FCC LISTED, REGISTRATION NUMBER: 720267

IC LISTED REGISTRATION NUMBER IC 4621A-1

Test report No:

NIE: 45636RRF.002

Test report
REFERENCE STANDARD:
USA FCC Part 24
CANADA IC RSS-133

Identification of item tested.....:	Yotaphone2 Dual screen SmartPhone with EPD back screen
Trade .....:	YotaPhone
Model and /or type reference.....:	YD205
Other identification of the product .....:	FCC ID: 2ADHW205 IC: 12469A-205
Final HW version .....:	P2
Final SW version .....:	4.4.3-S01-003-US1.0.3.63a
Features.....:	CPU: Qualcomm Snapdragon 801, quad-core 2.26 GHz Network: GSM 850, 900, 1800, 1900 MHz, UMTS/HSPA+/DC-HSDPA 850,900,1900,1700/2100,2100 MHz; LTE CAT4 B2 MIMO,B3 MIMO, B4 MIMO, B5 MIMO, B7 MIMO, B12 MIMO and B20 MIMO Connectivity: WiFi 802.11 a/b/g/n/ac, USB 2.0, BT v4.0 LE, GPS w/A-GPS + Glonass, NFC
Manufacturer.....:	YOTA DEVICES LTD Arch. Makariou & Kalograion, 4, Nicolaides Sea View City, 9th Floor, Flat/Offices 903 -904, Block A-B, 6016, Larnaca, Cyprus
Test method requested, standard.....:	USA FCC Part 24 10-1-14 Edition. CANADA IC RSS-133 Issue 6, Jan. 2013. Measurement Guidance 971168 D01 v02r01 for certification of Licensed Digital Transmitters
Summary.....:	IN COMPLIANCE
Approved by (name / position & signature) .....:	A. Llamas RF Lab. Manager
Date of issue .....:	2015-05-21
Report template No.....:	FDT08_16

Firmado digitalmente por Alejandro Llamas Rodríguez
Fecha: 2015.05.21 16:29:45 +02'00'

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Competences and guarantees

AT4 wireless is a laboratory with a measurement facility in compliance with the requirements of Section 2.948 of the FCC rules and has been added to the list of facilities whose measurements data will be accepted in conjuction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Registration Number: 720267.

AT4 wireless is a laboratory with a measurement site in compliance with the requirements of RSS 212, Issue 1 (Provisional) and has been added to the list of filed sites of the Canadian Certification and Engineering Bureau. Reference File Number: IC 4621A-1.

In order to assure the traceability to other national and international laboratories, AT4 wireless has a calibration and maintenance program for its measurement equipment.

AT4 wireless guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at AT4 wireless at the time of performance of the test.

AT4 wireless is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of AT4 wireless.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of AT4 wireless and the Accreditation Bodies.

Uncertainty

Uncertainty (factor k=2) was calculated according to the AT4 wireless internal document PODT000.

Usage of samples

Samples undergoing test have been selected by: **the client**.

Sample M/01 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
45636B/007	Smartphone with integral antenna	YD205	IMEI: 356431061029911	2015-04-22

1. Sample M/01 has undergone the test(s).

   All radiated tests indicated in appendix A.

Sample M/02 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
45636B/016	Smartphone with an antenna connector	YD205	IMEI: 356431061029804	2015-05-05

1. Sample M/01 has undergone the test(s).

   All conducted tests indicated in appendix A.

Test sample description

The test sample consists of a Dual screen SmartPhone with EPD back screen.

Identification of the client

YOTA DEVICES LTD

Arch. Makariou & Kalograion, 4, Nicolaides Sea View City, 9th Floor, Flat/Offices 903 -904, Block A-B, 6016, Larnaca, Cyprus.

Testing period

The performed test started on 2015-04-27 and finished on 2015-05-11.

The tests have been performed at AT4 wireless.

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 20 % Max. = 75 %
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 0,5 Ω

In the semianechoic chamber the following limits were not exceeded during the test.

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 20 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 0,5 Ω
Normal site attenuation (NSA)	< ±4 dB at 10 m distance between item under test and receiver antenna, (30 MHz to 1000 MHz)
Field homogeneity	More than 75% of illuminated surface is between 0 and 6 dB (26 MHz to 1000 MHz).

In the chamber for conducted measurements the following limits were not exceeded during the test:

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 20 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar
Shielding effectiveness	> 100 dB
Electric insulation	> 10 kΩ
Reference resistance to earth	< 0,5 Ω

Remarks and comments

1: Used instrumentation.

Conducted Measurements

		Last Cal. date	Cal. due date
1.	Spectrum analyser Agilent PSA E4440A	2014/05	2016/05
2.	Climatic chamber HERAEUS VM 07/100	2012/10	2015/10
3.	DC power supply R&S NGPE 40/40	2014/11	2017/11
4.	Universal Radio communication Tester R&S CMU200	2014-02	2016-02
5.	Universal Radio communication Tester R&S CMW500	2014/07	2017/07

Radiated Measurements

		Last Cal. date	Cal. due date
1.	Semianechoic Absorber Lined Chamber ETS FACT3 200STP	N.A.	N.A.
2.	BiconicalLog antenna ETS LINDGREN 3142E	2014/03	2017/03
3.	Multi Device Controller EMCO 2090	N.A.	N.A.
4.	Double-ridge Guide Horn antenna 1-18 GHz SCHWARZBECK BBHA 9120 D	2013/11	2016/11
5.	SHF-EHF Horn antenna 15-40 GHz Schwarbeck BBHA 9170	2014/03	2017/03
6.	EMI Test Receiver R&S ESU 26	2013/08	2015/08
7.	Spectrum analyser Rohde & Schwarz FSW50	2013/10	2015/10
8.	RF pre-amplifier 10 MHz-6 GHz SCHWARZBECK BBV9743	2015/03	2016/03
9.	RF pre-amplifier 1-18 GHz Schwarzbeck BBV 9718	2015/02	2016/02
10.	RF pre-amplifier BONN BLMA 1840-1M 18-40 GHz.	2014/02	2016/02
11.	Universal Radio communication Tester R&S CMU200	2014/02	2016/02
12.	Universal Radio communication Tester R&S CMW500	2014/07	2017/07

2. GSM mode has not been tested to prove USA FCC Part 24 and Canada IC RSS-133 compliance because the modulation scheme and the power maximum levels are the same as for GPRS mode.

Taking into account the above comments, testing in GSM mode is redundant for FCC Part 24 and IC RSS-133 as it is the same as GPRS mode. GPRS mode has been tested as indicated on the present test report.

3. HSDPA modulation mode has not been tested to prove USA FCC Part 24 and Canada IC RSS-133 compliance because it is an improved mode of operation only for Downlink (UE reception), but using the normal WCDMA mode for UL (Up Link, UE transmission). Therefore HSDPA has no associated a Power class or modulation scheme different than WCDMA mode for the UL transmission.

Taking into account the above comments, testing in HSDPA modulation mode is redundant for FCC Part 24 and IC RSS-133 as it is the same as WCDMA mode as long as UE transmission is concerned. WCDMA modulation mode has been tested as indicated on the present test report.

Testing verdicts

Not applicable ..... :	N/A
Pass ..... :	P
Fail ..... :	F
Not measured ..... :	N/M

FCC PART 24/IC RSS-133 PARAGRAPH	VERDICT			
	NA	P	F	NM
Clause 24.232/RSS-133 Clause 6.4: RF output power		P		
Clause 2.1047/RSS-133 Clause 6.2: Modulation characteristics		P		
Clause 24.235/RSS-133 Clause 6.3: Frequency stability		P		
Clause 2.1049: Occupied Bandwidth		P		
Clause 24.238/RSS-133 Clause 6.5: Spurious emissions at antenna terminals		P		
Clause 24.238/RSS-133 Clause 6.5: Radiated emissions		P		

Appendix A – Test result for FCC Part 24/IC RSS-133

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TEST RESULTS FOR FCC PART 24 AND RSS-133

TEST CONDITIONS

Power supply (V):

V_{nom} = 3.8 Vdc

V_{max} = 4.2 Vdc (*)

V_{min} = 3.4 Vdc (*)

The subscripts nom, min and max indicate voltage test conditions (nominal, minimum and maximum respectively, as declared by the applicant).

(*): Declared by applicant

Type of power supply = DC Voltage from rechargeable battery

Type of antenna = Integral antenna

TEST FREQUENCIES:

GPRS AND EDGE MODULATION

Lowest channel (512): 1850.2 MHz

Middle channel (662): 1880.2 MHz

Highest channel (810): 1909.8 MHz

WCDMA AND HSUPA MODULATION

Lowest channel (9262): 1852.4 MHz

Middle channel (9400): 1880.0 MHz

Highest channel (9538): 1907.6 MHz

LTE. QPSK AND 16QAM MODULATION (BAND II)

	Channel (Frequency, MHz)					
	BW = 1.4 MHz	BW = 3 MHz	BW = 5 MHz	BW = 10 MHz	BW = 15 MHz	BW = 20 MHz
Lowest	18607 (1850.70)	18615 (1851.50)	18625 (1852.50)	18650 (1855.00)	18675 (1857.50)	18700 (1860.00)
Middle	18900 (1880)	18900 (1880)	18900 (1880)	18900 (1880)	18900 (1880)	18900 (1880)
Highest	19193 (1909.30)	19185 (1908.50)	19175 (1907.50)	19150 (1905.00)	19125 (1902.50)	19100 (1900.00)

RF Output Power (conducted and E.I.R.P.)

SPECIFICATION

FCC §2.1046 and 24.232
RSS-133. Clause 6.4.

Mobile/portable stations are limited to 2 Watts (33 dBm) Effective Isotropic Radiated Power (E.I.R.P.).

When measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

METHOD

The conducted RF output power measurements were made at the RF output terminals of the EUT using the power meter of the Universal Radio Communication tester R&S CMU200 and CMW500, selecting maximum transmission power of the EUT and different modes of modulation.

The maximum equivalent isotropic radiated power e.i.r.p. is calculated by adding the declared maximum antenna gain (dBi).

RESULTS

MAXIMUM OUTPUT POWER (CONDUCTED).

GPRS MODULATION

Channel	Lowest	Middle	Highest
Maximum declared antenna gain (dBi)	-1.90	-2.20	-2.80
Measured maximum peak power (dBm) at antenna port	29.10	28.90	28.90
Maximum effective isotropic radiated peak power E.I.R.P. (dBm)	27.20	26.70	26.10
Measured maximum average power (dBm) at antenna port	28.90	28.70	28.70
Maximum effective isotropic radiated average power E.I.R.P. (dBm)	27.00	26.50	25.90
Peak-to-average ratio (PAR) (dB)	0.20	0.20	0.20
Measurement uncertainty (dB)	±0.5		

EDGE MODULATION

Channel	Lowest	Middle	Highest
Maximum declared antenna gain (dBi)	-1.90	-2.20	-2.80
Measured maximum peak power (dBm) at antenna port	27.10	27.20	27.20
Maximum effective isotropic radiated peak power E.I.R.P. (dBm)	25.20	25.00	24.40
Measured maximum average power (dBm) at antenna port	25.40	25.50	25.50
Maximum effective isotropic radiated average power E.I.R.P. (dBm)	23.50	23.30	22.70
Peak-to-average ratio (PAR) (dB)	1.70	1.70	1.70
Measurement uncertainty (dB)	±0.5		

WCDMA MODULATION

Channel	Lowest	Middle	Highest
Maximum declared antenna gain (dBi)	-0.90	-1.50	-2.30
Measured maximum peak power (dBm) at antenna port	26.82	26.88	26.81
Maximum effective isotropic radiated peak power E.I.R.P. (dBm)	25.90	25.38	24.51
Measured maximum average power (dBm) at antenna port	22.66	22.62	22.53
Maximum effective isotropic radiated average power E.I.R.P. (dBm)	21.76	21.12	20.23
Peak-to-average ratio (PAR) (dB)	4.16	4.26	4.28
Measurement uncertainty (dB)	±0.5		

HSUPA MODULATION

Channel	Lowest	Middle	Highest
Maximum declared antenna gain (dBi)	-0.90	-1.50	-2.30
Measured maximum peak power (dBm) at antenna port	25.83	25.83	25.85
Maximum effective isotropic radiated peak power E.I.R.P. (dBm)	24.93	24.33	23.55
Measured maximum average power (dBm) at antenna port	21.04	20.99	20.94
Maximum effective isotropic radiated average power E.I.R.P. (dBm)	20.14	19.49	18.64
Peak-to-average ratio (PAR) (dB)	4.79	4.84	4.91
Measurement uncertainty (dB)	±0.5		

BANDWIDTH (MHz)	CHANNEL	FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)	PK POWER (dBm)	PAPR (dB)
1.4	**Low 18607**	1850.7	QPSK	1	0	23.5	27.2	3.7
				1	2	23.41	27.23	3.82
				1	5	23.48	27.26	3.78
				3	0	23.44	27.55	4.11
				3	1	23.41	27.5	4.09
				3	2	23.45	27.51	4.06
				6	0	22.55	27.84	5.12
			16-QAM	1	0	22.6	27.26	4.66
				1	2	22.57	27.32	4.75
				1	5	22.59	27.37	4.78
				3	0	22.48	27.48	5
				3	1	22.45	27.45	5
				3	2	22.42	27.44	5.02
				6	0	21.68	27.61	5.93
	Middle 18900	1880	QPSK	1	0	23.57	27.92	4.35
				1	2	23.53	27.92	4.39
				1	5	23.55	28.01	4.46
				3	0	23.58	28.18	4.6
				3	1	23.57	28.27	4.7
				3	2	23.56	28.21	4.65
				6	0	22.72	28.29	5.57
			16-QAM	1	0	22.76	28.06	5.3
				1	2	22.72	28.29	5.57
				1	5	22.78	28.22	5.44
				3	0	22.62	28.23	5.61
				3	1	22.6	28.23	5.63
				3	2	22.79	28.25	5.46
				6	0	21.82	28.04	6.22
	High 19193	1909.3	QPSK	1	0	23.57	27.73	4.16
				1	2	23.56	27.75	4.19
				1	5	23.6	27.73	4.13
				3	0	23.58	27.95	4.37
				3	1	23.55	27.92	4.37
				3	2	23.54	27.9	4.36
				6	0	22.71	28.04	5.33
			16-QAM	1	0	22.9	27.78	4.88
				1	2	22.82	27.81	4.99
				1	5	22.88	27.81	4.93
				3	0	22.64	27.92	5.28
				3	1	22.6	27.94	5.34
				3	2	22.6	27.91	5.31
				6	0	21.61	27.91	6.3

BANDWIDTH (MHz)	CHANNEL	FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)	PK POWER (dBm)	PAPR (dB)
3	Low 18615	1851.5	QPSK	1	0	22.9	27.26	4.36
				1	7	23.37	27.48	4.11
				1	14	22.84	27.49	4.65
				8	0	22.24	27.2	4.96
				8	4	22.43	27.33	4.9
				8	7	22.26	27.286	5.026
				15	0	22.19	27.27	5.08
			16-QAM	1	0	21.8	26.65	4.85
				1	7	22.7	27.36	4.66
				1	14	21.54	26.85	5.31
				8	0	21.55	27.21	5.66
				8	4	21.54	27.35	5.81
				8	7	21.09	27.29	6.2
				15	0	21.2	27.35	6.15
	Middle 18900	1880	QPSK	1	0	23.76	28.01	4.25
				1	7	23.62	28.07	4.45
				1	14	23.68	28.26	4.58
				8	0	22.65	27.91	5.26
				8	4	22.66	27.8	5.14
				8	7	22.65	27.92	5.27
				15	0	22.66	28.11	5.45
			16-QAM	1	0			0
				1	7	22.43	28.09	5.66
				1	14	22.51	28.3	5.79
				8	0	21.74	27.67	5.93
				8	4	21.71	27.5	5.79
				8	7	21.76	27.54	5.78
				15	0	21.76	28.17	6.41
	High 19185	1908.5	QPSK	1	0	22.97	27.09	4.12
				1	7	23.53	27.8	4.27
				1	14	23	27.06	4.06
				8	0	22.37	27.53	5.16
				8	4	22.59	27.72	5.13
				8	7	22.39	27.6	5.21
				15	0	22.32	27.71	5.39
			16-QAM	1	0	21.91	27.159	5.249
				1	7	22.46	27.84	5.38
				1	14	21.96	27.12	5.16
				8	0	22.17	27.635	5.465
				8	4	21.51	27.7	6.19
				8	7	21.36	27.56	6.2
				15	0	21.54	27.78	6.24

BANDWIDTH (MHz)	CHANNEL	FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)	PK POWER (dBm)	PAPR (dB)
5	Low 18625	1852.5	QPSK	1	0	22.86	26.72	3.86
				1	12	23.34	27.48	4.14
				1	24	22.98	27.24	4.26
				12	0	22.34	27.23	4.89
				12	6	22.47	27.44	4.97
				12	11	22.43	27.53	5.1
				25	0	22.27	27.49	5.22
			16-QAM	1	0	22.08	26.77	4.69
				1	12	22.15	27.55	5.4
				1	24	21.77	27.3	5.53
				12	0	21.4	27.28	5.88
				12	6	21.68	27.53	5.85
				12	11	21.71	27.57	5.86
				25	0	21.4	27.59	6.19
	Middle 18900	1880	QPSK	1	0	23.03	27.21	4.18
				1	12	23.5	28.156	4.656
				1	24	22.91	27.69	4.78
				12	0	22.59	27.75	5.16
				12	6	22.65	27.86	5.21
				12	11	22.54	27.87	5.33
				25	0	22.52	28.01	5.49
			16-QAM	1	0	21.94	27.31	5.37
				1	12	22.94	28.04	5.1
				1	24	22	27.6	5.6
				12	0	21.53	27.74	6.21
				12	6	21.85	27.76	5.91
				12	11	21.65	27.7	6.05
				25	0	21.55	28.05	6.5
	High 19175	1907.5	QPSK	1	0	22.98	27.39	4.41
				1	12	23.49	27.83	4.34
				1	24	22.98	27.3	4.32
				12	0	22.38	27.67	5.29
				12	6	22.6	27.69	5.09
				12	11	22.56	27.7	5.14
				25	0	22.45	27.89	5.44
			16-QAM	1	0	22.12	27.47	5.35
				1	12	22.39	27.9	5.51
				1	24	21.85	27.38	5.53
				12	0	21.5	27.61	6.11
				12	6	21.6	27.7	6.1
				12	11	21.5	27.65	6.15
				25	0	21.47	27.88	6.41

BANDWIDTH (MHz)	CHANNEL	FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)	PK POWER (dBm)	PAPR (dB)
10	Low 18650	1855	QPSK	1	0	23.39	27.96	4.57
				1	24	23.6	28.381	4.781
				1	49	23.34	28.51	5.17
				25	0	22.49	27.65	5.16
				25	12	22.6	27.89	5.29
				25	24	22.5	27.95	5.45
				50	0	22.53	28.33	5.8
			16-QAM	1	0	23.2	27.93	4.73
				1	24	23.2	28.41	5.21
				1	49	23.1	28.63	5.53
				25	0	21.59	28.08	6.49
				25	12	21.72	28.25	6.53
				25	24	21.59	28.15	6.56
				50	0	21.55	28.58	7.03
	Middle 18900	1880	QPSK	1	0	23.88	27.61	3.73
				1	24	23.71	28.16	4.45
				1	49	23.61	28.37	4.76
				25	0	22.81	27.96	5.15
				25	12	22.7	28.02	5.32
				25	24	22.74	28.13	5.39
				50	0	22.71	28.66	5.95
			16-QAM	1	0	23.09	27.719	4.629
				1	24	22.82	28.22	5.4
				1	49	22.86	28.43	5.57
				25	0	21.99	28.01	6.02
				25	12	21.73	27.94	6.21
				25	24	21.79	28.08	6.29
				50	0	21.78	28.61	6.83
	High 19150	1905	QPSK	1	0	23.51	28.29	4.78
				1	24	23.45	27.97	4.52
				1	49	23.65	27.98	4.33
				25	0	22.56	28.12	5.56
				25	12	22.64	27.97	5.33
				25	24	22.68	28.04	5.36
				50	0	22.75	28.56	5.81
			16-QAM	1	0	22.37	28.37	6
				1	24	22.4	28.03	5.63
				1	49	22.84	28.08	5.24
				25	0	21.67	28.08	6.41
				25	12	21.82	28.02	6.2
				25	24	21.76	28.01	6.25
				50	0	21.77	28.61	6.84

BANDWIDTH (MHz)	CHANNEL	FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)	PK POWER (dBm)	PAPR (dB)
15	Low 18675	1857.5	QPSK	1	0	23.5	27.25	3.75
				1	37	23.43	28.07	4.64
				1	74	23.61	27.95	4.34
				36	0	22.63	28.18	5.55
				36	18	22.52	27.77	5.25
				36	37	22.53	27.97	5.44
				75	0	22.66	28.32	5.66
			16-QAM	1	0	22.45	27.31	4.86
				1	37	22.31	28.16	5.85
				1	74	22.9	28.02	5.12
				36	0	21.72	27.88	6.16
				36	18	21.65	27.75	6.1
				36	37	21.55	27.95	6.4
				75	0	21.76	28.34	6.58
	Middle 18900	1880	QPSK	1	0	23.66	27.72	4.06
				1	37	23.45	28.15	4.7
				1	74	23.61	28.26	4.65
				36	0	22.81	27.89	5.08
				36	18	22.65	27.9	5.25
				36	37	22.72	28.04	5.32
				75	0	22.78	28.32	5.54
			16-QAM	1	0	22.93	27.39	4.46
				1	37	23.06	28.2	5.14
				1	74	22.88	28.52	5.64
				36	0	21.86	27.91	6.05
				36	18	21.8	27.97	6.17
				36	37	21.87	28.1	6.23
				75	0	21.88	28.45	6.57
	High 19125	1902.5	QPSK	1	0	23.32	28.38	5.06
				1	37	23.29	28.06	4.77
				1	74	23.45	27.89	4.44
				36	0	22.58	28.05	5.47
				36	18	22.58	27.88	5.3
				36	37	22.68	28.13	5.45
				75	0	22.66	28.58	5.92
			16-QAM	1	0	22.58	28.32	5.74
				1	37	22.68	28.16	5.48
				1	74	22.8	27.93	5.13
				36	0	21.66	28.13	6.47
				36	18	21.65	27.82	6.17
				36	37	21.75	28.11	6.36
				75	0	21.74	28.36	6.62

BANDWIDTH (MHz)	CHANNEL	FREQUENCY (MHz)	MODULATION	RB SIZE	RB OFFSET	AVERAGE POWER (dBm)	PK POWER (dBm)	PAPR (dB)
20	Low 18700	1860	QPSK	1	0	23.29	27.13	3.84
				1	49	23.28	27.97	4.69
				1	99	23.55	27.15	3.6
				50	0	22.51	27.92	5.41
				50	24	22.57	27.97	5.4
				50	49	22.52	27.93	5.41
				100	0	22.58	28.41	5.83
			16-QAM	1	0	22.69	27.17	4.48
				1	49	22.6	27.9	5.3
				1	99	22.94	27.21	4.27
				50	0	21.66	27.97	6.31
				50	24	21.73	27.97	6.24
				50	49	21.78	27.97	6.19
				100	0	21.75	28.34	6.59
	Middle 18900	1880	QPSK	1	0	23.51	26.92	3.411
				1	49	23.46	28.14	4.68
				1	99	23.46	28.13	4.67
				50	0	22.78	27.83	5.05
				50	24	22.69	28.06	5.37
				50	49	22.65	28.24	5.59
				100	0	22.7	28.58	5.88
			16-QAM	1	0	23.02	26.97	3.95
				1	49	22.98	28.06	5.08
				1	99	22.89	28.21	5.32
				50	0	21.95	27.85	5.9
				50	24	21.88	28.11	6.23
				50	49	21.81	28.1	6.29
				100	0	21.83	28.31	6.48
	High 19100	1900	QPSK	1	0	23.45	28.15	4.7
				1	49	23.3	28.08	4.78
				1	99	23.5	27.71	4.21
				50	0	22.54	28.27	5.73
				50	24	22.63	28.09	5.46
				50	49	22.69	28.29	5.6
				100	0	22.63	29.02	6.39
			16-QAM	1	0	22.81	28.36	5.55
				1	49	23.07	28.23	5.16
				1	99	22.98	27.75	4.77
				50	0	21.59	28.15	6.56
				50	24	21.65	28.01	6.36
				50	49	21.72	28.23	6.51
				100	0	21.68	28.69	7.01

LTE QPSK AND 16QAM MODULATION. Bandwidth = 1.4 MHz

Channel	Lowest	Middle	Highest
Maximum declared antenna gain (dBi)	-1.20	-1.30	-1.00
Measured maximum peak power (dBm) at antenna port	27.84	28.29	28.04
Maximum effective isotropic radiated peak power E.I.R.P. (dBm)	26.64	26.99	27.04
Measured maximum average power (dBm) at antenna port	23.50	23.58	23.60
Maximum effective isotropic radiated average power E.I.R.P. (dBm)	22.30	22.28	22.60
Peak-to-average ratio (PAR) (dB)	4.34	4.71	4.44
Measurement uncertainty (dB)	±0.5		

LTE QPSK AND 16QAM MODULATION. Bandwidth = 3 MHz

Channel	Lowest	Middle	Highest
Maximum declared antenna gain (dBi)	-1.20	-1.30	-1.00
Measured maximum peak power (dBm) at antenna port	27.49	28.30	27.84
Maximum effective isotropic radiated peak power E.I.R.P. (dBm)	26.29	27.00	26.84
Measured maximum average power (dBm) at antenna port	23.37	23.76	23.53
Maximum effective isotropic radiated average power E.I.R.P. (dBm)	22.17	22.46	22.53
Peak-to-average ratio (PAR) (dB)	4.12	4.54	4.31
Measurement uncertainty (dB)	±0.5		

LTE QPSK AND 16QAM MODULATION. Bandwidth = 5 MHz

Channel	Lowest	Middle	Highest
Maximum declared antenna gain (dBi)	-1.20	-1.30	-1.00
Measured maximum peak power (dBm) at antenna port	27.59	28.156	27.90
Maximum effective isotropic radiated peak power E.I.R.P. (dBm)	26.39	26.856	26.90
Measured maximum average power (dBm) at antenna port	23.34	23.50	23.49
Maximum effective isotropic radiated average power E.I.R.P. (dBm)	22.14	22.20	22.49
Peak-to-average ratio (PAR) (dB)	4.25	4.66	4.41
Measurement uncertainty (dB)	±0.5		

LTE QPSK AND 16QAM MODULATION. Bandwidth = 10 MHz

Channel	Lowest	Middle	Highest
Maximum declared antenna gain (dBi)	-1.20	-1.30	-1.00
Measured maximum peak power (dBm) at antenna port	28.63	28.66	28.61
Maximum effective isotropic radiated peak power E.I.R.P. (dBm)	27.43	27.36	27.61
Measured maximum average power (dBm) at antenna port	23.60	23.88	23.65
Maximum effective isotropic radiated average power E.I.R.P. (dBm)	22.40	22.58	22.65
Peak-to-average ratio (PAR) (dB)	5.03	4.78	4.96
Measurement uncertainty (dB)	±0.5		

LTE QPSK AND 16QAM MODULATION. Bandwidth = 15 MHz

Channel	Lowest	Middle	Highest
Maximum declared antenna gain (dBi)	-1.20	-1.30	-1.00
Measured maximum peak power (dBm) at antenna port	28.34	28.52	28.58
Maximum effective isotropic radiated peak power E.I.R.P. (dBm)	27.14	27.22	27.58
Measured maximum average power (dBm) at antenna port	23.61	23.66	23.45
Maximum effective isotropic radiated average power E.I.R.P. (dBm)	22.41	22.36	22.45
Peak-to-average ratio (PAR) (dB)	4.73	4.86	5.13
Measurement uncertainty (dB)	±0.5		

LTE QPSK AND 16QAM MODULATION. Bandwidth = 20 MHz

Channel	Lowest	Middle	Highest
Maximum declared antenna gain (dBi)	-1.20	-1.30	-1.00
Measured maximum peak power (dBm) at antenna port	28.41	28.58	29.02
Maximum effective isotropic radiated peak power E.I.R.P. (dBm)	27.21	27.28	28.02
Measured maximum average power (dBm) at antenna port	23.55	23.51	23.50
Maximum effective isotropic radiated average power E.I.R.P. (dBm)	22.35	22.21	22.50
Peak-to-average ratio (PAR) (dB)	4.86	5.07	5.52
Measurement uncertainty (dB)	±0.5		

Verdict: PASS

Modulation Characteristics

SPECIFICATION

FCC §2.1047
RSS-133. Clause 6.2. The devices shall employ digital modulation techniques.

METHOD

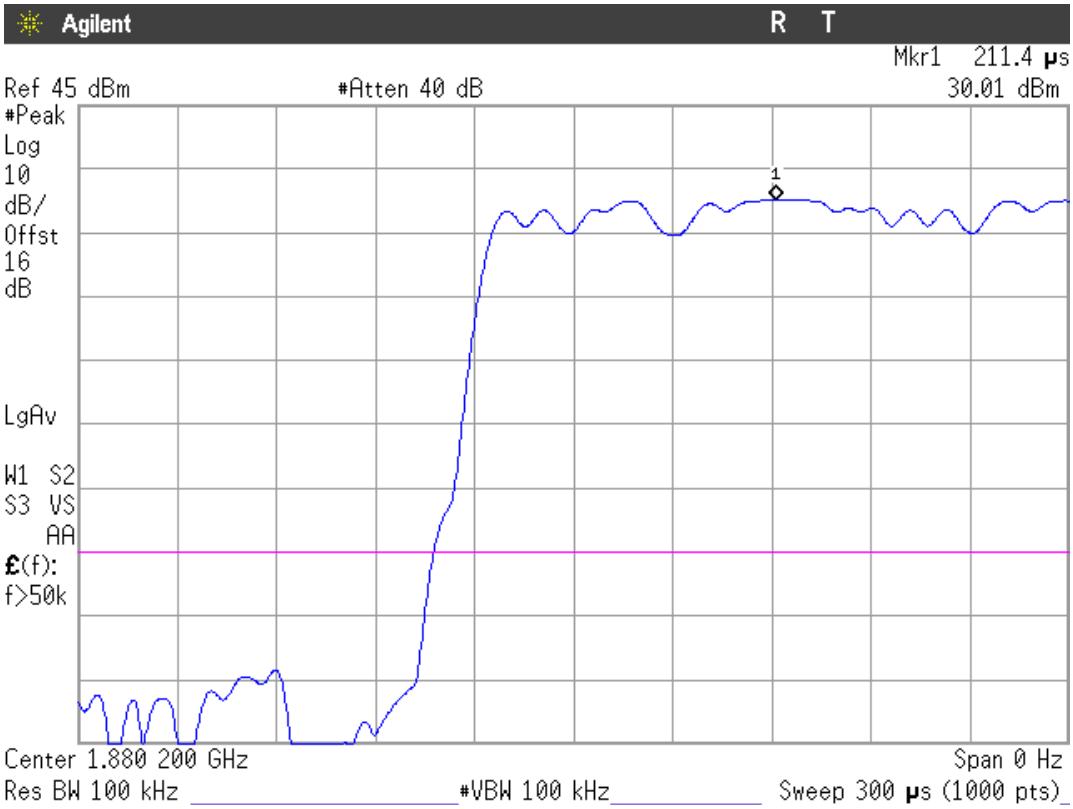
For 2G/3G, the EUT operates with GPRS (GMSK), EDGE (8-PSK), WCDMA (QPSK) and HSUPA (QPSK) modes, in which the information is digitised and coded into a bit stream.

For LTE the EUT operates with QPSK and 16QAM modulation modes in which the information is digitised and coded into a bit stream. The RF transmission is multiplexed using *Orthogonal Frequency Division Multiplexing (OFDM)* using different possible arrangement of subcarriers (Resource Blocks RB).

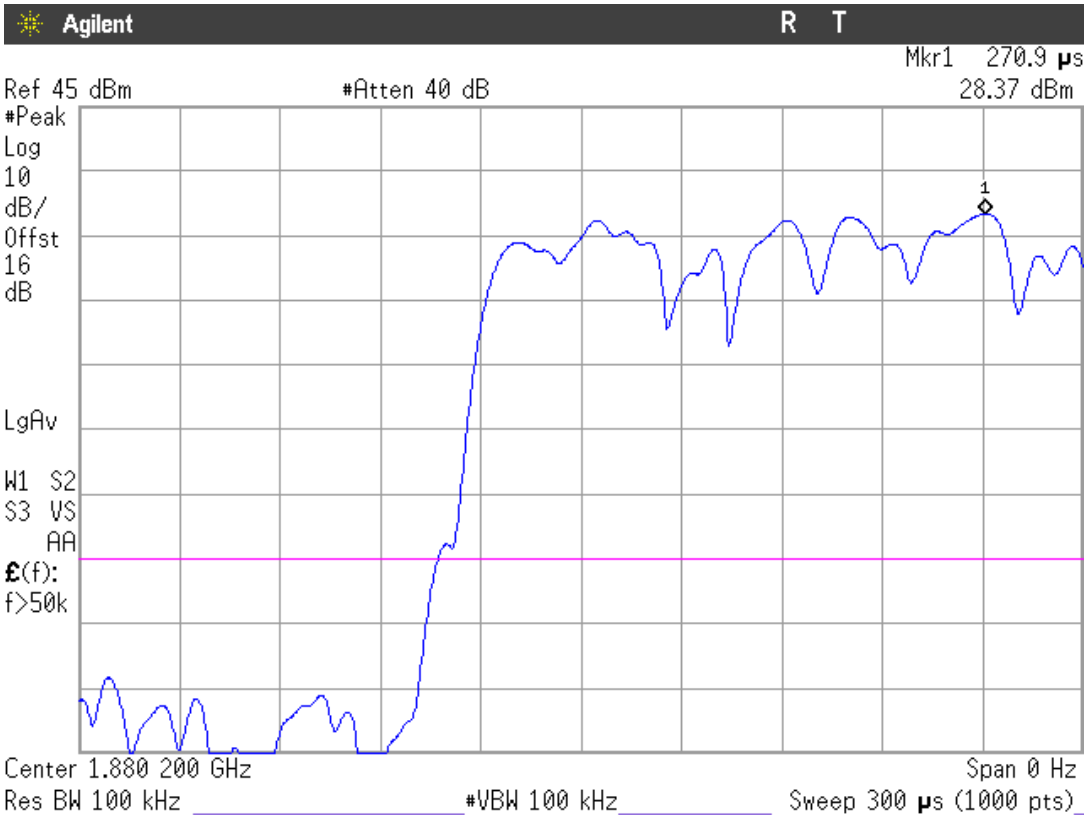
RESULTS

The following plot shows the modulation schemes in the EUT.

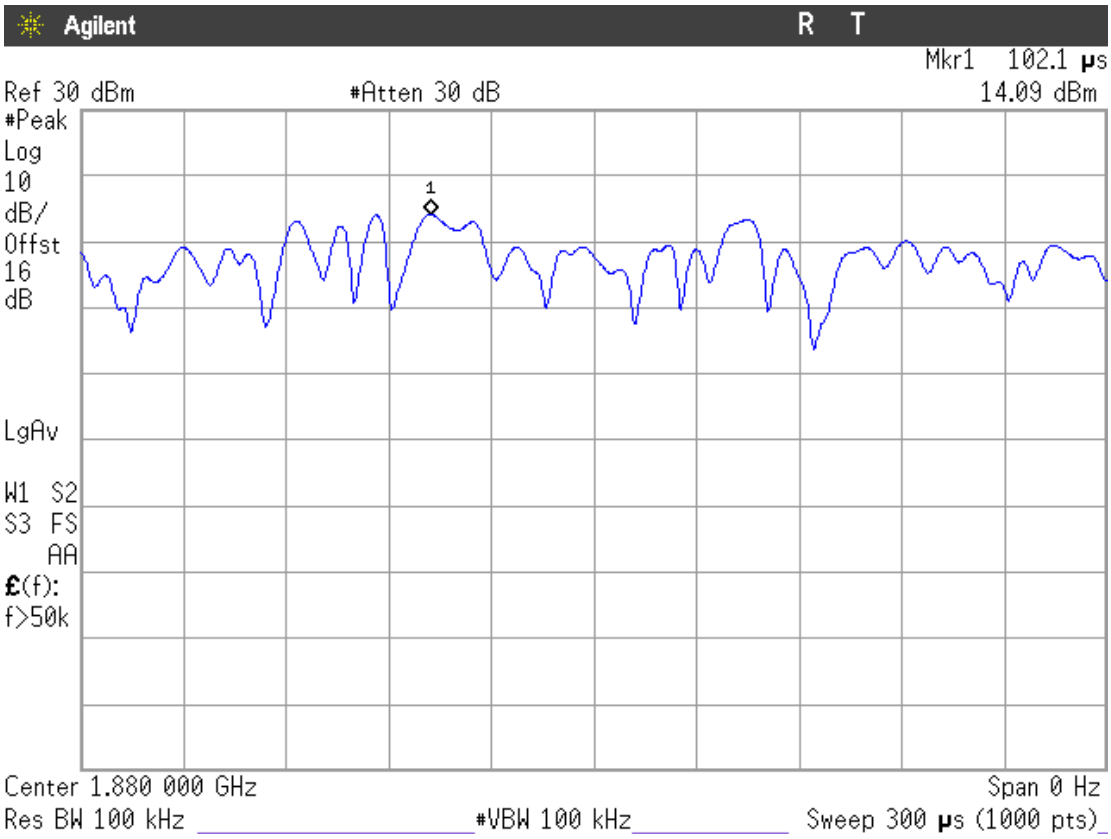
GPRS MODULATION



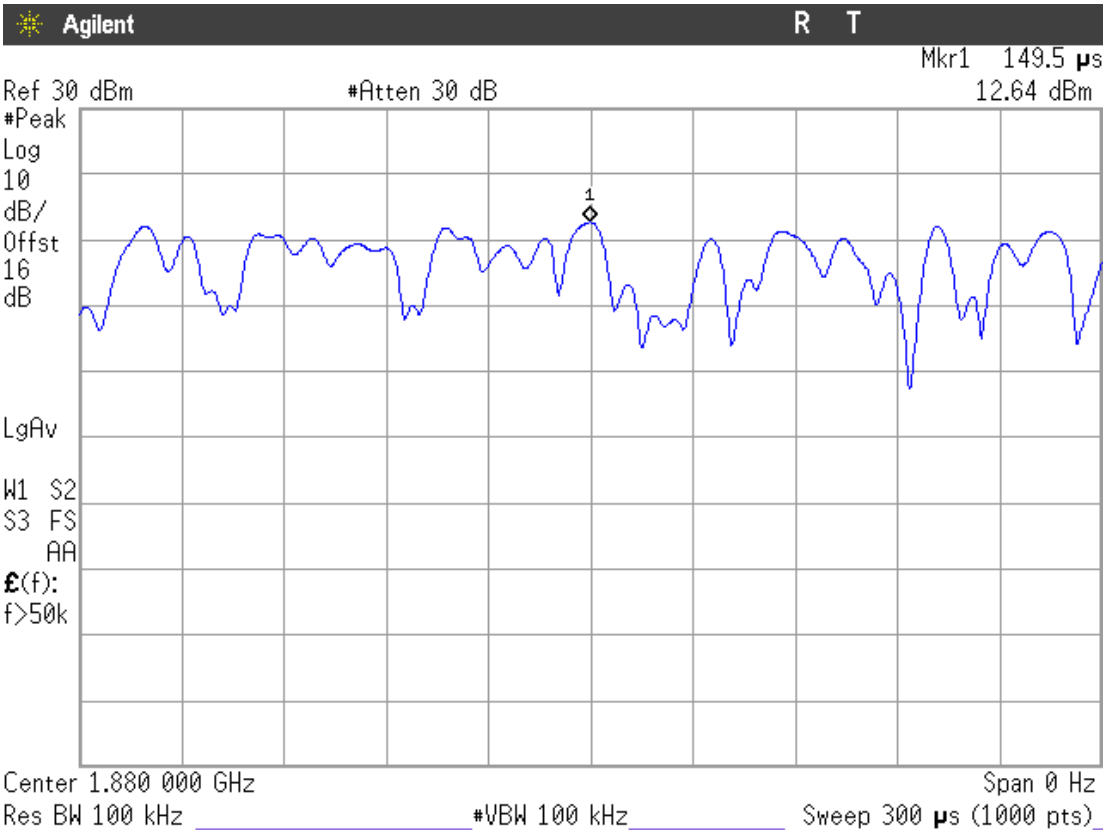
EDGE MODULATION



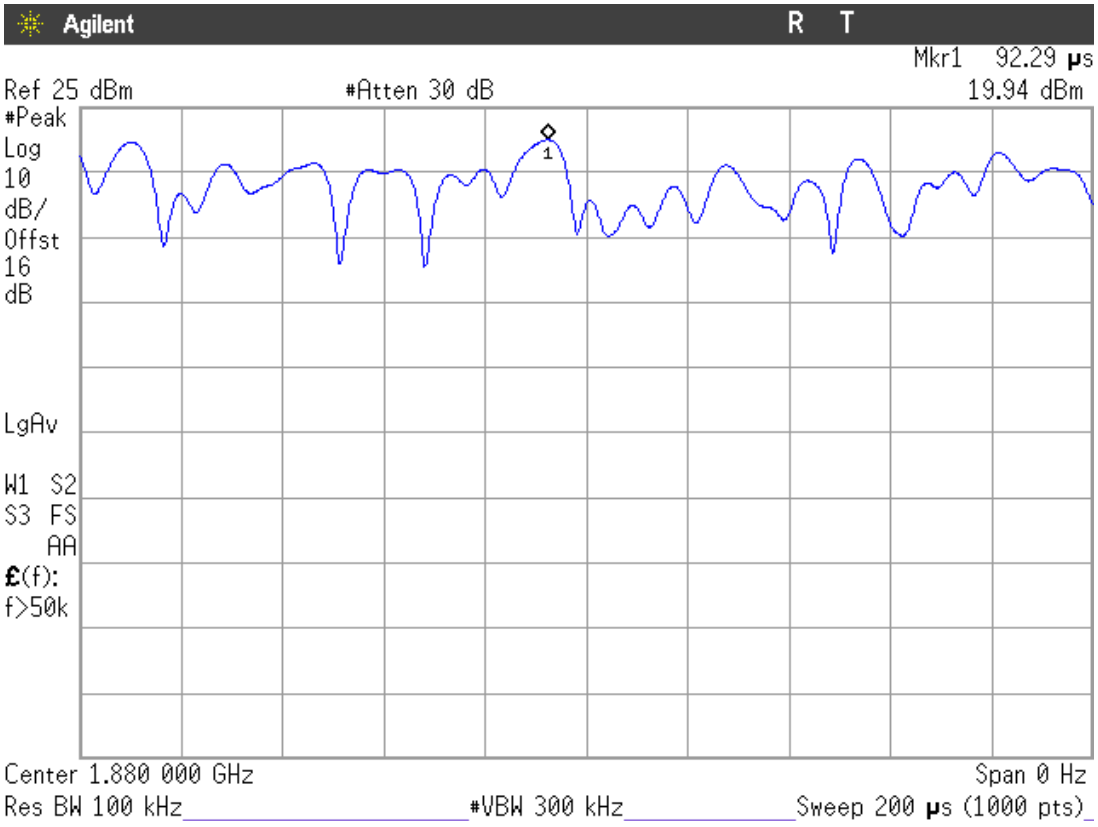
WCDMA MODULATION



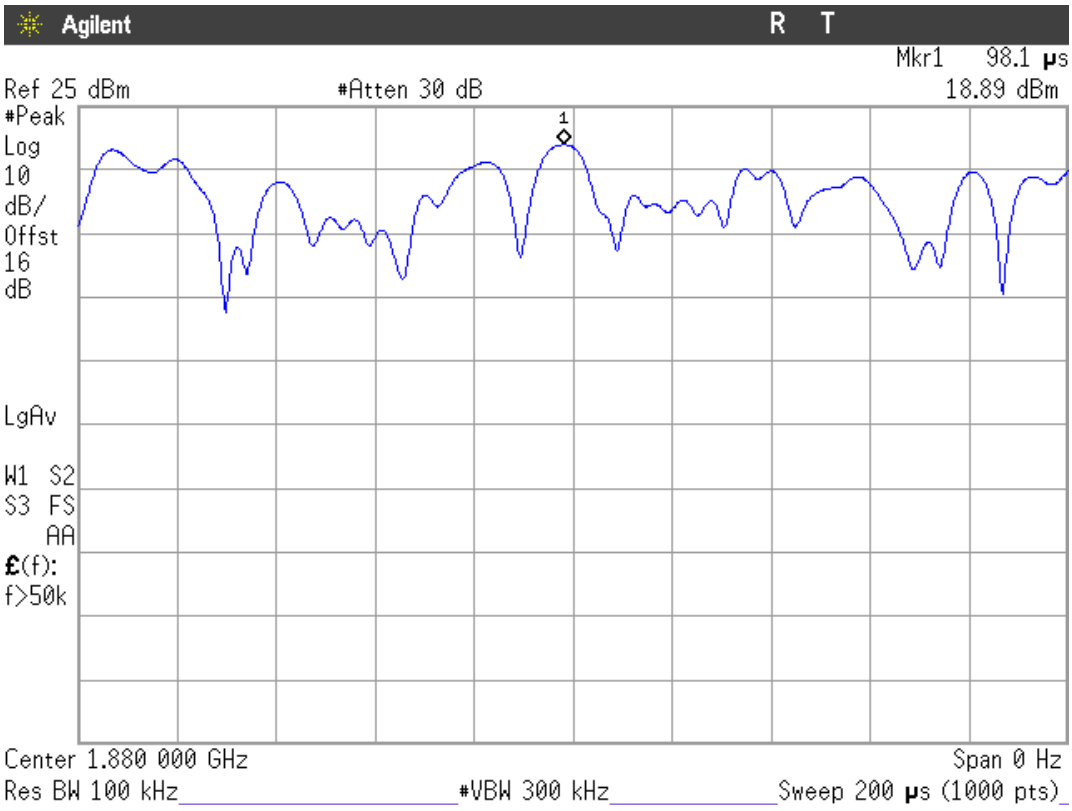
HSUPA MODULATION



LTE MODULATION. QPSK.



LTE MODULATION. 16QAM.



Frequency Stability

SPECIFICATION

FCC §2.1055 and §24.235. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

RSS-133. Clause 6.3. The carrier frequency shall not depart from the reference frequency in excess of ±2.5 ppm for mobile stations.

METHOD

The frequency tolerance measurements over temperature variations were made over the temperature range of –30ºC to +50ºC. The EUT was placed inside a climatic chamber and the temperature was raised hourly in 10ºC steps from –30ºC up to +50ºC.
For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.

The EUT was set in "call mode" in the middle channel using the Universal Radio Communication tester R&S CMU200 or CMW500 and the maximum frequency error was measured using the built-in calibrated frequency meter.

For LTE mode the QPSK modulation was used for the test as it is the worst case for conducted power.

RESULTS

Frequency stability over temperature variations.

GPRS AND EDGE MODULATION

Temperature (ºC)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
+50	48.46	0.0258	0.00000258
+40	57.92	0.0308	0.00000308
+30	62.67	0.0333	0.00000333
+20	69.06	0.0367	0.00000367
+10	68.35	0.0364	0.00000364
0	68.99	0.0367	0.00000367
-10	55.85	0.0297	0.00000297
-20	51.3	0.0273	0.00000273
-30	56.47	0.0300	0.00000300

WCDMA AND HSUPA MODULATION

Temperature (ºC)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
+50	7.95	0.0042	0.00000042
+40	7.60	0.0040	0.00000040
+30	8.69	0.0046	0.00000046
+20	9.00	0.0048	0.00000048
+10	6.95	0.0037	0.00000037
0	8.82	0.0047	0.00000047
-10	6.76	0.0036	0.00000036
-20	6.44	0.0034	0.00000034
-30	5.50	0.0029	0.00000029

LTE QPSK MODULATION. BW = 1.4 MHz.

Temperature (ºC)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
+50	9.04	0.0048	0.00000048
+40	-11.57	-0.0062	-0.00000062
+30	8.50	0.0045	0.00000045
+20	7.94	0.0042	0.00000042
+10	9.48	0.0050	0.00000050
0	9.53	0.0051	0.00000051
-10	-7.31	-0.0039	-0.00000039
-20	8.74	0.0046	0.00000046
-30	8.17	0.0043	0.00000043

LTE QPSK MODULATION. BW = 3 MHz.

Temperature (ºC)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
+50	11.22	0.0060	0.00000060
+40	16.42	0.0087	0.00000087
+30	12.37	0.0066	0.00000066
+20	11.24	0.0060	0.00000060
+10	11.84	0.0063	0.00000063
0	12.06	0.0064	0.00000064
-10	10.87	0.0058	0.00000058
-20	11.06	0.0059	0.00000059
-30	11.16	0.0059	0.00000059

LTE QPSK MODULATION. BW = 5 MHz.

Temperature (ºC)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
+50	11.32	0.0060	0.00000060
+40	12.10	0.0064	0.00000064
+30	8.60	0.0046	0.00000046
+20	12.56	0.0067	0.00000067
+10	12.36	0.0066	0.00000066
0	10.04	0.0053	0.00000053
-10	9.78	0.0052	0.00000052
-20	9.91	0.0053	0.00000053
-30	9.44	0.0050	0.00000050

LTE QPSK MODULATION. BW = 10 MHz.

Temperature (ºC)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
+50	10.31	0.0055	0.00000055
+40	9.33	0.0050	0.00000050
+30	7.74	0.0041	0.00000041
+20	7.80	0.0041	0.00000041
+10	11.01	0.0059	0.00000059
0	11.32	0.0060	0.00000060
-10	-9.48	-0.0050	-0.00000050
-20	10.34	0.0055	0.00000055
-30	8.83	0.0047	0.00000047

LTE QPSK MODULATION. BW = 15 MHz.

Temperature (ºC)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
+50	10.07	0.0054	0.00000054
+40	10.90	0.0058	0.00000058
+30	8.41	0.0045	0.00000045
+20	9.07	0.0048	0.00000048
+10	8.90	0.0047	0.00000047
0	10.36	0.0055	0.00000055
-10	9.34	0.0050	0.00000050
-20	8.47	0.0045	0.00000045
-30	8.77	0.0047	0.00000047

LTE QPSK MODULATION. BW = 20 MHz.

Temperature (ºC)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
+50	11.30	0.0060	0.00000060
+40	12.65	0.0067	0.00000067
+30	8.35	0.0044	0.00000044
+20	9.44	0.0050	0.00000050
+10	6.97	0.0037	0.00000037
0	10.10	0.0054	0.00000054
-10	10.91	0.0058	0.00000058
-20	10.24	0.0054	0.00000054
-30	10.04	0.0053	0.00000053

Frequency stability over voltage variations.

GPRS AND EDGE MODULATION

Battery Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
Vmax	4.2	59.79	0.0318	0.00000318
Vmin	3.4 (*)	62.44	0.0332	0.00000332

WCDMA AND HSUPA MODULATION

Battery Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
Vmax	4.2	8.92	0.0047	0.00000047
Vmin	3.4 (*)	7.48	0.0040	0.00000040

LTE QPSK MODULATION. BW = 1.4 MHz

Battery Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
Vmax	4.2	9.34	0.0050	0.00000045
Vmin	3.4 (*)	8.55	0.0045	0.00000050

LTE QPSK MODULATION. BW = 3 MHz

Battery Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
Vmax	4.2	10.09	0.0054	0.00000054
Vmin	3.4 (*)	12.52	0.0067	0.00000067

LTE QPSK MODULATION. BW = 5 MHz

Battery Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
Vmax	4.2	9.44	0.0047	0.00000050
Vmin	3.4 (*)	8.78	0.0050	0.00000047

LTE QPSK MODULATION. BW = 10 MHz

Battery Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
Vmax	4.2	8.41	0.0045	0.00000045
Vmin	3.4 (*)	8.85	0.0047	0.00000047

LTE QPSK MODULATION. BW = 15 MHz

Battery Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
Vmax	4.2	8.97	0.0048	0.00000048
Vmin	3.4 (*)	9.71	0.0052	0.00000052

LTE QPSK MODULATION. BW = 20 MHz

Battery Supply voltage	Voltage (V)	Frequency Error (Hz)	Frequency Error (ppm)	Frequency Error (%)
Vmax	4.2	8.18	0.0044	0.00000044
Vmin	3.4 (*)	9.80	0.0052	0.00000052

(*): Operating end point specified by the manufacturer.

Occupied Bandwidth

SPECIFICATION

FCC §2.1049

METHOD

The EUT was configured to transmit a modulated carrier signal with different possible modulations and nominal bandwidths, where applicable. The 99% occupied bandwidth and the -26 dBc bandwidth were measured directly using the built-in bandwidth measuring option of spectrum analyser E4440A.

RESULTS

GPRS MODULATION

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	242.30	244.11	244.22
-26 dBc bandwidth (kHz)	314.16	310.56	313.26
Measurement uncertainty (kHz)	<±3.15		

EDGE MODULATION

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	250.74	255.89	251.73
-26 dBc bandwidth (kHz)	318.26	312.26	315.50
Measurement uncertainty (kHz)	<±3.15		

WCDMA MODULATION

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	4164.2	4170.9	4164.1
-26 dBc bandwidth (kHz)	4652	4641	4653
Measurement uncertainty (kHz)	<±27.1		

HSUPA MODULATION

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	4171.6	4183.0	4161.5
-26 dBc bandwidth (kHz)	4642	4647	4630
Measurement uncertainty (kHz)	<±27.1		

LTE QPSK MODULATION. BW = 1.4 MHz

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	1097.3	1100.0	1107.6
-26 dBc bandwidth (kHz)	1293	1301	1291
Measurement uncertainty (kHz)	<±9.9		

LTE 16QAM MODULATION. BW = 1.4 MHz

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	1101.2	1093.3	1094.7
-26 dBc bandwidth (kHz)	1302	1274	1294
Measurement uncertainty (kHz)	<±9.9		

LTE QPSK MODULATION. BW = 3 MHz

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	2740.8	2753.3	2752.5
-26 dBc bandwidth (kHz)	3067	3064	3068
Measurement uncertainty (kHz)	<±23.0		

LTE 16QAM MODULATION. BW = 3 MHz

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	2747.3	2741.3	2734.9
-26 dBc bandwidth (kHz)	3048	3043	3067
Measurement uncertainty (kHz)	<±23.0		

LTE QPSK MODULATION. BW = 5 MHz

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	4509.8	4517.5	4503.2
-26 dBc bandwidth (kHz)	4937	5021	4972
Measurement uncertainty (kHz)	<±35.0		

LTE 16QAM MODULATION. BW = 5 MHz

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	4513.4	4523.3	4512.7
-26 dBc bandwidth (kHz)	4984	5014	4964
Measurement uncertainty (kHz)	<±35.0		

LTE QPSK MODULATION. BW = 10 MHz

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	9060.2	9062.3	9019.4
-26 dBc bandwidth (kHz)	10106	10125	9996
Measurement uncertainty (kHz)	<±75.0		

LTE 16QAM MODULATION. BW = 10 MHz

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	9031.6	9022.9	9009.6
-26 dBc bandwidth (kHz)	9984	10083	10051
Measurement uncertainty (kHz)	<±75.0		

LTE QPSK MODULATION. BW = 15 MHz

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	13453.9	13401.5	13436.6
-26 dBc bandwidth (kHz)	14654	14635	14646
Measurement uncertainty (kHz)	<±105		

LTE 16QAM MODULATION. BW = 15 MHz

Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	13442.1	13442.3	13423.5
-26 dBc bandwidth (kHz)	14606	14707	14582
Measurement uncertainty (kHz)	<±105		

LTE QPSK MODULATION. BW = 20 MHz

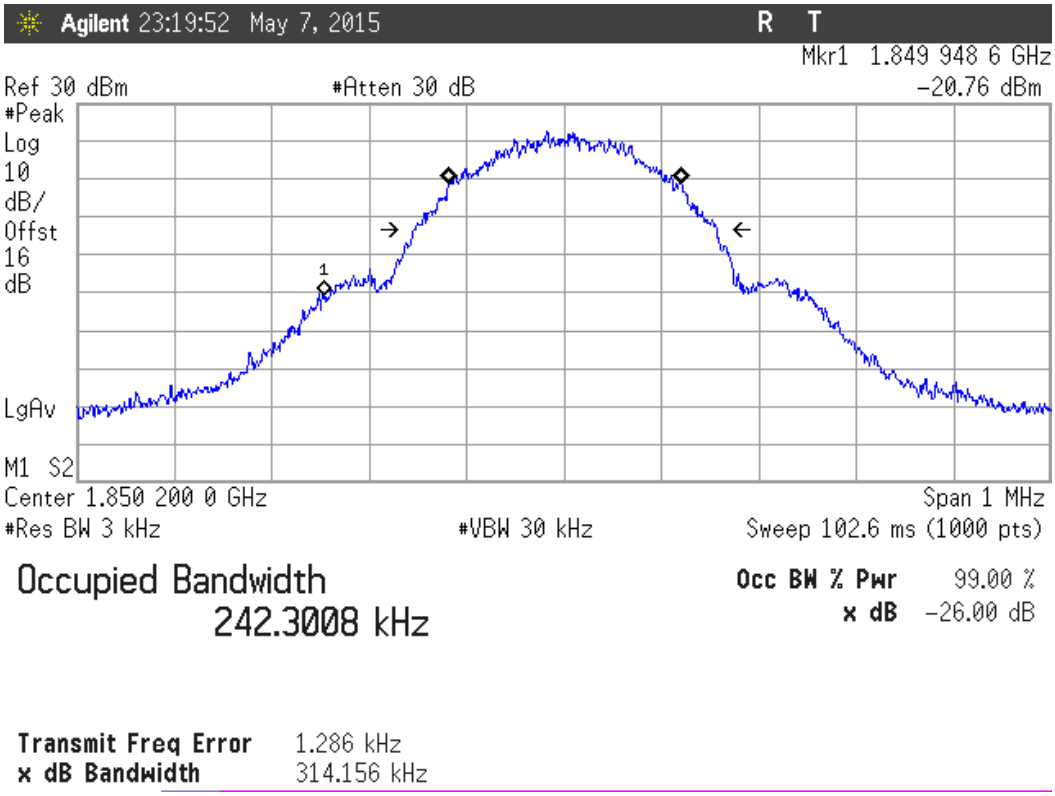
Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	17831.0	17846.7	17828.7
-26 dBc bandwidth (kHz)	19195	19184	19247
Measurement uncertainty (kHz)	<±135		

LTE 16QAM MODULATION. BW = 20 MHz

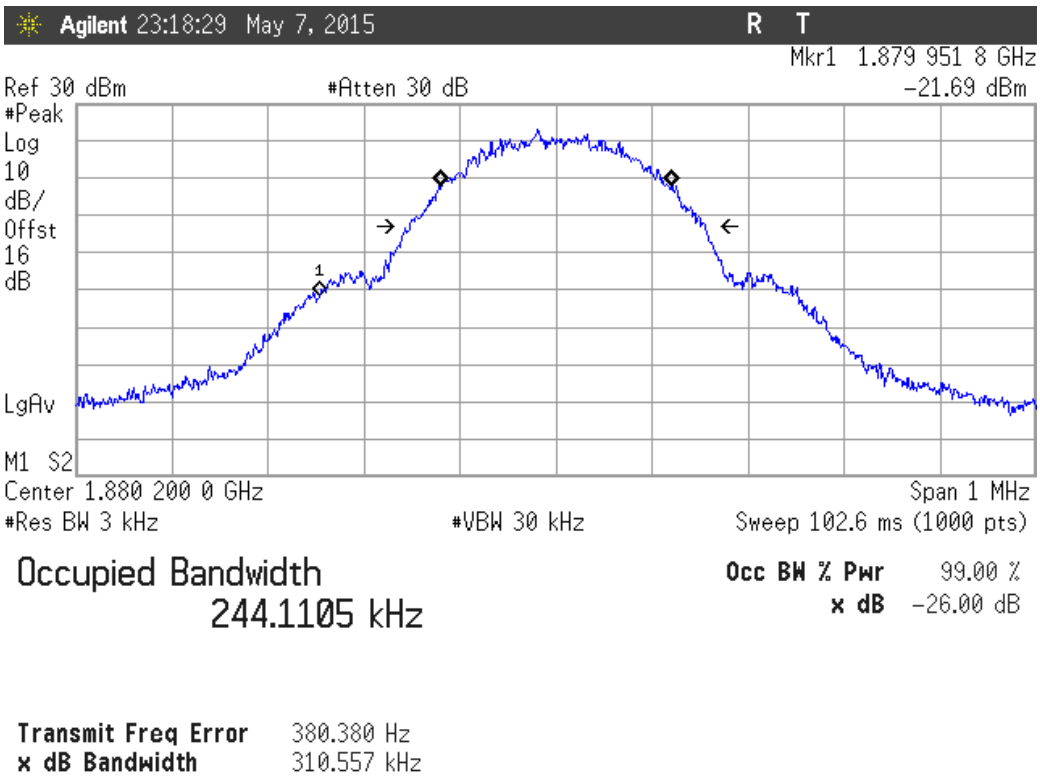
Channel	Lowest	Middle	Highest
99% Occupied bandwidth (kHz)	17828.6	17880.5	17830.0
-26 dBc bandwidth (kHz)	19222	19327	19166
Measurement uncertainty (kHz)	<±135		

GPRS MODULATION

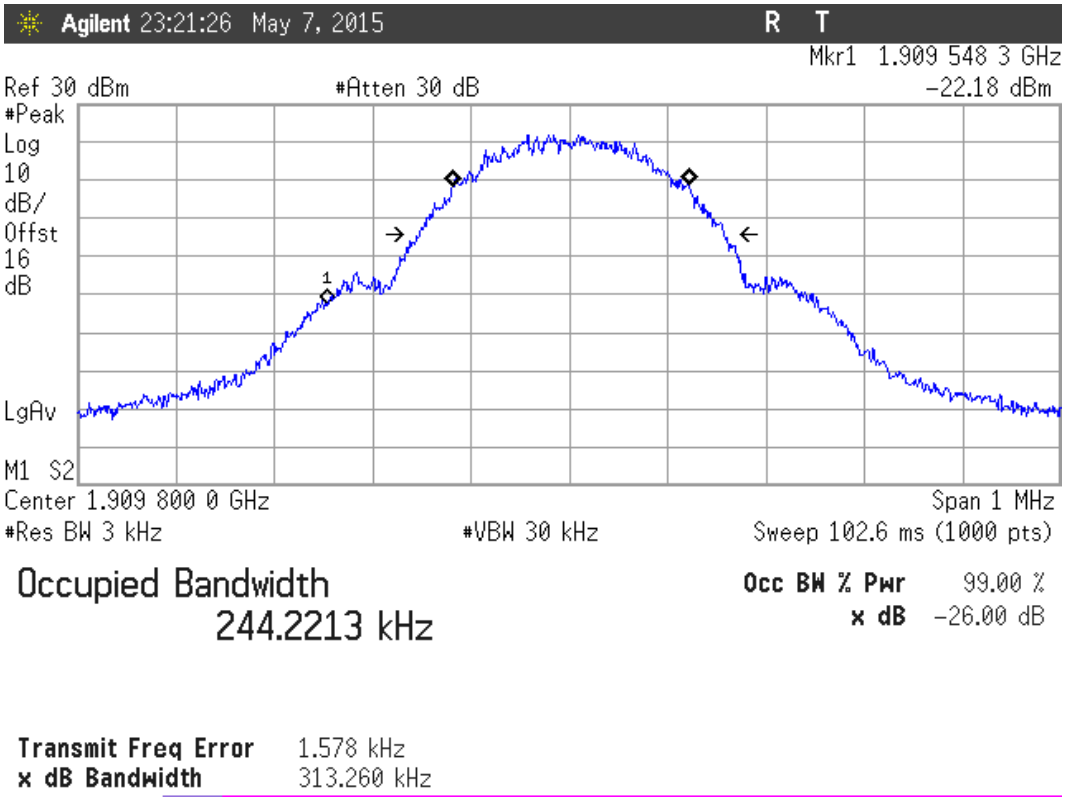
Lowest Channel



Middle Channel

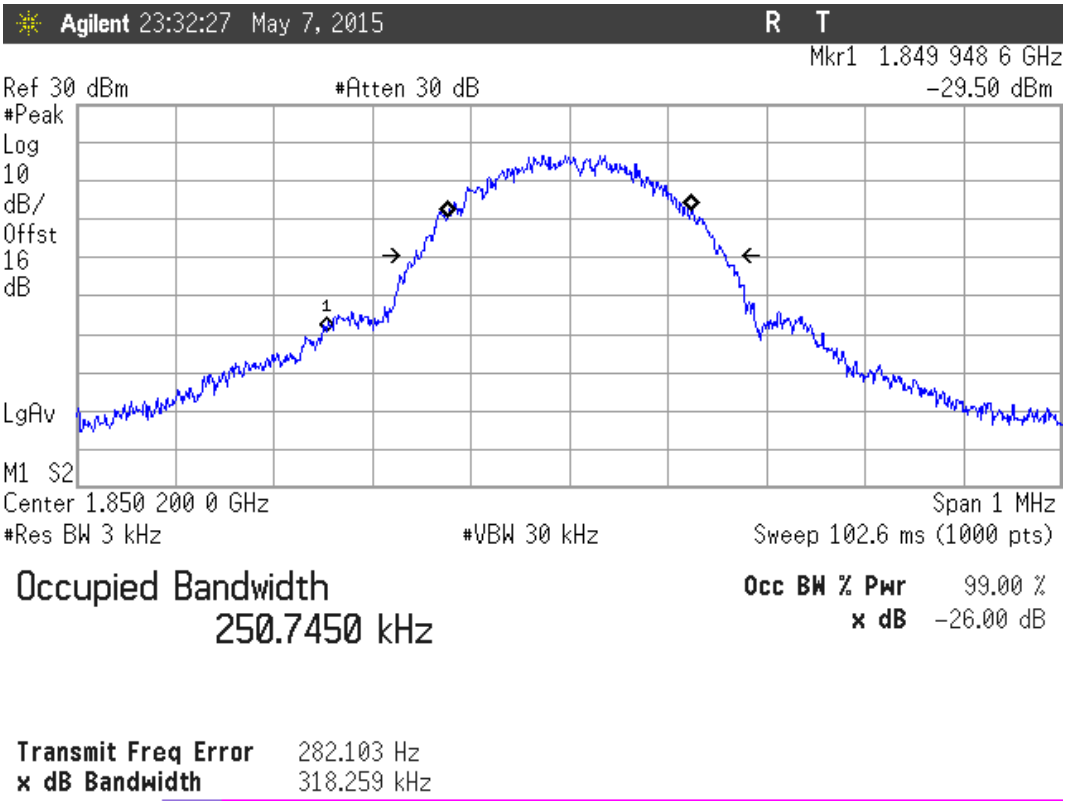


Highest Channel

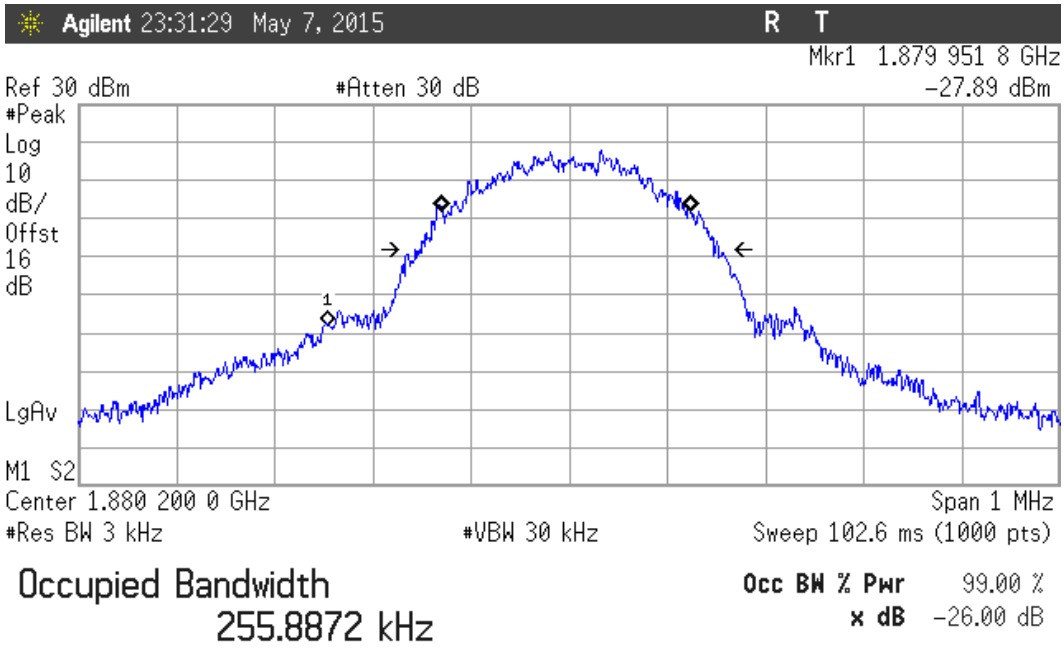


EDGE MODULATION

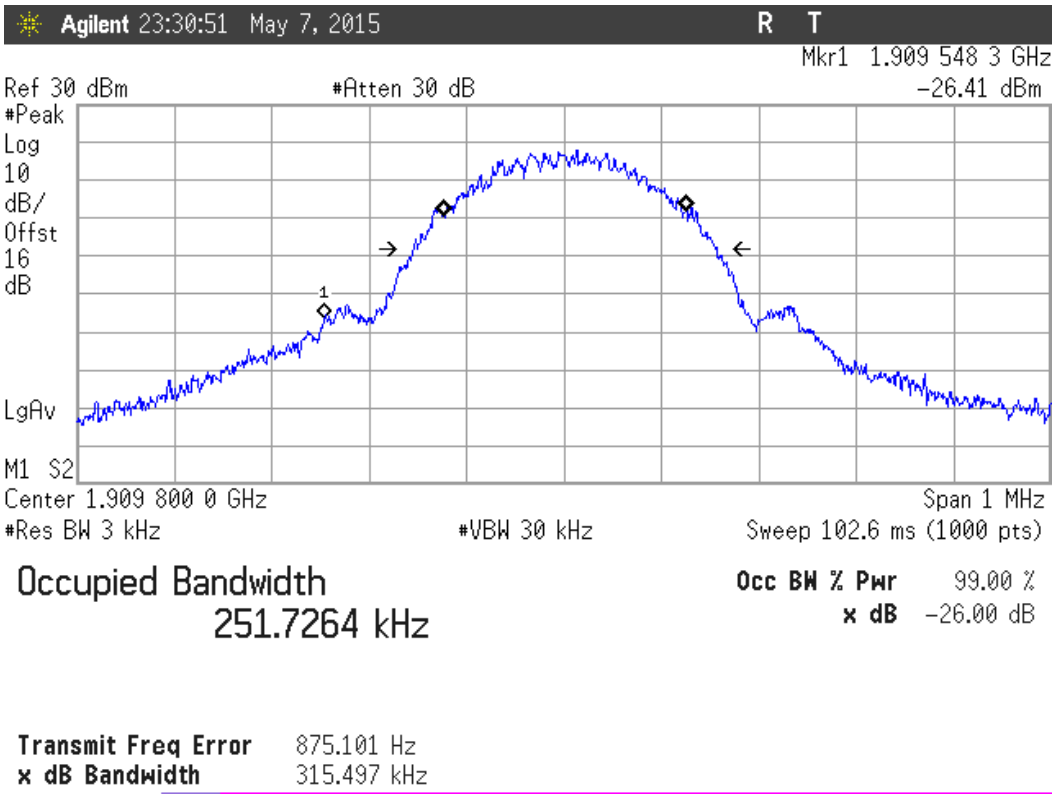
Lowest Channel



Middle Channel

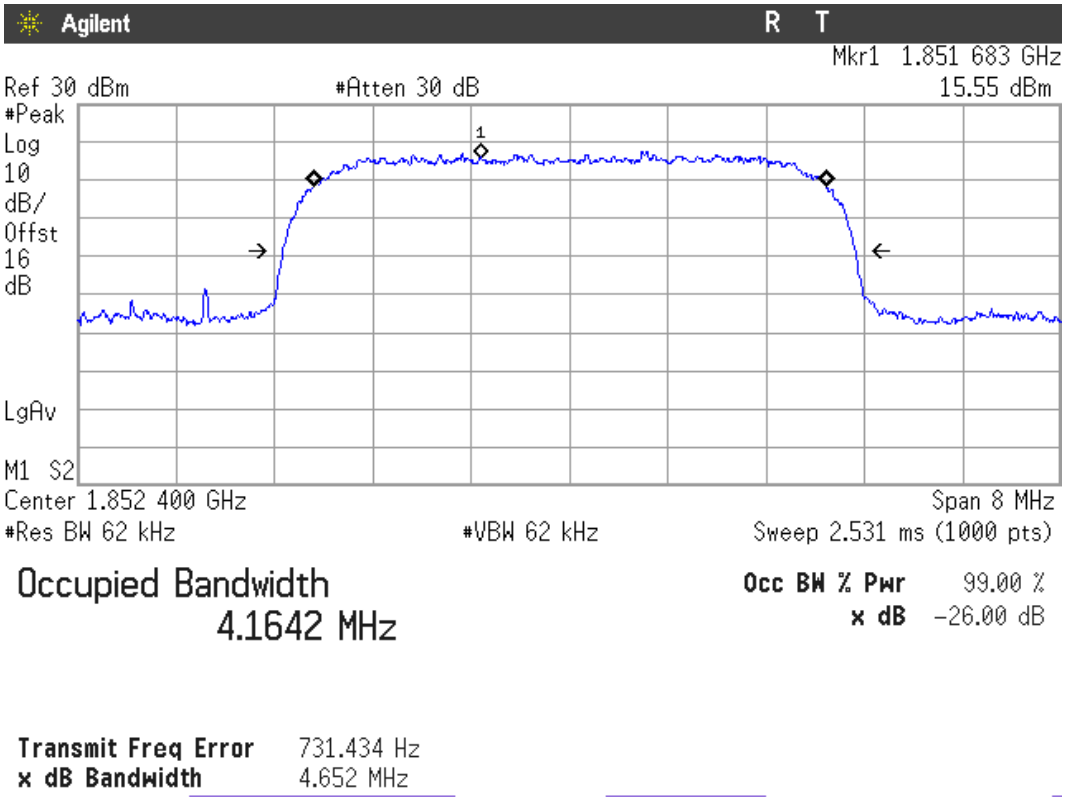


Highest Channel

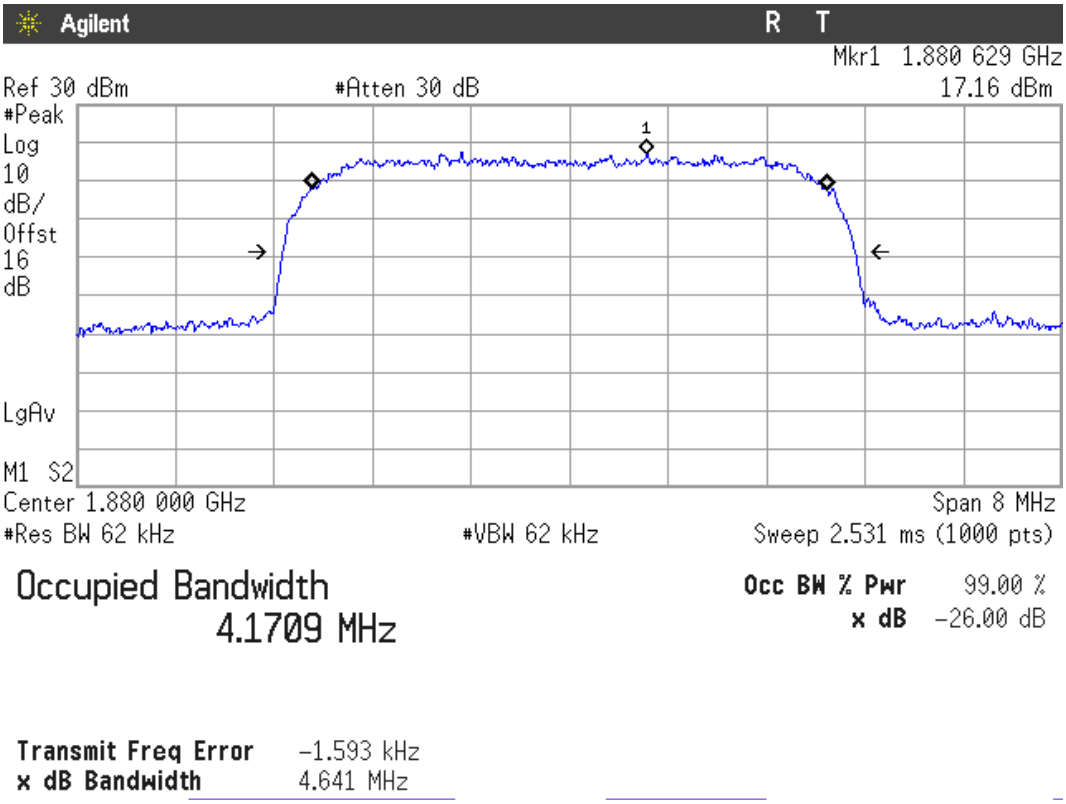


WCDMA MODULATION

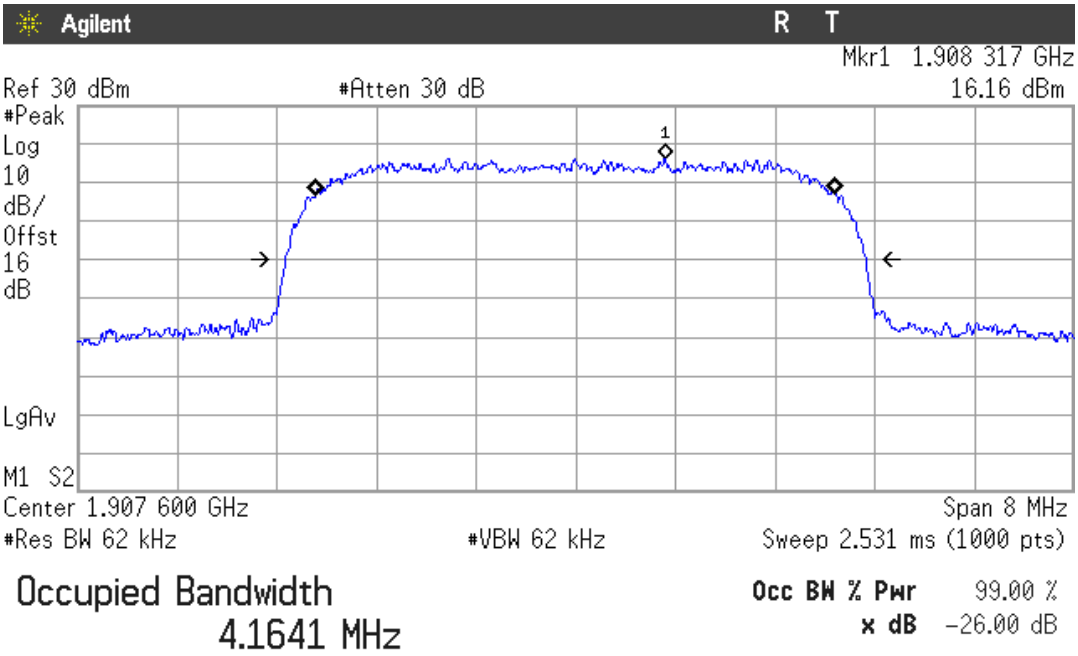
Lowest Channel



Middle Channel

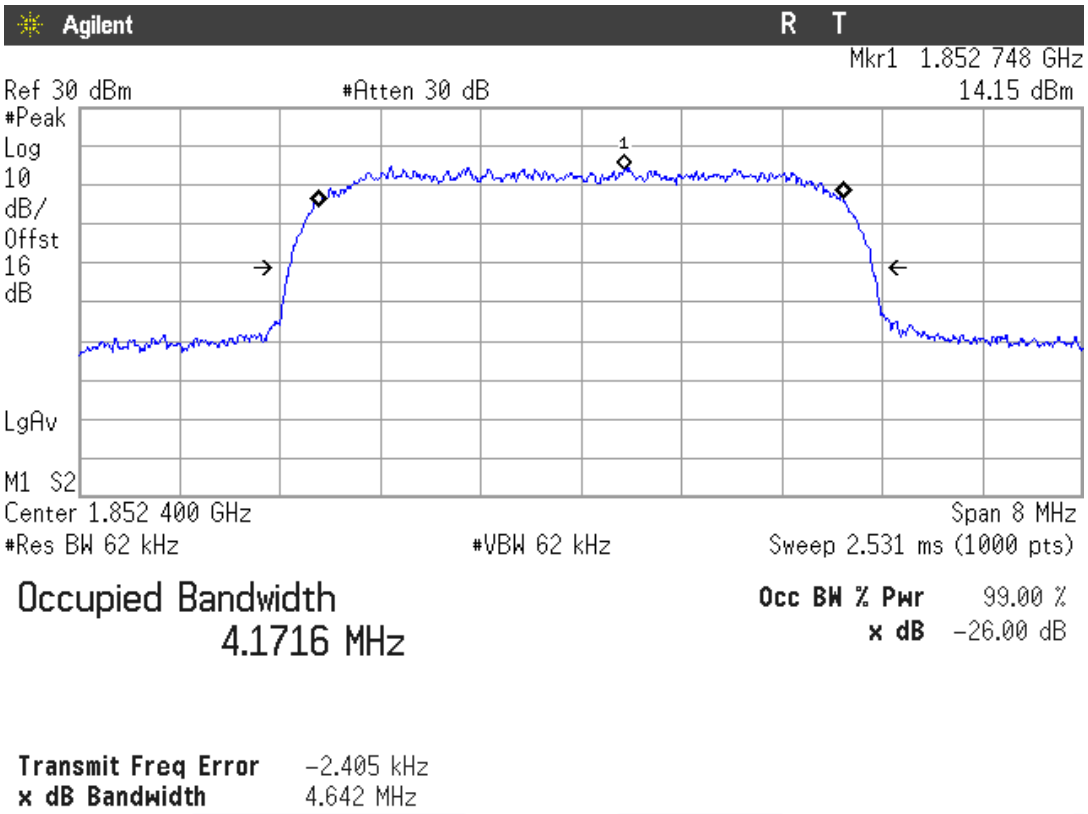


Highest Channel

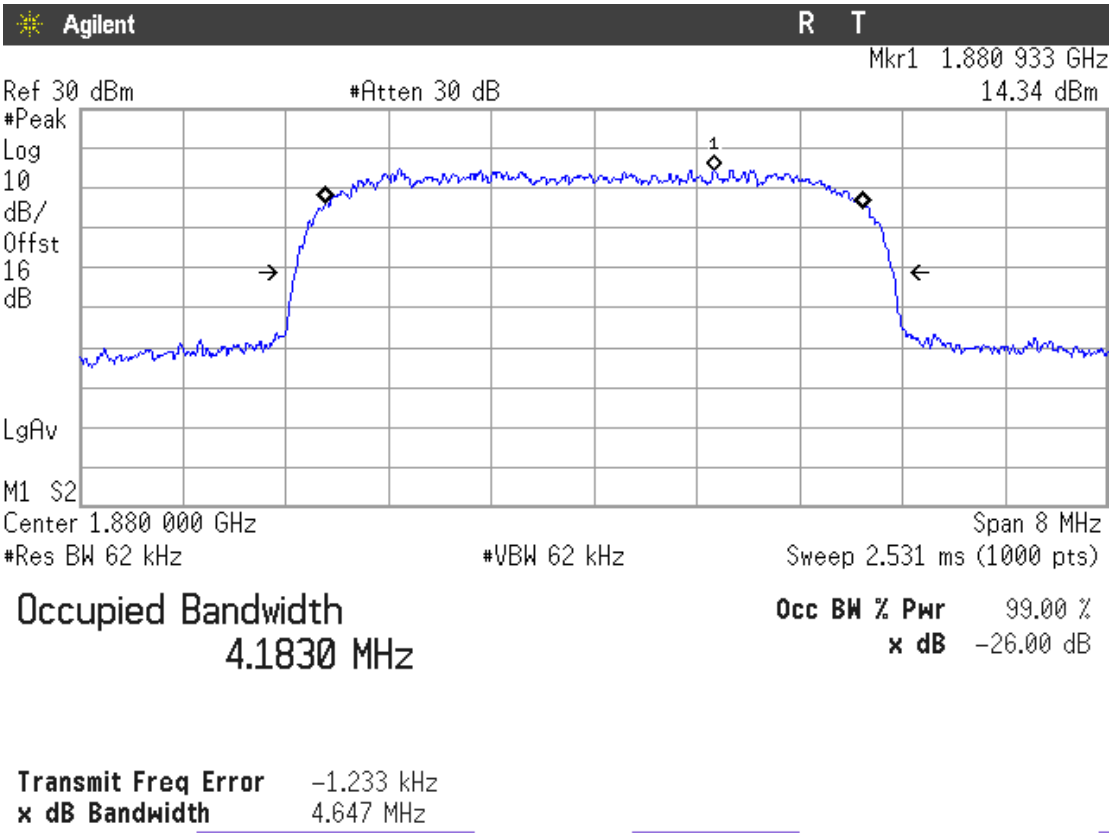


HSUPA MODULATION

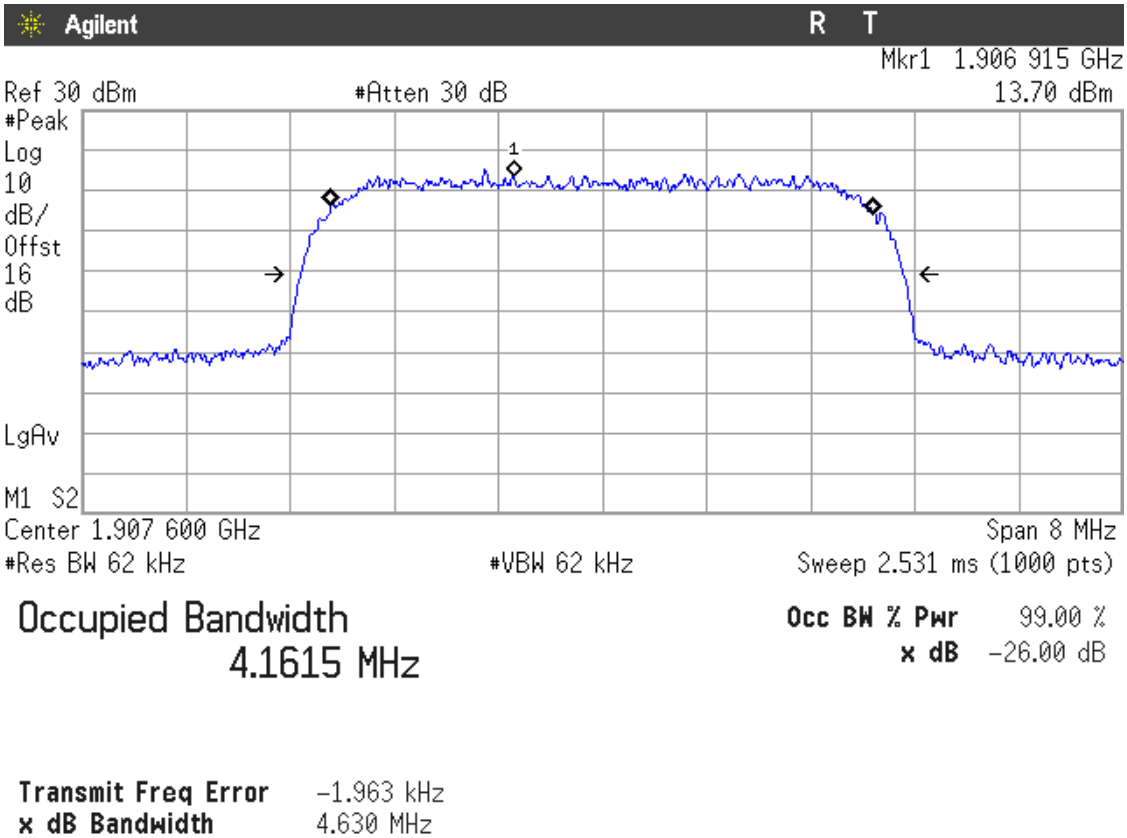
Lowest Channel



Middle Channel

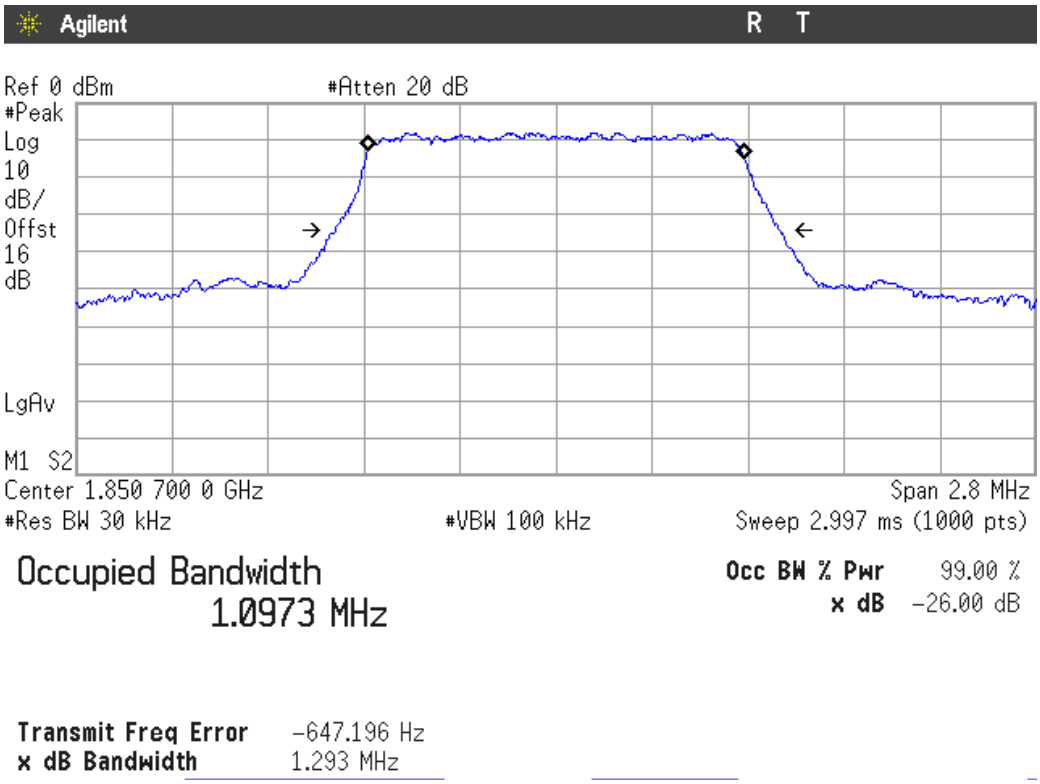


Highest Channel

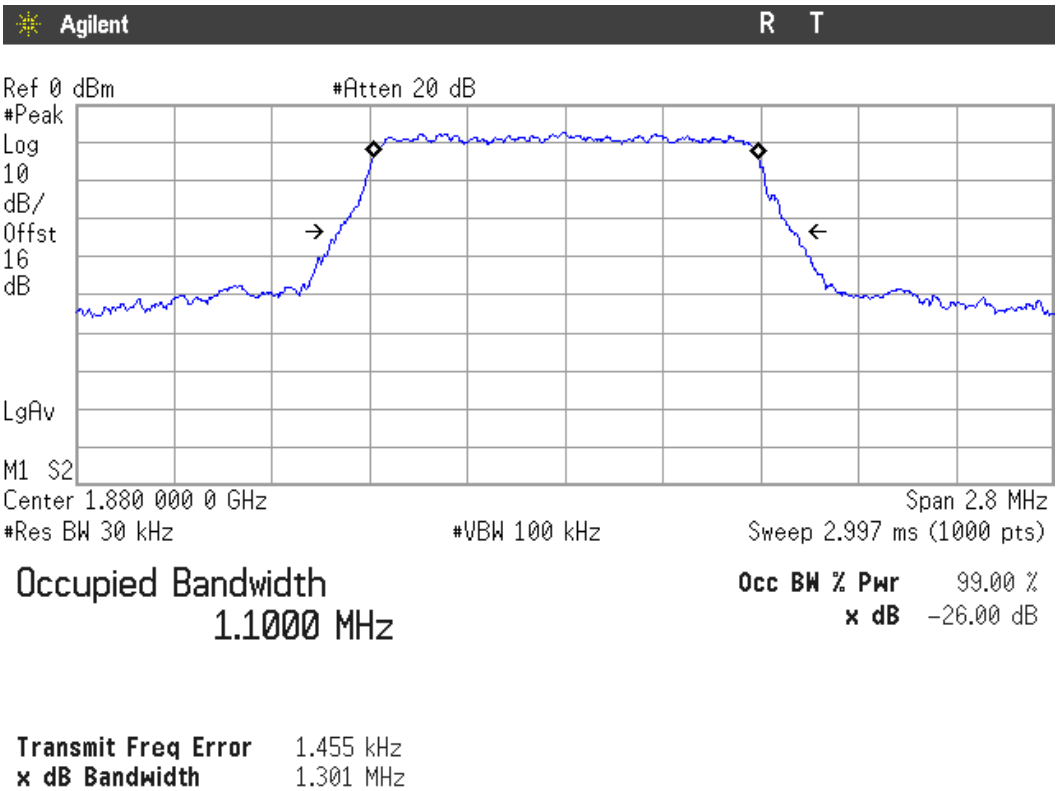


LTE QPSK MODULATION. BW = 1.4 MHz

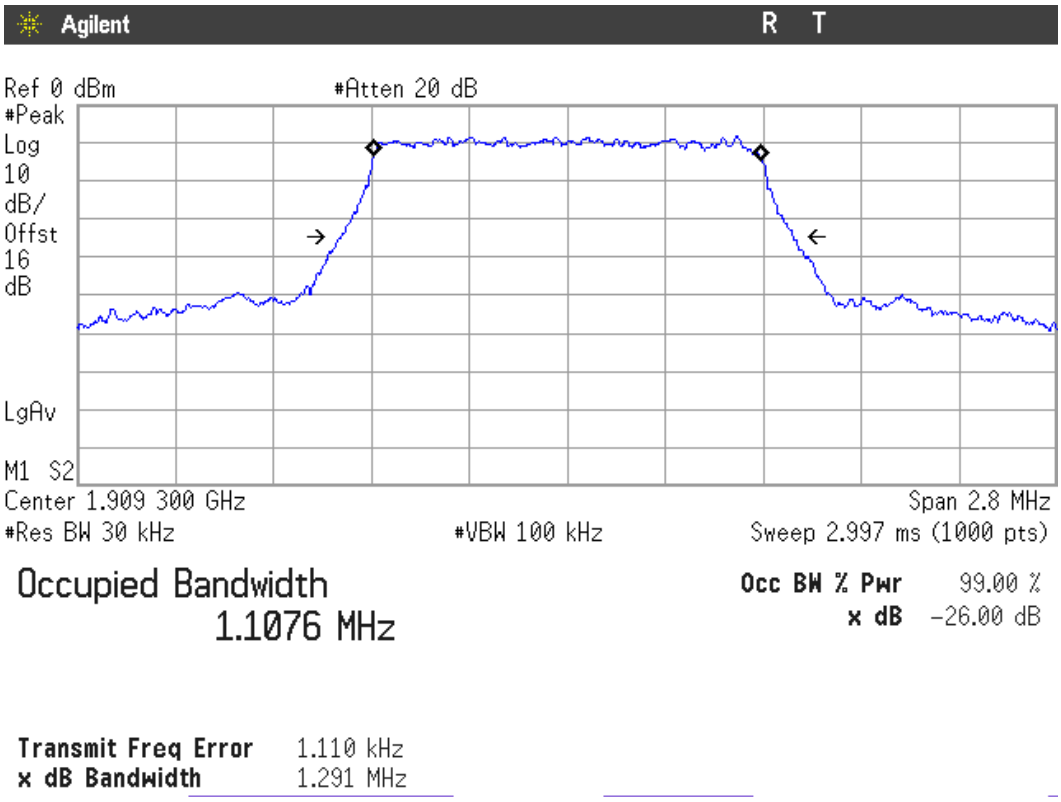
Lowest Channel



Middle Channel

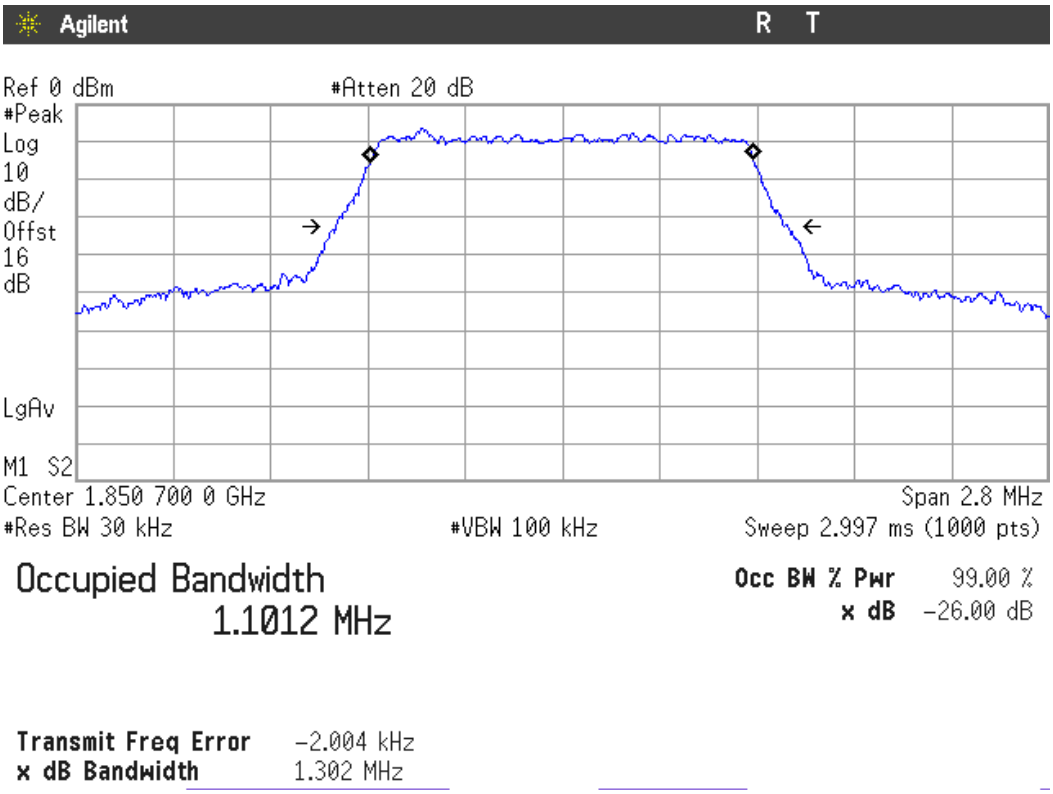


Highest Channel

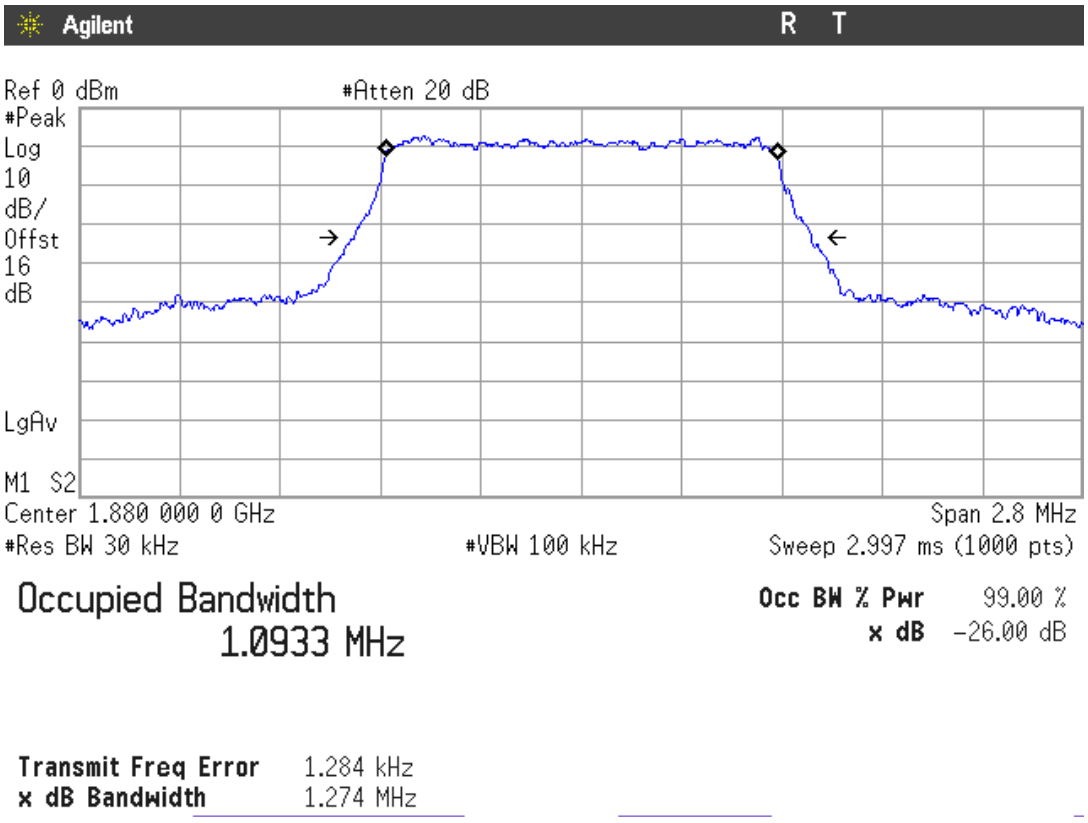


LTE 16QAM MODULATION. BW = 1.4 MHz

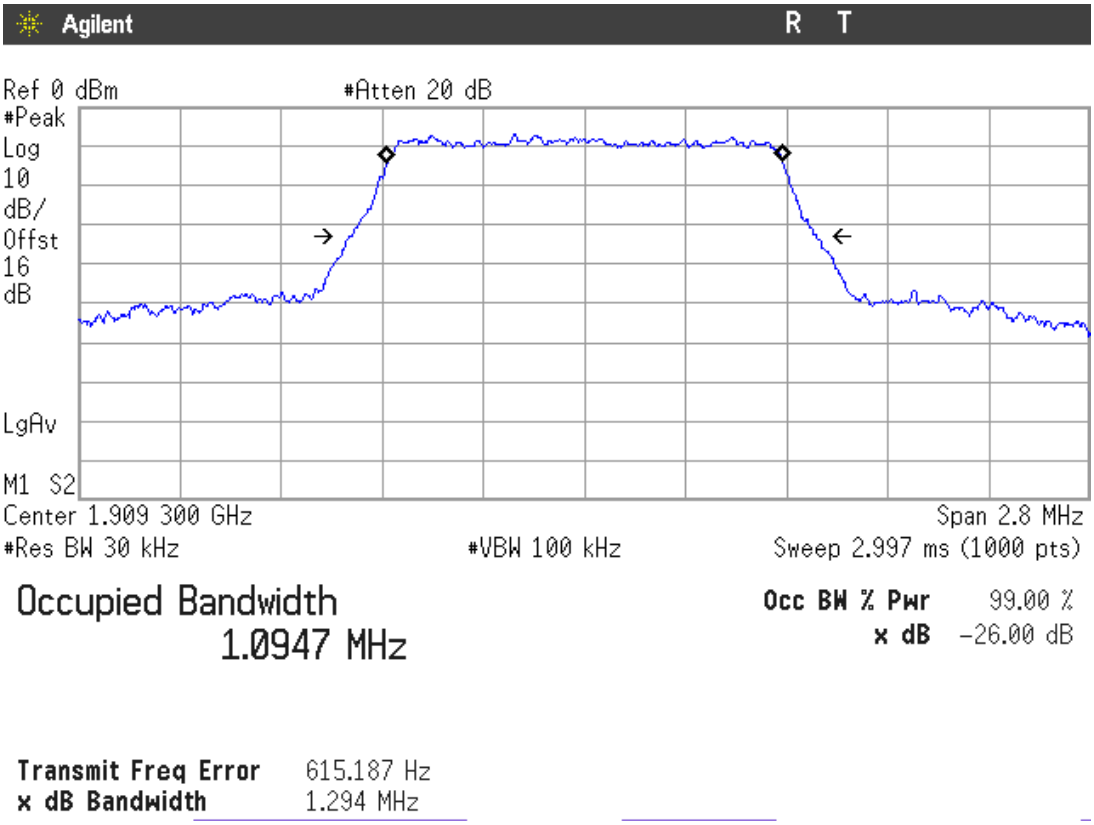
Lowest Channel



Middle Channel

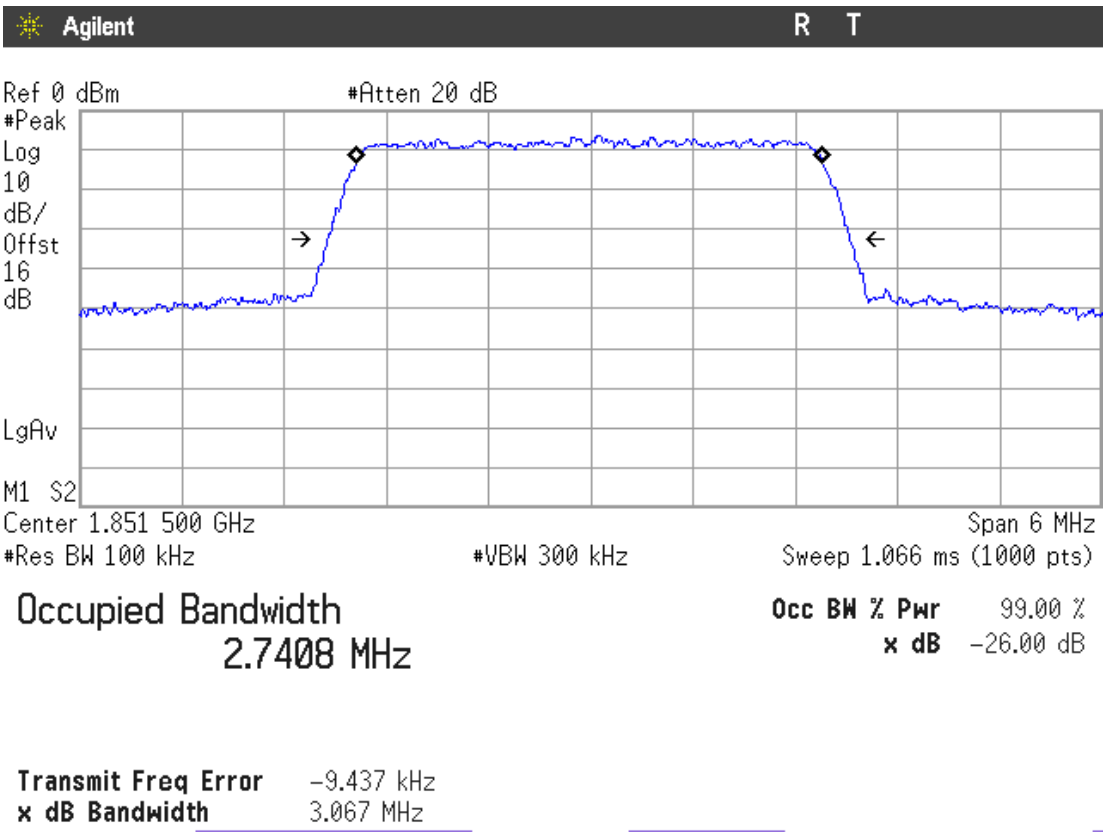


Highest Channel

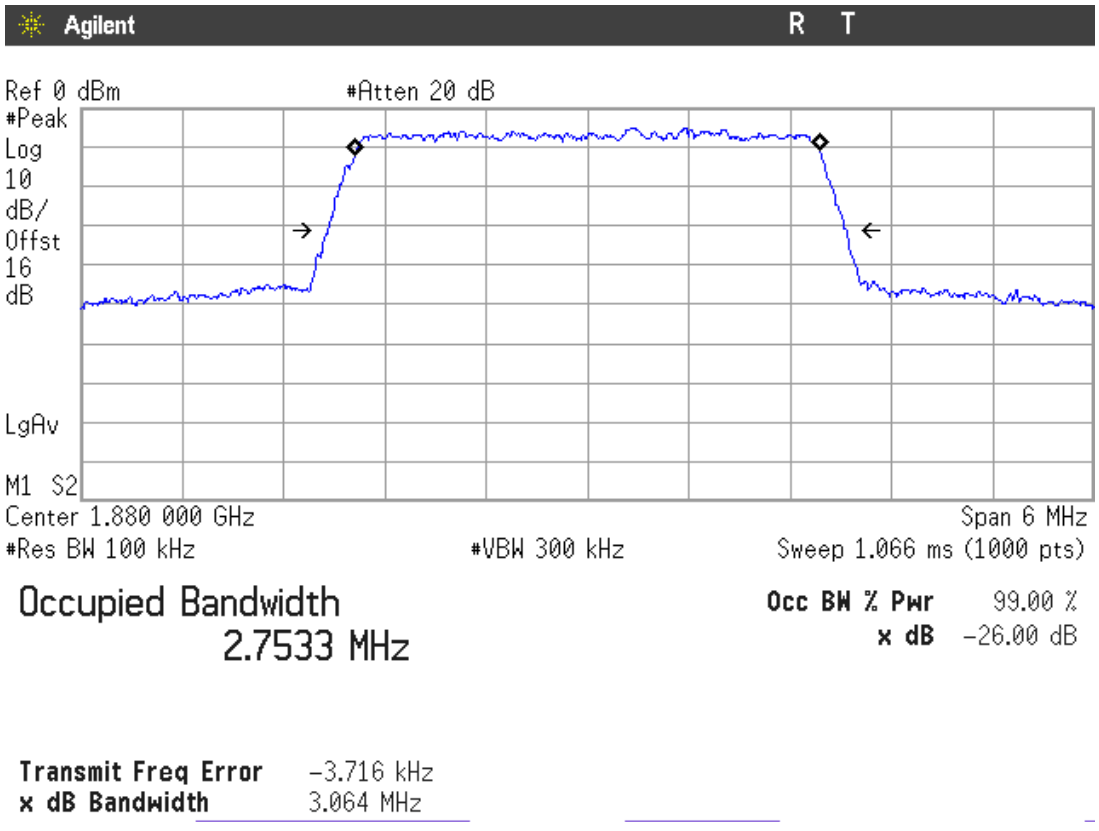


LTE QPSK MODULATION. BW = 3 MHz

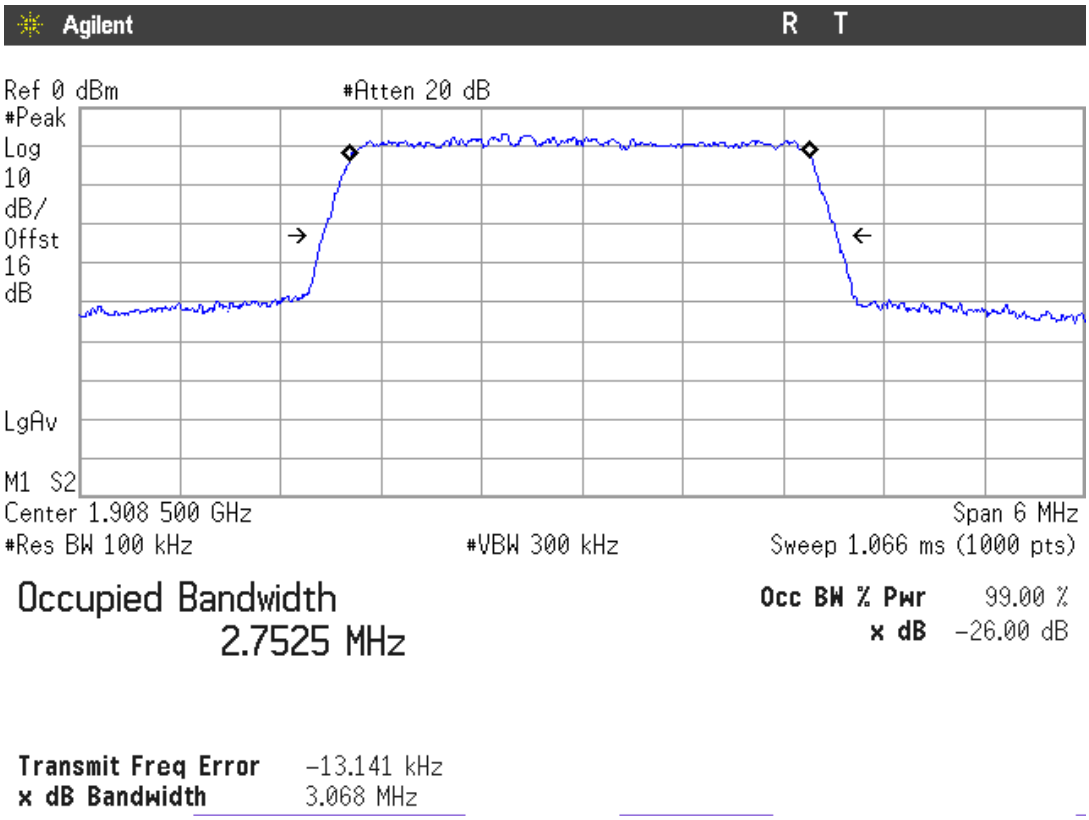
Lowest Channel



Middle Channel

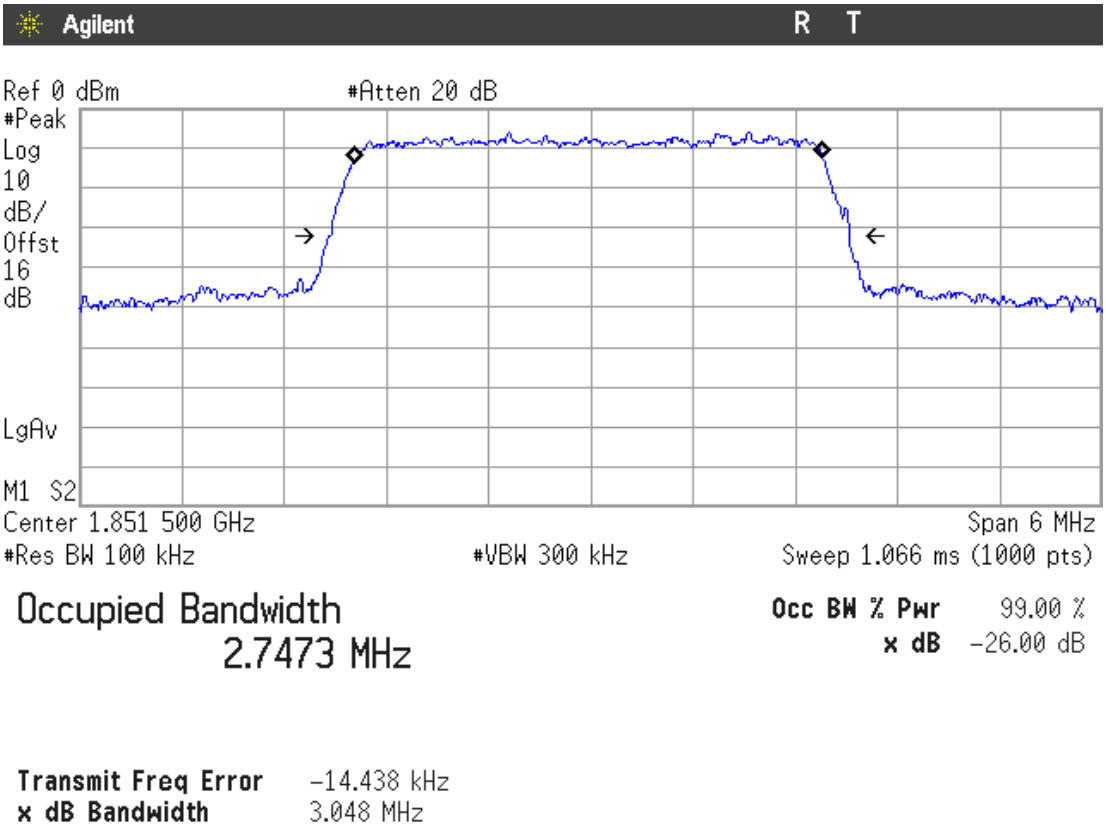


Highest Channel

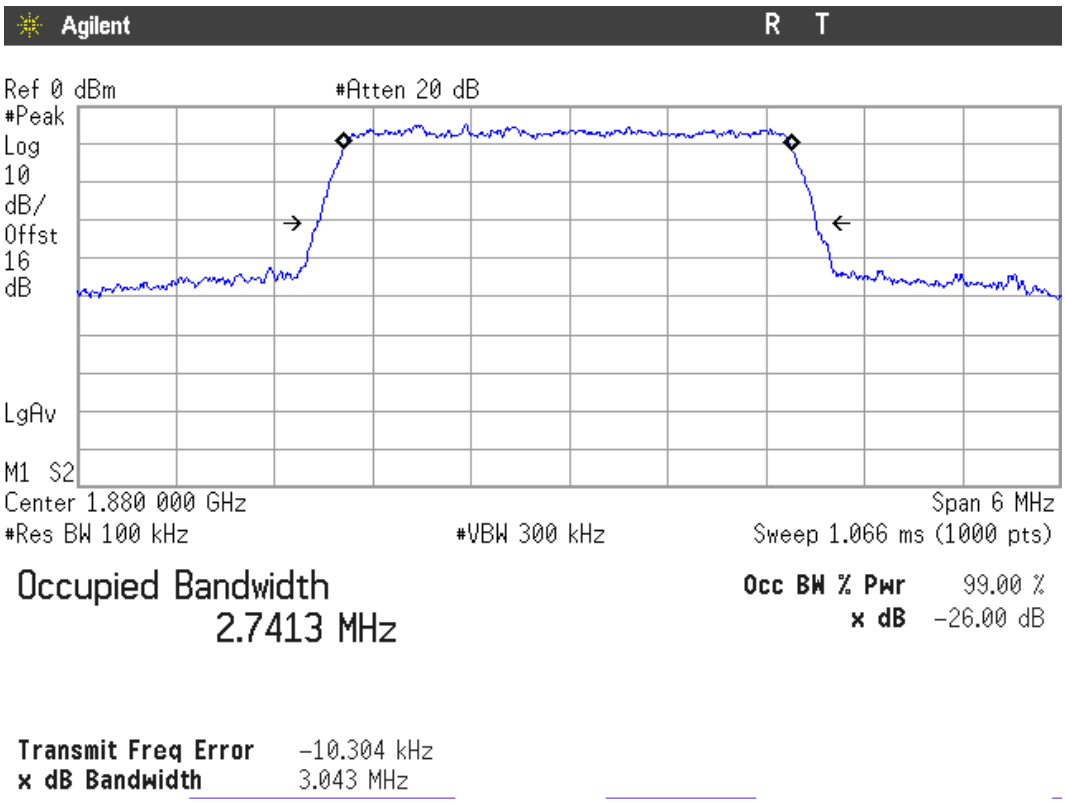


LTE 16QAM MODULATION. BW = 3 MHz

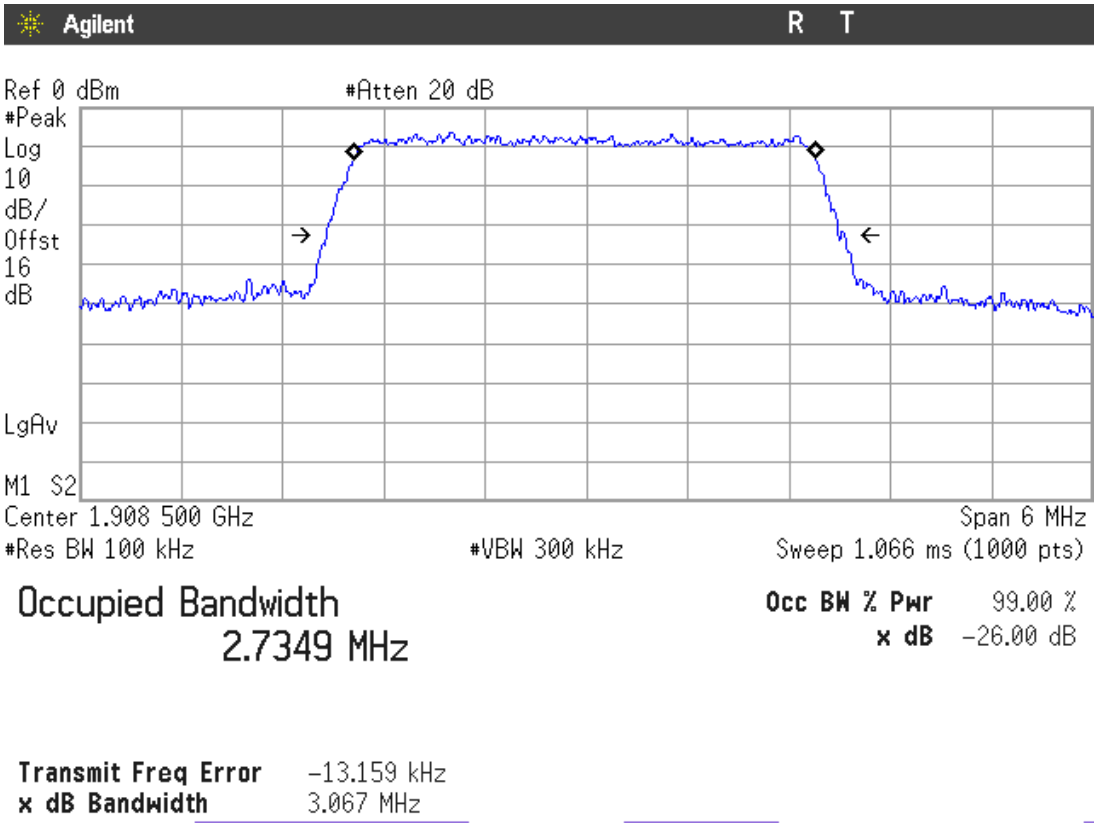
Lowest Channel



Middle Channel

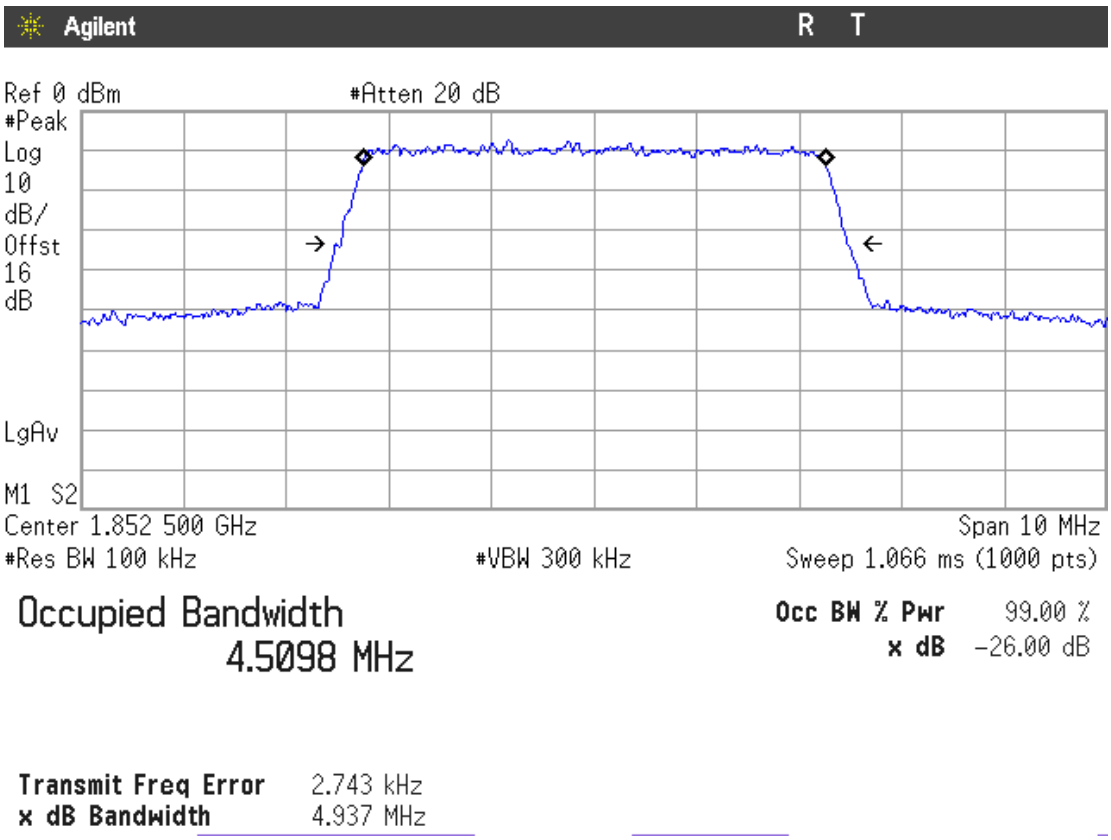


Highest Channel

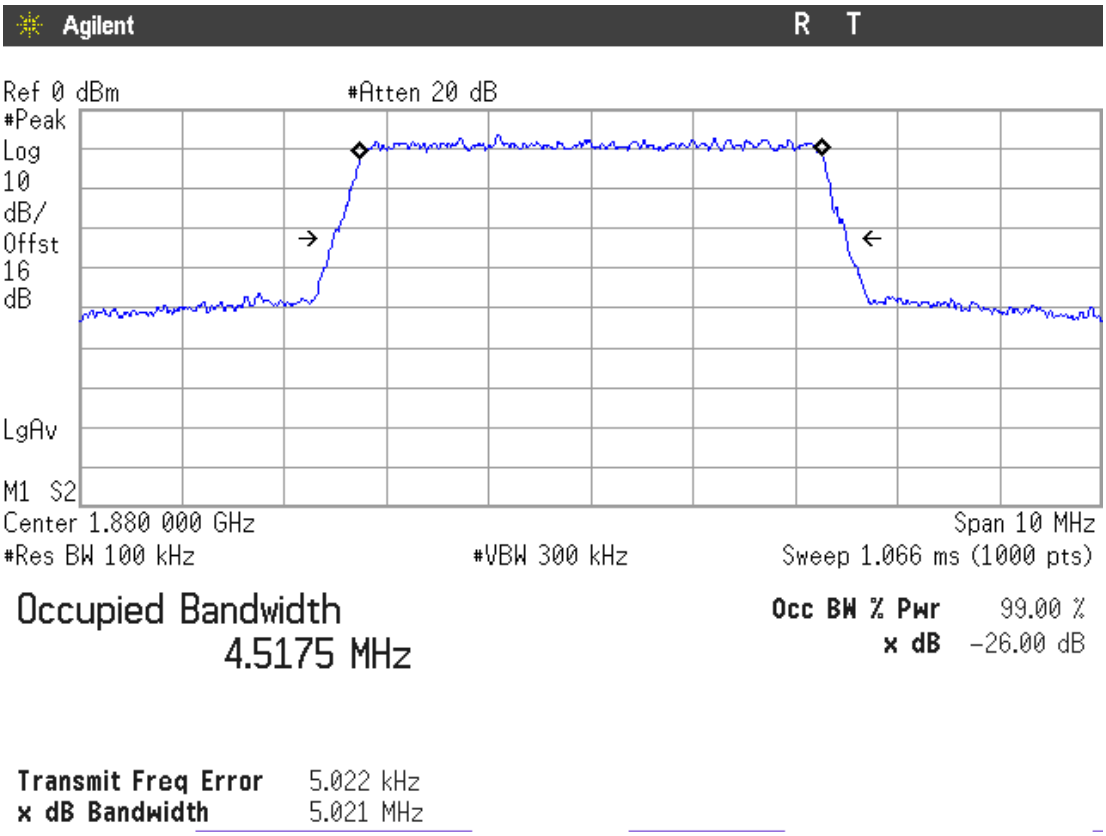


LTE QPSK MODULATION. BW = 5 MHz

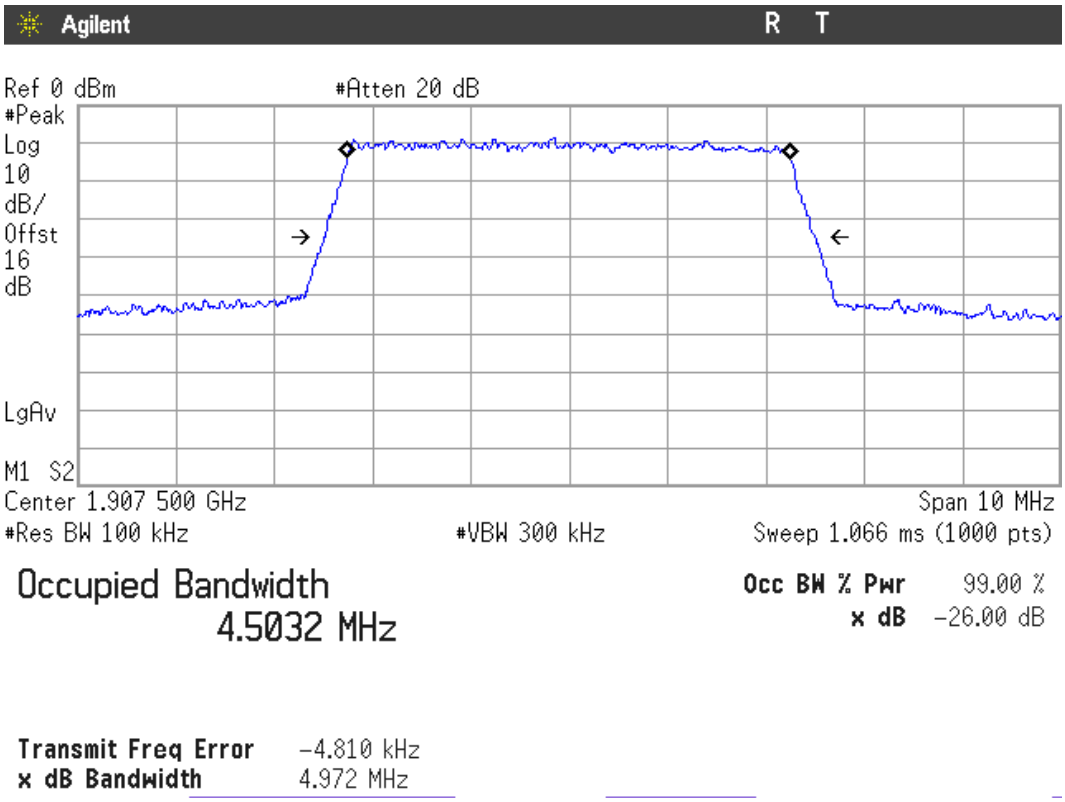
Lowest Channel



Middle Channel

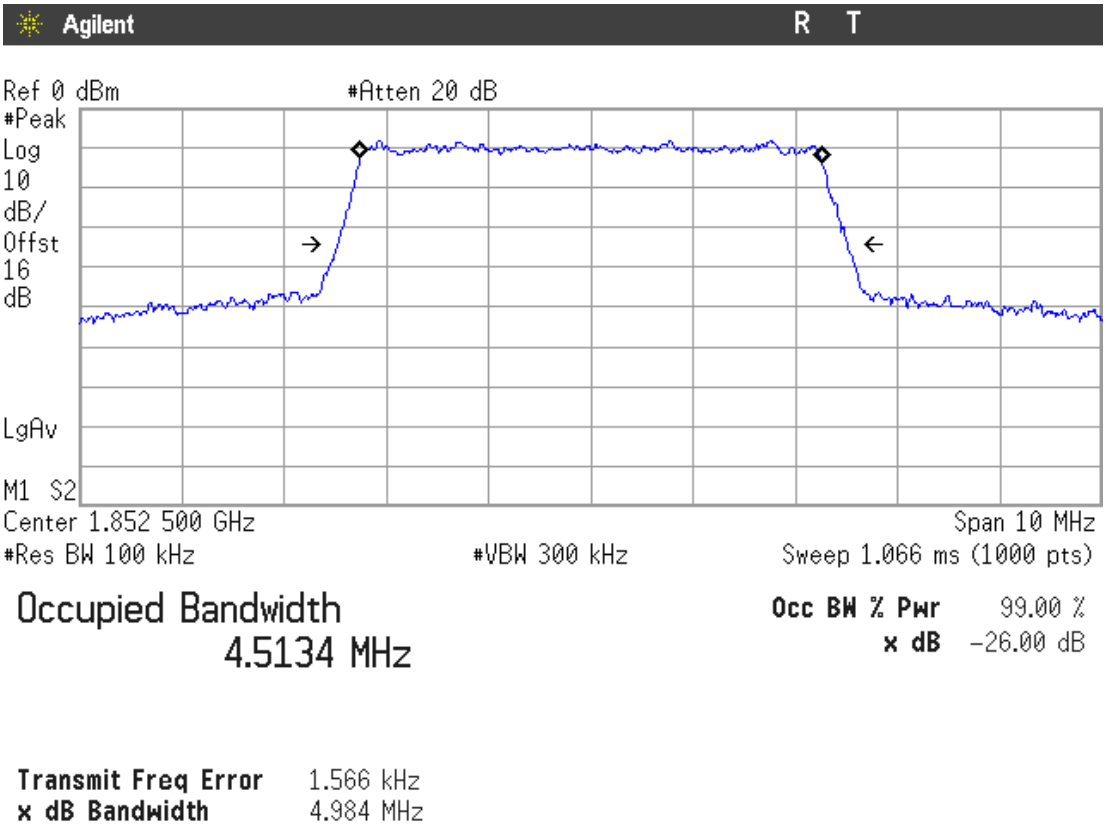


Highest Channel

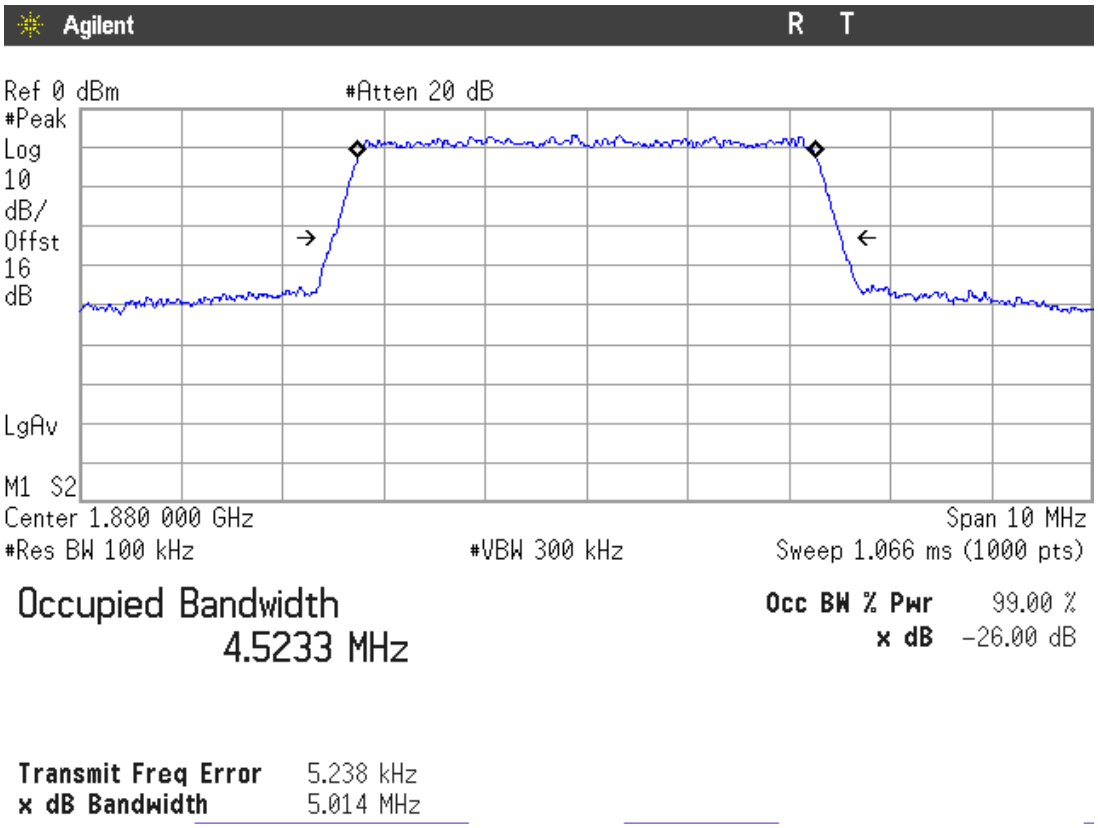


LTE 16QAM MODULATION. BW = 5 MHz

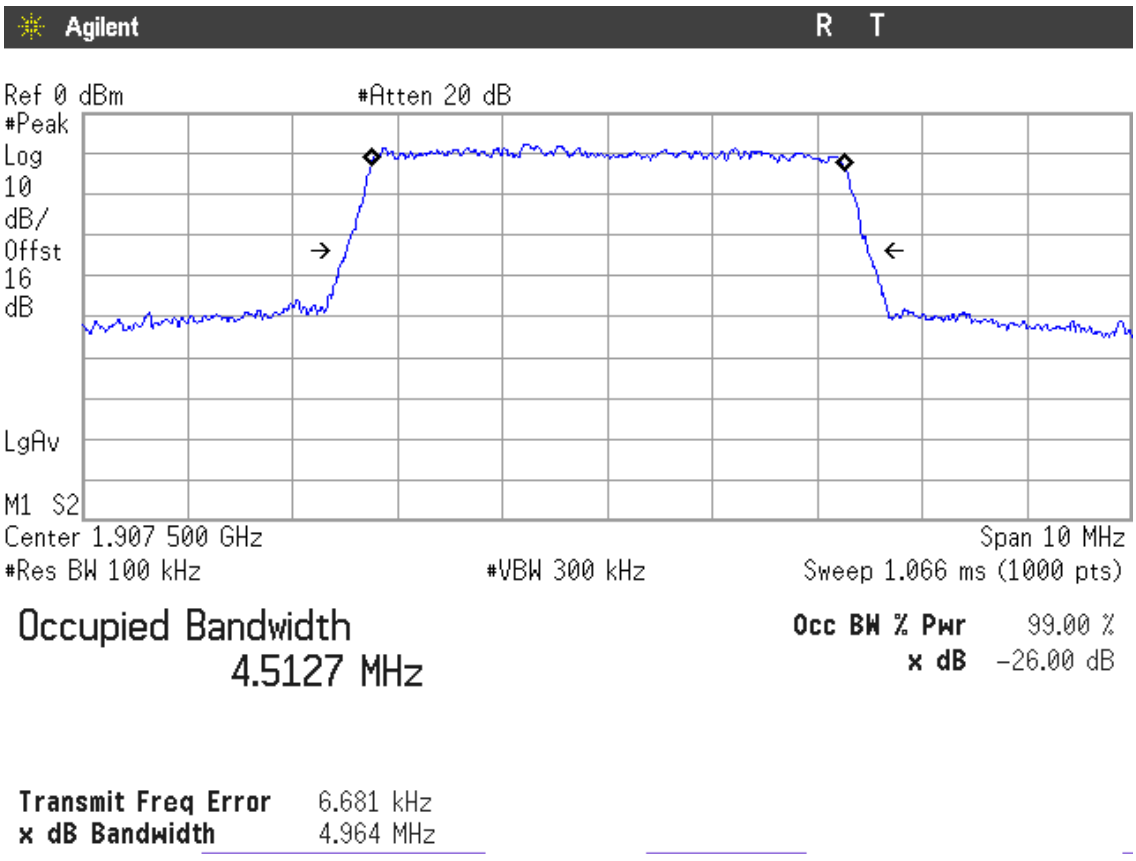
Lowest Channel



Middle Channel

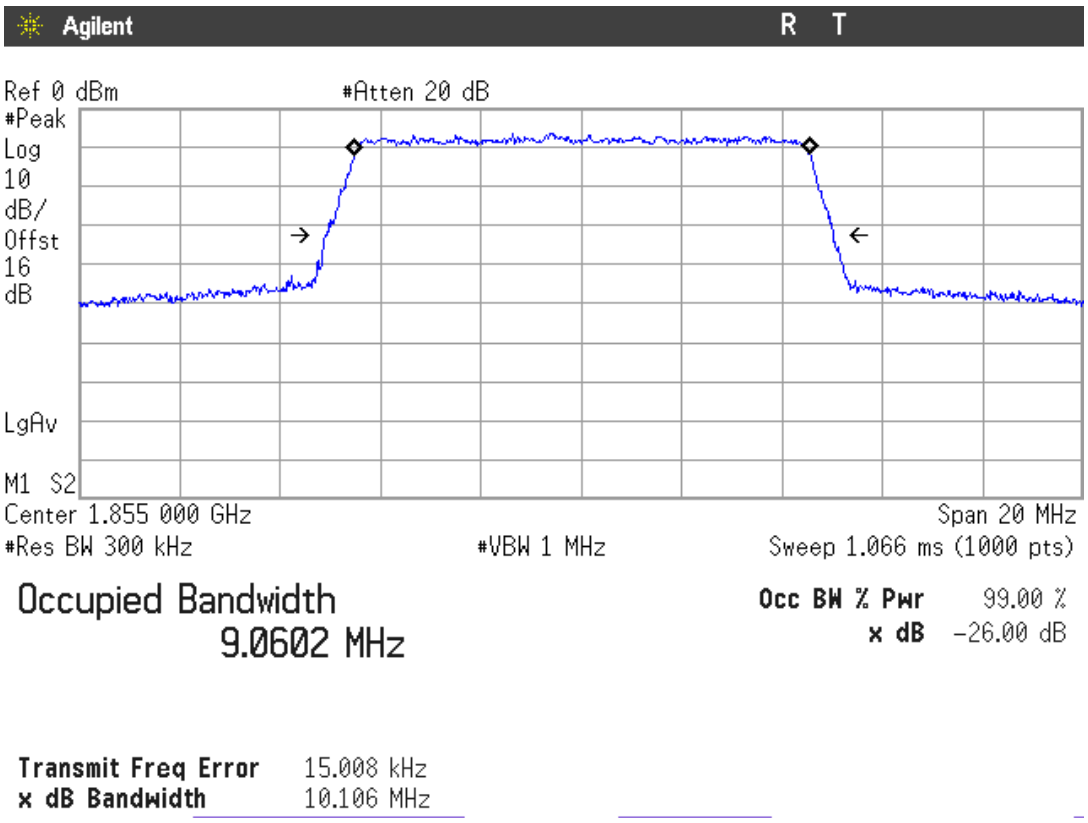


Highest Channel

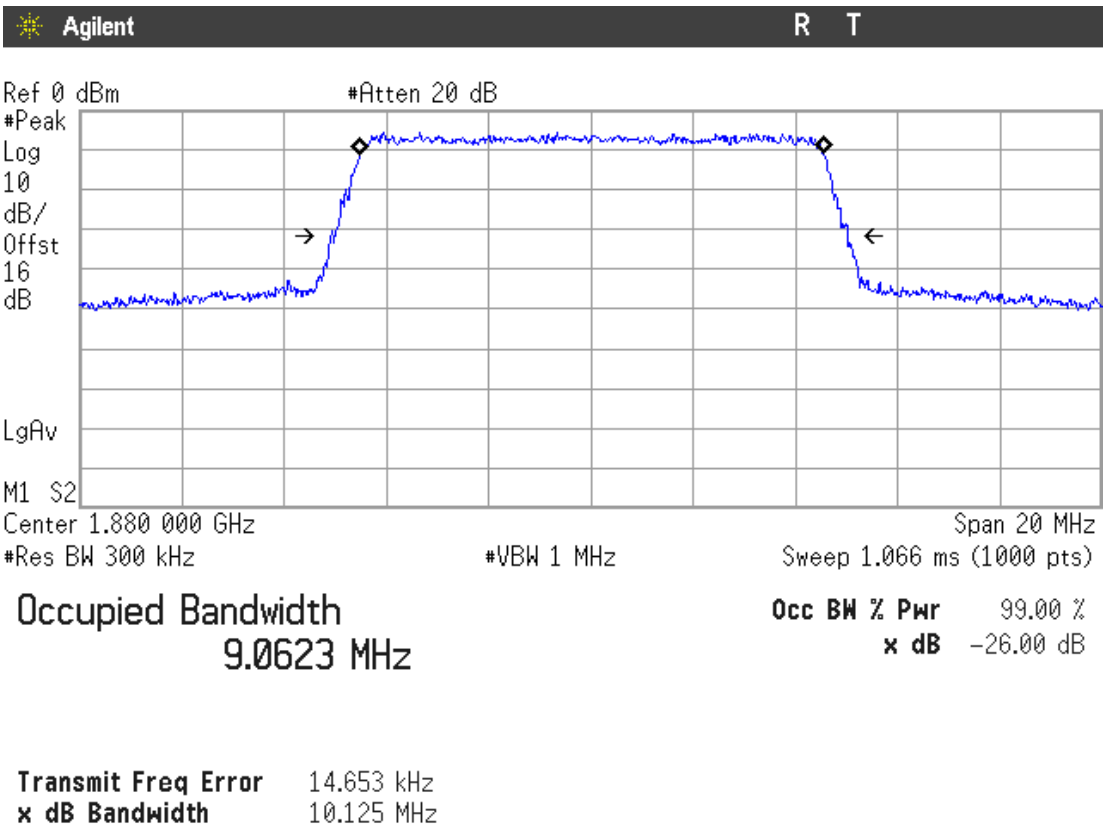


LTE QPSK MODULATION. BW = 10 MHz

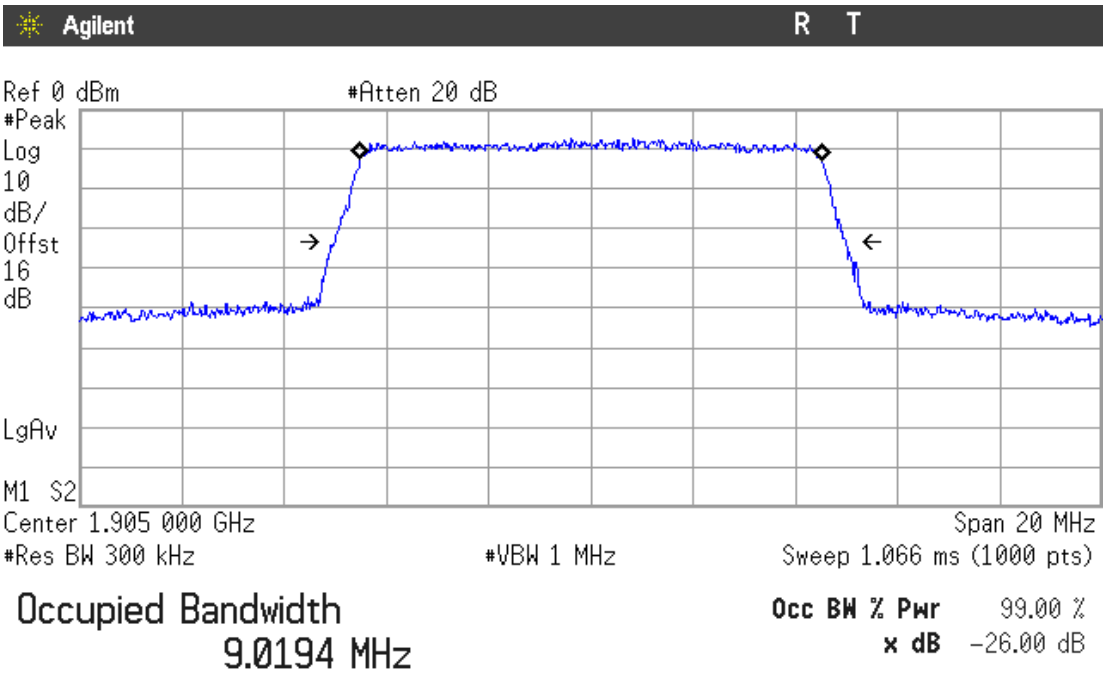
Lowest Channel



Middle Channel

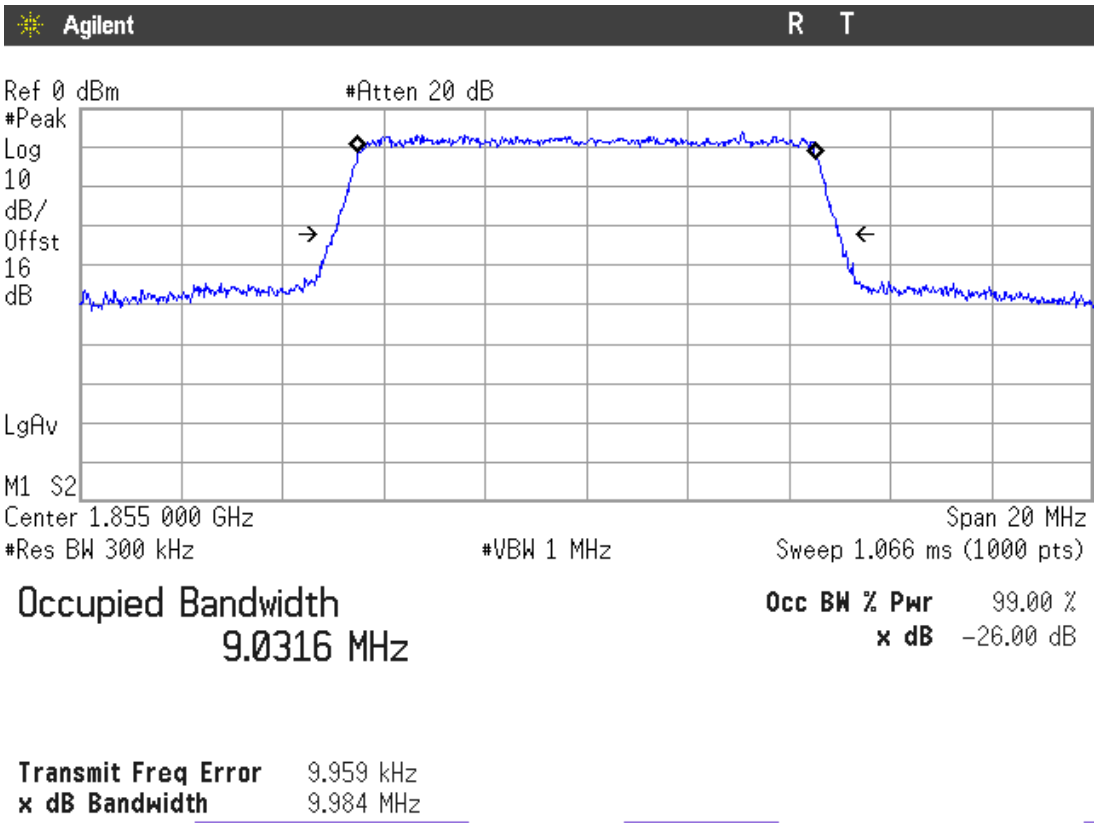


Highest Channel

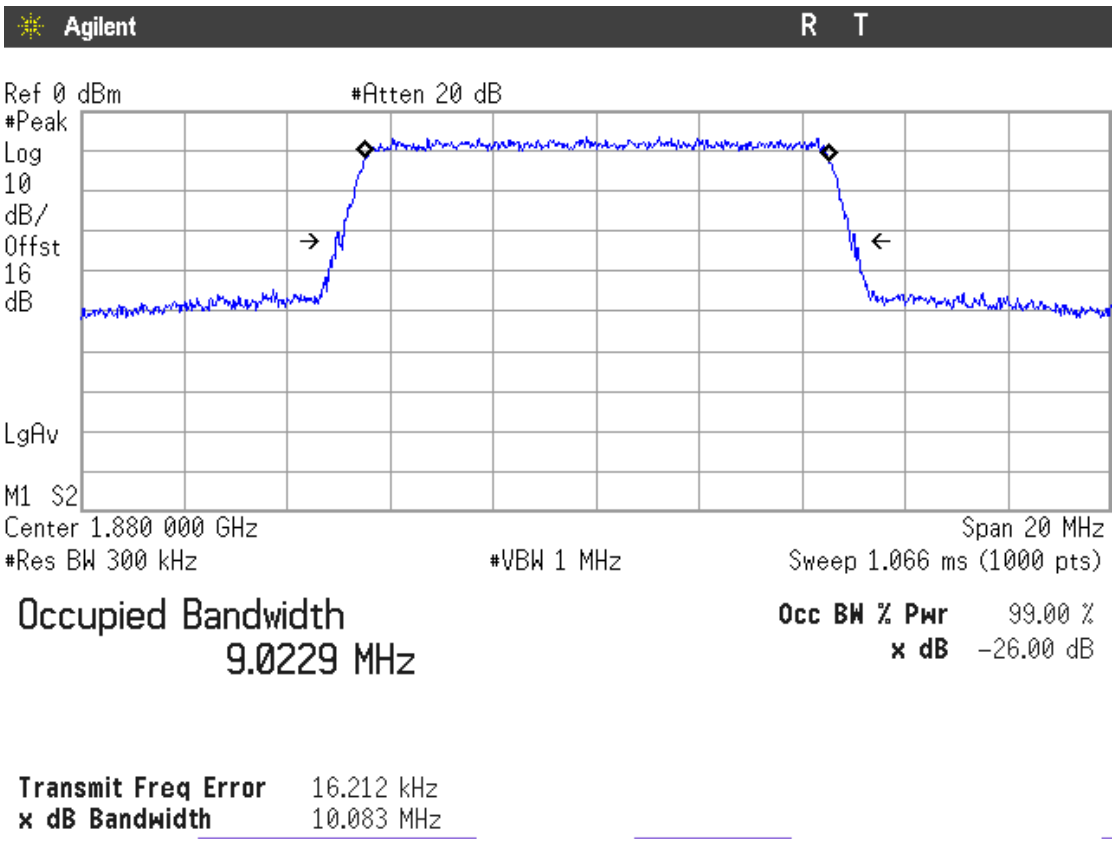


LTE 16QAM MODULATION. BW = 10 MHz

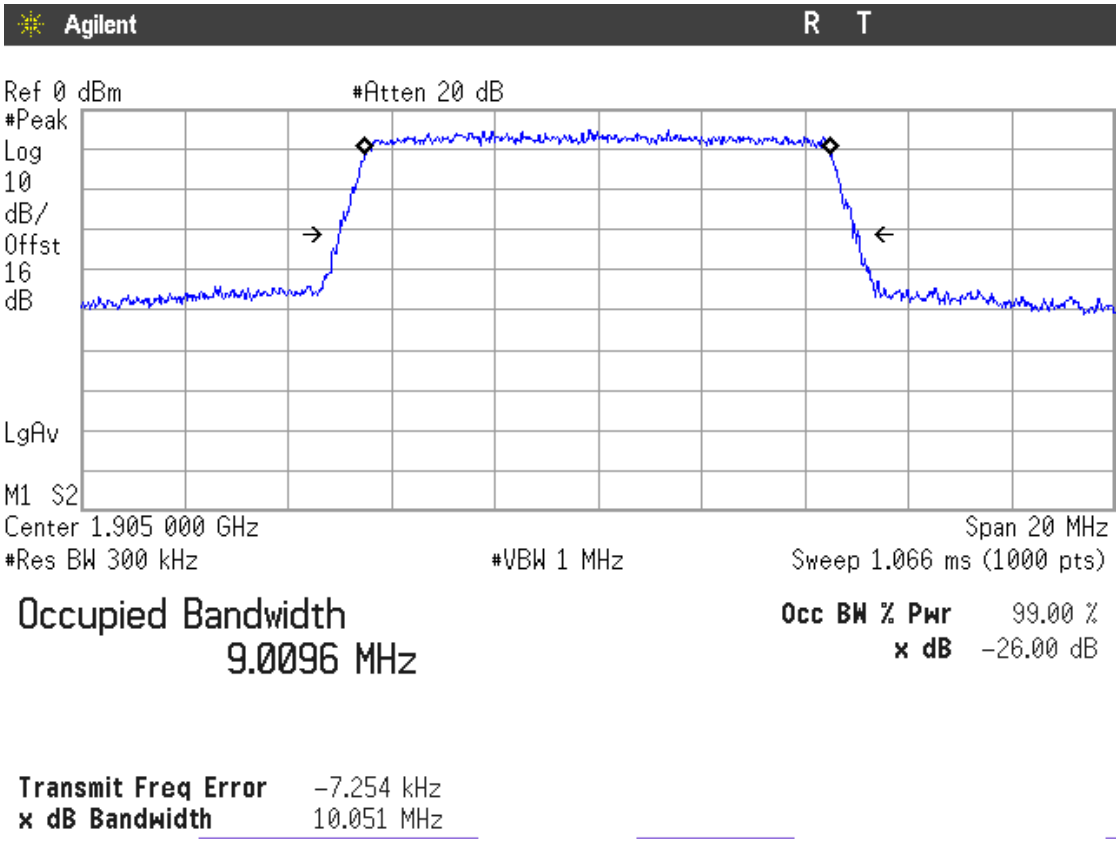
Lowest Channel



Middle Channel

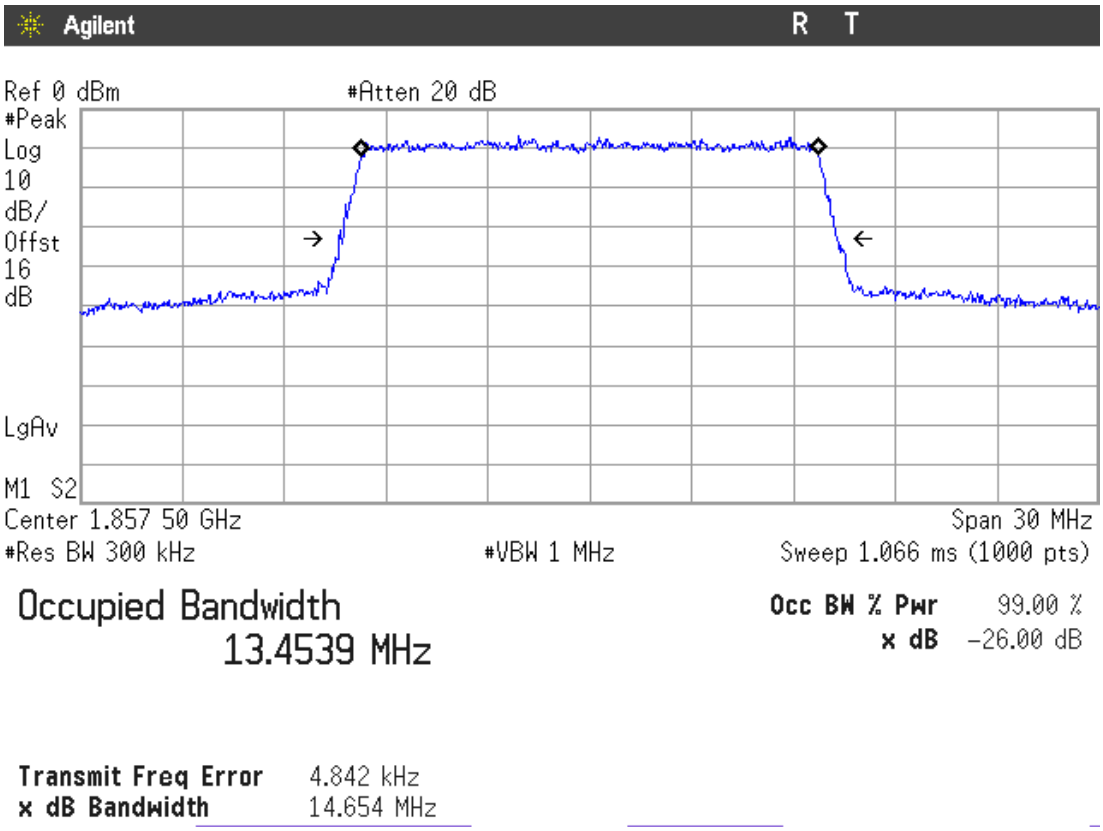


Highest Channel

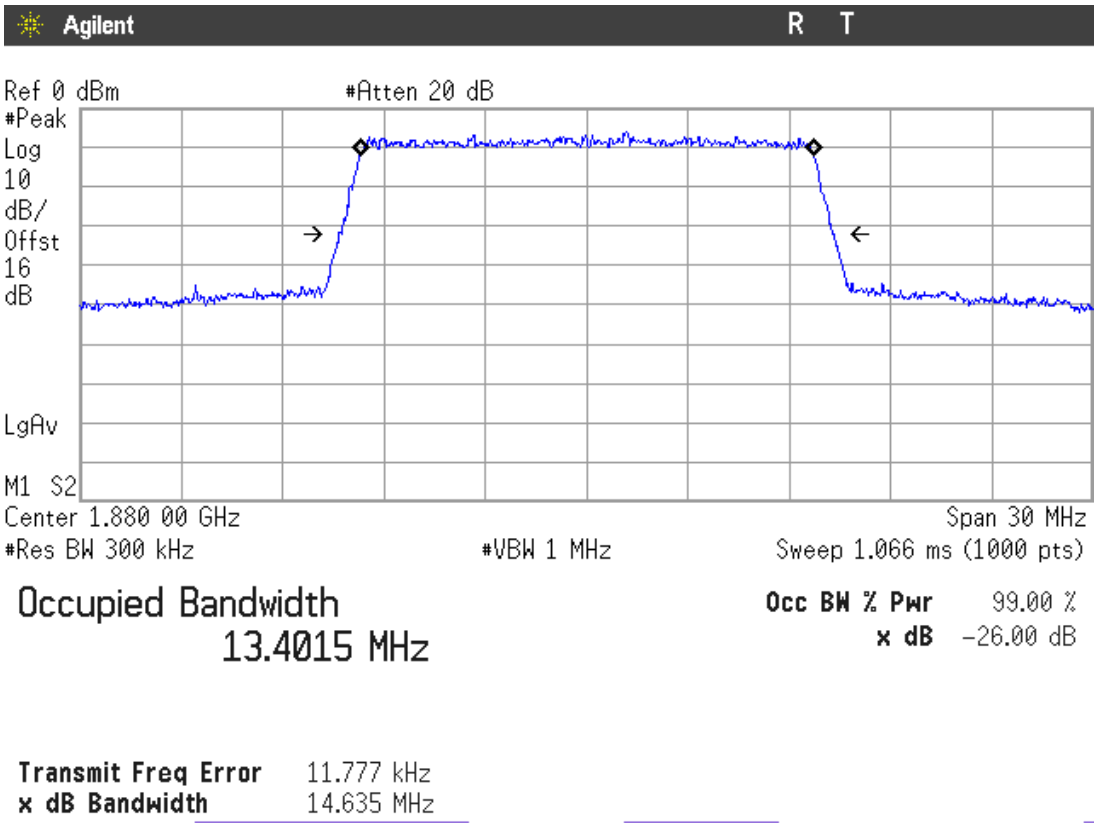


LTE QPSK MODULATION. BW = 15 MHz

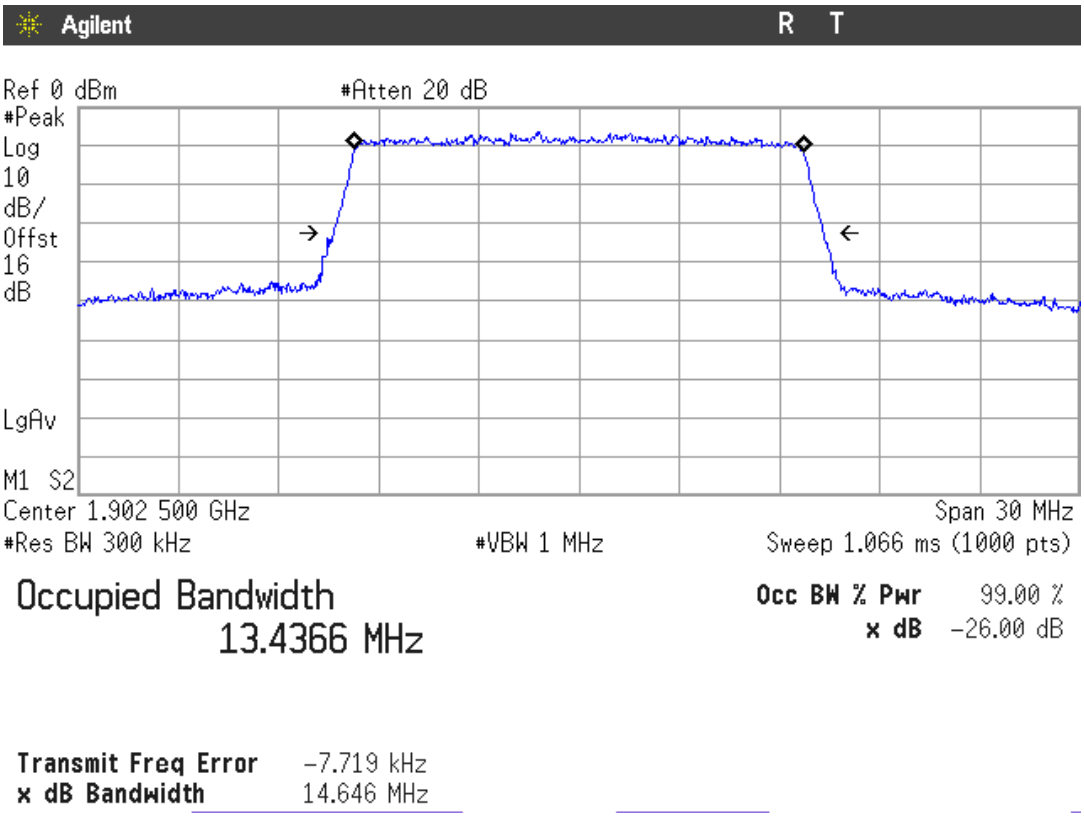
Lowest Channel



Middle Channel

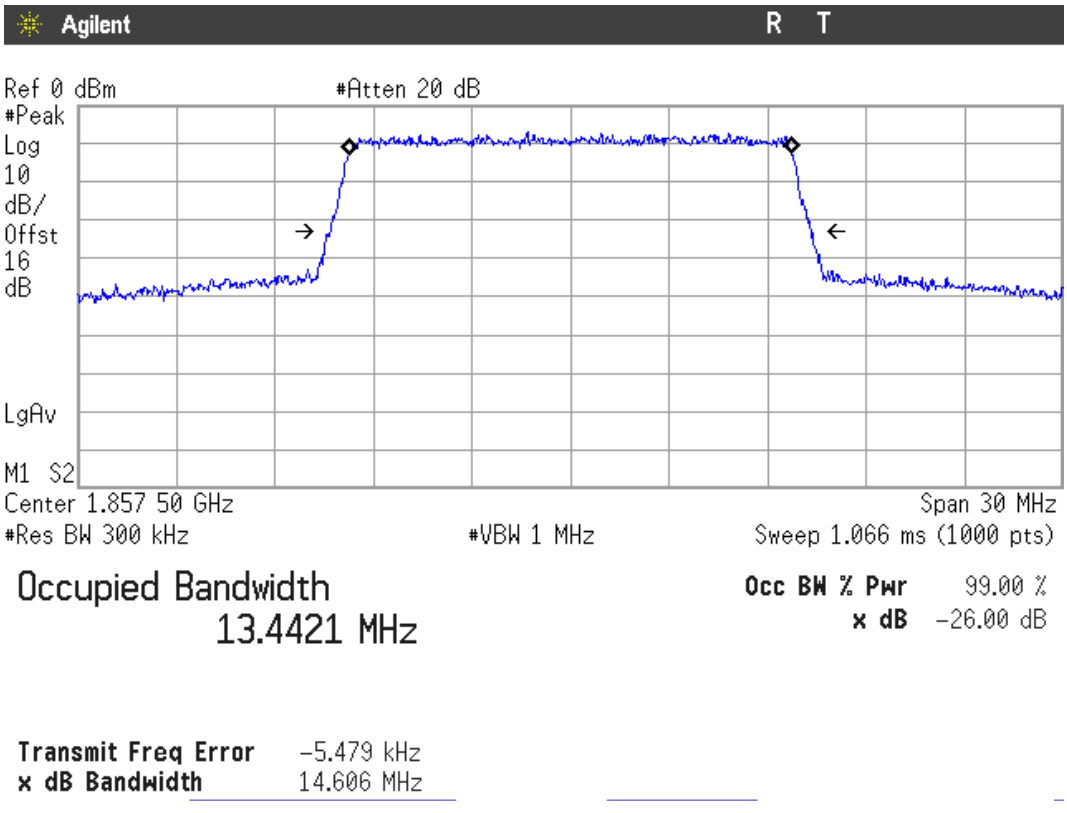


Highest Channel

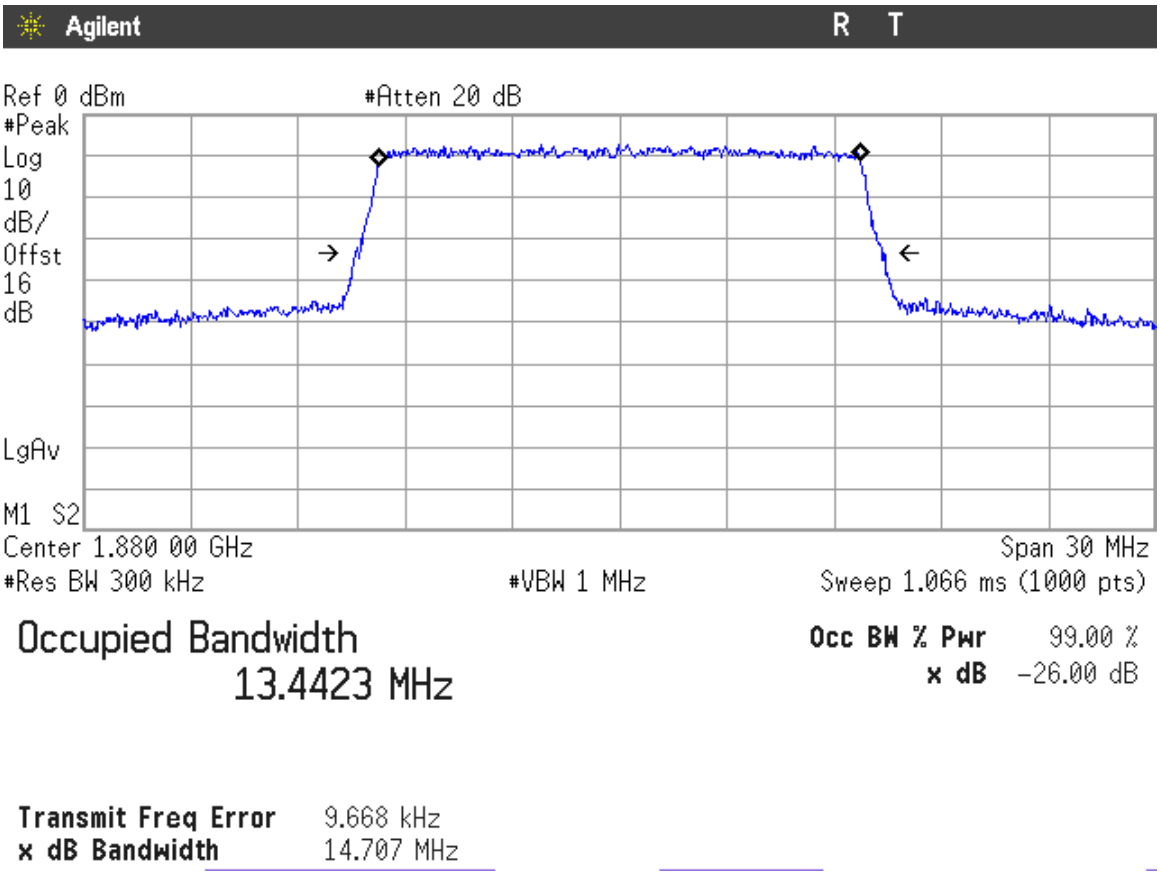


LTE 16QAM MODULATION. BW = 15 MHz

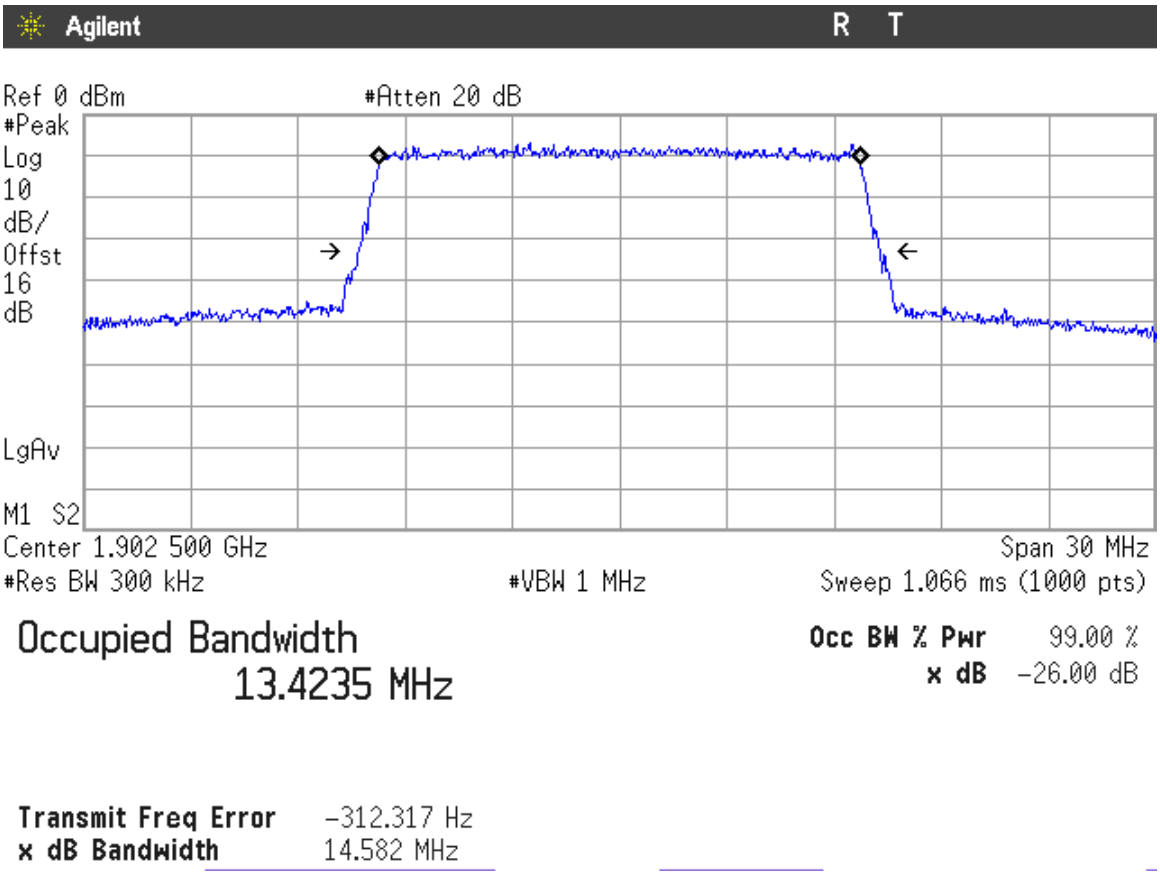
Lowest Channel



Middle Channel

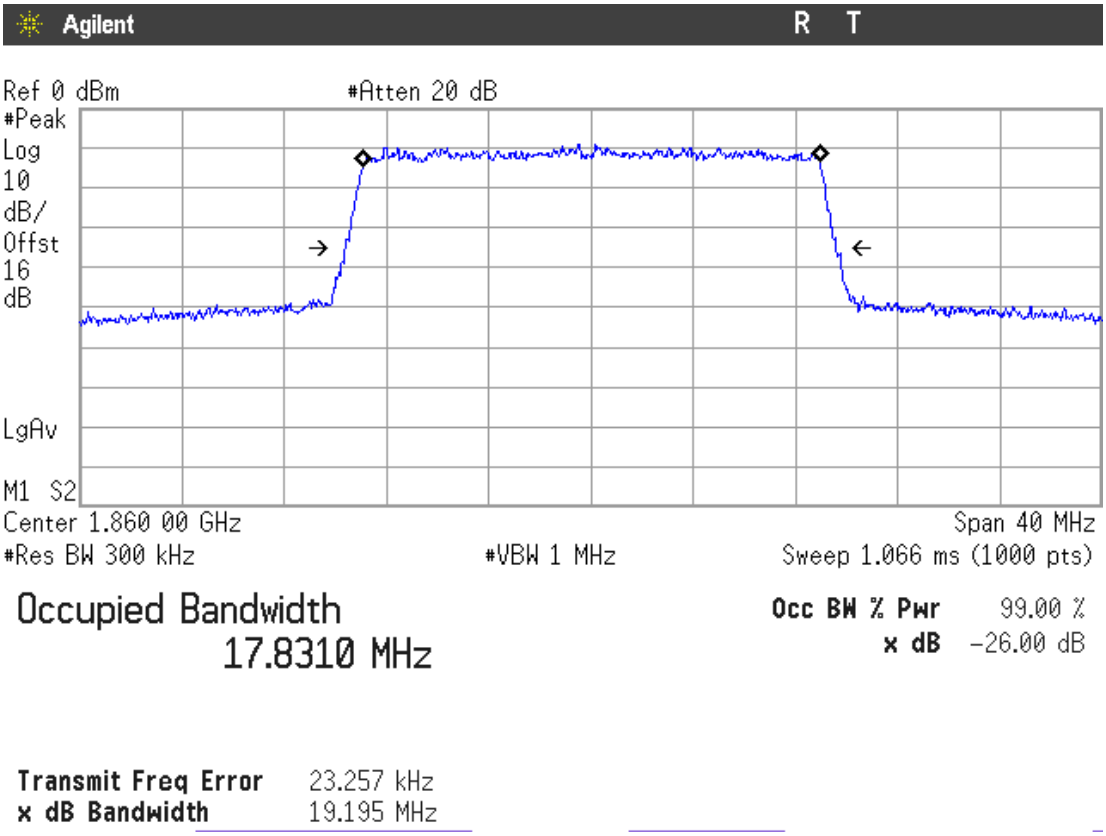


Highest Channel

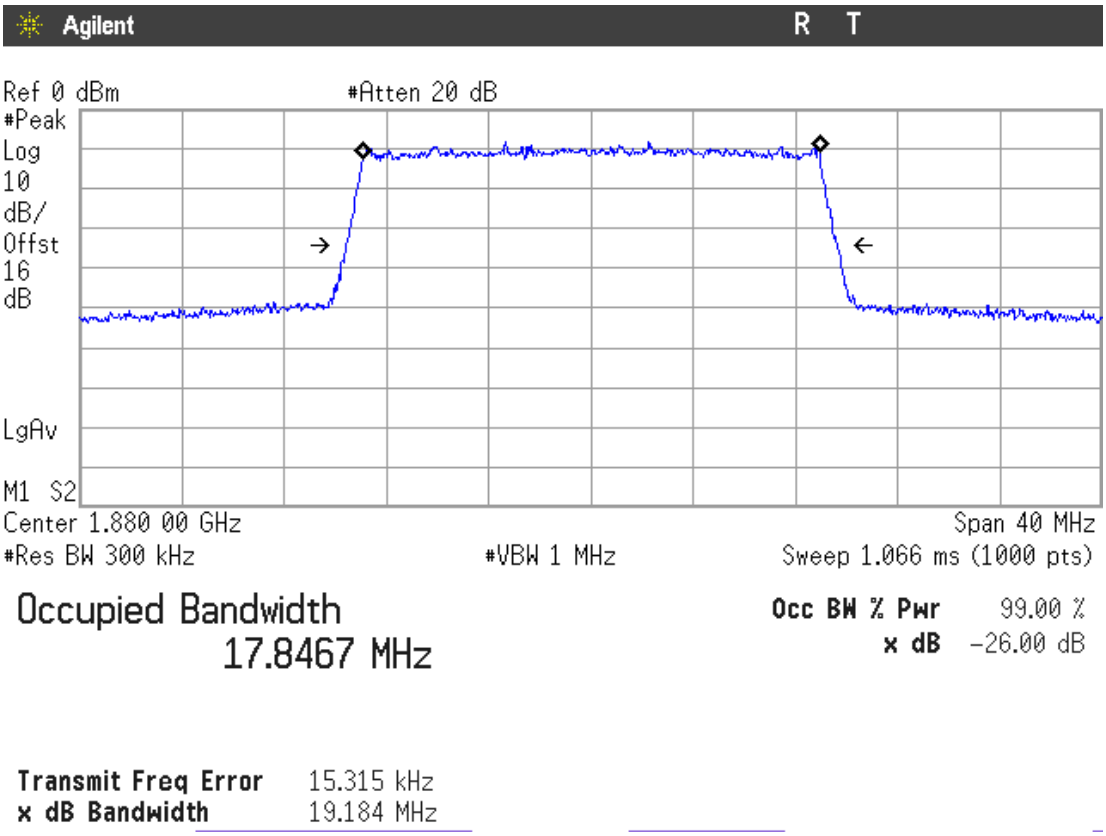


LTE QPSK MODULATION. BW = 20 MHz

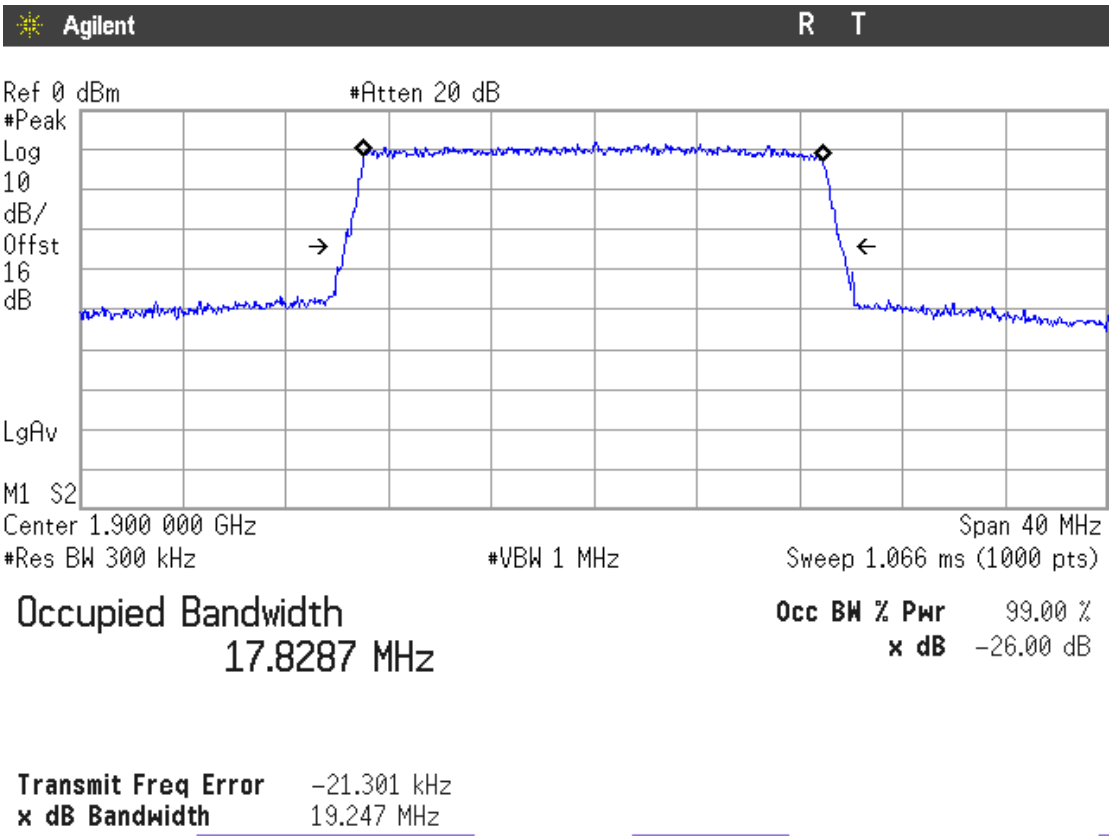
Lowest Channel



Middle Channel

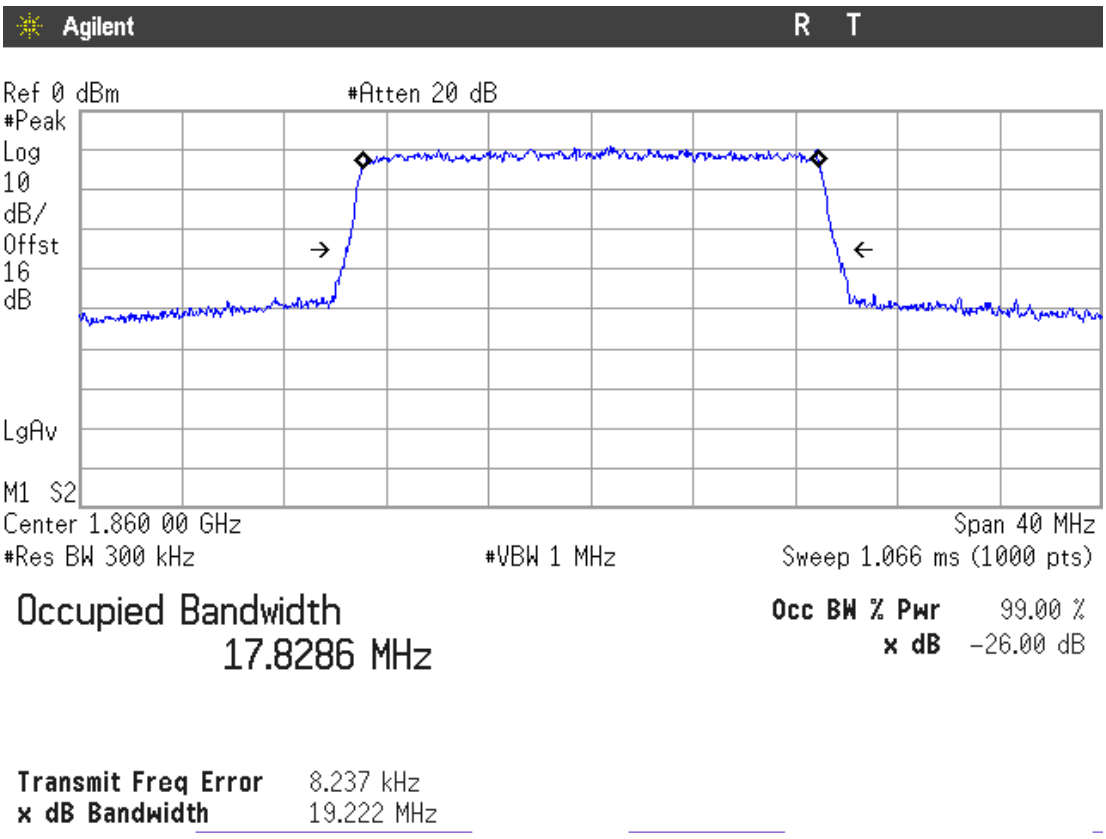


Highest Channel

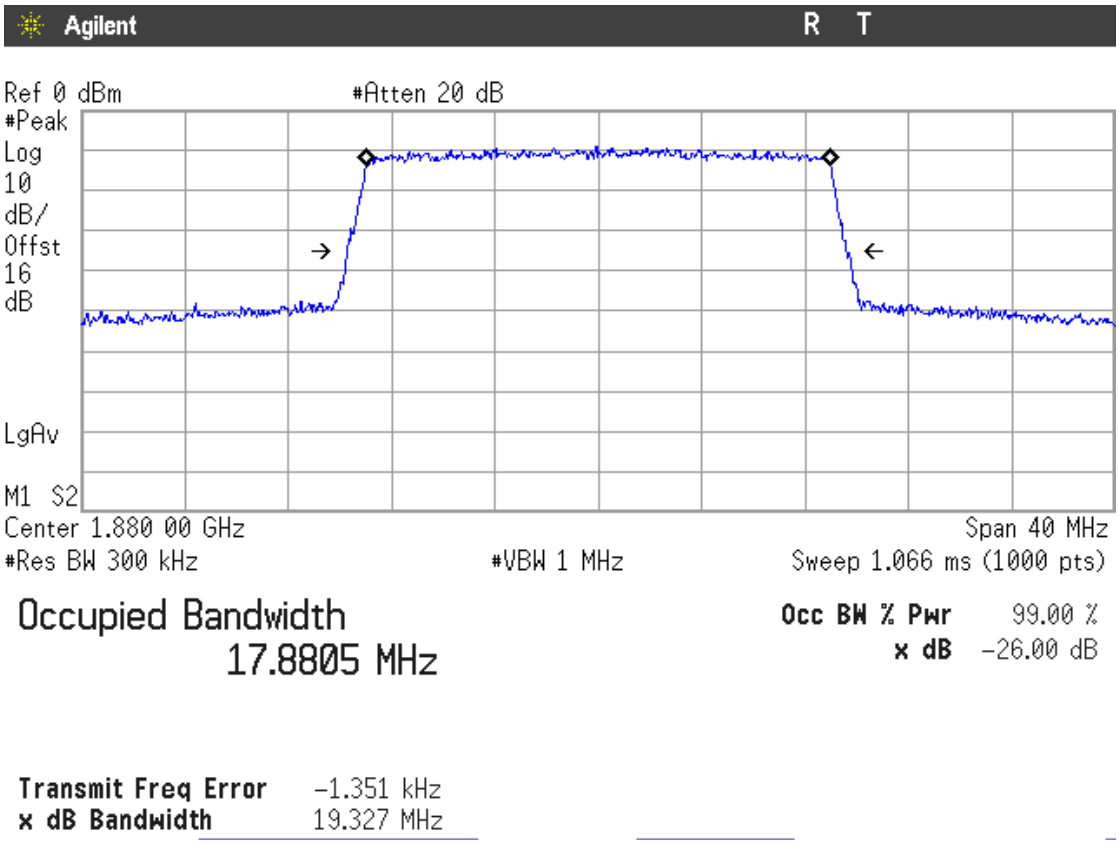


LTE 16QAM MODULATION. BW = 20 MHz

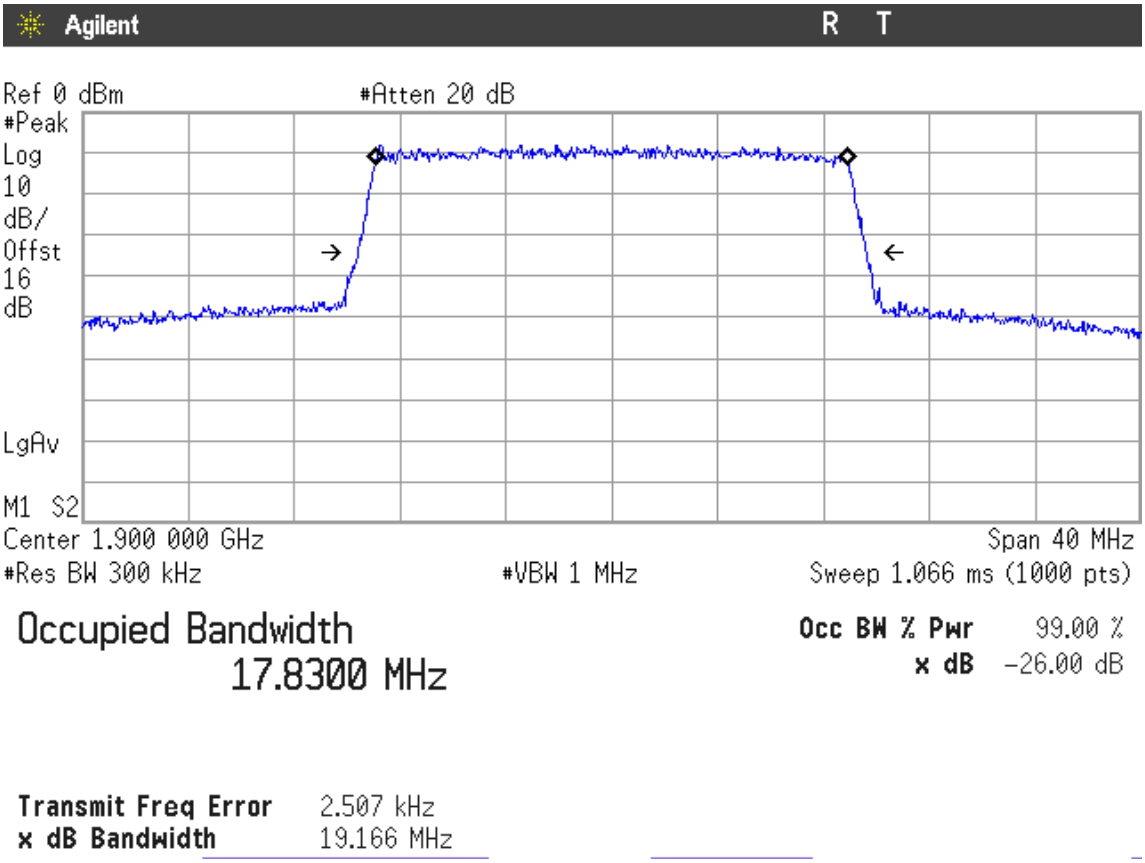
Lowest Channel



Middle Channel



Highest Channel



Spurious emissions at antenna terminals

SPECIFICATION

FCC §2.1051 and §24.238

RSS-133. Clause 6.5.

METHOD

The EUT RF output connector was connected to a spectrum analyser and to the Universal Radio Communication tester R&S CMU200 and CMW500 (selecting maximum transmission power of the EUT and different modes of modulation) using a 50 ohm attenuator and a power splitter.

The spectrum was investigated from 9 kHz to 20 GHz.

The reading of the spectrum analyser is corrected with the attenuation loss of connection between output terminal of EUT and input of the spectrum analyser.

For LTE mode the configuration of Resource Blocks and modulation which is the worst case for conducted power was used.

Measurement Limit**:**

According to specification. the power of emissions shall be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. P in watts.

At Po transmitting power. the specified minimum attenuation becomes 43+10log (Po). and the level in dBm relative Po becomes:

Po (dBm) – [43 + 10 log (Po in mwatts) - 30] = - 13 dBm

RESULTS (see plots in next pages)

GPRS MODULATION

1. CHANNEL: LOWEST
No spurious signals were found at less than 20dB respect to the limit in all the range.

2. CHANNEL: MIDDLE
No spurious signals were found at less than 20dB respect to the limit in all the range.

3. CHANNEL: HIGHEST
No spurious signals were found at less than 20dB respect to the limit in all the range.

EDGE MODULATION

1. CHANNEL: LOWEST
No spurious signals were found at less than 20dB respect to the limit in all the range.

2. CHANNEL: MIDDLE
No spurious signals were found at less than 20dB respect to the limit in all the range.

3. CHANNEL: HIGHEST
No spurious signals were found at less than 20dB respect to the limit in all the range.

WCDMA MODULATION

1. CHANNEL: LOWEST
No spurious signals were found at less than 20dB respect to the limit in all the range.

2. CHANNEL: MIDDLE
No spurious signals were found at less than 20dB respect to the limit in all the range.

3. CHANNEL: HIGHEST
No spurious signals were found at less than 20dB respect to the limit in all the range.

HSUPA MODULATION

1. CHANNEL: LOWEST
No spurious signals were found at less than 20dB respect to the limit in all the range.

2. CHANNEL: MIDDLE
No spurious signals were found at less than 20dB respect to the limit in all the range.

3. CHANNEL: HIGHEST
No spurious signals were found at less than 20dB respect to the limit in all the range.

LTE QPSK MODULATION. BW = 1.4 MHz

1. CHANNEL: LOWEST
No spurious signals were found at less than 20dB respect to the limit in all the range.

2. CHANNEL: MIDDLE
No spurious signals were found at less than 20dB respect to the limit in all the range.

3. CHANNEL: HIGHEST
No spurious signals were found at less than 20dB respect to the limit in all the range.

LTE QPSK MODULATION. BW = 3 MHz

1. CHANNEL: LOWEST
No spurious signals were found at less than 20dB respect to the limit in all the range.

2. CHANNEL: MIDDLE
No spurious signals were found at less than 20dB respect to the limit in all the range.

3. CHANNEL: HIGHEST
No spurious signals were found at less than 20dB respect to the limit in all the range.

LTE QPSK MODULATION. BW = 5 MHz

1. CHANNEL: LOWEST
No spurious signals were found at less than 20dB respect to the limit in all the range.

2. CHANNEL: MIDDLE
No spurious signals were found at less than 20dB respect to the limit in all the range.

3. CHANNEL: HIGHEST
No spurious signals were found at less than 20dB respect to the limit in all the range.

LTE QPSK MODULATION. BW = 10 MHz

1. CHANNEL: LOWEST
No spurious signals were found at less than 20dB respect to the limit in all the range.

2. CHANNEL: MIDDLE
No spurious signals were found at less than 20dB respect to the limit in all the range.

3. CHANNEL: HIGHEST
No spurious signals were found at less than 20dB respect to the limit in all the range.

LTE QPSK MODULATION. BW = 15 MHz

1. CHANNEL: LOWEST
No spurious signals were found at less than 20dB respect to the limit in all the range.

2. CHANNEL: MIDDLE
No spurious signals were found at less than 20dB respect to the limit in all the range.

3. CHANNEL: HIGHEST
No spurious signals were found at less than 20dB respect to the limit in all the range.

LTE QPSK MODULATION. BW = 20 MHz

1. CHANNEL: LOWEST
No spurious signals were found at less than 20dB respect to the limit in all the range.

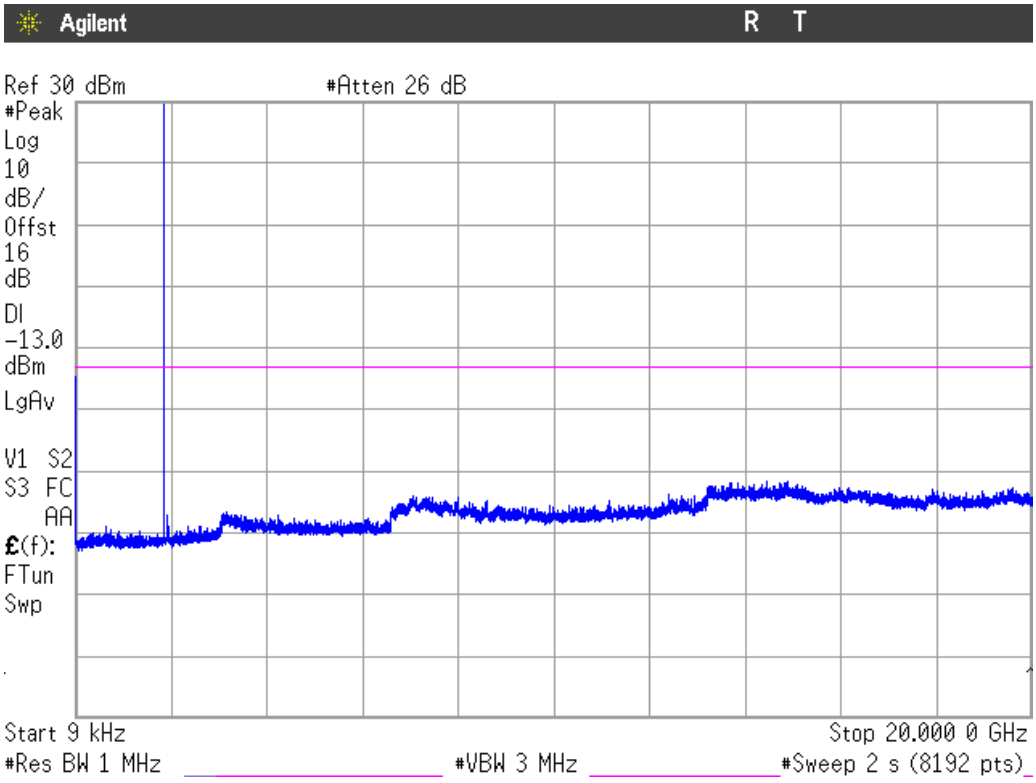
2. CHANNEL: MIDDLE
No spurious signals were found at less than 20dB respect to the limit in all the range.

3. CHANNEL: HIGHEST
No spurious signals were found at less than 20dB respect to the limit in all the range.

Verdict: PASS

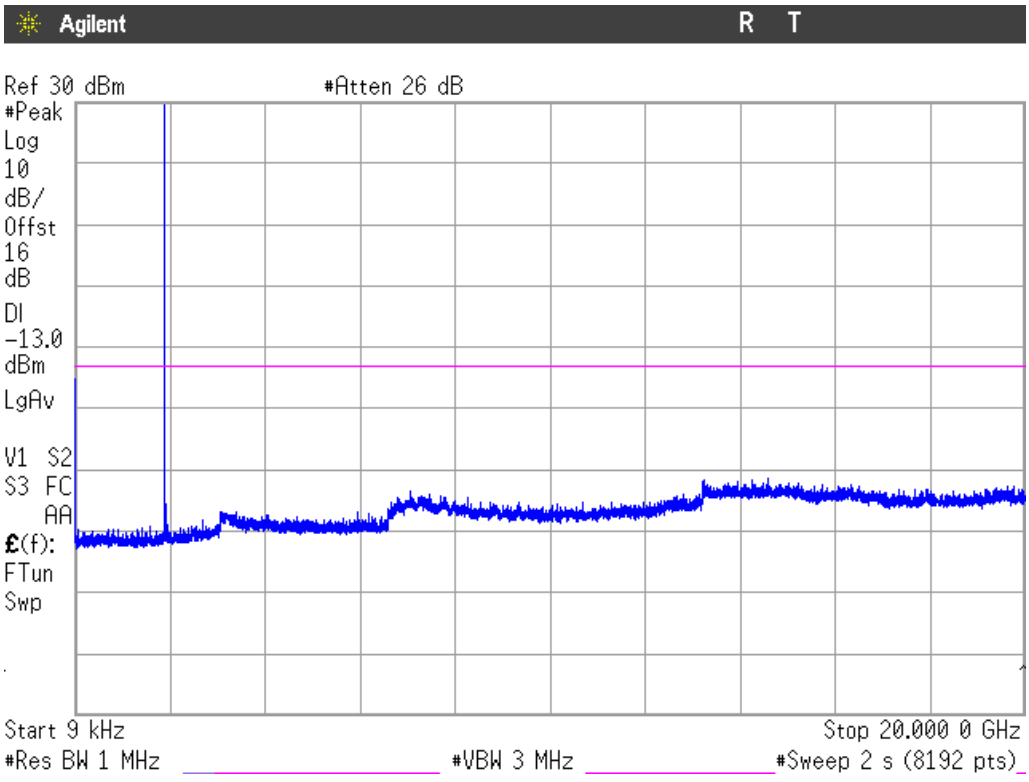
GPRS MODULATION

1. CHANNEL: LOWEST



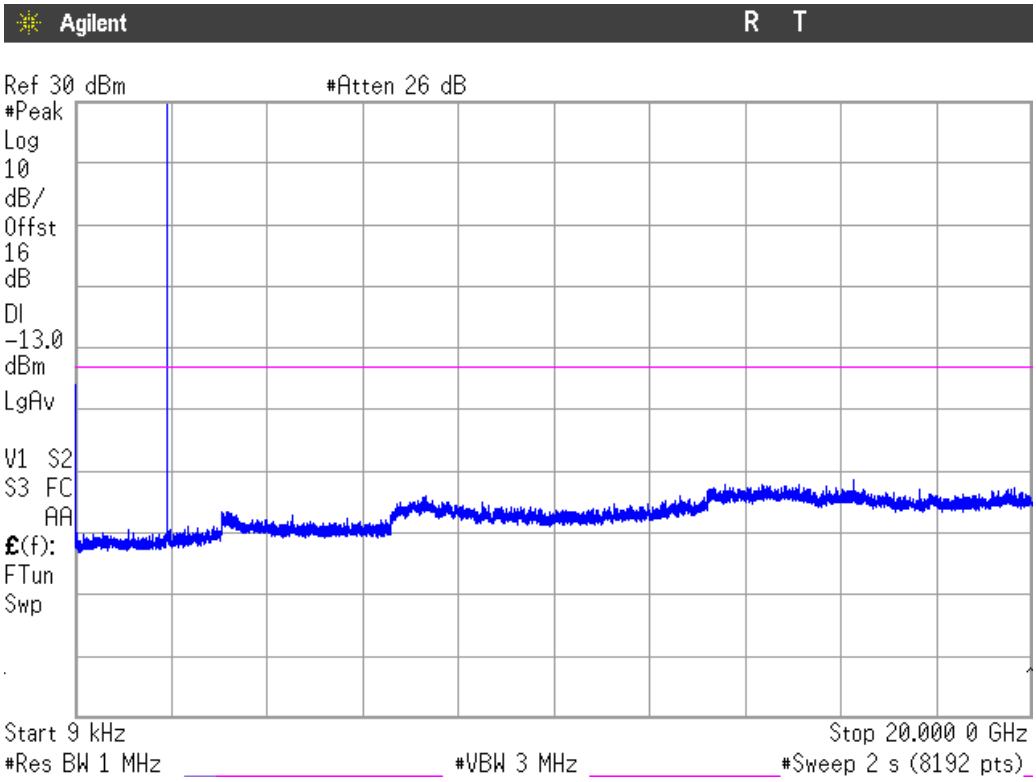
Note: The peak above the limit is the carrier frequency.

2. CHANNEL: MIDDLE



Note: The peak above the limit is the carrier frequency.

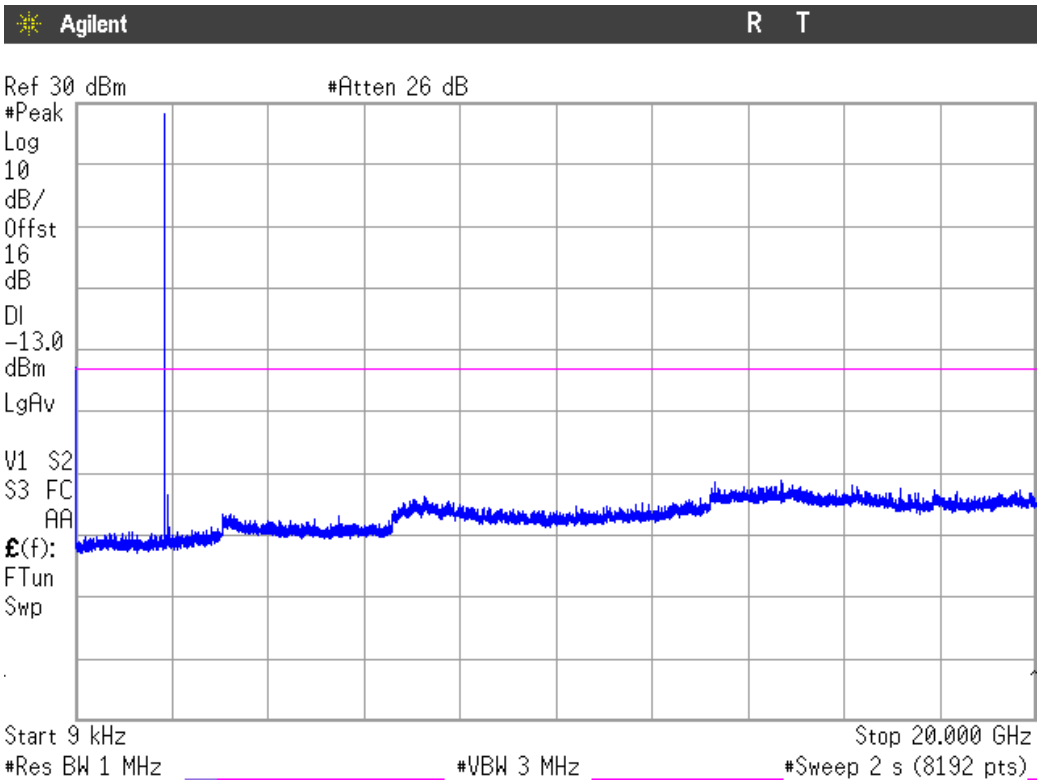
3. CHANNEL: HIGHEST



Note: The peak above the limit is the carrier frequency.

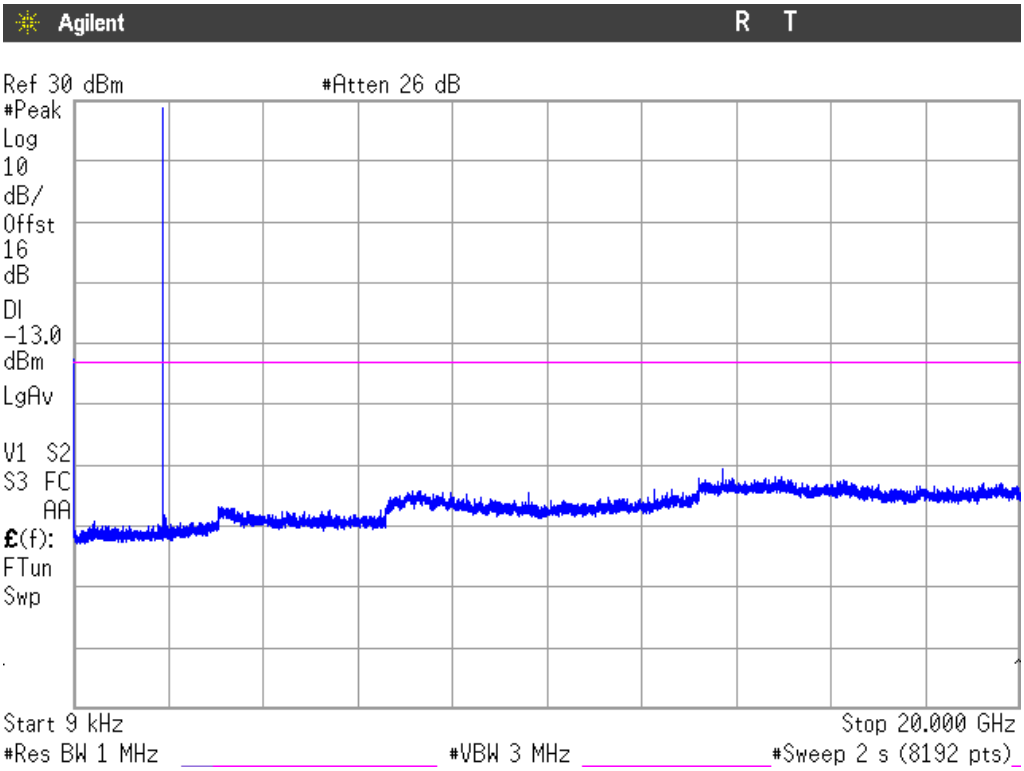
EDGE MODULATION

1. CHANNEL: LOWEST



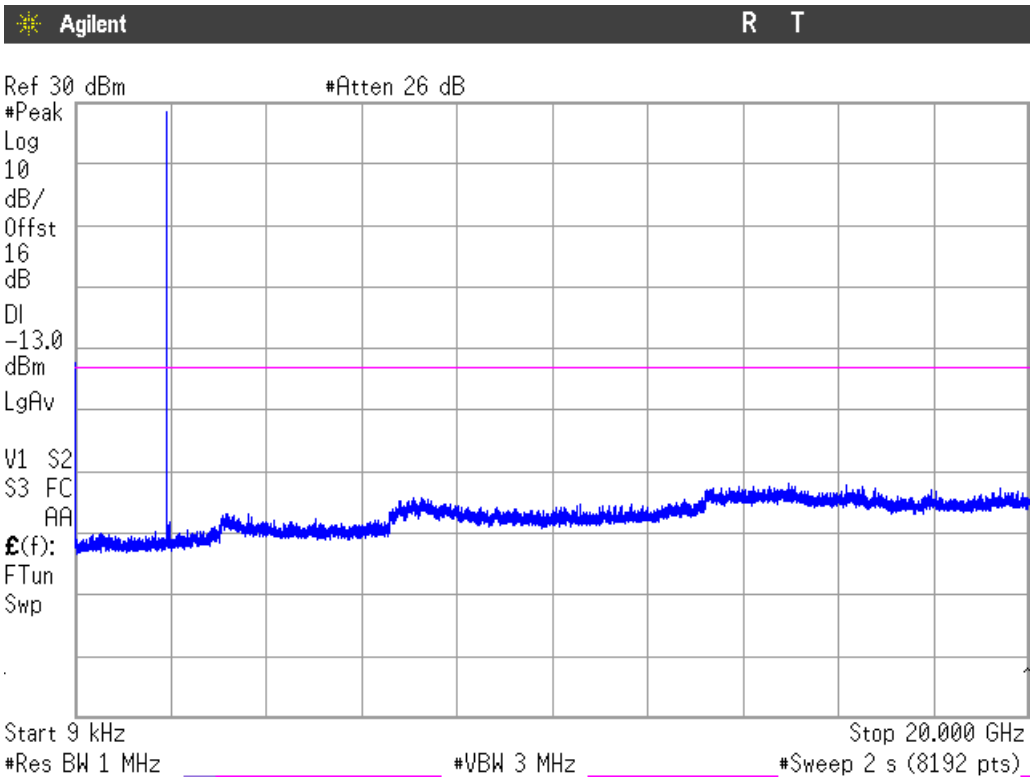
Note: The peak above the limit is the carrier frequency.

2. CHANNEL: MIDDLE



Note: The peak above the limit is the carrier frequency.

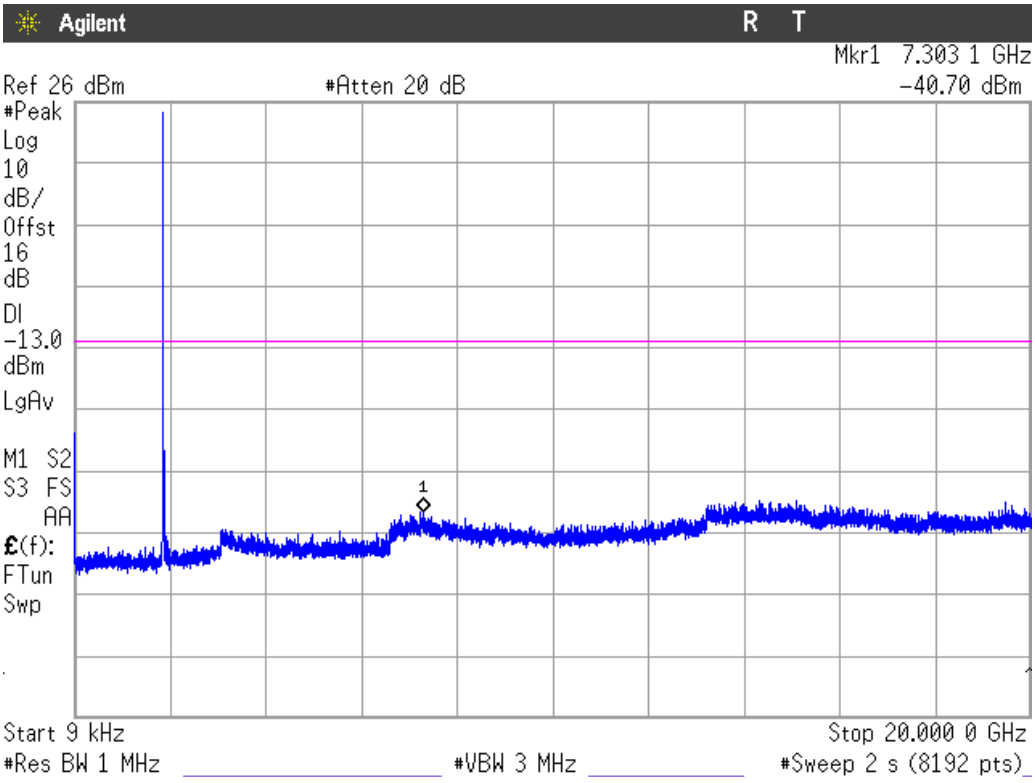
3. CHANNEL: HIGHEST



Note: The peak above the limit is the carrier frequency.

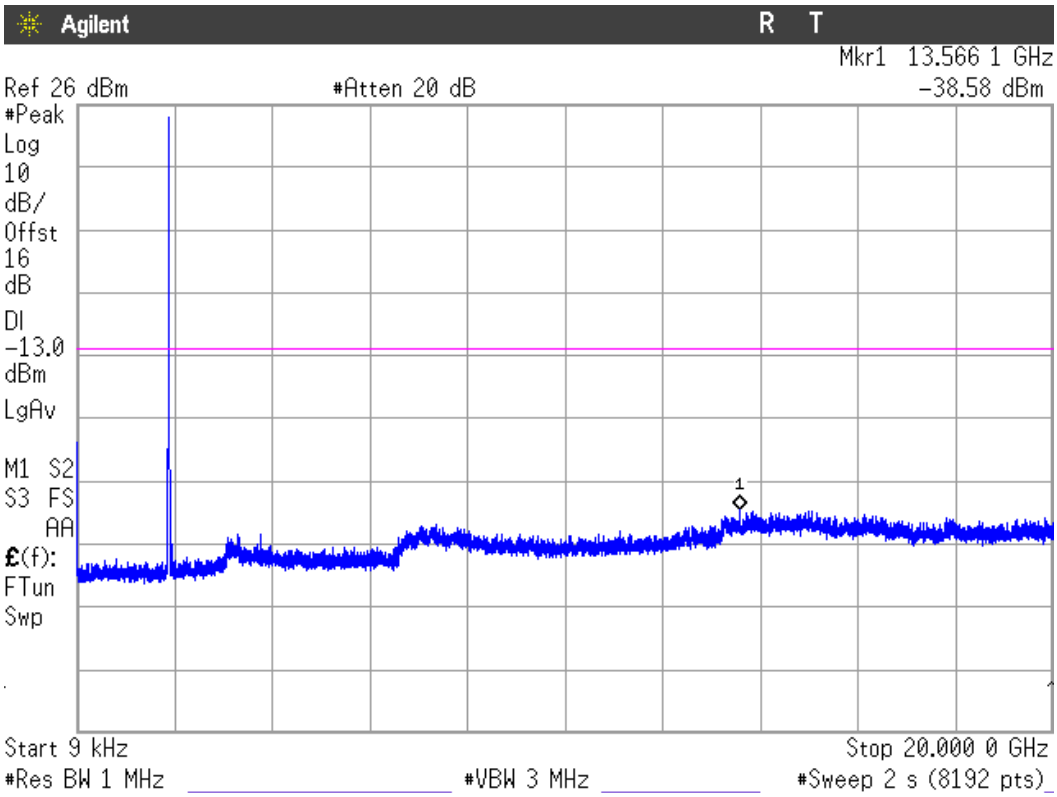
WCDMA MODULATION

1. CHANNEL: LOWEST



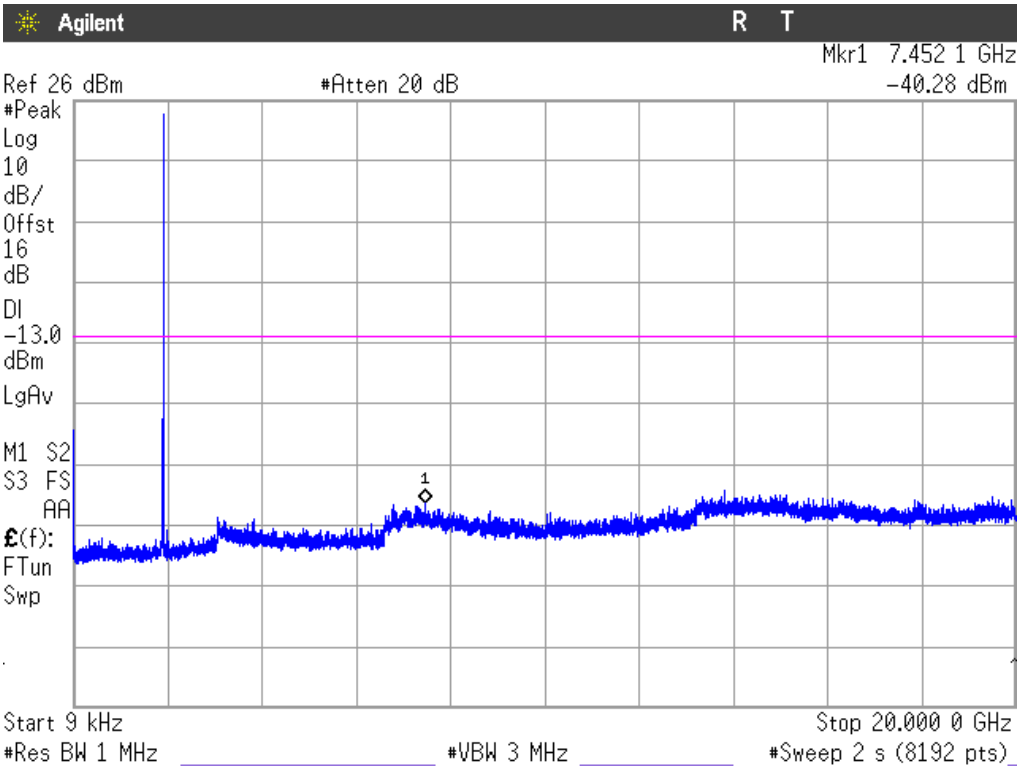
Note: The peak above the limit is the carrier frequency.

2. CHANNEL: MIDDLE



Note: The peak above the limit is the carrier frequency.

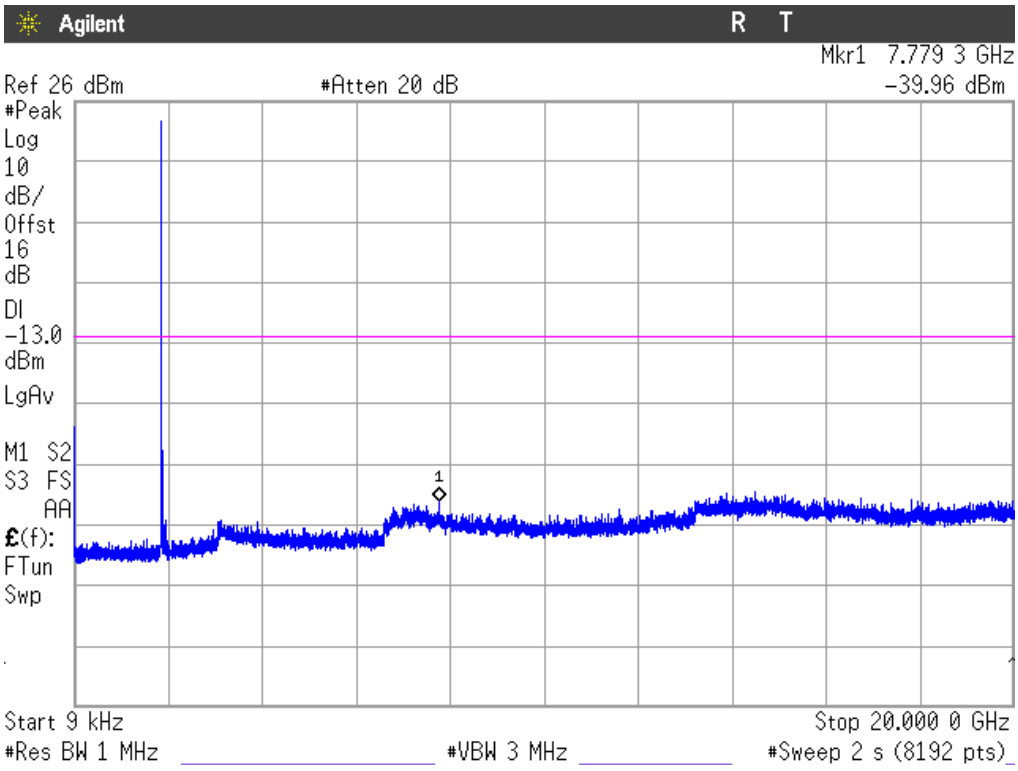
3. CHANNEL: HIGHEST



Note: The peak above the limit is the carrier frequency.

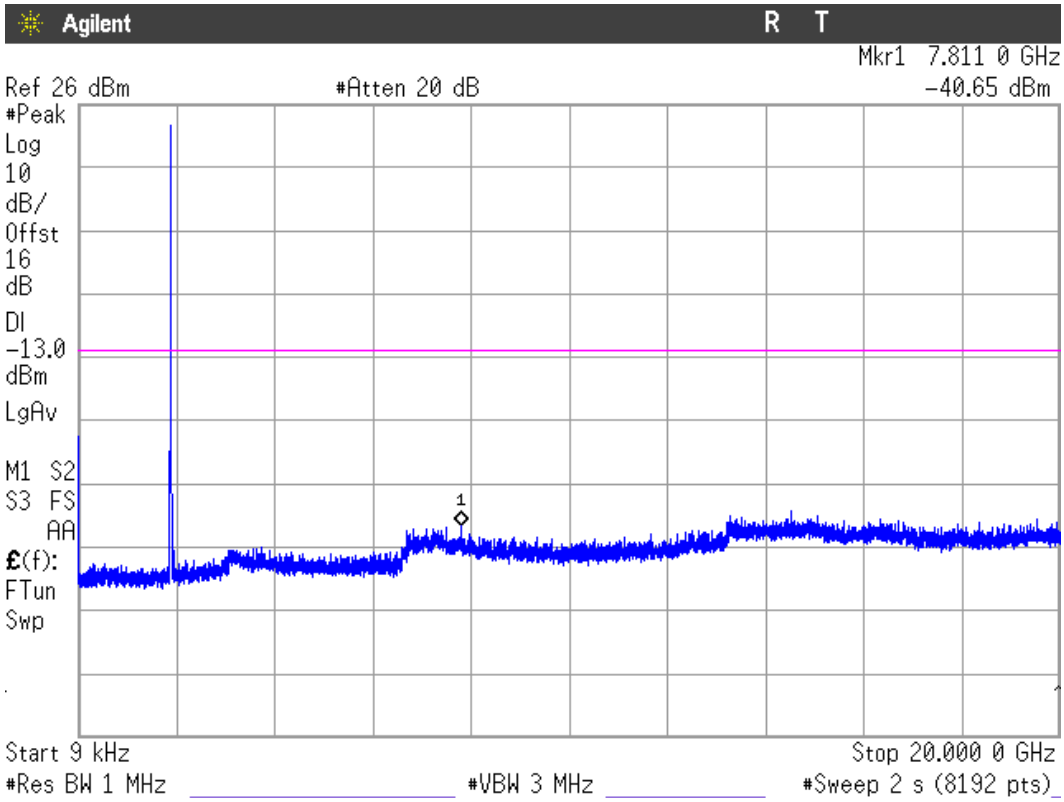
HSUPA MODULATION

1. CHANNEL: LOWEST



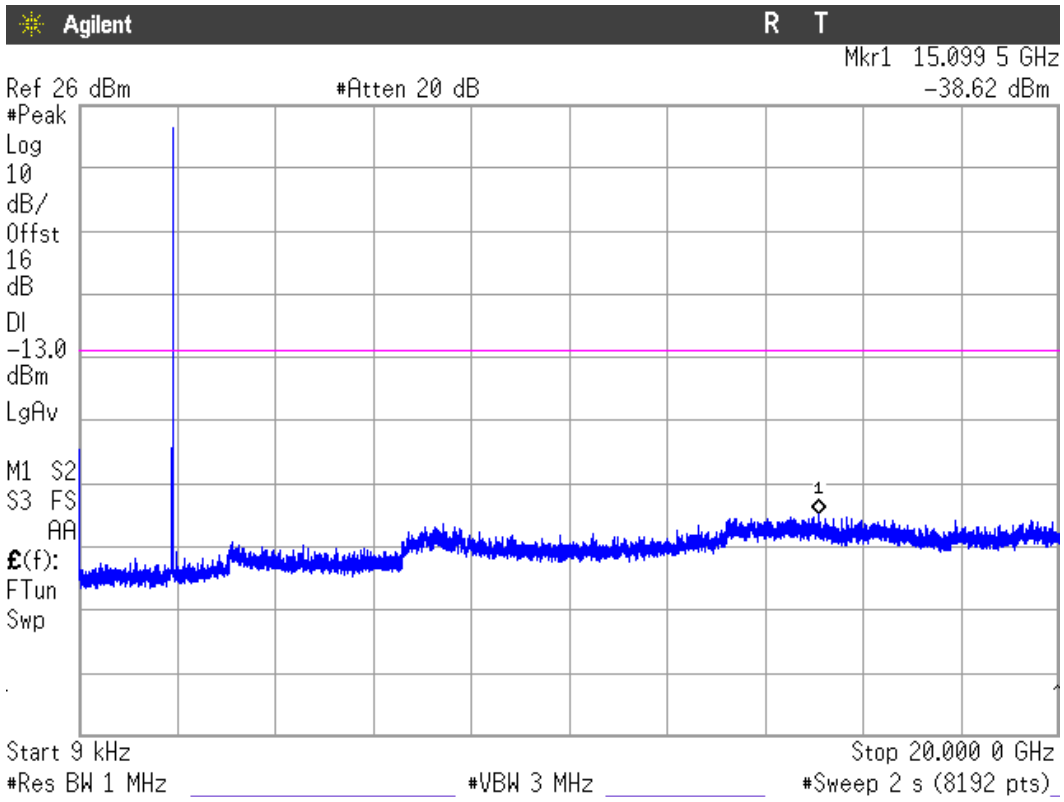
Note: The peak above the limit is the carrier frequency.

2. CHANNEL: MIDDLE



Note: The peak above the limit is the carrier frequency.

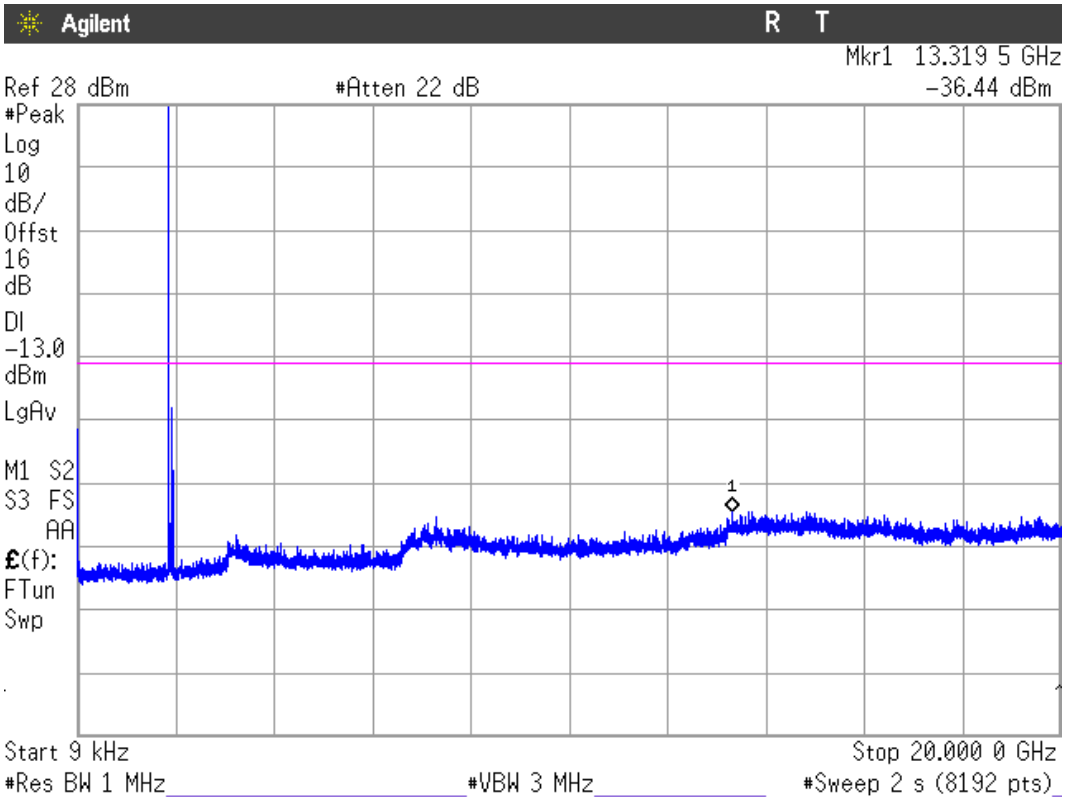
3. CHANNEL: HIGHEST



Note: The peak above the limit is the carrier frequency.

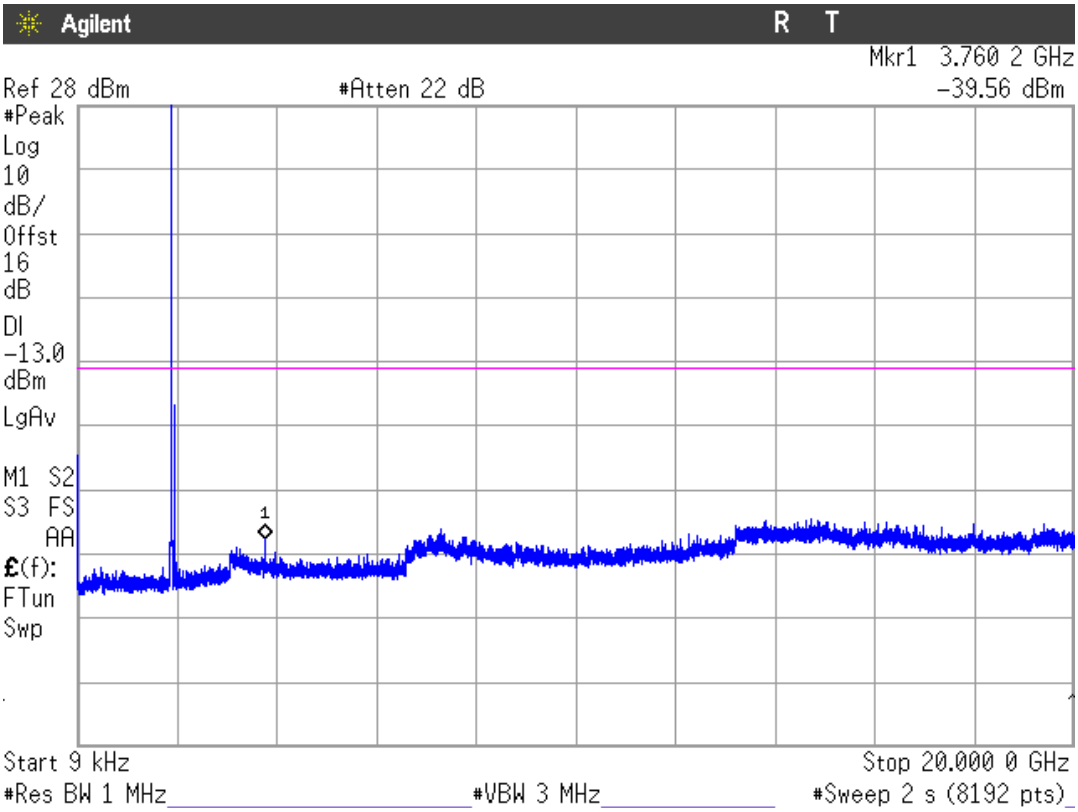
LTE QPSK MODULATION. BW = 1.4 MHz

1. CHANNEL: LOWEST



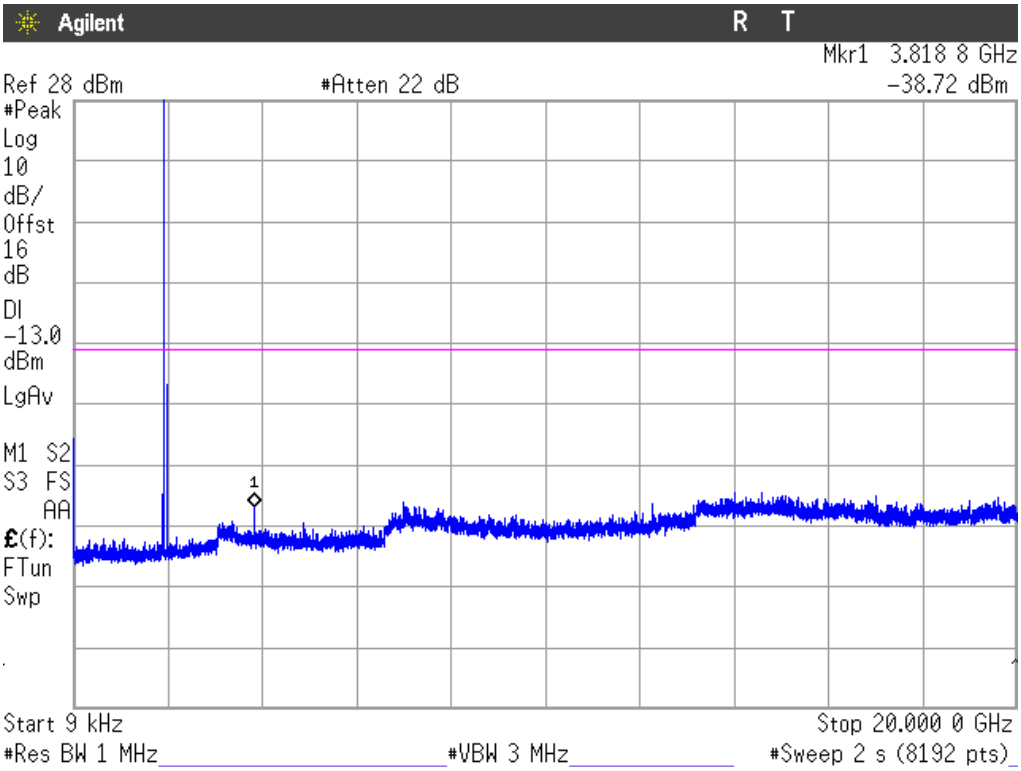
Note: The peak above the limit is the carrier frequency.

2. CHANNEL: MIDDLE



Note: The peak above the limit is the carrier frequency.

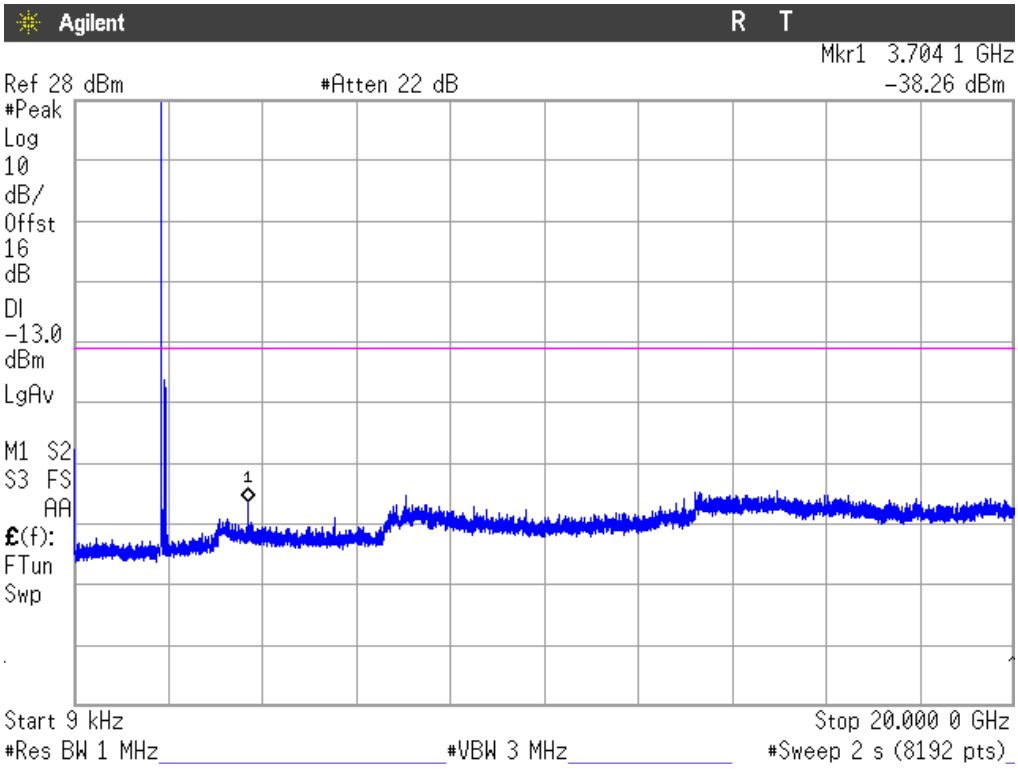
3. CHANNEL: HIGHEST



Note: The peak above the limit is the carrier frequency.

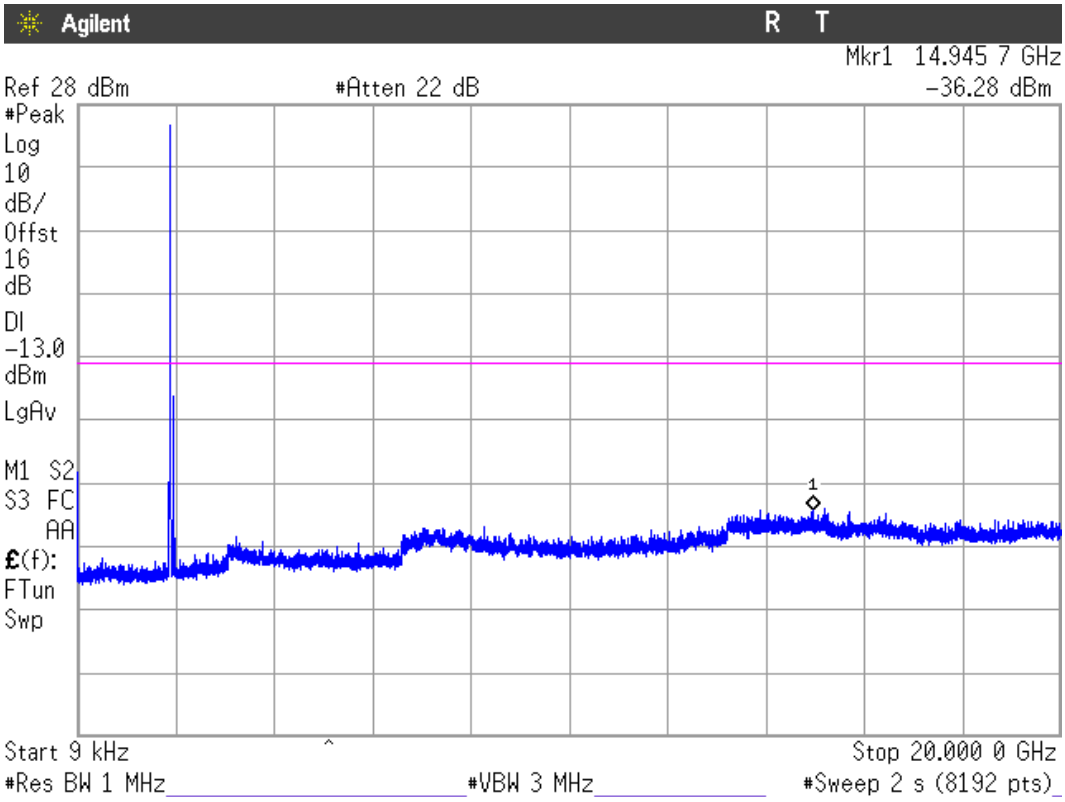
LTE QPSK MODULATION. BW = 3 MHz

1. CHANNEL: LOWEST



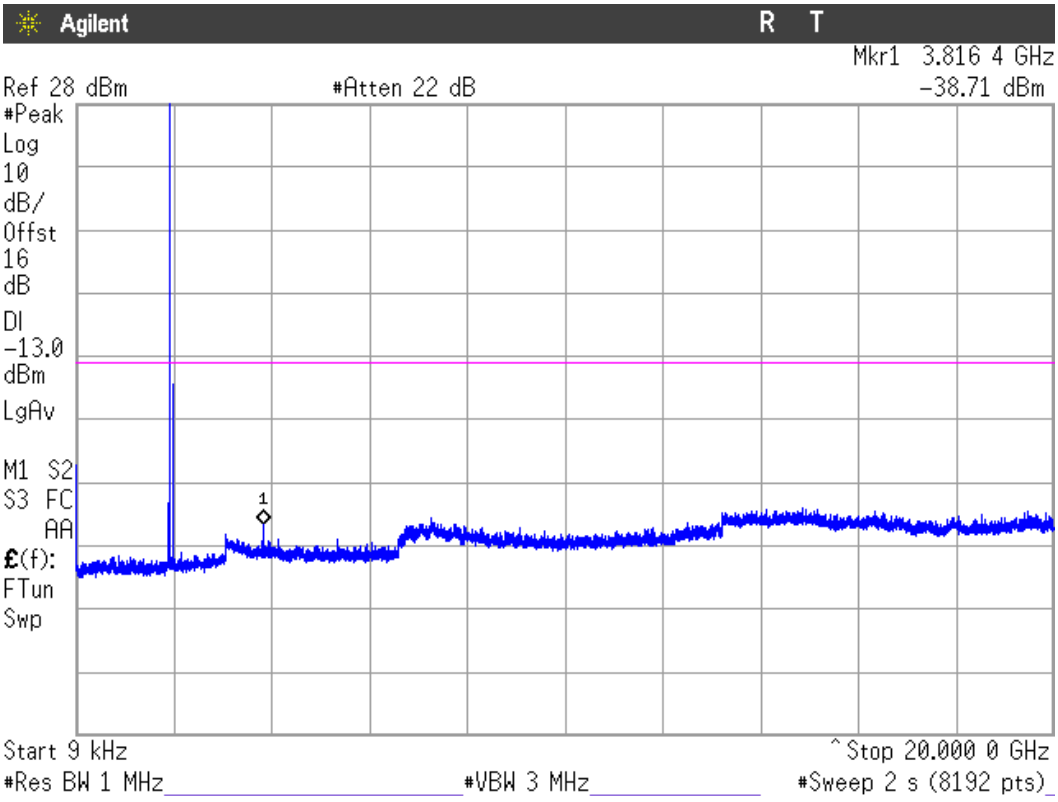
Note: The peak above the limit is the carrier frequency.

2. CHANNEL: MIDDLE



Note: The peak above the limit is the carrier frequency.

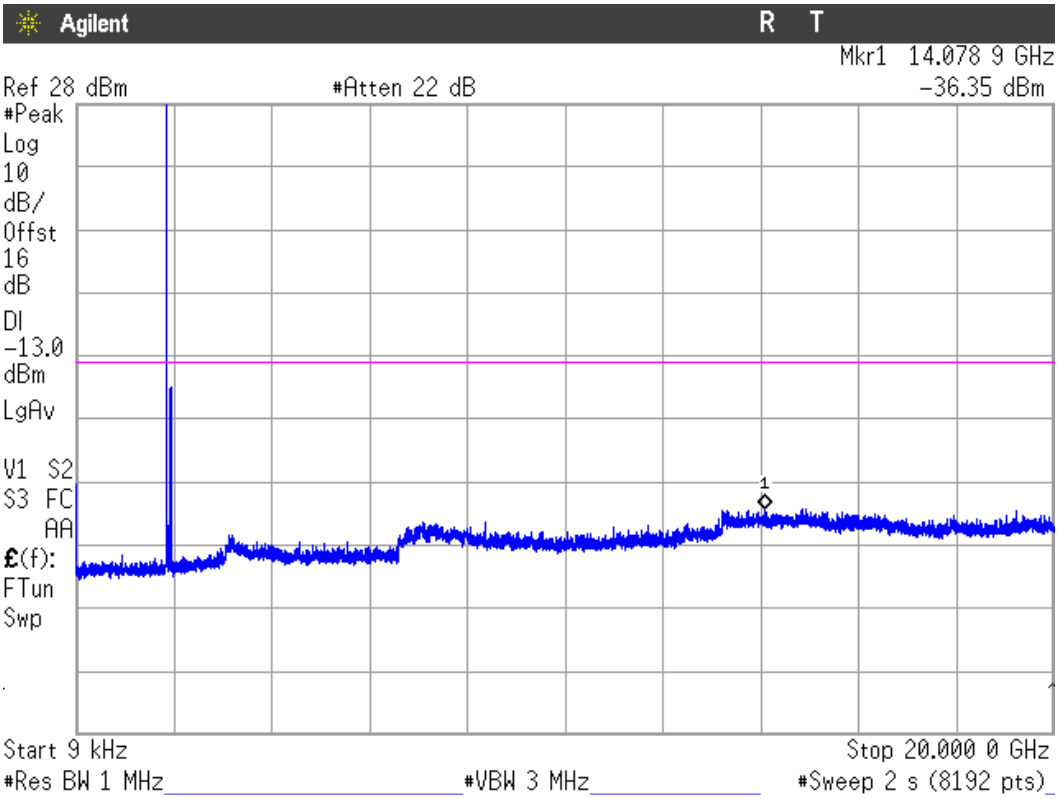
3. CHANNEL: HIGHEST



Note: The peak above the limit is the carrier frequency.

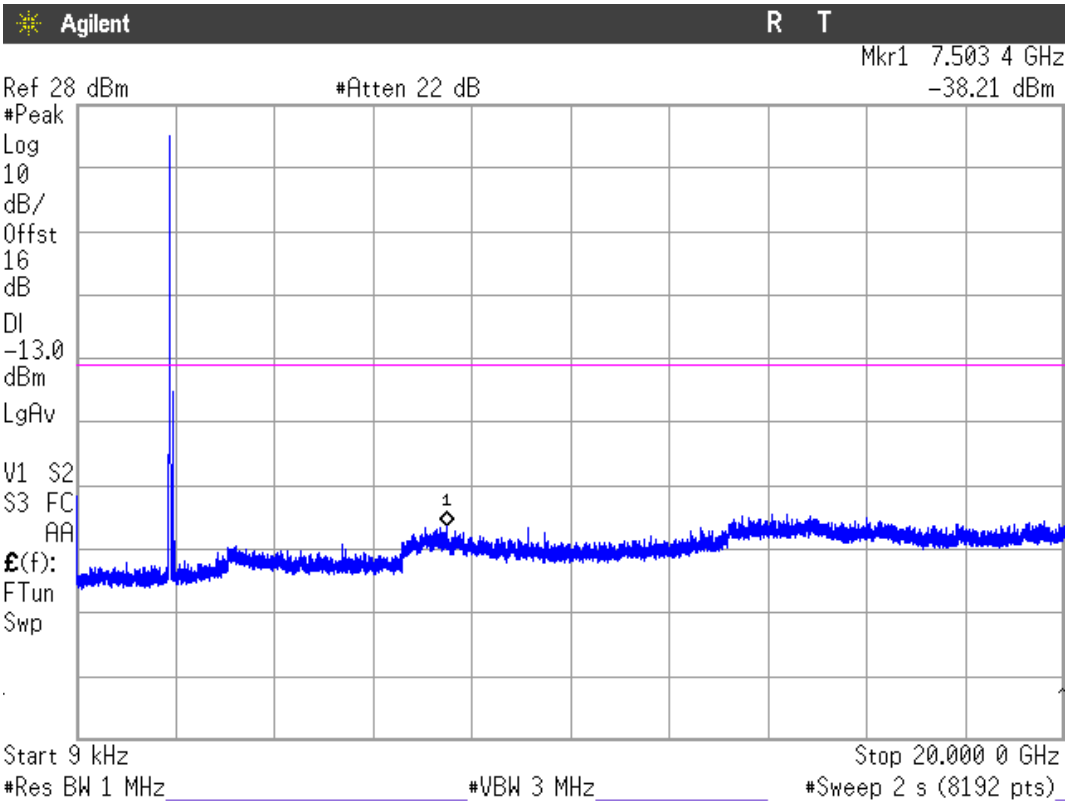
LTE QPSK MODULATION. BW = 5 MHz

1. CHANNEL: LOWEST



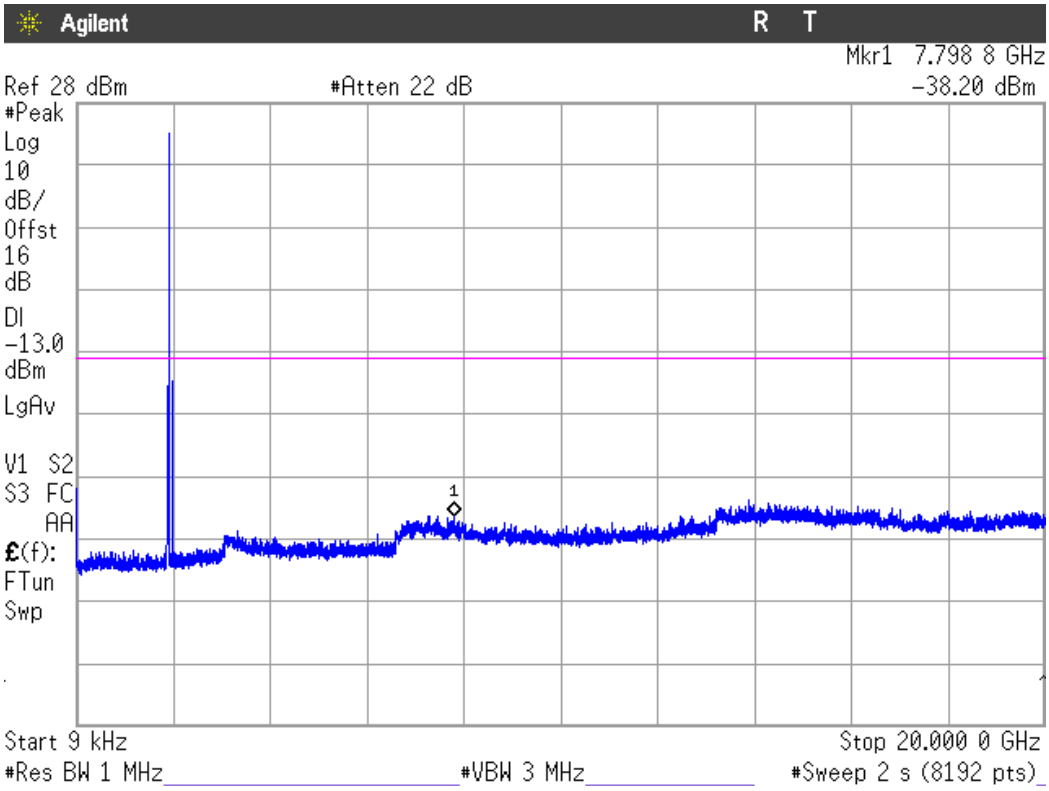
Note: The peak above the limit is the carrier frequency.

2. CHANNEL: MIDDLE



Note: The peak above the limit is the carrier frequency.

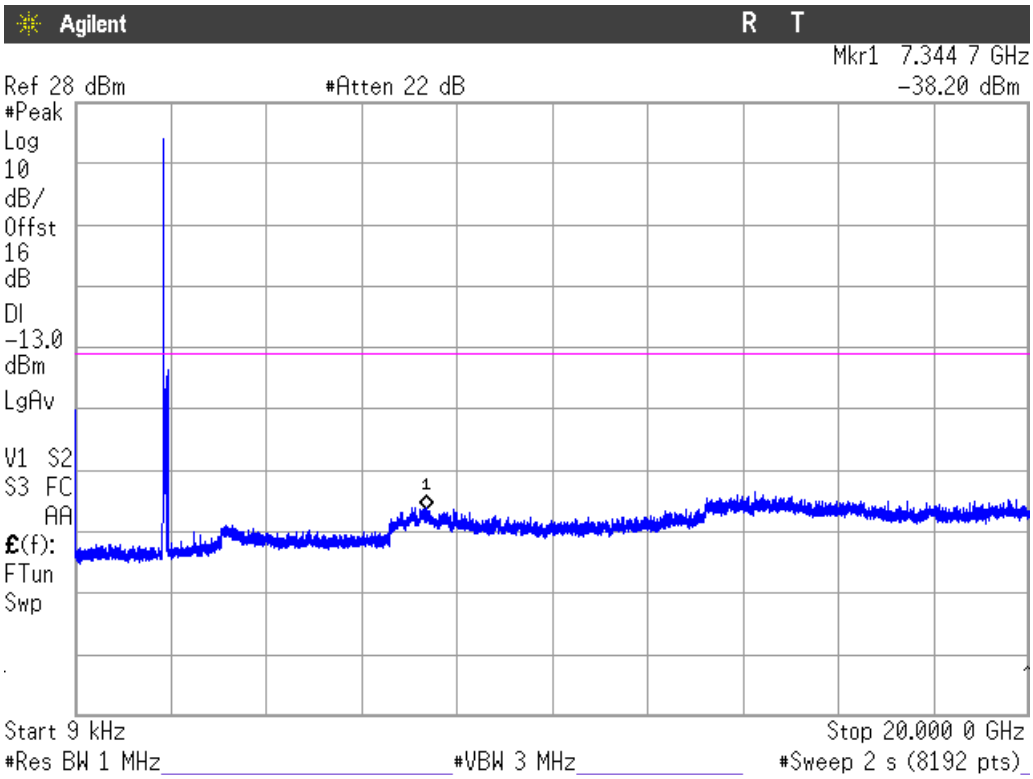
3. CHANNEL: HIGHEST



Note: The peak above the limit is the carrier frequency.

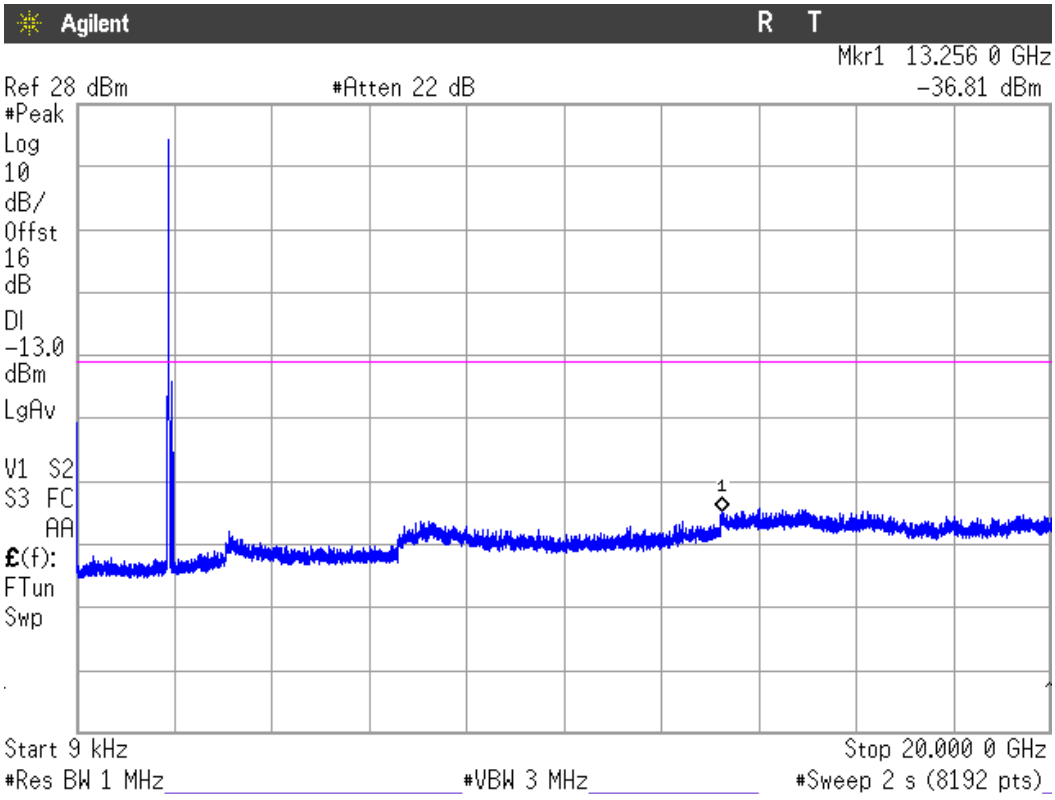
LTE QPSK MODULATION. BW = 10 MHz

1. CHANNEL: LOWEST



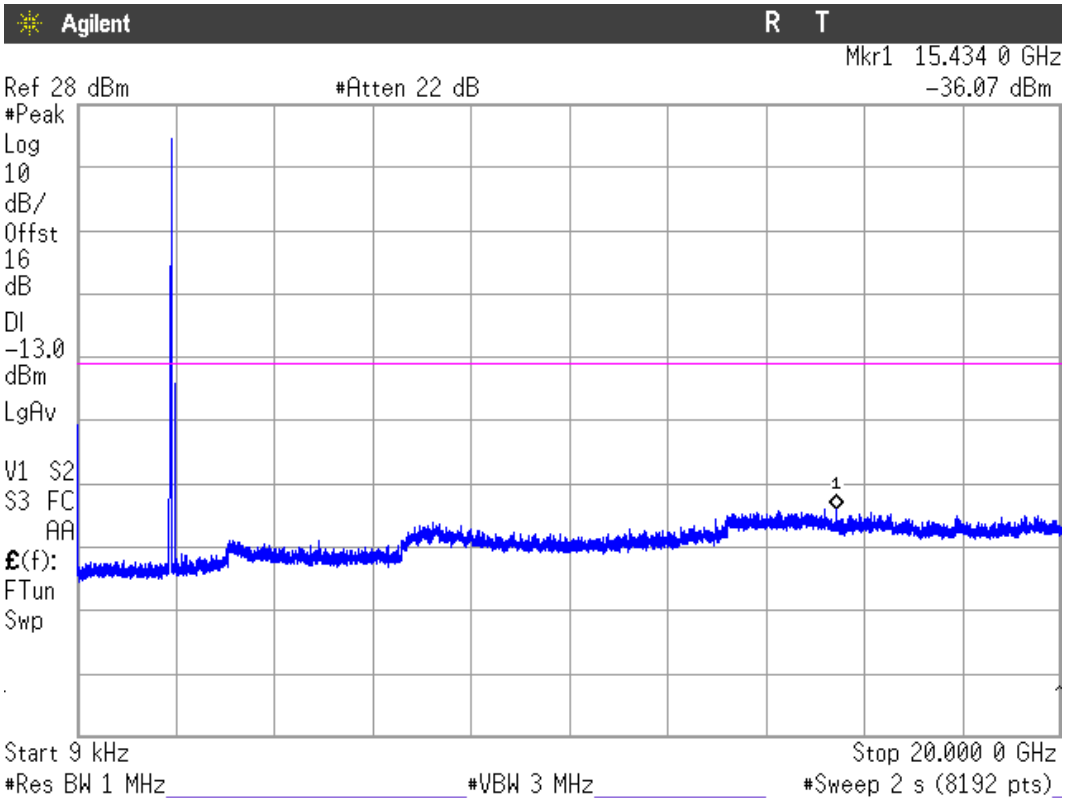
Note: The peak above the limit is the carrier frequency.

2. CHANNEL: MIDDLE



Note: The peak above the limit is the carrier frequency.

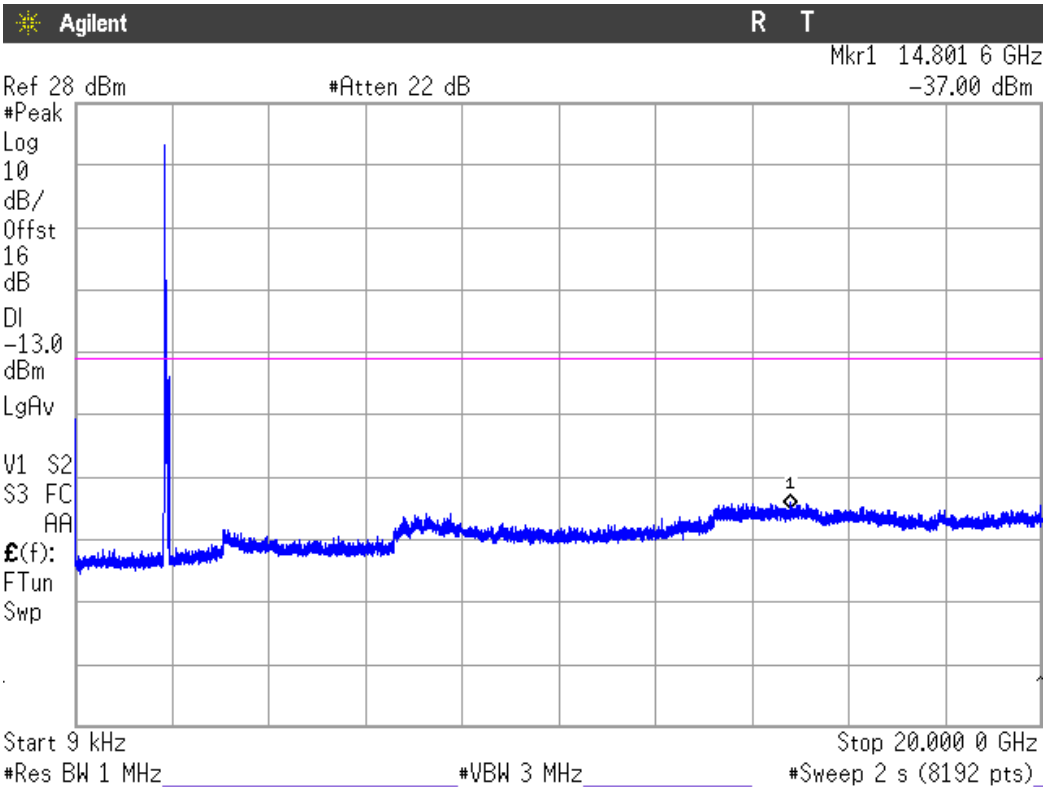
3. CHANNEL: HIGHEST



Note: The peak above the limit is the carrier frequency.

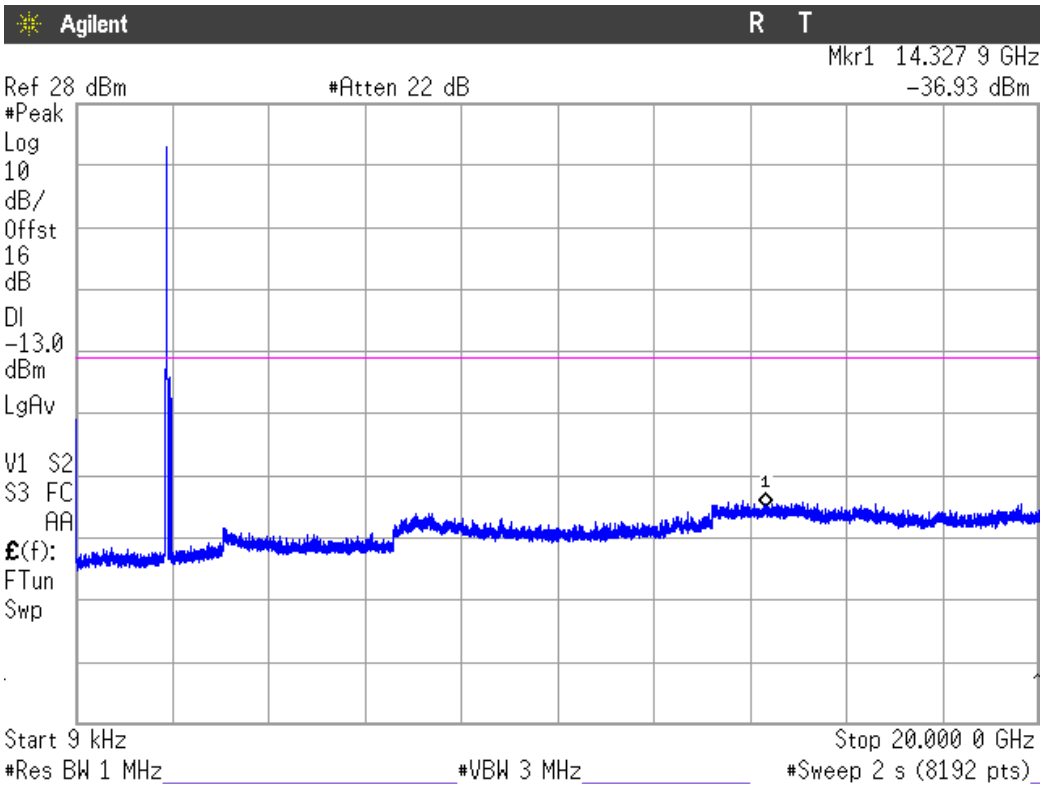
LTE QPSK MODULATION. BW = 15 MHz

1. CHANNEL: LOWEST



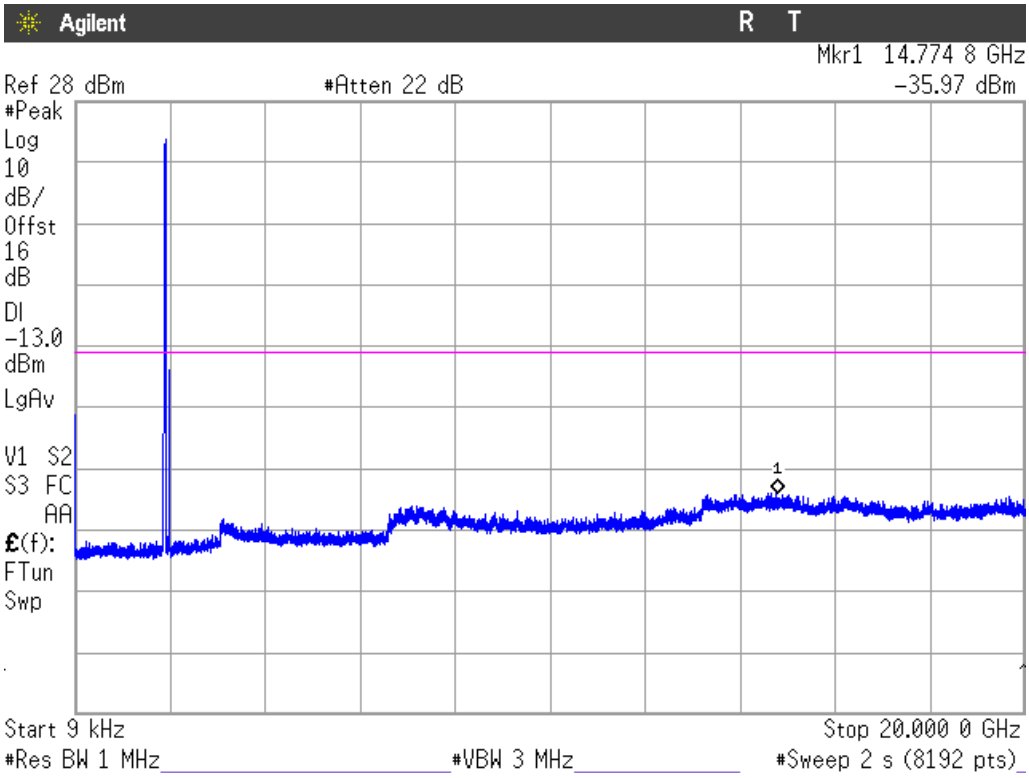
Note: The peak above the limit is the carrier frequency.

2. CHANNEL: MIDDLE



Note: The peak above the limit is the carrier frequency.

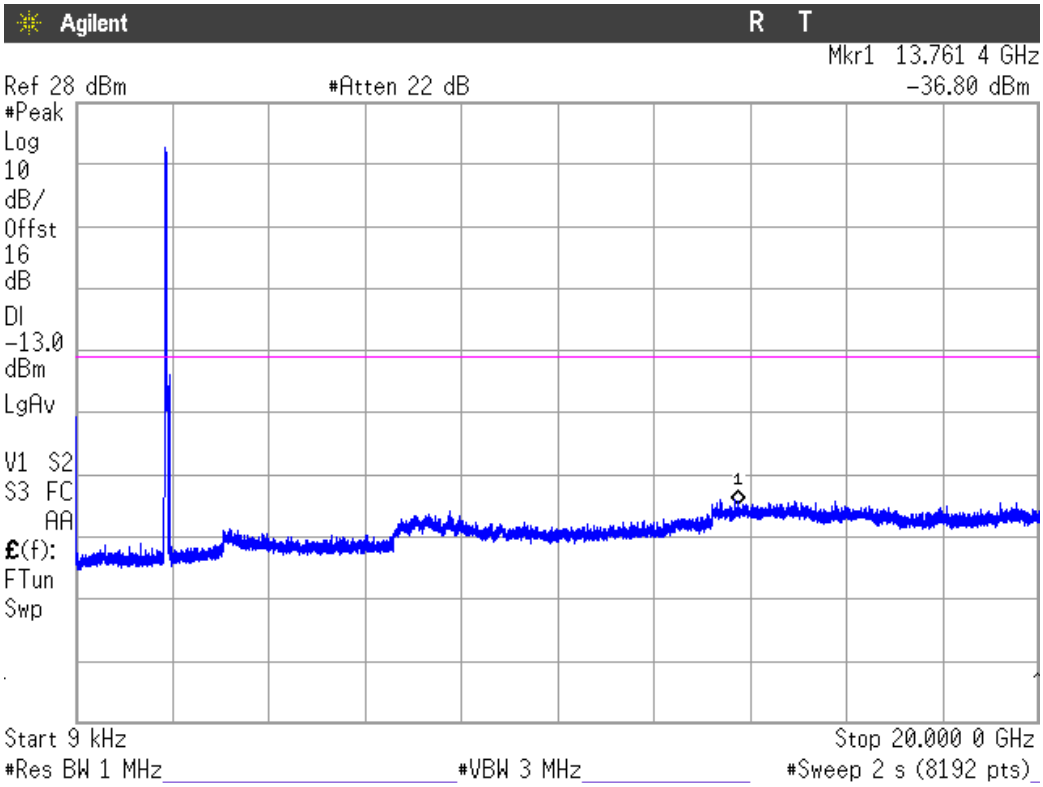
3. CHANNEL: HIGHEST



Note: The peak above the limit is the carrier frequency.

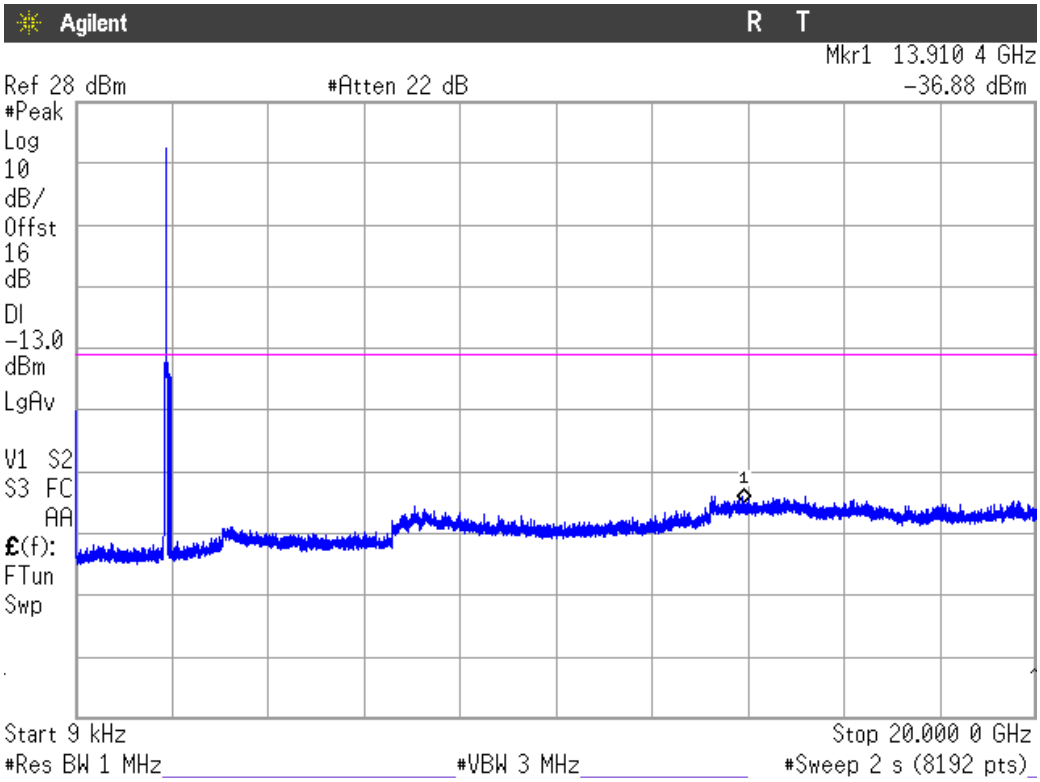
LTE QPSK MODULATION. BW = 20 MHz

1. CHANNEL: LOWEST



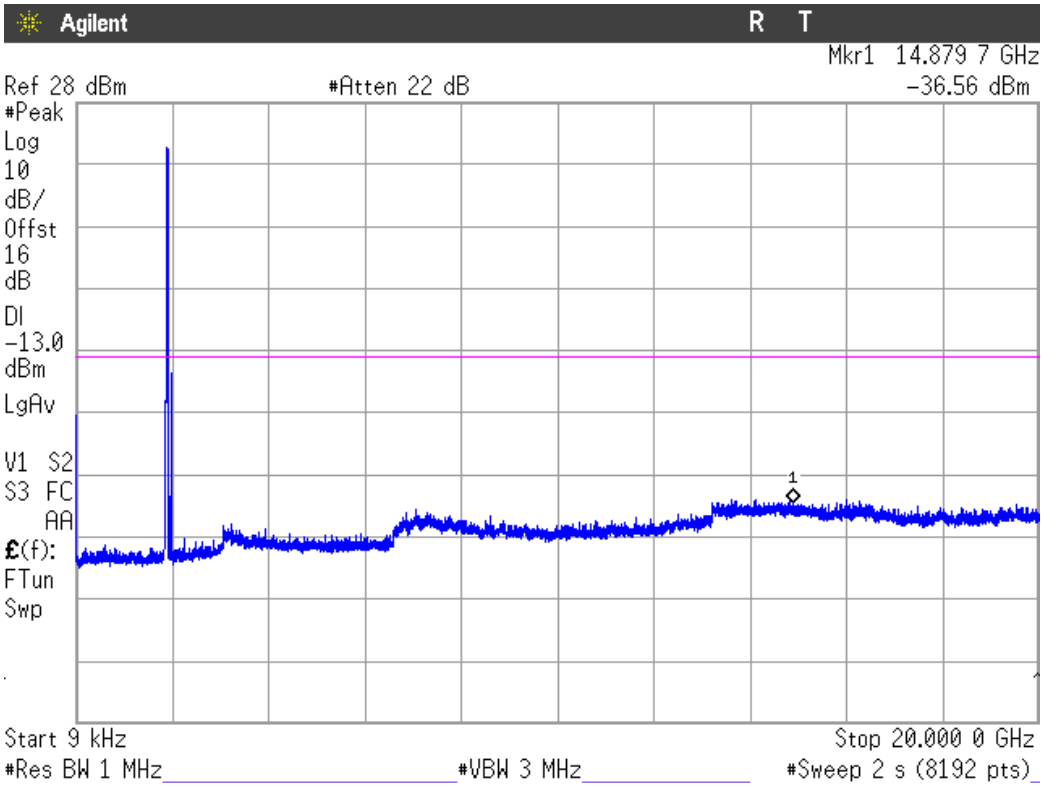
Note: The peak above the limit is the carrier frequency.

2. CHANNEL: MIDDLE



Note: The peak above the limit is the carrier frequency.

3. CHANNEL: HIGHEST



Note: The peak above the limit is the carrier frequency.

Spurious emissions at antenna terminals at Block Edges

SPECIFICATION

FCC §2.1051 and §24.238

RSS-133. Clause 6.5.

METHOD

As indicated in FCC part 24. in the 1 MHz bands immediately outside and adjacent to the frequency block or band a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

Measurement Limit**:**
According to specification. the power of emissions shall be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. P in watts.
At Po transmitting power. the specified minimum attenuation becomes 43+10log (Po). and the level in dBm relative Po becomes:

Po (dBm) – [43 + 10 log (Po in mwatts) - 30] = - 13 dBm

RESULTS (see plots in next pages)

MODULATION:	GPRS	EDGE	WCDMA	HSUPA
Maximum measured level at lowest Block Edge at antenna port (dBm)	-22.51	-30.85	-32.40	-33.13

MODULATION:	GPRS	EDGE	WCDMA	HSUPA
Maximum measured level at highest Block Edge at antenna port (dBm)	-23.23	-31.94	-32.33	-32.78

LTE QPSK MODULATION:	RB=1, Offset=0, BW=1.4 MHz	RB=1 , Offset =0, BW = 3 MHz	RB=1 , Offset =0, BW = 5 MHz	RB=1 , Offset =0, BW = 10 MHz	RB=1 , Offset =0, BW = 15 MHz	RB=1 , Offset =0, BW = 20 MHz
Maximum measured level at lowest Block Edge at antenna port (dBm)	-24.55	-20.98	-21.46	-30.25	-28.59	-30.56

LTE QPSK MODULATION:	RB= All, Offset=0, BW=1.4 MHz	RB= All, Offset =0, BW = 3 MHz	RB= All, Offset =0, BW = 5 MHz	RB= All, Offset =0, BW = 10 MHz	RB= All, Offset =0, BW = 15 MHz	RB= All, Offset =0, BW = 20 MHz
Maximum measured level at lowest Block Edge at antenna port (dBm)	-28.00	-26.90	-27.91	-31.80	-32.89	-31.88

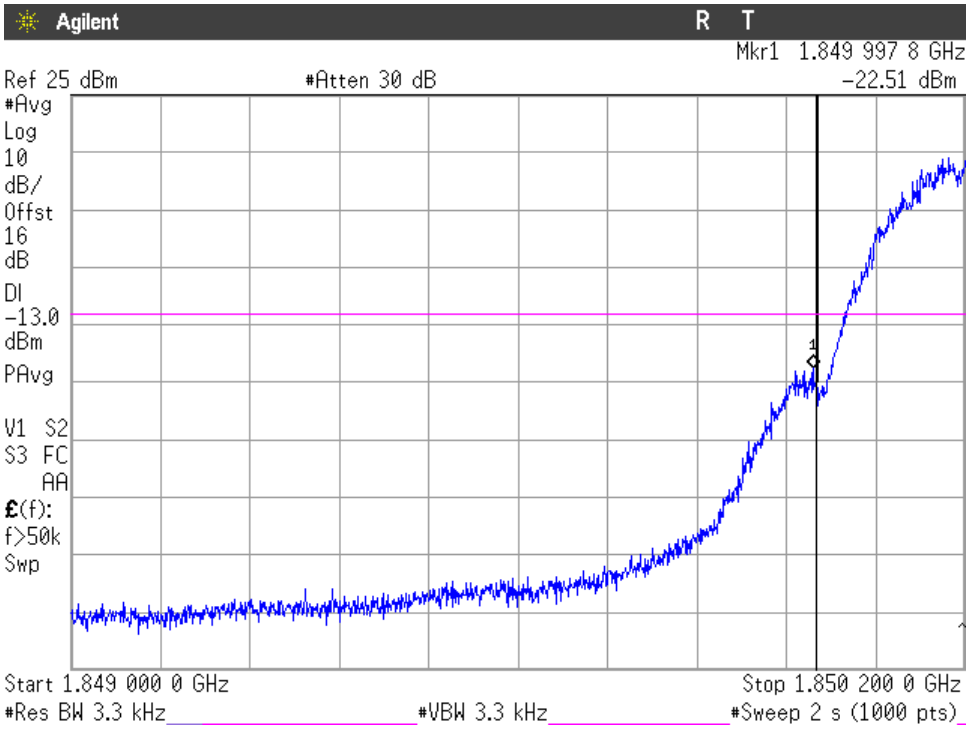
LTE QPSK MODULATION:	RB= 1, Offset=Max, BW=1.4 MHz	RB= 1, Offset=Max, BW = 3 MHz	RB= 1, Offset=Max, BW = 5 MHz	RB= 1, Offset=Max, BW = 10 MHz	RB= 1, Offset=Max, BW = 15 MHz	RB= 1, Offset=Max, BW = 20 MHz
Maximum measured level at highest Block Edge at antenna port (dBm)	-25.57	-23.04	-23.08	-32.09	-28.75	-29.88

LTE QPSK MODULATION:	RB= All, Offset=0, BW=1.4 MHz	RB= All, Offset =0, BW = 3 MHz	RB= All, Offset =0, BW = 5 MHz	RB= All, Offset =0, BW = 10 MHz	RB= All, Offset =0, BW = 15 MHz	RB= All, Offset =0, BW = 20 MHz
Maximum measured level at highest Block Edge at antenna port (dBm)	-31.04	-30.23	-28.23	-29.76	-30.46	-33.30

Measurement uncertainty = ±1.57 dB.

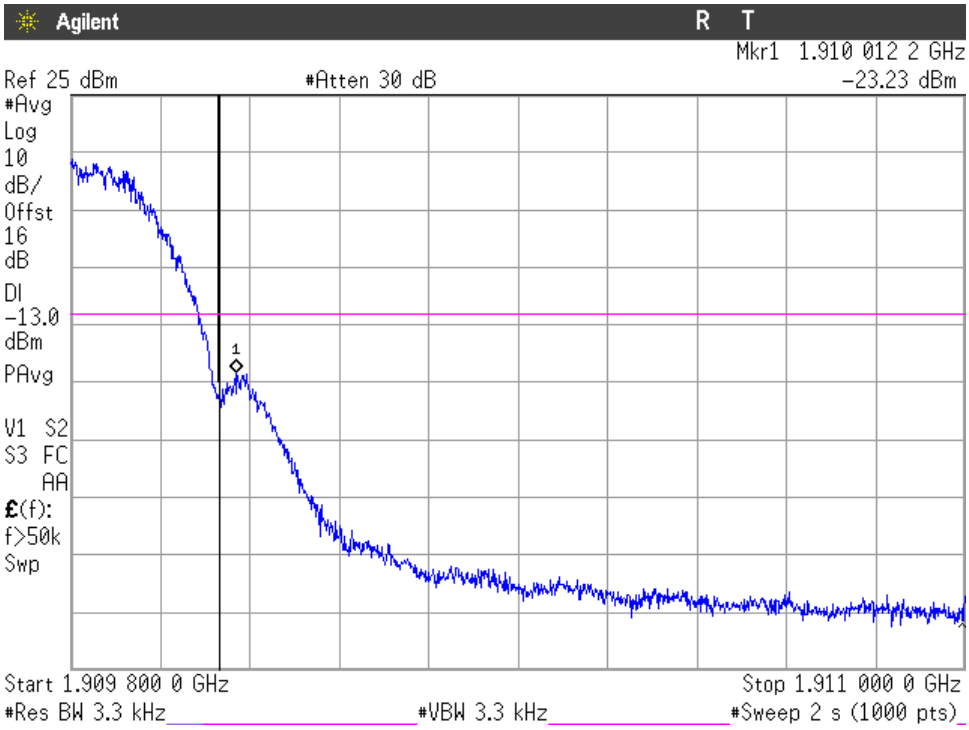
GPRS MODULATION

CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

CHANNEL HIGHEST

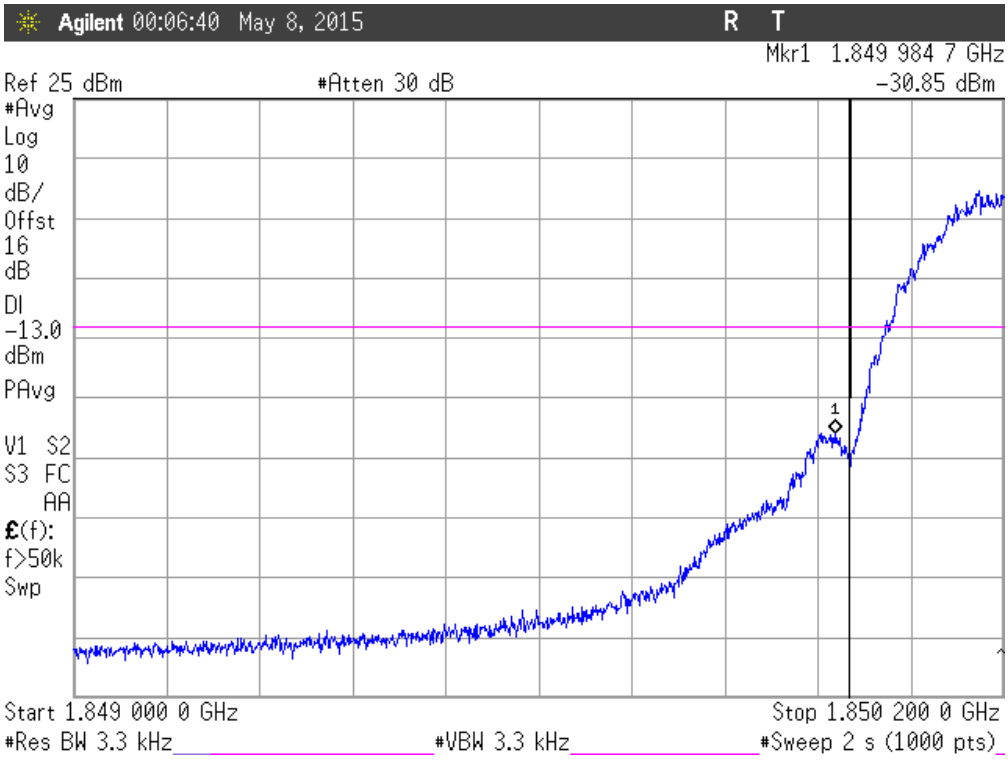


NOTE: The equipment transmits at the maximum output power

Verdict: PASS

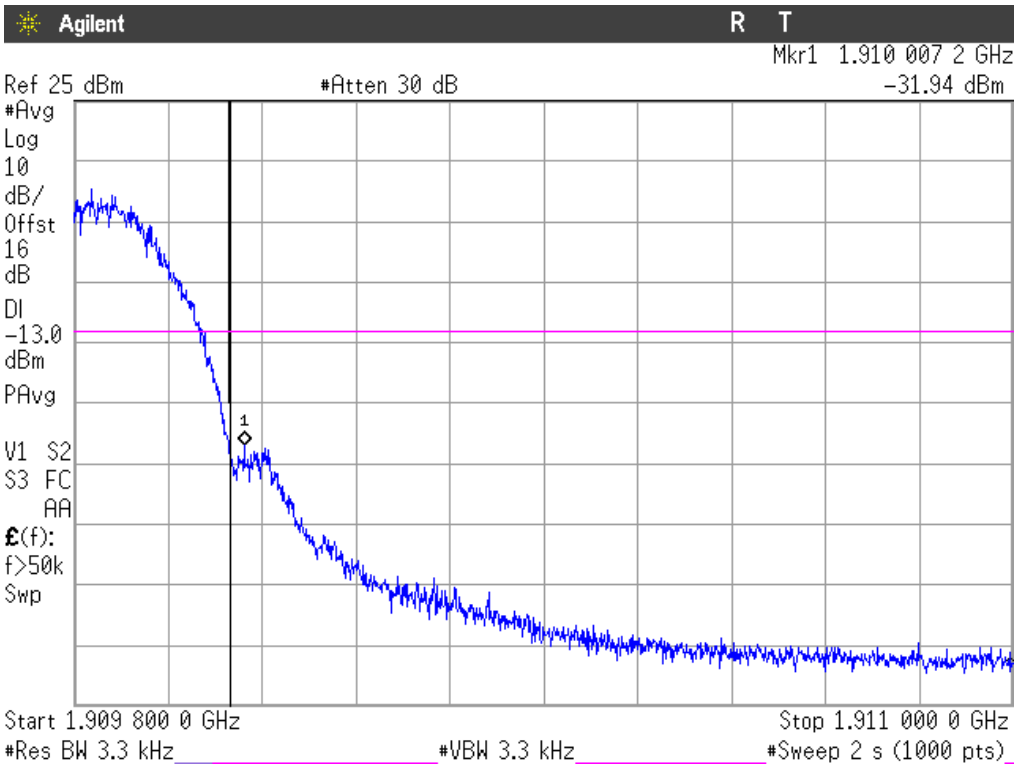
EDGE MODULATION

CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

CHANNEL HIGHEST

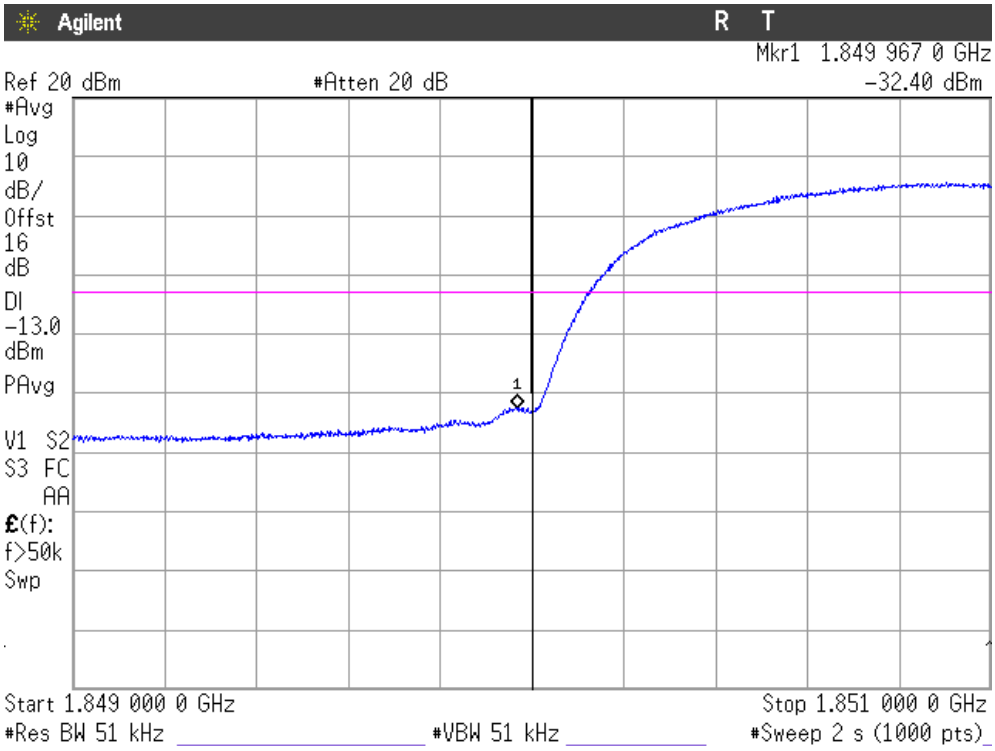


NOTE: The equipment transmits at the maximum output power

Verdict: PASS

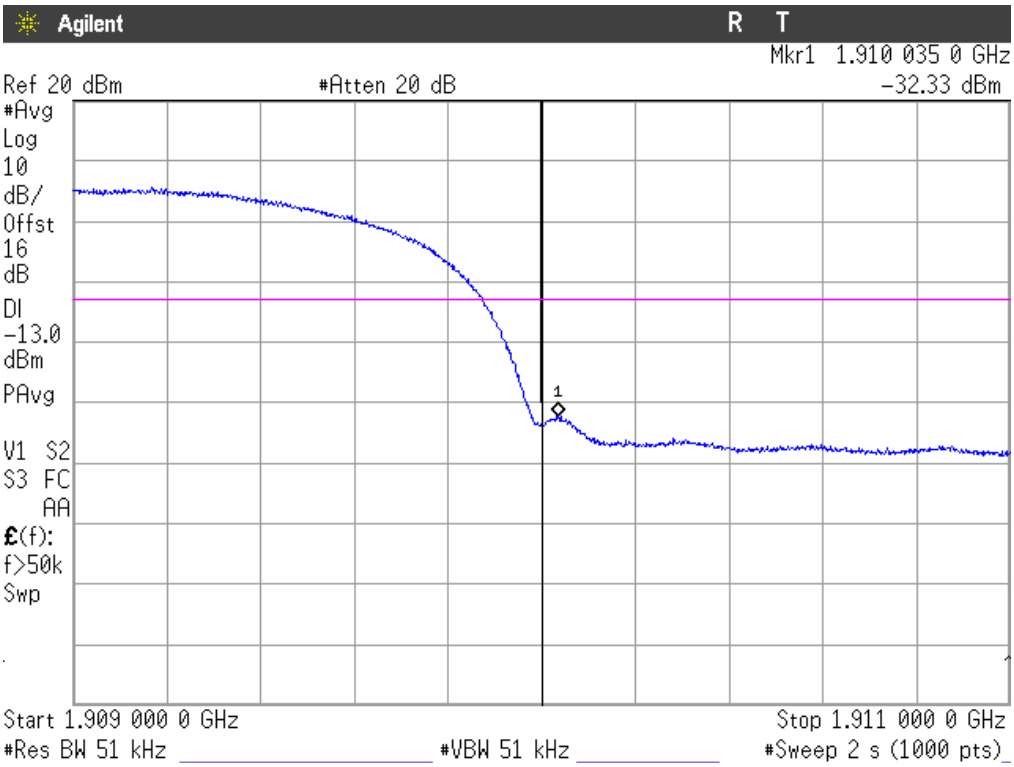
WCDMA MODULATION

CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

CHANNEL HIGHEST

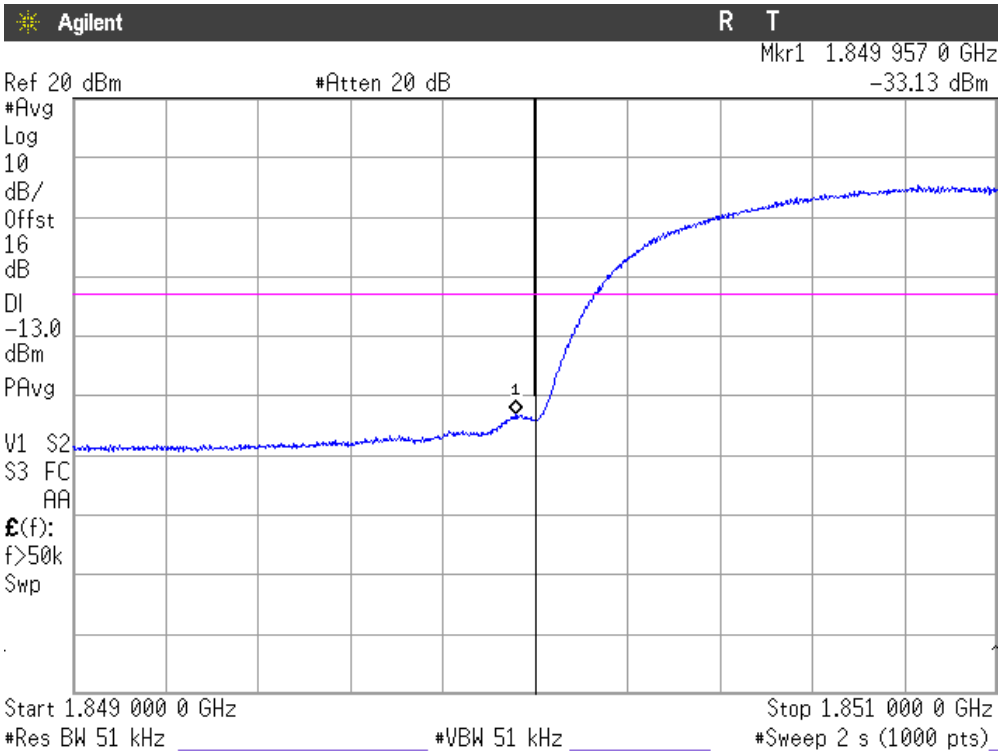


NOTE: The equipment transmits at the maximum output power

Verdict: PASS

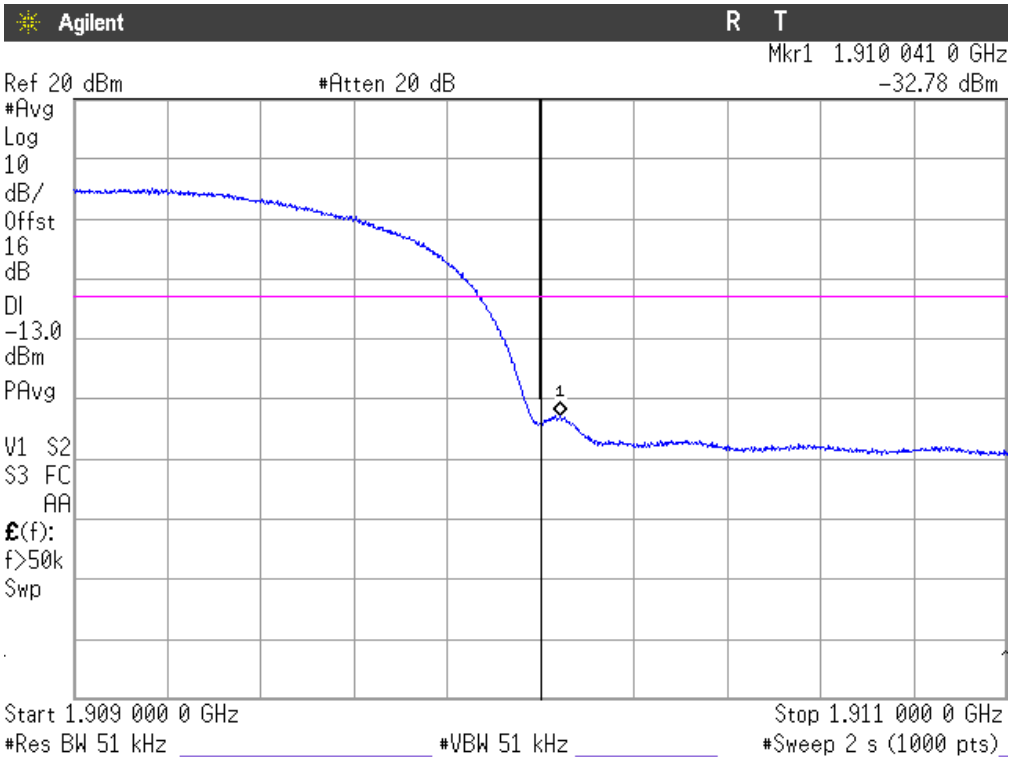
HSUPA MODULATION

CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

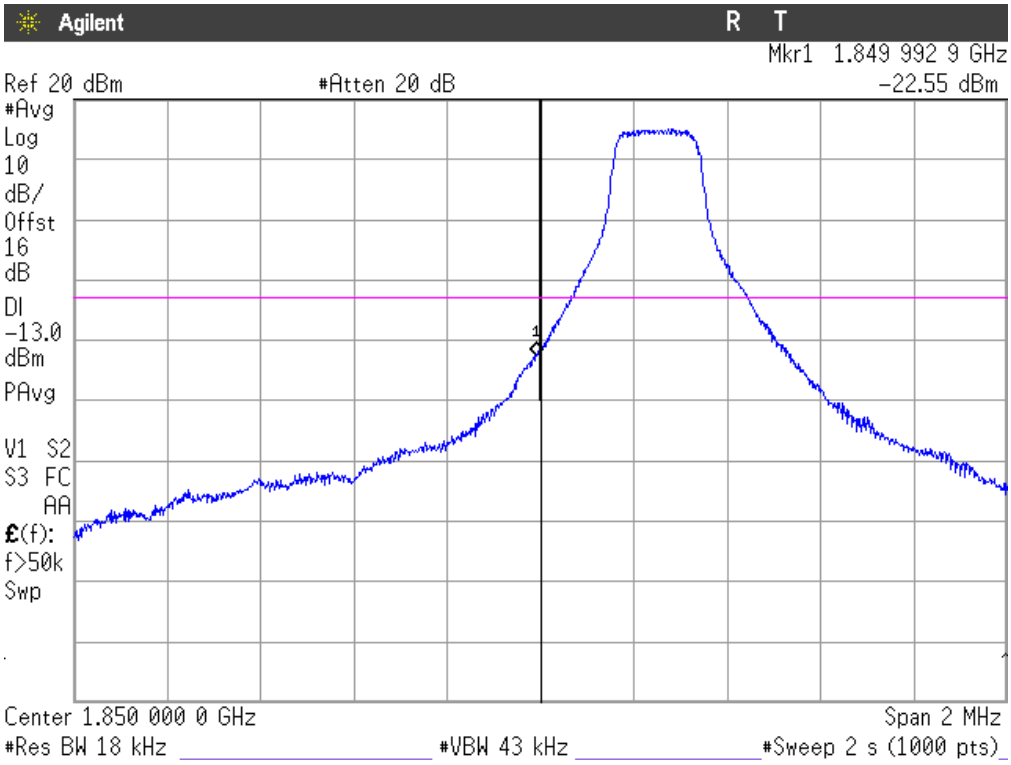
CHANNEL HIGHEST



NOTE: The equipment transmits at the maximum output power

LTE QPSK MODULATION. RB = 1, Offset = 0, BW = 1.4 MHz

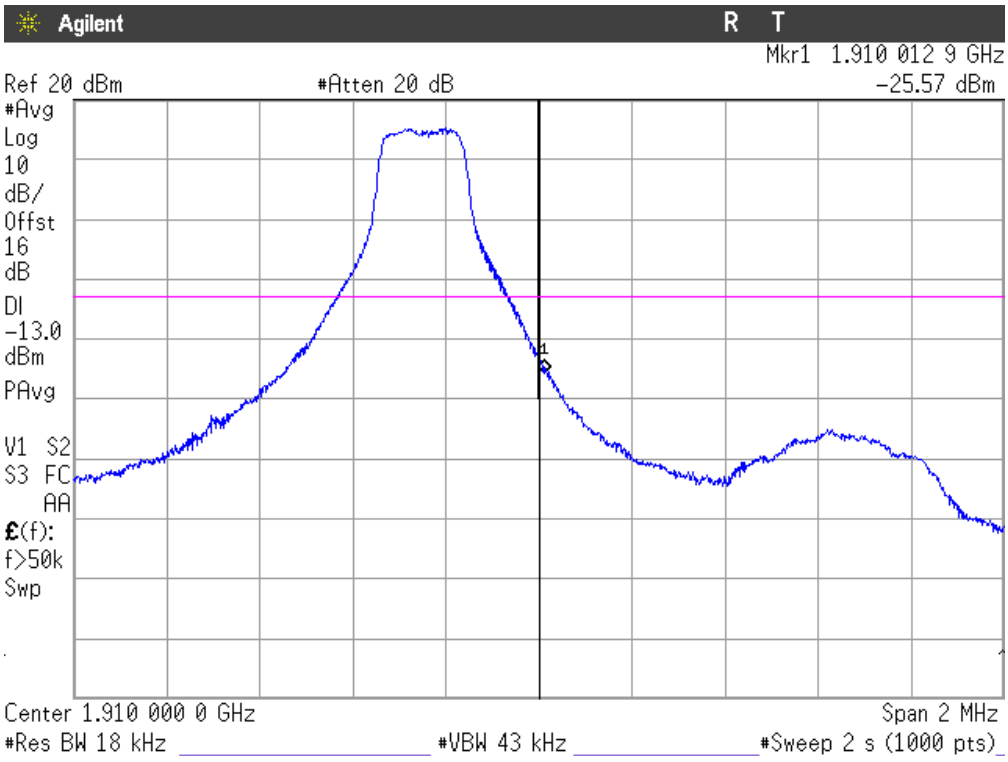
CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

LTE QPSK MODULATION. RB = 1, Offset = Max, BW = 1.4 MHz

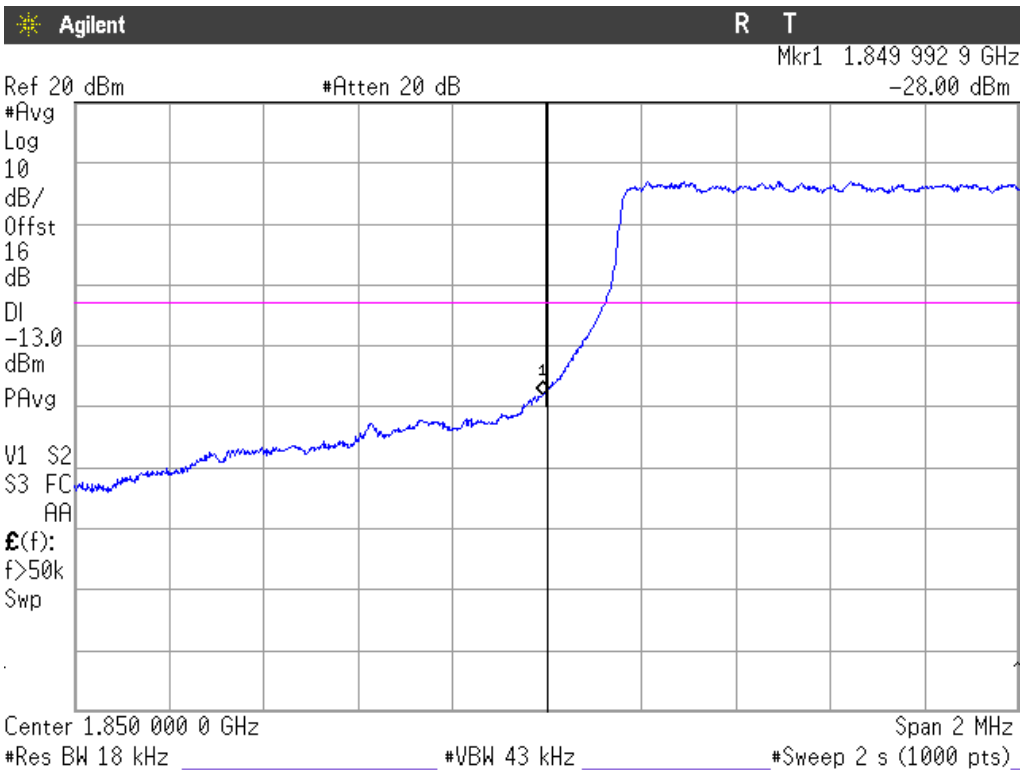
CHANNEL HIGHEST



NOTE: The equipment transmits at the maximum output power

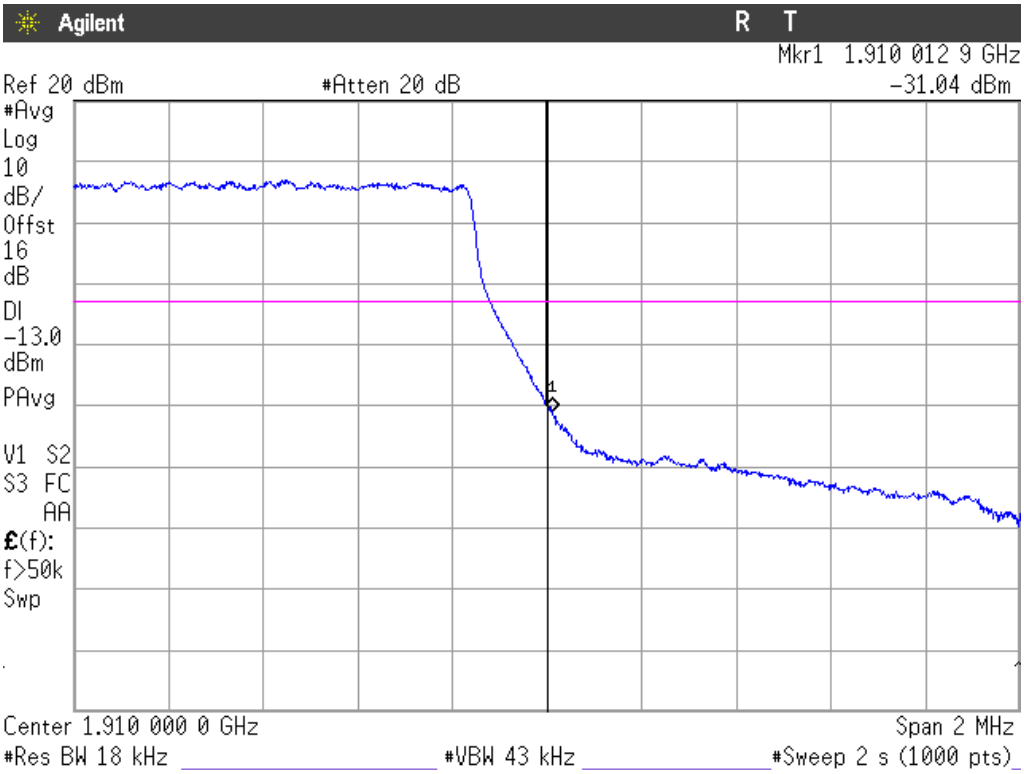
LTE QPSK MODULATION. RB = All, Offset = 0, BW = 1.4 MHz

CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

CHANNEL HIGHEST

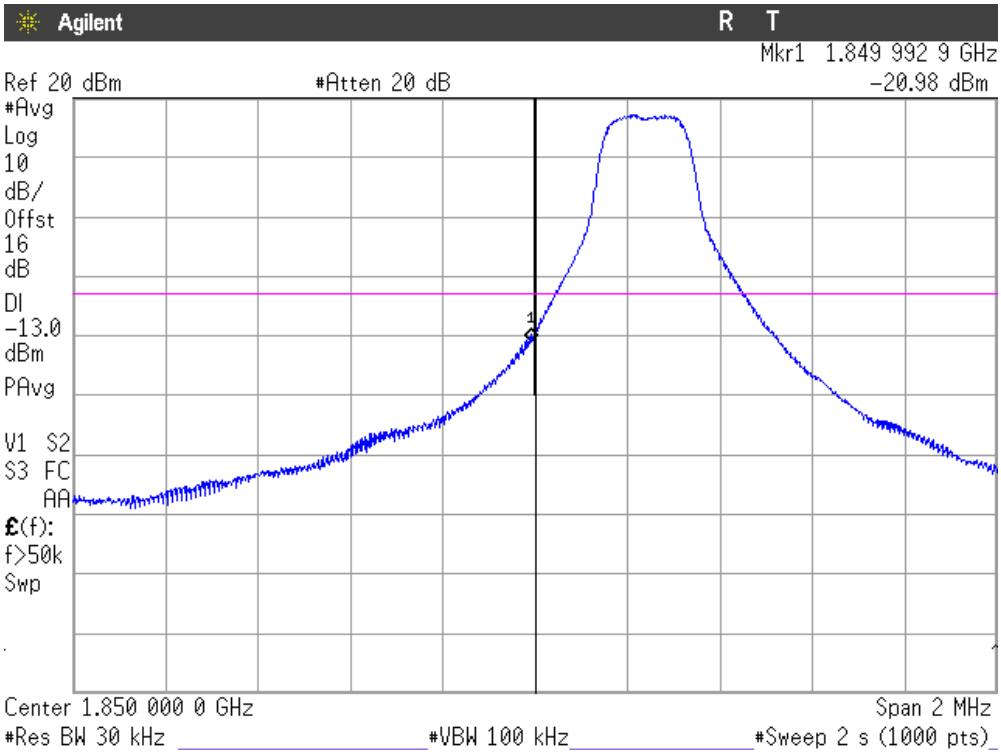


NOTE: The equipment transmits at the maximum output power

Verdict: PASS

LTE QPSK MODULATION. RB = 1, Offset = 0, BW = 3 MHz

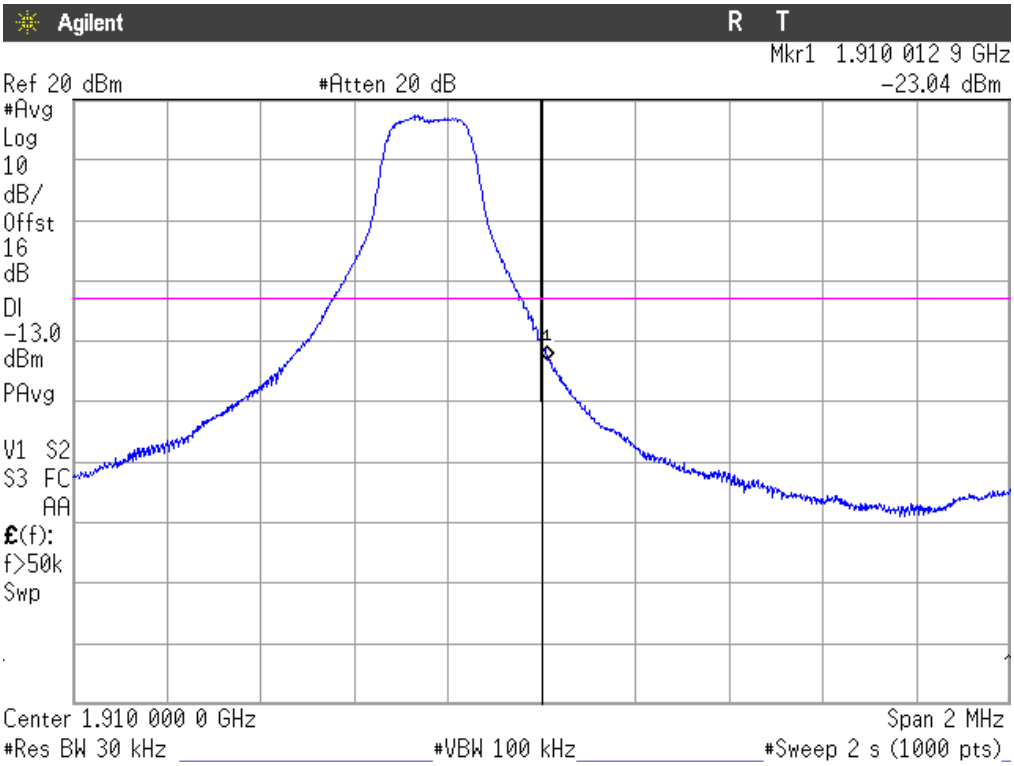
CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

LTE QPSK MODULATION. RB = 1, Offset = Max, BW = 3 MHz

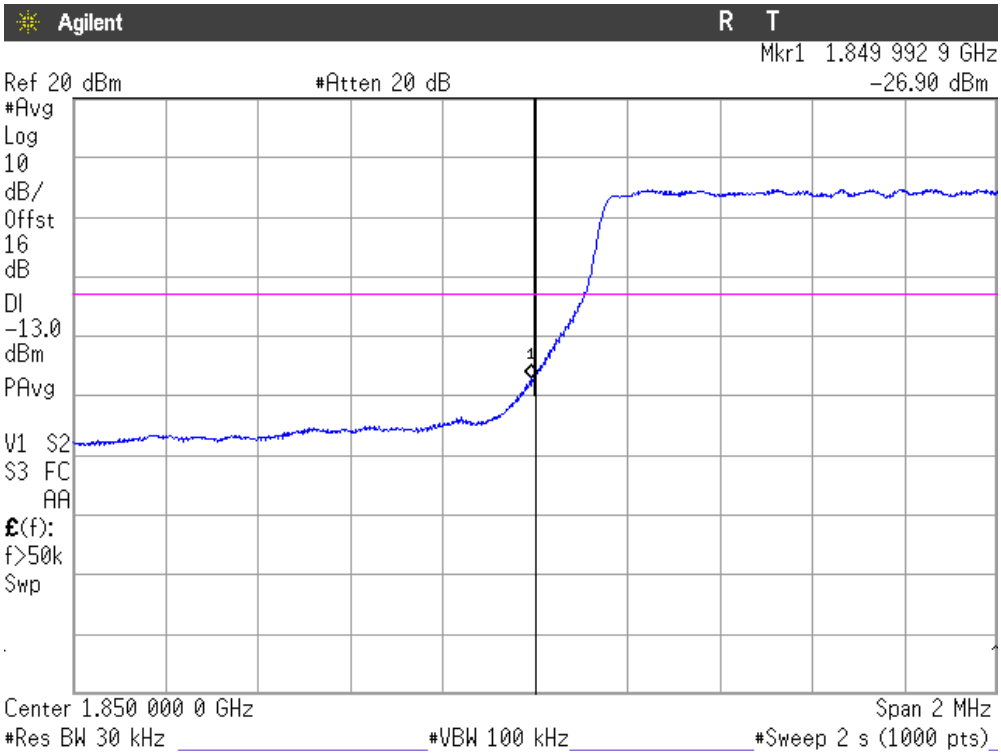
CHANNEL HIGHEST



NOTE: The equipment transmits at the maximum output power

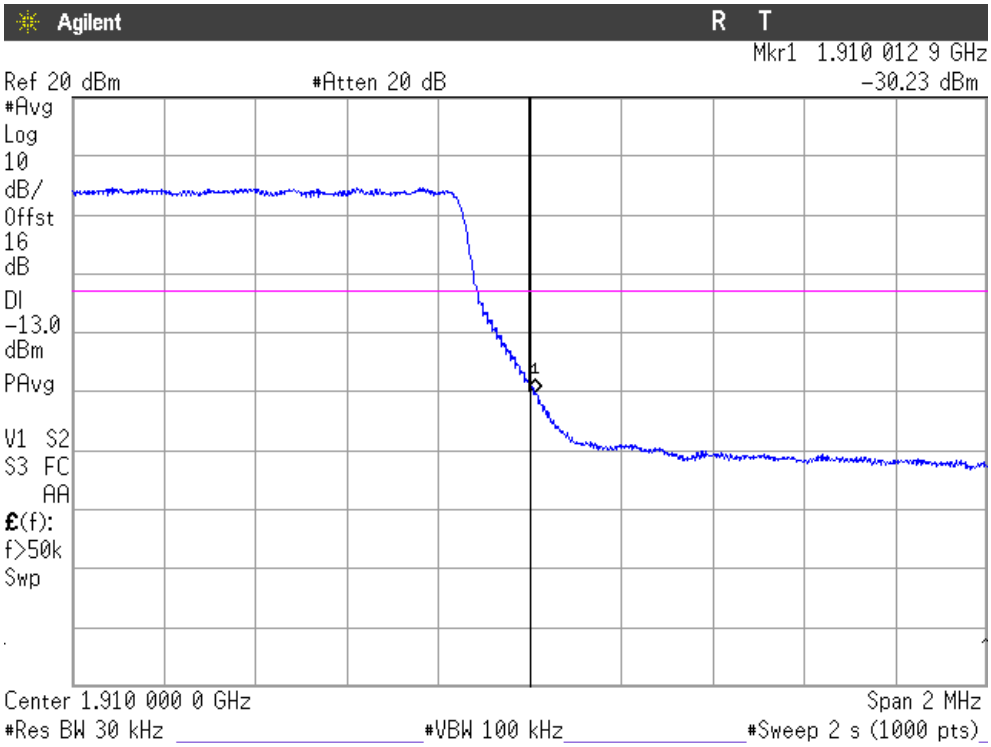
LTE QPSK MODULATION. RB = All, Offset = 0, BW = 3 MHz

CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

CHANNEL HIGHEST

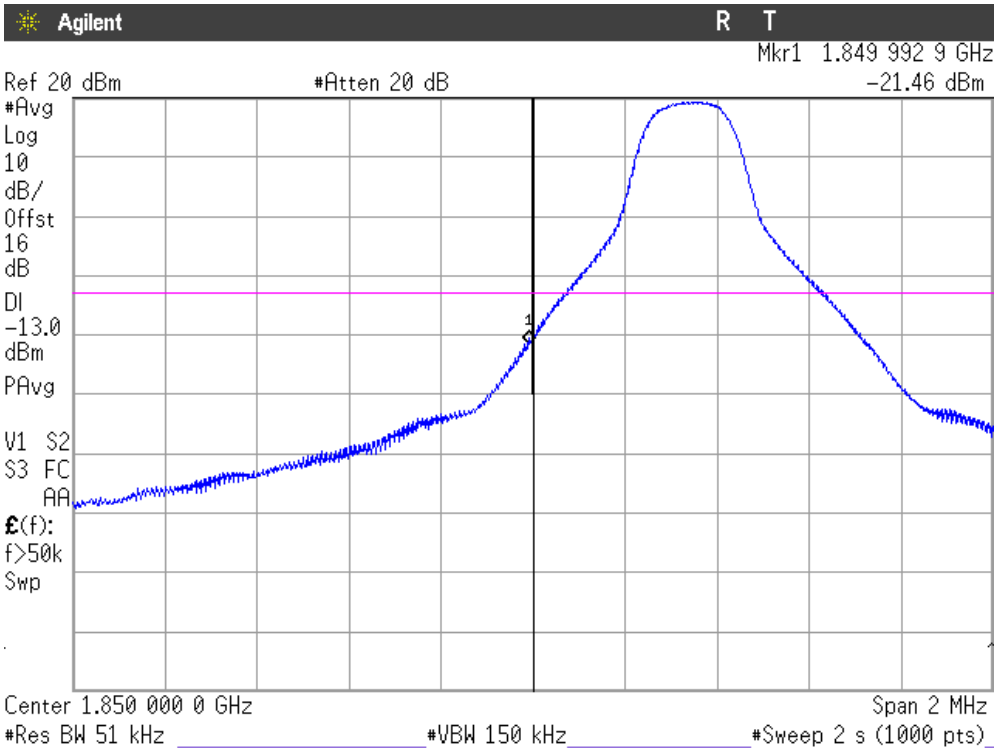


NOTE: The equipment transmits at the maximum output power

Verdict: PASS

LTE QPSK MODULATION. RB = 1, Offset = 0, BW = 5 MHz

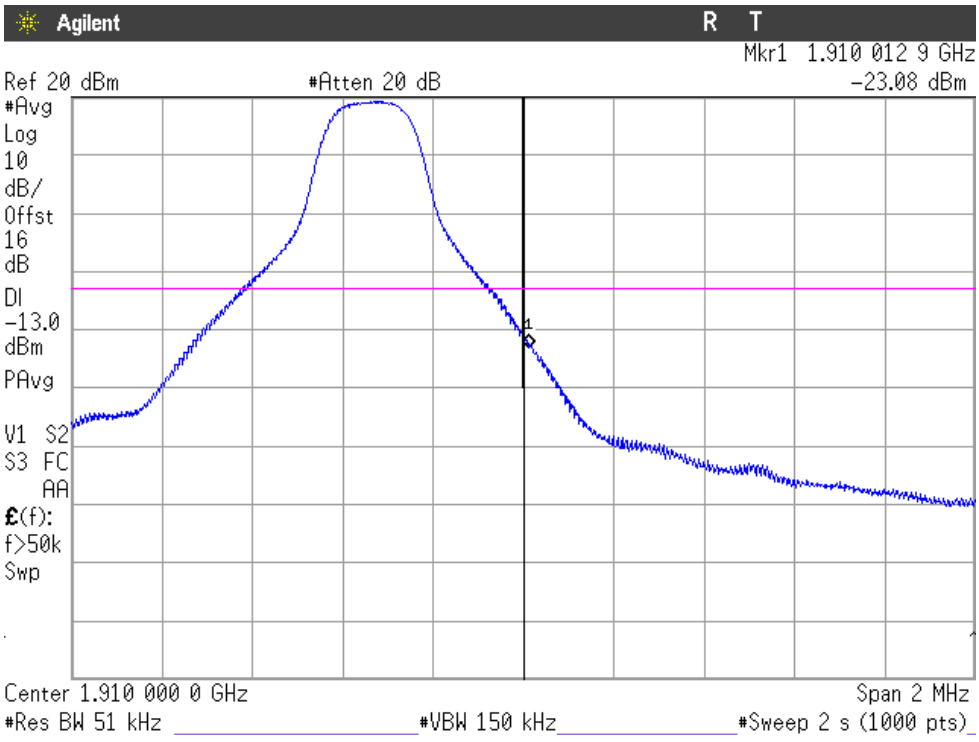
CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

LTE QPSK MODULATION. RB = 1, Offset = Max, BW = 5 MHz

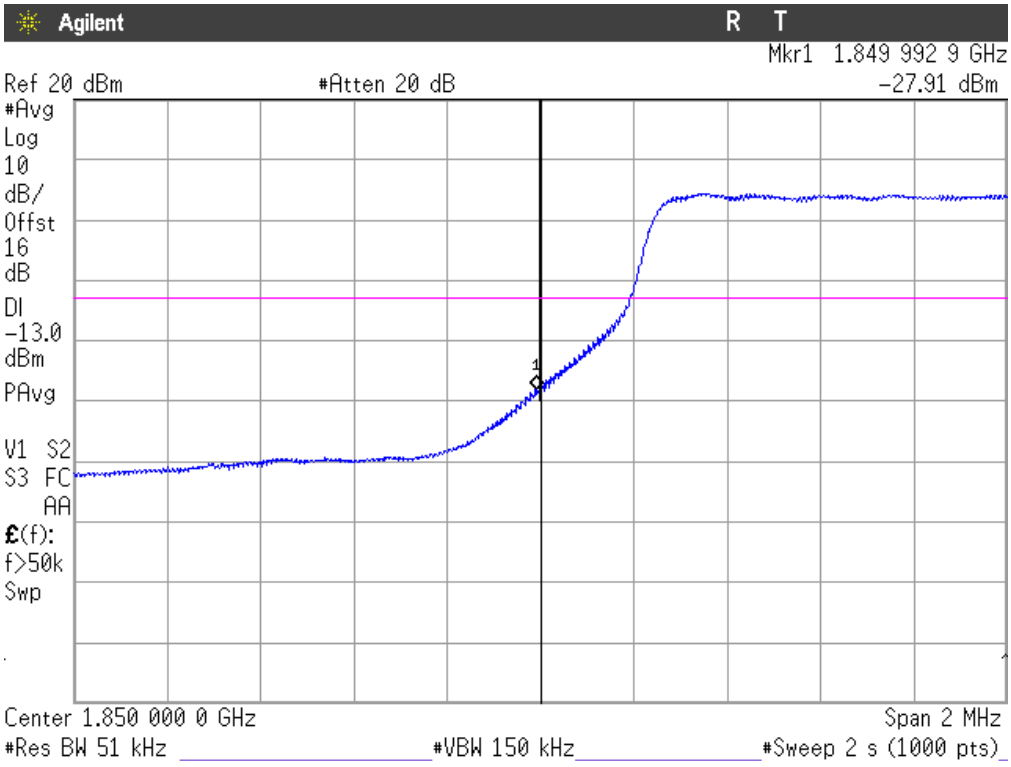
CHANNEL HIGHEST



NOTE: The equipment transmits at the maximum output power

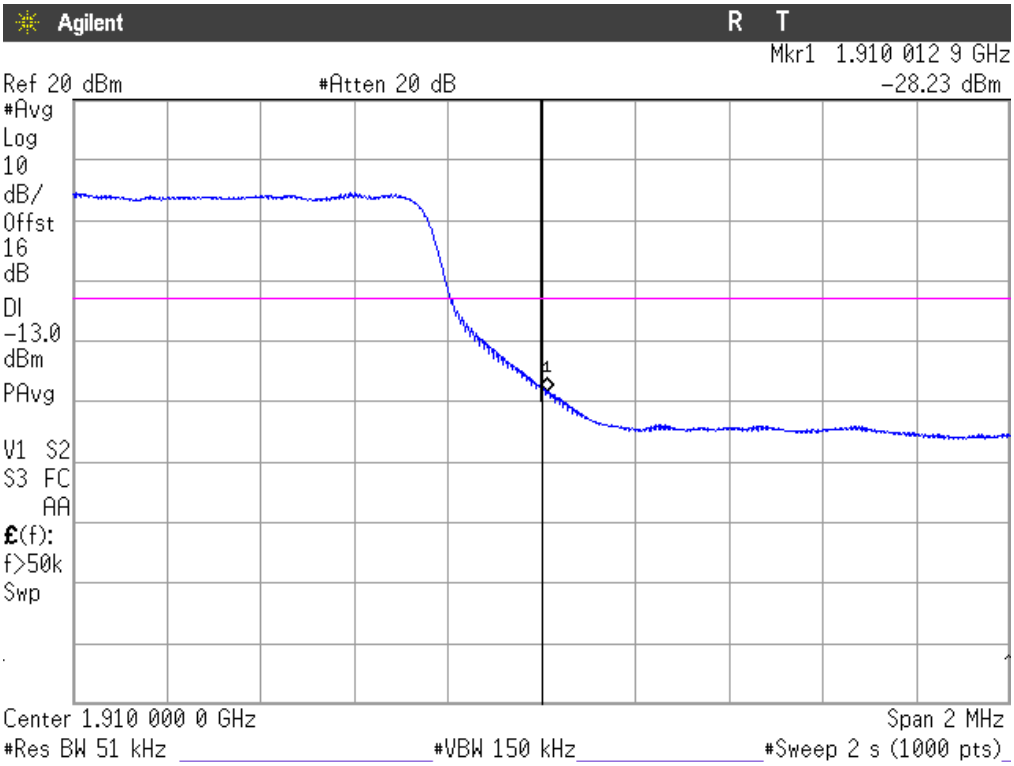
LTE QPSK MODULATION. RB = All, Offset = 0, BW = 5 MHz

CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

CHANNEL HIGHEST

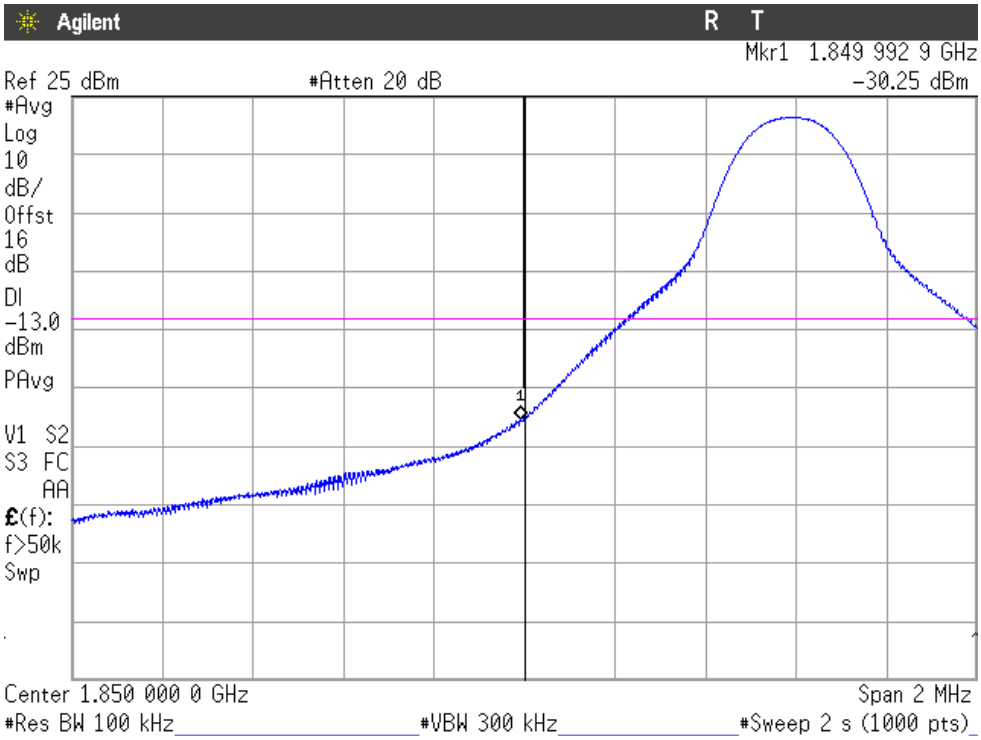


NOTE: The equipment transmits at the maximum output power

Verdict: PASS

LTE QPSK MODULATION. RB = 1, Offset = 0, BW = 10 MHz

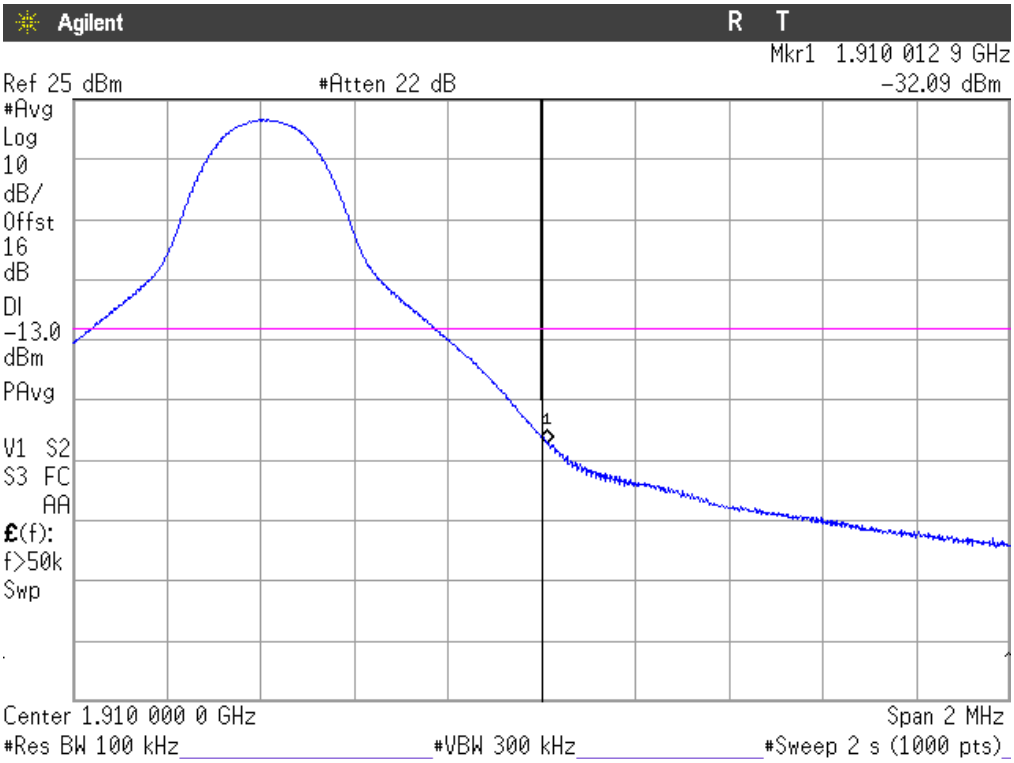
CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

LTE QPSK MODULATION. RB = 1, Offset = Max, BW = 10 MHz

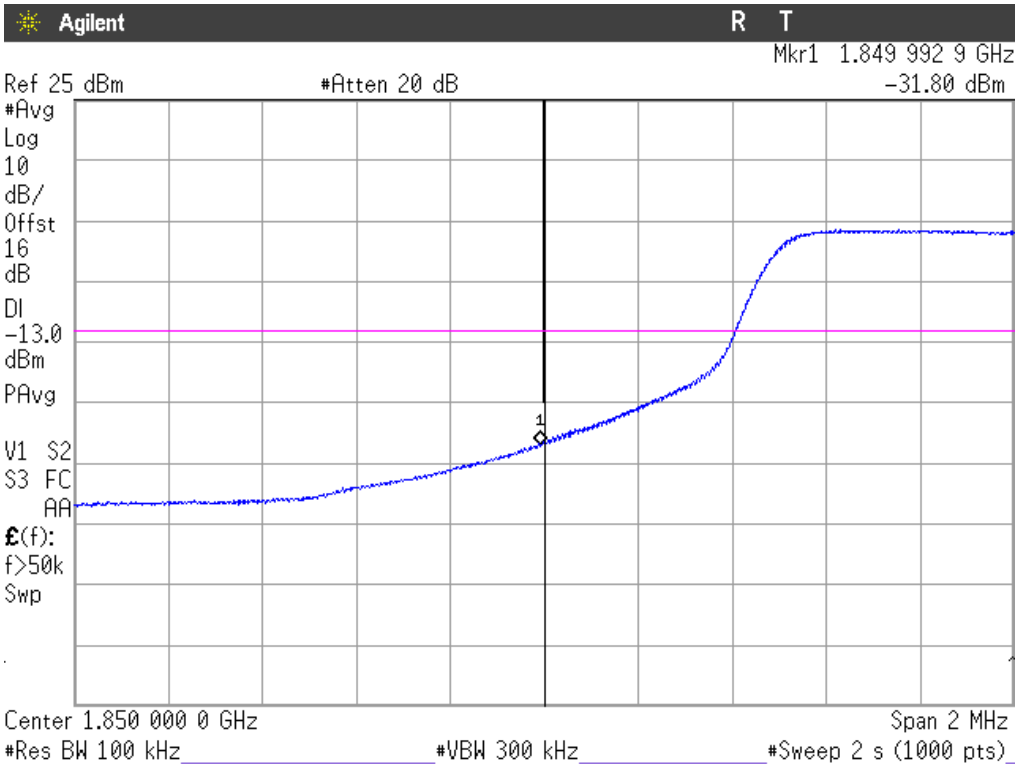
CHANNEL HIGHEST



NOTE: The equipment transmits at the maximum output power

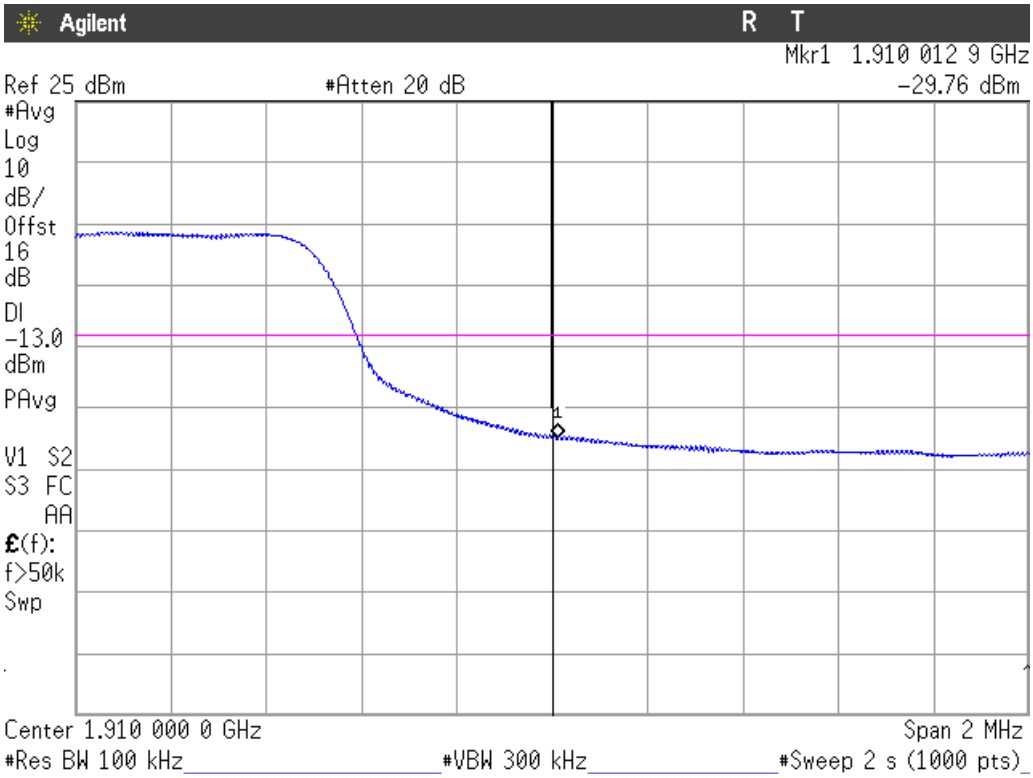
LTE QPSK MODULATION. RB = All, Offset = 0, BW = 10 MHz

CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

CHANNEL HIGHEST

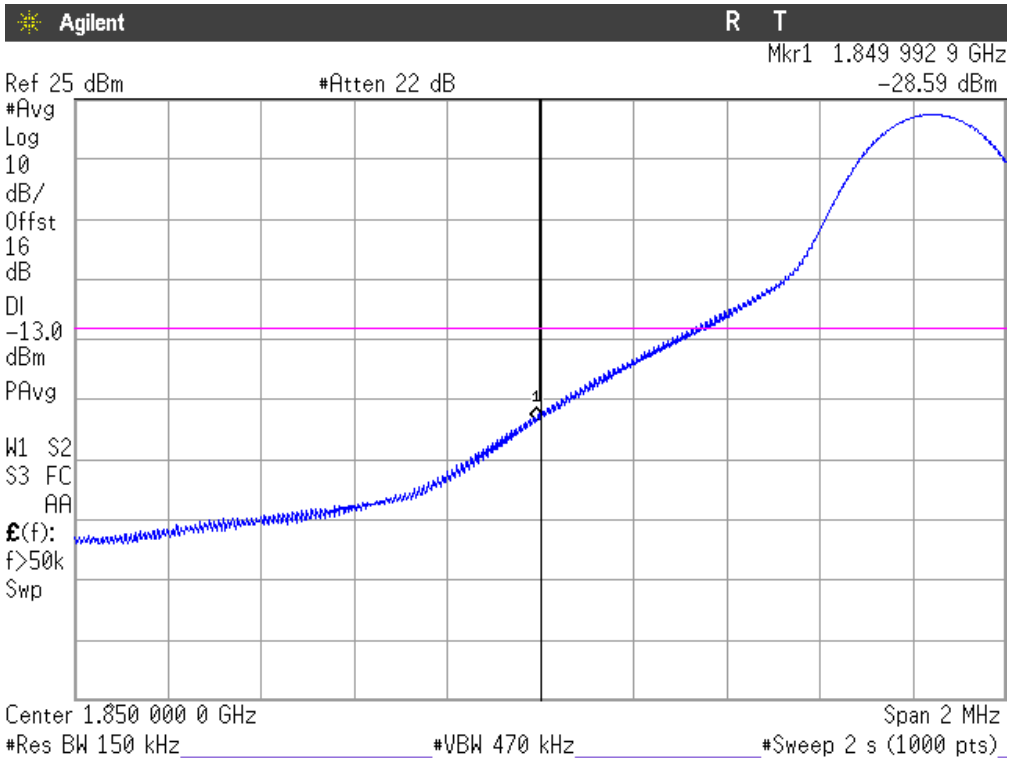


NOTE: The equipment transmits at the maximum output power

Verdict: PASS

LTE QPSK MODULATION. RB = 1, Offset = 0, BW = 15 MHz

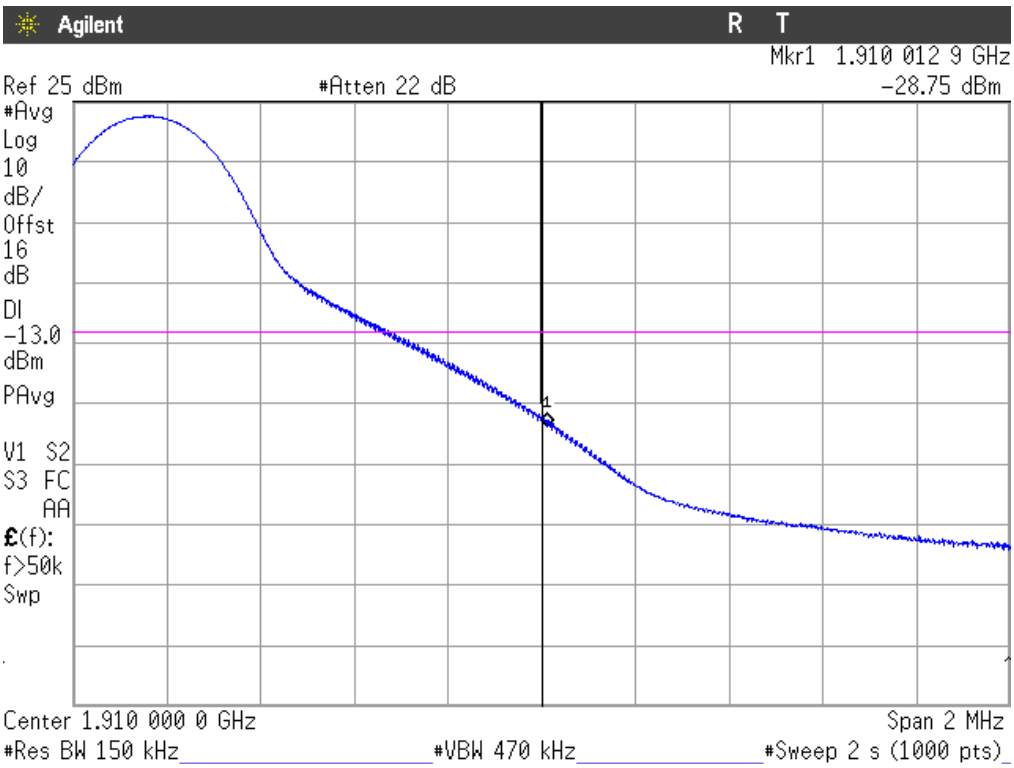
CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

LTE QPSK MODULATION. RB = 1, Offset = Max, BW = 15 MHz

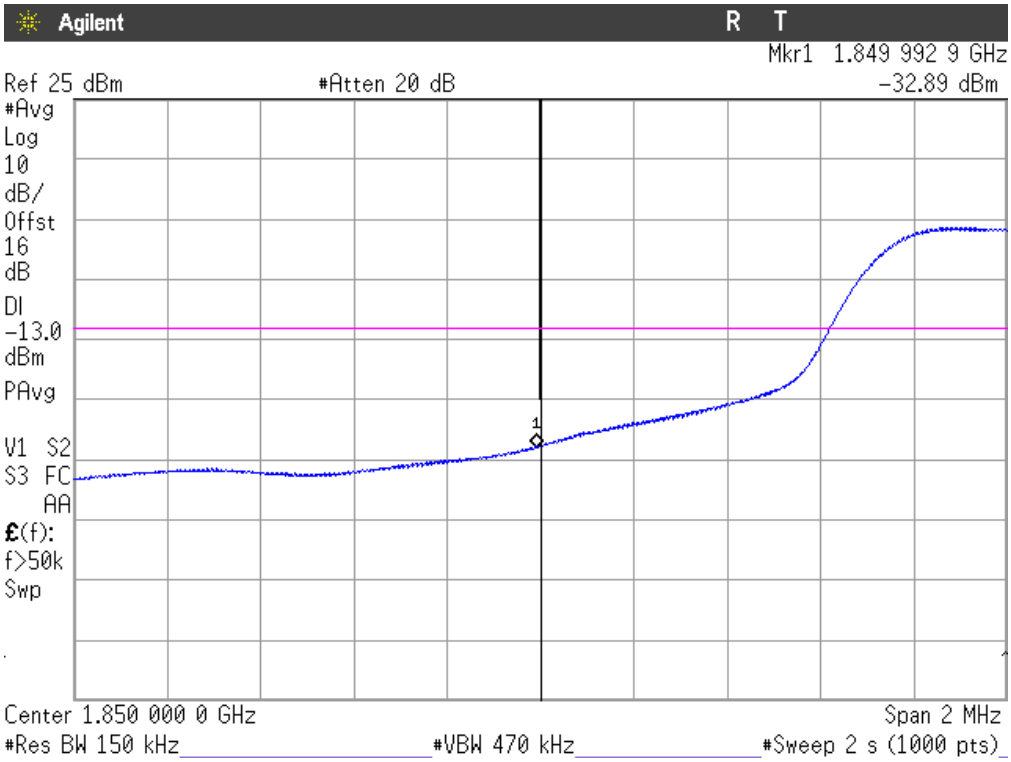
CHANNEL HIGHEST



NOTE: The equipment transmits at the maximum output power

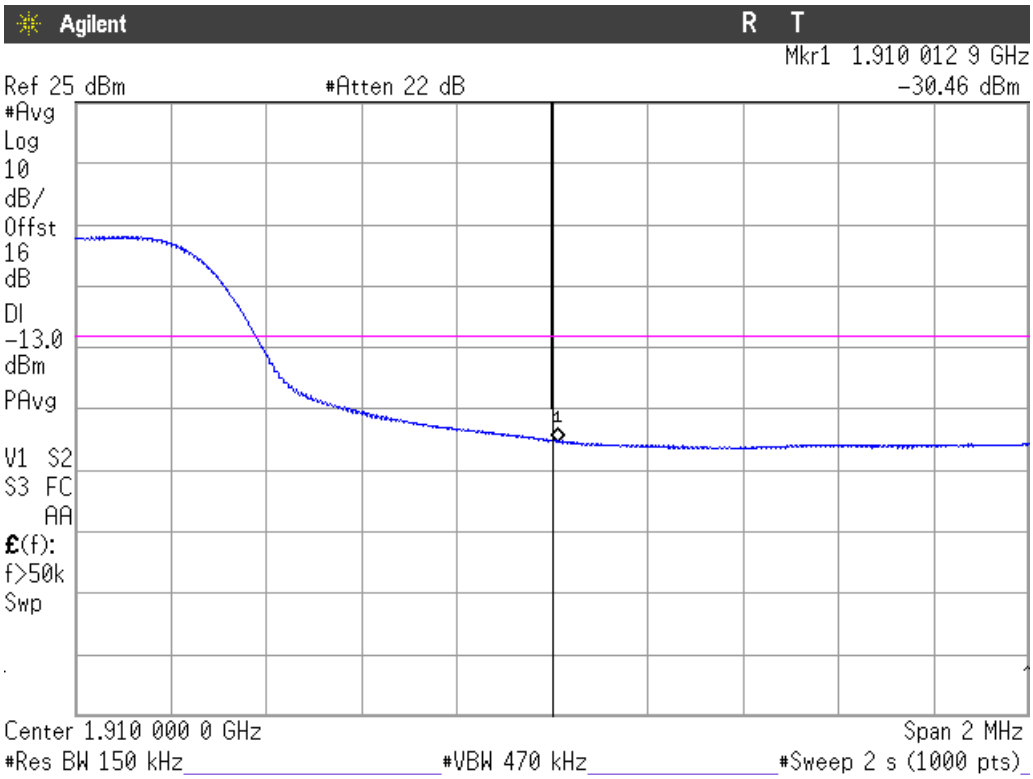
LTE QPSK MODULATION. RB = All, Offset = 0, BW = 15 MHz

CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

CHANNEL HIGHEST

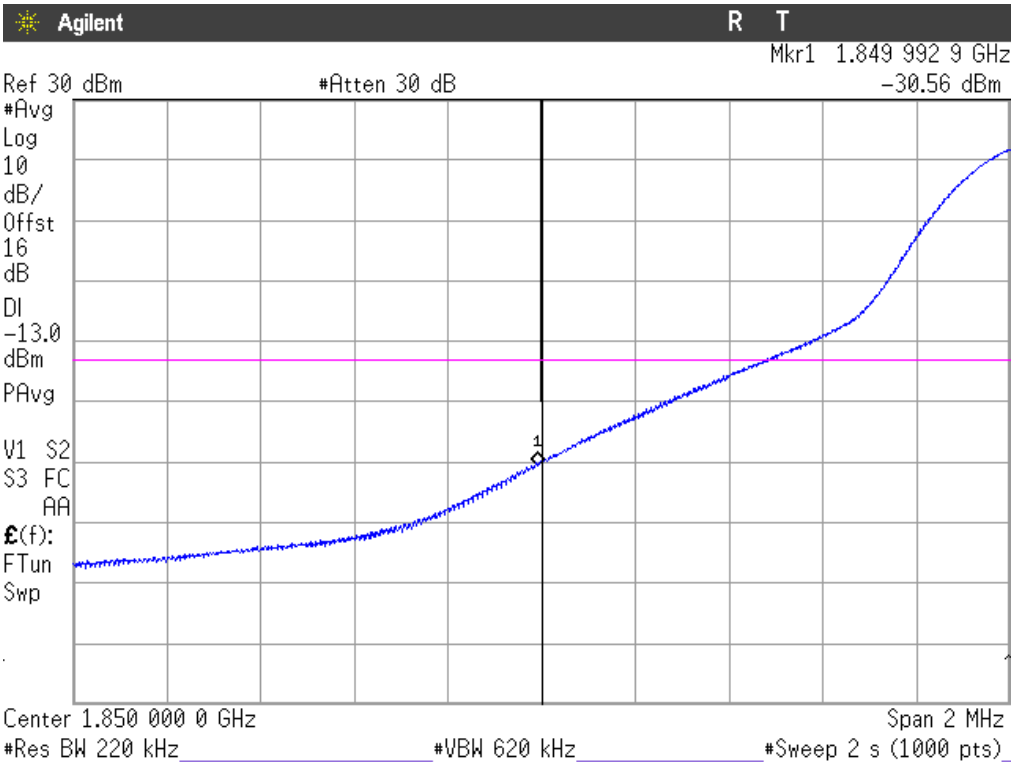


NOTE: The equipment transmits at the maximum output power

Verdict: PASS

LTE QPSK MODULATION. RB = 1, Offset = 0, BW = 20 MHz

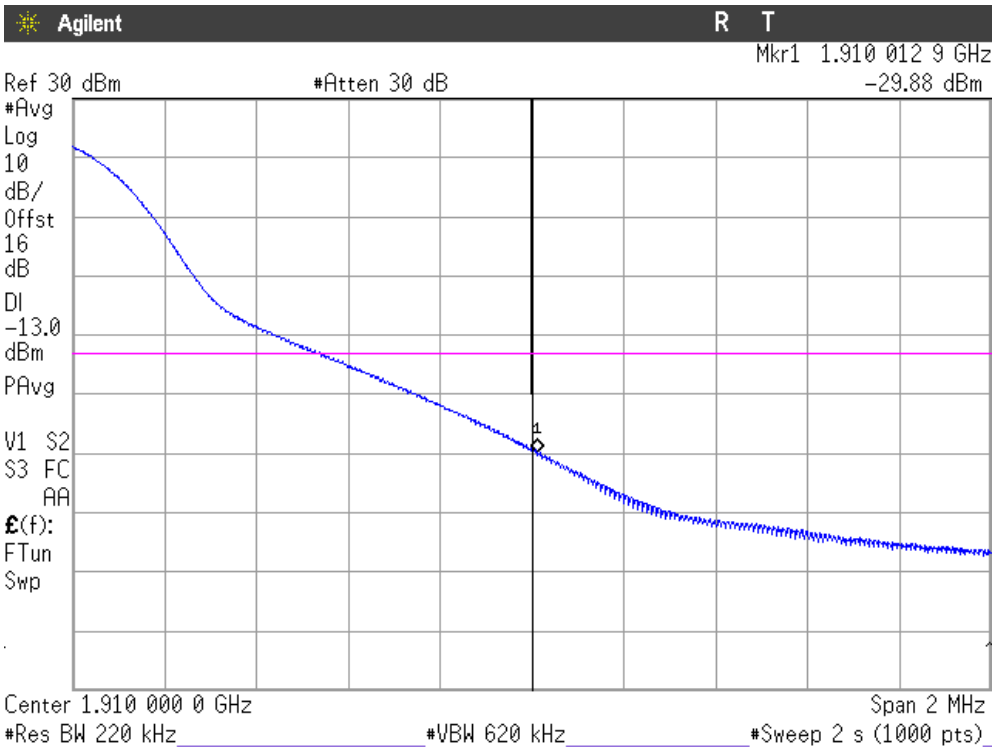
CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

LTE QPSK MODULATION. RB = 1, Offset = Max, BW = 20 MHz

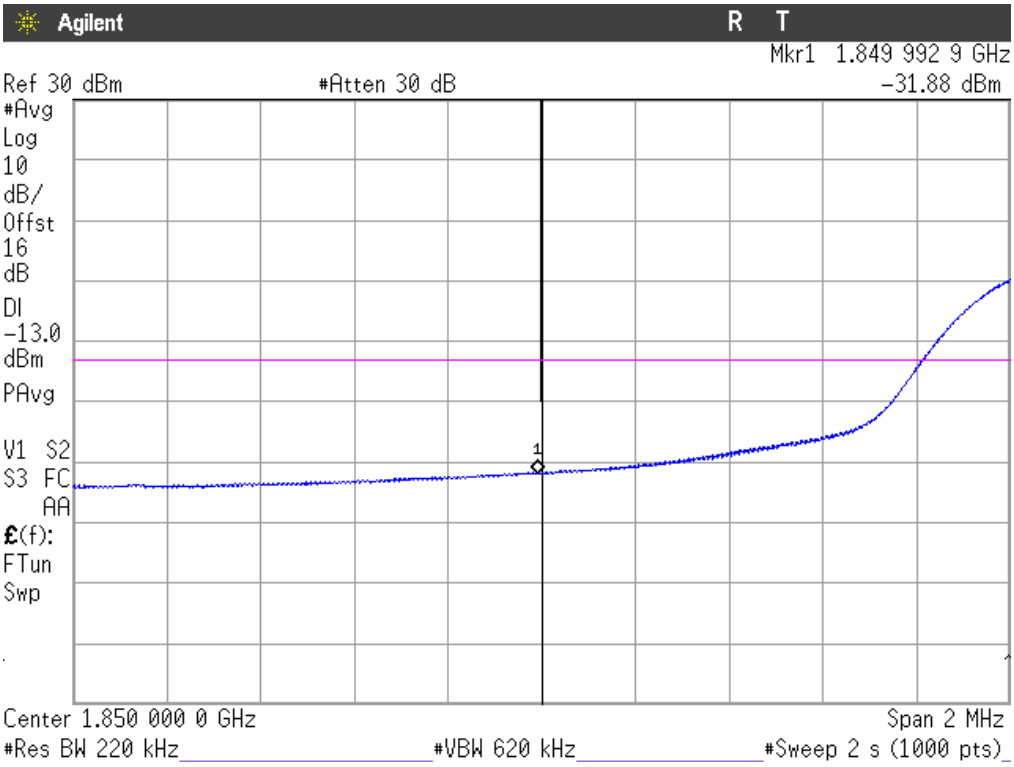
CHANNEL HIGHEST



NOTE: The equipment transmits at the maximum output power

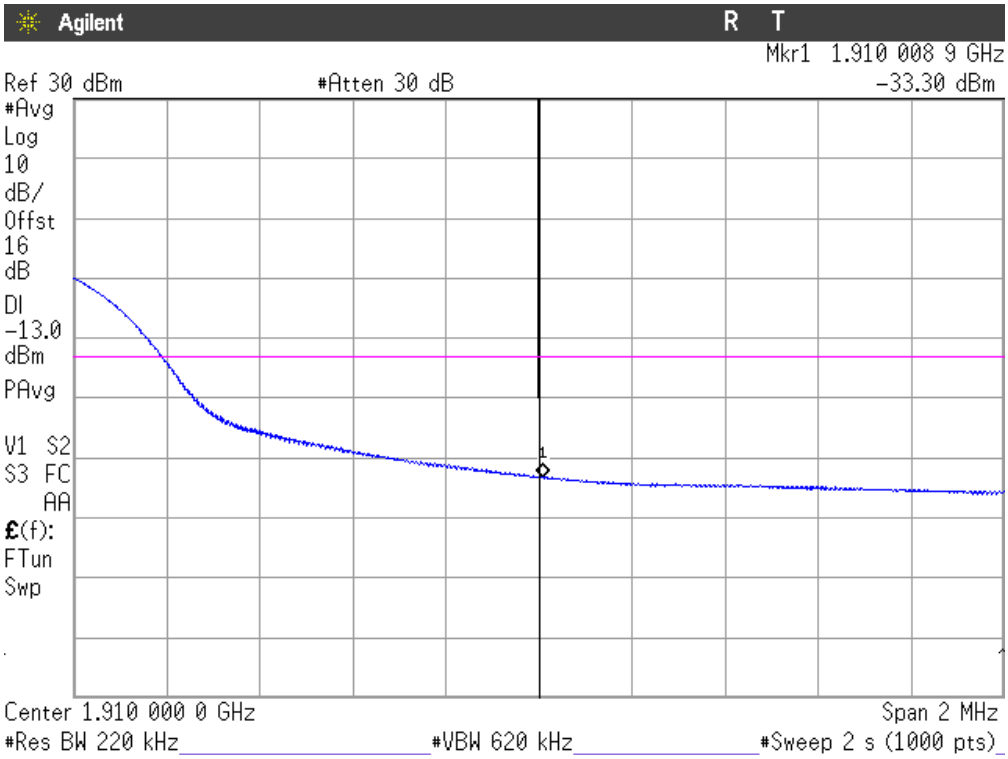
LTE QPSK MODULATION. RB = All, Offset = 0, BW = 20 MHz

CHANNEL LOWEST



NOTE: The equipment transmits at the maximum output power

CHANNEL HIGHEST



NOTE: The equipment transmits at the maximum output power

Verdict: PASS

Radiated emissions

SPECIFICATION

FCC § 24.238

RSS-133. Clause 6.5.

METHOD

The measurement was performed with the EUT inside an anechoic chamber. The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment.

The EUT was placed on a 1 meter high non-conductive stand at a 3 meter distance from the measuring antenna for measurements below 1 GHz and at 1 m distance for measurements above 1 GHz.

Detected emissions were maximized at each frequency by rotating the EUT and adjusting the measuring antenna height and polarization. The maximum meter reading was recorded. The radiated emissions were measured with peak detector and 1 MHz bandwidth.

Each detected emissions were substituted by the Substitution method, in accordance with the ANSI/TIA/EIA-603-C: 2004.

Measurement Limit**:**

According to specification. the power of emissions shall be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB. P in watts.
At Po transmitting power. the specified minimum attenuation becomes 43+10log (Po). and the level in dBm relative Po becomes:

Po (dBm) – [43 + 10 log (Po in mwatts) - 30] = - 13 dBm

RESULTS

GPRS AND EDGE MODULATION

A preliminary scan determined the GPRS modulation as the worst case. The following plots show the results for GPRS modulation.

1. CHANNEL: LOWEST

Frequency range 30 MHz-1000 MHz.
No spurious signals were found in all the range.

Frequency range 1 GHz-20 GHz.
No radiated spurious signals were detected at less than 20 dB respect to the limit.

2. CHANNEL: MIDDLE

Frequency range 30 MHz-1000 MHz.
No spurious signals were found in all the range.

Frequency range 1 GHz-20 GHz.
No radiated spurious signals were detected at less than 20 dB respect to the limit.

3. CHANNEL: HIGHEST

Frequency range 30 MHz-1000 MHz.
No spurious signals were found in all the range.

Frequency range 1 GHz-20 GHz.
No radiated spurious signals were detected at less than 20 dB respect to the limit.

WCDMA AND HSUPA MODULATION

A preliminary scan determined the WCDMA modulation as the worst case. The following plots show the results for WCDMA modulation.

1. CHANNEL: LOWEST

Frequency range 30 MHz-1000 MHz.
No spurious signals were found in all the range.

Frequency range 1 GHz-20 GHz.
No radiated spurious signals were detected at less than 20 dB respect to the limit.

2. CHANNEL: MIDDLE

Frequency range 30 MHz-1000 MHz.
No spurious signals were found in all the range.

Frequency range 1 GHz-20 GHz.
No radiated spurious signals were detected at less than 20 dB respect to the limit.

3. CHANNEL: HIGHEST

Frequency range 30 MHz-1000 MHz.
No spurious signals were found in all the range.

Frequency range 1 GHz-20 GHz.
No radiated spurious signals were detected at less than 20 dB respect to the limit.

LTE QPSK AND 16QAM MODULATION. BW = 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz and 20 MHz.

A preliminary scan determined the QPSK 3 MHz bandwidth as the worst case. The configuration of Resource Blocks which is the worst case for conducted power was used.

The following tables and plots show the results for this configuration.

1. CHANNEL: LOWEST

Frequency range 30 MHz-1000 MHz.
No radiated spurious signals were detected at less than 20 dB respect to the limit.

Frequency range 1 GHz-20 GHz.
No radiated spurious signals were detected at less than 20 dB respect to the limit.

2. CHANNEL: MIDDLE

Frequency range 30 MHz-1000 MHz.
No radiated spurious signals were detected at less than 20 dB respect to the limit.

Frequency range 1 GHz-20 GHz.
No radiated spurious signals were detected at less than 20 dB respect to the limit.

3. CHANNEL: HIGHEST

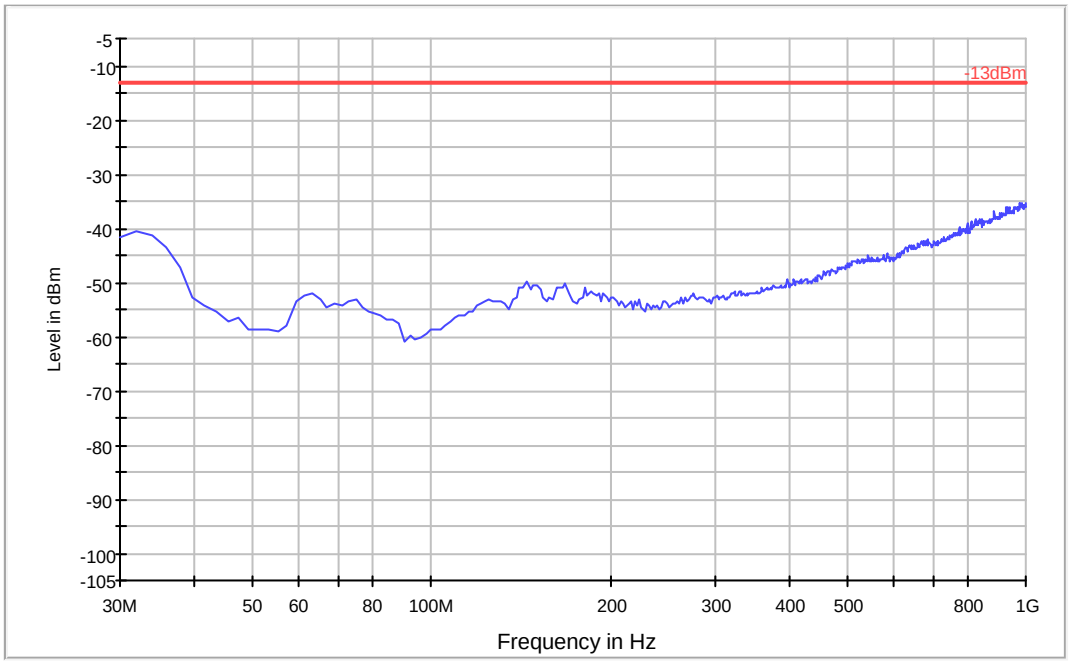
Frequency range 30 MHz-1000 MHz.
No radiated spurious signals were detected at less than 20 dB respect to the limit.

Frequency range 1 GHz-20 GHz.
No radiated spurious signals were detected at less than 20 dB respect to the limit.

Verdict: PASS

FREQUENCY RANGE 30 MHz-1000 MHz.

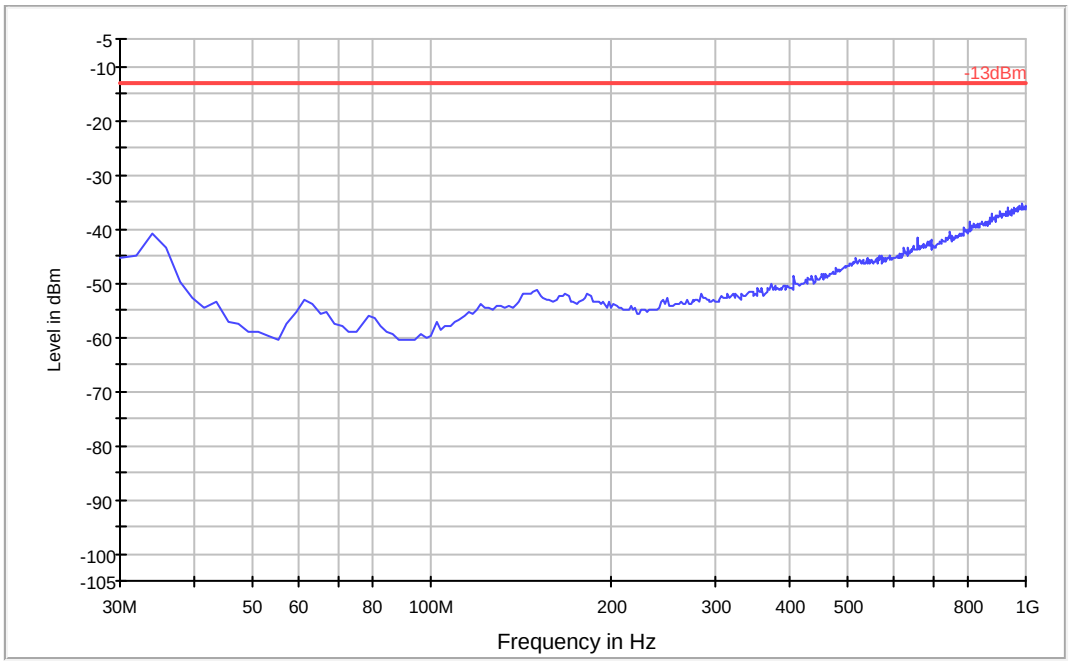
GPRS MODULATION



VBW	RBW	SWT	Ref. Level	Preamp	Att.	Det.
1MHz	1MHz	1s	-5dBm	0dB	0dB	Peak

(This plot is valid for all three channels)

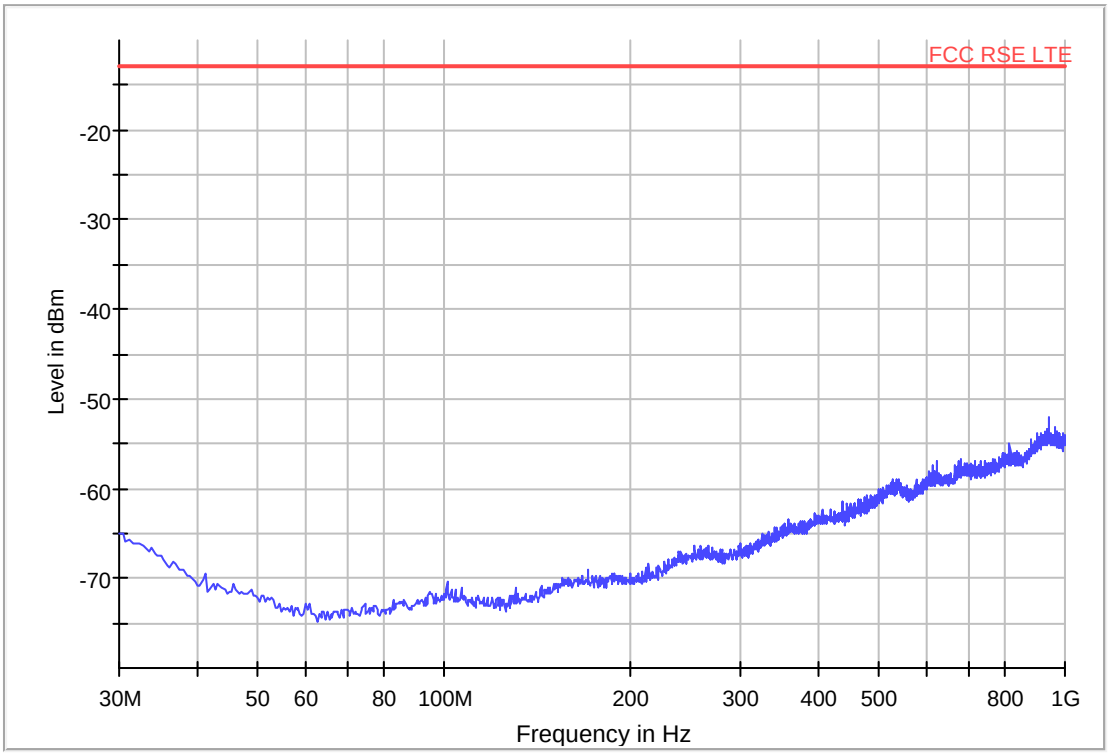
WCDMA MODULATION



VBW	RBW	SWT	Ref. Level	Preamp	Att.	Det.
1MHz	1MHz	1s	-5dBm	0dB	0dB	Peak

(This plot is valid for all three channels)

LTE QPSK MODULATION. BW=3 MHz



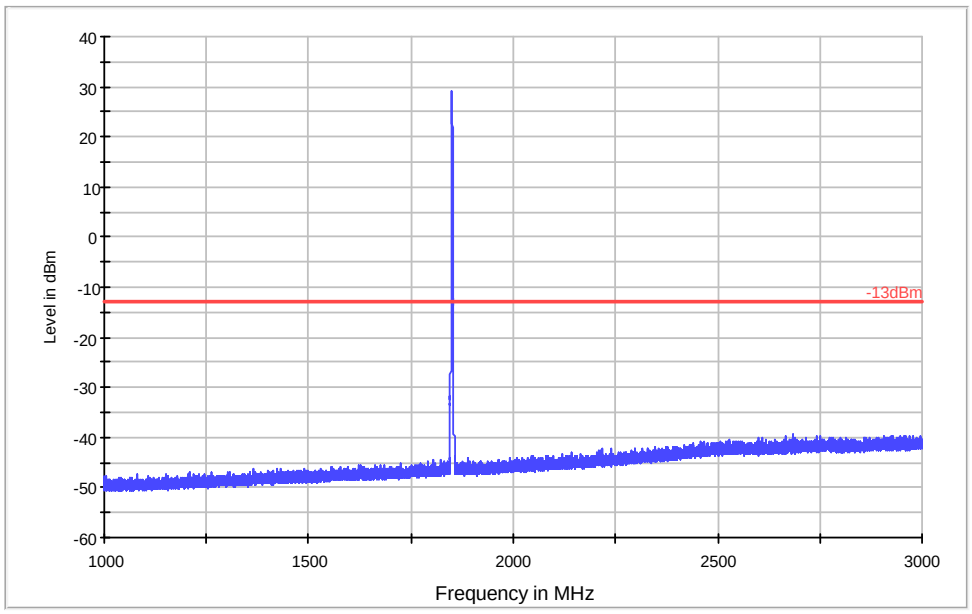
VBW	RBW	SWT	Ref. Level	Preamp	Att.	Det.
1MHz	1MHz	1s	-10dBm	28dB	0dB	Peak

(This plot is valid for all three channels)

FREQUENCY RANGE 1 GHz to 3 GHz.

GPRS MODULATION

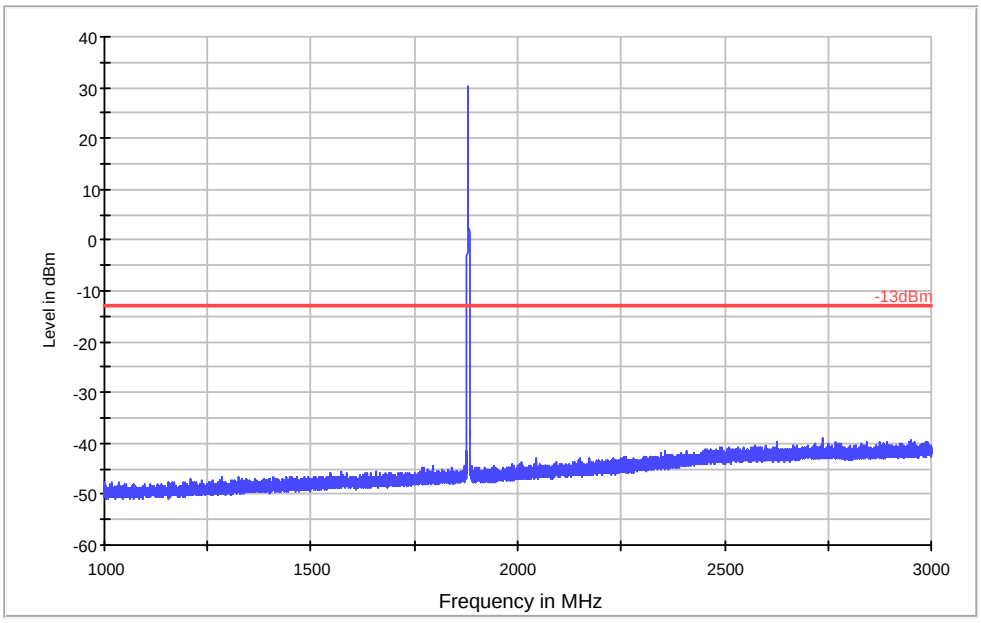
CHANNEL: LOWEST



VBW	RBW	SWT	Ref. Level	Preamp	Att.	Det.
1MHz	1MHz	1s	40dBm	0dB	0dB	Peak

Note: The peak above the limit is the carrier frequency.

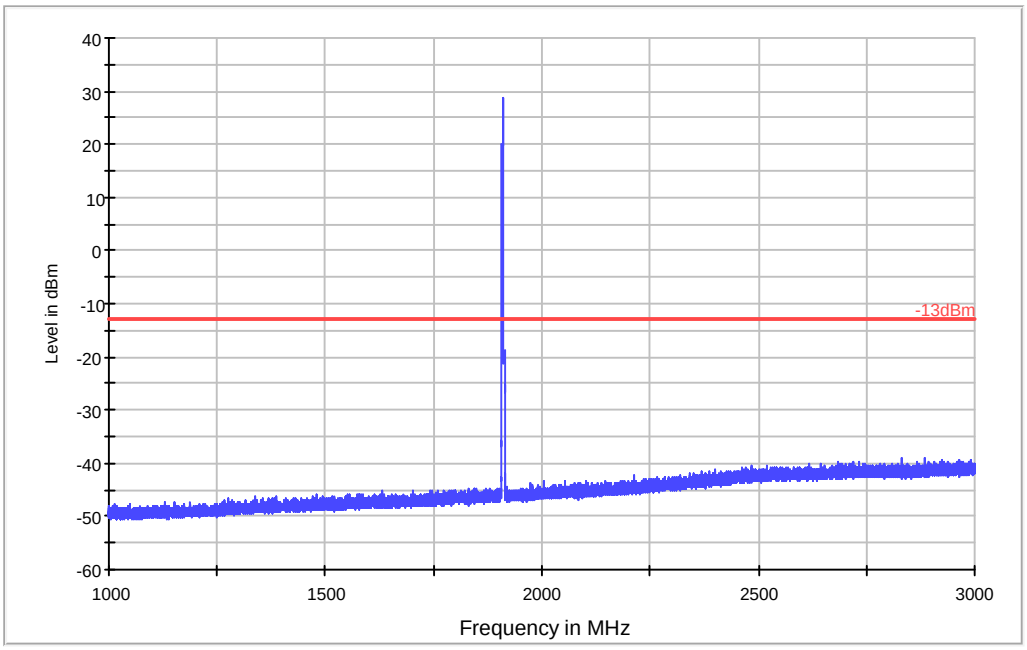
CHANNEL: MIDDLE



VBW	RBW	SWT	Ref. Level	Preamp	Att.	Det.
1MHz	1MHz	1s	40dBm	0dB	0dB	Peak

Note: The peak above the limit is the carrier frequency.

CHANNEL: HIGHEST

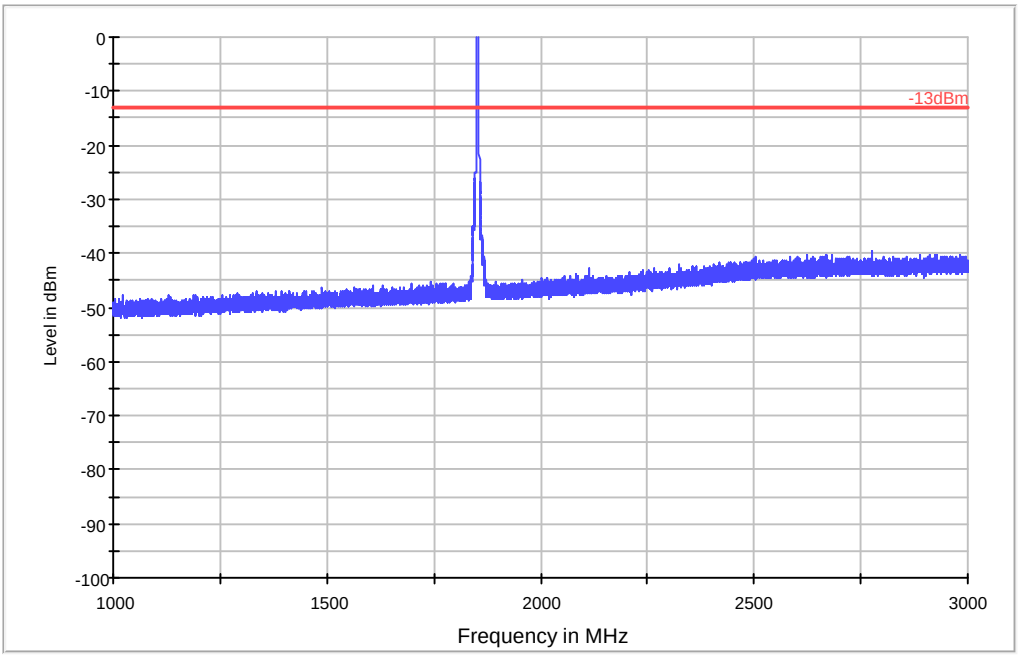


VBW	RBW	SWT	Ref. Level	Preamp	Att.	Det.
1MHz	1MHz	1s	40dBm	0dB	0dB	Peak

Note: The peak above the limit is the carrier frequency.

WCDMA MODULATION

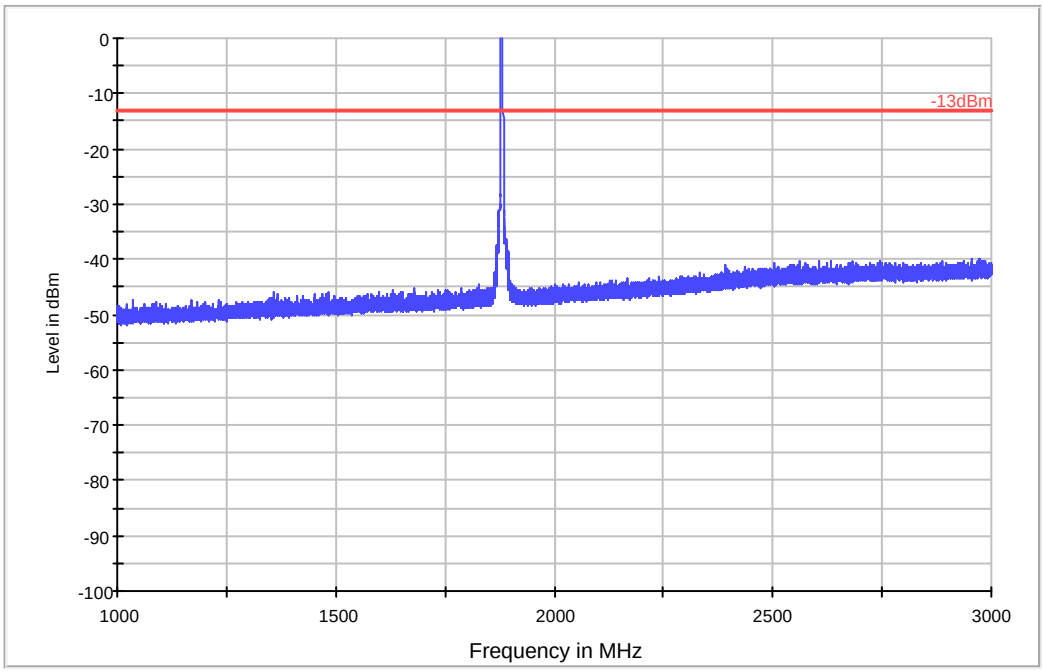
CHANNEL: LOWEST



VBW	RBW	SWT	Ref. Level	Preamp	Att.	Det.
1MHz	1MHz	1s	0dBm	0dB	0dB	Peak

Note: The peak above the limit is the carrier frequency.

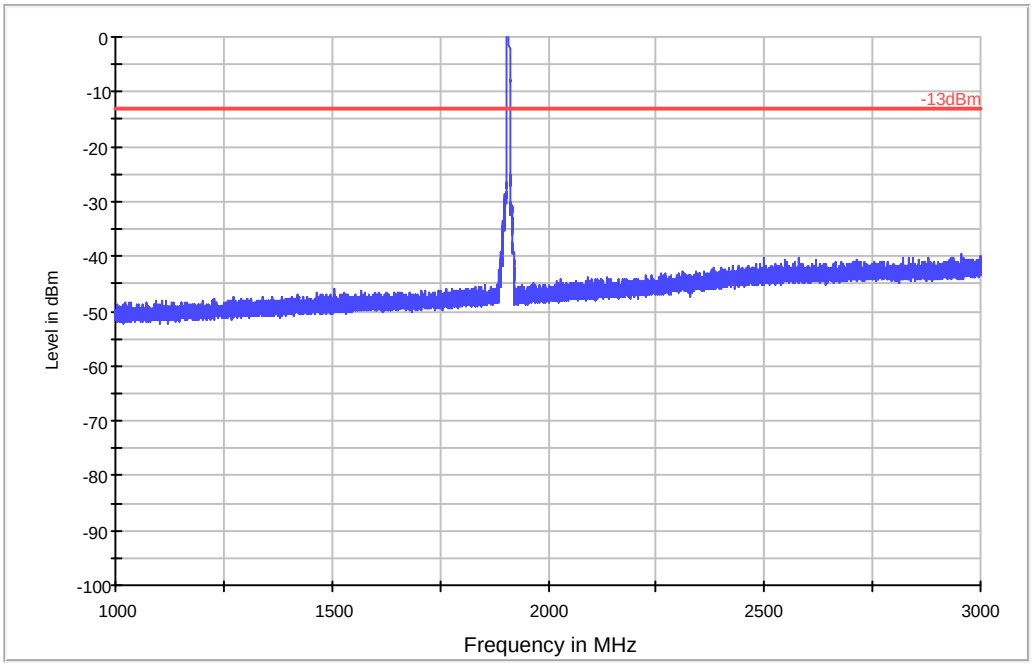
CHANNEL: MIDDLE



VBW	RBW	SWT	Ref. Level	Preamp	Att.	Det.
1MHz	1MHz	1s	0dBm	0dB	0dB	Peak

Note: The peak above the limit is the carrier frequency.

CHANNEL: HIGHEST

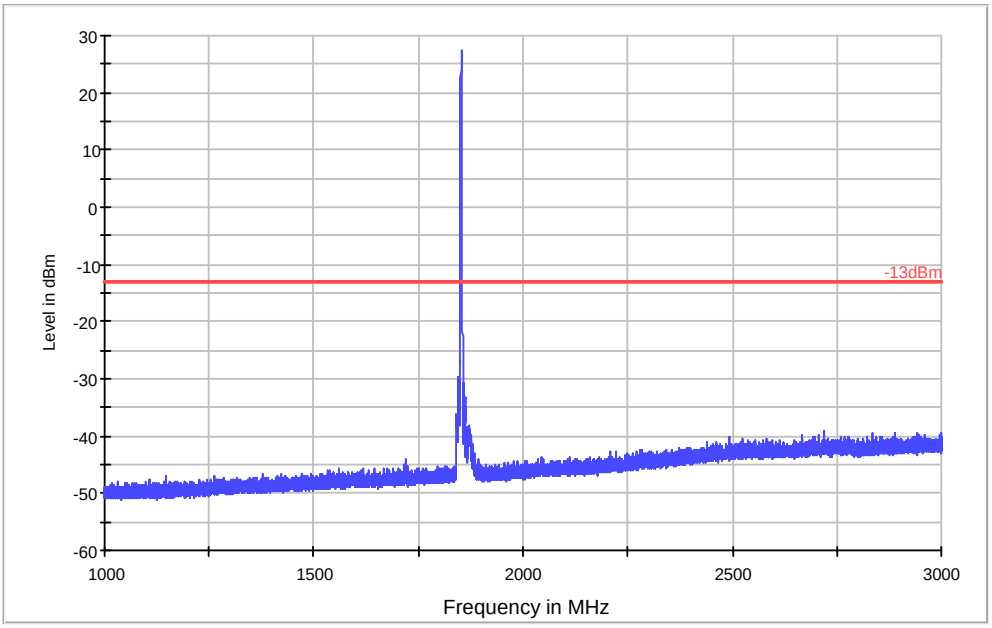


VBW	RBW	SWT	Ref. Level	Preamp	Att.	Det.
1MHz	1MHz	1s	0dBm	0dB	0dB	Peak

Note: The peak above the limit is the carrier frequency.

LTE QPSK MODULATION. BW=3 MHz

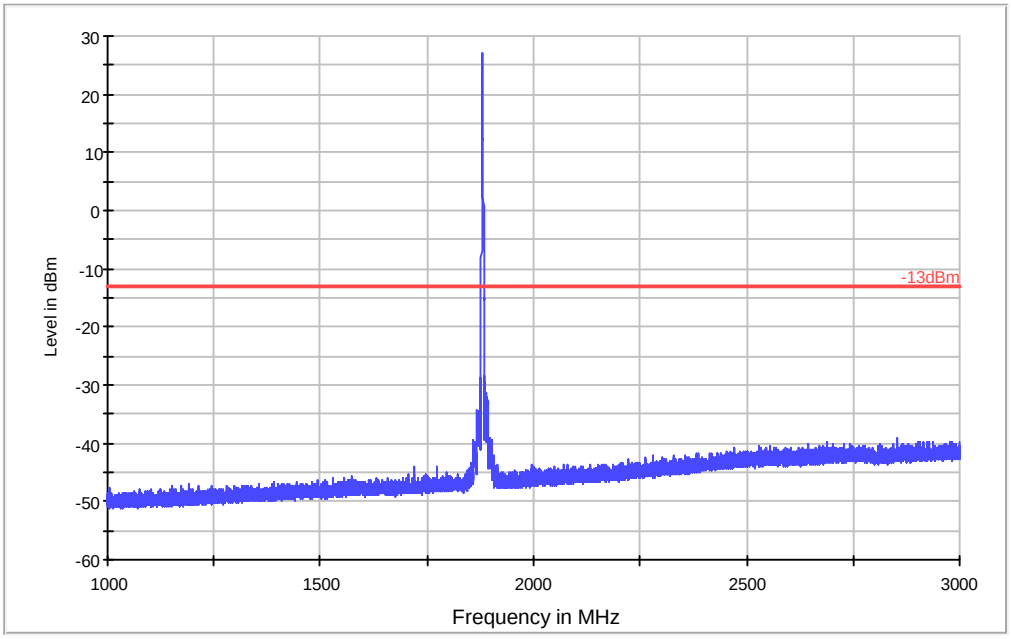
CHANNEL: LOWEST



VBW	RBW	SWT	Ref. Level	Preamp	Att.	Det.
1MHz	1MHz	1s	30dBm	0dB	0dB	Peak

Note: The peak above the limit is the carrier frequency.

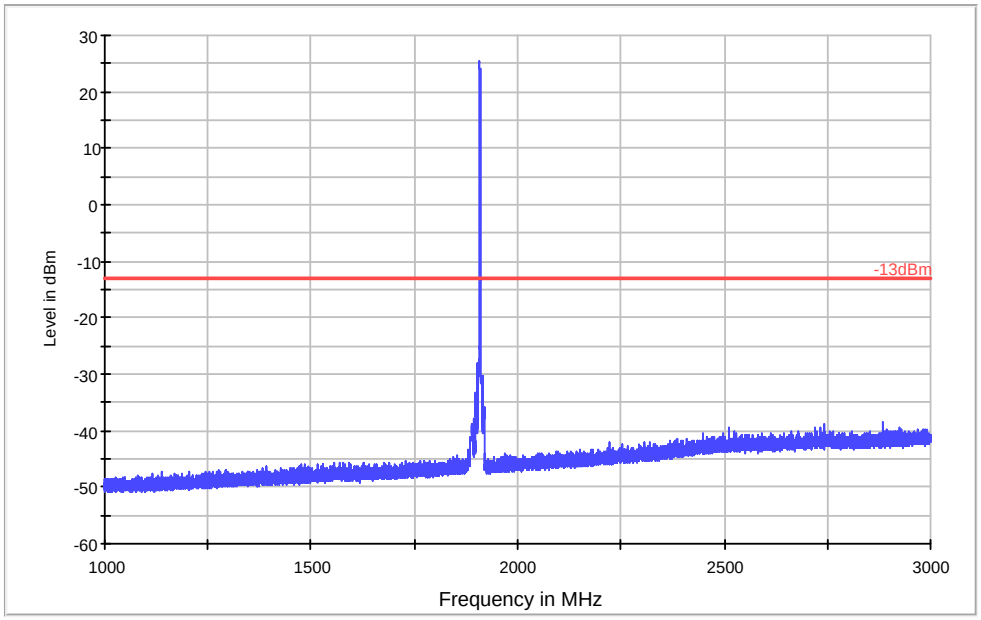
CHANNEL: MIDDLE



VBW	RBW	SWT	Ref. Level	Preamp	Att.	Det.
1MHz	1MHz	1s	30dBm	0dB	0dB	Peak

Note: The peak above the limit is the carrier frequency.

CHANNEL: HIGHEST



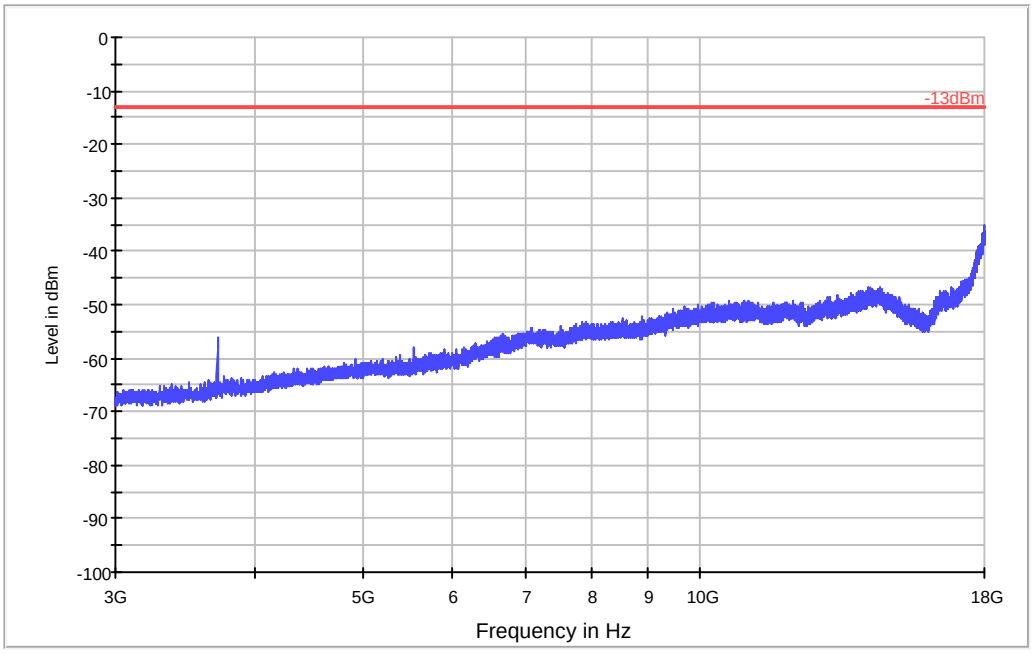
VBW	RBW	SWT	Ref. Level	Preamp	Att.	Det.
1MHz	1MHz	1s	30dBm	0dB	0dB	Peak

Note: The peak above the limit is the carrier frequency.

FREQUENCY RANGE 3 GHz to 18 GHz.

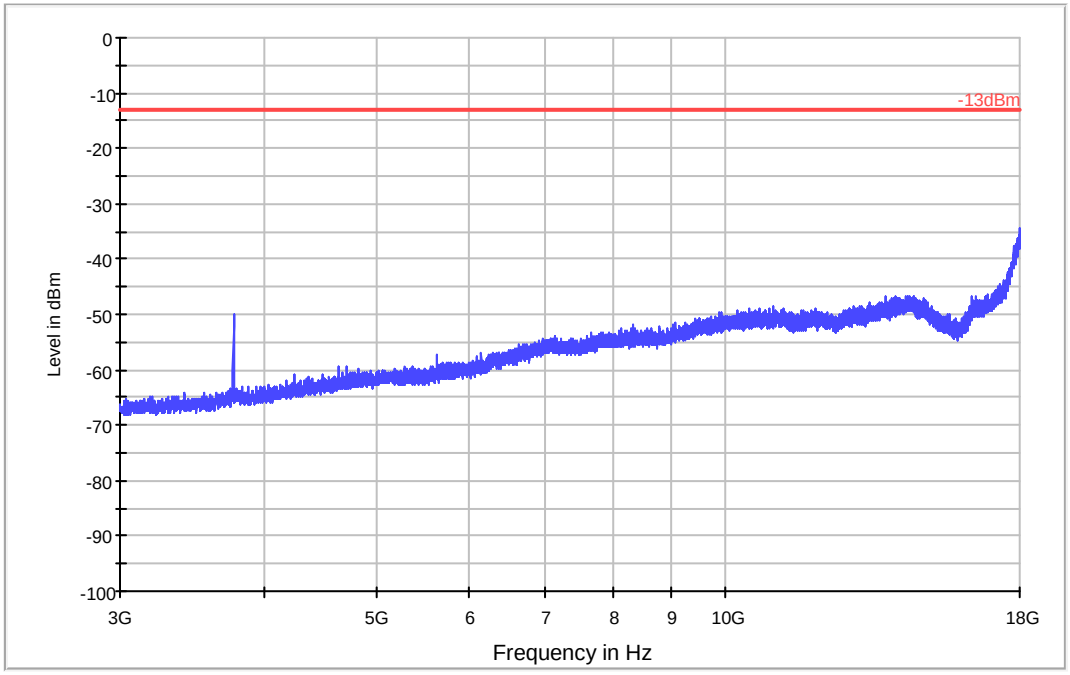
GPRS MODULATION

CHANNEL: LOWEST



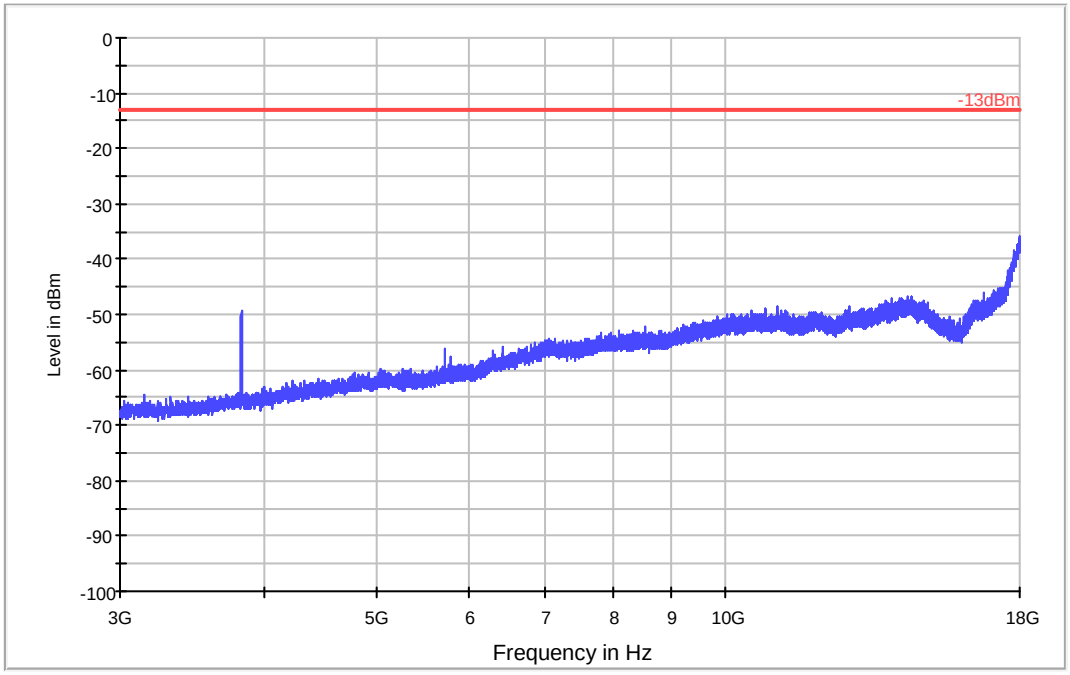
VBW	RBW	SWT	Ref. Level	Preamp	Att.	Det.
1MHz	1MHz	1s	0dBm	35dB	0dB	Peak

CHANNEL: MIDDLE



VBW	RBW	SWT	Ref. Level	Preamp	Att.	Det.
1MHz	1MHz	1s	0dBm	35dB	0dB	Peak

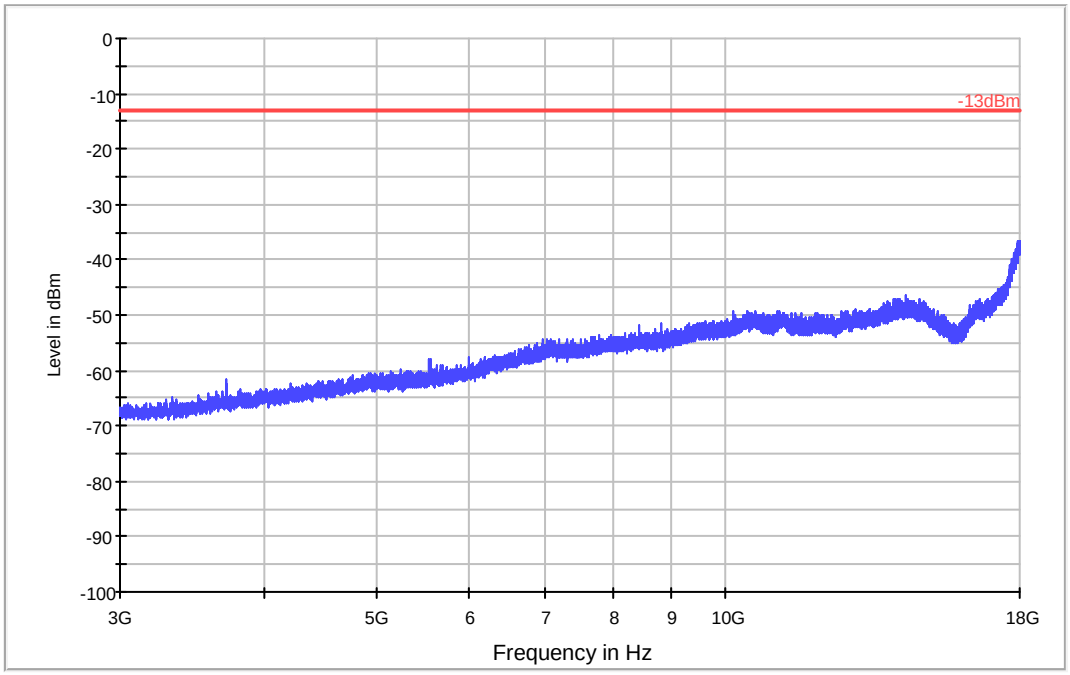
CHANNEL: HIGHEST



VBW	RBW	SWT	Ref. Level	Preamp	Att.	Det.
1MHz	1MHz	1s	0dBm	35dB	0dB	Peak

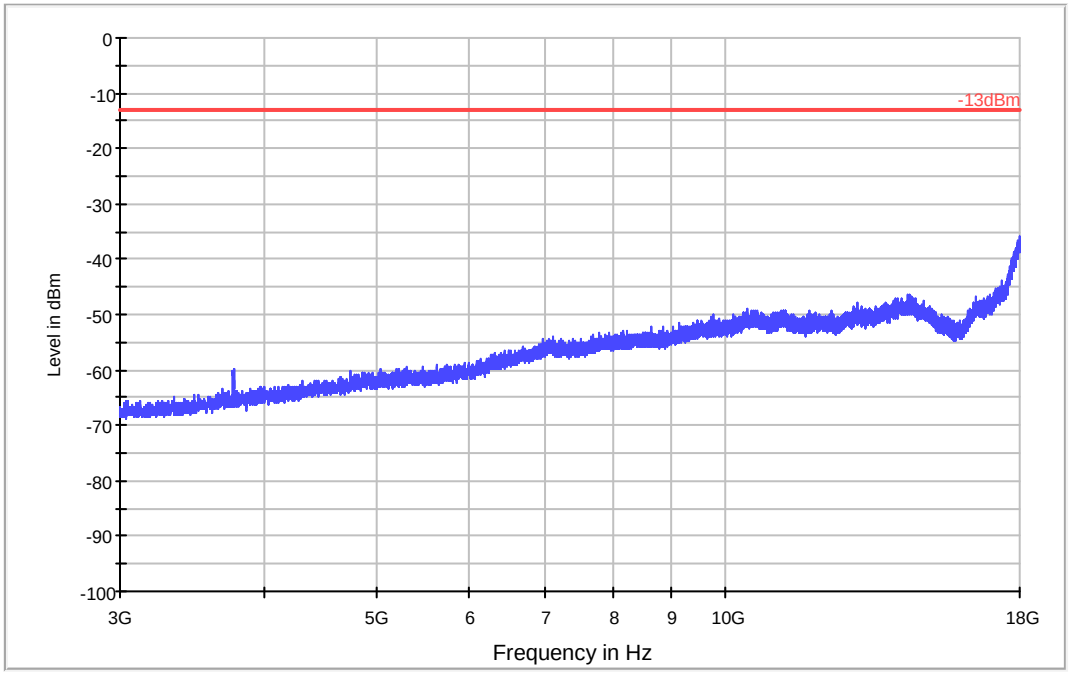
WCDMA MODULATION

CHANNEL: LOWEST



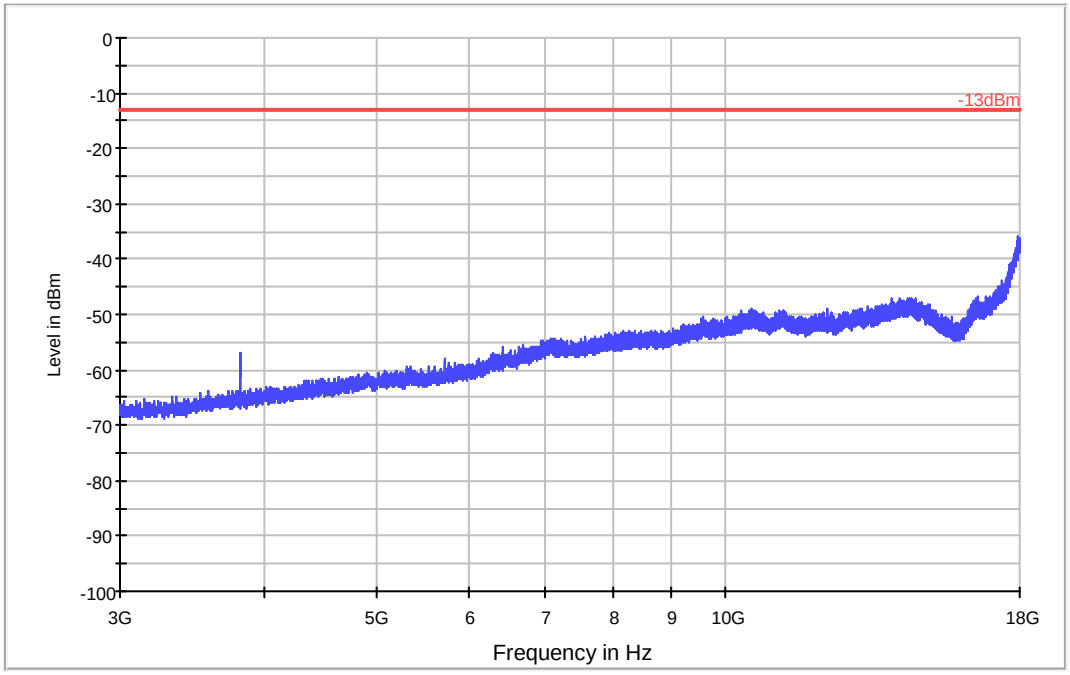
VBW	RBW	SWT	Ref. Level	Preamp	Att.	Det.
1MHz	1MHz	1s	0dBm	35dB	0dB	Peak

CHANNEL: MIDDLE



VBW	RBW	SWT	Ref. Level	Preamp	Att.	Det.
1MHz	1MHz	1s	0dBm	35dB	0dB	Peak

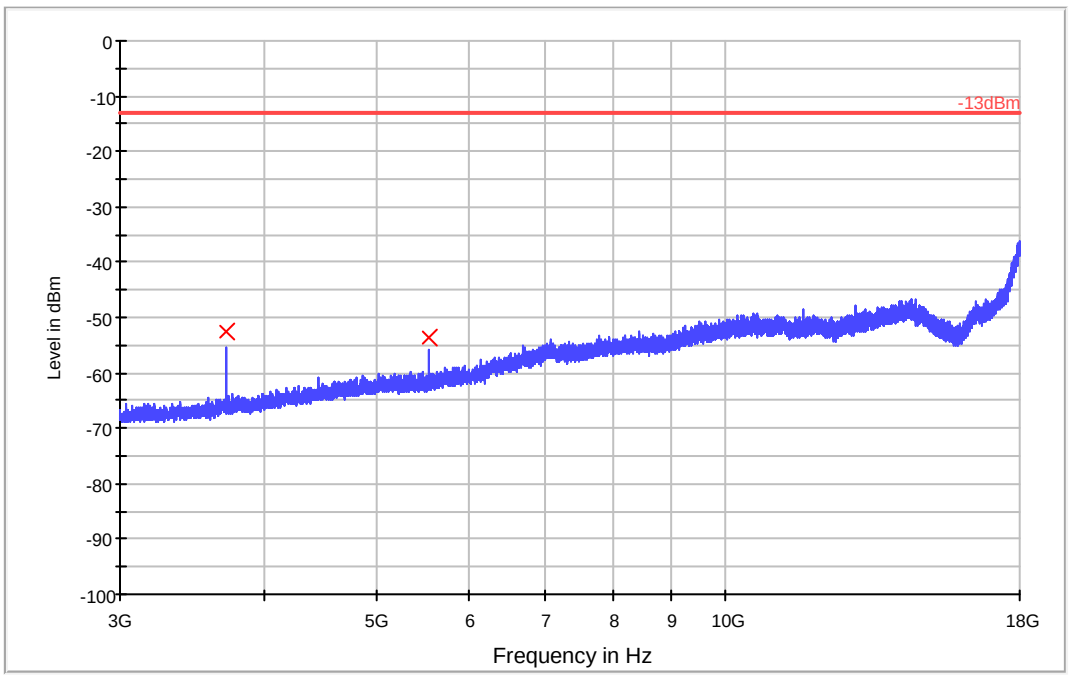
CHANNEL: HIGHEST



VBW	RBW	SWT	Ref. Level	Preamp	Att.	Det.
1MHz	1MHz	1s	0dBm	35dB	0dB	Peak

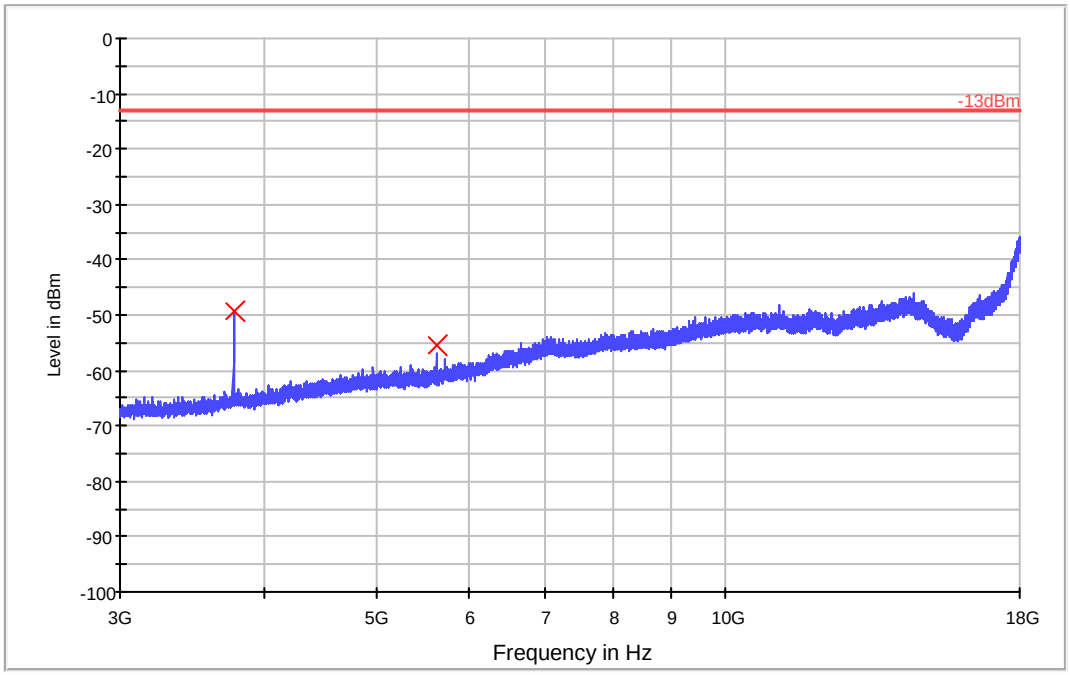
LTE QPSK MODULATION. BW=3 MHz

CHANNEL: LOWEST



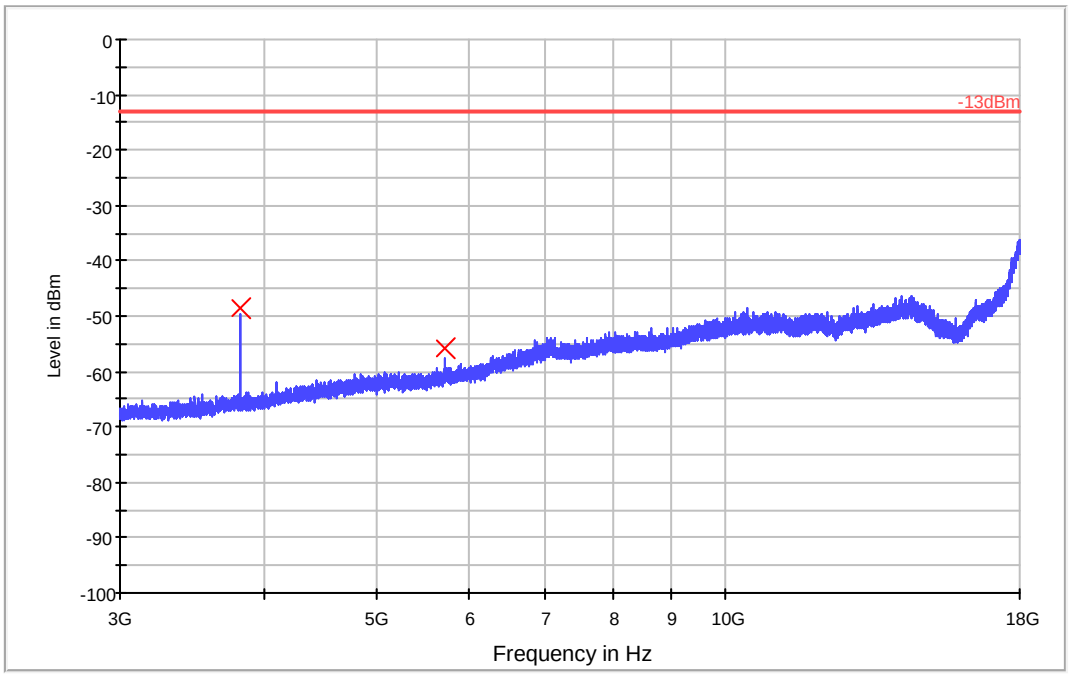
VBW	RBW	SWT	Ref. Level	Preamp	Att.	Det.
1MHz	1MHz	1s	0dBm	35dB	0dB	Peak

CHANNEL: MIDDLE



VBW	RBW	SWT	Ref. Level	Preamp	Att.	Det.
1MHz	1MHz	1s	0dBm	35dB	0dB	Peak

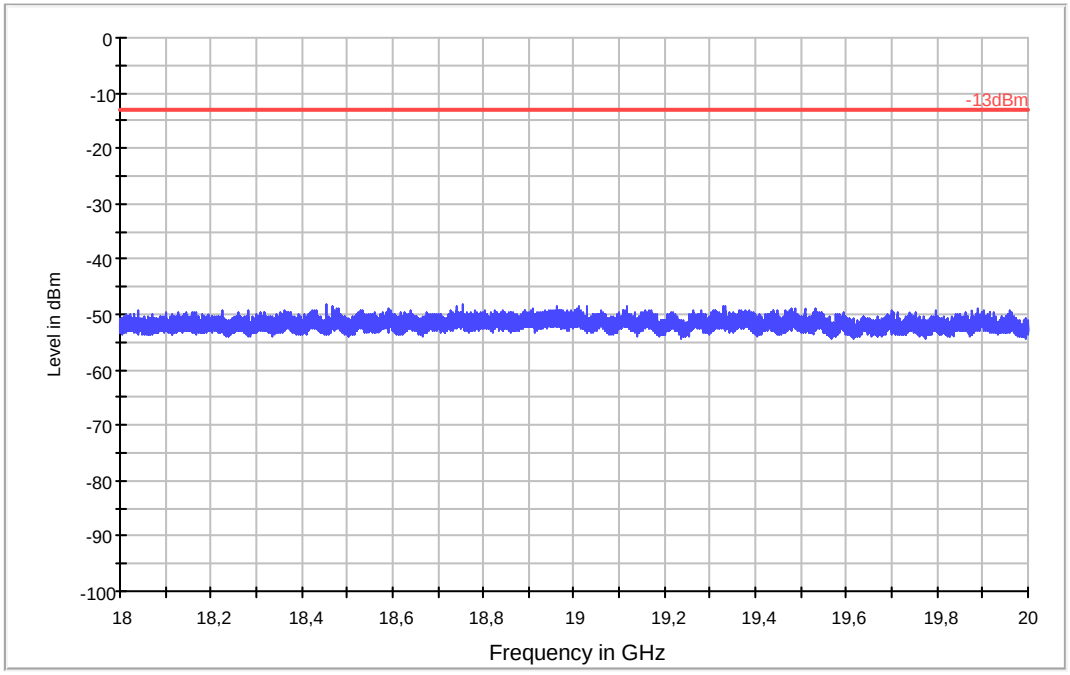
CHANNEL: HIGHEST



VBW	RBW	SWT	Ref. Level	Preamp	Att.	Det.
1MHz	1MHz	1s	0dBm	35dB	0dB	Peak

FREQUENCY RANGE 18 GHz TO 20 GHz.

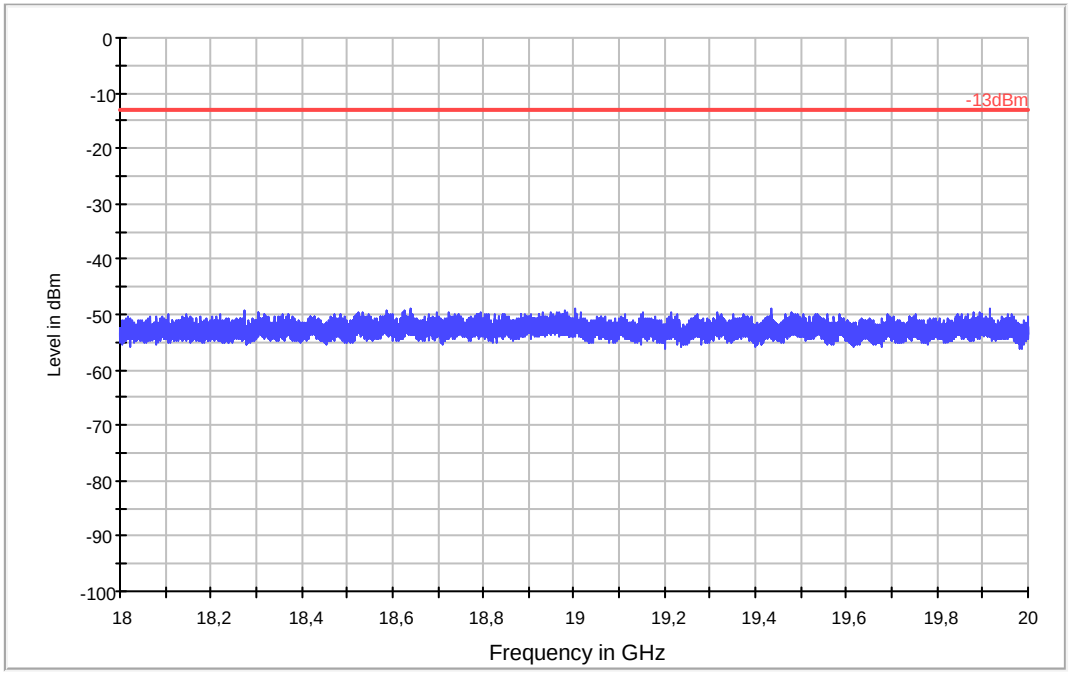
GPRS MODULATION



VBW	RBW	SWT	Ref. Level	Preamp	Att.	Det.
1MHz	1MHz	1s	0dBm	35dB	0dB	Peak

(This plot is valid for all three channels)

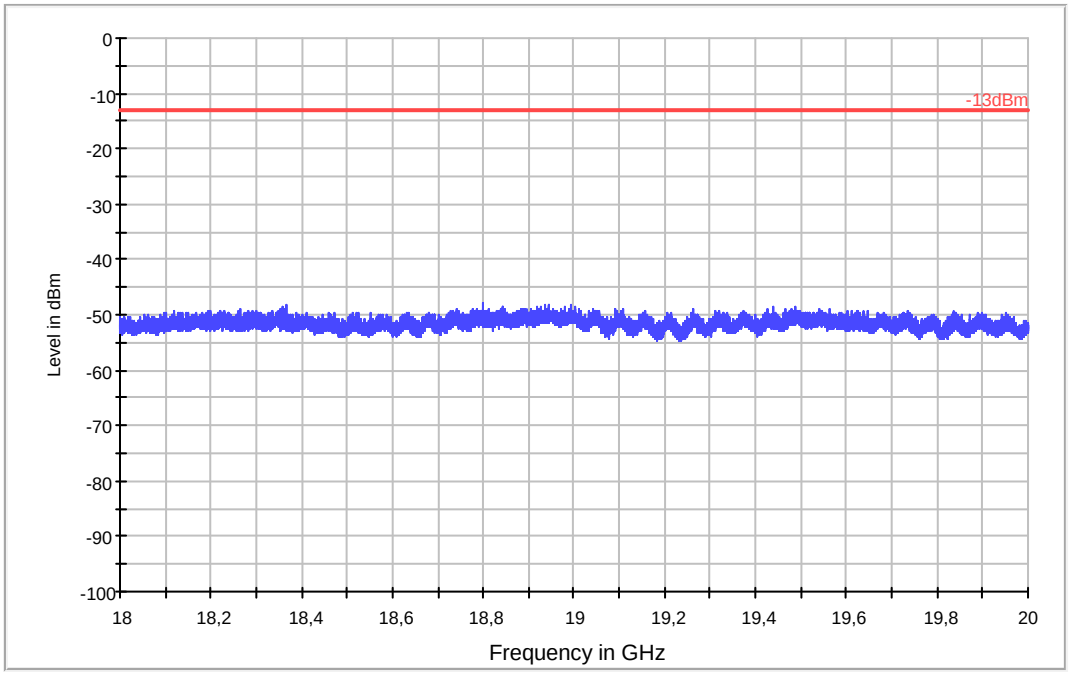
WCDMA MODULATION



VBW	RBW	SWT	Ref. Level	Preamp	Att.	Det.
1MHz	1MHz	1s	0dBm	35dB	0dB	Peak

(This plot is valid for all three channels)

LTE QPSK MODULATION. BW=3 MHz



VBW	RBW	SWT	Ref. Level	Preamp	Att.	Det.
1MHz	1MHz	1s	0dBm	35dB	0dB	Peak

(This plot is valid for all three channels)