

FCC Test Report

(PART 27)

Report No.: RF180125C14-8

FCC ID: B94HNQ10CPD

Test Model: HSN-Q10C

Received Date: Feb. 05, 2018

Test Date: Mar. 21, 2018 ~ May 23, 2018

Issued Date: Jun. 01, 2018

Applicant: HP Inc.

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

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FCC Registration /
Designation Number: 427177 / TW0011



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Release Control Record

Issue No.	Description	Date Issued
RF180125C14-8	Original Release	Jun. 01, 2018

1 Certificate of Conformity

Product: Notebook Computer

Brand: HP

Test Model: HSN-Q10C

Sample Status: Production Unit

Applicant: HP Inc.

Test Date: Mar. 21, 2018 ~ May 23, 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 : Evonne Liu, **Date:** Jun. 01, 2018
Evonne Liu / Specialist

Approved by : Dylan Chiou, **Date:** Jun. 01, 2018
Dylan Chiou / Project Engineer

2 Summary of Test Results

Applied Standard: FCC Part 27 & Part 2 (WCDMA)			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50(d)(4)	Equivalent Isotropic Radiated Power	Pass	Meet the requirement of limit.
2.1055 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 -34.19 dB at 158.79 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 4)			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50(d)(4)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1055 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 -14.09 dB at 10320 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 -34.11 dB at 157.71 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 13)			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50(b)(10)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1055 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)(f)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -15.00 dB at 1564 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 17)			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50(c)(10)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1055 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 -34.29 dB at 157.17 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 66)			
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 -17.48 dB at 10470 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	Expended Uncertainty (k=2) ($\pm$)
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.44 dB
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.0153 dB
	200 MHz ~ 1000 MHz	2.0224 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	1.0121 dB
	18 GHz ~ 40 GHz	1.1508 dB

2.2 Test Site and Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent Technologies	N9038A	MY52260177	Jul. 05, 2017	Jul. 04, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Jan. 11, 2018	Jan. 10, 2019
Double Ridge Guide Horn Antenna EMCO	3115	5619	Nov. 30, 2017	Nov. 29, 2018
HORN Antenna ETS	3117	00034128	Dec. 14, 2017	Dec. 13, 2018
BILOG Antenna SCHWARZBECK	VULB 9168	9168-153	Dec. 06, 2017	Dec. 05, 2018
Fixed Attenuator Mini-Circuits	BW-N10W5+	NA	Jul. 07, 2017	Jul. 06, 2018
Preamplifier Agilent	310N	187226	Jun. 23, 2017	Jun. 22, 2018
Preamplifier Agilent	83017A	MY39501357	Jun. 23, 2017	Jun. 22, 2018
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(R FC-SMS-100-SM S-120+RFC-SMS -100-SMS-400)	Jun. 23, 2017	Jun. 22, 2018
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(R FC-SMS-100-SM S-24)	Jun. 23, 2017	Jun. 22, 2018
Software BV ADT	E3 8.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA
Radio Communication Analyzer Anritsu	MT8820C	6201010284	Dec. 28, 2017	Dec. 27, 2018
Temperature & Humidity Chamber	GTH-120-40-CP-A R	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

- Note: 1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HsinTien Chamber 1.
3. The horn antenna and preamplifier (model: 83017A) are used only for the measurement of emission frequency above 1 GHz if tested.
4. The IC Site Registration No. is IC7450I-1.

3 General Information

3.1 General Description of EUT

Product	Notebook Computer	
Brand	HP	
Test Model	HSN-Q10C	
Status of EUT	Production Unit	
Power Supply Rating	20 or 15 or 12 or 9 or 5 Vdc (Adapter)	
Modulation Type	WCDMA	QPSK
	LTE	QPSK, 16QAM
Frequency Range	WCDMA	1712.4 ~ 1752.6 MHz
	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	1710.7 ~ 1754.3 MHz
	LTE Band 4 (Channel Bandwidth: 3 MHz)	1711.5 ~ 1753.5 MHz
	LTE Band 4 (Channel Bandwidth: 5 MHz)	1712.5 ~ 1752.5 MHz
	LTE Band 4 (Channel Bandwidth: 10 MHz)	1715.0 ~ 1750.0 MHz
	LTE Band 4 (Channel Bandwidth: 15 MHz)	1717.5 ~ 1747.5 MHz
	LTE Band 4 (Channel Bandwidth: 20 MHz)	1720.0 ~ 1745.0 MHz
	LTE Band 12 (Channel Bandwidth: 1.4 MHz)	699.7 ~ 715.3 MHz
	LTE Band 12 (Channel Bandwidth: 3 MHz)	700.5 ~ 714.5 MHz
	LTE Band 12 (Channel Bandwidth: 5 MHz)	701.5 ~ 713.5 MHz
	LTE Band 12 (Channel Bandwidth: 10 MHz)	704.0 ~ 711.0 MHz
	LTE Band 13 (Channel Bandwidth: 5 MHz)	779.5 ~ 784.5 MHz
	LTE Band 13 (Channel Bandwidth: 10 MHz)	782.0 MHz
	LTE Band 17 (Channel Bandwidth: 5 MHz)	706.5 ~ 713.5 MHz
	LTE Band 17 (Channel Bandwidth: 10 MHz)	709.0 ~ 711.0 MHz
	LTE Band 66 (Channel Bandwidth: 1.4 MHz)	1710.7 ~ 1779.3 MHz
	LTE Band 66 (Channel Bandwidth: 3 MHz)	1711.5 ~ 1778.5 MHz
	LTE Band 66 (Channel Bandwidth: 5 MHz)	1712.5 ~ 1777.5 MHz
	LTE Band 66 (Channel Bandwidth: 10 MHz)	1715.0 ~ 1775.0 MHz
	LTE Band 66 (Channel Bandwidth: 15 MHz)	1717.5 ~ 1772.5 MHz
	LTE Band 66 (Channel Bandwidth: 20 MHz)	1720.0 ~ 1770.0 MHz
Emission Designator	WCDMA	4M08F9W
	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	1M09W7D
	LTE Band 4 (Channel Bandwidth: 3 MHz)	2M70W7D
	LTE Band 4 (Channel Bandwidth: 5 MHz)	4M50W7D
	LTE Band 4 (Channel Bandwidth: 10 MHz)	9M0W7D
	LTE Band 4 (Channel Bandwidth: 15 MHz)	13M5W7D
	LTE Band 4 (Channel Bandwidth: 20 MHz)	18M0G7D
	LTE Band 12 (Channel Bandwidth: 1.4 MHz)	1M10W7D
	LTE Band 12 (Channel Bandwidth: 3 MHz)	2M70G7D
	LTE Band 12 (Channel Bandwidth: 5 MHz)	4M51G7D
	LTE Band 12 (Channel Bandwidth: 10 MHz)	9M0G7D
	LTE Band 13 (Channel Bandwidth: 5 MHz)	4M51G7D
	LTE Band 13 (Channel Bandwidth: 10 MHz)	8M96G7D
	LTE Band 17 (Channel Bandwidth: 5 MHz)	4M51G7D

	LTE Band 17 (Channel Bandwidth: 10 MHz)	9M01G7D
	LTE Band 66 (Channel Bandwidth: 1.4 MHz)	1M09W7D
	LTE Band 66 (Channel Bandwidth: 3 MHz)	2M70G7D
	LTE Band 66 (Channel Bandwidth: 5 MHz)	4M50G7D
	LTE Band 66 (Channel Bandwidth: 10 MHz)	8M99G7D
	LTE Band 66 (Channel Bandwidth: 15 MHz)	13M5W7D
	LTE Band 66 (Channel Bandwidth: 20 MHz)	18M0W7D
Max. ERP Power	LTE Band 12 (Channel Bandwidth: 1.4 MHz)	37.33 mW
	LTE Band 12 (Channel Bandwidth: 3 MHz)	37.68 mW
	LTE Band 12 (Channel Bandwidth: 5 MHz)	37.94 mW
	LTE Band 12 (Channel Bandwidth: 10 MHz)	38.53 mW
	LTE Band 13 (Channel Bandwidth: 5 MHz)	45.30 mW
	LTE Band 13 (Channel Bandwidth: 10 MHz)	46.10 mW
	LTE Band 17 (Channel Bandwidth: 5 MHz)	37.85 mW
	LTE Band 17 (Channel Bandwidth: 10 MHz)	38.44 mW
Max. EIRP Power	WCDMA	61.19 mW
	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	55.08 mW
	LTE Band 4 (Channel Bandwidth: 3 MHz)	55.27 mW
	LTE Band 4 (Channel Bandwidth: 5 MHz)	55.78 mW
	LTE Band 4 (Channel Bandwidth: 10 MHz)	56.04 mW
	LTE Band 4 (Channel Bandwidth: 15 MHz)	56.04 mW
	LTE Band 4 (Channel Bandwidth: 20 MHz)	56.56 mW
	LTE Band 66 (Channel Bandwidth: 1.4 MHz)	60.80 mW
	LTE Band 66 (Channel Bandwidth: 3 MHz)	60.80 mW
	LTE Band 66 (Channel Bandwidth: 5 MHz)	60.94 mW
	LTE Band 66 (Channel Bandwidth: 10 MHz)	61.59 mW
	LTE Band 66 (Channel Bandwidth: 15 MHz)	62.22 mW
	LTE Band 66 (Channel Bandwidth: 20 MHz)	62.65 mW
Antenna Type		Refer to Note as below
Accessory Device		Refer to Note as below
Data Cable Supplied		Refer to Note as below

Note:

1. The WWAN module (Brand: Fibocom, Model: L850-GL) was installed in the EUT.
2. The EUT contains following accessory devices.

Product	Brand	Model	Description
Adapter	hp	TPN-LA12	I/P: 100-240 Vac, 50-60 Hz, 1.6 A O/P: 20 Vdc, 3.25 A, 15 Vdc, 4.33 A, 12 Vdc, 5 A, 9 Vdc, 3 A, 5 Vdc, 3 A

3. The antenna information is listed as below.

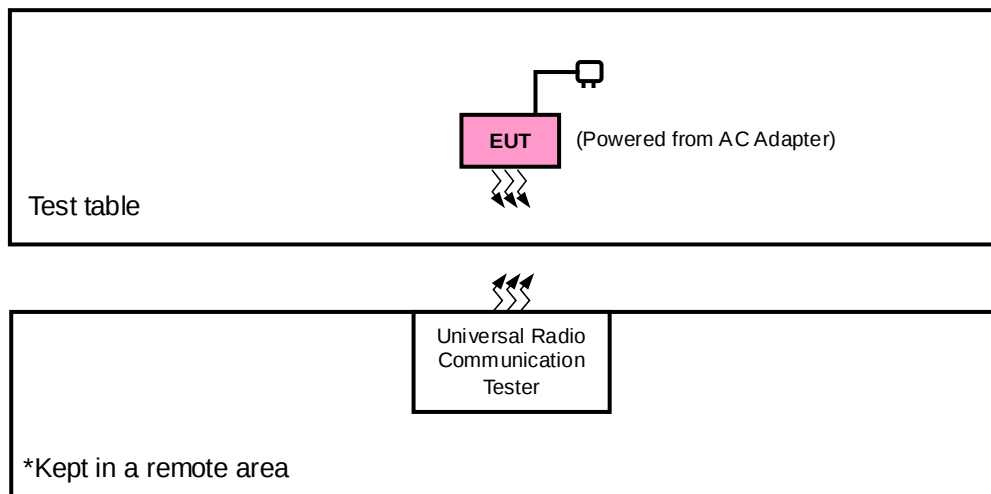
Ant. Type	Manuf.	Parts Number	Antenna Gain							
			LTE 2 / LTE 25 / WCDMA Band II	LTE 4 / LTE 66 / WCDMA Band IV	LTE 5 / LTE 26 / WCDMA Band V	LTE 7	LTE 12 / LTE 17	LTE 13	LTE 30	LTE 41
PIFA	INPAQ	Main Ant.: DQ6LB020017 (WA-P-LTE8LTE12LBB-02-001) Aux Ant.: DQ6LB020017 (WA-P-LTE8LTE12LBB-02-001)	-6.19	-5.79	-5.86	-4.9	-5.21	-4.32	-3.68	-4.9

Antenna Type	Vendor	Part Number	Antenna Gain (dBi)			
			Laptop PC Mode			
			WLAN 2.4GHz	WLAN 5.2GHz	WLAN 5.5GHz	WLAN 5.8GHz
PIFA	INPAQ	WLAN Main Antenna: DQ6LB020509 (WA-P-LBB-02-059)	1.66	0.54	0.56	-0.21
		WLAN Aux Antenna: DQ6LB020509 (WA-P-LBB-02-059)	Tablet PC Mode			
			WLAN 2.4GHz	WLAN 5.2GHz	WLAN 5.5GHz	WLAN 5.8GHz
			-0.36	3.36	2.21	3.08

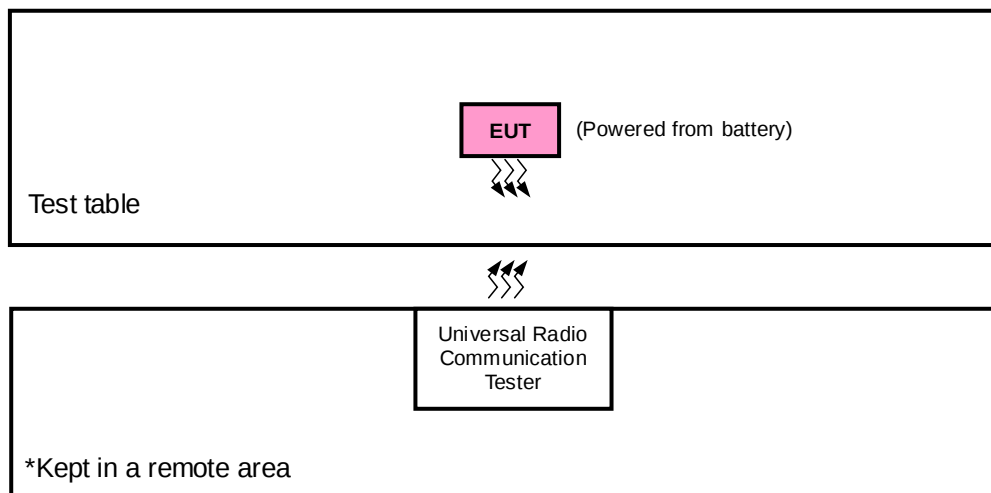
4. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

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, XYZ axis, and antenna ports

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

Band	ERP / EIRP	Radiated Emission
WCDMA	X-plane	Z-axis
LTE Band 4	X-plane	Z-axis
LTE Band 12	Z-plane	X-axis
LTE Band 13	Z-plane	X-axis
LTE Band 17	Z-plane	X-axis
LTE Band 66	X-plane	X-axis

WCDMA

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

LTE Band 4

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

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Band Edge	19957 to 20393	19957	1.4 MHz	QPSK	1 RB / 0 RB Offset
			20393	1.4 MHz	QPSK	6 RB / 0 RB Offset
		19965 to 20385	19965	3 MHz	QPSK	1 RB / 5 RB Offset
			20385	3 MHz	QPSK	6 RB / 0 RB Offset
		19975 to 20375	19975	5 MHz	QPSK	1 RB / 0 RB Offset
			20375	5 MHz	QPSK	15 RB / 0 RB Offset
		20000 to 20350	20000	10 MHz	QPSK	1 RB / 14 RB Offset
			20350	10 MHz	QPSK	15 RB / 0 RB Offset
		20025 to 20325	20025	15 MHz	QPSK	1 RB / 0 RB Offset
			20325	15 MHz	QPSK	25 RB / 0 RB Offset
		20050 to 20300	20050	20 MHz	QPSK	1 RB / 24 RB Offset
			20300	20 MHz	QPSK	25 RB / 0 RB Offset
		19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK	1 RB / 0 RB Offset
			19965, 20175, 20385	3 MHz	QPSK	50 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK	1 RB / 49 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK	50 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK	1 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK	75 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK	1 RB / 74 RB Offset
-	Conducted Emission	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK	75 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK	100 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK	1 RB / 99 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK	100 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK	
-	Radiated Emission	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK	1 RB / 2 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK	12 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK	50 RB / 0 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
-	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
-	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
-	Occupied Bandwidth	23017 to 23173	23017, 23095, 23173	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		23025 to 23165	23025, 23095, 23165	3 MHz	QPSK, 16QAM	15 RB / 0 RB Offset
		23035 to 23155	23035, 23095, 23155	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
-	Peak to Average Ratio	23017 to 23173	23017, 23095, 23173	1.4 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23025 to 23165	23025, 23095, 23165	3 MHz	QPSK, 16QAM	1 RB / 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
-	Band Edge	23017 to 23173	23017	1.4 MHz	QPSK	1 RB / 0 RB Offset
			23173	1.4 MHz	QPSK	6 RB / 0 RB Offset
		23025 to 23165	23025	3 MHz	QPSK	1 RB / 5 RB Offset
			23165	3 MHz	QPSK	6 RB / 0 RB Offset
		23035 to 23155	23035	5 MHz	QPSK	1 RB / 0 RB Offset
			23155	5 MHz	QPSK	15 RB / 0 RB Offset
		23060 to 23130	23060	10 MHz	QPSK	1 RB / 14 RB Offset
			23130	10 MHz	QPSK	15 RB / 0 RB Offset
		23035 to 23155	23035	5 MHz	QPSK	1 RB / 0 RB Offset
			23155	5 MHz	QPSK	25 RB / 0 RB Offset
		23060 to 23130	23060	10 MHz	QPSK	1 RB / 24 RB Offset
			23130	10 MHz	QPSK	25 RB / 0 RB Offset
-	Conducted Emission	23017 to 23173	23017, 23095, 23173	1.4 MHz	QPSK	1 RB / 0 RB Offset
		23025 to 23165	23025, 23095, 23165	3 MHz	QPSK	1 RB / 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
-	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.

LTE Band 13

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	ERP	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK, 16QAM	1 RB / 24 RB Offset
-	Frequency Stability	23205 to 23255	23205, 23255	5 MHz	QPSK	1 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK	1 RB / 24 RB Offset
-	Occupied Bandwidth	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
-	Peak to Average Ratio	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK, 16QAM	1 RB / 0 RB Offset
-	Band Edge	23205 to 23255	23205	5 MHz	QPSK	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
		23230	23255	5 MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
			23230	10 MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
-	Conducted Emission	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK	1 RB / 49 RB Offset
		23230	23230	10 MHz	QPSK	50 RB / 0 RB Offset
-	Radiated Emission	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK	1 RB / 0 RB Offset
		23230	23230	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.

LTE Band 17

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

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

LTE Band 66

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	EIRP	131979 to 132665	131979, 132322, 132665	1.4 MHz	QPSK, 16QAM	1 RB / 5 RB Offset
		131987 to 132657	131987, 132322, 132657	3 MHz	QPSK, 16QAM	1 RB / 14 RB Offset
		131997 to 132647	131997, 132322, 132647	5 MHz	QPSK, 16QAM	1 RB / 24 RB Offset
		132022 to 132622	132022, 132322, 132622	10 MHz	QPSK, 16QAM	1 RB / 49 RB Offset
		132047 to 132597	132047, 132322, 132597	15 MHz	QPSK, 16QAM	1 RB / 74 RB Offset
		132072 to 132572	132072, 132322, 132572	20 MHz	QPSK, 16QAM	1 RB / 99 RB Offset
-	Frequency Stability	131979 to 132665	131979, 132665	1.4 MHz	QPSK	1 RB / 5 RB Offset
		131987 to 132657	131987, 132657	3 MHz	QPSK	1 RB / 14 RB Offset
		131997 to 132647	131997, 132647	5 MHz	QPSK	1 RB / 24 RB Offset
		132022 to 132622	132022, 132622	10 MHz	QPSK	1 RB / 49 RB Offset
		132047 to 132597	132047, 132597	15 MHz	QPSK	1 RB / 74 RB Offset
		132072 to 132572	132072, 132572	20 MHz	QPSK	1 RB / 99 RB Offset
-	Occupied Bandwidth	131979 to 132665	131979, 132322, 132665	1.4 MHz	QPSK, 16QAM	6 RB / 0 RB Offset
		131987 to 132657	131987, 132322, 132657	3 MHz	QPSK, 16QAM	15 RB / 0 RB Offset
		131997 to 132647	131997, 132322, 132647	5 MHz	QPSK, 16QAM	25 RB / 0 RB Offset
		132022 to 132622	132022, 132322, 132622	10 MHz	QPSK, 16QAM	50 RB / 0 RB Offset
		132047 to 132597	132047, 132322, 132597	15 MHz	QPSK, 16QAM	75 RB / 0 RB Offset
		132072 to 132572	132072, 132322, 132572	20 MHz	QPSK, 16QAM	100 RB / 0 RB Offset
-	Peak to Average Ratio	131979 to 132665	131979, 132322, 132665	1.4 MHz	QPSK, 16QAM	1 RB / 2 RB Offset
		131987 to 132657	131987, 132322, 132657	3 MHz	QPSK, 16QAM	1 RB / 7 RB Offset
		131997 to 132647	131997, 132322, 132647	5 MHz	QPSK, 16QAM	12 RB / 0 RB Offset
		132022 to 132622	132022, 132322, 132622	10 MHz	QPSK, 16QAM	1 RB / 24 RB Offset
		132047 to 132597	132047, 132322, 132597	15 MHz	QPSK, 16QAM	36 RB / 0 RB Offset
		132072 to 132572	132072, 132322, 132572	20 MHz	QPSK, 16QAM	50 RB / 0 RB Offset

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Band Edge	131979 to 132665	131979	1.4 MHz	QPSK	1 RB / 0 RB Offset
			132665	1.4 MHz	QPSK	6 RB / 0 RB Offset
		131987 to 132657	131987	3 MHz	QPSK	1 RB / 5 RB Offset
			132657	3 MHz	QPSK	6 RB / 0 RB Offset
		131997 to 132647	131997	5 MHz	QPSK	1 RB / 0 RB Offset
			132647	5 MHz	QPSK	15 RB / 0 RB Offset
		132022 to 132622	132022	10 MHz	QPSK	1 RB / 14 RB Offset
			132622	10 MHz	QPSK	15 RB / 0 RB Offset
		132047 to 132597	132047	15 MHz	QPSK	1 RB / 0 RB Offset
			132597	15 MHz	QPSK	25 RB / 0 RB Offset
		132072 to 132572	132072	20 MHz	QPSK	1 RB / 24 RB Offset
			132572	20 MHz	QPSK	25 RB / 0 RB Offset
		131979 to 132665	131979, 132322, 132665	1.4 MHz	QPSK	1 RB / 0 RB Offset
			132665	1.4 MHz	QPSK	50 RB / 0 RB Offset
		131987 to 132657	131987, 132322, 132657	3 MHz	QPSK	1 RB / 49 RB Offset
			132657	3 MHz	QPSK	50 RB / 0 RB Offset
		131997 to 132647	131997, 132322, 132647	5 MHz	QPSK	1 RB / 0 RB Offset
			132647	5 MHz	QPSK	75 RB / 0 RB Offset
		132022 to 132622	132022, 132322, 132622	10 MHz	QPSK	1 RB / 74 RB Offset
			132622	10 MHz	QPSK	75 RB / 0 RB Offset
		132047 to 132597	132047, 132322, 132597	15 MHz	QPSK	1 RB / 0 RB Offset
			132597	15 MHz	QPSK	100 RB / 0 RB Offset
		132072 to 132572	132072, 132322, 132572	20 MHz	QPSK	1 RB / 99 RB Offset
			132572	20 MHz	QPSK	100 RB / 0 RB Offset
-	Conducted Emission	131979 to 132665	131979, 132322, 132665	1.4 MHz	QPSK	1 RB / 2 RB Offset
		131987 to 132657	131987, 132322, 132657	3 MHz	QPSK	1 RB / 7 RB Offset
		131997 to 132647	131997, 132322, 132647	5 MHz	QPSK	12 RB / 0 RB Offset
		132022 to 132622	132022, 132322, 132622	10 MHz	QPSK	50 RB / 0 RB Offset
		132047 to 132597	132047, 132322, 132597	15 MHz	QPSK	36 RB / 0 RB Offset
		132072 to 132572	132072, 132322, 132572	20 MHz	QPSK	50 RB / 0 RB Offset
-	Radiated Emission	131979 to 132665	131979, 132322, 132665	1.4 MHz	QPSK	1 RB / 2 RB Offset
		131997 to 132647	131997, 132322, 132647	5 MHz	QPSK	12 RB / 0 RB Offset
		132072 to 132572	132072, 132322, 132572	20 MHz	QPSK	50 RB / 0 RB Offset

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP / EIRP	25 deg. C, 65 % RH	6.54 Vdc	Karl Lee
Frequency Stability	25 deg. C, 65 % RH	6.54 Vdc	Wayne Lin
Occupied Bandwidth	25 deg. C, 65 % RH	6.54 Vdc	Wayne Lin
Band Edge	25 deg. C, 65 % RH	6.54 Vdc	Wayne Lin
Peak to Average Ratio	25 deg. C, 65 % RH	6.54 Vdc	Wayne Lin
Conducted Emission	25 deg. C, 65 % RH	6.54 Vdc	Wayne Lin
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

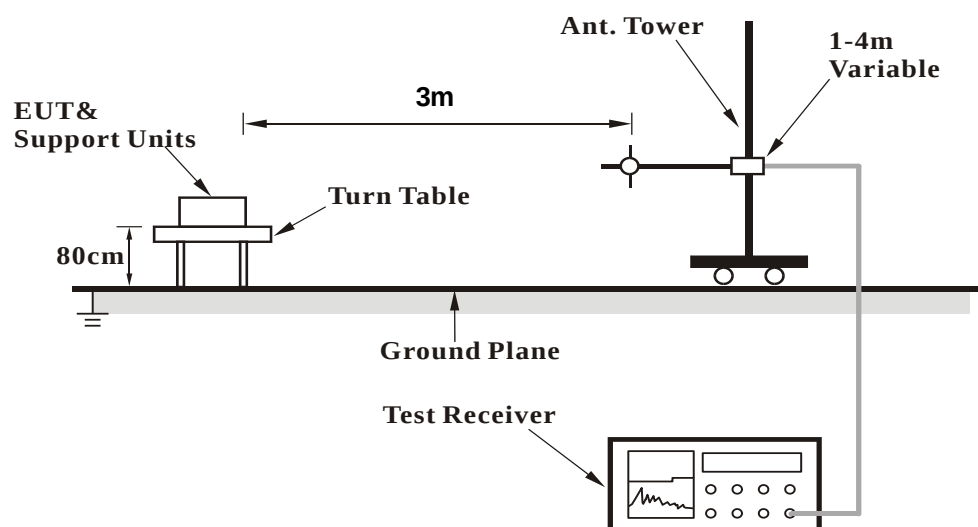
EIRP / ERP Measurement:

- 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 from E.I.R.P power by subtracting the gain of dipole, $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15 \text{ dBi}$.

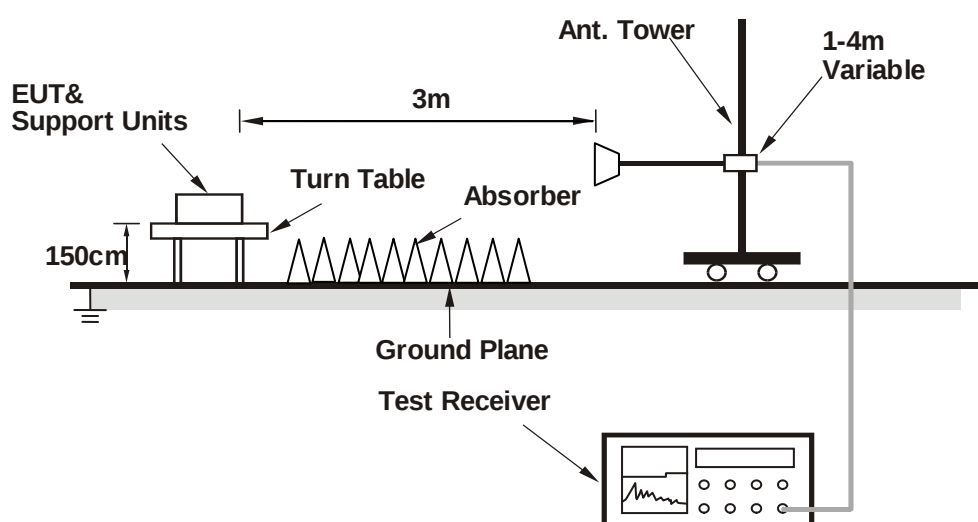
4.1.3 Test Setup

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).

4.1.4 Test Results

Band	WCDMA Band IV			3GPP MPR (dB)
Channel	1312	1413	1513	
Frequency (MHz)	1712.4	1732.6	1752.6	
RMC 12.2K	23.49	23.59	23.58	-
HSDPA Subtest-1	23.43	23.53	23.52	0
HSDPA Subtest-2	22.50	22.60	22.59	0
HSDPA Subtest-3	21.96	22.06	22.05	0.5
HSDPA Subtest-4	21.71	21.81	21.80	0.5
HSUPA Subtest-1	22.48	22.58	22.57	0
HSUPA Subtest-2	20.25	20.35	20.34	2
HSUPA Subtest-3	21.03	21.13	21.12	1
HSUPA Subtest-4	20.48	20.58	20.57	2
HSUPA Subtest-5	22.50	22.60	22.59	0

LTE Band 4															
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		20050	20175	20300				Channel		20025	20175	20325	
		Frequency (MHz)		1720.0	1732.5	1745.0				Frequency (MHz)		1717.5	1732.5	1747.5	
20M	QPSK	1	0	22.99	23.03	22.98	0	15M	QPSK	1	0	22.93	22.98	22.92	0
		1	50	22.95	22.98	23.01	0			1	37	22.88	22.92	22.95	0
		1	99	23.10	23.25	23.20	0			1	74	23.05	23.20	23.15	0
		50	0	22.09	22.07	22.15	1			36	0	21.99	21.94	22.07	1
		50	25	22.06	21.95	22.02	1			36	19	21.92	21.80	21.87	1
		50	50	22.05	21.92	22.08	1			36	39	21.90	21.77	21.97	1
		100	0	22.16	22.05	22.20	1			75	0	22.08	21.91	22.13	1
	16QAM	1	0	22.02	22.07	22.01	1		16QAM	1	0	21.93	21.99	21.91	1
		1	50	21.97	22.01	22.05	1			1	37	21.86	21.91	21.96	1
		1	99	22.15	22.30	22.25	1			1	74	22.07	22.24	22.18	1
		50	0	21.10	21.07	21.16	2			36	0	20.98	20.93	21.04	2
		50	25	21.05	20.90	20.97	2			36	19	20.91	20.77	20.86	2
		50	50	21.00	20.87	21.08	2			36	39	20.89	20.73	20.96	2
		100	0	21.17	21.02	21.21	2			75	0	21.07	20.89	21.11	2
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		20000	20175	20350				Channel		19975	20175	20375	
		Frequency (MHz)		1715.0	1732.5	1750.0				Frequency (MHz)		1712.5	1732.5	1752.5	
10M	QPSK	1	0	22.83	22.92	22.81	0	5M	QPSK	1	0	22.76	22.84	22.74	0
		1	24	22.77	22.81	22.86	0			1	12	22.70	22.74	22.80	0
		1	49	22.99	23.15	23.09	0			1	24	22.91	23.10	23.05	0
		25	0	21.87	21.84	21.94	1			12	0	21.77	21.71	21.86	1
		25	12	21.82	21.65	21.74	1			12	6	21.68	21.52	21.59	1
		25	25	21.78	21.62	21.85	1			12	13	21.64	21.48	21.75	1
		50	0	21.96	21.80	22.01	1			25	0	21.89	21.66	21.93	1
	16QAM	1	0	21.88	21.95	21.85	1		16QAM	1	0	21.80	21.88	21.75	1
		1	24	21.75	21.85	21.91	1			1	12	21.68	21.75	21.84	1
		1	49	22.04	22.20	22.15	1			1	24	21.96	22.14	22.07	1
		25	0	20.86	20.77	20.92	2			12	0	20.74	20.70	20.83	2
		25	12	20.75	20.61	20.68	2			12	6	20.66	20.47	20.57	2
		25	25	20.73	20.57	20.81	2			12	13	20.62	20.42	20.72	2
		50	0	20.94	20.74	20.99	2			25	0	20.86	20.64	20.91	2
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		19965	20175	20385				Channel		19957	20175	20393	
		Frequency (MHz)		1711.5	1732.5	1753.5				Frequency (MHz)		1710.7	1732.5	1754.3	
3M	QPSK	1	0	22.67	22.73	22.64	0	1.4M	QPSK	1	0	22.59	22.67	22.56	0
		1	7	22.57	22.64	22.70	0			1	2	22.47	22.56	22.62	0
		1	14	22.84	23.05	22.95	0			1	5	22.78	22.99	22.92	0
		8	0	21.67	21.60	21.74	1			3	0	21.63	21.57	21.69	0
		8	3	21.57	21.38	21.47	1			3	1	21.53	21.52	21.54	0
		8	7	21.52	21.33	21.63	1			3	3	21.57	21.58	21.60	0
		15	0	21.75	21.53	21.80	1			6	0	21.62	21.40	21.72	1
	16QAM	1	0	21.72	21.78	21.67	1		16QAM	1	0	21.65	21.73	21.61	1
		1	7	21.57	21.67	21.75	1			1	2	21.49	21.61	21.71	1
		1	14	21.88	22.08	22.01	1			1	5	21.82	22.03	21.96	1
		8	0	20.63	20.58	20.72	2			3	0	22.01	21.94	22.13	1
		8	3	20.54	20.33	20.42	2			3	1	21.91	21.69	21.79	1
		8	7	20.46	20.28	20.60	2			3	3	21.85	21.62	21.96	1
		15	0	20.75	20.50	20.79	2			6	0	20.66	20.40	20.72	2

LTE Band 12

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		23060	23095	23130				Channel		23035	23095	23155	
		Frequency (MHz)		704.0	707.5	711.0				Frequency (MHz)		701.5	707.5	713.5	
10M	QPSK	1	0	22.68	22.63	22.43	0	5M	QPSK	1	0	22.83	22.68	22.31	0
		1	24	22.77	22.80	22.46	0			1	12	22.72	22.75	22.39	0
		1	49	22.67	22.72	22.37	0			1	24	22.61	22.67	22.29	0
		25	0	21.73	21.72	21.35	1			12	0	21.85	21.60	21.20	1
		25	12	21.80	21.79	21.45	1			12	6	21.71	21.70	21.32	1
		25	25	21.75	21.70	21.42	1			12	13	21.65	21.58	21.28	1
		50	0	21.90	21.88	21.48	1			25	0	21.82	21.79	21.35	1
	16QAM	1	0	21.93	21.76	21.41	1		16QAM	1	0	21.86	21.69	21.31	1
		1	24	21.81	21.85	21.49	1			1	12	21.73	21.78	21.41	1
		1	49	21.70	21.75	21.39	1			1	24	21.62	21.68	21.30	1
		25	0	20.95	20.70	20.30	2			12	0	20.84	20.58	20.15	2
		25	12	20.79	20.78	20.42	2			12	6	20.67	20.66	20.27	2
		25	25	20.73	20.67	20.38	2			12	13	20.61	20.54	20.24	2
		50	0	20.91	20.88	20.45	2			25	0	20.80	20.76	20.31	2
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		23025	23095	23165				Channel		23017	23095	23173	
		Frequency (MHz)		700.5	707.5	714.5				Frequency (MHz)		699.7	707.5	715.3	
3M	QPSK	1	0	22.78	22.61	22.21	0	1.4M	QPSK	1	0	22.72	22.52	22.12	0
		1	7	22.65	22.69	22.30	0			1	2	22.58	22.63	22.21	0
		1	14	22.52	22.59	22.20	0			1	5	22.44	22.50	22.10	0
		8	0	21.75	21.48	21.06	1			3	0	21.65	21.37	21.35	0
		8	3	21.58	21.56	21.19	1			3	1	21.48	21.46	21.21	0
		8	7	21.52	21.45	21.15	1			3	3	21.40	21.33	21.22	0
		15	0	21.72	21.69	21.22	1			6	0	21.60	21.58	21.09	1
	16QAM	1	0	21.82	21.64	21.23	1		16QAM	1	0	21.77	21.56	21.12	1
		1	7	21.68	21.72	21.33	1			1	2	21.64	21.68	21.23	1
		1	14	21.55	21.61	21.21	1			1	5	21.49	21.55	21.10	1
		8	0	20.77	20.43	20.00	2			3	0	20.66	20.33	20.15	1
		8	3	20.58	20.55	20.13	2			3	1	20.47	20.43	20.29	1
		8	7	20.48	20.39	20.08	2			3	3	20.38	20.30	20.23	1
		15	0	20.73	20.68	20.16	2			6	0	20.60	20.56	20.05	2

LTE Band 13

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		23230						Channel		23205	23230	23255	
		Frequency (MHz)		782.0						Frequency (MHz)		779.5	782.0	784.5	
10M	QPSK	1	0		23.07		0	5M	QPSK	1	0	23.09	23.06	23.06	0
		1	24		23.02		0			1	12	23.07	23.01	23.09	0
		1	49		23.10		0			1	24	23.04	23.04	23.09	0
		25	0		22.07		1			12	0	22.07	22.01	21.95	1
		25	12		22.06		1			12	6	21.95	22.08	22.02	1
		25	25		22.15		1			12	13	21.91	22.13	22.00	1
		50	0		22.13		1			25	0	21.97	22.11	22.06	1
	16QAM	1	0		22.42		1		16QAM	1	0	22.41	22.49	22.31	1
		1	24		22.34		1			1	12	22.47	22.44	22.38	1
		1	49		22.45		1			1	24	22.46	22.37	22.32	1
		25	0		21.17		2			12	0	21.05	21.06	21.04	2
		25	12		21.10		2			12	6	21.02	21.10	21.05	2
		25	25		21.21		2			12	13	20.96	21.17	21.07	2
		50	0		21.19		2			25	0	21.05	21.15	21.04	2

LTE Band 17															
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		23780	23790	23800				Channel		23755	23790	23825	
		Frequency (MHz)		709.0	710.0	711.0				Frequency (MHz)		706.5	710.0	713.5	
10M	QPSK	1	0	22.71	22.52	22.99	0	5M	QPSK	1	0	22.63	22.44	22.91	0
		1	24	22.68	22.54	22.94	0			1	12	22.60	22.46	22.86	0
		1	49	22.78	22.67	22.91	0			1	24	22.70	22.59	22.83	0
		25	0	21.72	21.63	21.85	1			12	0	21.64	21.55	21.77	1
		25	12	21.68	21.50	21.75	1			12	6	21.60	21.42	21.67	1
		25	25	21.77	21.68	21.65	1			12	13	21.69	21.60	21.57	1
		50	0	21.65	21.71	21.76	1			25	0	21.57	21.63	21.68	1
	16QAM	1	0	21.65	21.46	21.93	1		16QAM	1	0	21.59	21.40	21.87	1
		1	24	21.62	21.48	21.88	1			1	12	21.56	21.42	21.82	1
		1	49	21.72	21.61	21.85	1			1	24	21.66	21.55	21.79	1
		25	0	20.66	20.57	20.79	2			12	0	20.60	20.51	20.73	2
		25	12	20.62	20.44	20.69	2			12	6	20.56	20.38	20.63	2
		25	25	20.71	20.62	20.59	2			12	13	20.65	20.56	20.53	2
		50	0	20.59	20.65	20.70	2			25	0	20.53	20.59	20.64	2

LTE Band 66

BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		132072	132322	132572				Channel		132047	132322	132597	
		Frequency (MHz)		1720.0	1745.0	1770.0				Frequency (MHz)		1717.5	1745.0	1772.5	
20M	QPSK	1	0	22.88	23.01	23.25	0	15M	QPSK	1	0	22.80	22.93	23.19	0
		1	50	22.67	22.80	23.04	0			1	37	22.58	22.72	22.97	0
		1	99	23.00	23.13	23.37	0			1	74	22.92	23.06	23.31	0
		50	0	21.74	21.87	22.11	1			36	0	21.59	21.73	21.99	1
		50	25	21.70	21.83	22.07	1			36	19	21.55	21.68	21.95	1
		50	50	21.81	21.94	22.18	1			36	39	21.66	21.81	22.07	1
		100	0	21.92	22.05	22.29	1			75	0	21.78	21.93	22.19	1
	16QAM	1	0	21.91	22.05	22.30	1		16QAM	1	0	21.83	21.99	22.25	1
		1	50	21.70	21.83	22.08	1			1	37	21.59	21.75	22.03	1
		1	99	22.03	22.18	22.42	1			1	74	21.97	22.13	22.37	1
		50	0	20.69	20.85	21.11	2			36	0	20.54	20.73	21.00	2
		50	25	20.65	20.80	21.07	2			36	19	20.50	20.66	20.95	2
		50	50	20.77	20.94	21.20	2			36	39	20.61	20.80	21.08	2
		100	0	20.91	21.05	21.31	2			75	0	20.78	20.93	21.21	2
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		132022	132322	132622				Channel		131997	132322	132647	
		Frequency (MHz)		1715.0	1745.0	1775.0				Frequency (MHz)		1712.5	1745.0	1777.5	
10M	QPSK	1	0	22.71	22.85	23.12	0	5M	QPSK	1	0	22.64	22.80	23.09	0
		1	24	22.50	22.63	22.89	0			1	12	22.40	22.55	22.85	0
		1	49	22.84	22.99	23.25	0			1	24	22.77	22.96	23.22	0
		25	0	21.44	21.61	21.92	1			12	0	21.30	21.49	21.80	1
		25	12	21.40	21.57	21.86	1			12	6	21.26	21.43	21.74	1
		25	25	21.51	21.71	22.00	1			12	13	21.38	21.59	21.88	1
		50	0	21.68	21.84	22.12	1			25	0	21.56	21.70	22.00	1
	16QAM	1	0	21.76	21.90	22.18	1		16QAM	1	0	21.66	21.81	22.11	1
		1	24	21.53	21.67	21.96	1			1	12	21.39	21.56	21.88	1
		1	49	21.89	22.05	22.31	1			1	24	21.79	21.99	22.25	1
		25	0	20.41	20.59	20.90	2			12	0	20.26	20.47	20.77	2
		25	12	20.35	20.55	20.83	2			12	6	20.22	20.38	20.72	2
		25	25	20.50	20.67	20.98	2			12	13	20.35	20.56	20.85	2
		50	0	20.65	20.80	21.13	2			25	0	20.52	20.68	20.99	2
BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)	BW	MCS Index	RB Size	RB Offset	Low	Mid	High	3GPP MPR (dB)
		Channel		131987	132322	132657				Channel		131979	132322	132665	
		Frequency (MHz)		1711.5	1745.5	1778.5				Frequency (MHz)		1710.7	1745.0	1779.3	
3M	QPSK	1	0	22.64	22.82	23.10	0	1.4M	QPSK	1	0	22.53	22.69	23.02	0
		1	7	22.39	22.55	22.85	0			1	2	22.29	22.43	22.77	0
		1	14	22.77	22.95	23.22	0			1	5	22.67	22.89	23.16	0
		8	0	21.30	21.46	21.81	1			3	0	21.68	21.86	21.65	0
		8	3	21.25	21.41	21.74	1			3	1	21.61	21.79	21.61	0
		8	7	21.37	21.58	21.89	1			3	3	21.76	21.95	21.74	0
		15	0	21.53	21.69	22.01	1			6	0	21.42	21.59	21.88	1
	16QAM	1	0	21.68	21.87	22.15	1		16QAM	1	0	21.59	21.80	22.10	1
		1	7	21.41	21.57	21.90	1			1	2	21.28	21.47	21.84	1
		1	14	21.83	22.01	22.27	1			1	5	21.75	21.97	22.22	1
		8	0	20.28	20.47	20.79	2			3	0	20.65	20.80	20.67	1
		8	3	20.22	20.41	20.73	2			3	1	20.57	20.74	20.61	1
		8	7	20.37	20.58	20.87	2			3	3	20.72	20.95	20.75	1
		15	0	20.55	20.70	21.02	2			6	0	20.37	20.57	20.90	2

ERP Power (dBm)

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)
Z	23017	699.7	-14.85	32.719	15.72	37.32	H
	23095	707.5	-14.89	32.736	15.70	37.12	
	23173	715.3	-14.72	32.591	15.72	37.33	
	23017	699.7	-20.83	32.69	9.71	9.35	V
	23095	707.5	-20.98	32.81	9.68	9.29	
	23173	715.3	-20.86	32.74	9.73	9.40	
Channel Bandwidth: 1.4 MHz / 16QAM							
Z	23017	699.7	-15.86	32.719	14.71	29.57	H
	23095	707.5	-15.92	32.736	14.67	29.28	
	23173	715.3	-15.74	32.591	14.70	29.52	
	23017	699.7	-21.85	32.69	8.69	7.40	V
	23095	707.5	-22.00	32.81	8.66	7.35	
	23173	715.3	-21.89	32.74	8.70	7.41	

LTE Band 12							
Channel Bandwidth: 3 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Z	23025	700.5	-14.83	32.719	15.74	37.49	H
	23095	707.5	-14.86	32.736	15.73	37.38	
	23165	714.5	-14.68	32.591	15.76	37.68	
	23025	700.5	-20.85	32.69	9.69	9.31	V
	23095	707.5	-20.93	32.81	9.73	9.40	
	23165	714.5	-20.84	32.74	9.75	9.44	
Channel Bandwidth: 3 MHz / 16QAM							
Z	23025	700.5	-15.85	32.719	14.72	29.64	H
	23095	707.5	-15.87	32.736	14.72	29.62	
	23165	714.5	-15.70	32.591	14.74	29.79	
	23025	700.5	-21.86	32.69	8.68	7.38	V
	23095	707.5	-21.95	32.81	8.71	7.43	
	23165	714.5	-21.84	32.74	8.75	7.50	

LTE Band 12							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Z	23035	701.5	-14.81	32.719	15.76	37.66	H
	23095	707.5	-14.82	32.736	15.77	37.72	
	23155	713.5	-14.65	32.591	15.79	37.94	
	23035	701.5	-20.80	32.69	9.74	9.42	V
	23095	707.5	-20.90	32.81	9.76	9.46	
	23155	713.5	-20.80	32.74	9.79	9.53	
Channel Bandwidth: 5 MHz / 16QAM							
Z	23035	701.5	-15.83	32.719	14.74	29.78	H
	23095	707.5	-15.85	32.736	14.74	29.76	
	23155	713.5	-15.67	32.591	14.77	30.00	
	23035	701.5	-21.82	32.69	8.72	7.45	V
	23095	707.5	-21.91	32.81	8.75	7.50	
	23155	713.5	-21.82	32.74	8.77	7.53	

LTE Band 12							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Z	23060	704.0	-14.79	32.727	15.79	37.91	H
	23095	707.5	-14.76	32.739	15.83	38.27	
	23130	711.0	-14.72	32.728	15.86	38.53	
	23060	704.0	-20.83	32.75	9.77	9.48	V
	23095	707.5	-20.86	32.81	9.80	9.55	
	23130	711.0	-20.87	32.84	9.82	9.59	
Channel Bandwidth: 10 MHz / 16QAM							
Z	23060	704.0	-15.82	32.727	14.76	29.90	H
	23095	707.5	-15.79	32.739	14.80	30.19	
	23130	711.0	-15.76	32.728	14.82	30.32	
	23060	704.0	-21.86	32.75	8.74	7.48	V
	23095	707.5	-21.87	32.81	8.79	7.57	
	23130	711.0	-21.88	32.84	8.81	7.60	

LTE Band 13							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Z	23205	779.5	-14.06	32.771	16.56	45.30	H
	23230	782.0	-14.10	32.741	16.49	44.58	
	23255	784.5	-14.20	32.854	16.50	44.71	
	23205	779.5	-18.80	32.5	11.55	14.29	V
	23230	782.0	-18.85	32.52	11.52	14.19	
	23255	784.5	-19.00	32.62	11.47	14.03	
Channel Bandwidth: 5 MHz / 16QAM							
Z	23205	779.5	-15.08	32.771	15.54	35.82	H
	23230	782.0	-15.13	32.741	15.46	35.16	
	23255	784.5	-15.21	32.854	15.49	35.43	
	23205	779.5	-19.82	32.5	10.53	11.30	V
	23230	782.0	-19.87	32.52	10.50	11.22	
	23255	784.5	-20.02	32.62	10.45	11.09	

LTE Band 13							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Z	23230	782.0	-13.95	32.737	16.64	46.10	H
	23230	782.0	-18.79	32.52	11.58	14.39	V
Channel Bandwidth: 10 MHz / 16QAM							
Z	23230	782.0	-14.96	32.737	15.63	36.53	H
	23230	782.0	-19.82	32.52	10.55	11.35	V

LTE Band 17							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Z	23755	706.5	-14.83	32.719	15.74	37.49	H
	23790	710.0	-14.84	32.736	15.75	37.55	
	23825	713.5	-14.66	32.591	15.78	37.85	
	23755	706.5	-20.80	32.69	9.74	9.42	V
	23790	710.0	-20.90	32.81	9.76	9.46	
	23825	713.5	-20.80	32.74	9.79	9.53	
Channel Bandwidth: 5 MHz / 16QAM							
Z	23755	706.5	-15.85	32.719	14.72	29.64	H
	23790	710.0	-15.86	32.736	14.73	29.69	
	23825	713.5	-15.66	32.591	14.78	30.07	
	23755	706.5	-21.81	32.69	8.73	7.46	V
	23790	710.0	-21.93	32.81	8.73	7.46	
	23825	713.5	-21.85	32.74	8.74	7.48	

LTE Band 17							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
Z	23780	709.0	-14.80	32.727	15.78	37.82	H
	23790	710.0	-14.79	32.739	15.80	38.01	
	23800	711.0	-14.73	32.728	15.85	38.44	
	23780	709.0	-20.78	32.75	9.82	9.59	V
	23790	710.0	-20.80	32.81	9.86	9.68	
	23800	711.0	-20.82	32.84	9.87	9.71	
Channel Bandwidth: 10 MHz / 16QAM							
Z	23780	709.0	-15.83	32.727	14.75	29.83	H
	23790	710.0	-15.81	32.739	14.78	30.05	
	23800	711.0	-15.75	32.728	14.83	30.39	
	23780	709.0	-21.80	32.75	8.80	7.59	V
	23790	710.0	-21.81	32.81	8.85	7.67	
	23800	711.0	-21.83	32.84	8.86	7.69	

EIRP Power (dBm)

WCDMA							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	1312	1712.4	-24.66	42.49	17.83	60.60	H
	1413	1732.6	-24.46	42.33	17.87	61.19	
	1513	1752.6	-24.29	42.10	17.81	60.39	
	1312	1712.4	-29.17	42.99	13.82	24.10	V
	1413	1732.6	-28.90	42.74	13.84	24.21	
	1513	1752.6	-28.44	42.21	13.77	23.82	

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	-25.08	42.49	17.41	55.02	H
	20175	1732.5	-24.96	42.33	17.37	54.54	
	20393	1754.3	-24.69	42.10	17.41	55.08	
	19957	1710.7	-29.59	42.99	13.40	21.88	V
	20175	1732.5	-29.36	42.74	13.38	21.78	
	20393	1754.3	-28.85	42.21	13.36	21.68	
Channel Bandwidth: 1.4 MHz / 16QAM							
X	19957	1710.7	-26.05	42.49	16.44	44.00	H
	20175	1732.5	-25.93	42.33	16.40	43.62	
	20393	1754.3	-25.67	42.10	16.43	43.95	
	19957	1710.7	-30.58	42.99	12.41	17.42	V
	20175	1732.5	-30.34	42.74	12.40	17.38	
	20393	1754.3	-29.83	42.21	12.38	17.30	

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	-25.06	42.49	17.43	55.27	H
	20175	1732.5	-24.93	42.33	17.40	54.92	
	20385	1753.5	-24.72	42.10	17.38	54.70	
	19965	1711.5	-29.54	42.99	13.45	22.13	V
	20175	1732.5	-29.31	42.74	13.43	22.03	
	20385	1753.5	-28.80	42.21	13.41	21.93	
Channel Bandwidth: 3 MHz / 16QAM							
X	19965	1711.5	-26.04	42.49	16.45	44.11	H
	20175	1732.5	-25.93	42.33	16.40	43.62	
	20385	1753.5	-25.70	42.10	16.40	43.65	
	19965	1711.5	-30.51	42.99	12.48	17.70	V
	20175	1732.5	-30.27	42.74	12.47	17.66	
	20385	1753.5	-29.83	42.21	12.38	17.30	

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	-25.02	42.49	17.47	55.78	H
	20175	1732.5	-24.88	42.33	17.45	55.55	
	20375	1752.5	-24.66	42.10	17.44	55.46	
	19975	1712.5	-29.54	42.99	13.45	22.13	V
	20175	1732.5	-29.32	42.74	13.42	21.98	
	20375	1752.5	-28.82	42.21	13.39	21.83	
Channel Bandwidth: 5 MHz / 16QAM							
X	19975	1712.5	-26.00	42.49	16.49	44.51	H
	20175	1732.5	-25.86	42.33	16.47	44.33	
	20375	1752.5	-25.64	42.10	16.46	44.26	
	19975	1712.5	-30.51	42.99	12.48	17.70	V
	20175	1732.5	-30.30	42.74	12.44	17.54	
	20375	1752.5	-29.81	42.21	12.40	17.38	

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	-25.00	42.49	17.49	56.04	H
	20175	1732.5	-24.86	42.33	17.47	55.81	
	20350	1750.0	-24.66	42.10	17.44	55.46	
	20000	1715.0	-29.52	42.99	13.47	22.23	V
	20175	1732.5	-29.31	42.74	13.43	22.03	
	20350	1750.0	-28.80	42.21	13.41	21.93	
Channel Bandwidth: 10 MHz / 16QAM							
X	20000	1715.0	-25.98	42.49	16.51	44.72	H
	20175	1732.5	-25.83	42.33	16.50	44.64	
	20350	1750.0	-25.62	42.10	16.48	44.46	
	20000	1715.0	-30.50	42.99	12.49	17.74	V
	20175	1732.5	-30.30	42.74	12.44	17.54	
	20350	1750.0	-29.78	42.21	12.43	17.50	

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	-25.00	42.49	17.49	56.04	H
	20175	1732.5	-24.85	42.33	17.48	55.94	
	20325	1747.5	-24.65	42.10	17.45	55.59	
	20025	1717.5	-29.50	42.99	13.49	22.34	V
	20175	1732.5	-29.27	42.74	13.47	22.23	
	20325	1747.5	-28.77	42.21	13.44	22.08	
Channel Bandwidth: 15 MHz / 16QAM							
X	20025	1717.5	-24.96	42.49	17.53	56.56	H
	20175	1732.5	-25.81	42.33	16.52	44.84	
	20325	1747.5	-25.63	42.10	16.47	44.36	
	20025	1717.5	-30.46	42.99	12.53	17.91	V
	20175	1732.5	-30.25	42.74	12.49	17.74	
	20325	1747.5	-29.76	42.21	12.45	17.58	

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	-24.96	42.49	17.53	56.56	H
	20175	1732.5	-24.82	42.33	17.51	56.32	
	20300	1745.0	-24.63	42.10	17.47	55.85	
	20050	1720.0	-29.48	42.99	13.51	22.44	V
	20175	1732.5	-29.26	42.74	13.48	22.28	
	20300	1745.0	-28.75	42.21	13.46	22.18	
Channel Bandwidth: 20 MHz / 16QAM							
X	20050	1720.0	-25.92	42.49	16.57	45.34	H
	20175	1732.5	-25.80	42.33	16.53	44.95	
	20300	1745.0	-25.60	42.10	16.50	44.67	
	20050	1720.0	-30.43	42.99	12.56	18.03	V
	20175	1732.5	-30.21	42.74	12.53	17.91	
	20300	1745.0	-29.73	42.21	12.48	17.70	

LTE Band 66							
Channel Bandwidth: 1.4 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	131979	1710.7	-18.64	36.45	17.81	60.39	H
	132322	1745	-18.96	36.80	17.84	60.80	
	132665	1779.3	-19.15	36.94	17.79	60.16	
	131979	1710.7	-23.48	37.28	13.80	23.97	V
	132322	1745	-23.79	37.63	13.84	24.21	
	132665	1779.3	-23.82	37.64	13.82	24.10	
Channel Bandwidth: 1.4 MHz / 16QAM							
X	131979	1710.7	-19.66	36.45	16.79	47.75	H
	132322	1745	-19.97	36.80	16.83	48.18	
	132665	1779.3	-20.16	36.94	16.78	47.68	
	131979	1710.7	-24.50	37.28	12.78	18.95	V
	132322	1745	-24.81	37.63	12.82	19.14	
	132665	1779.3	-24.83	37.64	12.81	19.10	

LTE Band 66							
Channel Bandwidth: 3 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	131987	1711.5	-18.63	36.45	17.82	60.53	H
	132322	1745	-18.96	36.80	17.84	60.80	
	132657	1778.5	-19.14	36.94	17.80	60.30	
	131987	1711.5	-23.45	37.28	13.83	24.14	V
	132322	1745	-23.78	37.63	13.85	24.27	
	132657	1778.5	-23.83	37.64	13.81	24.04	
Channel Bandwidth: 3 MHz / 16QAM							
X	131987	1711.5	-19.61	36.45	16.84	48.31	H
	132322	1745	-19.94	36.80	16.86	48.52	
	132657	1778.5	-20.16	36.94	16.78	47.68	
	131987	1711.5	-24.44	37.28	12.84	19.22	V
	132322	1745	-24.75	37.63	12.88	19.41	
	132657	1778.5	-24.86	37.64	12.78	18.97	

LTE Band 66							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	131997	1712.5	-18.61	36.45	17.84	60.81	H
	132322	1745	-18.95	36.80	17.85	60.94	
	132647	1777.5	-19.12	36.94	17.82	60.58	
	131997	1712.5	-23.44	37.28	13.84	24.19	V
	132322	1745	-23.76	37.63	13.87	24.38	
	132647	1777.5	-23.79	37.64	13.85	24.27	
Channel Bandwidth: 5 MHz / 16QAM							
X	131997	1712.5	-19.63	36.45	16.82	48.08	H
	132322	1745	-19.97	36.80	16.83	48.18	
	132647	1777.5	-20.13	36.94	16.81	48.01	
	131997	1712.5	-24.45	37.28	12.83	19.17	V
	132322	1745	-24.78	37.63	12.85	19.28	
	132647	1777.5	-24.81	37.64	12.83	19.19	

LTE Band 66							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	132022	1715	-18.78	36.64	17.86	61.09	H
	132322	1745	-18.90	36.80	17.90	61.59	
	132622	1775	-18.96	36.80	17.84	60.81	
	132022	1715	-23.57	37.44	13.87	24.37	V
	132322	1745	-23.72	37.63	13.91	24.60	
	132622	1775	-23.77	37.64	13.87	24.35	
Channel Bandwidth: 10 MHz / 16QAM							
X	132022	1715	-19.79	36.64	16.85	48.42	H
	132322	1745	-19.92	36.80	16.88	48.70	
	132622	1775	-19.99	36.80	16.81	47.97	
	132022	1715	-24.55	37.44	12.89	19.45	V
	132322	1745	-24.71	37.63	12.92	19.58	
	132622	1775	-24.75	37.64	12.89	19.43	

LTE Band 66							
Channel Bandwidth: 15 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	132047	1717.5	-18.54	36.45	17.91	61.80	H
	132322	1745	-18.86	36.80	17.94	62.22	
	132597	1772.5	-19.04	36.94	17.90	61.70	
	132047	1717.5	-23.40	37.28	13.88	24.42	V
	132322	1745	-23.69	37.63	13.94	24.77	
	132597	1772.5	-23.75	37.64	13.89	24.49	
Channel Bandwidth: 15 MHz / 16QAM							
X	132047	1717.5	-19.55	36.45	16.90	48.98	H
	132322	1745	-19.87	36.80	16.93	49.31	
	132597	1772.5	-20.06	36.94	16.88	48.79	
	132047	1717.5	-24.42	37.28	12.86	19.31	V
	132322	1745	-24.71	37.63	12.92	19.59	
	132597	1772.5	-24.79	37.64	12.85	19.28	

LTE Band 66							
Channel Bandwidth: 20 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	132072	1720	-18.52	36.45	17.93	62.09	H
	132322	1745	-18.83	36.80	17.97	62.65	
	132572	1770	-19.00	36.94	17.94	62.27	
	132072	1720	-23.35	37.28	13.93	24.70	V
	132322	1745	-23.67	37.63	13.96	24.89	
	132572	1770	-23.69	37.64	13.95	24.83	
Channel Bandwidth: 20 MHz / 16QAM							
X	132072	1720	-19.53	36.45	16.92	49.20	H
	132322	1745	-19.82	36.80	16.98	49.88	
	132572	1770	-20.00	36.94	16.94	49.47	
	132072	1720	-24.36	37.28	12.92	19.57	V
	132322	1745	-24.69	37.63	12.94	19.68	
	132572	1770	-24.75	37.64	12.89	19.45	

4.2 Frequency Stability Measurement

4.2.1 Limits of Frequency Stability Measurement

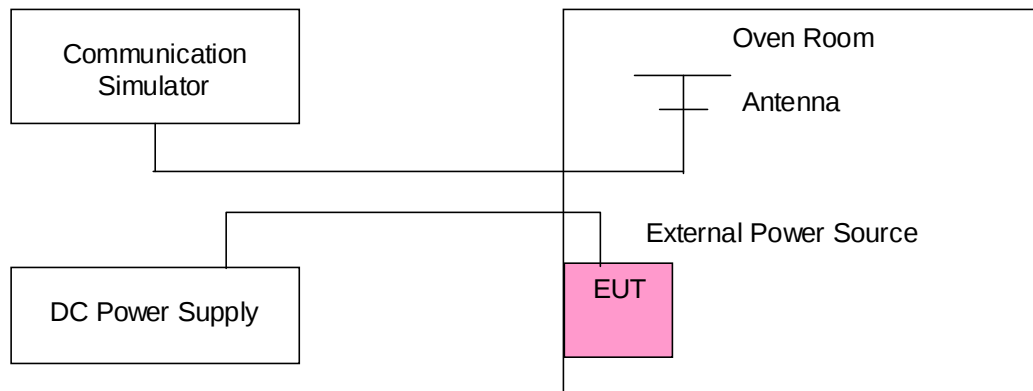
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

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 ± 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

Frequency Error vs. Voltage

Voltage (Volts)	WCDMA				Limit (ppm)
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
7.7	1712.400004	0.002	1752.600003	0.001	2.5
6.54	1712.400002	0.001	1752.600003	0.002	2.5
8.85	1712.400002	0.001	1752.600003	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	WCDMA				Limit (ppm)
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1712.400004	0.002	1752.600002	0.001	2.5
-20	1712.400004	0.002	1752.600003	0.002	2.5
-10	1712.400002	0.001	1752.600002	0.001	2.5
0	1712.400004	0.002	1752.600002	0.001	2.5
10	1712.400003	0.002	1752.600001	0.001	2.5
20	1712.399999	-0.001	1752.599997	-0.002	2.5
30	1712.399997	-0.002	1752.599997	-0.002	2.5
40	1712.399997	-0.002	1752.599998	-0.001	2.5
50	1712.399997	-0.002	1752.599998	-0.001	2.5

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)	
7.7	1710.700002	0.001	1754.300001	0.001	2.5
6.54	1710.700002	0.001	1754.300004	0.002	2.5
8.85	1710.700002	0.001	1754.300003	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 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	1710.700002	0.001	1754.300004	0.002	2.5
-10	1710.700004	0.002	1754.300004	0.002	2.5
0	1710.700004	0.002	1754.300003	0.001	2.5
10	1710.700003	0.002	1754.300003	0.001	2.5
20	1710.699997	-0.002	1754.299999	-0.001	2.5
30	1710.699998	-0.001	1754.299997	-0.002	2.5
40	1710.699996	-0.002	1754.299997	-0.002	2.5
50	1710.699997	-0.002	1754.299999	-0.001	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)	
7.7	1711.500003	0.002	1753.500003	0.002	2.5
6.54	1711.500003	0.002	1753.500003	0.002	2.5
8.85	1711.500001	0.001	1753.500003	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 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	1711.500003	0.002	1753.500002	0.001	2.5
-20	1711.500002	0.001	1753.500004	0.002	2.5
-10	1711.500001	0.001	1753.500002	0.001	2.5
0	1711.500002	0.001	1753.500004	0.002	2.5
10	1711.500001	0.001	1753.500003	0.001	2.5
20	1711.499997	-0.002	1753.499998	-0.001	2.5
30	1711.499996	-0.002	1753.499997	-0.002	2.5
40	1711.499997	-0.002	1753.499998	-0.001	2.5
50	1711.499996	-0.002	1753.499997	-0.002	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)	
7.7	1712.500003	0.002	1752.500003	0.002	2.5
6.54	1712.500001	0.001	1752.500004	0.002	2.5
8.85	1712.500001	0.001	1752.500003	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 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	1752.500004	0.002	2.5
-10	1712.500002	0.001	1752.500003	0.002	2.5
0	1712.500002	0.001	1752.500003	0.002	2.5
10	1712.500001	0.001	1752.500004	0.002	2.5
20	1712.499997	-0.002	1752.499996	-0.002	2.5
30	1712.499999	-0.001	1752.499996	-0.002	2.5
40	1712.499997	-0.002	1752.499998	-0.001	2.5
50	1712.499998	-0.001	1752.499998	-0.001	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)	
7.7	1715.000001	0.001	1750.000002	0.001	2.5
6.54	1715.000004	0.002	1750.000004	0.002	2.5
8.85	1715.000002	0.001	1750.000002	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 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	1715.000003	0.002	1750.000002	0.001	2.5
-20	1715.000003	0.002	1750.000004	0.002	2.5
-10	1715.000002	0.001	1750.000001	0.001	2.5
0	1715.000002	0.001	1750.000002	0.001	2.5
10	1715.000002	0.001	1750.000002	0.001	2.5
20	1714.999998	-0.001	1749.999997	-0.002	2.5
30	1714.999996	-0.002	1749.999998	-0.001	2.5
40	1714.999997	-0.002	1749.999998	-0.001	2.5
50	1714.999999	-0.001	1749.999999	-0.001	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)	
7.7	1717.500004	0.002	1747.500001	0.001	2.5
6.54	1717.500003	0.002	1747.500001	0.001	2.5
8.85	1717.500003	0.002	1747.500002	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 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	1717.500002	0.001	1747.500001	0.001	2.5
-20	1717.500004	0.002	1747.500004	0.002	2.5
-10	1717.500003	0.002	1747.500004	0.002	2.5
0	1717.500003	0.001	1747.500001	0.001	2.5
10	1717.500003	0.002	1747.500003	0.002	2.5
20	1717.499996	-0.002	1747.499998	-0.001	2.5
30	1717.499997	-0.002	1747.499997	-0.002	2.5
40	1717.499997	-0.002	1747.499998	-0.001	2.5
50	1717.499998	-0.001	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)	
7.7	1720.000002	0.001	1745.000004	0.002	2.5
6.54	1720.000004	0.002	1745.000002	0.001	2.5
8.85	1720.000003	0.002	1745.000002	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 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	1745.000002	0.001	2.5
-20	1720.000003	0.002	1745.000003	0.002	2.5
-10	1720.000004	0.002	1745.000003	0.002	2.5
0	1720.000002	0.001	1745.000003	0.002	2.5
10	1720.000004	0.002	1745.000002	0.001	2.5
20	1719.999997	-0.002	1744.999999	-0.001	2.5
30	1719.999997	-0.002	1744.999998	-0.001	2.5
40	1719.999997	-0.002	1744.999997	-0.002	2.5
50	1719.999999	-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)	
7.7	699.700004	0.005	715.300004	0.005	2.5
6.54	699.700003	0.004	715.300003	0.004	2.5
8.85	699.700002	0.003	715.300003	0.004	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 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	0.002	2.5
-20	699.700002	0.003	715.300002	0.002	2.5
-10	699.700001	0.002	715.300004	0.006	2.5
0	699.700004	0.005	715.300003	0.005	2.5
10	699.700003	0.004	715.300003	0.004	2.5
20	699.699996	-0.006	715.299999	-0.002	2.5
30	699.699998	-0.004	715.299998	-0.003	2.5
40	699.699998	-0.003	715.299999	-0.002	2.5
50	699.699999	-0.002	715.299998	-0.003	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)	
7.7	700.500003	0.004	714.500004	0.005	2.5
6.54	700.500003	0.004	714.500004	0.005	2.5
8.85	700.500003	0.005	714.500003	0.004	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 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	0.004	714.500002	0.003	2.5
-20	700.500003	0.004	714.500003	0.004	2.5
-10	700.500003	0.005	714.500003	0.004	2.5
0	700.500003	0.004	714.500002	0.003	2.5
10	700.500003	0.004	714.500004	0.005	2.5
20	700.499998	-0.003	714.499996	-0.006	2.5
30	700.499997	-0.004	714.499997	-0.005	2.5
40	700.499998	-0.003	714.499997	-0.005	2.5
50	700.499997	-0.005	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)	
7.7	701.500001	0.002	713.500003	0.004	2.5
6.54	701.500002	0.002	713.500001	0.002	2.5
8.85	701.500002	0.003	713.500003	0.004	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 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	701.500003	0.004	713.500002	0.003	2.5
-10	701.500001	0.001	713.500004	0.005	2.5
0	701.500004	0.006	713.500002	0.002	2.5
10	701.500001	0.002	713.500002	0.002	2.5
20	701.499996	-0.006	713.499997	-0.004	2.5
30	701.499999	-0.002	713.499997	-0.004	2.5
40	701.499998	-0.003	713.499998	-0.003	2.5
50	701.499998	-0.004	713.499999	-0.002	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)	
7.7	704.000003	0.005	711.000002	0.003	2.5
6.54	704.000001	0.002	711.000002	0.003	2.5
8.85	704.000002	0.003	711.000002	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 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	704.000003	0.005	711.000002	0.003	2.5
-20	704.000001	0.002	711.000002	0.002	2.5
-10	704.000001	0.002	711.000001	0.002	2.5
0	704.000003	0.005	711.000003	0.004	2.5
10	704.000002	0.002	711.000002	0.003	2.5
20	703.999998	-0.003	710.999999	-0.002	2.5
30	703.999996	-0.006	710.999999	-0.002	2.5
40	703.999998	-0.003	710.999998	-0.003	2.5
50	703.999997	-0.005	710.999998	-0.003	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 13				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
7.7	779.500002	0.002	784.500004	0.005	2.5
6.54	779.500001	0.001	784.500003	0.003	2.5
8.85	779.500002	0.003	784.500003	0.004	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 13				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	779.500003	0.004	784.500003	0.004	2.5
-20	779.500002	0.003	784.500003	0.003	2.5
-10	779.500004	0.005	784.500002	0.002	2.5
0	779.500002	0.002	784.500003	0.004	2.5
10	779.500003	0.004	784.500003	0.004	2.5
20	779.499998	-0.003	784.499998	-0.003	2.5
30	779.499996	-0.005	784.499999	-0.002	2.5
40	779.499996	-0.005	784.499999	-0.001	2.5
50	779.499997	-0.004	784.499996	-0.005	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 13		Limit (ppm)
	Channel Bandwidth: 10 MHz		
	Frequency (MHz)	Frequency Error (ppm)	
7.7	782.000003	0.004	2.5
6.54	782.000003	0.003	2.5
8.85	782.000002	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 13		Limit (ppm)
	Channel Bandwidth: 10 MHz		
	Frequency (MHz)	Frequency Error (ppm)	
-30	782.000002	0.003	2.5
-20	782.000003	0.003	2.5
-10	782.000004	0.005	2.5
0	782.000003	0.004	2.5
10	782.000003	0.004	2.5
20	781.999999	-0.002	2.5
30	781.999998	-0.003	2.5
40	781.999998	-0.002	2.5
50	781.999998	-0.003	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 17				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
7.7	706.500003	0.004	713.500003	0.004	2.5
6.54	706.500003	0.004	713.500003	0.004	2.5
8.85	706.500003	0.005	713.500004	0.005	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 17				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	706.500001	0.002	713.500001	0.001	2.5
-20	706.500003	0.004	713.500003	0.004	2.5
-10	706.500003	0.004	713.500001	0.002	2.5
0	706.500003	0.004	713.500004	0.005	2.5
10	706.500002	0.003	713.500004	0.005	2.5
20	706.499996	-0.005	713.499999	-0.002	2.5
30	706.499996	-0.005	713.499999	-0.002	2.5
40	706.499996	-0.005	713.499997	-0.004	2.5
50	706.499996	-0.005	713.499998	-0.003	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 17				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
7.7	709.000002	0.003	711.000004	0.005	2.5
6.54	709.000001	0.002	711.000001	0.002	2.5
8.85	709.000003	0.004	711.000001	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 17				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	709.000004	0.005	711.000002	0.003	2.5
-20	709.000002	0.002	711.000004	0.005	2.5
-10	709.000001	0.002	711.000002	0.003	2.5
0	709.000004	0.005	711.000002	0.003	2.5
10	709.000003	0.004	711.000001	0.001	2.5
20	708.999998	-0.003	710.999998	-0.004	2.5
30	708.999997	-0.004	710.999997	-0.004	2.5
40	708.999999	-0.002	710.999999	-0.002	2.5
50	708.999998	-0.003	710.999996	-0.005	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
7.7	1710.700002	0.001	1779.300003	0.002	2.5
6.54	1710.700002	0.001	1779.300003	0.002	2.5
8.85	1710.700002	0.001	1779.300004	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 66				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1710.700001	0.001	1779.300003	0.002	2.5
-20	1710.700002	0.001	1779.300004	0.002	2.5
-10	1710.700002	0.001	1779.300003	0.002	2.5
0	1710.700003	0.002	1779.300004	0.002	2.5
10	1710.700004	0.002	1779.300004	0.002	2.5
20	1710.699997	-0.002	1779.299996	-0.002	2.5
30	1710.699998	-0.001	1779.299998	-0.001	2.5
40	1710.699999	-0.001	1779.299998	-0.001	2.5
50	1710.699999	-0.001	1779.299997	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
7.7	1711.500001	0.001	1778.500003	0.001	2.5
6.54	1711.500003	0.002	1778.500004	0.002	2.5
8.85	1711.500002	0.001	1778.500003	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 66				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1711.500002	0.001	1778.500003	0.002	2.5
-20	1711.500004	0.002	1778.500003	0.001	2.5
-10	1711.500003	0.002	1778.500004	0.002	2.5
0	1711.500002	0.001	1778.500001	0.001	2.5
10	1711.500003	0.002	1778.500002	0.001	2.5
20	1711.499997	-0.002	1778.499999	-0.001	2.5
30	1711.499997	-0.002	1778.499996	-0.002	2.5
40	1711.499999	-0.001	1778.499998	-0.001	2.5
50	1711.499997	-0.002	1778.499998	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
7.7	1712.500002	0.001	1777.500003	0.002	2.5
6.54	1712.500002	0.001	1777.500004	0.002	2.5
8.85	1712.500003	0.002	1777.500002	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 66				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1712.500003	0.002	1777.500004	0.002	2.5
-20	1712.500003	0.002	1777.500004	0.002	2.5
-10	1712.500002	0.001	1777.500004	0.002	2.5
0	1712.500002	0.001	1777.500003	0.002	2.5
10	1712.500004	0.002	1777.500004	0.002	2.5
20	1712.499996	-0.002	1777.499999	-0.001	2.5
30	1712.499998	-0.001	1777.499996	-0.002	2.5
40	1712.499998	-0.001	1777.499997	-0.002	2.5
50	1712.499997	-0.002	1777.499998	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
7.7	1715.000003	0.001	1775.000004	0.002	2.5
6.54	1715.000003	0.002	1775.000003	0.001	2.5
8.85	1715.000002	0.001	1775.000003	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 66				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1715.000001	0.001	1775.000002	0.001	2.5
-20	1715.000002	0.001	1775.000002	0.001	2.5
-10	1715.000002	0.001	1775.000003	0.002	2.5
0	1715.000003	0.002	1775.000003	0.002	2.5
10	1715.000004	0.002	1775.000001	0.001	2.5
20	1714.999996	-0.002	1774.999998	-0.001	2.5
30	1714.999999	-0.001	1774.999999	-0.001	2.5
40	1714.999999	-0.001	1774.999998	-0.001	2.5
50	1714.999996	-0.002	1774.999999	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
7.7	1717.500004	0.002	1772.500003	0.002	2.5
6.54	1717.500003	0.002	1772.500003	0.002	2.5
8.85	1717.500002	0.001	1772.500003	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 66				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	1772.500004	0.002	2.5
-20	1717.500002	0.001	1772.500003	0.002	2.5
-10	1717.500002	0.001	1772.500004	0.002	2.5
0	1717.500003	0.002	1772.500003	0.002	2.5
10	1717.500002	0.001	1772.500004	0.002	2.5
20	1717.499996	-0.002	1772.499999	-0.001	2.5
30	1717.499996	-0.002	1772.499997	-0.002	2.5
40	1717.499997	-0.002	1772.499996	-0.002	2.5
50	1717.499997	-0.002	1772.499996	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 66				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
7.7	1720.000002	0.001	1770.000003	0.002	2.5
6.54	1720.000001	0.001	1770.000004	0.002	2.5
8.85	1720.000002	0.001	1770.000004	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 6.54 Vdc to 8.85 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 66				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1720.000001	0.001	1770.000004	0.002	2.5
-20	1720.000003	0.001	1770.000004	0.002	2.5
-10	1720.000004	0.002	1770.000003	0.002	2.5
0	1720.000003	0.002	1770.000001	0.001	2.5
10	1720.000001	0.001	1770.000001	0.001	2.5
20	1719.999997	-0.002	1769.999999	-0.001	2.5
30	1719.999996	-0.002	1769.999999	-0.001	2.5
40	1719.999999	-0.001	1769.999998	-0.001	2.5
50	1719.999998	-0.001	1769.999999	-0.001	2.5

4.3 Occupied Bandwidth Measurement

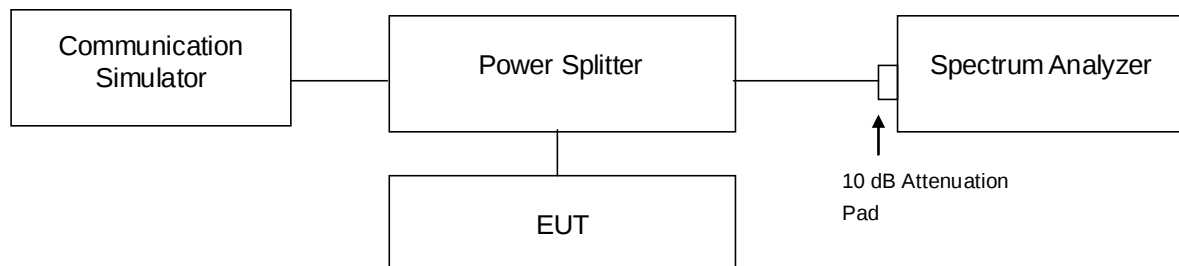
4.3.1 Limits of Occupied Bandwidth Measurement

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

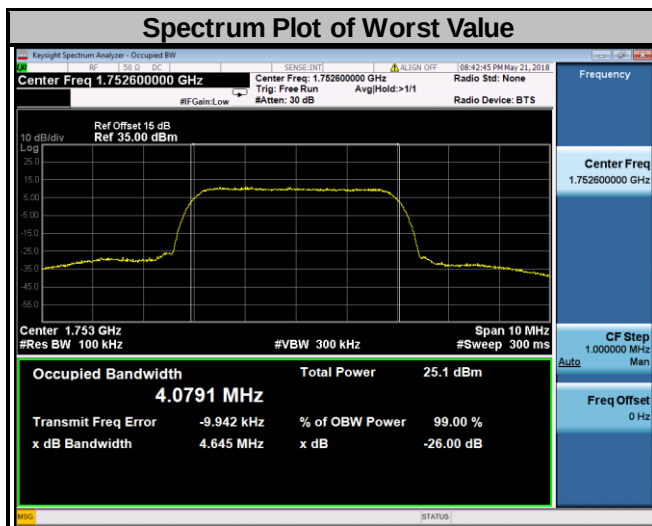
- The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

4.3.3 Test Setup

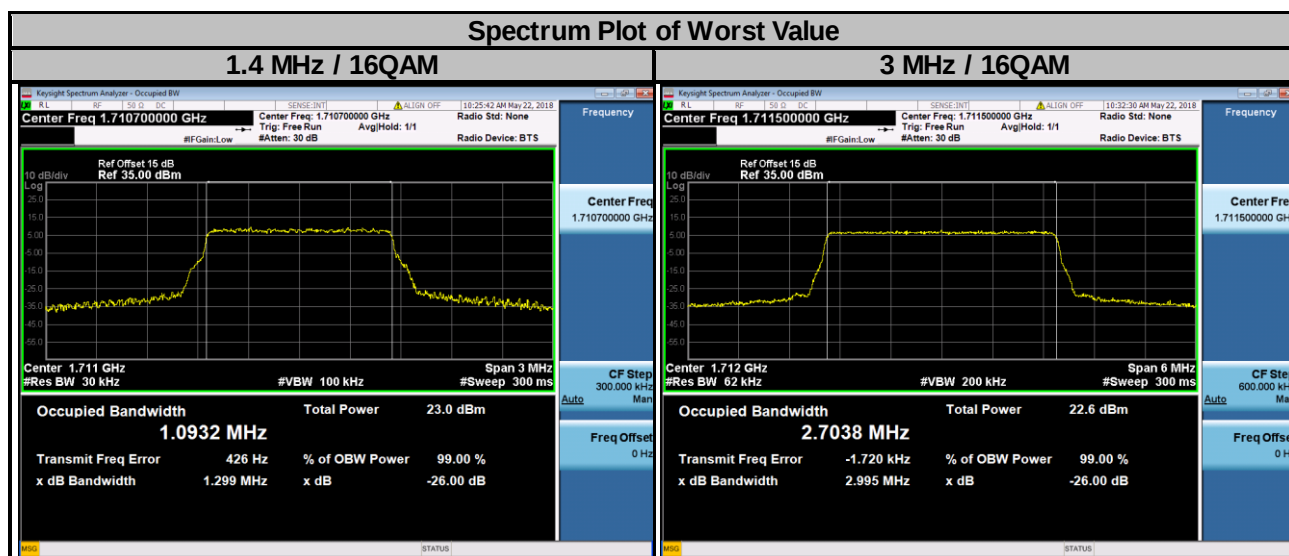


4.3.4 Test Result

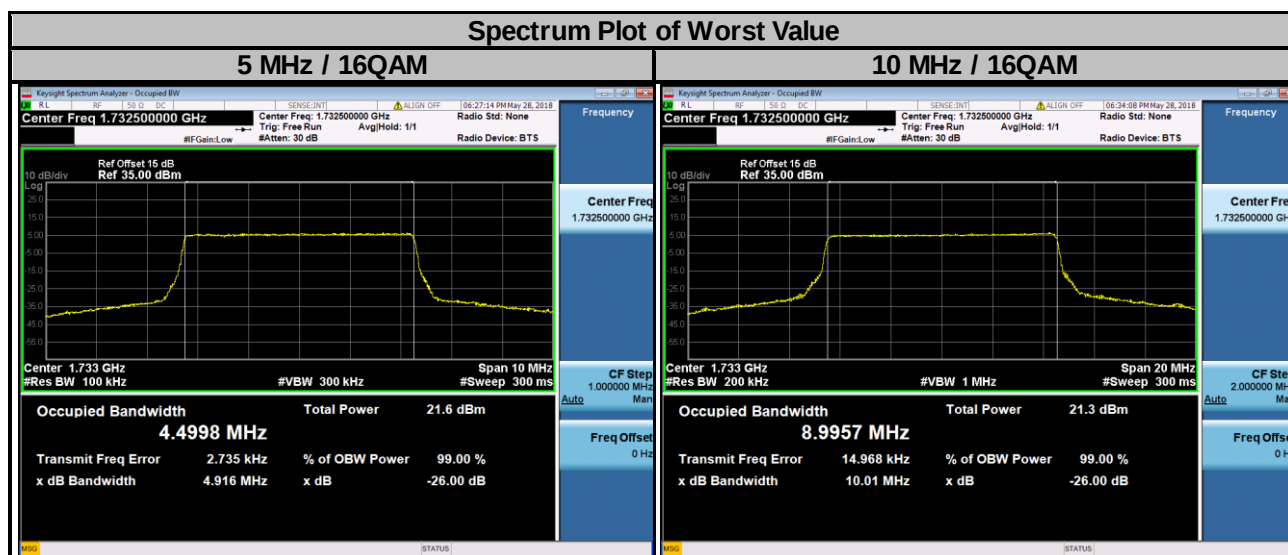
WCDMA		
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)
1312	1712.4	4.0731
1413	1732.6	4.0779
1513	1752.6	4.0791



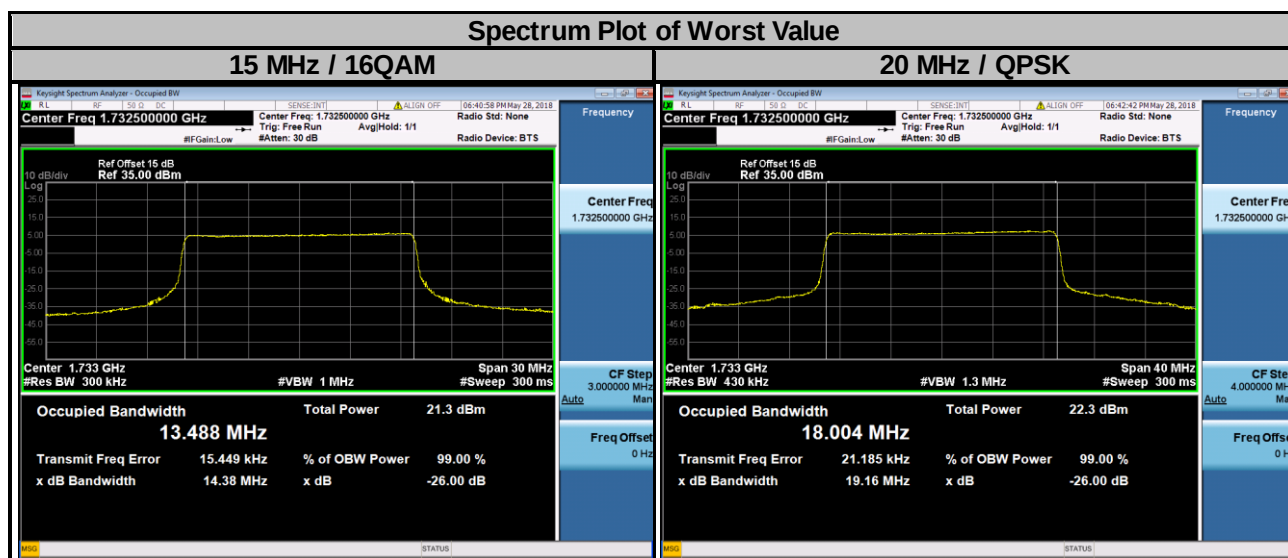
LTE Band 4							
Channel Bandwidth: 1.4 MHz				Channel Bandwidth: 3 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
19957	1710.7	1.0922	1.0932	19965	1711.5	2.7031	2.7038
20175	1732.5	1.0917	1.0905	20175	1732.5	2.7035	2.7015
20393	1754.3	1.0915	1.0916	20385	1753.5	2.7036	2.7012



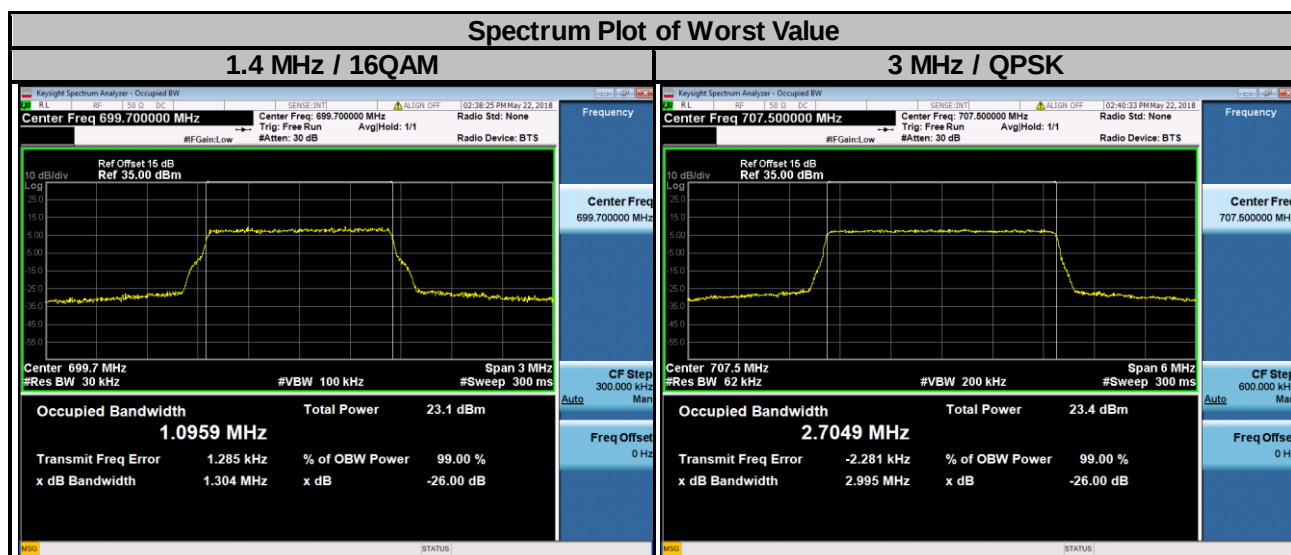
LTE Band 4							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
19975	1712.5	4.4949	4.4996	20000	1715.0	8.9855	8.9771
20175	1732.5	4.4909	4.4998	20175	1732.5	8.9899	8.9957
20375	1752.5	4.4896	4.4975	20350	1750.0	8.9675	8.9631



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	13.462	13.462	20050	1720.0	17.968	17.978
20175	1732.5	13.479	13.488	20175	1732.5	18.004	17.997
20325	1747.5	13.422	13.428	20300	1745.0	17.899	17.902



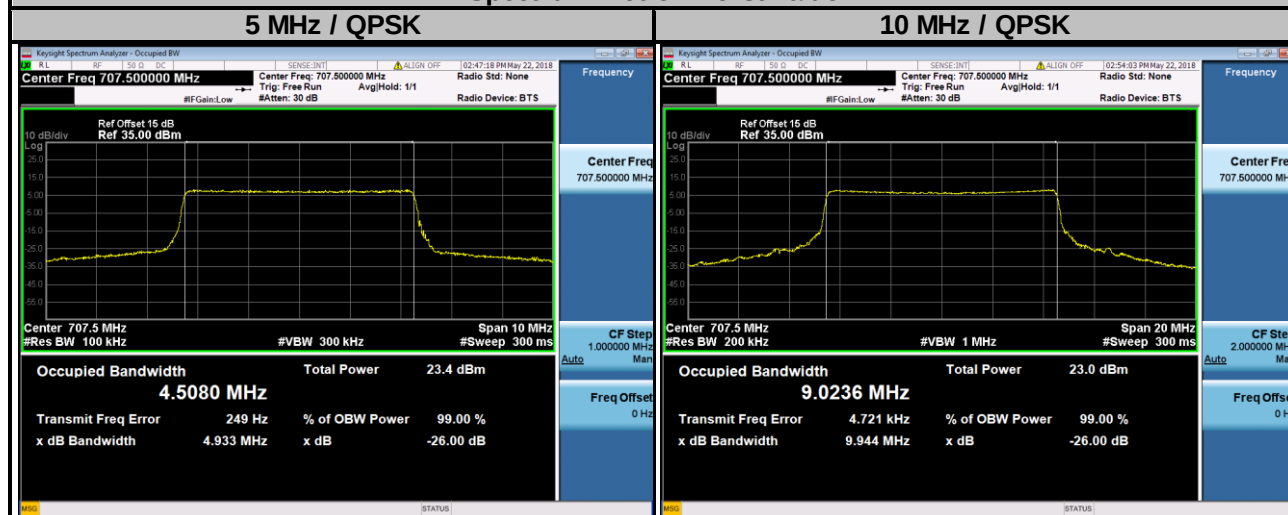
LTE Band 12							
Channel Bandwidth: 1.4 MHz				Channel Bandwidth: 3 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
23017	699.7	1.0929	1.0959	23025	700.5	2.7001	2.7009
23095	707.5	1.0901	1.0897	23095	707.5	2.7049	2.7041
23173	715.3	1.0883	1.0922	23165	714.5	2.6989	2.7023



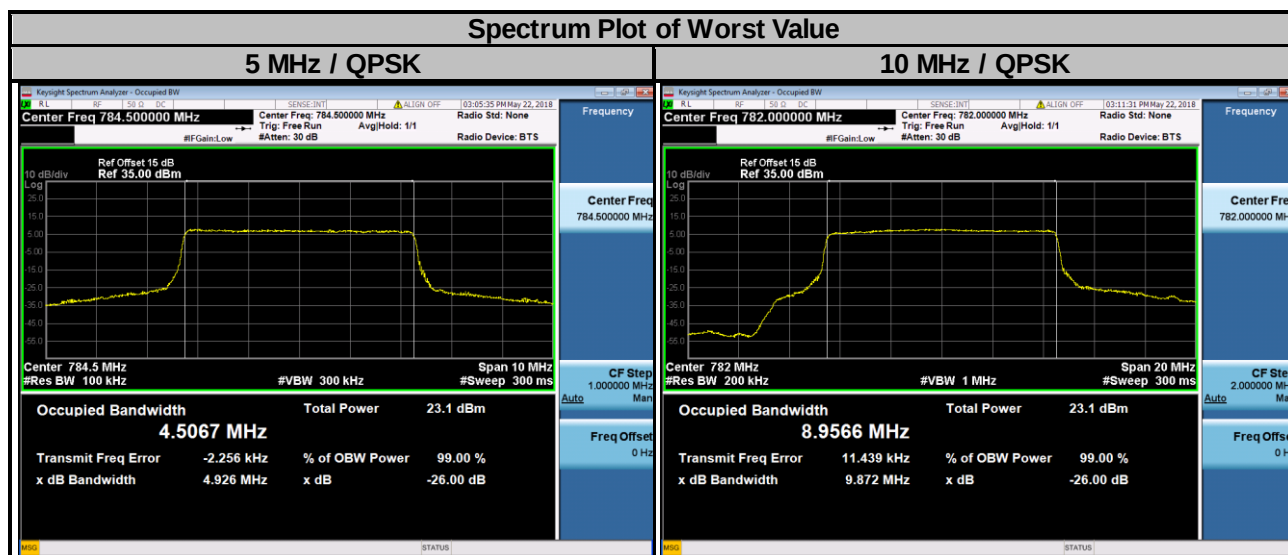
LTE Band 12

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	4.4913	4.4920	23060	704.0	8.9744	8.9697
23095	707.5	4.5080	4.5032	23095	707.5	9.0236	9.0235
23155	713.5	4.4840	4.4787	23130	711.0	8.9683	8.9724

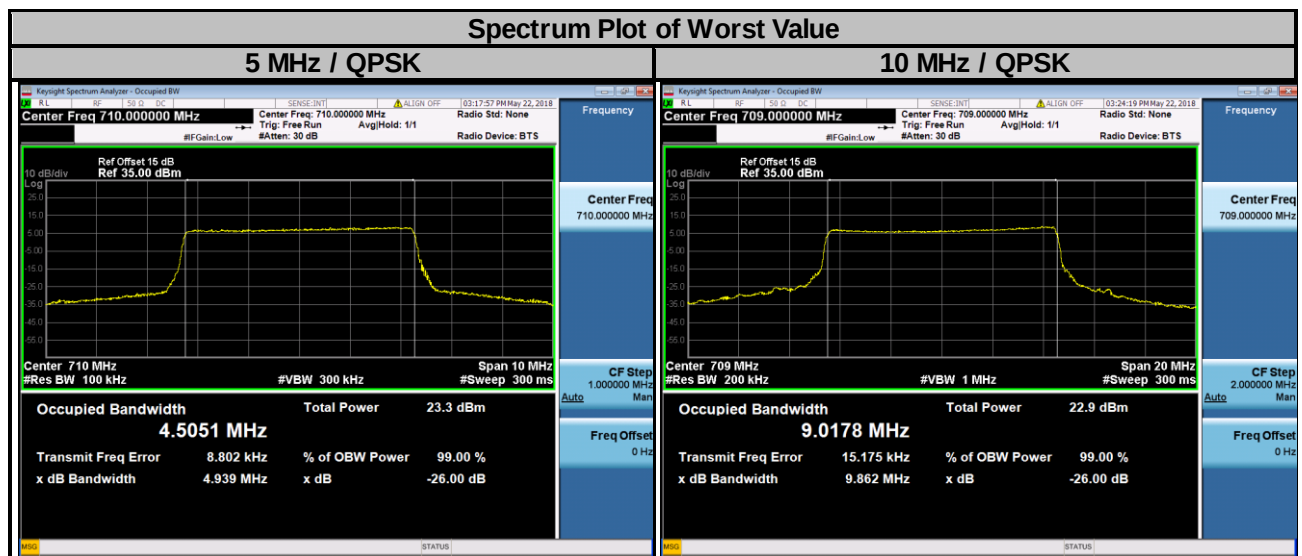
Spectrum Plot of Worst Value



LTE Band 13							
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
23205	779.5	4.4953	4.4968	23230	782.0	8.9566	8.9556
23230	782.0	4.4917	4.4887				
23255	784.5	4.5067	4.4992				



LTE Band 17							
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
23755	706.5	4.5045	4.5037	23780	709.0	9.0178	9.0106
23790	710.0	4.5051	4.5007	23790	710.0	8.9919	8.9923
23825	713.5	4.4824	4.4808	23800	711.0	8.9629	8.9617

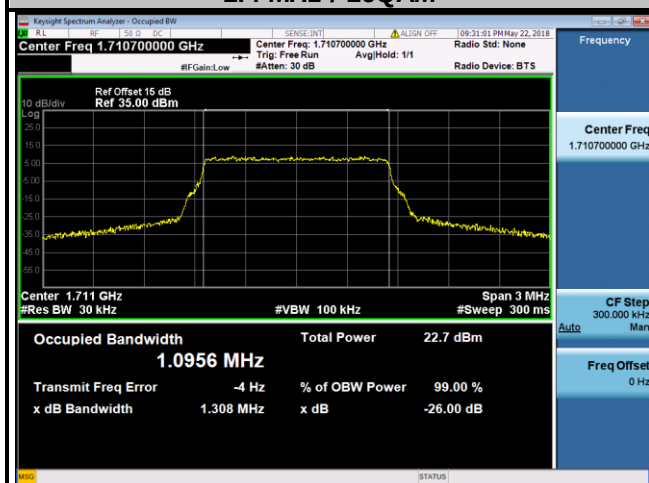


LTE Band 66

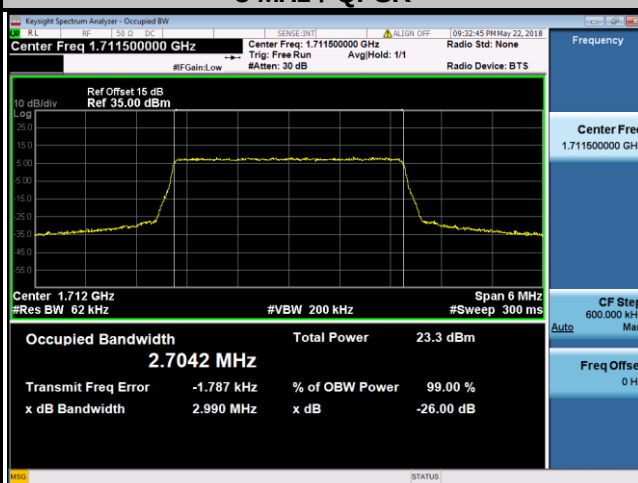
Channel Bandwidth: 1.4 MHz				Channel Bandwidth: 3 MHz			
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)	
		QPSK	16QAM			QPSK	16QAM
131979	1710.7	1.0941	1.0956	131987	1711.5	2.7042	2.7039
132322	1745.0	1.0924	1.0929	132322	1745.0	2.7012	2.7035
132665	1779.3	1.0906	1.0899	132657	1778.5	2.6968	2.7040

Spectrum Plot of Worst Value

1.4 MHz / 16QAM



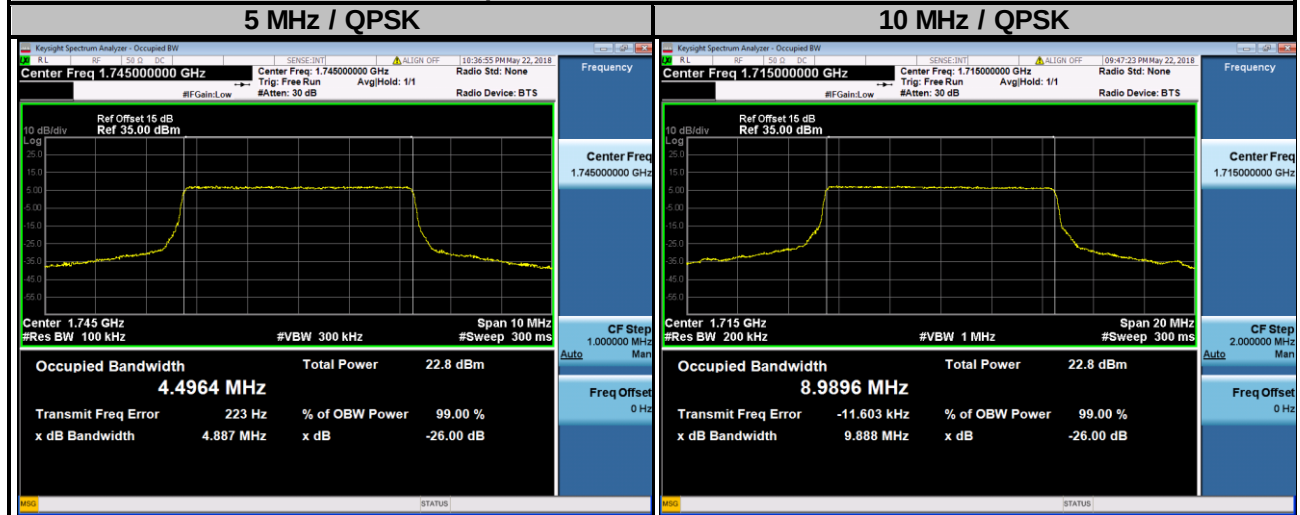
3 MHz / QPSK



LTE Band 66

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
131997	1712.5	4.4922	4.4932	132022	1715.0	8.9896	8.9816
132322	1745.0	4.4964	4.4933	132322	1745.0	8.9861	8.9842
132647	1777.5	4.4940	4.4914	132622	1775.0	8.9716	8.9611

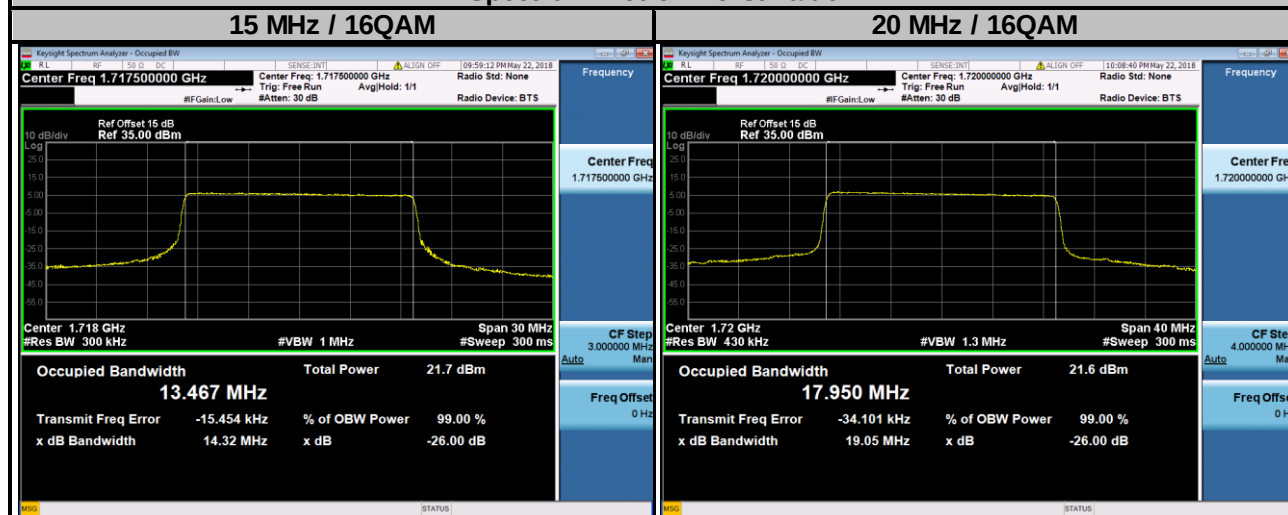
Spectrum Plot of Worst Value



LTE Band 66

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
132047	1717.5	13.453	13.467	132072	1720.0	17.949	17.950
132322	1745.0	13.455	13.457	132322	1745.0	17.920	17.935
132597	1772.5	13.425	13.444	132572	1770.0	17.925	17.944

Spectrum Plot of Worst Value



4.4 Band Edge Measurement

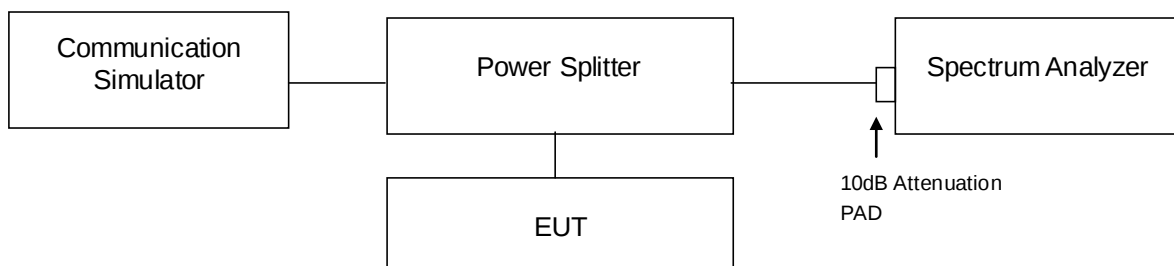
4.4.1 Limits of Band Edge Measurement

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 $43 + 10 \log (P)$ dB.

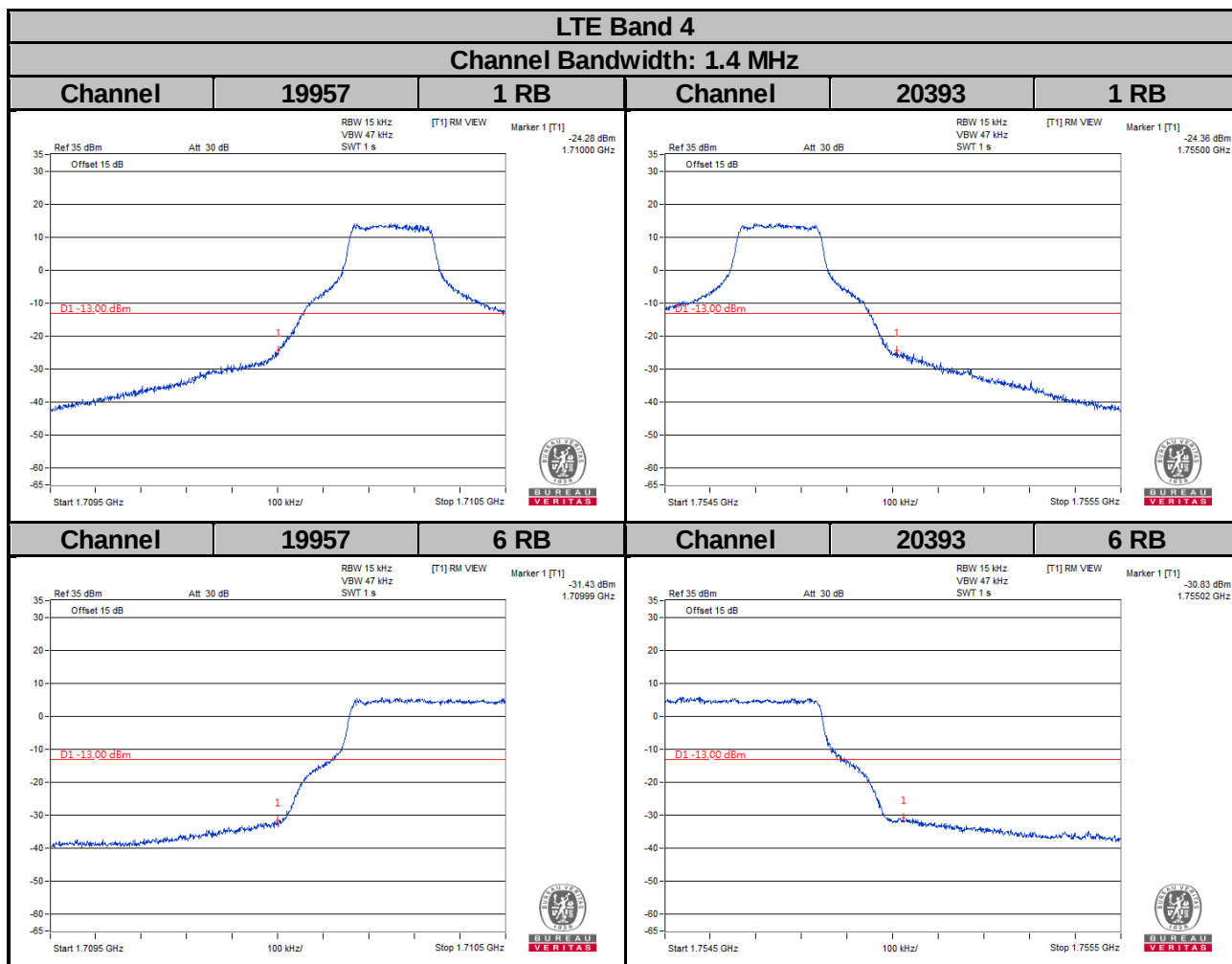
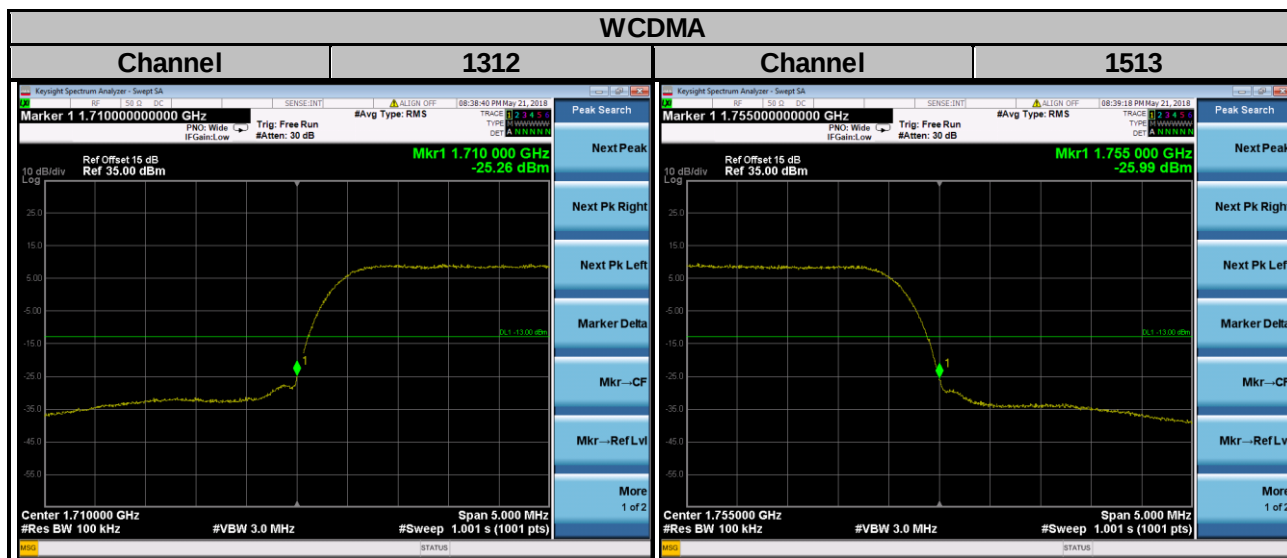
4.4.2 Test Setup

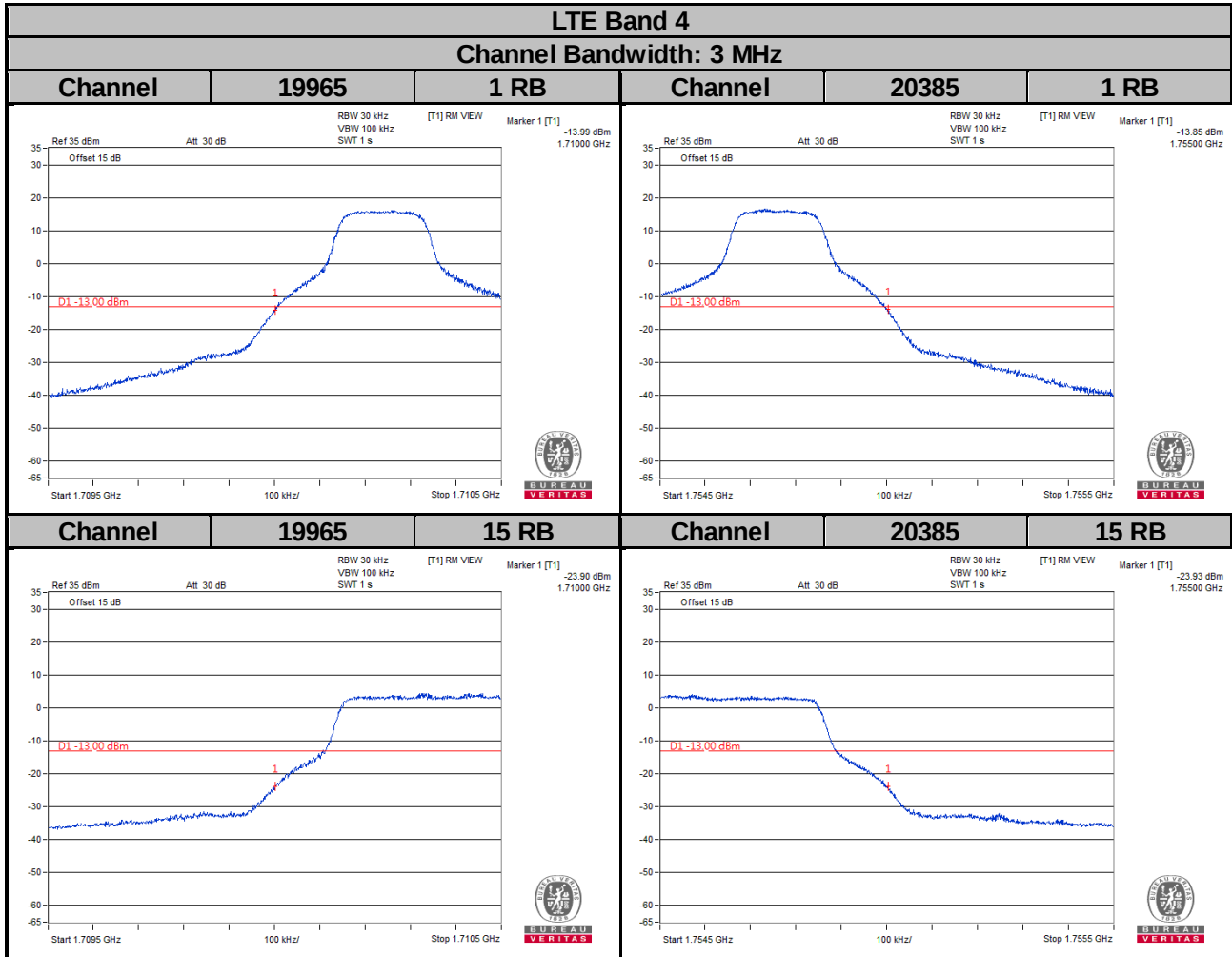


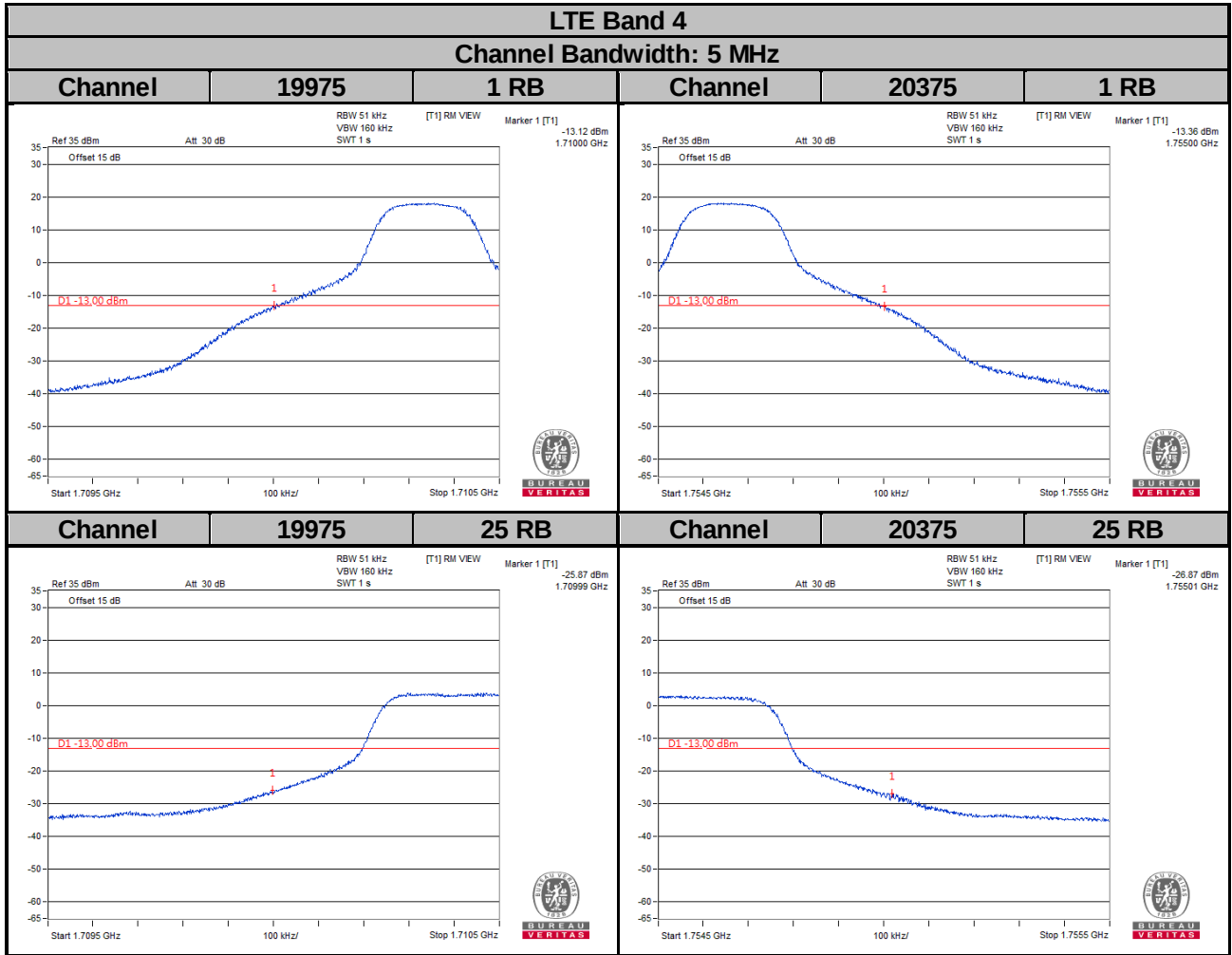
4.4.3 Test Procedures

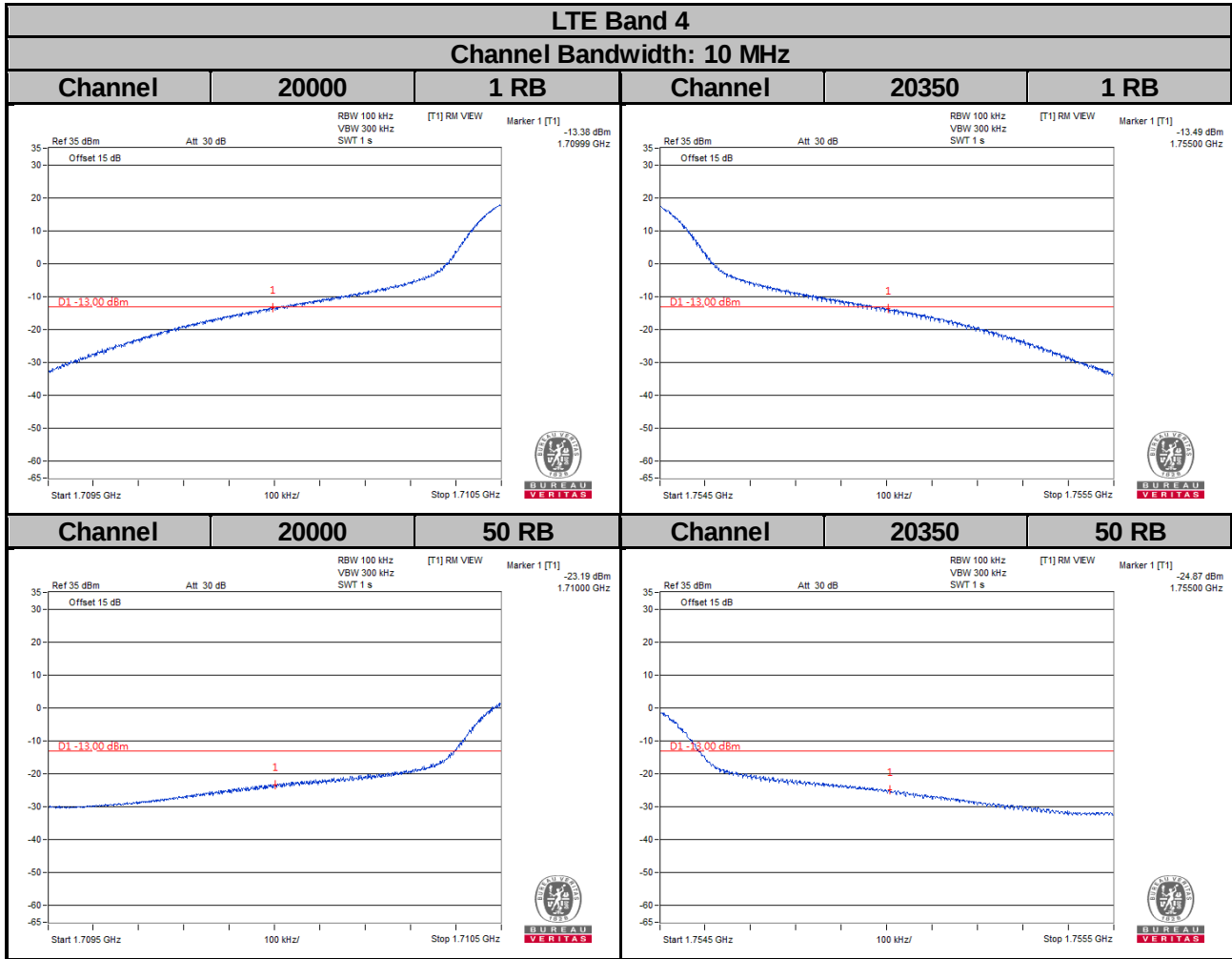
- All measurements were done at low and high operational frequency range.
- The center frequency of spectrum is the band edge frequency and span is 5 MHz. RB of the spectrum is 100 kHz and VB of the spectrum is 300 kHz (WCDMA).
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 15 kHz and VB of the spectrum is 47 kHz (LTE Bandwidth 1.4 MHz).
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 30 kHz and VB of the spectrum is 100 kHz (LTE Bandwidth 3 MHz).
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 51 kHz and VB of the spectrum is 150 kHz (LTE Bandwidth 5 MHz).
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 100 kHz and VB of the spectrum is 300 kHz (LTE Bandwidth 10 MHz).
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 150 kHz and VB of the spectrum is 470 kHz (LTE Bandwidth 15 MHz).
- Record the max trace plot into the test report.

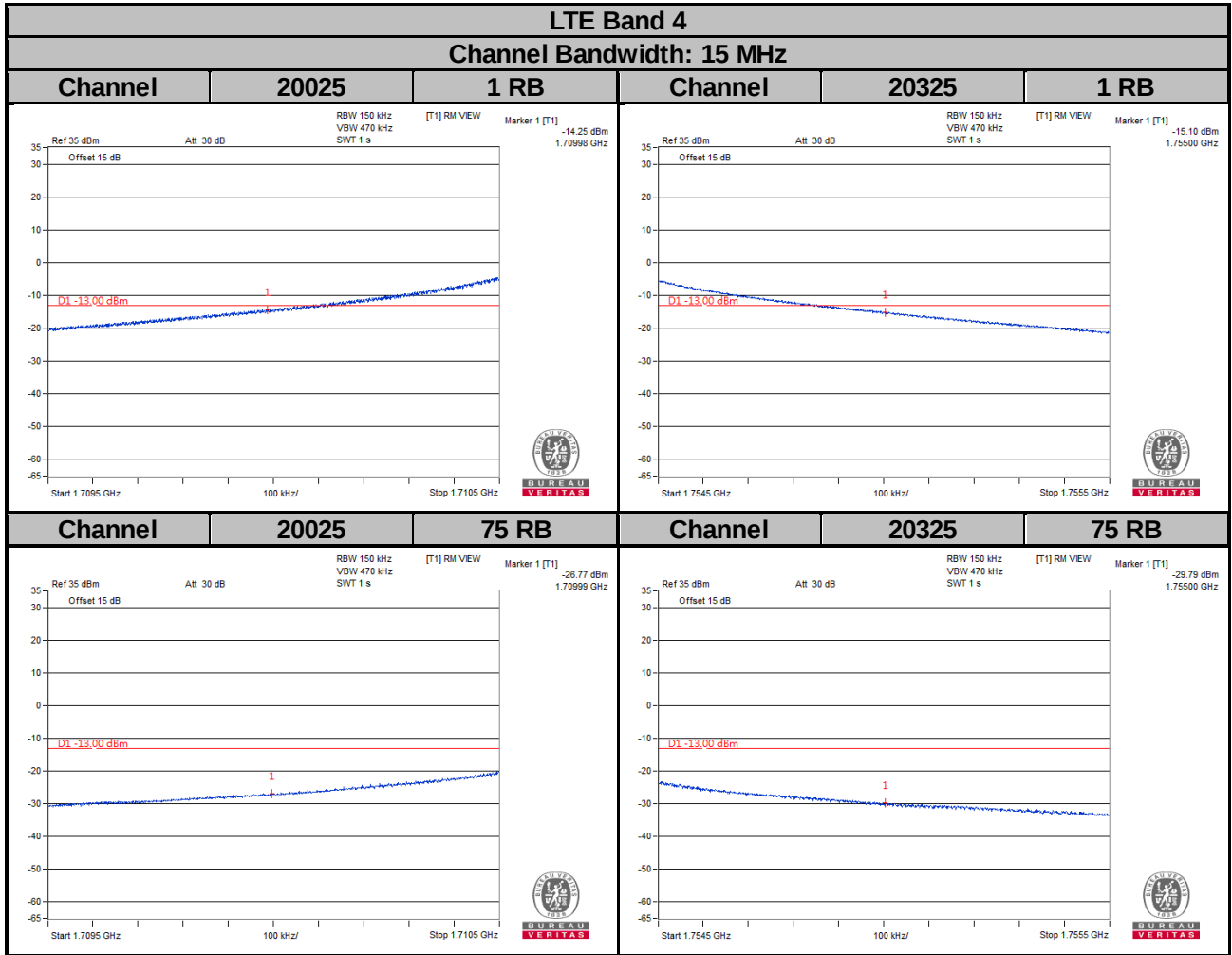
4.4.4 Test Results

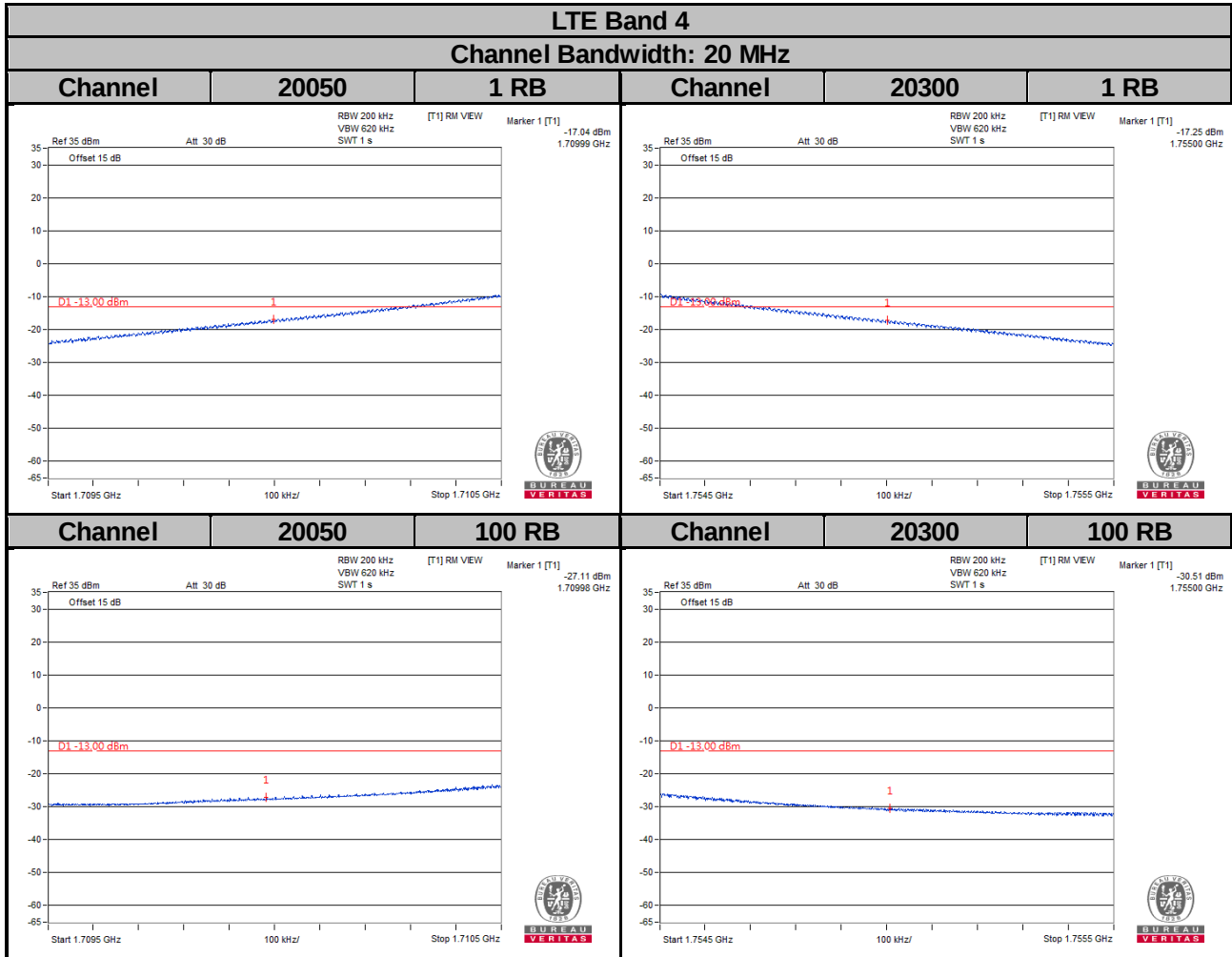






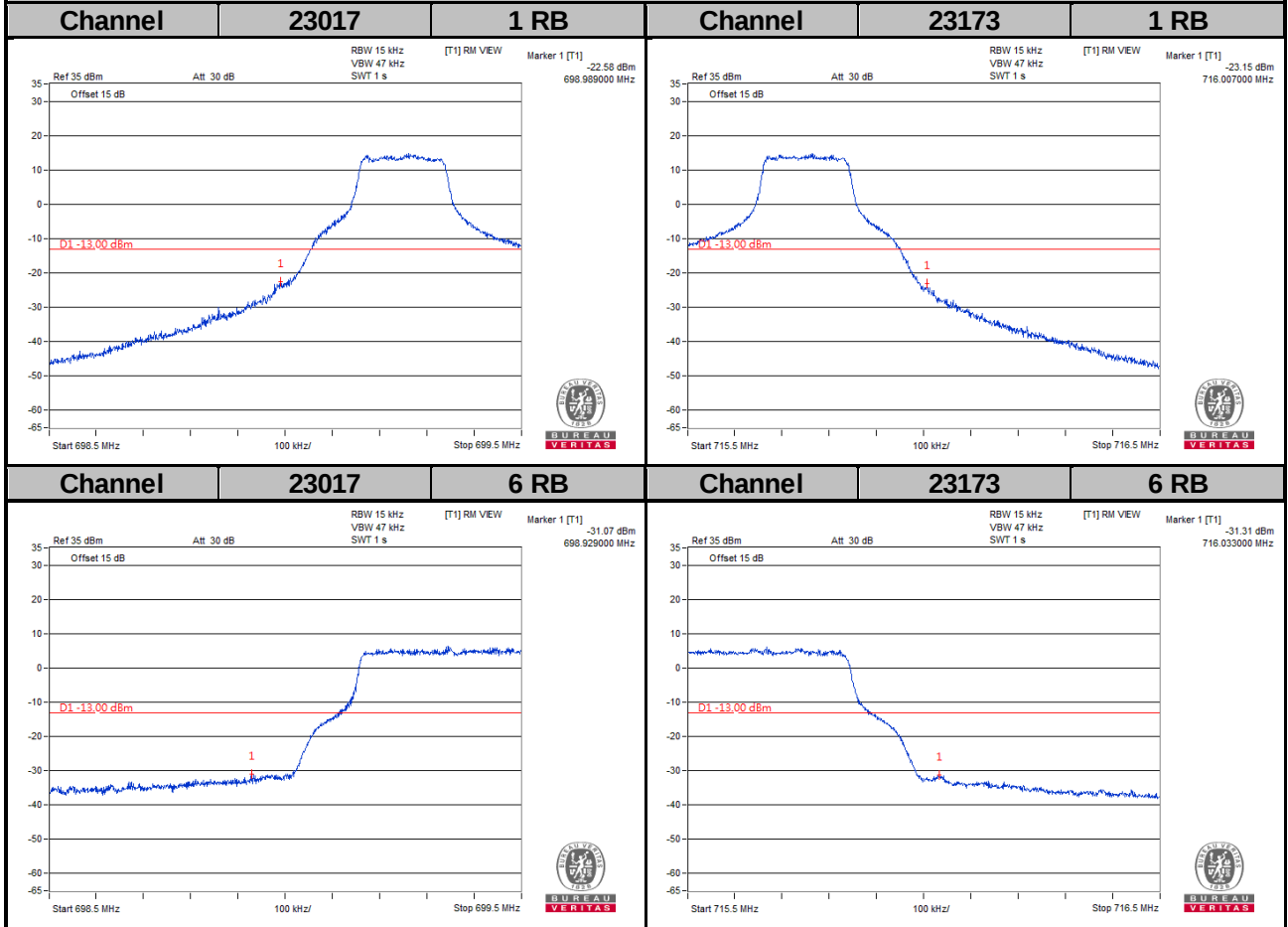






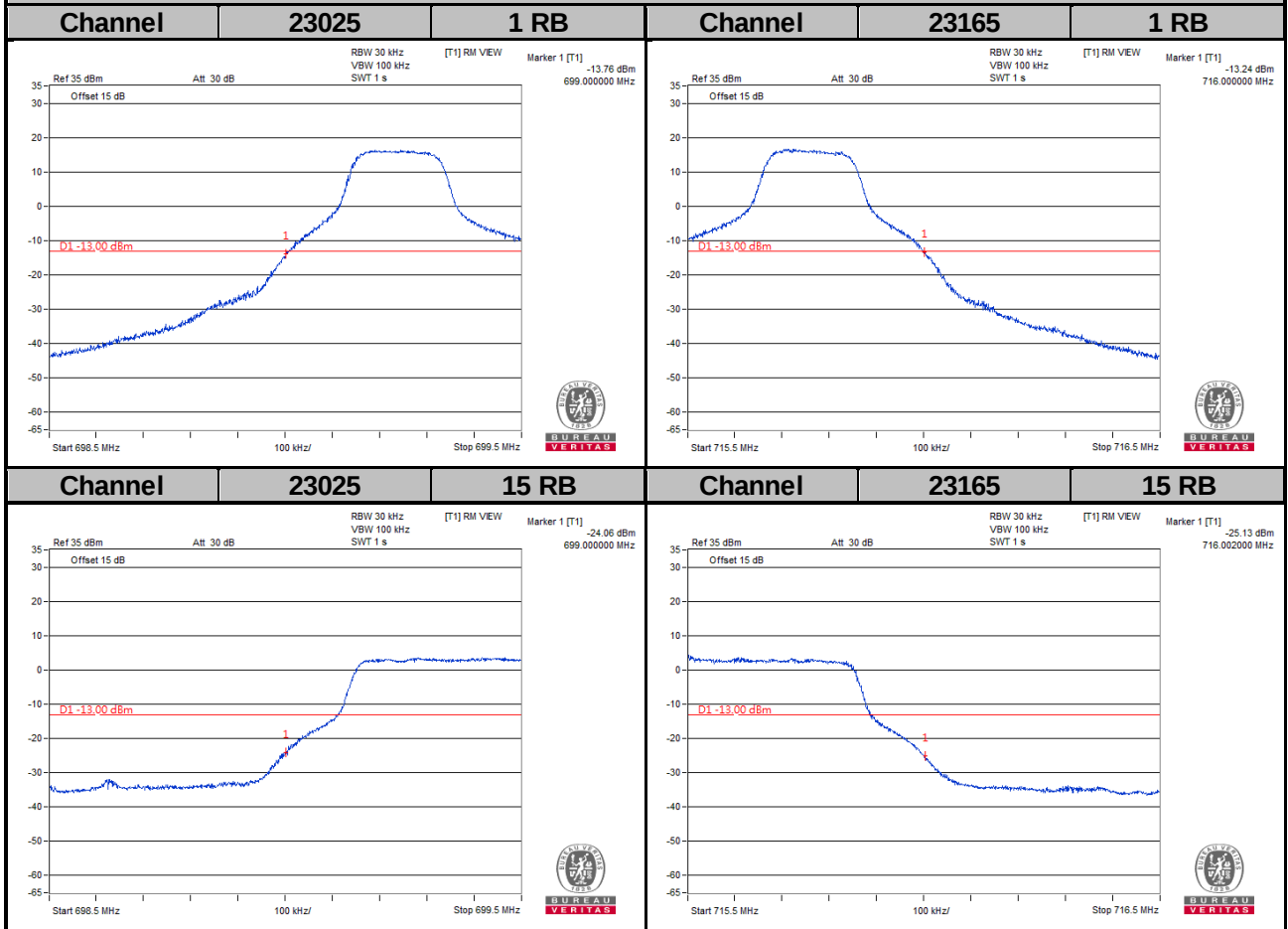
LTE Band 12

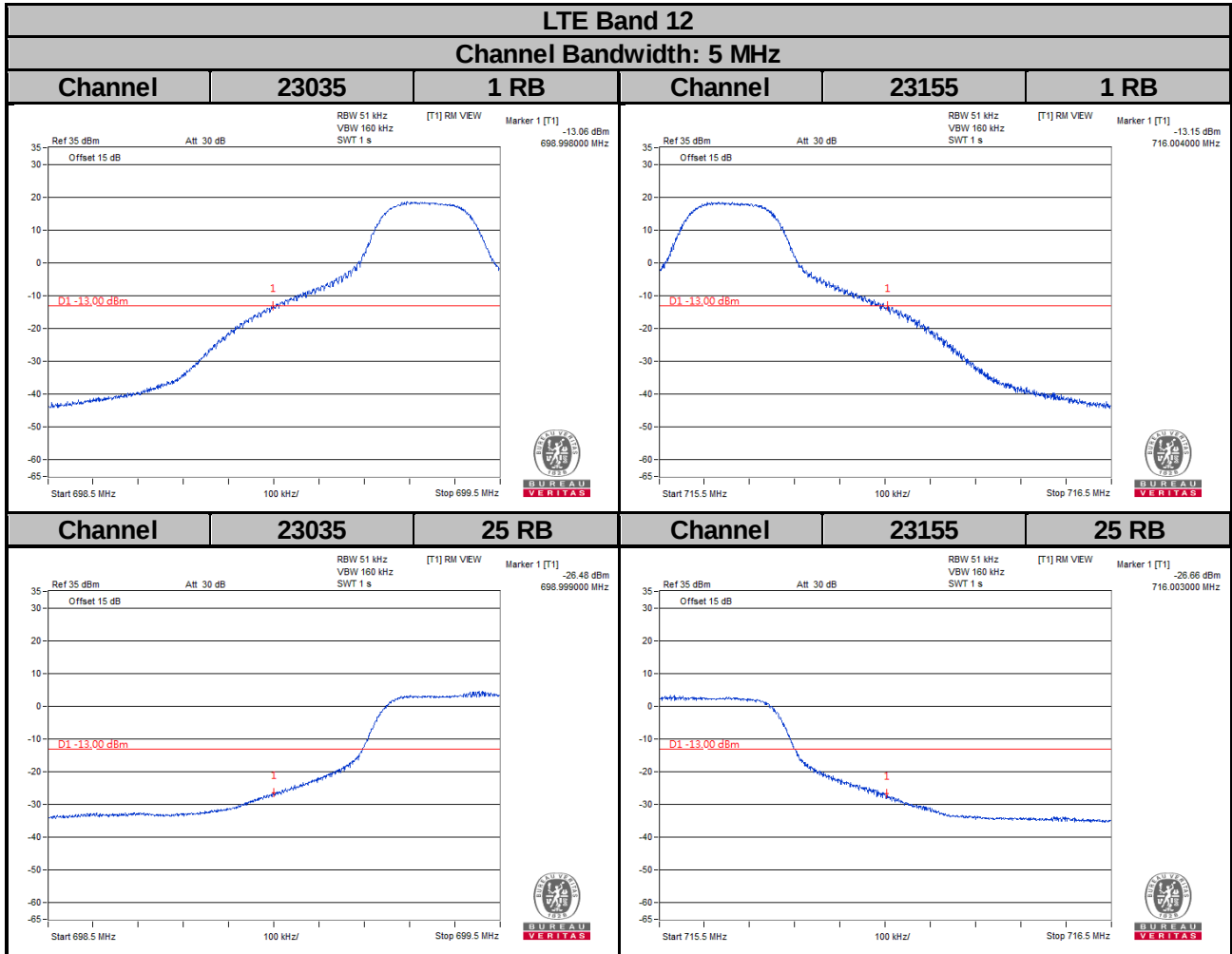
Channel Bandwidth: 1.4 MHz

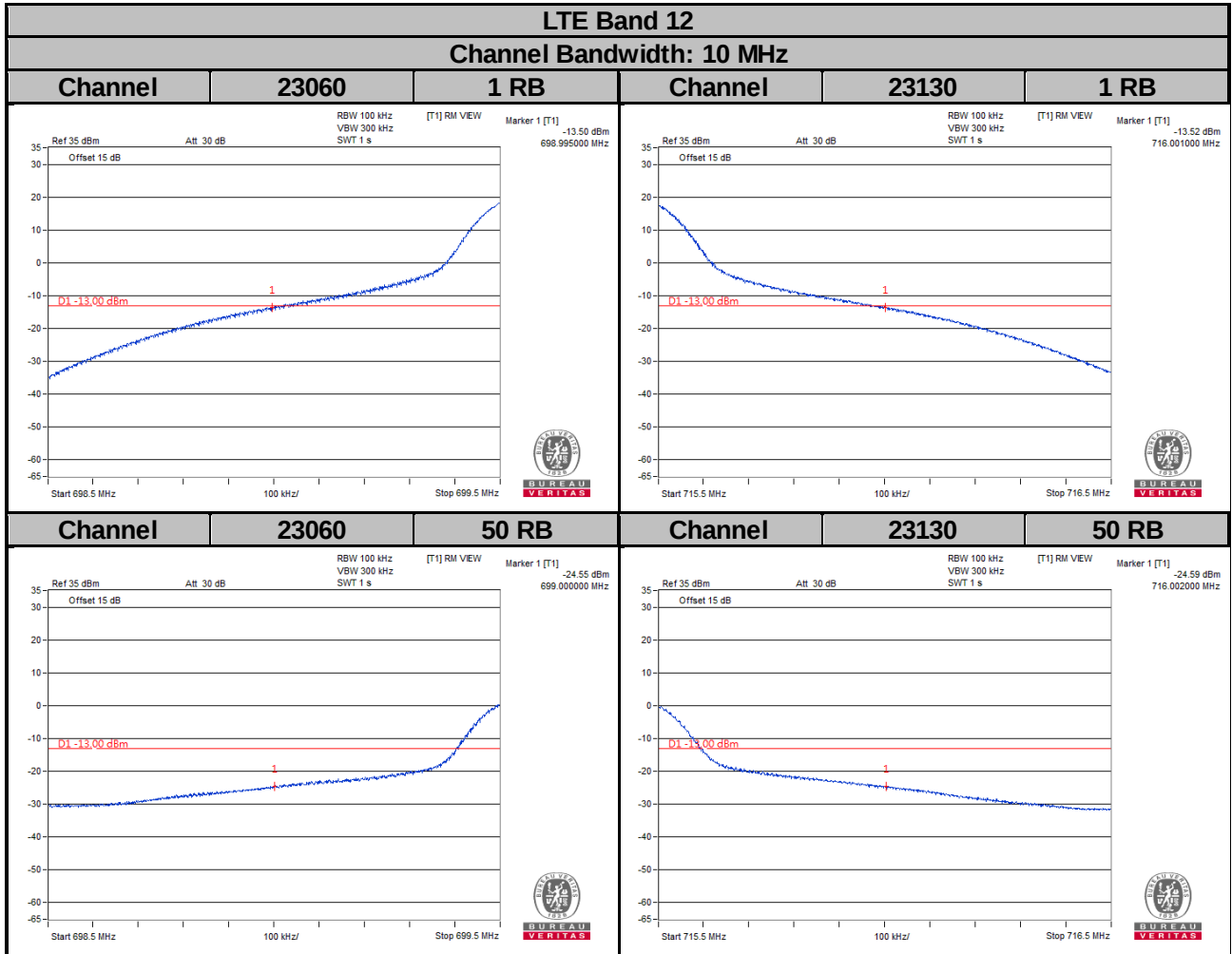


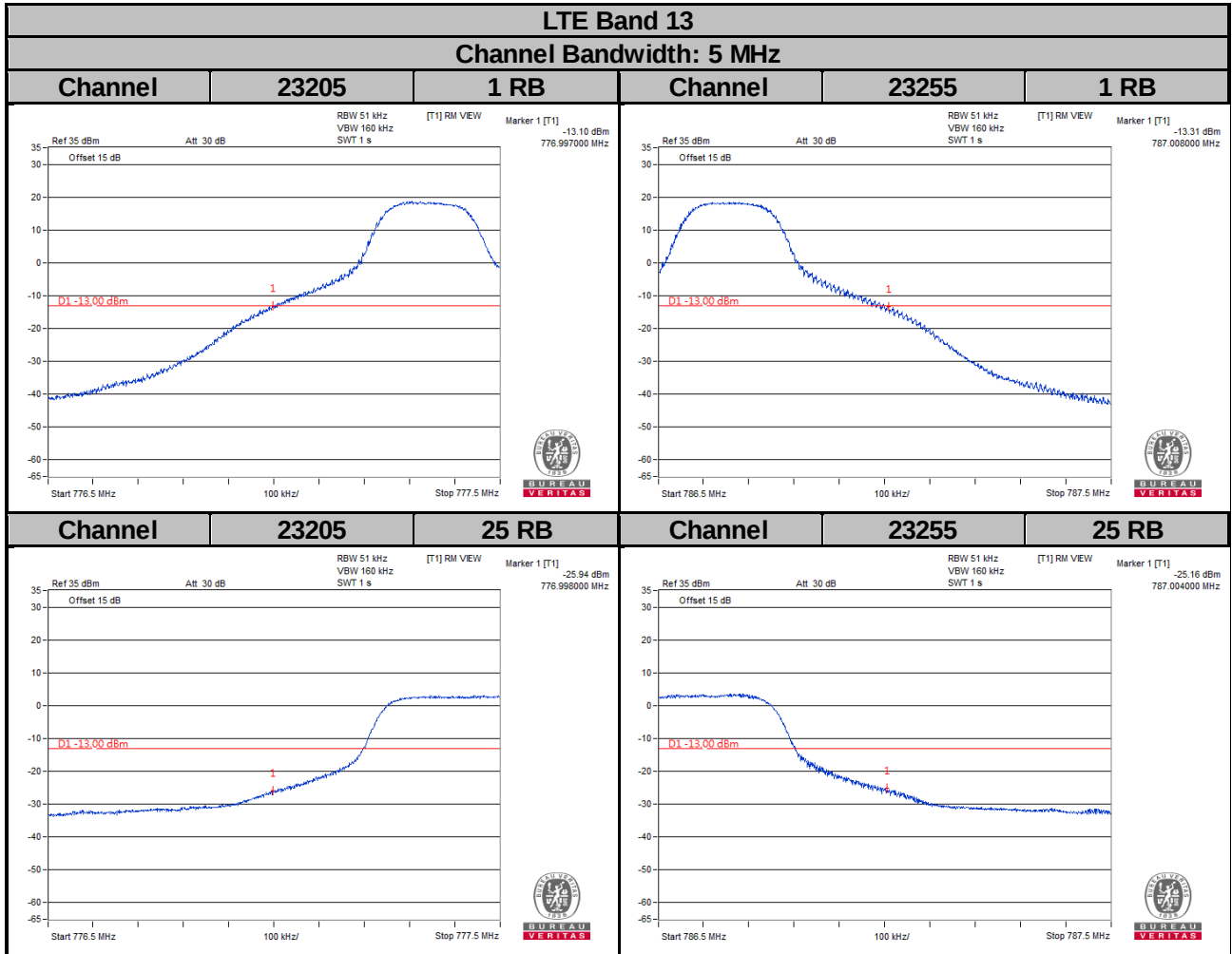
LTE Band 12

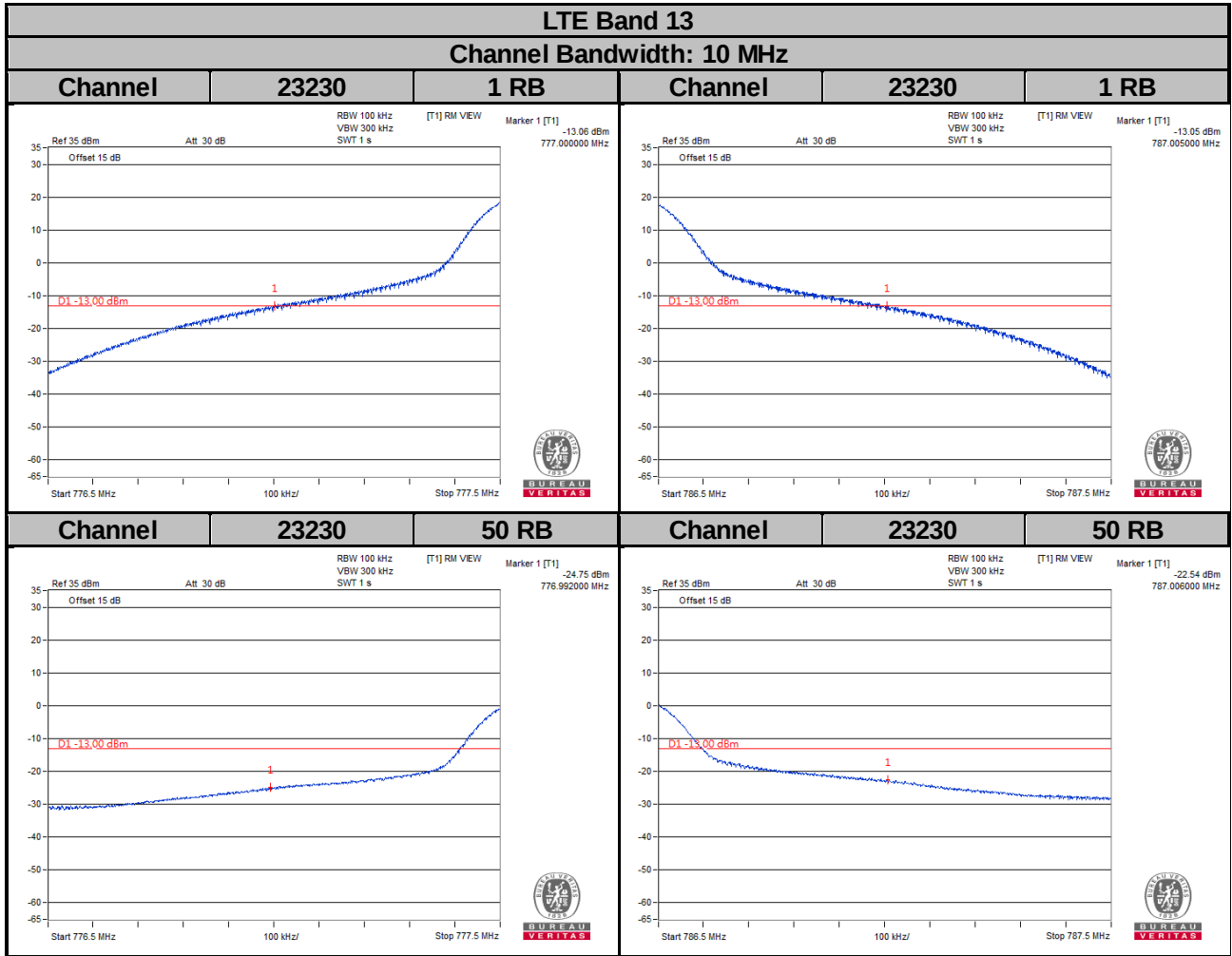
Channel Bandwidth: 3 MHz

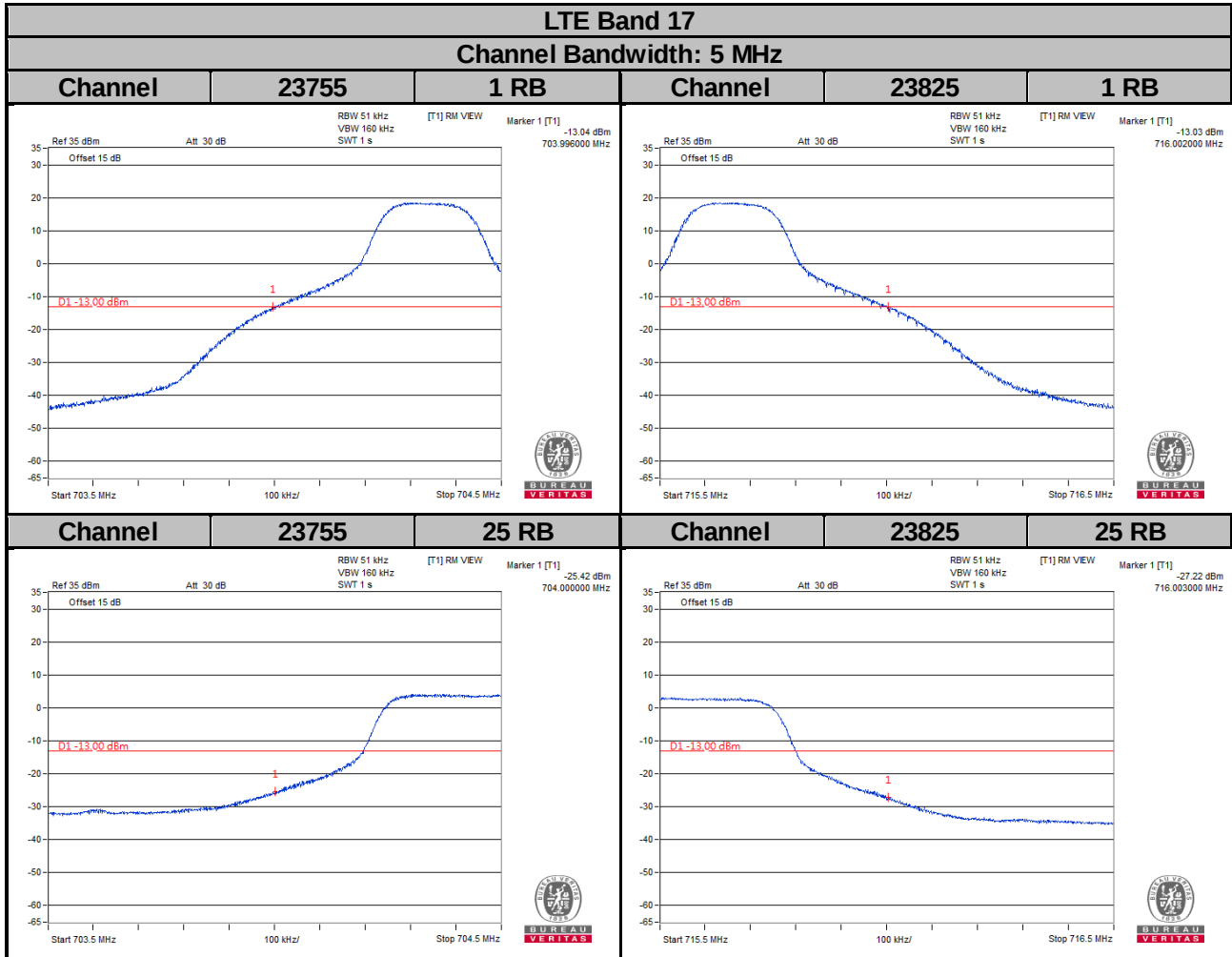


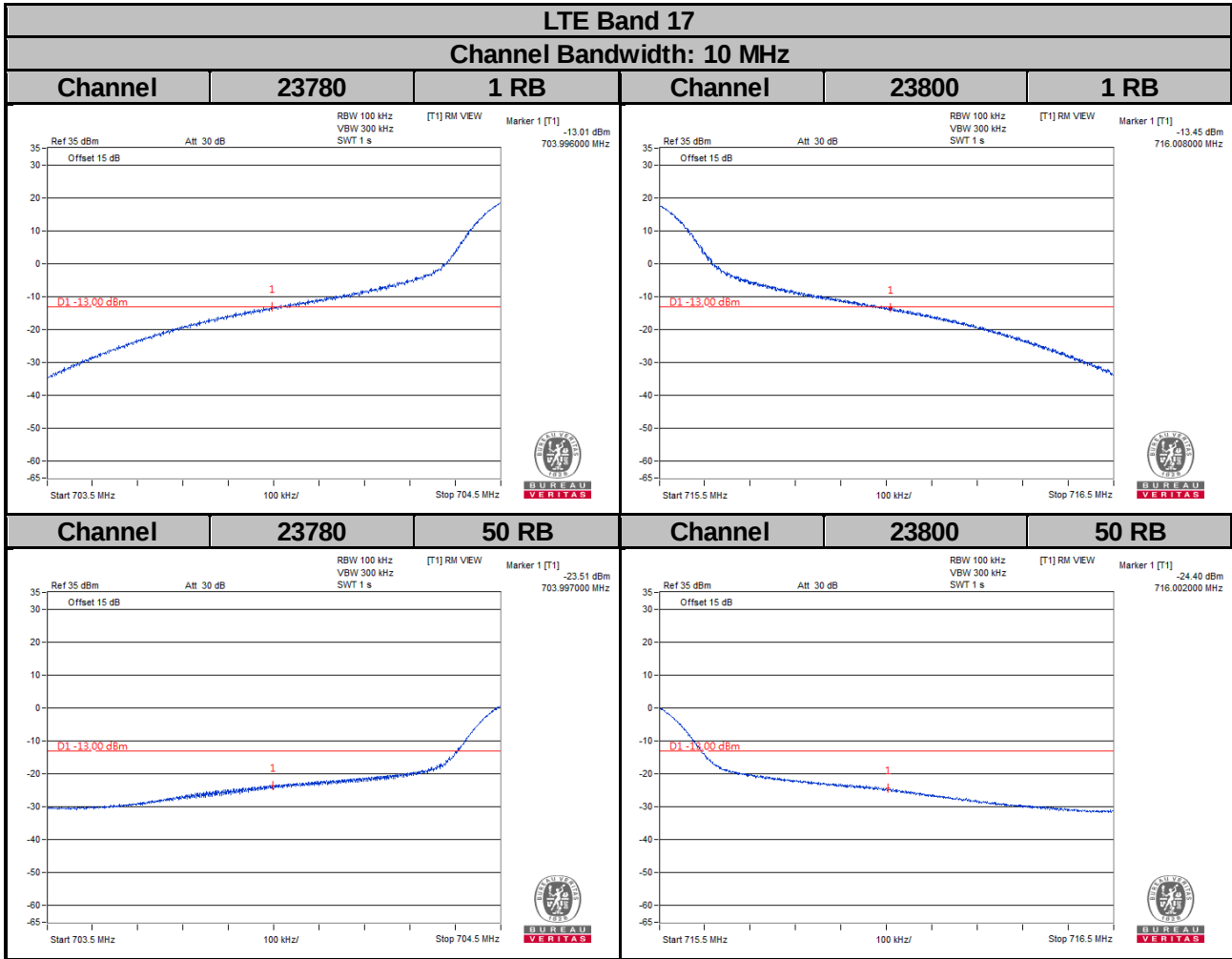






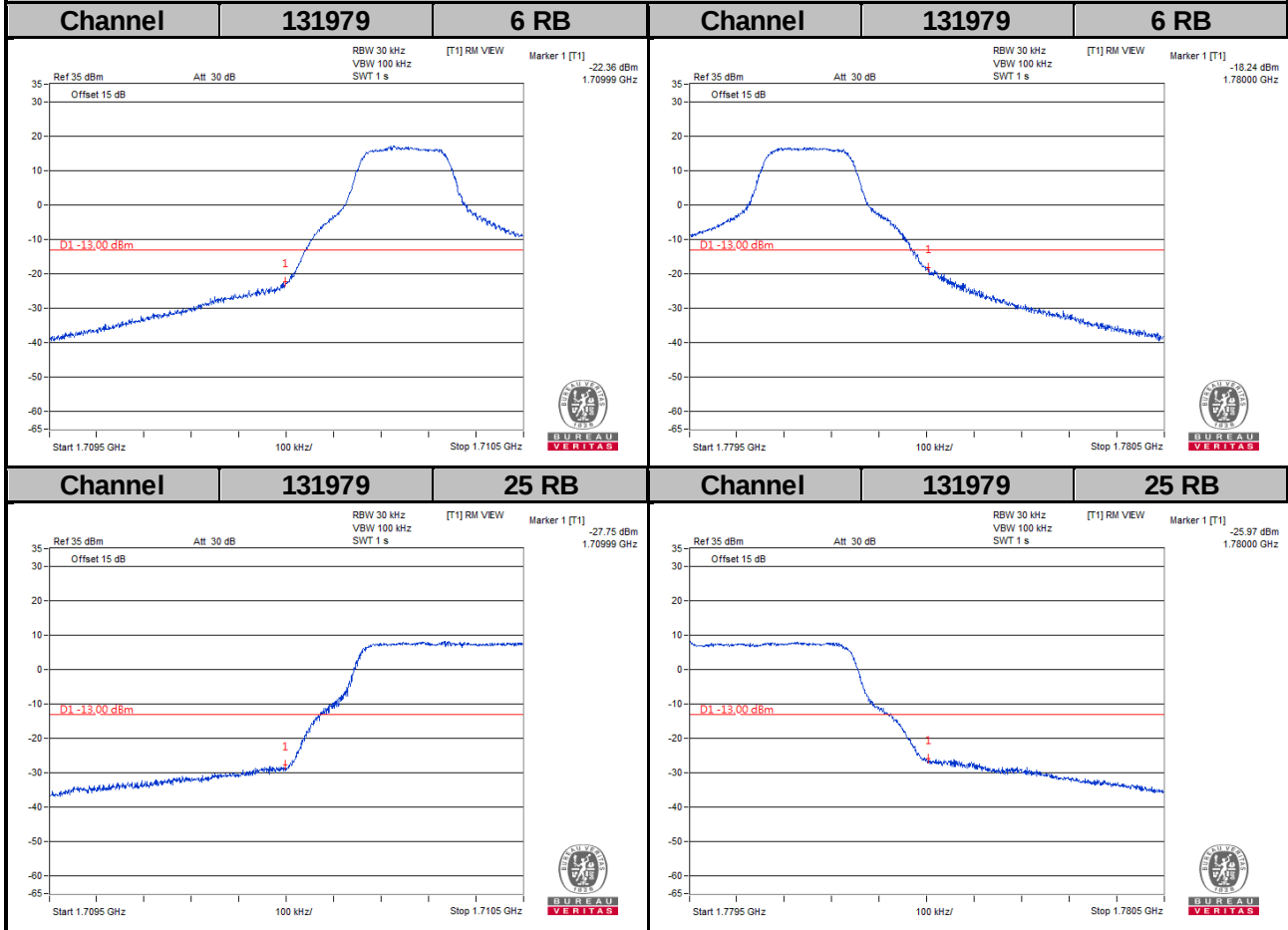






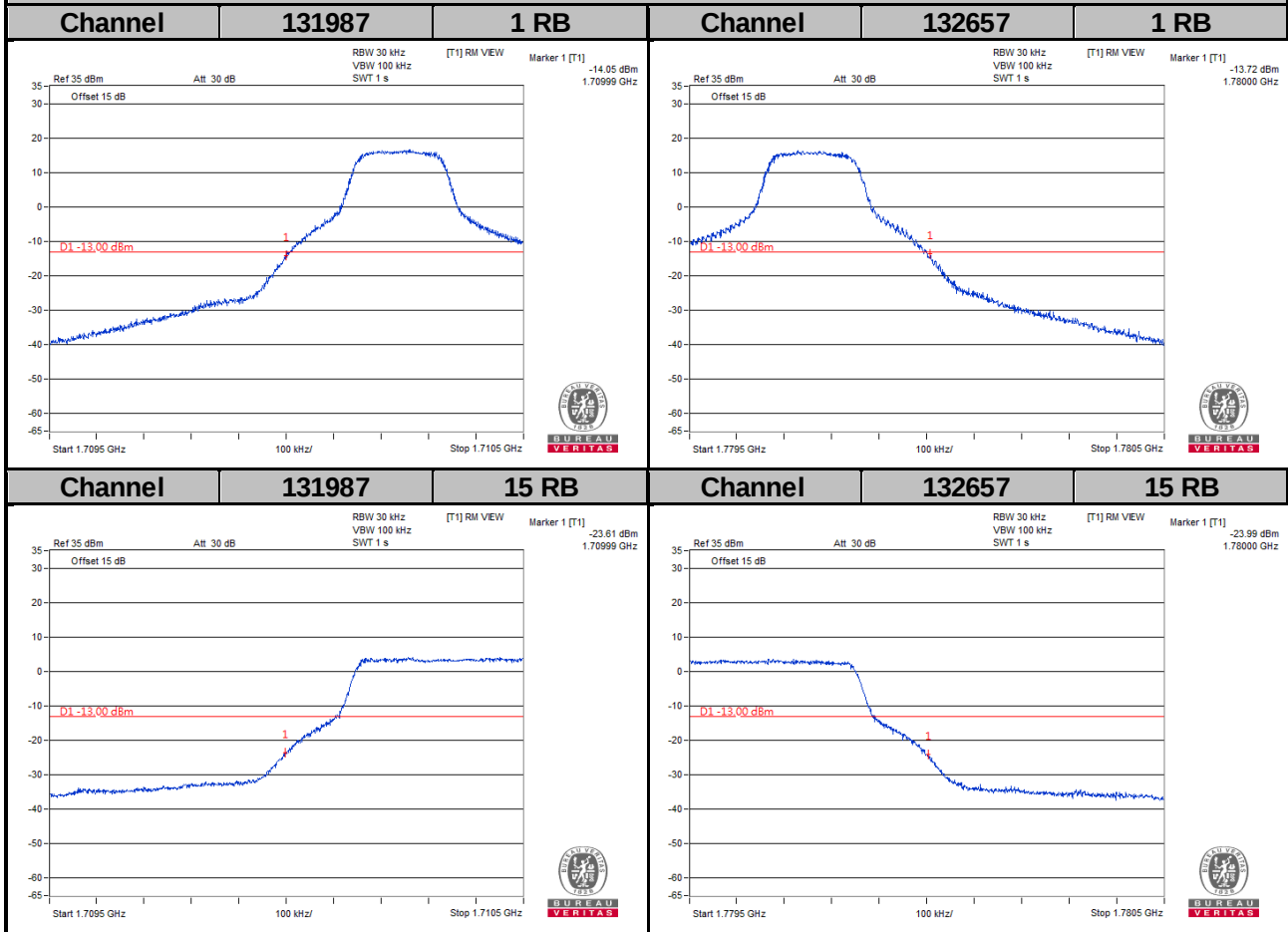
LTE Band 66

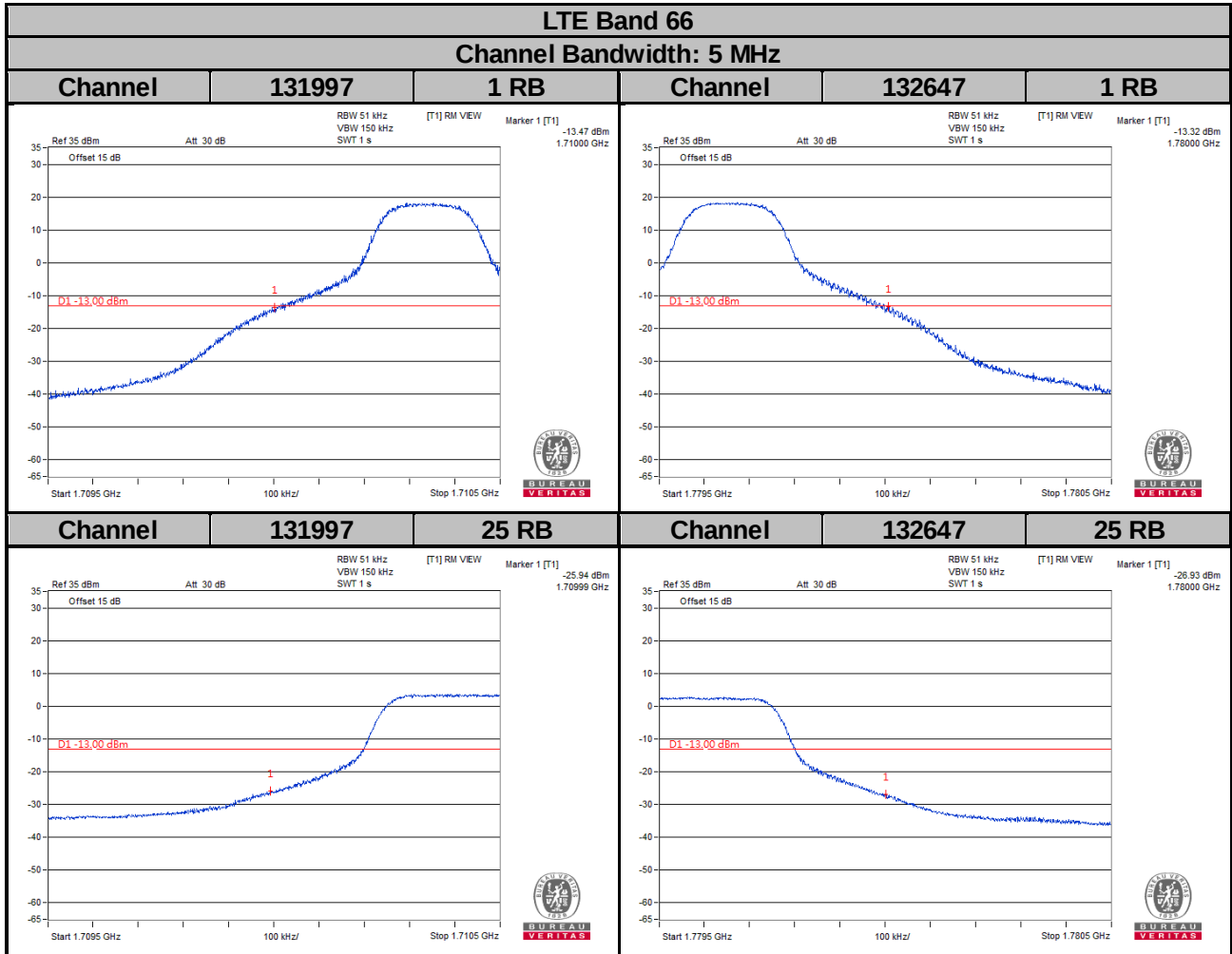
Channel Bandwidth: 1.4 MHz



LTE Band 66

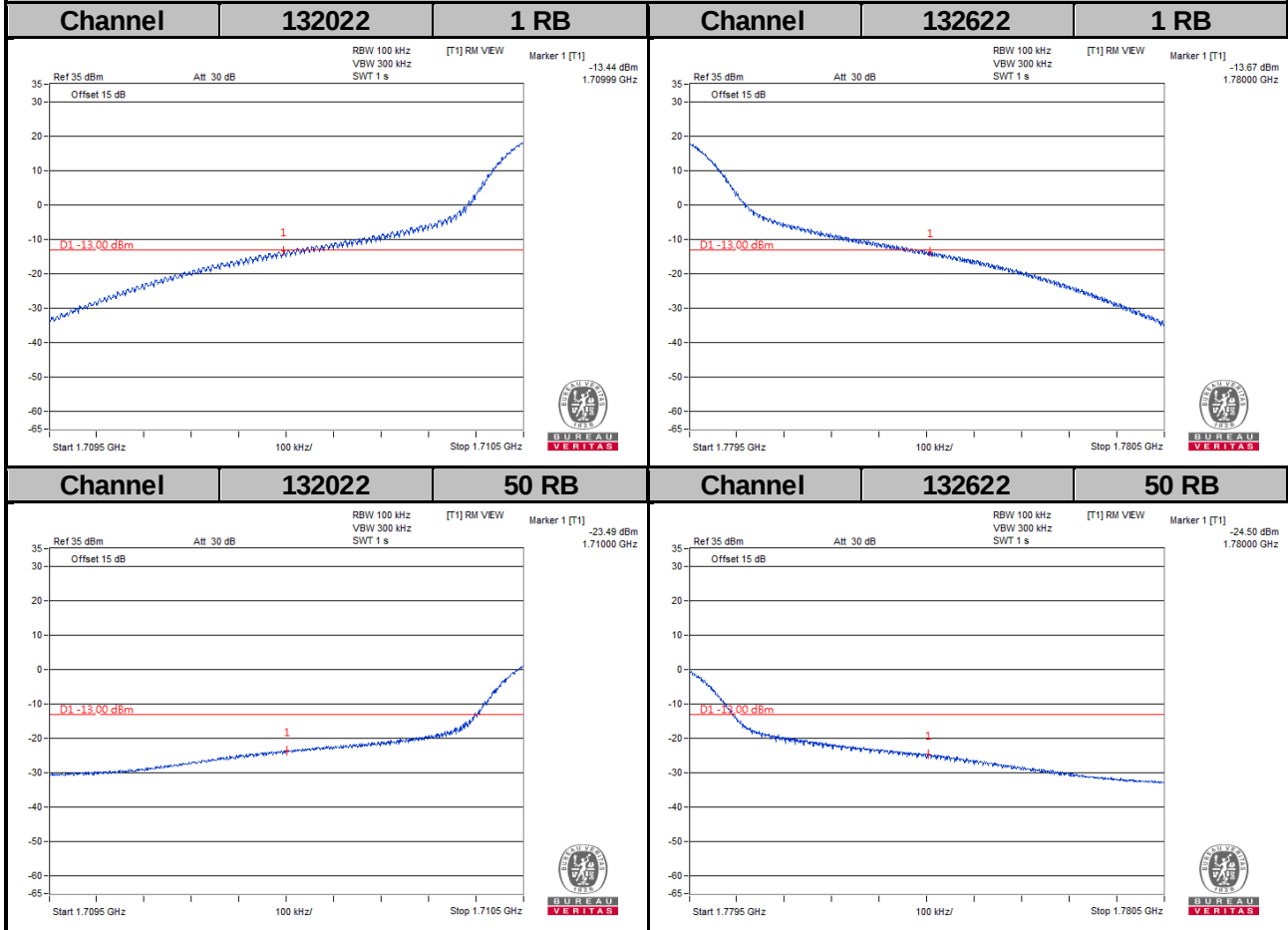
Channel Bandwidth: 3 MHz

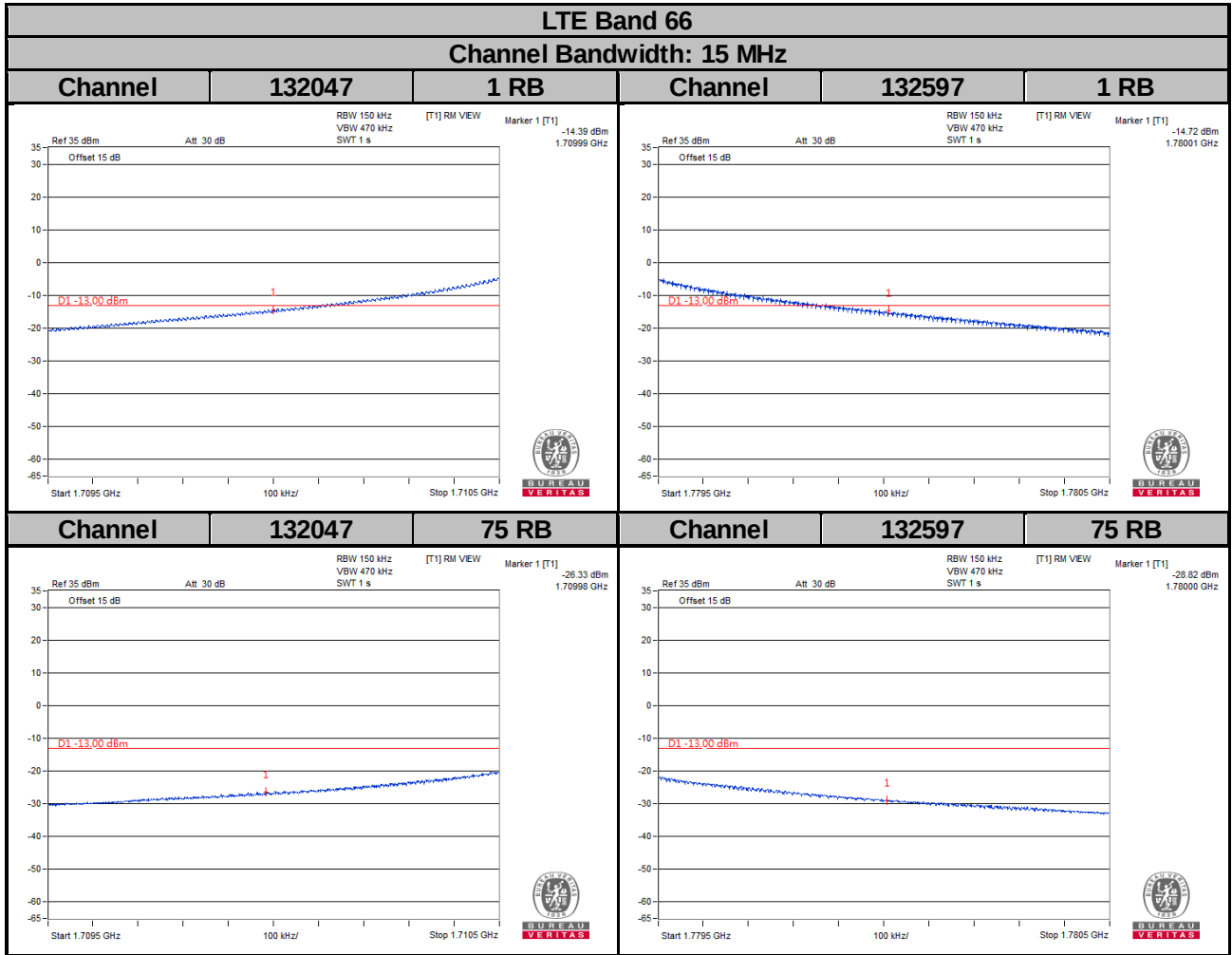


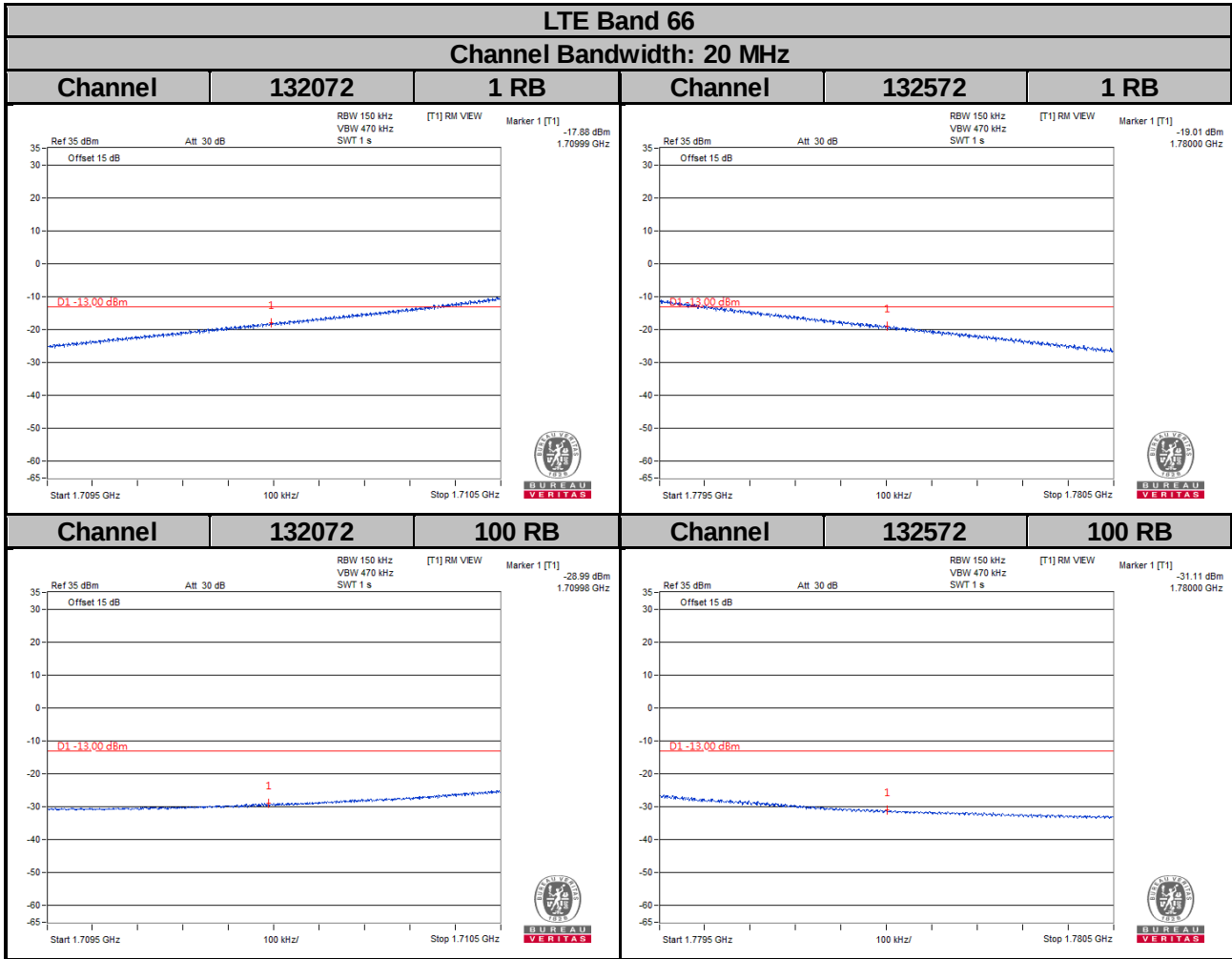


LTE Band 66

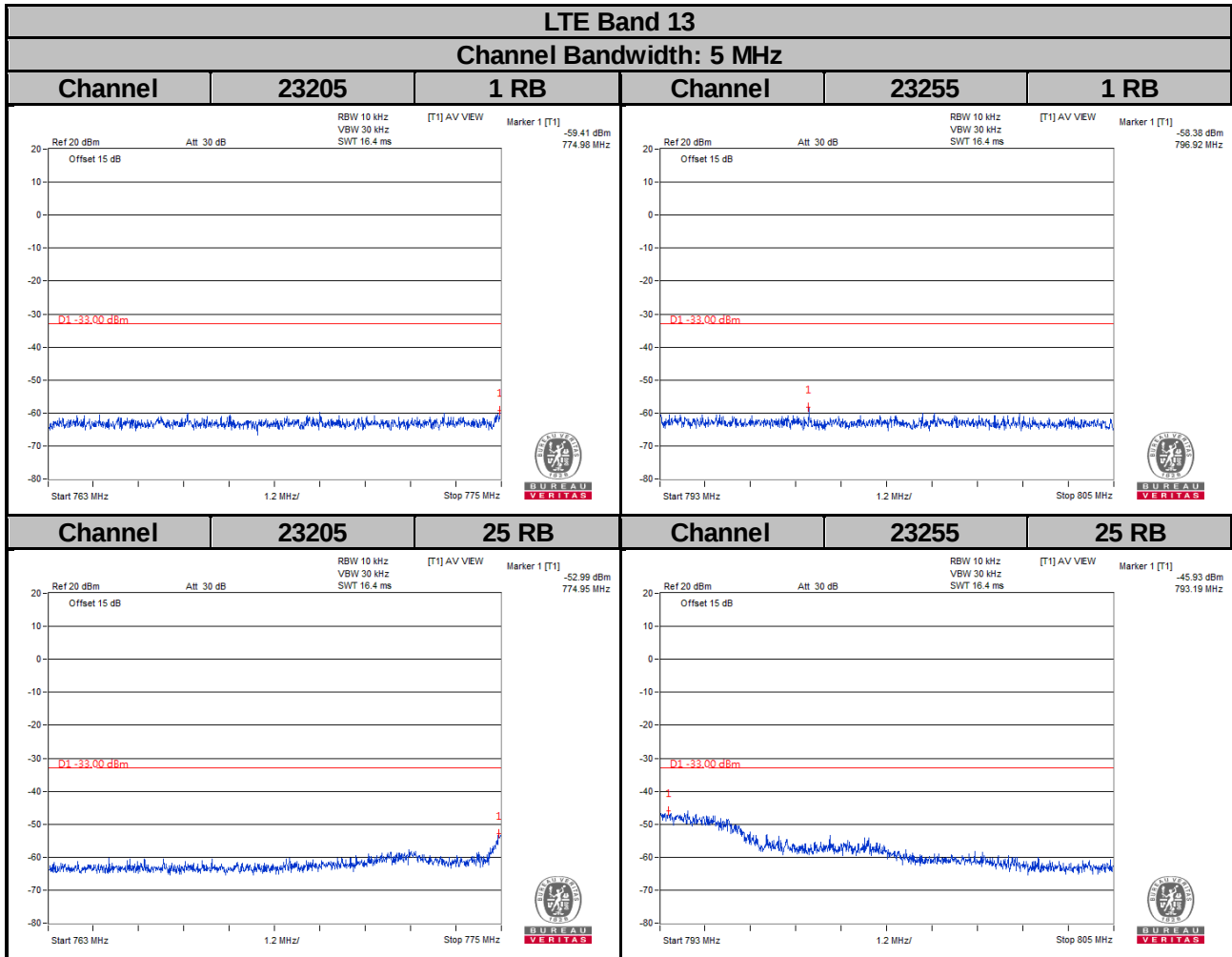
Channel Bandwidth: 10 MHz







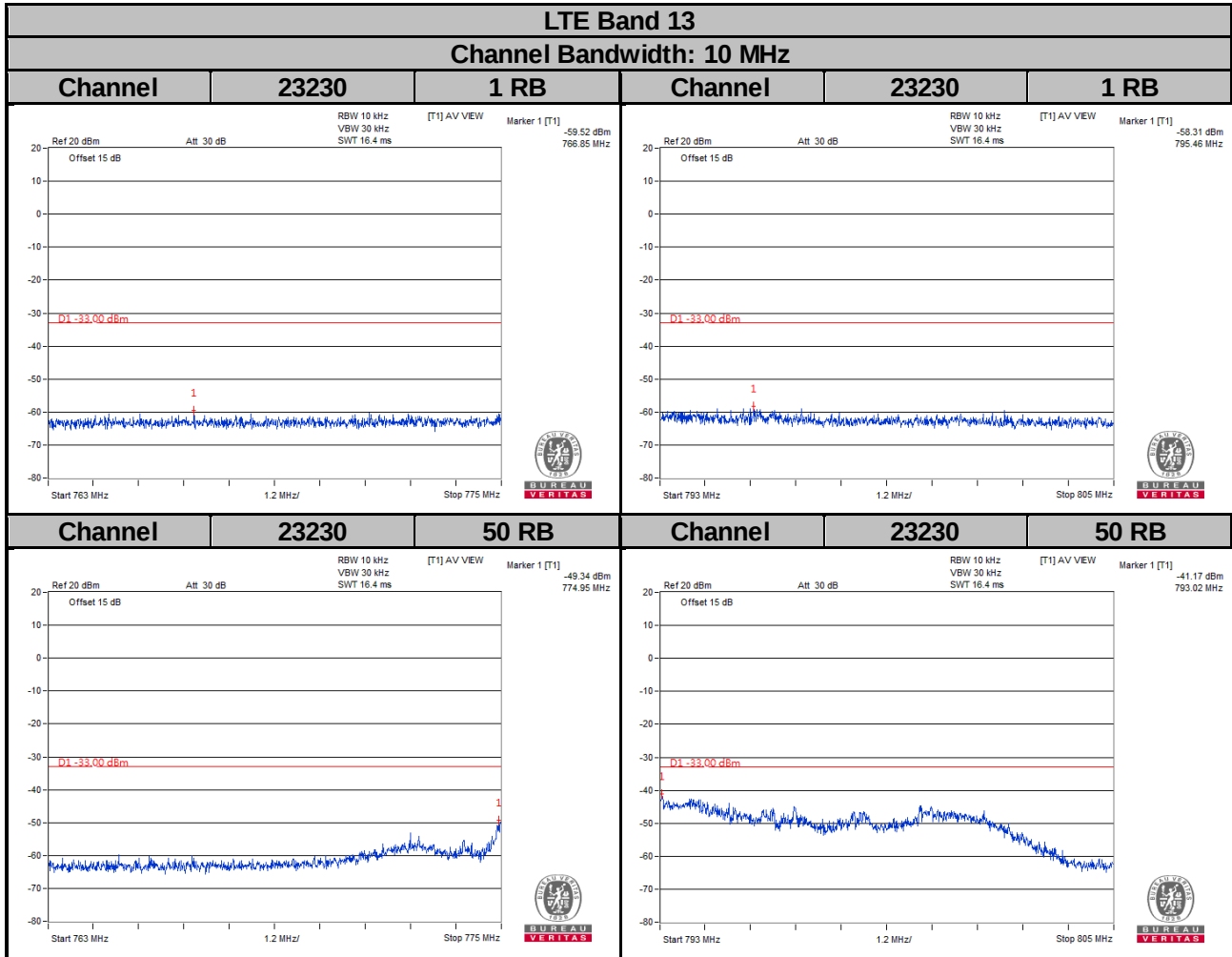
Emission Mask



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

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

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



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

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

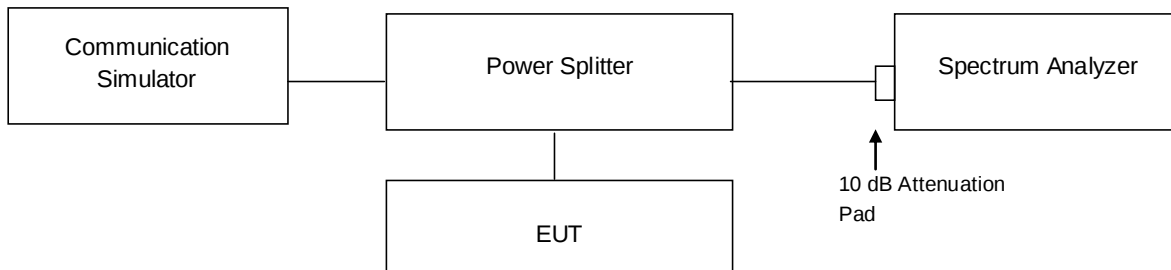
$$\text{Limit line} = -35 \text{ dBm} + 2.04 \text{ dB} = -32.96 \text{ dBm}$$

4.5 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

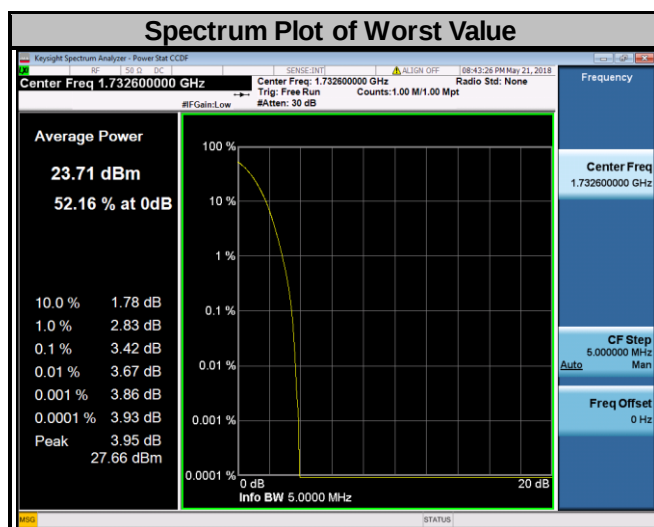


4.5.3 Test Procedures

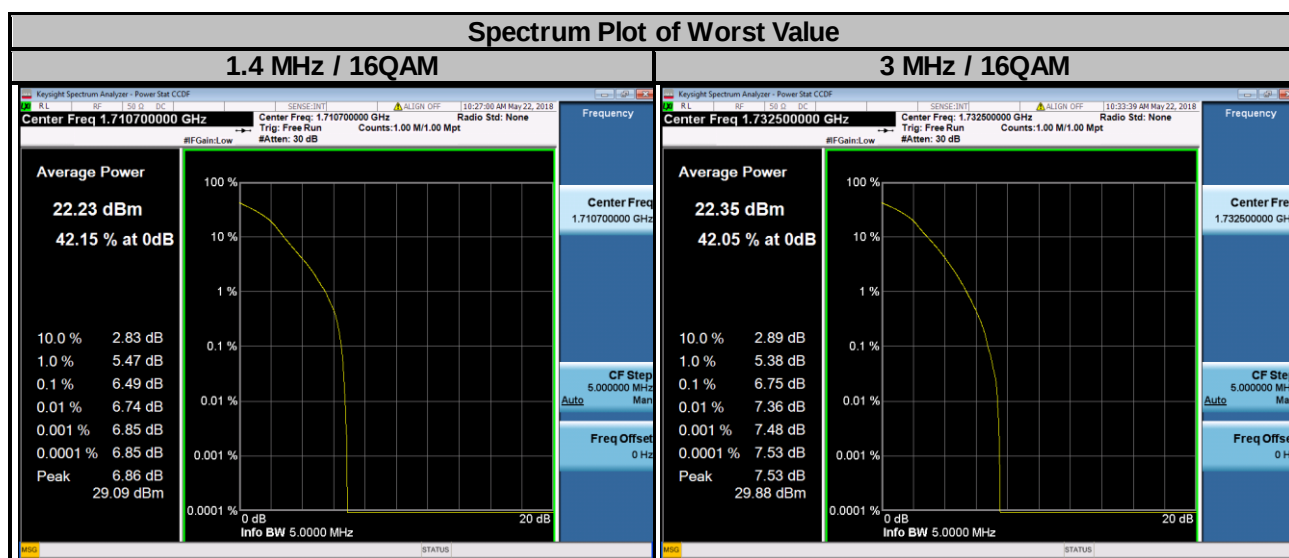
1. Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1 %.

4.5.4 Test Results

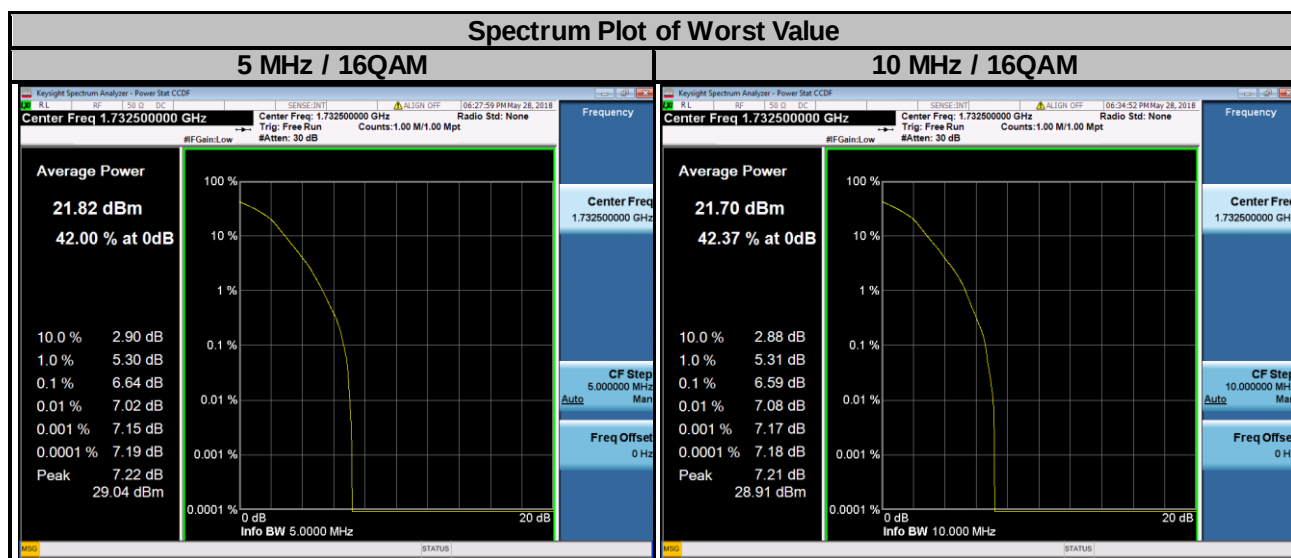
WCDMA		
Channel	Frequency (MHz)	Peak to Average Ratio (dB)
1312	1712.4	3.39
1413	1732.6	3.42
1513	1752.6	3.38



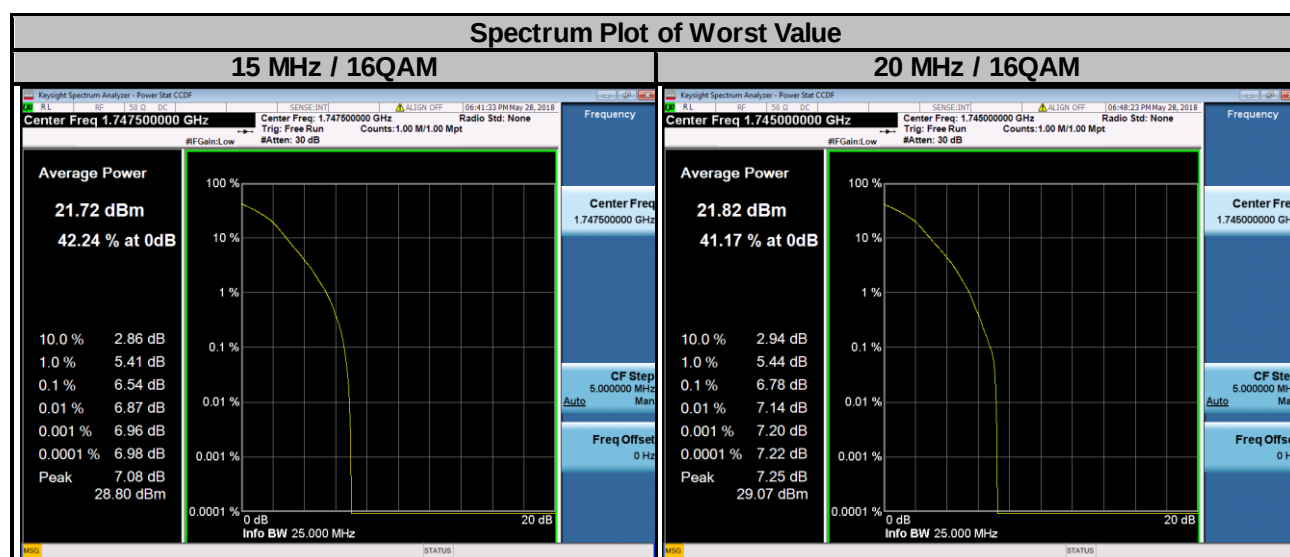
LTE Band 4							
Channel Bandwidth: 1.4 MHz				Channel Bandwidth: 3 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
19957	1710.7	5.92	6.49	19965	1711.5	6.00	6.43
20175	1732.5	5.86	6.87	20175	1732.5	5.96	6.75
20393	1754.3	5.69	6.30	20385	1753.5	5.67	6.42



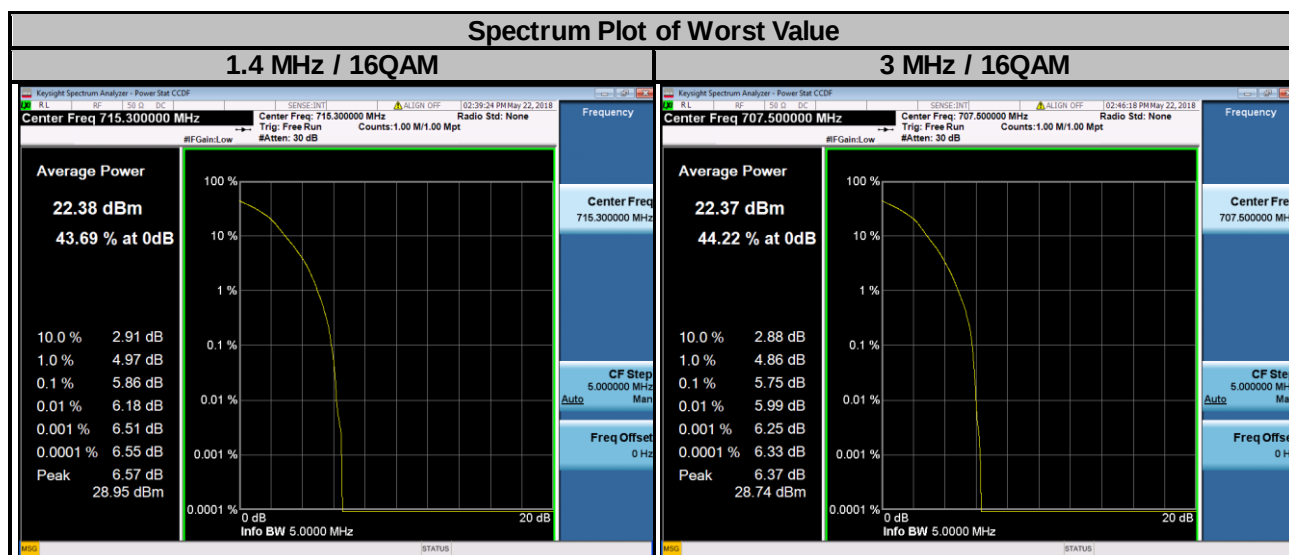
LTE Band 4							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
19975	1712.5	5.76	6.23	20000	1715.0	5.77	6.21
20175	1732.5	5.62	6.64	20175	1732.5	5.69	6.59
20375	1752.5	5.80	6.13	20350	1750.0	5.92	6.28



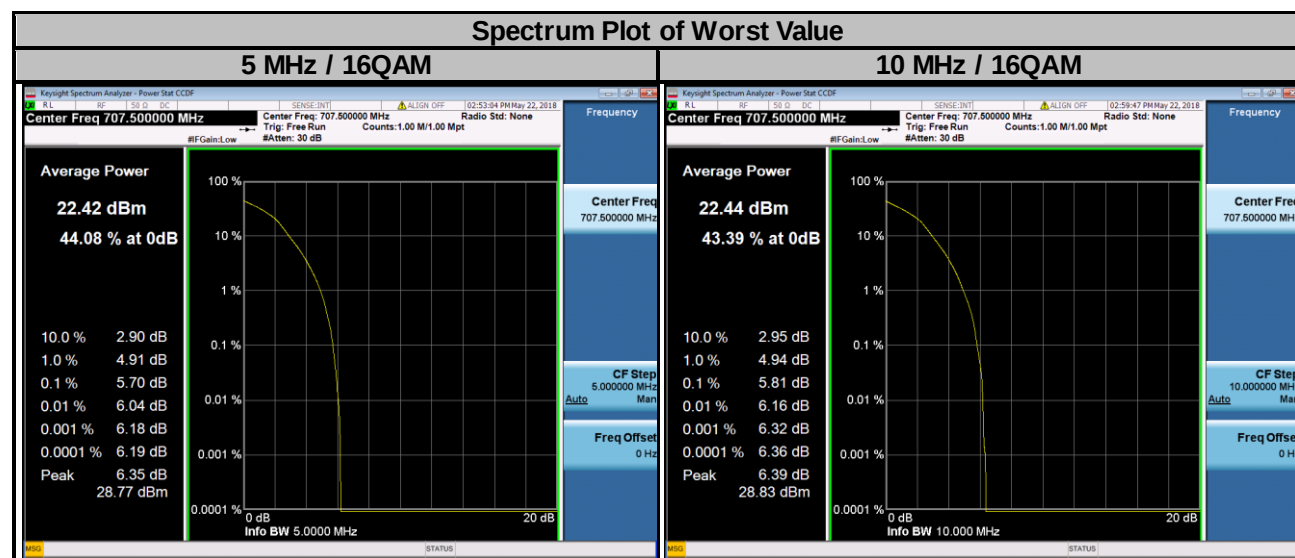
LTE Band 4							
Channel Bandwidth: 15 MHz				Channel Bandwidth: 20 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
20025	1717.5	5.84	6.22	20050	1720.0	5.88	6.19
20175	1732.5	5.67	6.43	20175	1732.5	5.76	6.66
20325	1747.5	6.20	6.54	20300	1745.0	5.99	6.78



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	4.42	5.15	23025	700.5	4.52	5.27
23095	707.5	4.73	5.63	23095	707.5	4.94	5.75
23173	715.3	5.16	5.86	23165	714.5	5.09	5.67



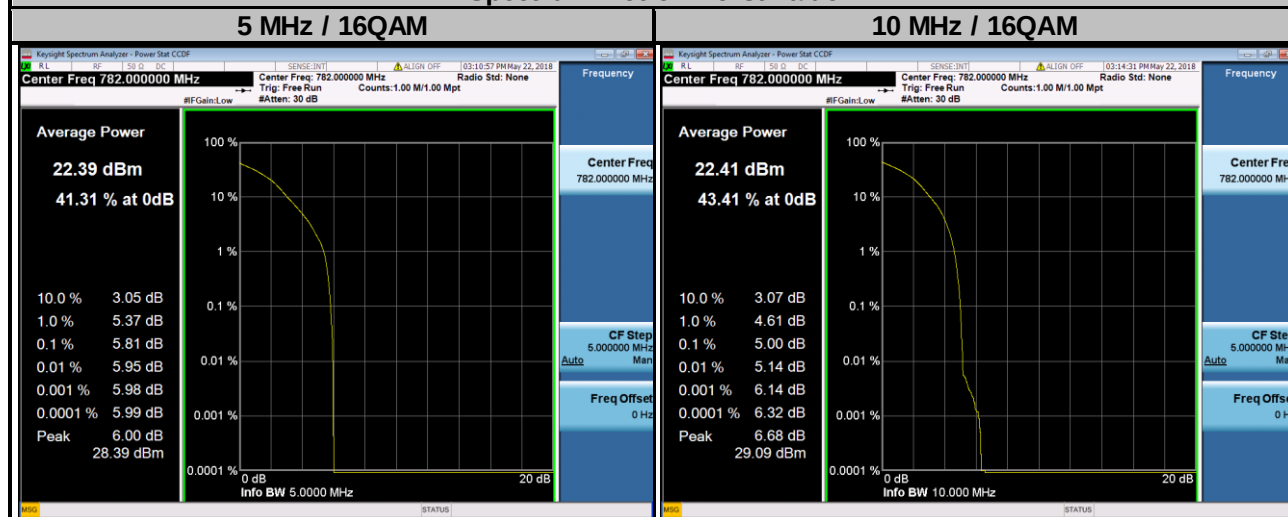
LTE Band 12							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
23035	701.5	4.42	5.10	23060	704.0	4.46	5.17
23095	707.5	4.93	5.70	23095	707.5	5.06	5.81
23155	713.5	4.57	5.28	23130	711.0	4.86	5.61



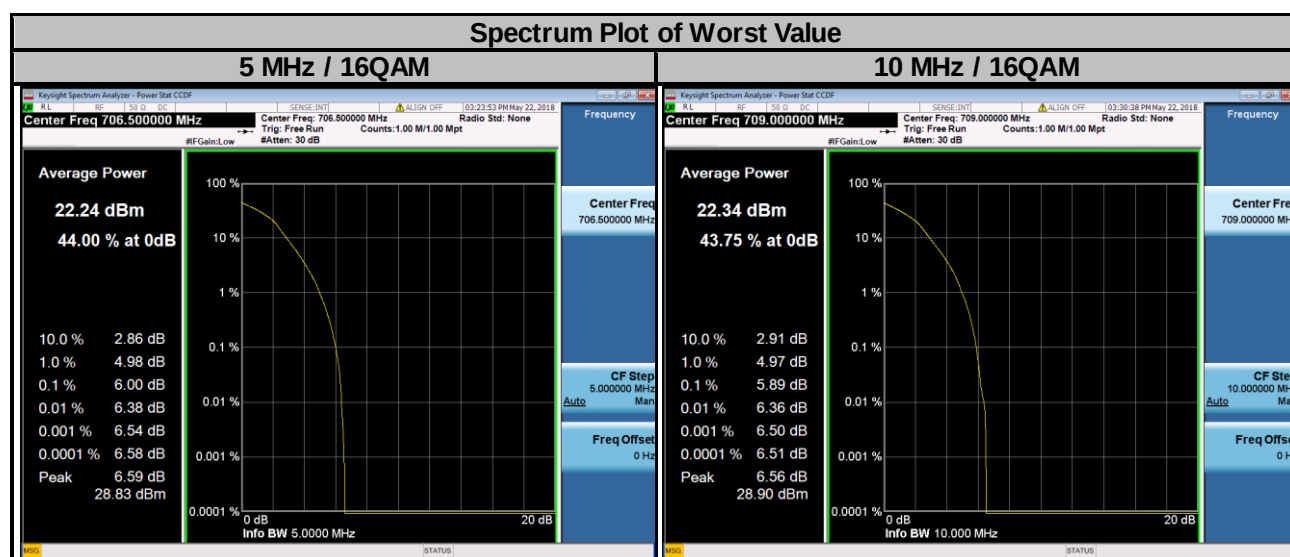
LTE Band 13

Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
23205	779.5	4.27	4.88	23230	782.0	4.42	5.00
23230	782.0	5.54	5.81				
23255	784.5	5.33	5.36				

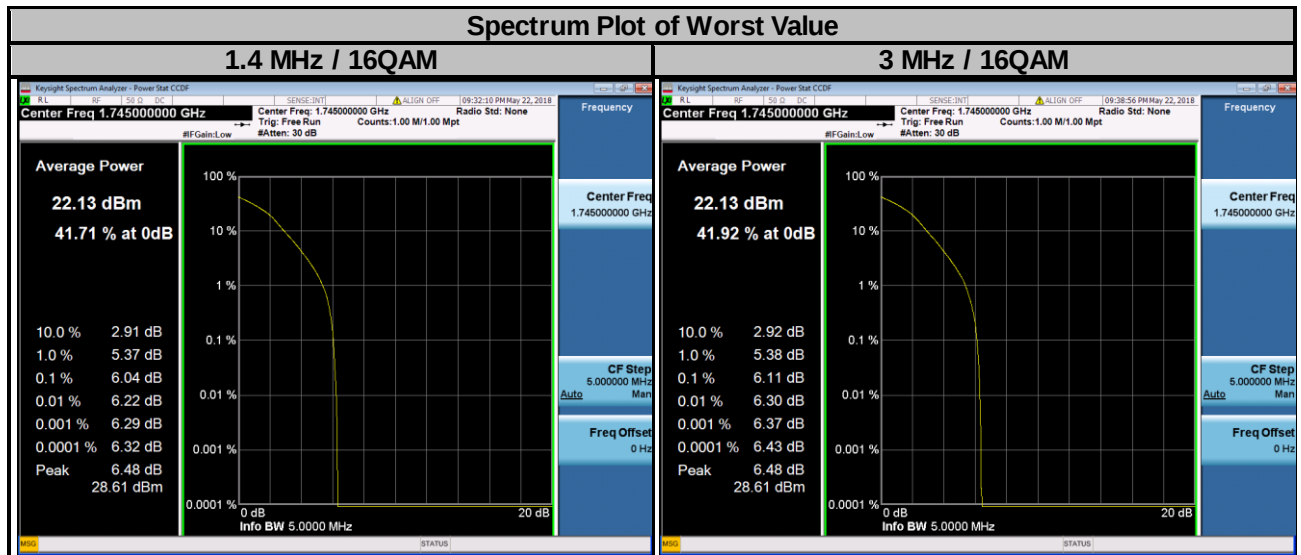
Spectrum Plot of Worst Value



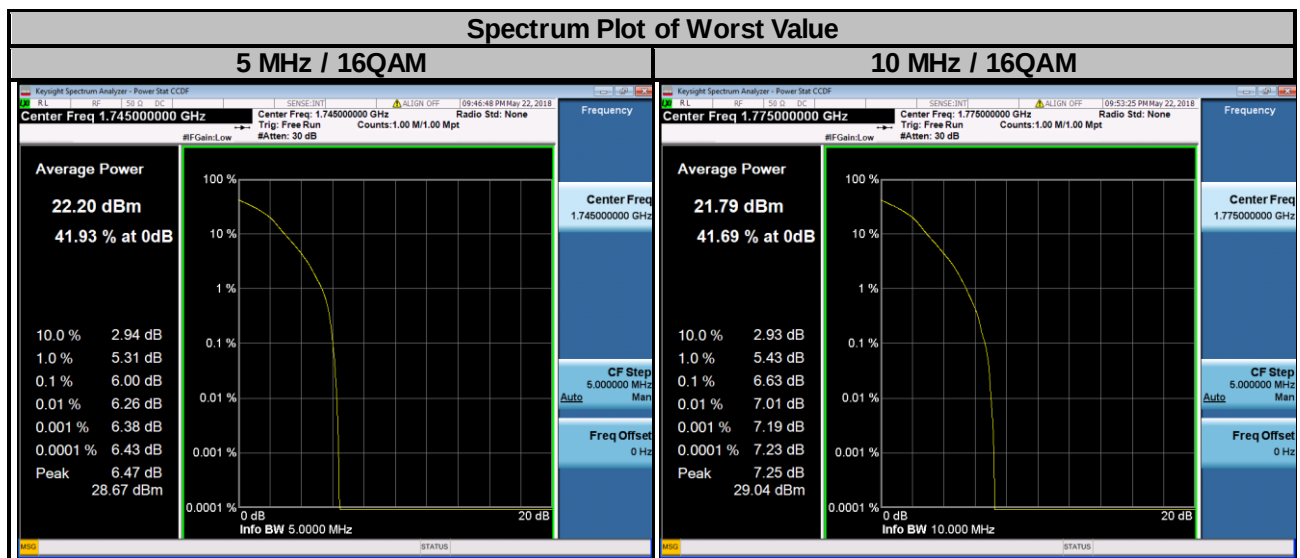
LTE Band 17							
Channel Bandwidth: 5 MHz				Channel Bandwidth: 10 MHz			
Channel	Frequency (MHz)	Peak to Average Ratio (dB)		Channel	Frequency (MHz)	Peak to Average Ratio (dB)	
		QPSK	16QAM			QPSK	16QAM
23755	706.5	5.04	6.00	23780	709.0	5.14	5.89
23790	710.0	4.67	5.56	23790	710.0	5.00	5.66
23825	713.5	4.56	5.33	23800	711.0	4.87	5.51



LTE Band 66							
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
131979	1710.7	5.78	5.93	131987	1711.5	5.88	6.07
132322	1745.0	5.87	6.04	132322	1745.0	5.94	6.11
132665	1779.3	5.47	5.70	132657	1778.5	5.68	6.03



LTE Band 66							
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
131997	1712.5	5.83	5.98	132022	1715.0	5.72	5.96
132322	1745.0	5.87	6.00	132322	1745.0	5.86	6.18
132647	1777.5	5.97	5.96	132622	1775.0	5.88	6.63

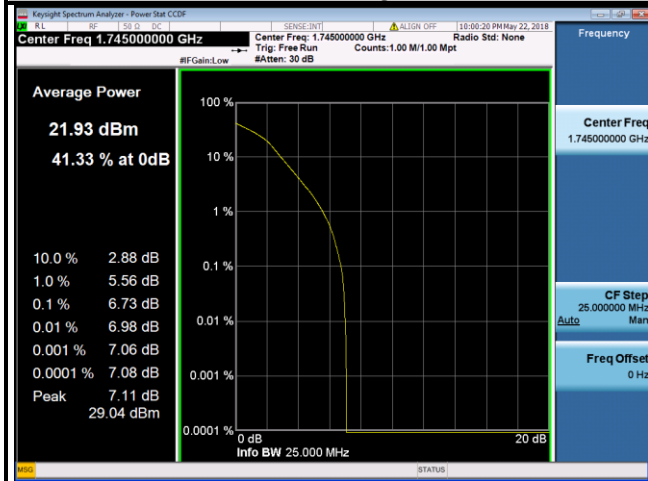


LTE Band 66

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
132047	1717.5	5.85	6.02	132072	1720.0	5.87	5.99
132322	1745.0	5.93	6.73	132322	1745.0	6.05	6.59
132597	1772.5	5.72	6.59	132572	1770.0	5.62	6.15

Spectrum Plot of Worst Value

15 MHz / 16QAM



20 MHz / 16QAM

