

# FCC TEST REPORT

## (PART 24)



Applicant:	Xiaomi Communications Co., Ltd.
Address:	The Rainbow City of China Resources, NO.68, Qinghe Middle Street, Haidian District, Beijing, China

Manufacturer or Supplier	Xiaomi Communications Co., Ltd.
Address	The Rainbow City of China Resources, NO.68, Qinghe Middle Street, Haidian District, Beijing, China
Product	Mobile Phone
Brand Name	XIAOMI
Model Name	M1904F3BG
FCC ID	2AFZZF3BG
Date of tests	Jul 13, 2019 ~ Aug 07, 2019

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

☒ **FCC PART 24, Subpart E**    ☒ **FCC PART 2**  
☒ **ANSI/TIA/EIA-603-D**    ☒ **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: Aug 08, 2019	 Date: Aug 08, 2019

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## TABLE OF CONTENTS

<b>RELEASE CONTROL RECORD .....</b>	<b>4</b>
<b>1 SUMMARY OF TEST RESULTS .....</b>	<b>5</b>
1.1 MEASUREMENT UNCERTAINTY .....	5
1.2 TEST SITE AND INSTRUMENTS .....	6
<b>2 GENERAL INFORMATION .....</b>	<b>7</b>
2.1 GENERAL DESCRIPTION OF EUT .....	7
2.2 CONFIGURATION OF SYSTEM UNDER TEST .....	10
2.3 DESCRIPTION OF SUPPORT UNITS .....	11
2.4 TEST ITEM AND TEST CONFIGURATION .....	11
2.5 EUT OPERATING CONDITIONS .....	14
2.6 GENERAL DESCRIPTION OF APPLIED STANDARDS .....	14
<b>3 TEST TYPES AND RESULTS .....</b>	<b>15</b>
3.1 OUTPUT POWER MEASUREMENT .....	15
3.1.1 LIMITS OF OUTPUT POWER MEASUREMENT .....	15
3.1.2 TEST PROCEDURES .....	15
3.1.3 TEST SETUP .....	16
3.1.4 TEST RESULTS .....	18
3.2 FREQUENCY STABILITY MEASUREMENT .....	39
3.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT .....	39
3.2.2 TEST PROCEDURE .....	39
3.2.3 TEST SETUP .....	39
3.2.4 TEST RESULTS .....	40
3.3 OCCUPIED BANDWIDTH MEASUREMENT .....	49
3.3.1 TEST PROCEDURES .....	49
3.3.2 TEST SETUP .....	49
3.3.3 TEST RESULTS .....	50
3.4 BAND EDGE MEASUREMENT .....	64
3.4.1 LIMITS OF BAND EDGE MEASUREMENT .....	64
3.4.2 TEST SETUP .....	64
3.4.3 TEST PROCEDURES .....	65
3.4.4 TEST RESULTS .....	66
3.5 CONDUCTED SPURIOUS EMISSIONS .....	85
3.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT .....	85
3.5.2 TEST PROCEDURE .....	85
3.5.3 TEST SETUP .....	85
3.5.4 TEST RESULTS .....	86
3.6 RADIATED EMISSION MEASUREMENT .....	95
3.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT .....	95
3.6.2 TEST PROCEDURES .....	95
3.6.3 DEVIATION FROM TEST STANDARD .....	95
3.6.4 TEST SETUP .....	96
3.6.5 TEST RESULTS .....	97
3.7 PEAK TO AVERAGE RATIO .....	169
3.7.1 LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT .....	169
3.7.2 TEST SETUP .....	169
3.7.3 TEST PROCEDURES .....	169
3.7.4 TEST RESULTS .....	170



Test Report No.: RF190712W002-4

4 INFORMATION ON THE TESTING LABORATORIES..... 185

5 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT  
BY THE LAB ..... 186



Test Report No.: RF190712W002-4

## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF190712W002-4	Original release	Aug 08, 2019

## 1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 24 & Part 2			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
2.1046 24.232	Equivalent Isotropic Radiated Power	PASS	Meet the requirement of limit.
2.1055 24.235	Frequency Stability	PASS	Meet the requirement of limit.
2.1049 24.238(b)	Occupied Bandwidth	PASS	Meet the requirement of limit.
24.232(d)	Peak to average ratio	PASS	Meet the requirement of limit.
24.238(b)	Band Edge Measurements	PASS	Meet the requirement of limit.
2.1051 24.238	Conducted Spurious Emissions	PASS	Meet the requirement of limit.
2.1053 24.238	Radiated Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -13.27dB at 42.150MHz.

### 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	$\pm 76.97\text{Hz}$
Radiated emissions & Radiated Power (30MHz~1GMHz)	$\pm 4.98\text{dB}$
Radiated emissions & Radiated Power (1GMHz ~6GMHz)	$\pm 4.70\text{dB}$
Radiated emissions (6GMHz ~18GMHz)	$\pm 4.60\text{dB}$
Radiated emissions (18GMHz ~40GMHz)	$\pm 4.12\text{dB}$
Conducted emissions	$\pm 4.01\text{dB}$
Occupied Channel Bandwidth	$\pm 43.58\text{KHz}$
Conducted Output power	$\pm 2.06\text{dB}$
Band Edge Measurements	$\pm 4.70\text{dB}$
Peak to average ratio	$\pm 0.76\text{dB}$

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



## 1.2 TEST SITE AND INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Feb. 26,19	Feb. 25,20
EXA Signal Analyzer	KEYSIGHT	N9010A-526	MY54510322	Feb. 26,19	Feb. 25,20
Bilog Antenna	ETS-LINDGREN	3143B	00161965	Feb. 26,19	Feb. 25,20
Horn Antenna (1GHz-18GHz)	ETS-LINDGREN	3117	00168692	Nov. 30, 18	Nov. 29, 19
Horn Antenna (18GHz-40GHz)	N/A	QWH-SL-18-40 -K-SG/QMS-00 361	15433	Nov. 21, 18	Nov. 20, 19
Radio Communication Analyzer	ANRITSU	MT8820C	6201465426	Feb. 26,19	Feb. 25,20
Signal Pre-Amplifier	EMSI	EMC 9135	980249	Jun. 24,19	Jun. 23,20
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	Jun. 24,19	Jun. 23,20
Signal Pre-Amplifier	EMSI	EMC 184045B	980259	Jun. 24,19	Jun. 23,20
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	Euroshieldpn- CT0001143-1216	Feb. 26,19	Feb. 25,20
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	Jun. 24,19	Jun. 23,20
Power Meter	Anritsu	ML2495A	1506002	Feb. 26,19	Feb. 25,20
Power Sensor	Anritsu	MA2411B	1339352	Feb. 26,19	Feb. 25,20
Humid & Temp Programmable Tester	Juyi	ITH-120-45-CP -AR	IAA1504-001	Jun. 24,19	Jun. 23,20
MXG Analog Microwave Signal Generator	KEYSIGHT	N5183A	MY50143024	Feb. 26,19	Feb. 25,20
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>	XIAOMI	
<b>MODEL NAME</b>	M1904F3BG	
<b>POWER SUPPLY</b>	5V/9V/12Vdc (adapter or host equipment) 3.85Vdc (Li-ion, battery) $V_{min}=3.6V$ , $V_{nor}=3.85V$ , $V_{max}=4.4V$	
<b>MODULATION TYPE</b>	<b>GSM, GPRS:</b> GMSK <b>EDGE:</b> 8PSK <b>WCDMA :</b> BPSK, QPSK <b>LTE Band 2:</b> QPSK, 16QAM, 64QAM	
<b>FREQUENCY RANGE</b>	<b>GSM, GPRS, EDGE</b>	1850.2MHz ~ 1909.8MHz
	<b>WCDMA</b>	1852.4MHz ~ 1907.6MHz
	<b>LTE Band 2</b> <b>Channel Bandwidth: 1.4MHz</b>	1850.7MHz ~ 1909.3MHz
	<b>LTE Band 2</b> <b>Channel Bandwidth: 3MHz</b>	1851.5MHz ~ 1908.5MHz
	<b>LTE Band 2</b> <b>Channel Bandwidth: 5MHz</b>	1852.5MHz ~ 1907.5MHz
	<b>LTE Band 2</b> <b>Channel Bandwidth: 10MHz</b>	1855.0MHz ~ 1905.0MHz
	<b>LTE Band 2</b> <b>Channel Bandwidth: 15MHz</b>	1857.5MHz ~ 1902.5MHz
	<b>LTE Band 2</b> <b>Channel Bandwidth: 20MHz</b>	1860.0MHz ~ 1900.0MHz
<b>MAX. EIRP POWER</b>	<b>GSM</b>	WWAN-ANT-0: 1196mW WWAN-ANT-1: 470mW
	<b>EDGE</b>	WWAN-ANT-0: 609mW WWAN-ANT-1: 190mW
	<b>WCDMA</b>	WWAN-ANT-0: 280mW WWAN-ANT-1: 108mW
	<b>LTE Band 2</b> <b>Channel Bandwidth: 1.4MHz</b>	WWAN-ANT-0: 272mW WWAN-ANT-1: 102mW
	<b>LTE Band 2</b> <b>Channel Bandwidth: 3MHz</b>	WWAN-ANT-0: 269mW WWAN-ANT-1: 101mW
	<b>LTE Band 2</b> <b>Channel Bandwidth: 5MHz</b>	WWAN-ANT-0: 272mW WWAN-ANT-1: 102mW
	<b>LTE Band 2</b> <b>Channel Bandwidth: 10MHz</b>	WWAN-ANT-0: 275mW WWAN-ANT-1: 103mW



	<b>LTE Band 2</b> <b>Channel Bandwidth: 15MHz</b>	WWAN-ANT-0: 271mW WWAN-ANT-1: 102mW
	<b>LTE Band 2</b> <b>Channel Bandwidth: 20MHz</b>	WWAN-ANT-0: 244mW WWAN-ANT-1: 92mW
<b>EMISSION DESIGNATOR</b>	<b>GSM</b>	248KGXW
	<b>EDGE</b>	251KG7W
	<b>WCDMA</b>	4M15F9W
	<b>LTE Band 2</b> <b>Channel Bandwidth: 1.4MHz</b>	QPSK: 1M08G7D
		16QAM: 1M08W7D
		64QAM: 1M08W7D
	<b>LTE Band 2</b> <b>Channel Bandwidth: 3MHz</b>	QPSK: 2M68G7D
		16QAM: 2M68W7D
		64QAM: 2M68W7D
	<b>LTE Band 2</b> <b>Channel Bandwidth: 5MHz</b>	QPSK: 4M48G7D
		16QAM: 4M48W7D
		64QAM: 4M49W7D
	<b>LTE Band 2</b> <b>Channel Bandwidth: 10MHz</b>	QPSK: 8M95G7D
		16QAM: 8M93W7D
		64QAM: 8M94W7D
	<b>LTE Band 2</b> <b>Channel Bandwidth: 15MHz</b>	QPSK: 13M4G7D
		16QAM: 13M4W7D
		64QAM: 13M4W7D
	<b>LTE Band 2</b> <b>Channel Bandwidth: 20MHz</b>	QPSK: 17M9G7D
		16QAM: 17M9W7D
		64QAM: 17M9W7D
<b>ANTENNA TYPE</b>	Main Antenna(ANT 0): Fixed Internal Antenna with 1.36dBi gain for GSM 1900/WCDMA B2/LTE Band 2 Diversity Antenna(ANT 1): Fixed Internal Antenna with -2.95dBi gain for GSM 1900/ WCDMA B2/LTE Band 2	
<b>HW VERSION</b>	P1	
<b>SW VERSION</b>	MIUI 10	
<b>I/O PORTS</b>	Refer to user's manual	
<b>CABLE SUPPLIED</b>	USB cable: non-shielded, detachable, 1m Earphone cable: non-shielded, detachable, 1.25m	



**Test Report No.: RF190712W002-4****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.
3. The EUT incorporates a SISO function. Physically, the EUT provides one completed transmitter and one receiver.

MODULATION MODE	TX FUNCTION
GSM/GPRS/EDGE	1TX/1RX diversity
WCDMA	1TX/1RX diversity
LTE	1TX/1RX diversity

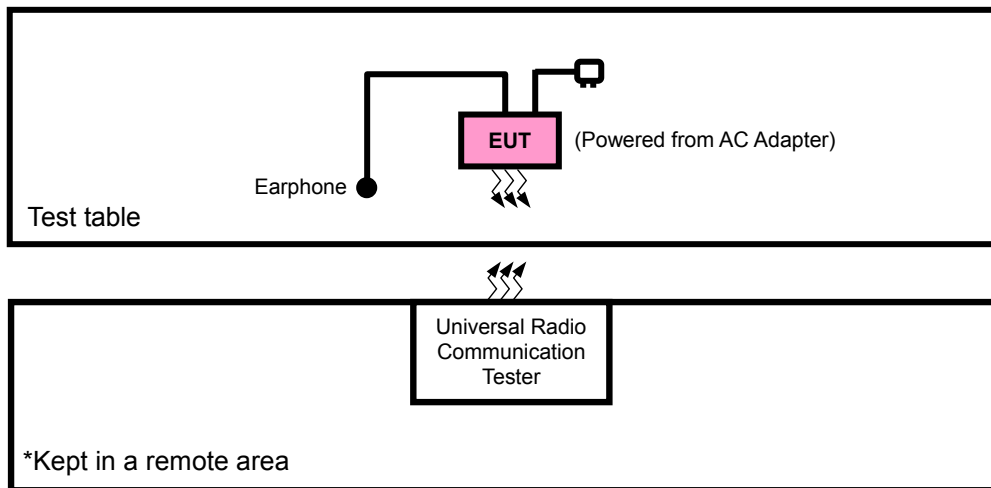
**List of Accessories:**

ACCESSORIES	BRAND	MODEL	MANUFACTURER	SPECIFICATION
Battery	MI	BM4F	Sunwoda Electronic Co., Ltd	Rating: 3.85Vdc, 4030mAh
AC Adapter	MI	MDY-10-ED	Jiansu Chenyang Electron Co., Ltd	I/P: 100 - 240 Vac, 0.5 A O/P: 5 Vdc, 3A or 9 Vdc, 2 A or 12 Vdc, 1.5A
USB Cable 1	MI	K23312	Suzhou Keli Science&Technology Development Co., Ltd	1.0m non-shielded cable, with w/o ferrite core
Earphone	MI	EM023	One More Acoustics Technology Co., Ltd	1.25m non-shielded cable, with w/o 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 TEST ITEM AND TEST CONFIGURATION

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 EIRP and radiated emission was found when positioned on X-plane for GSM/EDGE/WCDMA/ LTE. Following channel(s) was (were) selected for the final test as listed below:

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

### GSM MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
B	EIRP	512 to 810	512, 661, 810	GSM, EDGE
B	FREQUENCY STABILITY	512 to 810	512, 810	GSM, EDGE
B	OCCUPIED BANDWIDTH	512 to 810	512, 661, 810	GSM, EDGE
B	PEAK TO AVERAGE RATIO	512 to 810	512, 661, 810	GSM, EDGE
B	BAND EDGE	512 to 810	512, 810	GSM, EDGE
B	CONDCUDED EMISSION	512 to 810	512, 661, 810	GSM, EDGE
A	RADIATED EMISSION	512 to 810	512, 661, 810	GSM, EDGE



## WCDMA MODE

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
B	EIRP	9262 to 9538	9262, 9400, 9538	WCDMA
B	FREQUENCY STABILITY	9262 to 9538	9262, 9538	WCDMA
B	OCCUPIED BANDWIDTH	9262 to 9538	9262, 9400, 9538	WCDMA
B	PEAK TO AVERAGE RATIO	9262 to 9538	9262, 9400, 9538	WCDMA
B	BAND EDGE	9262 to 9538	9262, 9538	WCDMA
B	CONDCUDED EMISSION	9262 to 9538	9262, 9400, 9538	WCDMA
A	RADIATED EMISSION	9262 to 9538	9262, 9400, 9538	WCDMA

## LTE BAND 2

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	CHANNEL BANDWIDTH	MODULATION	MODE
B	EIRP	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
B	FREQUENCY STABILITY	18607 to 19193	18607, 19193	1.4MHz	QPSK	1 RB / 0 RB Offset
		18615 to 19185	18615, 19185	3MHz	QPSK	1 RB / 0 RB Offset
		18625 to 19175	18625, 19175	5MHz	QPSK	1 RB / 0 RB Offset
		18650 to 19150	18650, 19150	10MHz	QPSK	1 RB / 0 RB Offset
		18675 to 19125	18675, 19125	15MHz	QPSK	1 RB / 0 RB Offset
		18700 to 19100	18700, 19100	20MHz	QPSK	1 RB / 0 RB Offset
B	OCCUPIED BANDWIDTH	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK,16QAM, 64QAM	6 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3MHz	QPSK,16QAM, 64QAM	15 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5MHz	QPSK,16QAM, 64QAM	25 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10MHz	QPSK,16QAM, 64QAM	50 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15MHz	QPSK,16QAM, 64QAM	75 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20MHz	QPSK,16QAM, 64QAM	100 RB / 0 RB Offset
B	PEAK TO AVERAGE RATIO	18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset



B	BAND EDGE	18607 to 19193	18607	1.4MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
			19193	1.4MHz	QPSK,16QAM, 64QAM	6 RB / 0 RB Offset
		18615 to 19185	18615	3MHz	QPSK,16QAM, 64QAM	1 RB / 5 RB Offset
			19185	3MHz	QPSK,16QAM, 64QAM	6 RB / 0 RB Offset
		18625 to 19175	18625	5MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
			19175	5MHz	QPSK,16QAM, 64QAM	15 RB / 0 RB Offset
		18650 to 19150	18650	10MHz	QPSK,16QAM, 64QAM	1 RB / 14 RB Offset
			19150	10MHz	QPSK,16QAM, 64QAM	15 RB / 0 RB Offset
		18675 to 19125	18675	15MHz	QPSK,16QAM, 64QAM	1 RB / 0 RB Offset
			19125	15MHz	QPSK,16QAM, 64QAM	25 RB / 0 RB Offset
		18700 to 19100	18700	20MHz	QPSK,16QAM, 64QAM	1 RB / 24 RB Offset
			19100	20MHz	QPSK,16QAM, 64QAM	25 RB / 0 RB Offset
		18607 to 19193	18607, 18900, 19193	1.4MHz	QPSK	1 RB / 0 RB Offset
			18615, 18900, 19185	3MHz	QPSK	50 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5MHz	QPSK	1 RB / 49 RB Offset
			18650, 18900, 19150	10MHz	QPSK	50 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15MHz	QPSK	1 RB / 0 RB Offset
			18700, 18900, 19100	20MHz	QPSK	75 RB / 0 RB Offset
		18607 to 19193	18607	1.4MHz	QPSK	1 RB / 0 RB Offset
			18615	3MHz	QPSK	1 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5MHz	QPSK	1 RB / 0 RB Offset
			18650 to 19150	10MHz	QPSK	1 RB / 0 RB Offset
		18675 to 19125	18675	15MHz	QPSK	1 RB / 0 RB Offset
			18700 to 19100	20MHz	QPSK	1 RB / 0 RB Offset

**TEST CONDITION:**

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
EIRP	25deg. C, 57%RH	3.85Vdc from Battery	Star Le
FREQUENCY STABILITY	23deg. C, 61%RH	DC 3.6V/3.85V/4.4V	Walker Ye
OCCUPIED BANDWIDTH	23deg. C, 61%RH	3.85Vdc from Battery	Walker Ye
PEAK TO AVERAGE RATIO	23deg. C, 61%RH	3.85Vdc from Battery	Walker Ye
BAND EDGE	23deg. C, 61%RH	3.85Vdc from Battery	Walker Ye
CONDCUDED EMISSION	23deg. C, 61%RH	3.85Vdc from Battery	Walker Ye
RADIATED EMISSION	23deg. C, 70%RH	DC 5V/9V/12V from adaptor	Star Le

## 2.5 EUT OPERATING CONDITIONS

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency

## 2.6 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 24**

**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

Mobile and portable stations are limited to 2 watts EIRP.

##### 3.1.2 TEST PROCEDURES

###### EIRP MEASUREMENT:

- a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 1MHz for GSM & GPRS, 5MHz for WCDMA mode and 10MHz for LTE mode.
- b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
- c. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value “ of step b. Record the power level of S.G
- d.  $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn.}$

###### CONDUCTED POWER MEASUREMENT:

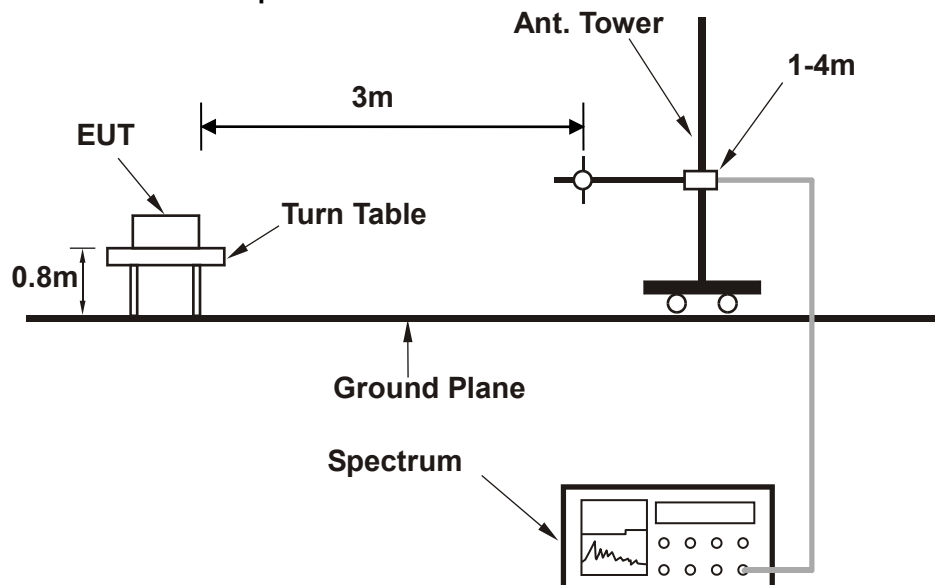
The EUT was set up for the maximum power with WCDMA link data modulation and link up with simulator. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.



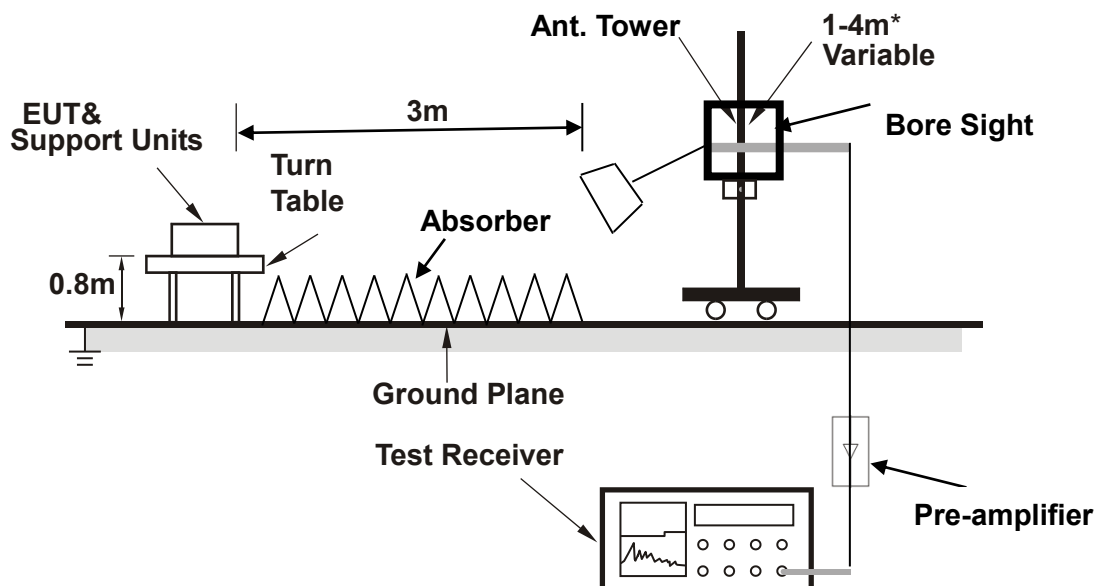
### 3.1.3 TEST SETUP

#### EIRP / ERP Measurement:

<Radiated Emission below or equal 1 GHz>



<Frequency Range above 1GHz>



**Note:** Above 1G is a directional antenna

Depends on the EUT height and the antenna 3dB beamwidth both, refer to section 7.3 of CISPR 16-2-3.

For the actual test configuration, please refer to the attached file (Test Setup Photo).





Test Report No.: RF190712W002-4

**CONDUCTED POWER MEASUREMENT:**





### 3.1.4 TEST RESULTS

#### CONDUCTED OUTPUT POWER (dBm)

Band	GSM1900		
Channel	512	661	810
Frequency (MHz)	1850.2	1880	1909.8
GSM (GMSK, 1Tx-slot)	29.05	<b>29.10</b>	29.04
GPRS (GMSK, 1Tx-slot)	29.03	29.08	29.02
GPRS (GMSK, 2Tx-slot)	25.86	25.91	25.85
GPRS (GMSK, 3Tx-slot)	24.09	24.14	24.08
GPRS (GMSK, 4Tx-slot)	22.73	22.78	22.72
EDGE (8PSK, 1Tx-slot)	25.01	25.06	25.00
EDGE (8PSK, 2Tx-slot)	22.01	22.06	22.00
EDGE (8PSK, 3Tx-slot)	20.17	20.22	20.16
EDGE (8PSK, 4Tx-slot)	18.86	18.91	18.85

Band	WCDMA II		
Channel	9262	9400	9538
Frequency (MHz)	1852.4	1880	1907.6
RMC 12.2K	22.93	<b>23.00</b>	22.97
HSPA			
HSDPA Subtest-1	22.02	22.05	21.95
HSDPA Subtest-2	22.00	22.01	21.94
HSDPA Subtest-3	21.50	21.52	21.48
HSDPA Subtest-4	21.48	21.51	21.46
DC-HSDPA Subtest-1	21.98	22.03	21.92
DC-HSDPA Subtest-2	21.95	22.01	21.90
DC-HSDPA Subtest-3	21.45	21.48	21.45
DC-HSDPA Subtest-4	21.42	21.46	21.42
HSUPA Subtest-1	22.02	22.03	21.89
HSUPA Subtest-2	20.09	20.02	19.92
HSUPA Subtest-3	21.00	21.02	20.92
HSUPA Subtest-4	20.11	20.12	20.08
HSUPA Subtest-5	21.90	22.00	21.90



LTE Band 2							
BW	Modulation	RB Size	RB Offset	Low CH 18607	Mid CH 18900	High CH 19193	3GPP MPR (dB)
				Frequency 1850.7 MHz	Frequency 1880 MHz	Frequency 1909.3 MHz	
1.4MHz	QPSK	1	0	22.06	21.96	21.87	0
		1	2	22.03	21.86	21.82	0
		1	5	21.96	21.77	21.71	0
		3	0	21.95	21.79	21.77	0
		3	1	22.14	21.99	21.85	0
		3	3	22.03	21.86	21.80	0
		6	0	21.06	20.87	20.83	1
	16QAM	1	0	21.44	21.28	21.22	1
		1	2	21.32	21.12	21.10	1
		1	5	21.26	21.09	21.08	1
		3	0	21.26	21.11	21.03	1
		3	1	21.22	21.15	21.03	1
		3	3	21.21	21.06	21.02	1
		6	0	20.15	20.05	19.94	2
	64QAM	1	0	20.28	20.16	20.11	2
		1	2	20.21	20.13	20.02	2
		1	5	20.30	20.10	20.08	2
		3	0	20.33	20.21	20.11	2
		3	1	20.37	20.27	20.15	2
		3	3	20.35	20.18	20.17	2
		6	0	19.40	19.25	19.17	3



LTE Band 2							
BW	Modulation	RB Size	RB Offset	Low CH 18615	Mid CH 18900	High CH 19185	3GPP MPR (dB)
				Frequency 1851.5 MHz	Frequency 1880 MHz	Frequency 1908.5 MHz	
3MHz	QPSK	1	0	22.08	21.98	21.86	0
		1	7	21.99	21.87	21.82	0
		1	14	21.92	21.77	21.71	0
		8	0	20.94	20.82	20.77	1
		8	3	21.07	20.99	20.87	1
		8	7	21.00	20.93	20.84	1
		15	0	21.03	20.88	20.77	1
	16QAM	1	0	21.41	21.34	21.25	1
		1	7	21.29	21.15	21.08	1
		1	14	21.29	21.09	21.08	1
		8	0	20.22	20.12	20.03	2
		8	3	20.27	20.10	20.06	2
		8	7	20.23	20.04	19.98	2
		15	0	20.15	19.99	19.97	2
	64QAM	1	0	20.34	20.19	20.05	2
		1	7	20.24	20.07	20.01	2
		1	14	20.31	20.12	20.08	2
		8	0	19.36	19.25	19.12	3
		8	3	19.41	19.21	19.20	3
		8	7	19.32	19.22	19.13	3
		15	0	19.42	19.22	19.21	3



LTE Band 2							
BW	Modulation	RB Size	RB Offset	Low CH 18625	Mid CH 18900	High CH 19175	3GPP MPR (dB)
				Frequency 1852.5 MHz	Frequency 1880 MHz	Frequency 1907.5 MHz	
5MHz	QPSK	1	0	22.09	21.93	21.87	0
		1	12	22.04	21.84	21.82	0
		1	24	21.93	21.76	21.75	0
		12	0	20.97	20.82	20.74	1
		12	6	21.07	21.00	20.88	1
		12	13	21.04	20.89	20.85	1
		25	0	21.01	20.91	20.80	1
	16QAM	1	0	21.42	21.30	21.25	1
		1	12	21.26	21.18	21.07	1
		1	24	21.29	21.09	21.07	1
		12	0	20.22	20.10	20.00	2
		12	6	20.24	20.14	20.02	2
		12	13	20.18	20.06	20.01	2
		25	0	20.15	20.00	19.94	2
	64QAM	1	0	20.28	20.16	20.11	2
		1	12	20.21	20.13	20.01	2
		1	24	20.24	20.17	20.08	2
		12	0	19.37	19.22	19.11	3
		12	6	19.35	19.28	19.19	3
		12	13	19.36	19.21	19.10	3
		25	0	19.38	19.28	19.19	3



LTE Band 2							
BW	Modulation	RB Size	RB Offset	Low CH 18650	Mid CH 18900	High CH 19150	3GPP MPR (dB)
				Frequency 1855 MHz	Frequency 1880 MHz	Frequency 1905 MHz	
10MHz	QPSK	1	0	22.06	21.96	21.87	0
		1	24	22.04	21.84	21.83	0
		1	49	21.90	21.80	21.71	0
		25	0	20.98	20.81	20.77	1
		25	12	21.13	20.94	20.88	1
		25	25	21.02	20.86	20.84	1
		50	0	21.06	20.91	20.77	1
	16QAM	1	0	21.42	21.27	21.21	1
		1	24	21.31	21.14	21.10	1
		1	49	21.29	21.10	21.04	1
		25	0	20.24	20.08	20.06	2
		25	12	20.28	20.08	20.07	2
		25	25	20.17	20.07	19.98	2
		50	0	20.19	19.99	19.98	2
	64QAM	1	0	20.27	20.17	20.08	2
		1	24	20.26	20.09	20.05	2
		1	49	20.30	20.11	20.05	2
		25	0	19.35	19.19	19.17	3
		25	12	19.42	19.27	19.13	3
		25	25	19.35	19.18	19.12	3
		50	0	19.43	19.24	19.20	3



LTE Band 2							
BW	Modulation	RB Size	RB Offset	Low CH 18675	Mid CH 18900	High CH 19125	3GPP MPR (dB)
				Frequency 1857.5 MHz	Frequency 1880 MHz	Frequency 1902.5 MHz	
15MHz	QPSK	1	0	22.13	21.96	21.84	0
		1	37	22.02	21.89	21.78	0
		1	74	21.96	21.83	21.72	0
		36	0	20.95	20.82	20.78	1
		36	19	21.14	20.99	20.88	1
		36	39	21.00	20.87	20.84	1
		75	0	21.06	20.89	20.82	1
	16QAM	1	0	21.46	21.34	21.21	1
		1	37	21.30	21.15	21.10	1
		1	74	21.25	21.15	21.06	1
		36	0	20.28	20.08	20.07	2
		36	19	20.22	20.12	20.03	2
		36	39	20.22	20.05	20.01	2
		75	0	20.20	20.02	19.91	2
	64QAM	1	0	20.29	20.18	20.09	2
		1	37	20.27	20.08	20.02	2
		1	74	20.26	20.10	20.08	2
		36	0	19.40	19.25	19.11	3
		36	19	19.36	19.21	19.15	3
		36	39	19.38	19.25	19.14	3
		75	0	19.42	19.22	19.21	3



LTE Band 2							
BW	Modulation	RB Size	RB Offset	Low CH 18700	Mid CH 18900	High CH 19100	3GPP MPR (dB)
				Frequency 1860 MHz	Frequency 1880 MHz	Frequency 1900 MHz	
20MHz	QPSK	1	0	22.14	22.00	21.92	0
		1	50	22.06	21.92	21.84	0
		1	99	21.98	21.84	21.76	0
		50	0	21.01	20.87	20.79	1
		50	25	21.15	21.01	20.93	1
		50	50	21.08	20.94	20.86	1
		100	0	21.07	20.93	20.85	1
	16QAM	1	0	21.49	21.35	21.27	1
		1	50	21.34	21.20	21.12	1
		1	99	21.31	21.17	21.09	1
		50	0	20.30	20.16	20.08	2
		50	25	20.30	20.16	20.08	2
		50	50	20.25	20.11	20.03	2
		100	0	20.21	20.07	19.99	2
	64QAM	1	0	20.35	20.21	20.13	2
		1	50	20.29	20.15	20.07	2
		1	99	20.32	20.18	20.10	2
		50	0	19.41	19.27	19.19	3
		50	25	19.43	19.29	19.21	3
		50	50	19.40	19.26	19.18	3
		100	0	19.44	19.30	19.22	3





## EIRP POWER (dBm)

## WWAN-ANT-0

## GSM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
512	1850.2	-20.41	43.83	23.42	219.79	H
661	1880.0	-19.65	43.57	23.92	246.60	H
810	1909.8	-20.36	44.57	24.21	263.63	H
512	1850.2	-15.75	46.39	30.64	1158.78	V
661	1880.0	-16.32	47.10	30.78	<b>1196.19</b>	V
810	1909.8	-16.58	45.98	29.40	870.16	V

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

## EDGE

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
512	1850.2	-24.32	43.83	19.51	89.33	H
661	1880.0	-23.54	43.57	20.03	100.69	H
810	1909.8	-23.89	44.57	20.68	116.95	H
512	1850.2	-20.12	46.39	26.27	423.64	V
661	1880.0	-19.25	47.10	27.85	<b>609.26</b>	V
810	1909.8	-19.68	45.98	26.30	426.19	V

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

## WCDMA

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
9262	1852.4	-28.31	43.83	15.52	35.65	H
9400	1880.0	-27.45	43.57	16.12	40.93	H
9538	1907.6	-27.64	44.57	16.93	49.32	H
9262	1852.4	-23.57	46.39	22.82	191.43	V
9400	1880.0	-22.63	47.10	24.47	<b>279.77</b>	V
9538	1907.6	-23.16	45.98	22.82	191.25	V

**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 2

## CHANNEL BANDWIDTH: 1.4MHz QPSK

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18607	1850.7	-25.58	43.83	18.25	66.90	H	2
18900	1880.0	-25.44	43.57	18.13	65.01	H	2
19193	1908.3	-26.40	44.32	17.92	61.93	H	2
18607	1850.7	-23.18	46.41	23.23	210.43	V	2
18900	1880.0	-22.72	47.07	24.35	<b>272.27</b>	V	2
19193	1908.3	-23.62	45.88	22.26	168.42	V	2

## CHANNEL BANDWIDTH: 1.4MHz 16QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18607	1850.7	-26.45	43.83	17.38	54.75	H	2
18900	1880.0	-26.37	43.57	17.20	52.48	H	2
19193	1908.3	-27.36	44.32	16.96	49.65	H	2
18607	1850.7	-24.05	46.41	22.36	172.23	V	2
18900	1880.0	-23.65	47.07	23.42	219.79	V	2
19193	1908.3	-24.58	45.88	21.30	135.02	V	2

## CHANNEL BANDWIDTH: 1.4MHz 64QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18607	1850.7	-28.48	43.83	15.35	34.31	H	2
18900	1880.0	-28.60	43.57	14.97	31.41	H	2
19193	1908.3	-29.47	44.32	14.85	30.54	H	2
18607	1850.7	-26.1	46.4	20.29	106.93	V	2
18900	1880.0	-25.8	47.1	21.30	134.90	V	2
19193	1908.3	-26.7	45.9	19.22	83.64	V	2



## CHANNEL BANDWIDTH: 3MHz QPSK

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18615	1851.5	-25.56	43.82	18.26	67.02	H	2
18900	1880.0	-25.50	43.57	18.07	64.12	H	2
19185	1908.5	-26.35	44.38	18.03	63.47	H	2
18615	1851.5	-23.16	46.45	23.29	213.35	V	2
18900	1880.0	-22.78	47.07	24.29	<b>268.53</b>	V	2
19185	1908.5	-23.57	45.88	22.31	170.22	V	2

## CHANNEL BANDWIDTH: 3MHz 16QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18615	1851.5	-26.63	43.82	17.19	52.38	H	2
18900	1880.0	-26.39	43.57	17.18	52.24	H	2
19185	1908.5	-27.34	44.38	17.04	50.54	H	2
18615	1851.5	-24.23	46.45	22.22	166.76	V	2
18900	1880.0	-23.67	47.07	23.40	218.78	V	2
19185	1908.5	-24.56	45.88	21.32	135.52	V	2

## CHANNEL BANDWIDTH: 3MHZ 64QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18615	1851.5	-28.90	43.82	14.92	31.06	H	2
18900	1880.0	-28.32	43.57	15.25	33.50	H	2
19185	1908.5	-29.58	44.38	14.80	30.17	H	2
18615	1851.5	-26.3	46.5	20.18	104.26	V	2
18900	1880.0	-25.9	47.1	21.20	131.83	V	2
19185	1908.5	-26.6	45.9	19.25	84.14	V	2

CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18625	1852.5	-25.62	43.83	18.21	66.19	H	2
18900	1880.0	-25.45	43.57	18.12	64.86	H	2
19175	1907.5	-26.30	44.19	17.89	61.49	H	2
18625	1852.5	-23.22	46.46	23.24	211.01	V	2
18900	1880.0	-22.73	47.07	24.34	<b>271.64</b>	V	2
19175	1907.5	-23.52	45.89	22.37	172.62	V	2

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18625	1852.5	-26.45	43.83	17.38	54.68	H	2
18900	1880.0	-26.47	43.57	17.10	51.29	H	2
19175	1907.5	-27.40	44.19	16.79	47.73	H	2
18625	1852.5	-24.05	46.46	22.41	174.30	V	2
18900	1880.0	-23.75	47.07	23.32	214.78	V	2
19175	1907.5	-24.62	45.89	21.27	134.00	V	2

CHANNEL BANDWIDTH: 5MHz 64QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18625	1852.5	-28.48	43.83	15.35	34.26	H	2
18900	1880.0	-28.51	43.57	15.06	32.06	H	2
19175	1907.5	-29.67	44.19	14.52	28.30	H	2
18625	1852.5	-26.09	46.46	20.37	108.97	V	2
18900	1880.0	-25.82	47.07	21.25	133.35	V	2
19175	1907.5	-26.80	45.89	19.09	81.11	V	2



## CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18650	1855.0	-25.43	43.86	18.43	69.68	H	2
18900	1880.0	-25.39	43.57	18.18	65.77	H	2
19150	1905.0	-26.17	43.99	17.82	60.59	H	2
18650	1855.0	-23.03	46.28	23.25	211.25	V	2
18900	1880.0	-22.67	47.07	24.40	<b>275.42</b>	V	2
19150	1905.0	-23.39	45.92	22.53	179.14	V	2

## CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18650	1855.0	-26.58	43.86	17.28	53.47	H	2
18900	1880.0	-26.49	43.57	17.08	51.05	H	2
19150	1905.0	-27.33	43.99	16.66	46.39	H	2
18650	1855.0	-24.18	46.28	22.10	162.11	V	2
18900	1880.0	-23.77	47.07	23.30	213.80	V	2
19150	1905.0	-24.55	45.92	21.37	137.15	V	2

## CHANNEL BANDWIDTH: 10MHz 64QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18650	1855.0	-28.74	43.86	15.12	32.52	H	2
18900	1880.0	-28.94	43.57	14.63	29.04	H	2
19150	1905.0	-29.38	43.99	14.61	28.93	H	2
18650	1855.0	-26.37	46.28	19.91	97.90	V	2
18900	1880.0	-25.73	47.07	21.34	136.14	V	2
19150	1905.0	-26.64	45.92	19.28	84.76	V	2



## CHANNEL BANDWIDTH: 15MHz QPSK

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18675	1857.5	-25.44	43.99	18.55	71.65	H	2
18900	1880.0	-25.46	43.57	18.11	64.71	H	2
19125	1902.5	-26.24	43.66	17.42	55.14	H	2
18675	1857.5	-23.04	45.93	22.89	194.40	V	2
18900	1880.0	-22.74	47.07	24.33	<b>271.02</b>	V	2
19125	1902.5	-23.46	46.20	22.74	188.02	V	2

## CHANNEL BANDWIDTH: 15MHz 16QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18675	1857.5	-26.30	43.99	17.69	58.78	H	2
18900	1880.0	-26.33	43.57	17.24	52.97	H	2
19125	1902.5	-27.09	43.66	16.57	45.34	H	2
18675	1857.5	-23.90	45.93	22.03	159.48	V	2
18900	1880.0	-23.61	47.07	23.46	221.82	V	2
19125	1902.5	-24.31	46.20	21.89	154.60	V	2

## CHANNEL BANDWIDTH: 15MHz 64QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18675	1857.5	-28.34	43.99	15.65	36.75	H	2
18900	1880.0	-28.82	43.57	14.75	29.85	H	2
19125	1902.5	-29.15	43.66	14.51	28.22	H	2
18675	1857.5	-25.85	45.93	20.08	101.79	V	2
18900	1880.0	-25.87	47.07	21.20	131.83	V	2
19125	1902.5	-26.43	46.20	19.77	94.89	V	2

CHANNEL BANDWIDTH: 20MHz QPSK

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18700	1860.0	-26.02	43.50	17.48	55.96	H	2
18900	1880.0	-25.91	43.57	17.66	58.34	H	2
19100	1900.0	-26.82	43.62	16.80	47.82	H	2
18700	1860.0	-23.62	45.57	21.95	156.68	V	2
18900	1880.0	-23.19	47.07	23.88	<b>244.34</b>	V	2
19100	1900.0	-24.04	46.26	22.22	166.76	V	2

CHANNEL BANDWIDTH: 20MHz 16QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18700	1860.0	-26.95	43.50	16.55	45.18	H	2
18900	1880.0	-26.98	43.57	16.59	45.60	H	2
19100	1900.0	-27.65	43.62	15.97	39.50	H	2
18700	1860.0	-24.55	45.57	21.02	126.47	V	2
18900	1880.0	-24.26	47.07	22.81	190.99	V	2
19100	1900.0	-24.87	46.26	21.39	137.75	V	2

CHANNEL BANDWIDTH: 20MHz 64QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18700	1860.0	-29.23	43.50	14.27	26.72	H	2
18900	1880.0	-29.23	43.57	14.34	27.16	H	2
19100	1900.0	-30.04	43.62	13.58	22.78	H	2
18700	1860.0	-26.7	45.57	18.87	77.09	V	2
18900	1880.0	-26.5	47.07	20.57	114.02	V	2
19100	1900.0	-27.2	46.26	19.08	80.93	V	2

**REMARKS:** 1. EIRP Output Power (dBm) = SPA LVL (dBm) + Correction Factor (dB).

2. Correction factor (dB) = Free Space Loss + Antenna Factor + Cable Loss



## WWAN-ANT-1

## GSM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
512	1850.2	-24.86	43.83	18.97	78.89	H
661	1880.0	-24.14	43.57	19.43	87.70	H
810	1909.8	-24.23	44.57	20.34	108.14	H
512	1850.2	-19.67	46.39	26.72	<b>469.89</b>	V
661	1880.0	-20.55	47.10	26.55	451.65	V
810	1909.8	-20.98	45.98	25.00	315.94	V

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

## EDGE

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
512	1850.2	-29.42	43.83	14.41	27.61	H
661	1880.0	-28.65	43.57	14.92	31.05	H
810	1909.8	-29.15	44.57	15.42	34.83	H
512	1850.2	-25.12	46.39	21.27	133.97	V
661	1880.0	-24.32	47.10	22.78	<b>189.58</b>	V
810	1909.8	-24.75	45.98	21.23	132.62	V

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

## WCDMA

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)
9262	1852.4	-32.24	43.83	11.59	14.42	H
9400	1880.0	-31.69	43.57	11.88	15.42	H
9538	1907.6	-32.21	44.57	12.36	17.22	H
9262	1852.4	-27.25	46.39	19.14	82.04	V
9400	1880.0	-26.78	47.10	20.32	<b>107.60</b>	V
9538	1907.6	-27.23	45.98	18.75	74.92	V

**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 2

### CHANNEL BANDWIDTH: 1.4MHz QPSK

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18607	1850.7	-29.15	43.83	14.68	29.40	H	2
18900	1880.0	-29.75	43.57	13.82	24.10	H	2
19193	1908.3	-29.49	44.32	14.83	30.40	H	2
18607	1850.7	-26.62	46.41	19.79	95.30	V	2
18900	1880.0	-26.98	47.07	20.09	<b>102.09</b>	V	2
19193	1908.3	-26.54	45.88	19.34	85.98	V	2

### CHANNEL BANDWIDTH: 1.4MHz 16QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18607	1850.7	-30.02	43.83	13.81	24.07	H	2
18900	1880.0	-30.68	43.57	12.89	19.45	H	2
19193	1908.3	-30.45	44.32	13.87	24.37	H	2
18607	1850.7	-27.49	46.41	18.92	78.00	V	2
18900	1880.0	-27.91	47.07	19.16	82.41	V	2
19193	1908.3	-27.50	45.88	18.38	68.93	V	2

### CHANNEL BANDWIDTH: 1.4MHz 64QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18607	1850.7	-32.05	43.83	11.78	15.08	H	2
18900	1880.0	-32.91	43.57	10.66	11.64	H	2
19193	1908.3	-32.56	44.32	11.76	14.99	H	2
18607	1850.7	-29.6	46.4	16.85	48.43	V	2
18900	1880.0	-30.0	47.1	17.04	50.58	V	2
19193	1908.3	-29.6	45.9	16.30	42.70	V	2



## CHANNEL BANDWIDTH: 3MHz QPSK

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18615	1851.5	-29.13	43.82	14.69	29.46	H	2
18900	1880.0	-29.81	43.57	13.76	23.77	H	2
19185	1908.5	-29.44	44.38	14.94	31.16	H	2
18615	1851.5	-26.60	46.45	19.85	96.63	V	2
18900	1880.0	-27.04	47.07	20.03	<b>100.69</b>	V	2
19185	1908.5	-26.49	45.88	19.39	86.90	V	2

## CHANNEL BANDWIDTH: 3MHz 16QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18615	1851.5	-30.20	43.82	13.62	23.03	H	2
18900	1880.0	-30.70	43.57	12.87	19.36	H	2
19185	1908.5	-30.43	44.38	13.95	24.81	H	2
18615	1851.5	-27.67	46.45	18.78	75.53	V	2
18900	1880.0	-27.93	47.07	19.14	82.04	V	2
19185	1908.5	-27.48	45.88	18.40	69.18	V	2

## CHANNEL BANDWIDTH: 3MHz 64QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18615	1851.5	-32.47	43.82	11.35	13.65	H	2
18900	1880.0	-32.63	43.57	10.94	12.42	H	2
19185	1908.5	-32.67	44.38	11.71	14.81	H	2
18615	1851.5	-29.7	46.5	16.74	47.22	V	2
18900	1880.0	-30.1	47.1	16.94	49.43	V	2
19185	1908.5	-29.6	45.9	16.33	42.95	V	2

CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18625	1852.5	-29.19	43.83	14.64	29.09	H	2
18900	1880.0	-29.76	43.57	13.81	24.04	H	2
19175	1907.5	-29.39	44.19	14.80	30.19	H	2
18625	1852.5	-26.66	46.46	19.80	95.57	V	2
18900	1880.0	-26.99	47.07	20.08	<b>101.86</b>	V	2
19175	1907.5	-26.44	45.89	19.45	88.13	V	2

CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18625	1852.5	-30.02	43.83	13.81	24.03	H	2
18900	1880.0	-30.78	43.57	12.79	19.01	H	2
19175	1907.5	-30.49	44.19	13.70	23.43	H	2
18625	1852.5	-27.49	46.46	18.97	78.94	V	2
18900	1880.0	-28.01	47.07	19.06	80.54	V	2
19175	1907.5	-27.54	45.89	18.35	68.41	V	2

CHANNEL BANDWIDTH: 5MHz 64QAM

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18625	1852.5	-32.05	43.83	11.78	15.06	H	2
18900	1880.0	-32.82	43.57	10.75	11.89	H	2
19175	1907.5	-32.76	44.19	11.43	13.89	H	2
18625	1852.5	-29.53	46.46	16.93	49.35	V	2
18900	1880.0	-30.08	47.07	16.99	50.00	V	2
19175	1907.5	-29.72	45.89	16.17	41.41	V	2

**CHANNEL BANDWIDTH: 10MHz QPSK**

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18650	1855.0	-29.00	43.86	14.86	30.63	H	2
18900	1880.0	-29.70	43.57	13.87	24.38	H	2
19150	1905.0	-29.26	43.99	14.73	29.74	H	2
18650	1855.0	-26.47	46.28	19.81	95.68	V	2
18900	1880.0	-26.93	47.07	20.14	<b>103.28</b>	V	2
19150	1905.0	-26.31	45.92	19.61	91.45	V	2

**CHANNEL BANDWIDTH: 10MHz 16QAM**

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18650	1855.0	-30.15	43.86	13.71	23.50	H	2
18900	1880.0	-30.80	43.57	12.77	18.92	H	2
19150	1905.0	-30.42	43.99	13.57	22.77	H	2
18650	1855.0	-27.62	46.28	18.66	73.42	V	2
18900	1880.0	-28.03	47.07	19.04	80.17	V	2
19150	1905.0	-27.47	45.92	18.45	70.02	V	2

**CHANNEL BANDWIDTH: 10MHz 64QAM**

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18650	1855.0	-32.31	43.86	11.55	14.29	H	2
18900	1880.0	-33.25	43.57	10.32	10.76	H	2
19150	1905.0	-32.47	43.99	11.52	14.20	H	2
18650	1855.0	-29.81	46.28	16.47	44.34	V	2
18900	1880.0	-29.99	47.07	17.08	51.05	V	2
19150	1905.0	-29.56	45.92	16.36	43.27	V	2

**CHANNEL BANDWIDTH: 15MHz QPSK**

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18675	1857.5	-29.01	43.99	14.98	31.49	H	2
18900	1880.0	-29.77	43.57	13.80	23.99	H	2
19125	1902.5	-29.33	43.66	14.33	27.07	H	2
18675	1857.5	-26.48	45.93	19.45	88.04	V	2
18900	1880.0	-27.00	47.07	20.07	<b>101.62</b>	V	2
19125	1902.5	-26.38	46.20	19.82	95.98	V	2

**CHANNEL BANDWIDTH: 15MHz 16QAM**

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18675	1857.5	-29.87	43.99	14.12	25.83	H	2
18900	1880.0	-30.64	43.57	12.93	19.63	H	2
19125	1902.5	-30.18	43.66	13.48	22.26	H	2
18675	1857.5	-27.34	45.93	18.59	72.23	V	2
18900	1880.0	-27.87	47.07	19.20	83.18	V	2
19125	1902.5	-27.23	46.20	18.97	78.92	V	2

**CHANNEL BANDWIDTH: 15MHz 64QAM**

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18675	1857.5	-31.91	43.99	12.08	16.15	H	2
18900	1880.0	-33.13	43.57	10.44	11.07	H	2
19125	1902.5	-32.24	43.66	11.42	13.85	H	2
18675	1857.5	-29.29	45.93	16.64	46.10	V	2
18900	1880.0	-30.13	47.07	16.94	49.43	V	2
19125	1902.5	-29.35	46.20	16.85	48.44	V	2

**CHANNEL BANDWIDTH: 20MHz QPSK**

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18700	1860.0	-29.59	43.50	13.91	24.60	H	2
18900	1880.0	-30.22	43.57	13.35	21.63	H	2
19100	1900.0	-29.91	43.62	13.71	23.47	H	2
18700	1860.0	-27.06	45.57	18.51	70.96	V	2
18900	1880.0	-27.45	47.07	19.62	<b>91.62</b>	V	2
19100	1900.0	-26.96	46.26	19.30	85.13	V	2

**CHANNEL BANDWIDTH: 20MHz 16QAM**

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18700	1860.0	-30.52	43.50	12.98	19.86	H	2
18900	1880.0	-31.29	43.57	12.28	16.90	H	2
19100	1900.0	-30.74	43.62	12.88	19.39	H	2
18700	1860.0	-27.99	45.57	17.58	57.28	V	2
18900	1880.0	-28.52	47.07	18.55	71.61	V	2
19100	1900.0	-27.79	46.26	18.47	70.32	V	2

**CHANNEL BANDWIDTH: 20 MHz 64QAM**

Channel	Frequency (MHz)	SPA LVL (dBm)	Correction Factor(dB)	EIRP(dBm)	EIRP(mW)	Polarization (H/V)	LIMIT (W)
18700	1860.0	-32.80	43.50	10.70	11.75	H	2
18900	1880.0	-33.54	43.57	10.03	10.07	H	2
19100	1900.0	-33.13	43.62	10.49	11.18	H	2
18700	1860.0	-30.1	45.57	15.43	34.91	V	2
18900	1880.0	-30.8	47.07	16.31	42.76	V	2
19100	1900.0	-30.1	46.26	16.16	41.31	V	2

**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

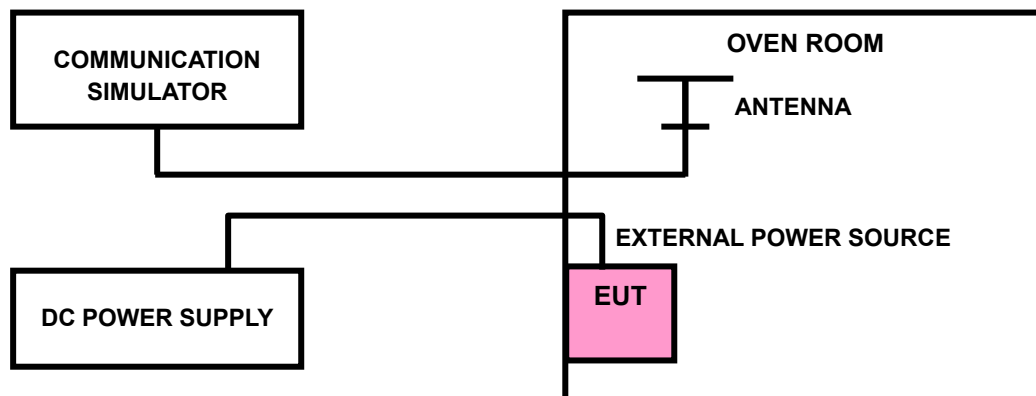
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

### 3.2.2 TEST PROCEDURE

- 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.
- 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.
- 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

#### GSM1900

##### FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
$V_{nor}$	0.0009	0.0012	2.5
$V_{min}$	-0.0012	-0.0012	2.5
$V_{max}$	0.0009	0.0011	2.5

**NOTE:** The applicant defined the normal working voltage of the battery is from  $V_{min}$  to  $V_{max}$ .

##### FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
-30	-0.0055	-0.0053	2.5
-20	-0.0051	-0.0048	2.5
-10	-0.0046	-0.0043	2.5
0	-0.0037	-0.0035	2.5
10	-0.0030	-0.0028	2.5
20	-0.0022	-0.0020	2.5
30	-0.0017	-0.0015	2.5
40	-0.0014	-0.0012	2.5
50	-0.0005	-0.0003	2.5



**EDGE 1900****FREQUENCY ERROR VS. VOLTAGE**

VOLTAGE (Volts)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
$V_{nor}$	0.0012	0.0011	2.5
$V_{min}$	-0.0013	-0.0012	2.5
$V_{max}$	0.0010	0.0009	2.5

**NOTE:** The applicant defined the normal working voltage of the battery is from  $V_{min}$  to  $V_{max}$ .

**FREQUENCY ERROR vs. TEMPERATURE.**

TEMP. (°C)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
-30	-0.0057	-0.0053	2.5
-20	-0.0050	-0.0047	2.5
-10	-0.0045	-0.0043	2.5
0	-0.0038	-0.0036	2.5
10	-0.0029	-0.0027	2.5
20	-0.0024	-0.0022	2.5
30	-0.0017	-0.0016	2.5
40	-0.0012	-0.0011	2.5
50	-0.0005	-0.0004	2.5



## WCDMA BAND II

### FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
$V_{nor}$	0.0009	0.0009	2.5
$V_{min}$	-0.0010	-0.0011	2.5
$V_{max}$	0.0009	0.0010	2.5

**NOTE:** The applicant defined the normal working voltage of the battery is from  $V_{min}$  to  $V_{max}$ .

### FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
-30	-0.0055	-0.0052	2.5
-20	-0.0052	-0.0048	2.5
-10	-0.0045	-0.0042	2.5
0	-0.0039	-0.0036	2.5
10	-0.0029	-0.0028	2.5
20	-0.0023	-0.0021	2.5
30	-0.0017	-0.0016	2.5
40	-0.0012	-0.0012	2.5
50	-0.0005	-0.0005	2.5



## LTE BAND 2

### FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	1.4MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V <sub>nor</sub>	0.0008	0.0009	2.5
V <sub>min</sub>	-0.0009	-0.0010	2.5
V <sub>max</sub>	0.0007	0.0009	2.5

**NOTE:** The applicant defined the normal working voltage of the battery is from  $V_{min}$  to  $V_{max}$ .

### FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	1.4MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0055	-0.0055	2.5
-20	-0.0050	-0.0051	2.5
-10	-0.0044	-0.0045	2.5
0	-0.0039	-0.0039	2.5
10	-0.0030	-0.0030	2.5
20	-0.0024	-0.0023	2.5
30	-0.0018	-0.0018	2.5
40	-0.0006	-0.0006	2.5
50	-0.0003	-0.0004	2.5



## FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	3MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V <sub>nor</sub>	0.0008	0.0010	2.5
V <sub>min</sub>	-0.0010	-0.0010	2.5
V <sub>max</sub>	0.0010	0.0009	2.5

**NOTE:** The applicant defined the normal working voltage of the battery is from  $V_{min}$  to  $V_{max}$ .

## FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	3MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0055	-0.0057	2.5
-20	-0.0050	-0.0048	2.5
-10	-0.0044	-0.0041	2.5
0	-0.0035	-0.0033	2.5
10	-0.0030	-0.0029	2.5
20	-0.0017	-0.0025	2.5
30	-0.0015	-0.0014	2.5
40	-0.0010	-0.0008	2.5
50	-0.0003	-0.0002	2.5



## FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	5MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V <sub>nor</sub>	0.0009	0.0011	2.5
V <sub>min</sub>	-0.0011	-0.0012	2.5
V <sub>max</sub>	0.0010	0.0010	2.5

**NOTE:** The applicant defined the normal working voltage of the battery is from  $V_{min}$  to  $V_{max}$ .

## FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	5MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0053	-0.0053	2.5
-20	-0.0046	-0.0048	2.5
-10	-0.0041	-0.0039	2.5
0	-0.0036	-0.0034	2.5
10	-0.0030	-0.0029	2.5
20	-0.0023	-0.0020	2.5
30	-0.0014	-0.0013	2.5
40	-0.0008	-0.0007	2.5
50	-0.0002	0.0002	2.5



## FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	10MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V <sub>nor</sub>	0.0010	0.0008	2.5
V <sub>min</sub>	-0.0012	-0.0009	2.5
V <sub>max</sub>	0.0009	0.0008	2.5

**NOTE:** The applicant defined the normal working voltage of the battery is from  $V_{min}$  to  $V_{max}$ .

## FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	10MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0051	-0.0052	2.5
-20	-0.0044	-0.0046	2.5
-10	-0.0039	-0.0040	2.5
0	-0.0033	-0.0034	2.5
10	-0.0028	-0.0025	2.5
20	-0.0021	-0.0019	2.5
30	-0.0015	-0.0013	2.5
40	-0.0010	-0.0008	2.5
50	0.0003	0.0002	2.5



## FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	15MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V <sub>nor</sub>	0.0012	0.0011	2.5
V <sub>min</sub>	-0.0011	-0.0012	2.5
V <sub>max</sub>	0.0009	0.0010	2.5

**NOTE:** The applicant defined the normal working voltage of the battery is from  $V_{min}$  to  $V_{max}$ .

## FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	15MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0051	-0.0049	2.5
-20	-0.0047	-0.0043	2.5
-10	-0.0039	-0.0036	2.5
0	-0.0030	-0.0028	2.5
10	-0.0024	-0.0025	2.5
20	-0.0019	-0.0013	2.5
30	-0.0012	-0.0010	2.5
40	-0.0007	-0.0003	2.5
50	0.0002	0.0002	2.5



## FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	20MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V <sub>nor</sub>	0.0011	0.0011	2.5
V <sub>min</sub>	-0.0012	-0.0011	2.5
V <sub>max</sub>	0.0010	0.0012	2.5

**NOTE:** The applicant defined the normal working voltage of the battery is from  $V_{min}$  to  $V_{max}$ .

## FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	20MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0048	-0.0051	2.5
-20	-0.0041	-0.0042	2.5
-10	-0.0037	-0.0036	2.5
0	-0.0028	-0.0029	2.5
10	-0.0022	-0.0023	2.5
20	-0.0018	-0.0013	2.5
30	-0.0008	-0.0009	2.5
40	-0.0005	-0.0001	2.5
50	0.0002	0.0002	2.5



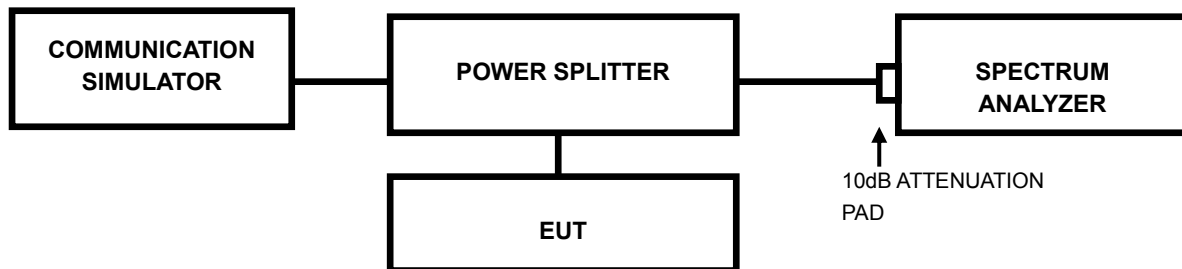


### 3.3 OCCUPIED BANDWIDTH MEASUREMENT

#### 3.3.1 TEST PROCEDURES

The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

#### 3.3.2 TEST SETUP



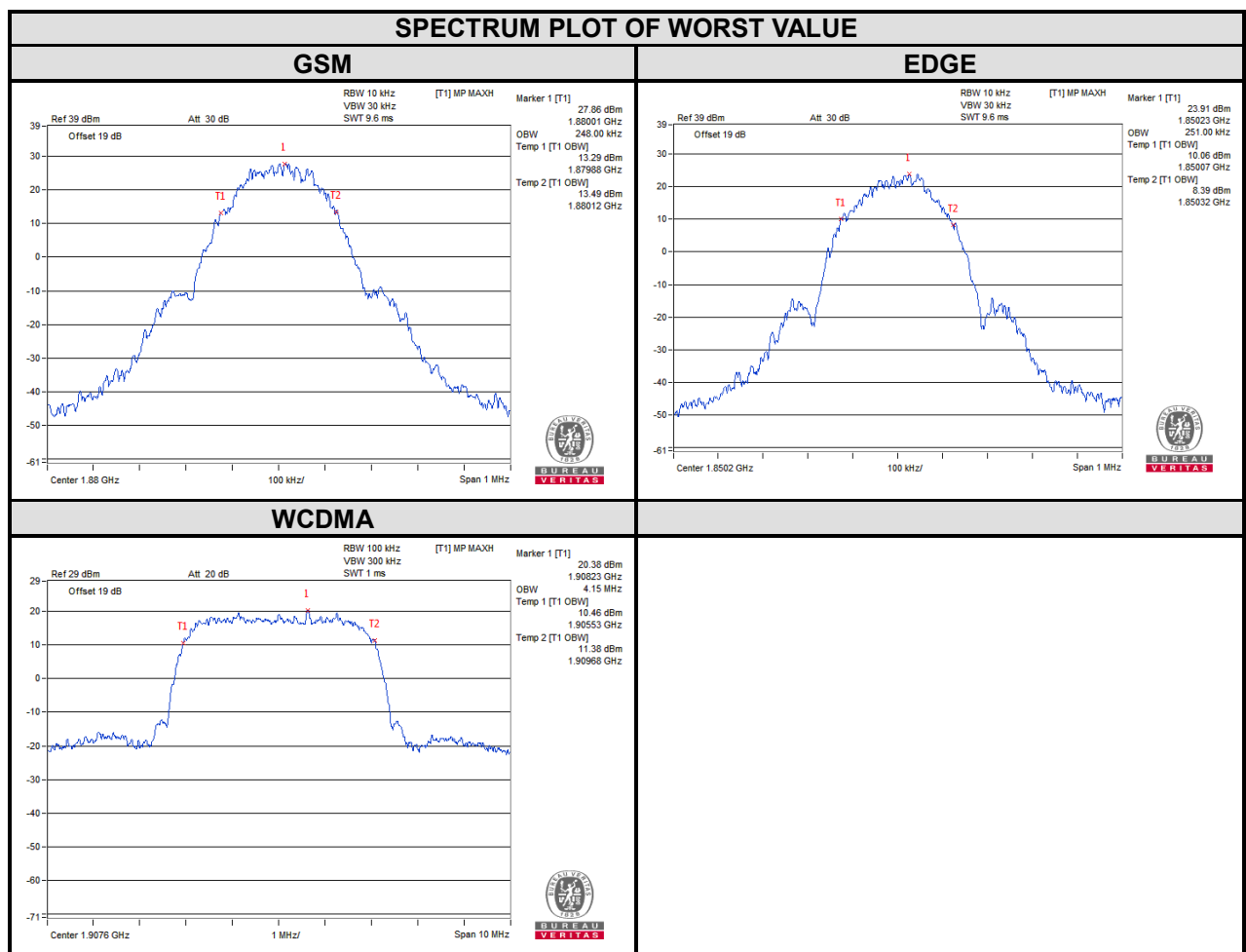


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Test Report No.: RF190712W002-4

### 3.3.3 TEST RESULTS

Channel	Frequency (MHz)	99% Occupied bandwidth (kHz)		Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)
		GSM	EDGE			
512	1850.2	245.00	<b>251.00</b>	9262	1852.4	4.14
661	1880.0	<b>248.00</b>	247.00	9400	1880.0	4.14
810	1909.8	240.00	244.00	9538	1907.6	<b>4.15</b>

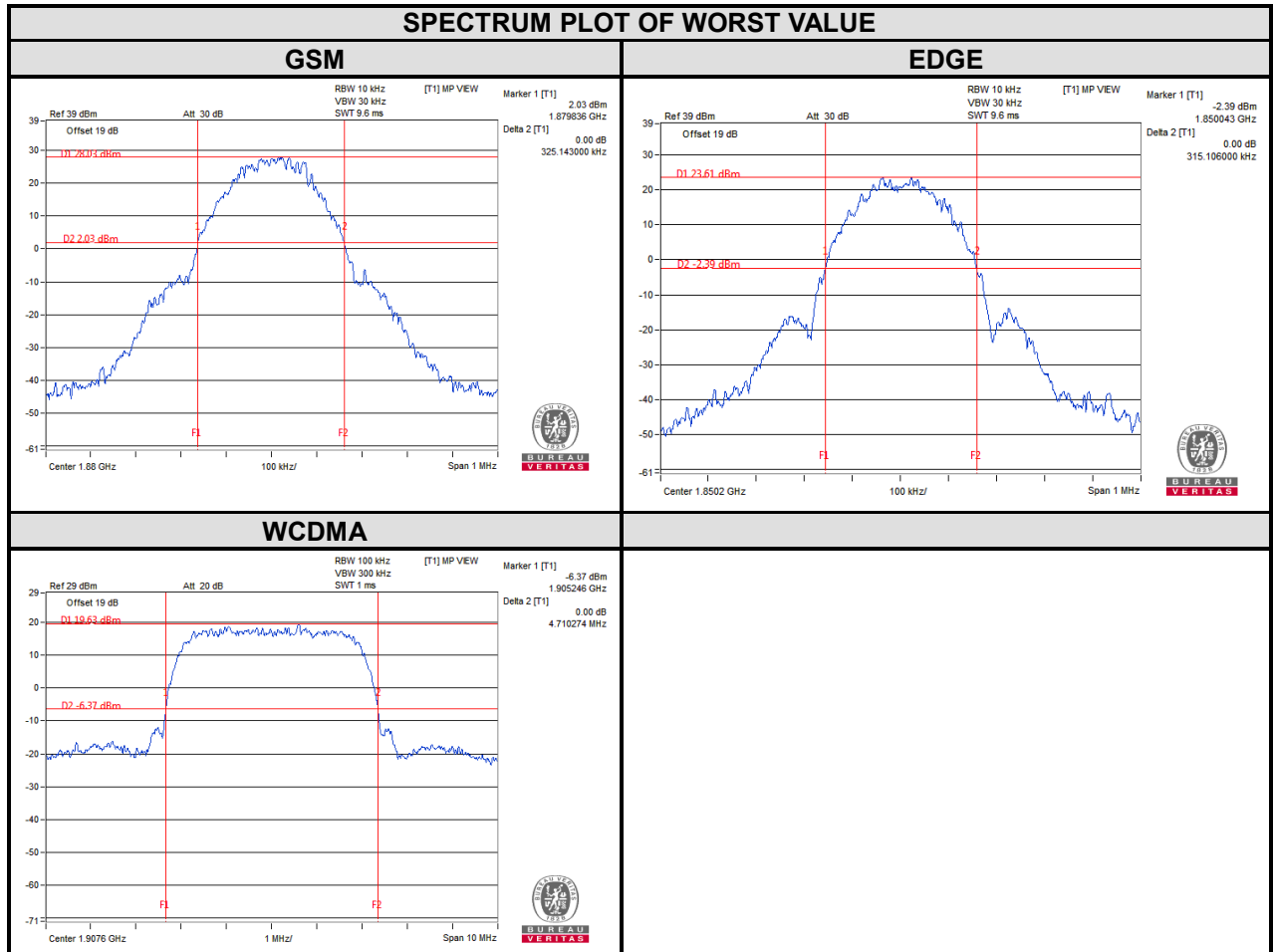




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**Test Report No.: RF190712W002-4**

Channel	Frequency (MHz)	26dB bandwidth (kHz)		CHANNEL	FREQUENCY (MHz)	26dB bandwidth (MHz)
		GSM	EDGE			WCDMA
512	1850.2	318.93	315.11	9262	1852.4	4.71
661	1880.0	325.14	305.20	9400	1880.0	4.68
810	1909.8	320.11	310.91	9538	1907.6	4.71





LTE band 2				
Channel Bandwidth : 1.4MHz				
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		
		QPSK	16QAM	64QAM
18607	1850.7	1.08	1.08	1.08
18900	1880	1.08	1.08	1.08
19193	1909.3	1.08	1.08	1.08





LTE band 2				
Channel Bandwidth : 3MHz				
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		
		QPSK	16QAM	64QAM
18615	1851.5	2.68	2.68	2.68
18900	1880	2.68	2.68	2.68
19185	1908.5	2.68	2.68	2.68





LTE band 2				
Channel Bandwidth : 5MHz				
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		
		QPSK	16QAM	64QAM
18625	1852.5	4.48	4.48	4.49
18900	1880	4.48	4.48	4.49
19175	1907.5	4.48	4.48	4.49







LTE band 2				
Channel Bandwidth : 10MHz				
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		
		QPSK	16QAM	64QAM
18650	1855	8.94	8.93	8.94
18900	1880	8.95	8.92	8.93
19150	1905	8.94	8.93	8.93





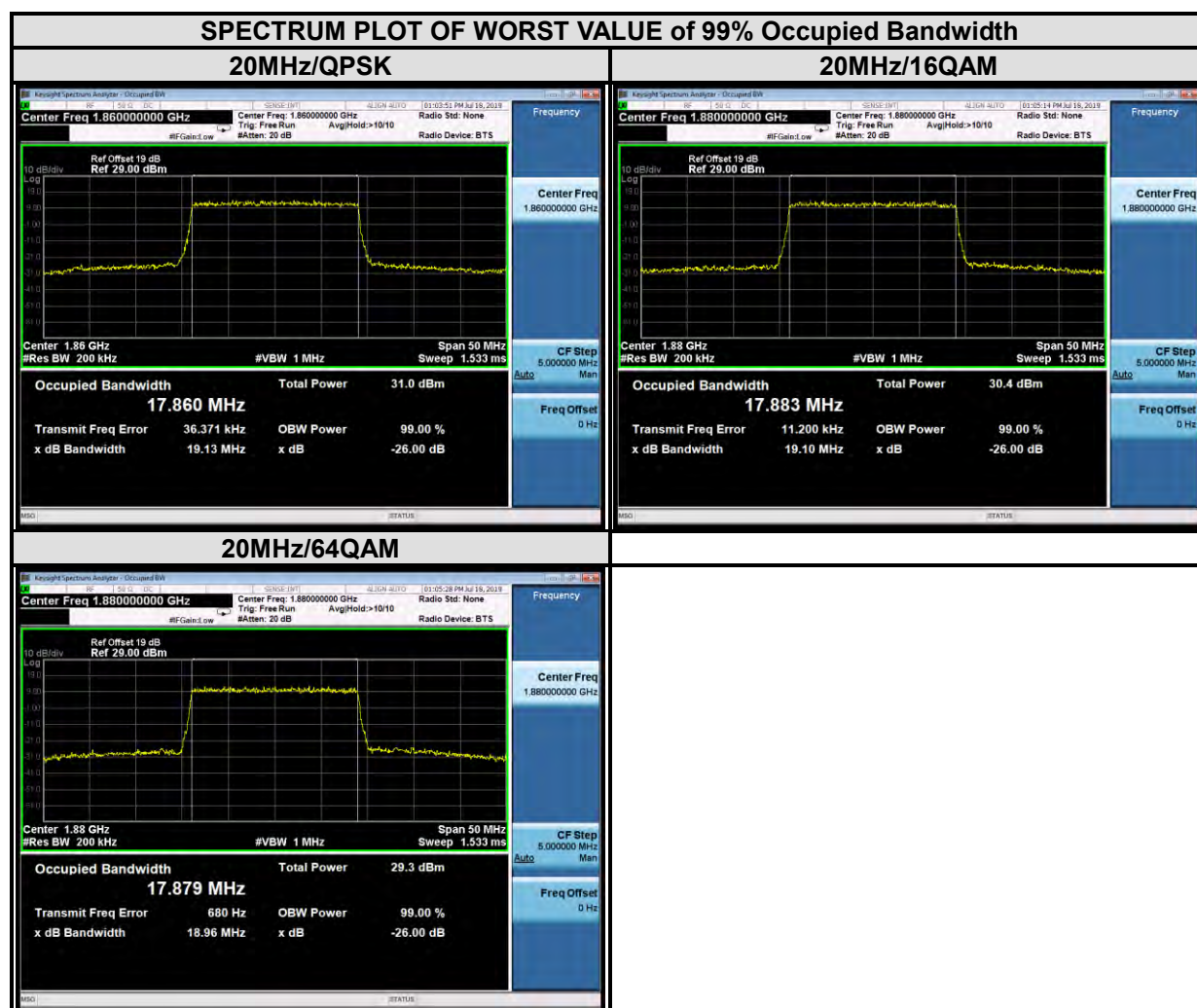
LTE band 2				
Channel Bandwidth : 15MHz				
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		
		QPSK	16QAM	64QAM
18675	1857.5	13.38	13.40	13.38
18900	1880	13.43	13.40	13.38
19125	1902.5	13.42	13.40	13.37







LTE band 2				
Channel Bandwidth : 20MHz				
Channel	Frequency (MHz)	99% Occupied bandwidth (MHz)		
		QPSK	16QAM	64QAM
18700	1860	17.86	17.88	17.85
18900	1880	17.85	17.88	17.88
19100	1900	17.86	17.86	17.87





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LTE band 2				
Channel Bandwidth : 1.4MHz				
CHANNEL	Frequency (MHz)	26 dB bandwidth (MHz)		
		QPSK	16QAM	64QAM
18607	1850.7	1.23	1.23	1.22
18900	1880	1.23	1.21	1.22
19193	1909.3	1.23	1.22	1.22

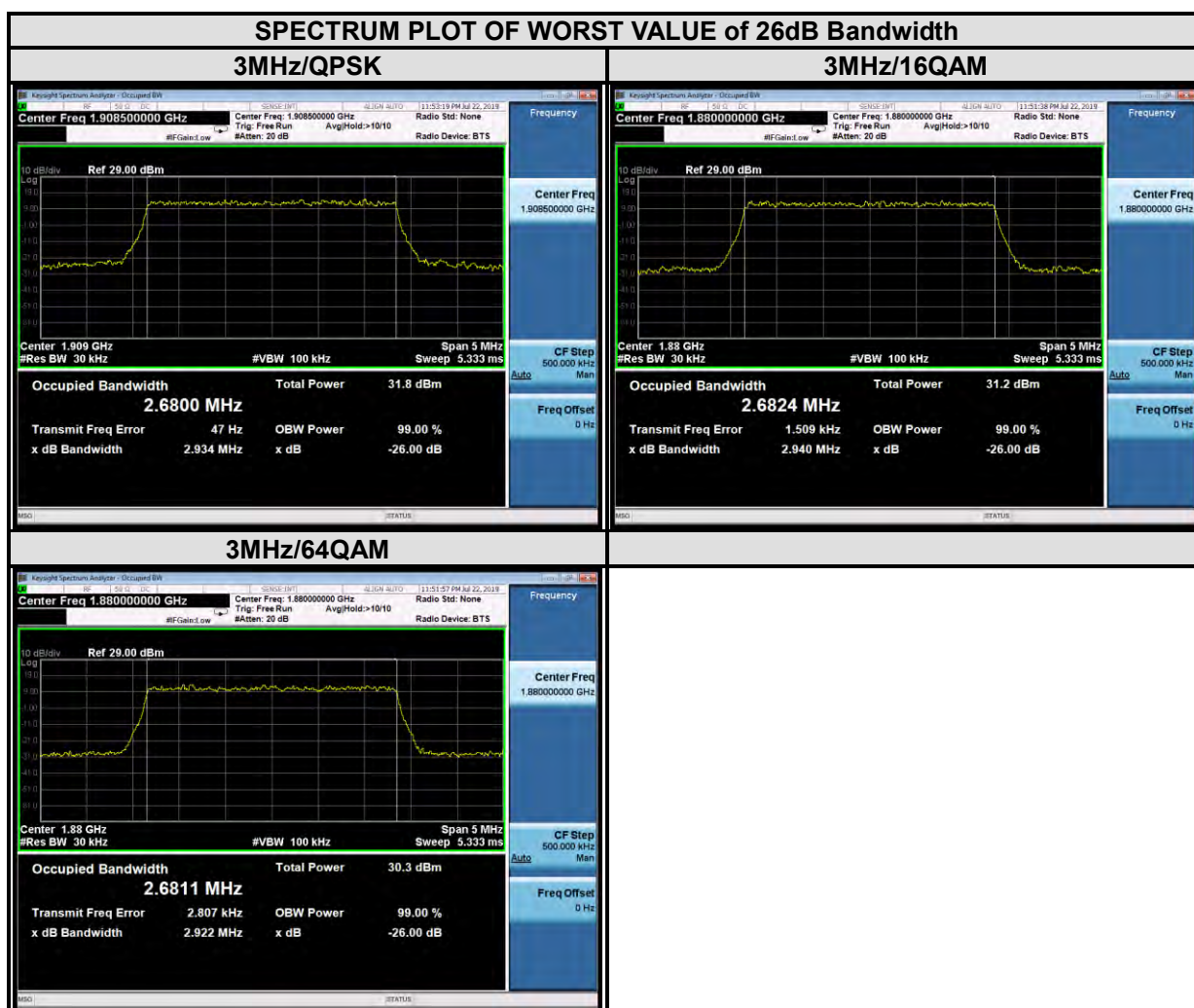




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LTE band 2				
Channel Bandwidth : 3MHz				
CHANNEL	Frequency (MHz)	26 dB bandwidth (MHz)		
		QPSK	16QAM	64QAM
18615	1851.5	2.92	2.94	2.91
18900	1880	2.92	2.94	2.92
19185	1908.5	2.93	2.94	2.92





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LTE band 2				
Channel Bandwidth : 5MHz				
CHANNEL	Frequency (MHz)	26 dB bandwidth (MHz)		
		QPSK	16QAM	64QAM
18625	1852.5	4.48	4.89	4.90
18900	1880	4.92	4.89	4.90
19175	1907.5	4.90	4.91	4.90







LTE band 2				
Channel Bandwidth : 10MHz				
CHANNEL	Frequency (MHz)	26 dB bandwidth (MHz)		
		QPSK	16QAM	64QAM
18650	1855	9.59	9.60	9.60
18900	1880	9.57	9.64	9.63
19150	1905	9.64	9.55	9.54



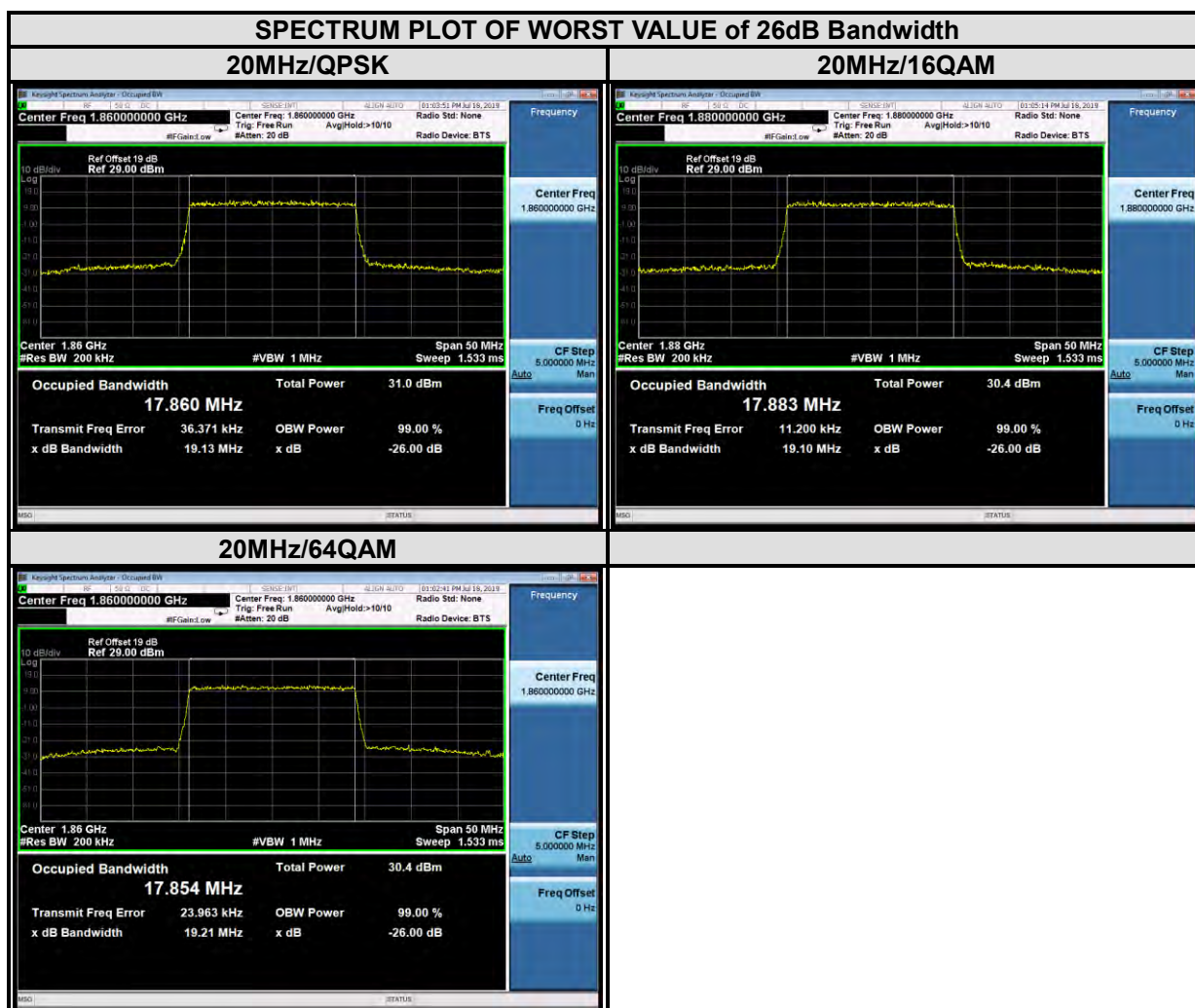


LTE band 2				
Channel Bandwidth : 15MHz				
CHANNEL	Frequency (MHz)	26 dB bandwidth (MHz)		
		QPSK	16QAM	64QAM
18675	1857.5	14.35	14.47	14.53
18900	1880	14.36	14.52	14.39
19125	1902.5	14.40	14.44	14.28





LTE band 2				
Channel Bandwidth : 20MHz				
CHANNEL	Frequency (MHz)	26 dB bandwidth (MHz)		
		QPSK	16QAM	64QAM
18700	1860	19.13	19.09	19.21
18900	1880	19.10	19.10	18.96
19100	1900	19.11	19.06	19.06



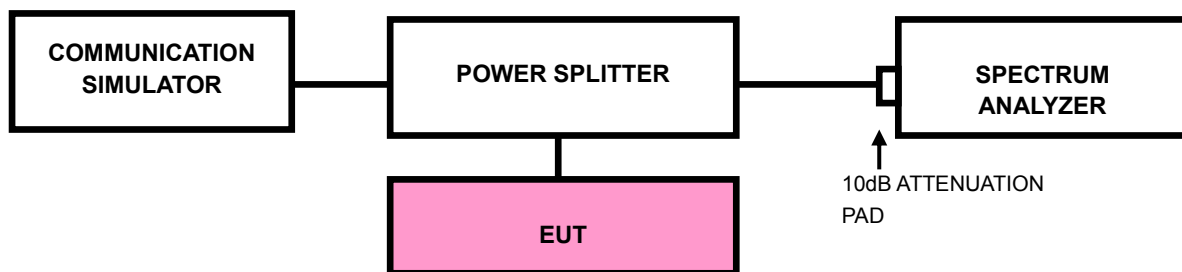


### 3.4 BAND EDGE MEASUREMENT

#### 3.4.1 LIMITS OF BAND EDGE MEASUREMENT

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. 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.

#### 3.4.2 TEST SETUP





### 3.4.3 TEST PROCEDURES

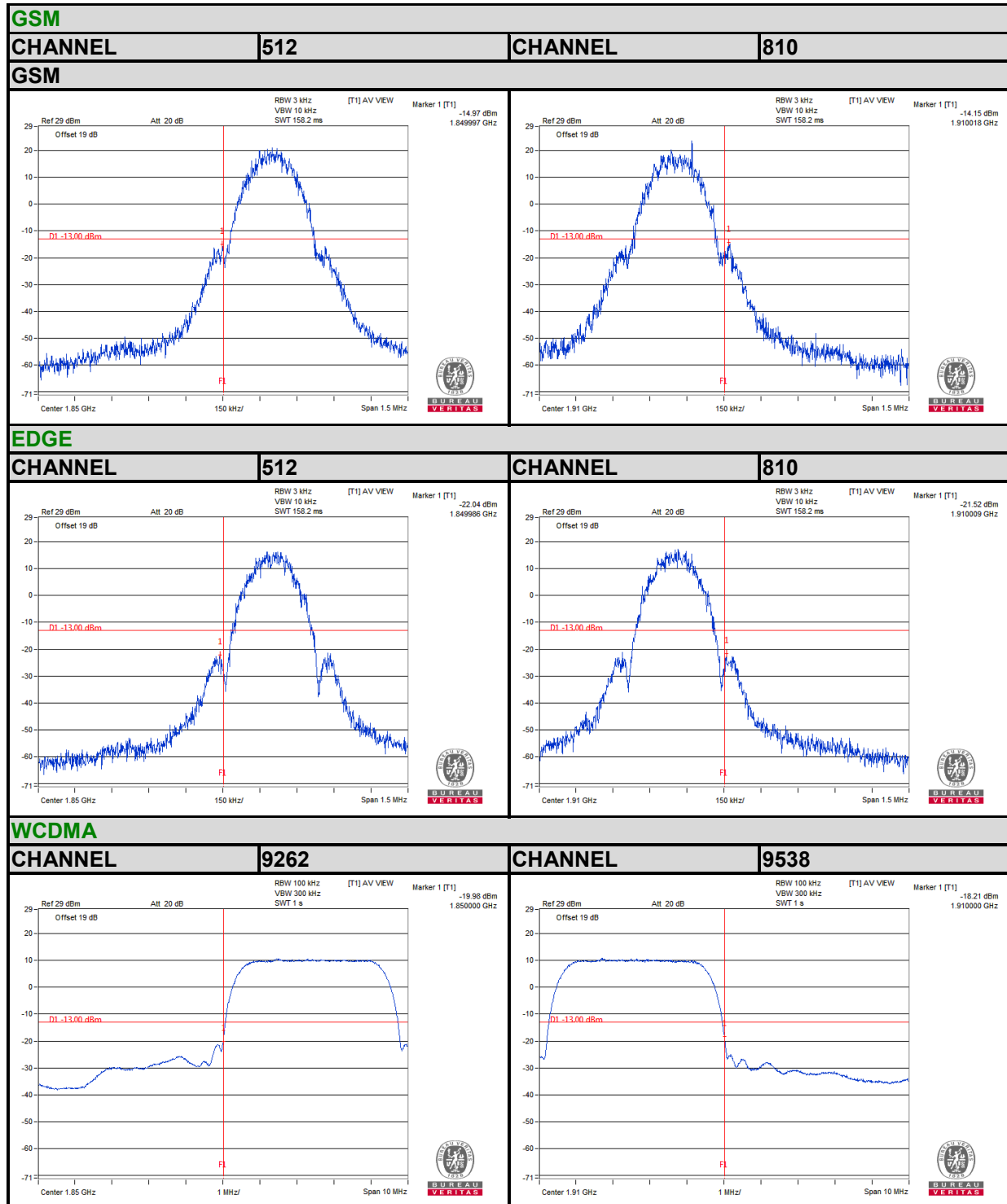
- a. All measurements were done at low and high operational frequency range.
- b. The center frequency of spectrum is the band edge frequency and span is 1.5 MHz. RBW of the spectrum is 10kHz and VBW of the spectrum is 30kHz (GSM/GPRS/ EDGE).
- c. The center frequency of spectrum is the band edge frequency 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.



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### 3.4.4. TEST RESULTS





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## LTE BAND 2

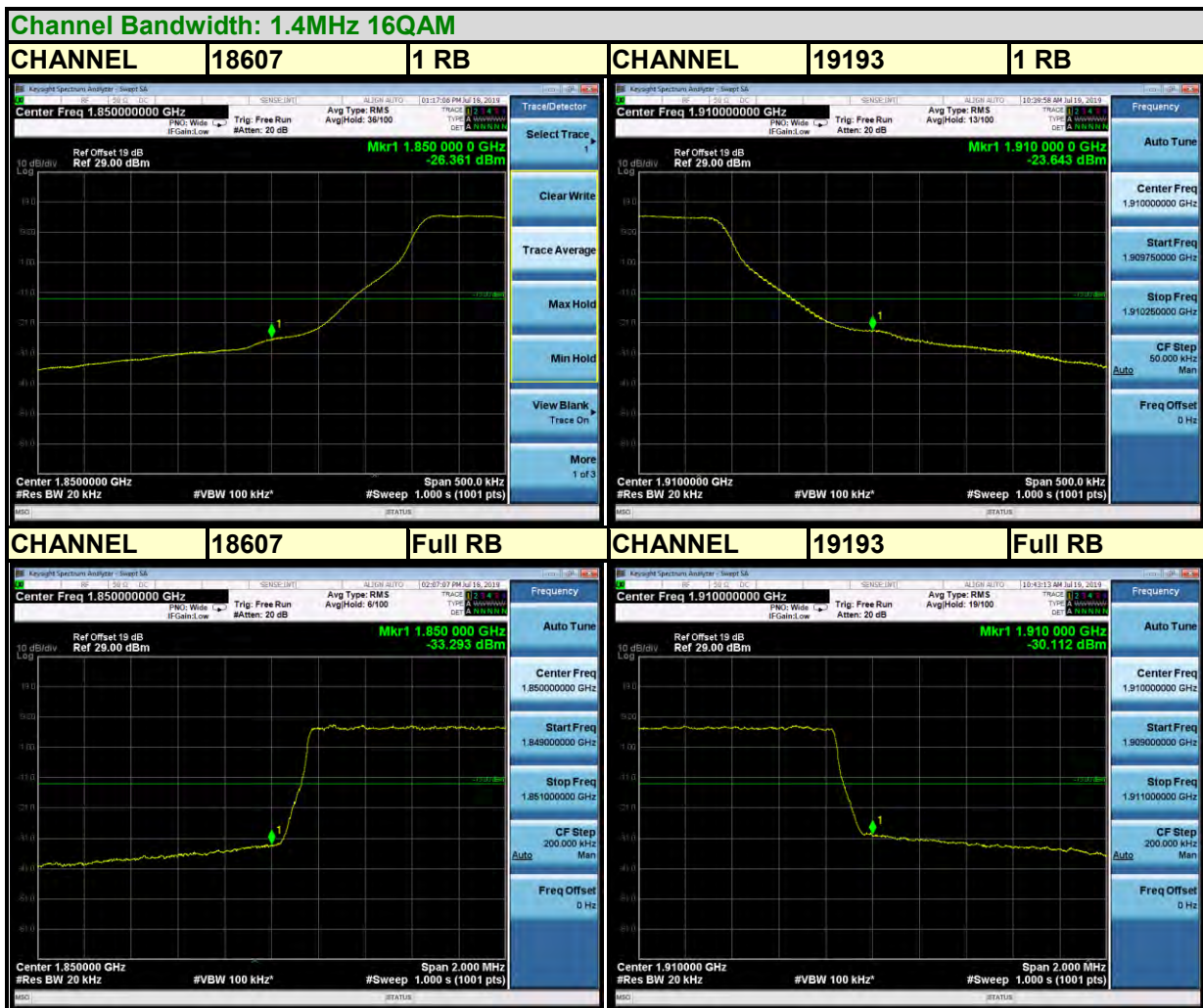
Channel Bandwidth: 1.4MHz QPSK





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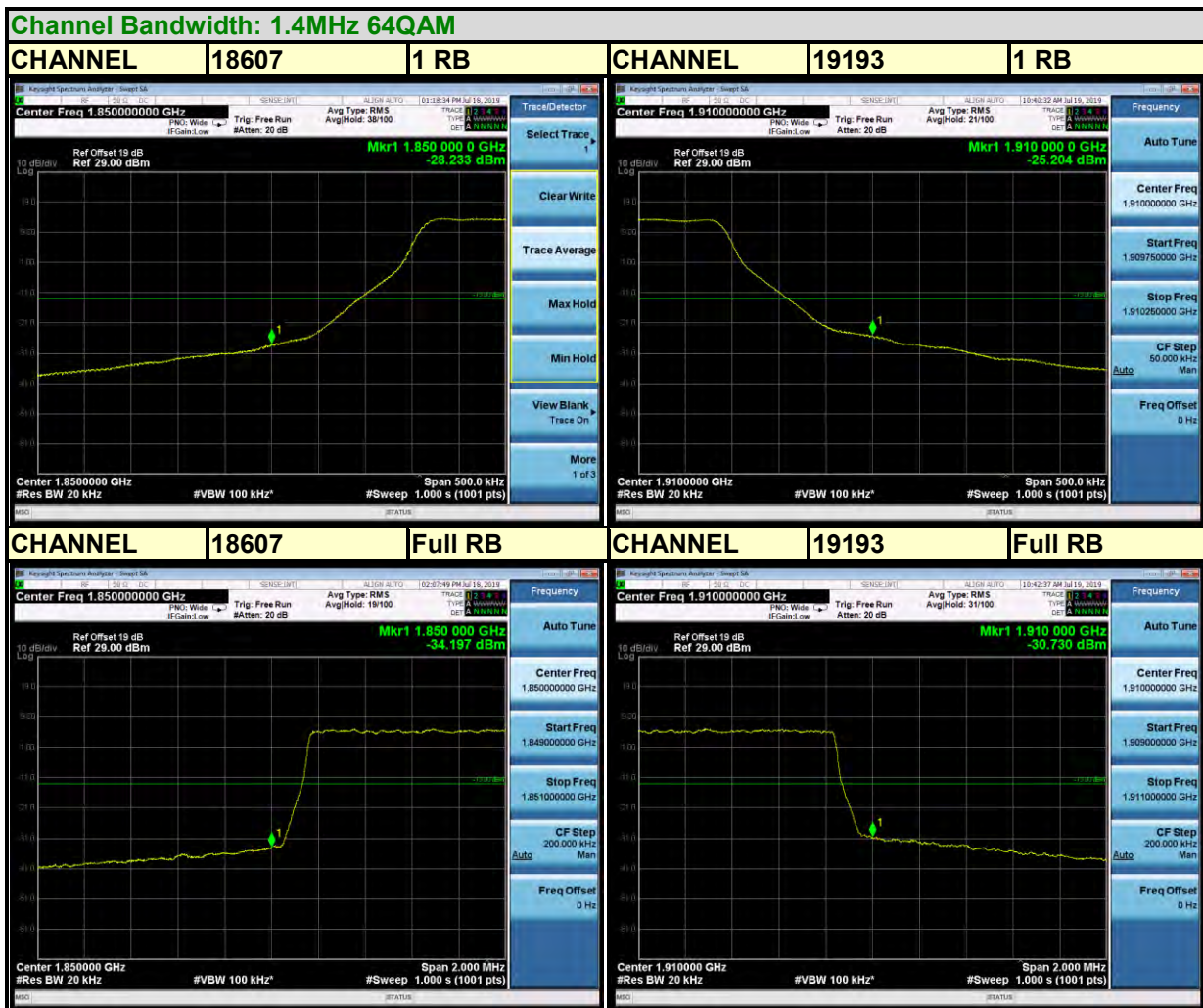
Test Report No.: RF190712W002-4





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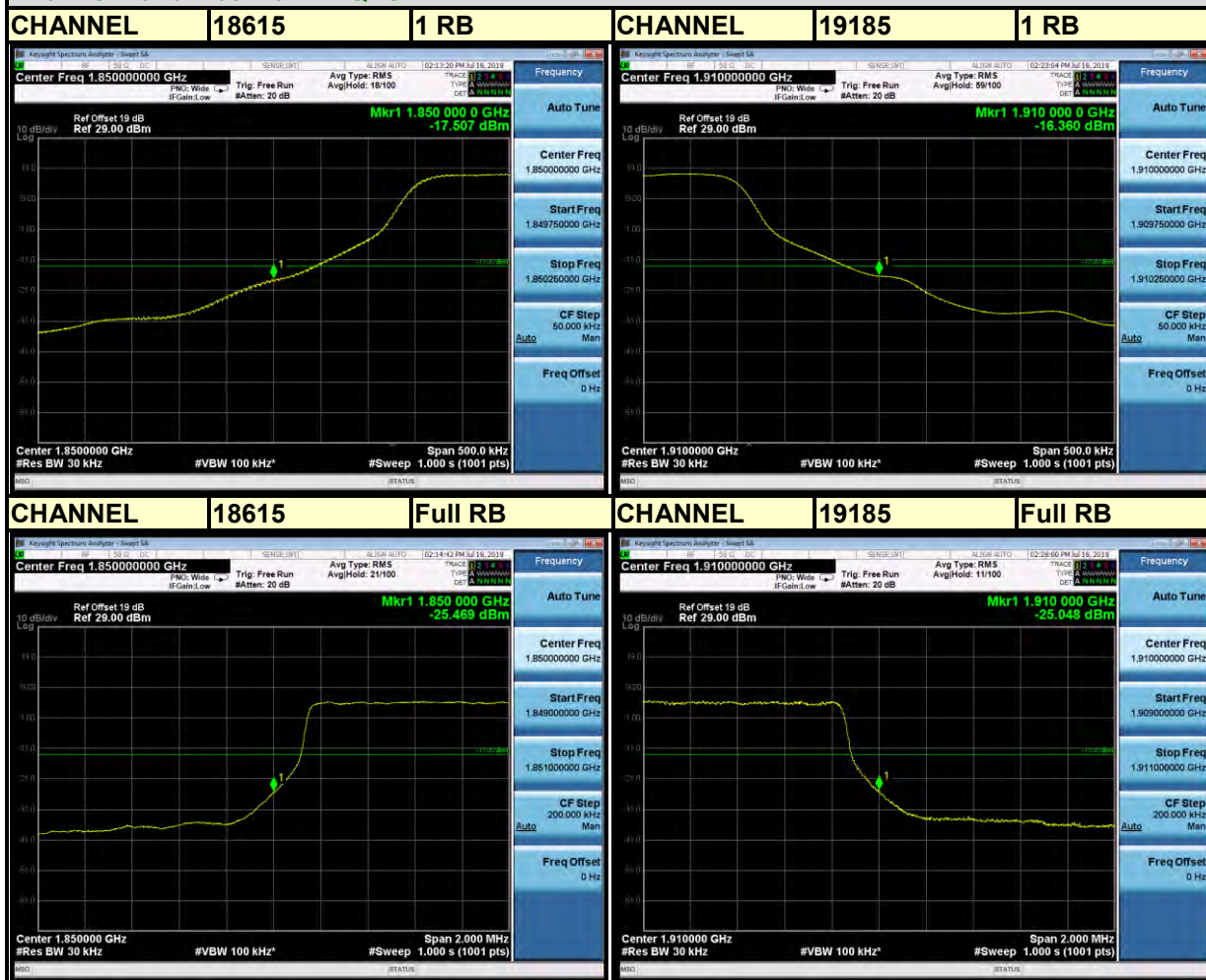


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## LTE BAND 2

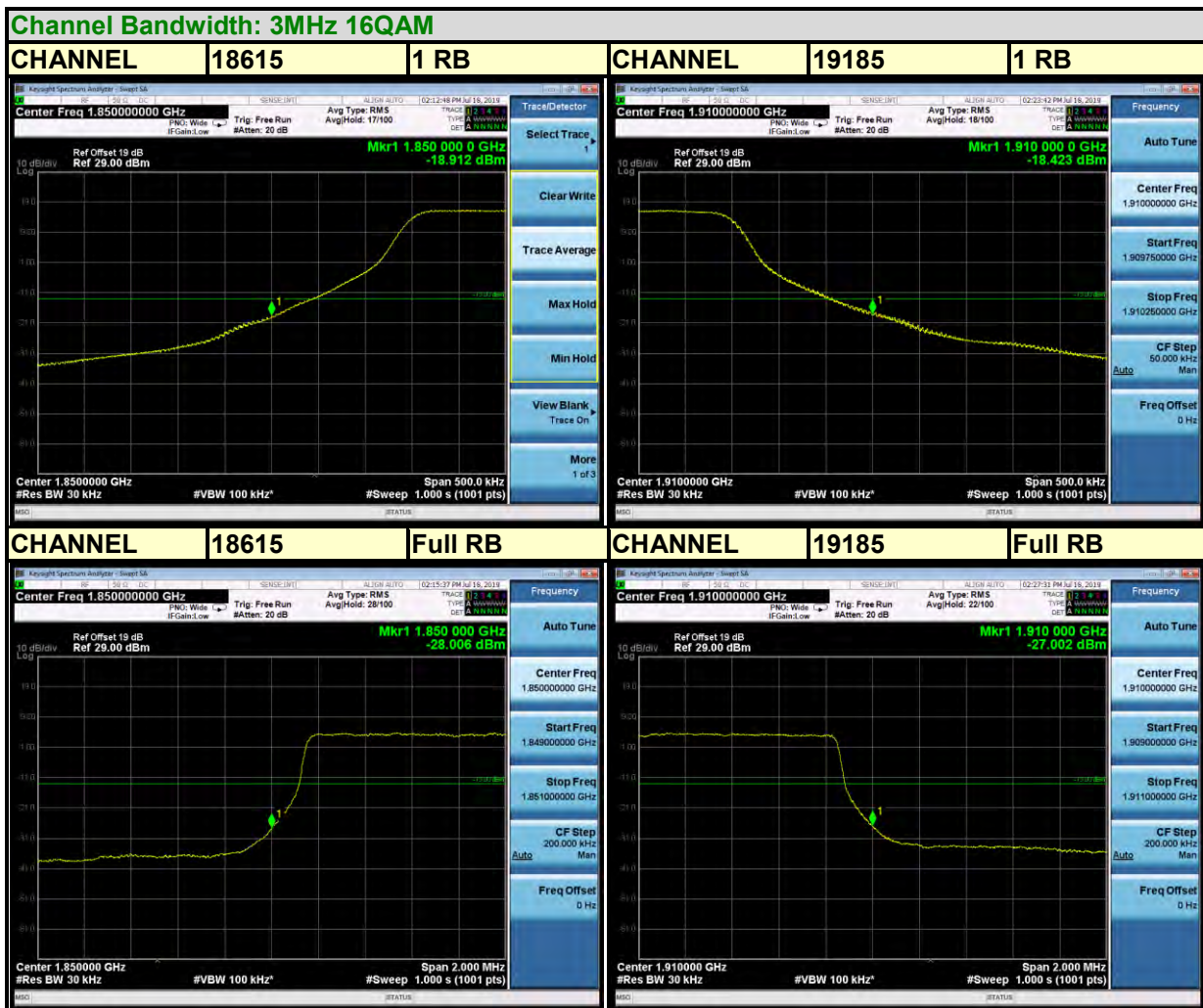
Channel Bandwidth: 3MHz QPSK





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Channel Bandwidth: 3MHz 64QAM





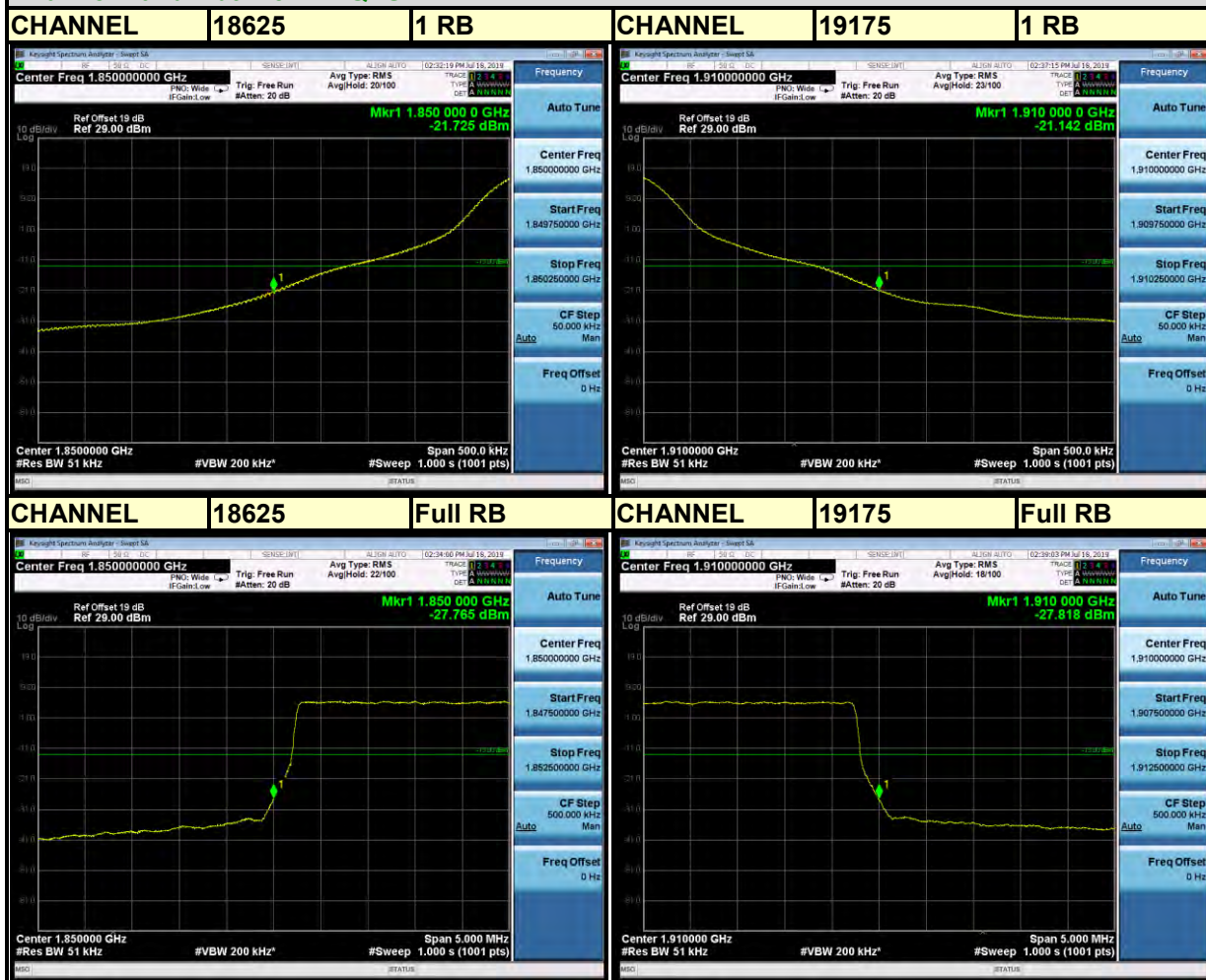


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Test Report No.: RF190712W002-4

## LTE BAND 2

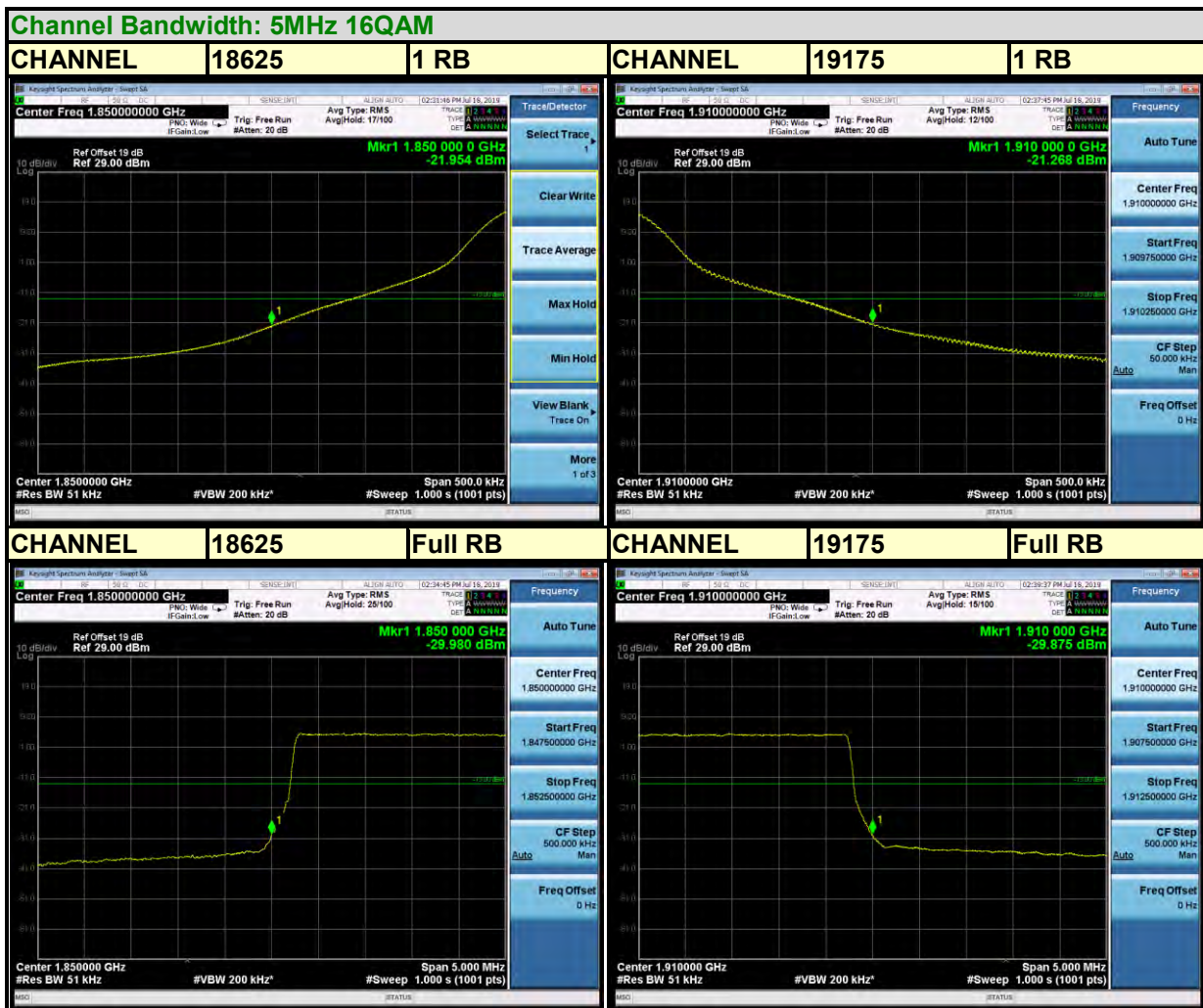
Channel Bandwidth: 5MHz QPSK





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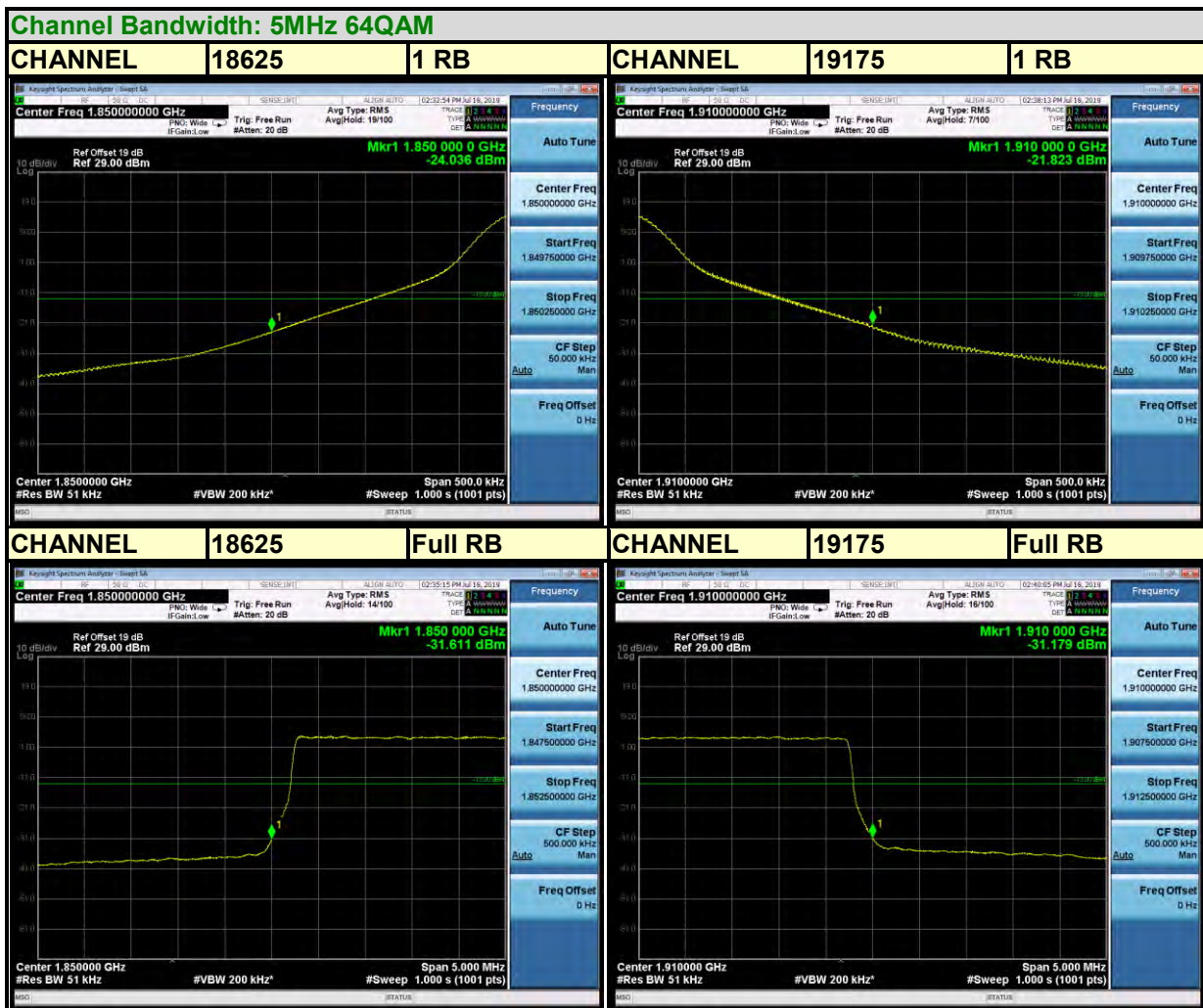
Test Report No.: RF190712W002-4





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Test Report No.: RF190712W002-4







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Test Report No.: RF190712W002-4

## LTE BAND 2

### Channel Bandwidth: 10MHz QPSK

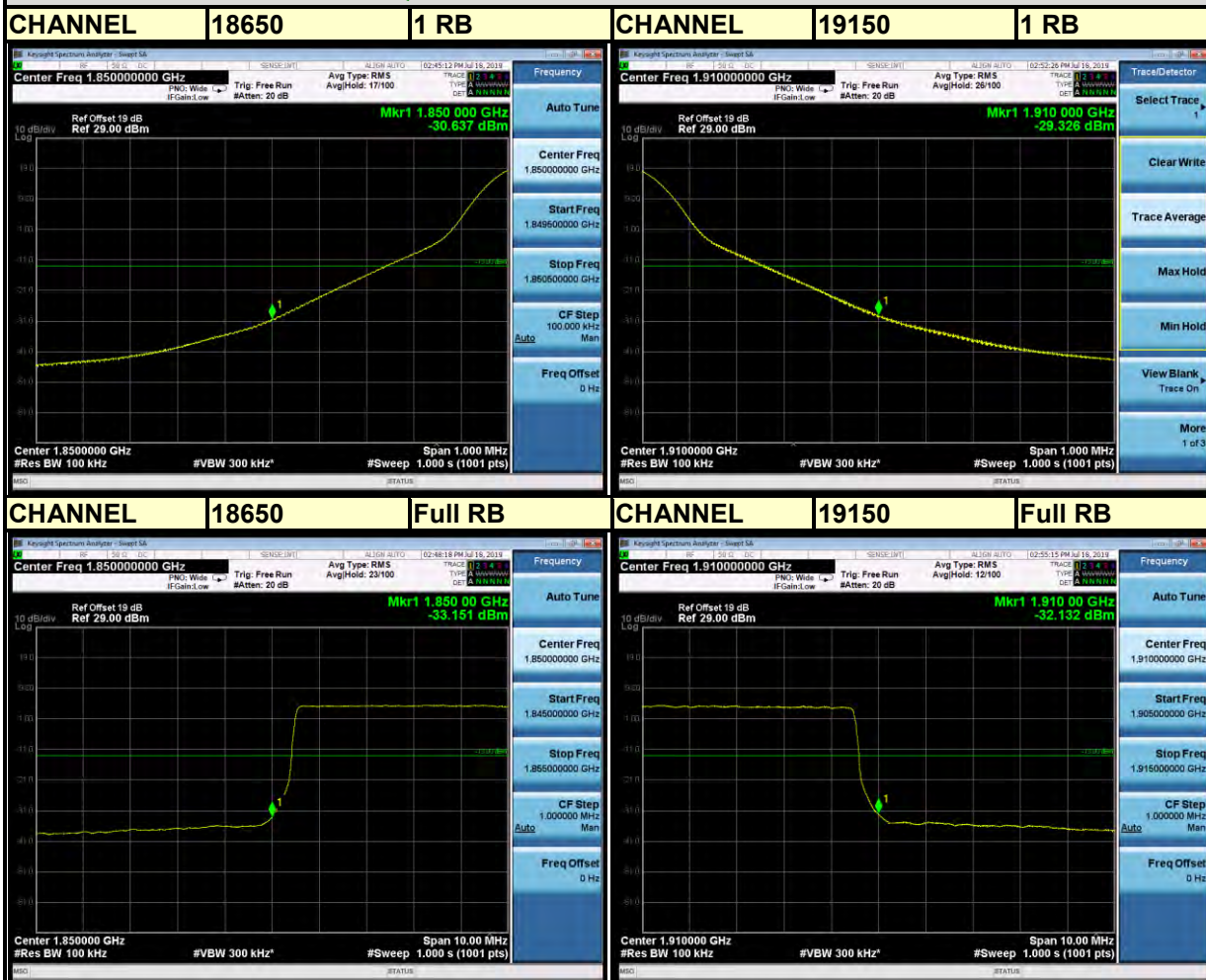




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Test Report No.: RF190712W002-4

Channel Bandwidth: 10MHz 16QAM

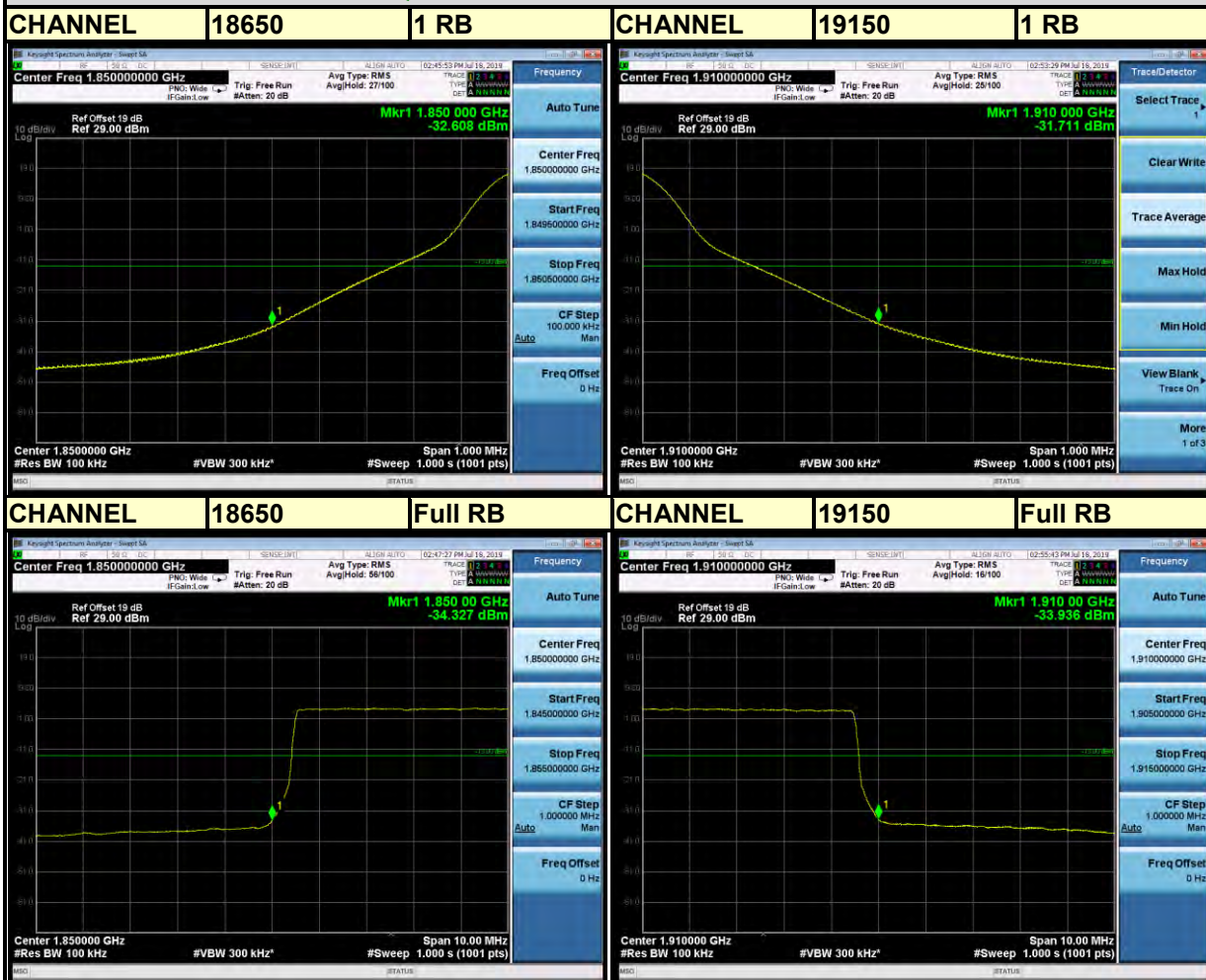




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Test Report No.: RF190712W002-4

Channel Bandwidth: 10MHz 64QAM





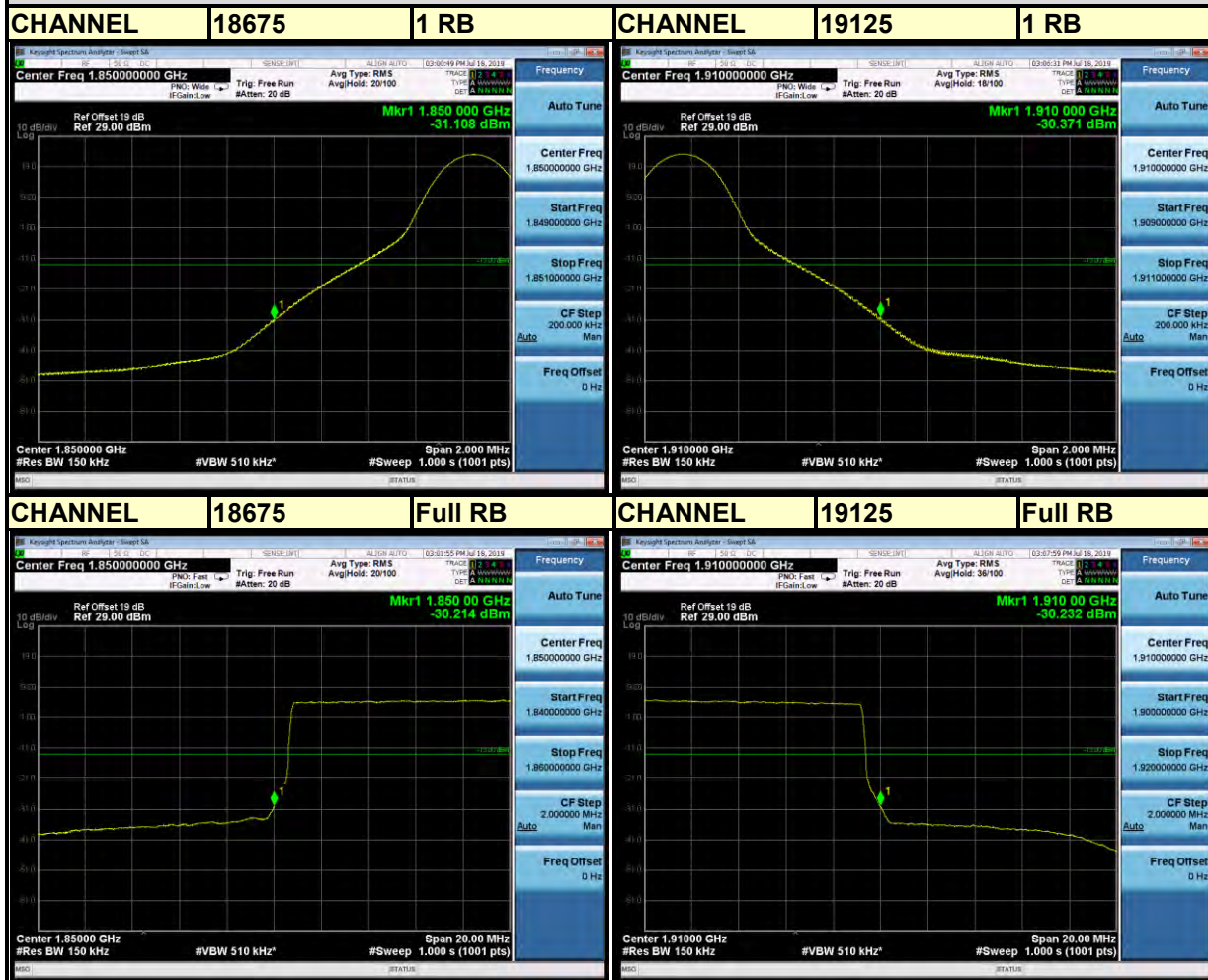


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Test Report No.: RF190712W002-4

## LTE BAND 2

### Channel Bandwidth: 15MHz QPSK

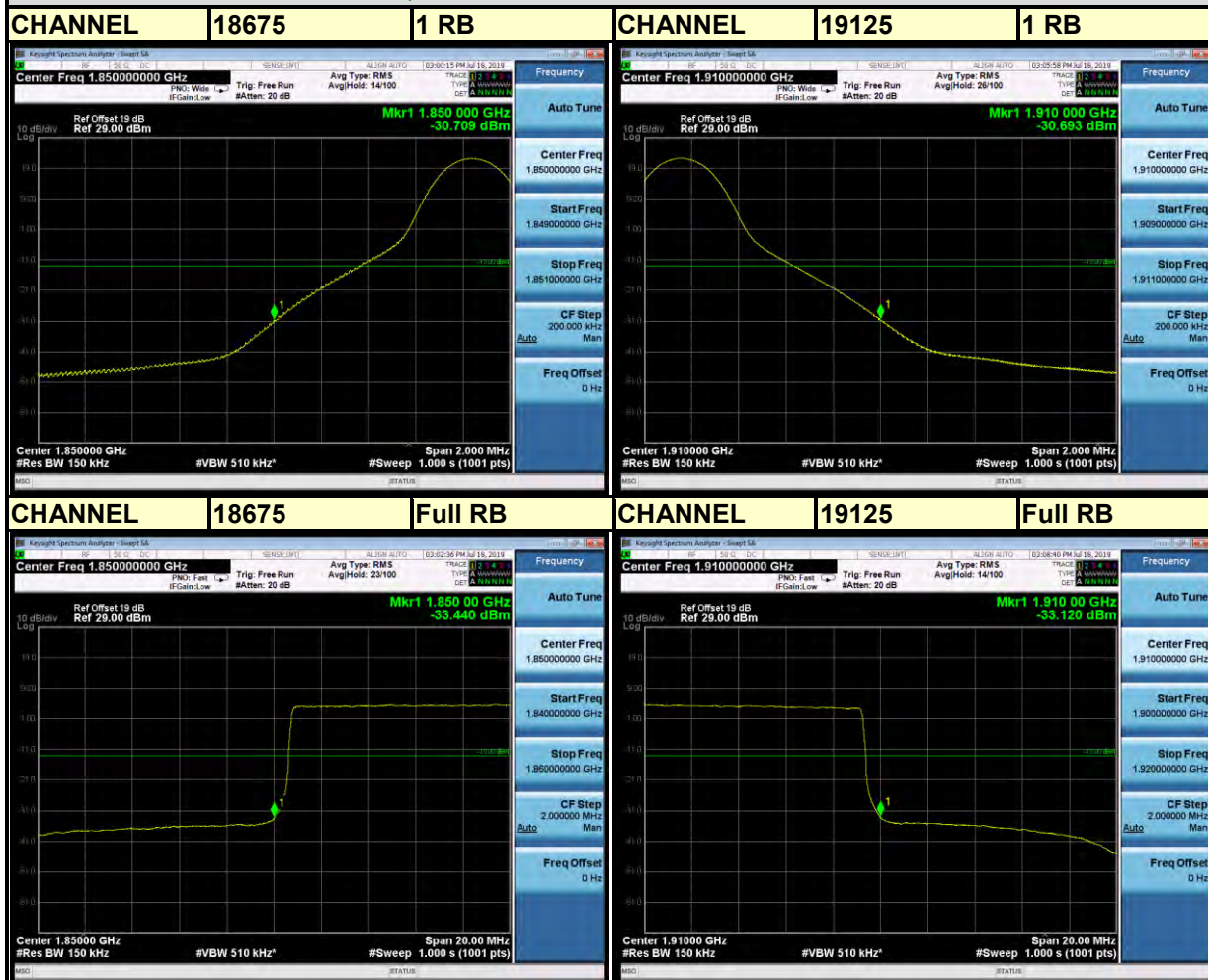




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Test Report No.: RF190712W002-4

Channel Bandwidth: 15MHz 16QAM



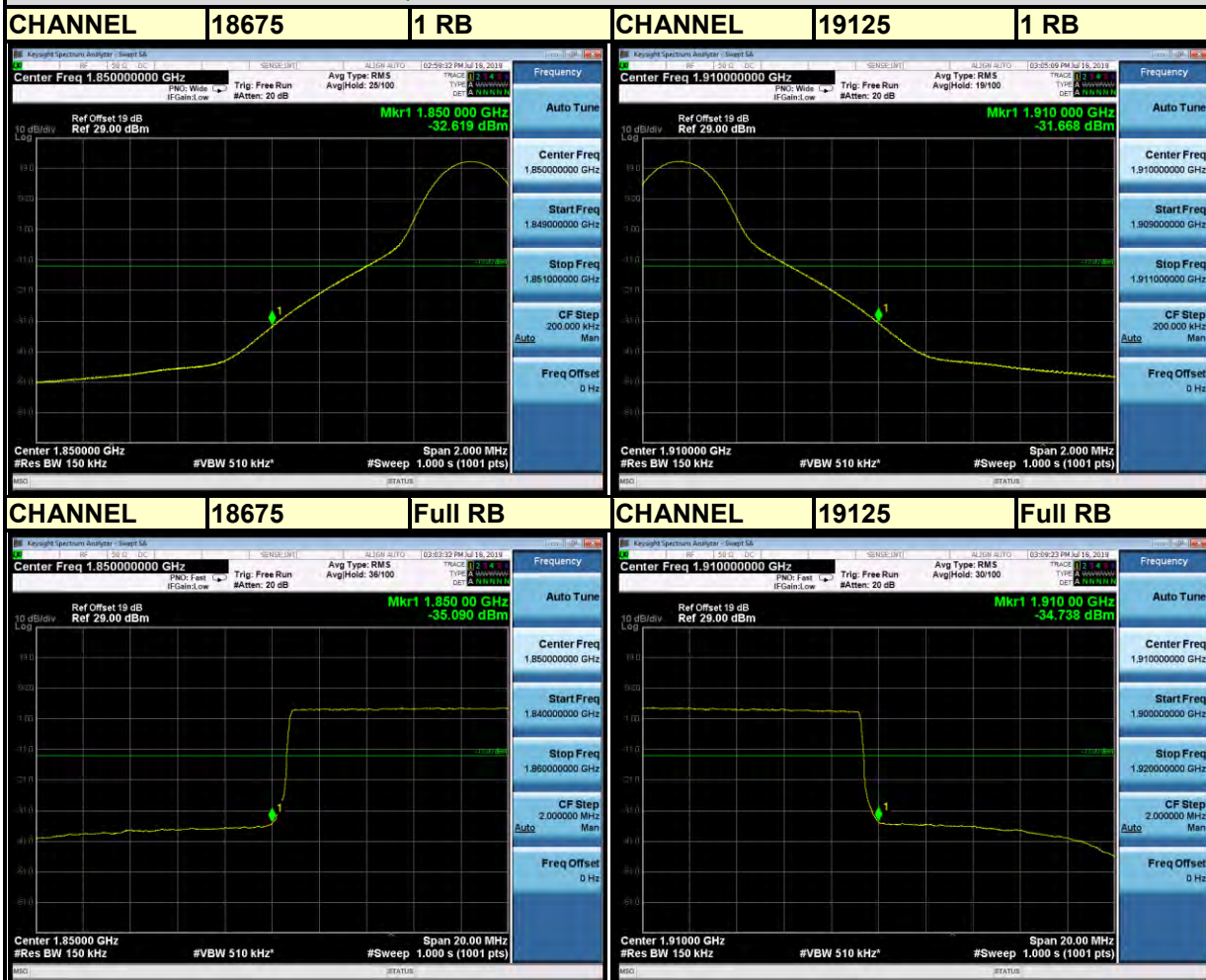




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Test Report No.: RF190712W002-4

Channel Bandwidth: 15MHz 64QAM



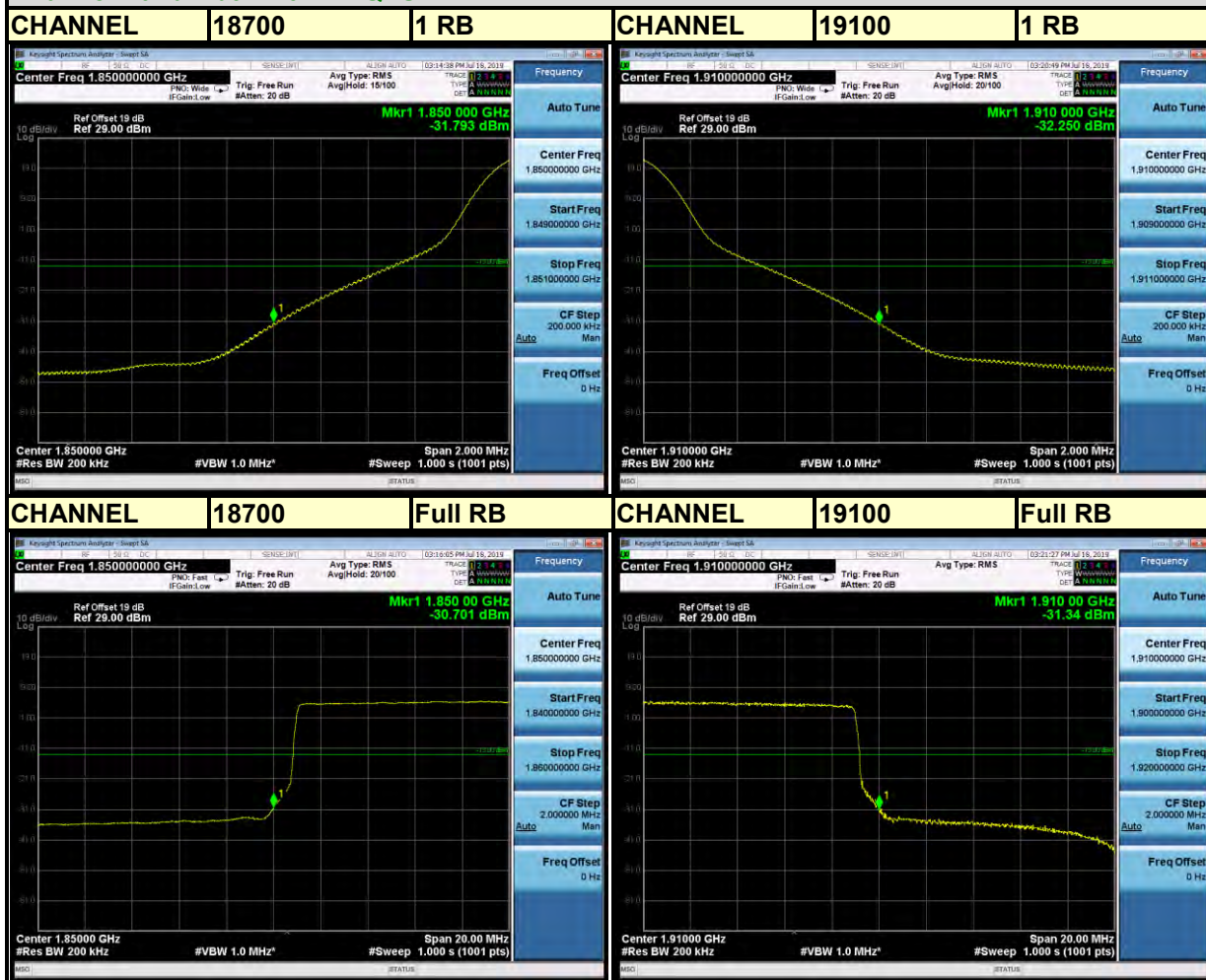


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Test Report No.: RF190712W002-4

## LTE BAND 2

### Channel Bandwidth: 20MHz QPSK

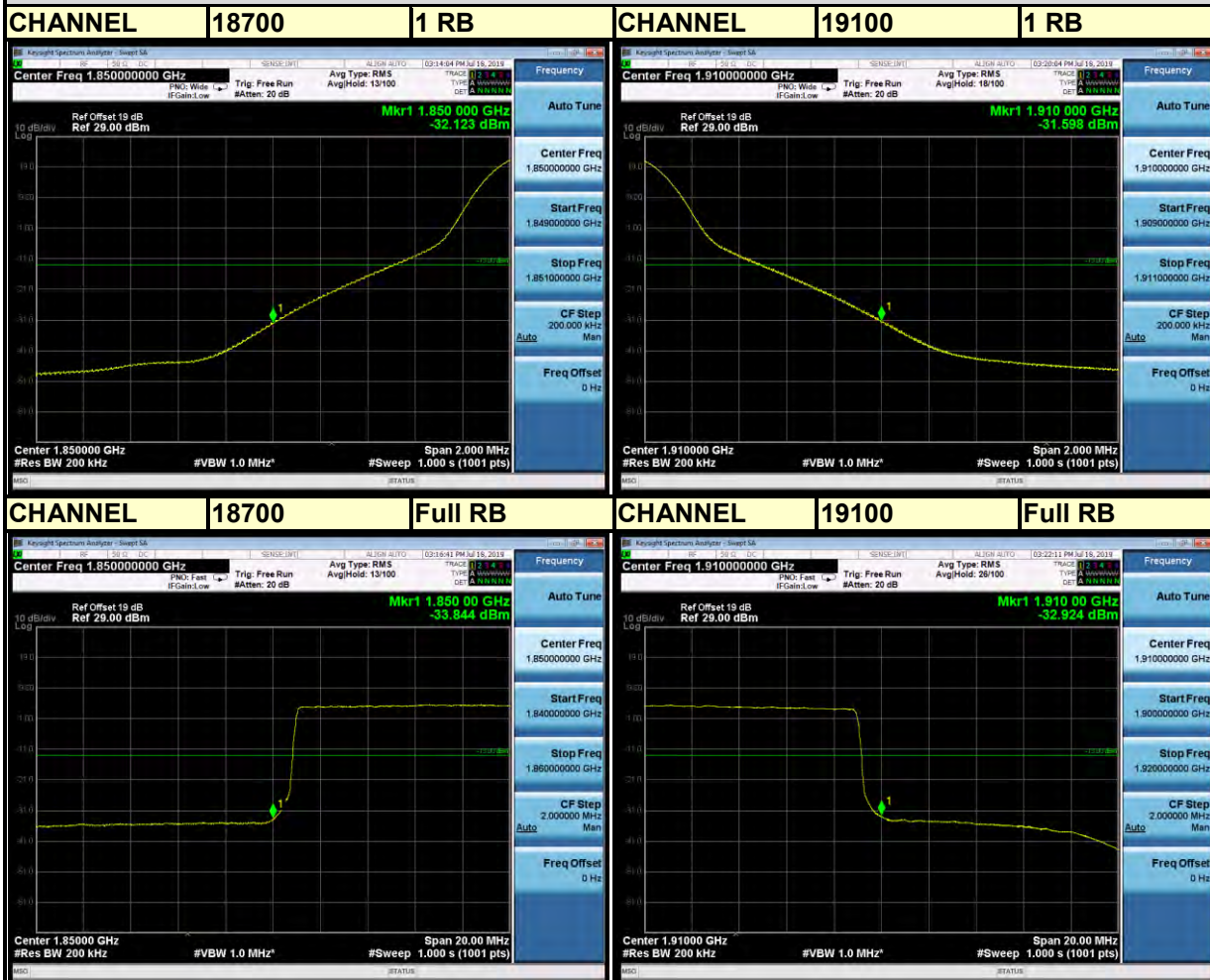




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Test Report No.: RF190712W002-4

Channel Bandwidth: 20MHz 16QAM







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Test Report No.: RF190712W002-4

Channel Bandwidth: 20MHz 64QAM

