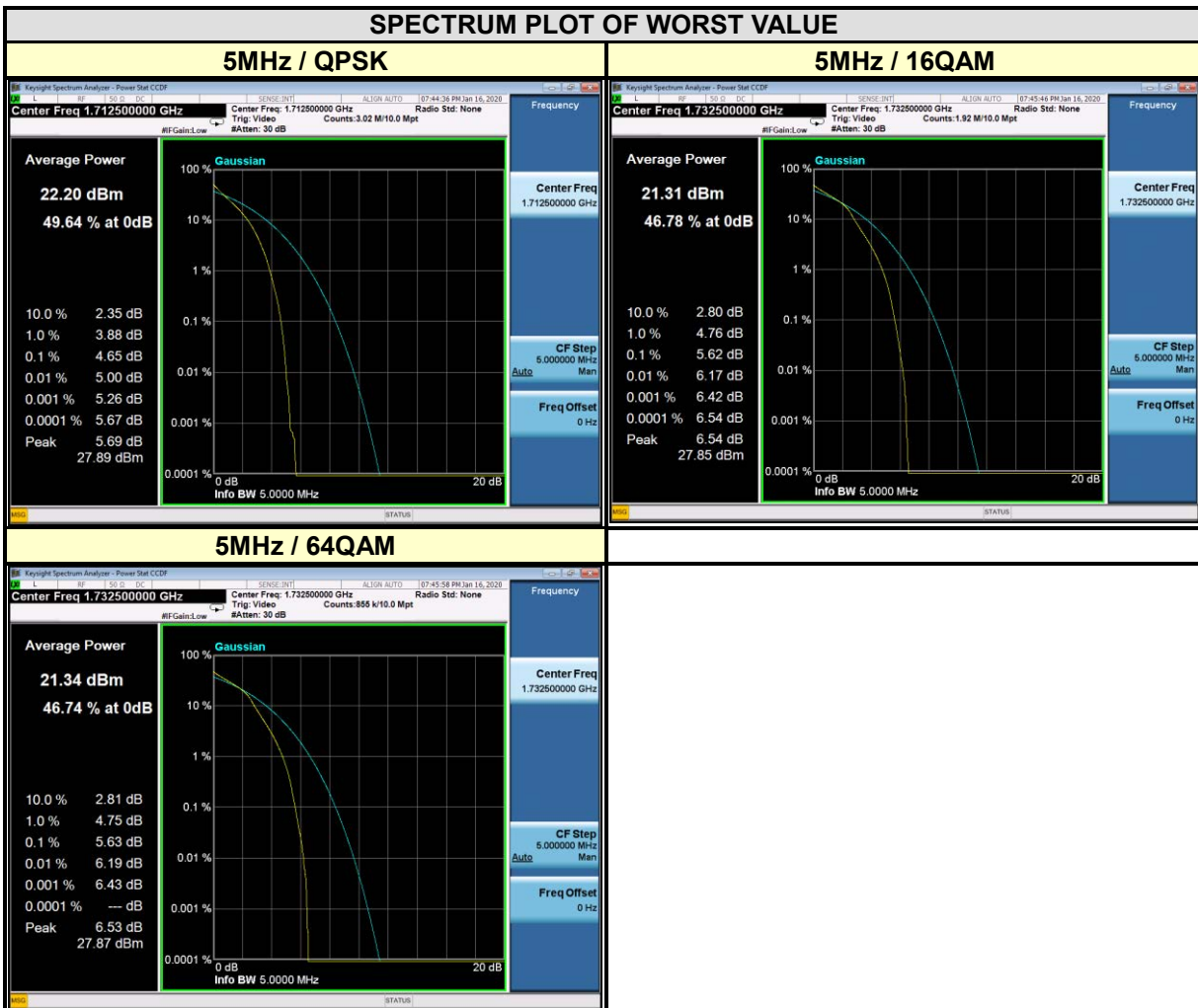




**BUREAU  
VERITAS**

Test Report No.: RF200106W008-6

CHANNEL BANDWIDTH: 5MHz				
CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)		
		QPSK	16QAM	64QAM
19975	1712.5	4.65	5.54	5.53
20175	1732.5	4.57	5.62	5.63
20375	1752.5	4.46	5.51	5.50

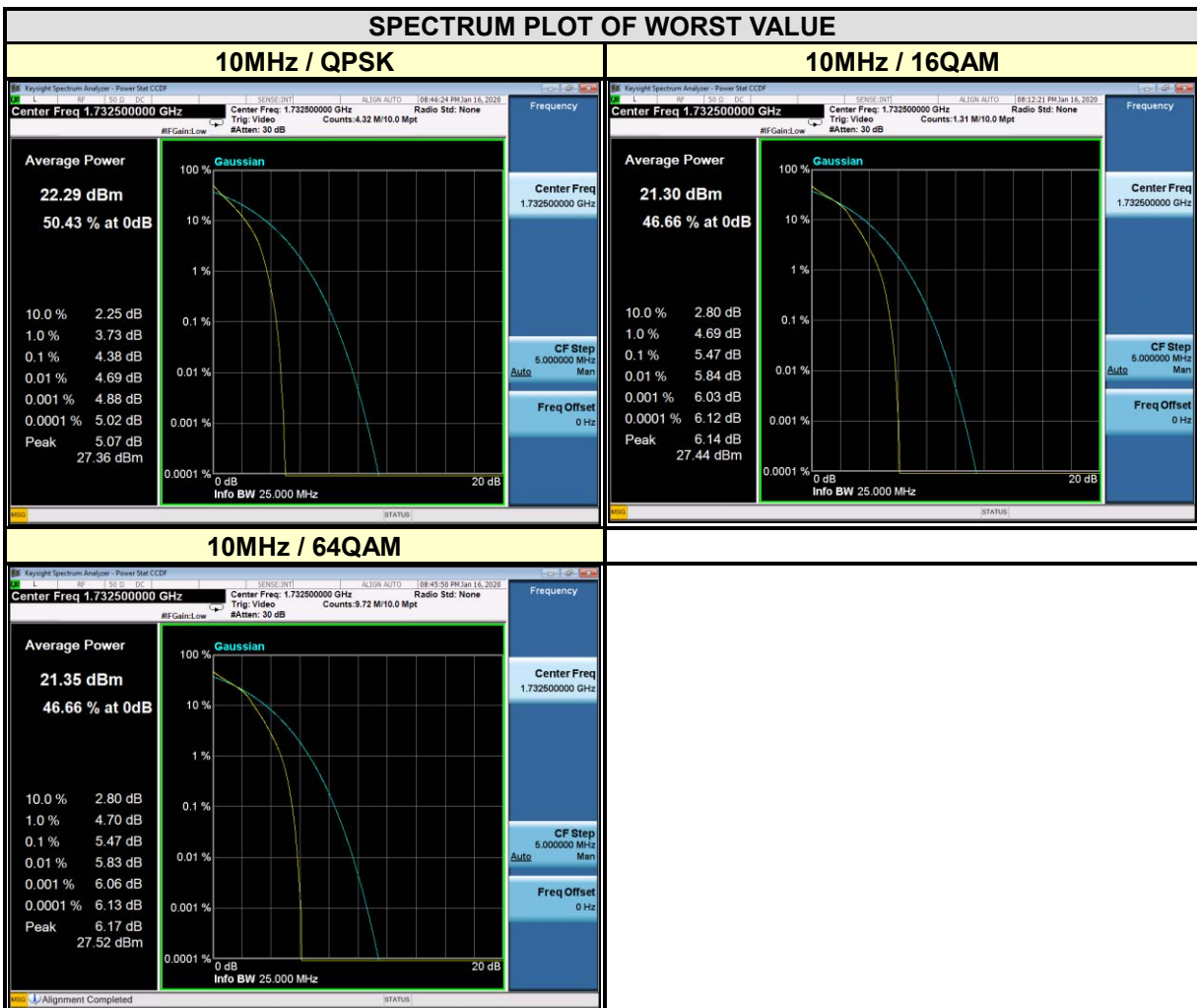




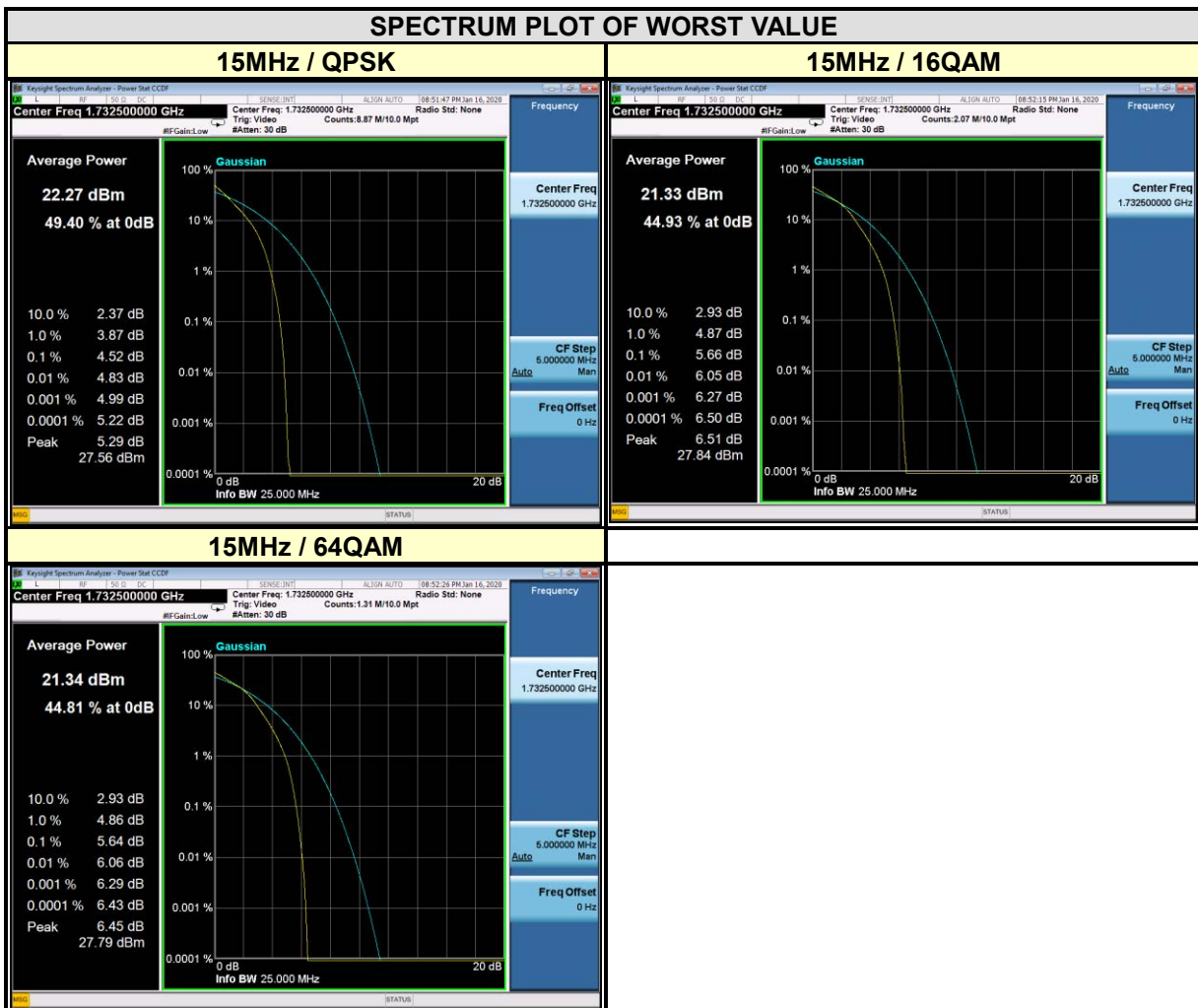
**BUREAU  
VERITAS**

Test Report No.: RF200106W008-6

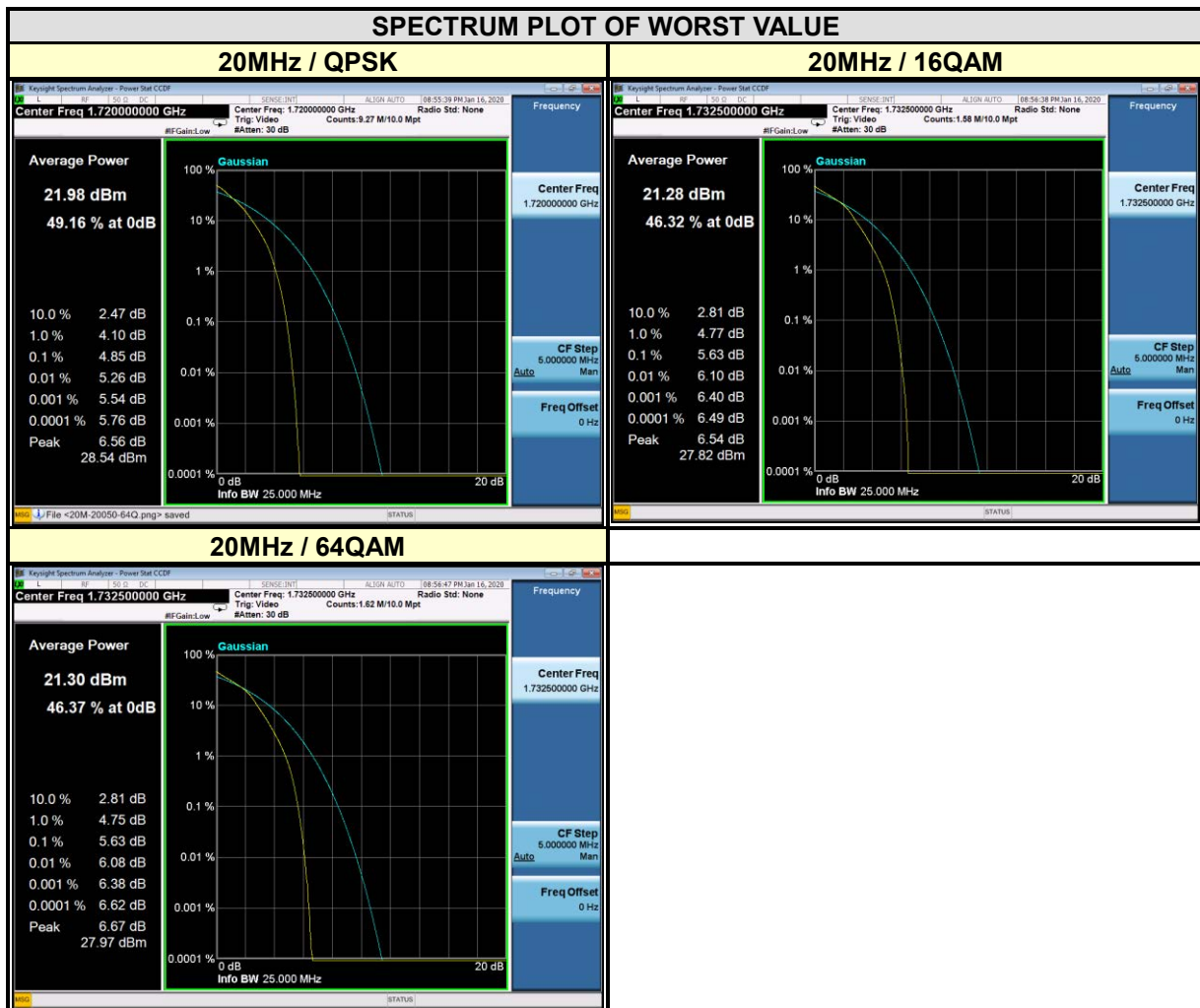
CHANNEL BANDWIDTH: 10MHz				
CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)		
		QPSK	16QAM	64QAM
20000	1715	4.19	5.27	5.28
20175	1732.5	4.38	5.47	5.47
20350	1750	4.30	5.32	5.31



CHANNEL BANDWIDTH: 15MHz				
CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)		
		QPSK	16QAM	64QAM
20025	1717.5	4.41	5.50	5.50
20175	1732.5	4.52	5.66	5.64
20325	1747.5	4.47	5.57	5.58



CHANNEL BANDWIDTH: 20MHz				
CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)		
		QPSK	16QAM	64QAM
20050	1720	4.85	5.49	5.50
20175	1732.5	4.53	5.63	5.63
20300	1745	4.50	5.59	5.60



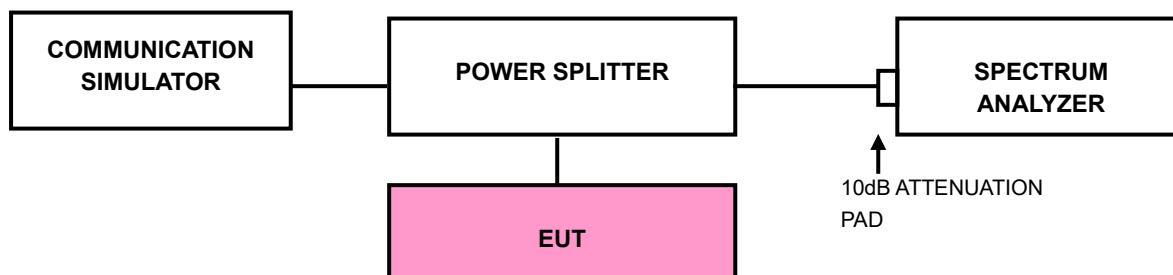
### 3.5 BAND EDGE MEASUREMENT

#### 3.5.1 LIMITS OF BAND EDGE MEASUREMENT

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.

#### 3.5.2 TEST SETUP







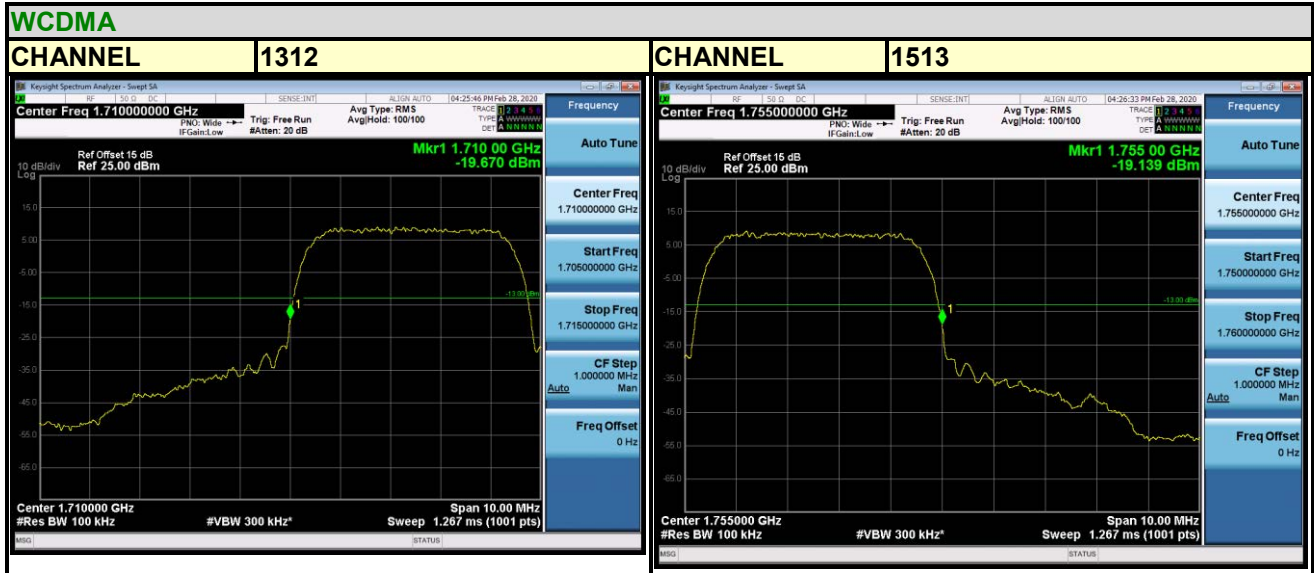
### 3.5.3 TEST PROCEDURES

- a. The EUT was set up for the maximum peak power with LTE link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 2 channels (low and high operational frequency range.).
- b. The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- c. The center frequency of spectrum is the band edge frequency and span is 10MHz. RBW of the spectrum is 100kHz and VBW of the spectrum is 300kHz (WCDMA).
- d. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 20kHz and VBW of the spectrum is 100 kHz. (LTE bandwidth 1.4MHz)
- e. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 30kHz and VBW of the spectrum is 100kHz. (LTE bandwidth 3MHz)
- f. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 50kHz and VBW of the spectrum is 200kHz. (LTE bandwidth 5MHz)
- g. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 100kHz and VBW of the spectrum is 300kHz. (LTE bandwidth 10MHz)
- h. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 200kHz and VBW of the spectrum is 1MHz. (LTE bandwidth 15MHz)
- i. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 200kHz and VBW of the spectrum is 1MHz. (LTE bandwidth 20MHz)
- j. Record the max trace plot into the test report.



### 3.5.4 TEST RESULTS

#### WCDMA BAND 4





LTE BAND 4





**Channel Bandwidth: 1.4MHz 16QAM**

