

## Variant FCC Test Report

### (PART 27)

**Report No.:** RF171206E01B-2

**FCC ID:** NKRM18Q2

**Test Model:** M18Q2FG-1, M14Q2FG-1

**Series Model:** M18Q2F, M14Q2F, M18Q2, M14Q2, M18Q2G, M14Q2G, M18Q2FG, M14Q2FG (Refer to item 3.1 for the more details)

**Received Date:** Mar. 26, 2018

**Test Date:** Apr. 16, 2018 ~ Apr. 18, 2018

**Issued Date:** Apr. 30, 2018

**Applicant:** Wistron NeWeb Corporation

**Address:** 20 Park Ave. II, Hsinchu Science Park, Hsichu 308, Taiwan

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

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

**Test Location:** No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

**FCC Registration /  
Designation Number:** 788550 / TW0003



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### Release Control Record

Issue No.	Description	Date Issued
RF171206E01B-2	Original Release	Apr. 30, 2018

## 1 Certificate of Conformity

**Product:** LGA Module

**Brand:** Wistron NeWeb Corporation

**Test Model:** M18Q2FG-1, M14Q2FG-1

**Series Model:** M18Q2F, M14Q2F, M18Q2, M14Q2, M18Q2G, M14Q2G, M18Q2FG, M14Q2FG  
(Refer to item 3.1 for the more details)

**Sample Status:** Engineering Sample

**Applicant:** Wistron NeWeb Corporation

**Test Date:** Apr. 16, 2018 ~ Apr. 18, 2018

**Standards:** FCC Part 27, Subpart C, 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. 30, 2018  
Gina Liu / Specialist

**Approved by :** , **Date:** Apr. 30, 2018  
Dylan Chiou / Project Engineer

## 2 Summary of Test Results

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.
2.1055 27.54	Frequency Stability	Pass	Meet the requirement of limit.
2.1049 27.53(h)	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 -18.73 dB at 5197.50 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.
2.1055 27.54	Frequency Stability	Pass	Meet the requirement of limit.
2.1049 27.53(g)	Occupied Bandwidth	Pass	Meet the requirement of limit.
27.50(d)(5)	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 -20.29 dB at 2122.50 MHz.

## 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) (±)
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.44 dB
Radiated Emissions up to 1 GHz	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	MY52220314	Nov. 24, 2017	Nov. 23, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Jan. 11, 2018	Jan. 10, 2019
BILOG Antenna SCHWARZBECK	VULB 9168	9168-153	Dec. 06, 2017	Dec. 05, 2018
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Dec. 12, 2017	Dec. 13, 2018
Double Ridge Guide Horn Antenna EMCO	3115	5619	Nov. 30, 2017	Nov. 29, 2018
BILOG Antenna SCHWARZBECK	VULB 9168	9168-153	Dec. 06, 2017	Dec. 05, 2018
Fixed Attenuator Mini-Circuits	MDC9331N-20	0724	Jun. 21, 2016	Jun. 20, 2018
MXG Vector signal generator Agilent	N5182B	MY53050430	Oct. 24, 2017	Oct. 23, 2018
Preamplifier EMCI	EMC 012645	980115	Oct. 20, 2017	Oct. 19, 2018
Preamplifier EMCI	EMC 184045	980116	Oct. 20, 2017	Oct. 19, 2018
Preamplifier EMCI	EMC 330H	980112	Oct. 13, 2017	Oct. 12, 2018
Power Meter Anritsu	ML2495A	1012010	Aug. 15, 2017	Aug. 14, 2018
Power Sensor Anritsu	MA2411B	1315050	Aug. 15, 2017	Aug. 14, 2018
RF Coaxial Cable HUBER+SUHNNER	EMC104-SM-SM-800 0&3000	140811+170717	Oct. 20, 2017	Oct. 19, 2018
RF Coaxial Cable HUBER+SUHNNER	SUCOFLEX 104	EMC104-SM-SM-1 000(140807)	Oct. 20, 2017	Oct. 19, 2018
RF Coaxial Cable Worken	8D-FB	Cable-Ch10-01	Oct. 20, 2017	Oct. 19, 2018
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

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA
Radio Communication Analyzer	MT8820C	6201300640	Aug. 16, 2017	Aug. 15, 2019
Temperature & Humidity Chamber	GTH-120-40-CP-AR	MAA1306-019	Sep. 08, 2017	Sep. 07, 2018
DC Power Supply Topward	33010D	807748	Oct. 25, 2016	Oct. 24, 2018
Digital Multimeter Fluke	87-III	70360742	Jun. 30, 2017	Jun. 29, 2018
Splitters / Combiners WOKEN	WDIV-4R4029	0002	Feb. 09, 2018	Feb. 07, 2019

- Note:
1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
  2. The test was performed in 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 IC7450F-10.



### 3 General Information

#### 3.1 General Description of EUT

<b>Product</b>	LGA Module	
<b>Brand</b>	Wistron NeWeb Corporation	
<b>Test Model</b>	M18Q2FG-1, M14Q2FG-1	
<b>Series Model</b>	M18Q2F, M14Q2F, M18Q2, M14Q2, M18Q2G, M14Q2G, M18Q2FG, M14Q2FG	
<b>Model Difference</b>	Refer to Note	
<b>Status of EUT</b>	Engineering Sample	
<b>Power Supply Rating</b>	5.0 Vdc (host equipment)	
<b>Modulation Type</b>	LTE	QPSK, 16QAM
<b>Frequency Range</b>	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
<b>Emission Designator</b>	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	1M09W7D
	LTE Band 4 (Channel Bandwidth: 3 MHz)	2M70G7D
	LTE Band 4 (Channel Bandwidth: 5 MHz)	4M49G7D
	LTE Band 4 (Channel Bandwidth: 10 MHz)	8M96W7D
	LTE Band 4 (Channel Bandwidth: 15 MHz)	13M4G7D
	LTE Band 4 (Channel Bandwidth: 20 MHz)	17M9W7D
	LTE Band 12 (Channel Bandwidth: 1.4 MHz)	1M09W7D
	LTE Band 12 (Channel Bandwidth: 3 MHz)	2M70G7D
	LTE Band 12 (Channel Bandwidth: 5 MHz)	4M49W7D
	LTE Band 12 (Channel Bandwidth: 10 MHz)	8M98W7D
<b>Max. ERP Power</b>	LTE Band 12 (Channel Bandwidth: 1.4 MHz)	75.14 mW
	LTE Band 12 (Channel Bandwidth: 3 MHz)	75.88 mW
	LTE Band 12 (Channel Bandwidth: 5 MHz)	75.44 mW
	LTE Band 12 (Channel Bandwidth: 10 MHz)	76.54 mW
<b>Max. EIRP Power</b>	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	131.13 mW
	LTE Band 4 (Channel Bandwidth: 3 MHz)	133.88 mW
	LTE Band 4 (Channel Bandwidth: 5 MHz)	133.26 mW
	LTE Band 4 (Channel Bandwidth: 10 MHz)	132.34 mW
	LTE Band 4 (Channel Bandwidth: 15 MHz)	131.52 mW
	LTE Band 4 (Channel Bandwidth: 20 MHz)	135.05 mW
<b>Antenna Type</b>	Dipole Antenna	
<b>Antenna Gain</b>	LTE Band 4	0.6 dBi
	LTE Band 12	-3.5 dBi

<b>Accessory Device</b>	Refer to Note as below
<b>Data Cable Supplied</b>	Refer to Note as below

Note:

1. This report is issued as a supplementary report to Sporton report no. FG622601B. The differences compared with original report are changing FW and HW (Refer to Hardware Change Notes letter); therefore the EUT is re-tested in this report.
2. All models are listed as below.

No.	Model name	Description of change	Support Spec.			
			LTE	UMTS	GPS	APGS
1	M18Q2F	FW: M18Q2_v16.01 HW: v1.1 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 4 LTE B2/4/5/12	UMTS B2/5	-	-
2	M14Q2F	FW: M14Q2_v16.01 HW: v1.1 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 1 LTE B2/4/5/12	UMTS B2/5	-	-
3	M18Q2	FW: M18Q2_v16.01 HW: v1.1 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 4 LTE B2/4/12	-	-	-
4	M14Q2	FW: M14Q2_v16.01 HW: v1.1 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 1 LTE B2/4/12	-	-	-
5	M18Q2G	FW: M18Q2_v16.01 HW: v1.1 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 4 LTE B2/4/12	-	supported	supported
6	M14Q2G	FW: M14Q2_v16.01 HW: v1.1 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 1 LTE B2/4/12	-	supported	supported
7	M18Q2FG	FW: M18Q2_v16.01 HW: v1.1 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 4 LTE B2/4/5/12	UMTS B2/5	supported	supported
8	M14Q2FG	FW: M14Q2_v16.01 HW: v1.1 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 1 LTE B2/4/5/12	UMTS B2/5	supported	supported
9	M18Q2FG-1	FW: M18Q2_v16.01 HW: v2.1 MCP 4Gb NAND Flash+2Gb LPDDR2	Cat 4 LTE B2/4/5/12	UMTS B2/5	supported	supported
10	M14Q2FG-1	FW: M14Q2_v16.01 HW: v2.1 MCP 4Gb NAND Flash+2Gb LPDDR2	Cat 1 LTE B2/4/5/12	UMTS B2/5	supported	supported
11	M18Q2F	FW: M18Q2_v12.09 HW: v1.1 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 4 LTE B2/4/5/12	UMTS B2/5	-	-
12	M14Q2F	FW: M14Q2_v12.09 HW: v1.1 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 1 LTE B2/4/5/12	UMTS B2/5	-	-
13	M18Q2	FW: M18Q2_v12.09 HW: v1.1 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 4 LTE B2/4/12	-	-	-
14	M14Q2	FW: M14Q2_v12.09 HW: v1.1 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 1 LTE B2/4/12	-	-	-
15	M18Q2G	FW: M18Q2_v12.09 HW: v1.1 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 4 LTE B2/4/12	-	supported	supported

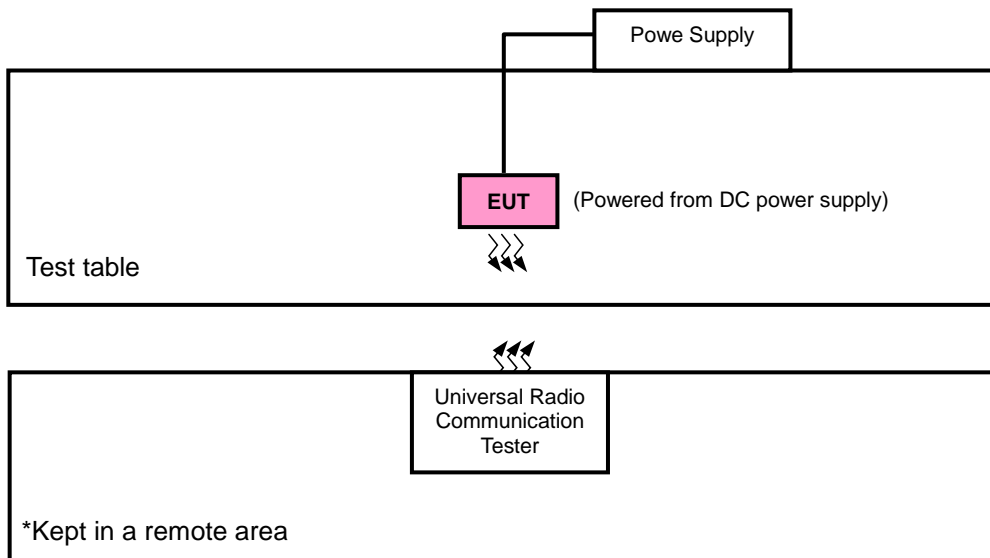
No.	Model name	Description of change	Support Spec.			
			LTE	UMTS	GPS	APGS
16	M14Q2G	FW: M14Q2_v12.09 HW: v1.1 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 1 LTE B2/4/12	-	supported	supported
17	M18Q2FG	FW: M18Q2_v12.09 HW: v1.1 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 4 LTE B2/4/5/12	UMTS B2/5	supported	supported
18	M14Q2FG	FW: M14Q2_v12.09 HW: v1.1 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 1 LTE B2/4/5/12	UMTS B2/5	supported	supported
19	M18Q2FG-1	FW: M18Q2_v12.09 HW: v2.1 MCP 4Gb NAND Flash+2Gb LPDDR2	Cat 4 LTE B2/4/5/12	UMTS B2/5	supported	supported
20	M14Q2FG-1	FW: M14Q2_v12.09 HW: v2.1 MCP 4Gb NAND Flash+2Gb LPDDR2	Cat 1 LTE B2/4/5/12	UMTS B2/5	supported	supported
21	M18Q2F	FW: M18Q2_v12.10 HW: v1.1 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 4 LTE B2/4/5/12	UMTS B2/5	-	-
22	M14Q2F	FW: M14Q2_v12.10 HW: v1.1 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 1 LTE B2/4/5/12	UMTS B2/5	-	-
23	M18Q2	FW: M18Q2_v12.10 HW: v1.1 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 4 LTE B2/4/12	-	-	-
24	M14Q2	FW: M14Q2_v12.10 HW: v1.1 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 1 LTE B2/4/12	-	-	-
25	M18Q2G	FW: M18Q2_v12.10 HW: v1.1 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 4 LTE B2/4/12	-	supported	supported
26	M14Q2G	FW: M14Q2_v12.10 HW: v1.1 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 1 LTE B2/4/12	-	supported	supported
27	M18Q2FG	FW: M18Q2_v12.10 HW: v1.1 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 4 LTE B2/4/5/12	UMTS B2/5	supported	supported
28	M14Q2FG	FW: M14Q2_v12.10 HW: v1.1 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 1 LTE B2/4/5/12	UMTS B2/5	supported	supported
29	M18Q2FG-1	FW: M18Q2_v12.10 HW: v2.1 MCP 4Gb NAND Flash+2Gb LPDDR2	Cat 4 LTE B2/4/5/12	UMTS B2/5	supported	supported
30	M14Q2FG-1	FW: M14Q2_v12.10 HW: v2.1 MCP 4Gb NAND Flash+2Gb LPDDR2	Cat 1 LTE B2/4/5/12	UMTS B2/5	supported	supported

No.	Model name	Description of change	Support Spec.			
			LTE	UMTS	GPS	APGS
31	M18Q2F	FW: M18Q2_v16.01 HW: v1.0 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 4 LTE B2/4/5/12	UMTS B2/5	-	-
32	M14Q2F	FW: M14Q2_v16.01 HW: v1.0 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 1 LTE B2/4/5/12	UMTS B2/5	-	-
33	M18Q2	FW: M18Q2_v16.01 HW: v1.0 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 4 LTE B2/4/12	-	-	-
34	M14Q2	FW: M14Q2_v16.01 HW: v1.0 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 1 LTE B2/4/12	-	-	-
35	M18Q2G	FW: M18Q2_v16.01 HW: v1.0 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 4 LTE B2/4/12	-	supported	supported
36	M14Q2G	FW: M14Q2_v16.01 HW: v1.0 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 1 LTE B2/4/12	-	supported	supported
37	M18Q2FG	FW: M18Q2_v16.01 HW: v1.0 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 4 LTE B2/4/5/12	UMTS B2/5	supported	supported
38	M14Q2FG	FW: M14Q2_v16.01 HW: v1.0 MCP 2Gb NAND Flash+1Gb LPDDR2	Cat 1 LTE B2/4/5/12	UMTS B2/5	supported	supported
39	M18Q2FG-1	FW: M18Q2_v16.01 HW: v2.0 MCP 4Gb NAND Flash+2Gb LPDDR2	Cat 4 LTE B2/4/5/12	UMTS B2/5	supported	supported
40	M14Q2FG-1	FW: M14Q2_v16.01 HW: v2.0 MCP 4Gb NAND Flash+2Gb LPDDR2	Cat 1 LTE B2/4/5/12	UMTS B2/5	supported	supported

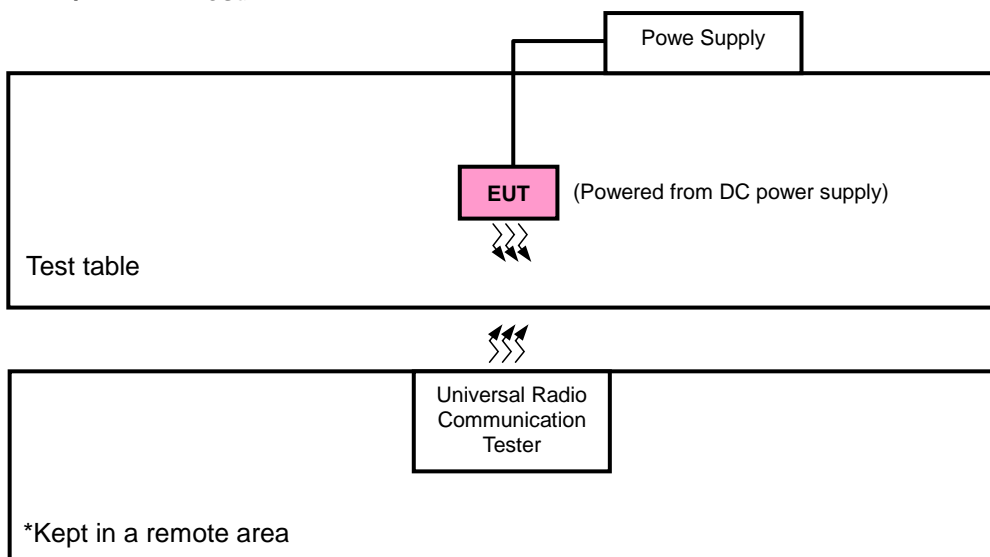
3. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

### 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.

### 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, XZ 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
LTE Band 4	X-plane	Y-axis
LTE Band 12	X-plane	Y-axis

#### LTE Band 4

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
A	EIRP	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM	1 RB / 5 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK, 16QAM	1 RB / 14 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK, 16QAM	1 RB / 24 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK, 16QAM	1 RB / 49 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK, 16QAM	1 RB / 74 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK, 16QAM	1 RB / 99 RB Offset
A, B	Frequency Stability	19957 to 20393	19957, 20393	1.4 MHz	QPSK	1 RB / 5 RB Offset
		19965 to 20385	19965, 20385	3 MHz	QPSK	1 RB / 14 RB Offset
		19975 to 20375	19975, 20375	5 MHz	QPSK	1 RB / 24 RB Offset
		20000 to 20350	20000, 20350	10 MHz	QPSK	1 RB / 49 RB Offset
		20025 to 20325	20025, 20325	15 MHz	QPSK	1 RB / 74 RB Offset
		20050 to 20300	20050, 20300	20 MHz	QPSK	1 RB / 99 RB Offset
A	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
B		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 25 RB / 25 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK 16QAM	75 RB / 0 RB Offset 1 RB / 74 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK 16QAM	100 RB / 0 RB Offset 1 RB / 99 RB Offset

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode		
A	Peak to Average Ratio	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM	1 RB / 2 RB Offset		
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK, 16QAM	1 RB / 7 RB Offset		
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK, 16QAM	12 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	36 RB / 0 RB Offset		
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK, 16QAM	50 RB / 0 RB Offset		
B		19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM	1 RB / 2 RB Offset		
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK, 16QAM	1 RB / 7 RB Offset		
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK, 16QAM	12 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	36 RB / 0 RB Offset		
					16QAM	1 RB / 74 RB Offset		
20050 to 20300	20050, 20175, 20300	20 MHz	QPSK	50 RB / 0 RB Offset				
			16QAM	1 RB / 99 RB Offset				
A, B	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		
		A, B	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	36 RB / 0 RB Offset
				20050 to 20300	20050, 20175, 20300	20 MHz	QPSK	50 RB / 0 RB Offset
A, B	Radiated Emission	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK	1 RB / 0 RB Offset		
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK	100 RB / 0 RB Offset		
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK	1 RB / 99 RB Offset		

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

### LTE Band 12

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode		
A, B	ERP	23017 to 23173	23017, 23095, 23173	1.4 MHz	QPSK, 16QAM	1 RB / 2 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 / 12 RB Offset		
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK, 16QAM	1 RB / 24 RB Offset		
A, B	Frequency Stability	23017 to 23173	23017, 23173	1.4 MHz	QPSK	1 RB / 2 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 / 12 RB Offset		
		23060 to 23130	23060, 23130	10 MHz	QPSK	1 RB / 24 RB Offset		
A	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		
B		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 25 RB / 25 RB Offset		
A, B	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 / 0 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 / 0 RB Offset		
A, B	Band Edge	23017 to 23173	23017	1.4 MHz	QPSK	1 RB / 0 RB Offset 6 RB / 0 RB Offset		
			23173	1.4 MHz	QPSK	1 RB / 5 RB Offset 6 RB / 0 RB Offset		
		23025 to 23165	23025	3 MHz	QPSK	1 RB / 0 RB Offset 15 RB / 0 RB Offset		
			23165	3 MHz	QPSK	1 RB / 14 RB Offset 15 RB / 0 RB Offset		
		23035 to 23155	23035	5 MHz	QPSK	1 RB / 0 RB Offset 25 RB / 0 RB Offset		
			23155	5 MHz	QPSK	1 RB / 24 RB Offset 25 RB / 0 RB Offset		
		23060 to 23130	23060	10 MHz	QPSK	1 RB / 0 RB Offset 50 RB / 0 RB Offset		
			23130	10 MHz	QPSK	1 RB / 49 RB Offset 50 RB / 0 RB Offset		
		A, B	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 / 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 / 0 RB Offset
A, B	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 / 0 RB Offset		

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



**Test Condition:**

Test Item	Environmental Conditions	Input Power	Tested By
ERP / EIRP	25 deg. C, 65 % RH	5 Vdc	Karl Lee
Frequency Stability	25 deg. C, 65 % RH	5 Vdc	Han Wu
Occupied Bandwidth	25 deg. C, 65 % RH	5 Vdc	Han Wu
Band Edge	25 deg. C, 65 % RH	5 Vdc	Han Wu
Peak to Average Ratio	25 deg. C, 65 % RH	5 Vdc	Han Wu
Conducted Emission	25 deg. C, 65 % RH	5 Vdc	Han Wu
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Karl Lee

### **3.4 EUT Operating Conditions**

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

### **3.5 General Description of Applied Standards**

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 v02r02**

**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 are limited to 1 watt EIRP.

Portable stations (hand-held devices) operating in the 704-716 MHz 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,  $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15 \text{ dBi}$ .

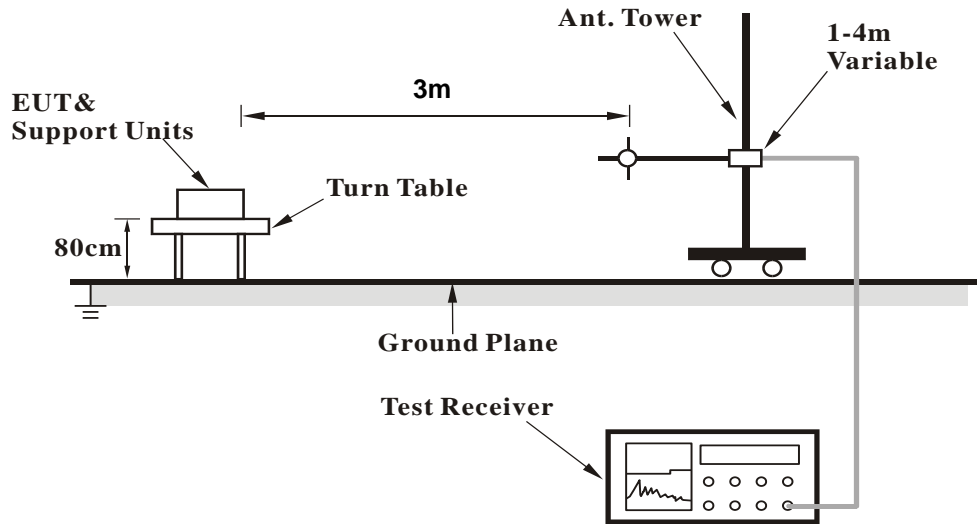
##### **Conducted Power Measurement:**

- a. The EUT was set up for the maximum power with 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.

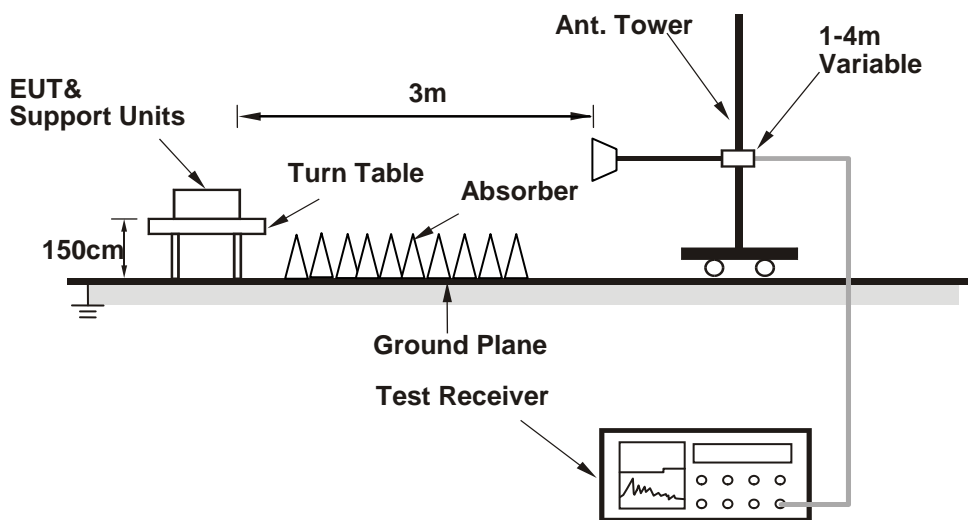
4.1.3 Test Setup

**EIRP / ERP Measurement:**

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

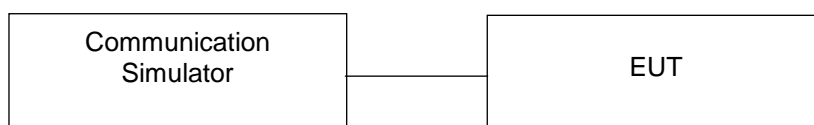


**<Radiated Emission above 1 GHz>**



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)**

**Mode A**

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 19957	Mid Ch 20175	High Ch 20393		Low Ch 19957	Mid Ch 20175	High Ch 20393	
			1710.7 MHz	1732.5 MHz	1754.3 MHz		1710.7 MHz	1732.5 MHz	1754.3 MHz	
4 / 1.4M	1	0	22.93	23.19	23.28	0	21.89	22.17	22.33	1
	1	2	22.81	23.16	23.18	0	21.92	21.90	22.08	1
	1	5	22.62	22.97	22.92	0	21.49	21.89	21.90	1
	3	0	22.69	23.06	23.05	0	21.73	21.83	21.93	1
	3	1	22.46	22.86	22.79	0	21.42	21.76	21.79	1
	3	3	22.59	22.96	22.91	0	21.61	21.71	21.82	1
	6	0	21.87	22.02	22.09	1	20.64	20.95	21.10	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 19965	Mid Ch 20175	High Ch 20385		Low Ch 19965	Mid Ch 20175	High Ch 20385	
			1711.5 MHz	1732.5 MHz	1753.5 MHz		1711.5 MHz	1732.5 MHz	1753.5 MHz	
4 / 3M	1	0	23.08	23.29	23.40	0	22.12	22.31	22.37	1
	1	7	22.98	23.25	23.20	0	21.86	22.23	22.31	1
	1	14	22.76	23.04	23.10	0	21.82	21.94	22.10	1
	8	0	22.06	22.13	22.24	1	20.89	20.95	21.23	2
	8	3	21.82	22.06	22.00	1	20.71	20.89	21.12	2
	8	7	21.76	21.83	21.98	1	20.60	20.82	20.99	2
	15	0	22.01	22.27	22.26	1	20.95	21.21	21.16	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 19975	Mid Ch 20175	High Ch 20375		Low CH 19975	Mid CH 20175	High CH 20375	
			1712.5 MHz	1732.5 MHz	1752.5 MHz		1712.5 MHz	1732.5 MHz	1752.5 MHz	
4 / 5M	1	0	23.24	23.49	23.43	0	22.20	22.50	22.52	1
	1	12	23.16	23.37	23.49	0	22.06	22.30	22.38	1
	1	24	22.94	23.32	23.09	0	21.86	22.00	22.12	1
	12	0	22.03	22.39	22.37	1	20.96	21.25	21.28	2
	12	6	21.94	22.15	22.24	1	20.87	21.11	21.16	2
	12	13	21.78	22.10	22.20	1	20.72	20.88	21.04	2
	25	0	22.09	22.41	22.44	1	21.01	21.22	21.35	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20000	Mid Ch 20175	High Ch 20350		Low Ch 20000	Mid Ch 20175	High Ch 20350	
			1715.0 MHz	1732.5 MHz	1750.0 MHz		1715.0 MHz	1732.5 MHz	1750.0 MHz	
4 / 10M	1	0	23.34	23.58	23.58	0	22.31	22.58	22.60	1
	1	24	23.25	23.44	23.57	0	22.26	22.41	22.50	1
	1	49	22.99	23.22	23.38	0	21.92	22.30	22.36	1
	25	0	22.26	22.47	22.51	1	20.99	21.36	21.42	2
	25	12	22.07	22.26	22.32	1	20.90	21.19	21.27	2
	25	25	21.95	22.30	22.27	1	20.90	21.01	21.27	2
	50	0	22.23	22.41	22.52	1	21.24	21.45	21.46	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20025	Mid Ch 20175	High Ch 20325		Low Ch 20025	Mid Ch 20175	High Ch 20325	
			1717.5 MHz	1732.5 MHz	1747.5 MHz		1717.5 MHz	1732.5 MHz	1747.5 MHz	
4 / 15M	1	0	23.50	23.69	23.78	0	22.40	22.64	22.67	1
	1	37	23.40	23.58	23.69	0	22.36	22.55	22.57	1
	1	74	23.22	23.34	23.46	0	22.16	22.30	22.49	1
	36	0	22.39	22.58	22.70	1	21.16	21.40	21.47	2
	36	19	22.17	22.39	22.50	1	21.08	21.41	21.32	2
	36	39	22.14	22.33	22.43	1	21.02	21.31	21.27	2
	75	0	22.32	22.53	22.63	1	21.31	21.48	21.59	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20050	Mid Ch 20175	High Ch 20300		Low Ch 20050	Mid Ch 20175	High Ch 20300	
			1720.0 MHz	1732.5 MHz	1745.0 MHz		1720.0 MHz	1732.5 MHz	1745.0 MHz	
4 / 20M	1	0	23.61	23.85	23.89	0	22.56	22.80	22.88	1
	1	50	23.48	23.72	23.73	0	22.44	22.64	22.68	1
	1	99	23.25	23.59	23.59	0	22.24	22.52	22.43	1
	50	0	22.49	22.70	22.76	1	21.46	21.67	21.65	2
	50	25	22.31	22.50	22.57	1	21.24	21.43	21.58	2
	50	50	22.21	22.42	22.43	1	21.16	21.35	21.42	2
	100	0	22.48	22.72	22.71	1	21.34	21.61	21.75	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 23017	Mid Ch 23095	High Ch 23173		Low Ch 23017	Mid Ch 23095	High Ch 23173	
			699.7 MHz	707.5 MHz	715.3 MHz		699.7 MHz	707.5 MHz	715.3 MHz	
12 / 1.4M	1	0	22.73	22.81	22.93	0	21.74	21.81	21.84	1
	1	2	22.53	22.77	22.84	0	21.53	21.59	21.76	1
	1	5	22.41	22.50	22.58	0	21.25	21.47	21.62	1
	3	0	22.41	22.67	22.71	0	21.44	21.50	21.60	1
	3	1	22.28	22.36	22.43	0	21.17	21.34	21.47	1
	3	3	22.25	22.51	22.59	0	21.25	21.37	21.48	1
	6	0	21.64	21.62	21.77	1	20.64	20.71	20.90	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 23025	Mid Ch 23095	High Ch 23165		Low Ch 23025	Mid Ch 23095	High Ch 23165	
			700.5 MHz	707.5 MHz	714.5 MHz		700.5 MHz	707.5 MHz	714.5 MHz	
12 / 3M	1	0	22.84	22.93	23.00	0	21.75	22.00	21.97	1
	1	7	22.78	22.83	22.82	0	21.78	21.77	21.95	1
	1	14	22.55	22.60	22.73	0	21.44	21.64	21.79	1
	8	0	21.73	21.89	21.79	1	20.57	20.67	20.77	2
	8	3	21.56	21.69	21.68	1	20.33	20.67	20.59	2
	8	7	21.43	21.60	21.61	1	20.43	20.43	20.56	2
	15	0	21.69	21.91	21.84	1	20.72	20.79	20.89	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 23035	Mid Ch 23095	High Ch 23155		Low Ch 23035	Mid Ch 23095	High Ch 23155	
			701.5 MHz	707.5 MHz	713.5 MHz		701.5 MHz	707.5 MHz	713.5 MHz	
12 / 5M	1	0	23.15	23.18	23.23	0	22.00	22.18	22.28	1
	1	12	23.01	23.09	23.08	0	21.86	21.98	22.12	1
	1	24	22.83	22.90	22.88	0	21.71	22.02	22.03	1
	12	0	21.94	22.14	22.17	1	20.89	20.99	21.17	2
	12	6	21.81	21.86	21.96	1	20.74	20.83	20.90	2
	12	13	21.64	21.79	21.92	1	20.62	20.81	20.89	2
	25	0	21.97	22.01	22.17	1	20.79	21.04	21.01	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 23060	Mid Ch 23095	High Ch 23130		Low Ch 23060	Mid Ch 23095	High Ch 23130	
			704.0 MHz	707.5 MHz	711.0 MHz		704.0 MHz	707.5 MHz	711.0 MHz	
12 / 10M	1	0	23.34	23.46	23.52	0	22.32	22.38	22.47	1
	1	24	23.24	23.31	23.38	0	22.17	22.24	22.29	1
	1	49	23.08	23.23	23.20	0	22.00	22.07	22.10	1
	25	0	22.25	22.31	22.39	1	21.13	21.25	21.21	2
	25	12	22.03	22.13	22.17	1	20.91	21.15	21.16	2
	25	25	21.95	22.02	22.05	1	20.90	21.09	21.07	2
	50	0	22.24	22.25	22.33	1	21.11	21.20	21.28	2

**Mode B**

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 19957	Mid Ch 20175	High Ch 20393		Low Ch 19957	Mid Ch 20175	High Ch 20393	
			1710.7 MHz	1732.5 MHz	1754.3 MHz		1710.7 MHz	1732.5 MHz	1754.3 MHz	
4 / 1.4M	1	0	22.86	23.18	23.15	0	21.86	22.12	22.17	1
	1	2	22.76	22.94	23.14	0	21.69	21.87	21.99	1
	1	5	22.70	22.81	22.90	0	21.52	21.68	21.82	1
	3	0	22.64	22.78	23.02	0	21.66	21.70	21.81	1
	3	1	22.56	22.70	22.80	0	21.37	21.61	21.65	1
	3	3	22.50	22.65	22.93	0	21.50	21.56	21.72	1
	6	0	21.84	22.08	21.98	1	20.71	20.98	21.08	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 19965	Mid Ch 20175	High Ch 20385		Low Ch 19965	Mid Ch 20175	High Ch 20385	
			1711.5 MHz	1732.5 MHz	1753.5 MHz		1711.5 MHz	1732.5 MHz	1753.5 MHz	
4 / 3M	1	0	23.12	23.19	23.34	0	22.01	22.16	22.23	1
	1	7	22.92	23.15	23.29	0	21.93	22.11	22.12	1
	1	14	22.85	22.90	22.96	0	21.74	21.93	21.96	1
	8	0	21.87	22.04	22.25	1	20.88	20.98	21.01	2
	8	3	21.68	21.93	21.97	1	20.60	20.92	20.93	2
	8	7	21.62	21.70	21.92	1	20.66	20.67	20.89	2
	15	0	22.00	22.02	22.24	1	20.88	21.02	21.07	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 19975	Mid Ch 20175	High Ch 20375		Low CH 19975	Mid CH 20175	High CH 20375	
			1712.5 MHz	1732.5 MHz	1752.5 MHz		1712.5 MHz	1732.5 MHz	1752.5 MHz	
4 / 5M	1	0	23.14	23.34	23.46	0	22.22	22.28	22.42	1
	1	12	23.01	23.12	23.31	0	21.97	22.08	22.31	1
	1	24	22.93	23.19	23.26	0	21.74	22.06	22.14	1
	12	0	22.12	22.20	22.23	1	20.90	21.07	21.27	2
	12	6	21.95	21.95	22.06	1	20.85	20.91	21.14	2
	12	13	21.78	21.87	22.00	1	20.68	20.77	21.00	2
	25	0	21.93	22.19	22.25	1	20.99	21.10	21.29	2



Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20000	Mid Ch 20175	High Ch 20350		Low Ch 20000	Mid Ch 20175	High Ch 20350	
			1715.0 MHz	1732.5 MHz	1750.0 MHz		1715.0 MHz	1732.5 MHz	1750.0 MHz	
4 / 10M	1	0	23.33	23.47	23.54	0	22.27	22.42	22.50	1
	1	24	23.23	23.36	23.44	0	22.13	22.30	22.40	1
	1	49	23.03	23.15	23.37	0	21.97	22.16	22.22	1
	25	0	22.22	22.37	22.41	1	21.03	21.24	21.29	2
	25	12	22.02	22.08	22.29	1	20.93	21.16	21.17	2
	25	25	21.99	22.10	22.12	1	20.78	21.04	21.13	2
	50	0	22.22	22.27	22.42	1				2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20025	Mid Ch 20175	High Ch 20325		Low Ch 20025	Mid Ch 20175	High Ch 20325	
			1717.5 MHz	1732.5 MHz	1747.5 MHz		1717.5 MHz	1732.5 MHz	1747.5 MHz	
4 / 15M	1	0	23.45	23.58	23.73	0	22.43	22.54	22.65	1
	1	37	23.36	23.45	23.61	0	22.29	22.46	22.49	1
	1	74	23.05	23.29	23.42	0	22.05	22.20	22.41	1
	36	0	22.30	22.49	22.56	1				2
	36	19	22.12	22.30	22.41	1				2
	36	39	22.01	22.16	22.27	1				2
	75	0	22.30	22.53	22.57	1				2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 20050	Mid Ch 20175	High Ch 20300		Low Ch 20050	Mid Ch 20175	High Ch 20300	
			1720.0 MHz	1732.5 MHz	1745.0 MHz		1720.0 MHz	1732.5 MHz	1745.0 MHz	
4 / 20M	1	0	23.56	23.71	23.82	0	22.51	22.62	22.75	1
	1	50	23.43	23.57	23.66	0	22.33	22.50	22.68	1
	1	99	23.31	23.41	23.54	0	22.09	22.36	22.58	1
	50	0	22.43	22.58	22.70	1				2
	50	25	22.21	22.38	22.49	1				2
	50	50	22.14	22.34	22.44	1				2
	100	0	22.33	22.45	22.49	1				2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 23017	Mid Ch 23095	High Ch 23173		Low Ch 23017	Mid Ch 23095	High Ch 23173	
			699.7 MHz	707.5 MHz	715.3 MHz		699.7 MHz	707.5 MHz	715.3 MHz	
12 / 1.4M	1	0	22.88	22.83	22.85	0	21.66	21.74	21.66	1
	1	2	22.66	22.67	22.58	0	21.74	21.71	21.50	1
	1	5	22.38	22.31	22.37	0	21.40	21.46	21.38	1
	3	0	22.50	22.53	22.43	0	21.57	21.58	21.35	1
	3	1	22.25	22.15	22.25	0	21.29	21.38	21.30	1
	3	3	22.39	22.38	22.32	0	21.52	21.54	21.30	1
	6	0	21.81	21.67	21.71	1	20.53	20.59	20.52	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 23025	Mid Ch 23095	High Ch 23165		Low Ch 23025	Mid Ch 23095	High Ch 23165	
			700.5 MHz	707.5 MHz	714.5 MHz		700.5 MHz	707.5 MHz	714.5 MHz	
12 / 3M	1	0	22.87	22.89	22.87	0	21.80	21.89	21.69	1
	1	7	22.82	22.79	22.78	0	21.79	21.76	21.56	1
	1	14	22.54	22.64	22.50	0	21.73	21.45	21.59	1
	8	0	21.79	21.77	21.68	1	20.80	20.66	20.71	2
	8	3	21.59	21.69	21.49	1	20.49	20.45	20.39	2
	8	7	21.53	21.48	21.37	1	20.46	20.48	20.46	2
	15	0	21.72	21.79	21.66	1	20.76	20.63	20.63	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 23035	Mid Ch 23095	High Ch 23155		Low Ch 23035	Mid Ch 23095	High Ch 23155	
			701.5 MHz	707.5 MHz	713.5 MHz		701.5 MHz	707.5 MHz	713.5 MHz	
12 / 5M	1	0	23.08	23.12	23.10	0	22.10	22.06	21.99	1
	1	12	23.06	23.07	22.99	0	21.98	21.94	21.88	1
	1	24	22.72	22.94	22.72	0	21.83	21.92	21.66	1
	12	0	22.07	22.06	21.98	1	20.97	20.96	20.79	2
	12	6	21.84	21.91	21.79	1	20.80	20.87	20.64	2
	12	13	21.72	21.69	21.69	1	20.67	20.79	20.53	2
	25	0	21.97	22.06	21.99	1	20.88	20.91	20.86	2

Band / BW	RB Size	RB Offset	QPSK			3GPP MPR (dB)	16QAM			3GPP MPR (dB)
			Low Ch 23060	Mid Ch 23095	High Ch 23130		Low Ch 23060	Mid Ch 23095	High Ch 23130	
			704.0 MHz	707.5 MHz	711.0 MHz		704.0 MHz	707.5 MHz	711.0 MHz	
12 / 10M	1	0	23.39	23.27	23.33	0	22.33	22.31	22.27	1
	1	24	23.27	23.29	23.21	0	22.26	22.23	22.22	1
	1	49	23.09	23.09	22.98	0	21.92	22.04	22.00	1
	25	0	22.27	22.29	22.17	1	21.13	21.10	21.17	2
	25	12	22.06	22.07	21.97	1	21.03	21.09	20.96	2
	25	25	21.96	22.03	21.83	1	20.89	20.94	20.80	2
	50	0	22.18	22.24	22.20	1				2

**ERP Power (dBm)**

**Mode A**

LTE Band 12							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	23017	699.7	-12.00	32.719	18.57	71.93	H
	23095	707.5	-12.00	32.736	18.59	72.21	
	23173	715.3	-11.91	32.591	18.53	71.30	
	V	23017	699.7	-18.56	32.69	11.98	15.78
		23095	707.5	-18.62	32.81	12.04	16.00
		23173	715.3	-18.55	32.74	12.04	16.00
Channel Bandwidth: 1.4 MHz / 16QAM							
X	23017	699.7	-13.03	32.719	17.54	56.74	H
	23095	707.5	-13.04	32.736	17.55	56.83	
	23173	715.3	-13.92	32.591	16.52	44.88	
	V	23017	699.7	-19.52	32.69	11.02	12.65
		23095	707.5	-19.56	32.81	11.10	12.88
		23173	715.3	-19.60	32.74	10.99	12.56

LTE Band 12							
Channel Bandwidth: 3 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	23025	700.5	-11.96	32.719	18.61	72.59	H
	23095	707.5	-11.98	32.736	18.61	72.54	
	23165	714.5	-11.85	32.591	18.59	72.29	
	V	23025	700.5	-18.54	32.69	12.00	15.85
		23095	707.5	-18.62	32.81	12.04	16.00
		23165	714.5	-18.53	32.74	12.06	16.07
Channel Bandwidth: 3 MHz / 16QAM							
X	23025	700.5	-13.00	32.719	17.57	57.13	H
	23095	707.5	-13.00	32.736	17.59	57.36	
	23165	714.5	-12.88	32.591	17.56	57.03	
	V	23025	700.5	-19.46	32.69	11.08	12.82
		23095	707.5	-19.53	32.81	11.13	12.97
		23165	714.5	-19.50	32.74	11.09	12.85

LTE Band 12							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	23035	701.5	-11.92	32.719	18.65	73.27	H
	23095	707.5	-11.90	32.736	18.69	73.89	
	23155	713.5	-11.79	32.591	18.65	73.30	
	23035	701.5	-18.46	32.69	12.08	16.14	V
	23095	707.5	-18.52	32.81	12.14	16.37	
	23155	713.5	-18.49	32.74	12.10	16.22	
Channel Bandwidth: 5 MHz / 16QAM							
X	23035	701.5	-12.98	32.719	17.59	57.40	H
	23095	707.5	-12.95	32.736	17.64	58.02	
	23155	713.5	-12.86	32.591	17.58	57.29	
	23035	701.5	-19.40	32.69	11.14	13.00	V
	23095	707.5	-19.47	32.81	11.19	13.15	
	23155	713.5	-19.46	32.74	11.13	12.97	

LTE Band 12							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	23060	704.0	-11.86	32.727	18.72	74.42	H
	23095	707.5	-11.85	32.739	18.74	74.80	
	23130	711.0	-11.90	32.728	18.68	73.76	
	23060	704.0	-18.42	32.75	12.18	16.52	V
	23095	707.5	-18.42	32.81	12.24	16.75	
	23130	711.0	-18.56	32.84	12.13	16.33	
Channel Bandwidth: 10 MHz / 16QAM							
X	23060	704.0	-12.89	32.727	17.69	58.71	H
	23095	707.5	-12.84	32.739	17.75	59.55	
	23130	711.0	-12.93	32.728	17.65	58.18	
	23060	704.0	-17.42	32.75	13.18	20.80	V
	23095	707.5	-19.44	32.81	11.22	13.24	
	23130	711.0	-19.52	32.84	11.17	13.09	

**Mode B**

LTE Band 12							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	23017	699.7	-11.81	32.719	18.76	75.14	H
	23095	707.5	-11.83	32.736	18.76	75.09	
	23173	715.3	-11.71	32.591	18.73	74.66	
	23017	699.7	-18.52	32.69	12.02	15.92	V
	23095	707.5	-18.62	32.81	12.04	16.00	
	23173	715.3	-18.50	32.74	12.09	16.18	
Channel Bandwidth: 1.4 MHz / 16QAM							
X	23017	699.7	-12.85	32.719	17.72	59.14	H
	23095	707.5	-12.83	32.736	17.76	59.65	
	23173	715.3	-12.78	32.591	17.66	58.36	
	23017	699.7	-19.46	32.69	11.08	12.82	V
	23095	707.5	-19.52	32.81	11.14	13.00	
	23173	715.3	-19.55	32.74	11.04	12.71	

LTE Band 12							
Channel Bandwidth: 3 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	23025	700.5	-11.80	32.719	18.77	75.32	H
	23095	707.5	-11.79	32.736	18.80	75.79	
	23165	714.5	-11.64	32.591	18.80	75.88	
	23025	700.5	-18.55	32.69	11.99	15.81	V
	23095	707.5	-18.60	32.81	12.06	16.07	
	23165	714.5	-18.53	32.74	12.06	16.07	
Channel Bandwidth: 3 MHz / 16QAM							
X	23025	700.5	-12.85	32.719	17.72	59.14	H
	23095	707.5	-12.86	32.736	17.73	59.24	
	23165	714.5	-12.86	32.591	17.58	57.29	
	23025	700.5	-19.37	32.69	11.17	13.09	V
	23095	707.5	-19.60	32.81	11.06	12.76	
	23165	714.5	-19.51	32.74	11.08	12.82	

LTE Band 12							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	23035	701.5	-11.87	32.719	18.70	74.11	H
	23095	707.5	-11.81	32.736	18.78	75.44	
	23155	713.5	-11.70	32.591	18.74	74.83	
	23035	701.5	-18.43	32.69	12.11	16.26	V
	23095	707.5	-18.46	32.81	12.20	16.60	
	23155	713.5	-18.50	32.74	12.09	16.18	
Channel Bandwidth: 5 MHz / 16QAM							
X	23035	701.5	-12.88	32.719	17.69	58.74	H
	23095	707.5	-12.83	32.736	17.76	59.65	
	23155	713.5	-12.72	32.591	17.72	59.17	
	23035	701.5	-19.48	32.69	11.06	12.76	V
	23095	707.5	-19.60	32.81	11.06	12.76	
	23155	713.5	-19.46	32.74	11.13	12.97	

LTE Band 12							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	23060	704.0	-11.76	32.727	18.82	76.16	H
	23095	707.5	-11.75	32.739	18.84	76.54	
	23130	711.0	-11.82	32.728	18.76	75.13	
	23060	704.0	-18.42	32.75	12.18	16.52	V
	23095	707.5	-18.46	32.81	12.20	16.60	
	23130	711.0	-18.47	32.84	12.22	16.67	
Channel Bandwidth: 10 MHz / 16QAM							
X	23060	704.0	-12.85	32.727	17.73	59.25	H
	23095	707.5	-12.83	32.739	17.76	59.69	
	23130	711.0	-12.75	32.728	17.83	60.65	
	23060	704.0	-19.41	32.75	11.19	13.15	V
	23095	707.5	-19.54	32.81	11.12	12.94	
	23130	711.0	-19.56	32.84	11.13	12.97	

**EIRP Power (dBm)**

**Mode A**

LTE Band 4							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	19957	1710.7	-21.33	42.49	21.16	130.47	H
	20175	1732.5	-21.16	42.33	21.17	130.83	
	20393	1754.3	-21.00	42.10	21.10	128.82	
	19957	1710.7	-25.60	42.99	17.39	54.83	V
	20175	1732.5	-25.33	42.74	17.41	55.03	
	20393	1754.3	-25.00	42.21	17.21	52.60	
Channel Bandwidth: 1.4 MHz / 16QAM							
X	19957	1710.7	-22.35	42.49	20.14	103.16	H
	20175	1732.5	-22.26	42.33	20.07	101.55	
	20393	1754.3	-22.10	42.10	20.00	100.00	
	19957	1710.7	-26.71	42.99	16.28	42.46	V
	20175	1732.5	-26.41	42.74	16.33	42.95	
	20393	1754.3	-25.91	42.21	16.30	42.66	

LTE Band 4							
Channel Bandwidth: 3 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	19965	1711.5	-21.39	42.49	21.10	128.68	H
	20175	1732.5	-21.16	42.33	21.17	130.89	
	20385	1753.5	-20.99	42.10	21.11	129.12	
	19965	1711.5	-25.64	42.99	17.35	54.33	V
	20175	1732.5	-25.43	42.74	17.31	53.83	
	20385	1753.5	-24.87	42.21	17.34	54.20	
Channel Bandwidth: 3 MHz / 16QAM							
X	19965	1711.5	-22.35	42.49	20.14	103.16	H
	20175	1732.5	-22.21	42.33	20.12	102.73	
	20385	1753.5	-22.02	42.10	20.08	101.86	
	19965	1711.5	-26.65	42.99	16.34	43.05	V
	20175	1732.5	-26.37	42.74	16.37	43.35	
	20385	1753.5	-25.89	42.21	16.32	42.85	

LTE Band 4							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	19975	1712.5	-21.27	42.49	21.22	132.28	H
	20175	1732.5	-21.20	42.33	21.13	129.63	
	20375	1752.5	-20.95	42.10	21.15	130.32	
	19975	1712.5	-25.64	42.99	17.35	54.33	V
	20175	1732.5	-25.43	42.74	17.31	53.83	
	20375	1752.5	-24.86	42.21	17.35	54.33	
Channel Bandwidth: 5 MHz / 16QAM							
X	19975	1712.5	-22.31	42.49	20.18	104.11	H
	20175	1732.5	-22.15	42.33	20.18	104.16	
	20375	1752.5	-22.00	42.10	20.10	102.33	
	19975	1712.5	-26.61	42.99	16.38	43.45	V
	20175	1732.5	-26.38	42.74	16.36	43.25	
	20375	1752.5	-25.91	42.21	16.30	42.66	

LTE Band 4							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	20000	1715.0	-21.35	42.49	21.14	129.87	H
	20175	1732.5	-21.12	42.33	21.21	132.04	
	20350	1750.0	-20.90	42.10	21.20	131.83	
	20000	1715.0	-25.56	42.99	17.43	55.34	V
	20175	1732.5	-25.31	42.74	17.43	55.34	
	20350	1750.0	-24.80	42.21	17.41	55.08	
Channel Bandwidth: 10 MHz / 16QAM							
X	20000	1715.0	-22.27	42.49	20.22	105.08	H
	20175	1732.5	-22.20	42.33	20.13	102.97	
	20350	1750.0	-21.90	42.10	20.20	104.71	
	20000	1715.0	-26.61	42.99	16.38	43.45	V
	20175	1732.5	-26.34	42.74	16.40	43.65	
	20350	1750.0	-25.89	42.21	16.32	42.85	



LTE Band 4							
Channel Bandwidth: 15 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	20025	1717.5	-21.31	42.49	21.18	131.07	H
	20175	1732.5	-21.14	42.33	21.19	131.43	
	20325	1747.5	-20.88	42.10	21.22	132.43	
	20025	1717.5	-25.56	42.99	17.43	55.34	V
	20175	1732.5	-25.33	42.74	17.41	55.08	
	20325	1747.5	-24.78	42.21	17.43	55.34	
Channel Bandwidth: 15 MHz / 16QAM							
X	20025	1717.5	-22.27	42.49	20.22	105.08	H
	20175	1732.5	-22.13	42.33	20.20	104.64	
	20325	1747.5	-21.93	42.10	20.17	103.99	
	20025	1717.5	-26.64	42.99	16.35	43.15	V
	20175	1732.5	-26.32	42.74	16.42	43.85	
	20325	1747.5	-25.82	42.21	16.39	43.55	

LTE Band 4							
Channel Bandwidth: 20 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	20050	1720.0	-21.30	42.49	21.19	131.37	H
	20175	1732.5	-21.10	42.33	21.23	132.65	
	20300	1745.0	-20.88	42.10	21.22	132.43	
	20050	1720.0	-25.60	42.99	17.39	54.83	V
	20175	1732.5	-25.33	42.74	17.41	55.08	
	20300	1745.0	-24.75	42.21	17.46	55.72	
Channel Bandwidth: 20 MHz / 16QAM							
X	20050	1720.0	-22.24	42.49	20.25	105.80	H
	20175	1732.5	-22.00	42.33	20.33	107.82	
	20300	1745.0	-21.86	42.10	20.24	105.68	
	20050	1720.0	-26.59	42.99	16.40	43.65	V
	20175	1732.5	-26.30	42.74	16.44	44.06	
	20300	1745.0	-25.81	42.21	16.40	43.65	

**Mode B**

LTE Band 4							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	19957	1710.7	-21.31	42.49	21.18	131.07	H
	20175	1732.5	-21.15	42.33	21.18	131.13	
	20393	1754.3	-20.94	42.10	21.16	130.62	
	19957	1710.7	-25.56	42.99	17.43	55.34	V
	20175	1732.5	-25.34	42.74	17.40	54.95	
	20393	1754.3	-24.82	42.21	17.39	54.83	
Channel Bandwidth: 1.4 MHz / 16QAM							
X	19957	1710.7	-22.26	42.49	20.23	105.32	H
	20175	1732.5	-22.08	42.33	20.25	105.85	
	20393	1754.3	-21.95	42.10	20.15	103.51	
	19957	1710.7	-26.51	42.99	16.48	44.46	V
	20175	1732.5	-26.30	42.74	16.44	44.06	
	20393	1754.3	-25.70	42.21	16.51	44.77	

LTE Band 4							
Channel Bandwidth: 3 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	19965	1711.5	-21.28	42.49	21.21	131.98	H
	20175	1732.5	-21.06	42.33	21.27	133.88	
	20385	1753.5	-20.84	42.10	21.26	133.66	
	19965	1711.5	-25.56	42.99	17.43	55.34	V
	20175	1732.5	-25.39	42.74	17.35	54.33	
	20385	1753.5	-24.80	42.21	17.41	55.08	
Channel Bandwidth: 3 MHz / 16QAM							
X	19965	1711.5	-22.28	42.49	20.21	104.83	H
	20175	1732.5	-22.08	42.33	20.25	105.85	
	20385	1753.5	-21.88	42.10	20.22	105.20	
	19965	1711.5	-26.46	42.99	16.53	44.98	V
	20175	1732.5	-26.31	42.74	16.43	43.95	
	20385	1753.5	-25.78	42.21	16.43	43.95	

LTE Band 4							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	19975	1712.5	-21.28	42.49	21.21	131.98	H
	20175	1732.5	-21.08	42.33	21.25	133.26	
	20375	1752.5	-20.92	42.10	21.18	131.22	
	19975	1712.5	-25.62	42.99	17.37	54.58	V
	20175	1732.5	-25.37	42.74	17.37	54.58	
	20375	1752.5	-24.78	42.21	17.43	55.34	
Channel Bandwidth: 5 MHz / 16QAM							
X	19975	1712.5	-22.23	42.49	20.26	106.05	H
	20175	1732.5	-22.01	42.33	20.32	107.57	
	20375	1752.5	-21.89	42.10	20.21	104.95	
	19975	1712.5	-26.52	42.99	16.47	44.36	V
	20175	1732.5	-26.23	42.74	16.51	44.77	
	20375	1752.5	-25.71	42.21	16.50	44.67	

LTE Band 4							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	20000	1715.0	-21.32	42.49	21.17	130.77	H
	20175	1732.5	-21.11	42.33	21.22	132.34	
	20350	1750.0	-20.95	42.10	21.15	130.32	
	20000	1715.0	-25.50	42.99	17.49	56.10	V
	20175	1732.5	-25.34	42.74	17.40	54.95	
	20350	1750.0	-24.83	42.21	17.38	54.70	
Channel Bandwidth: 10 MHz / 16QAM							
X	20000	1715.0	-22.24	42.49	20.25	105.80	H
	20175	1732.5	-22.10	42.33	20.23	105.37	
	20350	1750.0	-21.92	42.10	20.18	104.23	
	20000	1715.0	-26.53	42.99	16.46	44.26	V
	20175	1732.5	-26.35	42.74	16.39	43.55	
	20350	1750.0	-25.81	42.21	16.40	43.65	

LTE Band 4							
Channel Bandwidth: 15 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	20025	1717.5	-21.36	42.49	21.13	129.57	H
	20175	1732.5	-21.14	42.33	21.19	131.43	
	20325	1747.5	-20.91	42.10	21.19	131.52	
	20025	1717.5	-25.52	42.99	17.47	55.85	V
	20175	1732.5	-25.33	42.74	17.41	55.08	
	20325	1747.5	-24.78	42.21	17.43	55.34	
Channel Bandwidth: 15 MHz / 16QAM							
X	20025	1717.5	-22.25	42.49	20.24	105.56	H
	20175	1732.5	-22.13	42.33	20.20	104.64	
	20325	1747.5	-21.84	42.10	20.26	106.17	
	20025	1717.5	-26.59	42.99	16.40	43.65	V
	20175	1732.5	-26.16	42.74	16.58	45.50	
	20325	1747.5	-25.67	42.21	16.54	45.08	

LTE Band 4							
Channel Bandwidth: 20 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	20050	1720.0	-21.18	42.49	21.31	135.05	H
	20175	1732.5	-21.11	42.33	21.22	132.34	
	20300	1745.0	-20.80	42.10	21.30	134.90	
	20050	1720.0	-25.50	42.99	17.49	56.10	V
	20175	1732.5	-25.24	42.74	17.50	56.23	
	20300	1745.0	-24.73	42.21	17.48	55.98	
Channel Bandwidth: 20 MHz / 16QAM							
X	20050	1720.0	-22.23	42.49	20.26	106.05	H
	20175	1732.5	-22.00	42.33	20.33	107.82	
	20300	1745.0	-21.80	42.10	20.30	107.15	
	20050	1720.0	-26.38	42.99	16.61	45.81	V
	20175	1732.5	-26.17	42.74	16.57	45.39	
	20300	1745.0	-25.64	42.21	16.57	45.39	

## 4.2 Frequency Stability Measurement

### 4.2.1 Limits of Frequency Stability Measurement

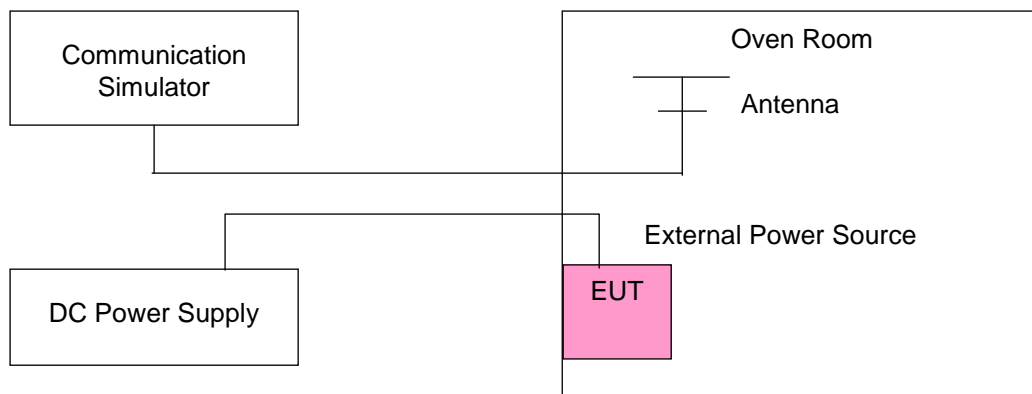
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

### 4.2.2 Test Procedure

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

### 4.2.3 Test Setup



4.2.4 Test Results

**Mode A**

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
8	1710.700003	0.002	1754.300003	0.002	2.5
5	1710.700001	0.001	1754.300003	0.002	2.5
12	1710.700001	0.001	1754.300002	0.001	2.5

**Note:** The applicant defined the normal working voltage of the battery is from 5 Vdc to 12 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1710.700003	0.001	1754.300002	0.001	2.5
-20	1710.700002	0.001	1754.300002	0.001	2.5
-10	1710.700002	0.001	1754.300002	0.001	2.5
0	1710.700002	0.001	1754.300002	0.001	2.5
10	1710.700003	0.002	1754.300003	0.002	2.5
20	1710.699997	-0.002	1754.299997	-0.002	2.5
30	1710.699998	-0.001	1754.299999	-0.001	2.5
40	1710.699998	-0.001	1754.299998	-0.001	2.5
50	1710.699997	-0.002	1754.299996	-0.002	2.5

## Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
8	1711.500001	0.001	1753.500003	0.002	2.5
5	1711.500001	0.001	1753.500001	0.001	2.5
12	1711.500003	0.002	1753.500002	0.001	2.5

**Note:** The applicant defined the normal working voltage of the battery is from 5 Vdc to 12 Vdc.

## Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1711.500001	0.001	1753.500001	0.001	2.5
-20	1711.500001	0.001	1753.500003	0.001	2.5
-10	1711.500003	0.002	1753.500004	0.002	2.5
0	1711.500003	0.002	1753.500002	0.001	2.5
10	1711.500002	0.001	1753.500001	0.001	2.5
20	1711.499997	-0.002	1753.499999	-0.001	2.5
30	1711.499997	-0.002	1753.499997	-0.002	2.5
40	1711.499997	-0.002	1753.499999	-0.001	2.5
50	1711.499998	-0.001	1753.499998	-0.001	2.5

## Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
8	1712.500003	0.002	1752.500001	0.001	2.5
5	1712.500003	0.002	1752.500003	0.001	2.5
12	1712.500001	0.001	1752.500003	0.002	2.5

**Note:** The applicant defined the normal working voltage of the battery is from 5 Vdc to 12 Vdc.

## Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1712.500002	0.001	1752.500002	0.001	2.5
-20	1712.500004	0.002	1752.500004	0.002	2.5
-10	1712.500004	0.002	1752.500004	0.002	2.5
0	1712.500003	0.002	1752.500002	0.001	2.5
10	1712.500004	0.002	1752.500003	0.002	2.5
20	1712.499997	-0.002	1752.499998	-0.001	2.5
30	1712.499998	-0.001	1752.499998	-0.001	2.5
40	1712.499997	-0.002	1752.499998	-0.001	2.5
50	1712.499996	-0.002	1752.499996	-0.002	2.5



Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
8	1715.000001	0.001	1750.000003	0.002	2.5
5	1715.000004	0.002	1750.000003	0.002	2.5
12	1715.000001	0.001	1750.000003	0.002	2.5

**Note:** The applicant defined the normal working voltage of the battery is from 5 Vdc to 12 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1715.000004	0.002	1750.000004	0.002	2.5
-20	1715.000002	0.001	1750.000003	0.002	2.5
-10	1715.000004	0.002	1750.000004	0.002	2.5
0	1715.000001	0.001	1750.000002	0.001	2.5
10	1715.000002	0.001	1750.000003	0.002	2.5
20	1714.999998	-0.001	1749.999996	-0.002	2.5
30	1714.999996	-0.002	1749.999999	-0.001	2.5
40	1714.999997	-0.002	1749.999999	-0.001	2.5
50	1714.999999	-0.001	1749.999997	-0.002	2.5

## Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
8	1717.500002	0.001	1747.500004	0.002	2.5
5	1717.500004	0.002	1747.500002	0.001	2.5
12	1717.500002	0.001	1747.500002	0.001	2.5

**Note:** The applicant defined the normal working voltage of the battery is from 5 Vdc to 12 Vdc.

## Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4				Limit (ppm)
	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	0.002	2.5
-20	1717.500001	0.001	1747.500001	0.001	2.5
-10	1717.500002	0.001	1747.500002	0.001	2.5
0	1717.500004	0.002	1747.500003	0.002	2.5
10	1717.500004	0.002	1747.500003	0.002	2.5
20	1717.499997	-0.002	1747.499996	-0.002	2.5
30	1717.499998	-0.001	1747.499996	-0.002	2.5
40	1717.499998	-0.001	1747.499998	-0.001	2.5
50	1717.499997	-0.002	1747.499996	-0.002	2.5

## Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
8	1720.000002	0.001	1745.000003	0.001	2.5
5	1720.000002	0.001	1745.000004	0.002	2.5
12	1720.000003	0.002	1745.000002	0.001	2.5

**Note:** The applicant defined the normal working voltage of the battery is from 5 Vdc to 12 Vdc.

## Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1720.000004	0.002	1745.000001	0.001	2.5
-20	1720.000003	0.002	1745.000002	0.001	2.5
-10	1720.000003	0.002	1745.000004	0.002	2.5
0	1720.000004	0.002	1745.000003	0.002	2.5
10	1720.000002	0.001	1745.000004	0.002	2.5
20	1719.999998	-0.001	1744.999998	-0.001	2.5
30	1719.999996	-0.002	1744.999997	-0.002	2.5
40	1719.999998	-0.001	1744.999997	-0.002	2.5
50	1719.999998	-0.001	1744.999997	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
8	699.700004	0.006	715.300001	0.002	2.5
5	699.700003	0.005	715.300003	0.005	2.5
12	699.700002	0.002	715.300002	0.003	2.5

**Note:** The applicant defined the normal working voltage of the battery is from 5 Vdc to 12 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	699.700003	0.005	715.300002	0.003	2.5
-20	699.700002	0.003	715.300003	0.005	2.5
-10	699.700004	0.005	715.300004	0.005	2.5
0	699.700001	0.002	715.300002	0.003	2.5
10	699.700004	0.005	715.300002	0.003	2.5
20	699.699997	-0.005	715.299997	-0.004	2.5
30	699.699998	-0.003	715.299998	-0.003	2.5
40	699.699998	-0.003	715.299997	-0.004	2.5
50	699.699998	-0.003	715.299997	-0.004	2.5

## Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
8	700.500001	0.002	714.500002	0.002	2.5
5	700.500002	0.002	714.500001	0.001	2.5
12	700.500002	0.003	714.500003	0.004	2.5

**Note:** The applicant defined the normal working voltage of the battery is from 5 Vdc to 12 Vdc.

## Frequency Error vs. Temperature

Temp. (°C)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	700.500003	0.005	714.500002	0.003	2.5
-20	700.500003	0.004	714.500003	0.004	2.5
-10	700.500001	0.002	714.500002	0.002	2.5
0	700.500003	0.004	714.500002	0.002	2.5
10	700.500002	0.002	714.500004	0.005	2.5
20	700.499999	-0.002	714.499997	-0.004	2.5
30	700.499998	-0.003	714.499998	-0.003	2.5
40	700.499997	-0.004	714.499998	-0.002	2.5
50	700.499998	-0.003	714.499998	-0.003	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
8	701.500003	0.005	713.500003	0.003	2.5
5	701.500004	0.005	713.500003	0.004	2.5
12	701.500002	0.002	713.500002	0.003	2.5

**Note:** The applicant defined the normal working voltage of the battery is from 5 Vdc to 12 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	701.500002	0.002	713.500002	0.002	2.5
-20	701.500003	0.004	713.500002	0.003	2.5
-10	701.500004	0.005	713.500001	0.002	2.5
0	701.500003	0.004	713.500002	0.003	2.5
10	701.500004	0.006	713.500001	0.002	2.5
20	701.499997	-0.004	713.499998	-0.003	2.5
30	701.499997	-0.004	713.499998	-0.003	2.5
40	701.499996	-0.006	713.499997	-0.004	2.5
50	701.499997	-0.004	713.499997	-0.004	2.5

## Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
8	704.000004	0.005	711.000004	0.005	2.5
5	704.000001	0.001	711.000002	0.003	2.5
12	704.000002	0.003	711.000003	0.005	2.5

**Note:** The applicant defined the normal working voltage of the battery is from 5 Vdc to 12 Vdc.

## Frequency Error vs. Temperature

Temp. (°C)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	704.000004	0.006	711.000002	0.002	2.5
-20	704.000002	0.003	711.000004	0.005	2.5
-10	704.000003	0.005	711.000002	0.003	2.5
0	704.000001	0.002	711.000002	0.003	2.5
10	704.000001	0.002	711.000002	0.002	2.5
20	703.999999	-0.002	710.999999	-0.002	2.5
30	703.999996	-0.006	710.999998	-0.003	2.5
40	703.999997	-0.005	710.999997	-0.004	2.5
50	703.999999	-0.002	710.999997	-0.004	2.5

### Mode B

#### Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
8	1710.700002	0.001	1754.300001	0.001	2.5
5	1710.700002	0.001	1754.300003	0.002	2.5
12	1710.700002	0.001	1754.300003	0.002	2.5

**Note:** The applicant defined the normal working voltage of the battery is from 5 Vdc to 12 Vdc.

#### Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1710.700002	0.001	1754.300002	0.001	2.5
-20	1710.700004	0.002	1754.300004	0.002	2.5
-10	1710.700001	0.001	1754.300003	0.001	2.5
0	1710.700002	0.001	1754.300004	0.002	2.5
10	1710.700002	0.001	1754.300004	0.002	2.5
20	1710.699997	-0.002	1754.299998	-0.001	2.5
30	1710.699996	-0.002	1754.299998	-0.001	2.5
40	1710.699996	-0.002	1754.299998	-0.001	2.5
50	1710.699997	-0.002	1754.299996	-0.002	2.5



Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
8	1711.500002	0.001	1753.500004	0.002	2.5
5	1711.500003	0.002	1753.500002	0.001	2.5
12	1711.500002	0.001	1753.500004	0.002	2.5

**Note:** The applicant defined the normal working voltage of the battery is from 5 Vdc to 12 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1711.500004	0.002	1753.500003	0.002	2.5
-20	1711.500003	0.002	1753.500001	0.001	2.5
-10	1711.500002	0.001	1753.500002	0.001	2.5
0	1711.500002	0.001	1753.500002	0.001	2.5
10	1711.500001	0.001	1753.500004	0.002	2.5
20	1711.499998	-0.001	1753.499997	-0.002	2.5
30	1711.499999	-0.001	1753.499998	-0.001	2.5
40	1711.499999	-0.001	1753.499999	-0.001	2.5
50	1711.499999	-0.001	1753.499999	-0.001	2.5

## Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
8	1712.500001	0.001	1752.500003	0.002	2.5
5	1712.500001	0.001	1752.500001	0.001	2.5
12	1712.500001	0.001	1752.500001	0.001	2.5

**Note:** The applicant defined the normal working voltage of the battery is from 5 Vdc to 12 Vdc.

## Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1712.500001	0.001	1752.500001	0.001	2.5
-20	1712.500002	0.001	1752.500002	0.001	2.5
-10	1712.500004	0.002	1752.500002	0.001	2.5
0	1712.500002	0.001	1752.500004	0.002	2.5
10	1712.500003	0.002	1752.500004	0.002	2.5
20	1712.499998	-0.001	1752.499996	-0.002	2.5
30	1712.499996	-0.002	1752.499996	-0.002	2.5
40	1712.499997	-0.002	1752.499998	-0.001	2.5
50	1712.499996	-0.002	1752.499997	-0.002	2.5

## Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
8	1715.000002	0.001	1750.000004	0.002	2.5
5	1715.000002	0.001	1750.000002	0.001	2.5
12	1715.000003	0.002	1750.000002	0.001	2.5

**Note:** The applicant defined the normal working voltage of the battery is from 5 Vdc to 12 Vdc.

## Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1715.000002	0.001	1750.000002	0.001	2.5
-20	1715.000003	0.002	1750.000002	0.001	2.5
-10	1715.000002	0.001	1750.000002	0.001	2.5
0	1715.000004	0.002	1750.000002	0.001	2.5
10	1715.000003	0.002	1750.000003	0.002	2.5
20	1714.999999	-0.001	1749.999999	-0.001	2.5
30	1714.999996	-0.002	1749.999997	-0.002	2.5
40	1714.999998	-0.001	1749.999998	-0.001	2.5
50	1714.999998	-0.001	1749.999997	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
8	1717.500003	0.002	1747.500003	0.002	2.5
5	1717.500003	0.002	1747.500001	0.001	2.5
12	1717.500002	0.001	1747.500002	0.001	2.5

**Note:** The applicant defined the normal working voltage of the battery is from 5 Vdc to 12 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1717.500004	0.002	1747.500002	0.001	2.5
-20	1717.500002	0.001	1747.500001	0.001	2.5
-10	1717.500003	0.002	1747.500002	0.001	2.5
0	1717.500004	0.002	1747.500003	0.002	2.5
10	1717.500004	0.002	1747.500003	0.002	2.5
20	1717.499997	-0.002	1747.499996	-0.002	2.5
30	1717.499998	-0.001	1747.499998	-0.001	2.5
40	1717.499998	-0.001	1747.499999	-0.001	2.5
50	1717.499997	-0.002	1747.499997	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
8	1720.000002	0.001	1745.000003	0.002	2.5
5	1720.000003	0.002	1745.000001	0.001	2.5
12	1720.000003	0.002	1745.000002	0.001	2.5

**Note:** The applicant defined the normal working voltage of the battery is from 5 Vdc to 12 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1720.000003	0.002	1745.000003	0.001	2.5
-20	1720.000003	0.002	1745.000001	0.001	2.5
-10	1720.000003	0.002	1745.000004	0.002	2.5
0	1720.000004	0.002	1745.000003	0.002	2.5
10	1720.000004	0.002	1745.000003	0.001	2.5
20	1719.999997	-0.002	1744.999998	-0.001	2.5
30	1719.999996	-0.002	1744.999998	-0.001	2.5
40	1719.999996	-0.002	1744.999999	-0.001	2.5
50	1719.999997	-0.002	1744.999998	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
8	699.700004	0.005	715.300003	0.004	2.5
5	699.700003	0.004	715.300003	0.003	2.5
12	699.700004	0.005	715.300002	0.003	2.5

**Note:** The applicant defined the normal working voltage of the battery is from 5 Vdc to 12 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	699.700003	0.005	715.300001	0.001	2.5
-20	699.700004	0.005	715.300002	0.002	2.5
-10	699.700004	0.006	715.300003	0.004	2.5
0	699.700001	0.002	715.300003	0.004	2.5
10	699.700002	0.002	715.300003	0.004	2.5
20	699.699999	-0.001	715.299998	-0.003	2.5
30	699.699999	-0.002	715.299997	-0.004	2.5
40	699.699999	-0.002	715.299997	-0.004	2.5
50	699.699998	-0.003	715.299997	-0.004	2.5

## Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
8	700.500003	0.004	714.500001	0.002	2.5
5	700.500003	0.005	714.500002	0.003	2.5
12	700.500002	0.003	714.500002	0.002	2.5

**Note:** The applicant defined the normal working voltage of the battery is from 5 Vdc to 12 Vdc.

## Frequency Error vs. Temperature

Temp. (°C)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	700.500004	0.005	714.500004	0.005	2.5
-20	700.500004	0.006	714.500004	0.006	2.5
-10	700.500004	0.006	714.500002	0.002	2.5
0	700.500002	0.003	714.500002	0.002	2.5
10	700.500003	0.005	714.500002	0.003	2.5
20	700.499997	-0.004	714.499997	-0.004	2.5
30	700.499996	-0.005	714.499998	-0.003	2.5
40	700.499997	-0.005	714.499999	-0.002	2.5
50	700.499999	-0.002	714.499997	-0.004	2.5

## Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
8	701.500002	0.003	713.500002	0.003	2.5
5	701.500003	0.004	713.500003	0.004	2.5
12	701.500002	0.003	713.500002	0.003	2.5

**Note:** The applicant defined the normal working voltage of the battery is from 5 Vdc to 12 Vdc.

## Frequency Error vs. Temperature

Temp. (°C)	LTE Band 12				Limit (ppm)
	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	0.003	2.5
-20	701.500002	0.003	713.500002	0.003	2.5
-10	701.500002	0.003	713.500001	0.002	2.5
0	701.500004	0.005	713.500003	0.004	2.5
10	701.500002	0.002	713.500002	0.002	2.5
20	701.499997	-0.004	713.499997	-0.004	2.5
30	701.499998	-0.003	713.499997	-0.005	2.5
40	701.499999	-0.002	713.499999	-0.002	2.5
50	701.499997	-0.005	713.499996	-0.005	2.5



Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
8	704.000003	0.005	711.000002	0.002	2.5
5	704.000002	0.003	711.000003	0.005	2.5
12	704.000001	0.002	711.000001	0.002	2.5

**Note:** The applicant defined the normal working voltage of the battery is from 5 Vdc to 12 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	704.000001	0.002	711.000002	0.003	2.5
-20	704.000003	0.005	711.000003	0.004	2.5
-10	704.000001	0.002	711.000004	0.005	2.5
0	704.000002	0.002	711.000003	0.004	2.5
10	704.000003	0.004	711.000003	0.004	2.5
20	703.999996	-0.005	710.999998	-0.002	2.5
30	703.999997	-0.004	710.999997	-0.005	2.5
40	703.999998	-0.002	710.999998	-0.003	2.5
50	703.999996	-0.005	710.999997	-0.004	2.5

### 4.3 Occupied Bandwidth Measurement

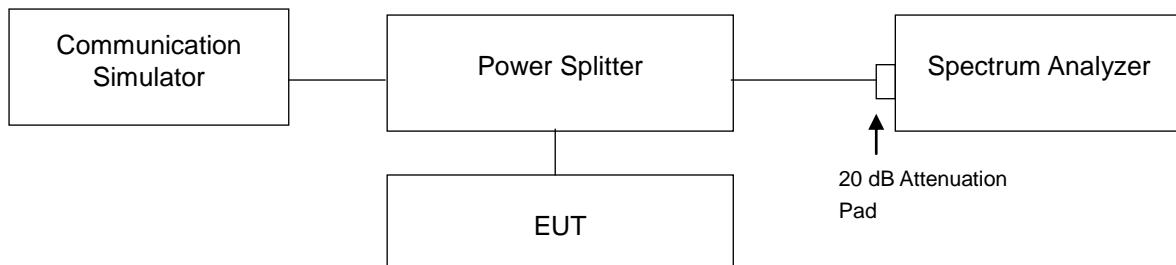
#### 4.3.1 Limits of Occupied Bandwidth Measurement

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.

#### 4.3.2 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.

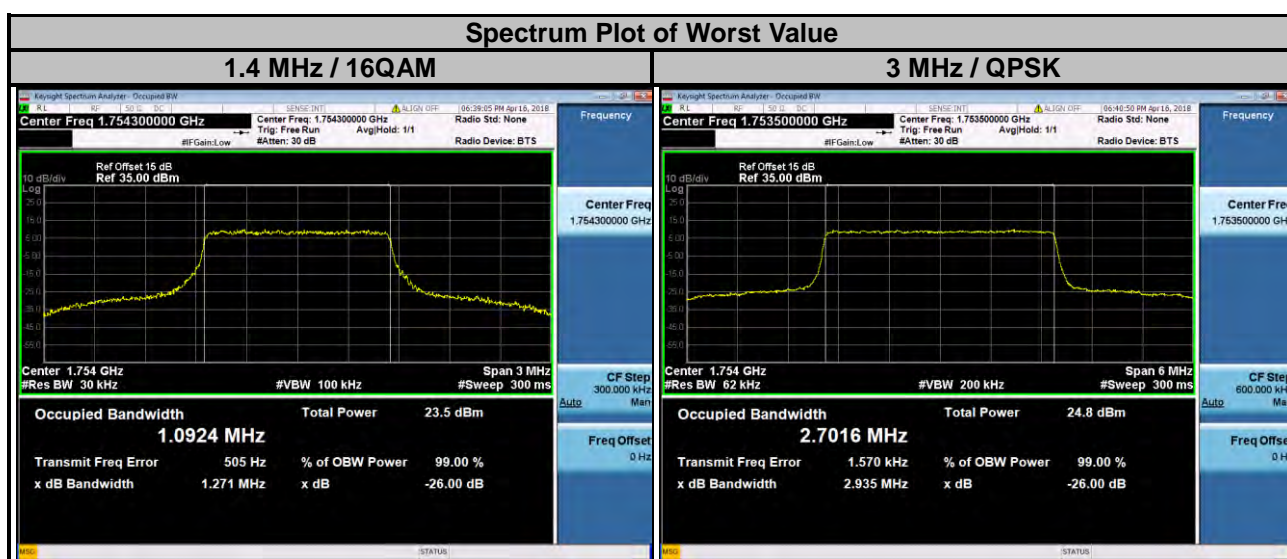
#### 4.3.3 Test Setup



### 4.3.4 Test Result

#### Mode A

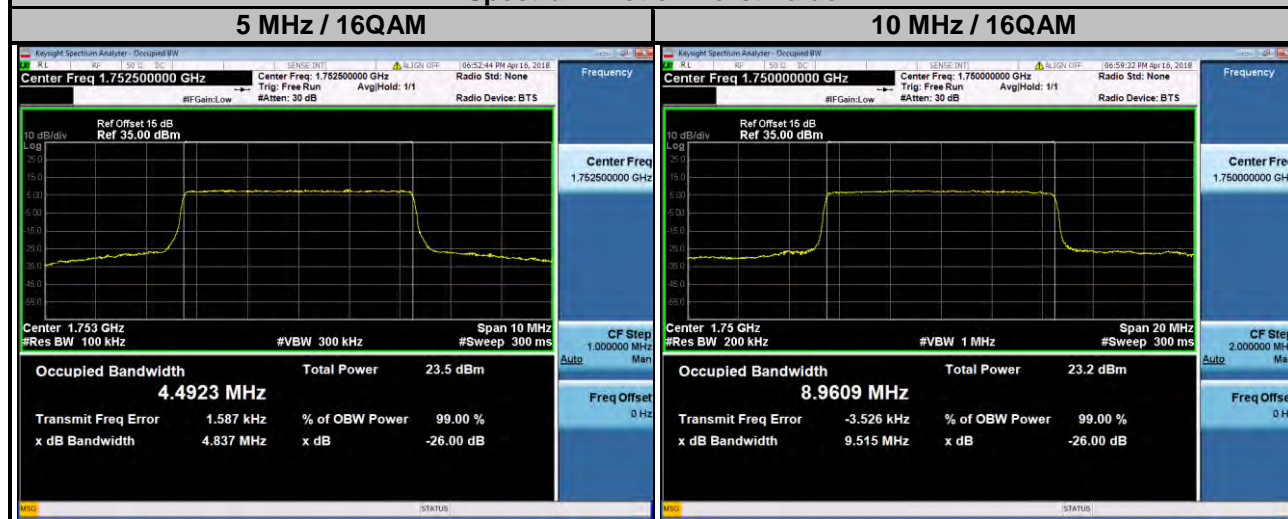
LTE Band 4							
Channel Bandwidth: 1.4 MHz				Channel Bandwidth: 3 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
19957	1710.7	1.09	1.09	19965	1711.5	2.70	2.70
20175	1732.5	1.09	1.09	20175	1732.5	2.70	2.70
20393	1754.3	1.09	1.09	20385	1753.5	2.70	2.70



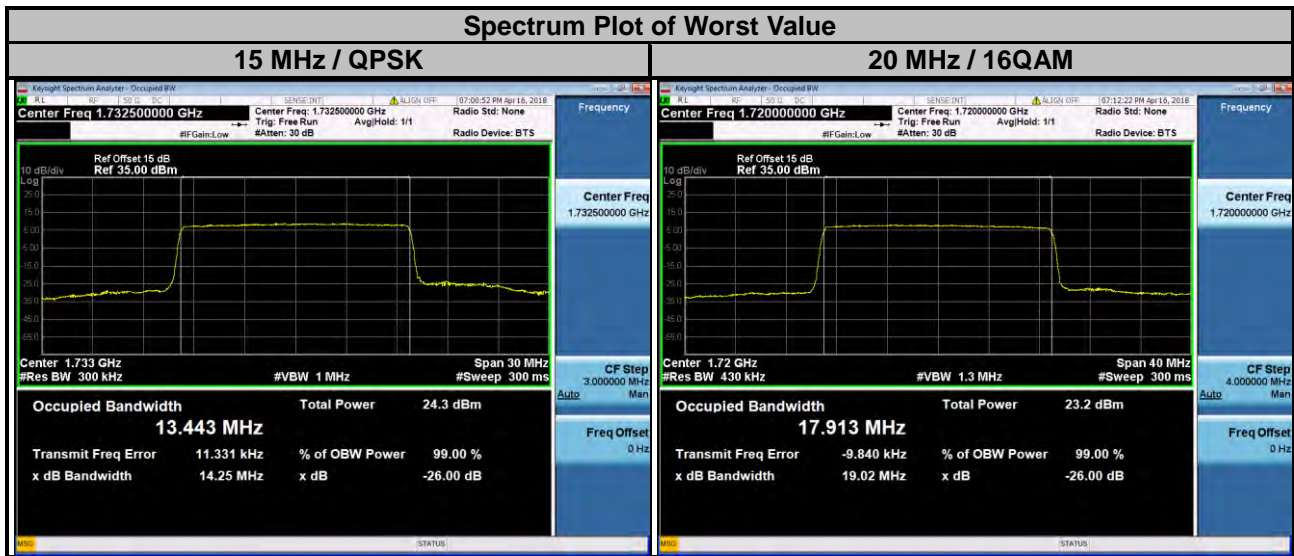
### LTE Band 4

Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
19975	1712.5	4.49	4.49	20000	1715.0	8.95	8.95
20175	1732.5	4.49	4.49	20175	1732.5	8.95	8.95
20375	1752.5	4.49	4.49	20350	1750.0	8.96	8.96

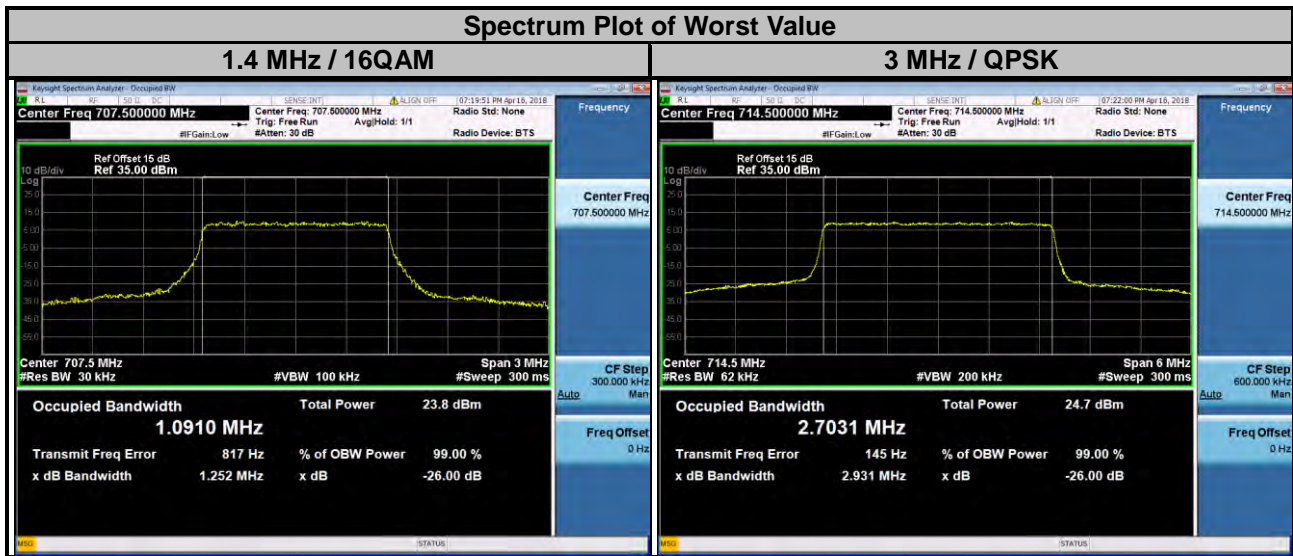
### Spectrum Plot of Worst Value



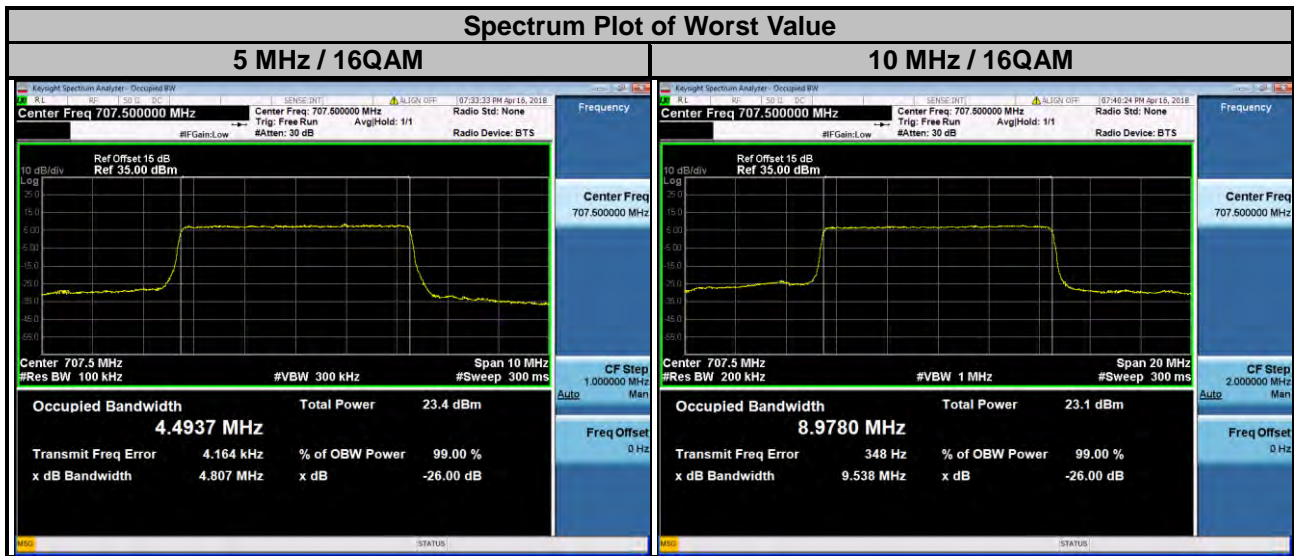
LTE Band 4							
Channel Bandwidth: 15 MHz				Channel Bandwidth: 20 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
20025	1717.5	13.43	13.42	20050	1720.0	17.89	17.91
20175	1732.5	13.44	13.43	20175	1732.5	17.89	17.90
20325	1747.5	13.44	13.43	20300	1745.0	17.89	17.91



LTE Band 12							
Channel Bandwidth: 1.4 MHz				Channel Bandwidth: 3 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
23017	699.7	1.09	1.09	23025	700.5	2.70	2.69
23095	707.5	1.09	1.09	23095	707.5	2.70	2.70
23173	715.3	1.09	1.09	23165	714.5	2.70	2.70

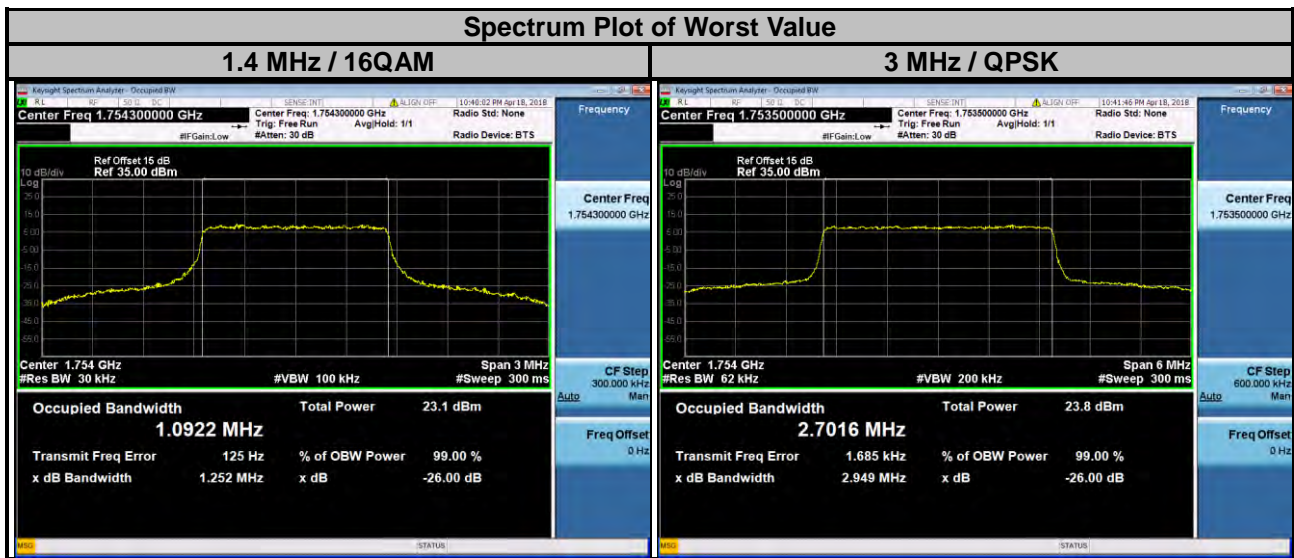


LTE Band 12							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
23035	701.5	4.48	4.48	23060	704.0	8.95	8.95
23095	707.5	4.49	4.49	23095	707.5	8.98	8.98
23155	713.5	4.48	4.49	23130	711.0	8.94	8.94



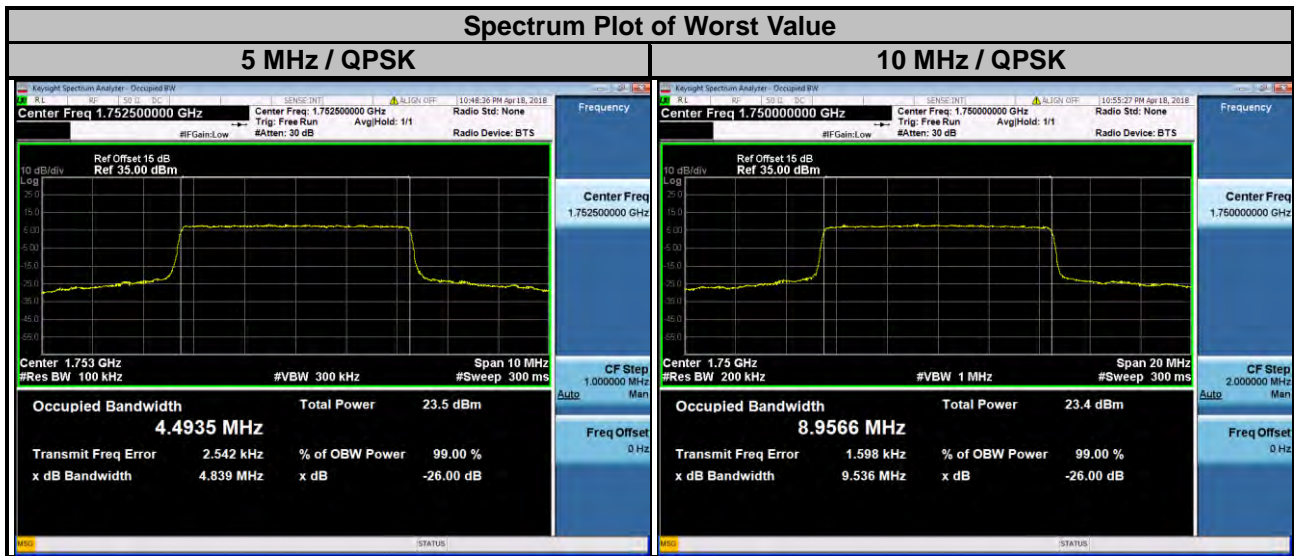
**Mode B**

LTE Band 4							
Channel Bandwidth: 1.4 MHz				Channel Bandwidth: 3 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
19957	1710.7	1.09	1.09	19965	1711.5	2.70	2.70
20175	1732.5	1.09	1.09	20175	1732.5	2.70	2.70
20393	1754.3	1.09	1.09	20385	1753.5	2.70	2.70

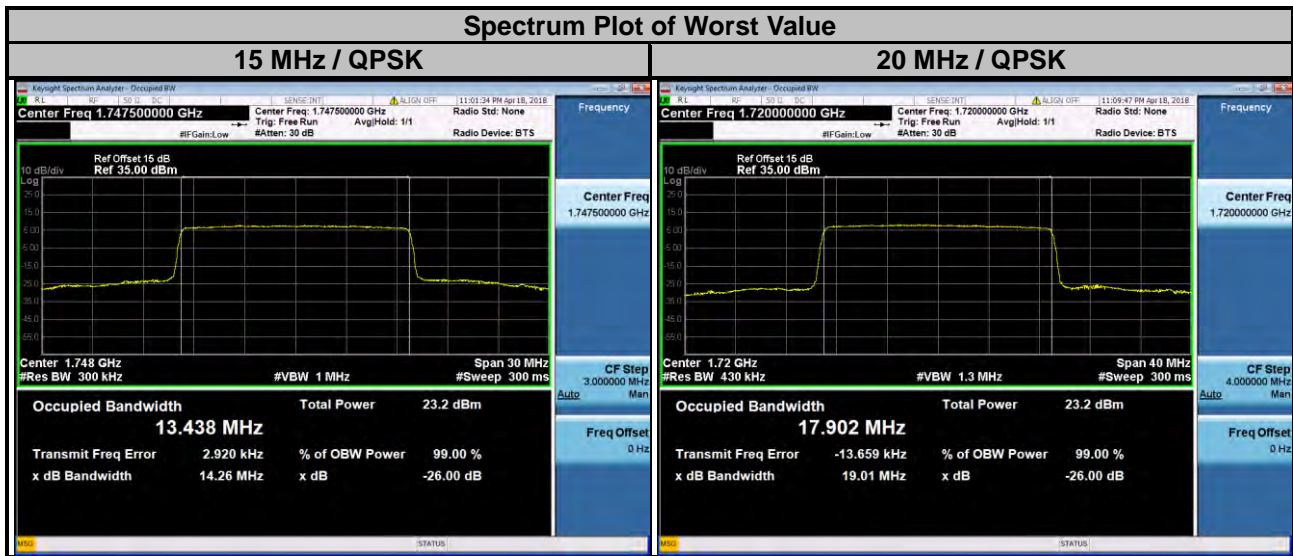




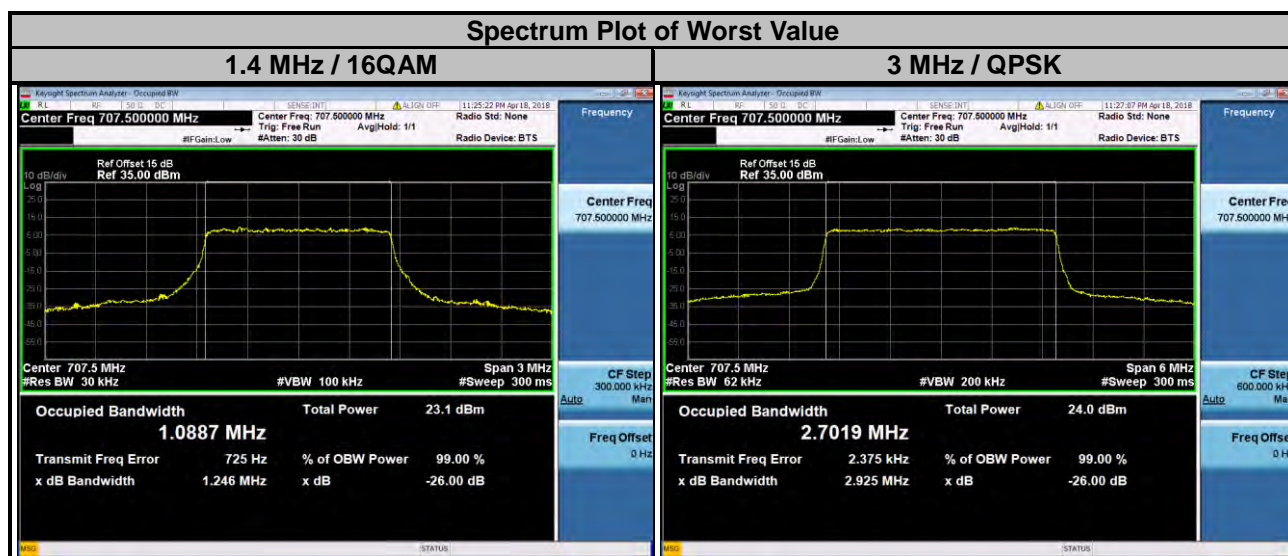
LTE Band 4							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
19975	1712.5	4.49	4.49	20000	1715.0	8.94	4.57
20175	1732.5	4.49	4.49	20175	1732.5	8.95	4.57
20375	1752.5	4.49	4.49	20350	1750.0	8.96	4.58



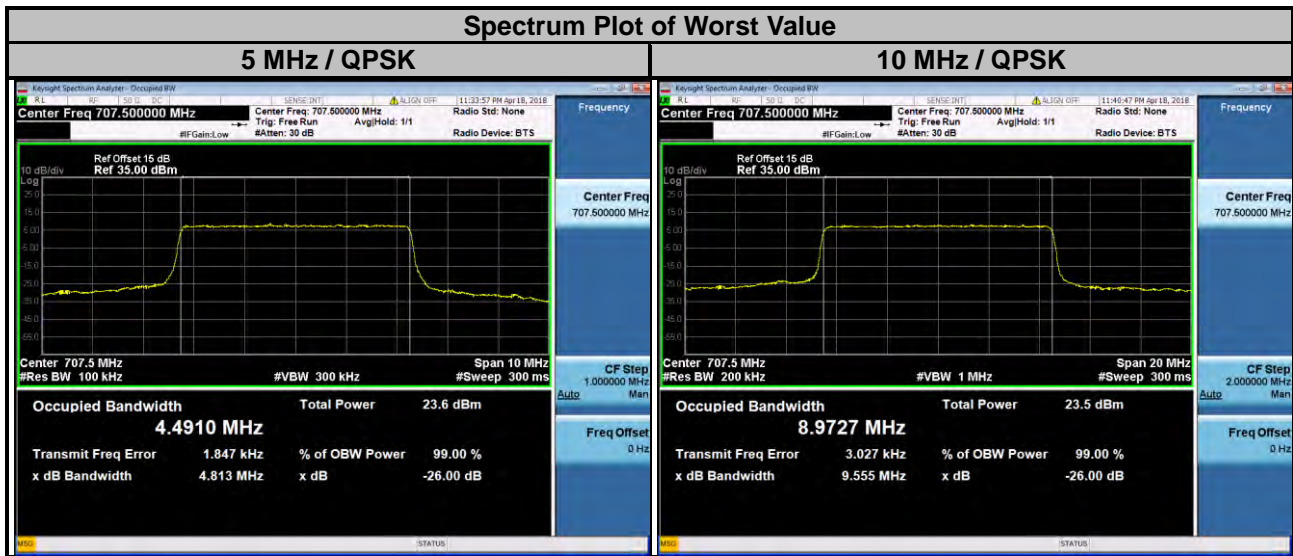
LTE Band 4							
Channel Bandwidth: 15 MHz				Channel Bandwidth: 20 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
20025	1717.5	13.42	0.28	20050	1720.0	17.90	0.30
20175	1732.5	13.43	0.26	20175	1732.5	17.90	0.31
20325	1747.5	13.44	0.27	20300	1745.0	17.89	0.31



LTE Band 12							
Channel Bandwidth: 1.4 MHz				Channel Bandwidth: 3 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
23017	699.7	1.09	1.09	23025	700.5	2.70	2.70
23095	707.5	1.09	1.09	23095	707.5	2.70	2.70
23173	715.3	1.09	1.09	23165	714.5	2.70	2.70



LTE Band 12							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
23035	701.5	4.48	4.49	23060	704.0	8.94	4.57
23095	707.5	4.49	4.49	23095	707.5	8.97	4.57
23155	713.5	4.48	4.49	23130	711.0	8.95	4.56



## 4.4 Band Edge Measurement

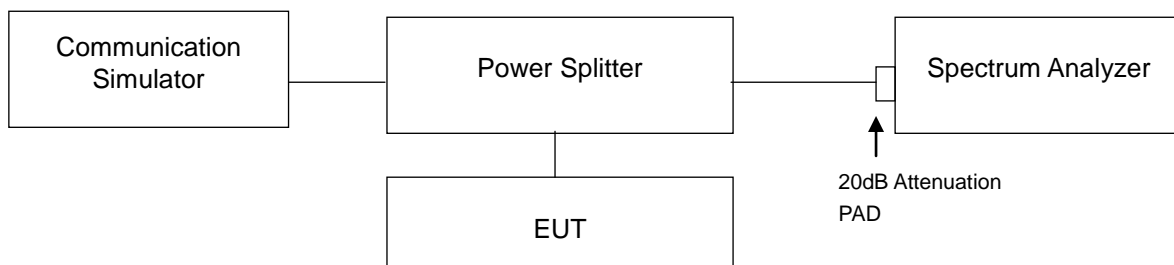
### 4.4.1 Limits of Band Edge Measurement

For operations in the 704-716 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 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  $43 + 10 \log_{10}(P)$  dB.

### 4.4.2 Test Setup

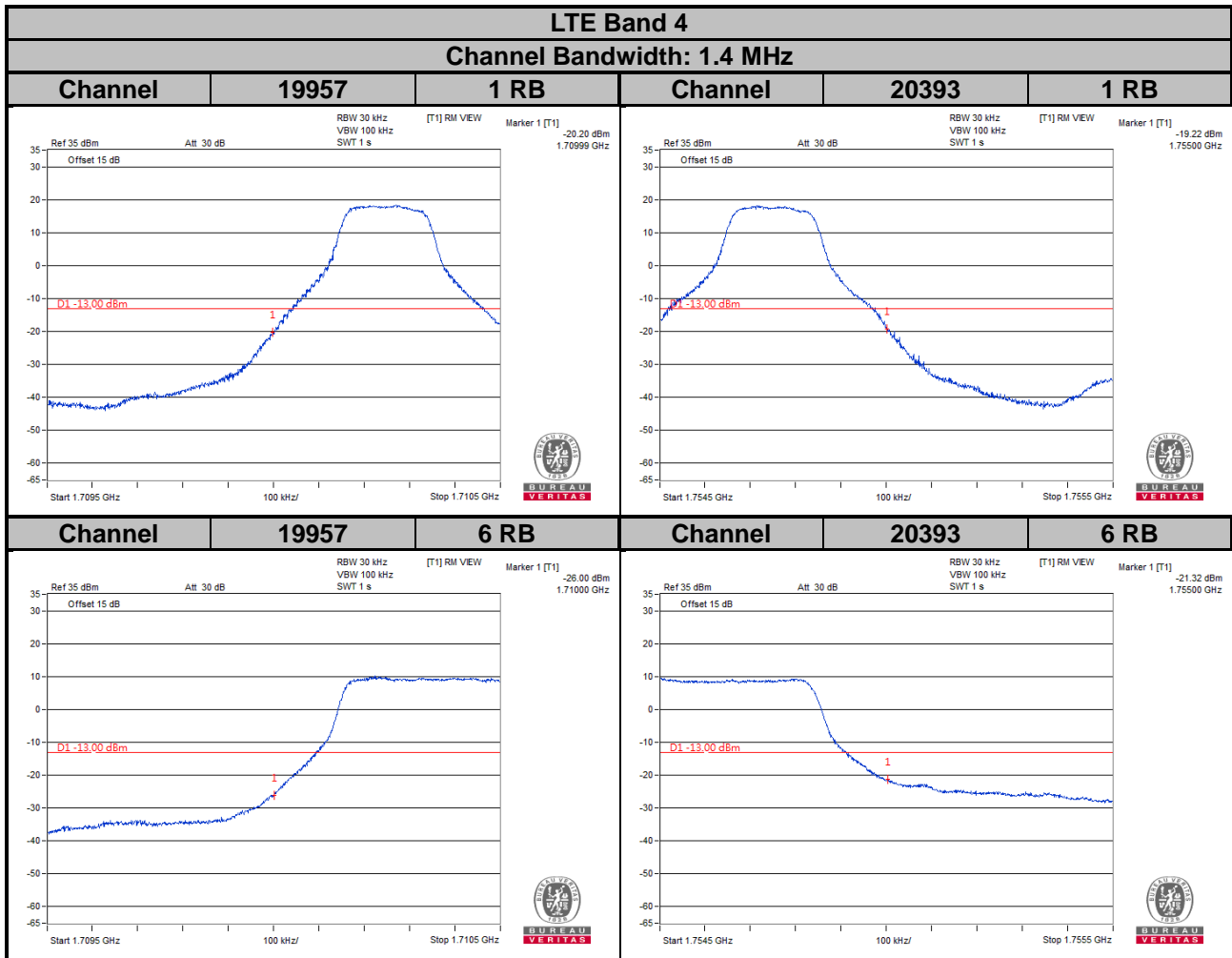


### 4.4.3 Test Procedures

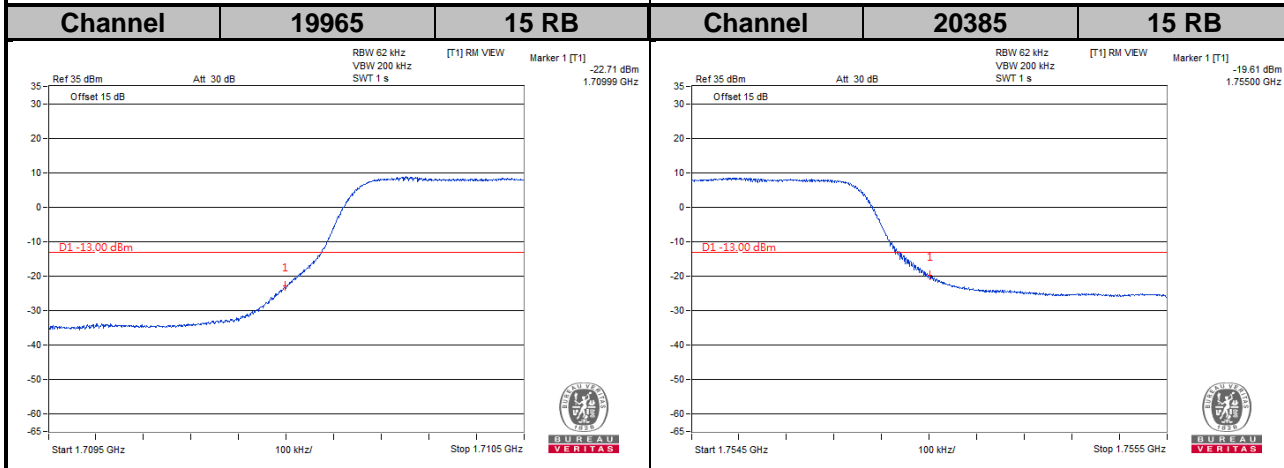
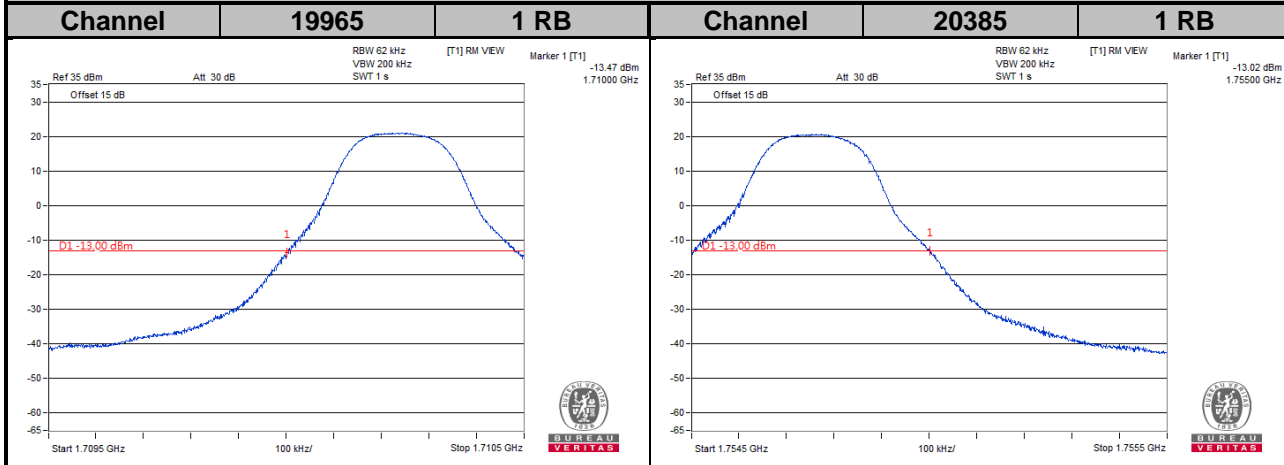
- a. All measurements were done at low and high operational frequency range.
- b. The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 30 kHz and VB of the spectrum is 100 kHz (LTE Bandwidth 1.4 MHz).
- c. The center frequency of spectrum is the band edge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

### 4.4.4 Test Results

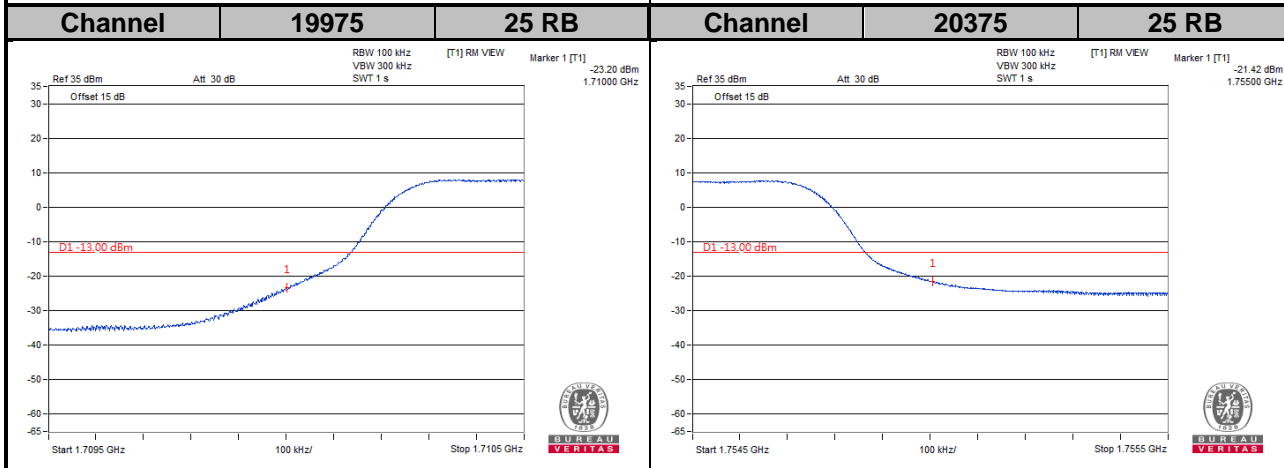
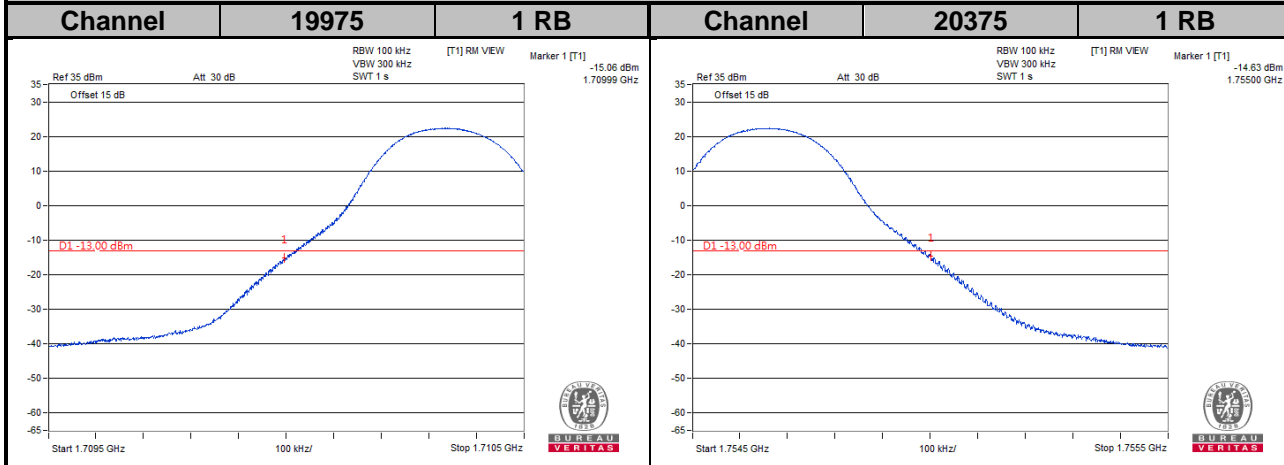
#### Mode A



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

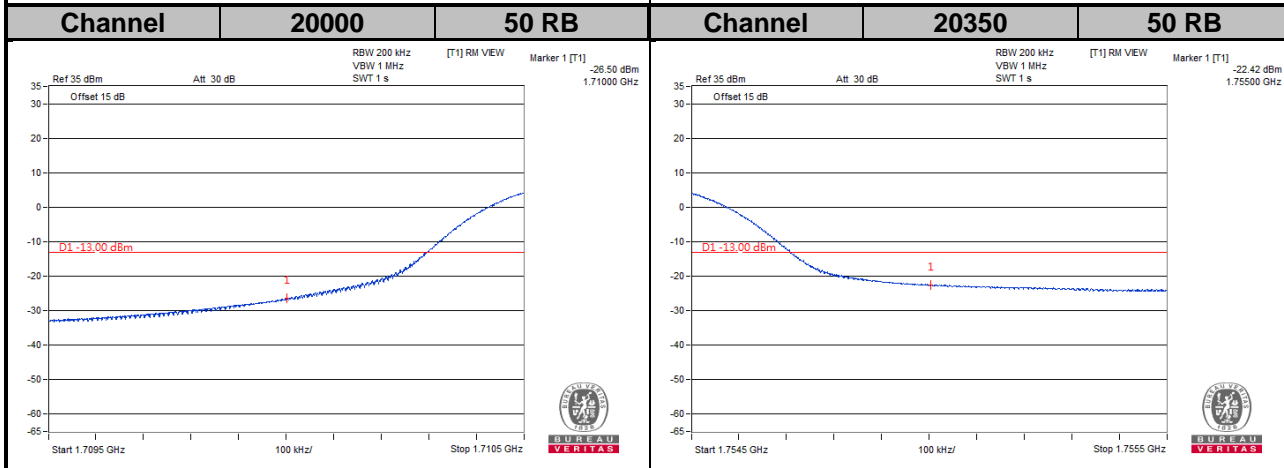
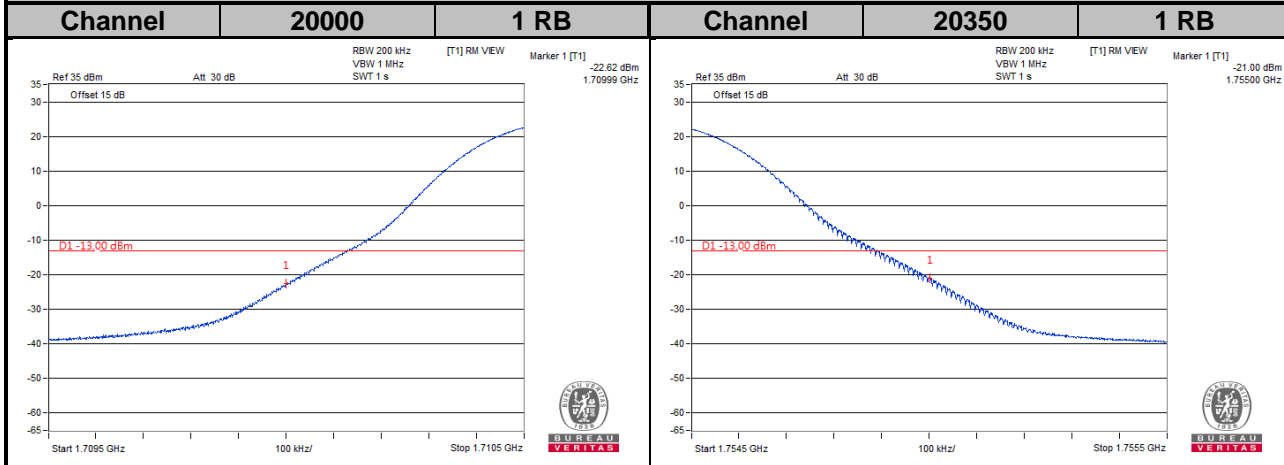


**LTE Band 4**  
**Channel Bandwidth: 5 MHz**

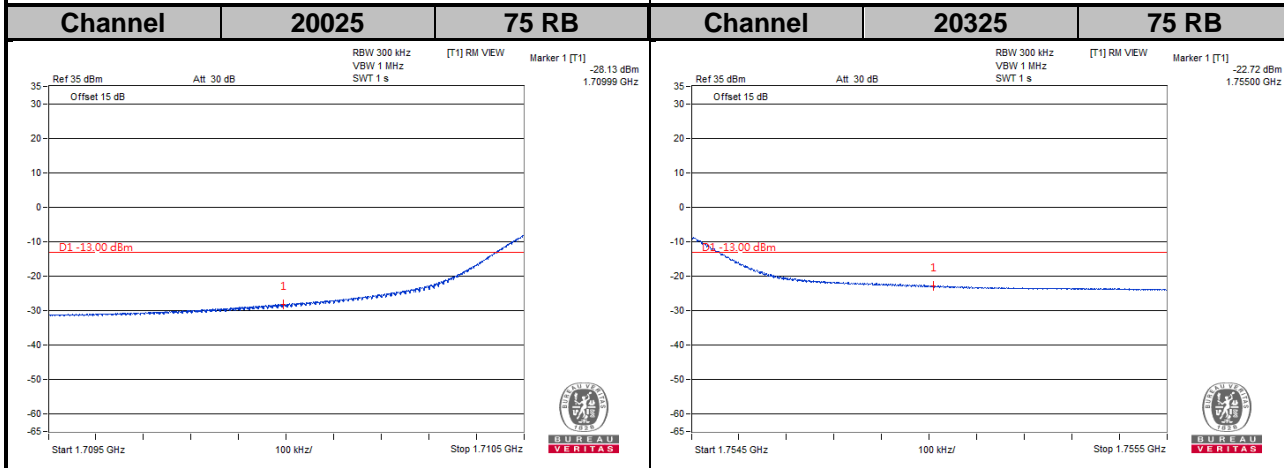
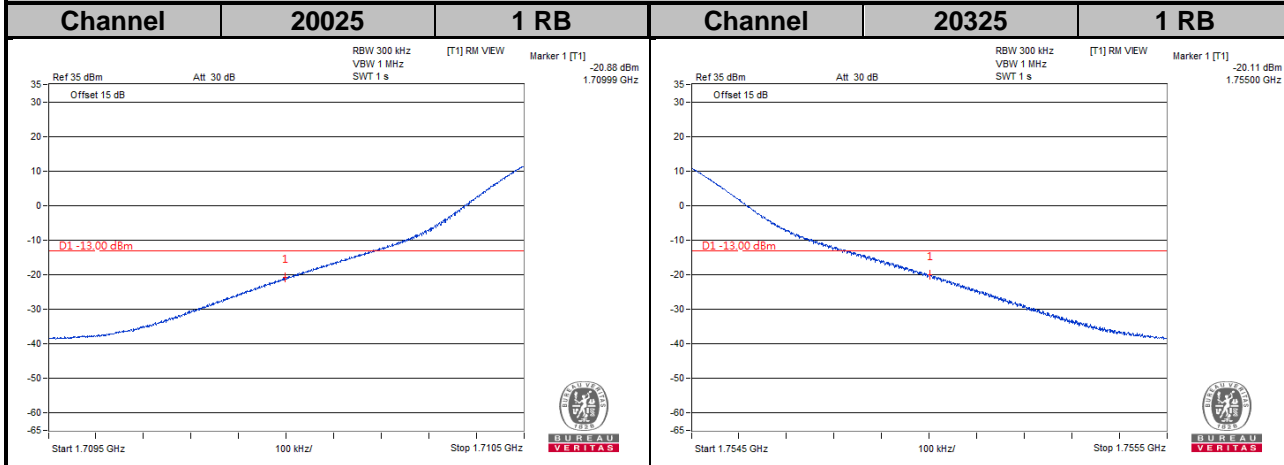




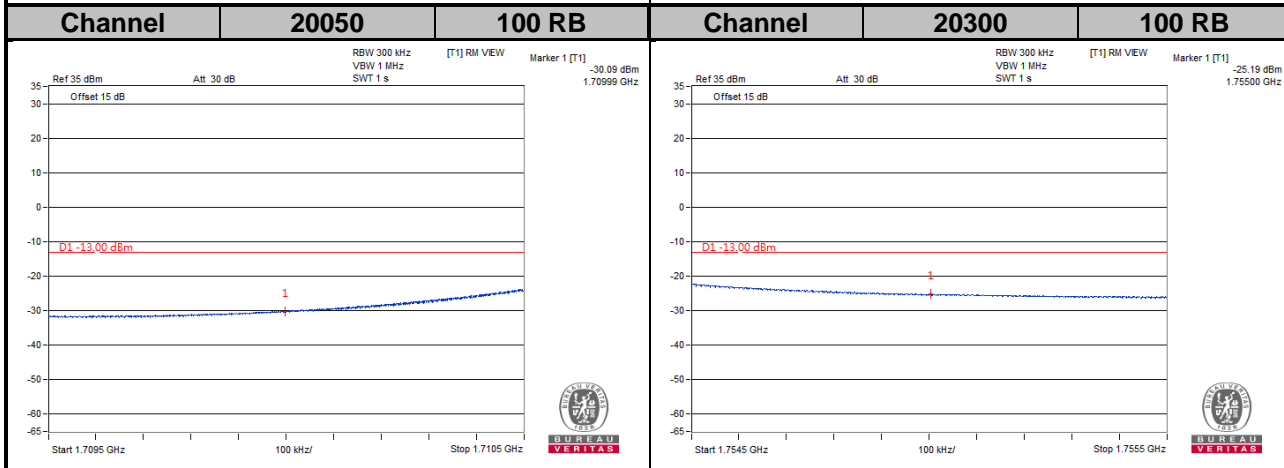
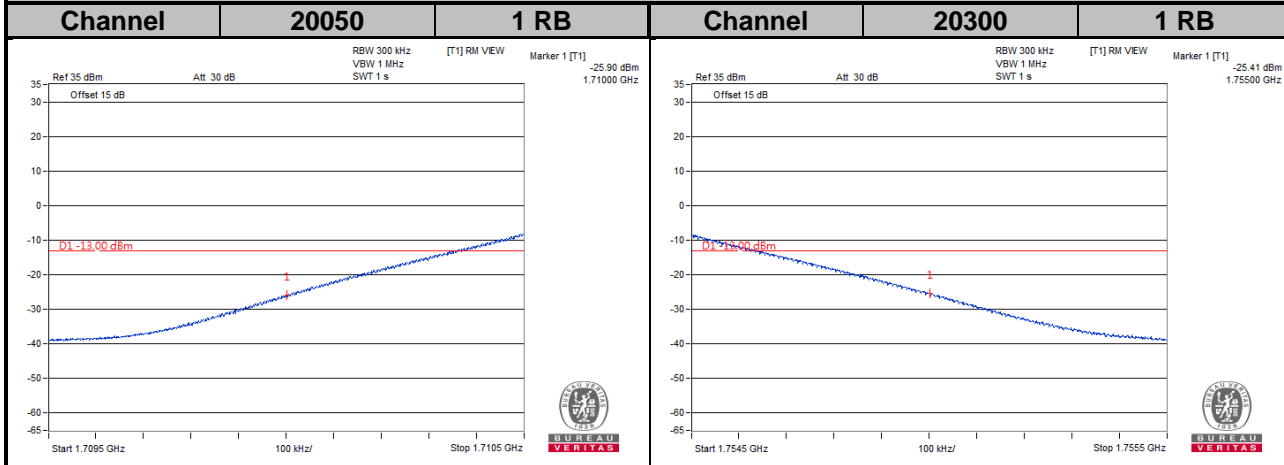
**LTE Band 4**  
**Channel Bandwidth: 10 MHz**



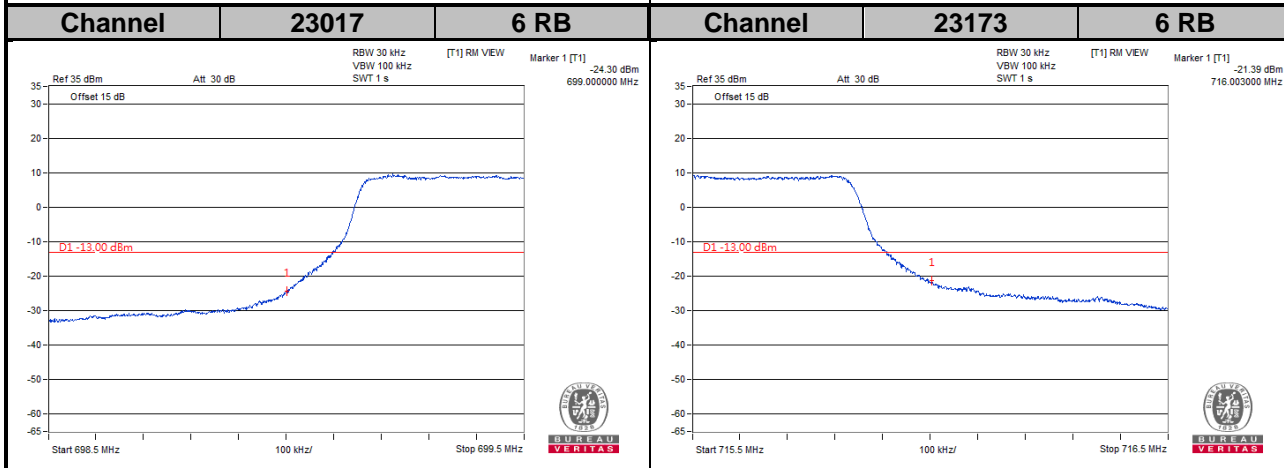
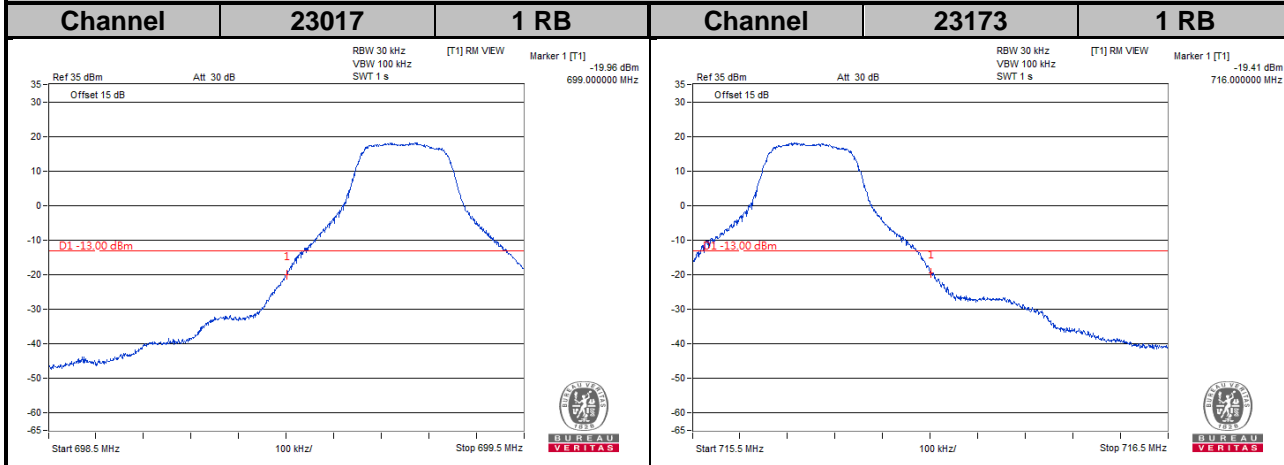
**LTE Band 4**  
**Channel Bandwidth: 15 MHz**

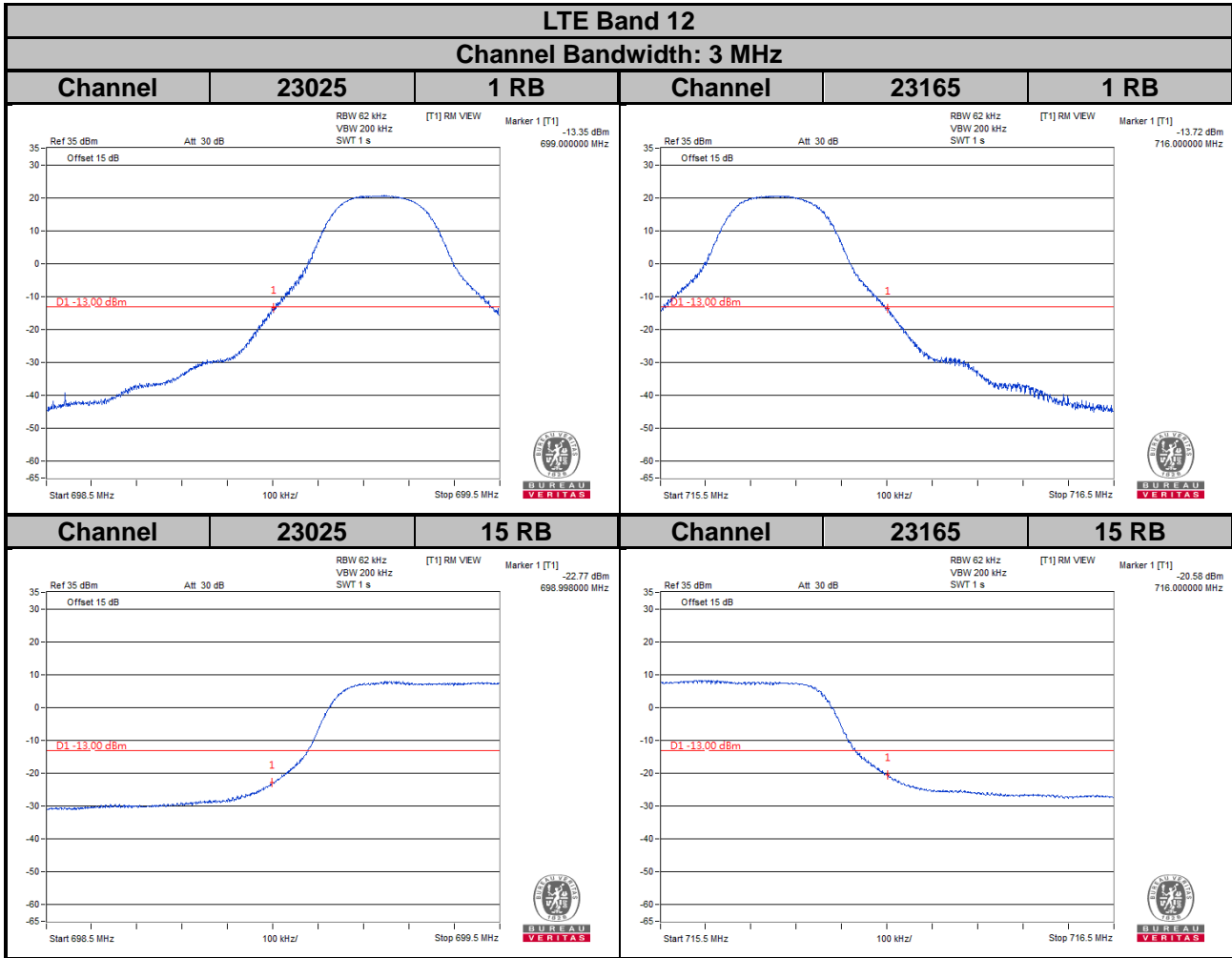


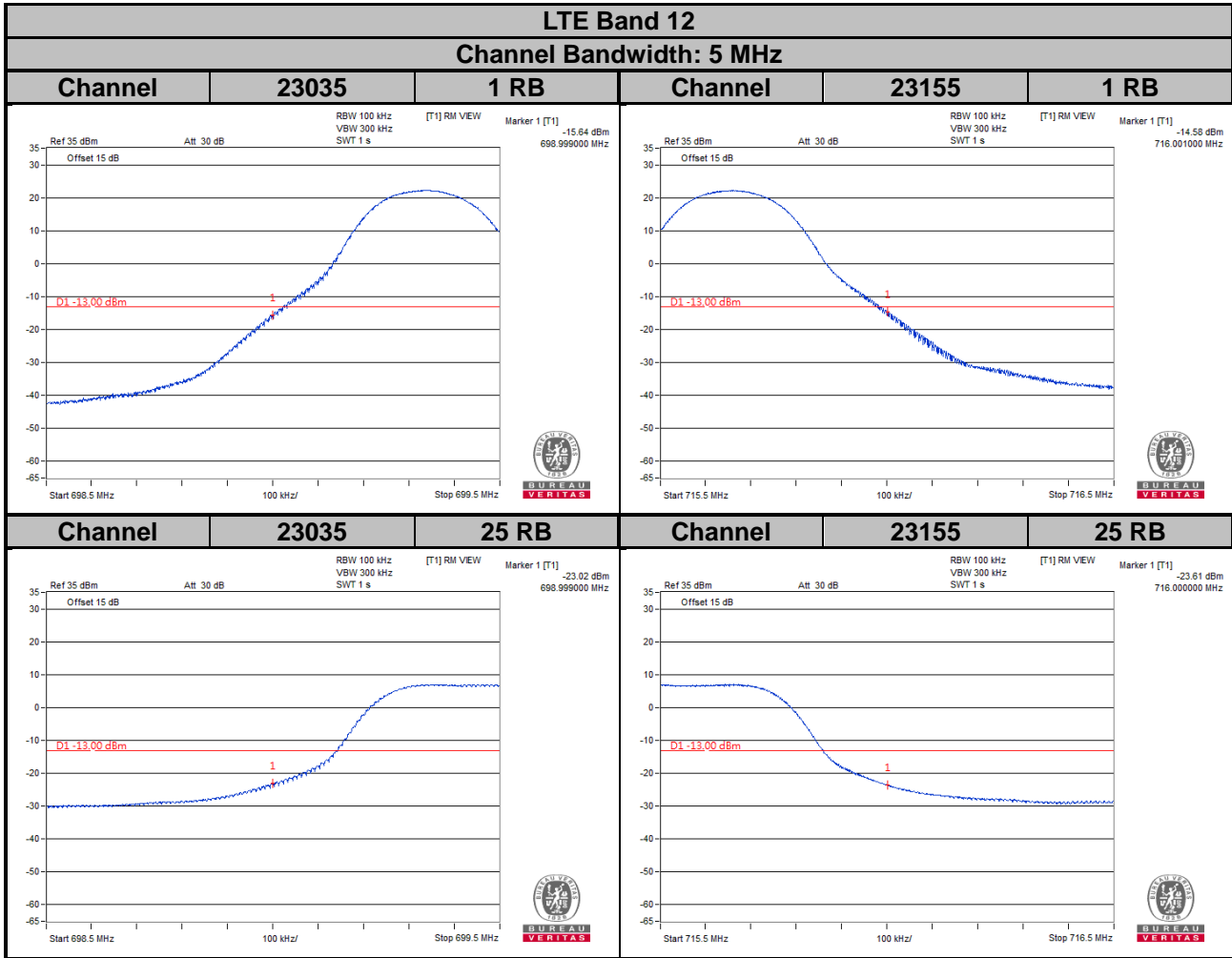
**LTE Band 4**  
**Channel Bandwidth: 20 MHz**



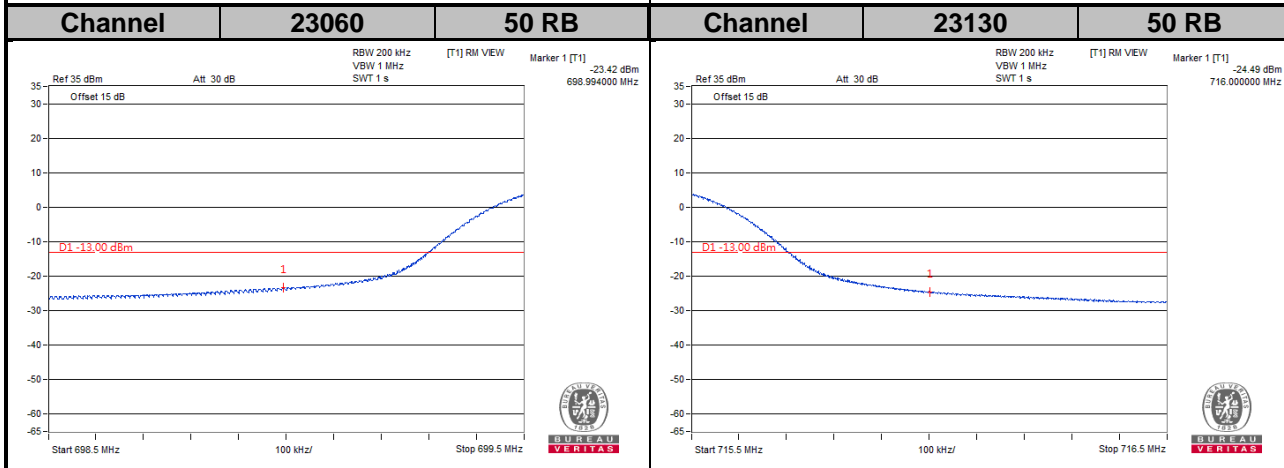
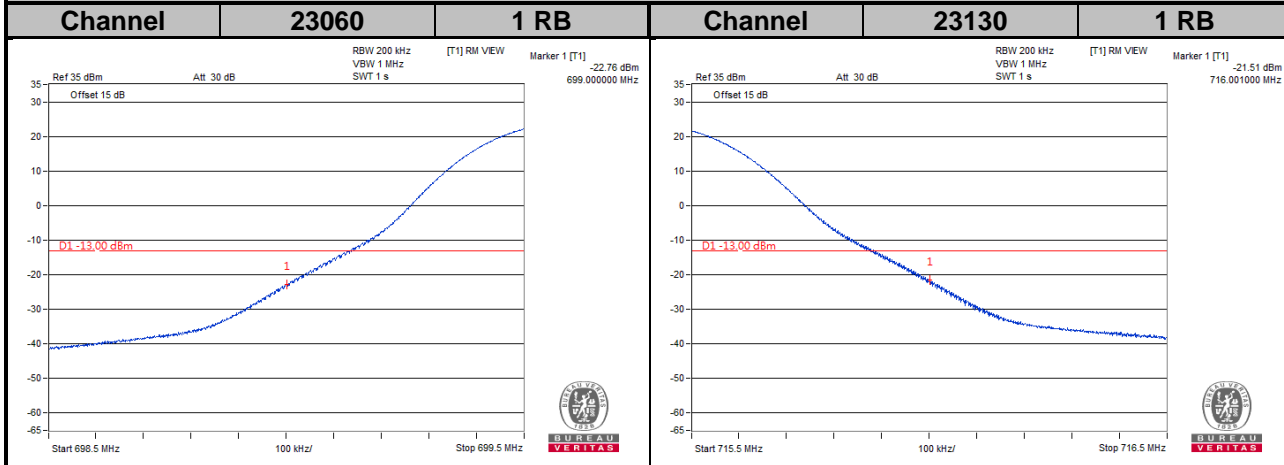
**LTE Band 12**  
**Channel Bandwidth: 1.4 MHz**



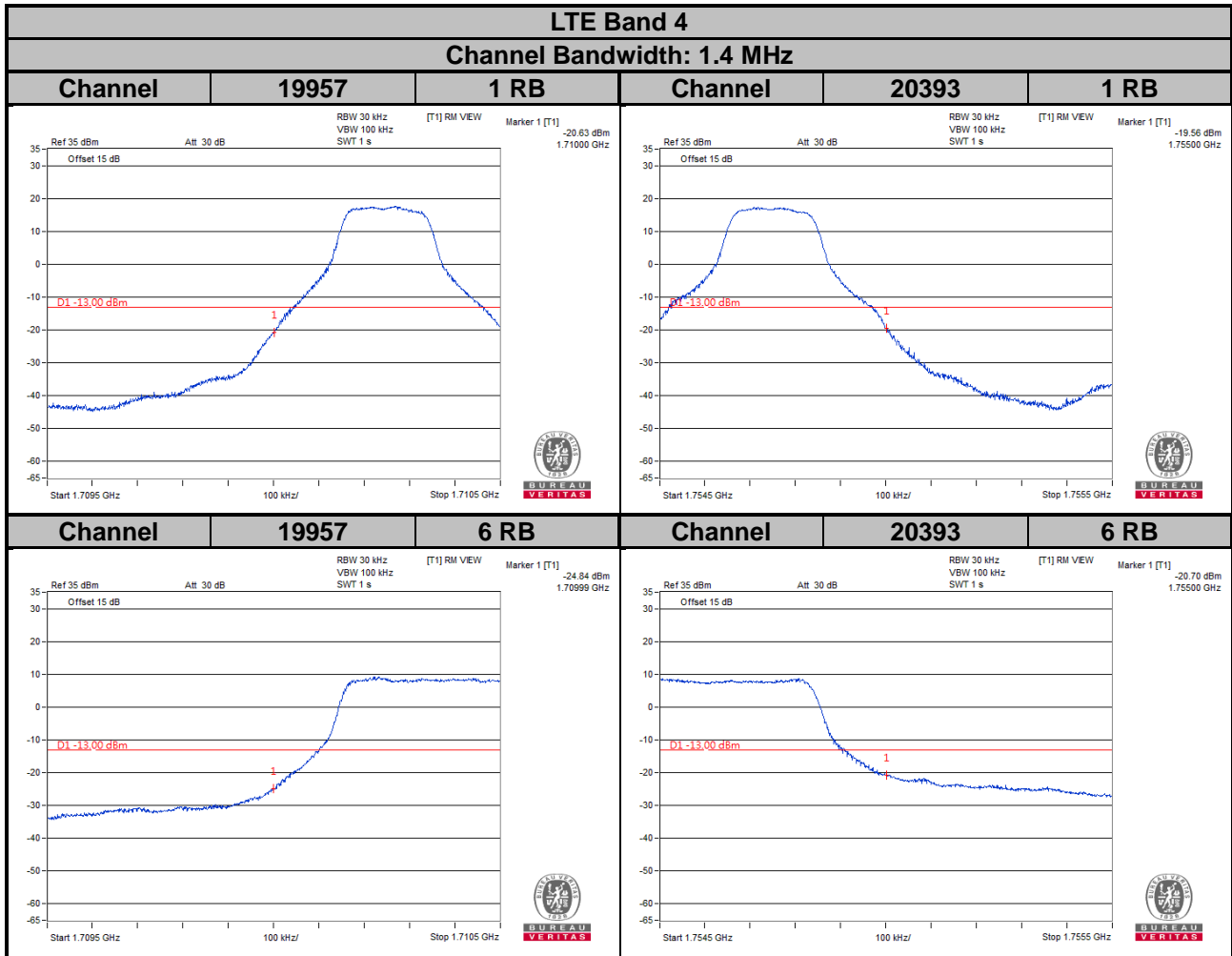




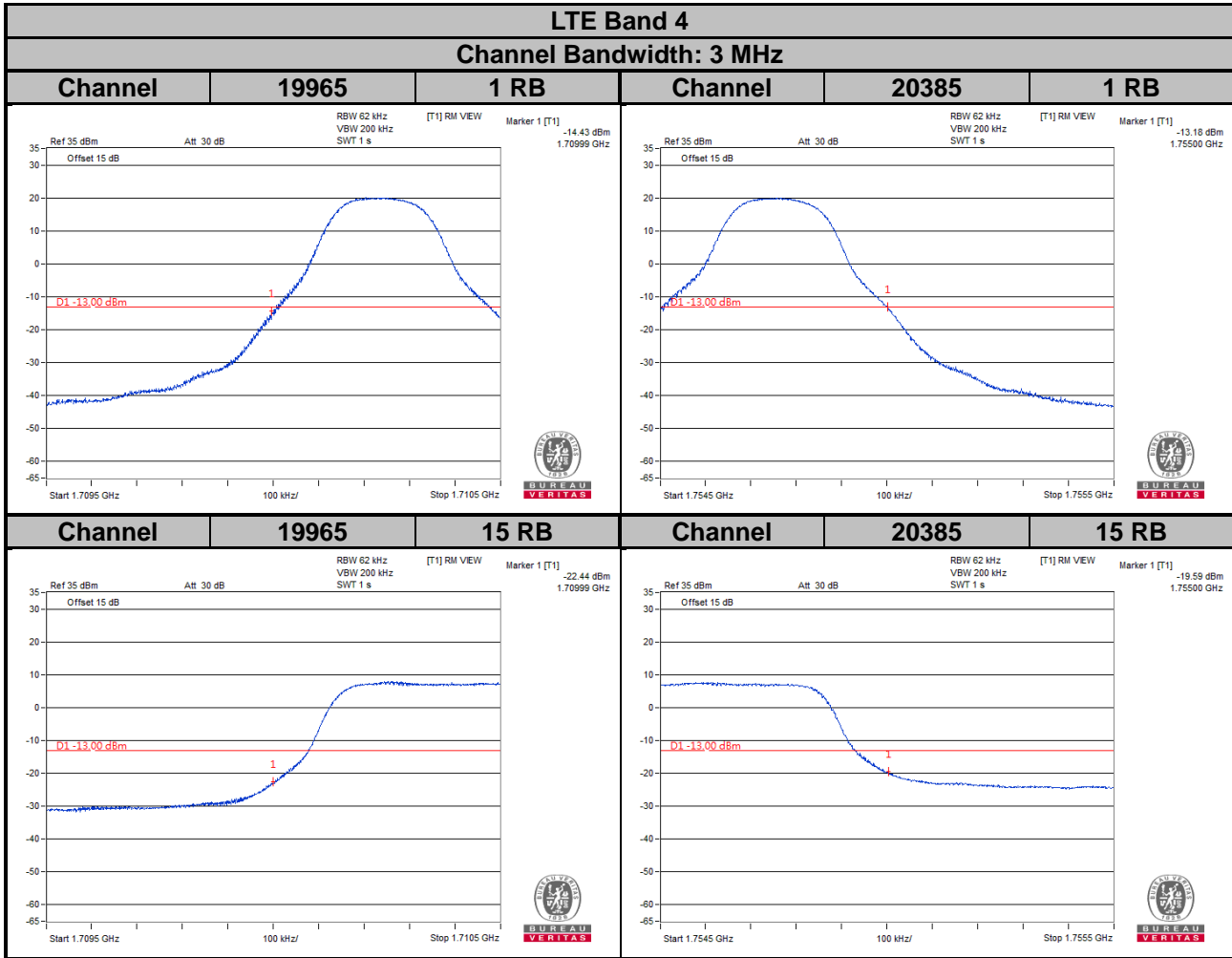
**LTE Band 12**  
**Channel Bandwidth: 10 MHz**



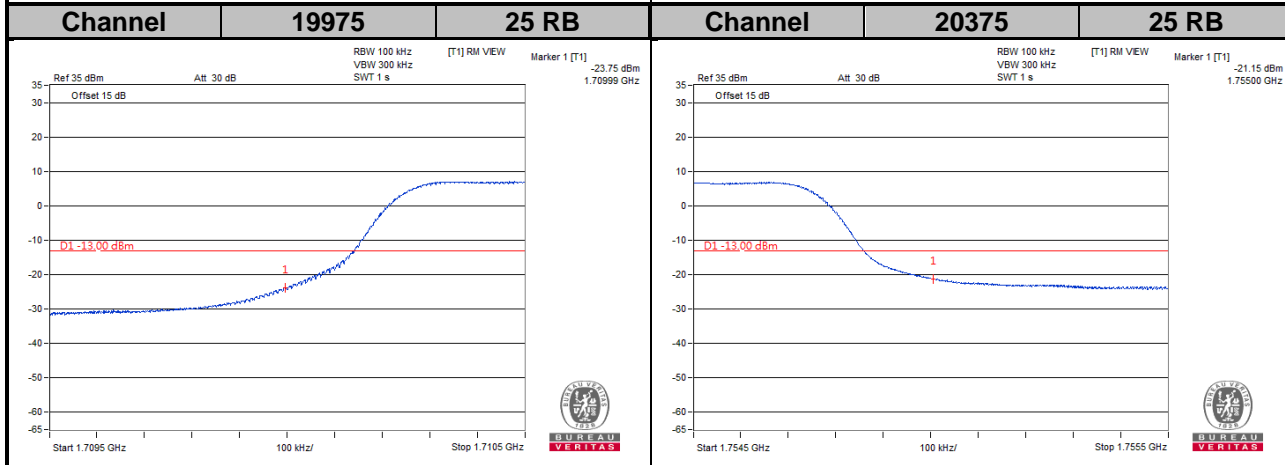
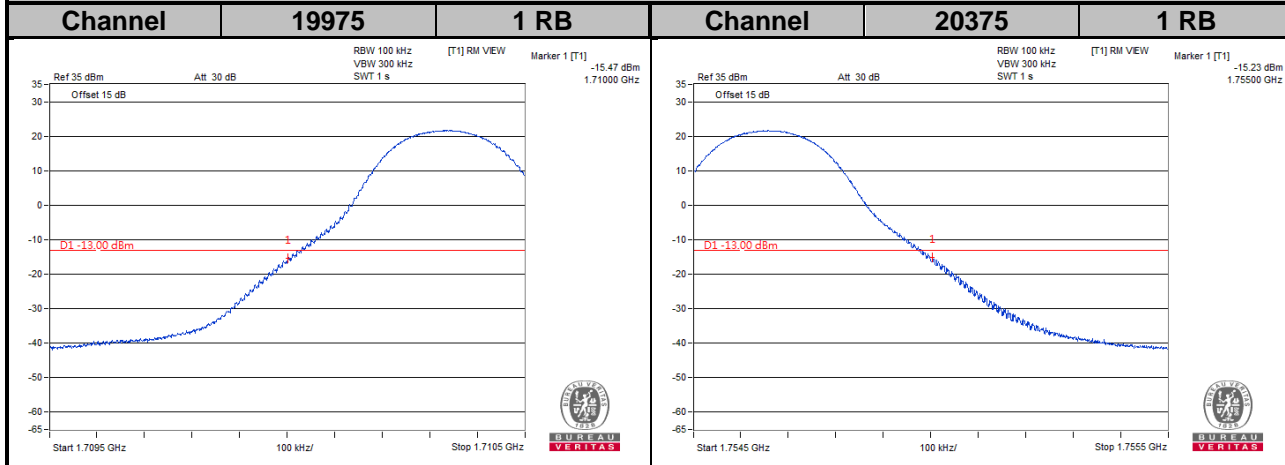
**Mode B**

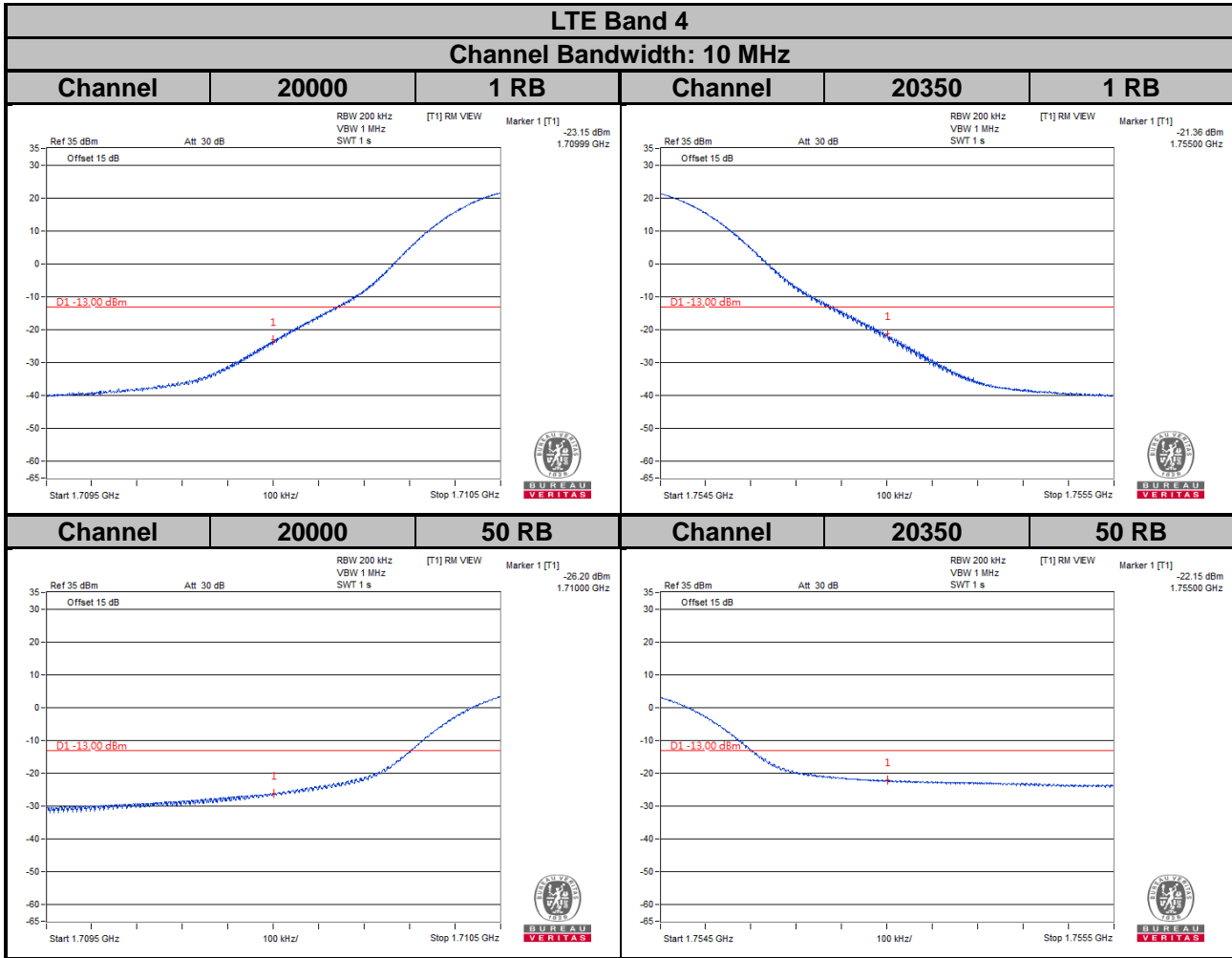




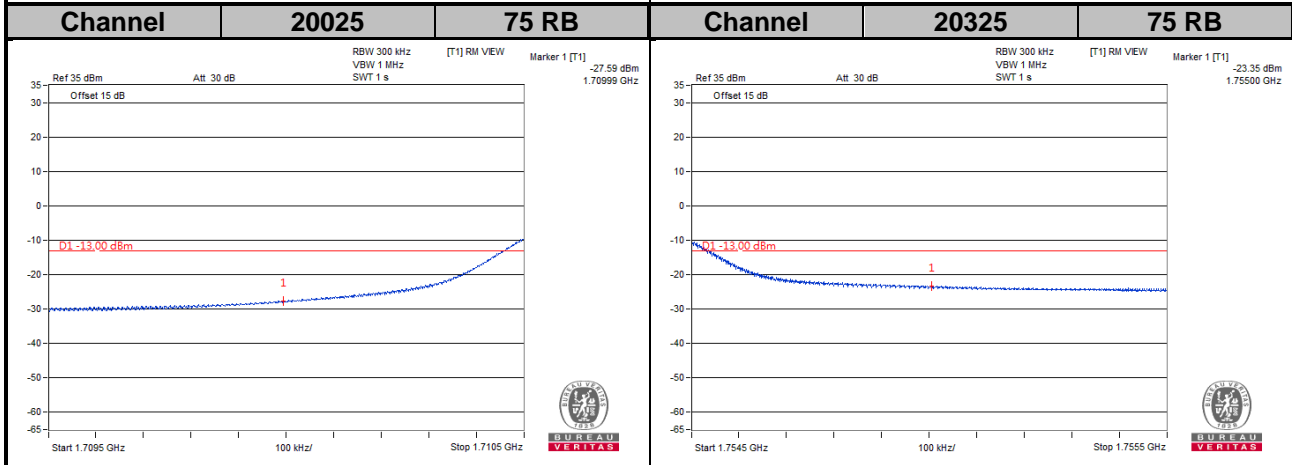
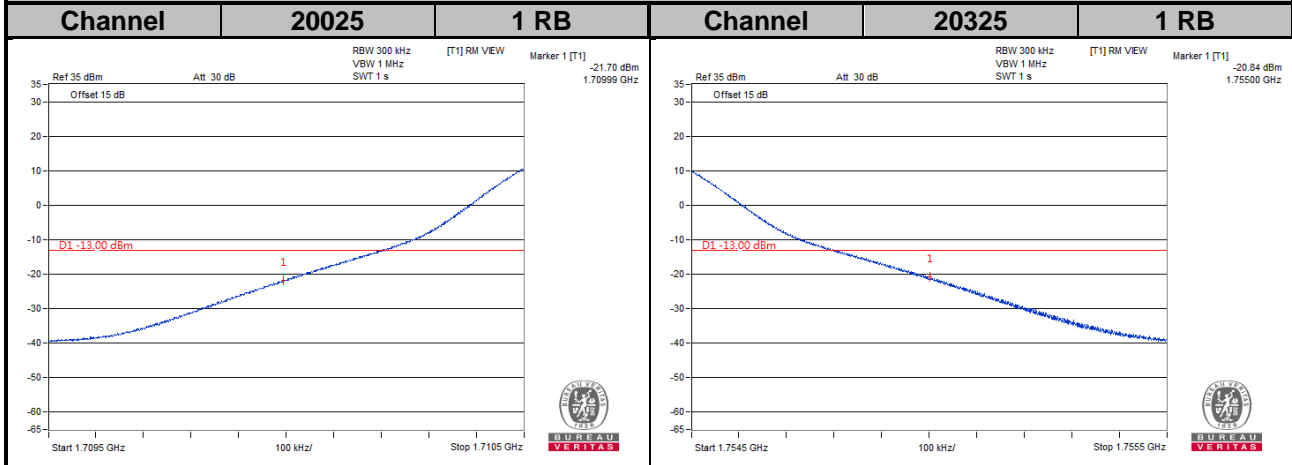


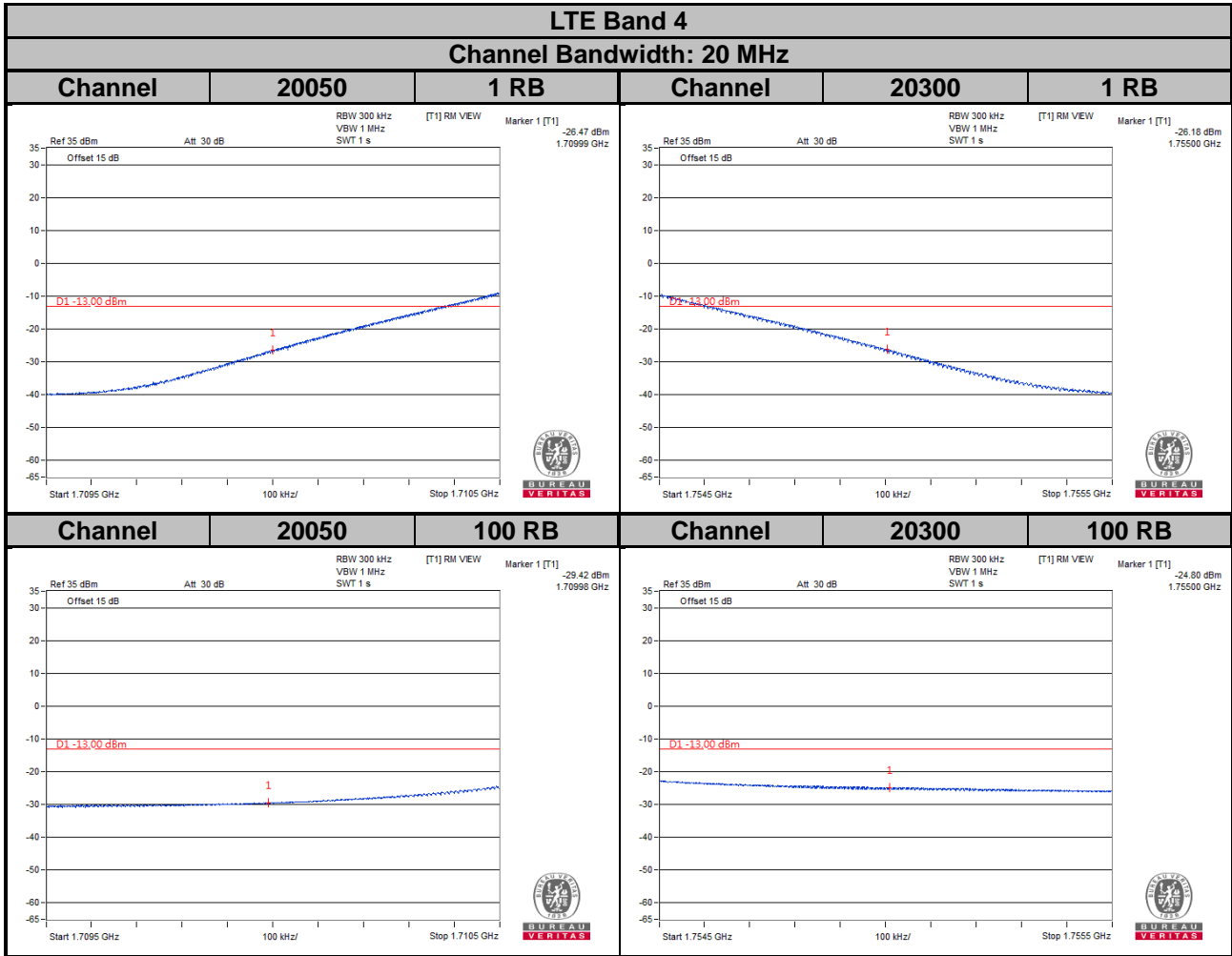
**LTE Band 4**  
**Channel Bandwidth: 5 MHz**



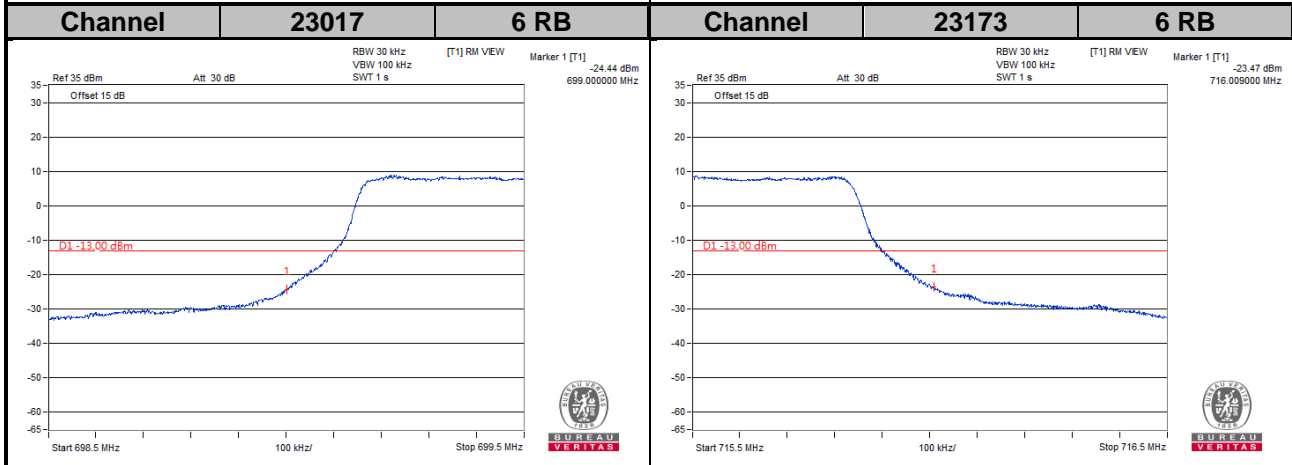
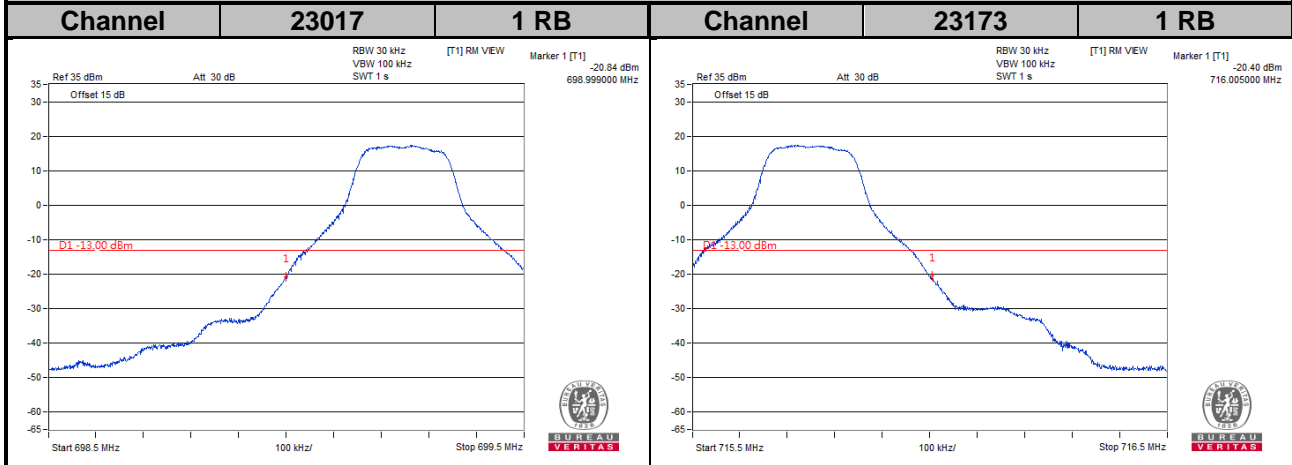


**LTE Band 4**  
**Channel Bandwidth: 15 MHz**

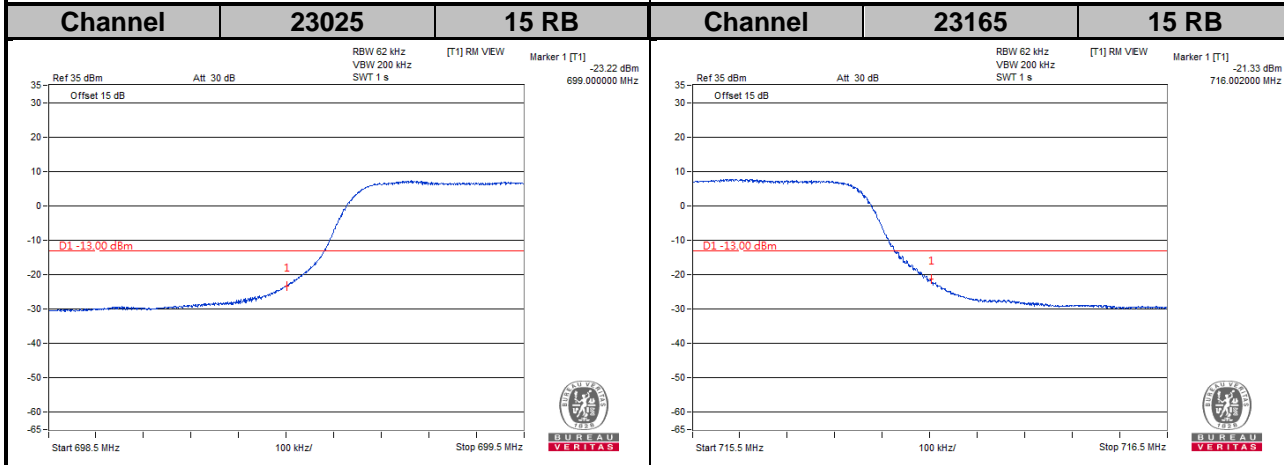
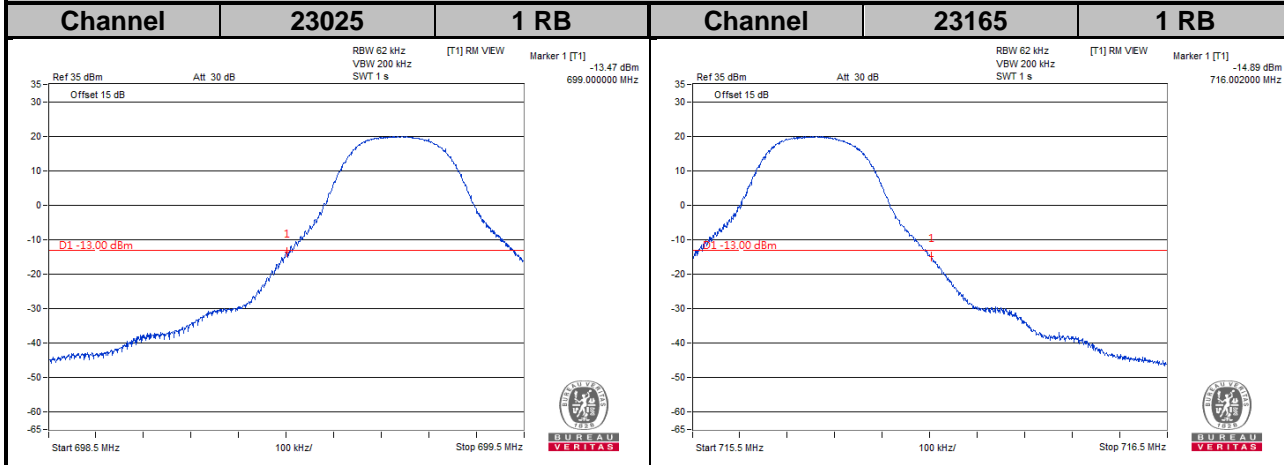


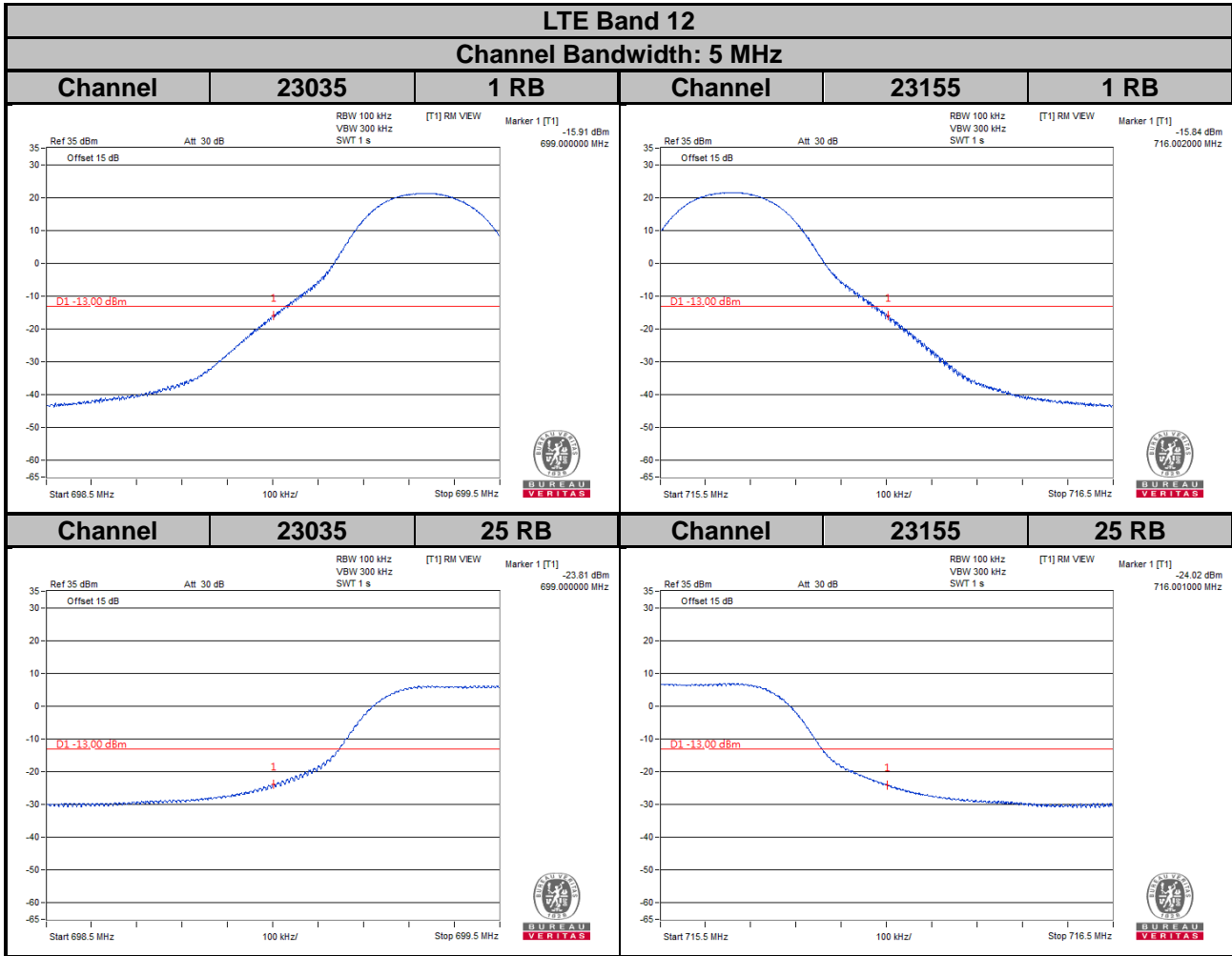


**LTE Band 12**  
**Channel Bandwidth: 1.4 MHz**



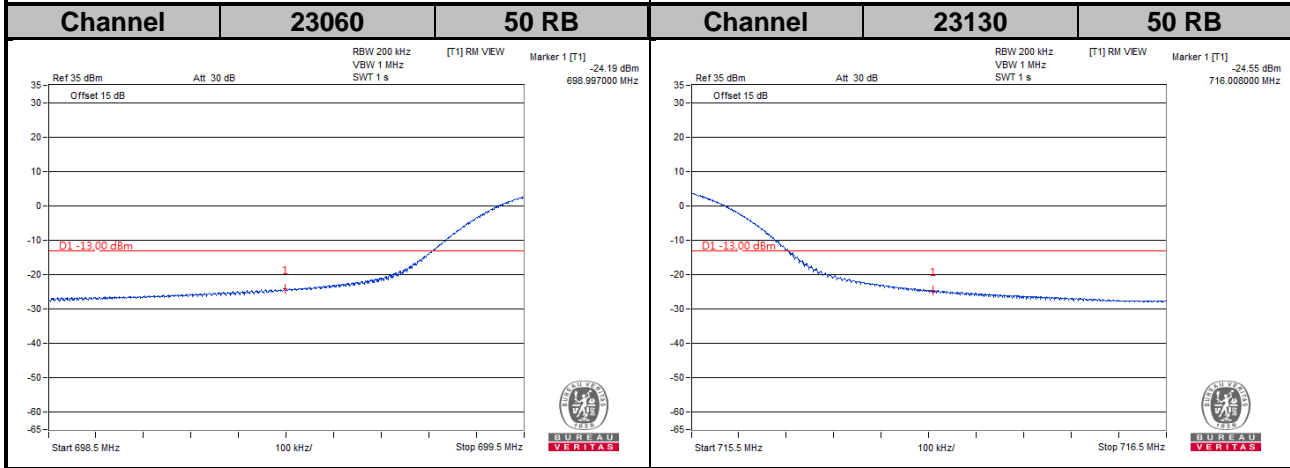
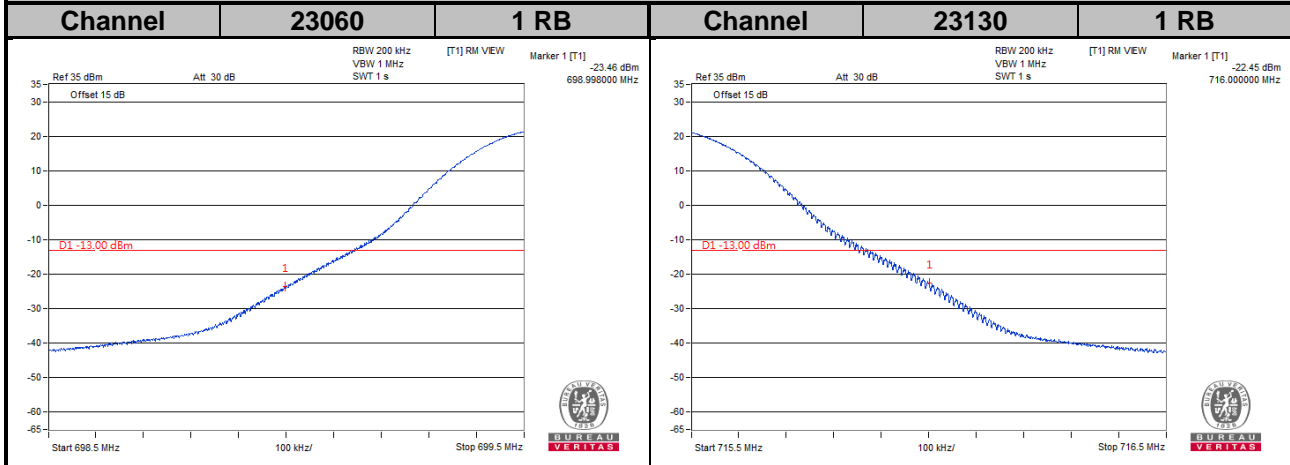
**LTE Band 12**  
**Channel Bandwidth: 3 MHz**







**LTE Band 12**  
**Channel Bandwidth: 10 MHz**

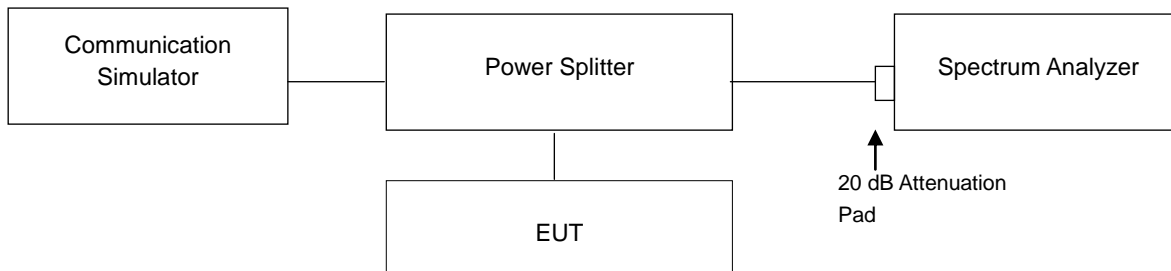


## 4.5 Peak to Average Ratio

### 4.5.1 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.

### 4.5.2 Test Setup



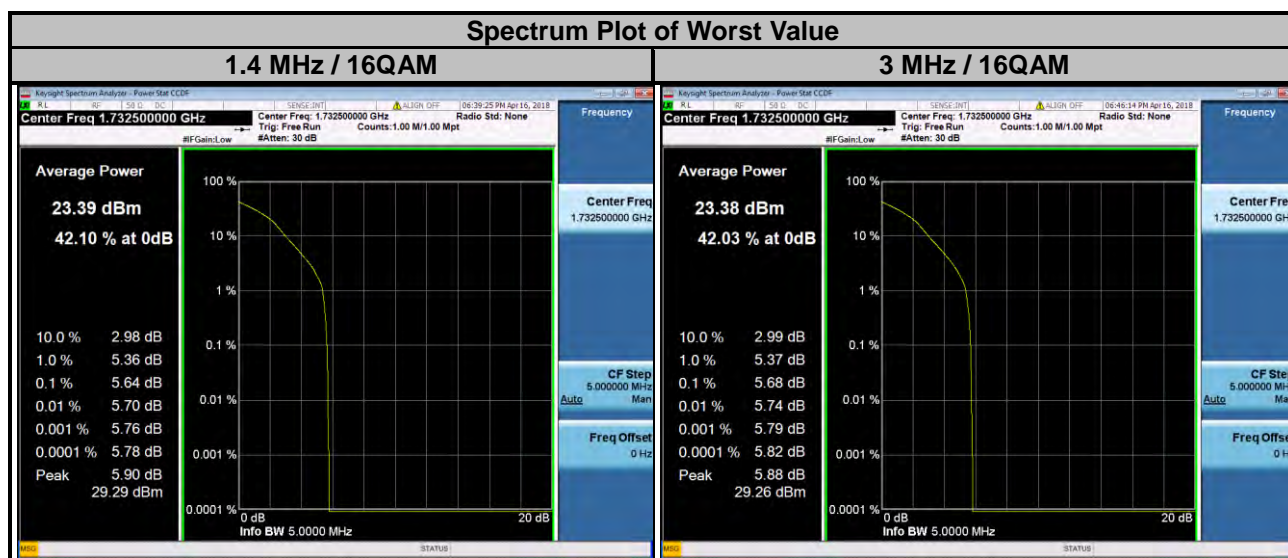
### 4.5.3 Test Procedures

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 %.

#### 4.5.4 Test Results

#### Mode A

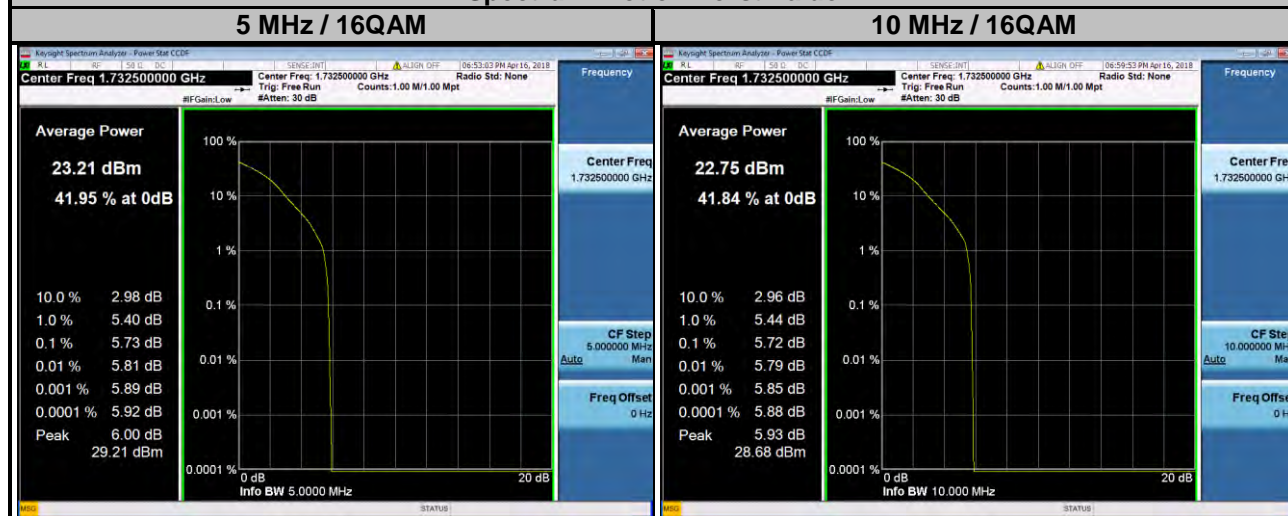
LTE Band 4							
Channel Bandwidth: 1.4 MHz				Channel Bandwidth: 3 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
19957	1710.7	4.41	5.37	19965	1711.5	4.48	5.28
20175	1732.5	4.81	5.64	20175	1732.5	4.85	5.68
20393	1754.3	3.78	4.73	20385	1753.5	3.87	4.85



### 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	4.44	5.26	20000	1715.0	4.33	5.32
20175	1732.5	4.85	5.73	20175	1732.5	4.83	5.72
20375	1752.5	3.97	4.88	20350	1750.0	4.06	4.99

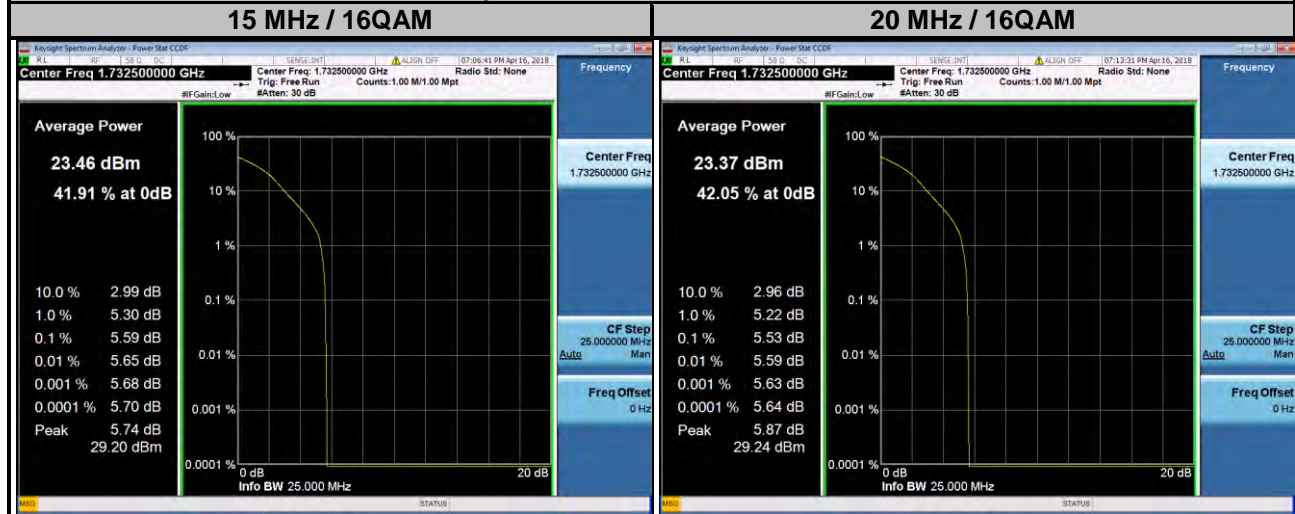
### Spectrum Plot of Worst Value



### 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	4.33	5.21	20050	1720.0	4.37	5.26
20175	1732.5	4.69	5.59	20175	1732.5	4.69	5.53
20325	1747.5	4.44	5.30	20300	1745.0	4.53	5.42

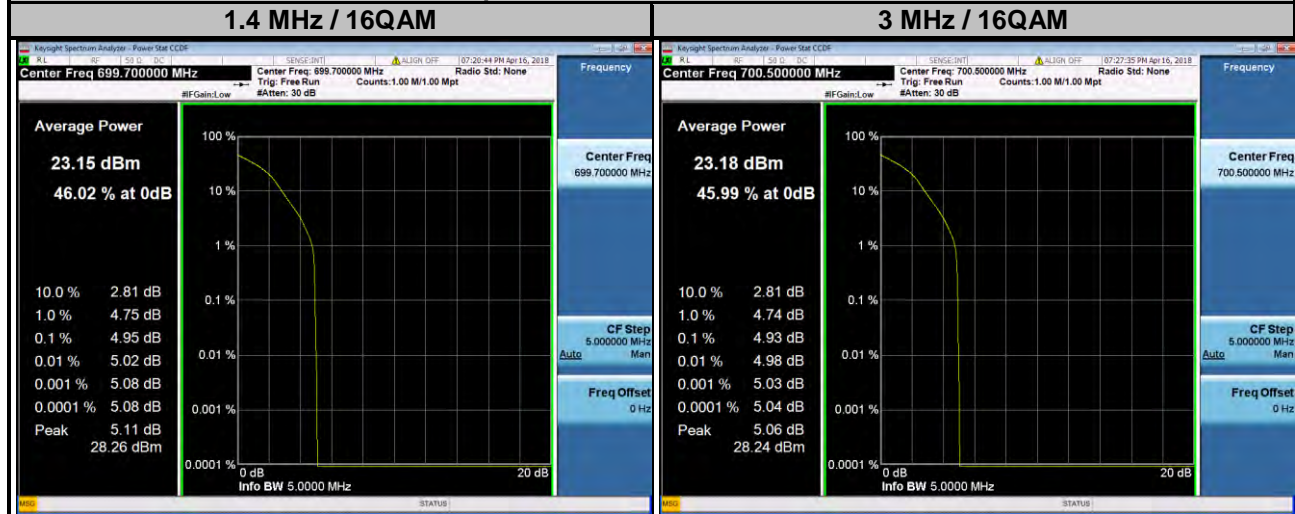
### Spectrum Plot of Worst Value



### 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	4.07	4.95	23025	700.5	4.10	4.93
23095	707.5	3.41	4.35	23095	707.5	3.49	4.29
23173	715.3	3.47	4.21	23165	714.5	3.66	4.48

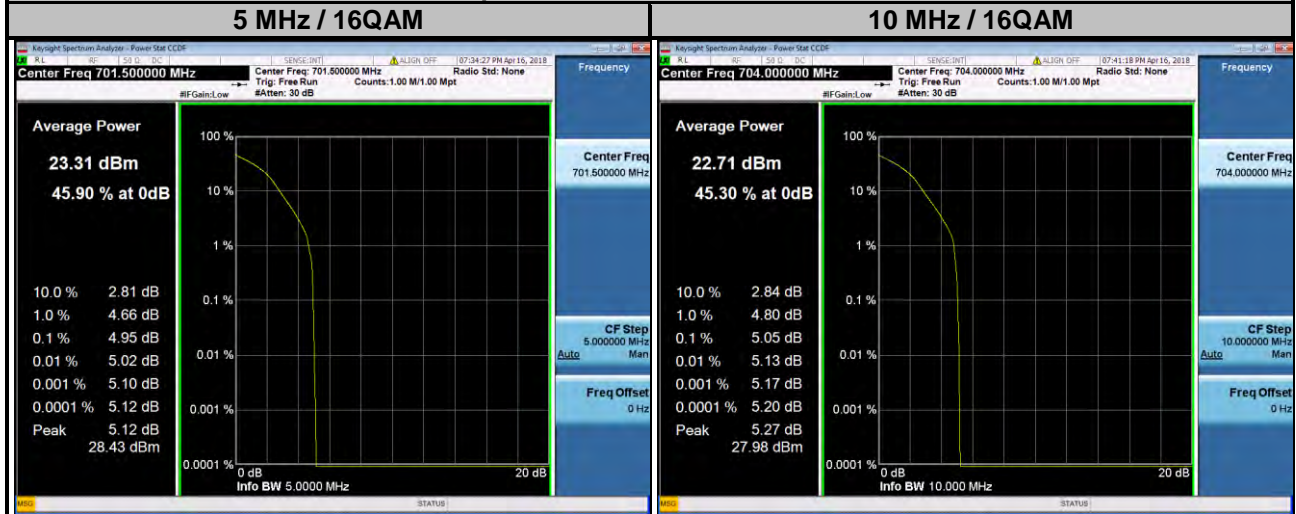
### Spectrum Plot of Worst Value



### LTE Band 12

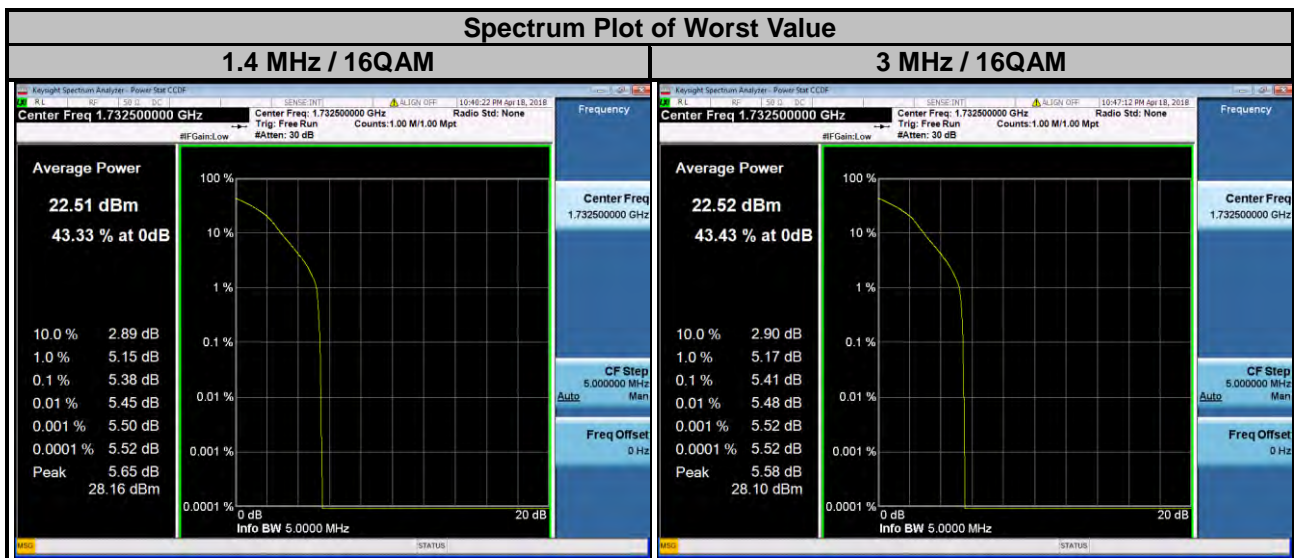
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
23035	701.5	4.08	4.95	23060	704.0	4.12	5.05
23095	707.5	3.69	4.56	23095	707.5	3.94	4.74
23155	713.5	3.99	4.85	23130	711.0	3.46	4.26

### Spectrum Plot of Worst Value



**Mode B**

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	4.19	5.07	19965	1711.5	4.21	5.07
20175	1732.5	4.57	5.38	20175	1732.5	4.62	5.41
20393	1754.3	3.65	4.50	20385	1753.5	3.73	4.64

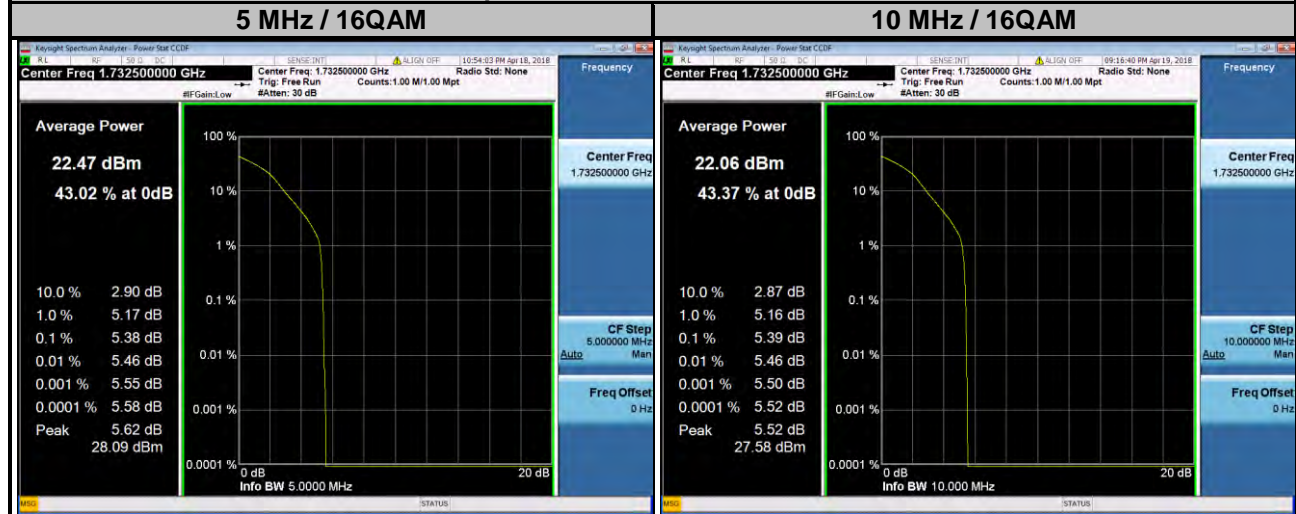




### LTE Band 4

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	4.25	5.07	20000	1715.0	4.17	4.96
20175	1732.5	4.60	5.38	20175	1732.5	4.57	5.39
20375	1752.5	3.79	4.67	20350	1750.0	3.92	4.72

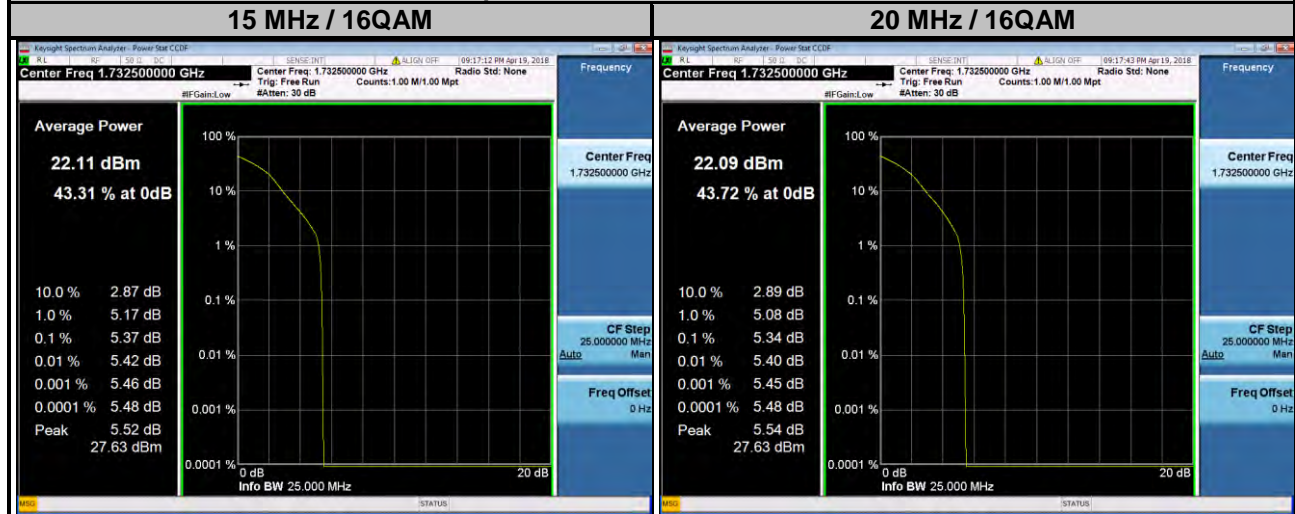
### Spectrum Plot of Worst Value



### 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	4.17	4.98	20050	1720.0	4.16	5.05
20175	1732.5	4.54	5.37	20175	1732.5	4.41	5.34
20325	1747.5	4.03	4.92	20300	1745.0	4.38	5.20

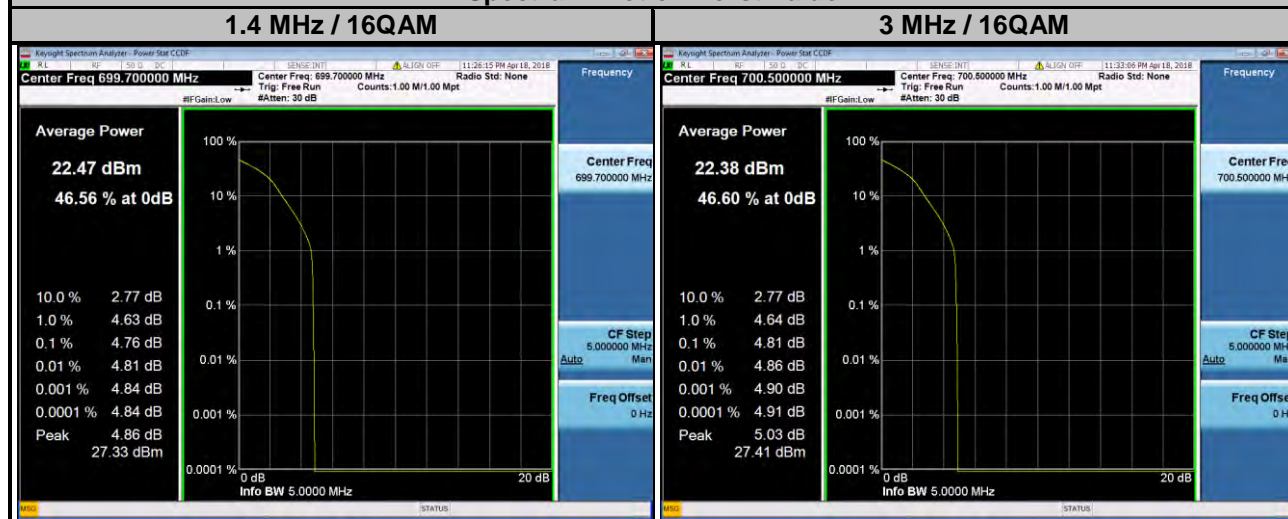
### Spectrum Plot of Worst Value



### 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	4.00	4.76	23025	700.5	4.02	4.81
23095	707.5	3.84	4.61	23095	707.5	3.84	4.60
23173	715.3	3.81	4.62	23165	714.5	3.94	4.69

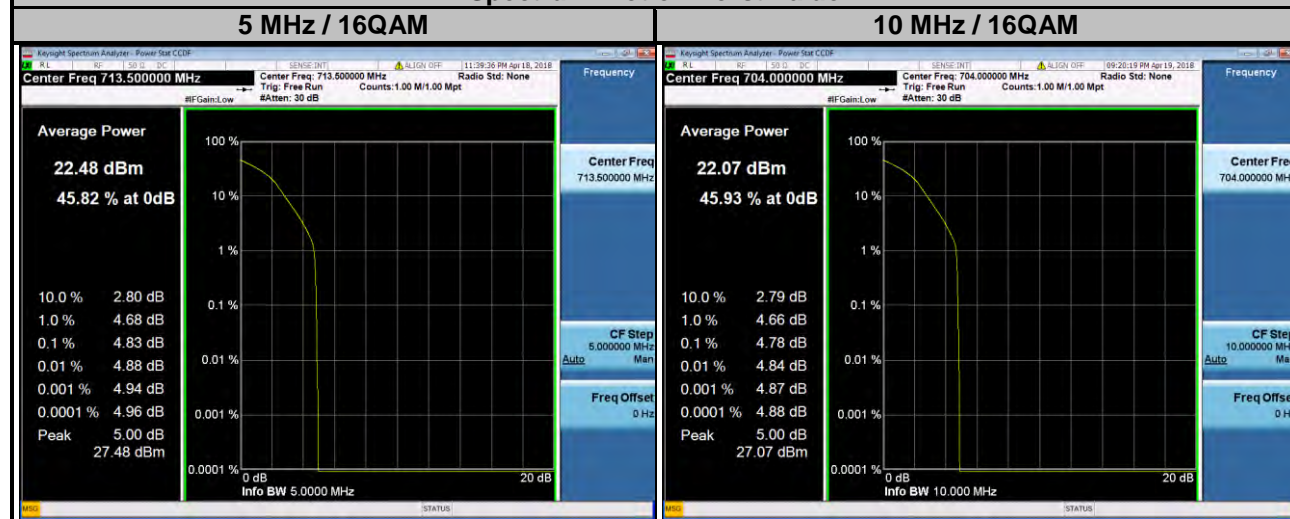
### Spectrum Plot of Worst Value



### 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	4.02	4.80	23060	704.0	3.97	4.78
23095	707.5	3.92	4.70	23095	707.5	3.92	4.75
23155	713.5	4.02	4.83	23130	711.0	3.82	4.62

### Spectrum Plot of Worst Value

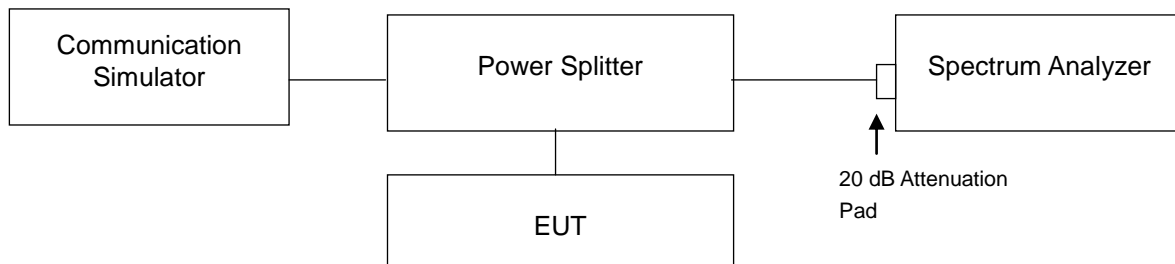


## 4.6 Conducted Spurious Emissions

### 4.6.1 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  $43 + 10 \log_{10}(P)$  dB. The limit of emission is equal to -13 dBm.

### 4.6.2 Test Setup

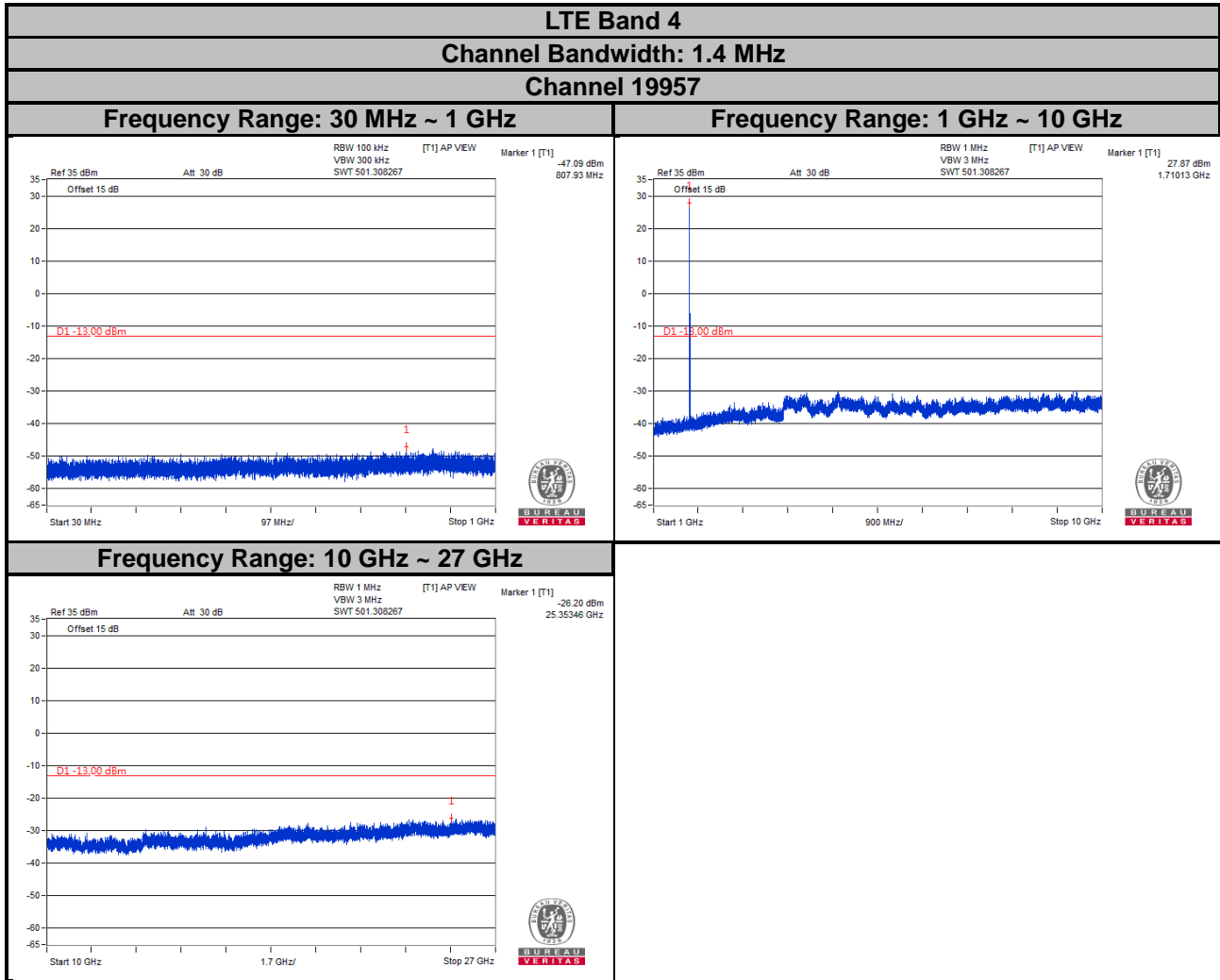


### 4.6.3 Test Procedure

- 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 30 MHz to 27 GHz for LTE Band 4. 10 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz are used for conducted emission measurement.

4.6.4 Test Results

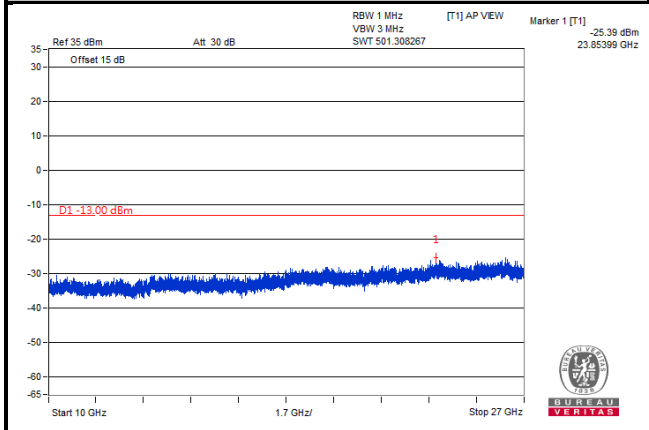
Mode A



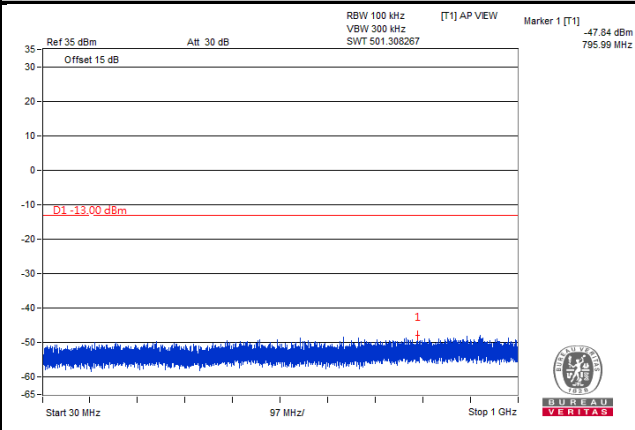
**LTE Band 4**  
**Channel Bandwidth: 1.4 MHz**

**Channel 20175**

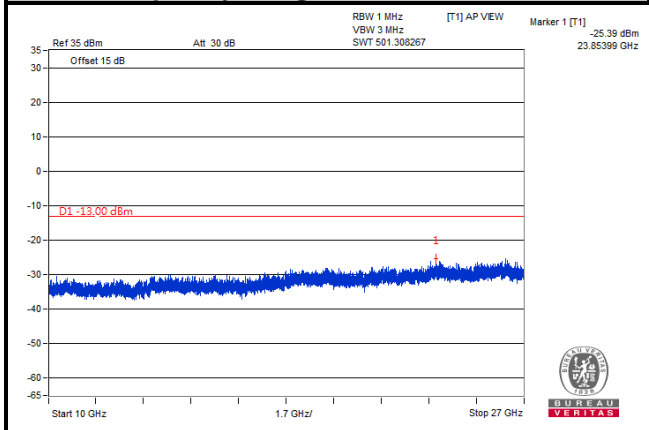
**Frequency Range: 30 MHz ~ 1 GHz**



**Frequency Range: 1 GHz ~ 10 GHz**

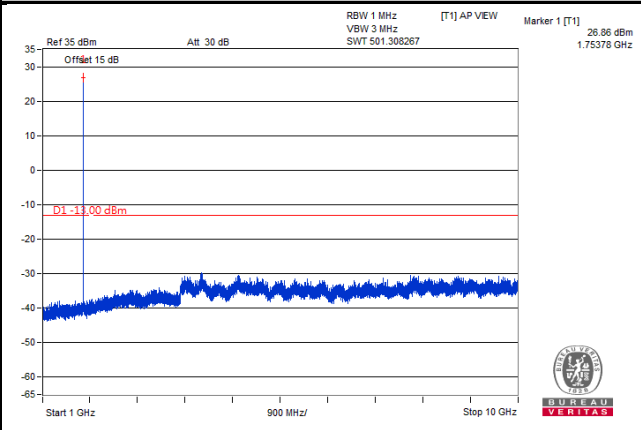
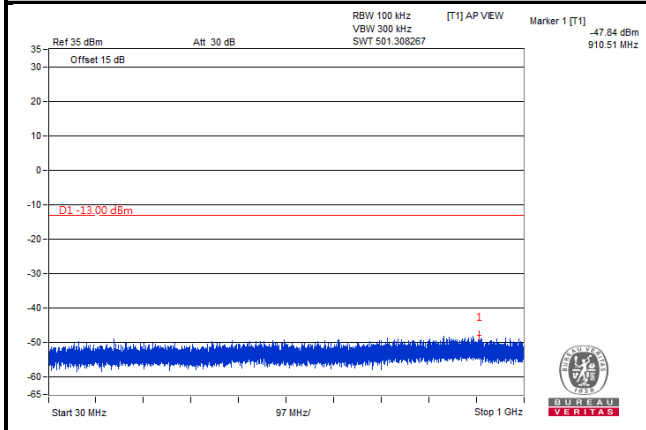


**Frequency Range: 10 GHz ~ 27 GHz**

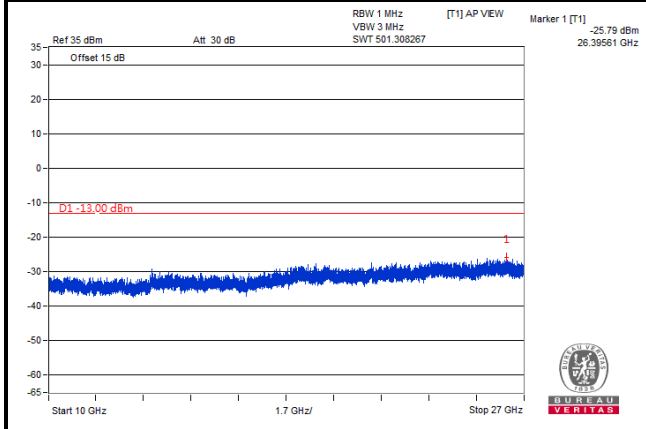


**LTE Band 4**  
**Channel Bandwidth: 1.4 MHz**  
**Channel 20393**

**Frequency Range: 30 MHz ~ 1 GHz**      **Frequency Range: 1 GHz ~ 10 GHz**



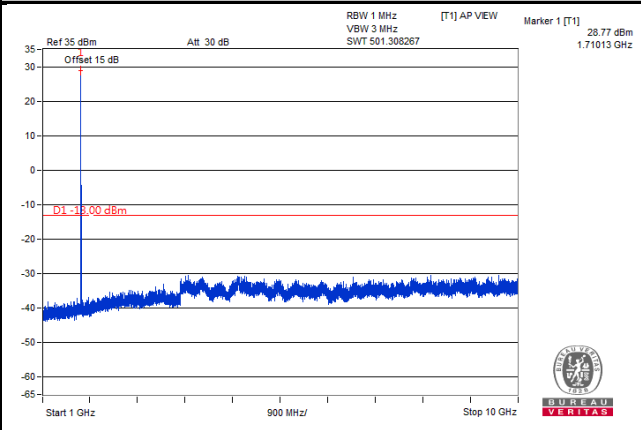
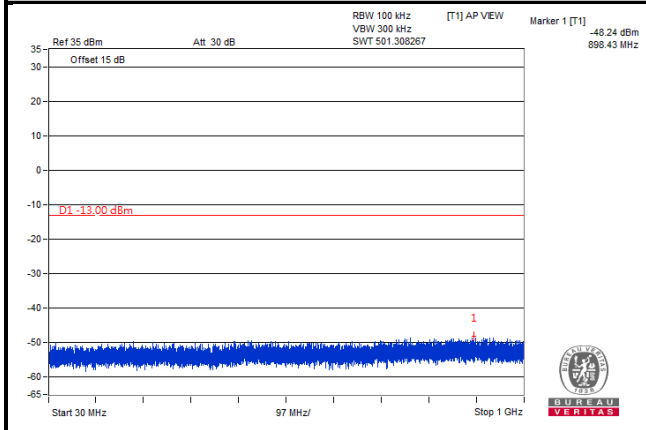
**Frequency Range: 10 GHz ~ 27 GHz**



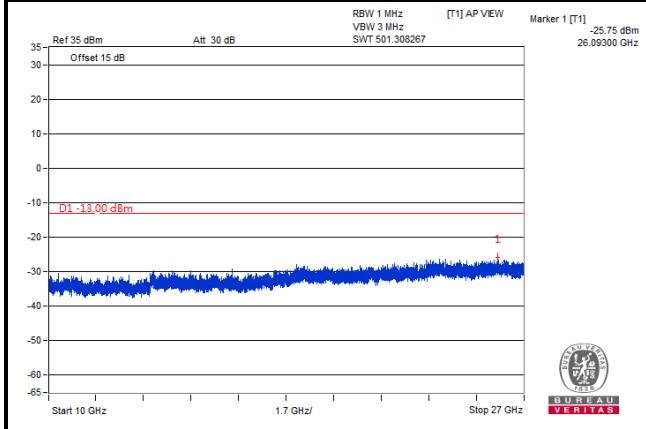


**LTE Band 4**  
**Channel Bandwidth: 3 MHz**  
**Channel 19965**

**Frequency Range: 30 MHz ~ 1 GHz**      **Frequency Range: 1 GHz ~ 10 GHz**



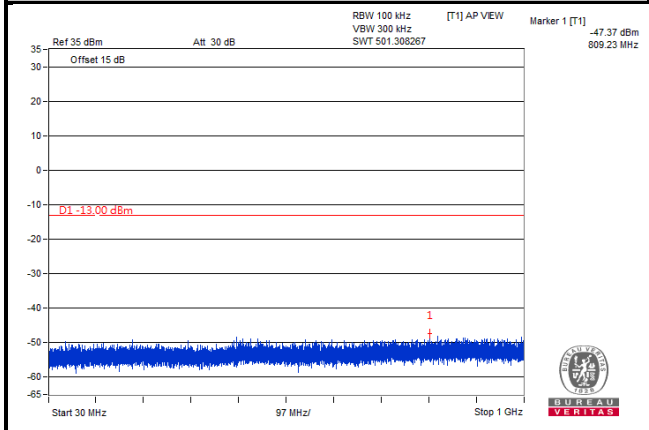
**Frequency Range: 10 GHz ~ 27 GHz**



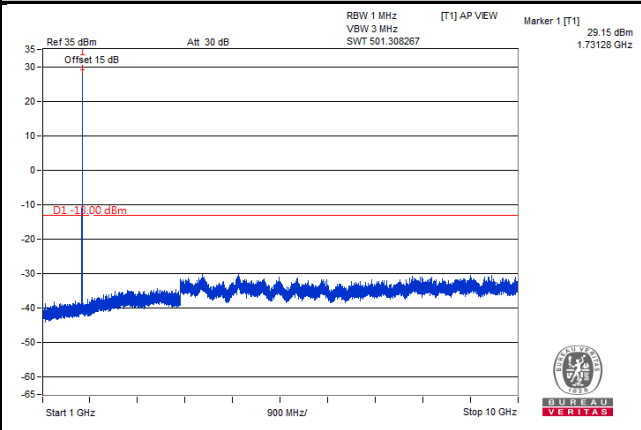
**LTE Band 4**  
**Channel Bandwidth: 3 MHz**

**Channel 20175**

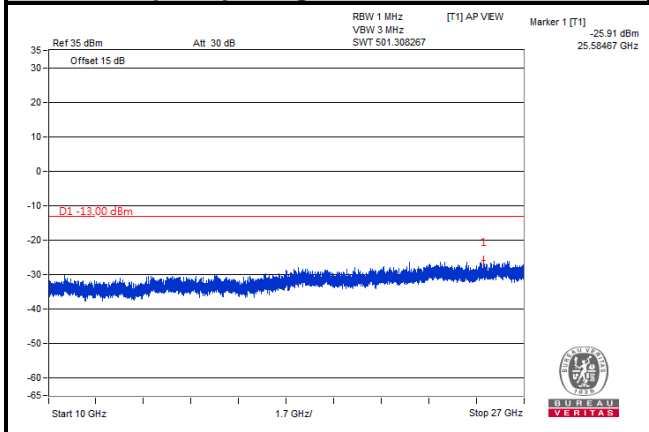
**Frequency Range: 30 MHz ~ 1 GHz**



**Frequency Range: 1 GHz ~ 10 GHz**

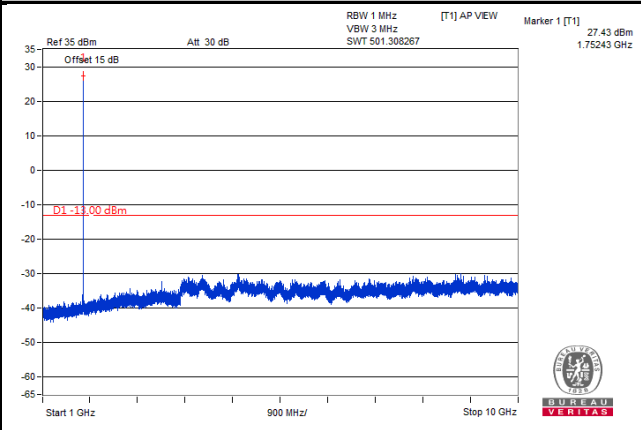
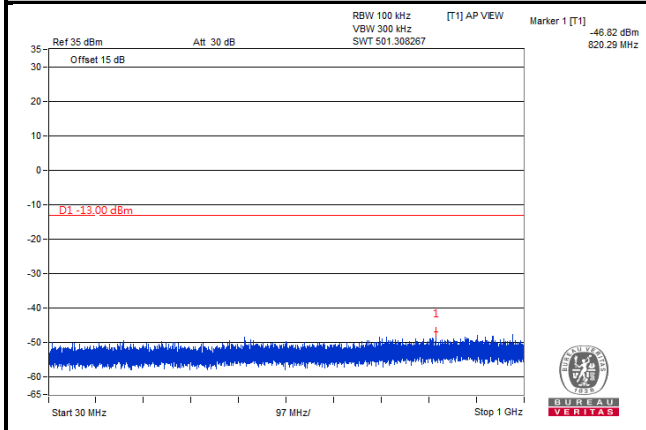


**Frequency Range: 10 GHz ~ 27 GHz**

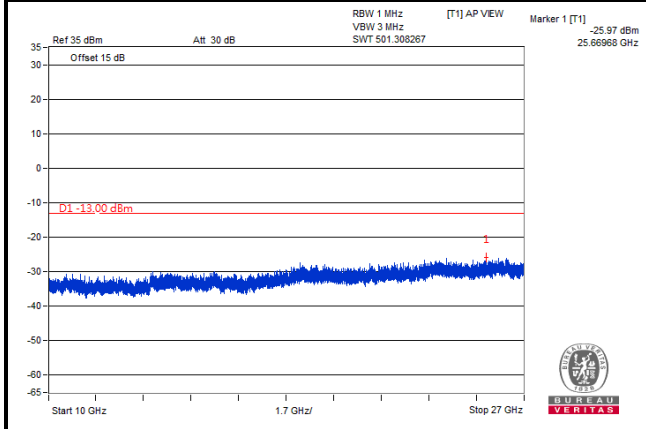


**LTE Band 4**  
**Channel Bandwidth: 3 MHz**  
**Channel 20385**

**Frequency Range: 30 MHz ~ 1 GHz**      **Frequency Range: 1 GHz ~ 10 GHz**

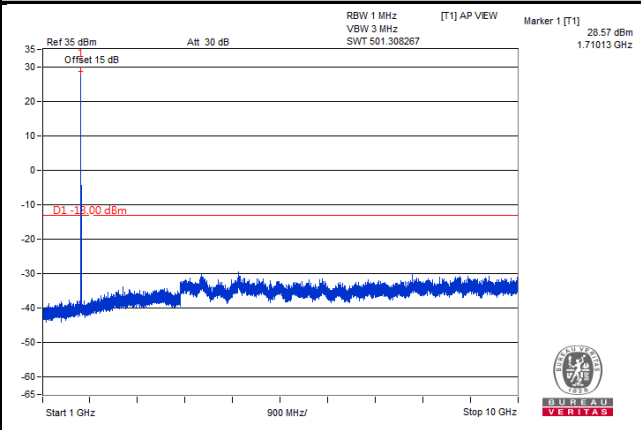
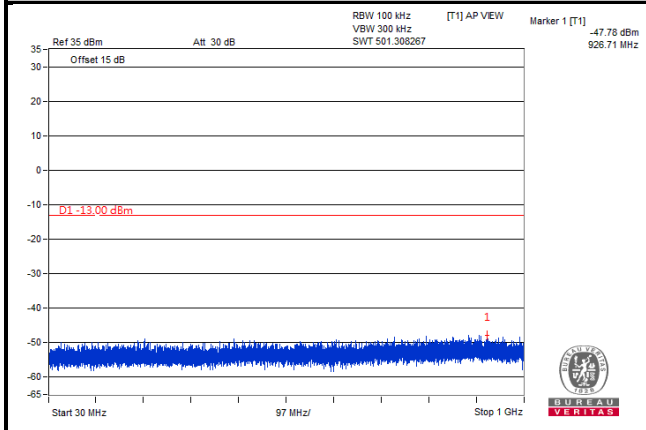


**Frequency Range: 10 GHz ~ 27 GHz**

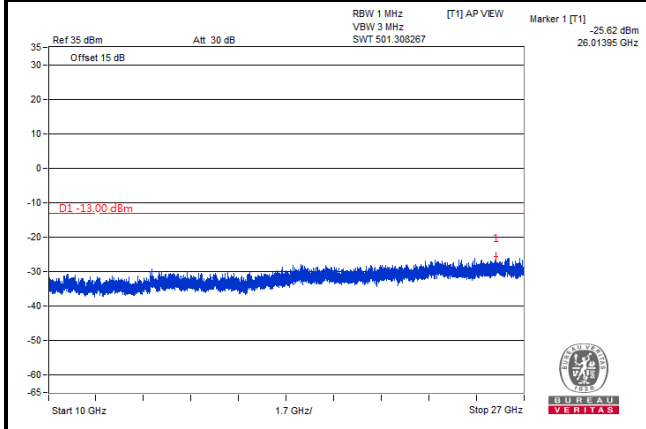


**LTE Band 4**  
**Channel Bandwidth: 5 MHz**  
**Channel 19975**

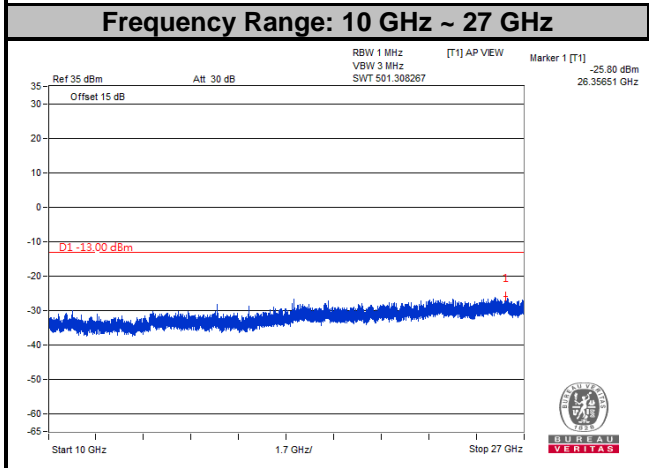
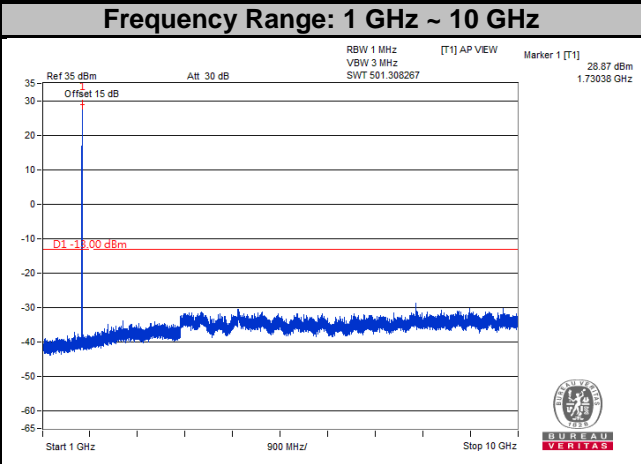
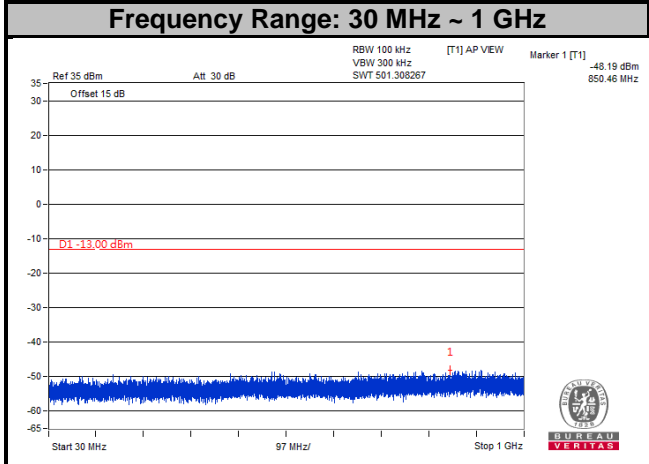
**Frequency Range: 30 MHz ~ 1 GHz**      **Frequency Range: 1 GHz ~ 10 GHz**



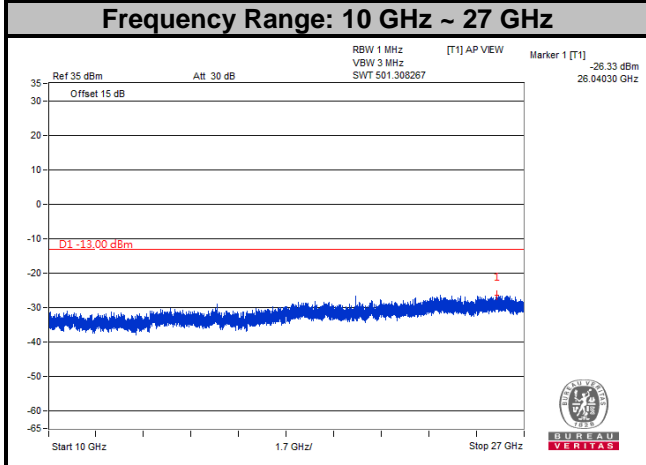
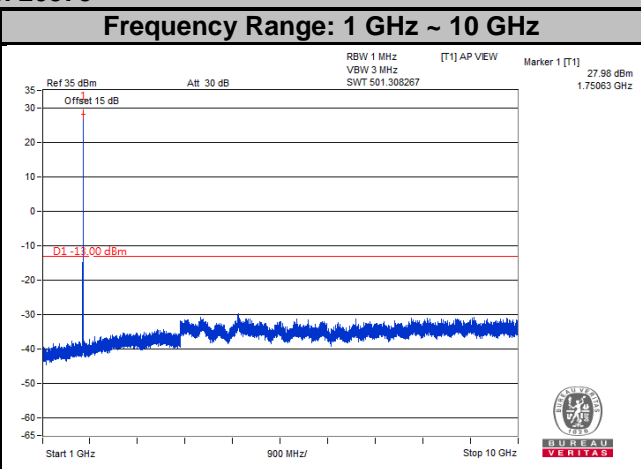
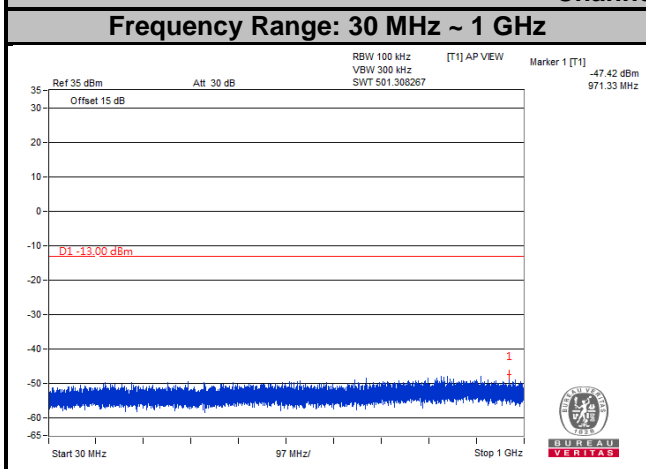
**Frequency Range: 10 GHz ~ 27 GHz**



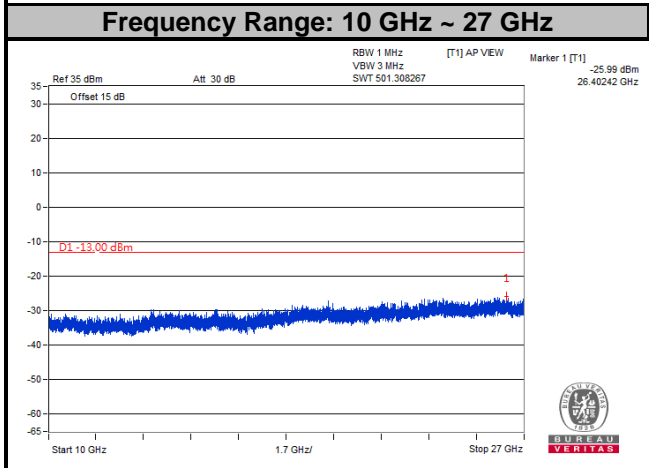
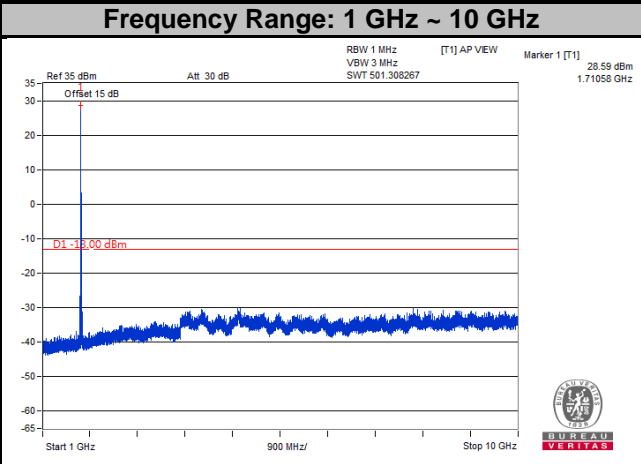
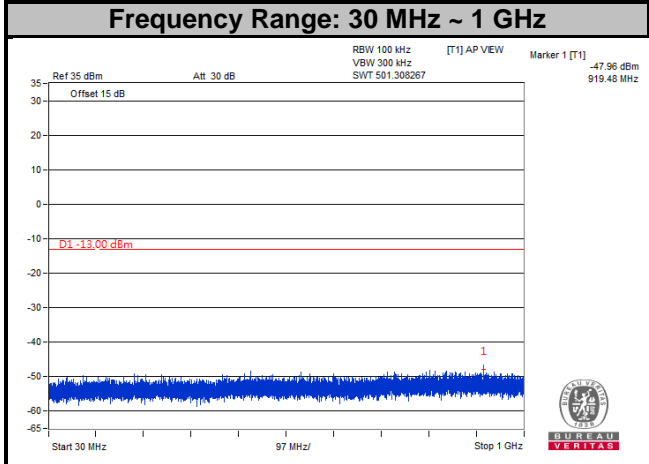
**LTE Band 4**  
**Channel Bandwidth: 5 MHz**  
**Channel 20175**



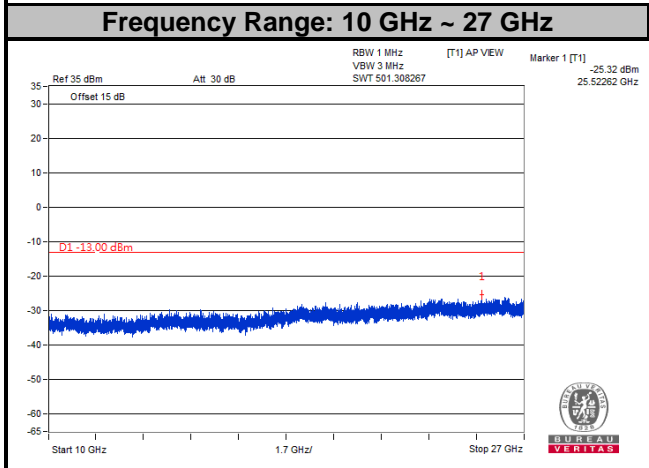
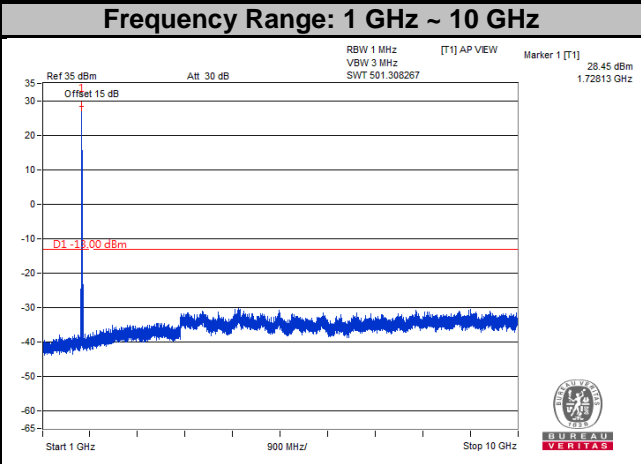
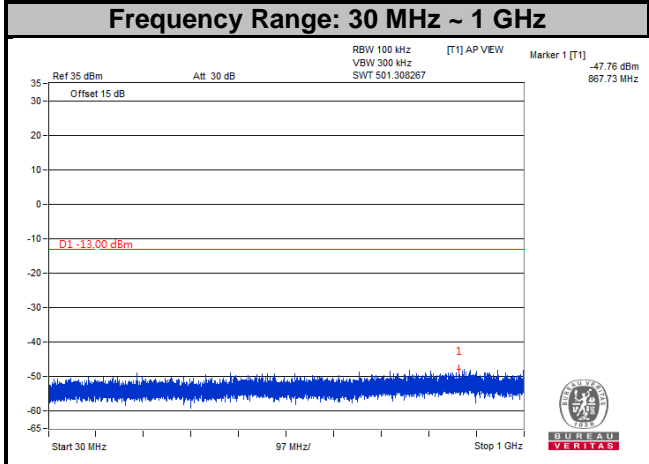
**LTE Band 4**  
**Channel Bandwidth: 5 MHz**  
**Channel 20375**



**LTE Band 4**  
**Channel Bandwidth: 10 MHz**  
**Channel 20000**

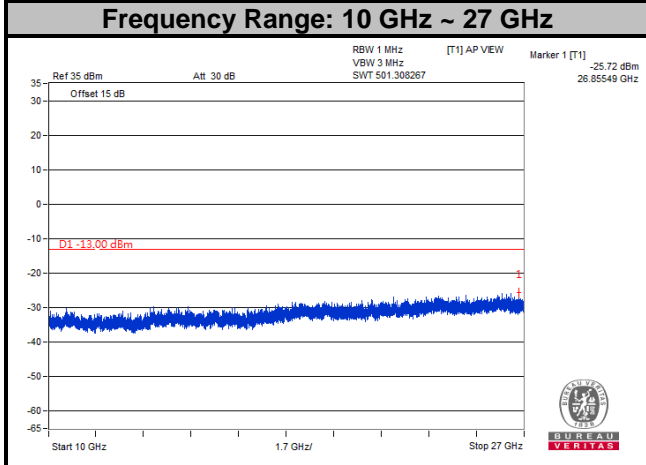
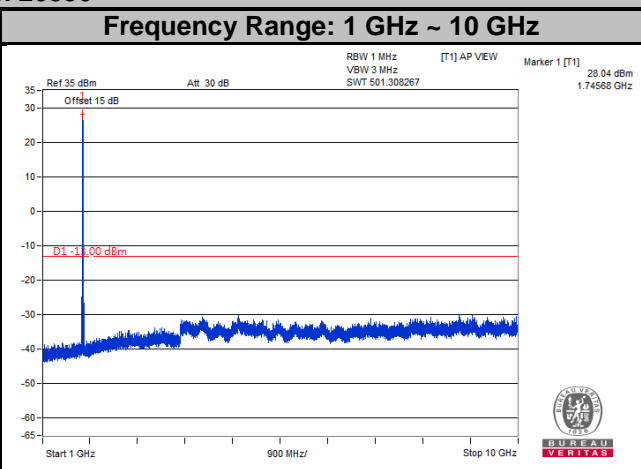
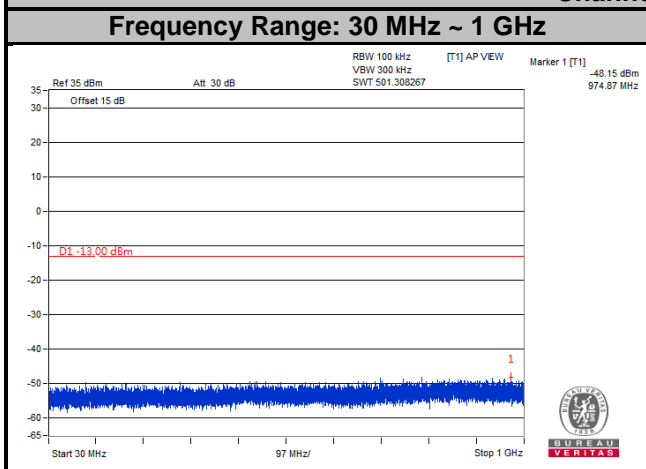


**LTE Band 4**  
**Channel Bandwidth: 10 MHz**  
**Channel 20175**

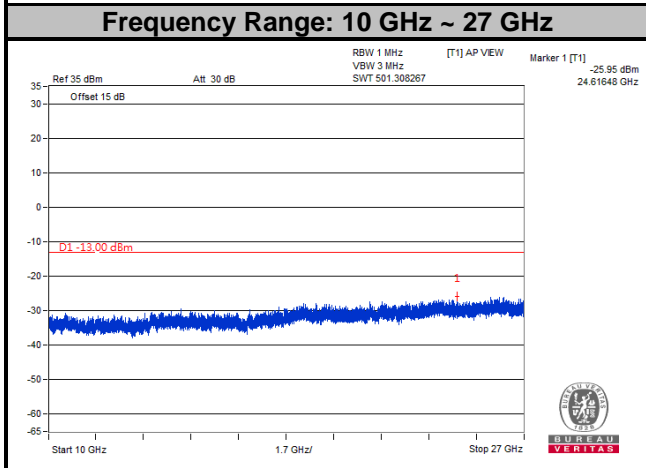
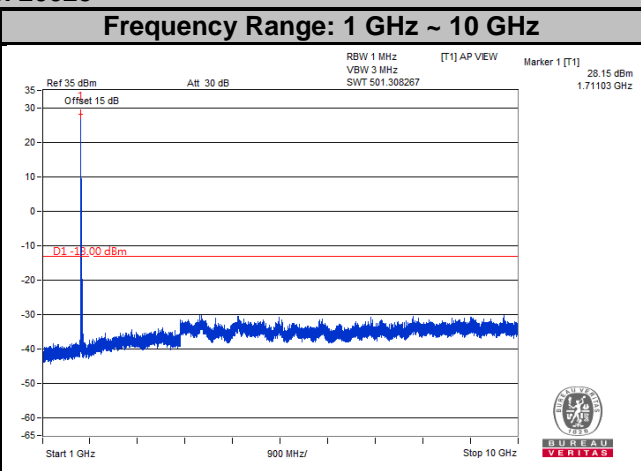
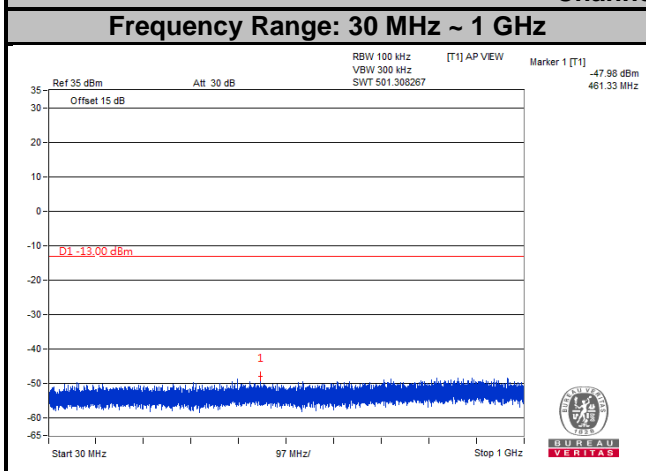




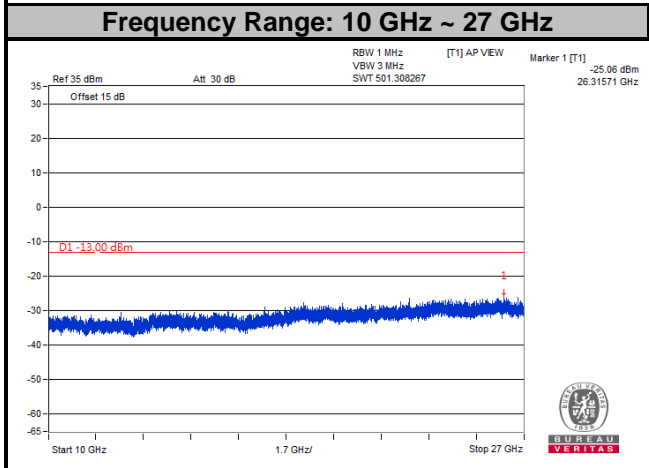
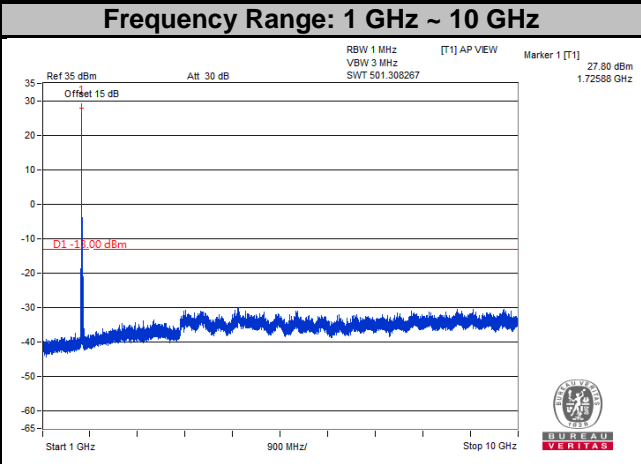
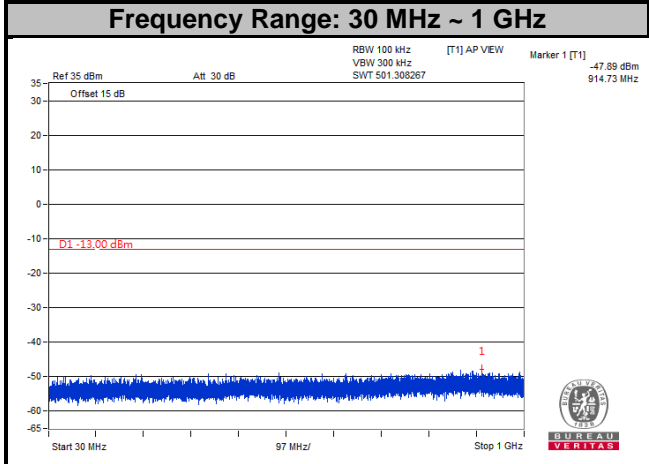
**LTE Band 4**  
**Channel Bandwidth: 10 MHz**  
**Channel 20350**



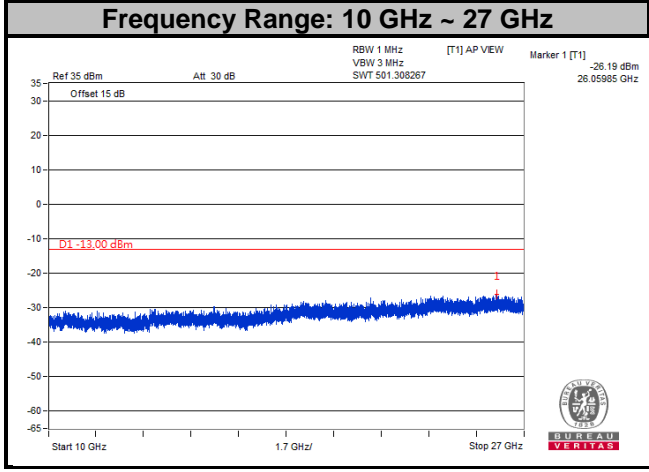
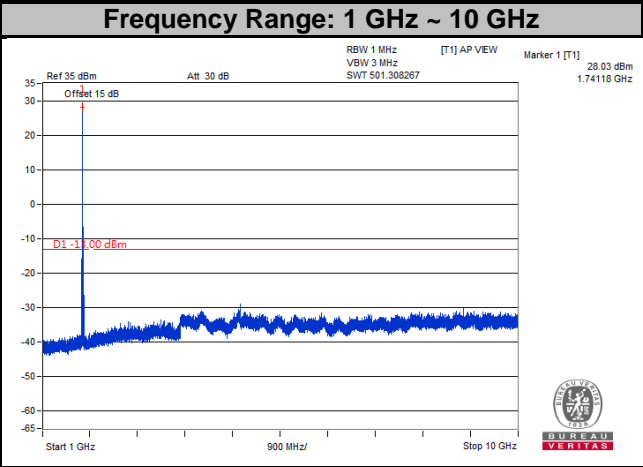
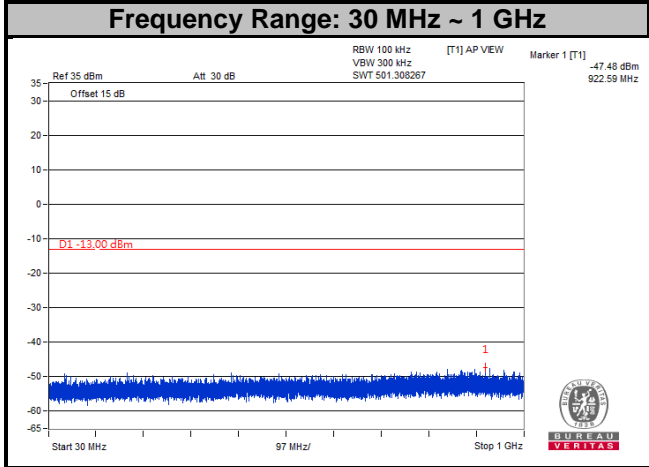
**LTE Band 4**  
**Channel Bandwidth: 15 MHz**  
**Channel 20025**



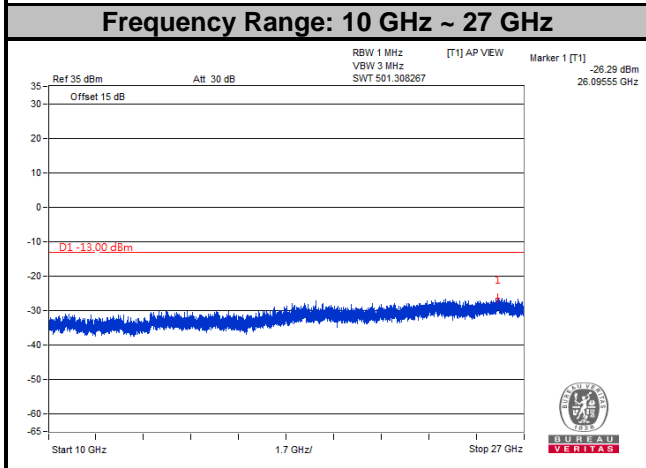
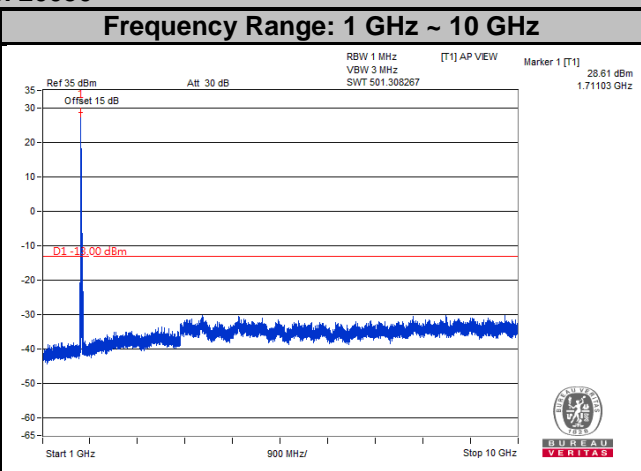
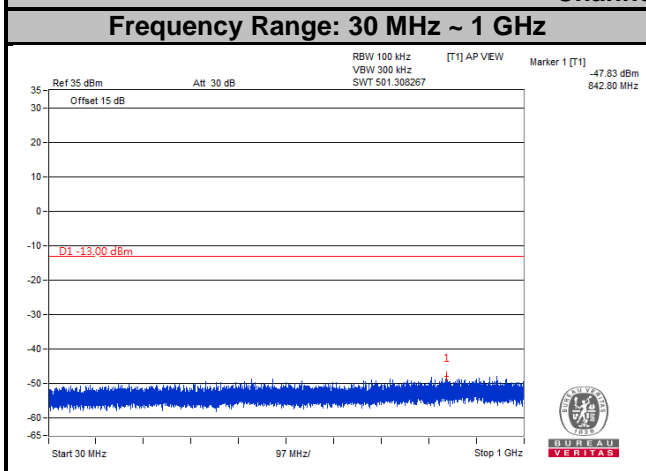
**LTE Band 4**  
**Channel Bandwidth: 15 MHz**  
**Channel 20175**



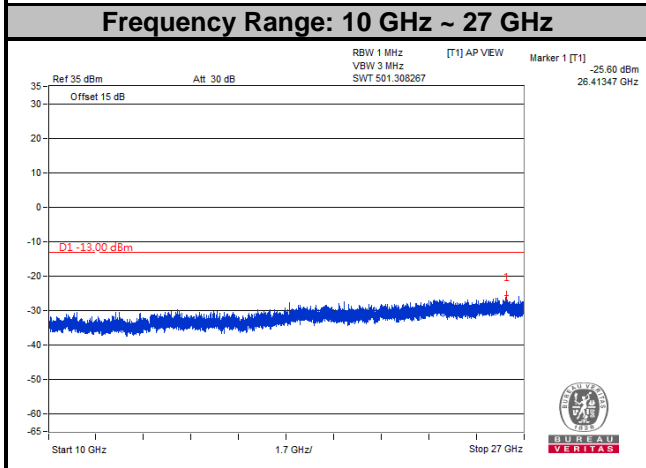
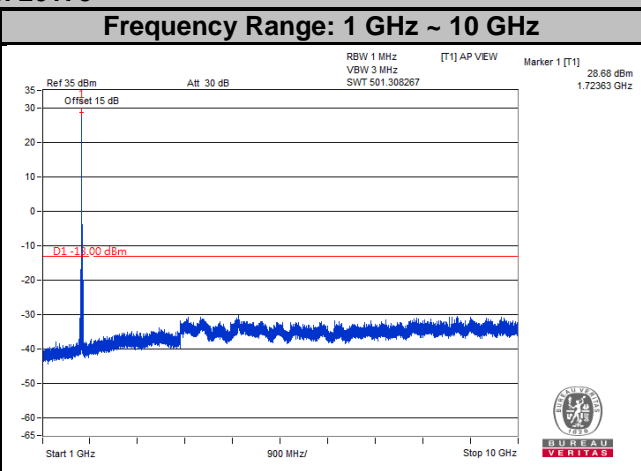
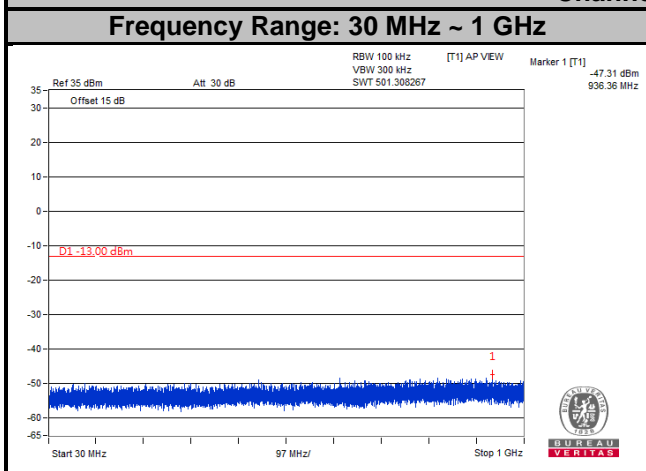
**LTE Band 4**  
**Channel Bandwidth: 15 MHz**  
**Channel 20325**



**LTE Band 4**  
**Channel Bandwidth: 20 MHz**  
**Channel 20050**

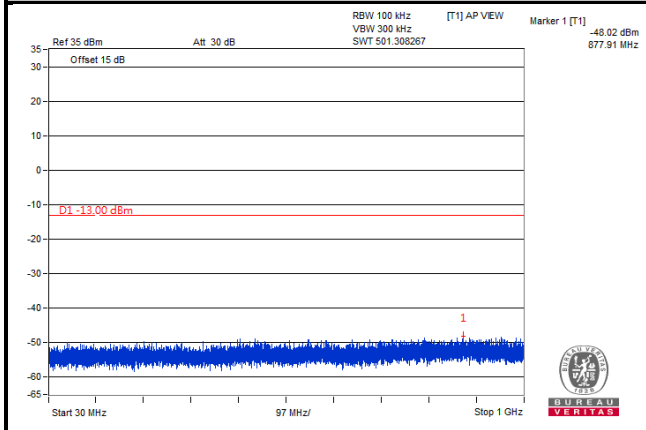


**LTE Band 4**  
**Channel Bandwidth: 20 MHz**  
**Channel 20175**

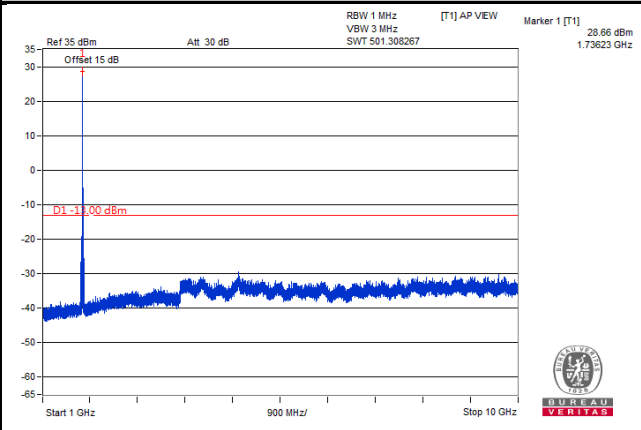


**LTE Band 4**  
**Channel Bandwidth: 20 MHz**  
**Channel 20300**

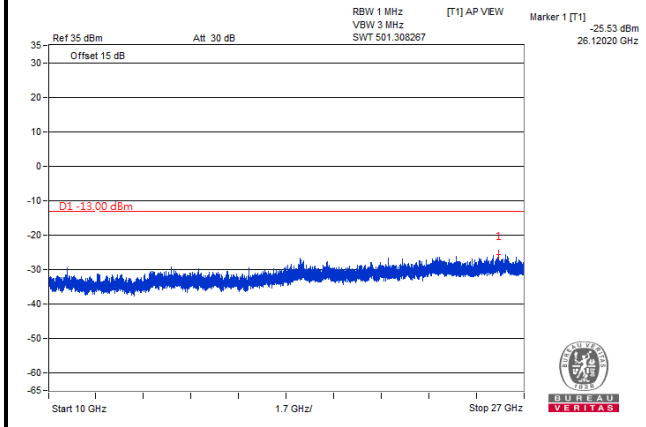
**Frequency Range: 30 MHz ~ 1 GHz**



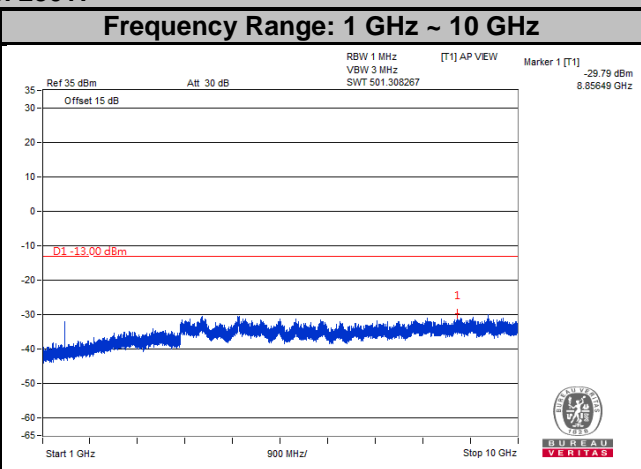
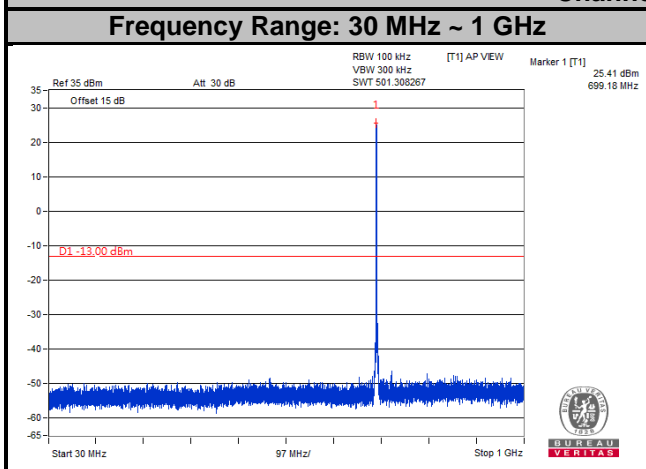
**Frequency Range: 1 GHz ~ 10 GHz**



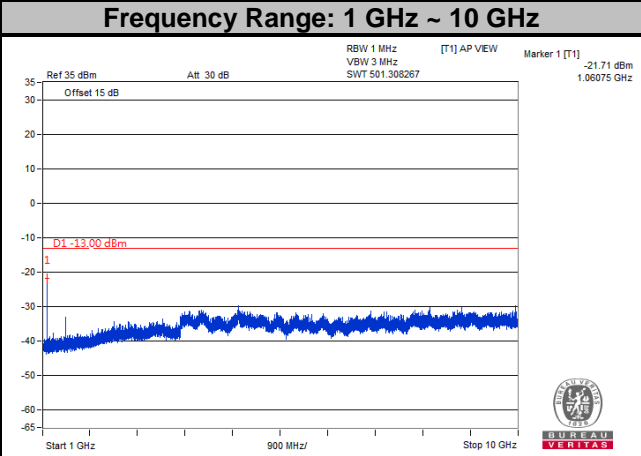
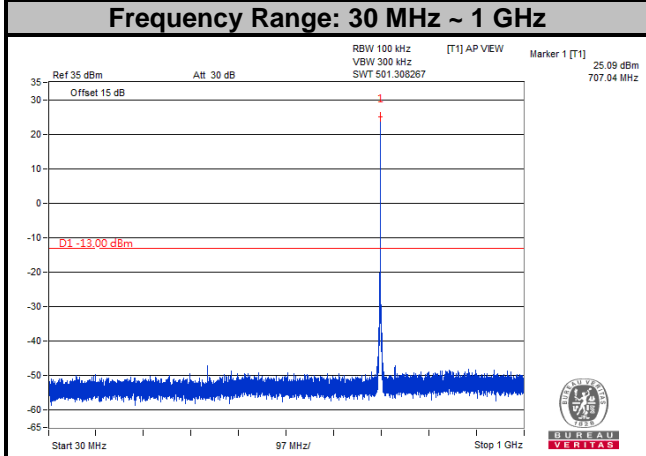
**Frequency Range: 10 GHz ~ 27 GHz**



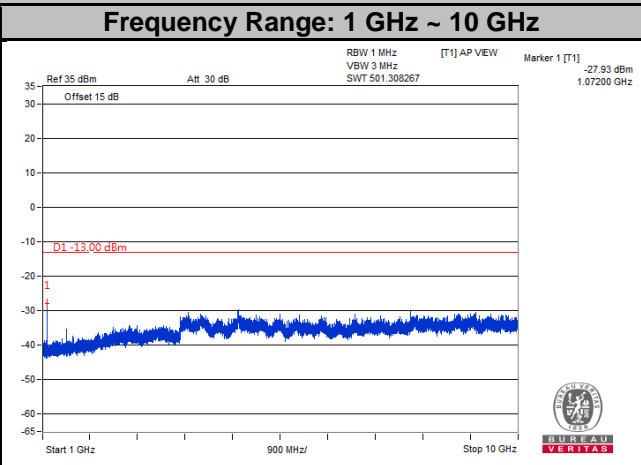
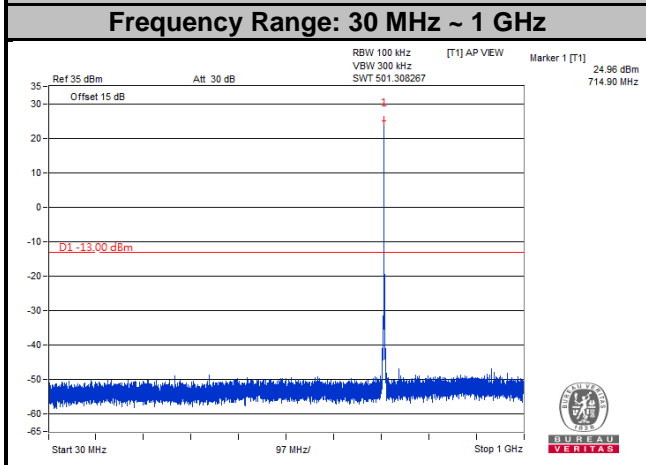
**LTE Band 12**  
**Channel Bandwidth: 1.4 MHz**  
**Channel 23017**



**Channel 23095**

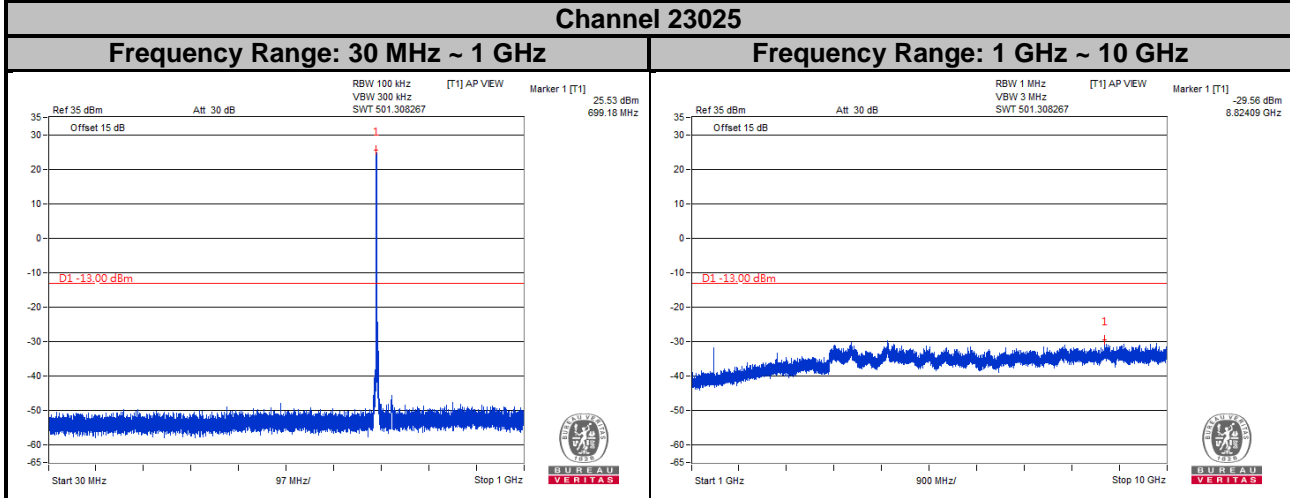


**Channel 23173**

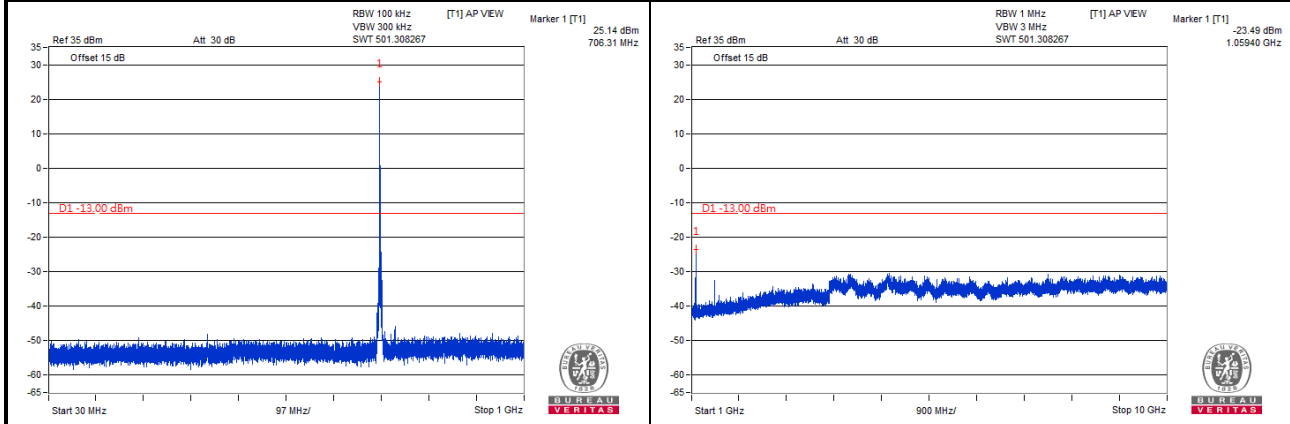




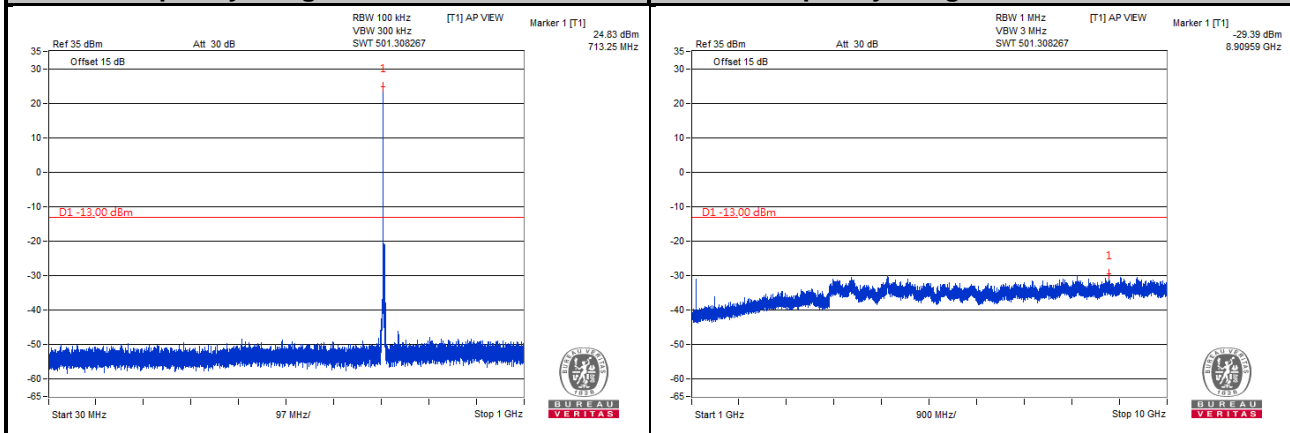
**LTE Band 12**  
**Channel Bandwidth: 3 MHz**  
**Channel 23025**



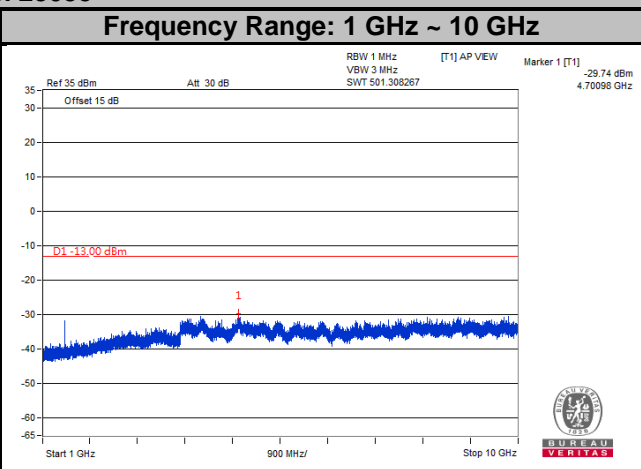
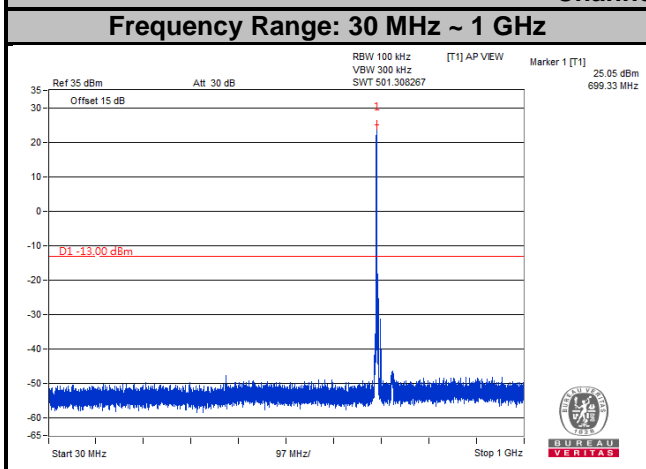
**Channel 23095**



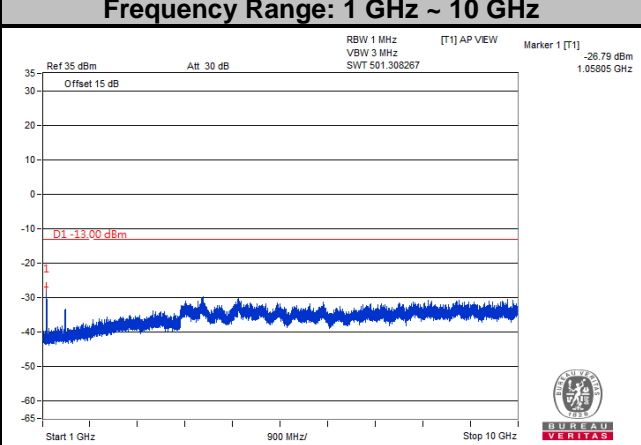
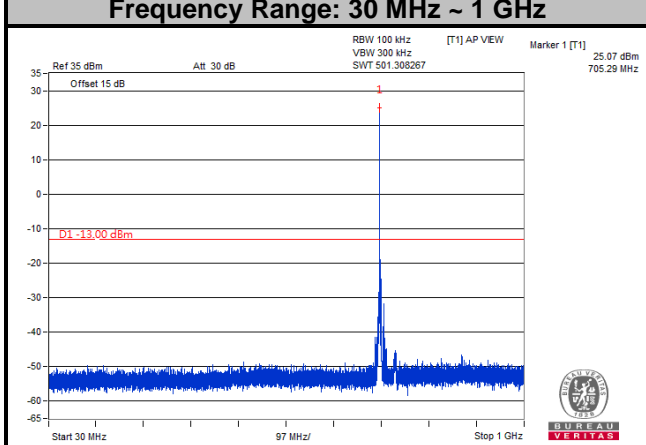
**Channel 23165**



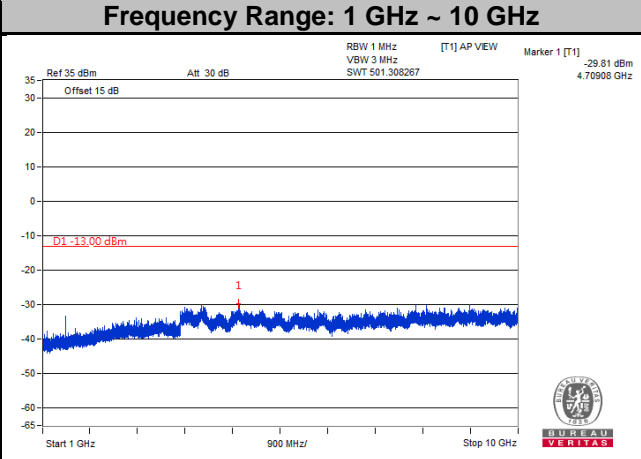
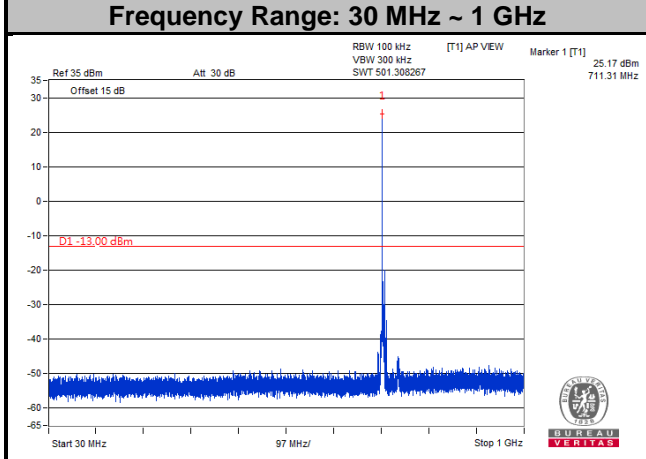
**LTE Band 12**  
**Channel Bandwidth: 5 MHz**  
**Channel 23035**



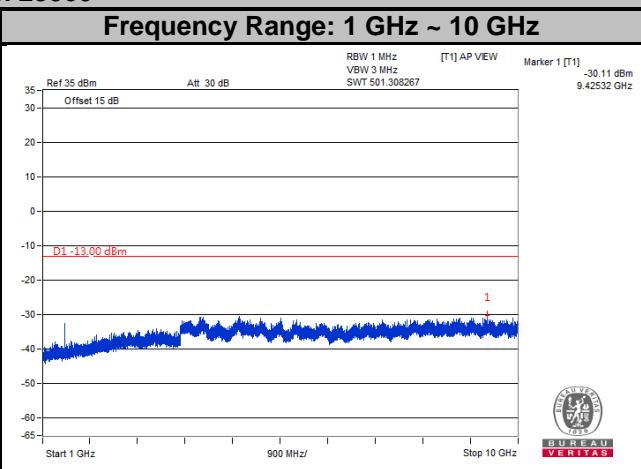
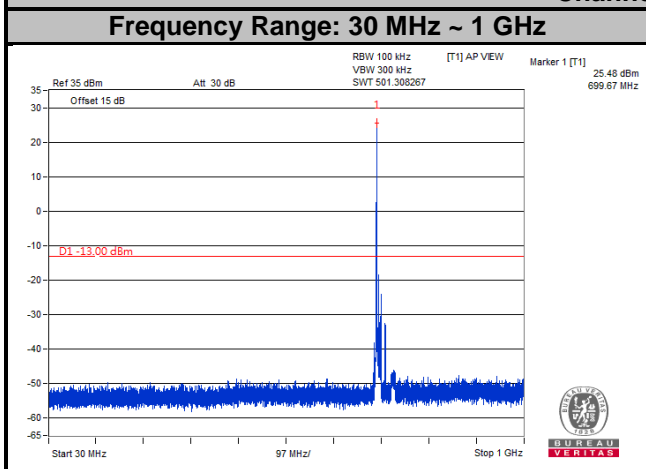
**Channel 23095**



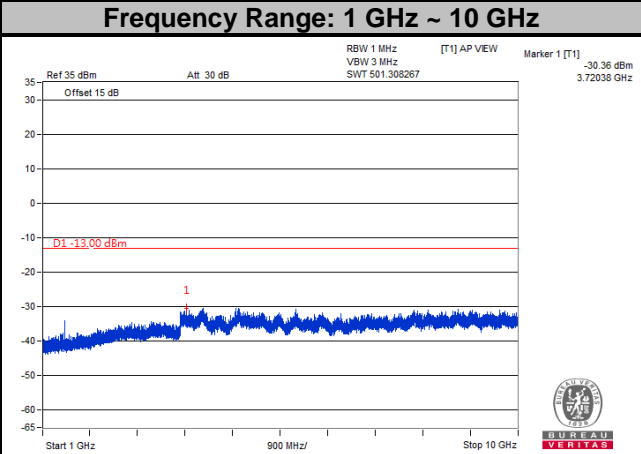
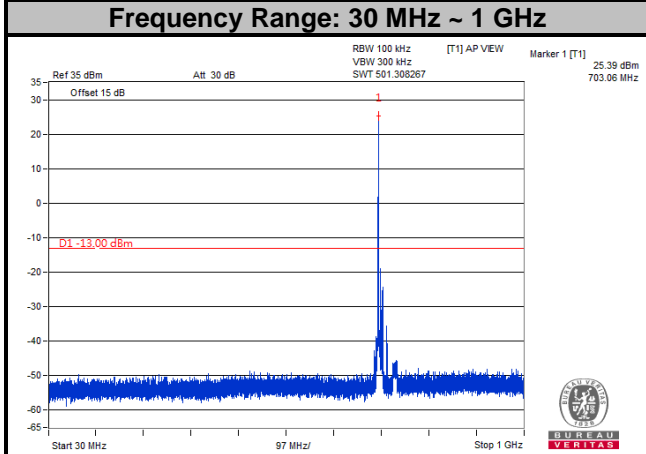
**Channel 23155**



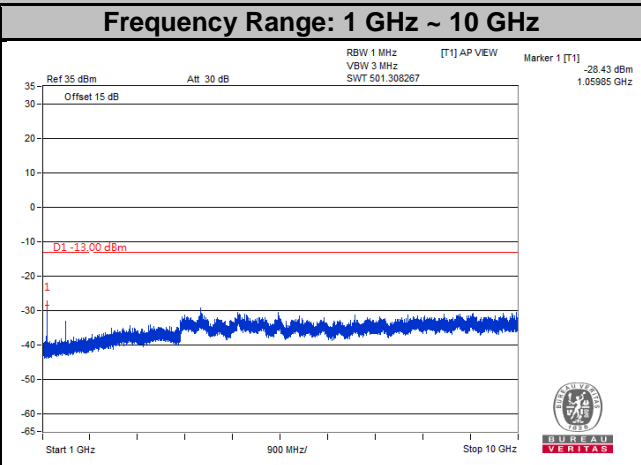
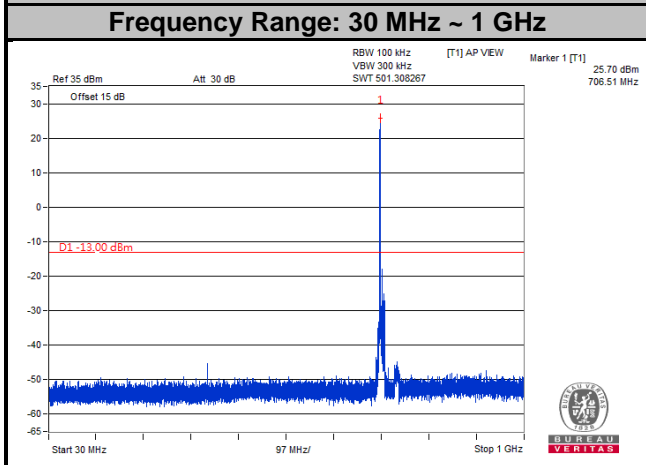
**LTE Band 12**  
**Channel Bandwidth: 10 MHz**  
**Channel 23060**



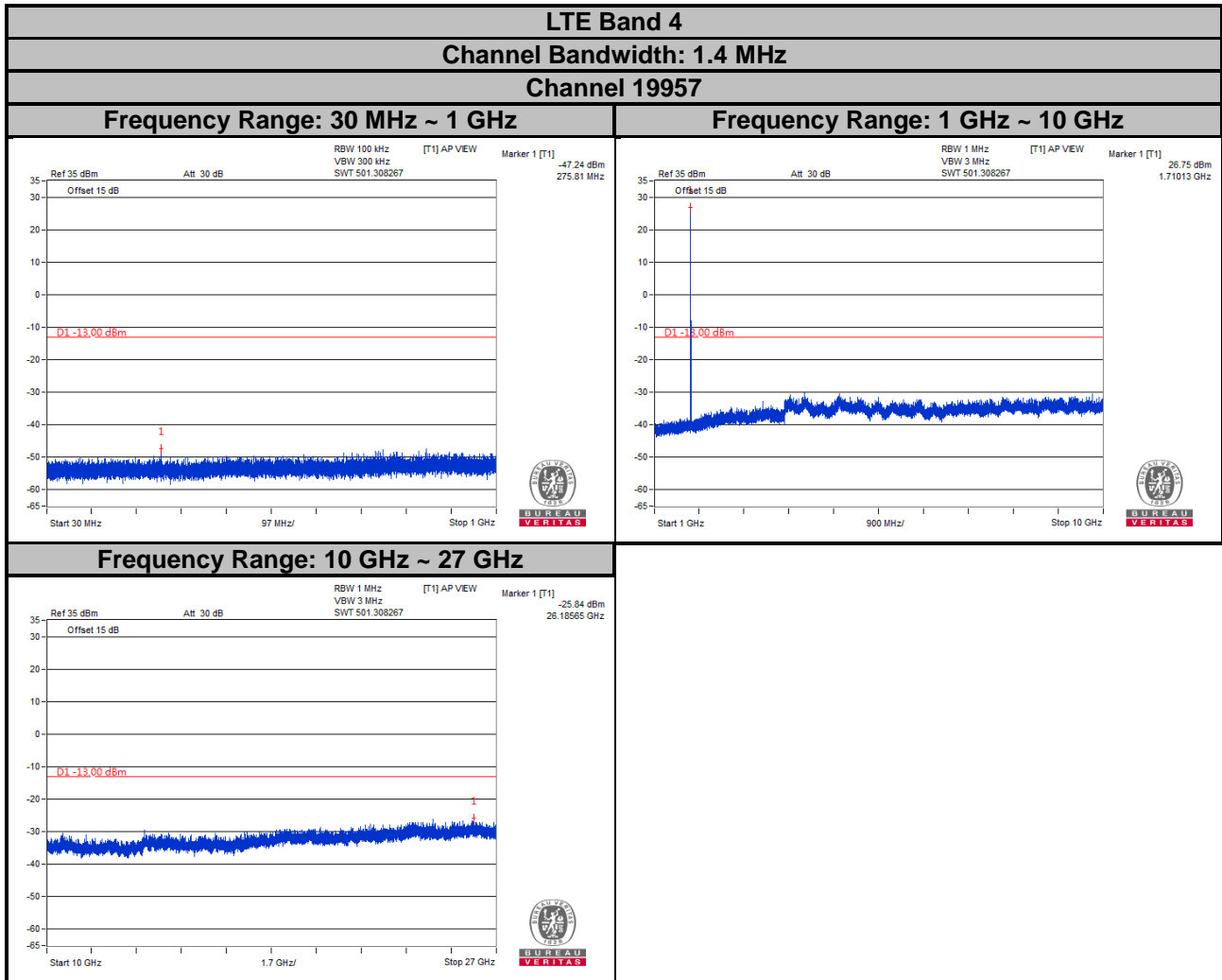
**Channel 23095**



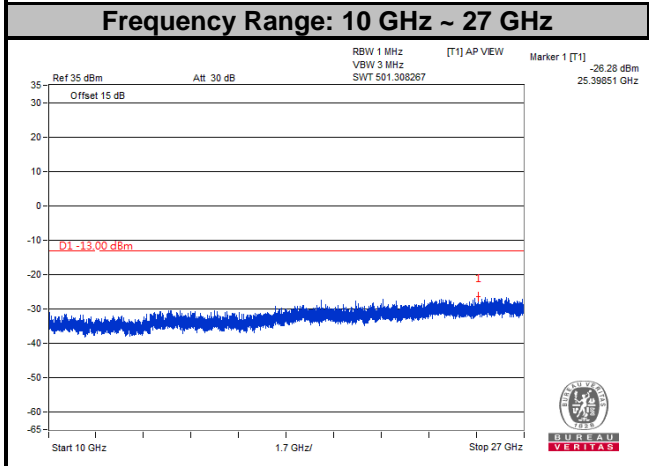
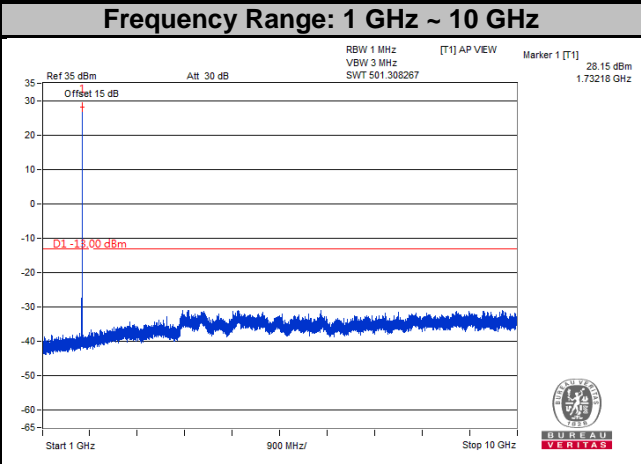
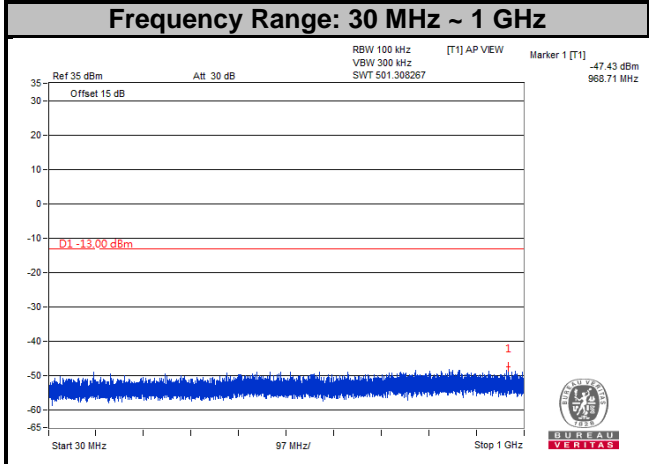
**Channel 23130**



**Mode B**



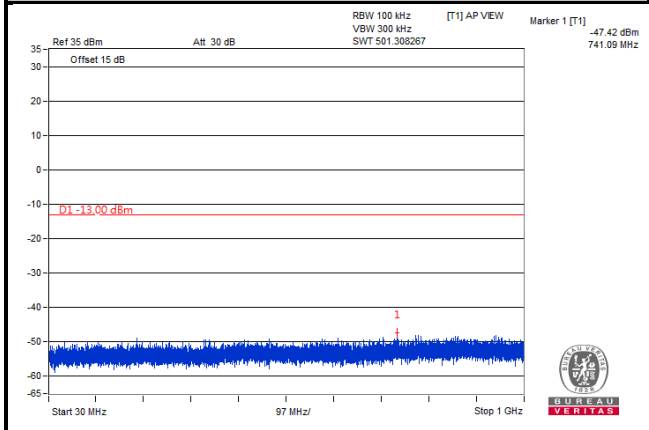
**LTE Band 4**  
**Channel Bandwidth: 1.4 MHz**  
**Channel 20175**



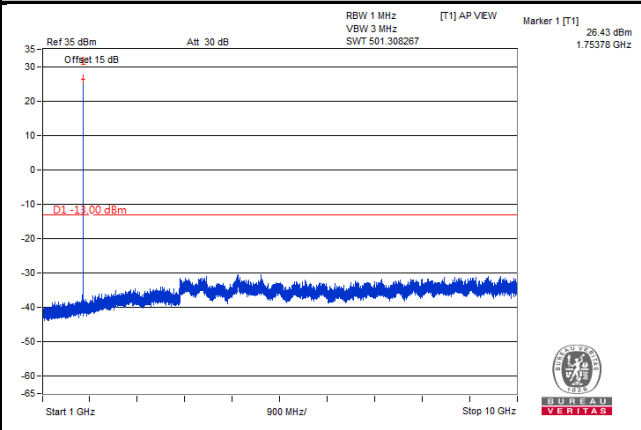
**LTE Band 4**  
**Channel Bandwidth: 1.4 MHz**

**Channel 20393**

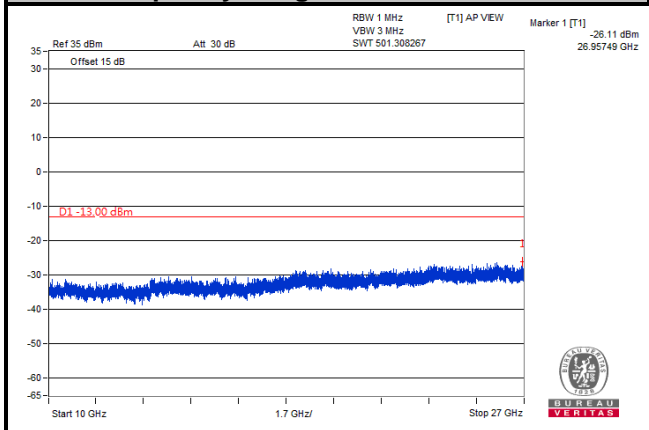
**Frequency Range: 30 MHz ~ 1 GHz**



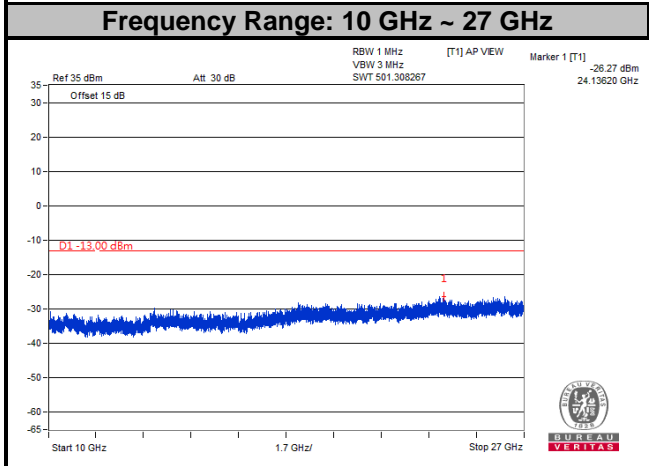
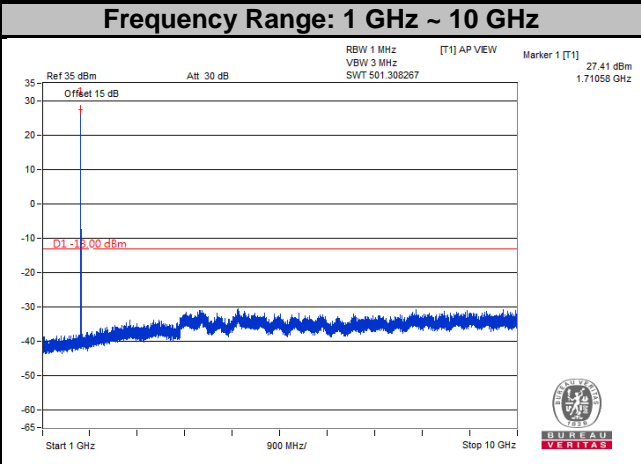
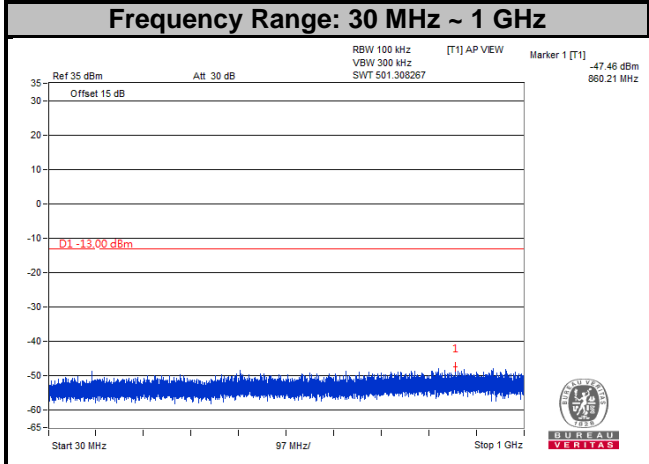
**Frequency Range: 1 GHz ~ 10 GHz**



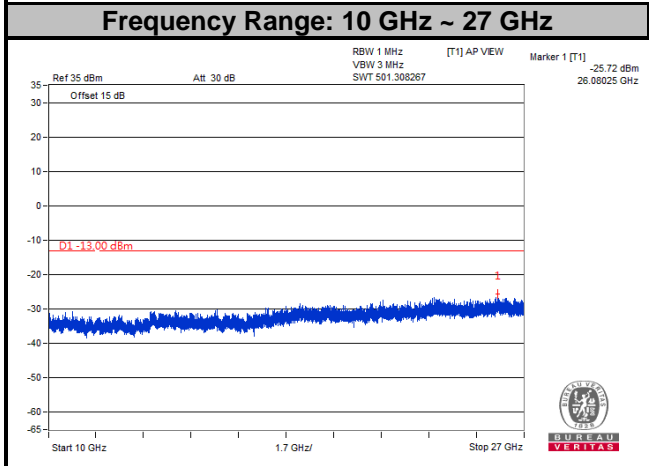
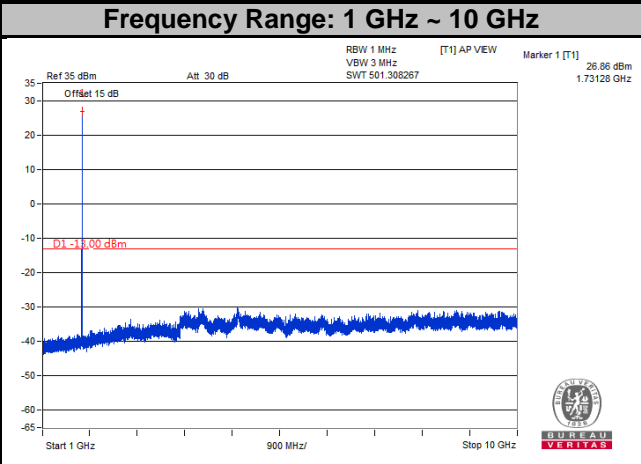
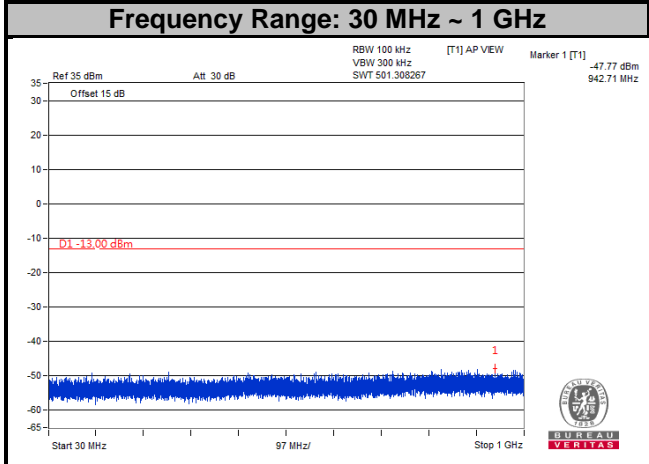
**Frequency Range: 10 GHz ~ 27 GHz**



**LTE Band 4**  
**Channel Bandwidth: 3 MHz**  
**Channel 19965**

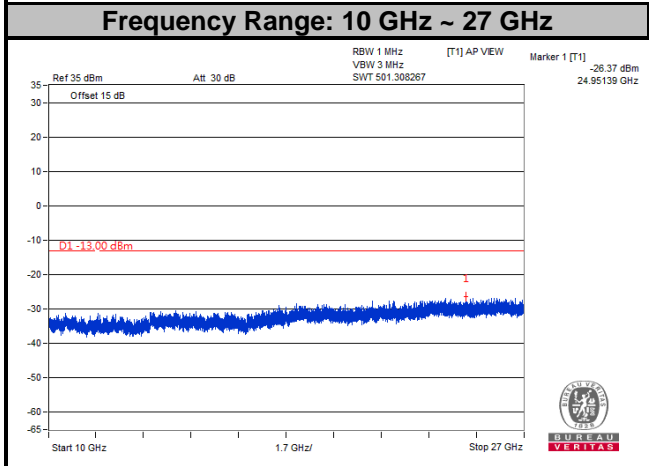
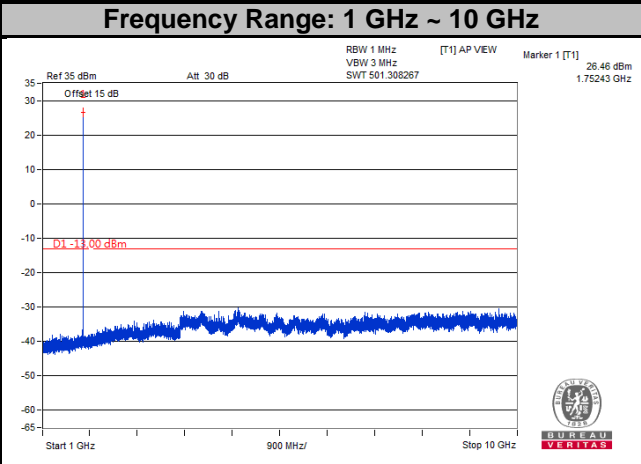
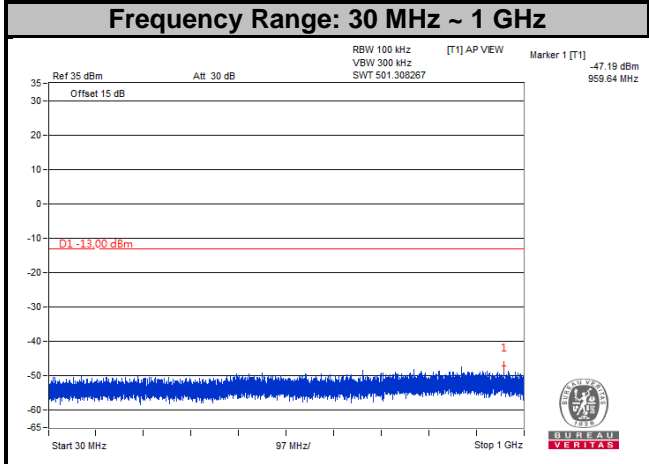


**LTE Band 4**  
**Channel Bandwidth: 3 MHz**  
**Channel 20175**

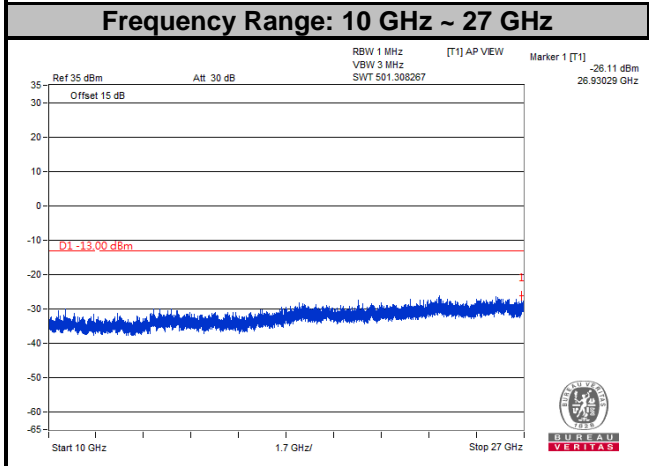
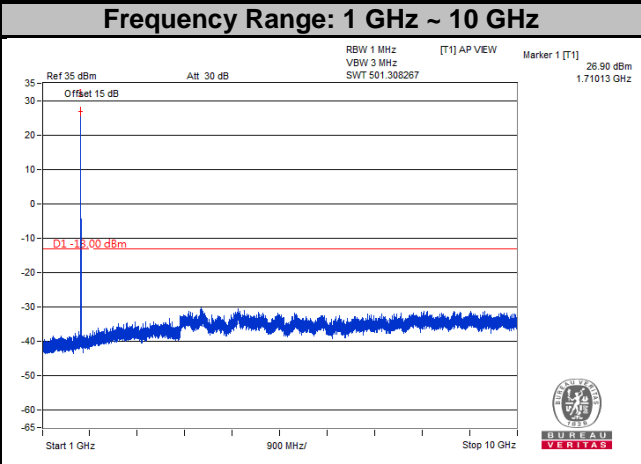
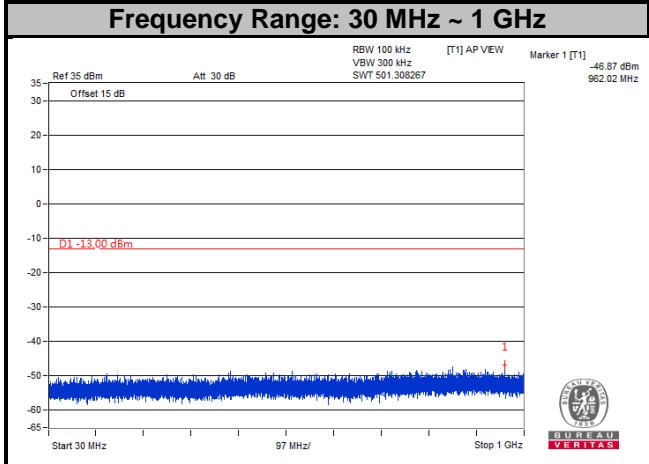




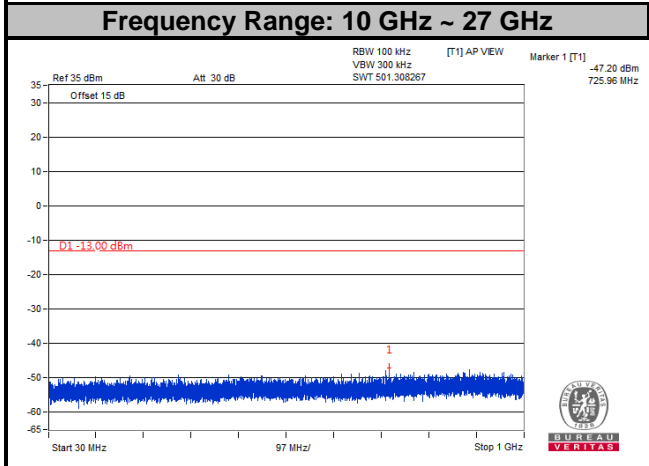
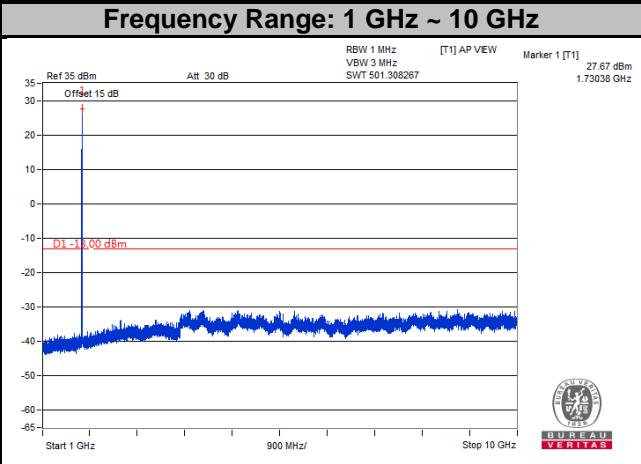
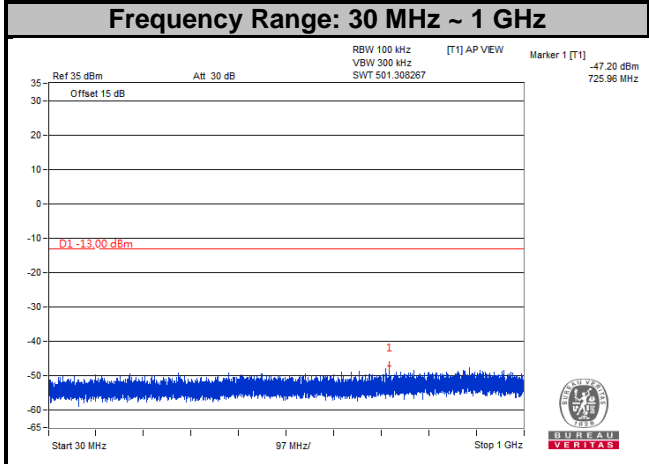
**LTE Band 4**  
**Channel Bandwidth: 3 MHz**  
**Channel 20385**



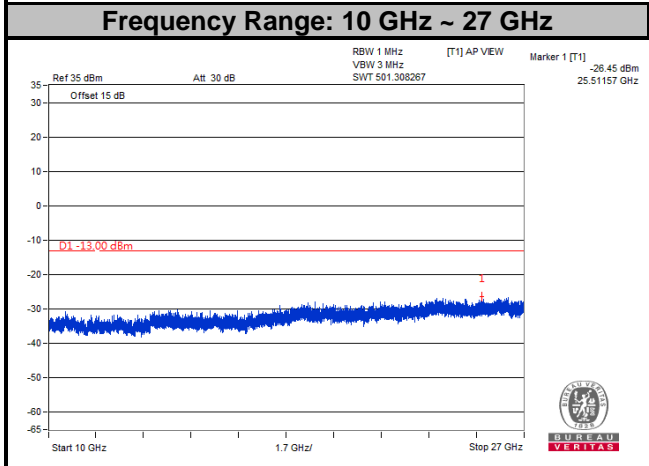
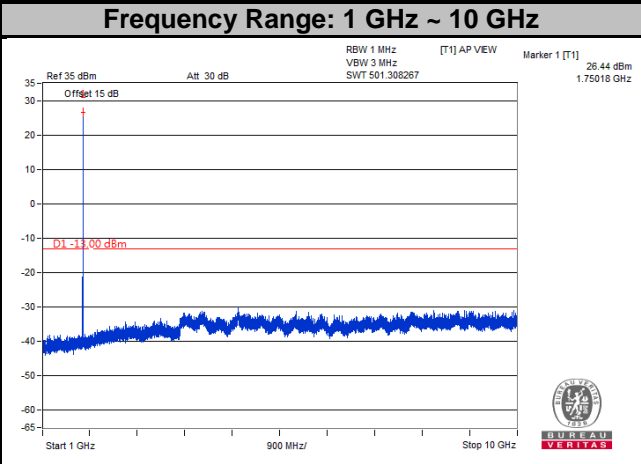
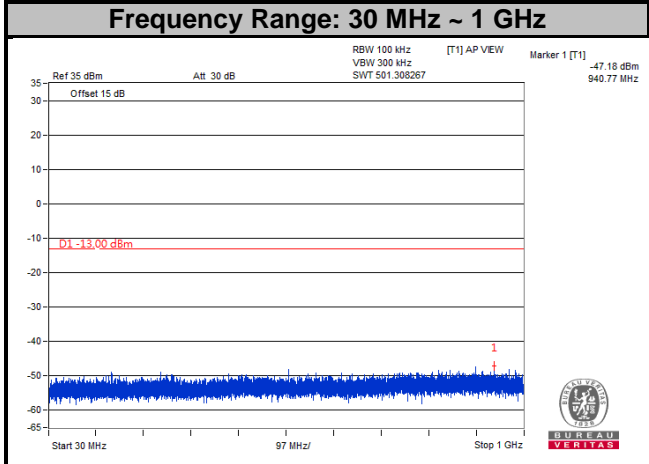
**LTE Band 4**  
**Channel Bandwidth: 5 MHz**  
**Channel 19975**



**LTE Band 4**  
**Channel Bandwidth: 5 MHz**  
**Channel 20175**



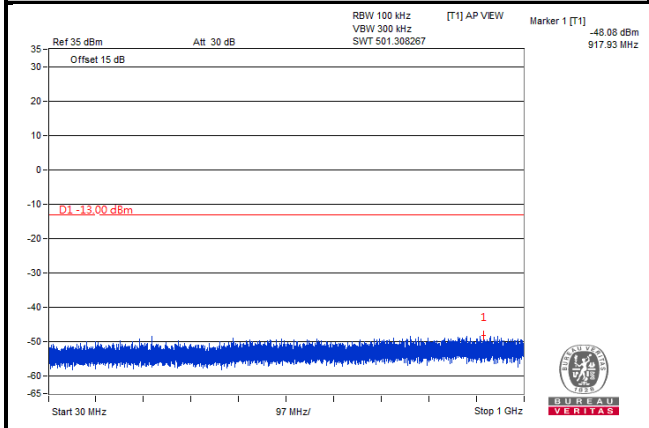
**LTE Band 4**  
**Channel Bandwidth: 5 MHz**  
**Channel 20375**



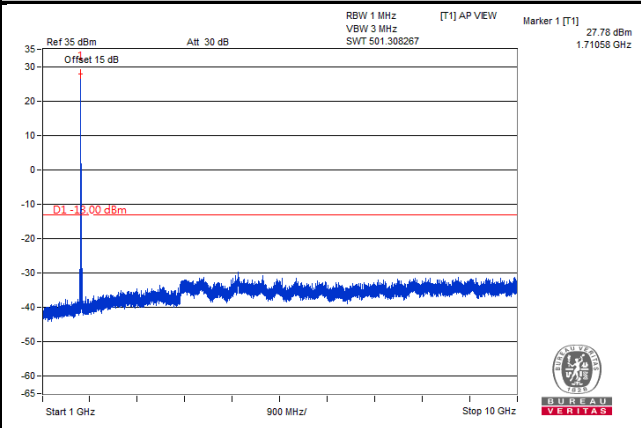
**LTE Band 4**  
**Channel Bandwidth: 10 MHz**

**Channel 20000**

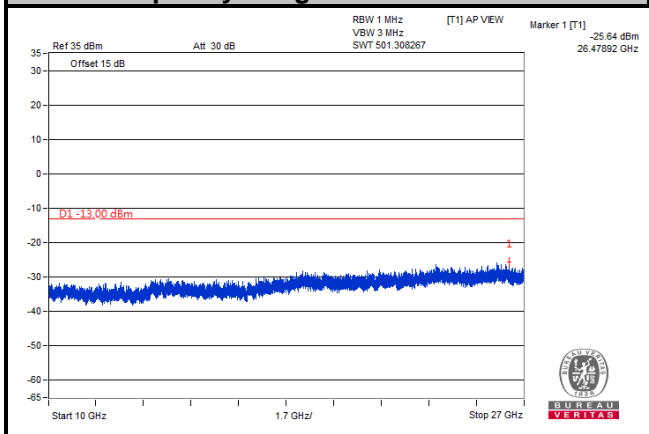
**Frequency Range: 30 MHz ~ 1 GHz**



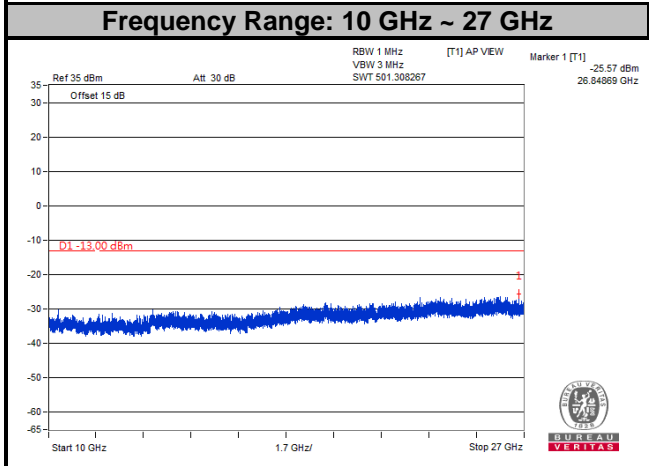
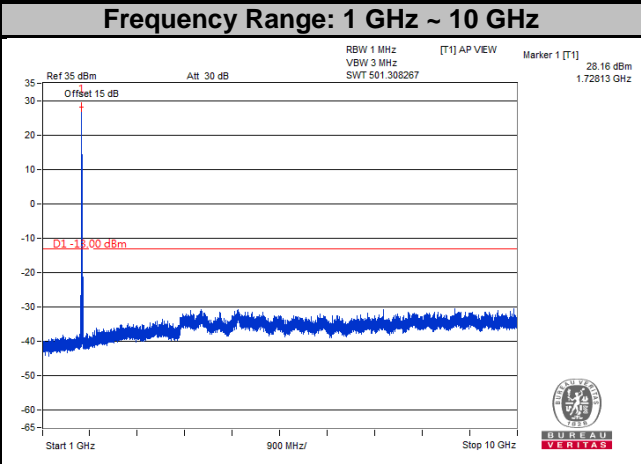
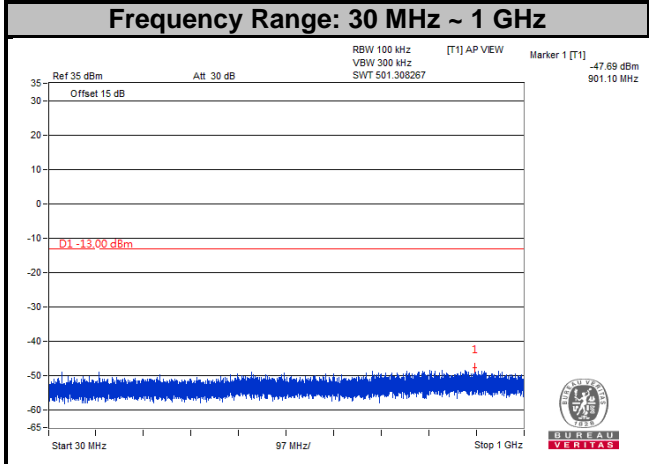
**Frequency Range: 1 GHz ~ 10 GHz**



**Frequency Range: 10 GHz ~ 27 GHz**



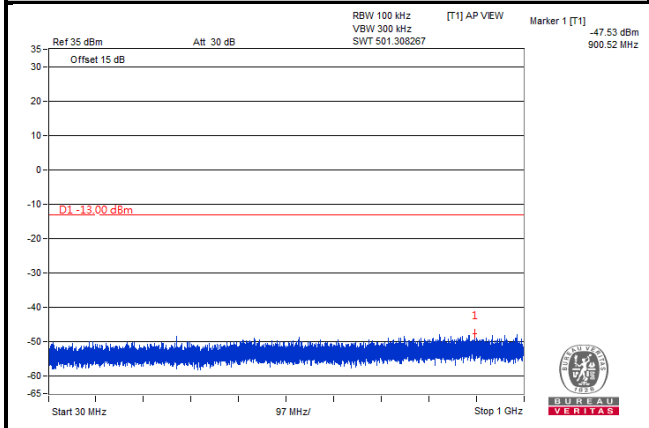
**LTE Band 4**  
**Channel Bandwidth: 10 MHz**  
**Channel 20175**



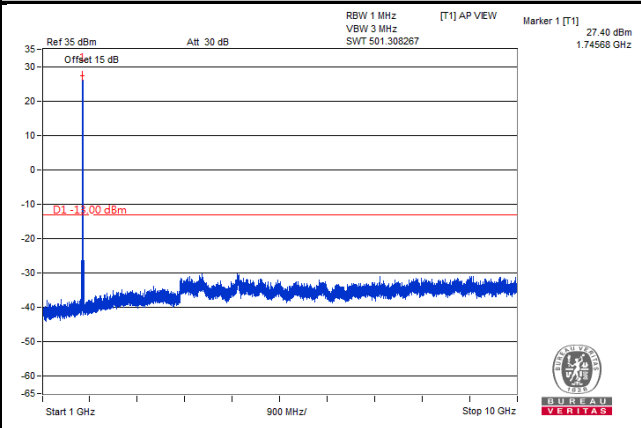
**LTE Band 4**  
**Channel Bandwidth: 10 MHz**

**Channel 20350**

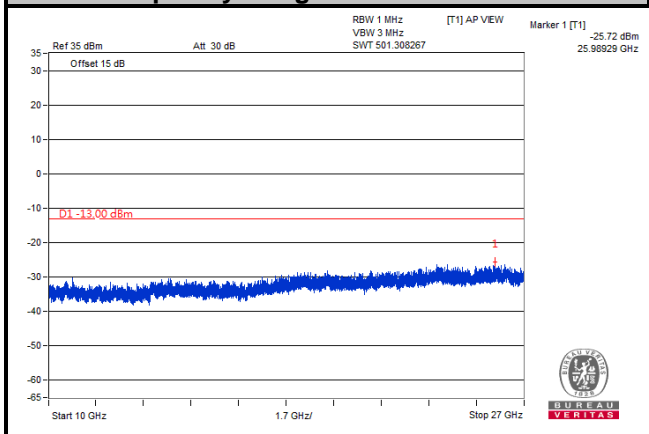
**Frequency Range: 30 MHz ~ 1 GHz**



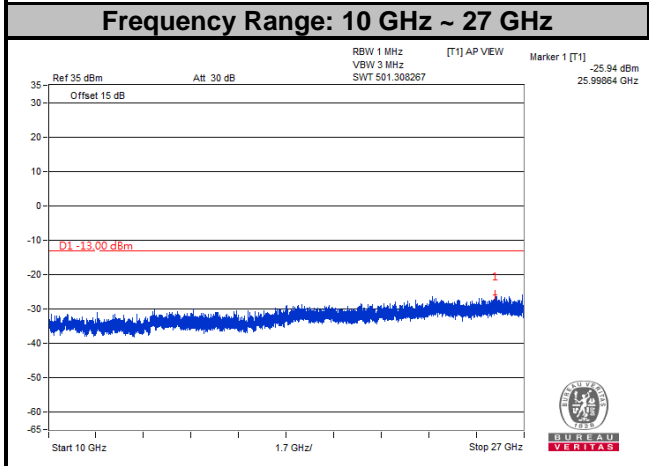
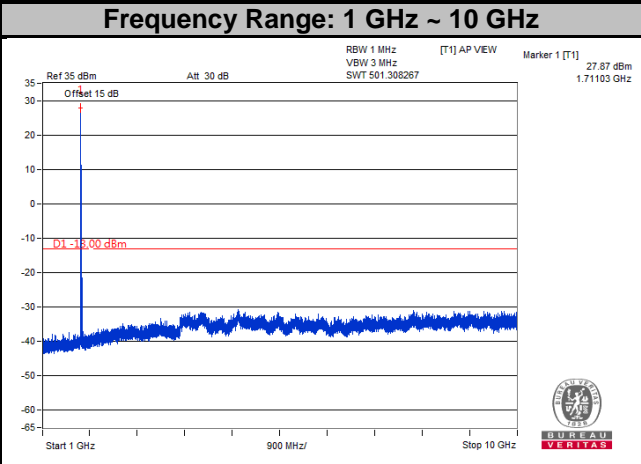
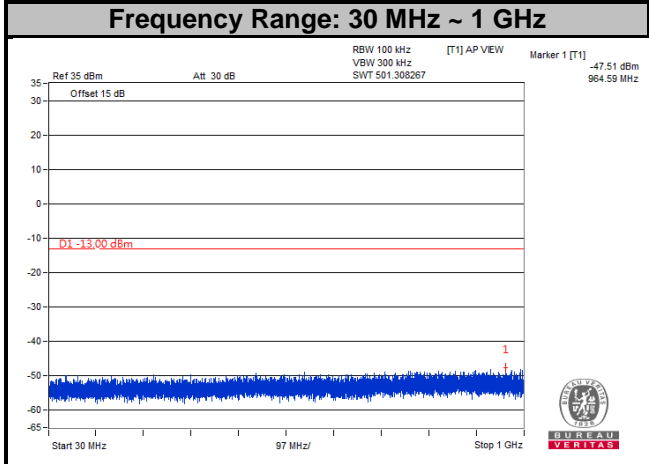
**Frequency Range: 1 GHz ~ 10 GHz**



**Frequency Range: 10 GHz ~ 27 GHz**

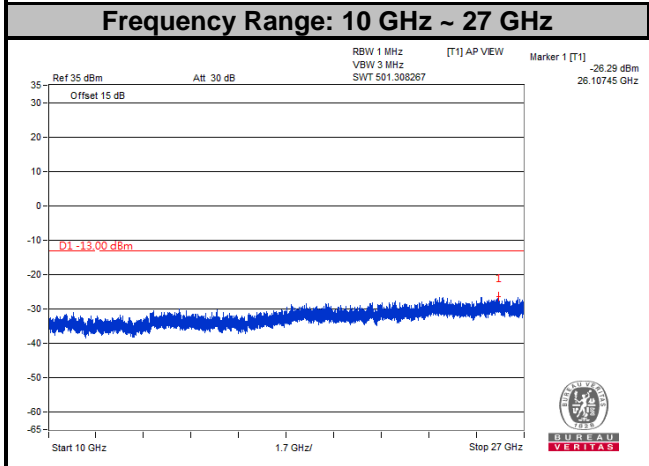
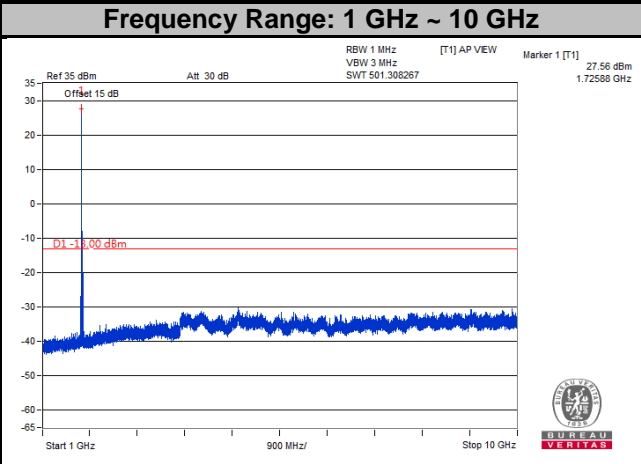
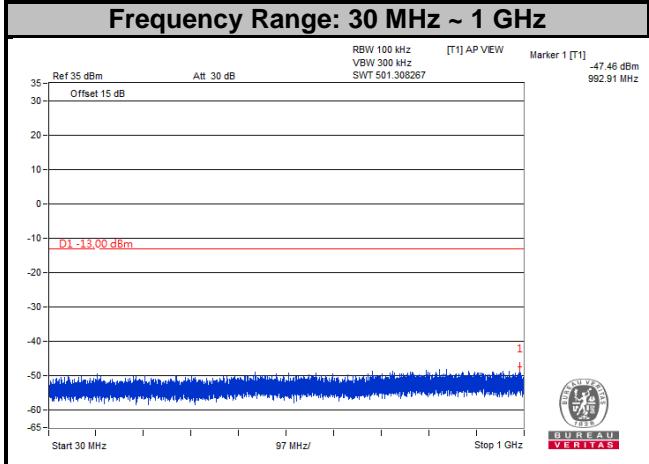


**LTE Band 4**  
**Channel Bandwidth: 15 MHz**  
**Channel 20025**

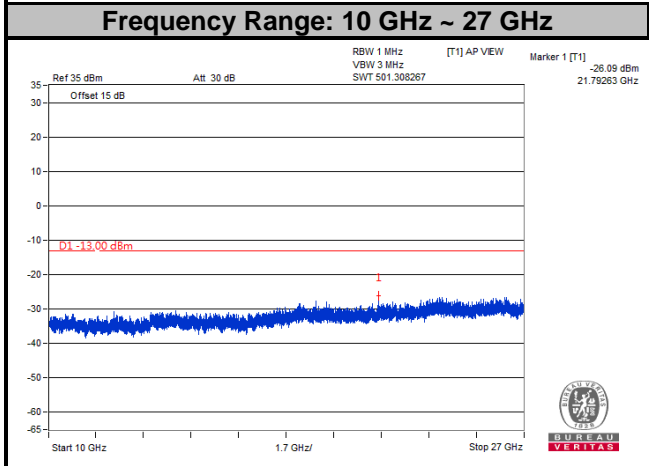
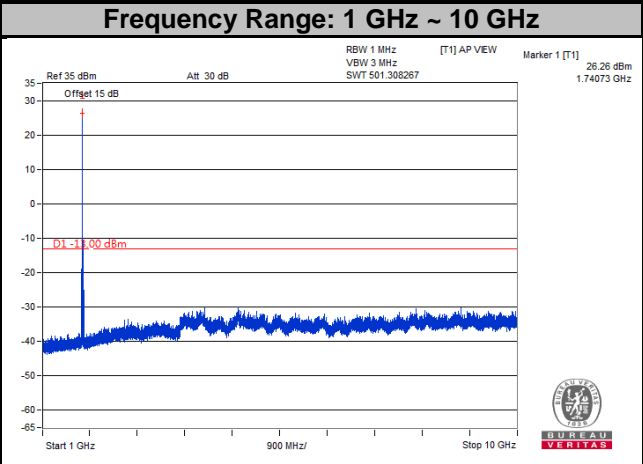
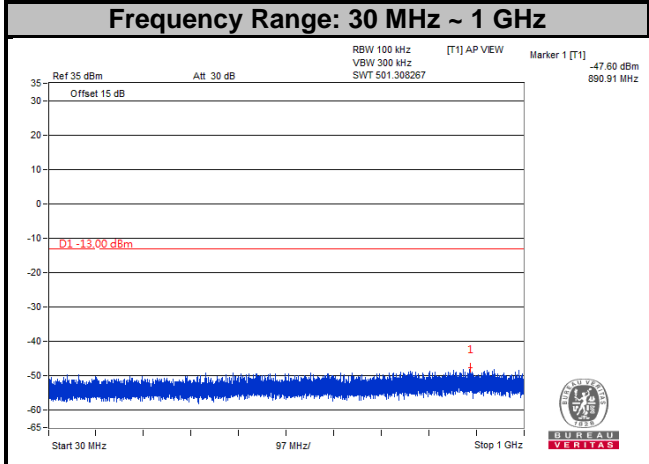




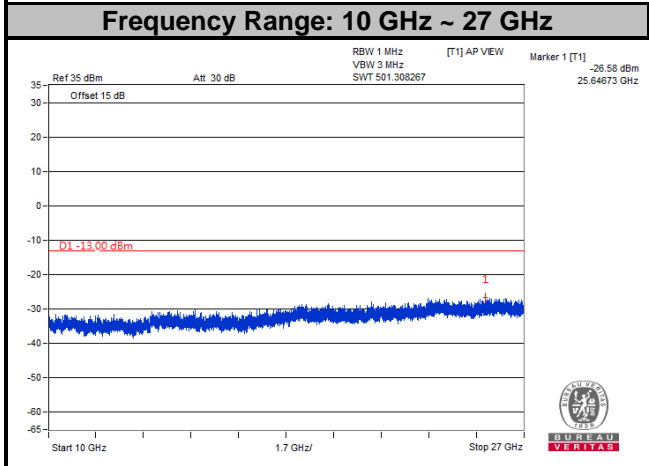
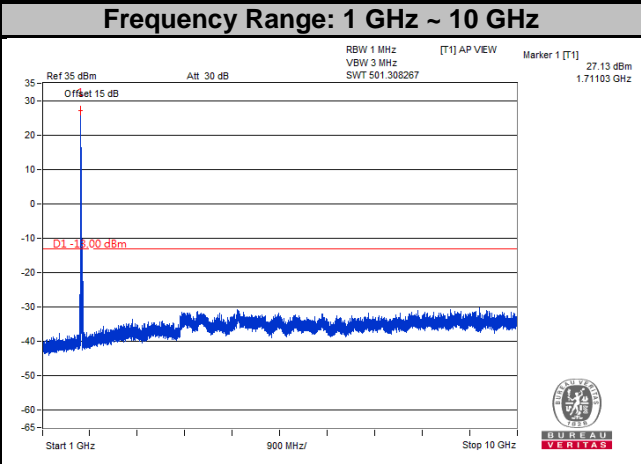
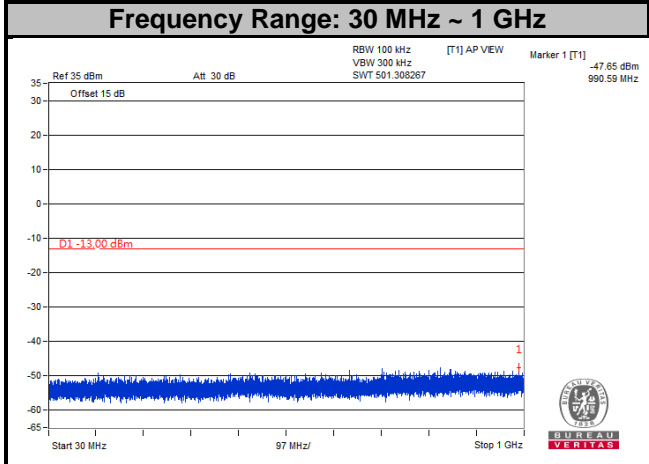
**LTE Band 4**  
**Channel Bandwidth: 15 MHz**  
**Channel 20175**



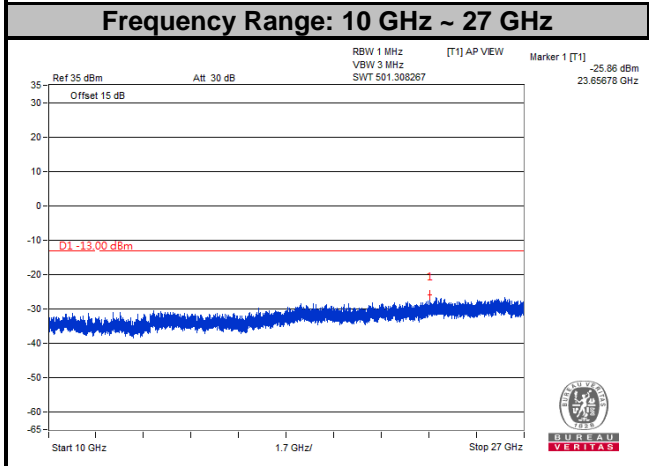
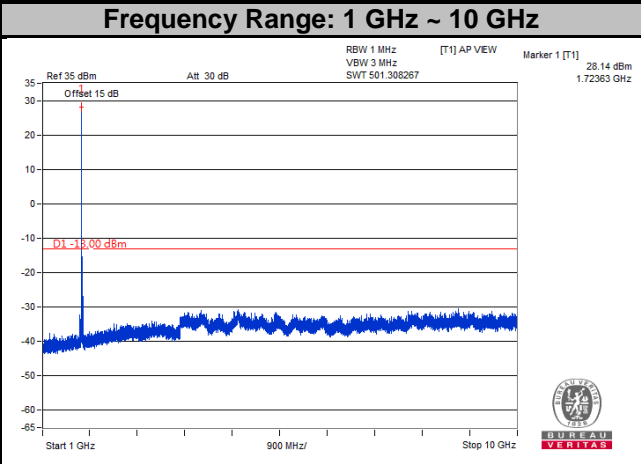
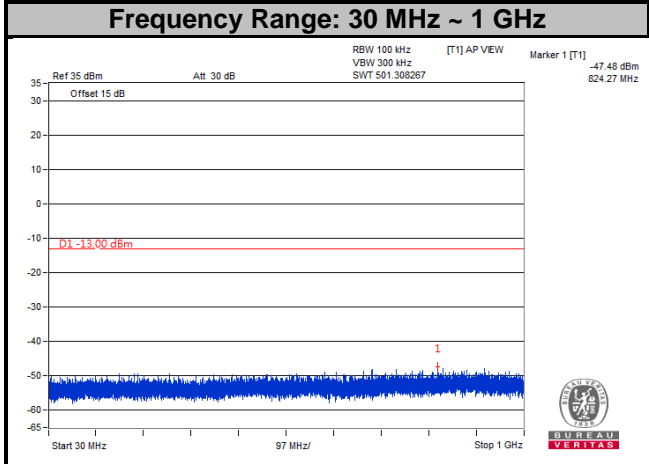
**LTE Band 4**  
**Channel Bandwidth: 15 MHz**  
**Channel 20325**



**LTE Band 4**  
**Channel Bandwidth: 20 MHz**  
**Channel 20050**

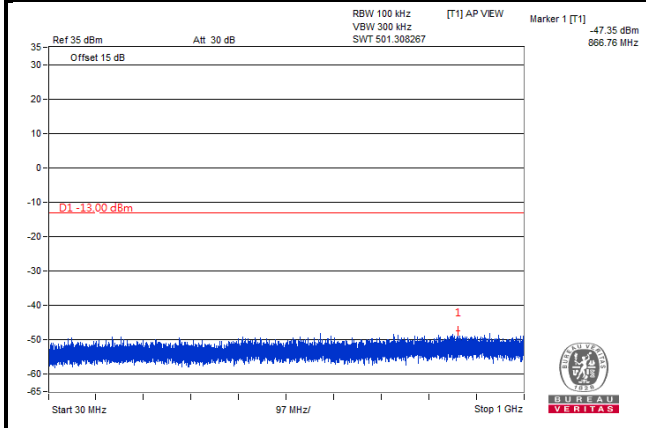


**LTE Band 4**  
**Channel Bandwidth: 20 MHz**  
**Channel 20175**

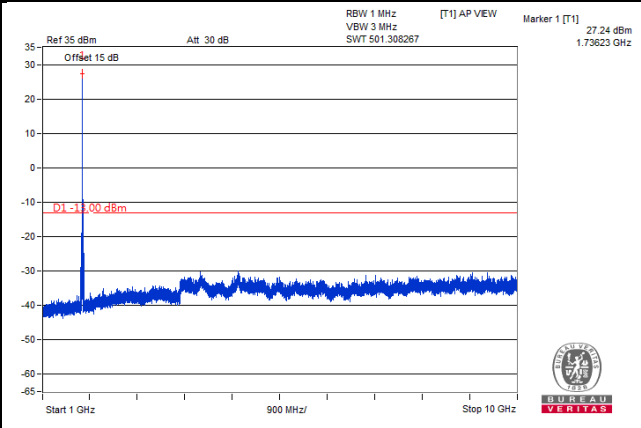


**LTE Band 4**  
**Channel Bandwidth: 20 MHz**  
**Channel 20300**

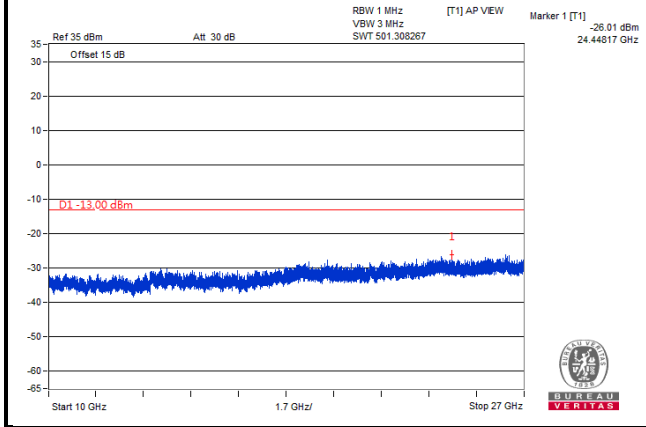
**Frequency Range: 30 MHz ~ 1 GHz**



**Frequency Range: 1 GHz ~ 10 GHz**

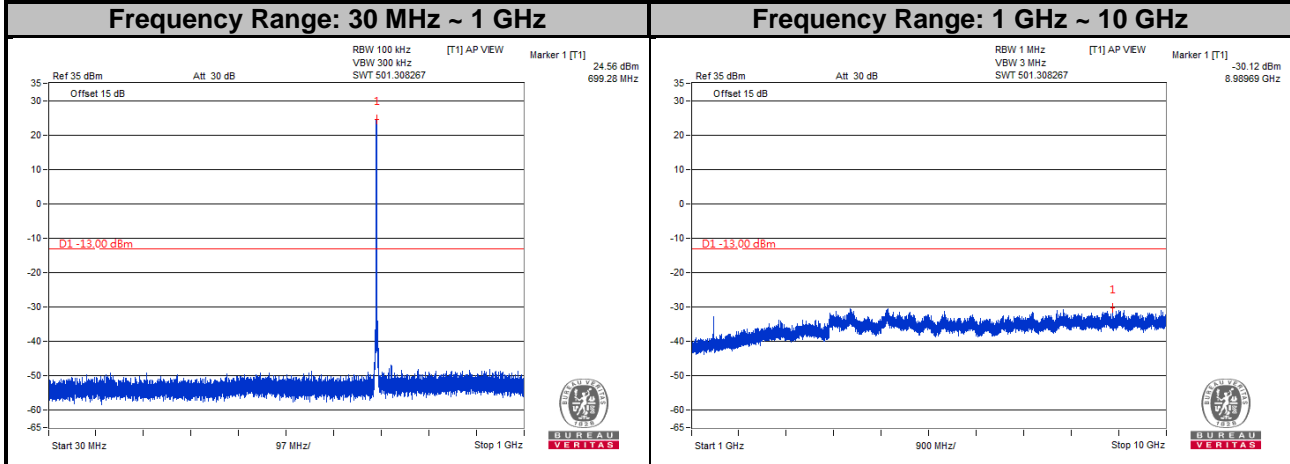


**Frequency Range: 10 GHz ~ 27 GHz**

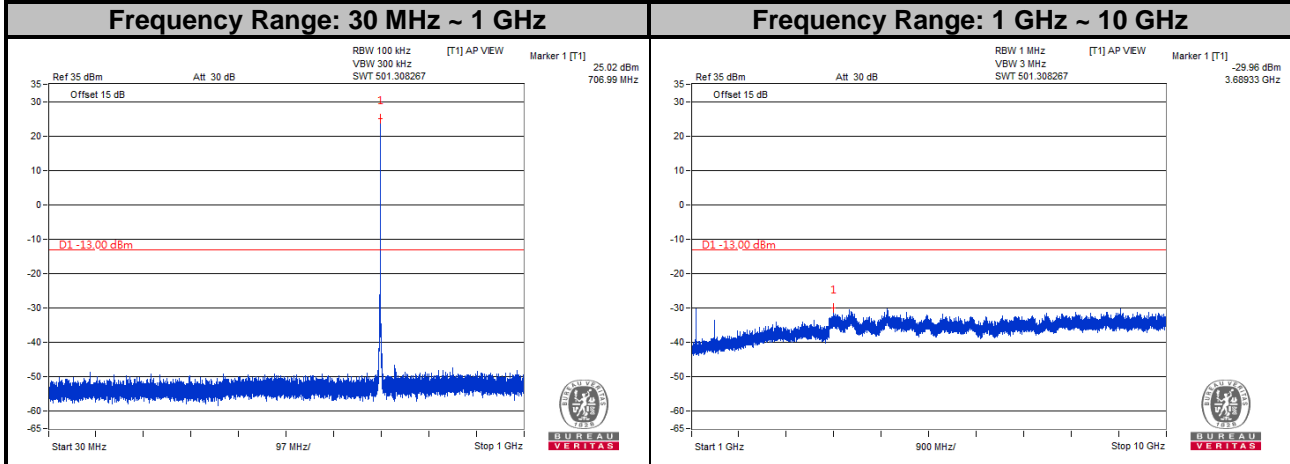


**LTE Band 12**  
**Channel Bandwidth: 1.4 MHz**

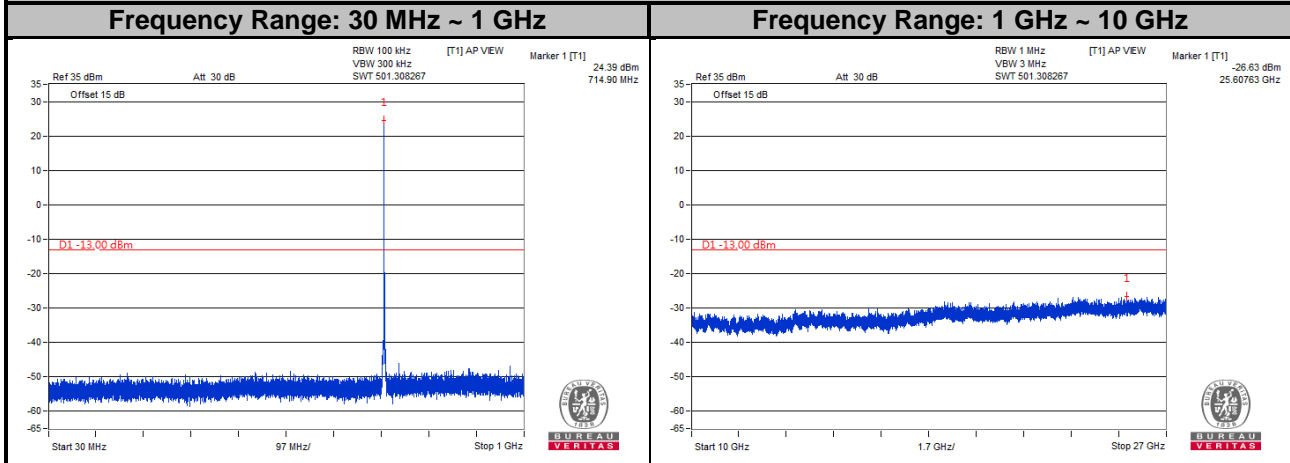
**Channel 23017**



**Channel 23095**



**Channel 23173**



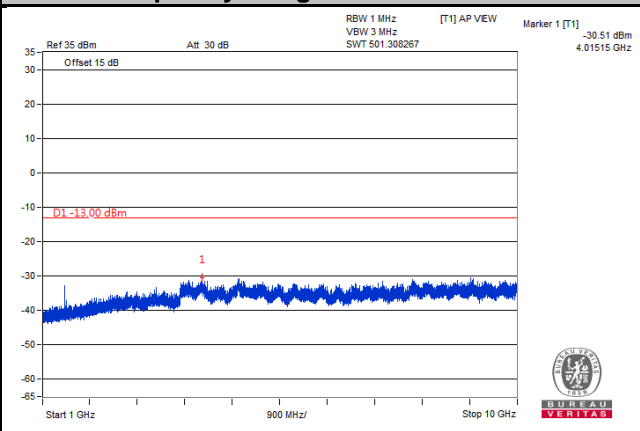
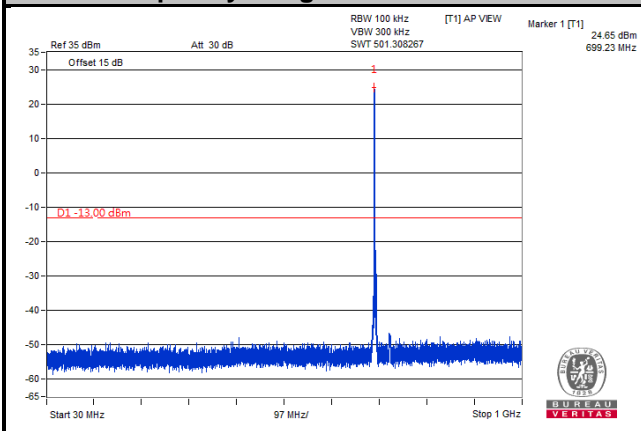
**LTE Band 12**

**Channel Bandwidth: 3 MHz**

**Channel 23025**

**Frequency Range: 30 MHz ~ 1 GHz**

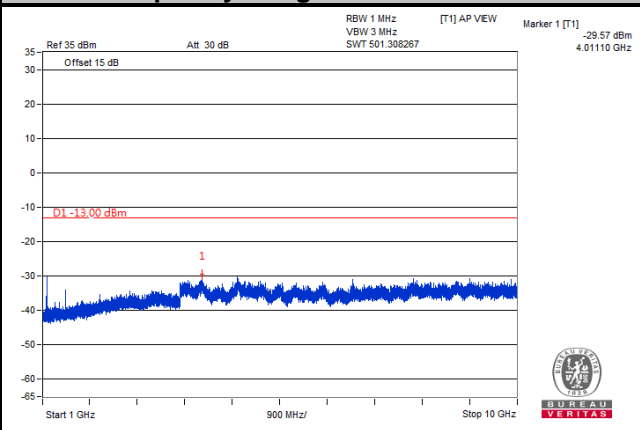
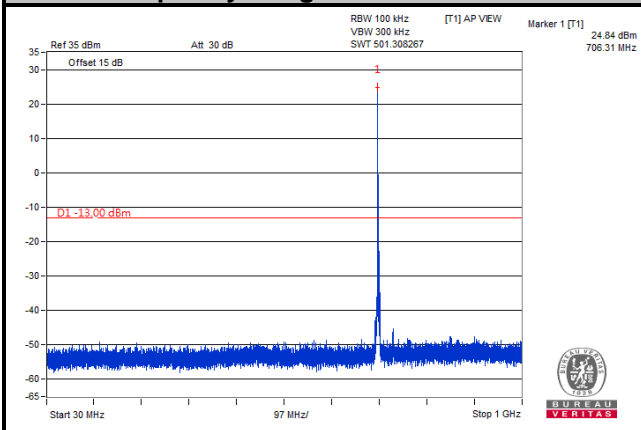
**Frequency Range: 1 GHz ~ 10 GHz**



**Channel 23095**

**Frequency Range: 30 MHz ~ 1 GHz**

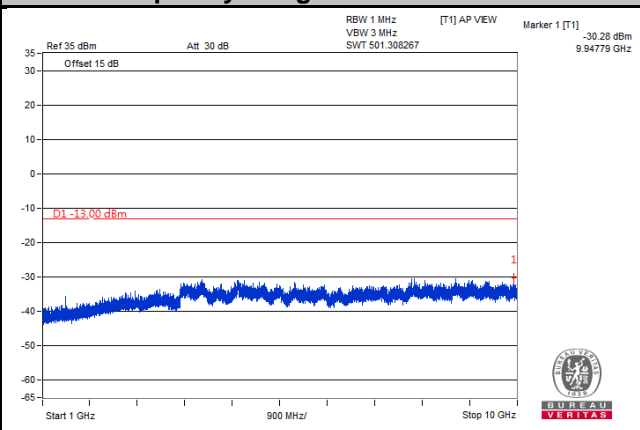
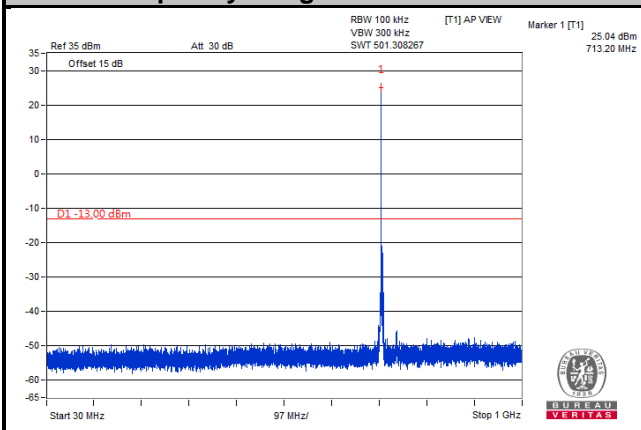
**Frequency Range: 1 GHz ~ 10 GHz**



**Channel 23165**

**Frequency Range: 30 MHz ~ 1 GHz**

**Frequency Range: 1 GHz ~ 10 GHz**

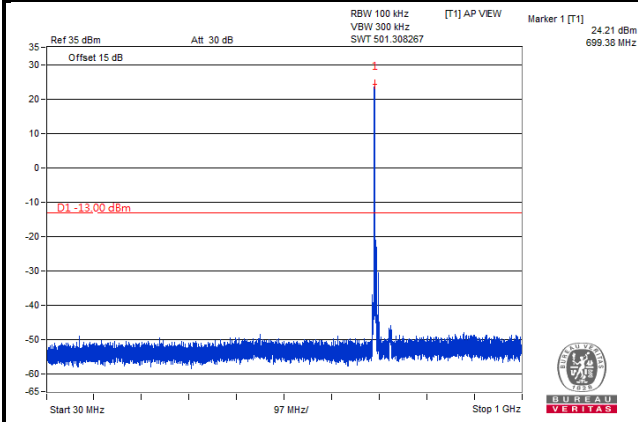


**LTE Band 12**

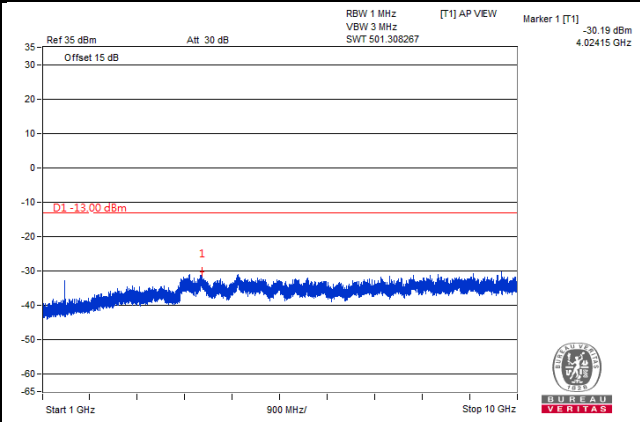
**Channel Bandwidth: 5 MHz**

**Channel 23035**

**Frequency Range: 30 MHz ~ 1 GHz**

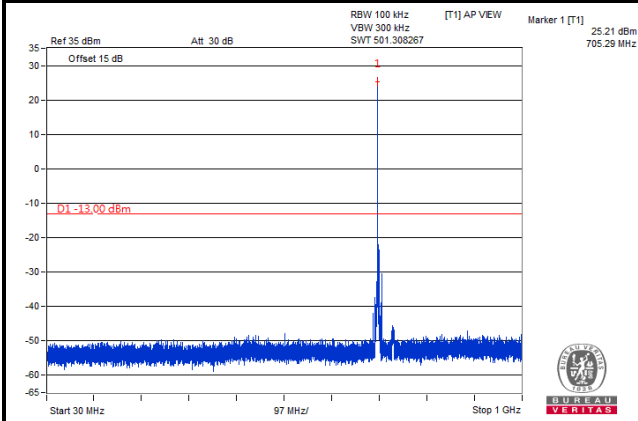


**Frequency Range: 1 GHz ~ 10 GHz**

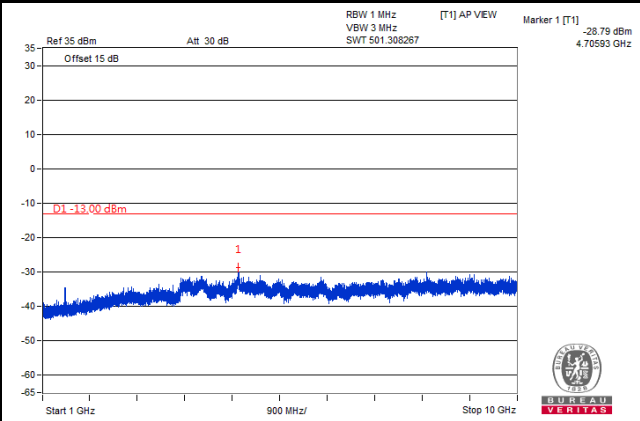


**Channel 23095**

**Frequency Range: 30 MHz ~ 1 GHz**

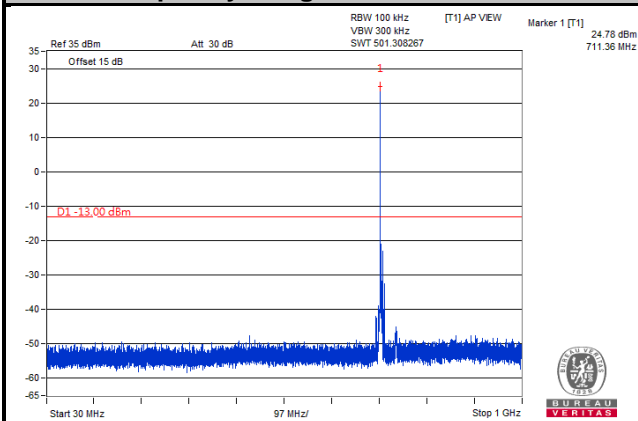


**Frequency Range: 1 GHz ~ 10 GHz**

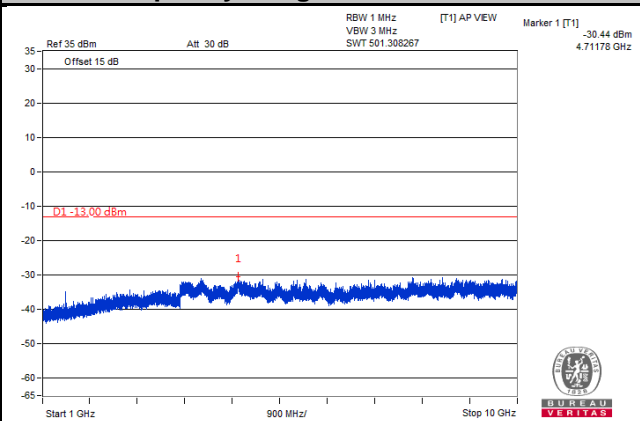


**Channel 23155**

**Frequency Range: 30 MHz ~ 1 GHz**

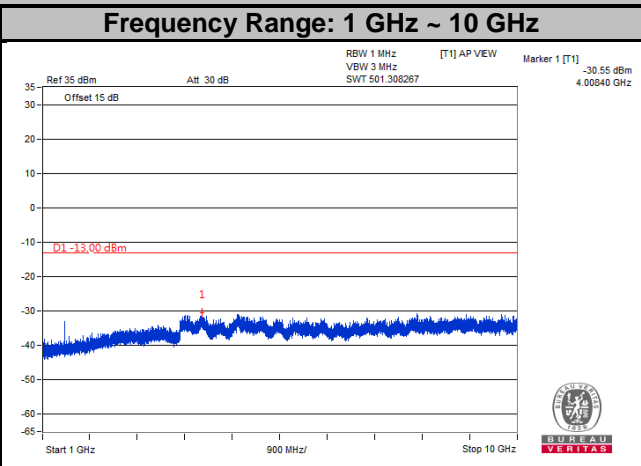
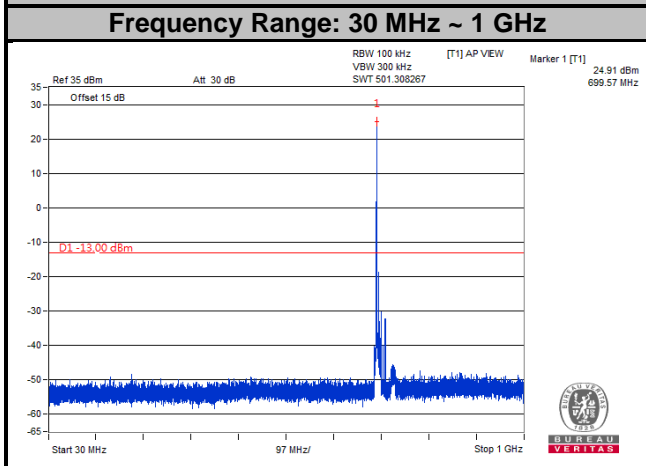


**Frequency Range: 1 GHz ~ 10 GHz**

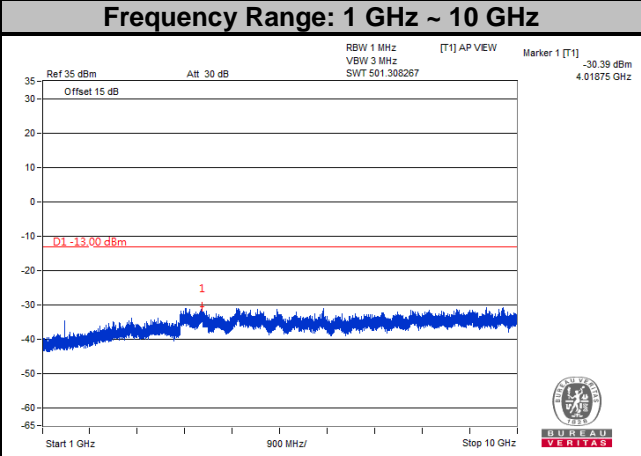
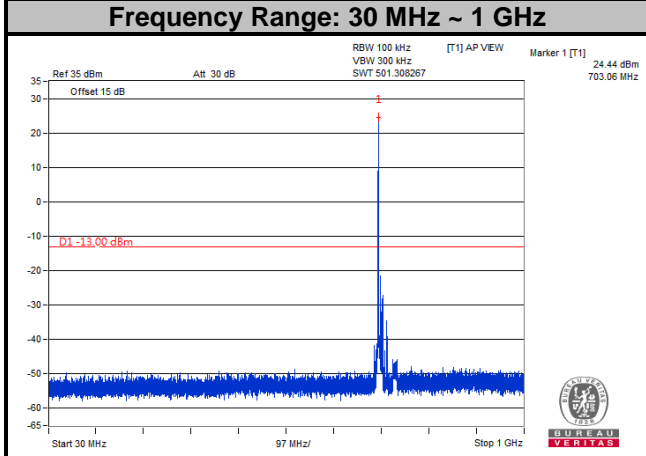




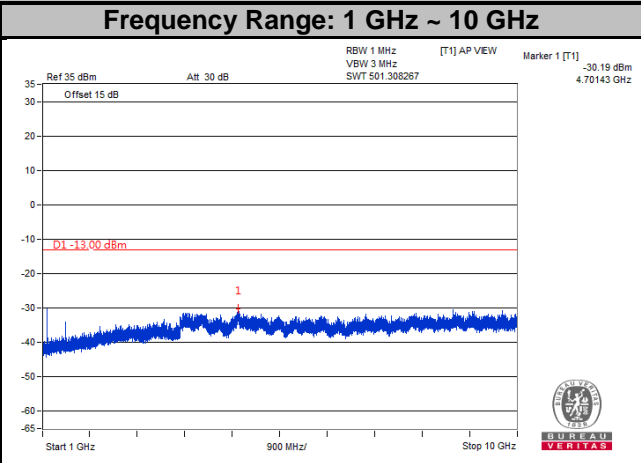
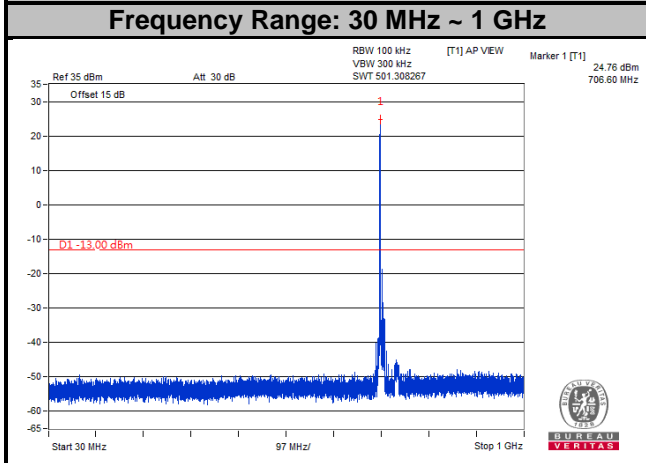
**LTE Band 12**  
**Channel Bandwidth: 10 MHz**  
**Channel 23060**



**Channel 23095**



**Channel 23130**



## 4.7 Radiated Emission Measurement

### 4.7.1 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  $43 + 10 \log_{10}(P)$  dB. The limit of emission is equal to -13 dBm.

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

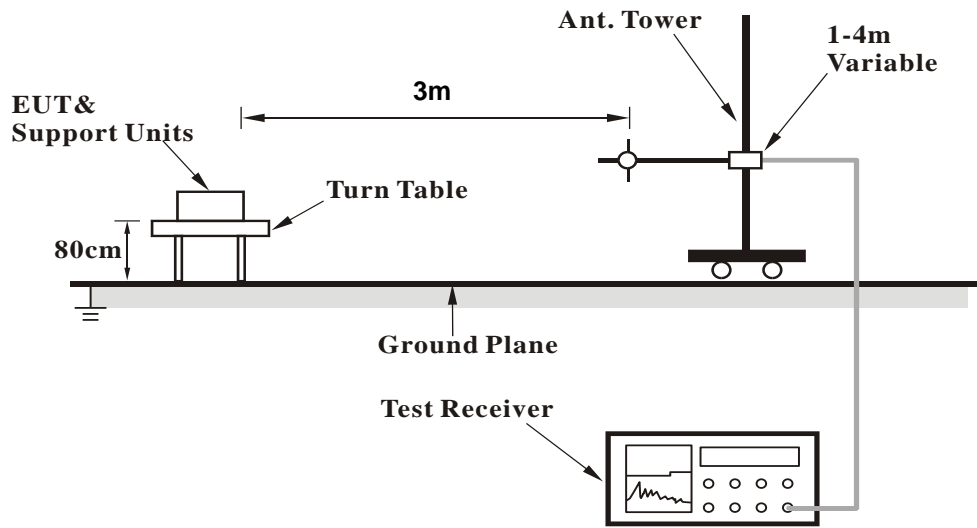
**Note:** The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

### 4.7.3 Deviation from Test Standard

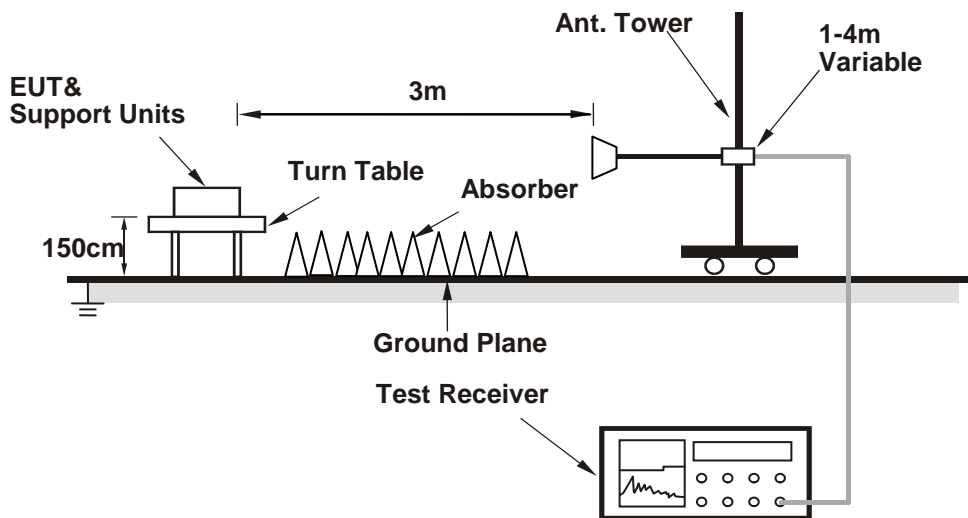
No deviation.

4.7.4 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).

4.7.5 Test Results

**Mode A**

LTE Band 4

Channel Bandwidth: 20 MHz / QPSK

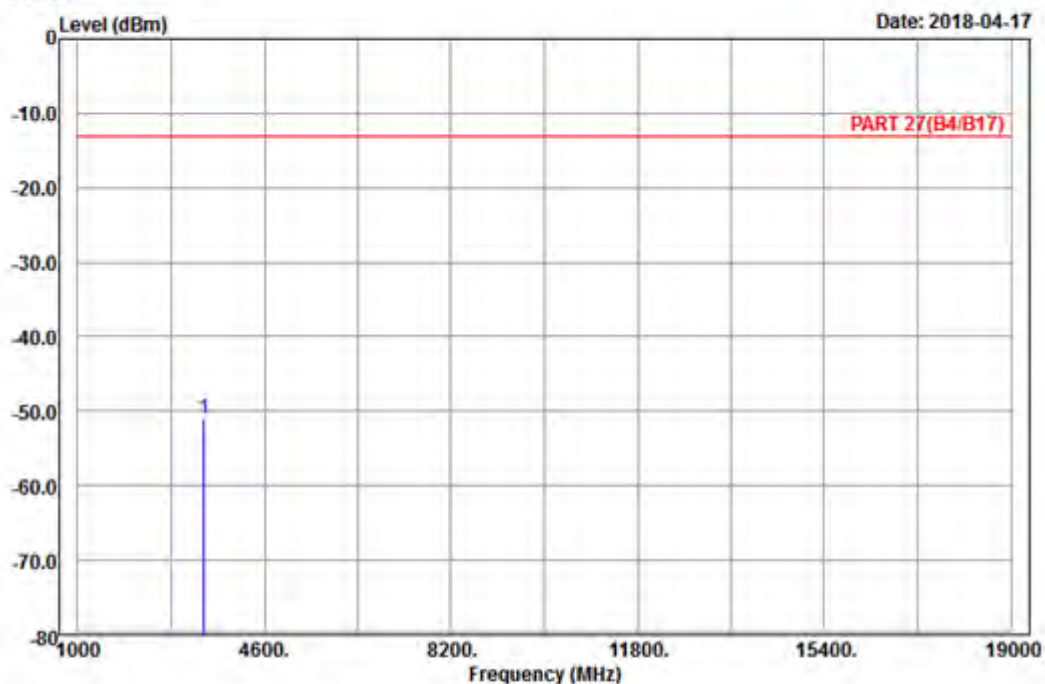
Low Channel



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A D T

Data: 9



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Horizontal  
 Remark : LTE\_Band 4\_Link\_CH20050  
 Tested by: Karl Lee

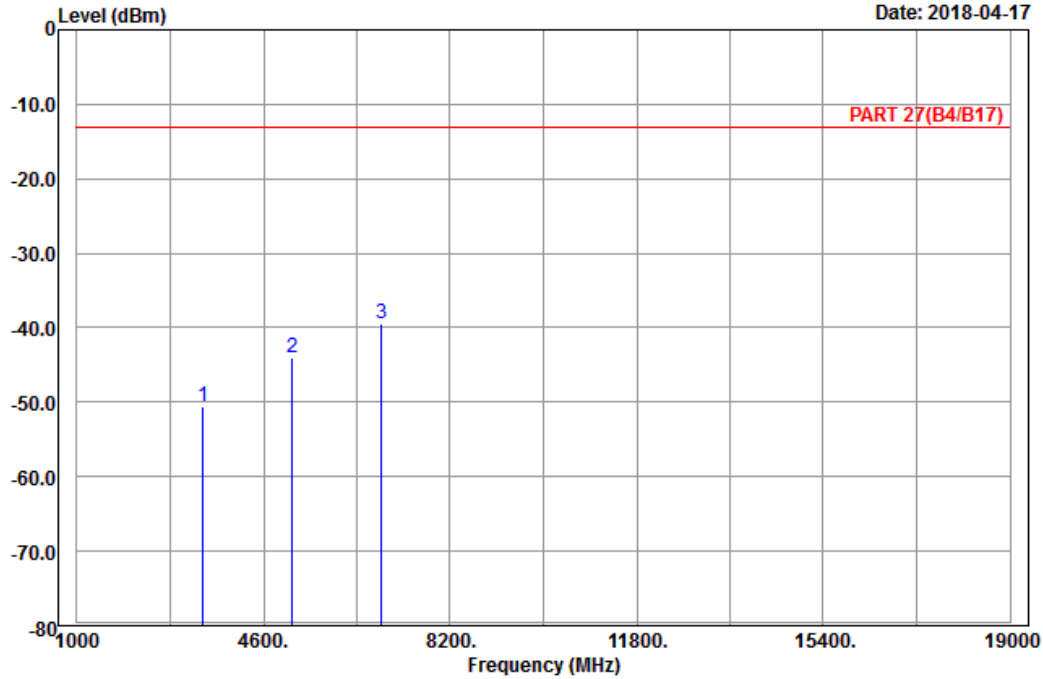
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	pp 3440.00	-51.08	-65.43	-13.00	-38.08	14.35	Peak



A D T

Data: 10

Date: 2018-04-17



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Vertical  
 Remark : LTE\_Band 4\_Link\_CH20050  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3440.00	-50.62	-64.97	-13.00	-37.62	14.35	Peak
2	5160.00	-44.13	-64.05	-13.00	-31.13	19.92	Peak
3 pp	6880.00	-39.44	-62.24	-13.00	-26.44	22.80	Peak

Middle Channel

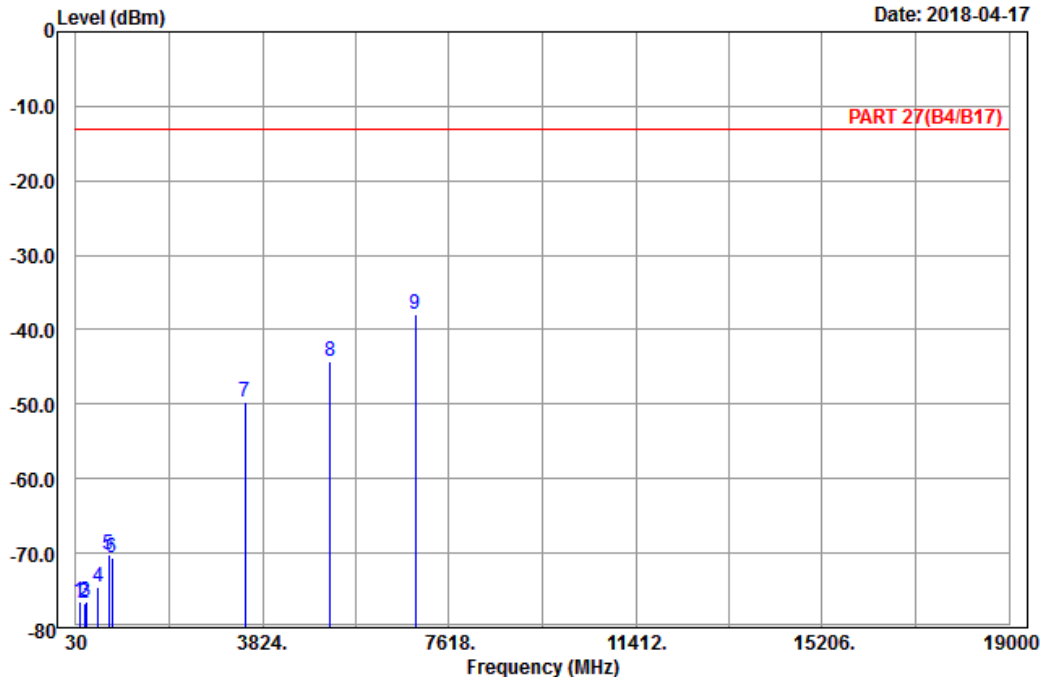


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A D T

Data: 13

Date: 2018-04-17



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Horizontal  
 Remark : LTE\_Band 4\_Link\_CH20175  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	100.74	-76.57	-66.57	-13.00	-63.57	-10.00	Peak
2	209.01	-76.67	-70.62	-13.00	-63.67	-6.05	Peak
3	241.95	-76.50	-70.89	-13.00	-63.50	-5.61	Peak
4	480.60	-74.49	-69.76	-13.00	-61.49	-4.73	Peak
5	694.10	-70.26	-69.91	-13.00	-57.26	-0.35	Peak
6	771.10	-70.72	-70.81	-13.00	-57.72	0.09	Peak
7	3465.00	-49.81	-64.15	-13.00	-36.81	14.34	Peak
8	5197.50	-44.17	-64.29	-13.00	-31.17	20.12	Peak
9 pp	6930.00	-37.95	-60.82	-13.00	-24.95	22.87	Peak

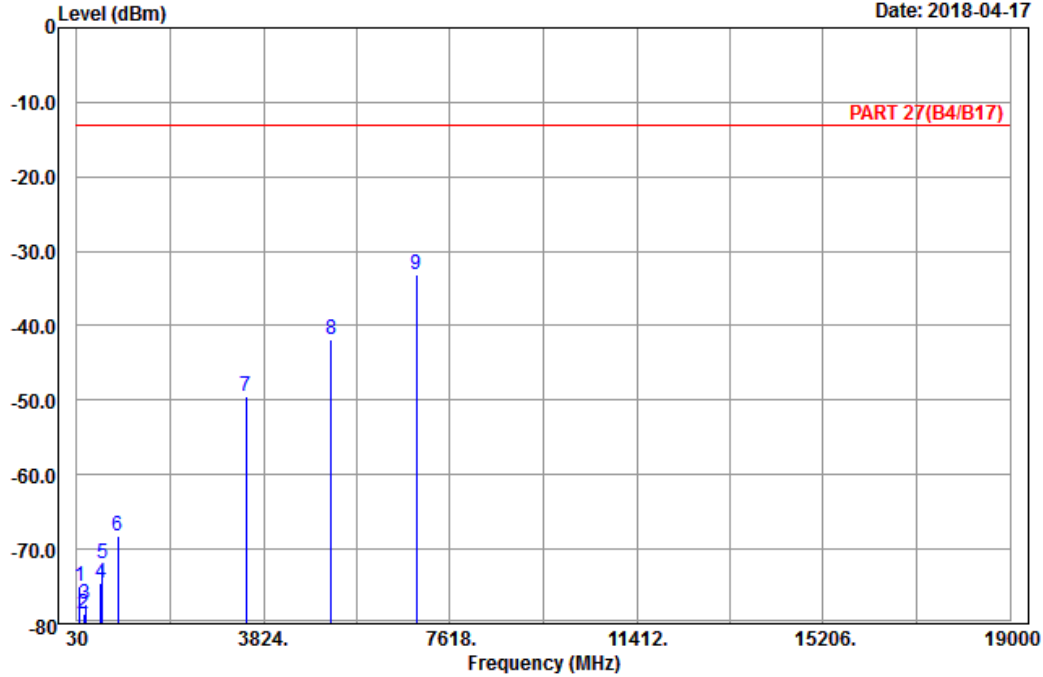


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A D T

Data: 14

Date: 2018-04-17



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Vertical  
 Remark : LTE\_Band 4\_Link\_CH20175  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	88.86	-74.97	-64.19	-13.00	-61.97	-10.78	Peak
2	169.86	-78.73	-72.02	-13.00	-65.73	-6.71	Peak
3	197.40	-77.36	-71.27	-13.00	-64.36	-6.09	Peak
4	522.60	-74.48	-70.83	-13.00	-61.48	-3.65	Peak
5	544.30	-72.04	-69.95	-13.00	-59.04	-2.09	Peak
6	857.90	-68.12	-69.82	-13.00	-55.12	1.70	Peak
7	3465.00	-49.46	-63.80	-13.00	-36.46	14.34	Peak
8	5197.50	-41.89	-62.01	-13.00	-28.89	20.12	Peak
9 pp	6930.00	-33.18	-56.05	-13.00	-20.18	22.87	Peak

# High Channel

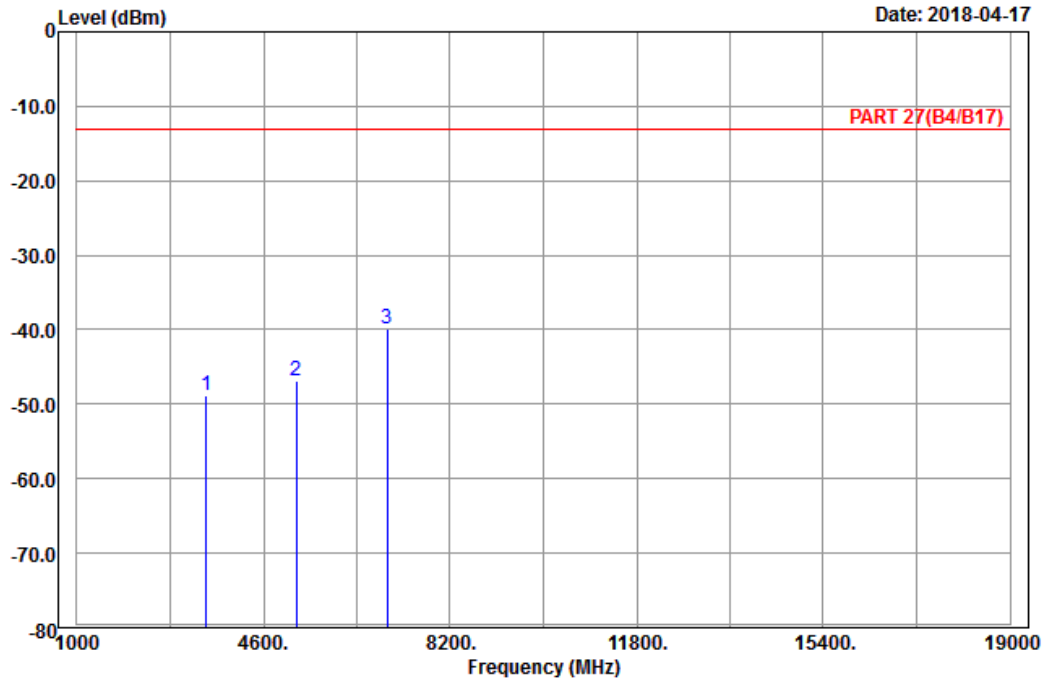


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A D T

Data: 9

Date: 2018-04-17



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Horizontal  
 Remark : LTE\_Band 4\_Link\_CH20300  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3490.00	-48.81	-63.12	-13.00	-35.81	14.31	Peak
2	5235.00	-46.87	-67.03	-13.00	-33.87	20.16	Peak
3 pp	6980.00	-39.87	-62.56	-13.00	-26.87	22.69	Peak

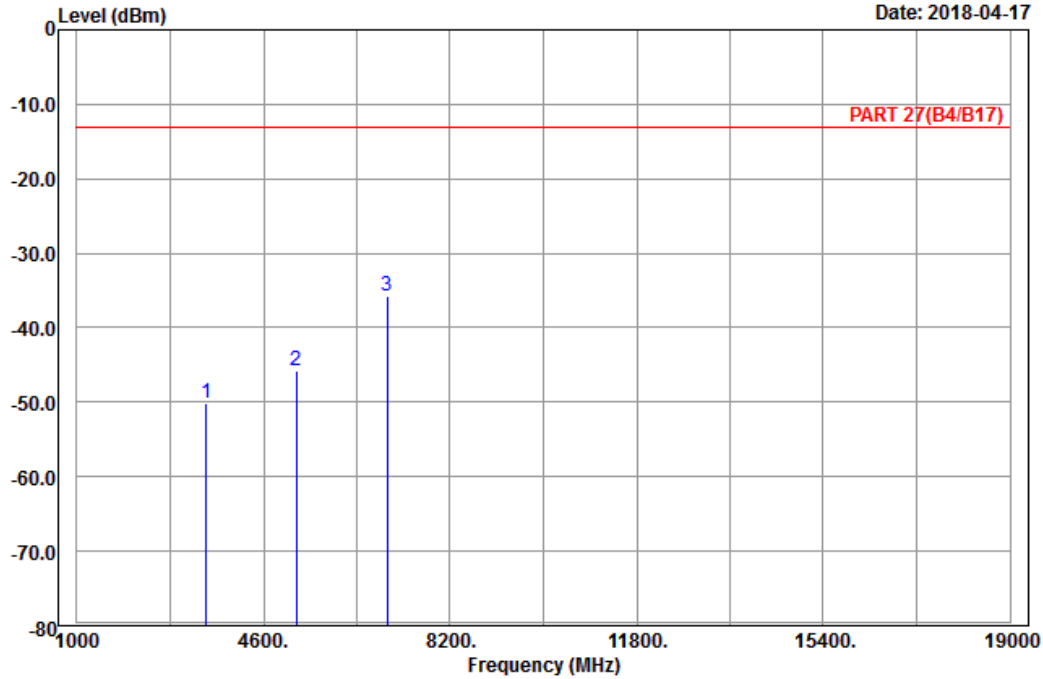




A D T

Data: 10

Date: 2018-04-17



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Vertical  
 Remark : LTE\_Band 4\_Link\_CH20300  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3490.00	-50.21	-64.52	-13.00	-37.21	14.31	Peak
2	5235.00	-45.81	-65.97	-13.00	-32.81	20.16	Peak
3 pp	6980.00	-35.66	-58.35	-13.00	-22.66	22.69	Peak

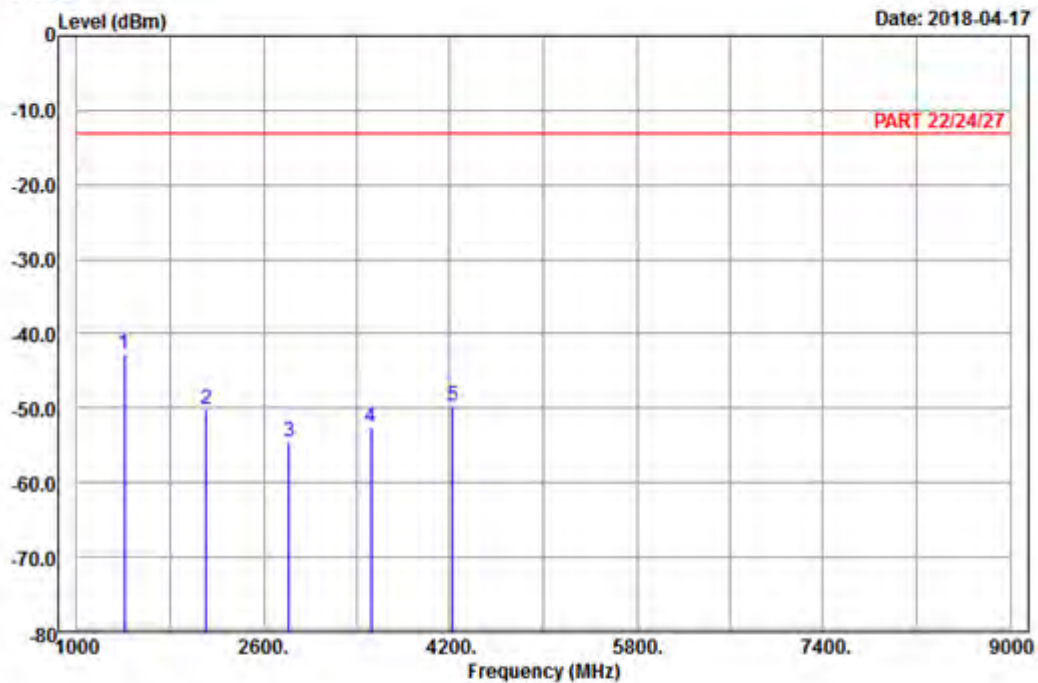
LTE Band 12  
Channel Bandwidth: 10 MHz / QPSK  
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5



Site : 966 chamber 1  
Condition: PART 22/24/27 Horizontal  
Remark : LTE\_Band 12\_Link\_CH23060  
Tested by: Karl Lee

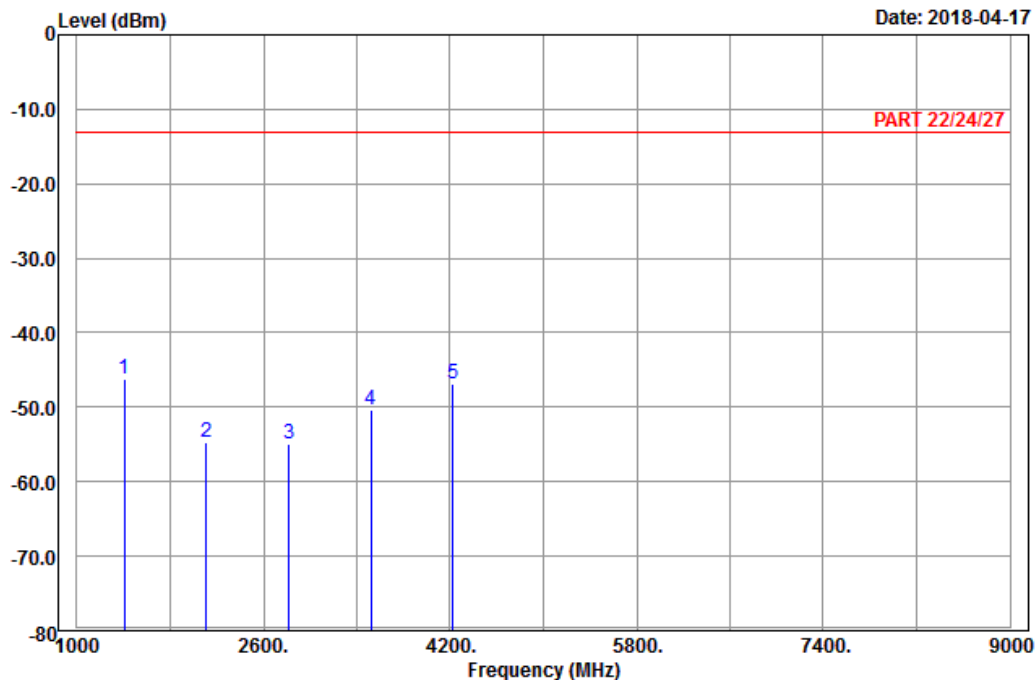
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1408.00	-42.71	-49.07	-13.00	-29.71	6.36	Peak
2	2112.00	-50.21	-61.32	-13.00	-37.21	11.11	Peak
3	2816.00	-54.54	-67.41	-13.00	-41.54	12.87	Peak
4	3520.00	-52.53	-67.11	-13.00	-39.53	14.58	Peak
5	4224.00	-49.80	-67.08	-13.00	-36.80	17.28	Peak



A D T

Data: 6

Date: 2018-04-17



Site : 966 chamber 1  
 Condition: PART 22/24/27 Vertical  
 Remark : LTE\_Band 12\_Link\_CH23060  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1 pp	1408.00	-46.31	-52.67	-13.00	-33.31	6.36	Peak
2	2112.00	-54.66	-65.77	-13.00	-41.66	11.11	Peak
3	2816.00	-55.02	-67.89	-13.00	-42.02	12.87	Peak
4	3520.00	-50.29	-64.87	-13.00	-37.29	14.58	Peak
5	4224.00	-46.84	-64.12	-13.00	-33.84	17.28	Peak

Middle Channel

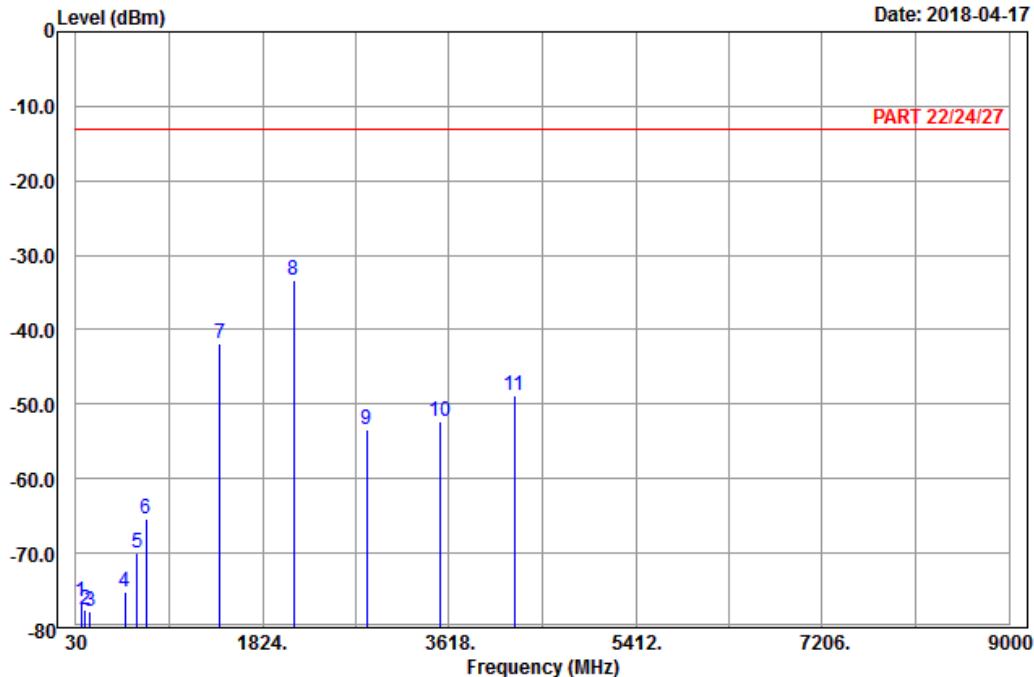


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2018-04-17



Site : 966 chamber 1  
 Condition: PART 22/24/27 Horizontal  
 Remark : LTE\_Band 12\_Link\_CH23095  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	81.84	-76.44	-64.78	-13.00	-63.44	-11.66	Peak
2	120.18	-77.65	-69.40	-13.00	-64.65	-8.25	Peak
3	167.43	-77.88	-70.98	-13.00	-64.88	-6.90	Peak
4	498.10	-75.16	-69.93	-13.00	-62.16	-5.23	Peak
5	619.90	-70.00	-70.21	-13.00	-57.00	0.21	Peak
6	704.60	-65.38	-64.93	-13.00	-52.38	-0.45	Peak
7	1415.00	-41.84	-48.20	-13.00	-28.84	6.36	Peak
8 pp	2122.50	-33.29	-44.40	-13.00	-20.29	11.11	Peak
9	2830.00	-53.51	-66.48	-13.00	-40.51	12.97	Peak
10	3537.50	-52.36	-67.25	-13.00	-39.36	14.89	Peak
11	4245.00	-48.74	-66.10	-13.00	-35.74	17.36	Peak

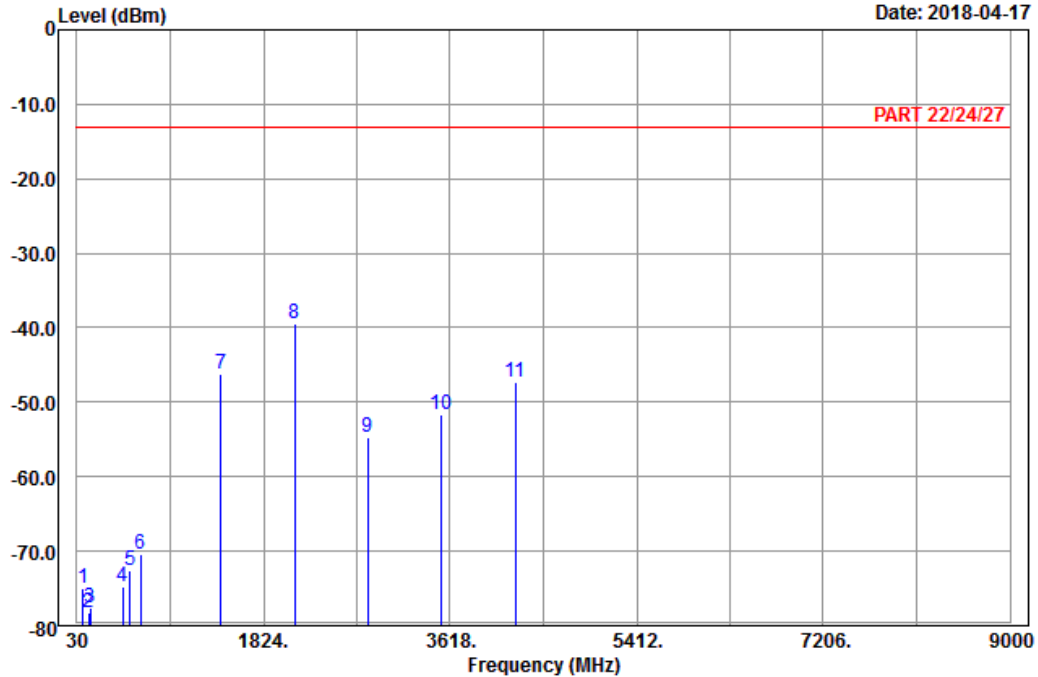


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-04-17



Site : 966 chamber 1  
 Condition: PART 22/24/27 Vertical  
 Remark : LTE\_Band 12\_Link\_CH23095  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	85.08	-75.04	-63.82	-13.00	-62.04	-11.22	Peak
2	142.05	-78.30	-70.54	-13.00	-65.30	-7.76	Peak
3	160.68	-77.57	-70.00	-13.00	-64.57	-7.57	Peak
4	470.80	-74.69	-70.26	-13.00	-61.69	-4.43	Peak
5	539.40	-72.59	-70.15	-13.00	-59.59	-2.44	Peak
6	643.70	-70.31	-70.24	-13.00	-57.31	-0.07	Peak
7	1415.00	-46.16	-52.52	-13.00	-33.16	6.36	Peak
8	pp 2122.50	-39.45	-50.56	-13.00	-26.45	11.11	Peak
9	2830.00	-54.64	-67.61	-13.00	-41.64	12.97	Peak
10	3537.50	-51.74	-66.63	-13.00	-38.74	14.89	Peak
11	4245.00	-47.25	-64.61	-13.00	-34.25	17.36	Peak

# High Channel

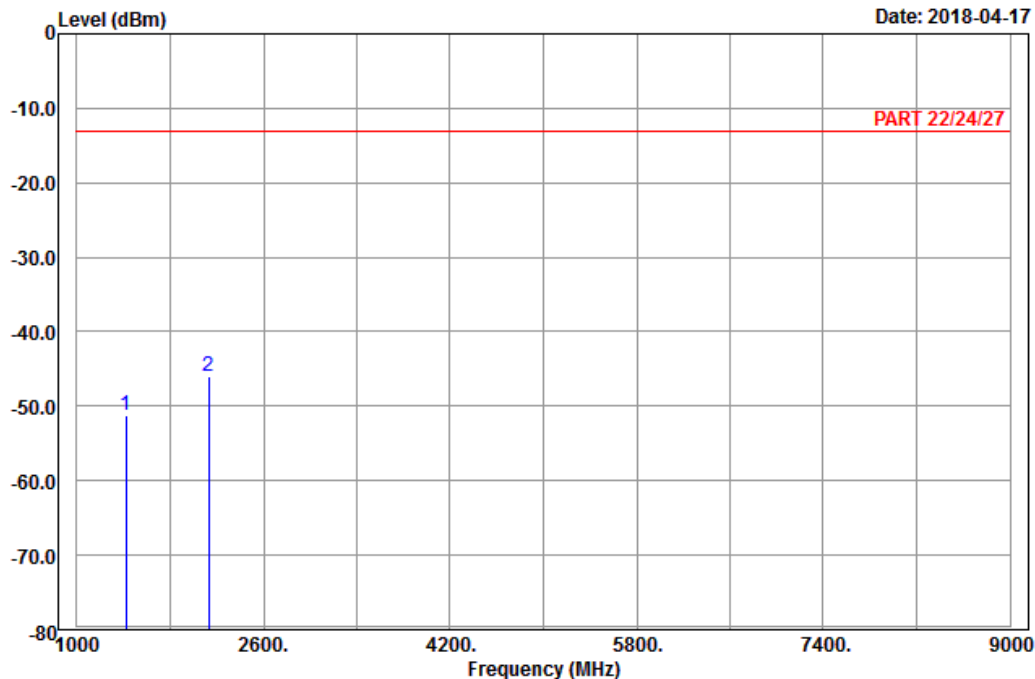


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5

Date: 2018-04-17



Site : 966 chamber 1  
 Condition: PART 22/24/27 Horizontal  
 Remark : LTE\_Band 12\_Link\_CH23130  
 Tested by: Karl Lee

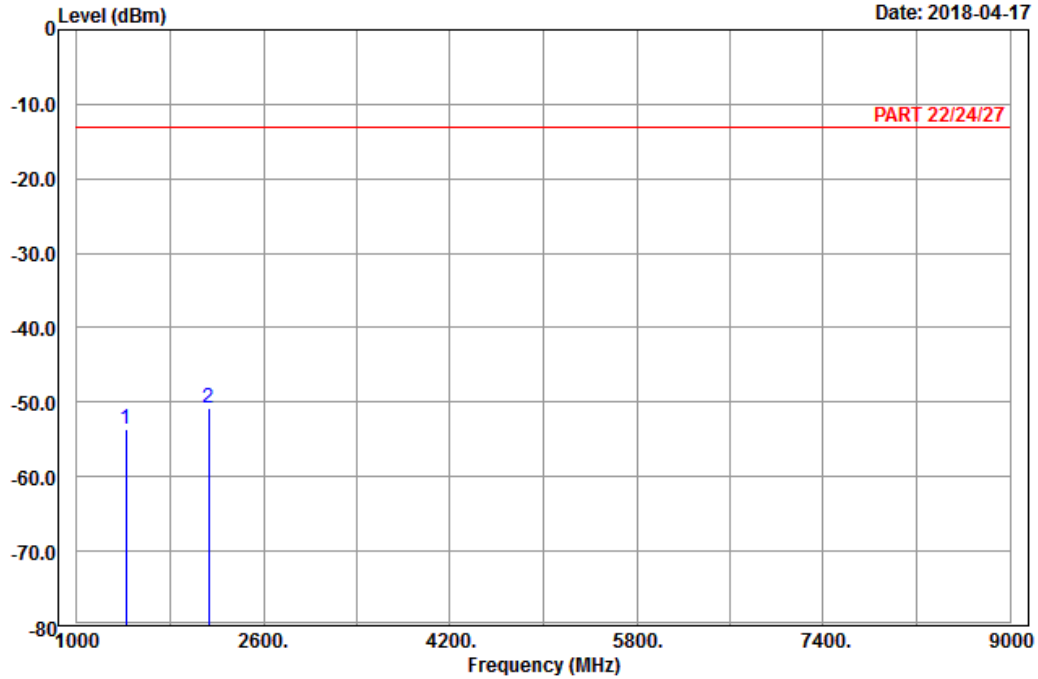
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1422.00	-51.14	-57.50	-13.00	-38.14	6.36	Peak
2	2133.00	-46.07	-57.35	-13.00	-33.07	11.28	Peak



A D T

Data: 6

Date: 2018-04-17



Site : 966 chamber 1  
 Condition: PART 22/24/27 Vertical  
 Remark : LTE\_Band 12\_Link\_CH23130  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1422.00	-53.57	-59.93	-13.00	-40.57	6.36	Peak
2 pp	2133.00	-50.76	-62.04	-13.00	-37.76	11.28	Peak

**Mode B**

LTE Band 4

Channel Bandwidth: 20 MHz / QPSK

Low Channel

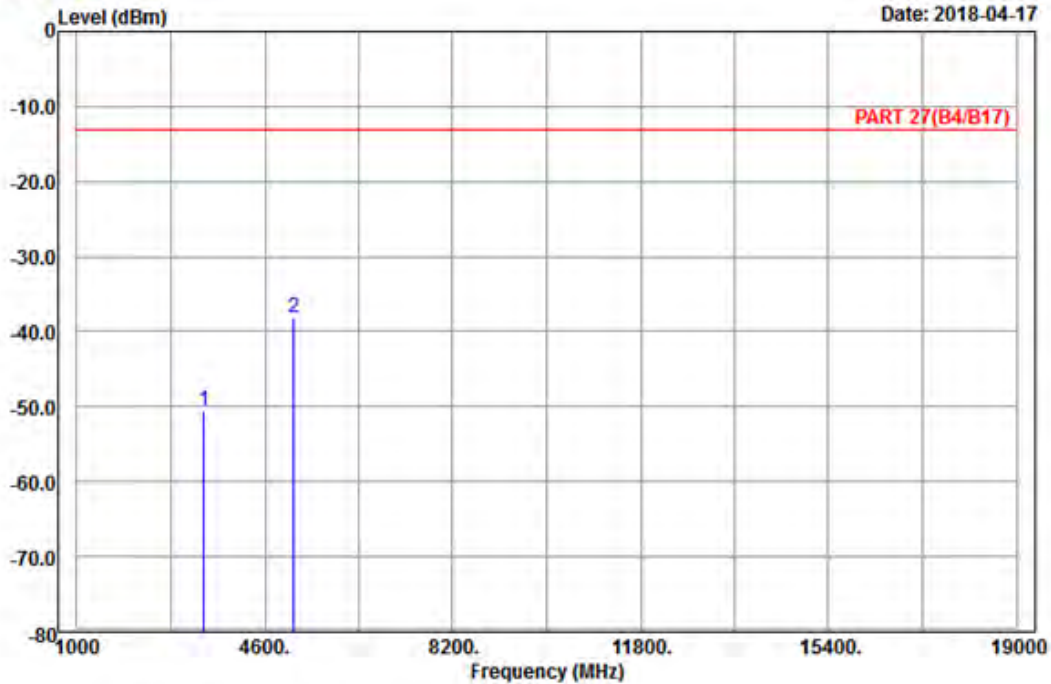


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3

Date: 2018-04-17



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Horizontal  
 Remark : LTE\_Band 4\_Link\_CH20050  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3440.00	-50.47	-64.82	-13.00	-37.47	14.35	Peak
2	5160.00	-38.05	-57.97	-13.00	-25.05	19.92	Peak



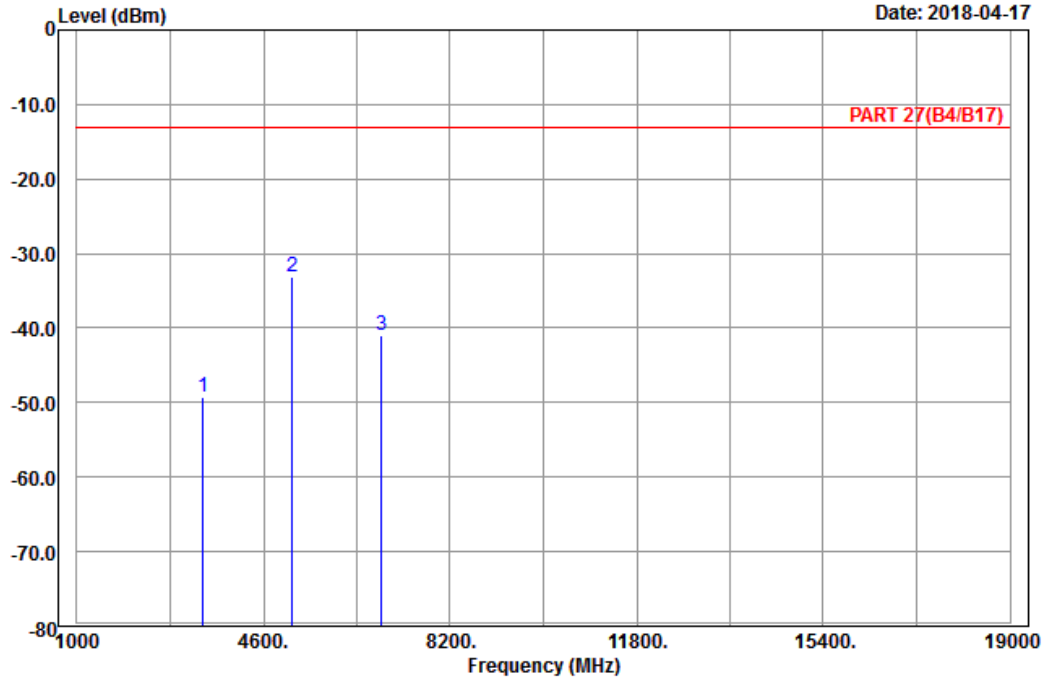


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 2018-04-17



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Vertical  
 Remark : LTE\_Band 4\_Link\_CH20050  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3440.00	-49.24	-63.59	-13.00	-36.24	14.35	Peak
2	pp 5160.00	-33.11	-53.03	-13.00	-20.11	19.92	Peak
3	6880.00	-41.04	-63.84	-13.00	-28.04	22.80	Peak

Middle Channel

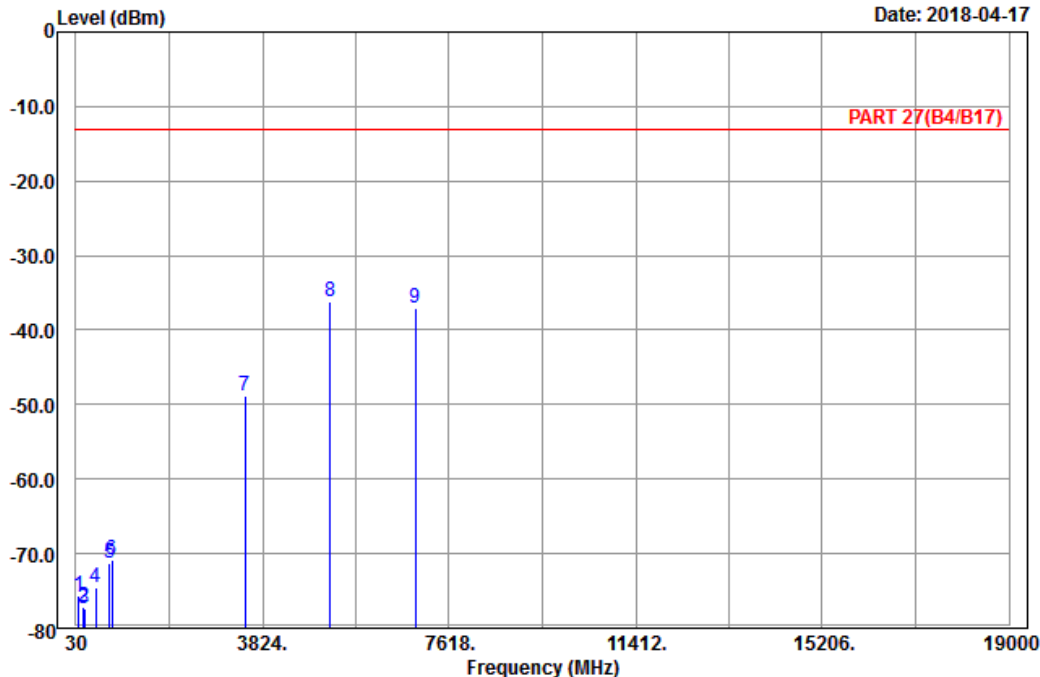


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 13

Date: 2018-04-17



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Horizontal  
 Remark : LTE\_Band 4\_Link\_CH20175  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	91.02	-75.72	-65.10	-13.00	-62.72	-10.62	Peak
2	185.25	-77.23	-71.58	-13.00	-64.23	-5.65	Peak
3	210.63	-77.37	-71.33	-13.00	-64.37	-6.04	Peak
4	441.40	-74.56	-70.91	-13.00	-61.56	-3.65	Peak
5	710.20	-71.19	-70.63	-13.00	-58.19	-0.56	Peak
6	758.50	-70.77	-70.03	-13.00	-57.77	-0.74	Peak
7	3465.00	-48.77	-63.11	-13.00	-35.77	14.34	Peak
8 pp	5197.50	-36.22	-56.34	-13.00	-23.22	20.12	Peak
9	6930.00	-37.09	-59.96	-13.00	-24.09	22.87	Peak

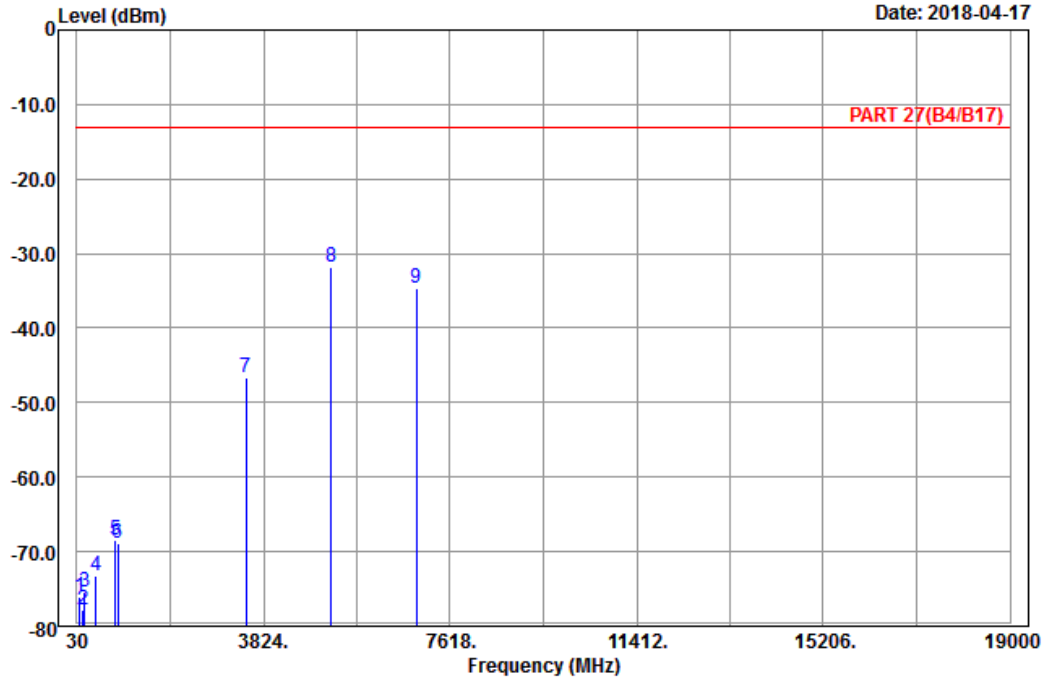


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 14

Date: 2018-04-17



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Vertical  
 Remark : LTE\_Band 4\_Link\_CH20175  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	81.30	-76.03	-64.37	-13.00	-63.03	-11.66	Peak
2	152.31	-77.72	-69.83	-13.00	-64.72	-7.89	Peak
3	185.79	-75.47	-69.80	-13.00	-62.47	-5.67	Peak
4	412.00	-73.17	-70.15	-13.00	-60.17	-3.02	Peak
5	820.80	-68.39	-70.17	-13.00	-55.39	1.78	Peak
6	862.80	-68.82	-70.66	-13.00	-55.82	1.84	Peak
7	3465.00	-46.56	-60.90	-13.00	-33.56	14.34	Peak
8 pp	5197.50	-31.73	-51.85	-13.00	-18.73	20.12	Peak
9	6930.00	-34.59	-57.46	-13.00	-21.59	22.87	Peak

# High Channel

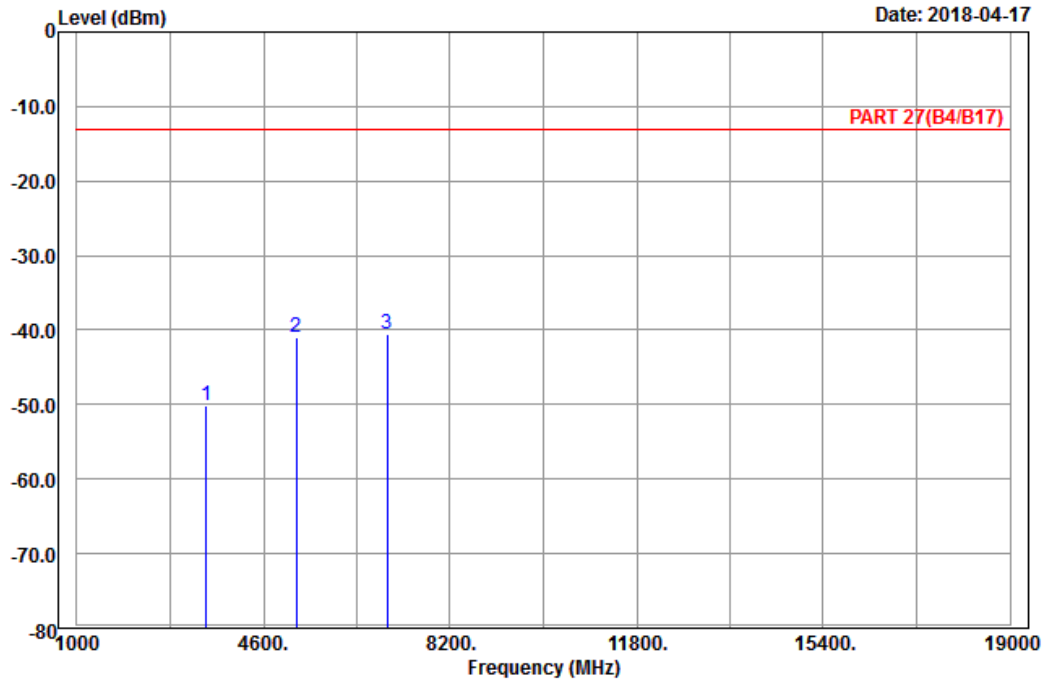


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3

Date: 2018-04-17



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Horizontal  
 Remark : LTE\_Band 4\_Link\_CH20300  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3490.00	-50.07	-64.38	-13.00	-37.07	14.31	Peak
2	5235.00	-40.96	-61.12	-13.00	-27.96	20.16	Peak
3	pp 6980.00	-40.44	-63.13	-13.00	-27.44	22.69	Peak

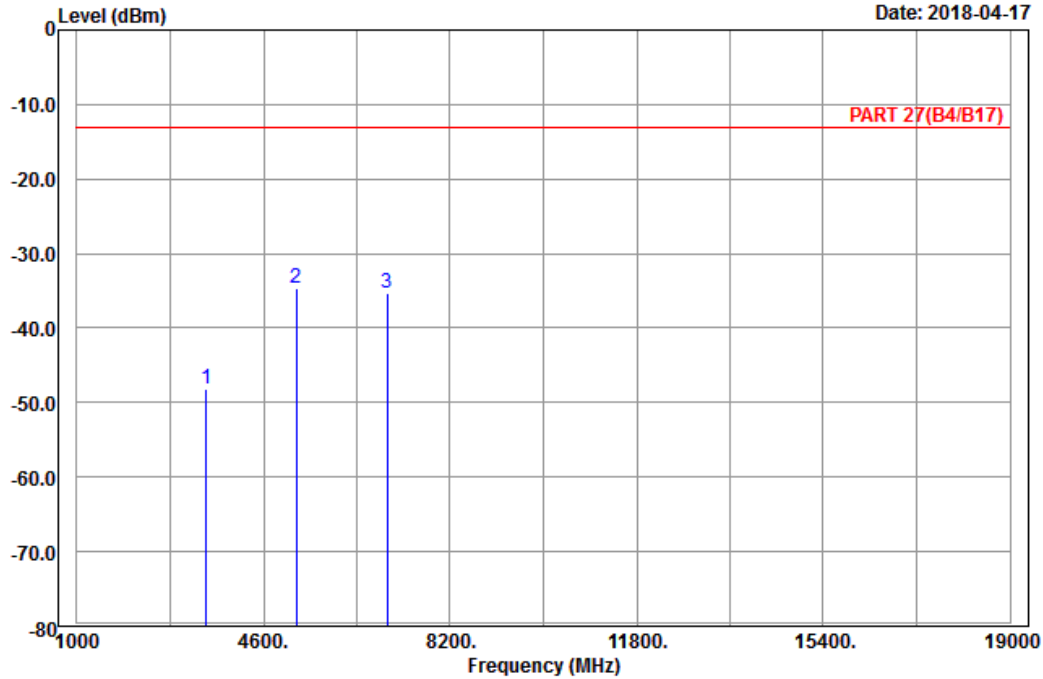


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 4

Date: 2018-04-17



Site : 966 chamber 1  
 Condition: PART 27(B4/B17) Vertical  
 Remark : LTE\_Band 4\_Link\_CH20300  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	3490.00	-48.21	-62.52	-13.00	-35.21	14.31	Peak
2	pp 5235.00	-34.71	-54.87	-13.00	-21.71	20.16	Peak
3	6980.00	-35.31	-58.00	-13.00	-22.31	22.69	Peak

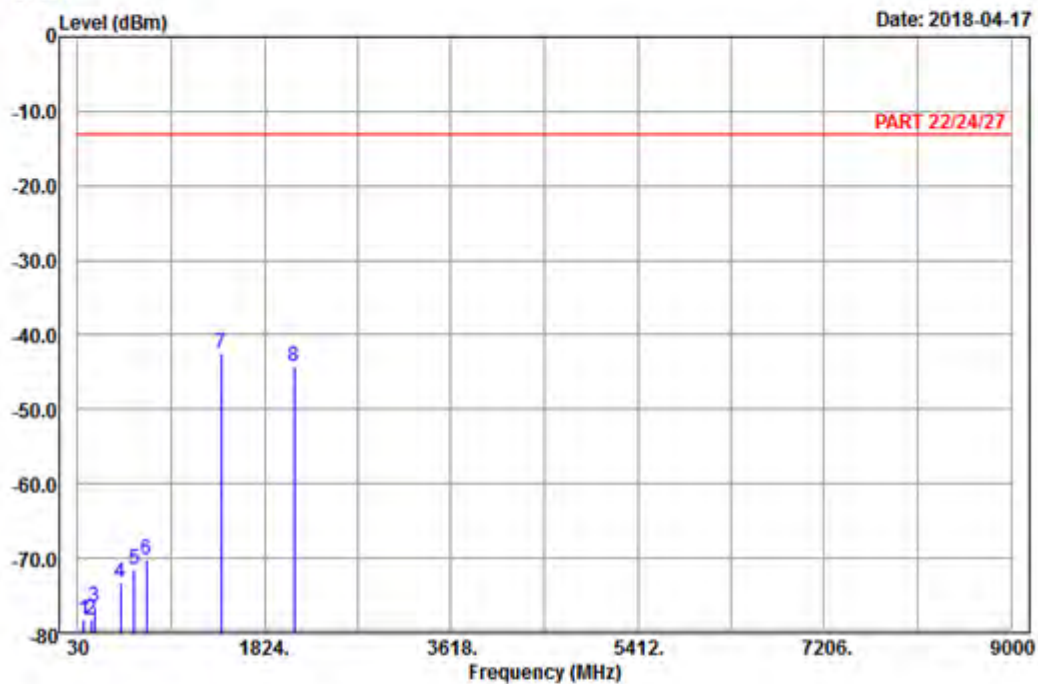
LTE Band 12  
Channel Bandwidth: 10 MHz / QPSK  
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 7



Site : 966 chamber 1  
Condition: PART 22/24/27 Horizontal  
Remark : LTE\_Band 12\_Link\_CH23060  
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	88.32	-78.17	-67.28	-13.00	-65.17	-10.89	Peak
2	162.57	-78.17	-70.79	-13.00	-65.17	-7.38	Peak
3	192.54	-76.50	-70.63	-13.00	-63.50	-5.87	Peak
4	439.30	-73.26	-69.65	-13.00	-60.26	-3.61	Peak
5	572.30	-71.45	-70.71	-13.00	-58.45	-0.74	Peak
6	686.40	-70.23	-69.92	-13.00	-57.23	-0.31	Peak
7 pp	1408.00	-42.41	-48.77	-13.00	-29.41	6.36	Peak
8	2112.00	-44.21	-55.32	-13.00	-31.21	11.11	Peak

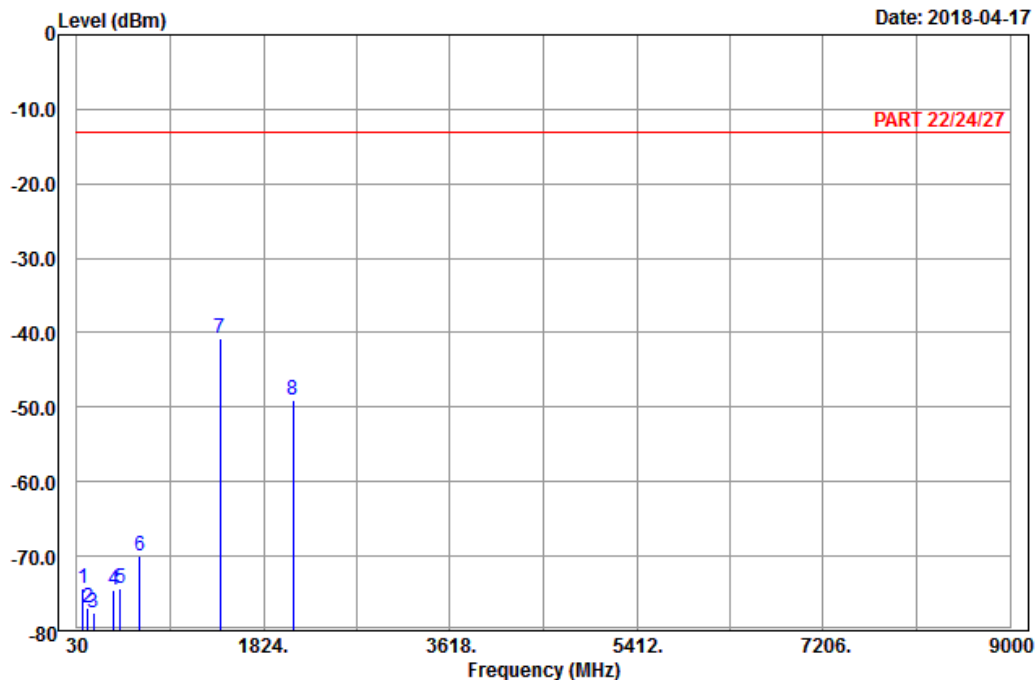


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 8

Date: 2018-04-17



Site : 966 chamber 1  
 Condition: PART 22/24/27 Vertical  
 Remark : LTE\_Band 12\_Link\_CH23060  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	86.16	-74.36	-63.25	-13.00	-61.36	-11.11	Peak
2	136.65	-76.85	-69.17	-13.00	-63.85	-7.68	Peak
3	189.57	-77.68	-71.95	-13.00	-64.68	-5.73	Peak
4	381.20	-74.45	-70.73	-13.00	-61.45	-3.72	Peak
5	450.50	-74.27	-70.40	-13.00	-61.27	-3.87	Peak
6	636.70	-69.98	-70.00	-13.00	-56.98	0.02	Peak
7 pp	1408.00	-40.80	-47.16	-13.00	-27.80	6.36	Peak
8	2112.00	-49.11	-60.22	-13.00	-36.11	11.11	Peak

Middle Channel

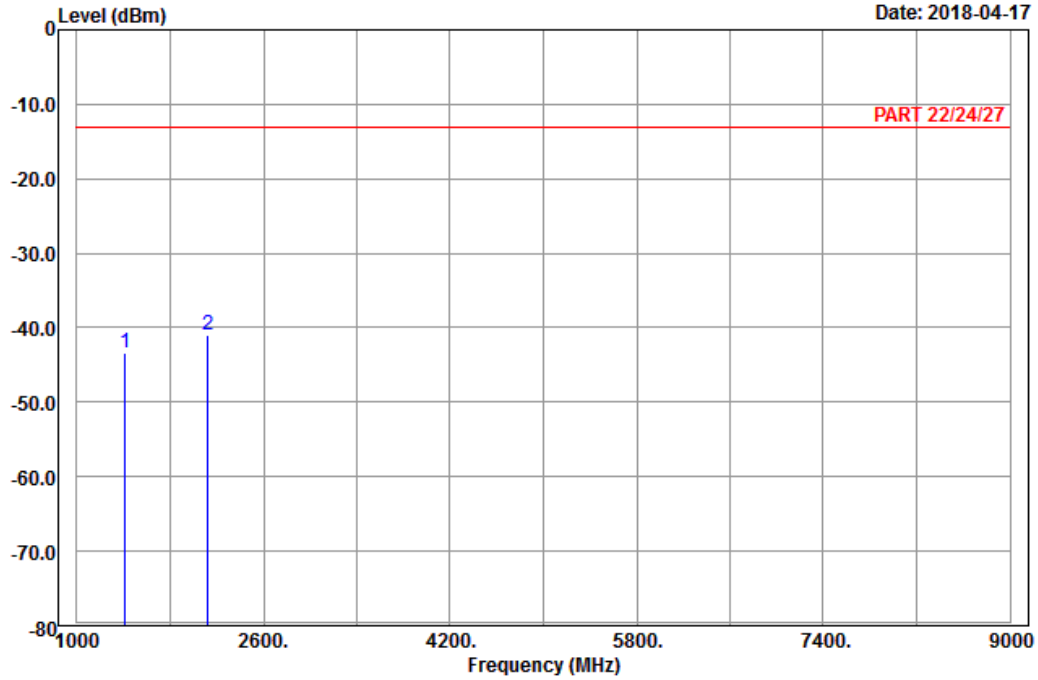


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5

Date: 2018-04-17



Site : 966 chamber 1  
 Condition: PART 22/24/27 Horizontal  
 Remark : LTE\_Band 12\_Link\_CH23095  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1415.00	-43.31	-49.67	-13.00	-30.31	6.36	Peak
2	2122.50	-40.97	-52.08	-13.00	-27.97	11.11	Peak

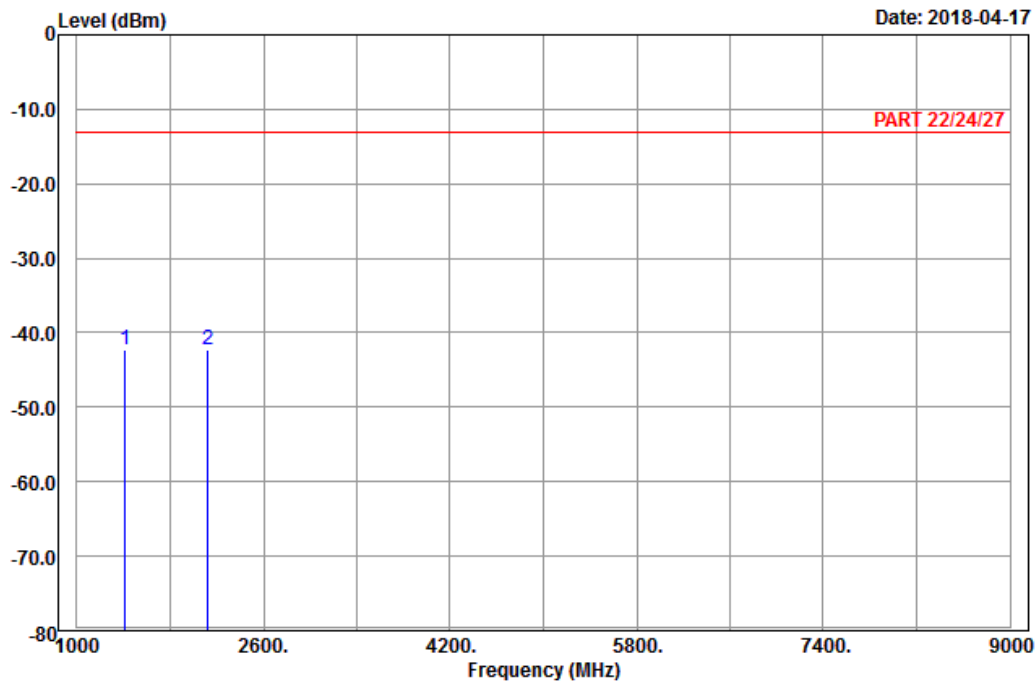




A D T

Data: 6

Date: 2018-04-17



Site : 966 chamber 1  
 Condition: PART 22/24/27 Vertical  
 Remark : LTE\_Band 12\_Link\_CH23095  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1415.00	-42.38	-48.74	-13.00	-29.38	6.36	Peak
2 pp	2122.50	-42.31	-53.42	-13.00	-29.31	11.11	Peak

High Channel

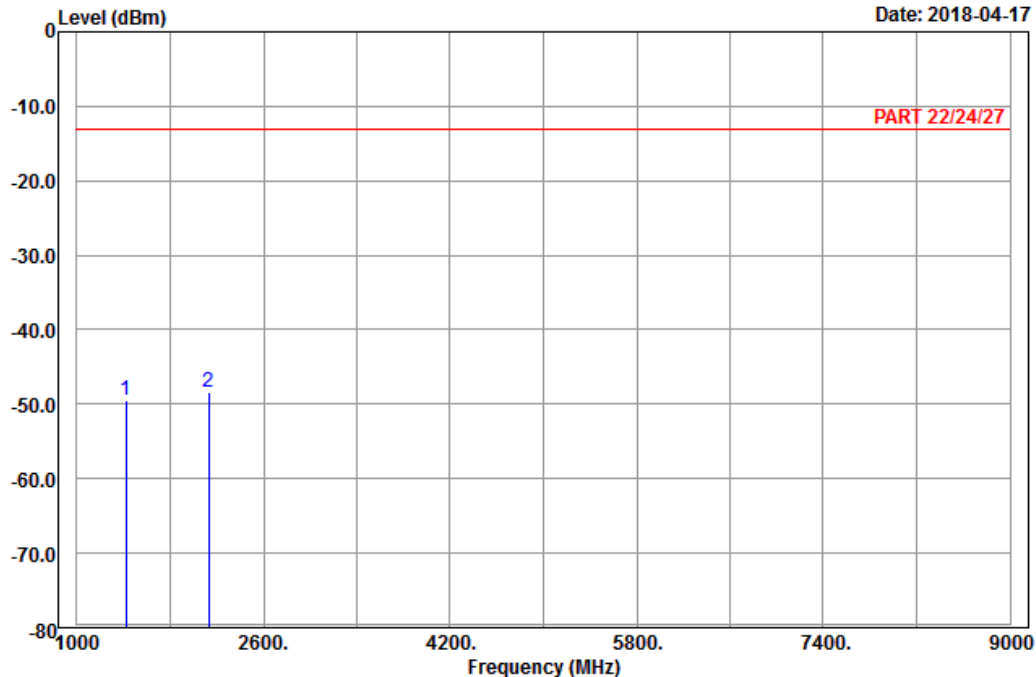


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 3

Date: 2018-04-17



Site : 966 chamber 1  
 Condition: PART 22/24/27 Horizontal  
 Remark : LTE\_Band 12\_Link\_CH23130  
 Tested by: Karl Lee

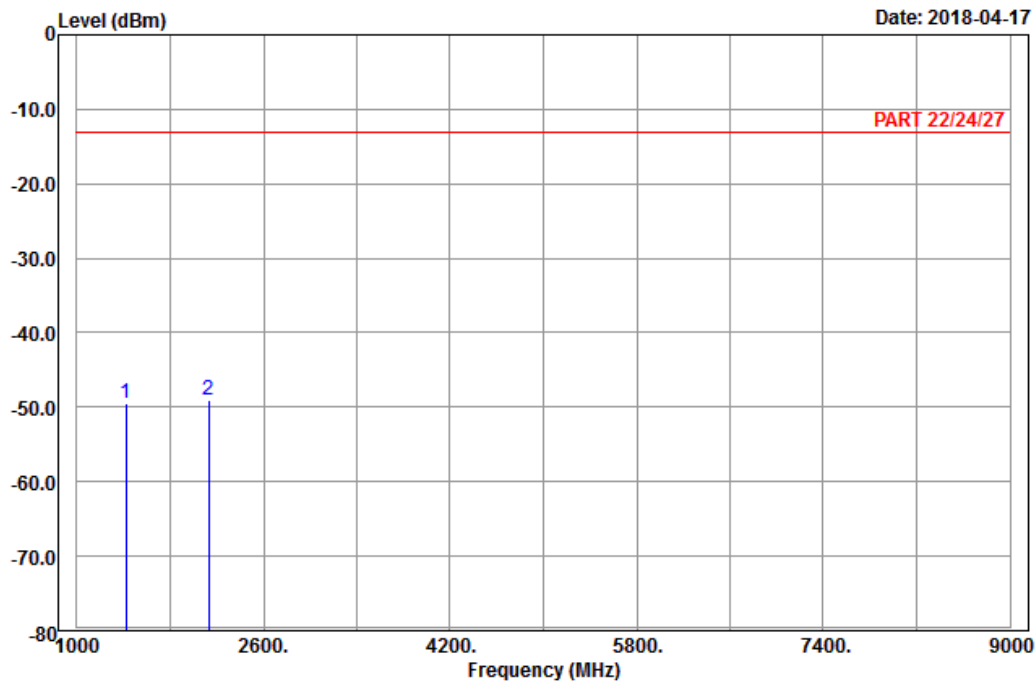
	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1422.00	-49.38	-55.74	-13.00	-36.38	6.36	Peak
2	2133.00	-48.50	-59.78	-13.00	-35.50	11.28	Peak



A D T

Data: 4

Date: 2018-04-17



Site : 966 chamber 1  
 Condition: PART 22/24/27 Vertical  
 Remark : LTE\_Band 12\_Link\_CH23130  
 Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	1422.00	-49.49	-55.85	-13.00	-36.49	6.36	Peak
2 pp	2133.00	-49.06	-60.34	-13.00	-36.06	11.28	Peak

## 5 Pictures of Test Arrangements

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

## Appendix – Information on the Testing Laboratories

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

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

**Linko EMC/RF Lab**

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Fax: 886-2-26051924

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**Web Site:** [www.bureauveritas-adt.com](http://www.bureauveritas-adt.com)

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

--- END ---