

# FCC Test Report

## (PART 27)

**Report No.:** RF200615C06-9

**FCC ID:** H8NTN502A1

**Test Model:** TN502A1

**Series Model:** TN502A1(WOS), access, access(WOS) (refer to item 3.1 for more details)

**Received Date:** Mar. 13, 2020

**Test Date:** Mar. 28 ~ Oct. 23, 2020

**Issued Date:** Oct. 28, 2020

**Applicant:** ASKEY COMPUTER CORP.

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23585, TAIWAN, R.O.C.

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

**Lab Address:** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

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

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

**FCC Registration /** 788550 / TW0003

**Designation Number:** 427177 / TW0011



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### Release Control Record

Issue No.	Description	Date Issued
RF200615C06-9	Original Release	Oct. 28, 2020

## 1 Certificate of Conformity

**Product:** TurboFon E4 / Handheld Device (refer to item 3.1 for more details)

**Brand:** TURBONET / Coppernic (refer to item 3.1 for more details)

**Test Model:** TN502A1

**Series Model:** TN502A1(WOS), access, access(WOS) (refer to item 3.1 for more details)

**Sample Status:** Engineering Sample


**Applicant:** ASKEY COMPUTER CORP.

**Test Date:** Mar. 28 ~ Oct. 23, 2020

**Standards:** FCC Part 27, Subpart C, F, L

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: Oct. 28, 2020  
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Approved by :  , Date: Oct. 28, 2020  
Dylan Chiou / Senior Project Engineer

## 2 Summary of Test Results

Applied Standard: FCC Part 27 & Part 2 (WCDMA)			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50(d)(4)	Equivalent Isotropic Radiated Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Meet the requirement.
2.1055 27.54	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
27.50(d)(5)	Peak to Average Ratio	Pass	Meet the requirement of limit.
27.53(h)	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 27.53(h)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53(h)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -35.25 dB at 3505.20 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 4)			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50(d)(4)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Meet the requirement.
2.1055 27.54	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
27.50(d)(5)	Peak to Average Ratio	Pass	Meet the requirement of limit.
27.53(h)	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 27.53(h)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53(h)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -23.82 dB at 6880.00 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 17)			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50(c)(10)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1047	Modulation Characteristics	Pass	Meet the requirement.
2.1055 27.54	Frequency Stability	Pass	Meet the requirement of limit.
2.1049	Occupied Bandwidth	Pass	Meet the requirement of limit.
---	Peak to Average Ratio	Pass	Meet the requirement of limit.
27.53(g)	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 27.53(g)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53(g)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -21.21 dB at 2127.00 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	9 kHz ~ 30 MHz	3.0400 dB
	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

For other test

Test Date: Mar. 28 ~ Jul. 24, 2020

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent Technologies	N9038A	MY52260177	Aug. 26, 2019	Aug. 25, 2020
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Jul. 17, 2019	Jul. 16, 2020
			Apr. 16, 2020	Apr. 15, 2021
HORN Antenna ETS-Lindgren	3117	00143293	Nov. 24, 2019	Nov. 23, 2020
BILOG Antenna SCHWARZBECK	VULB 9168	9168-616	Nov. 12, 2019	Nov. 11, 2020
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 17, 2019	Apr. 16, 2020
			Apr. 14, 2020	Apr. 13, 2021
Loop Antenna	EM-6879	269	Sep. 16, 2019	Sep. 15, 2020
MXG Vector signal generator Agilent	N5182B	MY53050430	Nov. 25, 2019	Nov. 24, 2020
Preamplifier Agilent	310N	187226	Jun. 18, 2019	Jun. 19, 2020
			Jun. 17, 2020	Jun. 16, 2021
Preamplifier Agilent	83017A	MY39501357	Jun. 18, 2019	Jun. 19, 2020
			Jun. 17, 2020	Jun. 16, 2021
Preamplifier EMCI	EMC 184045	980116	Oct. 08, 2019	Oct. 07, 2020
Power Meter Anritsu	ML2495A	1012010	Sep. 04, 2019	Sep. 03, 2020
Power Sensor Anritsu	MA2411B	1315050	Sep. 04, 2019	Sep. 03, 2020
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RFC-SMS-100-SMS-120+RFC-SMS-100-SMS-400)	Jun. 18, 2019	Jun. 19, 2020
			Jun. 17, 2020	Jun. 16, 2021
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(RFC-SMS-100-SMS-24)	Jun. 18, 2019	Jun. 19, 2020
			Jun. 17, 2020	Jun. 17, 2021
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	Jul. 01, 2019	Jun. 30, 2021
Radio Communication Analyzer Anritsu	MT8820C	6201300640	Aug. 19, 2019	Aug. 18, 2020
Temperature & Humidity Chamber	GTH-120-40-CP-AR	MAA1306-019	Sep. 10, 2019	Sep. 09, 2020
DC Power Supply Topward	33010D	807748	NA	NA

- 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.

For Docking Mode  
 Test Date: Oct. 23, 2020

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESR3	102579	Jul. 07, 2020	Jul. 06, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Jun. 09, 2020	Jun. 08, 2021
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Nov. 11, 2019	Nov. 10, 2020
HORN Antenna SCHWARZBECK	9120D	209	Nov. 24, 2019	Nov. 23, 2020
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 24, 2019	Nov. 23, 2020
Loop Antenna TESEQ	HLA 6121	45745	Jul. 06, 2020	Jul. 05, 2021
Preamplifier Agilent (Below 1GHz)	8447D	2944A10738	Aug. 16, 2020	Aug. 15, 2021
Preamplifier Agilent (Above 1GHz)	8449B	3008A02465	Mar. 23, 2020	Mar. 22, 2021
RF Coaxial Cable WOKEN With 5dB PAD	8D-FB	Cable-CH3-01	Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (223653/4)	Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER& EMCI	SUCOFLEX 104&EMC104-SM- SM-8000	Cable-CH3-03 (309224+170907)	Aug. 16, 2020	Aug. 15, 2021
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 01, 2020	May 31, 2021
JFW 20dB attenuation	50HF-020-SMA	NA	NA	NA
True RMS Clamp Meter Fluke	325	31130711WS	Jun 06, 2020	Jun 05, 2021
Communications Tester- Wireless Agilent	8960 Series 10	MY53201073	Jul. 01, 2019	Jun. 30, 2021
Temperature & Humidity Chamber	GTH-120-40-CP-AR	MAA1306-019	Sep. 09, 2020	Sep. 08, 2021
DC Power Supply Topward	33010D	807748	NA	NA

- 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 HwaYa Chamber 3.

### 3 General Information

#### 3.1 General Description of EUT

<b>Product</b>	TurboFon E4 / Handheld Device	
<b>Brand</b>	TURBONET / Coppernic	
<b>Test Model</b>	TN502A1	
<b>Series Model</b>	TN502A1(WOS), access, access(WOS)	
<b>Model Difference</b>	Refer to Note	
<b>Status of EUT</b>	Engineering Sample	
<b>Power Supply Rating</b>	3.85Vdc (from battery) 5.0Vdc / 9.0Vdc / 12.0Vdc (from adapter)	
<b>Modulation Type</b>	WCDMA	QPSK
	LTE	QPSK, 16QAM
<b>Frequency Range</b>	WCDMA	1712.4 ~ 1752.6 MHz
	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	1710.7 ~ 1754.3 MHz
	LTE Band 4 (Channel Bandwidth: 3 MHz)	1711.5 ~ 1753.5 MHz
	LTE Band 4 (Channel Bandwidth: 5 MHz)	1712.5 ~ 1752.5 MHz
	LTE Band 4 (Channel Bandwidth: 10 MHz)	1715.0 ~ 1750.0 MHz
	LTE Band 4 (Channel Bandwidth: 15 MHz)	1717.5 ~ 1747.5 MHz
	LTE Band 4 (Channel Bandwidth: 20 MHz)	1720.0 ~ 1745.0 MHz
	LTE Band 17 (Channel Bandwidth: 5 MHz)	706.5 ~ 713.5 MHz
	LTE Band 17 (Channel Bandwidth: 10 MHz)	709.0 ~ 711.0 MHz
<b>Emission Designator</b>	WCDMA	4M15F9W
	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	1M09D7W
	LTE Band 4 (Channel Bandwidth: 3 MHz)	2M70G7D
	LTE Band 4 (Channel Bandwidth: 5 MHz)	4M50D7W
	LTE Band 4 (Channel Bandwidth: 10 MHz)	8M98D7W
	LTE Band 4 (Channel Bandwidth: 15 MHz)	13M5G7D
	LTE Band 4 (Channel Bandwidth: 20 MHz)	18M0D7W
	LTE Band 17 (Channel Bandwidth: 5 MHz)	4M50D7W
	LTE Band 17 (Channel Bandwidth: 10 MHz)	8M95D7W
<b>Max. ERP Power</b>	LTE Band 17 (Channel Bandwidth: 5 MHz)	88.90 mW
	LTE Band 17 (Channel Bandwidth: 10 MHz)	89.47 mW
<b>Max. EIRP Power</b>	WCDMA	311.53 mW
	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	232.01 mW
	LTE Band 4 (Channel Bandwidth: 3 MHz)	234.15 mW
	LTE Band 4 (Channel Bandwidth: 5 MHz)	236.32 mW
	LTE Band 4 (Channel Bandwidth: 10 MHz)	238.51 mW
	LTE Band 4 (Channel Bandwidth: 15 MHz)	240.16 mW
	LTE Band 4 (Channel Bandwidth: 20 MHz)	242.38 mW
<b>Antenna Type</b>	Refer to Note as below	
<b>Antenna Gain</b>	Refer to Note as below	
<b>Accessory Device</b>	Refer to Note as below	
<b>Data Cable Supplied</b>	0.95m shielded USB cable without core	

Note:

1. All models are listed as below. Model TN502A1 is the representative for final test.

Brand	Product name	Model	Difference	
TURBONET	TurboFon E4	TN502A1	With scanner	-
		TN502A1(WOS)	Without scanner	-
Coppernic	Handheld Device	access	With scanner	Model: access is electrically identical to TN502A1, different brands and model names are for marketing purpose.
		access(WOS)	Without scanner	Model: access (WOS) is electrically identical to TN502A1(WOS), different brands and model names are for marketing purpose.

2. The antenna information is listed as below.

Antenna Type	PIFA							
Band	EDGE / WCDMA II / LTE 2	WCDMA IV / LTE 4	GSM / EDGE / WCDMA V / LTE5	LTE 7	LTE 17	LTE 26	LTE 38	LTE 41
Gain	2.25	1.93	-0.76	1.39	-2.74	-0.76	1.47	1.59

3. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

4. The EUT contains following accessory devices.

5. Battery	
Brand	ETI
Model	BP19-002710
Rating	3.85Vdc, 4000mAh. 15.4Wh

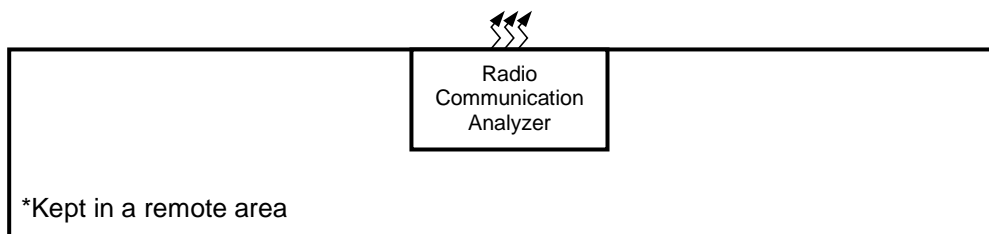
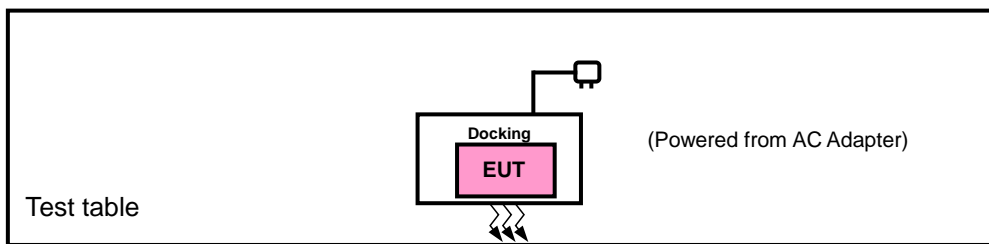
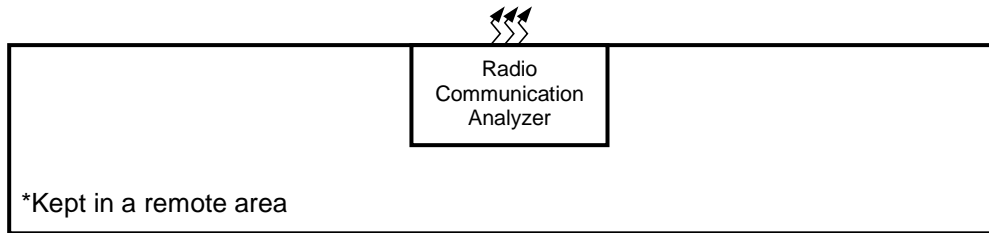
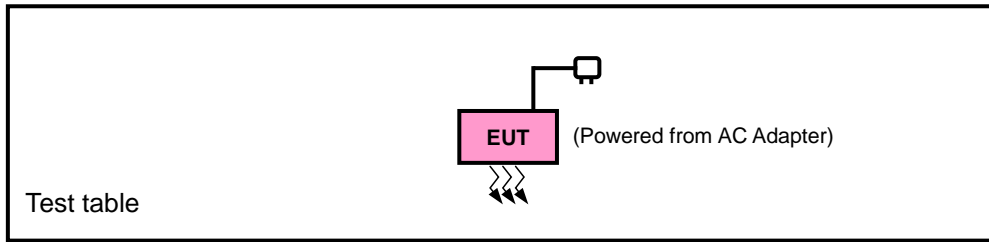
Adapter	
Brand	CHANNEL WELL TECHNOLOGY
Model	2ACP0183C
Input Power	100-240Vac~0.5A , 50/60Hz
Output Power	5.0Vdc, 3.0A, 15.0W / 9.0Vdc, 2.0A, 18.0W / 12.0Vdc, 1.5A, 18.0W

Item	Brand	Model	Description
Docking Station 1 (optional)	TURBONET	DS12310	The models and brand names of docking station are electrically identical, different models and brand names are for marketing purpose. The docking station 1 was chosen for final test.
Docking Station 2 (optional)	COPPERNIC	DS-ACCESS	
Data Cable Supplied	0.95m shielding USB cable without core		
Adapter (For docking use)			
Brand	Sunny ELECTRONICS CORP.		
Model	SYS1541-2412		
Input Power	100-240Vac, 1.0A, 50/60Hz		
Output Power	+12Vdc, 2A		
Power line	1.5m power cable without core		

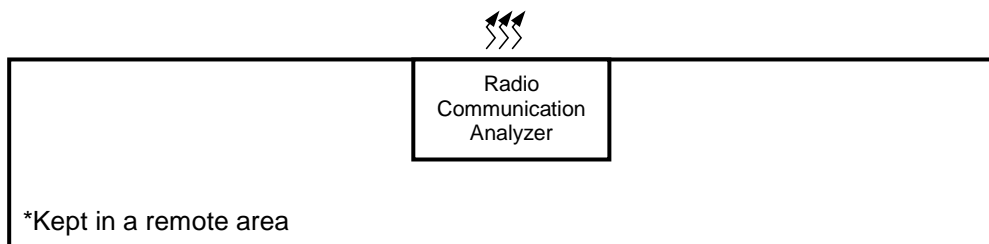
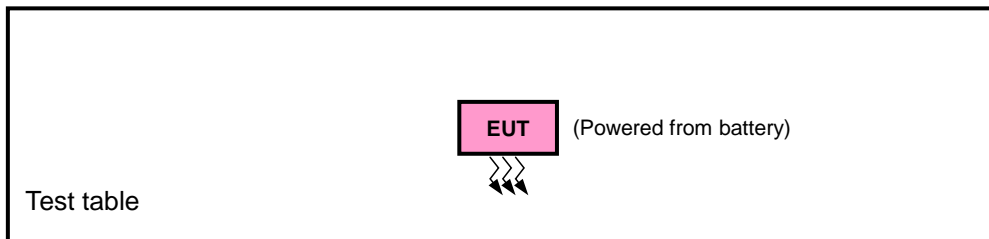
6. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

### 3.2 Configuration of System under Test

#### <Radiated Emission Test>



#### <E.R.P. / 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
A	Adapter	CHANNEL WELL TECHNOLOGY	2ACP0183C	N/A	N/A
B	Dock	TURBONET	DS12310	N/A	N/A

No.	Signal Cable Description Of The Above Support Units
1.	0.95m shielded USB cable without core provided by client

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	ERP / EIRP	Radiated Emission
WCDMA	X-plane	X-plane
LTE Band 4	X-plane	X-plane
LTE Band 17	X-plane	Y-plane

#### WCDMA

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Mode
-	EIRP	1312 to 1513	1312, 1413, 1513	WCDMA
-	Modulation Characteristics	1312 to 1513	1413	WCDMA
-	Frequency Stability	1312 to 1513	1312, 1513	WCDMA
-	Occupied Bandwidth	1312 to 1513	1312, 1413, 1513	WCDMA
-	Band Edge	1312 to 1513	1312, 1513	WCDMA
-	Peak to Average Ratio	1312 to 1513	1312, 1413, 1513	WCDMA
-	Conducted Emission	1312 to 1513	1312, 1413, 1513	WCDMA
-	Radiated Emission	1312 to 1513	1312, 1413, 1513	WCDMA



### LTE Band 4

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Modulation Characteristics	20050 to 20300	20175	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Frequency Stability	19957 to 20393	19957, 20393	1.4 MHz	QPSK	1 RB / 0 RB Offset
		19965 to 20385	19965, 20385	3 MHz	QPSK	1 RB / 0 RB Offset
		19975 to 20375	19975, 20375	5 MHz	QPSK	1 RB / 0 RB Offset
		20000 to 20350	20000, 20350	10 MHz	QPSK	1 RB / 0 RB Offset
		20025 to 20325	20025, 20325	15 MHz	QPSK	1 RB / 0 RB Offset
		20050 to 20300	20050, 20300	20 MHz	QPSK	1 RB / 0 RB Offset
-	Occupied Bandwidth	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK, 16QAM	15 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK, 16QAM	75 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK, 16QAM	100 RB / 0 RB Offset
-	Peak to Average Ratio	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK, 16QAM	1 RB / 0 RB Offset

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode		
-	Band Edge	19957 to 20393	19957	1.4 MHz	QPSK	1 RB / 0 RB Offset 6 RB / 0 RB Offset		
			20393	1.4 MHz	QPSK	1 RB / 5 RB Offset 6 RB / 0 RB Offset		
		19965 to 20385	19965	3 MHz	QPSK	1 RB / 0 RB Offset 15 RB / 0 RB Offset		
			20385	3 MHz	QPSK	1 RB / 14 RB Offset 15 RB / 0 RB Offset		
		19975 to 20375	19975	5 MHz	QPSK	1 RB / 0 RB Offset 25 RB / 0 RB Offset		
			20375	5 MHz	QPSK	1 RB / 24 RB Offset 25 RB / 0 RB Offset		
		20000 to 20350	20000	10 MHz	QPSK	1 RB / 0 RB Offset 50 RB / 0 RB Offset		
			20350	10 MHz	QPSK	1 RB / 49 RB Offset 50 RB / 0 RB Offset		
		20025 to 20325	20025	15 MHz	QPSK	1 RB / 0 RB Offset 75 RB / 0 RB Offset		
			20325	15 MHz	QPSK	1 RB / 74 RB Offset 75 RB / 0 RB Offset		
		20050 to 20300	20050	20 MHz	QPSK	1 RB / 0 RB Offset 100 RB / 0 RB Offset		
			20300	20 MHz	QPSK	1 RB / 99 RB Offset 100 RB / 0 RB Offset		
		-	Conducted Emission	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK	1 RB / 0 RB Offset
				19965 to 20385	19965, 20175, 20385	3 MHz	QPSK	1 RB / 0 RB Offset
				19975 to 20375	19975, 20175, 20375	5 MHz	QPSK	1 RB / 0 RB Offset
				20000 to 20350	20000, 20175, 20350	10 MHz	QPSK	1 RB / 0 RB Offset
				20025 to 20325	20025, 20175, 20325	15 MHz	QPSK	1 RB / 0 RB Offset
				20050 to 20300	20050, 20175, 20300	20 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK	1 RB / 0 RB Offset		
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK	1 RB / 0 RB Offset		
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK	1 RB / 0 RB Offset		

**Note:**

1. This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.
2. For radiated emission above 1 GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the lowest, 5 MHz & highest channel bandwidth for final test.

## LTE Band 17

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode		
-	ERP	23755 to 23825	23755, 23790, 23825	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset		
		23780 to 23800	23780, 23790, 23800	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset		
-	Modulation Characteristics	23780 to 23800	23790	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset		
-	Frequency Stability	23755 to 23825	23755, 23825	5 MHz	QPSK	1 RB / 0 RB Offset		
		23780 to 23800	23780, 23800	10 MHz	QPSK	1 RB / 0 RB Offset		
-	Occupied Bandwidth	23755 to 23825	23755, 23790, 23825	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset		
		23780 to 23800	23780, 23790, 23800	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset		
-	Peak to Average Ratio	23755 to 23825	23755, 23790, 23825	5 MHz	QPSK, 16QAM	1 RB / 12 RB Offset		
		23780 to 23800	23780, 23790, 23800	10 MHz	QPSK, 16QAM	1 RB / 24 RB Offset		
-	Band Edge	23755 to 23825	23755	5 MHz	QPSK	1 RB / 0 RB Offset 25 RB / 0 RB Offset		
			23825	5 MHz	QPSK	1 RB / 24 RB Offset 25 RB / 0 RB Offset		
		23780 to 23800	23780	10 MHz	QPSK	1 RB / 0 RB Offset 50 RB / 0 RB Offset		
			23800	10 MHz	QPSK	1 RB / 49 RB Offset 50 RB / 0 RB Offset		
		-	Conducted Emission	23755 to 23825	23755, 23790, 23825	5 MHz	QPSK	1 RB / 0 RB Offset
				23780 to 23800	23780, 23790, 23800	10 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission	23755 to 23825	23755, 23790, 23825	5 MHz	QPSK	1 RB / 0 RB Offset		
		23780 to 23800	23780, 23790, 23800	10 MHz	QPSK	1 RB / 0 RB Offset		

### Note:

1. This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.
2. For radiated emission above 1 GHz, according to 3GPP 36.521 Section 6.6.3.1.4, choose the lowest, 5 MHz & highest channel bandwidth for final test.

### Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP / EIRP	25 deg. C, 65 % RH	3.85 Vdc	Gavin Wu
Modulation Characteristics	25 deg. C, 65 % RH	3.85 Vdc	Gavin Wu
Frequency Stability	25 deg. C, 65 % RH	3.85 Vdc	Gavin Wu
Occupied Bandwidth	25 deg. C, 65 % RH	3.85 Vdc	Gavin Wu
Band Edge	25 deg. C, 65 % RH	3.85 Vdc	Gavin Wu
Peak to Average Ratio	25 deg. C, 65 % RH	3.85 Vdc	Gavin Wu
Conducted Emission	25 deg. C, 65 % RH	3.85 Vdc	Gavin Wu
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	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 and references**

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

**Test Standard:**

**FCC 47 CFR Part 2**

**FCC 47 CFR Part 27**

**ANSI 63.26-2015**

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

**References Test Guidance:**

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

**ANSI/TIA/EIA-603-E 2016**

**Note:** All test items have been performed as a reference to the above KDB test guidance.

## 4 Test Types and Results

### 4.1 Output Power Measurement

#### 4.1.1 Limits of Output Power Measurement

Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

Portable stations (hand-held devices) operating in the 746-757 MHz, 776-788 MHz and 805-806 MHz band are limited to 3 watts ERP

Portable stations (hand-held device) operating in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

#### 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,  $E.R.P \text{ power} = E.I.R.P \text{ power} - 2.15 \text{ dB}$ .

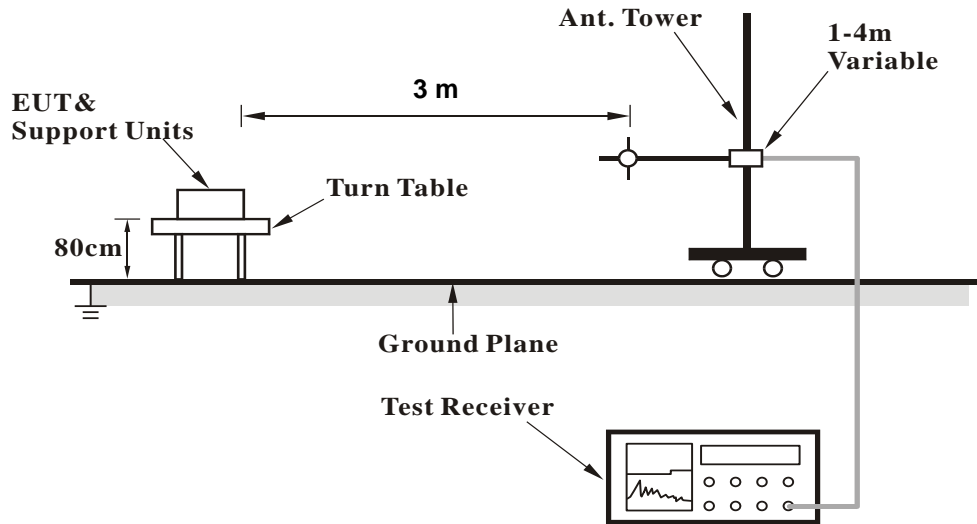
##### **Conducted Power Measurement:**

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

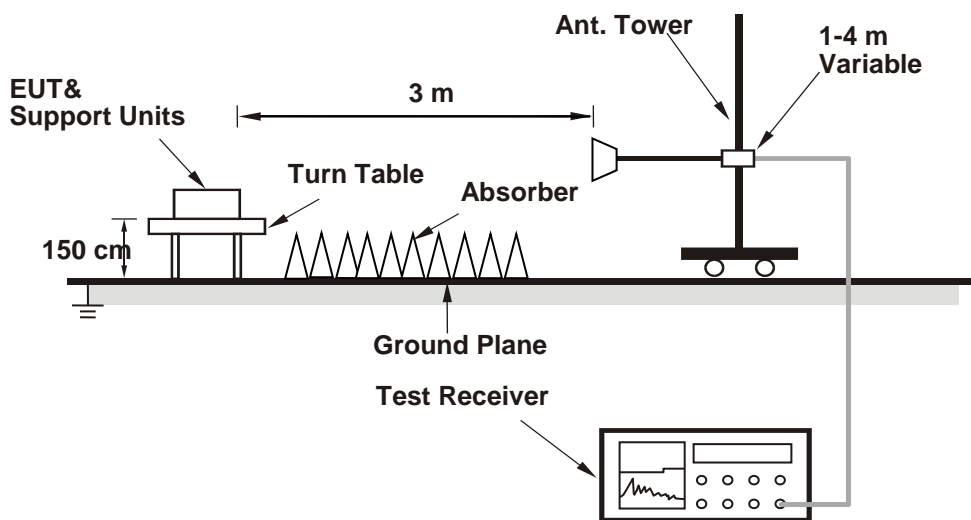
4.1.3 Test Setup

**EIRP / ERP Measurement:**

**<Radiated Emission below or equal 1 GHz>**

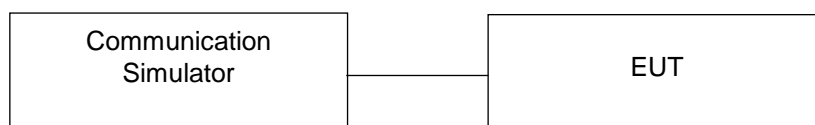


**<Radiated Emission above 1 GHz>**



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 IV		
	1312	1413	1513
Channel	1712.4	1732.6	1752.6
Frequency (MHz)	1712.4	1732.6	1752.6
RMC 12.2K	24.47	24.22	24.41
HSDPA Subtest-1	23.49	23.26	23.49
HSDPA Subtest-2	23.48	23.24	23.47
HSDPA Subtest-3	22.91	22.75	22.07
HSDPA Subtest-4	22.96	22.78	22.94
DC-HSDPA Subtest-1	23.46	23.24	23.47
DC-HSDPA Subtest-2	23.5	23.22	23.45
DC-HSDPA Subtest-3	22.98	22.73	22.05
DC-HSDPA Subtest-4	22.99	22.76	22.98
HSUPA Subtest-1	23.47	23.23	23.45
HSUPA Subtest-2	21.49	21.29	21.45
HSUPA Subtest-3	22.45	22.25	22.43
HSUPA Subtest-4	21.45	21.22	21.44
HSUPA Subtest-5	23.42	23.2	23.4

LTE Band 4																	
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	20050	20175						20300	Channel	20025		20175	20325
				Frequency (MHz)	1720.0	1732.5						1745.0	Frequency (MHz)	1717.5		1732.5	1747.5
20M	QPSK	1	0	22.73	22.66	22.71	0	15M	QPSK	1	0	22.41	22.34	22.29	0		
		1	50	22.63	22.52	22.58	0			1	37	22.36	22.30	22.21	0		
		1	99	22.48	22.43	22.45	0			1	74	22.24	22.11	22.05	0		
		50	0	21.80	21.59	21.65	1			36	0	21.40	21.31	21.26	1		
		50	25	21.66	21.57	21.63	1			36	19	21.38	21.31	21.20	1		
		50	50	21.62	21.52	21.56	1			36	39	21.35	21.31	21.17	1		
		100	0	21.69	21.60	21.64	1			75	0	21.42	21.32	21.32	1		
	16QAM	1	0	21.49	21.40	21.32	1		16QAM	1	0	21.45	21.32	21.30	1		
		1	50	21.40	21.31	21.23	1			1	37	21.36	21.23	21.14	1		
		1	99	21.30	21.21	21.13	1			1	74	21.28	21.17	21.05	1		
		50	0	20.29	20.20	20.12	2			36	0	20.24	20.13	20.11	2		
		50	25	20.30	20.21	20.13	2			36	19	20.21	20.18	20.11	2		
		50	50	20.22	20.13	20.05	2			36	39	20.12	20.03	20.04	2		
		100	0	20.24	20.15	20.07	2			75	0	20.14	20.07	20.00	2		

LTE Band 17																	
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	23780	23790						23800	Channel	23755		23790	23825
				Frequency (MHz)	709.0	710.0						711.0	Frequency (MHz)	706.5		710.0	713.5
10M	QPSK	1	0	22.57	22.64	22.61	0	5M	QPSK	1	0	22.53	22.54	22.60	0		
		1	24	22.56	22.63	22.59	0			1	12	22.51	22.55	22.57	0		
		1	49	22.53	22.59	22.55	0			1	24	22.45	22.56	22.51	0		
		25	0	21.63	21.69	21.65	1			12	0	21.60	21.59	21.60	1		
		25	12	21.57	21.63	21.59	1			12	6	21.54	21.61	21.52	1		
		25	25	21.53	21.59	21.55	1			12	13	21.48	21.54	21.54	1		
		50	0	21.55	21.61	21.57	1			25	0	21.45	21.57	21.52	1		
	16QAM	1	0	21.92	21.98	21.94	1		16QAM	1	0	21.83	21.98	21.92	1		
		1	24	21.78	21.84	21.80	1			1	12	21.72	21.77	21.70	1		
		1	49	21.76	21.82	21.78	1			1	24	21.72	21.75	21.77	1		
		25	0	20.77	20.83	20.79	2			12	0	20.76	20.82	20.71	2		
		25	12	20.68	20.74	20.70	2			12	6	20.61	20.64	20.68	2		
		25	25	20.65	20.71	20.67	2			12	13	20.63	20.65	20.62	2		
		50	0	20.68	20.74	20.70	2			25	0	20.58	20.66	20.61	2		



**ERP Power (dBm)**

LTE Band 17							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	23755	706.5	-11.08	32.719	19.49	88.90	H
	23790	710.0	-11.16	32.736	19.43	87.62	
	23825	713.5	-11.09	32.591	19.35	86.12	
	23755	706.5	-16.12	32.69	14.42	27.67	V
	23790	710.0	-16.29	32.81	14.37	27.35	
	23825	713.5	-16.28	32.74	14.31	26.98	
Channel Bandwidth: 5 MHz / 16QAM							
X	23755	706.5	-12.09	32.719	18.48	70.45	H
	23790	710.0	-12.16	32.736	18.43	69.60	
	23825	713.5	-12.10	32.591	18.34	68.25	
	23755	706.5	-17.12	32.69	13.42	21.98	V
	23790	710.0	-17.30	32.81	13.36	21.68	
	23825	713.5	-17.28	32.74	13.31	21.43	

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB) – 2.15

LTE Band 17							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	23780	709.0	-11.06	32.727	19.52	89.47	H
	23790	710.0	-11.12	32.739	19.47	88.49	
	23800	711.0	-11.19	32.728	19.39	86.86	
	23780	709.0	-16.14	32.75	14.46	27.93	V
	23790	710.0	-16.25	32.81	14.41	27.61	
	23800	711.0	-16.34	32.84	14.35	27.23	
Channel Bandwidth: 10 MHz / 16QAM							
X	23780	709.0	-12.06	32.727	18.52	71.07	H
	23790	710.0	-12.13	32.739	18.46	70.13	
	23800	711.0	-12.20	32.728	18.38	68.83	
	23780	709.0	-17.14	32.75	13.46	22.18	V
	23790	710.0	-17.26	32.81	13.40	21.88	
	23800	711.0	-17.34	32.84	13.35	21.63	

Note: ERP (dBm) = Reading (dBm) + Correction Factor (dB) – 2.15

**EIRP Power (dBm)**

WCDMA							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	1312	1712.4	-17.55	42.49	24.94	311.53	H
	1413	1732.6	-17.84	42.33	24.49	281.00	
	1513	1752.6	-17.89	42.10	24.21	263.63	
	1312	1712.4	-22.12	42.99	20.87	122.18	V
	1413	1732.6	-21.94	42.74	20.80	120.23	
	1513	1752.6	-21.81	42.21	20.40	109.65	

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

LTE Band 4							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	19957	1710.7	-18.83	42.49	23.66	232.01	H
	20175	1732.5	-18.68	42.33	23.65	231.58	
	20393	1754.3	-18.51	42.10	23.59	228.56	
	19957	1710.7	-22.43	42.99	20.56	113.76	V
	20175	1732.5	-22.14	42.74	20.60	114.82	
	20393	1754.3	-21.69	42.21	20.52	112.72	
Channel Bandwidth: 1.4 MHz / 16QAM							
X	19957	1710.7	-19.83	42.49	22.66	184.29	H
	20175	1732.5	-19.68	42.33	22.65	183.95	
	20393	1754.3	-19.52	42.10	22.58	181.13	
	19957	1710.7	-23.44	42.99	19.55	90.16	V
	20175	1732.5	-23.14	42.74	19.60	91.20	
	20393	1754.3	-22.70	42.21	19.51	89.33	

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

LTE Band 4							
Channel Bandwidth: 3 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	19965	1711.5	-18.79	42.49	23.70	234.15	H
	20175	1732.5	-18.64	42.33	23.69	233.72	
	20385	1753.5	-18.47	42.10	23.63	230.67	
	19965	1711.5	-22.39	42.99	20.60	114.82	V
	20175	1732.5	-22.10	42.74	20.64	115.88	
	20385	1753.5	-21.65	42.21	20.56	113.76	
Channel Bandwidth: 3 MHz / 16QAM							
X	19965	1711.5	-19.80	42.49	22.69	185.57	H
	20175	1732.5	-19.67	42.33	22.66	184.37	
	20385	1753.5	-19.48	42.10	22.62	182.81	
	19965	1711.5	-23.40	42.99	19.59	90.99	V
	20175	1732.5	-23.10	42.74	19.64	92.04	
	20385	1753.5	-22.65	42.21	19.56	90.36	

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

LTE Band 4							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	19975	1712.5	-18.75	42.49	23.74	236.32	H
	20175	1732.5	-18.61	42.33	23.72	235.34	
	20375	1752.5	-18.43	42.10	23.67	232.81	
	19975	1712.5	-22.35	42.99	20.64	115.88	V
	20175	1732.5	-22.06	42.74	20.68	116.95	
	20375	1752.5	-21.62	42.21	20.59	114.55	
Channel Bandwidth: 5 MHz / 16QAM							
X	19975	1712.5	-19.75	42.49	22.74	187.72	H
	20175	1732.5	-19.62	42.33	22.71	186.51	
	20375	1752.5	-19.44	42.10	22.66	184.50	
	19975	1712.5	-23.35	42.99	19.64	92.04	V
	20175	1732.5	-23.06	42.74	19.68	92.90	
	20375	1752.5	-22.63	42.21	19.58	90.78	

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

LTE Band 4							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	20000	1715.0	-18.71	42.49	23.78	238.51	H
	20175	1732.5	-18.57	42.33	23.76	237.52	
	20350	1750.0	-18.40	42.10	23.70	234.42	
	20000	1715.0	-22.31	42.99	20.68	116.95	V
	20175	1732.5	-22.03	42.74	20.71	117.76	
	20350	1750.0	-21.58	42.21	20.63	115.61	
Channel Bandwidth: 10 MHz / 16QAM							
X	20000	1715.0	-19.71	42.49	22.78	189.45	H
	20175	1732.5	-19.58	42.33	22.75	188.23	
	20350	1750.0	-19.41	42.10	22.69	185.78	
	20000	1715.0	-23.31	42.99	19.68	92.90	V
	20175	1732.5	-23.04	42.74	19.70	93.33	
	20350	1750.0	-22.58	42.21	19.63	91.83	

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

LTE Band 4							
Channel Bandwidth: 15 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	20025	1717.5	-18.68	42.49	23.81	240.16	H
	20175	1732.5	-18.53	42.33	23.80	239.72	
	20325	1747.5	-18.36	42.10	23.74	236.59	
	20025	1717.5	-22.27	42.99	20.72	118.03	V
	20175	1732.5	-22.00	42.74	20.74	118.58	
	20325	1747.5	-21.54	42.21	20.67	116.68	
Channel Bandwidth: 15 MHz / 16QAM							
X	20025	1717.5	-19.68	42.49	22.81	190.77	H
	20175	1732.5	-19.53	42.33	22.80	190.41	
	20325	1747.5	-19.36	42.10	22.74	187.93	
	20025	1717.5	-23.28	42.99	19.71	93.54	V
	20175	1732.5	-23.01	42.74	19.73	93.97	
	20325	1747.5	-22.54	42.21	19.67	92.68	

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

LTE Band 4							
Channel Bandwidth: 20 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	20050	1720.0	-18.64	42.49	23.85	242.38	H
	20175	1732.5	-18.50	42.33	23.83	241.38	
	20300	1745.0	-18.32	42.10	23.78	238.78	
	20050	1720.0	-22.23	42.99	20.76	119.12	V
	20175	1732.5	-21.96	42.74	20.78	119.67	
	20300	1745.0	-21.50	42.21	20.71	117.76	
Channel Bandwidth: 20 MHz / 16QAM							
X	20050	1720.0	-19.65	42.49	22.84	192.09	H
	20175	1732.5	-19.51	42.33	22.82	191.29	
	20300	1745.0	-19.32	42.10	22.78	189.67	
	20050	1720.0	-23.23	42.99	19.76	94.62	V
	20175	1732.5	-22.97	42.74	19.77	94.84	
	20300	1745.0	-22.51	42.21	19.70	93.33	

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

## 4.2 Modulation Characteristics Measurement

### 4.2.1 Limits of Modulation Characteristics

N/A

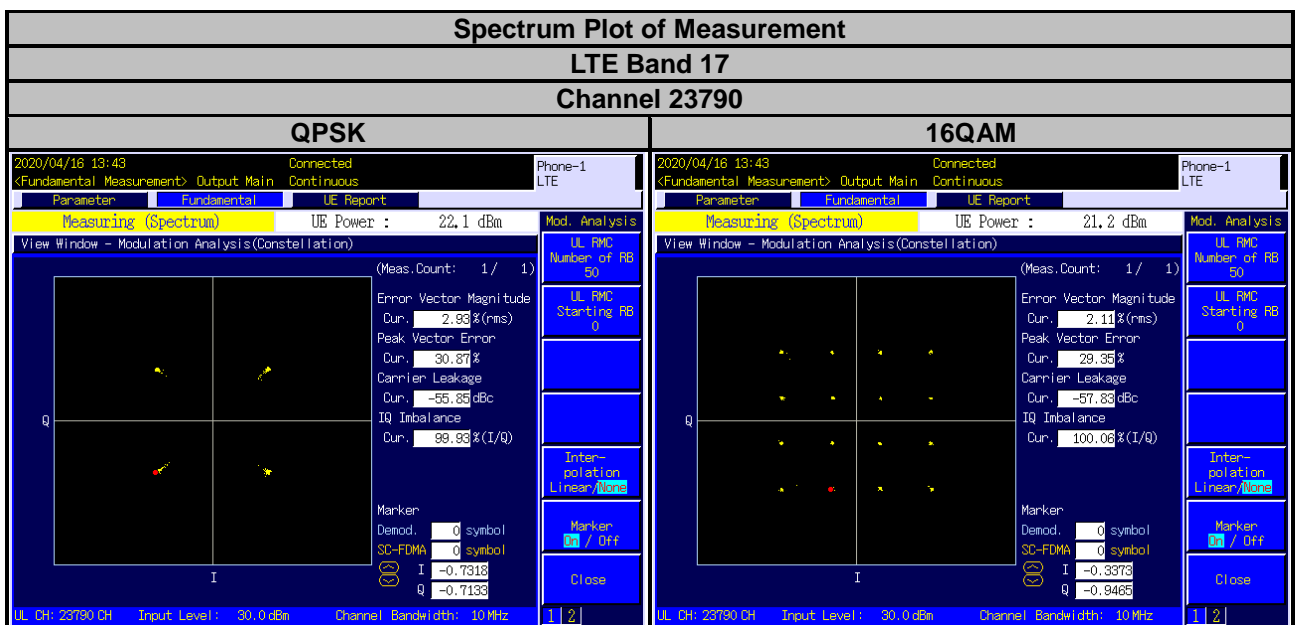
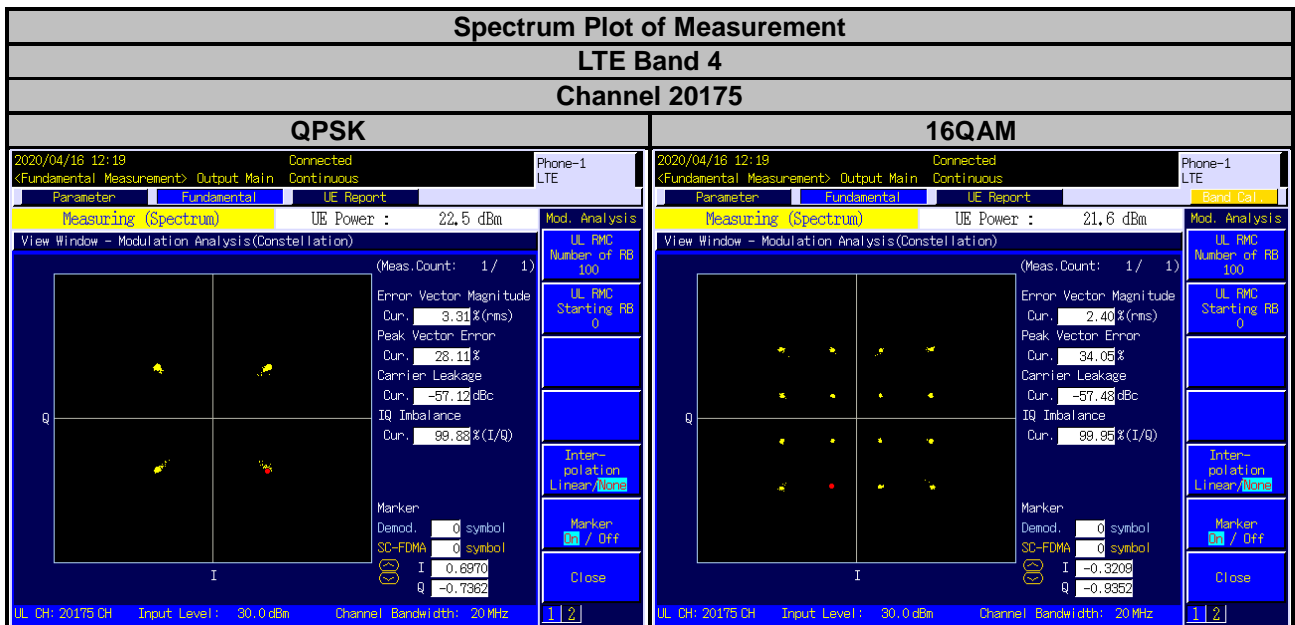
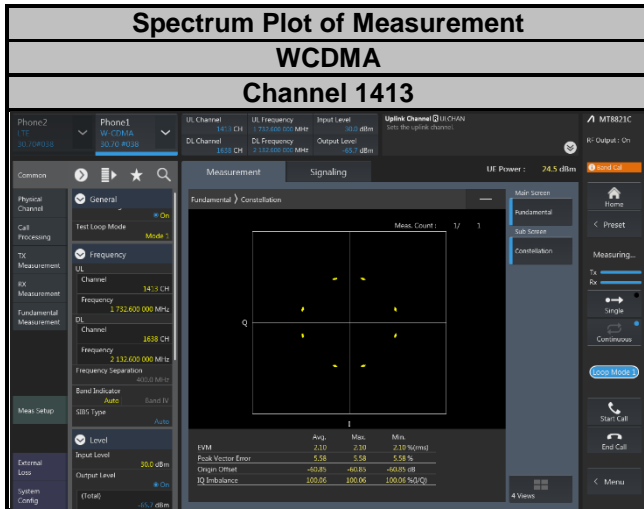
### 4.2.2 Test Setup



### 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

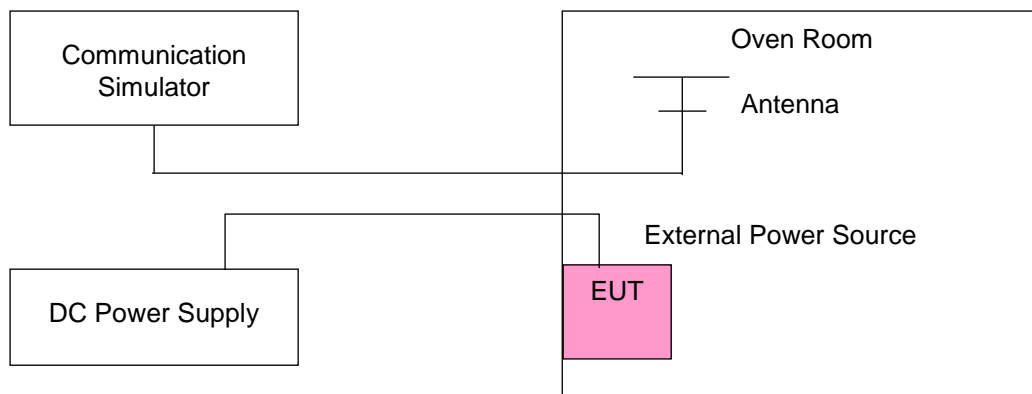
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

#### 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  $\pm 0.5^{\circ}\text{C}$  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.

#### 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)
3.85	1712.400004	0.002	1752.600002	0.001
3.65	1712.400002	0.001	1752.600003	0.002
4.23	1712.400002	0.001	1752.600002	0.001

**Note:** The applicant defined the normal working voltage of the battery is from 3.65 Vdc to 4.23 Vdc.

##### Frequency Error vs. Temperature

Temp. (°C)	WCDMA			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1712.400002	0.001	1752.600003	0.002
-20	1712.400002	0.001	1752.600001	0.001
-10	1712.400002	0.001	1752.600004	0.002
0	1712.400002	0.001	1752.600002	0.001
10	1712.400004	0.002	1752.600002	0.001
20	1712.399998	-0.001	1752.599998	-0.001
30	1712.399998	-0.001	1752.599997	-0.002
40	1712.399998	-0.001	1752.599998	-0.001
50	1712.399996	-0.002	1752.599998	-0.001

## Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.85	1710.700002	0.001	1754.300003	0.002
3.65	1710.700002	0.001	1754.300003	0.001
4.23	1710.700004	0.002	1754.300003	0.002

**Note:** The applicant defined the normal working voltage of the battery is from 3.65 Vdc to 4.23 Vdc.

## Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1710.700001	0.001	1754.300002	0.001
-20	1710.700001	0.001	1754.300002	0.001
-10	1710.700002	0.001	1754.300003	0.002
0	1710.700002	0.001	1754.300004	0.002
10	1710.700004	0.002	1754.300003	0.002
20	1710.699996	-0.002	1754.299999	-0.001
30	1710.699998	-0.001	1754.299997	-0.002
40	1710.699998	-0.001	1754.299996	-0.002
50	1710.699998	-0.001	1754.299997	-0.001

## Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.85	1711.500004	0.002	1753.500001	0.001
3.65	1711.500003	0.002	1753.500001	0.001
4.23	1711.500004	0.002	1753.500001	0.001

**Note:** The applicant defined the normal working voltage of the battery is from 3.65 Vdc to 4.23 Vdc.

## Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1711.500002	0.001	1753.500002	0.001
-20	1711.500003	0.002	1753.500003	0.001
-10	1711.500003	0.002	1753.500001	0.001
0	1711.500002	0.001	1753.500002	0.001
10	1711.500003	0.002	1753.500002	0.001
20	1711.499996	-0.002	1753.499998	-0.001
30	1711.499999	-0.001	1753.499999	-0.001
40	1711.499998	-0.001	1753.499996	-0.002
50	1711.499997	-0.002	1753.499997	-0.002

## Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.85	1712.500003	0.002	1752.500003	0.002
3.65	1712.500001	0.001	1752.500003	0.002
4.23	1712.500003	0.002	1752.500002	0.001

**Note:** The applicant defined the normal working voltage of the battery is from 3.65 Vdc to 4.23 Vdc.

## Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1712.500002	0.001	1752.500003	0.002
-20	1712.500003	0.002	1752.500003	0.002
-10	1712.500002	0.001	1752.500002	0.001
0	1712.500003	0.001	1752.500003	0.002
10	1712.500003	0.002	1752.500002	0.001
20	1712.499996	-0.002	1752.499997	-0.002
30	1712.499998	-0.001	1752.499998	-0.001
40	1712.499997	-0.002	1752.499999	-0.001
50	1712.499997	-0.002	1752.499997	-0.002

## Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.85	1715.000003	0.002	1750.000004	0.002
3.65	1715.000002	0.001	1750.000003	0.002
4.23	1715.000002	0.001	1750.000003	0.001

**Note:** The applicant defined the normal working voltage of the battery is from 3.65 Vdc to 4.23 Vdc.

## Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1715.000002	0.001	1750.000003	0.001
-20	1715.000003	0.001	1750.000004	0.002
-10	1715.000002	0.001	1750.000002	0.001
0	1715.000002	0.001	1750.000001	0.001
10	1715.000004	0.002	1750.000003	0.001
20	1714.999998	-0.001	1749.999998	-0.001
30	1714.999999	-0.001	1749.999996	-0.002
40	1714.999999	-0.001	1749.999997	-0.002
50	1714.999996	-0.002	1749.999999	-0.001

## Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.85	1717.500003	0.002	1747.500001	0.001
3.65	1717.500004	0.002	1747.500003	0.002
4.23	1717.500003	0.002	1747.500001	0.001

**Note:** The applicant defined the normal working voltage of the battery is from 3.65 Vdc to 4.23 Vdc.

## Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4			
	Channel Bandwidth: 15 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1717.500003	0.002	1747.500002	0.001
-20	1717.500004	0.002	1747.500002	0.001
-10	1717.500004	0.002	1747.500001	0.001
0	1717.500001	0.001	1747.500004	0.002
10	1717.500004	0.002	1747.500002	0.001
20	1717.499996	-0.002	1747.499999	-0.001
30	1717.499998	-0.001	1747.499997	-0.002
40	1717.499998	-0.001	1747.499997	-0.002
50	1717.499997	-0.002	1747.499996	-0.002

## Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.85	1720.000003	0.001	1745.000002	0.001
3.65	1720.000003	0.002	1745.000003	0.002
4.23	1720.000002	0.001	1745.000003	0.002

**Note:** The applicant defined the normal working voltage of the battery is from 3.65 Vdc to 4.23 Vdc.

## Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4			
	Channel Bandwidth: 20 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1720.000003	0.001	1745.000001	0.001
-20	1720.000003	0.002	1745.000002	0.001
-10	1720.000001	0.001	1745.000004	0.002
0	1720.000001	0.001	1745.000003	0.002
10	1720.000001	0.001	1745.000003	0.001
20	1719.999997	-0.002	1744.999998	-0.001
30	1719.999998	-0.001	1744.999999	-0.001
40	1719.999997	-0.002	1744.999998	-0.001
50	1719.999997	-0.002	1744.999998	-0.001

## Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 17			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.85	706.500004	0.006	713.500003	0.004
3.65	706.500002	0.003	713.500001	0.002
4.23	706.500004	0.005	713.500004	0.006

**Note:** The applicant defined the normal working voltage of the battery is from 3.65 Vdc to 4.23 Vdc.

## Frequency Error vs. Temperature

Temp. (°C)	LTE Band 17			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	706.500002	0.003	713.500004	0.005
-20	706.500002	0.003	713.500004	0.005
-10	706.500003	0.005	713.500004	0.005
0	706.500003	0.004	713.500003	0.004
10	706.500004	0.006	713.500004	0.005
20	706.499998	-0.003	713.499998	-0.003
30	706.499997	-0.005	713.499998	-0.003
40	706.499998	-0.003	713.499997	-0.004
50	706.499997	-0.004	713.499997	-0.005



## Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 17			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.85	709.000002	0.003	711.000003	0.005
3.65	709.000004	0.005	711.000003	0.005
4.23	709.000003	0.004	711.000004	0.005

**Note:** The applicant defined the normal working voltage of the battery is from 3.65 Vdc to 4.23 Vdc.

## Frequency Error vs. Temperature

Temp. (°C)	LTE Band 17			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	709.000001	0.002	711.000003	0.005
-20	709.000002	0.003	711.000004	0.005
-10	709.000003	0.005	711.000001	0.002
0	709.000002	0.002	711.000003	0.005
10	709.000004	0.006	711.000002	0.002
20	708.999998	-0.003	710.999996	-0.005
30	708.999997	-0.004	710.999999	-0.002
40	708.999999	-0.001	710.999998	-0.003
50	708.999999	-0.002	710.999997	-0.004

#### 4.4 Occupied Bandwidth Measurement

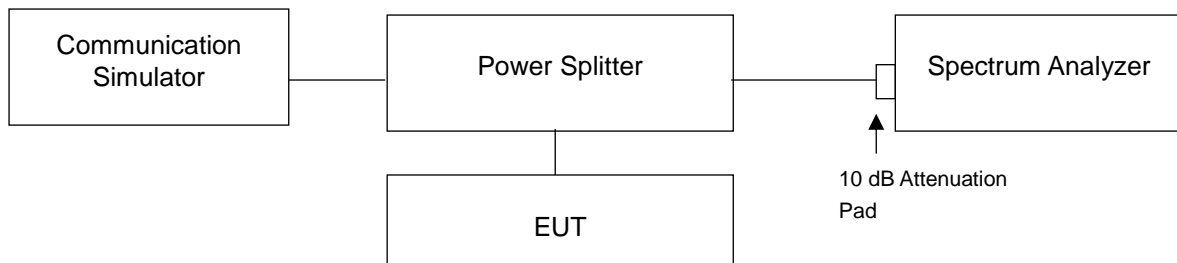
##### 4.4.1 Limits of Occupied Bandwidth Measurement

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

##### 4.4.2 Test Procedure

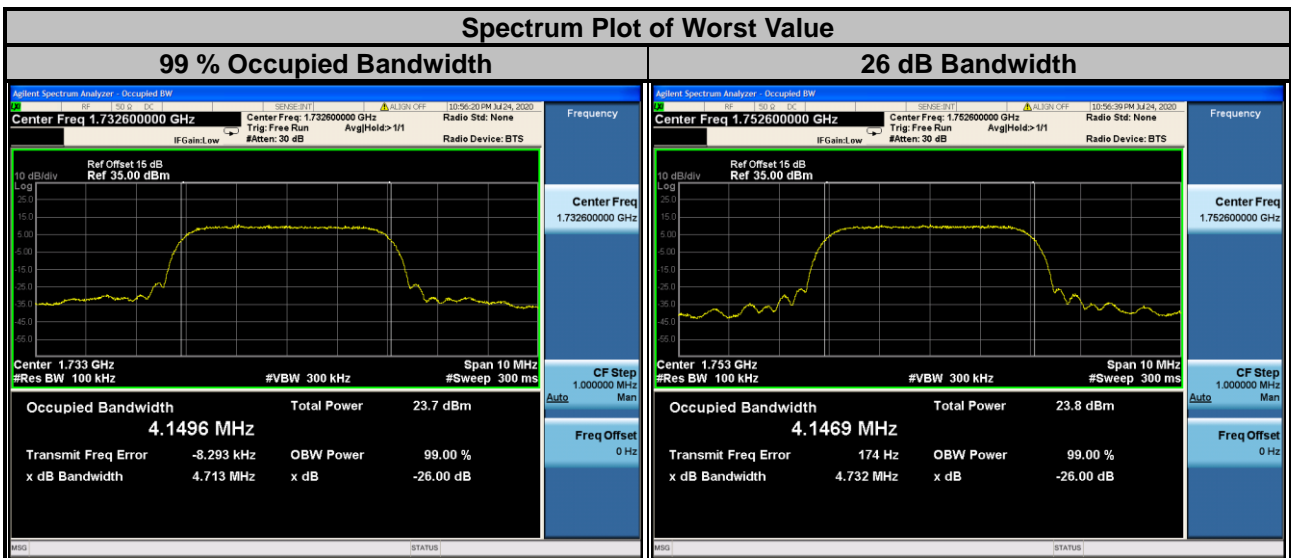
- The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

##### 4.4.3 Test Setup



#### 4.4.4 Test Result

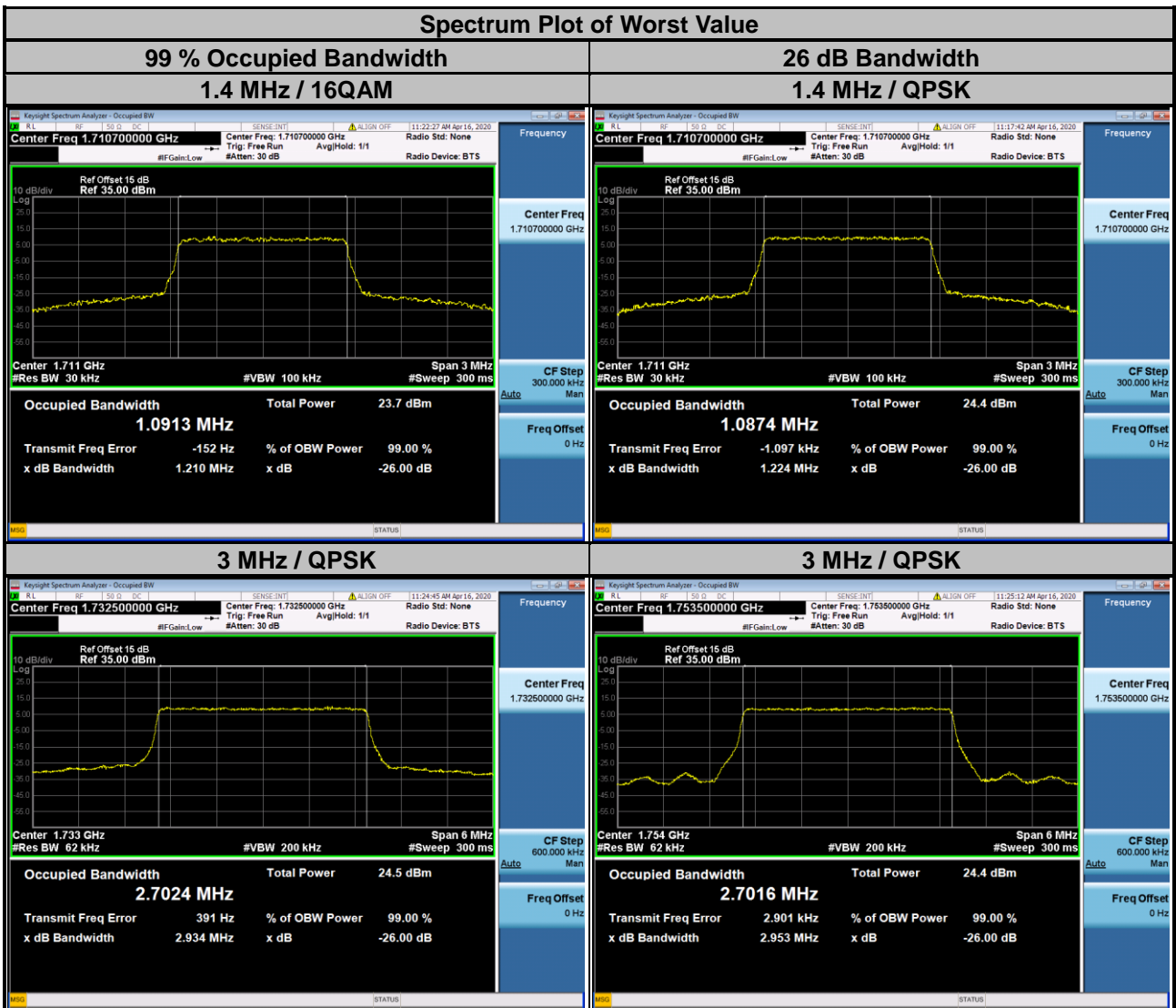
WCDMA			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
1312	1712.4	4.1449	4.728
1413	1732.6	4.1496	4.713
1513	1752.6	4.1469	4.732



LTE Band 4					
Channel Bandwidth: 1.4 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
19957	1710.7	1.0874	1.0913	1.224	1.210
20175	1732.5	1.0861	1.0882	1.221	1.217
20393	1754.3	1.0871	1.0885	1.223	1.214

Channel Bandwidth: 3 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
19965	1711.5	2.7011	2.6964	2.926	2.927
20175	1732.5	2.7024	2.6992	2.934	2.934
20385	1753.5	2.7016	2.6957	2.953	2.928



LTE Band 4					
Channel Bandwidth: 5 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
19975	1712.5	4.4941	4.4952	4.839	4.812
20175	1732.5	4.4947	4.4968	4.822	4.810
20375	1752.5	4.4914	4.4953	4.819	4.810

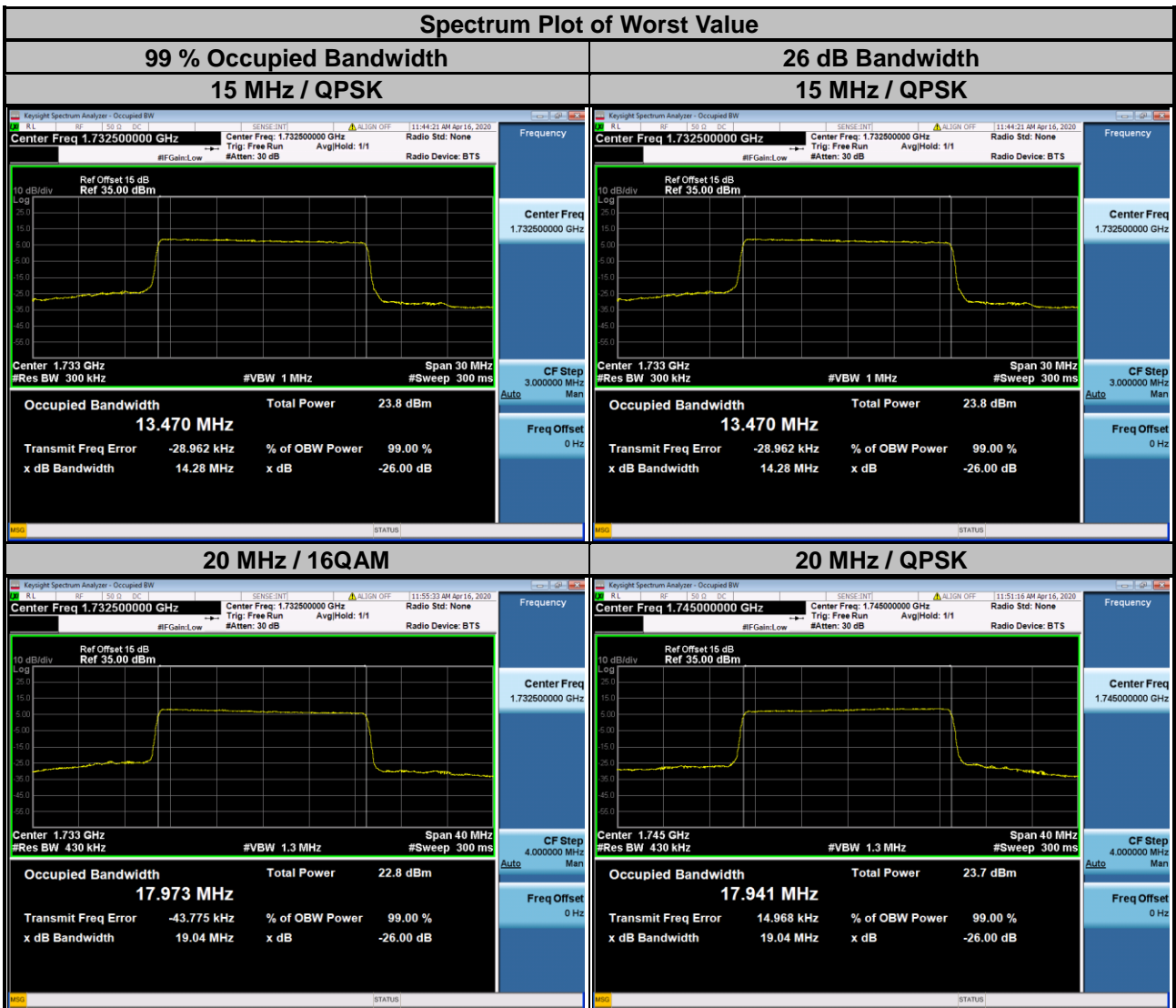
Channel Bandwidth: 10 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
20000	1715.0	8.9691	8.9815	9.521	9.501
20175	1732.5	8.9743	8.9765	9.542	9.525
20350	1750.0	8.9647	8.9725	9.532	9.518



LTE Band 4					
Channel Bandwidth: 15 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
20025	1717.5	13.430	13.422	14.25	14.22
20175	1732.5	13.470	13.465	14.28	14.24
20325	1747.5	13.449	13.445	14.27	14.24

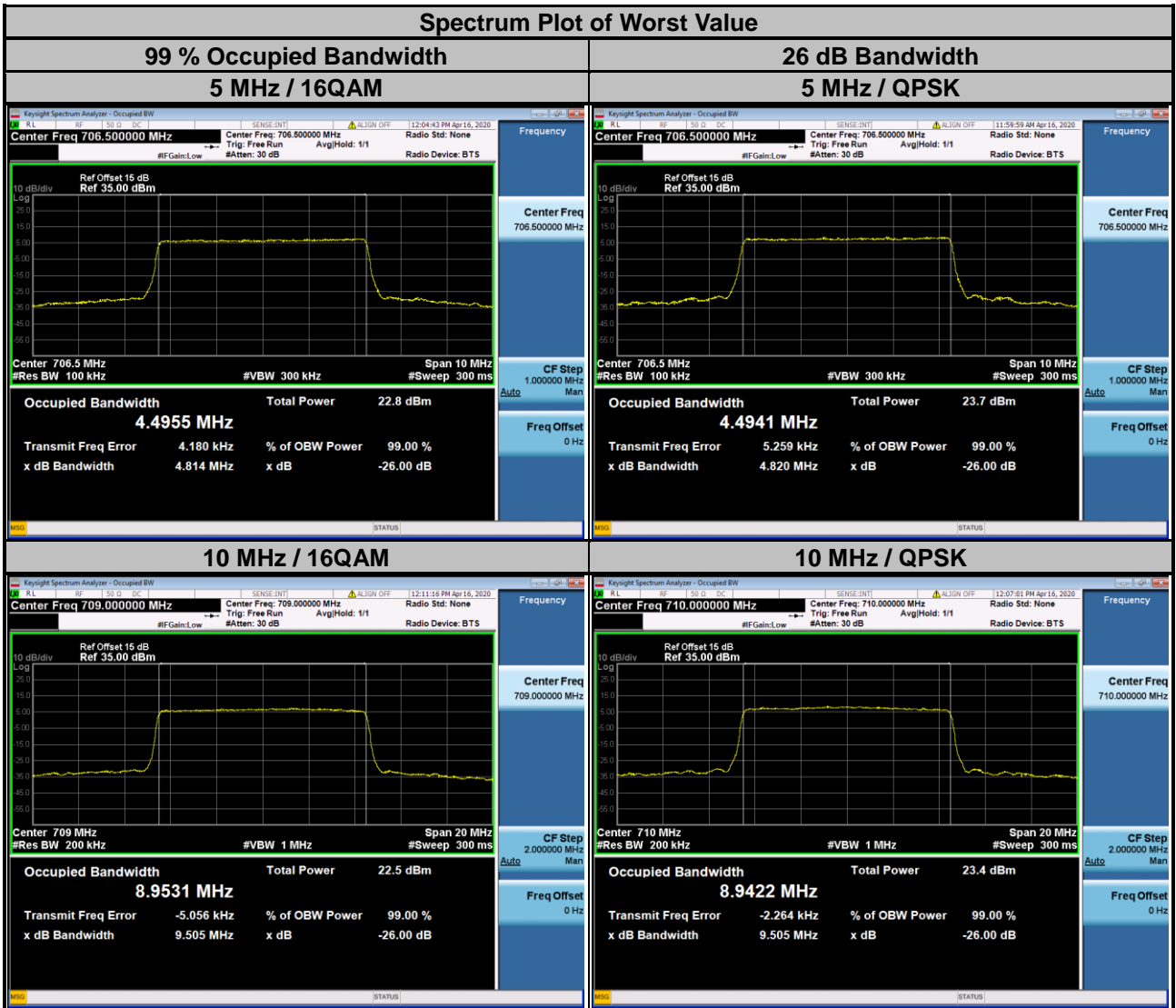
Channel Bandwidth: 20 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
20050	1720.0	17.853	17.875	19.00	19.01
20175	1732.5	17.946	17.973	19.03	19.04
20300	1745.0	17.941	17.957	19.04	19.02



LTE Band 17					
Channel Bandwidth: 5 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
23755	706.5	4.4941	4.4955	4.820	4.814
23790	710.0	4.4854	4.4847	4.788	4.793
23825	713.5	4.4932	4.4950	4.807	4.796

Channel Bandwidth: 10 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
23780	709.0	8.9489	8.9531	9.496	9.505
23790	710.0	8.9422	8.9492	9.505	9.501
23800	711.0	8.9454	8.9519	9.482	9.494



## 4.5 Band Edge Measurement

### 4.5.1 Limits of Band Edge Measurement

For operations in the 698-787 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log (P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater.

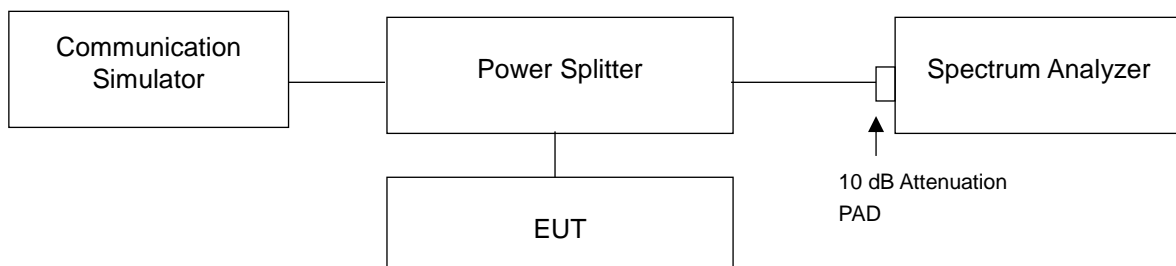
However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log (P)$  dB.

On all frequencies between 763-775 MHz and 793-805 MHz, by a factor no less than  $65 + 10 \log (P)$  dB in a 6.25 kHz band segment, for mobile and portable stations.

For operations in the 1710–1755 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB.

### 4.5.2 Test Setup

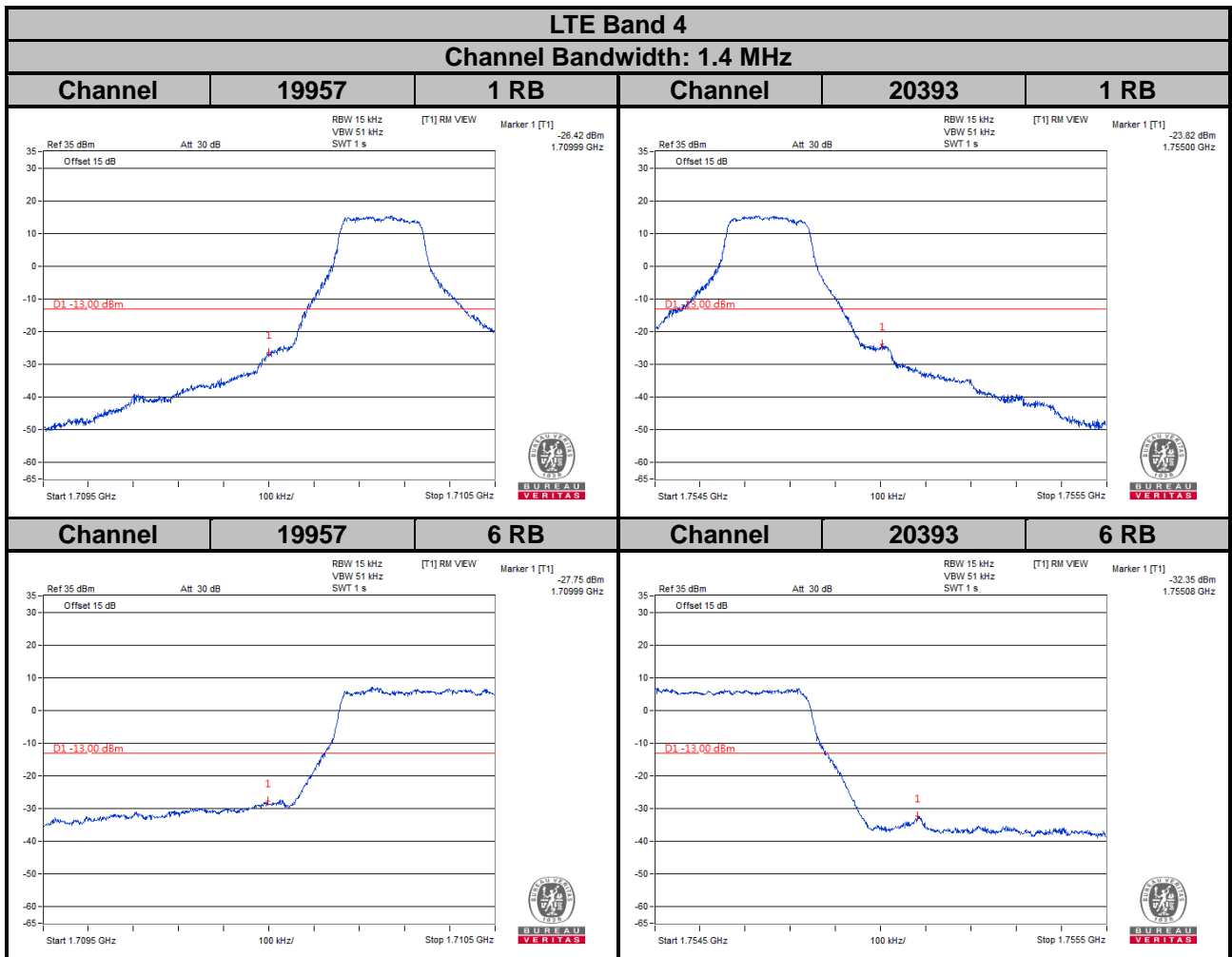
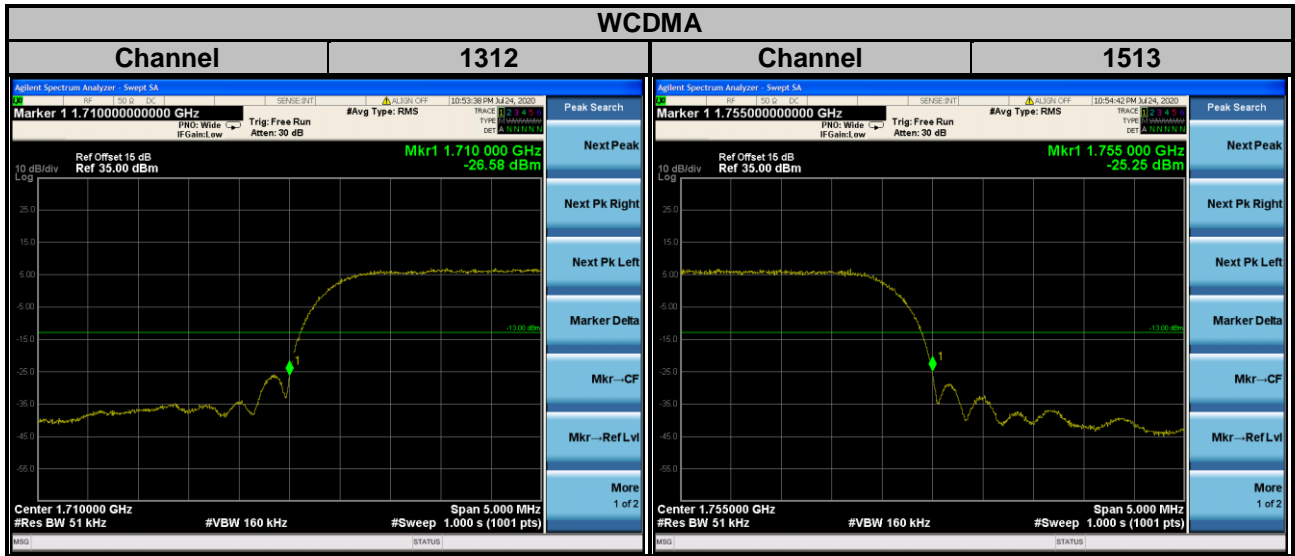


### 4.5.3 Test Procedures

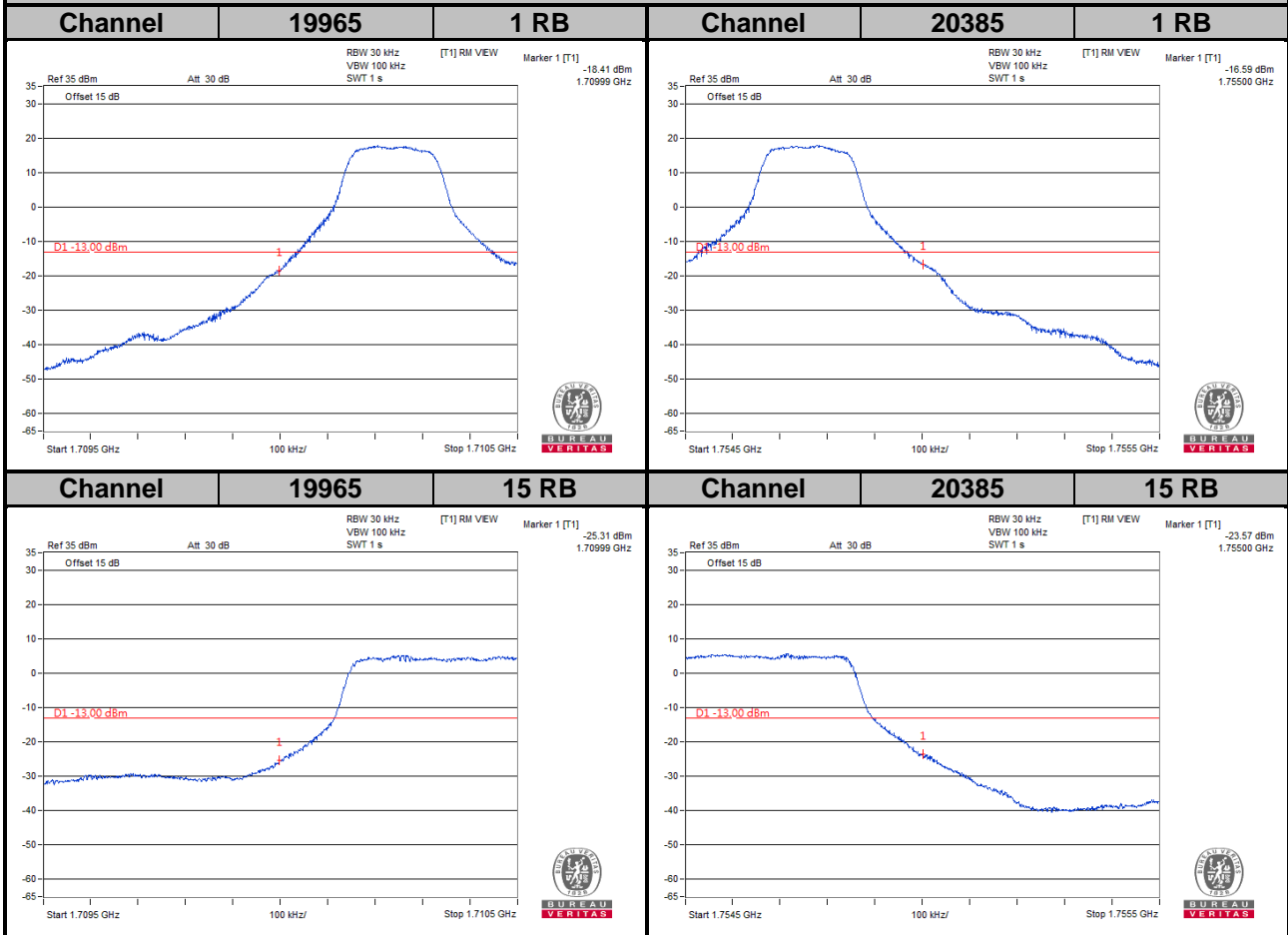
- All measurements were done at low and high operational frequency range.
- The center frequency of spectrum is the band edge frequency and span is 5 MHz. RB of the spectrum is 51 kHz and VB of the spectrum is 160 kHz (WCDMA).
- The center frequency of spectrum is the band edge frequency and span is 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 51 kHz and VB of the spectrum is 160 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.



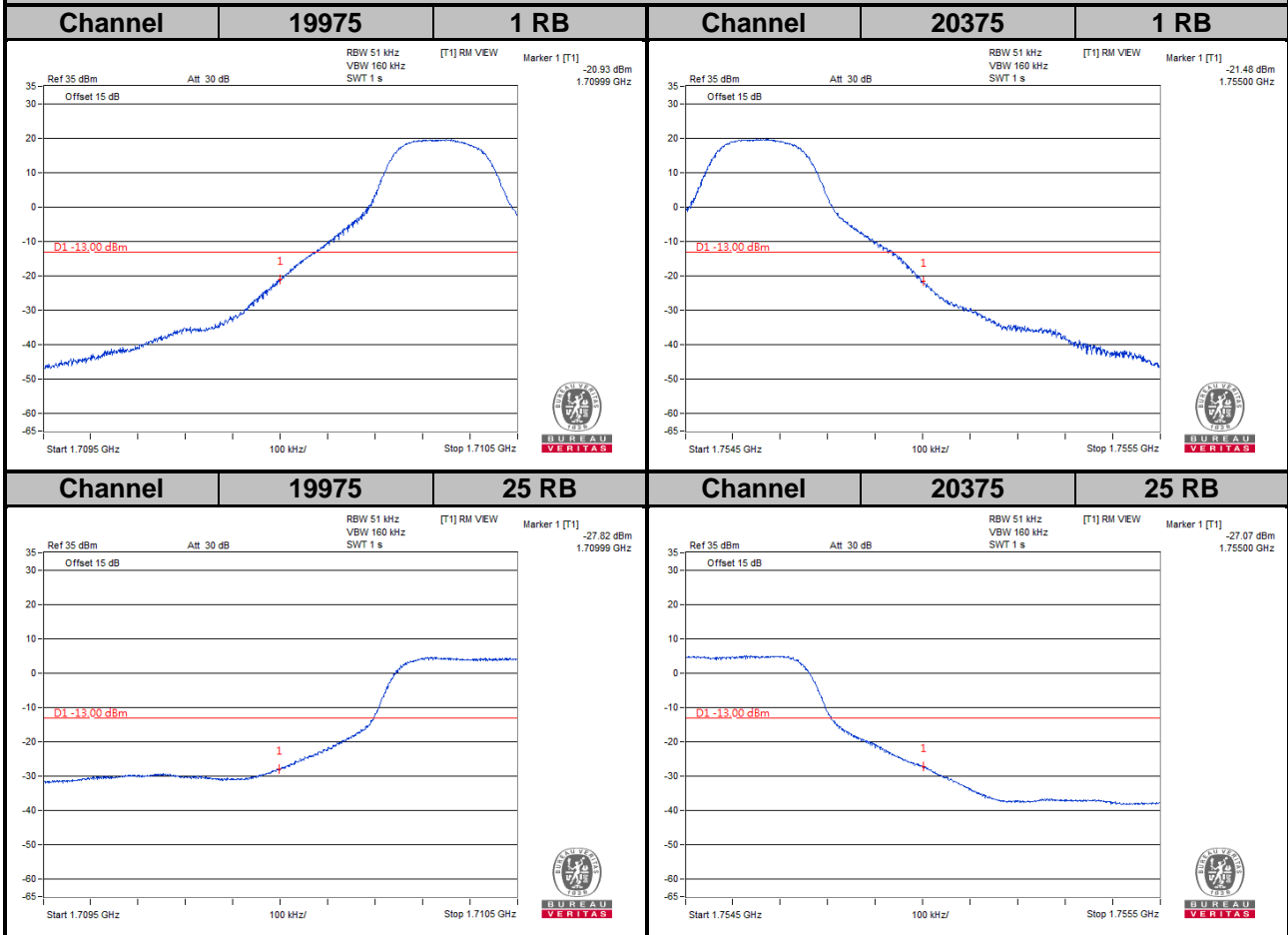
### 4.5.4 Test Results



**LTE Band 4**  
**Channel Bandwidth: 3 MHz**

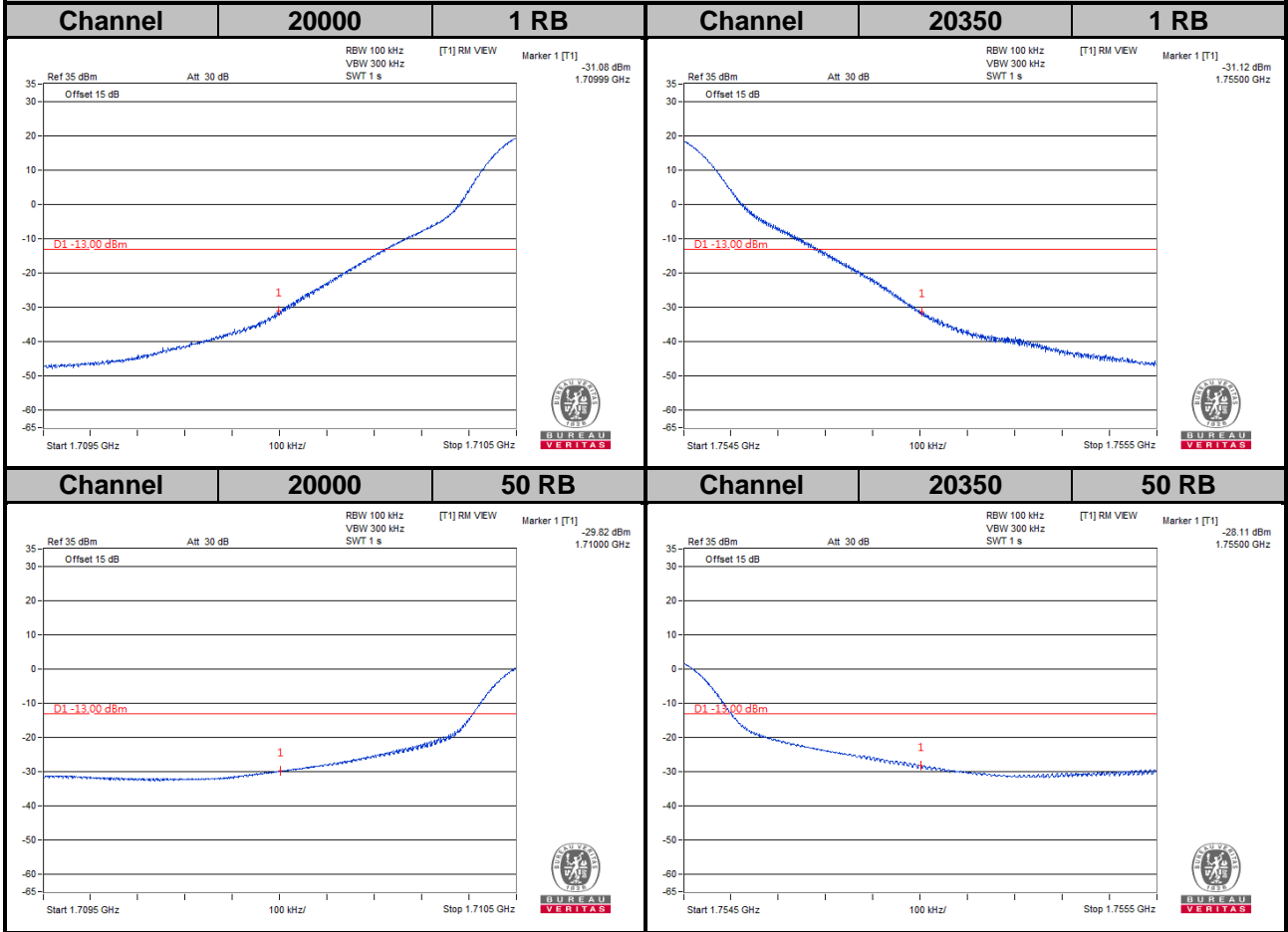


**LTE Band 4**  
**Channel Bandwidth: 5 MHz**

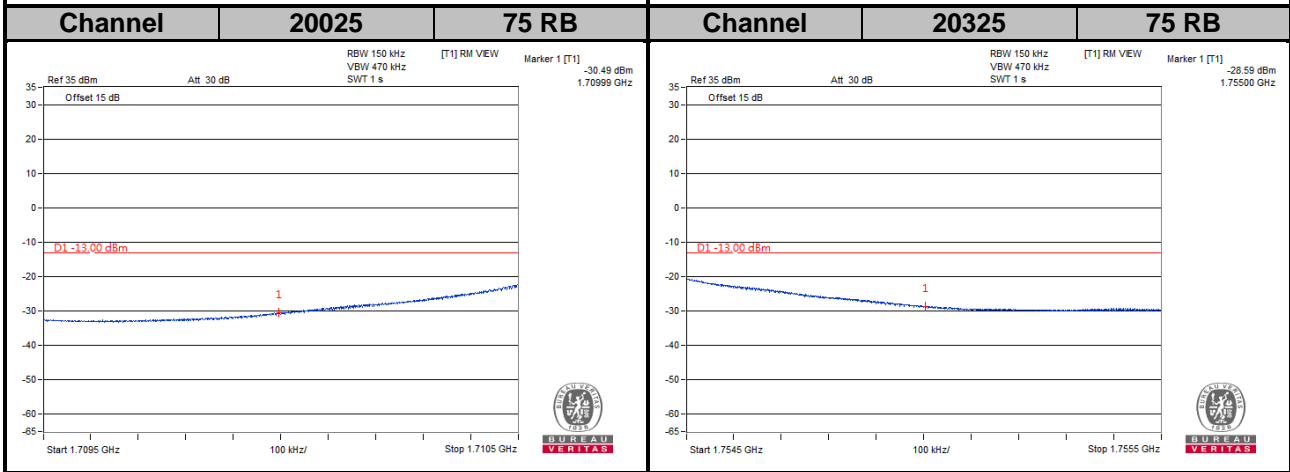
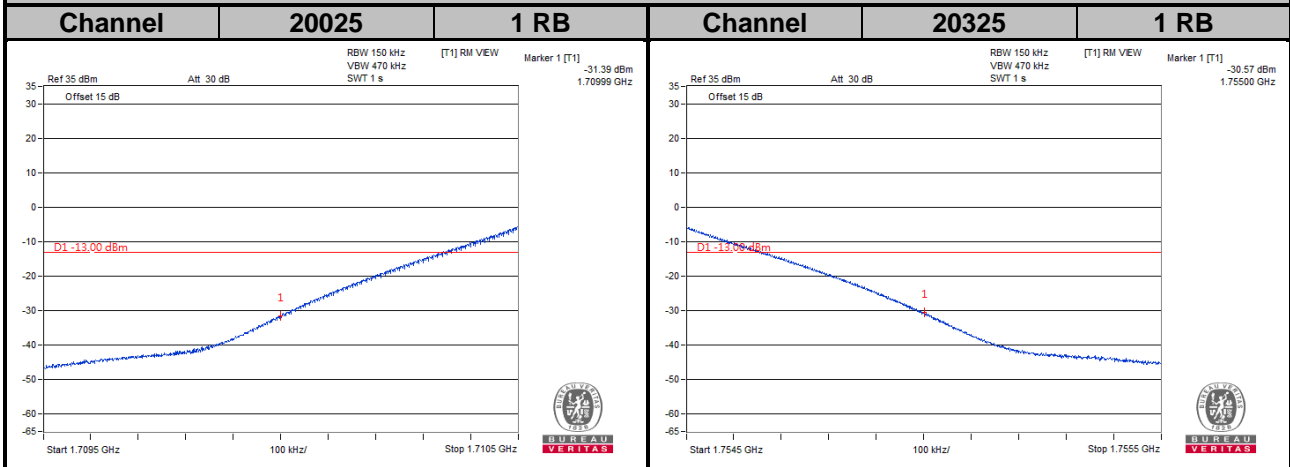


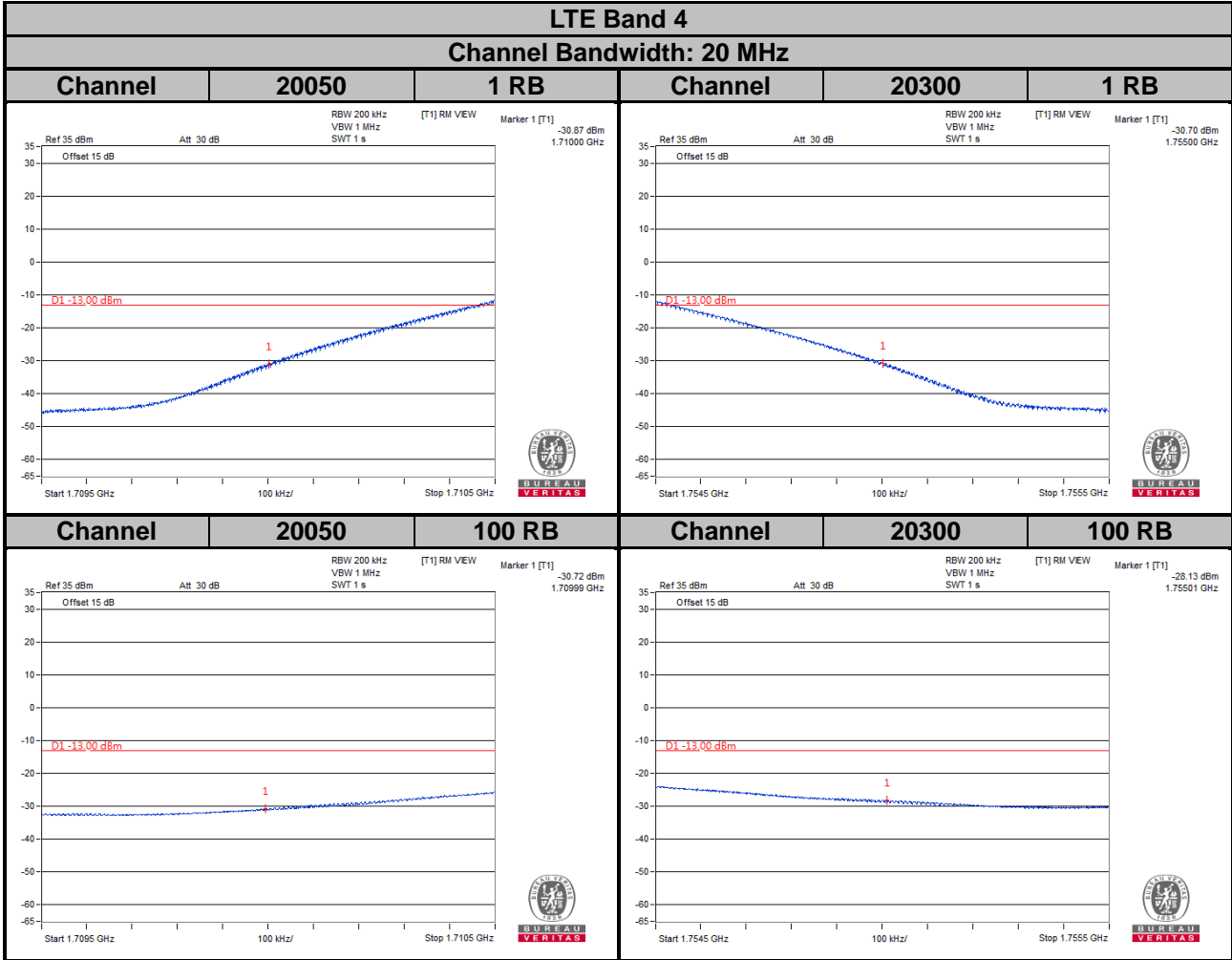
LTE Band 4

Channel Bandwidth: 10 MHz

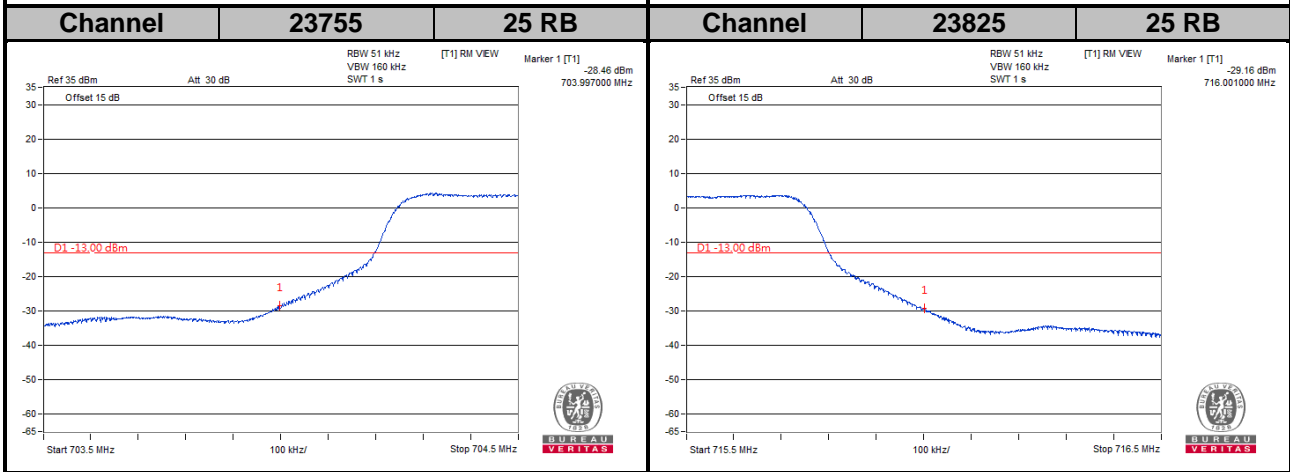
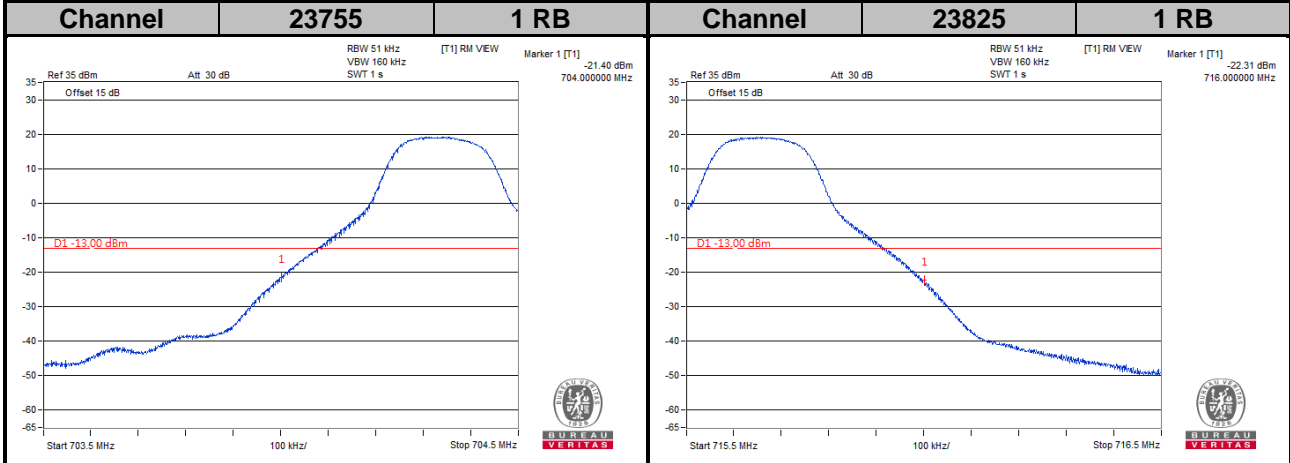


**LTE Band 4**  
**Channel Bandwidth: 15 MHz**

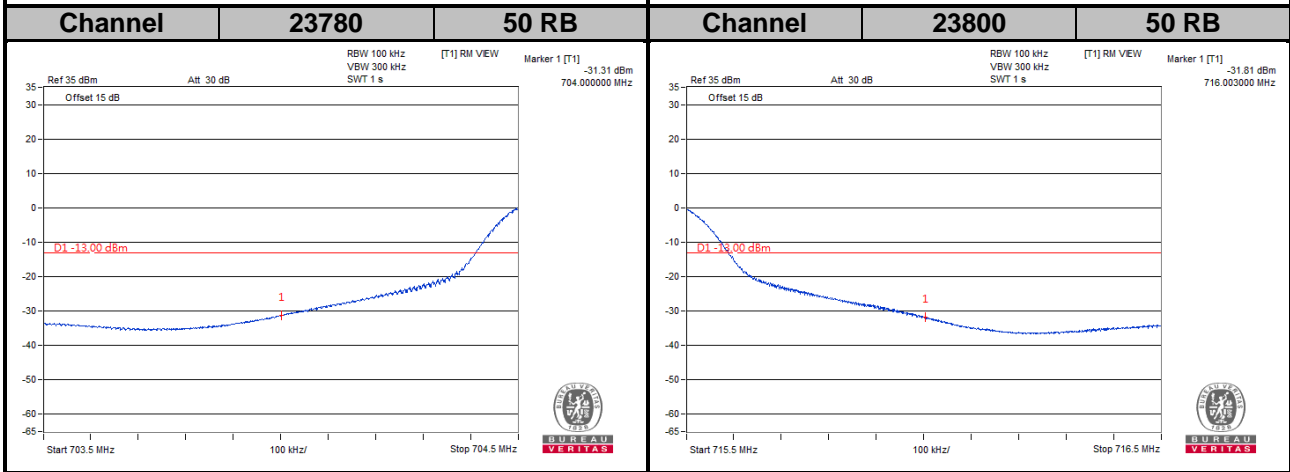
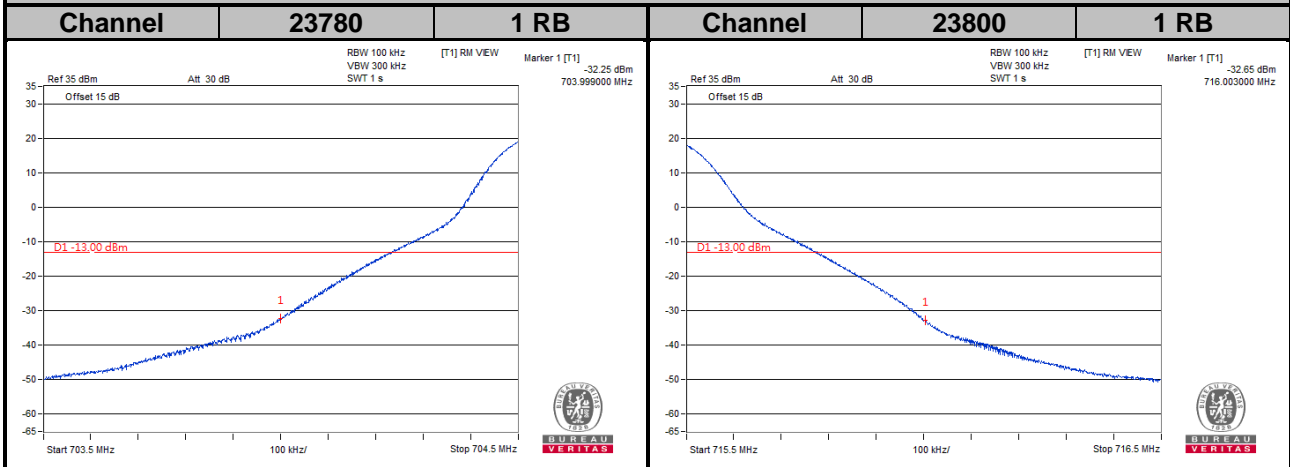




**LTE Band 17**  
**Channel Bandwidth: 5 MHz**



**LTE Band 17**  
**Channel Bandwidth: 10 MHz**



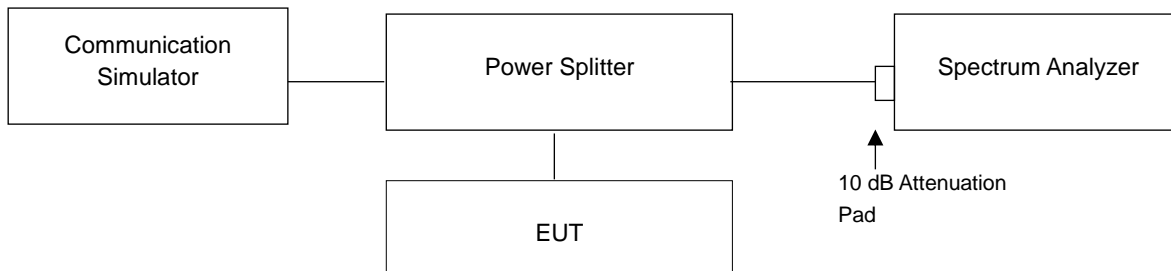


## 4.6 Peak to Average Ratio

### 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

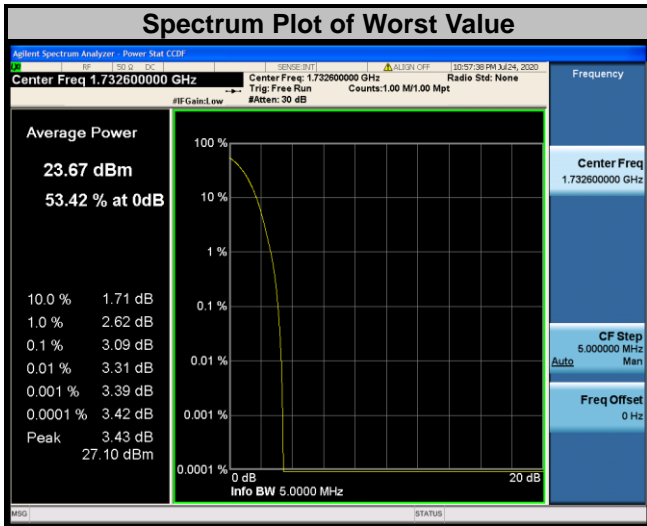


### 4.6.3 Test Procedures

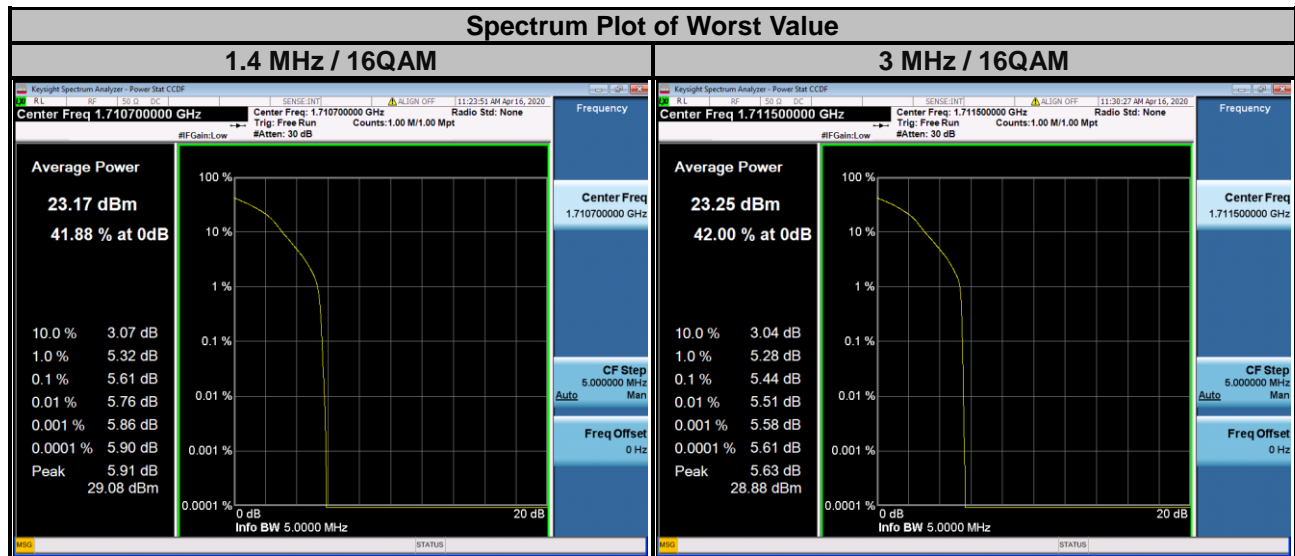
1. Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1 %.

#### 4.6.4 Test Results

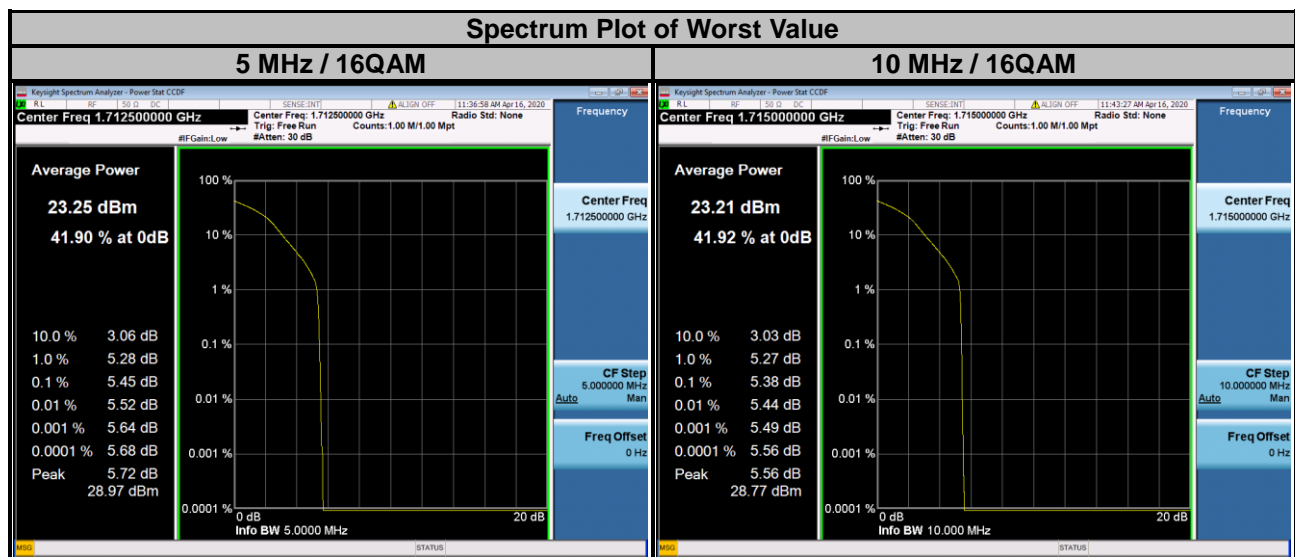
WCDMA		
Channel	Frequency (MHz)	Peak to Average Ratio (dB)
1312	1712.4	3.05
1413	1732.6	3.09
1513	1752.6	2.85



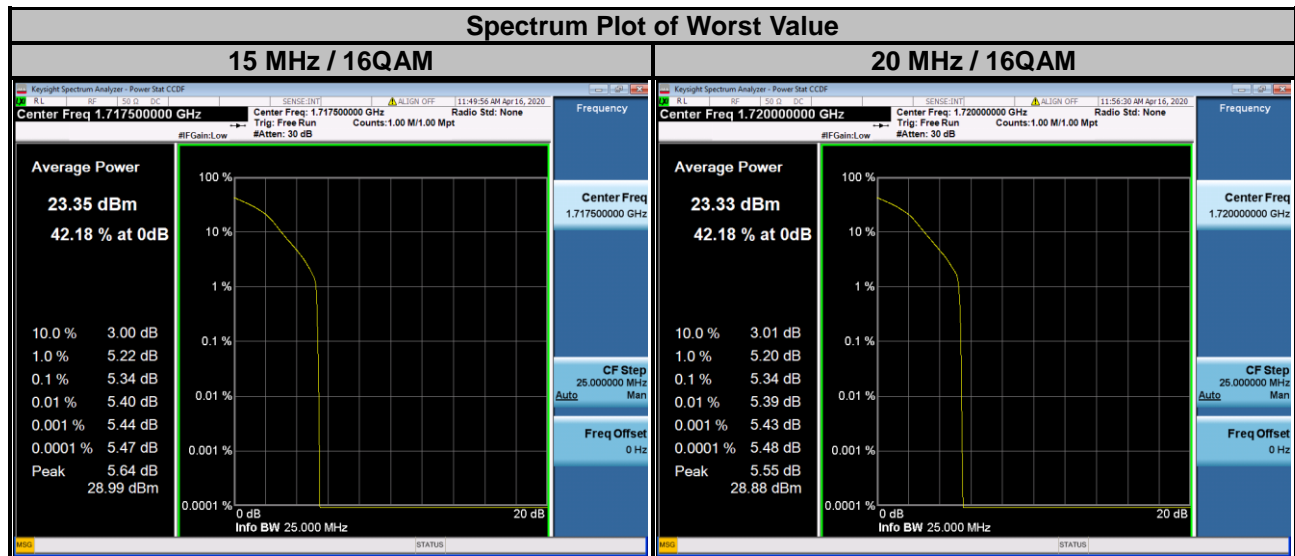
LTE Band 4							
Channel Bandwidth: 1.4 MHz				Channel Bandwidth: 3 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
19957	1710.7	4.01	5.61	19965	1711.5	3.78	5.44
20175	1732.5	3.54	4.80	20175	1732.5	3.35	4.65
20393	1754.3	3.41	4.65	20385	1753.5	3.37	4.74



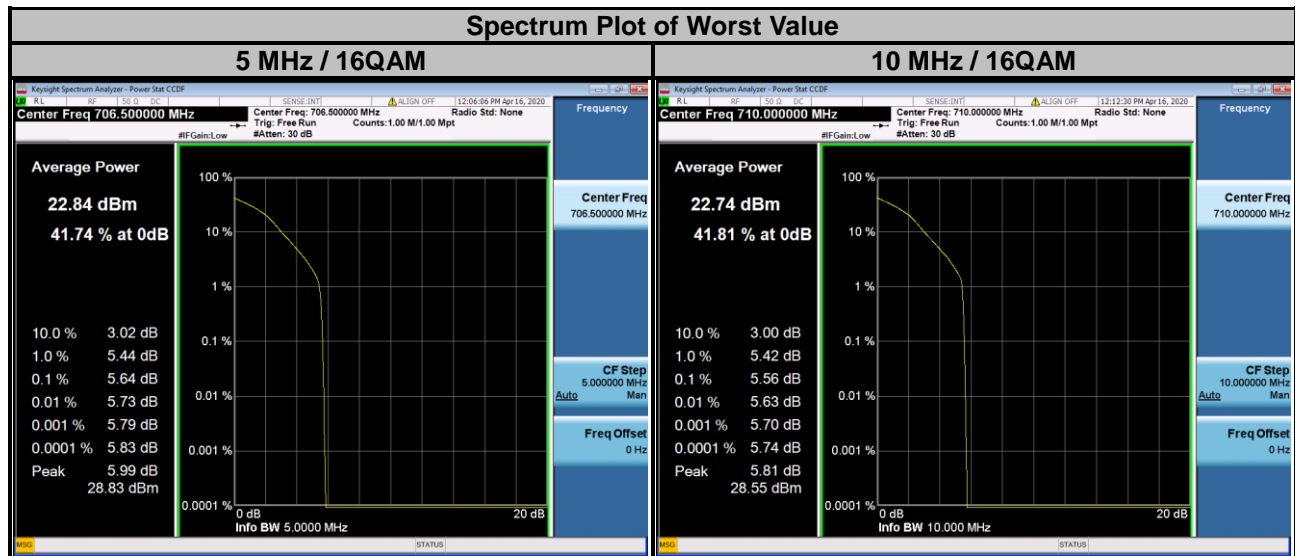
LTE Band 4							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
19975	1712.5	3.81	5.45	20000	1715.0	3.70	5.38
20175	1732.5	3.31	4.59	20175	1732.5	3.19	4.42
20375	1752.5	3.52	4.98	20350	1750.0	3.64	5.25



LTE Band 4							
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
20025	1717.5	3.66	5.34	20050	1720.0	3.63	5.34
20175	1732.5	3.18	4.46	20175	1732.5	3.19	4.58
20325	1747.5	3.59	5.13	20300	1745.0	3.46	4.91



LTE Band 17							
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
23755	706.5	3.85	5.64	23780	709.0	3.74	5.54
23790	710.0	3.81	5.55	23790	710.0	3.75	5.56
23825	713.5	3.70	5.40	23800	711.0	3.75	5.48

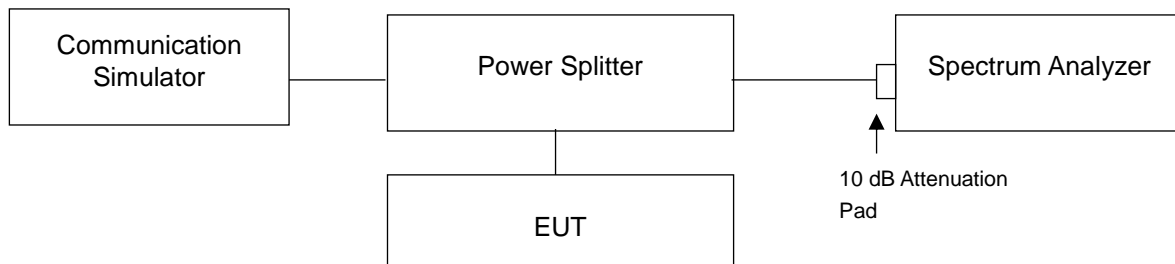


## 4.7 Conducted Spurious Emissions

### 4.7.1 Limits of Conducted Spurious Emissions Measurement

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB. The limit of emission is equal to -13 dBm.

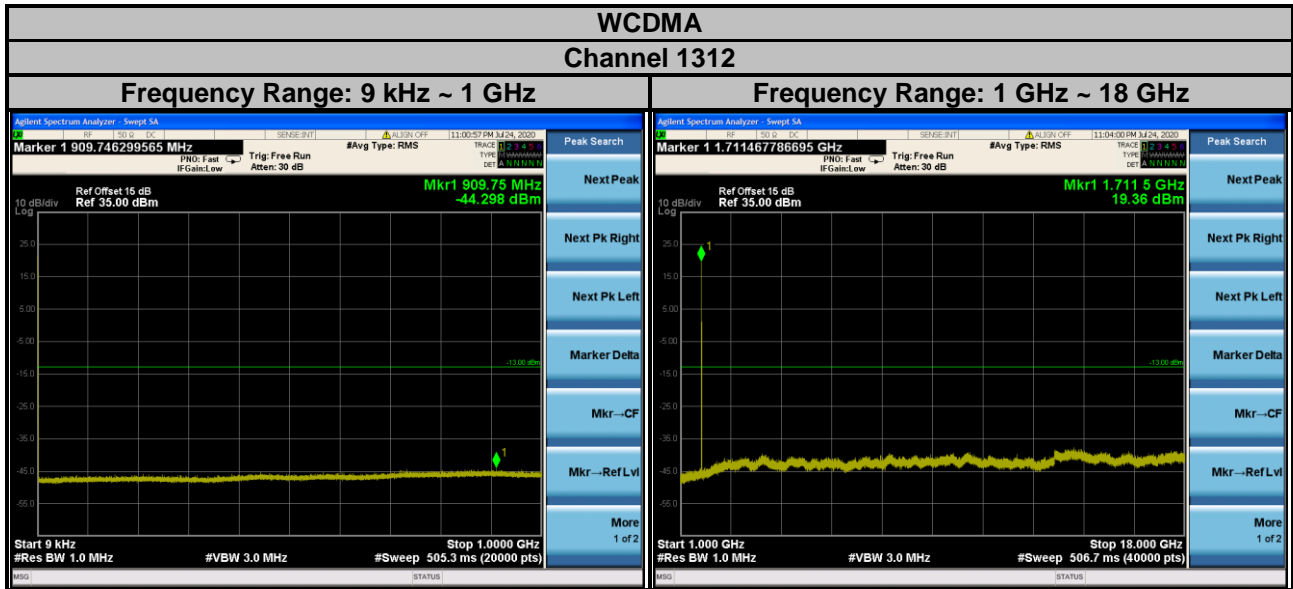
### 4.7.2 Test Setup



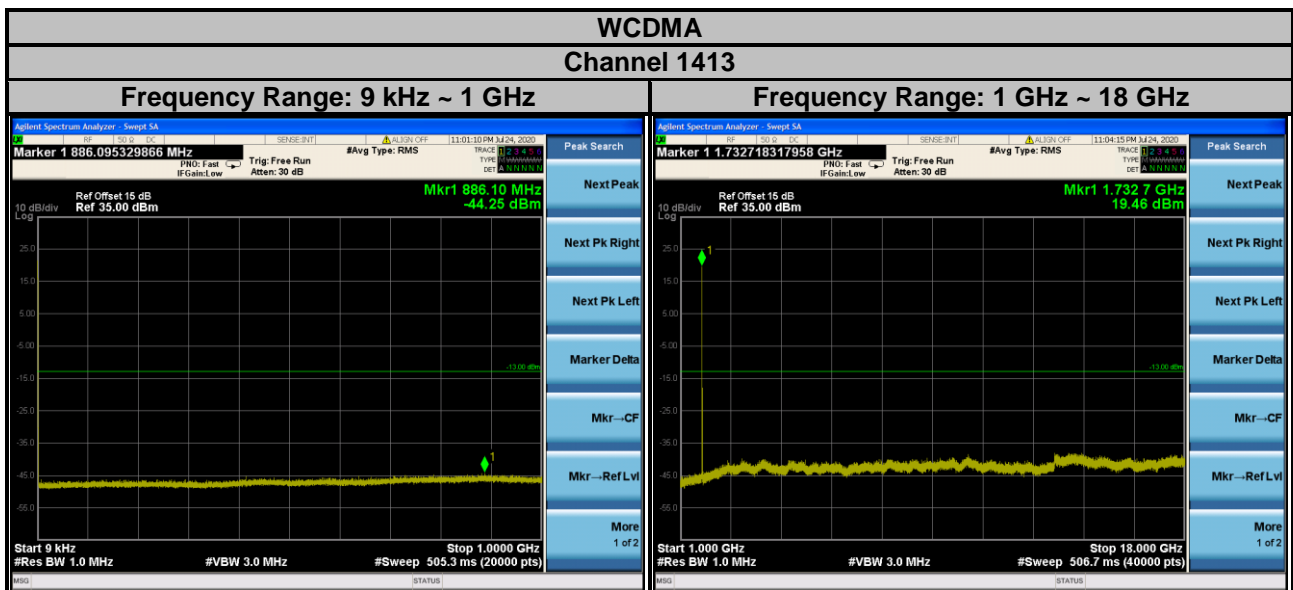
### 4.7.3 Test Procedure

- 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 = 1 MHz and VBW = 3 MHz is used for conducted emission measurement.
- Measuring frequency range is from 1 GHz to 8 GHz / 18 GHz. 10 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz is used for conducted emission measurement.

#### 4.7.4 Test Results

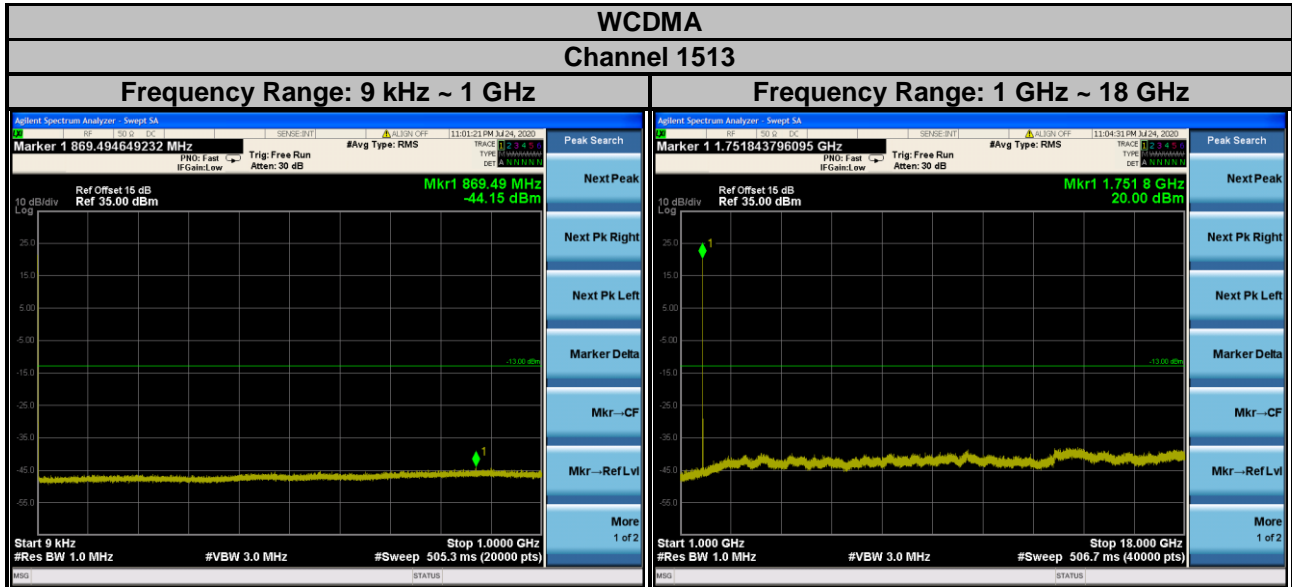


Note: The signal over the limit in 9 kHz is from spectrum analyzer.

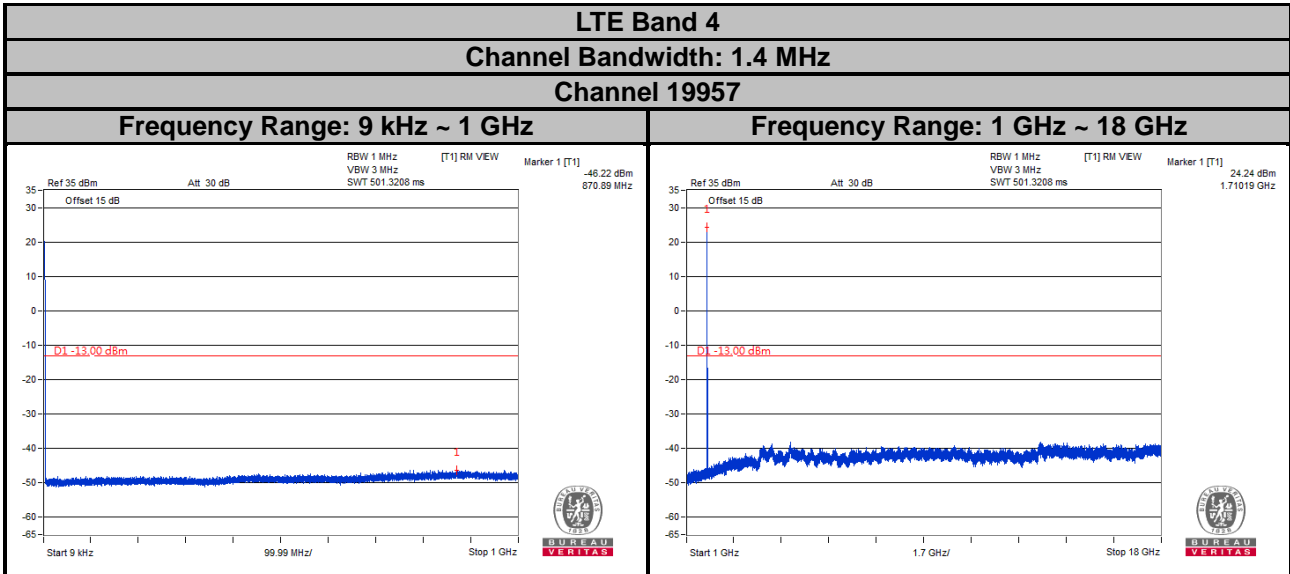


Note: The signal over the limit in 9 kHz is from spectrum analyzer.

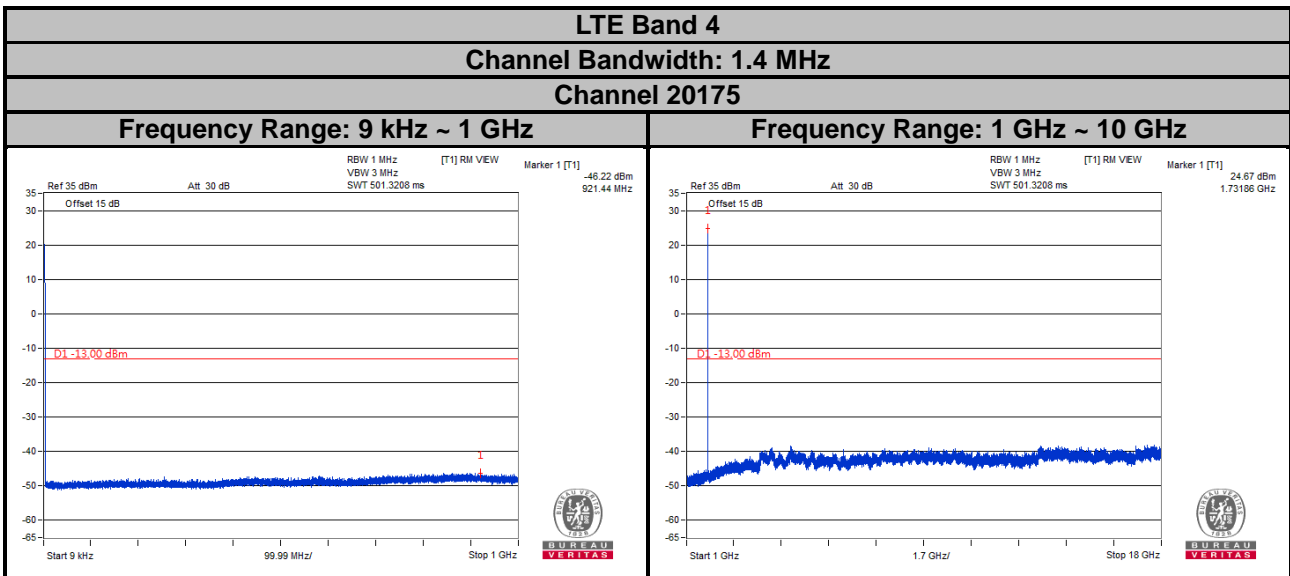




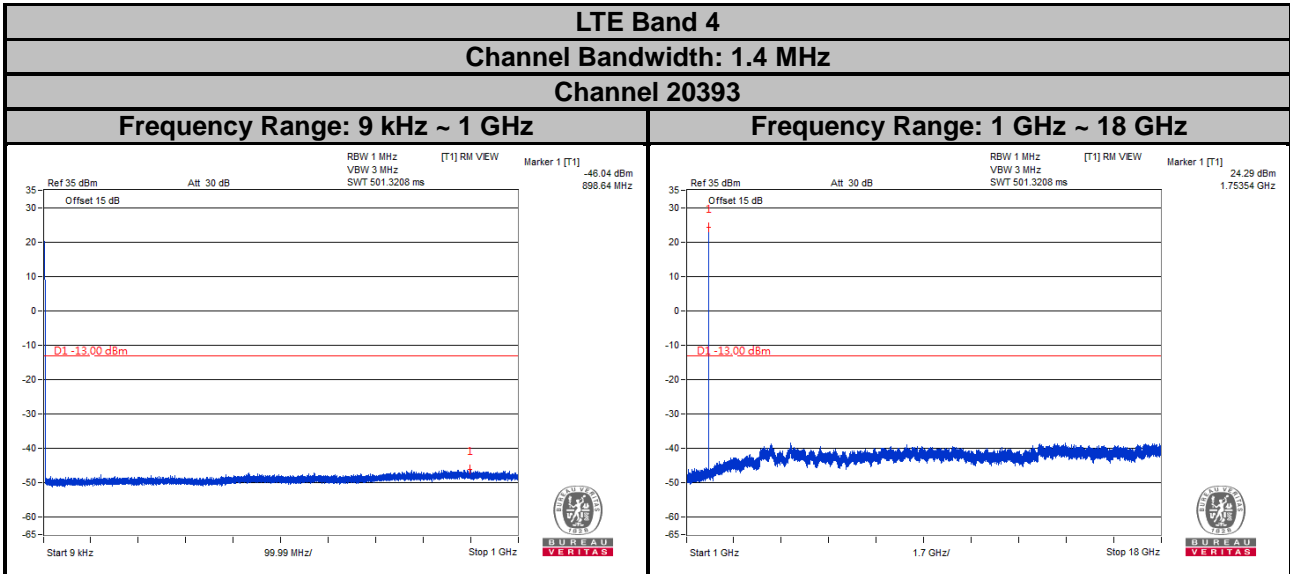
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



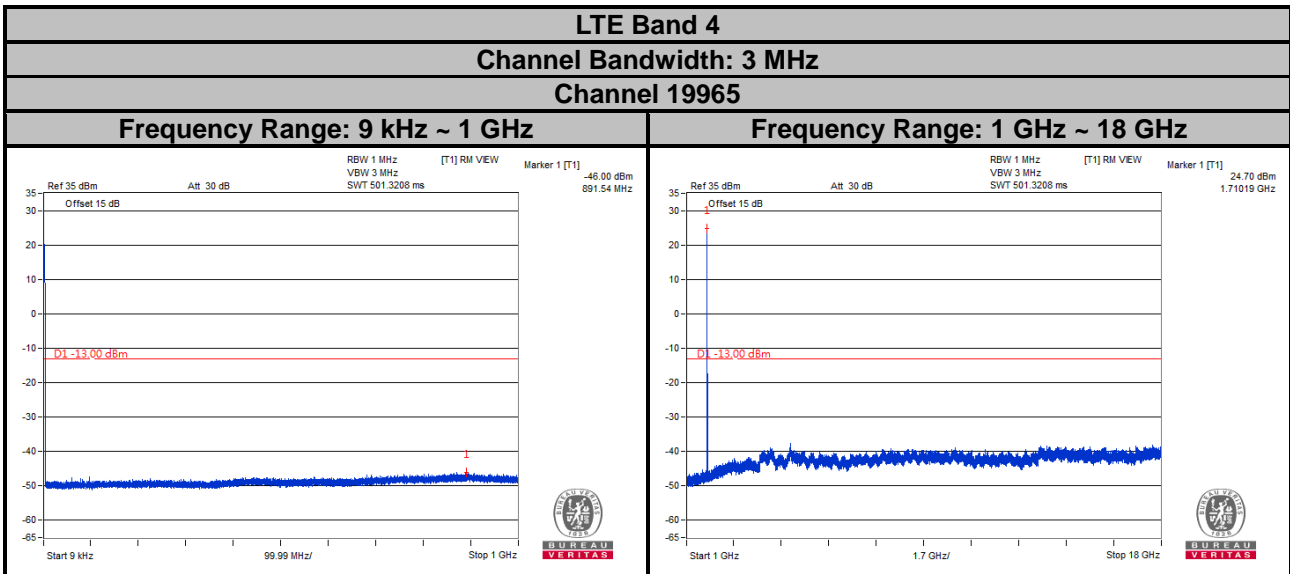
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



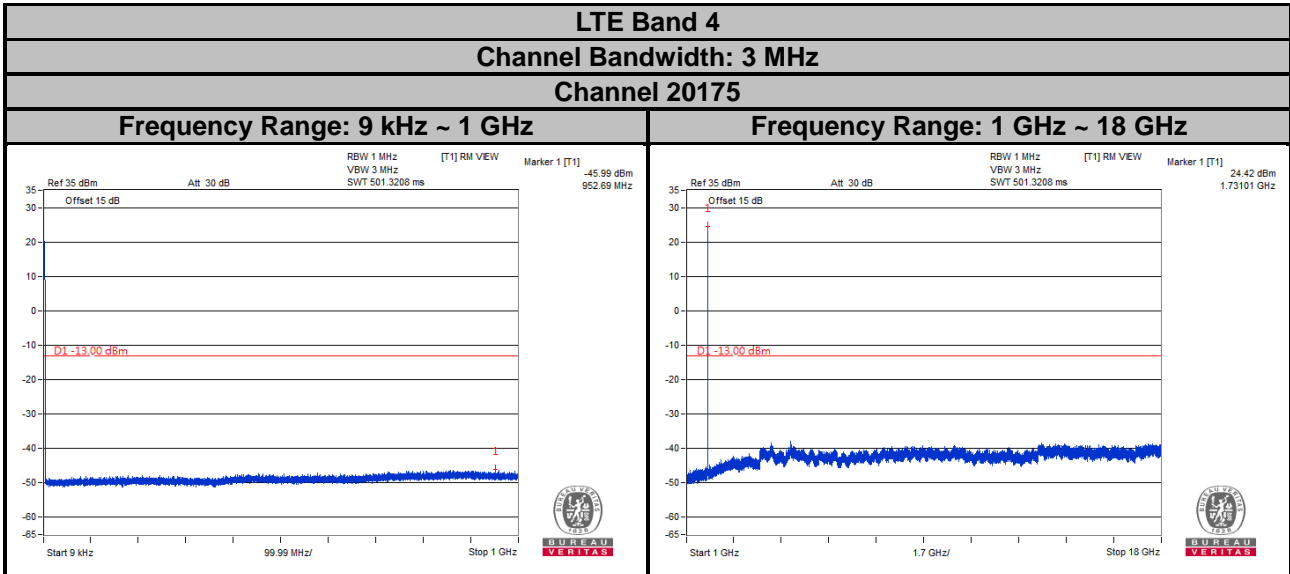
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



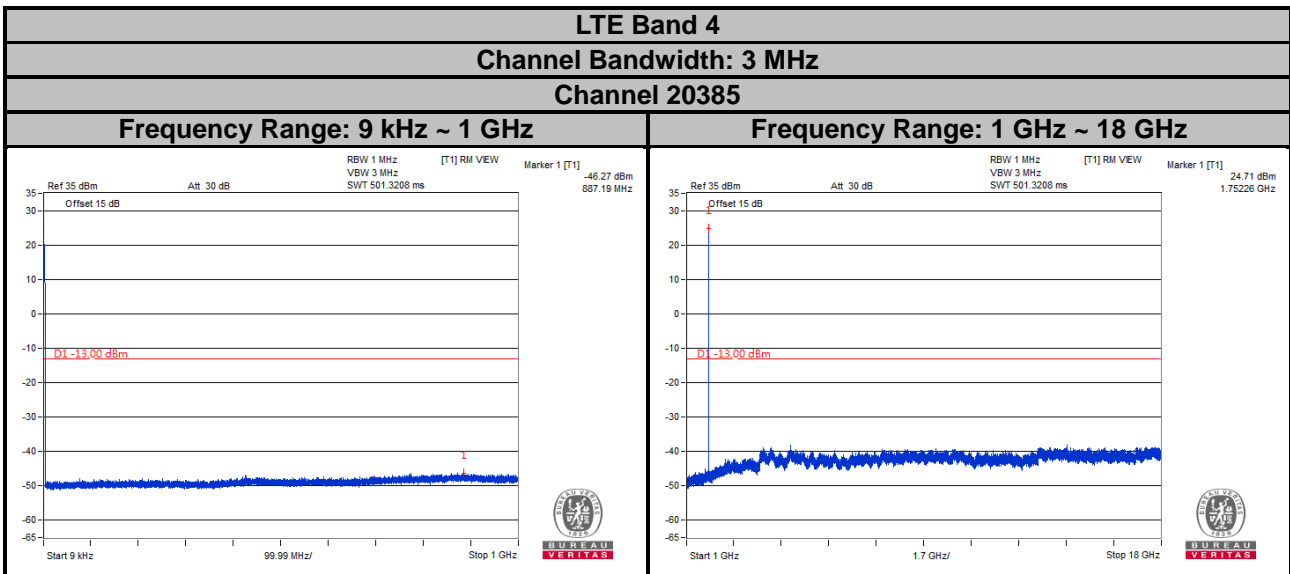
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



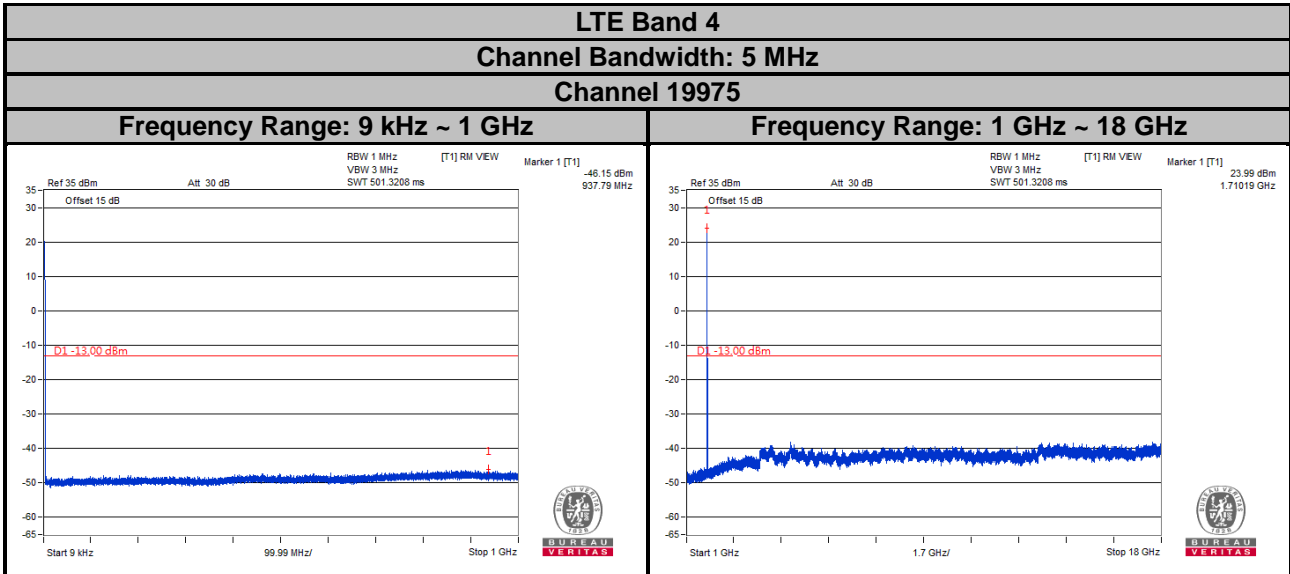
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



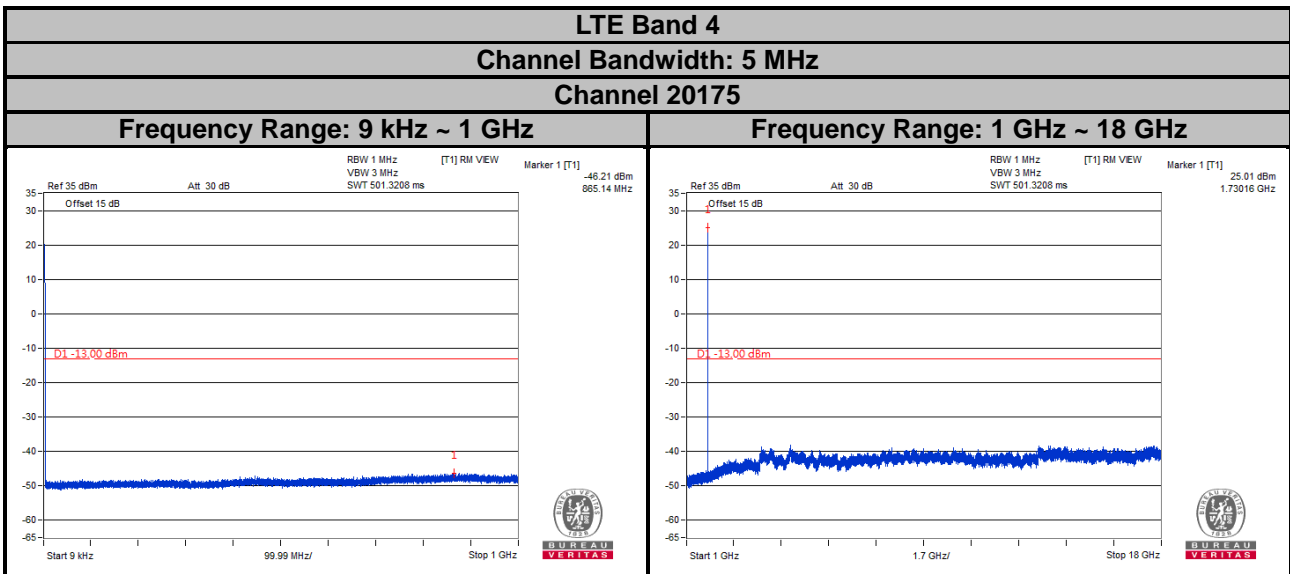
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



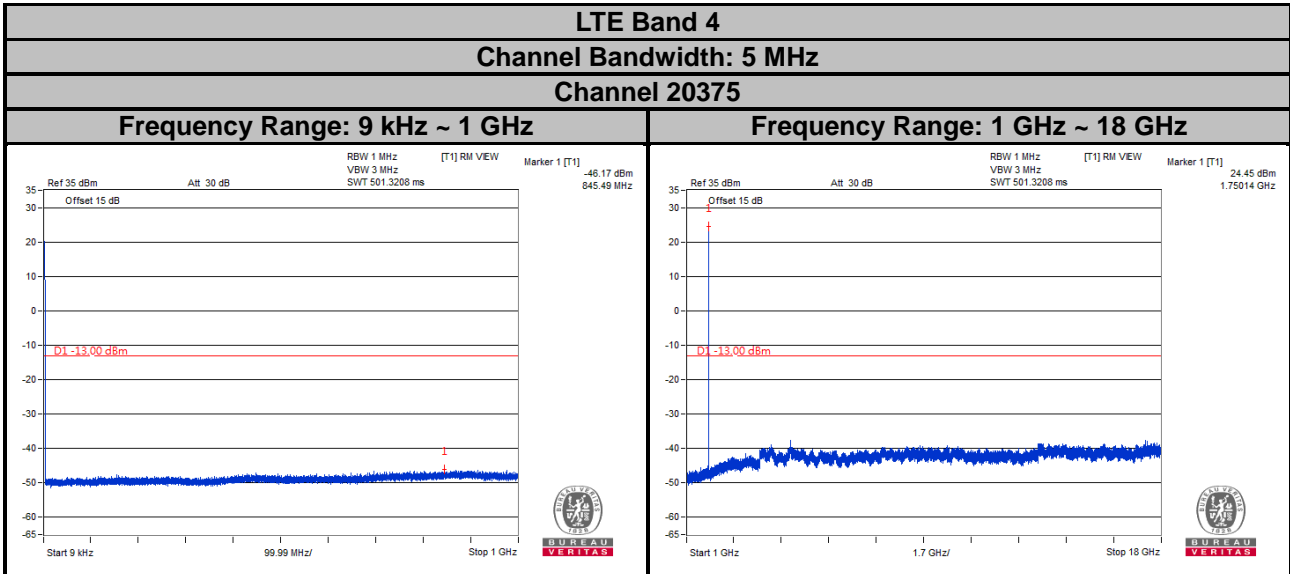
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



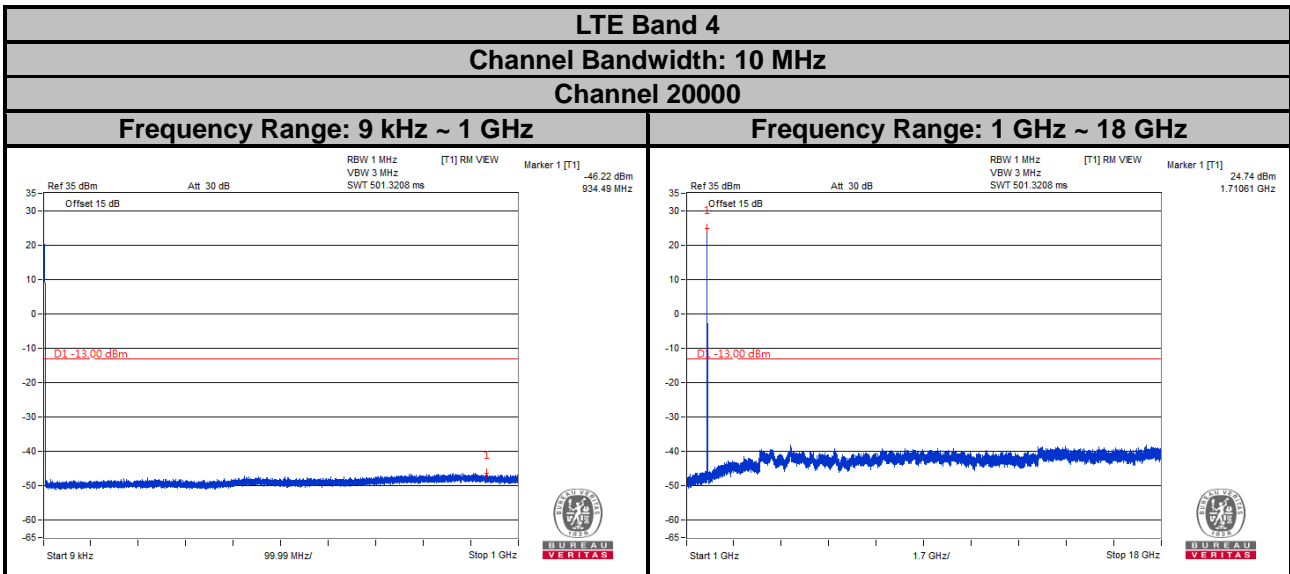
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



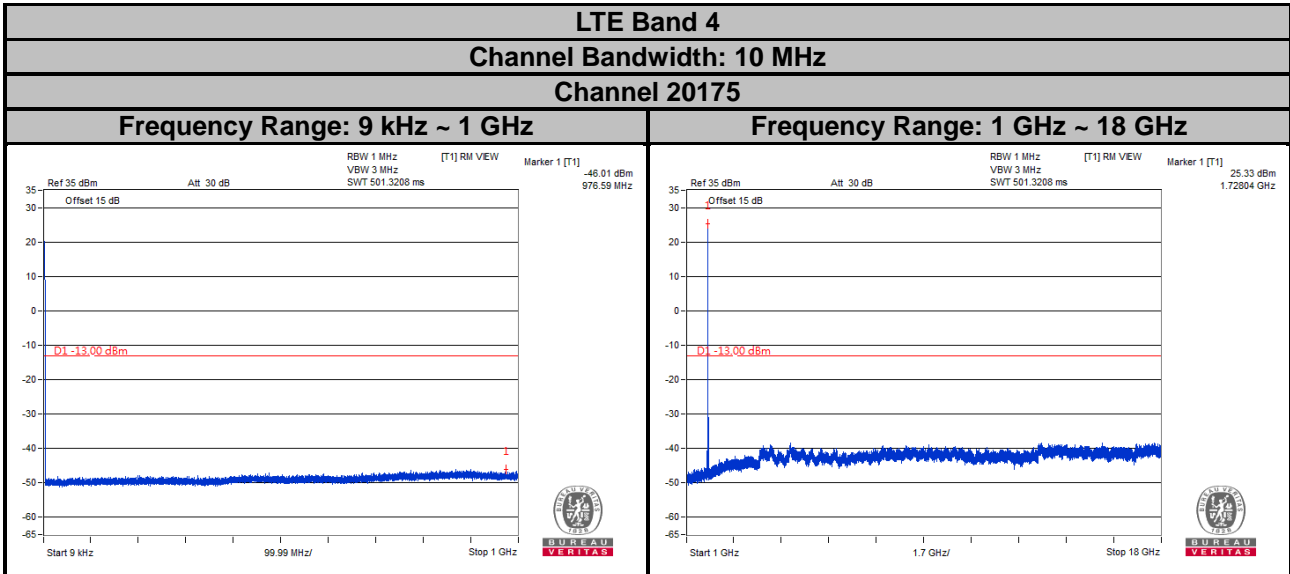
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



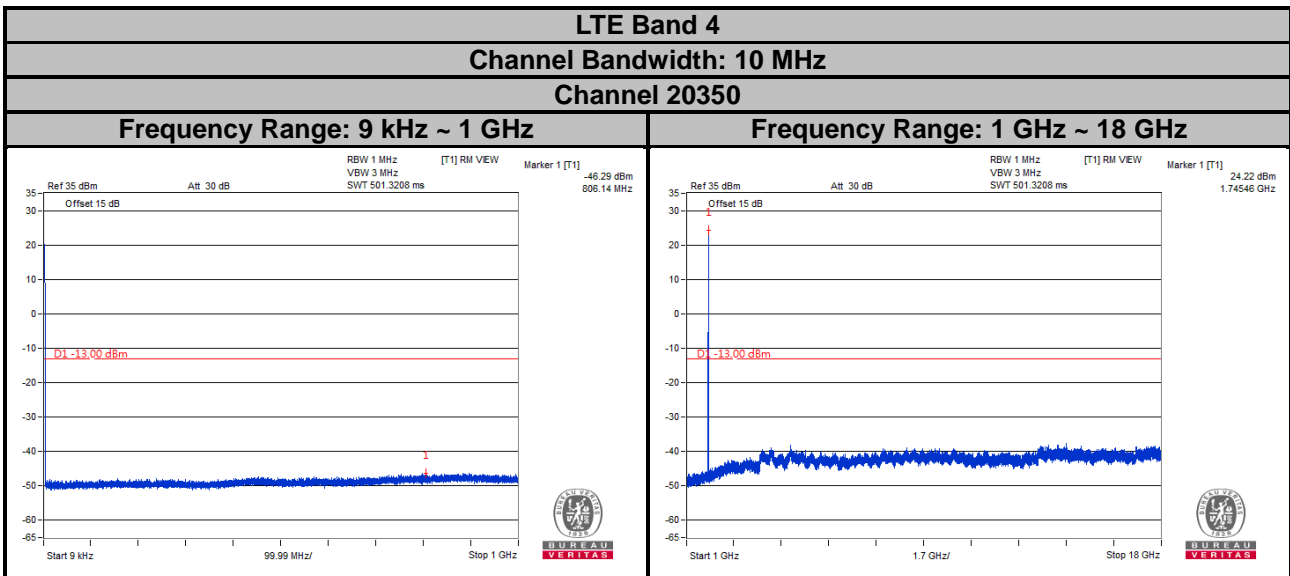
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



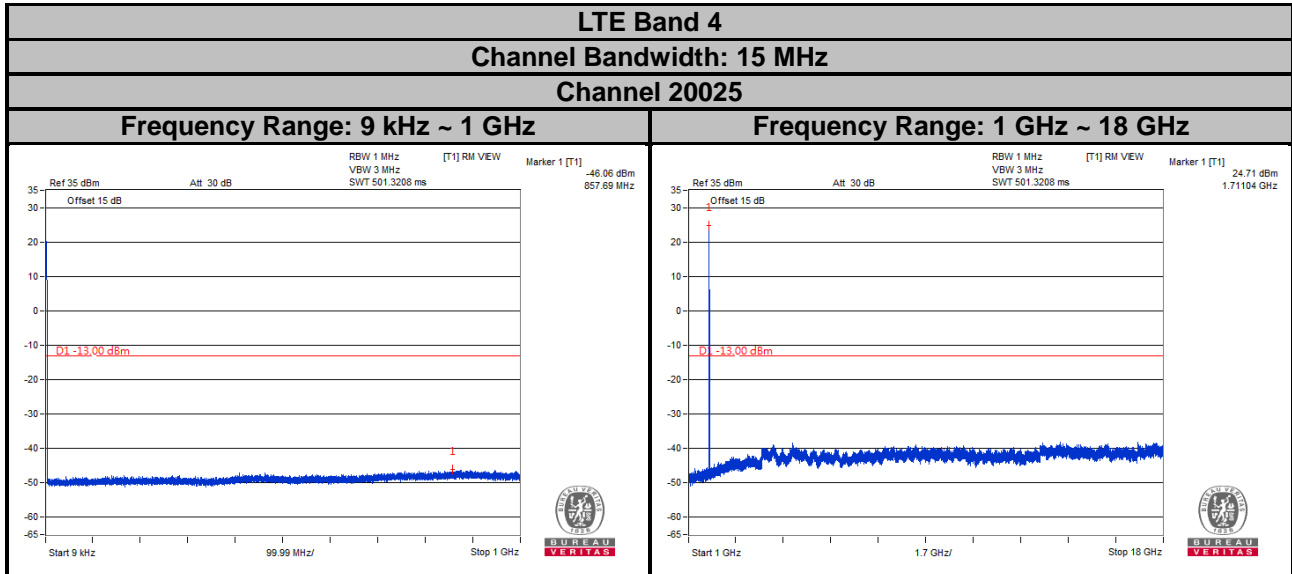
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



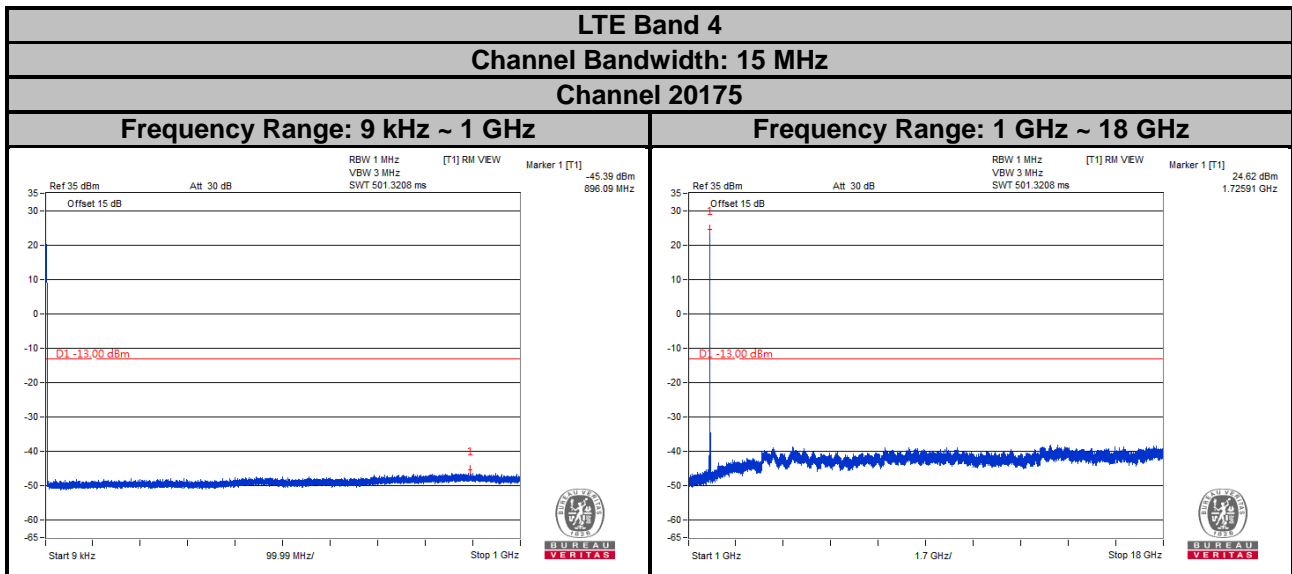
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



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

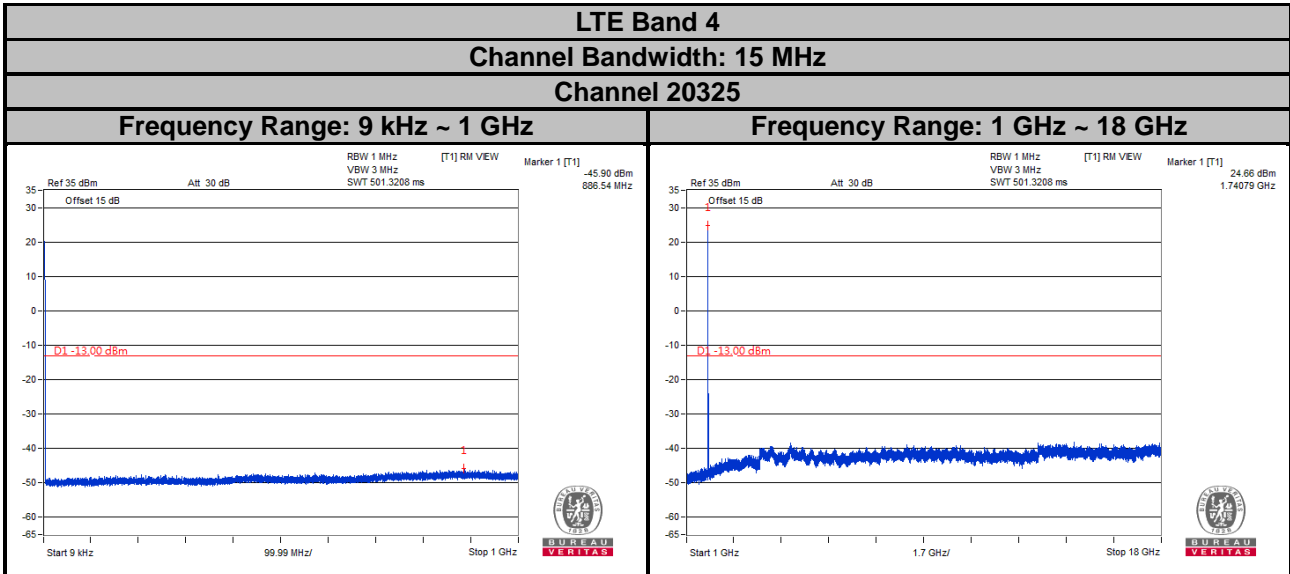


Note: The signal over the limit in 9 kHz is from spectrum analyzer.

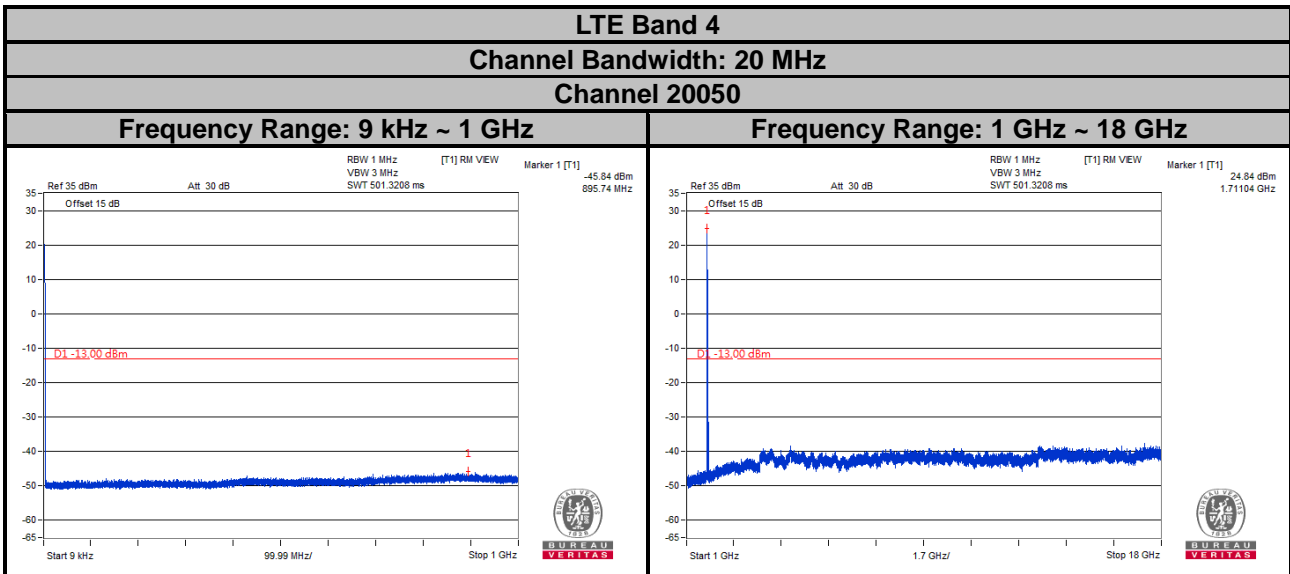


Note: The signal over the limit in 9 kHz is from spectrum analyzer.

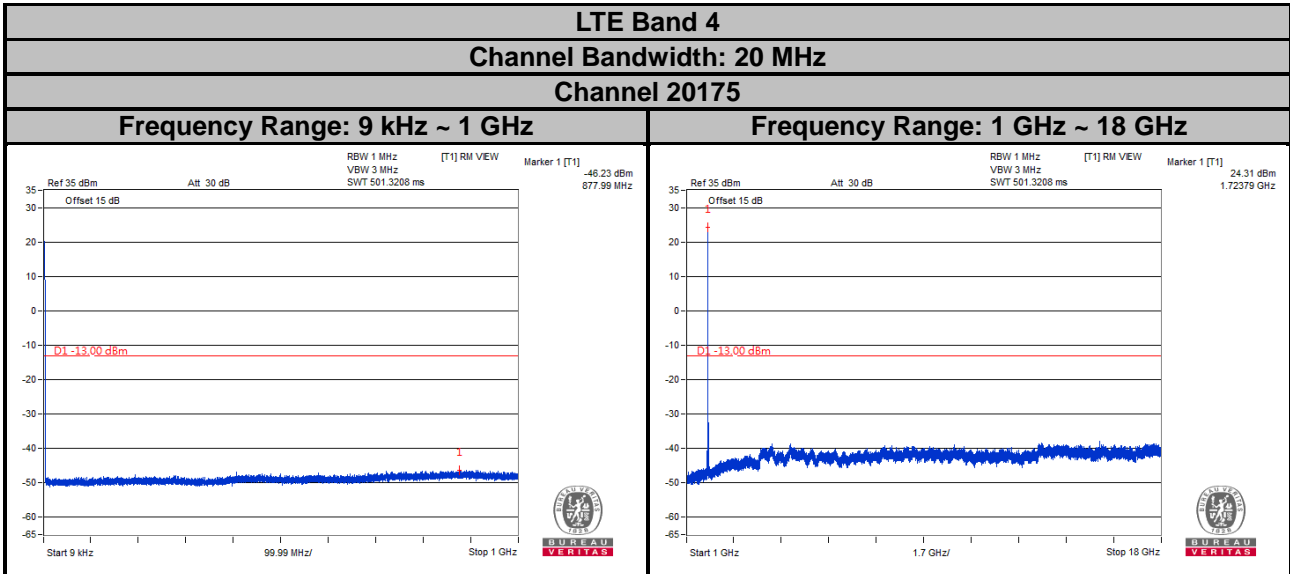




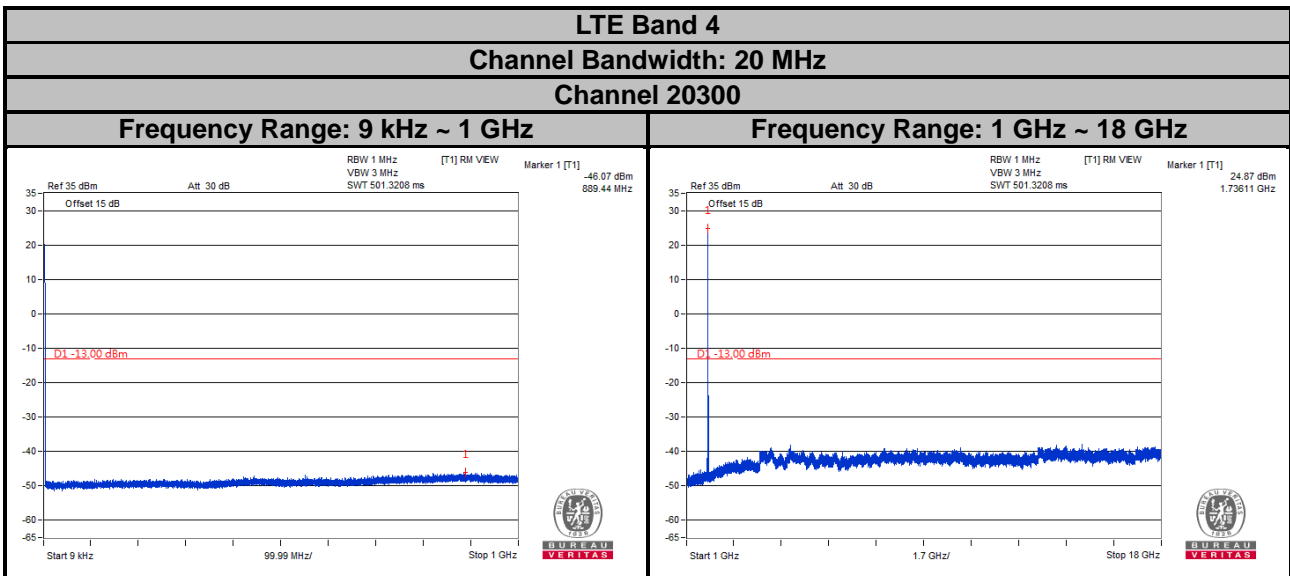
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



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



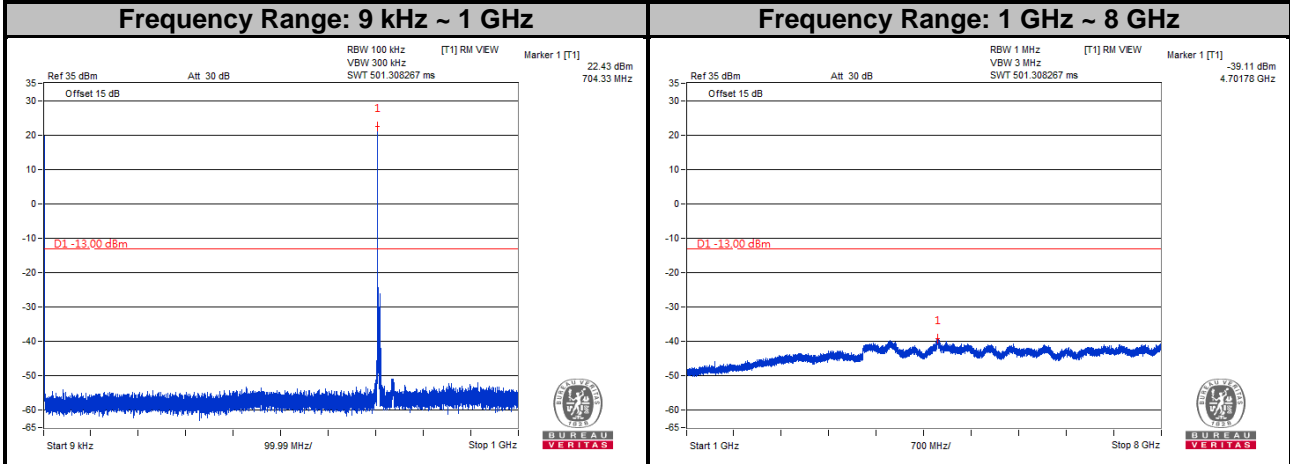
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



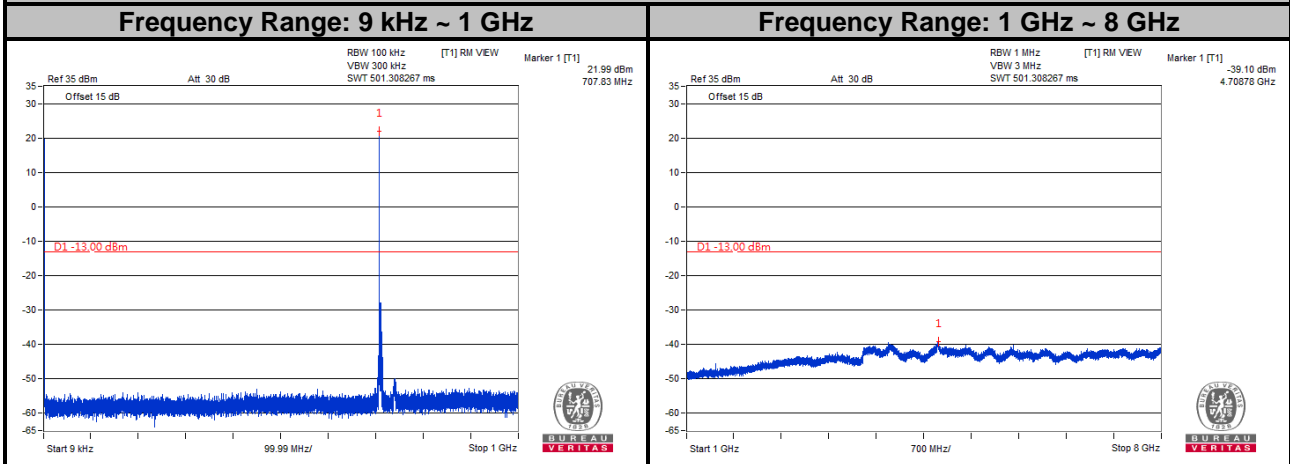
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

**LTE Band 17**  
**Channel Bandwidth: 5 MHz**

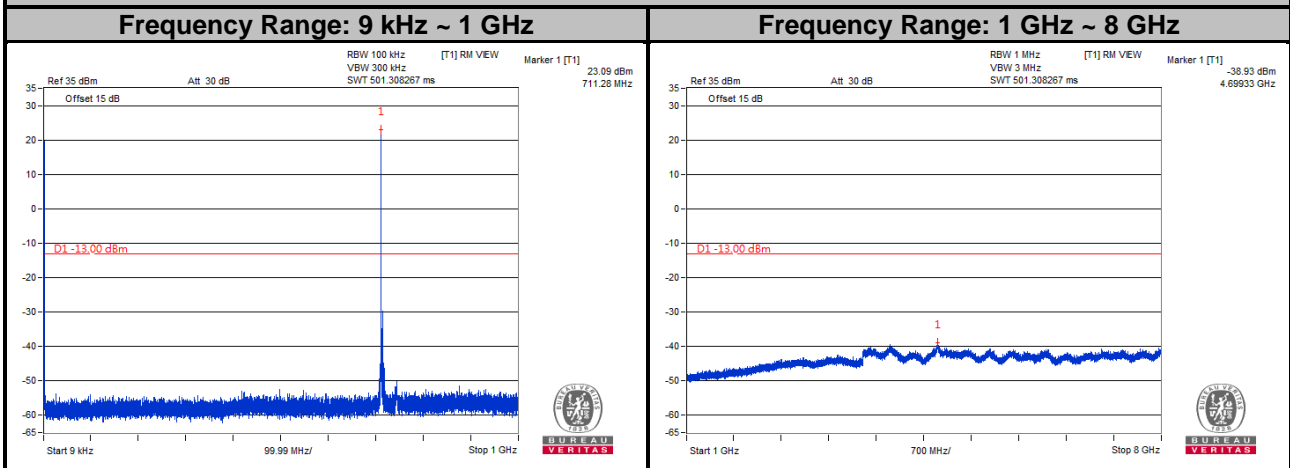
**Channel 23755**



**Channel 23790**



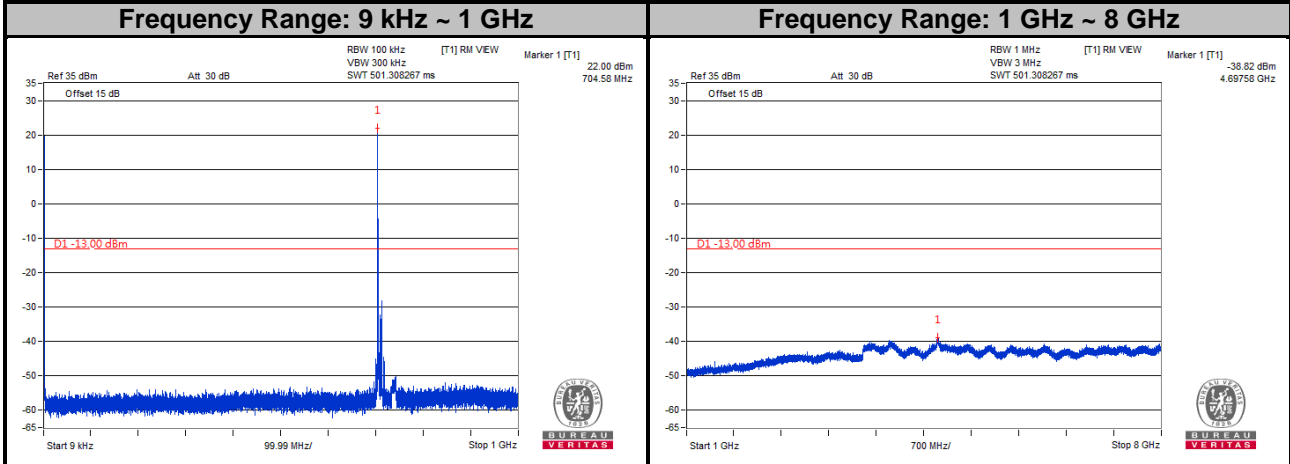
**Channel 23825**



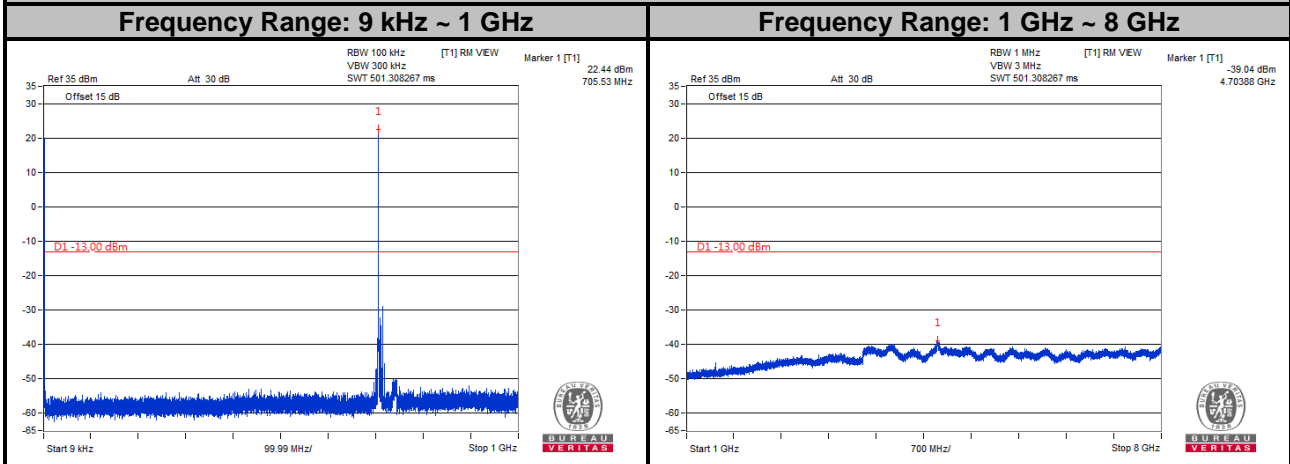
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

**LTE Band 17**  
**Channel Bandwidth: 10 MHz**

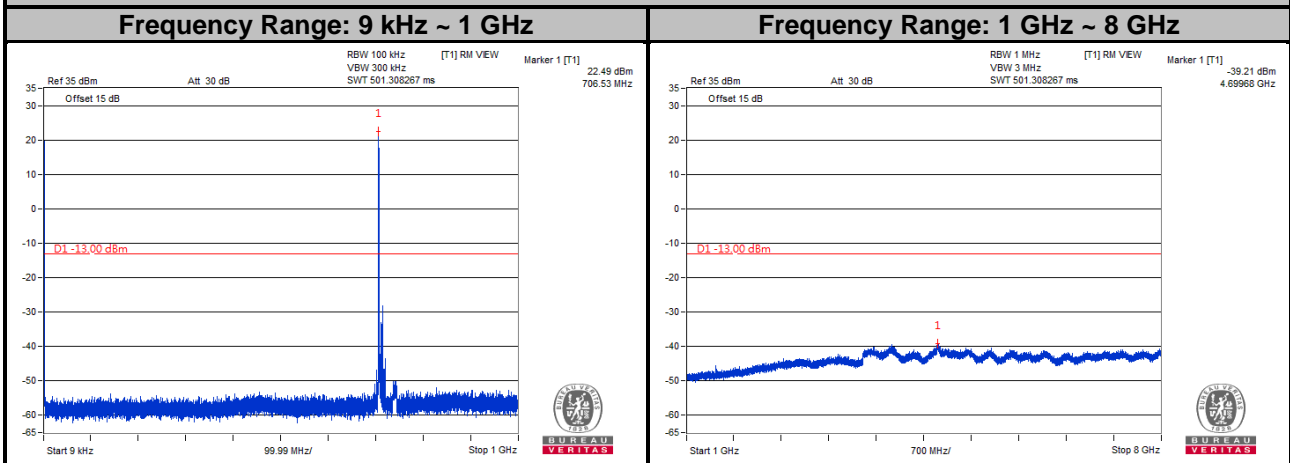
**Channel 23780**



**Channel 23790**



**Channel 23800**



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

- a. The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log (P)$  dB. The limit of emission 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.  $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$ .
- d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole,  $E.R.P \text{ power} = E.I.R.P \text{ power} - 2.15 \text{ dB}$ .

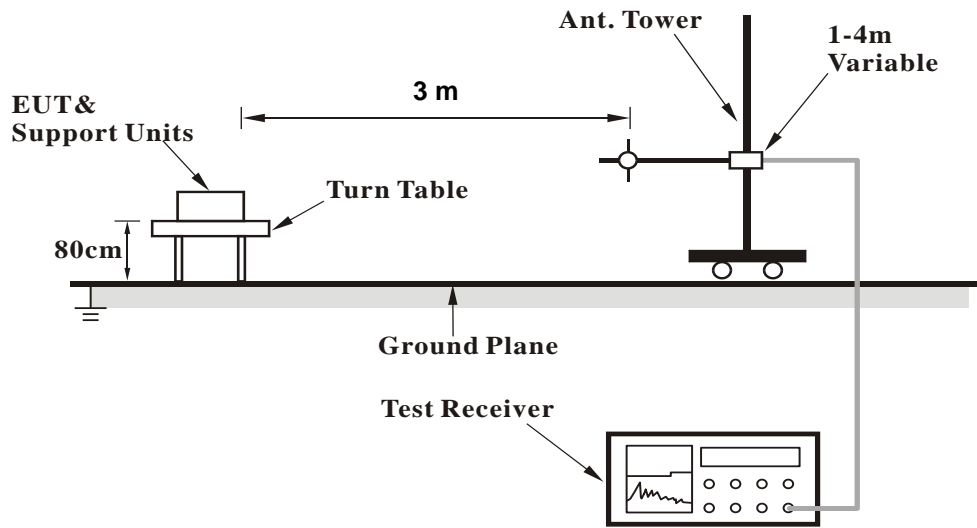
**Note:** The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

### 4.8.3 Deviation from Test Standard

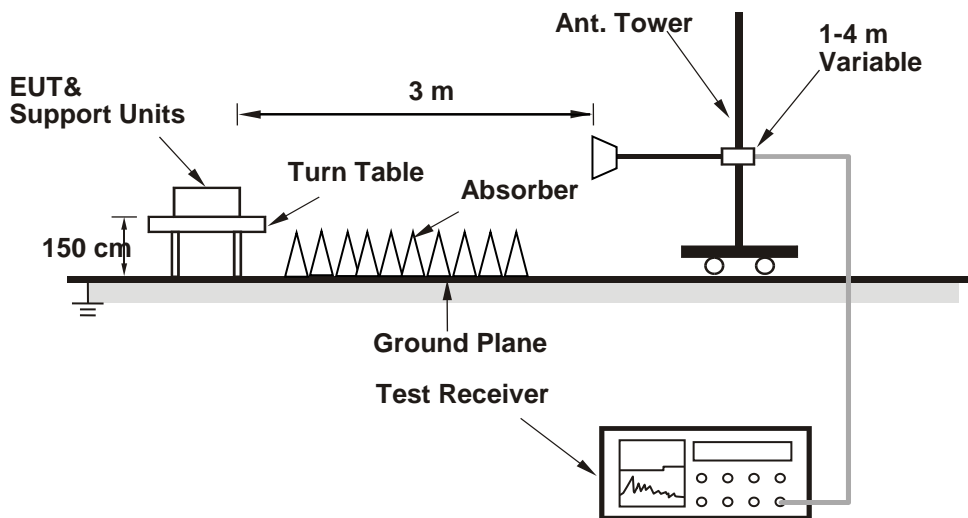
No deviation.

#### 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

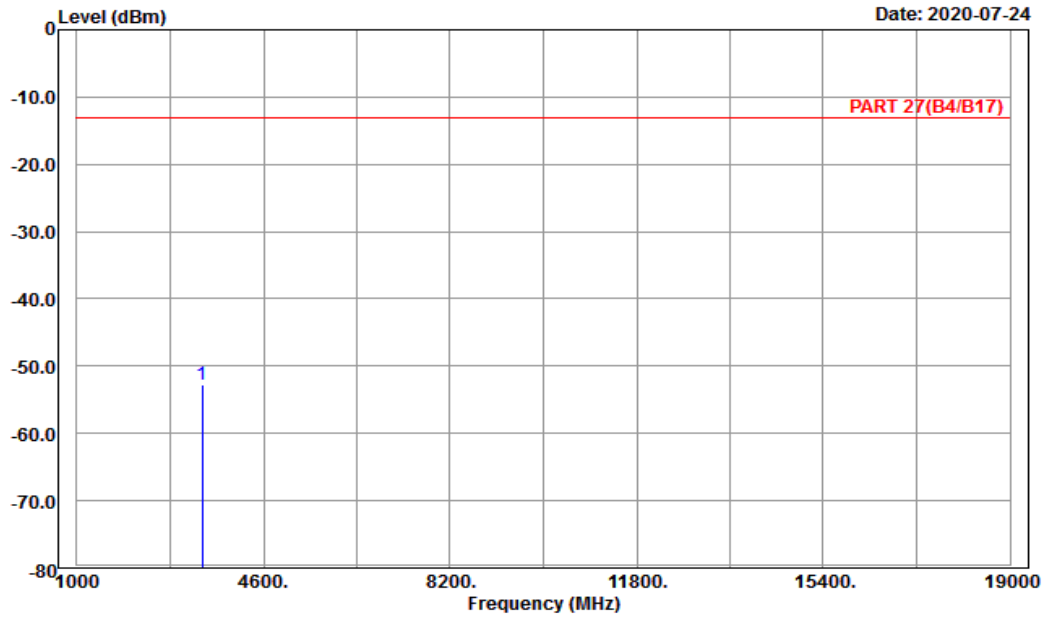


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2020-07-24



Site : 966 chamber 1  
Condition: PART 27(B4/B17) Horizontal  
Remark : Band IV\_Link\_L-Ch  
Tested by: Karl Lee

	Read	Limit	Over			
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3424.80	-52.67	-67.04	-13.00	-39.67	14.37	Peak

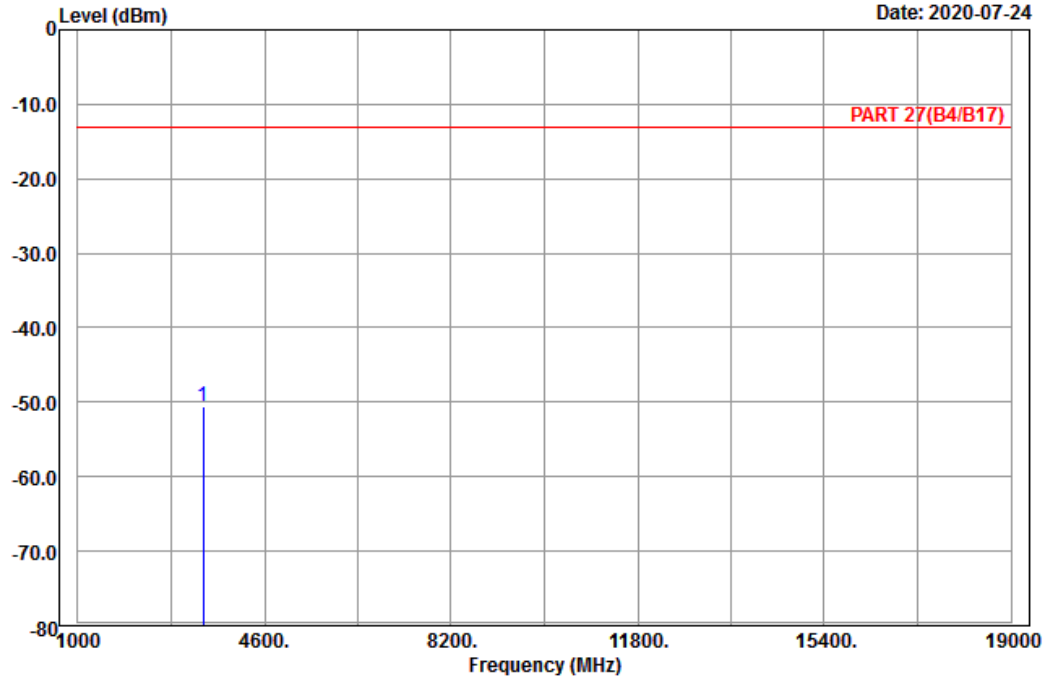


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Data: 10

Date: 2020-07-24



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Vertical  
 Remark : Band IV\_Link\_L-Ch  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3424.80	-50.60	-64.97	-13.00	-37.60	14.37	Peak



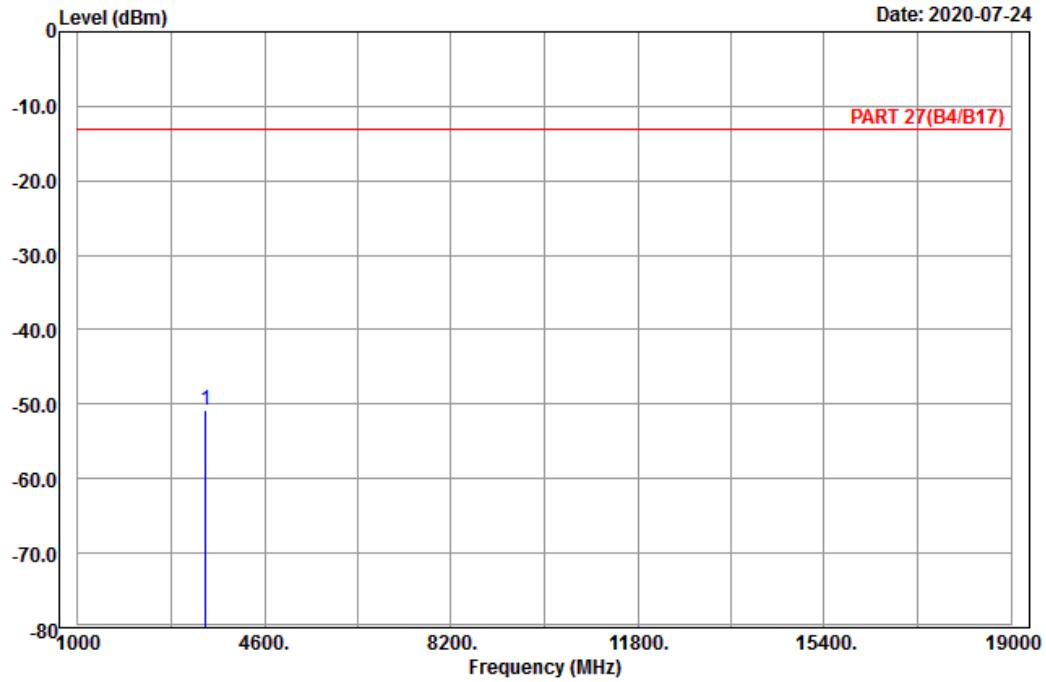
Middle Channel



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Data: 9



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Horizontal  
 Remark : Band IV\_Link\_M-Ch  
 Tested by: Karl Lee

Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3465.20	-50.86	-65.20	-13.00	-37.86	14.34	Peak

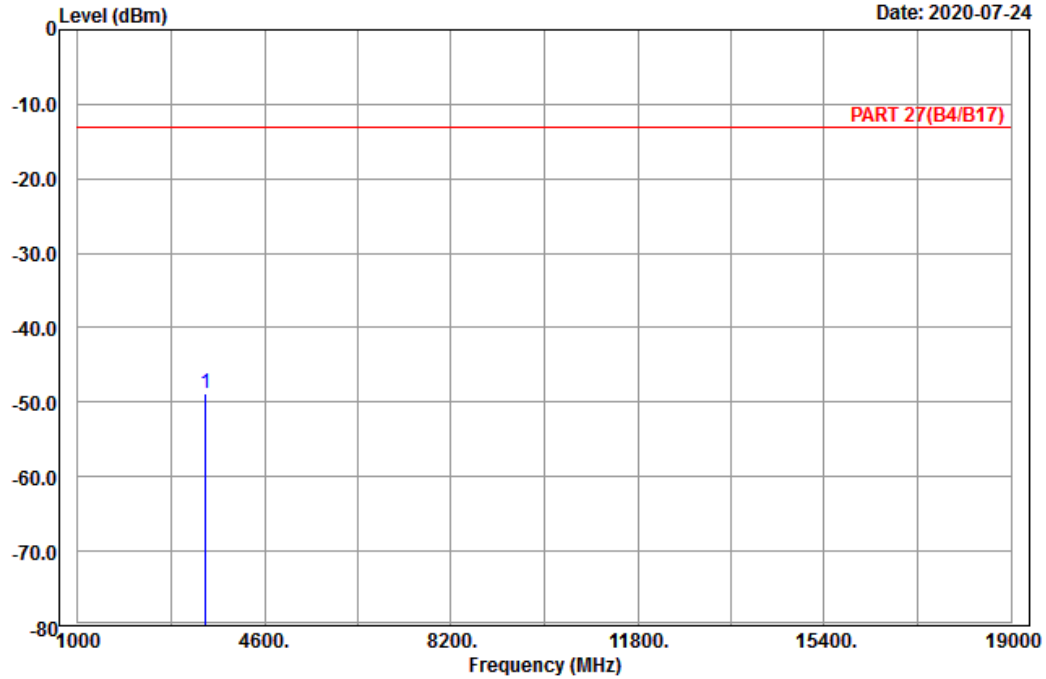


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A D T

Data: 10

Date: 2020-07-24



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Vertical  
 Remark : Band IV\_Link\_M-Ch  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	3465.20	-48.79	-63.13	-13.00	-35.79	14.34	Peak

# High Channel

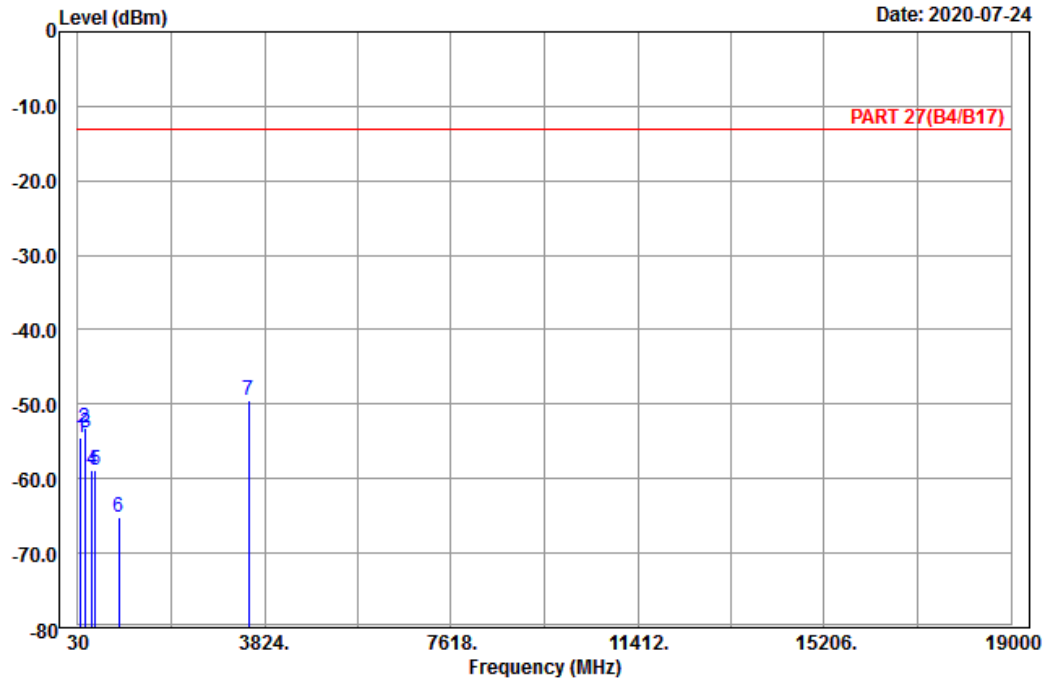


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A D T

Data: 13

Date: 2020-07-24



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Horizontal  
 Remark : Band IV\_Link\_H-Ch  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	95.61	-54.53	-44.19	-13.00	-41.53	-10.34	Peak
2	163.92	-53.12	-45.84	-13.00	-40.12	-7.28	Peak
3	193.62	-53.95	-48.04	-13.00	-40.95	-5.91	Peak
4	322.40	-58.90	-53.20	-13.00	-45.90	-5.70	Peak
5	389.60	-58.89	-55.63	-13.00	-45.89	-3.26	Peak
6	856.50	-65.08	-66.72	-13.00	-52.08	1.64	Peak
7 pp	3505.20	-49.55	-63.83	-13.00	-36.55	14.28	Peak

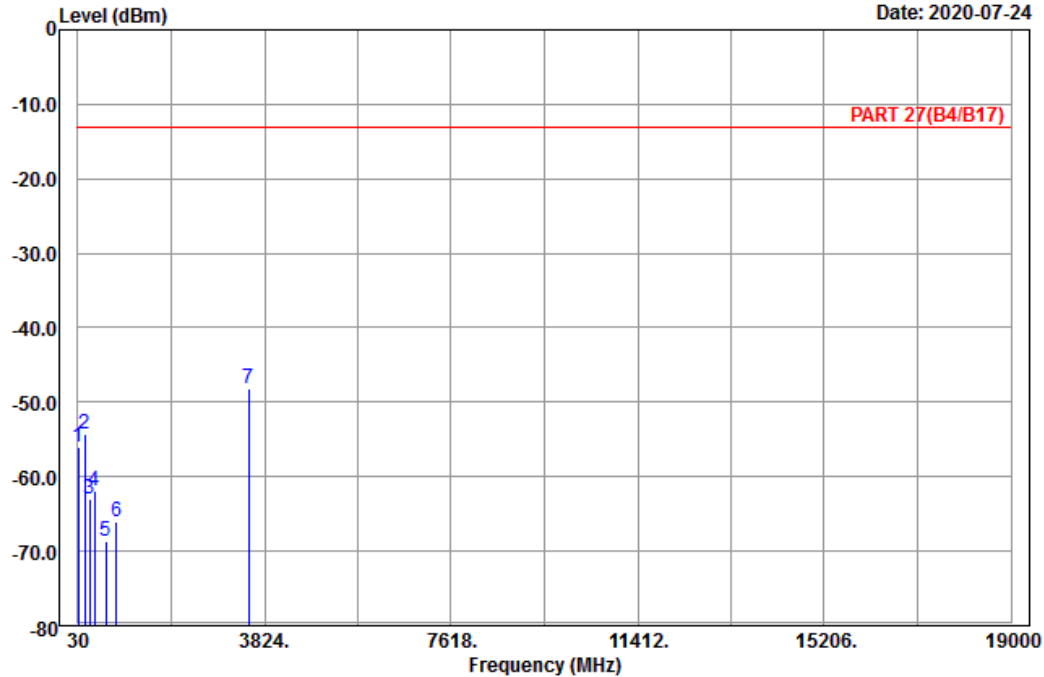


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A D T

Data: 14

Date: 2020-07-24



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Vertical  
 Remark : Band IV\_Link\_H-Ch  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	32.97	-55.94	-45.07	-13.00	-42.94	-10.87	Peak
2	170.13	-54.35	-47.64	-13.00	-41.35	-6.71	Peak
3	269.76	-62.92	-57.24	-13.00	-49.92	-5.68	Peak
4	373.50	-61.96	-57.82	-13.00	-48.96	-4.14	Peak
5	598.90	-68.58	-68.93	-13.00	-55.58	0.35	Peak
6	811.00	-65.97	-67.86	-13.00	-52.97	1.89	Peak
7 pp	3505.20	-48.25	-62.53	-13.00	-35.25	14.28	Peak

LTE Band 4  
 Channel Bandwidth: 1.4 MHz / QPSK  
 Low Channel

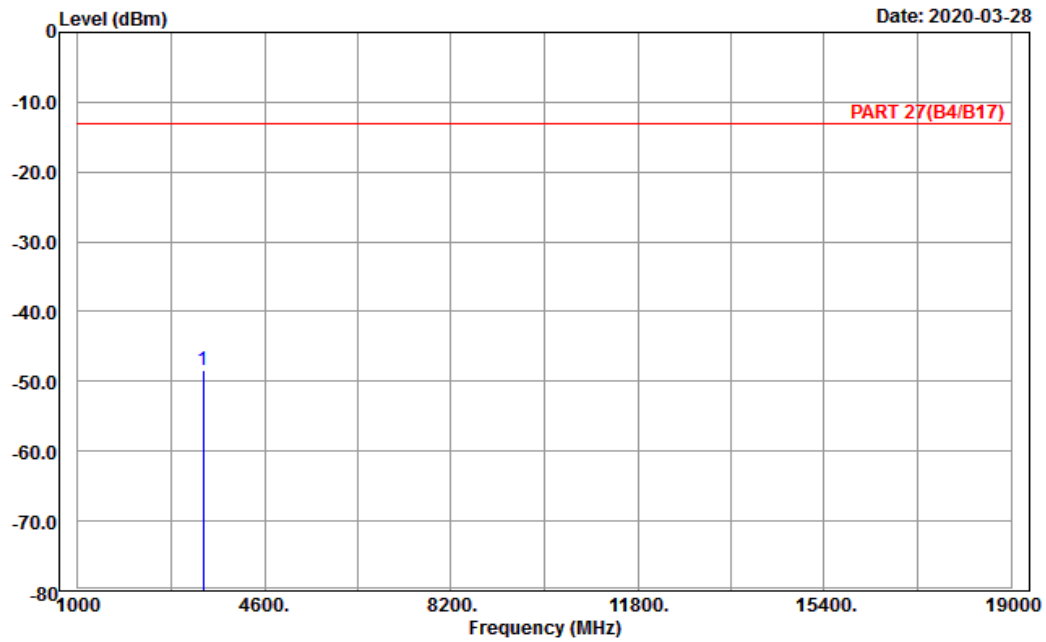


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Data: 9

Date: 2020-03-28



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Horizontal  
 Remark : LTE\_Band 4\_Link\_L-Ch  
 Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	3421.40	-48.39	-62.76	14.37	-13.00	-35.39	Peak

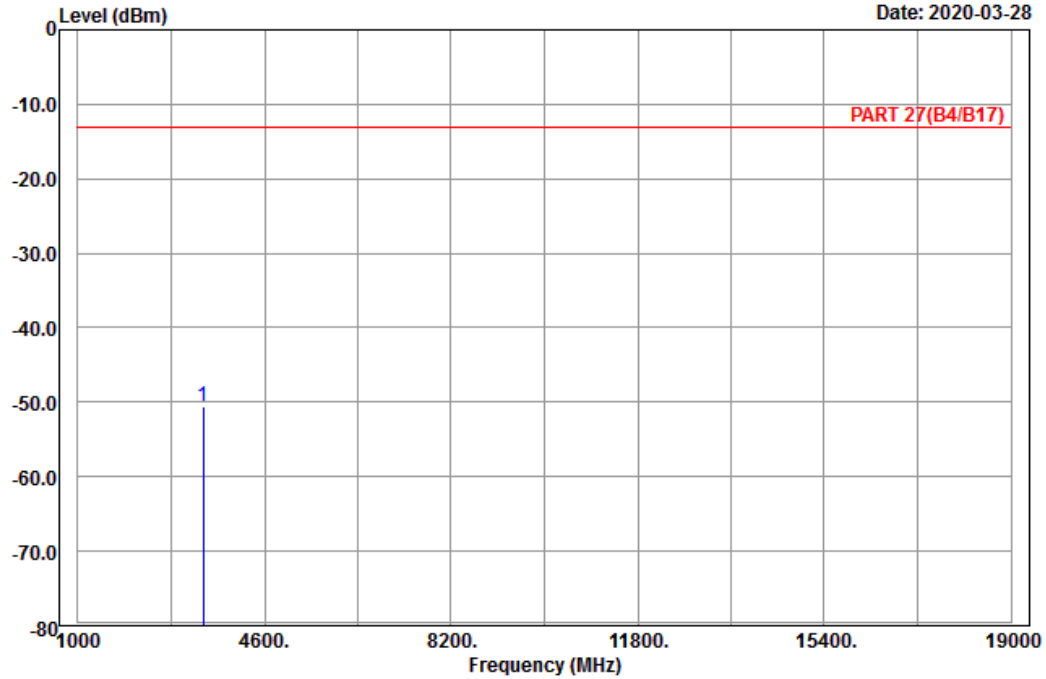


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2020-03-28



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Vertical  
 Remark : LTE\_Band 4\_Link\_L-Ch  
 Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	3421.40	-50.52	-64.89	14.37	-13.00	-37.52	Peak

Middle Channel

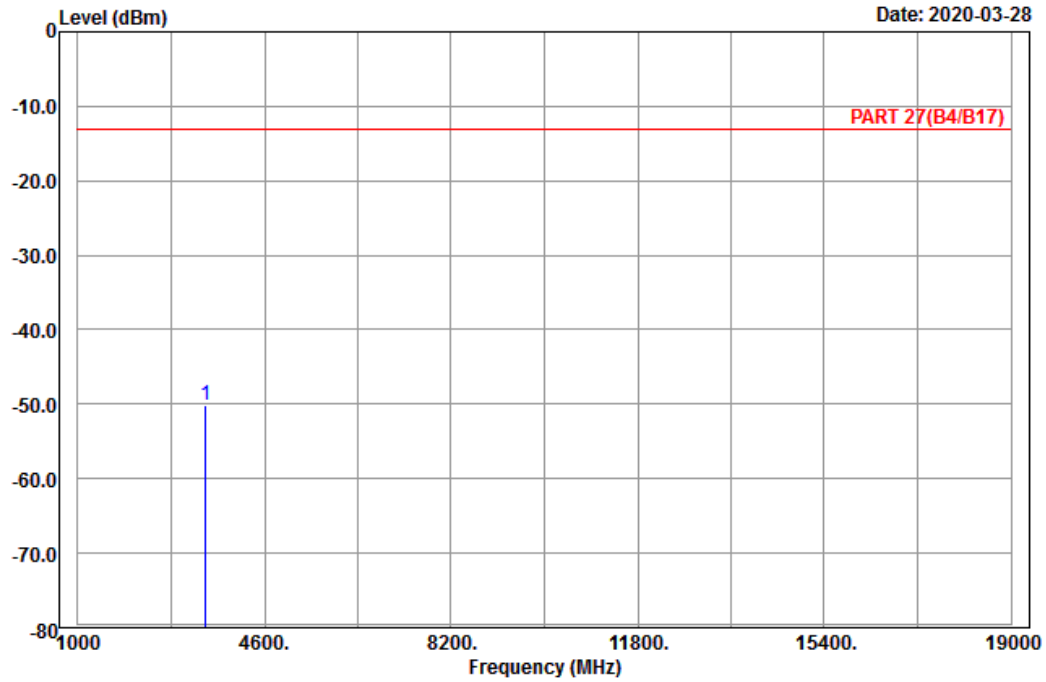


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A D T

Data: 9

Date: 2020-03-28



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Horizontal  
 Remark : LTE\_Band 4\_Link\_M-Ch  
 Tested by: Karl Lee

Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
MHz	dBm	dBm	dB	dBm	dB	
1 pp 3465.00	-50.07	-64.41	14.34	-13.00	-37.07	Peak

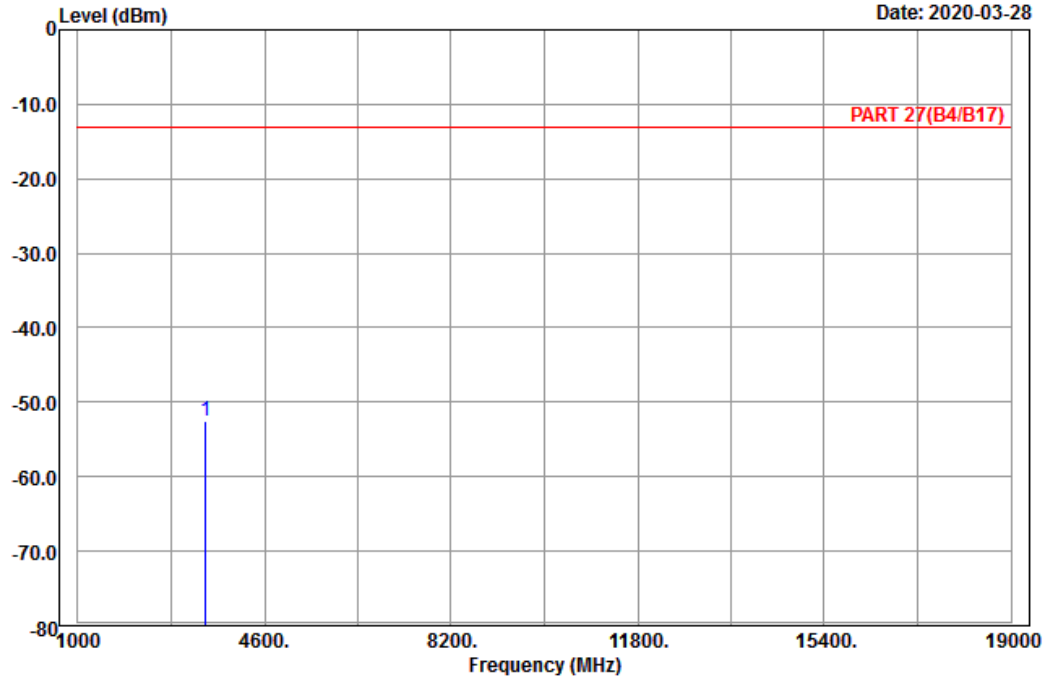


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2020-03-28



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Vertical  
 Remark : LTE\_Band 4\_Link\_M-Ch  
 Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	3465.00	-52.48	-66.82	14.34	-13.00	-39.48	Peak



High Channel

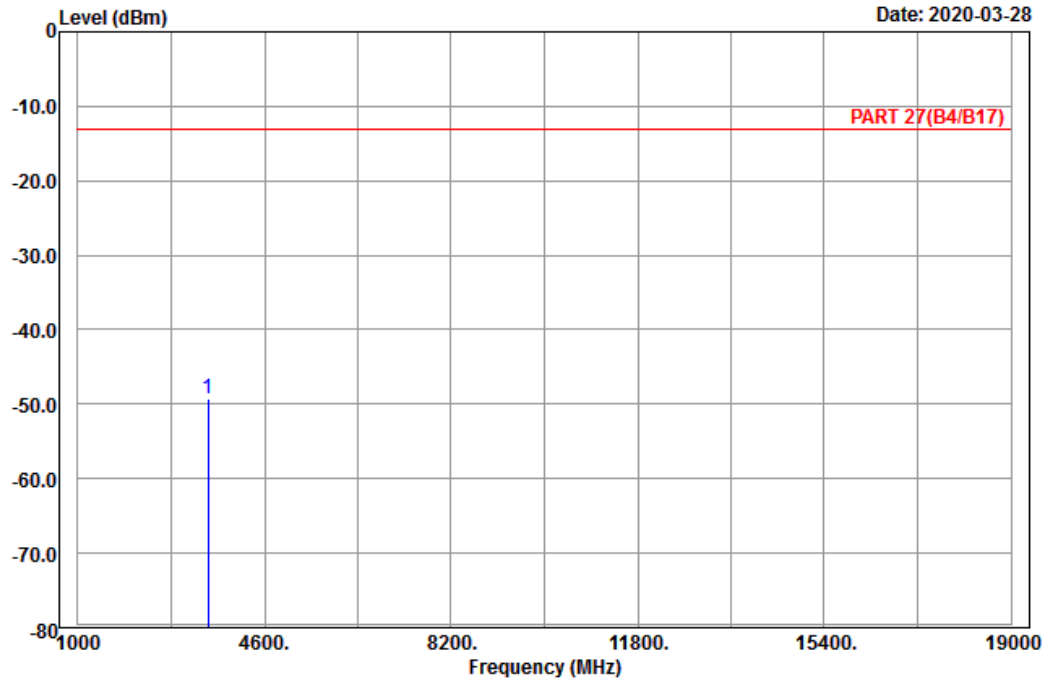


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2020-03-28



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Horizontal  
 Remark : LTE\_Band 4\_Link\_H-Ch  
 Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	pp 3508.60	-49.34	-63.62	14.28	-13.00	-36.34	Peak

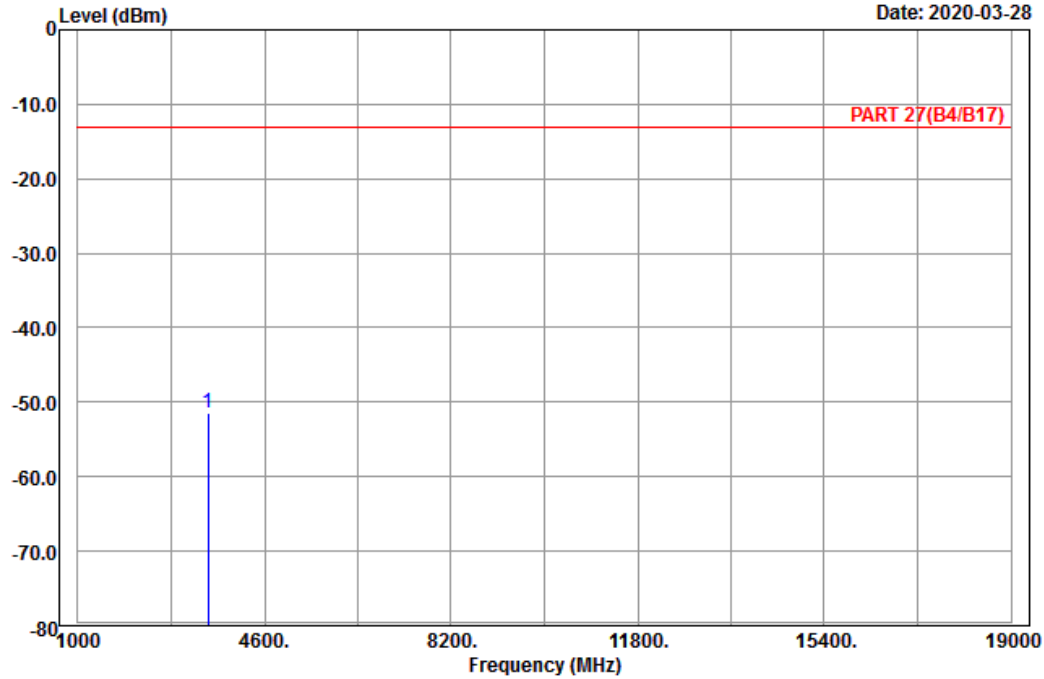


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2020-03-28



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Vertical  
 Remark : LTE\_Band 4\_Link\_H-Ch  
 Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	3508.60	-51.50	-65.78	14.28	-13.00	-38.50	Peak

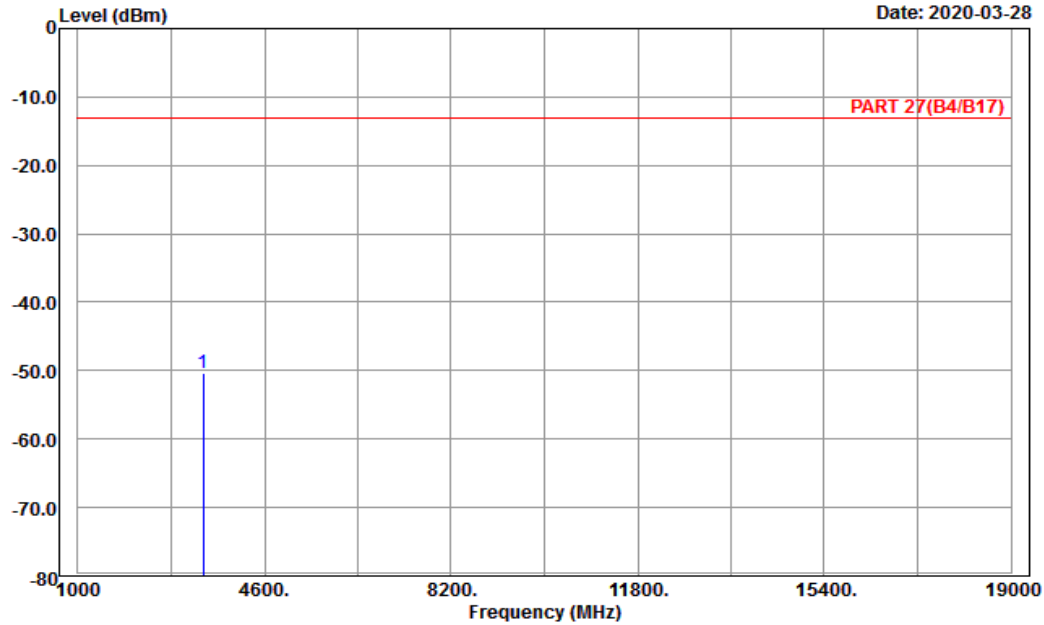
Channel Bandwidth: 5 MHz / QPSK  
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9



Site : 966 chamber 1  
Condition: PART 27(B4/B17) Horizontal  
Remark : LTE\_Band 4\_Link\_L-Ch  
Tested by: Karl Lee

	Read	Limit	Over	
Freq	Level	Level	Factor	Line
MHz	dBm	dBm	dB	dBm
1 pp 3425.00	-50.44	-64.81	14.37	-13.00
				-37.44
				Peak

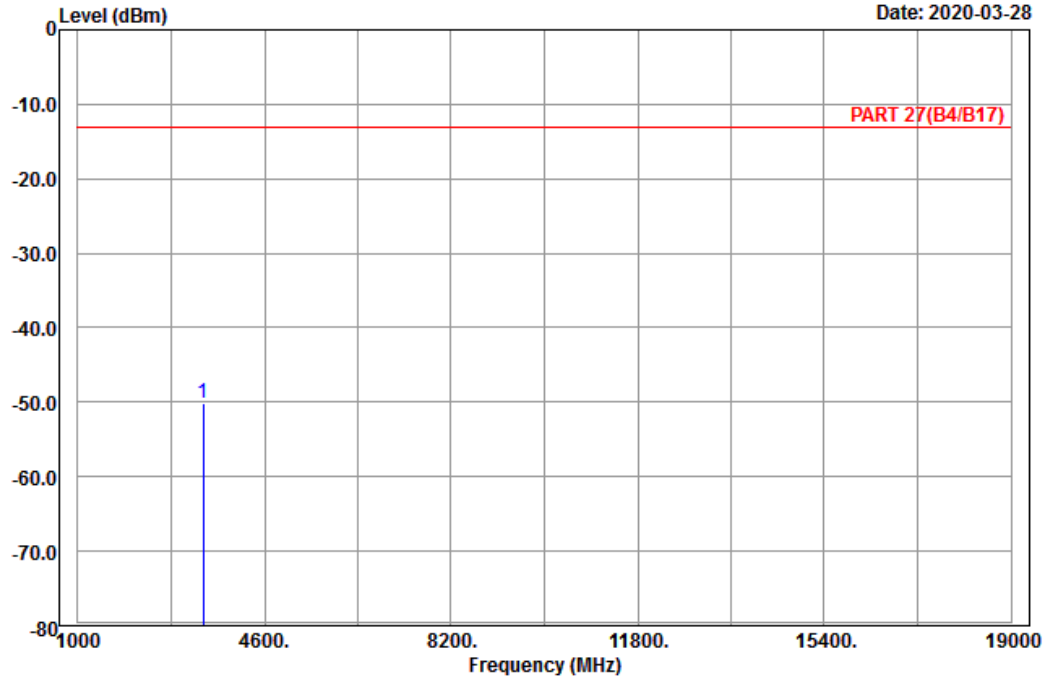


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2020-03-28



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Vertical  
 Remark : LTE\_Band 4\_Link\_L-Ch  
 Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	3425.00	-50.07	-64.44	14.37	-13.00	-37.07	Peak

Middle Channel

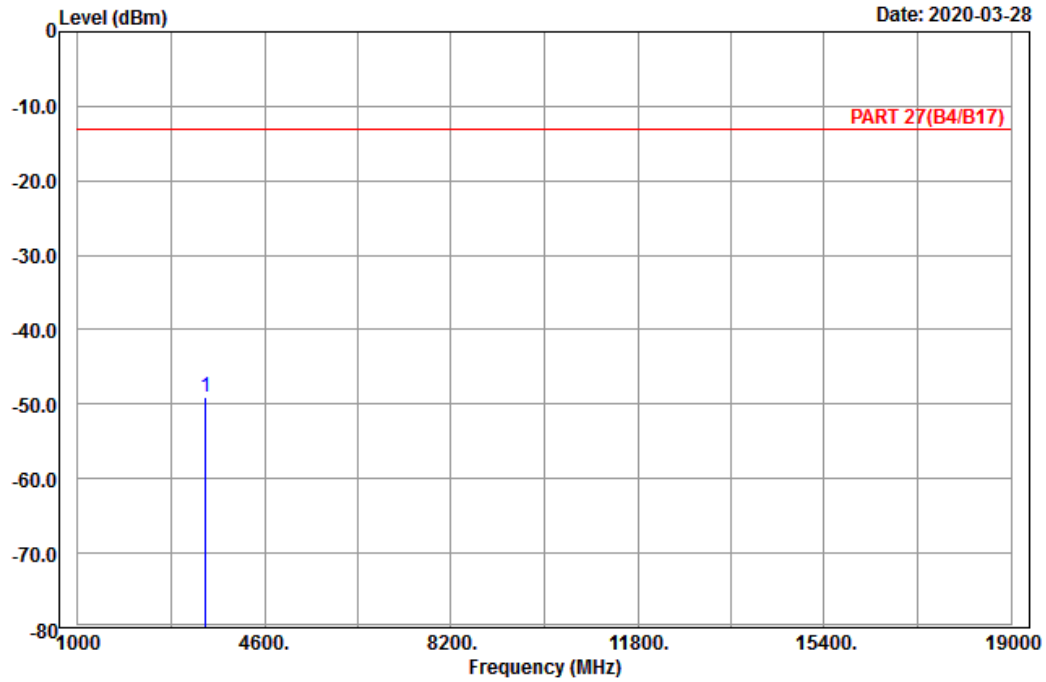


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2020-03-28



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Horizontal  
 Remark : LTE\_Band 4\_Link\_M-Ch  
 Tested by: Karl Lee

Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
MHz	dBm	dBm	dB	dBm	dB	
1 pp 3465.00	-49.08	-63.42	14.34	-13.00	-36.08	Peak

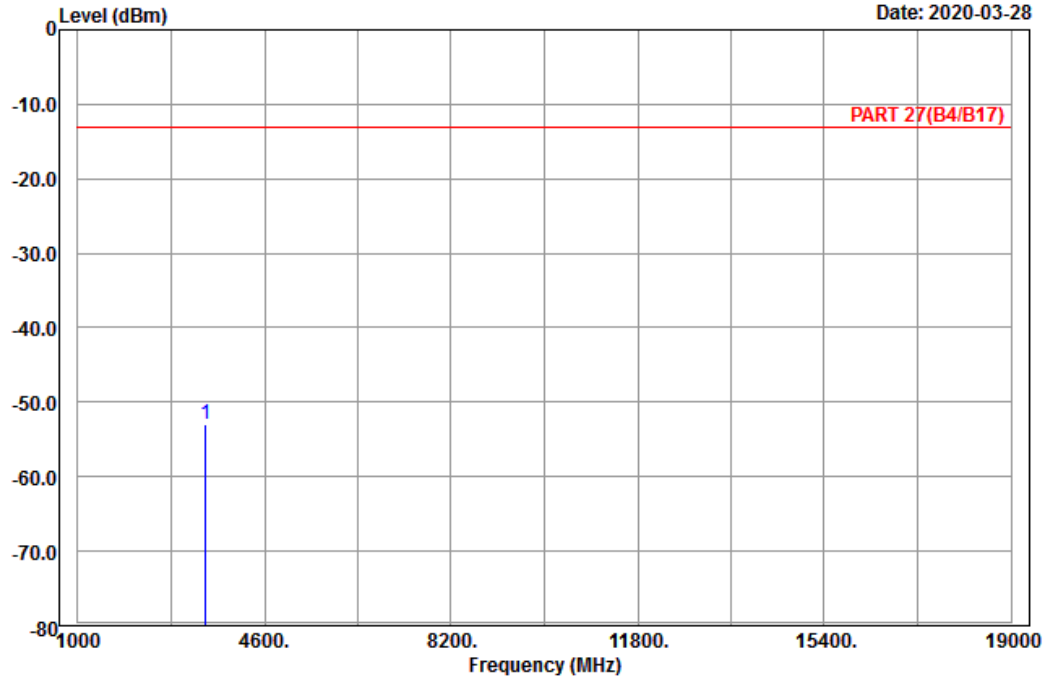


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2020-03-28



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Vertical  
 Remark : LTE\_Band 4\_Link\_M-Ch  
 Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	3465.00	-53.04	-67.38	14.34	-13.00	-40.04	Peak

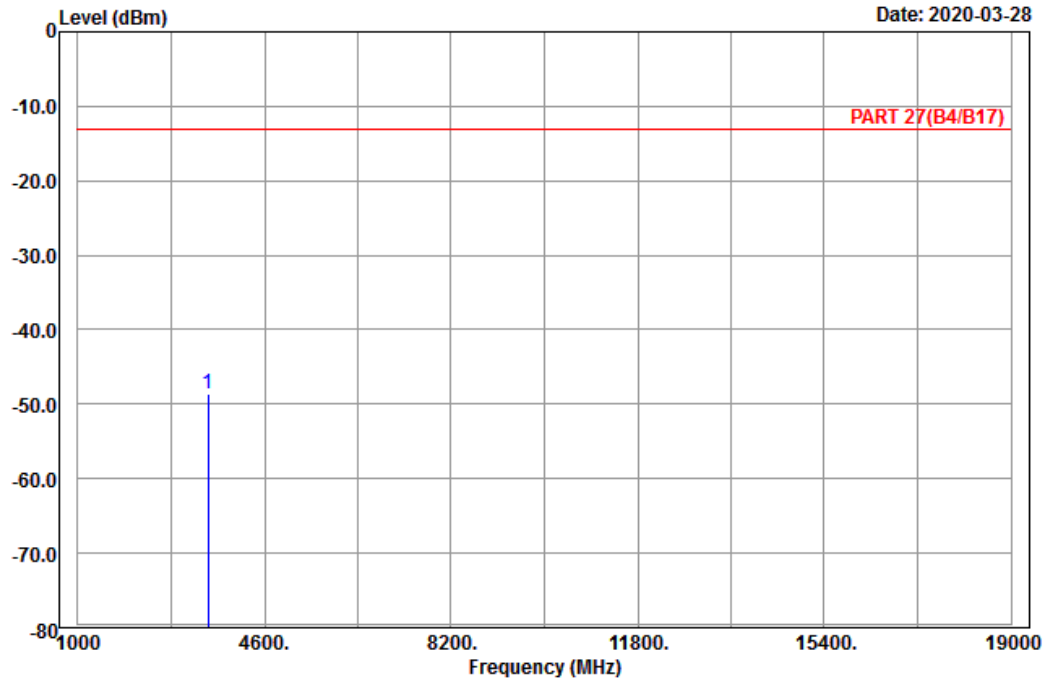
## High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Horizontal  
 Remark : LTE\_Band 4\_Link\_H-Ch  
 Tested by: Karl Lee

	Read	Limit	Over	
Freq	Level	Level	Factor	Line
MHz	dBm	dBm	dB	dBm
1 pp 3505.00	-48.52	-62.80	14.28	-13.00
				-35.52 Peak

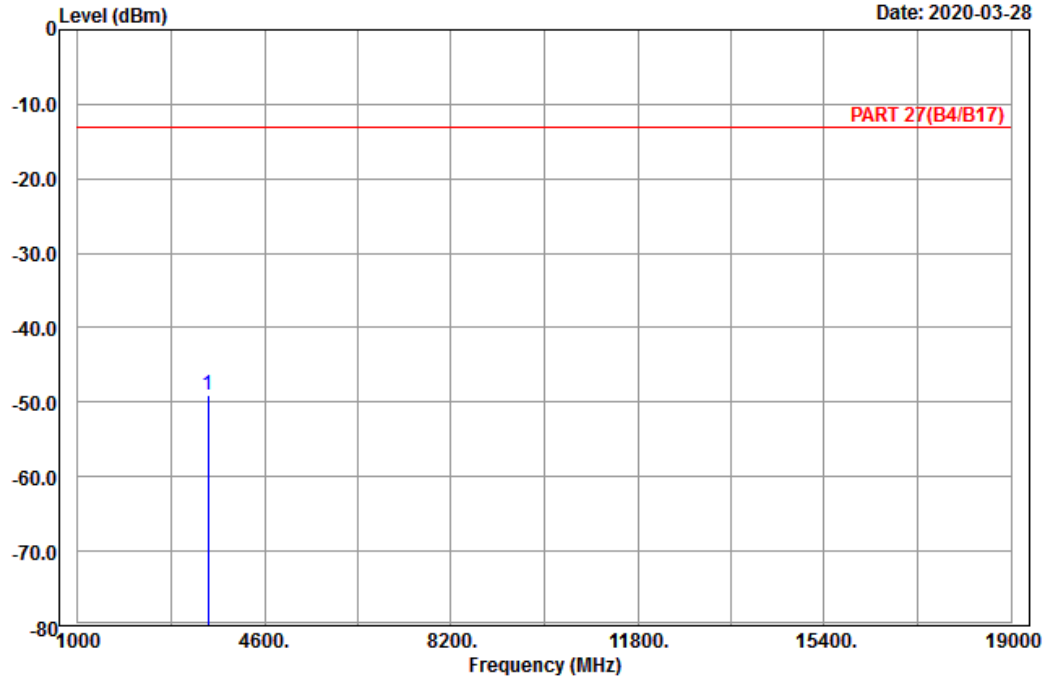


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2020-03-28



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Vertical  
 Remark : LTE\_Band 4\_Link\_H-Ch  
 Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1 pp	3505.00	-48.99	-63.27	14.28	-13.00	-35.99	Peak



Channel Bandwidth: 20 MHz / QPSK  
Low Channel

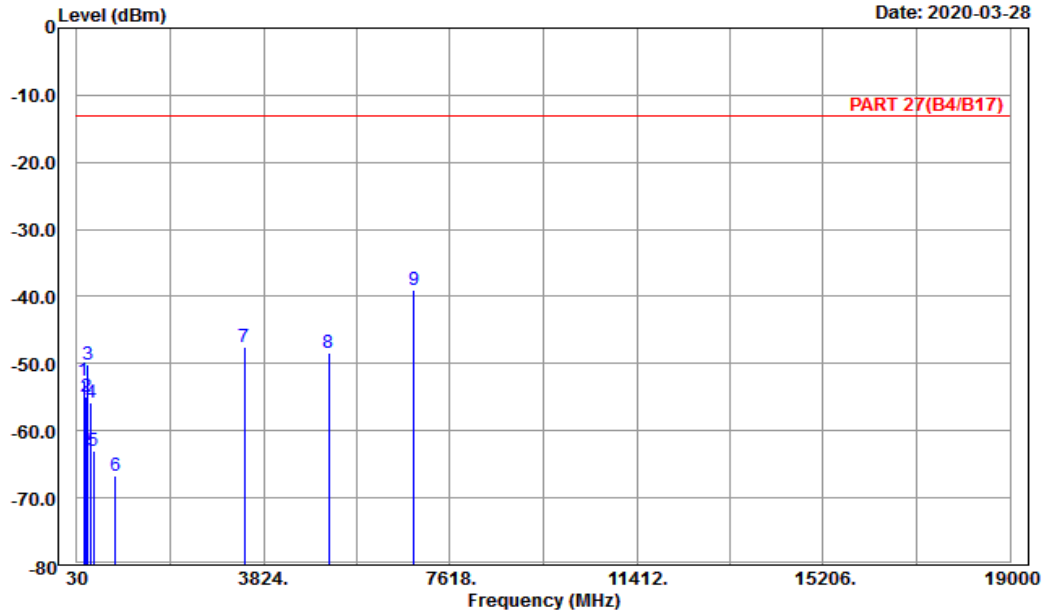


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 13

Date: 2020-03-28



Site : 966 chamber 1  
Condition: PART 27(B4/B17) Horizontal  
Remark : LTE\_Band 4\_Link\_CH-L  
Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	164.73	-52.54	-45.35	-7.19	-13.00	-39.54	Peak
2	214.41	-54.98	-48.99	-5.99	-13.00	-41.98	Peak
3	251.67	-50.03	-44.51	-5.52	-13.00	-37.03	Peak
4	321.00	-55.83	-50.12	-5.71	-13.00	-42.83	Peak
5	368.60	-62.94	-58.54	-4.40	-13.00	-49.94	Peak
6	808.20	-66.67	-68.59	1.92	-13.00	-53.67	Peak
7	3440.00	-47.50	-61.85	14.35	-13.00	-34.50	Peak
8	5160.00	-48.35	-68.27	19.92	-13.00	-35.35	Peak
9 pp	6880.00	-39.04	-61.84	22.80	-13.00	-26.04	Peak

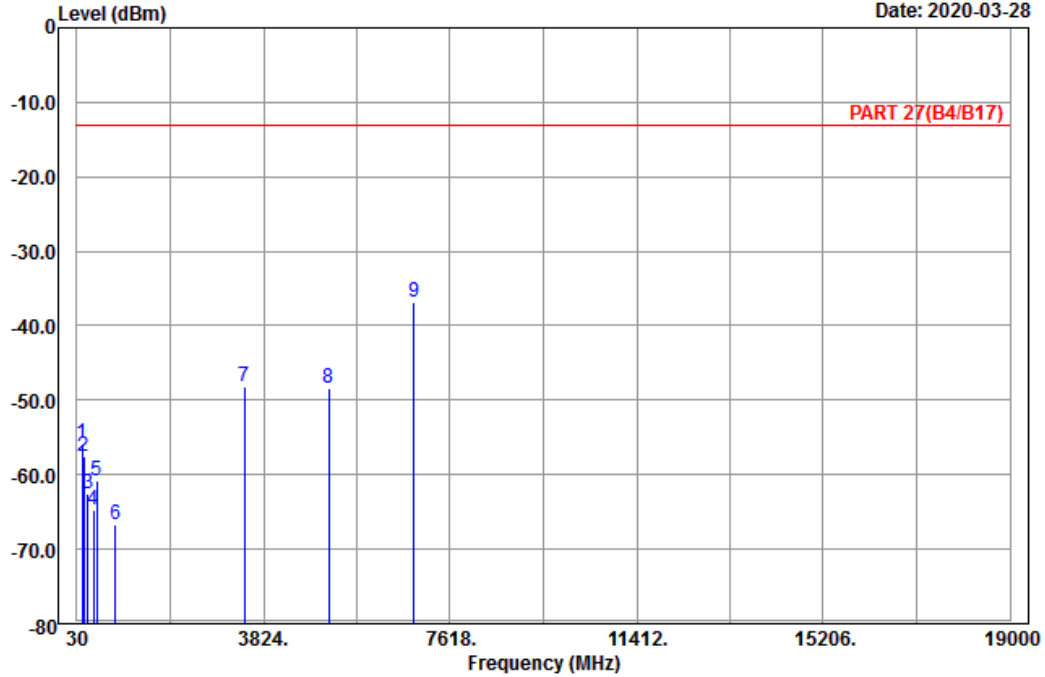


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 14

Date: 2020-03-28



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Vertical  
 Remark : LTE\_Band 4\_Link\_CH-L  
 Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	133.95	-55.90	-48.24	-7.66	-13.00	-42.90	Peak
2	168.24	-57.66	-50.86	-6.80	-13.00	-44.66	Peak
3	248.16	-62.59	-57.06	-5.53	-13.00	-49.59	Peak
4	362.30	-64.66	-59.95	-4.71	-13.00	-51.66	Peak
5	435.10	-60.83	-57.30	-3.53	-13.00	-47.83	Peak
6	806.10	-66.69	-68.63	1.94	-13.00	-53.69	Peak
7	3440.00	-48.15	-62.50	14.35	-13.00	-35.15	Peak
8	5160.00	-48.31	-68.23	19.92	-13.00	-35.31	Peak
9 pp	6880.00	-36.82	-59.62	22.80	-13.00	-23.82	Peak

Middle Channel

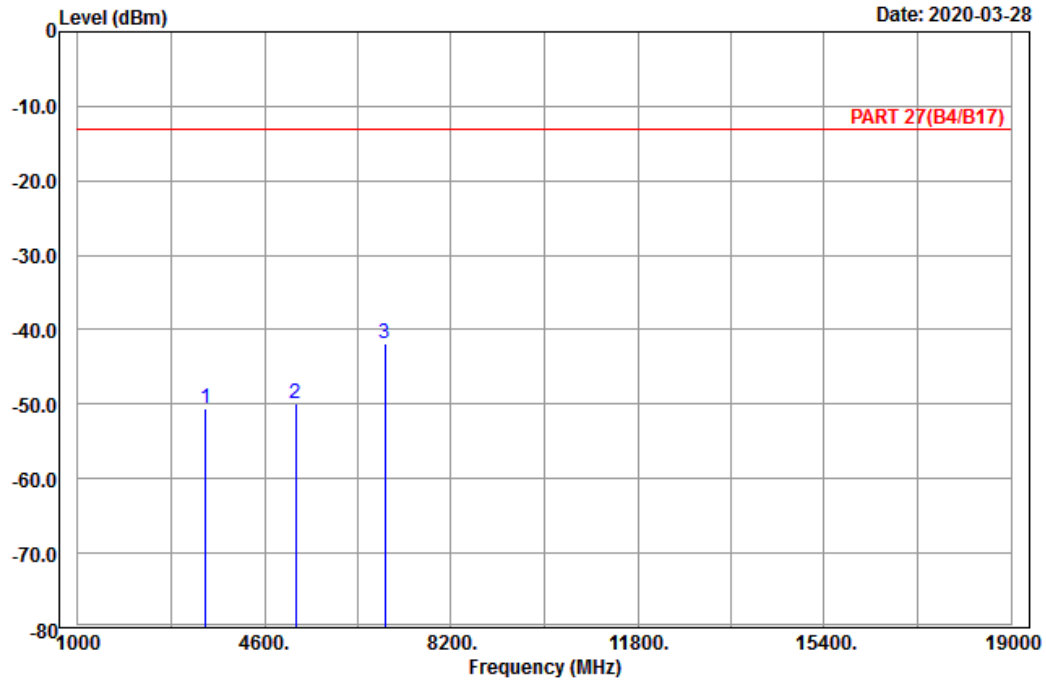


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2020-03-28



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Horizontal  
 Remark : LTE\_Band 4\_Link\_CH-M  
 Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3465.00	-50.55	-64.89	14.34	-13.00	-37.55	Peak
2	5197.50	-49.85	-69.97	20.12	-13.00	-36.85	Peak
3 pp	6930.00	-41.96	-64.83	22.87	-13.00	-28.96	Peak

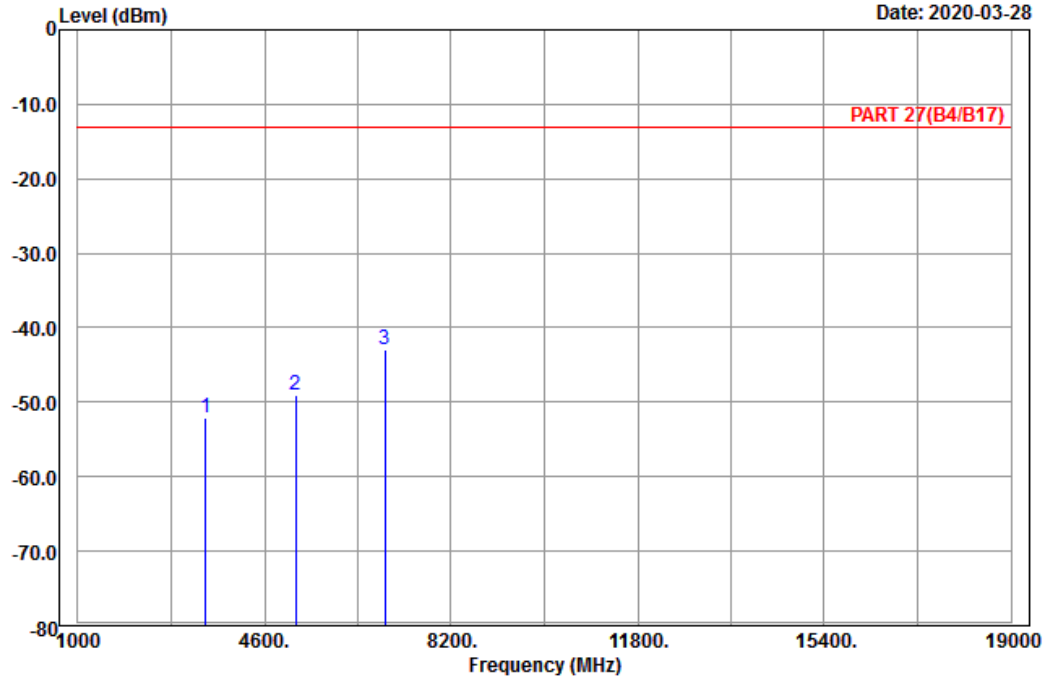


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2020-03-28



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Vertical  
 Remark : LTE\_Band 4\_Link\_CH-M  
 Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3465.00	-52.20	-66.54	14.34	-13.00	-39.20	Peak
2	5197.50	-49.11	-69.23	20.12	-13.00	-36.11	Peak
3 pp	6930.00	-42.85	-65.72	22.87	-13.00	-29.85	Peak

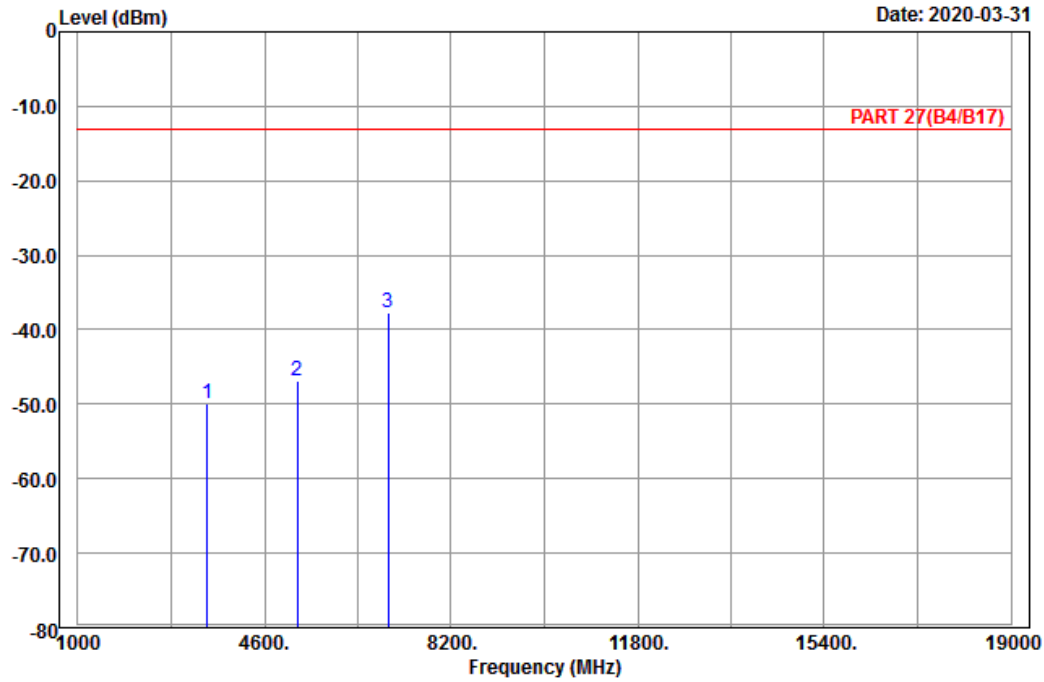
High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Horizontal  
 Remark : LTE\_Band 4\_Link\_CH-H  
 Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3490.00	-49.92	-64.23	14.31	-13.00	-36.92	Peak
2	5235.00	-46.88	-67.04	20.16	-13.00	-33.88	Peak
3 pp	6980.00	-37.68	-60.37	22.69	-13.00	-24.68	Peak

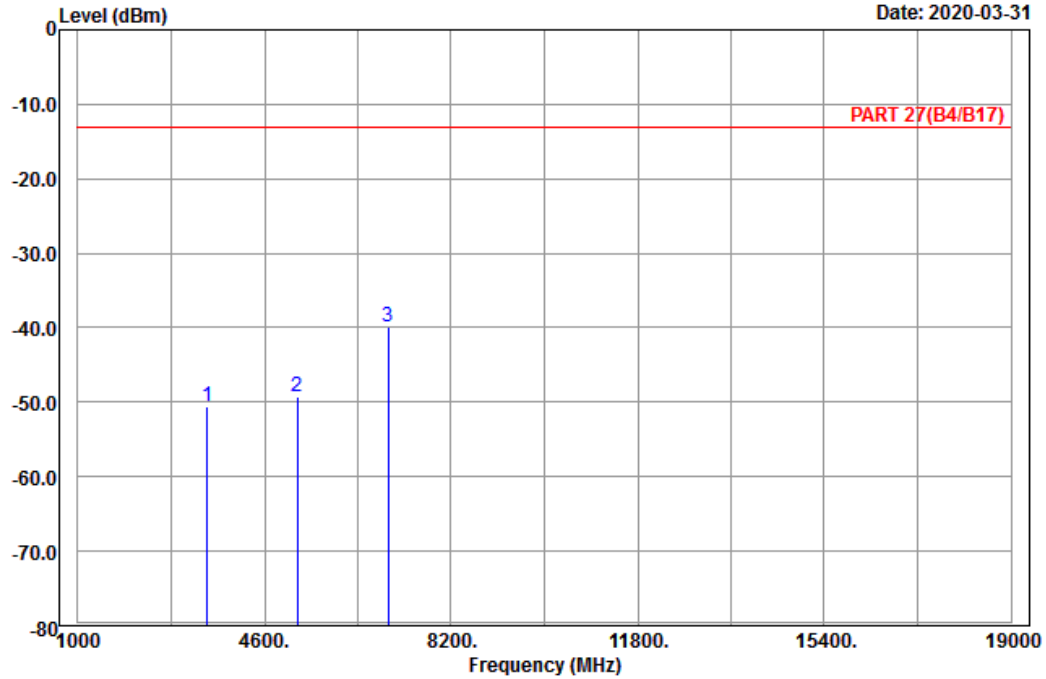


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 2020-03-31



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Vertical  
 Remark : LTE\_Band 4\_Link\_CH-H  
 Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	3490.00	-50.50	-64.81	14.31	-13.00	-37.50	Peak
2	5235.00	-49.37	-69.53	20.16	-13.00	-36.37	Peak
3 pp	6980.00	-39.97	-62.66	22.69	-13.00	-26.97	Peak

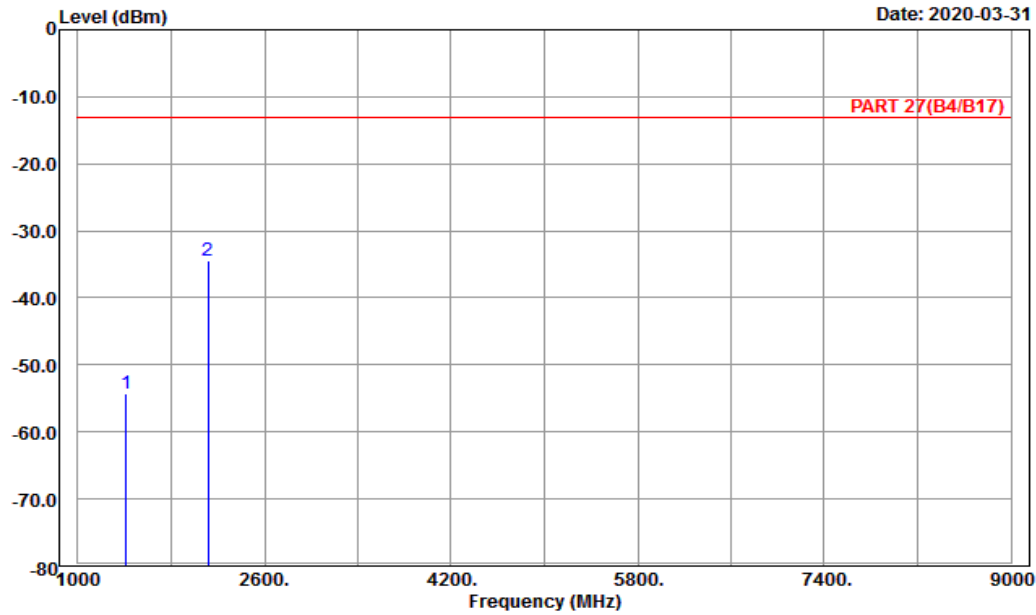
LTE Band 17  
 Channel Bandwidth: 5 MHz / QPSK  
 Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Horizontal  
 Remark : LTE\_Band 17\_Link\_L-Ch  
 Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1413.00	-54.20	-60.56	6.36	-13.00	-41.20	Peak
2 pp	2119.50	-34.52	-45.63	11.11	-13.00	-21.52	Peak

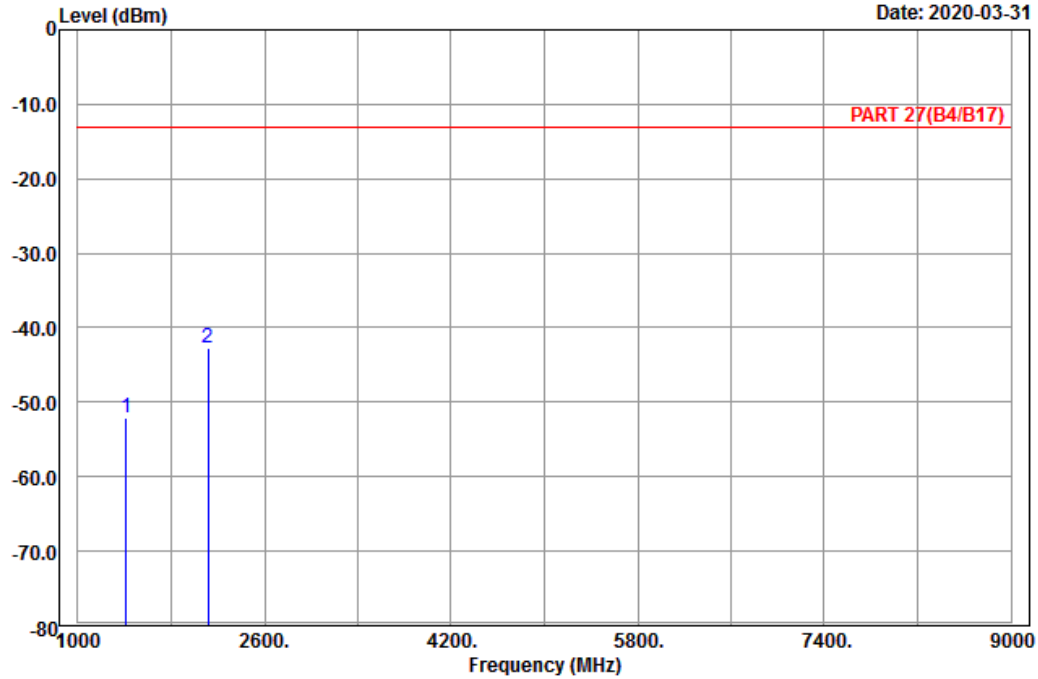


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 2020-03-31



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Vertical  
 Remark : LTE\_Band 17\_Link\_L-Ch  
 Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1413.00	-52.04	-58.40	6.36	-13.00	-39.04	Peak
2 pp	2119.50	-42.80	-53.91	11.11	-13.00	-29.80	Peak



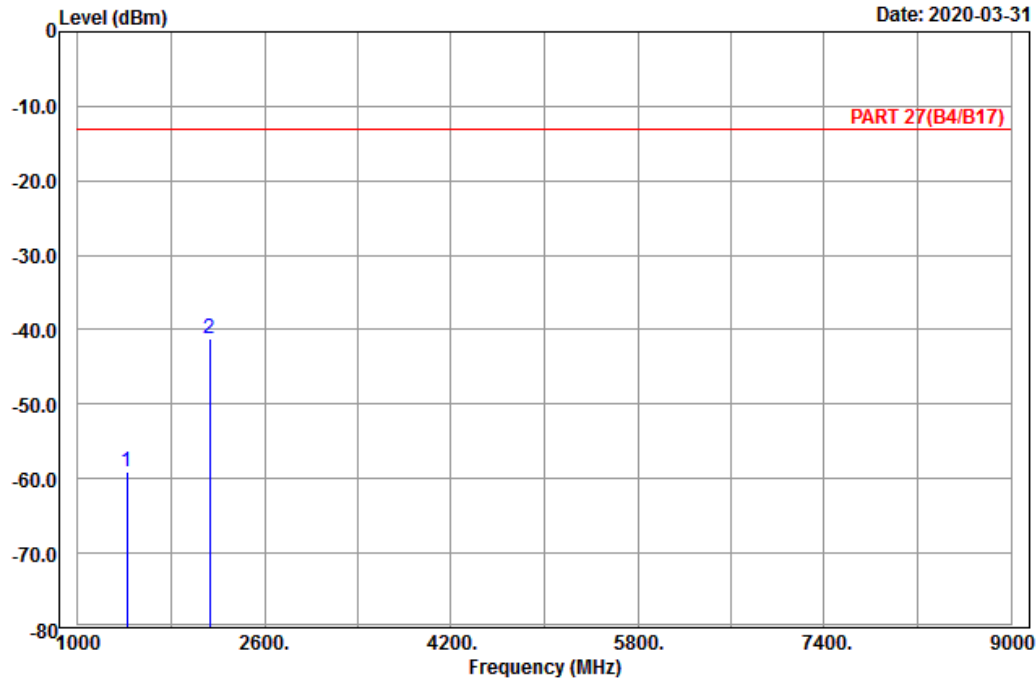
### Middle Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Horizontal  
 Remark : LTE\_Band 17\_Link\_M-Ch  
 Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1420.00	-59.06	-65.42	6.36	-13.00	-46.06	Peak
2 pp	2130.00	-41.18	-52.46	11.28	-13.00	-28.18	Peak

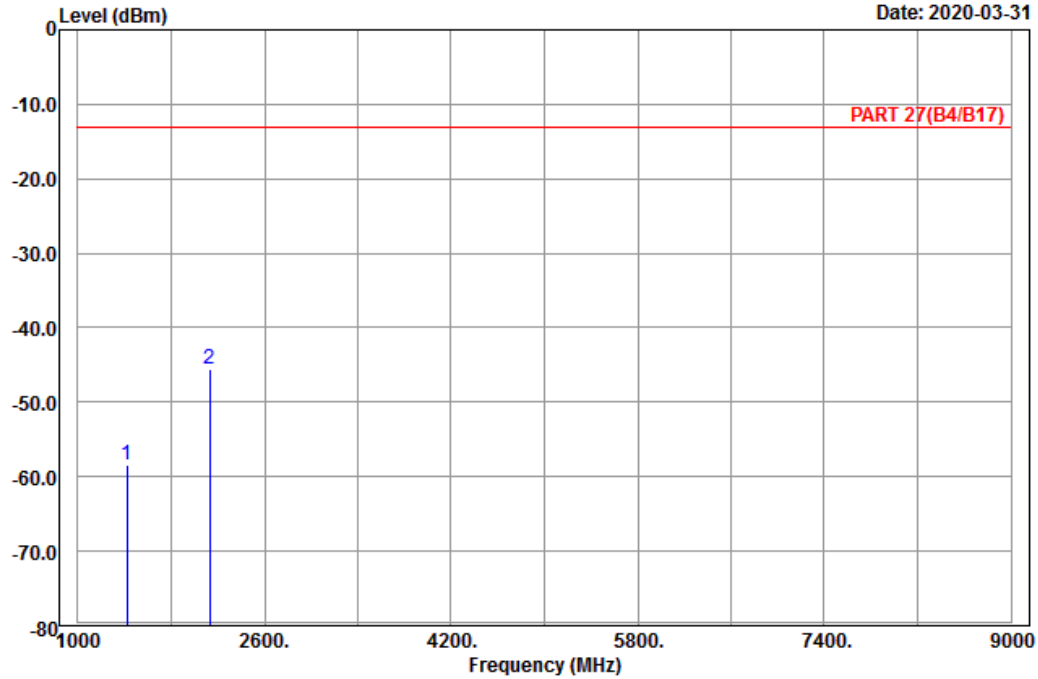


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 2020-03-31



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Vertical  
 Remark : LTE\_Band 17\_Link\_M-Ch  
 Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1420.00	-58.51	-64.87	6.36	-13.00	-45.51	Peak
2 pp	2130.00	-45.60	-56.88	11.28	-13.00	-32.60	Peak

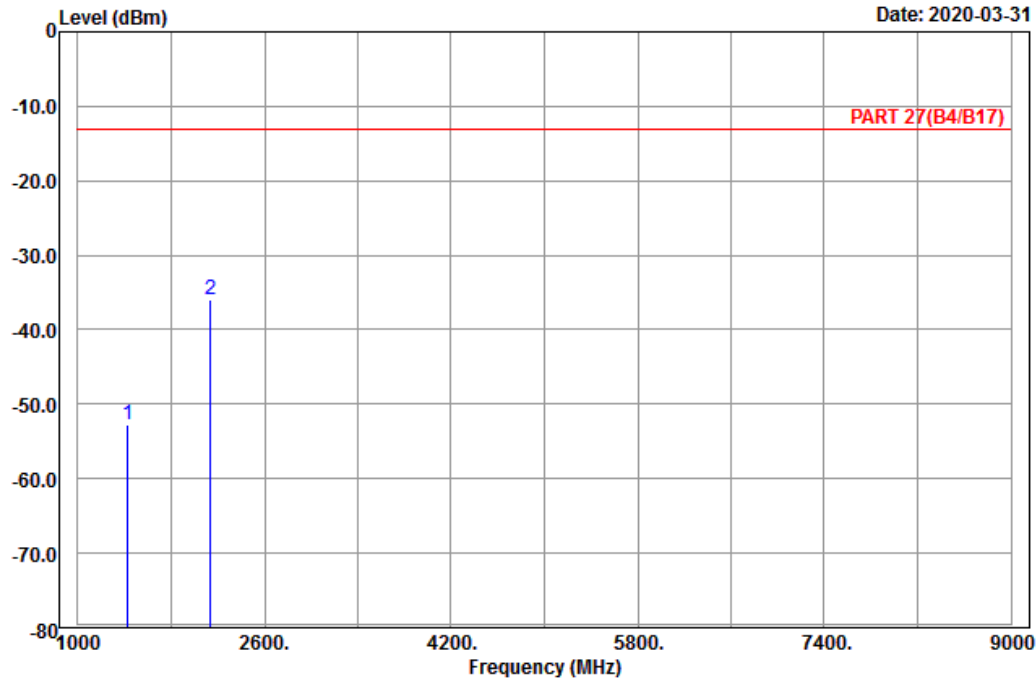
## High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Horizontal  
 Remark : LTE\_Band 17\_Link\_H-Ch  
 Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1427.00	-52.68	-58.92	6.24	-13.00	-39.68	Peak
2 pp	2140.50	-35.86	-47.14	11.28	-13.00	-22.86	Peak

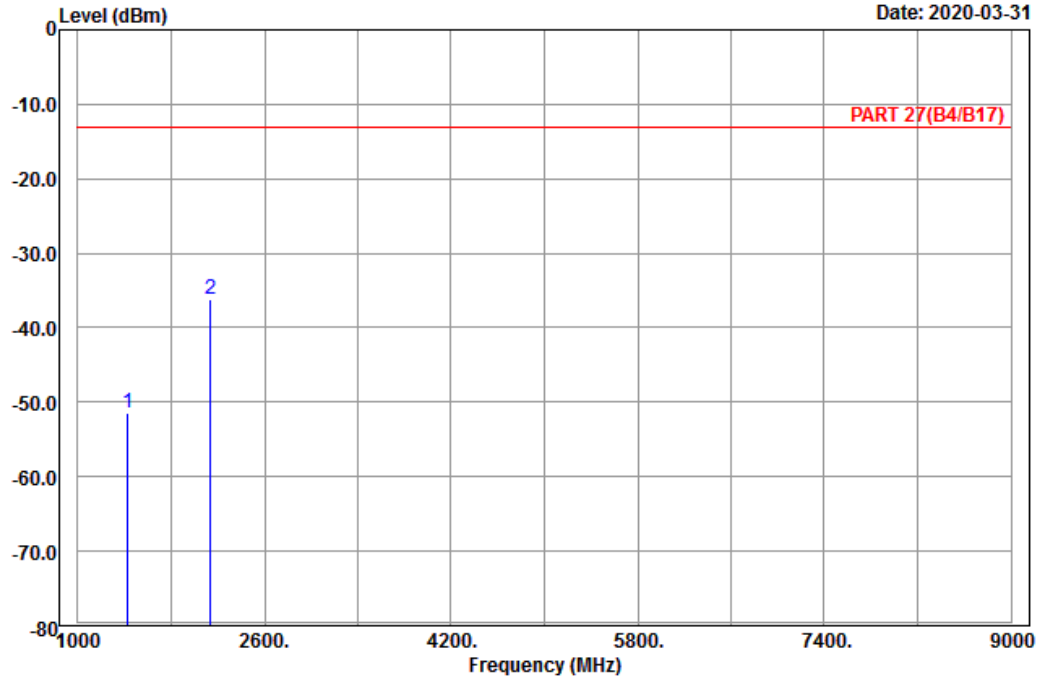


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 2020-03-31



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Vertical  
 Remark : LTE\_Band 17\_Link\_H-Ch  
 Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1427.00	-51.43	-57.67	6.24	-13.00	-38.43	Peak
2	pp 2140.50	-36.11	-47.39	11.28	-13.00	-23.11	Peak

Channel Bandwidth: 10 MHz / QPSK  
 Low Channel

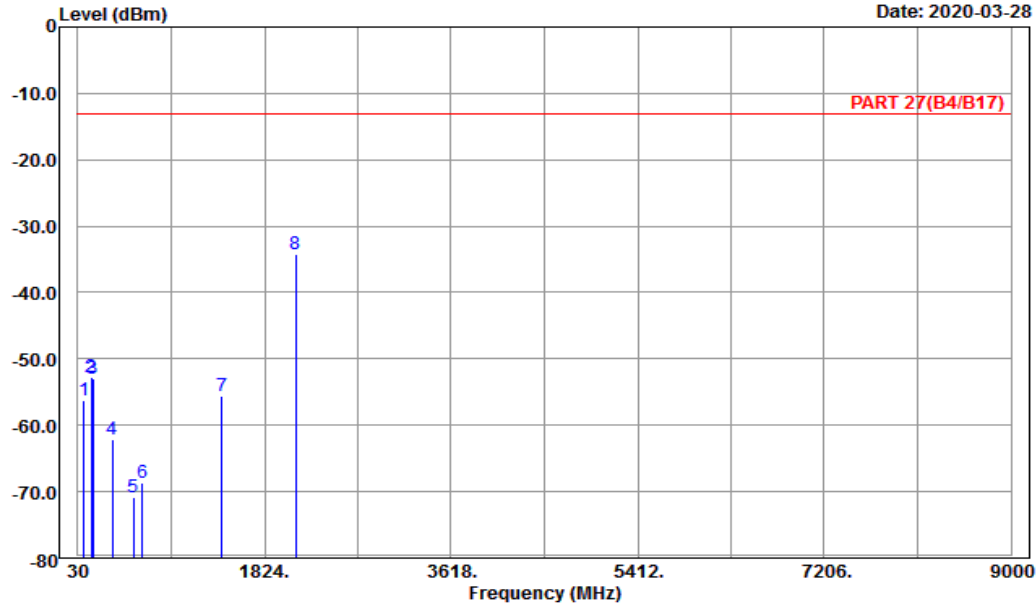


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2020-03-28



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Horizontal  
 Remark : LTE\_Band 17\_Link\_L-Ch  
 Tested by: Karl Lee

	Freq	Level	Read	Limit	Over	
	MHz	dBm	Level	Line	Limit	Remark
			dBm	dB	dBm	dB
1	92.37	-56.28	-45.72	-10.56	-13.00	-43.28 Peak
2	160.68	-52.77	-45.20	-7.57	-13.00	-39.77 Peak
3	175.80	-52.87	-46.78	-6.09	-13.00	-39.87 Peak
4	360.90	-62.11	-57.30	-4.81	-13.00	-49.11 Peak
5	566.70	-70.79	-69.81	-0.98	-13.00	-57.79 Peak
6	648.60	-68.68	-68.56	-0.12	-13.00	-55.68 Peak
7	1418.00	-55.50	-61.86	6.36	-13.00	-42.50 Peak
8 pp	2127.00	-34.21	-45.49	11.28	-13.00	-21.21 Peak

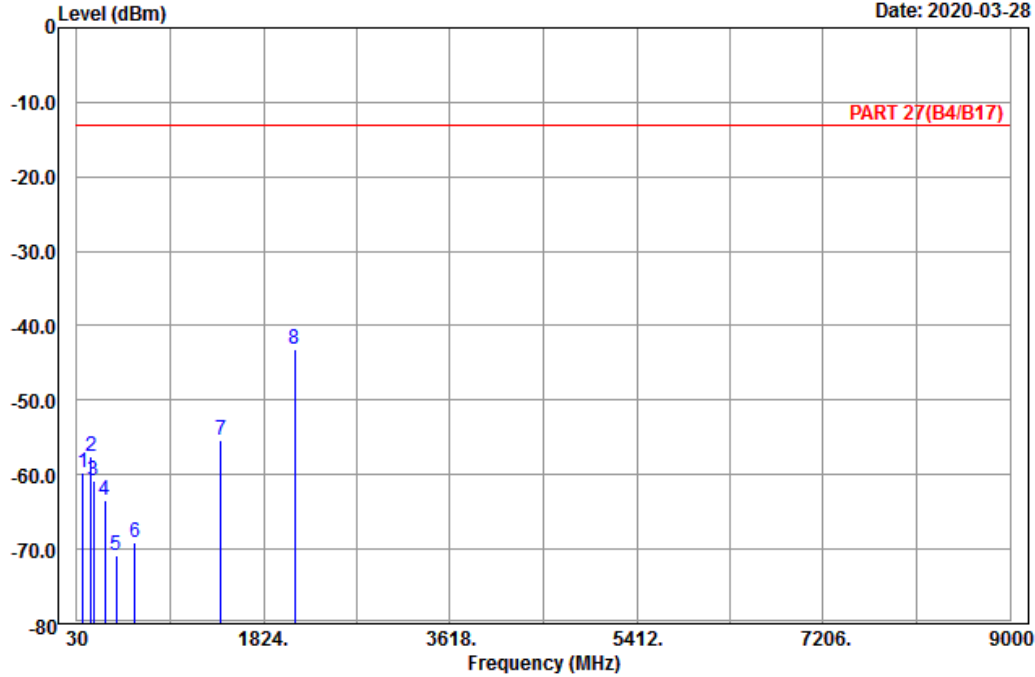


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2020-03-28



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Vertical  
 Remark : LTE\_Band 17\_Link\_L-Ch  
 Tested by: Karl Lee

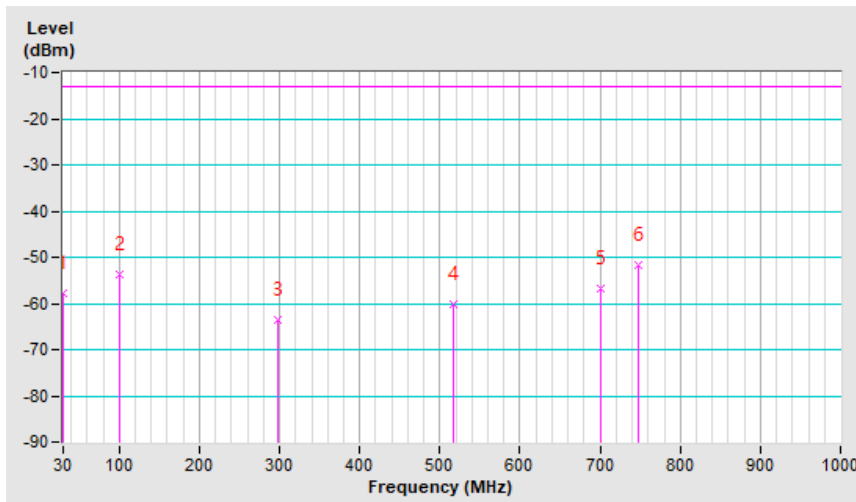
	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	87.24	-59.68	-48.68	-11.00	-13.00	-46.68	Peak
2	168.24	-57.66	-50.86	-6.80	-13.00	-44.66	Peak
3	187.95	-60.75	-55.05	-5.70	-13.00	-47.75	Peak
4	302.80	-63.45	-57.52	-5.93	-13.00	-50.45	Peak
5	412.00	-70.75	-67.73	-3.02	-13.00	-57.75	Peak
6	584.90	-69.20	-68.98	-0.22	-13.00	-56.20	Peak
7	1418.00	-55.33	-61.69	6.36	-13.00	-42.33	Peak
8 pp	2127.00	-43.21	-54.49	11.28	-13.00	-30.21	Peak

### For Docking Mode

Mode	TX channel 23780 (709.0MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Titan Hsu		

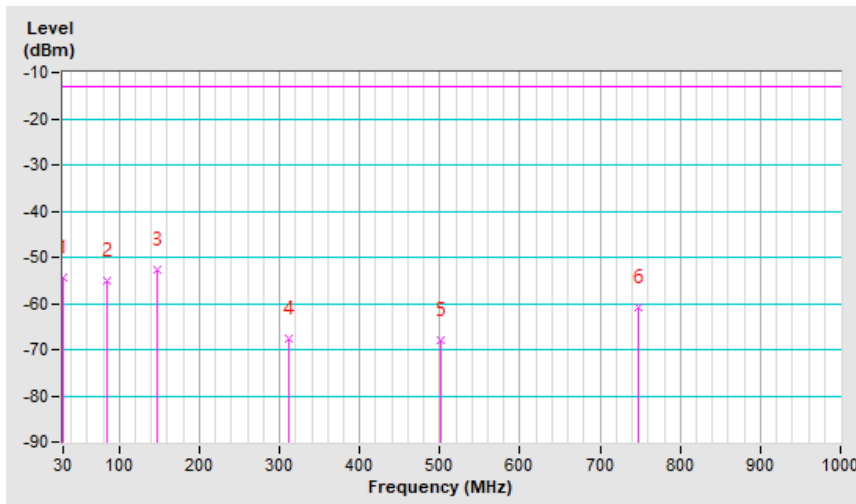
#### Antenna Polarity & Test Distance: Horizontal at 3 M

No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	30.41	-58.50	-45.70	-12.10	-57.80	-13.00	-44.80
2	100.29	-42.70	-54.60	0.90	-53.70	-13.00	-40.70
3	298.51	-59.20	-68.80	5.10	-63.70	-13.00	-50.70
4	516.41	-58.30	-65.10	4.80	-60.30	-13.00	-47.30
5	700.57	-57.90	-61.90	5.20	-56.70	-13.00	-43.70
6	746.96	-53.80	-56.40	4.70	-51.70	-13.00	-38.70



Mode	TX channel 23780 (709.0MHz)	Frequency Range	Below 1000 MHz
Environmental Conditions	23deg. C, 66%RH	Input Power	120Vac, 60Hz
Tested By	Titan Hsu		

Antenna Polarity & Test Distance: Vertical at 3 M							
No.	Freq. (MHz)	Reading (dBm)	S.G Power Value (dBm)	Correction Factor (dB)	EIRP (dBm)	Limit (dBm)	Margin (dB)
1	30.00	-43.80	-42.10	-12.20	-54.30	-13.00	-41.30
2	84.83	-47.50	-54.90	-0.30	-55.20	-13.00	-42.20
3	148.09	-47.80	-52.40	-0.20	-52.60	-13.00	-39.60
4	312.57	-65.80	-72.60	5.10	-67.50	-13.00	-54.50
5	500.94	-66.40	-72.80	4.90	-67.90	-13.00	-54.90
6	746.96	-65.90	-65.40	4.70	-60.70	-13.00	-47.70





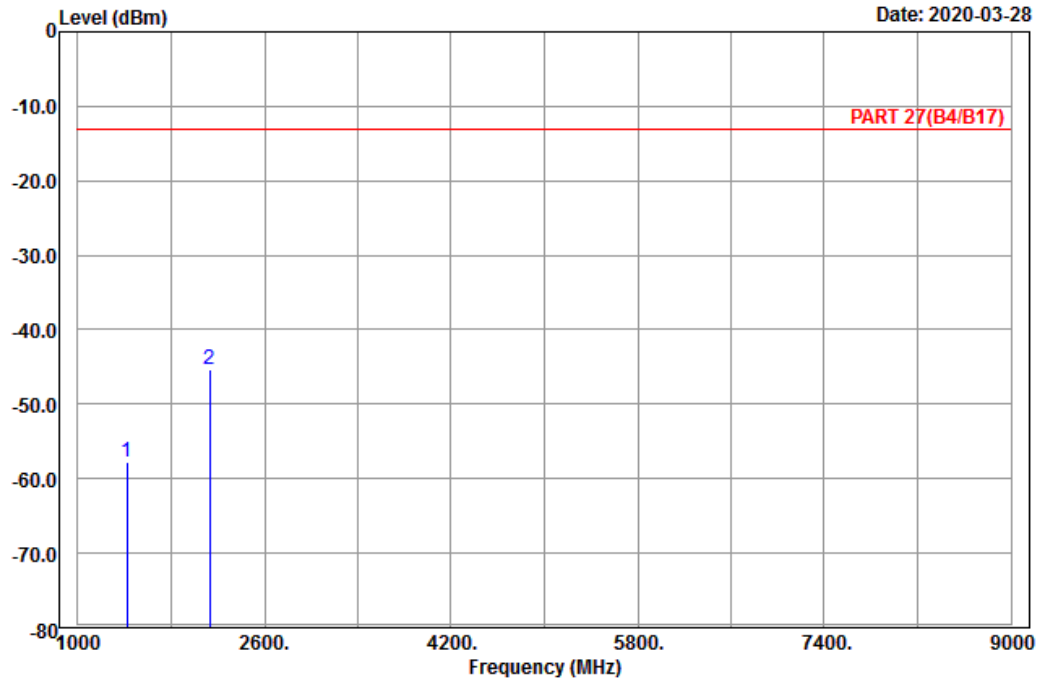
Middle Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Horizontal  
 Remark : LTE\_Band 17\_Link\_M-Ch  
 Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1420.00	-57.71	-64.07	6.36	-13.00	-44.71	Peak
2 pp	2130.00	-45.39	-56.67	11.28	-13.00	-32.39	Peak

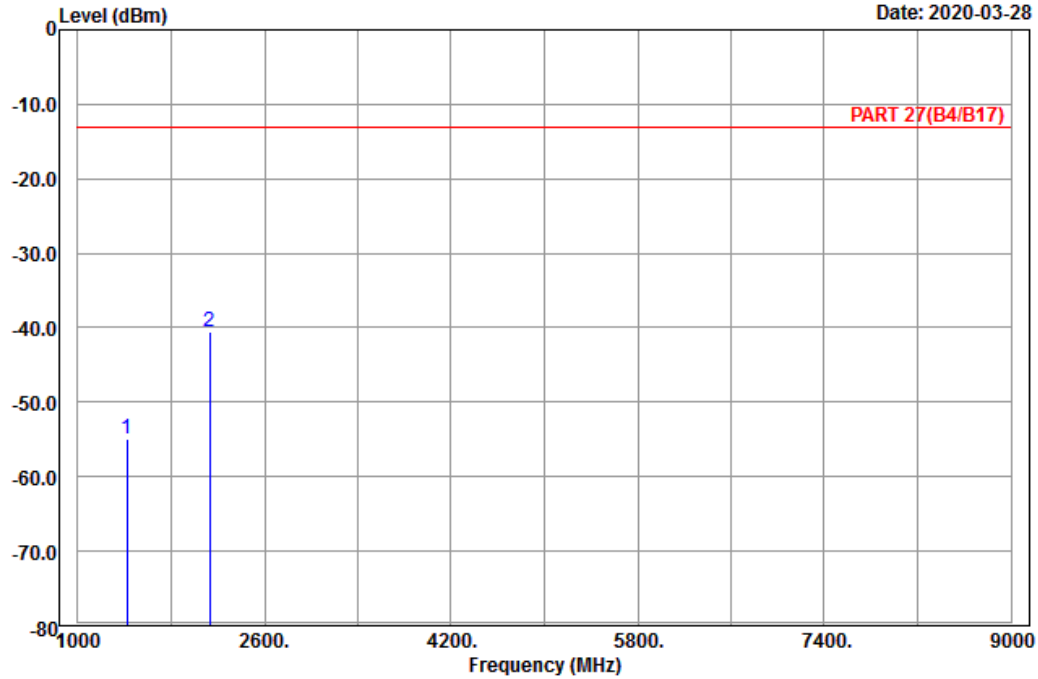


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

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Data: 6

Date: 2020-03-28



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Vertical  
 Remark : LTE\_Band 17\_Link\_M-Ch  
 Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1420.00	-54.96	-61.32	6.36	-13.00	-41.96	Peak
2 pp	2130.00	-40.51	-51.79	11.28	-13.00	-27.51	Peak

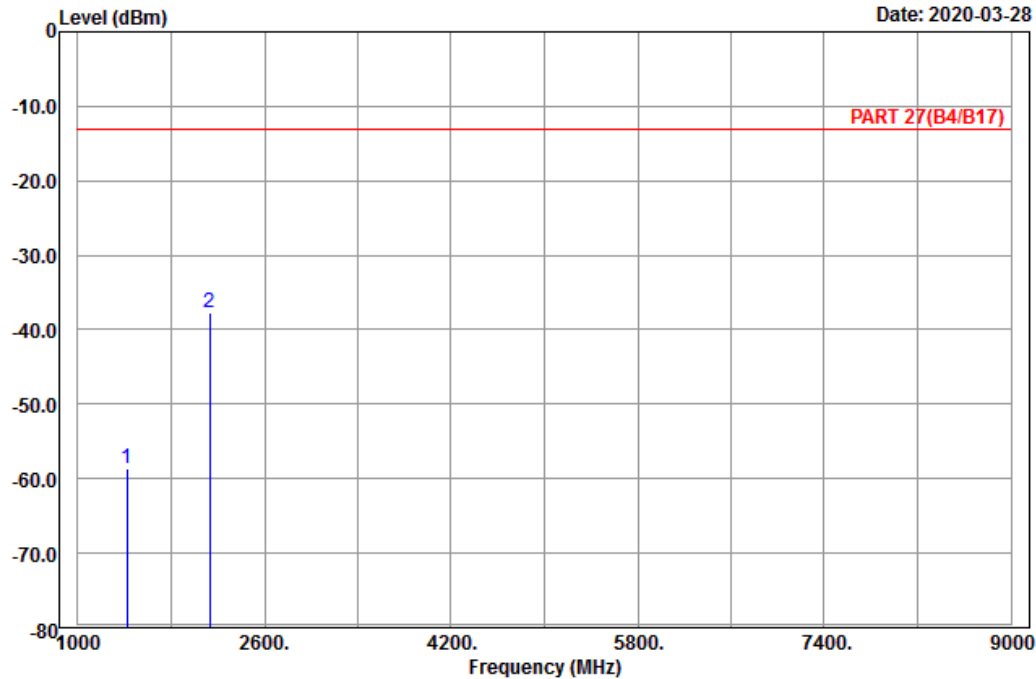
## High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

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Data: 5



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Horizontal  
 Remark : LTE\_Band 17\_Link\_H-Ch  
 Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1422.00	-58.64	-65.00	6.36	-13.00	-45.64	Peak
2	2133.00	-37.72	-49.00	11.28	-13.00	-24.72	Peak

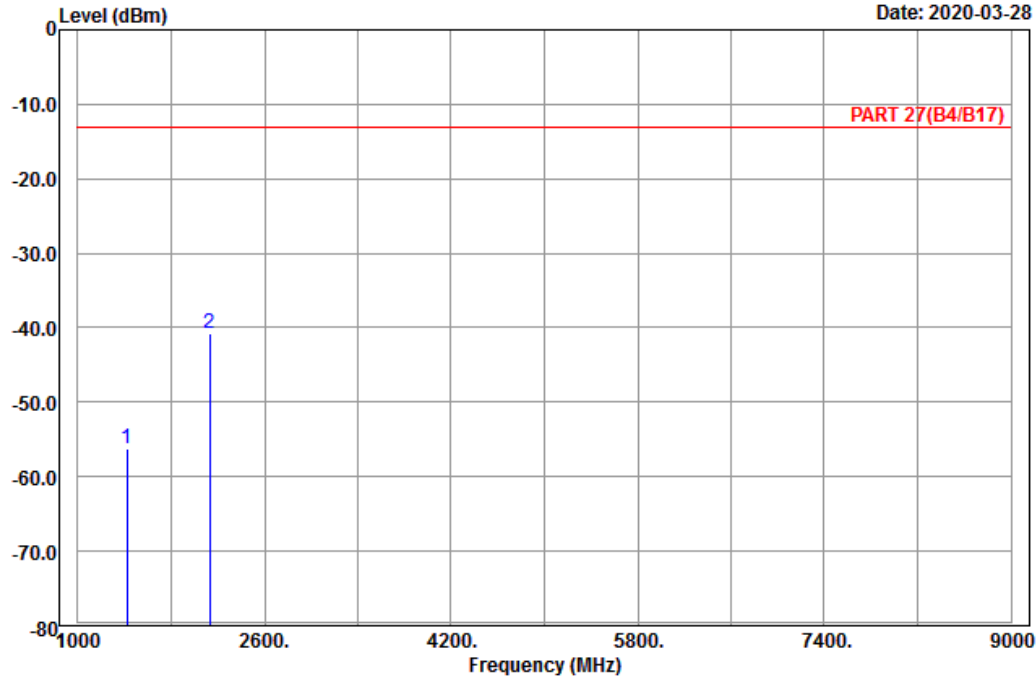


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 6

Date: 2020-03-28



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Vertical  
 Remark : LTE\_Band 17\_Link\_H-Ch  
 Tested by: Karl Lee

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	Remark
	MHz	dBm	dBm	dB	dBm	dB	
1	1422.00	-56.16	-62.52	6.36	-13.00	-43.16	Peak
2	pp 2133.00	-40.83	-52.11	11.28	-13.00	-27.83	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.

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

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