

FCC REPORT

(LTE)

Applicant: Whoop International Trading Limited

Address of Applicant: Flat-B 8/F Chong Gming Building 72 Cheung Sha Wan Road,
Kowloon, Hong kong

Equipment Under Test (EUT)

Product Name: HOME CONNECT

Model No.: WHP-HCLTE-TMO-1

Trade mark: ALLY

FCC ID: 2AP7L-WHC4TMO

Applicable standards: FCC CFR Title 47 Part 2
FCC CFR Title 47 Part 24 Subpart E
FCC CFR Title 47 Part 27 Subpart L
FCC CFR Title 47 Part 27 Subpart H

Date of sample receipt: 15 Jul., 2019

Date of Test: 16 Jul., to 28 Jul., 2019

Date of report issued: 29 Jul., 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.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful, and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

2. Version

Version No.	Date	Description
00	29 Jul., 2019	Original

Tested by:

Yao Wu
Test Engineer

Date:

29 Jul., 2019

Reviewed by:

Winner Zhang
Project Engineer

Date:

29 Jul., 2019

3. Contents

Page

1.	COVER PAGE	1
2.	VERSION	2
3.	CONTENTS	3
4.	TEST SUMMARY	4
5.	GENERAL INFORMATION	5
5.1	CLIENT INFORMATION	5
5.2	GENERAL DESCRIPTION OF E.U.T	5
5.3	TEST ENVIRONMENT AND MODE	10
5.4	DESCRIPTION OF SUPPORT UNITS	10
5.5	MEASUREMENT UNCERTAINTY	10
5.6	RELATED SUBMITTAL(S) / GRANT (S)	10
5.7	LABORATORY FACILITY	10
5.8	LABORATORY LOCATION	10
5.9	TEST INSTRUMENTS LIST	11
6.	TEST RESULTS	12
6.1	CONDUCTED OUTPUT POWER, ERP AND EIRP	12
6.2	PEAK-TO-AVERAGE RATIO	21
6.3	OCCUPY BANDWIDTH	24
6.4	OUT OF BAND EMISSION AT ANTENNA TERMINALS	60
6.5	FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT	157
6.6	FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT	174
6.7	FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT	178
7	TEST SETUP PHOTO	180
8	EUT CONSTRUCTIONAL DETAILS	181

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 24.232 (c) Part 27.50 (c)(10) Part 27.50 (d)(4)	Pass
Peak-to-Average Ratio	Part 24.232 (d) Part 27.50(d)(5)	Pass
Modulation Characteristics	Part 2.1047	Pass
99% & -26 dB Occupied Bandwidth	Part 2.1049 Part 24.238(b) Part 27.53(g) Part 27.53(h)	Pass
Out of band emission at antenna terminals	Part 2.1053 Part 24.238 (a) Part 27.53 (g) Part 27.53 (h)	Pass
Field strength of spurious radiation	Part 24.238 (a) Part 27.53 (g) Part 27.53 (h)	Pass
Frequency stability vs. temperature	Part 24.235 Part 27.54 Part 2.1055(a)(1)(b)	Pass
Frequency stability vs. voltage	Part 24.235 Part 27.54 Part 2.1055(d)(2)	Pass
Pass: The EUT complies with the essential requirements in the standard.		

5. General Information

5.1 Client Information

Applicant:	Whoop International Trading Limited
Address:	Flat-B 8/F Chong Gming Building 72 Cheung Sha Wan Road, Kowloon, Hong kong
Manufacturer:	Whoop International Trading Limited
Address:	Flat-B 8/F Chong Gming Building 72 Cheung Sha Wan Road, Kowloon, Hong kong

5.2 General Description of E.U.T.

Product Name:	HOME CONNECT
Model No.:	WHP-HCLTE-TMO-1
Operation Frequency range:	LTE Band 2: TX: 1850MHz-1910MHz, RX: 1930MHz-1990MHz LTE Band 4: TX: 1710MHz-1755MHz, RX: 2110MHz-2155MHz LTE Band 12: TX: 699MHz-716MHz, RX: 729MHz-746MHz
Modulation type:	QPSK, 16QAM
Antenna type:	Internal Antenna
Antenna gain:	LTE Band 2: 3.0dBi LTE Band 4: 5.0dBi LTE Band 12: 1.8dBi
Power supply:	DC 12V
AC adapter:	Model: SA12V-120100U Input: AC100-240V, 50/60Hz, 0.4A Output: DC 12V, 1A
Test Sample Condition:	The applicant provided engineering samples for staying in continuously transmitting for testing.
Remarks:	The built-in rechargeable lithium battery is used for emergency power supply.

Operation Frequency List:

LTE Band 2 (1.4MHz)		LTE Band 2 (3MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
18607	1850.70	18615	1851.50
18608	1850.80	18616	1851.60
....			
18899	1879.90	18899	1879.90
18900	1880.00	18900	1880.00
18901	1880.10	18901	1880.10
...	...	...	...
19193	1909.20	19185	1908.40
19194	1909.30	19186	1908.50
LTE Band 2 (5MHz)		LTE Band 2 (10MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
18625	1852.50	18650	1855.00
18626	1852.60	18651	1855.10
....			
18899	1879.90	18899	1879.90
18900	1880.00	18900	1880.00
18901	1880.10	18901	1880.10
...	...	...	...
19175	1907.40	19150	1904.90
19176	1907.50	19151	1905.00
LTE Band 2 (15MHz)		LTE Band 2 (20MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
18675	1857.50	18700	1860.00
18676	1857.60	18701	1860.10
....			
18899	1879.90	18899	1879.90
18900	1880.00	18900	1880.00
18901	1880.10	18901	1880.10
...	...	...	...
19125	1902.40	19100	1899.90
19126	1902.50	19101	1900.00

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 12 (1.4MHz)		LTE Band 12 (3MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
23017	699.70	23025	700.50
23756	699.80	23026	700.60
....			
23094	707.40	23094	707.40
23095	707.50	23095	707.50
23096	707.60	23096	707.60
...	...	...	...
23172	715.20	23164	714.40
23173	715.30	23165	714.50
LTE Band 12 (5MHz)		LTE Band 12 (10MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
23035	701.50	23060	704.00
23036	701.60	23061	704.10
....			
23094	707.40	23094	707.40
23095	707.50	23095	707.50
23096	707.60	23096	707.60
...	...	...	...
23154	713.40	23129	710.90
23155	713.50	23130	711.00

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 2 (1.4MHz)			LTE Band 2 (3MHz)		
Channel		Frequency (MHz)	Channel		Frequency (MHz)
Lowest channel	18607	1850.70	Lowest channel	18615	1851.50
Middle channel	18900	1880.00	Middle channel	18900	1880.00
Highest channel	19193	1909.30	Highest channel	19185	1908.50
LTE Band 2 (5MHz)			LTE Band 2 (10MHz)		
Channel		Frequency (MHz)	Channel		Frequency (MHz)
Lowest channel	18625	1852.50	Lowest channel	18650	1855.00
Middle channel	18900	1880.00	Middle channel	18900	1880.00
Highest channel	19175	1907.50	Highest channel	19150	1905.00
LTE Band 2 (15MHz)			LTE Band 2 (20MHz)		
Channel		Frequency (MHz)	Channel		Frequency (MHz)
Lowest channel	18675	1857.50	Lowest channel	18700	1860.00
Middle channel	18900	1880.00	Middle channel	18900	1880.00
Highest channel	19125	1902.50	Highest channel	19100	1900.00

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 12(1.4MHz)			LTE Band 12(3MHz)		
Channel		Frequency (MHz)	Channel		Frequency (MHz)
Lowest channel	23017	699.70	Lowest channel	23025	700.50
Middle channel	23095	707.50	Middle channel	23095	707.50
Highest channel	23173	715.30	Highest channel	23165	714.50
LTE Band 12(5MHz)			LTE Band 12(10MHz)		
Channel		Frequency (MHz)	Channel		Frequency (MHz)
Lowest channel	23035	701.50	Lowest channel	23060	704.00
Middle channel	23095	707.50	Middle channel	23095	707.50
Highest channel	23155	713.50	Highest channel	23130	711.00

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: 12.0Vdc, Extreme: Low 10.2Vdc, High 13.8Vdc
Test mode:	
LTE QPSK mode	Keep the EUT communication with simulated station in QPSK mode
LTE 16-QAM mode	Keep the EUT communication with simulated station in 16-QAM mode
Remark: The EUT has been tested under continuous 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.

5.7 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC - Designation No.: CN1211**

Shenzhen Zhongjian Nanfang 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 Zhongjian Nanfang 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 Zhongjian Nanfang 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>

5.8 Laboratory Location

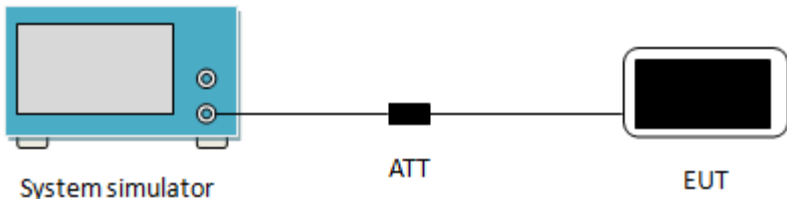
Shenzhen Zhongjian Nanfang Testing Co., Ltd.
Address: No. B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,
Bao'an District, Shenzhen, Guangdong, China
Tel: +86-755-23118282, Fax: +86-755-23116366
Email: info@ccis-cb.com, Website: http://www.ccis-cb.com

5.9 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	11-21-2018	11-20-2019
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	10-29-2018	10-28-2019
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	MWRFTTEST	MW200	N/A	N/A	N/A
Test Software	MWRFTTEST	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	10-31-2018	10-30-2019
Temperature Humidity Chamber	HengPu	HPGDS-500	20140828008	09-24-2018	09-23-2019
Simulated Station	Rohde & Schwarz	CMW500	140493	07-16-2018	07-15-2019

6. Test results

6.1 Conducted Output Power, ERP and EIRP

Test Requirement:	Part 24.232(c), part 27.50(c)(10), Part 27.50(d)(4)
Test Method:	ANSI/TIA-603-D 2010
Limit:	LTE Band 2: 2W, LTE Band 4: 1W, LTE Band 12: 3W
Test Setup:	 The diagram illustrates the test setup. On the left is a blue rectangular box labeled 'System simulator'. A line connects its right side to a small black square labeled 'ATT' (attenuator). Another line connects the right side of the 'ATT' to a black rectangular box labeled 'EUT' (Equipment Under Test).
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 5.9 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)			
					18607	18900	19193	
					1850.7MHz	1880.0MHz	1909.3MHz	
2	1.4	QPSK	1	0	22.44	22.03	22.64	
			1	2	22.58	22.85	22.68	
			1	5	22.32	22.68	22.65	
			3	0	22.72	22.90	22.69	
			3	1	22.87	22.94	22.60	
			3	2	22.88	22.96	22.63	
			6	0	21.72	22.00	21.79	
		Antenna Gain (dBi):				3.0		
		Max. EIRP (dBm):				25.96		
		EIRP Limit (dBm):				33.00		
		16QAM	1	0	21.40	21.58	21.71	
			1	2	21.08	21.77	21.45	
			1	5	21.24	21.55	21.02	
			3	0	21.22	21.63	21.65	
			3	1	21.79	21.97	21.60	
			3	2	21.62	21.92	21.66	
			6	0	20.59	21.01	20.66	
		Antenna Gain (dBi):				3.0		
		Max. EIRP (dBm):				24.97		
		EIRP Limit (dBm):				33.00		
LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)			
					18615	18900	19185	
					1851.5MHz	1880.0MHz	1908.5MHz	
2	3	QPSK	1	0	22.48	22.94	22.51	
			1	7	22.57	23.09	22.46	
			1	14	22.52	22.99	22.45	
			8	0	21.70	22.06	21.79	
			8	4	21.69	22.06	21.77	
			8	7	21.59	22.01	21.74	
			15	0	21.71	21.92	21.86	
		Antenna Gain (dBi):				3.0		
		Max. EIRP (dBm):				26.09		
		EIRP Limit (dBm):				33.00		
		16QAM	1	0	21.51	21.88	21.43	
			1	7	21.02	21.69	20.83	
			1	14	21.04	21.72	21.02	
			8	0	20.42	20.44	20.57	
			8	4	20.56	20.82	20.49	
			8	7	20.57	20.93	20.64	
			15	0	20.70	20.85	20.49	
		Antenna Gain (dBi):				3.0		
		Max. EIRP (dBm):				24.88		
		EIRP Limit (dBm):				33.00		
Note: EIRP (dBm) = Average power (dBm) + Antenna Gain (dBi).								

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

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					18625	18900	19175
					1852.5MHz	1880.0MHz	1907.5MHz
2	5	QPSK	1	0	22.49	22.80	22.61
			1	12	22.58	23.01	22.53
			1	24	22.54	22.99	22.46
			12	0	21.79	22.04	21.67
			12	6	21.84	22.07	21.59
			12	11	21.81	22.05	21.56
			25	0	21.75	21.96	21.68
		Antenna Gain (dBi):			3.0		
		Max. EIRP (dBm):			26.01		
		EIRP Limit (dBm):			33.00		
		16QAM	1	0	21.60	21.50	21.01
			1	12	21.50	21.61	21.48
			1	24	21.31	21.17	21.38
			12	0	20.60	20.52	20.59
			12	6	20.53	20.80	20.54
			12	11	20.50	20.78	20.47
			25	0	20.63	20.93	20.41
		Antenna Gain (dBi):			3.0		
		Max. EIRP (dBm):			24.61		
		EIRP Limit (dBm):			33.00		

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)		
					18650	18900	19150
					1855.0MHz	1880.0MHz	1905.0MHz
2	10	QPSK	1	0	22.25	22.16	22.10
			1	24	21.88	22.30	22.57
			1	49	21.90	22.04	22.36
			25	0	21.14	21.24	21.65
			25	12	21.27	21.35	21.92
			25	24	20.97	20.81	21.40
			50	0	20.94	21.06	21.67
		Antenna Gain (dBi):			3.0		
		Max. EIRP (dBm):			25.57		
		EIRP Limit (dBm):			33.00		
		16QAM	1	0	21.06	21.01	21.33
			1	24	21.57	21.08	21.44
			1	49	21.76	21.39	21.01
			25	0	20.85	20.99	20.87
			25	12	20.45	20.59	20.77
			25	24	20.61	20.34	20.45
			50	0	20.56	20.43	20.66
		Antenna Gain (dBi):			3.0		
		Max. EIRP (dBm):			24.76		
		EIRP Limit (dBm):			33.00		

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

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)			
					18675	18900	19125	
					1857.5MHz	1880.0MHz	1902.5MHz	
2	15	QPSK	1	0	22.41	22.62	22.49	
			1	37	22.55	22.96	22.65	
			1	74	22.29	22.54	22.37	
			36	0	21.89	21.56	21.65	
			36	16	21.84	21.74	22.08	
			36	35	21.59	21.93	21.54	
			75	0	21.63	21.83	21.55	
		Antenna Gain (dBi):				3.0		
		Max. EIRP (dBm):				25.96		
		EIRP Limit (dBm):				33.00		
		16QAM	1	0	21.15	21.74	21.19	
			1	37	21.28	22.39	21.53	
			1	74	21.11	21.31	20.22	
			36	0	20.43	20.39	20.59	
			36	16	20.87	20.94	21.16	
			36	35	20.52	20.57	20.49	
			75	0	20.56	20.88	20.63	
Antenna Gain (dBi):				3.0				
Max. EIRP (dBm):				25.39				
EIRP Limit (dBm):				33.00				
LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)			
					18700	18900	19100	
					1860.0MHz	1880.0MHz	1900.0MHz	
2	20	QPSK	1	0	22.49	22.62	22.33	
			1	49	22.68	22.81	22.48	
			1	99	22.35	22.38	22.27	
			50	0	22.13	22.07	22.02	
			50	24	21.97	22.10	21.99	
			50	49	21.60	21.58	21.32	
			100	0	21.75	21.72	21.29	
		Antenna Gain (dBi):				3.0		
		Max. EIRP (dBm):				25.81		
		EIRP Limit (dBm):				33.00		
		16QAM	1	0	21.76	21.64	21.57	
			1	49	21.13	21.68	21.32	
			1	99	20.62	20.54	20.68	
			50	0	20.58	20.64	20.56	
			50	24	20.91	21.00	20.42	
			50	49	20.45	20.49	20.53	
			100	0	20.54	20.74	20.93	
Antenna Gain (dBi):				3.0				
Max. EIRP (dBm):				24.76				
EIRP Limit (dBm):				33.00				
Note: EIRP (dBm) = Average power (dBm) + Antenna Gain (dBi).								

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	22.84	22.62	22.46	
			1	2	22.88	22.72	22.52	
			1	5	22.89	22.68	22.53	
			3	0	22.94	22.67	22.56	
			3	1	23.14	22.59	22.71	
			3	2	23.12	22.65	22.75	
			6	0	21.99	21.72	21.79	
		Antenna Gain (dBi):				5.0		
		Max. EIRP (dBm):				28.14		
		EIRP Limit (dBm):				30.00		
		16QAM	1	0	21.99	21.18	21.64	
			1	2	21.92	21.34	21.58	
			1	5	21.41	20.75	21.59	
			3	0	21.47	20.83	21.33	
			3	1	21.04	21.22	21.77	
			3	2	21.01	21.16	21.83	
			6	0	20.77	20.59	20.66	
		Antenna Gain (dBi):				5.0		
		Max. EIRP (dBm):				26.99		
		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	22.94	22.27	22.31	
			1	7	23.00	22.32	22.38	
			1	14	22.92	22.31	22.35	
			8	0	21.77	21.46	21.25	
			8	4	21.56	21.51	21.48	
			8	7	21.66	21.56	21.41	
			15	0	21.61	21.57	21.43	
		Antenna Gain (dBi):				5.0		
		Max. EIRP (dBm):				28.00		
		EIRP Limit (dBm):				30.00		
		16QAM	1	0	21.00	20.82	21.22	
			1	7	21.04	20.72	21.48	
			1	14	20.87	20.79	21.45	
			8	0	20.56	20.79	20.83	
			8	4	20.38	20.33	20.67	
			8	7	20.46	20.58	20.59	
			15	0	20.41	20.36	20.46	
		Antenna Gain (dBi):				5.0		
		Max. EIRP (dBm):				26.48		
		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	22.42	22.05	22.19
			1	12	22.55	22.03	22.30
			1	24	22.40	21.82	22.25
			12	0	21.58	21.35	21.44
			12	6	21.57	21.36	21.43
			12	11	21.56	21.42	21.40
			25	0	21.51	21.43	21.52
		Antenna Gain (dBi):			5.0		
		Max. EIRP (dBm):			27.55		
		EIRP Limit (dBm):			30.00		
		16QAM	1	0	21.60	21.22	20.98
			1	12	21.20	20.95	21.01
			1	24	20.84	21.01	20.97
			12	0	20.41	20.51	20.55
			12	6	20.52	20.55	20.54
			12	11	20.43	20.51	20.46
			25	0	20.49	20.43	20.37
		Antenna Gain (dBi):			5.0		
		Max. EIRP (dBm):			26.60		
		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	22.55	22.54	22.07
			1	24	22.45	22.41	22.35
			1	49	22.19	22.05	22.30
			25	0	21.66	21.46	21.55
			25	12	21.62	21.42	21.89
			25	24	21.43	21.32	21.28
			50	0	21.46	21.40	21.26
		Antenna Gain (dBi):			5.0		
		Max. EIRP (dBm):			27.55		
		EIRP Limit (dBm):			30.00		
		16QAM	1	0	21.31	21.01	21.24
			1	24	21.07	20.99	21.23
			1	49	20.62	20.47	21.05
			25	0	20.49	20.45	20.17
			25	12	20.64	20.52	20.70
			25	24	20.45	20.58	20.41
			50	0	20.43	20.41	20.37
		Antenna Gain (dBi):			5.0		
		Max. EIRP (dBm):			26.31		
		EIRP Limit (dBm):			30.00		

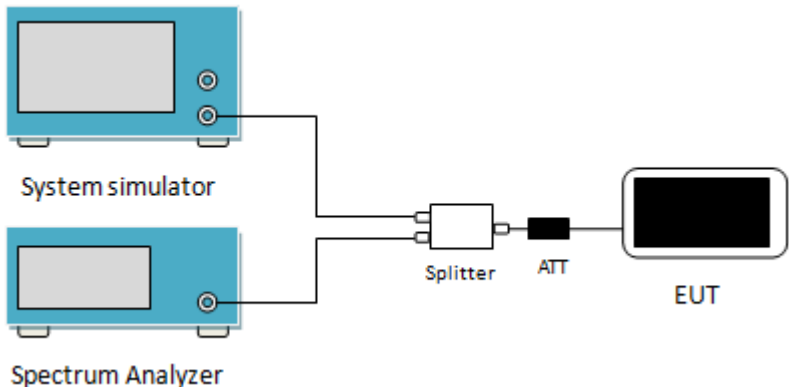
Note: EIRP (dBm) = Average power (dBm) + Antenna Gain (dBi).

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	22.44	22.41	22.43	
			1	37	22.39	22.36	22.41	
			1	74	22.26	22.23	22.14	
			36	0	21.67	21.52	21.63	
			36	16	21.84	21.54	21.80	
			36	35	21.44	21.33	21.49	
			75	0	21.29	21.32	21.66	
		Antenna Gain (dBi):				5.0		
		Max. EIRP (dBm):				27.44		
		EIRP Limit (dBm):				30.00		
		16QAM	1	0	21.31	21.39	21.18	
			1	37	21.15	21.69	21.62	
			1	74	20.36	20.31	21.48	
			36	0	20.38	20.50	20.26	
			36	16	20.60	20.61	20.78	
			36	35	20.90	20.41	20.62	
			75	0	20.40	20.37	20.45	
		Antenna Gain (dBi):				5.0		
		Max. EIRP (dBm):				26.69		
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	22.63	22.49	22.30	
			1	49	22.72	22.38	22.44	
			1	99	22.46	22.09	22.23	
			50	0	21.85	21.88	21.76	
			50	24	21.73	21.55	21.53	
			50	49	21.53	21.18	21.38	
			100	0	21.47	21.46	21.42	
		Antenna Gain (dBi):				5.0		
		Max. EIRP (dBm):				27.72		
		EIRP Limit (dBm):				30.00		
		16QAM	1	0	21.67	21.72	21.51	
			1	49	21.62	20.90	20.99	
			1	99	20.99	20.59	20.49	
			50	0	20.51	20.89	20.45	
			50	24	20.61	20.56	20.79	
			50	49	20.36	20.58	20.38	
			100	0	20.60	20.58	20.34	
		Antenna Gain (dBi):				5.0		
		Max. EIRP (dBm):				26.72		
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)			
					23017	23095	23173	
					699.7MHz	707.5MHz	715.3MHz	
12	1.4	QPSK	1	0	23.04	23.03	22.78	
			1	2	22.93	23.16	22.86	
			1	5	22.99	22.95	22.73	
			3	0	23.32	23.22	22.96	
			3	1	23.07	23.35	22.95	
			3	2	23.18	23.21	22.85	
			6	0	22.19	22.13	22.06	
		Antenna Gain(dBi):				1.8		
		Max. ERP (dBm):				23.00		
		ERP Limit (dBm):				34.77		
		16QAM	1	0	22.27	21.76	21.40	
			1	2	21.51	21.80	21.65	
			1	5	21.77	21.69	21.25	
			3	0	22.21	21.98	21.82	
			3	1	22.12	22.24	22.01	
			3	2	22.18	22.07	21.98	
			6	0	21.35	21.31	20.93	
		Antenna Gain(dBi):				1.8		
		Max. ERP (dBm):				21.92		
		ERP Limit (dBm):				34.77		
LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)			
					23025	23095	23165	
					700.5MHz	707.5MHz	714.5MHz	
12	3	QPSK	1	0	22.98	22.98	22.93	
			1	7	23.17	23.11	23.85	
			1	14	23.15	23.03	22.90	
			8	0	21.89	22.11	22.15	
			8	4	22.34	22.19	22.00	
			8	7	22.24	22.21	22.08	
			15	0	22.14	22.22	22.00	
		Antenna Gain(dBi):				1.8		
		Max. ERP (dBm):				23.50		
		ERP Limit (dBm):				34.77		
		16QAM	1	0	21.90	21.80	21.61	
			1	7	21.21	21.82	21.35	
			1	14	21.56	21.62	21.11	
			8	0	21.08	21.36	20.88	
			8	4	21.02	21.35	20.86	
			8	7	21.29	21.06	21.17	
			15	0	20.89	21.07	21.01	
		Antenna Gain(dBi):				1.8		
		Max. ERP (dBm):				21.55		
		ERP Limit (dBm):				34.77		
Note: EIRP (dBm) = Average power (dBm) + Antenna Gain (dBi). ERP (dBm) = EIRP (dBm) - 2.15 (dB).								

LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)			
					23035	23095	23155	
					701.5MHz	707.5MHz	713.5MHz	
12	5	QPSK	1	0	22.99	22.97	22.72	
			1	12	23.11	23.14	22.63	
			1	24	22.88	22.91	22.80	
			12	0	22.17	22.05	21.98	
			12	6	22.18	22.18	21.97	
			12	11	22.16	22.05	21.96	
			25	0	22.21	22.07	21.96	
		Antenna Gain(dBi):				1.8		
		Max. ERP (dBm):				22.79		
		ERP Limit (dBm):				34.77		
		16QAM	1	0	21.60	21.98	21.58	
			1	12	21.85	21.74	21.56	
			1	24	21.38	21.48	21.15	
			12	0	20.77	20.91	21.02	
			12	6	21.04	21.05	20.93	
			12	11	20.82	20.92	20.67	
			25	0	21.02	20.94	20.88	
		Antenna Gain(dBi):				1.8		
		Max. ERP (dBm):				21.63		
		ERP Limit (dBm):				34.77		
LTE Band	Bandwidth (MHz)	Modulation	RB Size	RB Offset	Average Power (dBm)			
					23060	23095	23130	
					704.0MHz	707.5MHz	711.0MHz	
12	10	QPSK	1	0	23.06	22.81	23.07	
			1	24	23.24	23.13	23.17	
			1	49	23.01	22.88	22.94	
			25	0	22.23	22.22	22.17	
			25	12	22.45	22.29	22.24	
			25	24	22.12	22.09	21.84	
			50	0	21.99	22.03	22.13	
		Antenna Gain(dBi):				1.8		
		Max. ERP (dBm):				22.89		
		ERP Limit (dBm):				34.77		
		16QAM	1	0	21.26	21.31	21.92	
			1	24	21.95	21.65	21.99	
			1	49	21.68	21.30	20.98	
			25	0	21.20	20.99	21.27	
			25	12	21.22	21.28	21.14	
			25	24	21.19	20.88	20.86	
			50	0	21.03	20.93	21.12	
		Antenna Gain(dBi):				1.8		
		Max. ERP (dBm):				21.64		
		ERP Limit (dBm):				34.77		
Note: EIRP (dBm) = Average power (dBm) + Antenna Gain (dBi). ERP (dBm) = EIRP (dBm) - 2.15 (dB).								

6.2 Peak-to-Average Ratio

Test Requirement:	Part 24.232 (d), Part 27.50(d)(5)
Test Method:	ANSI C63.26-2015
Limit:	The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.
Test Setup:	 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 single output port. These two ports are connected to a central 'Splitter' unit. From the 'Splitter', one line goes to an 'ATT' (Attenuator) unit, and another line goes to the 'EUT' (Equipment Under Test), which is represented by a black rectangular unit with a screen.
Test Procedure:	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 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

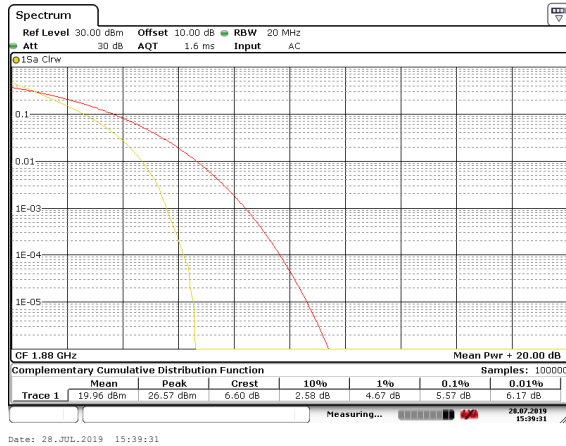
Measurement Data (Worst case):

Bandwidth	Modulation	RB Size	RB Offset	PAPR
LTE Band 2 (Middle Channel)				
20MHz	QPSK	100	0	5.57
	16QAM	100	0	5.54
LTE Band 4 (Middle Channel)				
20MHz	QPSK	100	0	5.13
	16QAM	100	0	5.16
LTE Band 12 (Middle Channel)				
10MHz	QPSK	50	0	5.51
	16QAM	50	0	5.51

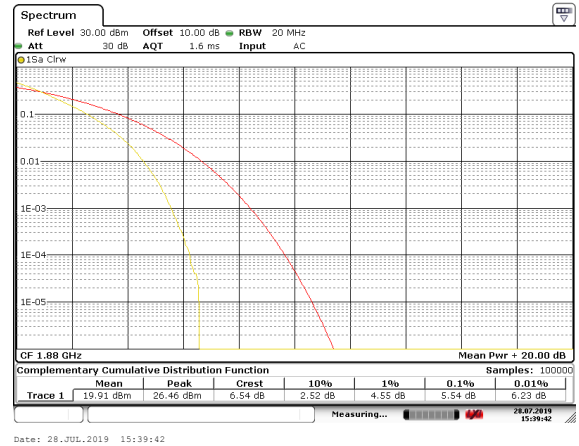
Test plots as below:

LTE Band 2 Middle channel

Modulation: QPSK

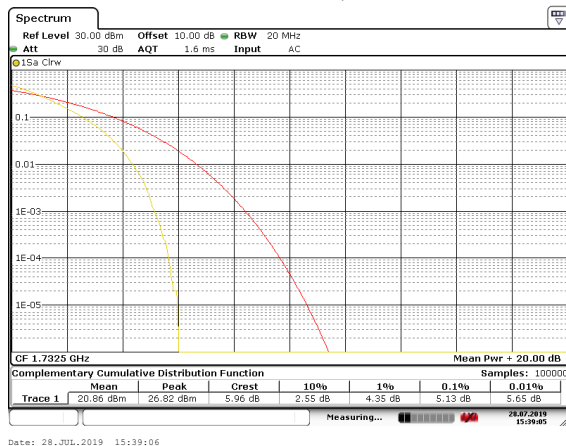


Modulation:16QAM

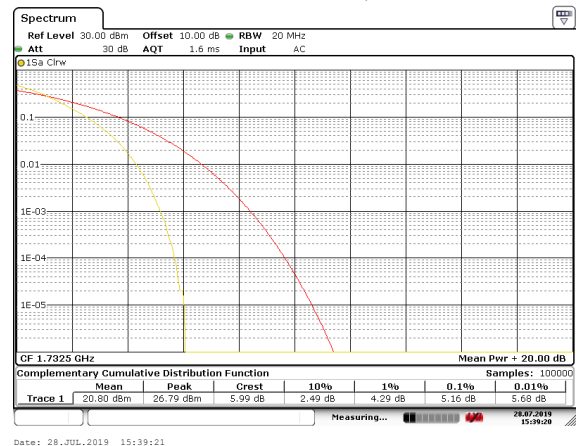


LTE Band 4 Middle channel

Modulation: QPSK

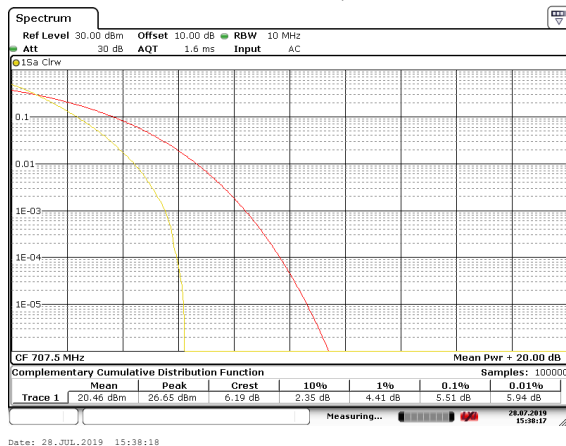


Modulation:16QAM

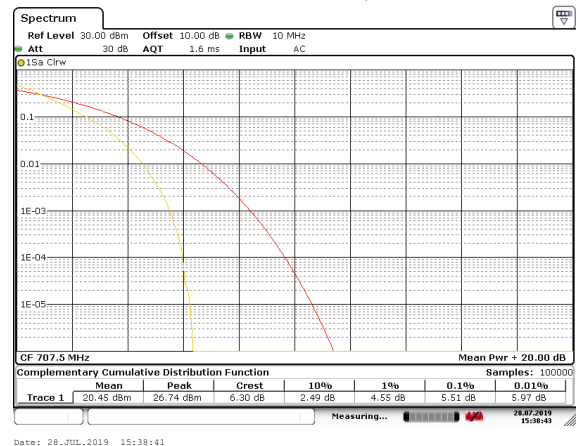


LTE Band 12 Middle channel

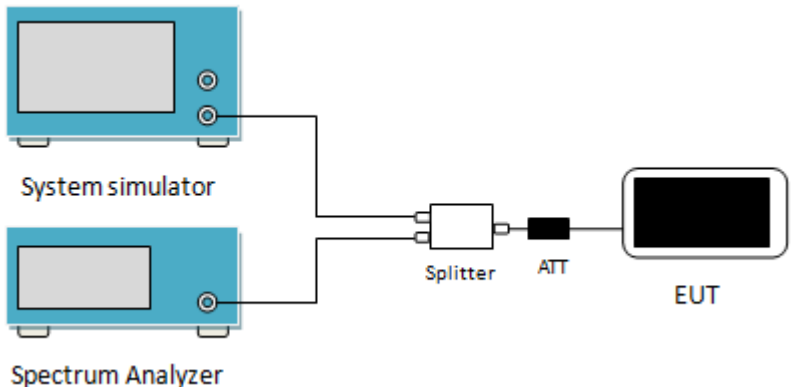
Modulation: QPSK



Modulation:16QAM



6.3 Occupy Bandwidth

Test Requirement:	Part 24.238(b), Part 27.53(g), Part 27.53(h)
Test Method:	ANSI/TIA-603-D 2010
Test Setup:	 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 single output port. These two ports are connected to a central 'Splitter' unit, which is a white rectangle with two input ports and one output port. The output of the Splitter is connected to a black rectangular unit labeled 'ATT' (Attenuator). Finally, the output of the ATT is connected to a black rectangular unit labeled 'EUT' (Equipment Under Test).
Test Procedure:	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 5.9 for details
Test mode:	Refer to section 5.3 for details
Test results:	Passed

Measurement Data:

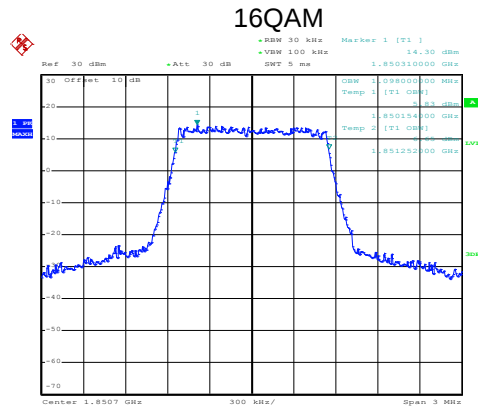
LTE Band 2					
Bandwidth	Channel	Frequency (MHz)	Modulation	99% OBW (kHz)	-26dBcEBW (kHz)
1.4MHz	18607	1850.70	16QAM	1098	1278
			QPSK	1104	1290
	18900	1880.00	16QAM	1098	1284
			QPSK	1104	1308
	19193	1909.30	16QAM	1098	1296
			QPSK	1104	1308
3MHz	18615	1851.50	16QAM	2724	3024
			QPSK	2736	3072
	18900	1880.00	16QAM	2724	3036
			QPSK	2736	3036
	19185	1908.50	16QAM	2712	3036
			QPSK	2724	3048
5MHz	18625	1852.50	16QAM	4500	4920
			QPSK	4500	5000
	18900	1880.00	16QAM	4520	4920
			QPSK	4520	5000
	19175	1907.50	16QAM	4500	4920
			QPSK	4520	4900
10MHz	18650	1855.00	16QAM	9080	10000
			QPSK	9080	12000
	18900	1880.00	16QAM	9040	10160
			QPSK	9080	10240
	19150	1905.00	16QAM	9040	10160
			QPSK	9080	10160
15MHz	18675	1857.50	16QAM	13500	14640
			QPSK	13500	14700
	18900	1880.00	16QAM	13440	14520
			QPSK	13500	14700
	19125	1902.50	16QAM	13500	14700
			QPSK	13500	14760
20MHz	18700	1860.00	16QAM	17920	19280
			QPSK	17920	19360
	18900	1880.00	16QAM	17840	19200
			QPSK	17920	19280
	19100	1900.00	16QAM	17920	19280
			QPSK	17920	19440

LTE Band 4					
Bandwidth	Channel	Frequency (MHz)	Modulation	99% OBW (kHz)	-26dBcEBW (kHz)
1.4MHz	19957	1710.7	16QAM	1104	1296
			QPSK	1104	1290
	20175	1732.5	16QAM	1092	1302
			QPSK	1104	1284
	20393	1754.3	16QAM	1104	1296
			QPSK	1104	1278
3MHz	19965	1711.5	16QAM	2724	3048
			QPSK	2736	3048
	20175	1732.5	16QAM	2724	3012
			QPSK	2736	3000
	20385	1750.5	16QAM	2736	3024
			QPSK	2736	3048
5MHz	19975	1712.5	16QAM	4480	4960
			QPSK	4500	4980
	20175	1732.5	16QAM	4500	4920
			QPSK	4520	4980
	20375	1752.5	16QAM	4500	4860
			QPSK	4540	4980
10MHz	20000	1715.0	16QAM	9040	10120
			QPSK	9080	10240
	20175	1732.5	16QAM	9040	10120
			QPSK	9040	10040
	20350	1750.0	16QAM	9000	10040
			QPSK	9040	10200
15MHz	20025	1717.5	16QAM	13500	14640
			QPSK	13440	14820
	20175	1732.5	16QAM	13440	14760
			QPSK	13500	14760
	20325	1747.5	16QAM	13440	14760
			QPSK	13500	14580
20MHz	20050	1720.0	16QAM	17840	19120
			QPSK	17920	19280
	20175	1732.5	16QAM	17920	19280
			QPSK	17920	19360
	20300	1745.0	16QAM	17840	19120
			QPSK	17920	19280

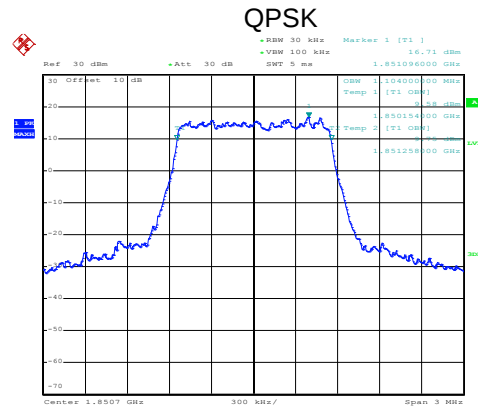
LTE Band 12					
Bandwidth	Channel	Frequency (MHz)	Modulation	99% OBW (kHz)	-26dBcEBW (kHz)
1.4MHz	23017	699.7	16QAM	1098	1290
			QPSK	1098	1296
	23095	707.5	16QAM	1104	1272
			QPSK	1098	1290
	23173	715.3	16QAM	1098	1302
			QPSK	1098	1302
3MHz	23025	700.5	16QAM	2724	2988
			QPSK	2736	3060
	23095	707.5	16QAM	2712	3024
			QPSK	2736	3072
	23165	714.5	16QAM	2736	3036
			QPSK	2748	3048
5MHz	23035	701.5	16QAM	4480	4880
			QPSK	4500	4980
	23095	707.5	16QAM	4480	4880
			QPSK	4520	4980
	23155	713.5	16QAM	4500	4900
			QPSK	4520	5000
10MHz	23060	704.0	16QAM	8920	9520
			QPSK	8920	9680
	23095	707.5	16QAM	8920	9600
			QPSK	8960	9680
	23130	711.0	16QAM	8920	9560
			QPSK	8920	9680

Test plot as follows:
LTE Band 2 part:

LTE Band 2: 99% Occupancy bandwidth
BW: 1.4MHz

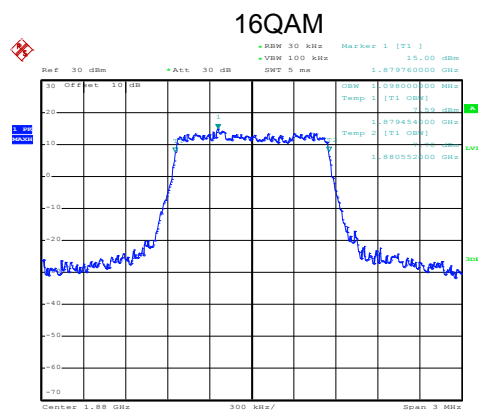


Date: 18.JUL.2019 09:26:00

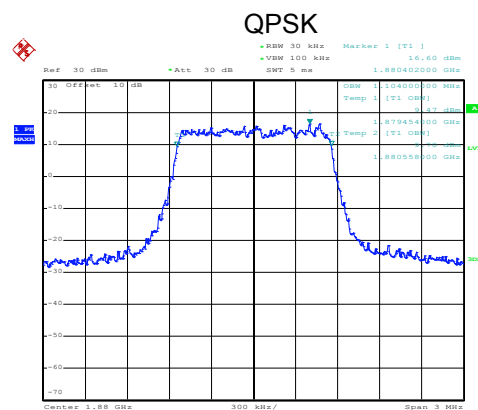


Date: 18.JUL.2019 09:25:49

Lowest channel

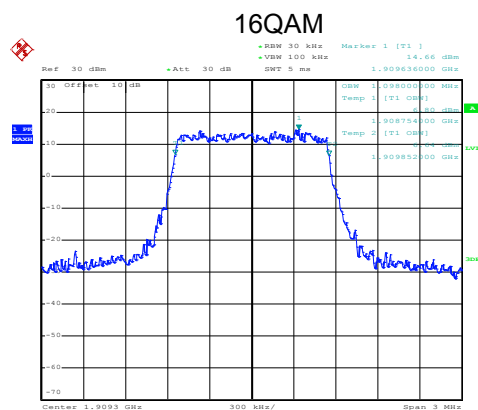


Date: 18.JUL.2019 09:26:51

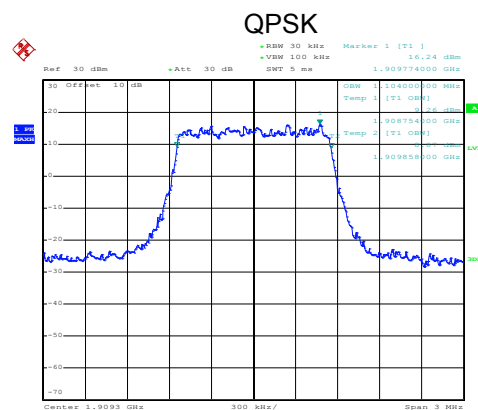


Date: 18.JUL.2019 09:26:45

Middle channel



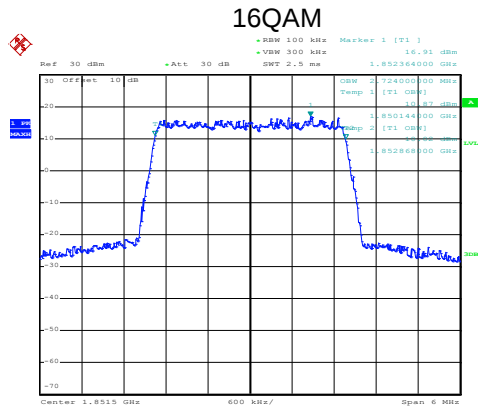
Date: 18.JUL.2019 09:29:05



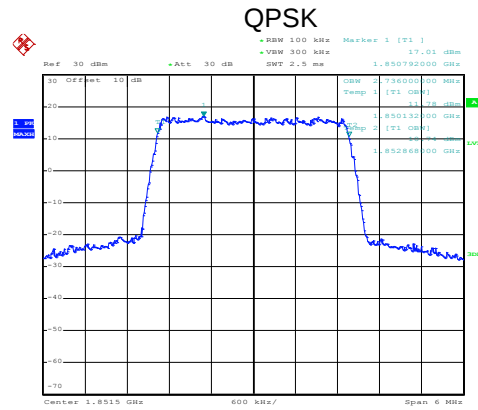
Date: 18.JUL.2019 09:29:00

Highest channel

LTE Band 2: 99% Occupancy bandwidth BW: 3MHz

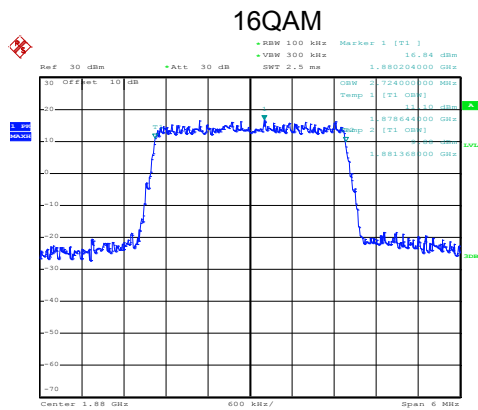


Date: 18.JUL.2019 09:30:13

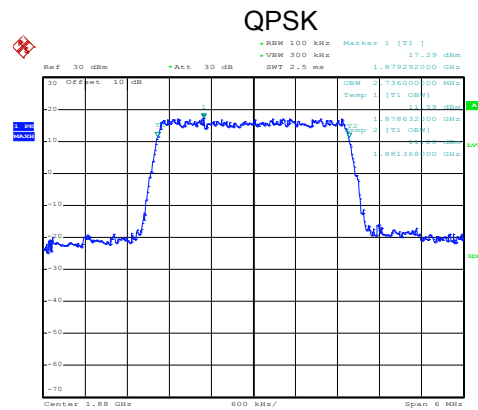


Date: 18.JUL.2019 09:30:04

Lowest channel

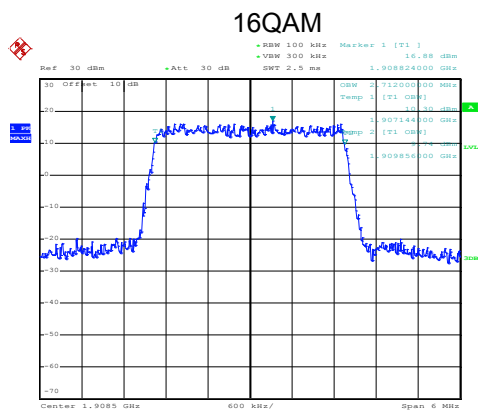


Date: 18.JUL.2019 09:31:23

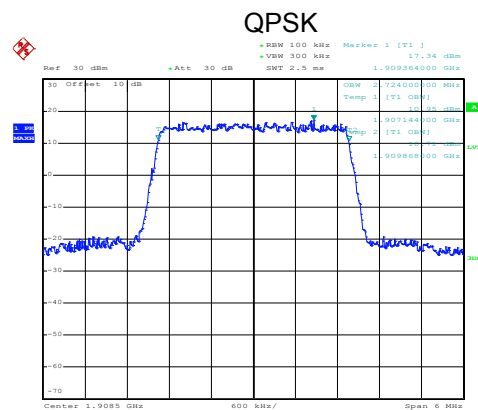


Date: 18.JUL.2019 09:31:19

Middle channel



Date: 18.JUL.2019 09:31:58

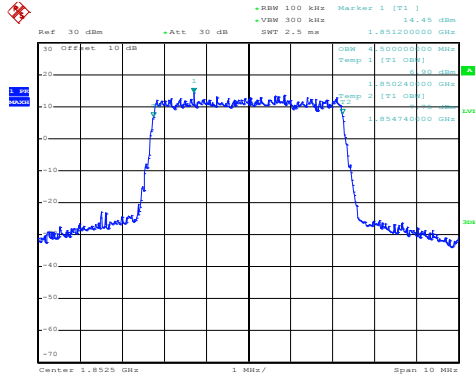


Date: 18.JUL.2019 09:31:52

Highest channel

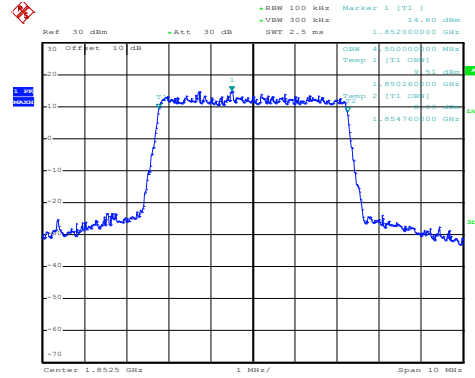
LTE Band 2: 99% Occupancy bandwidth BW: 5MHz

16QAM



Date: 18.JUL.2019 09:35:47

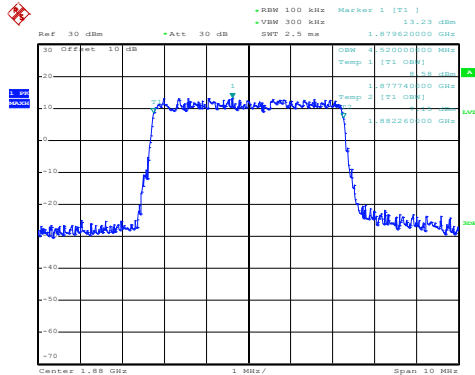
QPSK



Date: 18.JUL.2019 09:35:40

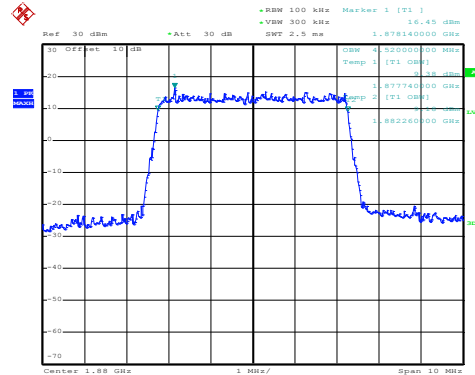
Lowest channel

16QAM



Date: 18.JUL.2019 09:34:20

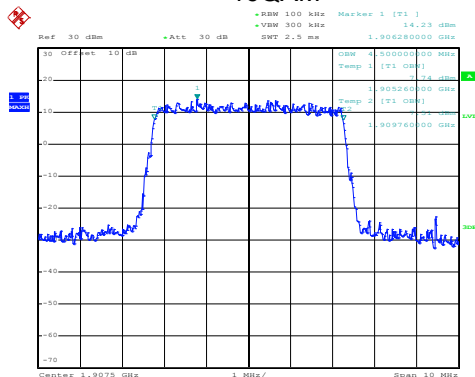
QPSK



Date: 18.JUL.2019 09:34:15

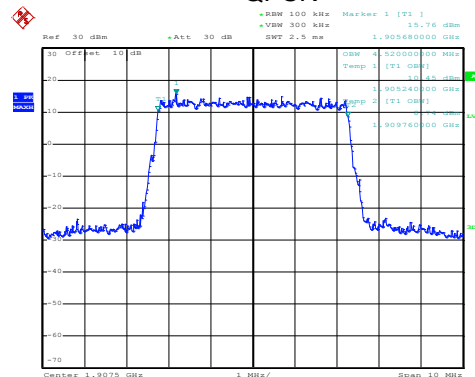
Middle channel

16QAM



Date: 18.JUL.2019 09:34:51

QPSK

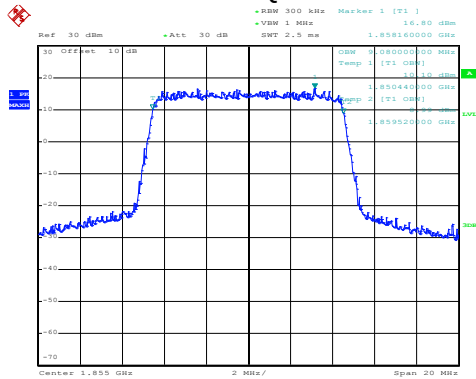


Date: 18.JUL.2019 09:34:45

Highest channel

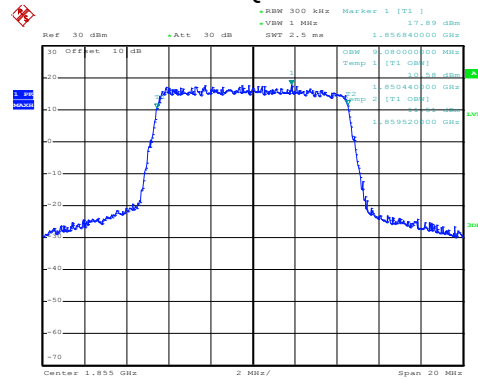
LTE Band 2: 99% Occupancy bandwidth
BW: 10MHz

16QAM



Date: 18.JUL.2019 09:37:00

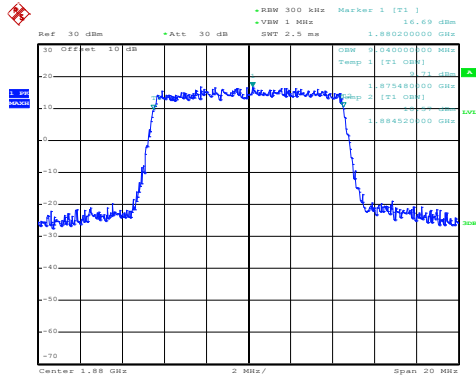
QPSK



Date: 18.JUL.2019 09:36:53

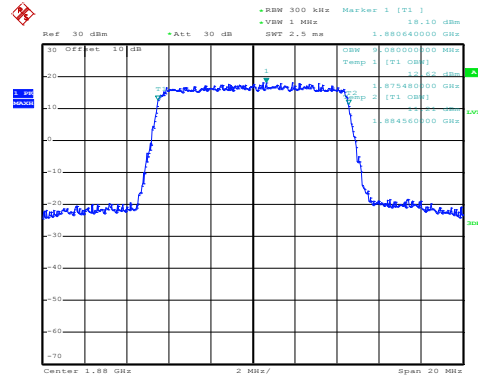
Lowest channel

16QAM



Date: 18.JUL.2019 09:38:11

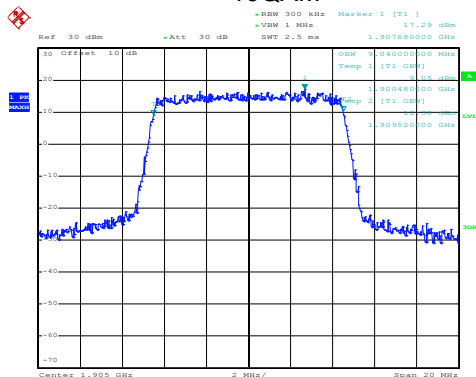
QPSK



Date: 18.JUL.2019 09:38:05

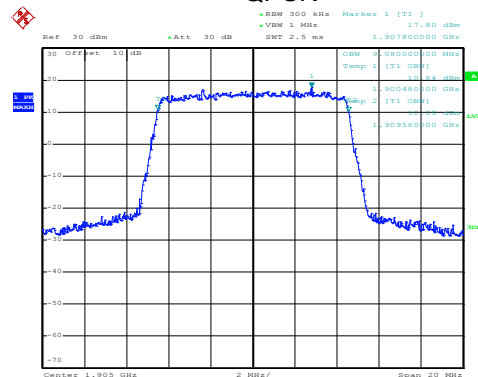
Middle channel

16QAM



Date: 18.JUL.2019 09:38:40

QPSK

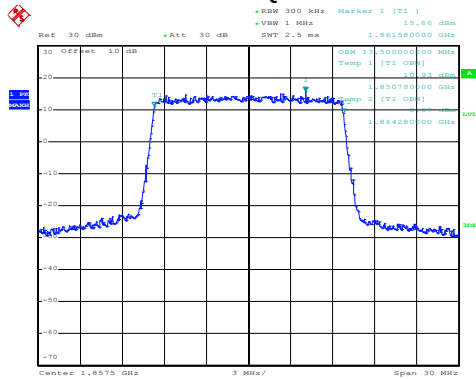


Date: 18.JUL.2019 09:38:33

Highest channel

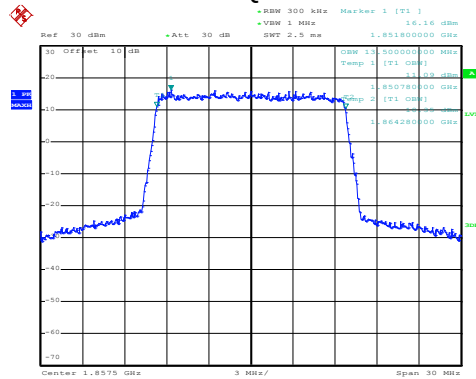
LTE Band 2: 99% Occupancy bandwidth
BW: 15MHz

16QAM



Date: 18.JUL.2019 09:48:56

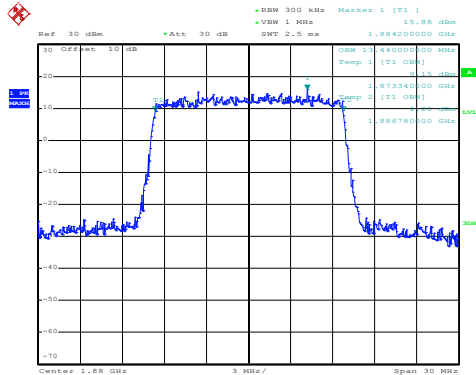
QPSK



Date: 18.JUL.2019 09:48:43

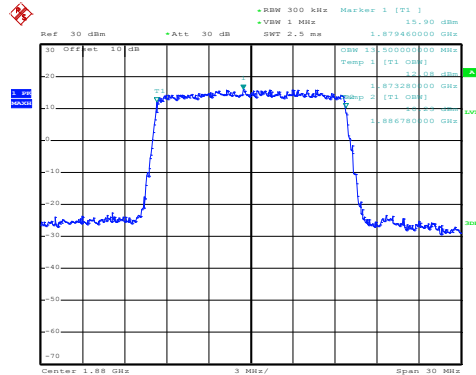
Lowest channel

16QAM



Date: 18.JUL.2019 09:46:50

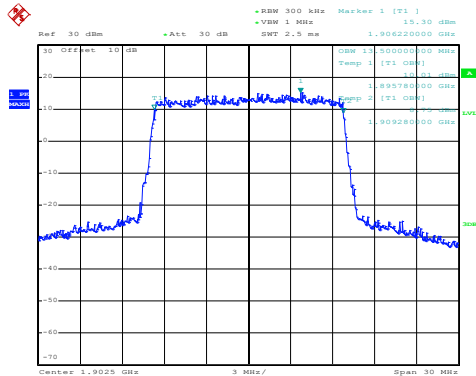
QPSK



Date: 18.JUL.2019 09:46:44

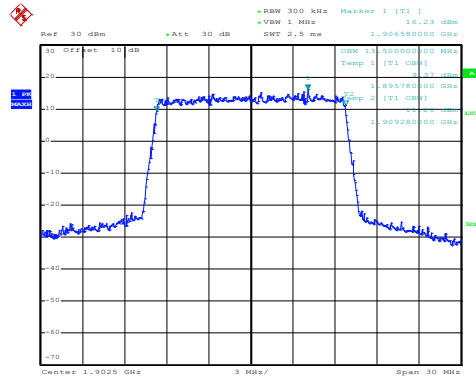
Middle channel

16QAM



Date: 18.JUL.2019 09:47:23

QPSK

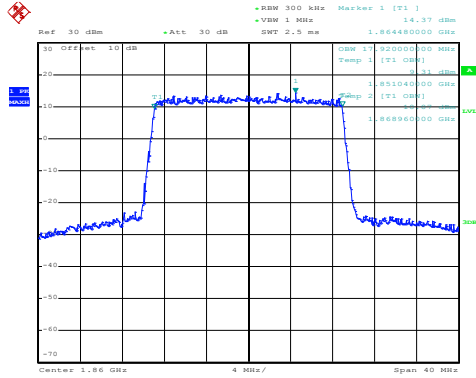


Date: 18.JUL.2019 09:47:16

Highest channel

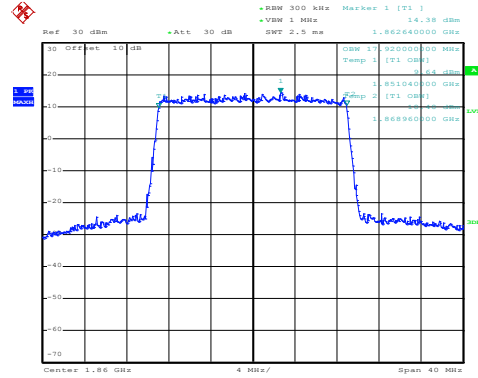
LTE Band 2: 99% Occupancy bandwidth
BW: 20MHz

16QAM



Date: 18.JUL.2019 09:50:00

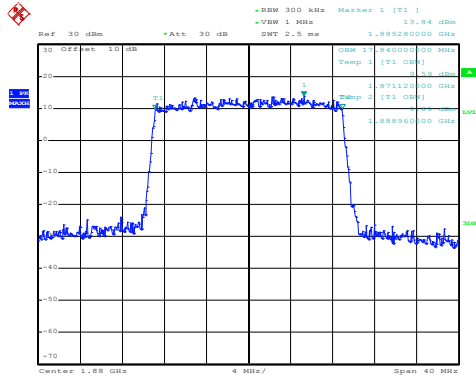
QPSK



Date: 18.JUL.2019 09:49:41

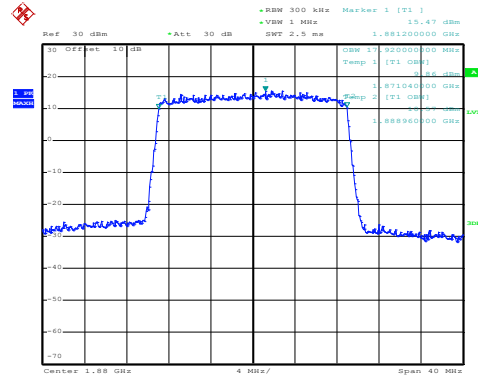
Lowest channel

16QAM



Date: 18.JUL.2019 09:51:37

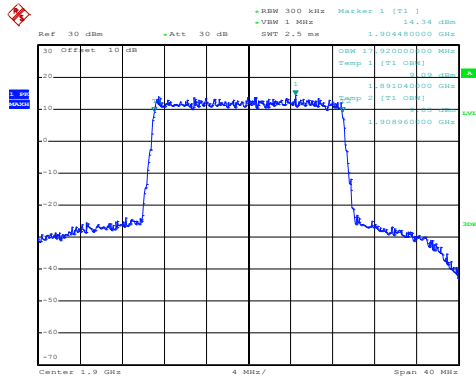
QPSK



Date: 18.JUL.2019 09:51:31

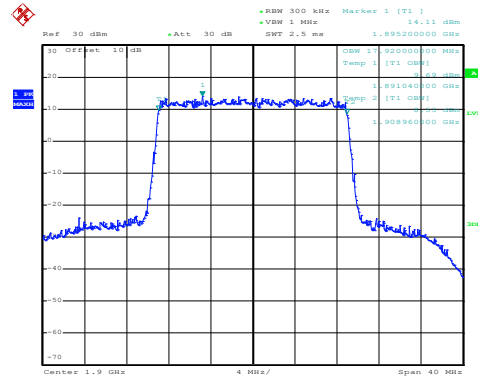
Middle channel

16QAM



Date: 18.JUL.2019 09:52:07

QPSK

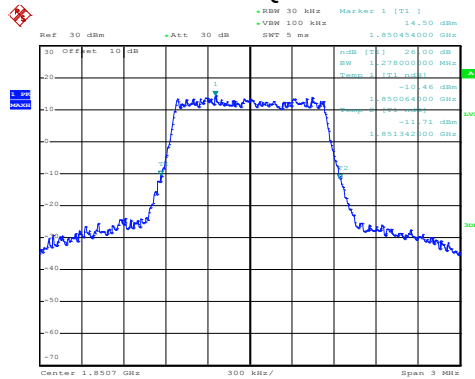


Date: 18.JUL.2019 09:51:59

Highest channel

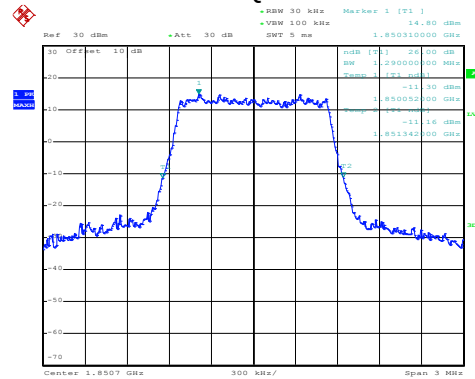
LTE Band 2: -26dBc bandwidth
BW: 1.4MHz

16QAM



Date: 18.JUL.2019 09:27:58

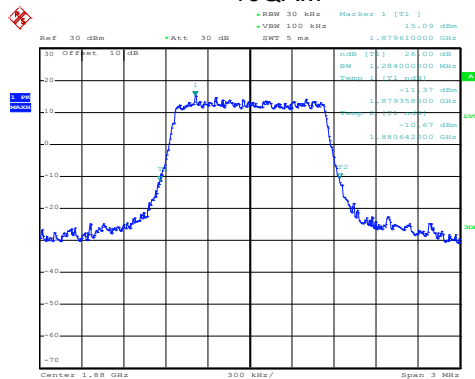
QPSK



Date: 18.JUL.2019 09:27:51

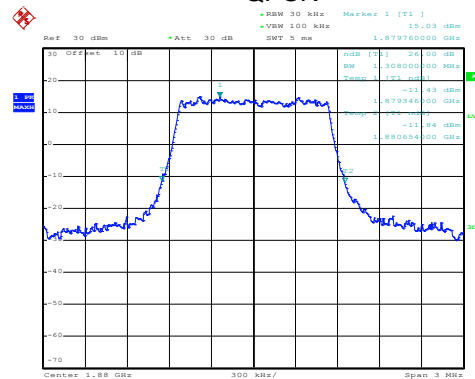
Lowest channel

16QAM



Date: 18.JUL.2019 09:27:29

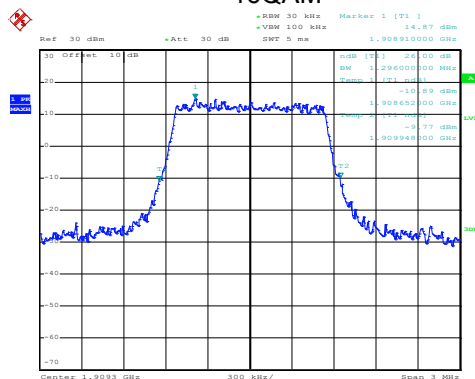
QPSK



Date: 18.JUL.2019 09:27:22

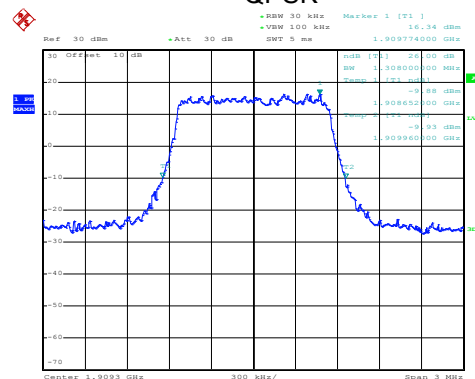
Middle channel

16QAM



Date: 18.JUL.2019 09:28:50

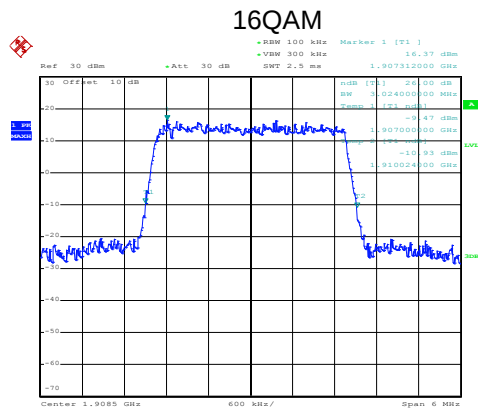
QPSK



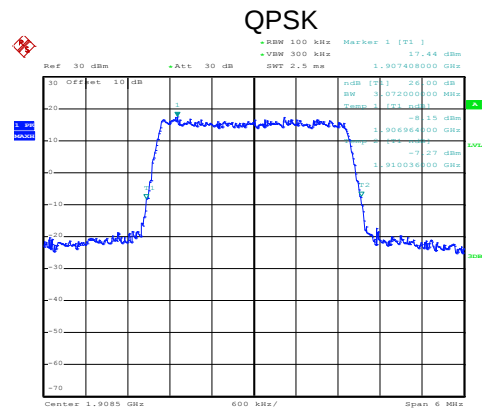
Date: 18.JUL.2019 09:28:44

Highest channel

LTE Band 2: -26dBc bandwidth
BW: 3MHz

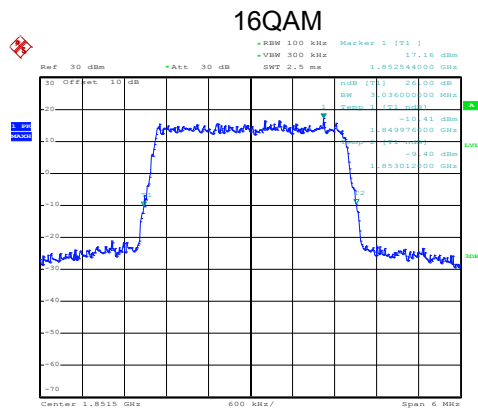


Date: 18.JUL.2019 09:32:16

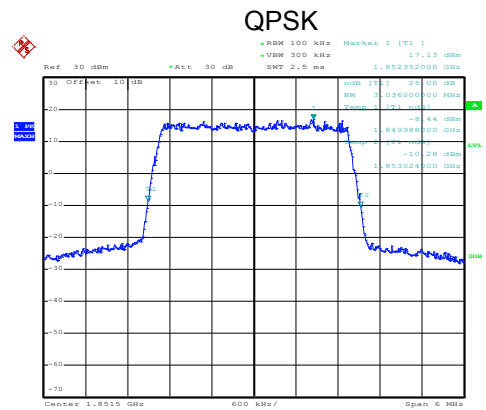


Date: 18.JUL.2019 09:32:12

Lowest channel

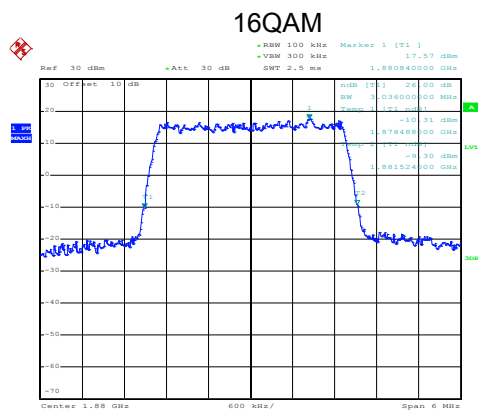


Date: 18.JUL.2019 09:30:31

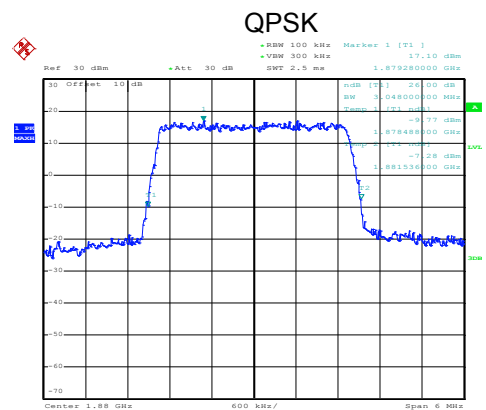


Date: 18.JUL.2019 09:30:26

Middle channel



Date: 18.JUL.2019 09:31:00

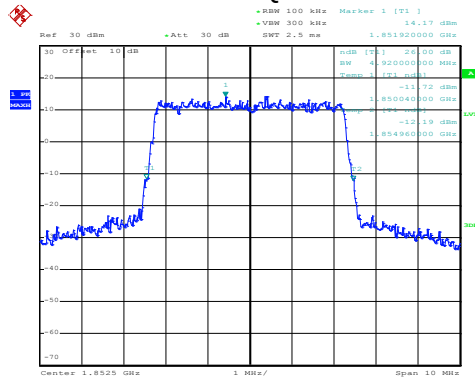


Date: 18.JUL.2019 09:30:46

Highest channel

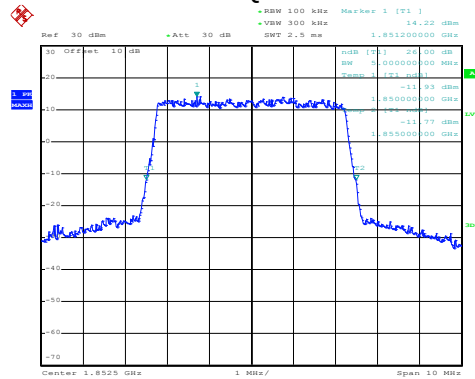
LTE Band 2: -26dBc bandwidth
BW: 5MHz

16QAM



Date: 18.JUL.2019 09:33:31

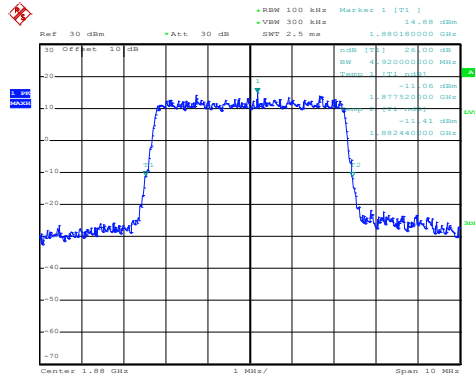
QPSK



Date: 18.JUL.2019 09:35:29

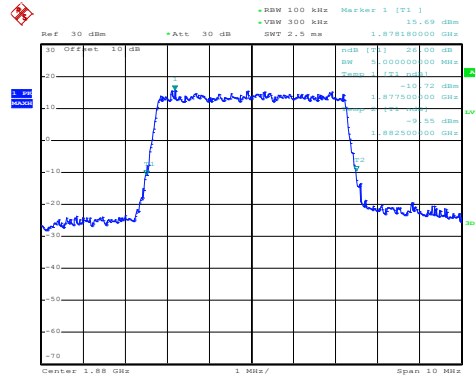
Lowest channel

16QAM



Date: 18.JUL.2019 09:34:02

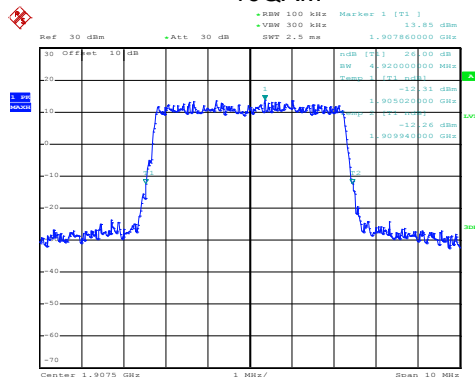
QPSK



Date: 18.JUL.2019 09:33:57

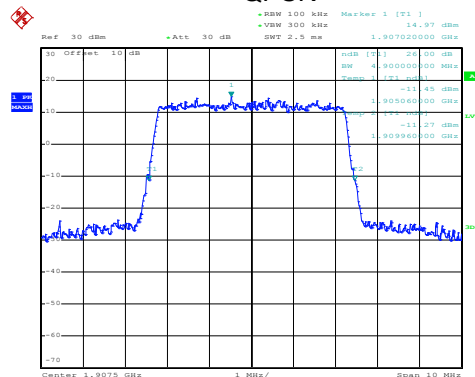
Middle channel

16QAM



Date: 18.JUL.2019 09:35:07

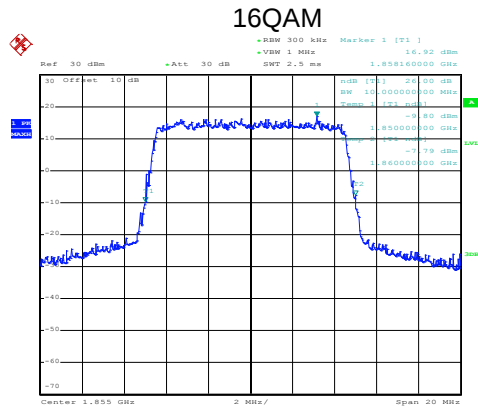
QPSK



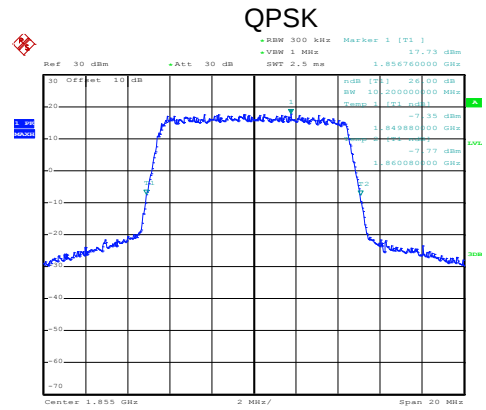
Date: 18.JUL.2019 09:35:01

Highest channel

LTE Band 2: -26dBc bandwidth
BW: 10MHz

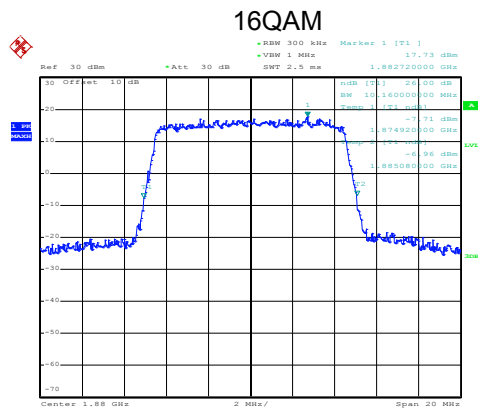


Date: 18.JUL.2019 09:37:18

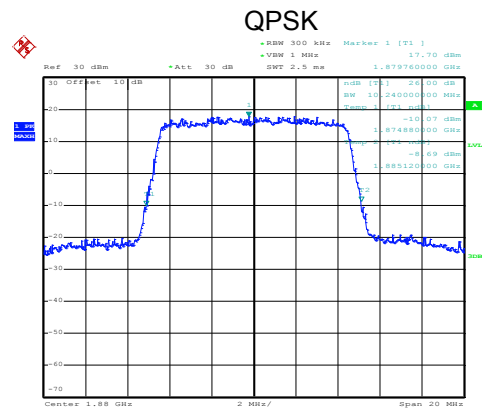


Date: 18.JUL.2019 09:37:12

Lowest channel

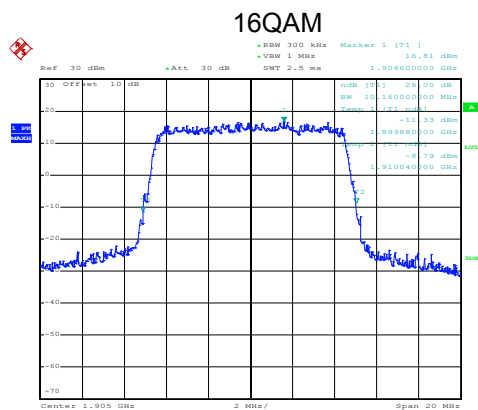


Date: 18.JUL.2019 09:37:50

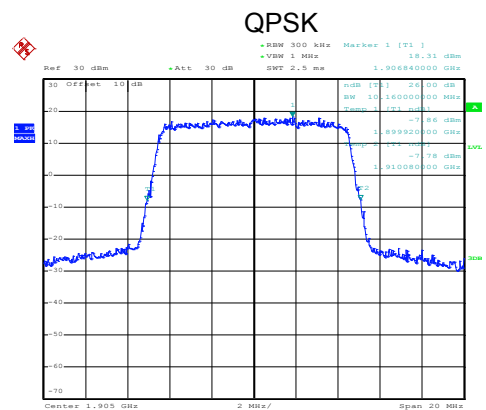


Date: 18.JUL.2019 09:37:39

Middle channel



Date: 18.JUL.2019 09:38:59

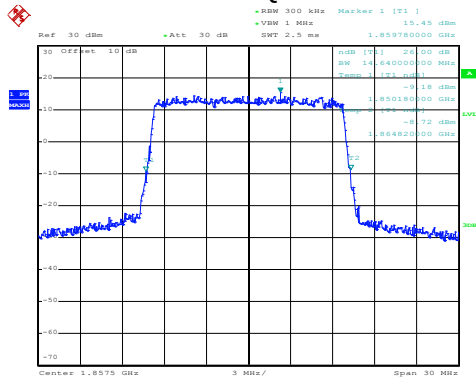


Date: 18.JUL.2019 09:38:51

Highest channel

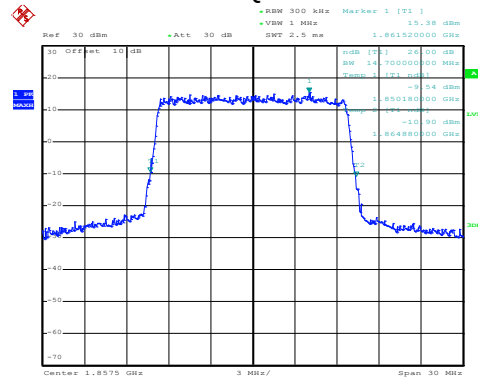
LTE Band 2: -26dBc bandwidth
BW: 15MHz

16QAM



Date: 18.JUL.2019 09:48:26

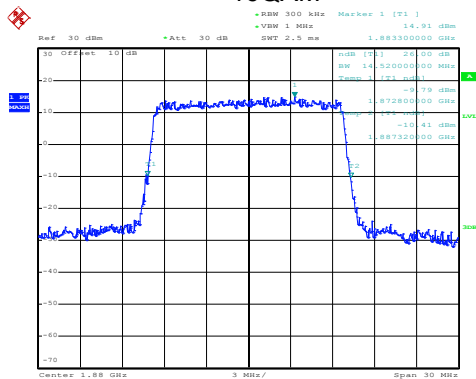
QPSK



Date: 18.JUL.2019 09:48:19

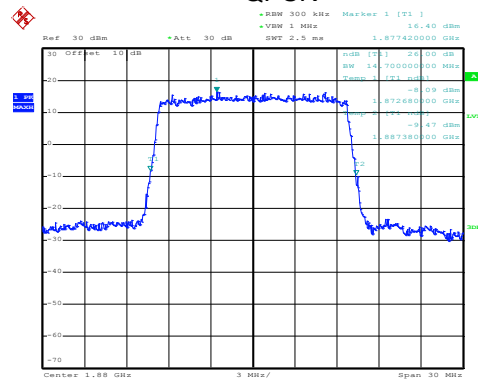
Lowest channel

16QAM



Date: 18.JUL.2019 09:46:32

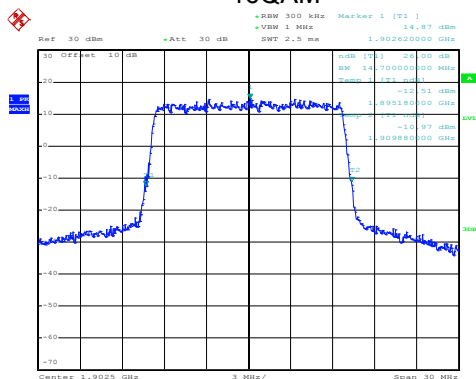
QPSK



Date: 18.JUL.2019 09:46:25

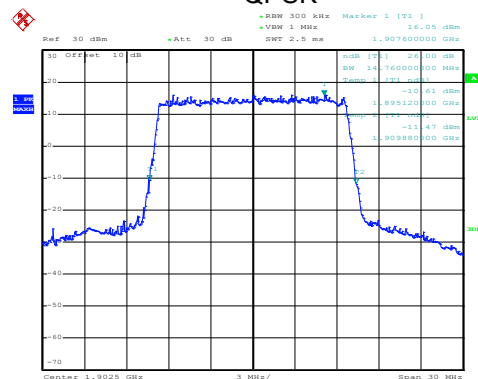
Middle channel

16QAM



Date: 18.JUL.2019 09:47:43

QPSK

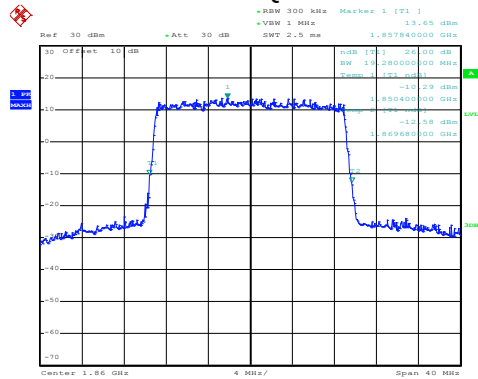


Date: 18.JUL.2019 09:47:36

Highest channel

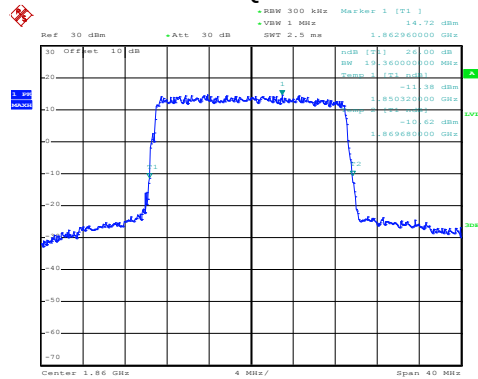
LTE Band 2: -26dBc bandwidth
BW: 20MHz

16QAM



Date: 18.JUL.2019 09:50:37

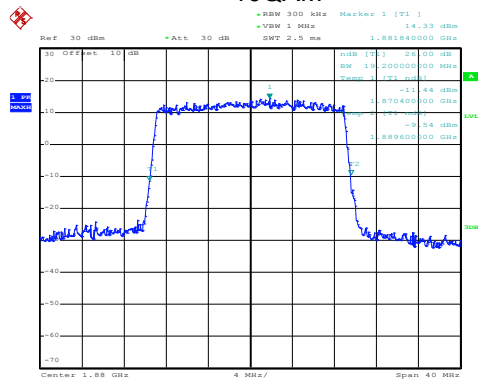
QPSK



Date: 18.JUL.2019 09:50:30

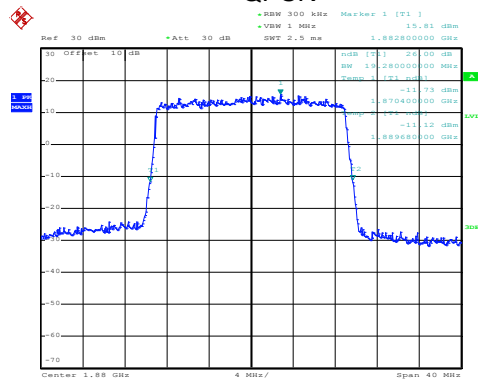
Lowest channel

16QAM



Date: 18.JUL.2019 09:51:15

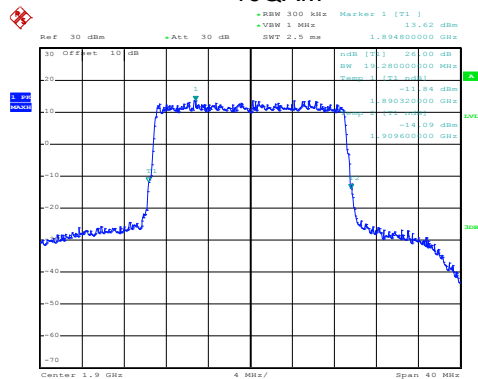
QPSK



Date: 18.JUL.2019 09:51:05

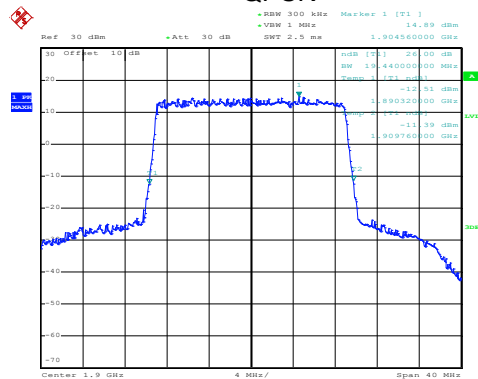
Middle channel

16QAM



Date: 18.JUL.2019 09:52:30

QPSK



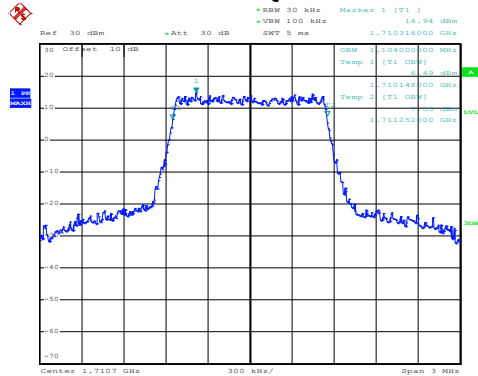
Date: 18.JUL.2019 09:52:23

Highest channel

LTE Band 4 part:

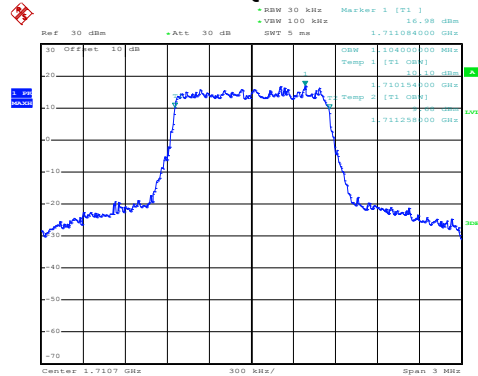
LTE Band 4: 99% Occupancy bandwidth
BW: 1.4MHz

16QAM



Date: 18.JUL.2019 10:19:50

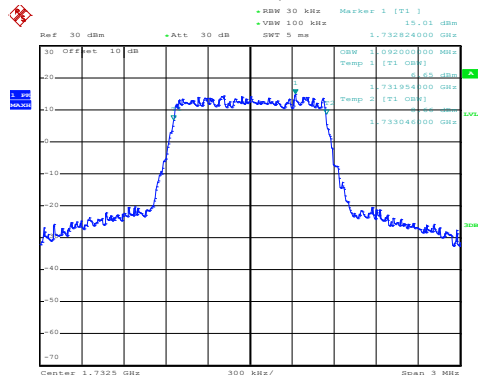
QPSK



Date: 18.JUL.2019 10:19:44

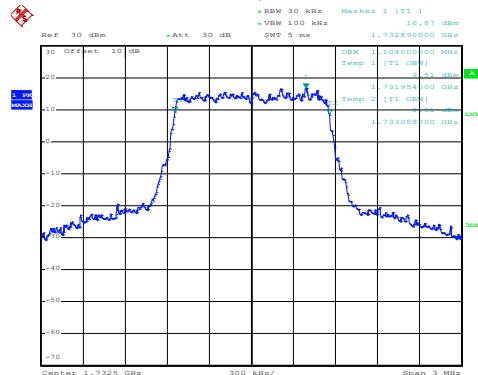
Lowest channel

16QAM



Date: 18.JUL.2019 10:20:55

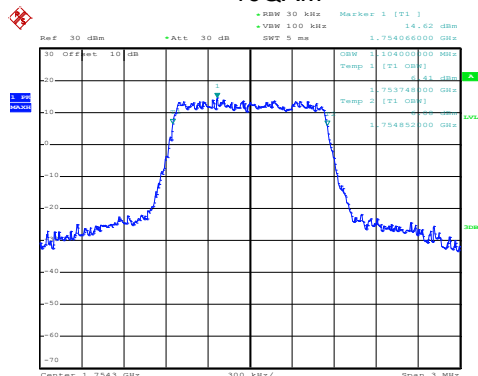
QPSK



Date: 18.JUL.2019 10:20:49

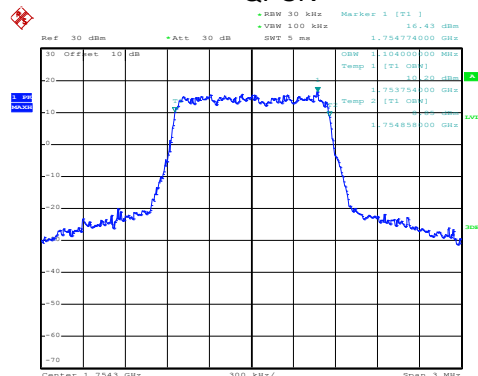
Middle channel

16QAM



Date: 18.JUL.2019 10:21:31

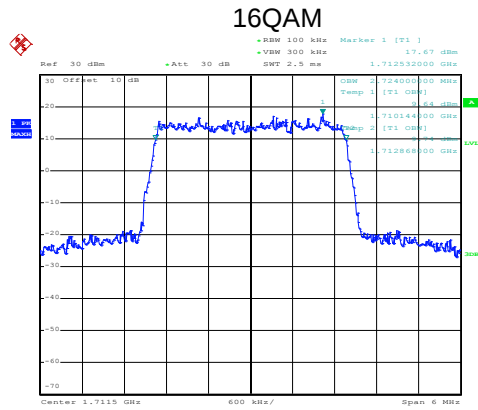
QPSK



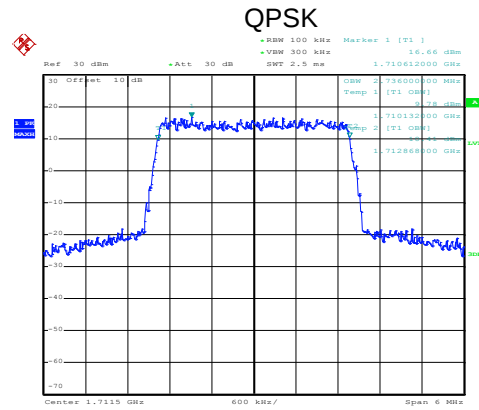
Date: 18.JUL.2019 10:21:25

Highest channel

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

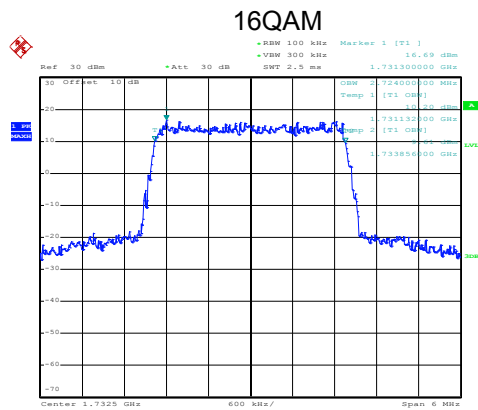


Date: 18.JUL.2019 10:15:21

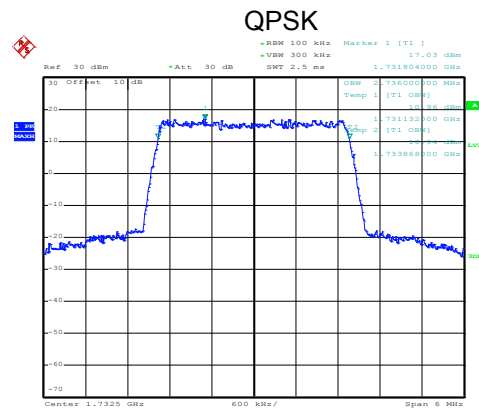


Date: 18.JUL.2019 10:15:15

Lowest channel

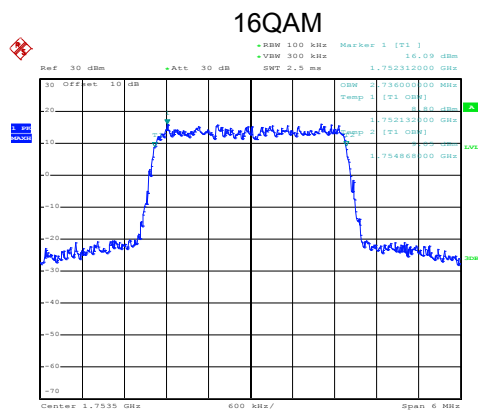


Date: 18.JUL.2019 10:16:12

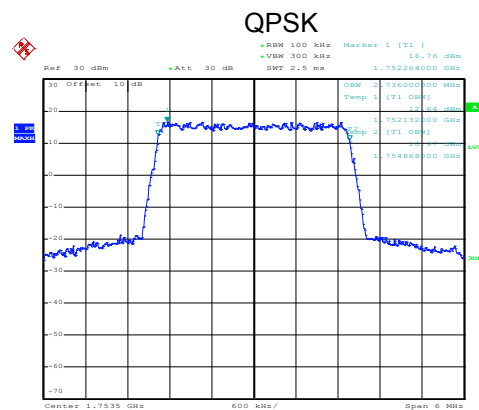


Date: 18.JUL.2019 10:16:07

Middle channel



Date: 18.JUL.2019 10:17:14

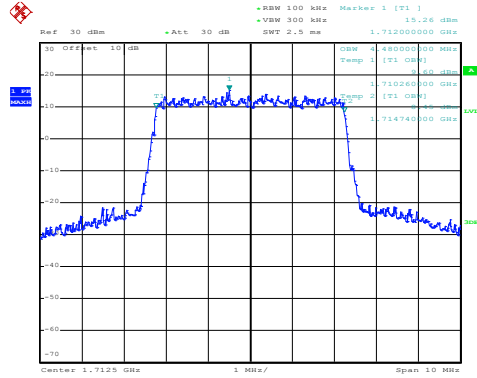


Date: 18.JUL.2019 10:17:51

Highest channel

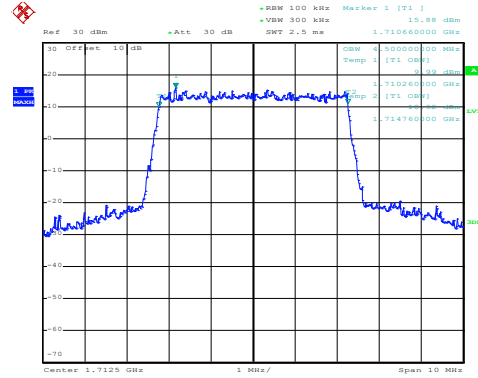
LTE Band 4: 99% Occupancy bandwidth
BW: 5MHz

16QAM



Date: 18.JUL.2019 10:12:49

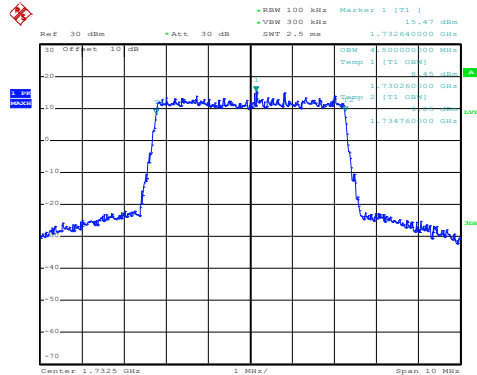
QPSK



Date: 18.JUL.2019 10:12:43

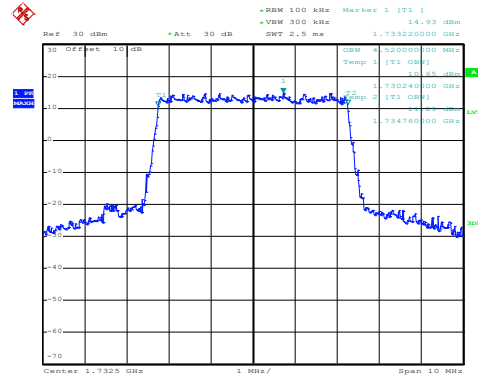
Lowest channel

16QAM



Date: 18.JUL.2019 10:13:19

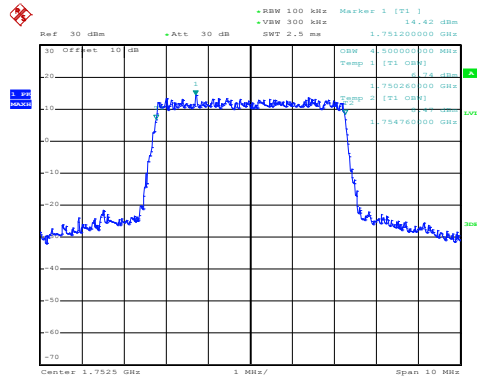
QPSK



Date: 18.JUL.2019 10:13:13

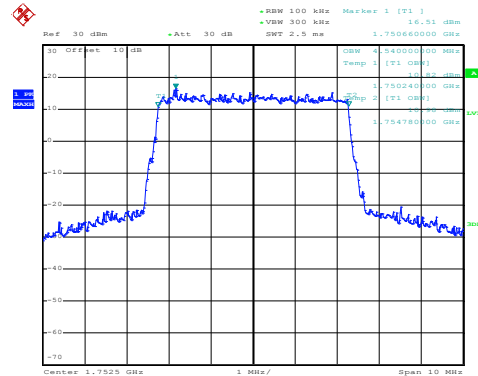
Middle channel

16QAM



Date: 18.JUL.2019 10:14:20

QPSK

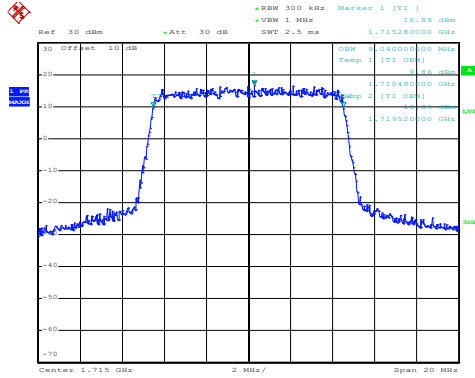


Date: 18.JUL.2019 10:14:15

Highest channel

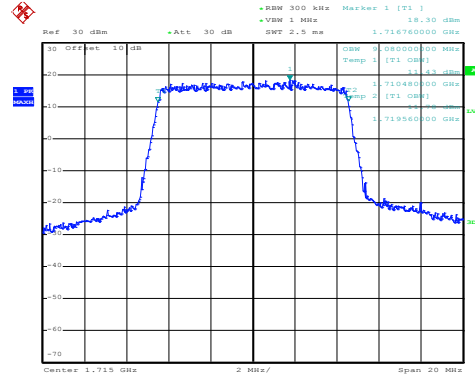
LTE Band 4: 99% Occupancy bandwidth BW: 10MHz

16QAM



Date: 18.JUL.2019 10:09:30

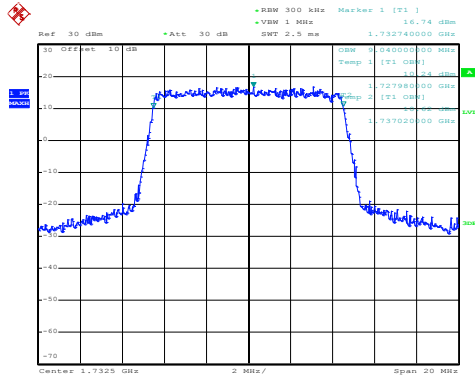
QPSK



Date: 18.JUL.2019 10:09:25

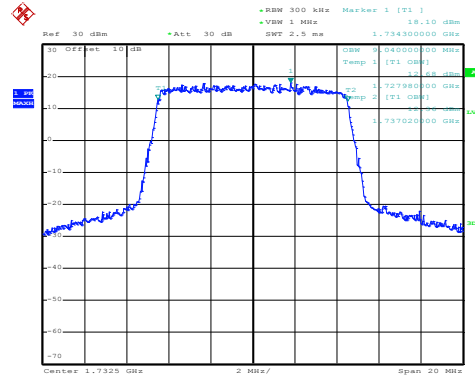
Lowest channel

16QAM



Date: 18.JUL.2019 10:10:22

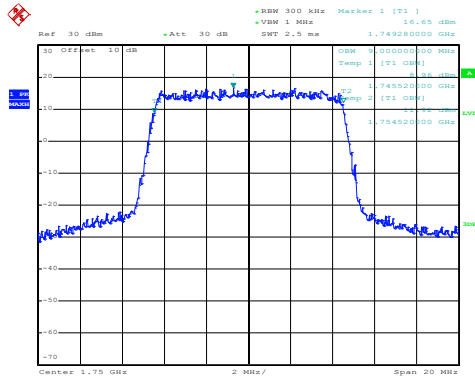
QPSK



Date: 18.JUL.2019 10:10:16

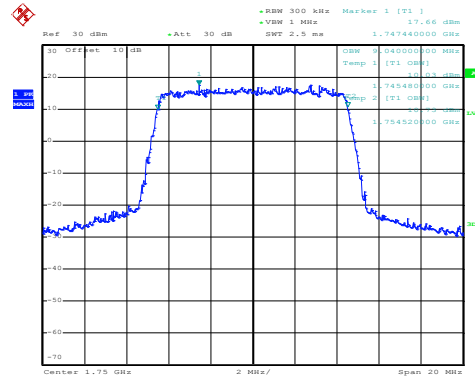
Middle channel

16QAM



Date: 18.JUL.2019 10:10:52

QPSK

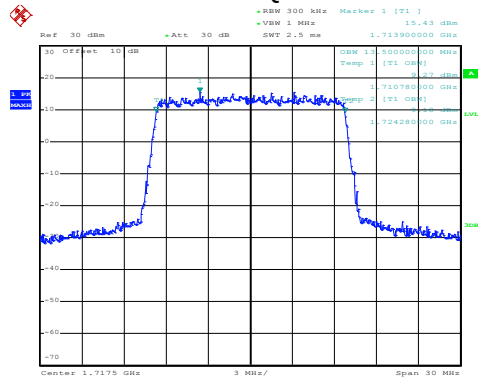


Date: 18.JUL.2019 10:10:48

Highest channel

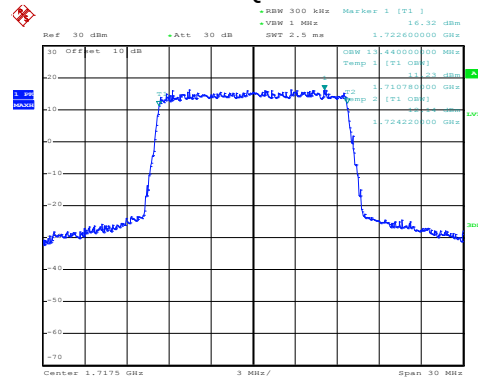
LTE Band 4: 99% Occupancy bandwidth
BW: 15MHz

16QAM



Date: 18.JUL.2019 10:07:01

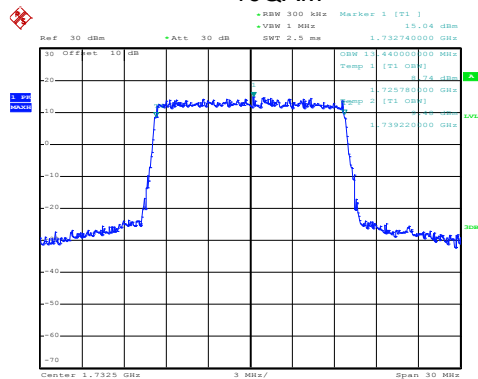
QPSK



Date: 18.JUL.2019 10:06:56

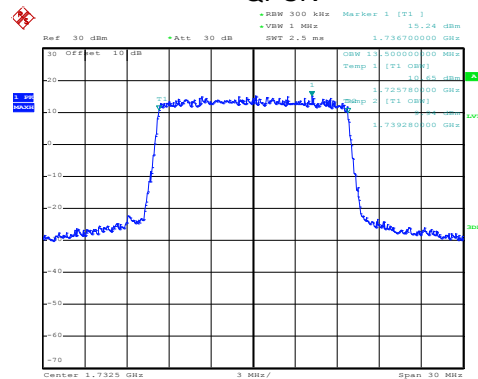
Lowest channel

16QAM



Date: 18.JUL.2019 10:07:20

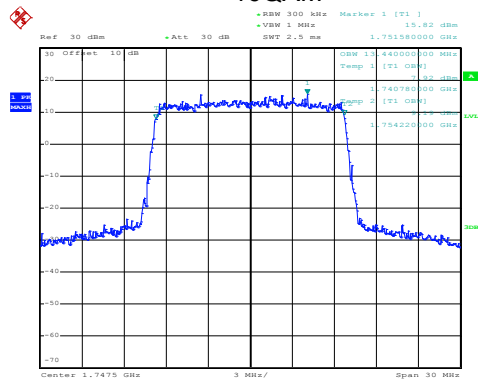
QPSK



Date: 18.JUL.2019 10:07:15

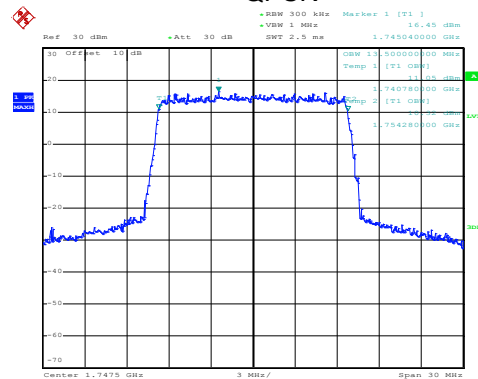
Middle channel

16QAM



Date: 18.JUL.2019 10:08:20

QPSK

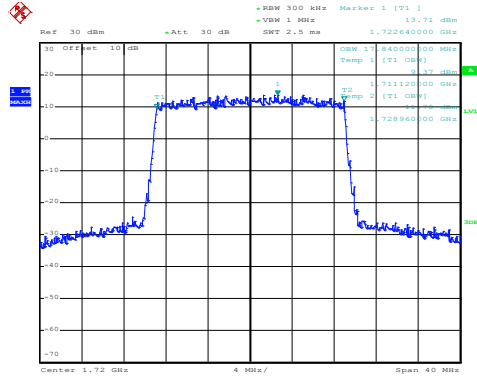


Date: 18.JUL.2019 10:08:15

Highest channel

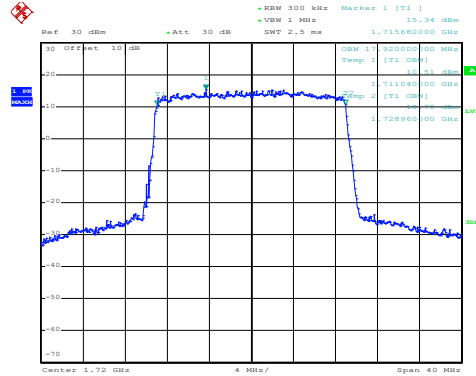
LTE Band 4: 99% Occupancy bandwidth
BW: 20MHz

16QAM



Date: 18.JUL.2019 10:03:16

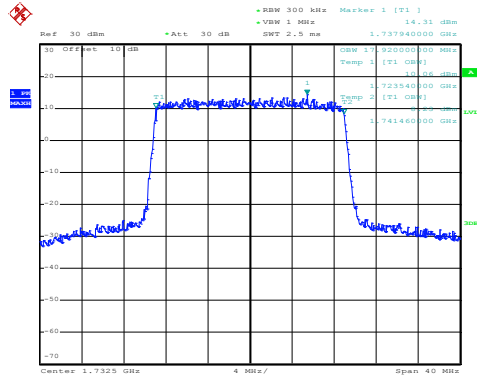
QPSK



Date: 18.JUL.2019 10:03:09

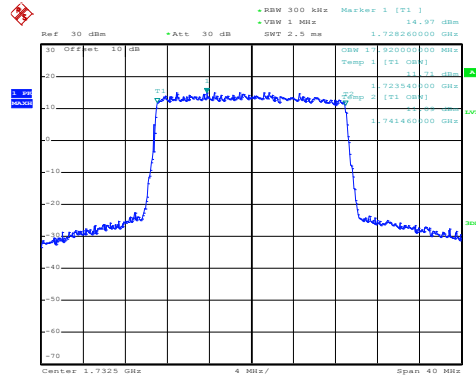
Lowest channel

16QAM



Date: 18.JUL.2019 10:04:26

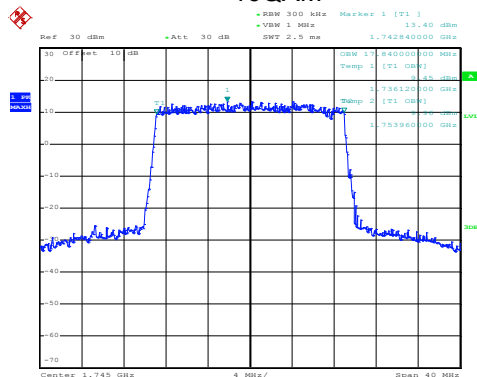
QPSK



Date: 18.JUL.2019 10:04:20

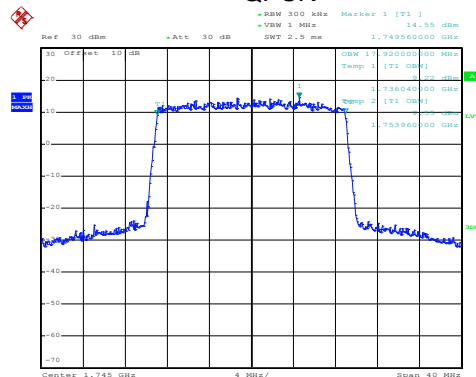
Middle channel

16QAM



Date: 18.JUL.2019 10:04:51

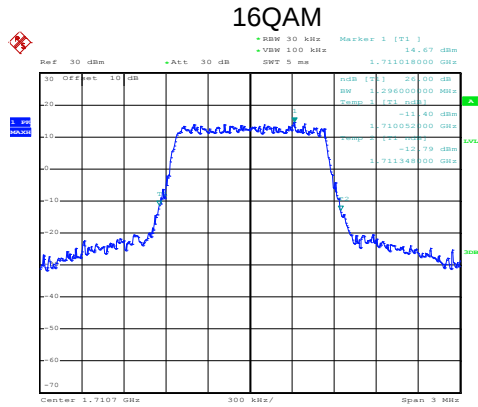
QPSK



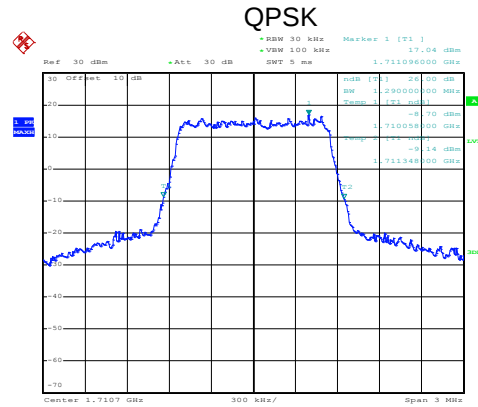
Date: 18.JUL.2019 10:04:45

Highest channel

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

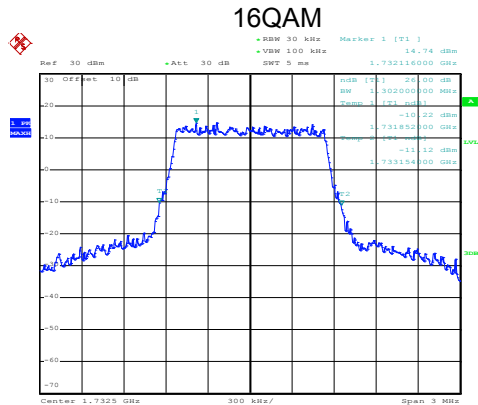


Date: 18.JUL.2019 10:20:07

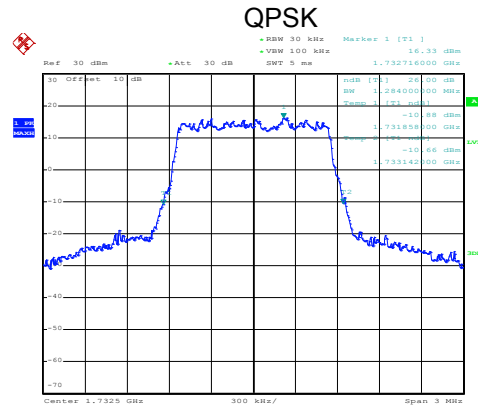


Date: 18.JUL.2019 10:20:02

Lowest channel

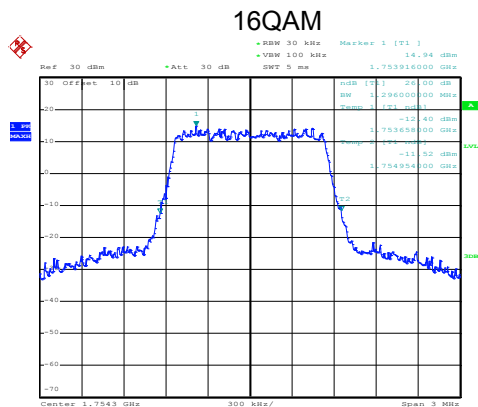


Date: 18.JUL.2019 10:20:36

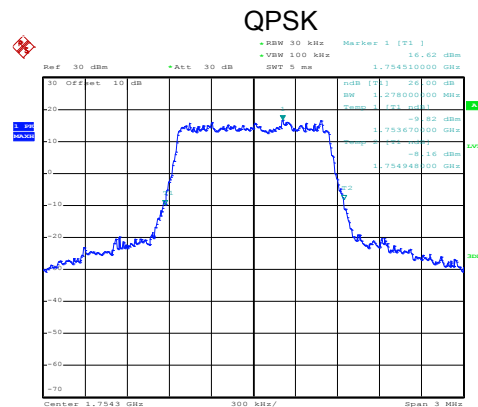


Date: 18.JUL.2019 10:20:30

Middle channel



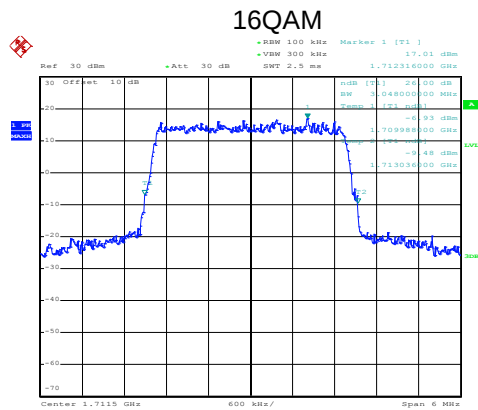
Date: 18.JUL.2019 10:21:52



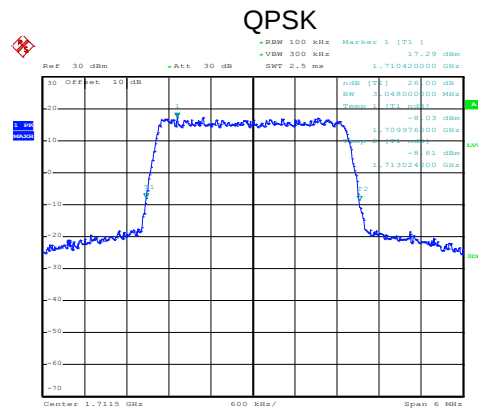
Date: 18.JUL.2019 10:21:47

Highest channel

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

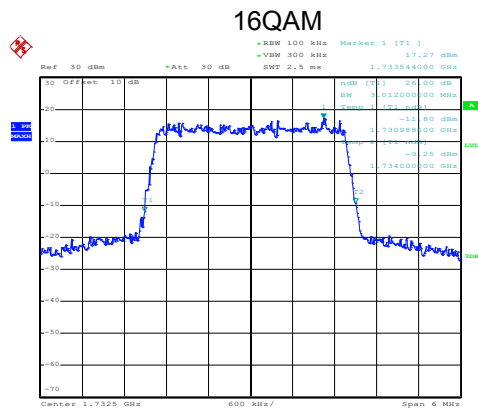


Date: 18.JUL.2019 10:15:38

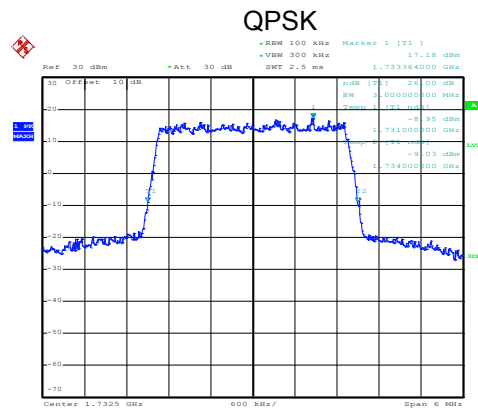


Date: 18.JUL.2019 10:15:32

Lowest channel

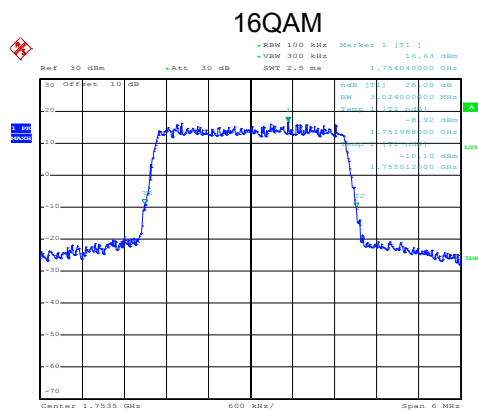


Date: 18.JUL.2019 10:15:57

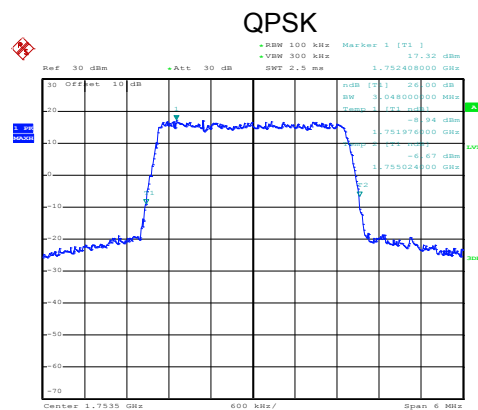


Date: 18.JUL.2019 10:15:52

Middle channel



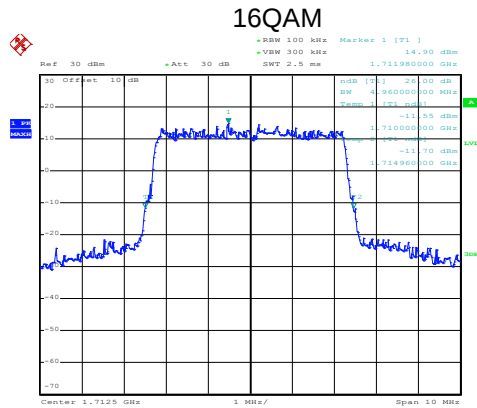
Date: 18.JUL.2019 10:17:32



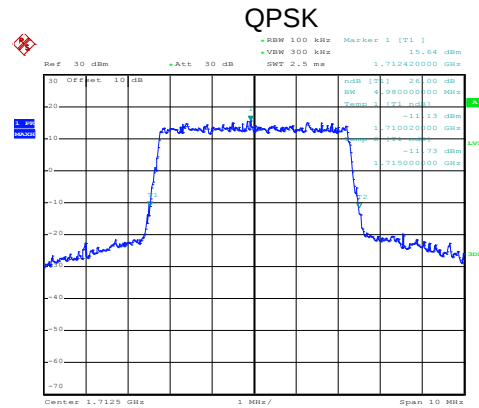
Date: 18.JUL.2019 10:17:26

Highest channel

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

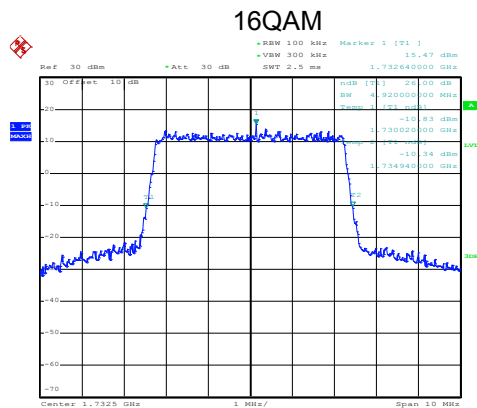


Date: 18.JUL.2019 10:12:31

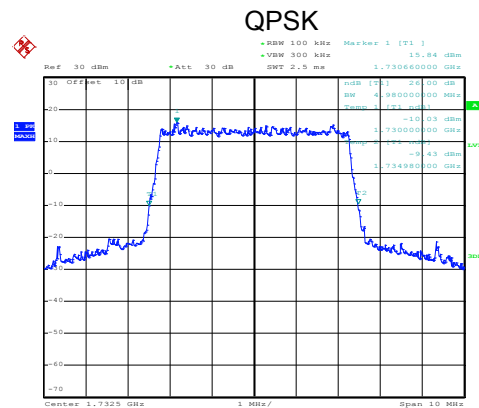


Date: 18.JUL.2019 10:12:26

Lowest channel

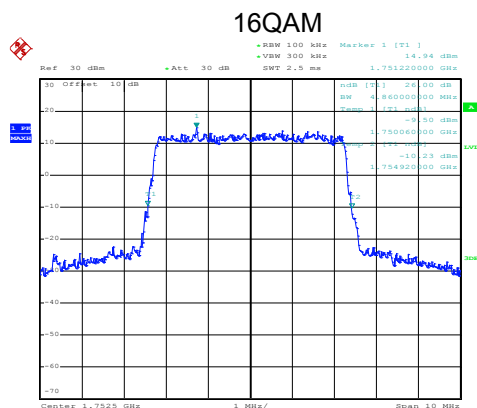


Date: 18.JUL.2019 10:13:35

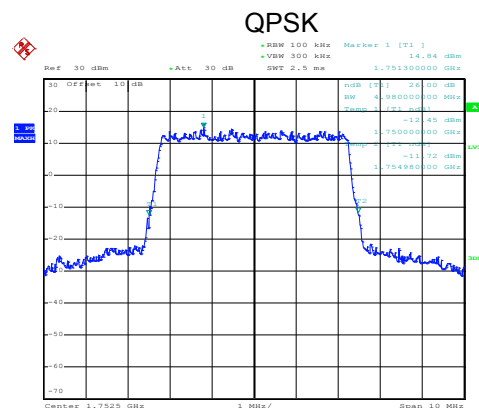


Date: 18.JUL.2019 10:13:30

Middle channel



Date: 18.JUL.2019 10:14:03

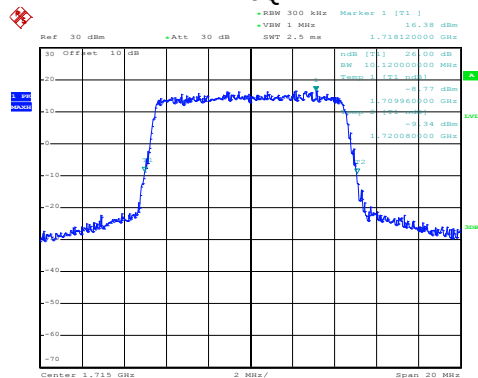


Date: 18.JUL.2019 10:13:58

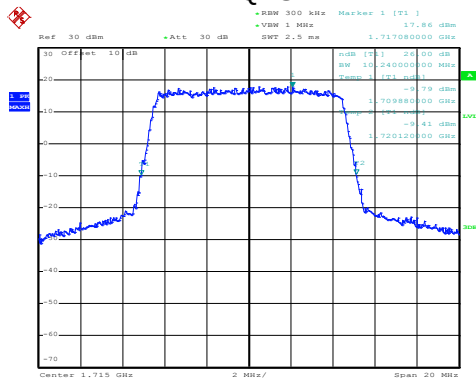
Highest channel

LTE Band 4: -26dBc bandwidth
BW: 10MHz

16QAM

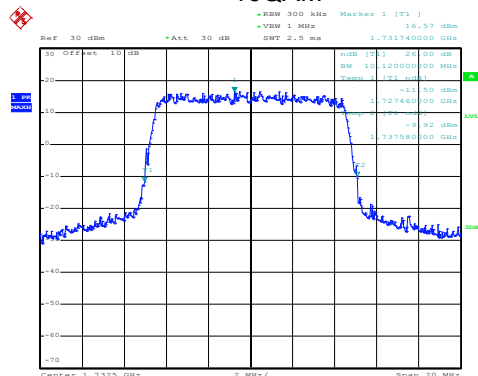


QPSK

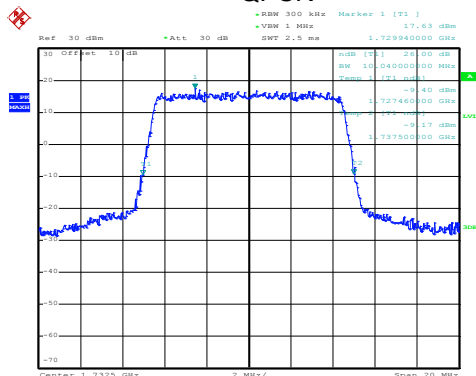


Lowest channel

16QAM

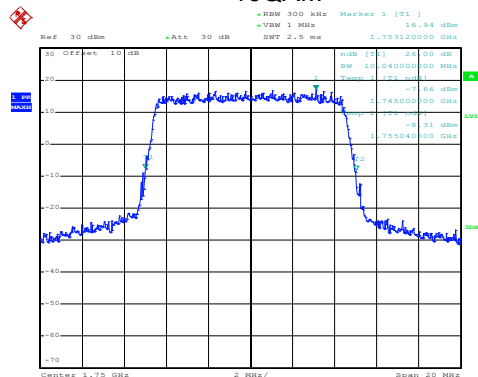


QPSK

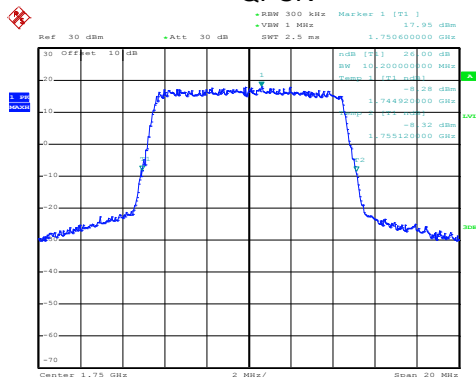


Middle channel

16QAM



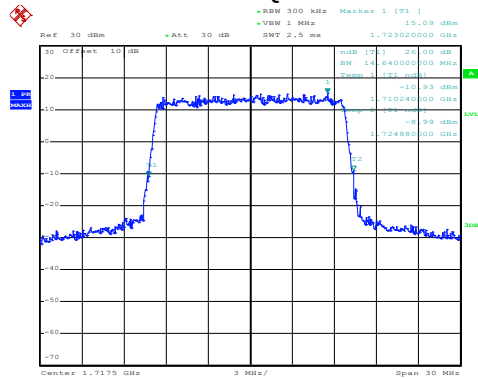
QPSK



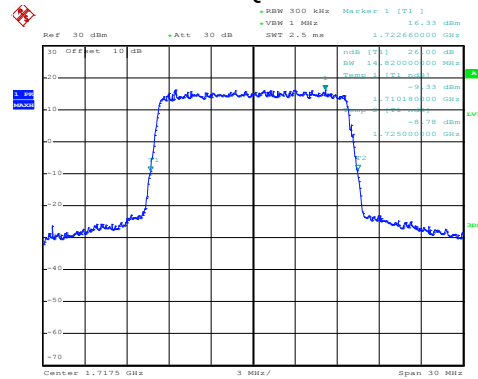
Highest channel

LTE Band 4: -26dBc bandwidth
BW: 15MHz

16QAM

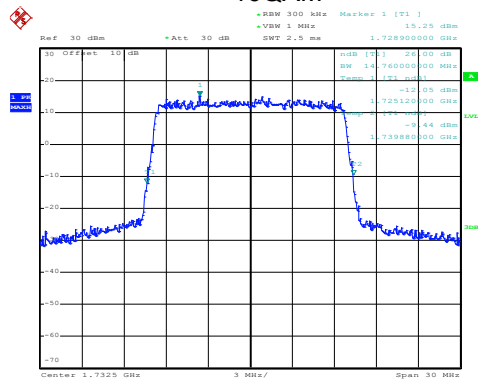


QPSK

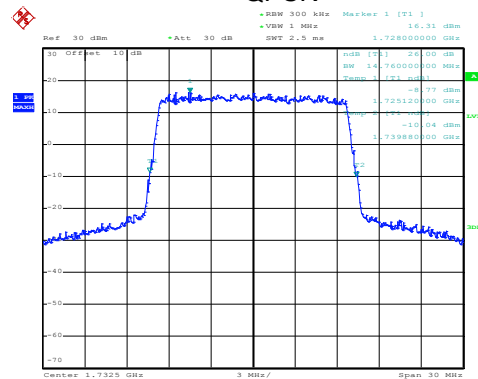


Lowest channel

16QAM

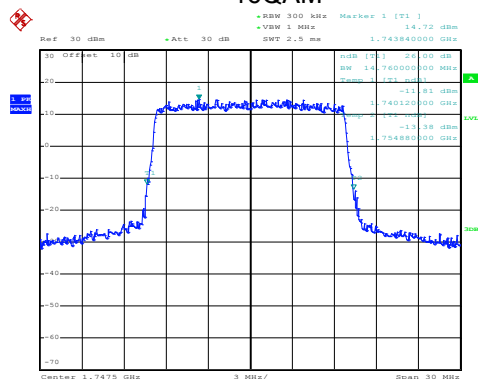


QPSK

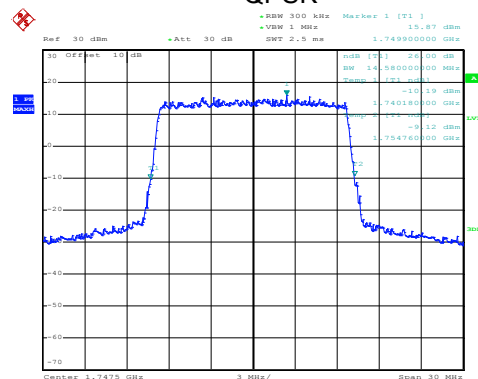


Middle channel

16QAM

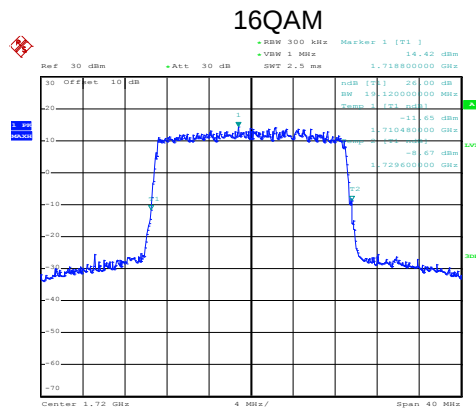


QPSK

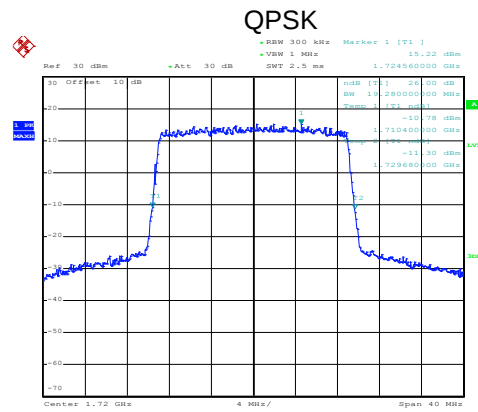


Highest channel

LTE Band 4: -26dBc bandwidth
BW: 20MHz

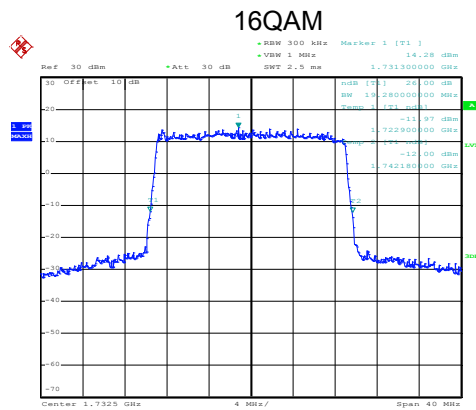


Date: 18.JUL.2019 10:03:35

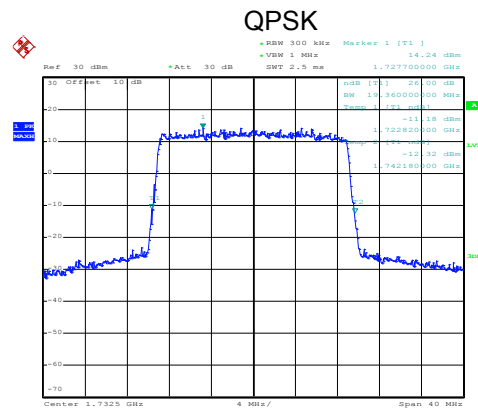


Date: 18.JUL.2019 10:03:31

Lowest channel

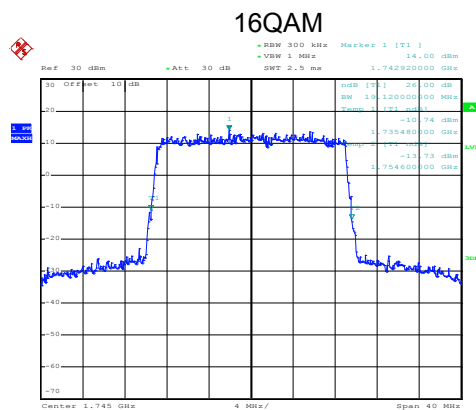


Date: 18.JUL.2019 10:04:06

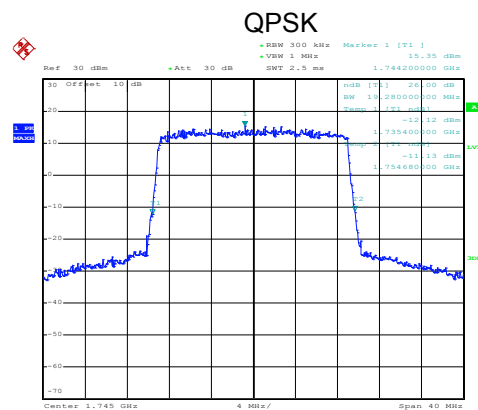


Date: 18.JUL.2019 10:03:56

Middle channel



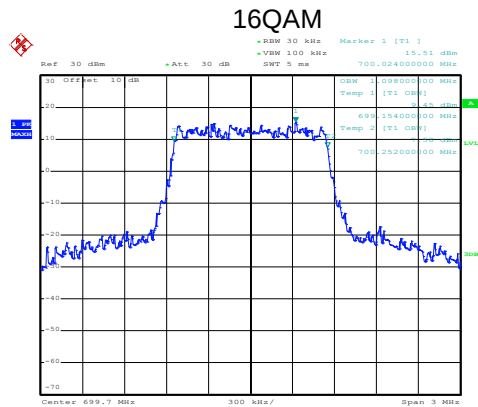
Date: 18.JUL.2019 10:05:09



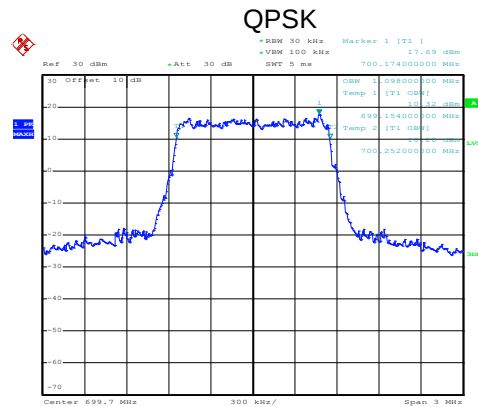
Date: 18.JUL.2019 10:05:03

Highest channel

LTE Band 12 part:

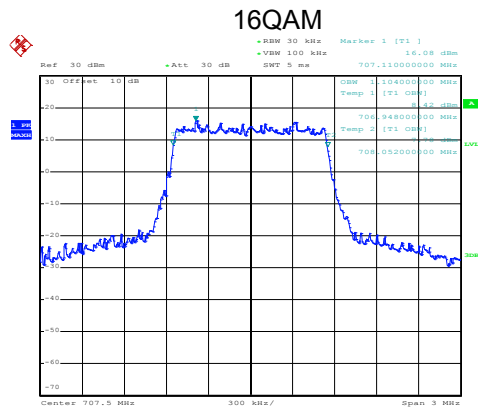
LTE Band 12: 99% Occupy bandwidth
BW: 1.4MHz

Date: 18.JUL.2019 10:25:26

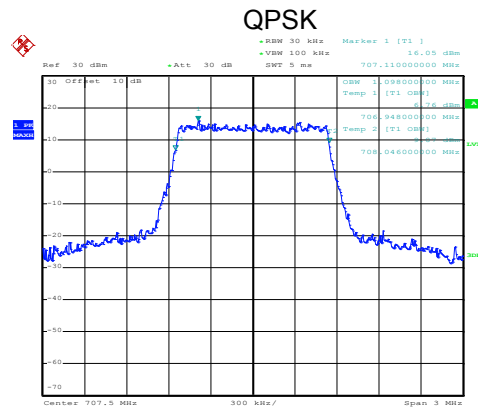


Date: 18.JUL.2019 10:25:21

Lowest channel

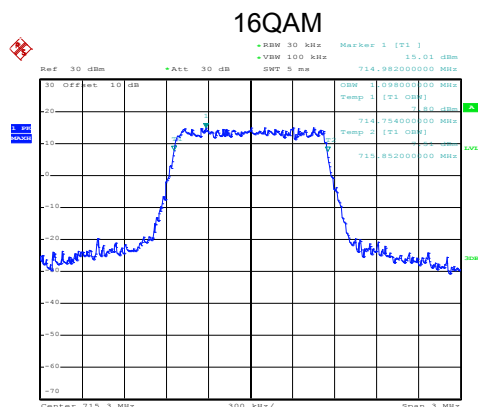


Date: 18.JUL.2019 10:25:53

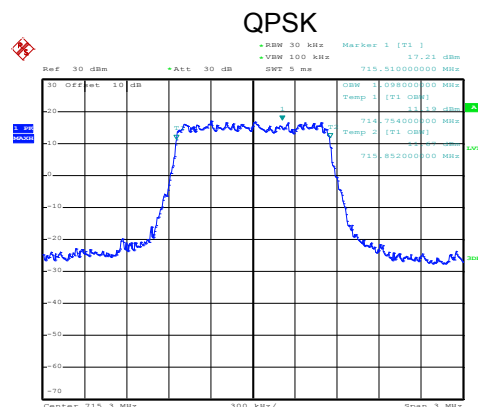


Date: 18.JUL.2019 10:25:48

Middle channel



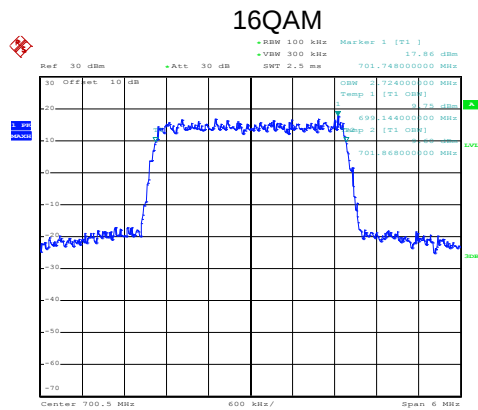
Date: 18.JUL.2019 10:26:57



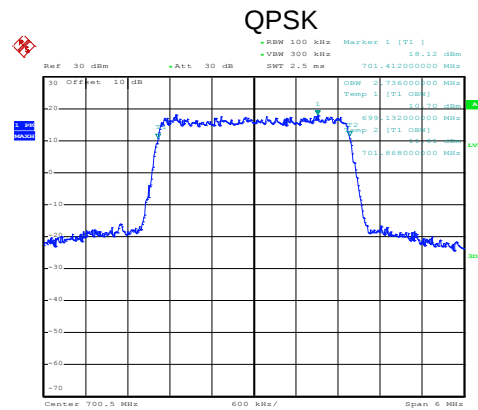
Date: 18.JUL.2019 10:26:51

Highest channel

LTE Band 12: 99% Occupy bandwidth BW: 3MHz

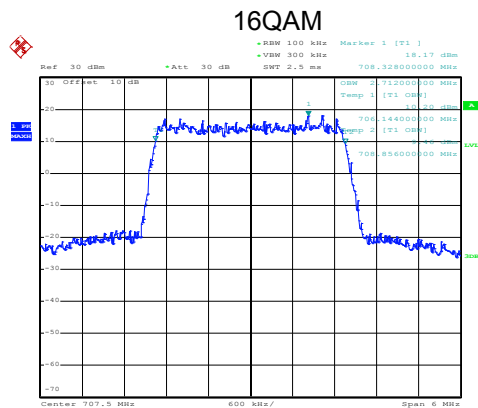


Date: 18.JUL.2019 10:27:41

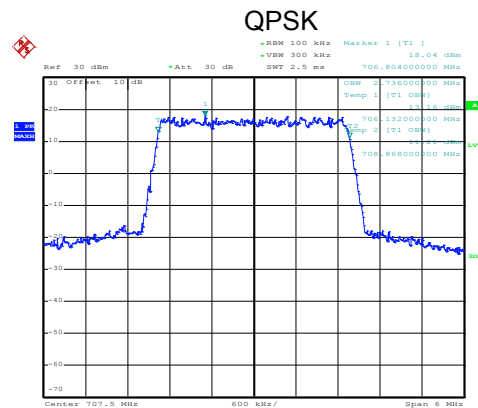


Date: 18.JUL.2019 10:27:36

Lowest channel

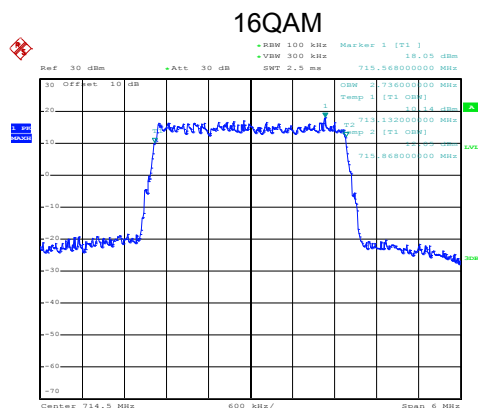


Date: 18.JUL.2019 10:29:19

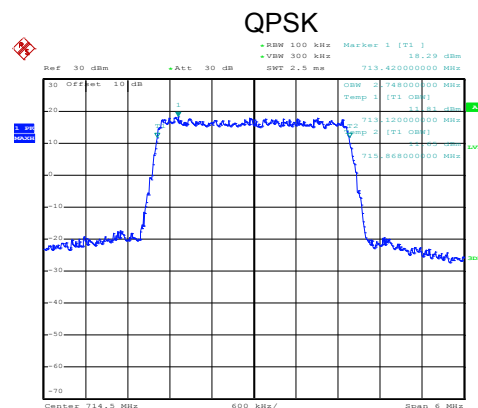


Date: 18.JUL.2019 10:29:15

Middle channel



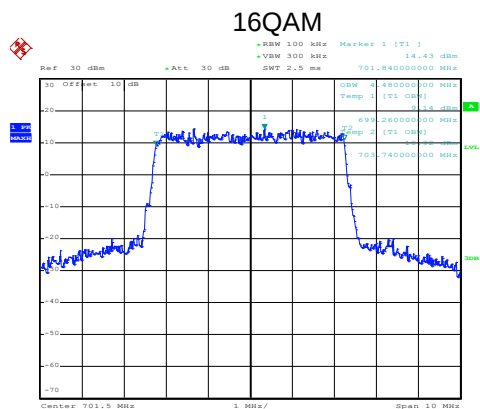
Date: 18.JUL.2019 10:28:56



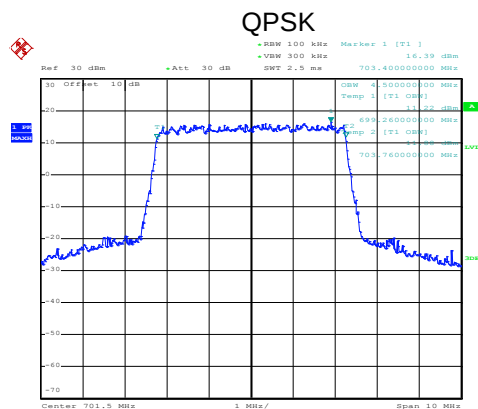
Date: 18.JUL.2019 10:28:51

Highest channel

LTE Band 12: 99% Occupy bandwidth BW: 5MHz

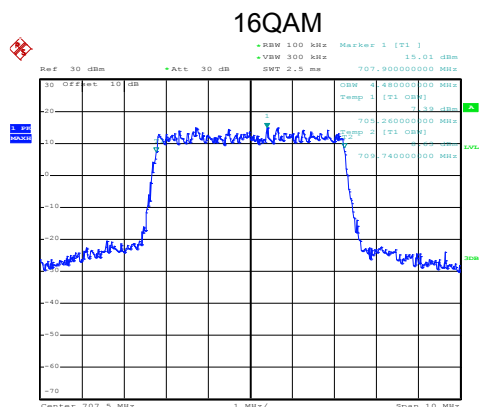


Date: 18.JUL.2019 10:30:52

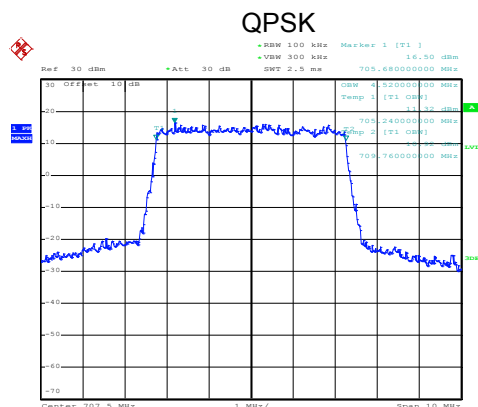


Date: 18.JUL.2019 10:30:45

Lowest channel

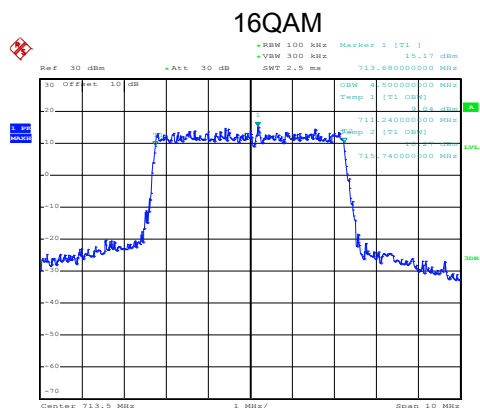


Date: 18.JUL.2019 10:31:48

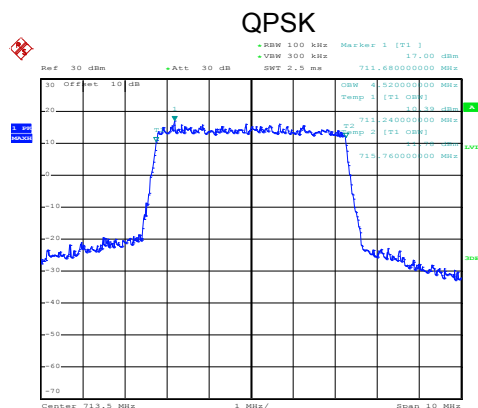


Date: 18.JUL.2019 10:31:43

Middle channel



Date: 18.JUL.2019 10:32:19

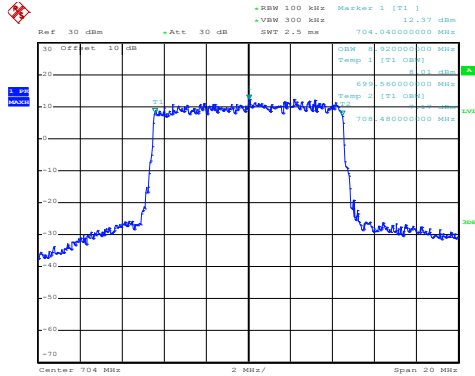


Date: 18.JUL.2019 10:32:14

Highest channel

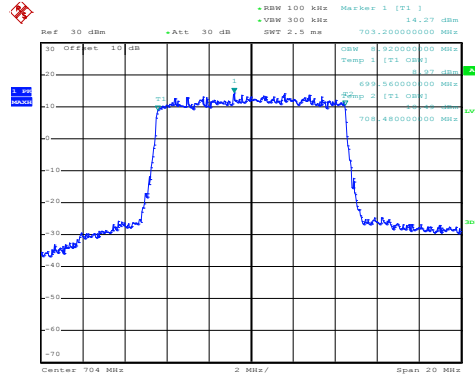
LTE Band 12: 99% Occupy bandwidth
BW: 10MHz

16QAM



Date: 18.JUL.2019 10:33:44

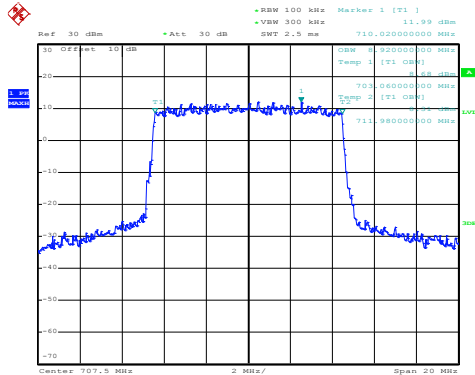
QPSK



Date: 18.JUL.2019 10:33:39

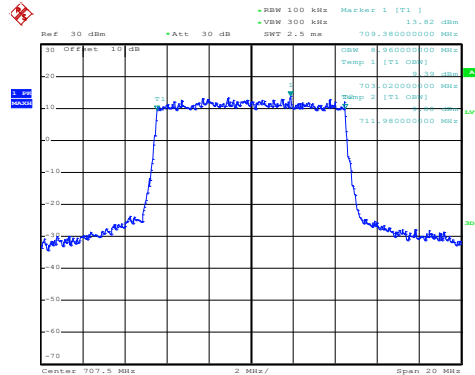
Lowest channel

16QAM



Date: 18.JUL.2019 10:34:17

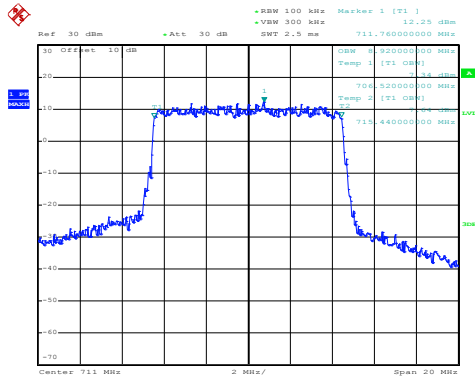
QPSK



Date: 18.JUL.2019 10:34:10

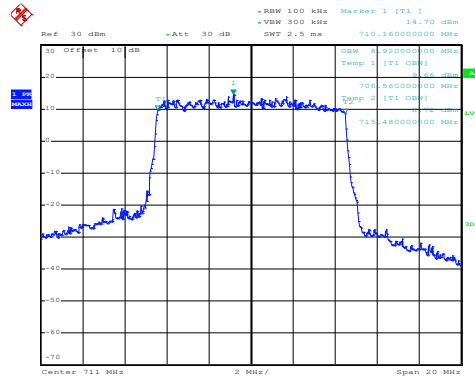
Middle channel

16QAM



Date: 18.JUL.2019 10:35:24

QPSK

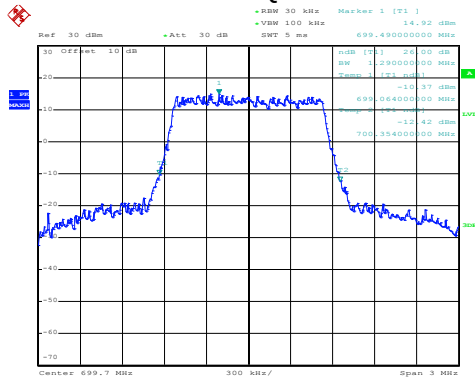


Date: 18.JUL.2019 10:35:17

Highest channel

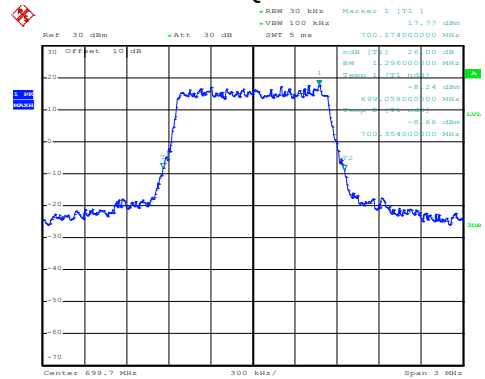
LTE Band 12: -26dBc bandwidth
BW: 1.4MHz

16QAM



Date: 18.JUL.2019 10:25:07

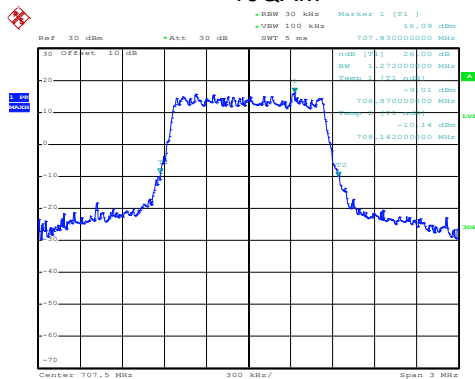
QPSK



Date: 18.JUL.2019 10:25:02

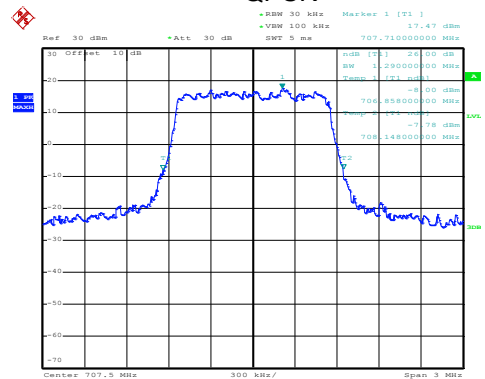
Lowest channel

16QAM



Date: 18.JUL.2019 10:26:10

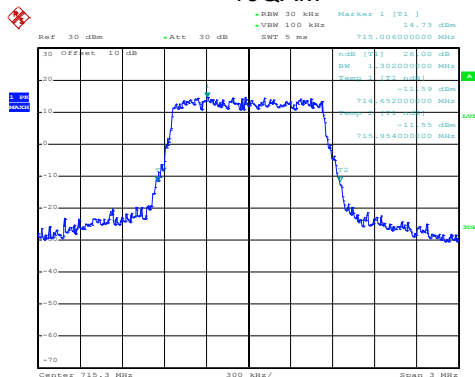
QPSK



Date: 18.JUL.2019 10:26:05

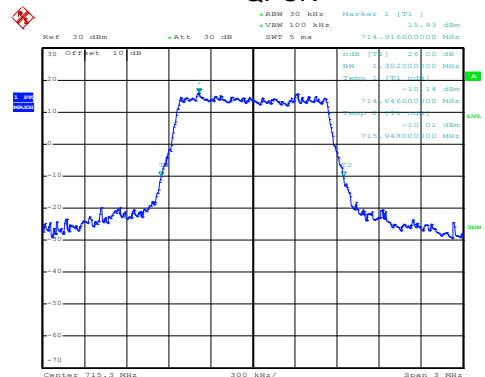
Middle channel

16QAM



Date: 18.JUL.2019 10:26:40

QPSK

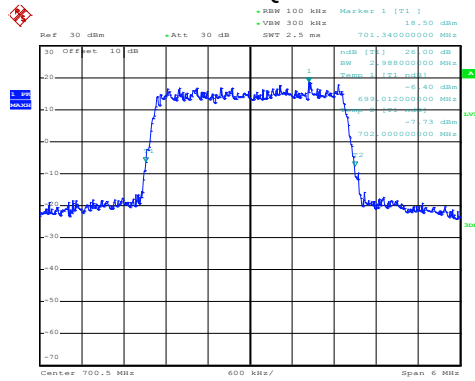


Date: 18.JUL.2019 10:26:36

Highest channel

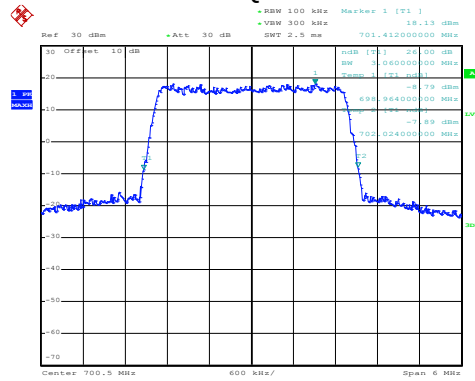
LTE Band 12: -26dBc bandwidth
BW: 3MHz

16QAM



Date: 18.JUL.2019 10:28:03

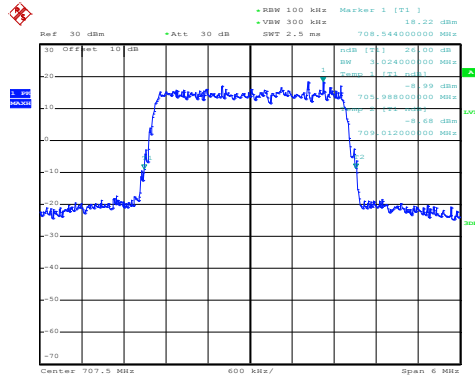
QPSK



Date: 18.JUL.2019 10:27:57

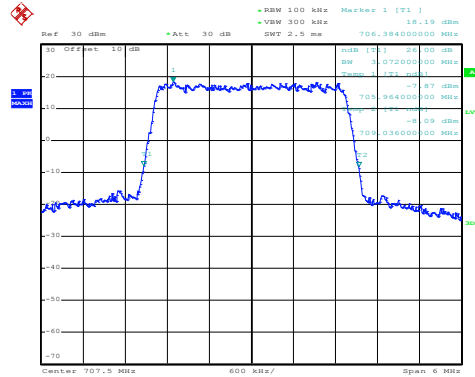
Lowest channel

16QAM



Date: 18.JUL.2019 10:29:40

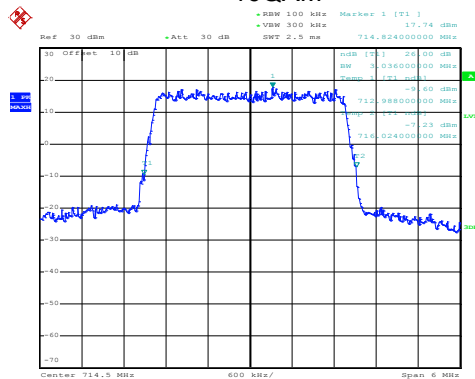
QPSK



Date: 18.JUL.2019 10:29:36

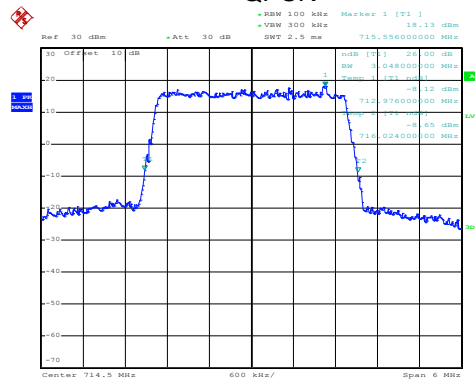
Middle channel

16QAM



Date: 18.JUL.2019 10:28:40

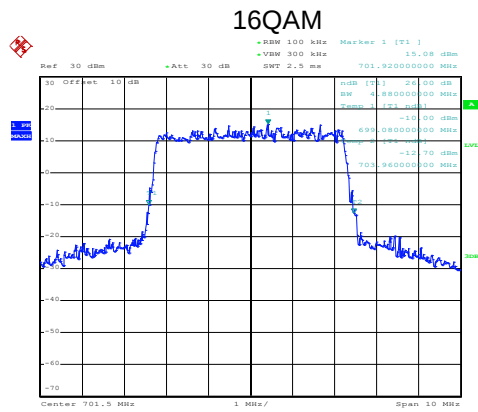
QPSK



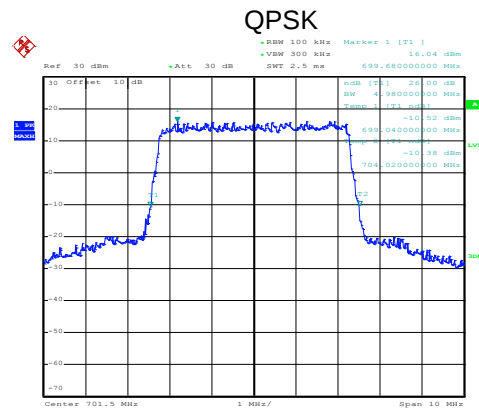
Date: 18.JUL.2019 10:28:33

Highest channel

LTE Band 12: -26dBc bandwidth
BW: 5MHz

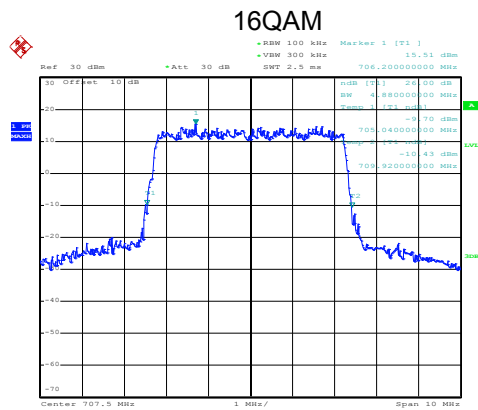


Date: 18.JUL.2019 10:30:24

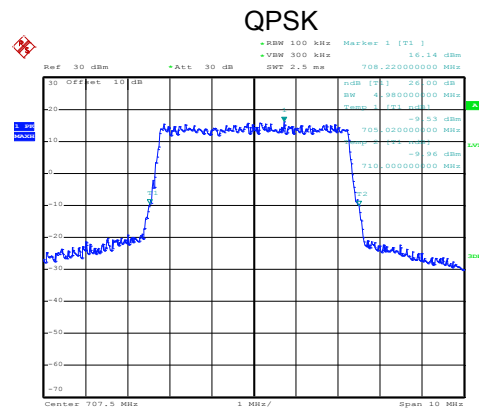


Date: 18.JUL.2019 10:31:05

Lowest channel

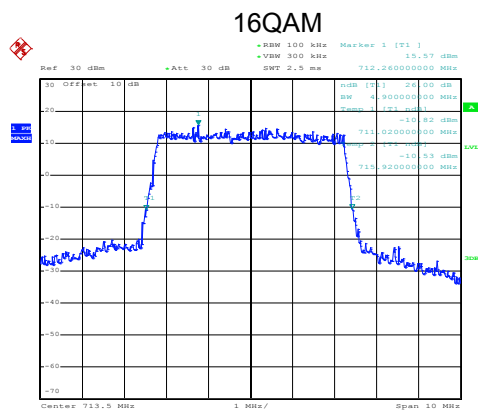


Date: 18.JUL.2019 10:31:31

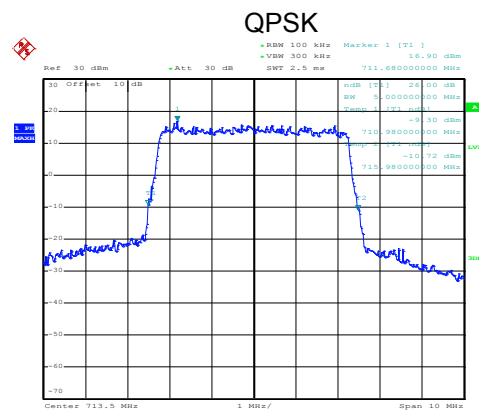


Date: 18.JUL.2019 10:31:26

Middle channel



Date: 18.JUL.2019 10:32:35

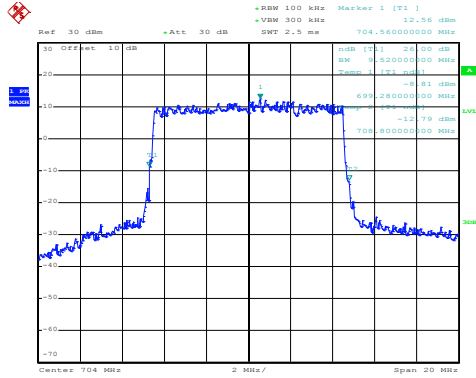


Date: 18.JUL.2019 10:32:29

Highest channel

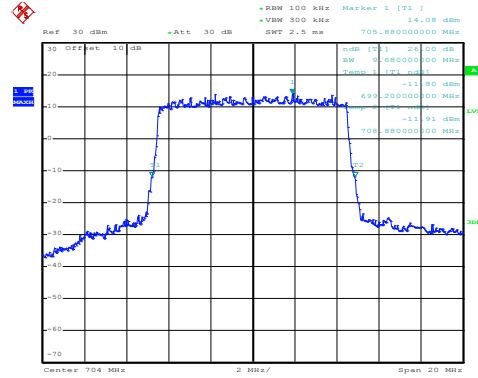
LTE Band 12: -26dBc bandwidth
BW: 10MHz

16QAM



Date: 18.JUL.2019 10:33:25

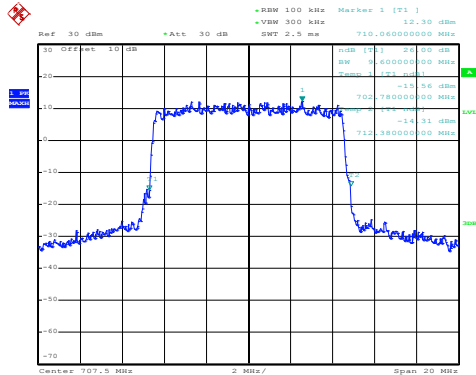
QPSK



Date: 18.JUL.2019 10:33:18

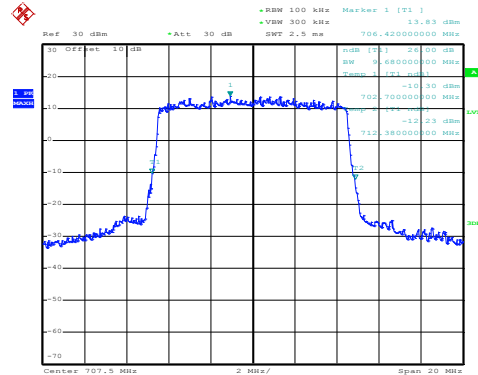
Lowest channel

16QAM



Date: 18.JUL.2019 10:34:37

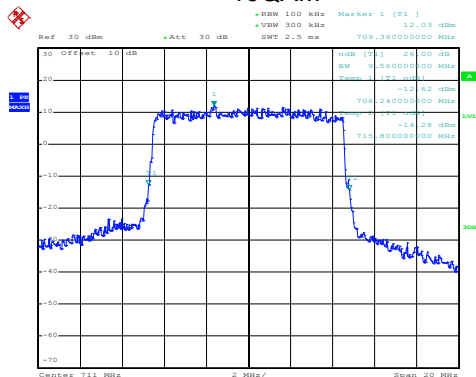
QPSK



Date: 18.JUL.2019 10:34:32

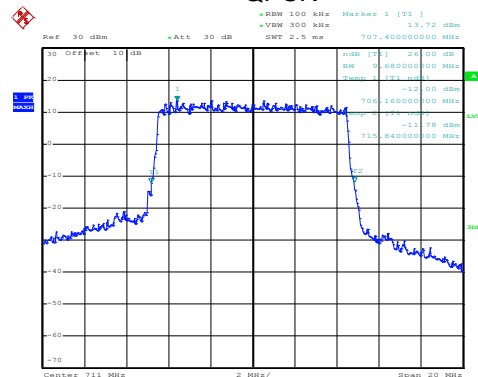
Middle channel

16QAM



Date: 18.JUL.2019 10:35:02

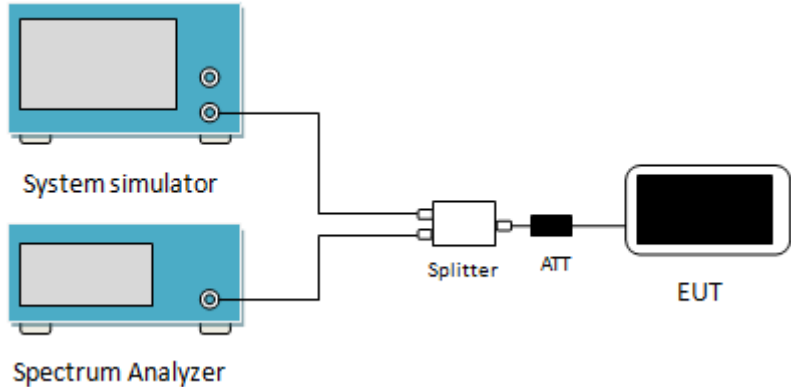
QPSK



Date: 18.JUL.2019 10:34:58

Highest channel

6.4 Out of band emission at antenna terminals

Test Requirement:	Part 24.238 (a), part 27.53(g), part 27.53(h),
Test Method:	ANSI/TIA-603-D 2010
Limit:	LTE Band 2 & 4 & 12 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).
Test Setup:	 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 single output port. These two ports are connected to a single input port of a white rectangular unit labeled 'Splitter'. The 'Splitter' has two output ports. One output port is connected to a black rectangular unit labeled 'ATT' (Attenuator). The other output port of the 'Splitter' is connected to the input port of a white rectangular unit labeled 'EUT' (Equipment Under Test).
Test Procedure:	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 5.9 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.