

FCC Test Report

(PART 24)

Report No.: RF181205C09-4

FCC ID: 2AP3D-CT001

Test Model: CT001

Received Date: Dec. 05, 2018

Test Date: Feb. 18, 2019 ~ Feb. 26, 2019

Issued Date: Mar. 08, 2019

Applicant: Spotify USA, Inc.

Address: 45 West 18th Street, New York, NY 10011, USA

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
(R.O.C)

Test Location (1): No. 19, Hwa Ya 2nd Rd, Wen Hwa Vil, Kwei Shan Dist., Taoyuan City
33383, Taiwan (R.O.C)

Test Location (2): B2F., No.215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231,
Taiwan, R.O.C

**FCC Registration /
Designation Number:** 427177 / TW0011



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Release Control Record

Issue No.	Description	Date Issued
RF181205C09-4	Original Release	Mar. 08, 2019

1 Certificate of Conformity

Product: Music Streaming Device

Brand: Spotify

Test Model: CT001


Sample Status: Engineering Sample


Applicant: Spotify USA, Inc.

Test Date: Feb. 18, 2019 ~ Feb. 26, 2019

Standards: FCC Part 24, Subpart E

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : , **Date:** Mar. 08, 2019
Ivonne Wu / Supervisor

Approved by : , **Date:** Mar. 08, 2019
Dylan Chiou / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 24 & Part 2			
FCC Clause	Test Item	Result	Remarks
2.1046 24.232	Effective Isotropic Radiated Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Meet the requirement.
2.1046 24.232(d)	Peak to Average Ratio	Pass	Meet the requirement of limit.
2.1055 24.235	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
24.238	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 24.238	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 24.238	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -27.94 dB at 89.94 MHz.

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 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	Frequency	Expanded Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.0153 dB
	200 MHz ~ 1000 MHz	2.0224 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	1.0121 dB
	18 GHz ~ 40 GHz	1.1508 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent Technologies	N9038A	MY52260177	Aug. 20, 2018	Aug. 19, 2019
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	100115	Jan. 21, 2019	Jan. 20, 2020
Spectrum Analyzer ROHDE & SCHWARZ	FSW26	102023	Oct. 11, 2018	Oct. 10, 2019
BILOG Antenna SCHWARZBECK	VULB9168	9168-616	Nov. 27, 2018	Nov. 26, 2019
HORN Antenna ETS-Lindgren	3117	00143293	Nov. 25, 2018	Nov. 24, 2019
HORN Antenna SCHWARZBECK	BBHA9170	9170-480	Nov. 25, 2018	Nov. 24, 2019
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-969	Nov. 25, 2018	Nov. 24, 2019
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 16, 2018	Apr. 15, 2019
MXG Vector signal generator Agilent	N5182B	MY53050430	Nov. 19, 2018	Nov. 18, 2019
Preamplifier Agilent	310N	187226	Jun. 19, 2018	Jun. 18, 2019
Preamplifier Agilent	83017A	MY39501357	Jun. 19, 2018	Jun. 18, 2019
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RF C-SMS-100-SMS- 120+RFC-SMS-1 00-SMS-400)	Jun. 19, 2018	Jun. 18, 2019
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(RF C-SMS-100-SMS- 24)	Jun. 19, 2018	Jun. 18, 2019
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Software BV ADT	E3 8.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA
Communications Tester-Wireless Agilent	8960 Series 10	MY53201073	Jun. 28, 2017	Jun. 27, 2019
Radio Communication Analyzer Anritsu	MT8820C	6201300640	Aug. 16, 2017	Aug. 15, 2019
Temperature & Humidity Chamber	GTH-120-40-CP-AR	MAA1306-019	Sep. 05, 2018	Sep. 04, 2019
True RMS Clamp Meter Fluke	325	31130711WS	May 22, 2018	May 21, 2019
Power Supply Agilent	66319D	MY43005576	Oct. 19, 2018	Oct. 18, 2019

- Note:
1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HsinTien Chamber 1.
 3. The horn antenna and preamplifier (model: 83017A) are used only for the measurement of emission frequency above 1 GHz if tested.
 4. The IC Site Registration No. is 7450I-1.

3 General Information

3.1 General Description of EUT

Product	Music Streaming Device	
Brand	Spotify	
Test Model	CT001	
Status of EUT	Engineering Sample	
Power Supply Rating	2.4 Vdc (battery) 5.0 Vdc (host equipment)	
Modulation Type	WCDMA	QPSK
	LTE	QPSK, 16QAM
Frequency Range	WCDMA	1852.4 ~ 1907.6 MHz
	LTE Band 2 (Channel Bandwidth: 1.4 MHz)	1850.7 ~ 1909.3 MHz
	LTE Band 2 (Channel Bandwidth: 3 MHz)	1851.5 ~ 1908.5 MHz
	LTE Band 2 (Channel Bandwidth: 5 MHz)	1852.5 ~ 1907.5 MHz
	LTE Band 2 (Channel Bandwidth: 10 MHz)	1855.0 ~ 1905.0 MHz
	LTE Band 2 (Channel Bandwidth: 15 MHz)	1857.5 ~ 1902.5 MHz
	LTE Band 2 (Channel Bandwidth: 20 MHz)	1860.0 ~ 1900.0 MHz
Max. EIRP Power	WCDMA	196.79 mW
	LTE Band 2 (Channel Bandwidth: 1.4 MHz)	185.48 mW
	LTE Band 2 (Channel Bandwidth: 3 MHz)	181.55 mW
	LTE Band 2 (Channel Bandwidth: 5 MHz)	188.93 mW
	LTE Band 2 (Channel Bandwidth: 10 MHz)	190.68 mW
	LTE Band 2 (Channel Bandwidth: 15 MHz)	192.00 mW
	LTE Band 2 (Channel Bandwidth: 20 MHz)	193.78 mW
Emission Designator	WCDMA	4M18F9W
	LTE Band 2 (Channel Bandwidth: 1.4 MHz)	1M09D7W
	LTE Band 2 (Channel Bandwidth: 3 MHz)	2M70G7D
	LTE Band 2 (Channel Bandwidth: 5 MHz)	4M50D7W
	LTE Band 2 (Channel Bandwidth: 10 MHz)	8M97D7W
	LTE Band 2 (Channel Bandwidth: 15 MHz)	13M5G7D
	LTE Band 2 (Channel Bandwidth: 20 MHz)	18M0D7W
Antenna Type	PIFA Antenna with 0.1 dBi gain (Main) / -3.1 dBi (Aux.)	
Accessory Device	Refer to Note as below	
Data Cable Supplied	Refer to Note as below	

Note:

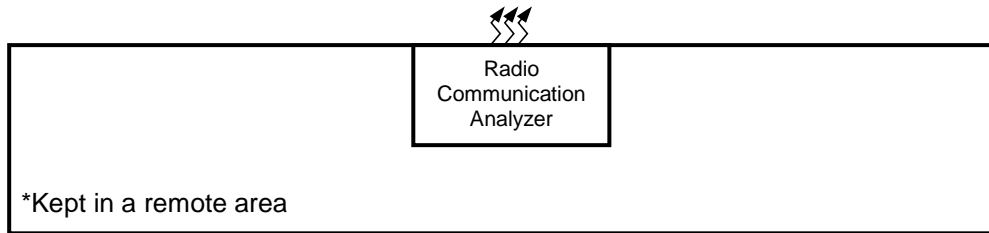
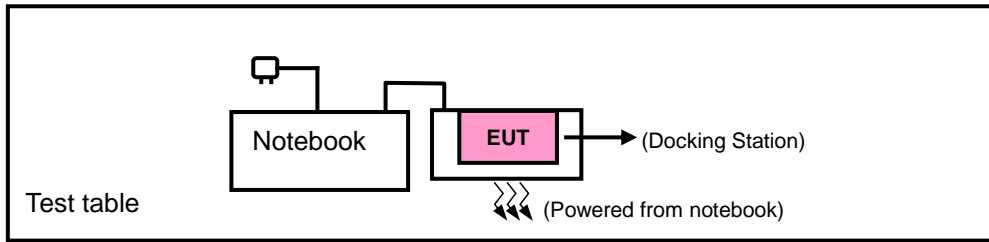
1. The EUT contains following accessory devices.

Product	Brand	Model	Description
12V to 5V car power supply	KYOHAYA	KC-D53	18W
Battery	Varta	V500HT	1.2 Vdc, 500 mAh
LCD Panel	AUO	H140QVT01.0	--
eMMC (=ROM)	Samsung	KMFE60012M-B214	16Gbyte
RAM	Samsung	KMFE60012M-B214	8Gbit LPDDR3
CPU	Qualcomm	MSM8909-4-504NSP	--
Docking station	In house design	N/A	P/N: 22222

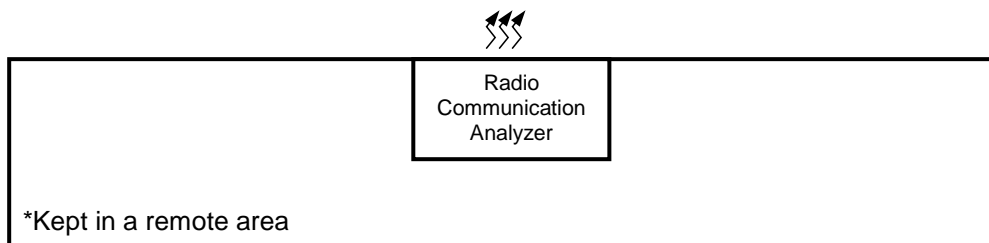
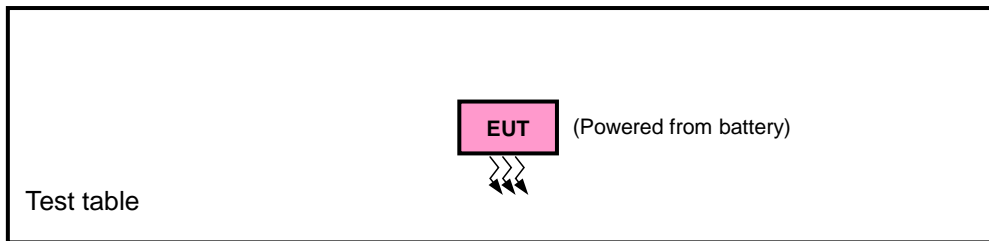
2. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3.2 Configuration of System under Test

<Radiated Emission Test>



<E.I.R.P. Test>



3.2.1 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	HTC	TC U250	100980	N/A
2.	Notebook	DELL	Inspiron 14R	8LRKKW1	N/A

No.	Signal Cable Description Of The Above Support Units
1.	N/A
2.	N/A

Note:

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

3.3 Test Mode Applicability and Tested Channel Detail

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 was found when positioned as the table below. Following channel(s) was (were) selected for the final test as listed below:

Band	EIRP	Radiated Emission
WCDMA	X-plane	Z-axis
LTE Band 2	X-plane	X-axis

WCDMA

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	EIRP	9262 to 9538	9262, 9400, 9538	WCDMA
-	Modulation Characteristics	9262 to 9538	9400	WCDMA
-	Frequency Stability	9262 to 9538	9262, 9538	WCDMA
-	Occupied Bandwidth	9262 to 9538	9262, 9400, 9538	WCDMA
-	Band Edge	9262 to 9538	9262, 9538	WCDMA
-	Peak to Average Ratio	9262 to 9538	9262, 9400, 9538	WCDMA
-	Conducted Emission	9262 to 9538	9262, 9400, 9538	WCDMA
-	Radiated Emission	9262 to 9538	9262, 9400, 9538	WCDMA

LTE Band 2

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Modulation Characteristics	18650 to 19150	18900	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
-	Frequency Stability	18607 to 19193	18607, 19193	1.4 MHz	QPSK	1 RB / 0 RB Offset
		18615 to 19185	18615, 19185	3 MHz	QPSK	1 RB / 0 RB Offset
		18625 to 19175	18625, 19175	5 MHz	QPSK	1 RB / 0 RB Offset
		18650 to 19150	18650, 19150	10 MHz	QPSK	1 RB / 0 RB Offset
		18675 to 19125	18675, 19125	15 MHz	QPSK	1 RB / 0 RB Offset
		18700 to 19100	18700, 19100	20 MHz	QPSK	1 RB / 0 RB Offset
-	Occupied Bandwidth	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3 MHz	QPSK, 16QAM	15 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15 MHz	QPSK, 16QAM	75 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20 MHz	QPSK, 16QAM	100 RB / 0 RB Offset
-	Peak to Average Ratio	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20 MHz	QPSK, 16QAM	1 RB / 0 RB Offset

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Band Edge	18607 to 19193	18607	1.4 MHz	QPSK	1 RB / 0 RB Offset
			19193	1.4 MHz	QPSK	6 RB / 0 RB Offset
		18615 to 19185	18615	3 MHz	QPSK	1 RB / 5 RB Offset
			19185	3 MHz	QPSK	6 RB / 0 RB Offset
		18625 to 19175	18625	5 MHz	QPSK	1 RB / 0 RB Offset
			19175	5 MHz	QPSK	15 RB / 0 RB Offset
		18650 to 19150	18625	5 MHz	QPSK	1 RB / 14 RB Offset
			19175	5 MHz	QPSK	15 RB / 0 RB Offset
		18650 to 19150	18625	5 MHz	QPSK	1 RB / 0 RB Offset
			19175	5 MHz	QPSK	25 RB / 0 RB Offset
		18650 to 19150	18650	10 MHz	QPSK	1 RB / 24 RB Offset
			19150	10 MHz	QPSK	25 RB / 0 RB Offset
		18675 to 19125	18650	10 MHz	QPSK	1 RB / 0 RB Offset
			19150	10 MHz	QPSK	50 RB / 0 RB Offset
		18675 to 19125	18675	15 MHz	QPSK	1 RB / 49 RB Offset
			19125	15 MHz	QPSK	50 RB / 0 RB Offset
		18700 to 19100	18675	15 MHz	QPSK	1 RB / 0 RB Offset
			19125	15 MHz	QPSK	75 RB / 0 RB Offset
18700 to 19100	18700	20 MHz	QPSK	1 RB / 74 RB Offset		
	19100	20 MHz	QPSK	75 RB / 0 RB Offset		
18700 to 19100	18700	20 MHz	QPSK	1 RB / 0 RB Offset		
	19100	20 MHz	QPSK	100 RB / 0 RB Offset		
-	Conducted Emission	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK	1 RB / 0 RB Offset
		18615 to 19185	18615, 18900, 19185	3 MHz	QPSK	1 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5 MHz	QPSK	1 RB / 0 RB Offset
		18650 to 19150	18650, 18900, 19150	10 MHz	QPSK	1 RB / 0 RB Offset
		18675 to 19125	18675, 18900, 19125	15 MHz	QPSK	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission	18607 to 19193	18607, 18900, 19193	1.4 MHz	QPSK	1 RB / 0 RB Offset
		18625 to 19175	18625, 18900, 19175	5 MHz	QPSK	1 RB / 0 RB Offset
		18700 to 19100	18700, 18900, 19100	20 MHz	QPSK	1 RB / 0 RB Offset

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

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
EIRP	26 deg. C, 58 % RH	5 Vdc	Karl Lee
Modulation Characteristics	26 deg. C, 58 % RH	5 Vdc	Gavin Wu
Frequency Stability	26 deg. C, 58 % RH	5 Vdc	Gavin Wu
Occupied Bandwidth	26 deg. C, 58 % RH	5 Vdc	Gavin Wu
Band Edge	26 deg. C, 58 % RH	5 Vdc	Gavin Wu
Peak to Average Ratio	26 deg. C, 58 % RH	5 Vdc	Gavin Wu
Conducted Emission	26 deg. C, 58 % RH	5 Vdc	Gavin Wu
Radiated Emission	25 deg. C, 65 % RH	5 Vdc	Karl Lee

3.4 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

3.5 General Description of Applied Standards

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

FCC 47 CFR Part 2

FCC 47 CFR Part 24

KDB 971168 D01 Power Meas License Digital Systems v03r01

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

ANSI 63.2 -1996

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

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

Mobile / Portable station are limited to 2 watts e.i.r.p.

4.1.2 Test Procedures

EIRP / ERP Measurement:

- a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 5 MHz for WCDMA and 10 MHz for LTE mode.
- b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) 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 1 m to 4 m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- c. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step b. Record the power level of S.G.
- d. $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, $E.R.P \text{ power} = E.I.R.P \text{ power} - 2.15 \text{ dB}$.

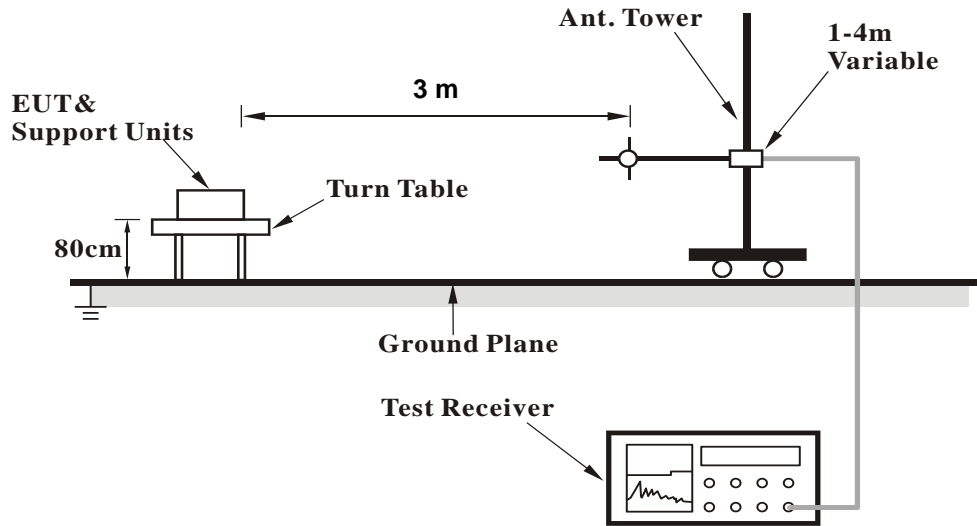
Conducted Power Measurement:

The EUT was set up for the maximum power with WCDMA and LTE 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.

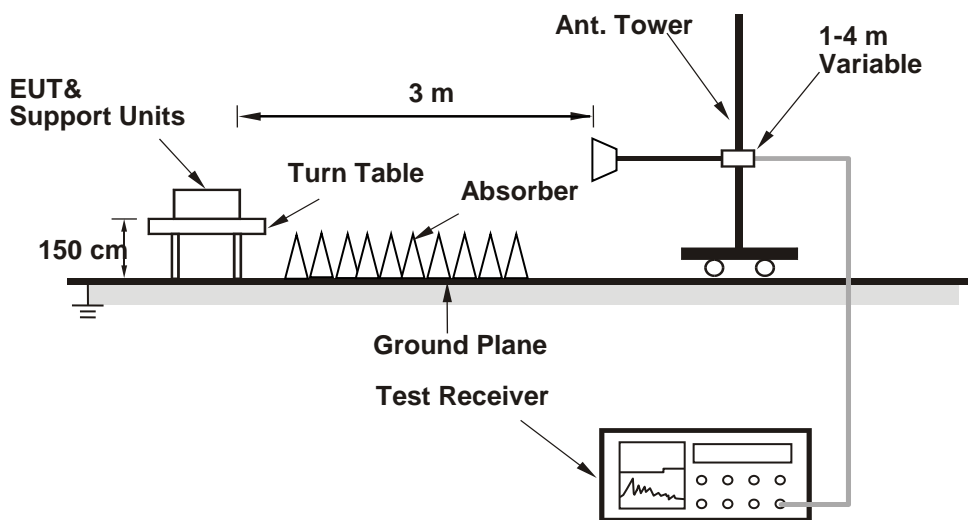
4.1.3 Test Setup

EIRP / ERP Measurement:

<Radiated Emission below or equal 1 GHz>

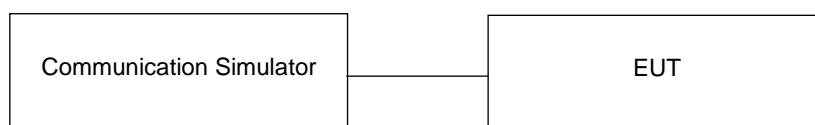


<Radiated Emission above 1 GHz>



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

Conducted Power Measurement:



4.1.4 Test Results

Conducted Output Power (dBm)

Band	WCDMA II		
Channel	9262	9400	9538
Frequency (MHz)	1852.4	1880.0	1907.6
RMC 12.2K	22.72	22.76	21.71
HSDPA Subtest-1	21.46	21.36	20.35
HSDPA Subtest-2	20.39	20.27	19.26
HSDPA Subtest-3	20.32	20.19	19.20
HSDPA Subtest-4	20.41	20.31	19.34
HSUPA Subtest-1	21.57	21.33	20.38
HSUPA Subtest-2	18.76	17.81	19.57
HSUPA Subtest-3	20.70	20.43	19.49
HSUPA Subtest-4	19.01	18.74	17.81
HSUPA Subtest-5	21.10	20.84	19.90

LTE Band 2																	
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)		
				Channel	18700	18900						19100	Channel	18675		18900	19125
				Frequency (MHz)	1860.0	1880.0						1900.0	Frequency (MHz)	1857.5		1880.0	1902.5
20M	QPSK	1	0	22.48	22.67	22.76	0	15M	QPSK	1	0	22.45	22.64	22.70	0		
		1	50	22.37	22.55	22.65	0			1	37	22.28	22.50	22.56	0		
		1	99	22.14	22.30	22.45	0			1	74	22.09	22.30	22.41	0		
		50	0	21.33	21.53	21.67	1			36	0	21.31	21.52	21.59	1		
		50	25	21.11	21.34	21.45	1			36	19	21.12	21.33	21.40	1		
		50	50	21.07	21.27	21.39	1			36	39	21.02	21.13	21.29	1		
	16QAM	100	0	21.36	21.58	21.62	1		75	0	21.28	21.48	21.61	1			
		1	0	21.47	21.63	21.68	1		1	0	21.36	21.63	21.64	1			
		1	50	21.34	21.46	21.58	1		1	37	21.27	21.42	21.50	1			
		1	99	21.05	21.26	21.36	1		1	74	21.06	21.23	21.39	1			
		50	0	20.26	20.43	20.65	2		36	0	20.26	20.36	20.53	2			
		50	25	20.05	20.30	20.39	2		36	19	20.04	20.30	20.34	2			
10M	QPSK	50	50	20.06	20.26	20.37	2	36	39	19.97	20.06	20.22	2				
		100	0	20.30	20.52	20.54	2	75	0	20.26	20.43	20.57	2				
		1	0	22.35	22.54	22.69	0	5M	QPSK	1	0	22.31	22.51	22.63	0		
		1	24	22.26	22.44	22.46	0			1	12	22.20	22.38	22.41	0		
		1	49	22.12	22.19	22.44	0			1	24	22.01	22.20	22.23	0		
		25	0	21.25	21.42	21.48	1			12	0	21.22	21.39	21.44	1		
	25	12	21.07	21.28	21.35	1	12			6	20.99	21.25	21.28	1			
	25	25	21.03	21.17	21.17	1	12			13	20.99	21.07	21.21	1			
	16QAM	50	0	21.17	21.39	21.52	1		25	0	21.20	21.43	21.40	1			
		1	0	21.32	21.50	21.66	1		1	0	21.24	21.48	21.58	1			
		1	24	21.25	21.43	21.43	1		1	12	21.19	21.31	21.35	1			
		1	49	21.05	21.12	21.40	1		1	24	20.96	21.12	21.15	1			
25		0	20.14	20.35	20.29	2	12		0	20.10	20.21	20.32	2				
25		12	20.00	20.25	20.30	2	12		6	19.98	20.19	20.25	2				
3M	QPSK	25	25	20.02	20.08	20.10	2	12	13	19.97	20.06	20.19	2				
		50	0	20.16	20.35	20.43	2	25	0	20.15	20.39	20.37	2				
		1	0	22.24	22.48	22.49	0	1.4M	QPSK	1	0	22.24	22.37	22.56	0		
		1	7	22.12	22.34	22.45	0			1	2	22.21	22.31	22.52	0		
		1	14	21.86	22.10	22.33	0			1	5	22.16	22.24	22.46	0		
		8	0	21.14	21.31	21.41	1			3	0	22.13	22.19	22.39	0		
	8	3	20.91	21.10	21.19	1	3			1	22.05	22.15	22.34	0			
	8	7	20.87	21.05	21.12	1	3			3	22.00	22.10	22.27	0			
	16QAM	15	0	21.08	21.32	21.37	1		6	0	21.01	21.24	21.33	1			
		1	0	21.15	21.42	21.43	1		1	0	21.18	21.31	21.53	1			
		1	7	21.03	21.33	21.37	1		1	2	21.20	21.28	21.51	1			
		1	14	20.82	21.06	21.27	1		1	5	21.08	21.18	21.43	1			
8		0	20.00	20.23	20.24	2	3		0	21.05	21.18	21.33	1				
8		3	19.84	20.03	20.12	2	3		1	21.00	21.08	21.26	1				
16QAM	8	7	19.80	19.96	20.10	2	3	3	20.92	21.05	21.24	1					
	15	0	20.06	20.19	20.26	2	6	0	19.98	20.17	20.29	2					

EIRP Power (dBm)

WCDMA							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	9262	1852.4	-15.34	38.19	22.85	192.75	H
	9400	1880.0	-15.76	38.70	22.94	196.79	
	9538	1907.6	-16.56	39.35	22.79	190.11	
	9262	1852.4	-18.60	38.48	19.88	97.27	V
	9400	1880.0	-18.60	38.59	19.99	99.77	
	9538	1907.6	-19.10	38.87	19.77	94.84	

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

LTE Band 2							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	18607	1850.7	-22.31	44.70	22.39	173.38	H
	18900	1880.0	-22.15	44.70	22.55	179.89	
	19193	1909.3	-21.89	44.57	22.68	185.48	
	18607	1850.7	-24.95	44.27	19.32	85.51	V
	18900	1880.0	-25.33	44.87	19.54	89.95	
	19193	1909.3	-24.93	44.61	19.68	92.96	
Channel Bandwidth: 1.4 MHz / 16QAM							
X	18607	1850.7	-23.32	44.70	21.38	137.40	H
	18900	1880.0	-23.16	44.70	21.54	142.56	
	19193	1909.3	-22.89	44.57	21.68	147.33	
	18607	1850.7	-25.96	44.27	18.31	67.76	V
	18900	1880.0	-26.33	44.87	18.54	71.45	
	19193	1909.3	-25.94	44.61	18.67	73.67	

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

LTE Band 2							
Channel Bandwidth: 3 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	18615	1851.5	-22.27	44.70	22.43	174.98	H
	18900	1880.0	-22.11	44.70	22.59	181.55	
	19185	1908.5	-22.85	44.57	21.72	148.70	
	18615	1851.5	-24.91	44.27	19.36	86.30	V
	18900	1880.0	-25.29	44.87	19.58	90.78	
	19185	1908.5	-24.89	44.61	19.72	93.82	
Channel Bandwidth: 3 MHz / 16QAM							
X	18615	1851.5	-23.27	44.70	21.43	139.00	H
	18900	1880.0	-23.12	44.70	21.58	143.88	
	19185	1908.5	-23.86	44.57	20.71	117.84	
	18615	1851.5	-25.92	44.27	18.35	68.39	V
	18900	1880.0	-26.29	44.87	18.58	72.11	
	19185	1908.5	-25.90	44.61	18.71	74.35	

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

LTE Band 2							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	18625	1852.5	-22.24	44.70	22.46	176.20	H
	18900	1880.0	-22.07	44.70	22.63	183.23	
	19175	1907.5	-21.81	44.57	22.76	188.93	
	18625	1852.5	-24.87	44.27	19.40	87.10	V
	18900	1880.0	-25.24	44.87	19.63	91.83	
	19175	1907.5	-24.86	44.61	19.75	94.47	
Channel Bandwidth: 5 MHz / 16QAM							
X	18625	1852.5	-23.25	44.70	21.45	139.64	H
	18900	1880.0	-23.08	44.70	21.62	145.21	
	19175	1907.5	-22.81	44.57	21.76	150.07	
	18625	1852.5	-25.87	44.27	18.40	69.18	V
	18900	1880.0	-26.25	44.87	18.62	72.78	
	19175	1907.5	-25.86	44.61	18.75	75.04	

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

LTE Band 2							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	18650	1855.0	-22.20	44.70	22.50	177.83	H
	18900	1880.0	-22.03	44.70	22.67	184.93	
	19150	1905.0	-21.77	44.57	22.80	190.68	
	18650	1855.0	-24.83	44.27	19.44	87.90	V
	18900	1880.0	-25.20	44.87	19.67	92.68	
	19150	1905.0	-24.82	44.61	19.79	95.35	
Channel Bandwidth: 10 MHz / 16QAM							
X	18650	1855.0	-23.21	44.70	21.49	140.93	H
	18900	1880.0	-23.03	44.70	21.67	146.89	
	19150	1905.0	-22.78	44.57	21.79	151.11	
	18650	1855.0	-25.84	44.27	18.43	69.66	V
	18900	1880.0	-26.20	44.87	18.67	73.62	
	19150	1905.0	-25.82	44.61	18.79	75.74	

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

LTE Band 2							
Channel Bandwidth: 15 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	18675	1857.5	-22.16	44.70	22.54	179.47	H
	18900	1880.0	-21.98	44.70	22.72	187.07	
	19125	1902.5	-21.74	44.57	22.83	192.00	
	18675	1857.5	-24.79	44.27	19.48	88.72	V
	18900	1880.0	-25.17	44.87	19.70	93.33	
	19125	1902.5	-24.79	44.61	19.82	96.01	
Channel Bandwidth: 15 MHz / 16QAM							
X	18675	1857.5	-23.16	44.70	21.54	142.56	H
	18900	1880.0	-22.98	44.70	21.72	148.59	
	19125	1902.5	-22.75	44.57	21.82	152.16	
	18675	1857.5	-25.80	44.27	18.47	70.31	V
	18900	1880.0	-26.18	44.87	18.69	73.96	
	19125	1902.5	-25.79	44.61	18.82	76.26	

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

LTE Band 2							
Channel Bandwidth: 20 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	18700	1860.0	-22.12	44.70	22.58	181.13	H
	18900	1880.0	-21.95	44.70	22.75	188.36	
	19100	1900.0	-21.70	44.57	22.87	193.78	
	18700	1860.0	-24.75	44.27	19.52	89.54	V
	18900	1880.0	-25.13	44.87	19.74	94.19	
	19100	1900.0	-24.76	44.61	19.85	96.67	
Channel Bandwidth: 20 MHz / 16QAM							
X	18700	1860.0	-23.13	44.70	21.57	143.55	H
	18900	1880.0	-22.95	44.70	21.75	149.62	
	19100	1900.0	-22.71	44.57	21.86	153.57	
	18700	1860.0	-25.76	44.27	18.51	70.96	V
	18900	1880.0	-26.13	44.87	18.74	74.82	
	19100	1900.0	-25.77	44.61	18.84	76.61	

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

4.2 Modulation Characteristics Measurement

4.2.1 Limits of Modulation Characteristics

N/A

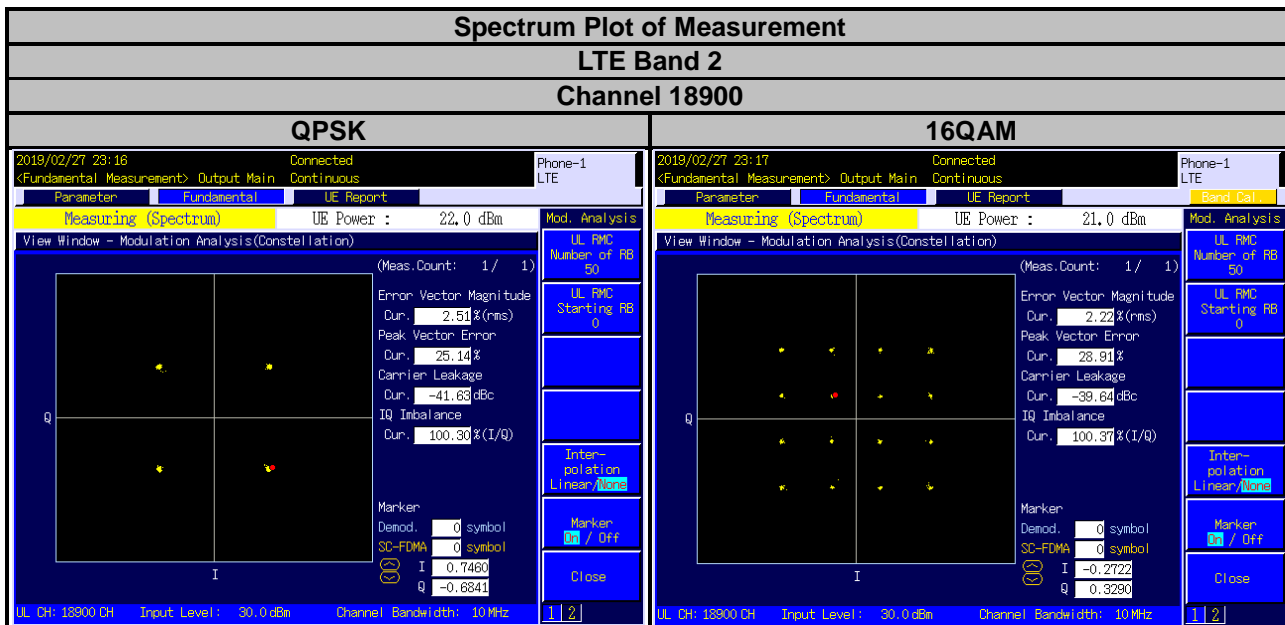
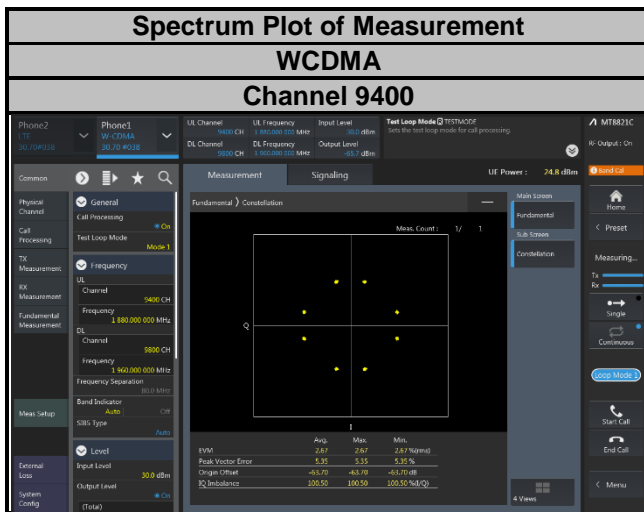
4.2.2 Test Setup



4.2.3 Test Procedure

Connect the EUT to Communication Simulator via the antenna connector. The frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

4.2.4 Test Results



4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

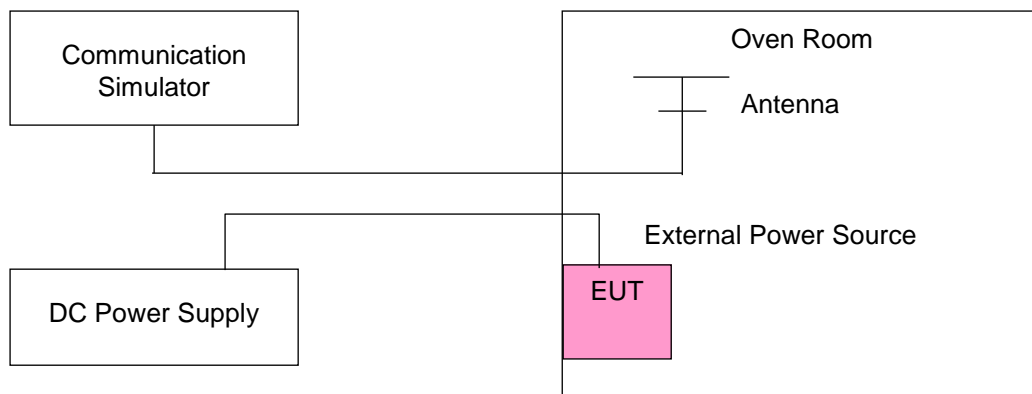
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

4.3.2 Test Procedure

- Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ± 0.5 °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.

4.3.3 Test Setup



4.3.4 Test Results

Frequency Error vs. Voltage

Voltage (Volts)	WCDMA			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1852.400002	0.001	1907.600002	0.001
5	1852.400004	0.002	1907.600003	0.002
5.75	1852.400002	0.001	1907.600002	0.001

Note: The applicant defined the normal working voltage of the battery is from 4.25 Vdc to 5.75 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	WCDMA			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1852.400003	0.002	1907.600002	0.001
-20	1852.400002	0.001	1907.600004	0.002
-10	1852.400004	0.002	1907.600002	0.001
0	1852.400004	0.002	1907.600004	0.002
10	1852.400003	0.002	1907.600003	0.002
20	1852.399998	-0.001	1907.599997	-0.002
30	1852.399998	-0.001	1907.599999	-0.001
40	1852.399997	-0.002	1907.599999	-0.001
50	1852.399997	-0.002	1907.599997	-0.001
55	1852.399998	-0.001	1907.599999	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1850.700003	0.002	1909.300000	0.001
5	1850.700004	0.002	1909.300004	0.002
5.75	1850.700001	0.001	1909.300002	0.001

Note: The applicant defined the normal working voltage of the battery is from 4.25 Vdc to 5.75 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1850.700001	0.001	1909.300004	0.002
-20	1850.700001	0.001	1909.300004	0.002
-10	1850.700003	0.001	1909.300002	0.001
0	1850.700003	0.002	1909.300002	0.001
10	1850.700003	0.002	1909.300002	0.001
20	1850.699997	-0.002	1909.299997	-0.001
30	1850.699999	-0.001	1909.299997	-0.001
40	1850.699998	-0.001	1909.299997	-0.001
50	1850.699997	-0.002	1909.299997	-0.002
55	1850.699998	-0.001	1909.299999	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1851.500002	0.001	1907.500001	0.001
5	1851.500002	0.001	1907.500003	0.001
5.75	1851.500002	0.001	1907.500003	0.002

Note: The applicant defined the normal working voltage of the battery is from 4.25 Vdc to 5.75 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1851.500002	0.001	1907.500004	0.002
-20	1851.500004	0.002	1907.500004	0.002
-10	1851.500004	0.002	1907.500002	0.001
0	1851.500003	0.002	1907.500003	0.001
10	1851.500002	0.001	1907.500004	0.002
20	1851.499997	-0.002	1907.499998	-0.001
30	1851.499998	-0.001	1907.499997	-0.001
40	1851.499996	-0.002	1907.499998	-0.001
50	1851.499996	-0.002	1907.499997	-0.002
55	1851.499998	-0.001	1907.499998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1852.500004	0.002	1907.500003	0.001
5	1852.500002	0.001	1907.500002	0.001
5.75	1852.500002	0.001	1907.500003	0.001

Note: The applicant defined the normal working voltage of the battery is from 4.25 Vdc to 5.75 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1852.500002	0.001	1907.500003	0.001
-20	1852.500001	0.001	1907.500003	0.002
-10	1852.500001	0.001	1907.500002	0.001
0	1852.500004	0.002	1907.500004	0.002
10	1852.500002	0.001	1907.500003	0.001
20	1852.499997	-0.002	1907.499999	-0.001
30	1852.499998	-0.001	1907.499997	-0.001
40	1852.499996	-0.002	1907.499999	-0.001
50	1852.499997	-0.002	1907.499998	-0.001
55	1852.499999	-0.001	1907.499996	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1855.000003	0.001	1905.000004	0.002
5	1855.000003	0.002	1905.000003	0.002
5.75	1855.000004	0.002	1905.000002	0.001

Note: The applicant defined the normal working voltage of the battery is from 4.25 Vdc to 5.75 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1855.000003	0.002	1905.000003	0.001
-20	1855.000001	0.001	1905.000004	0.002
-10	1855.000002	0.001	1905.000002	0.001
0	1855.000001	0.001	1905.000003	0.001
10	1855.000004	0.002	1905.000003	0.001
20	1854.999997	-0.001	1904.999997	-0.002
30	1854.999996	-0.002	1904.999998	-0.001
40	1854.999999	-0.001	1904.999999	-0.001
50	1854.999996	-0.002	1904.999998	-0.001
55	1854.999999	-0.001	1904.999996	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1857.500001	0.001	1902.500002	0.001
5	1857.500003	0.002	1902.500004	0.002
5.75	1857.500001	0.001	1902.500001	0.001

Note: The applicant defined the normal working voltage of the battery is from 4.25 Vdc to 5.75 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 2			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1857.500004	0.002	1902.500004	0.002
-20	1857.500003	0.001	1902.500003	0.002
-10	1857.500002	0.001	1902.500002	0.001
0	1857.500003	0.002	1902.500003	0.001
10	1857.500004	0.002	1902.500004	0.002
20	1857.499998	-0.001	1902.499998	-0.001
30	1857.499999	-0.001	1902.499999	-0.001
40	1857.499999	-0.001	1902.499998	-0.001
50	1857.499997	-0.002	1902.499998	-0.001
55	1857.499999	-0.001	1902.499998	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 2			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
4.25	1860.000004	0.002	1900.000002	0.001
5	1860.000003	0.001	1900.000003	0.002
5.75	1860.000003	0.001	1900.000002	0.001

Note: The applicant defined the normal working voltage of the battery is from 4.25 Vdc to 5.75 Vdc.

Frequency Error vs. Temperature

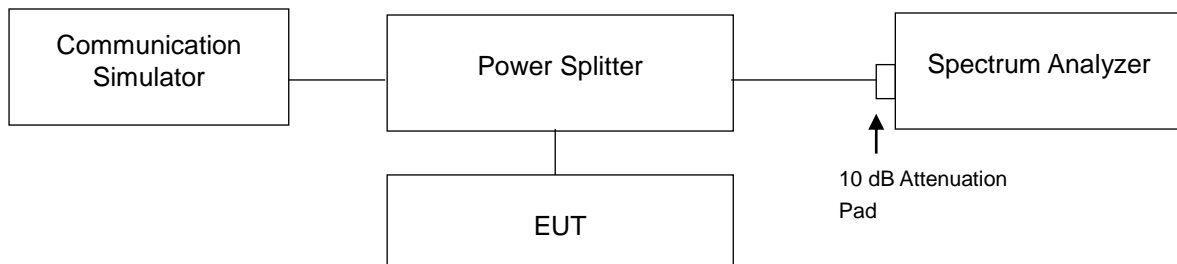
Temp. (°C)	LTE Band 2			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1860.000004	0.002	1900.000001	0.001
-20	1860.000003	0.002	1900.000003	0.001
-10	1860.000002	0.001	1900.000004	0.002
0	1860.000002	0.001	1900.000004	0.002
10	1860.000003	0.002	1900.000004	0.002
20	1859.999999	-0.001	1899.999998	-0.001
30	1859.999998	-0.001	1899.999997	-0.001
40	1859.999996	-0.002	1899.999996	-0.002
50	1859.999998	-0.001	1899.999999	-0.001
55	1859.999996	-0.002	1899.999998	-0.001

4.4 Occupied Bandwidth Measurement

4.4.1 Test Procedure

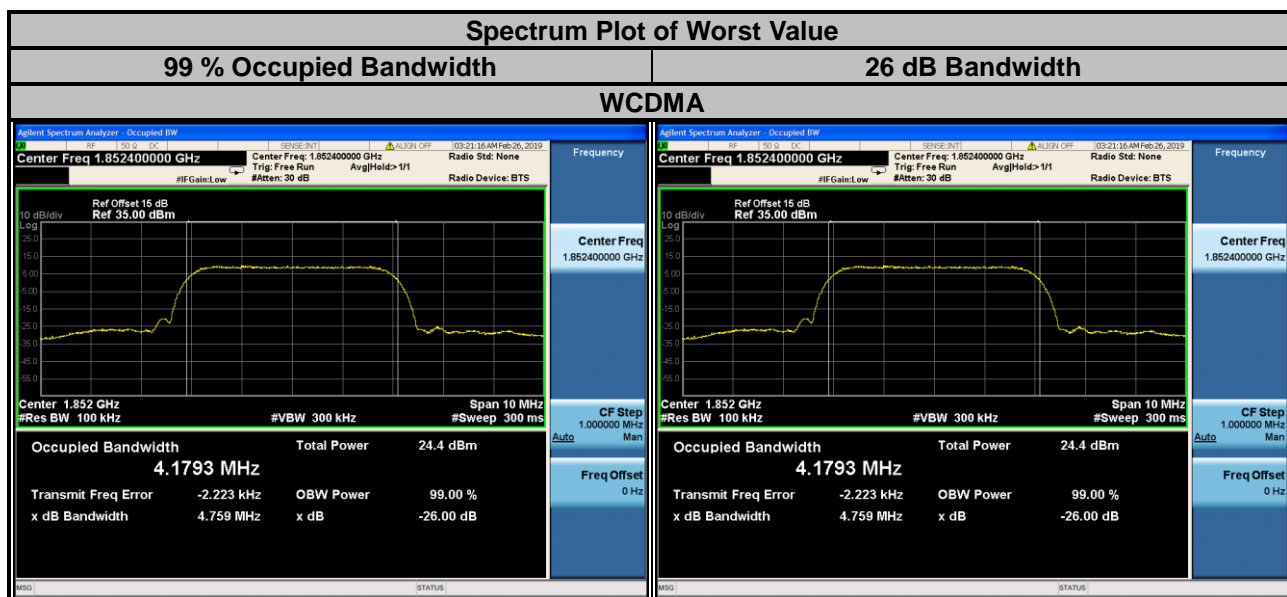
The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function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

4.4.2 Test Setup



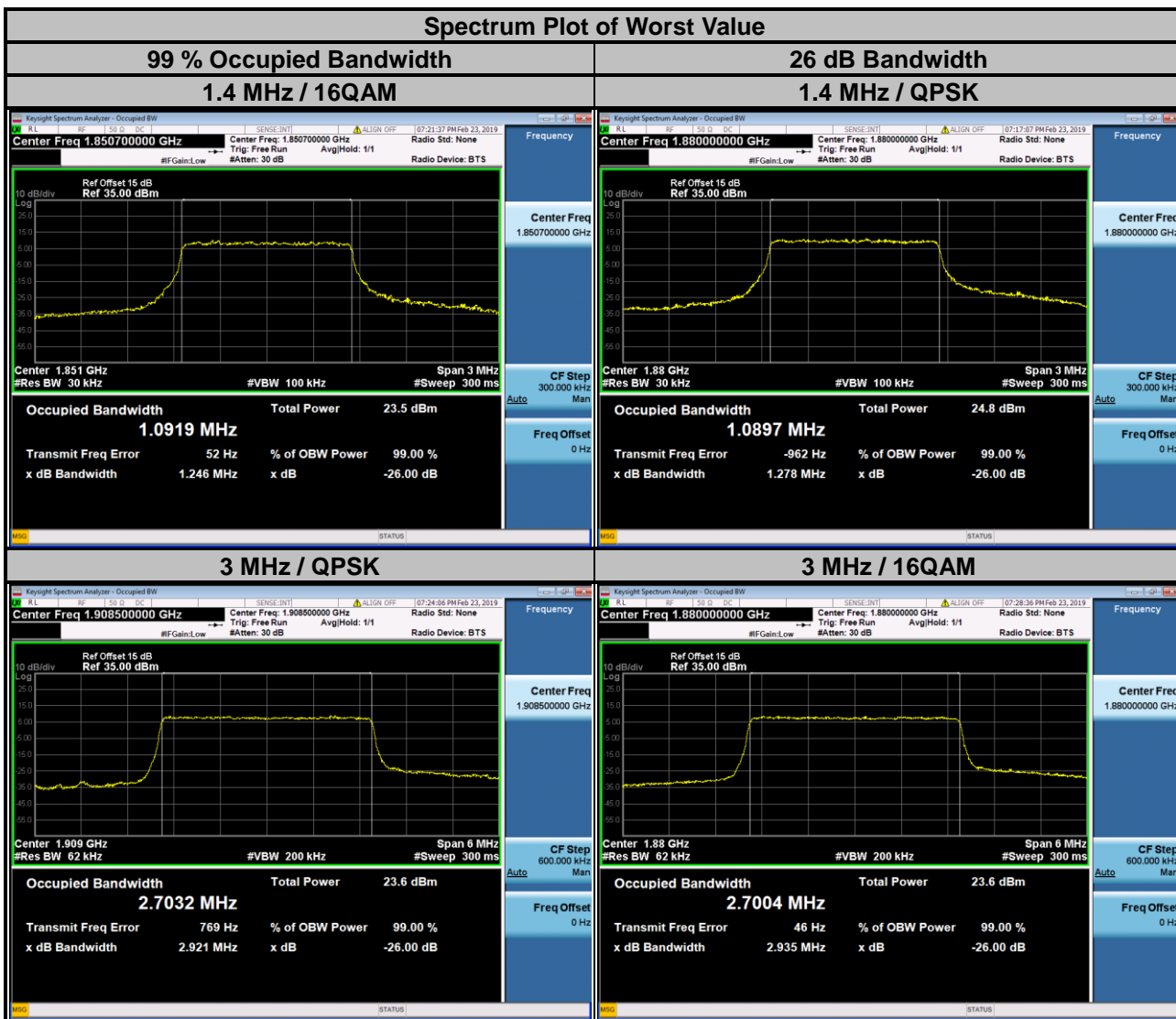
4.4.3 Test Result

WCDMA			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
9262	1852.4	4.1793	4.759
9400	1880.0	4.1752	4.755
9538	1907.6	4.1767	4.754



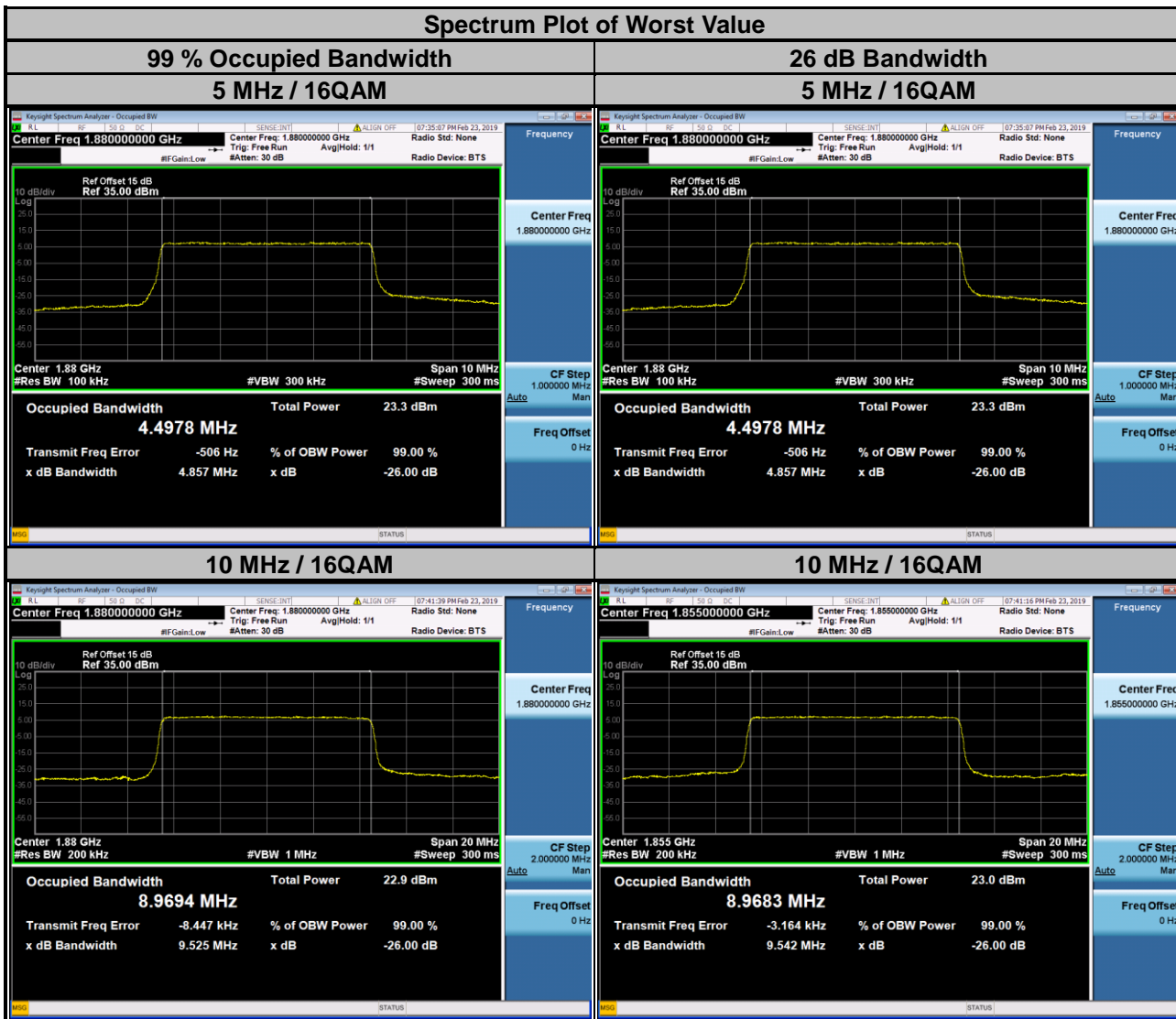
LTE Band 2					
Channel Bandwidth: 1.4 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
18607	1850.7	1.0869	1.0919	1.262	1.246
18900	1880.0	1.0897	1.0902	1.278	1.262
19193	1909.3	1.0882	1.0900	1.263	1.239

Channel Bandwidth: 3 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
18615	1851.5	2.7019	2.6984	2.918	2.927
18900	1880.0	2.7032	2.7004	2.927	2.935
19185	1908.5	2.7032	2.6968	2.921	2.928



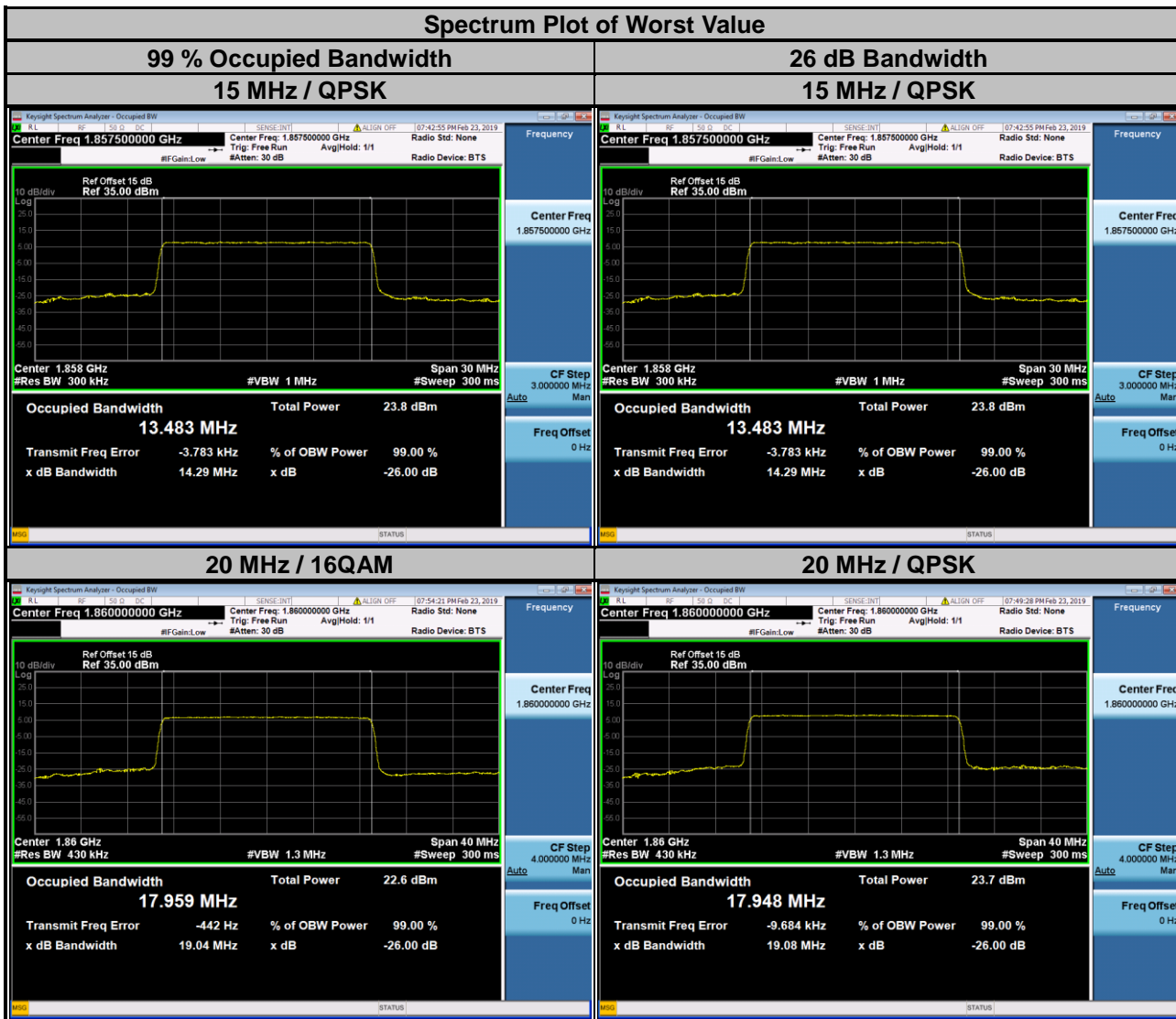
LTE Band 2					
Channel Bandwidth: 5 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
18625	1852.5	4.4974	4.4952	4.829	4.843
18900	1880.0	4.4970	4.4978	4.853	4.857
19175	1907.5	4.4945	4.4955	4.833	4.836

Channel Bandwidth: 10 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
18650	1855.0	8.9688	8.9683	9.514	9.542
18900	1880.0	8.9656	8.9694	9.528	9.525
19150	1905.0	8.9604	8.9585	9.523	9.522



LTE Band 2					
Channel Bandwidth: 15 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
18675	1857.5	13.483	13.464	14.29	14.29
18900	1880.0	13.474	13.455	14.28	14.28
19125	1902.5	13.466	13.453	14.27	14.27

Channel Bandwidth: 20 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
18700	1860.0	17.948	17.959	19.08	19.04
18900	1880.0	17.925	17.947	19.04	19.03
19100	1900.0	17.930	17.955	19.05	19.06

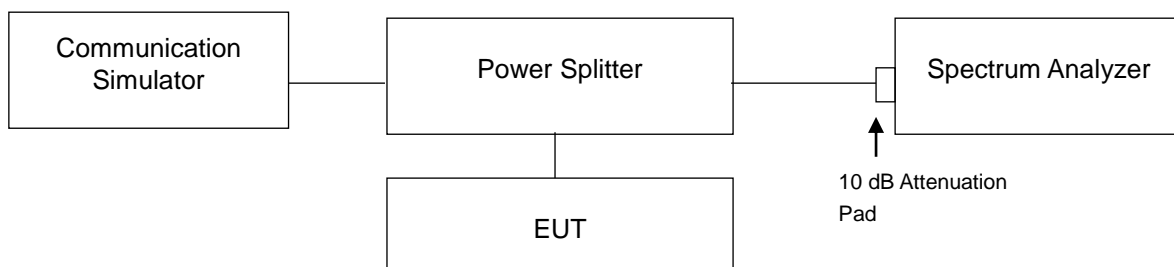


4.5 Band Edge Measurement

4.5.1 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.

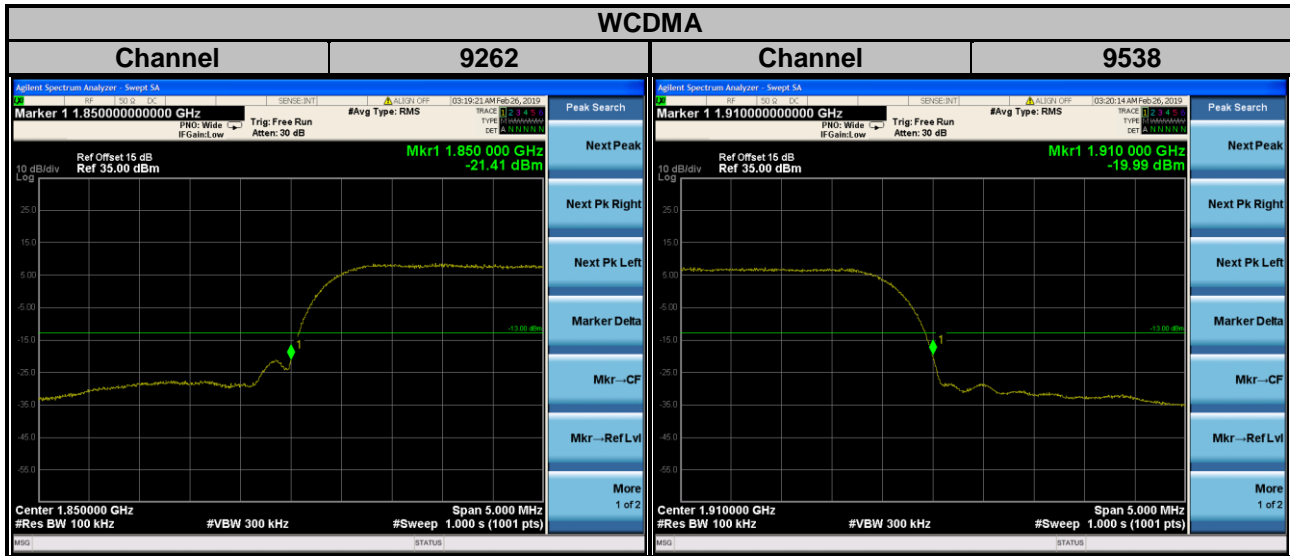
4.5.2 Test Setup

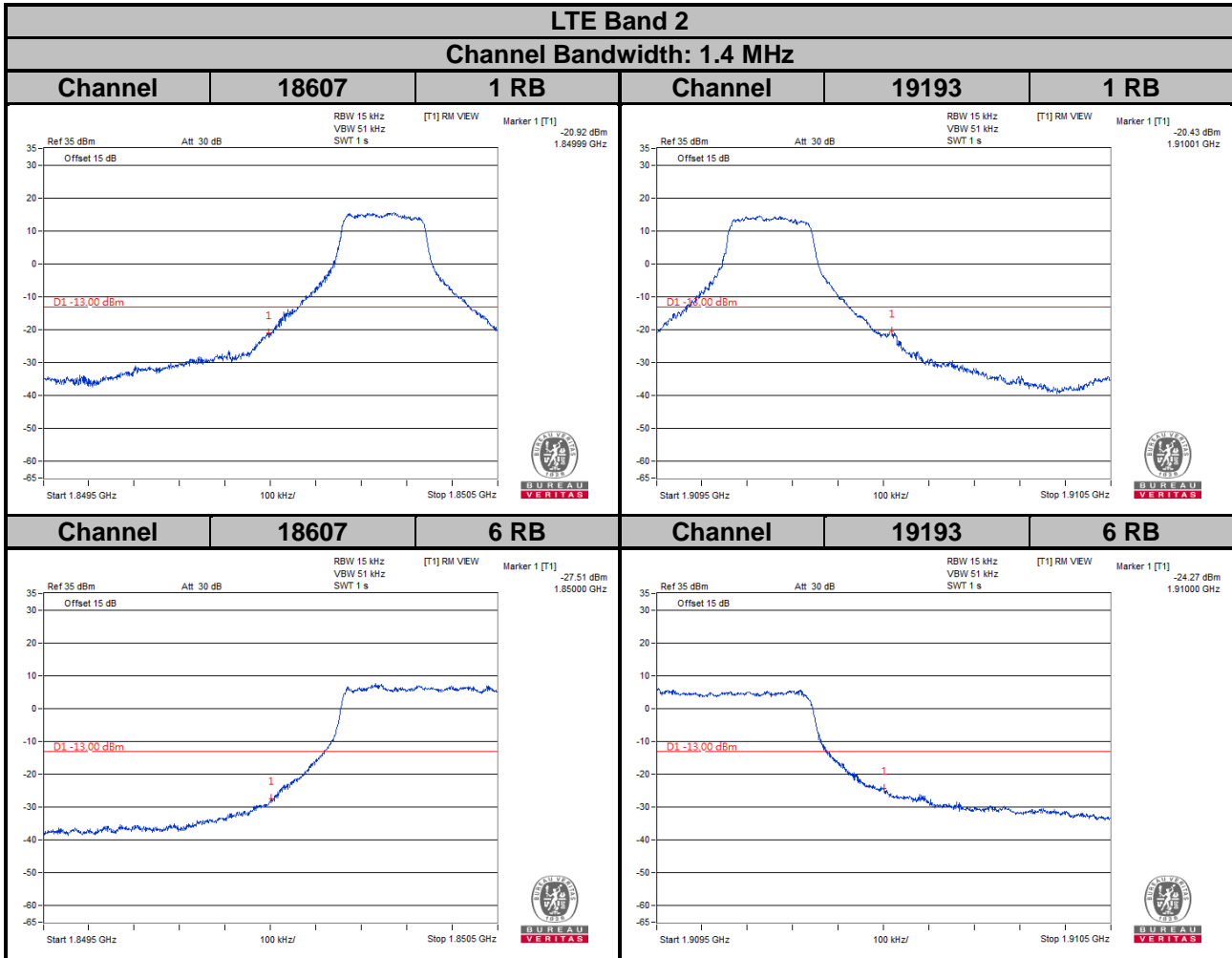


4.5.3 Test Procedures

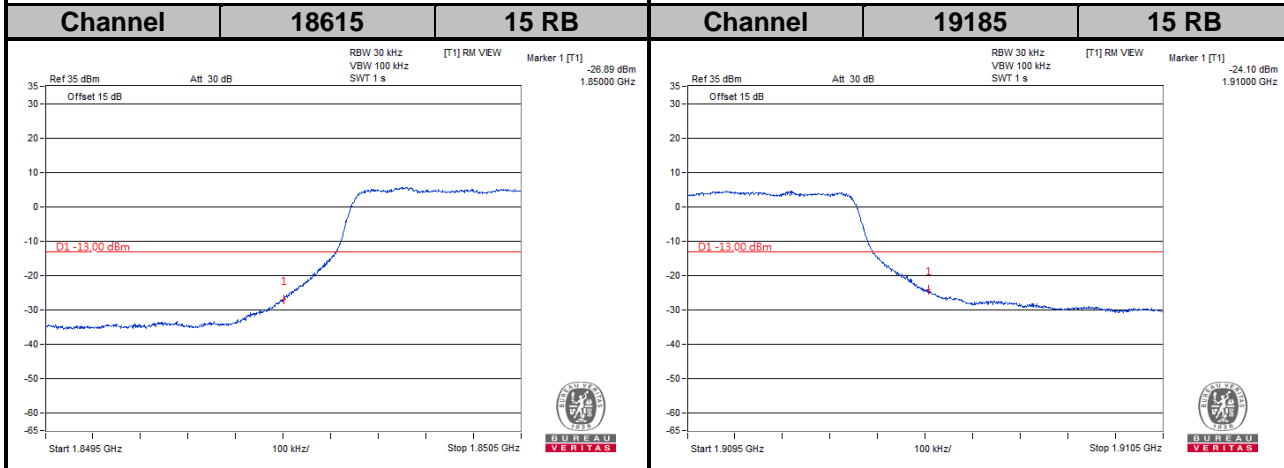
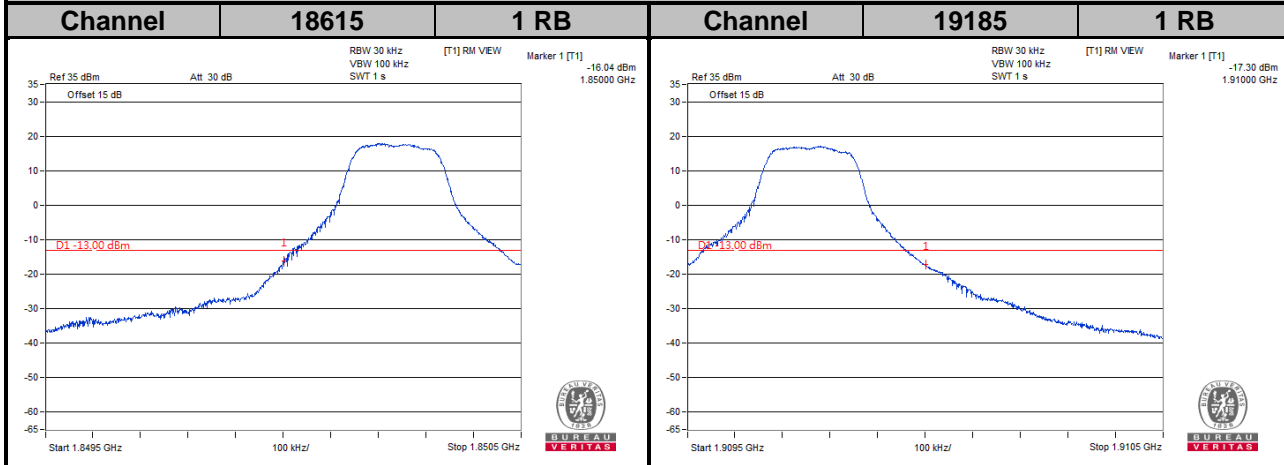
- All measurements were done at low and high operational frequency range.
- The center frequency of spectrum is the band edge frequency and span is 5 MHz. RB of the spectrum is 100 kHz and VB of the spectrum is 300 kHz (WCDMA).
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 15 kHz and VB of the spectrum is 51 kHz (LTE Bandwidth 1.4 MHz).
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 30 kHz and VB of the spectrum is 100 kHz (LTE Bandwidth 3 MHz).
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 62 kHz and VB of the spectrum is 200 kHz (LTE Bandwidth 5 MHz).
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 100 kHz and VB of the spectrum is 300 kHz (LTE Bandwidth 10 MHz).
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 150 kHz and VB of the spectrum is 470 kHz (LTE Bandwidth 15 MHz).
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 200 kHz and VB of the spectrum is 1 MHz (LTE Bandwidth 20 MHz).
- Record the max trace plot into the test report.

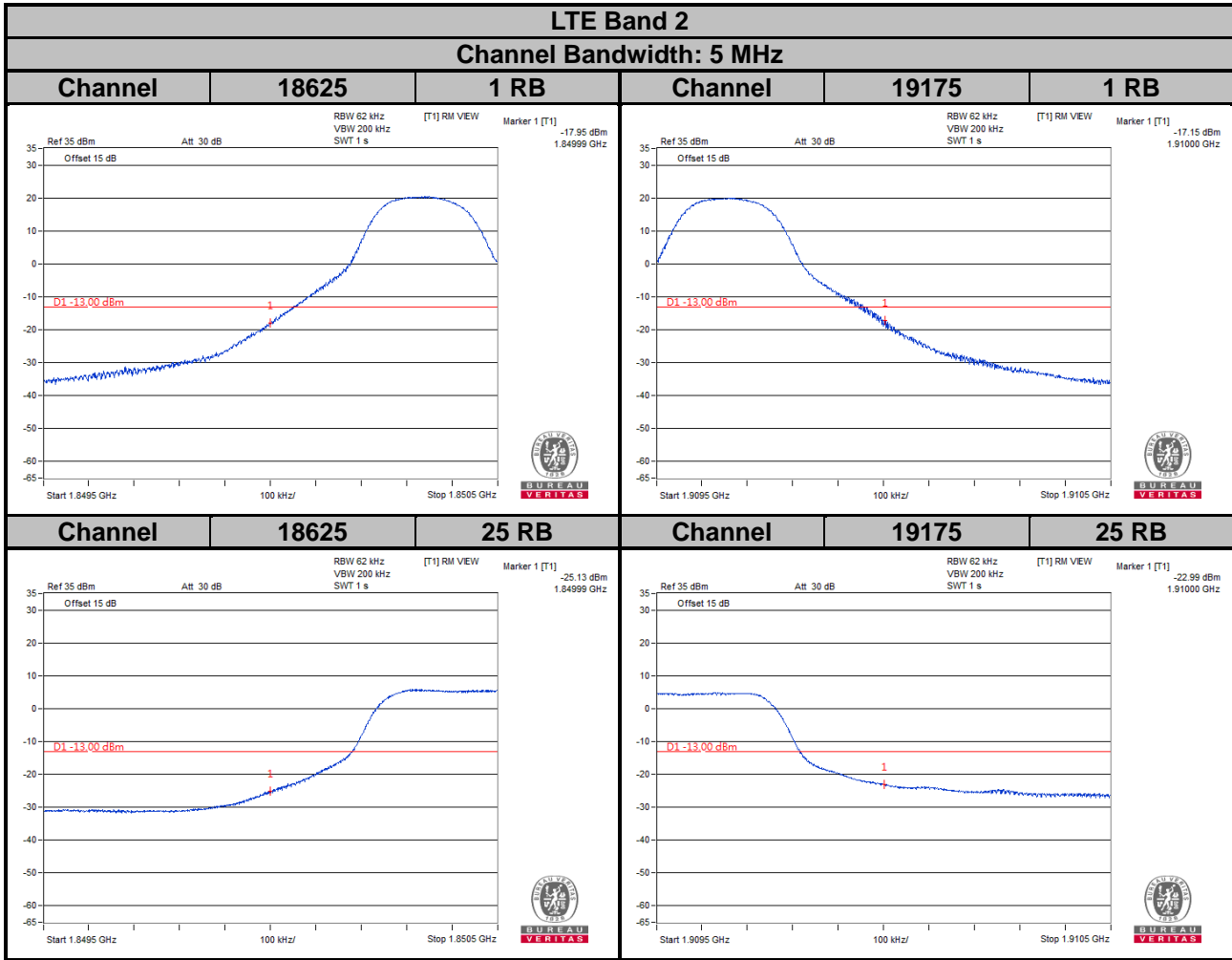
4.5.4 Test Results

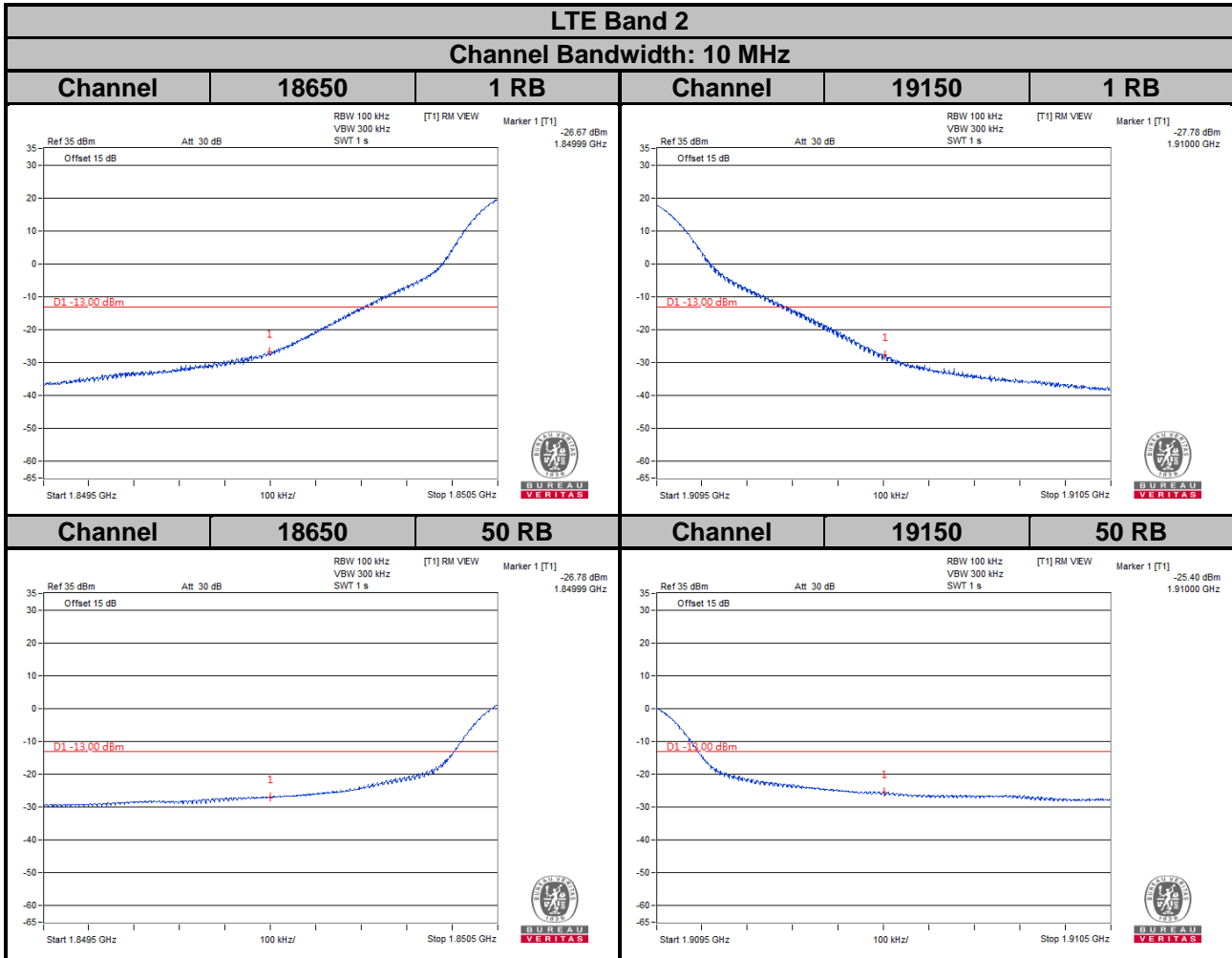


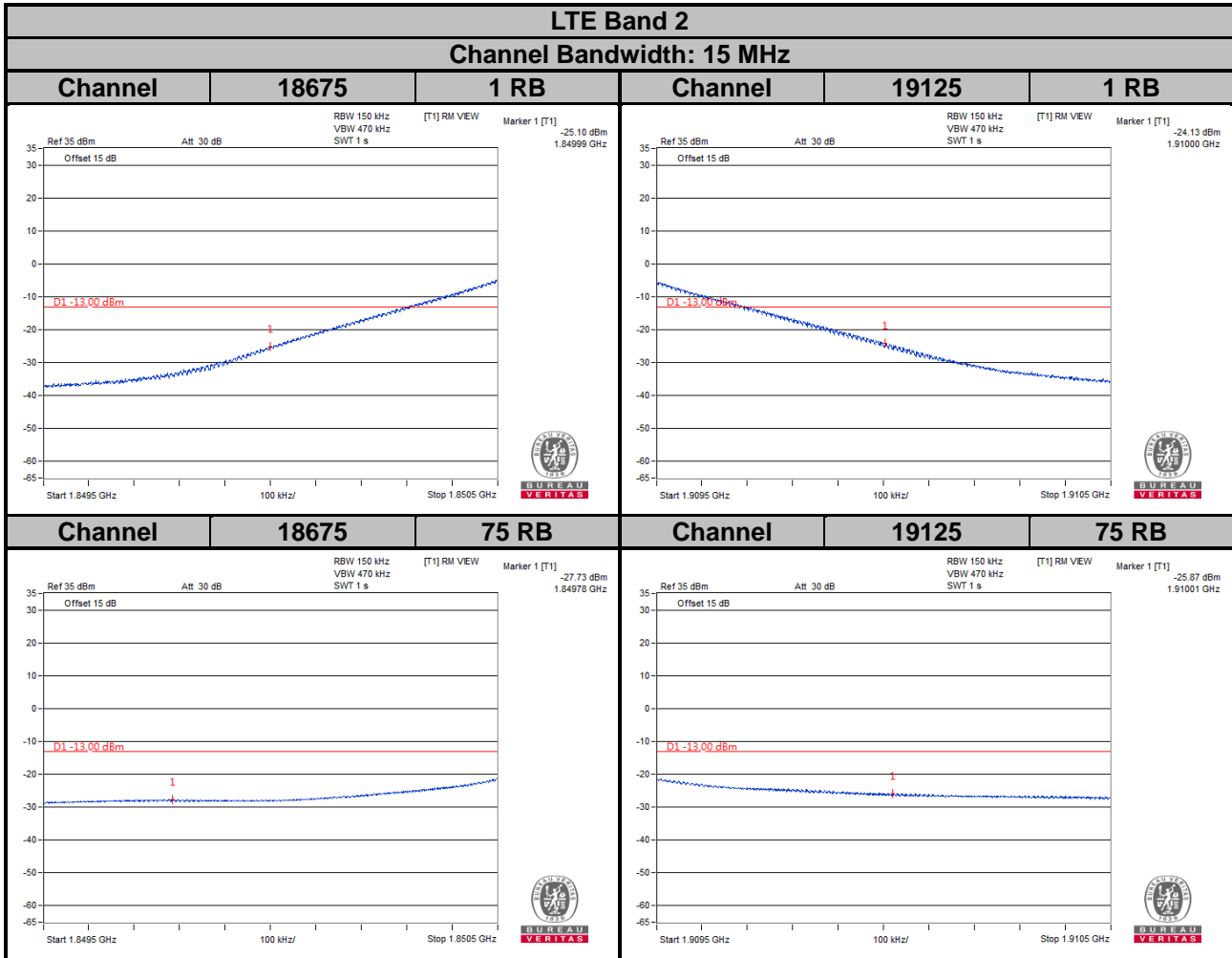


LTE Band 2
Channel Bandwidth: 3 MHz

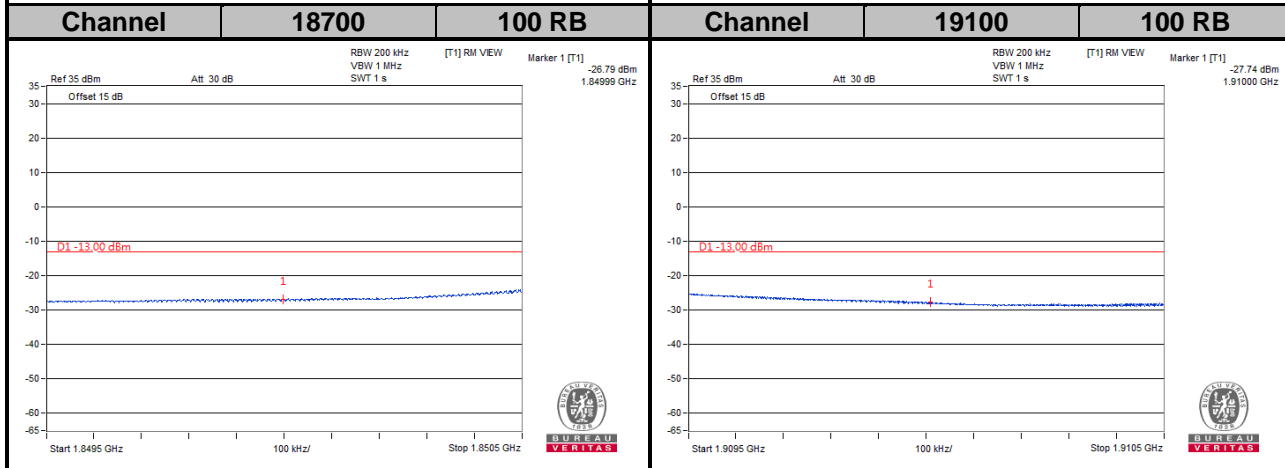
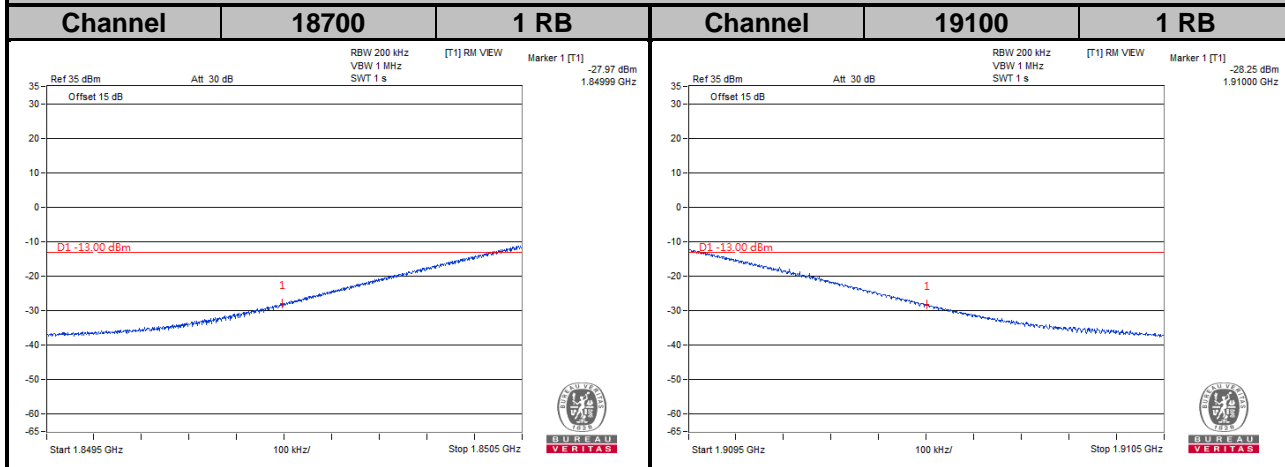








LTE Band 2
Channel Bandwidth: 20 MHz

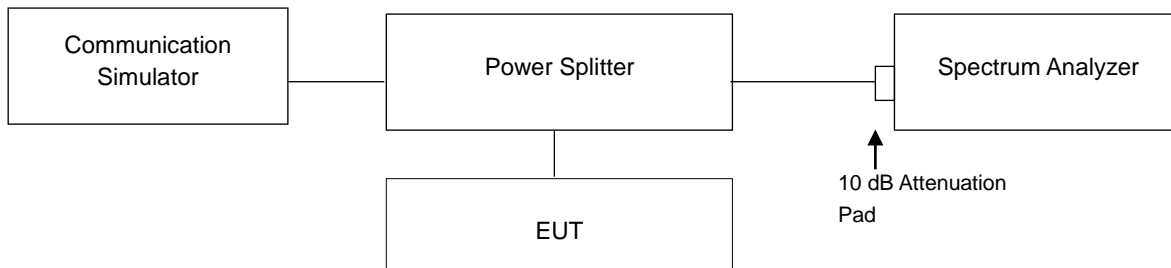


4.6 Peak to Average Ratio

4.6.1 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.

4.6.2 Test Setup

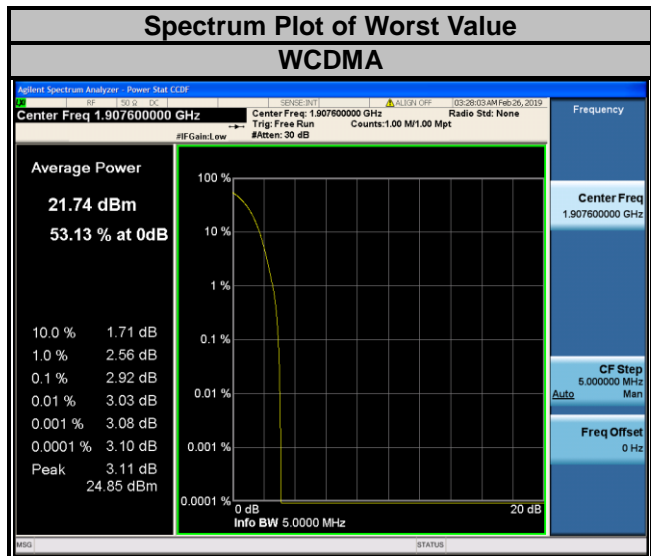


4.6.3 Test Procedures

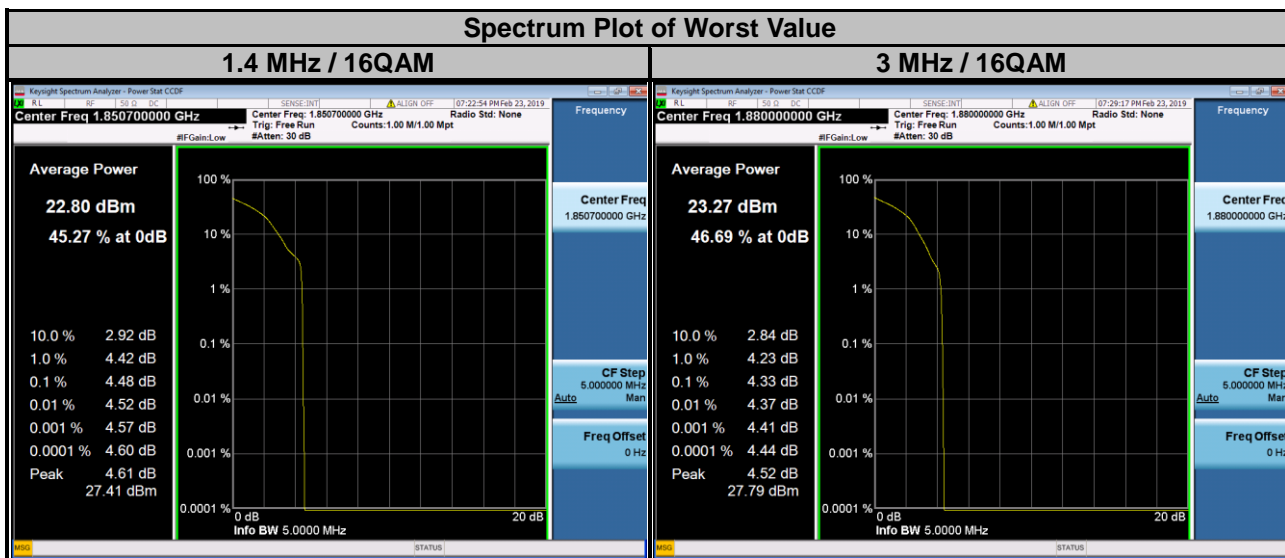
1. Set resolution/measurement bandwidth \geq signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1 %.

4.6.4 Test Results

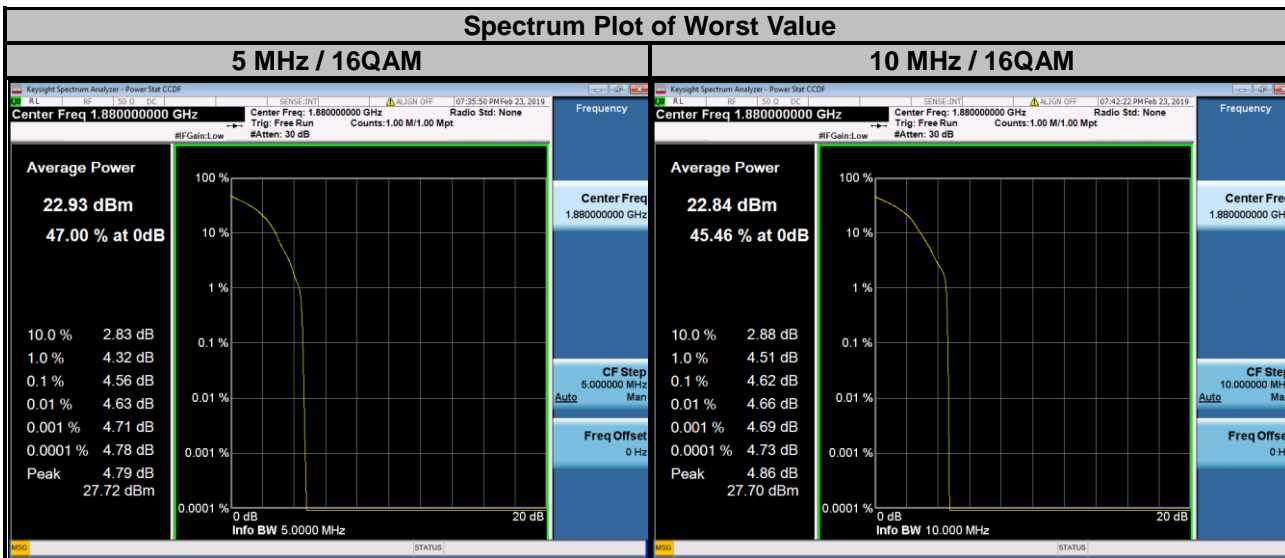
Channel	Frequency (MHz)	Peak to Average Ratio (dB)
		WCDMA
9262	1852.4	2.82
9400	1880.0	2.84
9538	1907.6	2.92



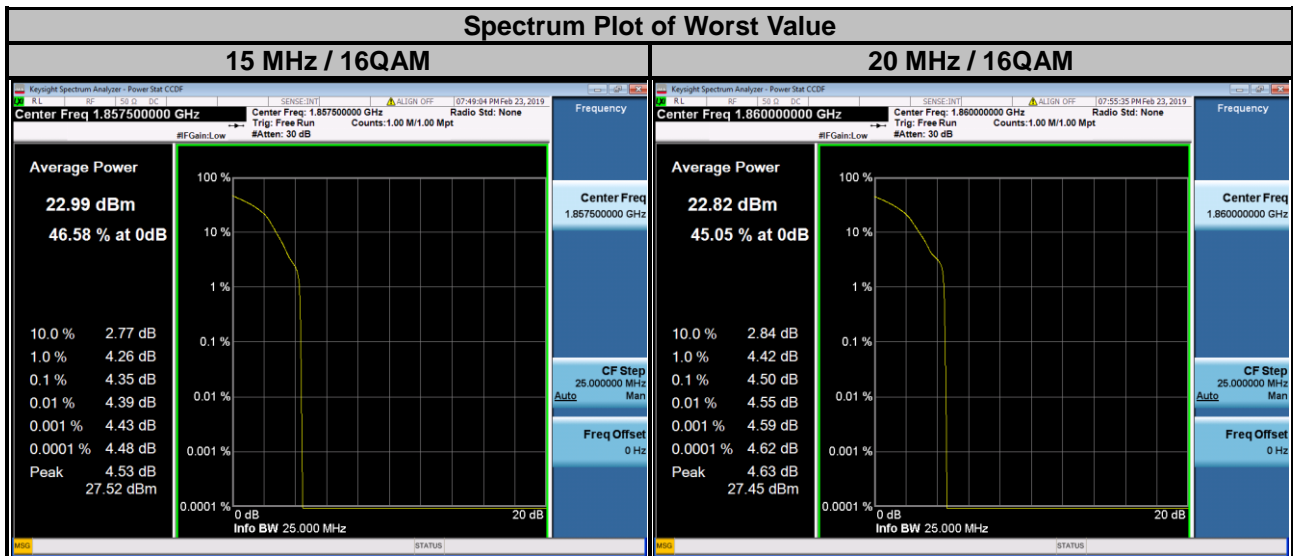
LTE Band 2							
Channel Bandwidth: 1.4 MHz				Channel Bandwidth: 3 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
18607	1850.7	3.53	4.48	18615	1851.5	3.48	4.25
18900	1880.0	3.56	4.45	18900	1880.0	3.47	4.33
19193	1909.3	3.48	4.25	19185	1908.5	3.11	3.83



LTE Band 2							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
18625	1852.5	3.64	4.46	18650	1855.0	3.44	4.45
18900	1880.0	3.54	4.56	18900	1880.0	3.37	4.62
19175	1907.5	2.84	3.59	19150	1905.0	3.30	4.09



LTE Band 2							
Channel Bandwidth: 15 MHz				Channel Bandwidth: 20 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
18675	1857.5	3.30	4.35	18700	1860.0	3.51	4.50
18900	1880.0	3.30	4.21	18900	1880.0	3.26	4.17
19125	1902.5	2.96	3.73	19100	1900.0	3.00	3.79

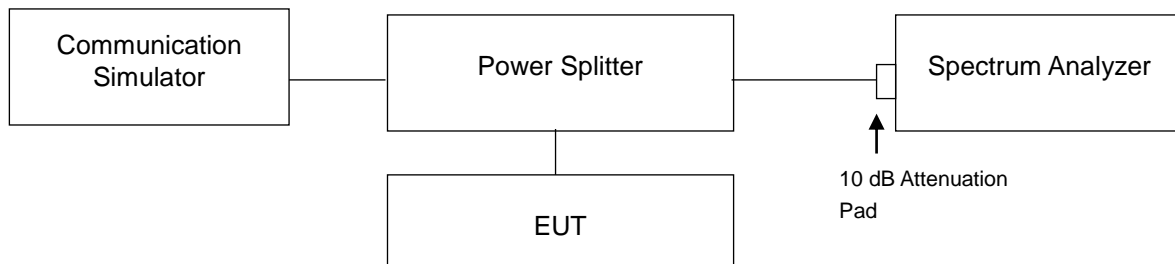


4.7 Conducted Spurious Emissions

4.7.1 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 dBm.

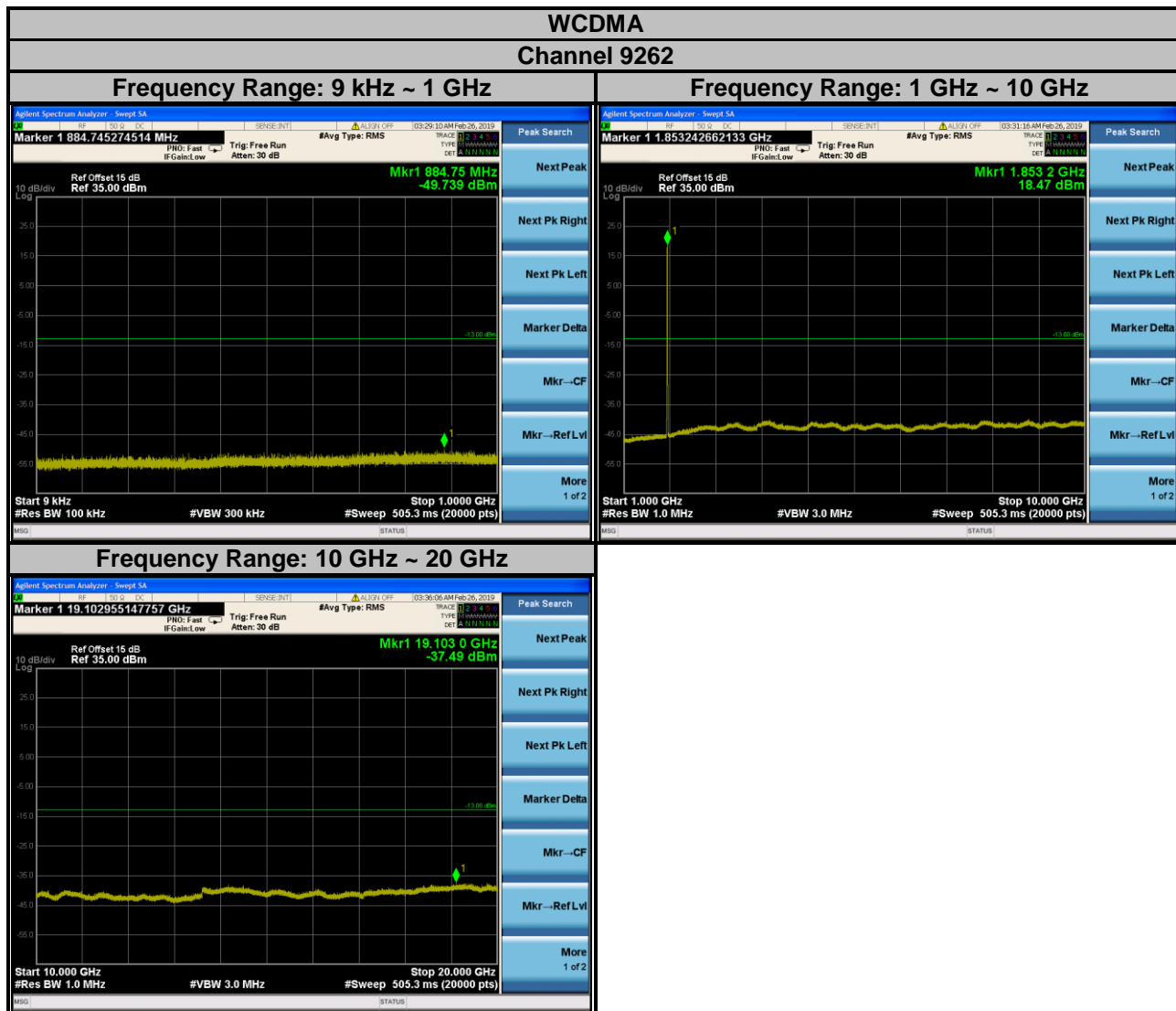
4.7.2 Test Setup



4.7.3 Test Procedure

- The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- Measuring frequency range is from 9 kHz to 1 GHz. 10 dB attenuation pad is connected with spectrum. RBW = 100 kHz and VBW = 300 kHz is used for conducted emission measurement.
- Measuring frequency range is from 1 GHz to 20 GHz. 10 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz is used for conducted emission measurement.
- Spectrum RBW settings are referenced to ANSI 63.2-1996 section 8.2.2 .

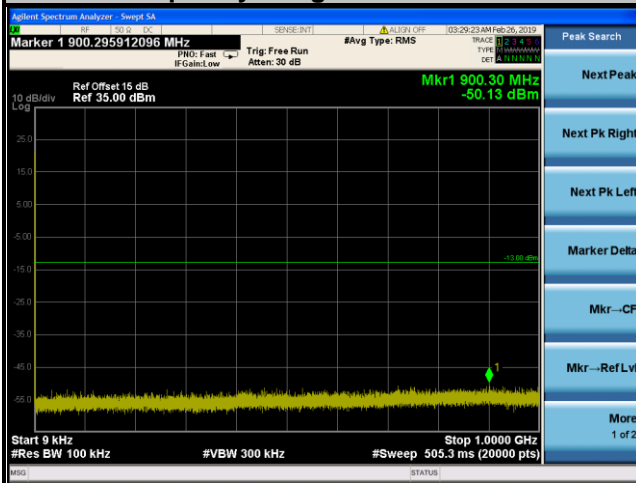
4.7.4 Test Results



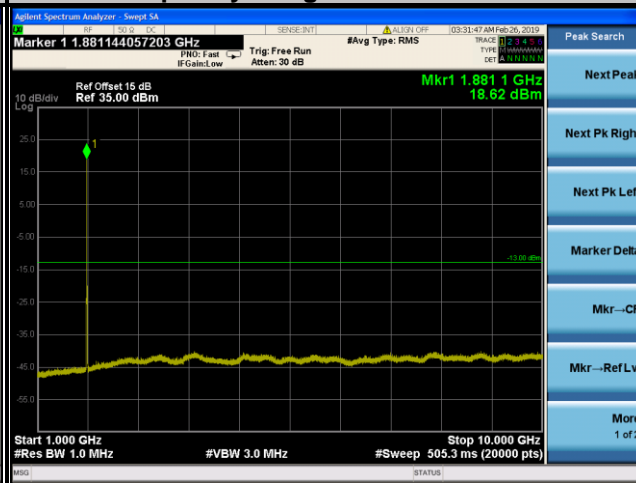
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

**WCDMA
Channel 9400**

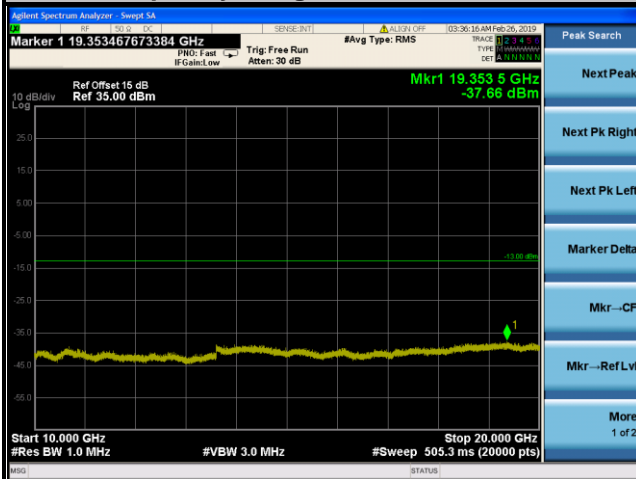
Frequency Range: 9 kHz ~ 1 GHz



Frequency Range: 1 GHz ~ 10 GHz



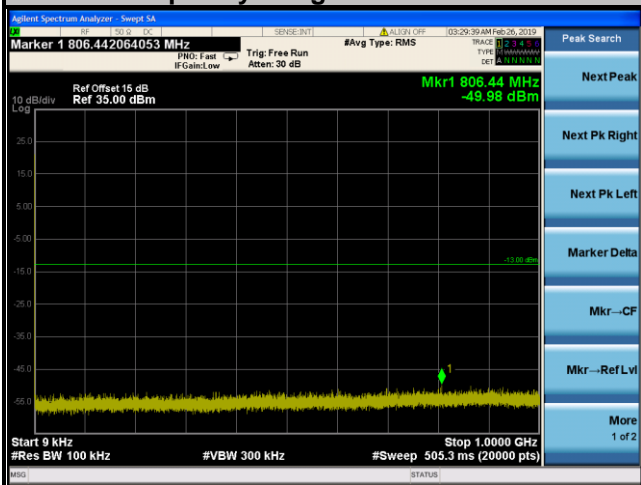
Frequency Range: 10 GHz ~ 20 GHz



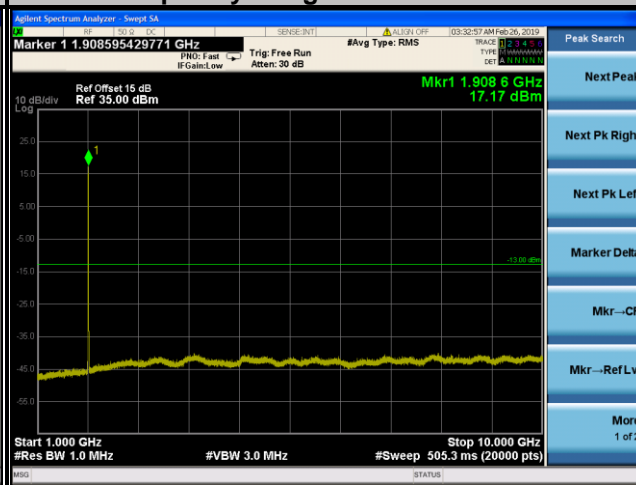
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

WCDMA Channel 9538

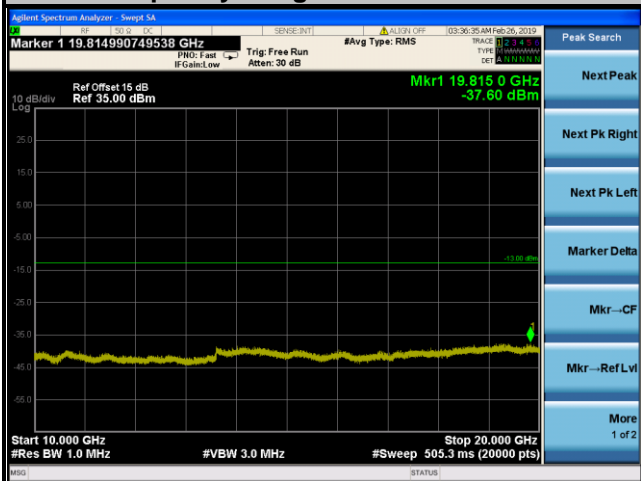
Frequency Range: 9 kHz ~ 1 GHz



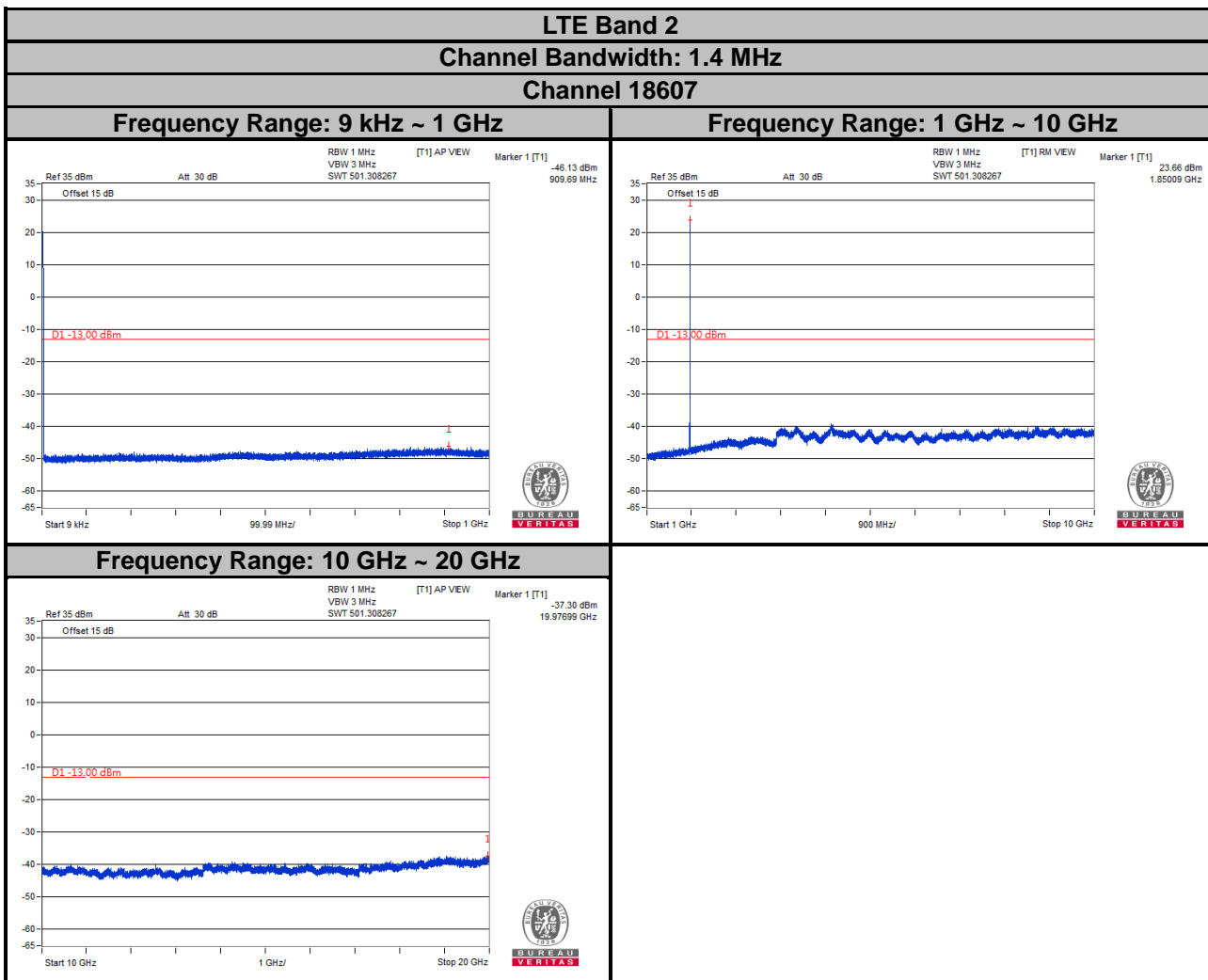
Frequency Range: 1 GHz ~ 10 GHz



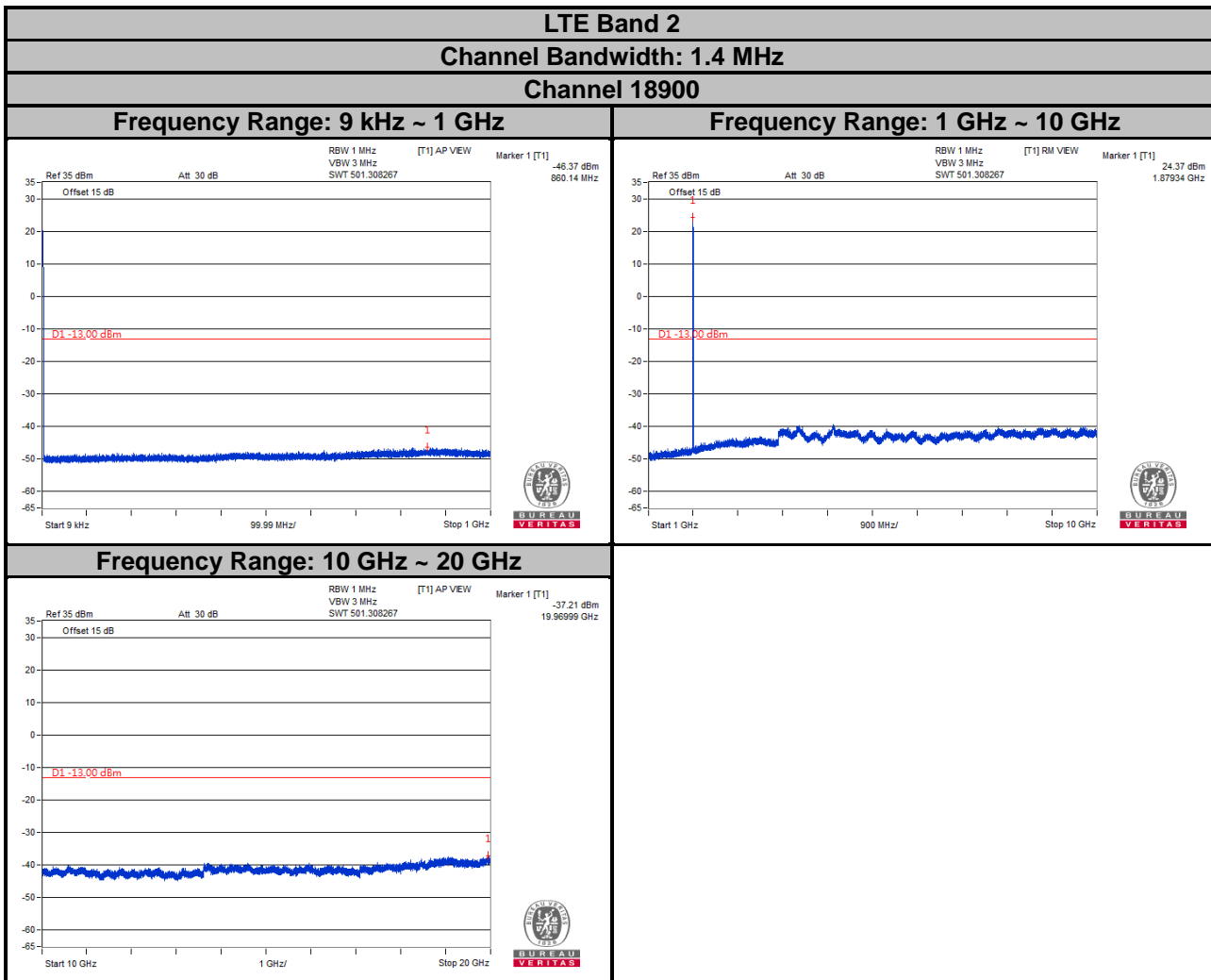
Frequency Range: 10 GHz ~ 20 GHz



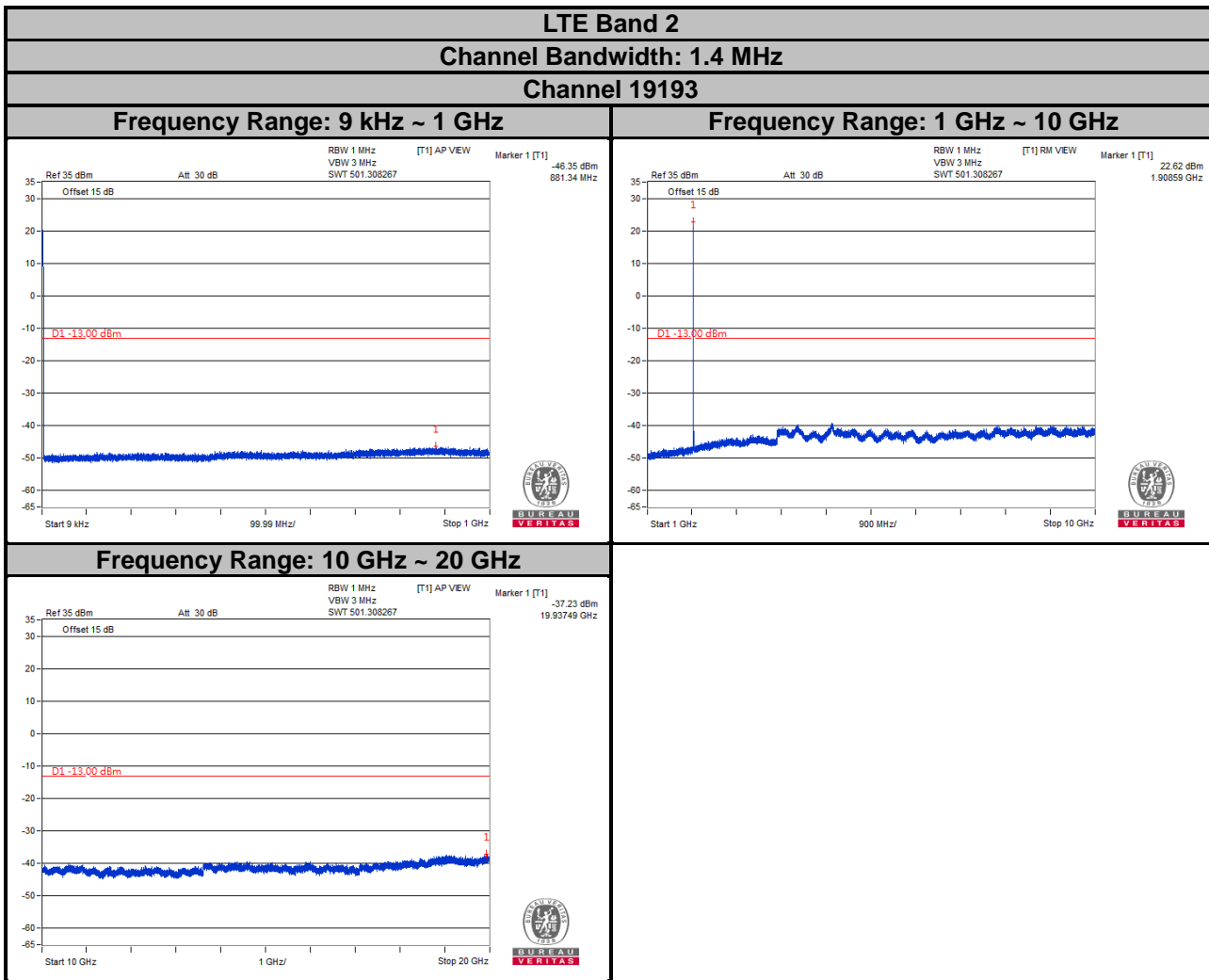
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



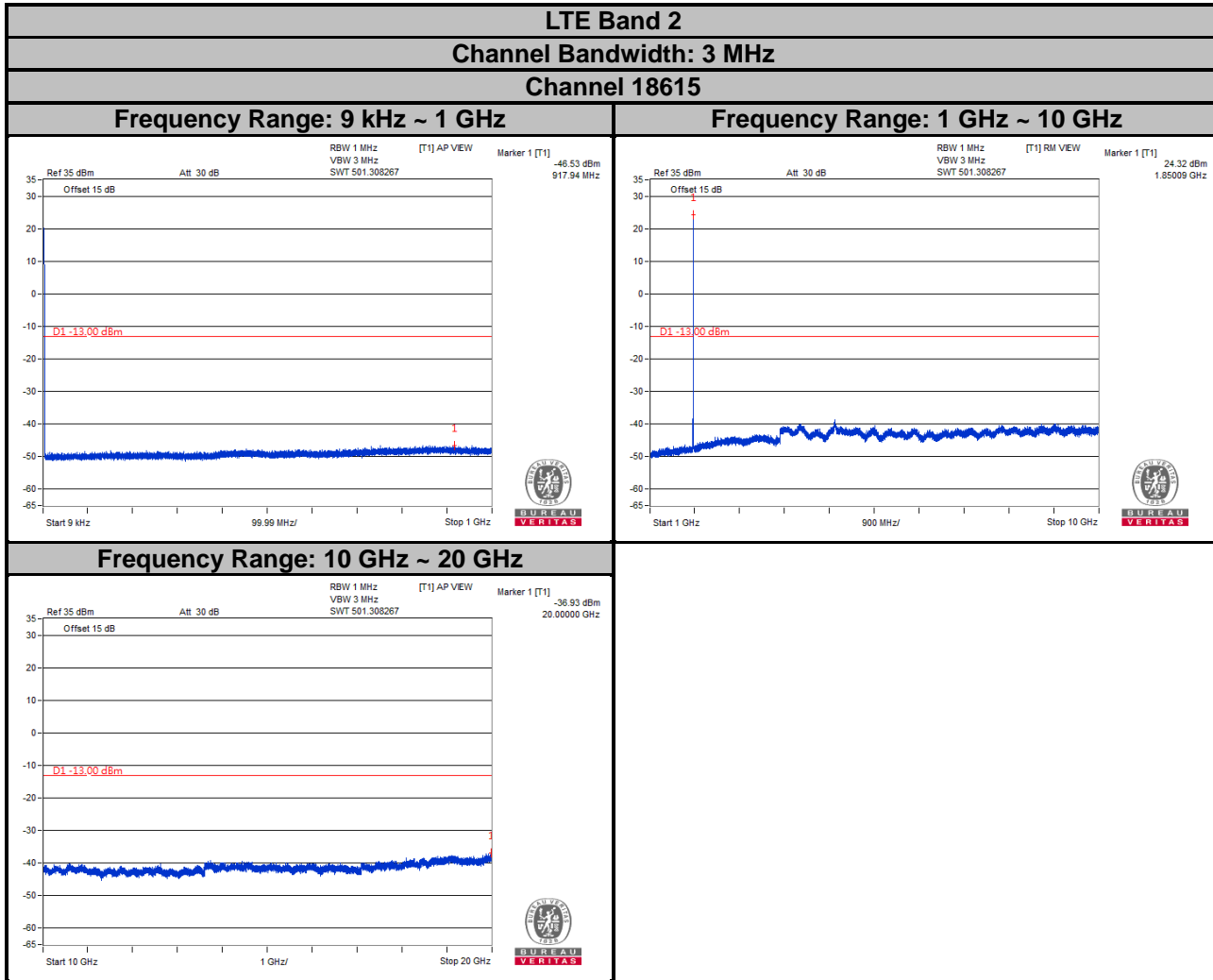
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



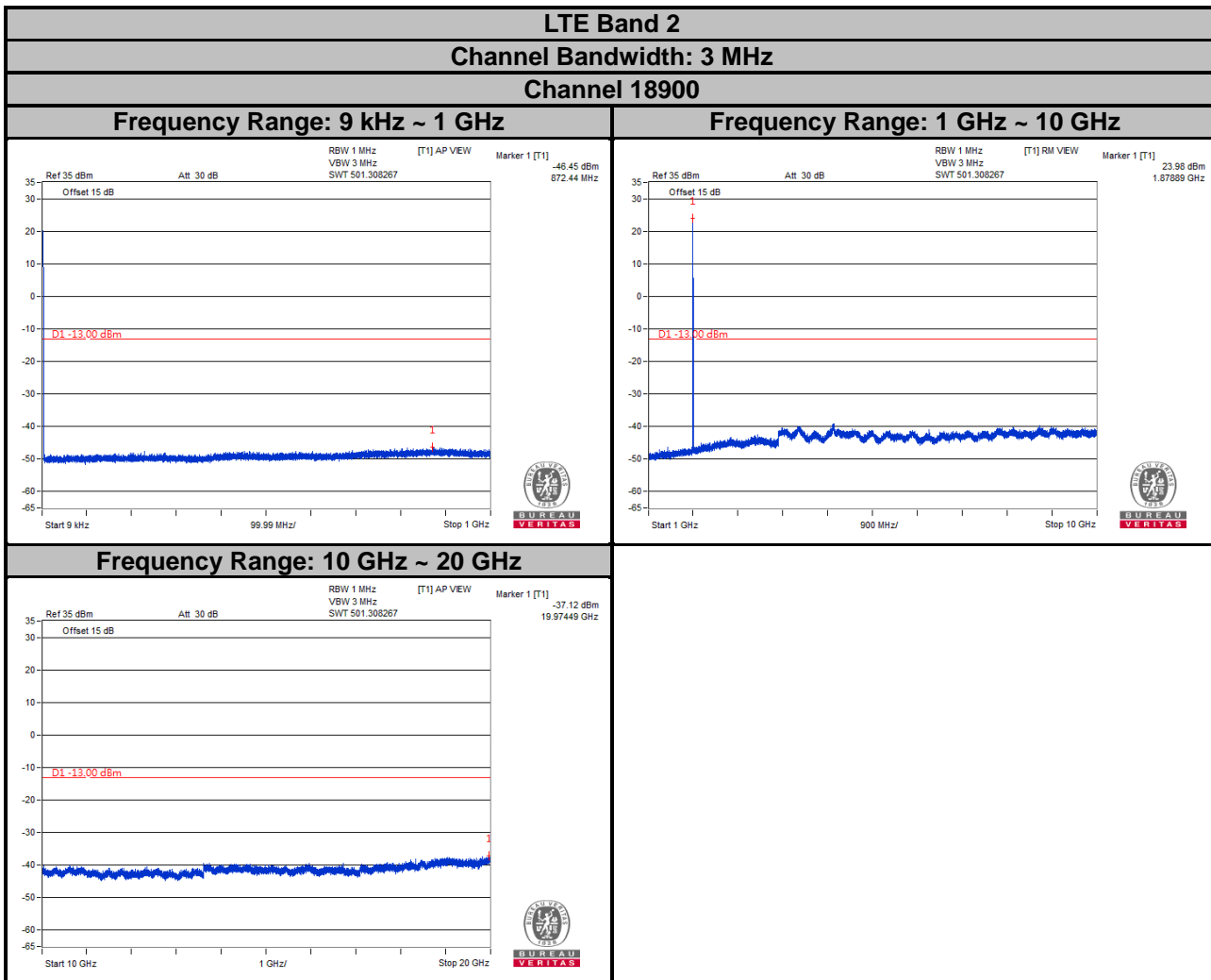
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



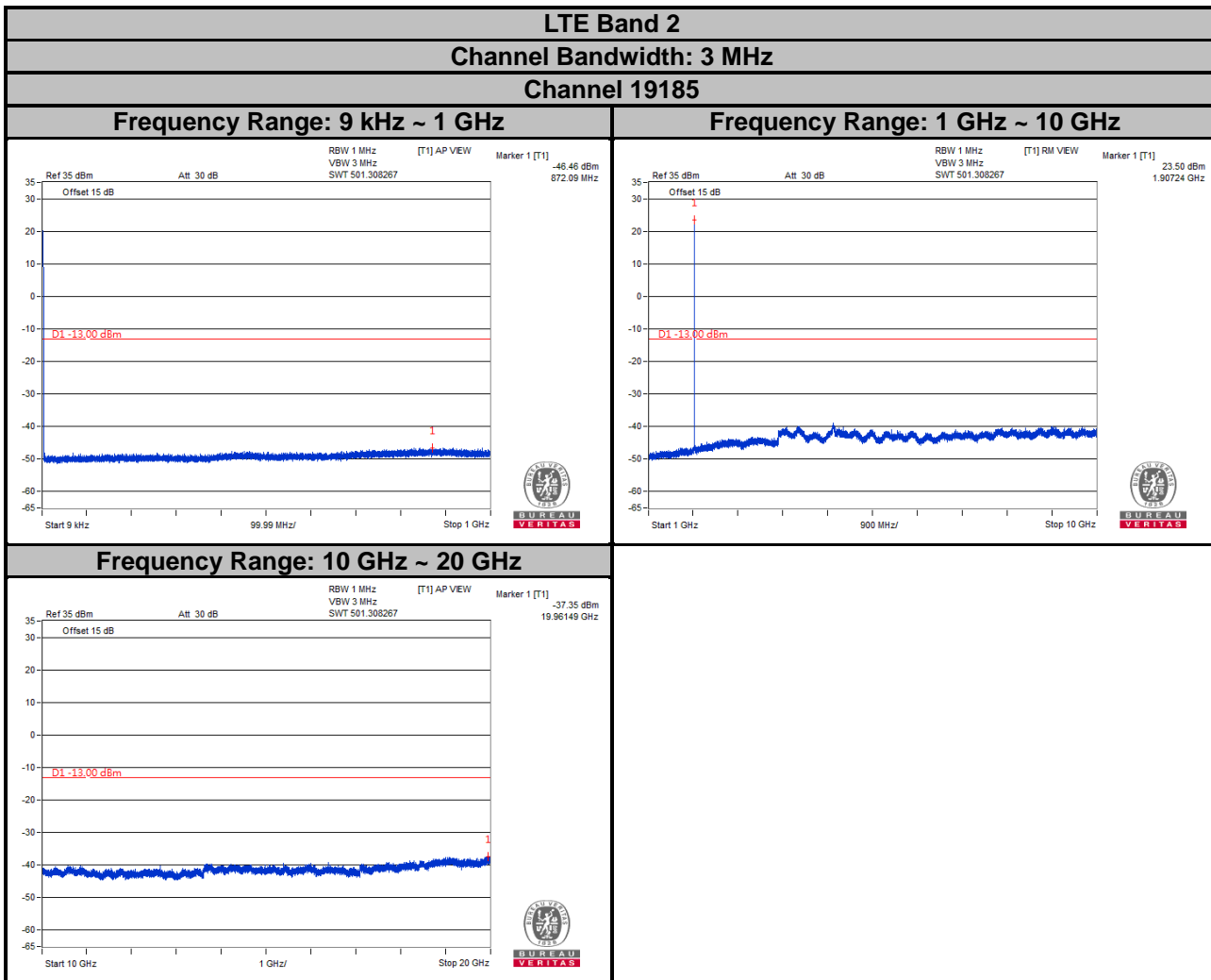
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



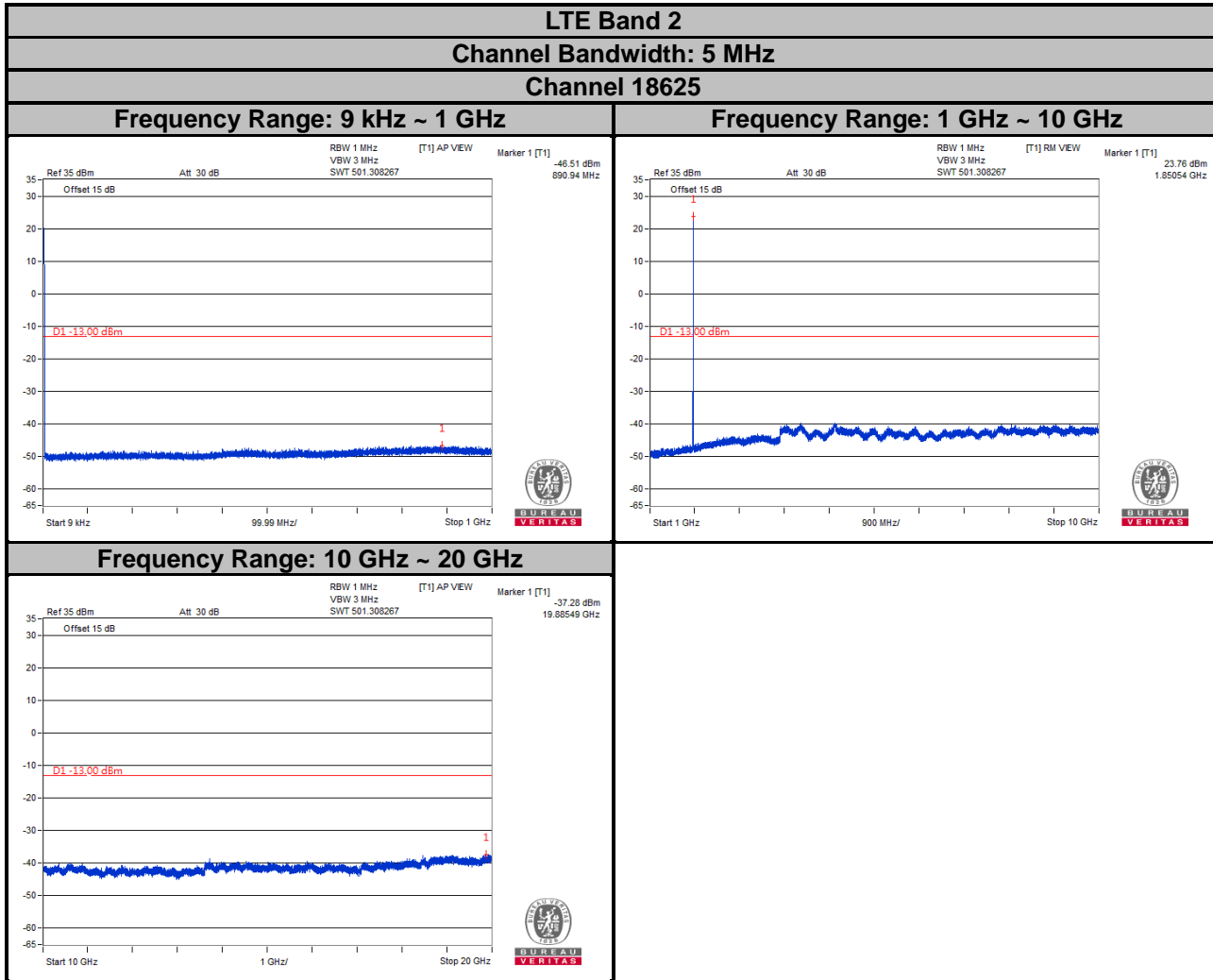
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



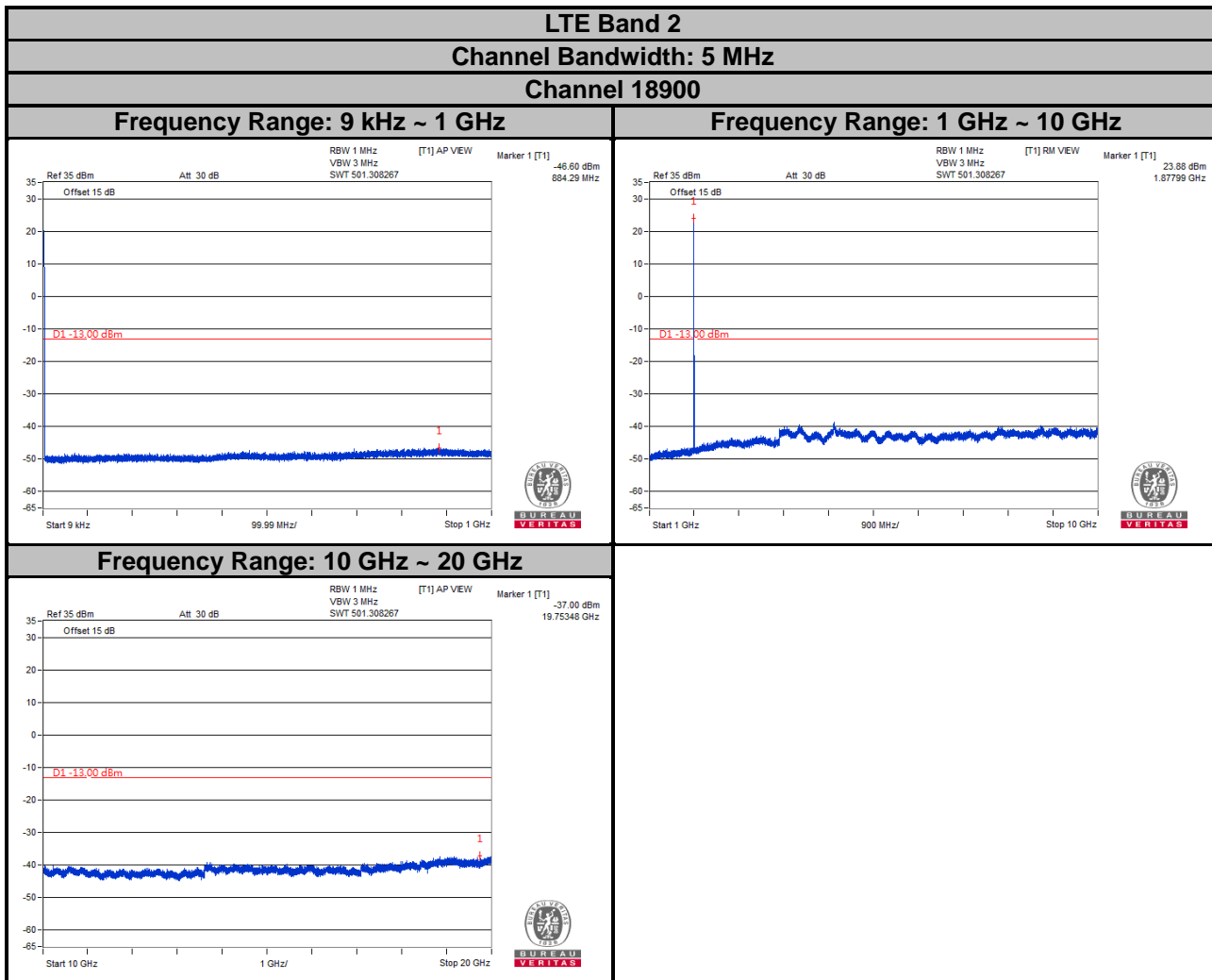
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



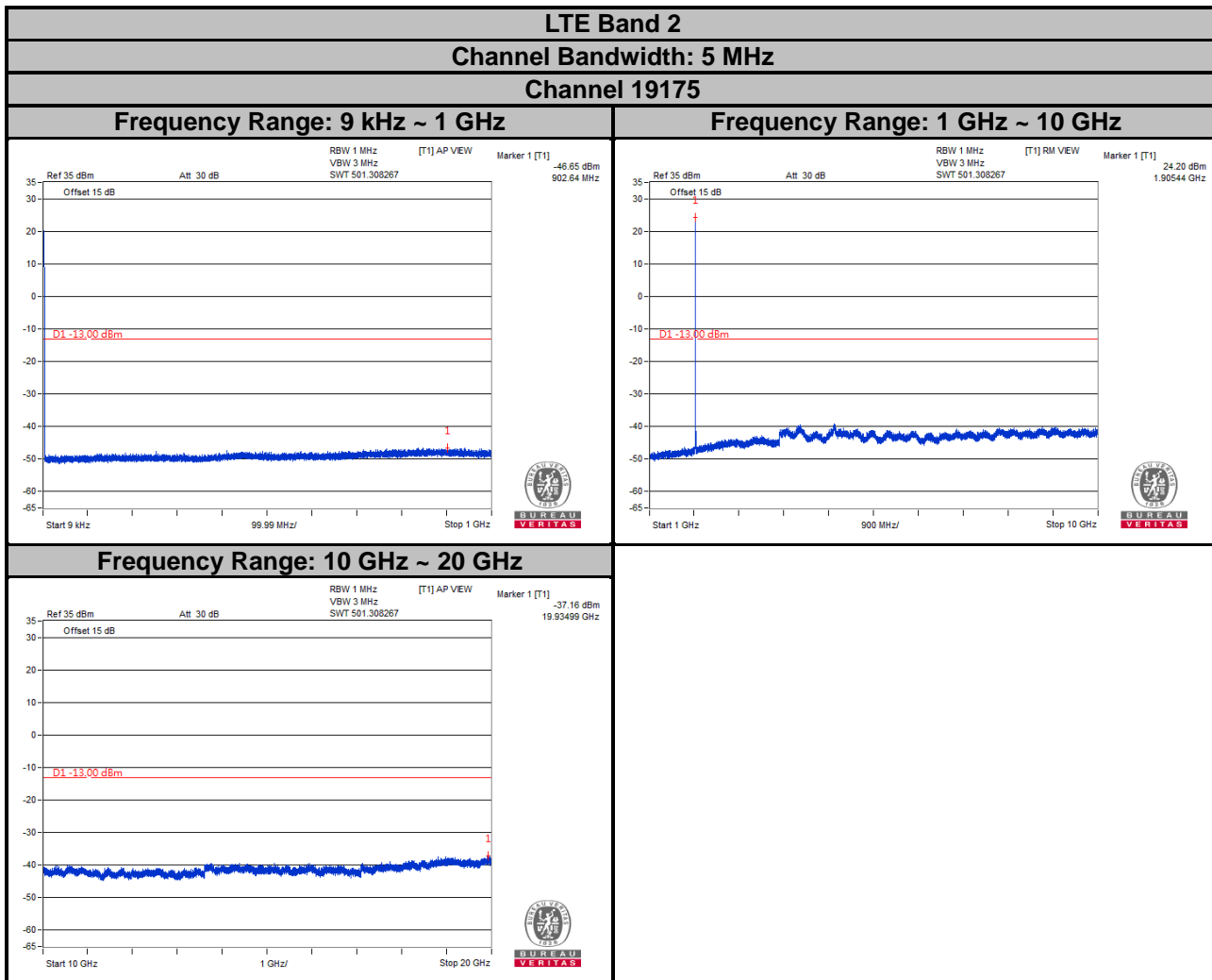
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



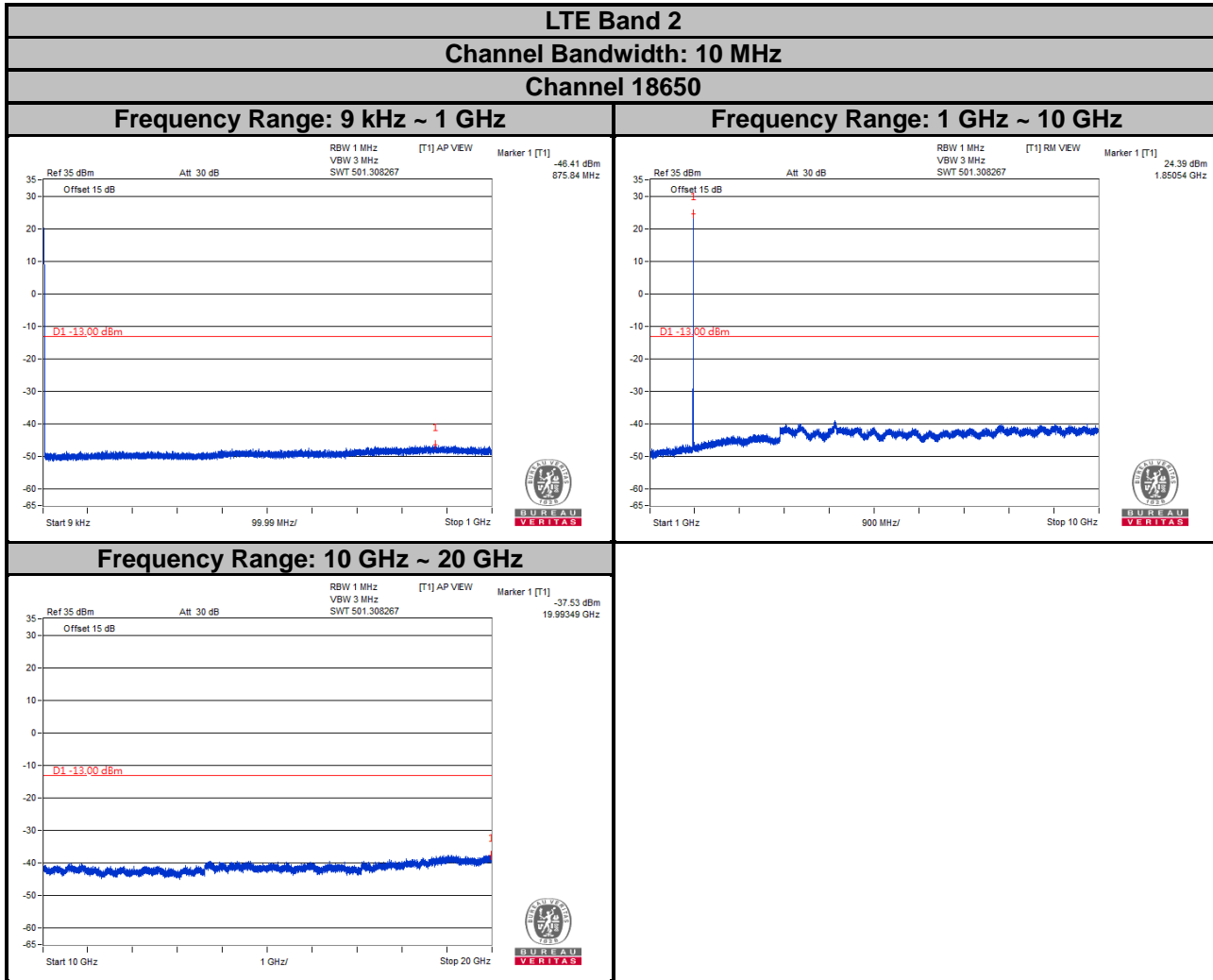
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



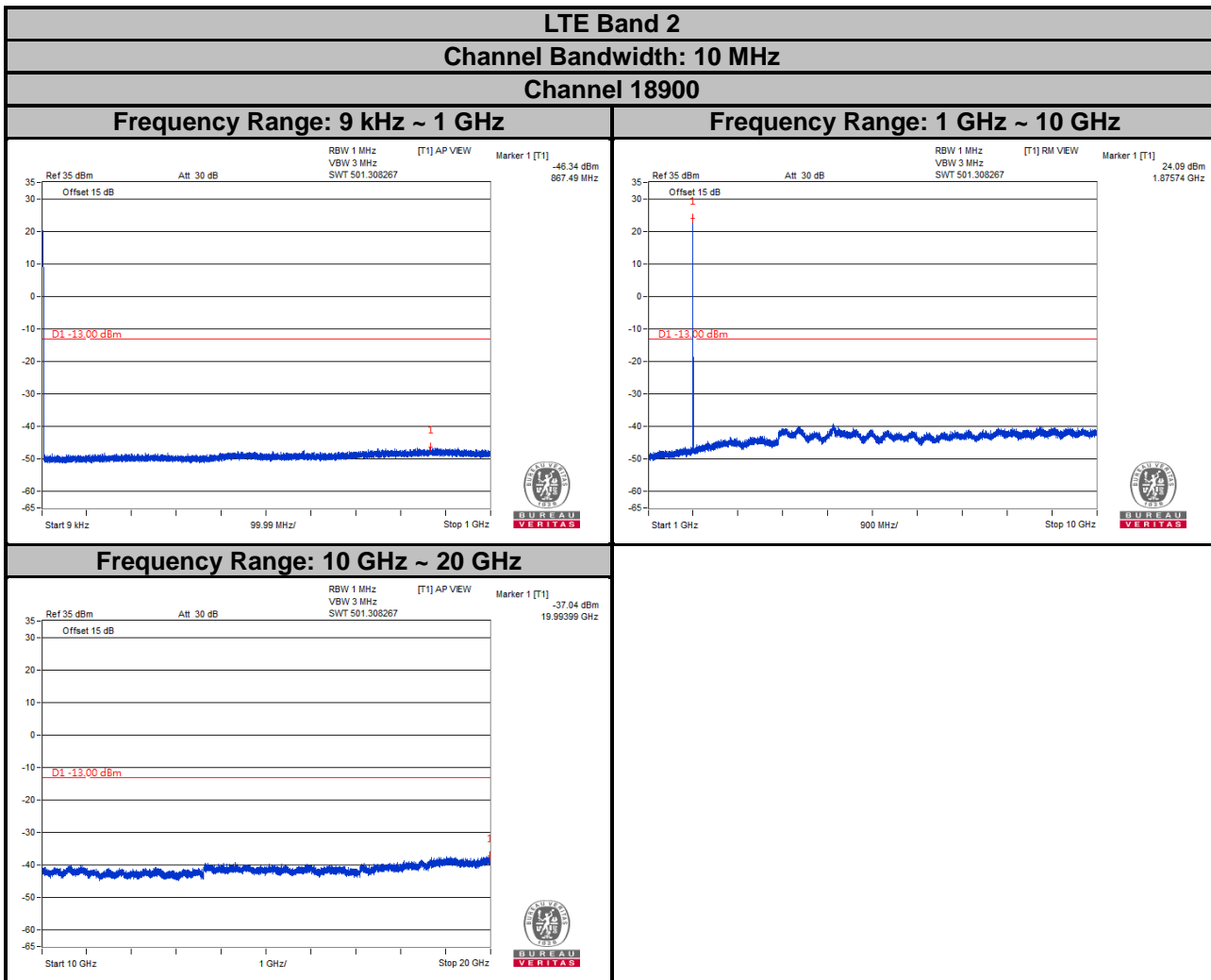
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



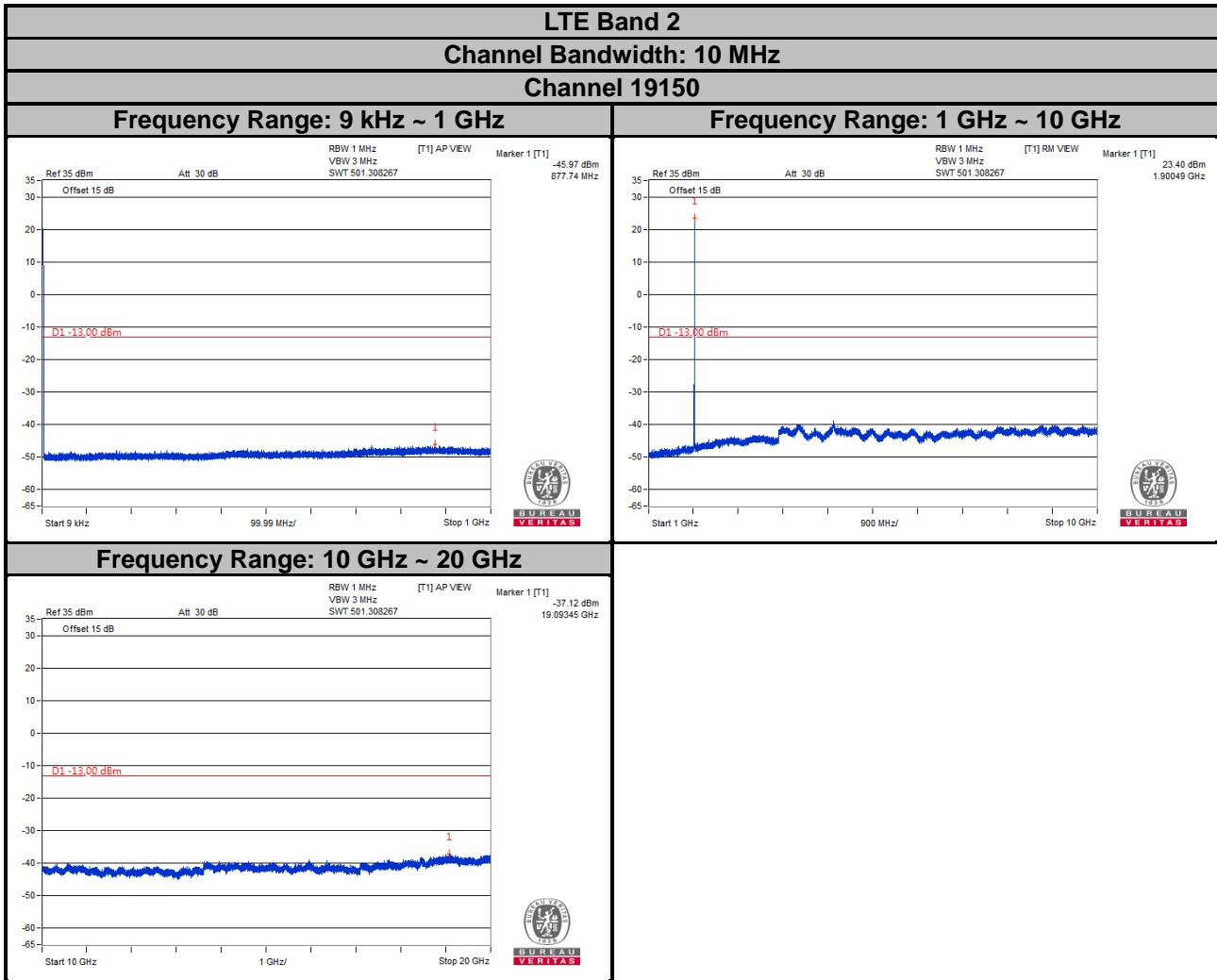
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



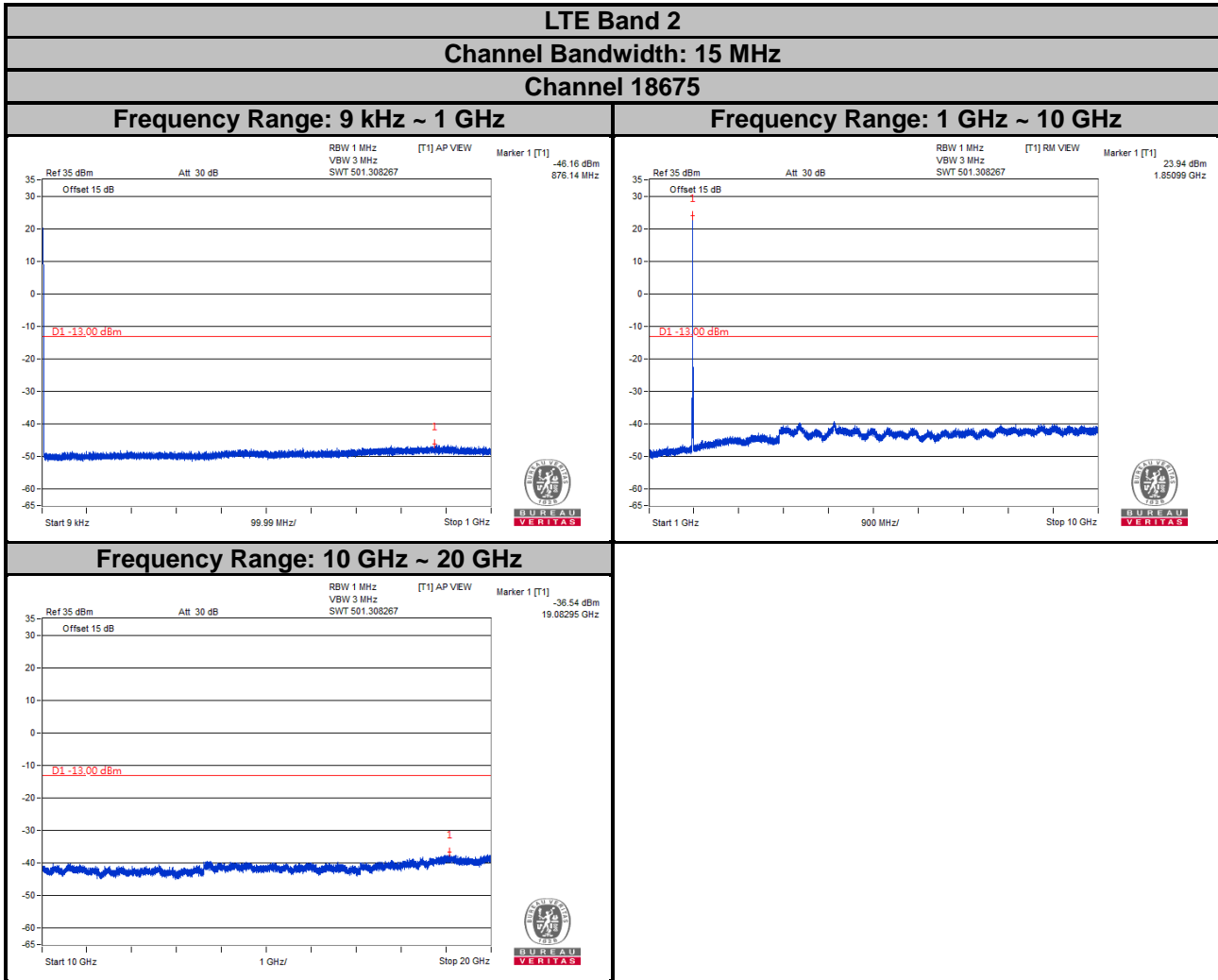
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



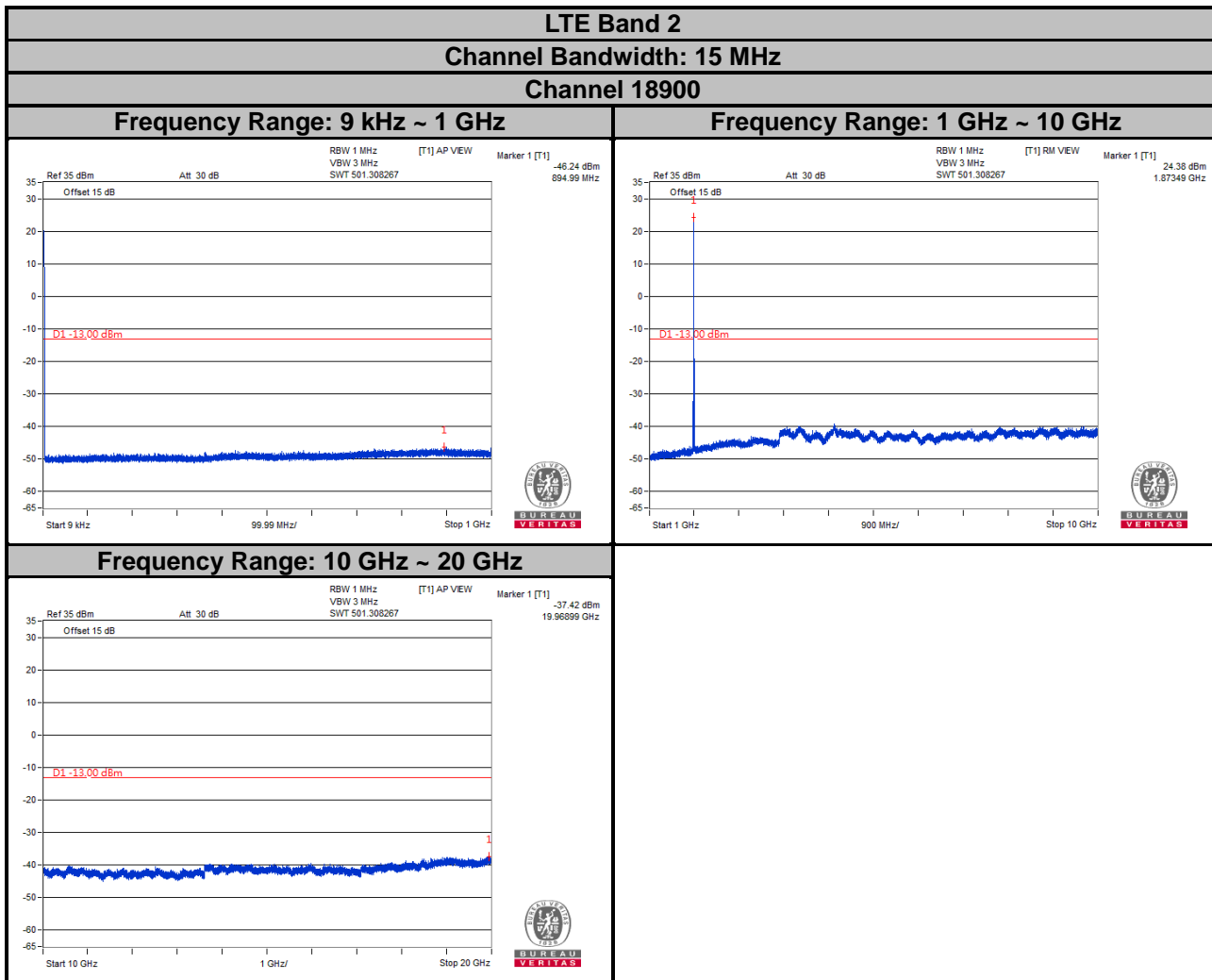
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



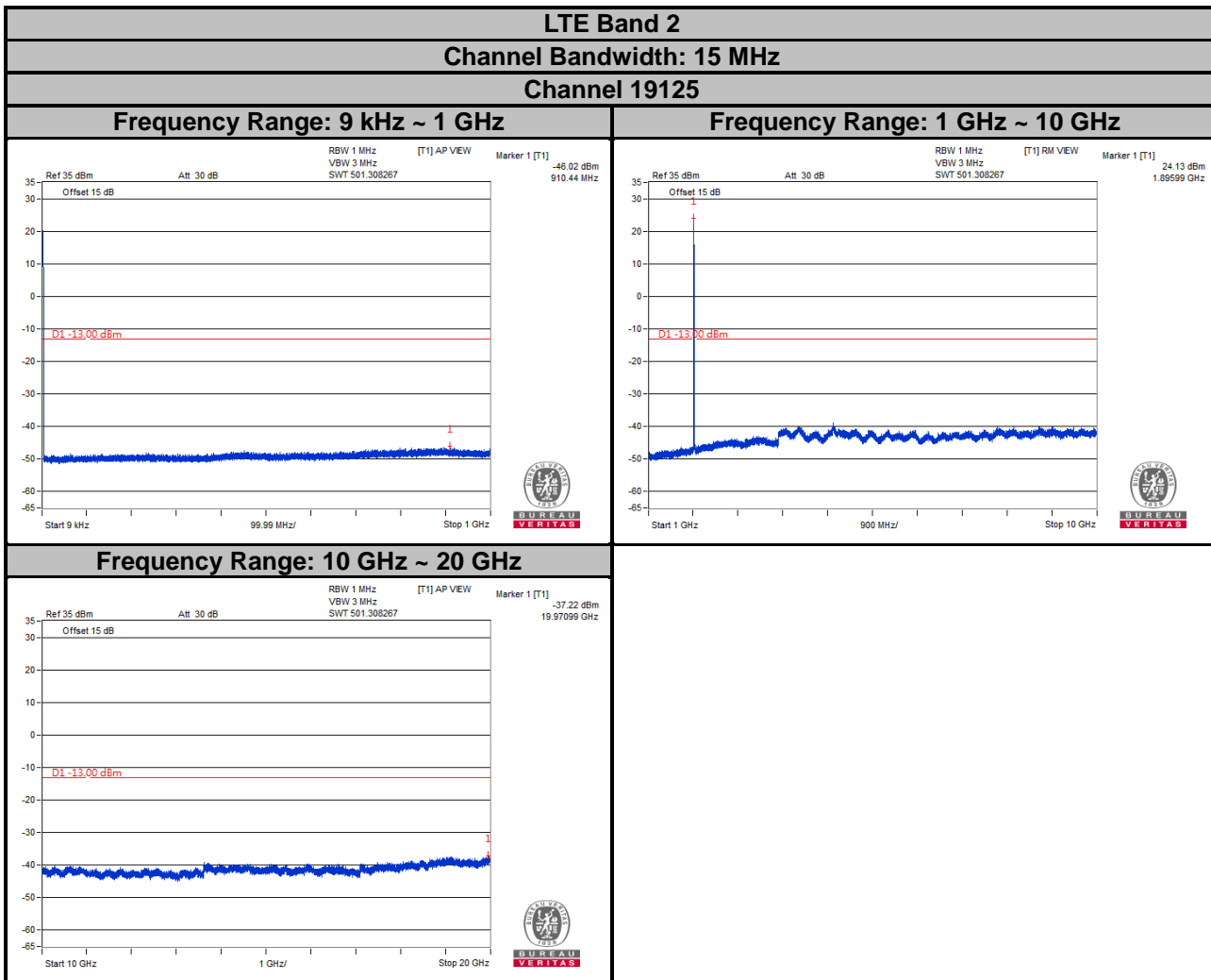
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



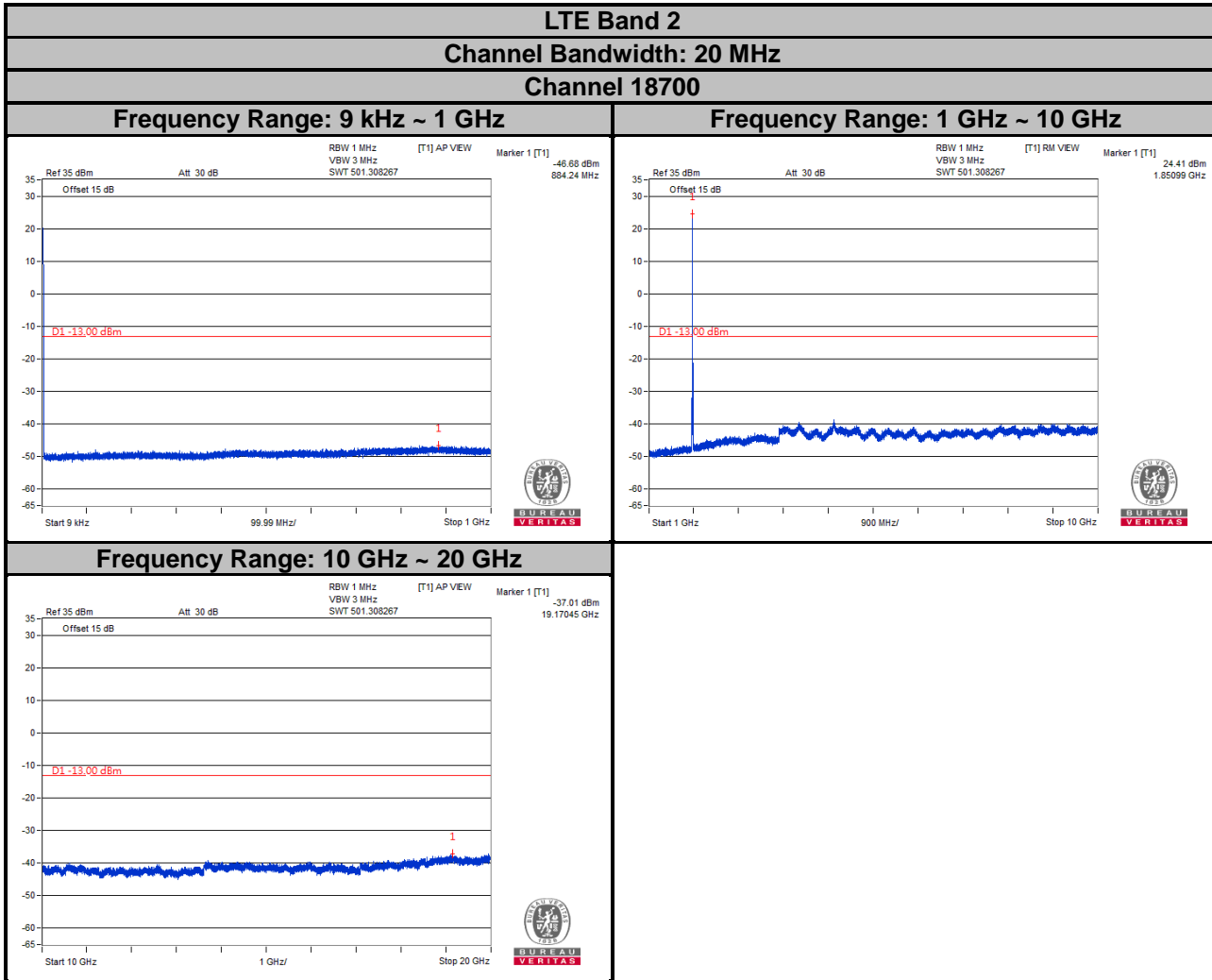
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



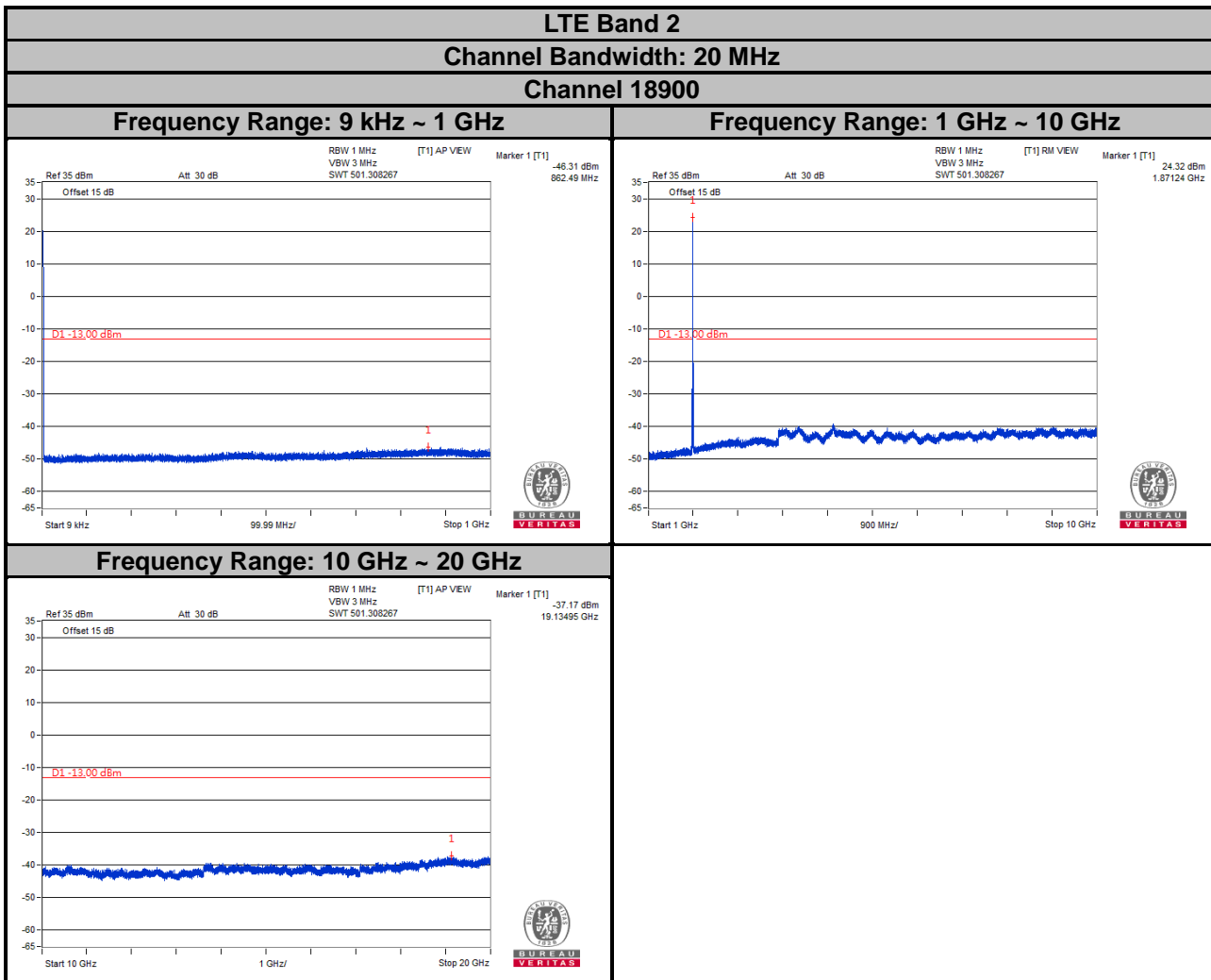
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



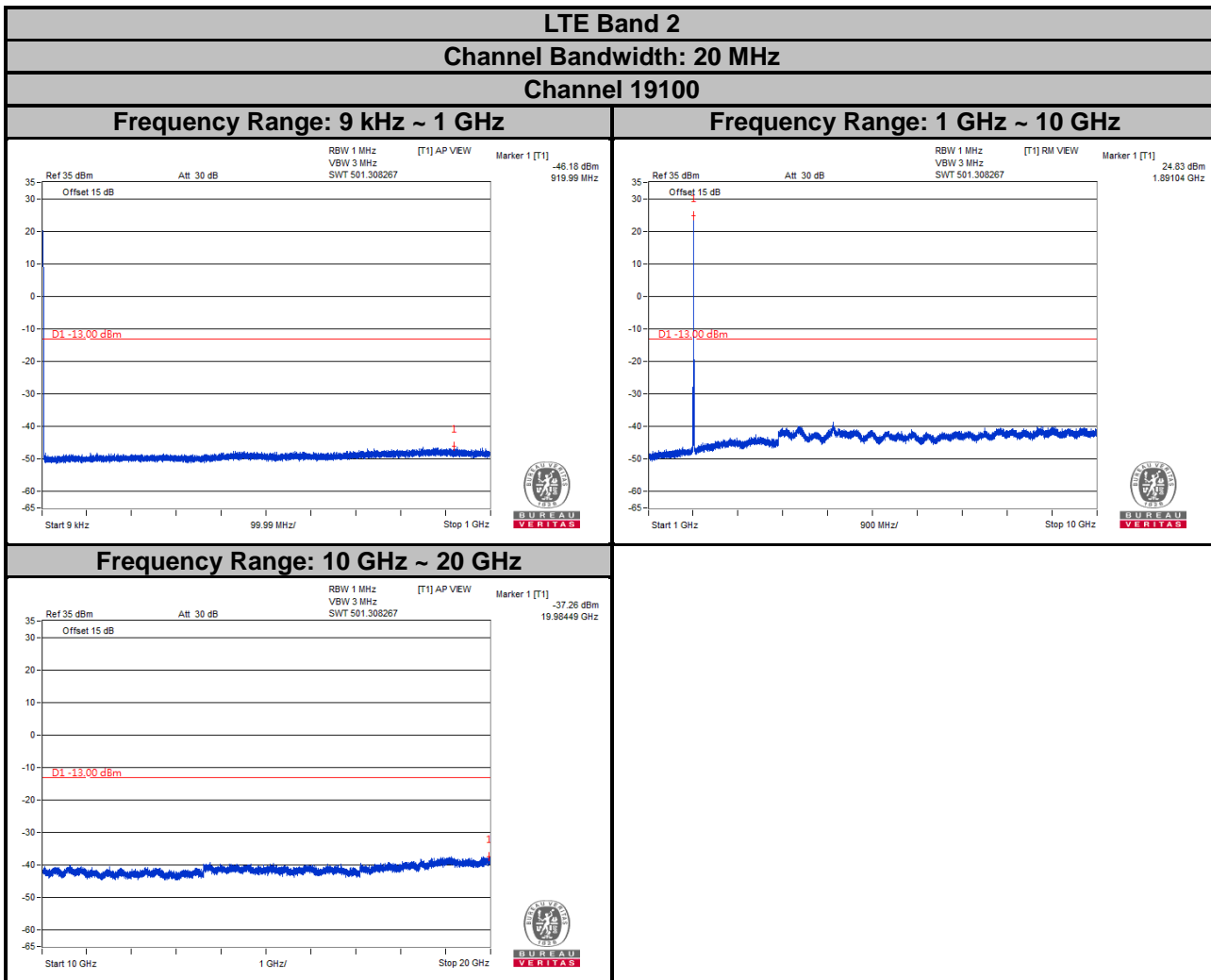
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



Note: The signal over the limit in 9 kHz is from spectrum analyzer.



Note: The signal over the limit in 9 kHz is from spectrum analyzer.



Note: The signal over the limit in 9 kHz is from spectrum analyzer.

4.8 Radiated Emission Measurement

4.8.1 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 is equal to -13 dBm.

4.8.2 Test Procedure

- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) 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 1 m to 4 m 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.R.P power - 2.15 dB.

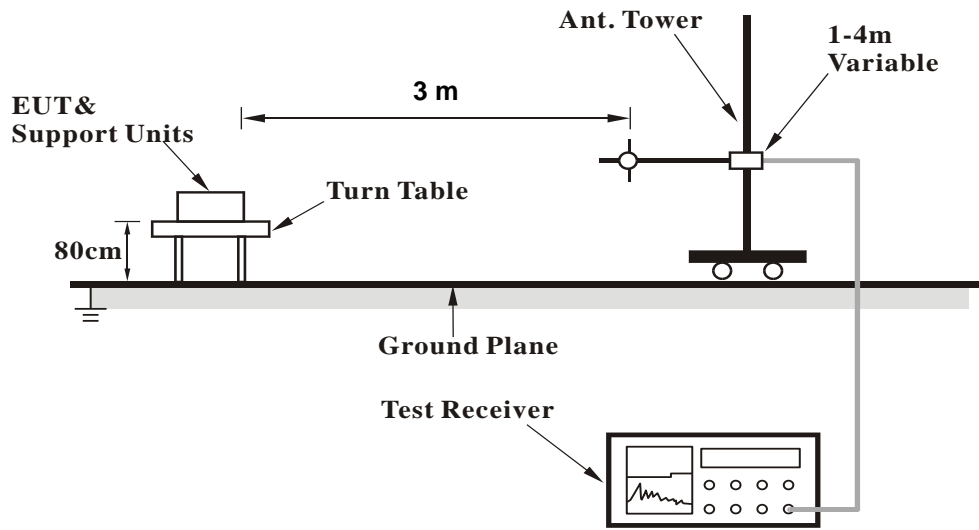
NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz/3 MHz.

4.8.3 Deviation from Test Standard

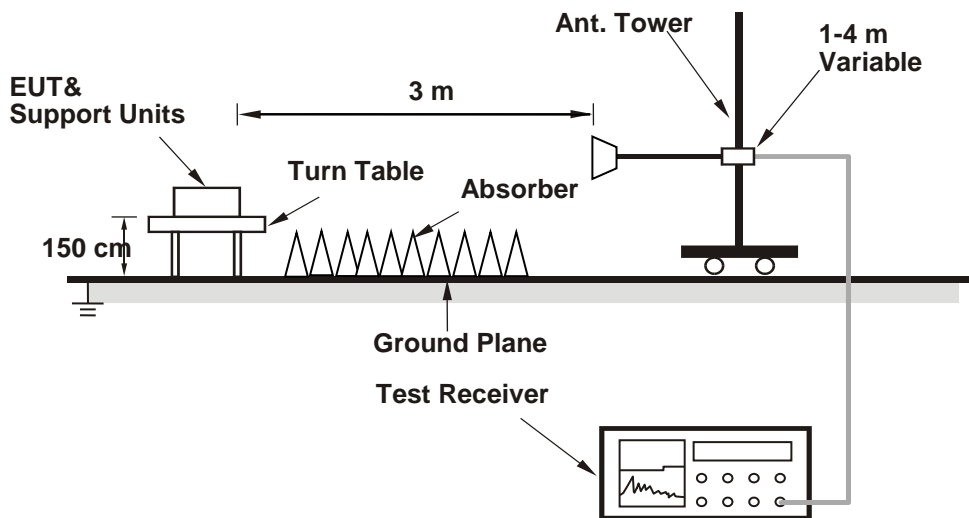
No deviation.

4.8.4 Test Setup

<Radiated Emission below or equal 1 GHz>



<Radiated Emission above 1 GHz>



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

4.8.5 Test Results

WCDMA:

Low Channel

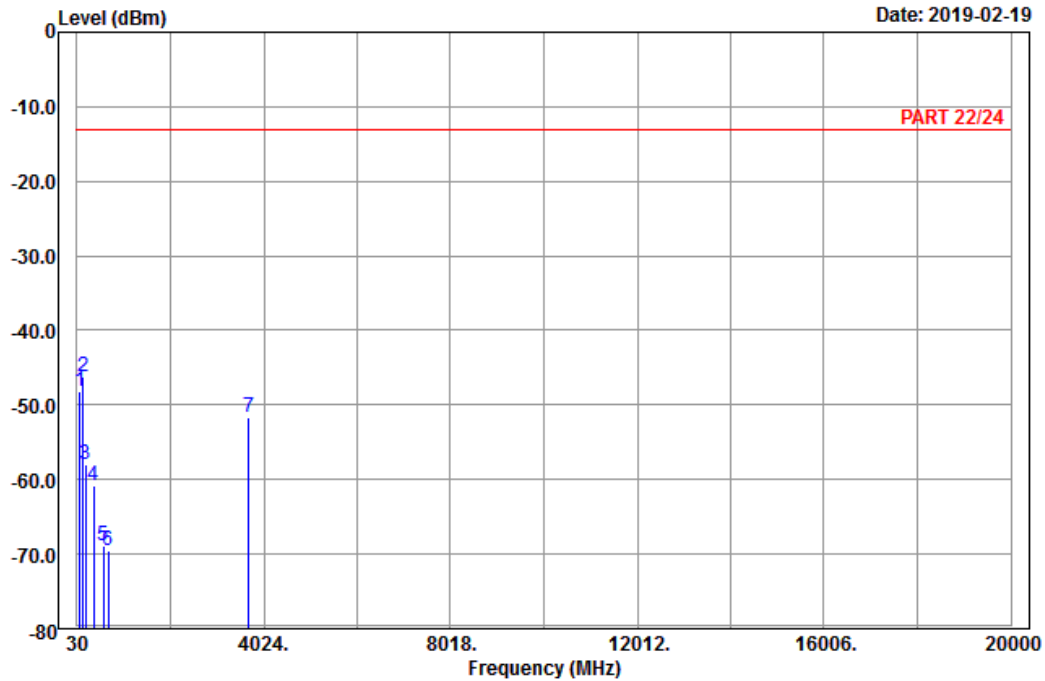


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 13

Date: 2019-02-19



Site : 966 chamber 1
 Condition: PART 22/24 Horizontal
 Remark : Band II_Link_CH9262
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	89.13	-48.07	-37.29	-13.00	-35.07	-10.78	Peak
2	pp 151.77	-46.24	-38.35	-13.00	-33.24	-7.89	Peak
3	210.09	-57.96	-51.92	-13.00	-44.96	-6.04	Peak
4	385.40	-60.83	-57.31	-13.00	-47.83	-3.52	Peak
5	598.90	-68.79	-69.14	-13.00	-55.79	0.35	Peak
6	696.90	-69.48	-69.12	-13.00	-56.48	-0.36	Peak
7	3704.80	-51.66	-67.54	-13.00	-38.66	15.88	Peak

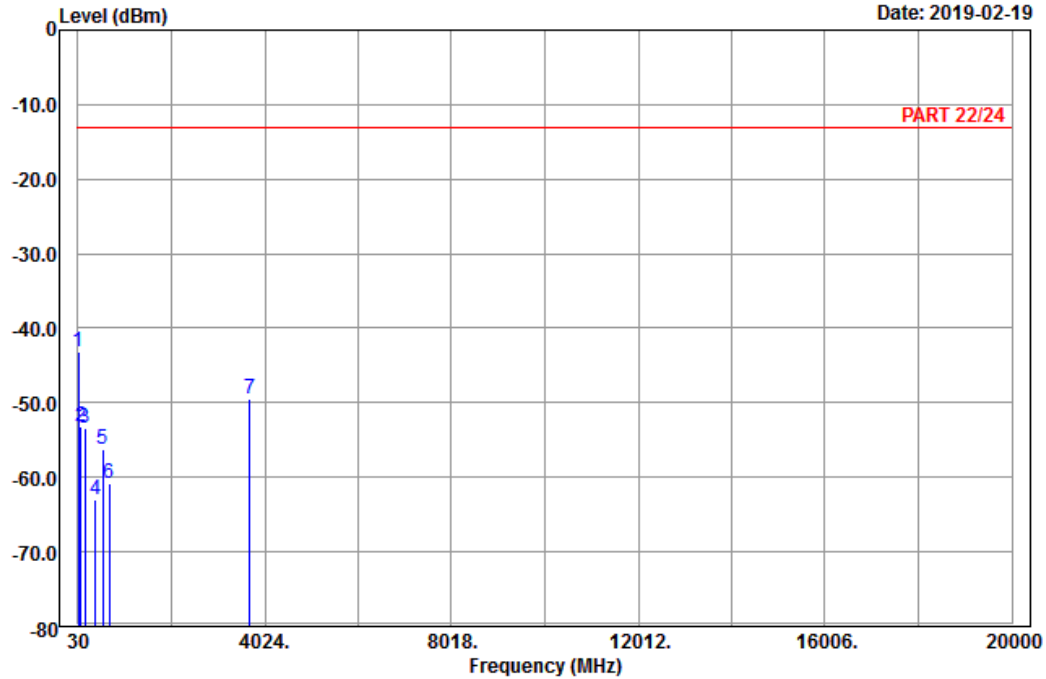


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 14

Date: 2019-02-19



Site : 966 chamber 1
 Condition: PART 22/24 Vertical
 Remark : Band II_Link_CH9262
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	31.35	-43.26	-32.61	-13.00	-30.26	-10.65	Peak
2	82.92	-53.11	-41.67	-13.00	-40.11	-11.44	Peak
3	178.50	-53.41	-47.63	-13.00	-40.41	-5.78	Peak
4	402.20	-62.90	-60.10	-13.00	-49.90	-2.80	Peak
5	554.80	-56.28	-54.82	-13.00	-43.28	-1.46	Peak
6	700.40	-60.80	-60.42	-13.00	-47.80	-0.38	Peak
7	3704.80	-49.55	-65.43	-13.00	-36.55	15.88	Peak

Middle Channel

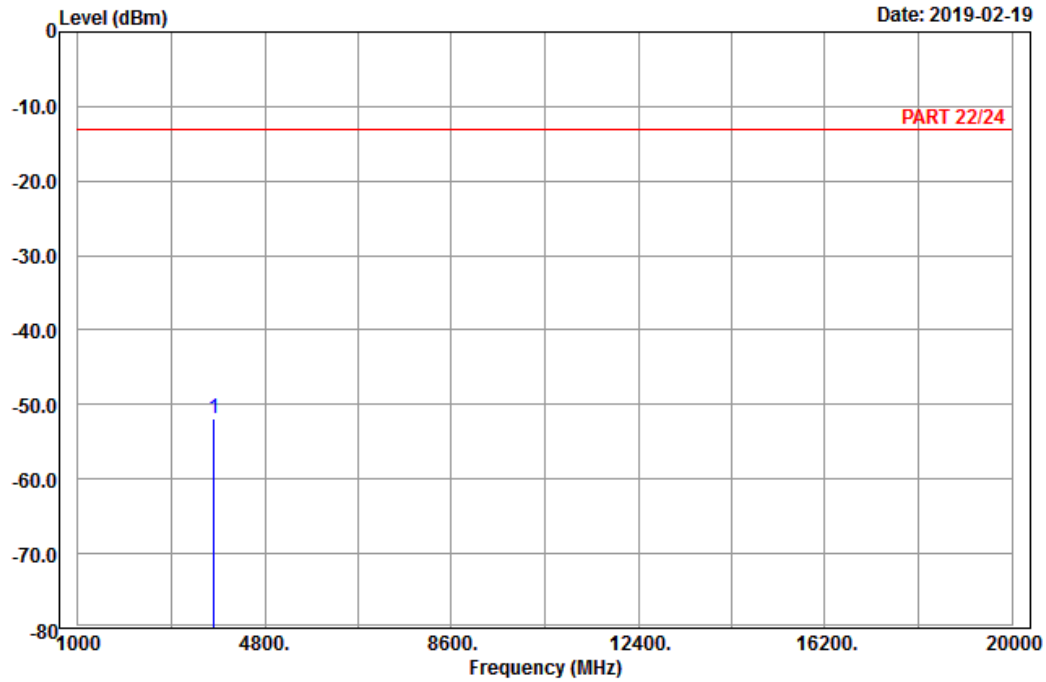


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2019-02-19



Site : 966 chamber 1
 Condition: PART 22/24 Horizontal
 Remark : Band II_Link_CH9400
 Tested by: Karl Lee

Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3760.00	-51.95	-68.09	-13.00	-38.95	16.14	Peak

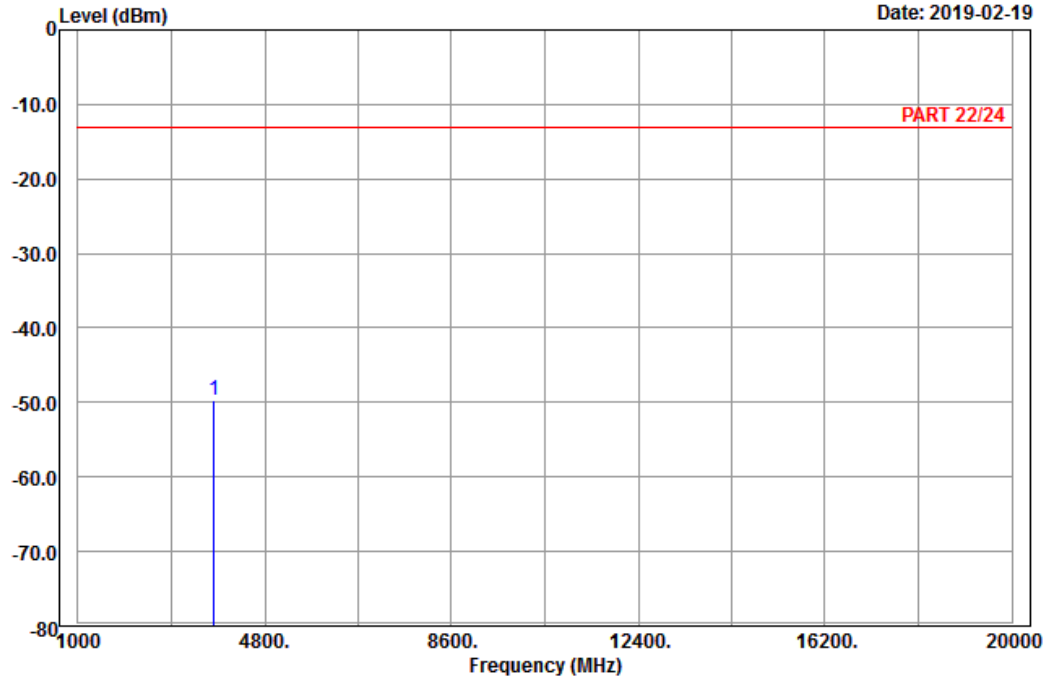


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2019-02-19



Site : 966 chamber 1
 Condition: PART 22/24 Vertical
 Remark : Band II_Link_CH9400
 Tested by: Karl Lee

	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3760.00	-49.76	-65.90	-13.00	-36.76	16.14	Peak

High Channel

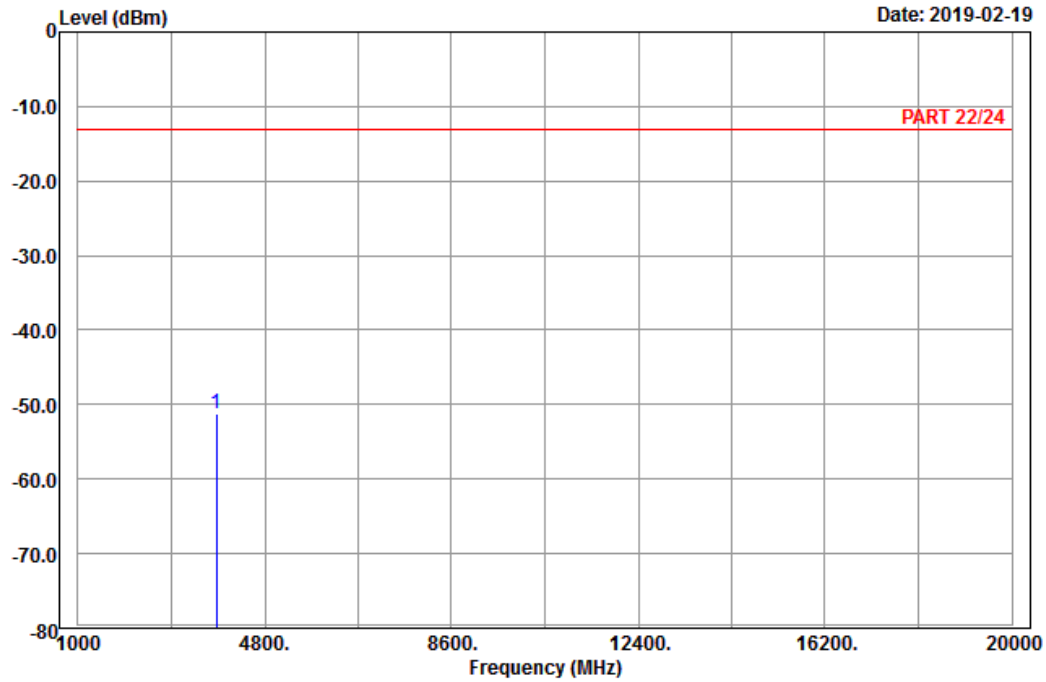


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2019-02-19



Site : 966 chamber 1
 Condition: PART 22/24 Horizontal
 Remark : Band II_Link_CH9538
 Tested by: Karl Lee

Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3815.20	-51.17	-67.58	-13.00	-38.17	16.41	Peak

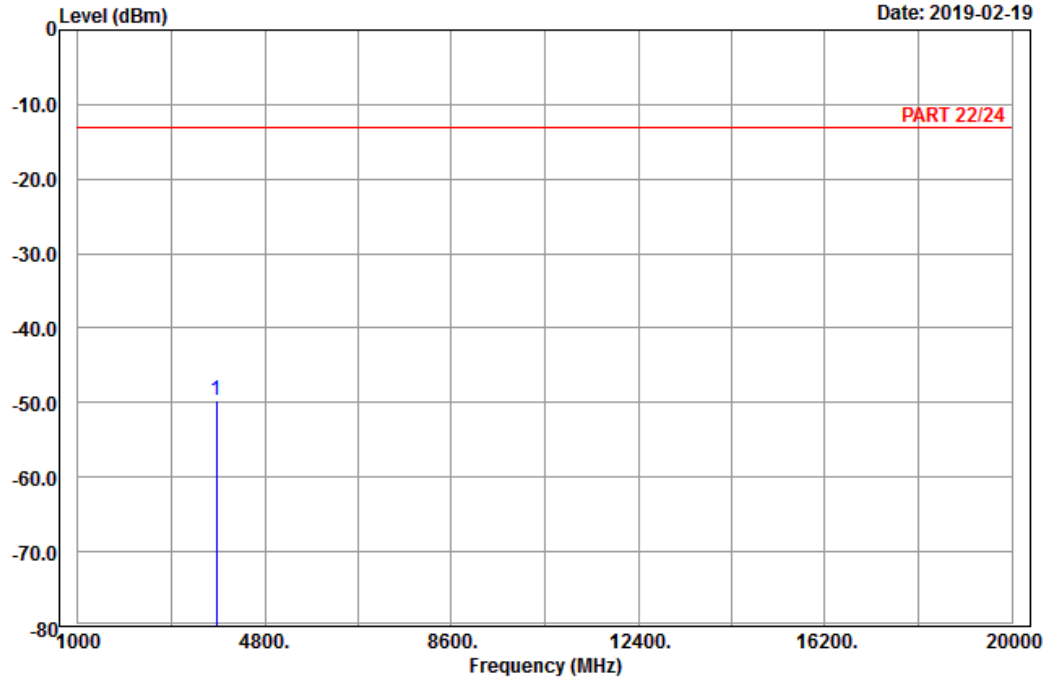


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2019-02-19



Site : 966 chamber 1
 Condition: PART 22/24 Vertical
 Remark : Band II_Link_CH9538
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3815.20	-49.80	-66.21	-13.00	-36.80	16.41	Peak

LTE Band 2
 Channel Bandwidth: 1.4 MHz / QPSK
 Low Channel

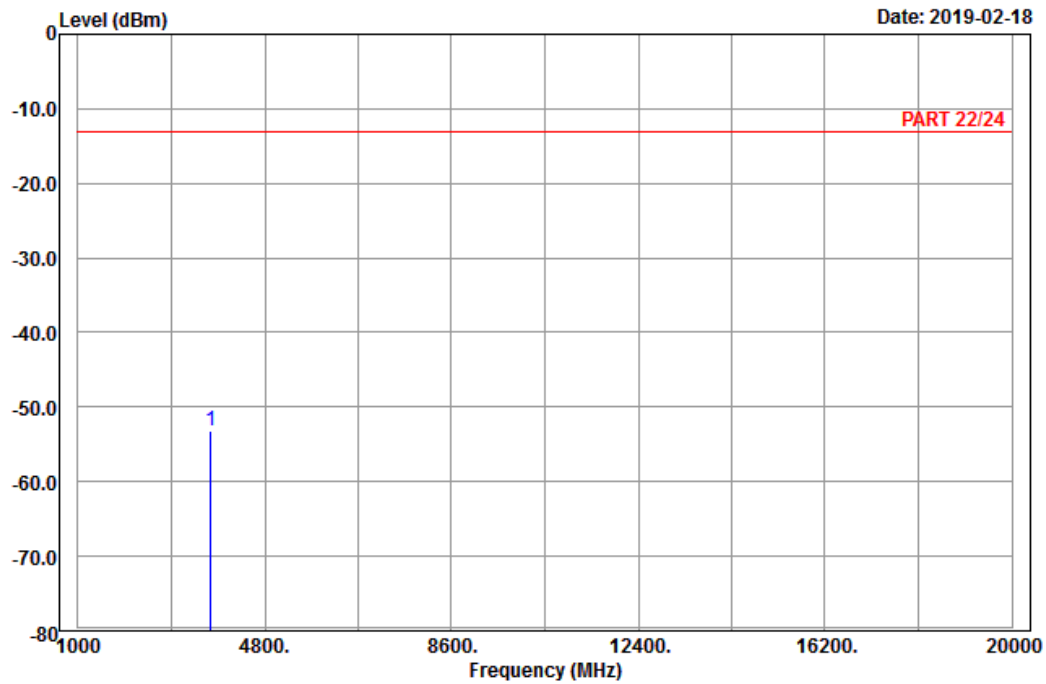


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2019-02-18



Site : 966 chamber 1
 Condition: PART 22/24 Horizontal
 Remark : LTE_Band 2_Link_CH18607
 Tested by: Karl Lee

	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3701.40	-53.17	-69.05	-13.00	-40.17	15.88	Peak

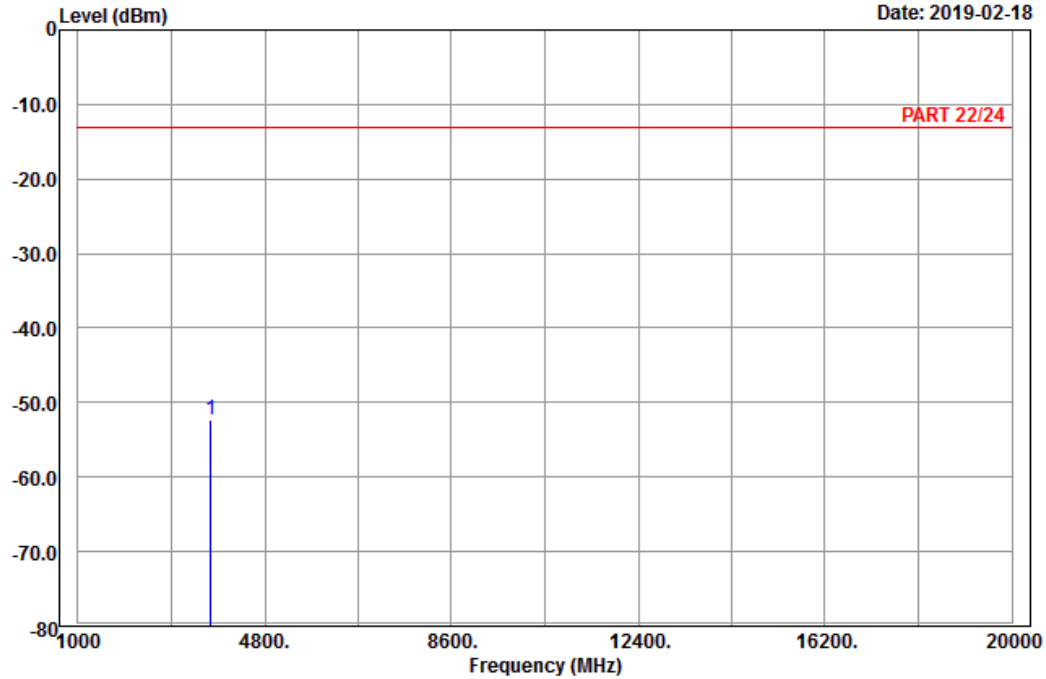


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2019-02-18



Site : 966 chamber 1
 Condition: PART 22/24 Vertical
 Remark : LTE_Band 2_Link_CH18607
 Tested by: Karl Lee

	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3701.40	-52.22	-68.10	-13.00	-39.22	15.88	Peak

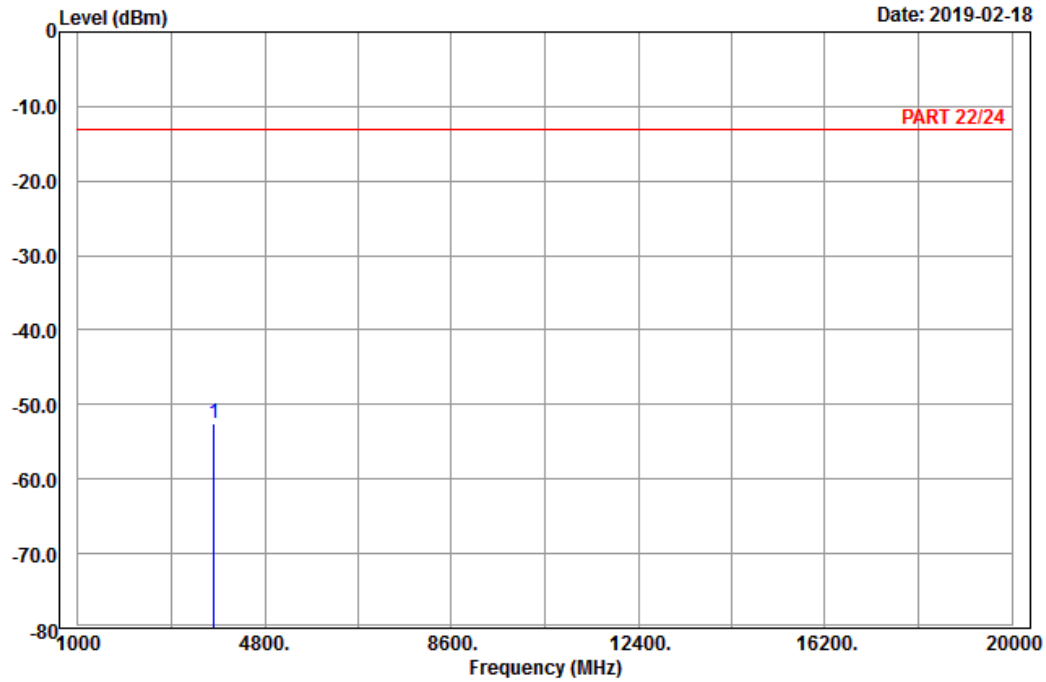
Middle Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9



Site : 966 chamber 1
 Condition: PART 22/24 Horizontal
 Remark : LTE_Band 2_Link_CH18900
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	pp 3760.00	-52.62	-68.76	-13.00	-39.62	16.14	Peak

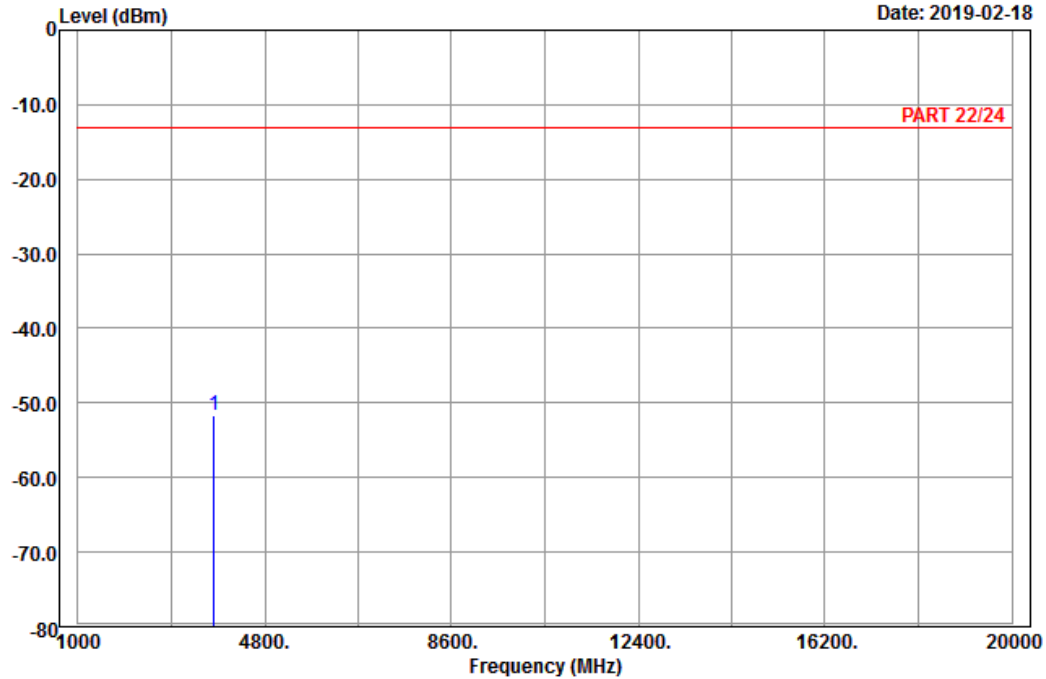


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2019-02-18



Site : 966 chamber 1
 Condition: PART 22/24 Vertical
 Remark : LTE_Band 2_Link_CH18900
 Tested by: Karl Lee

	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3760.00	-51.61	-67.75	-13.00	-38.61	16.14	Peak

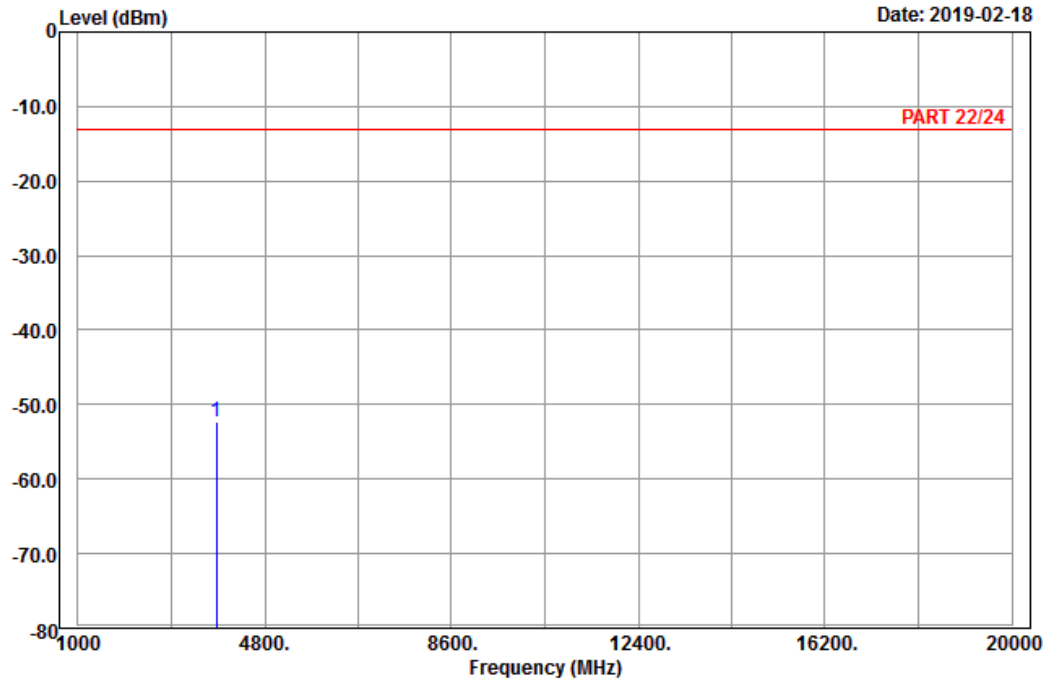
High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9



Site : 966 chamber 1
 Condition: PART 22/24 Horizontal
 Remark : LTE_Band 2_Link_CH19193
 Tested by: Karl Lee

Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3818.60	-52.25	-68.75	-13.00	-39.25	16.50	Peak

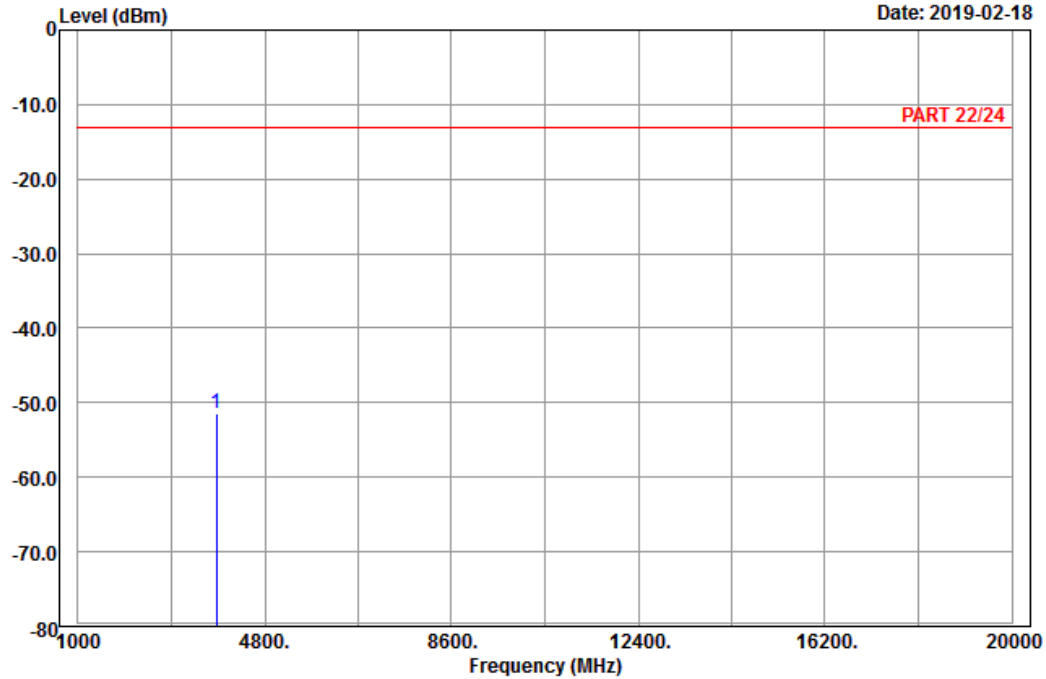


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2019-02-18



Site : 966 chamber 1
 Condition: PART 22/24 Vertical
 Remark : LTE_Band 2_Link_CH19193
 Tested by: Karl Lee

	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3818.60	-51.46	-67.96	-13.00	-38.46	16.50	Peak

Channel Bandwidth: 5 MHz / QPSK
Low Channel

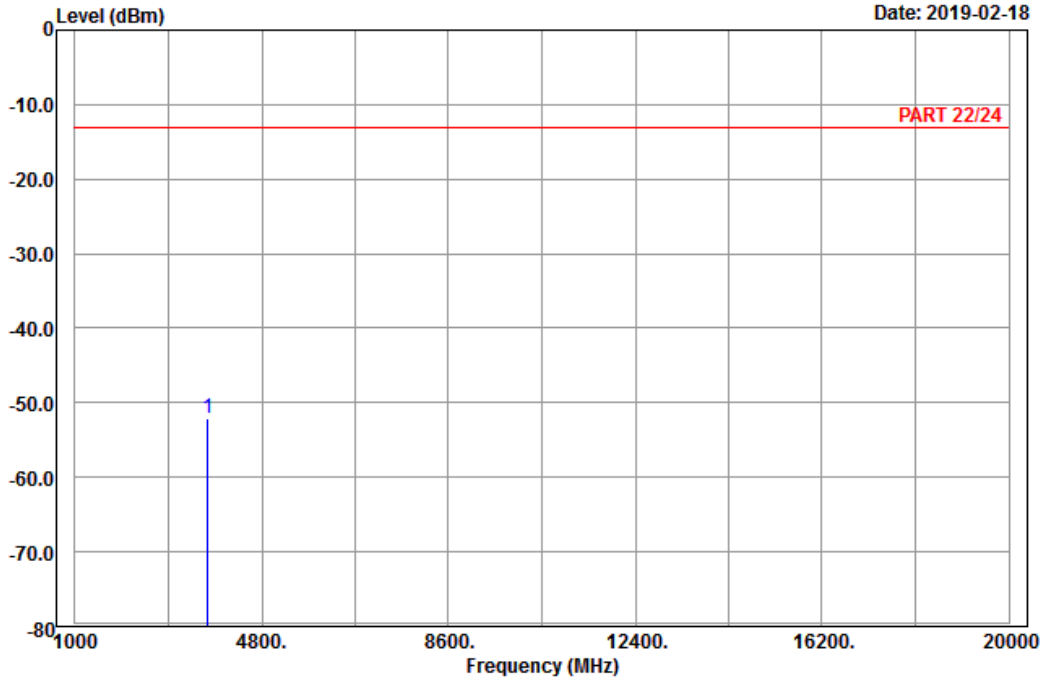


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2019-02-18



Site : 966 chamber 1
Condition: PART 22/24 Horizontal
Remark : LTE_Band 2_Link_CH18625
Tested by: Karl Lee

	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3705.00	-52.15	-68.03	-13.00	-39.15	15.88	Peak

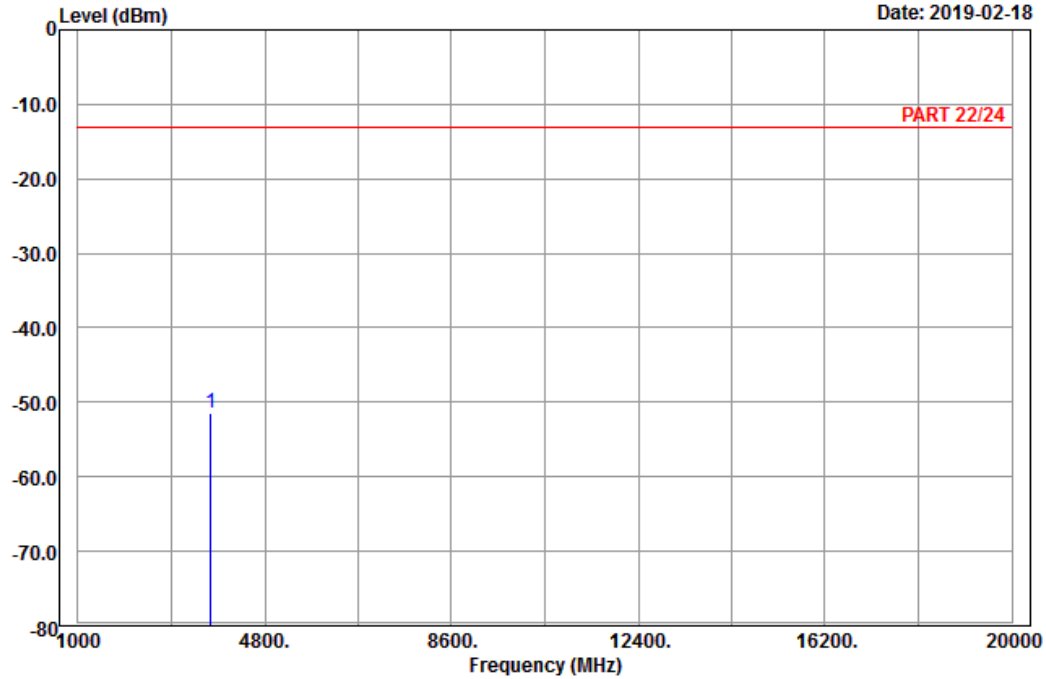


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2019-02-18



Site : 966 chamber 1
 Condition: PART 22/24 Vertical
 Remark : LTE_Band 2_Link_CH18625
 Tested by: Karl Lee

	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3705.00	-51.51	-67.39	-13.00	-38.51	15.88	Peak

Middle Channel

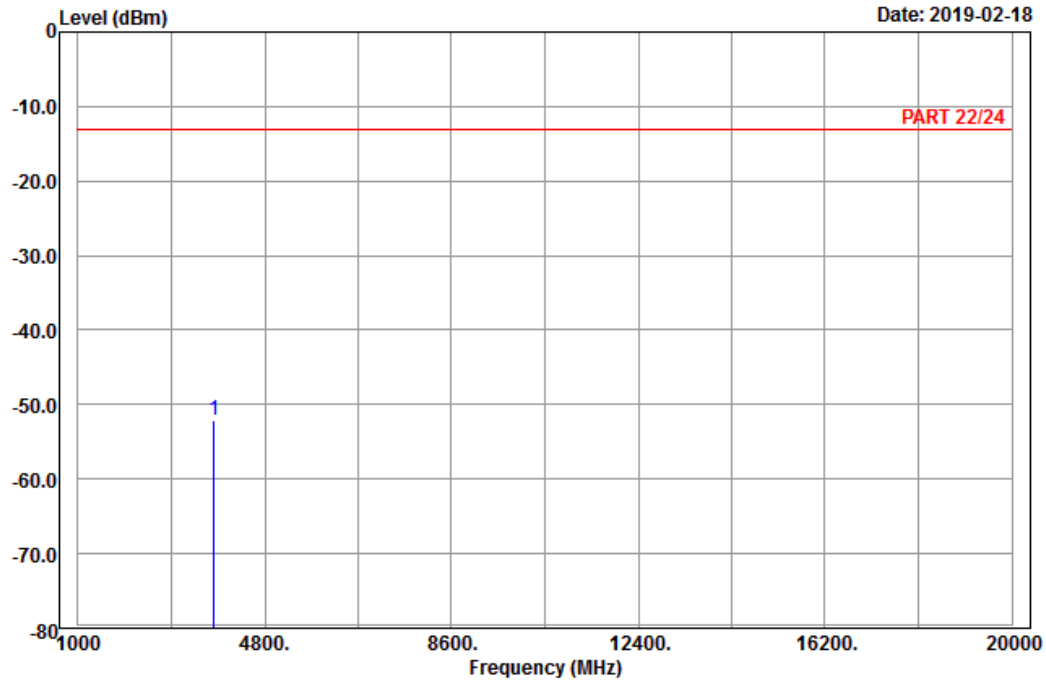


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2019-02-18



Site : 966 chamber 1
 Condition: PART 22/24 Horizontal
 Remark : LTE_Band 2_Link_CH18900
 Tested by: Karl Lee

Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3760.00	-52.00	-68.14	-13.00	-39.00	16.14	Peak

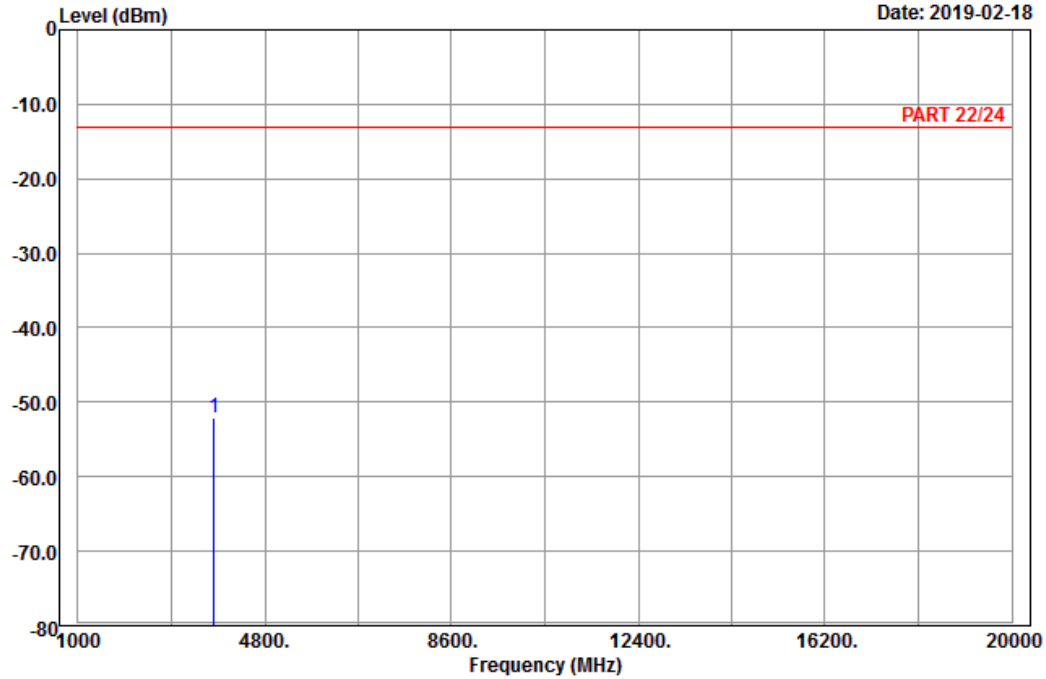


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2019-02-18



Site : 966 chamber 1
 Condition: PART 22/24 Vertical
 Remark : LTE_Band 2_Link_CH18900
 Tested by: Karl Lee

	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3760.00	-52.12	-68.26	-13.00	-39.12	16.14	Peak

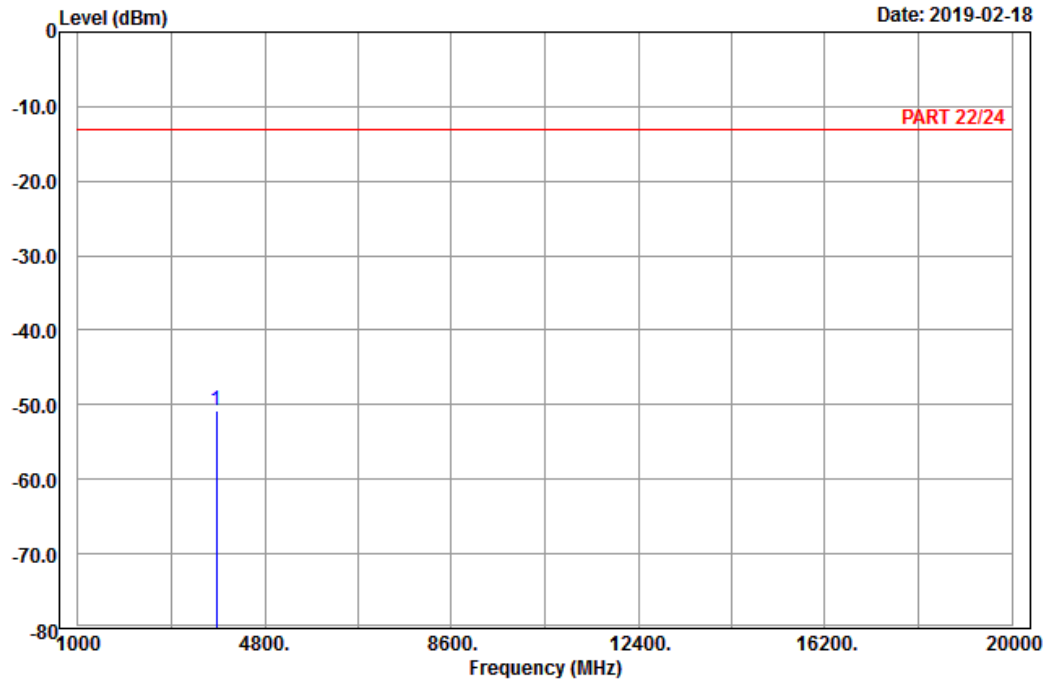
High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9



Site : 966 chamber 1
 Condition: PART 22/24 Horizontal
 Remark : LTE_Band 2_Link_CH19175
 Tested by: Karl Lee

Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3815.00	-50.78	-67.19	-13.00	-37.78	16.41	Peak

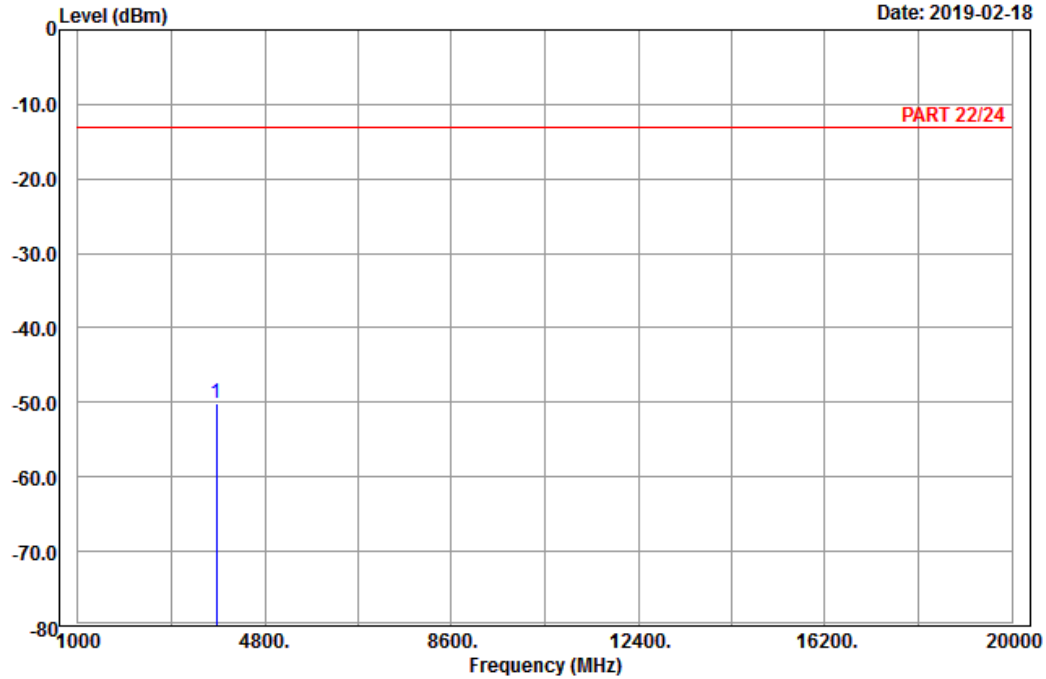


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2019-02-18



Site : 966 chamber 1
 Condition: PART 22/24 Vertical
 Remark : LTE_Band 2_Link_CH19175
 Tested by: Karl Lee

	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3815.00	-50.24	-66.65	-13.00	-37.24	16.41	Peak

Channel Bandwidth: 20 MHz / QPSK
Low Channel

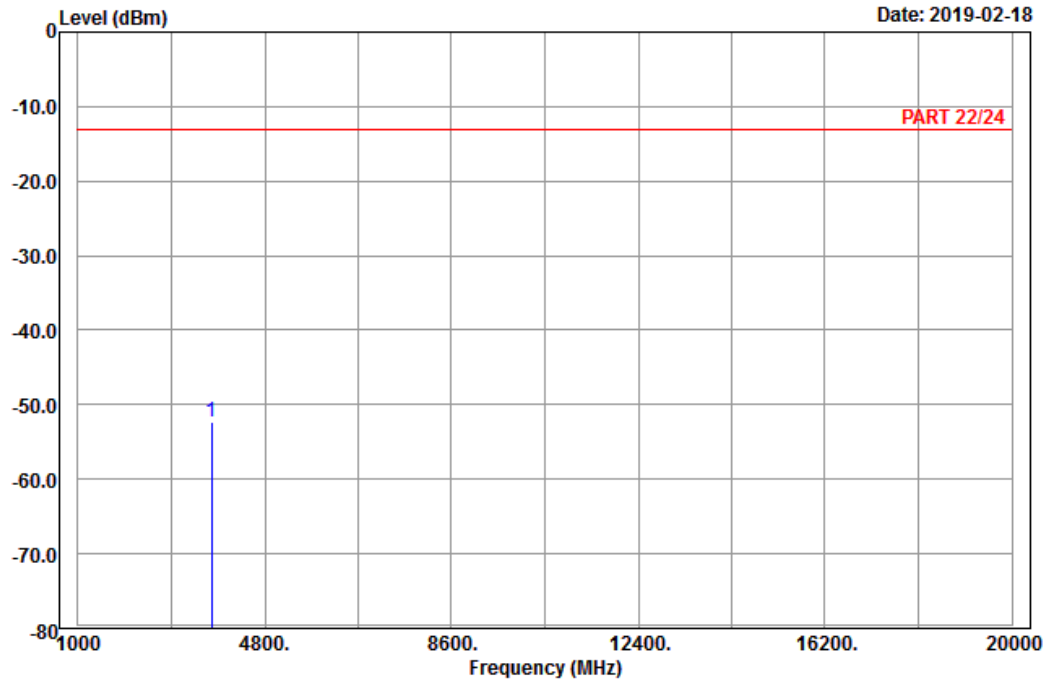


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2019-02-18



Site : 966 chamber 1
Condition: PART 22/24 Horizontal
Remark : LTE_Band 2_Link_CH18700
Tested by: Karl Lee

	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3720.00	-52.38	-68.35	-13.00	-39.38	15.97	Peak

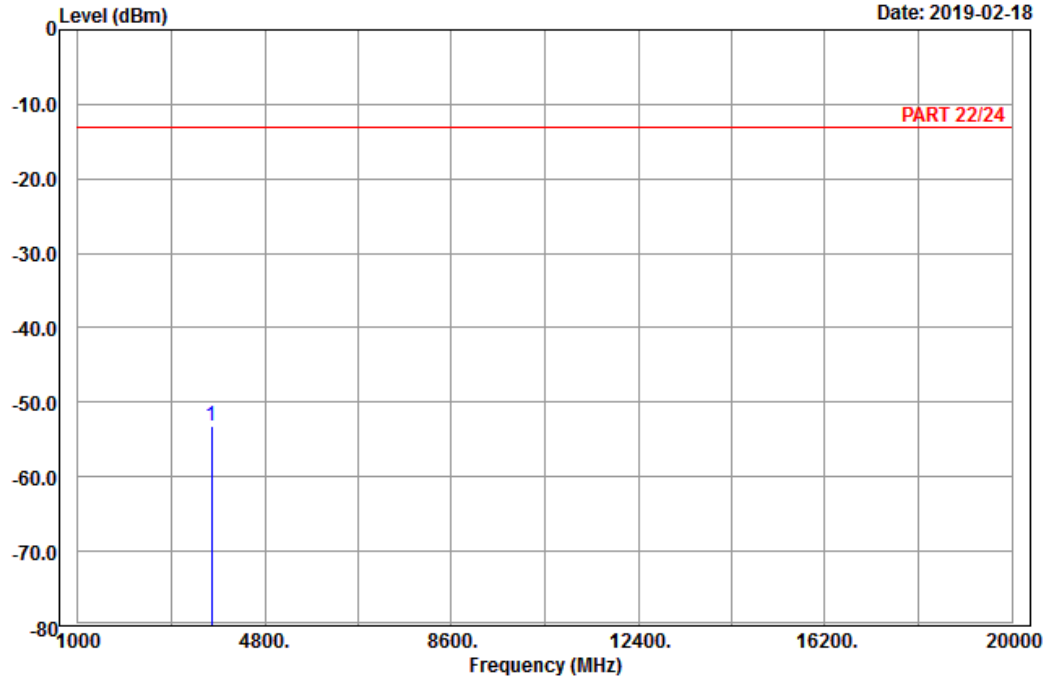


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2019-02-18



Site : 966 chamber 1
 Condition: PART 22/24 Vertical
 Remark : LTE_Band 2_Link_CH18700
 Tested by: Karl Lee

	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3720.00	-53.29	-69.26	-13.00	-40.29	15.97	Peak

Middle Channel

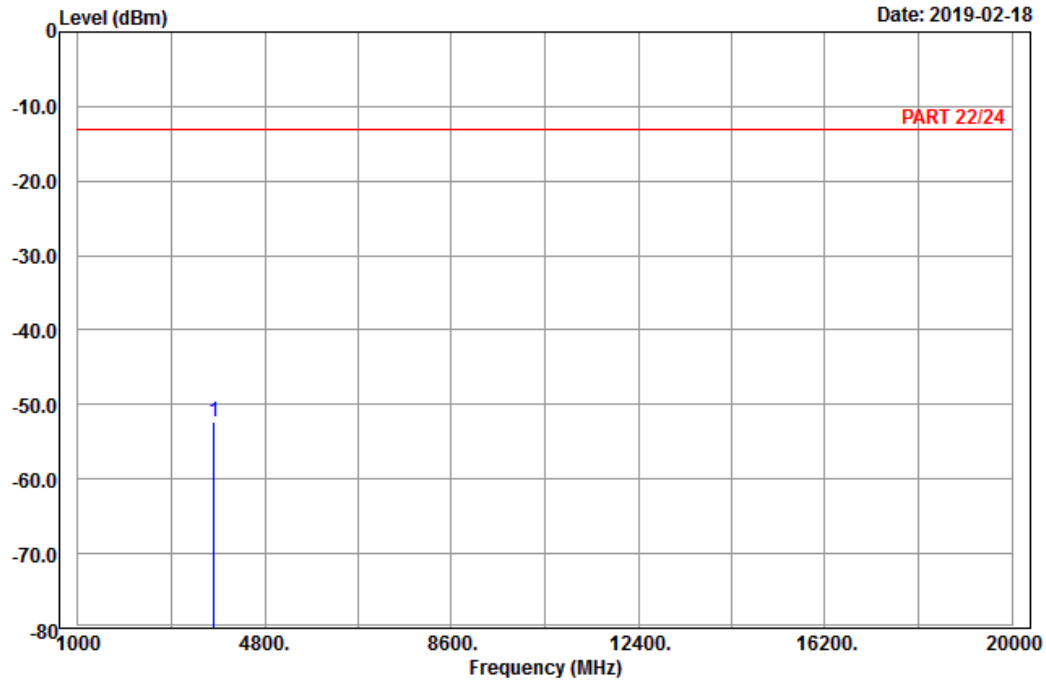


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2019-02-18



Site : 966 chamber 1
 Condition: PART 22/24 Horizontal
 Remark : LTE_Band 2_Link_CH18900
 Tested by: Karl Lee

Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3760.00	-52.29	-68.43	-13.00	-39.29	16.14	Peak

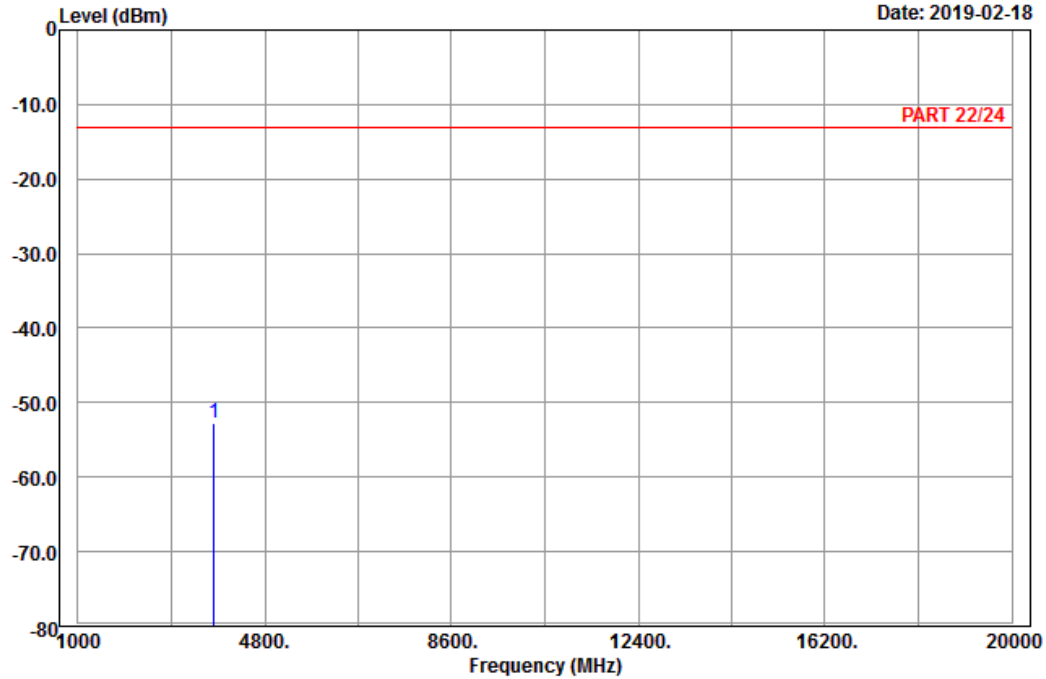


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2019-02-18



Site : 966 chamber 1
 Condition: PART 22/24 Vertical
 Remark : LTE_Band 2_Link_CH18900
 Tested by: Karl Lee

	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3760.00	-52.68	-68.82	-13.00	-39.68	16.14	Peak

High Channel

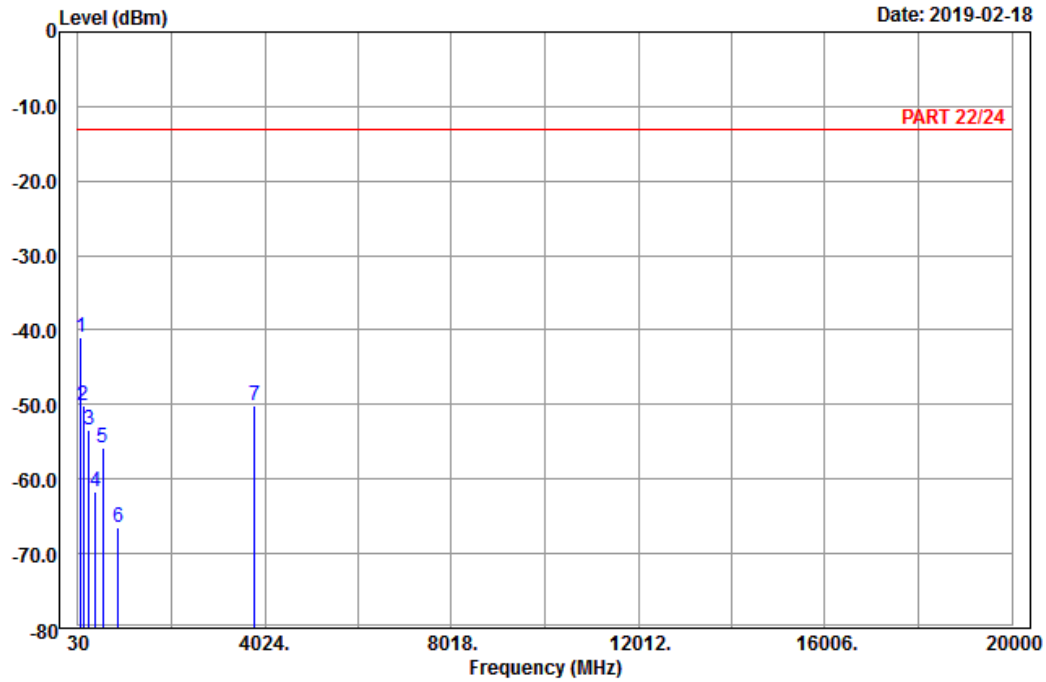


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 13

Date: 2019-02-18



Site : 966 chamber 1
 Condition: PART 22/24 Horizontal
 Remark : LTE_Band 2_Link_CH19100
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	pp	89.94	-40.94	-30.27	-13.00	-27.94	-10.67 Peak
2		145.83	-50.21	-42.38	-13.00	-37.21	-7.83 Peak
3		266.25	-53.42	-47.76	-13.00	-40.42	-5.66 Peak
4		409.20	-61.67	-58.72	-13.00	-48.67	-2.95 Peak
5		559.00	-55.84	-54.54	-13.00	-42.84	-1.30 Peak
6		895.00	-66.58	-69.33	-13.00	-53.58	2.75 Peak
7		3800.00	-50.22	-66.63	-13.00	-37.22	16.41 Peak

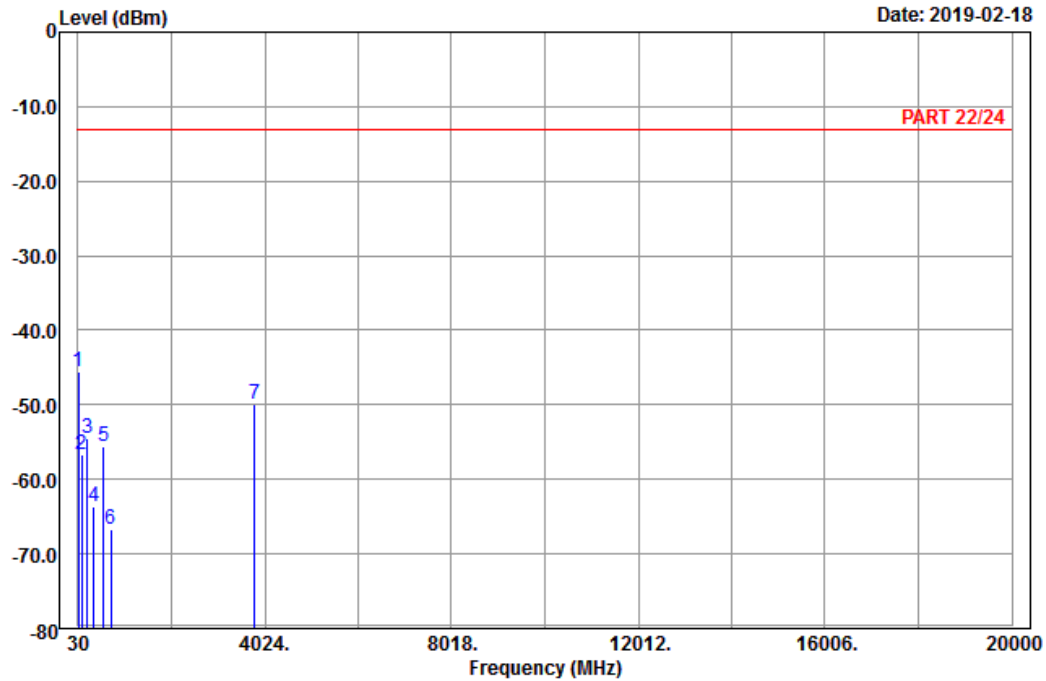


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 14

Date: 2019-02-18



Site : 966 chamber 1
 Condition: PART 22/24 Vertical
 Remark : LTE_Band 2_Link_CH19100
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	36.48	-45.63	-35.29	-13.00	-32.63	-10.34	Peak
2	111.27	-56.57	-47.75	-13.00	-43.57	-8.82	Peak
3	225.48	-54.46	-48.63	-13.00	-41.46	-5.83	Peak
4	372.80	-63.70	-59.51	-13.00	-50.70	-4.19	Peak
5	568.80	-55.62	-54.72	-13.00	-42.62	-0.90	Peak
6	729.80	-66.75	-65.82	-13.00	-53.75	-0.93	Peak
7	3800.00	-49.83	-66.24	-13.00	-36.83	16.41	Peak

5 Pictures of Test Arrangements

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

Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

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

Linko EMC/RF Lab

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Fax: 886-2-26051924

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Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

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