

FCC Test Report

(PART 27)

Report No.: RF170808C06-10

FCC ID: 2AJOTTA-1005

Test Model: TA-1005

Received Date: Aug. 08, 2017

Test Date: Aug. 19, 2017 ~ Oct. 25, 2017

Issued Date: Nov. 16, 2017

Applicant: HMD Global Oy

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



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Release Control Record

Issue No.	Description	Date Issued
RF170808C06-10	Original Release	Nov. 16, 2017

1 Certificate of Conformity

Product: Smart Phone

Brand: Nokia

Test Model: TA-1005

Sample Status: Identical Prototype

Applicant: HMD Global Oy

Test Date: Aug. 19, 2017 ~ Oct. 25, 2017

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 EMC characteristics under the conditions specified in this report.

Prepared by :

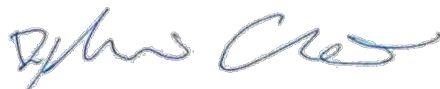


Date:

Nov. 16, 2017

Ivonne Wu / Supervisor

Approved by :



Date:

Nov. 16, 2017

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 -35.41 dB at 3465.20 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 4)			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50(d)(4)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1055 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 -31.74 dB at 5197.50 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 12)			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50(C)(10)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1055 27.54	Frequency Stability	Pass	Meet the requirement of limit.
2.1049 27.53(g)	Occupied Bandwidth	Pass	Meet the requirement of limit.
27.50(d)(5)	Peak to Average Ratio	Pass	Meet the requirement of limit.
27.53(g)	Band Edge Measurements	Pass	Meet the requirement of limit.
2.1051 27.53(g)	Conducted Spurious Emissions	Pass	Meet the requirement of limit.
2.1053 27.53(g)	Radiated Spurious Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -43.48 dB at 1408.00 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 13)			
FCC Clause	Test Item	Result	Remarks
2.1046 27.50(b)(10)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1055 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 -18.50 dB at 1564.00 MHz.

Applied Standard: FCC Part 27 & Part 2 (LTE 17)

FCC Clause	Test Item	Result	Remarks
2.1046 27.50(C)(10)	Maximum Peak Output Power	Pass	Meet the requirement of limit.
2.1055 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 -41.69 dB at 249.78 MHz.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.44 dB
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.0153 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	Dec. 13, 2016	Dec. 12, 2017
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Dec. 13, 2016	Dec. 12, 2017
HORN Antenna ETS-Lindgren	3117	00143293	Jun. 26, 2017	Jun. 25, 2018
Double Ridge Guide Horn Antenna EMCO	3115	5619	Dec. 15, 2016	Dec. 14, 2017
BILOG Antenna SCHWARZBECK	VULB 9168	9168-153	Dec. 13, 2016	Dec. 12, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 14, 2016	Dec. 13, 2017
Fixed Attenuator Mini-Circuits	BW-N10W5+	NA	Jul. 07, 2017	Jul. 06, 2018
MXG Vector signal generator Agilent	N5182B	MY53050430	Oct. 19, 2016	Oct. 18, 2017
MXG Vector signal generator Agilent	N5182B	MY53050430	Oct. 24, 2017	Oct. 23, 2018
Preamplifier Agilent	310N	187226	Jun. 23, 2017	Jun. 22, 2018
Preamplifier Agilent	83017A	MY39501357	Jun. 23, 2017	Jun. 22, 2018
Power Meter Anritsu	ML2495A	1012010	Aug. 15, 2017	Aug. 14, 2018
Power Sensor Anritsu	MA2411B	1315050	Aug. 15, 2017	Aug. 14, 2018
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(R FC-SMS-100-SM S-120+RFC-SMS -100-SMS-400)	Jun. 26, 2017	Jun. 25, 2018
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(R FC-SMS-100-SM S-24)	Jun. 26, 2017	Jun. 25, 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
Communications Tester-Wireless Agilent	8960 Series 10	MY53201073	Jun. 28, 2017	Jun. 27, 2019
Radio Communication Analyzer Anritsu	MT8820C	6201010284	Nov. 30, 2016	Nov. 29, 2017

- 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	Smart Phone	
Brand	Nokia	
Test Model	TA-1005	
Status of EUT	Identical Prototype	
Power Supply Rating	5 Vdc or 9 Vdc or 12 Vdc (adapter) 5 Vdc (host equipment) 3.85 Vdc (battery)	
Modulation Type	WCDMA	QPSK
	LTE	QPSK, 16QAM, 64QAM
Frequency Range	WCDMA	1712.4 ~ 1752.6 MHz
	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	1710.7 ~ 1754.3 MHz
	LTE Band 4 (Channel Bandwidth: 3 MHz)	1711.5 ~ 1753.5 MHz
	LTE Band 4 (Channel Bandwidth: 5 MHz)	1712.5 ~ 1752.5 MHz
	LTE Band 4 (Channel Bandwidth: 10 MHz)	1715.0 ~ 1750.0 MHz
	LTE Band 4 (Channel Bandwidth: 15 MHz)	1717.5 ~ 1747.5 MHz
	LTE Band 4 (Channel Bandwidth: 20 MHz)	1720.0 ~ 1745.0 MHz
	LTE Band 12 (Channel Bandwidth: 1.4 MHz)	699.7 ~ 715.3 MHz
	LTE Band 12 (Channel Bandwidth: 3 MHz)	700.5 ~ 714.5 MHz
	LTE Band 12 (Channel Bandwidth: 5 MHz)	701.5 ~ 713.5 MHz
	LTE Band 12 (Channel Bandwidth: 10 MHz)	704.0 ~ 711.0 MHz
	LTE Band 13 (Channel Bandwidth: 5 MHz)	779.5 ~ 784.5 MHz
	LTE Band 13 (Channel Bandwidth: 10 MHz)	782.0 MHz
	LTE Band 17 (Channel Bandwidth: 5 MHz)	706.5 ~ 713.5 MHz
	LTE Band 17 (Channel Bandwidth: 10 MHz)	709.0 ~ 711.0 MHz
Emission Designator	WCDMA	4M14F9W
	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	1M09G7D
	LTE Band 4 (Channel Bandwidth: 3 MHz)	2M70G7D
	LTE Band 4 (Channel Bandwidth: 5 MHz)	4M50W7D
	LTE Band 4 (Channel Bandwidth: 10 MHz)	8M98W7D
	LTE Band 4 (Channel Bandwidth: 15 MHz)	13M5G7D
	LTE Band 4 (Channel Bandwidth: 20 MHz)	18M0W7D
	LTE Band 12 (Channel Bandwidth: 1.4 MHz)	1M09W7D
	LTE Band 12 (Channel Bandwidth: 3 MHz)	2M70G7D
	LTE Band 12 (Channel Bandwidth: 5 MHz)	4M49W7D
	LTE Band 12 (Channel Bandwidth: 10 MHz)	8M97W7D
	LTE Band 13 (Channel Bandwidth: 5 MHz)	4M49W7D
	LTE Band 13 (Channel Bandwidth: 10 MHz)	8M95G7D
	LTE Band 17 (Channel Bandwidth: 5 MHz)	4M49W7D
	LTE Band 17 (Channel Bandwidth: 10 MHz)	8M97W7D

Max. ERP Power	LTE Band 12 (Channel Bandwidth: 1.4 MHz)	56.51 mW
	LTE Band 12 (Channel Bandwidth: 3 MHz)	56.87 mW
	LTE Band 12 (Channel Bandwidth: 5 MHz)	56.96 mW
	LTE Band 12 (Channel Bandwidth: 10 MHz)	57.66 mW
	LTE Band 13 (Channel Bandwidth: 5 MHz)	56.94 mW
	LTE Band 13 (Channel Bandwidth: 10 MHz)	57.37 mW
	LTE Band 17 (Channel Bandwidth: 5 MHz)	202.72 mW
	LTE Band 17 (Channel Bandwidth: 10 MHz)	206.49 mW
Max. EIRP Power	WCDMA	161.70 mW
	LTE Band 4 (Channel Bandwidth: 1.4 MHz)	160.88 mW
	LTE Band 4 (Channel Bandwidth: 3 MHz)	162.07 mW
	LTE Band 4 (Channel Bandwidth: 5 MHz)	160.21 mW
	LTE Band 4 (Channel Bandwidth: 10 MHz)	160.69 mW
	LTE Band 4 (Channel Bandwidth: 15 MHz)	160.95 mW
	LTE Band 4 (Channel Bandwidth: 20 MHz)	165.84 mW
Antenna Type	Fixed Internal Antenna	
Accessory Device	Refer to Note as below	
Data Cable Supplied	Refer to Note as below	

Note:

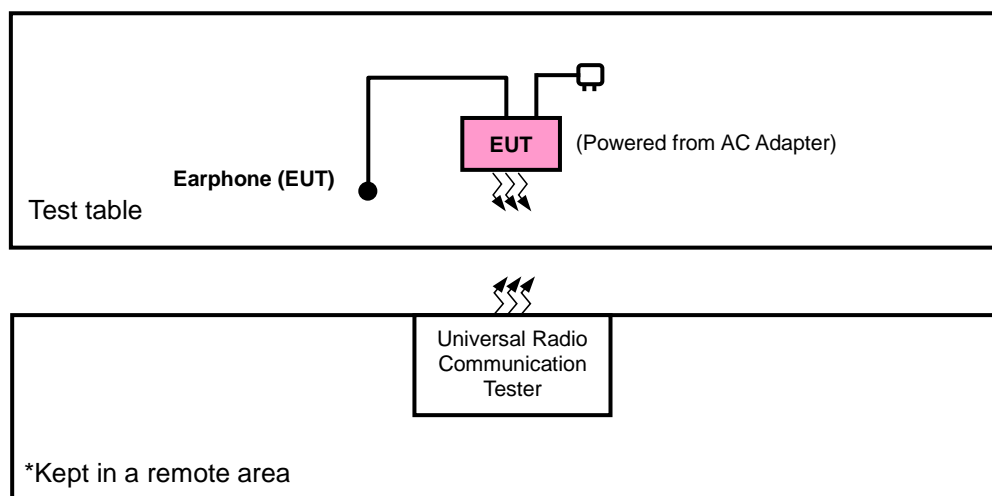
1. The EUT contains following accessory devices.

Product	Brand	Model	Description
Adapter	Salcomp	FC0302	I/P: 100-240 Vac, 0.5 A O/P: 5 Vdc, 2.5 A or 9 Vdc, 2 A or 12 Vdc, 1.5 A
Battery	SCUD	HE333	3.85 Vdc, 3250 mAh
Earphone	NOKIA	HS-A01	1.15 meter
USB Cable	Foxconn	CUDT01E-FA210-EH	0.95 meter
LCD Panel	LG Display	LH546QH1-EDD1-QG1	5.5" OLED
Front Camera	Chicony	CBFH51020005020LH	5M
Main Camera	Primay	FCDC1N	12+13M
eMMC 1 (=ROM 1)	SAMSUNG	IC_UFS2.1_128G	128G
Main Board	AT&S	FIH1883	--
BT/WLAN Module	murata	LBDD5QA1MS-119	--
WWAN Module	Qualcomm	MSM8998	--

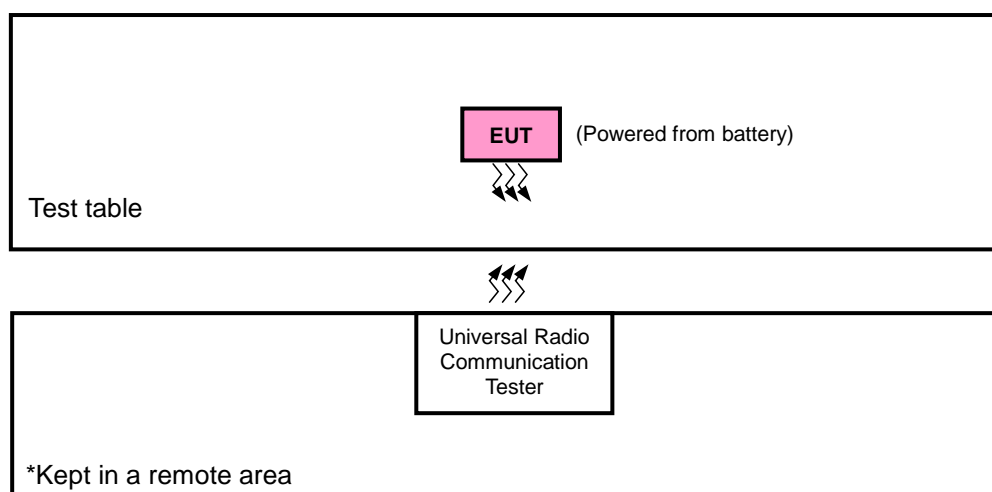
2. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

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:

Antenna	Band	ERP / EIRP	Radiated Emission
0	WCDMA	X-plane	Y-axis
	LTE Band 4	X-plane	X-axis
1	LTE Band 12	X-plane	X-axis
	LTE Band 13	X-plane	X-axis
	LTE Band 17	X-plane	X-axis

Note: The EUT incorporates WWAN diversity antenna.

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
-	Conducuted 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, 64QAM	1 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Frequency Stability	19957 to 20393	19957, 20393	1.4 MHz	QPSK	1 RB / 0 RB Offset
		19965 to 20385	19965, 20385	3 MHz	QPSK	1 RB / 0 RB Offset
		19975 to 20375	19975, 20375	5 MHz	QPSK	1 RB / 0 RB Offset
		20000 to 20350	20000, 20350	10 MHz	QPSK	1 RB / 0 RB Offset
		20025 to 20325	20025, 20325	15 MHz	QPSK	1 RB / 0 RB Offset
		20050 to 20300	20050, 20300	20 MHz	QPSK	1 RB / 0 RB Offset
-	Occupied Bandwidth	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM, 64QAM	6 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK, 16QAM, 64QAM	15 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK, 16QAM, 64QAM	75 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK, 16QAM, 64QAM	100 RB / 0 RB Offset
-	Peak to Average Ratio	19957 to 20393	19957, 20175, 20393	1.4 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		19965 to 20385	19965, 20175, 20385	3 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	Band Edge	19957 to 20393	19957	1.4 MHz	QPSK	1 RB / 0 RB Offset
			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
		19975 to 20375	19975, 20175, 20375	5 MHz	QPSK	1 RB / 49 RB Offset
		20000 to 20350	20000, 20175, 20350	10 MHz	QPSK	50 RB / 0 RB Offset
		20025 to 20325	20025, 20175, 20325	15 MHz	QPSK	1 RB / 0 RB Offset
		20050 to 20300	20050, 20175, 20300	20 MHz	QPSK	75 RB / 0 RB Offset
-	Radiated Emission	20050 to 20300	20050, 20175, 20300	20 MHz	QPSK	1 RB / 74 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, 64QAM	1 RB / 0 RB Offset
		23025 to 23165	23025, 23095, 23165	3 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23035 to 23155	23035, 23095, 23155	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Frequency Stability	23017 to 23173	23017, 23173	1.4 MHz	QPSK	1 RB / 0 RB Offset
		23025 to 23165	23025, 23165	3 MHz	QPSK	1 RB / 0 RB Offset
		23035 to 23155	23035, 23155	5 MHz	QPSK	1 RB / 0 RB Offset
		23060 to 23130	23060, 23130	10 MHz	QPSK	1 RB / 0 RB Offset
-	Occupied Bandwidth	23017 to 23173	23017, 23095, 23173	1.4 MHz	QPSK, 16QAM, 64QAM	6 RB / 0 RB Offset
		23025 to 23165	23025, 23095, 23165	3 MHz	QPSK, 16QAM, 64QAM	15 RB / 0 RB Offset
		23035 to 23155	23035, 23095, 23155	5 MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
-	Peak to Average Ratio	23017 to 23173	23017, 23095, 23173	1.4 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23025 to 23165	23025, 23095, 23165	3 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23035 to 23155	23035, 23095, 23155	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23060 to 23130	23060, 23095, 23130	10 MHz	QPSK, 16QAM, 64QAM	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
		23017 to 23173	23017	1.4 MHz	QPSK	1 RB / 0 RB Offset
			23173	1.4 MHz	QPSK	50 RB / 0 RB Offset
		23025 to 23165	23025	3 MHz	QPSK	1 RB / 49 RB Offset
			23165	3 MHz	QPSK	50 RB / 0 RB Offset

EUT Configure Mode	Test Item	Available Channel	Tested Channel	Channel Bandwidth	Modulation	Mode
-	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	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, 64QAM	1 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Frequency Stability	23205 to 23255	23205, 23255	5 MHz	QPSK	1 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK	1 RB / 0 RB Offset
-	Occupied Bandwidth	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
-	Peak to Average Ratio	23205 to 23255	23205, 23230, 23255	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23230	23230	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Band Edge	23205 to 23255	23205	5 MHz	QPSK	1 RB / 0 RB Offset
			23255	5 MHz	QPSK	25 RB / 0 RB Offset
		23230	23230	10 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 / 0 RB Offset
		23230	23230	10 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission	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, 64QAM	1 RB / 0 RB Offset
		23780 to 23800	23780, 23790, 23800	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Frequency Stability	23755 to 23825	23755, 23825	5 MHz	QPSK	1 RB / 0 RB Offset
		23780 to 23800	23780, 23800	10 MHz	QPSK	1 RB / 0 RB Offset
-	Occupied Bandwidth	23755 to 23825	23755, 23790, 23825	5 MHz	QPSK, 16QAM, 64QAM	25 RB / 0 RB Offset
		23780 to 23800	23780, 23790, 23800	10 MHz	QPSK, 16QAM, 64QAM	50 RB / 0 RB Offset
-	Peak to Average Ratio	23755 to 23825	23755, 23790, 23825	5 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
		23780 to 23800	23780, 23790, 23800	10 MHz	QPSK, 16QAM, 64QAM	1 RB / 0 RB Offset
-	Band Edge	23755 to 23825	23755	5 MHz	QPSK	1 RB / 0 RB Offset
						25 RB / 0 RB Offset
		23780 to 23800	23825	5 MHz	QPSK	1 RB / 24 RB Offset
						25 RB / 0 RB Offset
			23780	10 MHz	QPSK	1 RB / 0 RB Offset
						50 RB / 0 RB Offset
-	Conducted Emission	23755 to 23825	23755, 23790, 23825	5 MHz	QPSK	1 RB / 0 RB Offset
		23780 to 23800	23780, 23790, 23800	10 MHz	QPSK	1 RB / 0 RB Offset
-	Radiated Emission	23780 to 23800	23780, 23790, 23800	10 MHz	QPSK	1 RB / 0 RB Offset

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

Test Condition:

Test Item	Environmental Conditions	Input Power	Tested By
ERP / EIRP	25 deg. C, 65 % RH	3.85 Vdc	Karl Lee
Frequency Stability	25 deg. C, 65 % RH	3.85 Vdc	Carlos Chen
Occupied Bandwidth	25 deg. C, 65 % RH	3.85 Vdc	Carlos Chen
Band Edge	25 deg. C, 65 % RH	3.85 Vdc	Carlos Chen
Peak to Average Ratio	25 deg. C, 65 % RH	3.85 Vdc	Carlos Chen
Conducuted Emission	25 deg. C, 65 % RH	3.85 Vdc	Carlos Chen
Radiated Emission	25 deg. C, 65 % RH	120 Vac, 60 Hz	Karl Lee / Charles Hsiao

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 698-787 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, $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15 \text{ dBi}$.

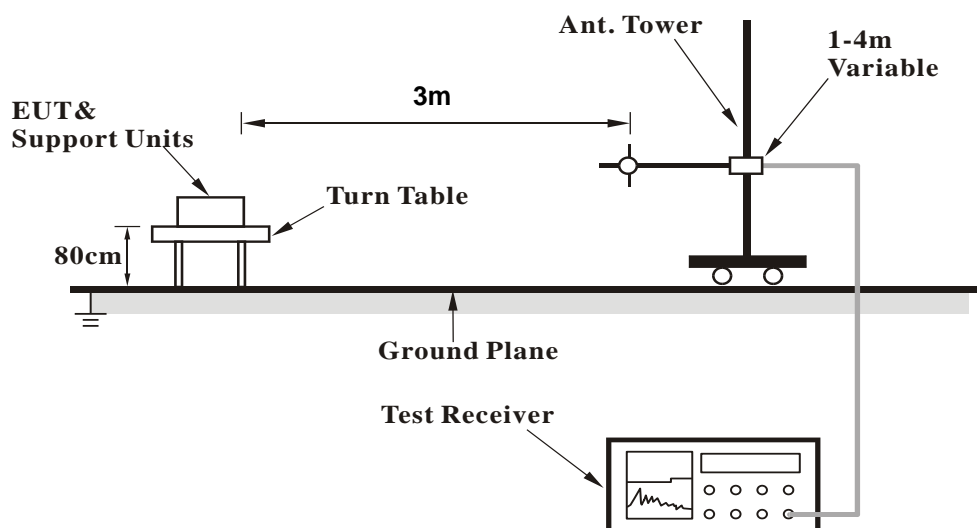
Conducted Power Measurement:

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

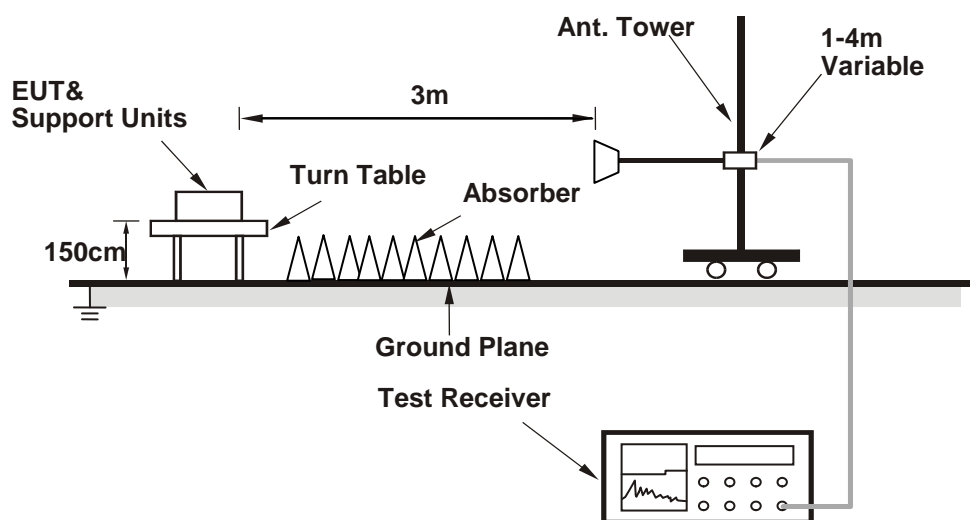
4.1.3 Test Setup

EIRP / ERP Measurement:

<Radiated Emission below or equal 1 GHz>

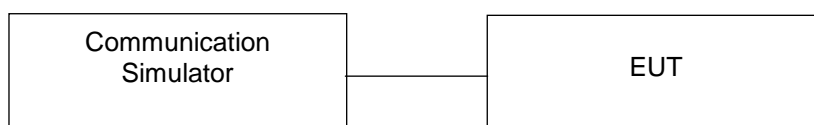


<Radiated Emission above 1 GHz>



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

Conducted Power Measurement:



4.1.4 Test Results

Conducted Output Power (dBm)

Band	WCDMA IV		
Channel	1312	1413	1513
Frequency (MHz)	1712.4	1732.6	1752.6
RMC 12.2K	23.31	23.39	23.30
HSDPA Subtest-1	22.27	22.35	22.26
HSDPA Subtest-2	22.30	22.38	22.29
HSDPA Subtest-3	22.10	22.18	22.09
HSDPA Subtest-4	22.09	22.17	22.08
HSUPA Subtest-1	22.33	22.32	22.32
HSUPA Subtest-2	20.30	20.38	20.29
HSUPA Subtest-3	21.30	21.38	21.29
HSUPA Subtest-4	20.33	20.27	20.32
HSUPA Subtest-5	22.32	22.33	22.31

LTE Band 4

BW (MHz)	RB Size	RB Offset	QPSK				16QAM				64QAM			
			Low CH	Mid CH	High CH	3GPP MPR (dB)	Low CH	Mid CH	High CH	3GPP MPR (dB)	Low CH	Mid CH	High CH	3GPP MPR (dB)
			20050 MHz	20175 MHz	20300 MHz		20050 MHz	20175 MHz	20300 MHz		20050 MHz	20175 MHz	20300 MHz	
20	1	0	23.41	23.52	23.61	0	22.39	22.50	22.59	1	21.46	21.58	21.56	2
	1	50	23.21	23.32	23.41	0	22.19	22.30	22.39	1	21.25	21.37	21.35	2
	1	99	23.23	23.34	23.43	0	22.21	22.32	22.41	1	21.17	21.42	21.32	2
	50	0	22.42	22.53	22.62	1	21.40	21.51	21.60	2	20.30	20.51	20.63	3
	50	25	22.35	22.46	22.55	1	21.33	21.44	21.53	2	20.22	20.23	20.37	3
	50	50	22.18	22.29	22.38	1	21.16	21.27	21.36	2	20.12	20.39	20.41	3
	100	0	22.29	22.40	22.49	1	21.27	21.38	21.47	2	20.13	20.25	20.44	3
BW (MHz)	RB Size	RB Offset	QPSK				16QAM				64QAM			
			Low CH	Mid CH	High CH	3GPP MPR (dB)	Low CH	Mid CH	High CH	3GPP MPR (dB)	Low CH	Mid CH	High CH	3GPP MPR (dB)
			20025 MHz	20175 MHz	20325 MHz		20025 MHz	20175 MHz	20325 MHz		20025 MHz	20175 MHz	20325 MHz	
15	1	0	23.39	23.50	23.59	0	22.37	22.48	22.57	1	21.37	21.45	21.57	2
	1	37	23.19	23.30	23.39	0	22.17	22.28	22.37	1	21.11	21.33	21.42	2
	1	74	23.21	23.32	23.41	0	22.19	22.30	22.39	1	21.15	21.29	21.45	2
	36	0	22.40	22.51	22.60	1	21.38	21.49	21.58	2	20.32	20.44	20.63	3
	36	19	22.33	22.44	22.53	1	21.31	21.42	21.51	2	20.11	20.33	20.47	3
	36	39	22.16	22.27	22.36	1	21.14	21.25	21.34	2	20.22	20.24	20.39	3
	75	0	22.27	22.38	22.47	1	21.25	21.36	21.45	2	20.28	20.40	20.35	3
BW (MHz)	RB Size	RB Offset	QPSK				16QAM				64QAM			
			Low CH	Mid CH	High CH	3GPP MPR (dB)	Low CH	Mid CH	High CH	3GPP MPR (dB)	Low CH	Mid CH	High CH	3GPP MPR (dB)
			20000 MHz	20175 MHz	20350 MHz		20000 MHz	20175 MHz	20350 MHz		20000 MHz	20175 MHz	20350 MHz	
10	1	0	23.35	23.46	23.55	0	22.33	22.44	22.53	1	21.41	21.59	21.55	2
	1	24	23.15	23.26	23.35	0	22.13	22.24	22.33	1	21.13	21.22	21.35	2
	1	49	23.17	23.28	23.37	0	22.15	22.26	22.35	1	21.13	21.38	21.38	2
	25	0	22.36	22.47	22.56	1	21.34	21.45	21.54	2	20.37	20.60	20.53	3
	25	12	22.29	22.40	22.49	1	21.27	21.38	21.47	2	20.19	20.25	20.38	3
	25	25	22.12	22.23	22.32	1	21.10	21.21	21.30	2	20.18	20.30	20.33	3
	50	0	22.23	22.34	22.43	1	21.21	21.32	21.41	2	20.26	20.28	20.38	3
BW (MHz)	RB Size	RB Offset	QPSK				16QAM				64QAM			
			Low CH	Mid CH	High CH	3GPP MPR (dB)	Low CH	Mid CH	High CH	3GPP MPR (dB)	Low CH	Mid CH	High CH	3GPP MPR (dB)
			19975 MHz	20175 MHz	20375 MHz		19975 MHz	20175 MHz	20375 MHz		19975 MHz	20175 MHz	20375 MHz	
5	1	0	23.34	23.45	23.54	0	22.32	22.43	22.52	1	21.31	21.55	21.49	2
	1	12	23.14	23.25	23.34	0	22.12	22.23	22.32	1	21.10	21.32	21.41	2
	1	24	23.16	23.27	23.36	0	22.14	22.25	22.34	1	21.27	21.41	21.34	2
	12	0	22.35	22.46	22.55	1	21.33	21.44	21.53	2	20.32	20.44	20.62	3
	12	6	22.28	22.39	22.48	1	21.26	21.37	21.46	2	20.22	20.26	20.40	3
	12	13	22.11	22.22	22.31	1	21.09	21.20	21.29	2	20.11	20.29	20.39	3
	25	0	22.22	22.33	22.42	1	21.20	21.31	21.40	2	20.24	20.33	20.37	3
BW (MHz)	RB Size	RB Offset	QPSK				16QAM				64QAM			
			Low CH	Mid CH	High CH	3GPP MPR (dB)	Low CH	Mid CH	High CH	3GPP MPR (dB)	Low CH	Mid CH	High CH	3GPP MPR (dB)
			19965 MHz	20175 MHz	20385 MHz		19965 MHz	20175 MHz	20385 MHz		19965 MHz	20175 MHz	20385 MHz	
3	1	0	23.30	23.41	23.50	0	22.28	22.39	22.48	1	21.24	21.52	21.56	2
	1	7	23.10	23.21	23.30	0	22.08	22.19	22.28	1	21.20	21.27	21.32	2
	1	14	23.12	23.23	23.32	0	22.10	22.21	22.30	1	21.17	21.26	21.35	2
	8	0	22.31	22.42	22.51	1	21.29	21.40	21.49	2	20.33	20.37	20.56	3
	8	3	22.24	22.35	22.44	1	21.22	21.33	21.42	2	20.23	20.26	20.38	3
	8	7	22.07	22.18	22.27	1	21.05	21.16	21.25	2	20.22	20.17	20.35	3
	15	0	22.18	22.29	22.38	1	21.16	21.27	21.36	2	20.20	20.25	20.33	3
BW (MHz)	RB Size	RB Offset	QPSK				16QAM				64QAM			
			Low CH	Mid CH	High CH	3GPP MPR (dB)	Low CH	Mid CH	High CH	3GPP MPR (dB)	Low CH	Mid CH	High CH	3GPP MPR (dB)
			19957 MHz	20175 MHz	20393 MHz		19957 MHz	20175 MHz	20393 MHz		19957 MHz	20175 MHz	20393 MHz	
1.4	1	0	23.29	23.40	23.49	0	22.27	22.38	22.47	1	21.25	21.43	21.45	2
	1	2	23.09	23.20	23.29	0	22.07	22.18	22.27	1	21.10	21.17	21.44	2
	1	5	23.11	23.22	23.31	0	22.09	22.20	22.29	1	21.10	21.18	21.27	2
	3	0	23.10	23.21	23.30	0	22.08	22.19	22.28	1	21.39	21.39	21.63	2
	3	1	23.03	23.14	23.23	0	22.01	22.12	22.21	1	21.22	21.16	21.44	2
	3	3	22.86	22.97	23.06	0	21.84	21.95	22.04	1	21.25	21.27	21.45	2
	6	0	22.17	22.28	22.37	1	21.15	21.26	21.35	2	20.09	20.34	20.43	3

LTE Band 12

BW (MHz)	RB Size	RB Offset	QPSK				16QAM				64QAM			
			Low CH 23060	Mid CH 23095	High CH 23130	3GPP MPR (dB)	Low CH 23060	Mid CH 23095	High CH 23130	3GPP MPR (dB)	Low CH 23060	Mid CH 23095	High CH 23130	3GPP MPR (dB)
			704.0 MHz	707.5 MHz	711.0 MHz		704.0 MHz	707.5 MHz	711.0 MHz		704.0 MHz	707.5 MHz	711.0 MHz	
10	1	0	23.37	23.39	23.33	0	22.35	22.37	22.31	1	21.38	21.41	21.32	2
	1	24	23.28	23.30	23.24	0	22.26	22.28	22.22	1	21.36	21.28	21.28	2
	1	49	23.14	23.16	23.10	0	22.12	22.14	22.08	1	21.17	21.17	21.22	2
	25	0	22.30	22.32	22.26	1	21.28	21.30	21.24	2	20.39	20.39	20.33	3
	25	12	22.28	22.30	22.24	1	21.26	21.28	21.22	2	20.28	20.36	20.37	3
	25	25	22.27	22.29	22.23	1	21.25	21.27	21.21	2	20.16	20.25	20.08	3
	50	0	22.15	22.17	22.11	1	21.13	21.15	21.09	2	20.14	20.27	20.09	3
BW (MHz)	RB Size	RB Offset	QPSK				16QAM				64QAM			
			Low CH 23035	Mid CH 23095	High CH 23155	3GPP MPR (dB)	Low CH 23035	Mid CH 23095	High CH 23155	3GPP MPR (dB)	Low CH 23035	Mid CH 23095	High CH 23155	3GPP MPR (dB)
			701.5 MHz	707.5 MHz	713.5 MHz		701.5 MHz	707.5 MHz	713.5 MHz		701.5 MHz	707.5 MHz	713.5 MHz	
5	1	0	23.33	23.35	23.29	0	22.31	22.33	22.27	1	21.33	21.39	21.29	2
	1	12	23.24	23.26	23.20	0	22.22	22.24	22.18	1	21.29	21.31	21.32	2
	1	24	23.10	23.12	23.06	0	22.08	22.10	22.04	1	21.12	21.29	21.10	2
	12	0	22.26	22.28	22.22	1	21.24	21.26	21.20	2	20.43	20.48	20.42	3
	12	6	22.24	22.26	22.20	1	21.22	21.24	21.18	2	20.39	20.43	20.32	3
	12	13	22.23	22.25	22.19	1	21.21	21.23	21.17	2	20.15	20.25	20.10	3
	25	0	22.11	22.13	22.07	1	21.09	21.11	21.05	2	20.23	20.21	20.16	3
BW (MHz)	RB Size	RB Offset	QPSK				16QAM				64QAM			
			Low CH 23025	Mid CH 23095	High CH 23165	3GPP MPR (dB)	Low CH 23025	Mid CH 23095	High CH 23165	3GPP MPR (dB)	Low CH 23025	Mid CH 23095	High CH 23165	3GPP MPR (dB)
			700.5 MHz	707.5 MHz	714.5 MHz		700.5 MHz	707.5 MHz	714.5 MHz		700.5 MHz	707.5 MHz	714.5 MHz	
3	1	0	23.31	23.33	23.27	0	22.29	22.31	22.25	1	21.38	21.50	21.28	2
	1	7	23.22	23.24	23.18	0	22.20	22.22	22.16	1	21.39	21.27	21.31	2
	1	14	23.08	23.10	23.04	0	22.06	22.08	22.02	1	21.28	21.12	21.17	2
	8	0	22.24	22.26	22.20	1	21.22	21.24	21.18	2	20.33	20.54	20.45	3
	8	3	22.22	22.24	22.18	1	21.20	21.22	21.16	2	20.30	20.35	20.23	3
	8	7	22.21	22.23	22.17	1	21.19	21.21	21.15	2	20.19	20.19	20.14	3
	15	0	22.09	22.11	22.05	1	21.07	21.09	21.03	2	20.16	20.18	20.06	3
BW (MHz)	RB Size	RB Offset	QPSK				16QAM				64QAM			
			Low CH 23017	Mid CH 23095	High CH 23173	3GPP MPR (dB)	Low CH 23017	Mid CH 23095	High CH 23173	3GPP MPR (dB)	Low CH 23017	Mid CH 23095	High CH 23173	3GPP MPR (dB)
			699.7 MHz	707.5 MHz	715.3 MHz		699.7 MHz	707.5 MHz	715.3 MHz		699.7 MHz	707.5 MHz	715.3 MHz	
1.4	1	0	23.30	23.32	23.26	0	22.28	22.30	22.24	1	21.41	21.46	21.36	2
	1	2	23.21	23.23	23.17	0	22.19	22.21	22.15	1	21.25	21.36	21.22	2
	1	5	23.07	23.09	23.03	0	22.05	22.07	22.01	1	21.09	21.11	21.19	2
	3	0	23.13	23.15	23.09	0	22.11	22.13	22.07	1	21.40	21.53	21.36	2
	3	1	23.11	23.13	23.07	0	22.09	22.11	22.05	1	21.39	21.40	21.32	2
	3	3	23.10	23.12	23.06	0	22.08	22.10	22.04	1	21.28	21.28	21.22	2
	6	0	22.08	22.10	22.04	1	21.06	21.08	21.02	2	20.24	20.11	20.06	3

LTE Band 13

BW (MHz)	RB Size	RB Offset	QPSK				16QAM				64QAM			
				Mid CH 23230 782.0 MHz		3GPP MPR (dB)		Mid CH 23230 782.0 MHz		3GPP MPR (dB)		Mid CH 23230 782.0 MHz		3GPP MPR (dB)
10	1	0		23.23		0		22.21		1		21.24		2
	1	24		23.12		0		22.10		1		21.20		2
	1	49		23.05		0		22.03		1		21.15		2
	25	0		22.22		1		21.20		2		20.24		3
	25	12		22.06		1		21.04		2		20.11		3
	25	25		22.04		1		21.02		2		20.08		3
	50	0		21.98		1		20.96		2		20.05		3
BW (MHz)	RB Size	RB Offset	QPSK				16QAM				64QAM			
			Low CH 23205 779.5 MHz	Mid CH 23230 782.0 MHz	High CH 23255 784.5 MHz	3GPP MPR (dB)	Low CH 23205 779.5 MHz	Mid CH 23230 782.0 MHz	High CH 23255 784.5 MHz	3GPP MPR (dB)	Low CH 23205 779.5 MHz	Mid CH 23230 782.0 MHz	High CH 23255 784.5 MHz	3GPP MPR (dB)
5	1	0	23.18	23.21	23.19	0	22.15	22.18	22.16	1	21.13	21.25	21.29	2
	1	12	23.07	23.10	23.08	0	22.04	22.07	22.05	1	21.22	21.09	21.05	2
	1	24	23.00	23.03	23.01	0	21.97	22.00	21.98	1	20.98	21.06	21.01	2
	12	0	22.17	22.20	22.18	1	21.14	21.17	21.15	2	20.21	20.36	20.27	3
	12	6	22.01	22.04	22.02	1	20.98	21.01	20.99	2	20.03	20.07	20.13	3
	12	13	21.99	22.02	22.00	1	20.96	20.99	20.97	2	20.04	20.02	20.11	3
	25	0	21.93	21.96	21.94	1	20.90	20.93	20.91	2	20.04	20.15	20.04	3

LTE Band 17

BW (MHz)	RB Size	RB Offset	QPSK				16QAM				64QAM			
			Low CH 23780 709.0 MHz	Mid CH 23790 710.0 MHz	High CH 23800 711.0 MHz	3GPP MPR (dB)	Low CH 23780 709.0 MHz	Mid CH 23790 710.0 MHz	High CH 23800 711.0 MHz	3GPP MPR (dB)	Low CH 23780 709.0 MHz	Mid CH 23790 710.0 MHz	High CH 23800 711.0 MHz	3GPP MPR (dB)
10	1	0	23.24	23.40	23.39	0	22.20	22.36	22.35	1	21.29	21.39	21.47	2
	1	24	23.23	23.39	23.38	0	22.19	22.35	22.34	1	21.38	21.44	21.46	2
	1	49	23.16	23.32	23.31	0	22.12	22.28	22.27	1	21.11	21.45	21.35	2
	25	0	22.23	22.39	22.38	1	21.19	21.35	21.34	2	20.37	20.39	20.54	3
	25	12	22.08	22.24	22.23	1	21.04	21.20	21.19	2	20.23	20.51	20.50	3
	25	25	22.02	22.18	22.17	1	20.98	21.14	21.13	2	20.13	20.46	20.26	3
	50	0	21.90	22.06	22.05	1	20.86	21.02	21.01	2	20.16	20.40	20.30	3
BW (MHz)	RB Size	RB Offset	QPSK				16QAM				64QAM			
			Low CH 23755 706.5 MHz	Mid CH 23790 710.0 MHz	High CH 23825 713.5 MHz	3GPP MPR (dB)	Low CH 23755 706.5 MHz	Mid CH 23790 710.0 MHz	High CH 23825 713.5 MHz	3GPP MPR (dB)	Low CH 23755 706.5 MHz	Mid CH 23790 710.0 MHz	High CH 23825 713.5 MHz	3GPP MPR (dB)
5	1	0	23.21	23.37	23.36	0	22.17	22.33	22.32	1	21.31	21.48	21.49	2
	1	12	23.20	23.36	23.35	0	22.16	22.32	22.31	1	21.30	21.45	21.41	2
	1	24	23.13	23.29	23.28	0	22.09	22.25	22.24	1	21.21	21.47	21.37	2
	12	0	22.20	22.36	22.35	1	21.16	21.32	21.31	2	20.35	20.43	20.49	3
	12	6	22.05	22.21	22.20	1	21.01	21.17	21.16	2	20.20	20.52	20.40	3
	12	13	21.99	22.15	22.14	1	20.95	21.11	21.10	2	20.14	20.43	20.34	3
	25	0	21.87	22.03	22.02	1	20.83	20.99	20.98	2	20.21	20.32	20.33	3

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)
X	23017	699.7	-13.06	32.719	17.51	56.35	H
	23095	707.5	-13.09	32.736	17.50	56.18	
	23173	715.3	-12.92	32.591	17.52	56.51	
	23017	699.7	-16.08	32.69	14.46	27.93	V
	23095	707.5	-16.20	32.81	14.46	27.93	
	23173	715.3	-16.07	32.74	14.52	28.31	
Channel Bandwidth: 1.4 MHz / 16QAM							
X	23017	699.7	-14.05	32.719	16.52	44.86	H
	23095	707.5	-14.03	32.736	16.56	45.25	
	23173	715.3	-13.90	32.591	16.54	45.09	
	23017	699.7	-17.00	32.69	13.54	22.59	V
	23095	707.5	-17.12	32.81	13.54	22.59	
	23173	715.3	-17.08	32.74	13.51	22.44	
Channel Bandwidth: 1.4 MHz / 64QAM							
X	23017	699.7	-14.85	32.719	15.72	37.28	H
	23095	707.5	-14.97	32.736	15.62	36.45	
	23173	715.3	-14.65	32.591	15.79	37.92	
	23017	699.7	-17.96	32.69	12.58	18.13	V
	23095	707.5	-17.86	32.81	12.80	19.07	
	23173	715.3	-17.82	32.74	12.78	18.95	

LTE Band 12							
Channel Bandwidth: 3 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	23025	700.5	-13.02	32.719	17.55	56.87	H
	23095	707.5	-13.04	32.736	17.55	56.83	
	23165	714.5	-12.91	32.591	17.53	56.64	
	23025	700.5	-16.00	32.69	14.54	28.44	V
	23095	707.5	-16.20	32.81	14.46	27.93	
	23165	714.5	-16.08	32.74	14.51	28.25	
Channel Bandwidth: 3 MHz / 16QAM							
X	23025	700.5	-14.00	32.719	16.57	45.38	H
	23095	707.5	-14.12	32.736	16.47	44.32	
	23165	714.5	-13.94	32.591	16.50	44.68	
	23025	700.5	-17.12	32.69	13.42	21.98	V
	23095	707.5	-17.15	32.81	13.51	22.44	
	23165	714.5	-17.08	32.74	13.51	22.44	
Channel Bandwidth: 3 MHz / 64QAM							
X	23025	700.5	-14.66	32.719	15.91	39.00	H
	23095	707.5	-14.86	32.736	15.73	37.39	
	23165	714.5	-14.86	32.591	15.58	36.16	
	23025	700.5	-18.24	32.69	12.30	16.98	V
	23095	707.5	-18.53	32.81	12.13	16.35	
	23165	714.5	-18.26	32.74	12.33	17.09	

LTE Band 12							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	23035	701.5	-13.02	32.719	17.55	56.87	H
	23095	707.5	-13.03	32.736	17.56	56.96	
	23155	713.5	-12.92	32.591	17.52	56.51	
	23035	701.5	-16.05	32.69	14.49	28.12	V
	23095	707.5	-16.12	32.81	14.54	28.44	
	23155	713.5	-16.11	32.74	14.48	28.05	
Channel Bandwidth: 5 MHz / 16QAM							
X	23035	701.5	-13.99	32.719	16.58	45.49	H
	23095	707.5	-14.11	32.736	16.48	44.42	
	23155	713.5	-13.90	32.591	16.54	45.09	
	23035	701.5	-17.02	32.69	13.52	22.49	V
	23095	707.5	-17.13	32.81	13.53	22.54	
	23155	713.5	-17.10	32.74	13.49	22.34	
Channel Bandwidth: 5 MHz / 64QAM							
X	23035	701.5	-14.70	32.719	15.87	38.67	H
	23095	707.5	-14.90	32.736	15.69	37.08	
	23155	713.5	-14.69	32.591	15.75	37.61	
	23035	701.5	-17.89	32.69	12.65	18.41	V
	23095	707.5	-17.96	32.81	12.70	18.63	
	23155	713.5	-17.86	32.74	12.73	18.75	

LTE Band 12							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	23060	704.0	-13.02	32.727	17.56	56.98	H
	23095	707.5	-12.98	32.739	17.61	57.66	
	23130	711.0	-13.00	32.728	17.58	57.25	
	23060	704.0	-16.08	32.75	14.52	28.31	V
	23095	707.5	-16.13	32.81	14.53	28.38	
	23130	711.0	-16.11	32.84	14.58	28.71	
Channel Bandwidth: 10 MHz / 16QAM							
X	23060	704.0	-14.02	32.727	16.56	45.26	H
	23095	707.5	-14.08	32.739	16.51	44.76	
	23130	711.0	-13.95	32.728	16.63	46.00	
	23060	704.0	-17.21	32.75	13.39	21.83	V
	23095	707.5	-17.16	32.81	13.50	22.39	
	23130	711.0	-17.20	32.84	13.49	22.34	
Channel Bandwidth: 10 MHz / 64QAM							
X	23060	704.0	-15.21	32.727	15.37	34.41	H
	23095	707.5	-15.88	32.739	14.71	29.58	
	23130	711.0	-15.48	32.728	15.10	32.34	
	23060	704.0	-17.87	32.75	12.73	18.75	V
	23095	707.5	-17.92	32.81	12.74	18.79	
	23130	711.0	-17.78	32.84	12.91	19.54	

LTE Band 13							
Channel Bandwidth: 5 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	23205	779.5	-13.09	32.771	17.53	56.64	H
	23230	782.0	-13.07	32.741	17.52	56.51	
	23255	784.5	-13.15	32.854	17.55	56.94	
	23205	779.5	-15.76	32.5	14.59	28.77	V
	23230	782.0	-15.82	32.52	14.55	28.51	
	23255	784.5	-15.96	32.62	14.51	28.25	
Channel Bandwidth: 5 MHz / 16QAM							
X	23205	779.5	-14.12	32.771	16.50	44.68	H
	23230	782.0	-14.08	32.741	16.51	44.78	
	23255	784.5	-14.16	32.854	16.54	45.12	
	23205	779.5	-16.82	32.5	13.53	22.54	V
	23230	782.0	-16.83	32.52	13.54	22.59	
	23255	784.5	-16.98	32.62	13.49	22.34	
Channel Bandwidth: 5 MHz / 64QAM							
X	23205	779.5	-15.23	32.771	15.39	34.60	H
	23230	782.0	-15.02	32.741	15.57	36.07	
	23255	784.5	-14.86	32.854	15.85	38.43	
	23205	779.5	-17.52	32.5	12.83	19.19	V
	23230	782.0	-17.62	32.52	12.75	18.84	
	23255	784.5	-17.95	32.62	12.52	17.86	

LTE Band 13							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	23230	782.0	-13.00	32.737	17.59	57.37	H
	23230	782.0	-15.76	32.52	14.61	28.91	V
Channel Bandwidth: 10 MHz / 16QAM							
X	23230	782.0	-13.96	32.737	16.63	45.99	H
	23230	782.0	-16.72	32.52	13.65	23.17	V
Channel Bandwidth: 10 MHz / 64QAM							
X	23230	782.0	-14.62	32.737	15.97	39.51	H
	23230	782.0	-17.56	32.52	12.81	19.10	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)
X	23755	706.5	-7.50	32.719	23.07	202.72	H
	23790	710.0	-7.53	32.736	23.06	202.12	
	23825	713.5	-7.41	32.591	23.03	200.96	
	23755	706.5	-12.49	32.69	18.05	63.83	V
	23790	710.0	-12.56	32.81	18.10	64.57	
	23825	713.5	-12.56	32.74	18.03	63.53	
Channel Bandwidth: 5 MHz / 16QAM							
X	23755	706.5	-13.03	32.719	17.54	56.74	H
	23790	710.0	-13.08	32.736	17.51	56.31	
	23825	713.5	-12.86	32.591	17.58	57.29	
	23755	706.5	-16.00	32.69	14.54	28.44	V
	23790	710.0	-16.08	32.81	14.58	28.71	
	23825	713.5	-16.07	32.74	14.52	28.31	
Channel Bandwidth: 5 MHz / 64QAM							
X	23755	706.5	-13.98	32.719	16.59	45.59	H
	23790	710.0	-13.85	32.736	16.74	47.16	
	23825	713.5	-13.65	32.591	16.79	47.76	
	23755	706.5	-16.75	32.69	13.79	23.93	V
	23790	710.0	-16.88	32.81	13.78	23.88	
	23825	713.5	-16.69	32.74	13.90	24.55	

LTE Band 17							
Channel Bandwidth: 10 MHz / QPSK							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (mW)	Polarization (H/V)
X	23780	709.0	-7.53	32.727	23.05	201.70	H
	23790	710.0	-7.44	32.739	23.15	206.49	
	23800	711.0	-7.56	32.728	23.02	200.35	
	23780	709.0	-12.58	32.75	18.02	63.39	V
	23790	710.0	-12.52	32.81	18.14	65.16	
	23800	711.0	-12.53	32.84	18.16	65.46	
Channel Bandwidth: 10 MHz / 16QAM							
X	23780	709.0	-13.09	32.727	17.49	56.07	H
	23790	710.0	-13.07	32.739	17.52	56.48	
	23800	711.0	-13.06	32.728	17.52	56.47	
	23780	709.0	-16.08	32.75	14.52	28.31	V
	23790	710.0	-16.16	32.81	14.50	28.18	
	23800	711.0	-16.20	32.84	14.49	28.12	
Channel Bandwidth: 10 MHz / 64QAM							
X	23780	709.0	-13.87	32.727	16.71	46.90	H
	23790	710.0	-13.77	32.739	16.82	48.08	
	23800	711.0	-13.96	32.728	16.62	45.91	
	23780	709.0	-16.86	32.75	13.74	23.68	V
	23790	710.0	-16.95	32.81	13.71	23.52	
	23800	711.0	-16.86	32.84	13.83	24.17	

EIRP Power (dBm)

WCDMA							
Plane	Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (mW)	Polarization (H/V)
X	1312	1712.4	-20.43	42.49	22.06	160.51	H
	1413	1732.6	-20.24	42.33	22.09	161.70	
	1513	1752.6	-20.07	42.10	22.03	159.59	
	1312	1712.4	-25.93	42.99	17.06	50.82	V
	1413	1732.6	-25.63	42.74	17.11	51.40	
	1513	1752.6	-25.20	42.21	17.01	50.23	

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	-20.42	42.49	22.07	160.88	H
	20175	1732.5	-20.31	42.33	22.02	159.11	
	20393	1754.3	-20.09	42.10	22.01	158.85	
	19957	1710.7	-25.89	42.99	17.10	51.29	V
	20175	1732.5	-25.70	42.74	17.04	50.58	
	20393	1754.3	-25.12	42.21	17.09	51.17	
Channel Bandwidth: 1.4 MHz / 16QAM							
X	19957	1710.7	-21.48	42.49	21.01	126.04	H
	20175	1732.5	-21.30	42.33	21.03	126.68	
	20393	1754.3	-21.06	42.10	21.04	127.06	
	19957	1710.7	-26.93	42.99	16.06	40.36	V
	20175	1732.5	-26.64	42.74	16.10	40.74	
	20393	1754.3	-26.14	42.21	16.07	40.46	
Channel Bandwidth: 1.4 MHz / 64QAM							
X	19957	1710.7	-22.14	42.49	20.35	108.27	H
	20175	1732.5	-21.98	42.33	20.35	108.32	
	20393	1754.3	-21.87	42.10	20.23	105.44	
	19957	1710.7	-27.24	42.99	15.75	37.58	V
	20175	1732.5	-27.62	42.74	15.12	32.51	
	20393	1754.3	-27.14	42.21	15.07	32.14	

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	-20.42	42.49	22.07	160.88	H
	20175	1732.5	-20.23	42.33	22.10	162.07	
	20385	1753.5	-20.08	42.10	22.02	159.22	
	19965	1711.5	-25.92	42.99	17.07	50.93	V
	20175	1732.5	-25.60	42.74	17.14	51.76	
	20385	1753.5	-25.21	42.21	17.00	50.12	
Channel Bandwidth: 3 MHz / 16QAM							
X	19965	1711.5	-21.42	42.49	21.07	127.79	H
	20175	1732.5	-21.30	42.33	21.03	126.68	
	20385	1753.5	-21.07	42.10	21.03	126.77	
	19965	1711.5	-26.90	42.99	16.09	40.64	V
	20175	1732.5	-26.64	42.74	16.10	40.74	
	20385	1753.5	-26.20	42.21	16.01	39.90	
Channel Bandwidth: 3 MHz / 64QAM							
X	19965	1711.5	-22.12	42.49	20.37	108.77	H
	20175	1732.5	-21.89	42.33	20.44	110.59	
	20385	1753.5	-21.78	42.10	20.32	107.65	
	19965	1711.5	-27.21	42.99	15.78	37.84	V
	20175	1732.5	-27.51	42.74	15.23	33.34	
	20385	1753.5	-27.01	42.21	15.20	33.11	

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	-20.49	42.49	22.00	158.31	H
	20175	1732.5	-20.28	42.33	22.05	160.21	
	20375	1752.5	-20.06	42.10	22.04	159.96	
	19975	1712.5	-25.97	42.99	17.02	50.35	V
	20175	1732.5	-25.64	42.74	17.10	51.29	
	20375	1752.5	-25.18	42.21	17.03	50.47	
Channel Bandwidth: 5 MHz / 16QAM							
X	19975	1712.5	-21.42	42.49	21.07	127.79	H
	20175	1732.5	-21.28	42.33	21.05	127.26	
	20375	1752.5	-21.05	42.10	21.05	127.35	
	19975	1712.5	-26.87	42.99	16.12	40.93	V
	20175	1732.5	-26.68	42.74	16.06	40.36	
	20375	1752.5	-26.12	42.21	16.09	40.64	
Channel Bandwidth: 5 MHz / 64QAM							
X	19975	1712.5	-22.36	42.49	20.13	102.92	H
	20175	1732.5	-21.96	42.33	20.37	108.82	
	20375	1752.5	-21.81	42.10	20.29	106.91	
	19975	1712.5	-27.21	42.99	15.78	37.84	V
	20175	1732.5	-27.26	42.74	15.48	35.32	
	20375	1752.5	-26.95	42.21	15.26	33.57	

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	-20.46	42.49	22.03	159.40	H
	20175	1732.5	-20.30	42.33	22.03	159.48	
	20350	1750.0	-20.04	42.10	22.06	160.69	
	20000	1715.0	-25.93	42.99	17.06	50.82	V
	20175	1732.5	-25.70	42.74	17.04	50.58	
	20350	1750.0	-25.16	42.21	17.05	50.70	
Channel Bandwidth: 10 MHz / 16QAM							
X	20000	1715.0	-21.46	42.49	21.03	126.62	H
	20175	1732.5	-21.32	42.33	21.01	126.10	
	20350	1750.0	-21.07	42.10	21.03	126.77	
	20000	1715.0	-26.89	42.99	16.10	40.74	V
	20175	1732.5	-26.67	42.74	16.07	40.46	
	20350	1750.0	-26.13	42.21	16.08	40.55	
Channel Bandwidth: 10 MHz / 64QAM							
X	20000	1715.0	-22.36	42.49	20.13	102.92	H
	20175	1732.5	-22.01	42.33	20.32	107.57	
	20350	1750.0	-21.85	42.10	20.25	105.93	
	20000	1715.0	-27.22	42.99	15.77	37.76	V
	20175	1732.5	-27.14	42.74	15.60	36.31	
	20350	1750.0	-26.85	42.21	15.36	34.36	

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	-20.46	42.49	22.03	159.40	H
	20175	1732.5	-20.26	42.33	22.07	160.95	
	20325	1747.5	-20.04	42.10	22.06	160.69	
	20025	1717.5	-25.96	42.99	17.03	50.47	V
	20175	1732.5	-25.61	42.74	17.13	51.64	
	20325	1747.5	-25.20	42.21	17.01	50.23	
Channel Bandwidth: 15 MHz / 16QAM							
X	20025	1717.5	-21.43	42.49	21.06	127.50	H
	20175	1732.5	-21.32	42.33	21.01	126.10	
	20325	1747.5	-21.00	42.10	21.10	128.82	
	20025	1717.5	-26.93	42.99	16.06	40.36	V
	20175	1732.5	-26.74	42.74	16.00	39.81	
	20325	1747.5	-26.18	42.21	16.03	40.09	
Channel Bandwidth: 15 MHz / 64QAM							
X	20025	1717.5	-21.96	42.49	20.53	112.85	H
	20175	1732.5	-22.12	42.33	20.21	104.88	
	20325	1747.5	-21.88	42.10	20.22	105.20	
	20025	1717.5	-27.15	42.99	15.84	38.37	V
	20175	1732.5	-27.26	42.74	15.48	35.32	
	20325	1747.5	-27.03	42.21	15.18	32.95	

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	-20.46	42.49	22.03	159.40	H
	20175	1732.5	-20.13	42.33	22.20	165.84	
	20300	1745.0	-20.06	42.10	22.04	159.96	
	20050	1720.0	-25.97	42.99	17.02	50.35	V
	20175	1732.5	-25.62	42.74	17.12	51.52	
	20300	1745.0	-25.04	42.21	17.17	52.12	
Channel Bandwidth: 20 MHz / 16QAM							
X	20050	1720.0	-21.42	42.49	21.07	127.79	H
	20175	1732.5	-21.24	42.33	21.09	128.44	
	20300	1745.0	-20.94	42.10	21.16	130.62	
	20050	1720.0	-26.97	42.99	16.02	39.99	V
	20175	1732.5	-26.69	42.74	16.05	40.27	
	20300	1745.0	-26.05	42.21	16.16	41.30	
Channel Bandwidth: 20 MHz / 64QAM							
X	20050	1720.0	-22.33	42.49	20.16	103.63	H
	20175	1732.5	-21.95	42.33	20.38	109.07	
	20300	1745.0	-21.54	42.10	20.56	113.76	
	20050	1720.0	-27.25	42.99	15.74	37.50	V
	20175	1732.5	-27.41	42.74	15.33	34.12	
	20300	1745.0	-27.01	42.21	15.20	33.11	

4.2 Frequency Stability Measurement

4.2.1 Limits of Frequency Stability Measurement

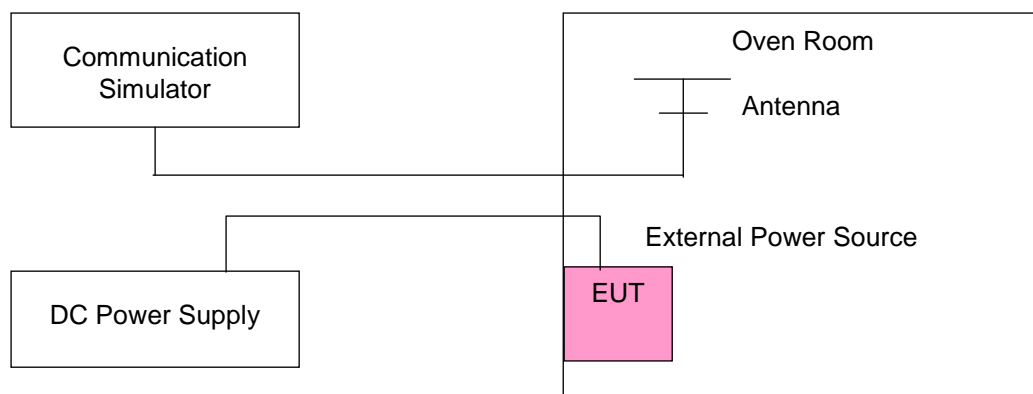
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

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)	
3.5	1712.400002	0.001	1752.600002	0.001	2.5
3.85	1712.400001	0.001	1752.600001	0.001	2.5
4.3	1712.400002	0.001	1752.600004	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.5 Vdc to 4.3 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	1712.400002	0.001	1752.600004	0.002	2.5
-20	1712.400002	0.001	1752.600001	0.001	2.5
-10	1712.400003	0.002	1752.600001	0.001	2.5
0	1712.400002	0.001	1752.600003	0.002	2.5
10	1712.400003	0.002	1752.600002	0.001	2.5
20	1712.399997	-0.002	1752.599998	-0.001	2.5
30	1712.399996	-0.002	1752.599998	-0.001	2.5
40	1712.399997	-0.002	1752.599998	-0.001	2.5
50	1712.399999	-0.001	1752.599997	-0.002	2.5
55	1712.399996	-0.002	1752.599996	-0.002	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)	
3.5	1710.700001	0.001	1754.300002	0.001	2.5
3.85	1710.700001	0.001	1754.300002	0.001	2.5
4.3	1710.700003	0.002	1754.300003	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.5 Vdc to 4.3 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	1754.300004	0.002	2.5
-20	1710.700003	0.002	1754.300003	0.002	2.5
-10	1710.700002	0.001	1754.300003	0.002	2.5
0	1710.700004	0.002	1754.300002	0.001	2.5
10	1710.700003	0.002	1754.300004	0.002	2.5
20	1710.699998	-0.001	1754.299999	-0.001	2.5
30	1710.699999	-0.001	1754.299998	-0.001	2.5
40	1710.699999	-0.001	1754.299997	-0.001	2.5
50	1710.699999	-0.001	1754.299997	-0.002	2.5
55	1710.699998	-0.001	1754.299997	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 3 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.5	1711.500003	0.002	1753.500004	0.002	2.5
3.85	1711.500002	0.001	1753.500002	0.001	2.5
4.3	1711.500004	0.002	1753.500002	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.5 Vdc to 4.3 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	1753.500004	0.002	2.5
-20	1711.500001	0.001	1753.500004	0.002	2.5
-10	1711.500003	0.002	1753.500002	0.001	2.5
0	1711.500004	0.002	1753.500002	0.001	2.5
10	1711.500001	0.001	1753.500003	0.002	2.5
20	1711.499999	-0.001	1753.499996	-0.002	2.5
30	1711.499996	-0.002	1753.499997	-0.002	2.5
40	1711.499998	-0.001	1753.499999	-0.001	2.5
50	1711.499999	-0.001	1753.499997	-0.002	2.5
55	1711.499997	-0.002	1753.499999	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 5 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.5	1712.500003	0.002	1752.500001	0.001	2.5
3.85	1712.500004	0.002	1752.500004	0.002	2.5
4.3	1712.500004	0.002	1752.500002	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.5 Vdc to 4.3 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	1712.500004	0.002	1752.500004	0.002	2.5
-20	1712.500002	0.001	1752.500001	0.001	2.5
-10	1712.500003	0.002	1752.500003	0.002	2.5
0	1712.500001	0.001	1752.500002	0.001	2.5
10	1712.500004	0.002	1752.500001	0.001	2.5
20	1712.499997	-0.002	1752.499997	-0.002	2.5
30	1712.499999	-0.001	1752.499998	-0.001	2.5
40	1712.499997	-0.002	1752.499999	-0.001	2.5
50	1712.499999	-0.001	1752.499998	-0.001	2.5
55	1712.499999	-0.001	1752.499999	-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)	
3.5	1715.000004	0.002	1750.000004	0.002	2.5
3.85	1715.000003	0.001	1750.000002	0.001	2.5
4.3	1715.000003	0.001	1750.000002	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.5 Vdc to 4.3 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1715.000002	0.001	1750.000002	0.001	2.5
-20	1715.000002	0.001	1750.000002	0.001	2.5
-10	1715.000004	0.002	1750.000004	0.002	2.5
0	1715.000002	0.001	1750.000001	0.001	2.5
10	1715.000004	0.002	1750.000004	0.002	2.5
20	1714.999999	-0.001	1749.999997	-0.001	2.5
30	1714.999999	-0.001	1749.999997	-0.002	2.5
40	1714.999997	-0.002	1749.999998	-0.001	2.5
50	1714.999996	-0.002	1749.999996	-0.002	2.5
55	1714.999997	-0.002	1749.999996	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.5	1717.500002	0.001	1747.500002	0.001	2.5
3.85	1717.500003	0.002	1747.500004	0.002	2.5
4.3	1717.500003	0.002	1747.500004	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.5 Vdc to 4.3 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 15 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	1717.500003	0.002	1747.500004	0.002	2.5
-20	1717.500003	0.002	1747.500002	0.001	2.5
-10	1717.500003	0.002	1747.500002	0.001	2.5
0	1717.500002	0.001	1747.500004	0.002	2.5
10	1717.500002	0.001	1747.500003	0.002	2.5
20	1717.499999	-0.001	1747.499999	-0.001	2.5
30	1717.499997	-0.002	1747.499998	-0.001	2.5
40	1717.499998	-0.001	1747.499998	-0.001	2.5
50	1717.499998	-0.001	1747.499997	-0.002	2.5
55	1717.499997	-0.002	1747.499997	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 4				Limit (ppm)
	Channel Bandwidth: 20 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.5	1720.000003	0.002	1745.000003	0.001	2.5
3.85	1720.000001	0.001	1745.000002	0.001	2.5
4.3	1720.000003	0.002	1745.000002	0.001	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.5 Vdc to 4.3 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	1720.000002	0.001	1745.000002	0.001	2.5
-20	1720.000003	0.002	1745.000003	0.002	2.5
-10	1720.000003	0.001	1745.000004	0.002	2.5
0	1720.000004	0.002	1745.000002	0.001	2.5
10	1720.000003	0.002	1745.000002	0.001	2.5
20	1719.999997	-0.002	1744.999998	-0.001	2.5
30	1719.999999	-0.001	1744.999997	-0.002	2.5
40	1719.999998	-0.001	1744.999997	-0.002	2.5
50	1719.999996	-0.002	1744.999996	-0.002	2.5
55	1719.999996	-0.002	1744.999999	-0.001	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 1.4 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
3.5	699.700003	0.004	715.300001	0.002	2.5
3.85	699.700003	0.004	715.300002	0.003	2.5
4.3	699.700002	0.003	715.300002	0.003	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.5 Vdc to 4.3 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	699.700004	0.005	715.300002	0.002	2.5
-20	699.700002	0.002	715.300004	0.005	2.5
-10	699.700003	0.004	715.300003	0.004	2.5
0	699.700004	0.005	715.300003	0.004	2.5
10	699.700003	0.004	715.300002	0.002	2.5
20	699.699996	-0.006	715.299999	-0.002	2.5
30	699.699998	-0.003	715.299999	-0.002	2.5
40	699.699998	-0.003	715.299998	-0.003	2.5
50	699.699997	-0.005	715.299998	-0.003	2.5
55	699.699997	-0.004	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)	
3.5	700.500002	0.002	714.500002	0.002	2.5
3.85	700.500002	0.003	714.500003	0.004	2.5
4.3	700.500001	0.002	714.500003	0.004	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.5 Vdc to 4.3 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	700.500002	0.003	714.500002	0.002	2.5
-20	700.500003	0.004	714.500001	0.001	2.5
-10	700.500004	0.006	714.500004	0.005	2.5
0	700.500002	0.003	714.500003	0.004	2.5
10	700.500003	0.004	714.500004	0.006	2.5
20	700.499997	-0.004	714.499997	-0.004	2.5
30	700.499998	-0.003	714.499997	-0.004	2.5
40	700.499997	-0.005	714.499999	-0.002	2.5
50	700.499997	-0.005	714.499998	-0.003	2.5
55	700.499997	-0.004	714.499999	-0.002	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)	
3.5	701.500001	0.002	713.500004	0.005	2.5
3.85	701.500003	0.005	713.500003	0.004	2.5
4.3	701.500003	0.005	713.500001	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.5 Vdc to 4.3 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	0.005	713.500003	0.004	2.5
-20	701.500004	0.005	713.500003	0.005	2.5
-10	701.500003	0.004	713.500004	0.005	2.5
0	701.500002	0.003	713.500003	0.004	2.5
10	701.500003	0.004	713.500003	0.003	2.5
20	701.499996	-0.006	713.499998	-0.002	2.5
30	701.499996	-0.006	713.499998	-0.002	2.5
40	701.499997	-0.004	713.499999	-0.002	2.5
50	701.499998	-0.004	713.499998	-0.003	2.5
55	701.499997	-0.005	713.499998	-0.003	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)	
3.5	704.000004	0.005	711.000004	0.005	2.5
3.85	704.000003	0.004	711.000002	0.003	2.5
4.3	704.000001	0.001	711.000004	0.005	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.5 Vdc to 4.3 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 12				Limit (ppm)
	Channel Bandwidth: 10 MHz				
	Low Channel		High Channel		
	Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)	
-30	704.000001	0.002	711.000002	0.002	2.5
-20	704.000002	0.002	711.000002	0.003	2.5
-10	704.000004	0.005	711.000001	0.002	2.5
0	704.000003	0.005	711.000004	0.005	2.5
10	704.000004	0.005	711.000002	0.003	2.5
20	703.999997	-0.005	710.999998	-0.003	2.5
30	703.999998	-0.003	710.999998	-0.003	2.5
40	703.999998	-0.003	710.999998	-0.004	2.5
50	703.999996	-0.006	710.999999	-0.002	2.5
55	703.999997	-0.004	710.999998	-0.002	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)	
3.5	779.500002	0.003	784.500002	0.003	2.5
3.85	779.500002	0.002	784.500003	0.003	2.5
4.3	779.500004	0.005	784.500004	0.005	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.5 Vdc to 4.3 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	779.500001	0.002	784.500003	0.004	2.5
-20	779.500004	0.005	784.500001	0.001	2.5
-10	779.500003	0.003	784.500003	0.003	2.5
0	779.500003	0.004	784.500004	0.005	2.5
10	779.500002	0.002	784.500003	0.004	2.5
20	779.499998	-0.002	784.499997	-0.004	2.5
30	779.499998	-0.002	784.499996	-0.005	2.5
40	779.499997	-0.004	784.499998	-0.002	2.5
50	779.499997	-0.004	784.499998	-0.003	2.5
55	779.499997	-0.004	784.499999	-0.002	2.5

Frequency Error vs. Voltage

Voltage (Volts)	LTE Band 13		Limit (ppm)
	Channel Bandwidth: 10 MHz		
	Frequency (MHz)	Frequency Error (ppm)	
3.5	782.000004	0.004	2.5
3.85	782.000003	0.003	2.5
4.3	782.000002	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.5 Vdc to 4.3 Vdc.

Frequency Error vs. Temperature

Temp. (°C)	LTE Band 13		Limit (ppm)
	Channel Bandwidth: 10 MHz		
	Frequency (MHz)	Frequency Error (ppm)	
-30	782.000004	0.005	2.5
-20	782.000002	0.002	2.5
-10	782.000003	0.004	2.5
0	782.000002	0.003	2.5
10	782.000003	0.003	2.5
20	781.999997	-0.004	2.5
30	781.999998	-0.002	2.5
40	781.999996	-0.005	2.5
50	781.999998	-0.002	2.5
55	781.999999	-0.001	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)	
3.5	706.500004	0.005	713.500002	0.003	2.5
3.85	706.500003	0.005	713.500003	0.004	2.5
4.3	706.500002	0.003	713.500003	0.004	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.5 Vdc to 4.3 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	706.500002	0.003	713.500003	0.004	2.5
-20	706.500004	0.005	713.500002	0.003	2.5
-10	706.500002	0.003	713.500001	0.002	2.5
0	706.500002	0.002	713.500002	0.003	2.5
10	706.500003	0.005	713.500004	0.005	2.5
20	706.499998	-0.003	713.499998	-0.004	2.5
30	706.499997	-0.005	713.499999	-0.002	2.5
40	706.499996	-0.005	713.499998	-0.003	2.5
50	706.499997	-0.004	713.499996	-0.006	2.5
55	706.499998	-0.003	713.499996	-0.005	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)	
3.5	709.000003	0.004	711.000002	0.003	2.5
3.85	709.000004	0.006	711.000003	0.004	2.5
4.3	709.000003	0.004	711.000002	0.002	2.5

Note: The applicant defined the normal working voltage of the battery is from 3.5 Vdc to 4.3 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	709.000002	0.003	711.000004	0.005	2.5
-20	709.000002	0.002	711.000001	0.002	2.5
-10	709.000001	0.002	711.000002	0.002	2.5
0	709.000001	0.002	711.000003	0.005	2.5
10	709.000003	0.005	711.000001	0.002	2.5
20	708.999998	-0.003	710.999996	-0.006	2.5
30	708.999996	-0.006	710.999998	-0.002	2.5
40	708.999997	-0.004	710.999999	-0.002	2.5
50	708.999998	-0.004	710.999999	-0.001	2.5
55	708.999997	-0.004	710.999999	-0.002	2.5

4.3 Occupied Bandwidth Measurement

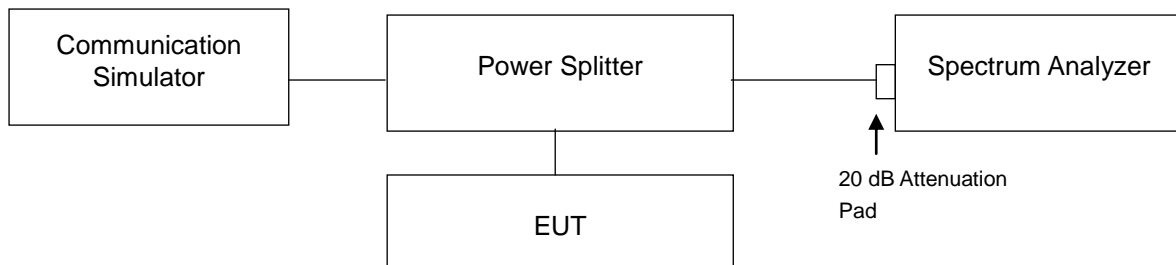
4.3.1 Limits of Occupied Bandwidth Measurement

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

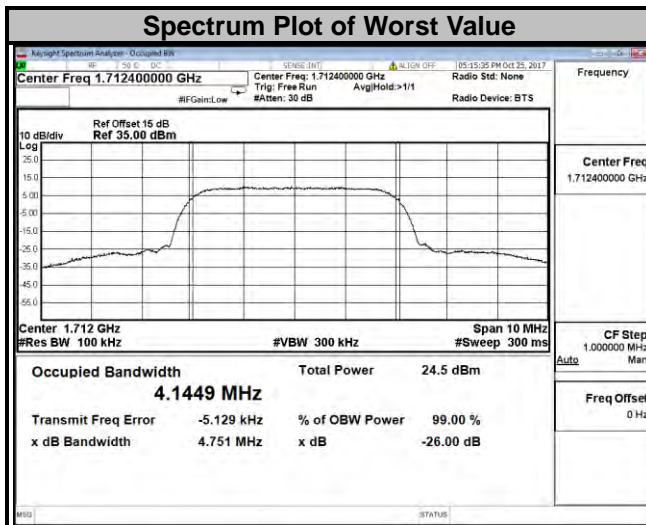
- The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

4.3.3 Test Setup

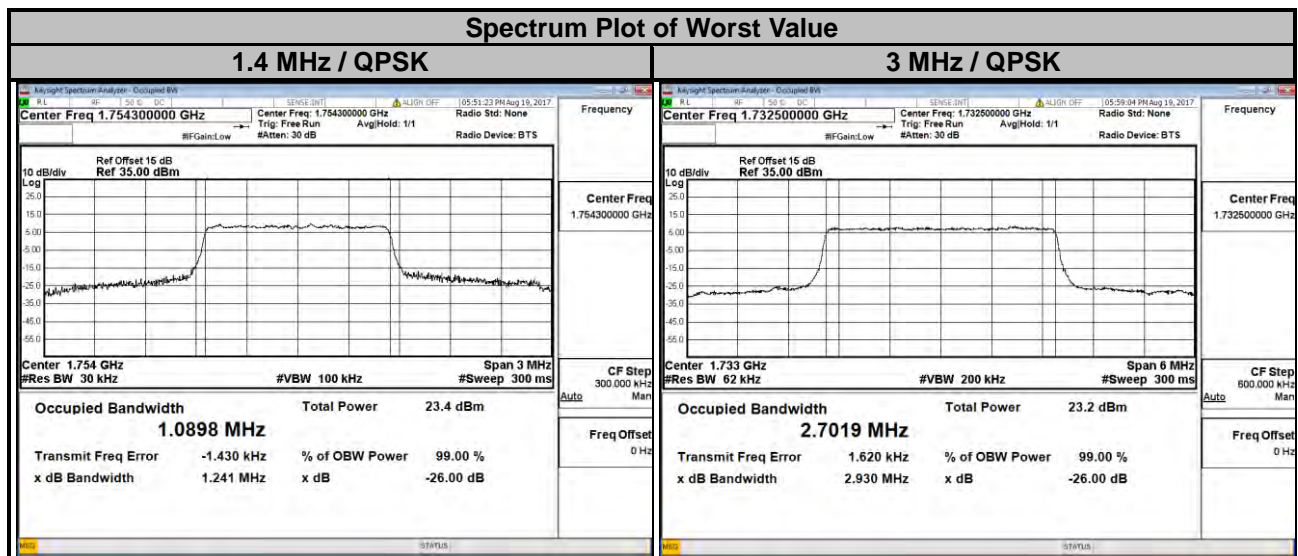


4.3.4 Test Result

WCDMA		
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)
1312	1712.4	4.1449
1413	1732.6	4.1350
1513	1752.6	4.1348



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	64QAM			QPSK	16QAM	64QAM
19957	1710.7	1.0860	1.0879	1.0881	19965	1711.5	2.7005	2.6965	2.6979
20175	1732.5	1.0875	1.0864	1.0890	20175	1732.5	2.7019	2.6989	2.6976
20393	1754.3	1.0898	1.0890	1.0892	20385	1753.5	2.7007	2.6999	2.6974

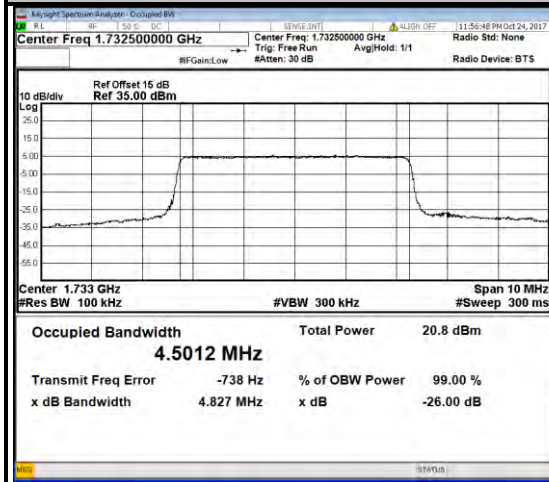


LTE Band 4

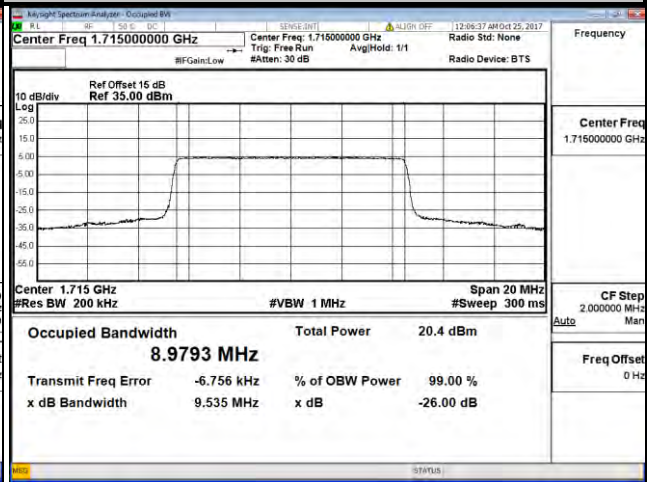
Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
19975	1712.5	4.4882	4.4862	4.4966	20000	1715.0	8.9736	8.9719	8.9793
20175	1732.5	4.4903	4.4944	4.5012	20175	1732.5	8.9704	8.9717	8.9721
20375	1752.5	4.4905	4.4913	4.5010	20350	1750.0	8.9726	8.9788	8.9760

Spectrum Plot of Worst Value

5 MHz / 64QAM



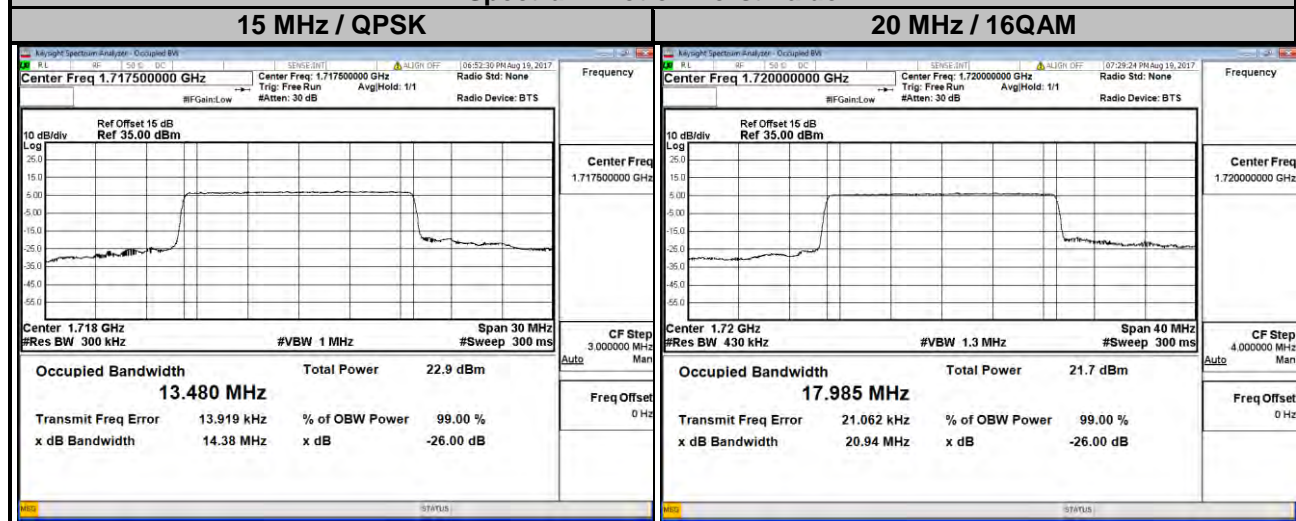
10 MHz / 64QAM



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	64QAM			QPSK	16QAM	64QAM
20025	1717.5	13.480	13.474	13.458	20050	1720.0	17.960	17.985	17.950
20175	1732.5	13.466	13.450	13.439	20175	1732.5	17.929	17.947	17.931
20325	1747.5	13.477	13.466	13.451	20300	1745.0	17.962	17.983	17.954

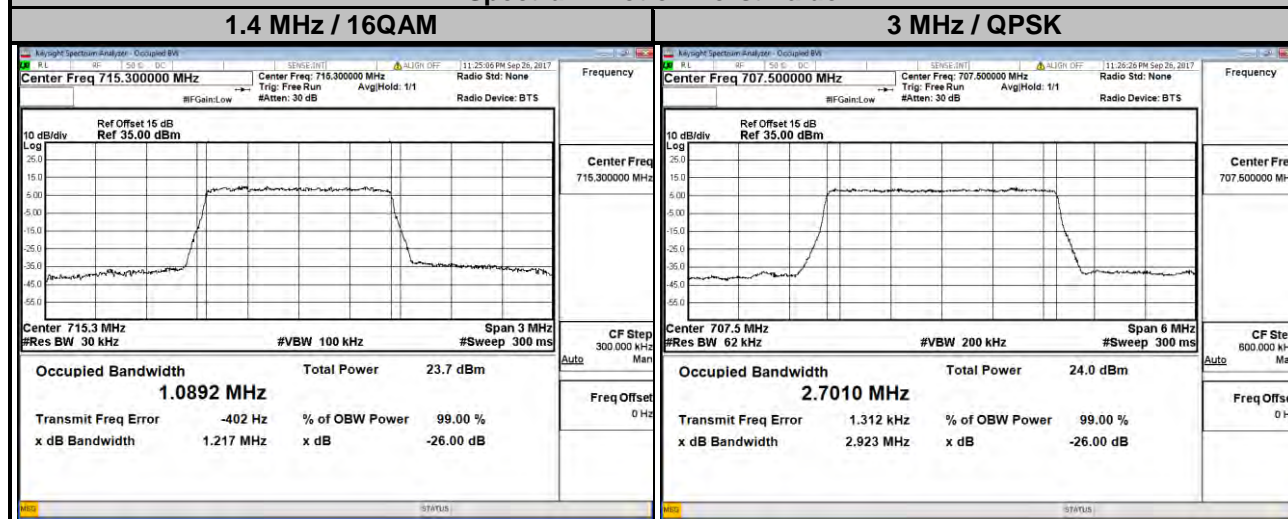
Spectrum Plot of Worst Value



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	64QAM			QPSK	16QAM	64QAM
23017	699.7	1.0864	1.0872	1.0858	23025	700.5	2.7002	2.6977	2.7024
23095	707.5	1.0865	1.0855	1.0869	23095	707.5	2.7010	2.6966	2.7008
23173	715.3	1.0864	1.0892	1.0872	23165	714.5	2.6984	2.6954	2.7008

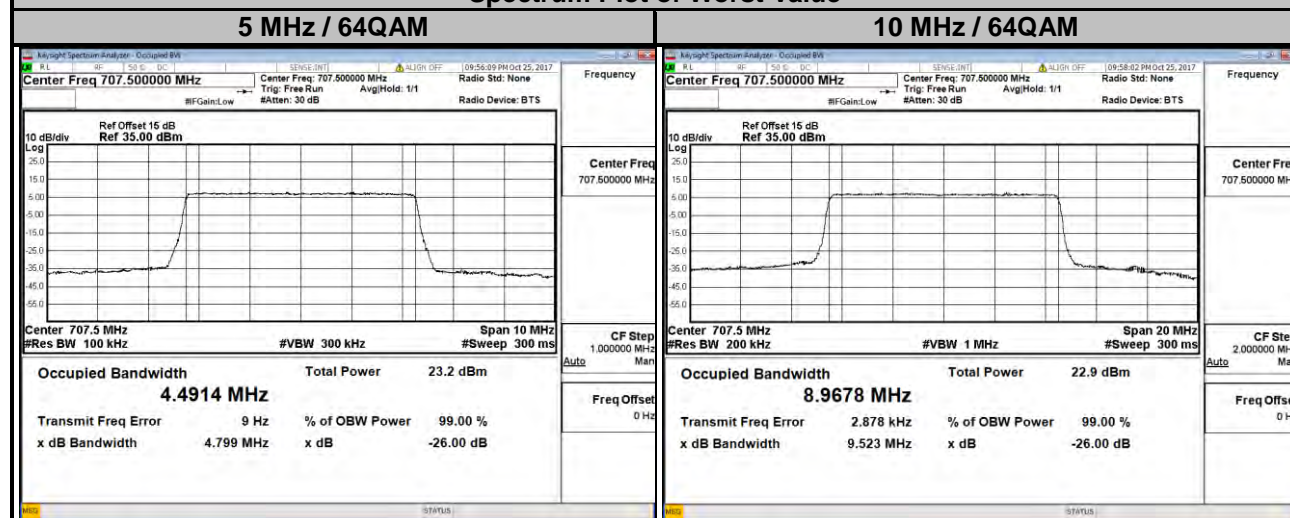
Spectrum Plot of Worst Value



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	64QAM			QPSK	16QAM	64QAM
23035	701.5	4.4884	4.4913	4.4888	23060	704.0	8.9626	8.9643	8.9567
23095	707.5	4.4889	4.4893	4.4914	23095	707.5	8.9641	8.9671	8.9678
23155	713.5	4.4830	4.4874	4.4854	23130	711.0	8.9582	8.9638	8.9564

Spectrum Plot of Worst Value

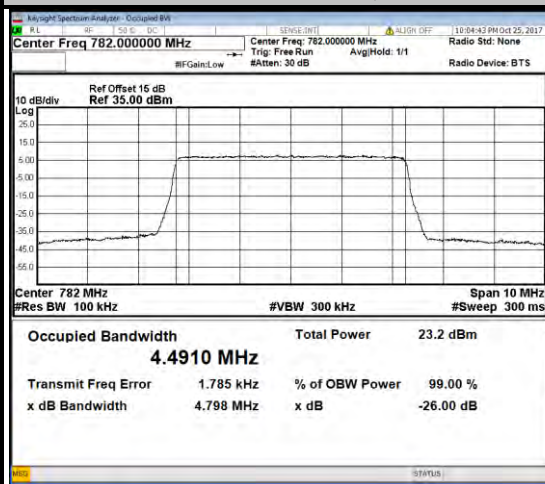


LTE Band 13

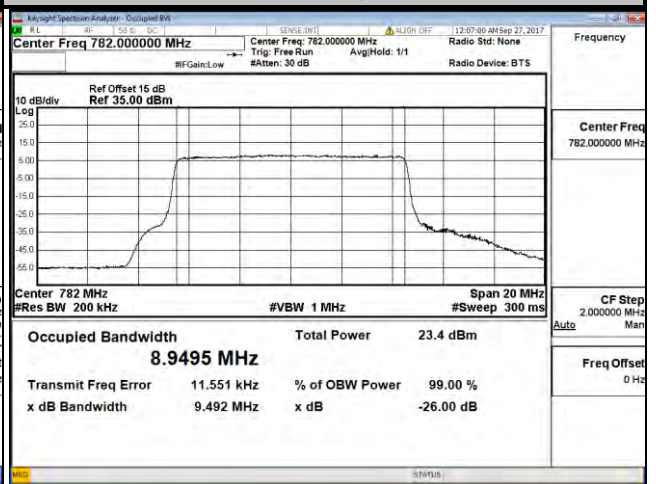
Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
23205	779.5	4.4826	4.4816	4.4861	23230	782.0	8.9495	8.9476	8.9450
23230	782.0	4.4835	4.4845	4.4910					
23255	784.5	4.4885	4.4896	4.4891					

Spectrum Plot of Worst Value

5 MHz / 64QAM



10 MHz / QPSK

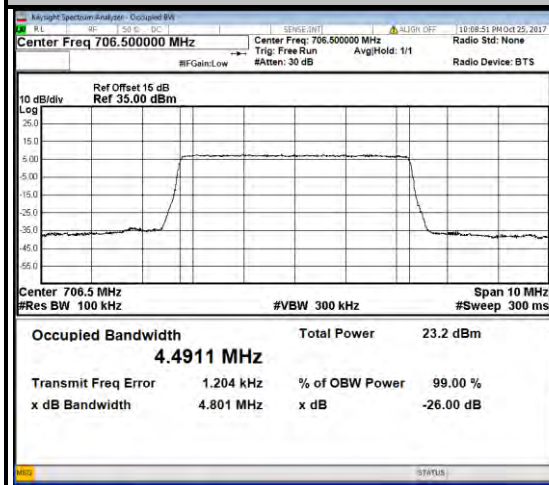


LTE Band 17

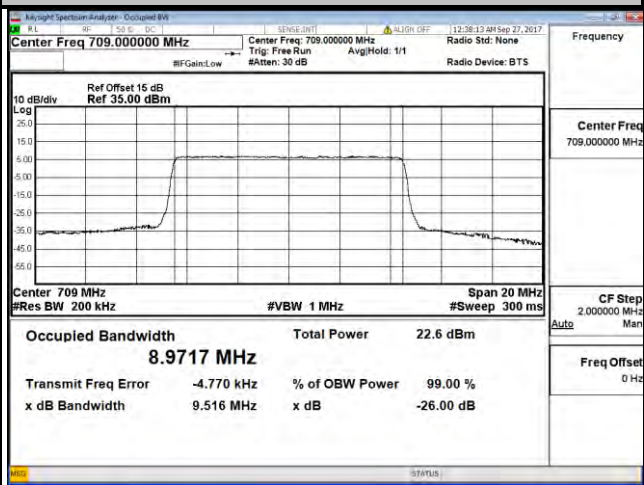
Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)			Channel	Frequency (MHz)	99 % Occupied Bandwidth (MHz)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
23755	706.5	4.4881	4.4881	4.4911	23780	709.0	8.9697	8.9717	8.9644
23790	710.0	4.4882	4.4900	4.4877	23790	710.0	8.9642	8.9647	8.9649
23825	713.5	4.4840	4.4834	4.4853	23800	711.0	8.9591	8.9616	8.9558

Spectrum Plot of Worst Value

5 MHz / 64QAM



10 MHz / 16QAM



4.4 Band Edge Measurement

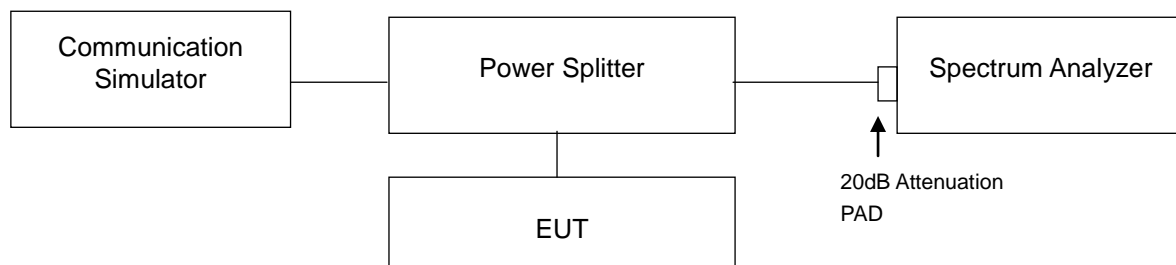
4.4.1 Limits of Band Edge Measurement

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

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

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

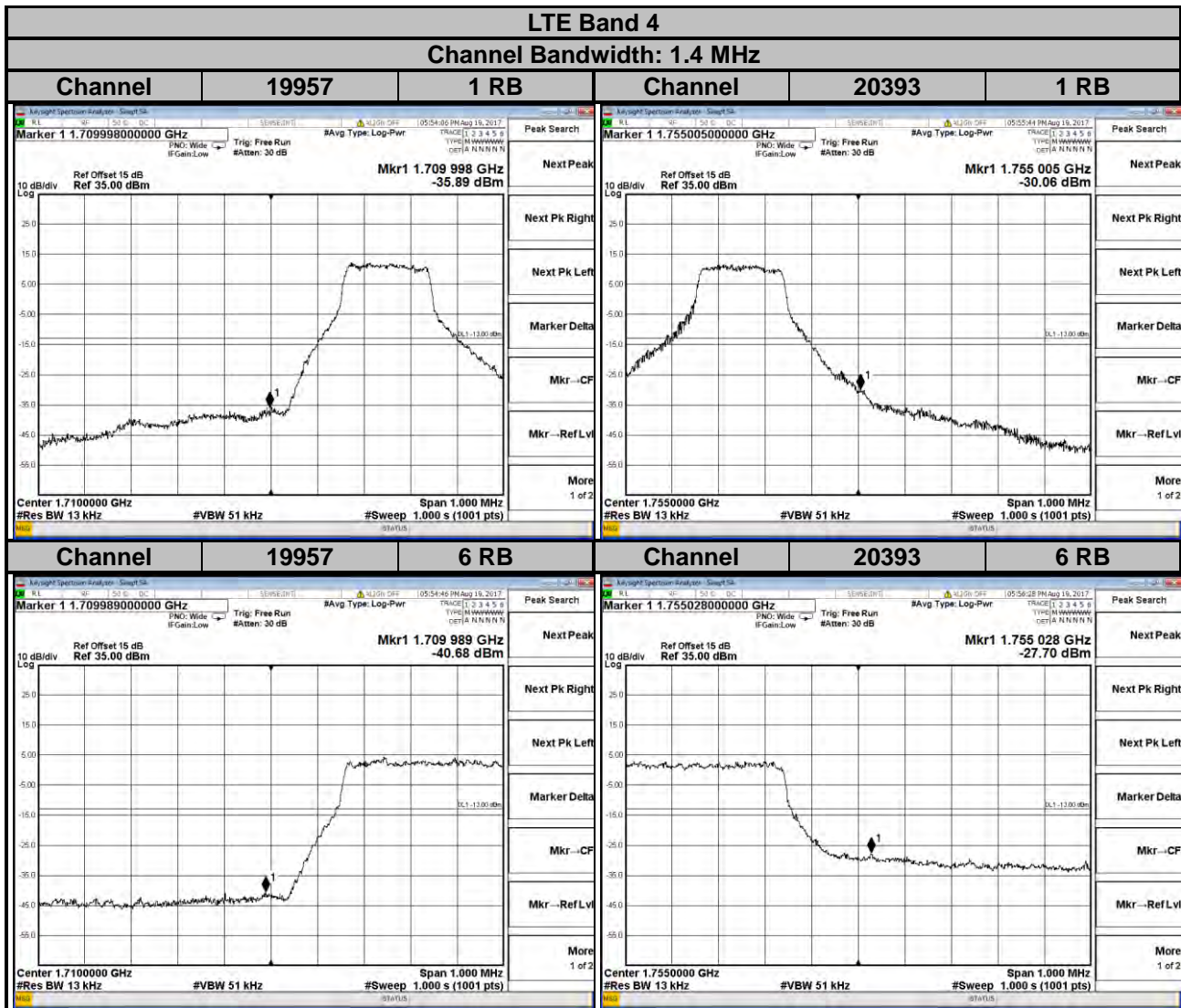
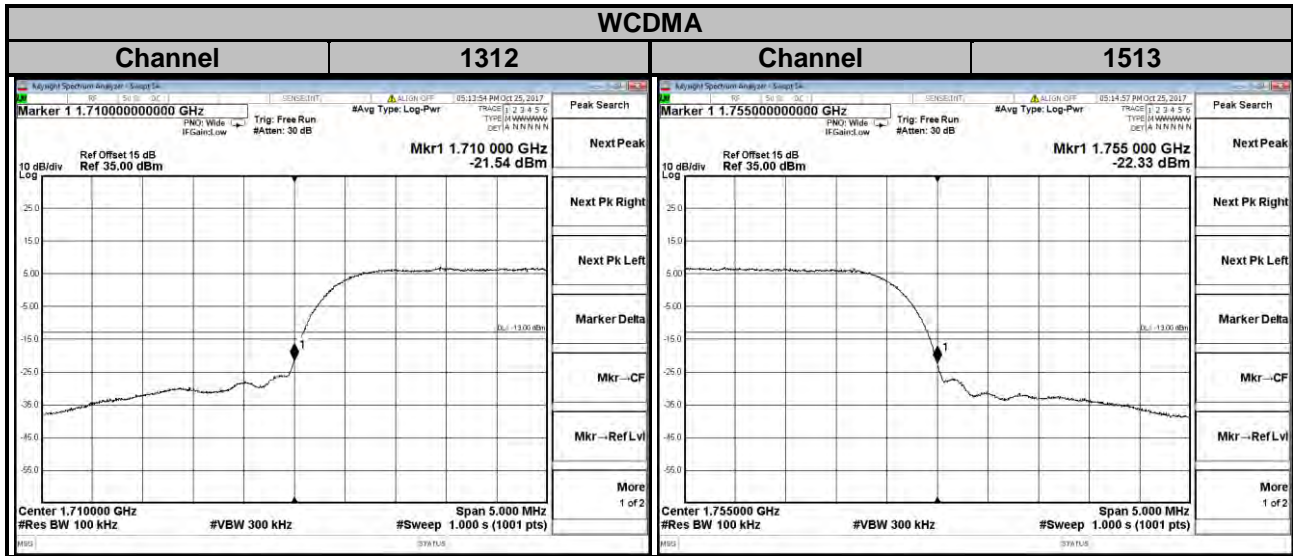
4.4.2 Test Setup

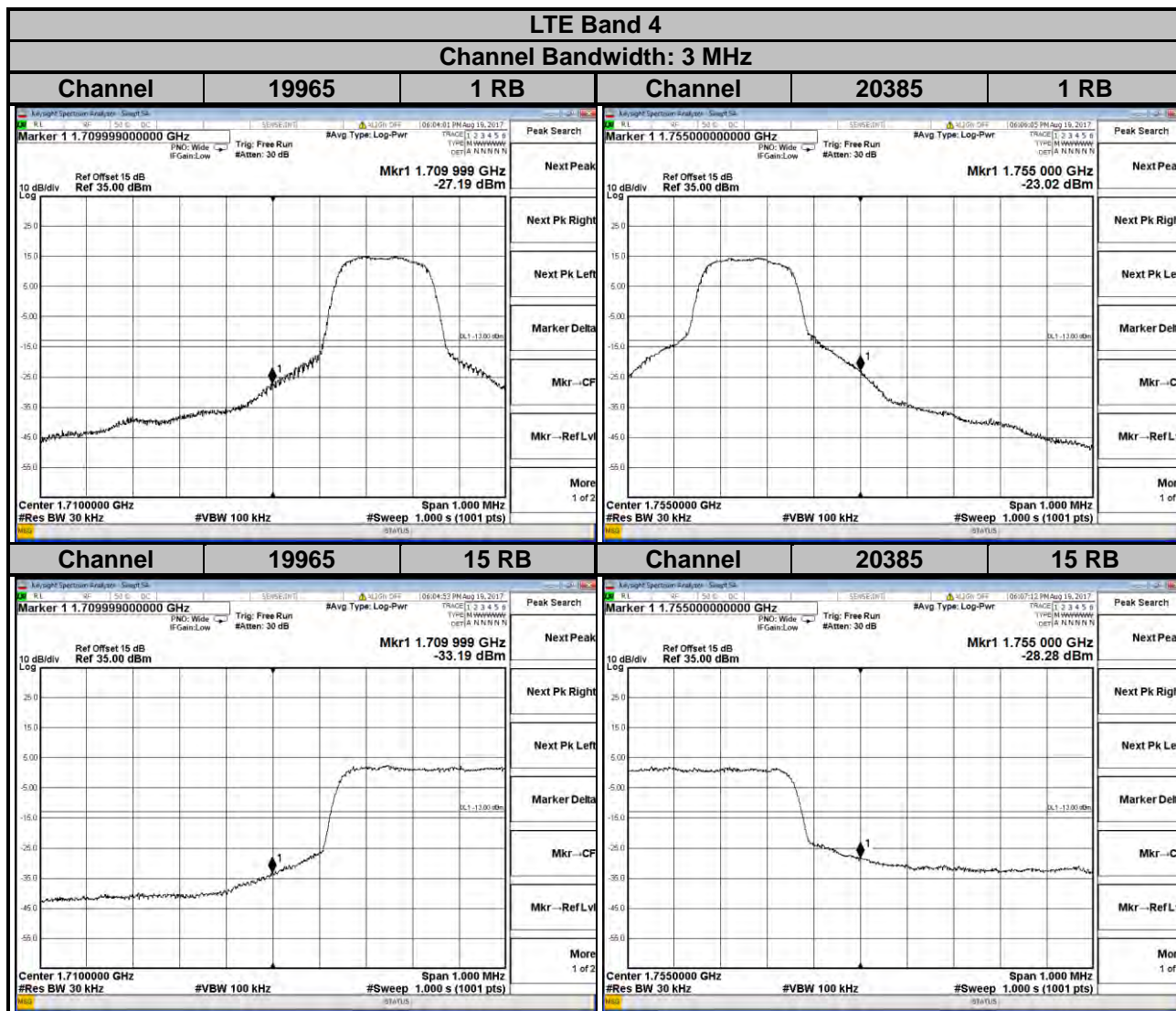


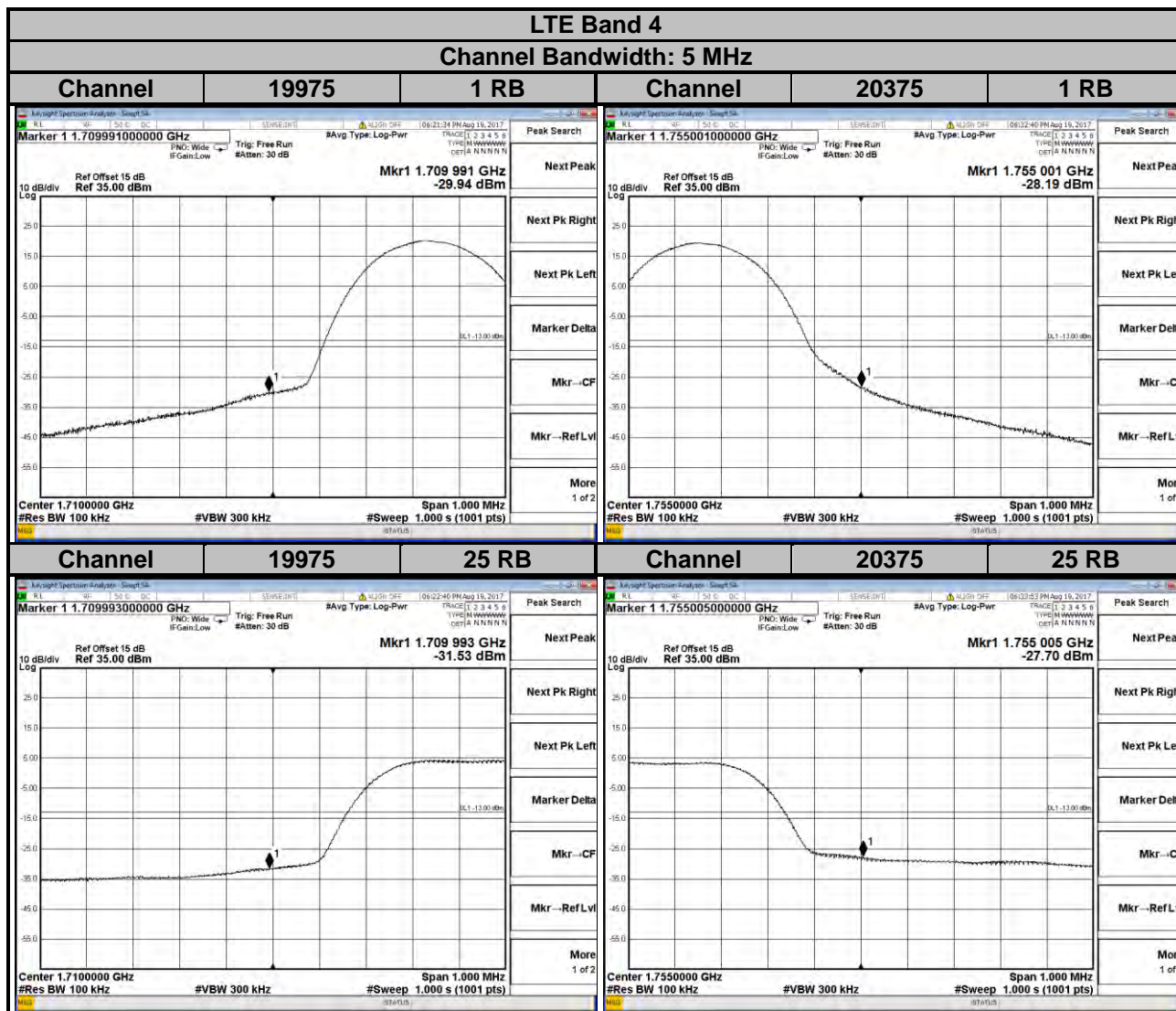
4.4.3 Test Procedures

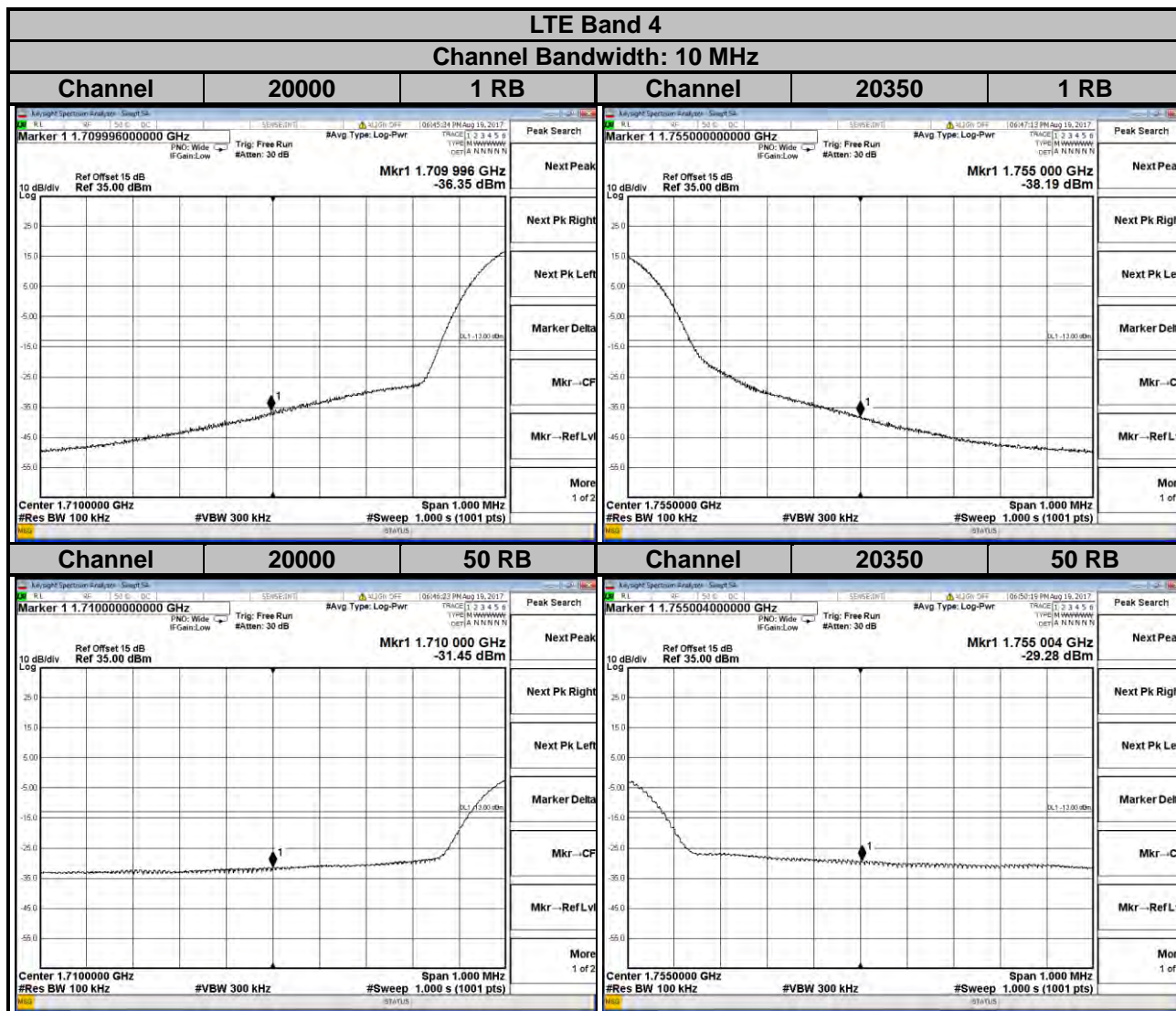
- All measurements were done at low and high operational frequency range.
- The center frequency of spectrum is the band edge frequency and span is 5 MHz. RB of the spectrum is 100 kHz and VB of the spectrum is 300 kHz (WCDMA).
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 13 kHz and VB of the spectrum is 51 kHz (LTE Bandwidth 1.4 MHz).
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 30 kHz and VB of the spectrum is 100 kHz (LTE Bandwidth 3 MHz).
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 100 kHz and VB of the spectrum is 300 kHz (LTE Bandwidth 5 MHz/10 MHz).
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 150 kHz and VB of the spectrum is 470 kHz (LTE Bandwidth 15 MHz).
- The center frequency of spectrum is the band edge frequency and span is 1 MHz. RB of the spectrum is 180 kHz and VB of the spectrum is 560 kHz (LTE Bandwidth 20 MHz).
- Record the max. trace plot into the test report.

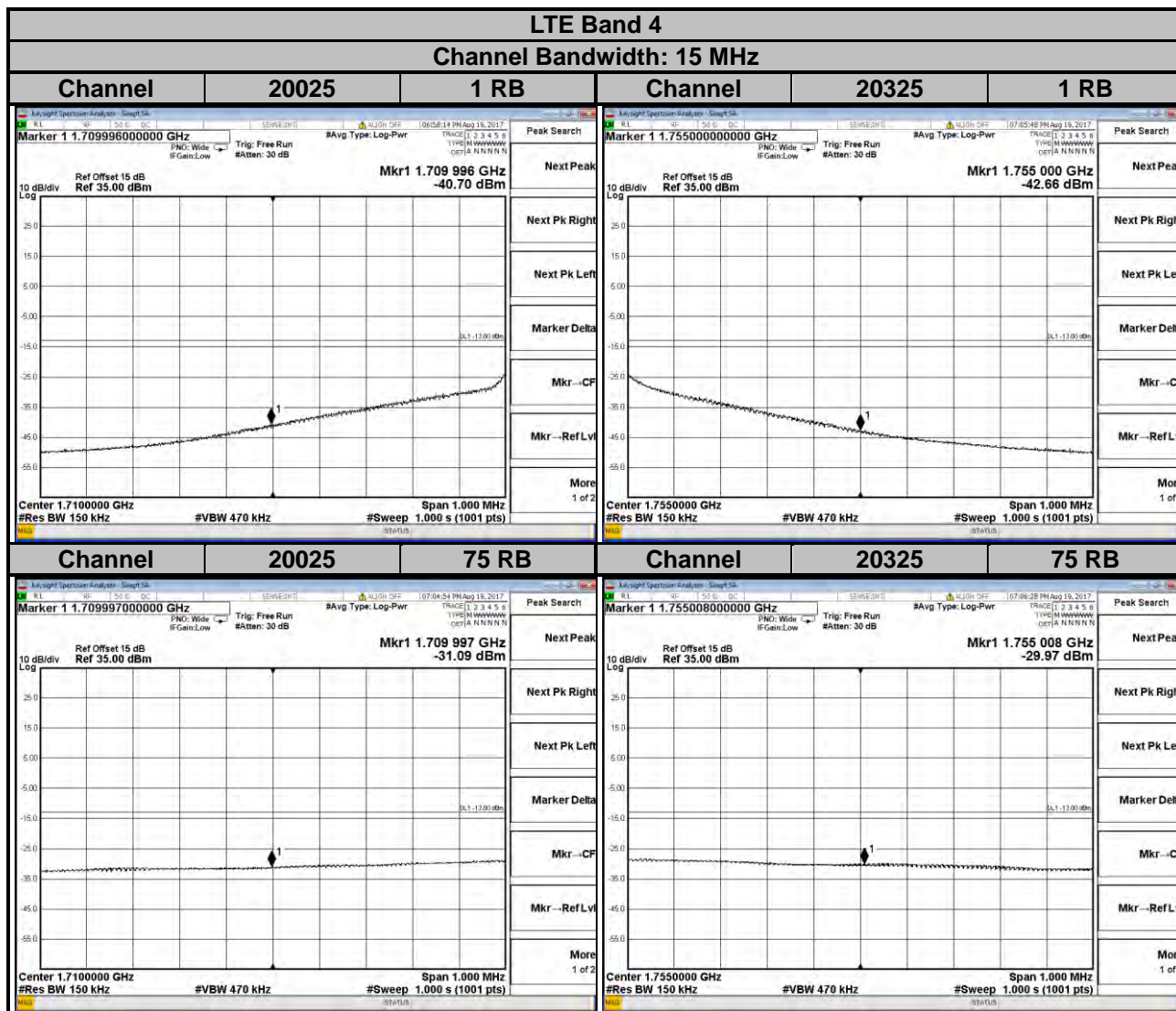
4.4.4 Test Results

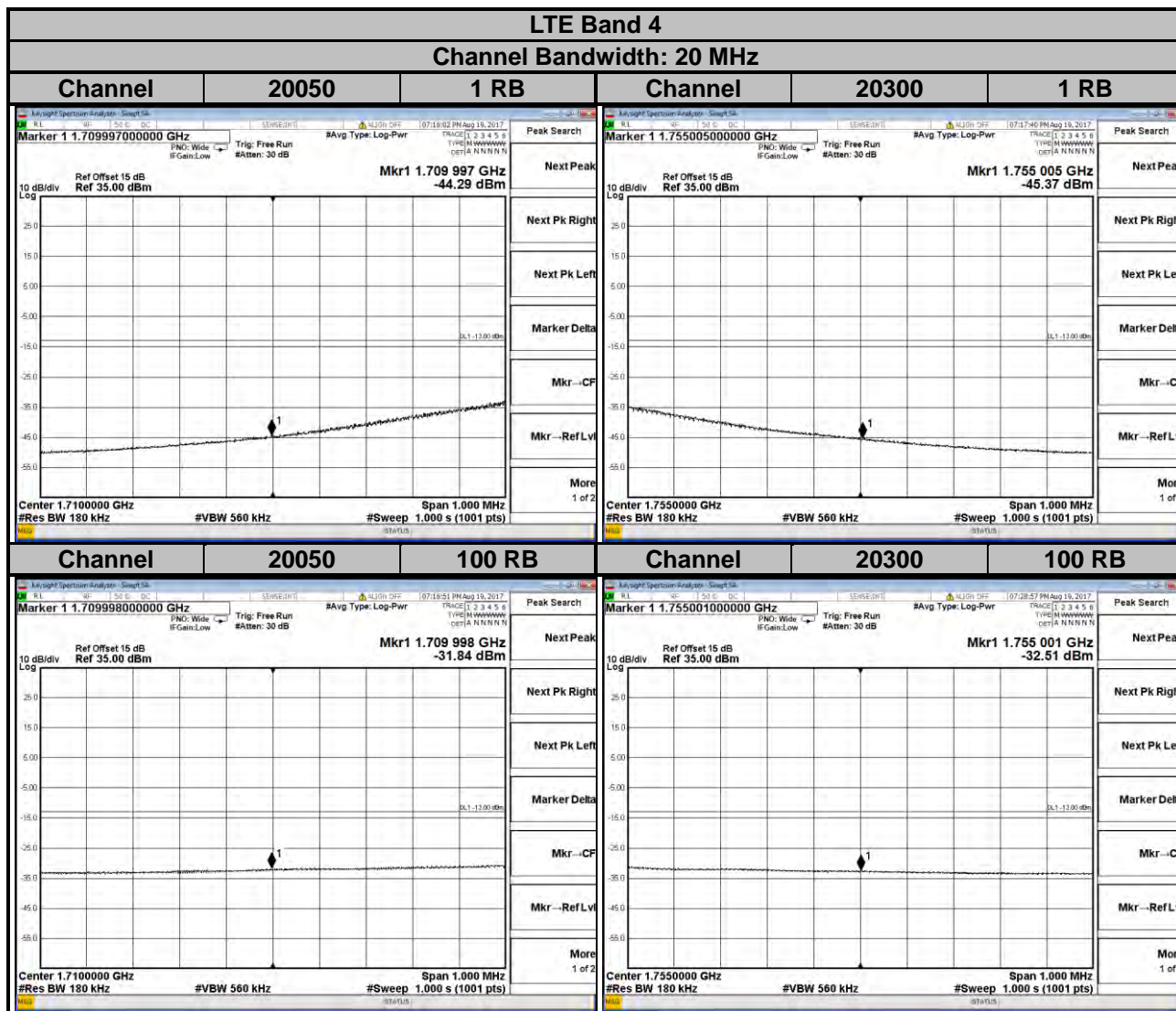


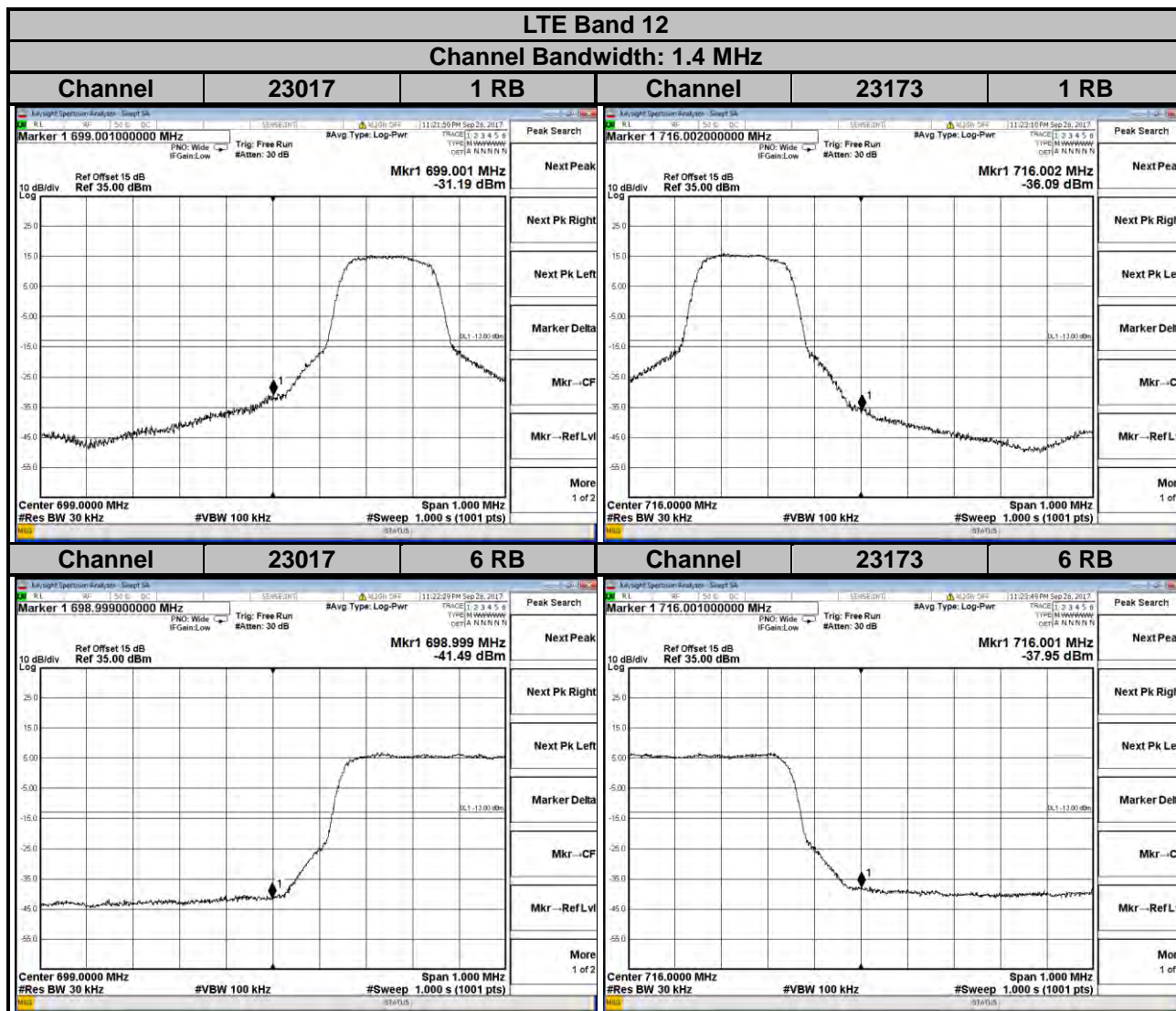


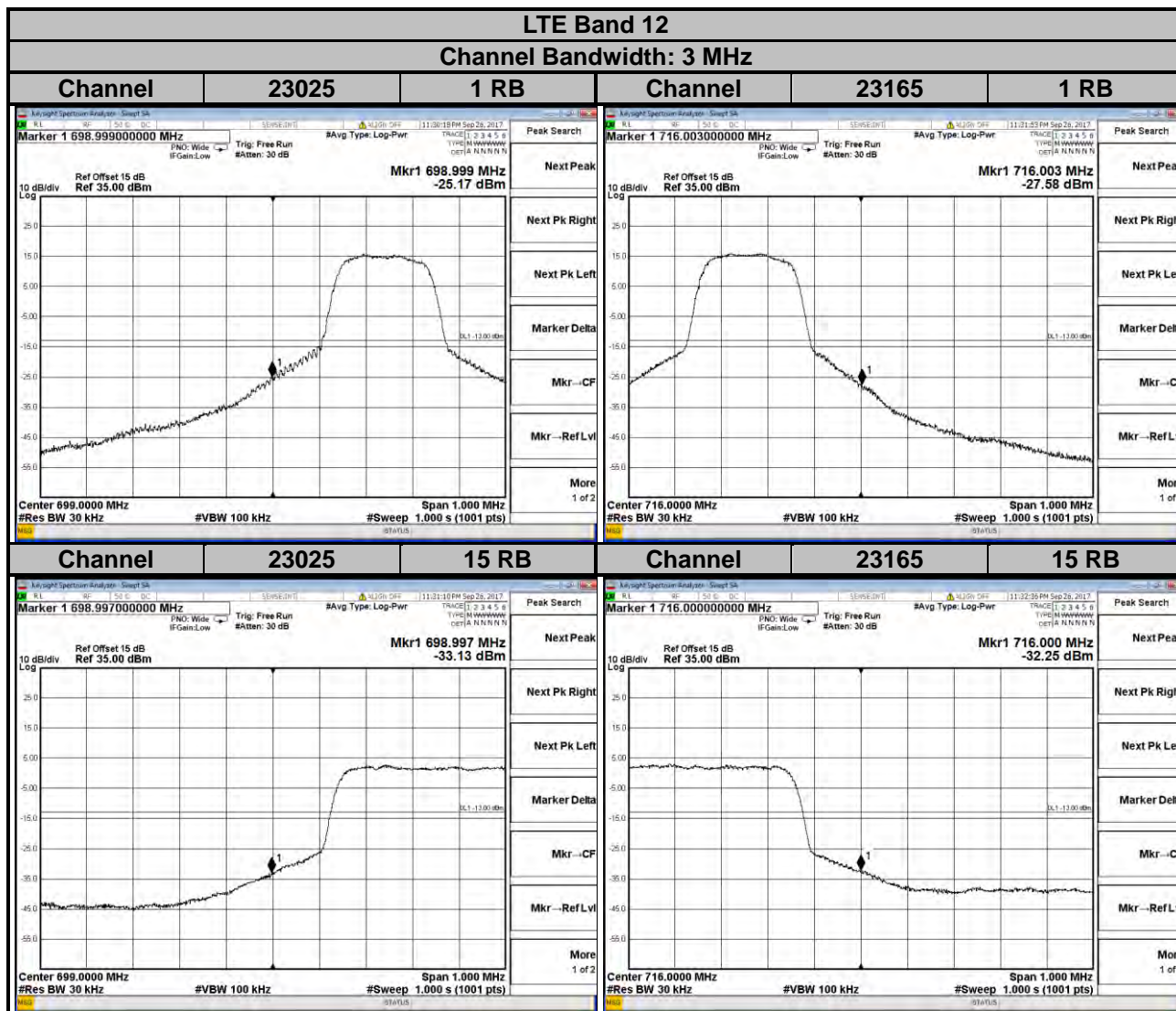


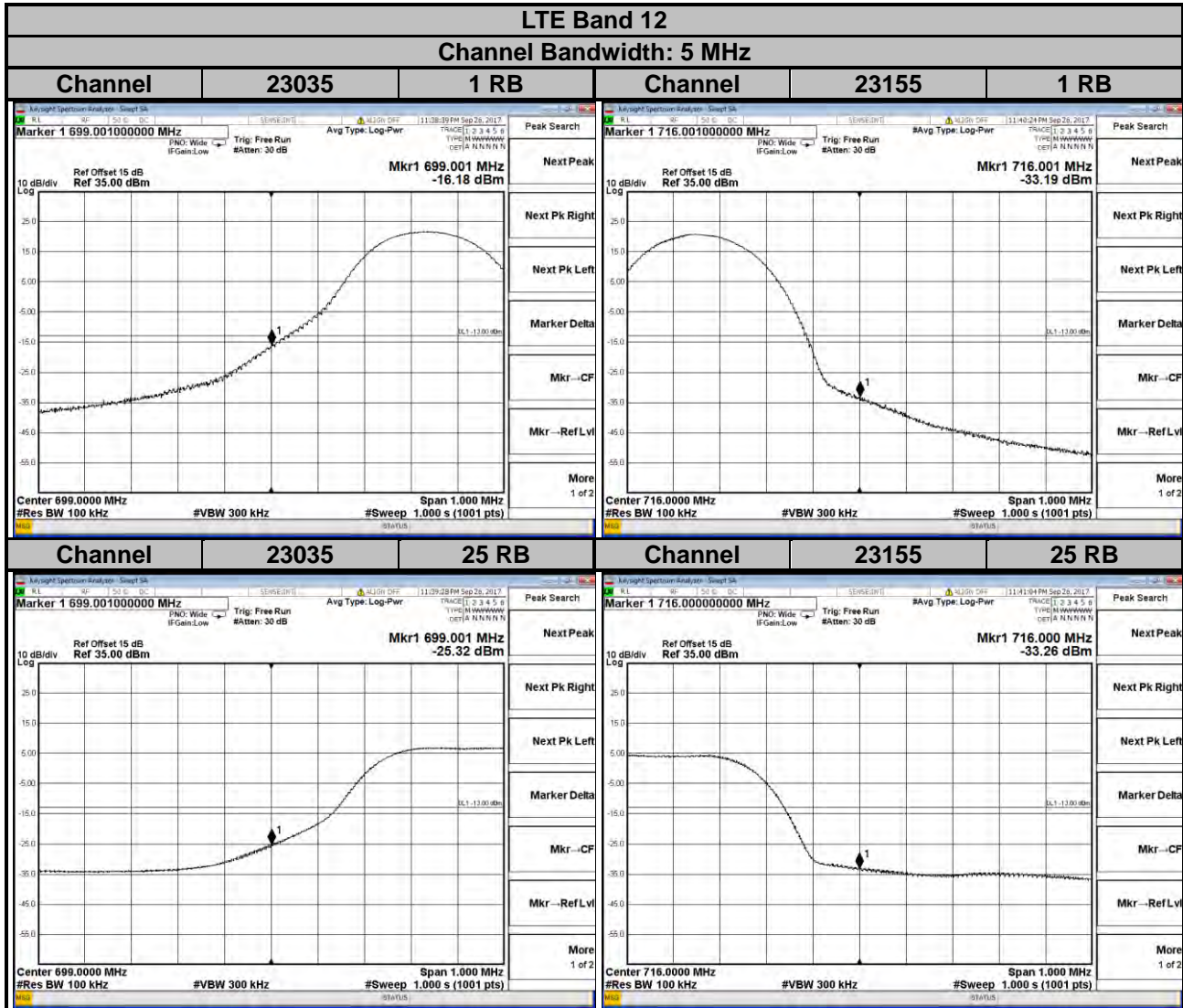


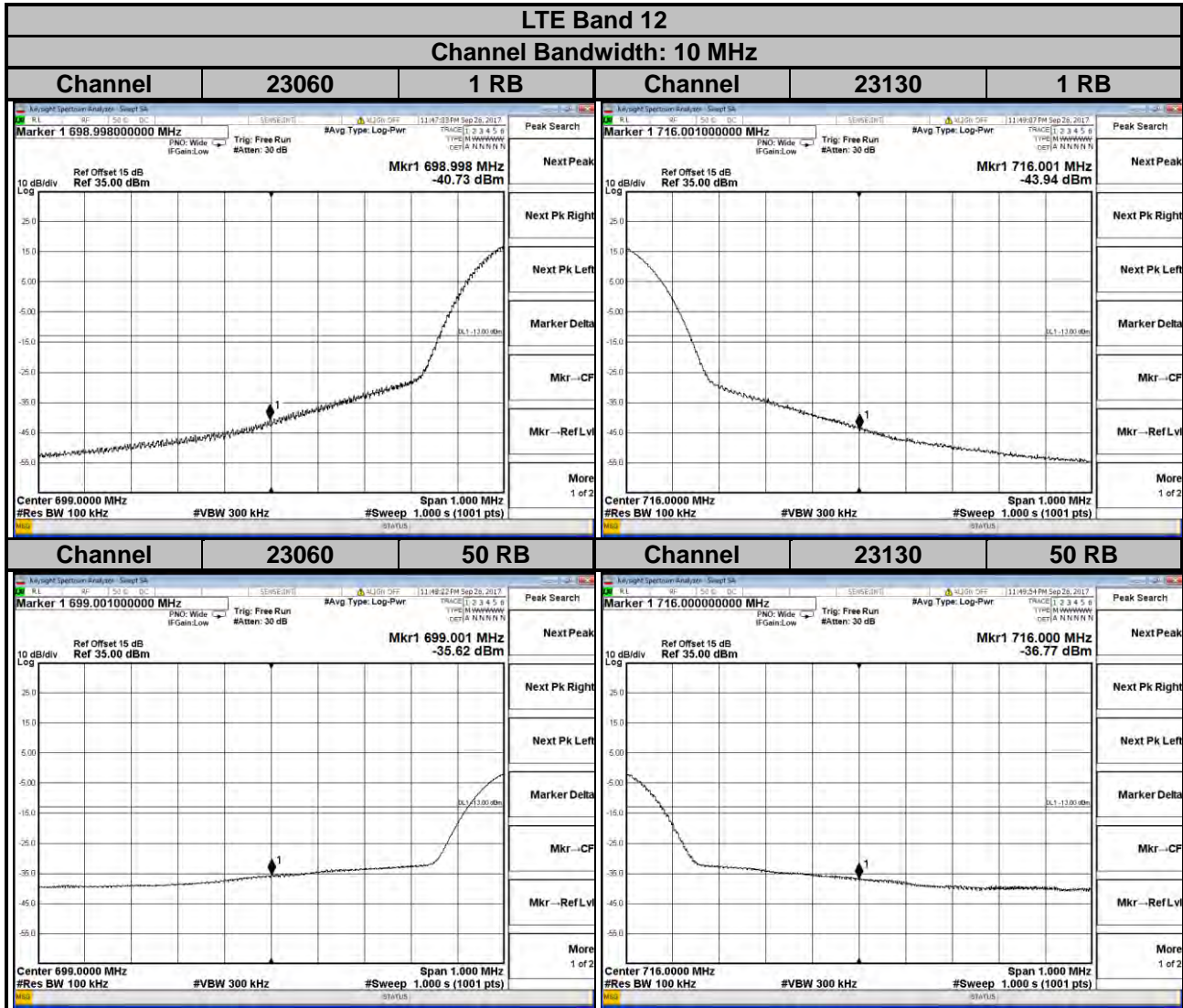


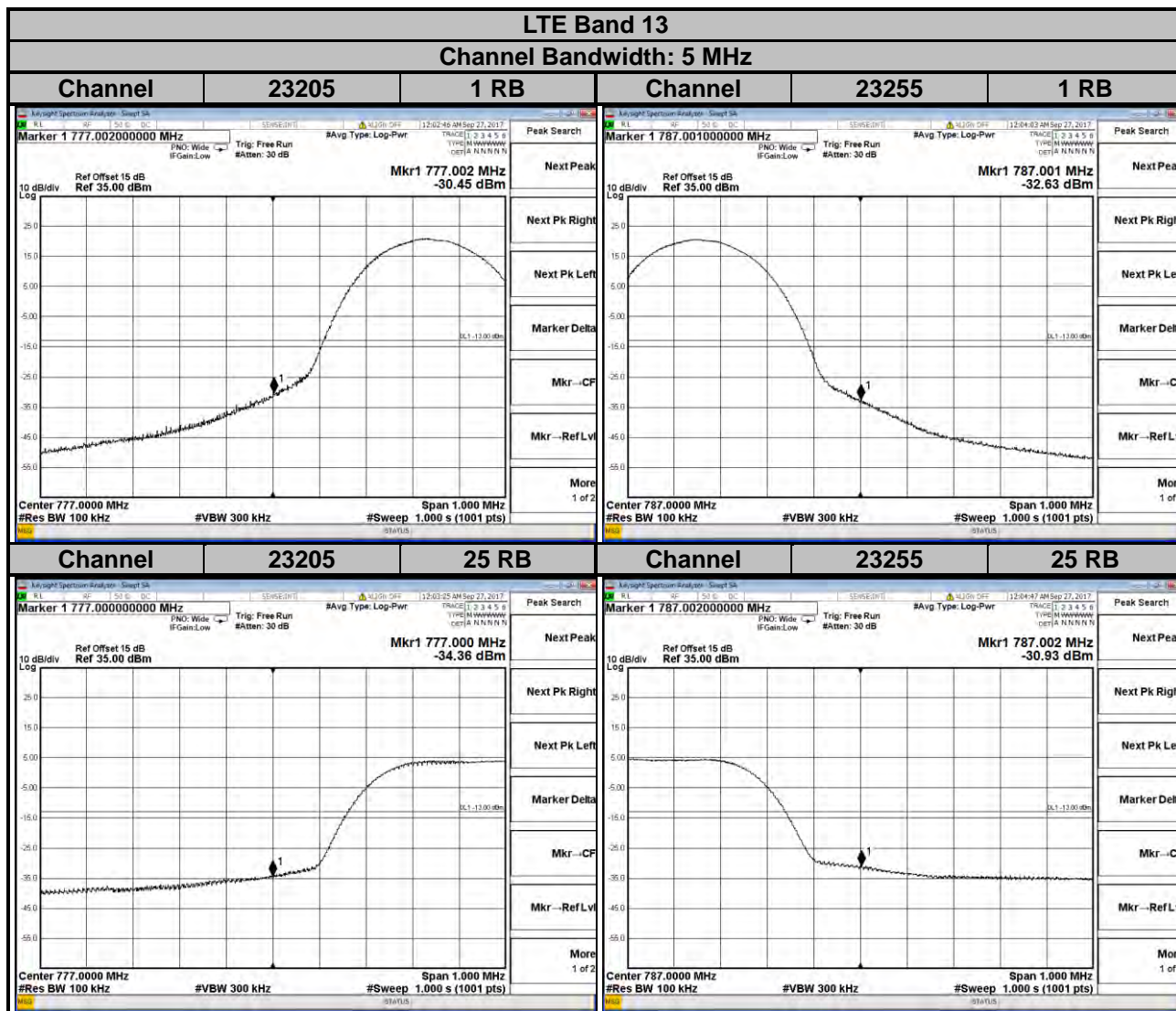


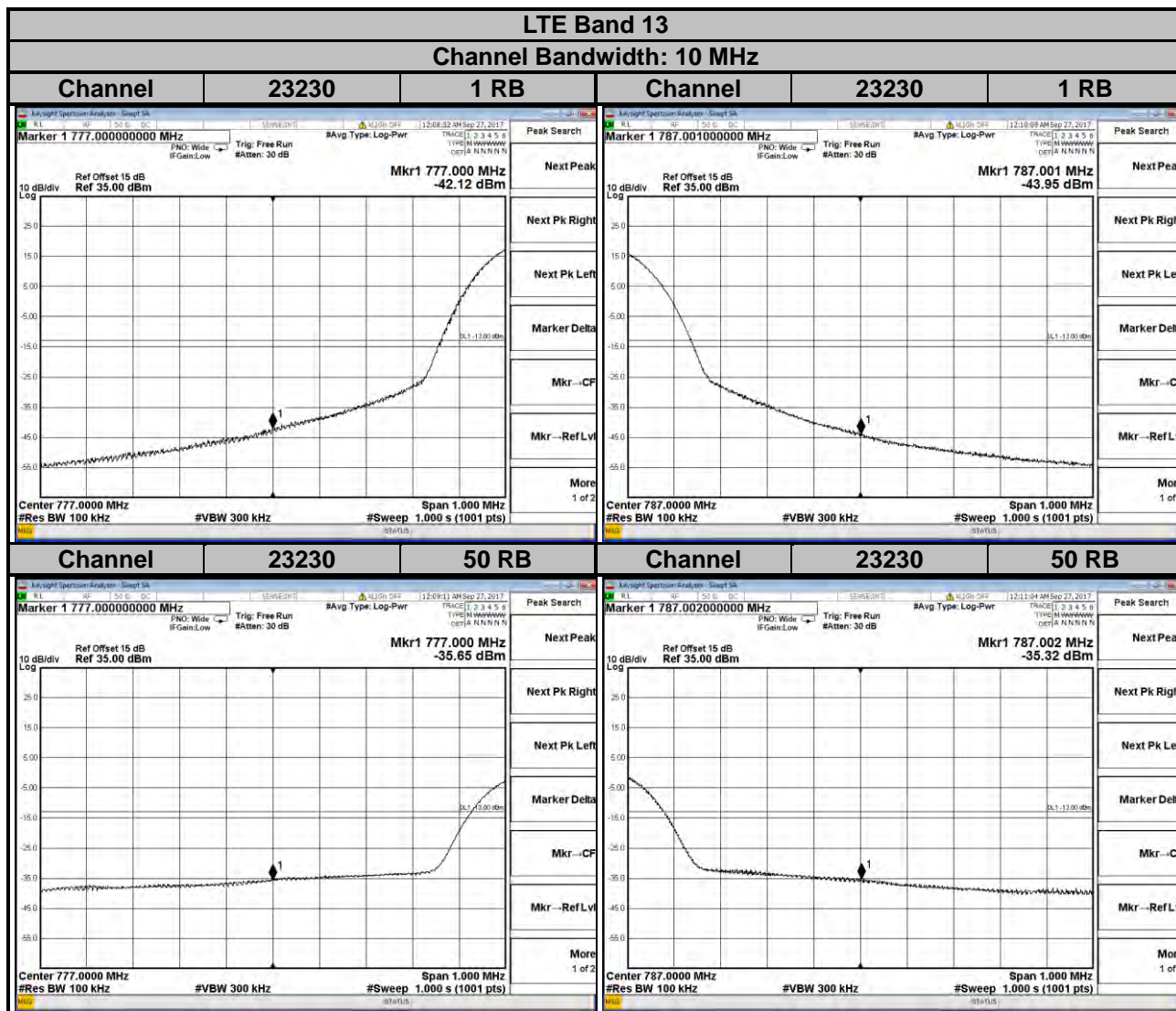


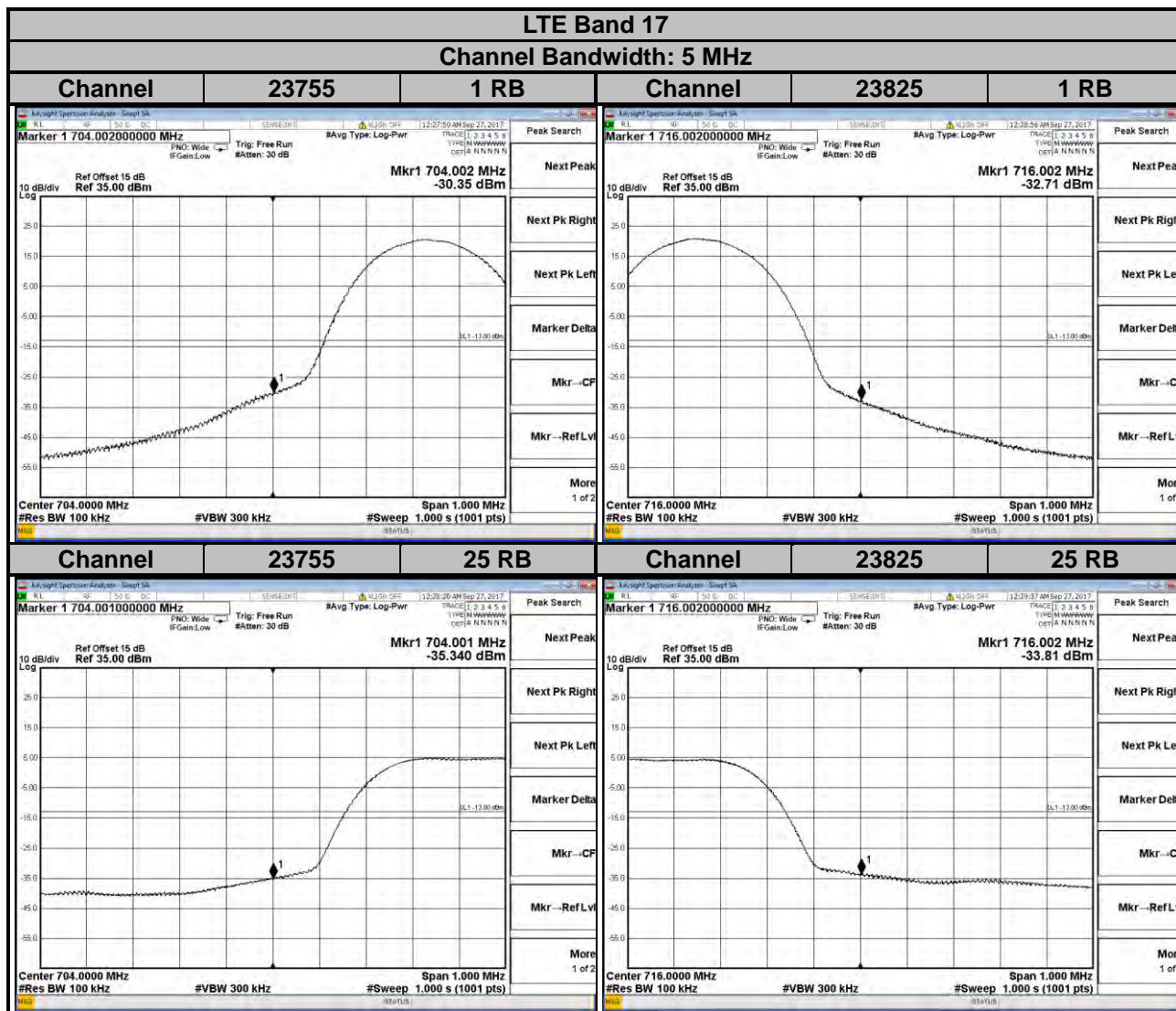


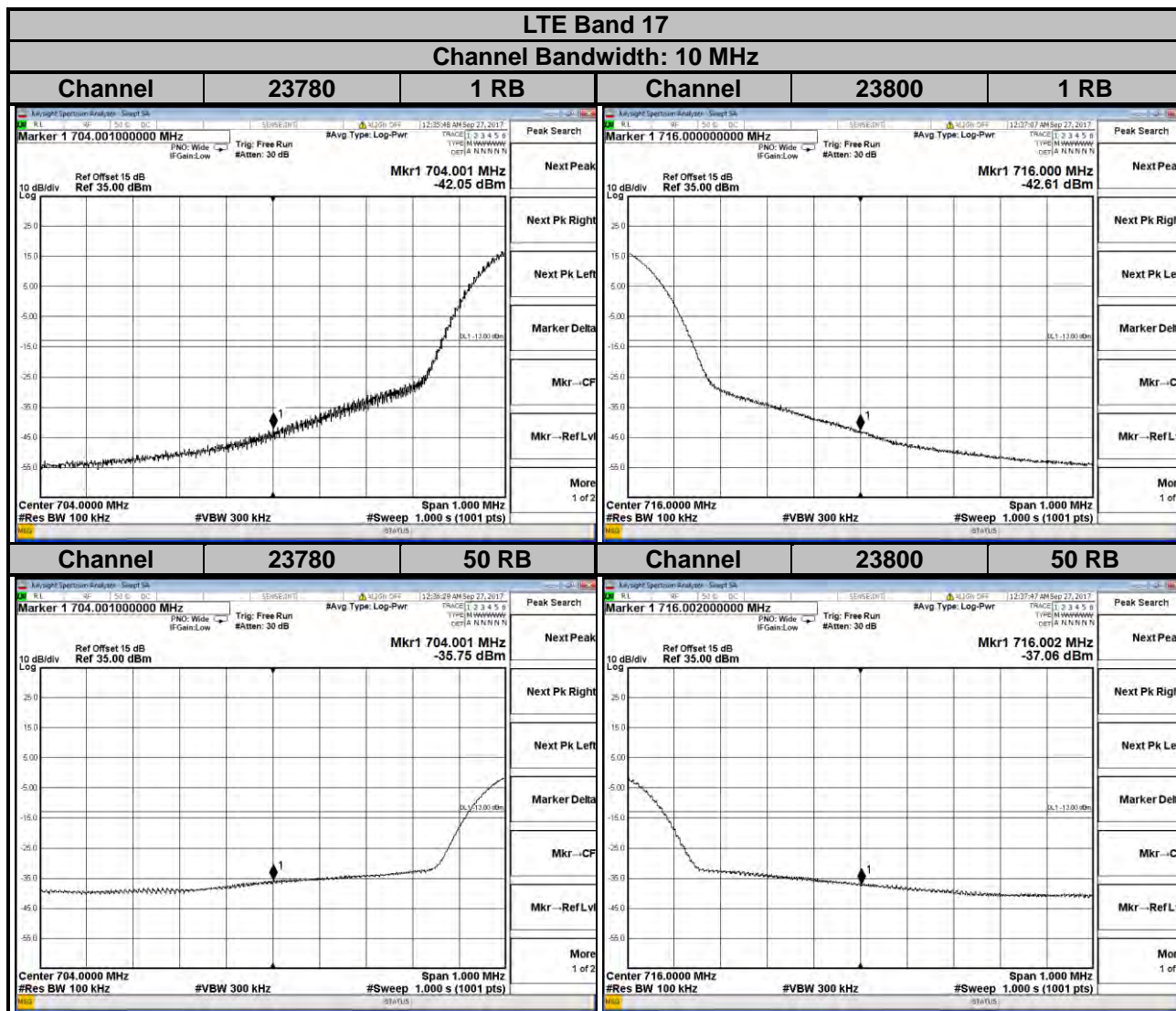




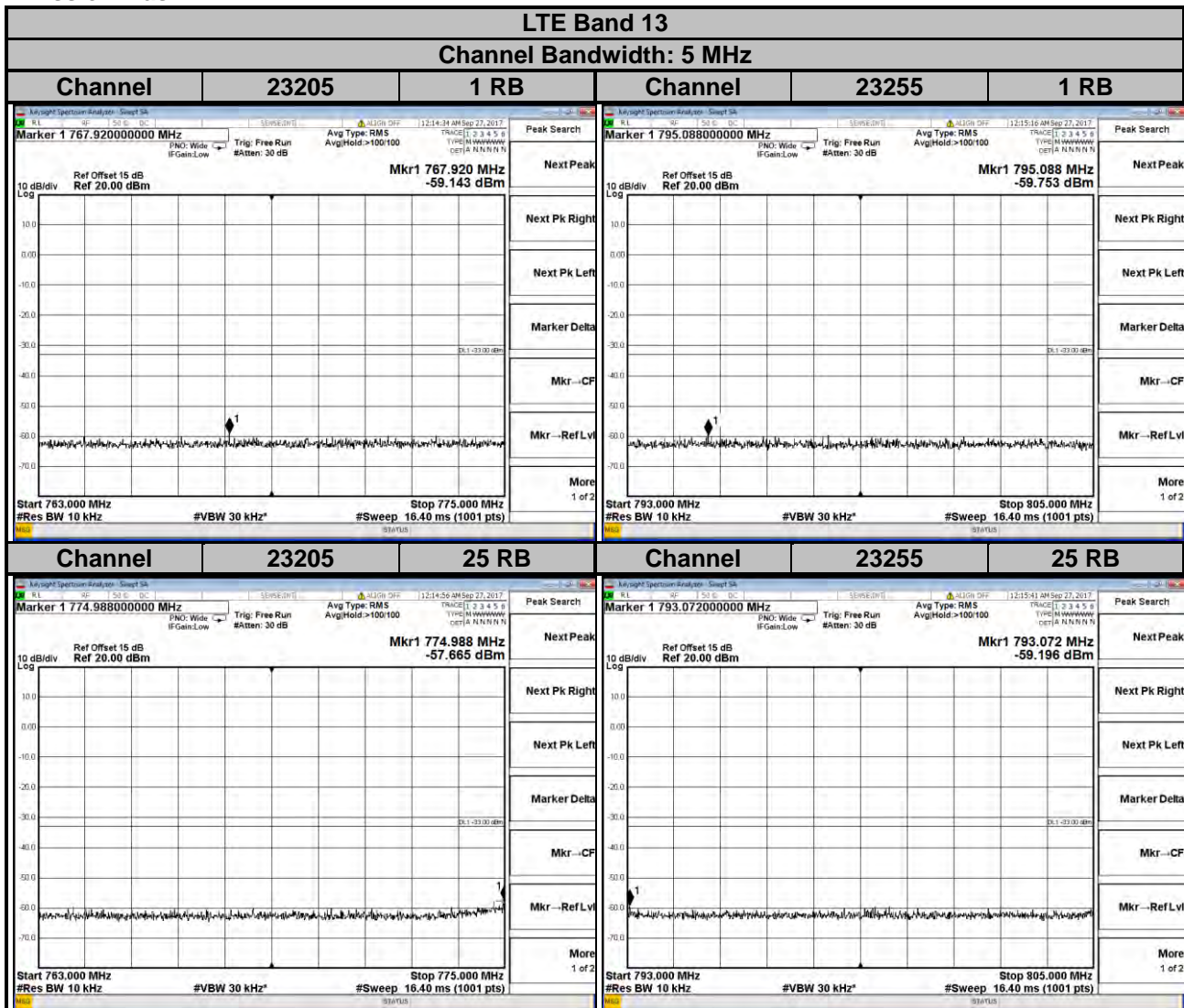








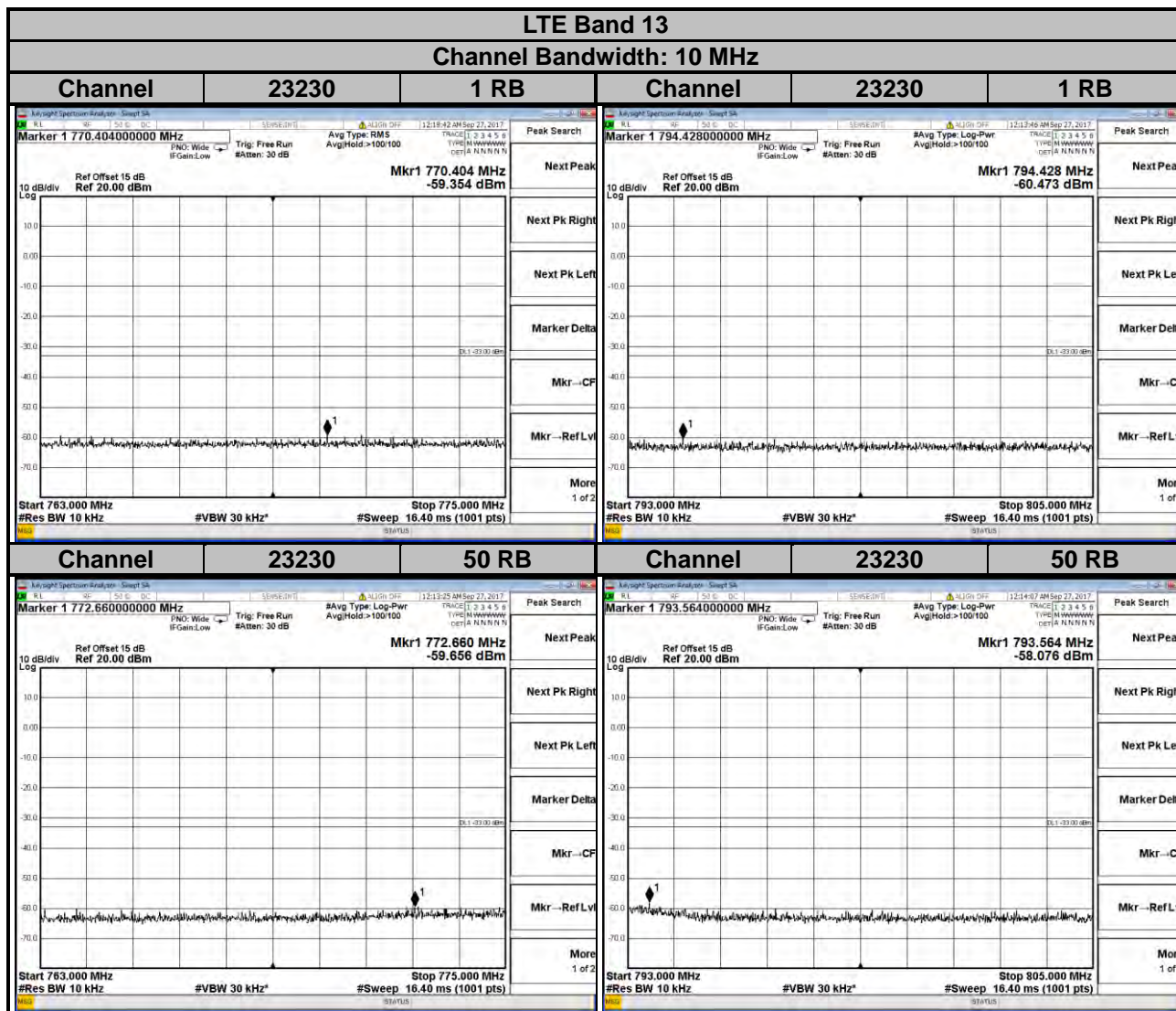
Emission Mask



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.

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

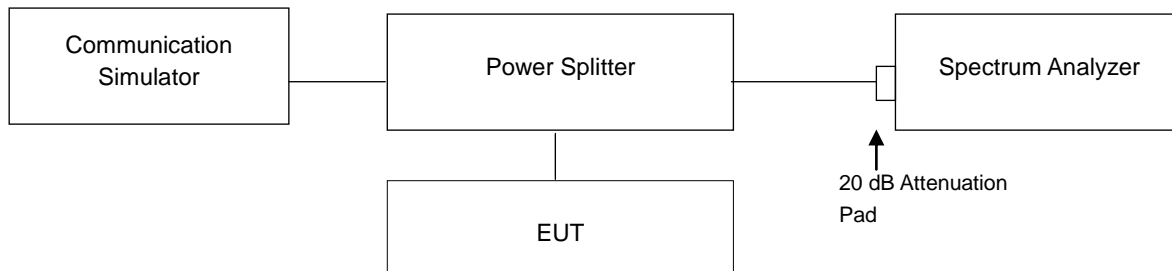
$$\text{Limit line} = -35 \text{ dBm} + 2.04 \text{ dB} = -32.96 \text{ dBm}$$

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

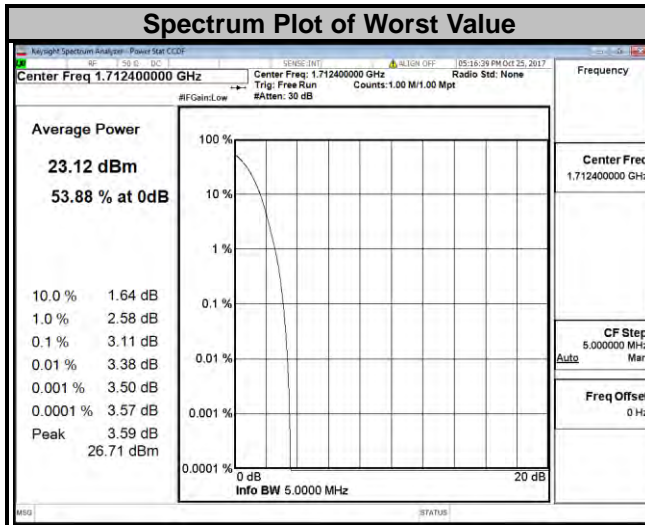


4.5.3 Test Procedures

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

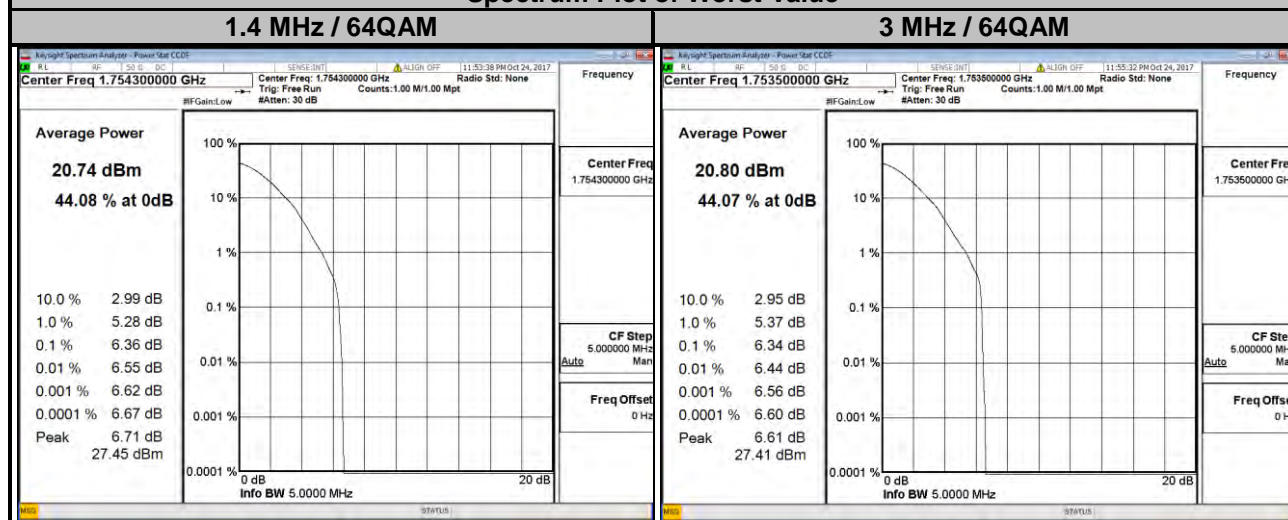
WCDMA		
Channel	Frequency (MHz)	Peak to Average Ratio (dB)
1312	1712.4	3.11
1413	1732.6	3.05
1513	1752.6	3.04



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	64QAM			QPSK	16QAM	64QAM
19957	1710.7	4.71	5.49	5.32	19965	1711.5	4.53	5.24	5.35
20175	1732.5	3.60	4.43	6.35	20175	1732.5	3.63	4.49	6.29
20393	1754.3	4.67	5.35	6.36	20385	1753.5	4.48	5.23	6.34

Spectrum Plot of Worst Value

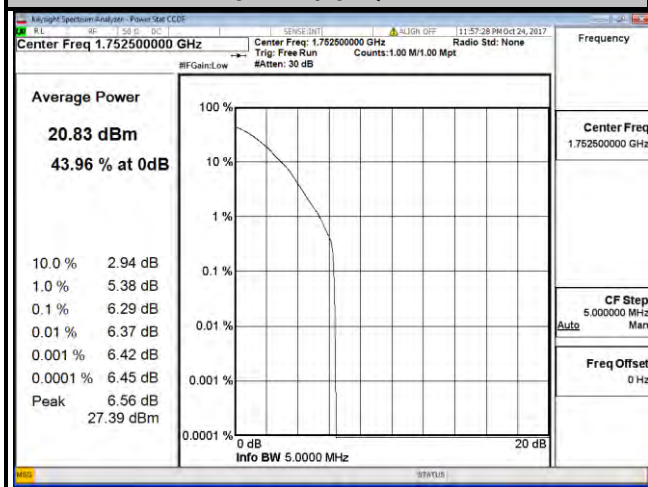


LTE Band 4

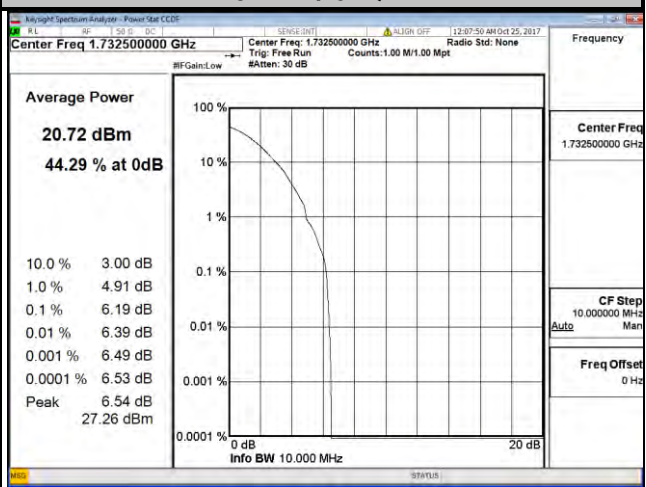
Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
19975	1712.5	4.53	5.26	5.29	20000	1715.0	4.47	5.23	5.40
20175	1732.5	3.86	4.78	6.28	20175	1732.5	4.38	5.15	6.19
20375	1752.5	3.93	4.67	6.29	20350	1750.0	4.50	5.20	5.67

Spectrum Plot of Worst Value

5 MHz / 64QAM



10 MHz / 64QAM

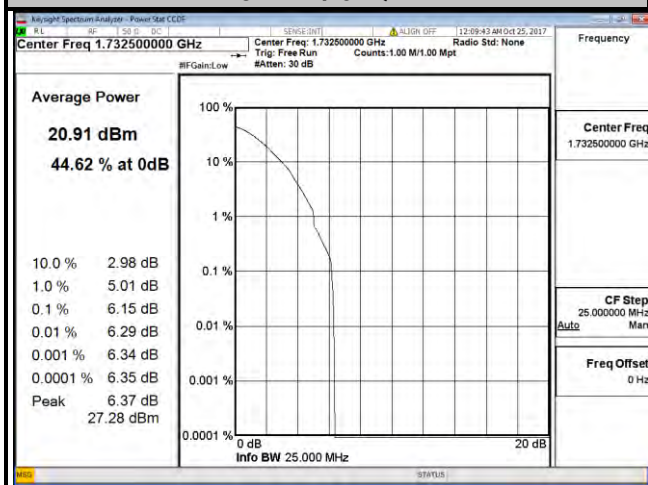


LTE Band 4

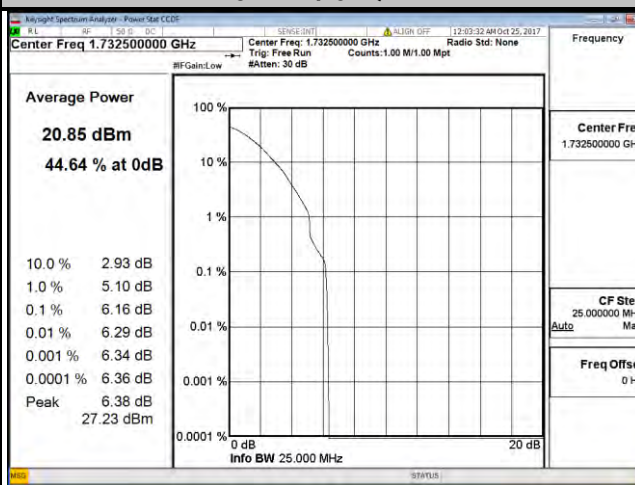
Channel Bandwidth: 15 MHz					Channel Bandwidth: 20 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
20025	1717.5	4.49	5.15	5.20	20050	1720.0	4.45	5.22	5.26
20175	1732.5	4.39	5.10	6.15	20175	1732.5	4.37	5.08	6.16
20325	1747.5	4.48	5.21	5.30	20300	1745.0	4.43	5.15	5.90

Spectrum Plot of Worst Value

15 MHz / 64QAM



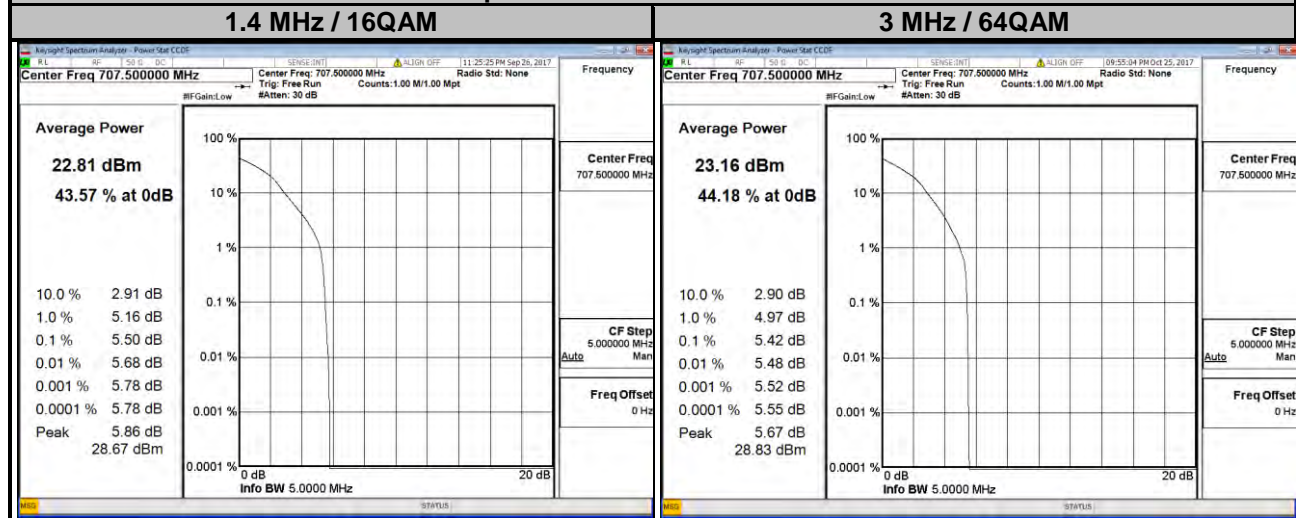
20 MHz / 64QAM



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	64QAM			QPSK	16QAM	64QAM
23017	699.7	3.80	4.52	4.53	23025	700.5	3.74	4.49	4.43
23095	707.5	4.74	5.50	5.49	23095	707.5	4.56	5.38	5.42
23173	715.3	4.58	5.42	5.17	23165	714.5	4.28	4.22	5.38

Spectrum Plot of Worst Value

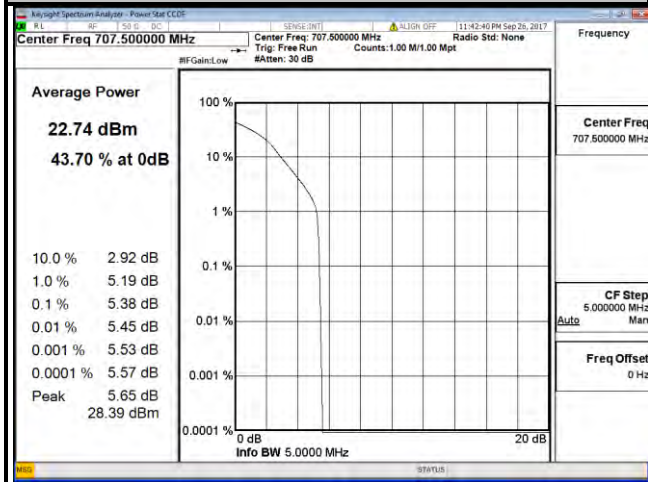


LTE Band 12

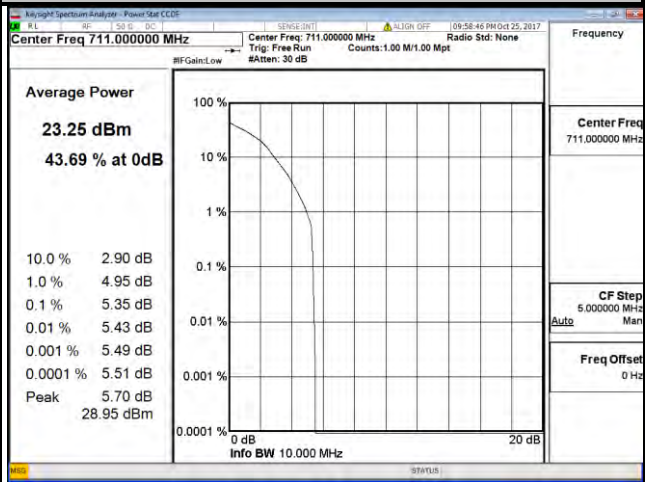
Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
23035	701.5	3.66	4.44	5.35	23060	704.0	3.73	4.52	4.39
23095	707.5	4.54	5.38	5.34	23095	707.5	4.49	4.27	5.31
23155	713.5	3.56	4.37	4.38	23130	711.0	4.52	5.23	5.35

Spectrum Plot of Worst Value

5 MHz / 16QAM



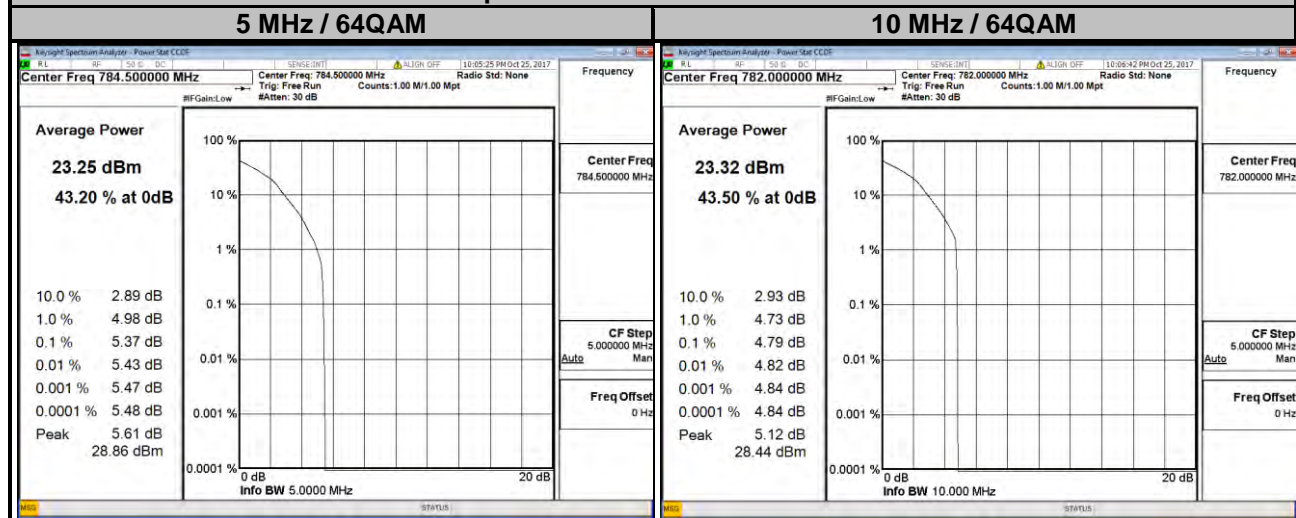
10 MHz / 64QAM



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	64QAM			QPSK	16QAM	64QAM
23205	779.5	3.65	4.39	4.58	23230	782.0	3.94	4.68	4.79
23230	782.0	4.56	5.30	5.30					
23255	784.5	4.55	5.34	5.37					

Spectrum Plot of Worst Value

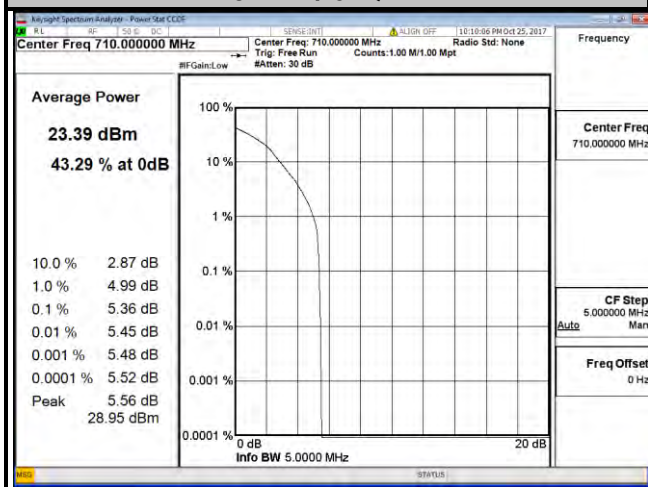


LTE Band 17

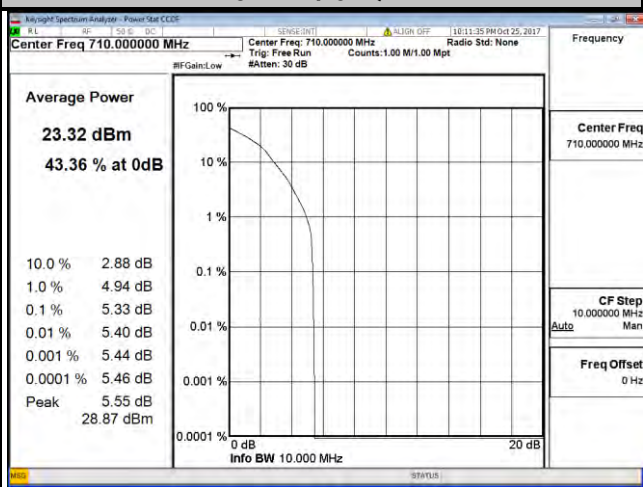
Channel Bandwidth: 5 MHz					Channel Bandwidth: 10 MHz				
Channel	Frequency (MHz)	Peak to Average Ratio (dB)			Channel	Frequency (MHz)	Peak to Average Ratio (dB)		
		QPSK	16QAM	64QAM			QPSK	16QAM	64QAM
23755	706.5	4.59	5.26	5.35	23780	709.0	4.49	5.23	5.30
23790	710.0	4.60	5.29	5.36	23790	710.0	4.52	5.25	5.33
23825	713.5	4.60	4.25	5.31	23800	711.0	4.51	5.24	5.31

Spectrum Plot of Worst Value

5 MHz / 64QAM



10 MHz / 64QAM

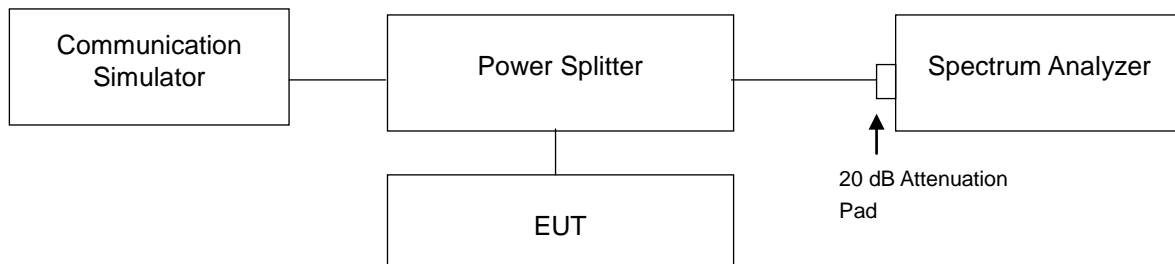


4.6 Conducted Spurious Emissions

4.6.1 Limits of Conducted Spurious Emissions Measurement

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

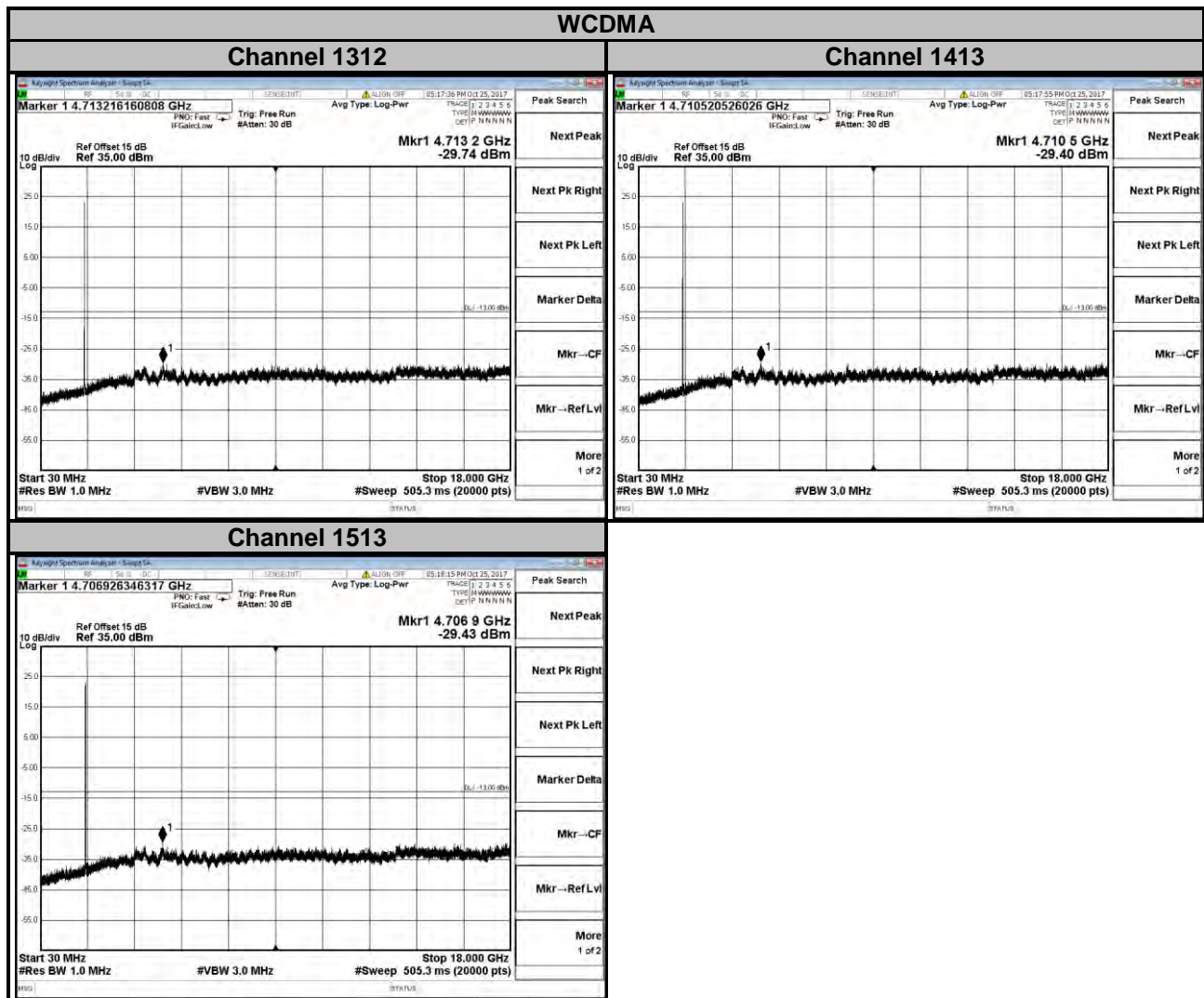
4.6.2 Test Setup



4.6.3 Test Procedure

- The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- Measuring frequency range is from 30 MHz to 8 GHz for LTE Band 12/13/17 and from 30 MHz to 18 GHz for WCDMA & LTE Band 4. 10 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz are used for conducted emission measurement.

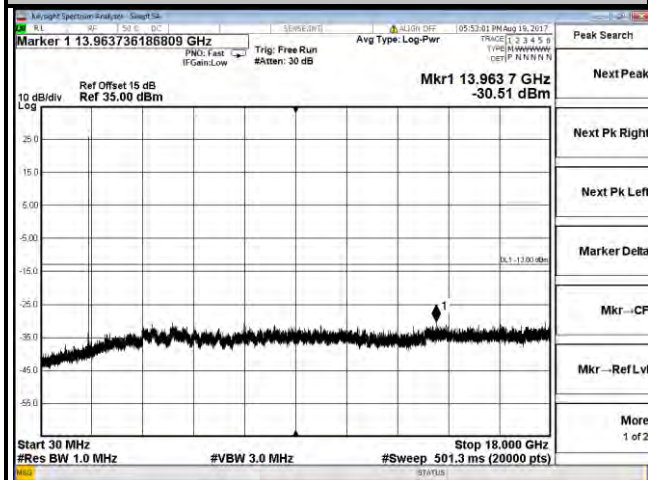
4.6.4 Test Results



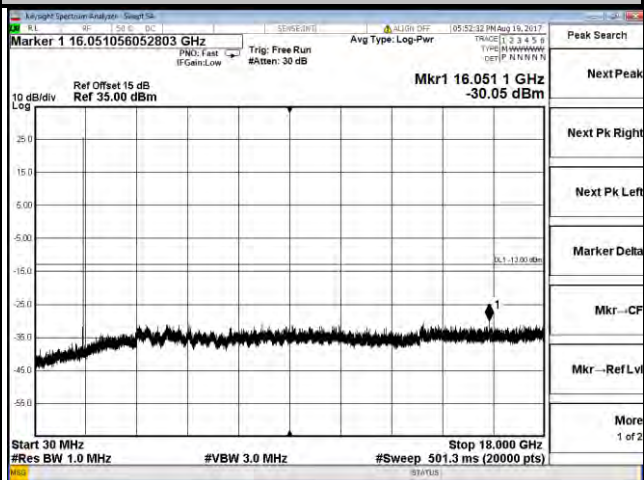
LTE Band 4

Channel Bandwidth: 1.4 MHz

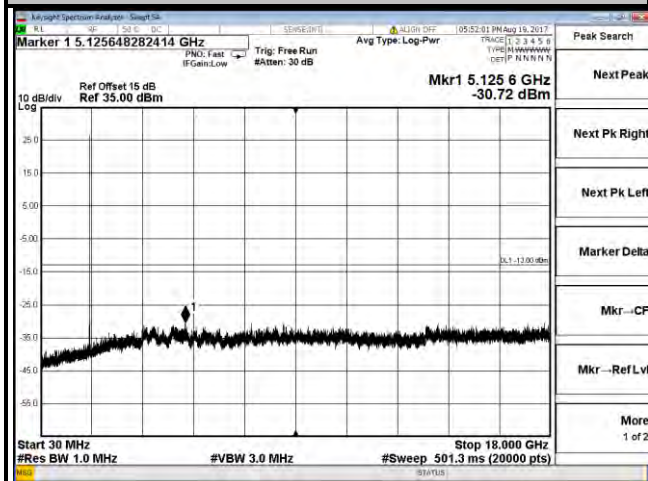
Channel 19957



Channel 10715



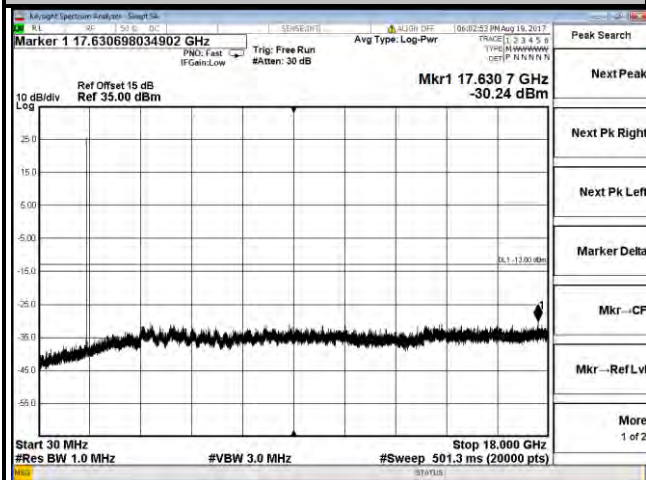
Channel 20393



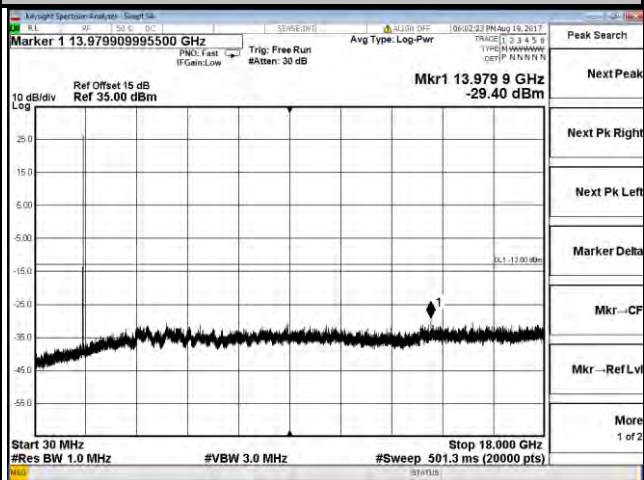
LTE Band 4

Channel Bandwidth: 3 MHz

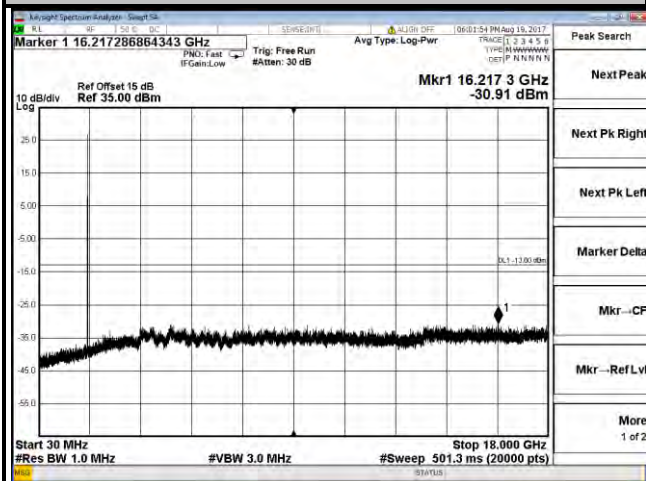
Channel 19965



Channel 107175



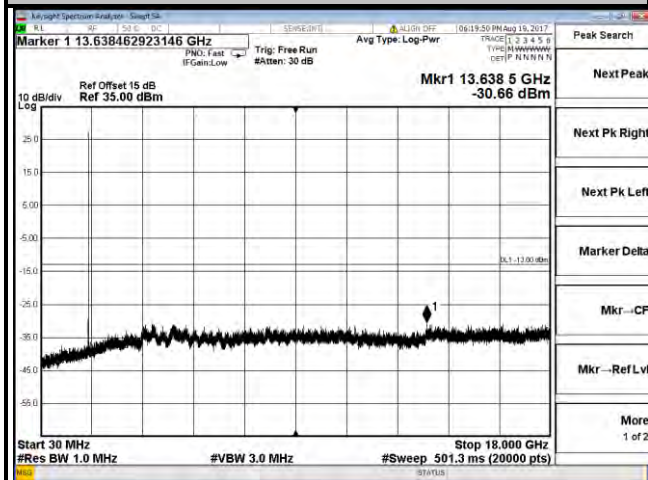
Channel 20385



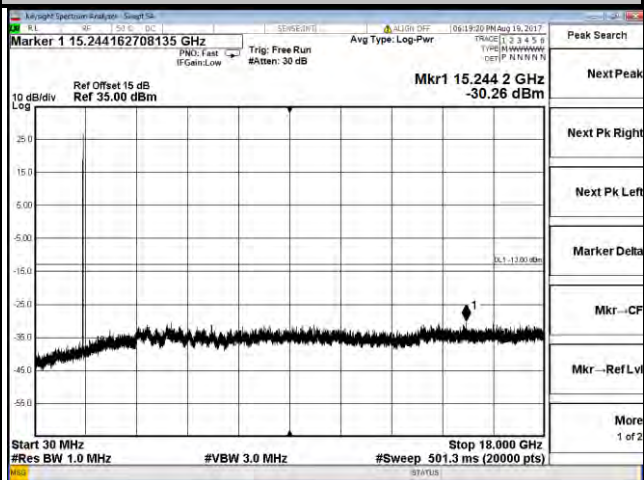
LTE Band 4

Channel Bandwidth: 5 MHz

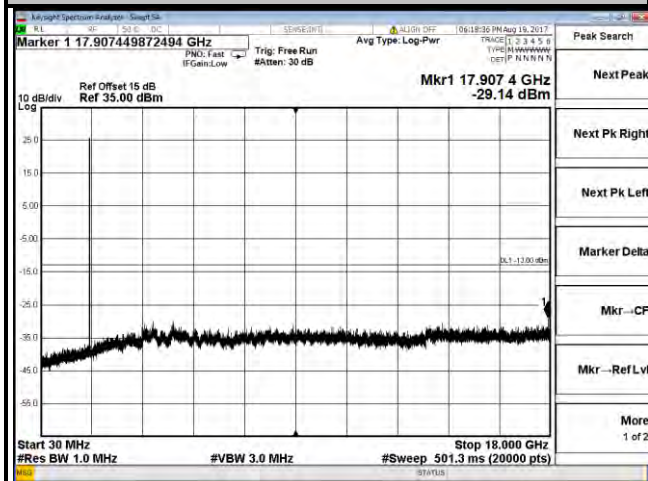
Channel 19975



Channel 10175



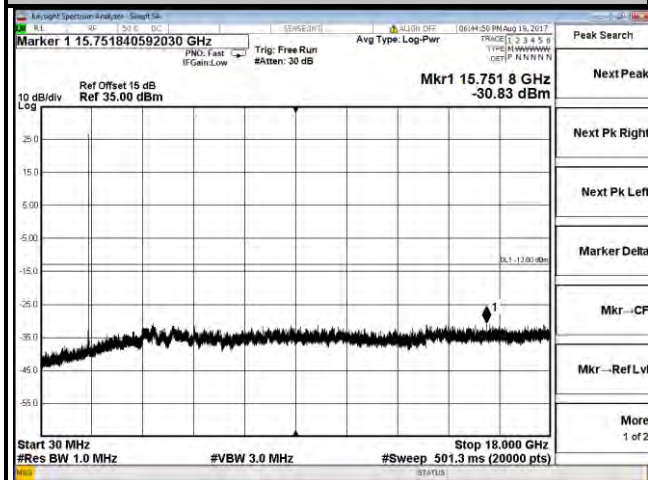
Channel 20375



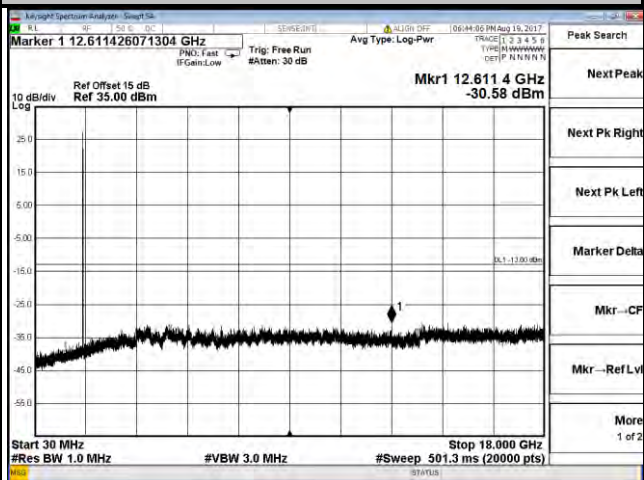
LTE Band 4

Channel Bandwidth: 10 MHz

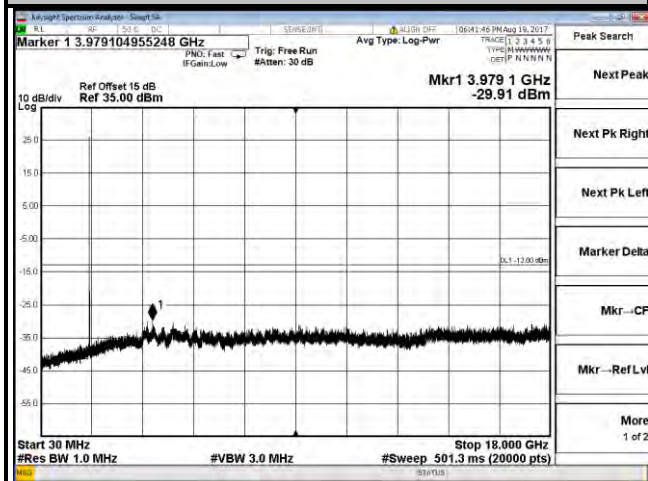
Channel 20000



Channel 17175



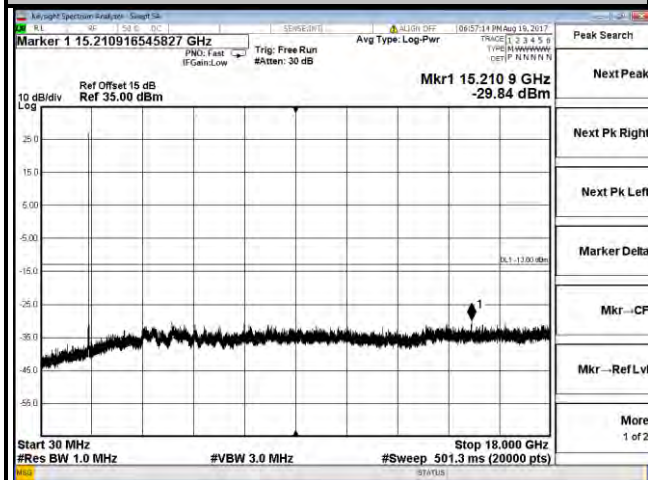
Channel 20350



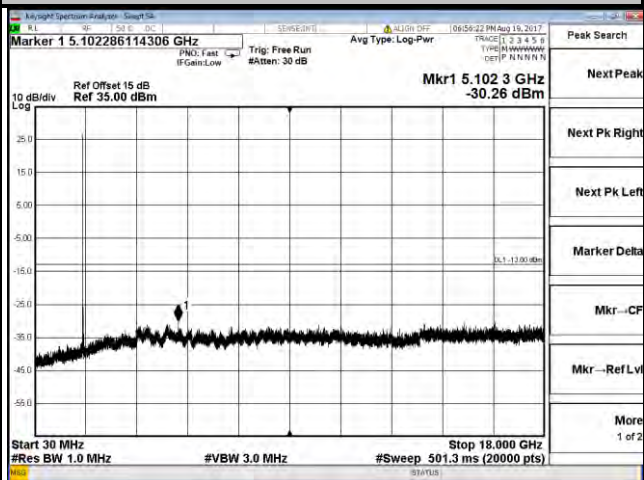
LTE Band 4

Channel Bandwidth: 15 MHz

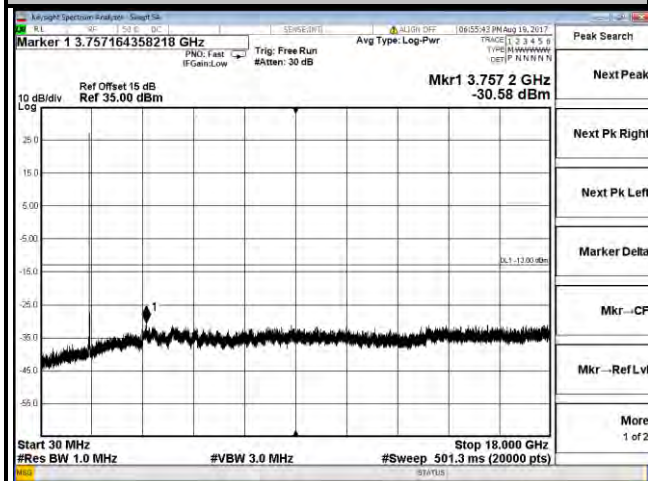
Channel 20025



Channel 10175



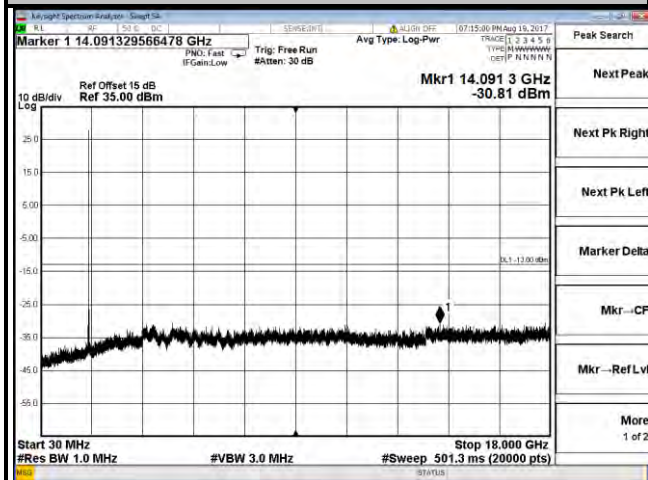
Channel 20325



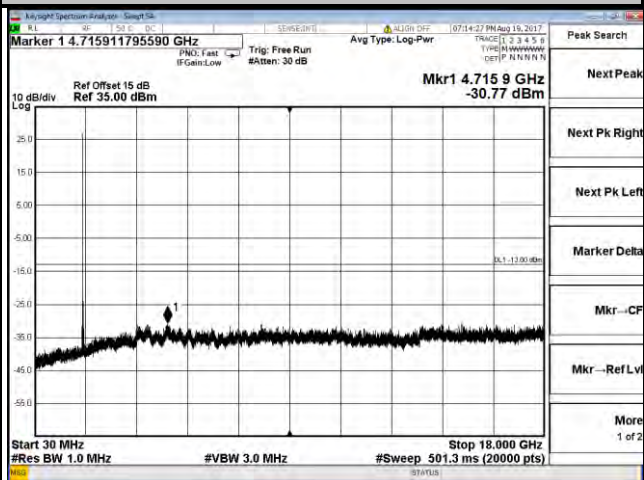
LTE Band 4

Channel Bandwidth: 20 MHz

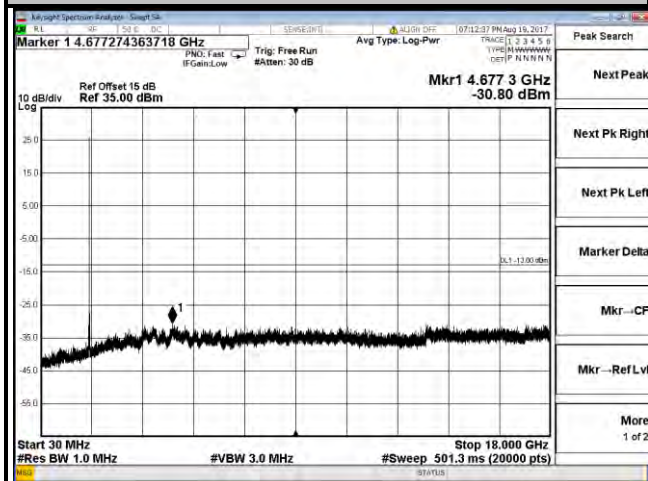
Channel 20050



Channel 17175



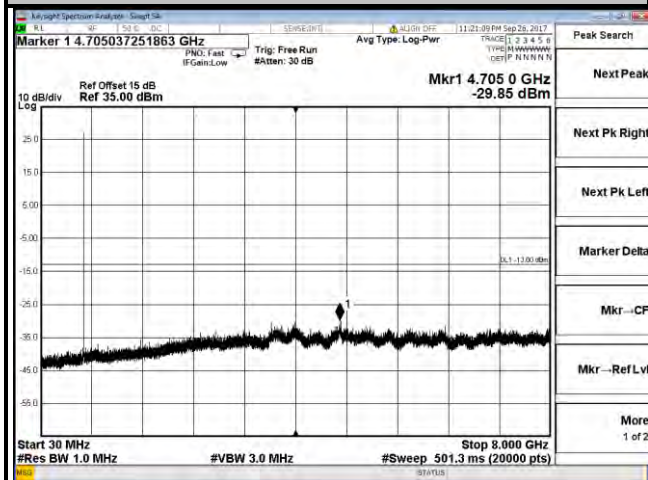
Channel 20300



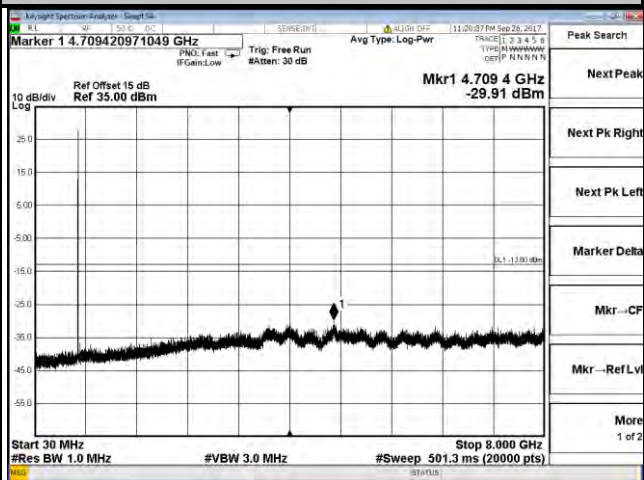
LTE Band 12

Channel Bandwidth: 1.4 MHz

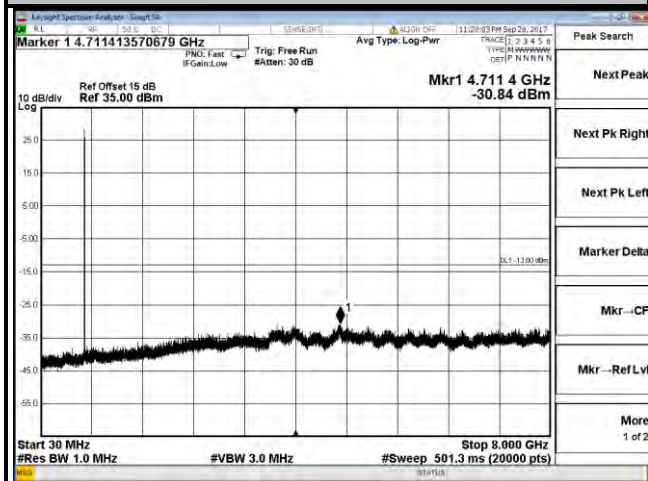
Channel 23017



Channel 23095



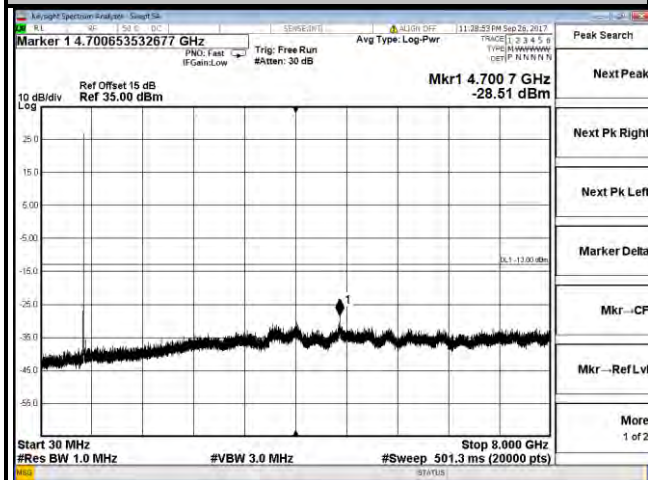
Channel 23173



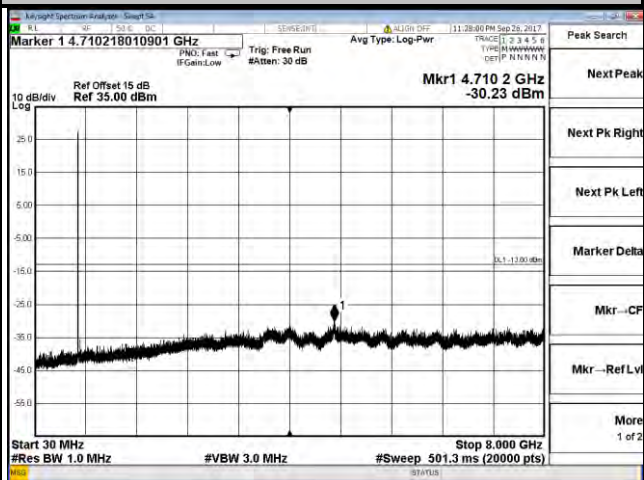
LTE Band 12

Channel Bandwidth: 3 MHz

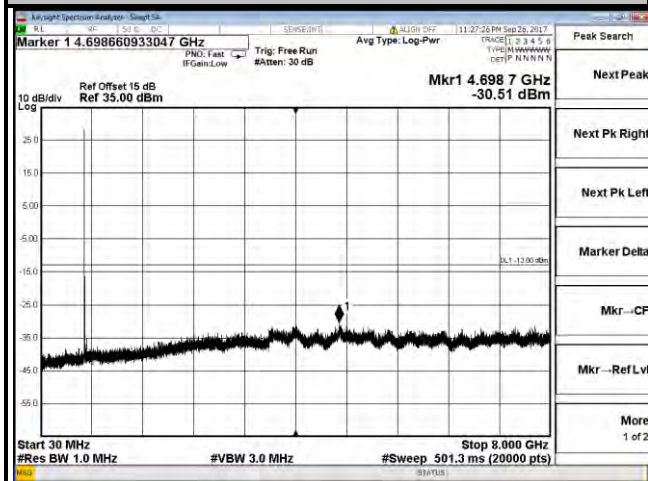
Channel 23025



Channel 23095



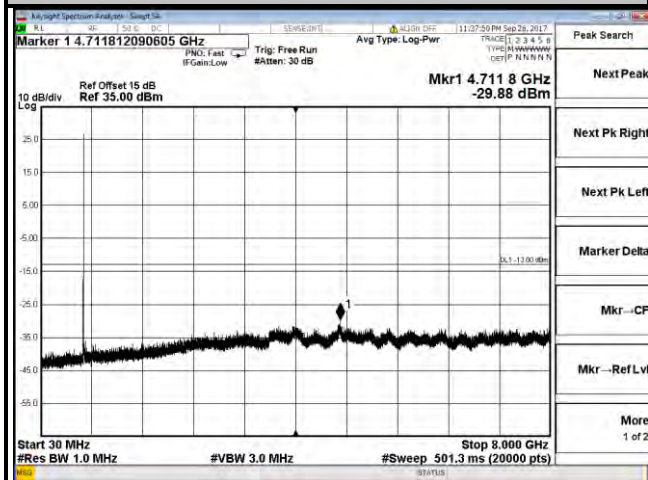
Channel 23165



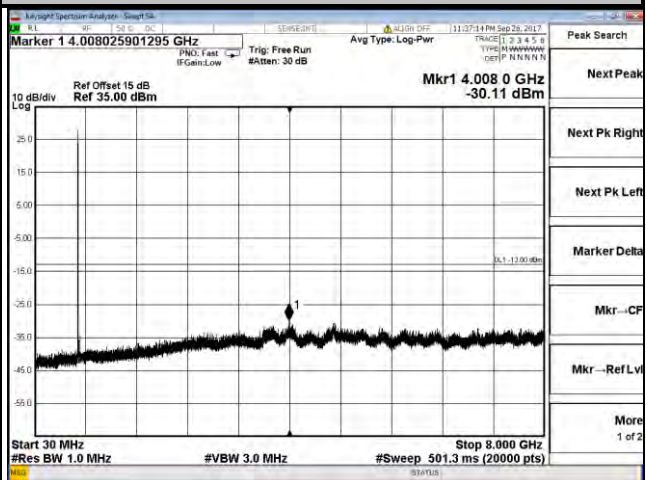
LTE Band 12

Channel Bandwidth: 5 MHz

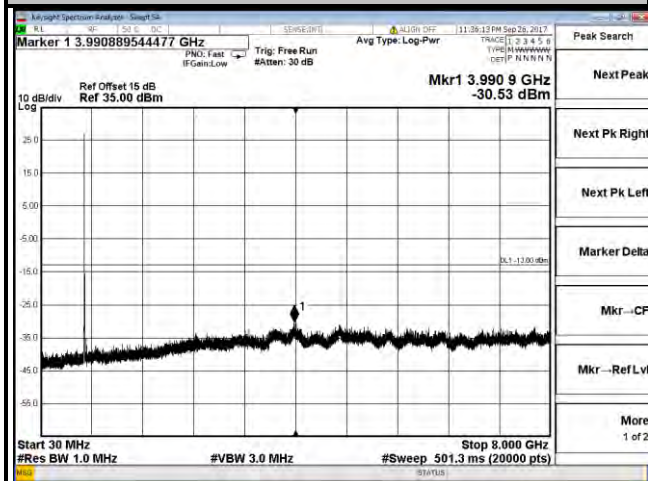
Channel 23035



Channel 23095



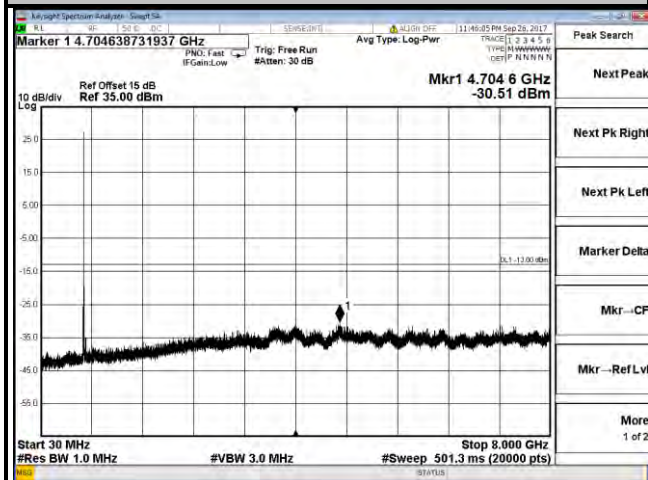
Channel 23155



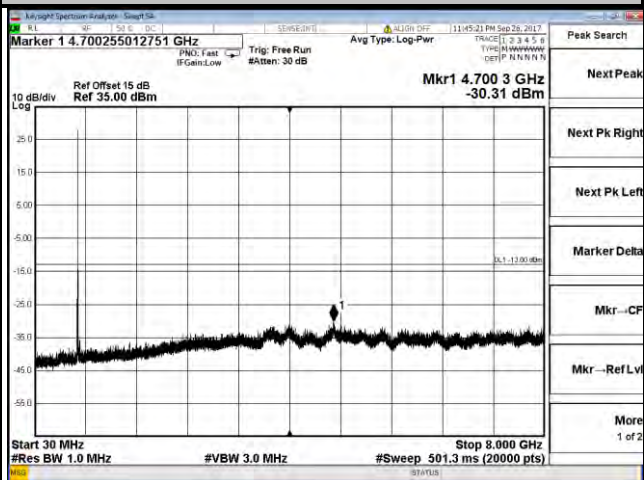
LTE Band 12

Channel Bandwidth: 10 MHz

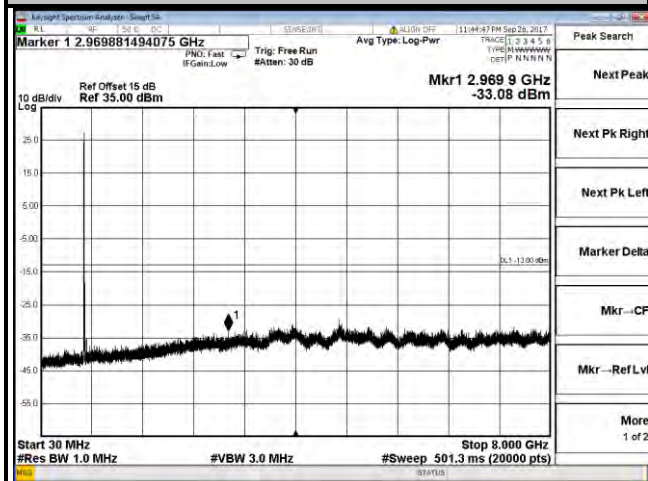
Channel 23060



Channel 23095

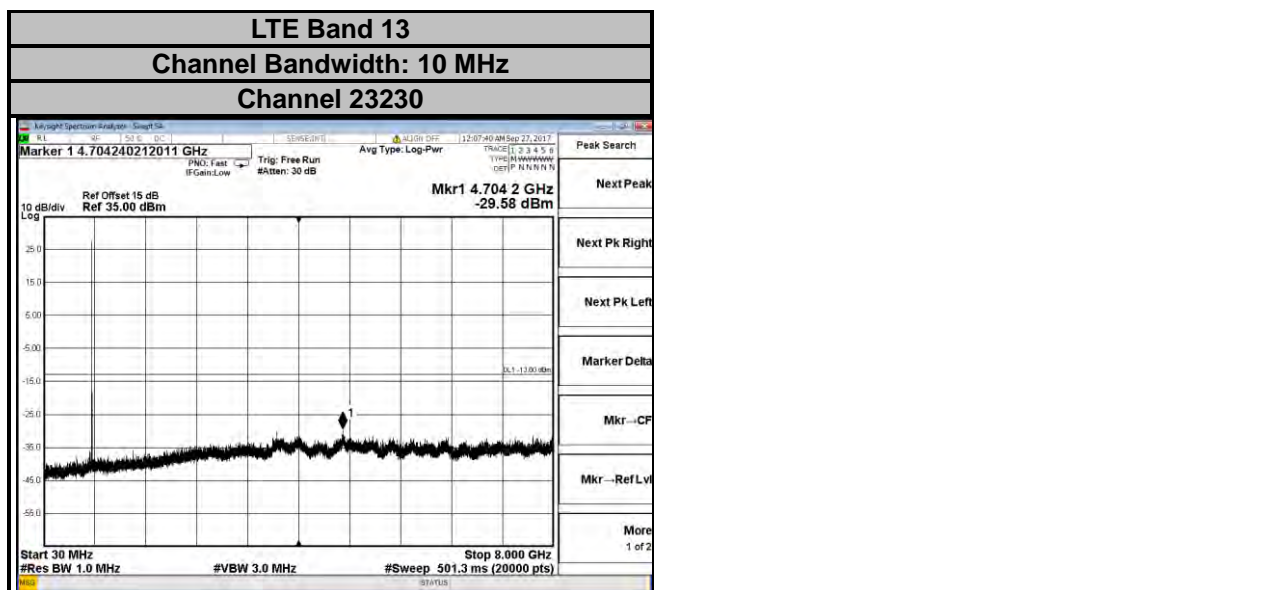
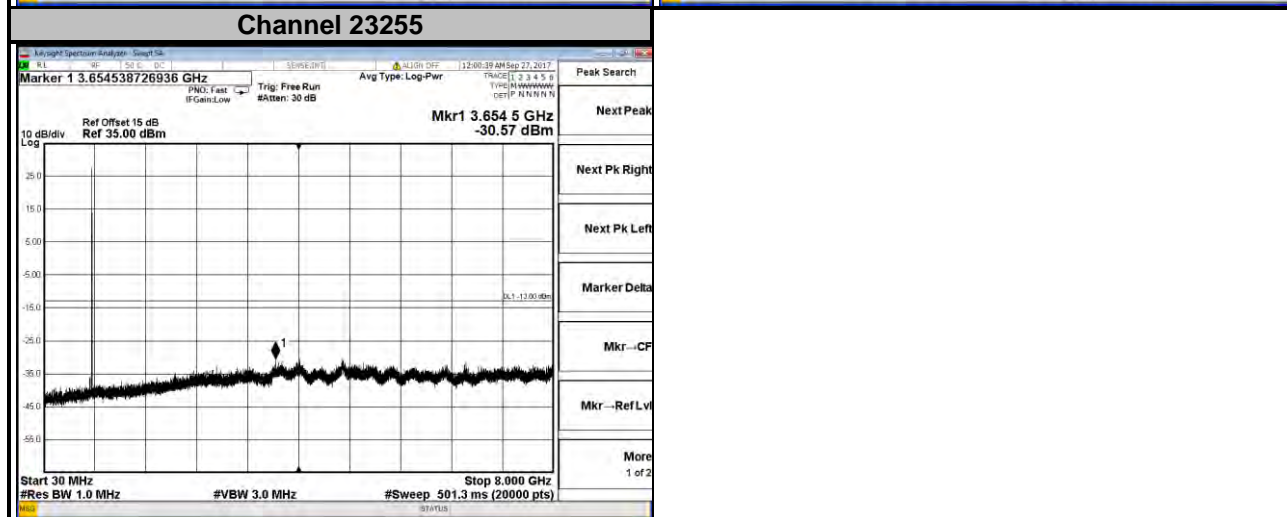
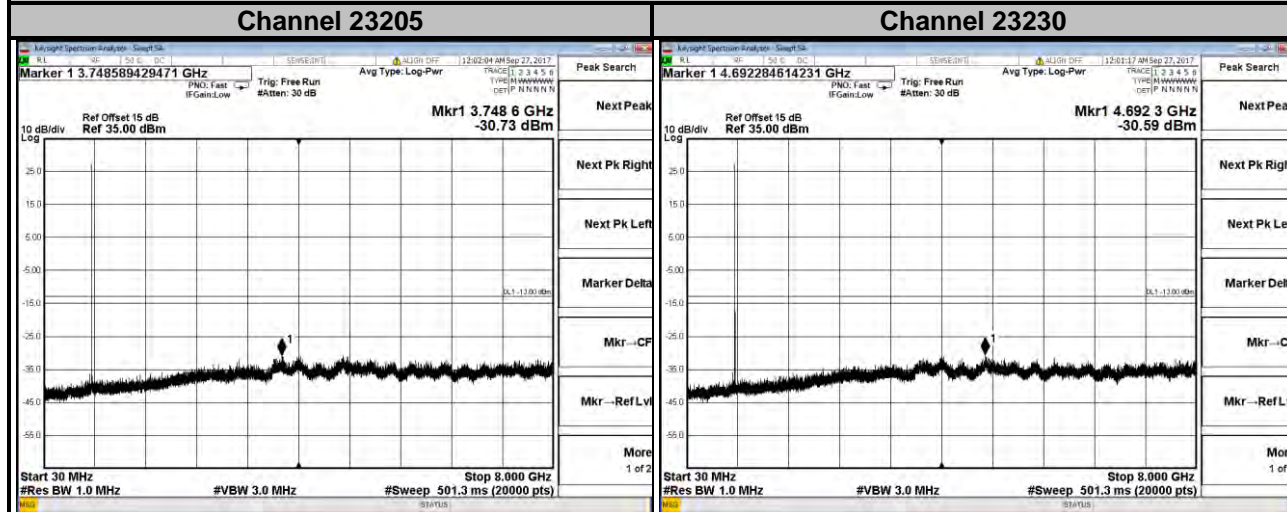


Channel 23130



LTE Band 13

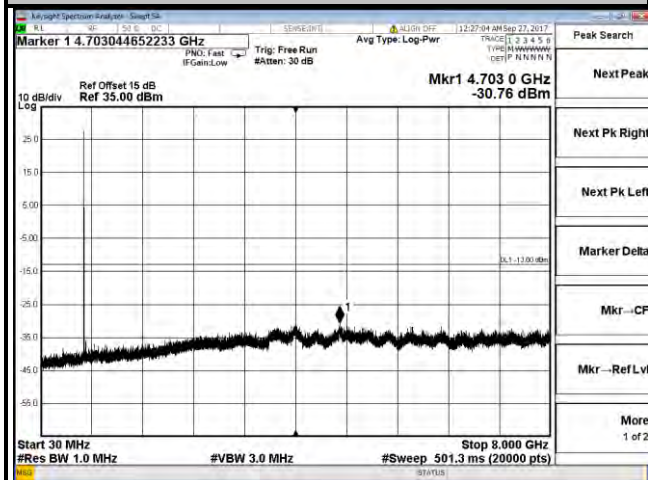
Channel Bandwidth: 5 MHz



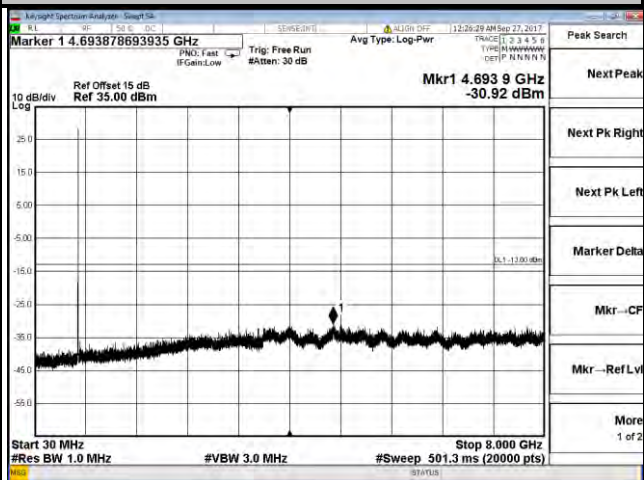
LTE Band 17

Channel Bandwidth: 5 MHz

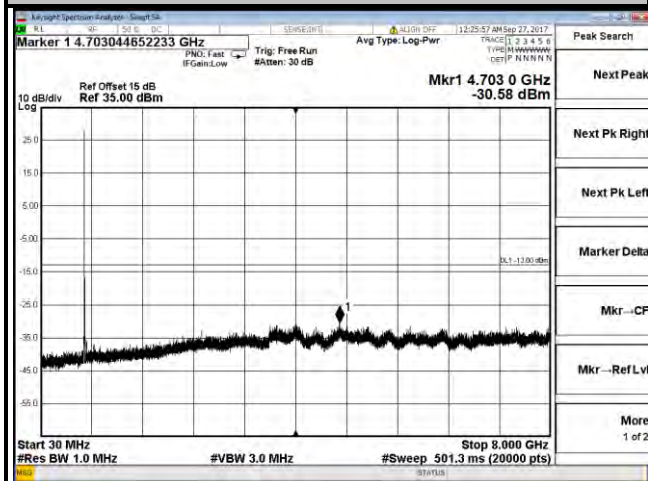
Channel 23755

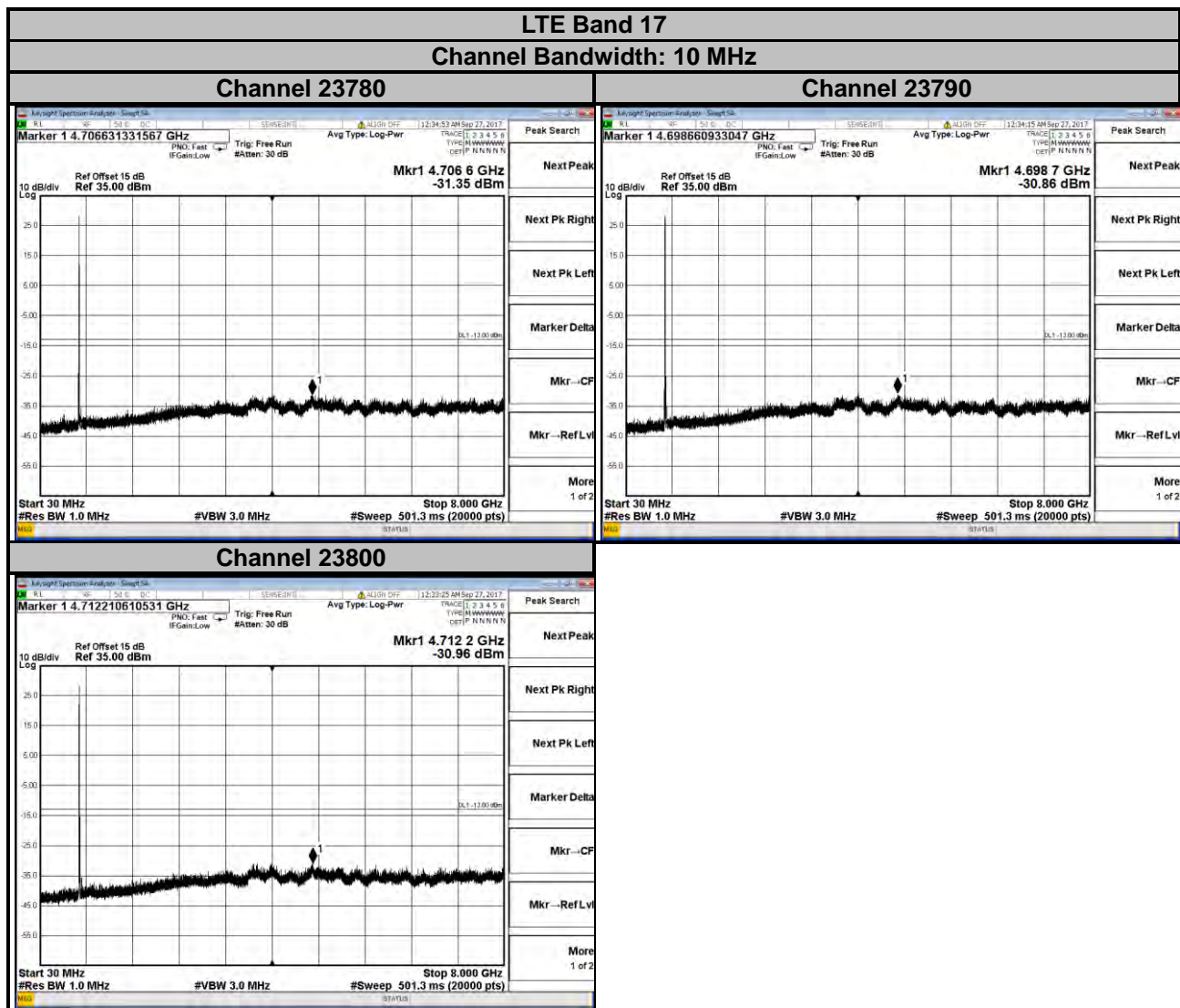


Channel 23790



Channel 23825





4.7 Radiated Emission Measurement

4.7.1 Limits of Radiated Emission Measurement

- a. The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}(P)$ dB. The limit of emission is equal to -13 dBm.
- b. For operations in the 775-788 MHz, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz. The limit of emissions is equal to -40 dBm.

4.7.2 Test Procedure

- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step a. Record the power level of S.G.
- c. $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}$.
- d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, $E.R.P \text{ power} = E.I.P.R \text{ power} - 2.15 \text{ dBi}$.

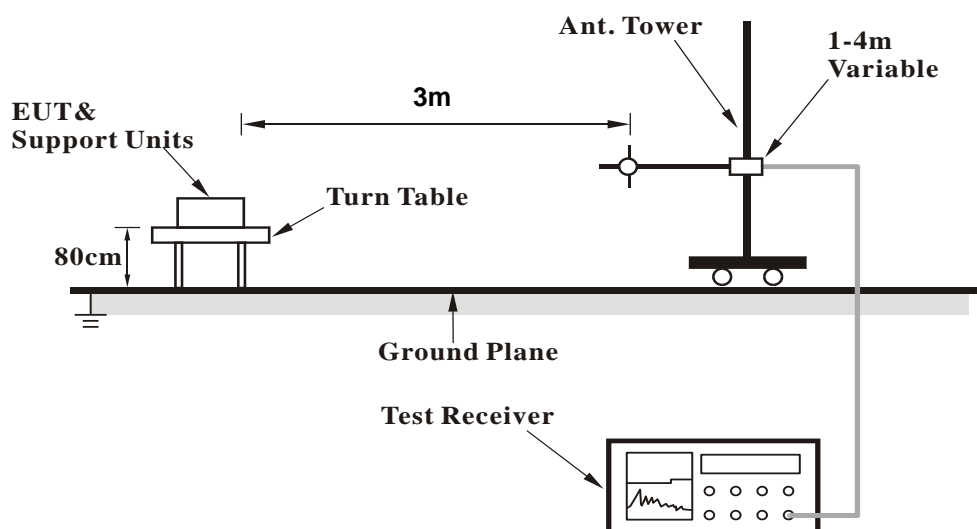
Note: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.7.3 Deviation from Test Standard

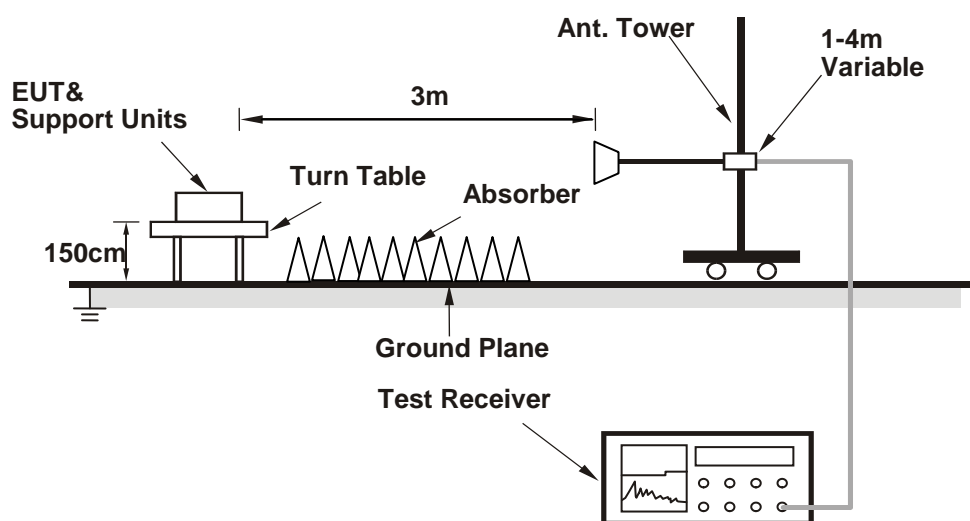
No deviation.

4.7.4 Test Setup

<Radiated Emission below or equal 1 GHz>



<Radiated Emission above 1 GHz>



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

4.7.5 Test Results

WCDMA:

Low Channel

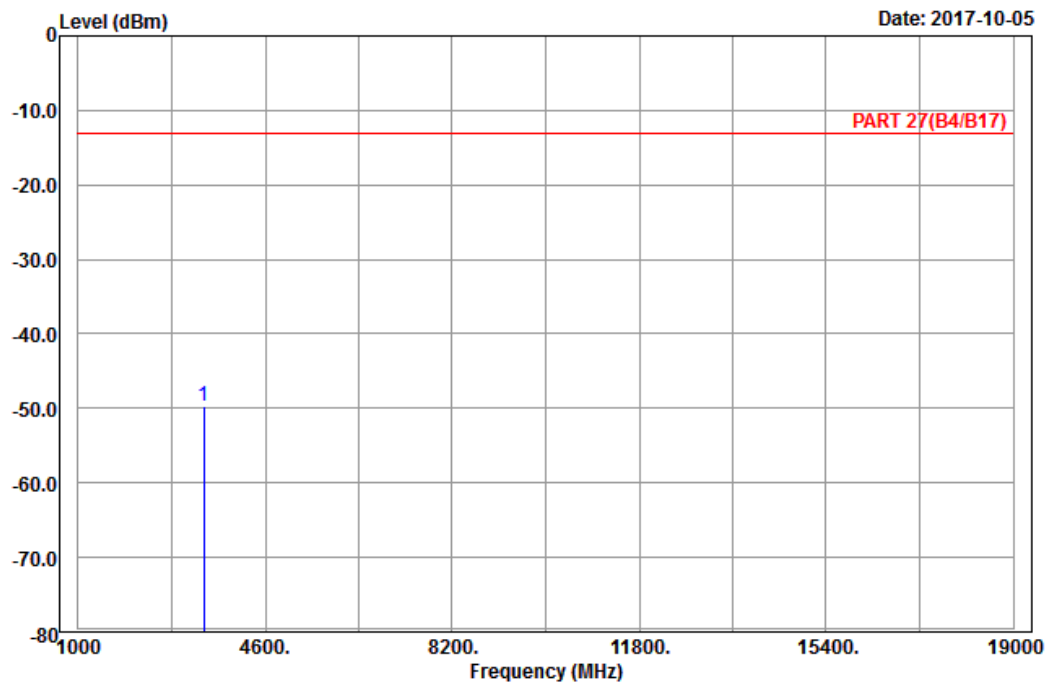


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2017-10-05



Site : 966 chamber 1

Condition: PART 27(B4/B17) Horizontal

Remark : Band IV_Link_CH1312

Tested by: Karl Lee

			Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark	
MHz	dBm	dBm	dBm	dB	dB		
1 pp 3424.80	-49.72	-64.09	-13.00	-36.72	14.37	Peak	

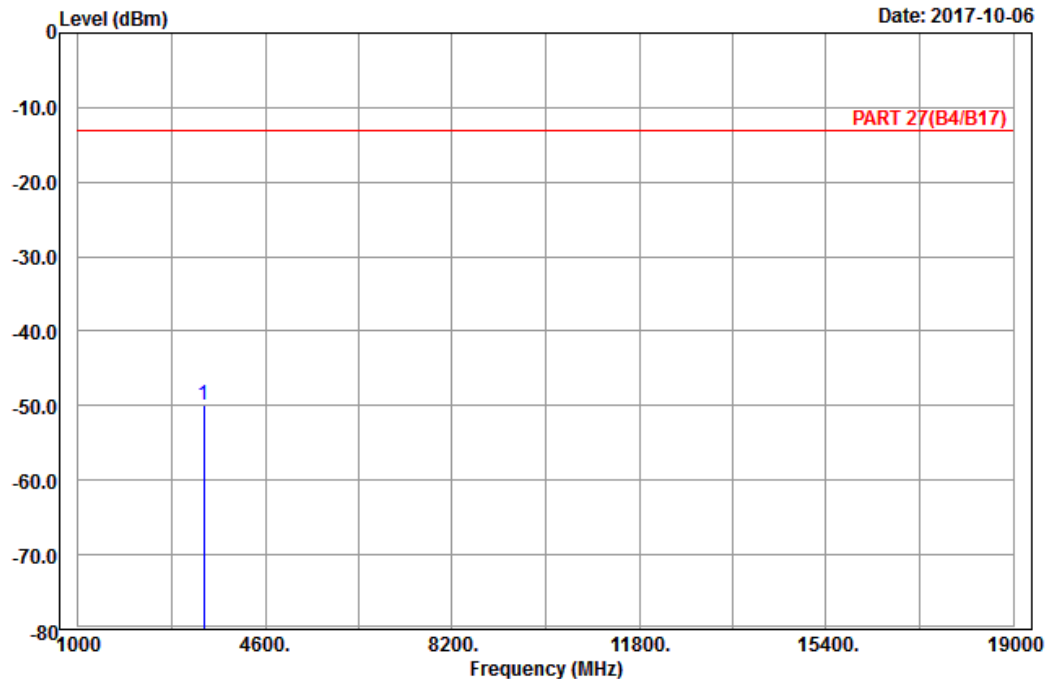


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2017-10-06



Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : Band IV_Link_CH1312
Tested by: Karl Lee

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3424.80	-50.03	-64.40	-13.00	-37.03	14.37	Peak

Middle Channel

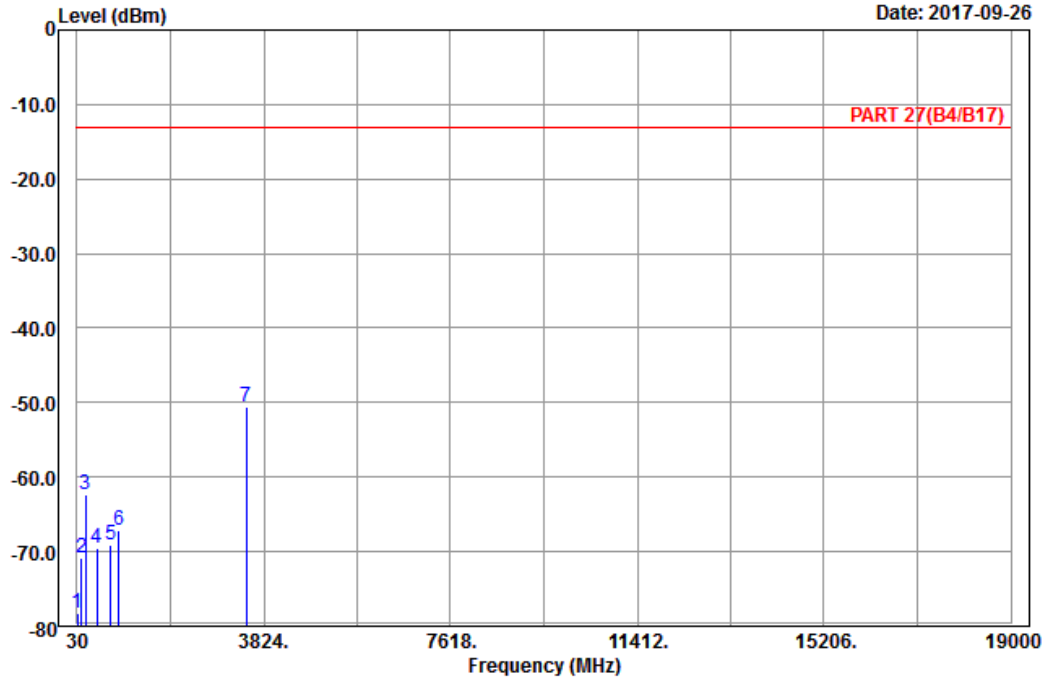


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 13

Date: 2017-09-26



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : Band IV_Link_CH1413
Tested by: Charles Hsiao

			Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	35.67	-78.22	-67.50	-13.00	-65.22	-10.72	Peak
2	118.29	-70.85	-62.47	-13.00	-57.85	-8.38	Peak
3	202.26	-62.30	-56.16	-13.00	-49.30	-6.14	Peak
4	430.20	-69.46	-66.04	-13.00	-56.46	-3.42	Peak
5	708.10	-69.18	-68.66	-13.00	-56.18	-0.52	Peak
6	885.20	-67.09	-69.56	-13.00	-54.09	2.47	Peak
7 pp	3465.20	-50.57	-64.91	-13.00	-37.57	14.34	Peak

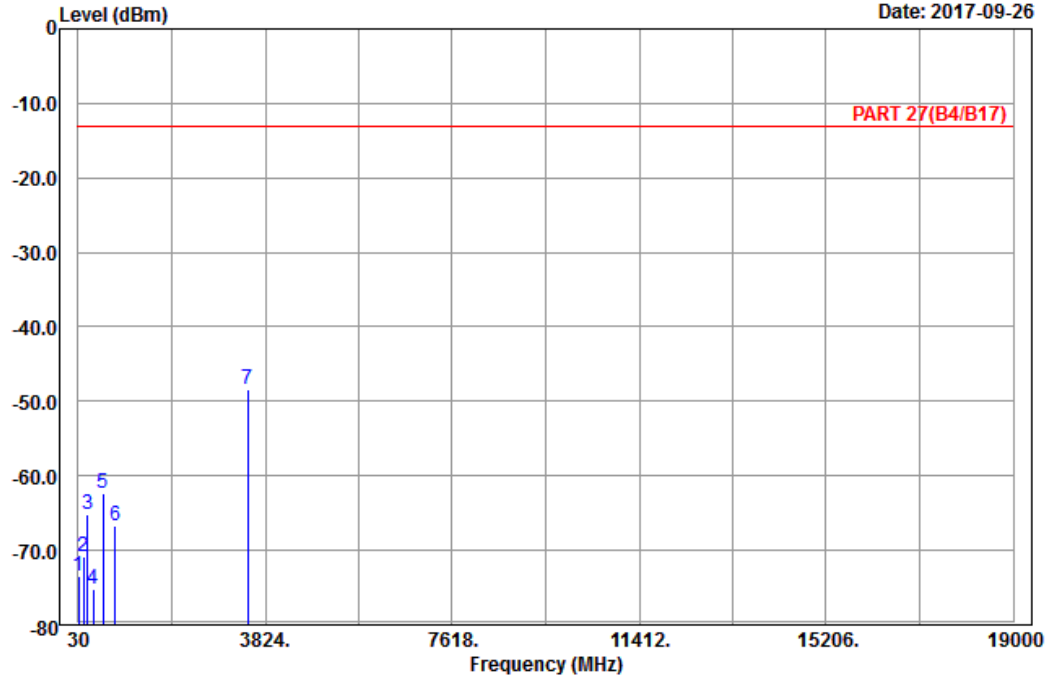


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 14

Date: 2017-09-26



Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : Band IV_Link_CH1413
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	38.10	-73.48	-63.51	-13.00	-60.48	-9.97	Peak
2	136.38	-70.75	-63.07	-13.00	-57.75	-7.68	Peak
3	221.70	-65.14	-59.26	-13.00	-52.14	-5.88	Peak
4	333.60	-75.17	-69.60	-13.00	-62.17	-5.57	Peak
5	528.90	-62.40	-59.18	-13.00	-49.40	-3.22	Peak
6	778.80	-66.68	-67.29	-13.00	-53.68	0.61	Peak
7 pp	3465.20	-48.41	-62.75	-13.00	-35.41	14.34	Peak

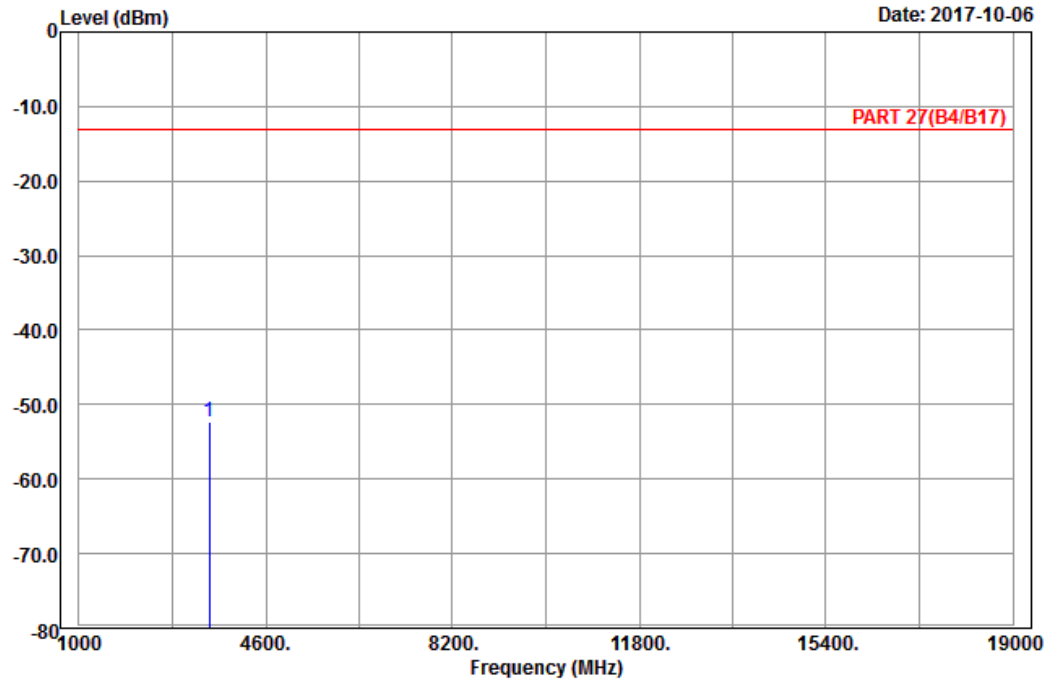
High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : Band IV_Link_CH1513
Tested by: Karl Lee

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3505.20	-52.35	-66.63	-13.00	-39.35	14.28	Peak

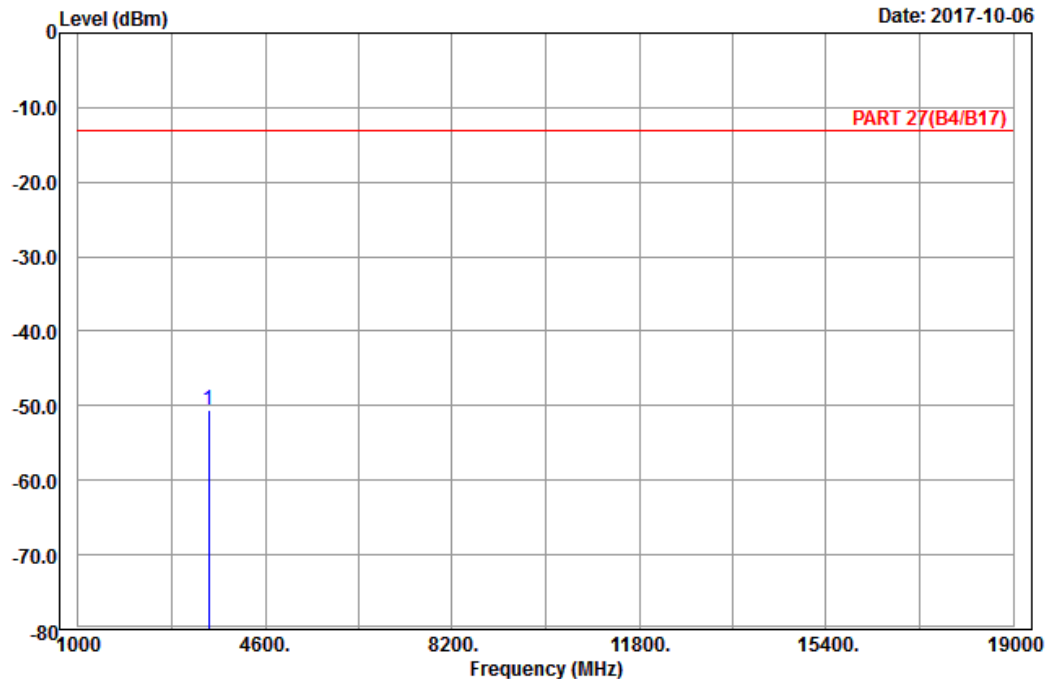


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2017-10-06



Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : Band IV_Link_CH1513
Tested by: Karl Lee

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3505.20	-50.49	-64.77	-13.00	-37.49	14.28	Peak

LTE Band 4
Channel Bandwidth: 20 MHz / QPSK
Low Channel

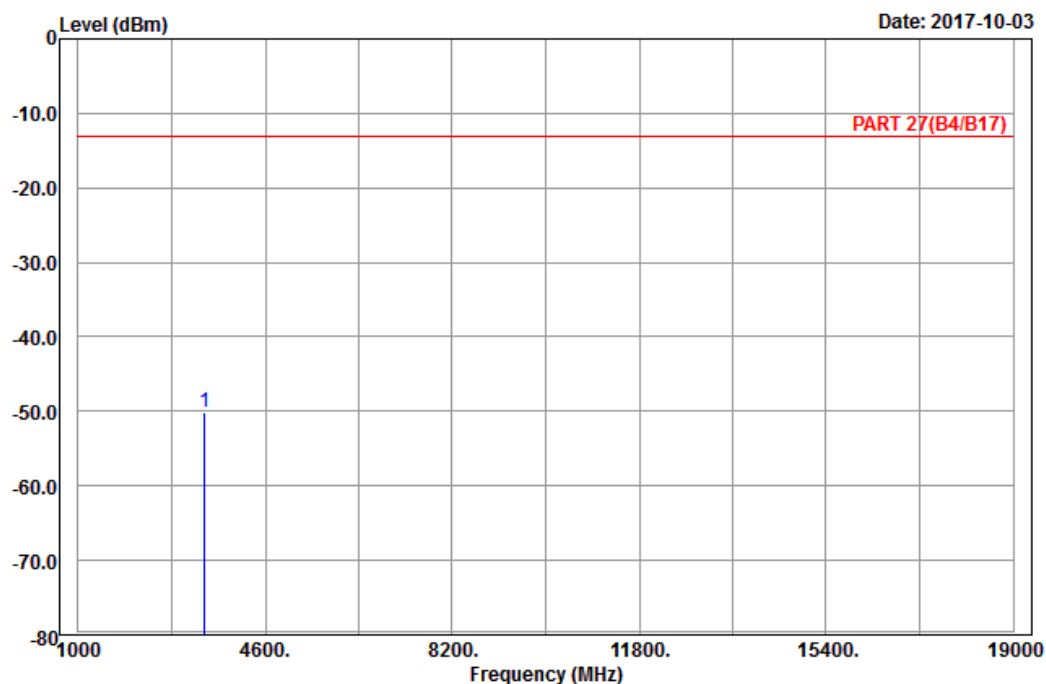


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2017-10-03



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : LTE_Band 4_Link_CH20050
Tested by: Charles Hsiao

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3440.00	-50.20	-64.55	-13.00	-37.20	14.35	Peak

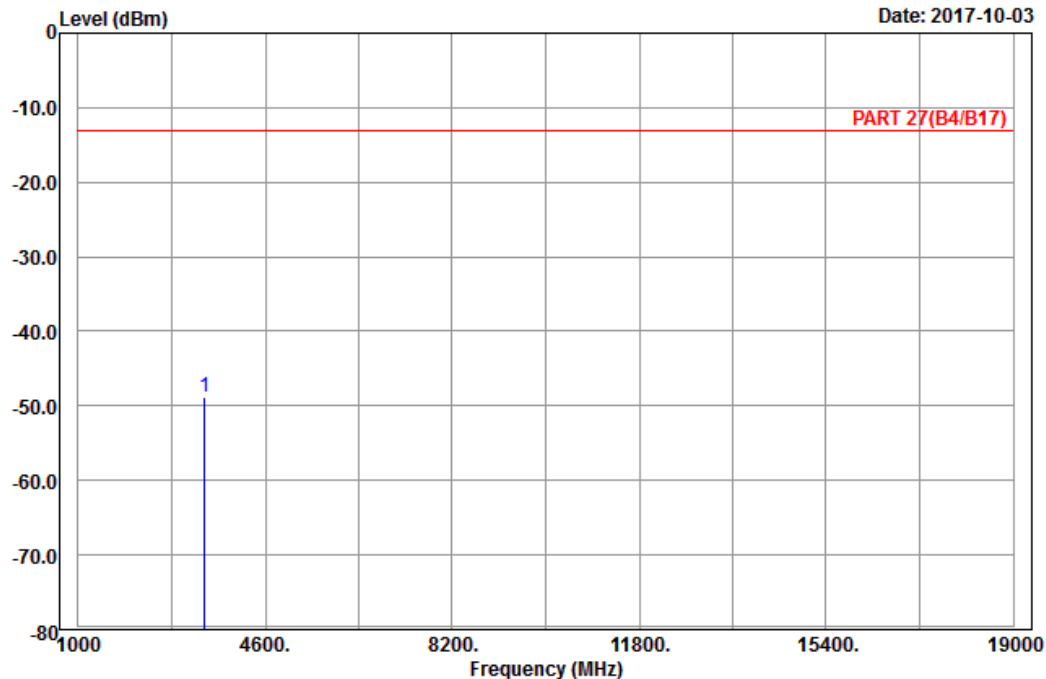


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2017-10-03



Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH20050
Tested by: Charles Hsiao

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3440.00	-48.83	-63.18	-13.00	-35.83	14.35	Peak

Middle Channel

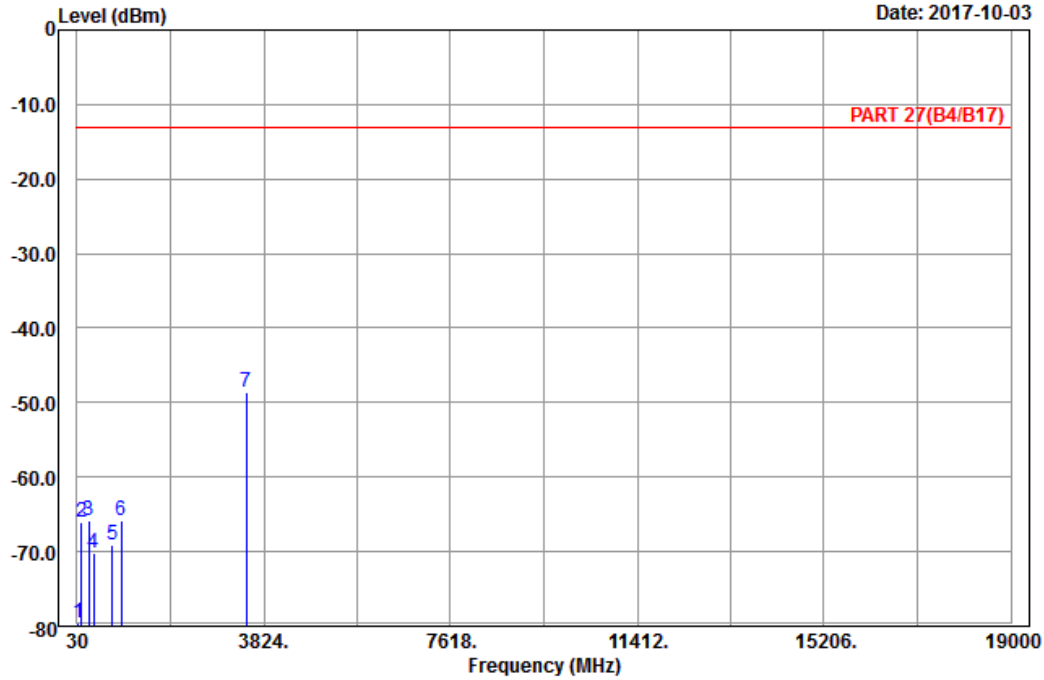


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 13

Date: 2017-10-03



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : LTE_Band 4_Link_CH20175
Tested by: Karl Lee

		Read	Limit	Over			
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	53.49	-79.62	-65.56	-13.00	-66.62	-14.06	Peak
2	127.47	-66.03	-58.20	-13.00	-53.03	-7.83	Peak
3	263.28	-65.83	-60.21	-13.00	-52.83	-5.62	Peak
4	373.50	-70.14	-66.00	-13.00	-57.14	-4.14	Peak
5	752.20	-69.11	-67.99	-13.00	-56.11	-1.12	Peak
6	925.80	-65.94	-70.00	-13.00	-52.94	4.06	Peak
7 pp	3465.00	-48.57	-62.91	-13.00	-35.57	14.34	Peak

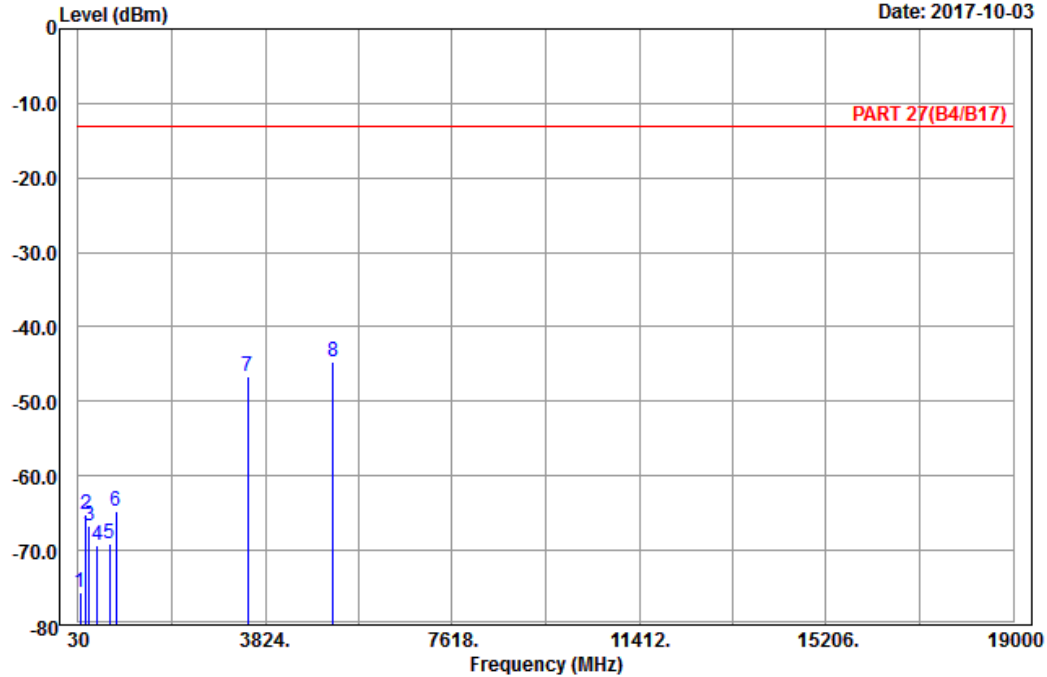


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 14

Date: 2017-10-03



Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH20175
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	64.83	-75.67	-62.29	-13.00	-62.67	-13.38	Peak
2	193.35	-65.12	-59.25	-13.00	-52.12	-5.87	Peak
3	254.64	-66.63	-61.08	-13.00	-53.63	-5.55	Peak
4	416.90	-69.27	-66.15	-13.00	-56.27	-3.12	Peak
5	659.80	-69.02	-68.84	-13.00	-56.02	-0.18	Peak
6	804.70	-64.74	-66.70	-13.00	-51.74	1.96	Peak
7	3465.00	-46.69	-61.03	-13.00	-33.69	14.34	Peak
8 pp	5197.50	-44.74	-64.86	-13.00	-31.74	20.12	Peak

High Channel

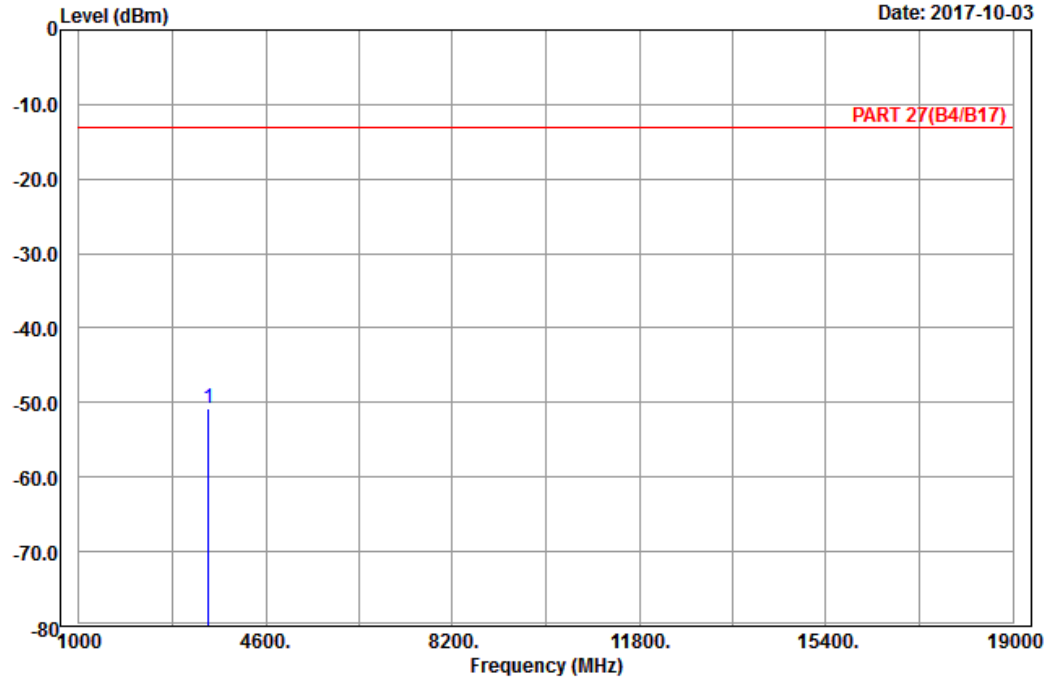


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2017-10-03



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : LTE_Band 4_Link_CH20300
Tested by: Karl Lee

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3490.00	-50.87	-65.18	-13.00	-37.87	14.31	Peak

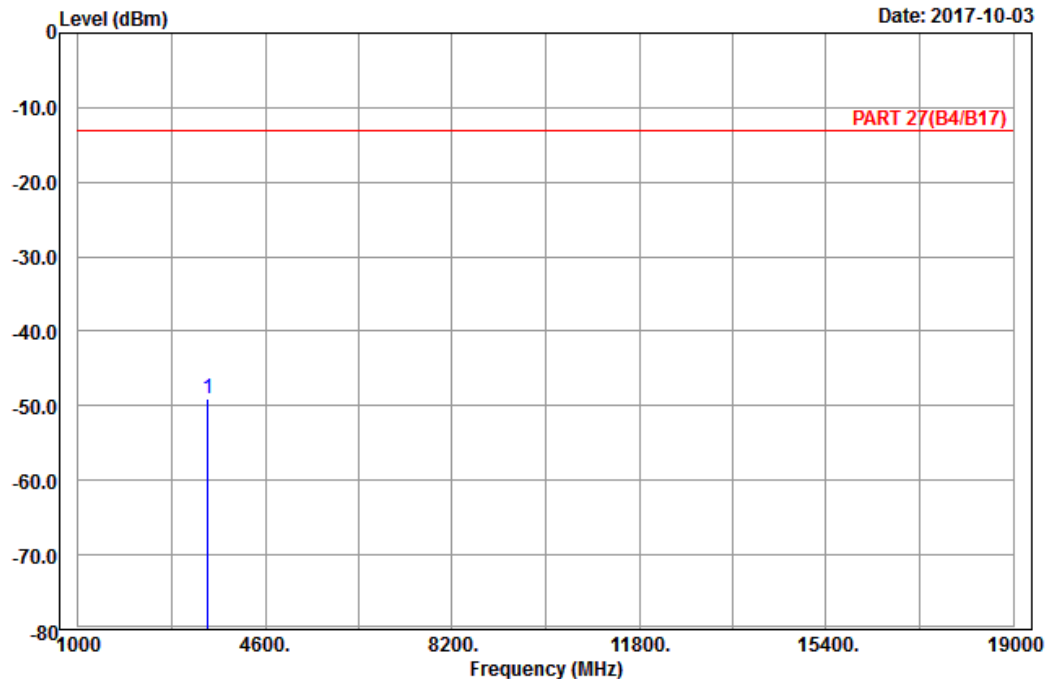


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2017-10-03



Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 4_Link_CH20300
Tested by: Karl Lee

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 3490.00	-49.02	-63.33	-13.00	-36.02	14.31	Peak

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

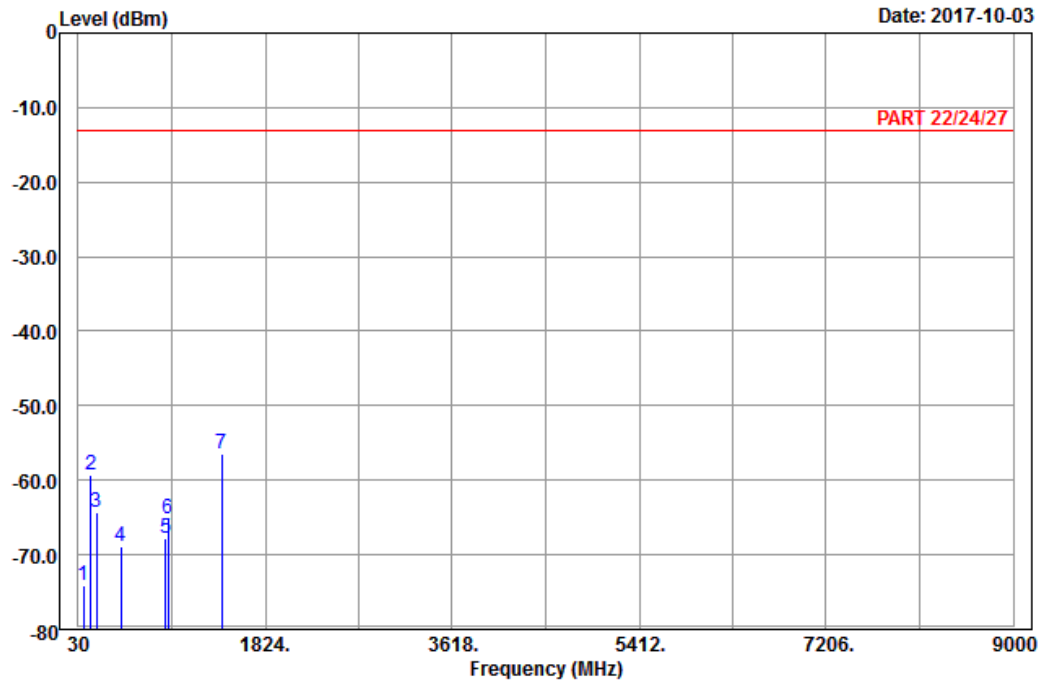


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2017-10-03



Site : 966 chamber 1
Condition: PART 22/24/27 Horizontal
Remark : LTE_Band 12_Link_CH23060
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	82.11	-74.10	-62.55	-13.00	-61.10	-11.55	Peak
2	149.34	-59.32	-51.39	-13.00	-46.32	-7.93	Peak
3	207.12	-64.25	-58.17	-13.00	-51.25	-6.08	Peak
4	436.50	-68.80	-65.25	-13.00	-55.80	-3.55	Peak
5	869.80	-67.77	-69.80	-13.00	-54.77	2.03	Peak
6	894.30	-65.18	-67.90	-13.00	-52.18	2.72	Peak
7 pp	1408.00	-56.48	-62.84	-13.00	-43.48	6.36	Peak

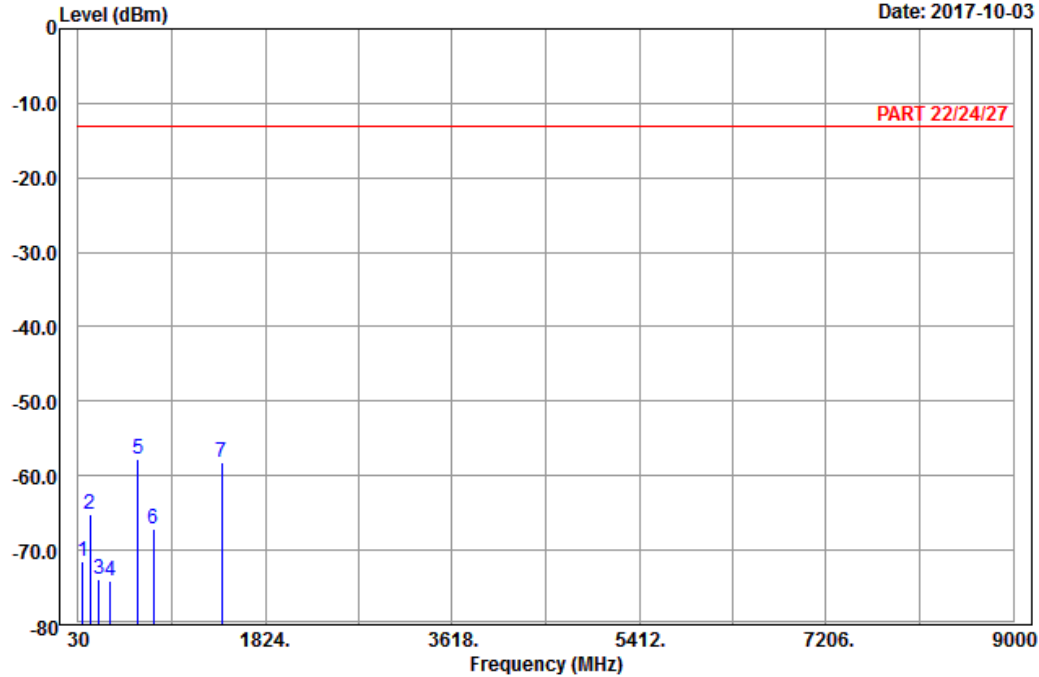


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2017-10-03



Site : 966 chamber 1
Condition: PART 22/24/27 Vertical
Remark : LTE_Band 12_Link_CH23060
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	71.58	-71.59	-59.07	-13.00	-58.59	-12.52	Peak
2	145.29	-65.24	-57.41	-13.00	-52.24	-7.83	Peak
3	228.45	-73.83	-68.04	-13.00	-60.83	-5.79	Peak
4	342.00	-74.20	-68.73	-13.00	-61.20	-5.47	Peak
5 pp	599.60	-57.81	-58.20	-13.00	-44.81	0.39	Peak
6	749.40	-67.12	-65.81	-13.00	-54.12	-1.31	Peak
7	1408.00	-58.18	-64.54	-13.00	-45.18	6.36	Peak

Middle Channel

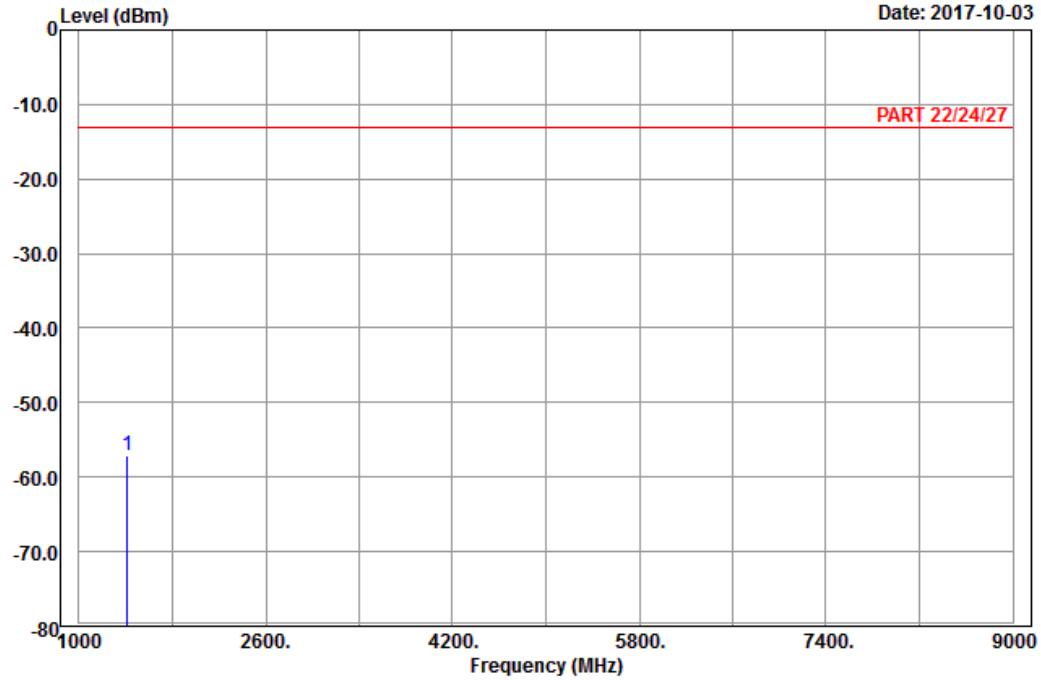


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5

Date: 2017-10-03



Site : 966 chamber 1
Condition: PART 22/24/27 Horizontal
Remark : LTE_Band 12_Link_CH23095
Tested by: Karl Lee

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 1415.00	-57.04	-63.40	-13.00	-44.04	6.36	Peak

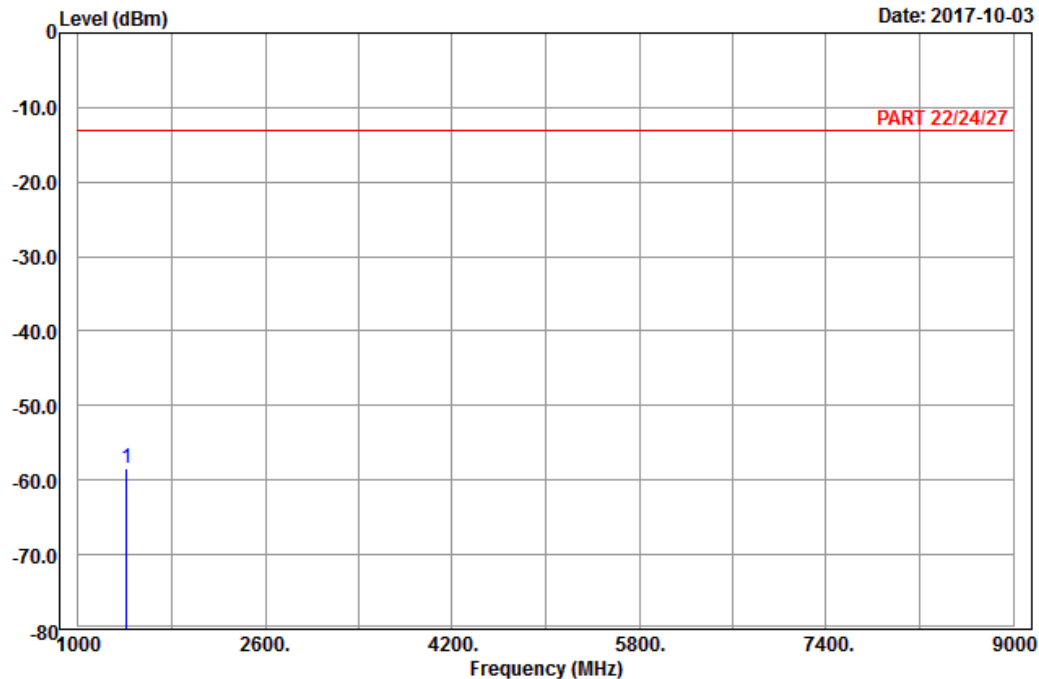


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 6

Date: 2017-10-03



Site : 966 chamber 1
Condition: PART 22/24/27 Vertical
Remark : LTE_Band 12_Link_CH23095
Tested by: Karl Lee

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 1415.00	-58.38	-64.74	-13.00	-45.38	6.36	Peak

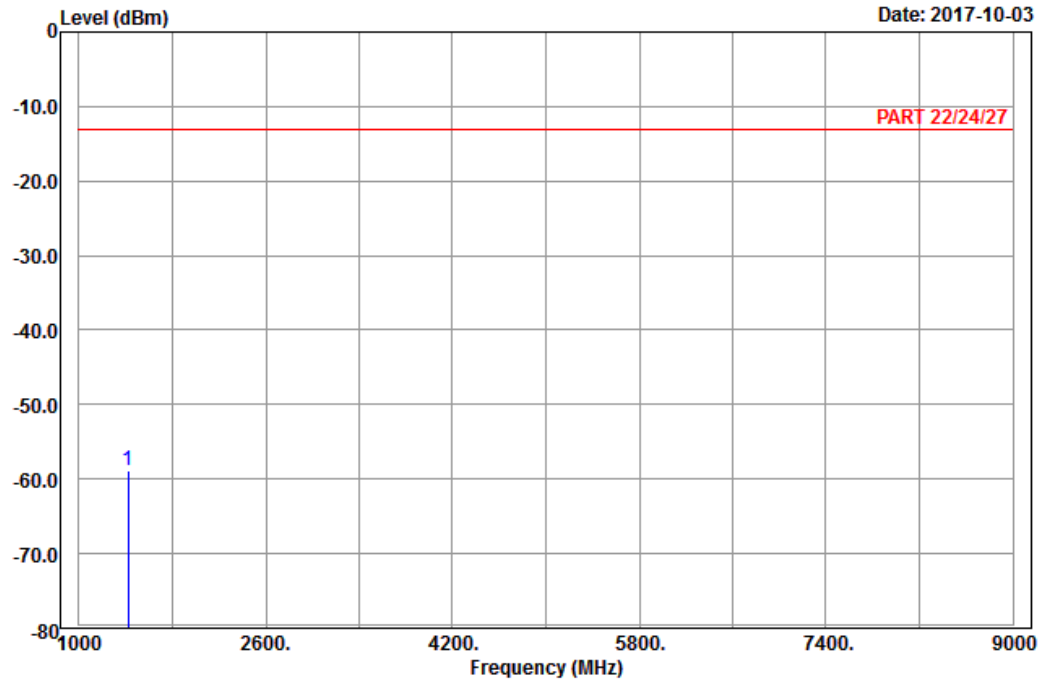
High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5



Site : 966 chamber 1
 Condition: PART 22/24/27 Horizontal
 Remark : LTE_Band 12_Link_CH23130
 Tested by: Karl Lee

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 1422.00	-58.76	-65.12	-13.00	-45.76	6.36	Peak

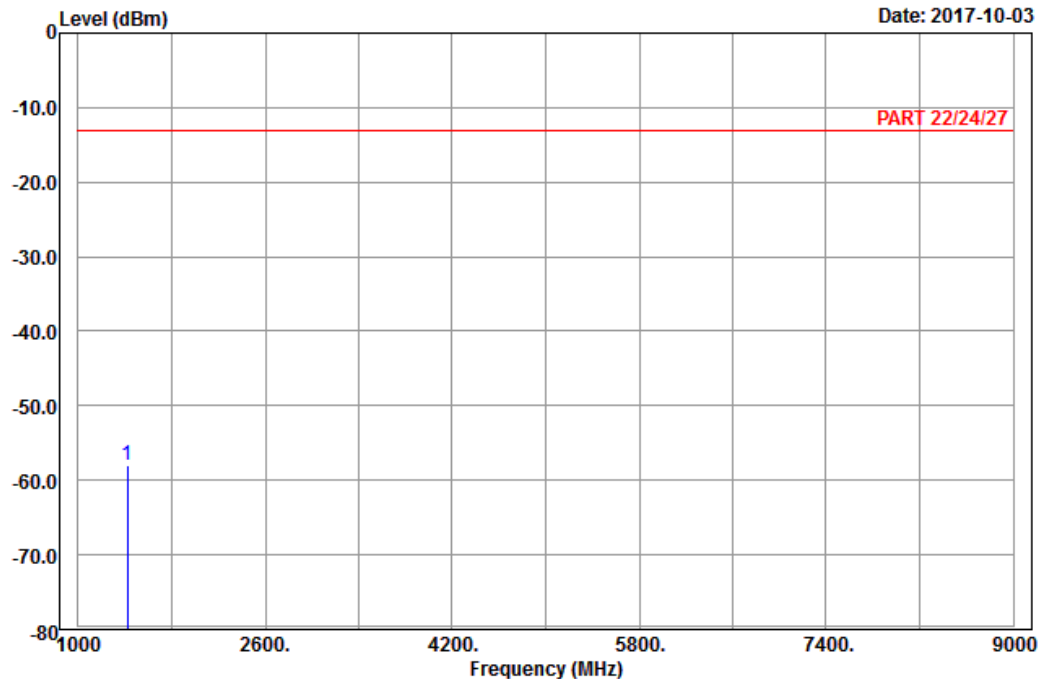


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 6

Date: 2017-10-03



Site : 966 chamber 1
Condition: PART 22/24/27 Vertical
Remark : LTE_Band 12_Link_CH23130
Tested by: Karl Lee

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 1422.00	-57.97	-64.33	-13.00	-44.97	6.36	Peak

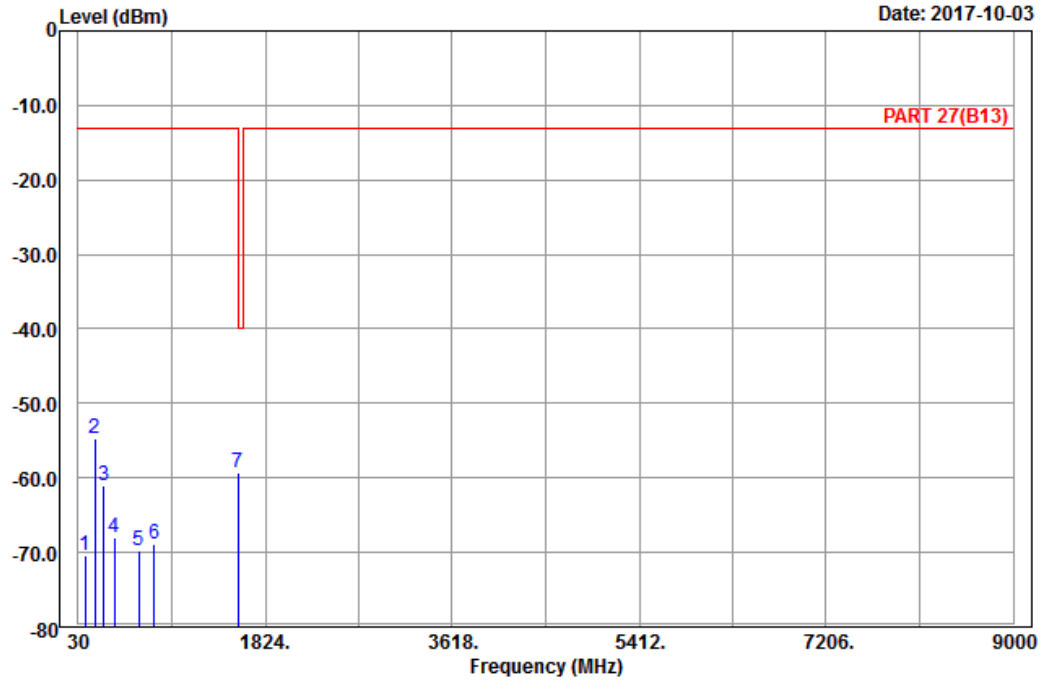
LTE Band 13
Channel Bandwidth: 10 MHz / QPSK



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9



Site : 966 chamber 1
Condition: PART 27(B13) Horizontal
Remark : LTE_Band 13_Link_CH23230
Tested by: Karl Lee

		Read	Limit	Over			
	Freq	Level	Level	Line	Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	98.58	-70.42	-60.24	-13.00	-57.42	-10.18	Peak
2	190.65	-54.63	-48.85	-13.00	-41.63	-5.78	Peak
3	275.16	-60.94	-55.20	-13.00	-47.94	-5.74	Peak
4	374.90	-68.02	-63.99	-13.00	-55.02	-4.03	Peak
5	614.30	-69.71	-69.98	-13.00	-56.71	0.27	Peak
6	756.40	-68.80	-67.94	-13.00	-55.80	-0.86	Peak
7 pp	1564.00	-59.32	-66.18	-40.00	-19.32	6.86	Peak

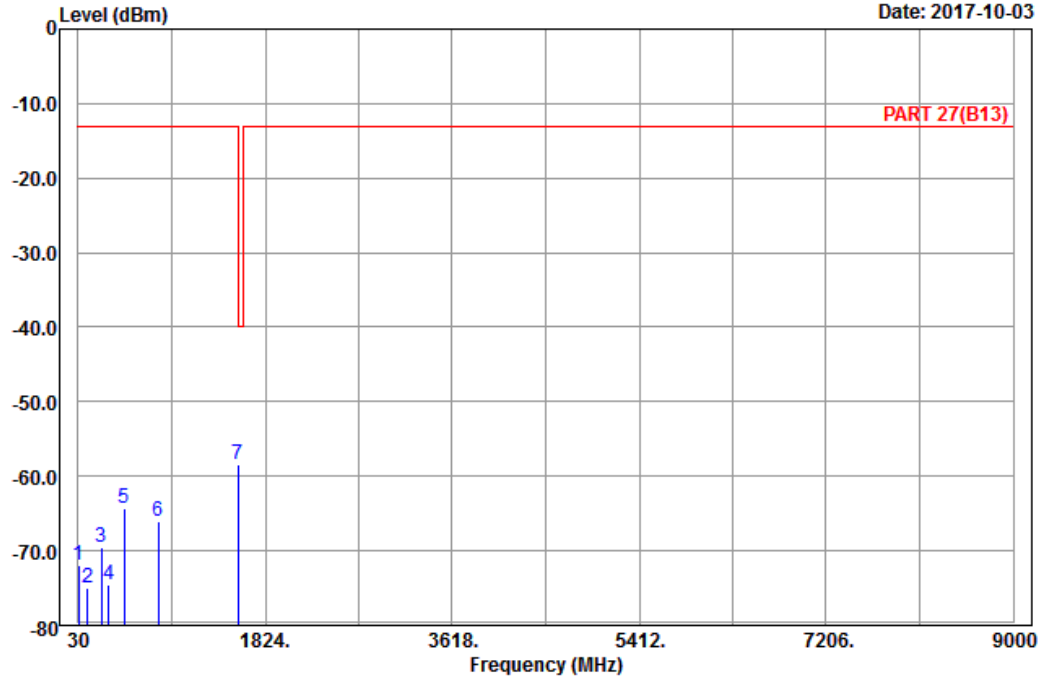


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2017-10-03



Site : 966 chamber 1
Condition: PART 27(B13) Vertical
Remark : LTE_Band 13_Link_CH23230
Tested by: Karl Lee

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	35.67	-71.99	-61.27	-13.00	-58.99	-10.72	Peak
2	122.34	-74.95	-66.82	-13.00	-61.95	-8.13	Peak
3	252.75	-69.59	-64.06	-13.00	-56.59	-5.53	Peak
4	321.70	-74.61	-68.91	-13.00	-61.61	-5.70	Peak
5	473.60	-64.25	-59.74	-13.00	-51.25	-4.51	Peak
6	796.30	-65.99	-67.75	-13.00	-52.99	1.76	Peak
7 pp	1564.00	-58.50	-65.36	-40.00	-18.50	6.86	Peak

LTE Band 17
Channel Bandwidth: 10 MHz / QPSK
Low Channel

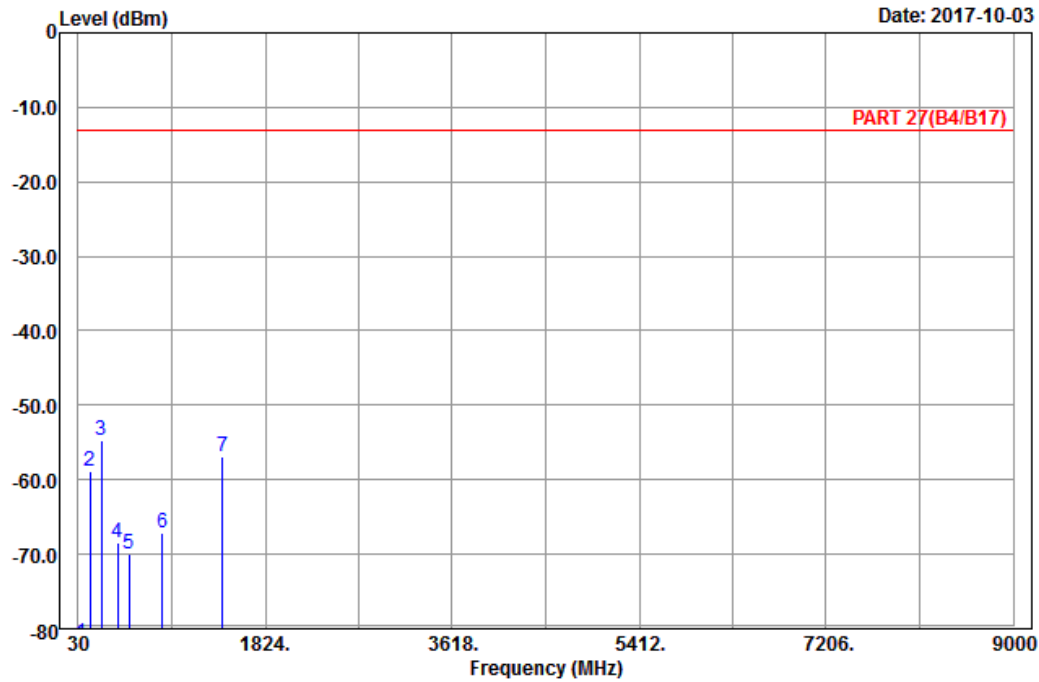


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2017-10-03



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : LTE_Band 17_Link_CH23780
Tested by: Charles Hsiao

		Read	Limit	Over		
	Freq	Level	Level	Line	Limit	Factor Remark
	MHz	dBm	dBm	dBm	dB	dB
1	63.48	-82.01	-68.50	-13.00	-69.01	-13.51 Peak
2	139.35	-58.94	-51.25	-13.00	-45.94	-7.69 Peak
3 pp	249.78	-54.69	-49.18	-13.00	-41.69	-5.51 Peak
4	409.20	-68.43	-65.48	-13.00	-55.43	-2.95 Peak
5	517.70	-70.02	-66.02	-13.00	-57.02	-4.00 Peak
6	840.40	-67.14	-68.70	-13.00	-54.14	1.56 Peak
7	1418.00	-56.86	-63.22	-13.00	-43.86	6.36 Peak

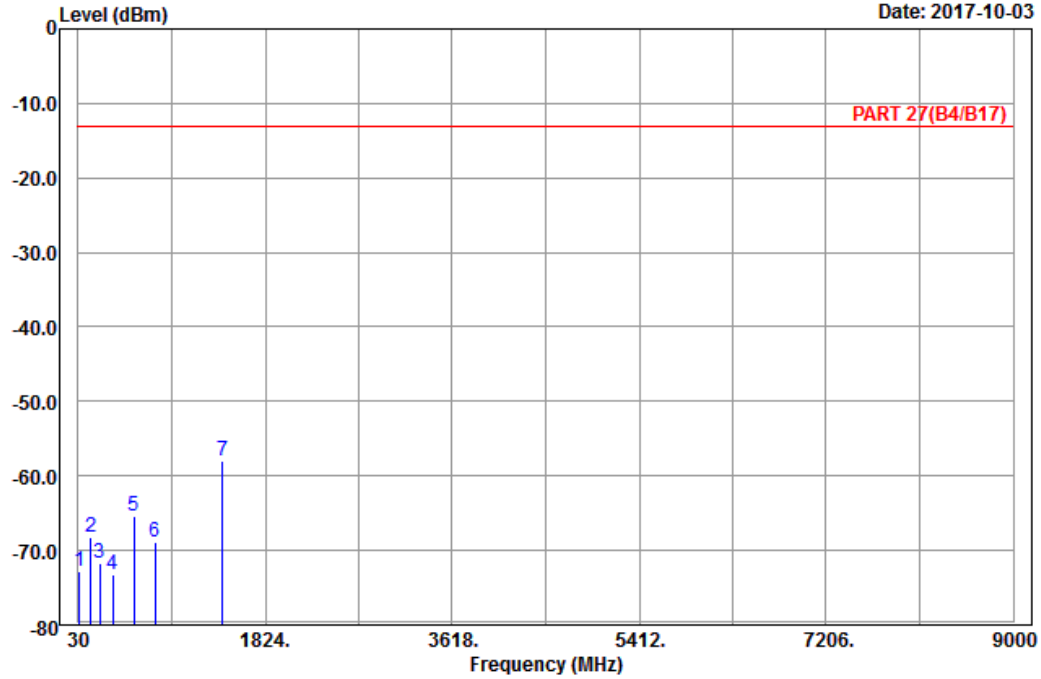


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2017-10-03



Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 17_Link_CH23780
Tested by: Charles Hsiao

	Freq	Level	Read Level	Limit Line	Over Limit	Factor	Remark
	MHz	dBm	dBm	dBm	dB	dB	
1	39.72	-72.81	-63.60	-13.00	-59.81	-9.21	Peak
2	150.96	-68.18	-60.26	-13.00	-55.18	-7.92	Peak
3	233.04	-71.75	-66.01	-13.00	-58.75	-5.74	Peak
4	365.10	-73.28	-68.68	-13.00	-60.28	-4.60	Peak
5	567.40	-65.34	-64.40	-13.00	-52.34	-0.94	Peak
6	766.20	-68.87	-68.65	-13.00	-55.87	-0.22	Peak
7 pp	1418.00	-57.89	-64.25	-13.00	-44.89	6.36	Peak

Middle Channel

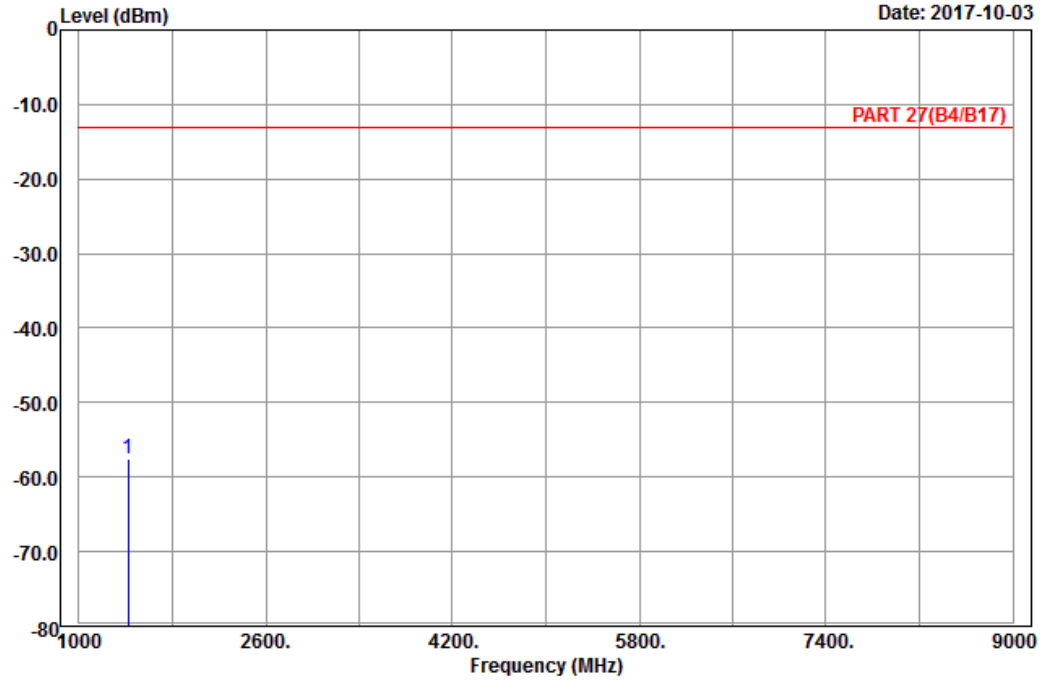


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5

Date: 2017-10-03



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : LTE_Band 17_Link_CH23790
Tested by: Charles Hsiao

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 1420.00	-57.51	-63.87	-13.00	-44.51	6.36	Peak

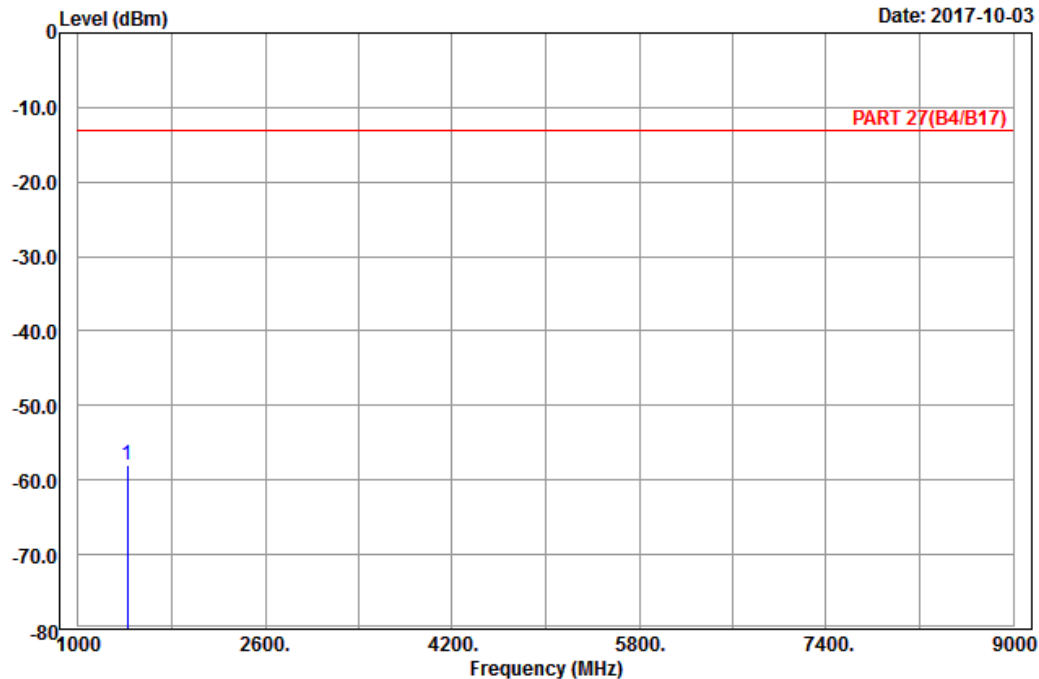


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 6

Date: 2017-10-03



Site : 966 chamber 1
 Condition: PART 27(B4/B17) Vertical
 Remark : LTE_Band 17_Link_CH23790
 Tested by: Charles Hsiao

			Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark	
MHz	dBm	dBm	dBm	dB	dB		
1 pp 1420.00	-57.94	-64.30	-13.00	-44.94	6.36	Peak	

High Channel

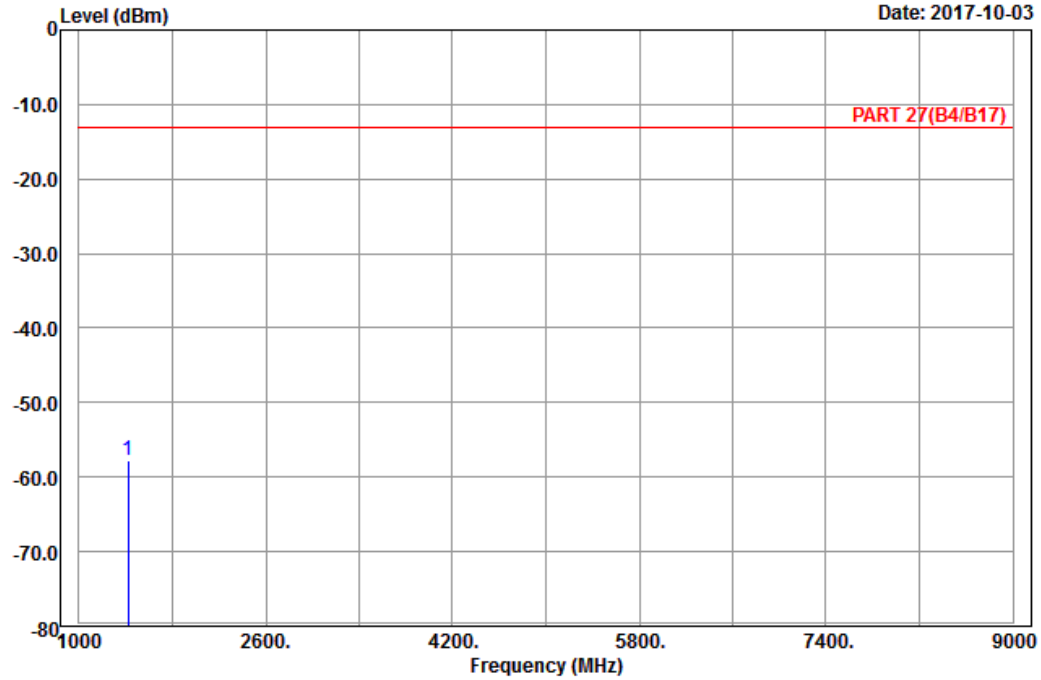


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 5

Date: 2017-10-03



Site : 966 chamber 1
Condition: PART 27(B4/B17) Horizontal
Remark : LTE_Band 17_Link_CH23800
Tested by: Charles Hsiao

		Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark
MHz	dBm	dBm	dBm	dB	dB	
1 pp 1422.00	-57.84	-64.20	-13.00	-44.84	6.36	Peak

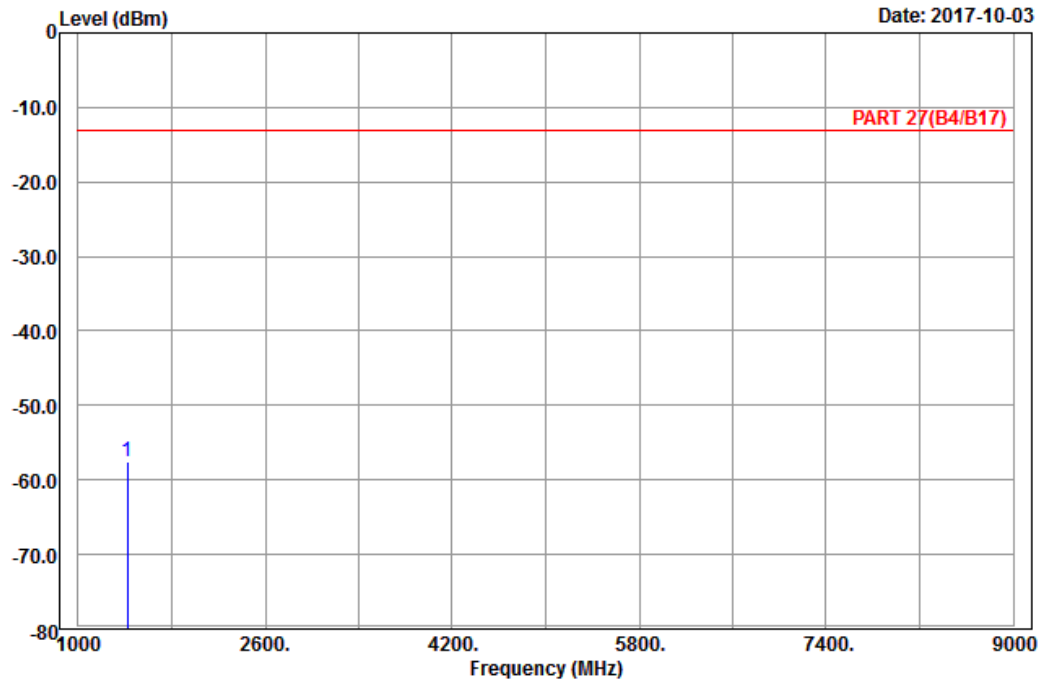


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 6

Date: 2017-10-03



Site : 966 chamber 1
Condition: PART 27(B4/B17) Vertical
Remark : LTE_Band 17_Link_CH23800
Tested by: Charles Hsiao

			Read	Limit	Over		
Freq	Level	Level	Line	Limit	Factor	Remark	
MHz	dBm	dBm	dBm	dB	dB		
1 pp 1422.00	-57.46	-63.82	-13.00	-44.46	6.36	Peak	

5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

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Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

--- END ---