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Test Report No.: RF190522W005-1



Certificate # 3939.01

# FCC TEST REPORT

## (PART 22)

Applicant:	Quectel Wireless Solutions Co., Ltd.
Address:	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233

Manufacturer or Supplier:	Quectel Wireless Solutions Co., Ltd.
Address:	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233
Product:	LTE Module
Brand Name:	Quectel
Model Name:	SC66-A
FCC ID:	XMR201908SC66A
Date of tests:	Jul. 13, 2019 ~ Sept. 06, 2019

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

- FCC PART 22, Subpart H     FCC Part 2  
 ANSI/TIA/EIA-603-D     ANSI C63.26-2015  
 ANSI/TIA/EIA-603-E

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: Sept. 06, 2019	 Date: Sept. 06, 2019

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BUREAU  
VERITAS

Test Report No.: RF190522W005-1

## 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.....	17
2.6 GENERAL DESCRIPTION OF APPLIED STANDARDS .....	18
<b>3 TEST TYPES AND RESULTS.....</b>	<b>19</b>
3.1 OUTPUT POWER MEASUREMENT .....	19
3.1.1 LIMITS OF OUTPUT POWER MEASUREMENT.....	19
3.1.2 TEST PROCEDURES .....	19
3.1.3 TEST SETUP.....	20
3.1.4 TEST RESULTS .....	20
3.2 FREQUENCY STABILITY MEASUREMENT .....	36
3.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT.....	36
3.2.2 TEST PROCEDURE.....	36
3.2.3 TEST SETUP.....	36
3.2.4 TEST RESULTS .....	37
3.3 OCCUPIED BANDWIDTH MEASUREMENT .....	47
3.3.1 TEST PROCEDURES .....	47
3.3.2 TEST SETUP.....	47
3.3.3 TEST RESULTS .....	48
3.4 BAND EDGE MEASUREMENT .....	58
3.4.1 LIMITS OF BAND EDGE MEASUREMENT .....	58
3.4.2 TEST SETUP.....	58
3.4.3 TEST PROCEDURES .....	59
3.4.4 TEST RESULTS .....	60
3.5 CONDUCTED SPURIOUS EMISSIONS.....	79
3.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT .....	79
3.5.2 TEST PROCEDURE.....	79
3.5.3 TEST SETUP.....	79
3.5.4 TEST RESULTS .....	80
3.6 RADIATED EMISSION MEASUREMENT .....	90
3.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT .....	90
3.6.2 TEST PROCEDURES .....	90
3.6.3 DEVIATION FROM TEST STANDARD .....	90
3.6.4 TEST SETUP .....	91



BUREAU  
VERITAS

**Test Report No.: RF190522W005-1**

3.6.5	TEST RESULTS .....	92
3.7	PEAK TO AVERAGE RATIO .....	126
3.7.1	LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT .....	126
3.7.2	TEST SETUP .....	126
3.7.3	TEST PROCEDURES .....	126
3.7.4	TEST RESULTS .....	127
<b>4</b>	<b>PHOTOGRAPHS OF THE TEST CONFIGURATION .....</b>	<b>139</b>
<b>5</b>	<b>INFORMATION ON THE TESTING LABORATORIES .....</b>	<b>140</b>
<b>6</b>	<b>APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB .....</b>	<b>141</b>



BUREAU  
VERITAS

Test Report No.: RF190522W005-1

## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF190522W005-1	Original release	Sept. 06, 2019

BUREAU  
VERITAS

Test Report No.: RF190522W005-1

## 1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 22 & Part 2		
STANDARD SECTION	TEST TYPE	RESULT
2.1046 22.913 (a)	Effective Radiated Power	Compliance
2.1055 22.355	Frequency Stability	Compliance
2.1049 22.917 (b)	Occupied Bandwidth	Compliance
22.913 (d)	Peak to average ratio*	Compliance
22.917	Band Edge Measurements	Compliance
2.1051 22.917	Conducted Spurious Emissions	Compliance
2.1053 22.917	Radiated Spurious Emissions	Compliance

\* Refer to KDB 971168 D01 Power Meas License Digital Systems v03r01.

### 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
Maximum Peak Output Power	±2.06dB
Frequency Stability	±76.97Hz
Radiated emissions (30MHz~1GHz)	±4.98dB
Radiated emissions (1GHz ~6GHz)	±4.70dB
Radiated emissions (6GHz ~18GHz)	±4.60dB
Radiated emissions (18GHz ~40GHz)	±4.12dB
Conducted emissions	±4.01dB
Occupied Channel Bandwidth	±43.58KHz
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.

BUREAU  
VERITAS

Test Report No.: RF190522W005-1

## 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	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. 26,19	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	Jul. 08,19	Jul. 09,20
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	Jul. 08,19	Jul. 09,20
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.



BUREAU  
VERITAS

Test Report No.: RF190522W005-1

## 2 GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

EUT	LTE Module	
BRAND NAME	Quectel	
MODEL NAME	SC66-A	
POWER SUPPLY	$V_{min}=3.55\text{Vdc}$ , $V_{nor}=4\text{Vdc}$ , $V_{max}=4.4\text{Vdc}$	
MODULATION TYPE	WCDMA	BPSK, QPSK
	LTE	QPSK, 16QAM
FREQUENCY RANGE	WCDMA	826.4MHz ~ 846.6MHz
	LTE Band 5 (Channel Bandwidth: 1.4MHz)	824.7MHz ~ 848.3MHz
	LTE Band 5 (Channel Bandwidth: 3MHz)	825.5MHz ~ 847.5MHz
	LTE Band 5 (Channel Bandwidth: 5MHz)	826.5MHz ~ 846.5MHz
	LTE Band 5 (Channel Bandwidth: 10MHz)	829MHz ~ 844MHz
	LTE Band 26 (Channel Bandwidth: 1.4MHz)	824.7MHz ~ 848.3MHz
	LTE Band 26 (Channel Bandwidth: 3MHz)	825.5MHz ~ 847.5MHz
	LTE Band 26 (Channel Bandwidth: 5MHz)	826.5MHz ~ 846.5MHz
	LTE Band 26 (Channel Bandwidth: 10MHz)	829MHz ~ 844MHz
	LTE Band 26 (Channel Bandwidth: 15MHz)	821.5MHz ~ 841.5MHz

BUREAU  
VERITAS

Test Report No.: RF190522W005-1

MAX. ERP POWER	WCDMA	190.99 mW
	LTE Band 5 (Channel Bandwidth: 1.4MHz)	188.36 mW
	LTE Band 5 (Channel Bandwidth: 3MHz)	185.35 mW
	LTE Band 5 (Channel Bandwidth: 5MHz)	185.78 mW
	LTE Band 5 (Channel Bandwidth: 10MHz)	187.93 mW
	LTE Band 26 (Channel Bandwidth: 1.4MHz)	182.81 mW
	LTE Band 26 (Channel Bandwidth: 3MHz)	184.5 mW
	LTE Band 26 (Channel Bandwidth: 5MHz)	185.78 mW
	LTE Band 26 (Channel Bandwidth: 10MHz)	187.07 mW
	LTE Band 26 (Channel Bandwidth: 15MHz)	188.36 mW
EMISSION DESIGNATOR	WCDMA	4M15F9W
	LTE Band 5 (Channel Bandwidth: 1.4MHz)	QPSK: 1M08G7D 16QAM: 1M08W7D
	LTE Band 5 (Channel Bandwidth: 3MHz)	QPSK: 2M69G7D 16QAM: 2M68W7D
	LTE Band 5 (Channel Bandwidth: 5MHz)	QPSK: 4M48G7D 16QAM: 4M47W7D
	LTE Band 5 (Channel Bandwidth: 10MHz)	QPSK: 8M94G7D 16QAM: 8M93W7D
	LTE Band 26 (Channel Bandwidth: 1.4MHz)	QPSK: 1M09G7D 16QAM: 1M08W7D
	LTE Band 26 (Channel Bandwidth: 3MHz)	QPSK: 2M69G7D 16QAM: 2M69W7D
	LTE Band 26 (Channel Bandwidth: 5MHz)	QPSK: 4M48G7D 16QAM: 4M51W7D
	LTE Band 26 (Channel Bandwidth: 10MHz)	QPSK: 8M94G7D 16QAM: 8M95W7D
	LTE Band 26 (Channel Bandwidth: 15MHz)	QPSK: 13M4G7D 16QAM: 13M4W7D
ANTENNA TYPE	Fixed External Antenna with 2.13dBi gain	
HW VERSION	R1.0	
SW VERSION	SC66ANAR01A06	
I/O PORTS	Refer to user's manual	



BUREAU  
VERITAS

**Test Report No.: RF190522W005-1**

**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.

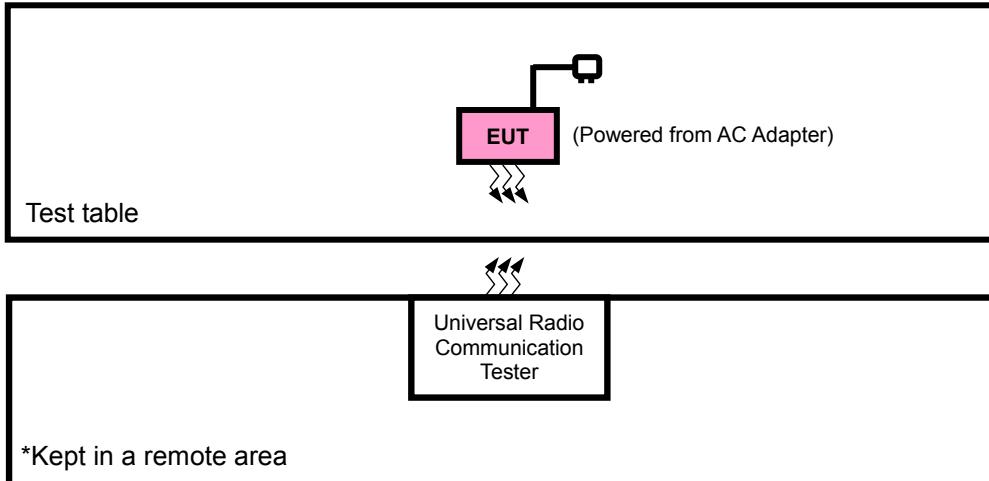
MODULATION MODE	TX FUNCTION
WCDMA	1TX/1RX
LTE	1TX/1RX



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VERITAS

Test Report No.: RF190522W005-1

## 2.2 CONFIGURATION OF SYSTEM UNDER TEST FOR RADIATION EMISSION





BUREAU  
VERITAS

Test Report No.: RF190522W005-1

## 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	Adapter	JINGSAI	CLS-050200	N/A	N/A
2	DC source	LONG WEI	PS-6403D	010934269	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	Unshielded, Detachable 1.8m
2	DC Line: Unshielded, Detachable 1.0m

## 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 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



BUREAU  
VERITAS

Test Report No.: RF190522W005-1

**WCDMA MODE**

TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
ERP	4132 to 4233	4132, 4182, 4233	WCDMA
FREQUENCY STABILITY	4132 to 4233	4132, 4233	WCDMA
OCCUPIED BANDWIDTH	4132 to 4233	4132, 4182, 4233	WCDMA
BAND EDGE	4132 to 4233	4132, 4233	WCDMA
CONDUCDETED EMISSION	4132 to 4233	4132, 4182, 4233	WCDMA
RADIATED EMISSION	4132 to 4233	4132, 4182, 4233	WCDMA
PEAK TO AVERAGE RATIO	4132 to 4233	4132, 4182, 4233	WCDMA

BUREAU  
VERITAS

Test Report No.: RF190522W005-1

## LTE BAND 5 MODE

TEST ITEM	Available Channel	Tested Channel	Channel bandwidth	modulation	mode
ERP	20407 to 20643	20407, 20525, 20643	1.4MHz	QPSK,16QAM	1 RB / 0 RB Offset
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK,16QAM	1 RB / 0 RB Offset
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK,16QAM	1 RB / 0 RB Offset
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK,16QAM	1 RB / 0 RB Offset
FREQUENCY STABILITY	20407 to 20643	20407, 20643	1.4MHz	QPSK	1 RB / 0 RB Offset
	20415 to 20635	20415, 20635	3MHz	QPSK	1 RB / 0 RB Offset
	20425 to 20625	20425, 20625	5MHz	QPSK	1 RB / 0 RB Offset
	20450 to 20600	20450, 20600	10MHz	QPSK	1 RB / 0 RB Offset
OCCUPIED BANDWIDTH	20407 to 20643	20407, 20525, 20643	1.4MHz	QPSK,16QAM	6 RB / 0 RB Offset
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK,16QAM	15 RB / 0 RB Offset
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK,16QAM	25 RB / 0 RB Offset
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK,16QAM	50 RB / 0 RB Offset
BAND EDGE	20407 to 20643	20407	1.4 MHz	QPSK,16QAM	1 RB / 0 RB Offset
					6 RB / 0 RB Offset
	20407 to 20643	20643	1.4 MHz	QPSK,16QAM	1 RB / 5 RB Offset
					6 RB / 0 RB Offset
	20415 to 20635	20415	3 MHz	QPSK,16QAM	1 RB / 0 RB Offset
					15 RB / 0 RB Offset
	20415 to 20635	20635	3 MHz	QPSK,16QAM	1 RB / 14 RB Offset
					15 RB / 0 RB Offset
	20425 to 20625	20425	5MHz	QPSK,16QAM	1 RB / 0 RB Offset
					25 RB / 0 RB Offset
	20425 to 20625	20625	5MHz	QPSK,16QAM	1 RB / 24 RB Offset
					25 RB / 0 RB Offset
	20450 to 20600	20450	10MHz	QPSK,16QAM	1 RB / 0 RB Offset
					50 RB / 0 RB Offset
	20450 to 20600	20600	10MHz	QPSK,16QAM	1 RB / 49 RB Offset
					50 RB / 0 RB Offset



BUREAU  
VERITAS

**Test Report No.: RF190522W005-1**

CONDUCTED EMISSION	20407 to 20643	20407, 20525, 20643	1.4MHz	QPSK	1 RB / 0 RB Offset
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK	1 RB / 0 RB Offset
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK	1 RB / 0 RB Offset
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK	1 RB / 0 RB Offset
RADIATED EMISSION	20407 to 20643	20525	1.4MHz	QPSK	1 RB / 0 RB Offset
	20415 to 20635	20525	3MHz	QPSK	1 RB / 0 RB Offset
	20425 to 20625	20525	5MHz	QPSK	1 RB / 0 RB Offset
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK	1 RB / 0 RB Offset
PEAK TO AVERAGE RATIO	20407 to 20643	20407, 20525, 20643	1.4MHz	QPSK,16QAM	1 RB / 0 RB Offset
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK,16QAM	1 RB / 0 RB Offset
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK,16QAM	1 RB / 0 RB Offset
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK,16QAM	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.



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Test Report No.: RF190522W005-1

## LTE BAND 26 MODE

TEST ITEM	Available Channel	Tested Channel	Channel bandwidth	modulation	mode
ERP	20407 to 20643	20407, 20525, 20643	1.4MHz	QPSK,16QAM	1 RB / 0 RB Offset
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK,16QAM	1 RB / 0 RB Offset
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK,16QAM	1 RB / 0 RB Offset
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK,16QAM	1 RB / 0 RB Offset
	26765 to 26965	26765, 26865, 26965	15MHz	QPSK,16QAM	1 RB / 0 RB Offset
FREQUENCY STABILITY	20407 to 20643	20407, 20643	1.4MHz	QPSK	1 RB / 0 RB Offset
	20415 to 20635	20415, 20635	3MHz	QPSK	1 RB / 0 RB Offset
	20425 to 20625	20425, 20625	5MHz	QPSK	1 RB / 0 RB Offset
	20450 to 20600	20450, 20600	10MHz	QPSK	1 RB / 0 RB Offset
	26765 to 26965	26765, 26965	15MHz	QPSK	1 RB / 0 RB Offset
OCCUPIED BANDWIDTH	20407 to 20643	20407, 20525, 20643	1.4MHz	QPSK,16QAM	6 RB / 0 RB Offset
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK,16QAM	15 RB / 0 RB Offset
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK,16QAM	25 RB / 0 RB Offset
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK,16QAM	50 RB / 0 RB Offset
	26765 to 26965	26765, 26865, 26965	15MHz	QPSK,16QAM	75 RB / 0 RB Offset

BUREAU  
VERITAS

Test Report No.: RF190522W005-1

BAND EDGE	20407 to 20643	20407	1.4 MHz	QPSK,16QAM	1 RB / 0 RB Offset
	20407 to 20643	20643	1.4 MHz	QPSK,16QAM	6 RB / 0 RB Offset
	20415 to 20635	20415	3 MHz	QPSK,16QAM	1 RB / 5 RB Offset
					6 RB / 0 RB Offset
	20415 to 20635	20635	3 MHz	QPSK,16QAM	1 RB / 0 RB Offset
					15 RB / 0 RB Offset
	20425 to 20625	20425	5MHz	QPSK,16QAM	1 RB / 14 RB Offset
					15 RB / 0 RB Offset
	20450 to 20600	20450	10MHz	QPSK,16QAM	1 RB / 0 RB Offset
					50 RB / 0 RB Offset
CONDCUDETED EMISSION	20450 to 20600	20600	10MHz	QPSK,16QAM	1 RB / 49 RB Offset
					50 RB / 0 RB Offset
	26765 to 26965	26765	15MHz	QPSK,16QAM	1 RB / 74 RB Offset
					75 RB / 0 RB Offset
	26765 to 26965	26965	15MHz	QPSK,16QAM	1 RB / 74 RB Offset
					75 RB / 0 RB Offset
RADIATED EMISSION	20407 to 20643	20407, 20525, 20643	1.4MHz	QPSK	1 RB / 0 RB Offset
	20415 to 20635	20415, 20525, 20635	3MHz	QPSK	1 RB / 0 RB Offset
	20425 to 20625	20425, 20525, 20625	5MHz	QPSK	1 RB / 0 RB Offset
	20450 to 20600	20450, 20525, 20600	10MHz	QPSK	1 RB / 0 RB Offset
	26765 to 26965	26765, 26865, 26965	15MHz	QPSK	1 RB / 0 RB Offset
PEAK TO AVERAGE RATIO	20407 to 20643	20407, 20525, 20643	1.4MHz	QPSK	1 RB / 0 RB Offset
	20415 to 20635	20525	3MHz	QPSK	1 RB / 0 RB Offset
	20425 to 20625	20525	5MHz	QPSK	1 RB / 0 RB Offset



BUREAU  
VERITAS

Test Report No.: RF190522W005-1

	20450 to 20600	20450, 20525, 20600	10MHz	QPSK,16QAM	1 RB / 0 RB Offset
	26765 to 26965	26765, 26865, 26965	15MHz	QPSK,16QAM	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 ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
ERP	23deg. C, 70%RH	5Vdc from adapter	Star Le
FREQUENCY STABILITY	23deg. C, 70%RH	DC 3.55V/4V/4.4V	Walker Ye
OCCUPIED BANDWIDTH	23deg. C, 70%RH	5Vdc from adapter	Walker Ye
BAND EDGE	23deg. C, 70%RH	5Vdc from adapter	Walker Ye
CONDUCDETED EMISSION	23deg. C, 70%RH	5Vdc from adapter	Walker Ye
RADIATED EMISSION	23deg. C, 70%RH	5Vdc from adapter	Star Le
PEAK TO AVERAGE RATIO	23deg. C, 70%RH	5Vdc from adapter	Walker Ye

## 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



Test Report No.: RF190522W005-1

## 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 22**

**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.



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Test Report No.: RF190522W005-1

### 3 TEST TYPES AND RESULTS

#### 3.1 OUTPUT POWER MEASUREMENT

##### 3.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

Mobile / Portable station are limited to 7 watts e.r.p.

##### 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:

$$\text{ERP or EIRP} = P_{\text{Meas}} + G_T - L_c$$

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;

$G_T$  = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

$L_c$  = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

$$\text{ERP}=\text{EIRP}-2.15$$

###### 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.

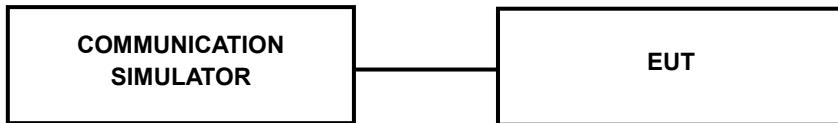


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Test Report No.: RF190522W005-1

### 3.1.3 TEST SETUP

#### CONDUCTED POWER MEASUREMENT:



### 3.1.4 TEST RESULTS

#### CONDUCTED OUTPUT POWER (dBm)

Band	WCDMA V		
Channel	4132	4182	4233
Rx Channel	4357	4407	4458
Frequency (MHz)	826.4	836.4	846.6
RMC 12.2K	22.78	22.83	22.81
HSPA			
HSDPA Subtest-1	21.75	21.91	21.86
HSDPA Subtest-2	21.81	21.85	21.90
HSDPA Subtest-3	21.22	21.40	21.41
HSDPA Subtest-4	21.19	21.37	21.39
DC-HSDPA Subtest-1	21.84	21.79	21.77
DC-HSDPA Subtest-2	21.76	21.82	21.78
DC-HSDPA Subtest-3	21.30	21.44	21.51
DC-HSDPA Subtest-4	21.27	21.31	21.25
HSUPA Subtest-1	21.67	21.92	21.84
HSUPA Subtest-2	19.89	20.04	19.92
HSUPA Subtest-3	20.83	21.06	20.95
HSUPA Subtest-4	19.61	20.11	19.97
HSUPA Subtest-5	21.58	21.82	21.94



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Test Report No.: RF190522W005-1

LTE Band 5

Band/BW	Modulation	RB Size	RB Offset	Low CH 20407	Mid CH 20525	High CH 20643	3GPP MPR (dB)
				Frequency 824.7 MHz	Frequency 836.5 MHz	Frequency 848.3 MHz	
5/1.4	QPSK	1	0	22.56	22.63	22.71	0
		1	2	22.53	22.53	22.66	0
		1	5	22.56	22.54	22.65	0
		3	0	22.61	22.62	22.77	0
		3	1	22.67	22.69	22.72	0
		3	3	22.57	22.57	22.68	0
		6	0	21.65	21.63	21.76	1
	16QAM	1	0	21.85	21.86	21.97	1
		1	2	21.80	21.77	21.92	1
		1	5	21.74	21.74	21.90	1
		3	0	21.67	21.69	21.78	1
		3	1	21.65	21.75	21.80	1
		3	3	21.61	21.63	21.76	1
		6	0	20.66	20.73	20.79	2



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Test Report No.: RF190522W005-1

Band/BW	Modulation	RB Size	RB Offset	Low CH 20415	Mid CH 20525	High CH 20635	3GPP MPR (dB)
				Frequency 825.5 MHz	Frequency 836.5 MHz	Frequency 847.5 MHz	
5/ 3	QPSK	1	0	22.58	22.65	22.70	0
		1	7	22.49	22.54	22.66	0
		1	14	22.52	22.54	22.65	0
		8	0	21.60	21.65	21.77	1
		8	3	21.60	21.69	21.74	1
		8	7	21.54	21.64	21.72	1
		15	0	21.62	21.64	21.70	1
	16QAM	1	0	21.82	21.92	22.00	1
		1	7	21.77	21.80	21.90	1
		1	14	21.77	21.74	21.90	1
		8	0	20.63	20.70	20.78	2
		8	3	20.70	20.70	20.83	2
		8	7	20.63	20.61	20.72	2
		15	0	20.66	20.67	20.82	2



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Test Report No.: RF190522W005-1

Band/BW	Modulation	RB Size	RB Offset	Low CH 20425	Mid CH 20525	High CH 20625	3GPP MPR (dB)
				Frequency 826.5 MHz	Frequency 836.5 MHz	Frequency 846.5 MHz	
5/ 5	QPSK	1	0	22.59	22.60	22.71	0
		1	12	22.54	22.51	22.66	0
		1	24	22.53	22.53	22.69	0
		12	0	21.63	21.65	21.74	1
		12	6	21.60	21.70	21.75	1
		12	13	21.58	21.60	21.73	1
		25	0	21.60	21.67	21.73	1
	16QAM	1	0	21.83	21.88	22.00	1
		1	12	21.74	21.83	21.89	1
		1	24	21.77	21.74	21.89	1
		12	0	20.63	20.68	20.75	2
		12	6	20.67	20.74	20.79	2
		12	13	20.58	20.63	20.75	2
		25	0	20.66	20.68	20.79	2



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Test Report No.: RF190522W005-1

Band/BW	Modulation	RB Size	RB Offset	Low CH 20450	Mid CH 20525	High CH 20600	3GPP MPR (dB)
				Frequency 829 MHz	Frequency 836.5 MHz	Frequency 844 MHz	
5/ 10	QPSK	1	0	22.64	22.67	22.76	0
		1	24	22.56	22.59	22.68	0
		1	49	22.58	22.61	22.70	0
		25	0	21.67	21.70	21.79	1
		25	12	21.68	21.71	21.80	1
		25	25	21.62	21.65	21.74	1
		50	0	21.66	21.69	21.78	1
	16QAM	1	0	21.90	21.93	22.02	1
		1	24	21.82	21.85	21.94	1
		1	49	21.79	21.82	21.91	1
		25	0	20.71	20.74	20.83	2
		25	12	20.73	20.76	20.85	2
		25	25	20.65	20.68	20.77	2
		50	0	20.72	20.75	20.84	2



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Test Report No.: RF190522W005-1

LTE Band 26

Band/BW	Modulation	RB Size	RB Offset	Low CH 26797	Mid CH 26915	High CH 27033	3GPP MPR (dB)
				Frequency 824.7 MHz	Frequency 836.5 MHz	Frequency 848.3 MHz	
26/1.4	QPSK	1	0	22.59	22.56	22.55	0
		1	2	22.62	22.59	22.58	0
		1	5	22.64	22.61	22.60	0
		3	0	22.57	22.54	22.53	0
		3	1	22.60	22.57	22.56	0
		3	3	22.62	22.59	22.58	0
		6	0	21.70	21.67	21.66	1
	16QAM	1	0	21.91	21.88	21.87	1
		1	2	21.94	21.91	21.90	1
		1	5	21.95	21.92	21.91	1
		3	0	21.90	21.87	21.86	1
		3	1	21.93	21.90	21.89	1
		3	3	21.94	21.91	21.90	1
		6	0	20.71	20.68	20.67	2



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Test Report No.: RF190522W005-1

Band/BW	Modulation	RB Size	RB Offset	Low CH 26805	Mid CH 26915	High CH 27025	3GPP MPR (dB)
				Frequency 825.5 MHz	Frequency 836.5 MHz	Frequency 847.5 MHz	
26/ 3	QPSK	1	0	22.63	22.60	22.59	0
		1	7	22.66	22.63	22.62	0
		1	14	22.68	22.65	22.64	0
		8	0	21.68	21.65	21.64	1
		8	3	21.71	21.68	21.67	1
		8	7	21.75	21.72	21.71	1
		15	0	21.74	21.71	21.70	1
	16QAM	1	0	21.95	21.92	21.91	1
		1	7	21.98	21.95	21.94	1
		1	14	21.99	21.96	21.95	1
		8	0	20.81	20.78	20.77	2
		8	3	20.79	20.76	20.75	2
		8	7	20.82	20.79	20.78	2
		15	0	20.75	20.72	20.71	2



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Test Report No.: RF190522W005-1

Band/BW	Modulation	RB Size	RB Offset	Low CH 26815	Mid CH 26915	High CH 27015	3GPP MPR (dB)
				Frequency 826.5 MHz	Frequency 836.5MHz	Frequency 846.5 MHz	
26/ 5	QPSK	1	0	22.66	22.63	22.62	0
		1	12	22.69	22.66	22.65	0
		1	24	22.71	22.68	22.67	0
		12	0	21.71	21.68	21.67	1
		12	6	21.74	21.71	21.70	1
		12	13	21.78	21.75	21.74	1
		25	0	21.77	21.74	21.73	1
	16QAM	1	0	21.98	21.95	21.94	1
		1	12	22.01	21.98	21.97	1
		1	24	22.02	21.99	21.98	1
		12	0	20.84	20.81	20.80	2
		12	6	20.82	20.79	20.78	2
		12	13	20.85	20.82	20.81	2
		25	0	20.78	20.75	20.74	2



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Test Report No.: RF190522W005-1

Band/BW	Modulation	RB Size	RB Offset	Low CH 26840	Mid CH 26915	High CH 26990	3GPP MPR (dB)
				Frequency 829MHz	Frequency 836.5MHz	Frequency 844MHz	
26/ 10	QPSK	1	0	22.69	22.66	22.65	0
		1	24	22.72	22.69	22.68	0
		1	49	22.74	22.71	22.70	0
		25	0	21.74	21.71	21.70	1
		25	12	21.77	21.74	21.73	1
		25	25	21.81	21.78	21.77	1
		50	0	21.80	21.77	21.76	1
	16QAM	1	0	22.01	21.98	21.97	1
		1	24	22.04	22.01	22.00	1
		1	49	22.05	22.02	22.01	1
		25	0	20.87	20.84	20.83	2
		25	12	20.85	20.82	20.81	2
		25	25	20.88	20.85	20.84	2
		50	0	20.81	20.78	20.77	2



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Test Report No.: RF190522W005-1

Band/BW	Modulation	RB Size	RB Offset	Low CH 26865	Mid CH 26915	High CH 26965	3GPP MPR (dB)
				Frequency 831.5 MHz	Frequency 836.5 MHz	Frequency 841.5 MHz	
26/ 15	QPSK	1	0	22.72	22.69	22.68	0
		1	37	22.75	22.72	22.71	0
		1	74	22.77	22.74	22.73	0
		36	0	21.77	21.74	21.73	1
		36	19	21.80	21.77	21.76	1
		36	39	21.84	21.81	21.80	1
		75	0	21.83	21.80	21.79	1
	16QAM	1	0	22.04	22.01	22.00	1
		1	37	22.07	22.04	22.03	1
		1	74	22.08	22.05	22.04	1
		36	0	20.90	20.87	20.86	2
		36	19	20.88	20.85	20.84	2
		36	39	20.91	20.88	20.87	2
		75	0	20.84	20.81	20.80	2



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Test Report No.: RF190522W005-1

### ERP POWER (dBm)

#### WCDMA

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	ERP (dBm)	ERP (mW)	Limit (W)
4132	826.4	22.78	2.13	22.76	188.80	7
4182	836.4	22.83	2.13	22.81	190.99	7
4233	846.6	22.81	2.13	22.79	190.11	7

**REMARKS:** ERP Output Power (dBm) = EIRP (dBm) -2.15(dB).

#### LTE BAND 5

#### CHANNEL BANDWIDTH: 1.4MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20407	824.7	22.67	2.13	22.65	184.08	7
20525	836.5	22.69	2.13	22.67	184.93	7
20643	848.3	22.77	2.13	22.75	188.36	7

#### CHANNEL BANDWIDTH: 1.4MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20407	824.7	21.85	2.13	21.83	152.41	7
20525	836.5	21.86	2.13	21.84	152.76	7
20643	848.3	21.97	2.13	21.95	156.68	7



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Test Report No.: RF190522W005-1

**CHANNEL BANDWIDTH: 3MHz QPSK**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20415	825.5	22.58	2.13	22.56	180.30	7
20525	836.5	22.65	2.13	22.63	183.23	7
20635	847.5	22.70	2.13	22.68	185.35	7

**CHANNEL BANDWIDTH: 3MHz 16QAM**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20415	825.5	21.82	2.13	21.80	151.36	7
20525	836.5	21.92	2.13	21.90	154.88	7
20635	847.5	22.00	2.13	21.98	157.76	7

**CHANNEL BANDWIDTH: 5MHz QPSK**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20425	826.5	22.59	2.13	22.57	180.72	7
20525	836.5	22.60	2.13	22.58	181.13	7
20625	846.5	22.71	2.13	22.69	185.78	7

**CHANNEL BANDWIDTH: 5MHz 16QAM**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20425	826.5	21.83	2.13	21.81	151.71	7
20525	836.5	21.88	2.13	21.86	153.46	7
20625	846.5	22.00	2.13	21.98	157.76	7



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Test Report No.: RF190522W005-1

**CHANNEL BANDWIDTH: 10MHz QPSK**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>C</sub> (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20450	829.0	22.64	2.13	22.62	182.81	7
20525	836.5	22.67	2.13	22.65	184.08	7
20600	844.0	22.76	2.13	22.74	187.93	7

**CHANNEL BANDWIDTH: 10MHz 16QAM**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>C</sub> (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20450	829.0	21.90	2.13	21.88	154.17	7
20525	836.5	21.93	2.13	21.91	155.24	7
20600	844.0	22.02	2.13	22.00	158.49	7

**REMARKS:** ERP Output Power (dBm) = EIRP (dBm) -2.15(dB).



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Test Report No.: RF190522W005-1

## LTE BAND 26

### CHANNEL BANDWIDTH: 1.4MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>C</sub> (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26797	824.7	22.64	2.13	22.62	182.81	7
26915	836.5	22.61	2.13	22.59	181.55	7
27033	848.3	22.60	2.13	22.58	181.13	7

### CHANNEL BANDWIDTH: 1.4MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>C</sub> (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26797	824.7	21.95	2.13	21.93	155.96	7
26915	836.5	21.92	2.13	21.90	154.88	7
27033	848.3	21.91	2.13	21.89	154.53	7

### CHANNEL BANDWIDTH: 3MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>C</sub> (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26805	825.5	22.68	2.13	22.66	184.50	7
26915	836.5	22.65	2.13	22.63	183.23	7
27015	847.5	22.64	2.13	22.62	182.81	7

### CHANNEL BANDWIDTH: 3MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>C</sub> (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26805	825.5	21.99	2.13	21.97	157.40	7
26915	836.5	21.96	2.13	21.94	156.31	7
27015	847.5	21.95	2.13	21.93	155.96	7



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Test Report No.: RF190522W005-1

#### CHANNEL BANDWIDTH: 5MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26815	826.5	22.71	2.13	22.69	185.78	7
26915	836.5	22.68	2.13	22.66	184.50	7
27015	846.5	22.67	2.13	22.65	184.08	7

#### CHANNEL BANDWIDTH: 5MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26815	826.5	22.02	2.13	22.00	158.49	7
26915	836.5	21.99	2.13	21.97	157.40	7
27015	846.5	21.98	2.13	21.96	157.04	7

#### CHANNEL BANDWIDTH: 10MHz QPSK

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26840	829.0	22.74	2.13	22.72	187.07	7
26915	836.5	22.71	2.13	22.69	185.78	7
26990	844.0	22.70	2.13	22.68	185.35	7

#### CHANNEL BANDWIDTH: 10MHz 16QAM

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26840	829.0	22.05	2.13	22.03	159.59	7
26915	836.5	22.02	2.13	22.00	158.49	7
26990	844.0	22.01	2.13	21.99	158.12	7



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Test Report No.: RF190522W005-1

**CHANNEL BANDWIDTH: 15MHz QPSK**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	ERP (dBm)	ERP (mW)	Limit (W)
26865	831.5	22.77	2.13	22.75	188.36	7
26915	836.5	22.74	2.13	22.72	187.07	7
26965	841.5	22.73	2.13	22.71	186.64	7

**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)
26865	831.5	22.08	2.13	22.06	160.69	7
26915	836.5	22.05	2.13	22.03	159.59	7
26965	841.5	22.04	2.13	22.02	159.22	7

**REMARKS:** ERP Output Power (dBm) = EIRP (dBm) -2.15(dB).



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Test Report No.: RF190522W005-1

### 3.2 FREQUENCY STABILITY MEASUREMENT

#### 3.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

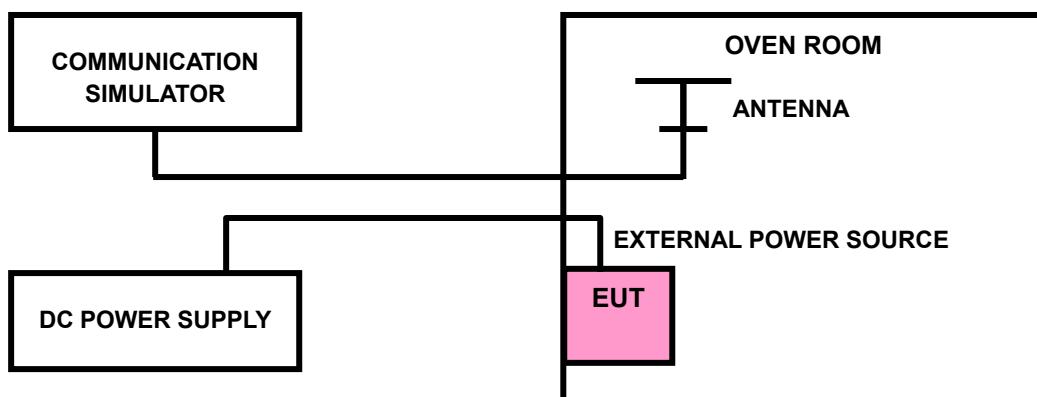
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

#### 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



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Test Report No.: RF190522W005-1

### 3.2.4 TEST RESULTS

#### WCDMA Band V

##### FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
V <sub>nor</sub>	0.0021	0.0026	2.5
V <sub>min</sub>	-0.0026	-0.0020	2.5
V <sub>max</sub>	0.0026	0.0026	2.5

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

##### FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
-30	-0.0119	-0.0118	2.5
-20	-0.0100	-0.0101	2.5
-10	-0.0081	-0.0082	2.5
0	-0.0076	-0.0073	2.5
10	-0.0048	-0.0045	2.5
20	-0.0039	-0.0042	2.5
30	-0.0039	-0.0039	2.5
40	-0.0018	-0.0018	2.5
50	-0.0002	-0.0001	2.5

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Test Report No.: RF190522W005-1

## LTE Band 5

## FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	1.4MHz		LIMIT (ppm)	
	FREQUENCY ERROR (ppm)			
	Low Channel	High Channel		
V <sub>nor</sub>	0.0022	0.0026	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 V<sub>min</sub> to V<sub>max</sub>.

## FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	1.4MHz		LIMIT (ppm)	
	FREQUENCY ERROR (ppm)			
	Low Channel	High Channel		
-30	-0.0123	-0.0115	2.5	
-20	-0.0103	-0.0104	2.5	
-10	-0.0085	-0.0084	2.5	
0	-0.0075	-0.0075	2.5	
10	-0.0056	-0.0045	2.5	
20	-0.0041	-0.0040	2.5	
30	-0.0028	-0.0036	2.5	
40	-0.0016	-0.0020	2.5	
50	-0.0002	-0.0003	2.5	



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Test Report No.: RF190522W005-1

### FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	3MHz		LIMIT (ppm)	
	FREQUENCY ERROR (ppm)			
	Low Channel	High Channel		
V <sub>nor</sub>	0.0021	0.0020	2.5	
V <sub>min</sub>	-0.0021	-0.0025	2.5	
V <sub>max</sub>	0.0019	0.0018	2.5	

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

### FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	3MHz		LIMIT (ppm)	
	FREQUENCY ERROR (ppm)			
	Low Channel	High Channel		
-30	-0.0121	-0.0110	2.5	
-20	-0.0107	-0.0097	2.5	
-10	-0.0084	-0.0084	2.5	
0	-0.0076	-0.0072	2.5	
10	-0.0048	-0.0044	2.5	
20	-0.0040	-0.0042	2.5	
30	-0.0042	-0.0035	2.5	
40	-0.0020	-0.0022	2.5	
50	-0.0005	-0.0005	2.5	



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Test Report No.: RF190522W005-1

#### FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	5MHz		LIMIT (ppm)	
	FREQUENCY ERROR (ppm)			
	Low Channel	High Channel		
V <sub>nor</sub>	0.0021	0.0023	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>max</sub>.

#### FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	5MHz		LIMIT (ppm)	
	FREQUENCY ERROR (ppm)			
	Low Channel	High Channel		
-30	-0.0119	-0.0113	2.5	
-20	-0.0112	-0.0100	2.5	
-10	-0.0086	-0.0083	2.5	
0	-0.0075	-0.0073	2.5	
10	-0.0046	-0.0054	2.5	
20	-0.0043	-0.0044	2.5	
30	-0.0035	-0.0040	2.5	
40	-0.0022	-0.0019	2.5	
50	-0.0004	-0.0004	2.5	



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Test Report No.: RF190522W005-1

#### FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	10MHz		LIMIT (ppm)	
	FREQUENCY ERROR (ppm)			
	Low Channel	High Channel		
V <sub>nor</sub>	0.0026	0.0025	2.5	
V <sub>min</sub>	-0.0031	-0.0030	2.5	
V <sub>max</sub>	0.0026	0.0024	2.5	

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

#### FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	10MHz		LIMIT (ppm)	
	FREQUENCY ERROR (ppm)			
	Low Channel	High Channel		
-30	-0.0117	-0.0112	2.5	
-20	-0.0110	-0.0109	2.5	
-10	-0.0084	-0.0079	2.5	
0	-0.0076	-0.0073	2.5	
10	-0.0045	-0.0054	2.5	
20	-0.0042	-0.0037	2.5	
30	-0.0035	-0.0026	2.5	
40	-0.0021	-0.0018	2.5	
50	-0.0004	-0.0003	2.5	

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Test Report No.: RF190522W005-1

## LTE Band 26

## FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	1.4MHz		LIMIT (ppm)	
	FREQUENCY ERROR (ppm)			
	Low Channel	High Channel		
V <sub>nor</sub>	0.0021	0.0025	2.5	
V <sub>min</sub>	-0.0031	-0.0030	2.5	
V <sub>max</sub>	0.0021	0.0020	2.5	

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

## FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	1.4MHz		LIMIT (ppm)	
	FREQUENCY ERROR (ppm)			
	Low Channel	High Channel		
-30	-0.0114	-0.0117	2.5	
-20	-0.0099	-0.0100	2.5	
-10	-0.0083	-0.0080	2.5	
0	-0.0074	-0.0076	2.5	
10	-0.0052	-0.0045	2.5	
20	-0.0040	-0.0040	2.5	
30	-0.0026	-0.0031	2.5	
40	-0.0023	-0.0020	2.5	
50	-0.0005	-0.0002	2.5	



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Test Report No.: RF190522W005-1

### 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>	0.0019	0.0018	2.5	

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

### FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	3MHz		LIMIT (ppm)	
	FREQUENCY ERROR (ppm)			
	Low Channel	High Channel		
-30	-0.0119	-0.0114	2.5	
-20	-0.0108	-0.0106	2.5	
-10	-0.0081	-0.0079	2.5	
0	-0.0076	-0.0074	2.5	
10	-0.0050	-0.0047	2.5	
20	-0.0039	-0.0037	2.5	
30	-0.0027	-0.0032	2.5	
40	-0.0019	-0.0017	2.5	
50	-0.0002	-0.0003	2.5	



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Test Report No.: RF190522W005-1

#### FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	5MHz		LIMIT (ppm)	
	FREQUENCY ERROR (ppm)			
	Low Channel	High Channel		
V <sub>nor</sub>	0.0021	0.0025	2.5	
V <sub>min</sub>	-0.0024	-0.0031	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>max</sub>.

#### FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	5MHz		LIMIT (ppm)	
	FREQUENCY ERROR (ppm)			
	Low Channel	High Channel		
-30	-0.0115	-0.0111	2.5	
-20	-0.0112	-0.0101	2.5	
-10	-0.0086	-0.0082	2.5	
0	-0.0074	-0.0074	2.5	
10	-0.0051	-0.0049	2.5	
20	-0.0039	-0.0038	2.5	
30	-0.0031	-0.0041	2.5	
40	-0.0016	-0.0016	2.5	
50	-0.0002	-0.0002	2.5	



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Test Report No.: RF190522W005-1

#### FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	10MHz		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>	0.0025	0.0026	2.5	

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

#### FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	10MHz		LIMIT (ppm)	
	FREQUENCY ERROR (ppm)			
	Low Channel	High Channel		
-30	-0.0116	-0.0113	2.5	
-20	-0.0112	-0.0101	2.5	
-10	-0.0084	-0.0082	2.5	
0	-0.0074	-0.0072	2.5	
10	-0.0050	-0.0052	2.5	
20	-0.0044	-0.0041	2.5	
30	-0.0043	-0.0036	2.5	
40	-0.0022	-0.0018	2.5	
50	-0.0003	-0.0003	2.5	



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#### FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	15MHz		LIMIT (ppm)	
	FREQUENCY ERROR (ppm)			
	Low Channel	High Channel		
V <sub>nor</sub>	0.0024	0.0026	2.5	
V <sub>min</sub>	-0.0031	-0.0030	2.5	
V <sub>max</sub>	0.0026	0.0025	2.5	

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

#### FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	15MHz		LIMIT (ppm)	
	FREQUENCY ERROR (ppm)			
	Low Channel	High Channel		
-30	-0.0117	-0.0117	2.5	
-20	-0.0108	-0.0099	2.5	
-10	-0.0083	-0.0080	2.5	
0	-0.0076	-0.0072	2.5	
10	-0.0045	-0.0050	2.5	
20	-0.0038	-0.0038	2.5	
30	-0.0036	-0.0039	2.5	
40	-0.0023	-0.0020	2.5	
50	-0.0006	-0.0003	2.5	



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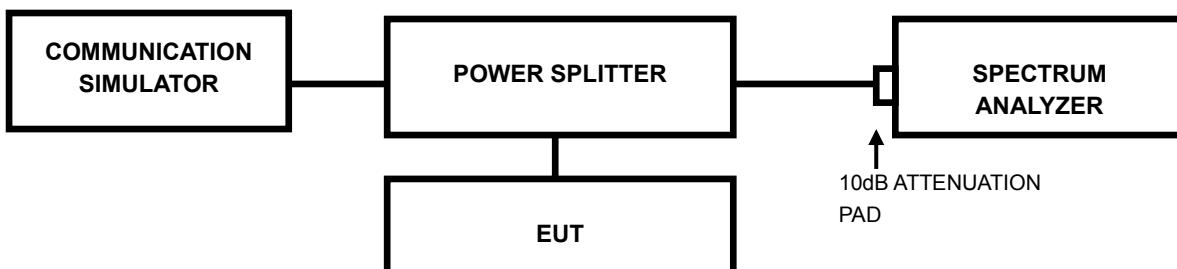
Test Report No.: RF190522W005-1

### 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



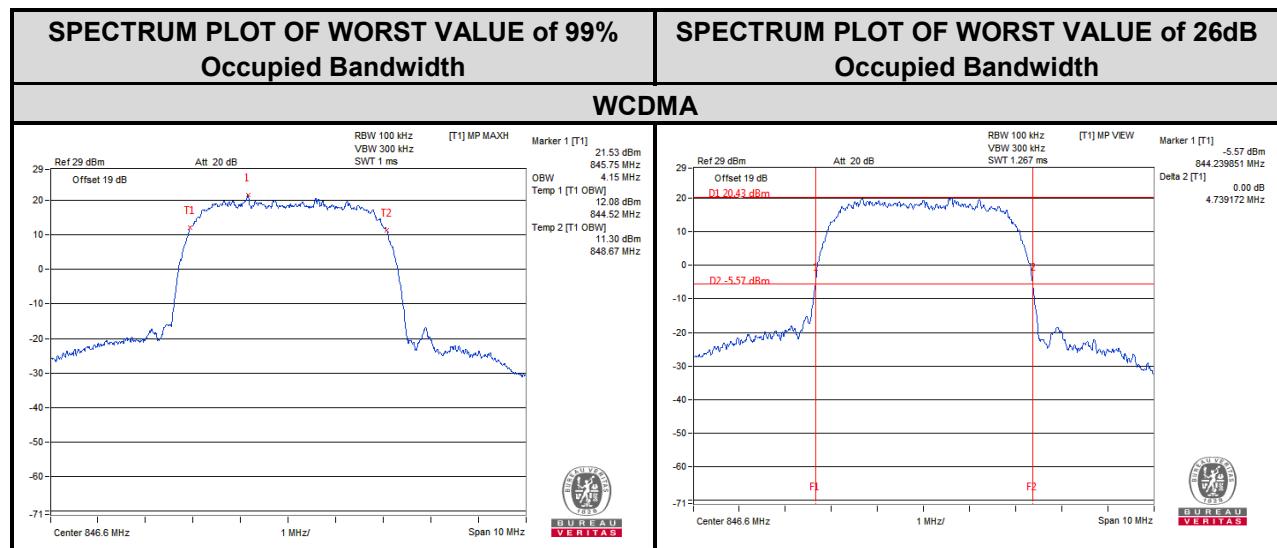


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Test Report No.: RF190522W005-1

### 3.3.3 TEST RESULTS

CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (kHz)	CHANNEL	Frequency (MHz)	26dB Bandwidth (MHz)
		WCDMA			WCDMA
4132	826.4	4.140	4132	826.4	4.690
4182	836.4	4.140	4182	836.4	4.685
4233	846.6	4.150	4233	846.6	4.739





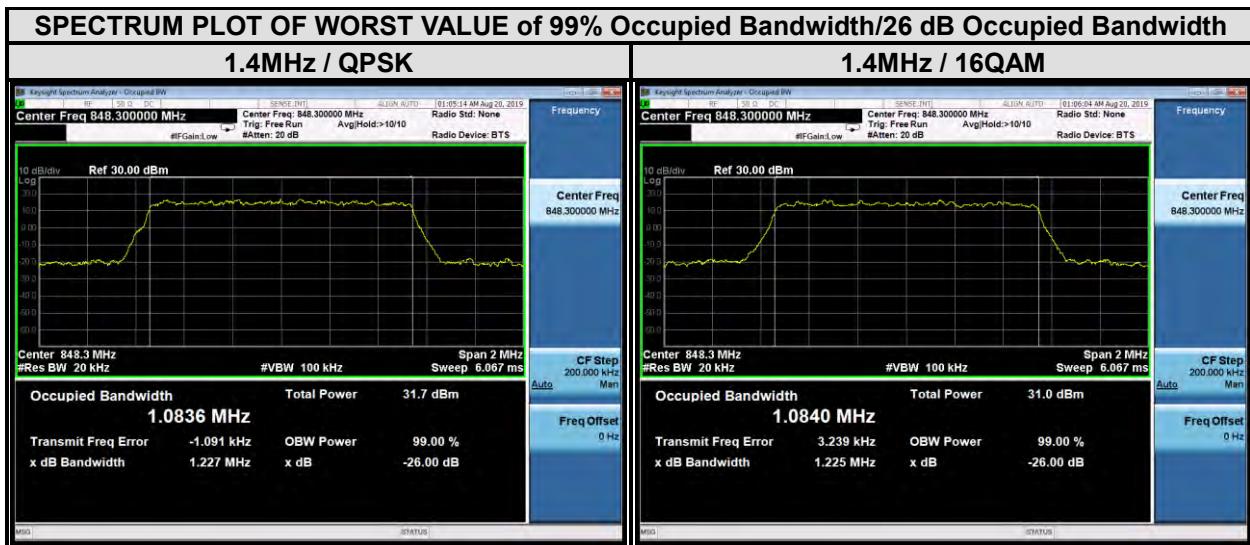
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Test Report No.: RF190522W005-1

## LTE BAND 5

CHANNEL	Frequency (MHz)	CHANNEL BANDWIDTH: 1.4MHz	
		99% OCCUPIED Bandwidth (MHz)	
		QPSK	16QAM
20407	824.7	1.08	1.08
20525	836.5	1.08	1.08
20643	848.3	1.08	1.08

CHANNEL	Frequency (MHz)	26 dB bandwidth (MHz)	
		99% OCCUPIED Bandwidth (MHz)	
		QPSK	16QAM
20407	824.7	1.23	1.22
20525	836.5	1.23	1.22
20643	848.3	1.23	1.23





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Test Report No.: RF190522W005-1

### CHANNEL BANDWIDTH: 3MHz

CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)	
		QPSK	16QAM
20415	825.5	2.68	2.68
20525	836.5	2.68	2.68
20635	847.5	2.69	2.68

### 26 dB bandwidth (MHz)

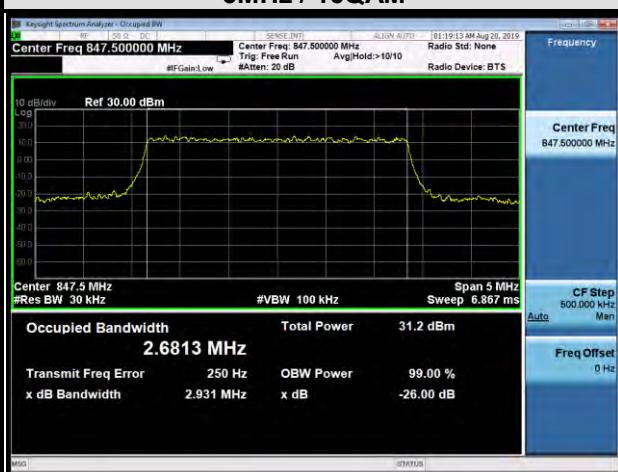
CHANNEL	Frequency (MHz)	26 dB bandwidth (MHz)	
		QPSK	16QAM
20415	825.5	2.94	2.94
20525	836.5	2.94	2.93
20635	847.5	2.99	2.93

### SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth/26 dB Occupied Bandwidth

#### 3MHz / QPSK



#### 3MHz / 16QAM



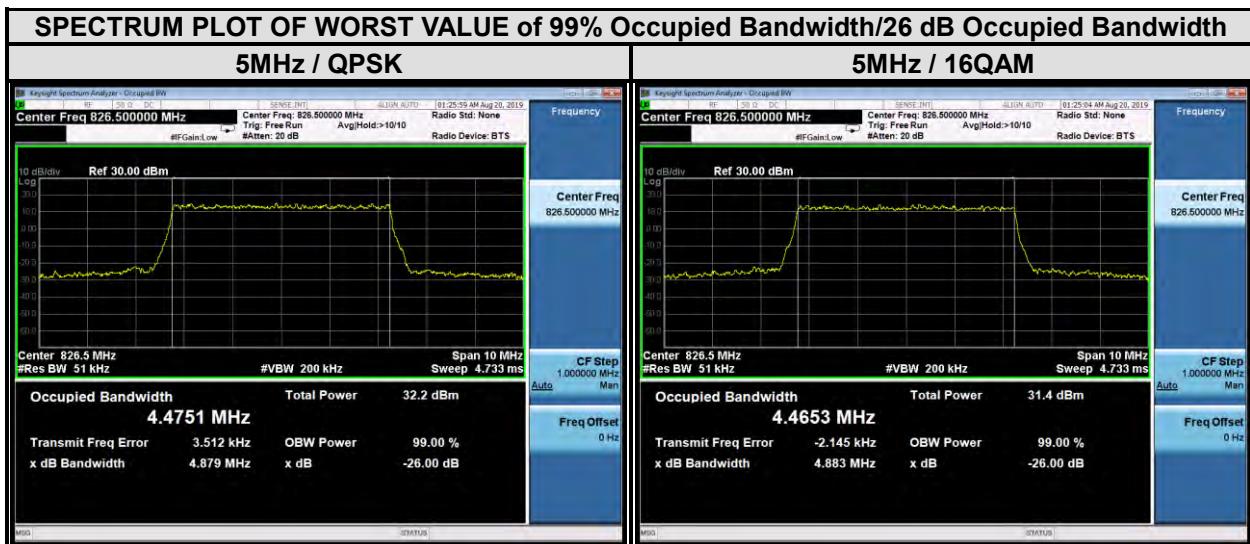


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Test Report No.: RF190522W005-1

CHANNEL BANDWIDTH: 5MHz			
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)	
		QPSK	16QAM
20425	826.5	4.48	4.47
20525	836.5	4.47	4.47
20625	846.5	4.47	4.47

CHANNEL	Frequency (MHz)	26 dB bandwidth (MHz)	
		QPSK	16QAM
20425	826.5	4.88	4.88
20525	836.5	4.91	4.90
20625	846.5	4.92	4.93





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Test Report No.: RF190522W005-1

### CHANNEL BANDWIDTH: 10MHz

CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)	
		QPSK	16QAM
20450	829	8.94	8.92
20525	836.5	8.94	8.91
20600	844	8.93	8.93

CHANNEL	Frequency (MHz)	26 dB bandwidth (MHz)	
		QPSK	16QAM
20450	829	9.66	9.59
20525	836.5	9.65	9.58
20600	844	9.65	9.71

### SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth/26 dB Occupied Bandwidth

#### 10MHz / QPSK



#### 10MHz / 16QAM





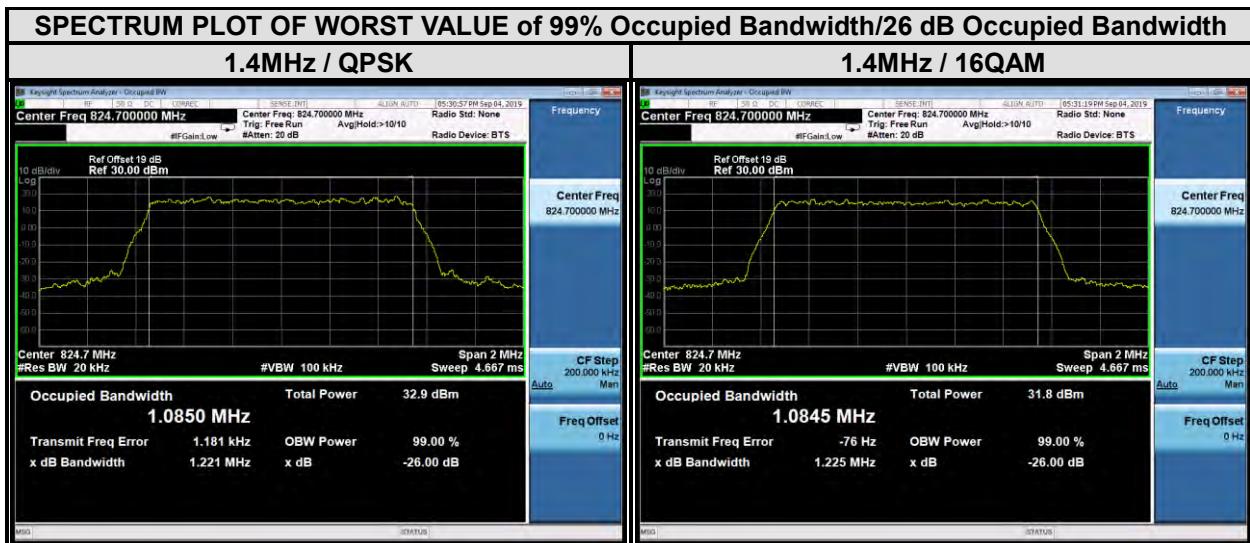
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Test Report No.: RF190522W005-1

## LTE BAND 26

CHANNEL	Frequency (MHz)	CHANNEL BANDWIDTH: 1.4MHz	
		99% OCCUPIED Bandwidth (MHz)	
		QPSK	16QAM
20407	824.7	1.09	1.08
20525	836.5	1.09	1.08
20643	848.3	1.08	1.08

CHANNEL	Frequency (MHz)	26 dB bandwidth (MHz)	
		99% OCCUPIED Bandwidth (MHz)	
		QPSK	16QAM
20407	824.7	1.22	1.23
20525	836.5	1.22	1.22
20643	848.3	1.22	1.23



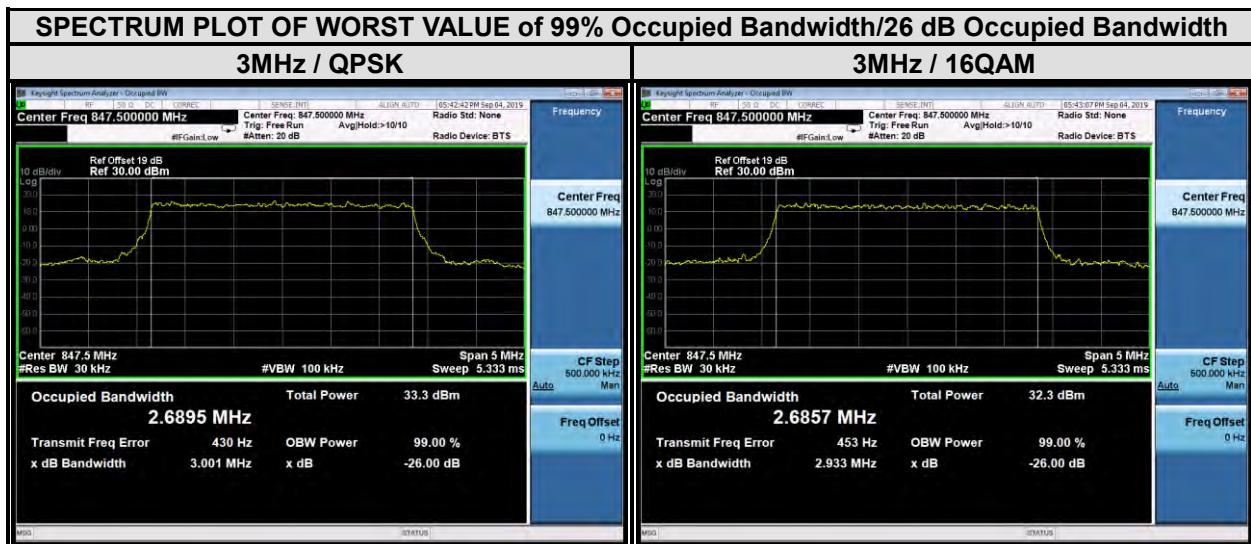


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Test Report No.: RF190522W005-1

CHANNEL BANDWIDTH: 3MHz			
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)	
		QPSK	16QAM
20415	825.5	2.69	2.68
20525	836.5	2.69	2.68
20635	847.5	2.69	2.69

CHANNEL	Frequency (MHz)	26 dB bandwidth (MHz)	
		QPSK	16QAM
20415	825.5	2.96	2.94
20525	836.5	3.00	2.94
20635	847.5	3.00	2.93





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Test Report No.: RF190522W005-1

### CHANNEL BANDWIDTH: 5MHz

CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)	
		QPSK	16QAM
20425	826.5	4.48	4.47
20525	836.5	4.48	4.51
20625	846.5	4.48	4.47

### 26 dB bandwidth (MHz)

CHANNEL	Frequency (MHz)	26 dB bandwidth (MHz)	
		QPSK	16QAM
20425	826.5	4.89	4.86
20525	836.5	4.90	4.94
20625	846.5	4.91	4.89

### SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth/26 dB Occupied Bandwidth

#### 5MHz / QPSK



#### 5MHz / 16QAM





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Test Report No.: RF190522W005-1

### CHANNEL BANDWIDTH: 10MHz

CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)	
		QPSK	16QAM
20450	829	8.94	8.95
20525	836.5	8.93	8.95
20600	844	8.92	8.94

### 26 dB bandwidth (MHz)

CHANNEL	Frequency (MHz)	26 dB bandwidth (MHz)	
		QPSK	16QAM
20450	829	9.70	9.60
20525	836.5	9.71	9.74
20600	844	9.68	9.66

### SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth/26 dB Occupied Bandwidth

#### 10MHz / QPSK



#### 10MHz / 16QAM





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Test Report No.: RF190522W005-1

### CHANNEL BANDWIDTH: 15MHz

CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)	
		QPSK	16QAM
26865	831.5	13.40	13.41
26915	836.5	13.37	13.39
26965	841.5	13.43	13.43

CHANNEL	Frequency (MHz)	26 dB bandwidth (MHz)	
		QPSK	16QAM
26865	831.5	14.45	14.46
26915	836.5	14.40	14.37
26965	841.5	14.54	14.45

### SPECTRUM PLOT OF WORST VALUE of 99% Occupied Bandwidth/26 dB Occupied Bandwidth

#### 10MHz / QPSK



#### 10MHz / 16QAM





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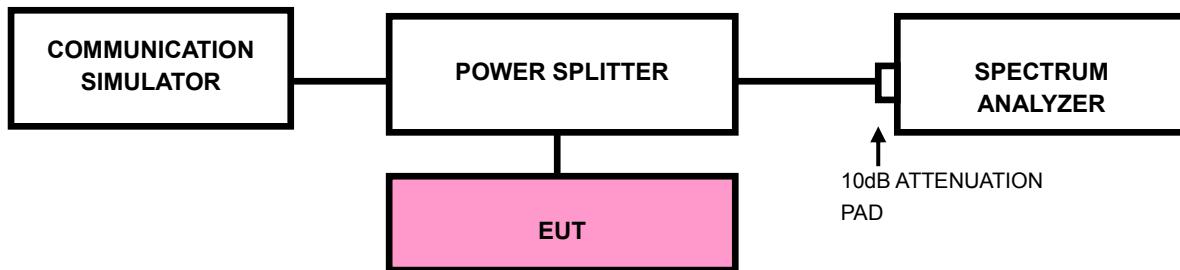
Test Report No.: RF190522W005-1

### 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





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Test Report No.: RF190522W005-1

### 3.4.3 TEST PROCEDURES

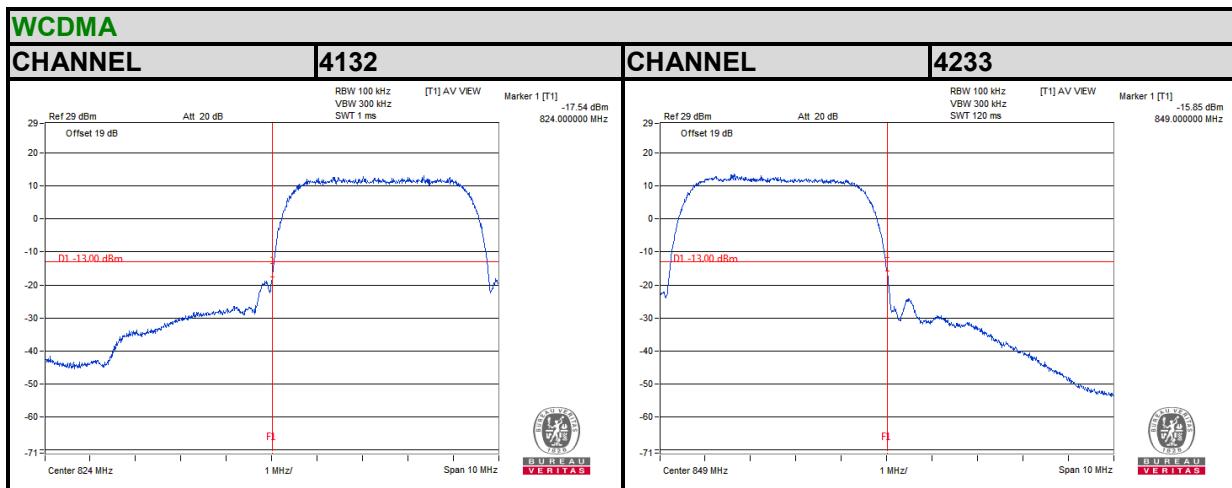
- a. All measurements were done at low and high operational frequency range.
- b. The center frequency of spectrum is the band edge frequency and span is 10MHz. RBW of the spectrum is 100kHz and VBW of the spectrum is 300kHz (WCDMA).
- c. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 20kHz and VBW of the spectrum is 100 kHz. (LTE bandwidth 1.4MHz).
- d. 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)
- e. 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)
- f. 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)
- g. Record the max trace plot into the test report.



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Test Report No.: RF190522W005-1

### 3.4.4 TEST RESULTS



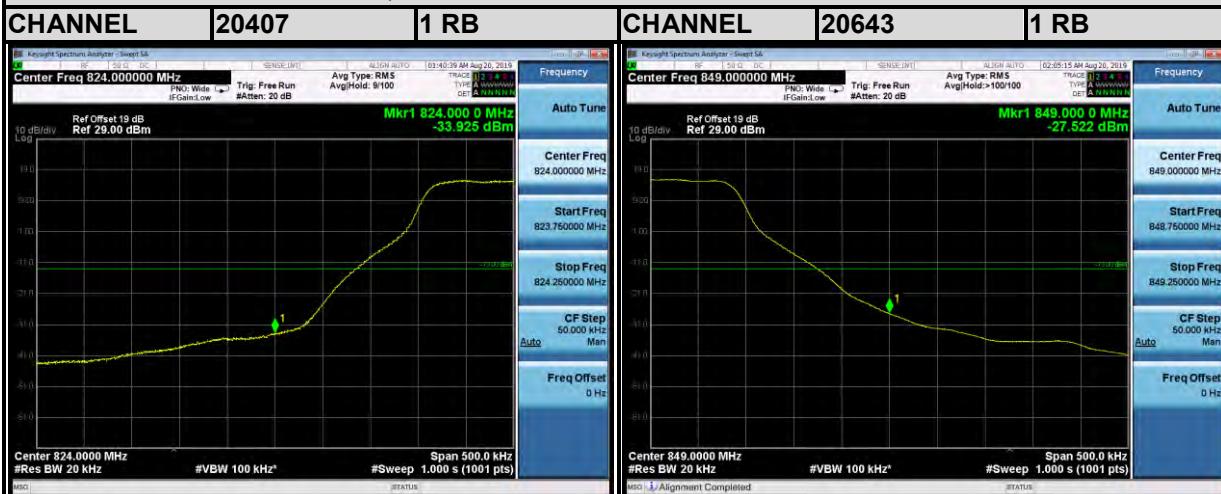


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Test Report No.: RF190522W005-1

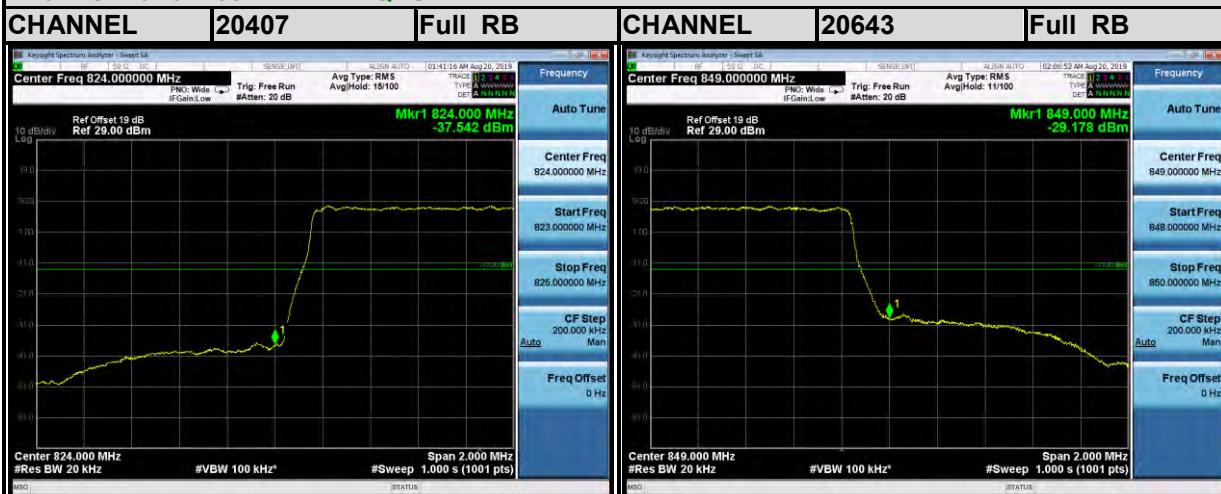
## LTE Band5

### Channel Bandwidth: 1.4MHz QPSK



## LTE Band5

### Channel Bandwidth: 1.4MHz QPSK



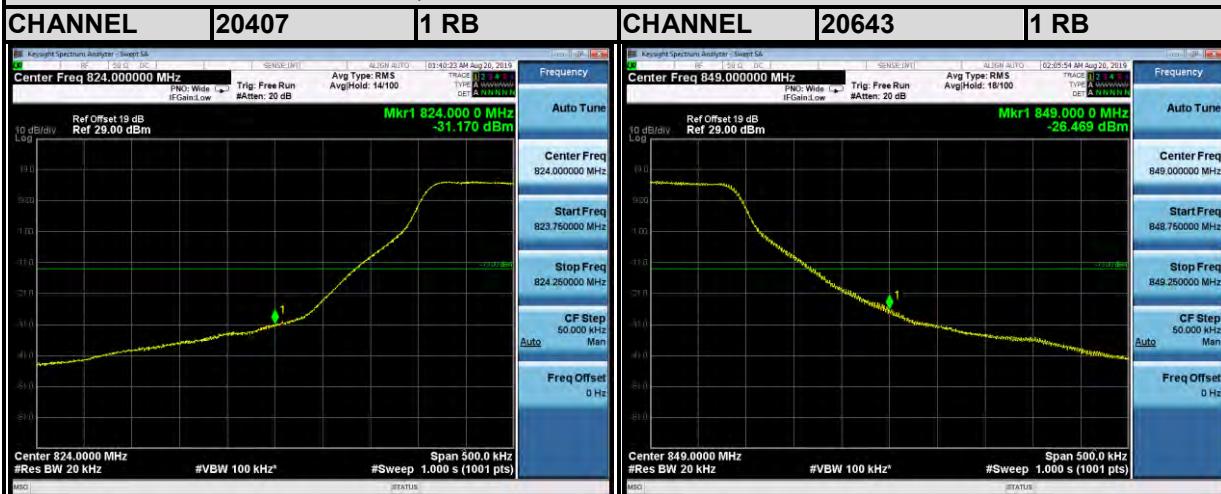


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Test Report No.: RF190522W005-1

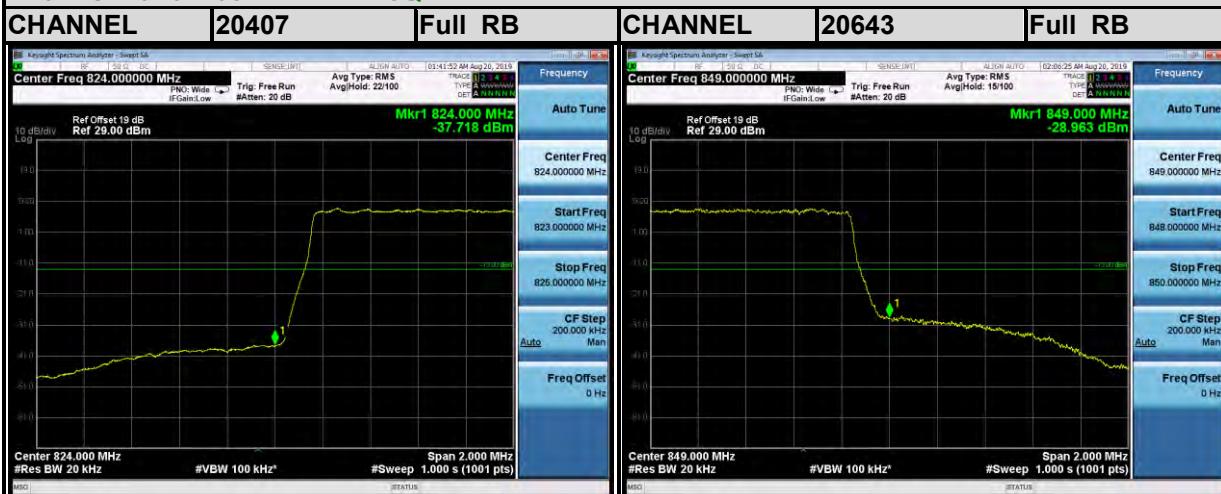
### LTE Band5

#### Channel Bandwidth: 1.4MHz 16QAM



### LTE Band5

#### Channel Bandwidth: 1.4MHz 16QAM



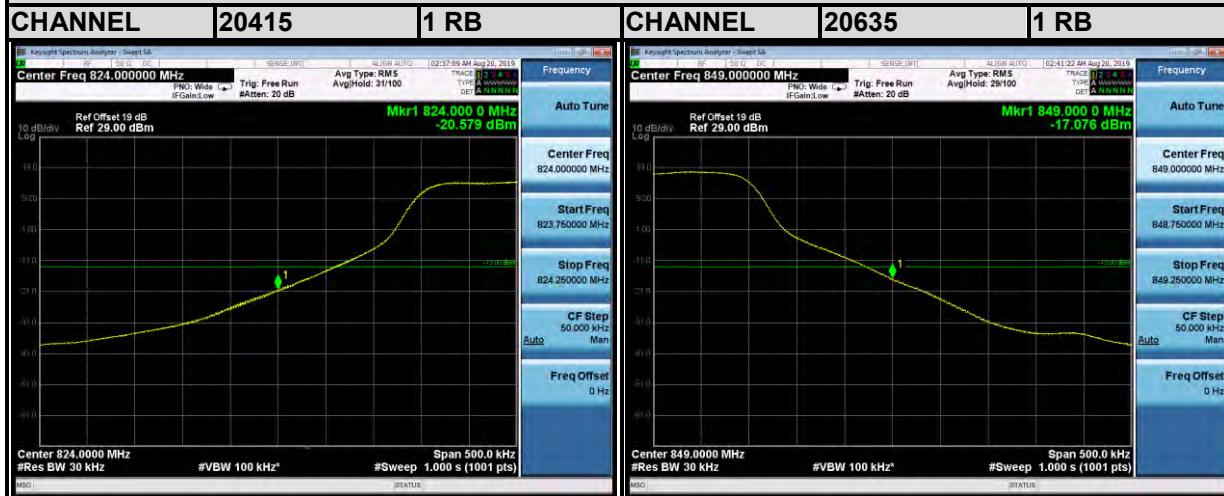


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Test Report No.: RF190522W005-1

### LTE Band5

#### Channel Bandwidth: 3MHz QPSK



### LTE Band5

#### Channel Bandwidth: 3MHz QPSK



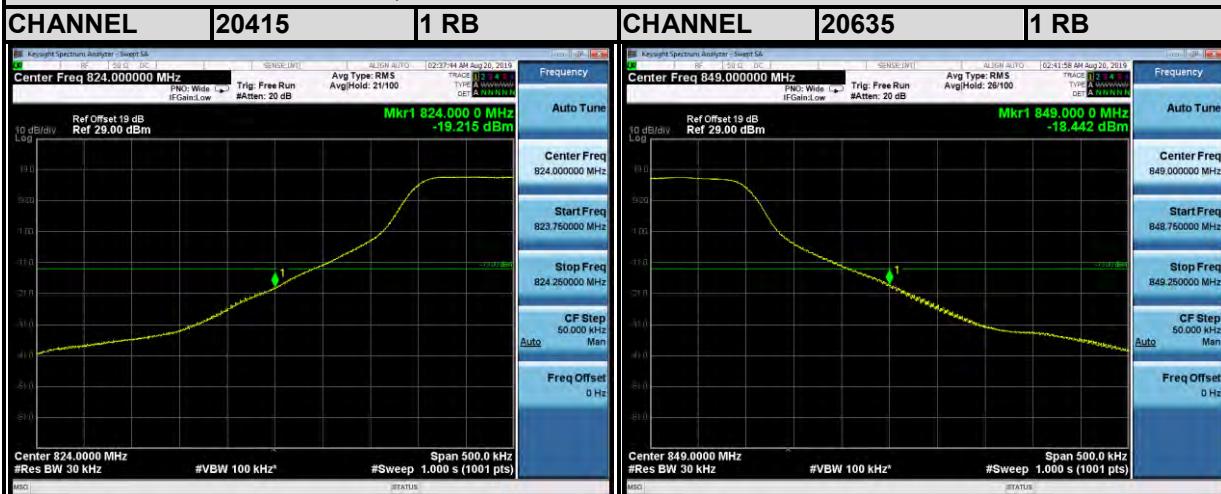


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Test Report No.: RF190522W005-1

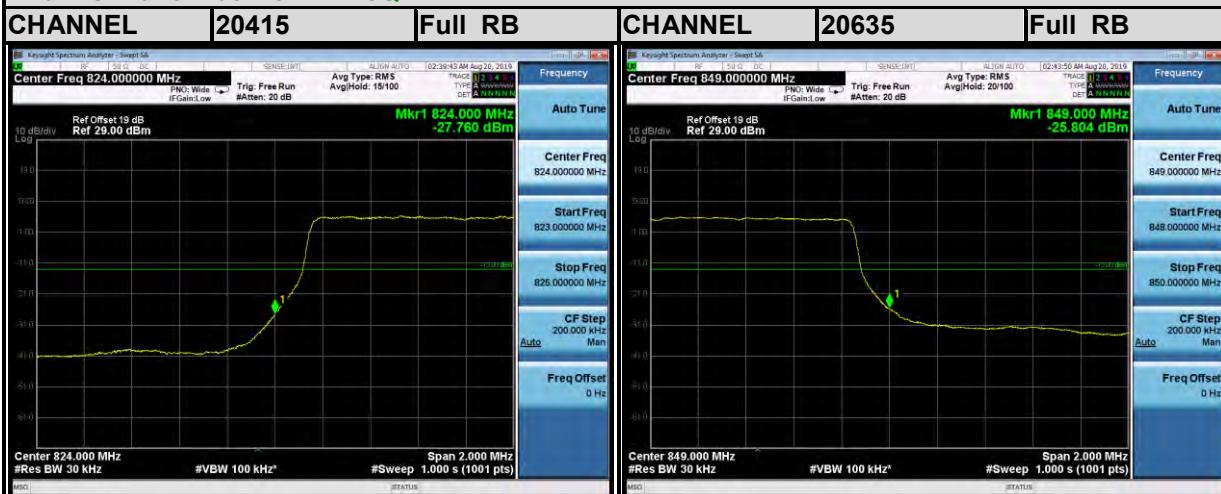
### LTE Band5

#### Channel Bandwidth: 3MHz 16QAM



### LTE Band5

#### Channel Bandwidth: 3MHz 16QAM



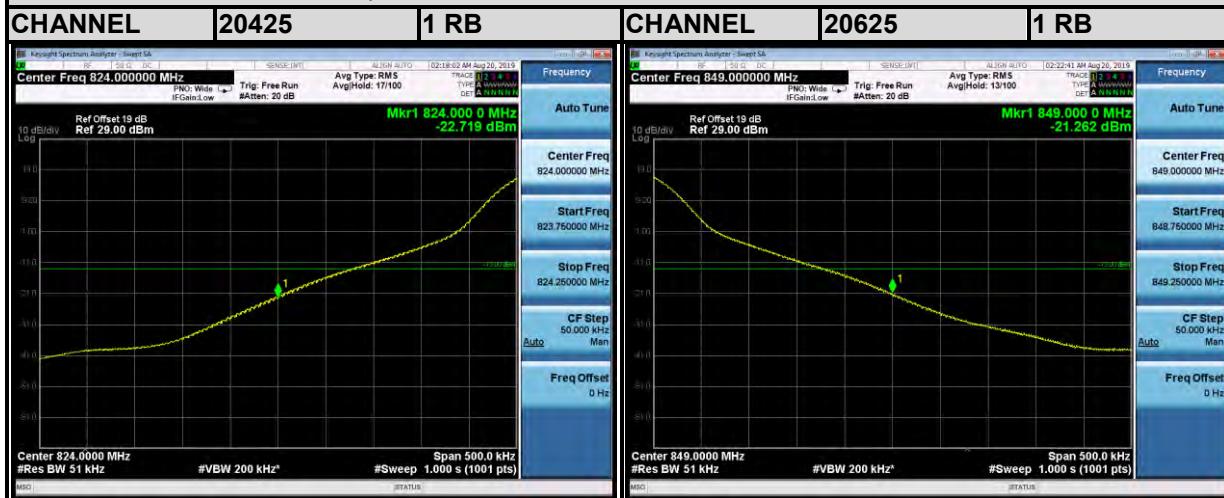


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VERITAS

Test Report No.: RF190522W005-1

## LTE Band5

### Channel Bandwidth: 5MHz QPSK



## LTE Band5

### Channel Bandwidth: 5MHz QPSK





BUREAU  
VERITAS

Test Report No.: RF190522W005-1

### LTE Band5

#### Channel Bandwidth: 5MHz 16QAM



### LTE Band5

#### Channel Bandwidth: 5MHz 16QAM



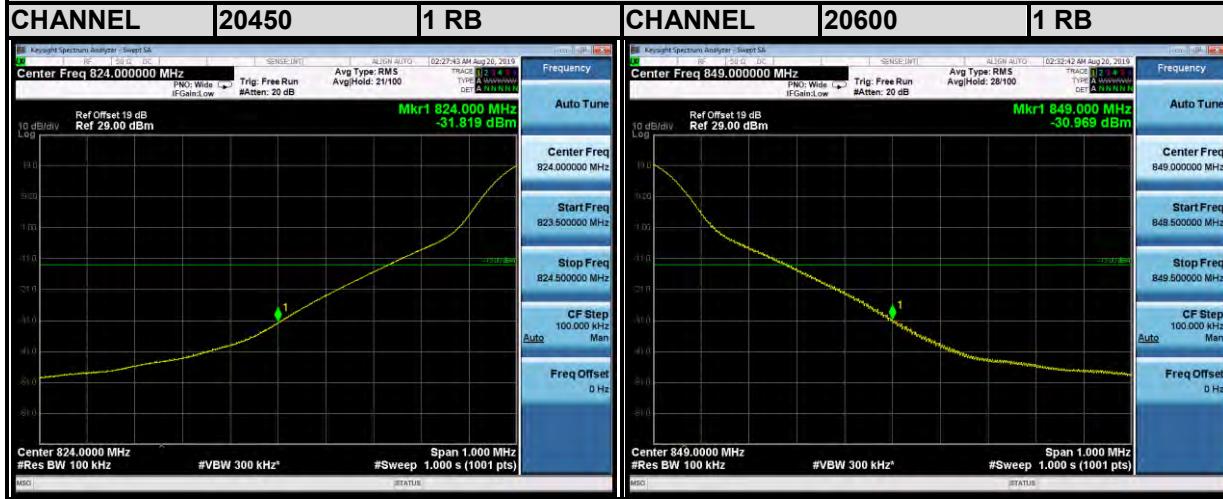


BUREAU  
VERITAS

Test Report No.: RF190522W005-1

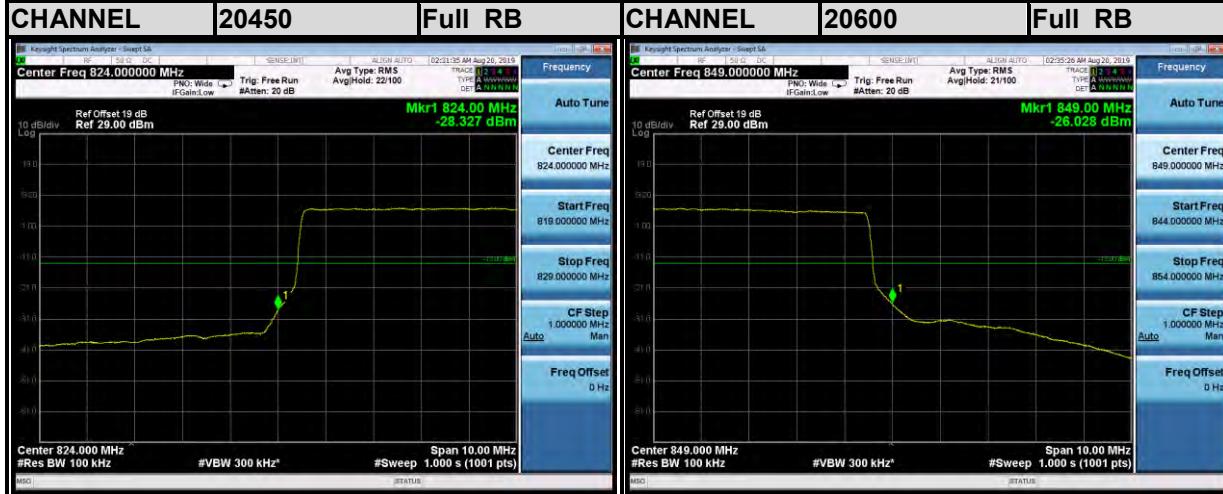
## LTE Band5

### Channel Bandwidth: 10MHz QPSK



## LTE Band5

### Channel Bandwidth: 10MHz QPSK



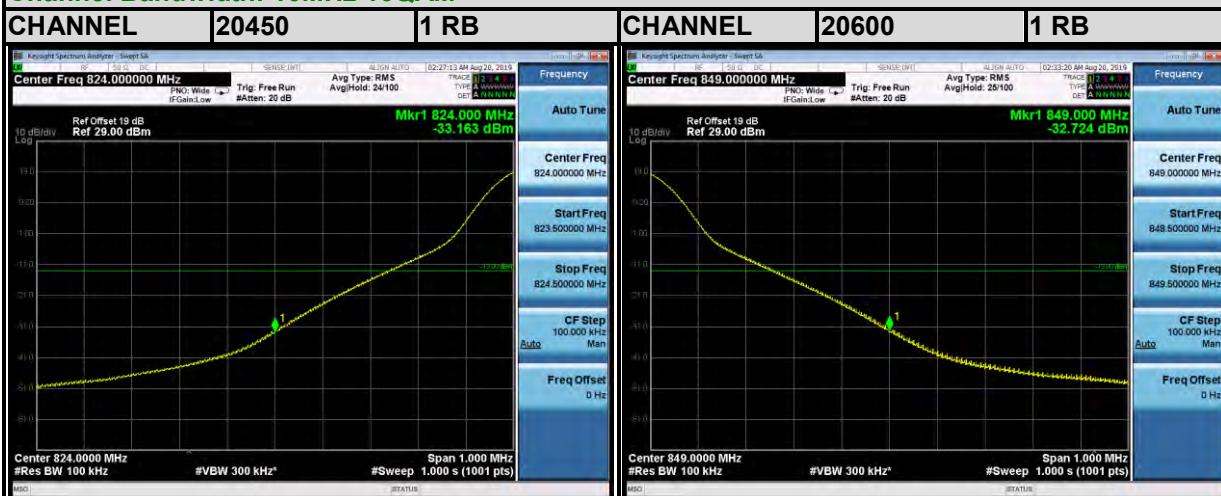


BUREAU  
VERITAS

Test Report No.: RF190522W005-1

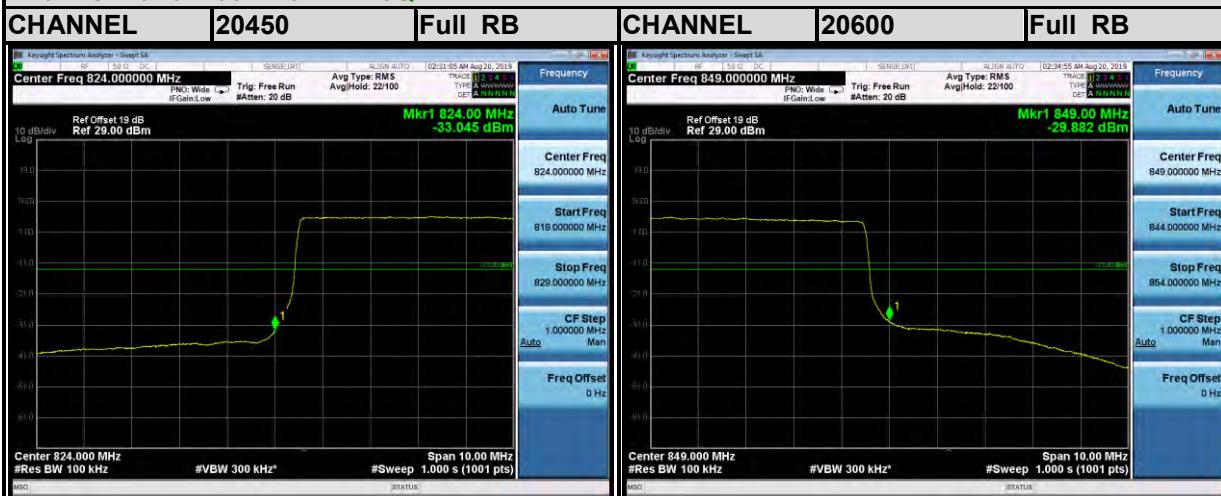
### LTE Band5

#### Channel Bandwidth: 10MHz 16QAM



### LTE Band5

#### Channel Bandwidth: 10MHz 16QAM



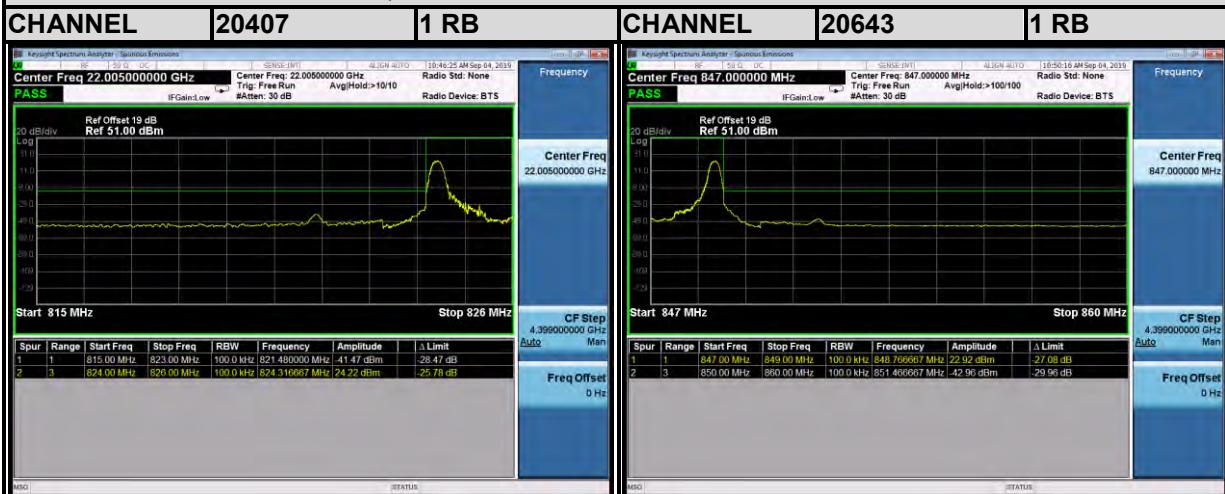


BUREAU  
VERITAS

Test Report No.: RF190522W005-1

## LTE Band26

### Channel Bandwidth: 1.4MHz QPSK



## LTE Band26

### Channel Bandwidth: 1.4MHz QPSK



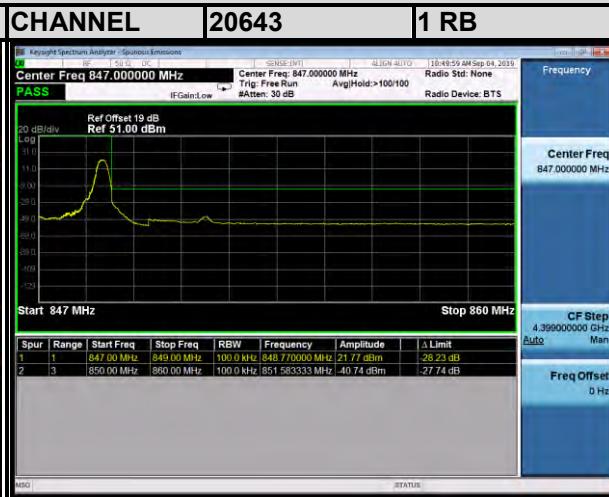
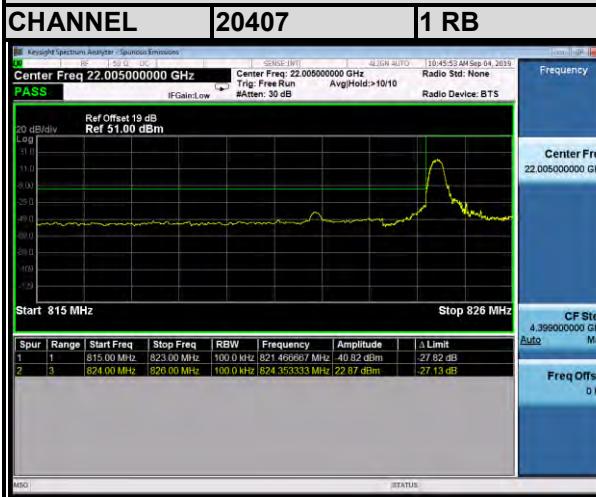


BUREAU  
VERITAS

Test Report No.: RF190522W005-1

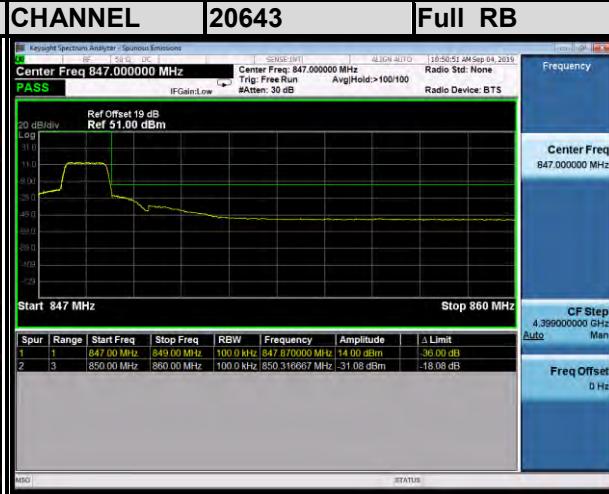
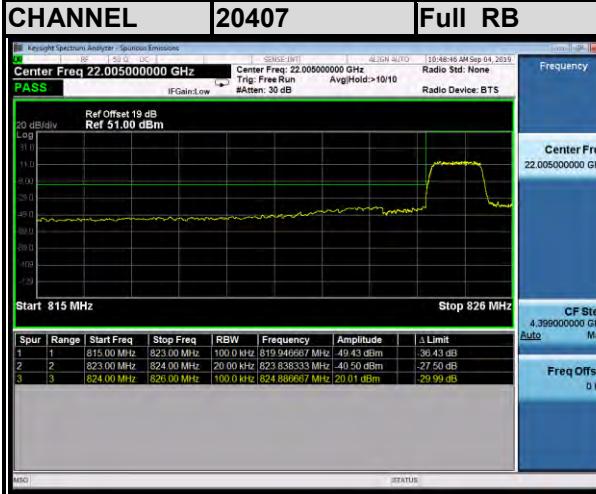
## LTE Band26

Channel Bandwidth: 1.4MHz 16QAM



## LTE Band26

Channel Bandwidth: 1.4MHz 16QAM



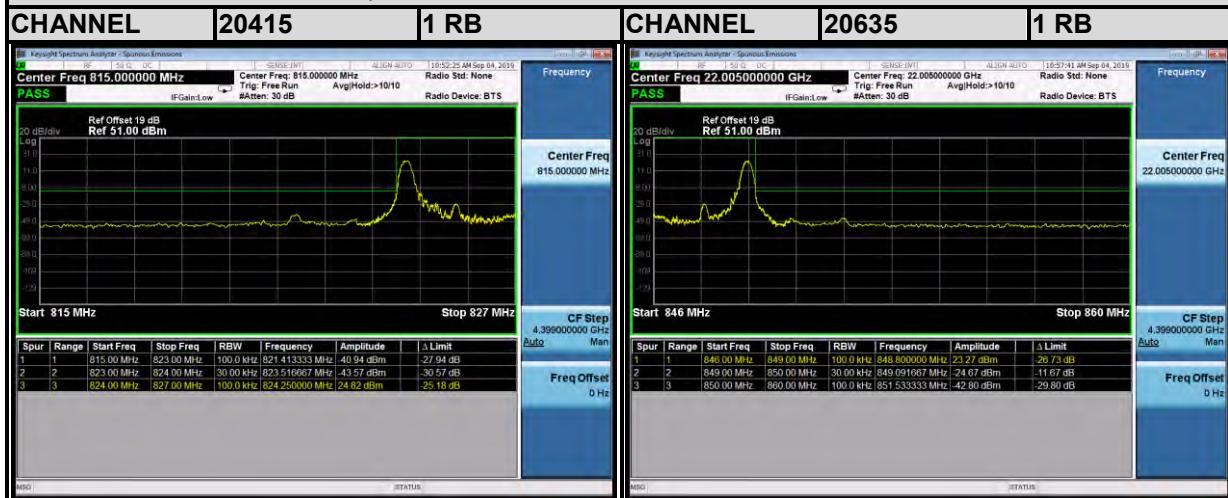


BUREAU  
VERITAS

Test Report No.: RF190522W005-1

## LTE Band26

### Channel Bandwidth: 3MHz QPSK



## LTE Band26

### Channel Bandwidth: 3MHz QPSK



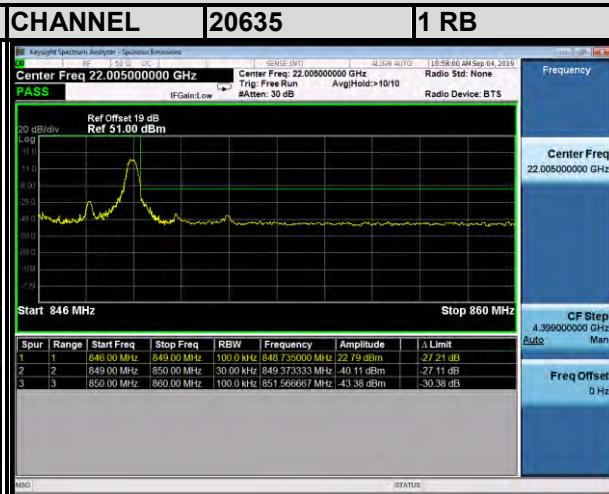
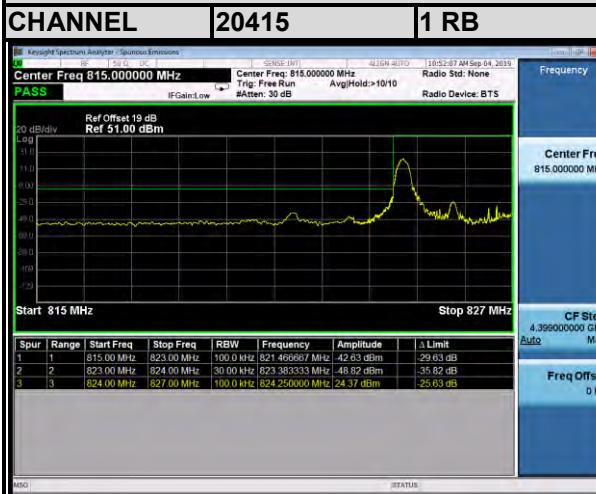


BUREAU  
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Test Report No.: RF190522W005-1

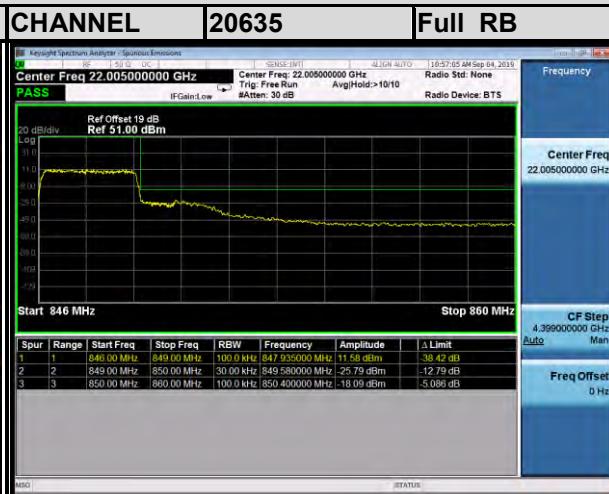
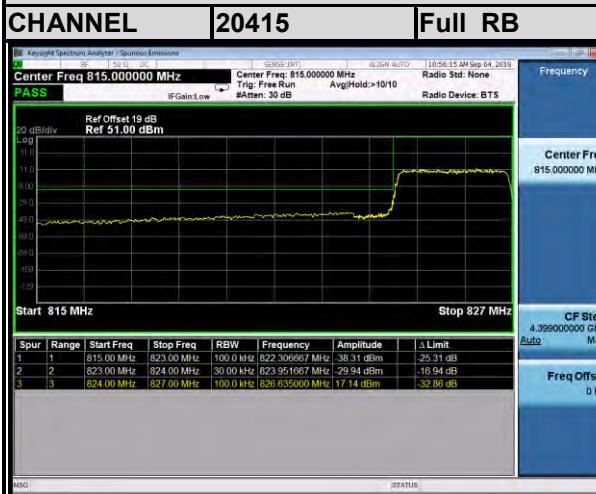
## LTE Band26

### Channel Bandwidth: 3MHz 16QAM



## LTE Band26

### Channel Bandwidth: 3MHz 16QAM



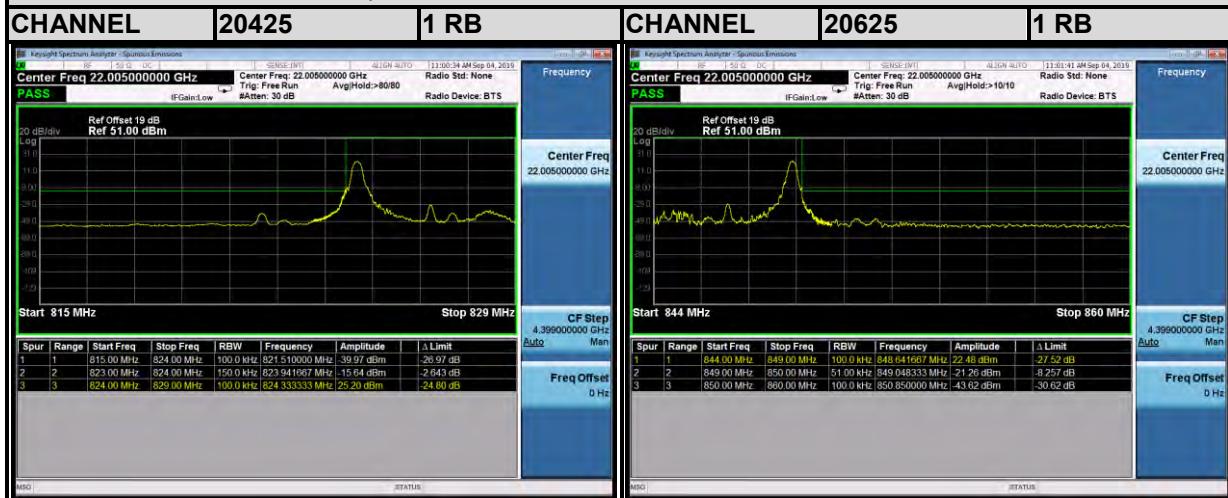


BUREAU  
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Test Report No.: RF190522W005-1

## LTE Band26

### Channel Bandwidth: 5MHz QPSK



## LTE Band26

### Channel Bandwidth: 5MHz QPSK



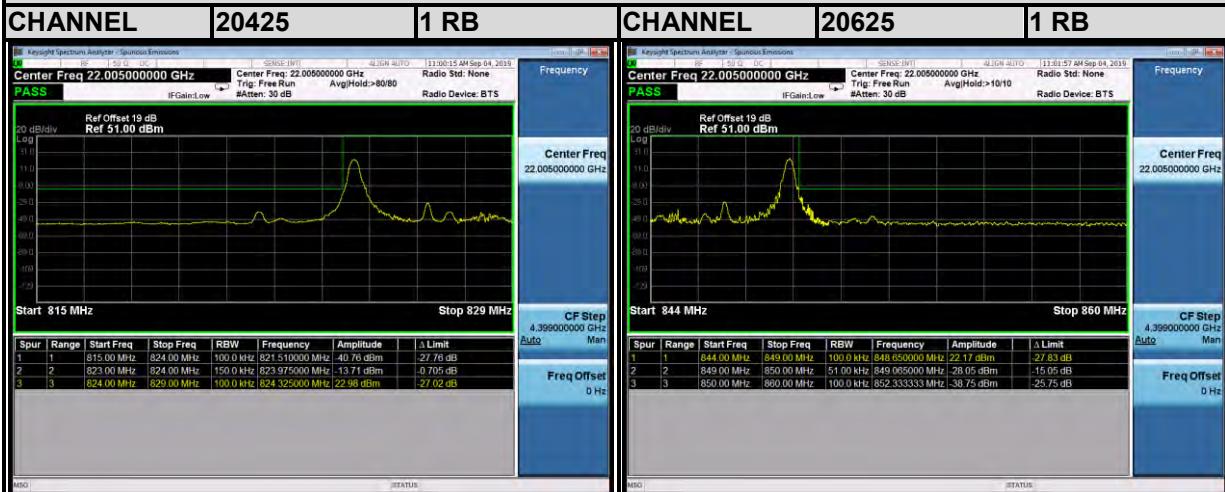


BUREAU  
VERITAS

Test Report No.: RF190522W005-1

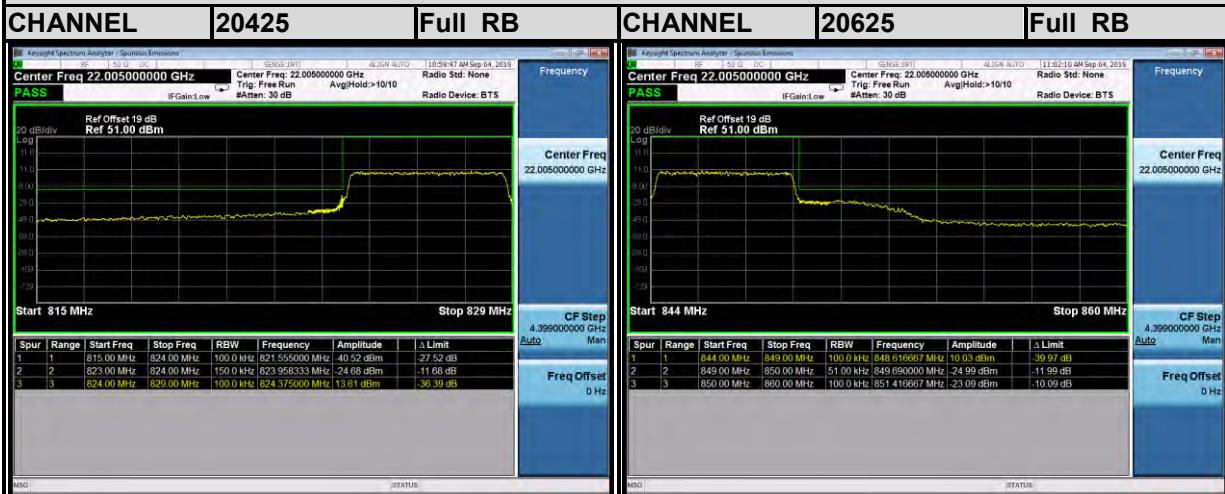
## LTE Band26

### Channel Bandwidth: 5MHz 16QAM



## LTE Band26

### Channel Bandwidth: 5MHz 16QAM



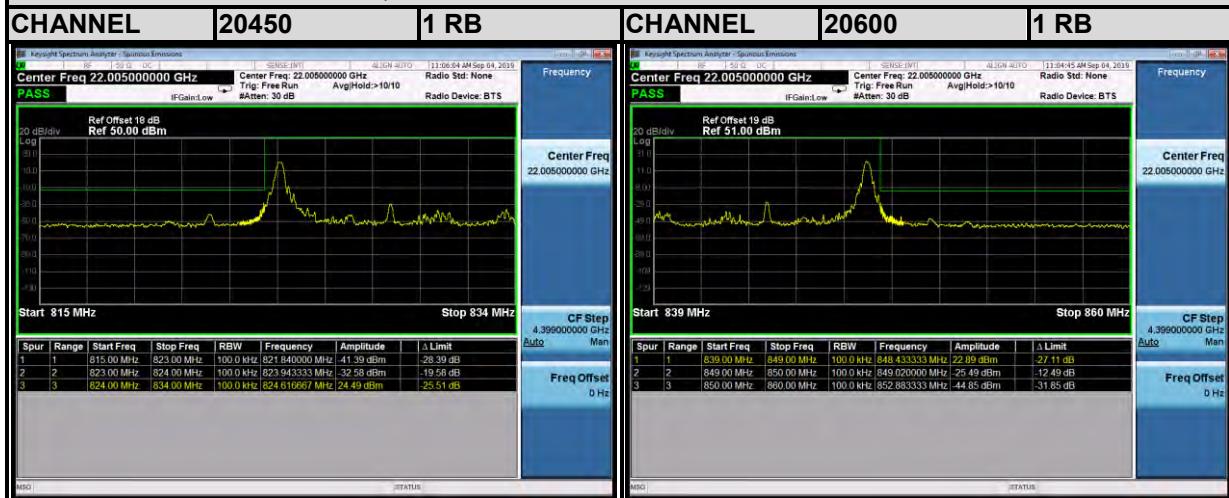


BUREAU  
VERITAS

Test Report No.: RF190522W005-1

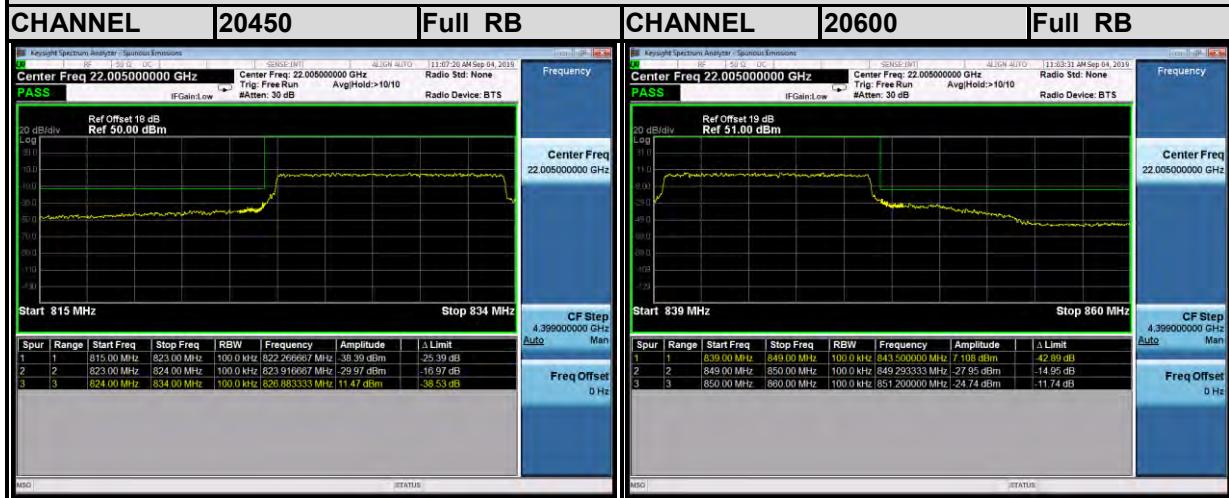
## LTE Band26

### Channel Bandwidth: 10MHz QPSK



## LTE Band26

### Channel Bandwidth: 10MHz QPSK



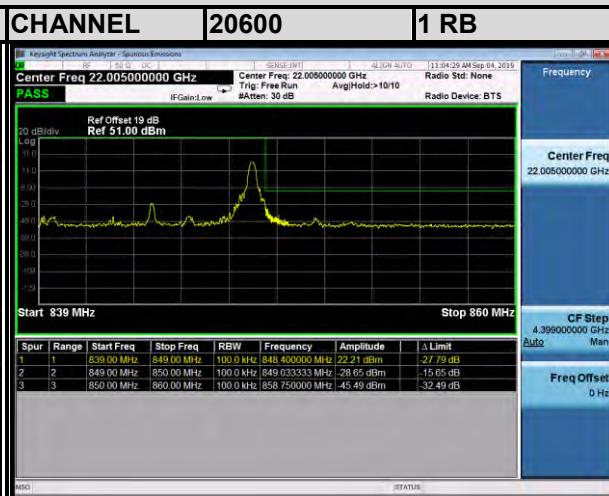
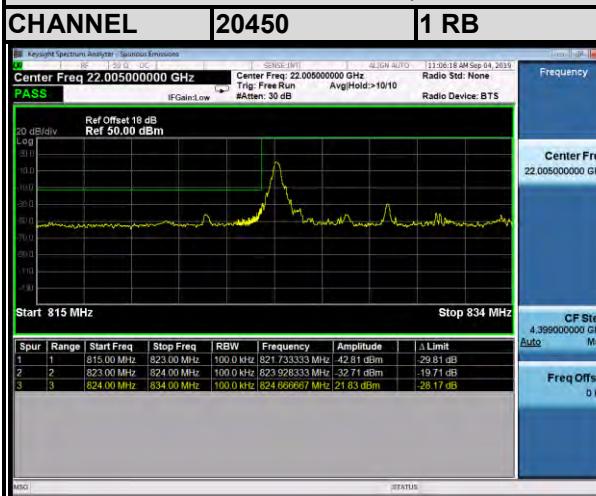


BUREAU  
VERITAS

Test Report No.: RF190522W005-1

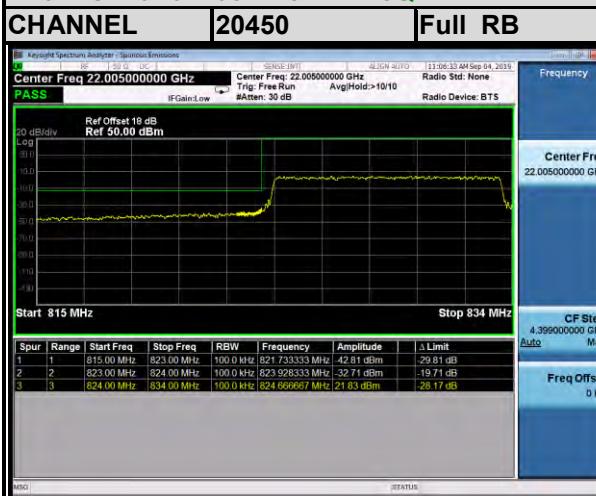
## LTE Band26

Channel Bandwidth: 10MHz 16QAM



## LTE Band26

Channel Bandwidth: 10MHz 16QAM



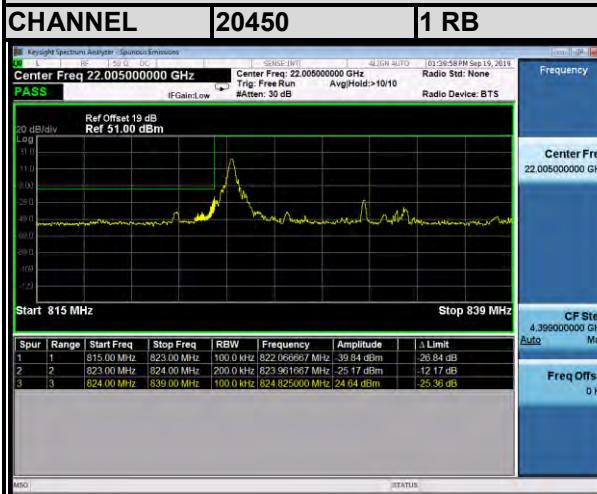


BUREAU  
VERITAS

Test Report No.: RF190522W005-1

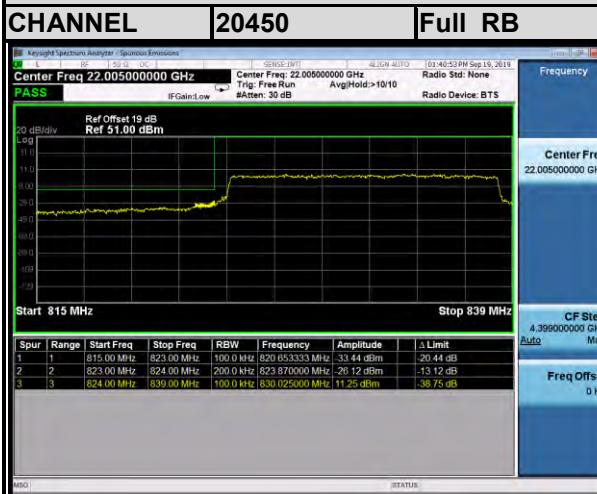
## LTE Band26

### Channel Bandwidth: 15MHz QPSK



## LTE Band26

### Channel Bandwidth: 15MHz QPSK



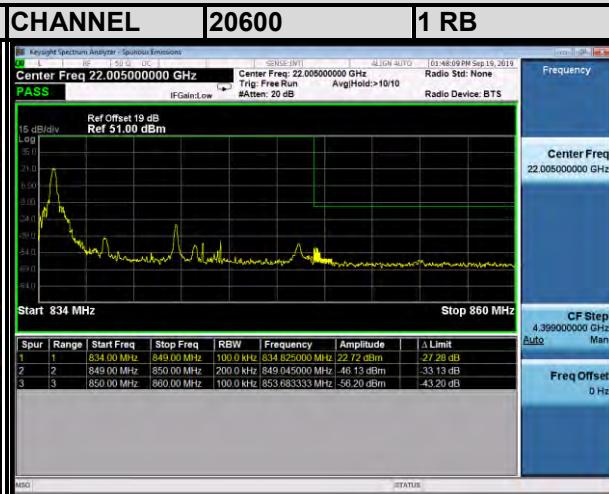
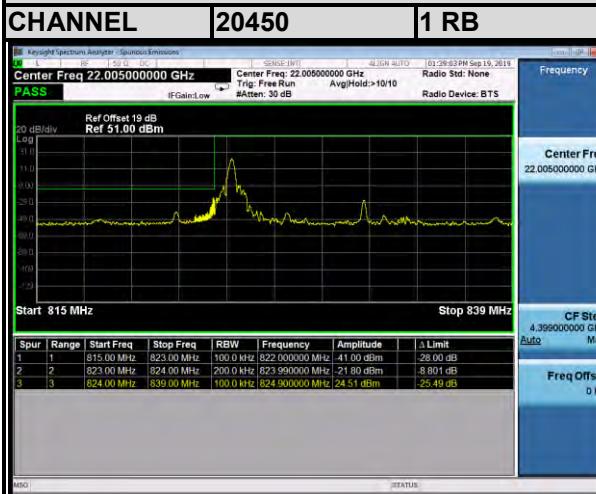


BUREAU  
VERITAS

Test Report No.: RF190522W005-1

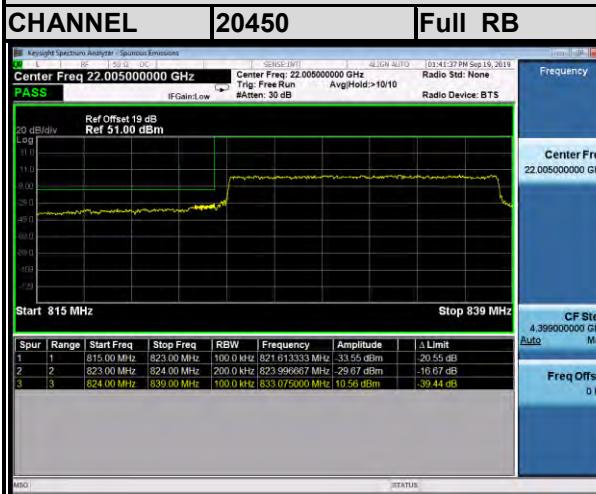
## LTE Band26

Channel Bandwidth: 15MHz 16QAM



## LTE Band26

Channel Bandwidth: 15MHz 16QAM





### 3.5 CONDUCTED SPURIOUS EMISSIONS

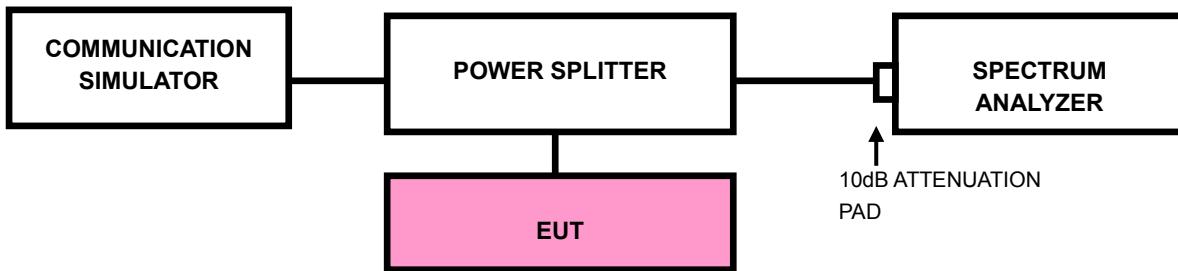
#### 3.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The emission limit equal to  $-13\text{dBm}$ .

#### 3.5.2 TEST PROCEDURE

- a. The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- b. Measuring frequency range is from 9 kHz to 9GHz. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz is used for conducted emission measurement.

#### 3.5.3 TEST SETUP

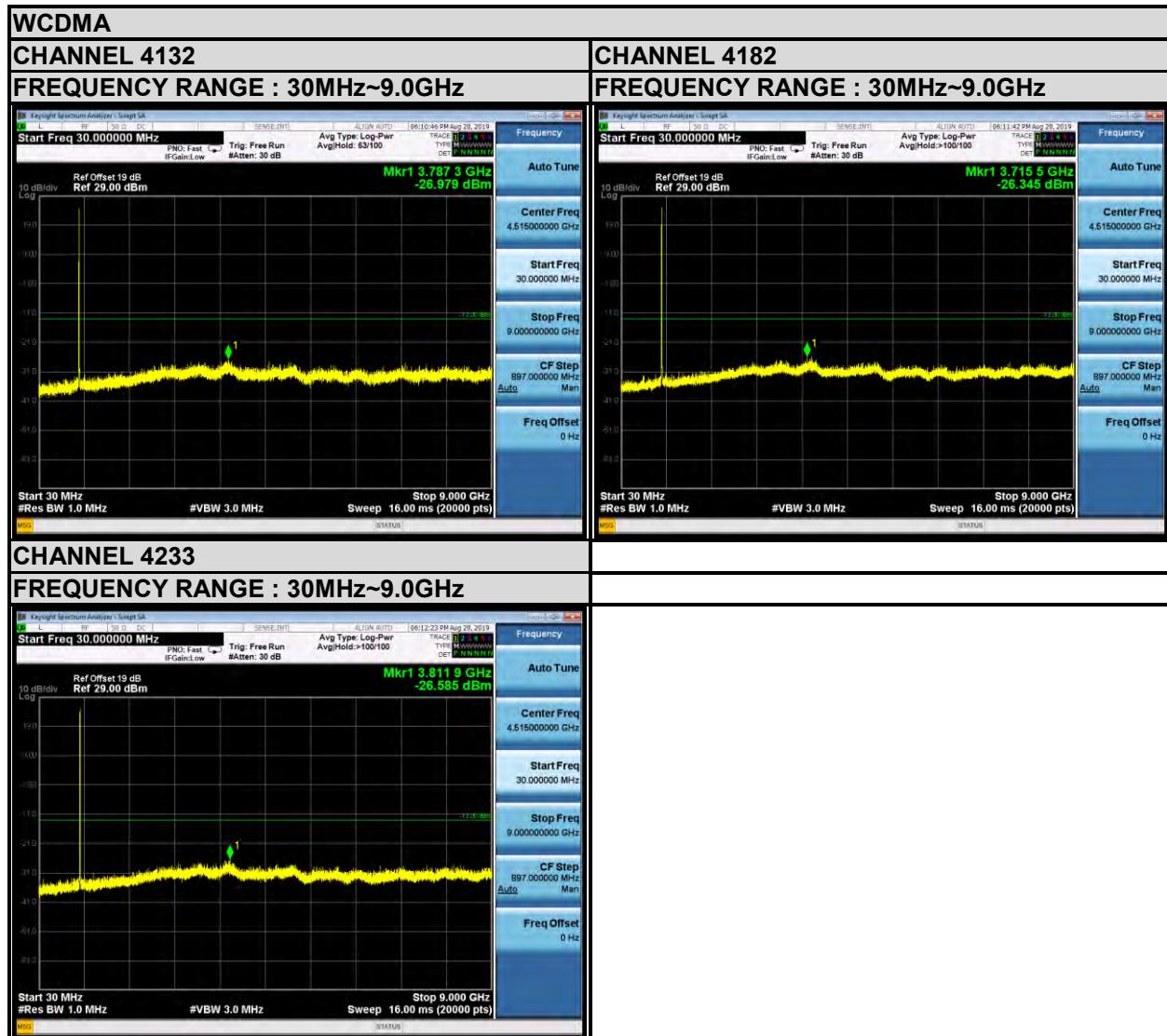




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Test Report No.: RF190522W005-1

### 3.5.4 TEST RESULTS





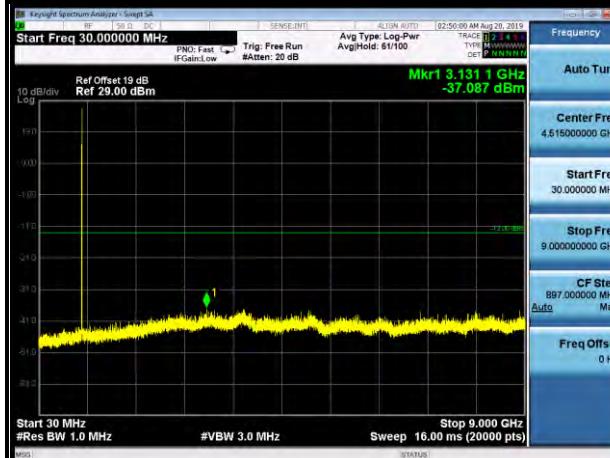
BUREAU  
VERITAS

Test Report No.: RF190522W005-1

### LTE Band 5 (Channel Bandwidth: 1.4MHz)

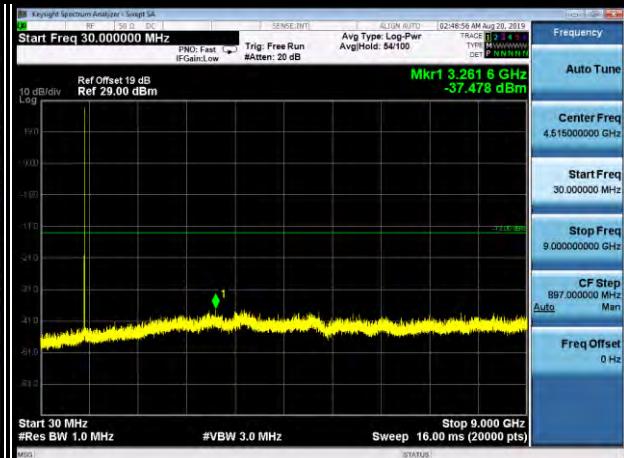
#### CHANNEL 20407

##### FREQUENCY RANGE : 30MHz~9.0GHz



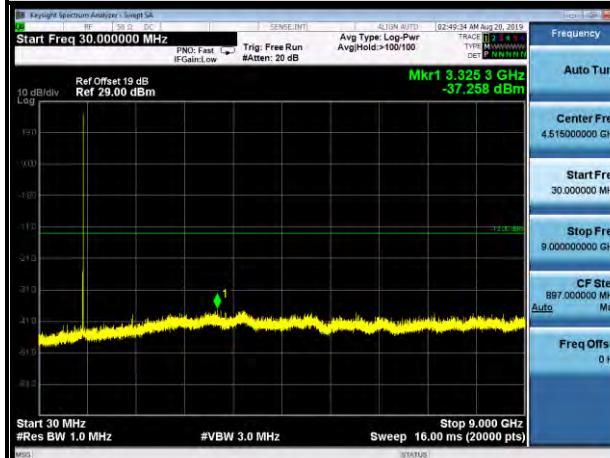
#### CHANNEL 20525

##### FREQUENCY RANGE : 30MHz~9.0GHz



#### CHANNEL 20643

##### FREQUENCY RANGE : 30MHz~9.0GHz





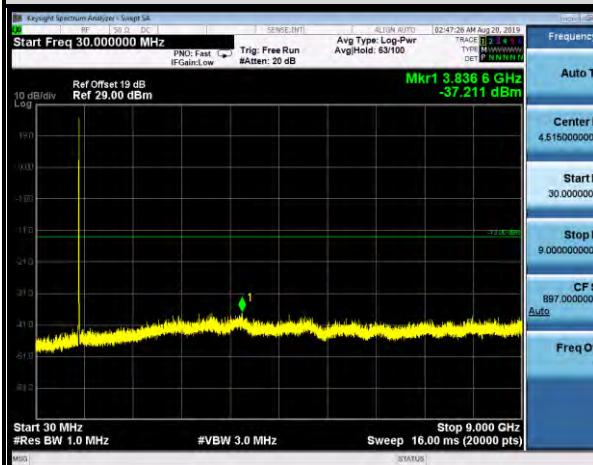
BUREAU  
VERITAS

Test Report No.: RF190522W005-1

### LTE Band 5 (Channel Bandwidth: 3MHz)

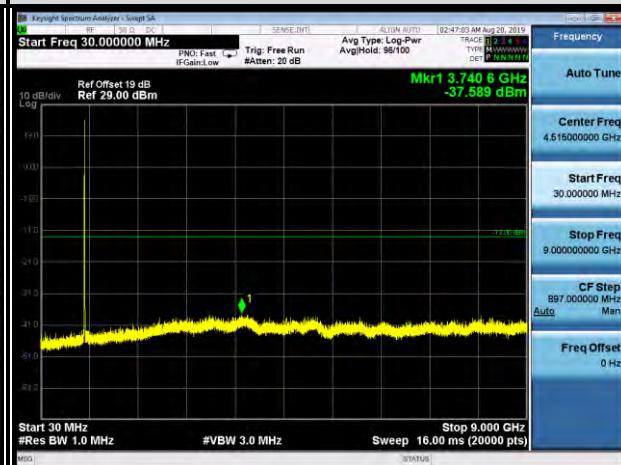
#### CHANNEL 20415

FREQUENCY RANGE : 30MHz~9.0GHz



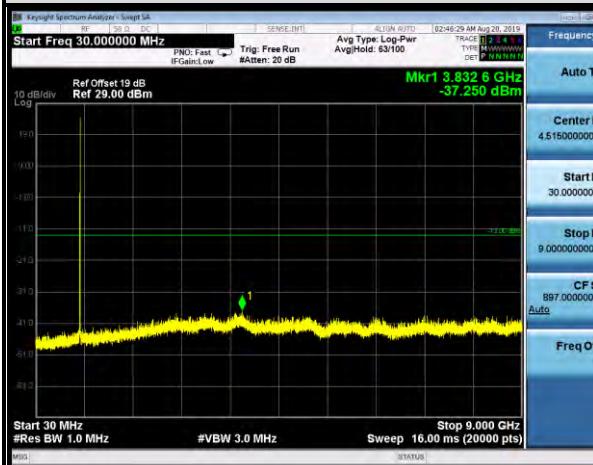
#### CHANNEL 20525

FREQUENCY RANGE : 30MHz~9.0GHz



#### CHANNEL 20635

FREQUENCY RANGE : 30MHz~9.0GHz





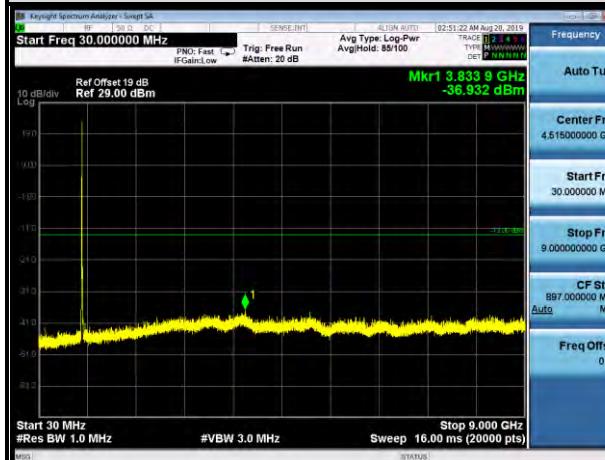
BUREAU  
VERITAS

Test Report No.: RF190522W005-1

### LTE Band 5 (Channel Bandwidth: 5MHz)

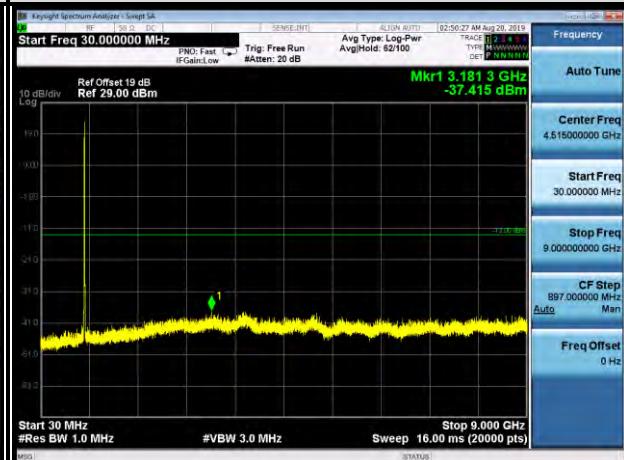
#### CHANNEL 20425

FREQUENCY RANGE : 30MHz~9.0GHz



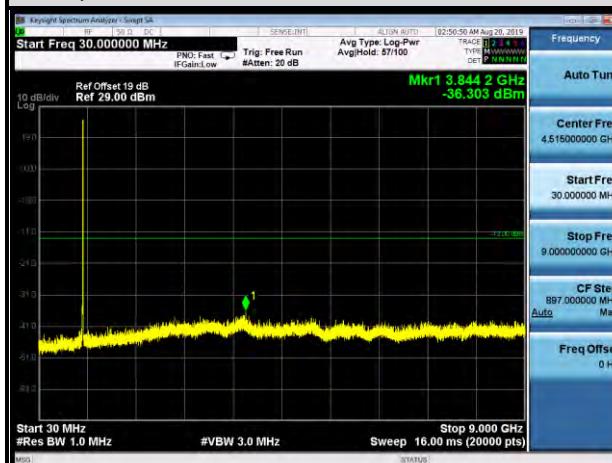
#### CHANNEL 20525

FREQUENCY RANGE : 30MHz~9.0GHz



#### CHANNEL 20625

FREQUENCY RANGE : 30MHz~9.0GHz





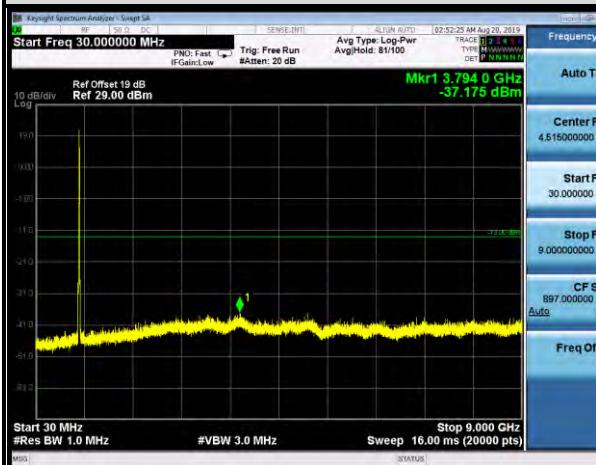
BUREAU  
VERITAS

Test Report No.: RF190522W005-1

### LTE Band 5 (Channel Bandwidth: 10MHz)

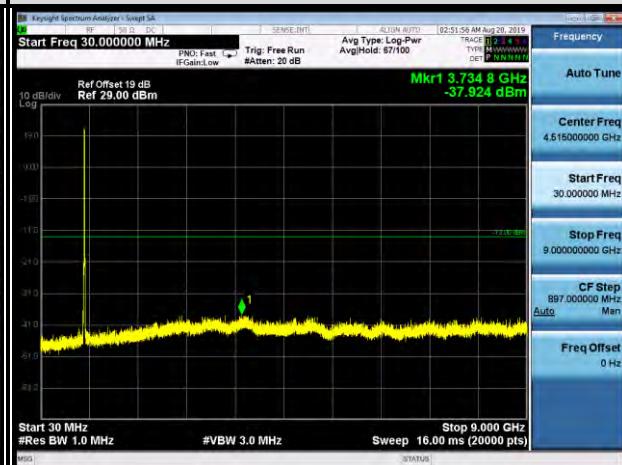
#### CHANNEL 20450

##### FREQUENCY RANGE : 30MHz~9.0GHz



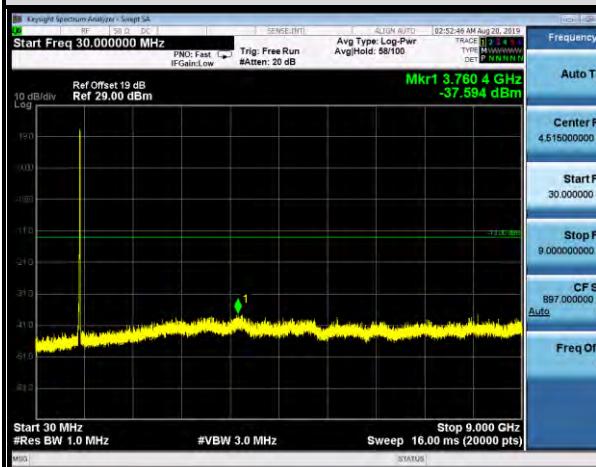
#### CHANNEL 20525

##### FREQUENCY RANGE : 30MHz~9.0GHz



#### CHANNEL 20600

##### FREQUENCY RANGE : 30MHz~9.0GHz





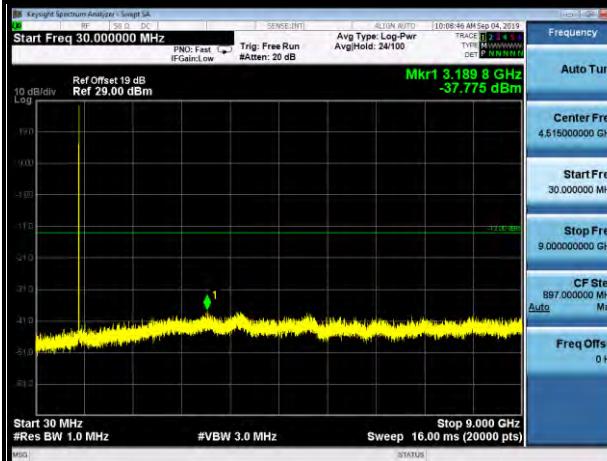
BUREAU  
VERITAS

Test Report No.: RF190522W005-1

### LTE Band 26 (Channel Bandwidth: 1.4MHz)

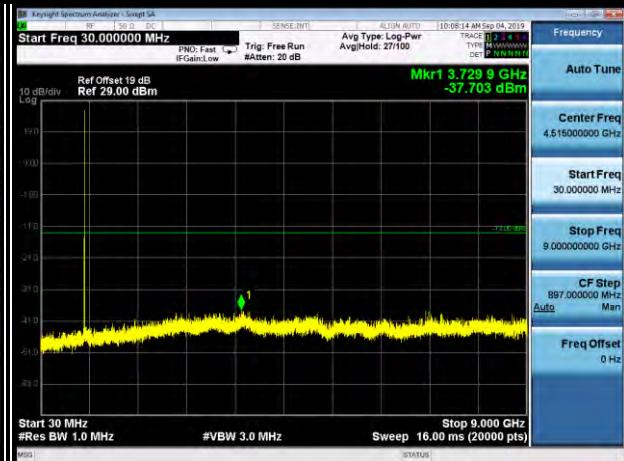
#### CHANNEL 20407

##### FREQUENCY RANGE : 30MHz~9.0GHz



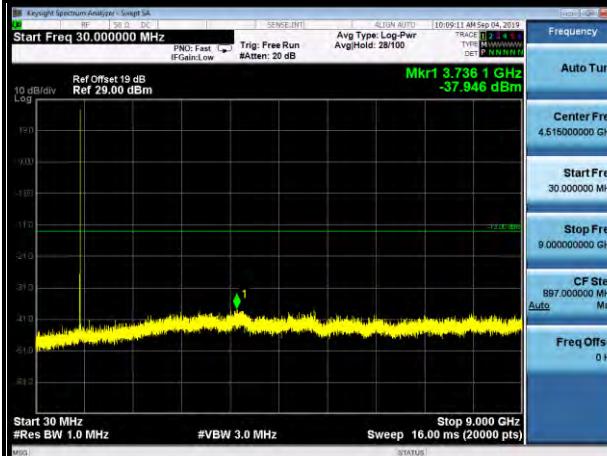
#### CHANNEL 20525

##### FREQUENCY RANGE : 30MHz~9.0GHz



#### CHANNEL 20643

##### FREQUENCY RANGE : 30MHz~9.0GHz





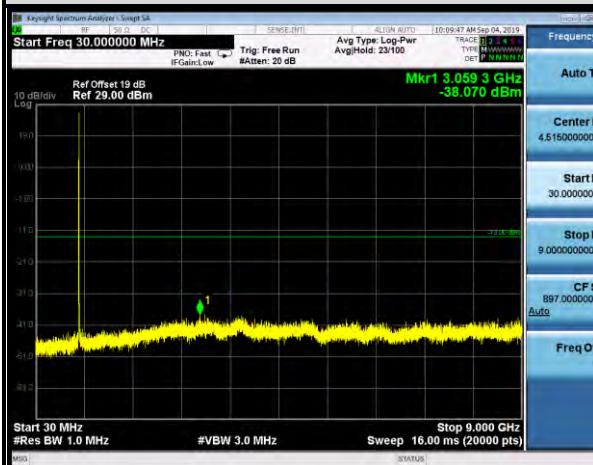
BUREAU  
VERITAS

Test Report No.: RF190522W005-1

### LTE Band 26 (Channel Bandwidth: 3MHz)

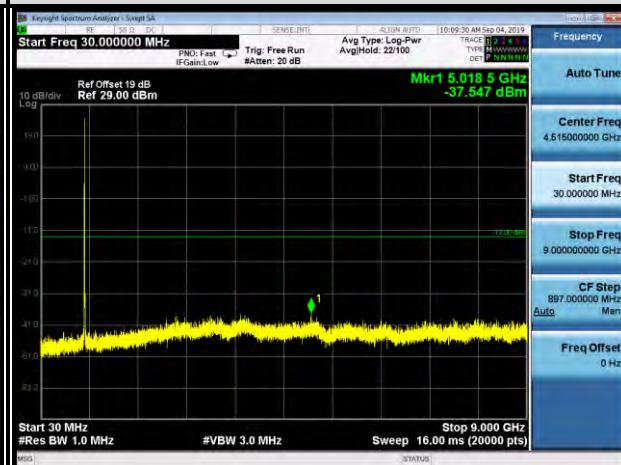
#### CHANNEL 20415

##### FREQUENCY RANGE : 30MHz~9.0GHz



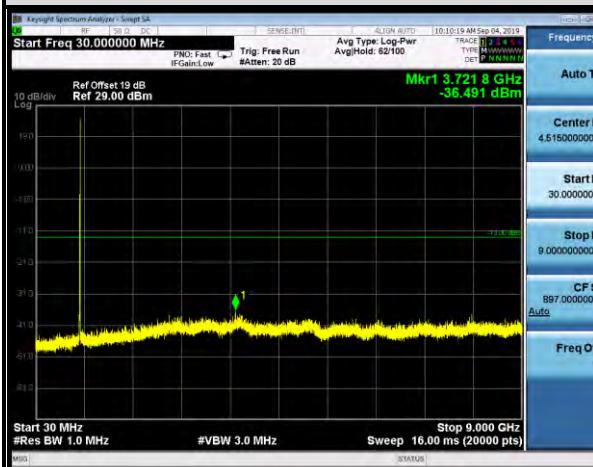
#### CHANNEL 20525

##### FREQUENCY RANGE : 30MHz~9.0GHz



#### CHANNEL 20635

##### FREQUENCY RANGE : 30MHz~9.0GHz





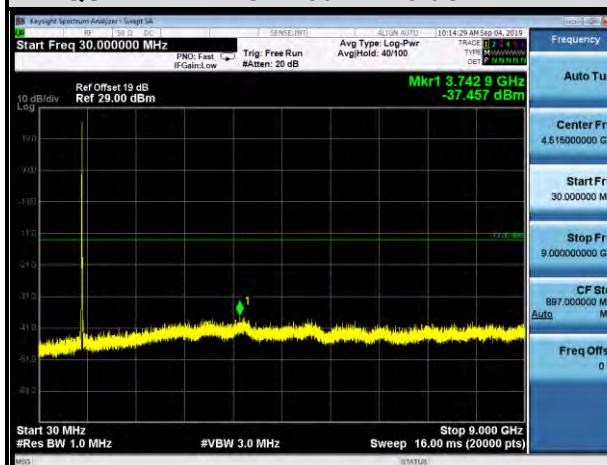
BUREAU  
VERITAS

Test Report No.: RF190522W005-1

### LTE Band 26 (Channel Bandwidth: 5MHz)

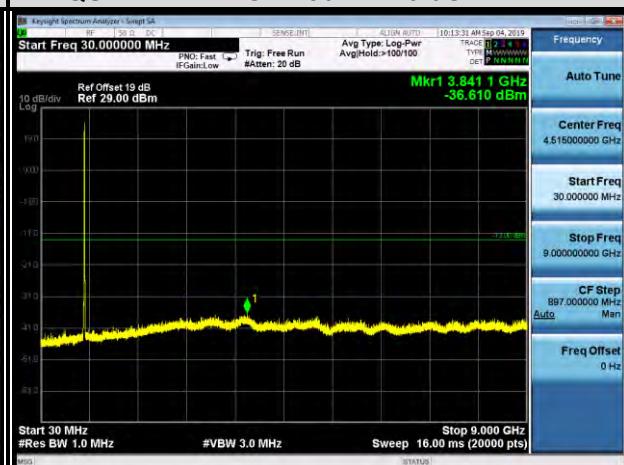
#### CHANNEL 20425

#### FREQUENCY RANGE : 30MHz~9.0GHz



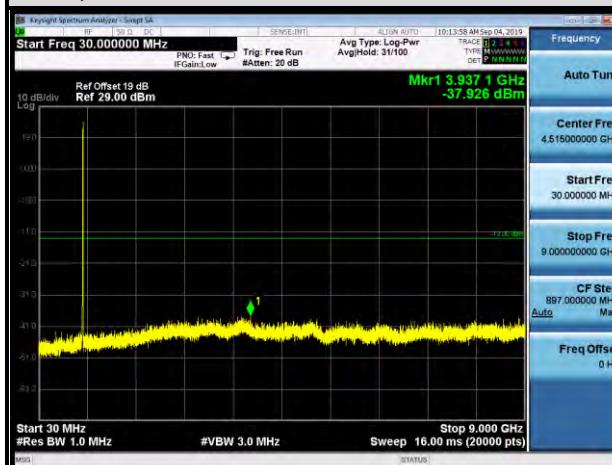
#### CHANNEL 20525

#### FREQUENCY RANGE : 30MHz~9.0GHz



#### CHANNEL 20625

#### FREQUENCY RANGE : 30MHz~9.0GHz





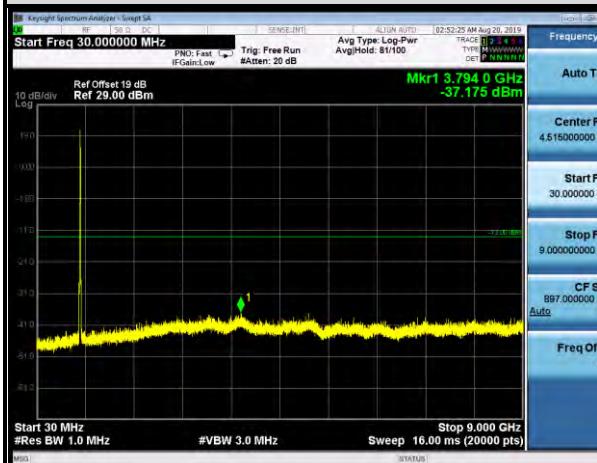
BUREAU  
VERITAS

Test Report No.: RF190522W005-1

## LTE Band 26 (Channel Bandwidth: 10MHz)

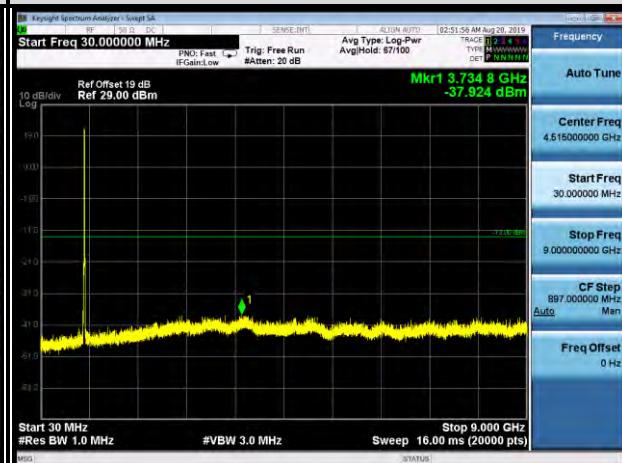
CHANNEL 20450

**FREQUENCY RANGE : 30MHz~9.0GHz**



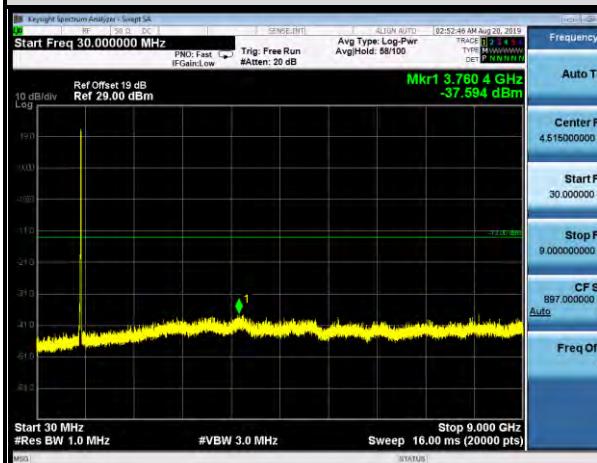
CHANNEL 20525

**FREQUENCY RANGE : 30MHz~9.0GHz**



CHANNEL 20600

**FREQUENCY RANGE : 30MHz~9.0GHz**





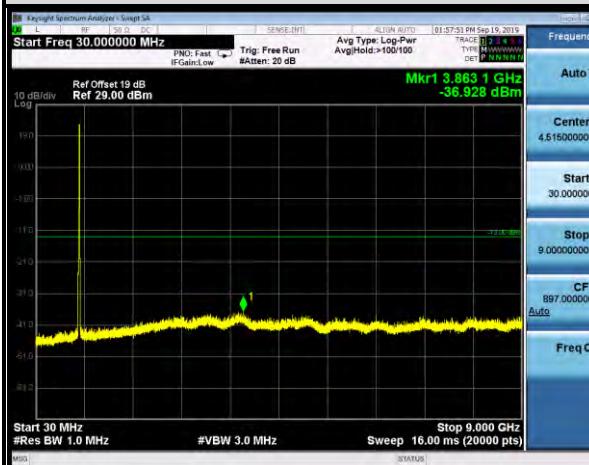
BUREAU  
VERITAS

Test Report No.: RF190522W005-1

### LTE Band 26 (Channel Bandwidth: 15MHz)

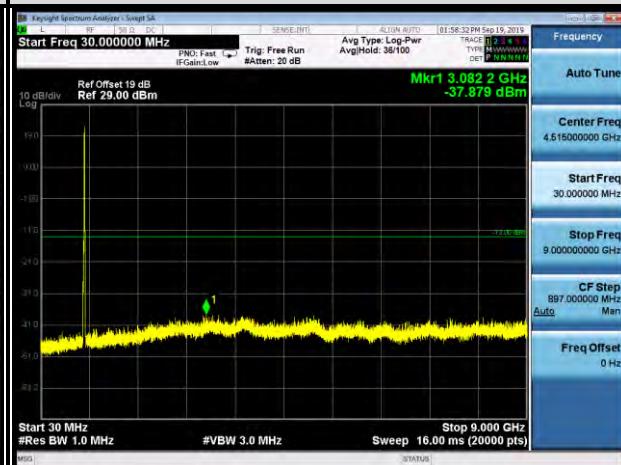
#### CHANNEL 26865

##### FREQUENCY RANGE : 30MHz~9.0GHz



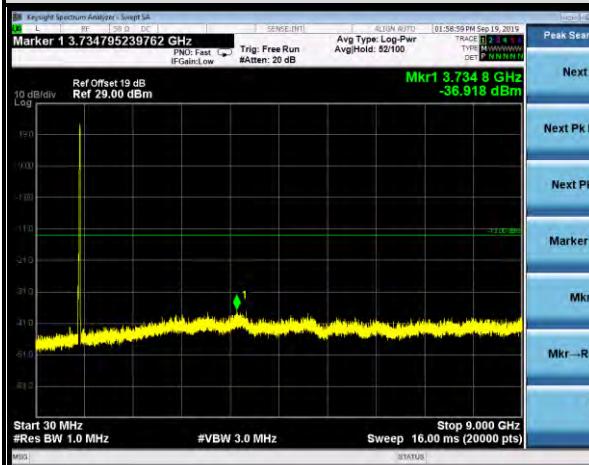
#### CHANNEL 26915

##### FREQUENCY RANGE : 30MHz~9.0GHz



#### CHANNEL 26965

##### FREQUENCY RANGE : 30MHz~9.0GHz





BUREAU  
VERITAS

Test Report No.: RF190522W005-1

### 3.6 RADIATED EMISSION MEASUREMENT

#### 3.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. The emission limit equal to  $-13\text{dBm}$ .

#### 3.6.2 TEST PROCEDURES

- a. 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.
- b. 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 a. Record the power level of S.G
- c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
- d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.P.R power - 2.15dBi.

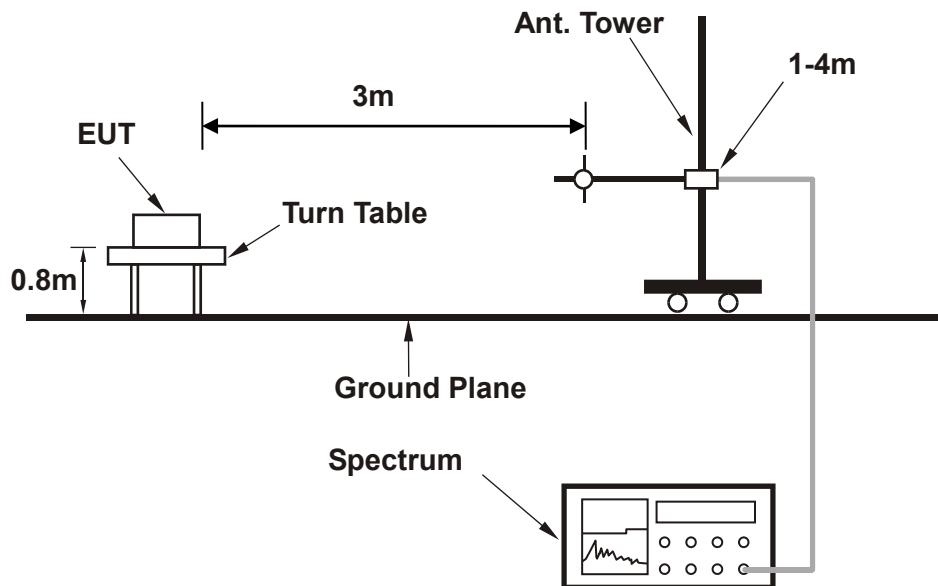
**NOTE:** The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz.

#### 3.6.3 DEVIATION FROM TEST STANDARD

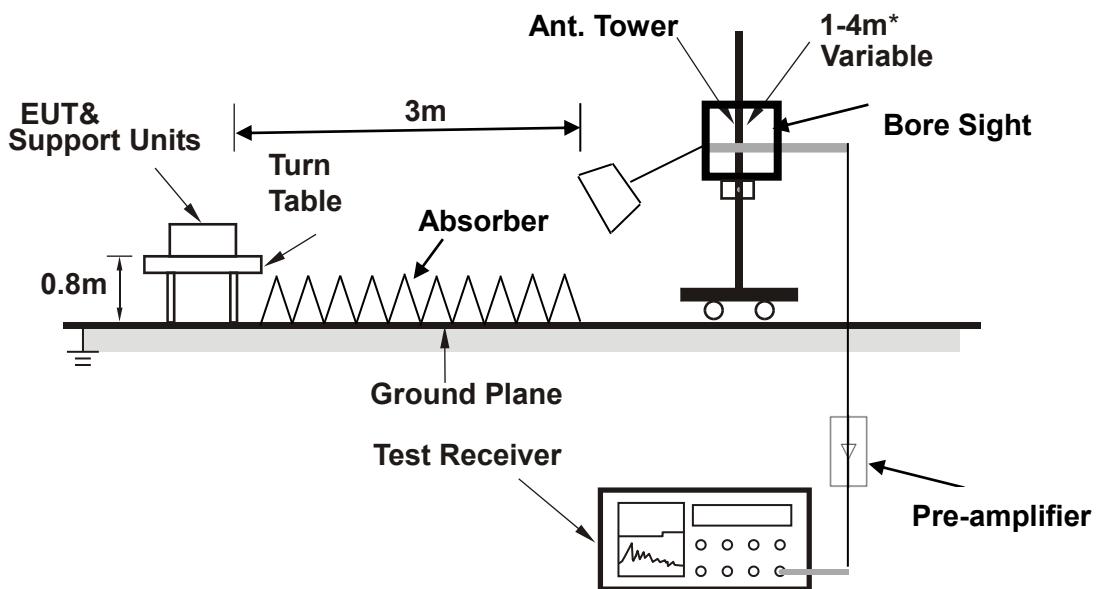
No deviation

### 3.6.4 TEST SETUP

< Frequency Range 30MHz~1GHz >



<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).



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Test Report No.: RF190522W005-1

### 3.6.5 TEST RESULTS

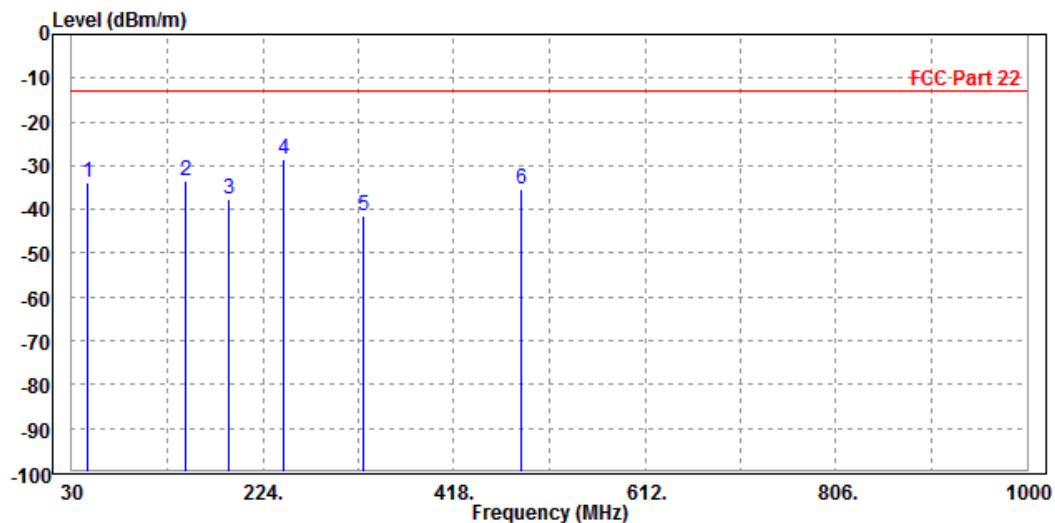
#### BELOW 1GHz WORST-CASE DATA

30 MHz – 1GHz data:

#### LTE BAND 5

MODE	TX channel 20525	FREQUENCY RANGE	Below 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Freq	Level	Read	Limit	Over	Factor	Remark	Pol/Phase
		Line	Line	Limit Factor			
MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	46.690	-33.87	-41.23	-13.00	-20.87	7.36 Peak	Horizontal
2	145.210	-33.32	-42.59	-13.00	-20.32	9.27 Peak	Horizontal
3	189.640	-37.82	-48.36	-13.00	-24.82	10.54 Peak	Horizontal
4 PP	245.120	-28.44	-41.23	-13.00	-15.44	12.79 Peak	Horizontal
5	325.640	-41.49	-56.38	-13.00	-28.49	14.89 Peak	Horizontal
6	485.610	-35.31	-53.62	-13.00	-22.31	18.31 Peak	Horizontal



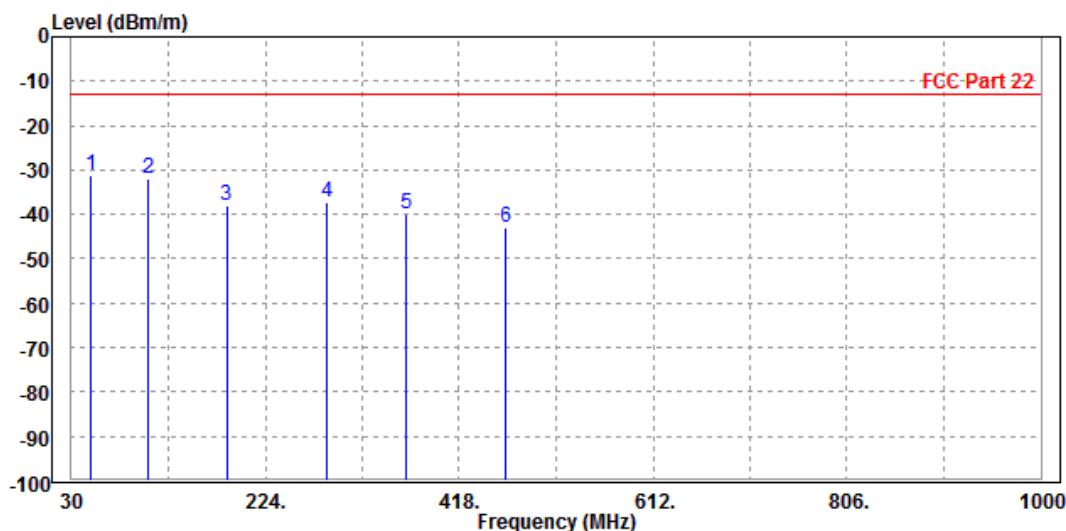


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VERITAS

Test Report No.: RF190522W005-1

<b>MODE</b>	TX channel 20525	<b>FREQUENCY RANGE</b>	Below 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 5V from adapter
<b>TESTED BY</b>	Star Le		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>			

Freq	Level	Read	Limit	Over	Factor	Remark	Pol/Phase
		Level	Line	Limit			
MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	49.680	-31.11	-38.52	-13.00	-18.11	7.41 Peak	Vertical
2	106.280	-31.77	-41.22	-13.00	-18.77	9.45 Peak	Vertical
3	185.220	-38.13	-48.63	-13.00	-25.13	10.50 Peak	Vertical
4	285.610	-37.33	-51.24	-13.00	-24.33	13.91 Peak	Vertical
5	365.240	-40.01	-56.23	-13.00	-27.01	16.22 Peak	Vertical
6	465.210	-43.07	-61.28	-13.00	-30.07	18.21 Peak	Vertical





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VERITAS

Test Report No.: RF190522W005-1

## ABOVE 1GHz DATA

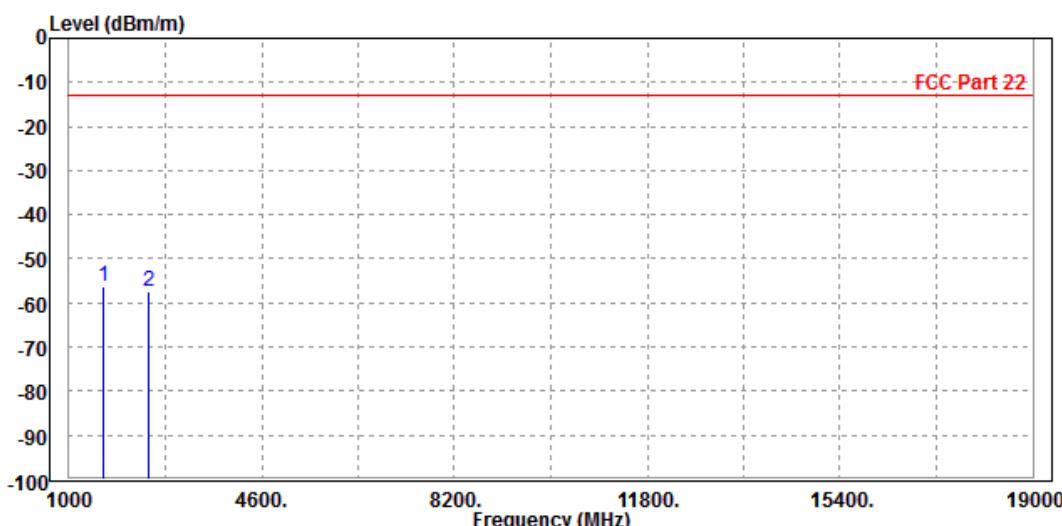
Note: For higher frequency, the emission is too low to be detected.

### WCDMA Band V:

#### CH 4132:

MODE	TX channel 4132	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Freq	Level	Read	Limit	Over	Factor	Remark	Pol/Phase
		Level	Line	Limit			
MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	1648.000	-56.20	-51.23	-13.00	-43.20	-4.97 Peak	Horizontal
2	2480.000	-57.50	-55.85	-13.00	-44.50	-1.65 Peak	Horizontal



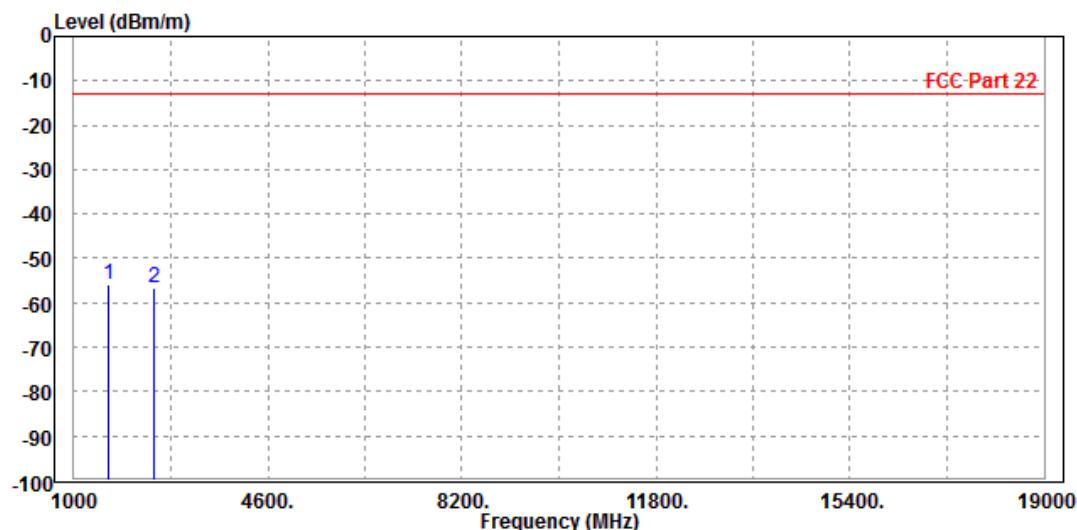


BUREAU  
VERITAS

Test Report No.: RF190522W005-1

MODE	TX channel 4132	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Freq	Level	Read	Limit	Over	Factor	Remark	Pol/Phase
		Level	Line	Limit			
MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP	1648.000	-55.96	-52.41	-13.00	-42.96	-3.55 Peak
2		2480.000	-56.56	-56.39	-13.00	-43.56	-0.17 Peak





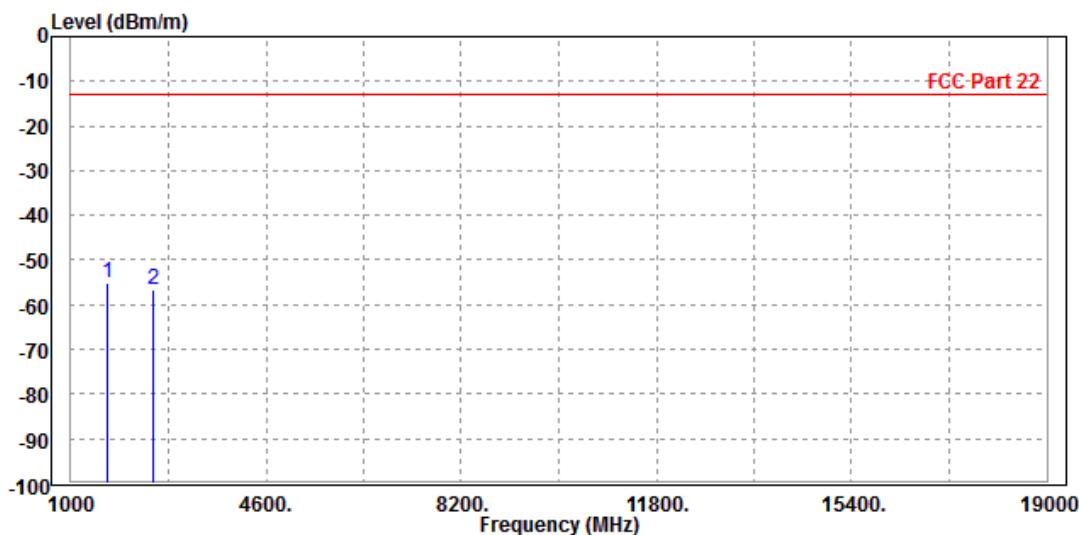
BUREAU  
VERITAS

Test Report No.: RF190522W005-1

CH 4182:

MODE	TX channel 4182	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Freq MHz	Level dBm/m	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		dBm	dBm/m	dB			
1 PP 1666.000	-55.14	-50.32	-13.00	-42.14	-4.82	Peak	Horizontal
2 2512.000	-56.84	-55.25	-13.00	-43.84	-1.59	Peak	Horizontal



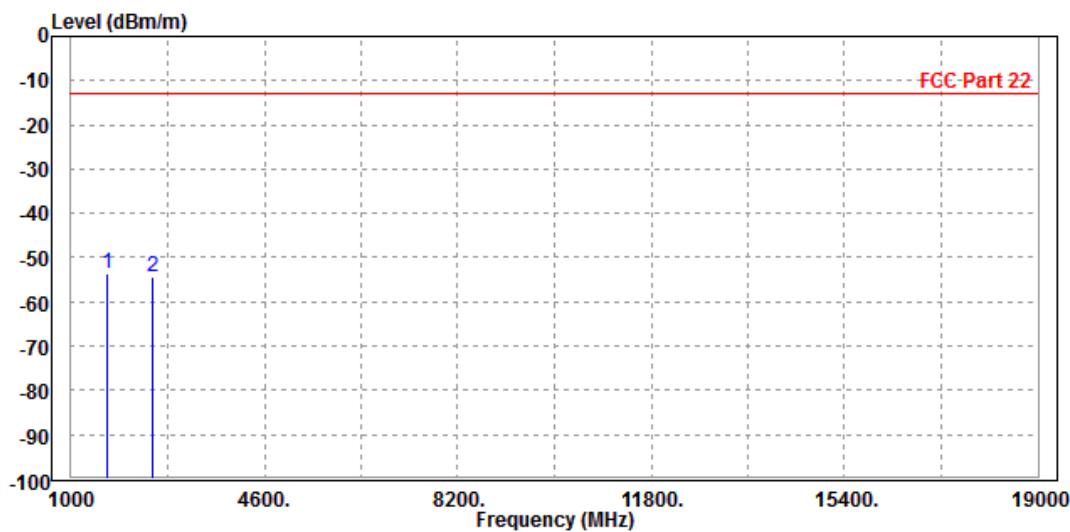


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VERITAS

Test Report No.: RF190522W005-1

MODE	TX channel 4182	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Freq	Level	Read	Limit	Over	Remark	Pol/Phase
		Line	dBm	Factor		
MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	PP 1666.000	-53.62	-50.24	-13.00	-40.62	-3.38 Peak Vertical
2	2512.000	-54.50	-54.38	-13.00	-41.50	-0.12 Peak Vertical





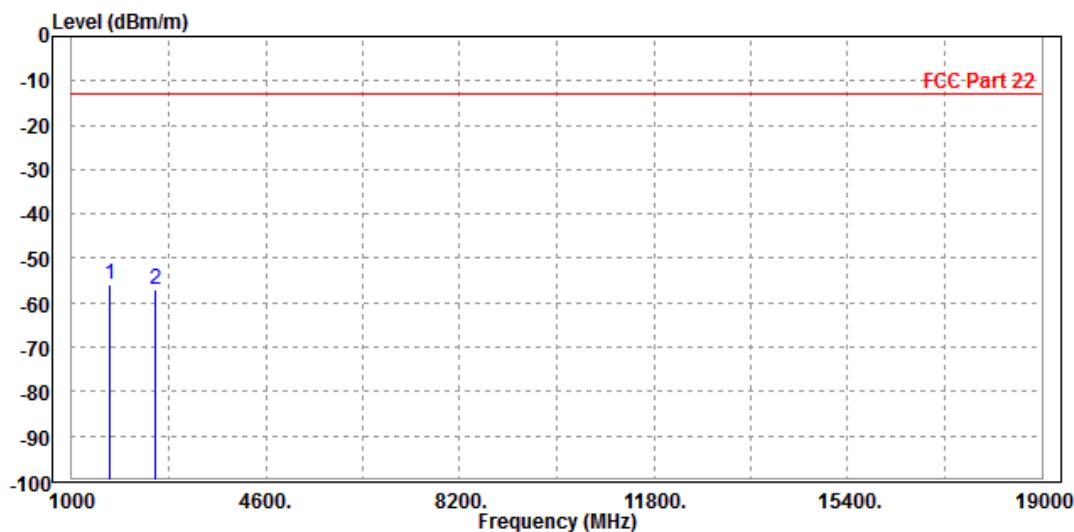
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VERITAS

Test Report No.: RF190522W005-1

CH 4233:

MODE	TX channel 4233	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Freq MHz	Level dBm/m	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
		dBm	dBm/m	dB			
1 PP 1702.000	-55.73	-51.21	-13.00	-42.73	-4.52	Peak	Horizontal
2 2548.000	-56.87	-55.42	-13.00	-43.87	-1.45	Peak	Horizontal



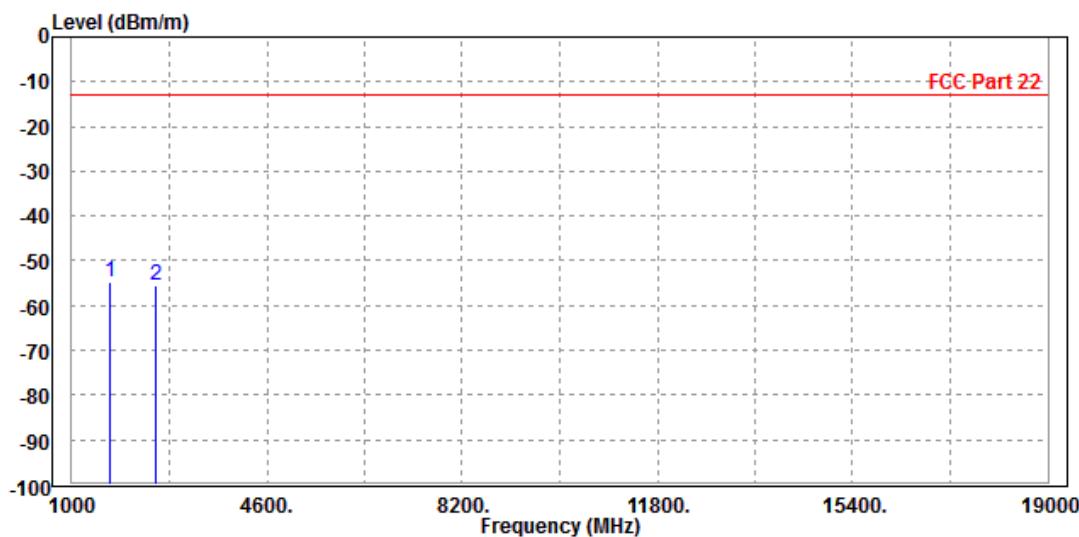


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VERITAS

Test Report No.: RF190522W005-1

MODE	TX channel 4233	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Freq	Level	Read	Limit	Over	Factor	Remark	Pol/Phase
		Level	Line	Limit			
MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1702.000	-54.69	-51.64	-13.00	-41.69	-3.05 Peak	Vertical
2	2548.000	-55.33	-55.36	-13.00	-42.33	0.03 Peak	Vertical





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VERITAS

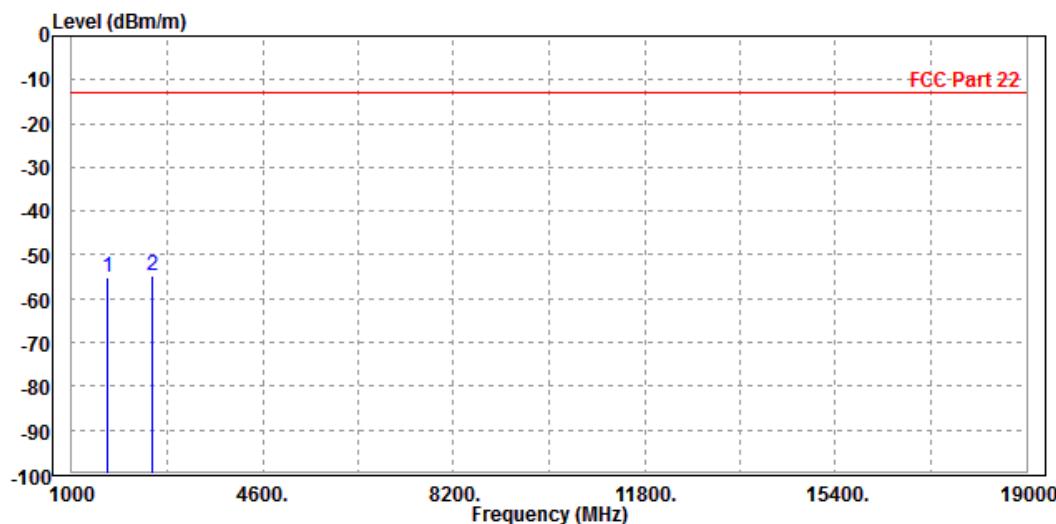
Test Report No.: RF190522W005-1

LTE Band 5

CHANNEL BANDWIDTH: 1.4MHz / QPSK

MODE	TX channel 20525	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Freq MHz	Read Level dBm/m	Limit Level dBm	Over Line dBm/m	Over Limit dB	Over Factor	Remark	Pol/Phase
	dBm/m	dBm	dBm/m	dB	dB/m		
1 1666.000	-55.09	-50.27	-13.00	-42.09	-4.82	Peak	Horizontal
2 PP 2512.000	-54.84	-53.25	-13.00	-41.84	-1.59	Peak	Horizontal



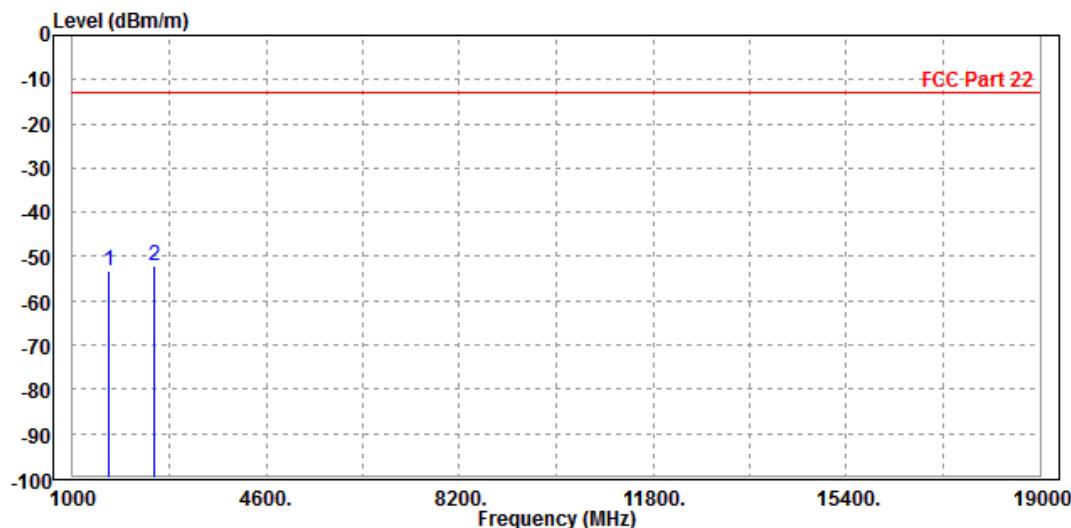


BUREAU  
VERITAS

Test Report No.: RF190522W005-1

MODE	TX channel 20525	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

	Freq	Read Level	Limit Level	Over Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1666.000	-53.06	-49.68	-13.00	-40.06	-3.38	Peak	Vertical
2	PP 2512.000	-52.01	-51.89	-13.00	-39.01	-0.12	Peak	Vertical





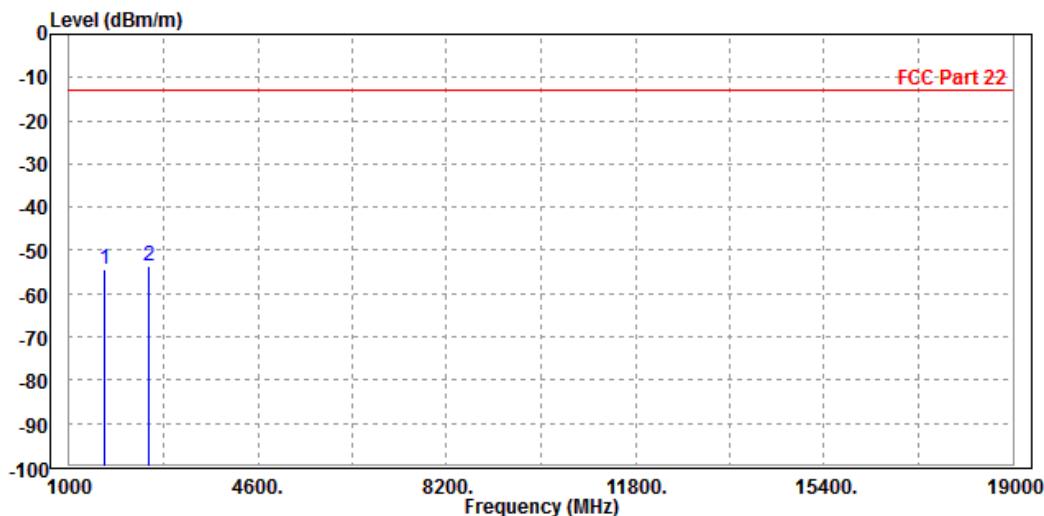
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VERITAS

Test Report No.: RF190522W005-1

CHANNEL BANDWIDTH: 3MHz / QPSK

MODE	TX channel 20525	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Read Level	Limit Level	Over Line	Limit	Over Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1666.000	-54.47	-49.65	-13.00	-41.47	-4.82	Peak	Horizontal
2 PP	2512.000	-53.78	-52.19	-13.00	-40.78	-1.59	Peak	Horizontal



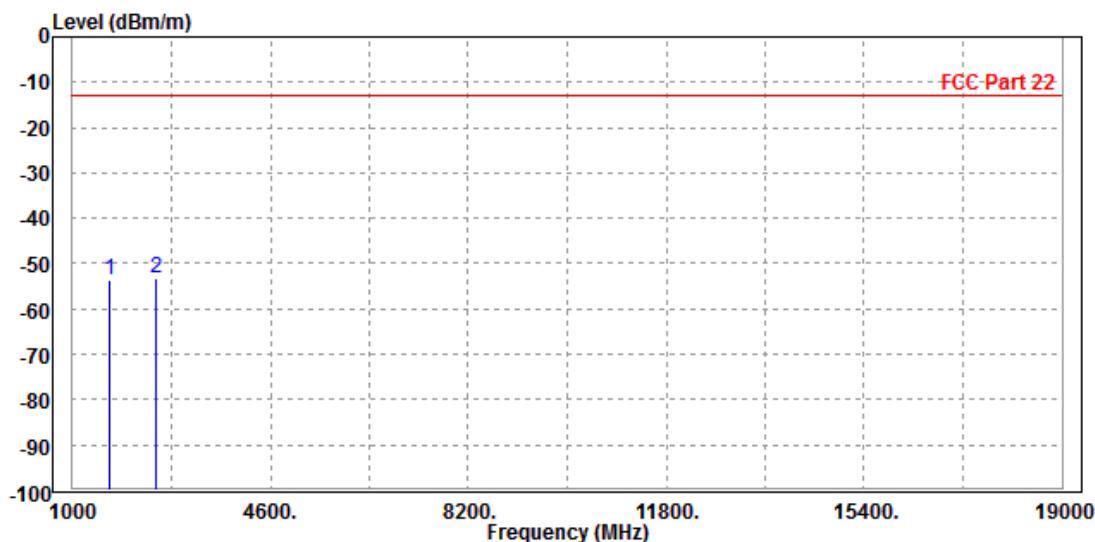


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VERITAS

Test Report No.: RF190522W005-1

MODE	TX channel 20525	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Freq	Level	Read	Limit	Over	Factor	Remark	Pol/Phase
		Level	Line	Limit			
MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1666.000	-53.62	-50.24	-13.00	-40.62	-3.38 Peak	Vertical
2 PP	2512.000	-53.35	-53.23	-13.00	-40.35	-0.12 Peak	Vertical





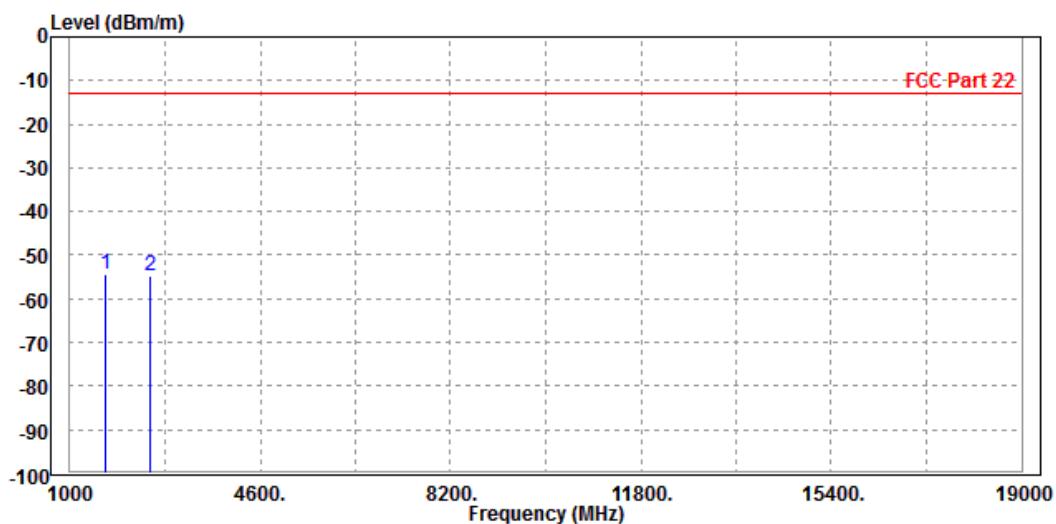
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VERITAS

Test Report No.: RF190522W005-1

CHANNEL BANDWIDTH: 5MHz / QPSK

MODE	TX channel 20525	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Freq	Level	Read	Limit	Over	Factor	Remark	Pol/Phase
		Line	Line	Limit			
MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP	1666.000	-54.43	-49.61	-13.00	-41.43	-4.82 Peak	Horizontal
2	2512.000	-54.88	-53.29	-13.00	-41.88	-1.59 Peak	Horizontal



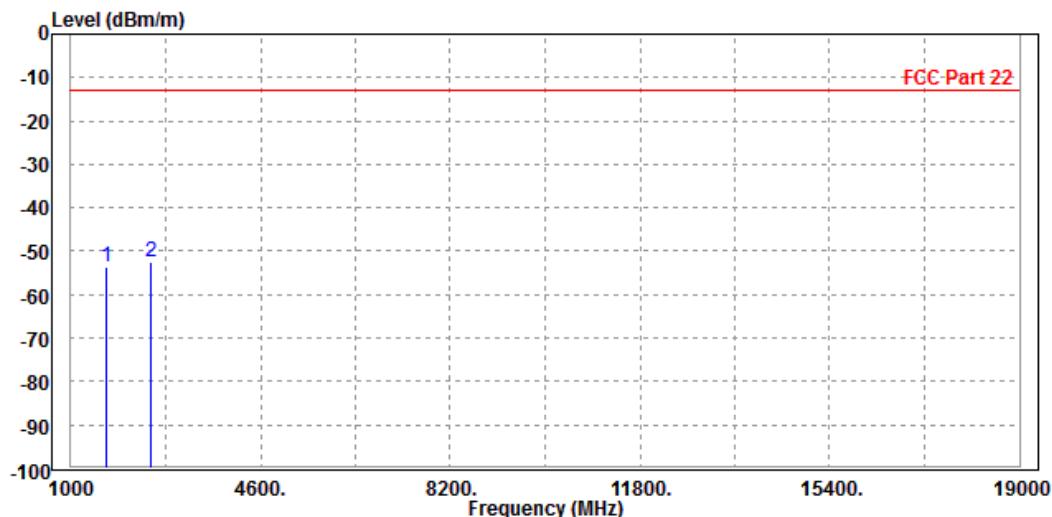


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VERITAS

Test Report No.: RF190522W005-1

MODE	TX channel 20525	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Freq	Level	Read	Limit	Over	Factor	Remark	Pol/Phase
		Level	Line	Limit			
MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1666.000	-53.70	-50.32	-13.00	-40.70	-3.38 Peak	Vertical
2 PP	2512.000	-52.60	-52.48	-13.00	-39.60	-0.12 Peak	Vertical





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VERITAS

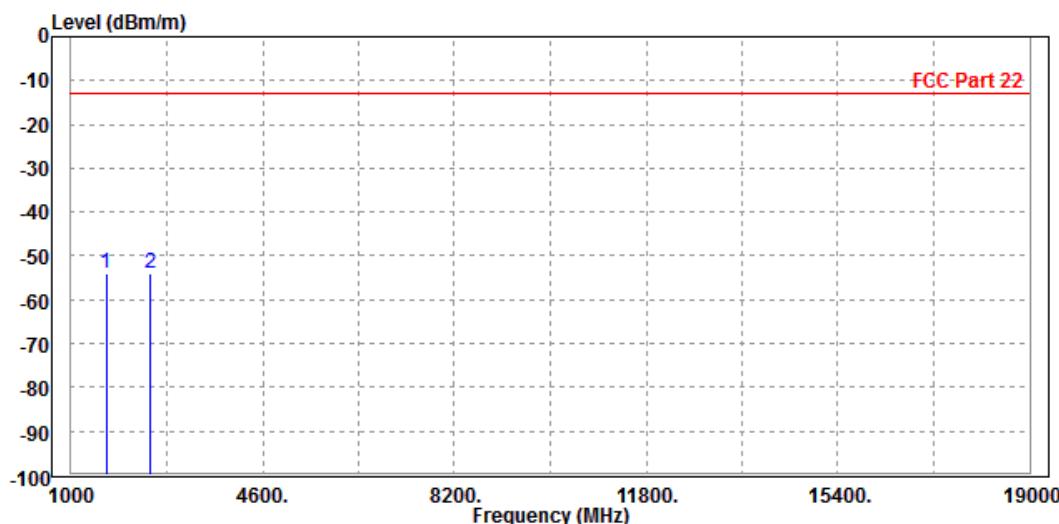
Test Report No.: RF190522W005-1

CHANNEL BANDWIDTH: 10MHz / QPSK

CH20450

MODE	TX channel 20450	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Freq	Level	Read	Limit	Over	Factor	Remark	Pol/Phase
		Line	Line	Limit			
MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1658.000	-54.11	-49.23	-13.00	-41.11	-4.88 Peak	Horizontal
2	PP 2487.000	-54.11	-52.46	-13.00	-41.11	-1.65 Peak	Horizontal



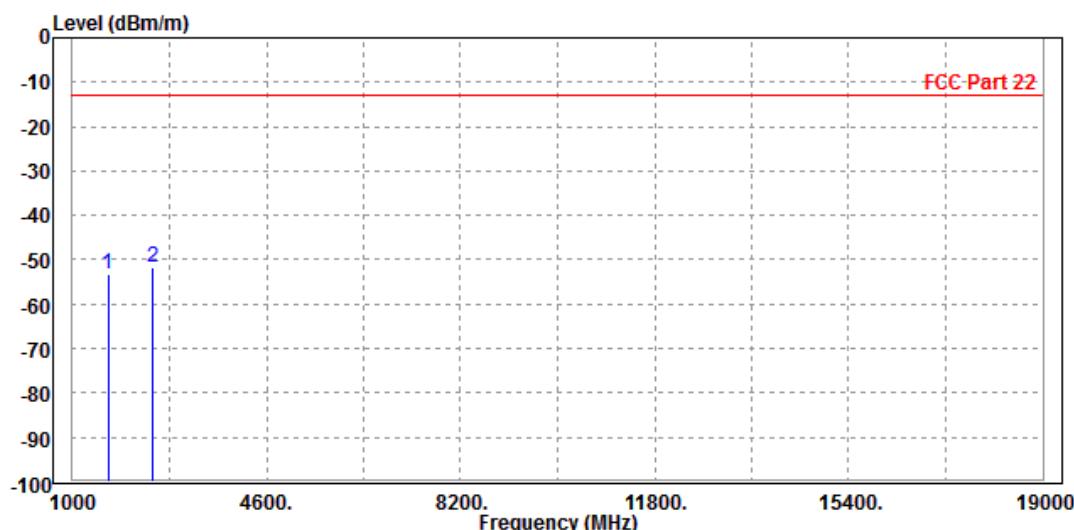


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VERITAS

Test Report No.: RF190522W005-1

MODE	TX channel 20450	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Freq	Level	Read	Limit	Over	Remark	Pol/Phase
		Level	Line	Limit Factor		
MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	1658.000	-53.09	-49.63	-13.00	-40.09	-3.46 Peak Vertical
2 PP	2487.000	-51.65	-51.48	-13.00	-38.65	-0.17 Peak Vertical





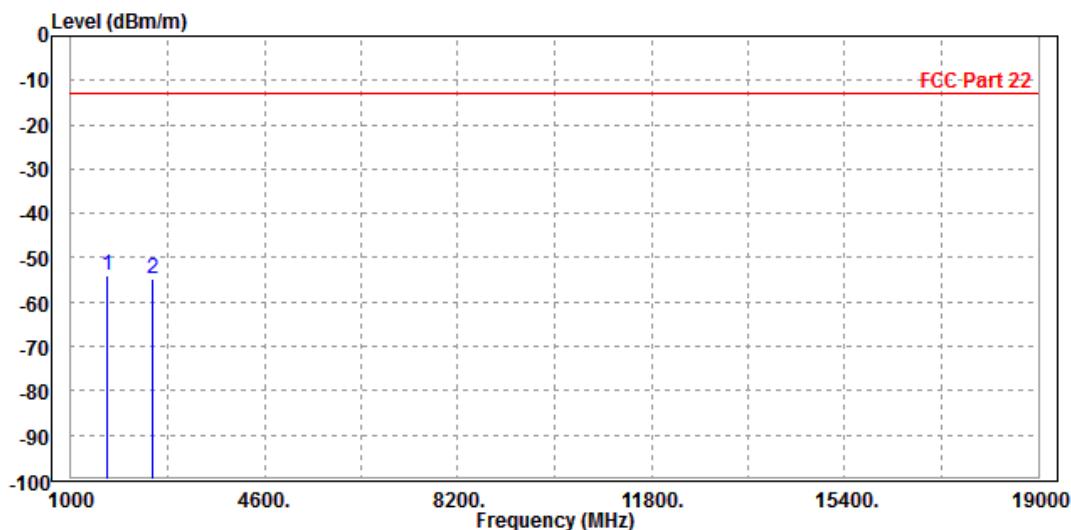
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VERITAS

Test Report No.: RF190522W005-1

CH20525

MODE	TX channel 20525	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Freq	Level	Read	Limit	Over	Remark	Pol/Phase
		Level	Line	Limit Factor		
MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1 PP	1666.000	-54.18	-49.36	-13.00	-41.18	-4.82 Peak
2	2512.000	-54.83	-53.24	-13.00	-41.83	-1.59 Peak



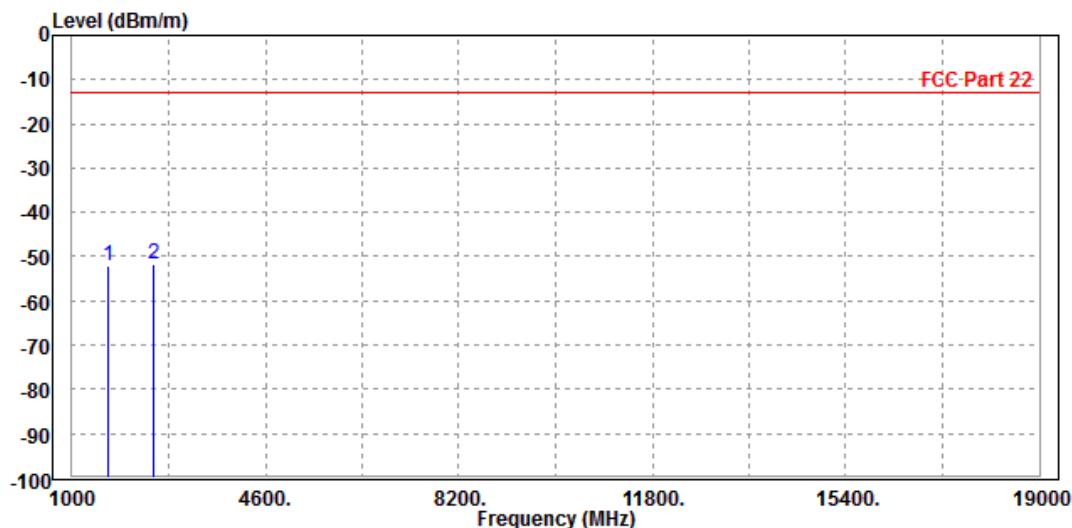


BUREAU  
VERITAS

Test Report No.: RF190522W005-1

MODE	TX channel 20525	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Freq	Level	Read	Limit	Over	Factor	Remark	Pol/Phase
		Level	Line	Limit			
MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1666.000	-52.13	-48.75	-13.00	-39.13	-3.38 Peak	Vertical
2	PP 2512.000	-51.60	-51.48	-13.00	-38.60	-0.12 Peak	Vertical



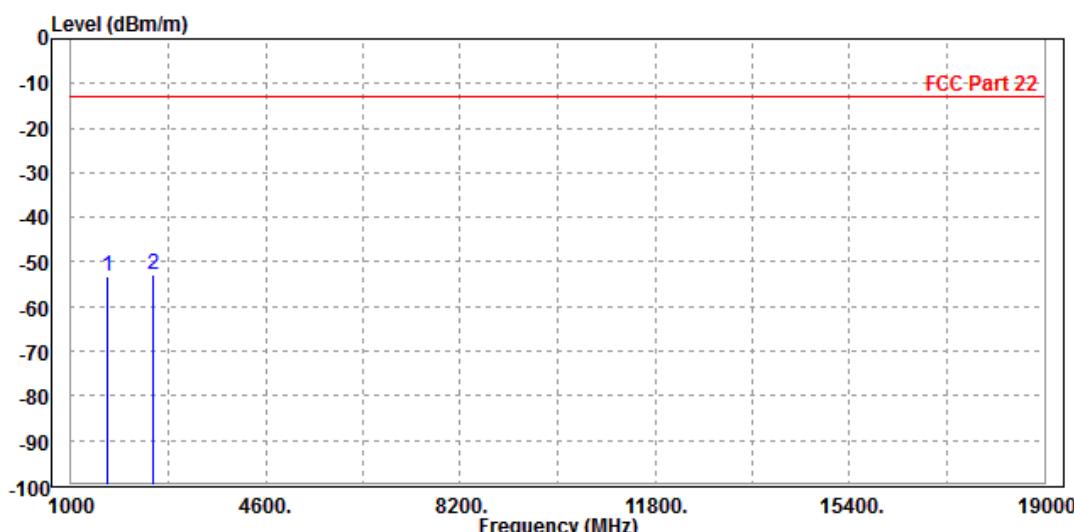
BUREAU  
VERITAS

Test Report No.: RF190522W005-1

CH20600

MODE	TX channel 20600	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Freq	Level	Read	Limit	Over	Remark	Pol/Phase
		Level	Line	Limit Factor		
MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	1688.000	-53.19	-48.56	-13.00	-40.19	-4.63 Peak Horizontal
2 PP	2532.000	-52.75	-51.24	-13.00	-39.75	-1.51 Peak Horizontal



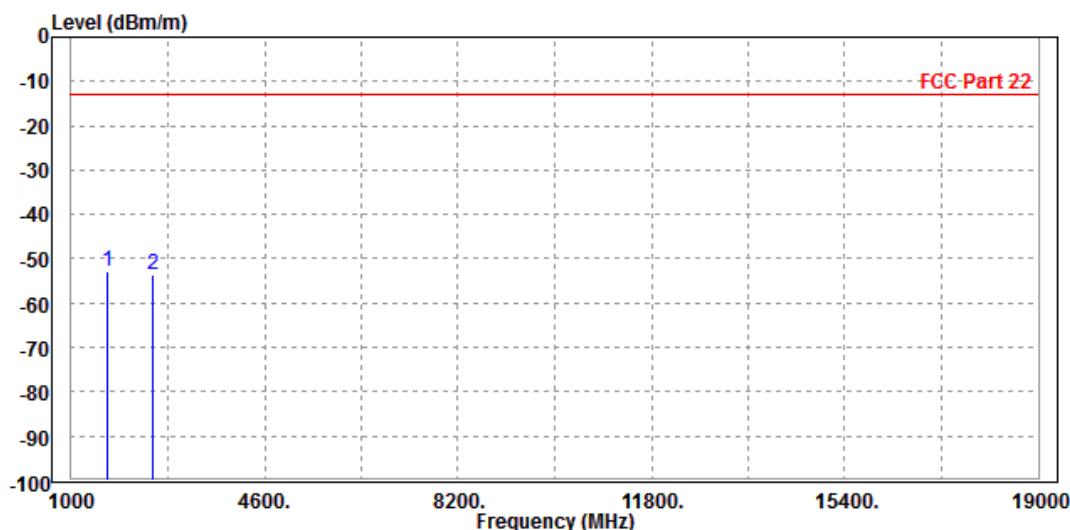


BUREAU  
VERITAS

Test Report No.: RF190522W005-1

MODE	TX channel 20600	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Freq	Level	Read	Limit	Over	Remark	Pol/Phase
		Level	Line	Limit Factor		
MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	PP 1688.000	-53.03	-49.85	-13.00	-40.03	-3.18 Peak
2	2532.000	-53.67	-53.64	-13.00	-40.67	-0.03 Peak





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VERITAS

Test Report No.: RF190522W005-1

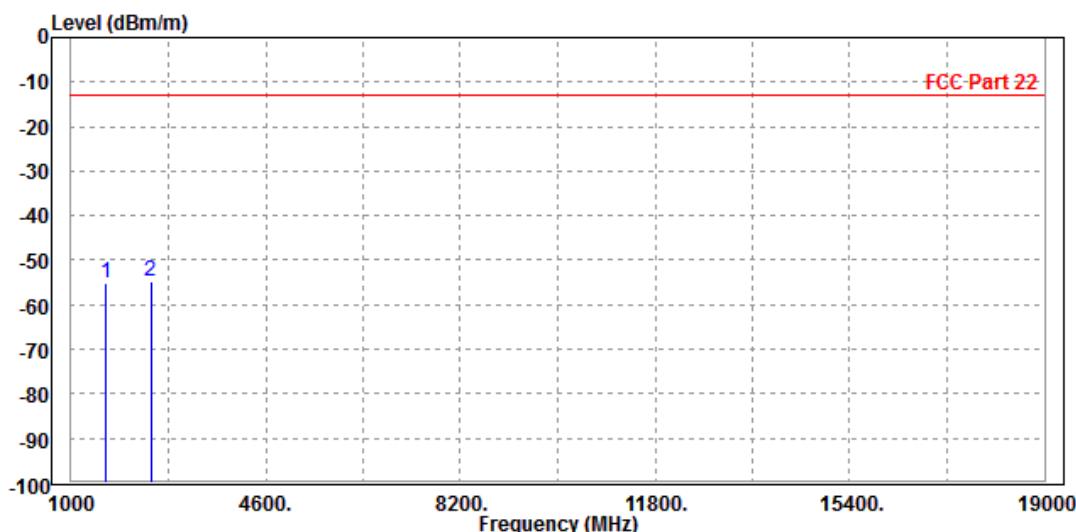
LTE Band 26

CHANNEL BANDWIDTH: 1.4MHz / QPSK

CH 20407

MODE	TX channel 20407	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Freq	Level	Read	Limit	Over	Factor	Remark	Pol/Phase
		Level	Line	Limit			
MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1648.000	-55.26	-50.29	-13.00	-42.26	-4.97 Peak	Horizontal
2 PP	2472.000	-54.82	-53.16	-13.00	-41.82	-1.66 Peak	Horizontal



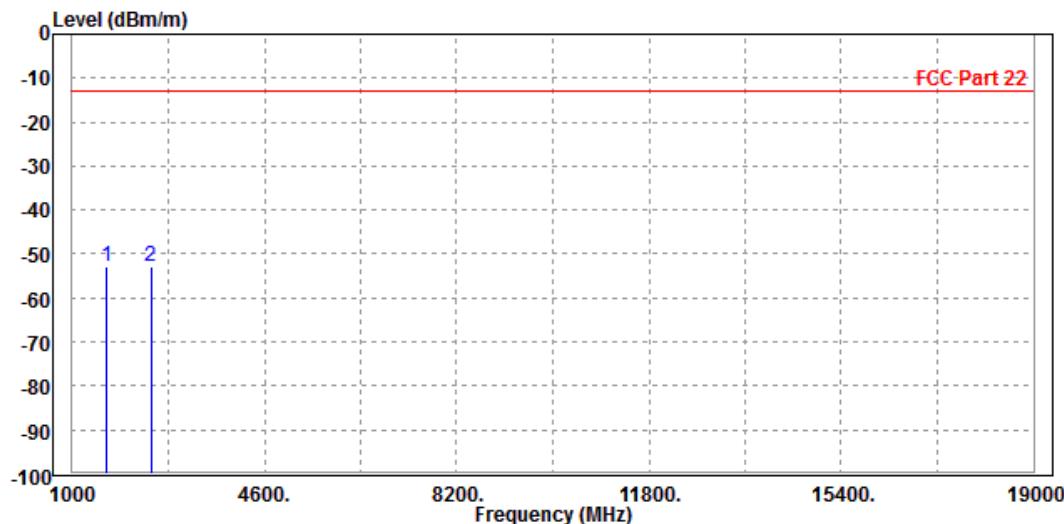


BUREAU  
VERITAS

Test Report No.: RF190522W005-1

MODE	TX channel 20407	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Freq	Level	Read	Limit	Over	Factor	Remark	Pol/Phase
		Level	Line	Limit			
MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1648.000	-52.90	-49.35	-13.00	-39.90	-3.55	Peak Vertical
2 PP	2472.000	-52.79	-52.62	-13.00	-39.79	-0.17	Peak Vertical





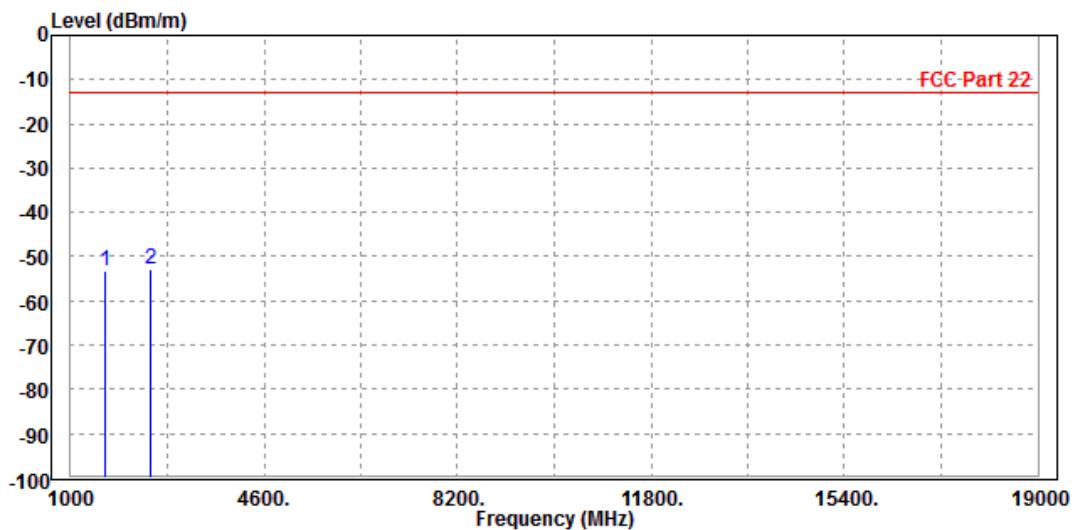
BUREAU  
VERITAS

Test Report No.: RF190522W005-1

CH 20525

MODE	TX channel 20525	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Freq	Level	Read	Limit	Over	Factor	Remark	Pol/Phase
		Level	Line	Limit			
MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1650.000	-53.33	-48.38	-13.00	-40.33	-4.95 Peak	Horizontal
2	PP 2493.000	-52.79	-51.15	-13.00	-39.79	-1.64 Peak	Horizontal



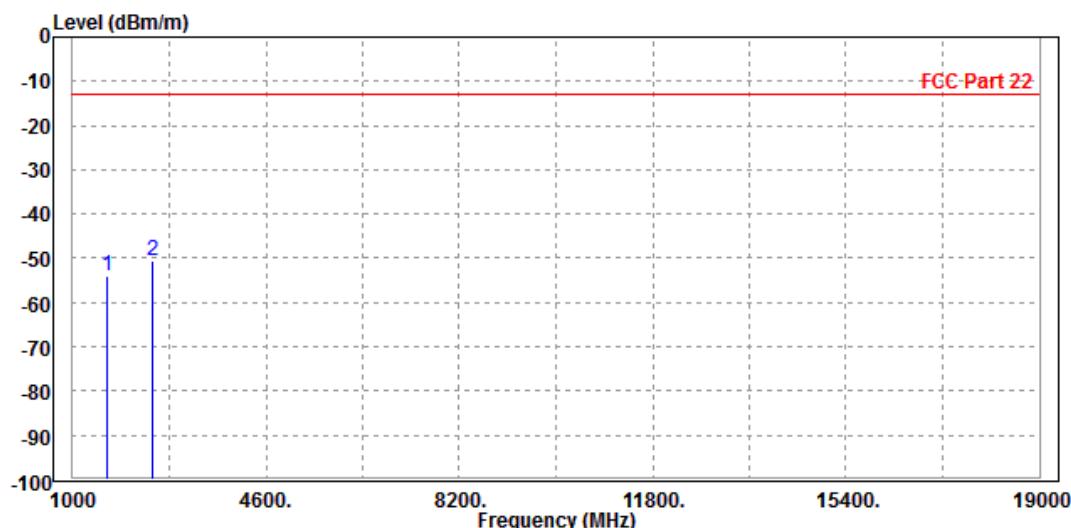


BUREAU  
VERITAS

Test Report No.: RF190522W005-1

MODE	TX channel 20525	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

	Freq	Read Level	Limit Level	Over Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1650.000	-53.84	-50.31	-13.00	-40.84	-3.53	Peak	Vertical
2 PP	2493.000	-50.40	-50.23	-13.00	-37.40	-0.17	Peak	Vertical





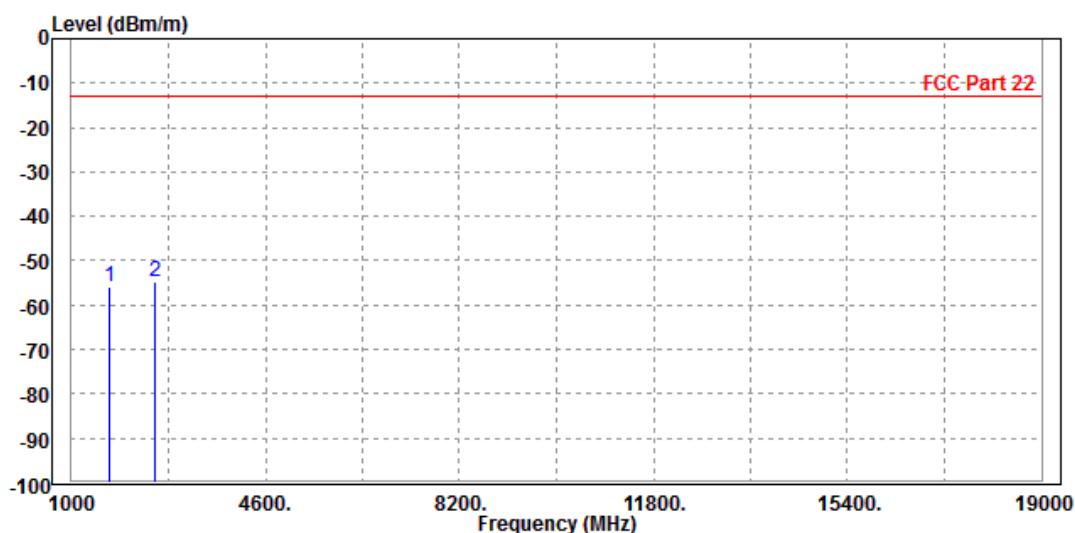
BUREAU  
VERITAS

Test Report No.: RF190522W005-1

CH 20643

MODE	TX channel 20643	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Freq MHz	Level dBm/m	Read	Limit	Over	Remark	Pol/Phase
		Level dBm	Line dBm/m	dB		
1 1702.000	-55.86	-51.34	-13.00	-42.86	-4.52 Peak	Horizontal
2 PP 2544.900	-54.59	-53.12	-13.00	-41.59	-1.47 Peak	Horizontal



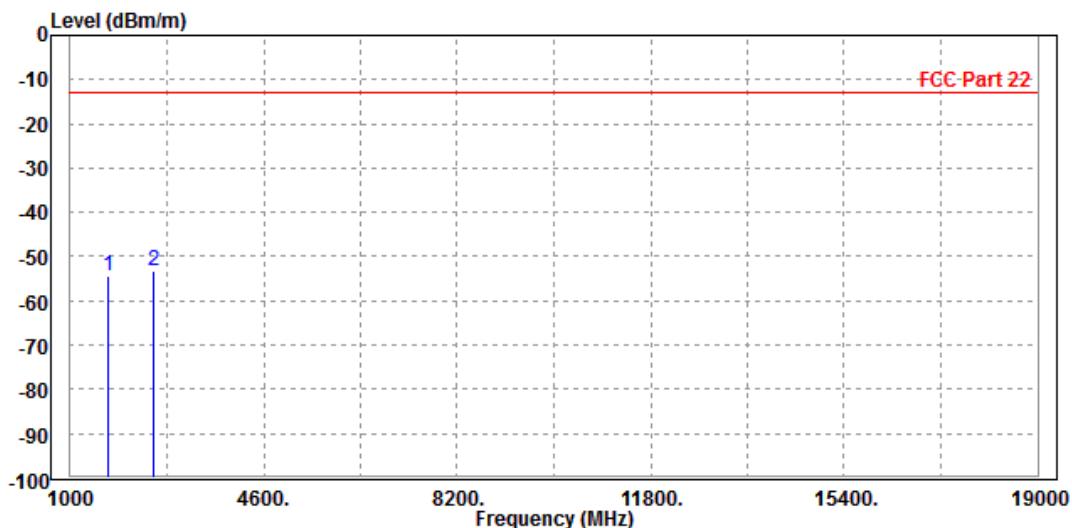


BUREAU  
VERITAS

Test Report No.: RF190522W005-1

MODE	TX channel 20643	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Freq	Level	Read	Limit	Over	Remark	Pol/Phase
		Level	Line	Limit Factor		
MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	1702.000	-54.34	-51.29	-13.00	-41.34	-3.05 Peak Vertical
2	PP 2544.900	-53.11	-53.13	-13.00	-40.11	0.02 Peak Vertical





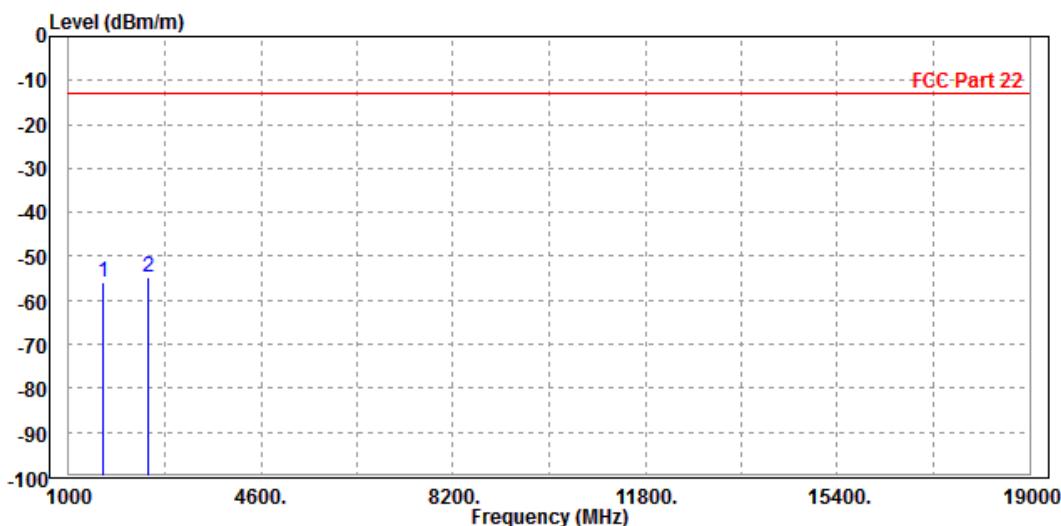
BUREAU  
VERITAS

Test Report No.: RF190522W005-1

CHANNEL BANDWIDTH: 3MHz / QPSK

MODE	TX channel 20525	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Freq	Level	Read	Limit	Over	Factor	Remark	Pol/Phase
		Level	Line	Limit			
MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1650.000	-55.97	-51.02	-13.00	-42.97	-4.95 Peak	Horizontal
2	PP 2493.000	-54.92	-53.28	-13.00	-41.92	-1.64 Peak	Horizontal



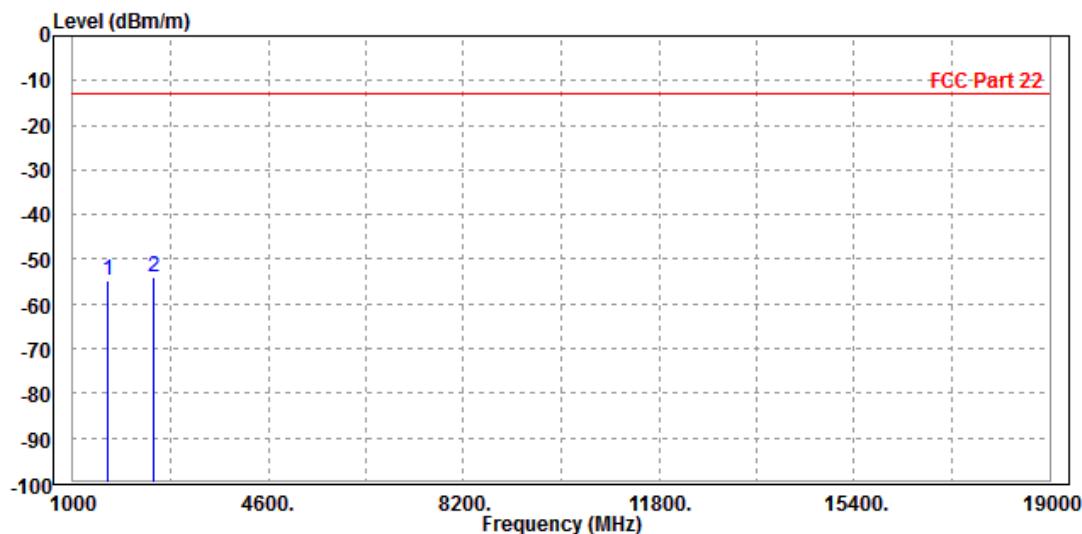


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VERITAS

Test Report No.: RF190522W005-1

MODE	TX channel 20525	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Freq	Level	Read	Limit	Over	Remark	Pol/Phase
		Line	dBm/m	dB		
MHz	dBm/m	dB	dBm/m	dB	dB/m	
1	1650.000	-54.87	-51.34	-13.00	-41.87	-3.53 Peak Vertical
2	PP 2493.000	-53.86	-53.69	-13.00	-40.86	-0.17 Peak Vertical





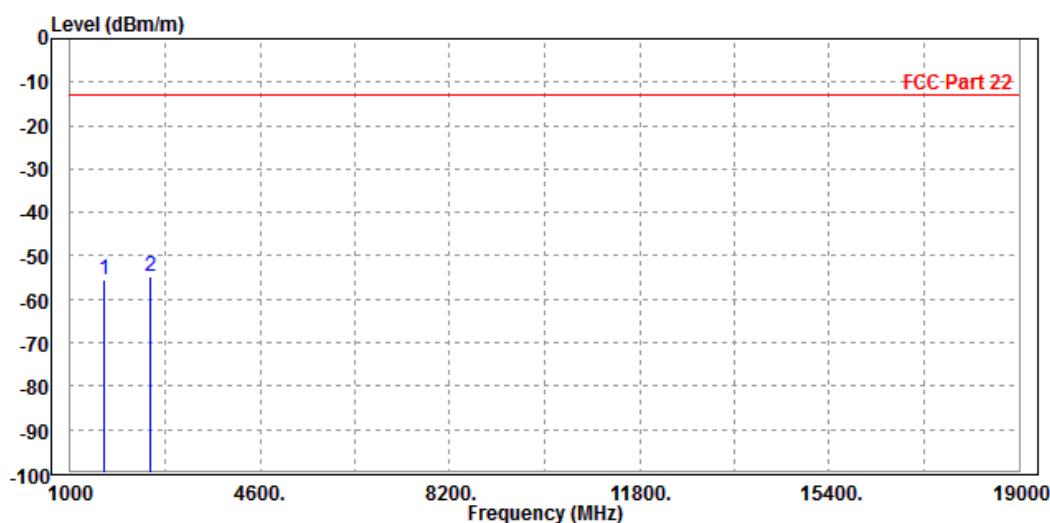
BUREAU  
VERITAS

Test Report No.: RF190522W005-1

CHANNEL BANDWIDTH: 5MHz / QPSK

MODE	TX channel 20525	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

	Freq	Read Level	Limit Level	Over Line	Limit Factor	Over Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1650.000	-55.64	-50.69	-13.00	-42.64	-4.95	Peak	Horizontal
2 PP	2509.000	-54.88	-53.28	-13.00	-41.88	-1.60	Peak	Horizontal



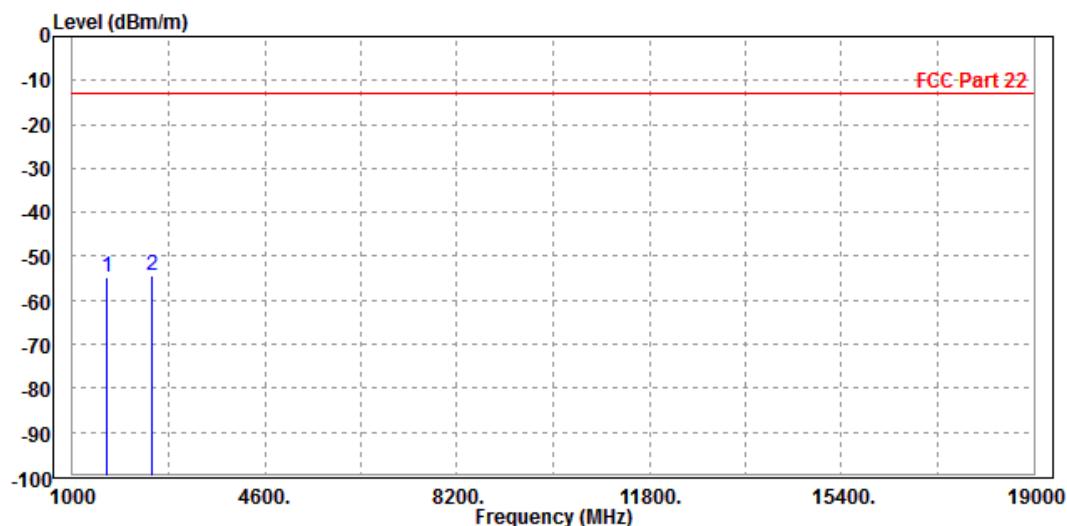


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Test Report No.: RF190522W005-1

MODE	TX channel 20525	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Freq	Level	Read	Limit	Over	Factor	Remark	Pol/Phase
		Level	Line	Limit			
MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1650.000	-54.85	-51.32	-13.00	-41.85	-3.53 Peak	Vertical
2	PP 2493.000	-54.48	-54.31	-13.00	-41.48	-0.17 Peak	Vertical





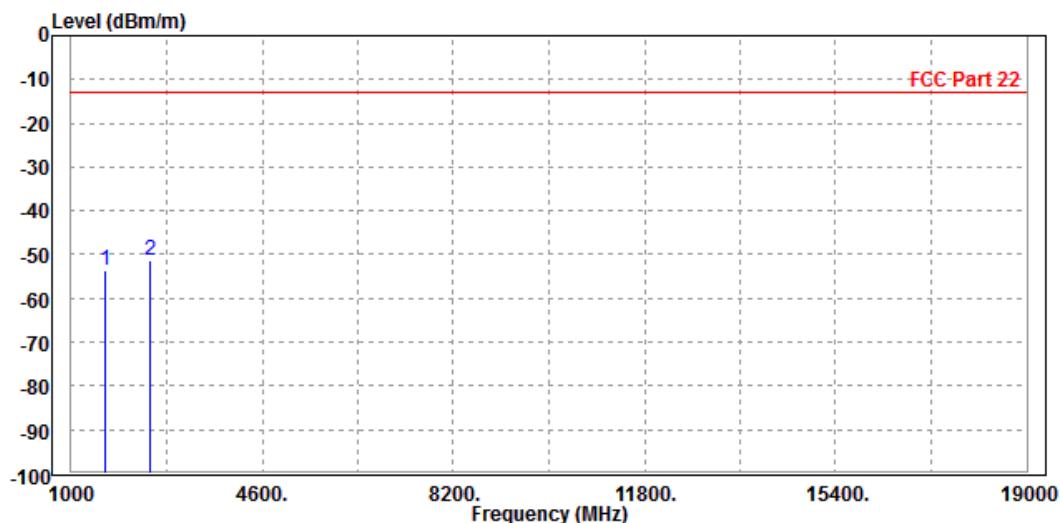
BUREAU  
VERITAS

Test Report No.: RF190522W005-1

CHANNEL BANDWIDTH: 10MHz / QPSK

MODE	TX channel 20525	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Freq	Level	Read	Limit	Over	Factor	Remark	Pol/Phase
		Line	Line	Limit			
MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1650.000	-53.63	-48.68	-13.00	-40.63	-4.95 Peak	Horizontal
2	PP 2493.000	-51.27	-49.63	-13.00	-38.27	-1.64 Peak	Horizontal



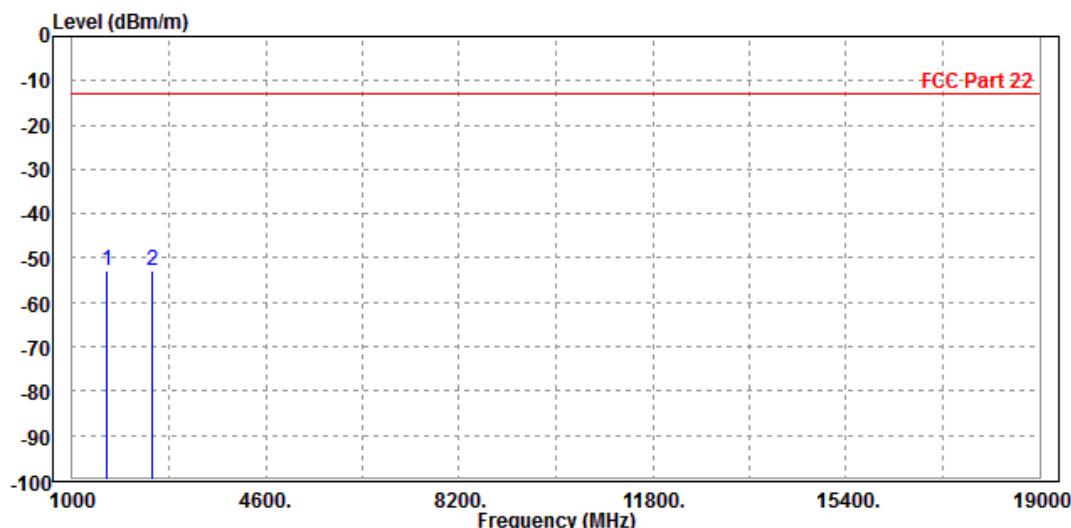


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VERITAS

Test Report No.: RF190522W005-1

MODE	TX channel 20525	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Freq	Level	Read	Limit	Over	Factor	Remark	Pol/Phase
		Level	Line	Limit			
MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1650.000	-52.82	-49.29	-13.00	-39.82	-3.53 Peak	Vertical
2 PP	2493.000	-52.81	-52.64	-13.00	-39.81	-0.17 Peak	Vertical





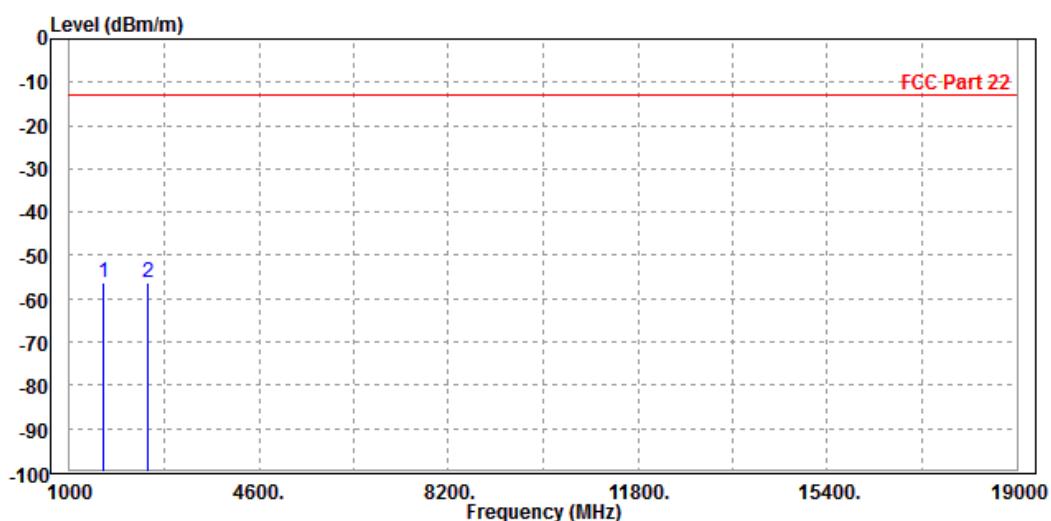
BUREAU  
VERITAS

Test Report No.: RF190522W005-1

CHANNEL BANDWIDTH: 15MHz / QPSK

MODE	TX channel 20525	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M			

Freq	Level	Read	Limit	Over	Factor	Remark	Pol/Phase
		Line	Line	Limit			
MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1 PP 1650.000	-56.27	-51.32	-13.00	-43.27	-4.95	Peak	Horizontal
2 2493.000	-56.31	-54.67	-13.00	-43.31	-1.64	Peak	Horizontal



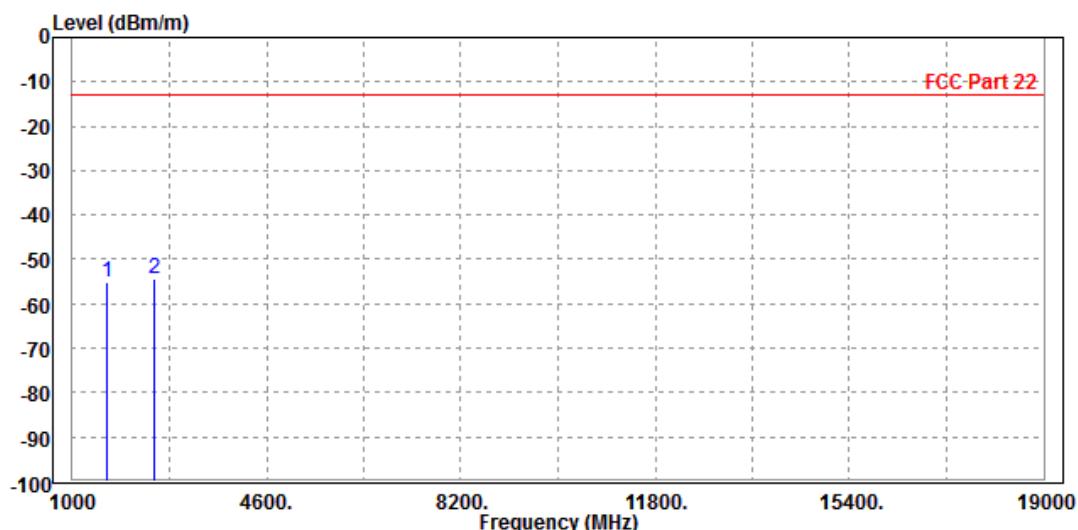


BUREAU  
VERITAS

Test Report No.: RF190522W005-1

MODE	TX channel 20525	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 5V from adapter
TESTED BY	Star Le		
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M			

Freq	Level	Read	Limit	Over	Remark	Pol/Phase
		Level	Line	Limit Factor		
MHz	dBm/m	dBm	dBm/m	dB	dB/m	
1	1650.000	-54.99	-51.46	-13.00	-41.99	-3.53 Peak Vertical
2 PP	2509.000	-54.44	-54.31	-13.00	-41.44	-0.13 Peak Vertical





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VERITAS

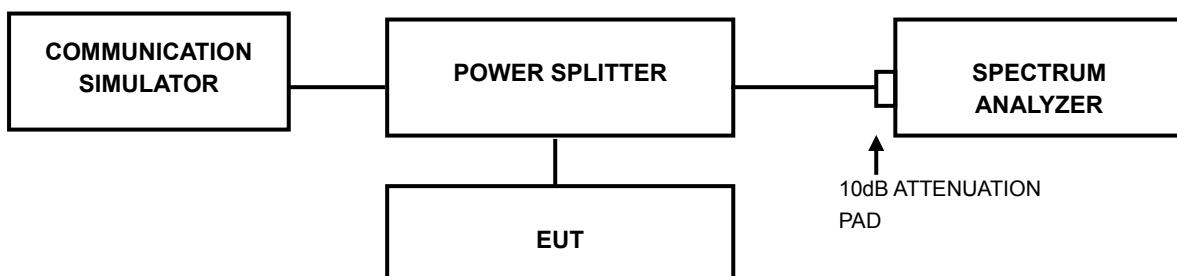
Test Report No.: RF190522W005-1

### 3.7 PEAK TO AVERAGE RATIO

#### 3.7.1 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

#### 3.7.2 TEST SETUP



#### 3.7.3 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%.



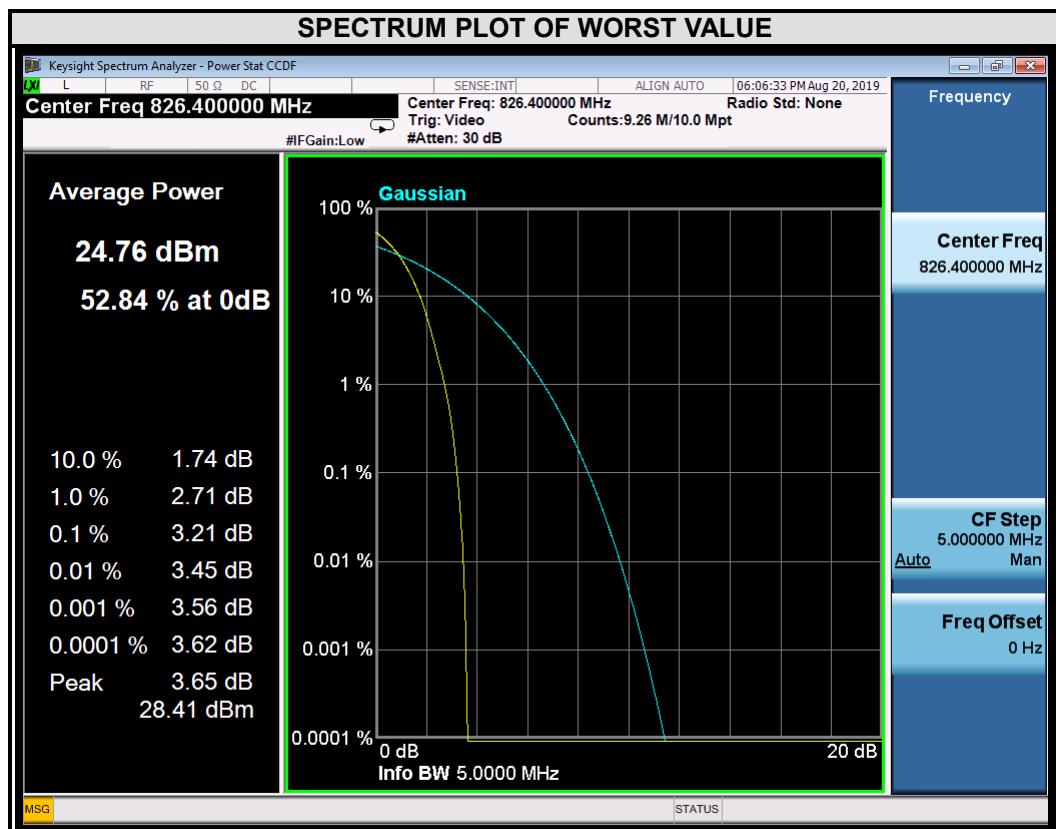
BUREAU  
VERITAS

Test Report No.: RF190522W005-1

### 3.7.4 TEST RESULTS

#### WCDMA

CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
4132	826.4	3.21

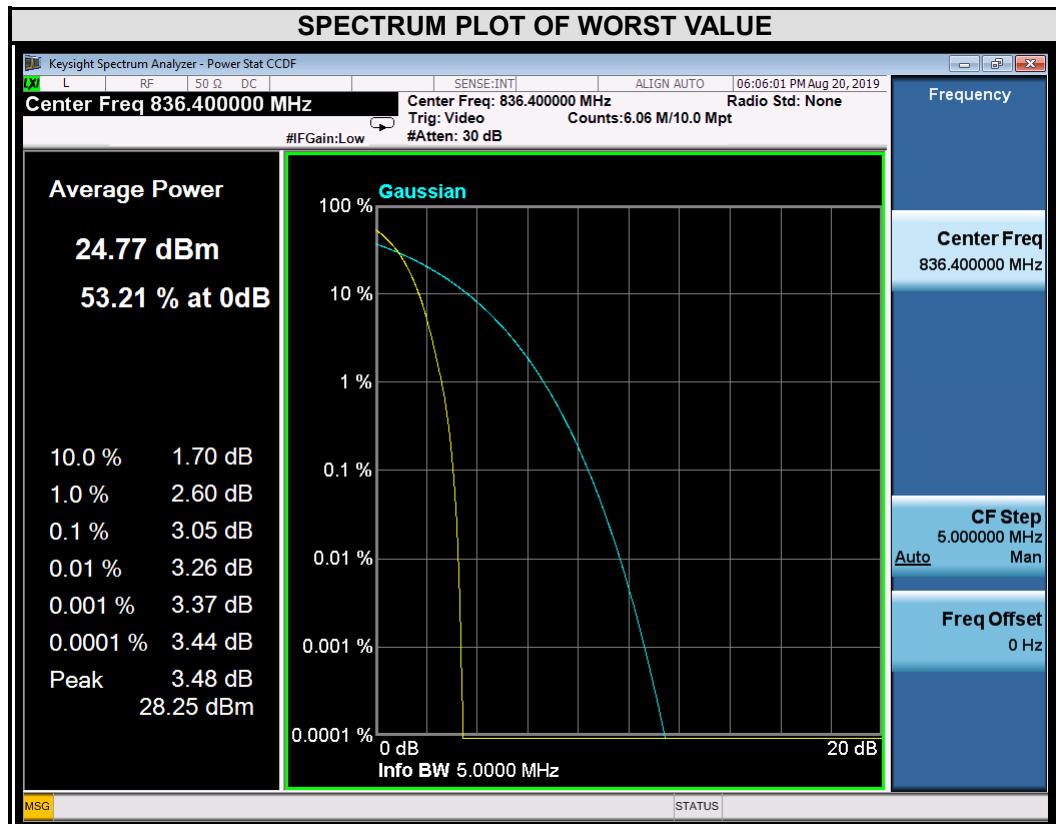




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Test Report No.: RF190522W005-1

CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
4182	836.4	3.05

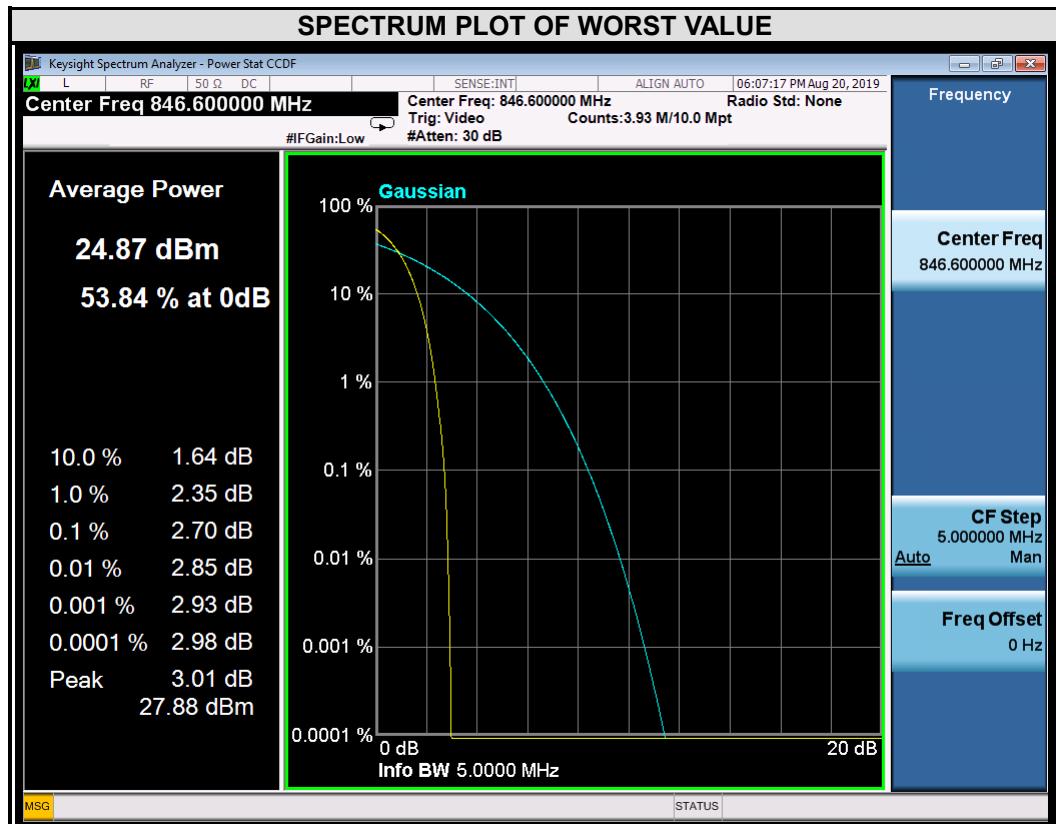




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Test Report No.: RF190522W005-1

CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
4233	846.6	2.70



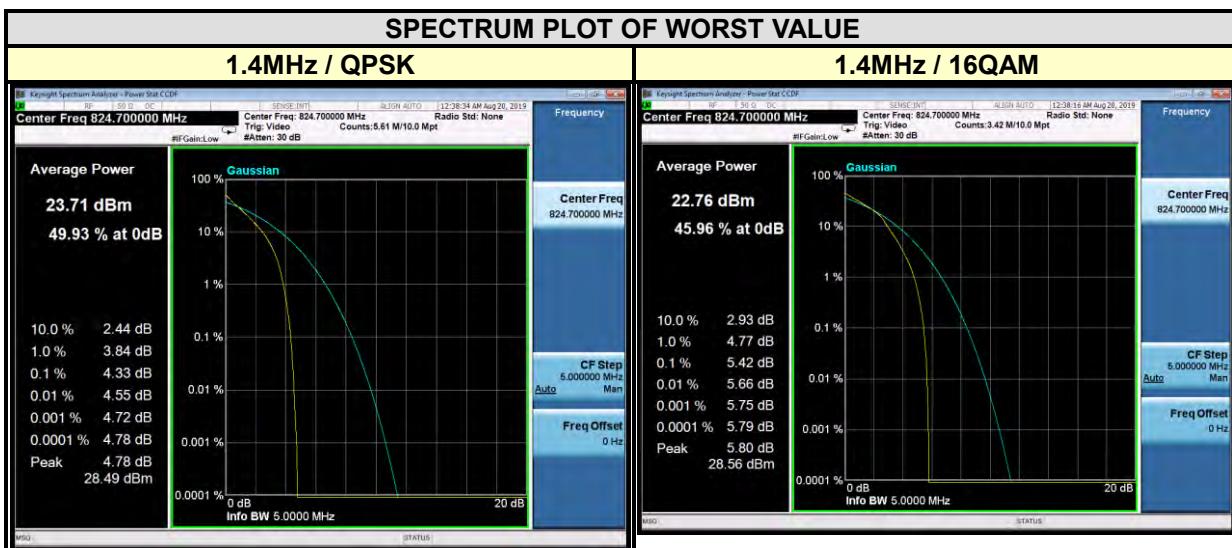


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Test Report No.: RF190522W005-1

## LTE BAND 5

CHANNEL	Frequency (MHz)	CHANNEL BANDWIDTH: 1.4MHz	
		PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM
20407	824.7	4.33	5.42
20525	836.5	3.96	5.03
20643	848.3	4.03	5.07





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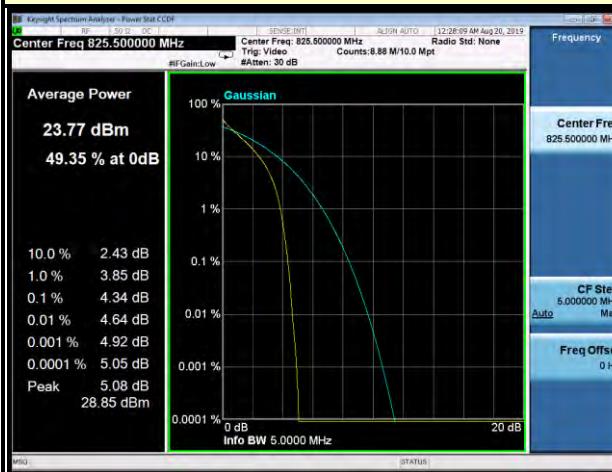
Test Report No.: RF190522W005-1

### CHANNEL BANDWIDTH: 3MHz

CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM
20415	825.5	4.34	5.49
20525	836.5	3.98	5.07
20635	847.5	4.06	5.16

### SPECTRUM PLOT OF WORST VALUE

#### 3MHz / QPSK



#### 3MHz / 16QAM





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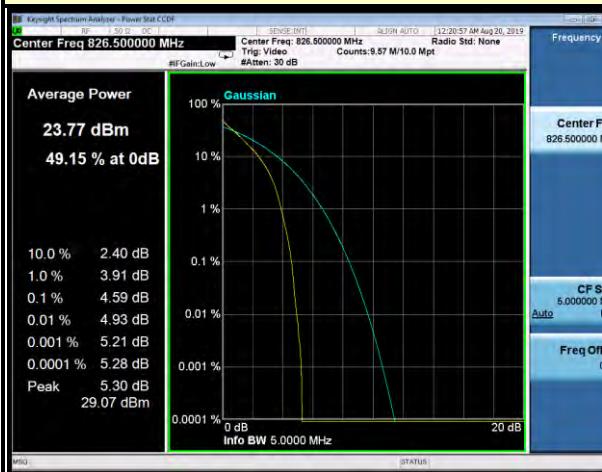
Test Report No.: RF190522W005-1

### CHANNEL BANDWIDTH: 5MHz

CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM
20425	826.5	4.59	5.63
20525	836.5	4.33	5.33
20625	846.5	4.25	5.24

### SPECTRUM PLOT OF WORST VALUE

#### 5MHz / QPSK



#### 5MHz / 16QAM





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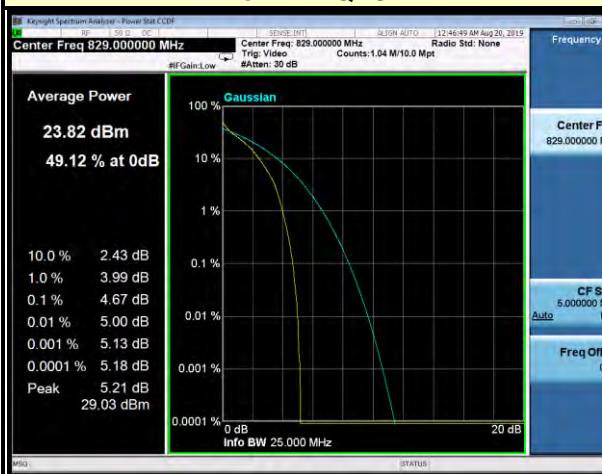
Test Report No.: RF190522W005-1

### CHANNEL BANDWIDTH: 10MHz

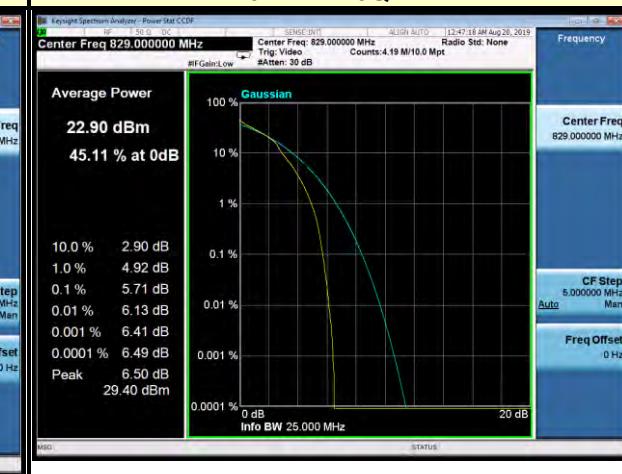
CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM
20450	829	4.67	5.71
20525	836.5	4.45	5.49
20600	844	4.28	5.32

### SPECTRUM PLOT OF WORST VALUE

#### 10MHz / QPSK



#### 10MHz / 16QAM





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Test Report No.: RF190522W005-1

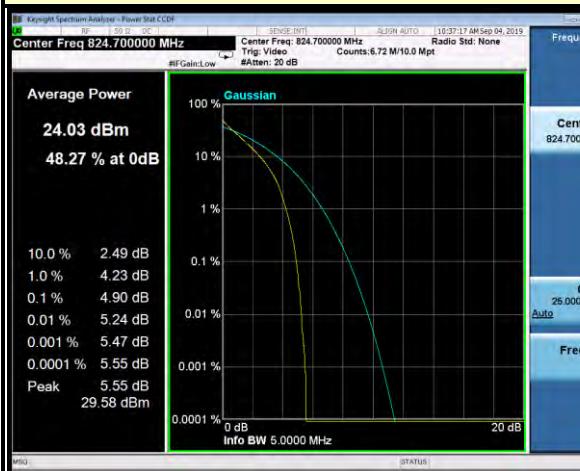
## LTE BAND 26

### CHANNEL BANDWIDTH: 1.4MHz

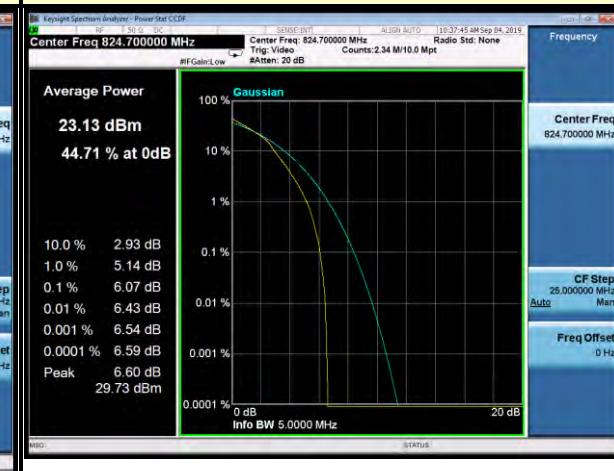
CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM
26797	824.7	4.90	6.07
26915	836.5	4.10	5.17
27033	848.3	3.80	4.83

### SPECTRUM PLOT OF WORST VALUE

#### 1.4MHz / QPSK



#### 1.4MHz / 16QAM





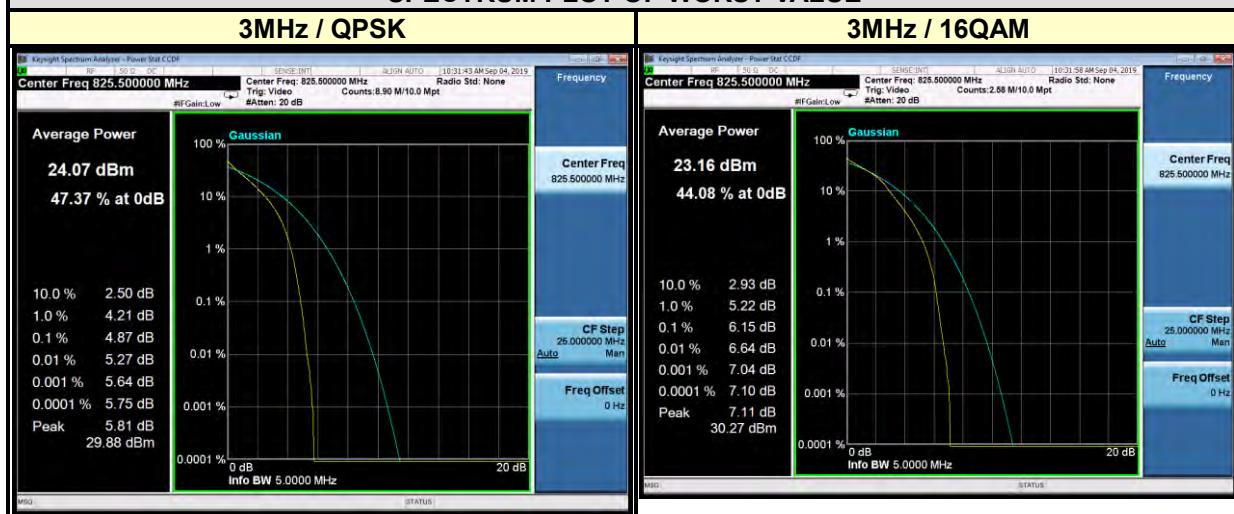
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Test Report No.: RF190522W005-1

### CHANNEL BANDWIDTH: 3MHz

CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM
26805	825.5	4.87	6.15
26915	836.5	4.11	5.21
27025	847.5	3.89	4.98

### SPECTRUM PLOT OF WORST VALUE





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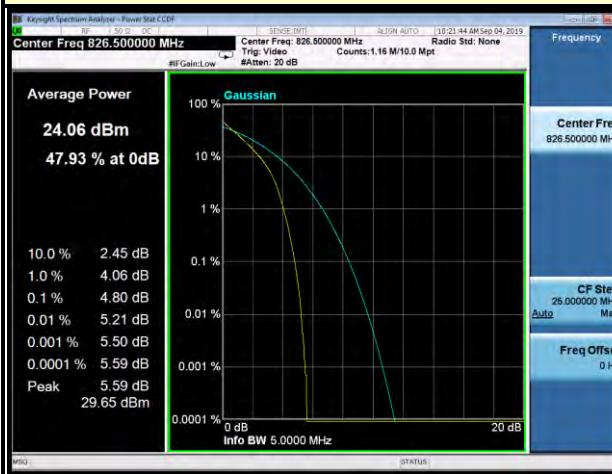
Test Report No.: RF190522W005-1

### CHANNEL BANDWIDTH: 5MHz

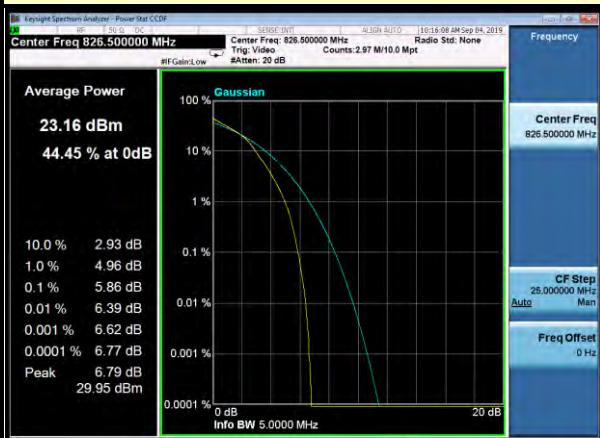
CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM
26815	826.5	4.80	5.86
26915	836.5	4.45	5.45
27015	846.5	4.41	5.21

### SPECTRUM PLOT OF WORST VALUE

#### 5MHz / QPSK



#### 5MHz / 16QAM





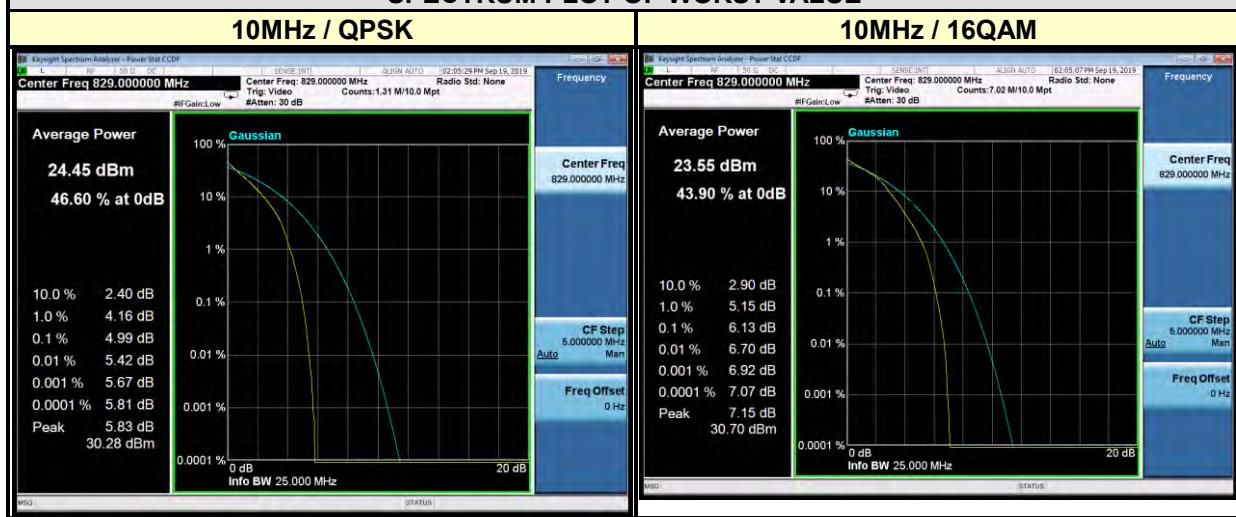
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Test Report No.: RF190522W005-1

### CHANNEL BANDWIDTH: 10MHz

CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM
26840	829	4.99	6.13
26915	836.5	4.52	5.73
26990	844	4.45	5.60

### SPECTRUM PLOT OF WORST VALUE

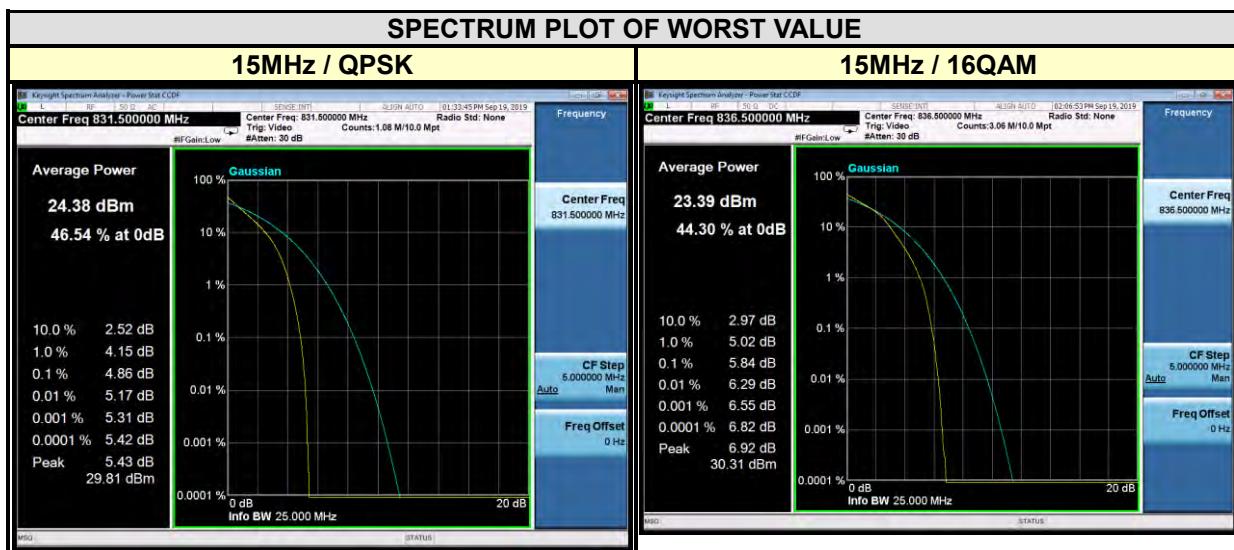




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Test Report No.: RF190522W005-1

CHANNEL BANDWIDTH: 15MHz			
CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM
26865	831.5	4.86	5.56
26915	836.5	4.83	5.84
26965	841.5	4.77	5.75





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Test Report No.: RF190522W005-1

## 4 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).



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Test Report No.: RF190522W005-1

## 5 INFORMATION ON THE TESTING LABORATORIES

We, BV 7LAYERS COMMUNICATIONS TECHNOLOGY (SHENZHEN) CO. LTD., were founded in 2015 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

**Shenzhen EMC/RF Lab:**

Tel: +86-755-88696566

Fax: +86-755-88696577

Email: [customerservice.dg@cn.bureauveritas.com](mailto:customerservice.dg@cn.bureauveritas.com)

Web Site: [www.adt.com.tw](http://www.adt.com.tw)

The address and road map of all our labs can be found in our web site also.



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Test Report No.: RF190522W005-1

## 6 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

---END---