

FCC Test Report

(PART 27)

Report No.: RF181011C15-2

FCC ID: 2AIBC-ENJOYNOW

Test Model: TLP201

Received Date: Oct. 11, 2018

Test Date: Nov. 15, 2018 ~ Nov. 28, 2018

Issued Date: Apr. 11, 2019

Applicant: The Light Phone Inc

Address: 49 Bogart St #44 Brooklyn New York United States 11206

Manufacturer: The Light Phone Inc

Address: 19 Morris Ave, Brooklyn, NY 11205

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

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FCC Registration /
Designation Number: 788550 / TW0003



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Release Control Record

Issue No.	Description	Date Issued
RF181011C15-2	Original Release	Apr. 11, 2019

1 Certificate of Conformity

Product: Light Phone 2

Brand: Light

Test Model: TLP201

Sample Status: Engineering Sample

Applicant: The Light Phone Inc

Test Date: Nov. 15, 2018 ~ Nov. 28, 2018

Standards: FCC Part 27, Subpart C, H, 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:

Apr. 11, 2019

Ivonne Wu / Supervisor

Approved by :



Date:

Apr. 11, 2019

Dylan Chiou / 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 -33.92 dB at 43.58 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 -31.13 dB at 44.55 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 12)			
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 -21.54 dB at 3520.00 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 13)			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50(b)(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(c)(2)(4)	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 27.53(c)(2)&(f)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53(c)(2)&(f)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -16.05 dB at 1564.00 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 -25.68 dB at 3555.00 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	3.04 dB
	30 MHz ~ 200 MHz	2.93 dB
	200 MHz ~ 1000 MHz	2.95 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	2.26 dB
	18 GHz ~ 40 GHz	1.94 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent	N9038A	MY51210203	Mar. 16, 2018	Mar. 15, 2019
Spectrum Analyzer Agilent	N9010A	MY56070348	Sep. 06, 2018	Sep. 05, 2019
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Jan. 11, 2018	Jan. 10, 2019
Spectrum Analyzer ROHDE & SCHWARZ	FSW26	102023	Oct. 11, 2018	Oct. 10, 2019
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Dec. 12, 2017	Dec. 11, 2018
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Dec. 06, 2017	Dec. 05, 2018
Double Ridge Guide Horn Antenna EMCO	3115	5619	Dec. 12, 2017	Dec. 11, 2018
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 16, 2018	Apr. 15, 2019
MXG Vector signal generator Agilent	N5182B	MY53052282	Dec. 28, 2017	Dec. 27, 2018
Preamplifier EMCI	EMC 012645	980115	Oct. 12, 2018	Oct. 11, 2019
Preamplifier EMCI	EMC 330H	980112	Oct. 12, 2018	Oct. 11, 2019
RF Coaxial Cable HUBER+SUHNNER	EMC104-SM-SM-800 0&3000	140811+170717	Oct. 12, 2018	Oct. 11, 2019
RF Coaxial Cable HUBER+SUHNNER	SUCOFLEX 104	EMC104-SM-SM- 1000(140807)	Oct. 12, 2018	Oct. 11, 2019
RF Coaxial Cable WOKEN	8D-FB	Cable-Ch10-01	Oct. 12, 2018	Oct. 11, 2019
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA
Universal Radio Communication Tester R&S	CMU200	123112	Dec. 28, 2017	Dec. 27, 2018
Radio Communication Analyzer Anritsu	MT8820C	6201300640	Aug. 16, 2017	Aug. 15, 2019
Temperature & Humidity Chamber	GTH-120-40-CP-AR	MAA1306-019	Sep. 05, 2018	Sep. 04, 2019
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 10.
3. The horn antenna and preamplifier (model: EMC 184045) are used only for the measurement of emission frequency above 1 GHz if tested.
4. The IC Site Registration No. is 7450F-10.

3 General Information

3.1 General Description of EUT

Product	Light Phone 2	
Brand	Light	
Test Model	TLP201	
Status of EUT	Engineering Sample	
Power Supply Rating	5.0 Vdc (adapter) 3.8 Vdc (battery)	
Modulation Type	WCDMA	QPSK
	LTE	QPSK, 16QAM
Frequency Range	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 12 (Channel Bandwidth: 1.4 MHz)	699.7 ~ 715.3 MHz
	LTE Band 12 (Channel Bandwidth: 3 MHz)	700.5 ~ 714.5 MHz
	LTE Band 12 (Channel Bandwidth: 5 MHz)	701.5 ~ 713.5 MHz
	LTE Band 12 (Channel Bandwidth: 10 MHz)	704.0 ~ 711.0 MHz
	LTE Band 13 (Channel Bandwidth: 5 MHz)	779.5 ~ 784.5 MHz
	LTE Band 13 (Channel Bandwidth: 10 MHz)	782.0 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
Emission Designator	WCDMA	4M17F9W
	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	1M09G7D
	LTE Band 4 (Channel Bandwidth: 3 MHz)	2M27G7D
	LTE Band 4 (Channel Bandwidth: 5 MHz)	4M50D7W
	LTE Band 4 (Channel Bandwidth: 10 MHz)	8M98D7W
	LTE Band 4 (Channel Bandwidth: 15 MHz)	13M5D7W
	LTE Band 4 (Channel Bandwidth: 20 MHz)	18M0G7D
	LTE Band 12 (Channel Bandwidth: 1.4 MHz)	1M09D7W
	LTE Band 12 (Channel Bandwidth: 3 MHz)	2M70G7D
	LTE Band 12 (Channel Bandwidth: 5 MHz)	4M50D7W
	LTE Band 12 (Channel Bandwidth: 10 MHz)	8M99D7W
	LTE Band 13 (Channel Bandwidth: 5 MHz)	4M50D7W
	LTE Band 13 (Channel Bandwidth: 10 MHz)	8M97G7D
	LTE Band 17 (Channel Bandwidth: 5 MHz)	4M50D7W
	LTE Band 17 (Channel Bandwidth: 10 MHz)	8M99D7W

Max. ERP Power	LTE Band 12 (Channel Bandwidth: 1.4 MHz)	11.30 mW
	LTE Band 12 (Channel Bandwidth: 3 MHz)	12.11 mW
	LTE Band 12 (Channel Bandwidth: 5 MHz)	12.68 mW
	LTE Band 12 (Channel Bandwidth: 10 MHz)	13.71 mW
	LTE Band 13 (Channel Bandwidth: 5 MHz)	12.45 mW
	LTE Band 13 (Channel Bandwidth: 10 MHz)	13.00 mW
	LTE Band 17 (Channel Bandwidth: 5 MHz)	14.59 mW
	LTE Band 17 (Channel Bandwidth: 10 MHz)	15.35 mW
Max. EIRP Power	WCDMA	26.49 mW
	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	21.33 mW
	LTE Band 4 (Channel Bandwidth: 3 MHz)	22.91 mW
	LTE Band 4 (Channel Bandwidth: 5 MHz)	24.83 mW
	LTE Band 4 (Channel Bandwidth: 10 MHz)	26.00 mW
	LTE Band 4 (Channel Bandwidth: 15 MHz)	27.35 mW
	LTE Band 4 (Channel Bandwidth: 20 MHz)	29.44 mW
Antenna Type	PIFA Antenna	
Antenna Gain	WCDMA	-8 dBi (Main) / -12 dBi (Aux.)
	LTE Band 4	-8 dBi (Main) / -12 dBi (Aux.)
	LTE Band 12	-11 dBi (Main) / -25.8 dBi (Aux.)
	LTE Band 13	-11 dBi (Main) / -25.8 dBi (Aux.)
	LTE Band 17	-11 dBi (Main) / -25.8 dBi (Aux.)
Accessory Device	Refer to Note as below	
Data Cable Supplied	Refer to Note as below	

Note:

- There're 2 colors for EUT listed as below

Brand	Model	Color	Description
Light	TLP201	Black	Different colors are for marketing purpose
		Gray	

- The EUT contains following accessory devices.

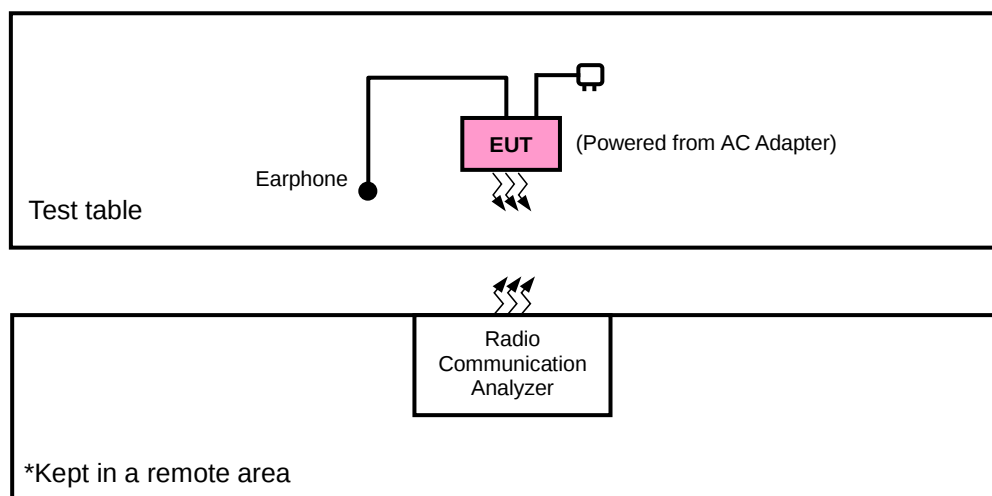
Product	Brand	Model	Description
USB Cable 1 (Black)	UDE	LP2	1 m cable P/N.: 410-4102000001
USB Cable 2 (Gray)	UDE	LP2	1 m cable P/N.: 410-4101000001
Battery	ZHENGZHOU BAK Battery Co. Ltd.	V304556P	3.8 Vdc

* The USB cables have the same layout, circuit, and components, but different P/N and color.

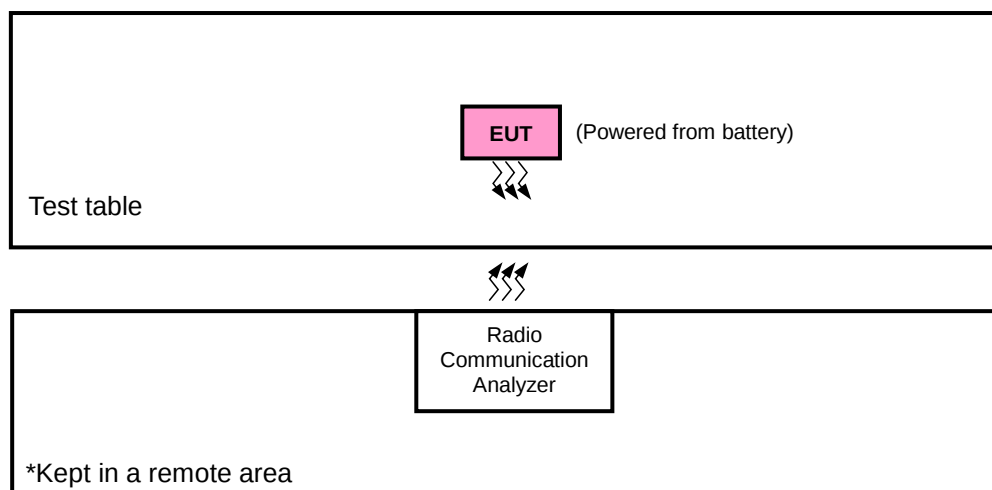
- The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

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
1.	Adapter	SONY	AC-0060-EU	N/A	N/A
2.	Earphone	N/A	N/A	N/A	N/A

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

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item 1 was provided by client.

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-axis
LTE Band 4	X-plane	Y-axis
LTE Band 12	Y-plane	X-axis
LTE Band 13	Y-plane	X-axis
LTE Band 17	Y-plane	X-axis

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	3 RB / 1 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 / 24 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK, 16QAM	1 RB / 37 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK, 16QAM	1 RB / 50 RB Offset
-	Modulation Characteristics	20000 to 20350	20175	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
-	Frequency Stability	19957 to 20393	19957, 20393	1.4 MHz	QPSK	3 RB / 1 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 / 24 RB Offset
		20025 to 20325	20025, 20325	15 MHz	QPSK	1 RB / 37 RB Offset
		20050 to 20300	20050, 20300	20 MHz	QPSK	1 RB / 50 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	3 RB / 1 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 / 24 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK, 16QAM	1 RB / 37 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK, 16QAM	1 RB / 50 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
			20393	1.4 MHz	QPSK	6 RB / 0 RB Offset
		19965 to 20385	19965	3 MHz	QPSK	1 RB / 5 RB Offset
			20385	3 MHz	QPSK	6 RB / 0 RB Offset
		19975 to 20375	19975	5 MHz	QPSK	1 RB / 0 RB Offset
			20375	5 MHz	QPSK	15 RB / 0 RB Offset
		20000 to 20350	20000	10 MHz	QPSK	1 RB / 14 RB Offset
			20350	10 MHz	QPSK	15 RB / 0 RB Offset
		20025 to 20325	20025	15 MHz	QPSK	1 RB / 0 RB Offset
			20325	15 MHz	QPSK	25 RB / 0 RB Offset
		20050 to 20300	20050	20 MHz	QPSK	1 RB / 24 RB Offset
			20300	20 MHz	QPSK	25 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	50 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK	1 RB / 49 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK	50 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	75 RB / 0 RB Offset
-	Radiated Emission	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK	1 RB / 74 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK	75 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 12

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	23017 to 23173	23017, 23095, 23173	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23025 to 23165	23025, 23095, 23165	3 MHz	QPSK, 16QAM	1 RB / 7 RB Offset
		23035 to 23155	23035, 23095, 23155	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK, 16QAM	1 RB / 24 RB Offset
-	Modulation Characteristics	23060 to 23130	23095	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
-	Frequency Stability	23017 to 23173	23017, 23173	1.4 MHz	QPSK	1 RB / 0 RB Offset
		23025 to 23165	23025, 23165	3 MHz	QPSK	1 RB / 7 RB Offset
		23035 to 23155	23035, 23155	5 MHz	QPSK	1 RB / 0 RB Offset
		23060 to 23130	23060, 23130	10 MHz	QPSK	1 RB / 24 RB Offset
-	Occupied Bandwidth	23017 to 23173	23017, 23095, 23173	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		23025 to 23165	23025, 23095, 23165	3 MHz	QPSK, 16QAM	15 RB / 0 RB Offset
		23035 to 23155	23035, 23095, 23155	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
-	Peak to Average Ratio	23017 to 23173	23017, 23095, 23173	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23025 to 23165	23025, 23095, 23165	3 MHz	QPSK, 16QAM	1 RB / 7 RB Offset
		23035 to 23155	23035, 23095, 23155	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK, 16QAM	1 RB / 24 RB Offset
-	Band Edge	23017 to 23173	23017	1.4 MHz	QPSK	1 RB / 0 RB Offset
			23173	1.4 MHz	QPSK	6 RB / 0 RB Offset
		23025 to 23165	23025	3 MHz	QPSK	1 RB / 5 RB Offset
			23165	3 MHz	QPSK	6 RB / 0 RB Offset
		23035 to 23155	23035	5 MHz	QPSK	1 RB / 0 RB Offset
			23155	5 MHz	QPSK	15 RB / 0 RB Offset
		23060 to 23130	23060	10 MHz	QPSK	1 RB / 14 RB Offset
			23130	10 MHz	QPSK	15 RB / 0 RB Offset
		23017 to 23173	23017	1.4 MHz	QPSK	1 RB / 0 RB Offset
			23173	1.4 MHz	QPSK	50 RB / 0 RB Offset
		23025 to 23165	23025	3 MHz	QPSK	1 RB / 49 RB Offset
			23165	3 MHz	QPSK	50 RB / 0 RB Offset
-	Conducted Emission	23017 to 23173	23017, 23095, 23173	1.4 MHz	QPSK	1 RB / 0 RB Offset
		23025 to 23165	23025, 23095, 23165	3 MHz	QPSK	1 RB / 7 RB Offset
		23035 to 23155	23035, 23095, 23155	5 MHz	QPSK	1 RB / 0 RB Offset
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK	1 RB / 24 RB Offset
-	Radiated Emission	23017 to 23173	23017, 23095, 23173	1.4 MHz	QPSK	1 RB / 0 RB Offset
		23035 to 23155	23035, 23095, 23155	5 MHz	QPSK	1 RB / 0 RB Offset
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK	1 RB / 24 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 13

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK, 16QAM	1 RB / 24 RB Offset
		23230	23230	10 MHz	QPSK, 16QAM	1 RB / 49 RB Offset
-	Modulation Characteristics	23230	23230	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
-	Frequency Stability	23205 to 23255	23205, 23255	5 MHz	QPSK	1 RB / 24 RB Offset
		23230	23230	10 MHz	QPSK	1 RB / 49 RB Offset
-	Occupied Bandwidth	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
-	Peak to Average Ratio	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK, 16QAM	1 RB / 24 RB Offset
		23230	23230	10 MHz	QPSK, 16QAM	1 RB / 49 RB Offset
-	Band Edge	23205 to 23255	23205	5 MHz	QPSK	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
			23255	5 MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
-	Conducted Emission	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK	1 RB / 24 RB Offset
		23230	23230	10 MHz	QPSK	1 RB / 49 RB Offset
-	Radiated Emission	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK	1 RB / 24 RB Offset
		23230	23230	10 MHz	QPSK	1 RB / 49 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	10 MHz	QPSK, 16QAM	50 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
		23780 to 23800	23825	5 MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
			23780	10 MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
-	Conducted Emission	23755 to 23825	23755, 23790, 23825	5 MHz	QPSK	1 RB / 49 RB Offset
		23780 to 23800	23780, 23790, 23800	10 MHz	QPSK	50 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	3.8 Vdc	Thomas Wei
Modulation Characteristics	25 deg. C, 65 % RH	3.8 Vdc	Wayne Lin
Frequency Stability	25 deg. C, 65 % RH	3.8 Vdc	Wayne Lin
Occupied Bandwidth	25 deg. C, 65 % RH	3.8 Vdc	Wayne Lin
Band Edge	25 deg. C, 65 % RH	3.8 Vdc	Wayne Lin
Peak to Average Ratio	25 deg. C, 65 % RH	3.8 Vdc	Wayne Lin
Conducted Emission	25 deg. C, 65 % RH	3.8 Vdc	Wayne Lin
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Thomas Wei

3.4 EUT Operating Conditions

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

3.5 General Description of Applied Standards

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

FCC 47 CFR Part 2

FCC 47 CFR Part 27

KDB 971168 D01 Power Meas License Digital Systems v03r01

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

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

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

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

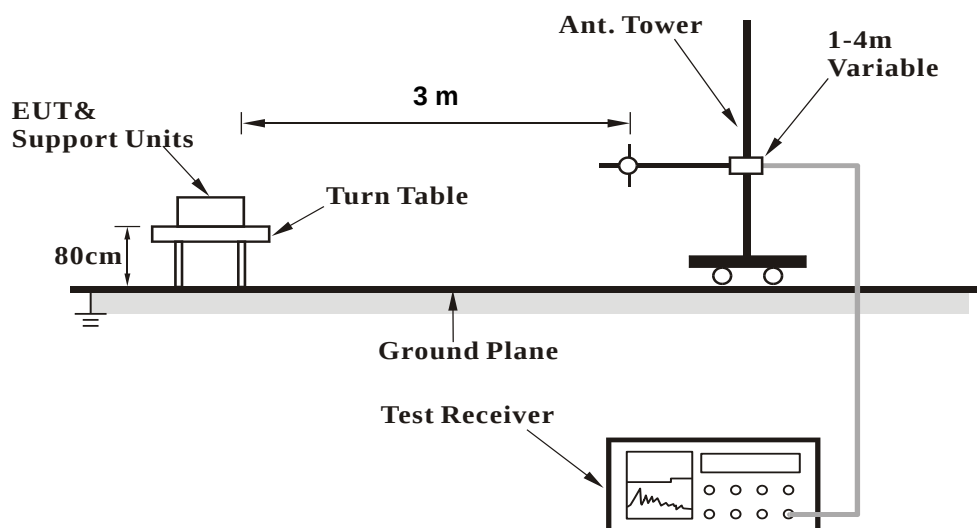
Conducted Power Measurement:

- 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.

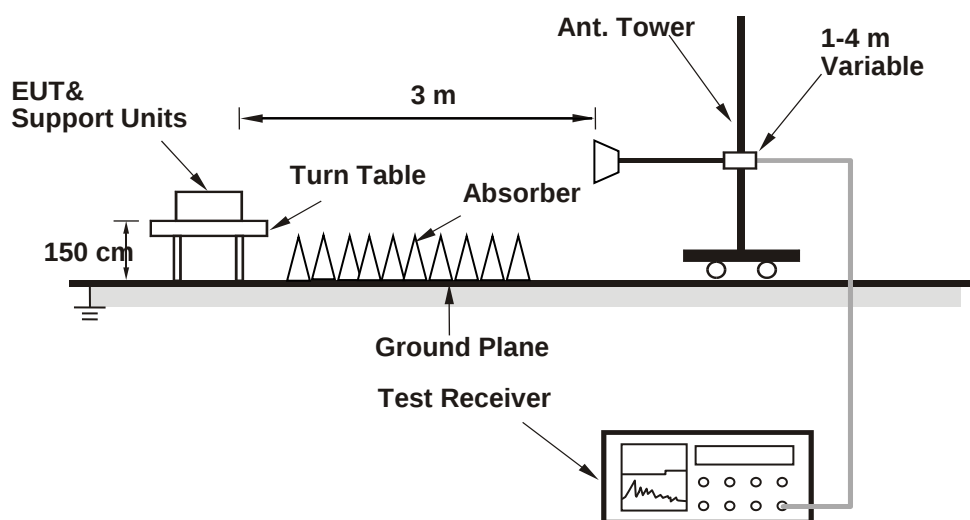
4.1.3 Test Setup

EIRP / ERP Measurement:

<Radiated Emission below or equal 1 GHz>

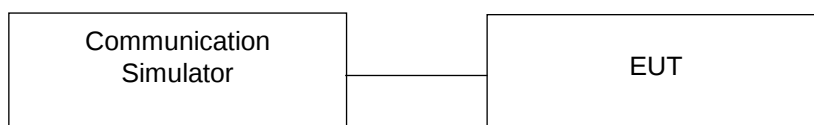


<Radiated Emission above 1 GHz>



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		
Channel	1312	1413	1513
Frequency (MHz)	1712.4	1732.6	1752.6
RMC 12.2K	22.94	22.71	22.52
HSDPA Subtest-1	21.85	21.82	21.73
HSDPA Subtest-2	21.86	21.86	21.76
HSDPA Subtest-3	21.34	21.38	21.28
HSDPA Subtest-4	21.34	21.38	21.29
DC-HSDPA Subtest-1	21.82	21.76	21.65
DC-HSDPA Subtest-2	21.83	21.80	21.68
DC-HSDPA Subtest-3	21.31	21.32	21.20
DC-HSDPA Subtest-4	21.31	21.32	21.21
HSUPA Subtest-1	21.52	21.98	21.31
HSUPA Subtest-2	20.88	20.71	20.86
HSUPA Subtest-3	20.70	20.63	20.53
HSUPA Subtest-4	20.91	20.88	20.79
HSUPA Subtest-5	21.9	22.0	21.9

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	22.89	22.84	22.93	0	15M	QPSK	1	0	22.83	22.78	22.87	0
		1	50	22.92	22.87	22.94	0			1	37	22.88	22.78	22.88	0
		1	99	22.79	22.74	22.81	0			1	74	22.73	22.74	22.75	0
		50	0	21.95	21.90	21.97	1			36	0	21.85	21.83	21.91	1
		50	25	21.97	21.92	21.99	1			36	19	21.95	21.82	21.94	1
		50	50	21.93	21.88	21.95	1			36	39	21.93	21.80	21.93	1
		100	0	21.95	21.90	21.97	1			75	0	21.91	21.84	21.87	1
	16QAM	1	0	21.83	21.83	21.86	1		16QAM	1	0	21.80	21.83	21.80	1
		1	50	21.87	21.78	21.88	1			1	37	21.85	21.83	21.88	1
		1	99	21.75	21.69	21.77	1			1	74	21.65	21.56	21.74	1
		50	0	20.91	20.86	20.90	2			36	0	20.84	20.75	20.86	2
		50	25	20.92	20.88	20.89	2			36	19	20.90	20.78	20.80	2
		50	50	20.91	20.82	20.88	2			36	39	20.80	20.82	20.84	2
		100	0	20.88	20.83	20.89	2			75	0	20.84	20.82	20.88	2
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		20000	20175	20350				Channel		19975	20175	20375	
		Frequency (MHz)		1715.0	1732.5	1750.0				Frequency (MHz)		1712.5	1732.5	1752.5	
10M	QPSK	1	0	22.82	22.64	22.81	0	5M	QPSK	1	0	22.86	22.76	22.77	0
		1	24	22.83	22.74	22.85	0			1	12	22.79	22.68	22.63	0
		1	49	22.73	22.68	22.67	0			1	24	22.74	22.64	22.65	0
		25	0	21.89	21.82	21.88	1			12	0	21.80	21.86	21.90	1
		25	12	21.84	21.85	21.79	1			12	6	21.85	21.72	21.69	1
		25	25	21.82	21.74	21.84	1			12	13	21.81	21.75	21.71	1
		50	0	21.82	21.73	21.88	1			25	0	21.83	21.66	21.75	1
	16QAM	1	0	21.72	21.67	21.76	1		16QAM	1	0	21.69	21.70	21.72	1
		1	24	21.85	21.73	21.78	1			1	12	21.68	21.78	21.78	1
		1	49	21.56	21.65	21.66	1			1	24	21.46	21.45	21.62	1
		25	0	20.70	20.72	20.67	2			12	0	20.74	20.81	20.79	2
		25	12	20.87	20.79	20.80	2			12	6	20.68	20.84	20.90	2
		25	25	20.67	20.62	20.83	2			12	13	20.73	20.74	20.83	2
		50	0	20.85	20.79	20.89	2			25	0	20.75	20.83	20.67	2
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		19965	20175	20385				Channel		19957	20175	20393	
		Frequency (MHz)		1711.5	1732.5	1753.5				Frequency (MHz)		1710.7	1732.5	1754.3	
3M	QPSK	1	0	22.68	22.75	22.82	0	1.4M	QPSK	1	0	22.82	22.70	22.77	0
		1	7	22.69	22.70	22.79	0			1	2	22.81	22.74	22.75	0
		1	14	22.76	22.55	22.66	0			1	5	22.65	22.66	22.68	0
		8	0	21.83	21.76	21.83	1			3	0	22.89	22.85	22.83	0
		8	3	21.88	21.82	21.81	1			3	1	22.91	22.82	22.85	0
		8	7	21.80	21.83	21.80	1			3	3	22.75	22.71	22.89	0
		15	0	21.81	21.74	21.89	1			6	0	21.81	21.77	21.84	1
	16QAM	1	0	21.61	21.76	21.67	1		16QAM	1	0	21.67	21.62	21.78	1
		1	7	21.84	21.63	21.80	1			1	2	21.61	21.63	21.78	1
		1	14	21.59	21.59	21.71	1			1	5	21.75	21.51	21.59	1
		8	0	20.81	20.68	20.85	2			3	0	21.84	21.65	21.83	1
		8	3	20.86	20.86	20.88	2			3	1	21.81	21.63	21.67	1
		8	7	20.70	20.70	20.76	2			3	3	21.79	21.66	21.80	1
		15	0	20.74	20.73	20.82	2			6	0	20.78	20.81	20.89	2

LTE Band 12															
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		23060	23095	23130				Channel		23035	23095	23155	
		Frequency (MHz)		704.0	707.5	711.0				Frequency (MHz)		701.5	707.5	713.5	
10M	QPSK	1	0	22.84	22.95	22.85	0	5M	QPSK	1	0	22.84	22.93	22.77	0
		1	24	22.86	22.97	22.87	0			1	12	22.86	22.89	22.81	0
		1	49	22.68	22.79	22.69	0			1	24	22.67	22.76	22.59	0
		25	0	21.84	21.95	21.85	1			12	0	21.84	21.90	21.82	1
		25	12	21.86	21.97	21.87	1			12	6	21.83	21.91	21.77	1
		25	25	21.82	21.93	21.83	1			12	13	21.81	21.92	21.77	1
	16QAM	50	0	21.84	21.95	21.85	1			25	0	21.75	21.89	21.85	1
		1	0	21.75	21.92	21.75	1		16QAM	1	0	21.78	21.82	21.82	1
		1	24	21.81	21.94	21.80	1			1	12	21.68	21.86	21.81	1
		1	49	21.64	21.71	21.69	1			1	24	21.60	21.74	21.62	1
		25	0	20.82	20.95	20.76	2			12	0	20.72	20.93	20.70	2
		25	12	20.76	20.91	20.80	2			12	6	20.82	20.85	20.76	2
3M	QPSK	25	25	20.75	20.92	20.77	2			12	13	20.66	20.80	20.67	2
		50	0	20.77	20.89	20.83	2			25	0	20.71	20.76	20.76	2
	16QAM	1	0	21.05	21.12	21.05	1		QPSK	1	0	22.63	22.89	22.69	0
		1	24	21.07	21.14	21.07	1			1	2	22.69	22.81	22.82	0
		1	49	20.89	20.96	20.89	1			1	5	22.53	22.75	22.60	0
		25	0	20.71	20.78	20.71	1			3	0	22.64	22.78	22.67	0
		25	12	20.73	20.87	20.73	1			3	1	22.84	22.86	22.70	0
		25	25	20.75	20.89	20.75	1			3	3	22.73	22.70	22.70	0
	16QAM	50	0	20.77	20.89	20.83	2			6	0	21.76	21.80	21.77	1
		1	0	21.57	21.82	21.76	1	1.4M	16QAM	1	0	21.65	21.82	21.71	1
		1	7	21.73	21.74	21.68	1			1	2	21.76	21.89	21.65	1
		1	14	21.50	21.62	21.53	1			1	5	21.37	21.65	21.37	1
		8	0	20.67	20.74	20.69	2			3	0	21.63	21.74	21.58	1
		8	3	20.62	20.73	20.81	2			3	1	21.62	21.71	21.84	1
		8	7	20.67	20.72	20.74	2			3	3	21.67	21.78	21.65	1
3M	QPSK	15	0	20.68	20.73	20.71	2			6	0	20.66	20.73	20.59	2
		1	0	22.73	22.74	22.72	0		QPSK	1	0	22.63	22.89	22.69	0
		1	7	22.71	22.84	22.76	0			1	2	22.69	22.81	22.82	0
		1	14	22.51	22.75	22.55	0			1	5	22.53	22.75	22.60	0
		8	0	21.71	21.85	21.74	1			3	0	22.64	22.78	22.67	0
		8	3	21.65	21.85	21.85	1			3	1	22.84	22.86	22.70	0
	16QAM	8	7	21.66	21.76	21.68	1			3	3	22.73	22.70	22.70	0
		15	0	21.70	21.71	21.67	1			6	0	21.76	21.80	21.77	1
		1	0	21.57	21.82	21.76	1	1.4M	16QAM	1	0	21.65	21.82	21.71	1
		1	7	21.73	21.74	21.68	1			1	2	21.76	21.89	21.65	1
		1	14	21.50	21.62	21.53	1			1	5	21.37	21.65	21.37	1
		8	0	20.67	20.74	20.69	2			3	0	21.63	21.74	21.58	1
		8	3	20.62	20.73	20.81	2			3	1	21.62	21.71	21.84	1
		8	7	20.67	20.72	20.74	2			3	3	21.67	21.78	21.65	1

LTE Band 13															
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		23205	23230	23255				Channel		23205	23230	23255	
		Frequency (MHz)		782.0	782.0	784.5				Frequency (MHz)		779.5	782.0	784.5	
10M	QPSK	1	0	22.86	22.86	22.86	0	5M	QPSK	1	0	22.73	22.86	22.65	0
		1	24	22.83	22.83	22.83	0			1	12	22.70	22.83	22.62	0
		1	49	22.93	22.93	22.93	0			1	24	22.80	22.93	22.72	0
		25	0	21.88	21.88	21.88	1			12	0	21.75	21.88	21.67	1
		25	12	21.85	21.85	21.85	1			12	6	21.72	21.85	21.64	1
		25	25	22.03	22.03	22.03	1			12	13	21.90	21.93	21.82	1
	16QAM	50	0	21.79	21.79	21.79	1			25	0	21.66	21.79	21.58	1
		1	0	21.76	21.76	21.76	1		16QAM	1	0	21.66	21.77	21.59	1
		1	24	21.78	21.78	21.78	1			1	12	21.70	21.81	21.55	1
		1	49	21.87	21.87	21.87	1			1	24	21.73	21.84	21.62	1
		25	0	20.78	20.78	20.78	2			12	0	20.75	20.82	20.57	2
		25	12	20.83	20.83	20.83	2			12	6	20.66	20.77	20.57	2
3M	QPSK	25	25	20.98	20.98	20.98	2			12	13	20.83	20.87	20.73	2
		50	0	20.74	20.74	20.74	2			25	0	20.65	20.70	20.51	2
	16QAM	1	0	22.37	22.43	22.38	0	5M	QPSK	1	0	23.35	23.37	23.29	0
		1	24	23.29	23.35	23.30	0			1	12	23.25	23.33	23.25	0
		1	49	23.25	23.31	23.26	0			1	24	23.22	23.24	23.21	0
		25	0	22.27	22.33	22.28	1			12	0	22.24	22.24	22.20	1
		25	12	22.25	22.31	22.26	1			12	6	22.23	22.22	22.25	1
		25	25	22.24	22.30	22.25	1			12	13	22.14	22.22	22.23	1
	16QAM	50	0	22.29	22.35	22.30	1			25	0	22.20	22.27	22.22	1
		1	0	22.37	22.33	22.37	1	5M	16QAM	1	0	22.29	22.37	22.23	1
		1	24	22.22	22.26	22.26	1			1	12	22.15	22.19	22.24	1
		1	49	22.23	22.27	22.23	1			1	24	22.09	22.23	22.15	1
		25	0	21.24	21.26	21.25	2			12	0	21.15	21.25	21.21	2
		25	12	21.23	21.22	21.22	2			12	6	21.15	21.29	21.06	2
		25	25	21.20	21.23	21.19	2			12	13	21.21	21.25	21.13	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	23.37	23.43	23.38	0	5M	QPSK	1	0	23.35	23.37	23.29	0
		1	24	23.29	23.35	23.30	0			1	12	23.25	23.33	23.25	0
		1	49	23.25	23.31	23.26	0			1	24	23.22	23.24	23.21	0
		25	0	22.27	22.33	22.28	1			12	0	22.24	22.24	22.20	1
		25	12	22.25	22.31	22.26	1			12	6	22.23	22.22	22.25	1
		25	25	22.24	22.30	22.25	1			12	13	22.14	22.22	22.23	1
		50	0	22.29	22.35	22.30	1			25	0	22.20	22.27	22.22	1
	16QAM	1	0	22.37	22.33	22.37	1		16QAM	1	0	22.29	22.37	22.23	1
		1	24	22.22	22.26	22.26	1			1	12	22.15	22.19	22.24	1
		1	49	22.23	22.27	22.23	1			1	24	22.09	22.23	22.15	1
		25	0	21.24	21.26	21.25	2			12	0	21.15	21.25	21.21	2
		25	12	21.23	21.22	21.22	2			12	6	21.15	21.29	21.06	2
		25	25	21.20	21.23	21.19	2			12	13	21.21	21.25	21.13	2
		50	0	21.27	21.25	21.26	2			25	0	21.14	21.24	21.26	2

ERP Power (dBm)

LTE Band 12							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Y	23017	699.7	-17.91	30.36	10.30	10.72	H
	23095	707.5	-17.59	30.17	10.43	11.04	
	23173	715.3	-17.49	30.17	10.53	11.30	
	23017	699.7	-24.00	32.03	5.88	3.87	V
	23095	707.5	-24.13	31.98	5.70	3.72	
	23173	715.3	-23.94	32.06	5.97	3.95	
Channel Bandwidth: 1.4 MHz / 16QAM							
Y	23017	699.7	-19.07	30.36	9.14	8.20	H
	23095	707.5	-18.48	30.17	9.54	8.99	
	23173	715.3	-18.29	30.17	9.73	9.40	
	23017	699.7	-25.04	32.03	4.84	3.05	V
	23095	707.5	-24.94	31.98	4.89	3.08	
	23173	715.3	-24.92	32.06	4.99	3.16	

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

LTE Band 12							
Channel Bandwidth: 3 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Y	23025	700.5	-17.37	30.17	10.65	11.61	H
	23095	707.5	-17.32	30.17	10.70	11.75	
	23165	714.5	-17.20	30.18	10.83	12.11	
	23025	700.5	-23.68	31.96	6.13	4.10	V
	23095	707.5	-23.79	31.98	6.04	4.02	
	23165	714.5	-23.61	32.03	6.27	4.24	
Channel Bandwidth: 3 MHz / 16QAM							
Y	23025	700.5	-18.55	30.17	9.47	8.85	H
	23095	707.5	-18.26	30.17	9.76	9.46	
	23165	714.5	-18.08	30.18	9.95	9.89	
	23025	700.5	-24.73	31.96	5.08	3.22	V
	23095	707.5	-24.67	31.98	5.16	3.28	
	23165	714.5	-24.69	32.03	5.19	3.30	

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

LTE Band 12							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Y	23035	701.5	-17.07	30.17	10.95	12.45	H
	23095	707.5	-17.03	30.17	10.99	12.56	
	23155	713.5	-17.00	30.18	11.03	12.68	
	23035	701.5	-23.37	31.96	6.44	4.41	V
	23095	707.5	-23.47	31.98	6.36	4.33	
	23155	713.5	-23.37	32.03	6.51	4.48	
Channel Bandwidth: 5 MHz / 16QAM							
Y	23035	701.5	-18.35	30.17	9.67	9.27	H
	23095	707.5	-18.00	30.17	10.02	10.05	
	23155	713.5	-17.85	30.18	10.18	10.42	
	23035	701.5	-24.51	31.96	5.30	3.39	V
	23095	707.5	-24.46	31.98	5.37	3.44	
	23155	713.5	-24.45	32.03	5.43	3.49	

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

LTE Band 12							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Y	23060	704.0	-16.75	30.17	11.27	13.40	H
	23095	707.5	-16.69	30.17	11.33	13.58	
	23130	711.0	-16.66	30.18	11.37	13.71	
	23060	704.0	-23.10	31.96	6.71	4.69	V
	23095	707.5	-23.15	31.98	6.68	4.66	
	23130	711.0	-23.13	32.03	6.75	4.73	
Channel Bandwidth: 10 MHz / 16QAM							
Y	23060	704.0	-18.02	30.17	10.00	10.00	H
	23095	707.5	-17.75	30.17	10.27	10.64	
	23130	711.0	-17.59	30.18	10.44	11.07	
	23060	704.0	-24.23	31.96	5.58	3.61	V
	23095	707.5	-24.20	31.98	5.63	3.66	
	23130	711.0	-24.13	32.03	5.75	3.76	

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

LTE Band 13							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Y	23205	779.5	-19.18	32.24	10.91	12.33	H
	23230	782.0	-19.07	32.17	10.95	12.45	
	23255	784.5	-19.14	32.11	10.82	12.08	
	23205	779.5	-25.31	32.43	4.97	3.14	V
	23230	782.0	-25.16	32.42	5.11	3.24	
	23255	784.5	-25.25	32.46	5.06	3.21	
Channel Bandwidth: 5 MHz / 16QAM							
Y	23205	779.5	-20.36	32.24	9.73	9.40	H
	23230	782.0	-20.26	32.17	9.76	9.46	
	23255	784.5	-20.32	32.11	9.64	9.20	
	23205	779.5	-26.28	32.43	4.00	2.51	V
	23230	782.0	-26.12	32.42	4.15	2.60	
	23255	784.5	-26.49	32.46	3.82	2.41	

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

LTE Band 13							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Y	23230	782.0	-18.88	32.17	11.14	13.00	H
	23230	782.0	-24.95	32.42	5.32	3.40	V
Channel Bandwidth: 10 MHz / 16QAM							
Y	23230	782.0	-19.97	32.17	10.05	10.12	H
	23230	782.0	-25.92	32.42	4.35	2.72	V

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

LTE Band 17							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	Reading (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Y	23755	706.5	-16.62	30.36	11.59	14.42	H
	23790	710.0	-16.38	30.17	11.64	14.59	
	23825	713.5	-16.52	30.17	11.50	14.13	
	23755	706.5	-23.49	32.03	6.39	4.36	V
	23790	710.0	-23.29	31.98	6.54	4.51	
	23825	713.5	-23.60	32.06	6.31	4.28	
Channel Bandwidth: 5 MHz / 16QAM							
Y	23755	706.5	-17.80	30.36	10.41	10.99	H
	23790	710.0	-17.52	30.17	10.50	11.22	
	23825	713.5	-17.74	30.17	10.28	10.67	
	23755	706.5	-24.64	32.03	5.24	3.34	V
	23790	710.0	-24.29	31.98	5.54	3.58	
	23825	713.5	-24.82	32.06	5.09	3.23	

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)
Y	23780	709.0	-16.22	30.17	11.80	15.14	H
	23790	710.0	-16.16	30.17	11.86	15.35	
	23800	711.0	-16.26	30.18	11.77	15.03	
	23780	709.0	-23.10	31.96	6.71	4.69	V
	23790	710.0	-23.06	31.98	6.77	4.75	
	23800	711.0	-23.23	32.03	6.65	4.62	
Channel Bandwidth: 10 MHz / 16QAM							
Y	23780	709.0	-17.41	30.17	10.61	11.51	H
	23790	710.0	-17.23	30.17	10.79	11.99	
	23800	711.0	-17.47	30.18	10.56	11.38	
	23780	709.0	-24.33	31.96	5.48	3.53	V
	23790	710.0	-24.01	31.98	5.82	3.82	
	23800	711.0	-24.47	32.03	5.41	3.48	

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	-22.11	36.29	14.18	26.18	H
	1413	1732.6	-22.46	36.69	14.23	26.49	
	1513	1752.6	-22.78	36.98	14.20	26.30	
	1312	1712.4	-28.88	37.11	8.23	6.65	V
	1413	1732.6	-29.33	37.60	8.27	6.71	
	1513	1752.6	-29.47	37.65	8.18	6.58	

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	-23.25	36.45	13.20	20.89	H
	20175	1732.5	-23.51	36.80	13.29	21.33	
	20393	1754.3	-23.74	36.94	13.20	20.89	
	19957	1710.7	-28.92	37.28	8.36	6.85	V
	20175	1732.5	-29.10	37.63	8.53	7.13	
	20393	1754.3	-29.21	37.64	8.43	6.97	
Channel Bandwidth: 1.4 MHz / 16QAM							
X	19957	1710.7	-24.36	36.45	12.09	16.18	H
	20175	1732.5	-24.31	36.80	12.49	17.74	
	20393	1754.3	-24.83	36.94	12.11	16.26	
	19957	1710.7	-30.24	37.28	7.04	5.06	V
	20175	1732.5	-30.17	37.63	7.46	5.57	
	20393	1754.3	-30.39	37.64	7.25	5.31	

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	-22.93	36.45	13.52	22.49	H
	20175	1732.5	-23.20	36.80	13.60	22.91	
	20385	1753.5	-23.40	36.94	13.54	22.59	
	19965	1711.5	-28.66	37.28	8.62	7.28	V
	20175	1732.5	-28.80	37.63	8.83	7.64	
	20385	1753.5	-28.97	37.64	8.67	7.36	
Channel Bandwidth: 3 MHz / 16QAM							
X	19965	1711.5	-24.12	36.45	12.33	17.10	H
	20175	1732.5	-24.07	36.80	12.73	18.75	
	20385	1753.5	-24.57	36.94	12.37	17.26	
	19965	1711.5	-29.98	37.28	7.30	5.37	V
	20175	1732.5	-29.85	37.63	7.78	6.00	
	20385	1753.5	-30.08	37.64	7.56	5.70	

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	-22.72	36.45	13.73	23.60	H
	20175	1732.5	-22.85	36.80	13.95	24.83	
	20375	1752.5	-23.14	36.94	13.80	23.99	
	19975	1712.5	-28.46	37.28	8.82	7.62	V
	20175	1732.5	-28.60	37.63	9.03	8.00	
	20375	1752.5	-28.70	37.64	8.94	7.83	
Channel Bandwidth: 5 MHz / 16QAM							
X	19975	1712.5	-23.87	36.45	12.58	18.11	H
	20175	1732.5	-23.82	36.80	12.98	19.86	
	20375	1752.5	-24.24	36.94	12.70	18.62	
	19975	1712.5	-29.66	37.28	7.62	5.78	V
	20175	1732.5	-29.57	37.63	8.06	6.40	
	20375	1752.5	-29.81	37.64	7.83	6.07	

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	-22.70	36.64	13.94	24.77	H
	20175	1732.5	-22.65	36.80	14.15	26.00	
	20350	1750.0	-22.69	36.80	14.11	25.76	
	20000	1715.0	-28.37	37.44	9.07	8.07	V
	20175	1732.5	-28.31	37.63	9.32	8.55	
	20350	1750.0	-28.50	37.64	9.14	8.20	
Channel Bandwidth: 10 MHz / 16QAM							
X	20000	1715.0	-23.81	36.64	12.83	19.19	H
	20175	1732.5	-23.55	36.80	13.25	21.13	
	20350	1750.0	-23.81	36.80	12.99	19.91	
	20000	1715.0	-29.51	37.44	7.93	6.21	V
	20175	1732.5	-29.36	37.63	8.27	6.71	
	20350	1750.0	-29.51	37.64	8.13	6.50	

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	-22.18	36.45	14.27	26.73	H
	20175	1732.5	-22.43	36.80	14.37	27.35	
	20325	1747.5	-22.63	36.94	14.31	26.98	
	20025	1717.5	-27.93	37.28	9.35	8.61	V
	20175	1732.5	-28.05	37.63	9.58	9.08	
	20325	1747.5	-28.18	37.64	9.46	8.83	
Channel Bandwidth: 15 MHz / 16QAM							
X	20025	1717.5	-23.30	36.45	13.15	20.65	H
	20175	1732.5	-23.27	36.80	13.53	22.54	
	20325	1747.5	-23.63	36.94	13.31	21.43	
	20025	1717.5	-29.06	37.28	8.22	6.64	V
	20175	1732.5	-29.07	37.63	8.56	7.18	
	20325	1747.5	-29.30	37.64	8.34	6.82	

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	-21.87	36.45	14.58	28.71	H
	20175	1732.5	-22.11	36.80	14.69	29.44	
	20300	1745.0	-22.33	36.94	14.61	28.91	
	20050	1720.0	-27.59	37.28	9.69	9.31	V
	20175	1732.5	-27.85	37.63	9.78	9.51	
	20300	1745.0	-27.92	37.64	9.72	9.38	
Channel Bandwidth: 20 MHz / 16QAM							
X	20050	1720.0	-23.08	36.45	13.37	21.73	H
	20175	1732.5	-23.04	36.80	13.76	23.77	
	20300	1745.0	-23.33	36.94	13.61	22.96	
	20050	1720.0	-28.83	37.28	8.45	7.00	V
	20175	1732.5	-28.77	37.63	8.86	7.69	
	20300	1745.0	-29.08	37.64	8.56	7.18	

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

4.2 Modulation Characteristics Measurement

4.2.1 Limits of Modulation Characteristics

N/A

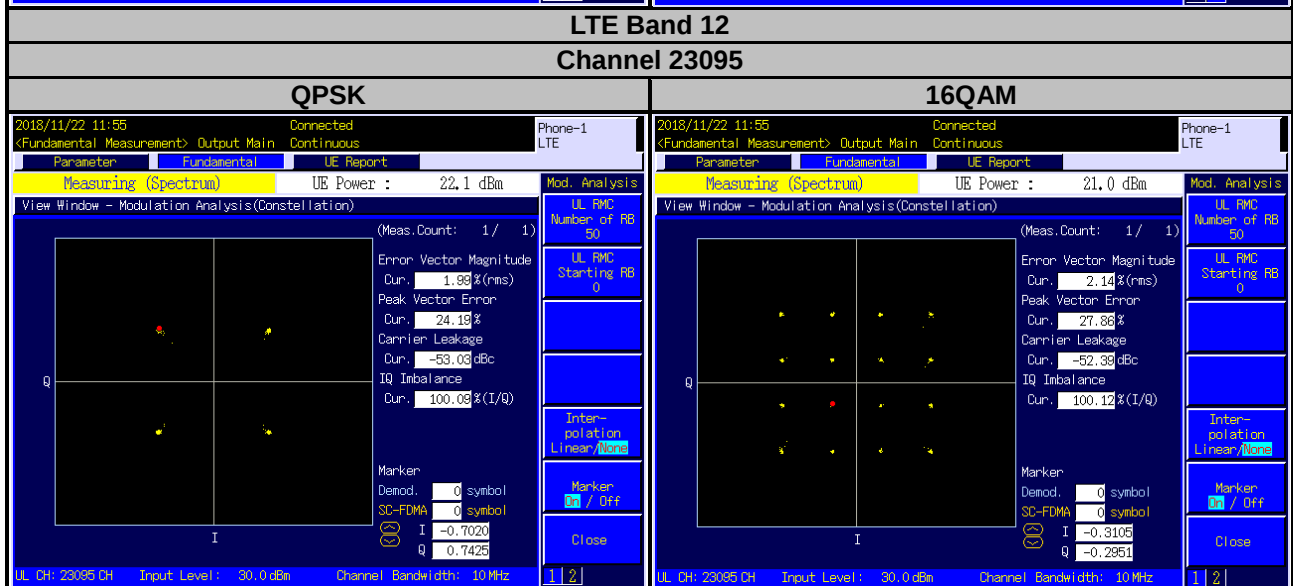
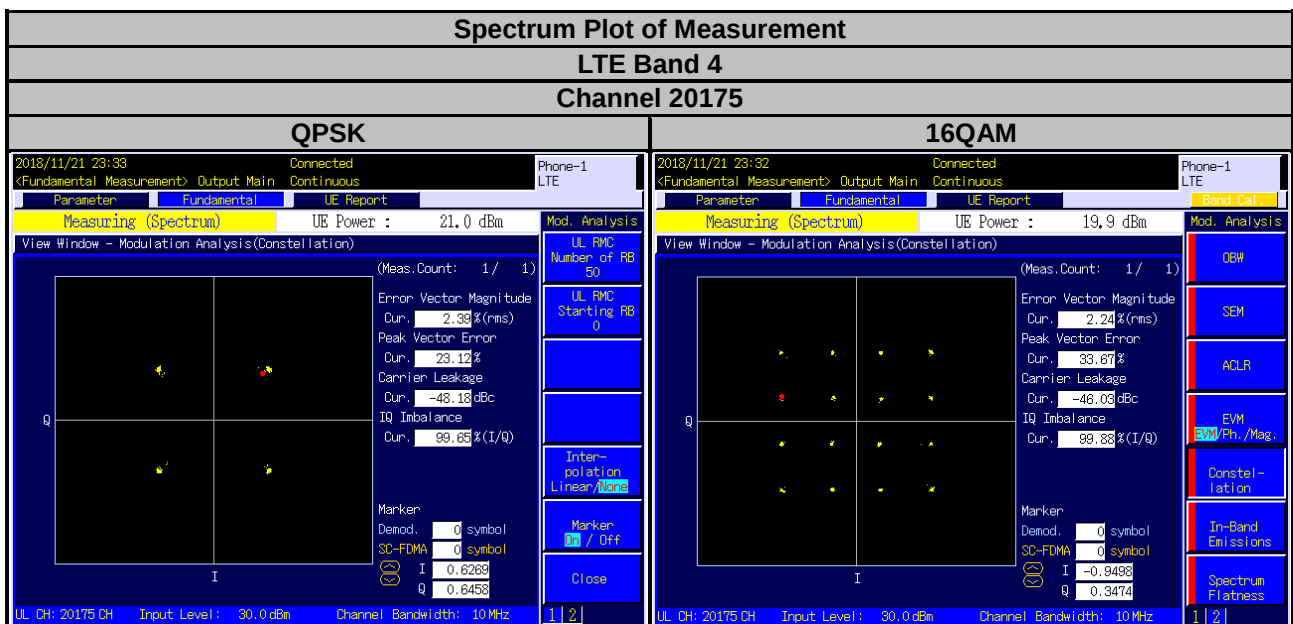
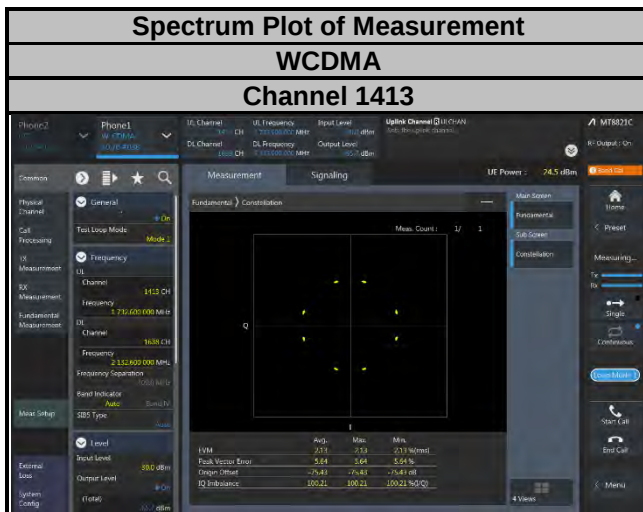
4.2.2 Test Setup



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



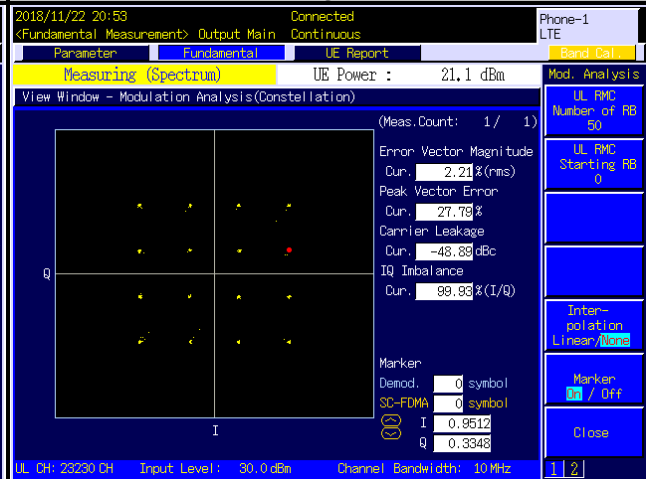
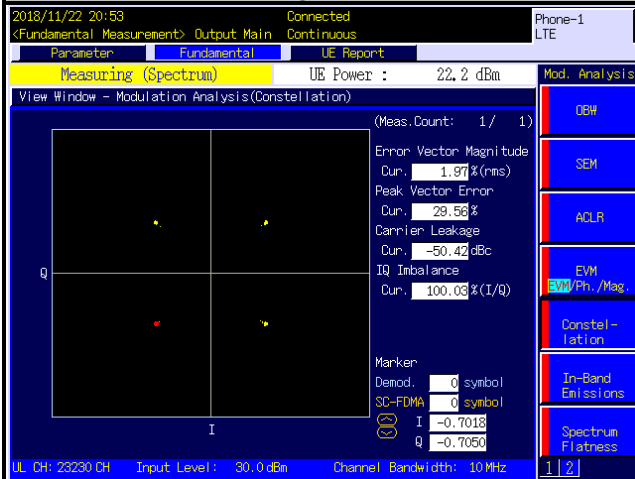
Spectrum Plot of Measurement

LTE Band 13

Channel 23230

QPSK

16QAM

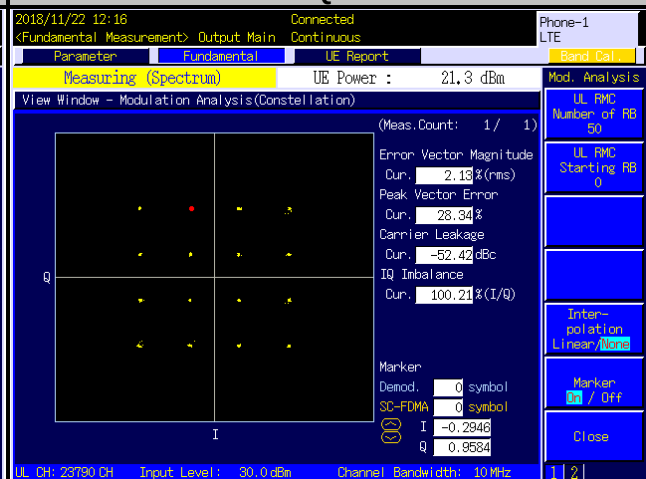
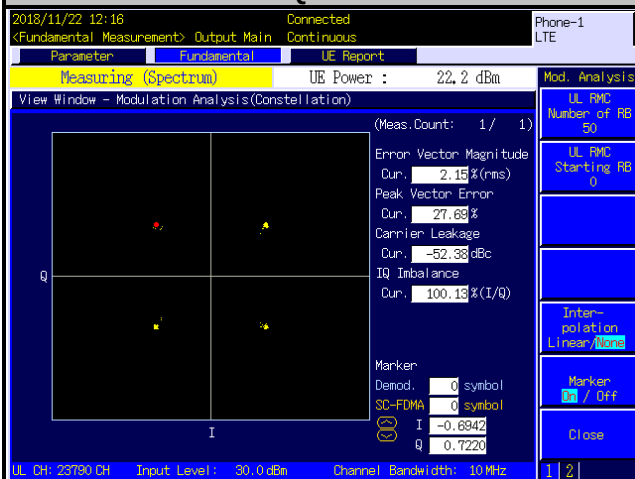


LTE Band 17

Channel 23790

QPSK

16QAM



4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

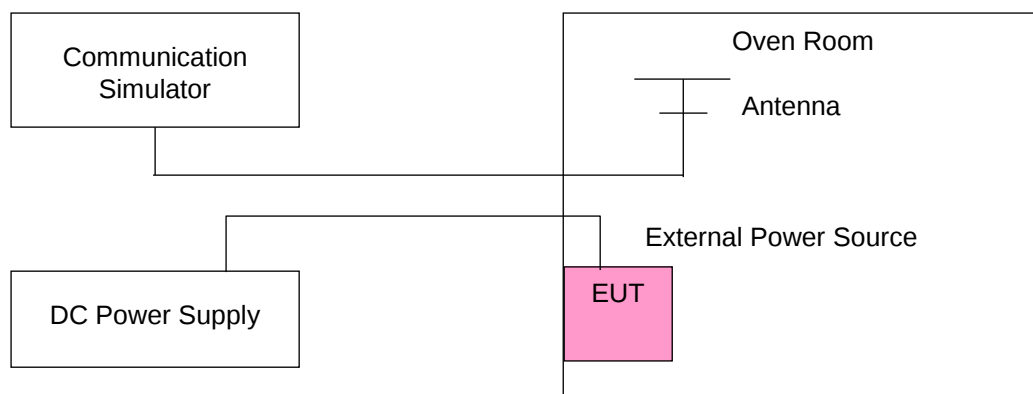
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

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 ± 0.5 °C during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

Note: The frequency error was recorded frequency error from the communication simulator.

4.3.3 Test Setup



4.3.4 Test Results

Frequency Error vs. Voltage

Voltage (Volts)	WCDMA			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.8	1712.400001	0.001	1752.600003	0.002
3.23	1712.400002	0.001	1752.600004	0.002
4.37	1712.400003	0.001	1752.600004	0.002

Note: The applicant defined the normal working voltage of the battery is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	WCDMA			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	1712.400003	0.002	1752.600001	0.001
-20	1712.400002	0.001	1752.600002	0.001
-10	1712.400002	0.001	1752.600001	0.001
0	1712.400003	0.002	1752.600004	0.002
10	1712.400002	0.001	1752.600004	0.002
20	1712.399999	-0.001	1752.599997	-0.002
30	1712.399998	-0.001	1752.599997	-0.002
40	1712.399998	-0.001	1752.599997	-0.001
50	1712.399996	-0.002	1752.599996	-0.002
55	1712.399998	-0.001	1752.599997	-0.002

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)
3.8	1710.700004	0.002	1754.300003	0.002
3.23	1710.700002	0.001	1754.300004	0.002
4.37	1710.700003	0.002	1754.300001	0.001

Note: The applicant defined the normal working voltage of the battery is from 3.23 Vdc to 4.37 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	1710.700003	0.002	1754.300002	0.001
-20	1710.700004	0.002	1754.300004	0.002
-10	1710.700002	0.001	1754.300003	0.002
0	1710.700004	0.002	1754.300002	0.001
10	1710.700003	0.001	1754.300004	0.002
20	1710.699998	-0.001	1754.299997	-0.002
30	1710.699998	-0.001	1754.299998	-0.001
40	1710.699997	-0.002	1754.299997	-0.002
50	1710.699997	-0.002	1754.299999	-0.001
55	1710.699998	-0.001	1754.299997	-0.002

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)
3.8	1711.500002	0.001	1753.500002	0.001
3.23	1711.500003	0.002	1753.500003	0.001
4.37	1711.500002	0.001	1753.500003	0.002

Note: The applicant defined the normal working voltage of the battery is from 3.23 Vdc to 4.37 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	1753.500003	0.001
-20	1711.500003	0.002	1753.500002	0.001
-10	1711.500001	0.001	1753.500004	0.002
0	1711.500004	0.002	1753.500003	0.002
10	1711.500001	0.001	1753.500003	0.002
20	1711.499999	-0.001	1753.499997	-0.002
30	1711.499998	-0.001	1753.499997	-0.002
40	1711.499998	-0.001	1753.499997	-0.002
50	1711.499997	-0.002	1753.499999	-0.001
55	1711.499996	-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)
3.8	1712.500001	0.001	1752.500002	0.001
3.23	1712.500004	0.002	1752.500002	0.001
4.37	1712.500002	0.001	1752.500004	0.002

Note: The applicant defined the normal working voltage of the battery is from 3.23 Vdc to 4.37 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	1712.500003	0.002	1752.500002	0.001
-20	1712.500004	0.002	1752.500002	0.001
-10	1712.500002	0.001	1752.500001	0.001
0	1712.500002	0.001	1752.500003	0.001
10	1712.500003	0.002	1752.500001	0.001
20	1712.499998	-0.001	1752.499997	-0.002
30	1712.499999	-0.001	1752.499998	-0.001
40	1712.499999	-0.001	1752.499998	-0.001
50	1712.499998	-0.001	1752.499998	-0.001
55	1712.499996	-0.002	1752.499998	-0.001

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)
3.8	1715.000003	0.002	1750.000004	0.002
3.23	1715.000002	0.001	1750.000002	0.001
4.37	1715.000004	0.002	1750.000002	0.001

Note: The applicant defined the normal working voltage of the battery is from 3.23 Vdc to 4.37 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	0.002
-20	1715.000002	0.001	1750.000003	0.001
-10	1715.000002	0.001	1750.000002	0.001
0	1715.000002	0.001	1750.000002	0.001
10	1715.000002	0.001	1750.000003	0.002
20	1714.999997	-0.002	1749.999997	-0.002
30	1714.999997	-0.002	1749.999998	-0.001
40	1714.999998	-0.001	1749.999999	-0.001
50	1714.999997	-0.002	1749.999999	-0.001
55	1714.999998	-0.001	1749.999997	-0.002

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)
3.8	1717.500003	0.001	1747.500002	0.001
3.23	1717.500003	0.002	1747.500003	0.002
4.37	1717.500004	0.002	1747.500004	0.002

Note: The applicant defined the normal working voltage of the battery is from 3.23 Vdc to 4.37 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	1747.500003	0.001
-20	1717.500002	0.001	1747.500004	0.002
-10	1717.500004	0.002	1747.500001	0.001
0	1717.500003	0.002	1747.500002	0.001
10	1717.500003	0.002	1747.500002	0.001
20	1717.499997	-0.002	1747.499996	-0.002
30	1717.499996	-0.002	1747.499998	-0.001
40	1717.499998	-0.001	1747.499996	-0.002
50	1717.499997	-0.002	1747.499998	-0.001
55	1717.499998	-0.001	1747.499997	-0.001

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)
3.8	1720.000004	0.002	1745.000003	0.002
3.23	1720.000004	0.002	1745.000003	0.002
4.37	1720.000003	0.002	1745.000003	0.002

Note: The applicant defined the normal working voltage of the battery is from 3.23 Vdc to 4.37 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	0.002	1745.000002	0.001
-20	1720.000004	0.002	1745.000001	0.001
-10	1720.000003	0.001	1745.000003	0.002
0	1720.000001	0.001	1745.000001	0.001
10	1720.000003	0.001	1745.000004	0.002
20	1719.999999	-0.001	1744.999998	-0.001
30	1719.999998	-0.001	1744.999998	-0.001
40	1719.999996	-0.002	1744.999998	-0.001
50	1719.999997	-0.002	1744.999998	-0.001
55	1719.999998	-0.001	1744.999997	-0.001

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.8	699.700004	0.005	715.300003	0.003
3.23	699.700002	0.003	715.300001	0.002
4.37	699.700001	0.002	715.300003	0.004

Note: The applicant defined the normal working voltage of the battery is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 12			
	Channel Bandwidth: 1.4 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	699.700004	0.005	715.300002	0.003
-20	699.700002	0.003	715.300003	0.004
-10	699.700003	0.005	715.300002	0.003
0	699.700002	0.003	715.300001	0.002
10	699.700002	0.003	715.300004	0.005
20	699.699996	-0.006	715.299998	-0.002
30	699.699998	-0.003	715.299997	-0.004
40	699.699998	-0.003	715.299997	-0.005
50	699.699997	-0.005	715.299998	-0.003
55	699.699997	-0.004	715.299996	-0.005

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.8	700.500002	0.003	714.500002	0.003
3.23	700.500003	0.004	714.500003	0.004
4.37	700.500001	0.002	714.500001	0.002

Note: The applicant defined the normal working voltage of the battery is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 12			
	Channel Bandwidth: 3 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	700.500002	0.002	714.500004	0.005
-20	700.500002	0.002	714.500003	0.004
-10	700.500003	0.004	714.500003	0.005
0	700.500002	0.003	714.500002	0.003
10	700.500003	0.004	714.500004	0.005
20	700.499997	-0.004	714.499997	-0.004
30	700.499999	-0.001	714.499999	-0.002
40	700.499997	-0.004	714.499997	-0.004
50	700.499999	-0.001	714.499999	-0.002
55	700.499997	-0.004	714.499998	-0.003

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.8	701.500003	0.004	713.500002	0.002
3.23	701.500001	0.002	713.500002	0.003
4.37	701.500003	0.004	713.500003	0.004

Note: The applicant defined the normal working voltage of the battery is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 12			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	701.500003	0.004	713.500002	0.002
-20	701.500003	0.004	713.500003	0.004
-10	701.500002	0.003	713.500002	0.002
0	701.500003	0.004	713.500003	0.004
10	701.500004	0.006	713.500001	0.002
20	701.499997	-0.004	713.499998	-0.003
30	701.499998	-0.002	713.499999	-0.002
40	701.499998	-0.003	713.499996	-0.005
50	701.499998	-0.003	713.499999	-0.002
55	701.499998	-0.003	713.499998	-0.003

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.8	704.000004	0.006	711.000004	0.005
3.23	704.000002	0.002	711.000003	0.004
4.37	704.000002	0.003	711.000003	0.004

Note: The applicant defined the normal working voltage of the battery is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 12			
	Channel Bandwidth: 10 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	704.000001	0.002	711.000003	0.004
-20	704.000003	0.004	711.000003	0.004
-10	704.000003	0.004	711.000003	0.004
0	704.000002	0.003	711.000003	0.005
10	704.000004	0.005	711.000002	0.002
20	703.999998	-0.003	710.999999	-0.002
30	703.999997	-0.005	710.999997	-0.004
40	703.999998	-0.003	710.999997	-0.004
50	703.999998	-0.003	710.999997	-0.004
55	703.999996	-0.006	710.999999	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 13			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
3.8	779.500003	0.004	784.500001	0.001
3.23	779.500003	0.004	784.500003	0.004
4.37	779.500002	0.002	784.500003	0.003

Note: The applicant defined the normal working voltage of the battery is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 13			
	Channel Bandwidth: 5 MHz			
	Low Channel		High Channel	
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
-30	779.500003	0.003	784.500002	0.002
-20	779.500003	0.004	784.500003	0.004
-10	779.500002	0.002	784.500002	0.003
0	779.500003	0.004	784.500003	0.003
10	779.500003	0.003	784.500002	0.002
20	779.499997	-0.004	784.499999	-0.001
30	779.499996	-0.005	784.499997	-0.004
40	779.499998	-0.003	784.499997	-0.004
50	779.499997	-0.004	784.499999	-0.002
55	779.499999	-0.002	784.499999	-0.002

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 13	
	Channel Bandwidth: 10 MHz	
	Frequency (MHz)	Frequency Error (ppm)
3.8	782.000003	0.004
3.23	782.000002	0.002
4.37	782.000003	0.003

Note: The applicant defined the normal working voltage of the battery is from 3.23 Vdc to 4.37 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 13	
	Channel Bandwidth: 10 MHz	
	Frequency (MHz)	Frequency Error (ppm)
-30	782.000002	0.003
-20	782.000002	0.003
-10	782.000001	0.002
0	782.000004	0.005
10	782.000003	0.004
20	781.999999	-0.002
30	781.999998	-0.002
40	781.999999	-0.002
50	781.999998	-0.003
55	781.999999	-0.002

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)
3.8	706.500002	0.003	713.500002	0.003
3.23	706.500003	0.004	713.500004	0.005
4.37	706.500003	0.004	713.500002	0.003

Note: The applicant defined the normal working voltage of the battery is from 3.23 Vdc to 4.37 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	706.500001	0.002	713.500003	0.004
-10	706.500002	0.002	713.500002	0.003
0	706.500004	0.006	713.500003	0.004
10	706.500003	0.004	713.500003	0.004
20	706.499997	-0.004	713.499999	-0.002
30	706.499997	-0.004	713.499998	-0.003
40	706.499997	-0.005	713.499999	-0.002
50	706.499999	-0.002	713.499998	-0.003
55	706.499997	-0.004	713.499998	-0.002

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)
3.8	709.000003	0.004	711.000003	0.004
3.23	709.000003	0.004	711.000003	0.004
4.37	709.000004	0.006	711.000002	0.003

Note: The applicant defined the normal working voltage of the battery is from 3.23 Vdc to 4.37 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	709.000003	0.004	711.000004	0.005
-20	709.000002	0.003	711.000003	0.004
-10	709.000003	0.005	711.000002	0.002
0	709.000004	0.005	711.000003	0.004
10	709.000002	0.003	711.000001	0.002
20	708.999997	-0.004	710.999996	-0.005
30	708.999997	-0.004	710.999999	-0.002
40	708.999997	-0.005	710.999996	-0.005
50	708.999997	-0.004	710.999998	-0.003
55	708.999997	-0.004	710.999997	-0.004

4.4 Occupied Bandwidth Measurement

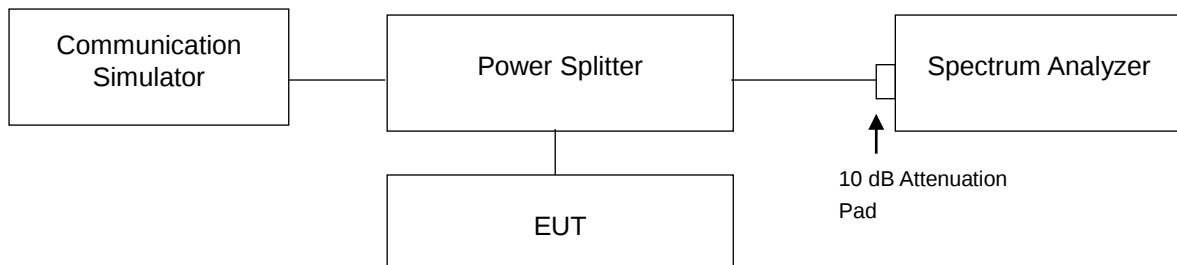
4.4.1 Limits of Occupied Bandwidth Measurement

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

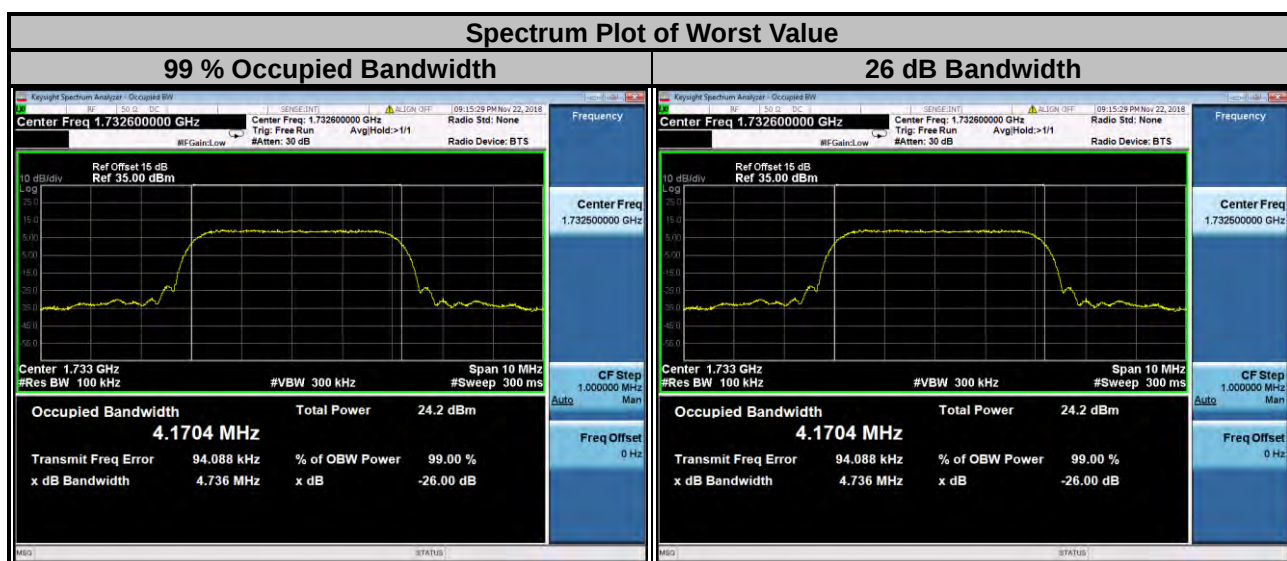
- The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

4.4.3 Test Setup



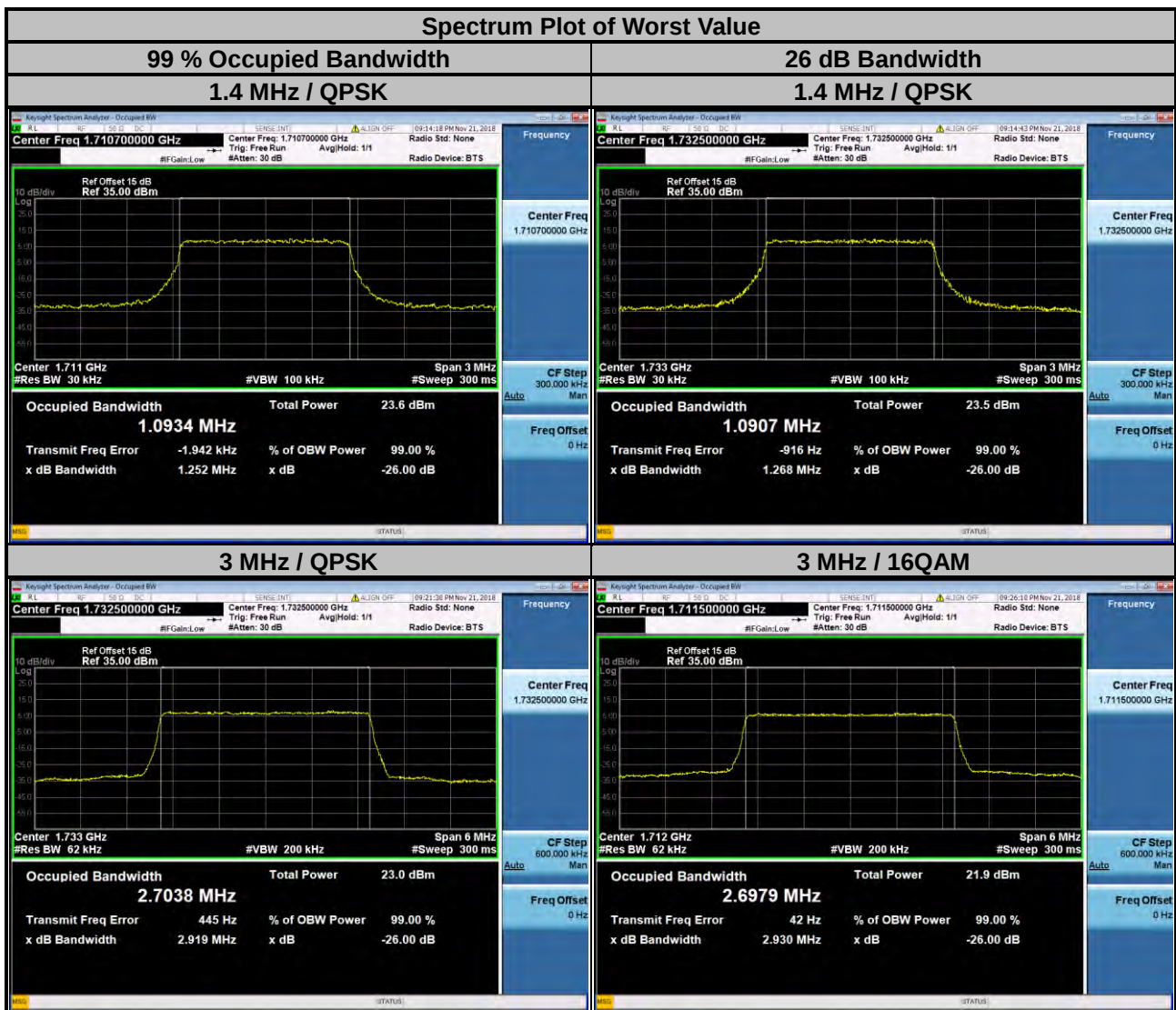
4.4.4 Test Result

WCDMA			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
1312	1712.4	4.1659	4.734
1413	1732.6	4.1704	4.736
1513	1752.6	4.1653	4.723



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	1.0934	1.0899	1.252	1.261
20175	1732.5	1.0907	1.0890	1.268	1.267
20393	1754.3	1.0927	1.0892	1.258	1.261

Channel Bandwidth: 3 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
19965	1711.5	2.7001	2.6979	2.917	2.930
20175	1732.5	2.7038	2.7002	2.919	2.925
20385	1753.5	2.7026	2.6993	2.919	2.926



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	4.4927	4.4959	4.827	4.836
20175	1732.5	4.4940	4.4952	4.843	4.825
20375	1752.5	4.4935	4.4966	4.816	4.835
Channel Bandwidth: 10 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
20000	1715.0	8.9550	8.9594	9.509	9.513
20175	1732.5	8.9692	8.9763	9.518	9.521
20350	1750.0	8.9596	8.9674	9.514	9.524



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	13.443	13.441	14.23	14.23
20175	1732.5	13.479	13.479	14.25	14.26
20325	1747.5	13.452	13.452	14.24	14.24
Channel Bandwidth: 20 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
20050	1720.0	17.915	17.912	19.02	19.01
20175	1732.5	18.006	17.999	19.07	19.06
20300	1745.0	17.943	17.938	19.04	19.04



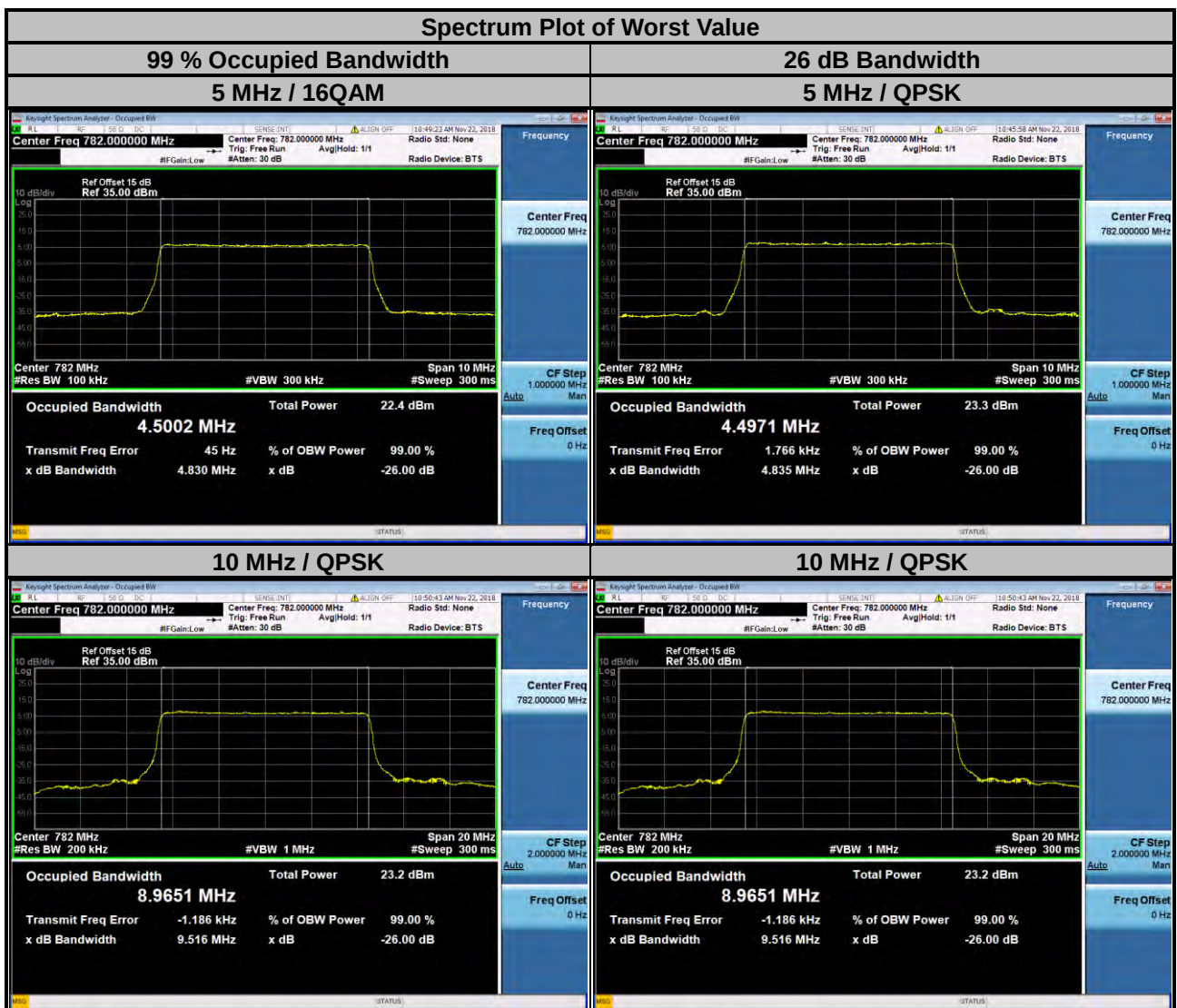
LTE Band 12					
Channel Bandwidth: 1.4 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
23017	699.7	1.0895	1.0894	1.270	1.258
23095	707.5	1.0875	1.0904	1.258	1.252
23173	715.3	1.0878	1.0872	1.258	1.252
Channel Bandwidth: 3 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
23025	700.5	2.7017	2.6957	2.916	2.923
23095	707.5	2.7015	2.6996	2.911	2.933
23165	714.5	2.6988	2.6966	2.915	2.923



LTE Band 12					
Channel Bandwidth: 5 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
23035	701.5	4.4848	4.4842	4.797	4.800
23095	707.5	4.4984	4.5008	4.838	4.837
23155	713.5	4.4857	4.4864	4.791	4.799
Channel Bandwidth: 10 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
23060	704.0	8.9418	8.9430	9.490	9.505
23095	707.5	8.9921	8.9935	9.533	9.556
23130	711.0	8.9564	8.9603	9.490	9.501



LTE Band 13					
Channel Bandwidth: 5 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
23205	779.5	4.4874	4.4947	4.831	4.817
23230	782.0	4.4971	4.5002	4.835	4.830
23255	784.5	4.4940	4.4948	4.817	4.828
Channel Bandwidth: 10 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
23230	782.0	8.9651	8.9627	9.516	9.516



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	4.4978	4.5006	4.827	4.827
23790	710.0	4.5003	4.5012	4.823	4.826
23825	713.5	4.4849	4.4847	4.811	4.813
Channel Bandwidth: 10 MHz					
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		26 dB Bandwidth (MHz)	
		QPSK	16QAM	QPSK	16QAM
23780	709.0	8.9851	8.9876	9.518	9.519
23790	710.0	8.9714	8.9710	9.507	9.507
23800	711.0	8.9513	8.9582	9.503	9.513



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.

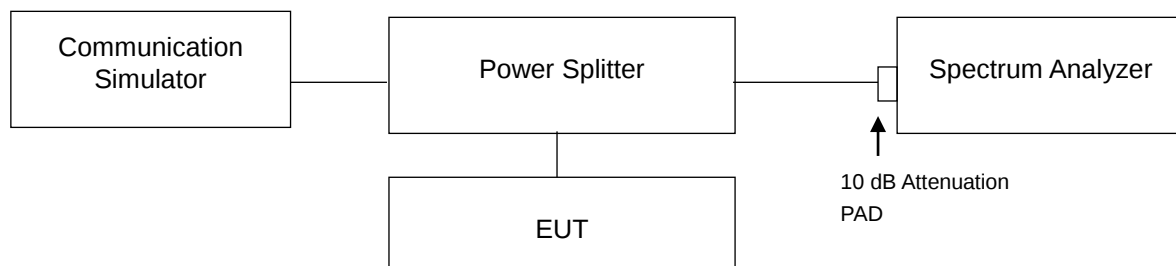
However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

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.

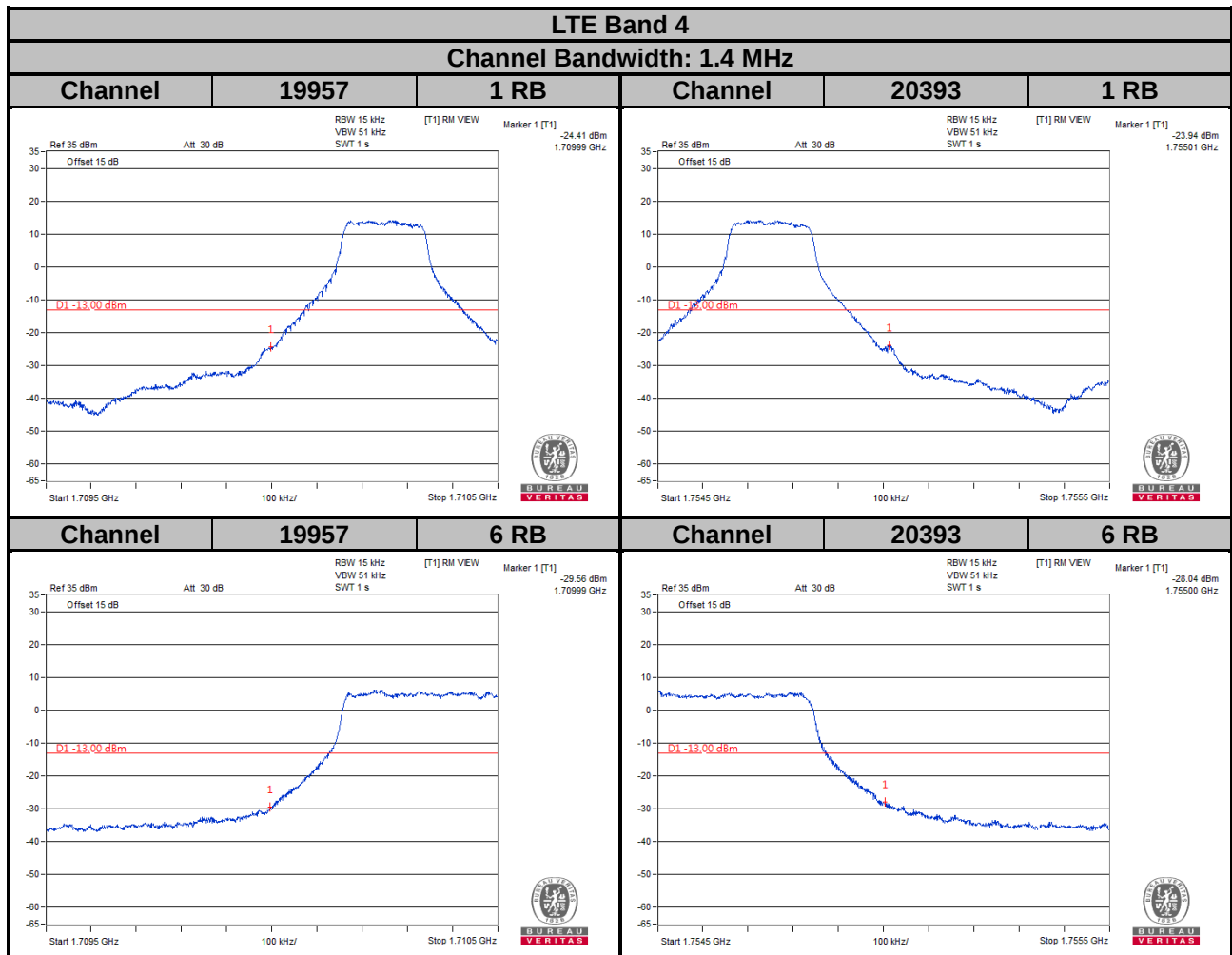
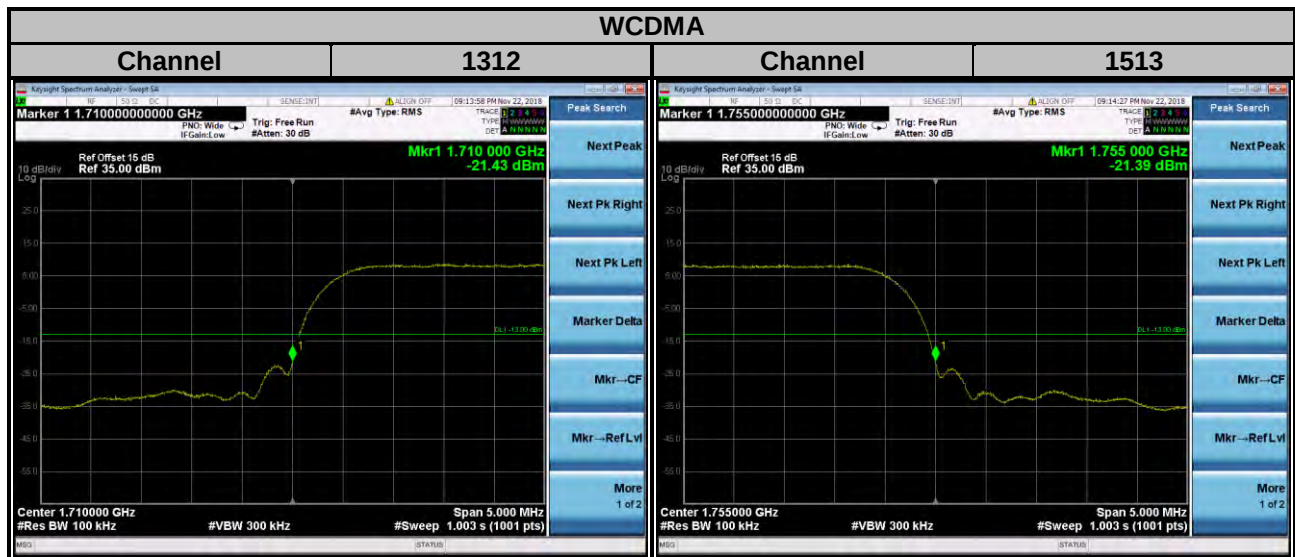
4.5.2 Test Setup

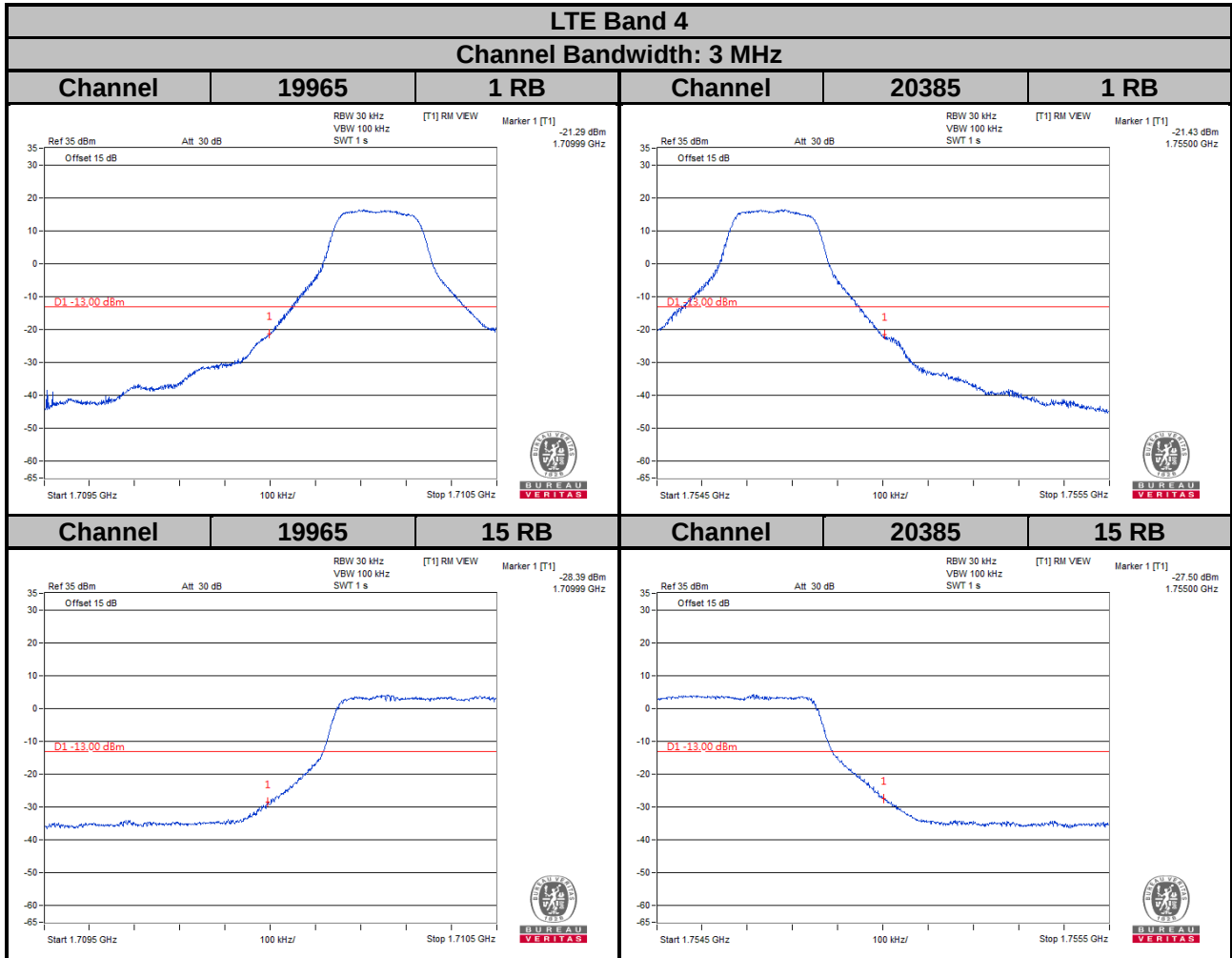


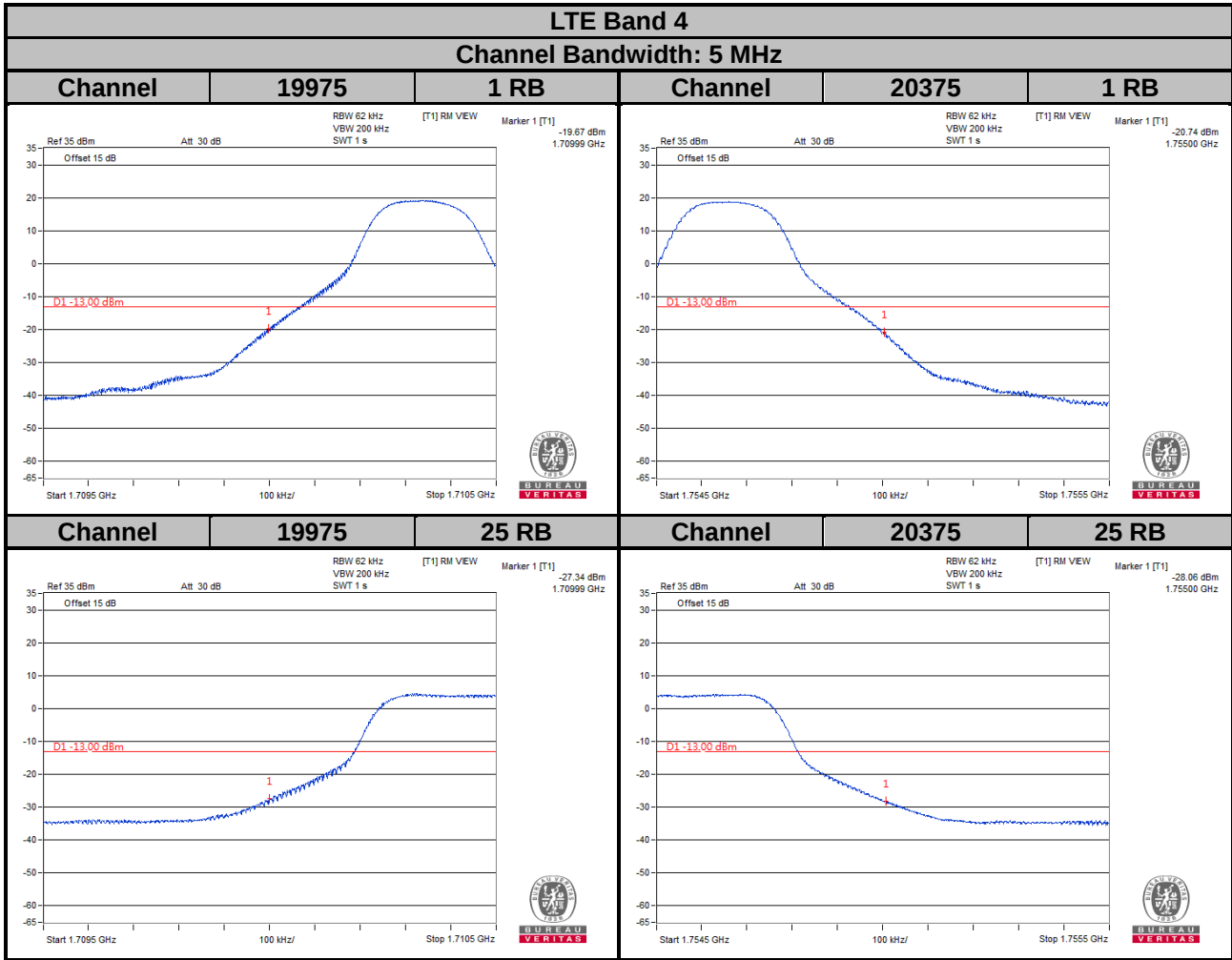
4.5.3 Test Procedures

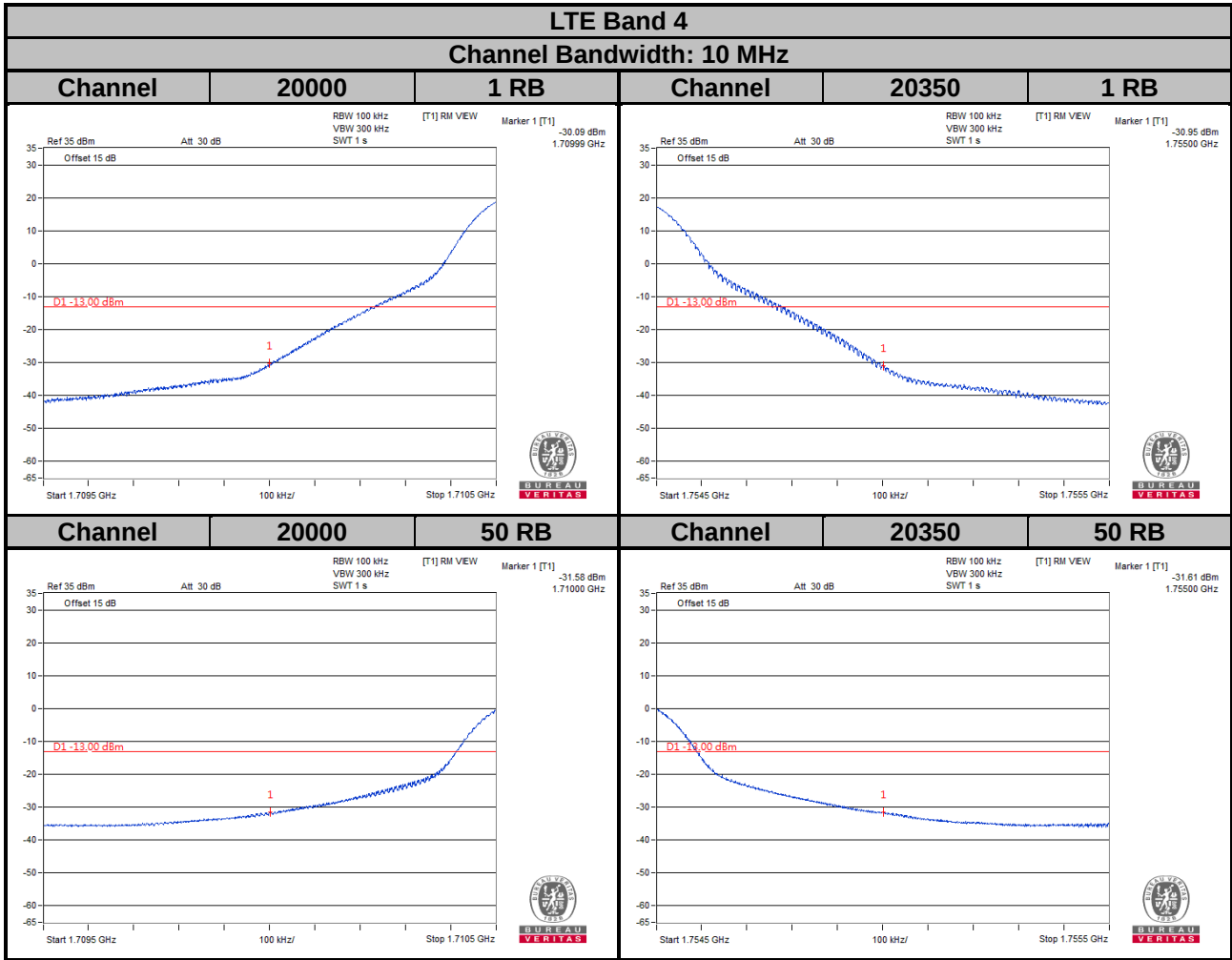
- All measurements were done at low and high operational frequency range.
- The center frequency of spectrum is the band edge frequency and span is 5 MHz. RB of the spectrum is 100 kHz and VB of the spectrum is 300 kHz (WCDMA).
- The center frequency of spectrum is the band edge frequency and span is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

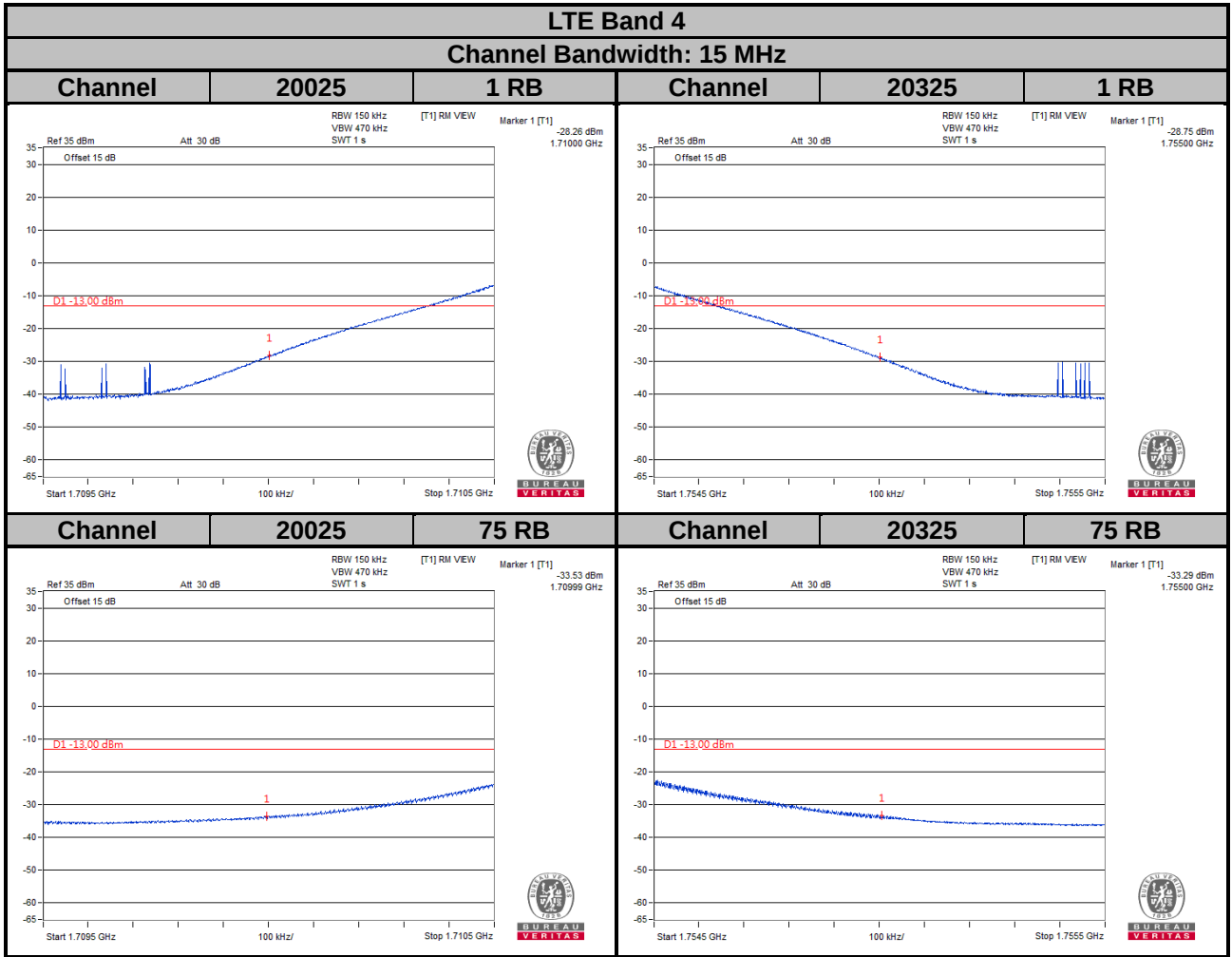
4.5.4 Test Results

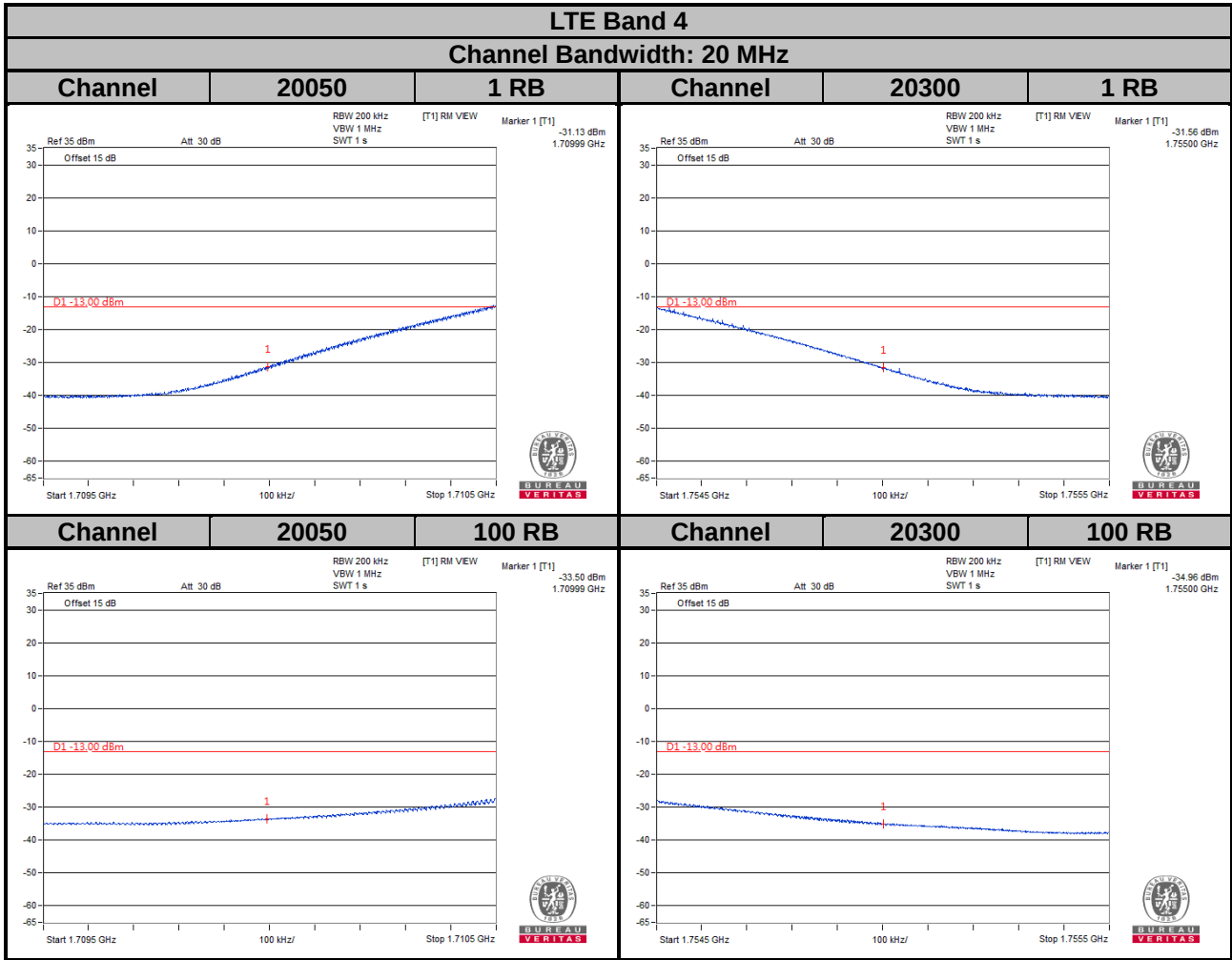






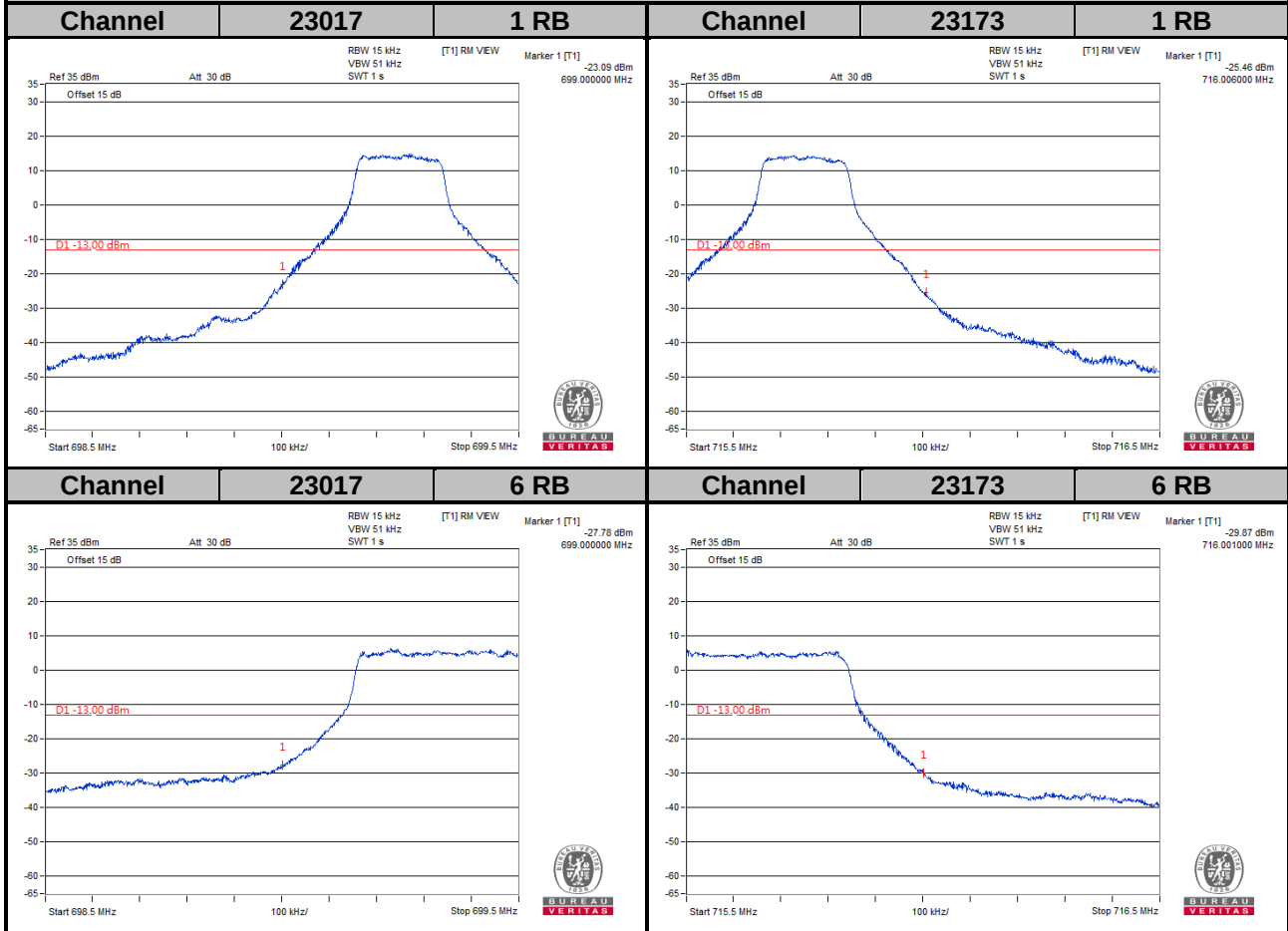


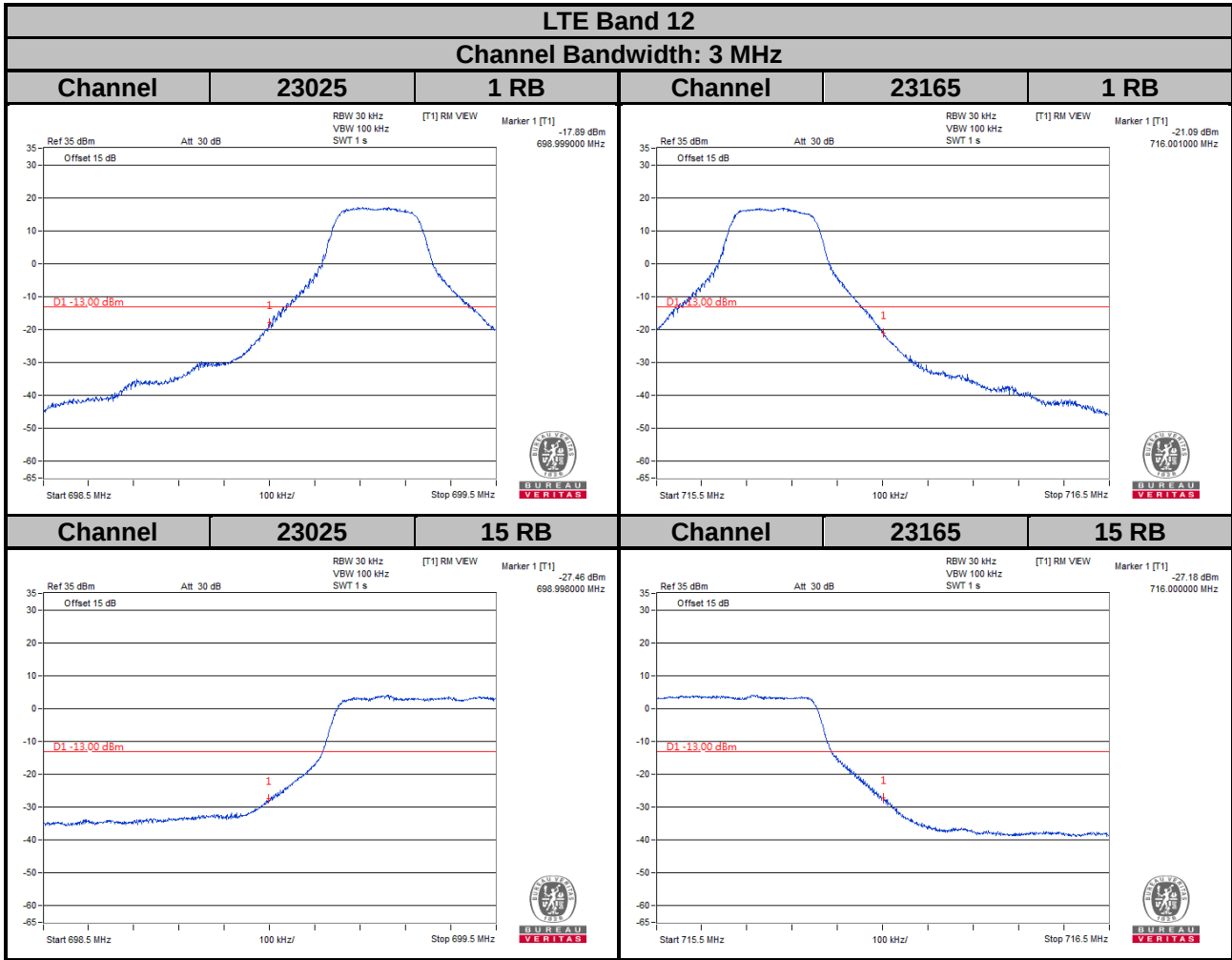


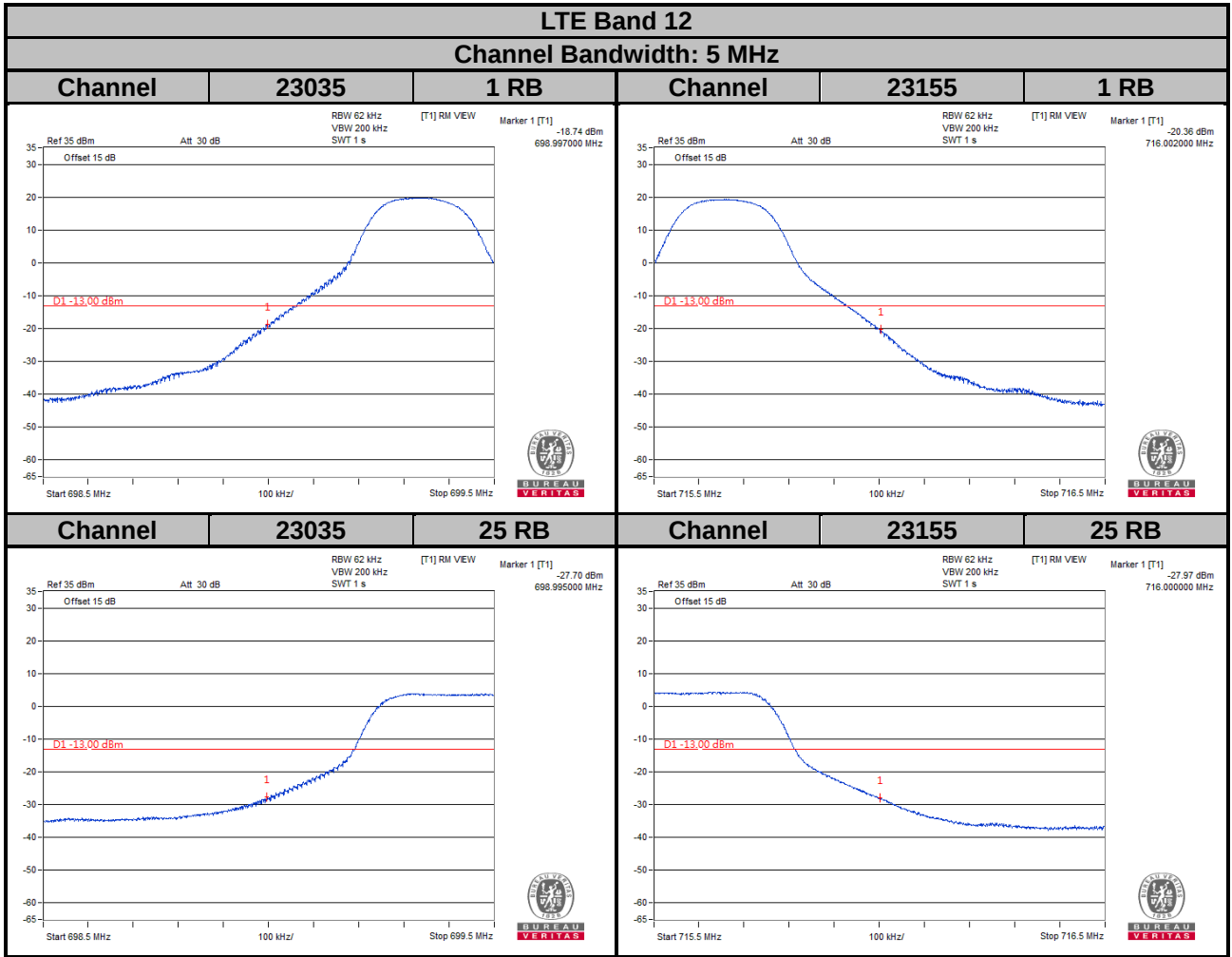


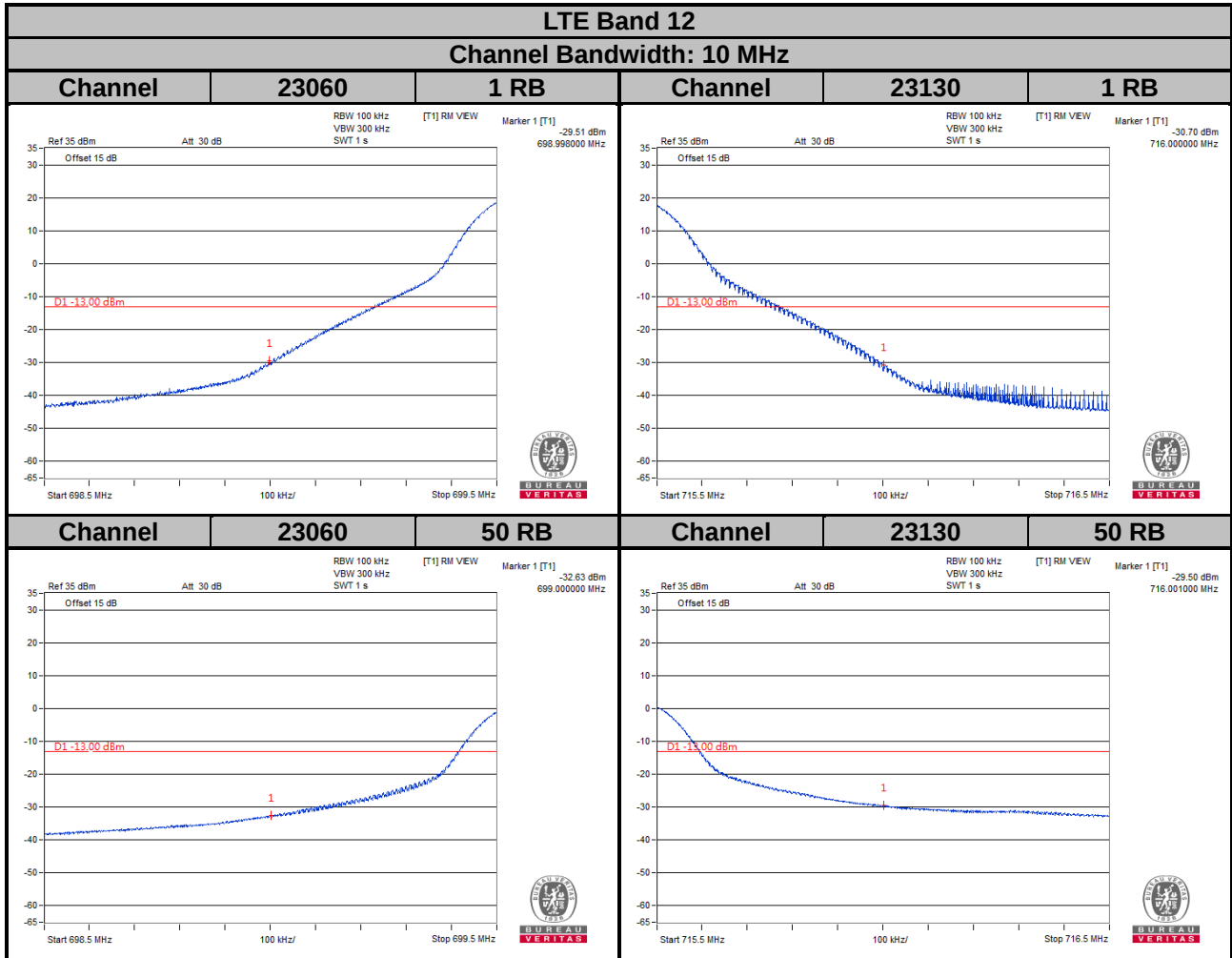
LTE Band 12

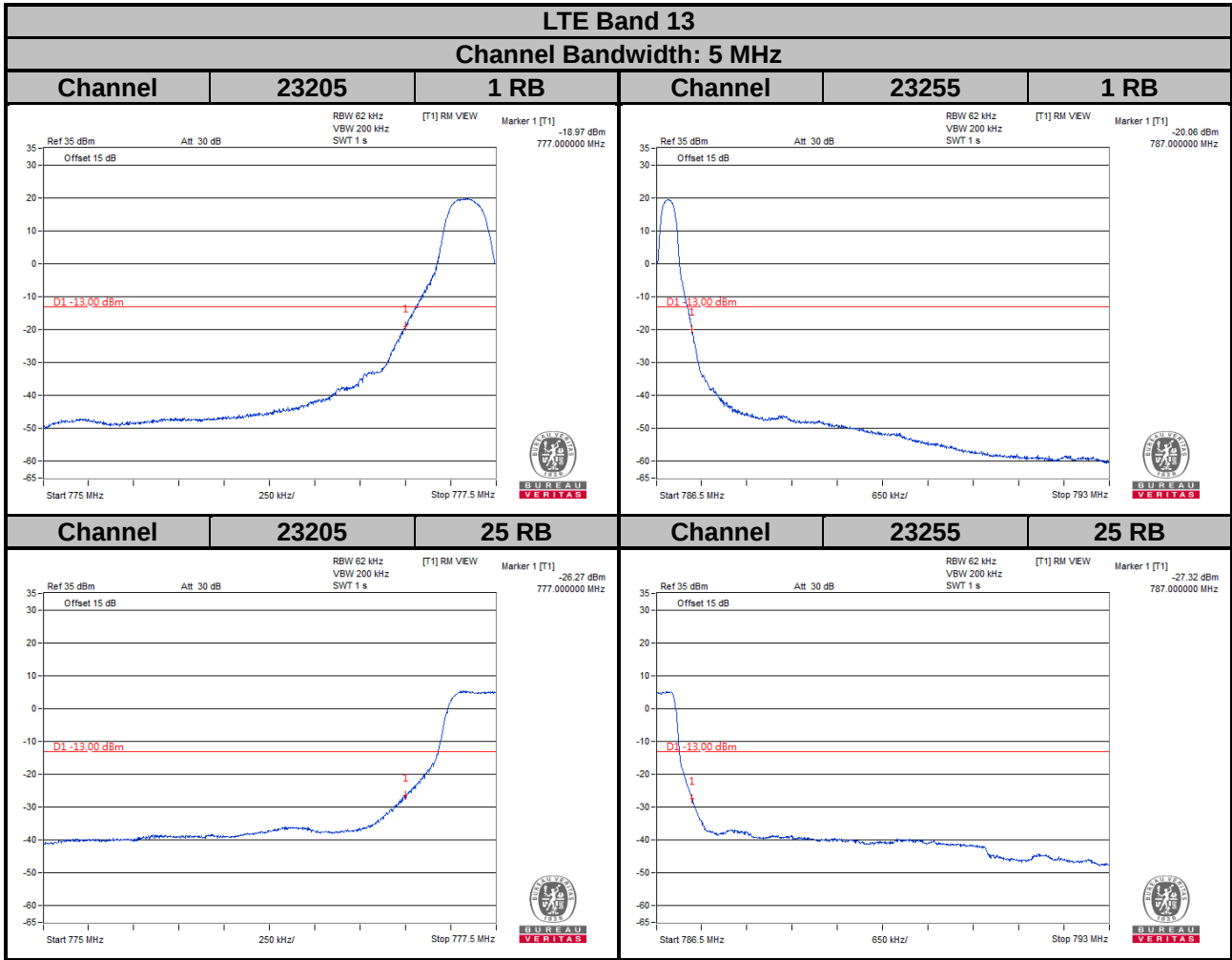
Channel Bandwidth: 1.4 MHz

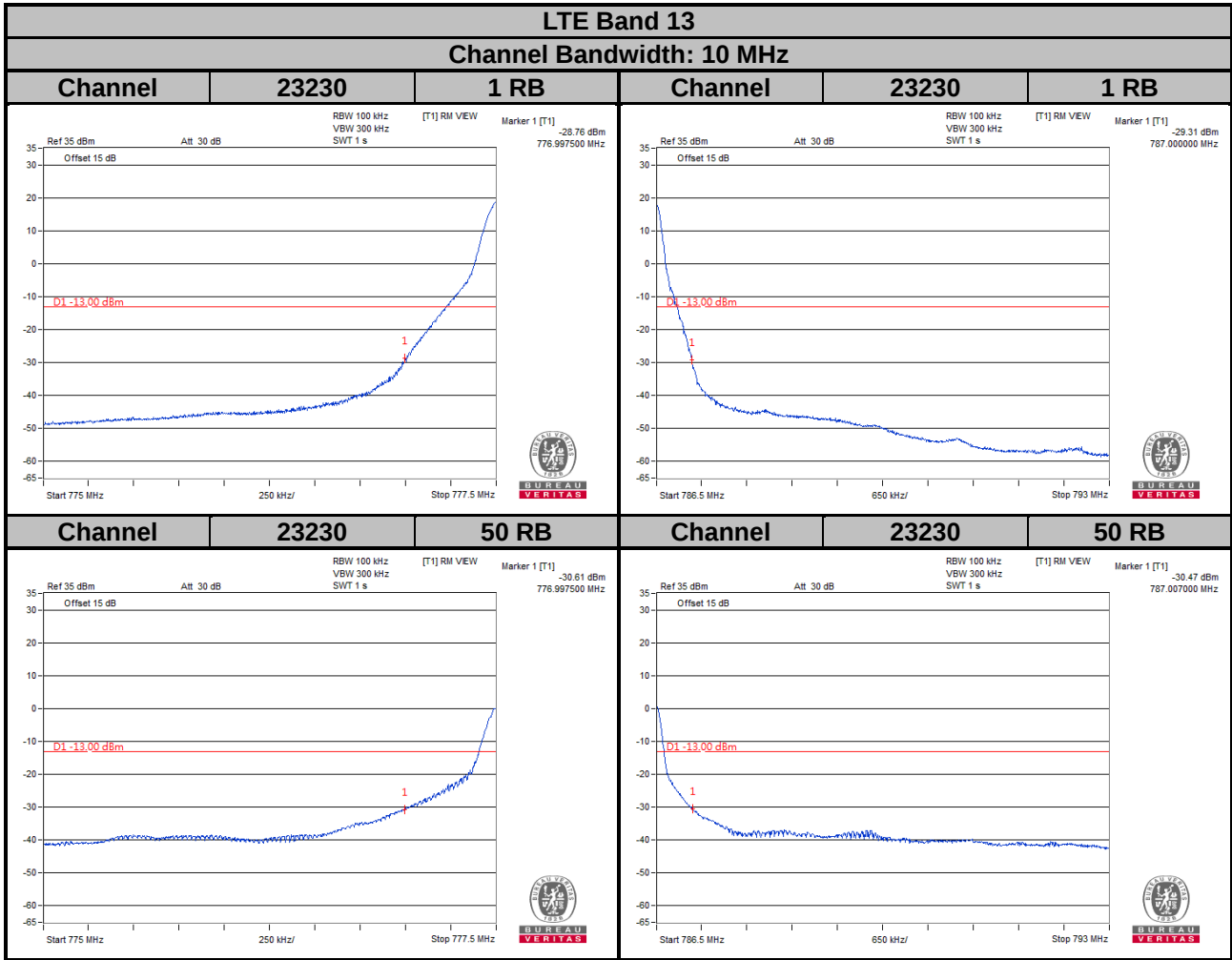






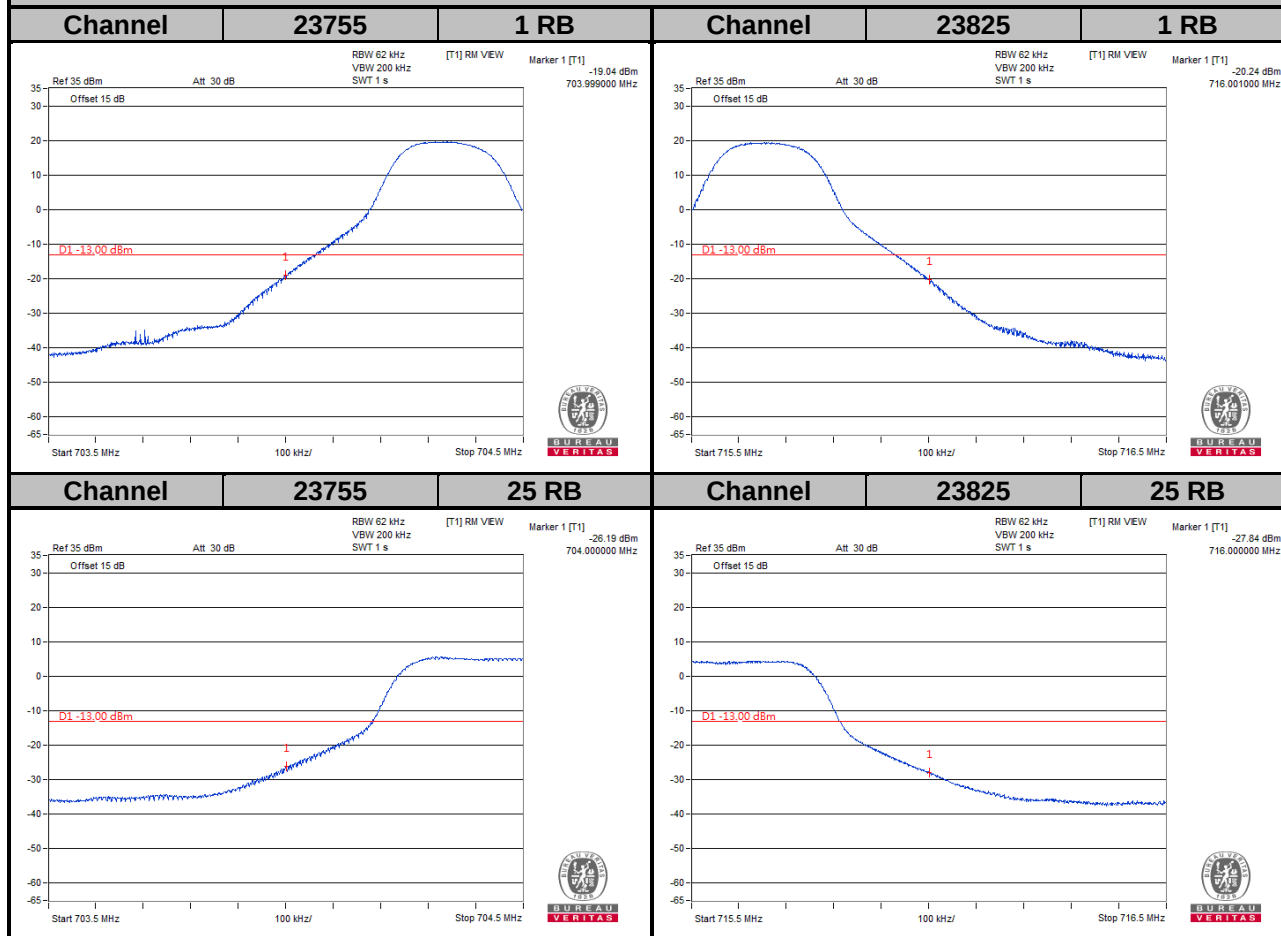






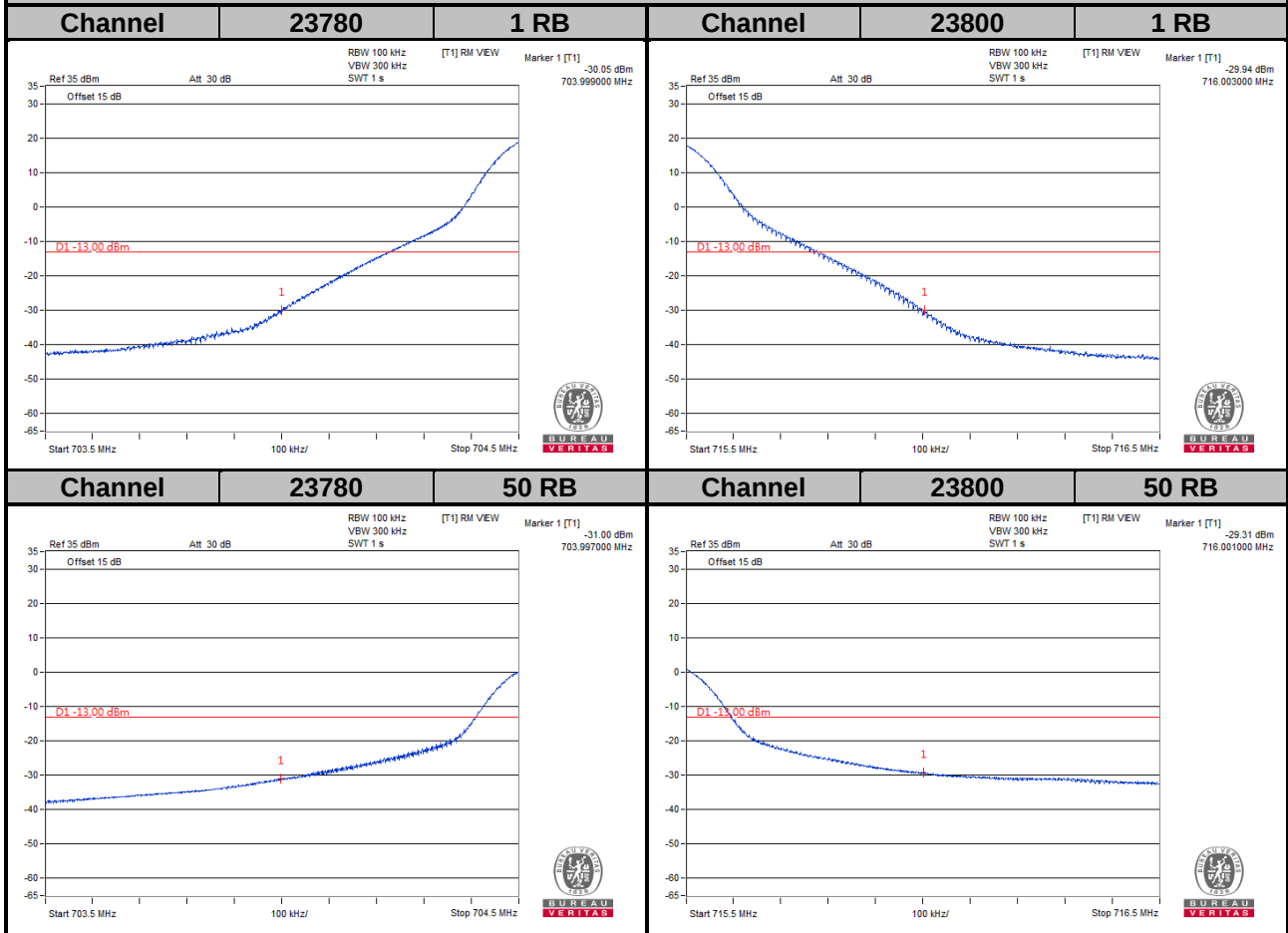
LTE Band 17

Channel Bandwidth: 5 MHz

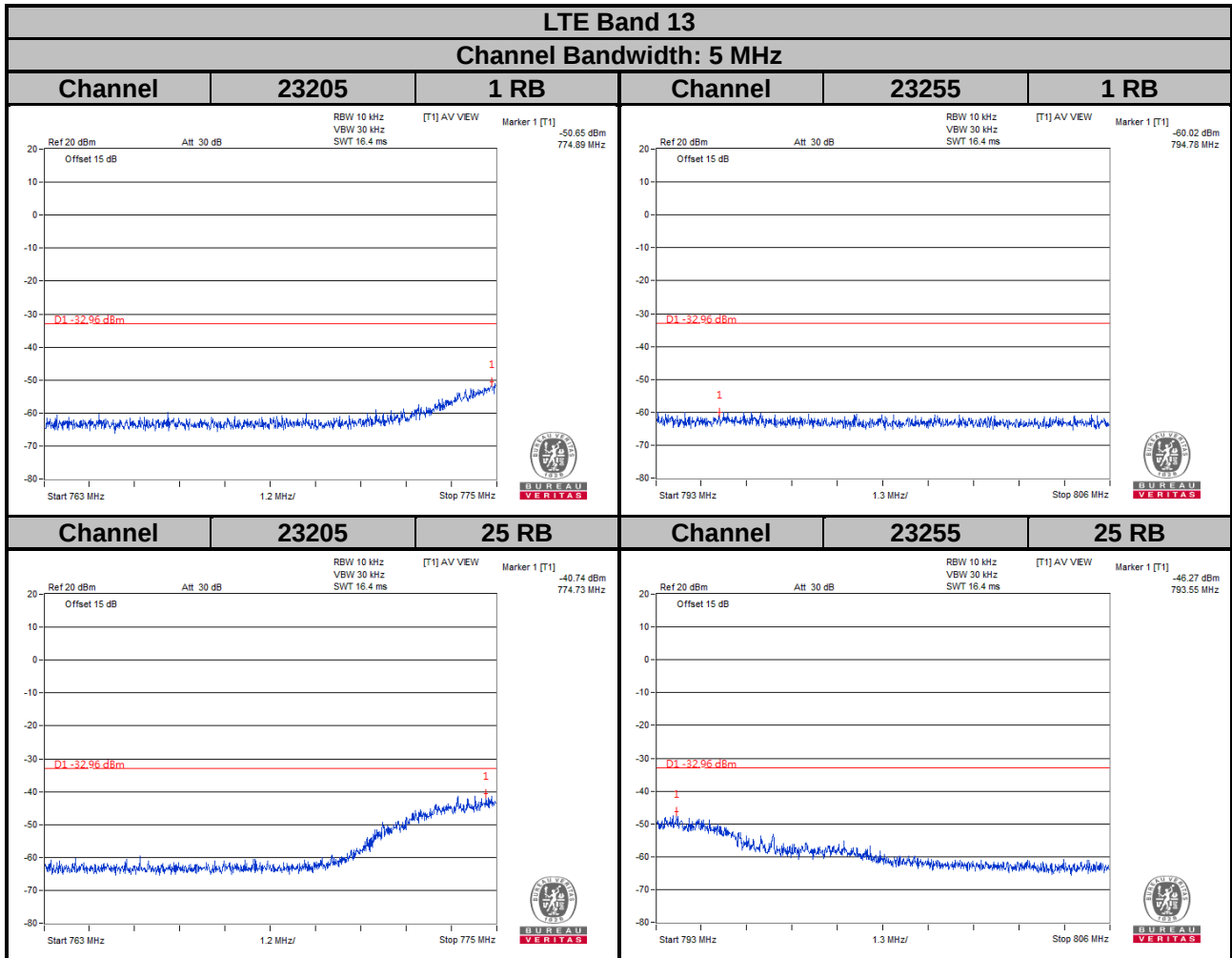


LTE Band 17

Channel Bandwidth: 10 MHz



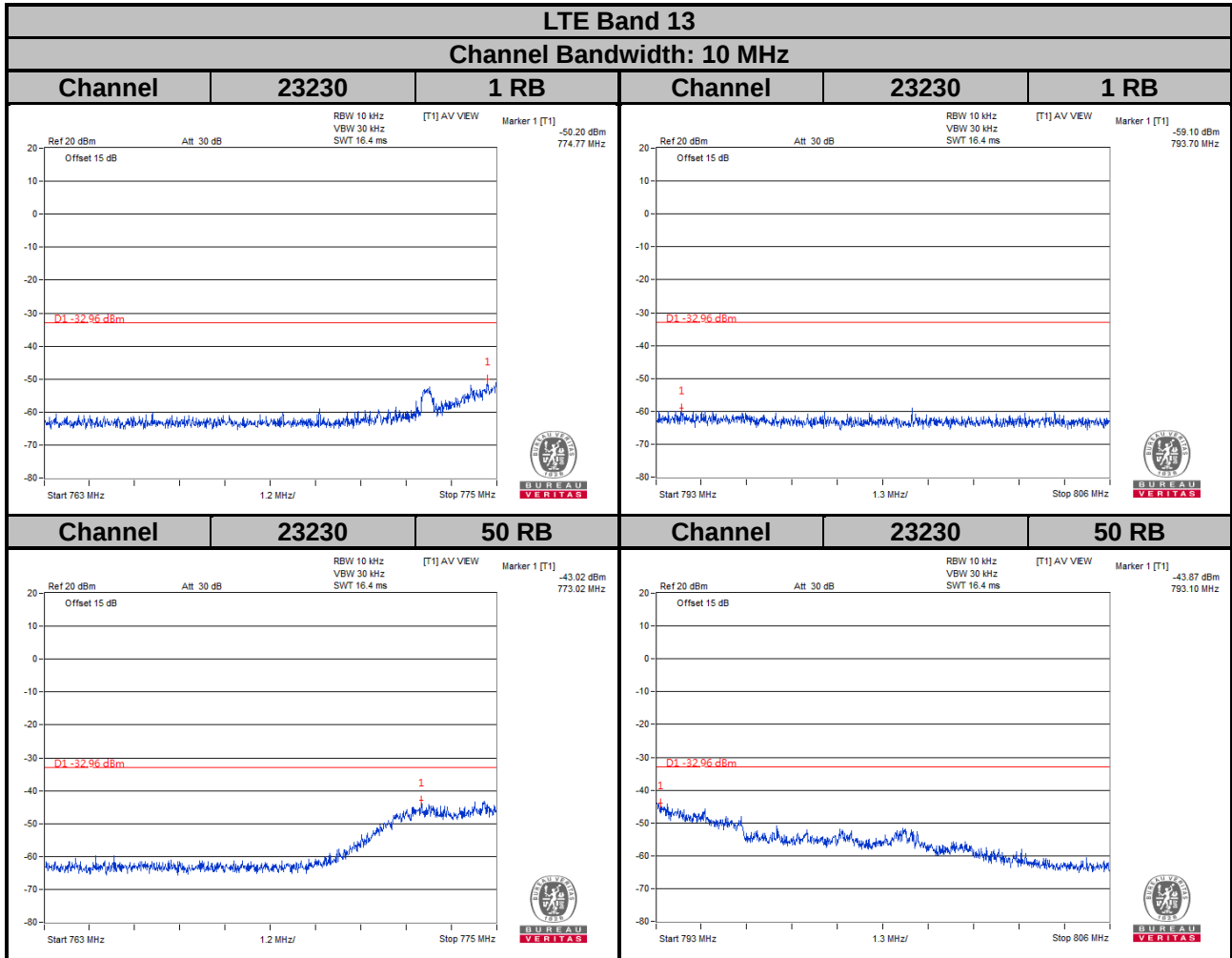
Emission Mask



For the 763 - 775 MHz and 793 - 805 MHz band, the FCC limit is $65 + 10\log(P[\text{watt}])$ in a 6.25 kHz bandwidth. Since it was not possible to set the resolution bandwidth to 6.25 kHz with the available equipment, a bandwidth of 10 kHz was used instead to show compliance. By using a 10 kHz bandwidth on the spectrum analyzer.

$$10\log(10\text{kHz}/6.25\text{kHz}) = 2.04 \text{ dB}$$

$$\text{Limit line} = -35 \text{ dBm} + 2.04 \text{ dB} = -32.96 \text{ dBm}$$



For the 763 - 775 MHz and 793 - 805 MHz band, the FCC limit is $65 + 10\log(P[\text{watt}])$ in a 6.25 kHz bandwidth. Since it was not possible to set the resolution bandwidth to 6.25 kHz with the available equipment, a bandwidth of 10 kHz was used instead to show compliance. By using a 10 kHz bandwidth on the spectrum analyzer.

$$10\log(10\text{kHz}/6.25\text{kHz}) = 2.04 \text{ dB}$$

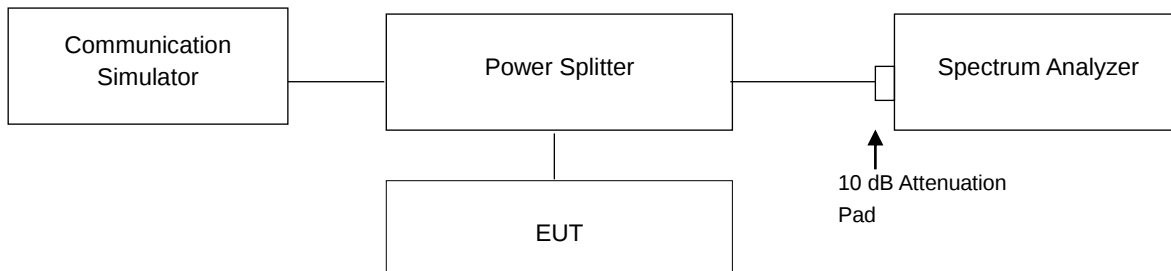
$$\text{Limit line} = -35 \text{ dBm} + 2.04 \text{ dB} = -32.96 \text{ dBm}$$

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

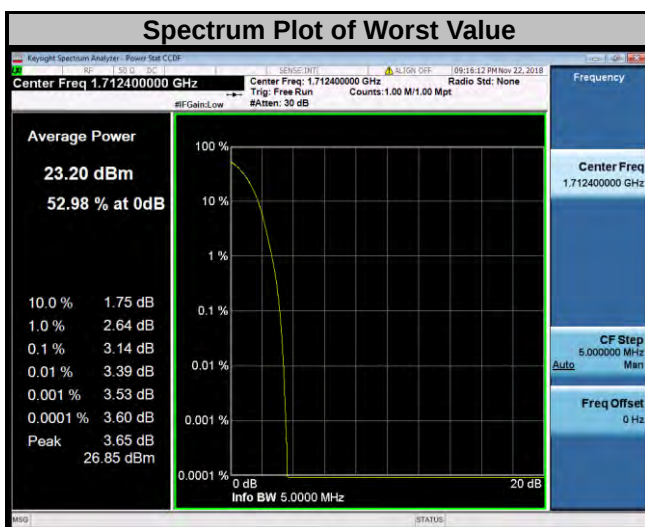


4.6.3 Test Procedures

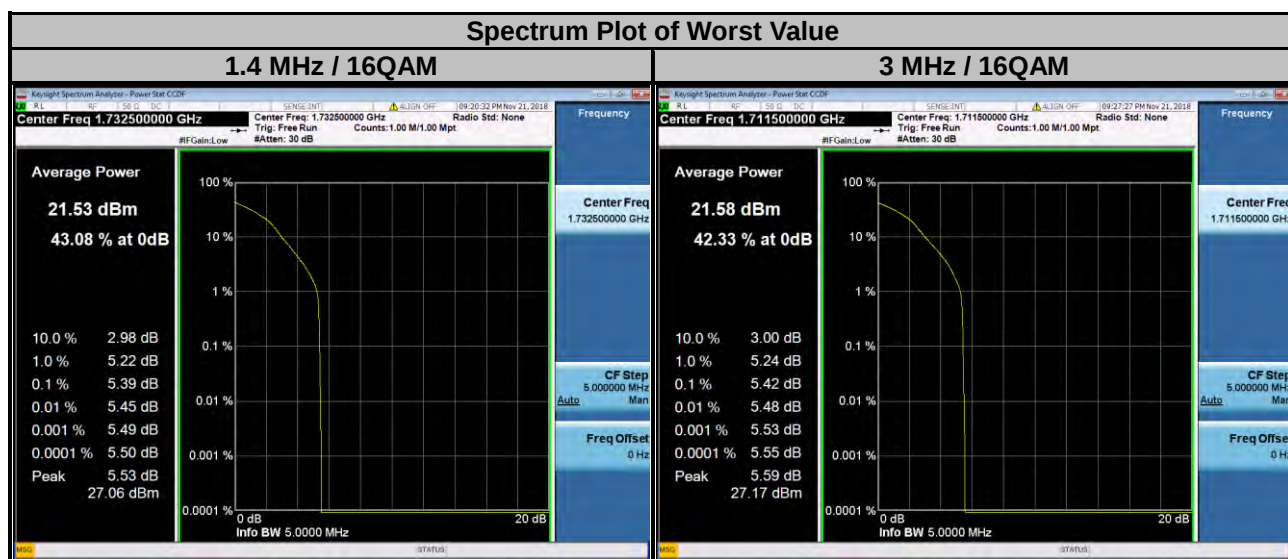
1. Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1 %.

4.6.4 Test Results

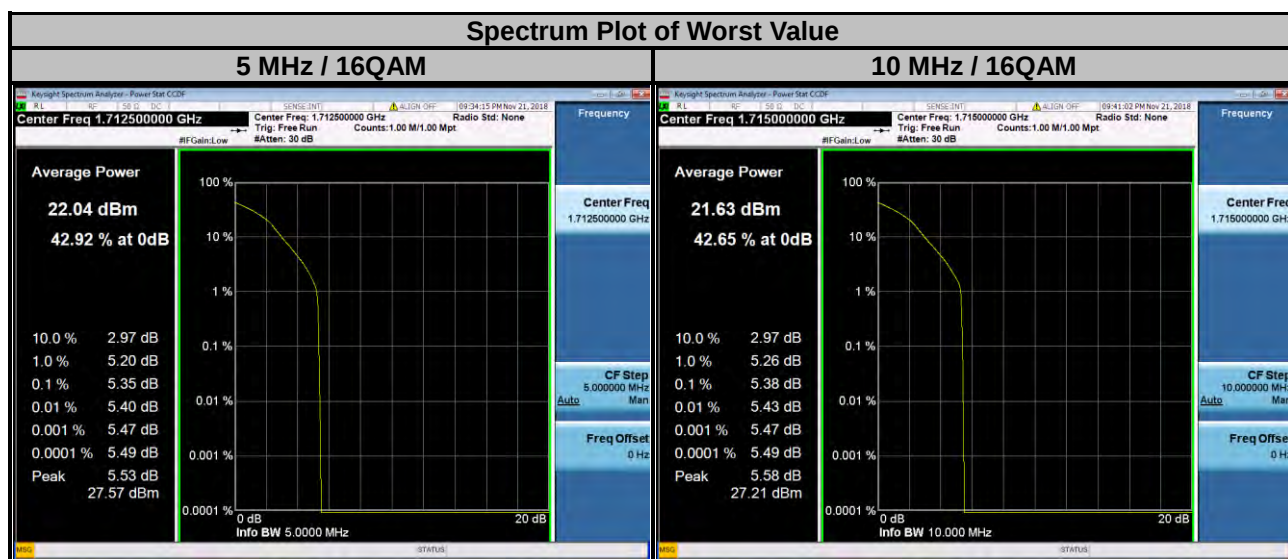
WCDMA		
Channel	Frequency (MHz)	Peak to Average Ratio (dB)
1312	1712.4	3.14
1413	1732.6	3.09
1513	1752.6	3.10



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	4.68	5.38	19965	1711.5	4.65	5.42
20175	1732.5	4.53	5.39	20175	1732.5	4.54	5.29
20393	1754.3	4.46	5.33	20385	1753.5	4.54	5.34



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	4.59	5.35	20000	1715.0	4.52	5.38
20175	1732.5	4.52	5.28	20175	1732.5	4.38	5.15
20375	1752.5	4.57	5.34	20350	1750.0	4.52	5.21

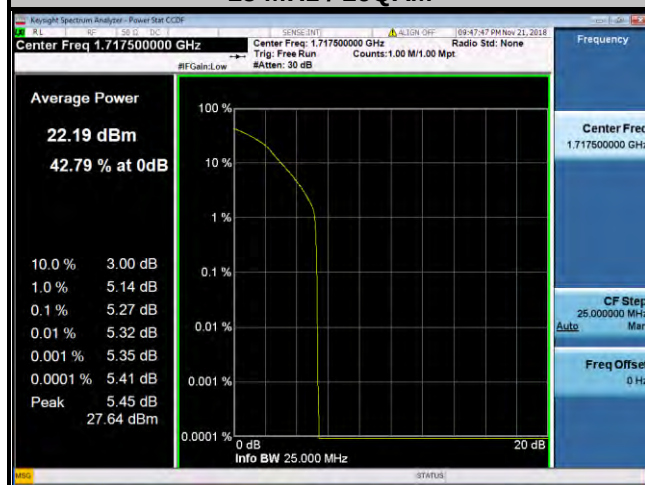


LTE Band 4

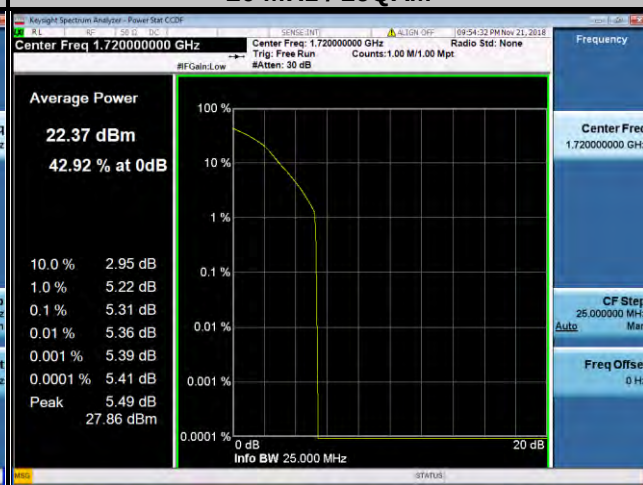
Channel Bandwidth: 15 MHz				Channel Bandwidth: 20 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
20025	1717.5	4.57	5.27	20050	1720.0	4.44	5.31
20175	1732.5	4.35	5.17	20175	1732.5	4.33	5.12
20325	1747.5	4.55	5.20	20300	1745.0	4.48	5.21

Spectrum Plot of Worst Value

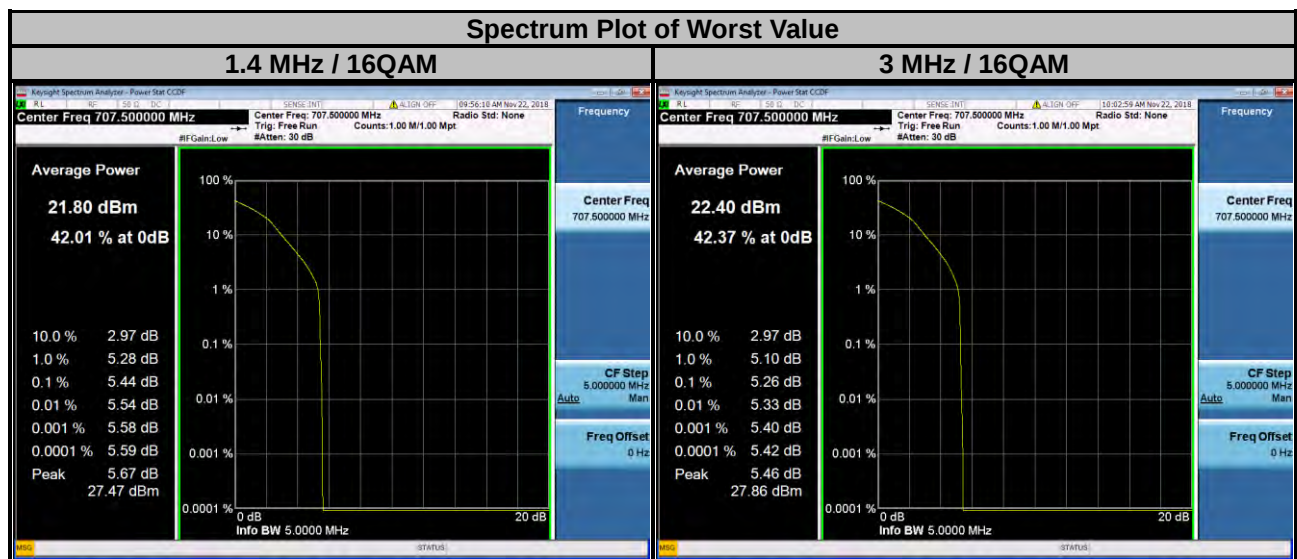
15 MHz / 16QAM



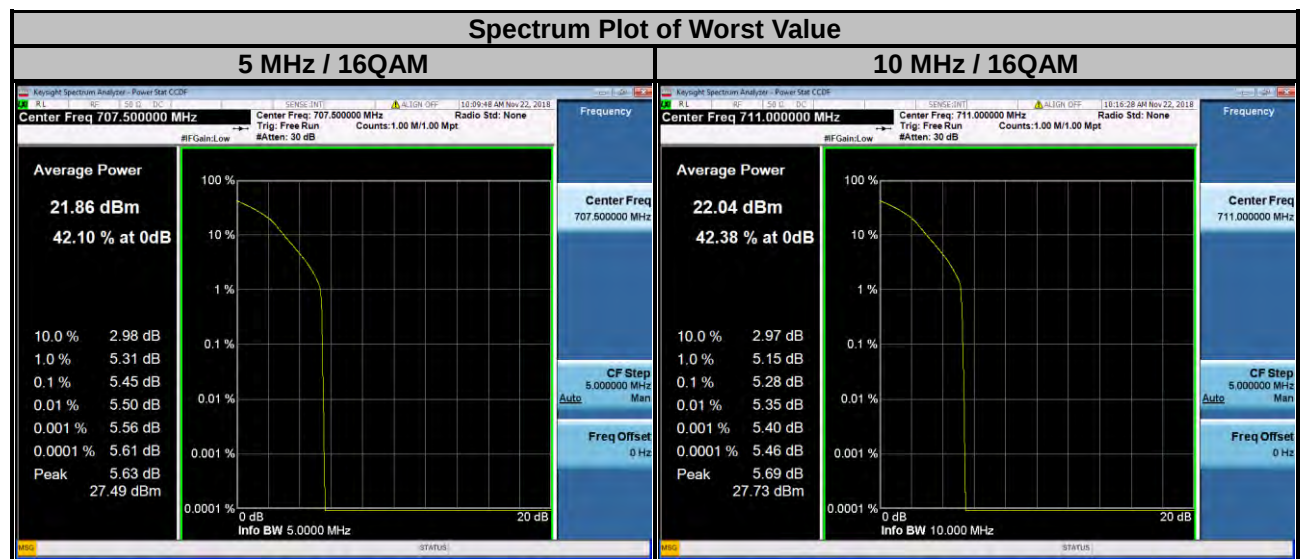
20 MHz / 16QAM



LTE Band 12							
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
23017	699.7	4.13	5.04	23025	700.5	4.12	4.90
23095	707.5	4.57	5.44	23095	707.5	4.48	5.26
23173	715.3	4.15	5.09	23165	714.5	4.08	4.80



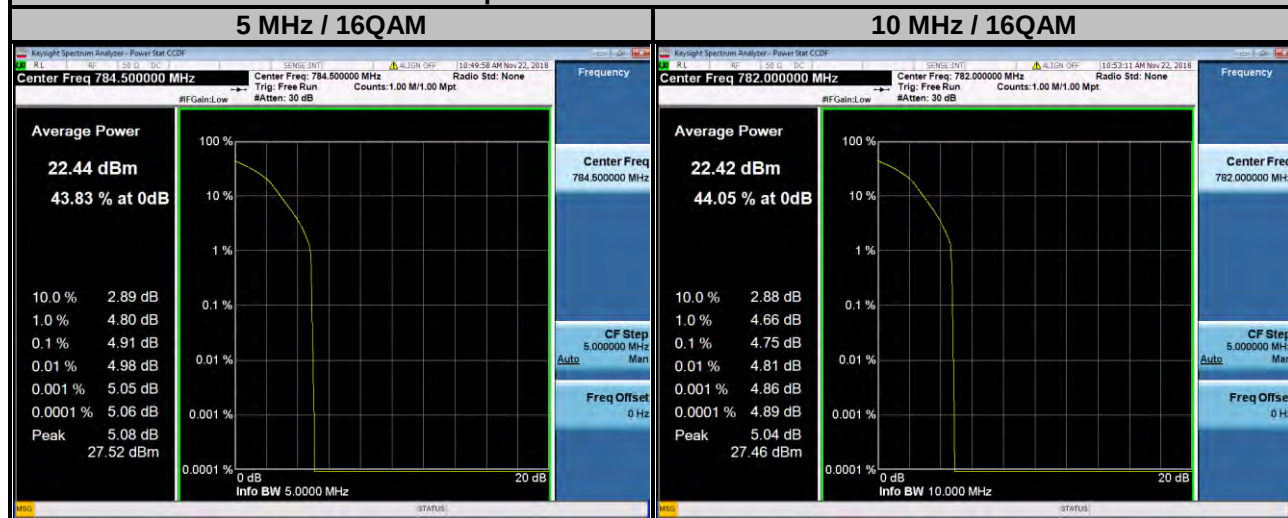
LTE Band 12							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
23035	701.5	4.11	4.96	23060	704.0	4.16	4.98
23095	707.5	4.44	5.45	23095	707.5	4.36	5.17
23155	713.5	4.26	5.02	23130	711.0	4.42	5.28



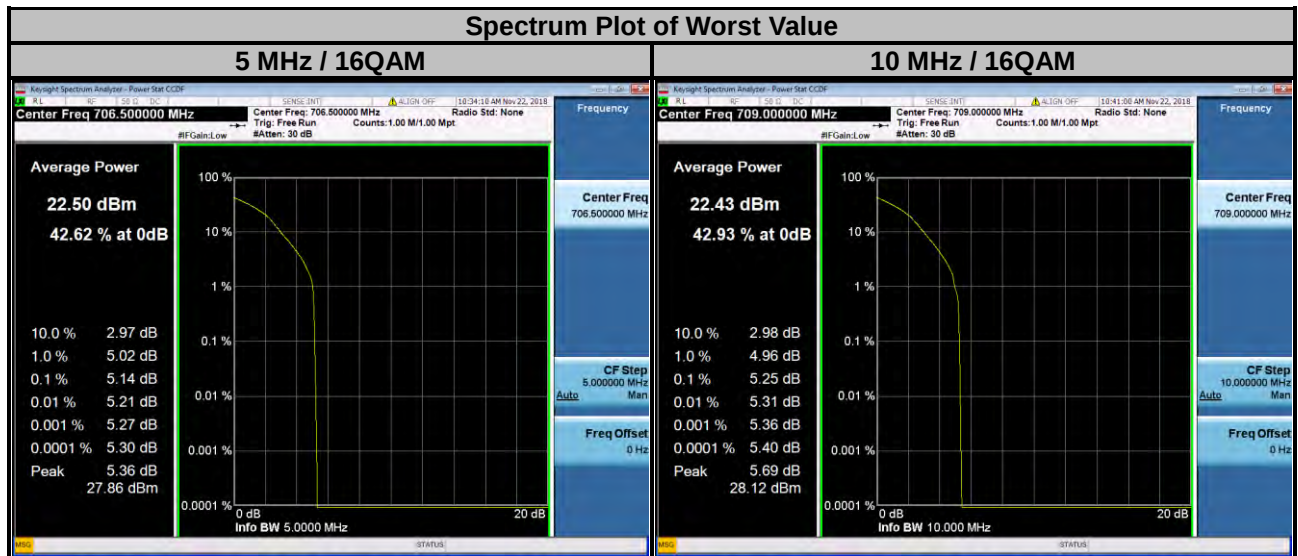
LTE Band 13

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
23205	779.5	4.01	4.77	23230	782.0	3.97	4.75
23230	782.0	4.01	4.72				
23255	784.5	4.15	4.91				

Spectrum Plot of Worst Value



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	4.40	5.14	23780	709.0	4.32	5.25
23790	710.0	4.47	5.05	23790	710.0	4.34	5.10
23825	713.5	4.22	5.11	23800	711.0	4.39	5.14

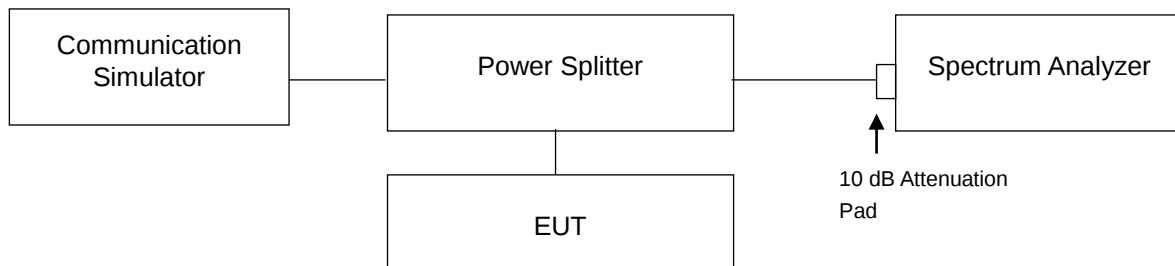


4.7 Conducted Spurious Emissions

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.

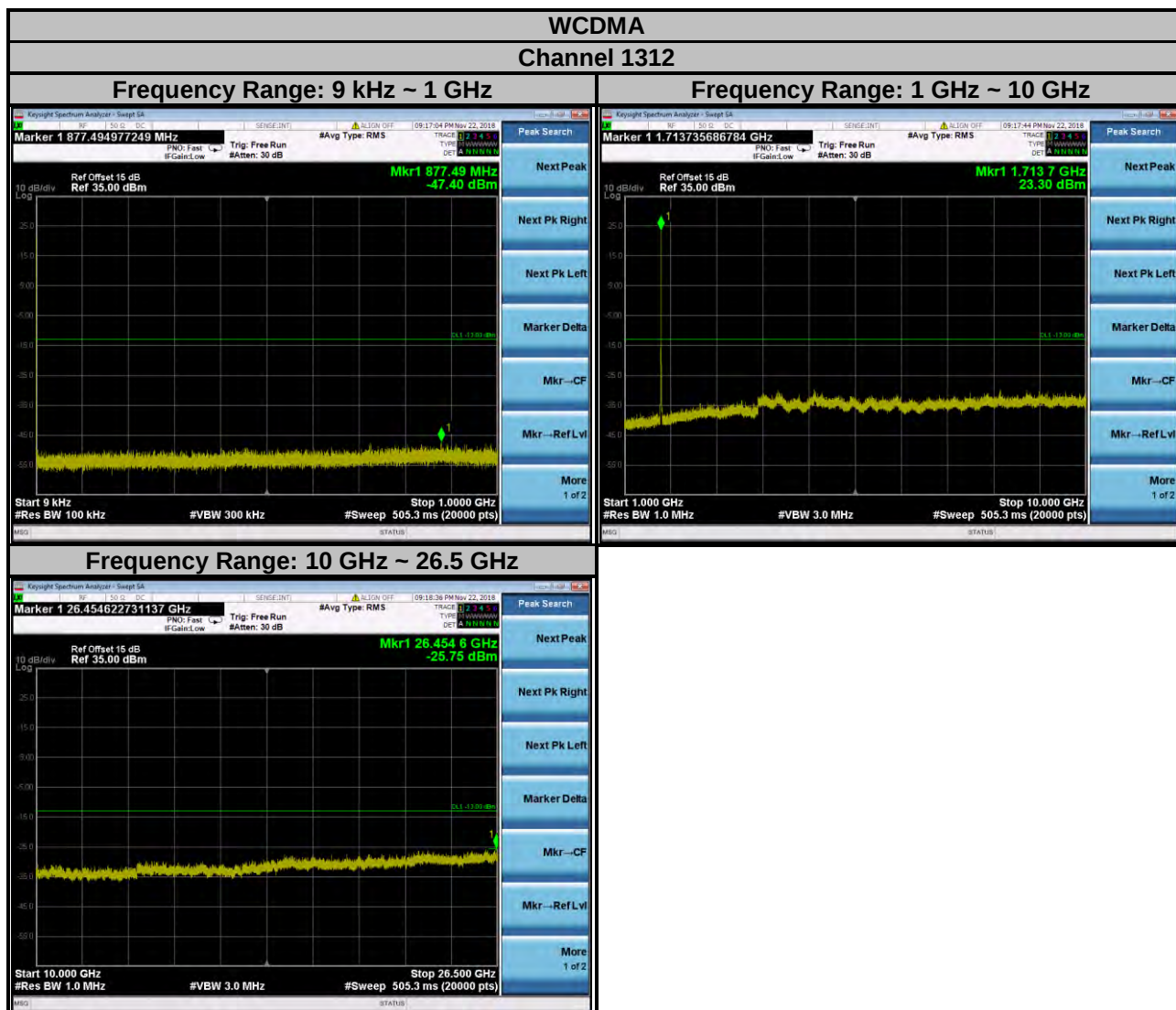
4.7.2 Test Setup



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 = 100 kHz and VBW = 300 kHz is used for conducted emission measurement.
- Measuring frequency range is from 1 GHz to 10 GHz / 26.5 GHz / 27 GHz. 10 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz is used for conducted emission measurement.

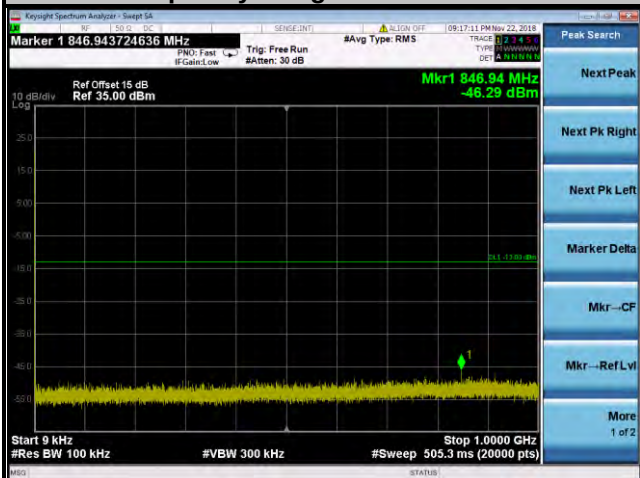
4.7.4 Test Results



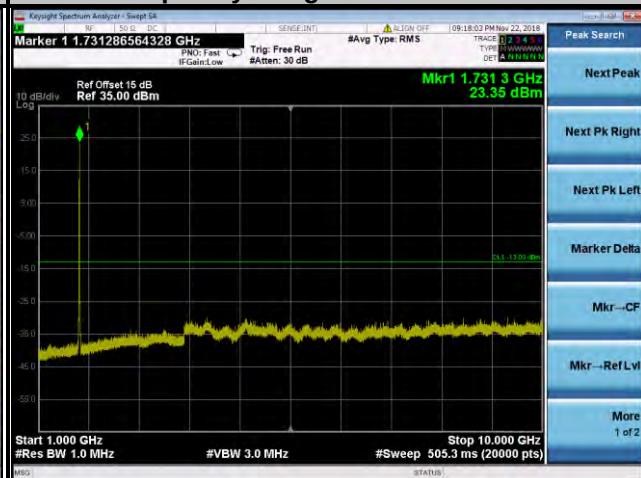
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

WCDMA Channel 1413

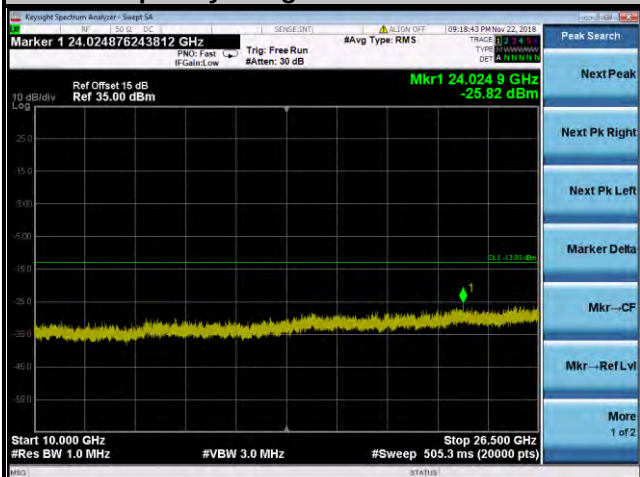
Frequency Range: 9 kHz ~ 1 GHz



Frequency Range: 1 GHz ~ 10 GHz



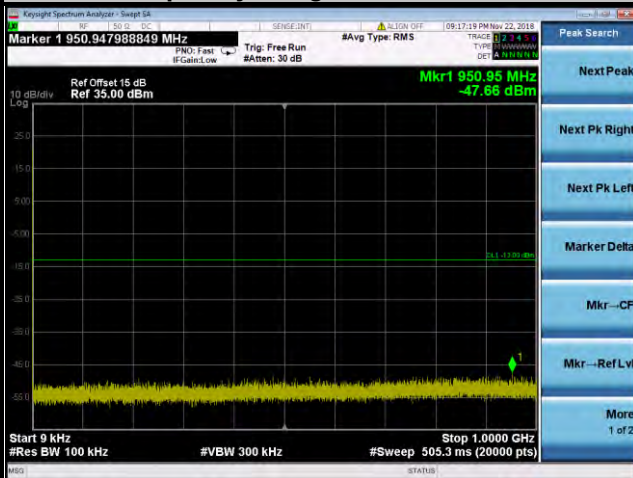
Frequency Range: 10 GHz ~ 26.5 GHz



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

WCDMA Channel 1513

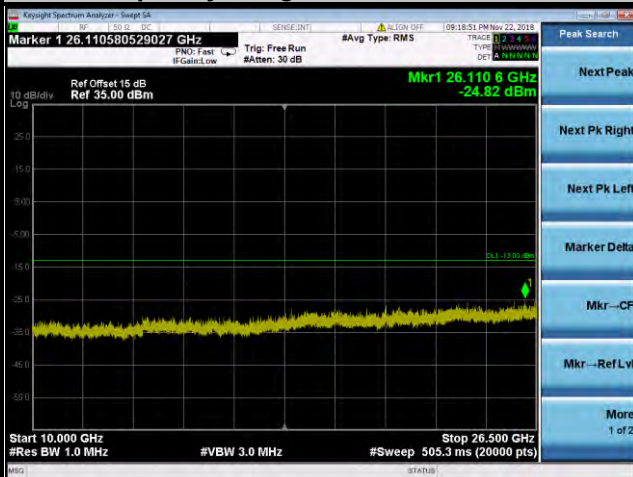
Frequency Range: 9 kHz ~ 1 GHz



Frequency Range: 1 GHz ~ 10 GHz



Frequency Range: 10 GHz ~ 26.5 GHz



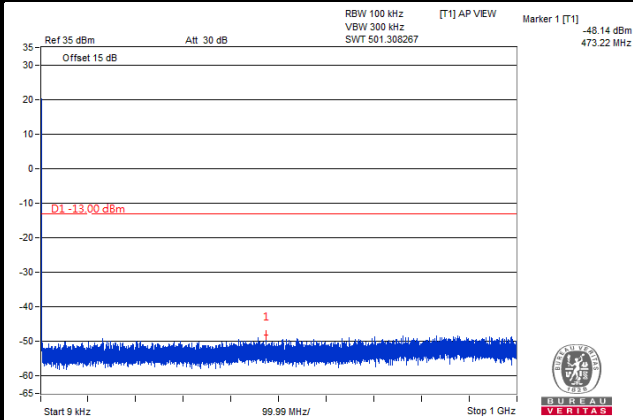
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4

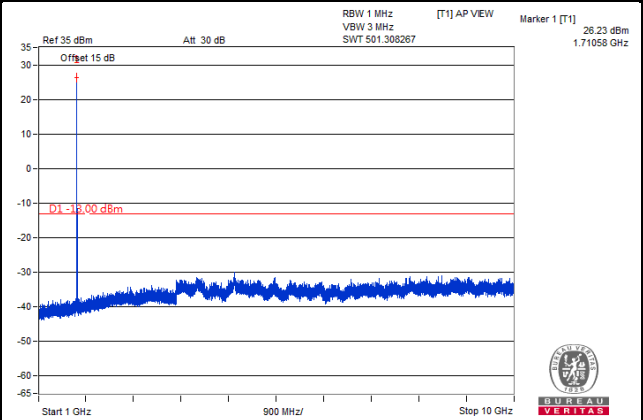
Channel Bandwidth: 1.4 MHz

Channel 19957

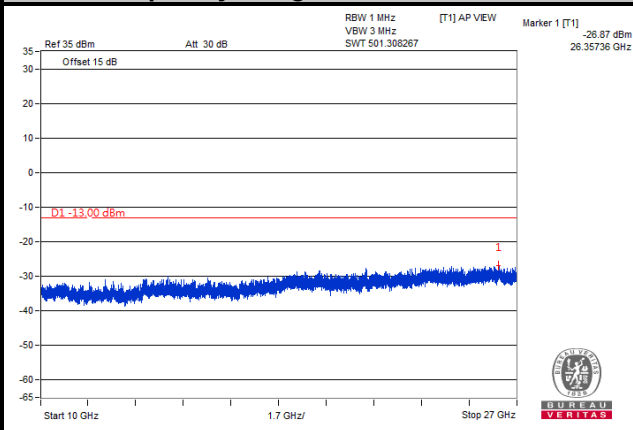
Frequency Range: 9 kHz ~ 1 GHz



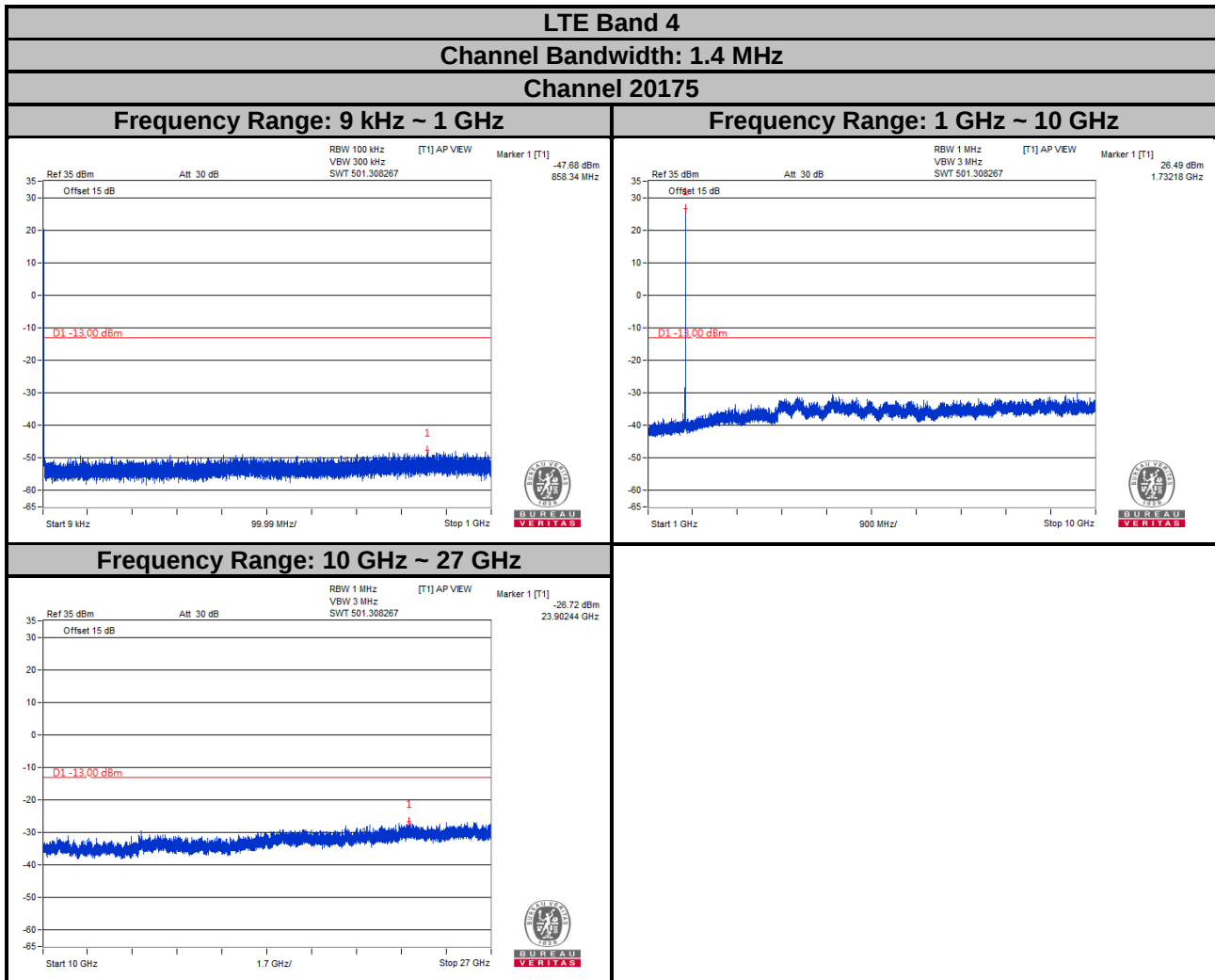
Frequency Range: 1 GHz ~ 10 GHz



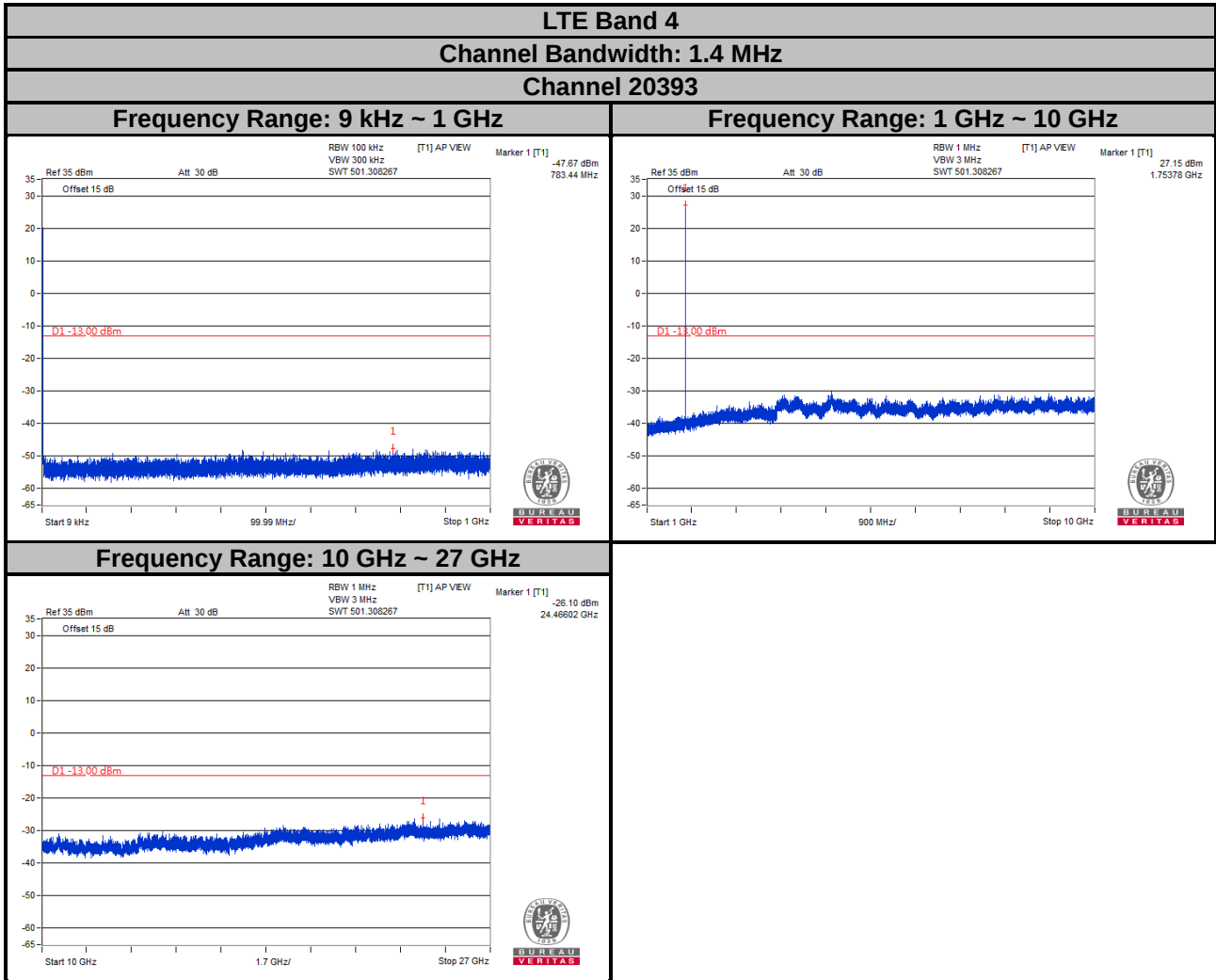
Frequency Range: 10 GHz ~ 27 GHz



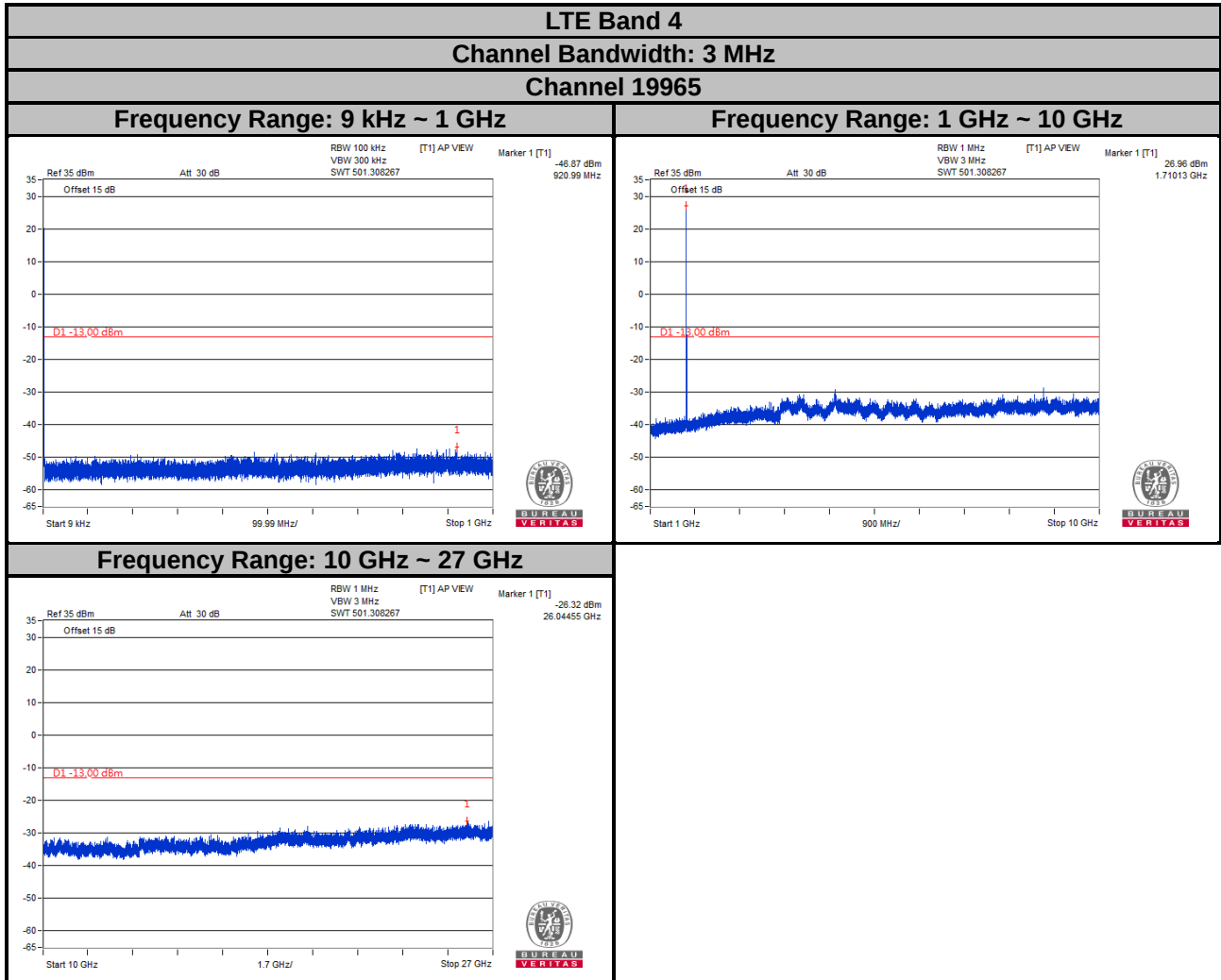
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



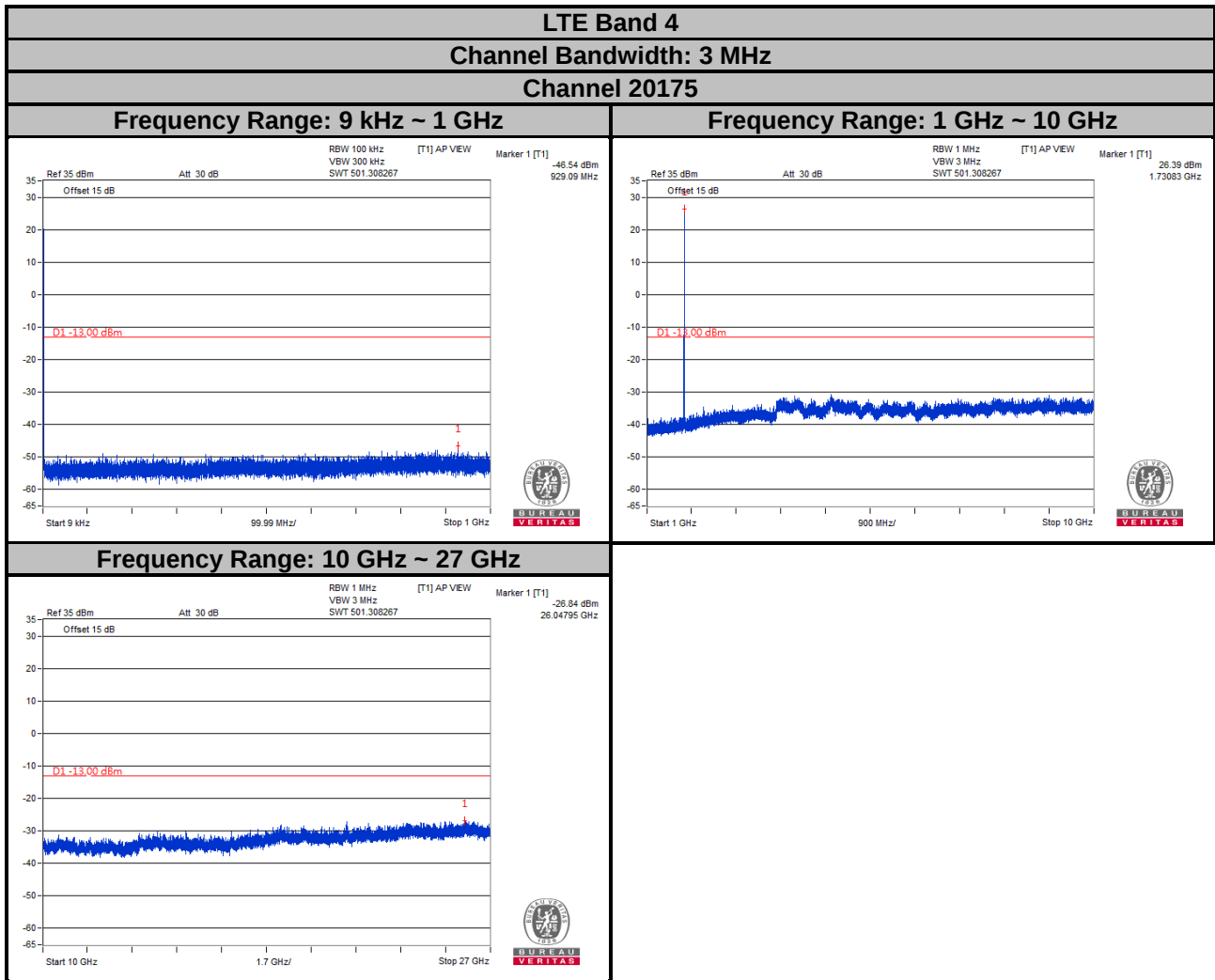
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



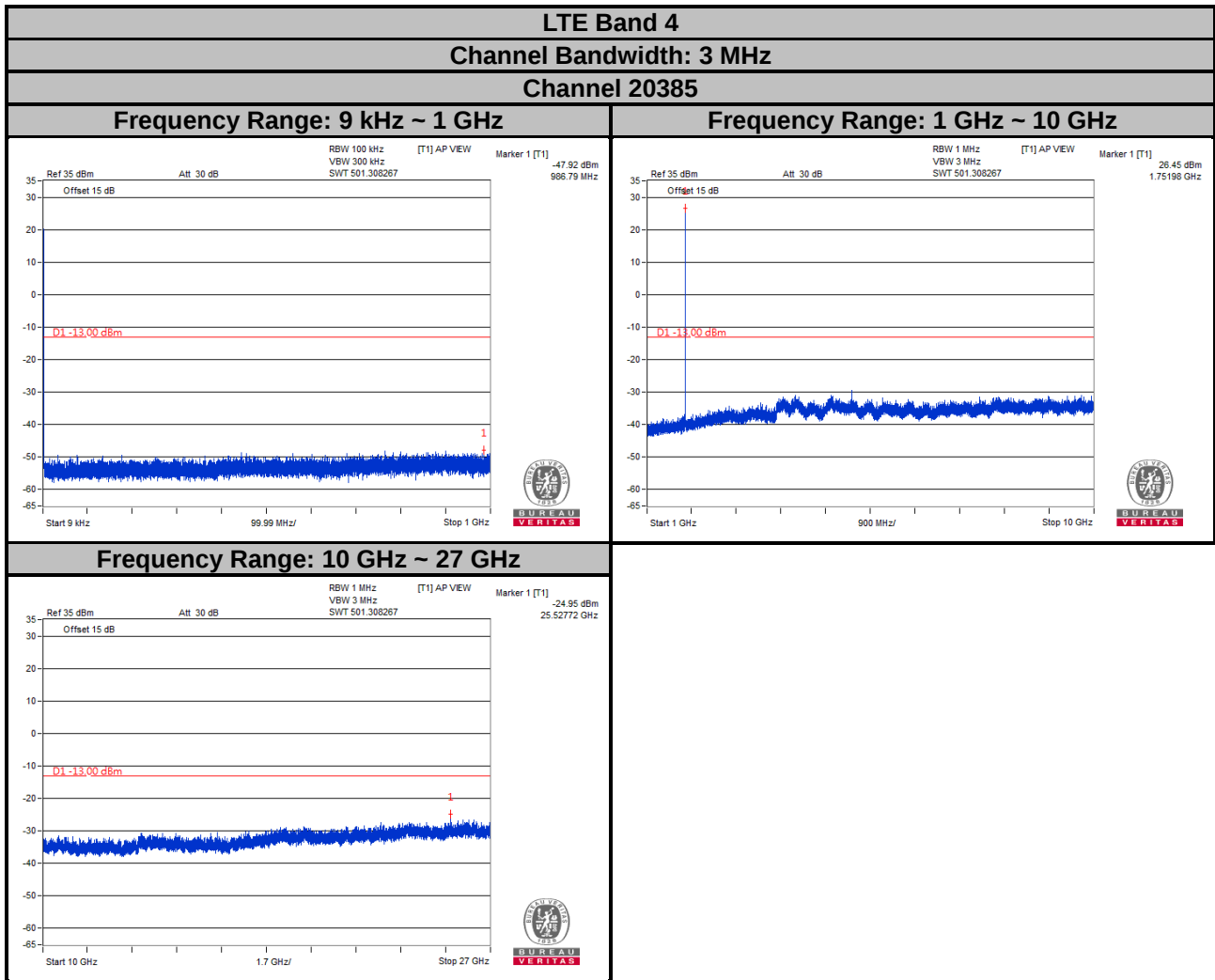
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



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



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



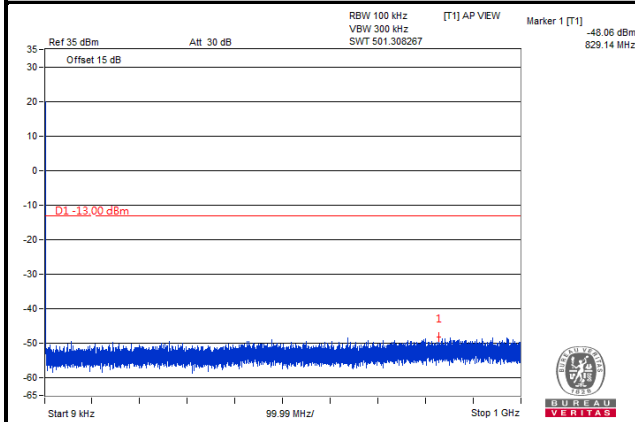
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4

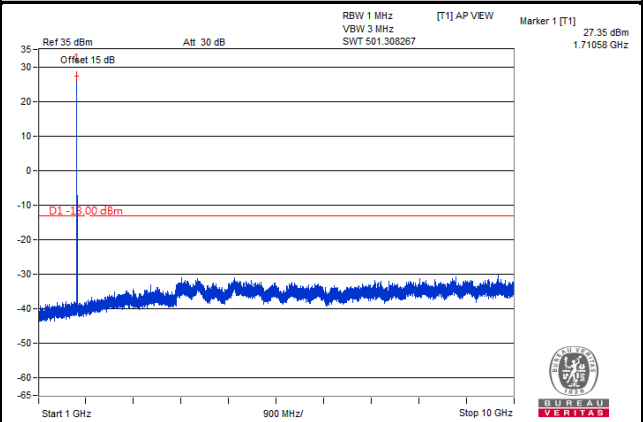
Channel Bandwidth: 5 MHz

Channel 19975

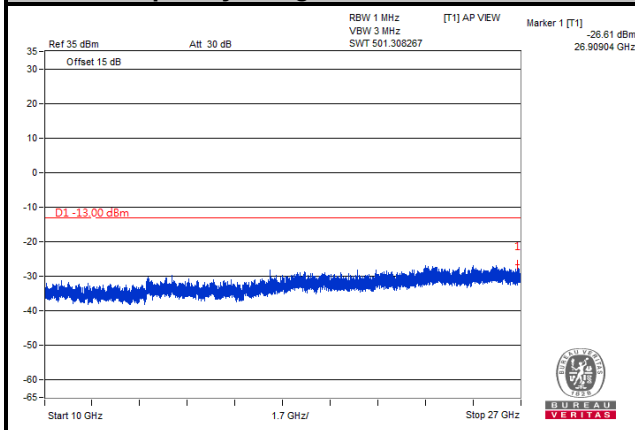
Frequency Range: 9 kHz ~ 1 GHz



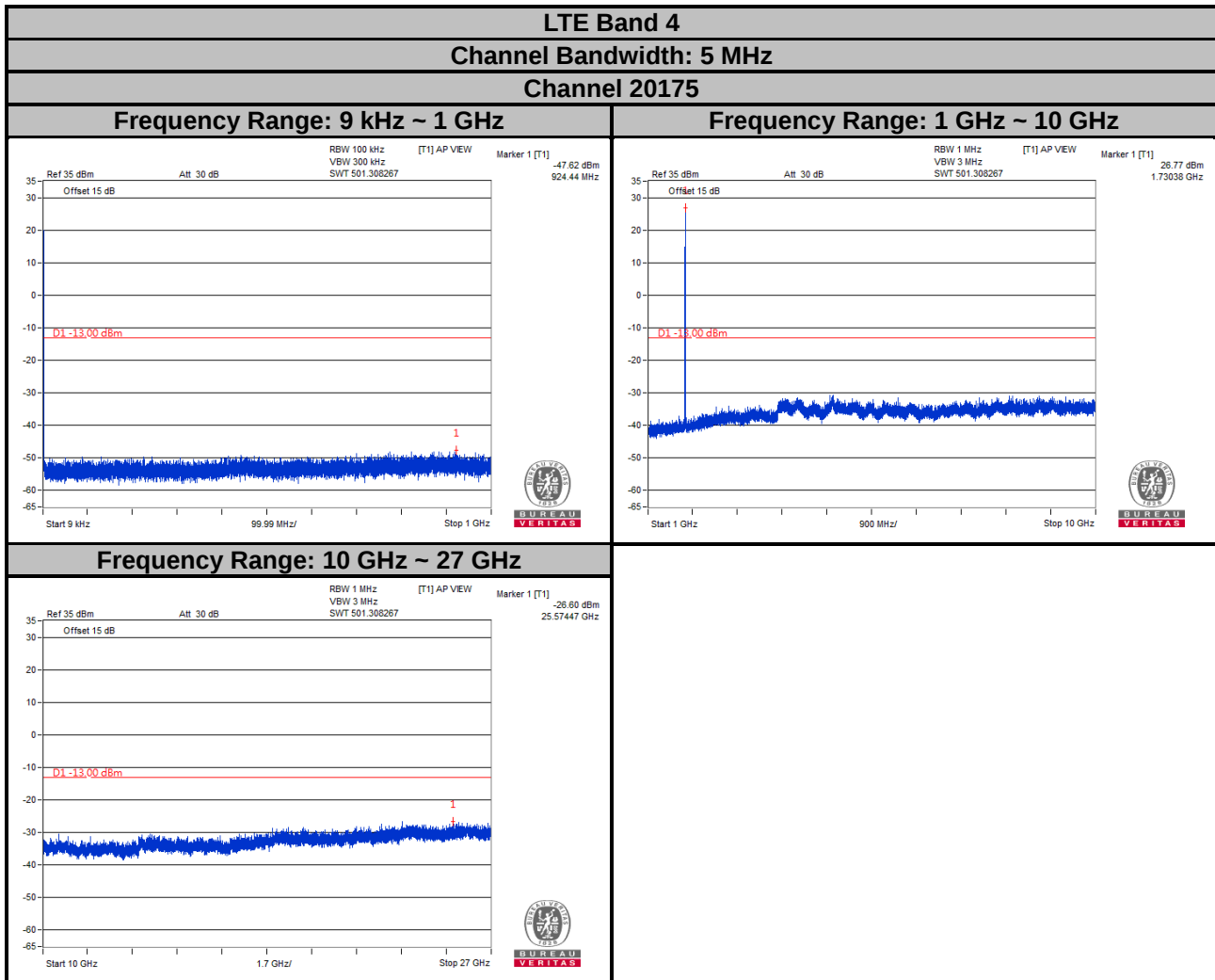
Frequency Range: 1 GHz ~ 10 GHz



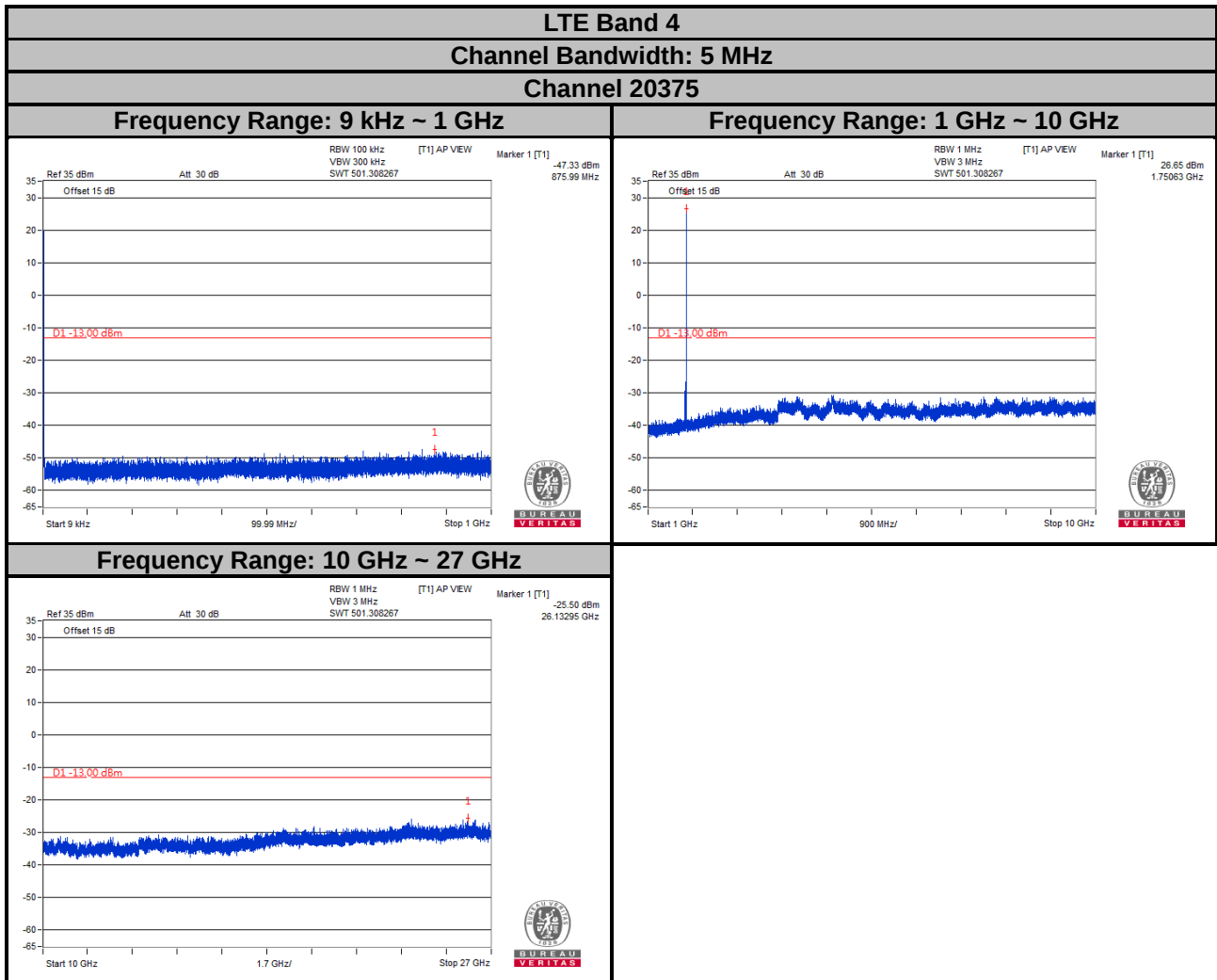
Frequency Range: 10 GHz ~ 27 GHz



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



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



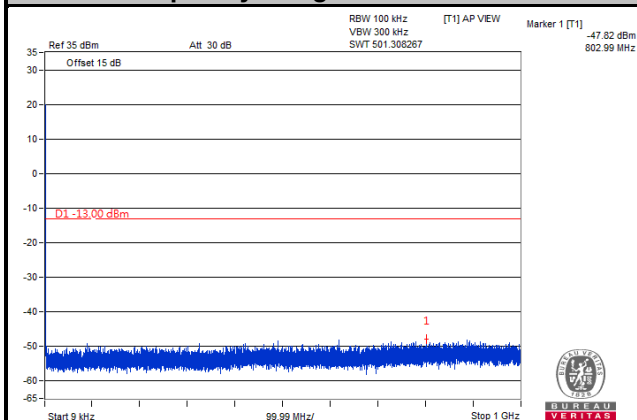
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4

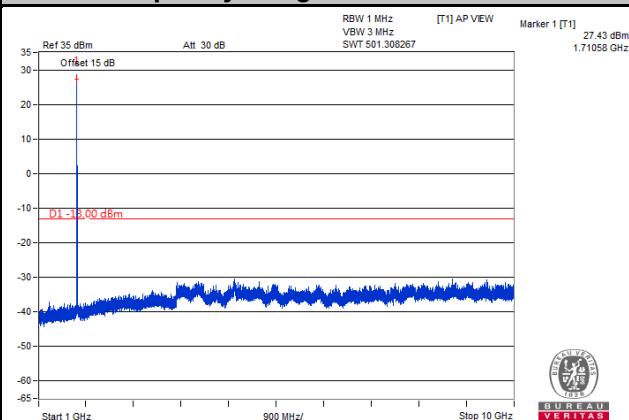
Channel Bandwidth: 10 MHz

Channel 20000

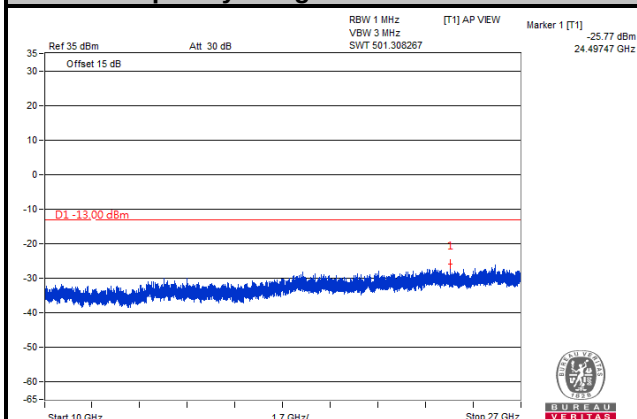
Frequency Range: 9 kHz ~ 1 GHz



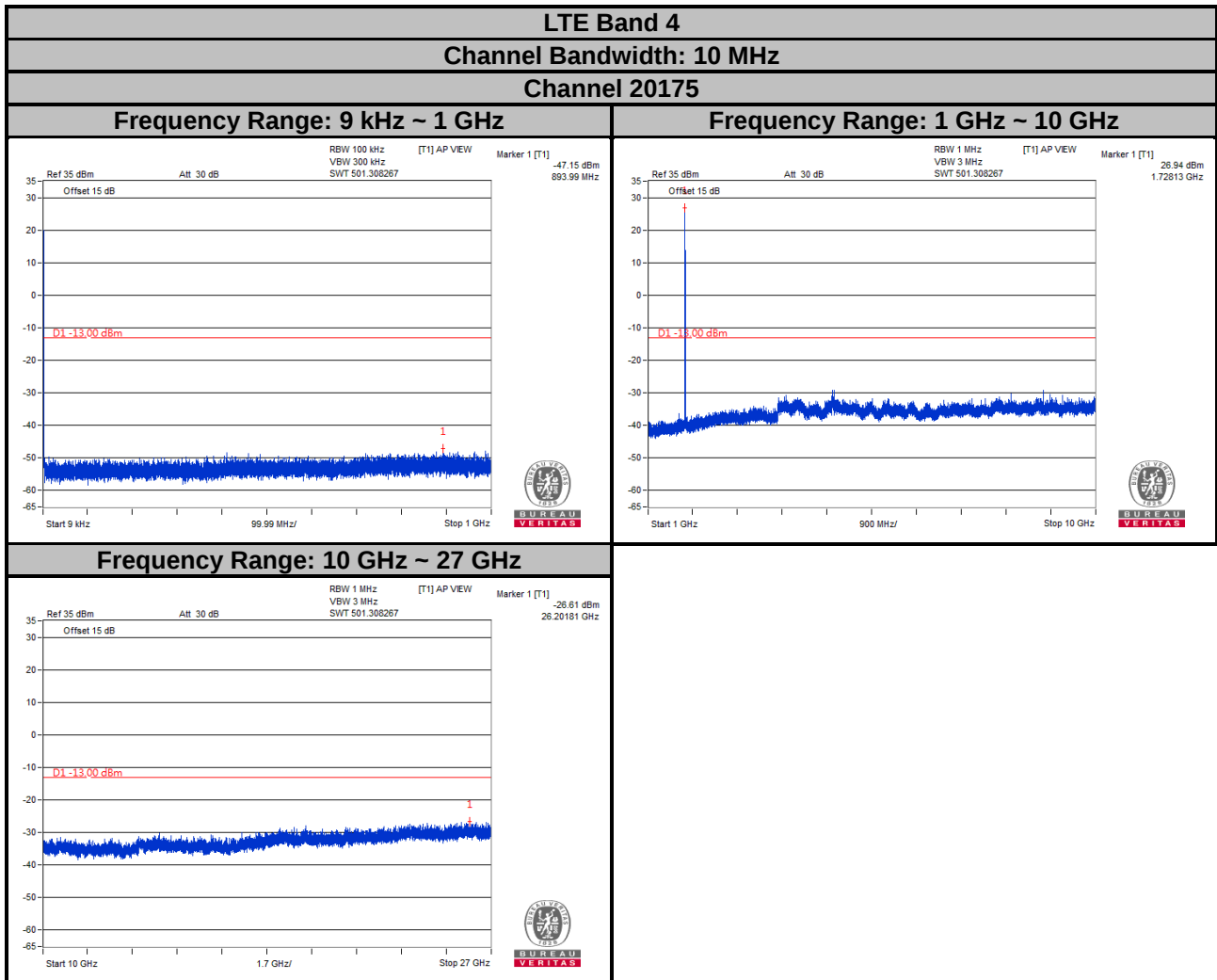
Frequency Range: 1 GHz ~ 10 GHz



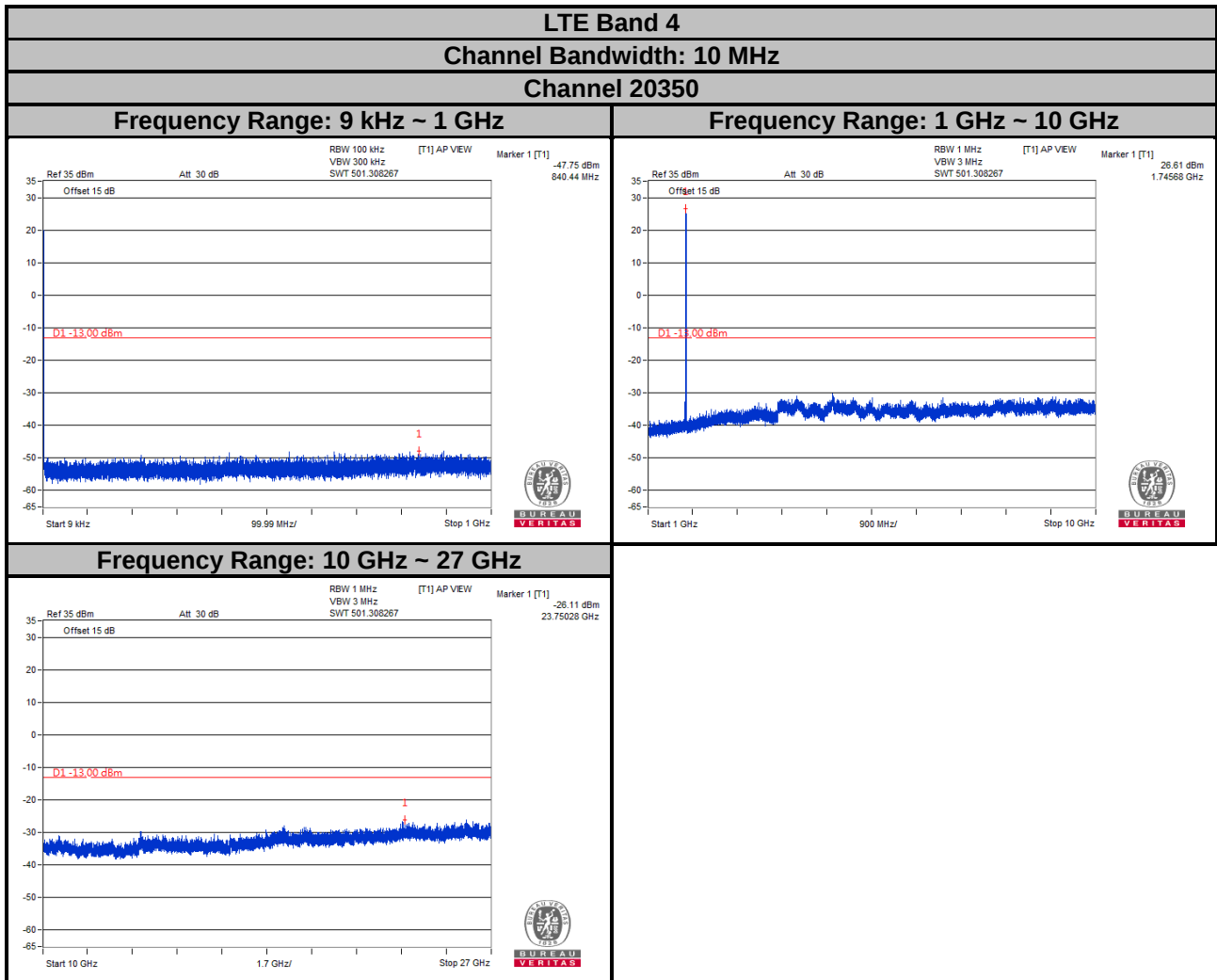
Frequency Range: 10 GHz ~ 27 GHz



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



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



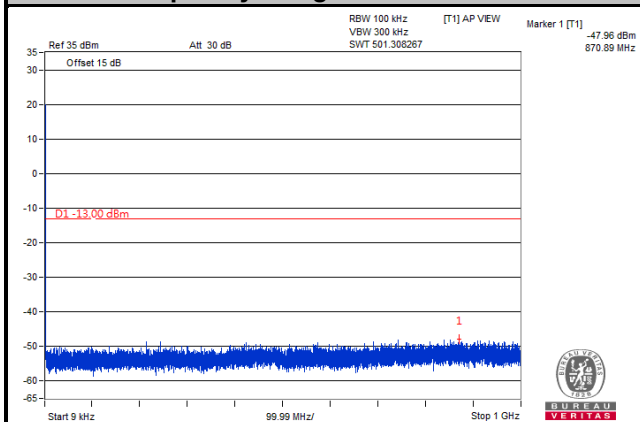
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 4

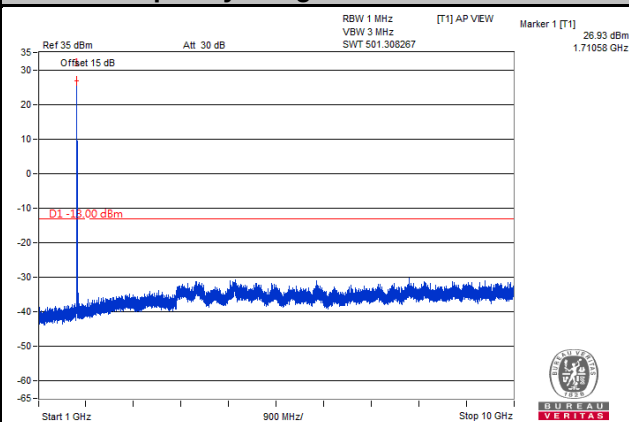
Channel Bandwidth: 15 MHz

Channel 20025

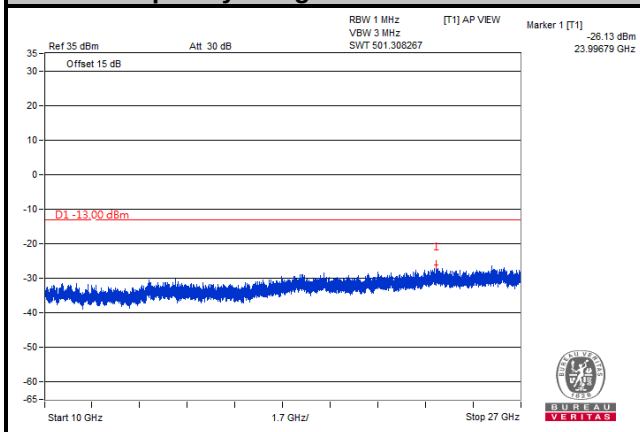
Frequency Range: 9 kHz ~ 1 GHz



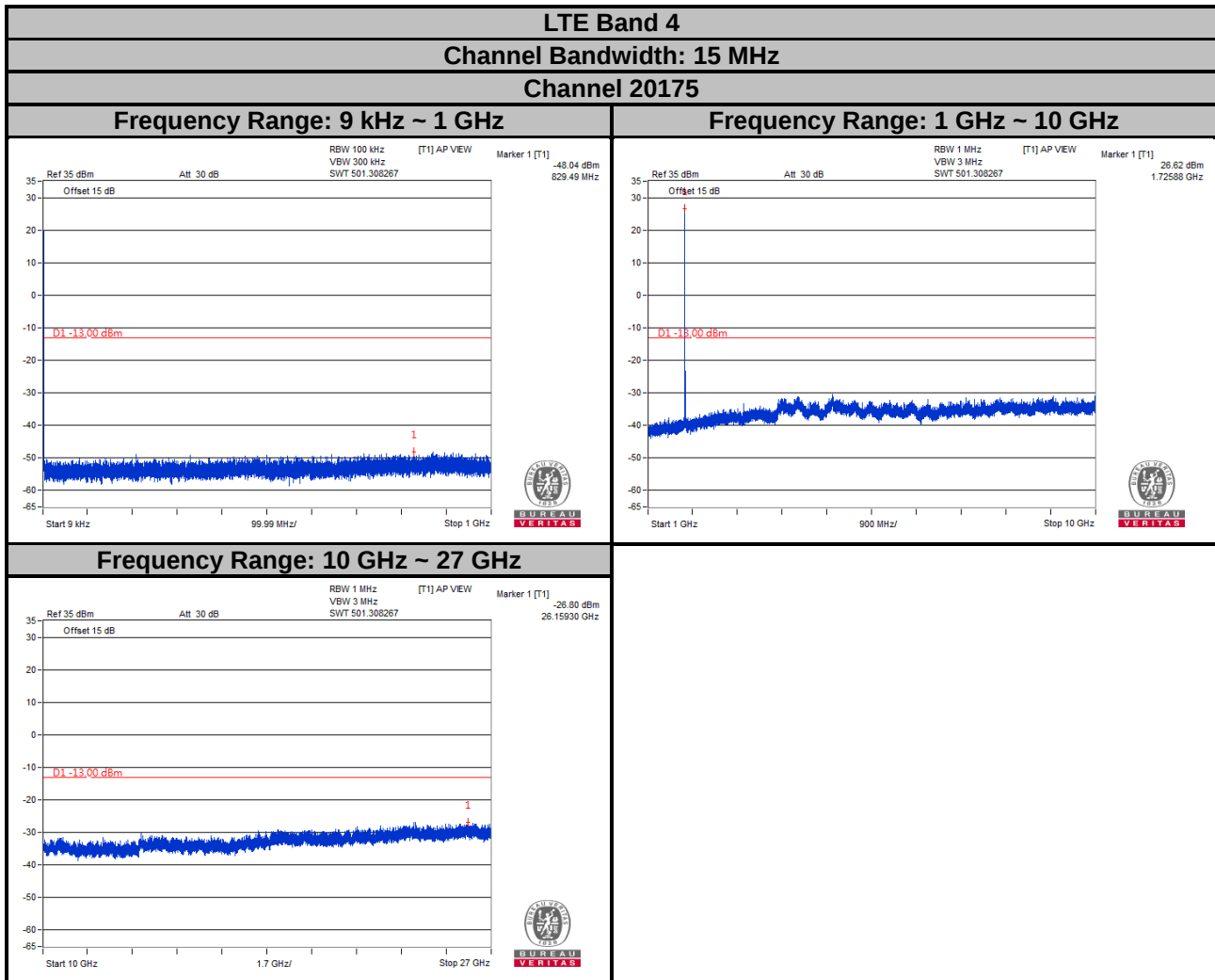
Frequency Range: 1 GHz ~ 10 GHz



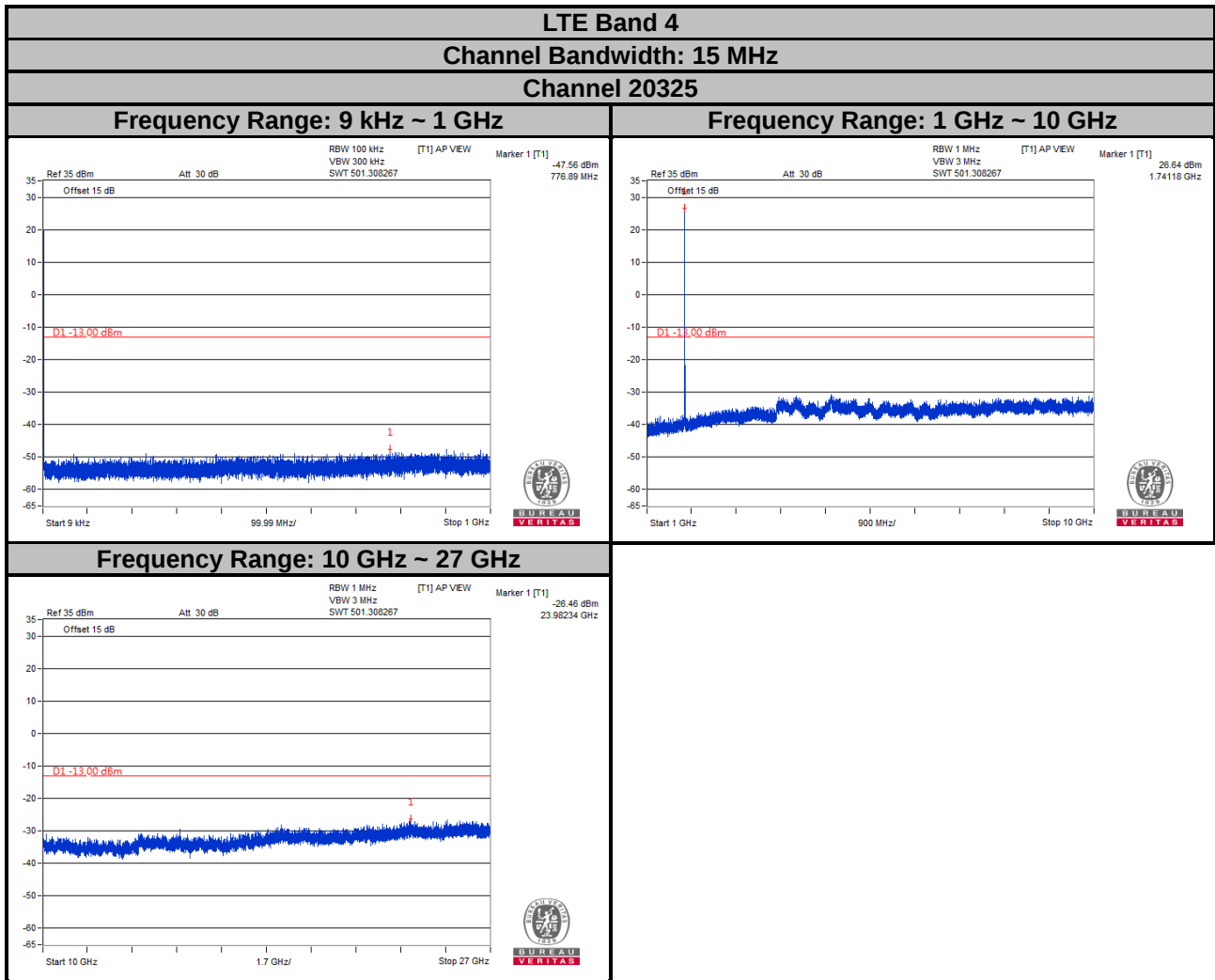
Frequency Range: 10 GHz ~ 27 GHz



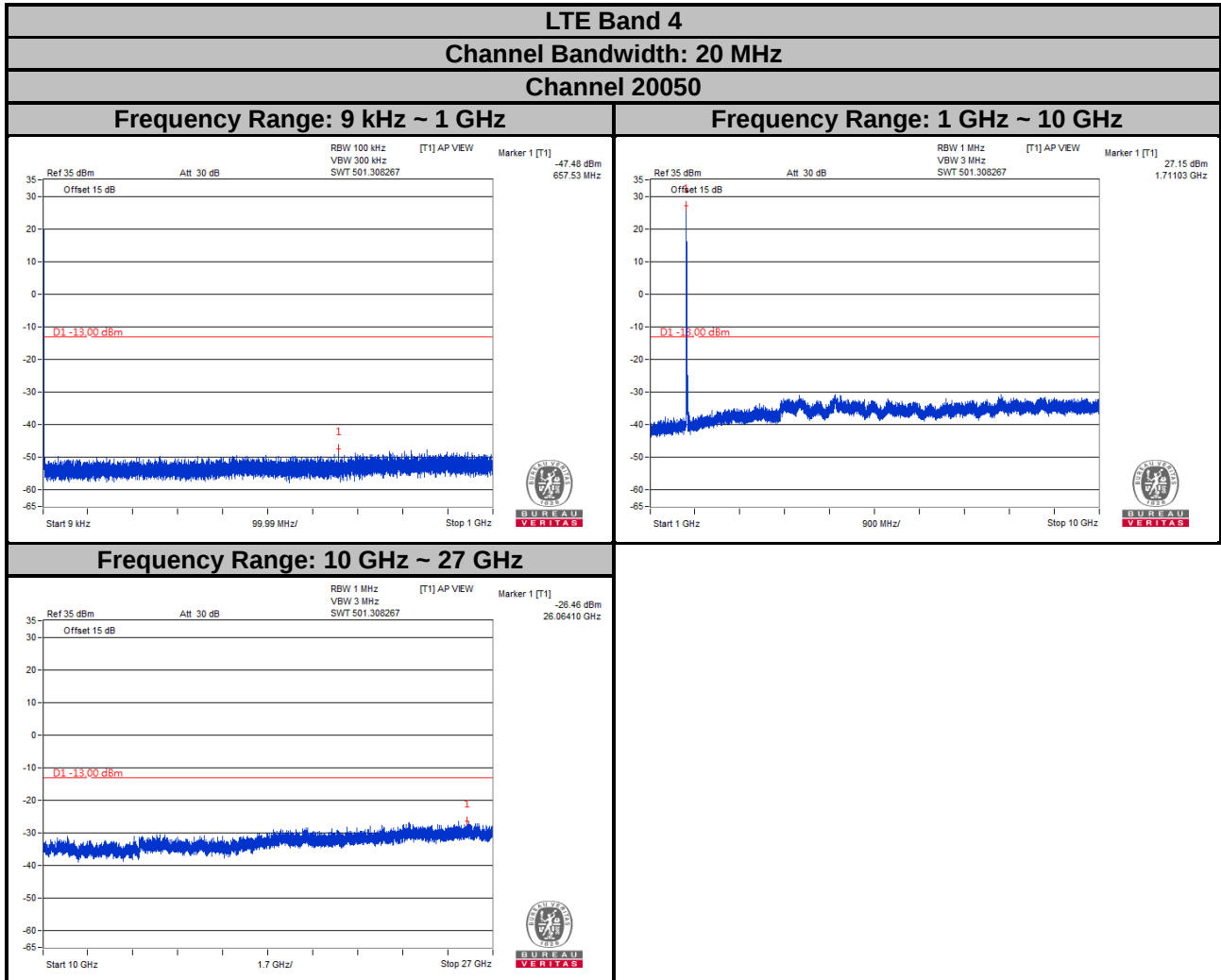
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



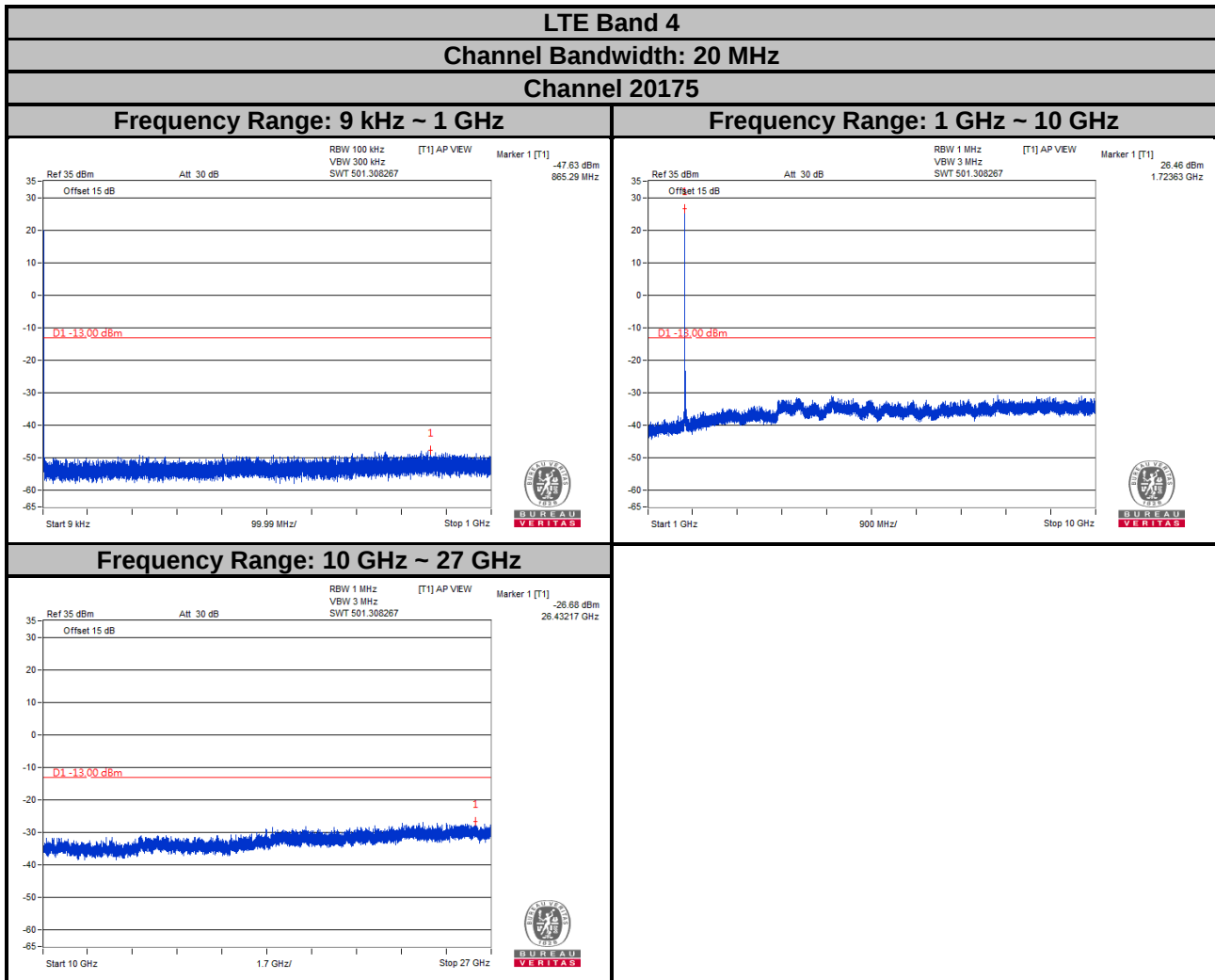
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



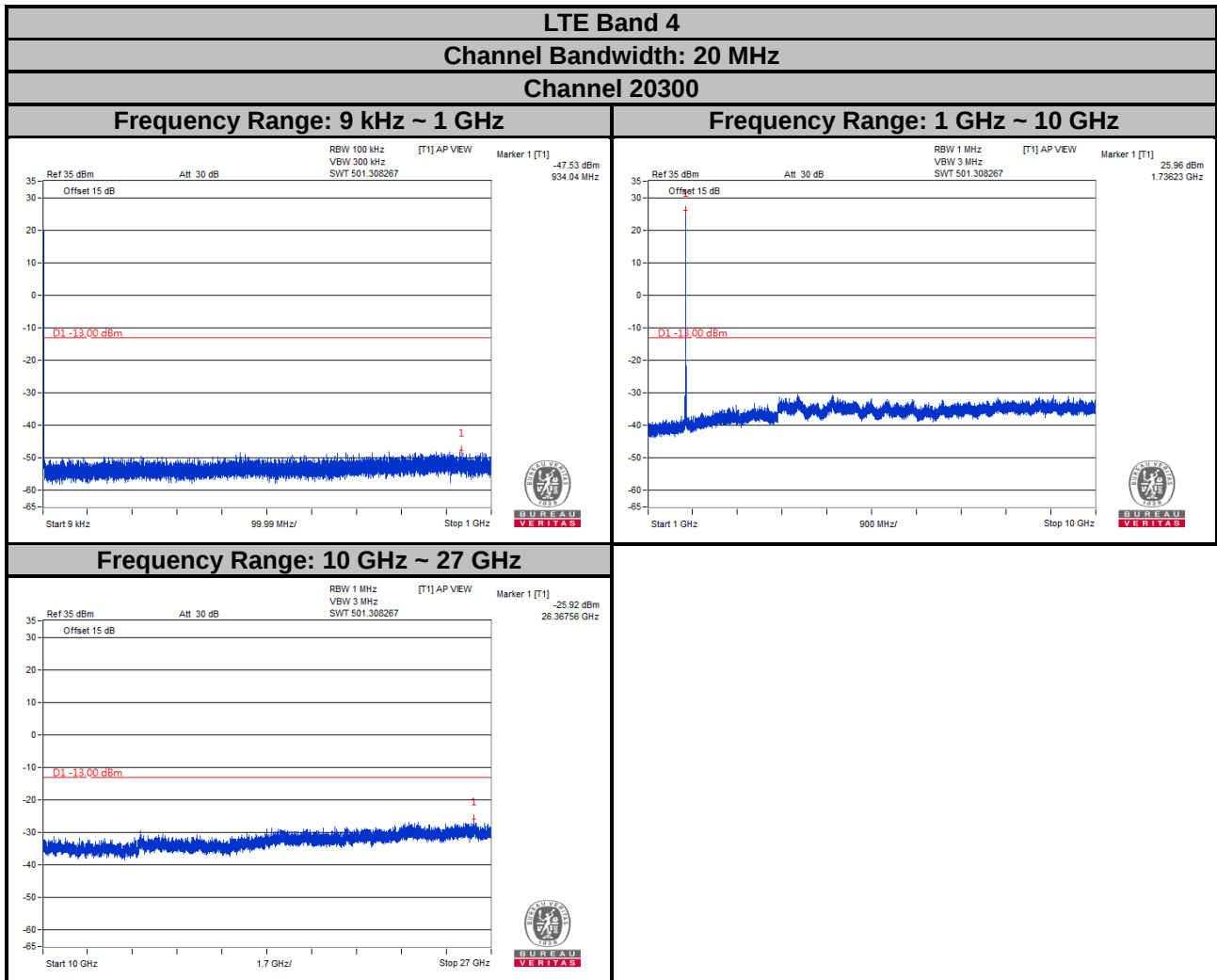
Note: The signal over the limit in 9 kHz is from spectrum analyzer.



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



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



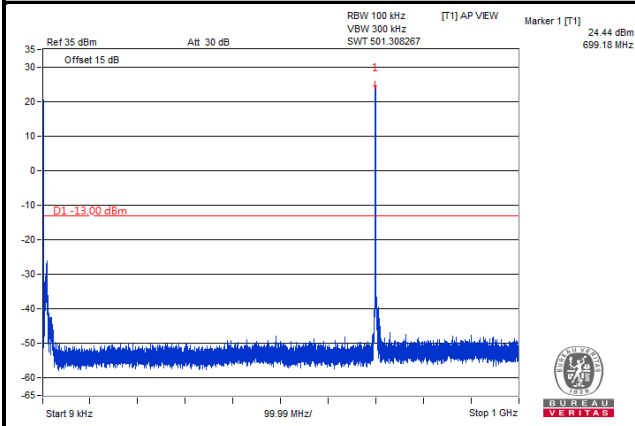
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 12

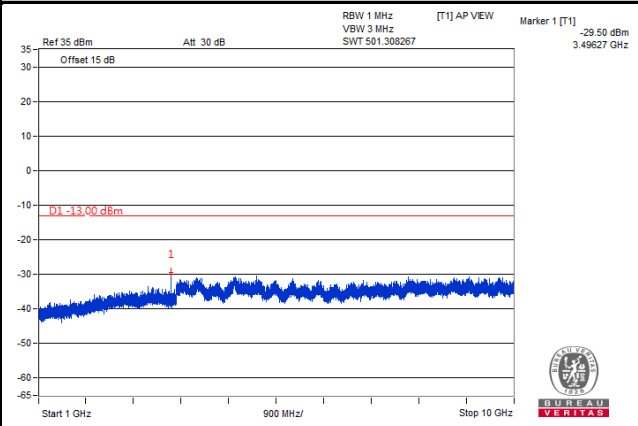
Channel Bandwidth: 1.4 MHz

Channel 23017

Frequency Range: 9 kHz ~ 1 GHz

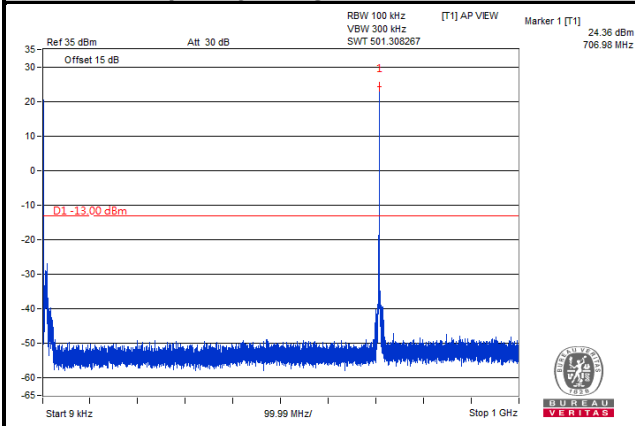


Frequency Range: 1 GHz ~ 10 GHz

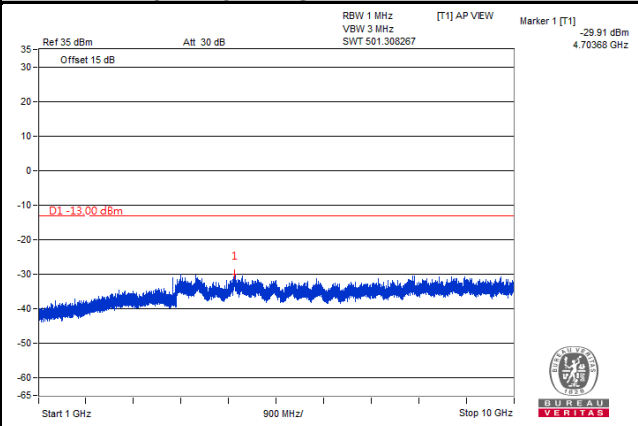


Channel 23095

Frequency Range: 9 kHz ~ 1 GHz

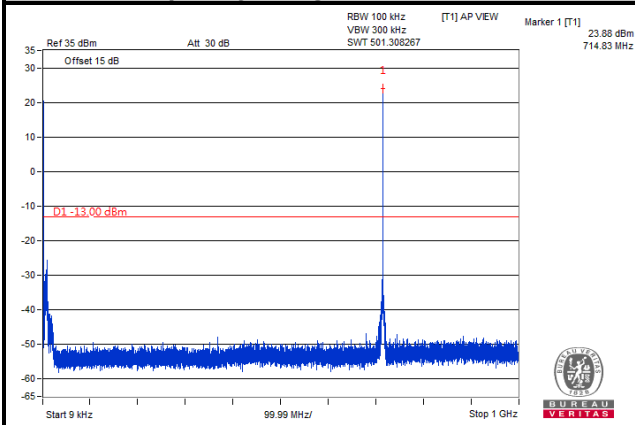


Frequency Range: 1 GHz ~ 10 GHz

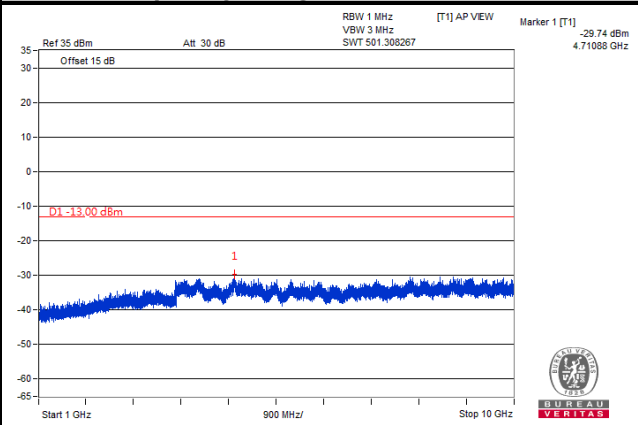


Channel 23173

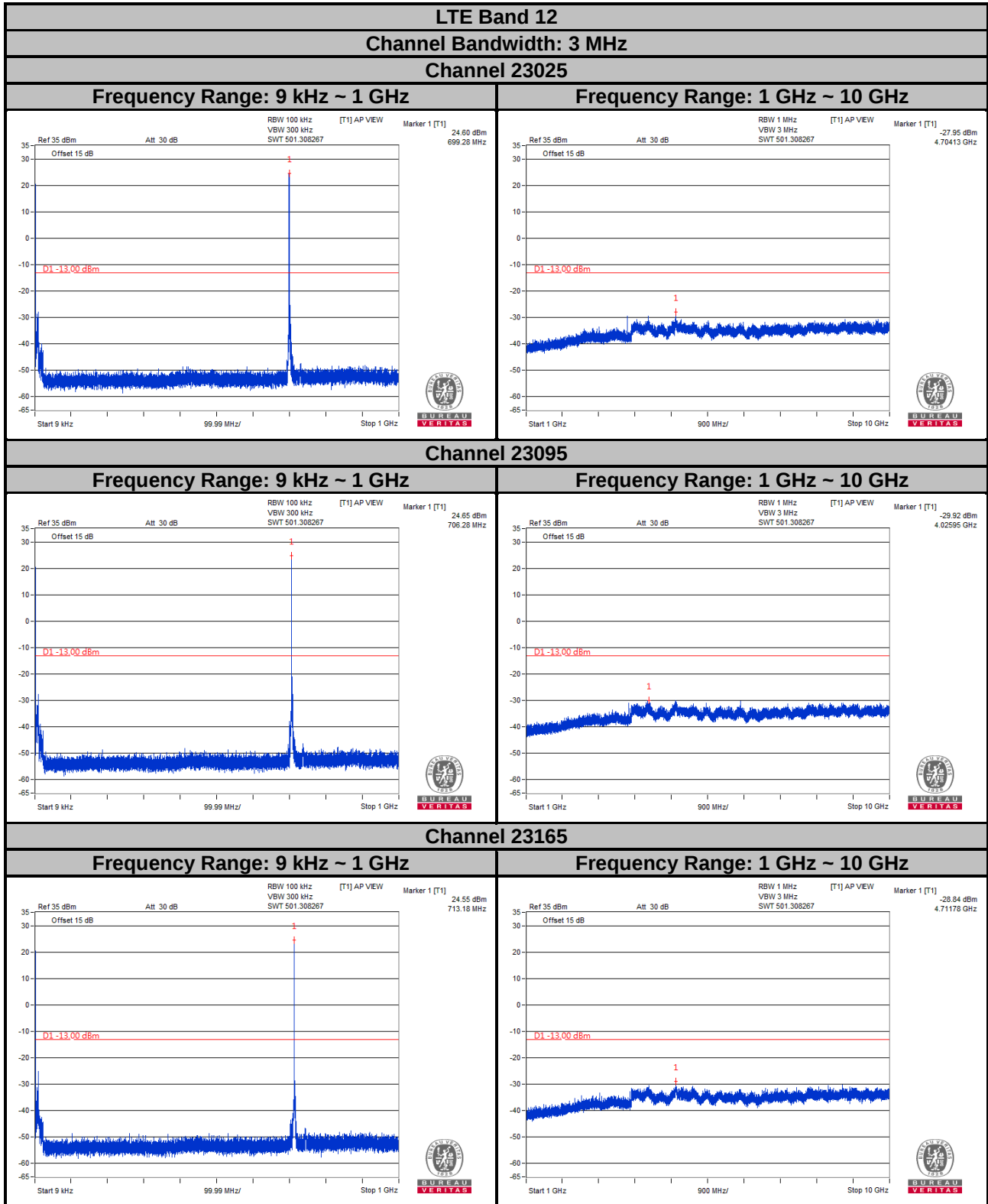
Frequency Range: 9 kHz ~ 1 GHz



Frequency Range: 1 GHz ~ 10 GHz



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



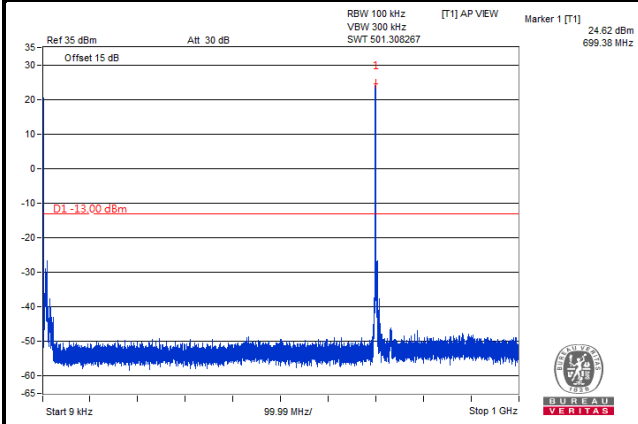
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 12

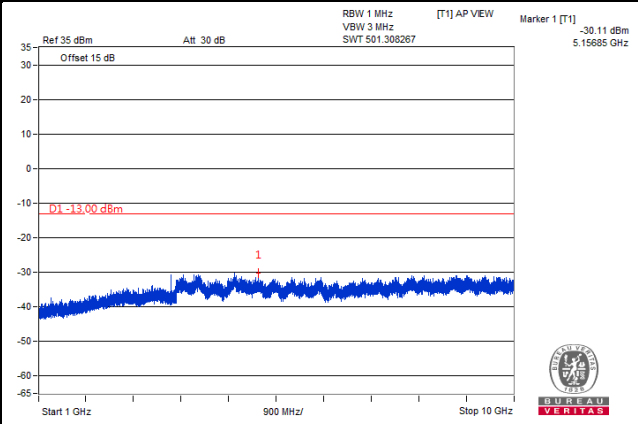
Channel Bandwidth: 5 MHz

Channel 23035

Frequency Range: 9 kHz ~ 1 GHz

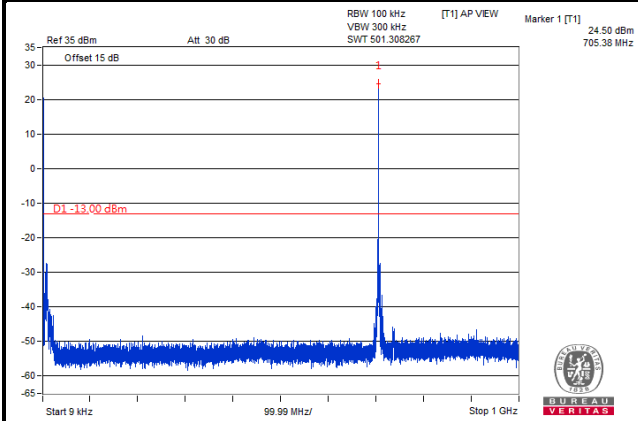


Frequency Range: 1 GHz ~ 10 GHz

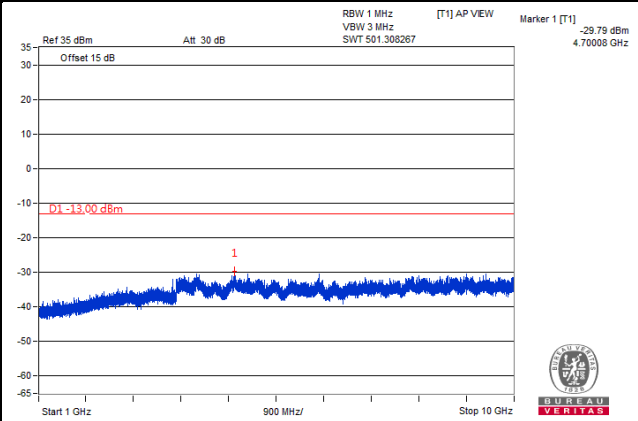


Channel 23095

Frequency Range: 9 kHz ~ 1 GHz

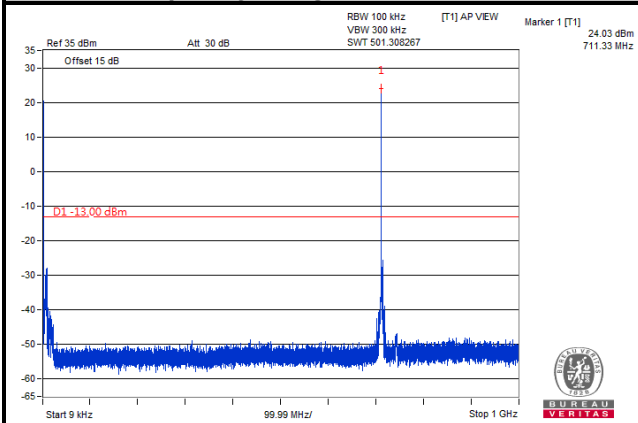


Frequency Range: 1 GHz ~ 10 GHz

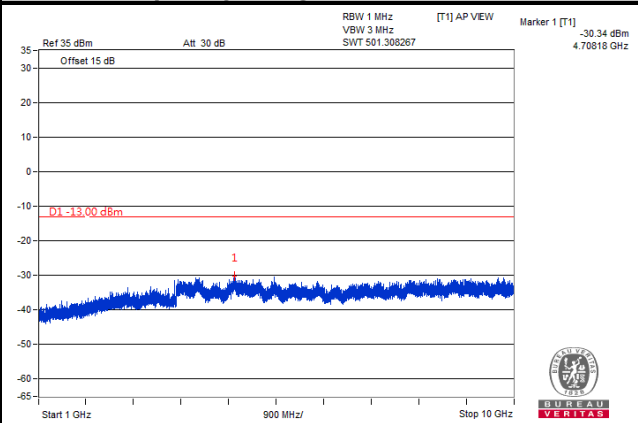


Channel 23155

Frequency Range: 9 kHz ~ 1 GHz



Frequency Range: 1 GHz ~ 10 GHz



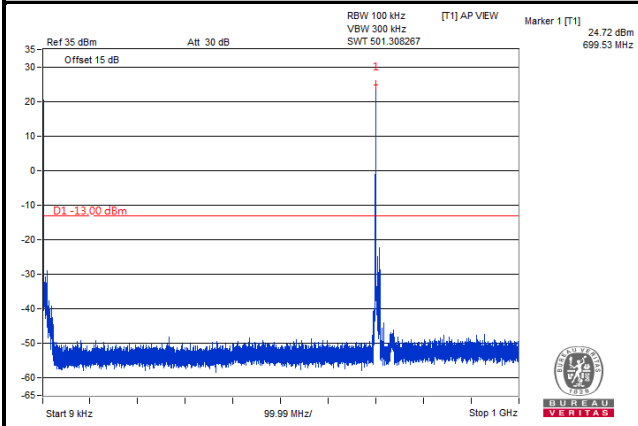
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 12

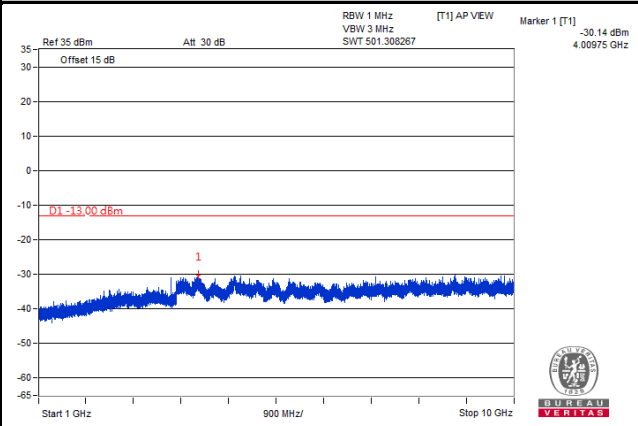
Channel Bandwidth: 10 MHz

Channel 23060

Frequency Range: 9 kHz ~ 1 GHz

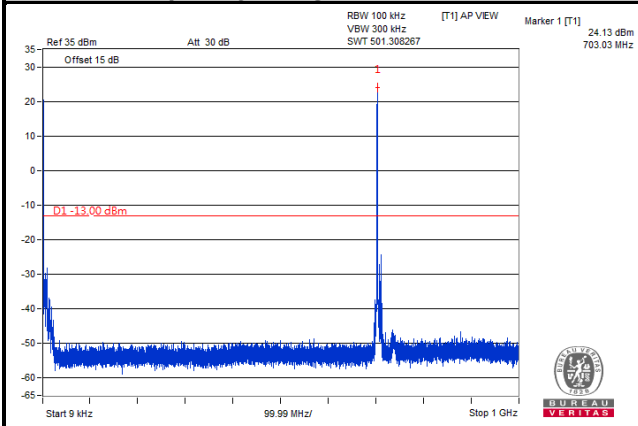


Frequency Range: 1 GHz ~ 10 GHz

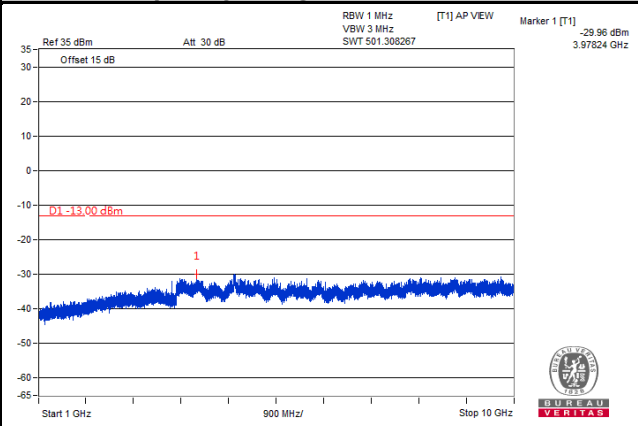


Channel 23095

Frequency Range: 9 kHz ~ 1 GHz

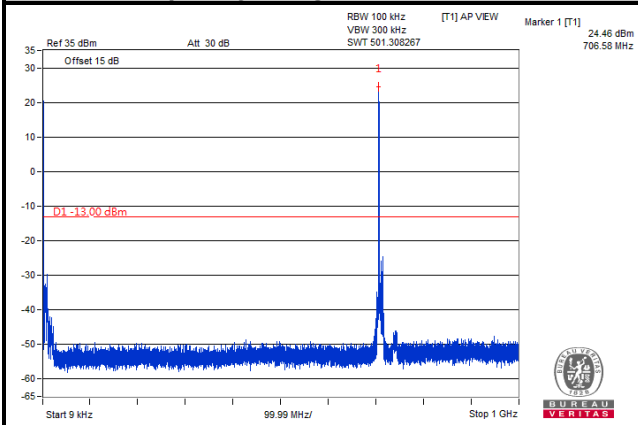


Frequency Range: 1 GHz ~ 10 GHz

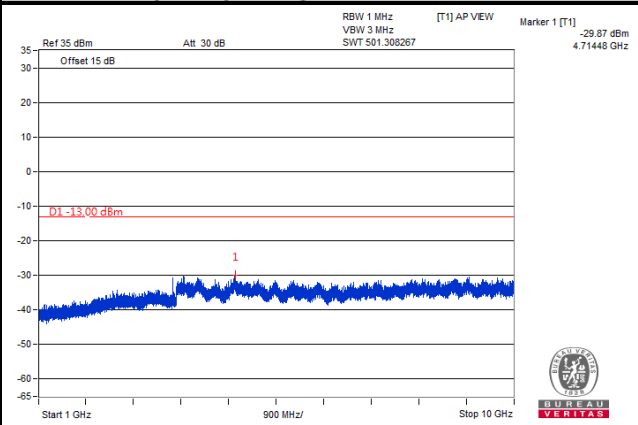


Channel 23130

Frequency Range: 9 kHz ~ 1 GHz



Frequency Range: 1 GHz ~ 10 GHz



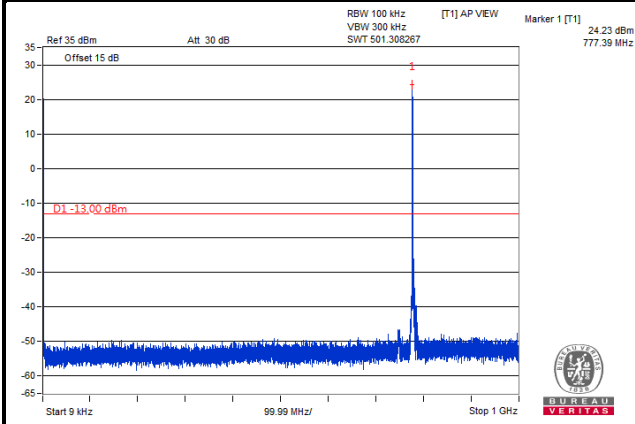
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 13

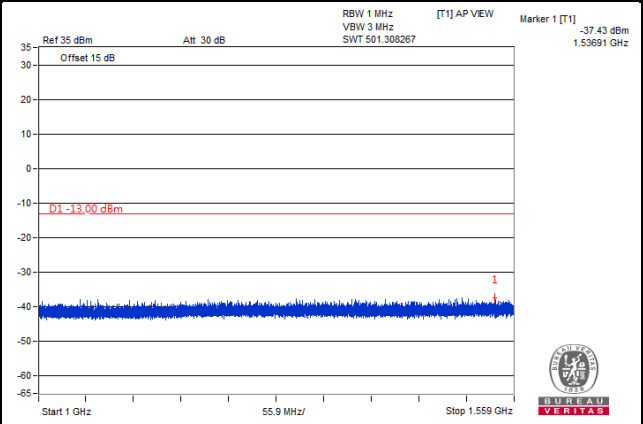
Channel Bandwidth: 5 MHz

Channel 23205

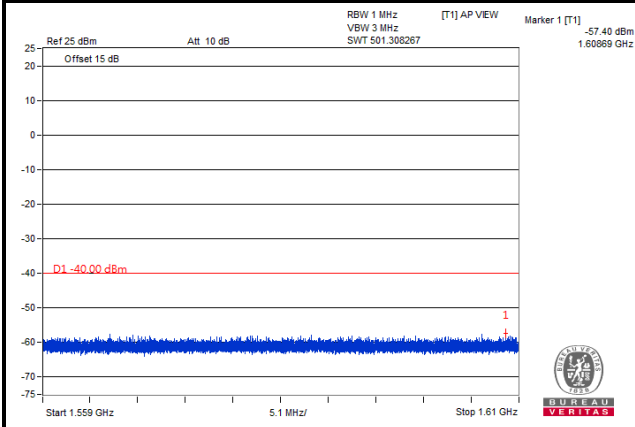
Frequency Range: 9 kHz ~ 1 GHz



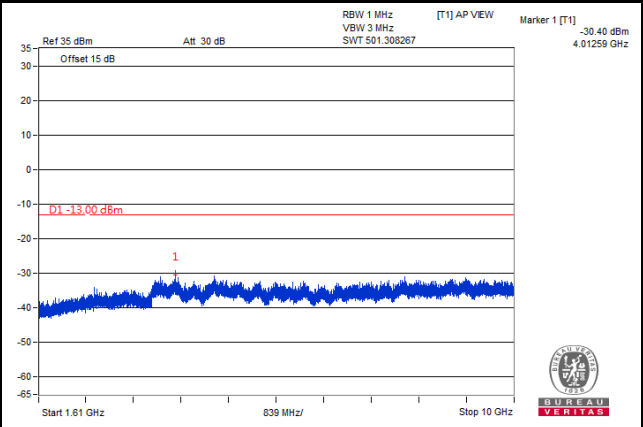
Frequency Range: 1 GHz ~ 1.559 GHz



Frequency Range: 1.559 GHz ~ 1.61 GHz



Frequency Range: 1.61 GHz ~ 10 GHz



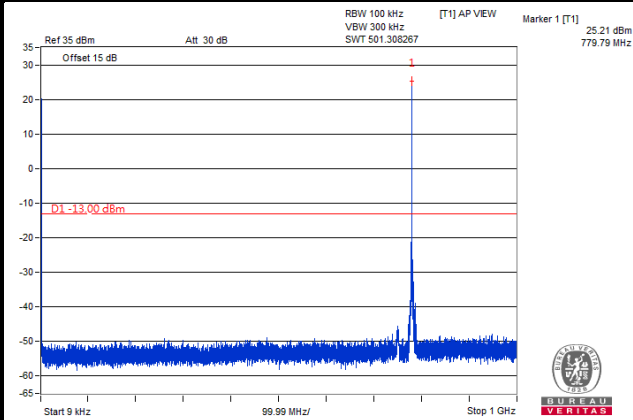
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 13

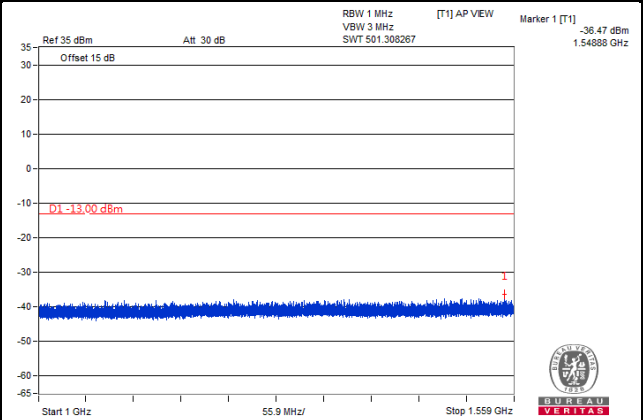
Channel Bandwidth: 5 MHz

Channel 23230

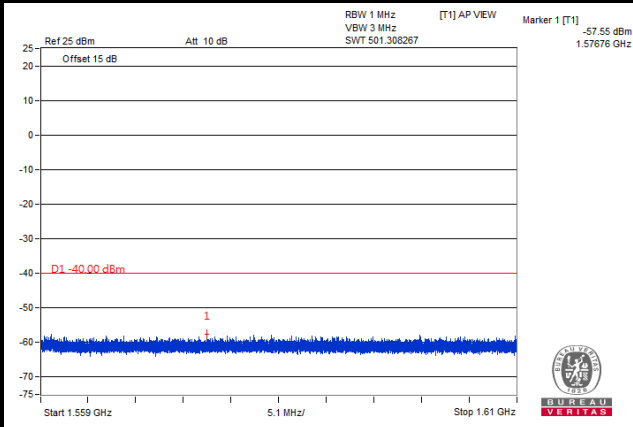
Frequency Range: 9 kHz ~ 1 GHz



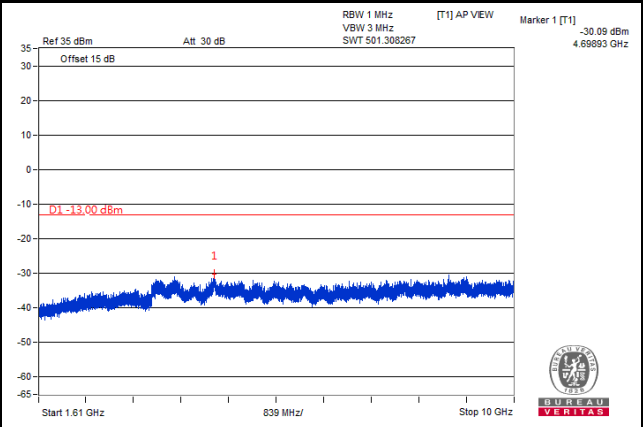
Frequency Range: 1 GHz ~ 1.559 GHz



Frequency Range: 1.559 GHz ~ 1.61 GHz



Frequency Range: 1.61 GHz ~ 10 GHz



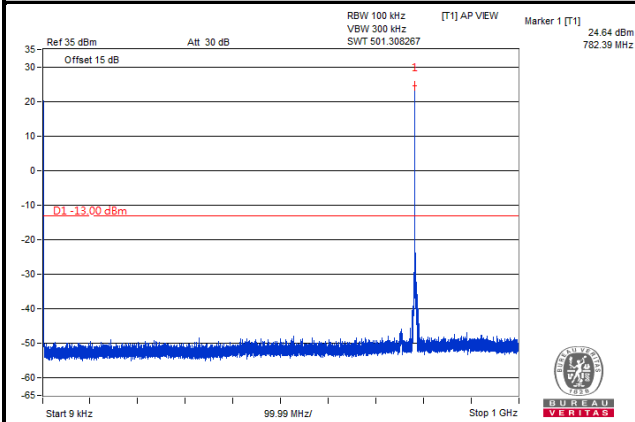
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 13

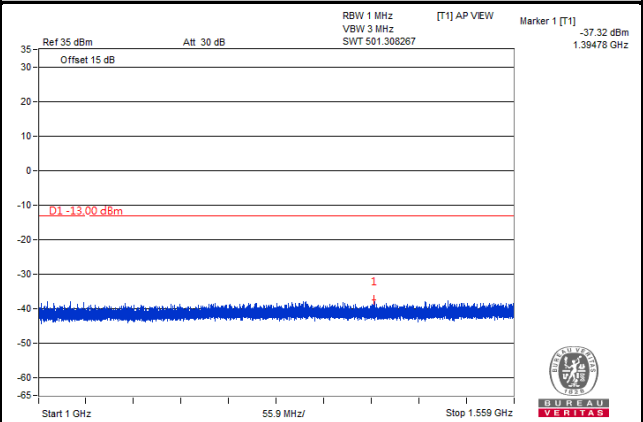
Channel Bandwidth: 5 MHz

Channel 23255

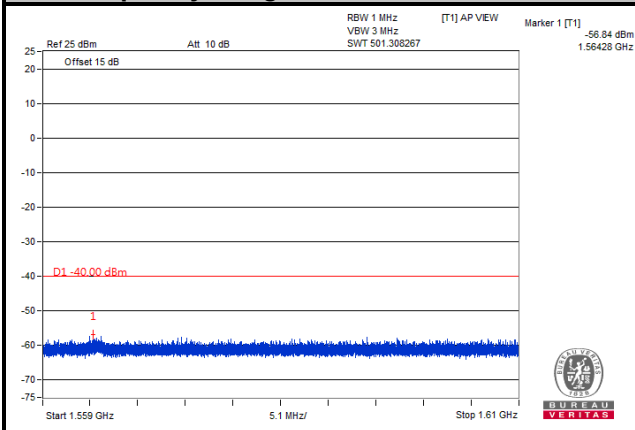
Frequency Range: 9 kHz ~ 1 GHz



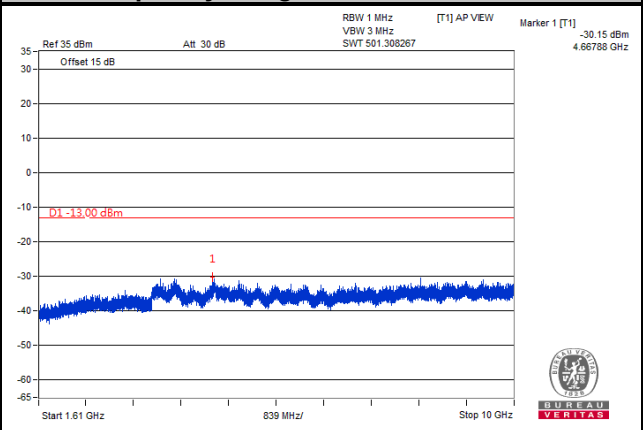
Frequency Range: 1 GHz ~ 1.559 GHz



Frequency Range: 1.559 GHz ~ 1.61 GHz



Frequency Range: 1.61 GHz ~ 10 GHz



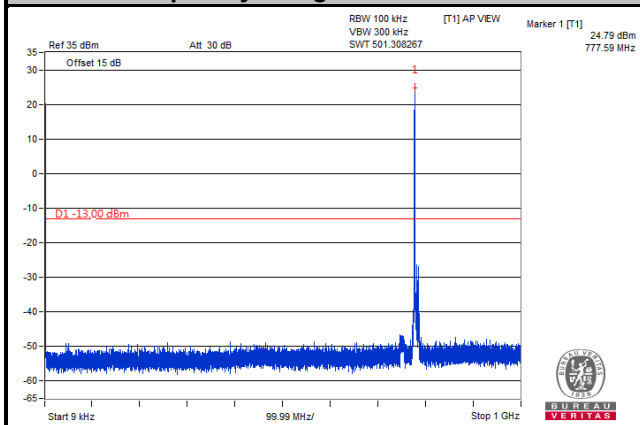
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 13

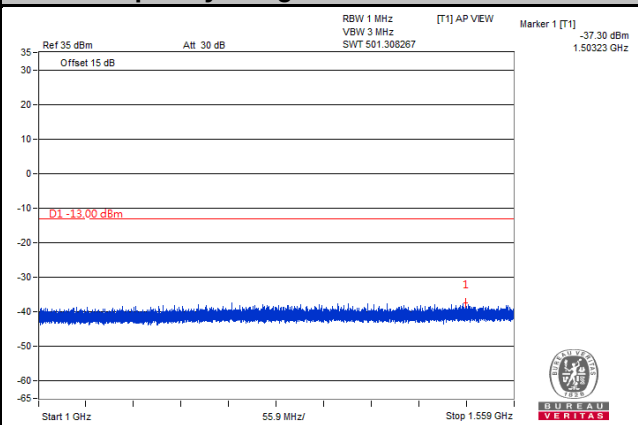
Channel Bandwidth: 10 MHz

Channel 23230

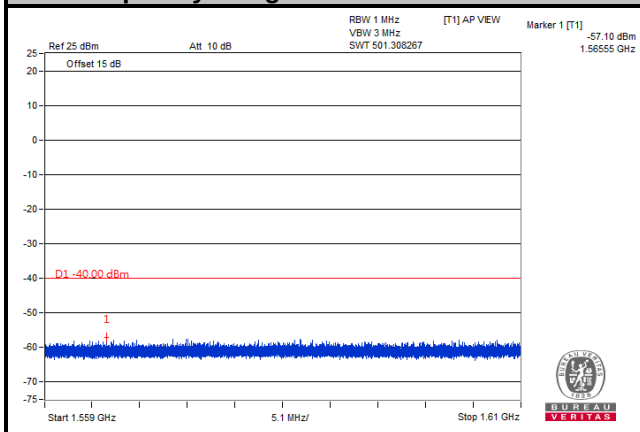
Frequency Range: 9 kHz ~ 1 GHz



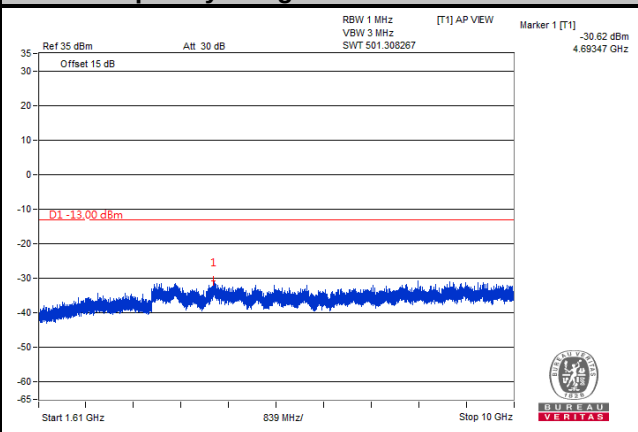
Frequency Range: 1 GHz ~ 1.559 GHz



Frequency Range: 1.559 GHz ~ 1.61 GHz



Frequency Range: 1.61 GHz ~ 10 GHz



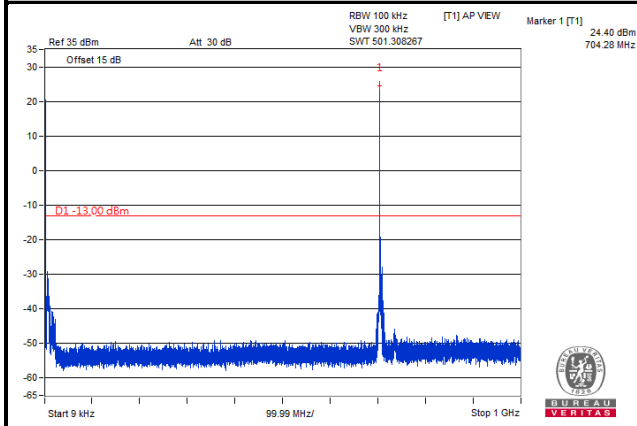
Note: The signal over the limit in 9 kHz is from spectrum analyzer.

LTE Band 17

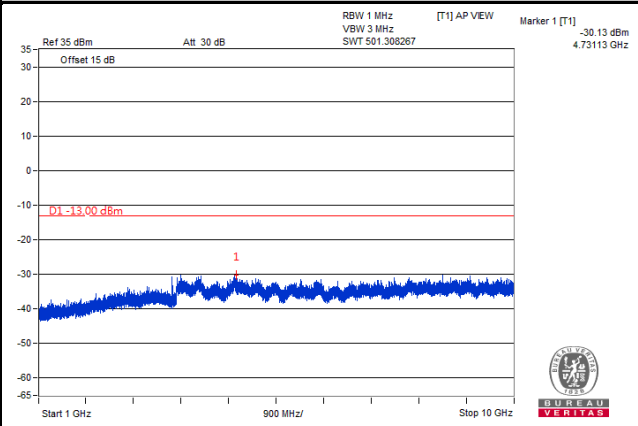
Channel Bandwidth: 5 MHz

Channel 23755

Frequency Range: 9 kHz ~ 1 GHz

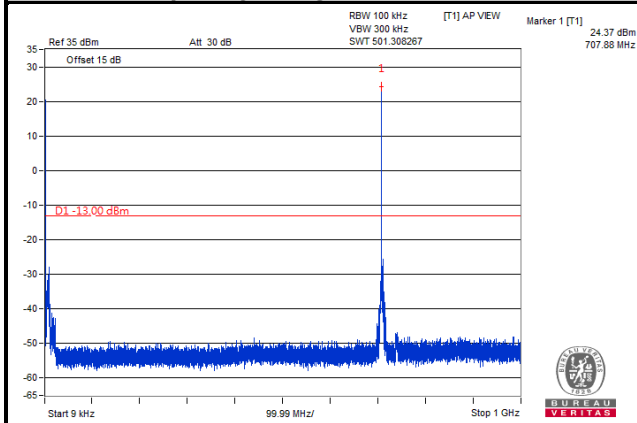


Frequency Range: 1 GHz ~ 10 GHz

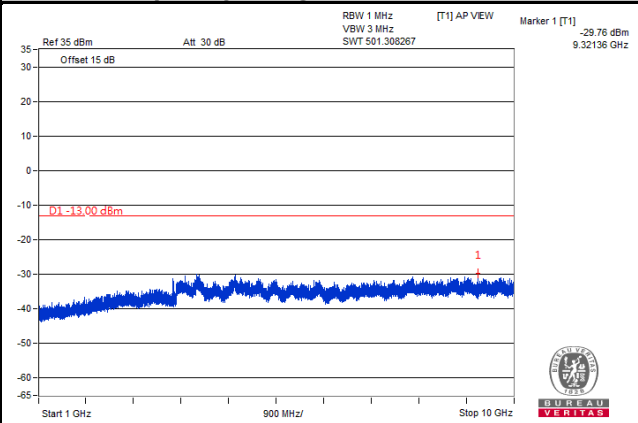


Channel 23790

Frequency Range: 9 kHz ~ 1 GHz

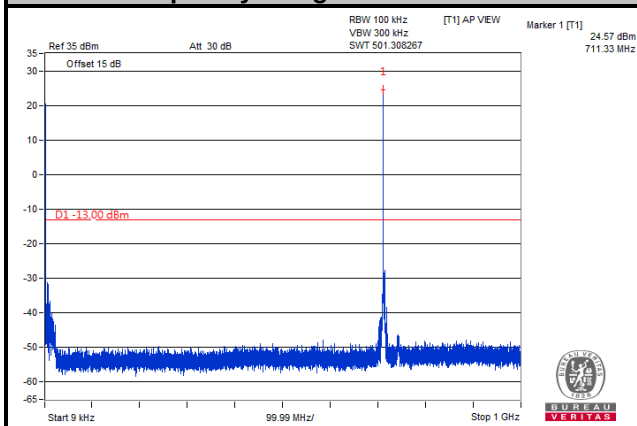


Frequency Range: 1 GHz ~ 10 GHz

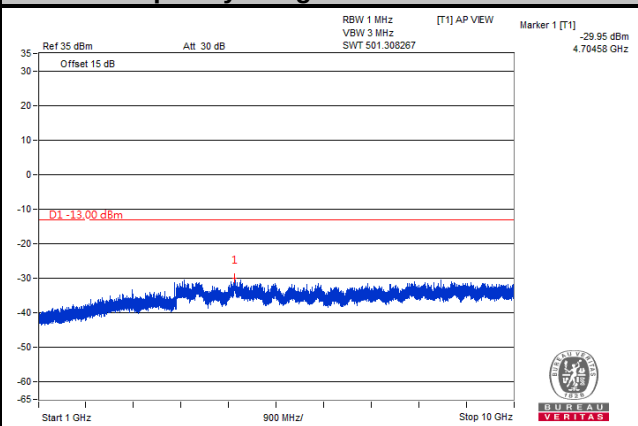


Channel 23825

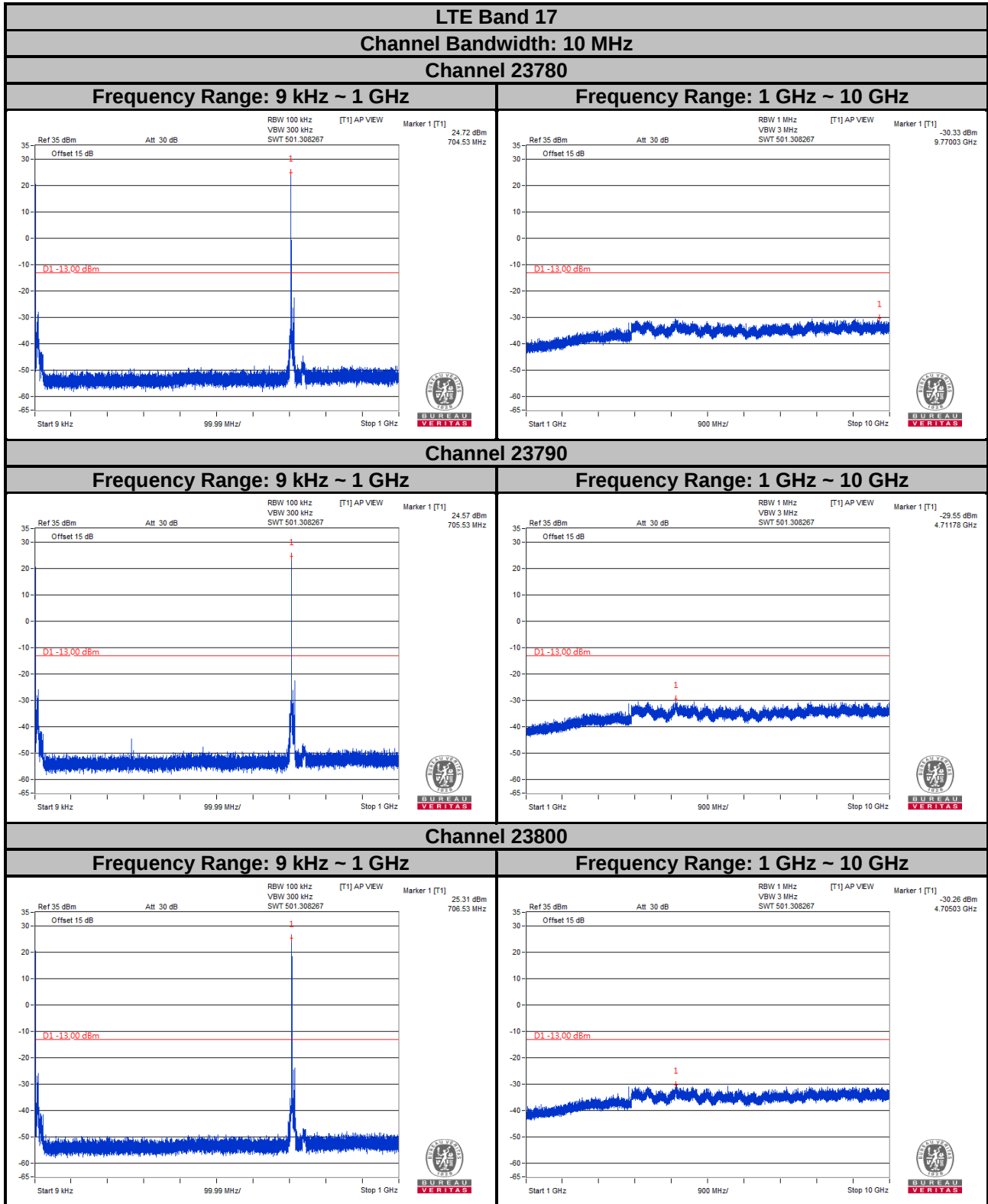
Frequency Range: 9 kHz ~ 1 GHz



Frequency Range: 1 GHz ~ 10 GHz



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



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

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.
- b. For operations in the 775-788 MHz, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz. The limit of emissions is equal to -40 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, $E.R.P \text{ power} = E.I.R.P \text{ power} - 2.15 \text{ dB}$.

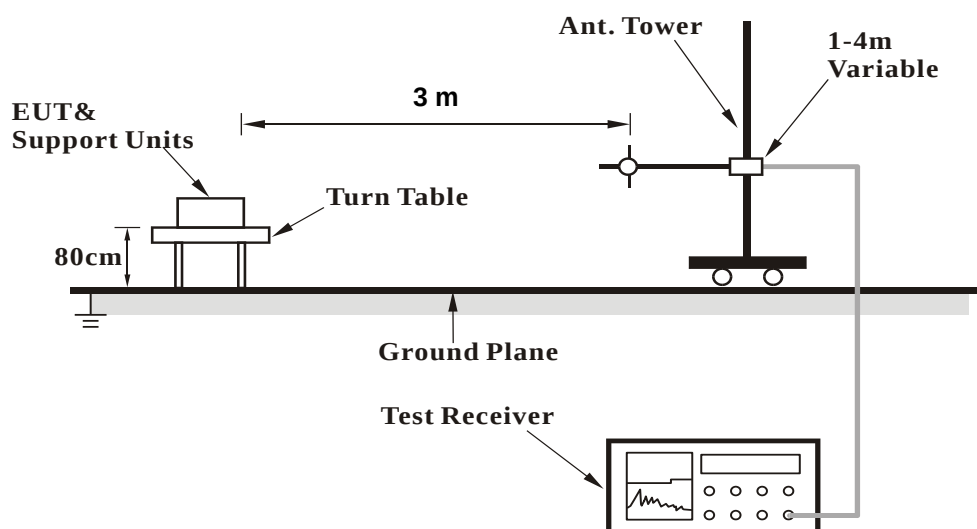
Note: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.8.3 Deviation from Test Standard

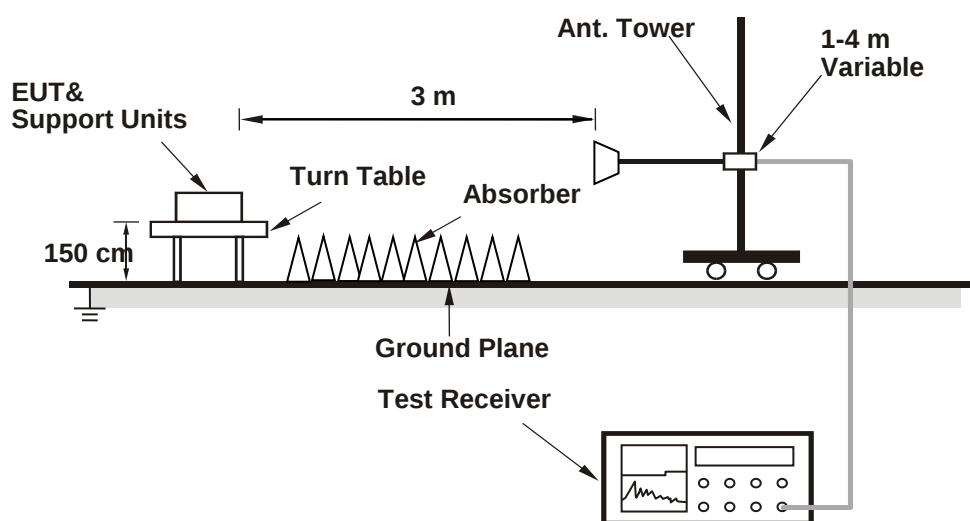
No deviation.

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:

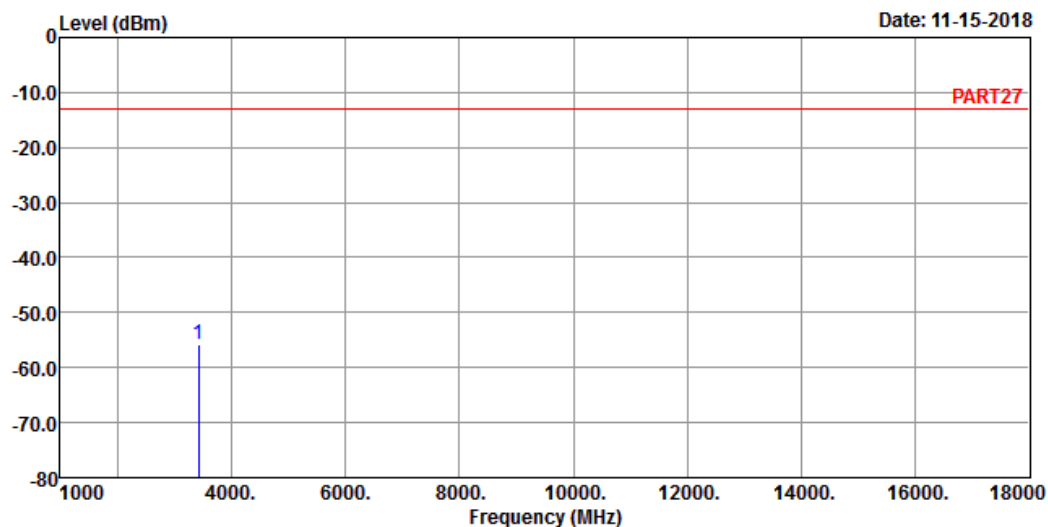
Low Channel



Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T

Data: 1



Site : 966 Chamber 5

Condition: PART27 HORIZONTAL

Remark : WCDMA Band 4 Link_L-CH

Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 3424.80 -55.82 -47.48 -13.00 -42.82 -8.34 Peak

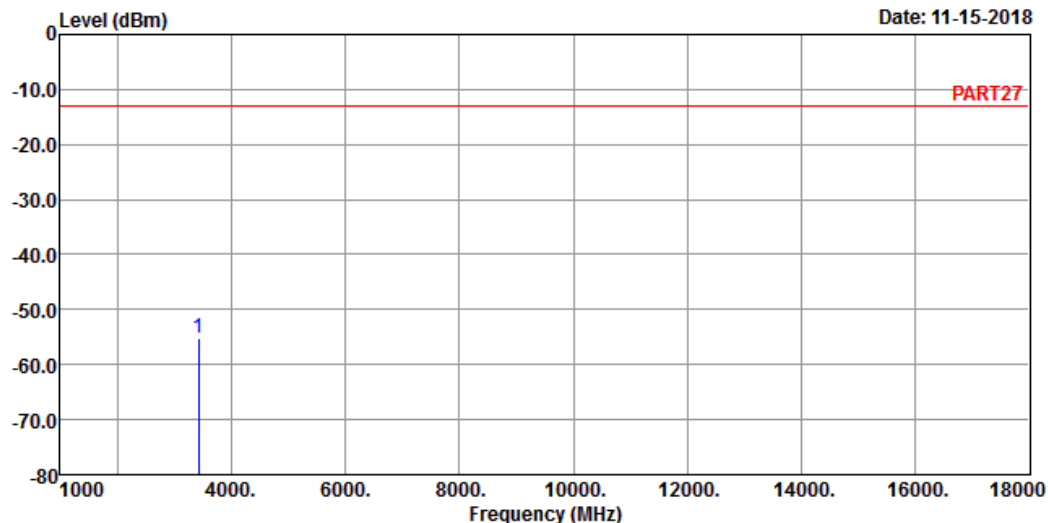


Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T

Data: 2

Date: 11-15-2018



Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remark : WCDMA Band 4 Link_L-CH
Tested by: Thomas Wei

Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3424.80	-55.22	-46.88	-13.00	-42.22	-8.34	Peak

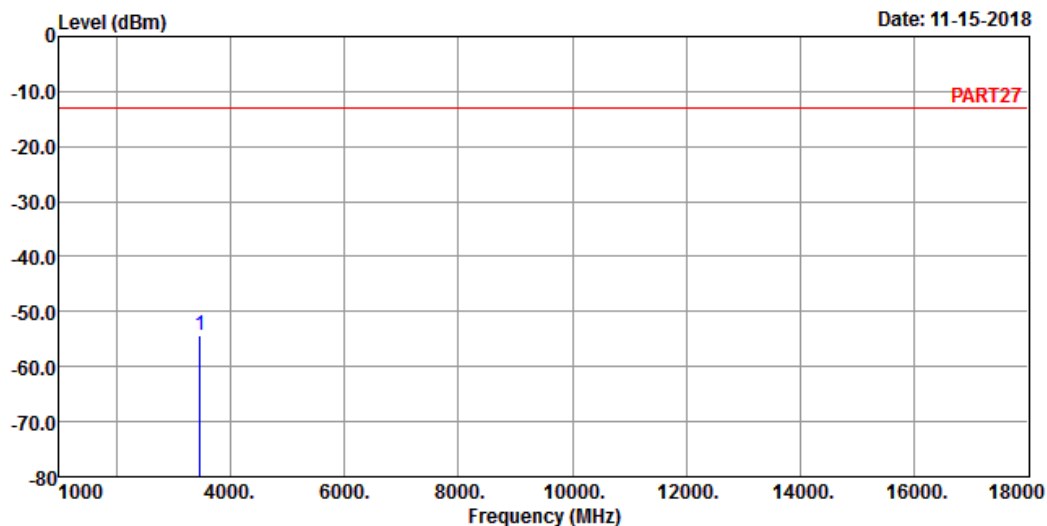
Middle Channel



Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T

Data: 1



Site : 966 Chamber 5
 Condition: PART27 HORIZONTAL
 Remark : WCDMA Band 4 Link_M-CH
 Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 3465.20 -54.21 -46.33 -13.00 -41.21 -7.88 Peak

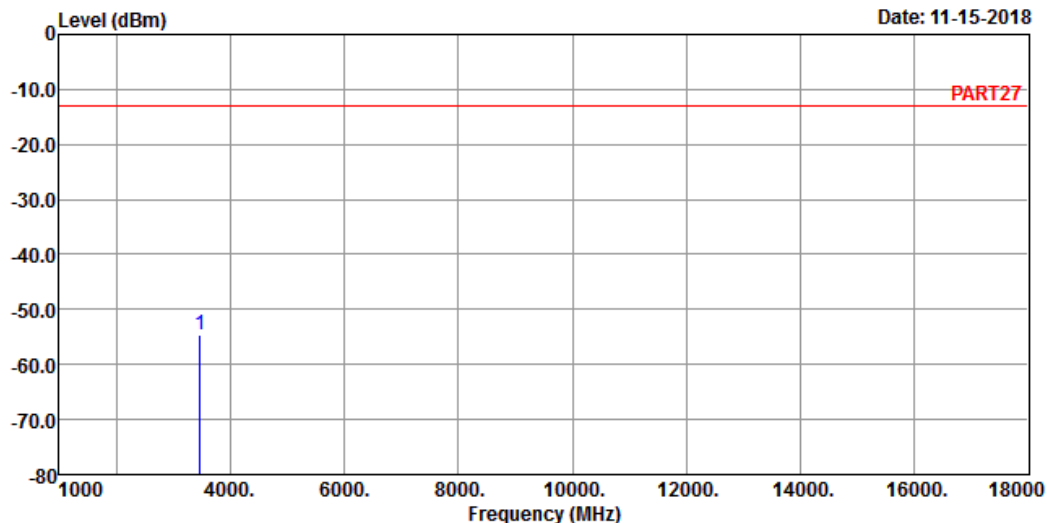


Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T

Data: 2

Date: 11-15-2018



Site : 966 Chamber 5

Condition: PART27 VERTICAL

Remark : WCDMA Band 4 Link_M-CH

Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3465.20	-54.70	-46.82	-13.00	-41.70	-7.88	Peak

High Channel

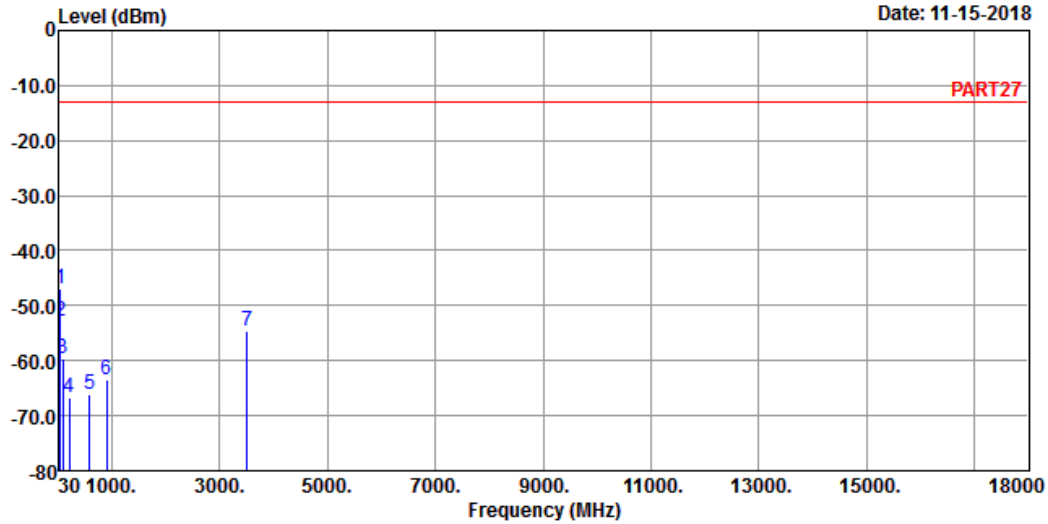


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 7

Date: 11-15-2018



Site : 966 Chamber 5

Condition: PART27 HORIZONTAL

Remark : WCDMA Band 4 Link_H-CH

Tested by: Thomas Wei

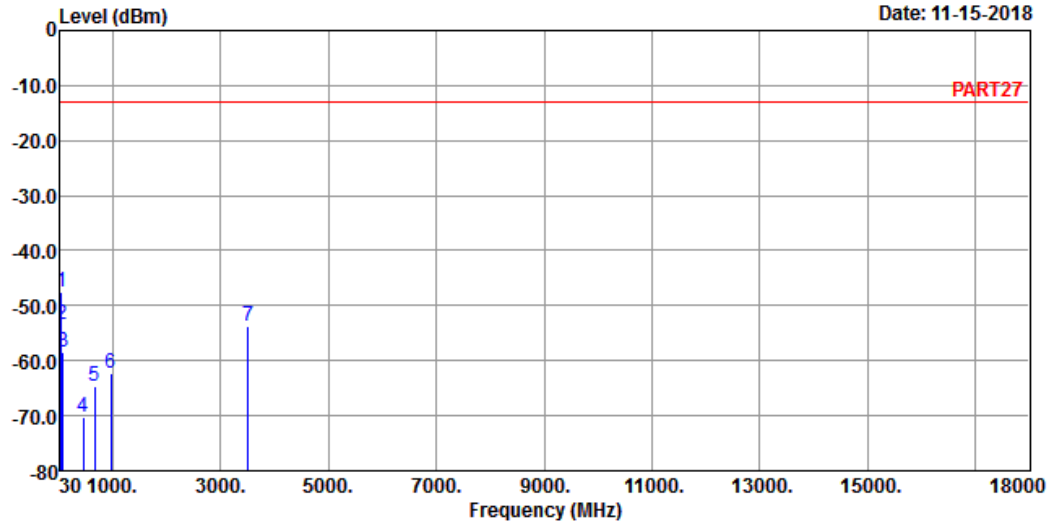
			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	43.58	-46.92	-45.45	-13.00	-33.92	-1.47	Peak
2	52.31	-52.75	-47.21	-13.00	-39.75	-5.54	Peak
3	96.93	-59.49	-48.76	-13.00	-46.49	-10.73	Peak
4	216.24	-66.83	-59.47	-13.00	-53.83	-7.36	Peak
5	590.66	-66.04	-64.88	-13.00	-53.04	-1.16	Peak
6	910.76	-63.52	-64.36	-13.00	-50.52	0.84	Peak
7	3505.20	-54.60	-47.15	-13.00	-41.60	-7.45	Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 8



Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remark : WCDMA Band 4 Link_H-CH
Tested by: Thomas Wei

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	44.55	-47.49	-45.50	-13.00	-34.49	-1.99	Peak
2	52.31	-53.56	-48.02	-13.00	-40.56	-5.54	Peak
3	78.50	-58.35	-47.92	-13.00	-45.35	-10.43	Peak
4	460.68	-70.22	-64.87	-13.00	-57.22	-5.35	Peak
5	671.17	-64.73	-64.18	-13.00	-51.73	-0.55	Peak
6	965.08	-62.16	-64.51	-13.00	-49.16	2.35	Peak
7	3505.20	-53.76	-46.31	-13.00	-40.76	-7.45	Peak

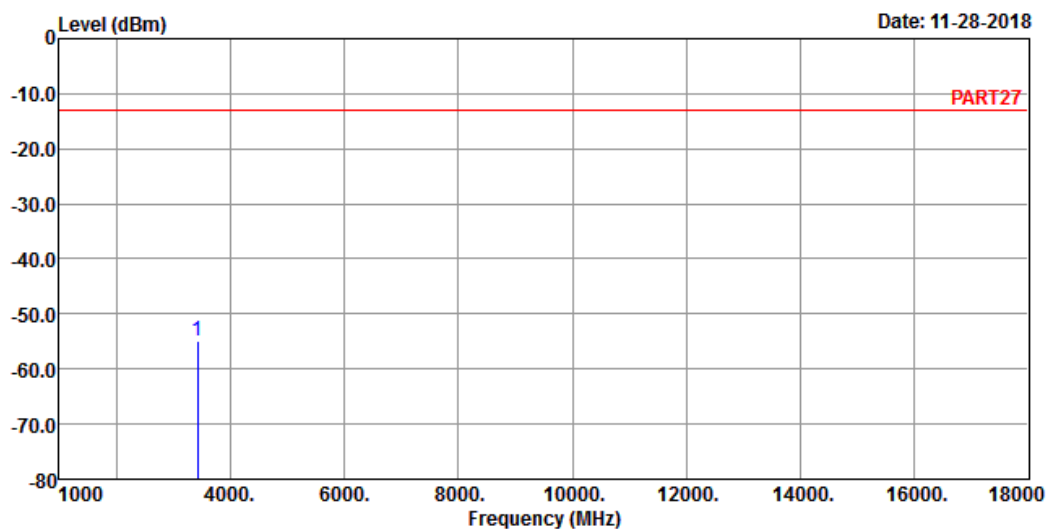
LTE Band 4
Channel Bandwidth: 1.4 MHz / QPSK
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 4 QPSK_1.4M Link_L-CH
Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3421.40	-55.02	-46.68	-13.00	-42.02	-8.34	Peak

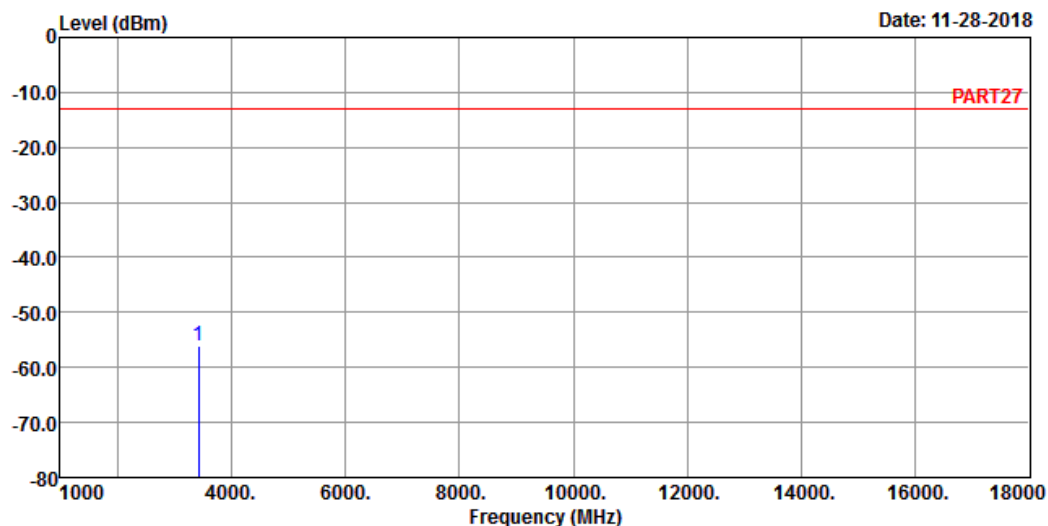


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 11-28-2018



Site : 966 Chamber 5

Condition: PART27 VERTICAL

Remak : LTE Band 4 QPSK_1.4M Link_L-CH

Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 3421.40 -55.98 -47.64 -13.00 -42.98 -8.34 Peak

Middle Channel

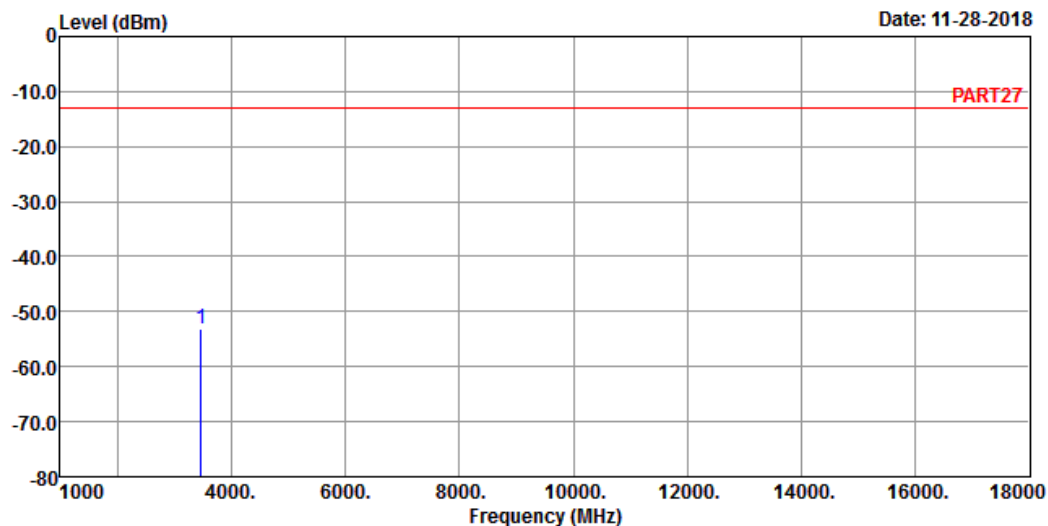


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3

Date: 11-28-2018



Site : 966 Chamber 5

Condition: PART27 HORIZONTAL

Remak : LTE Band 4 QPSK_1.4M Link_M-CH

Tested by: Thomas Wei

Freq	Level	Read	Limit	Over	Factor	Remark
		Level	Line	Limit		
MHz	dBm	dBm	dBm	dB	dB	

1 pp 3465.00 -52.99 -45.11 -13.00 -39.99 -7.88 Peak

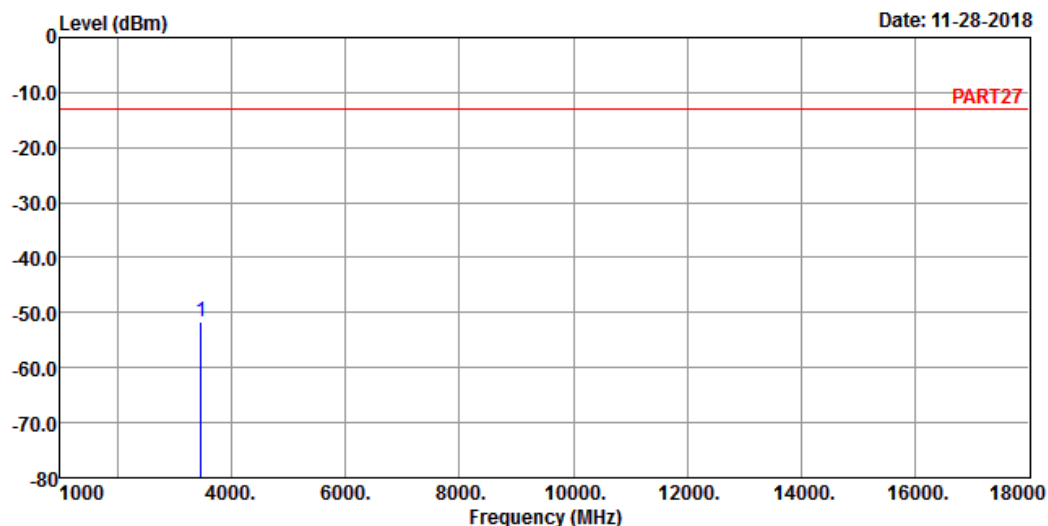


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 11-28-2018



Site : 966 Chamber 5

Condition: PART27 VERTICAL

Remak : LTE Band 4 QPSK_1.4M Link_M-CH

Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 3465.00 -51.78 -43.90 -13.00 -38.78 -7.88 Peak

High Channel

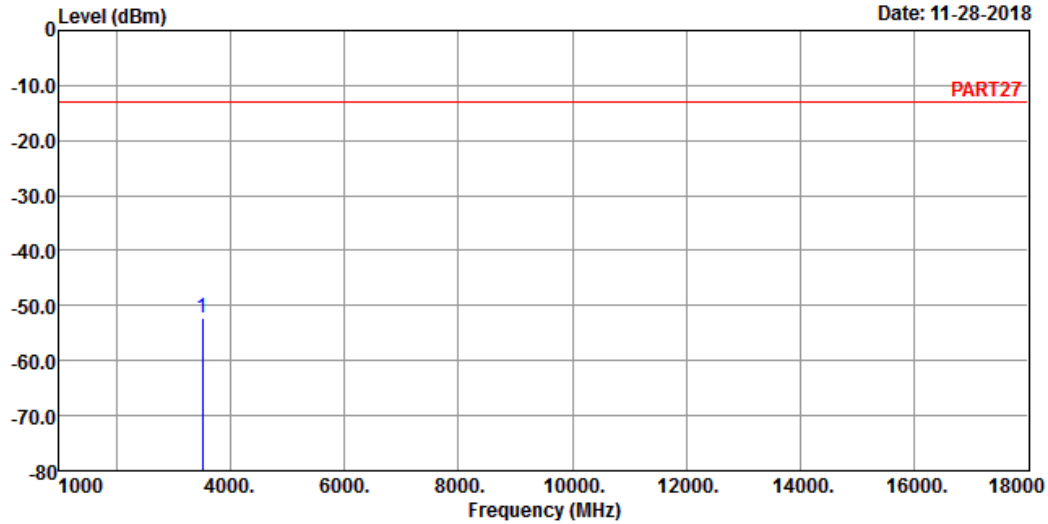


Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T

Data: 3

Date: 11-28-2018



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 4 QPSK_1.4M Link_H-CH
Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 3508.60 -52.23 -44.78 -13.00 -39.23 -7.45 Peak

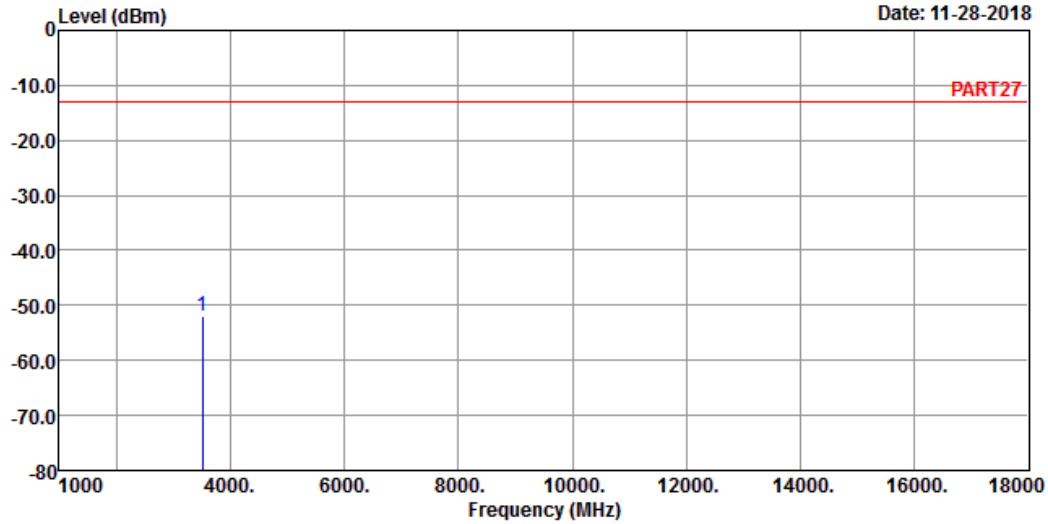


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 11-28-2018



Site : 966 Chamber 5
 Condition: PART27 VERTICAL
 Remak : LTE Band 4 QPSK_1.4M Link_H-CH
 Tested by: Thomas Wei

Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3508.60	-51.99	-44.54	-13.00	-38.99	-7.45	Peak

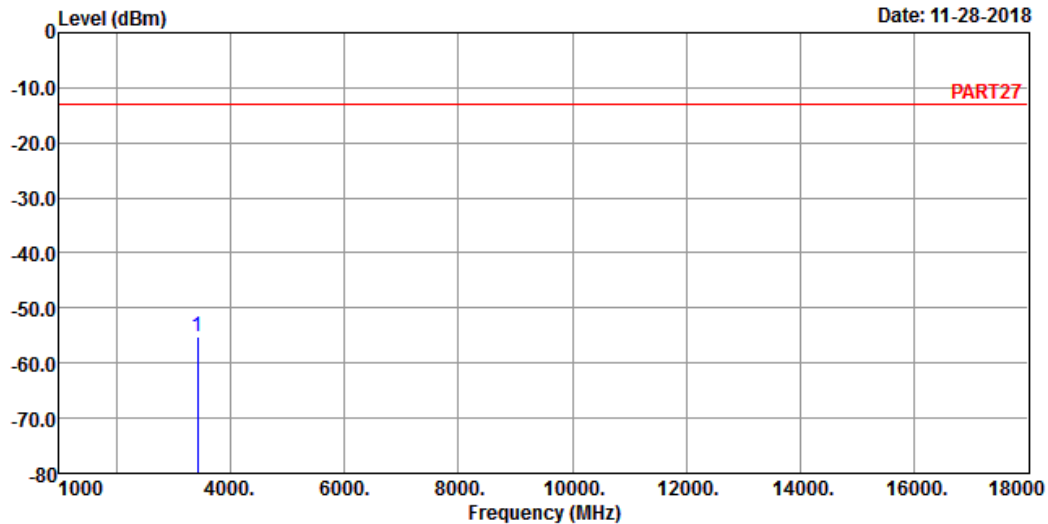
Channel Bandwidth: 5 MHz / QPSK
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 4 QPSK_5M Link_L-CH
Tested by: Thomas Wei

Freq	Level	Read	Limit	Over		
MHz	dBm	Level	Line	Limit	Factor	Remark

1 pp 3425.00 -55.23 -46.89 -13.00 -42.23 -8.34 Peak

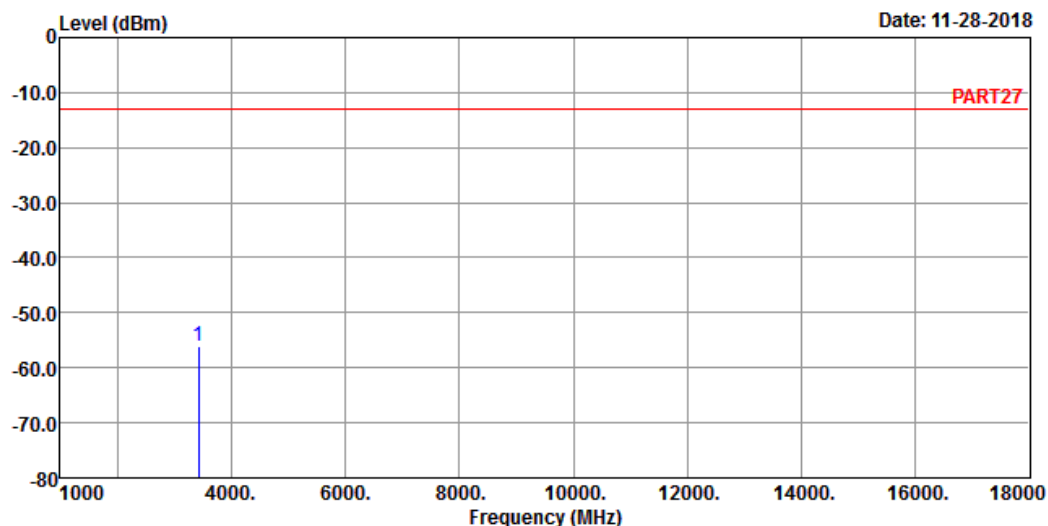


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 11-28-2018



Site : 966 Chamber 5

Condition: PART27 VERTICAL

Remak : LTE Band 4 QPSK_5M Link_L-CH

Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 3425.00 -56.14 -47.80 -13.00 -43.14 -8.34 Peak

Middle Channel

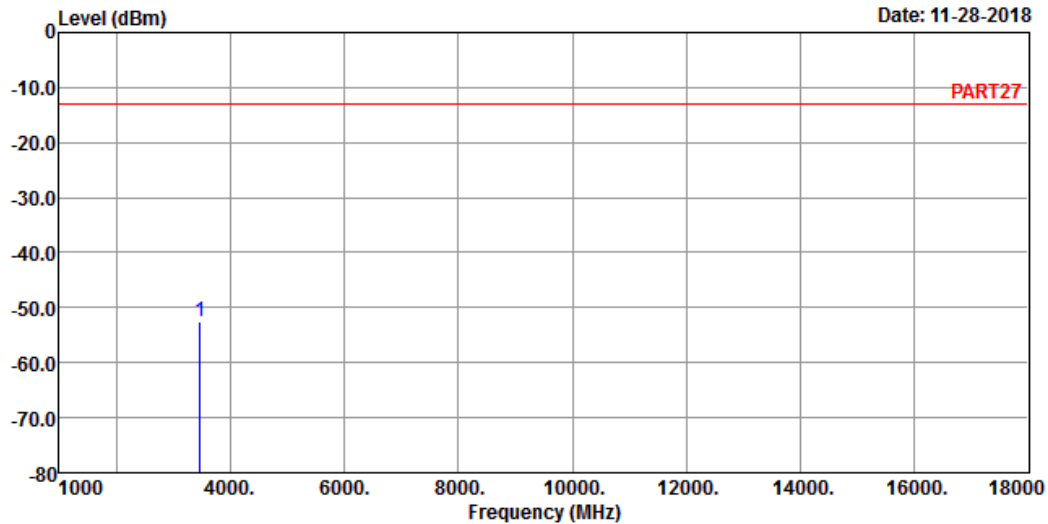


Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T

Data: 3

Date: 11-28-2018



Site : 966 Chamber 5

Condition: PART27 HORIZONTAL

Remak : LTE Band 4 QPSK_5M Link_M-CH

Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 3465.00 -52.62 -44.74 -13.00 -39.62 -7.88 Peak

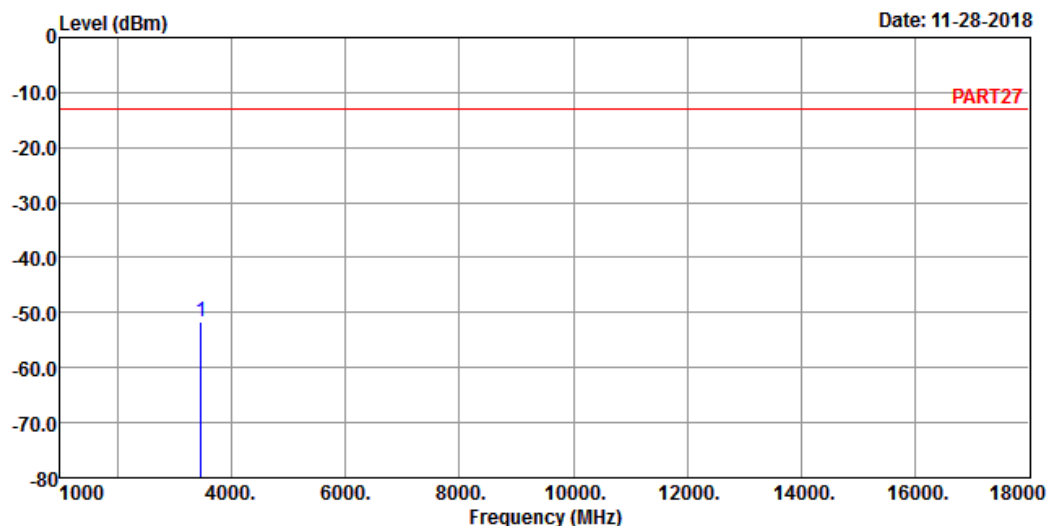


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 11-28-2018



Site : 966 Chamber 5

Condition: PART27 VERTICAL

Remak : LTE Band 4 QPSK_5M Link_M-CH

Tested by: Thomas Wei

Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 3465.00 -51.63 -43.75 -13.00 -38.63 -7.88 Peak

High Channel

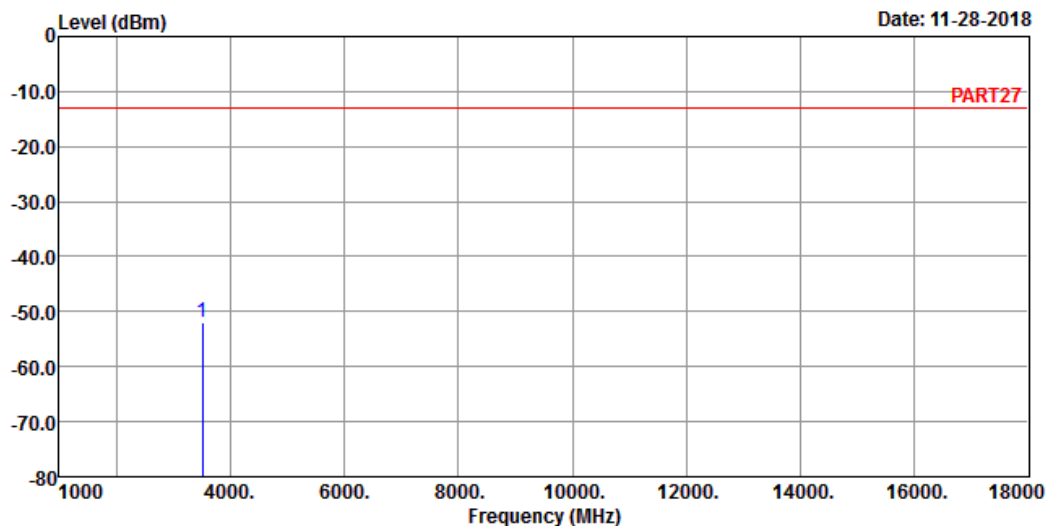


Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T

Data: 3

Date: 11-28-2018



Site : 966 Chamber 5

Condition: PART27 HORIZONTAL

Remak : LTE Band 4 QPSK_5M Link_H-CH

Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 3505.00 -51.99 -44.54 -13.00 -38.99 -7.45 Peak

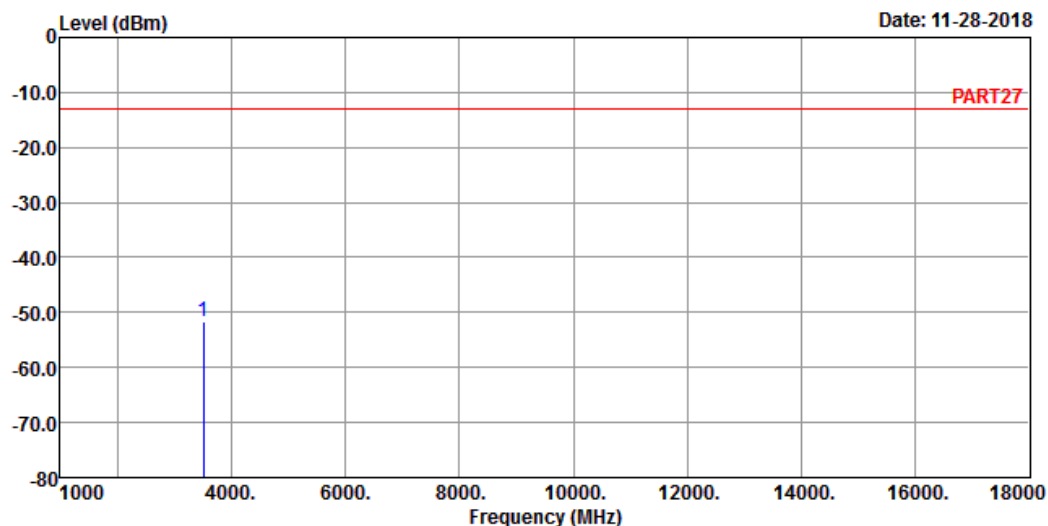


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 11-28-2018



Site : 966 Chamber 5

Condition: PART27 VERTICAL

Remak : LTE Band 4 QPSK_5M Link_H-CH

Tested by: Thomas Wei

Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 3505.00 -51.75 -44.30 -13.00 -38.75 -7.45 Peak

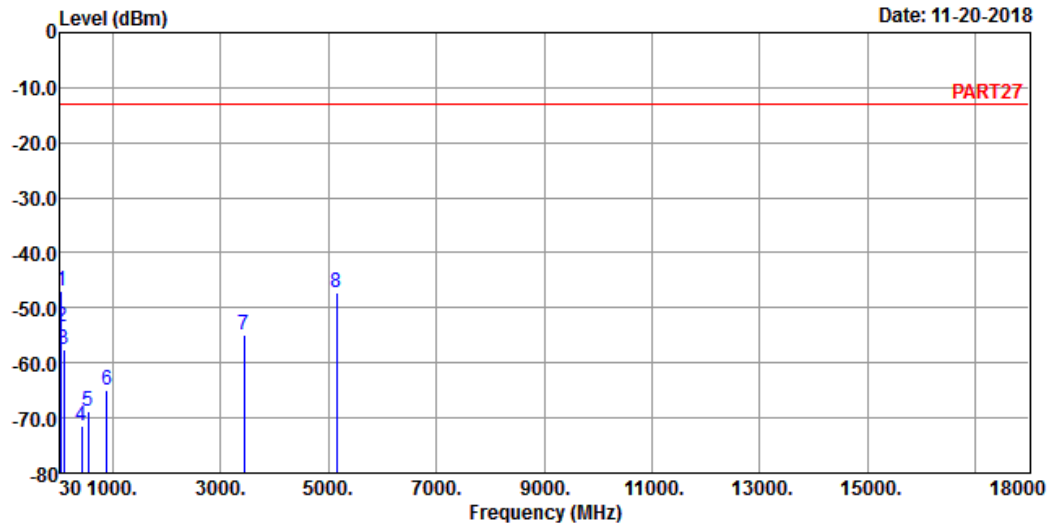
Channel Bandwidth: 20 MHz / QPSK
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 7



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 4 QPSK_20M Link_L-CH
Tested by: Thomas Wei

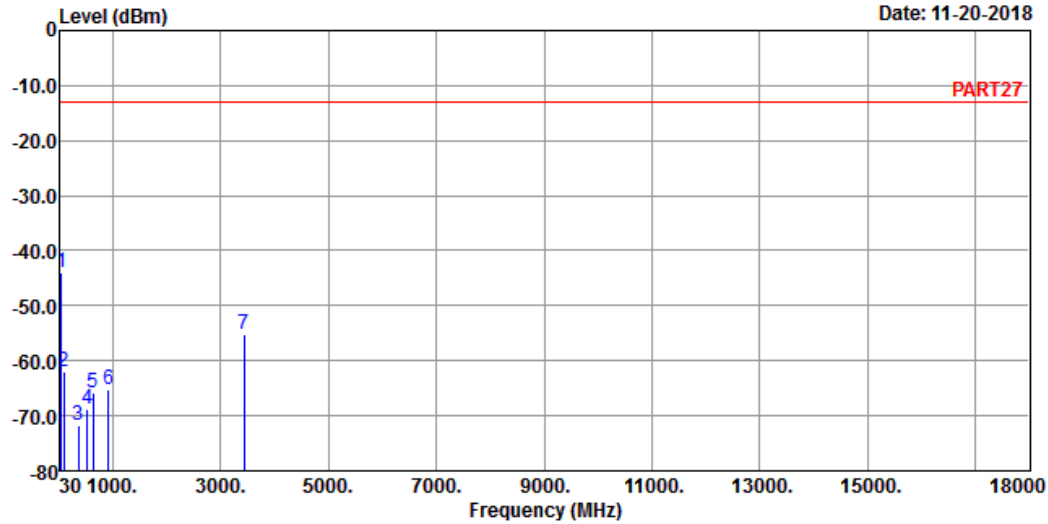
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	44.55	-46.97	-44.98	-13.00	-33.97	-1.99	Peak
2	52.31	-53.30	-47.76	-13.00	-40.30	-5.54	Peak
3	99.84	-57.42	-46.86	-13.00	-44.42	-10.56	Peak
4	432.55	-71.55	-65.86	-13.00	-58.55	-5.69	Peak
5	551.86	-68.88	-66.11	-13.00	-55.88	-2.77	Peak
6	894.27	-64.94	-65.48	-13.00	-51.94	0.54	Peak
7	3440.00	-54.79	-46.57	-13.00	-41.79	-8.22	Peak
8	5160.00	-47.18	-45.27	-13.00	-34.18	-1.91	Peak



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 8



Site : 966 Chamber 5
Condition: PART27 VERTICAL
Remak : LTE Band 4 QPSK_20M Link_L-CH
Tested by: Thomas Wei

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	44.55	-44.13	-42.14	-13.00	-31.13	-1.99	Peak
2	100.81	-61.91	-51.37	-13.00	-48.91	-10.54	Peak
3	358.83	-71.87	-65.68	-13.00	-58.87	-6.19	Peak
4	534.40	-68.80	-65.40	-13.00	-55.80	-3.40	Peak
5	643.04	-65.96	-65.09	-13.00	-52.96	-0.87	Peak
6	917.55	-65.13	-66.13	-13.00	-52.13	1.00	Peak
7	3440.00	-55.19	-46.97	-13.00	-42.19	-8.22	Peak

Middle Channel

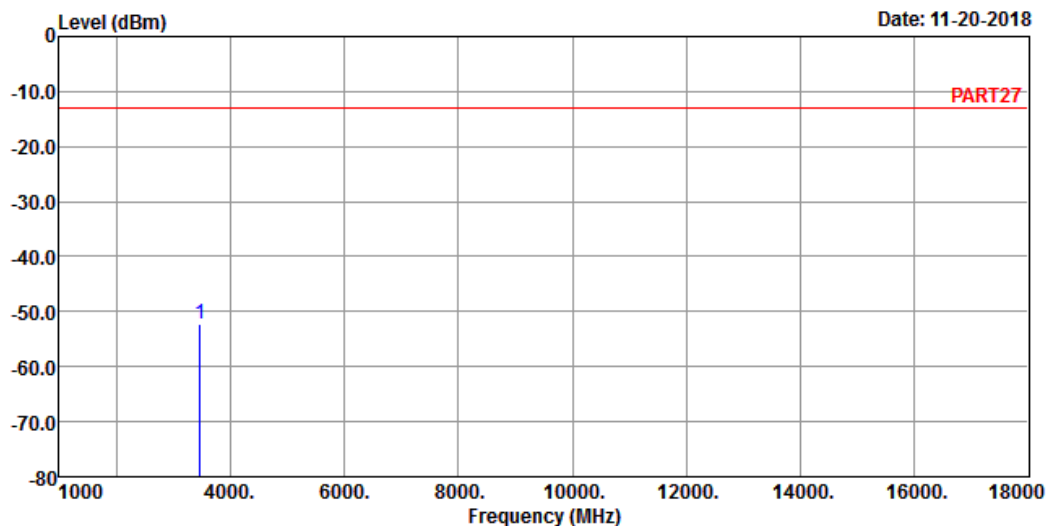


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3

Date: 11-20-2018



Site : 966 Chamber 5

Condition: PART27 HORIZONTAL

Remak : LTE Band 4 QPSK_20M Link_M-CH

Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 3465.00 -52.26 -44.38 -13.00 -39.26 -7.88 Peak

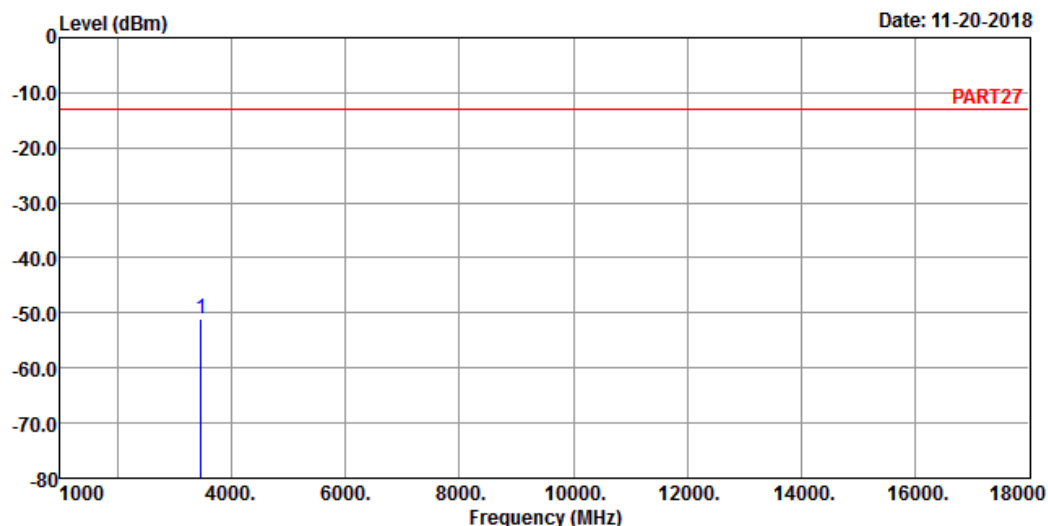


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 11-20-2018



Site : 966 Chamber 5

Condition: PART27 VERTICAL

Remak : LTE Band 4 QPSK_20M Link_M-CH

Tested by: Thomas Wei

Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 3465.00 -51.06 -43.18 -13.00 -38.06 -7.88 Peak

High Channel

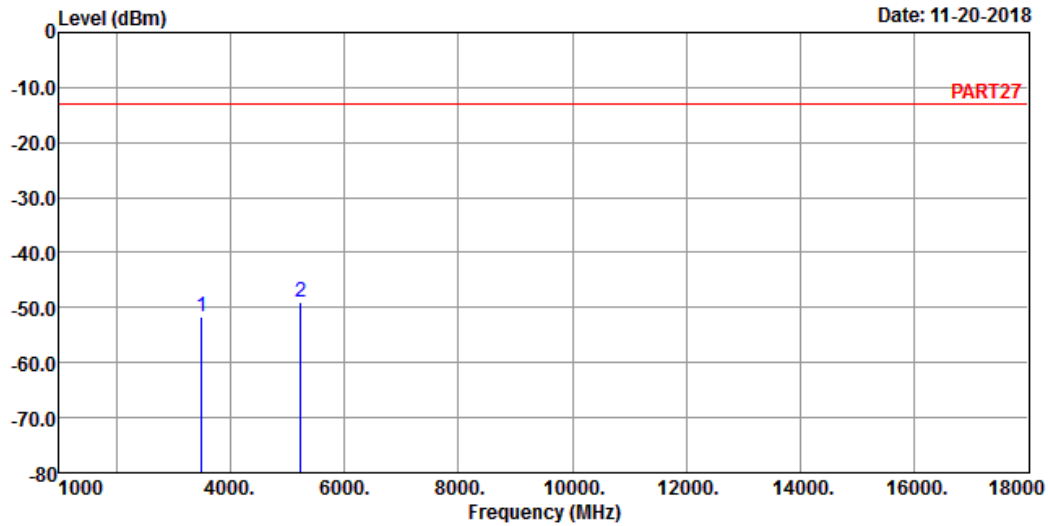


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3

Date: 11-20-2018



Site : 966 Chamber 5

Condition: PART27 HORIZONTAL

Remak : LTE Band 4 QPSK_20M Link_H-CH

Tested by: Thomas Wei

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3490.00	-51.76	-44.11	-13.00	-38.76	-7.65	Peak
2 pp	5235.00	-48.96	-46.55	-13.00	-35.96	-2.41	Peak

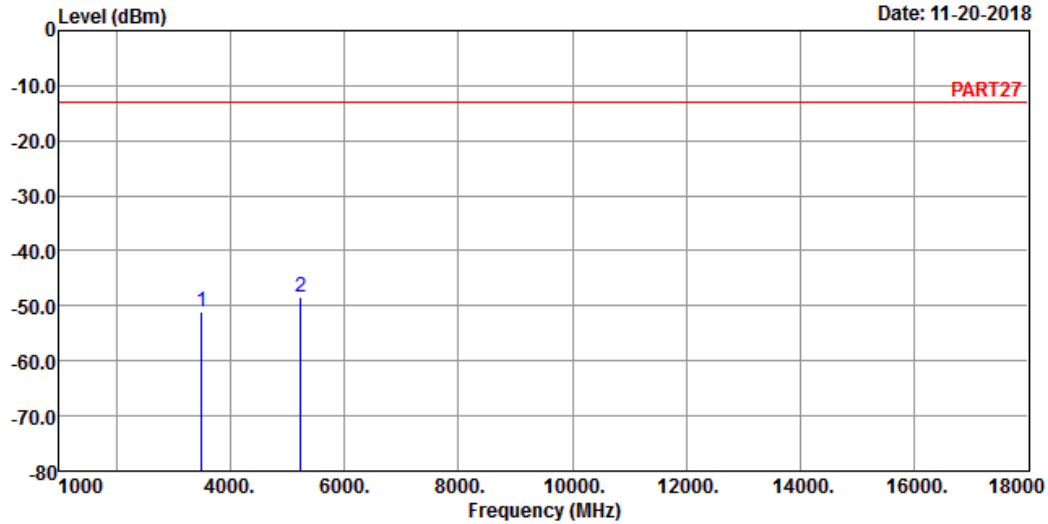


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 11-20-2018



Site : 966 Chamber 5

Condition: PART27 VERTICAL

Remak : LTE Band 4 QPSK_20M Link_H-CH

Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3490.00	-51.20	-43.55	-13.00	-38.20	-7.65	Peak
2 pp	5235.00	-48.47	-46.06	-13.00	-35.47	-2.41	Peak

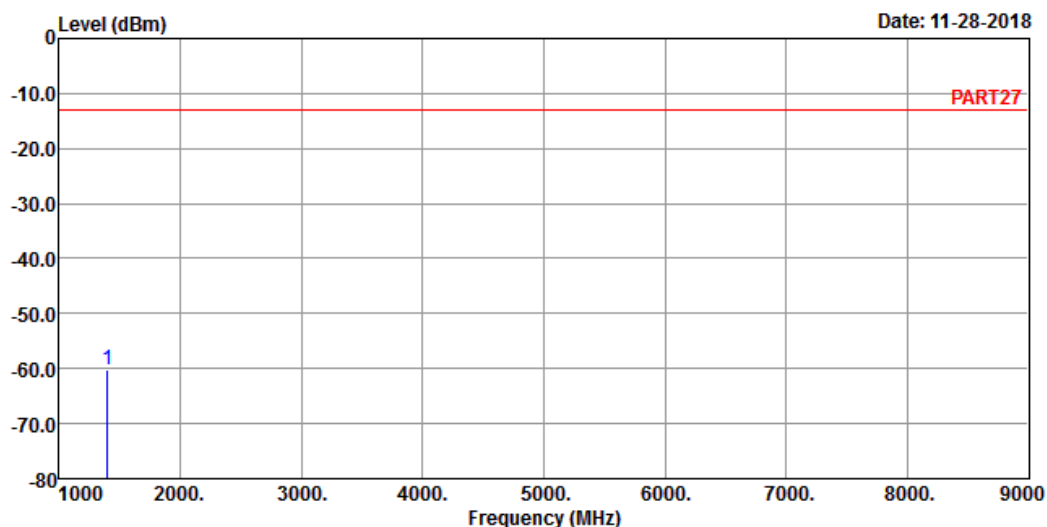
LTE Band 12
Channel Bandwidth: 1.4 MHz / QPSK
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 12 QPSK_1.4M Link_L-CH
Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 1399.40 -60.12 -48.27 -13.00 -47.12 -11.85 Peak

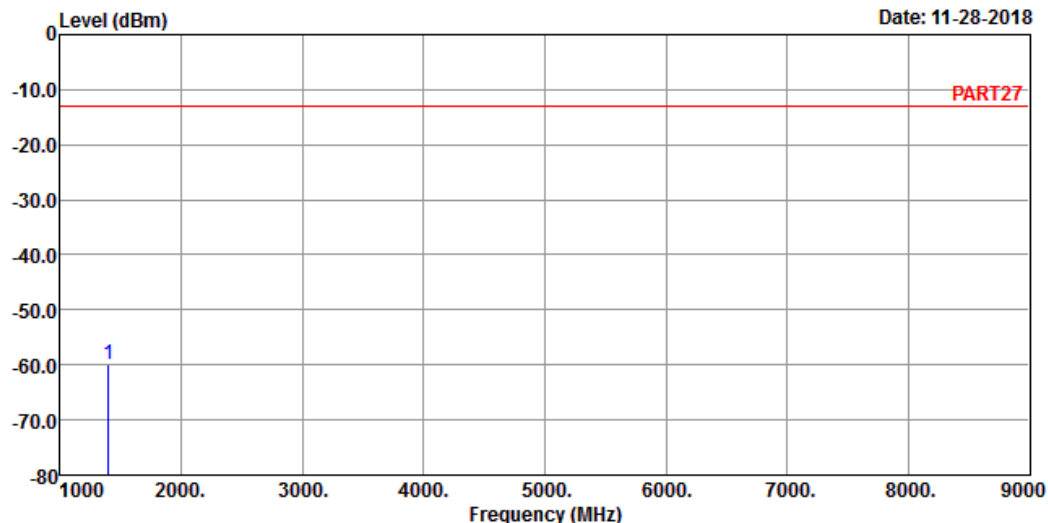


Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T

Data: 4

Date: 11-28-2018



Site : 966 Chamber 5

Condition: PART27 VERTICAL

Remak : LTE Band 12 QPSK_1.4M Link_L-CH

Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 1399.40 -59.98 -48.13 -13.00 -46.98 -11.85 Peak

Middle Channel

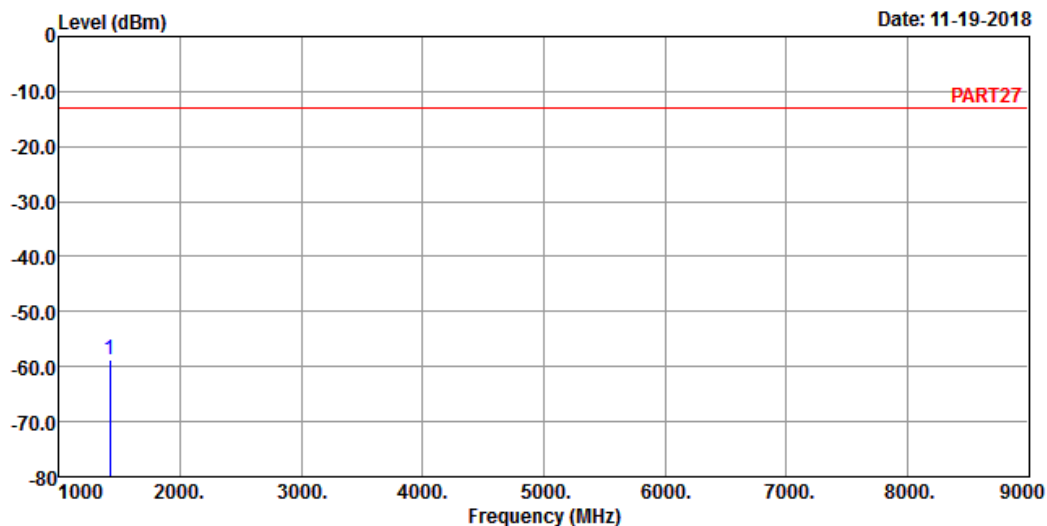


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3

Date: 11-19-2018



Site : 966 Chamber 5

Condition: PART27 HORIZONTAL

Remak : LTE Band 12 QPSK_1.4M Link_M-CH

Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 1415.00 -58.61 -46.53 -13.00 -45.61 -12.08 Peak

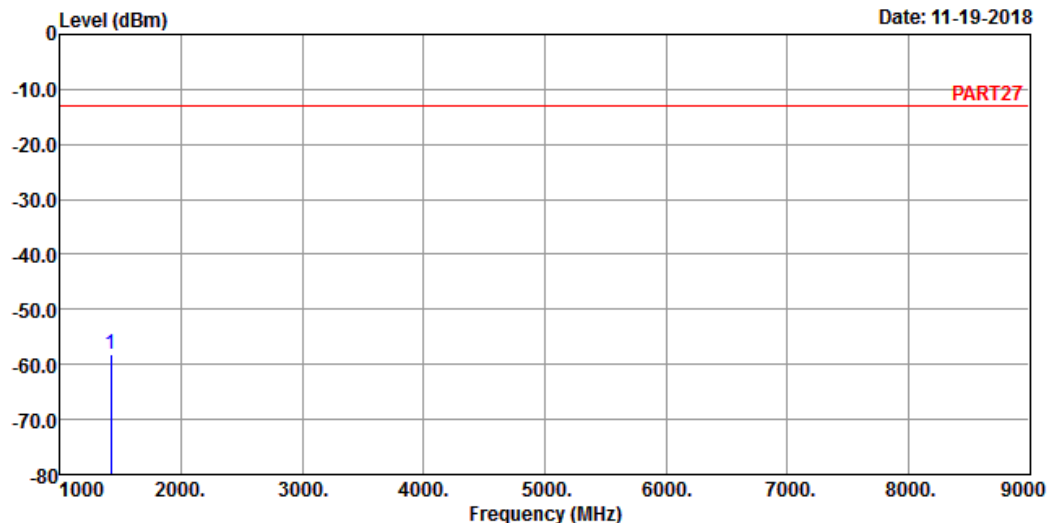


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 11-19-2018



Site : 966 Chamber 5

Condition: PART27 VERTICAL

Remak : LTE Band 12 QPSK_1.4M Link_M-CH

Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 1415.00 -58.15 -46.07 -13.00 -45.15 -12.08 Peak

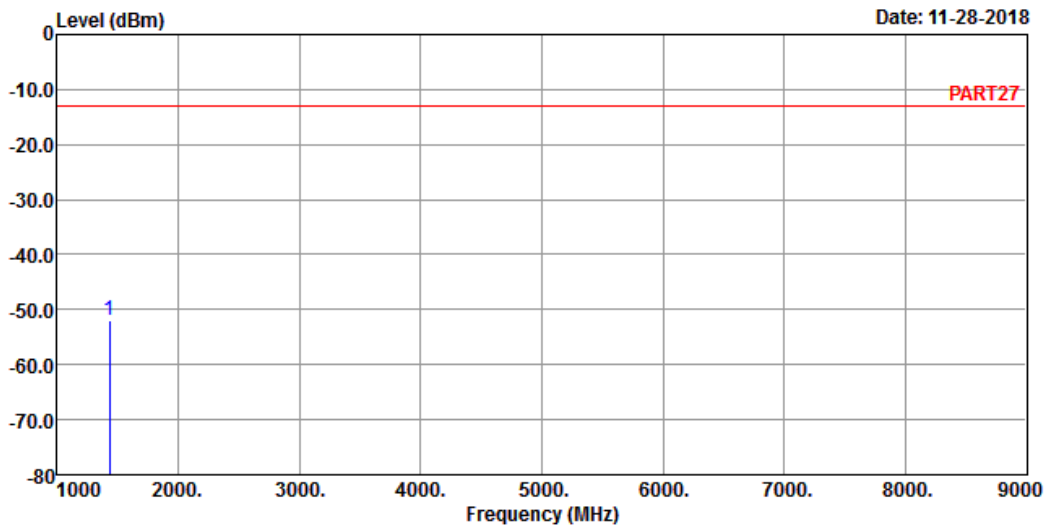
High Channel



Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T

Data: 3



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 12 QPSK_1.4M Link_H-CH
Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 1430.60 -51.85 -39.54 -13.00 -38.85 -12.31 Peak

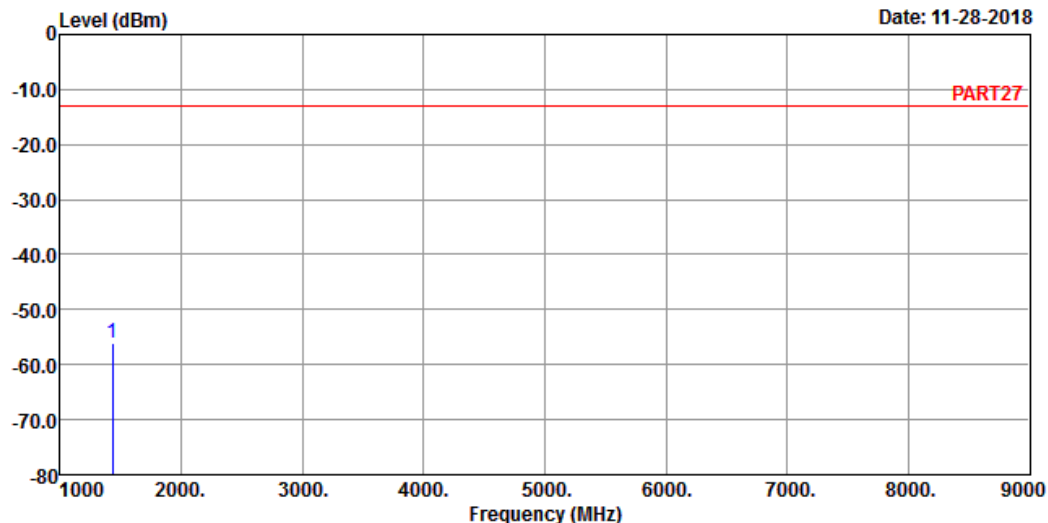


Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T

Data: 4

Date: 11-28-2018



Site : 966 Chamber 5

Condition: PART27 VERTICAL

Remak : LTE Band 12 QPSK_1.4M Link_H-CH

Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 1430.60 -55.96 -43.65 -13.00 -42.96 -12.31 Peak

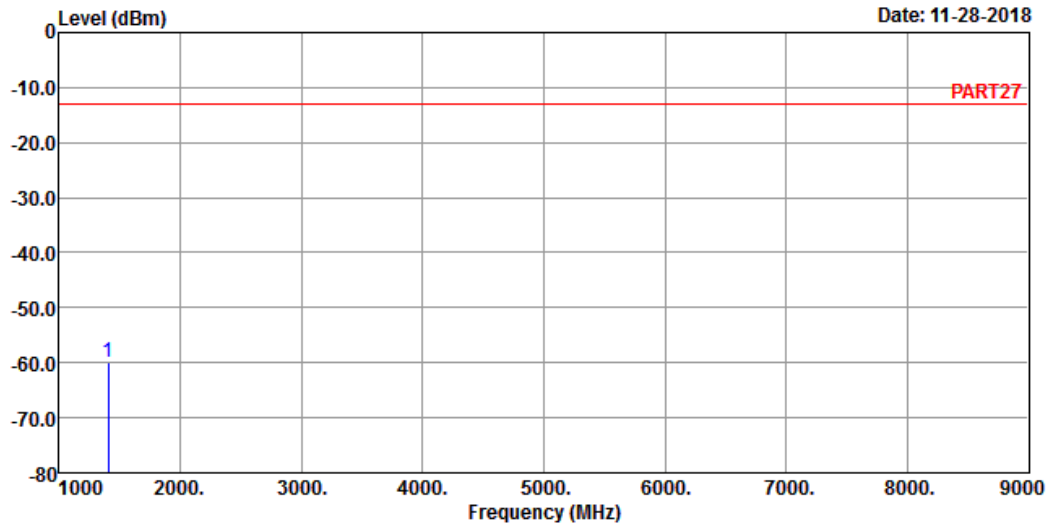
Channel Bandwidth: 5 MHz / QPSK
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 12 QPSK_5M Link_L-CH
Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 1403.00 -59.79 -47.88 -13.00 -46.79 -11.91 Peak

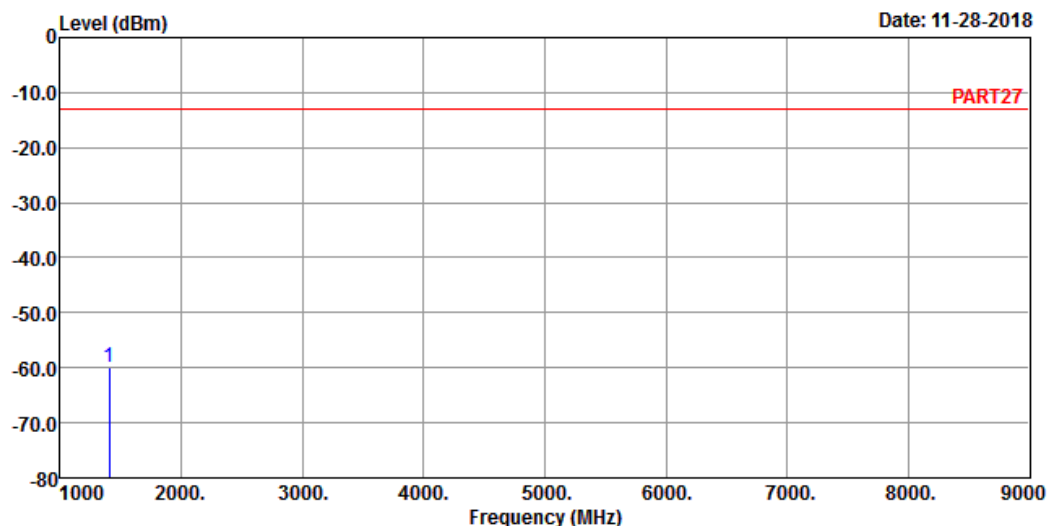


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 11-28-2018



Site : 966 Chamber 5

Condition: PART27 VERTICAL

Remak : LTE Band 12 QPSK_5M Link_L-CH

Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 1403.00 -59.99 -48.08 -13.00 -46.99 -11.91 Peak

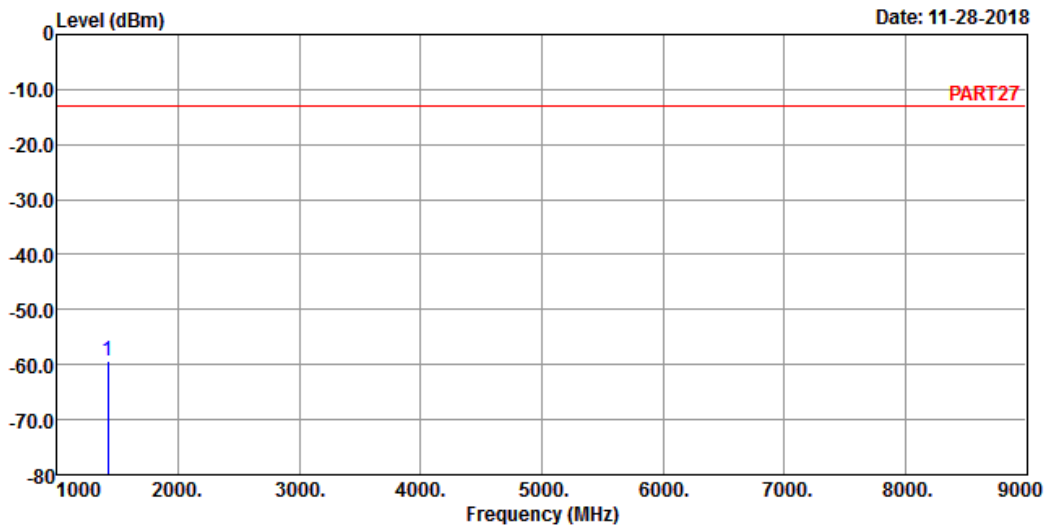
Middle Channel



Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T

Data: 3



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 12 QPSK_5M Link_M-CH
Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 1415.00 -59.34 -47.26 -13.00 -46.34 -12.08 Peak

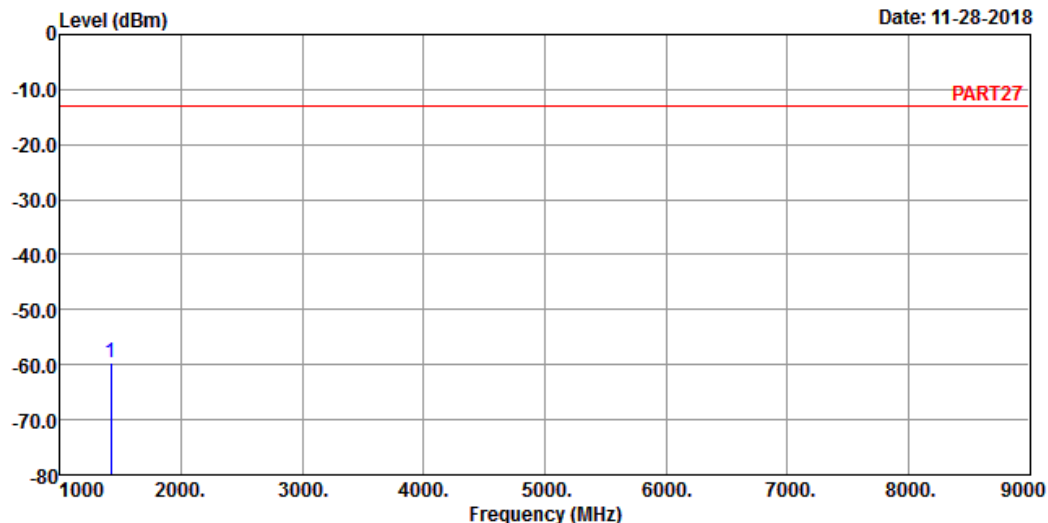


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 11-28-2018



Site : 966 Chamber 5

Condition: PART27 VERTICAL

Remak : LTE Band 12 QPSK_5M Link_M-CH

Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 1415.00 -59.62 -47.54 -13.00 -46.62 -12.08 Peak

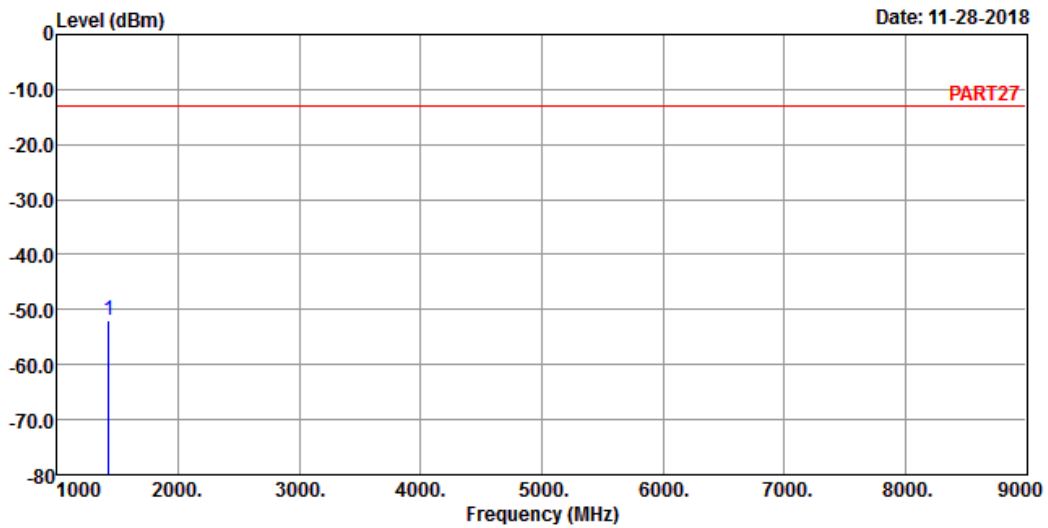
High Channel



Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T

Data: 3



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 12 QPSK_5M Link_H-CH
Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 1427.00 -51.99 -39.74 -13.00 -38.99 -12.25 Peak

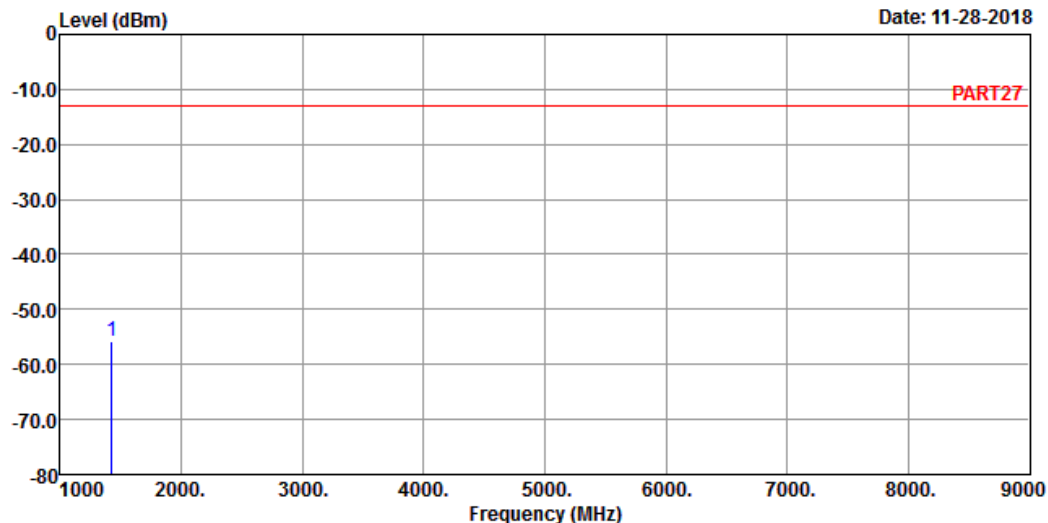


Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T

Data: 4

Date: 11-28-2018



Site : 966 Chamber 5

Condition: PART27 VERTICAL

Remak : LTE Band 12 QPSK_5M Link_H-CH

Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 1427.00 -55.78 -43.53 -13.00 -42.78 -12.25 Peak

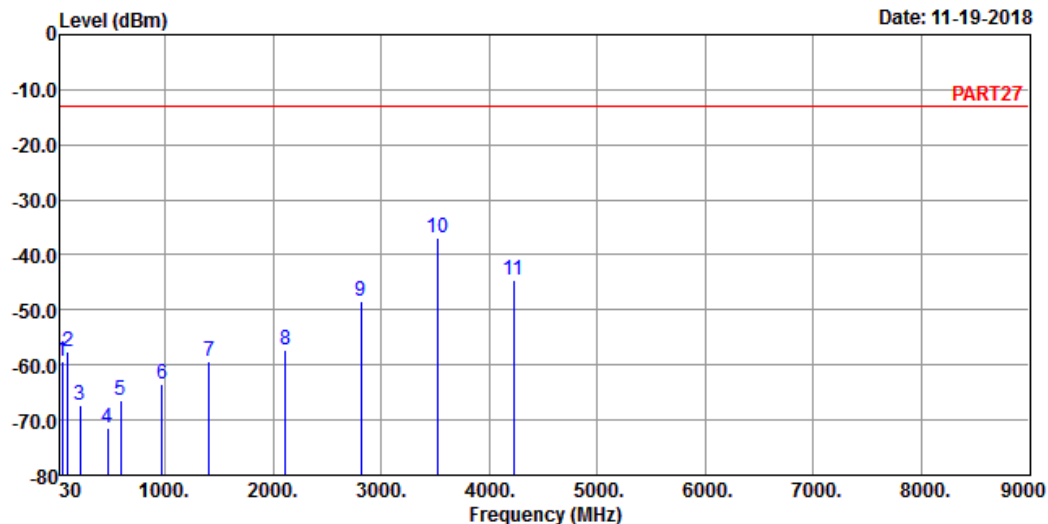
Channel Bandwidth: 10 MHz / QPSK
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 7



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 12 QPSK_10M Link_L-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	50.37	-59.31	-54.30	-13.00	-46.31	-5.01	Peak
2	99.84	-57.42	-46.86	-13.00	-44.42	-10.56	Peak
3	216.24	-67.27	-59.91	-13.00	-54.27	-7.36	Peak
4	469.41	-71.39	-66.20	-13.00	-58.39	-5.19	Peak
5	587.75	-66.45	-65.17	-13.00	-53.45	-1.28	Peak
6	967.99	-63.38	-65.83	-13.00	-50.38	2.45	Peak
7	1408.00	-59.46	-47.50	-13.00	-46.46	-11.96	Peak
8	2112.00	-57.35	-47.39	-13.00	-44.35	-9.96	Peak
9	2816.00	-48.43	-39.94	-13.00	-35.43	-8.49	Peak
10 pp	3520.00	-37.04	-29.66	-13.00	-24.04	-7.38	Peak
11	4224.00	-44.64	-39.07	-13.00	-31.64	-5.57	Peak

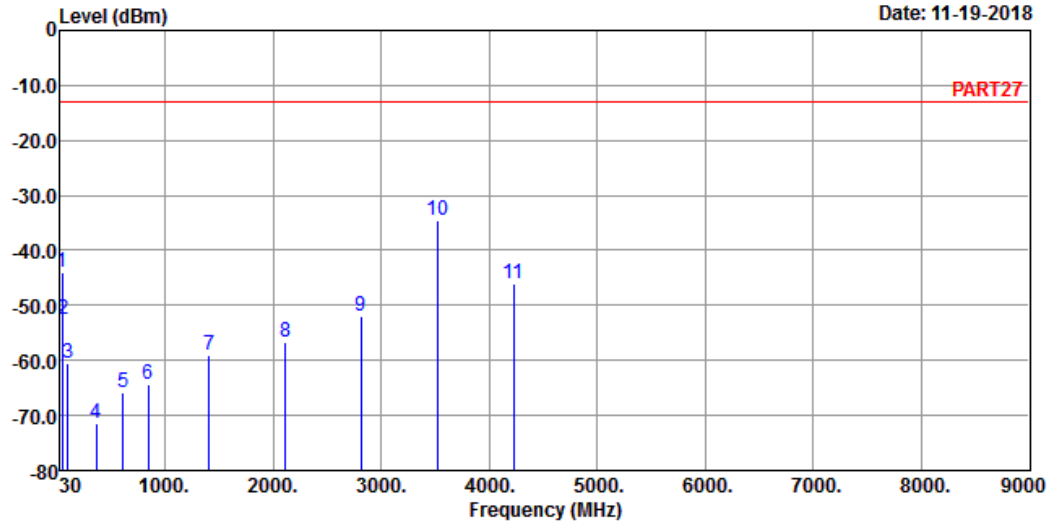


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 8

Date: 11-19-2018



Site : 966 Chamber 5

Condition: PART27 VERTICAL

Remak : LTE Band 12 QPSK_10M Link_L-CH

Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	44.55	-44.13	-42.14	-13.00	-31.13	-1.99	Peak
2	52.31	-52.62	-47.08	-13.00	-39.62	-5.54	Peak
3	98.87	-60.60	-49.98	-13.00	-47.60	-10.62	Peak
4	360.77	-71.37	-65.19	-13.00	-58.37	-6.18	Peak
5	613.94	-65.87	-65.08	-13.00	-52.87	-0.79	Peak
6	843.83	-64.25	-64.59	-13.00	-51.25	0.34	Peak
7	1408.00	-59.16	-47.20	-13.00	-46.16	-11.96	Peak
8	2112.00	-56.80	-46.84	-13.00	-43.80	-9.96	Peak
9	2816.00	-51.96	-43.47	-13.00	-38.96	-8.49	Peak
10 pp	3520.00	-34.54	-27.16	-13.00	-21.54	-7.38	Peak
11	4224.00	-45.94	-40.37	-13.00	-32.94	-5.57	Peak

Middle Channel

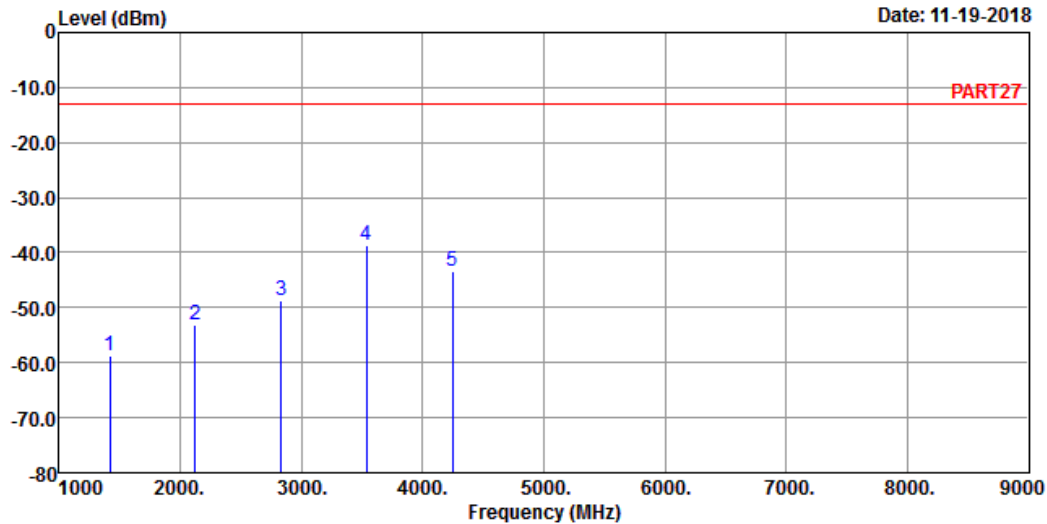


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3

Date: 11-19-2018



Site : 966 Chamber 5

Condition: PART27 HORIZONTAL

Remak : LTE Band 12 QPSK_10M Link_M-CH

Tested by: Thomas Wei

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1415.00	-58.61	-46.53	-13.00	-45.61	-12.08	Peak
2	2122.50	-53.22	-43.35	-13.00	-40.22	-9.87	Peak
3	2830.00	-48.81	-40.33	-13.00	-35.81	-8.48	Peak
4 pp	3537.50	-38.57	-31.35	-13.00	-25.57	-7.22	Peak
5	4245.00	-43.31	-37.78	-13.00	-30.31	-5.53	Peak

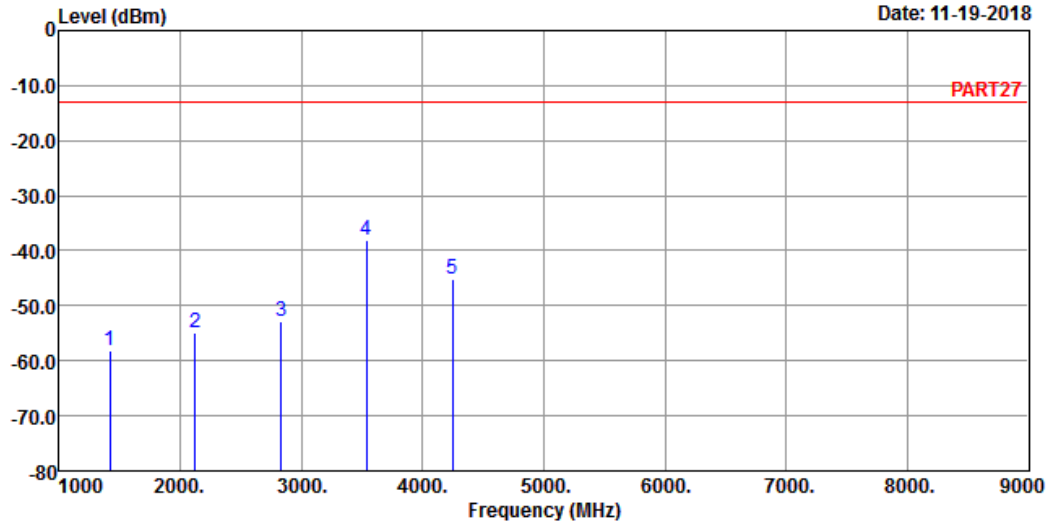


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 11-19-2018



Site : 966 Chamber 5

Condition: PART27 VERTICAL

Remak : LTE Band 12 QPSK_10M Link_M-CH

Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1415.00	-58.15	-46.07	-13.00	-45.15	-12.08	Peak
2	2122.50	-54.94	-45.07	-13.00	-41.94	-9.87	Peak
3	2830.00	-52.73	-44.25	-13.00	-39.73	-8.48	Peak
4 pp	3537.50	-38.03	-30.81	-13.00	-25.03	-7.22	Peak
5	4245.00	-45.28	-39.75	-13.00	-32.28	-5.53	Peak

High Channel

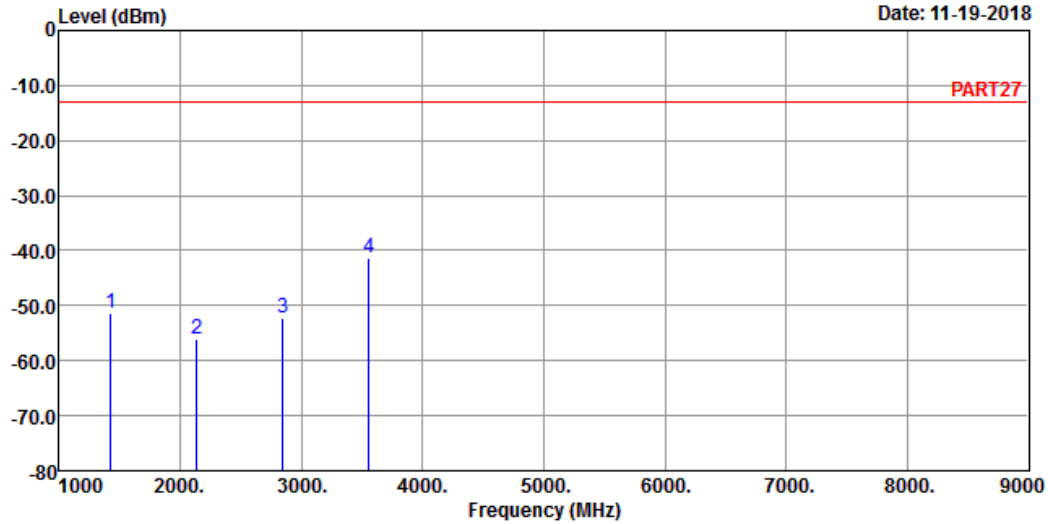


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3

Date: 11-19-2018



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 12 QPSK_10M Link_H-CH
Tested by: Thomas Wei

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1422.00	-51.38	-39.19	-13.00	-38.38	-12.19	Peak
2	2133.00	-56.13	-46.46	-13.00	-43.13	-9.67	Peak
3	2844.00	-52.37	-43.91	-13.00	-39.37	-8.46	Peak
4 pp	3555.00	-41.42	-34.27	-13.00	-28.42	-7.15	Peak

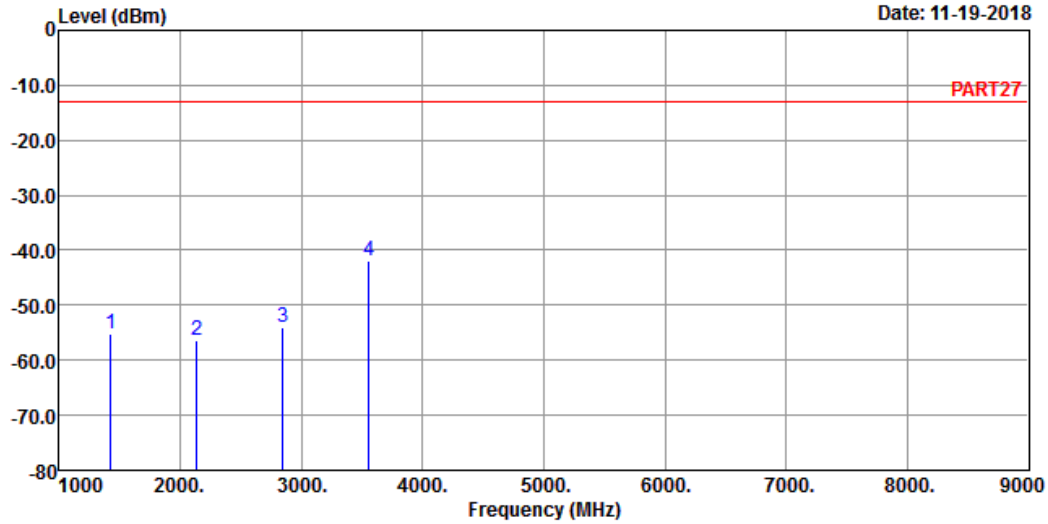


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 11-19-2018



Site : 966 Chamber 5

Condition: PART27 VERTICAL

Remak : LTE Band 12 QPSK_10M Link_H-CH

Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1422.00	-55.11	-42.92	-13.00	-42.11	-12.19	Peak
2	2133.00	-56.49	-46.82	-13.00	-43.49	-9.67	Peak
3	2844.00	-54.13	-45.67	-13.00	-41.13	-8.46	Peak
4 pp	3555.00	-42.01	-34.86	-13.00	-29.01	-7.15	Peak

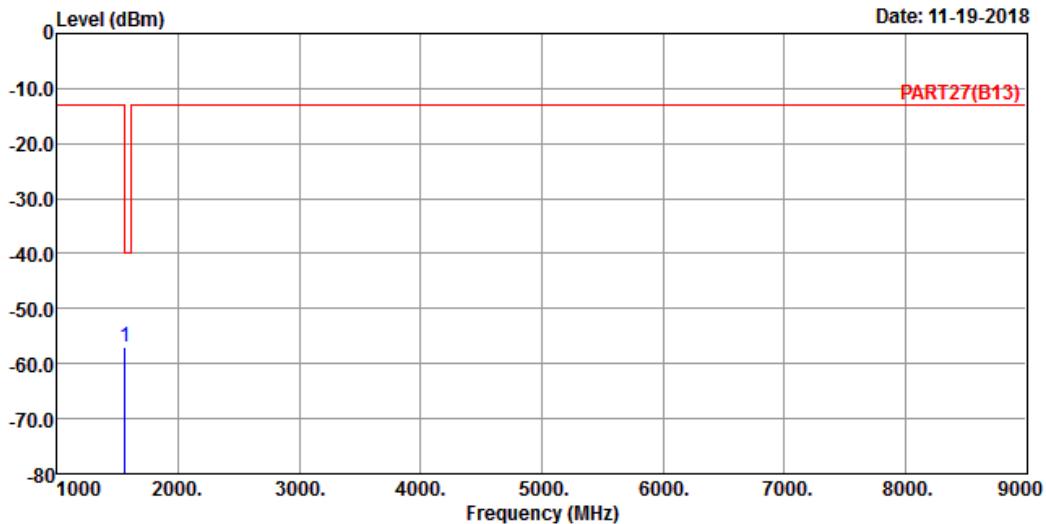
LTE Band 13
Channel Bandwidth: 5 MHz / QPSK
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



Site : 966 Chamber 5
Condition: PART27(B13) HORIZONTAL
Remak : LTE Band 13 QPSK_5M Link_L-CH
Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 1559.00 -56.94 -43.62 -40.00 -16.94 -13.32 Peak

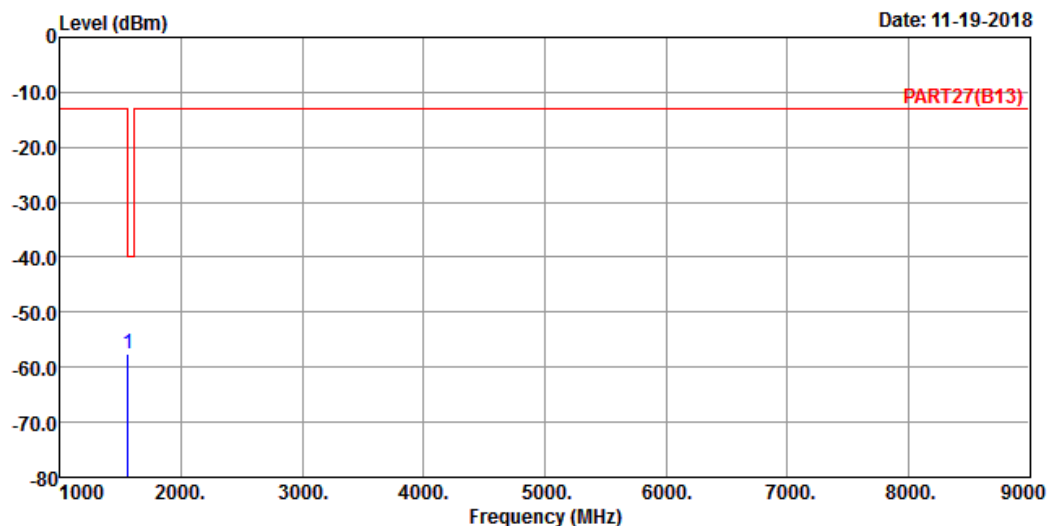


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 11-19-2018



Site : 966 Chamber 5

Condition: PART27(B13) VERTICAL

Remak : LTE Band 13 QPSK_5M Link_L-CH

Tested by: Thomas Wei

			Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark	
MHz	dBm	dBm	dBm	dB	dB		

1 pp 1559.00 -57.57 -44.25 -40.00 -17.57 -13.32 Peak

Middle Channel

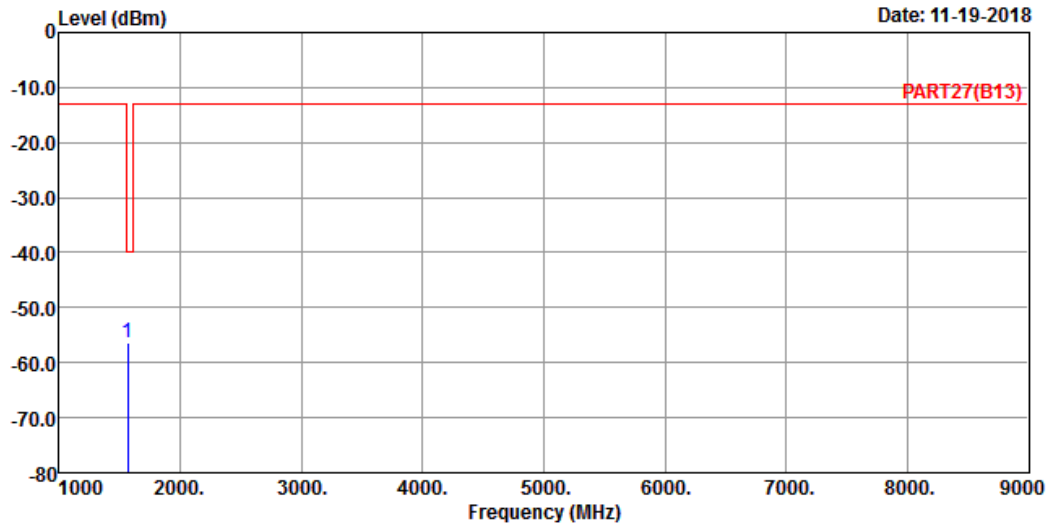


Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T

Data: 3

Date: 11-19-2018



Site : 966 Chamber 5

Condition: PART27(B13) HORIZONTAL

Remak : LTE Band 13 QPSK_5M Link_M-CH

Tested by: Thomas Wei

Freq	Level	Read		Limit		Over	Factor	Remark
		Level	Line	Level	Line			
MHz	dBm	dBm	dBm	dBm	dB	dB		

1 pp 1564.00 -56.40 -43.06 -40.00 -16.40 -13.34 Peak

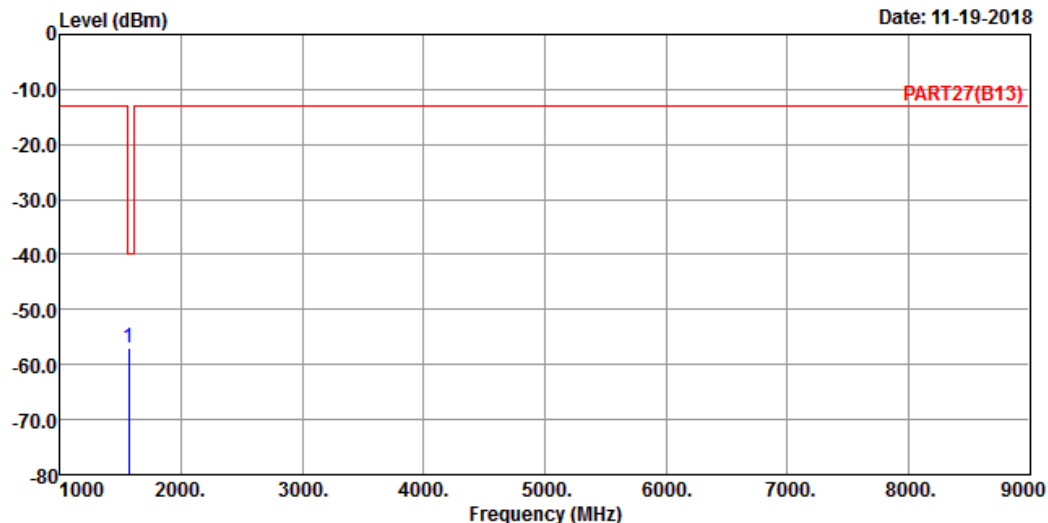


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 11-19-2018



Site : 966 Chamber 5

Condition: PART27(B13) VERTICAL

Remak : LTE Band 13 QPSK_5M Link_M-CH

Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 1564.00 -57.12 -43.78 -40.00 -17.12 -13.34 Peak

High Channel

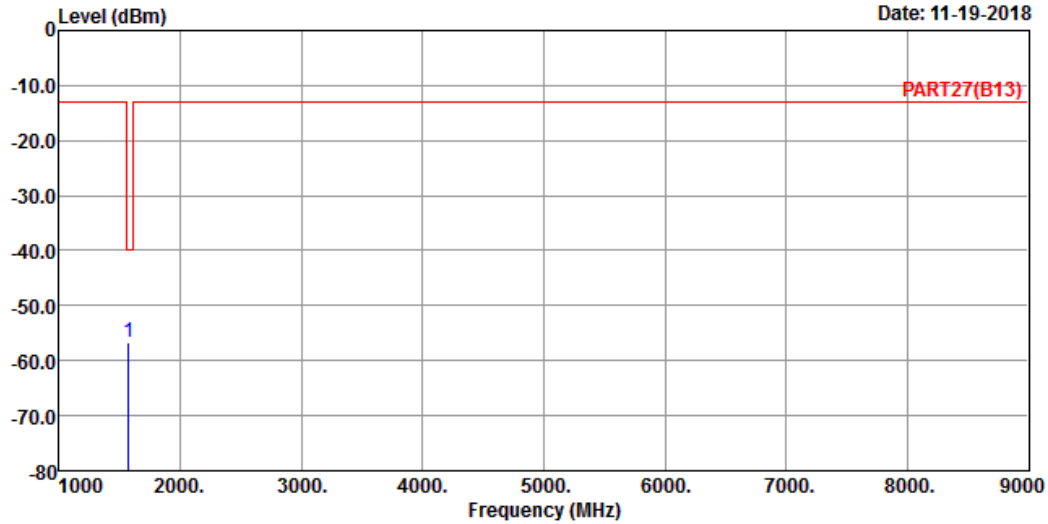


Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T

Data: 3

Date: 11-19-2018



Site : 966 Chamber 5
Condition: PART27(B13) HORIZONTAL
Remak : LTE Band 13 QPSK_5M Link_H-CH
Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 1569.00 -56.64 -43.29 -40.00 -16.64 -13.35 Peak

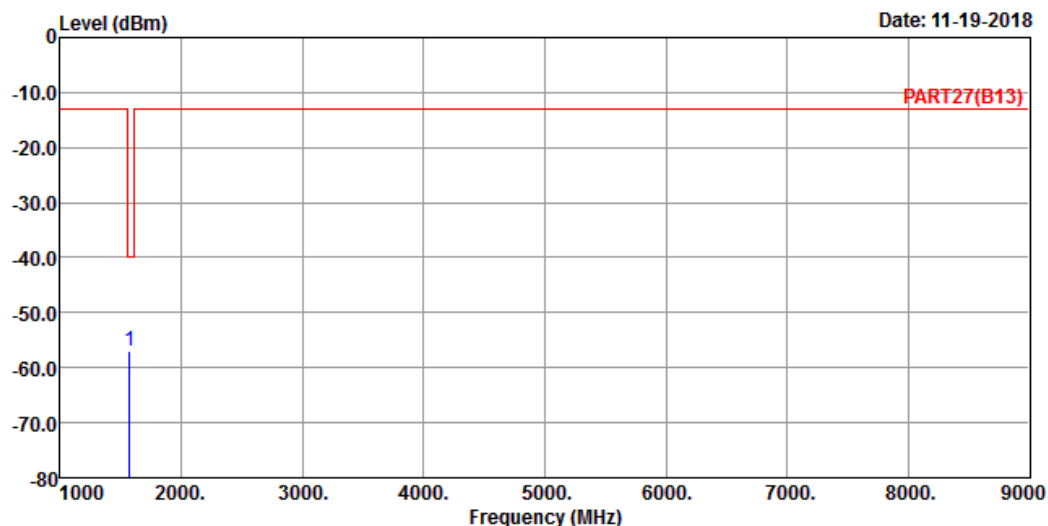


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 11-19-2018



Site : 966 Chamber 5

Condition: PART27(B13) VERTICAL

Remak : LTE Band 13 QPSK_5M Link_H-CH

Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 1569.00 -56.83 -43.48 -40.00 -16.83 -13.35 Peak

Channel Bandwidth: 10 MHz / QPSK

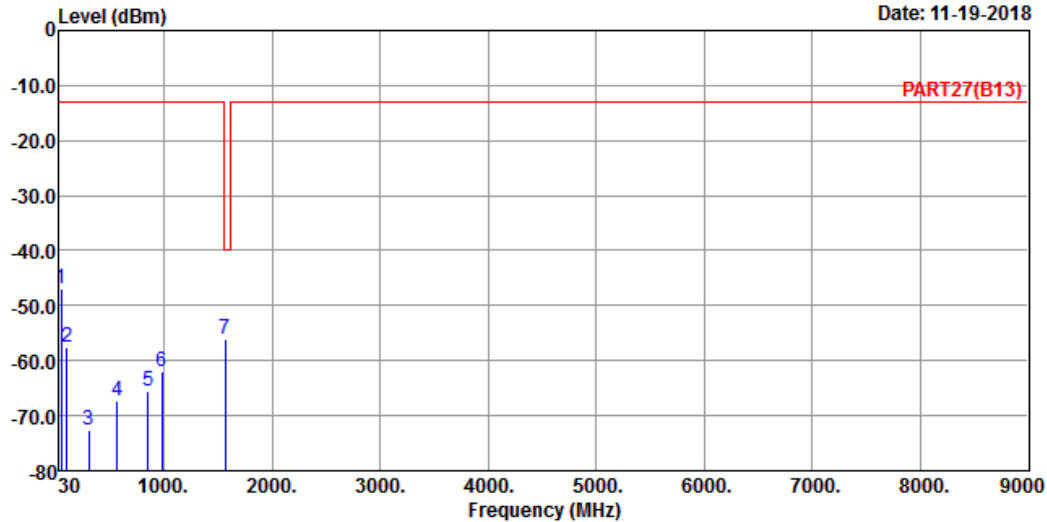


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 7

Date: 11-19-2018



Site : 966 Chamber 5

Condition: PART27(B13) HORIZONTAL

Remak : LTE Band 13 QPSK_10M Link_M-CH

Tested by: Thomas Wei

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	44.55	-46.97	-44.98	-13.00	-33.97	-1.99	Peak
2	99.84	-57.42	-46.86	-13.00	-44.42	-10.56	Peak
3	299.66	-72.51	-65.50	-13.00	-59.51	-7.01	Peak
4	564.47	-67.38	-65.14	-13.00	-54.38	-2.24	Peak
5	848.68	-65.62	-65.92	-13.00	-52.62	0.30	Peak
6	975.75	-62.06	-64.78	-13.00	-49.06	2.72	Peak
7 pp	1564.00	-56.05	-42.71	-40.00	-16.05	-13.34	Peak

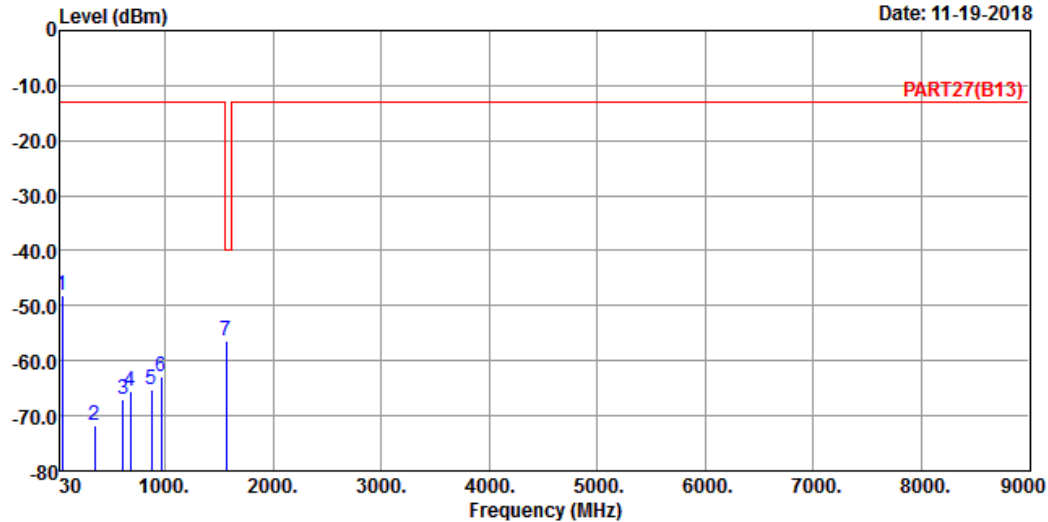


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 8

Date: 11-19-2018



Site : 966 Chamber 5

Condition: PART27(B13) VERTICAL

Remak : LTE Band 13 QPSK_10M Link_M-CH

Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	45.52	-47.97	-45.47	-13.00	-34.97	-2.50	Peak
2	345.25	-71.70	-65.39	-13.00	-58.70	-6.31	Peak
3	611.03	-66.93	-66.15	-13.00	-53.93	-0.78	Peak
4	679.90	-65.64	-65.22	-13.00	-52.64	-0.42	Peak
5	873.90	-65.22	-65.65	-13.00	-52.22	0.43	Peak
6	967.02	-62.89	-65.30	-13.00	-49.89	2.41	Peak
7 pp	1564.00	-56.29	-42.95	-40.00	-16.29	-13.34	Peak

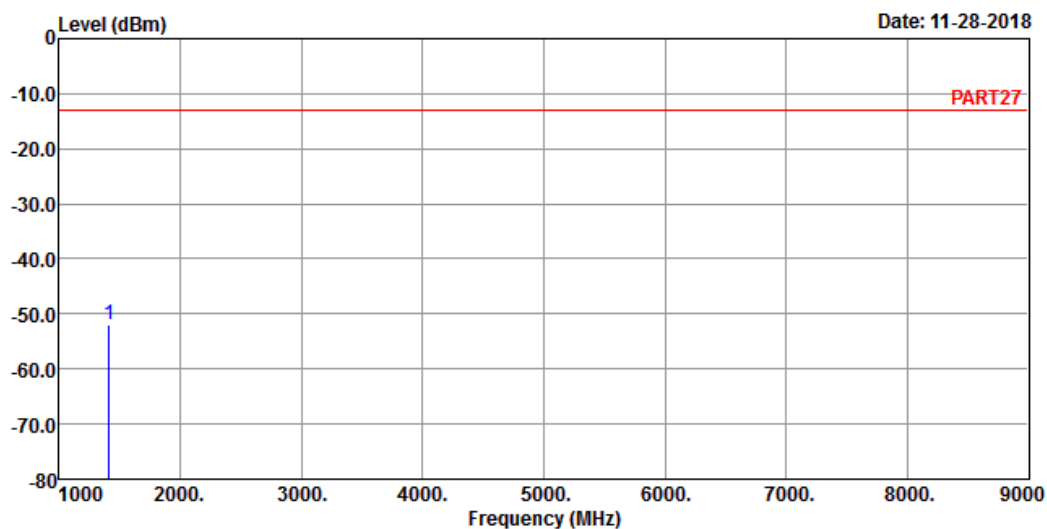
LTE Band 17
Channel Bandwidth: 5 MHz / QPSK
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 17 QPSK_5M Link_L-CH
Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

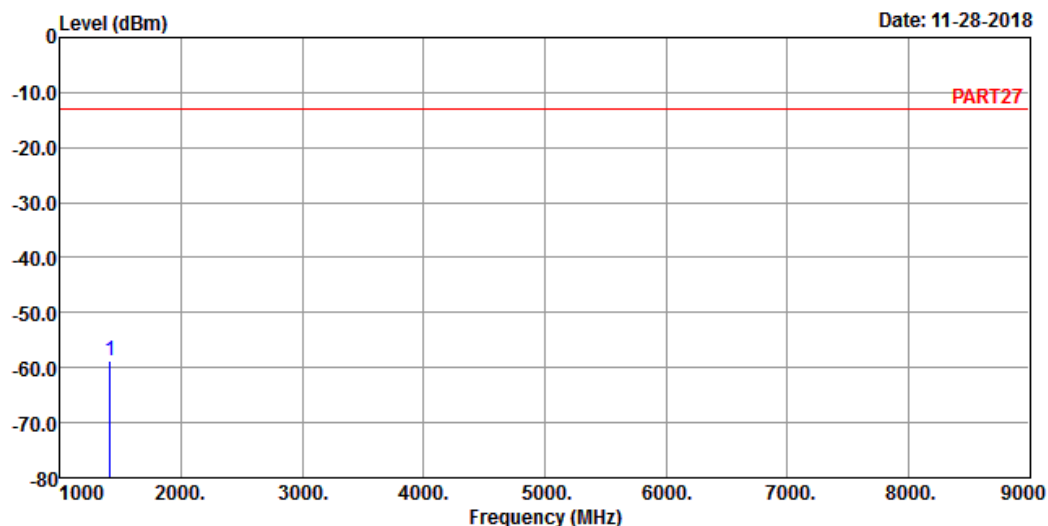
1 pp 1413.00 -51.99 -39.97 -13.00 -38.99 -12.02 Peak



Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T

Data: 4



Site : 966 Chamber 5

Condition: PART27 VERTICAL

Remak : LTE Band 17 QPSK_5M Link_L-CH

Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 1413.00 -58.65 -46.63 -13.00 -45.65 -12.02 Peak

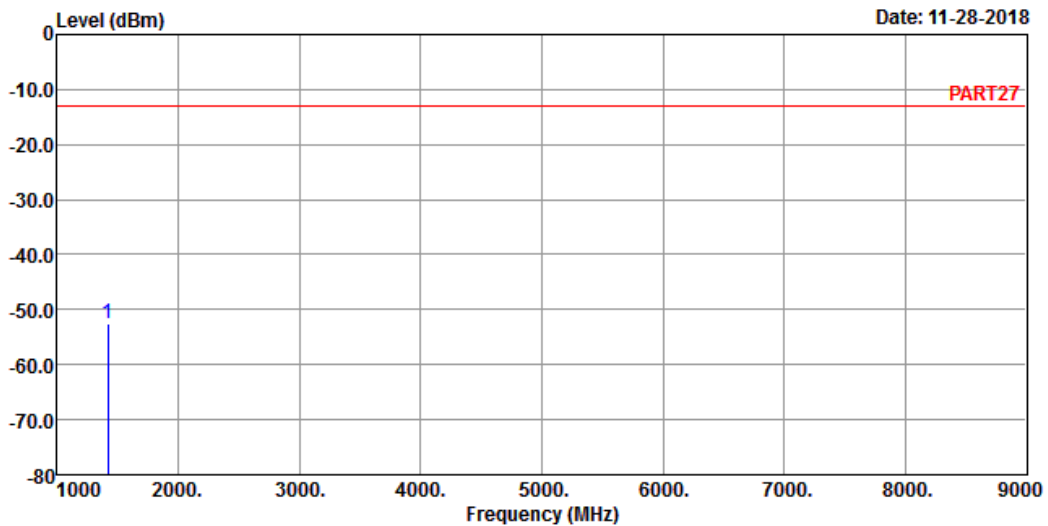
Middle Channel



Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T

Data: 3



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 17 QPSK_5M Link_M-CH
Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 1420.00 -52.52 -40.38 -13.00 -39.52 -12.14 Peak

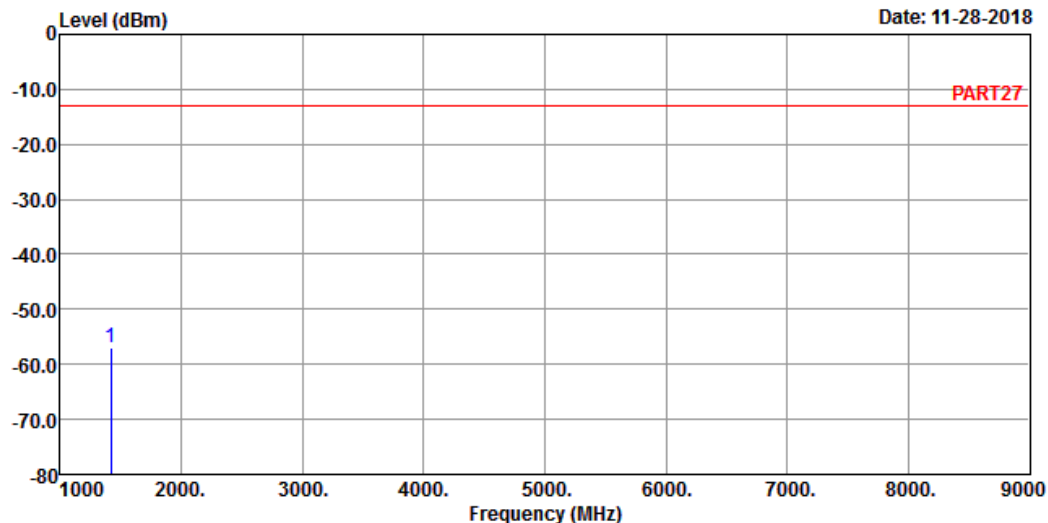


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 11-28-2018



Site : 966 Chamber 5

Condition: PART27 VERTICAL

Remak : LTE Band 17 QPSK_5M Link_M-CH

Tested by: Thomas Wei

Freq	Level	Read	Limit	Over	Factor	Remark
		Level	Line	Limit		
MHz	dBm	dBm	dBm	dB	dB	

1 pp 1420.00 -56.85 -44.71 -13.00 -43.85 -12.14 Peak

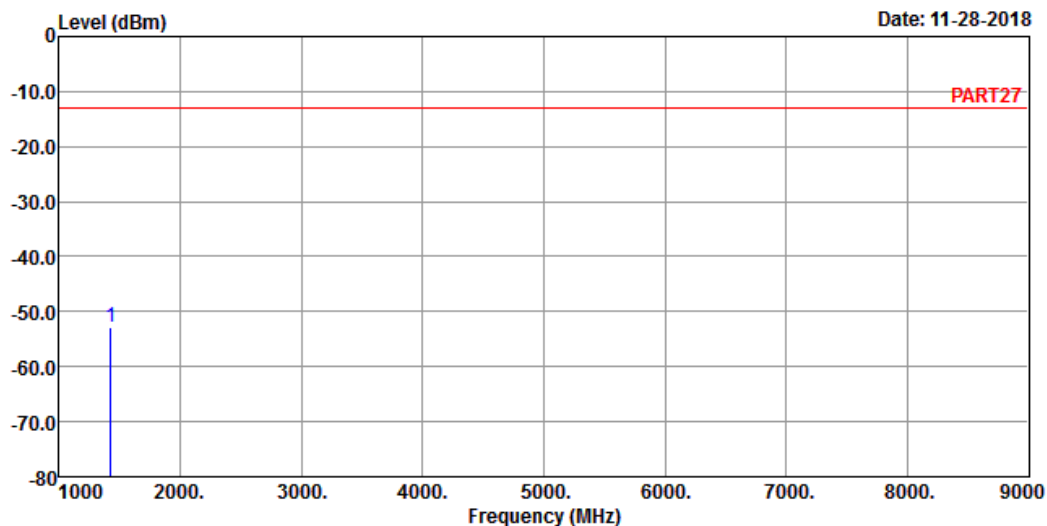
High Channel



Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T

Data: 3



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 17 QPSK_5M Link_H-CH
Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 1427.00 -52.98 -40.73 -13.00 -39.98 -12.25 Peak

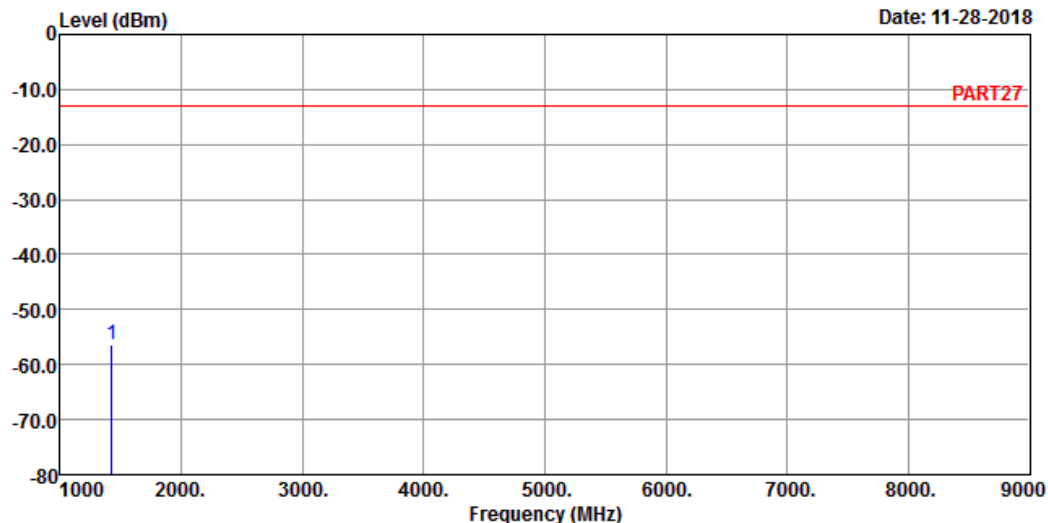


Bureau Veritas Consumer Products Services Ltd.,Taoyuan Branch

A D T

Data: 4

Date: 11-28-2018



Site : 966 Chamber 5

Condition: PART27 VERTICAL

Remak : LTE Band 17 QPSK_5M Link_H-CH

Tested by: Thomas Wei

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	

1 pp 1427.00 -56.36 -44.11 -13.00 -43.36 -12.25 Peak

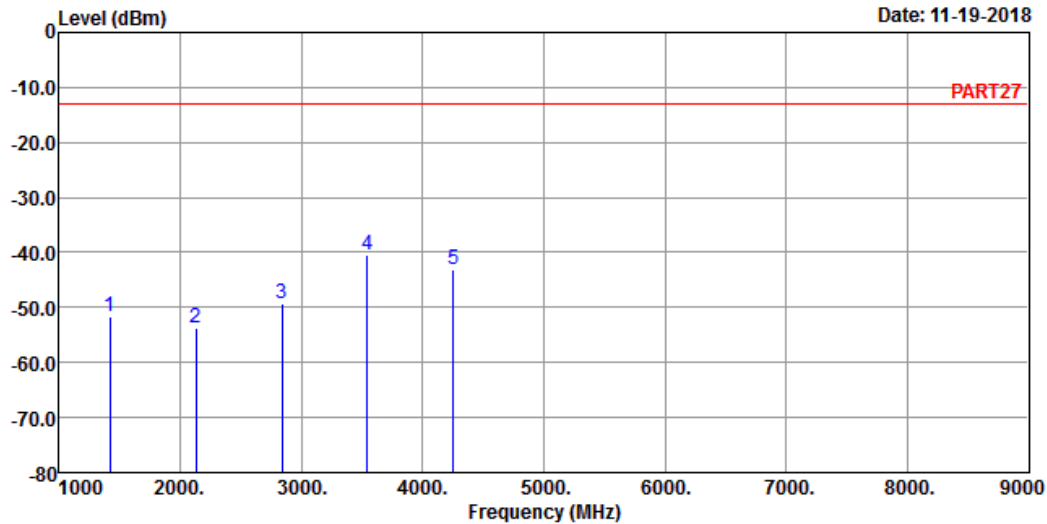
Channel Bandwidth: 10 MHz / QPSK
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3



Site : 966 Chamber 5
Condition: PART27 HORIZONTAL
Remak : LTE Band 17 QPSK_10M Link_L-CH
Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1418.00	-51.65	-39.51	-13.00	-38.65	-12.14	Peak
2	2127.00	-53.61	-43.84	-13.00	-40.61	-9.77	Peak
3	2836.00	-49.32	-40.85	-13.00	-36.32	-8.47	Peak
4 pp	3545.00	-40.35	-33.13	-13.00	-27.35	-7.22	Peak
5	4254.00	-43.24	-37.71	-13.00	-30.24	-5.53	Peak

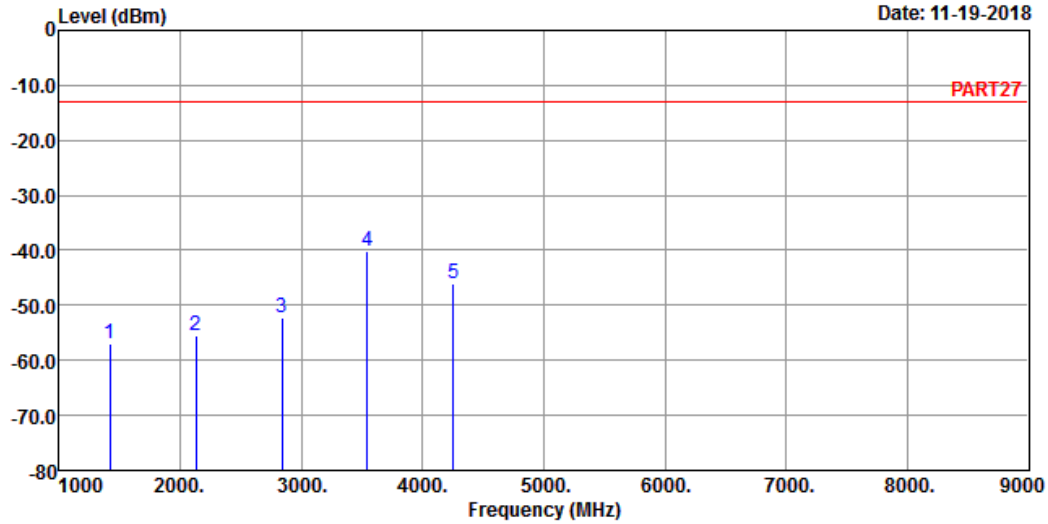


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 11-19-2018



Site : 966 Chamber 5

Condition: PART27 VERTICAL

Remak : LTE Band 17 QPSK_10M Link_L-CH

Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1418.00	-57.08	-44.94	-13.00	-44.08	-12.14	Peak
2	2127.00	-55.63	-45.86	-13.00	-42.63	-9.77	Peak
3	2836.00	-52.12	-43.65	-13.00	-39.12	-8.47	Peak
4 pp	3545.00	-40.24	-33.02	-13.00	-27.24	-7.22	Peak
5	4254.00	-45.95	-40.42	-13.00	-32.95	-5.53	Peak

Middle Channel

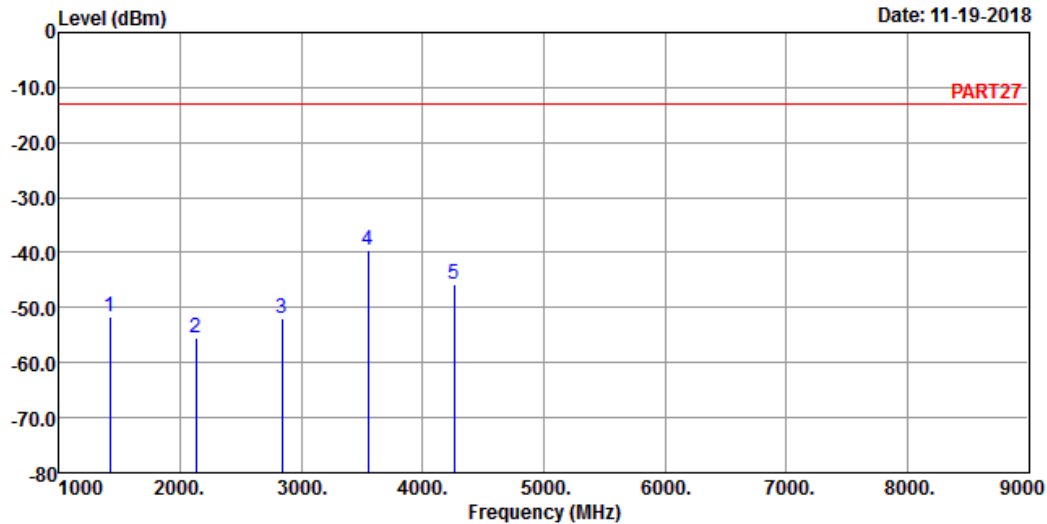


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3

Date: 11-19-2018



Site : 966 Chamber 5

Condition: PART27 HORIZONTAL

Remak : LTE Band 17 QPSK_10M Link_M-CH

Tested by: Thomas Wei

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1420.00	-51.73	-39.59	-13.00	-38.73	-12.14	Peak
2	2130.00	-55.40	-45.63	-13.00	-42.40	-9.77	Peak
3	2840.00	-51.81	-43.34	-13.00	-38.81	-8.47	Peak
4 pp	3550.00	-39.55	-32.40	-13.00	-26.55	-7.15	Peak
5	4260.00	-45.73	-40.21	-13.00	-32.73	-5.52	Peak

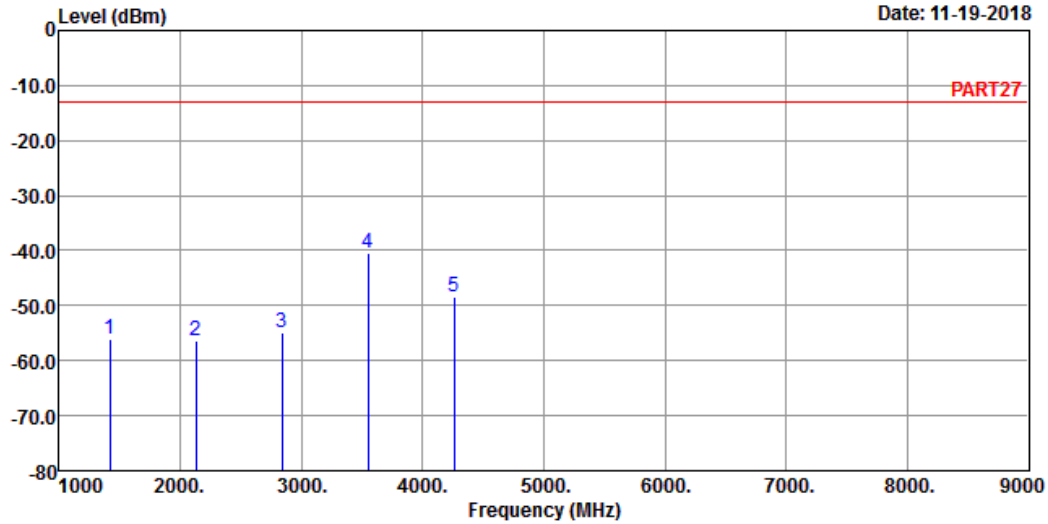


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 11-19-2018



Site : 966 Chamber 5

Condition: PART27 VERTICAL

Remak : LTE Band 17 QPSK_10M Link_M-CH

Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1420.00	-56.06	-43.92	-13.00	-43.06	-12.14	Peak
2	2130.00	-56.47	-46.70	-13.00	-43.47	-9.77	Peak
3	2840.00	-55.03	-46.56	-13.00	-42.03	-8.47	Peak
4 pp	3550.00	-40.40	-33.25	-13.00	-27.40	-7.15	Peak
5	4260.00	-48.49	-42.97	-13.00	-35.49	-5.52	Peak

High Channel

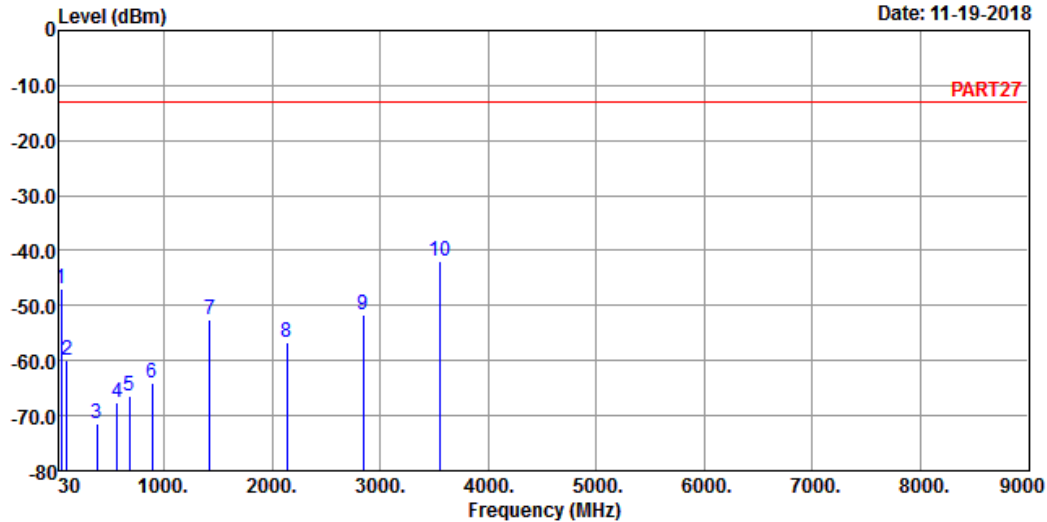


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 7

Date: 11-19-2018



Site : 966 Chamber 5

Condition: PART27 HORIZONTAL

Remak : LTE Band 17 QPSK_10M Link_H-CH

Tested by: Thomas Wei

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	43.58	-46.94	-45.47	-13.00	-33.94	-1.47	Peak
2	101.78	-60.01	-49.49	-13.00	-47.01	-10.52	Peak
3	379.20	-71.55	-65.48	-13.00	-58.55	-6.07	Peak
4	563.50	-67.63	-65.35	-13.00	-54.63	-2.28	Peak
5	680.87	-66.28	-65.88	-13.00	-53.28	-0.40	Peak
6	885.54	-64.04	-64.53	-13.00	-51.04	0.49	Peak
7	1422.00	-52.52	-40.33	-13.00	-39.52	-12.19	Peak
8	2133.00	-56.77	-47.10	-13.00	-43.77	-9.67	Peak
9	2844.00	-51.68	-43.22	-13.00	-38.68	-8.46	Peak
10 pp	3555.00	-41.90	-34.75	-13.00	-28.90	-7.15	Peak

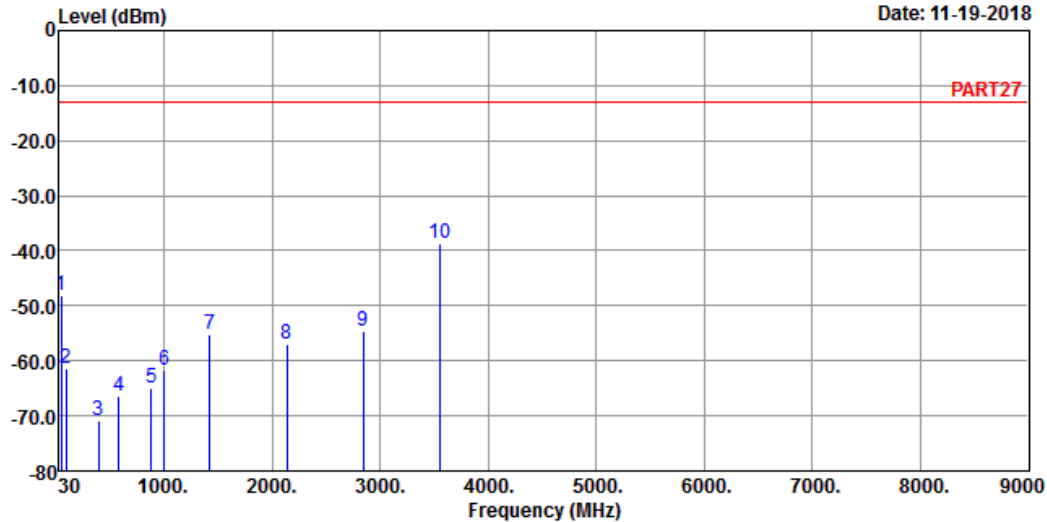


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 8

Date: 11-19-2018



Site : 966 Chamber 5

Condition: PART27 VERTICAL

Remak : LTE Band 17 QPSK_10M Link_H-CH

Tested by: Thomas Wei

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	43.58	-47.99	-46.52	-13.00	-34.99	-1.47	Peak
2	91.11	-61.32	-50.27	-13.00	-48.32	-11.05	Peak
3	393.75	-70.98	-65.00	-13.00	-57.98	-5.98	Peak
4	579.99	-66.56	-64.96	-13.00	-53.56	-1.60	Peak
5	878.75	-64.82	-65.27	-13.00	-51.82	0.45	Peak
6	1000.00	-61.71	-65.29	-13.00	-48.71	3.58	Peak
7	1422.00	-55.25	-43.06	-13.00	-42.25	-12.19	Peak
8	2133.00	-56.90	-47.23	-13.00	-43.90	-9.67	Peak
9	2844.00	-54.47	-46.01	-13.00	-41.47	-8.46	Peak
10 pp	3555.00	-38.68	-31.53	-13.00	-25.68	-7.15	Peak

5 Pictures of Test Arrangements

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

Appendix – Information of the Testing Laboratories

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

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

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Web Site: www.bureauveritas-adt.com

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

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