

FCC REPORT

(LTE)

Applicant: Prometheus Group LLC

Address of Applicant: P.O. Box 130100 birmingham, Alabama 35213-0100 USA.

Equipment Under Test (EUT)

Product Name: Hunting Camera

Model No.: BTC-DWC-VZW, BTC-SFW-VZW

Trade mark: BROWNING

FCC ID: 2ALGTBTC-DWC-VZW

FCC CFR Title 47 Part 2

Applicable standards: FCC CFR Title 47 Part 27 Subpart L
FCC CFR Title 47 Part 27 Subpart E

Date of sample receipt: 19 Nov., 2019

Date of Test: 20 Nov., to 09 Dec., 2019

Date of report issued: 10 Dec., 2019

Test Result: PASS*

*In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Bruce Zhang
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the CCIS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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2. Version

Version No.	Date	Description
00	10 Dec., 2019	Original

Tested by: Janet Wei **Date:** 10 Dec., 2019
Test Engineer

Reviewed by: Winner Zhang **Date:** 10 Dec., 2019
Project Engineer

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4. Test Summary

Test Items	Section in CFR 47	Result
RF Exposure (SAR)	Part 1.1307 Part 2.1093	Passed (Please refer to SAR Report)
RF Output Power	Part 2.1046 Part 27.50 (d)(4) Part 27.50 (b)(10)	Pass
Peak-to-Average Ratio	Part 27.50(d)(5)	Pass
Modulation Characteristics	Part 2.1047	Pass
99% & -26 dB Occupied Bandwidth	Part 2.1049 Part 27.53(h) Part 27.53(c)	Pass
Out of band emission at antenna terminals	Part 2.1053 Part 27.53 (h) Part 27.53(c)	Pass
Field strength of spurious radiation	Part 27.53 (h) Part 27.53(c)(f)	Pass
Frequency stability vs. temperature	Part 27.54 Part 2.1055(a)(1)(b)	Pass
Frequency stability vs. voltage	Part 27.54 Part 2.1055(d)(2)	Pass
Remark:		
<ol style="list-style-type: none"> 1. Pass: The EUT complies with the essential requirements in the standard. 2. The cable insertion loss used by "RF Output Power" and other conduction measurement items is 0.5dB (provided by the customer). 		
Test Method:	ANSI/TIA-603-E-2016 ANSI C63.26-2015	

5. General Information

5.1 Client Information

Applicant:	Prometheus Group LLC
Address:	P.O. Box 130100 Birmingham, Alabama 35213-0100 USA.
Manufacturer:	Systech Electronics Limited
Address:	Unit 802, 8/F, Sunbeam Centre, 27 Shing Yip Street, Kwun Tong, Kowloon, Hong Kong.

5.2 General Description of E.U.T.

Product Name:	Hunting Camera
Model No.:	BTC-DWC-VZW, BTC-SFW-VZW
Operation Frequency range:	LTE Band 4:TX: 1710MHz-1755MHz, RX: 2110MHz-2155MHz LTE Band 13: TX:777MHz-787MHz, RX: 746MHz-756MHz
Modulation type:	QPSK, 16QAM
Antenna type:	Internal Antenna
Antenna gain:	LTE Band4:1.93dBi LTE Band 13:1.03dBi
Power supply:	DC12V OR POWER SOURCE: 8x1.5AA x 2 Battery
Test Sample Condition:	The applicant provided engineering samples for staying in continuously transmitting for testing.
Remark:	The No.: BTC-DWC-VZW, BTC-SFW-VZW were identical inside, the electrical circuit design, layout, components used and internal wiring, with only model number is different for the marketing requirement.

Operation Frequency List:

LTE Band 4(1.4MHz)		LTE Band 4(3MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
19957	1710.70	19965	1711.50
19958	1710.80	19966	1711.60
....
20174	1732.40	20174	1732.40
20175	1732.50	20175	1732.50
20176	1732.60	20176	1732.60
...
20392	1754.20	20384	1753.40
20393	1754.30	20385	1753.50
LTE Band 4(5MHz)		LTE Band 4(10MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
19975	1712.50	20000	1715.00
19976	1712.60	20001	1715.10
....
20174	1732.40	20174	1732.40
20175	1732.50	20175	1732.50
20176	1732.60	20176	1732.60
...
20374	1752.40	20349	1749.90
20375	1752.50	20350	1750.00
LTE Band 4(15MHz)		LTE Band 4(20MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
20025	1717.50	20050	1720.00
20026	1717.60	20051	1720.10
....
20174	1732.40	20174	1732.40
20175	1732.50	20175	1732.50
20176	1732.60	20176	1732.60
...
20324	1747.40	20299	1744.90
20325	1747.50	20300	1745.00

LTE Band 13(5MHz)		LTE Band 13(10MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
23205	779.50	/	/
23206	779.60	/	/
....	/	/
23229	781.90	/	/
23230	782.00	23230	782.00
23231	782.10	/	/
...	...	/	/
23255	784.50	/	/
23256	784.60	/	/

Regards to the operating frequency range, the lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channels as below:

LTE Band 4(1.4MHz)			LTE Band 4(3MHz)		
Channel:	Frequency (MHz)		Channel	Frequency (MHz)	
Lowest channel	19957	1710.70	Lowest channel	19965	1711.50
Middle channel	20175	1732.50	Middle channel	20175	1732.50
Highest channel	20393	1754.30	Highest channel	20385	1753.50
LTE Band 4(5MHz)			LTE Band 4(10MHz)		
Channel	Frequency (MHz)		Channel	Frequency (MHz)	
Lowest channel	19975	1712.50	Lowest channel	20000	1715.00
Middle channel	20175	1732.50	Middle channel	20175	1732.50
Highest channel	20375	1752.50	Highest channel	20350	1750.00
LTE Band 4(15MHz)			LTE Band 4(20MHz)		
Channel	Frequency (MHz)		Channel	Frequency (MHz)	
Lowest channel	20025	1717.50	Lowest channel	20050	1720.00
Middle channel	20175	1732.50	Middle channel	20175	1732.50
Highest channel	20325	1747.50	Highest channel	20300	1745.00

LTE Band 13(5MHz)			LTE Band 13(10MHz)		
Channel	Frequency (MHz)		Channel	Frequency (MHz)	
Lowest channel	23205	779.5	Lowest channel	/	/
Middle channel	23230	782.0	Middle channel	23230	782.00
Highest channel	23255	784.5	Highest channel	/	/

5.3 Test environment and mode

Operating Environment:	
Temperature:	Normal: 15°C ~ 35°C, Extreme: -30°C ~ +50°C
Humidity:	20 % ~ 75 % RH
Atmospheric Pressure:	1008 mbar
Voltage:	Nominal: 12Vdc, Extreme: Low 11.2Vdc, High 12.8Vdc
Test mode:	
LTE QPSKmode	Keep the EUT communication with simulated station in QPSK mode
LTE 16-QAMmode	Keep the EUT communication with simulated station in 16-QAM mode
Remark: The EUT has been tested undercontinuous transmitting mode. Channel Low, Mid and High for each type band with rated data rate were chosen for full testing.The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for these modes with power adaptor, earphone and Data cable. Just the worst case position (H mode) shown in report.	

5.4 Description of Support Units

Test Equipment	Manufacturer	Model No.	Serial No.
Simulated Station	Anritsu	MT8820C	6201026545

5.5 Measurement Uncertainty

Parameters	Expanded Uncertainty
Radiated Emission (9kHz ~ 30MHz)	±3.12 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	±4.32 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	±5.38 dB (k=2)
Radiated Emission (18GHz ~ 40GHz)	±3.36 dB (k=2)

5.6 Related Submittal(s) / Grant (s)

This is an original grant, no related submittals and grants.
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5.7 Additions to, deviations, or exclusions from the method

No

5.8 Laboratory Facility

<p>The test facility is recognized, certified, or accredited by the following organizations:</p> <ul style="list-style-type: none"> ● FCC - Designation No.: CN1211 Shenzhen ZhongjianNanfang Testing Co., Ltd. has been accredited as a testing laboratory by FCC (Federal Communications Commission). The test firm Registration No. is 727551. ● ISED-CAB identifier.: CN0021 The 3m Semi-anechoic chamber of Shenzhen ZhongjianNanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1. ● CNAS - Registration No.: CNAS L6048 Shenzhen ZhongjianNanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048. ● A2LA - Registration No.: 4346.01 This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: https://portal.a2la.org/scopepdf/4346-01.pdf
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5.9 Laboratory Location

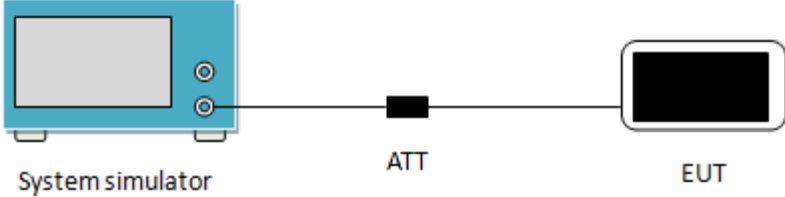
Shenzhen ZhongjianNanfang Testing Co., Ltd.
 Address: No.B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,
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 Tel: +86-755-23118282, Fax:+86-755-23116366
 Email: info@ccis-cb.com, Website: <http://www.ccis-cb.com>

5.10 Test Instruments list

Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
3m SAC	SAEMC	9m*6m*6m	966	07-22-2017	07-21-2020
BiConiLog Antenna	SCHWARZBECK	VULB9163	497	03-18-2019	03-17-2020
Biconical Antenna	SCHWARZBECK	VUBA9117	359	06-22-2017	06-21-2020
Horn Antenna	SCHWARZBECK	BBHA9120D	916	03-18-2019	03-17-2020
Horn Antenna	SCHWARZBECK	BBHA9120D	1805	06-22-2017	06-21-2020
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170582	11-21-2019	11-20-2020
EMI Test Software	AUDIX	E3	Version: 6.110919b		
Pre-amplifier	HP	8447D	2944A09358	03-18-2019	03-17-2020
Pre-amplifier	CD	PAP-1G18	11804	03-18-2019	03-17-2020
Spectrum analyzer	Rohde & Schwarz	FSP30	101454	03-18-2019	03-17-2020
EMI Test Receiver	Rohde & Schwarz	ESRP7	101070	03-18-2019	03-17-2020
Spectrum Analyzer	Agilent	N9020A	MY50510123	10-29-2019	10-28-2020
Signal Generator	Rohde & Schwarz	SMX	835454/016	03-18-2019	03-17-2020
Signal Generator	R&S	SMR20	1008100050	03-18-2019	03-17-2020
RF Switch Unit	MWRFTST	MW200	N/A	N/A	N/A
Test Software	MWRFTST	MTS8200	Version: 2.0.0.0		
Cable	ZDECL	Z108-NJ-NJ-81	1608458	03-18-2019	03-17-2020
Cable	MICRO-COAX	MFR64639	K10742-5	03-18-2019	03-17-2020
Cable	SUHNER	SUCOFLEX100	58193/4PE	03-18-2019	03-17-2020
DC Power Supply	XinNuoEr	WYK-10020K	1409050110020	10-31-2019	10-30-2020
Temperature Humidity Chamber	HengPu	HPGDS-500	20140828008	09-24-2019	09-23-2020
Simulated Station	Rohde & Schwarz	CMW500	140493	07-16-2019	07-15-2020

6. Test results

6.1 Conducted Output Power, ERP and EIRP

Test Requirement:	Part 27.50(d)(4), Part 27.50 (b)(10)
Limit:	LTE Band 4: 1W, LTE Band 13: 3W
Test Setup:	 <p>The diagram illustrates the test setup. On the left is a blue 'System simulator' with a screen and two ports. A cable connects it to a black 'ATT' (attenuator). Another cable connects the 'ATT' to a black 'EUT' (Equipment Under Test) on the right.</p>
Test Procedure:	The transmitter output was connected to a calibrated attenuator, the other end of which was connected to the CMW500. Transmitter output power was read off in dBm.
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)				
					19957	20175	20393		
					1710.7MHz	1732.5MHz	1754.3MHz		
4	1.4	QPSK	1	0	22.37	22.31	22.18		
			1	2	22.41	22.28	22.08		
			1	5	22.47	22.22	21.85		
			3	0	22.34	22.27	22.09		
			3	1	22.36	22.31	22.05		
			3	2	22.39	22.28	22.08		
			6	0	21.36	21.35	21.12		
		Antenna Gain(dBi):					1.93		
		Max. EIRP (dBm):					24.40		
		EIRP Limit (dBm):					30.00		
		16QAM	1	0	21.72	21.91	21.64		
			1	2	21.75	21.80	21.51		
			1	5	21.76	21.73	21.43		
			3	0	21.49	21.52	21.53		
			3	1	21.53	21.51	21.45		
			3	2	21.81	21.61	21.41		
			6	0	20.41	20.28	20.20		
		Antenna Gain(dBi):					1.93		
		Max. EIRP (dBm):					23.84		
		EIRP Limit (dBm):					30.00		
		LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
19965	20175						20385		
1711.5MHz	1732.5MHz						1753.5MHz		
4	3	QPSK	1	0	22.81	22.67	23.47		
			1	7	23.12	22.72	23.41		
			1	14	23.16	22.65	23.11		
			8	0	22.04	21.60	22.37		
			8	4	22.15	21.56	22.41		
			8	7	22.25	21.58	22.23		
			15	0	22.03	21.51	22.21		
		Antenna Gain(dBi):					1.93		
		Max. EIRP (dBm):					25.40		
		EIRP Limit (dBm):					30.00		
		16QAM	1	0	22.38	22.03	22.74		
			1	7	22.57	22.28	22.84		
			1	14	22.72	22.15	22.48		
			8	0	21.16	20.73	21.57		
			8	4	21.22	20.81	21.54		
			8	7	21.15	20.73	21.41		
			15	0	21.04	20.59	21.40		
		Antenna Gain(dBi):					1.93		
		Max. EIRP (dBm):					24.77		
		EIRP Limit (dBm):					30.00		
		Note: EIRP (dBm) = Average power (dBm) + Antenna Gain (dBi).							

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)				
					19975	20175	20375		
					1712.5MHz	1732.5MHz	1752.5MHz		
4	5	QPSK	1	0	22.53	22.44	22.96		
			1	12	22.96	22.72	22.97		
			1	24	22.74	22.24	22.18		
			12	0	21.96	21.63	22.02		
			12	6	21.94	21.72	22.01		
			12	11	21.93	21.63	21.79		
			25	0	21.85	21.53	21.89		
		Antenna Gain(dBi):					1.93		
		Max. EIRP (dBm):					24.90		
		EIRP Limit (dBm):					30.00		
		16QAM	1	0	21.91	21.86	22.24		
			1	12	22.49	21.87	22.27		
			1	24	21.98	21.57	21.86		
			12	0	20.83	20.64	20.99		
			12	6	20.95	20.55	21.04		
			12	11	20.97	20.58	20.85		
			25	0	20.82	20.55	20.87		
		Antenna Gain(dBi):					1.93		
		Max. EIRP (dBm):					24.42		
		EIRP Limit (dBm):					30.00		
		LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
20000	20175						20350		
1715.0MHz	1732.5MHz						1750.0MHz		
4	10	QPSK	1	0	22.35	23.15	23.71		
			1	24	23.01	23.50	24.32		
			1	49	22.28	22.75	23.23		
			25	0	21.77	22.13	22.98		
			25	12	21.89	22.08	23.07		
			25	24	21.73	21.87	22.79		
			50	0	21.70	22.53	22.81		
		Antenna Gain(dBi):					1.93		
		Max. EIRP (dBm):					26.25		
		EIRP Limit (dBm):					30.00		
		16QAM	1	0	21.93	22.45	22.92		
			1	24	22.33	22.73	23.72		
			1	49	21.77	22.20	22.67		
			25	0	21.23	21.22	21.49		
			25	12	21.47	21.16	21.62		
			25	24	21.42	21.02	21.60		
			50	0	/	/	/		
		Antenna Gain(dBi):					1.93		
		Max. EIRP (dBm):					25.65		
		EIRP Limit (dBm):					30.00		

Note: EIRP (dBm) = Average power (dBm) + Antenna Gain (dBi).

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)				
					20025	20175	20325		
					1717.5MHz	1732.5MHz	1747.5MHz		
4	15	QPSK	1	0	23.83	23.87	22.82		
			1	37	23.72	23.72	22.87		
			1	74	23.45	23.71	23.02		
			36	0	22.95	22.59	22.75		
			36	16	22.81	22.55	23.45		
			36	35	22.46	22.35	24.22		
			75	0	22.65	22.44	23.83		
		Antenna Gain(dBi):					1.93		
		Max. EIRP (dBm):					26.15		
		EIRP Limit (dBm):					30.00		
		16QAM	1	0	23.54	23.26	23.42		
			1	37	23.38	23.15	23.74		
			1	74	23.08	23.39	23.22		
			36	0	/	/	/		
			36	16	/	/	/		
			36	35	/	/	/		
			75	0	/	/	/		
		Antenna Gain(dBi):					1.93		
		Max. EIRP (dBm):					25.67		
		EIRP Limit (dBm):					30.00		
		LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
20050	20175						20300		
1720.0MHz	1732.5MHz						1745.0MHz		
4	20	QPSK	1	0	24.17	23.87	24.02		
			1	49	23.27	23.22	23.67		
			1	99	23.75	23.93	23.75		
			50	0	22.73	22.61	22.60		
			50	24	22.54	22.30	22.64		
			50	49	22.63	22.44	22.87		
			100	0	22.72	22.59	22.76		
		Antenna Gain(dBi):					1.93		
		Max. EIRP (dBm):					26.10		
		EIRP Limit (dBm):					30.00		
		16QAM	1	0	23.71	23.39	23.33		
			1	49	22.99	22.55	23.11		
			1	99	23.33	23.41	23.21		
			50	0	/	/	/		
			50	24	/	/	/		
			50	49	/	/	/		
			100	0	/	/	/		
		Antenna Gain(dBi):					1.93		
		Max. EIRP (dBm):					25.64		
		EIRP Limit (dBm):					30.00		

Note: EIRP (dBm) = Average power (dBm) + Antenna Gain (dBi).

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)				
					23205	23230	23255		
					779.5MHz	782.0MHz	784.5MHz		
13	5	QPSK	1	0	23.30	23.26	23.36		
			1	12	23.31	23.42	23.40		
			1	24	23.35	23.25	23.75		
			12	0	22.42	22.26	22.30		
			12	6	22.35	22.39	22.36		
			12	11	22.33	22.40	22.70		
			25	0	22.35	22.35	22.31		
		Antenna Gain(dBi):					1.03		
		Max. ERP (dBm):					22.63		
		ERP Limit (dBm):					34.77		
		16QAM	1	0	22.86	22.81	22.83		
			1	12	22.87	22.77	22.73		
			1	24	22.55	22.82	23.06		
			12	0	21.36	21.26	21.25		
			12	6	21.31	21.41	21.25		
			12	11	21.34	21.57	21.71		
			25	0	21.43	21.50	21.25		
		Antenna Gain(dBi):					1.03		
		Max. ERP (dBm):					21.94		
		ERP Limit (dBm):					34.77		
LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)				
						23230			
						782.0MHz			
13	10	QPSK	1	0	/	22.88	/		
			1	24	/	23.50	/		
			1	49	/	22.72	/		
			25	0	/	22.36	/		
			25	12	/	22.40	/		
			25	24	/	22.83	/		
			50	0	/	22.12	/		
		Antenna Gain(dBi):					1.03		
		Max. ERP (dBm):					22.38		
		ERP Limit (dBm):					34.77		
		16QAM	1	0	/	22.67	/		
			1	24	/	22.82	/		
			1	49	/	23.17	/		
			25	0	/	22.41	/		
			25	12	/	22.63	/		
			25	24	/	22.47	/		
			50	0	/	/	/		
		Antenna Gain(dBi):					1.03		
		Max. ERP (dBm):					22.05		
		ERP Limit (dBm):					34.77		
<p>Note: EIRP (dBm) = Average power (dBm) + Antenna Gain (dBi). ERP (dBm) = EIRP (dBm) - 2.15 (dB).</p>									

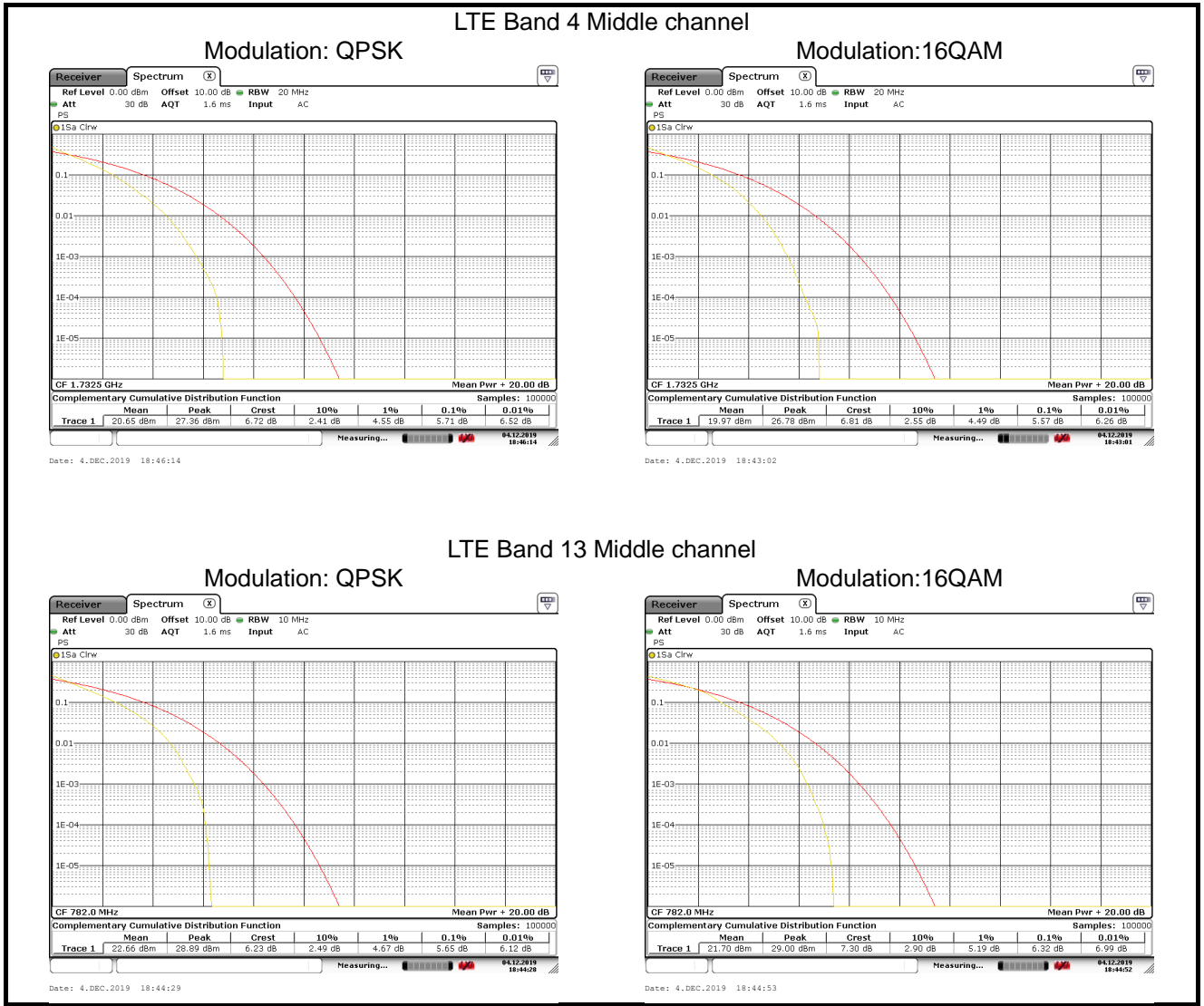
6.2 Peak-to-Average Ratio

Test Requirement:	Part 27.50(d)(5)
Limit:	The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.
Test Setup:	
Test Procedure:	<ol style="list-style-type: none"> 1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. 2 Set the CCDF option in spectrum analyzer, $RBW \geq OBW$, 3 Set the EUT working in highest power level, measured and recorded the 0.1% as PAPR level. 4 Repeat step 1~3 at other frequency and modulations.
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

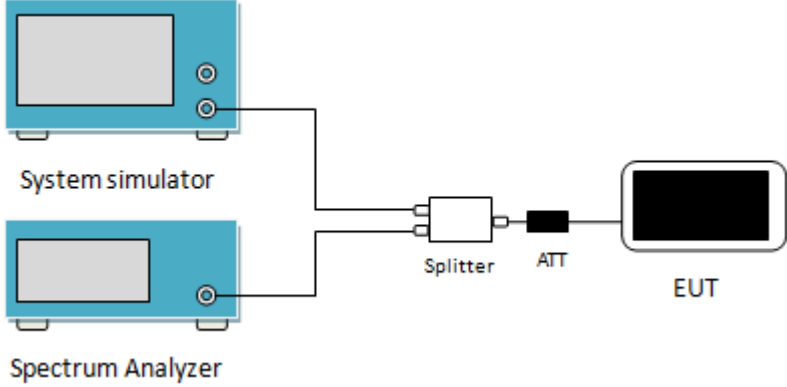
Measurement Data (Worst case):

Bandwidth	Modulation	RB Size	RB Offset	PAPR
LTE Band 4 (Middle Channel)				
20MHz	QPSK	100	0	5.71
	16QAM	27	0	5.57
LTE Band 13 (Middle Channel)				
10MHz	QPSK	50	0	5.65
	16QAM	27	0	6.32

Test plots as below:



6.3 Occupy Bandwidth

Test Requirement:	Part 27.53(h), Part 27.53(c)
Test Setup:	 <p>The diagram illustrates the test setup. On the left, there are two blue rectangular units: the top one is labeled 'System simulator' and the bottom one is labeled 'Spectrum Analyzer'. Both have a screen and two circular ports on the right side. A single line connects the two ports of the System simulator and Spectrum Analyzer to a central 'Splitter' box. From the right side of the Splitter, a line goes to a small black rectangular 'ATT' (Attenuator) block. Finally, a line connects the ATT to the 'EUT' (Equipment Under Test), which is represented by a black rounded rectangle with a white border.</p>
Test Procedure:	<ol style="list-style-type: none"> 1. The EUT's output RF connector was connected with a short cable to the spectrum analyzer 2. RBW was set to about 1% ~ 5% of emission BW, VBW= 3 times RBW. 3. -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

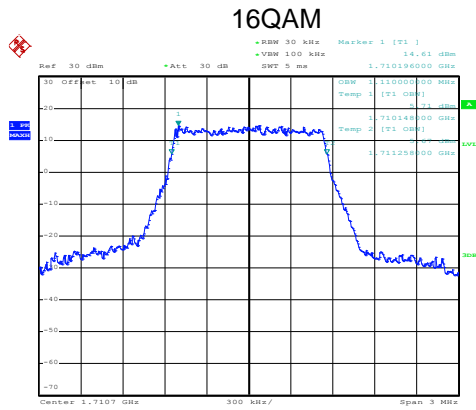
Measurement Data:

LTE Band 4					
Bandwidth	Channel	Frequency(MHz)	Modulation	99% OBW (kHz)	-26dBcEBW (kHz)
1.4MHz	19957	1710.7	16QAM	1110	1338
			QPSK	1104	1374
	20175	1732.5	16QAM	1110	1368
			QPSK	1104	1392
	20393	1754.3	16QAM	1110	1356
			QPSK	1104	1368
3MHz	19965	1711.5	16QAM	2748	3120
			QPSK	2748	3168
	20175	1732.5	16QAM	2748	3144
			QPSK	2760	3132
	20385	1750.5	16QAM	2736	3156
			QPSK	2748	3144
5MHz	19975	1712.5	16QAM	4560	5820
			QPSK	4560	5780
	20175	1732.5	16QAM	4560	5760
			QPSK	4560	5900
	20375	1752.5	16QAM	4580	5720
			QPSK	4560	5640
10MHz	20000	1715.0	16QAM	/	/
			QPSK	9320	11840
	20175	1732.5	16QAM	/	/
			QPSK	9240	11640
	20350	1750.0	16QAM	/	/
			QPSK	9320	11800
15MHz	20025	1717.5	16QAM	/	/
			QPSK	13680	16620
	20175	1732.5	16QAM	/	/
			QPSK	13680	16440
	20325	1747.5	16QAM	/	/
			QPSK	13620	16320
20MHz	20050	1720.0	16QAM	/	/
			QPSK	18160	20800
	20175	1732.5	16QAM	/	/
			QPSK	18160	20720
	20300	1745.0	16QAM	/	/
			QPSK	18080	20720

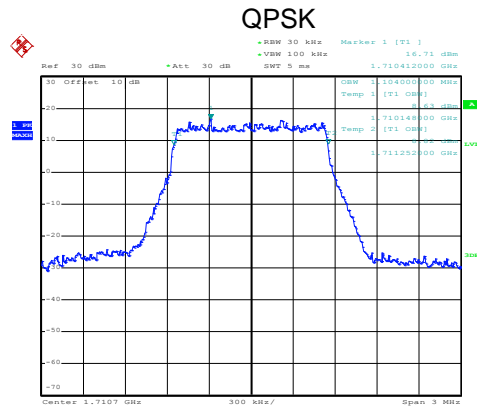
LTE Band 13					
Bandwidth	Channel	Frequency(MHz)	Modulation	99% OBW (kHz)	-26dBcEBW (kHz)
5MHz	23205	779.5	16QAM	4580	5500
			QPSK	4580	5700
	23230	782.0	16QAM	4580	5820
			QPSK	4580	5860
	23255	784.5	16QAM	4520	5740
			QPSK	4560	5680
10MHz	23230	782.0	16QAM	/	/
			QPSK	9440	11960

Test plot as follows:
LTE Band 4 part:

LTE Band 4: 99% Occupy bandwidth
BW: 1.4MHz

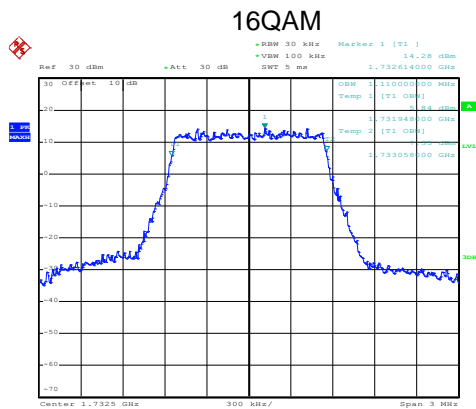


Date: 30.NOV.2019 14:04:53

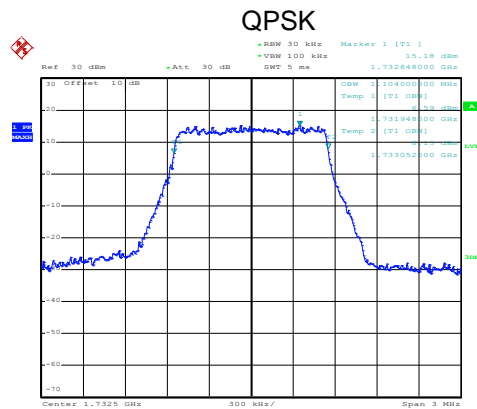


Date: 30.NOV.2019 14:04:18

Lowest channel

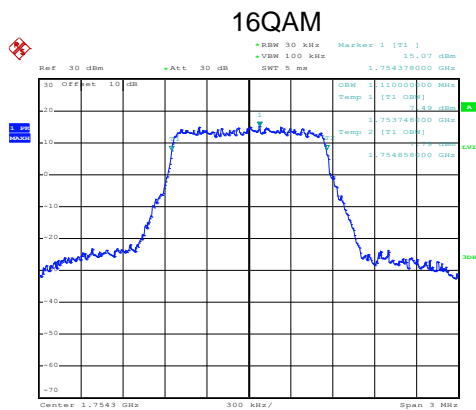


Date: 30.NOV.2019 14:03:43

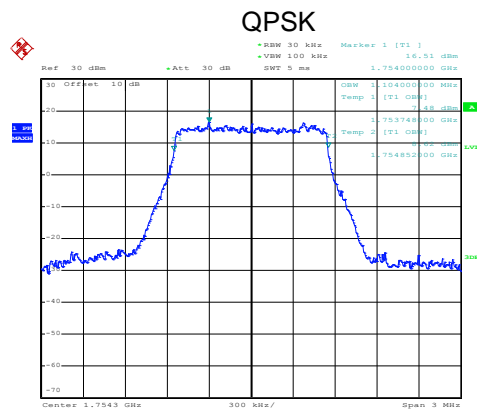


Date: 30.NOV.2019 14:03:31

Middle channel



Date: 30.NOV.2019 14:06:10

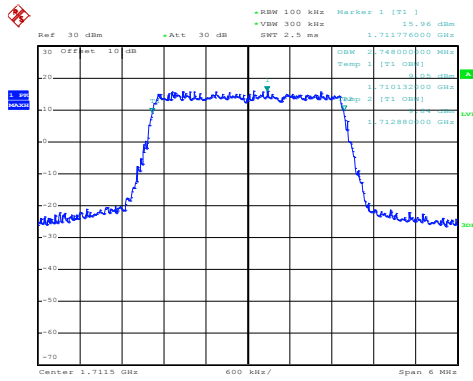


Date: 30.NOV.2019 14:05:26

Highest channel

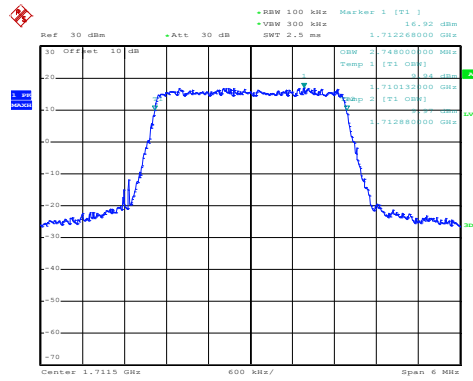
LTE Band 4: 99% Occupancy bandwidth
BW: 3MHz

16QAM



Date: 30.NOV.2019 14:07:58

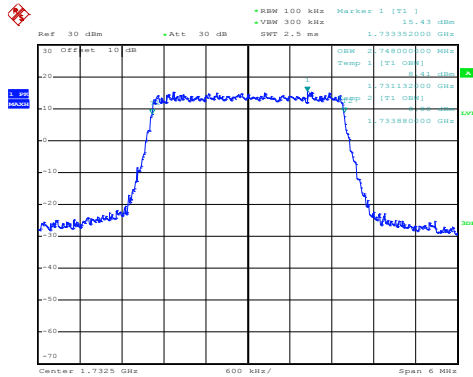
QPSK



Date: 30.NOV.2019 14:07:10

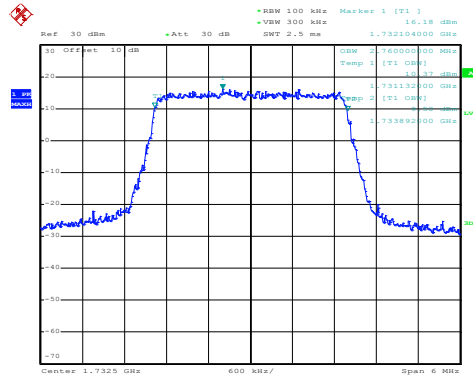
Lowest channel

16QAM



Date: 30.NOV.2019 14:10:08

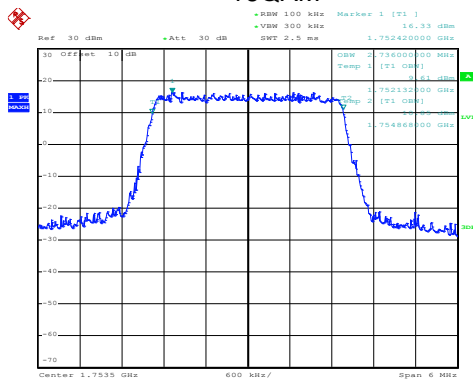
QPSK



Date: 30.NOV.2019 14:09:35

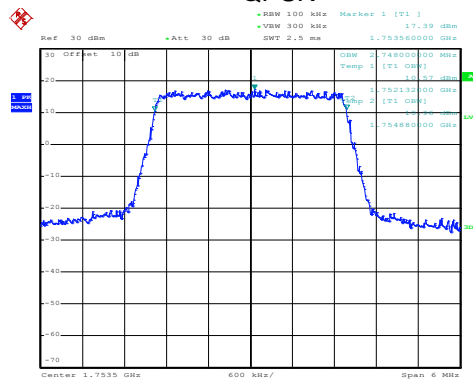
Middle channel

16QAM



Date: 30.NOV.2019 14:09:08

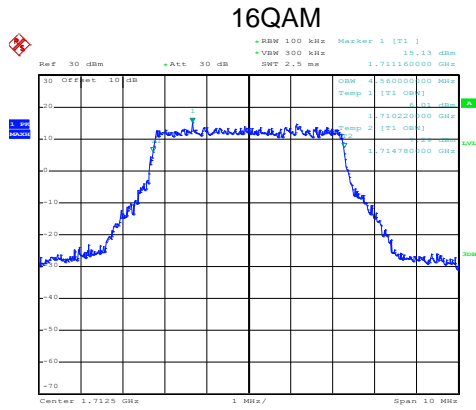
QPSK



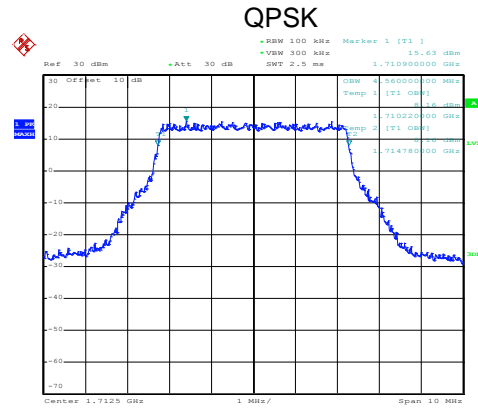
Date: 30.NOV.2019 14:08:29

Highest channel

LTE Band 4: 99% Occupancy bandwidth
BW: 5MHz

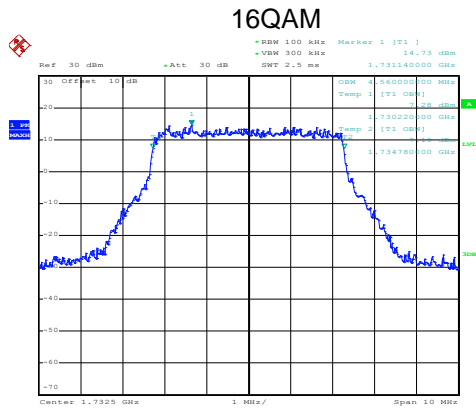


Date: 24.NOV.2019 15:24:52

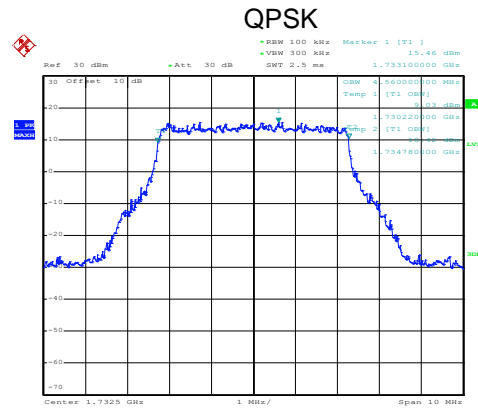


Date: 24.NOV.2019 15:24:39

Lowest channel

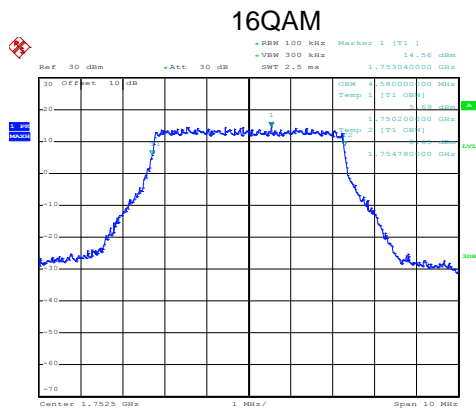


Date: 24.NOV.2019 15:27:07

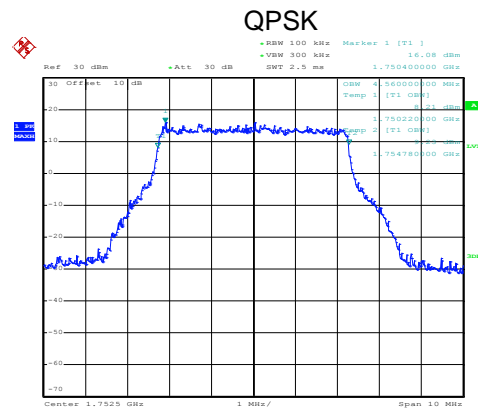


Date: 24.NOV.2019 15:26:55

Middle channel



Date: 24.NOV.2019 15:28:48

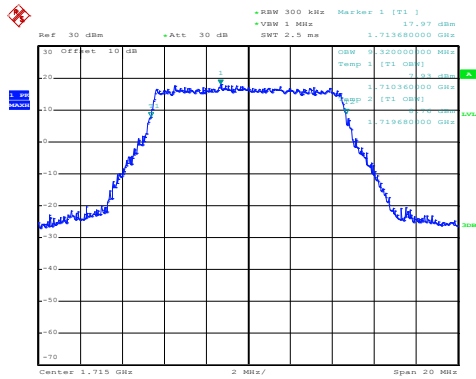


Date: 24.NOV.2019 15:27:48

Highest channel

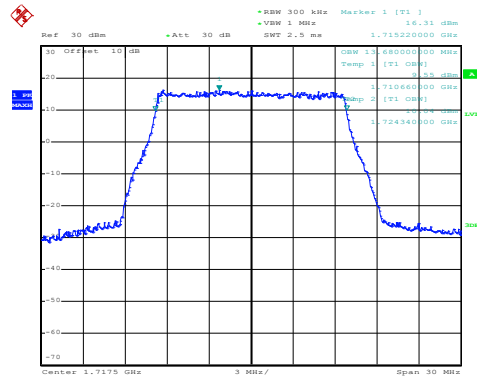
LTE Band 4: 99% Occupancy bandwidth

BW: 10MHz
QPSK



Date: 24.NOV.2019 15:34:33

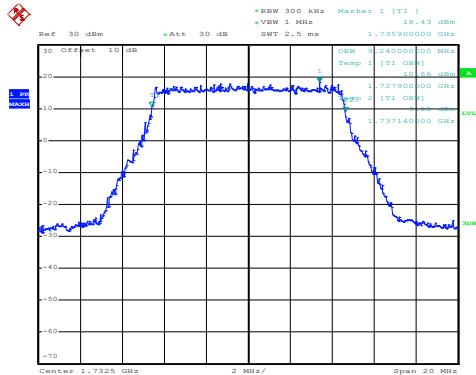
BW: 15MHz
QPSK



Date: 24.NOV.2019 15:38:59

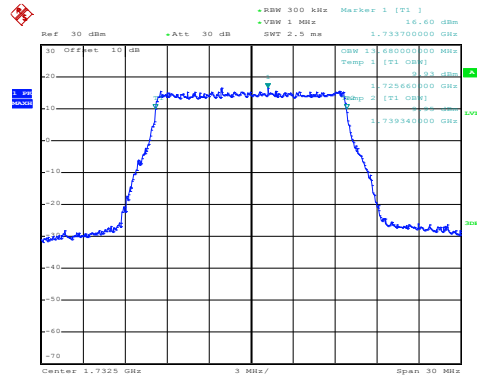
Lowest channel

QPSK



Date: 24.NOV.2019 15:35:49

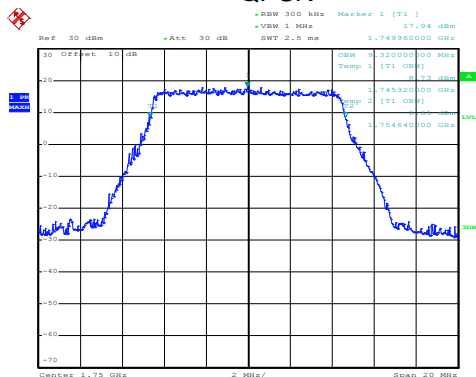
QPSK



Date: 24.NOV.2019 15:40:02

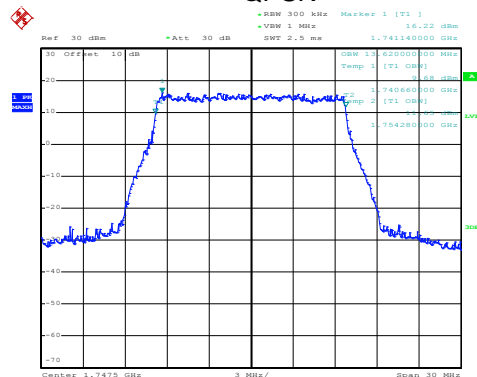
Middle channel

QPSK



Date: 24.NOV.2019 15:37:21

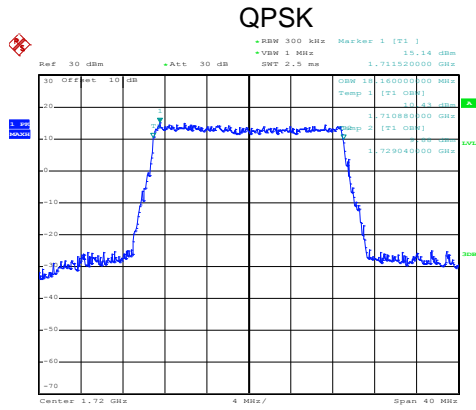
QPSK



Date: 24.NOV.2019 15:40:53

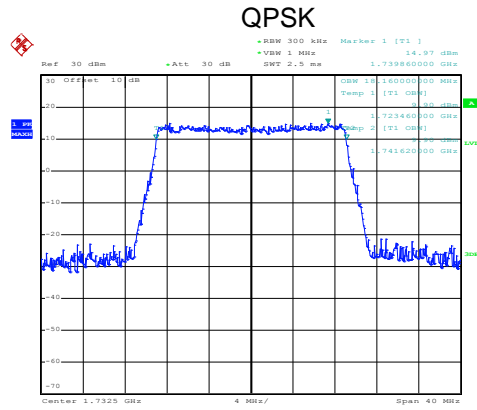
Highest channel

LTE Band 4: 99% Occupancy bandwidth
BW: 20MHz



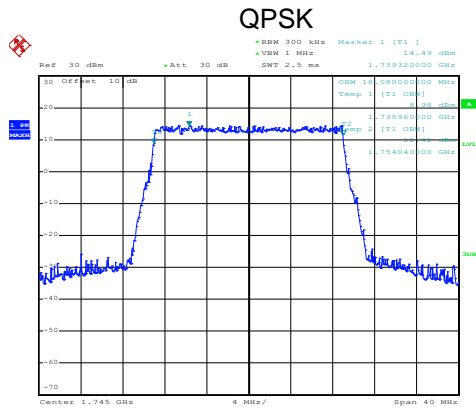
Date: 24.NOV.2019 15:43:00

Lowest channel



Date: 24.NOV.2019 15:43:33

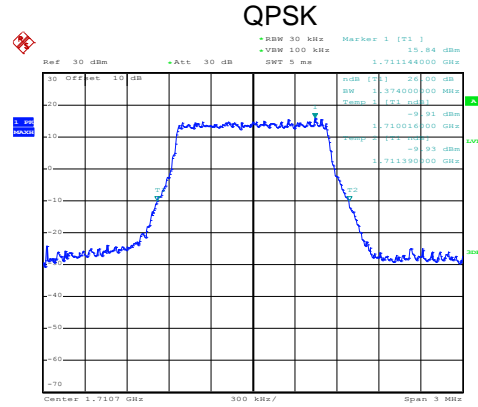
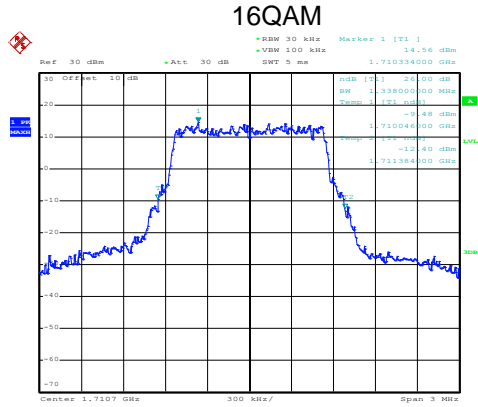
Middle channel



Date: 24.NOV.2019 15:44:41

Highest channel

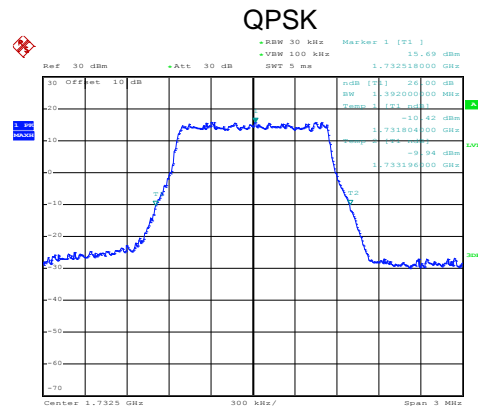
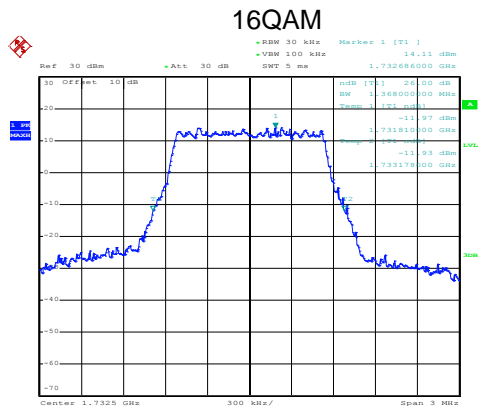
LTE Band 4: -26dBc bandwidth
BW: 1.4MHz



Date: 30.NOV.2019 14:04:37

Date: 30.NOV.2019 14:04:30

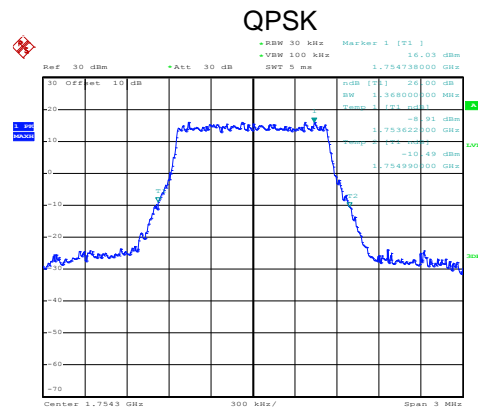
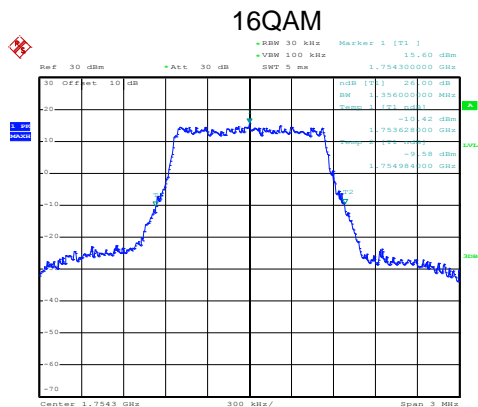
Lowest channel



Date: 30.NOV.2019 14:02:53

Date: 30.NOV.2019 14:02:36

Middle channel



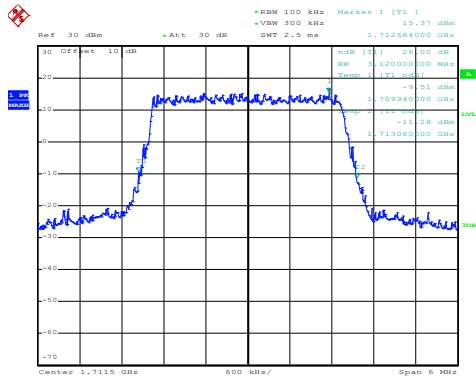
Date: 30.NOV.2019 14:05:55

Date: 30.NOV.2019 14:05:39

Highest channel

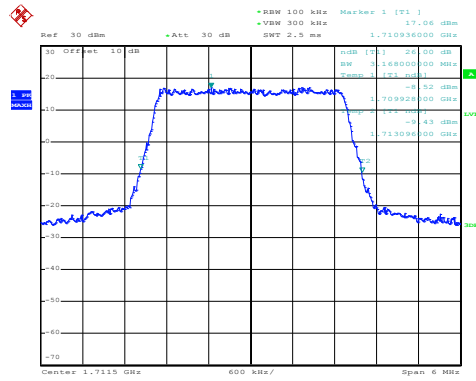
LTE Band 4: -26dBc bandwidth
BW: 3MHz

16QAM



Date: 30.NOV.2019 14:07:45

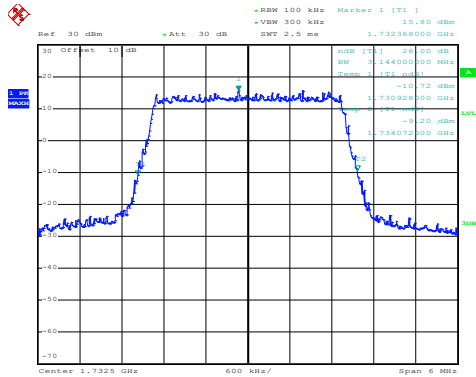
QPSK



Date: 30.NOV.2019 14:07:37

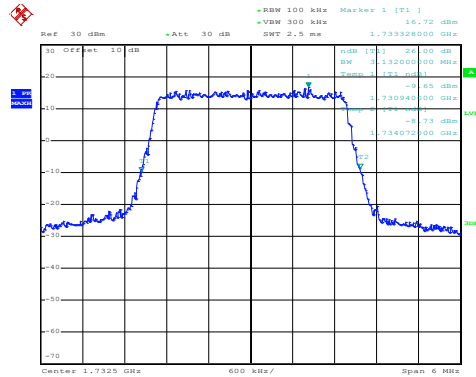
Lowest channel

16QAM



Date: 30.NOV.2019 14:09:56

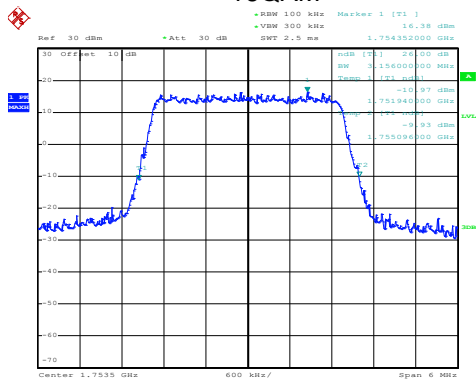
QPSK



Date: 30.NOV.2019 14:09:46

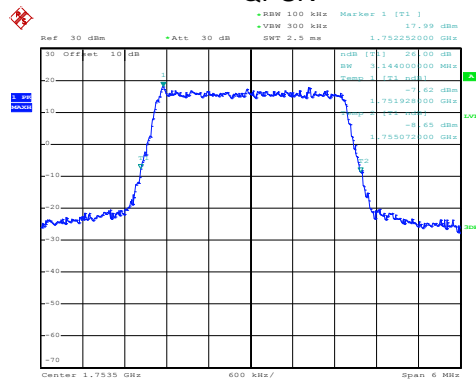
Middle channel

16QAM



Date: 30.NOV.2019 14:08:56

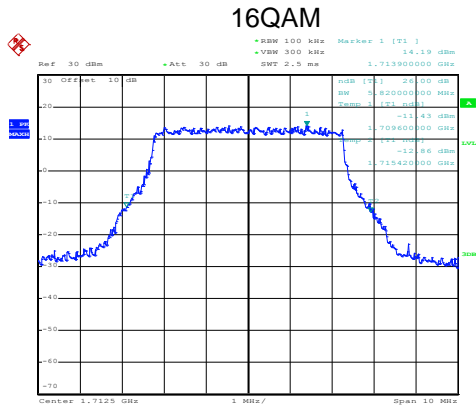
QPSK



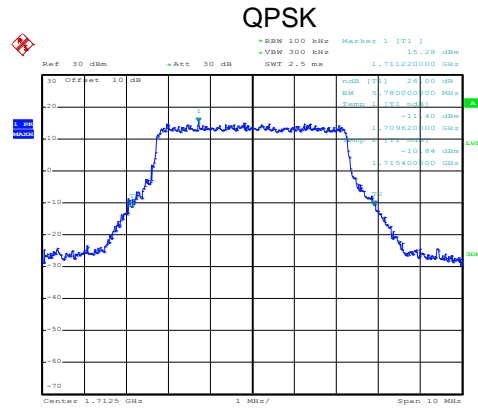
Date: 30.NOV.2019 14:08:45

Highest channel

LTE Band 4: -26dBc bandwidth
BW: 5MHz

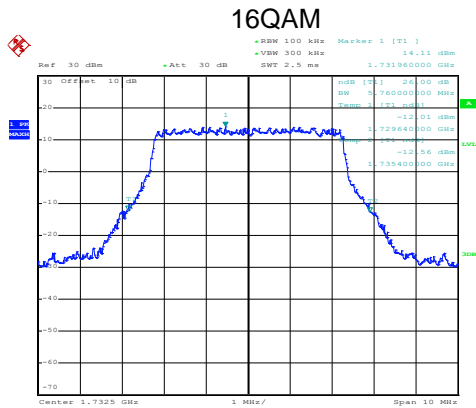


Date: 24.NOV.2019 15:25:08

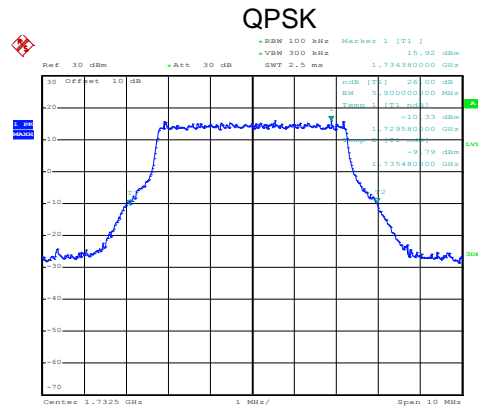


Date: 24.NOV.2019 15:24:08

Lowest channel

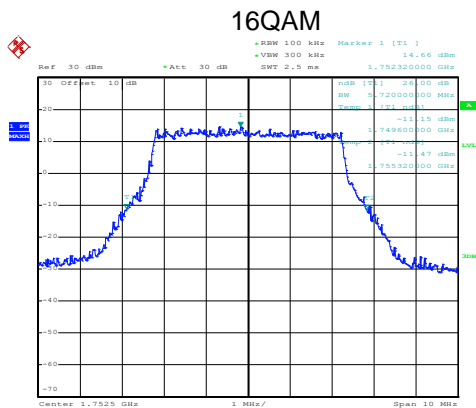


Date: 24.NOV.2019 15:25:49

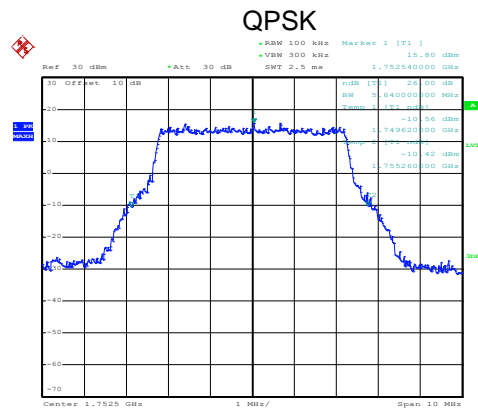


Date: 24.NOV.2019 15:22:27

Middle channel



Date: 24.NOV.2019 15:29:03

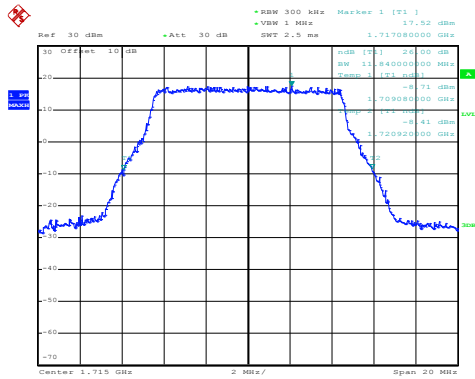


Date: 24.NOV.2019 15:28:05

Highest channel

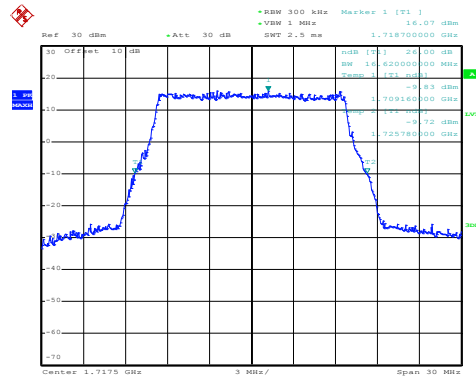
LTE Band 4: -26dBc bandwidth

BW: 10MHz
QPSK



Date: 24.NOV.2019 15:30:22

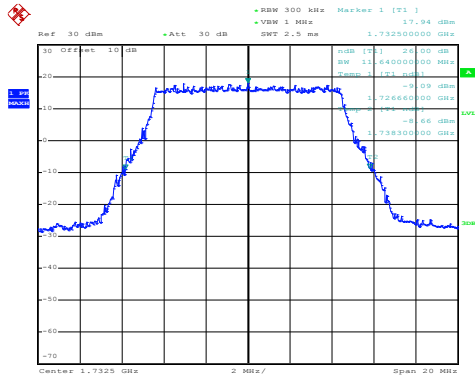
BW: 15MHz
QPSK



Date: 24.NOV.2019 15:39:18

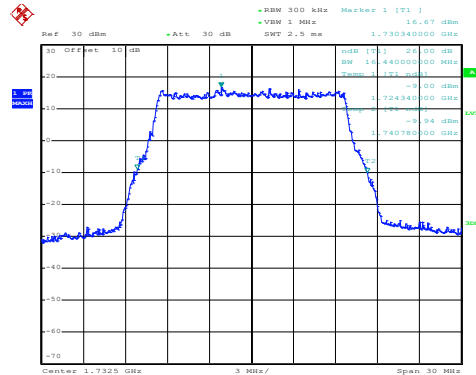
Lowest channel

QPSK



Date: 24.NOV.2019 15:36:21

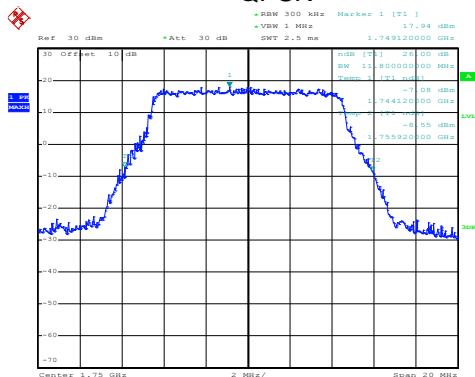
QPSK



Date: 24.NOV.2019 15:39:48

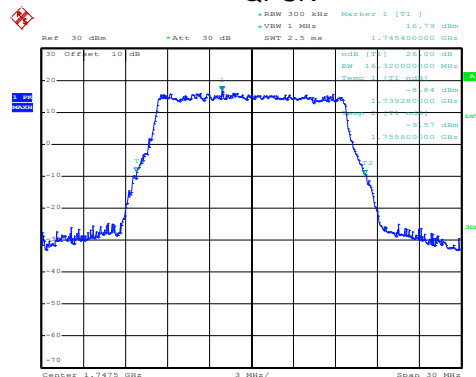
Middle channel

QPSK



Date: 24.NOV.2019 15:37:02

QPSK

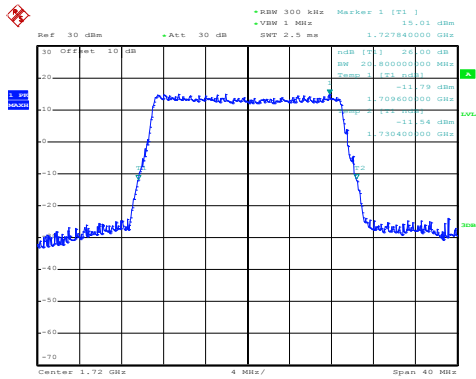


Date: 24.NOV.2019 15:41:12

Highest channel

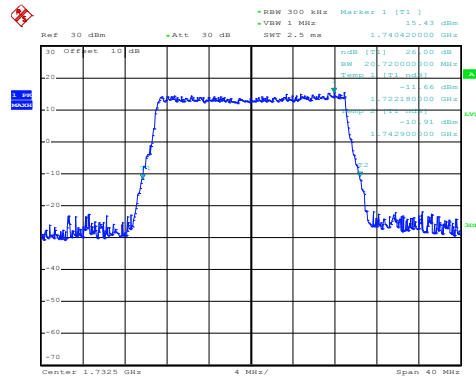
LTE Band 4: -26dBc bandwidth

QPSK



Date: 24.NOV.2019 15:42:19

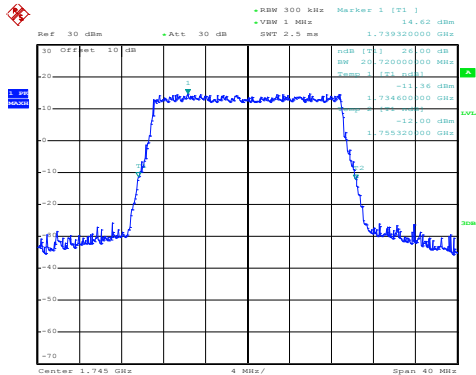
Lowest channel



Date: 24.NOV.2019 15:43:54

Middle channel

QPSK

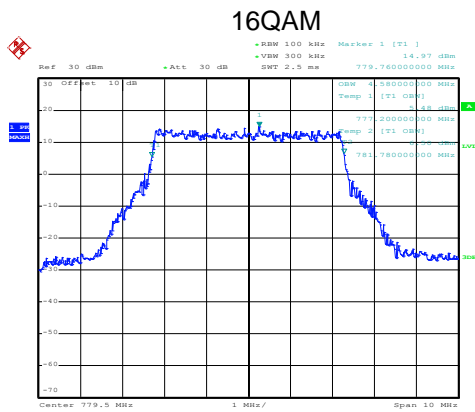


Date: 24.NOV.2019 15:44:23

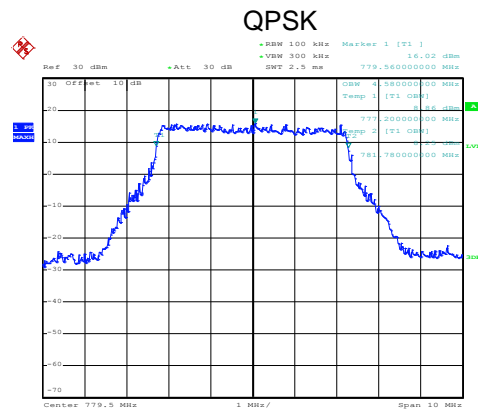
Highest channel

LTE Band 13 part:

LTE Band 13: 99% Occupancy bandwidth BW: 5MHz

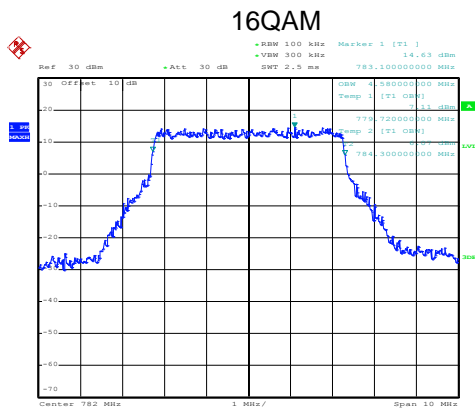


Date: 24.NOV.2019 15:49:58

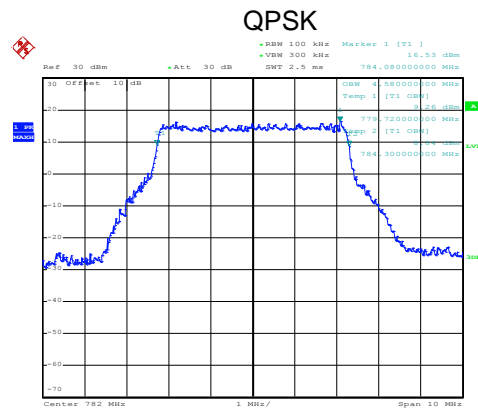


Date: 24.NOV.2019 15:49:50

Lowest channel

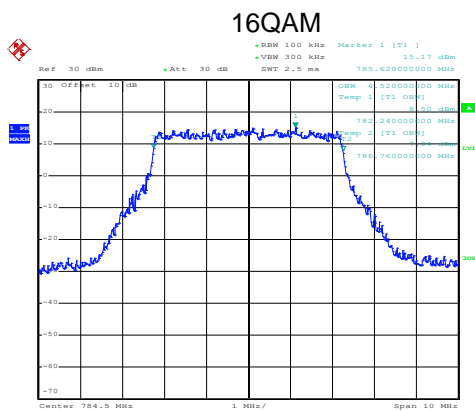


Date: 24.NOV.2019 15:47:26

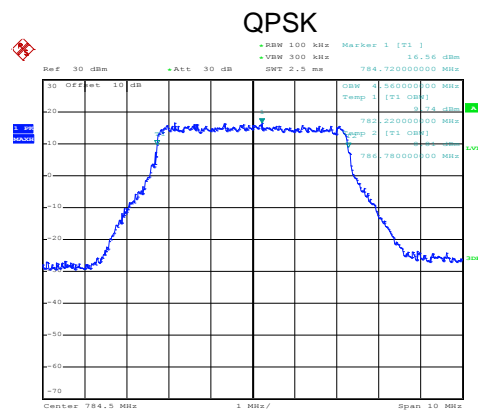


Date: 24.NOV.2019 15:47:16

Middle channel

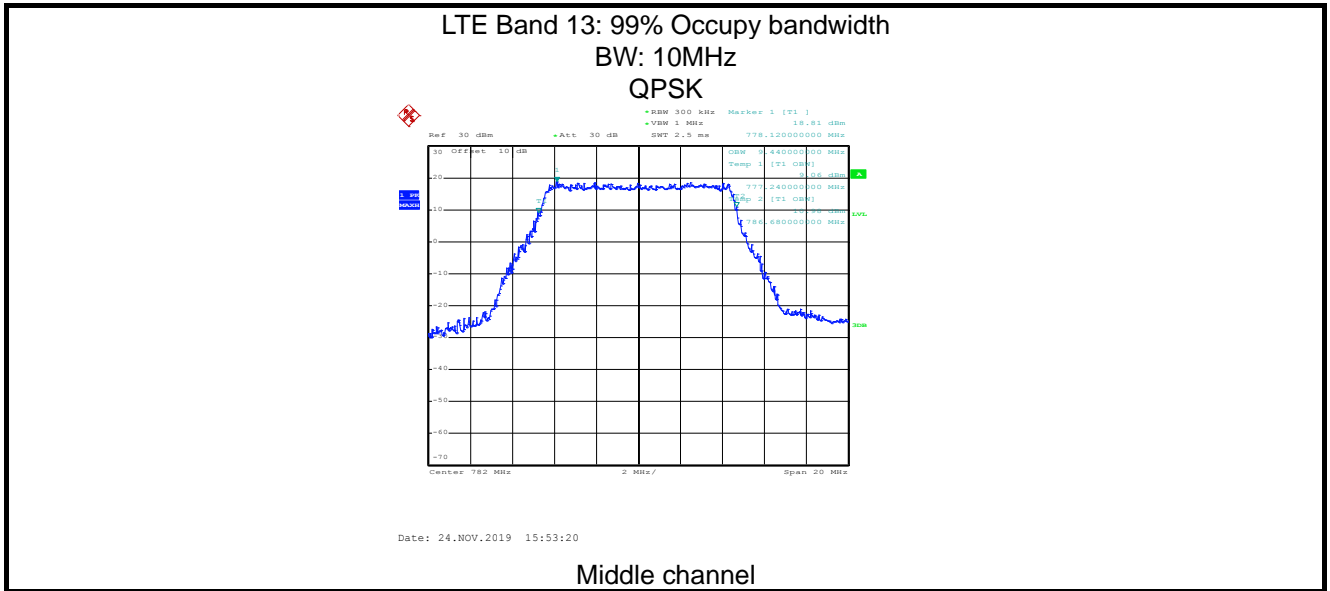


Date: 24.NOV.2019 15:50:59

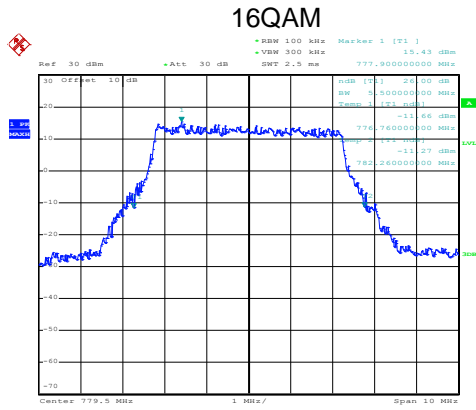


Date: 24.NOV.2019 15:50:48

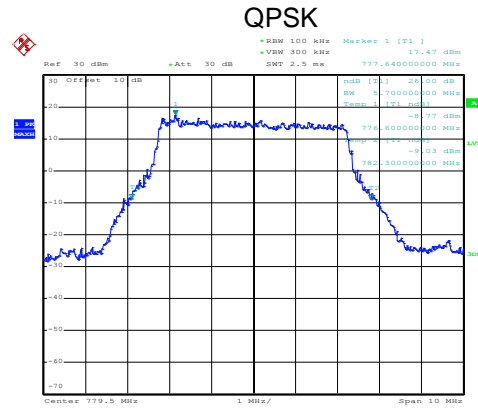
Highest channel



LTE Band 13: -26dBc bandwidth
BW: 5MHz

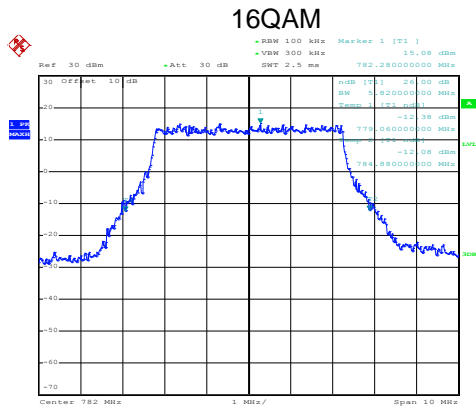


Date: 24.NOV.2019 15:49:34

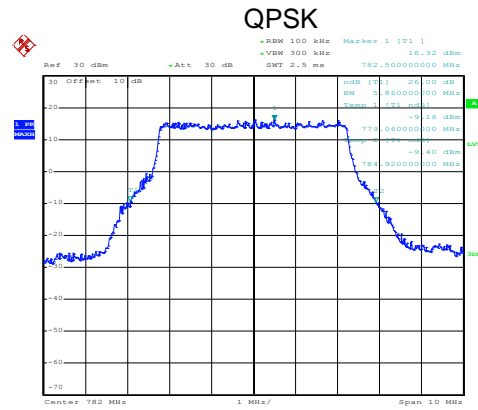


Date: 24.NOV.2019 15:49:26

Lowest channel

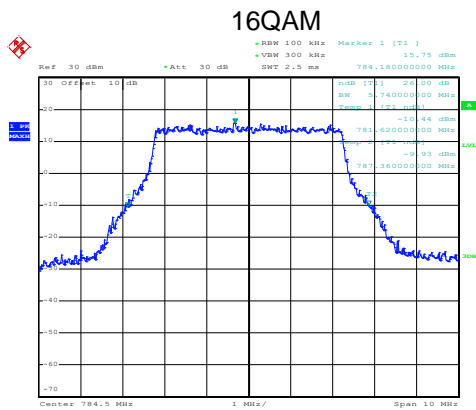


Date: 24.NOV.2019 15:48:08

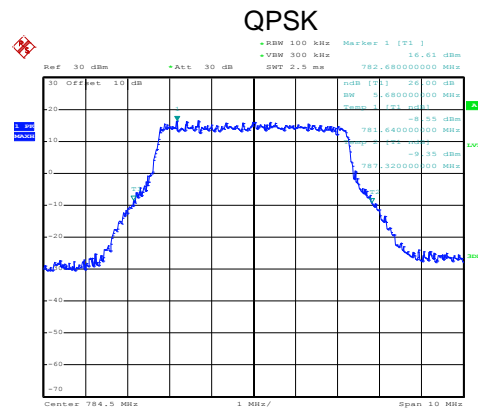


Date: 24.NOV.2019 15:47:50

Middle channel

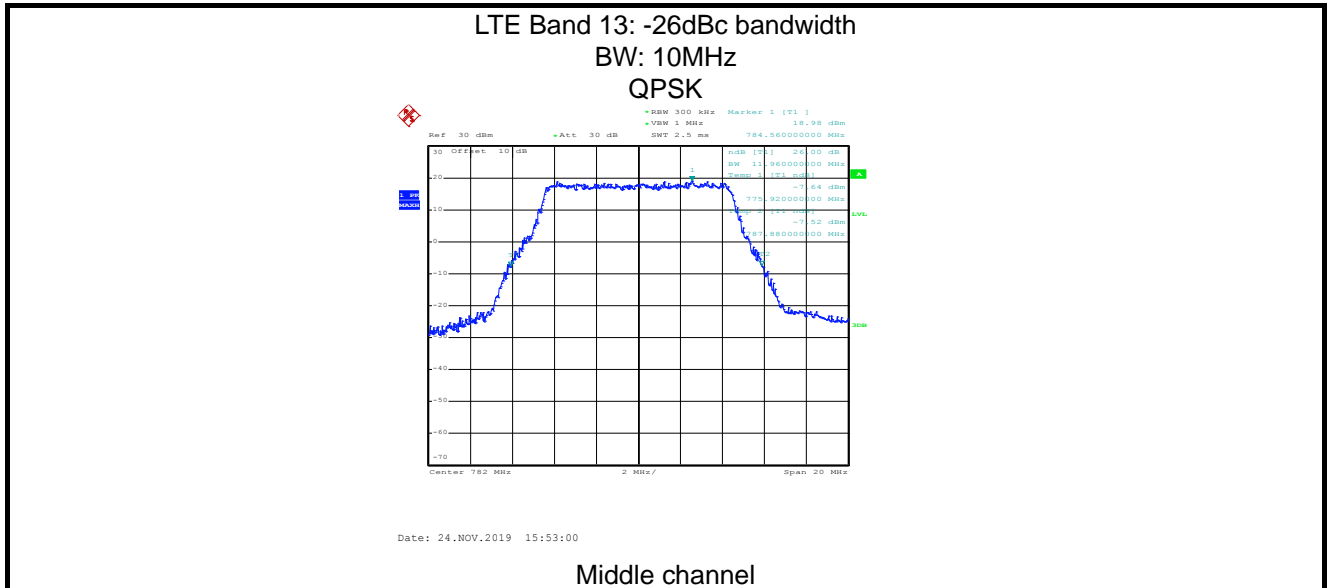


Date: 24.NOV.2019 15:51:43



Date: 24.NOV.2019 15:51:15

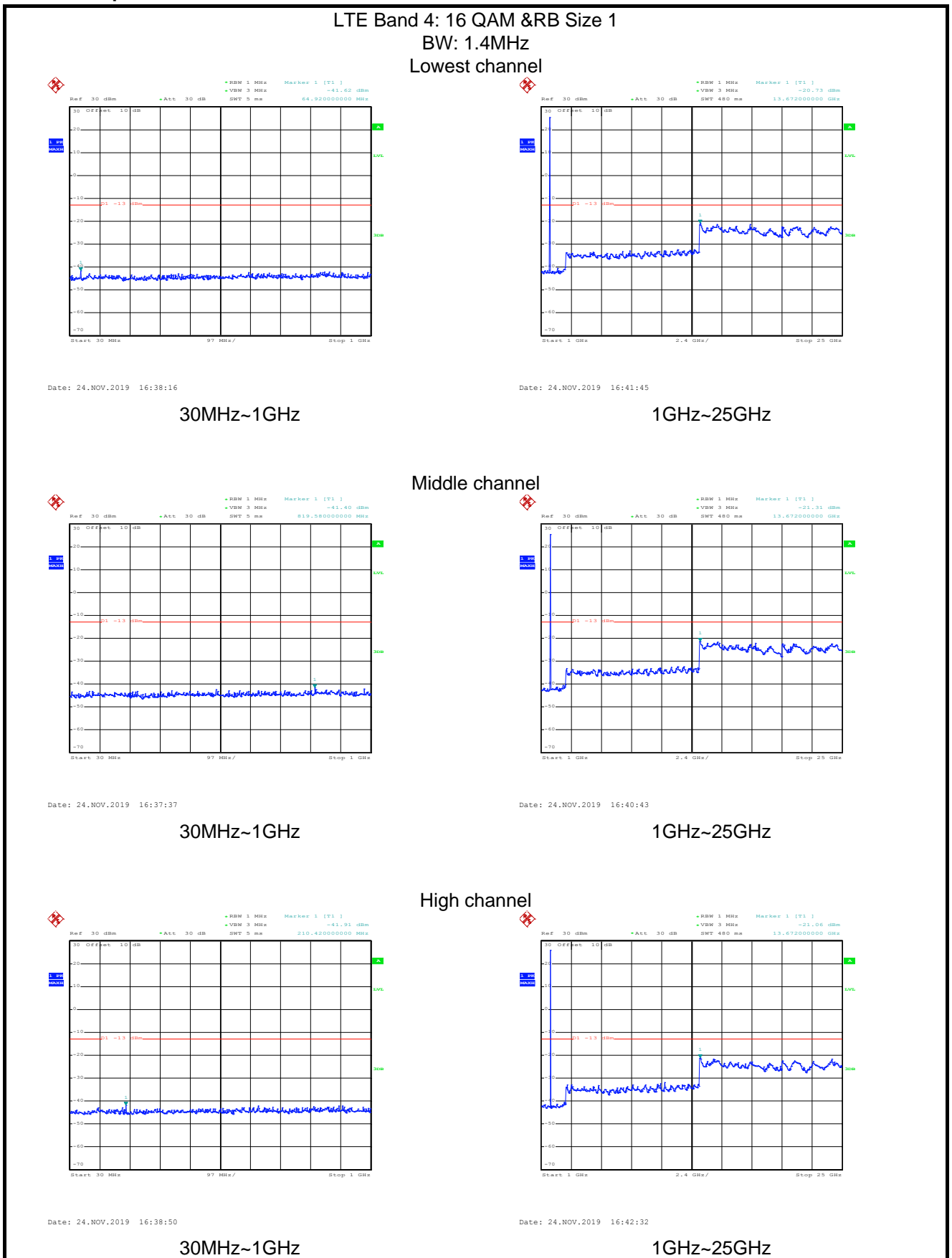
Highest channel



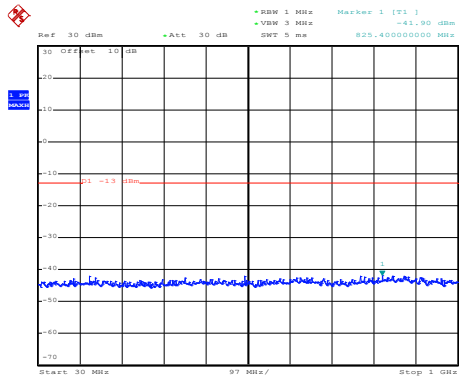
6.4 Out of band emission at antenna terminals

Test Requirement:	part 27.53(h), Part 27.53(c)
Limit:	<p>LTE Band4: The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB (-13 dBm).</p> <p>LTE Band13: The power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log(P)$ dB(-13 dBm). For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals.</p>
Test Setup:	
Test Procedure:	<ol style="list-style-type: none"> 1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. 2 The resolution bandwidth of the spectrum analyzer was set at 100 kHz when below 1GHz, 1MHz when above 1 GHz; sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic. 3 For the out of band: Set the RBW=100 kHz, VBW=300 kHz when below 1 GHz, RBW =1 MHz, VBW=3 MHz when above 1 GHz, Start=30MHz, Stop= 10th harmonic. 4 Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions.
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed
Remark:	Pre-scan all RB Size and offset, and found the RB Size and offset of worst case, so the report shows only the worst case test data.

Test plots as follows (Conducted spurious emission) (worst case):
 LTE Band 4 part:

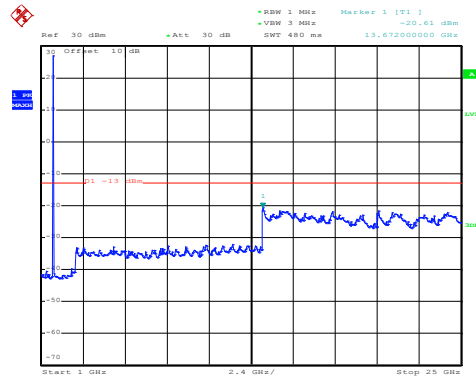


LTE Band 4: QPSK &RB Size 1 BW: 1.4MHz Lowest channel



Date: 24.NOV.2019 16:38:03

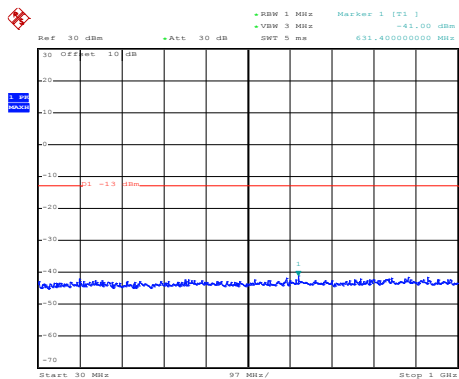
30MHz~1GHz



Date: 24.NOV.2019 16:41:16

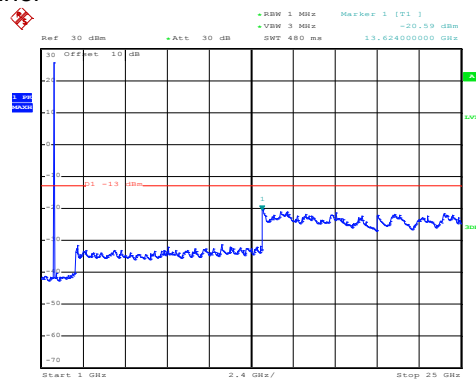
1GHz~25GHz

Middle channel



Date: 24.NOV.2019 16:37:25

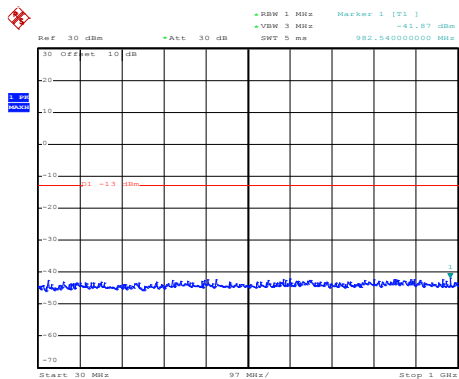
30MHz~1GHz



Date: 24.NOV.2019 16:40:21

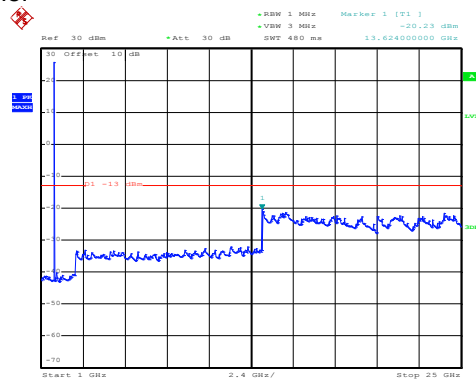
1GHz~25GHz

High channel



Date: 24.NOV.2019 16:38:38

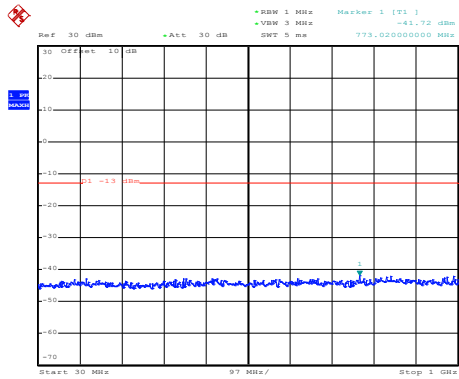
30MHz~1GHz



Date: 24.NOV.2019 16:42:15

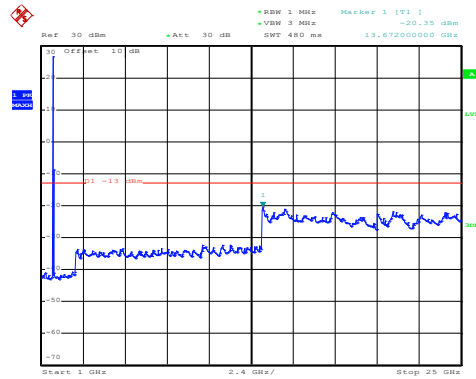
1GHz~25GHz

LTE Band 4: 16 QAM & RB Size 1 BW: 20MHz Lowest channel



Date: 24.NOV.2019 16:33:43

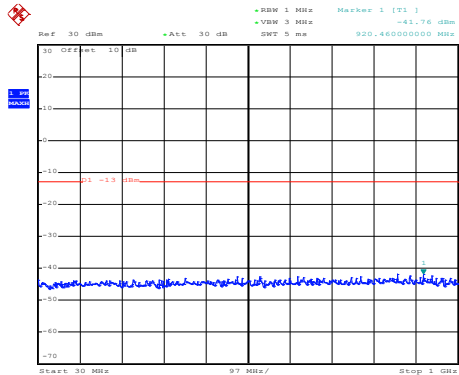
30MHz~1GHz



Date: 24.NOV.2019 16:46:37

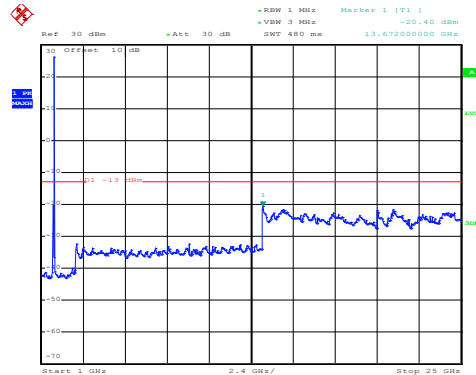
1GHz~25GHz

Middle channel



Date: 24.NOV.2019 16:33:02

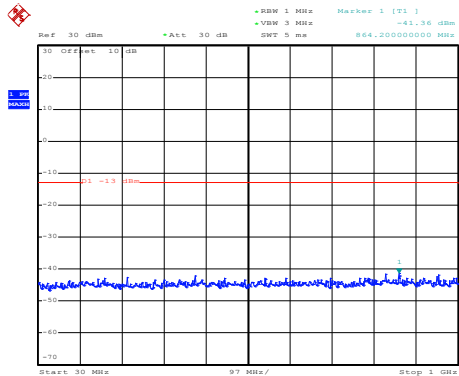
30MHz~1GHz



Date: 24.NOV.2019 16:47:24

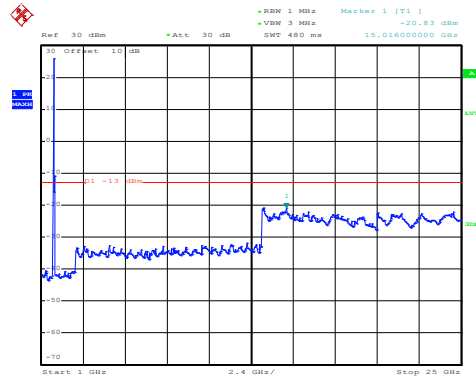
1GHz~25GHz

High channel



Date: 24.NOV.2019 16:32:19

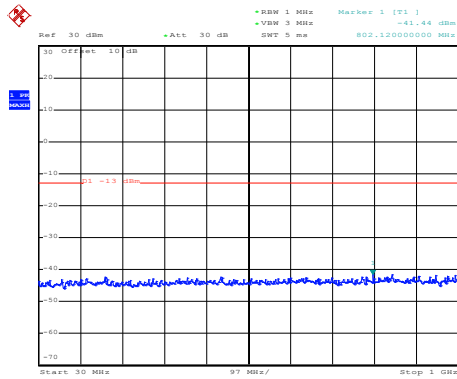
30MHz~1GHz



Date: 24.NOV.2019 16:48:28

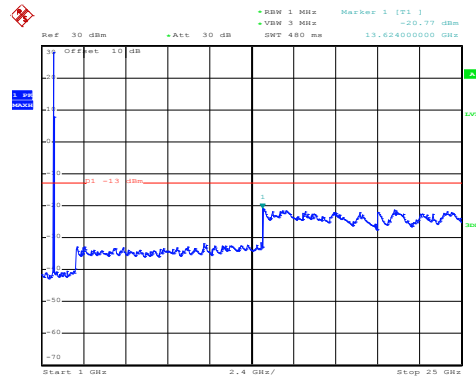
1GHz~25GHz

LTE Band 4: QPSK &RB Size 1 BW: 20MHz Lowest channel



Date: 24.NOV.2019 16:33:29

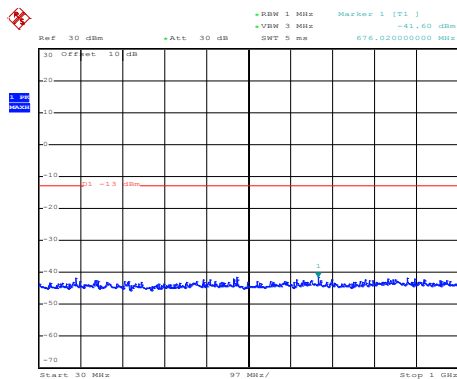
30MHz~1GHz



Date: 24.NOV.2019 16:46:15

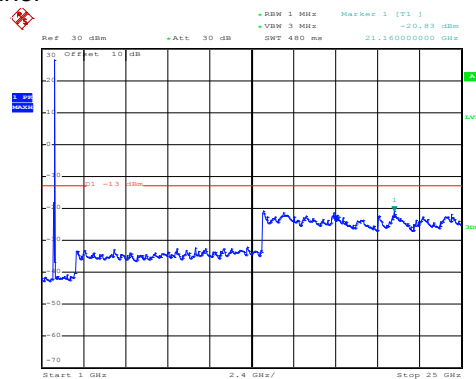
1GHz~25GHz

Middle channel



Date: 24.NOV.2019 16:32:52

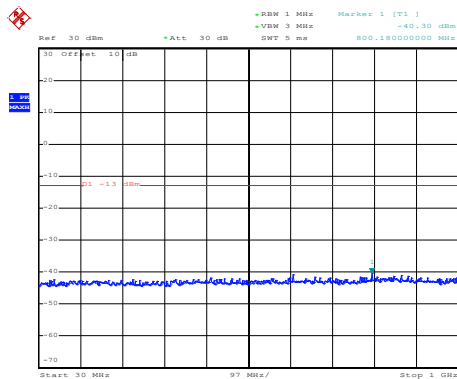
30MHz~1GHz



Date: 24.NOV.2019 16:47:07

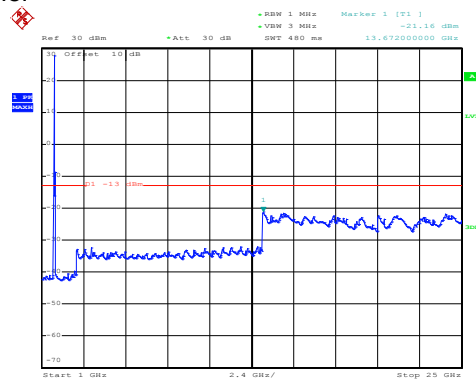
1GHz~25GHz

High channel



Date: 24.NOV.2019 16:32:08

30MHz~1GHz

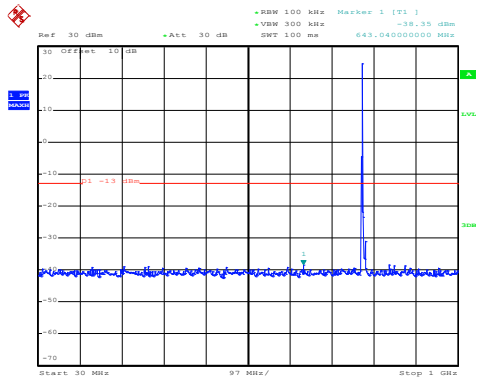


Date: 24.NOV.2019 16:47:59

1GHz~25GHz

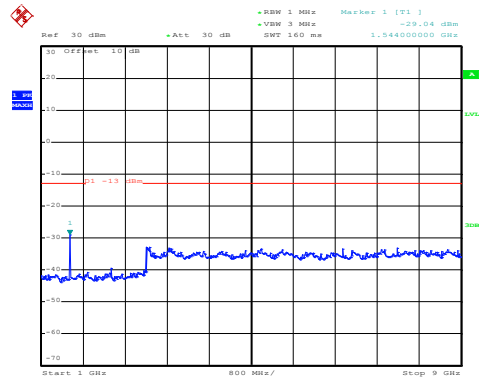
LTE Band 13 part:

LTE Band 13: 16 QAM &RB Size 1
 BW: 5MHz
 Lowest channel



Date: 24.NOV.2019 17:35:35

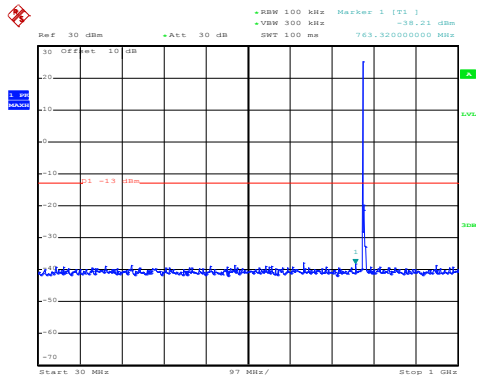
30MHz~1GHz



Date: 24.NOV.2019 16:57:27

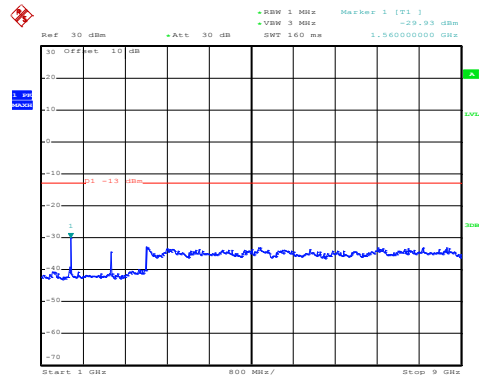
1GHz~9GHz

Middle channel



Date: 24.NOV.2019 17:34:41

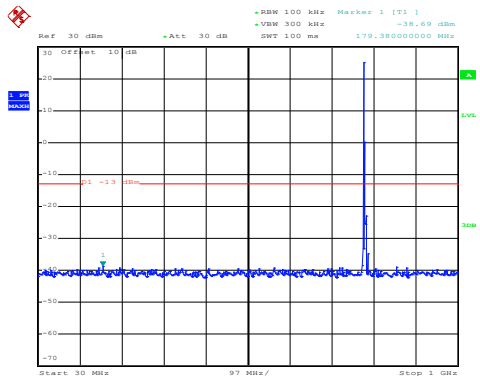
30MHz~1GHz



Date: 24.NOV.2019 16:56:36

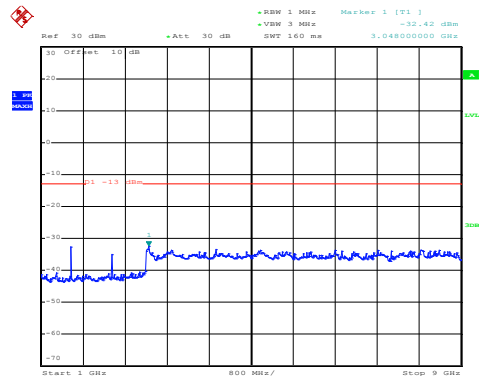
1GHz~9GHz

High channel



Date: 24.NOV.2019 17:36:20

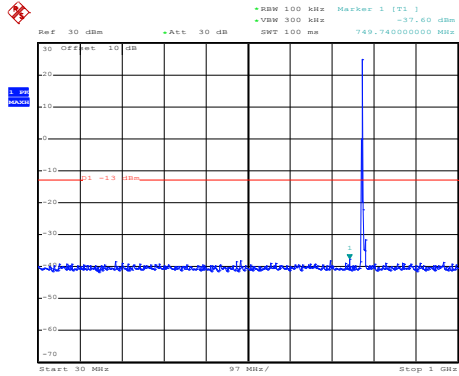
30MHz~1GHz



Date: 24.NOV.2019 17:30:45

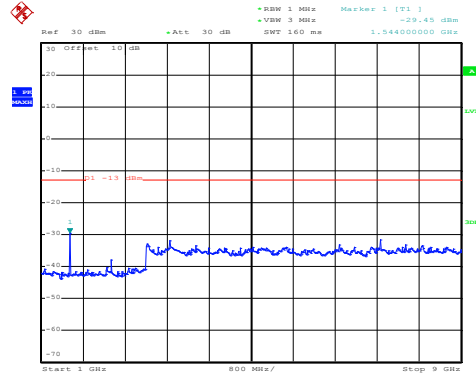
1GHz~9GHz

LTE Band 13: QPSK &RB Size 1 BW: 5MHz Lowest channel



Date: 24.NOV.2019 17:35:17

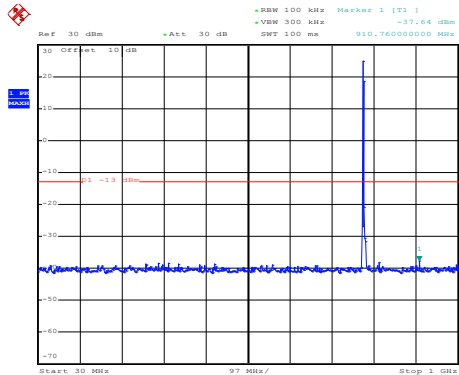
30MHz~1GHz



Date: 24.NOV.2019 16:57:07

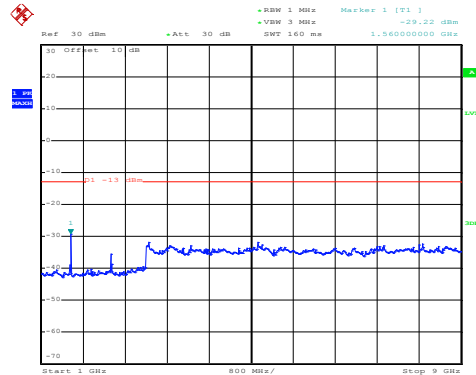
1GHz~9GHz

Middle channel



Date: 24.NOV.2019 17:34:22

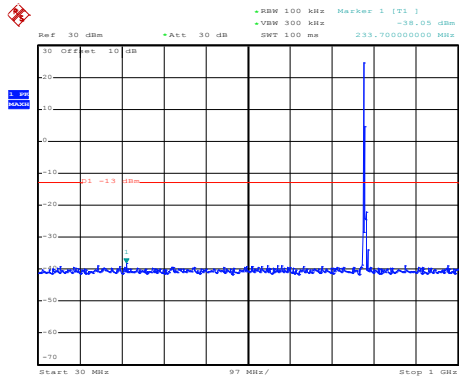
30MHz~1GHz



Date: 24.NOV.2019 16:55:49

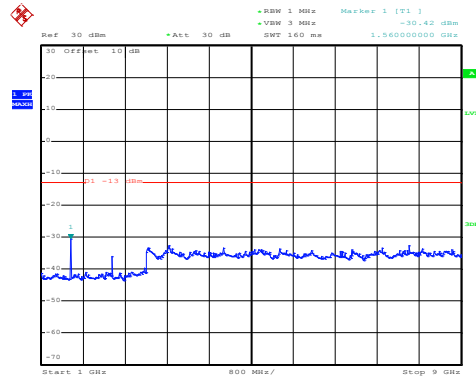
1GHz~9GHz

High channel



Date: 24.NOV.2019 17:36:05

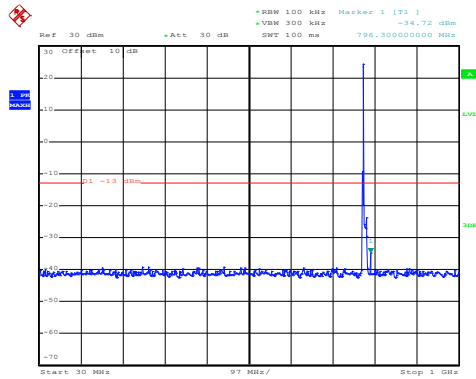
30MHz~1GHz



Date: 24.NOV.2019 17:30:21

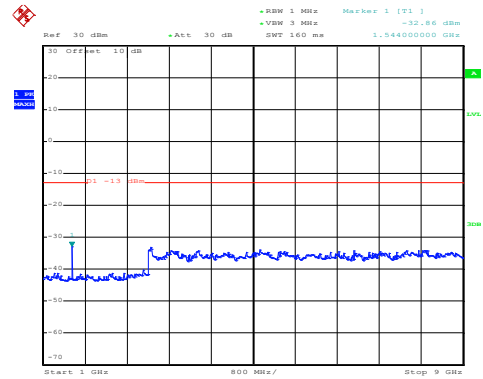
1GHz~9GHz

LTE Band 13: 16 QAM &RB Size 1
 BW: 10MHz
 Middle channel



Date: 24.NOV.2019 17:33:38

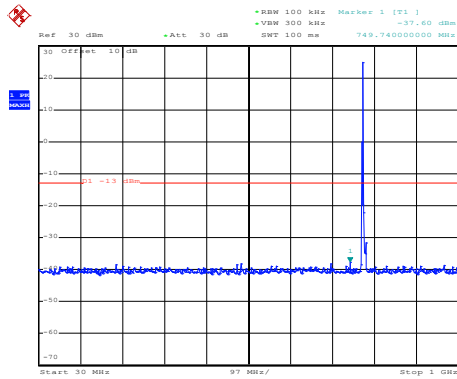
30MHz~1GHz



Date: 24.NOV.2019 17:32:02

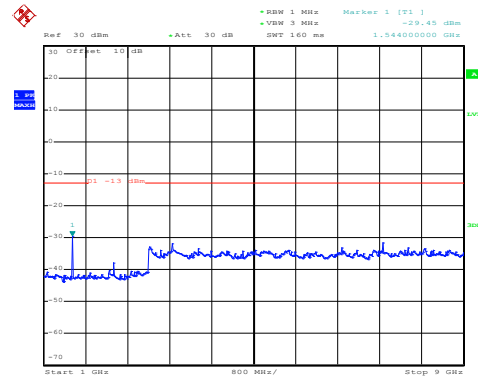
1GHz~9GHz

LTE Band 13: QPSK &RB Size 1 BW: 10MHz Lowest channel



Date: 24.NOV.2019 17:35:17

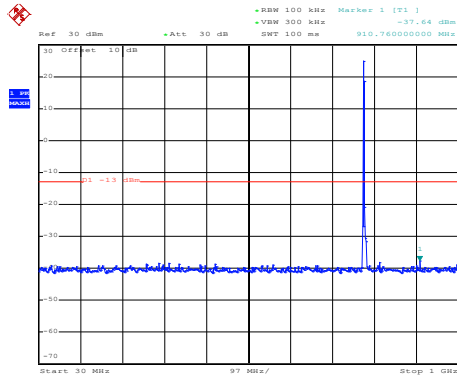
30MHz~1GHz



Date: 24.NOV.2019 16:57:07

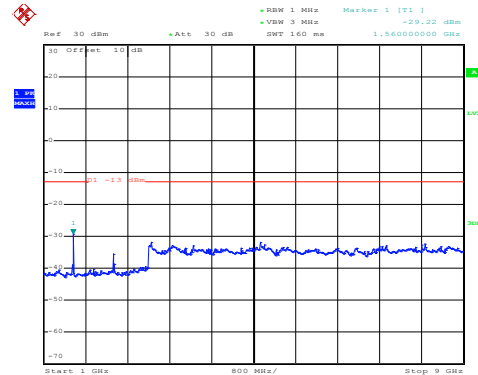
1GHz~9GHz

Middle channel



Date: 24.NOV.2019 17:34:22

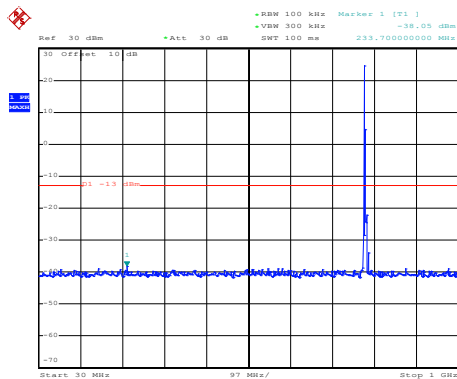
30MHz~1GHz



Date: 24.NOV.2019 16:55:49

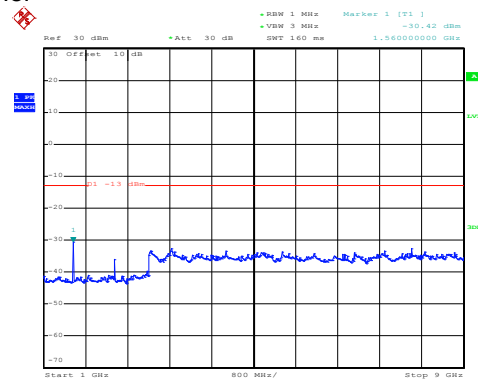
1GHz~9GHz

High channel



Date: 24.NOV.2019 17:36:05

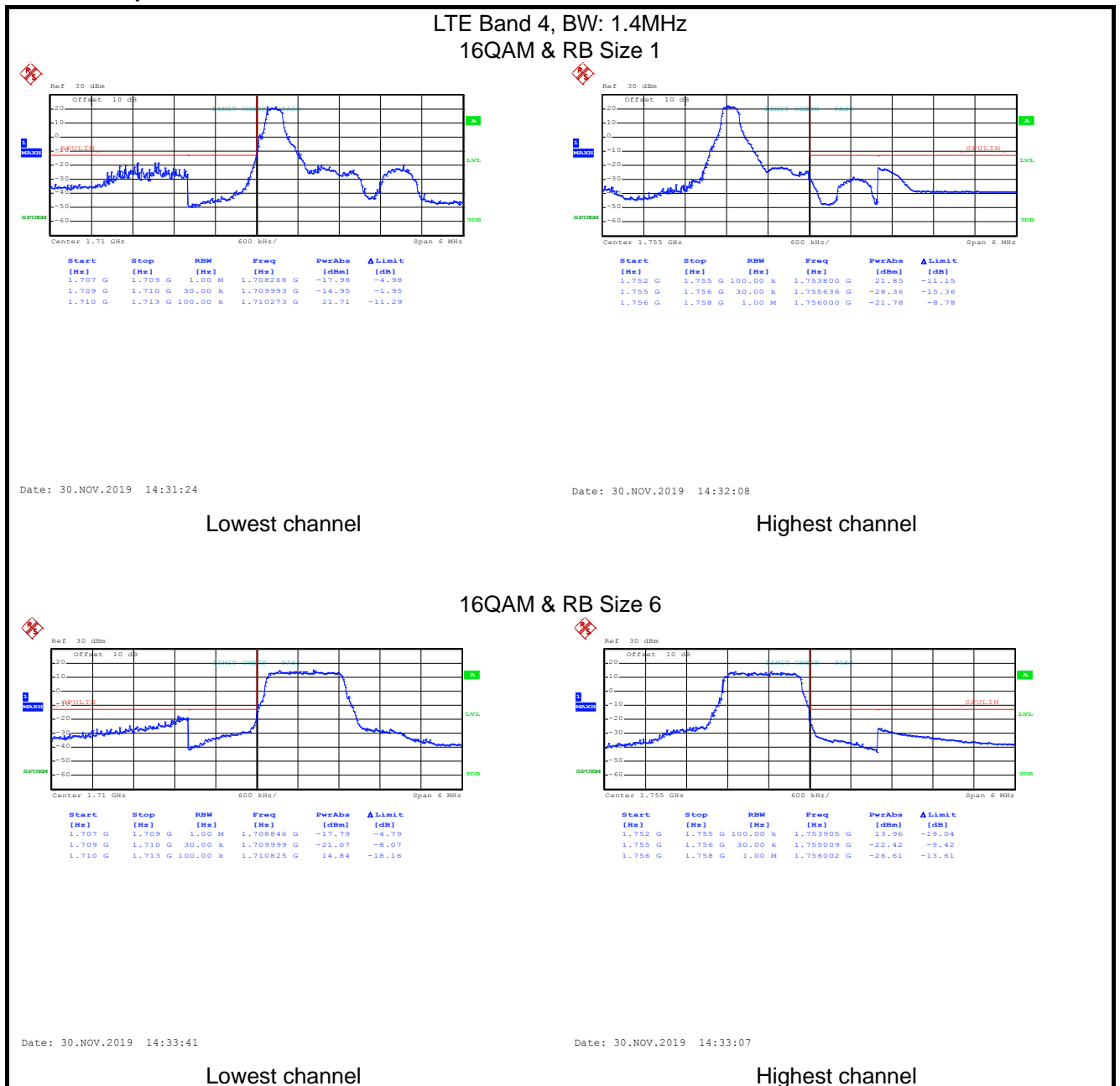
30MHz~1GHz



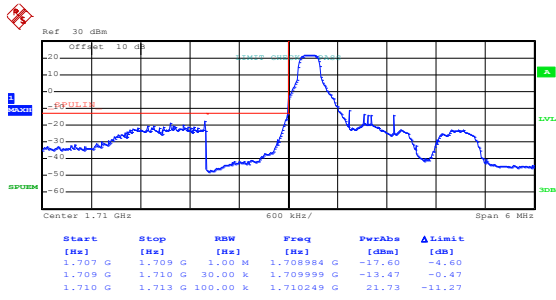
Date: 24.NOV.2019 17:30:21

1GHz~9GHz

Band edge emission:
LTE Band 4 part:

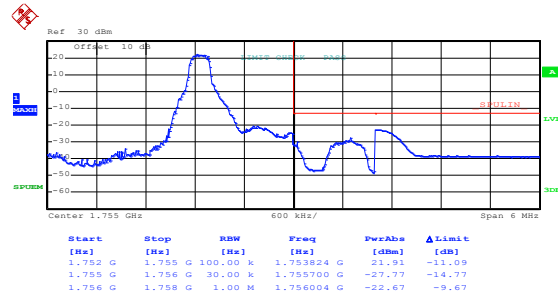


LTE Band 4, BW: 1.4MHz QPSK&RB Size 1



Date: 30.NOV.2019 14:31:04

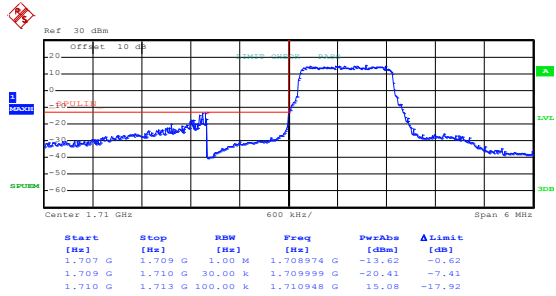
Lowest channel



Date: 30.NOV.2019 14:32:25

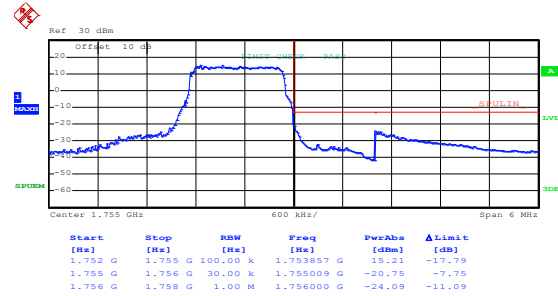
Highest channel

QPSK&RB Size6



Date: 30.NOV.2019 14:33:54

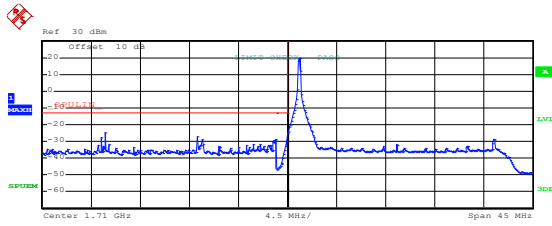
Lowest channel



Date: 30.NOV.2019 14:32:52

Highest channel

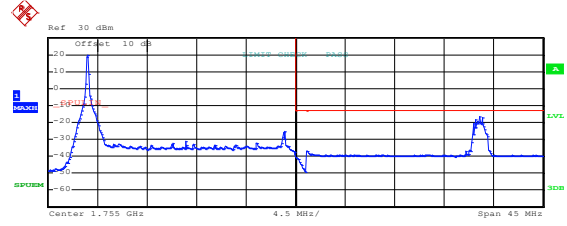
LTE Band 4, BW: 20MHz
16QAM &RB Size 1



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
1.688 G	1.709 G	1.00 M	1.693283 G	-24.66	-11.66
1.709 G	1.710 G	30.00 k	1.709999 G	-20.02	-17.02
1.710 G	1.732 G	100.00 k	1.711057 G	19.97	-13.03

Date: 24.NOV.2019 16:28:18

Lowest channel

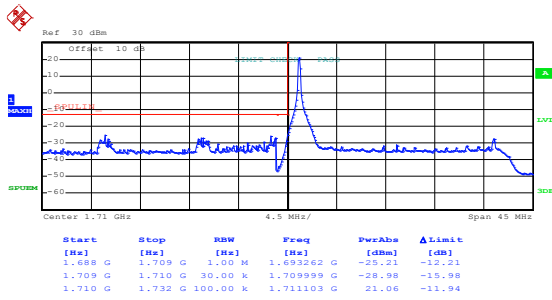


Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
1.732 G	1.755 G	100.00 k	1.738400 G	19.62	-13.38
1.755 G	1.756 G	30.00 k	1.755017 G	-40.09	-27.09
1.756 G	1.778 G	1.00 M	1.771738 G	-16.57	-3.57

Date: 24.NOV.2019 16:29:17

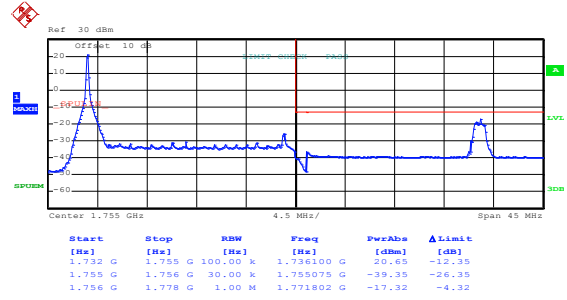
Highest channel

LTE Band 4, BW: 20MHz QPSK &RB Size 1



Date: 24.NOV.2019 16:27:57

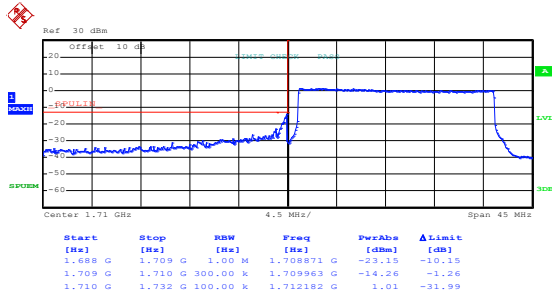
Lowest channel



Date: 24.NOV.2019 16:29:02

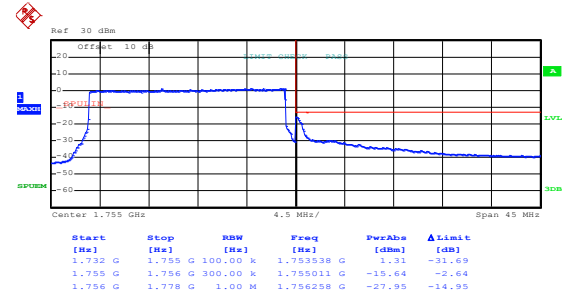
Highest channel

QPSK &RB Size 100



Date: 30.NOV.2019 14:39:52

Lowest channel

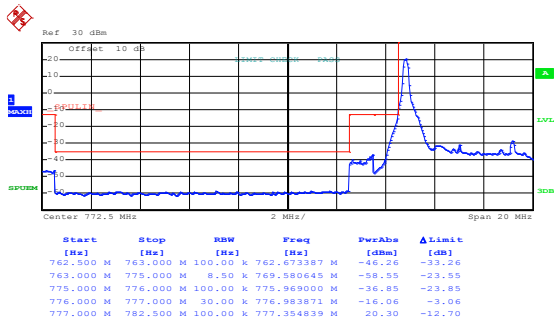


Date: 30.NOV.2019 14:42:03

Highest channel

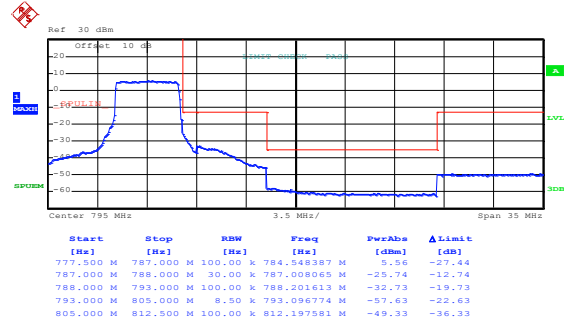
LTE Band 13 part:

LTE Band 13, BW: 5MHz 16QAM &RB Size 1



Date: 24.NOV.2019 15:57:15

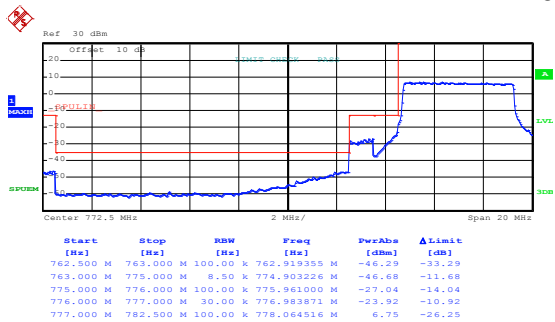
Lowest channel



Date: 24.NOV.2019 15:59:17

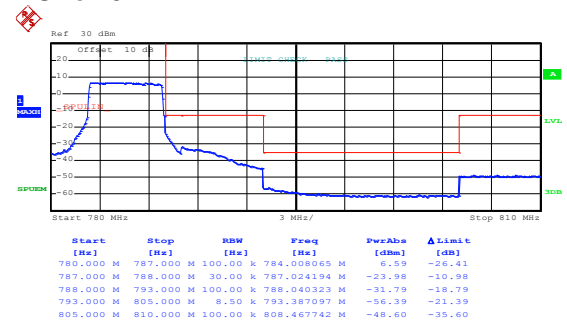
Highest channel

16QAM &RB Size 25



Date: 30.NOV.2019 14:25:07

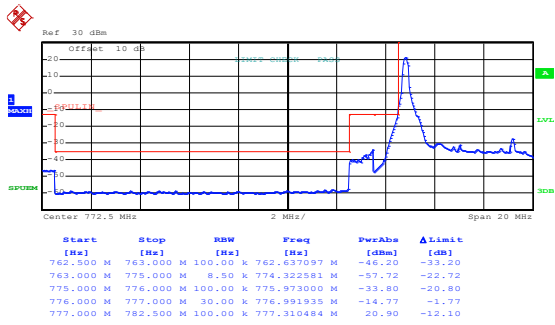
Lowest channel



Date: 30.NOV.2019 14:27:34

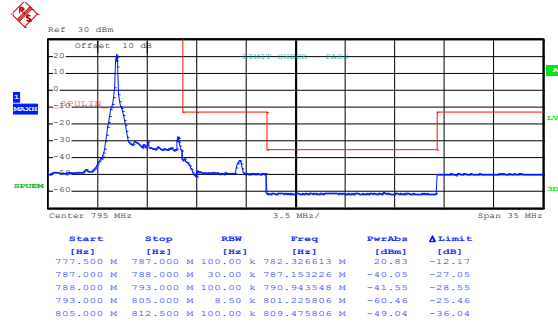
Highest channel

LTE Band 13, BW: 5MHz QPSK & RB Size 1



Date: 24.NOV.2019 15:56:39

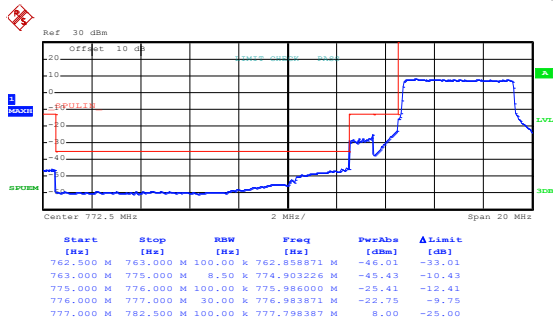
Lowest channel



Date: 24.NOV.2019 15:59:03

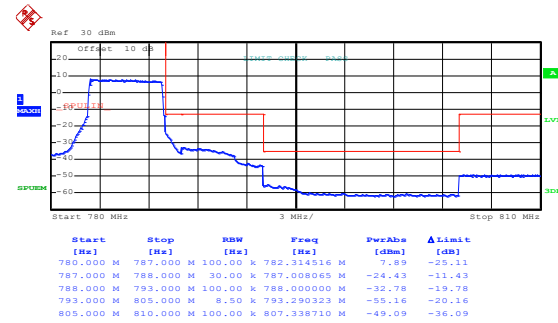
Highest channel

QPSK & RB Size 25



Date: 30.NOV.2019 14:24:13

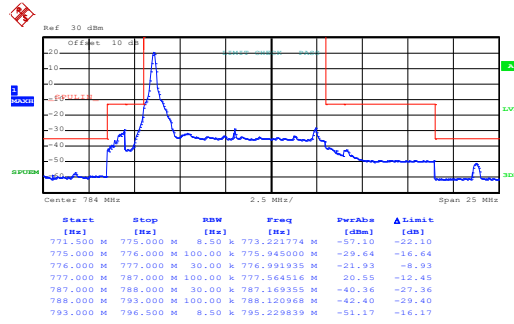
Lowest channel



Date: 30.NOV.2019 14:27:56

Highest channel

LTE Band 13, BW: 10MHz
16QAM &RB Size 1

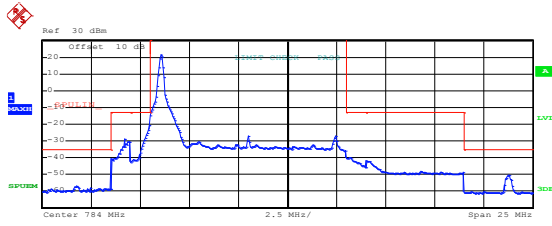


Date: 30.NOV.2019 14:20:28

Middle Channel

LTE Band 13, BW: 10MHz

QPSK &RB Size 1

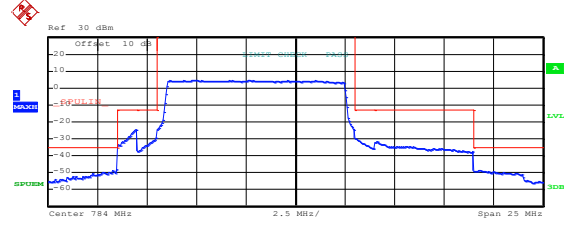


Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
771.500 M	775.000 M	8.50 k	773.221774 M	-56.98	-21.98
775.000 M	776.000 M	100.00 k	775.700000 M	-28.79	-15.79
776.000 M	777.000 M	30.00 k	776.991935 M	-21.16	-8.16
777.000 M	787.000 M	100.00 k	777.564516 M	21.67	-11.33
787.000 M	788.000 M	30.00 k	787.169355 M	-39.81	-26.81
788.000 M	793.000 M	100.00 k	788.000000 M	-41.76	-28.76
793.000 M	796.500 M	8.50 k	795.229839 M	-50.20	-15.20

Date: 30.NOV.2019 14:18:00

Middle Channel

QPSK &RB Size 50

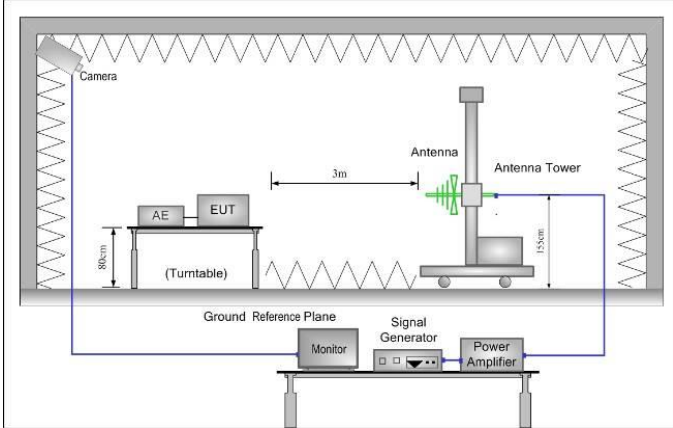
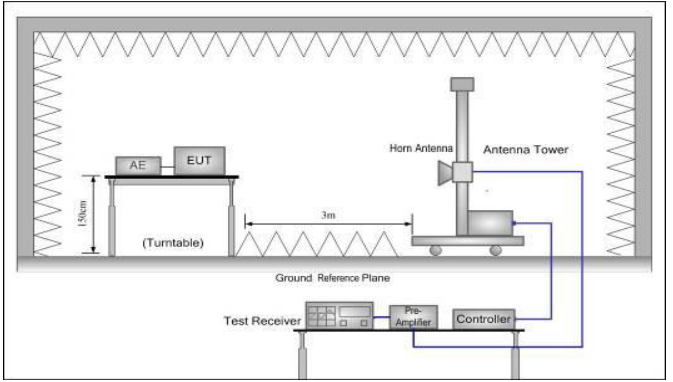


Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	ΔLimit [dB]
771.500 M	775.000 M	8.50 k	774.717742 M	-48.46	-13.46
775.000 M	776.000 M	100.00 k	775.918000 M	-24.76	-11.76
776.000 M	777.000 M	30.00 k	776.975806 M	-29.44	-16.44
777.000 M	787.000 M	100.00 k	779.016129 M	4.50	-28.50
787.000 M	788.000 M	30.00 k	787.040323 M	-29.88	-16.88
788.000 M	793.000 M	100.00 k	788.120968 M	-31.83	-18.83
793.000 M	796.500 M	8.50 k	793.310484 M	-48.62	-13.62

Date: 30.NOV.2019 14:18:32

Middle Channel

6.5 Field strength of spurious radiation measurement

<p>Test Requirement:</p>	<p>Part 27.53(h), Part 27.53(c)(f)</p>
<p>Limit:</p>	<p>LTE Band4: The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB (-13 dBm).</p> <p>LTE Band13: The power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log(P)$ dB(-13 dBm). For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals.</p>
<p>Test setup:</p>	<p>Below 1GHz</p>  <p>Above 1GHz</p> 
<p>Test Procedure:</p>	<ol style="list-style-type: none"> 1. The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer. 2. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations. 3. The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method. 4. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.

	ERP / EIRP = S.G. output (dBm) + Antenna Gain(dB/dBi) – Cable Loss (dB)
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details.
Test results:	Passed

Measurement Data:

LTE Band 4 part:

LTE Band 4, WB: 1.4MHz				
RB size 1 & RB offset 0				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
Lowest Channel				
3421.40	Vertical	-40.46	-13.00	Pass
5132.10	V	-45.72		
6842.80	V	-39.89		
3421.40	Horizontal	-42.44		
5132.10	H	-45.90		
6842.80	H	-40.23		
Middle Channel				
3465.00	Vertical	-40.81	-13.00	Pass
5197.50	V	-45.59		
6930.00	V	-40.16		
3465.00	Horizontal	-42.78		
5197.50	H	-45.88		
6930.00	H	-39.84		
Highest Channel				
3508.60	Vertical	-40.11	-13.00	Pass
5262.90	V	-45.63		
7017.20	V	-39.58		
3508.60	Horizontal	-42.31		
5262.90	H	-45.46		
7017.20	H	-40.51		
<p><i>Note:</i></p> <ol style="list-style-type: none"> <i>The emission levels of below 1 GHz are 20 dB lower than the limit so not show in this report.</i> <i>For above 1 GHz, all test modes were performed, and just the worst case shown in the report.</i> 				

LTE Band 4, WB: 3MHz				
RB size 1 & RB offset 0				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
Lowest Channel				
3423.00	Vertical	-41.12	-13.00	Pass
5134.50	V	-45.97		
6846.00	V	-39.69		
3423.00	Horizontal	-43.10		
5134.50	H	-46.35		
6846.00	H	-39.41		
Middle Channel				
3465.00	Vertical	-39.64	-13.00	Pass
5197.50	V	-46.06		
6930.00	V	-39.32		
3465.00	Horizontal	-41.99		
5197.50	H	-45.57		
6930.00	H	-40.87		
Highest Channel				
3507.00	Vertical	-40.92	-13.00	Pass
5260.50	V	-45.26		
7014.00	V	-40.51		
3507.00	Horizontal	-43.01		
5260.50	H	-45.65		
7014.00	H	-40.20		
<p><i>Note:</i></p> <ol style="list-style-type: none"> <i>The emission levels of below 1 GHz are 20 dB lower than the limit so not show in this report.</i> <i>For above 1 GHz, all test modes were performed, and just the worst case shown in the report.</i> 				

LTE Band 4, WB: 5MHz				
RB size 1 & RB offset 0				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
Lowest Channel				
3425.00	Vertical	-40.13	-13.00	Pass
5137.50	V	-45.61		
6850.00	V	-39.45		
3425.00	Horizontal	-42.04		
5137.50	H	-45.88		
6850.00	H	-39.83		
Middle Channel				
3465.00	Vertical	-40.04	-13.00	Pass
5197.50	V	-45.54		
6930.00	V	-39.60		
3465.00	Horizontal	-42.36		
5197.50	H	-46.18		
6930.00	H	-39.99		
Highest Channel				
3505.00	Vertical	-40.34	-13.00	Pass
5257.50	V	-45.21		
7010.00	V	-39.21		
3505.00	Horizontal	-42.39		
5257.50	H	-45.71		
7010.00	H	-40.10		
<p><i>Note:</i></p> <ol style="list-style-type: none"> <i>The emission levels of below 1 GHz are 20 dB lower than the limit so not show in this report.</i> <i>For above 1 GHz, all test modes were performed, and just the worst case shown in the report.</i> 				

LTE Band 4, WB: 10MHz				
RB size 1 & RB offset 0				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
Lowest Channel				
3430.00	Vertical	-40.82	-13.00	Pass
5145.00	V	-45.97		
6860.00	V	-39.56		
3430.00	Horizontal	-42.33		
5145.00	H	-45.76		
6860.00	H	-40.40		
Middle Channel				
3465.00	Vertical	-41.01	-13.00	Pass
5197.50	V	-46.20		
6930.00	V	-39.55		
3465.00	Horizontal	-42.81		
5197.50	H	-45.76		
6930.00	H	-40.19		
Highest Channel				
3500.00	Vertical	-41.48	-13.00	Pass
5250.00	V	-46.64		
7000.00	V	-39.91		
3500.00	Horizontal	-42.81		
5250.00	H	-45.33		
7000.00	H	-40.64		
<p><i>Note:</i></p> <ol style="list-style-type: none"> <i>The emission levels of below 1 GHz are 20 dB lower than the limit so not show in this report.</i> <i>For above 1 GHz, all test modes were performed, and just the worst case shown in the report.</i> 				

LTE Band 4, WB: 15MHz				
RB size 1 & RB offset 0				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
Lowest Channel				
3435.00	Vertical	-40.29	-13.00	Pass
5152.50	V	-45.80		
6870.00	V	-39.47		
3435.00	Horizontal	-42.48		
5152.50	H	-45.65		
6870.00	H	-40.70		
Middle Channel				
3465.00	Vertical	-39.94	-13.00	Pass
5197.50	V	-45.96		
6930.00	V	-39.65		
3465.00	Horizontal	-42.67		
5197.50	H	-45.55		
6930.00	H	-40.95		
Highest Channel				
3495.00	Vertical	-40.10	-13.00	Pass
5242.50	V	-44.74		
6990.00	V	-39.59		
3495.00	Horizontal	-42.46		
5242.50	H	-45.55		
6990.00	H	-39.83		
<p><i>Note:</i></p> <ol style="list-style-type: none"> <i>The emission levels of below 1 GHz are 20 dB lower than the limit so not show in this report.</i> <i>For above 1 GHz, all test modes were performed, and just the worst case shown in the report.</i> 				

LTE Band 4, WB: 20MHz				
RB size 1 & RB offset 0				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
Lowest Channel				
3440.00	Vertical	-39.98	-13.00	Pass
5160.00	V	-46.28		
6880.00	V	-39.24		
3440.00	Horizontal	-42.61		
5160.00	H	-45.44		
6880.00	H	-41.06		
Middle Channel				
3465.00	Vertical	-40.50	-13.00	Pass
5197.50	V	-46.46		
6930.00	V	-39.07		
3465.00	Horizontal	-42.03		
5197.50	H	-45.77		
6930.00	H	-40.90		
Highest Channel				
3490.00	Vertical	-40.74	-13.00	Pass
5235.00	V	-46.73		
6980.00	V	-39.17		
3490.00	Horizontal	-42.39		
5235.00	H	-45.44		
6980.00	H	-41.35		
<p><i>Note:</i></p> <ol style="list-style-type: none"> <i>The emission levels of below 1 GHz are 20 dB lower than the limit so not show in this report.</i> <i>For above 1 GHz, all test modes were performed, and just the worst case shown in the report.</i> 				

LTE Band 13 part:

LTE Band 13, WB: 5MHz				
RB size 1 & RB offset 0				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
Lowest Channel				
1559.00	Vertical	-41.92	-13.00	Pass
2338.50	V	-46.88		
3118.00	V	-52.58		
1559.00	Horizontal	-40.09		
2338.50	H	-51.84		
3118.00	H	-51.79		
Middle Channel				
1564.00	Vertical	-41.64	-13.00	Pass
2346.00	V	-46.40		
3128.00	V	-52.35		
1564.00	Horizontal	-39.83		
2346.00	H	-51.75		
3128.00	H	-52.15		
Highest Channel				
1569.00	Vertical	-41.42	-13.00	Pass
2353.50	V	-45.94		
3138.00	V	-52.63		
1569.00	Horizontal	-39.76		
2353.50	H	-52.02		
3138.00	H	-51.99		
<p>Note:</p> <ol style="list-style-type: none"> The emission levels of below 1 GHz are 20 dB lower than the limit so not show in this report. For above 1 GHz, all test modes were performed, and just the worst case shown in the report. 				

LTE Band 13, WB: 10MHz				
RB size 1 & RB offset 0				
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
Lowest Channel				
1564.00	Vertical	-41.61	-13.00	Pass
2346.00	V	-47.30		
3128.00	V	-52.21		
1564.00	Horizontal	-40.25		
2346.00	H	-52.17		
3128.00	H	-51.94		
Middle Channel				
1564.00	Vertical	-41.80	-13.00	Pass
2346.00	V	-47.08		
3128.00	V	-52.47		
1564.00	Horizontal	-40.64		
2346.00	H	-51.80		
3128.00	H	-51.67		
Highest Channel				
1564.00	Vertical	-42.27	-13.00	Pass
2346.00	V	-47.25		
3128.00	V	-52.12		
1564.00	Horizontal	-40.86		
2346.00	H	-51.48		
3128.00	H	-51.42		
<p><i>Note:</i></p> <ol style="list-style-type: none"> <i>The emission levels of below 1 GHz are 20 dB lower than the limit so not show in this report.</i> <i>For above 1 GHz, all test modes were performed, and just the worst case shown in the report.</i> 				

6.6 Frequency stability V.S. Temperature measurement

Test Requirement:	Part 27.54, Part 2.1055(a)(1)(b)
Limit:	±2.5ppm
Test setup:	
Test procedure:	<ol style="list-style-type: none"> 1. The equipment under test was connected to an external DC power supply and input rated voltage. 2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. 3. The EUT was placed inside the temperature chamber. 4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. 5. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. 6. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data (worst case):

LTE Band 4 part:

Reference Frequency: LTE Band 4(10MHz) Middle channel=20175 channel=1732.50MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.80	-30	178	0.102742	±2.5	Pass
	-20	164	0.094661		
	-10	158	0.091198		
	0	150	0.086580		
	10	143	0.082540		
	20	136	0.078499		
	30	129	0.074459		
	40	120	0.069264		
	50	116	0.066955		
16QAM					
3.80	-30	170	0.098124	±2.5	Pass
	-20	162	0.093506		
	-10	157	0.090620		
	0	149	0.086003		
	10	140	0.080808		
	20	133	0.076768		
	30	126	0.072727		
	40	117	0.067532		
	50	110	0.063492		

Note: Only the worst case shown in the report.

LTE Band 13 part:

Reference Frequency: LTE Band 13(10MHz) Middle channel=23230 channel=782.00MHz					
Power supplied (Vdc)	Temperature (°C)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
3.80	-30	177	0.226343	±2.5	Pass
	-20	161	0.205882		
	-10	153	0.195652		
	0	146	0.186701		
	10	137	0.175192		
	20	130	0.166240		
	30	124	0.158568		
	40	118	0.150895		
	50	109	0.139386		
16QAM					
3.80	-30	175	0.223785	±2.5	Pass
	-20	160	0.204604		
	-10	152	0.194373		
	0	147	0.187980		
	10	139	0.177749		
	20	130	0.166240		
	30	121	0.154731		
	40	113	0.144501		
	50	108	0.138107		
<i>Note: Only the worst case shown in the report.</i>					

6.7 Frequency stability V.S. Voltage measurement

Test Requirement:	Part 27.54, Part 2.1055(d)(2)
Limit:	±2.5ppm
Test setup:	
Test procedure:	<ol style="list-style-type: none"> 1. Set chamber temperature to 25°C. Use a variable DC power source to power the EUT and set the voltage to rated voltage. 2. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency. 3. Reduce the input voltage to specify extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.
Test Instruments:	Refer to section 5.10 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data(worst case):

LTE Band 4 part:

Reference Frequency: LTE Band 4(10MHz) Middle channel=20175 channel=1732.50MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	4.35	83	0.047908	±2.5	Pass
	3.80	70	0.040404		
	3.50	58	0.033478		
16QAM					
25	4.35	79	0.045599	±2.5	Pass
	3.80	60	0.034632		
	3.50	56	0.032323		

Note: Only the worst case shown in the report.

LTE Band 13 part:

Reference Frequency: LTE Band 13(10MHz) Middle channel=23230 channel=728.00MHz					
Temperature (°C)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
QPSK					
25	4.35	88	0.120879	±2.5	Pass
	3.80	73	0.100275		
	3.50	66	0.090659		
16QAM					
25	4.35	86	0.118132	±2.5	Pass
	3.80	70	0.096154		
	3.50	59	0.081044		

Note: Only the worst case shown in the report.