

# FCC TEST REPORT

## (PART 22)

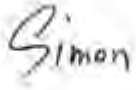
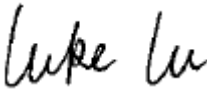
Applicant:	Lenovo (Shanghai) Electronics Technology Co., Ltd.
Address:	Section 304-305, Building No. 4, # 222, Meiyue Road, China (Shanghai) Pilot Free Trade Zone

Manufacturer or Supplier:	Lenovo PC HK Limited
Address:	23/F, Lincoln House, Taikoo Place 979 King's Road, Quarry Bay, Hong Kong, China
Product:	Tablet Computer
Brand Name:	Lenovo
Model Name:	Lenovo TB-X6C6NBL
FCC ID:	O57TBX6C6NBL
Date of tests:	Mar. 05, 2021 ~ Jun. 22, 2021

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 Simon Wang Engineer / Mobile Department	Approved by Luke Lu Manager / Mobile Department
	
Date: Jun. 23, 2021	Date: Jun. 23, 2021

This report is governed by, and incorporates by reference, CPS Conditions of Service as posted at the date of issuance of this report at <http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions> and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.



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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF210603W002-1	Original release	Jun. 23, 2021

## 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~1GMHz)	±4.98dB
Radiated emissions (1GMHz ~6GMHz)	±4.70dB
Radiated emissions (6GMHz ~18GMHz)	±4.60dB
Radiated emissions (18GMHz ~40GMHz)	±4.12dB
Conducted emissions	±4.01dB
Occupied Channel Bandwidth	±43.58KHz
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.



## 1.2 TEST SITE AND INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Apr. 27,21	Apr. 26,22
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Apr. 27,20	Apr. 26,21
EXA Signal Analyzer	KEYSIGHT	N9010A-526	MY54510322	Feb. 25,21	Feb. 24,22
Signal Analyzer	Rohde&Schwarz	FSV7	101561	Mar. 26,21	Mar. 25,22
Signal Analyzer	Rohde&Schwarz	FSV7	101561	Mar. 27,20	Mar. 26,21
Bilog Antenna	ETS-LINDGREN	3143B	00161965	Mar. 26,21	Mar. 25,22
Bilog Antenna	ETS-LINDGREN	3143B	00161965	Mar. 27,20	Mar. 26,21
Horn Antenna (1GHz-18GHz)	ETS-LINDGREN	3117	00168692	Nov. 24, 20	Nov. 23, 21
Horn Antenna (18GHz-40GHz)	N/A	QWH-SL-18-40 -K-SG/QMS-00 361	15433	Feb. 26,21	Feb. 25,22
Radio Communication Analyzer	ANRITSU	MT8820C	6201465426	Jun. 02,20	Jun. 01,21
Radio Communication Analyzer	ANRITSU	MT8820C	6201465426	Jun. 02,21	Jun. 01,22
Signal Pre-Amplifier	EMSI	EMC 9135	980249	Jun. 02,20	Jun. 01,21
Signal Pre-Amplifier	EMSI	EMC 9135	980249	Jun. 02,21	Jun. 01,22
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	Jun. 02,20	Jun. 01,21
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	Jun. 02,21	Jun. 01,22
Signal Pre-Amplifier	EMSI	EMC 184045B	980259	Apr. 30,21	Apr. 29,22
Signal Pre-Amplifier	EMSI	EMC 184045B	980259	Apr. 30,20	Apr. 29,21
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	Euroshieldpn- CT0001143-1216	May. 19,20	May. 19,21
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	Euroshieldpn- CT0001143-1216	May. 19,21	May. 19,22
Test Software	E3	V 9.160323	N/A	N/A	N/A
Test Software	ADT	ADT_Radiated V7.6.15.9.2	N/A	Jun. 03,20	Jun. 02,21
Test Software	ADT	ADT_Radiated V7.6.15.9.2	N/A	Jun. 03,21	Jun. 02,22
10dB Attenuator	JFW/USA	50HF-010-SM A	1505	Feb. 25,21	Feb. 24,22
Power Meter	Anritsu	ML2495A	1506002	Feb. 25,21	Feb. 24,22
Power Sensor	Anritsu	MA2411B	1339352	Jun. 02,20	Jun. 01,21
Power Sensor	Anritsu	MA2411B	1339352	Jun. 02,21	Jun. 01,22
Humid & Temp Programmable Tester	Juyi	ITH-120-45-CP -AR	IAA1504-001	Mar. 10,21	Mar. 09,22
Humid & Temp Programmable Tester	Juyi	ITH-120-45-CP -AR	IAA1504-001	Mar. 11,20	Mar. 10,21
MXG Analog Microvave Signal Generator	KEYSIGHT	N5183A	MY50143024	Apr. 27,20	Apr. 26,21
MXG Analog Microvave Signal Generator	KEYSIGHT	N5183A	MY50143024	Apr. 27,21	Apr. 26,22
Power Divider	MCLI/USA	PS2-15	24880	N/A	N/A



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DC Source	Kikusui/JP	PMX18-5A	0000001	Aug. 26,20	Aug. 25,21
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- NOTE:**
1. The calibration interval of the above test instruments is 12 months or 24 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
  2. The test was performed in 3m Semi-anechoic Chamber and RF Oven Room.
  3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.
  4. The FCC Site Registration No. is 525120; The Designation No. is CN1171.



## 2 GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	Tablet Computer	
<b>BRAND NAME</b>	Lenovo	
<b>MODEL NAME</b>	Lenovo TB-X6C6NBL	
<b>NOMINAL VOLTAGE</b>	DC12V	
<b>MODULATION TYPE</b>	<b>GPRS/EDGE</b>	GMSK, 8PSK
	<b>WCDMA</b>	BPSK,QPSK
	<b>LTE</b>	QPSK, 16QAM
<b>FREQUENCY RANGE</b>	<b>GPRS/EDGE</b>	824.2MHz ~ 848.8MHz
	<b>WCDMA</b>	826.4MHz ~ 846.6MHz
	<b>LTE Band 5 (Channel Bandwidth: 1.4MHz)</b>	824.7MHz ~ 848.3MHz
	<b>LTE Band 5 (Channel Bandwidth: 3MHz)</b>	825.5MHz ~ 847.5MHz
	<b>LTE Band 5 (Channel Bandwidth: 5MHz)</b>	826.5MHz ~ 846.5MHz
	<b>LTE Band 5 (Channel Bandwidth: 10MHz)</b>	829MHz ~ 844MHz
<b>MAX. ERP POWER</b>	<b>GPRS</b>	1153.45mW
	<b>EDGE</b>	301.30mW
	<b>WCDMA</b>	149.97mW
	<b>LTE Band 5 (Channel Bandwidth: 1.4MHz)</b>	141.25mW
	<b>LTE Band 5 (Channel Bandwidth: 3MHz)</b>	141.25mW
	<b>LTE Band 5 (Channel Bandwidth: 5MHz)</b>	141.25mW
	<b>LTE Band 5 (Channel Bandwidth: 10MHz)</b>	141.91mW





<b>EMISSION DESIGNATOR</b> GOGN	<b>GPRS</b>	240KGXW
	<b>EDGE</b>	250KG7W
	<b>WCDMA</b>	4M17F9W
	<b>LTE Band 5 (Channel Bandwidth: 1.4MHz)</b>	QPSK: 1M08G7D
		16QAM: 1M08W7D
	<b>LTE Band 5 (Channel Bandwidth: 3MHz)</b>	QPSK: 2M68G7D
		16QAM: 2M68W7D
<b>LTE Band 5 (Channel Bandwidth: 5MHz)</b>	QPSK: 4M47G7D	
	16QAM: 4M47W7D	
<b>LTE Band 5 (Channel Bandwidth: 10MHz)</b>	QPSK: 8M95G7D	
	16QAM: 8M95W7D	
<b>ANTENNA TYPE</b>	PIFA Antenna with 0.47dBi gain	
<b>HW VERSION</b>	Lenovo TB-X6C6NBL	
<b>SW VERSION</b>	TB-X6C6NBL_RF01_210930	
<b>I/O PORTS</b>	Refer to user's manual	
<b>CABLE SUPPLIED</b>	N/A	
<b>EXTREME TEMPERATURE</b>	-30-50 °C	
<b>EXTREME VOLTAGE</b>	9V- 15V	

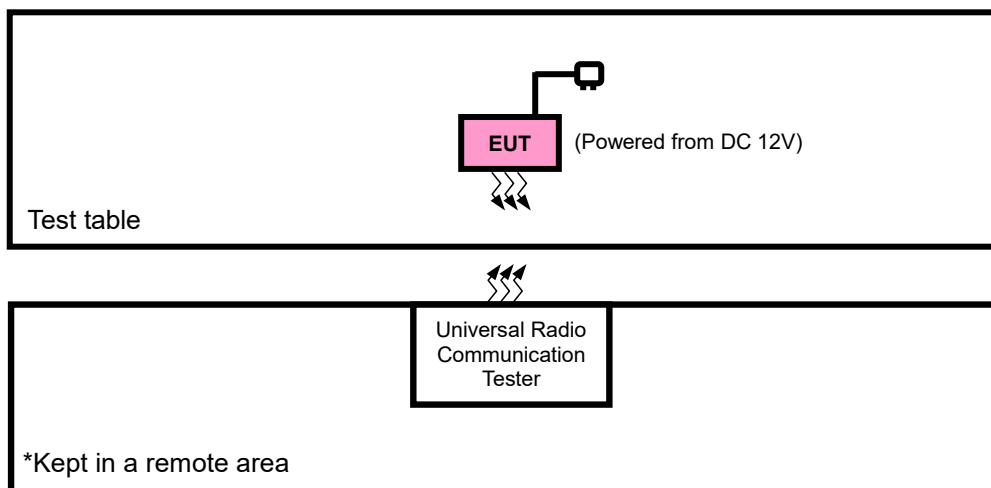
**NOTE:**

- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- The EUT incorporates a SISO function. Physically, the EUT provides one completed transmitter and one receiver.

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

- For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

## 2.2 CONFIGURATION OF SYSTEM UNDER TEST FOR RADIATION EMISSION





### 2.3 DESCRIPTION OF SUPPORT UNITS

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

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	DC source	Kikusui/JP	PMX18-5A	0000001	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	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 ERP and radiated emission was found when positioned on X-plane for GSM /EDGE /LTE. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	DESCRIPTION
A	EUT + DC Source with GSM or WCDMA or LTE link



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**GSM MODE**

EUT CONFIGURE MODE	TEST ITEM	AVAILABLE CHANNEL	TESTED CHANNEL	MODE
B	ERP	128 to 251	128, 189, 251	GPRS,EDGE
B	FREQUENCY STABILITY	128 to 251	128, 251	GPRS,EDGE
B	OCCUPIED BANDWIDTH	128 to 251	128, 189, 251	GPRS,EDGE
B	BAND EDGE	128 to 251	128, 251	GPRS,EDGE
B	CONDCUDETED EMISSION	128 to 251	128, 189, 251	GPRS,EDGE
A	RADIATED EMISSION	128 to 251	128, 189, 251	GPRS,EDGE
B	PEAK TO AVERAGE RATIO	128 to 251	128, 189, 251	GPRS,EDGE

**WCDMA MODE**

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



**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	



CONDCUDED 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	20415, 20525, 20635	3MHz	QPSK	1 RB / 0 RB Offset
	20425 to 20625	20525	5MHz	QPSK	1 RB / 0 RB Offset
	20450 to 20600	20525	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.

**TEST CONDITION:**

TEST ITEM	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
ERP	23deg. C, 70%RH	DC 12V	Jace Hu
FREQUENCY STABILITY	23deg. C, 70%RH	DC 12V	Chase Zhou
OCCUPIED BANDWIDTH	23deg. C, 70%RH	DC 12V	Chase Zhou
BAND EDGE	23deg. C, 70%RH	DC 12V	Chase Zhou
CONDCUDED EMISSION	23deg. C, 70%RH	DC 12V	Chase Zhou
RADIATED EMISSION	23deg. C, 70%RH	DC 12V	Jace Hu
PEAK TO AVERAGE RATIO	23deg. C, 70%RH	DC 12V	Chase Zhou

**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



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## 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.



### 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:

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

Where:

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

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

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

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

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

###### **CONDUCTED POWER MEASUREMENT:**

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

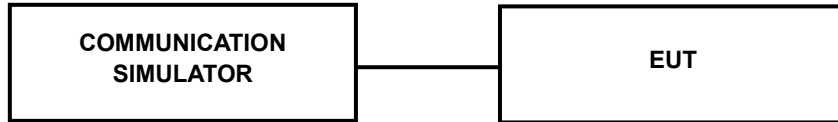




### 3.1.3 TEST SETUP

EIRP / ERP Measurement:

CONDUCTED POWER MEASUREMENT:



### 3.1.4 TEST RESULTS

#### CONDUCTED OUTPUT POWER (dBm)

Band	GSM850			Max. Tune-up Power
	128	189	251	
Channel	128	189	251	Max. Tune-up Power
Frequency	824.2	836.4	848.8	
GPRS (GMSK, 1Tx-slot)	32.30	32.29	32.28	33.5
GPRS (GMSK, 2Tx-slot)	31.45	31.56	31.47	33.0
GPRS (GMSK, 3Tx-slot)	29.73	29.77	29.81	31.0
GPRS (GMSK, 4Tx-slot)	28.86	28.94	28.92	30.5
EDGE (8PSK, 1Tx-slot)	26.29	26.37	26.47	27.5
EDGE (8PSK, 2Tx-slot)	25.17	25.42	25.36	26.5
EDGE (8PSK, 3Tx-slot)	23.20	23.36	23.40	24.5
EDGE (8PSK, 4Tx-slot)	22.20	22.37	22.30	23.5

Band	WCDMA V			Max. Tune-up Power
	4132	4182	4233	
Channel	4132	4182	4233	Max. Tune-up Power
Frequency	826.4	836.4	846.6	
RMC 12.2K	23.42	23.44	23.40	24.5
HSDPA Subtest-1	22.55	22.61	22.64	23.5
HSDPA Subtest-2	22.58	22.68	22.63	23.5
HSDPA Subtest-3	22.09	22.15	22.21	23.5
HSDPA Subtest-4	22.17	22.14	22.14	23.5
DC-HSDPA Subtest-1	22.66	22.72	22.78	23.5
DC-HSDPA Subtest-2	22.68	22.75	22.73	23.5
DC-HSDPA Subtest-3	22.22	22.27	22.22	23.5
DC-HSDPA Subtest-4	22.06	22.10	22.14	23.5
HSUPA Subtest-1	21.74	21.74	21.72	21.5
HSUPA Subtest-2	21.63	21.53	21.61	21.5
HSUPA Subtest-3	20.53	20.63	20.62	20.5
HSUPA Subtest-4	20.60	20.62	20.68	21.0
HSUPA Subtest-5	19.75	19.65	19.67	19.5
HSPA+ Subtest-1	21.95	21.95	21.99	22.5



**LTE Band 5**

Band/BW	Modulation	RB Size	RB Offset	Low CH 20407	Mid CH 20525	High CH 20643	MPR
				Frequency 824.7 MHz	Frequency 836.5 MHz	Frequency 848.3 MHz	
5/ 1.4	QPSK	1	0	22.95	22.99	23.02	0
		1	2	23.13	23.06	23.18	0
		1	5	22.99	22.93	23.04	0
		3	0	23.07	23.06	23.14	0
		3	1	23.03	23.11	23.03	0
		3	3	23.01	22.99	23.07	0
		6	0	22.11	22.12	22.15	1
	16QAM	1	0	22.21	22.23	22.30	1
		1	2	22.33	22.35	22.40	1
		1	5	22.28	22.21	22.36	1
		3	0	22.10	22.13	22.13	1
		3	1	22.04	22.17	22.11	1
		3	3	22.05	22.08	22.17	1
		6	0	21.09	21.14	21.15	2

Band/BW	Modulation	RB Size	RB Offset	Low CH 20415	Mid CH 20525	High CH 20635	MPR
				Frequency 825.5 MHz	Frequency 836.5 MHz	Frequency 847.5 MHz	
5/ 3	QPSK	1	0	22.97	23.01	23.01	0
		1	7	23.09	23.07	23.18	0
		1	14	22.95	22.93	23.04	0
		8	0	22.06	22.09	22.14	1
		8	3	21.96	22.11	22.05	1
		8	7	21.98	22.06	22.11	1
		15	0	22.08	22.13	22.09	1
	16QAM	1	0	22.18	22.29	22.33	1
		1	7	22.30	22.38	22.38	1
		1	14	22.31	22.21	22.36	1
		8	0	21.06	21.14	21.13	2
		8	3	21.09	21.12	21.14	2
		8	7	21.07	21.06	21.13	2
		15	0	21.09	21.08	21.18	2



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Band/BW	Modulation	RB Size	RB Offset	Low CH 20425	Mid CH 20525	High CH 20625	MPR
				Frequency 826.5 MHz	Frequency 836.5 MHz	Frequency 846.5 MHz	
5/ 5	QPSK	1	0	22.98	22.96	23.02	0
		1	12	23.14	23.04	23.18	0
		1	24	22.96	22.92	23.08	0
		12	0	22.09	22.09	22.11	1
		12	6	21.96	22.12	22.06	1
		12	13	22.02	22.02	22.12	1
		25	0	22.06	22.16	22.12	1
	16QAM	1	0	22.19	22.25	22.33	1
		1	12	22.27	22.41	22.37	1
		1	24	22.31	22.21	22.35	1
		12	0	21.06	21.12	21.10	2
		12	6	21.06	21.16	21.10	2
		12	13	21.02	21.08	21.16	2
		25	0	21.09	21.09	21.15	2

Band/BW	Modulation	RB Size	RB Offset	Low CH 20450	Mid CH 20525	High CH 20600	MPR
				Frequency 829 MHz	Frequency 836.5 MHz	Frequency 844 MHz	
5/ 10	QPSK	1	0	23.03	23.03	23.07	0
		1	24	23.16	23.12	<b>23.20</b>	0
		1	49	23.01	23.00	23.09	0
		25	0	22.13	22.14	22.16	1
		25	12	22.04	22.13	22.11	1
		25	25	22.06	22.07	22.13	1
		50	0	22.12	22.18	22.17	1
	16QAM	1	0	22.26	22.30	22.35	1
		1	24	22.35	22.43	22.42	1
		1	49	22.33	22.29	22.37	1
		25	0	21.14	21.18	21.18	2
		25	12	21.12	21.18	21.16	2
		25	25	21.09	21.13	21.18	2
		50	0	21.15	21.16	21.20	2



**ERP POWER (dBm)**

**GPRS**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	ERP (dBm)	ERP (mW)	Limit (W)
128	824.2	32.30	0.47	30.62	1153.45	7
189	836.4	32.29	0.47	30.61	1150.80	7
251	848.8	32.28	0.47	30.60	1148.15	7

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

**EDGE**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T</sub> -L <sub>c</sub> (dB)	ERP (dBm)	ERP (mW)	Limit (W)
128	824.2	26.29	0.47	24.61	289.07	7
189	836.4	26.37	0.47	24.69	294.44	7
251	848.8	26.47	0.47	24.79	301.30	7

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

**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	23.42	0.47	21.74	149.28	7
4182	836.4	23.44	0.47	21.76	149.97	7
4233	846.6	23.40	0.47	21.72	148.59	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	23.13	0.47	21.45	139.64	7
20525	836.5	23.11	0.47	21.43	139.00	7
20643	848.3	23.18	0.47	21.50	141.25	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	22.33	0.47	20.65	116.14	7
20525	836.5	22.35	0.47	20.67	116.68	7
20643	848.3	22.40	0.47	20.72	118.03	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)
20415	825.5	23.09	0.47	21.41	138.36	7
20525	836.5	23.07	0.47	21.39	137.72	7
20635	847.5	23.18	0.47	21.50	141.25	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	22.31	0.47	20.63	115.61	7
20525	836.5	22.38	0.47	20.70	117.49	7
20635	847.5	22.38	0.47	20.70	117.49	7



**CHANNEL BANDWIDTH: 5MHz QPSK**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T-Lc</sub> (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20425	826.5	23.14	0.47	21.46	139.96	7
20525	836.5	23.04	0.47	21.36	136.77	7
20625	846.5	23.18	0.47	21.50	141.25	7

**CHANNEL BANDWIDTH: 5MHz 16QAM**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T-Lc</sub> (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20425	826.5	22.31	0.47	20.63	115.61	7
20525	836.5	22.41	0.47	20.73	118.30	7
20625	846.5	22.37	0.47	20.69	117.22	7

**CHANNEL BANDWIDTH: 10MHz QPSK**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T-Lc</sub> (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20450	829.0	23.16	0.47	21.48	140.60	7
20525	836.5	23.12	0.47	21.44	139.32	7
20600	844.0	23.20	0.47	21.52	141.91	7

**CHANNEL BANDWIDTH: 10MHz 16QAM**

Channel	Frequency (MHz)	Conducted Power (dBm)	G <sub>T-Lc</sub> (dB)	ERP (dBm)	ERP (mW)	Limit (W)
20450	829.0	22.35	0.47	20.67	116.68	7
20525	836.5	22.43	0.47	20.75	118.85	7
20600	844.0	22.42	0.47	20.74	118.58	7

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

## 3.2 FREQUENCY STABILITY MEASUREMENT

### 3.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

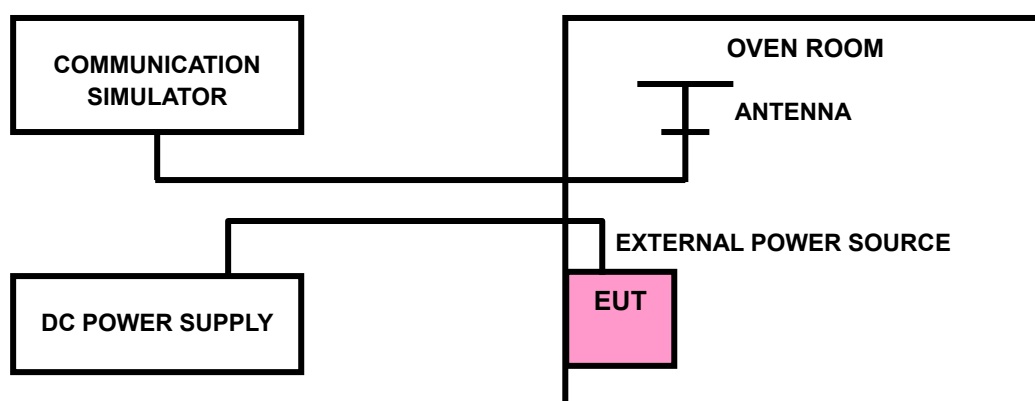
1.5 ppm is for base and fixed station. 2.5 ppm is for mobile station.

### 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





### 3.2.4 TEST RESULTS

#### GPRS 850

#### FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
$V_{nor}$	0.0018	0.0022	2.5
$V_{min}$	-0.0014	-0.0024	2.5
$V_{max}$	0.0012	0.0024	2.5

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

#### FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
-30	-0.0121	-0.0087	2.5
-20	-0.0098	-0.0095	2.5
-10	-0.0076	-0.0065	2.5
0	-0.0059	-0.0061	2.5
10	-0.0043	-0.0057	2.5
20	-0.015	-0.0032	2.5
30	-0.0024	-0.0012	2.5
40	-0.0017	-0.0021	2.5
50	-0.0009	-0.0053	2.5





EDGE 850

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
$V_{nor}$	0.0021	0.0025	2.5
$V_{min}$	-0.0026	-0.0027	2.5
$V_{max}$	0.0019	0.0021	2.5

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

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
-30	-0.0122	-0.0106	2.5
-20	-0.0103	-0.0091	2.5
-10	-0.0086	-0.0076	2.5
0	-0.0077	-0.0057	2.5
10	-0.0045	-0.004	2.5
20	-0.004	-0.0031	2.5
30	-0.0026	-0.0019	2.5
40	-0.0017	-0.001	2.5
50	-0.0004	-0.0058	2.5



WCDMA Band V

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
$V_{nor}$	0.0015	0.0014	2.5
$V_{min}$	-0.0026	-0.0026	2.5
$V_{max}$	0.0013	0.0019	2.5

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

FREQUENCY ERROR vs. TEMPERATURE.

TEMP. (°C)	FREQUENCY ERROR (ppm)		LIMIT (ppm)
	Low Channel	High Channel	
-30	0.0125	-0.0101	2.5
-20	-0.0104	-0.0126	2.5
-10	0.0103	-0.0097	2.5
0	-0.0092	-0.0079	2.5
10	-0.0074	-0.0036	2.5
20	-0.0055	-0.0051	2.5
30	0.0054	-0.0092	2.5
40	-0.0036	-0.0045	2.5
50	0.0004	-0.0008	2.5



LTE Band 5

FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	1.4MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V <sub>nor</sub>	0.002	0.0024	2.5
V <sub>min</sub>	-0.0031	-0.003	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)	1.4MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
-30	-0.0119	-0.0117	2.5
-20	-0.0108	-0.0097	2.5
-10	-0.0086	-0.0083	2.5
0	-0.0078	-0.0072	2.5
10	-0.0046	-0.0049	2.5
20	-0.0042	-0.004	2.5
30	-0.004	-0.0038	2.5
40	-0.0023	-0.0018	2.5
50	-0.0003	-0.0005	2.5



FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	3MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V <sub>nor</sub>	0.0021	0.0021	2.5
V <sub>min</sub>	-0.0022	-0.0025	2.5
V <sub>max</sub>	0.0019	0.0017	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	-0.0115	-0.011	2.5
-20	-0.0111	-0.0099	2.5
-10	-0.0083	-0.008	2.5
0	-0.0074	-0.0074	2.5
10	-0.0056	-0.0044	2.5
20	-0.004	-0.0043	2.5
30	-0.0038	-0.0027	2.5
40	-0.0016	-0.002	2.5
50	-0.0002	-0.0005	2.5



FREQUENCY ERROR VS. VOLTAGE

VOLTAGE (Volts)	5MHz		LIMIT (ppm)
	FREQUENCY ERROR (ppm)		
	Low Channel	High Channel	
V <sub>nor</sub>	0.0021	0.0025	2.5
V <sub>min</sub>	-0.0023	-0.003	2.5
V <sub>max</sub>	0.0021	0.002	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	-0.0111	2.5
-20	-0.011	-0.011	2.5
-10	-0.0086	-0.008	2.5
0	-0.0075	-0.0073	2.5
10	-0.0054	-0.0045	2.5
20	-0.0041	-0.004	2.5
30	-0.0028	-0.0039	2.5
40	-0.0022	-0.0015	2.5
50	-0.0004	-0.0003	2.5



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>	-0.003	-0.003	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	-0.0122	-0.0118	2.5
-20	-0.0106	-0.0106	2.5
-10	-0.0081	-0.0084	2.5
0	-0.0073	-0.0073	2.5
10	-0.005	-0.0053	2.5
20	-0.0039	-0.004	2.5
30	-0.0038	-0.0039	2.5
40	-0.0016	-0.0016	2.5
50	-0.0002	-0.0004	2.5

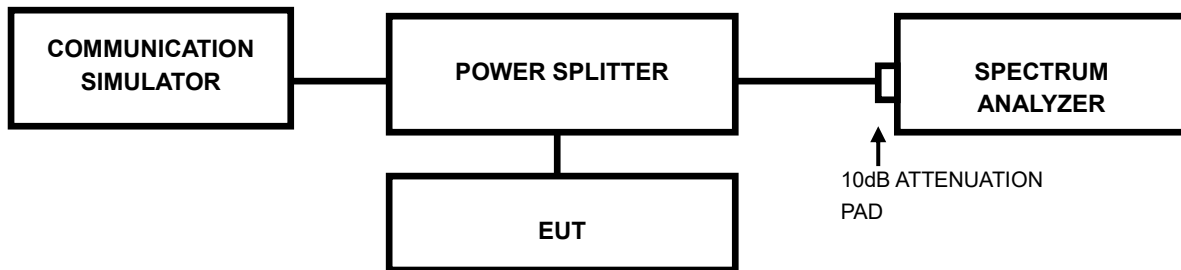


### 3.3 OCCUPIED BANDWIDTH MEASUREMENT

#### 3.3.1 TEST PROCEDURES

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

#### 3.3.2 TEST SETUP





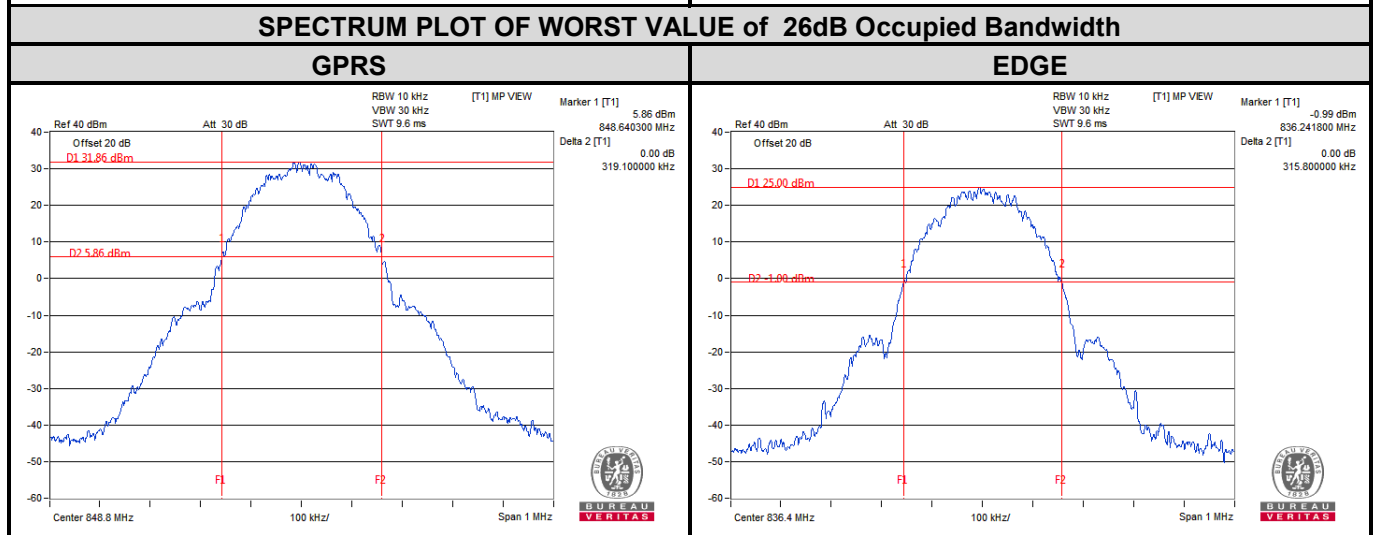
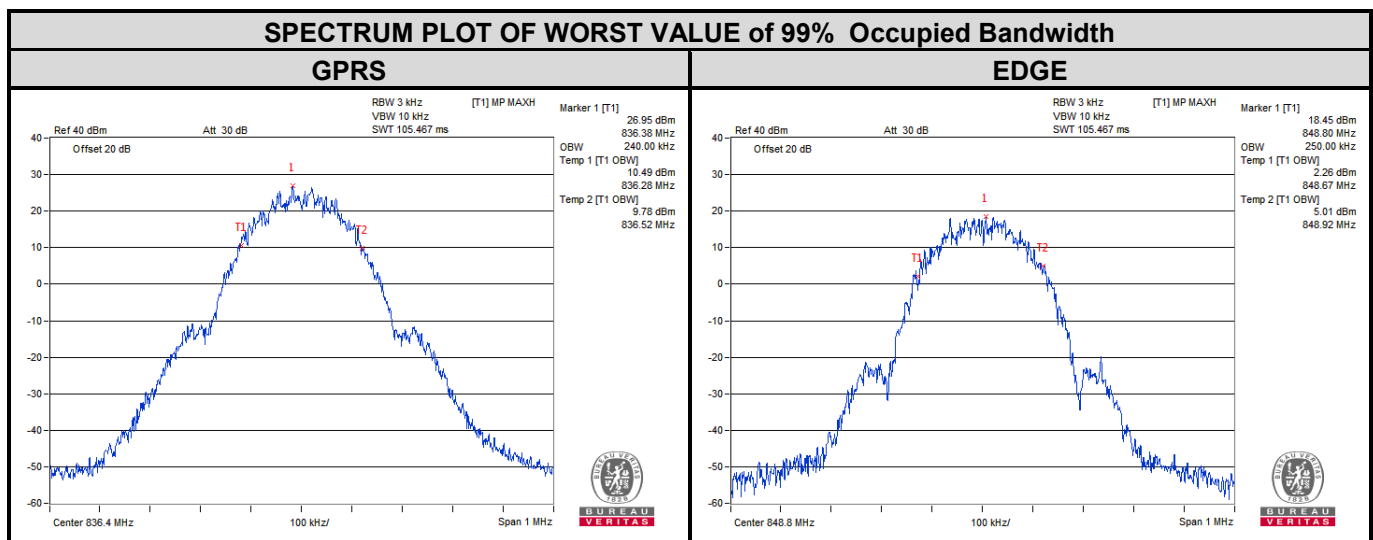
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### 3.3.3 TEST RESULTS

#### GPRS&EDGE

CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (kHz)		CHANNEL	Frequency (MHz)	26dB Bandwidth (kHz)	
		GPRS	EDGE			GPRS	EDGE
128	824.2	240.0	240.0	128	824.2	324	315.5
189	836.4	240.0	240.0	189	836.4	317.1	315.8
251	848.8	240.0	250.0	251	848.8	319.1	315.5





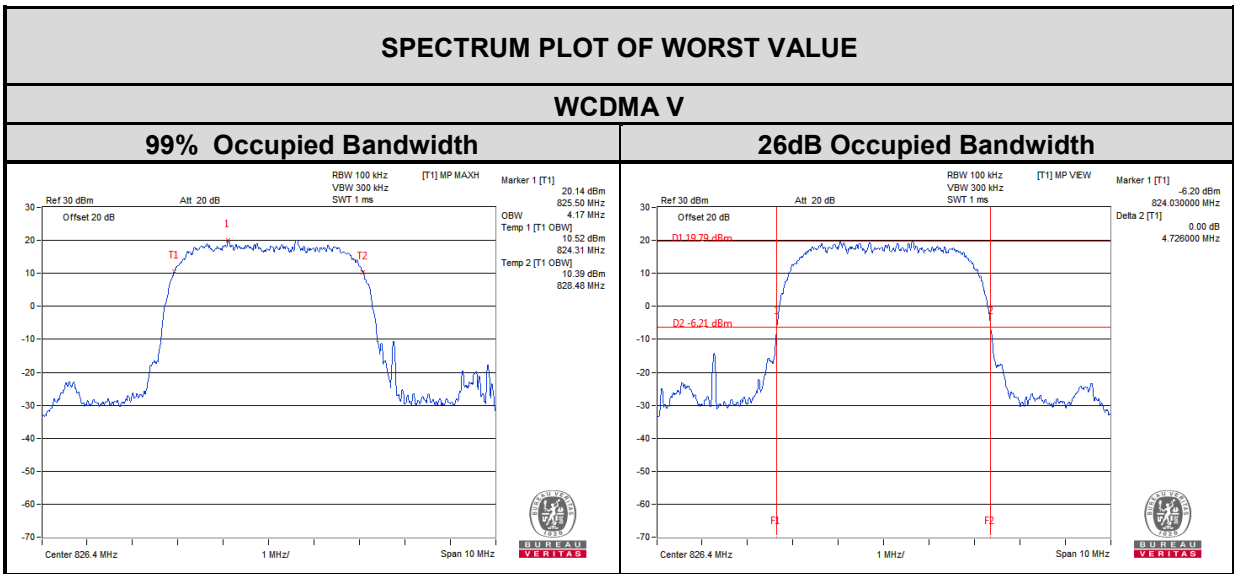


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**WCDMA**

CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)	CHANNEL	Frequency (MHz)	26dB Bandwidth (MHz)
		WCDMA V			WCDMA V
4132	826.4	4.170	4132	826.4	4.726
4182	836.4	4.160	4182	836.4	4.714
4233	846.6	4.170	4233	846.6	4.716



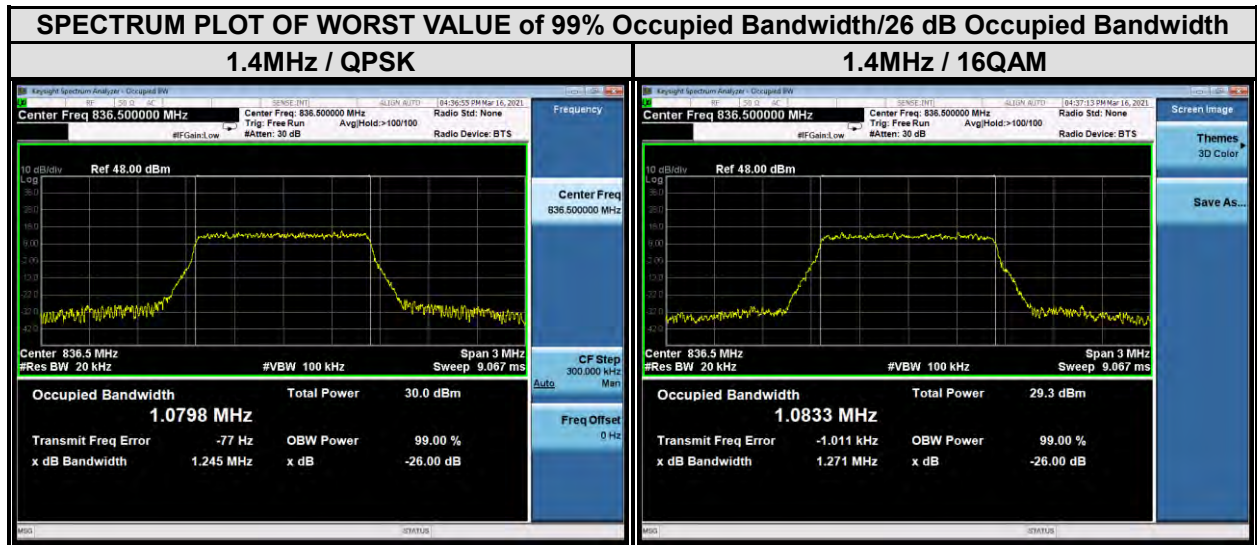


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Test Report No.: RF210603W002-1

**LTE BAND 5**

CHANNEL BANDWIDTH: 1.4MHz					
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)		26 dB bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
20407	824.7	1.08	1.08	1.27	1.24
20525	836.5	1.08	1.08	1.25	1.27
20643	848.3	1.08	1.08	1.26	1.22

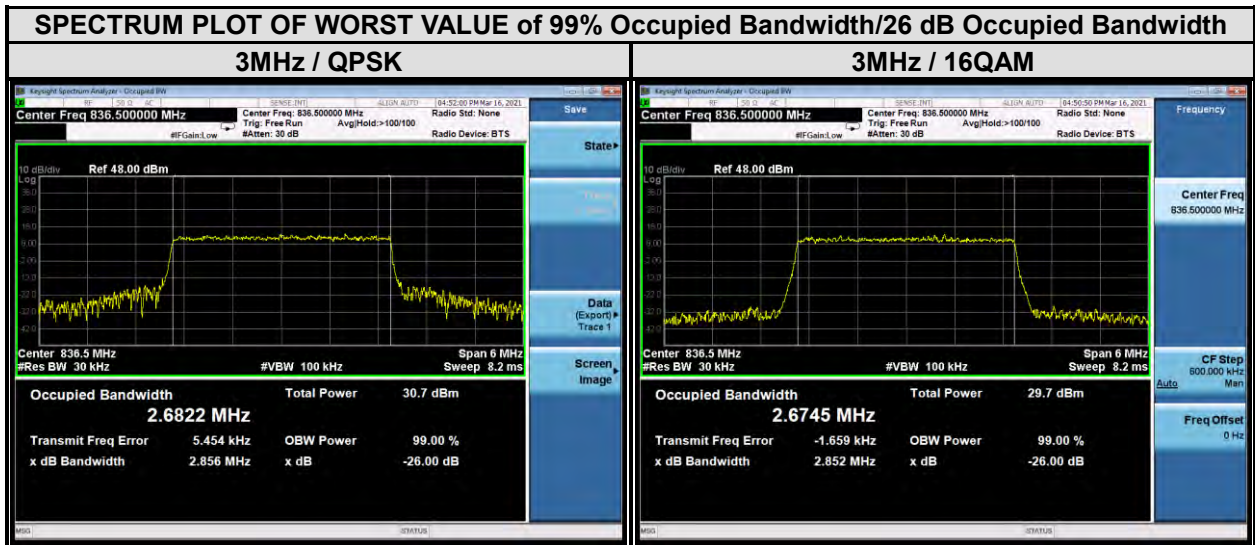




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Test Report No.: RF210603W002-1

CHANNEL BANDWIDTH: 3MHz					
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)		26 dB bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
20415	825.5	2.68	2.67	2.85	2.86
20525	836.5	2.68	2.67	2.86	2.85
20635	847.5	2.67	2.68	2.84	2.84

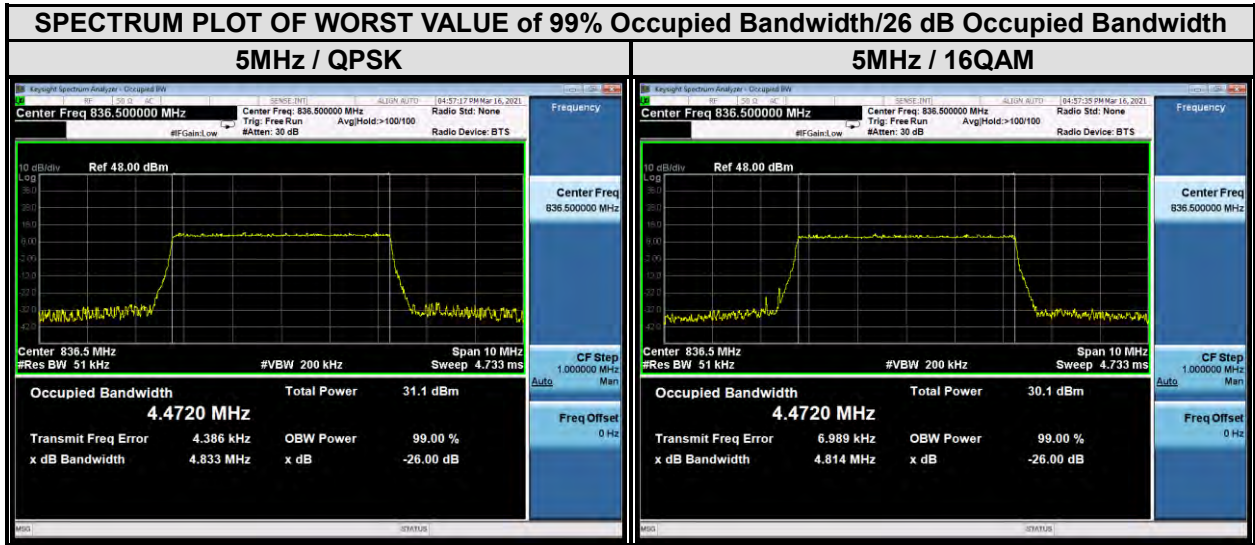




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Test Report No.: RF210603W002-1

CHANNEL BANDWIDTH: 5MHz					
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)		26 dB bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
20425	826.5	4.47	4.46	4.85	4.78
20525	836.5	4.47	4.47	4.83	4.81
20625	846.5	4.46	4.46	4.79	4.85

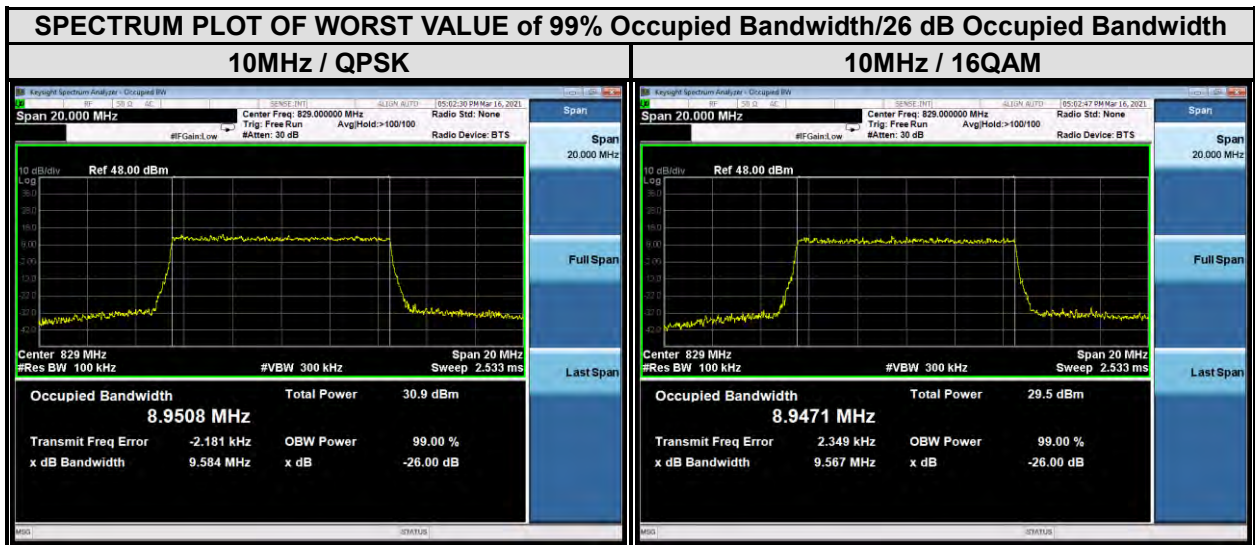




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Test Report No.: RF210603W002-1

CHANNEL BANDWIDTH: 10MHz					
CHANNEL	Frequency (MHz)	99% OCCUPIED Bandwidth (MHz)		26 dB bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
20450	829	8.95	8.95	9.58	9.57
20525	836.5	8.94	8.93	9.52	9.51
20600	844	8.94	8.94	9.49	9.49



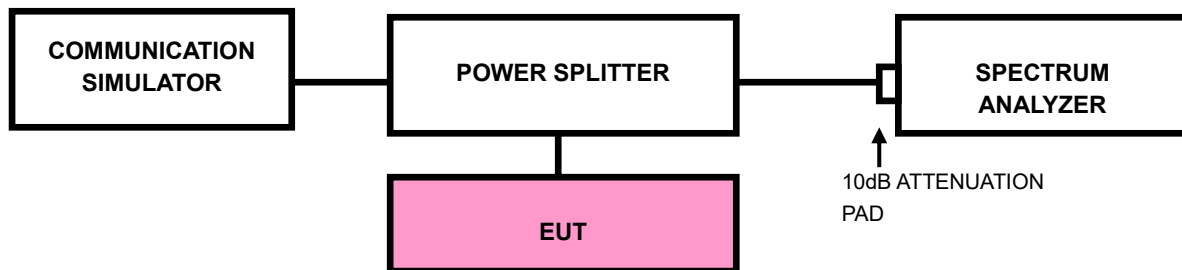


### 3.4 BAND EDGE MEASUREMENT

#### 3.4.1 LIMITS OF BAND EDGE MEASUREMENT

Power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

#### 3.4.2 TEST SETUP





### 3.4.3 TEST PROCEDURES

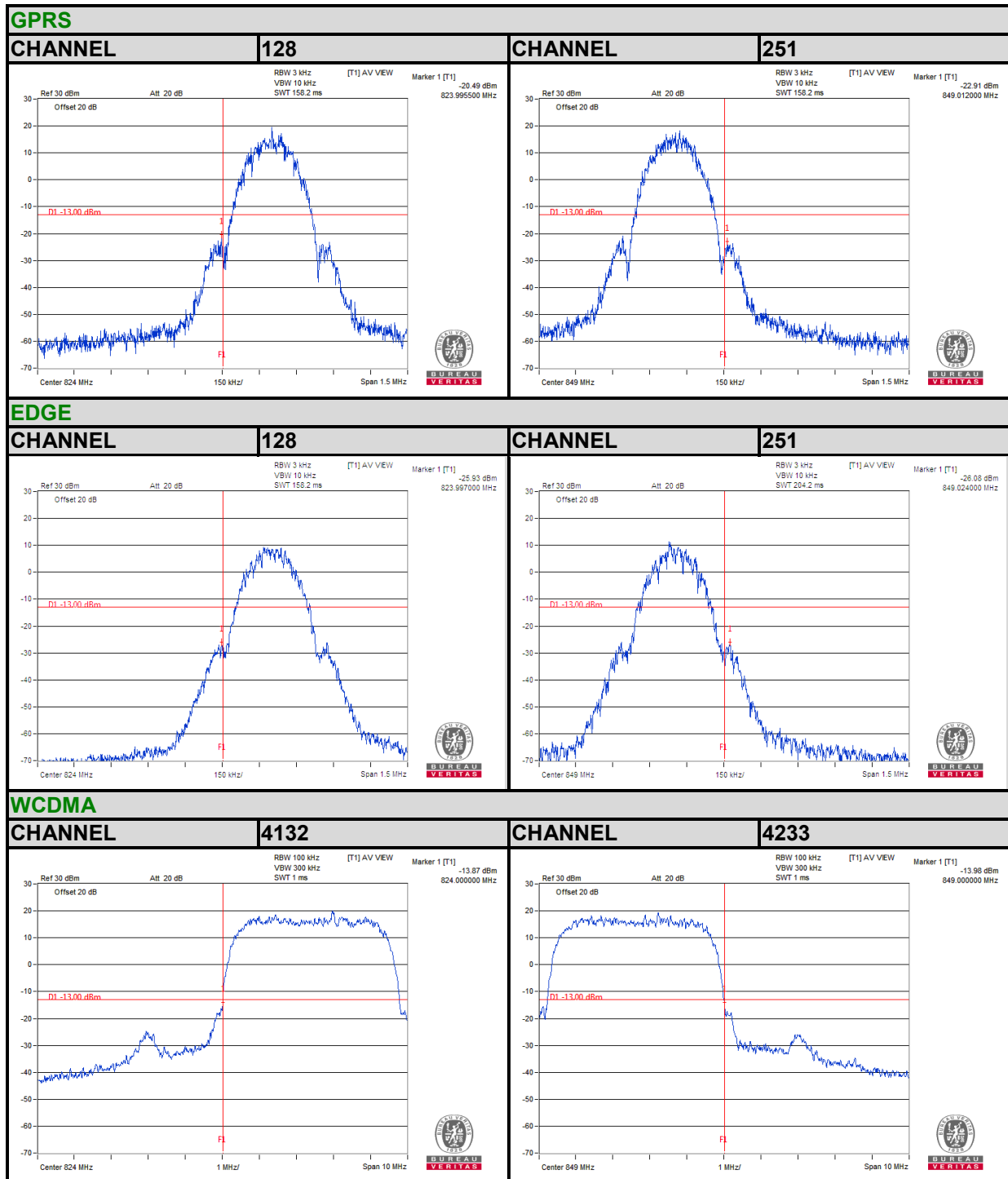
- a. All measurements were done at low and high operational frequency range.
- b. The center frequency of spectrum is the band edge frequency and span is 1.5MHz. RBW of the spectrum is 10kHz and VBW of the spectrum is 30kHz (GSM/GPRS/EDGE).
- c. The center frequency of spectrum is the band edge frequency and span is 10MHz. RBW of the spectrum is 100kHz and VBW of the spectrum is 300kHz (WCDMA).
- d. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 20kHz and VBW of the spectrum is 100 kHz. (LTE bandwidth 1.4MHz).
- e. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 30kHz and VBW of the spectrum is 100kHz. (LTE bandwidth 3MHz)
- f. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 50kHz and VBW of the spectrum is 200kHz. (LTE bandwidth 5MHz)
- g. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 100kHz and VBW of the spectrum is 300kHz. (LTE bandwidth 10MHz)
- h. Record the max trace plot into the test report.



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Test Report No.: RF210603W002-1

### 3.4.4 TEST RESULTS







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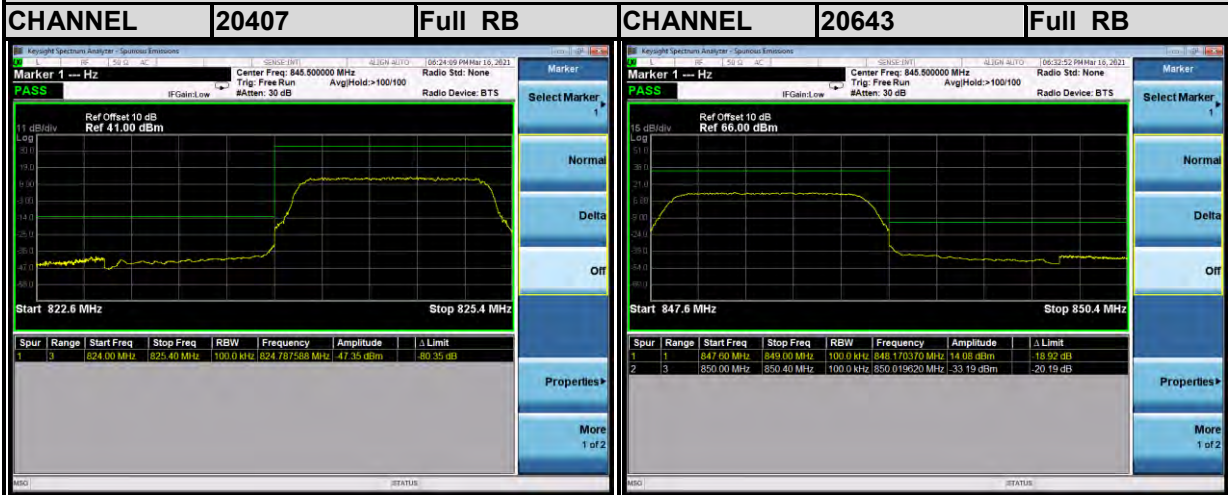
LTE Band5

Channel Bandwidth: 1.4MHz QPSK



LTE Band5

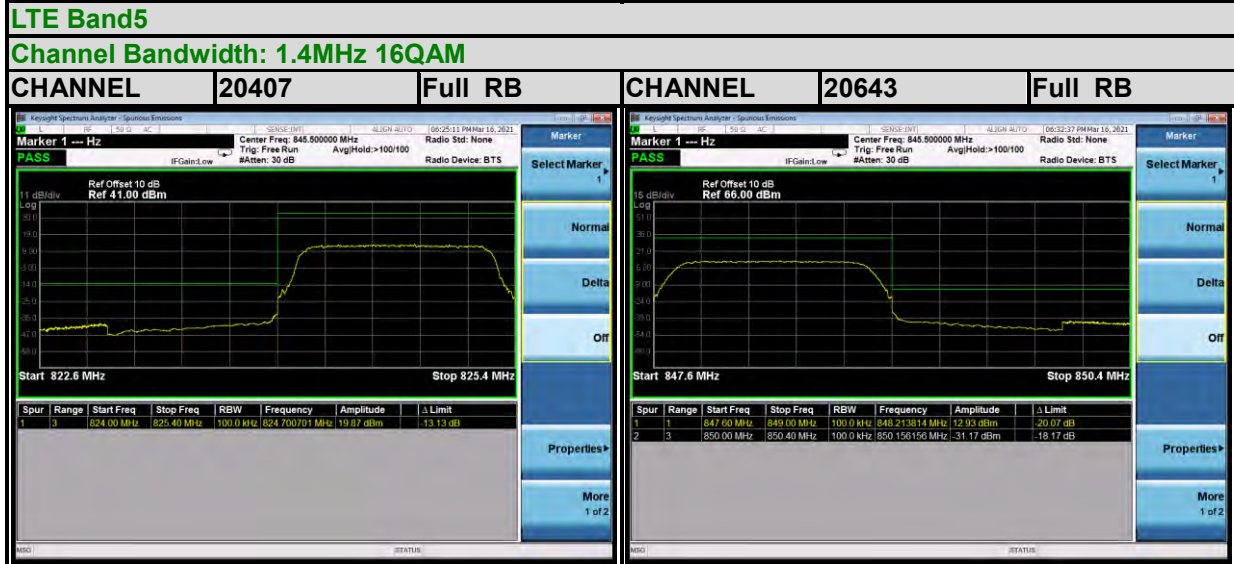
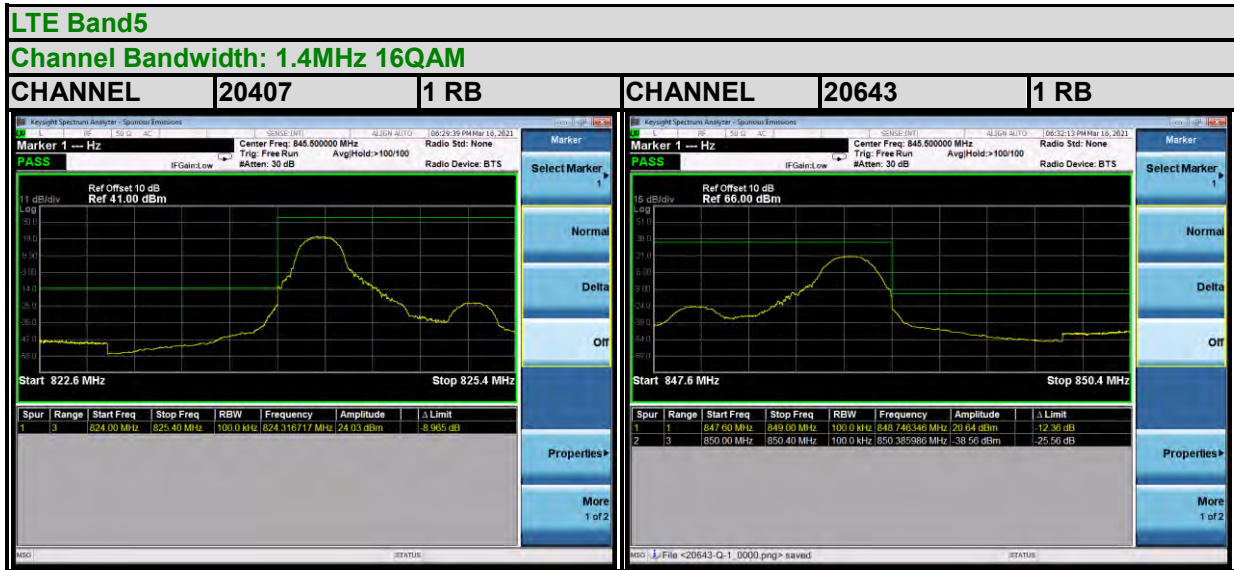
Channel Bandwidth: 1.4MHz QPSK





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Test Report No.: RF210603W002-1



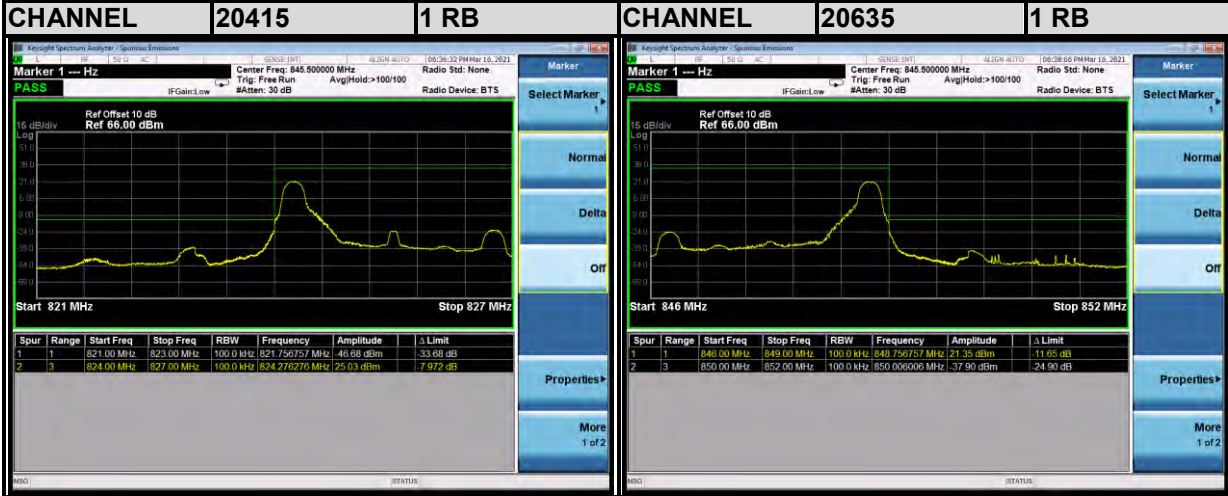


BUREAU VERITAS

Test Report No.: RF210603W002-1

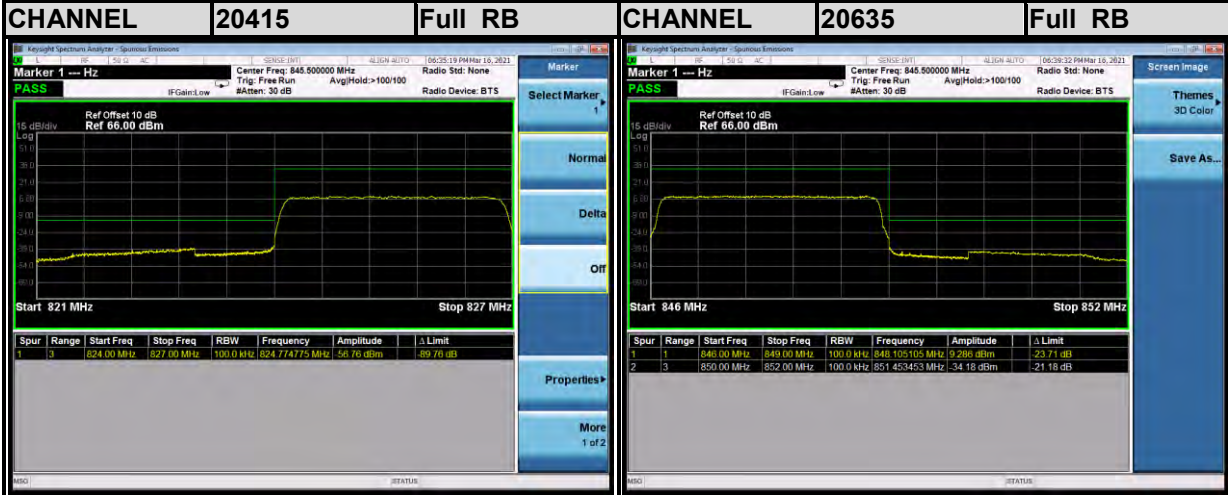
LTE Band5

Channel Bandwidth: 3MHz QPSK



LTE Band5

Channel Bandwidth: 3MHz QPSK





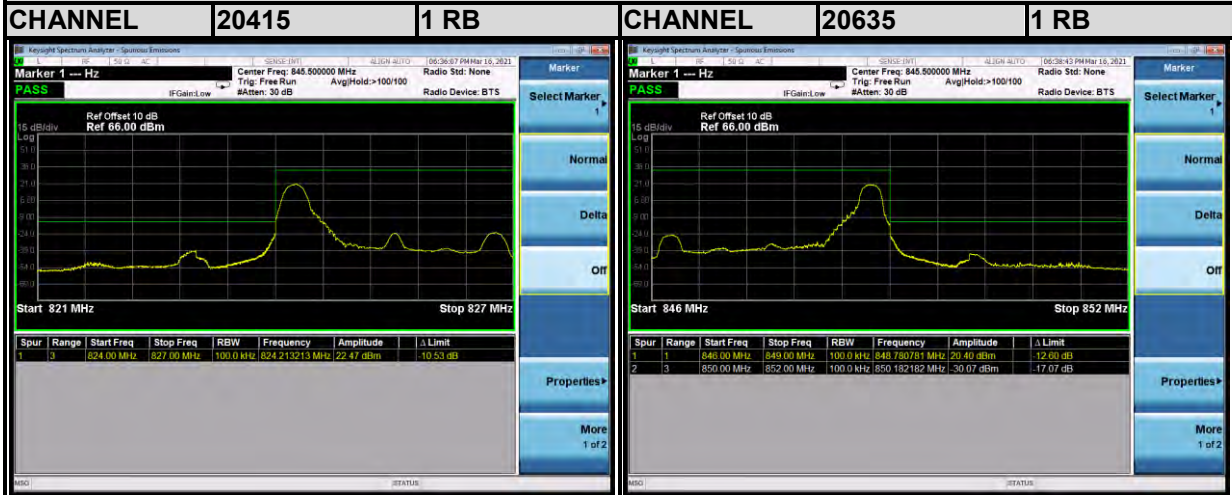


BUREAU VERITAS

Test Report No.: RF210603W002-1

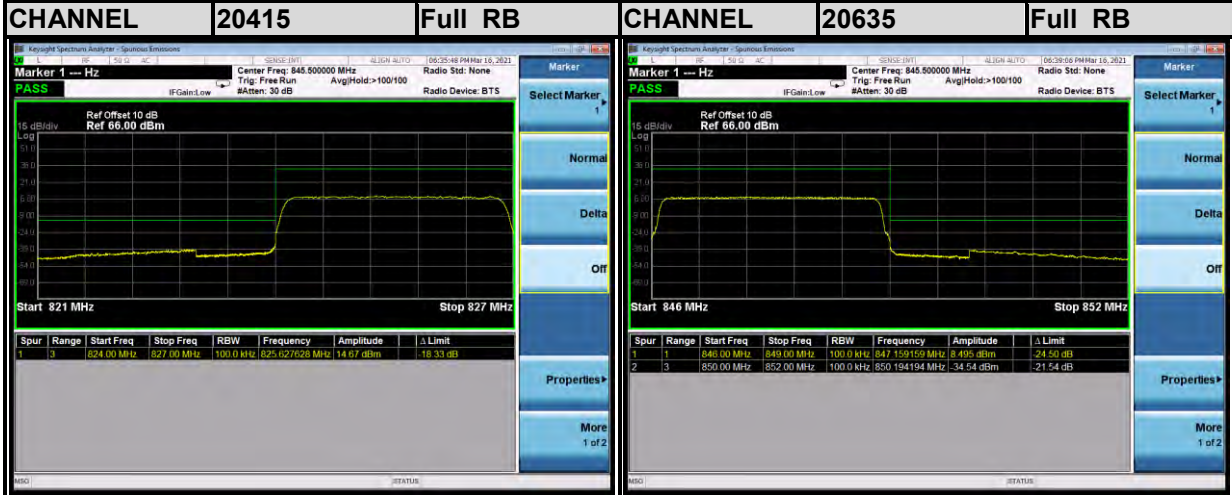
**LTE Band5**

**Channel Bandwidth: 3MHz 16QAM**



**LTE Band5**

**Channel Bandwidth: 3MHz 16QAM**



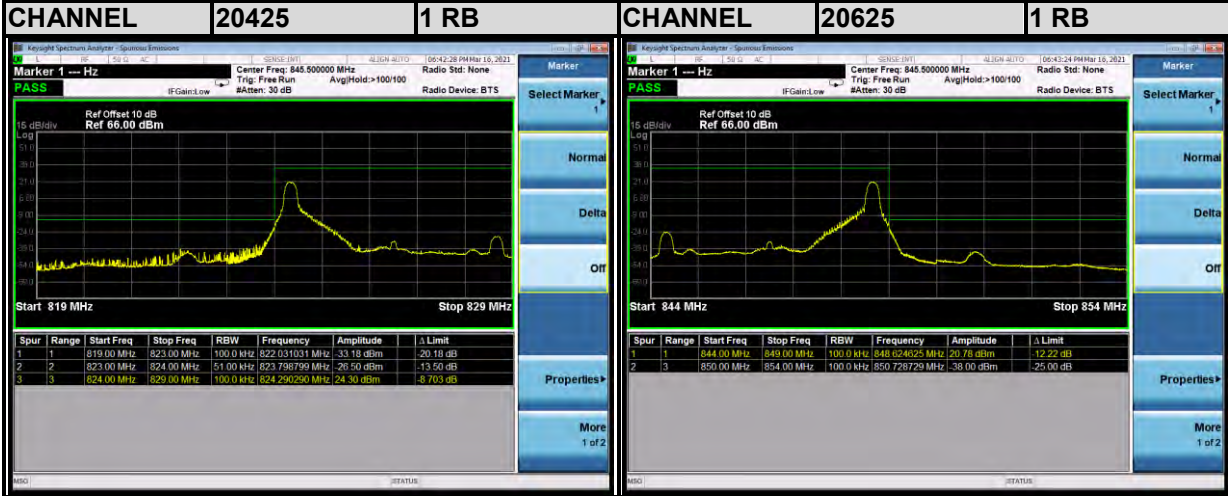


BUREAU VERITAS

Test Report No.: RF210603W002-1

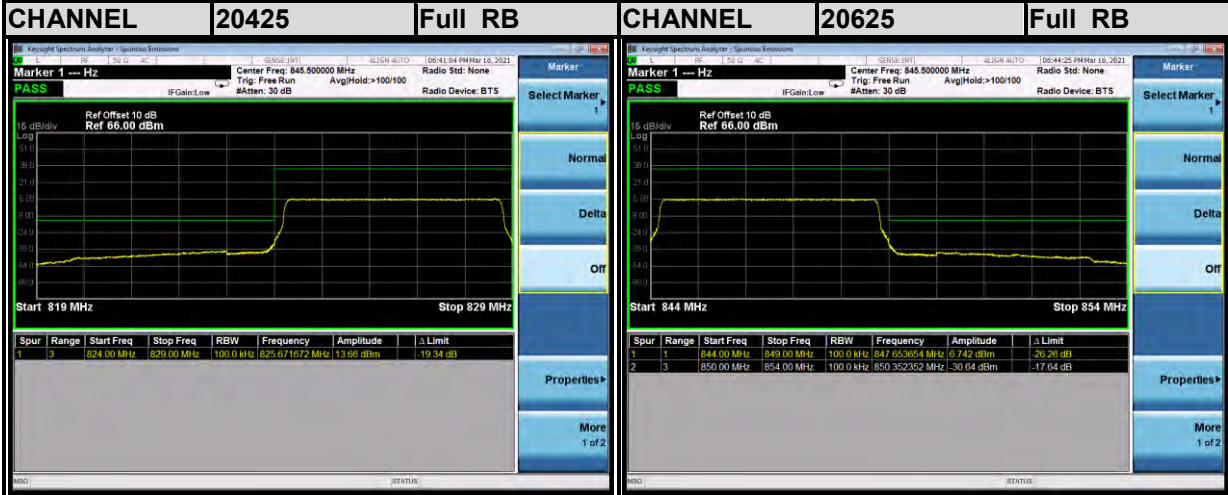
LTE Band5

Channel Bandwidth: 5MHz QPSK



LTE Band5

Channel Bandwidth: 5MHz QPSK



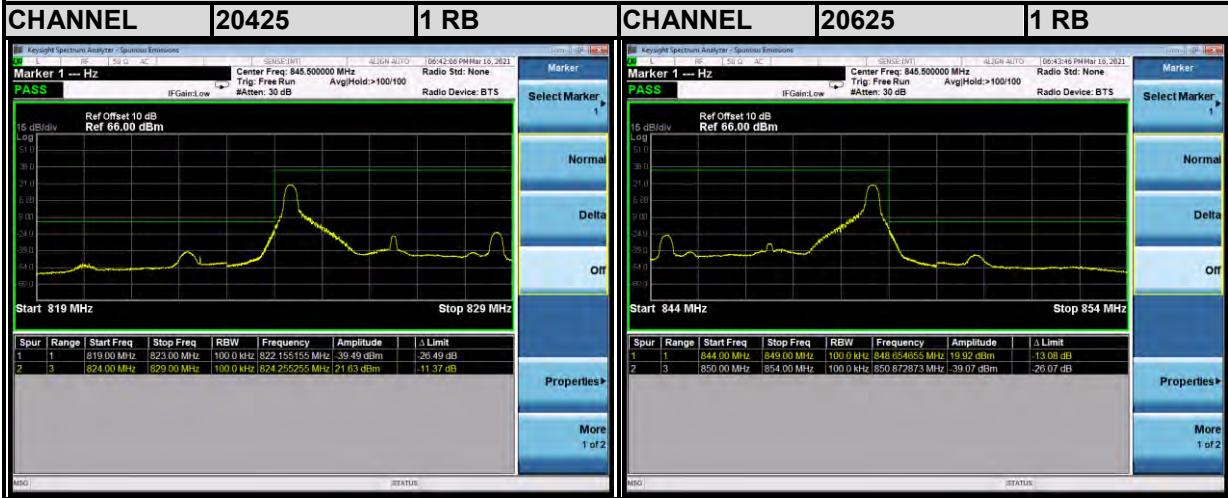


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Test Report No.: RF210603W002-1

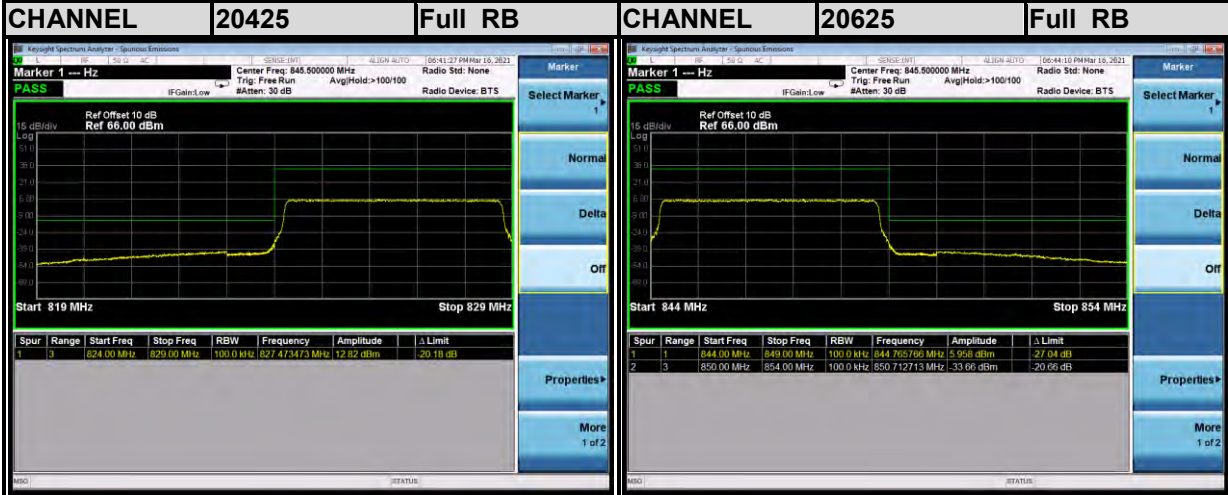
**LTE Band5**

**Channel Bandwidth: 5MHz 16QAM**



**LTE Band5**

**Channel Bandwidth: 5MHz 16QAM**

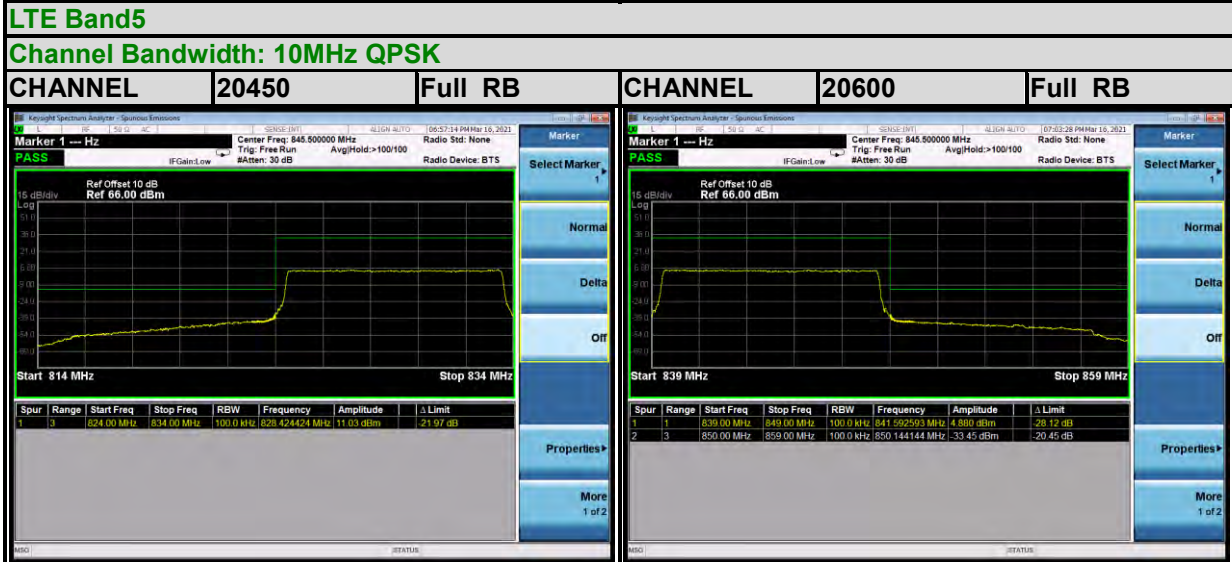
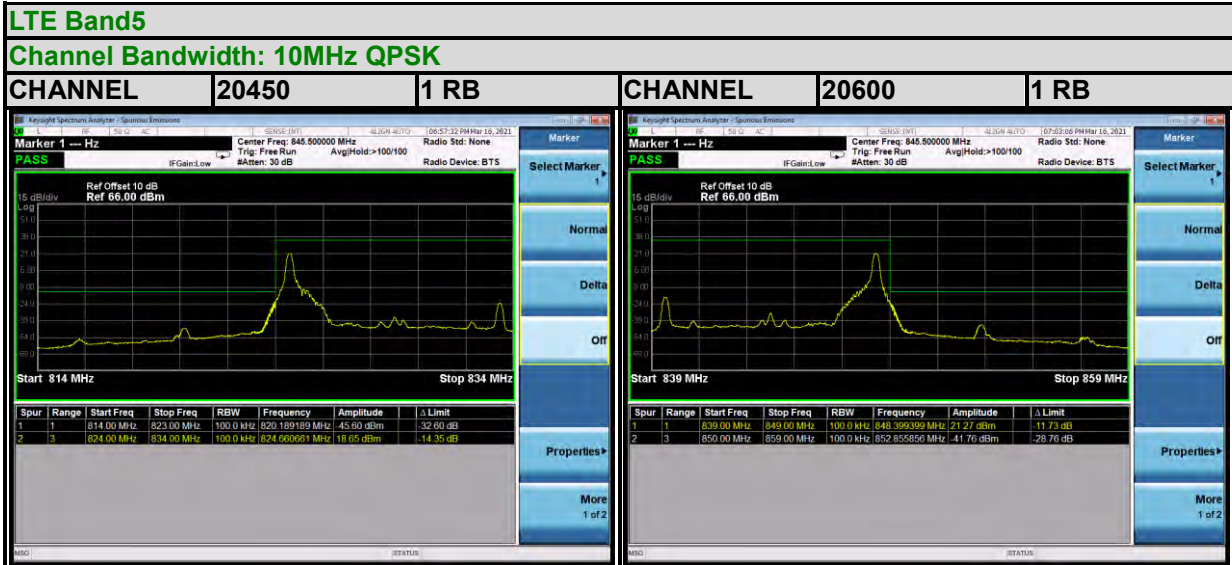






**BUREAU  
VERITAS**

Test Report No.: RF210603W002-1



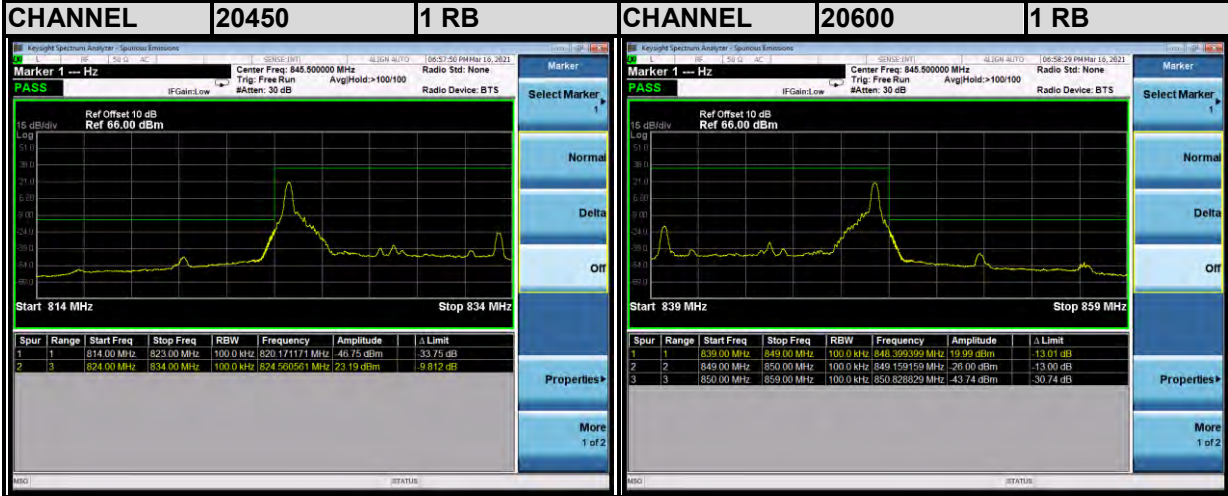


**BUREAU  
VERITAS**

Test Report No.: RF210603W002-1

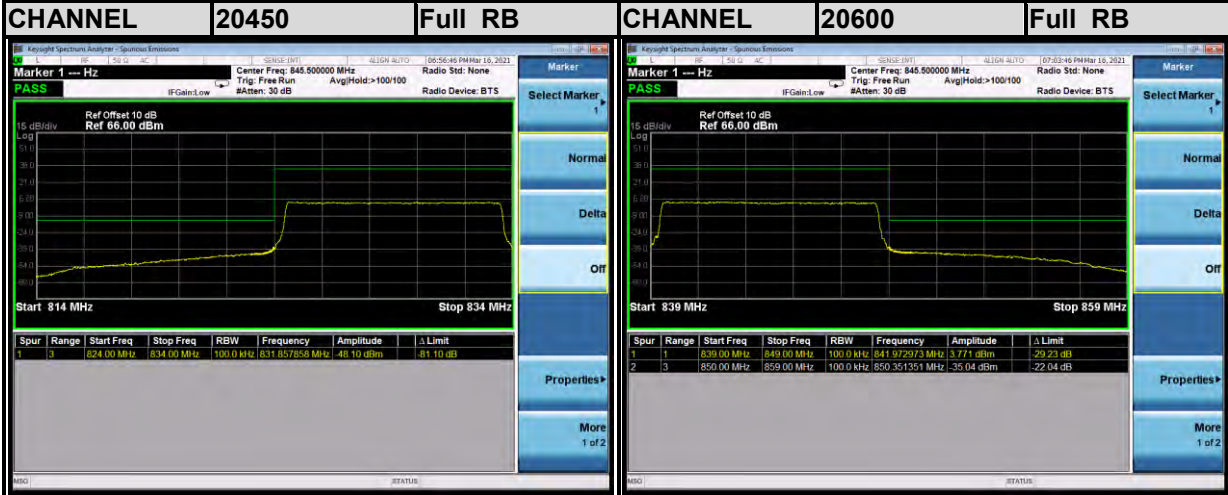
**LTE Band5**

**Channel Bandwidth: 10MHz 16QAM**



**LTE Band5**

**Channel Bandwidth: 10MHz 16QAM**





### 3.5 CONDUCTED SPURIOUS EMISSIONS

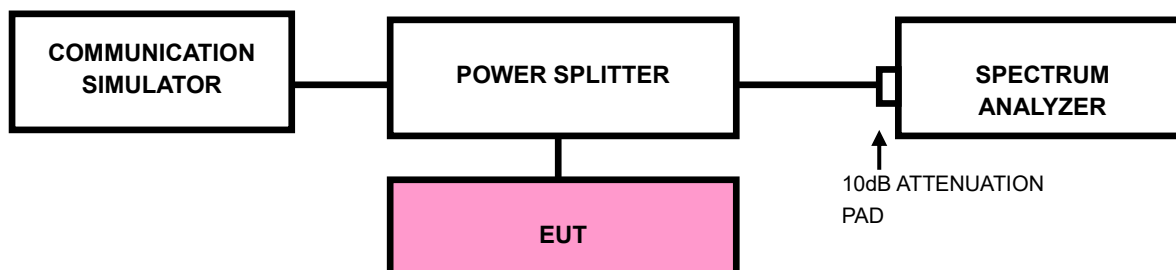
#### 3.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

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

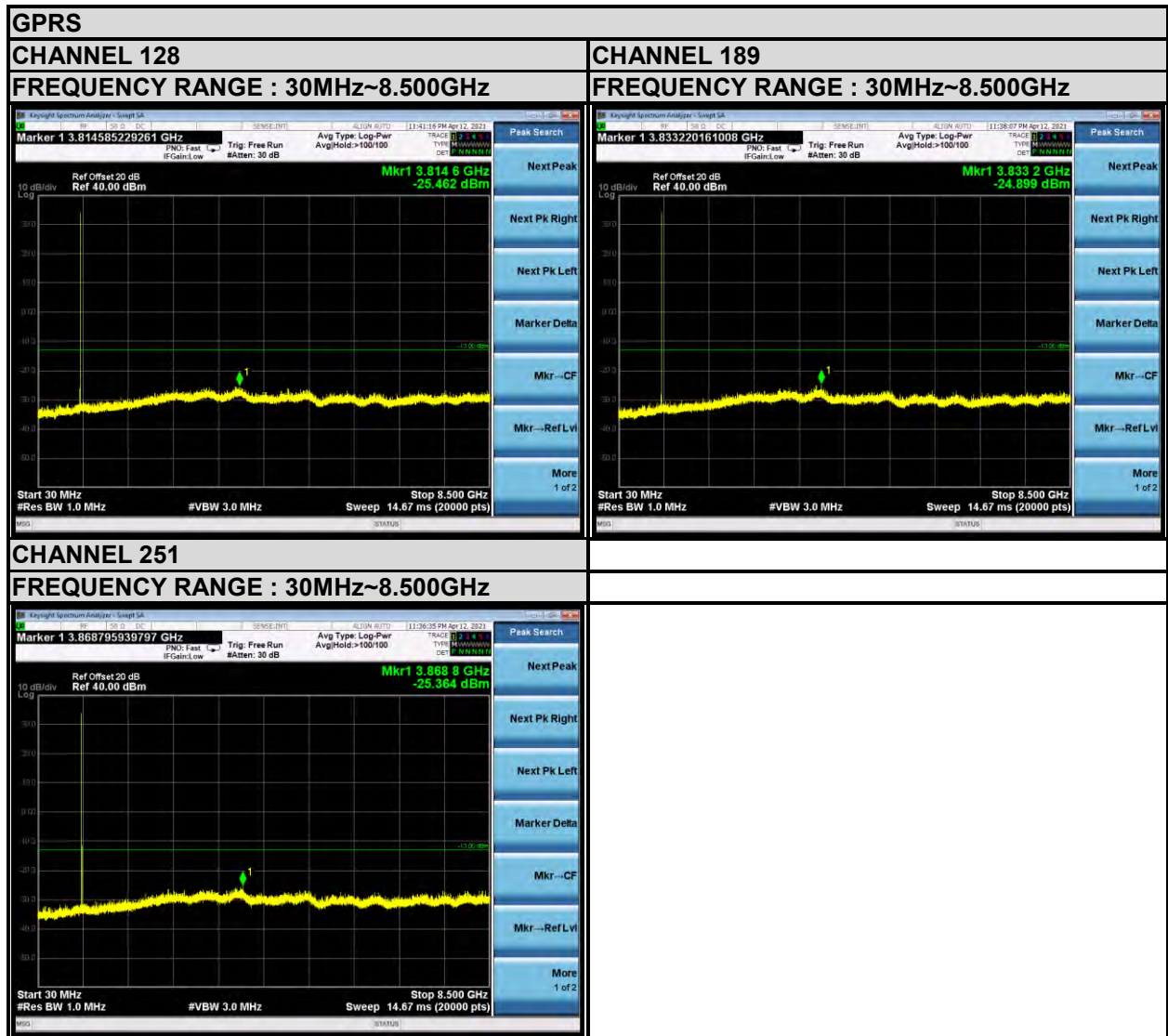




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Test Report No.: RF210603W002-1

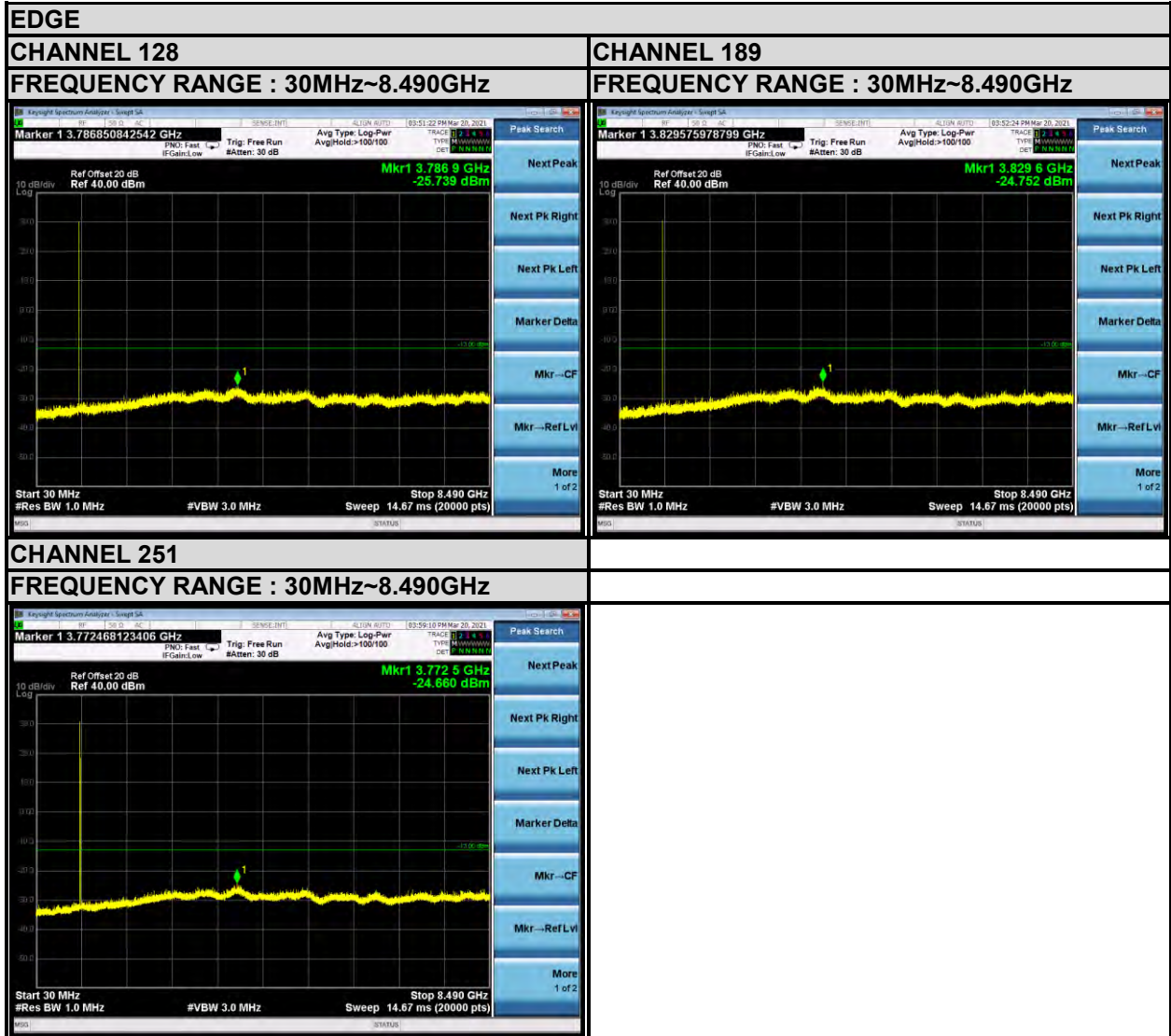
### 3.5.4 TEST RESULTS





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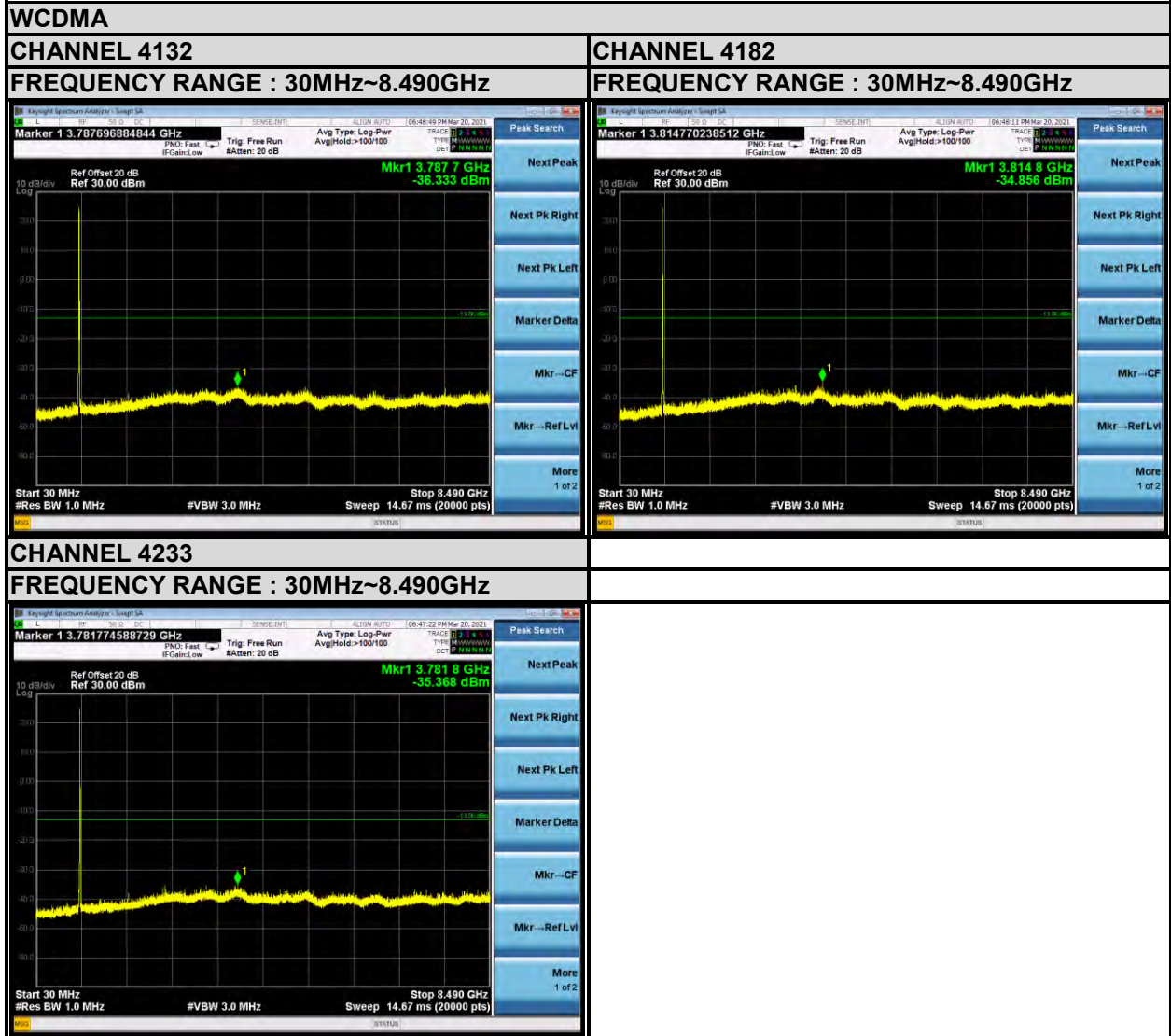
Test Report No.: RF210603W002-1





BUREAU VERITAS

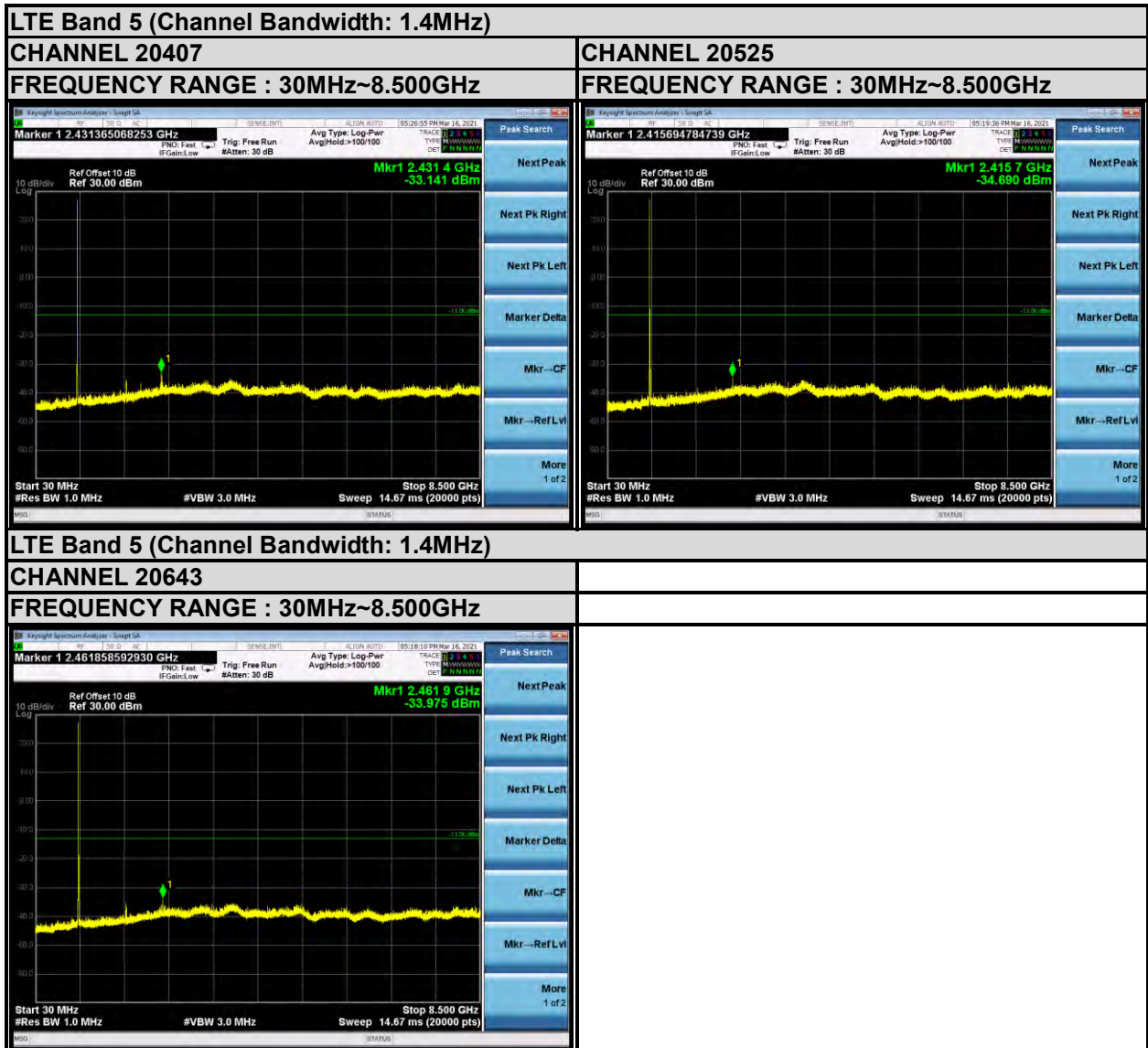
Test Report No.: RF210603W002-1





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Test Report No.: RF210603W002-1







BUREAU VERITAS

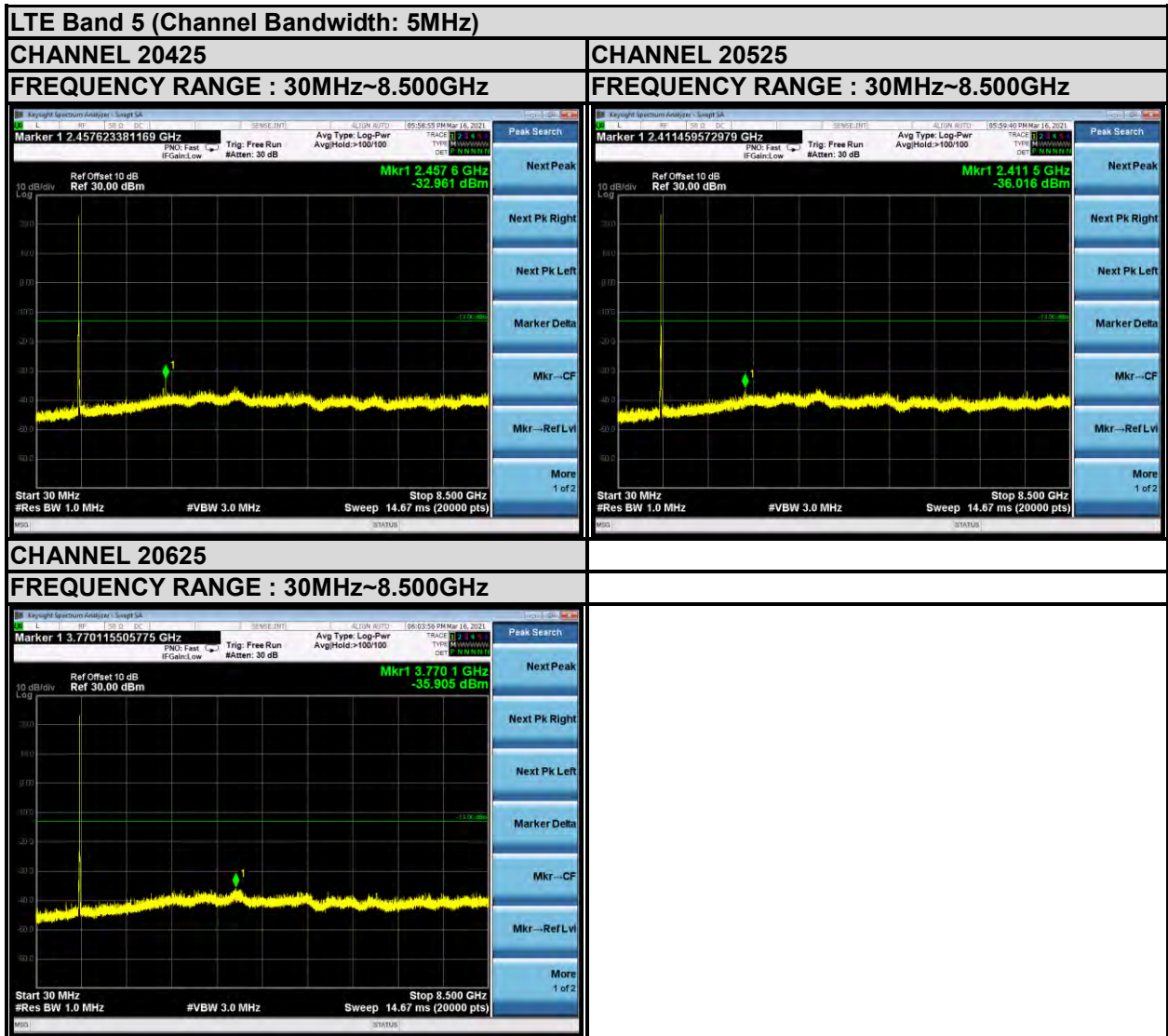
Test Report No.: RF210603W002-1





BUREAU VERITAS

Test Report No.: RF210603W002-1





BUREAU VERITAS

Test Report No.: RF210603W002-1







### 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.  $\text{EIRP} = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$ .
- d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole,  $\text{E.R.P power} = \text{E.I.P.R power} - 2.15\text{dBi}$ .

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

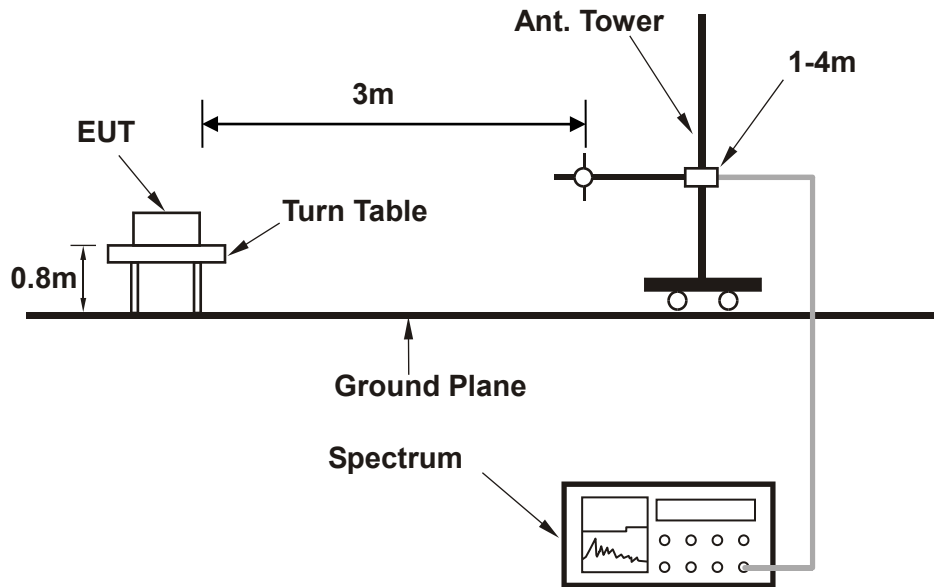
#### 3.6.3 DEVIATION FROM TEST STANDARD

No deviation

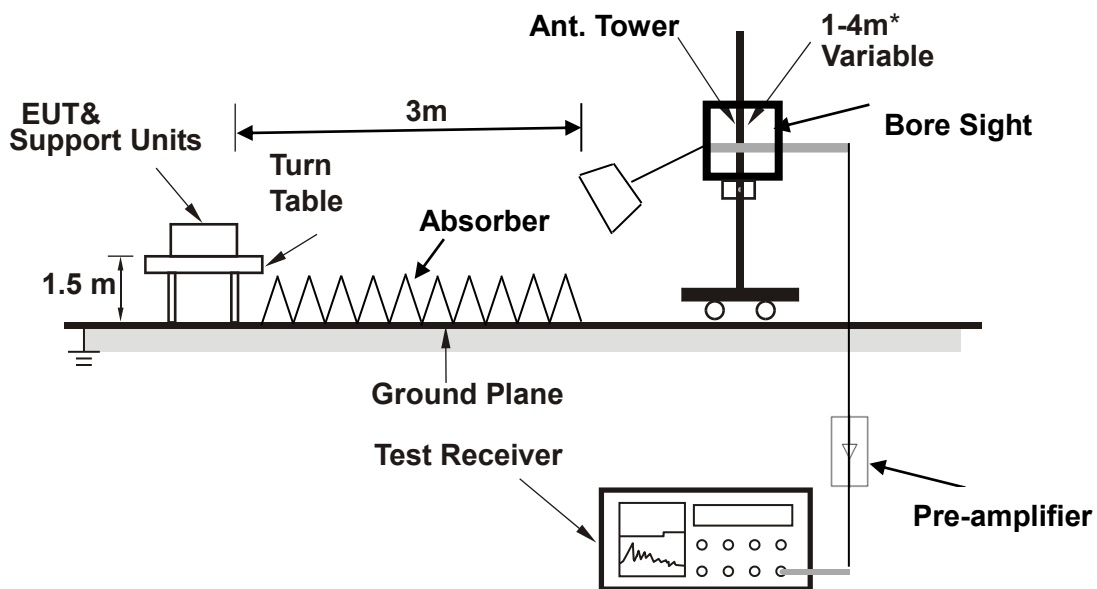


### 3.6.4 TEST SETUP

#### < 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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### 3.6.5 TEST RESULTS

#### BELOW 1GHz WORST-CASE DATA

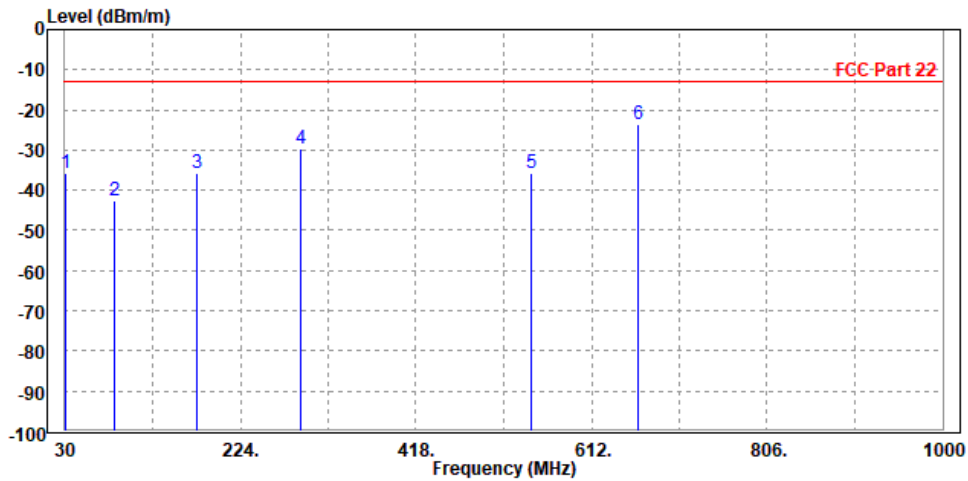
30 MHz – 1GHz data:

LTE Band 5

CHANNEL BANDWIDTH: 3MHz / QPSK

<b>MODE</b>	TX channel 20415	<b>FREQUENCY RANGE</b>	Below 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	30.970	-35.71	-56.13	-13.00	-22.71	20.42	Peak	Horizontal
2	84.320	-42.54	-50.39	-13.00	-29.54	7.85	Peak	Horizontal
3	176.470	-35.83	-45.87	-13.00	-22.83	10.04	Peak	Horizontal
4	290.930	-29.52	-43.10	-13.00	-16.52	13.58	Peak	Horizontal
5	545.070	-35.87	-55.39	-13.00	-22.87	19.52	Peak	Horizontal
6 PP	663.410	-23.39	-45.13	-13.00	-10.39	21.74	Peak	Horizontal



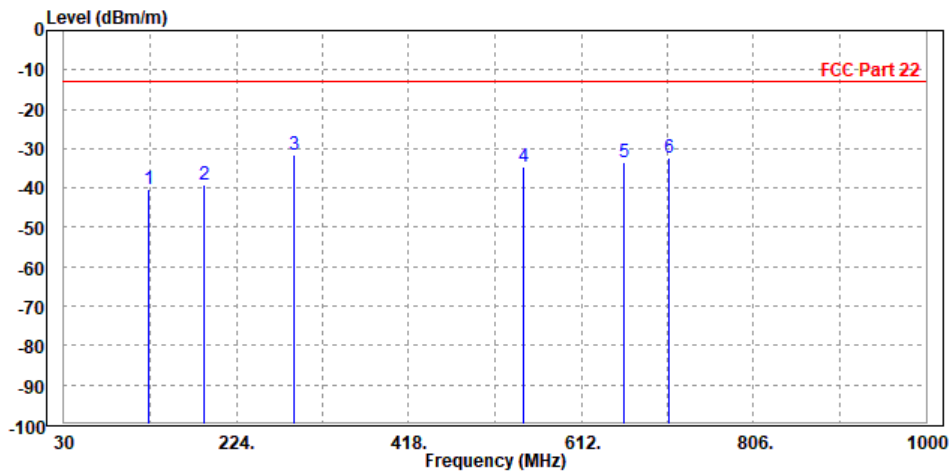


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**Test Report No.: RF210603W002-1**

<b>MODE</b>	TX channel 20415	<b>FREQUENCY RANGE</b>	Below 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	125.060	-40.19	-47.59	-13.00	-27.19	7.40	Peak	Vertical
2	188.110	-39.23	-49.17	-13.00	-26.23	9.94	Peak	Vertical
3	288.990	-31.61	-45.19	-13.00	-18.61	13.58	Peak	Vertical
4	547.010	-34.75	-54.28	-13.00	-21.75	19.53	Peak	Vertical
5	660.500	-33.38	-55.03	-13.00	-20.38	21.65	Peak	Vertical
6	709.970	-32.27	-55.14	-13.00	-19.27	22.87	Peak	Vertical





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**ABOVE 1GHz DATA**

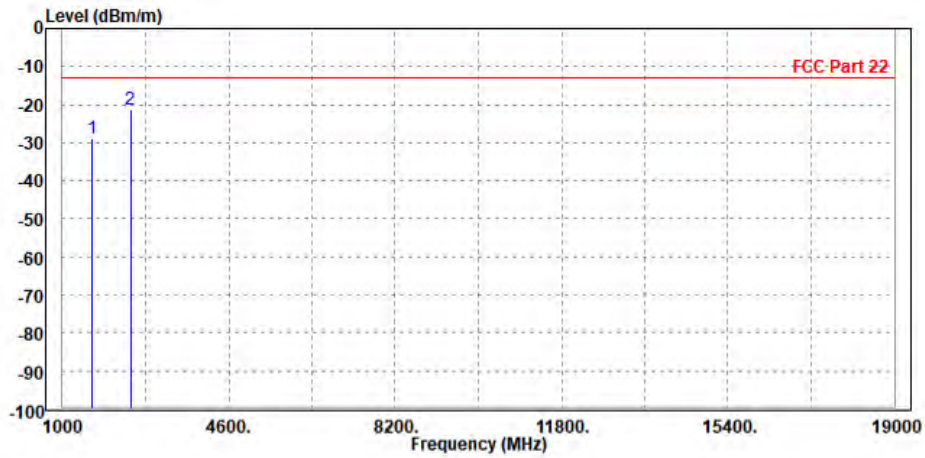
**Note:** For higher frequency, the emission is too low to be detected.

**GPRS 850**

**CH 128:**

<b>MODE</b>	TX channel 128	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1648.000	-28.88	-32.13	-13.00	-15.88	3.25	Peak	Horizontal
2	2472.600	-21.12	-29.14	-13.00	-8.12	8.02	Peak	Horizontal



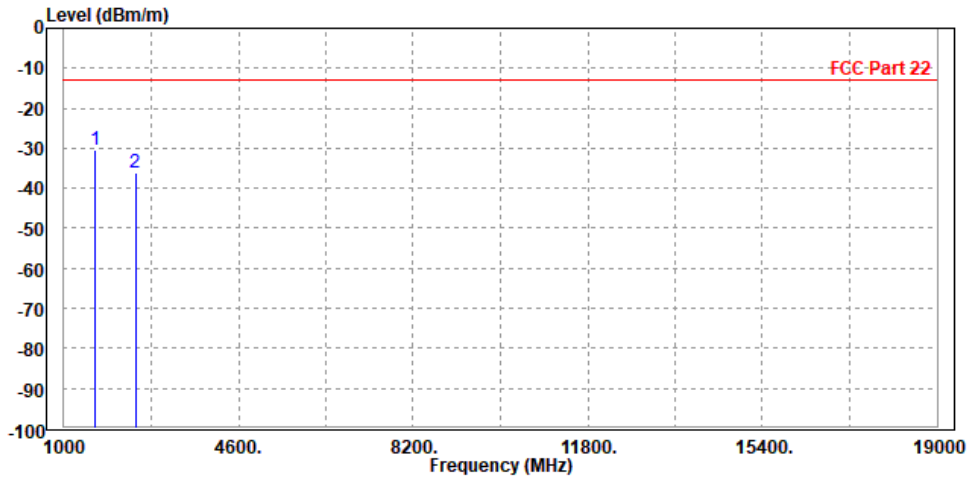


**BUREAU  
VERITAS**

**Test Report No.: RF210603W002-1**

<b>MODE</b>	TX channel 128	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1648.000	-30.25	-33.63	-13.00	-17.25	3.38	Peak	Vertical
2	2472.600	-35.99	-43.03	-13.00	-22.99	7.04	Peak	Vertical





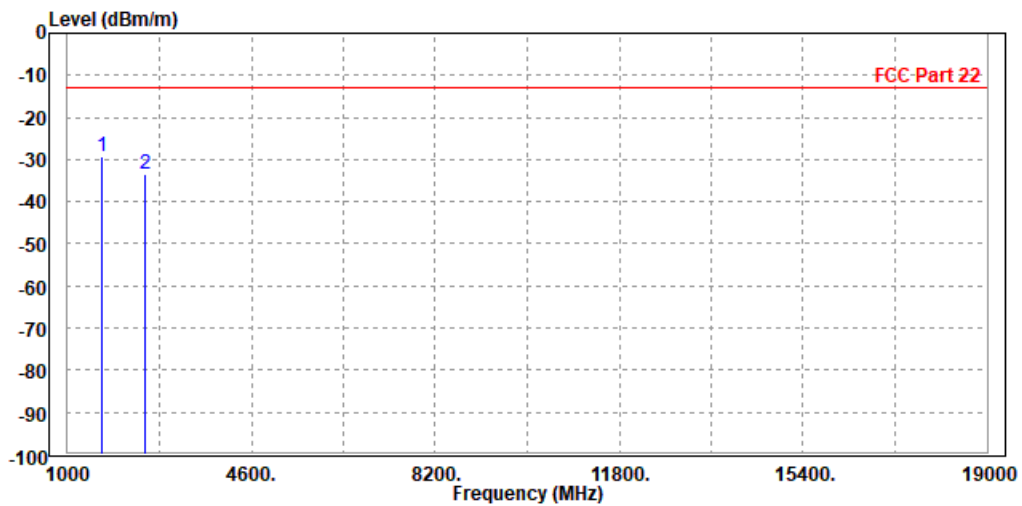
**BUREAU  
VERITAS**

Test Report No.: RF210603W002-1

**CH 189:**

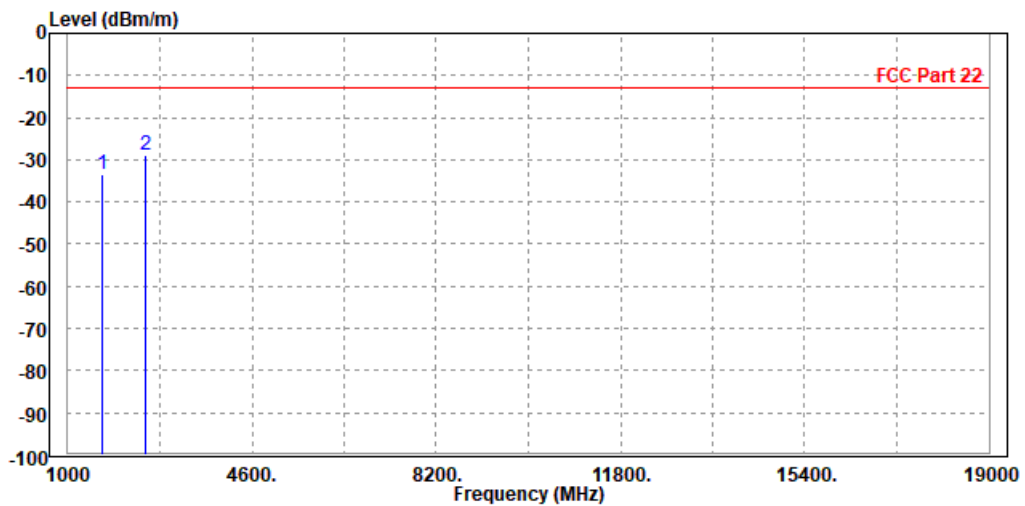
<b>MODE</b>	TX channel 189	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1666.000	-29.11	-32.58	-13.00	-16.11	3.47	Peak	Horizontal
2	2509.200	-33.40	-41.46	-13.00	-20.40	8.06	Peak	Horizontal



<b>MODE</b>	TX channel 189	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1666.000	-33.32	-36.86	-13.00	-20.32	3.54	Peak	Vertical
2 PP	2509.200	-29.06	-36.16	-13.00	-16.06	7.10	Peak	Vertical







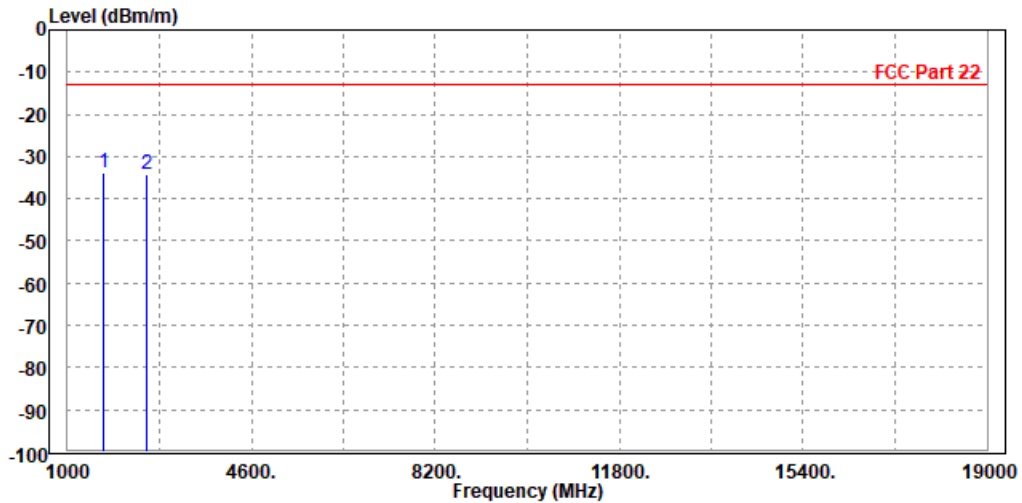
BUREAU VERITAS

Test Report No.: RF210603W002-1

CH 251:

<b>MODE</b>	TX channel 251	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1702.000	-33.70	-37.61	-13.00	-20.70	3.91	Peak	Horizontal
2	2546.400	-34.34	-42.45	-13.00	-21.34	8.11	Peak	Horizontal



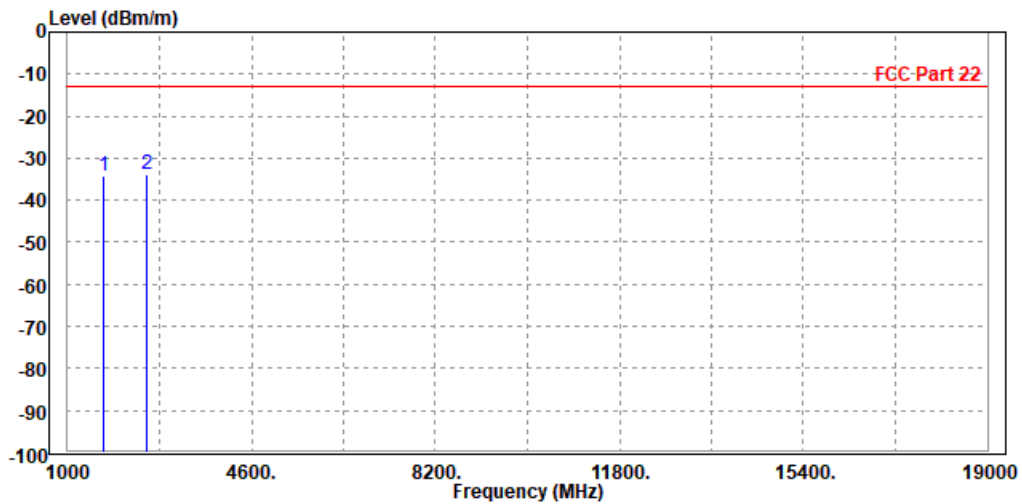


**BUREAU  
VERITAS**

**Test Report No.: RF210603W002-1**

<b>MODE</b>	TX channel 251	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1702.000	-37.51	-41.38	-13.00	-24.51	3.87	Peak	Vertical
2 PP	2546.400	-25.45	-32.67	-13.00	-12.45	7.22	Peak	Vertical





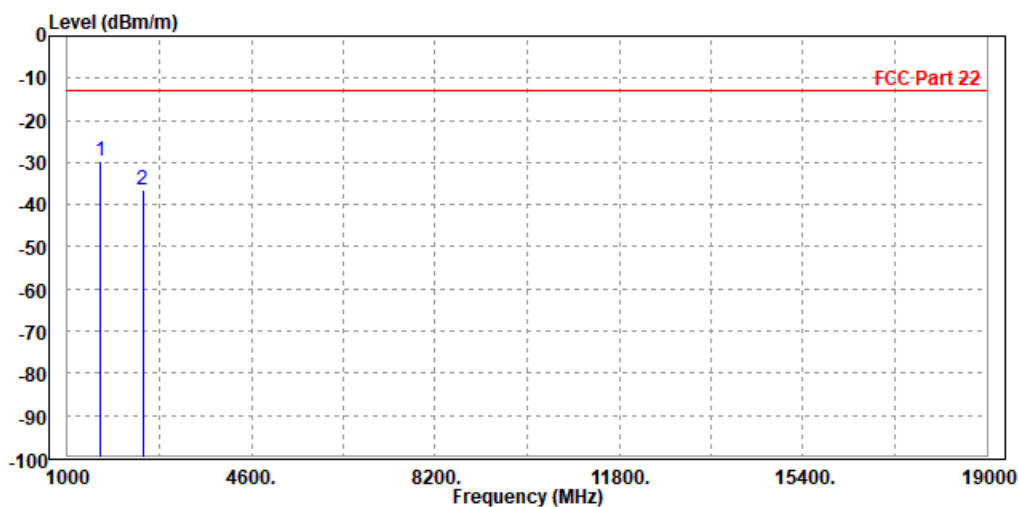
Test Report No.: RF210603W002-1

EDGE 850:

CH 128:

<b>MODE</b>	TX channel 128	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1648.000	-29.77	-33.02	-13.00	-16.77	3.25	Peak	Horizontal
2	2472.600	-36.34	-44.36	-13.00	-23.34	8.02	Peak	Horizontal



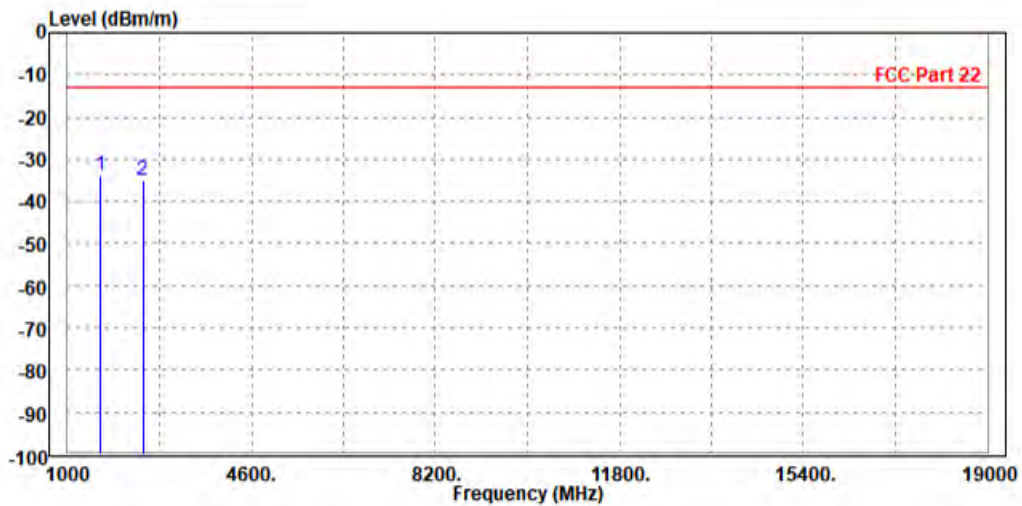


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VERITAS**

**Test Report No.: RF210603W002-1**

<b>MODE</b>	TX channel 128	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1648.000	-33.82	-37.20	-13.00	-20.82	3.38	Peak	Vertical
2	2472.600	-34.89	-41.93	-13.00	-21.89	7.04	Peak	Vertical





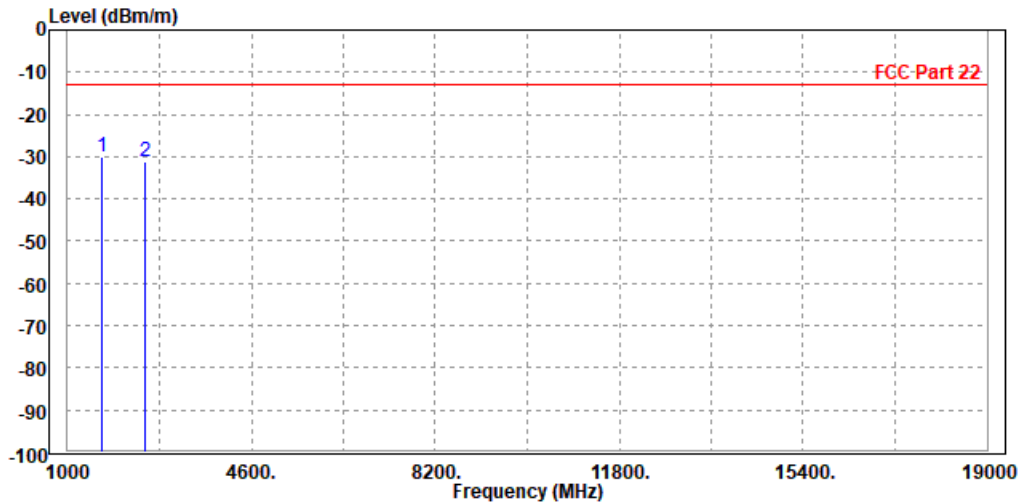
**BUREAU  
VERITAS**

Test Report No.: RF210603W002-1

**CH 189:**

<b>MODE</b>	TX channel 189	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1666.000	-30.11	-33.58	-13.00	-17.11	3.47	Peak	Horizontal
2	2509.200	-31.07	-39.13	-13.00	-18.07	8.06	Peak	Horizontal



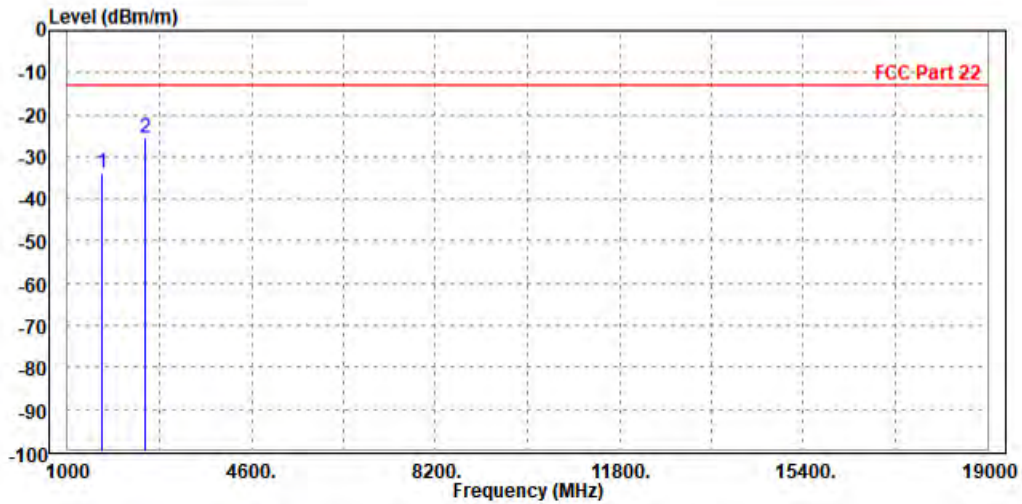


**BUREAU  
VERITAS**

Test Report No.: RF210603W002-1

<b>MODE</b>	TX channel 189	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1666.000	-33.99	-37.53	-13.00	-20.99	3.54	Peak	Vertical
2 PP	2509.200	-25.56	-32.66	-13.00	-12.56	7.10	Peak	Vertical





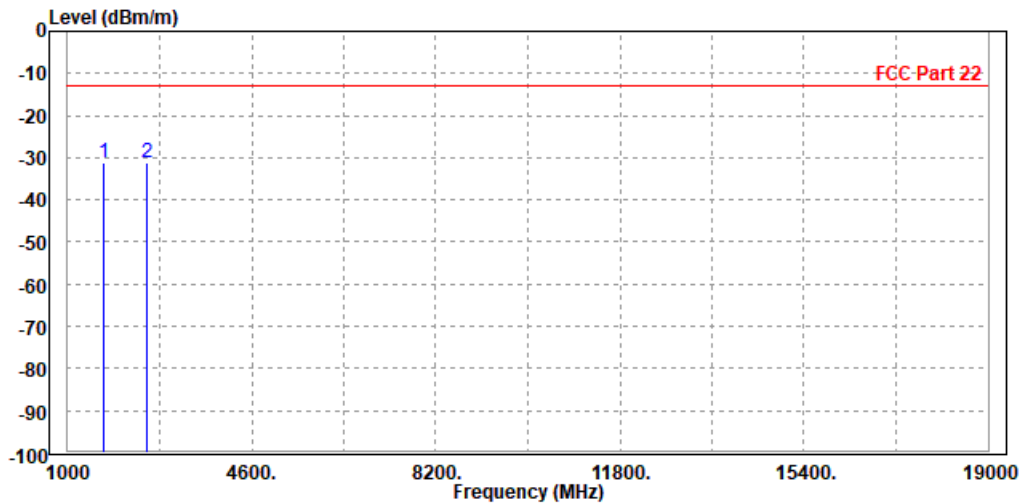
**BUREAU  
VERITAS**

**Test Report No.: RF210603W002-1**

**CH 251:**

<b>MODE</b>	TX channel 251	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1702.000	-31.18	-35.09	-13.00	-18.18	3.91	Peak	Horizontal
2	2546.400	-31.22	-39.33	-13.00	-18.22	8.11	Peak	Horizontal



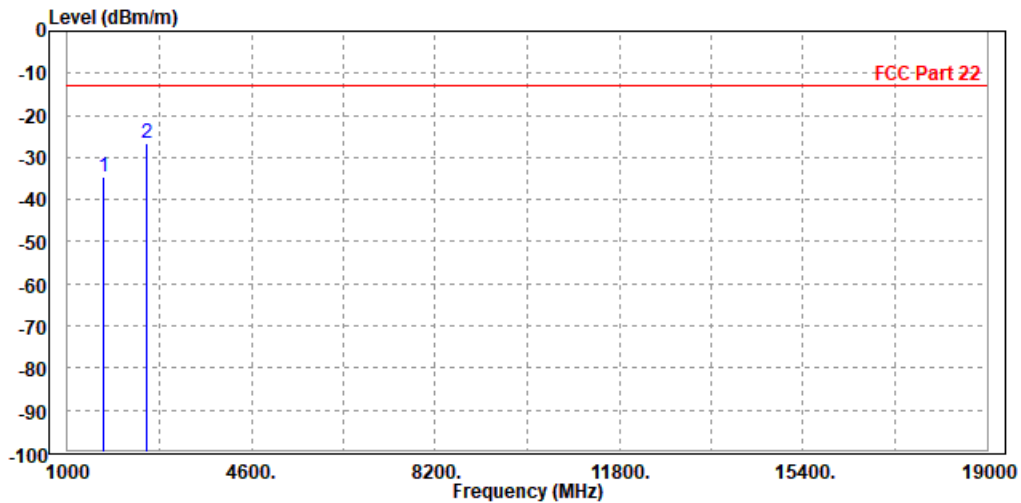


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VERITAS**

**Test Report No.: RF210603W002-1**

<b>MODE</b>	TX channel 251	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1702.000	-34.47	-38.34	-13.00	-21.47	3.87	Peak	Vertical
2 PP	2546.400	-26.66	-33.88	-13.00	-13.66	7.22	Peak	Vertical







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VERITAS**

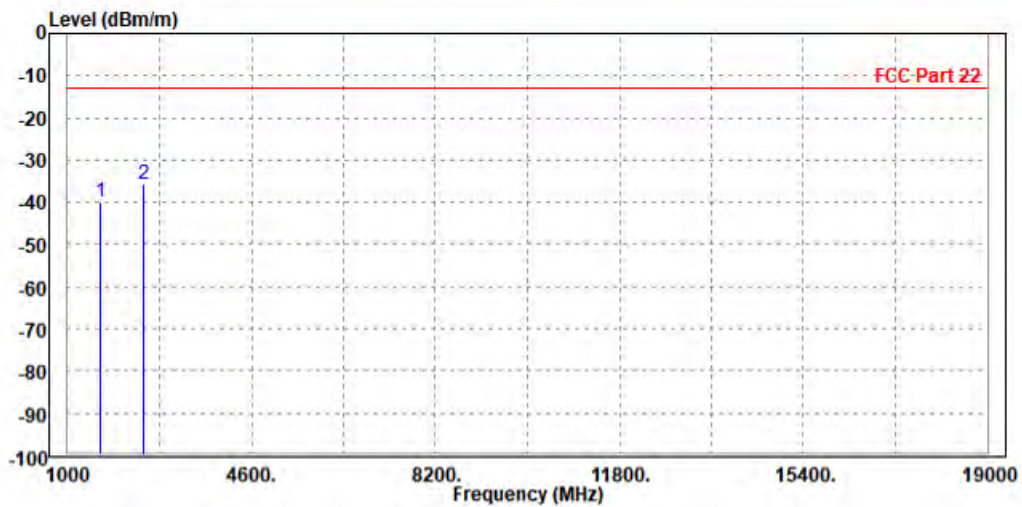
Test Report No.: RF210603W002-1

WCDMA Band V:

CH 4132:

<b>MODE</b>	TX channel 4132	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Rose Ma		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1648.000	-40.05	-43.30	-13.00	-27.05	3.25	Peak	Horizontal
2 PP	2479.200	-35.66	-43.69	-13.00	-22.66	8.03	Peak	Horizontal



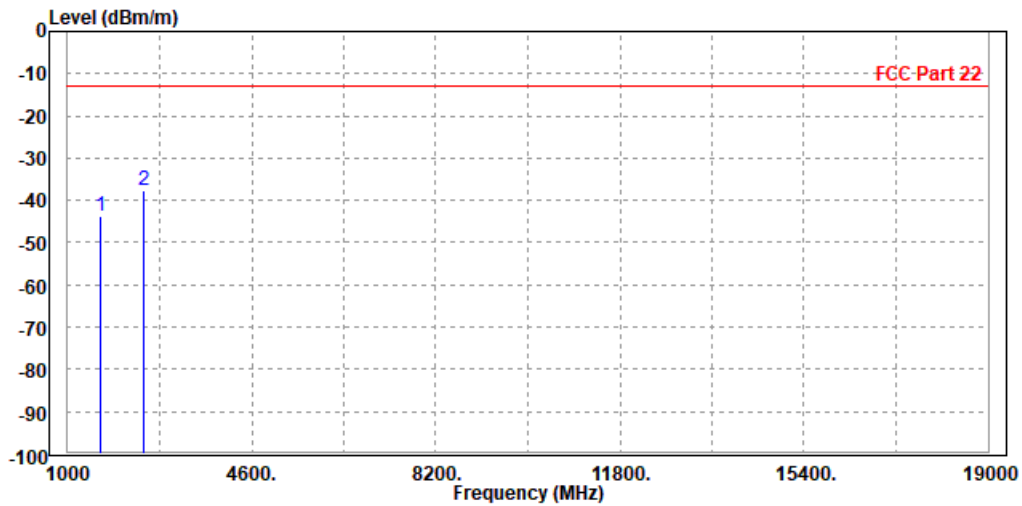


**BUREAU  
VERITAS**

**Test Report No.: RF210603W002-1**

<b>MODE</b>	TX channel 4132	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Rose Ma		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1648.000	-43.70	-47.08	-13.00	-30.70	3.38	Peak	Vertical
2 PP	2479.200	-37.71	-44.76	-13.00	-24.71	7.05	Peak	Vertical





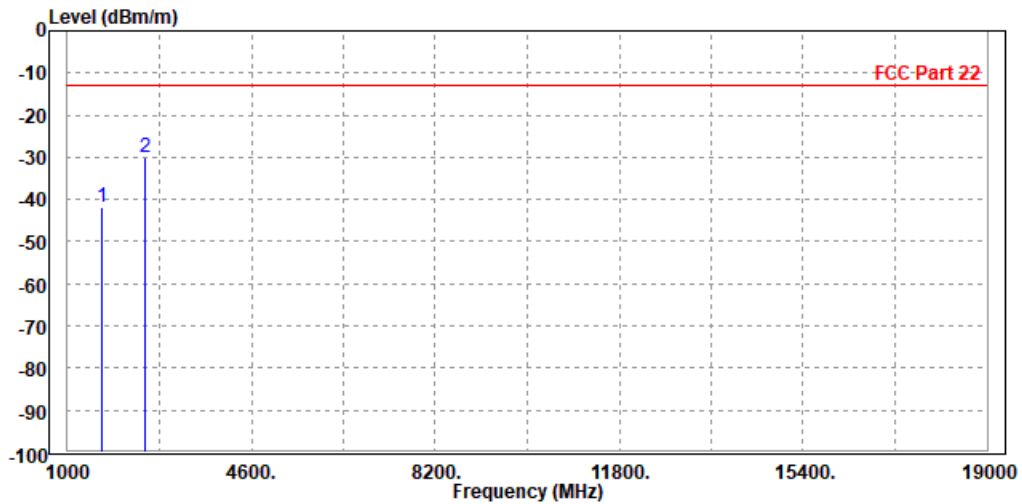
**BUREAU  
VERITAS**

**Test Report No.: RF210603W002-1**

**CH 4182:**

<b>MODE</b>	TX channel 4182	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Rose Ma		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1666.000	-41.66	-45.13	-13.00	-28.66	3.47	Peak	Horizontal
2 PP	2509.200	-29.98	-38.04	-13.00	-16.98	8.06	Peak	Horizontal



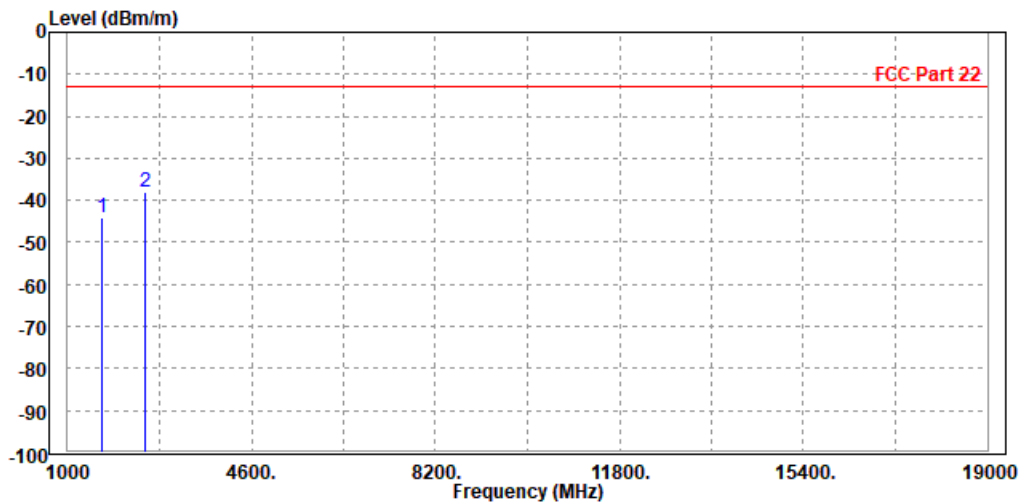


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VERITAS**

**Test Report No.: RF210603W002-1**

<b>MODE</b>	TX channel 4182	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Rose Ma		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1666.000	-44.27	-47.81	-13.00	-31.27	3.54	Peak	Vertical
2 PP	2509.200	-37.95	-45.05	-13.00	-24.95	7.10	Peak	Vertical





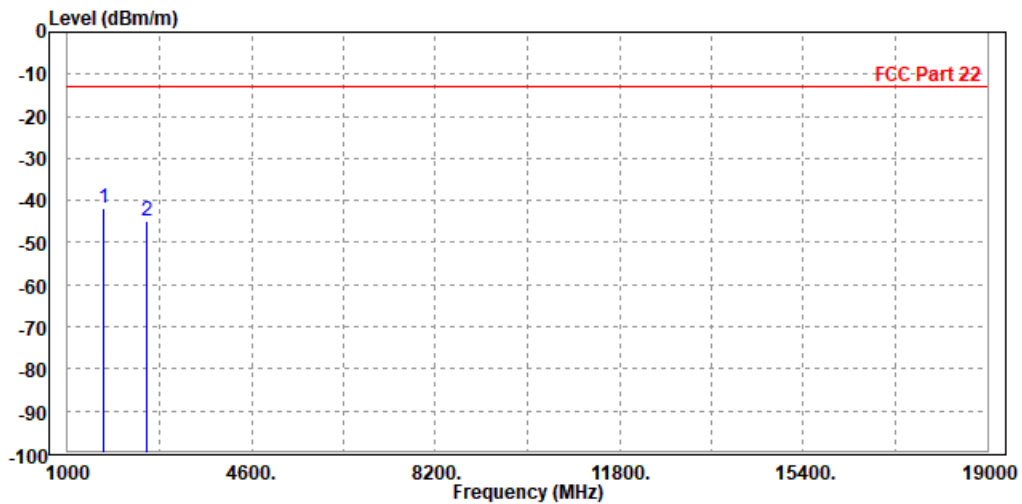
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VERITAS**

**Test Report No.: RF210603W002-1**

**CH 4233:**

<b>MODE</b>	TX channel 4233	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Rose Ma		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1702.000	-41.89	-45.80	-13.00	-28.89	3.91	Peak	Horizontal
2	2539.800	-44.91	-53.01	-13.00	-31.91	8.10	Peak	Horizontal



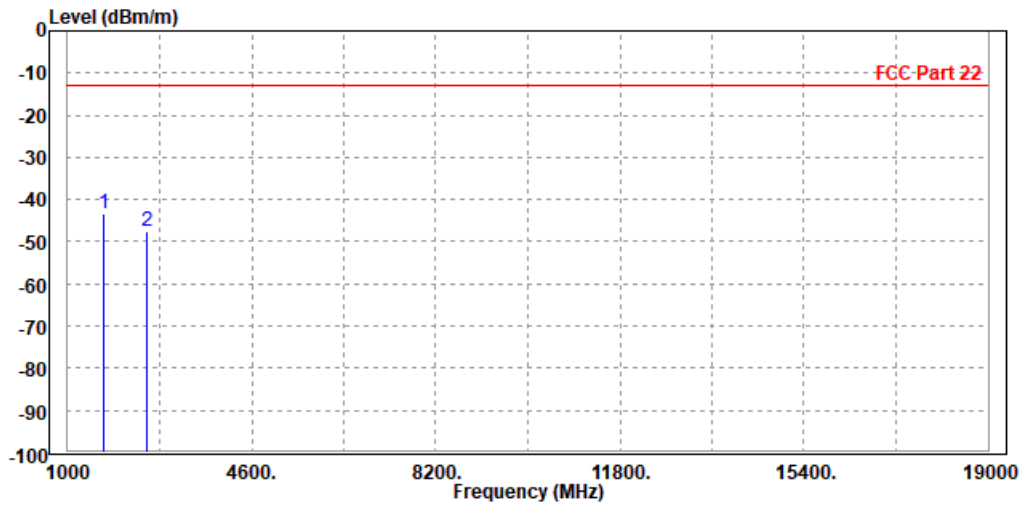


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VERITAS**

**Test Report No.: RF210603W002-1**

<b>MODE</b>	TX channel 4233	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Rose Ma		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1702.000	-43.39	-47.26	-13.00	-30.39	3.87	Peak	Vertical
2	2539.800	-47.69	-54.89	-13.00	-34.69	7.20	Peak	Vertical





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VERITAS**

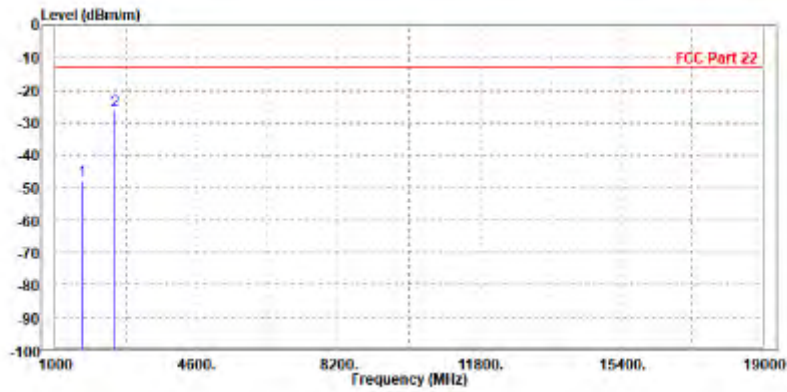
Test Report No.: RF210603W002-1

LTE Band 5

CHANNEL BANDWIDTH: 1.4MHz / QPSK

<b>MODE</b>	TX channel 20525	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1666.000	-47.78	-51.25	-13.00	-34.78	3.47	Peak	Horizontal
2 PP	2509.500	-26.14	-34.20	-13.00	-13.14	8.06	Peak	Horizontal



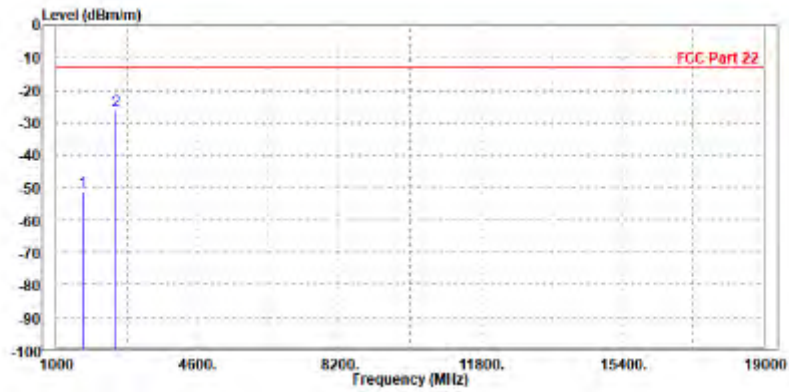


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VERITAS**

**Test Report No.: RF210603W002-1**

<b>MODE</b>	TX channel 20525	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1666.000	-51.31	-54.85	-13.00	-38.31	3.54	Peak	Vertical
2	PP 2509.500	-26.39	-33.49	-13.00	-13.39	7.10	Peak	Vertical







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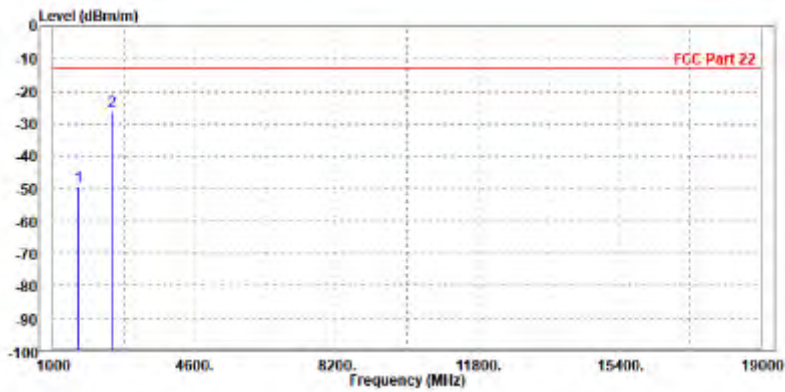
Test Report No.: RF210603W002-1

**CHANNEL BANDWIDTH: 3MHz / QPSK**

**CH 20415**

<b>MODE</b>	TX channel 20415	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1648.888	-49.42	-52.67	-13.08	-36.42	3.25	Peak	Horizontal
2 PP	2476.588	-26.48	-34.43	-13.08	-13.48	8.83	Peak	Horizontal



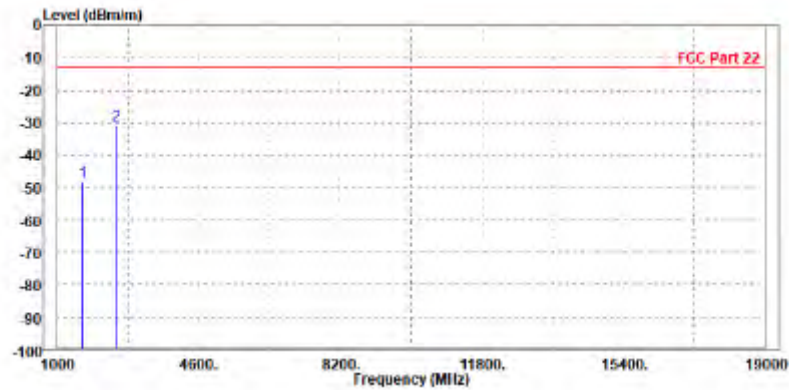


BUREAU VERITAS

Test Report No.: RF210603W002-1

MODE	TX channel 20415	FREQUENCY RANGE	Above 1000MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70%RH	INPUT POWER	DC 12V
TESTED BY	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	PoI/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1648.000	-48.23	-51.61	-13.00	-35.23	3.38	Peak	Vertical
2 PP	2476.500	-30.72	-37.76	-13.00	-17.72	7.04	Peak	Vertical





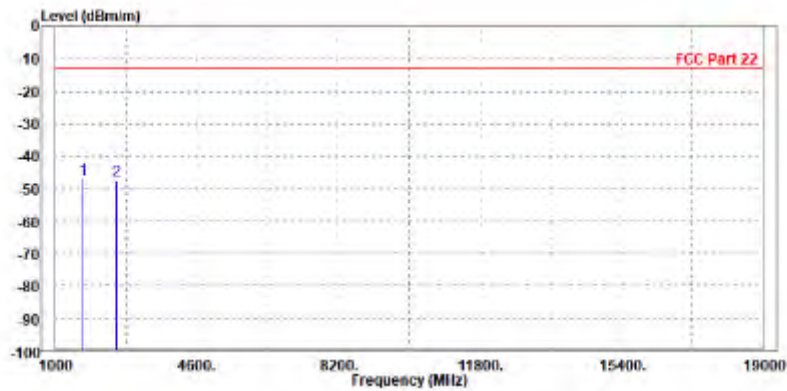
**BUREAU  
VERITAS**

Test Report No.: RF210603W002-1

**CH 20635**

<b>MODE</b>	TX channel 20635	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	PoI/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1702.000	-47.07	-50.98	-13.00	-34.07	3.91	Peak	Horizontal
2	2542.500	-47.38	-55.48	-13.00	-34.38	8.10	Peak	Horizontal



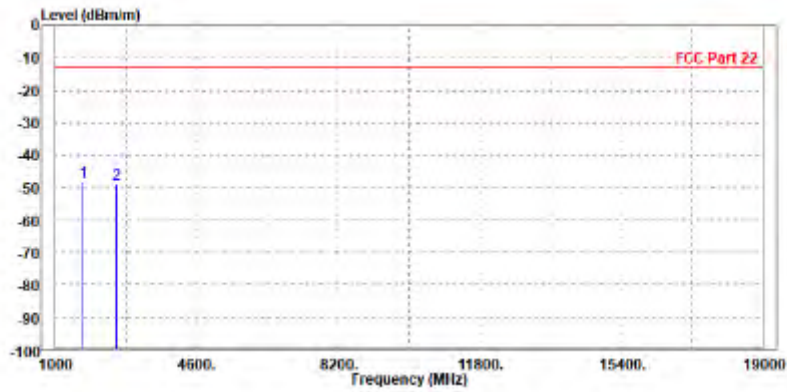


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VERITAS**

Test Report No.: RF210603W002-1

<b>MODE</b>	TX channel 20635	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	PoI/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	PP 1702.000	48.29	-52.16	-13.00	-35.29	3.87	Peak	Vertical
2	2542.500	49.18	-56.39	-13.00	-36.18	7.21	Peak	Vertical





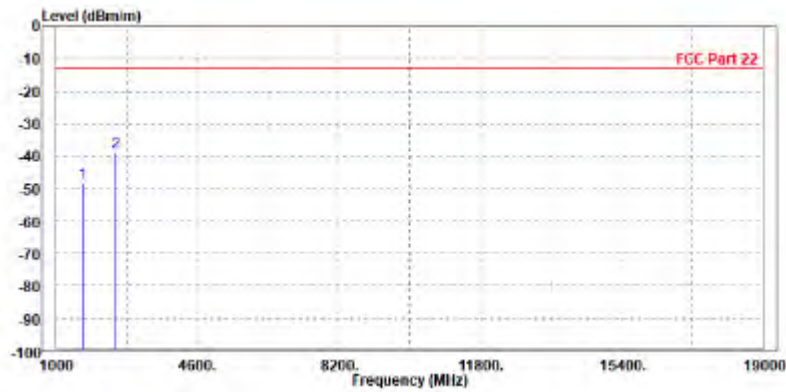
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Test Report No.: RF210603W002-1

**CHANNEL BANDWIDTH: 5MHz / QPSK**

<b>MODE</b>	TX channel 20525	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1666.000	-48.11	-51.58	-13.00	-35.11	3.47	Peak	Horizontal
2 PP	2509.500	-38.77	-46.83	-13.00	-25.77	8.06	Peak	Horizontal



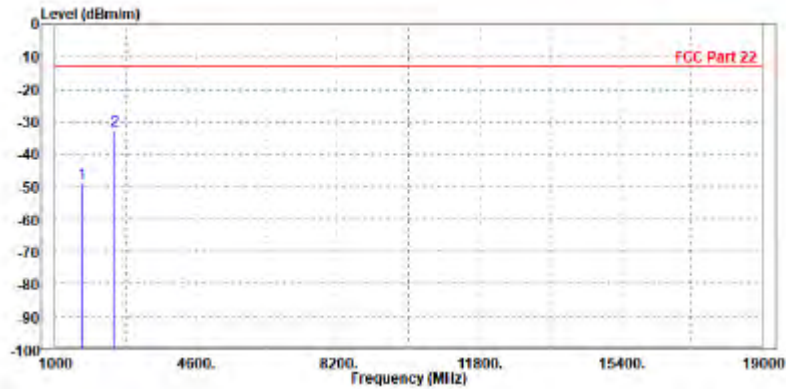


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VERITAS**

Test Report No.: RF210603W002-1

<b>MODE</b>	TX channel 20525	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1666.000	-49.19	-52.73	13.00	-36.19	3.54	Peak	Vertical
2 PP	2509.500	-32.77	-39.87	-13.00	-19.77	7.10	Peak	Vertical





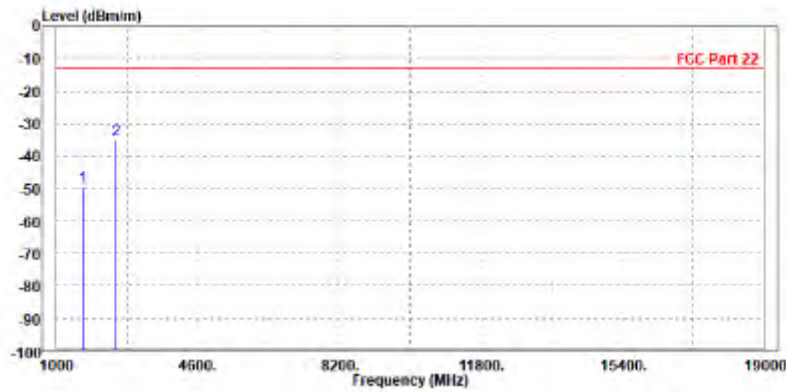
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VERITAS**

Test Report No.: RF210603W002-1

**CHANNEL BANDWIDTH: 10MHz / QPSK**

<b>MODE</b>	TX channel 20525	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1666.000	-49.51	-52.98	-13.00	-36.51	3.47	Peak	Horizontal
2 PP	2509.500	-35.00	-43.06	-13.00	-22.00	8.06	Peak	Horizontal



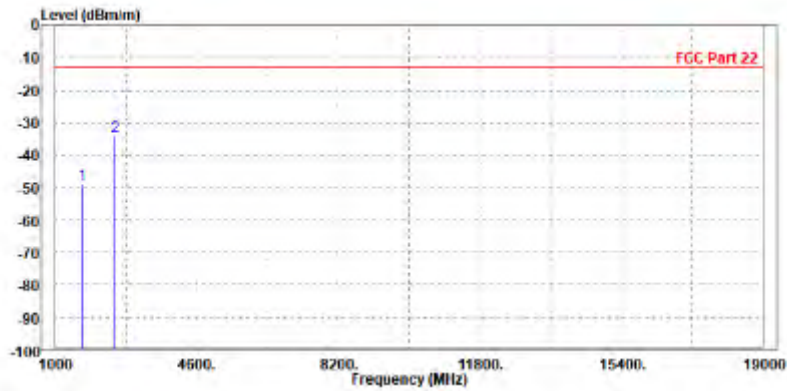


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**Test Report No.: RF210603W002-1**

<b>MODE</b>	TX channel 20525	<b>FREQUENCY RANGE</b>	Above 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70%RH	<b>INPUT POWER</b>	DC 12V
<b>TESTED BY</b>	Jace Hu		
<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>			

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark	Pol/Phase
	MHz	dBm/m	dBm	dBm/m	dB	dB/m		
1	1666.000	-48.96	-52.50	-13.00	-35.96	3.54	Peak	Vertical
2 PP	2509.500	-34.12	-41.22	-13.00	-21.12	7.10	Peak	Vertical



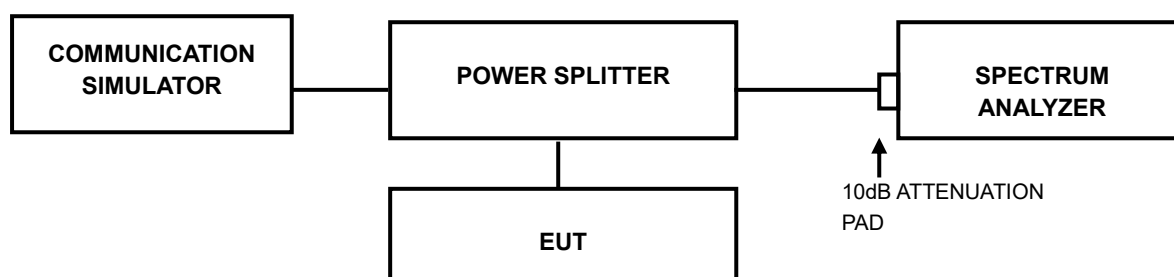


### 3.7 PEAK TO AVERAGE RATIO

#### 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%.



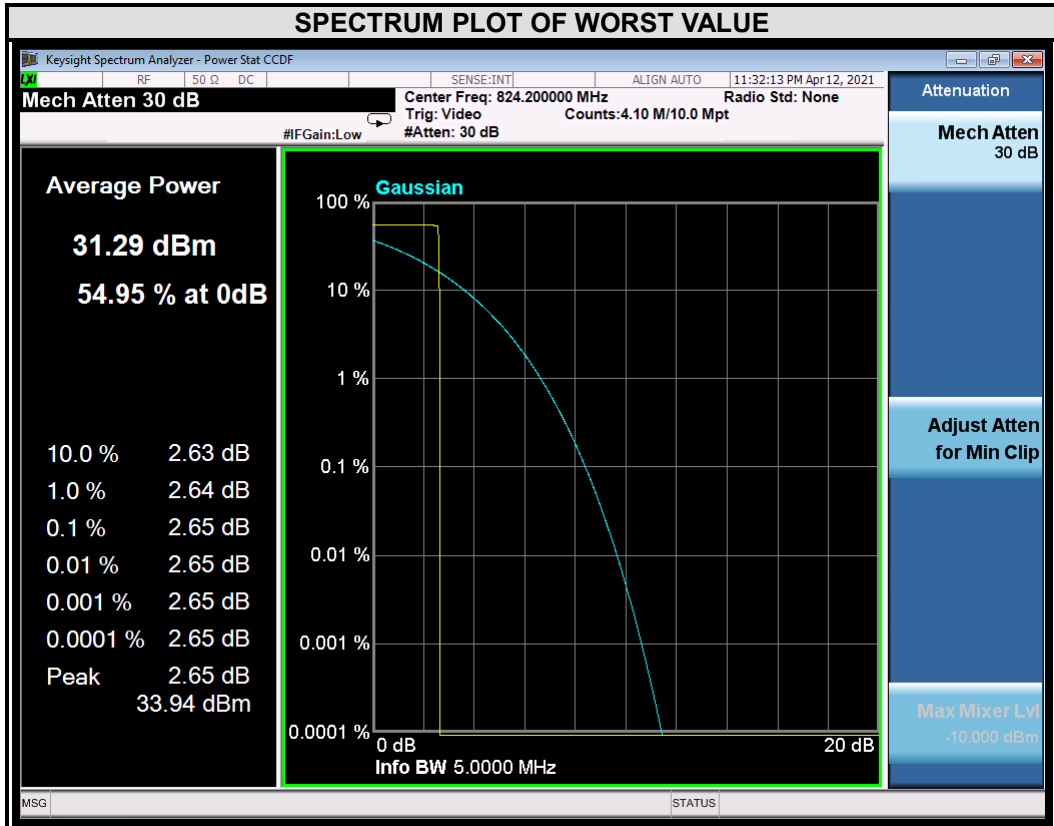
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Test Report No.: RF210603W002-1

### 3.7.4 TEST RESULTS

#### GPRS

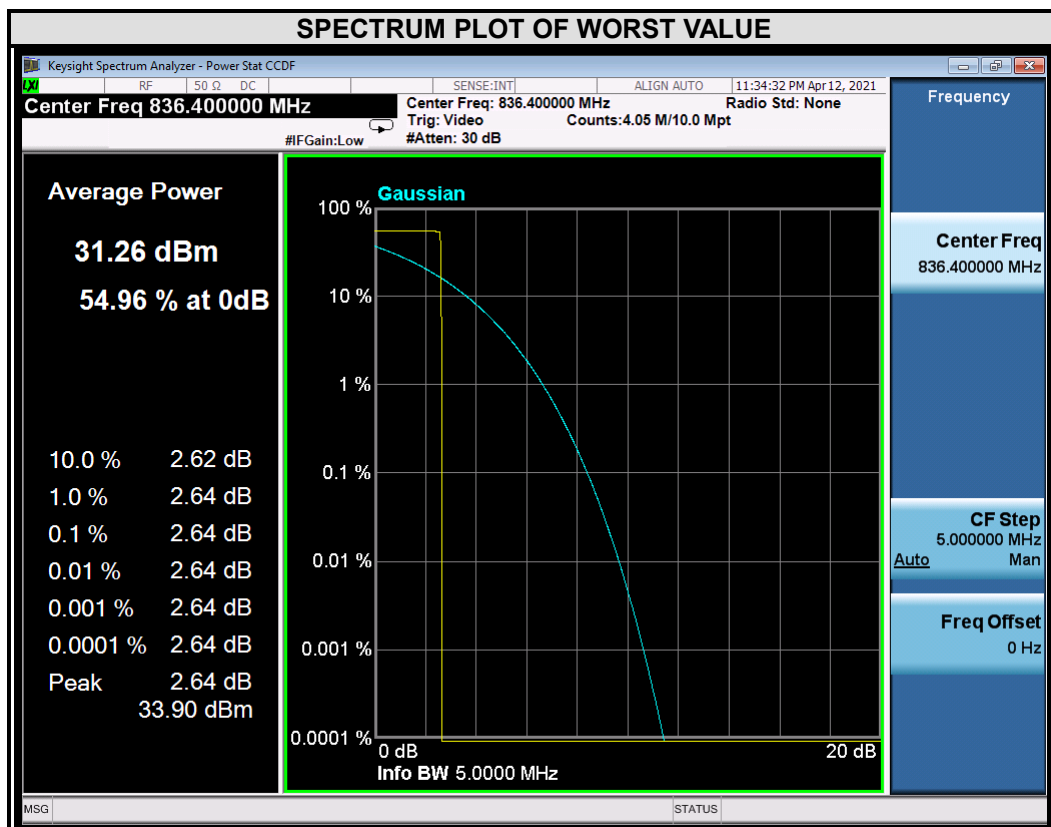
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
128	824.2	2.65





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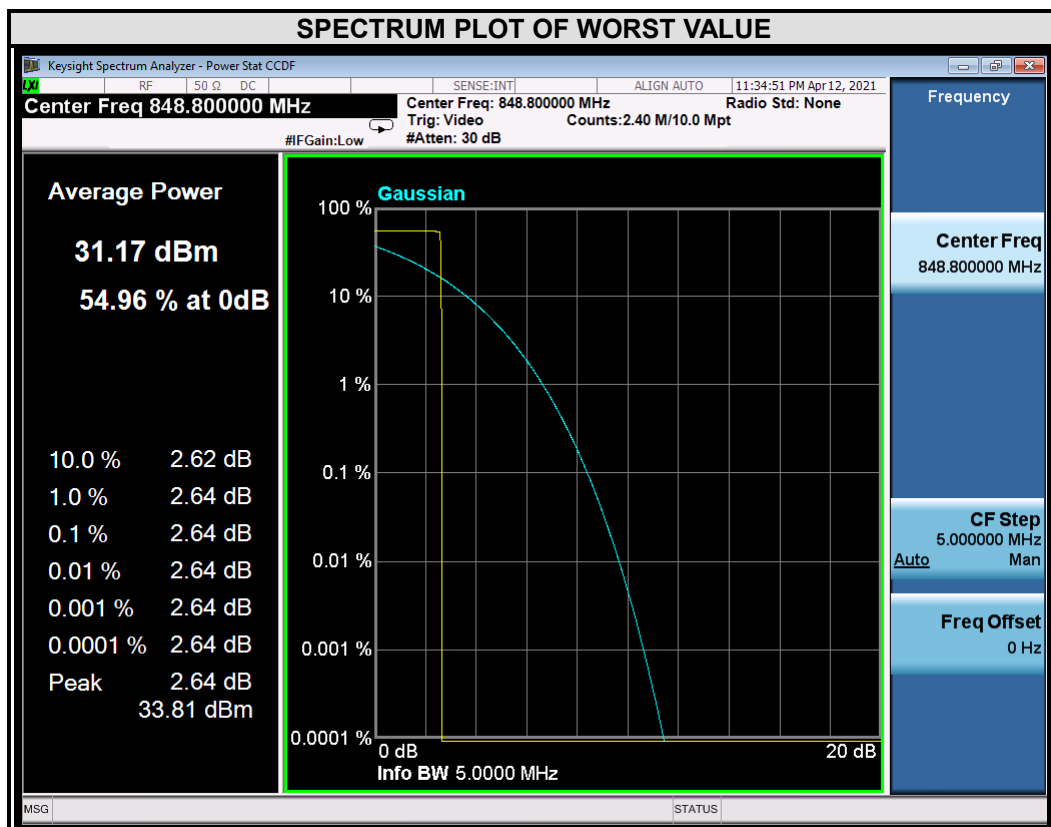
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
189	836.4	2.64





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CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
251	848.8	2.64



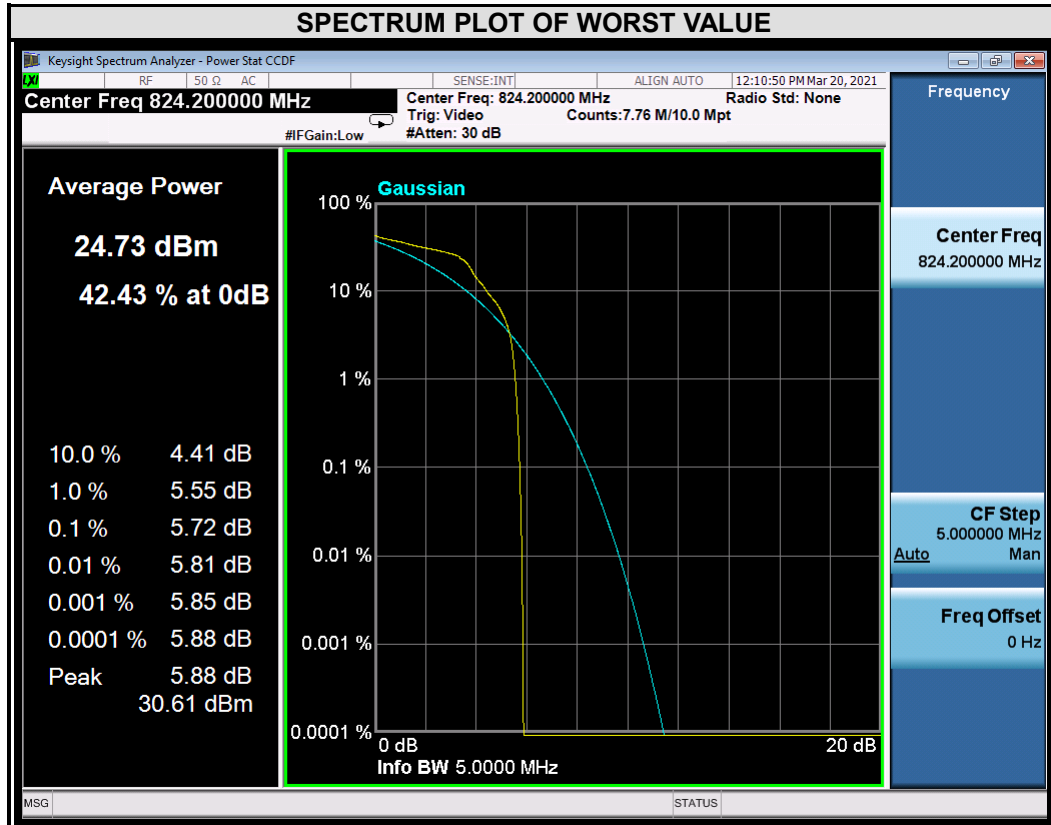


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Test Report No.: RF210603W002-1

EDGE

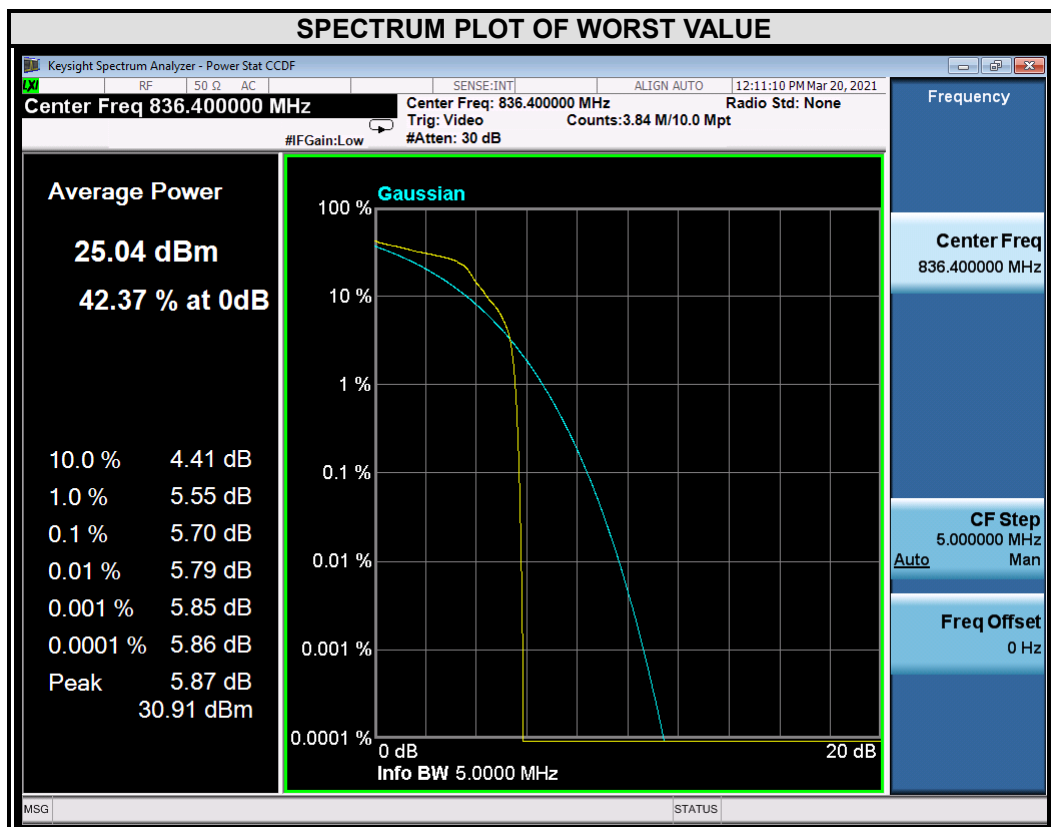
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
128	824.2	5.72





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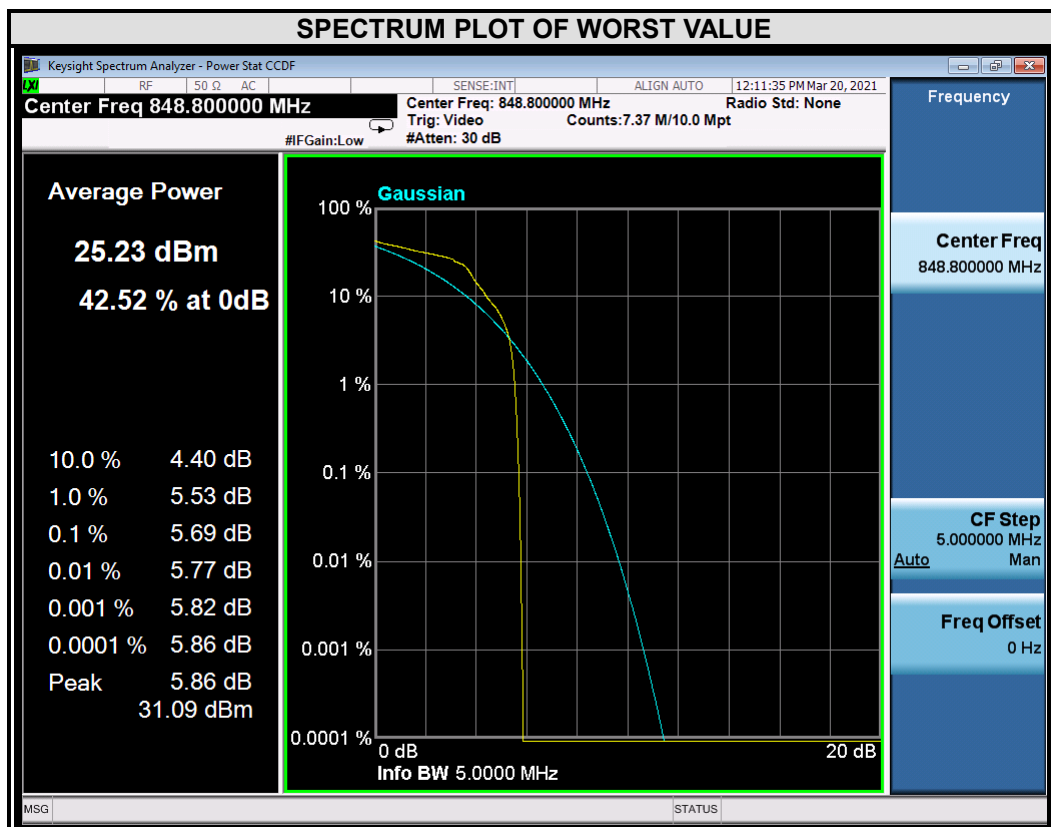
CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
189	836.4	5.70





Test Report No.: RF210603W002-1

CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
251	848.8	5.69



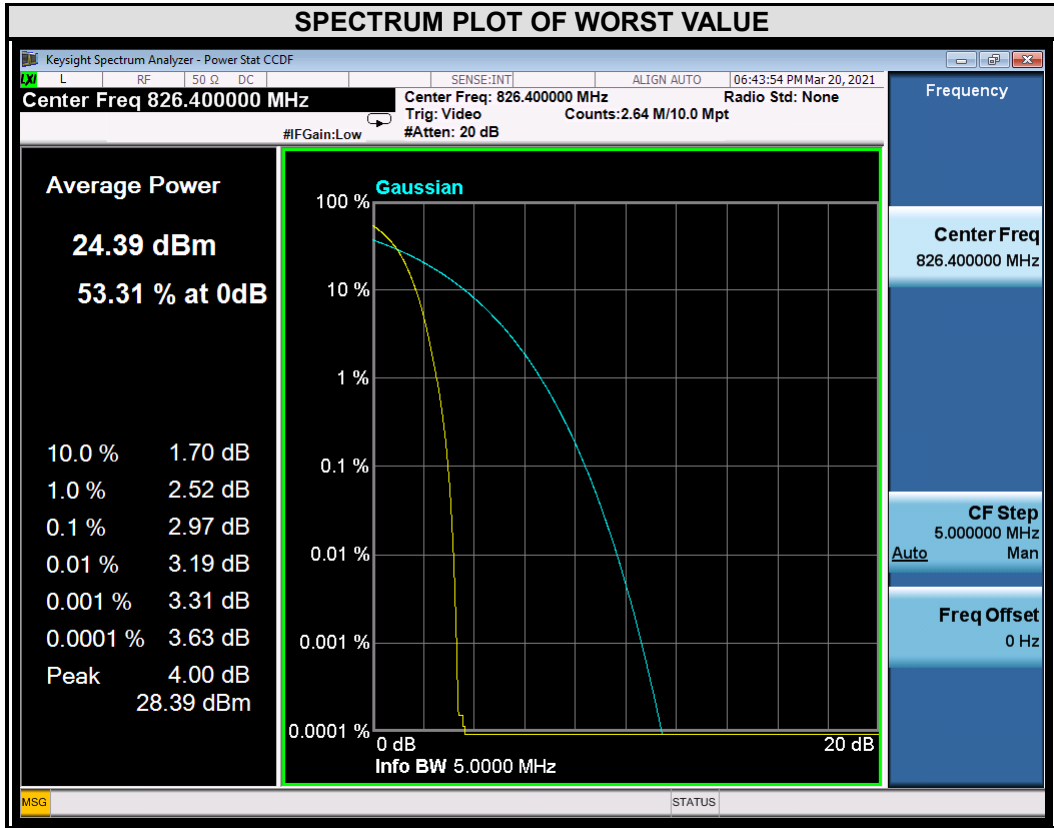


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Test Report No.: RF210603W002-1

WCDMA

CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
4132	826.4	2.97



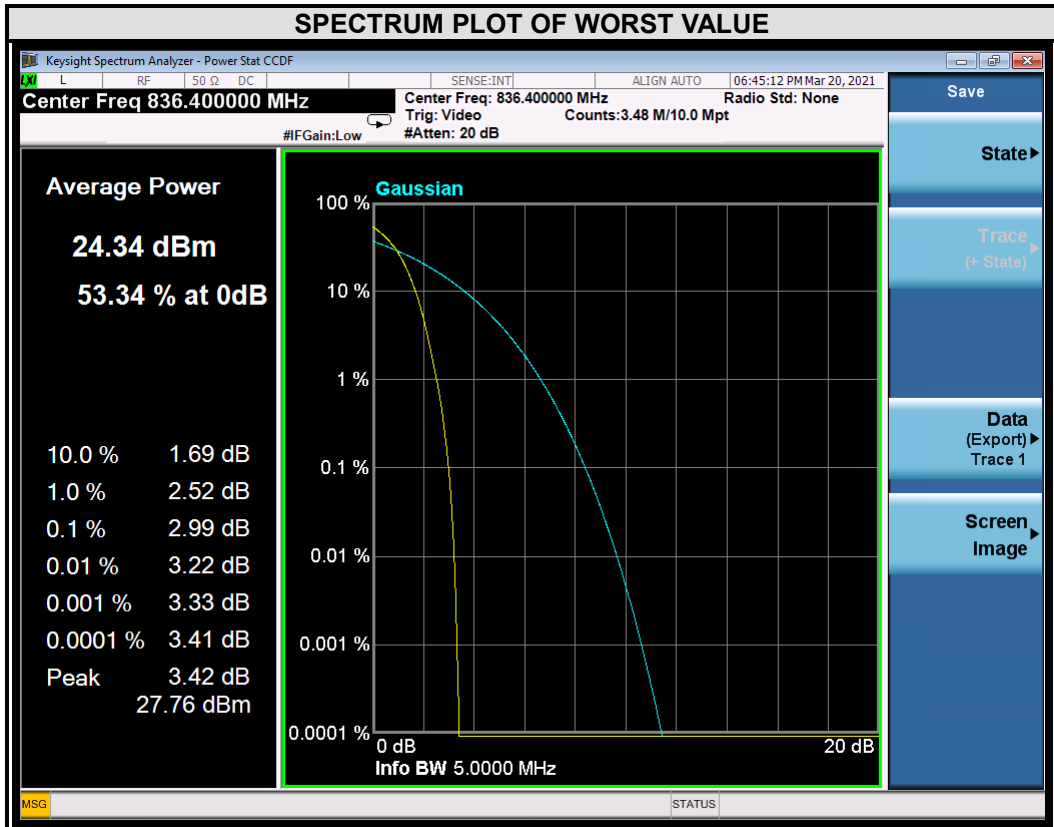




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Test Report No.: RF210603W002-1

CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
4182	836.4	2.99

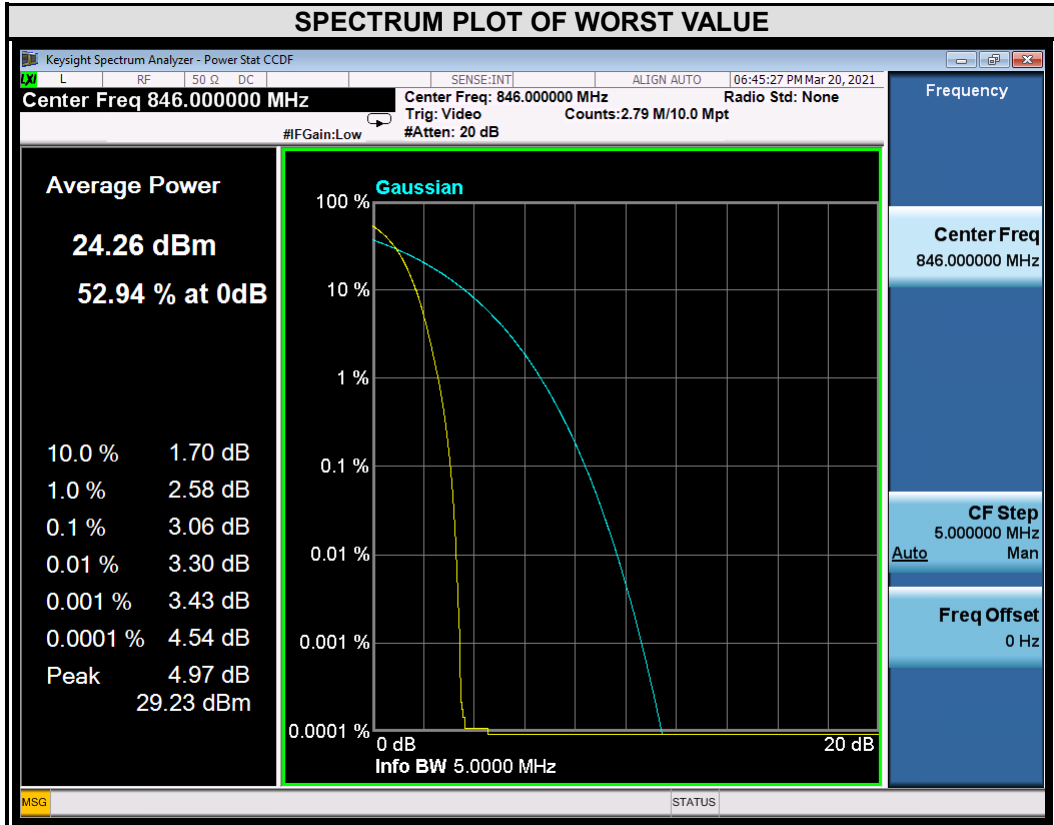




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CHANNEL	FREQUENCY (MHz)	PEAK TO AVERAGE RATIO (dB)
4233	846.6	3.06



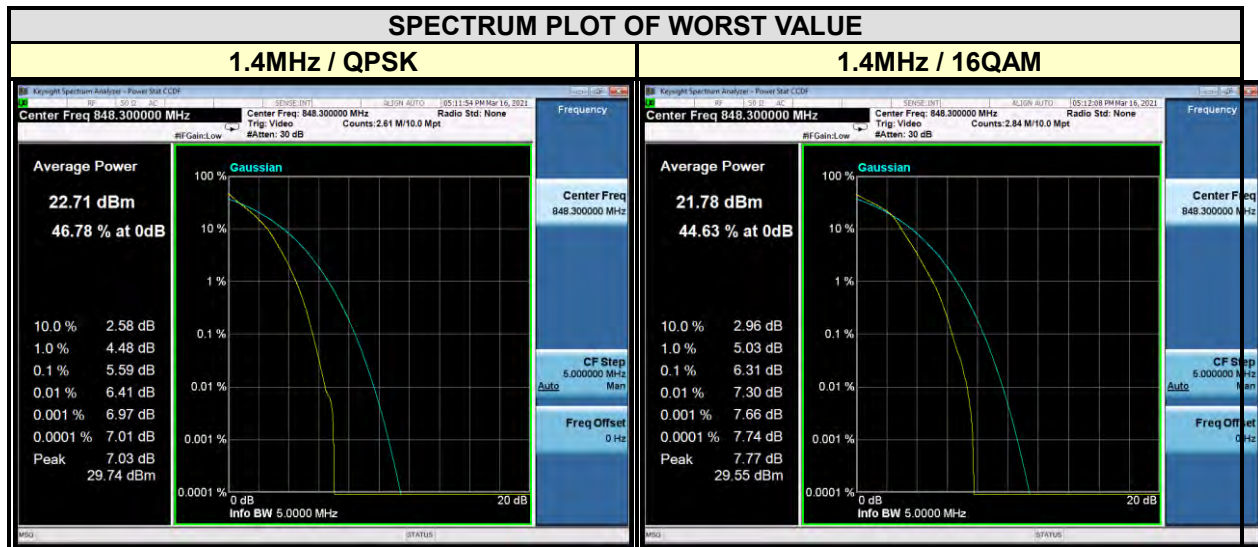


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**LTE BAND 5**

CHANNEL BANDWIDTH: 1.4MHz			
CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM
20407	824.7	5.18	6.05
20525	836.5	5.48	6.22
20643	848.3	5.59	6.31

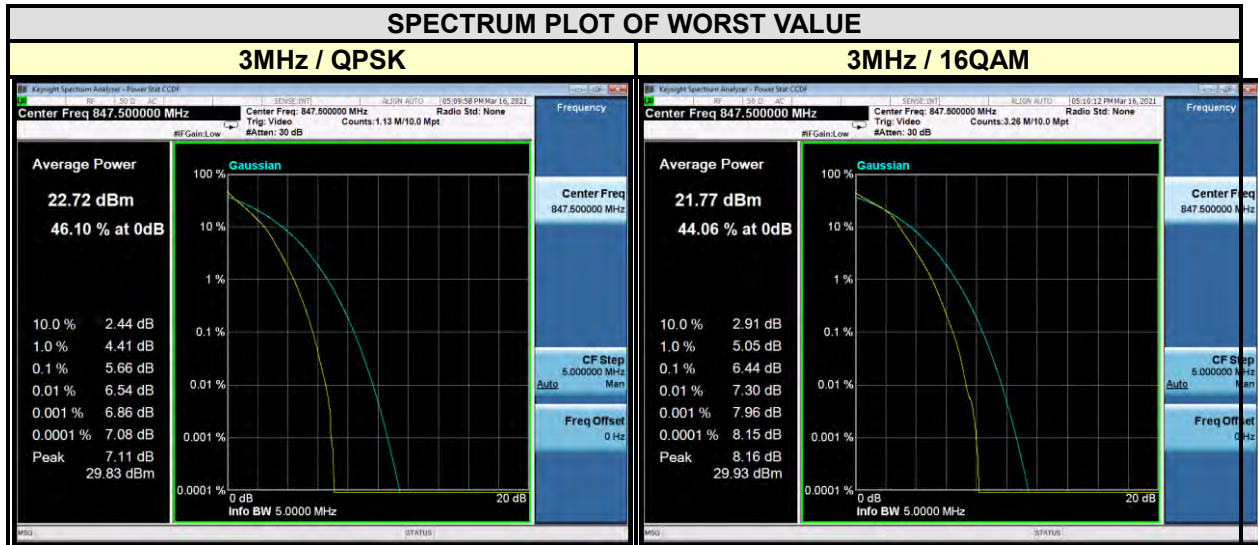




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VERITAS**

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CHANNEL BANDWIDTH: 3MHz			
CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM
20415	825.5	5.32	6.17
20525	836.5	5.49	6.30
20635	847.5	5.66	6.44

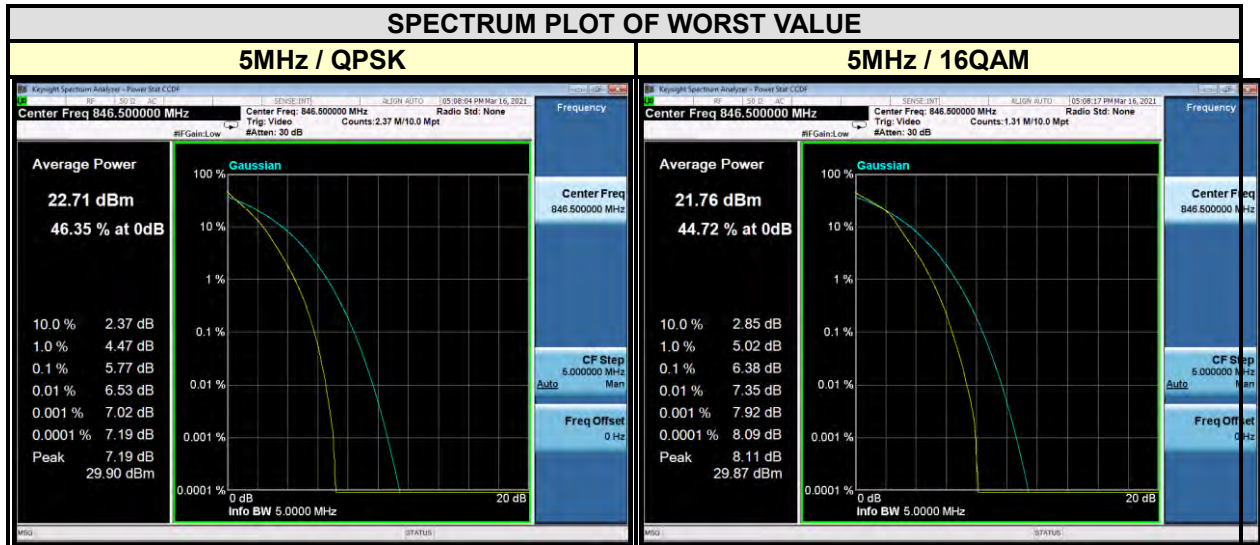




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VERITAS**

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CHANNEL BANDWIDTH: 5MHz			
CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM
20425	826.5	5.57	6.29
20525	836.5	5.64	6.34
20625	846.5	5.77	6.38

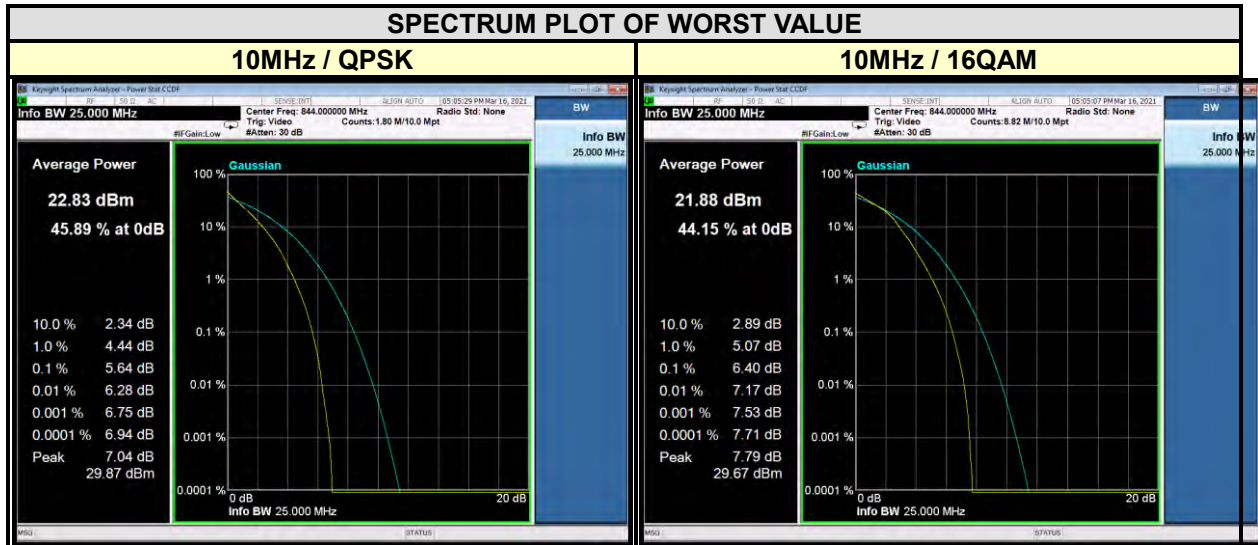




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CHANNEL BANDWIDTH: 10MHz			
CHANNEL	Frequency (MHz)	PEAK TO AVERAGE RATIO (dB)	
		QPSK	16QAM
20450	829	5.55	6.27
20525	836.5	5.54	6.32
20600	844	5.64	6.40





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## 4 PHOTOGRAPHS OF THE TEST CONFIGURATION

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



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## 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:

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**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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## **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---**