TESTING LABORATORY
CERTIFICATE #4820.01

FCC PART 22H, PART 24E,PART 27
MEASUREMENT AND TEST REPORT

For

MAXWEST COMMUNICATION LIMITED

ROOM 1802B FORTRESS TOWER 250 KING'S ROAD NORTH POINT,Hong Kong

FCC ID:2ASP8NITRO5P

Report Type:	**Product Type:**
Original Report	MOBILE PHONE

Report Number:	RDG191224001-00C
Report Date:	2020-01-17
Reviewed By:	Ivan Cao Assistant Manager
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:		MOBILE PHONE
EUT Model:		NITRO 5P
Operation modes:		GSM Voice, GPRS/EDGE Data, WCDMA(R99 (Voice+Data), HSDPA/HSUPA/HSPA+) FDD-LTE
Operation Frequency:		GSM 850: 824-849 MHz(TX); 869-894 MHz(RX) PCS 1900: 1850-1910 MHz(TX); 1930-1990 MHz(RX) WCDMA Band 2: 1850-1910 MHz(TX); 1930-1990 MHz(RX) WCDMA Band 4:1710-1755 MHz(TX), 2110-2155 MHz(RX) WCDMA Band 5: 824-849 MHz(TX); 869-894 MHz(RX) LTE Band 2:1850-1910 MHz(TX), 1930-1990 MHz(RX) LTE Band 4:1710-1755 MHz(TX), 2110-2155 MHz(RX) LTE Band 5:824-849 MHz(TX), 869-894 MHz(RX) LTE Band 12: 699-716 MHz(TX); 729-746 MHz(RX) LTE Band 17: 777-787 MHz(TX); 746-756 MHz(RX)
Maximum Output Power: (Conducted)		GSM 850 :32.32dBm; PCS 1900: 31.1 dBm WCDMA Band 2: 22.53 dBm; WCDMA Band 4: 22.69 dBm; WCDMA Band 5: 22.50 dBm LTE band 2: 22.45 dBm, LTE band 4: 22.51 dBm LTE band 5: 21.59 dBm, LTE Band 12: 22.50 dBm LTE Band 17: 22.47 dBm
Modulation Type:		GMSK, 8PSK, BPSK, QPSK, 16QAM
Adapter Information	**Model:**	Astro 5P
	Input:	100-240Vac 50/60Hz 0.2A
	Output:	5.0Vdc,1A
Rated Input Voltage:		3.8Vdc from battery or 5Vdc from Adapter
Serial Number:		RDG191108018-RF-S1
EUT Received Date:		2019.11.8
EUT Status:		Good

Objective

This report is prepared on behalf of ***MAXWEST COMMUNICATION LIMITED*** in accordance with: Part 2-Subpart J, Part 22-Subpart H, Part 24-Subpart E, Part 27of the Federal Communications Commission's rules.

The objective is to determine compliance with FCC Rules for output power, modulation characteristic, occupied bandwidth, spurious emissions at antenna terminal, spurious radiated emission, frequency stability and band edge.

Related Submittal(s)/Grant(s)

FCC Part 15B JBP submissions with FCC ID: 2ASP8NITRO5P
FCC Part 15C DSS submissions with FCC ID: 2ASP8NITRO5P
FCC Part 15C DTS submissions with FCC ID: 2ASP8NITRO5P

Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J as well as the following parts:

Part 22 Subpart H - Public Mobile Services
Part 24 Subpart E - Personal Communication Services
Part 27 – Miscellaneous wireless communications services

Applicable Standards: TIA/EIA 603-D-2010.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratories Corp.(Dongguan).

Measurement Uncertainty

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±0.61dB
Unwanted Emissions, radiated	30MHz ~ 1GHz:5.85 dB 1G~26.5GHz: 5.23 dB
Unwanted Emissions, conducted	±1.5 dB
Temperature	±1℃
Humidity	±5%
DC and low frequency voltages	±0.4%
Duty Cycle	1%

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China.

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218, the FCC Designation No. : CN1220.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0022.

Declarations

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol “△”. Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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SYSTEM TEST CONFIGURATION

Justification

The EUT was configured for testing according to TIA/EIA-603-D 2010.

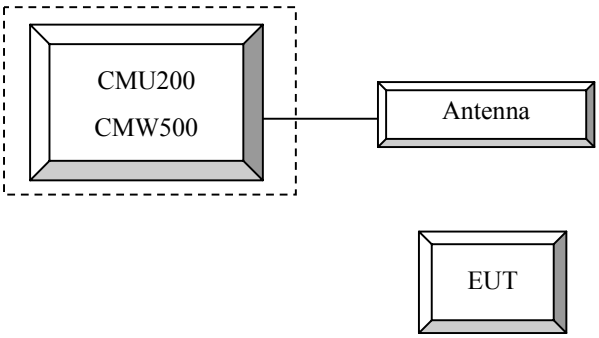
Equipment Modifications

No modification was made to the EUT.

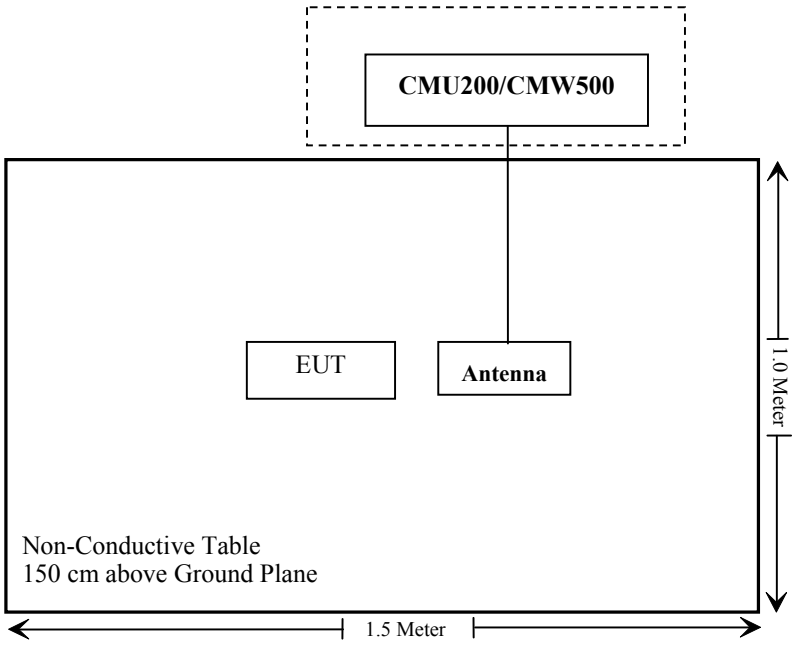
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
R&S	Universial Radio Communication Tester	CMU200	106 891
R&S	Wideband Radio Communication Tester	CMW500	147473
Un-Known	ANTENNA	Un-Known	Un-Known

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

Rules	Description of Test	Result
FCC§1.1310, §2.1093	RF Exposure	Compliance
FCC§2.1046;§ 22.913 (a); § 24.232 (c);§27.50	RF Output Power	Compliance
FCC§ 2.1047	Modulation Characteristics	Not Applicable
FCC§ 2.1049; § 22.905 § 22.917; § 24.238; §27.53	Occupied Bandwidth	Compliance
FCC§ 2.1051, § 22.917 (a); § 24.238 (a); §27.53;	Spurious Emissions at Antenna Terminal	Compliance
FCC§ 2.1053 § 22.917 (a); § 24.238 (a); §27.53	Field Strength of Spurious Radiation	Compliance
FCC§ 22.917 (a); § 24.238 (a); §27.53;	Out of band emission, Band Edge	Compliance
FCC§ 2.1055 § 22.355; § 24.235; §27.54	Frequency stability vs. temperature Frequency stability vs. voltage	Compliance

FCC §1.1310 & §2.1093- RF EXPOSURE

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliance, please refer to the SAR report: RDG191224001-20.

FCC §2.1047 - MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 22H & 24E there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

FCC § 2.1046, § 22.913 (a) & § 24.232 (c) & § 27.50- RF OUTPUT POWER

Applicable Standard

According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC §2.1046 and §24.232 (C), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

According to §24.232 (d) Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

According to §27.50

(b)(10) Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

(c) (10) Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

(d), (4) Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP. Fixed stations operating in the 1710-1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

(h),(2) Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

Test Procedure

GSM/GPRS/EGPRS

Function: Menu select > GSM Mobile Station > GSM 850/1900
Press Connection control to choose the different menus
Press RESET > choose all the reset all settings
Connection Press Signal Off to turn off the signal and change settings
Network Support > GSM + GPRS or GSM + EGSM
Main Service > Packet Data
Service selection > Test Mode A – Auto Slot Config. off
MS Signal Press Slot Config Bottom on the right twice to select and change the number of time slots and power setting
> Slot configuration > Uplink/Gamma
> 33 dBm for GPRS 850
> 30 dBm for GPRS 1900
> 27 dBm for EGPRS 850
> 26 dBm for EGPRS 1900
BS Signal Enter the same channel number for TCH channel (test channel) and BCCH channel
Frequency Offset > + 0 Hz
Mode > BCCH and TCH

BCCH Level > -85 dBm (May need to adjust if link is not stable)
BCCH Channel > choose desire test channel [Enter the same channel number for TCH channel (test channel) and BCCH channel]

Channel Type > Off
P0 > 4 dB
Slot Config > Unchanged (if already set under MS signal)
TCH > choose desired test channel
Hopping > Off
Main Timeslot > 3
Network Coding Scheme > CS4 (GPRS) and MCS5 (EGPRS)

Bit Stream > 2E9-1 PSR Bit Stream
AF/RF Enter appropriate offsets for Ext. Att. Output and Ext. Att. Input
Connection Press Signal on to turn on the signal and change settings

WCDMA-Release 99

The following tests were conducted according to the test requirements outlines in section 5.2 of the 3GPP TS34.121-1 specification. The EUT has a nominal maximum output power of 24dBm (+1.7/-3.7).

WCDMA General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	βc / βd	8/15

WCDMA HSDPA

The following tests were conducted according to the test requirements outlines in section 5.2 of the 3GPP TS34.121-1 specification.

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subset	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	Power Control Algorithm	Algorithm2			
	βc	2/15	12/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	βd (SF)	64			
	βc/ βd	2/15	12/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	MPR(dB)	0	0	0.5	0.5
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	Ahs=βhs/ βc	30/15			

WCDMA HSUPA

The following tests were conducted according to the test requirements outlines in section 5.2 of the 3GPP TS34.121-1 specification.

	Mode	HSUPA	HSUPA	HSUPA	HSUPA	HSUPA
	Subset	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2kbps RMC				
	HSDPA FRC	H-Set1				
	HSUPA Test	HSUPA Loopback				
	Power Control Algorithm	Algorithm2				
	βc	11/15	6/15	15/15	2/15	15/15
	βd	15/15	15/15	9/15	15/15	0
	βec	209/225	12/15	30/15	2/15	5/15
	βc/ βd	11/15	6/15	15/9	2/15	-
	βhs	22/15	12/15	30/15	4/15	5/15
	CM(dB)	1.0	3.0	2.0	3.0	1.0
	MPR(dB)	0	2	1	2	0
HSDPA Specific Settings	DACK	8				
	DNAK	8				
	DCQI	8				
	Ack-Nack repetition factor	3				
	CQI Feedback	4ms				
	CQI Repetition Factor	2				
	Ahs=βhs/ βc	30/15				
HSUPA Specific Settings	DE-DPCCH	6	8	8	5	7
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	21
	ETFCI	75	67	92	71	81
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E_FCIs	E-TFCI 11 E E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO23 E-TFCI 75 E-TFCI PO26 E-TFCI 81 E-TFCI PO 27		E-TFCI 11 E-TFCI PO4 E-TFCI 92 E-TFCI PO 18	E-TFCI 11 E E-TFCI PO 4 E-TFCI 67 E-TFCI PO 18 E-TFCI 71 E-TFCI PO23 E-TFCI 75 E-TFCI PO26 E-TFCI 81 E-TFCI PO 27	

HSPA+

The following tests were conducted according to the test requirements in Table C.11.1.4 of 3GPP TS 34.121-1

Sub-test	β_c (Note3)	β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{ed} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	$\beta_{ed}1$: 30/15 $\beta_{ed}2$: 30/15	$\beta_{ed}3$: 24/15 $\beta_{ed}4$: 24/15	3.5	2.5	14	105	105

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c .
Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).
Note 3: DPDCH is not configured, therefore the β_c is set to 1 and β_d = 0 by default.
Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value.
Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signalled to use the extrapolation algorithm.

DC-HSDPA

The following tests were conducted according to the test requirements in Table C.8.1.12 of 3GPP TS 34.121-1

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK

Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.
Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.

LTE (FDD):

The following tests were conducted according to the test requirements in 3GPP TS36.101

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth (RB)						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS_01".

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	NA
NS_03	6.6.2.2.1	2, 4,10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	See Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	n/a
NS_07	6.6.2.2.3 6.6.3.3.2	13	10	Table 6.2.4-2	Table 6.2.4-2
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	Table 6.2.4-3
NS_11	6.6.2.2.1	23[1]	1.4, 3, 5, 10	Table 6.2.4-5	Table 6.2.4-5
..					
NS_32	-	-	-	-	-

Note 1: Applies to the lower block of Band 23, i.e. a carrier placed in the 2000-2010 MHz region.

Radiated method:

ANSI/TIA-603-D section 2.2.17

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESR3	102453	2019-06-26	2020-06-26
Sunol Sciences	Antenna	JB3	A060611-1	2017-11-10	2020-11-10
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2019-05-06	2020-05-06
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2019-09-05	2020-09-05
Agilent	Signal Generator	E8247C	MY43321350	2019-12-10	2020-12-10
Agilent	Spectrum Analyzer	E4440A	SG43360054	2019-05-09	2020-05-09
TDK RF	Horn Antenna	HRN-0118	130 084	2018-10-12	2021-10-12
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2019-09-05	2020-09-05
R&S	Universal Radio Communication Tester	CMU200	106 891	2019-09-12	2020-09-12
R&S	Wideband Radio Communication Tester	CMW500	147473	2019-08-03	2020-08-03
Unknown	Coaxial Cable	C-SJ00-0010	C0010/03	Each time	/

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Test Items:	Radiation Below 1GHz	Radiation Above 1GHz	Conducted Output Power
Temperature:	25.7 °C	24.3°C	25~26.5 °C
Relative Humidity:	43%	38 %	39~46 %
ATM Pressure:	100.2 kPa	102.2 kPa	101.2~101.6kPa
Tester:	Davy Wang	Tyler Pan	Lily Xie & Xia Yang
Test Date:	2020-01-01	2020-01-03	2019-12-27 & 2020-01-11

Test Result: Compliance

Conducted Output Power

Cellular Band & PCS Band

Band	Channel No.	Conducted Peak Output Power (dBm)								
		GSM	GPRS 1 TX Slot	GPRS 2 TX Slots	GPRS 3 TX Slots	GPRS 4 TX Slots	EGPRS 1 TX Slot	EGPRS 2 TX Slots	EGPRS 3 TX Slots	EGPRS 4 TX Slots
Cellular	128	32.2	32.29	30.17	28.24	26.04	25.32	25.01	23.54	20.19
	190	32.3	32.32	30.23	28.22	26.01	26.05	25.78	24.39	21.27
	251	32.3	32.29	30.21	28.26	26.06	25.62	25.49	23.73	20.58
PCS	512	29.8	30.04	27.93	26.23	24.35	25.46	25.15	24.01	21.22
	661	31.1	29.92	27.68	26.01	23.89	26.45	26.04	24.57	21.36
	810	31.1	29.87	27.42	25.68	23.75	26.17	25.98	24.01	21.86

WCDMA Band 2

Mode	3GPP Sub Test	Low Channel		Middle Channel		High Channel	
		Ave. Power (dBm)	PAR (dB)	Ave. Power (dBm)	PAR (dB)	Ave. Power (dBm)	PAR (dB)
Rel 99	1	22.53	3.00	22.43	2.68	22.48	3.00
HSDPA	1	21.75	3.96	21.81	4.12	21.64	3.56
	2	21.81	3.75	22.22	4.23	21.64	3.86
	3	21.88	4.09	22.17	4.07	21.72	3.86
	4	22.03	3.73	21.86	3.94	21.52	3.69
HSUPA	1	21.85	4.00	21.81	3.20	21.68	4.24
	2	20.99	3.99	21.36	3.13	21.04	4.40
	3	21.36	4.44	21.09	3.23	20.87	4.22
	4	21.23	3.90	21.06	3.53	21.27	4.20
	5	21.09	4.05	20.93	3.61	21.42	4.19
DC-HSDPA	1	21.26	3.81	21.32	3.28	21.37	4.09
	2	21.41	4.42	21.18	3.27	20.76	4.34
	3	20.86	4.42	21.37	3.63	21.10	4.46
	4	21.19	4.00	21.38	3.50	21.28	4.39
HSPA+ (16QAM)	1	20.87	4.46	21.23	3.18	21.42	4.23

WCDMA Band 4

Mode	3GPP Sub Test	Low Channel		Middle Channel		High Channel	
		Ave. Power (dBm)	PAR (dB)	Ave. Power (dBm)	PAR (dB)	Ave. Power (dBm)	PAR (dB)
Rel 99	1	22.69	2.96	22.61	3.08	22.62	3.04
HSDPA	1	21.99	3.52	22.08	4.08	21.91	4.28
	2	21.31	3.41	21.48	3.92	21.99	4.12
	3	22.06	3.67	22.03	4.59	21.94	3.92
	4	21.82	3.72	21.82	4.52	22.00	4.42
HSUPA	1	21.95	3.32	22.09	4.08	21.93	3.96
	2	21.87	2.93	21.49	3.90	21.58	4.15
	3	21.79	3.62	21.29	4.33	21.74	4.00
	4	21.69	3.10	21.31	4.35	21.48	3.91
	5	21.29	3.67	21.71	4.22	21.50	3.88
DC-HSDPA	1	21.22	3.76	21.06	4.77	21.03	4.80
	2	20.96	3.88	20.85	4.91	20.81	4.73
	3	20.96	4.22	21.00	5.16	21.03	5.12
	4	21.21	3.71	21.09	4.94	21.16	5.11
HSPA+ (16QAM)	1	21.52	3.27	21.44	3.93	21.14	4.01

WCDMA Band 5

Mode	3GPP Sub Test	Low Channel		Middle Channel		High Channel	
		Ave. Power (dBm)	PAR (dB)	Ave. Power (dBm)	PAR (dB)	Ave. Power (dBm)	PAR (dB)
Rel 99	1	21.88	2.92	21.87	3.08	22.50	3.08
HSDPA	1	21.77	4.12	21.55	3.44	22.12	4.04
	2	21.56	4.39	21.75	3.41	21.57	4.30
	3	21.80	4.64	21.69	3.71	21.52	4.58
	4	22.17	4.44	21.73	3.98	21.89	4.55
HSUPA	1	21.87	3.44	21.51	3.32	22.15	3.48
	2	21.73	3.54	22.11	3.28	21.52	3.18
	3	21.95	3.68	21.49	3.50	21.54	3.56
	4	22.04	3.81	22.03	3.62	22.04	3.70
	5	21.42	3.68	21.73	3.31	21.98	3.47
DC-HSDPA	1	21.78	3.31	21.69	3.28	21.95	3.14
	2	22.12	3.14	21.93	3.44	22.10	3.46
	3	21.54	3.17	21.45	3.80	21.93	3.66
	4	21.62	3.36	21.53	3.14	21.92	3.30
HSPA+ (16QAM)	1	21.77	3.69	21.46	3.47	21.43	3.67

LTE Band 2

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4MHz	QPSK	RB1#0	22.17	22.20	22.21
		RB1#3	22.24	22.28	22.21
		RB1#5	22.24	22.22	22.18
		RB3#0	22.31	22.26	22.30
		RB3#3	22.32	22.26	22.17
		RB6#0	21.15	21.27	21.28
	16QAM	RB1#0	21.37	21.13	21.83
		RB1#3	21.38	21.14	21.90
		RB1#5	21.41	21.13	21.91
		RB3#0	21.41	21.45	21.37
		RB3#3	21.45	21.44	21.38
		RB6#0	20.47	20.36	20.46
3MHz	QPSK	RB1#0	22.20	22.15	22.18
		RB1#8	22.22	22.14	22.19
		RB1#14	22.18	22.13	22.19
		RB6#0	21.11	21.21	21.22
		RB6#9	21.24	21.17	21.15
		RB15#0	21.17	21.22	21.25
	16QAM	RB1#0	21.45	21.71	21.06
		RB1#8	21.45	21.72	21.00
		RB1#14	21.43	21.72	21.03
		RB6#0	20.45	20.41	20.51
		RB6#9	20.48	20.42	20.51
		RB15#0	20.35	20.22	20.36
5MHz	QPSK	RB1#0	22.17	22.29	22.08
		RB1#13	22.10	22.34	22.21
		RB1#24	22.19	22.38	22.17
		RB15#0	21.21	21.17	21.27
		RB15#10	21.19	21.18	21.28
		RB25#0	21.26	21.17	21.28
	16QAM	RB1#0	20.56	21.34	20.87
		RB1#13	20.54	21.41	20.84
		RB1#24	20.51	21.42	21.00
		RB15#0	20.42	20.19	20.35
		RB15#10	20.41	20.18	20.35
		RB25#0	20.38	20.28	20.21

10MHz	QPSK	RB1#0	22.16	22.19	22.11
		RB1#25	22.10	22.19	22.20
		RB1#49	22.17	22.22	22.25
		RB25#0	21.18	21.24	21.13
		RB25#25	21.23	21.14	21.24
		RB50#0	21.23	21.24	21.12
	16QAM	RB1#0	21.71	21.37	20.70
		RB1#25	21.46	21.37	20.73
		RB1#49	21.51	21.35	20.71
		RB25#0	20.30	20.41	20.38
		RB25#25	20.34	20.41	20.37
		RB50#0	20.36	20.39	20.33
15MHz	QPSK	RB1#0	22.17	22.16	22.15
		RB1#38	22.14	22.16	22.08
		RB1#74	22.12	22.19	22.24
		RB36#0	21.28	21.21	21.17
		RB36#39	21.13	21.25	21.15
		RB75#0	21.17	21.25	21.22
	16QAM	RB1#0	21.73	21.60	21.66
		RB1#38	21.58	21.52	21.65
		RB1#74	21.63	21.57	21.71
		RB36#0	20.33	20.44	20.31
		RB36#39	20.31	20.37	20.36
		RB75#0	20.35	20.31	20.32
20MHz	QPSK	RB1#0	22.45	22.31	22.30
		RB1#50	22.35	22.26	22.23
		RB1#99	22.35	22.30	22.44
		RB50#0	21.34	21.18	21.28
		RB50#50	21.26	21.26	21.25
		RB100#0	21.20	21.32	21.26
	16QAM	RB1#0	21.49	21.32	21.99
		RB1#50	21.45	21.32	21.88
		RB1#99	21.48	21.31	21.99
		RB50#0	20.50	20.44	20.33
		RB50#50	20.44	20.39	20.32
		RB100#0	20.43	20.28	20.39

LTE Band 4

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4MHz	QPSK	RB1#0	22.34	22.30	22.43
		RB1#3	22.31	22.25	22.40
		RB1#5	22.35	22.32	22.44
		RB3#0	22.36	22.42	22.33
		RB3#3	22.37	22.43	22.33
		RB6#0	21.29	21.37	21.34
	16QAM	RB1#0	21.99	22.12	21.43
		RB1#3	21.98	22.04	21.43
		RB1#5	22.02	22.06	21.42
		RB3#0	21.44	21.24	21.39
		RB3#3	21.49	21.28	21.36
		RB6#0	20.56	20.50	20.71
3MHz	QPSK	RB1#0	22.24	22.27	22.40
		RB1#8	22.25	22.30	22.44
		RB1#14	22.26	22.28	22.42
		RB6#0	21.28	21.30	21.25
		RB6#9	21.32	21.35	21.21
		RB15#0	21.34	21.37	21.39
	16QAM	RB1#0	21.75	22.09	21.52
		RB1#8	21.76	22.09	21.46
		RB1#14	21.72	22.10	21.47
		RB6#0	20.30	20.54	20.67
		RB6#9	20.33	20.47	20.70
		RB15#0	20.48	20.41	20.53
5MHz	QPSK	RB1#0	22.28	22.40	22.14
		RB1#13	22.33	22.41	22.15
		RB1#24	22.28	22.49	22.11
		RB15#0	21.34	21.32	21.34
		RB15#10	21.36	21.39	21.31
		RB25#0	21.31	21.20	21.29
	16QAM	RB1#0	20.62	21.53	20.93
		RB1#13	20.59	21.51	20.93
		RB1#24	20.59	21.59	20.96
		RB15#0	20.51	20.28	20.45
		RB15#10	20.52	20.35	20.44
		RB25#0	20.56	20.44	20.42

10MHz	QPSK	RB1#0	22.23	22.33	22.46
		RB1#25	22.24	22.35	22.51
		RB1#49	22.25	22.38	22.44
		RB25#0	21.39	21.39	21.35
		RB25#25	21.26	21.27	21.38
		RB50#0	21.30	21.29	21.31
	16QAM	RB1#0	21.56	21.49	20.89
		RB1#25	21.56	21.44	20.93
		RB1#49	21.61	21.47	20.97
		RB25#0	20.44	20.55	20.52
		RB25#25	20.52	20.57	20.52
		RB50#0	20.48	20.46	20.41
15MHz	QPSK	RB1#0	22.21	22.34	22.46
		RB1#38	22.18	22.33	22.35
		RB1#74	22.25	22.42	22.45
		RB36#0	21.40	21.36	21.28
		RB36#39	21.36	21.21	21.30
		RB75#0	21.25	21.26	21.37
	16QAM	RB1#0	21.55	22.08	21.66
		RB1#38	21.53	22.02	21.71
		RB1#74	21.64	22.11	21.67
		RB36#0	20.43	20.39	20.39
		RB36#39	20.54	20.33	20.41
		RB75#0	20.44	20.34	20.31
20MHz	QPSK	RB1#0	22.30	22.38	22.33
		RB1#50	22.28	22.38	22.32
		RB1#99	22.46	22.47	22.38
		RB50#0	21.23	21.24	21.19
		RB50#50	21.29	21.16	21.33
		RB100#0	21.33	21.17	21.25
	16QAM	RB1#0	21.29	21.47	22.21
		RB1#50	21.25	21.33	22.07
		RB1#99	21.32	21.44	22.18
		RB50#0	20.48	20.46	20.41
		RB50#50	20.48	20.45	20.41
		RB100#0	20.43	20.39	20.52

LTE Band 5

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4MHz	QPSK	RB1#0	22.48	22.32	22.47
		RB1#3	22.49	22.33	22.59
		RB1#5	22.45	22.38	22.59
		RB3#0	22.52	22.53	22.47
		RB3#3	22.44	22.50	22.44
		RB6#0	21.48	21.45	21.48
	16QAM	RB1#0	21.87	22.01	21.32
		RB1#3	21.87	22.07	21.29
		RB1#5	21.86	22.15	21.32
		RB3#0	21.47	21.35	21.56
		RB3#3	21.52	21.35	21.54
		RB6#0	20.62	20.50	20.74
3MHz	QPSK	RB1#0	22.32	22.35	22.48
		RB1#8	22.37	22.41	22.55
		RB1#14	22.22	22.44	22.53
		RB6#0	21.38	21.43	21.44
		RB6#9	21.35	21.37	21.37
		RB15#0	21.37	21.45	21.46
	16QAM	RB1#0	21.50	22.02	21.19
		RB1#8	21.48	22.12	21.16
		RB1#14	21.43	22.04	21.20
		RB6#0	20.53	20.51	20.78
		RB6#9	20.52	20.55	20.72
		RB15#0	20.52	20.54	20.64
5MHz	QPSK	RB1#0	22.35	22.50	22.34
		RB1#13	22.28	22.49	22.36
		RB1#24	22.32	22.52	22.38
		RB15#0	21.39	21.35	21.39
		RB15#10	21.43	21.44	21.47
		RB25#0	21.39	21.46	21.53
	16QAM	RB1#0	20.71	21.48	21.05
		RB1#13	20.54	21.49	21.14
		RB1#24	20.58	21.48	21.14
		RB15#0	20.42	20.40	20.64
		RB15#10	20.44	20.36	20.61
		RB25#0	20.45	20.51	20.57
10MHz	QPSK	RB1#0	22.41	22.55	22.55
		RB1#25	22.40	22.51	22.46
		RB1#49	22.44	22.51	22.39
		RB25#0	21.36	21.38	21.40
		RB25#25	21.36	21.39	21.51
		RB50#0	21.30	21.40	20.91
	16QAM	RB1#0	21.81	21.49	21.47
		RB1#25	21.74	21.60	21.54
		RB1#49	21.69	21.57	21.66
		RB25#0	20.44	20.68	20.03
		RB25#25	20.50	20.56	20.03
		RB50#0	20.40	20.58	20.08

LTE Band 12

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4MHz	QPSK	RB1#0	22.38	22.02	22.28
		RB1#3	22.39	22.08	22.30
		RB1#5	22.37	22.03	22.39
		RB3#0	22.35	22.25	22.29
		RB3#3	22.33	22.25	22.25
		RB6#0	21.14	21.15	21.19
	16QAM	RB1#0	21.43	21.76	20.81
		RB1#3	21.36	21.89	20.91
		RB1#5	21.43	21.88	20.95
		RB3#0	21.10	21.12	21.33
		RB3#3	21.10	21.10	21.32
		RB6#0	20.32	20.31	20.49
3MHz	QPSK	RB1#0	22.33	21.99	22.30
		RB1#8	22.32	22.11	22.29
		RB1#14	22.30	22.08	22.39
		RB6#0	21.28	21.12	21.24
		RB6#9	21.27	21.24	21.19
		RB15#0	21.30	21.20	21.27
	16QAM	RB1#0	21.43	21.78	20.89
		RB1#8	21.36	21.90	20.86
		RB1#14	21.35	21.86	20.98
		RB6#0	20.25	20.19	20.51
		RB6#9	20.47	20.29	20.45
		RB15#0	20.33	20.32	20.36
5MHz	QPSK	RB1#0	22.16	22.15	22.23
		RB1#13	22.16	22.19	22.16
		RB1#24	22.15	22.22	22.18
		RB15#0	21.29	21.13	21.33
		RB15#10	21.27	21.23	21.30
		RB25#0	21.17	21.14	21.18
	16QAM	RB1#0	20.46	21.17	20.85
		RB1#13	20.41	21.25	20.87
		RB1#24	20.29	21.17	20.85
		RB15#0	20.24	20.07	20.19
		RB15#10	20.39	20.23	20.31
		RB25#0	20.49	20.32	20.07
10MHz	QPSK	RB1#0	22.24	22.26	22.31
		RB1#25	22.11	22.09	22.44
		RB1#49	22.15	22.42	22.50
		RB25#0	21.26	21.14	21.19
		RB25#25	21.18	21.24	21.27
		RB50#0	21.15	21.22	21.27
	16QAM	RB1#0	21.44	21.34	20.65
		RB1#25	21.21	21.37	20.76
		RB1#49	21.31	21.55	20.83
		RB25#0	20.41	20.36	20.43
		RB25#25	20.22	20.29	20.40
		RB50#0	20.49	20.47	20.18

LTE Band 17

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5MHz	QPSK	RB1#0	22.30	22.17	22.19
		RB1#13	22.16	22.24	22.18
		RB1#24	22.26	22.37	22.28
		RB15#0	21.19	21.20	21.29
		RB15#10	21.24	21.21	21.30
		RB25#0	21.15	21.20	21.28
	16QAM	RB1#0	20.32	21.21	20.89
		RB1#13	20.46	21.15	20.83
		RB1#24	20.51	21.21	20.92
		RB15#0	20.33	20.02	20.21
		RB15#10	20.42	20.08	20.35
		RB25#0	20.33	20.09	20.16
10MHz	QPSK	RB1#0	22.13	22.04	22.26
		RB1#25	22.10	22.19	22.39
		RB1#49	22.20	22.31	22.47
		RB25#0	21.09	21.18	21.25
		RB25#25	21.33	21.35	21.36
		RB50#0	21.30	21.21	21.22
	16QAM	RB1#0	21.19	21.33	20.66
		RB1#25	21.20	21.42	20.79
		RB1#49	21.30	21.49	20.82
		RB25#0	20.26	20.45	20.48
		RB25#25	20.26	20.32	20.41
		RB50#0	20.43	20.21	20.21

PAR, Band 2

Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	20 MHz	4.78	4.78	4.97	13
	100 RB		5.54	5.42	5.45	13
16QAM	1 RB	20 MHz	5.10	5.61	6.03	13
	100 RB		6.41	6.28	6.35	13

PAR, Band 4

Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	20 MHz	4.52	4.49	4.29	13
	100 RB		5.48	5.48	5.42	13
16QAM	1 RB	20 MHz	5.64	5.45	5.42	13
	100 RB		6.25	6.31	6.22	13

PAR, Band 5

Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	10 MHz	4.55	4.78	5.06	13
	50 RB		5.45	5.45	5.48	13
16QAM	1 RB	10 MHz	5.71	6.22	6.41	13
	50 RB		6.22	6.25	6.44	13

PAR, Band 12

Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	10 MHz	3.40	5.67	4.17	13
	50 RB		5.90	5.48	4.74	13
16QAM	1 RB	10 MHz	4.10	6.31	5.35	13
	50 RB		6.60	6.35	5.90	13

PAR, Band 17

Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	10 MHz	/	5.06	/	13
	50 RB		/	4.90	/	13
16QAM	1 RB	10 MHz	/	6.19	/	13
	50 RB		/	5.80	/	13

Note: peak-to-average ratio (PAR) <13 dB.

ERP & EIRP

Part 22H

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
GSM 850 Middle Channel								
836.60	H	90.96	16.04	0.00	0.97	15.07	38.45	23.38
836.60	V	101.69	29.90	0.00	0.97	28.93	38.45	9.52
EGPRS850 Middle Channel								
836.60	H	86.23	11.31	0.00	0.97	10.34	38.45	28.11
836.60	V	96.34	24.55	0.00	0.97	23.58	38.45	14.87
WCDMA R99 Band 5 middle channel								
836.60	H	80.87	5.95	0.00	0.97	4.98	38.45	33.47
836.60	V	92.33	20.54	0.00	0.97	19.57	38.45	18.88

Part 24E

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
PCS 1900 Middle Channel								
1880.00	H	93.49	18.71	11.14	1.56	28.29	33.00	4.71
1880.00	V	87.31	12.34	11.14	1.56	21.92	33.00	11.08
EGPRS1900 Middle Channel								
1880.00	H	89.18	14.40	11.14	1.56	23.98	33.00	9.02
1880.00	V	85.20	10.23	11.14	1.56	19.81	33.00	13.19
WCDMA R99 Band 2 middle channel								
1880.00	H	83.98	9.20	11.14	1.56	18.78	33.00	14.22
1880.00	V	81.62	6.65	11.14	1.56	16.23	33.00	16.77

Part 27

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
WCDMA R99 Band 4 middle channel								
1732.60	H	86.25	11.04	10.70	1.52	20.22	30.00	9.78
1732.60	V	84.65	9.14	10.70	1.52	18.32	30.00	11.68

Note:
1) The unit of Antenna Gain is dBd for frequency below 1GHz, and the unit of Antenna Gain is dBi for frequency above 1GHz.
2) Absolute Level = Substituted Level - Cable loss + Antenna Gain
3) Margin = Limit-Absolute Level

LTE Band 2

Frequency (MHz)	BW (MHz)	Modulation	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
					Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
1880.00	1.40	QPSK	H	85.02	12.41	11.66	2.66	21.41	33.00	11.59
1880.00			V	80.75	8.28	11.66	2.66	17.28	33.00	15.72
1880.00	3.00		H	84.96	12.35	11.66	2.66	21.35	33.00	11.65
1880.00			V	81.19	8.72	11.66	2.66	17.72	33.00	15.28
1880.00	5.00		H	84.84	12.23	11.66	2.66	21.23	33.00	11.77
1880.00			V	80.97	8.50	11.66	2.66	17.50	33.00	15.50
1880.00	10.00		H	83.55	10.94	11.66	2.66	19.94	33.00	13.06
1880.00			V	79.97	7.50	11.66	2.66	16.50	33.00	16.50
1880.00	15.00		H	83.79	11.18	11.66	2.66	20.18	33.00	12.82
1880.00			V	79.83	7.36	11.66	2.66	16.36	33.00	16.64
1880.00	20.00		H	83.54	10.93	11.66	2.66	19.93	33.00	13.07
1880.00			V	79.80	7.33	11.66	2.66	16.33	33.00	16.67
1880.00	1.40	16QAM	H	85.69	13.08	11.66	2.66	22.08	33.00	10.92
1880.00			V	81.22	8.75	11.66	2.66	17.75	33.00	15.25
1880.00	3.00		H	85.07	12.46	11.66	2.66	21.46	33.00	11.54
1880.00			V	81.08	8.61	11.66	2.66	17.61	33.00	15.39
1880.00	5.00		H	84.86	12.25	11.66	2.66	21.25	33.00	11.75
1880.00			V	80.84	8.37	11.66	2.66	17.37	33.00	15.63
1880.00	10.00		H	84.03	11.42	11.66	2.66	20.42	33.00	12.58
1880.00			V	79.71	7.24	11.66	2.66	16.24	33.00	16.76
1880.00	15.00		H	83.86	11.25	11.66	2.66	20.25	33.00	12.75
1880.00			V	80.07	7.60	11.66	2.66	16.60	33.00	16.40
1880.00	20.00		H	82.73	10.12	11.66	2.66	19.12	33.00	13.88
1880.00			V	78.76	6.29	11.66	2.66	15.29	33.00	17.71

LTE Band 4

Frequency (MHz)	BW (MHz)	Modulation	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
					Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
1732.50	1.40	QPSK	H	85.88	11.83	10.90	2.51	20.22	30.00	9.78
1732.50			V	83.34	8.97	10.90	2.51	17.36	30.00	12.64
1732.50	3.00		H	85.70	11.65	10.90	2.51	20.04	30.00	9.96
1732.50			V	82.98	8.61	10.90	2.51	17.00	30.00	13.00
1732.50	5.00		H	85.66	11.61	10.90	2.51	20.00	30.00	10.00
1732.50			V	82.77	8.40	10.90	2.51	16.79	30.00	13.21
1732.50	10.00		H	84.48	10.43	10.90	2.51	18.82	30.00	11.18
1732.50			V	81.76	7.39	10.90	2.51	15.78	30.00	14.22
1732.50	15.00		H	84.62	10.57	10.90	2.51	18.96	30.00	11.04
1732.50			V	81.75	7.38	10.90	2.51	15.77	30.00	14.23
1732.50	20.00		H	84.56	10.51	10.90	2.51	18.90	30.00	11.10
1732.50			V	81.48	7.11	10.90	2.51	15.50	30.00	14.50
1732.50	1.40	16QAM	H	85.39	11.34	10.90	2.51	19.73	30.00	10.27
1732.50			V	82.12	7.75	10.90	2.51	16.14	30.00	13.86
1732.50	3.00		H	84.77	10.72	10.90	2.51	19.11	30.00	10.89
1732.50			V	81.89	7.52	10.90	2.51	15.91	30.00	14.09
1732.50	5.00		H	84.64	10.59	10.90	2.51	18.98	30.00	11.02
1732.50			V	81.81	7.44	10.90	2.51	15.83	30.00	14.17
1732.50	10.00		H	83.45	9.40	10.90	2.51	17.79	30.00	12.21
1732.50			V	80.48	6.11	10.90	2.51	14.50	30.00	15.50
1732.50	15.00		H	83.64	9.59	10.90	2.51	17.98	30.00	12.02
1732.50			V	80.73	6.36	10.90	2.51	14.75	30.00	15.25
1732.50	20.00		H	83.76	9.71	10.90	2.51	18.10	30.00	11.90
1732.50			V	80.59	6.22	10.90	2.51	14.61	30.00	15.39

LTE Band 5

Frequency (MHz)	BW (MHz)	Modulation	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
					Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
836.50	1.40	QPSK	H	82.24	7.31	0.00	0.97	6.34	38.45	32.11
836.50			V	91.20	19.41	0.00	0.97	18.44	38.45	20.01
836.50	3.00		H	82.44	7.51	0.00	0.97	6.54	38.45	31.91
836.50			V	91.12	19.33	0.00	0.97	18.36	38.45	20.09
836.50	5.00		H	81.33	6.40	0.00	0.97	5.43	38.45	33.02
836.50			V	90.25	18.46	0.00	0.97	17.49	38.45	20.96
836.50	10.00		H	81.89	6.96	0.00	0.97	5.99	38.45	32.46
836.50			V	89.88	18.09	0.00	0.97	17.12	38.45	21.33
836.50	1.40	16QAM	H	81.78	6.85	0.00	0.97	5.88	38.45	32.57
836.50			V	89.96	18.17	0.00	0.97	17.20	38.45	21.25
836.50	3.00		H	81.51	6.58	0.00	0.97	5.61	38.45	32.84
836.50			V	89.45	17.66	0.00	0.97	16.69	38.45	21.76
836.50	5.00		H	81.49	6.56	0.00	0.97	5.59	38.45	32.86
836.50			V	89.34	17.55	0.00	0.97	16.58	38.45	21.87
836.50	10.00		H	81.06	6.13	0.00	0.97	5.16	38.45	33.29
836.50			V	89.63	17.84	0.00	0.97	16.87	38.45	21.58

LTE Band 12

Frequency (MHz)	BW (MHz)	Modulation	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
					Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
707.50	1.40	QPSK	H	84.04	7.18	0.00	0.94	6.24	34.77	28.53
707.50			V	92.21	17.79	0.00	0.94	16.85	34.77	17.92
707.50	3.00		H	83.51	6.65	0.00	0.94	5.71	34.77	29.06
707.50			V	91.86	17.44	0.00	0.94	16.50	34.77	18.27
707.50	5.00		H	83.56	6.70	0.00	0.94	5.76	34.77	29.01
707.50			V	91.71	17.29	0.00	0.94	16.35	34.77	18.42
707.50	10.00		H	83.13	6.27	0.00	0.94	5.33	34.77	29.44
707.50			V	91.65	17.23	0.00	0.94	16.29	34.77	18.48
707.50	1.40	16QAM	H	82.65	5.79	0.00	0.94	4.85	34.77	29.92
707.50			V	92.00	17.58	0.00	0.94	16.64	34.77	18.13
707.50	3.00		H	82.05	5.19	0.00	0.94	4.25	34.77	30.52
707.50			V	91.74	17.32	0.00	0.94	16.38	34.77	18.39
707.50	5.00		H	82.38	5.52	0.00	0.94	4.58	34.77	30.19
707.50			V	91.56	17.14	0.00	0.94	16.20	34.77	18.57
707.50	10.00		H	82.62	5.76	0.00	0.94	4.82	34.77	29.95
707.50			V	91.53	17.11	0.00	0.94	16.17	34.77	18.60

LTE Band 17

Frequency (MHz)	BW (MHz)	Modulation	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
					Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
710.00	5.00	QPSK	H	82.08	5.27	0.00	0.94	4.33	34.77	30.44
710.00			V	91.75	17.39	0.00	0.94	16.45	34.77	18.32
710.00	10.00		H	81.99	5.18	0.00	0.94	4.24	34.77	30.53
710.00			V	91.44	17.08	0.00	0.94	16.14	34.77	18.63
710.00	5.00	16QAM	H	82.12	5.31	0.00	0.94	4.37	34.77	30.40
710.00			V	91.56	17.20	0.00	0.94	16.26	34.77	18.51
710.00	10.00		H	81.98	5.17	0.00	0.94	4.23	34.77	30.54
710.00			V	91.23	16.87	0.00	0.94	15.93	34.77	18.84

Note:
1) The unit of Antenna Gain is dBd for frequency below 1GHz, and the unit of Antenna Gain is dBi for frequency above 1GHz.
2) Absolute Level = Substituted Level - Cable loss + Antenna Gain
3) Margin = Limit-Absolute Level

FCC §2.1049, §22.917, §22.905 & §24.238 & §27.53- OCCUPIED BANDWIDTH

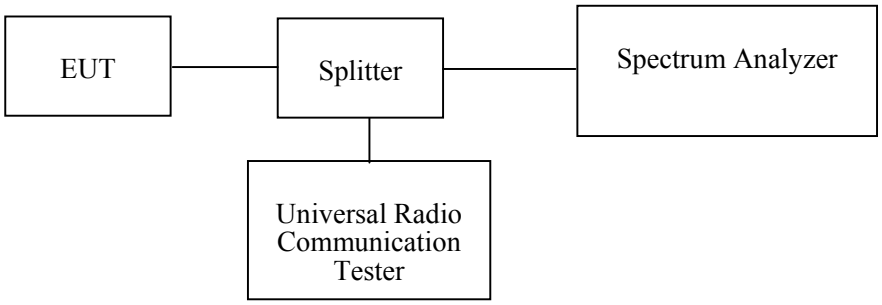
Applicable Standard

FCC §2.1049, §22.917, §22.905, §24.238 and §27.53.

Test Procedure

The RF output of the transmitter was connected to the simulator and the spectrum analyzer through sufficient attenuation.

The 26 dB & 99% bandwidth was recorded.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2019-12-10	2020-12-10
R&S	Spectrum Analyzer	FSU 26	200256	2019-05-09	2020-05-09
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41010013	Each time	/
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005011	Each time	/
Unknown	Coaxial Cable	C-SJ00-0010	C0010/03	Each time	/
E-Microwave	Two-way Spliter	ODP-1-6-2S	OE0120142	Each time	/

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	23.9 °C~ 26 °C
Relative Humidity:	49 %~62 %
ATM Pressure:	101.2kPa ~102.5kPa
Tester:	Xia Yang & Lily Xie
Test Date:	2020-01-02~2020-01-11

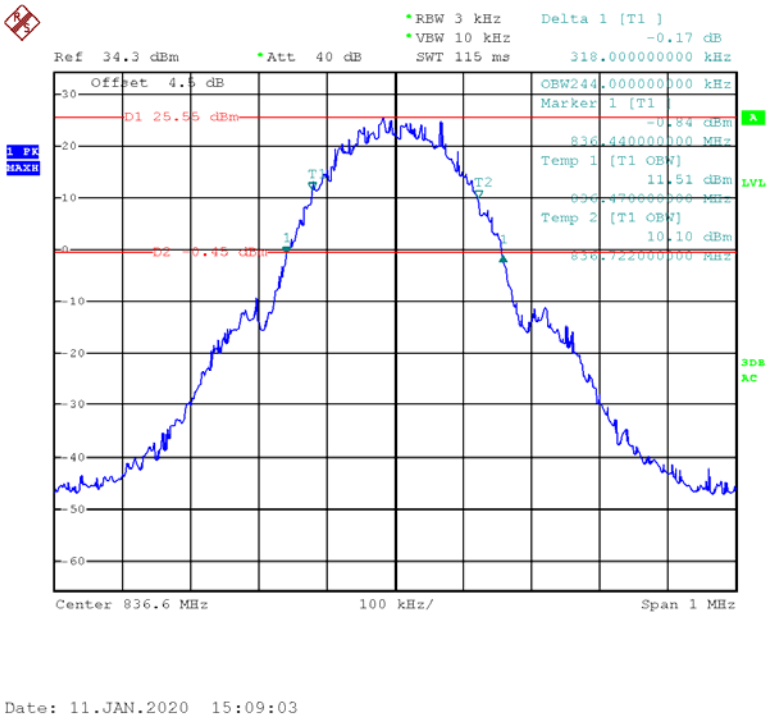
Test Mode: Transmitting
Test Result: Compliance. Please refer to the following table and plots.

Band	Test Channel	Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
Cellular	Middle	GSM	0.244	0.318
		EGPRS	0.250	0.320
PCS		GSM	0.248	0.314
		EGPRS	0.244	0.306
WCDMA Band 2		Rel 99	4.180	4.780
		HSDPA	4.180	4.740
		HSUPA	4.180	4.760
WCDMA Band 4		Rel 99	4.180	4.760
		HSDPA	4.200	4.740
		HSUPA	4.200	4.740
WCDMA Band 5		Rel 99	4.140	4.700
		HSDPA	4.160	4.740
		HSUPA	4.160	4.740

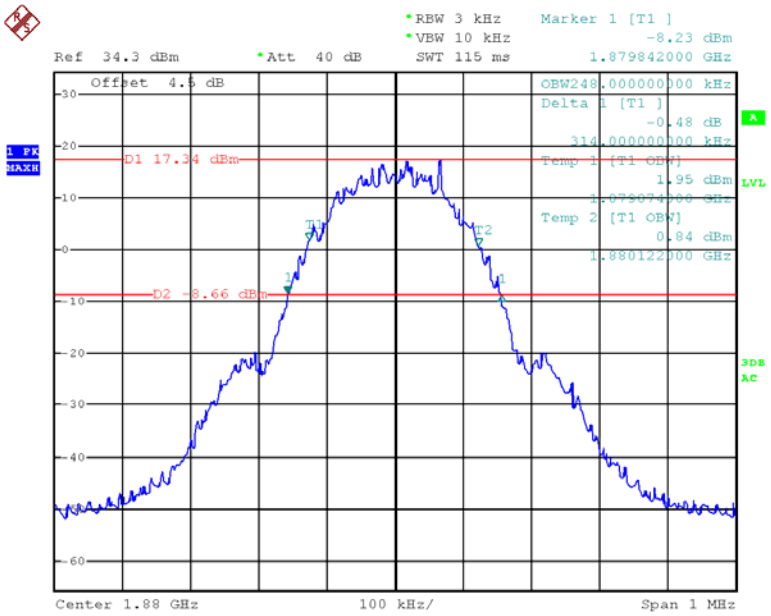
Band	Bandwidth	Modulation	99% occupied bandwidth (MHz)	26 dB bandwidth (MHz)
LTE Band 2	1.4 MHz	QPSK	1.110	1.314
		16QAM	1.098	1.290
	3 MHz	QPSK	2.712	3.012
		16QAM	2.712	3.000
	5 MHz	QPSK	4.540	5.340
		16QAM	4.520	5.320
	10 MHz	QPSK	8.960	9.760
		16QAM	8.960	9.760
	15 MHz	QPSK	13.560	15.480
		16QAM	13.560	15.120
	20 MHz	QPSK	17.920	19.840
		16QAM	18.080	20.000
LTE Band 4	1.4 MHz	QPSK	1.104	1.290
		16QAM	1.110	1.266
	3 MHz	QPSK	2.712	3.012
		16QAM	2.700	3.012
	5 MHz	QPSK	4.560	5.320
		16QAM	4.520	5.280
	10 MHz	QPSK	9.000	9.840
		16QAM	8.960	9.880
	15 MHz	QPSK	13.560	15.660
		16QAM	13.560	15.060
	20 MHz	QPSK	17.920	19.600
		16QAM	18.080	19.680

Band	Bandwidth	Modulation	99% occupied bandwidth (MHz)	26 dB bandwidth (MHz)
LTE Band 5	1.4 MHz	QPSK	1.104	1.284
		16QAM	1.116	1.266
	3 MHz	QPSK	2.712	3.024
		16QAM	2.700	3.024
	5 MHz	QPSK	4.540	5.340
		16QAM	4.520	5.180
	10 MHz	QPSK	8.960	9.800
		16QAM	8.960	9.840
LTE Band 12	1.4 MHz	QPSK	1.110	1.290
		16QAM	1.116	1.272
	3 MHz	QPSK	2.712	3.060
		16QAM	2.700	3.036
	5 MHz	QPSK	4.560	5.760
		16QAM	4.580	5.780
	10 MHz	QPSK	8.960	9.600
		16QAM	8.920	9.560
LTE Band 17	5 MHz	QPSK	4.480	5.000
		16QAM	4.480	5.080
	10 MHz	QPSK	8.840	9.520
		16QAM	8.840	9.480

GSM Cellular 850



GSM PCS 1900



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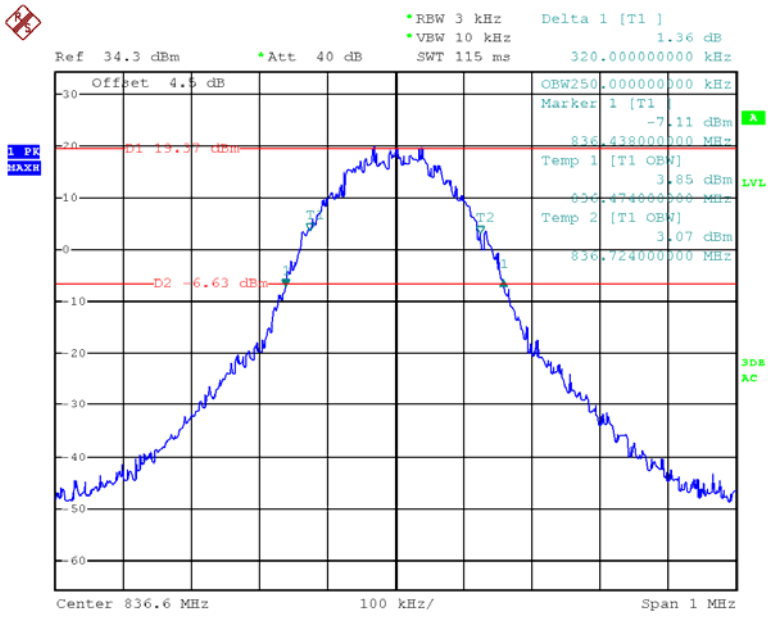
EDGE Cellular 850



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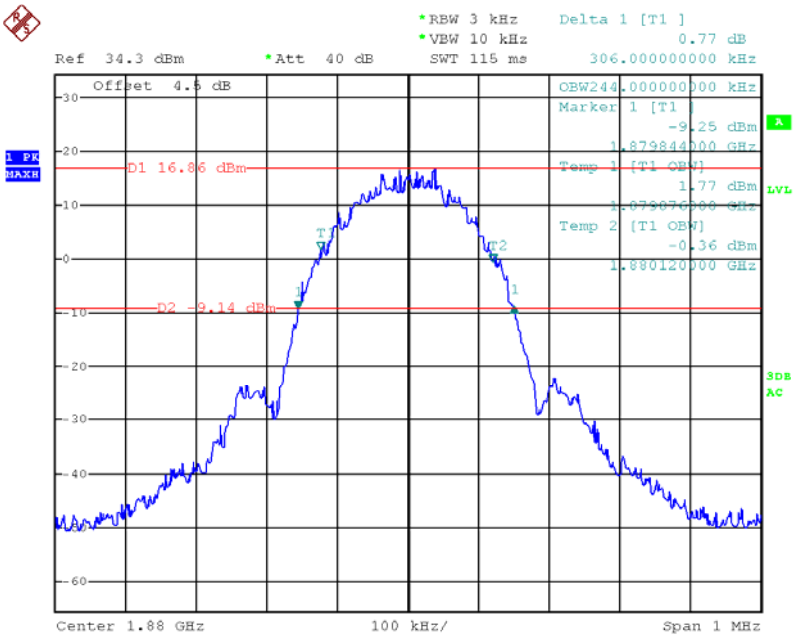
EDGE PCS 1900



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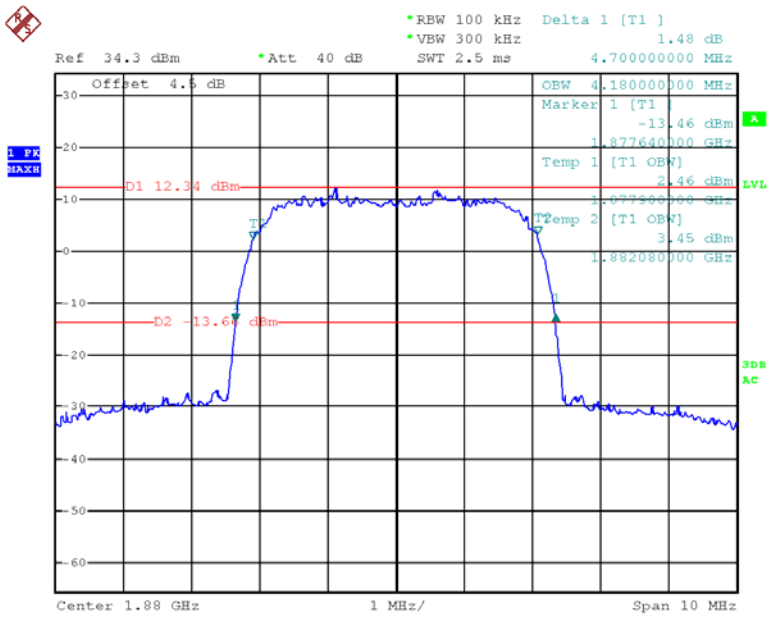
WCDMA Band 2 Rel 99



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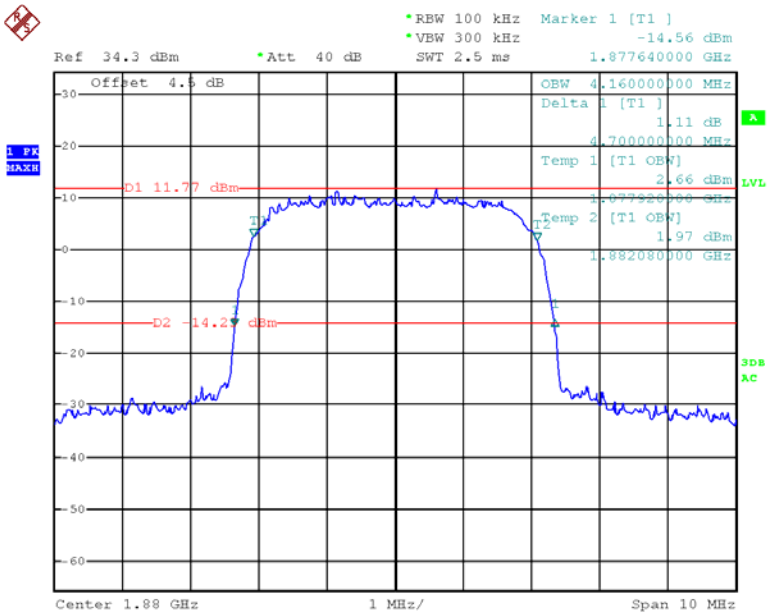
WCDMA Band 2 HSDPA



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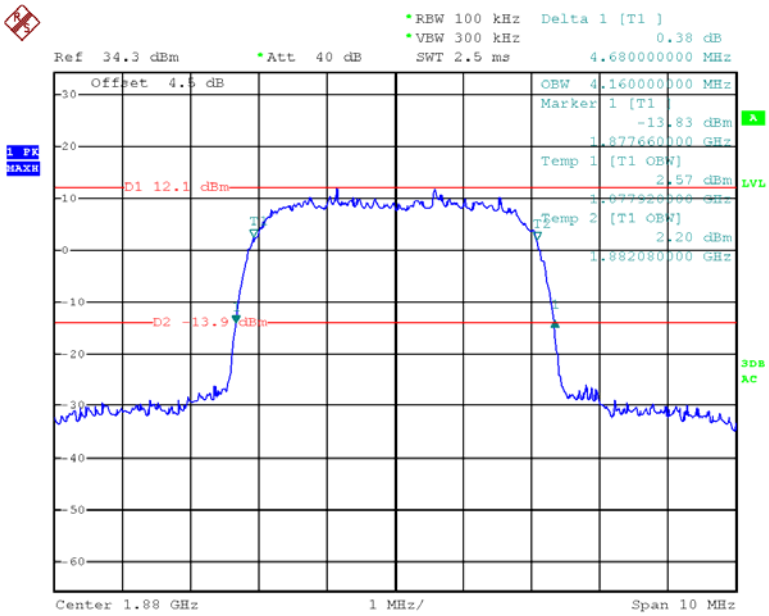

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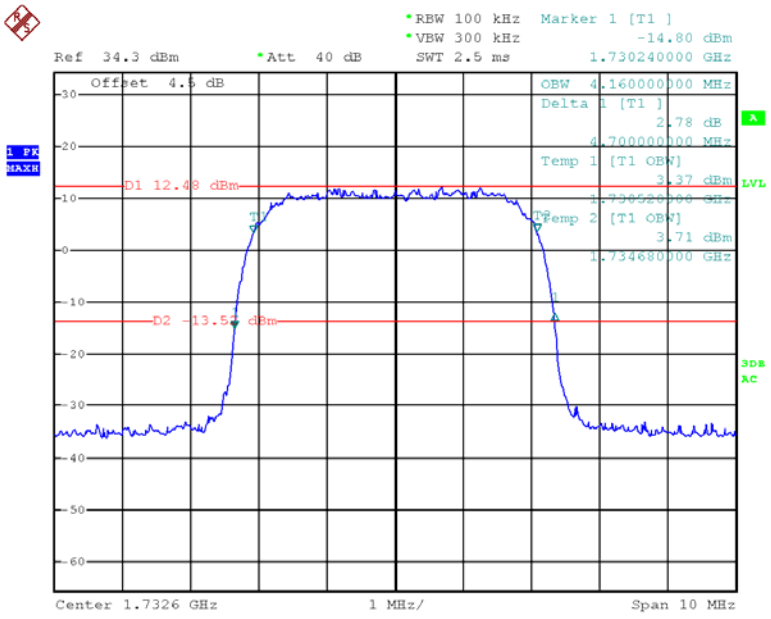

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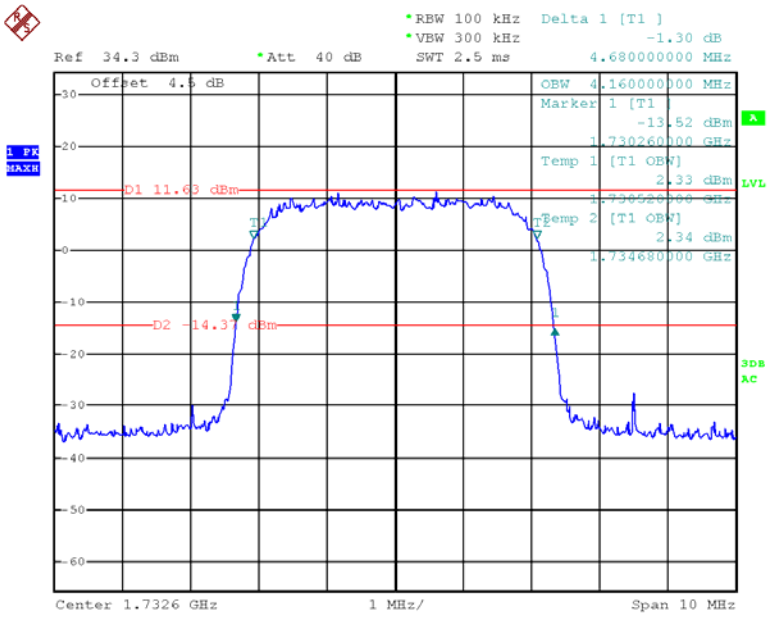

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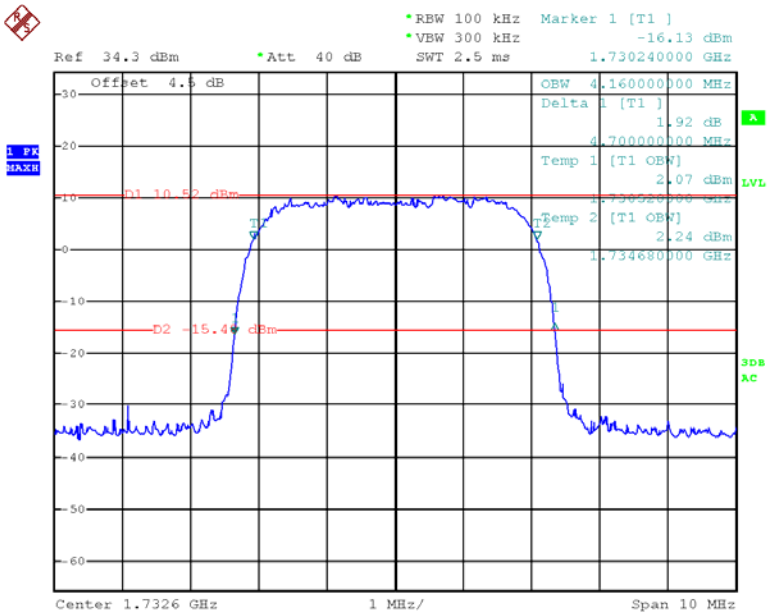

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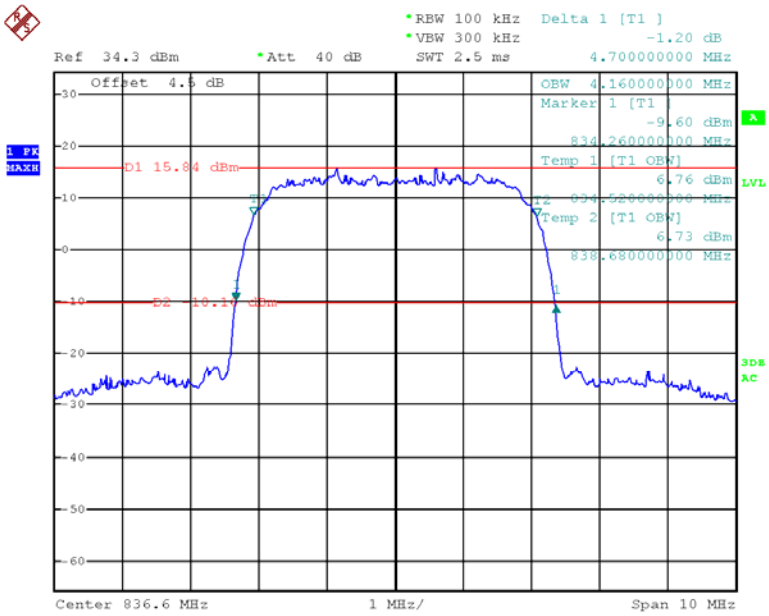
WCDMA Band 5 Rel 99



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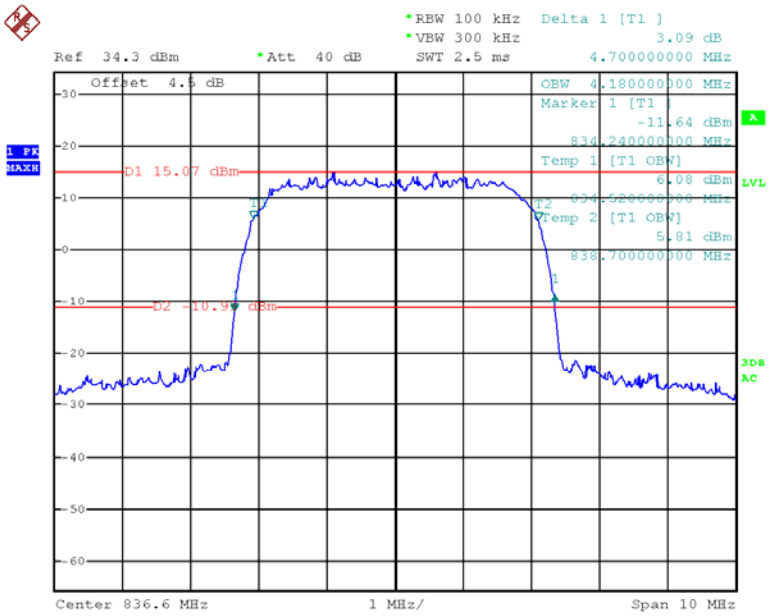
WCDMA Band 5 HSDPA



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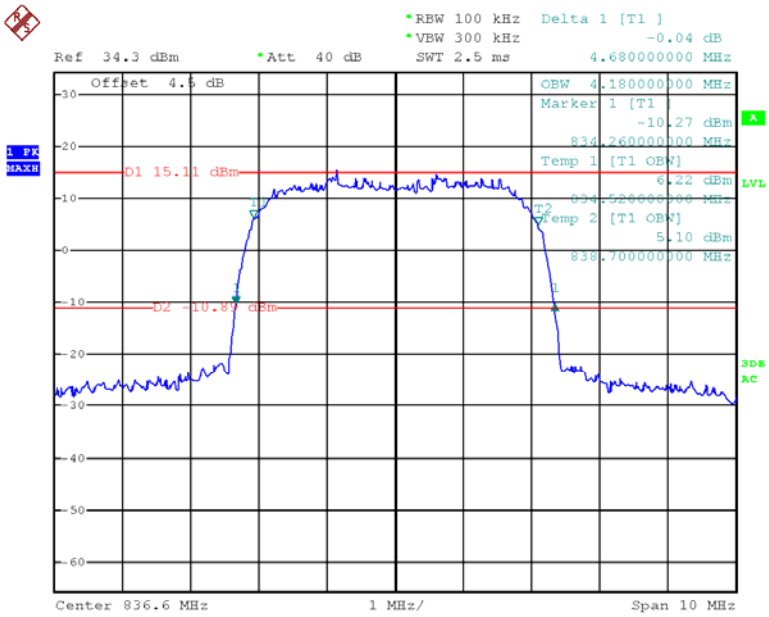

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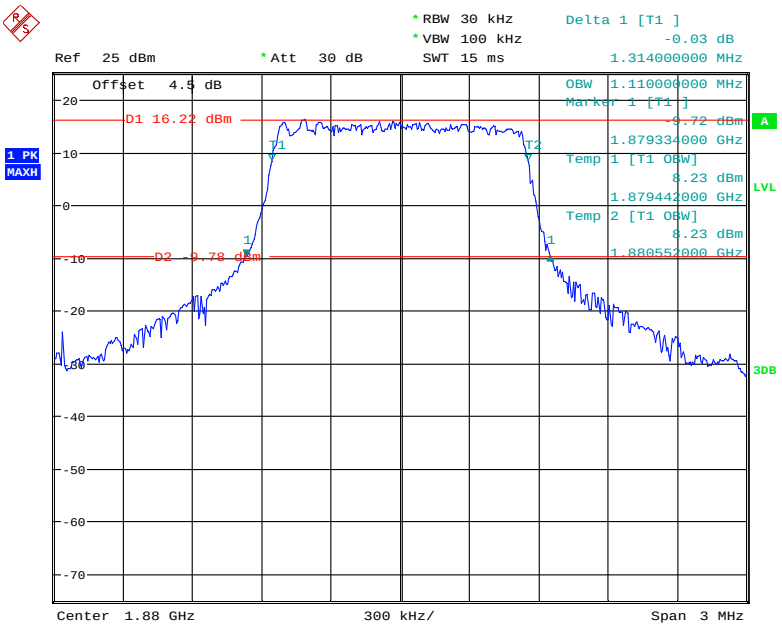
LTE Band 2

QPSK_1.4 MHz



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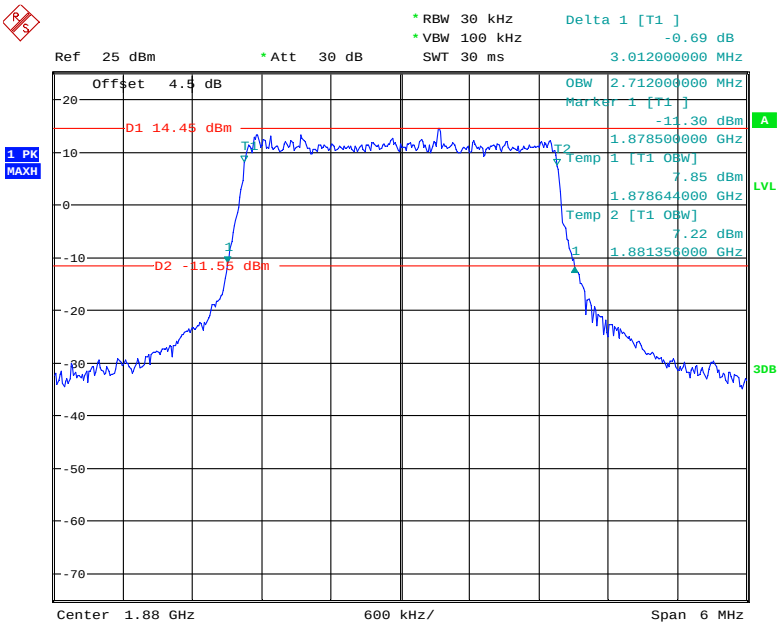
QPSK_3 MHz



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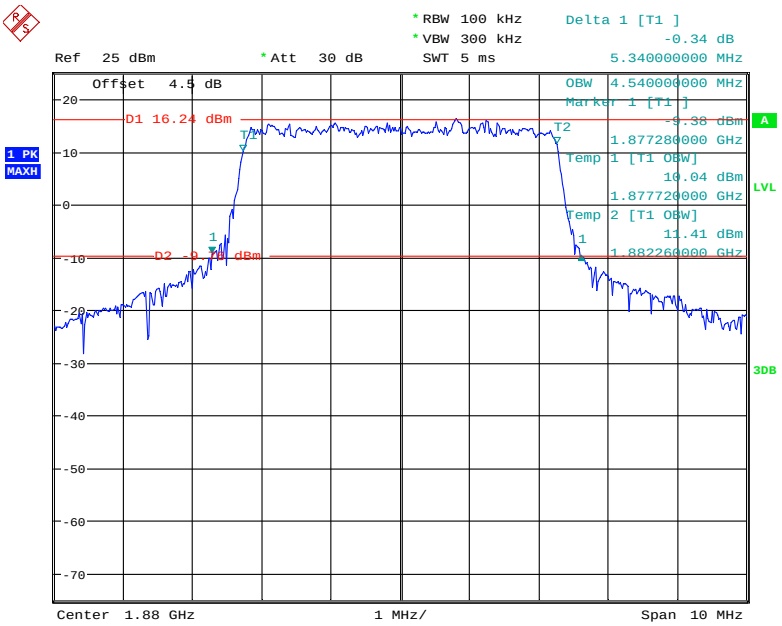
QPSK_5 MHz



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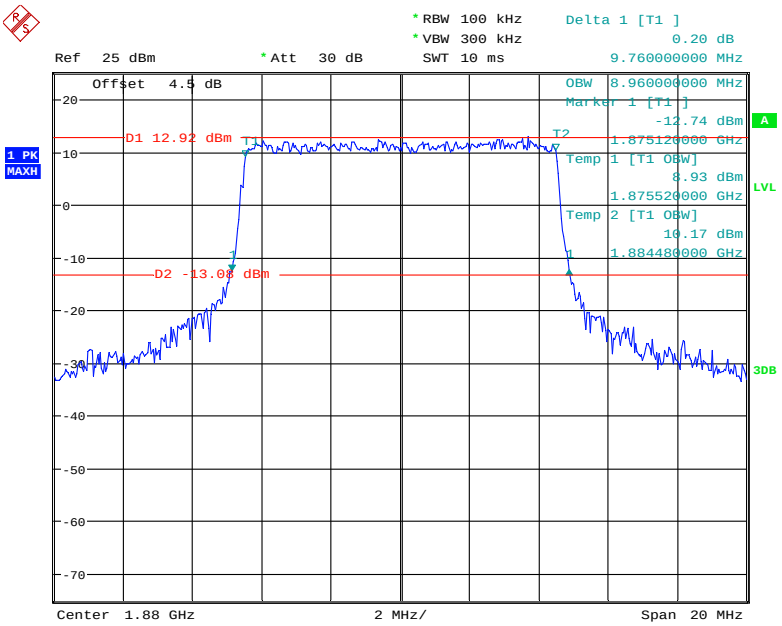
QPSK_10 MHz



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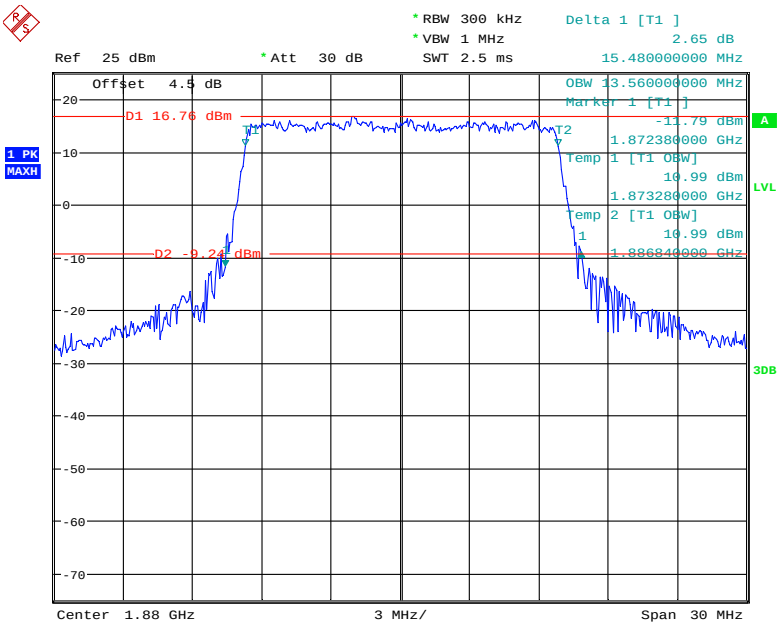
QPSK_15 MHz



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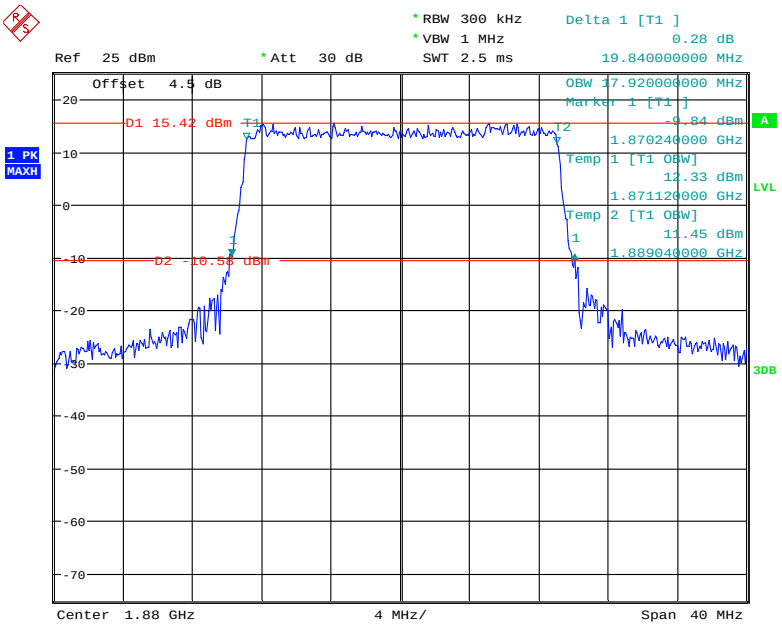
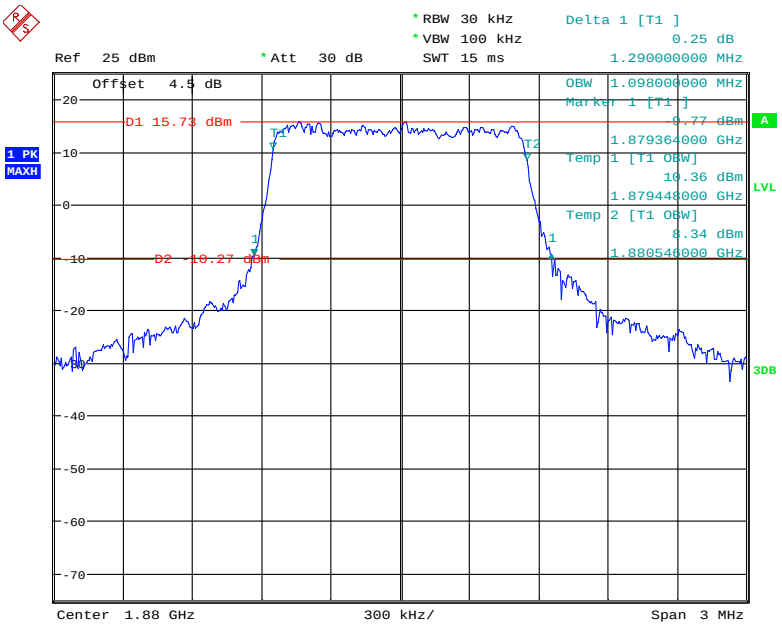
QPSK_20 MHz



Date: 2.JAN.2020 21:22:51

16QAM_1.4 MHz



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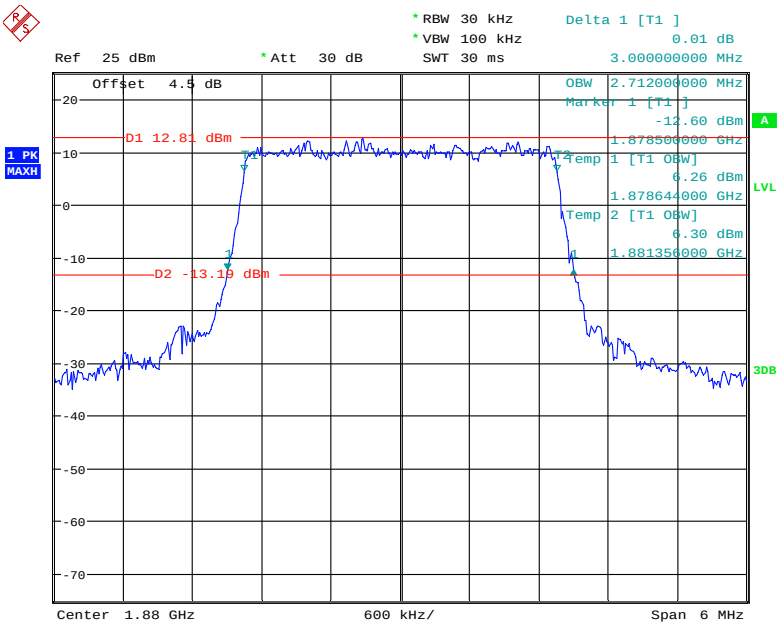
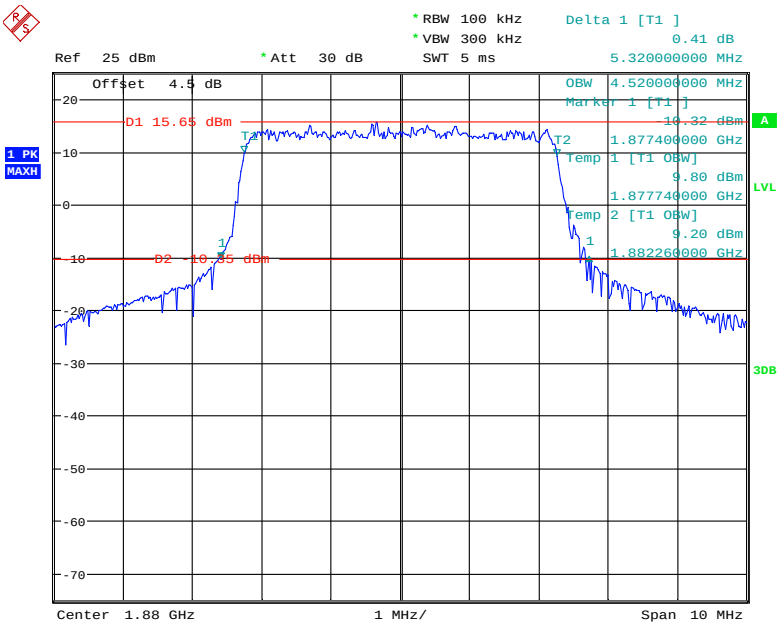
16QAM_3 MHz



Date: 2.JAN.2020 21:19:30

16QAM_5 MHz



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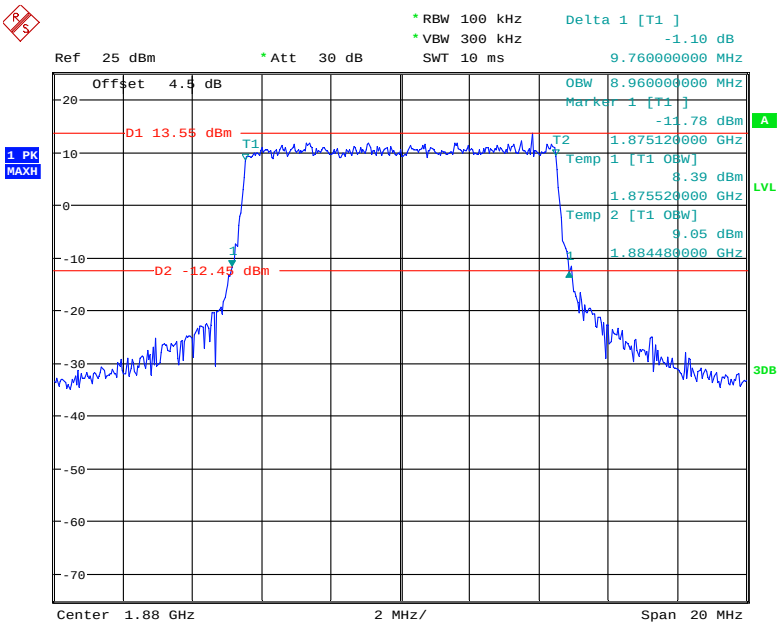
16QAM_10 MHz



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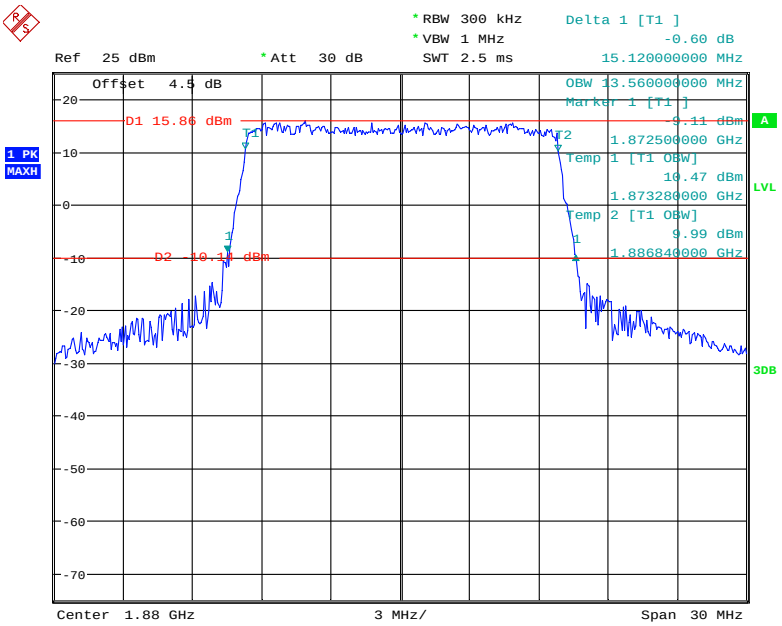
16QAM_15 MHz



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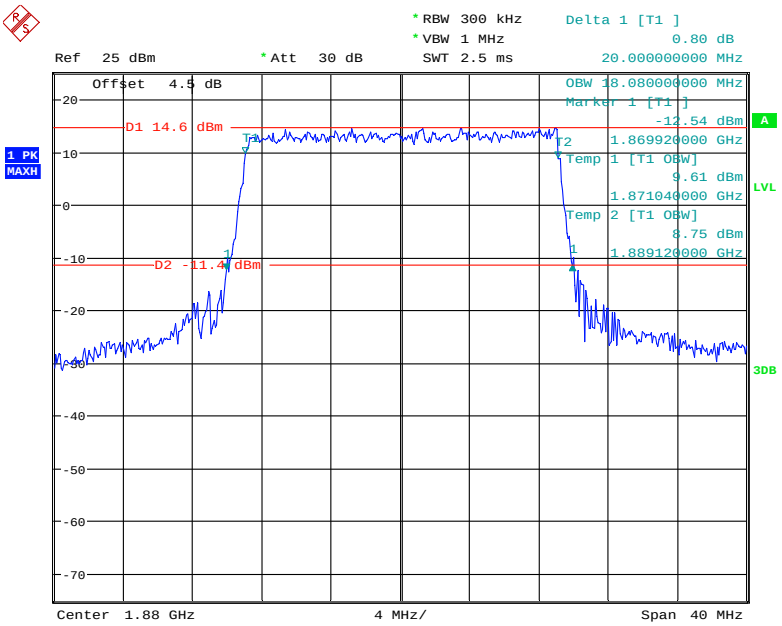
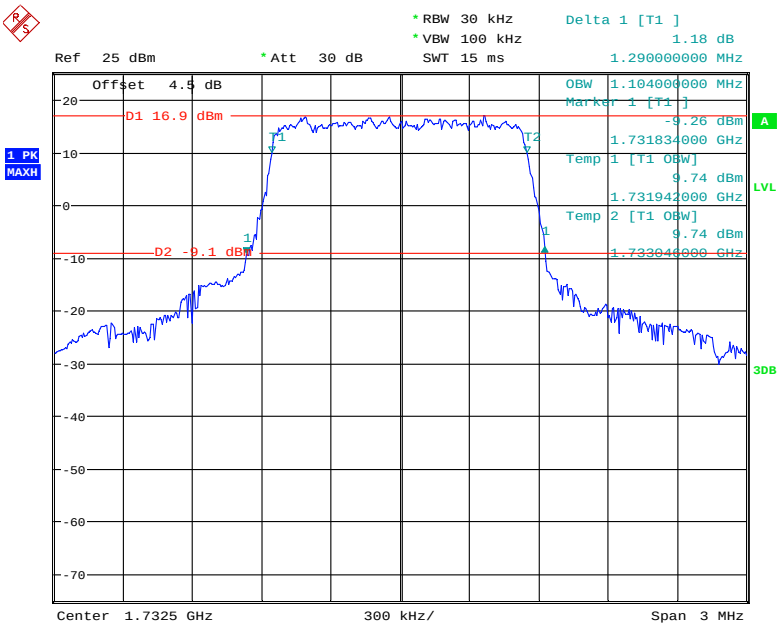
16QAM_20 MHz



Date: 2.JAN.2020 21:23:19

LTE Band 4

QPSK_1.4 MHz



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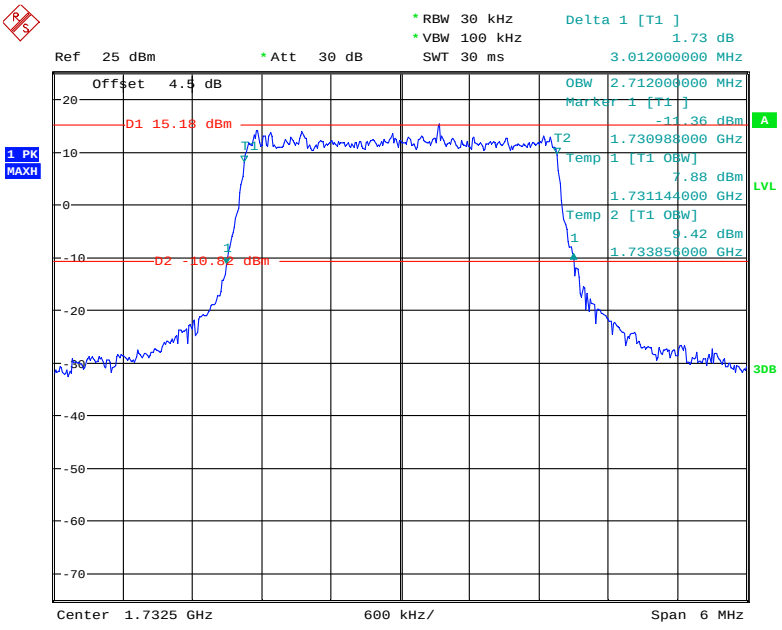
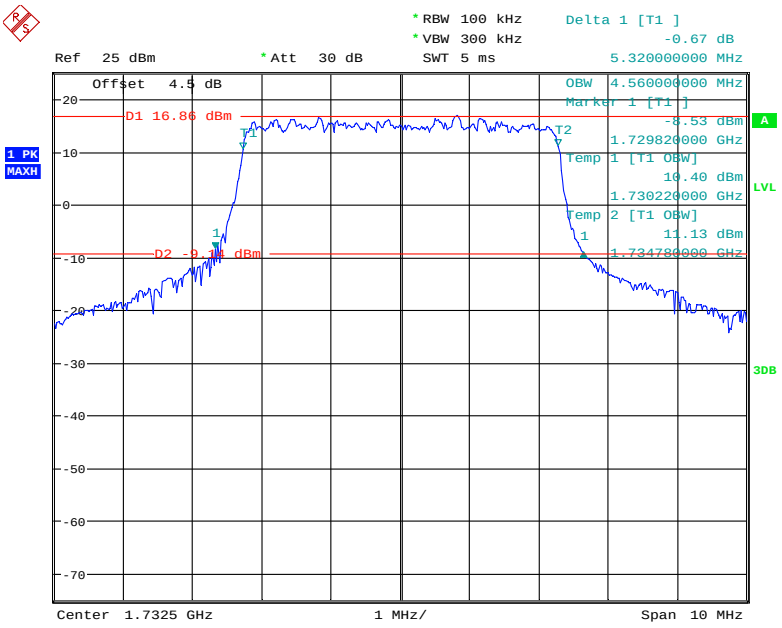
QPSK_3 MHz



Date: 2.JAN.2020 21:24:34

QPSK_5 MHz



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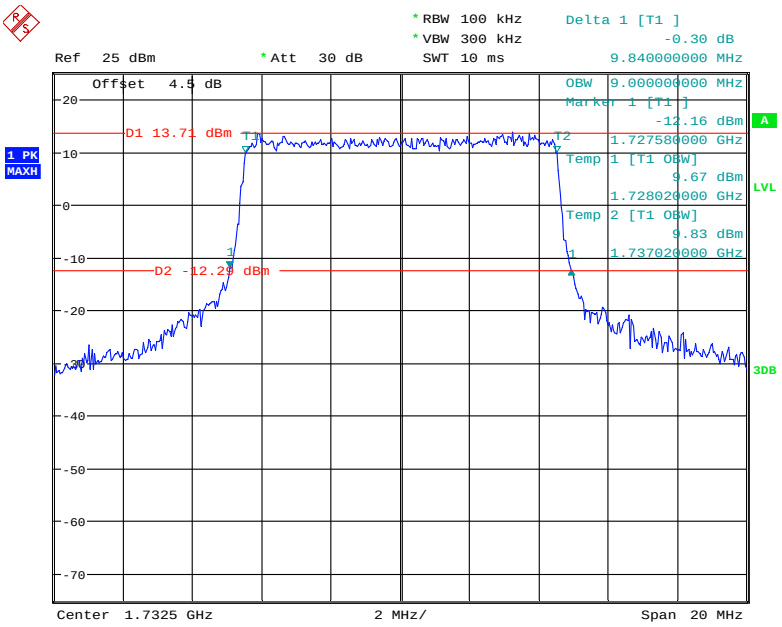
QPSK_10 MHz



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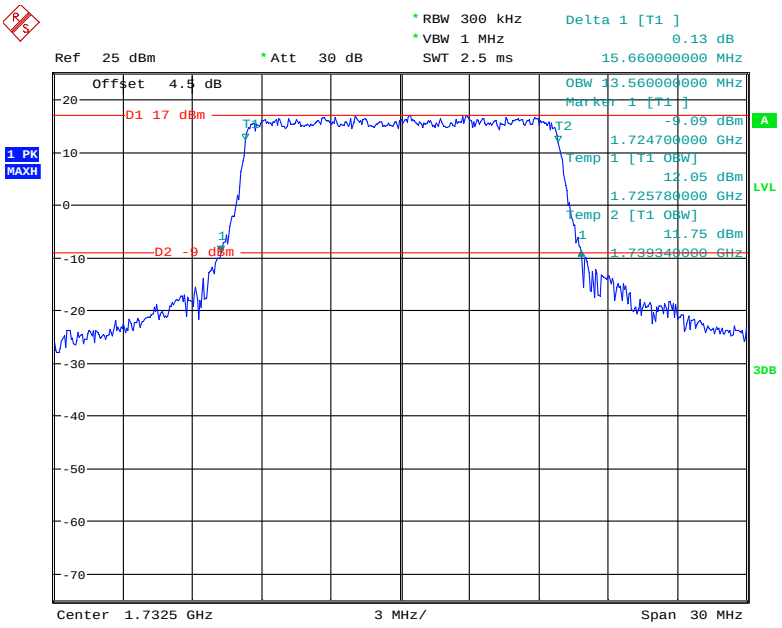
QPSK_15 MHz



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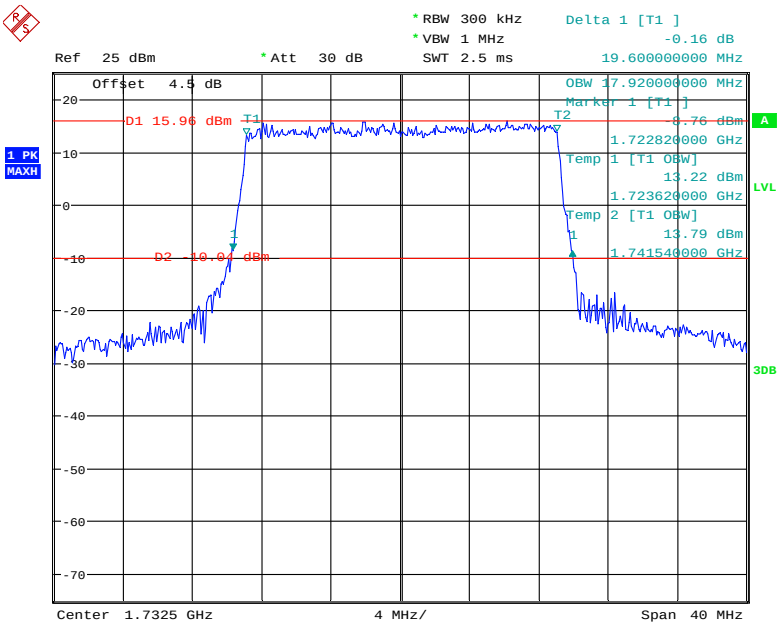
QPSK_20 MHz



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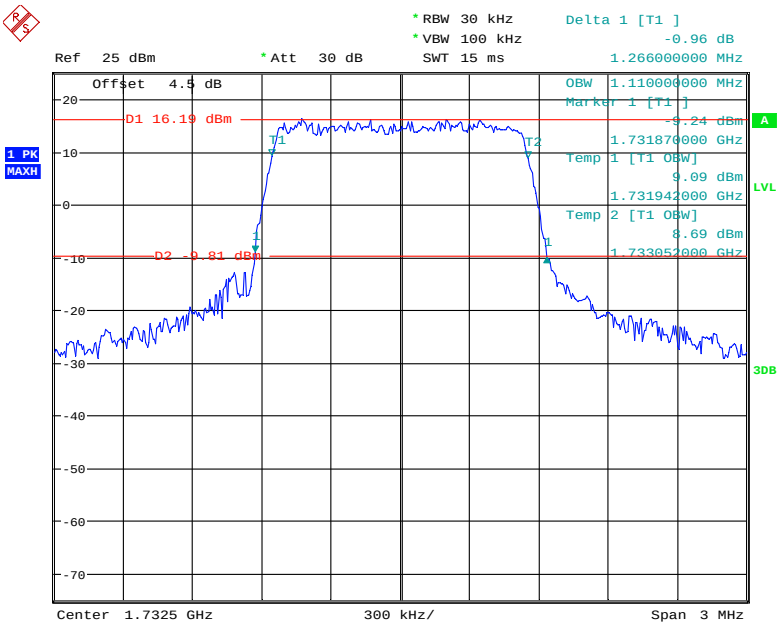
16QAM_1.4 MHz



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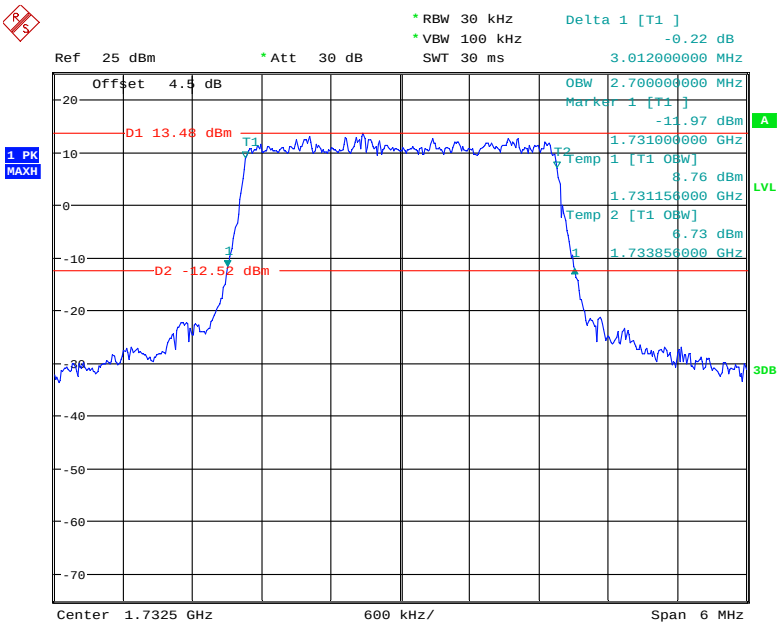
16QAM_3 MHz



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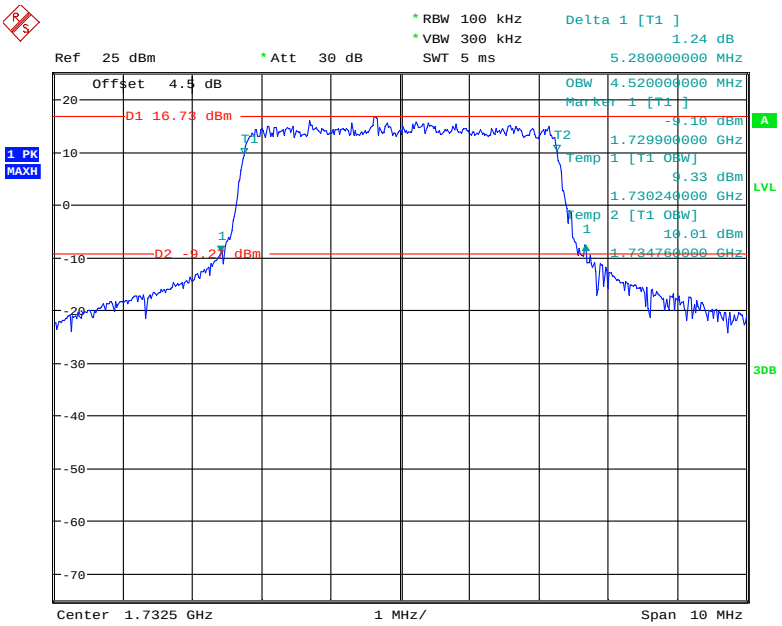
16QAM_5 MHz



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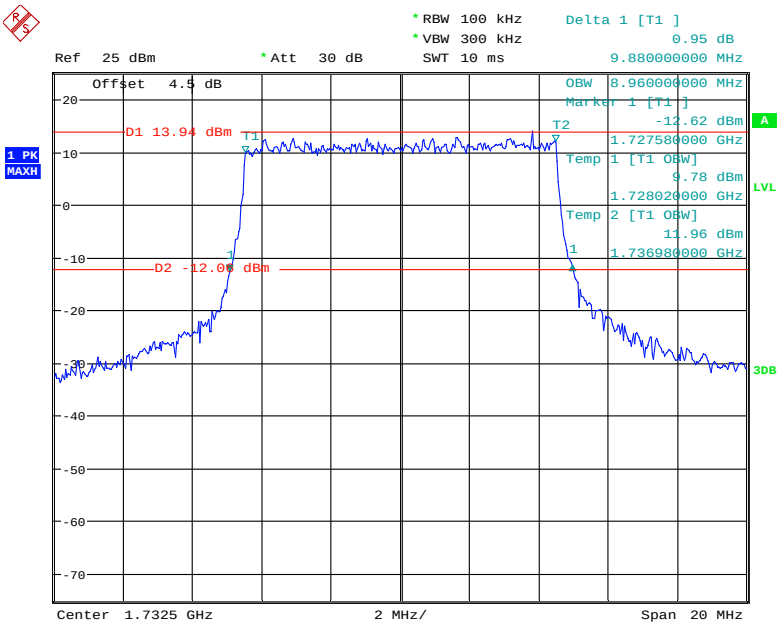
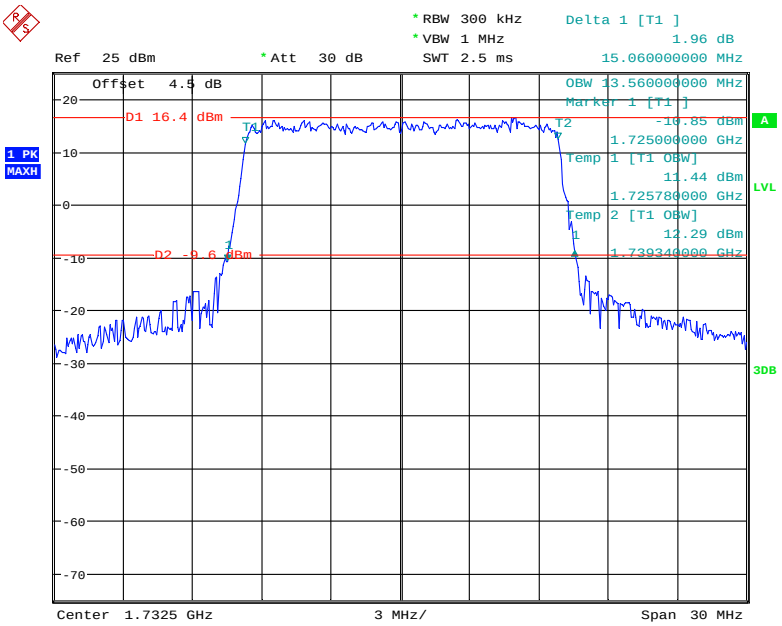
16QAM_10 MHz



Date: 2.JAN.2020 21:27:01

16QAM_15 MHz



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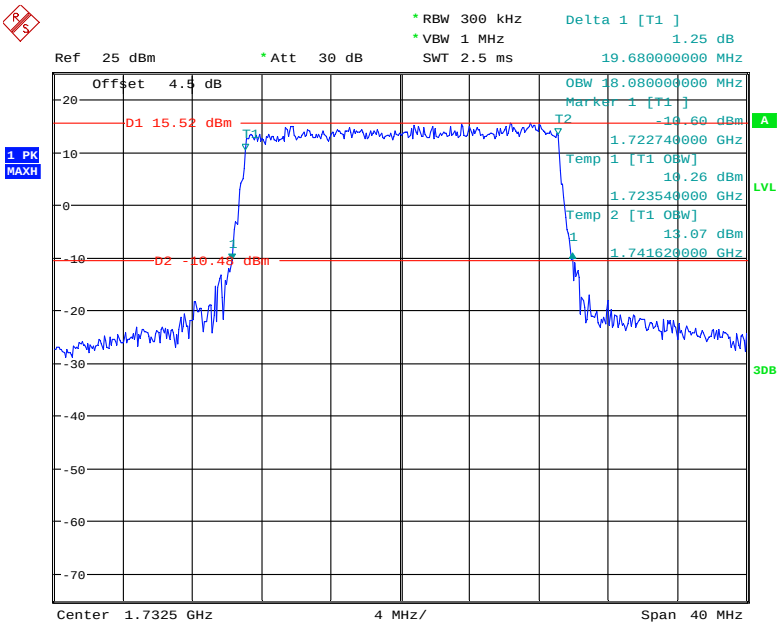
16QAM_20 MHz



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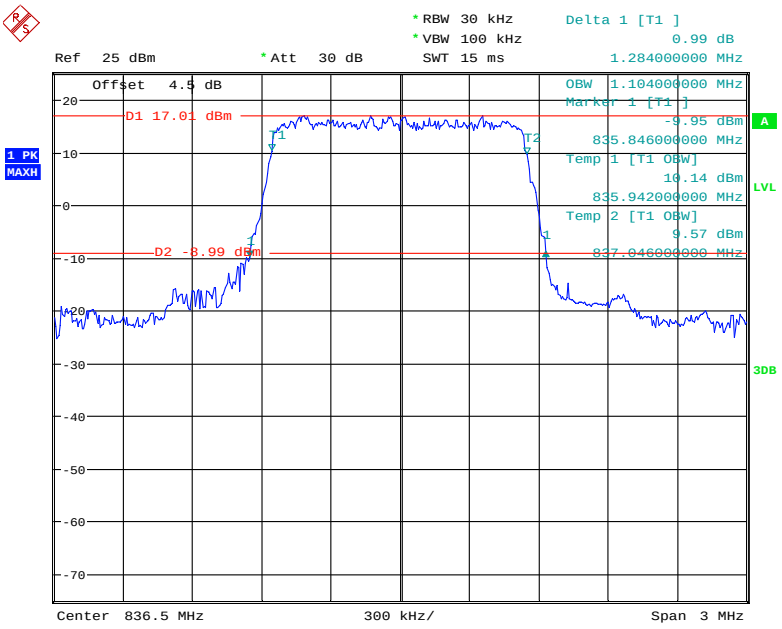
LTE Band 5:

QPSK_1.4 MHz



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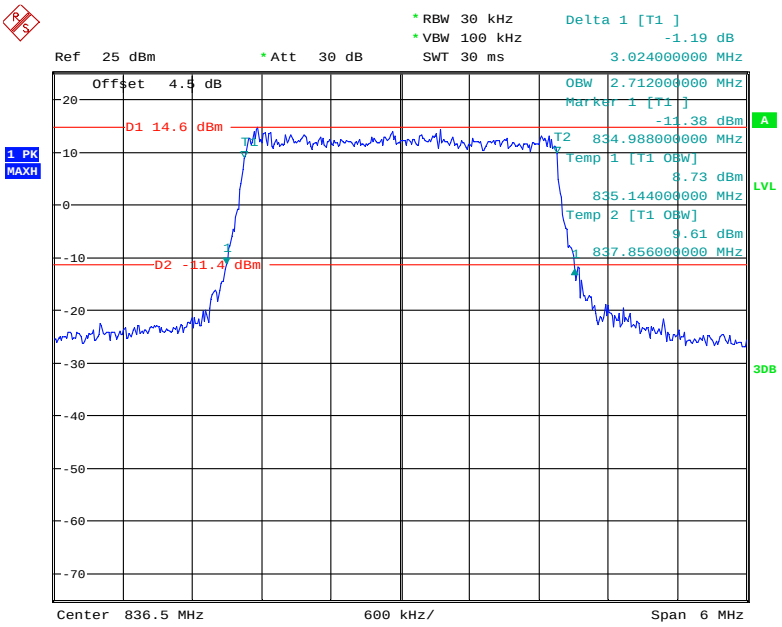
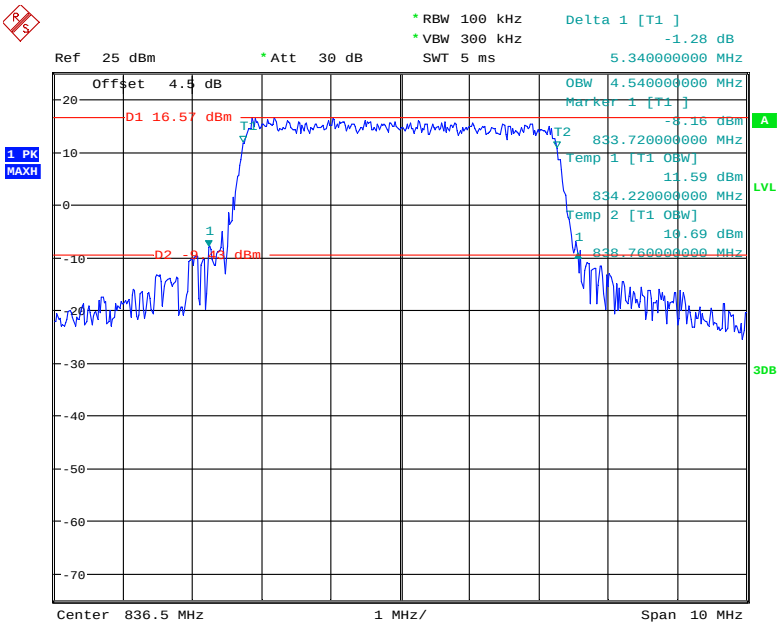
QPSK_3 MHz



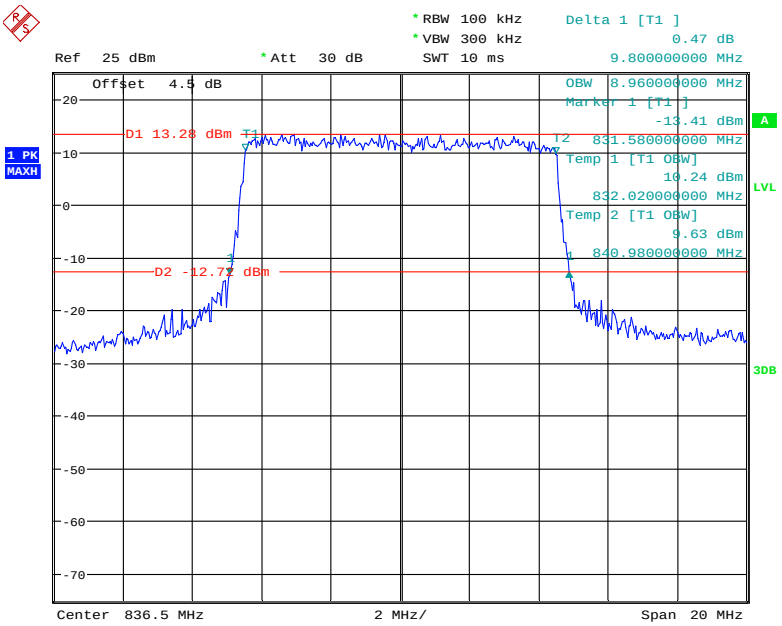
Date: 2.JAN.2020 21:30:09

QPSK_5 MHz



Date: 2.JAN.2020 21:31:01

QPSK_10 MHz



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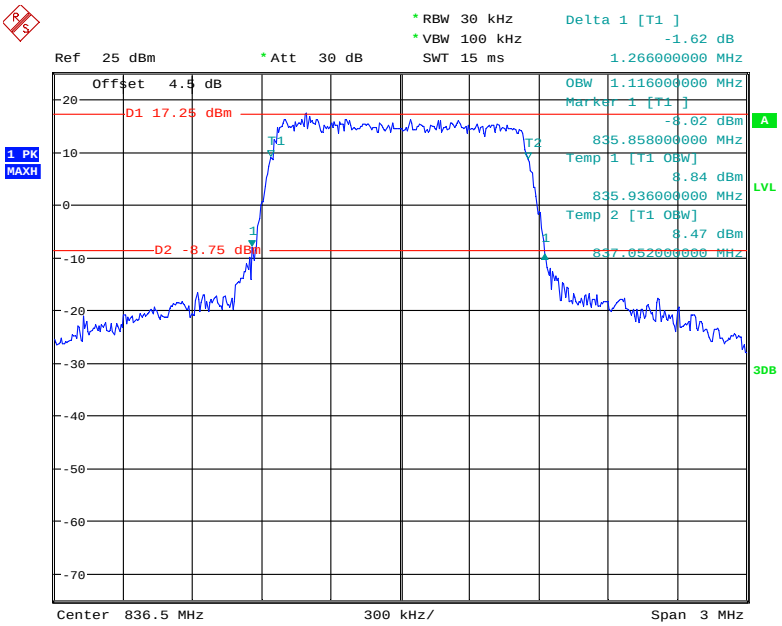
16QAM_1.4 MHz



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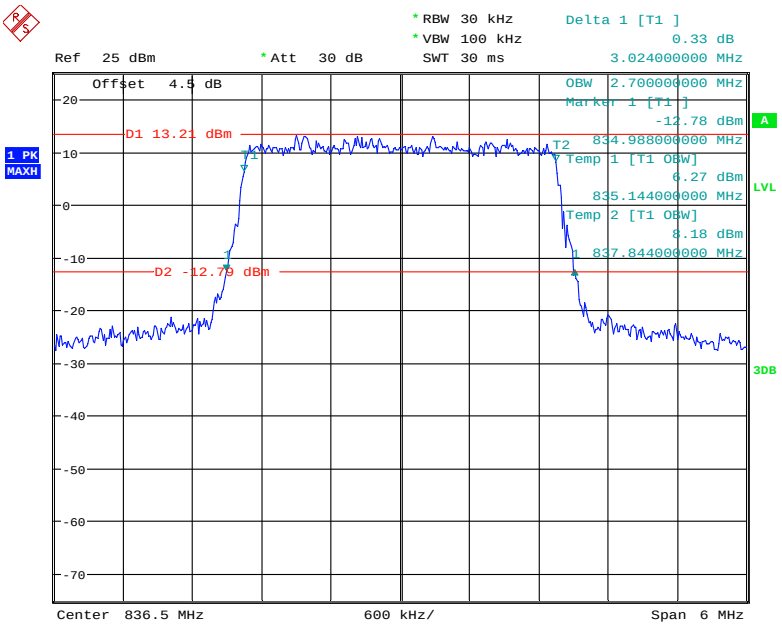
16QAM_3 MHz



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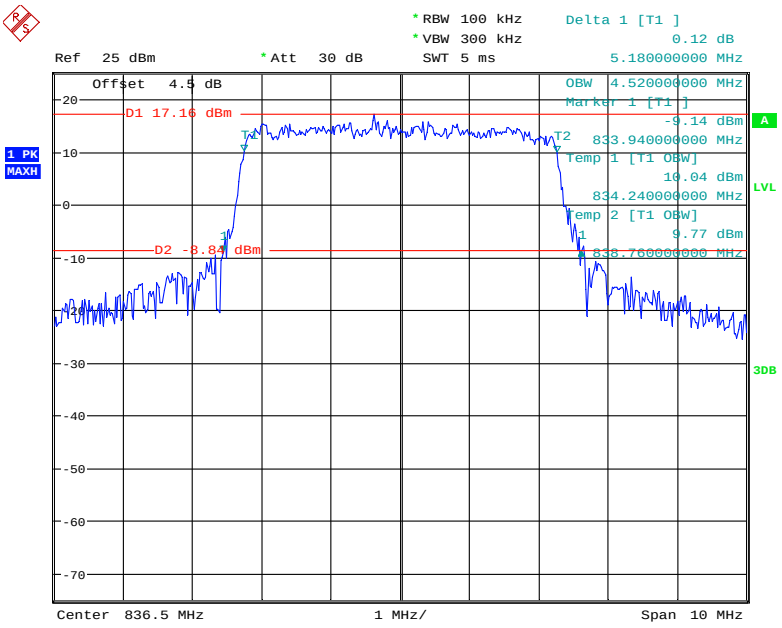
16QAM_5 MHz



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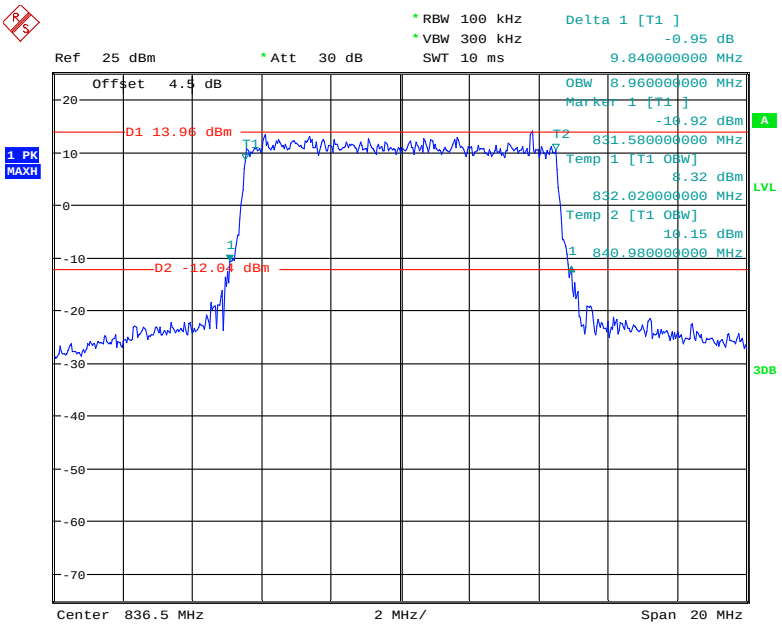
16QAM_10 MHz



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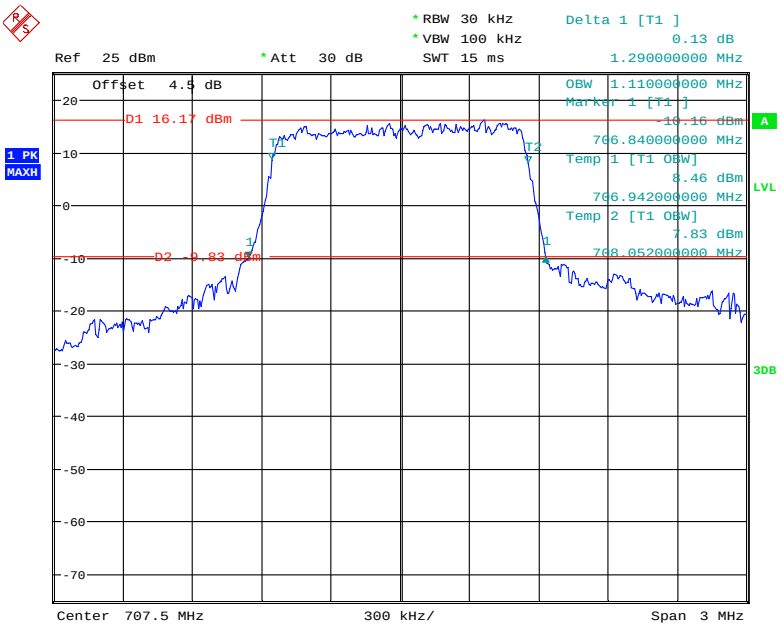
LTE Band 12:

QPSK_1.4 MHz



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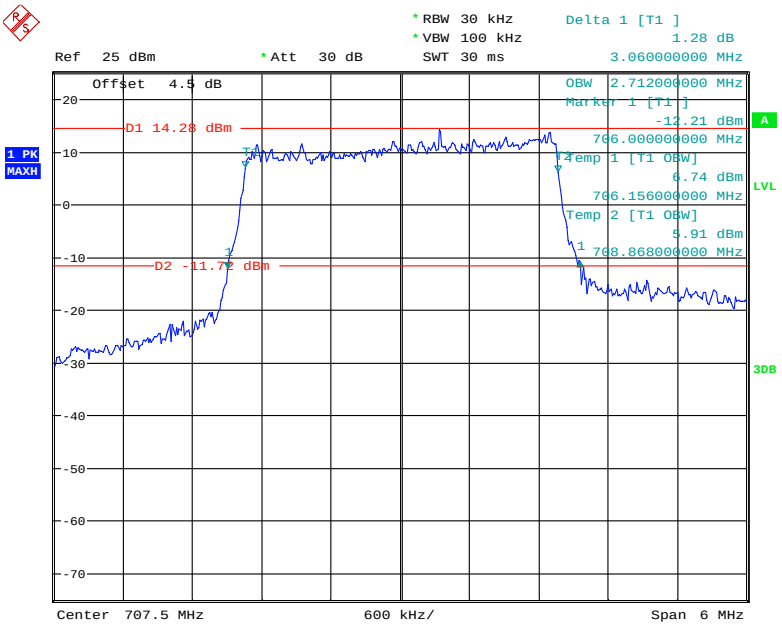
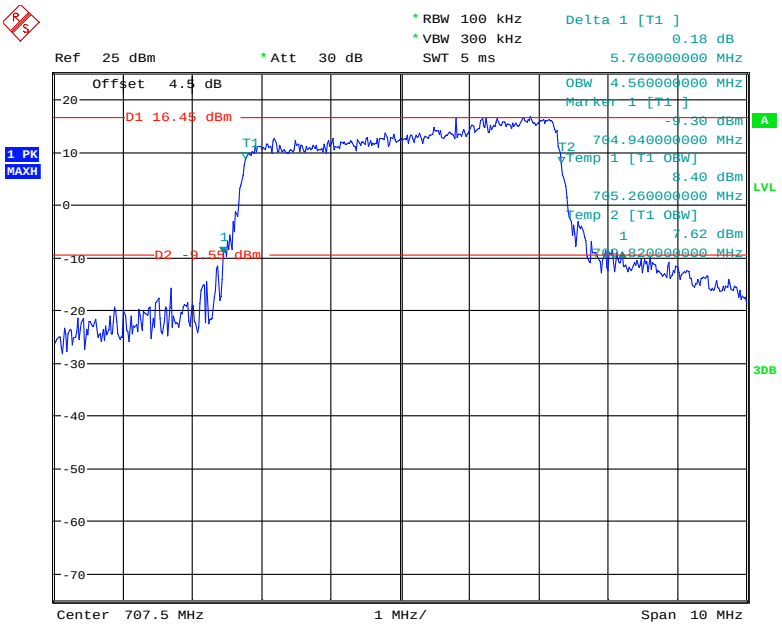
QPSK_3 MHz



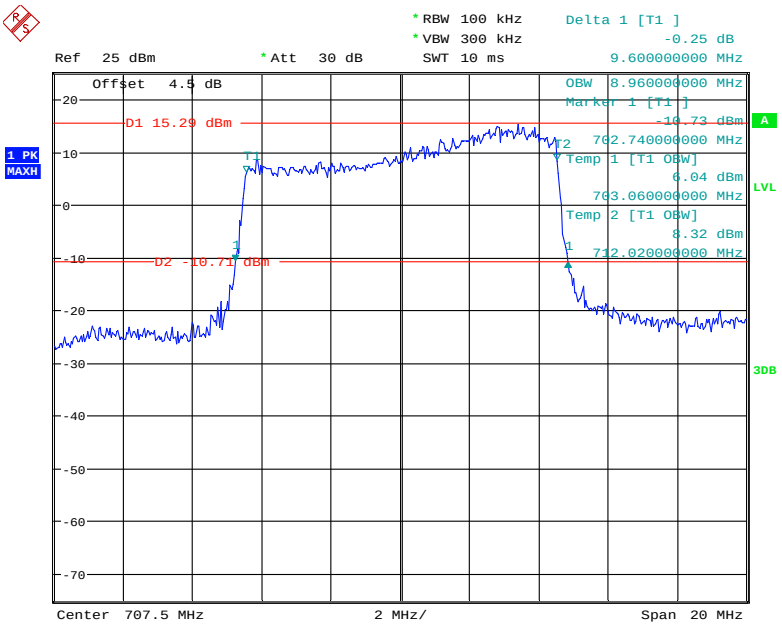
Date: 2.JAN.2020 21:33:31

QPSK_5 MHz



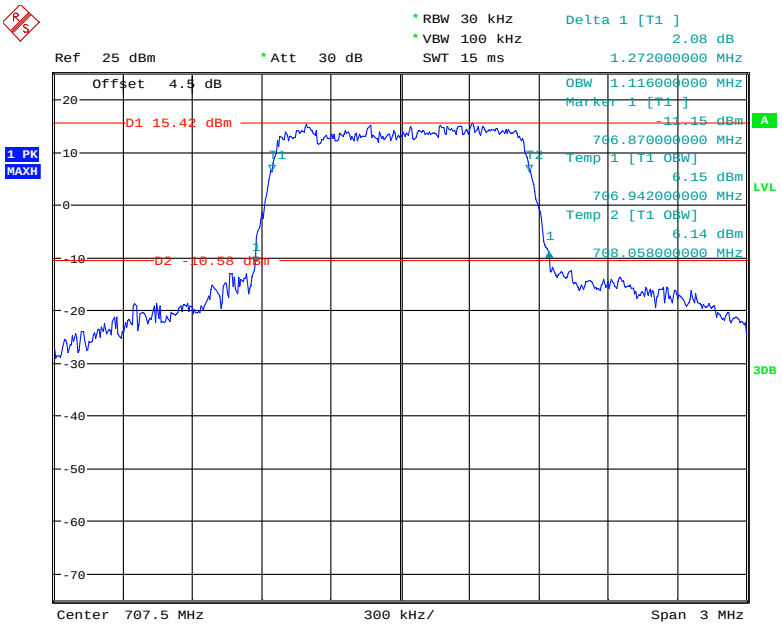
Date: 2.JAN.2020 21:34:23

QPSK_10 MHz



Date: 2.JAN.2020 21:35:13

16QAM_1.4 MHz



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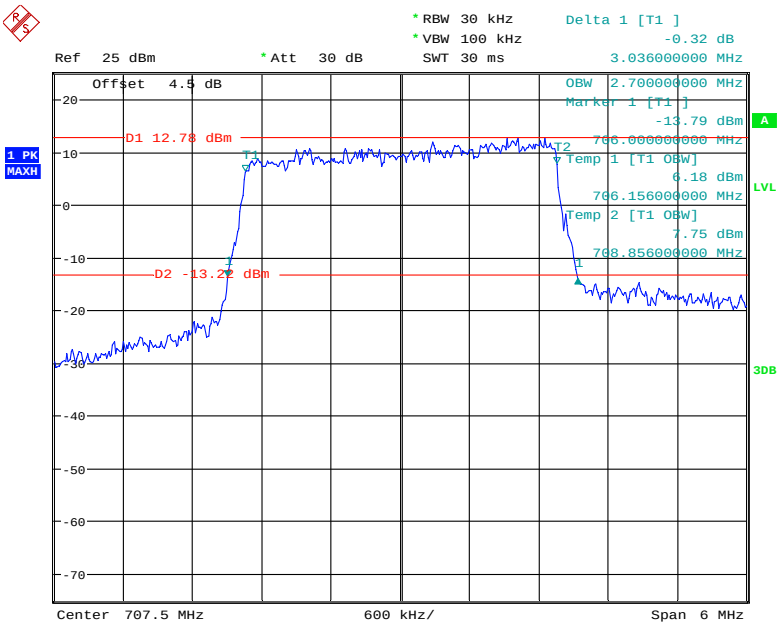
16QAM_3 MHz



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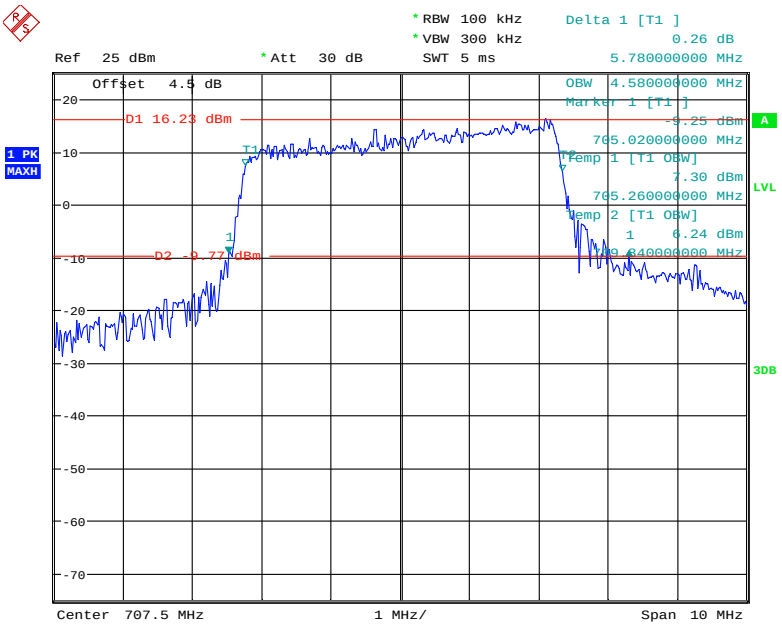
16QAM_5 MHz



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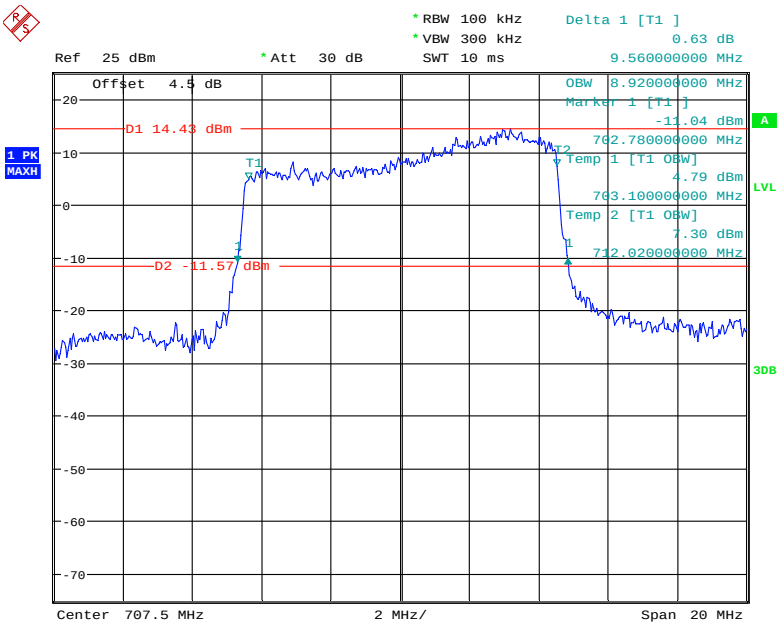
16QAM_10 MHz



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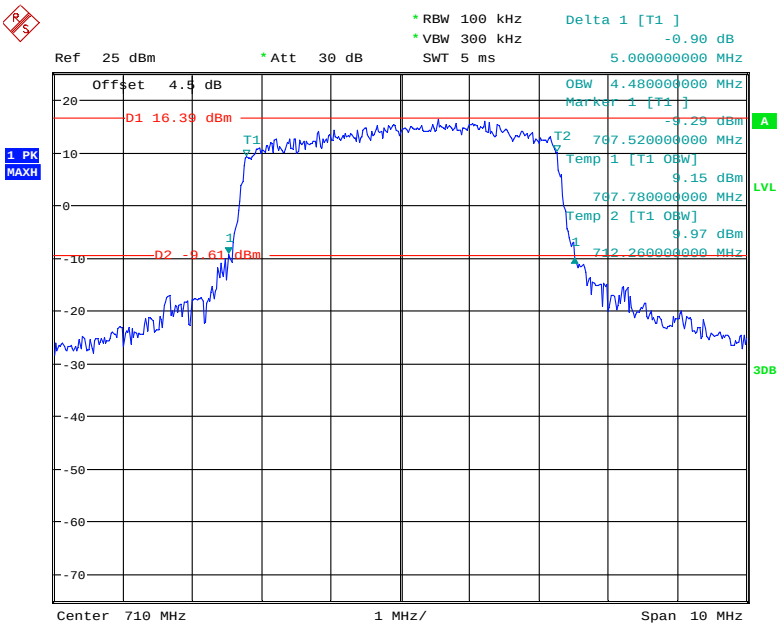
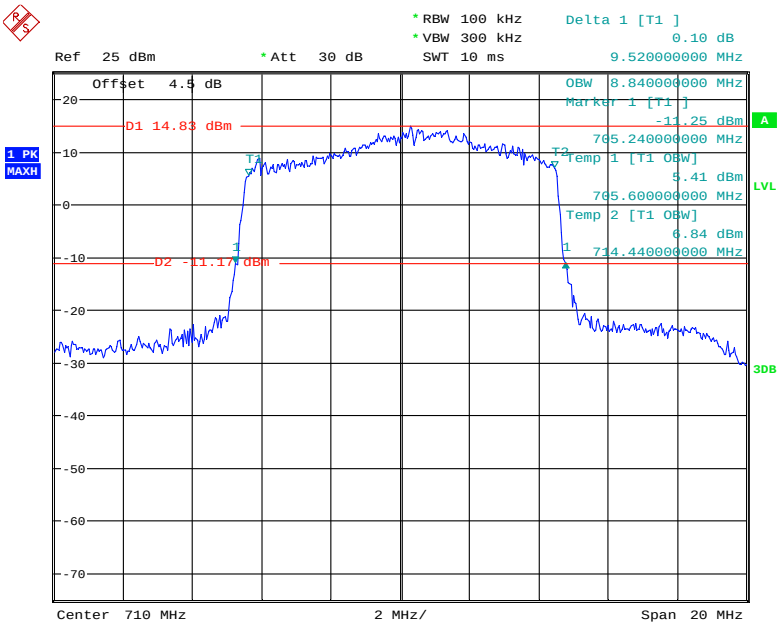
LTE Band 17:

QPSK_5 MHz



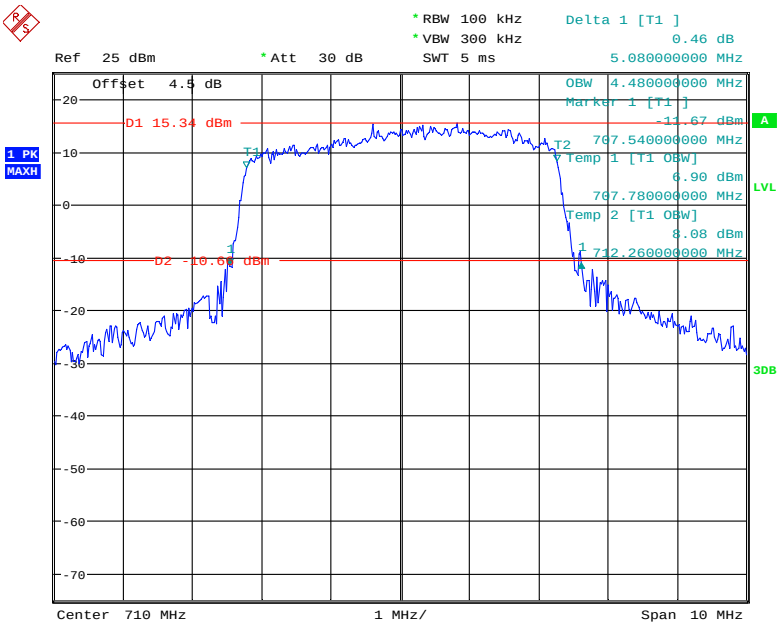
Date: 2.JAN.2020 21:36:03

QPSK_10 MHz



Date: 2.JAN.2020 21:36:53

16QAM_5 MHz



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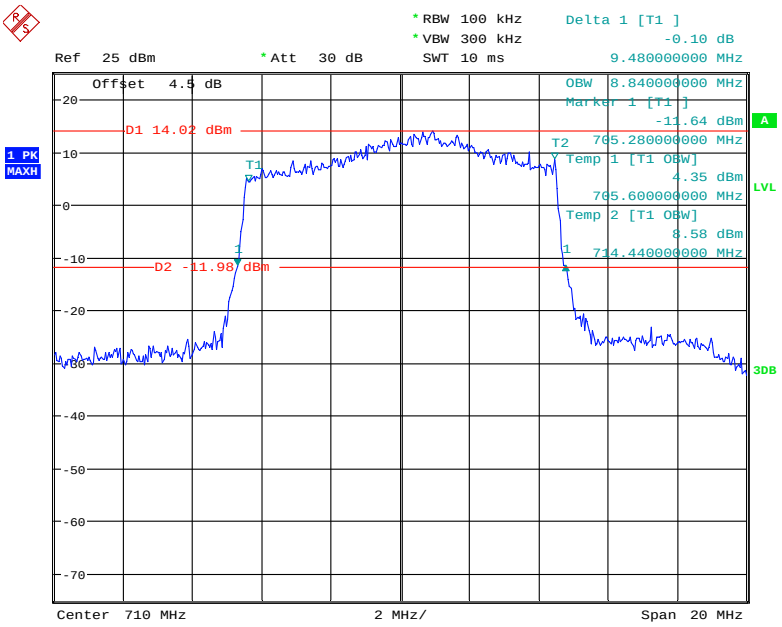
16QAM_10 MHz



Date: 2.JAN.2020 21:37:19

FCC §2.1051, §22.917(a) & §24.238(a) & §27.53- SPURIOUS EMISSIONS AT ANTENNA TERMINALS

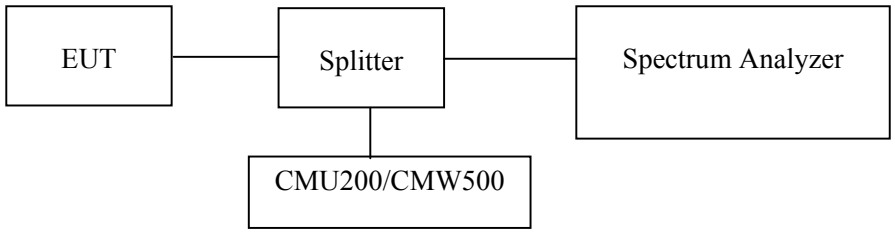
Applicable Standard

FCC §2.1051, §22.917(a) , §24.238(a) and §27.53.

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1051.

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2019-12-10	2020-12-10
R&S	Spectrum Analyzer	FSU 26	200256	2019-05-09	2020-05-09
Rohde & Schwarz	Signal Analyzer	FSIQ26	831929/005	2019-08-03	2020-08-03
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41010013	Each time	/
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005011	Each time	/
Unknown	Coaxial Cable	C-SJ00-0010	C0010/03	Each time	/
E-Microwave	Two-way Spliter	ODP-1-6-2S	OE0120142	Each time	/

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

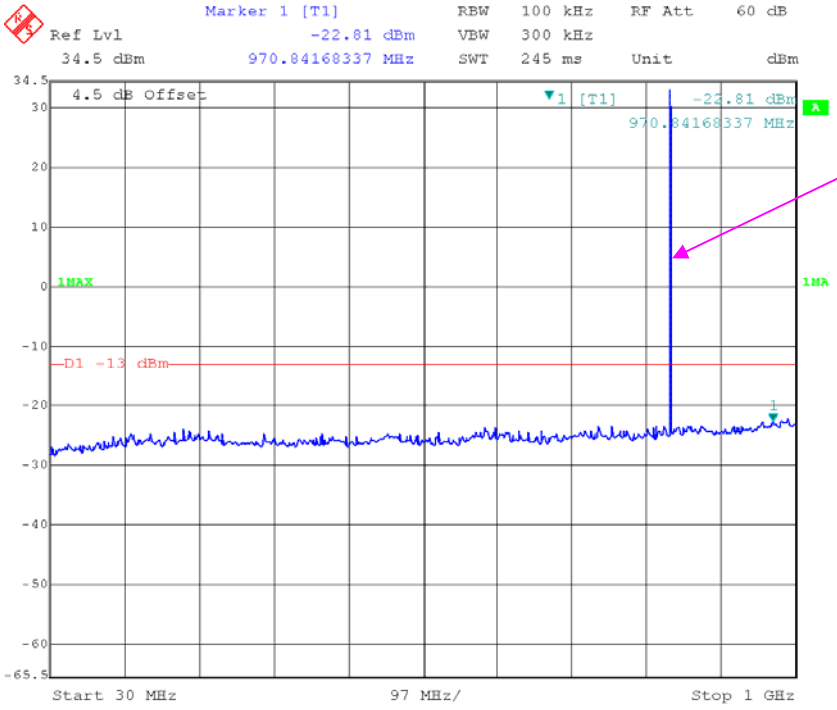
Test Data

Environmental Conditions

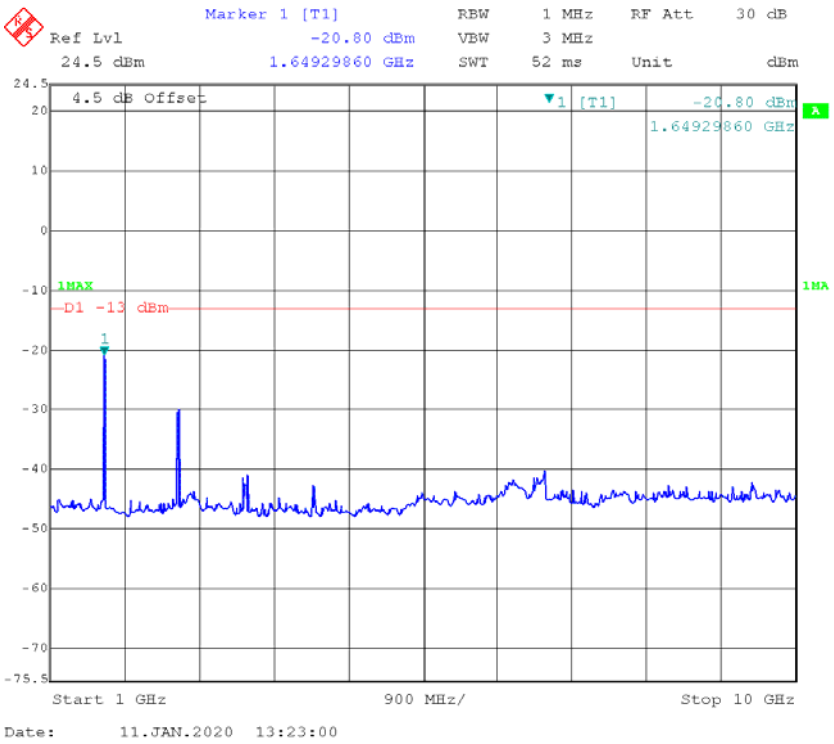
Temperature:	23.9 °C~ 26 °C
Relative Humidity:	49%~62 %
ATM Pressure:	101.2kPa ~102.5kPa
Tester:	Xia Yang & Lily Xie
Test Date:	2020-01-02~2020-01-11

Test Result: Compliance. Please refer to the following plots.

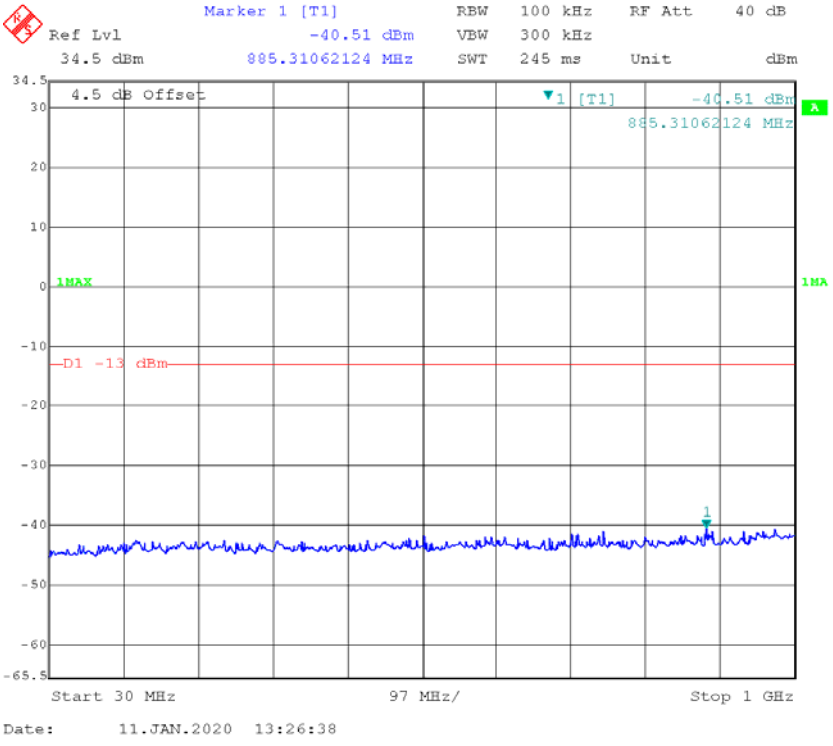
GSM850 Middle Channel

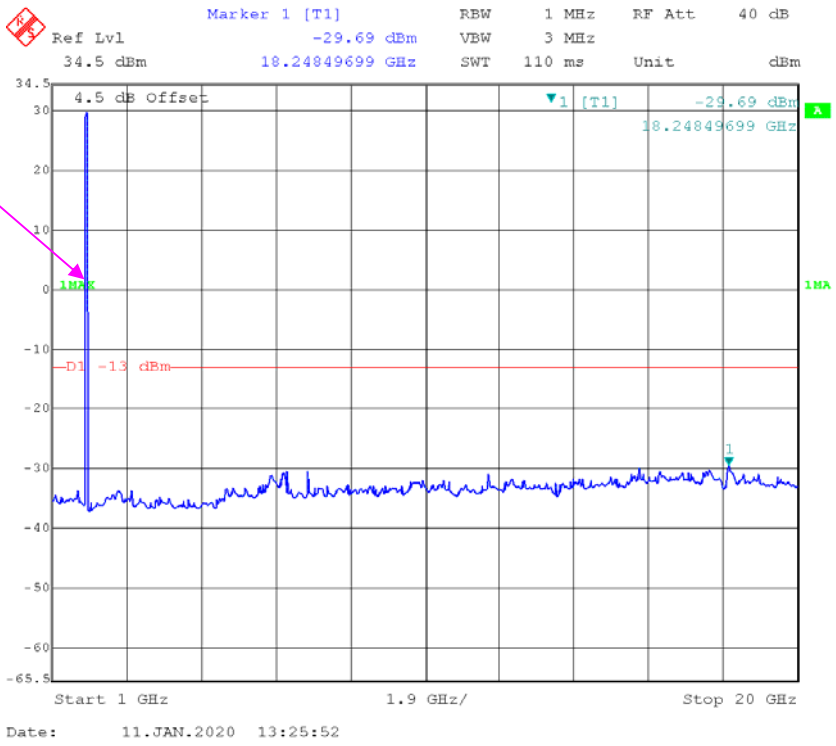


Fundamental



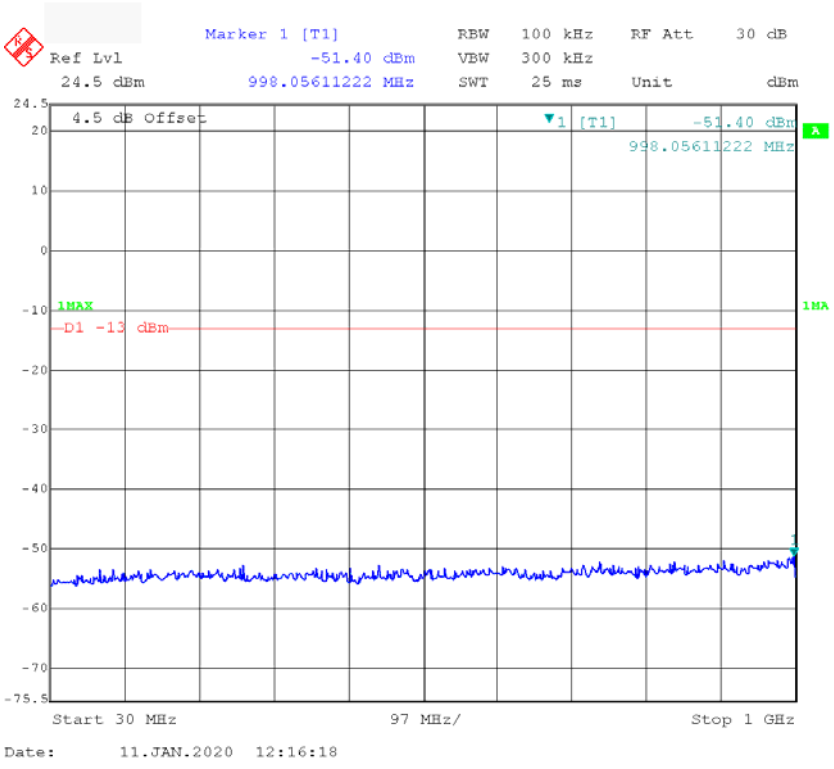
PCS 1900 Middle Channel

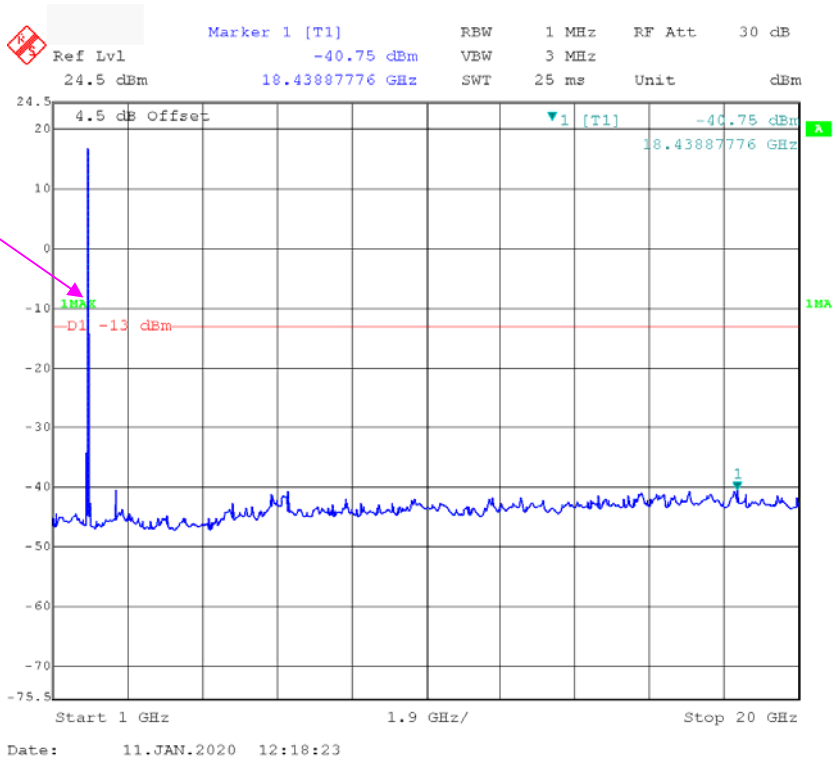




Fundamental

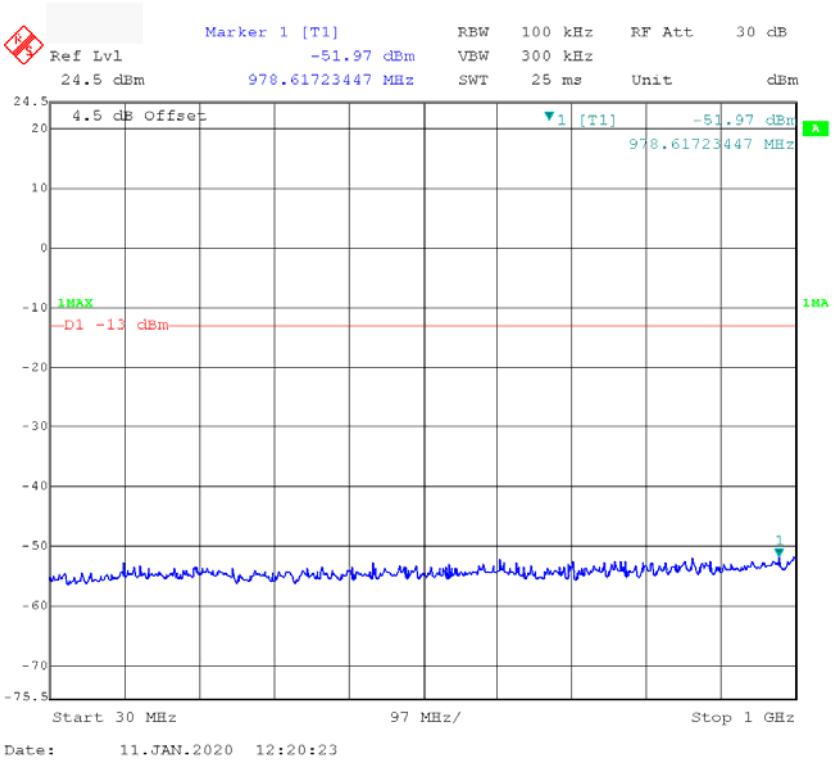
WCDMA Band 2 Rel 99 Middle Channel



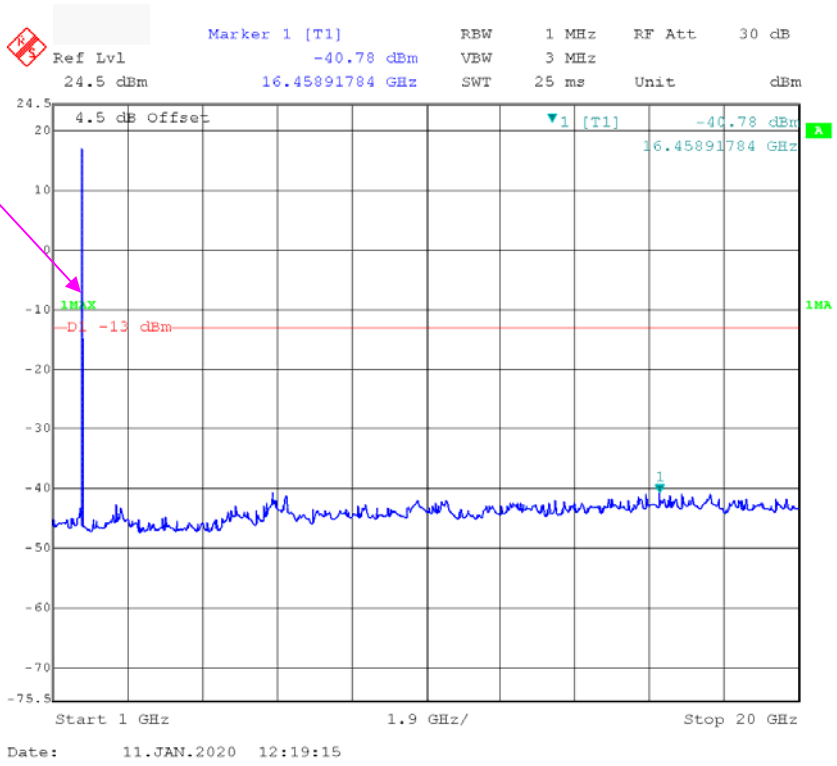


Fundamental

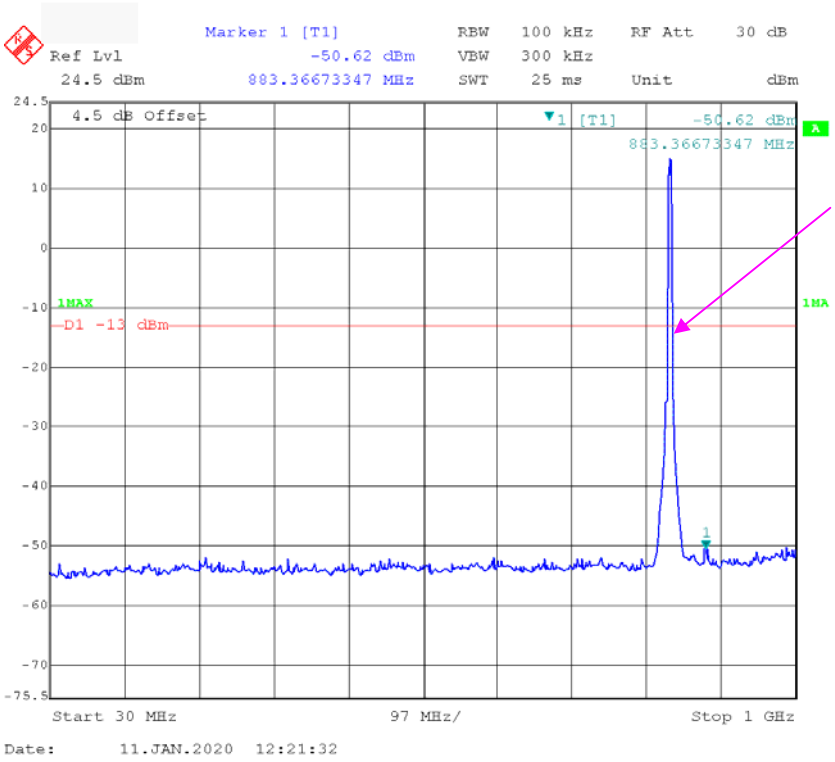
WCDMA Band 4 Rel 99 Middle Channel



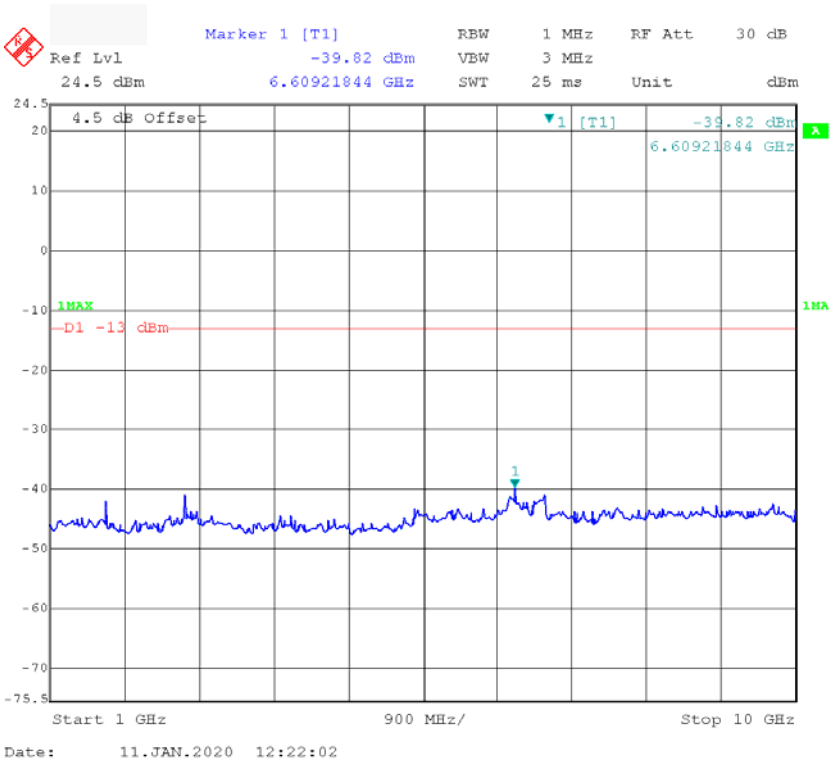
Fundamental



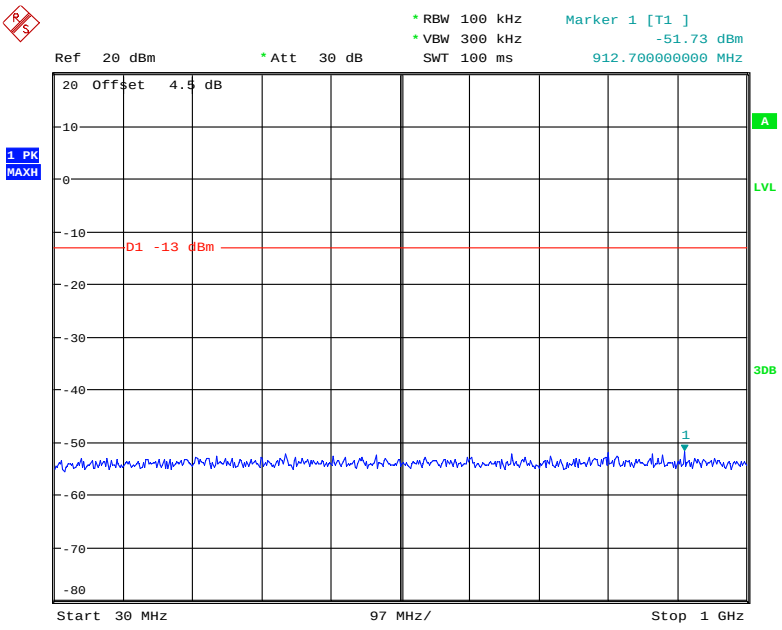
WCDMA Band 5 Rel 99 Middle Channel



Fundamental

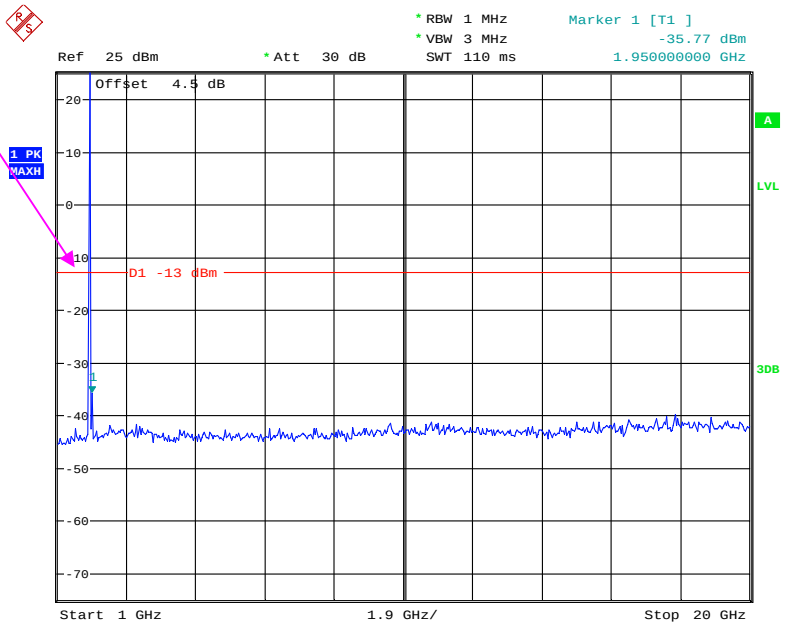


LTE Band 2_1.4 MHz_Middle_QPSK



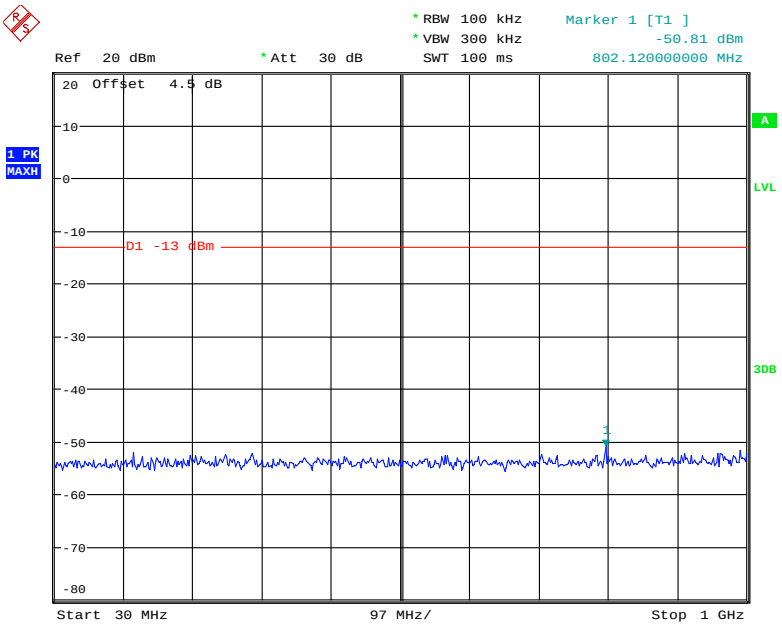
Date: 2.JAN.2020 21:39:16

Fundamental



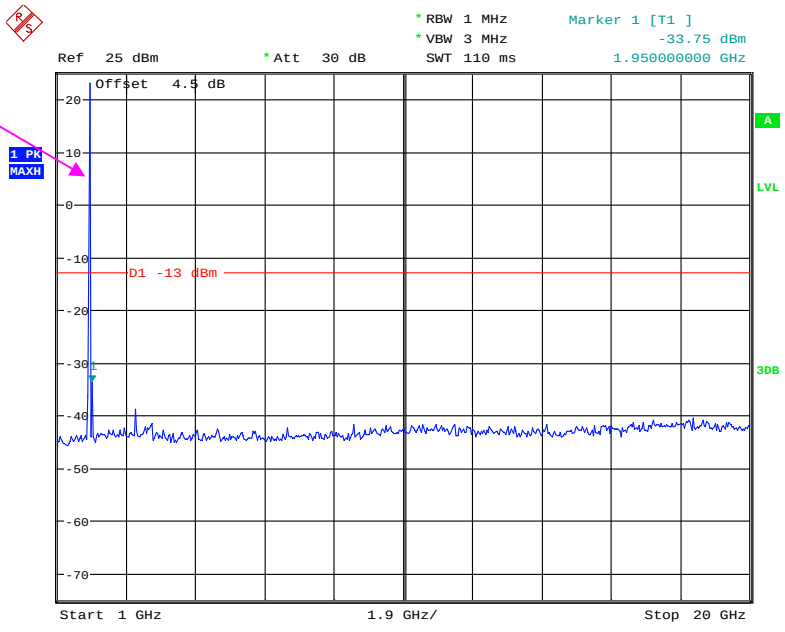
Date: 2.JAN.2020 21:39:28

LTE Band 2_3 MHz_Middle_QPSK



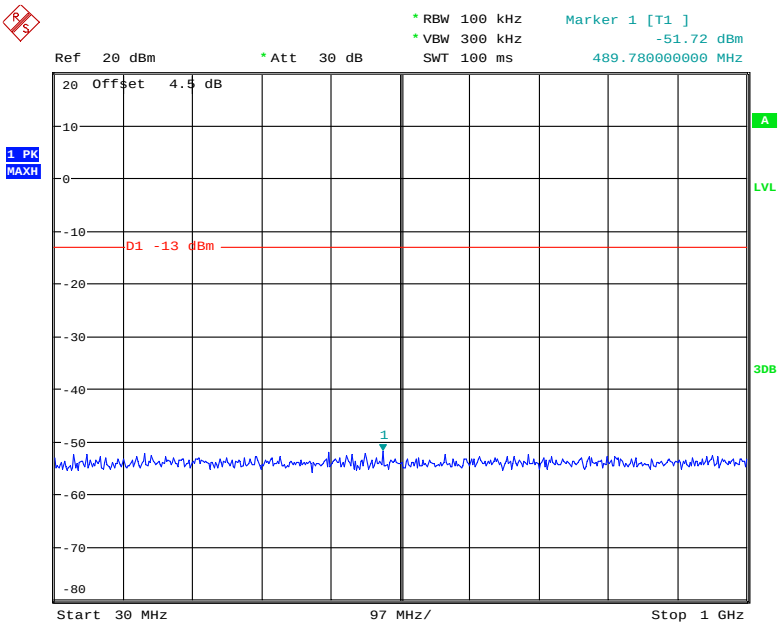
Date: 2.JAN.2020 21:39:46

Fundamental



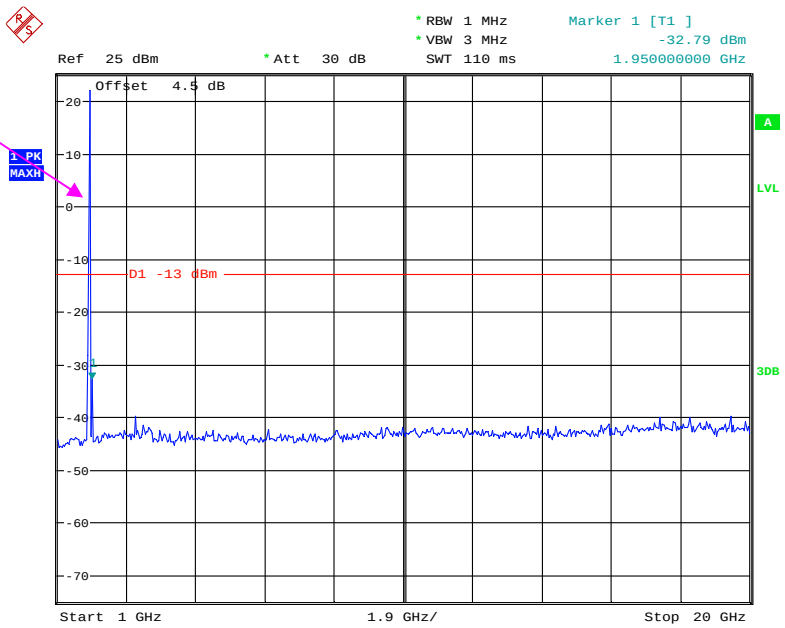
Date: 2.JAN.2020 21:39:58

LTE Band 2_5 MHz_Middle_QPSK



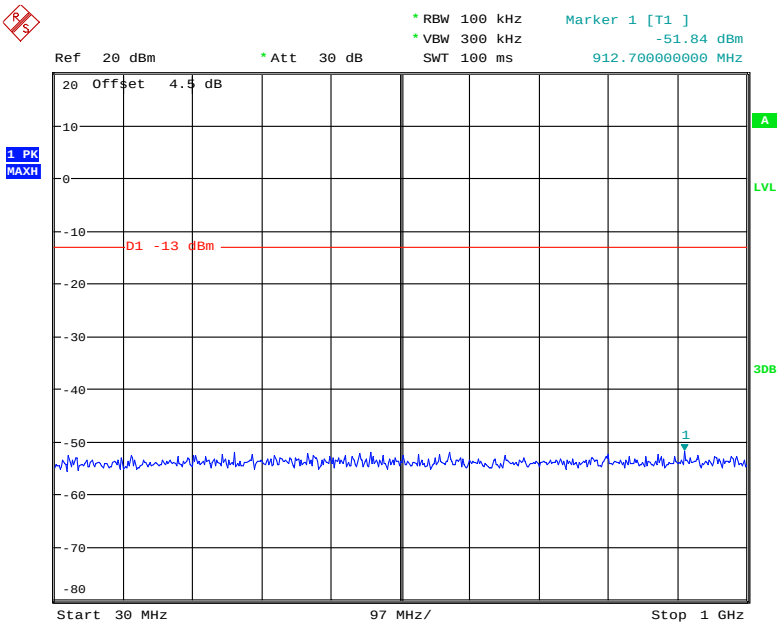
Date: 2.JAN.2020 21:40:18

Fundamental



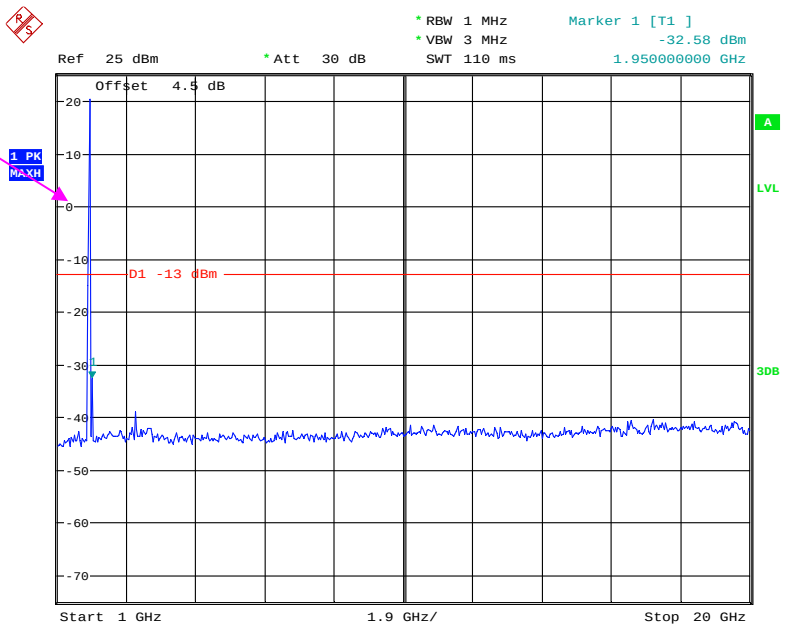
Date: 2.JAN.2020 21:40:29

LTE Band 2_10 MHz_Middle_QPSK



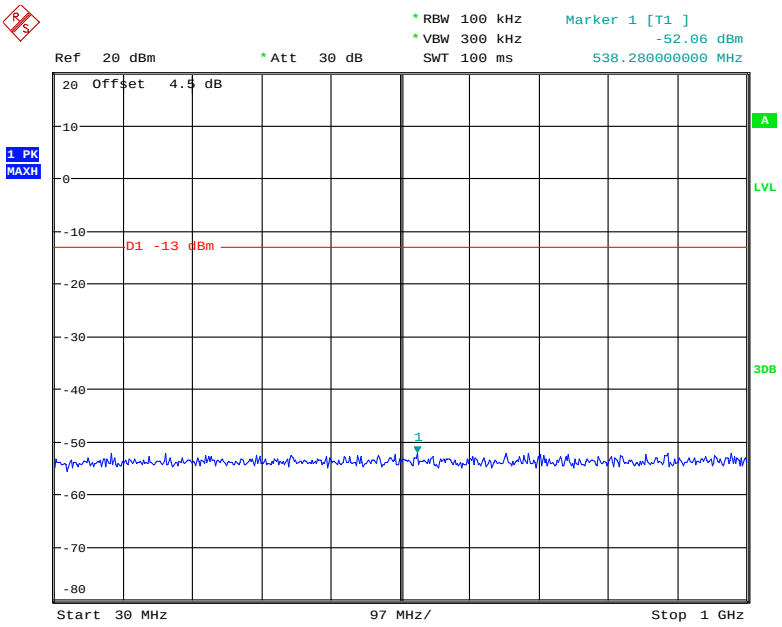
Date: 2.JAN.2020 21:40:49

Fundamental



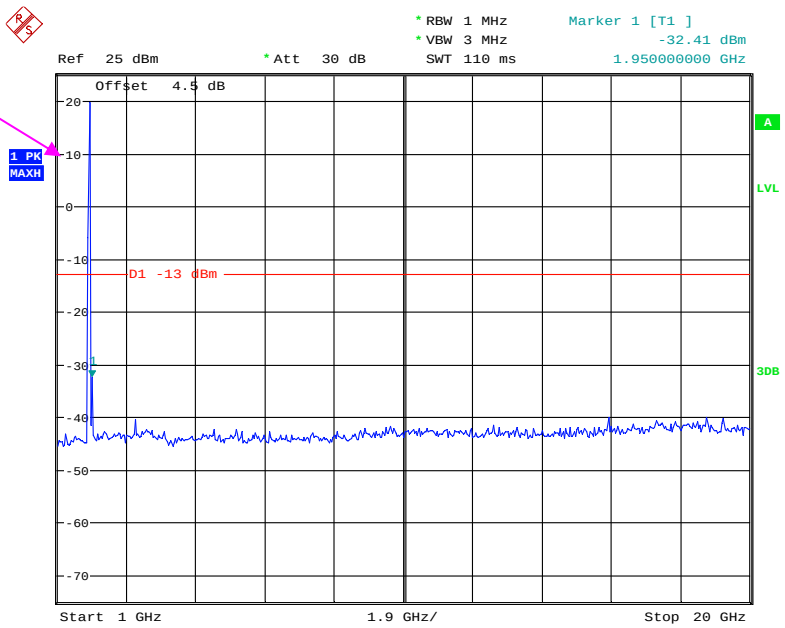
Date: 2.JAN.2020 21:41:01

LTE Band 2_15 MHz_Middle_QPSK



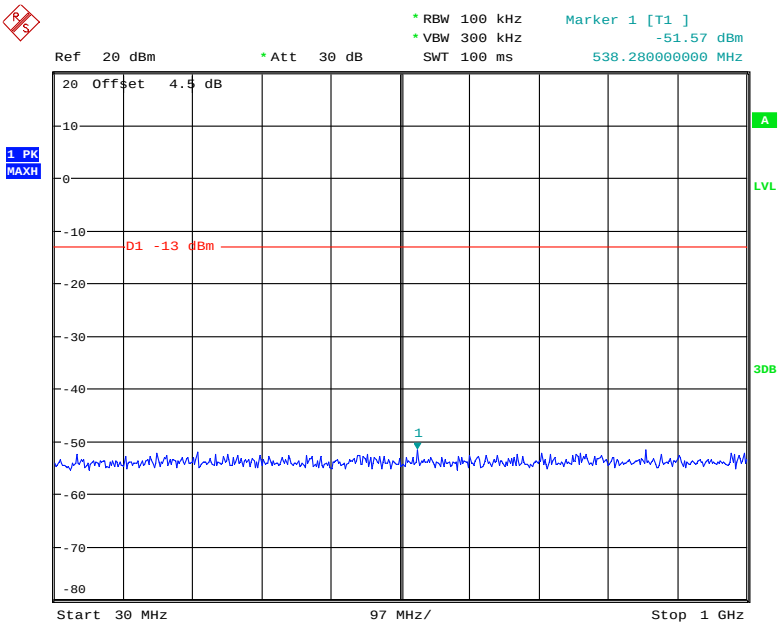
Date: 2.JAN.2020 21:41:27

Fundamental



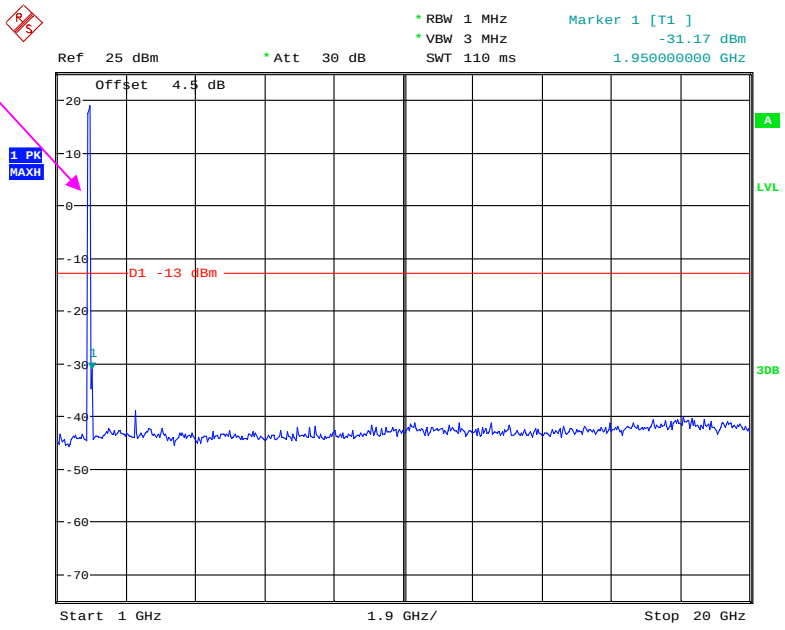
Date: 2.JAN.2020 21:41:38

LTE Band 2_20 MHz_Middle_QPSK



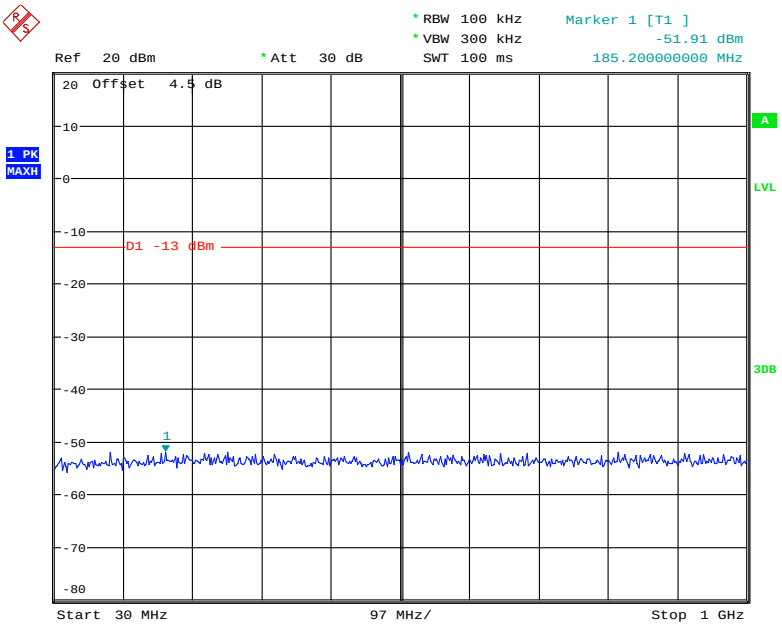
Date: 2.JAN.2020 21:42:01

Fundamental



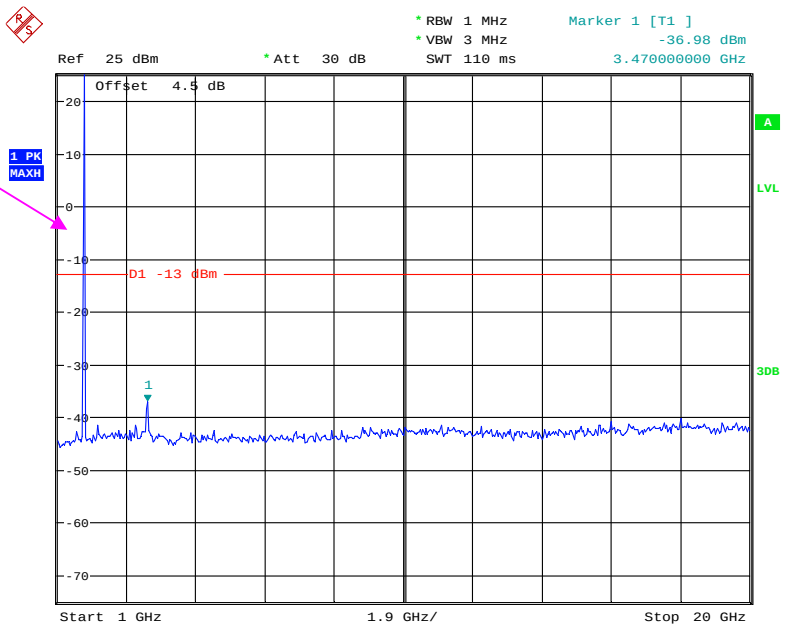
Date: 2.JAN.2020 21:42:16

LTE Band 4_1.4 MHz_Middle_QPSK



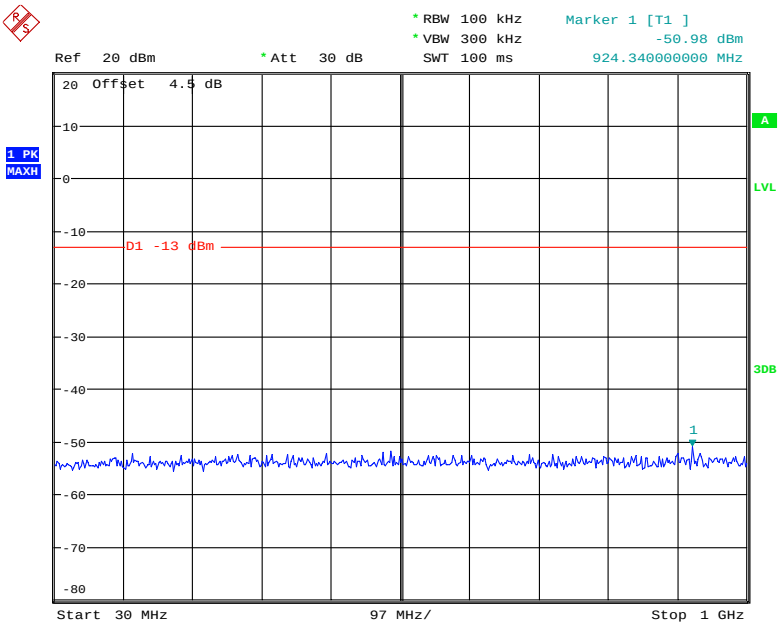
Date: 2.JAN.2020 21:42:38

Fundamental



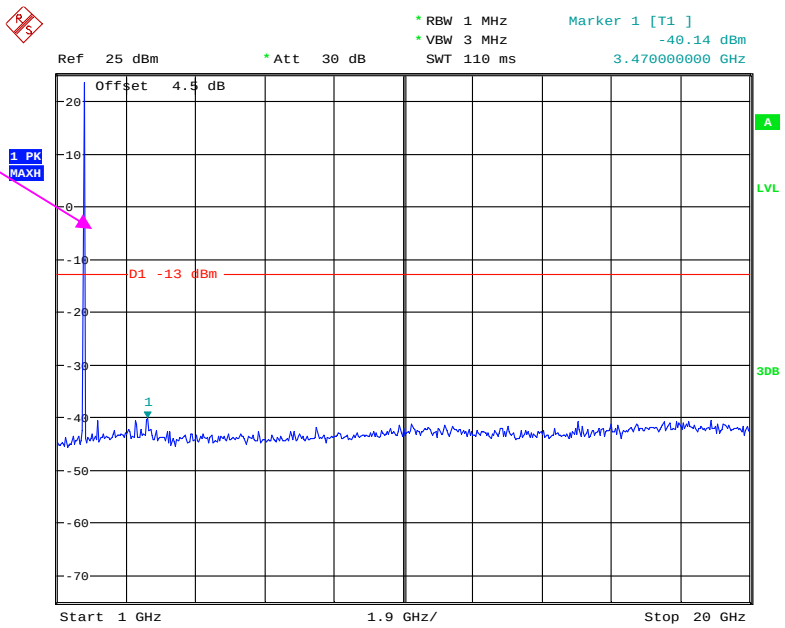
Date: 2.JAN.2020 21:42:50

LTE Band 4_3 MHz_Middle_QPSK



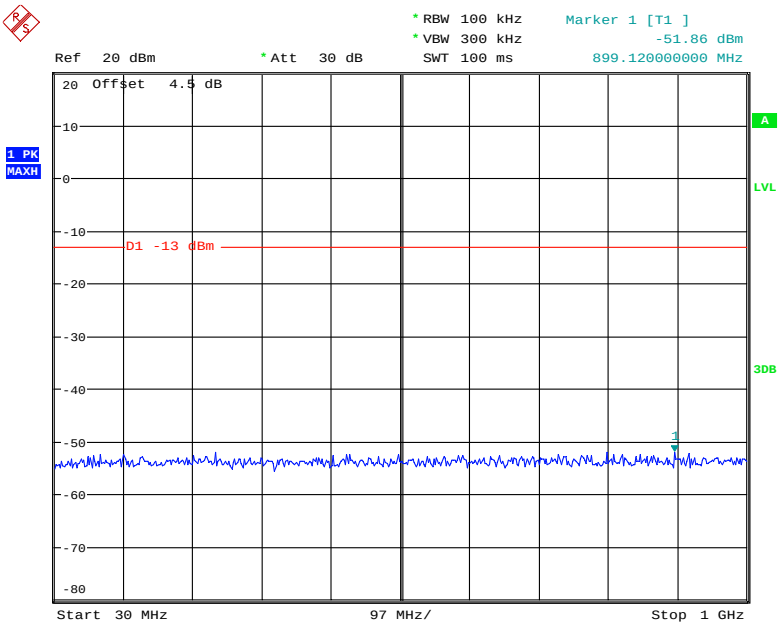
Date: 2.JAN.2020 21:43:08

Fundamental



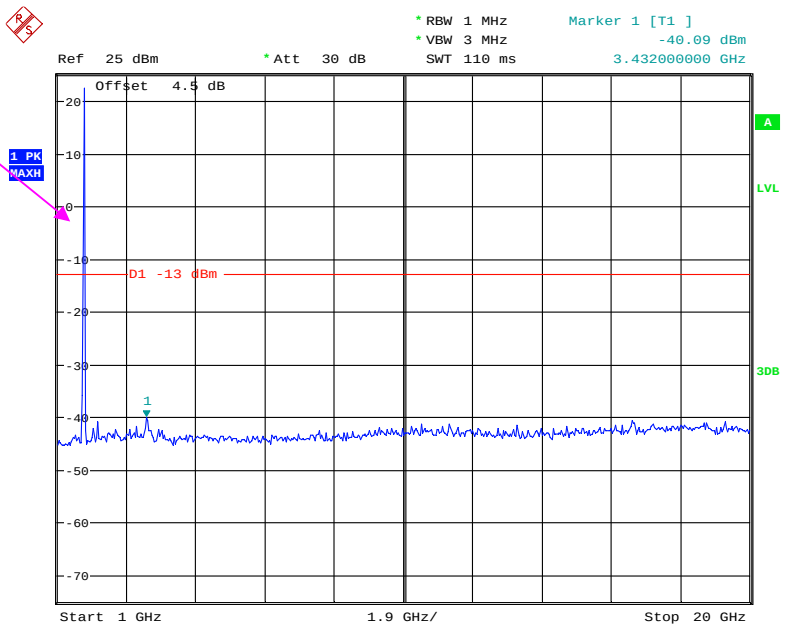
Date: 2.JAN.2020 21:43:20

LTE Band 4_5 MHz_Middle_QPSK



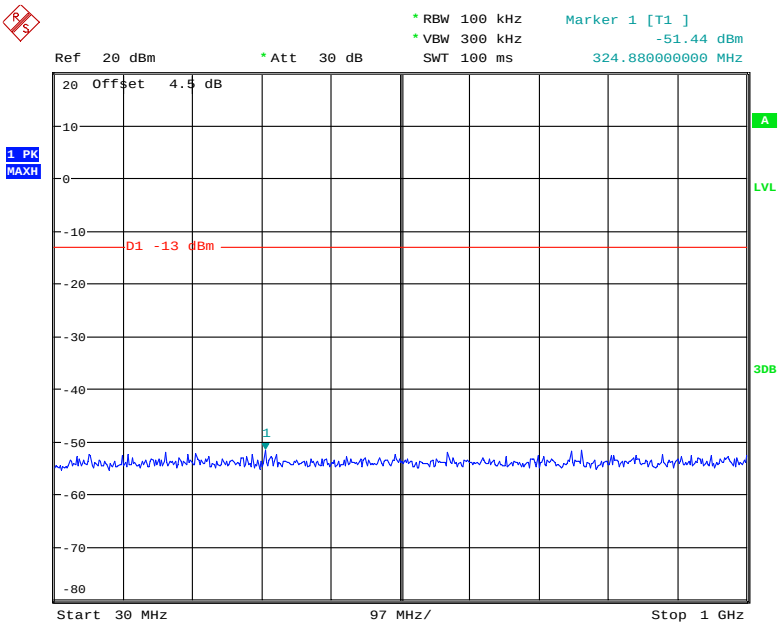
Date: 2.JAN.2020 21:43:42

Fundamental



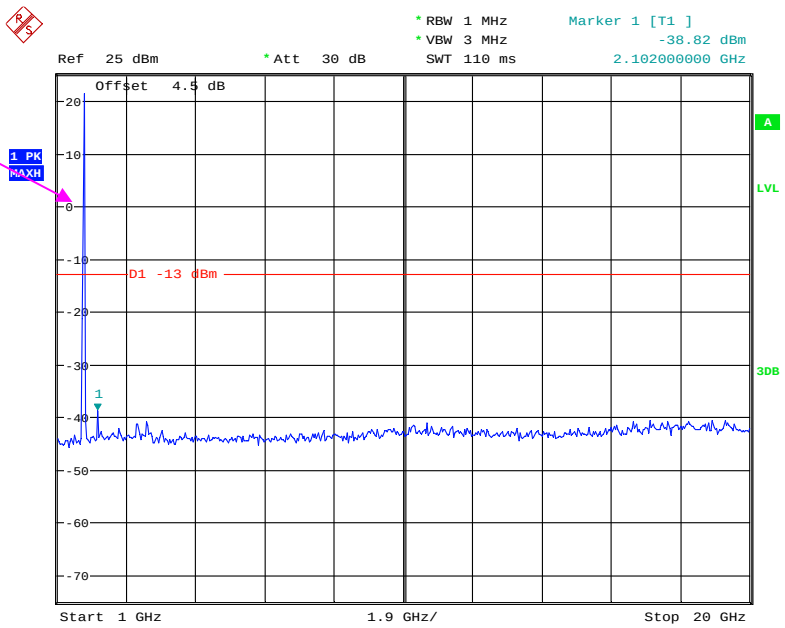
Date: 2.JAN.2020 21:43:54

LTE Band 4_10 MHz_Middle_QPSK



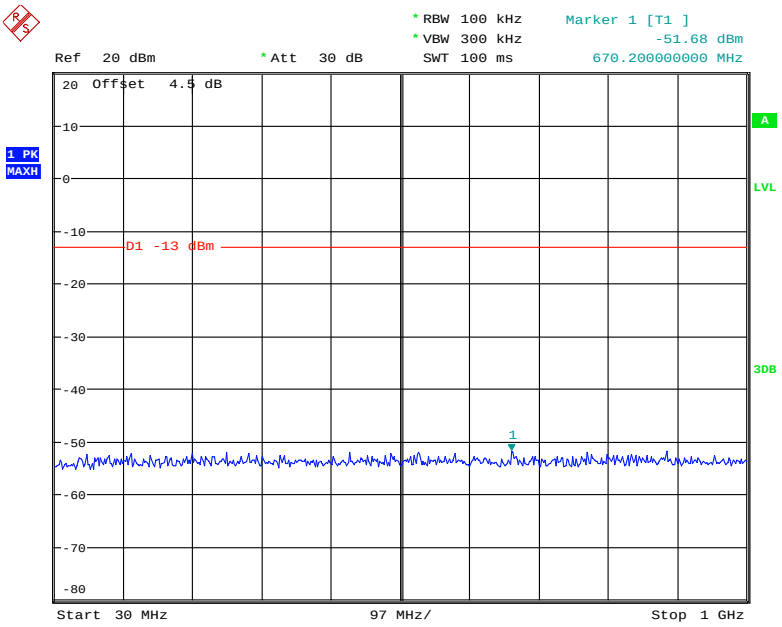
Date: 2.JAN.2020 21:44:13

Fundamental



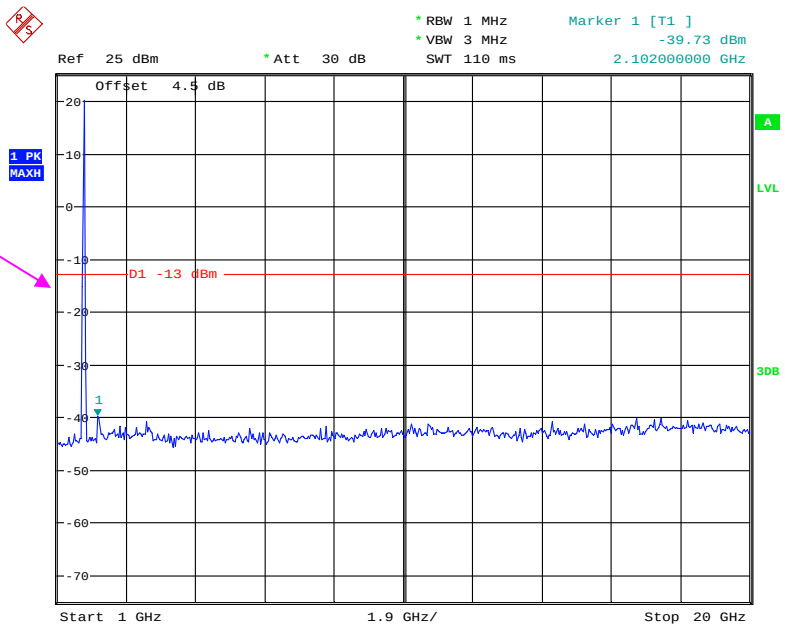
Date: 2.JAN.2020 21:44:25

LTE Band 4_15 MHz_Middle_QPSK



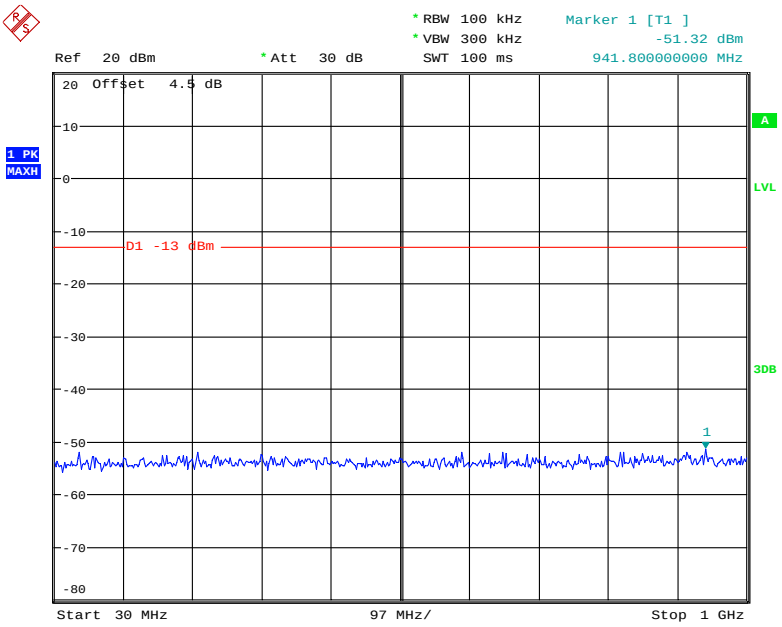
Date: 2.JAN.2020 21:44:51

Fundamental



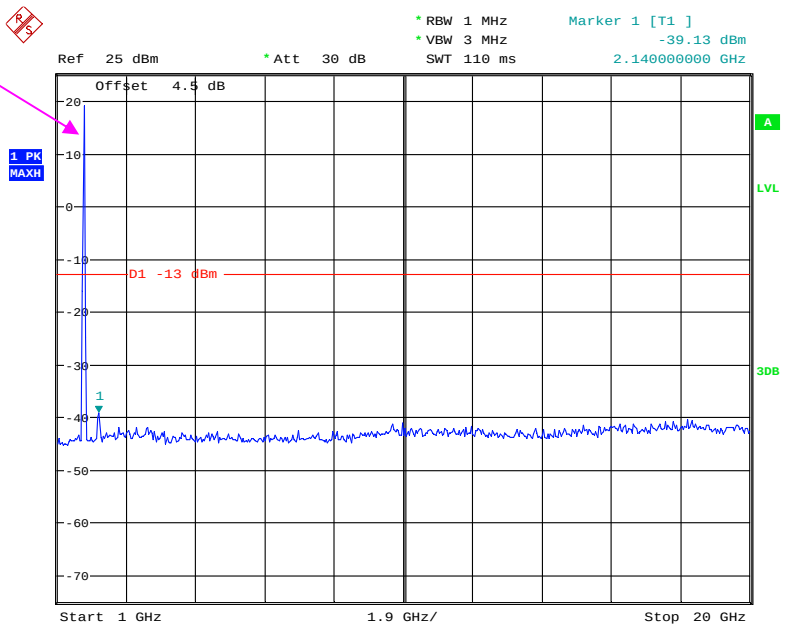
Date: 2.JAN.2020 21:45:03

LTE Band 4_20 MHz_Middle_QPSK



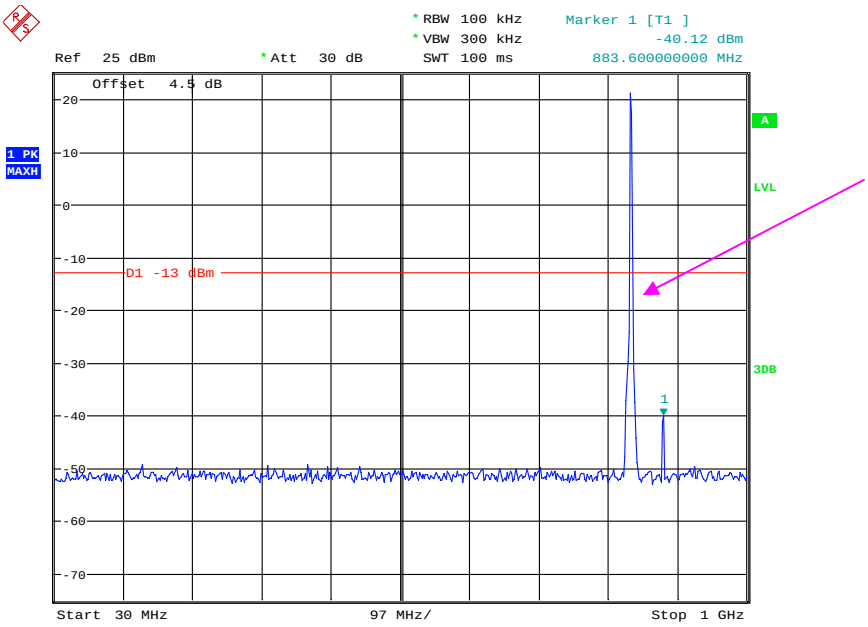
Date: 2.JAN.2020 21:45:26

Fundamental



Date: 2.JAN.2020 21:45:37

LTE Band 5_1.4 MHz_Middle_QPSK



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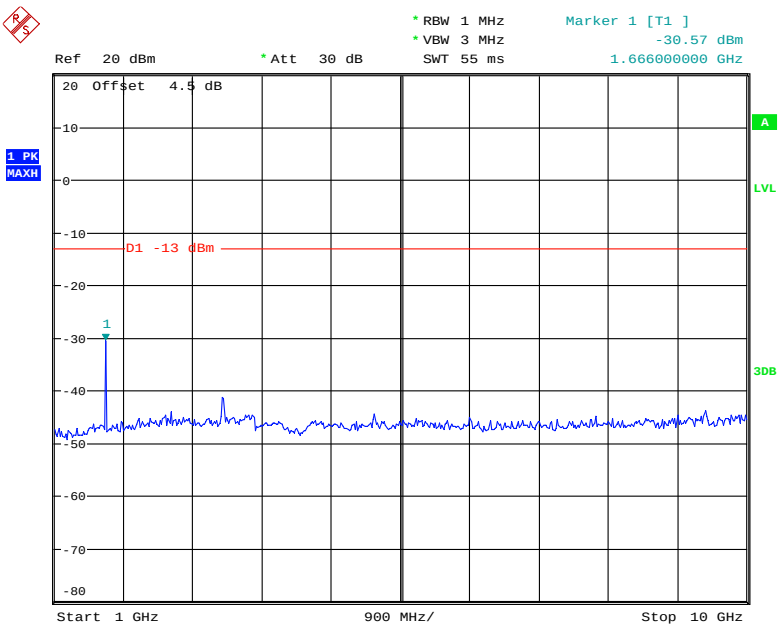
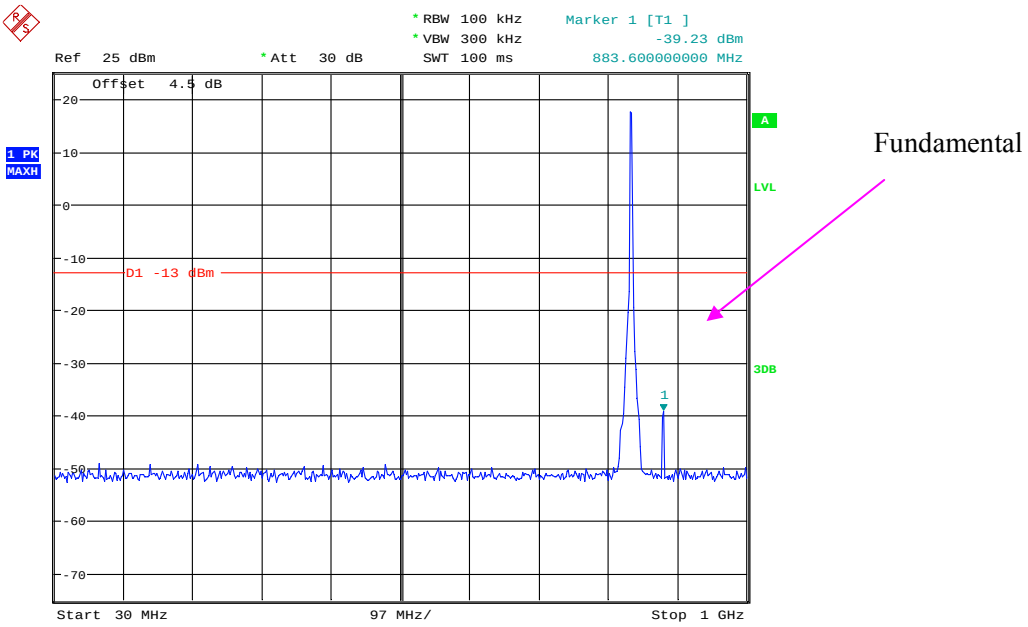
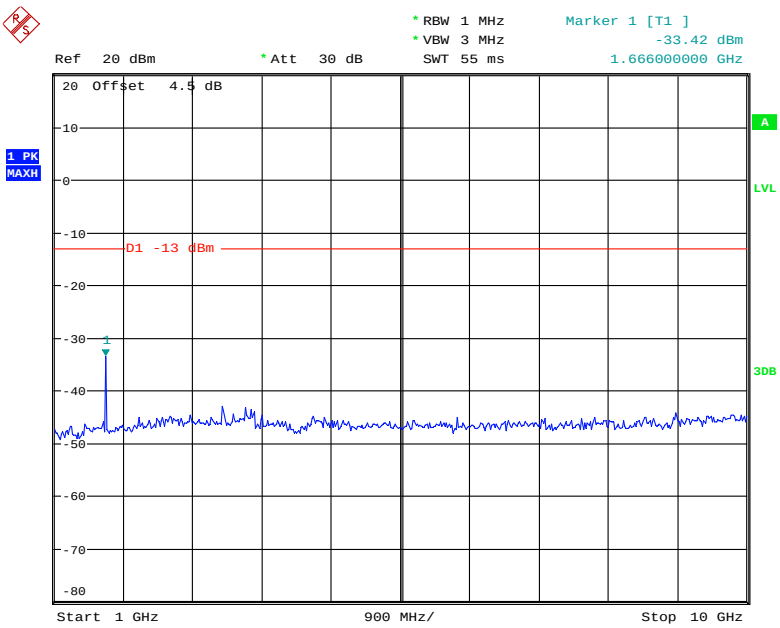


Date: 2.JAN.2020 21:46:08

LTE Band 5_3 MHz_Middle_QPSK

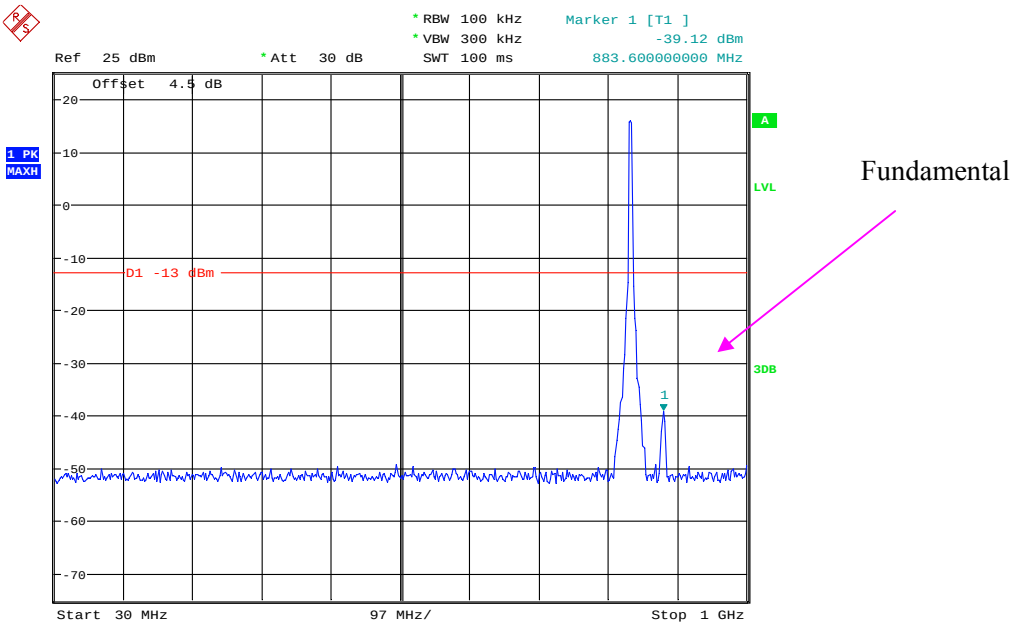


Date: 2.JAN.2020 21:46:30

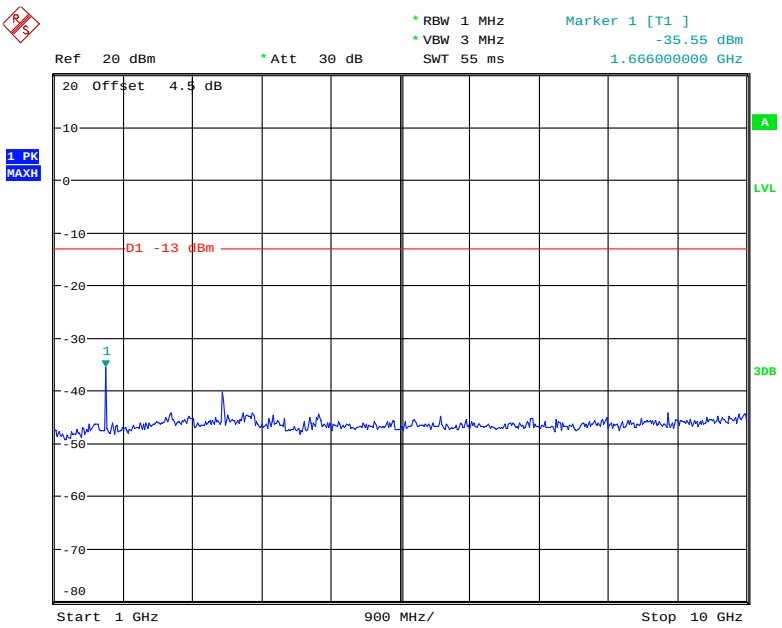


Date: 2.JAN.2020 21:46:42

LTE Band 5_5 MHz_Middle_QPSK

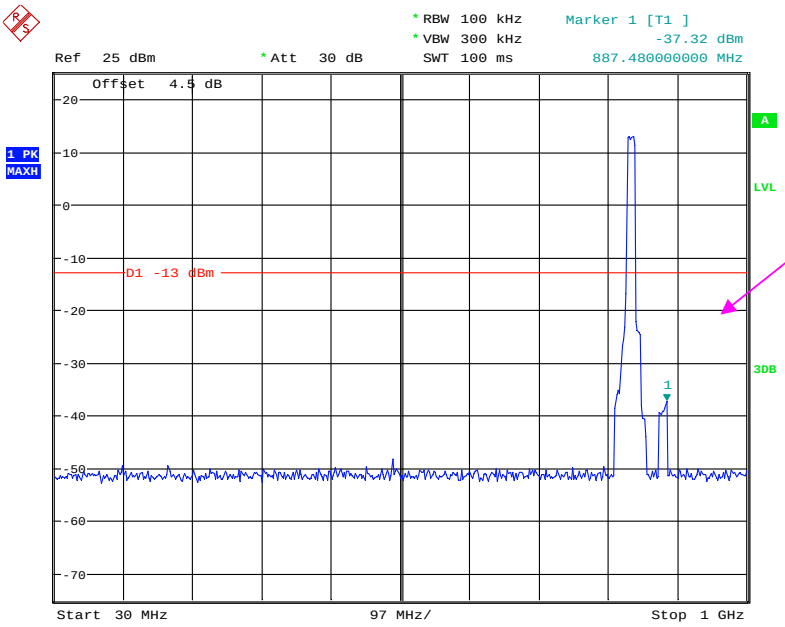


Date: 2.JAN.2020 21:47:02

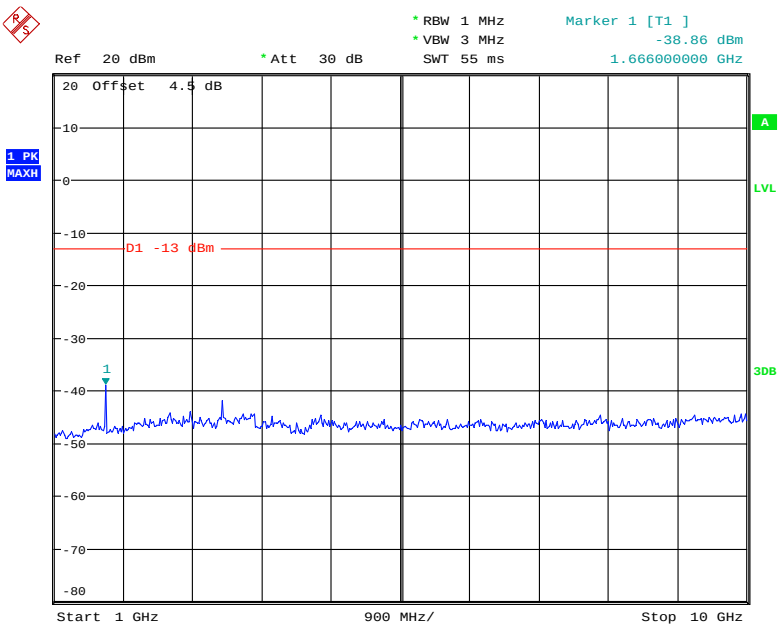


Date: 2.JAN.2020 21:47:14

LTE Band 5_10 MHz_Middle_QPSK

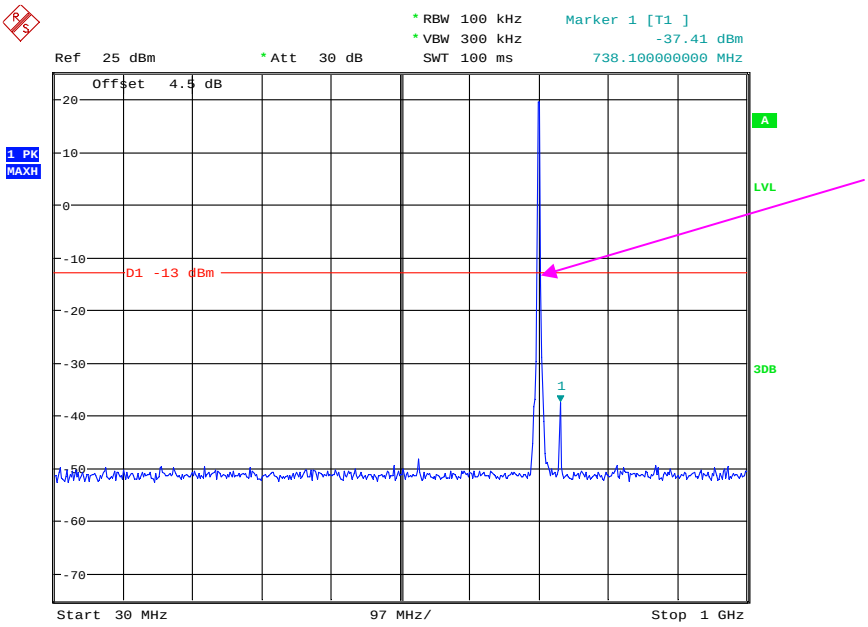


Date: 2.JAN.2020 21:47:37



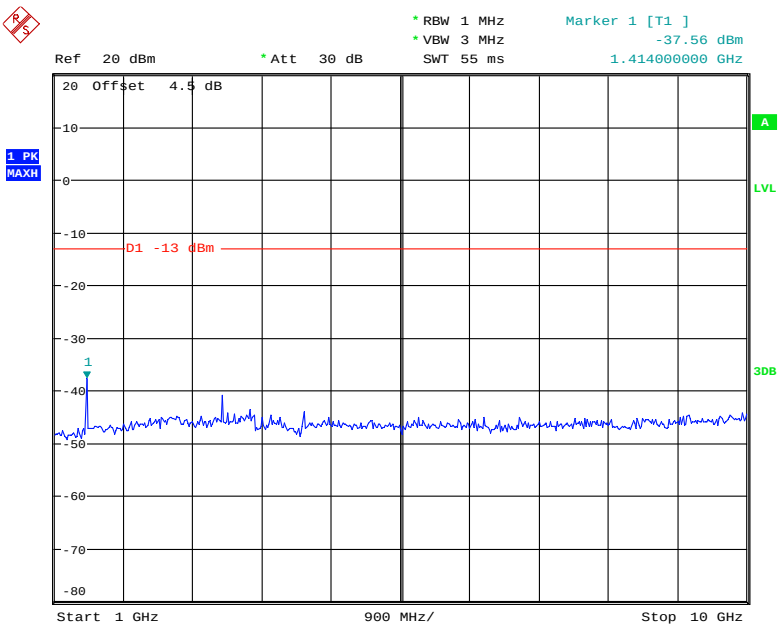
Date: 2.JAN.2020 21:47:49

LTE Band 12_1.4 MHz_Middle_QPSK



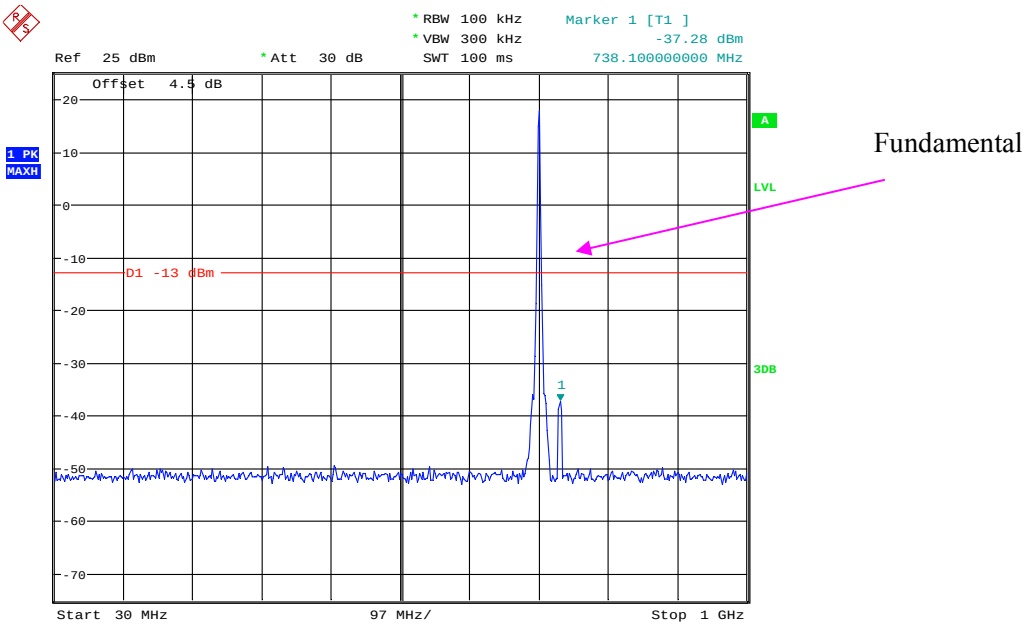
Fundamental

Date: 2.JAN.2020 21:48:12

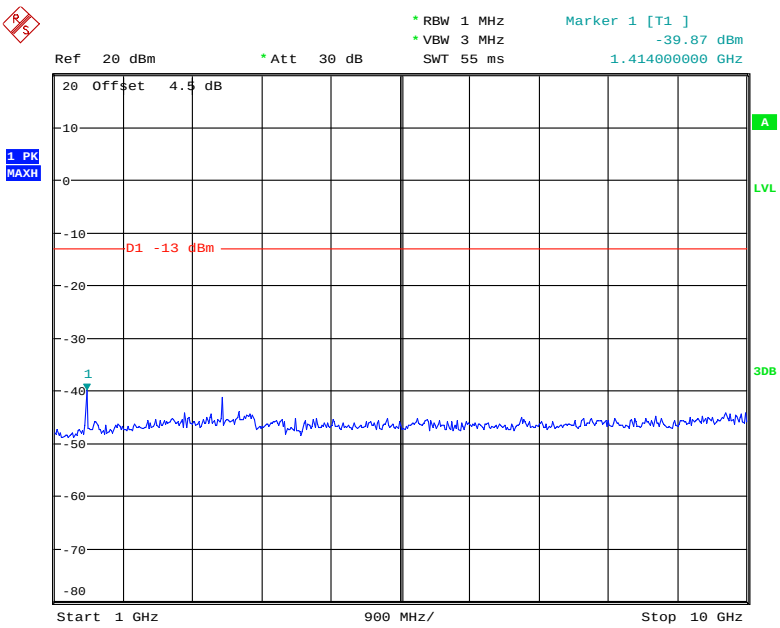


Date: 2.JAN.2020 21:48:23

LTE Band 12_3 MHz_Middle_QPSK

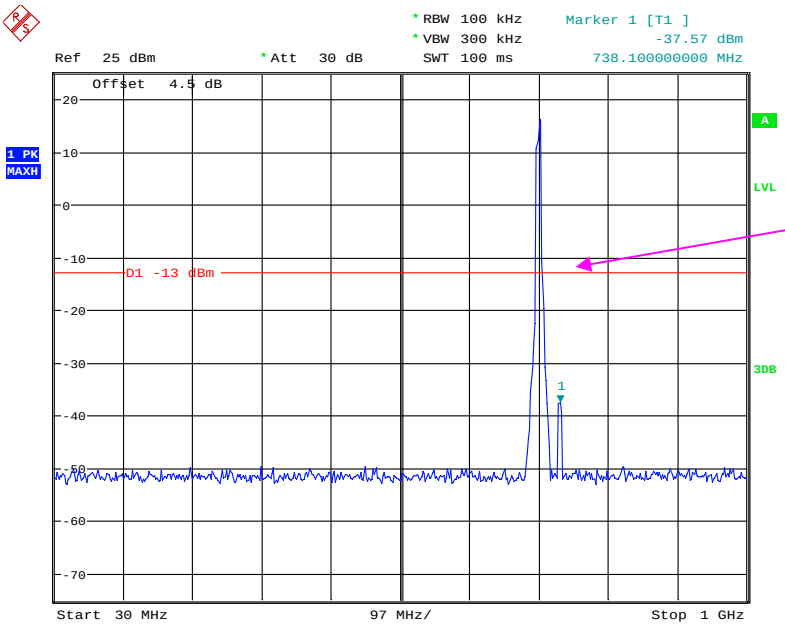


Date: 2.JAN.2020 21:48:42



Date: 2.JAN.2020 21:48:54

LTE Band 12_5 MHz_Middle_QPSK



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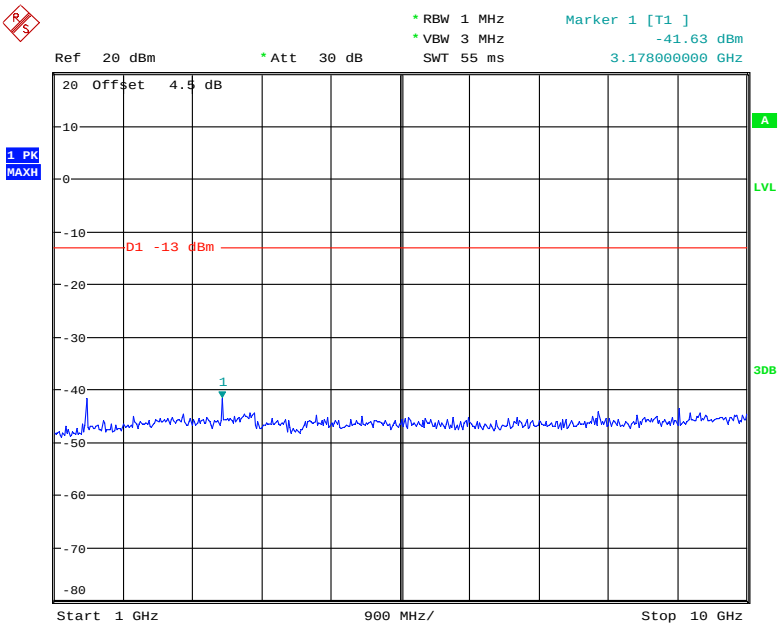
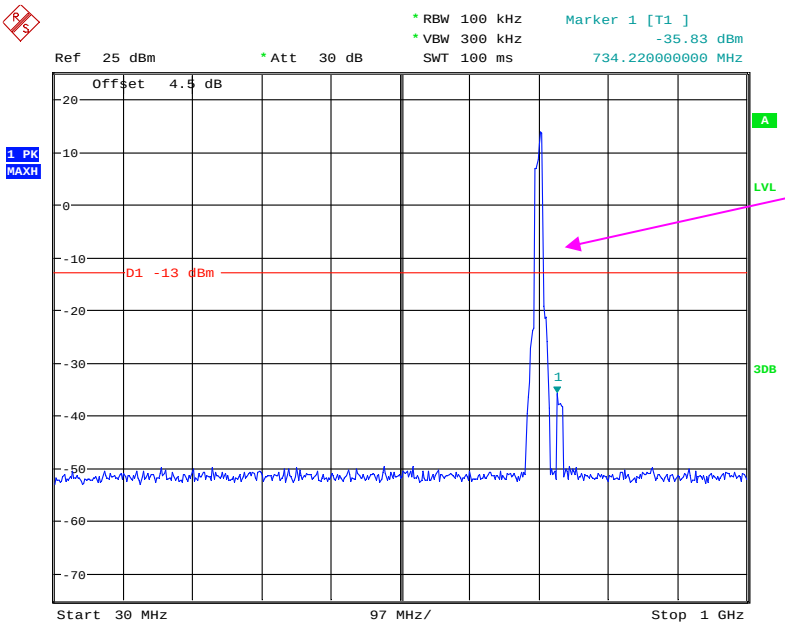
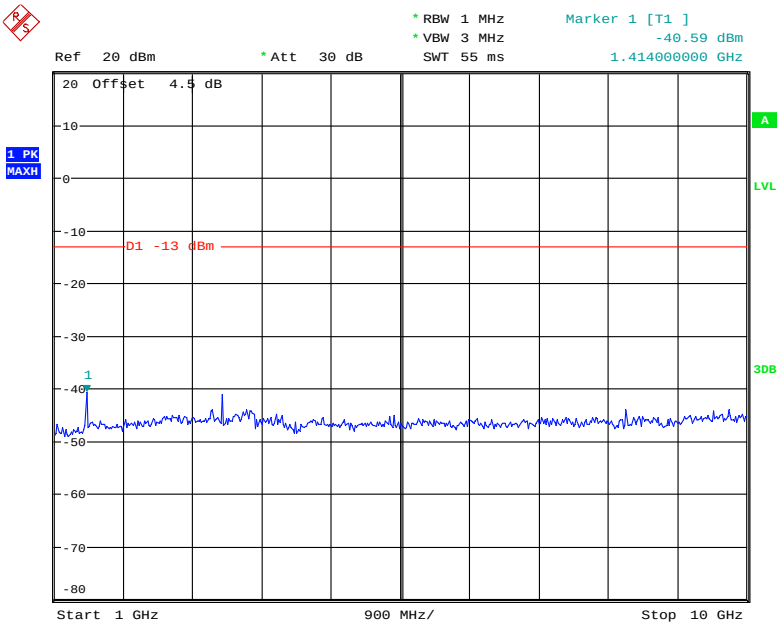


Date: 2.JAN.2020 21:49:26

LTE Band 12_10 MHz_Middle_QPSK

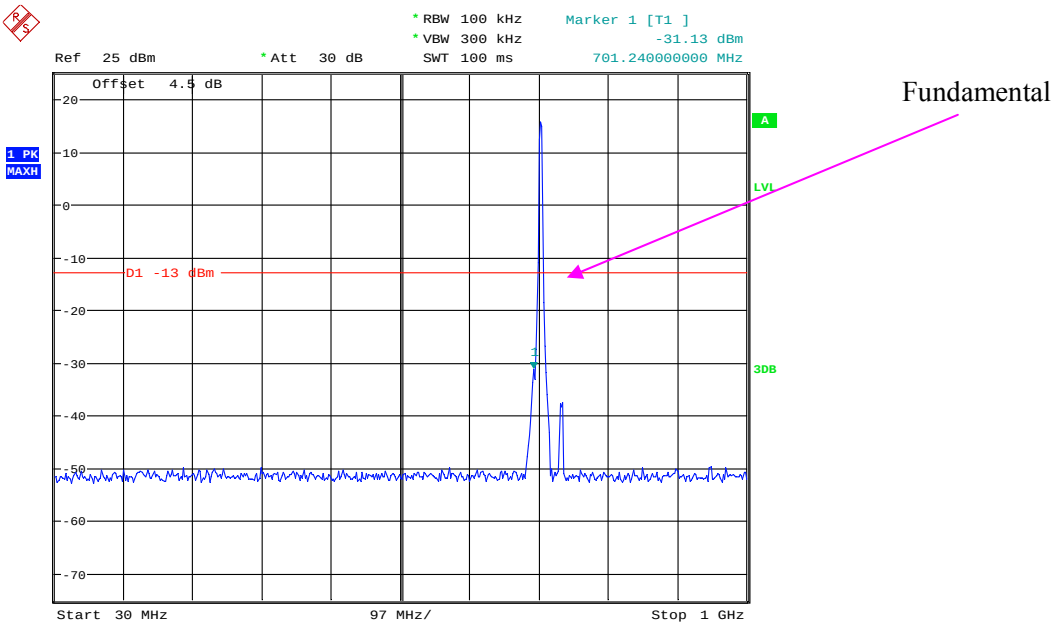


Date: 2.JAN.2020 21:49:46

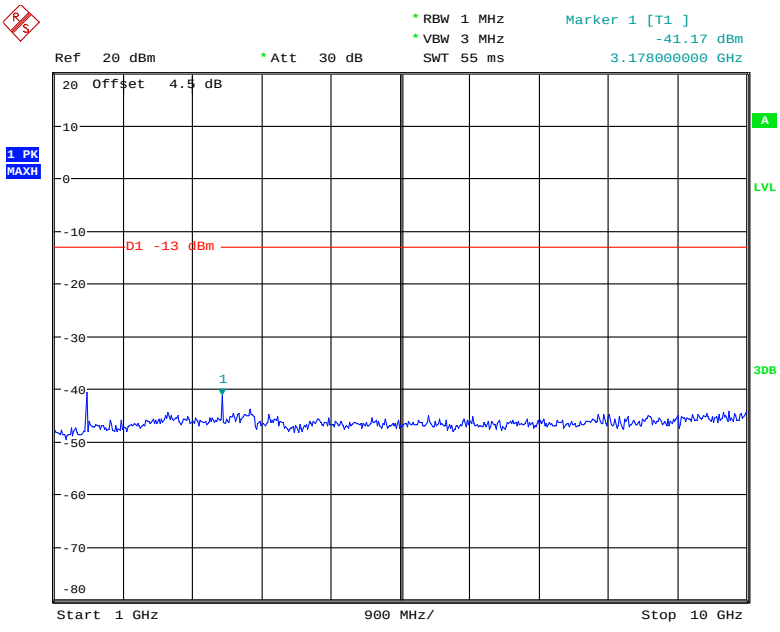


Date: 2.JAN.2020 21:49:58

LTE Band 17_5 MHz_Middle_QPSK

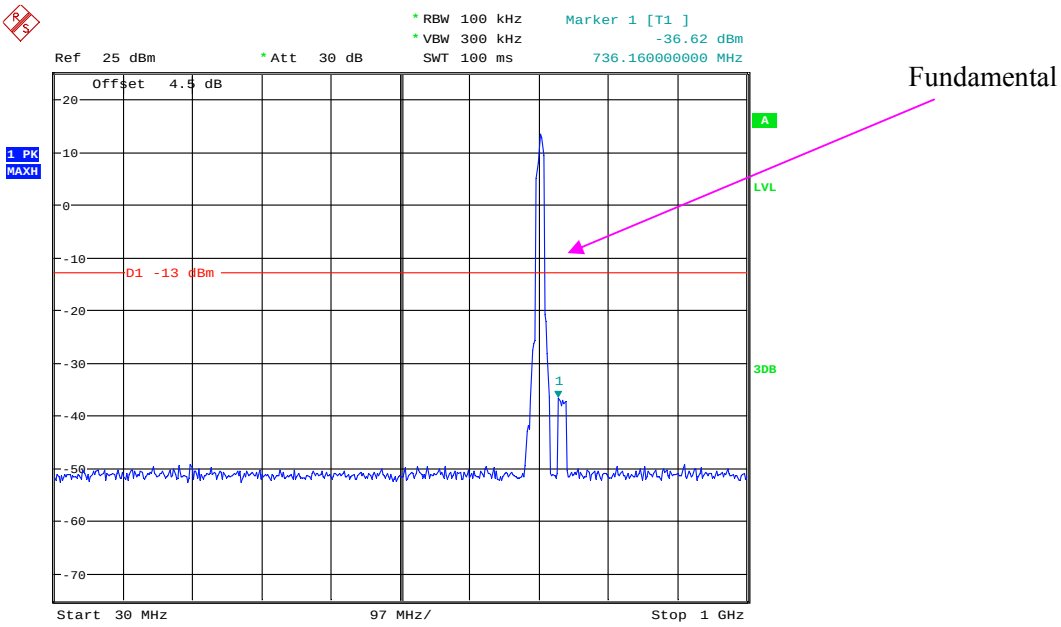


Date: 2.JAN.2020 21:50:18



Date: 2.JAN.2020 21:50:30

LTE Band 17_10 MHz_Middle_QPSK



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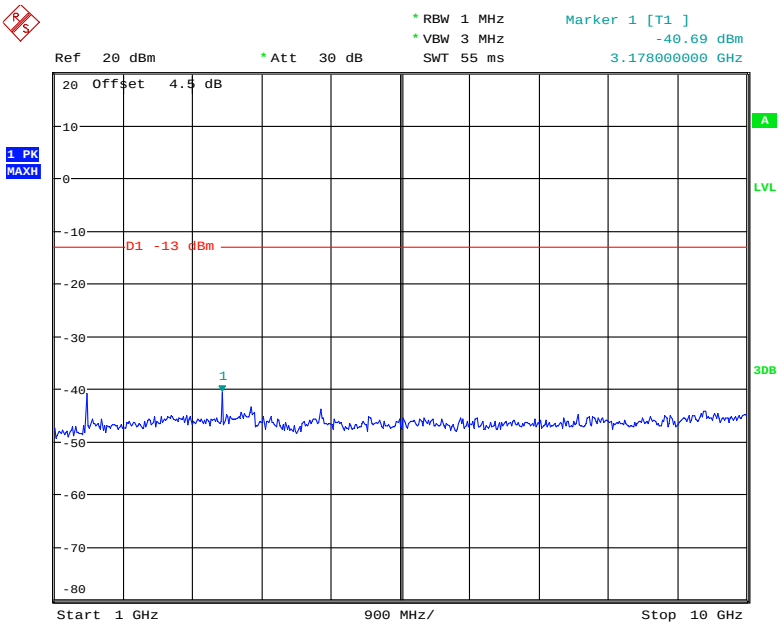


Date: 2.JAN.2020 21:51:04

FCC §2.1053, §22.917 & §24.238 & §27.53- SPURIOUS RADIATED EMISSIONS

Applicable Standard

FCC § 2.1053, §22.917, § 24.238 and § 27.53;

Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB = 10 lg (TXpwr in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = 43 + 10 Log_{10} (power out in Watts)

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESR3	102453	2019-06-26	2020-06-26
Sunol Sciences	Antenna	JB3	A060611-1	2017-11-10	2020-11-10
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2019-05-06	2020-05-06
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2019-09-05	2020-09-05
HP	Amplifier	8447D	2727A05902	2019-09-05	2020-09-05
Sinoscite	Band-stop filter	BSF824-862MS-1438-001	1438001	2019-06-16	2020-06-16
Agilent	Signal Generator	E8247C	MY43321350	2019-12-10	2020-12-10
Agilent	Spectrum Analyzer	E4440A	SG43360054	2019-05-09	2020-05-09
TDK RF	Horn Antenna	HRN-0118	130 084	2018-10-12	2021-10-12
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2019-09-05	2020-09-05
MITEQ	Amplifier	AFS42-00101800-25-S-42	2001271	2019-09-05	2020-09-05
Sinoscite	Band-stop filter	BSF1710-1785MN-0383-003	0383003	2019-06-16	2020-06-16
Sinoscite	Band-stop filter	BSF1850-1910MS-0935V2	0935V2	2019-06-16	2020-06-16
Ducommun Technolagies	Horn Antenna	ARH-4223-02	1007726-01 1304	2017-12-06	2020-12-05
Ducommun Technolagies	Horn Antenna	ARH-4223-02	1007726-02 1304	2017-12-06	2020-12-05
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2019-06-27	2020-06-27

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Test Items	Radiation Below 1GHz	Radiation Above 1GHz
Temperature:	25.7 °C	24.3°C
Relative Humidity:	43%	38 %
ATM Pressure:	100.2 kPa	102.2 kPa
Tester:	Davy Wang	Tyler Pan
Test Date:	2020-01-01	2020-01-03

Test Result: Compliance.

EUT Operation Mode: Transmitting

Cellular Band (PART 22H)

30 MHz-10 GHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
GSM850, Frequency:836.600 MHz								
1673.200	H	52.96	-50.98	10.6	0.73	-41.1	-13.0	28.1
1673.200	V	61.77	-42.77	10.6	0.73	-32.9	-13.0	19.9
2509.800	H	53.61	-49.3	13.1	1.25	-37.4	-13.0	24.4
2509.800	V	53.52	-49.42	13.1	1.25	-37.6	-13.0	24.6
3346.400	H	41.14	-58.54	13.8	1.61	-46.3	-13.0	33.3
3346.400	V	40.06	-59.66	13.8	1.61	-47.4	-13.0	34.4
2908.000	H	41.29	-59.34	13.9	1.36	-46.8	-13.0	33.8
2908.000	V	45.18	-55.74	13.9	1.36	-43.2	-13.0	30.2
700.000	H	45.96	-55.47	0.0	0.94	-56.4	-13.0	43.4
700.000	V	43.37	-60.53	0.0	0.94	-61.5	-13.0	48.5
WCDMA Band V, Frequency:836.600 MHz								
1673.00	H	39.82	-64.12	10.61	0.73	-54.24	-13.00	41.24
1673.00	V	41.97	-62.57	10.61	0.73	-52.69	-13.00	39.69
2509.50	H	40.82	-62.09	13.11	1.25	-50.23	-13.00	37.23
2509.50	V	42.19	-60.75	13.11	1.25	-48.89	-13.00	35.89
3346.00	H	37.09	-62.59	13.83	1.61	-50.37	-13.00	37.37
3346.00	V	36.84	-62.88	13.83	1.61	-50.66	-13.00	37.66
415.00	H	39.23	-65.49	0.00	0.63	-66.12	-13.00	53.12
575.40	V	38.53	-67.32	0.00	0.75	-68.07	-13.00	55.07

PCS Band (PART 24E)

30 MHz-20 GHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
GSM1900, Frequency:1880.000 MHz								
3760.000	H	71.37	-26.27	13.8	1.63	-14.1	-13.0	1.1
3760.000	V	66.13	-31.37	13.8	1.63	-19.2	-13.0	6.2
2910.000	H	41.48	-59.13	13.9	1.37	-46.6	-13.0	33.6
2910.000	V	40.29	-60.61	13.9	1.37	-48.1	-13.0	35.1
2910.000	H	41.48	-59.13	13.9	1.37	-46.6	-13.0	33.6
2910.000	V	40.29	-60.61	13.9	1.37	-48.1	-13.0	35.1
WCDMA Band II, Frequency:1880.000 MHz								
3760.000	H	49.65	-47.99	13.8	1.63	-35.9	-13.0	22.9
3760.000	V	46.78	-50.72	13.8	1.63	-38.6	-13.0	25.6
5640.000	H	46.29	-47.3	14.0	1.31	-34.6	-13.0	21.6
5640.000	V	45.19	-48.29	14.0	1.31	-35.6	-13.0	22.6
5810.000	H	41.98	-51.11	14.1	1.31	-38.3	-13.0	25.3
5810.000	V	40.79	-52.36	14.1	1.31	-39.6	-13.0	26.6
953.800	H	42.53	-52.37	0.0	0.88	-53.3	-13.0	40.3
601.400	V	38.25	-67.12	0.0	0.76	-67.9	-13.0	54.9

PCS Band (PART 27)

30 MHz-20 GHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
WCDMA Band IV, Frequency:1732.600 MHz								
3465.200	H	46.68	-52.5	13.9	1.62	-40.2	-13.0	27.2
3465.200	V	45.58	-53.64	13.9	1.62	-41.4	-13.0	28.4
5197.800	H	41.79	-52.9	14.0	1.52	-40.4	-13.0	27.4
5197.800	V	40.83	-53.93	14.0	1.52	-41.5	-13.0	28.5
830.200	H	40.32	-57.87	0.0	0.97	-58.8	-13.0	45.8
576.800	V	38.86	-66.96	0.0	0.75	-67.7	-13.0	54.7

LTE Band 2 (30MHz-20GHz):

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBµV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK,Frequency:1880.000 MHz								
3760.00	H	49.93	-47.71	13.76	1.63	-35.58	-13.00	22.58
3760.00	V	51.43	-46.07	13.76	1.63	-33.94	-13.00	20.94
5640.00	H	53.96	-39.63	14.02	1.31	-26.92	-13.00	13.92
5640.00	V	56.93	-36.55	14.02	1.31	-23.84	-13.00	10.84
800.00	H	39.13	-59.52	0.00	0.93	-60.45	-13.00	47.45
332.00	V	40.61	-68.79	0.00	0.55	-69.34	-13.00	56.34

LTE Band 4 (30MHz-20GHz):

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBµV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK,Frequency:1732.500 MHz								
3465.00	H	50.11	-49.08	13.91	1.62	-36.79	-13.00	23.79
3465.00	V	49.13	-50.09	13.91	1.62	-37.80	-13.00	24.80
5197.50	H	43.27	-51.42	14.00	1.52	-38.94	-13.00	25.94
5197.50	V	39.55	-55.21	14.00	1.52	-42.73	-13.00	29.73
750.00	H	39.46	-60.58	0.00	0.94	-61.52	-13.00	48.52
564.00	V	39.17	-66.89	0.00	0.74	-67.63	-13.00	54.63

LTE Band 5(30MHz-10GHz):

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBµV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK, Frequency: 836.500 MHz								
1673.00	H	39.82	-64.12	10.61	0.73	-54.24	-13.00	41.24
1673.00	V	41.97	-62.57	10.61	0.73	-52.69	-13.00	39.69
2509.50	H	40.82	-62.09	13.11	1.25	-50.23	-13.00	37.23
2509.50	V	42.19	-60.75	13.11	1.25	-48.89	-13.00	35.89
3346.00	H	37.09	-62.59	13.83	1.61	-50.37	-13.00	37.37
3346.00	V	36.84	-62.88	13.83	1.61	-50.66	-13.00	37.66
415.00	H	39.23	-65.49	0.00	0.63	-66.12	-13.00	53.12
575.40	V	38.53	-67.32	0.00	0.75	-68.07	-13.00	55.07

LTE Band 12 (30MHz-10GHz):

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBµV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK, Frequency: 707.500 MHz								
1415.00	H	39.97	-63.64	9.08	1.22	-55.78	-13.00	42.78
1415.00	V	39.43	-64.70	9.08	1.22	-56.84	-13.00	43.84
2122.50	H	38.05	-63.96	11.27	1.11	-53.80	-13.00	40.80
2122.50	V	38.04	-63.95	11.27	1.11	-53.79	-13.00	40.79
2830.00	H	37.95	-63.47	13.34	1.36	-51.49	-13.00	38.49
2830.00	V	37.19	-64.46	13.34	1.36	-52.48	-13.00	39.48
463.40	H	38.28	-66.16	0.00	0.67	-66.83	-13.00	53.83
637.00	V	38.79	-66.05	0.00	0.83	-66.88	-13.00	53.88

LTE Band 17 (30MHz-10GHz):

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBµV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK,Frequency: 710.000 MHz								
1420.00	H	43.05	-60.63	9.10	1.23	-52.76	-13.00	39.76
1420.00	V	42.36	-61.82	9.10	1.23	-53.95	-13.00	40.95
2130.00	H	37.63	-64.37	11.22	1.11	-54.26	-13.00	41.26
2130.00	V	37.59	-64.38	11.22	1.11	-54.27	-13.00	41.27
2840.00	H	37.23	-64.09	13.42	1.36	-52.03	-13.00	39.03
2840.00	V	37.51	-64.05	13.42	1.36	-51.99	-13.00	38.99
565.00	H	38.56	-64.31	0.00	0.74	-65.05	-13.00	52.05
496.00	V	38.84	-68.46	0.00	0.71	-69.17	-13.00	56.17

Note:
1) The unit of Antenna Gain is dBd for frequency below 1GHz, and the unit of Antenna Gain is dBi for frequency above 1GHz.
2) Absolute Level = Substituted Level - Cable loss + Antenna Gain
3) Margin = Limit-Absolute Level

FCC §22.917(a) & §24.238(a) & §27.53 - BAND EDGES

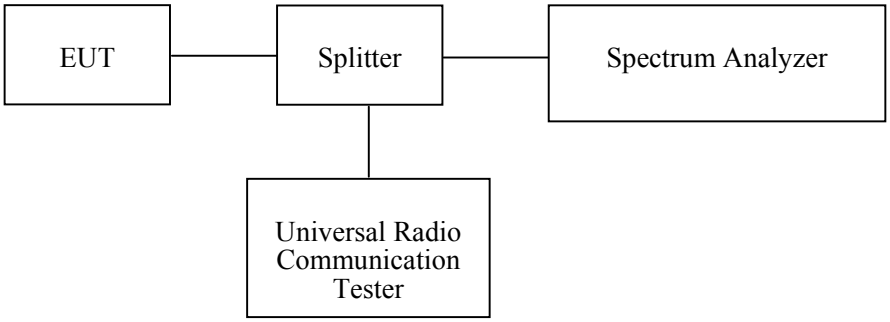
Applicable Standard

FCC § 2.1053, §22.917, § 24.238 and § 27.53

Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2019-12-10	2020-12-10
R&S	Spectrum Analyzer	FSU 26	200256	2019-05-09	2020-05-09
Rohde & Schwarz	Signal Analyzer	FSIQ26	831929/005	2019-08-03	2020-08-03
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41010013	Each time	/
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005011	Each time	/
Unknown	Coaxial Cable	C-SJ00-0010	C0010/03	Each time	/
E-Microwave	Two-way Spliter	ODP-1-6-2S	OE0120142	Each time	/

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

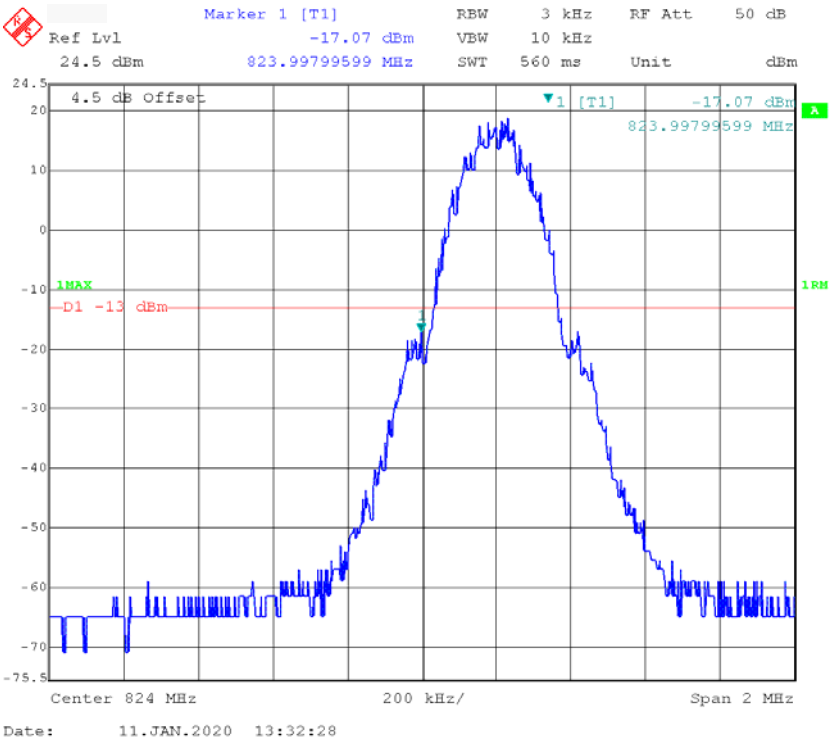
Test Data

Environmental Conditions

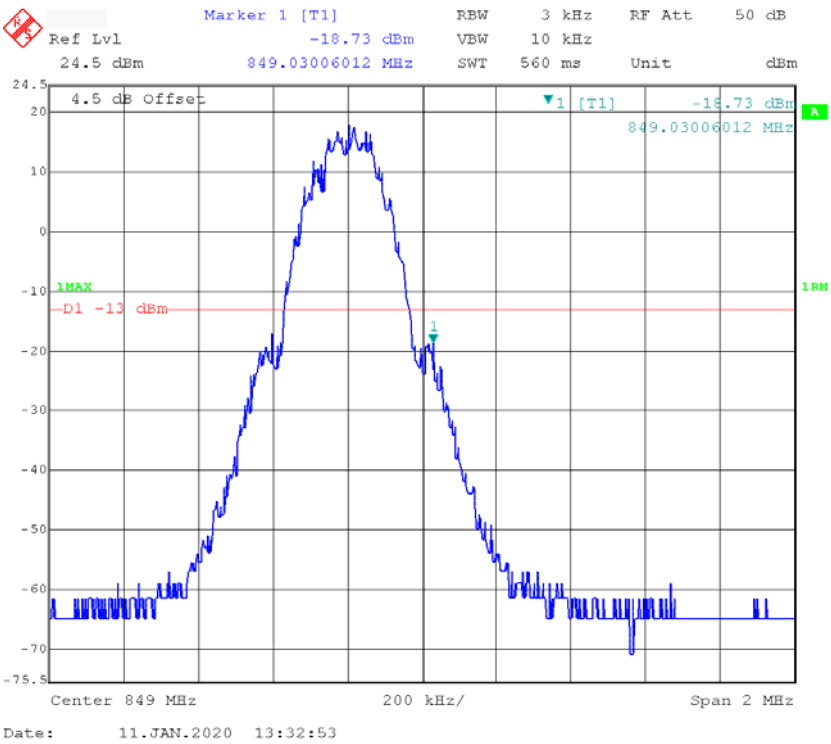
Temperature:	23.9 °C~ 26 °C
Relative Humidity:	49%~62 %
ATM Pressure:	101.2kPa ~102.5kPa
Tester:	Xia Yang & Lily Xie
Test Date:	2020-01-02~2020-01-11

Test Mode: Transmitting
Test Result: Compliance. Please refer to the following plots.

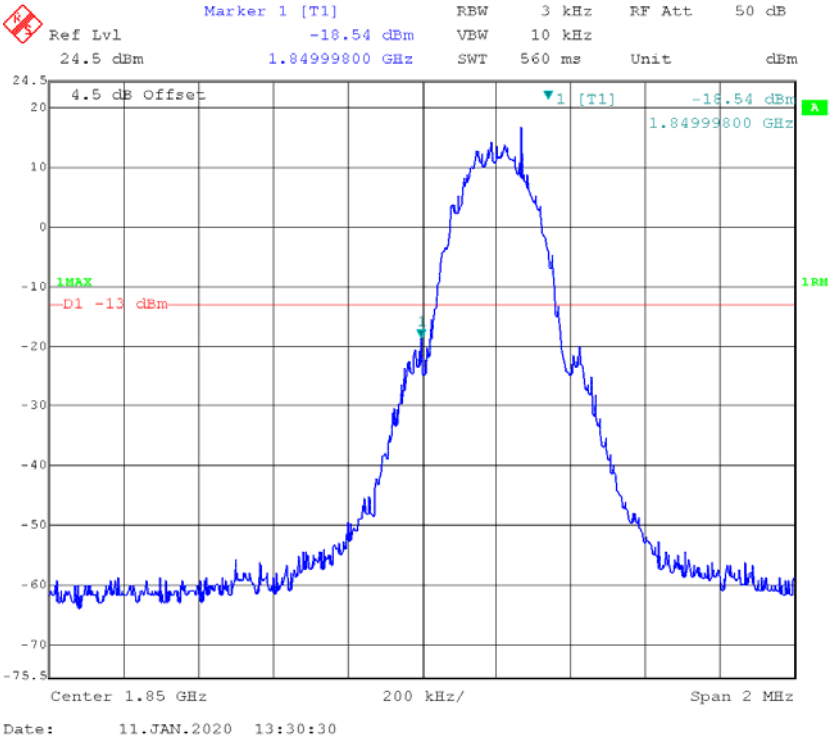
GSM 850, Left Band Edge



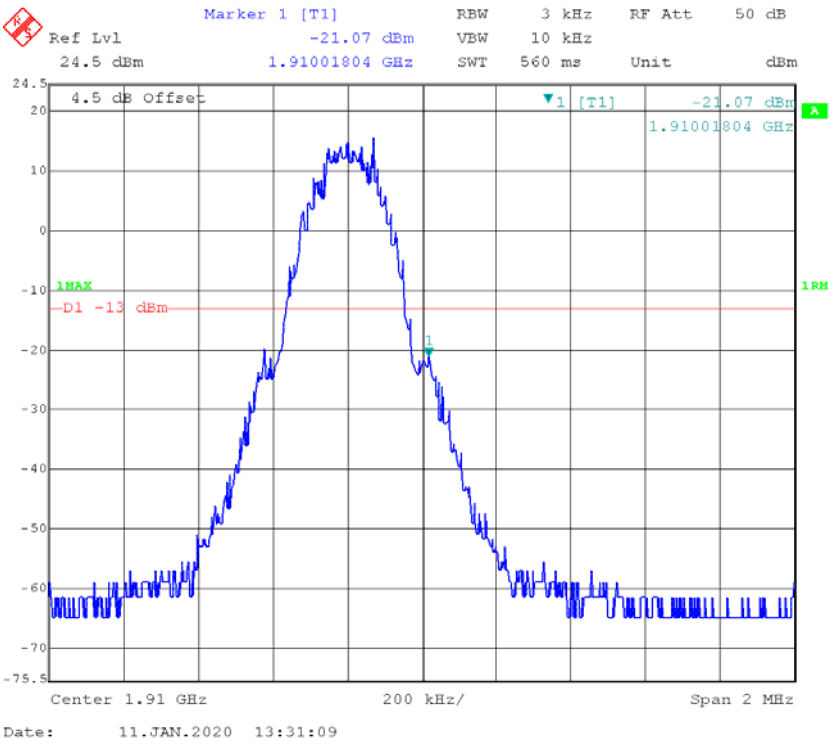
GSM 850, Right Band Edge



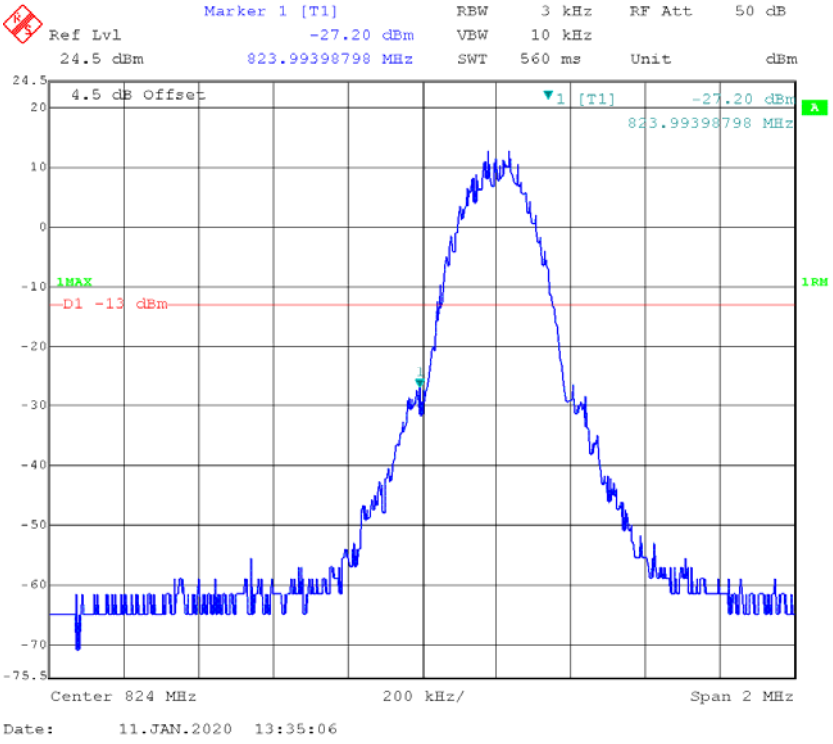
GSM 1900, Left Band Edge



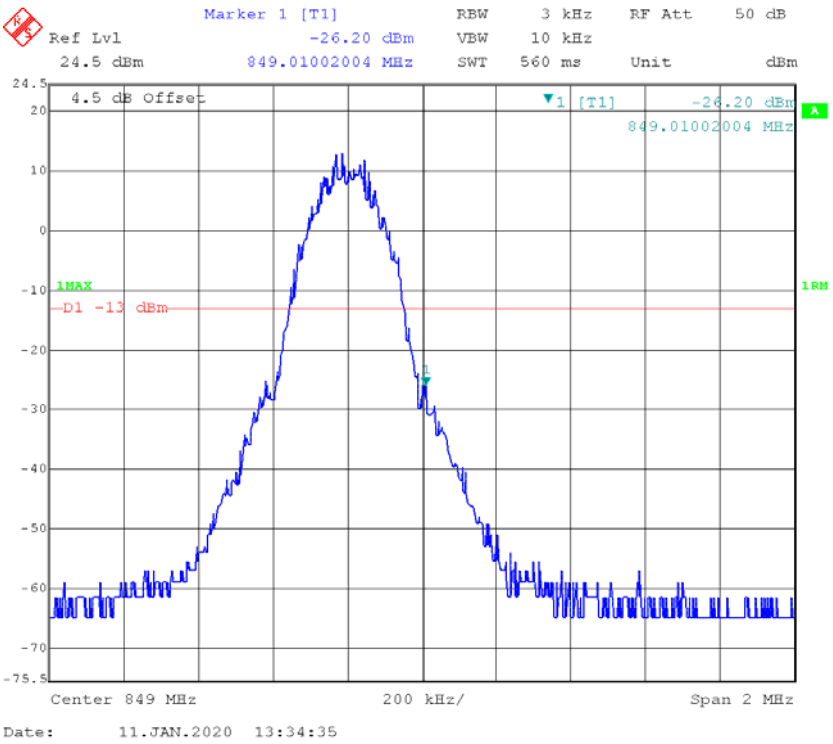
GSM 1900, Right Band Edge



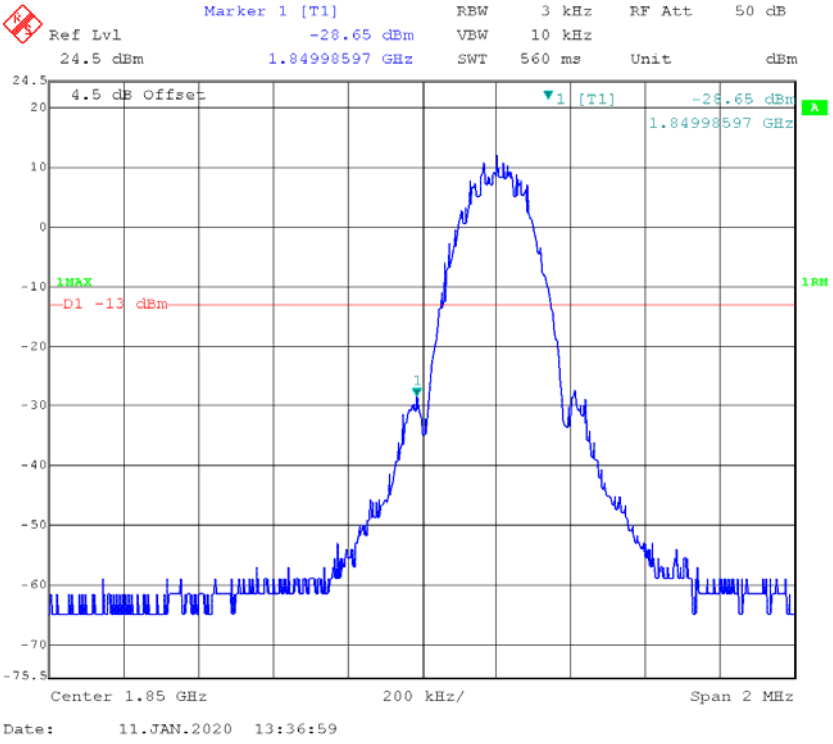
EDGE 850, Left Band Edge



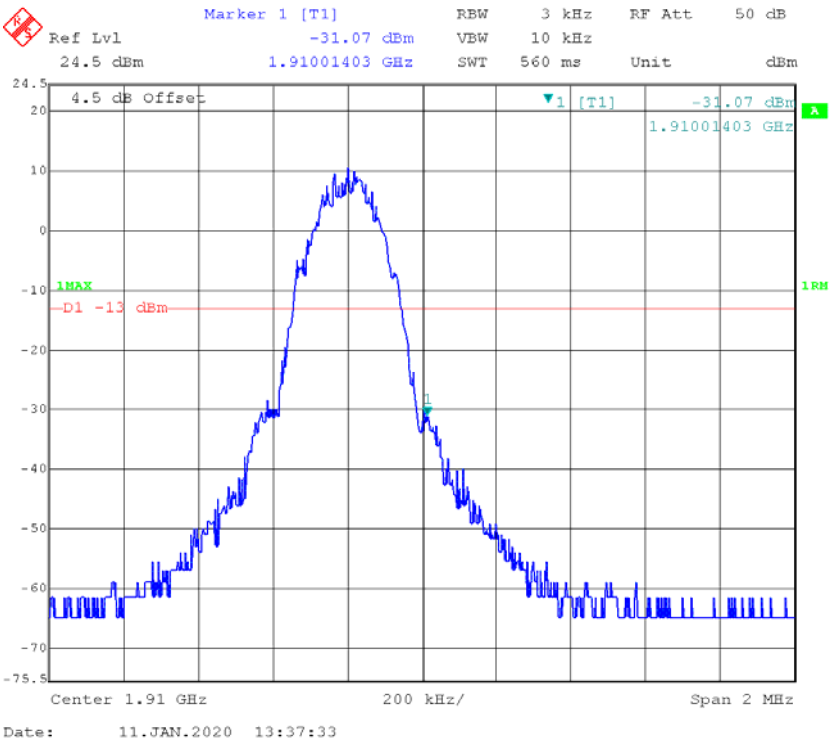
EDGE 850, Right Band Edge



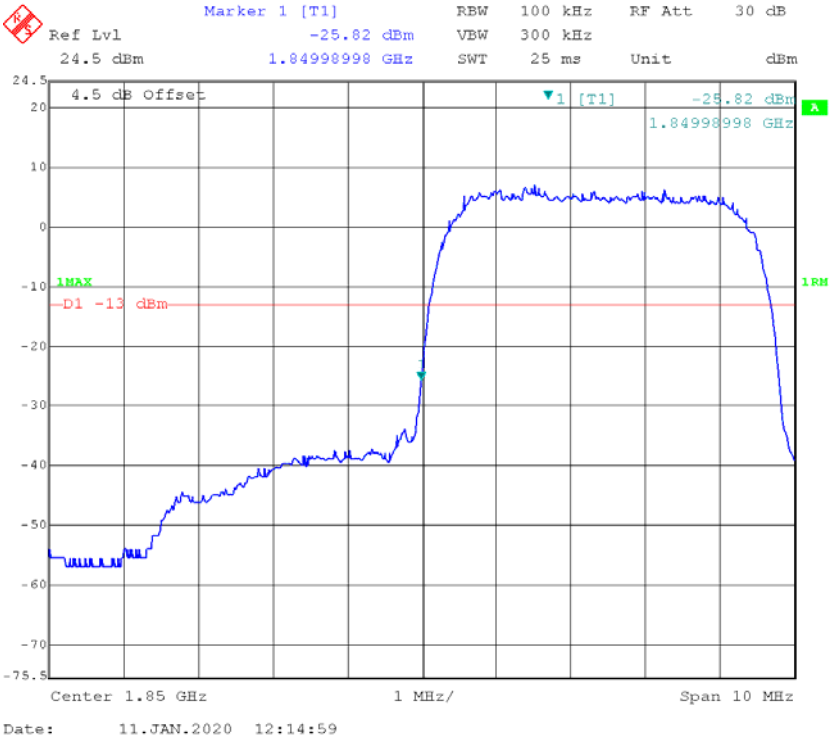
EDGE 1900, Left Band Edge



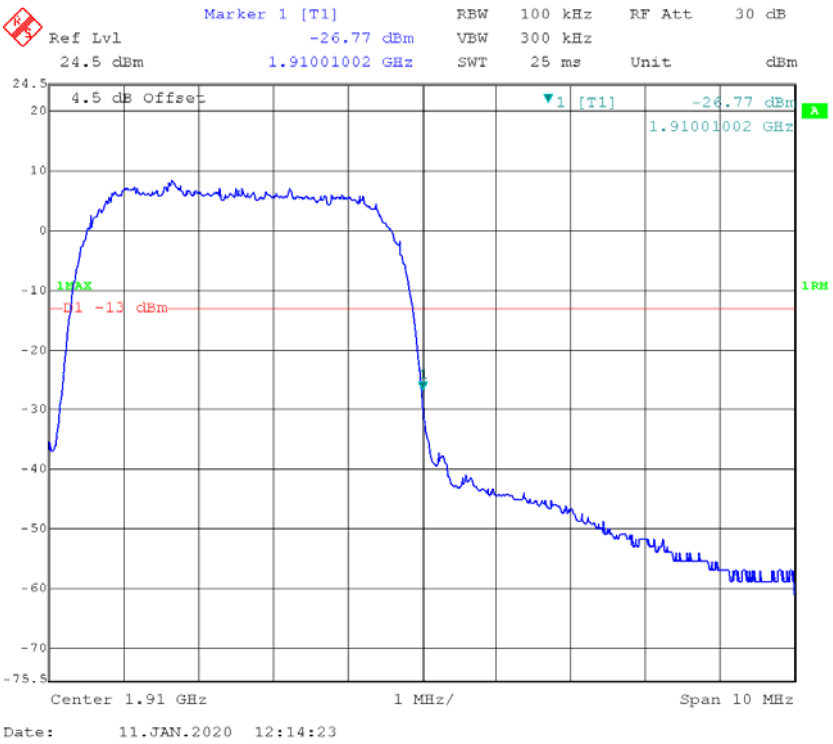
EDGE 1900, Right Band Edge



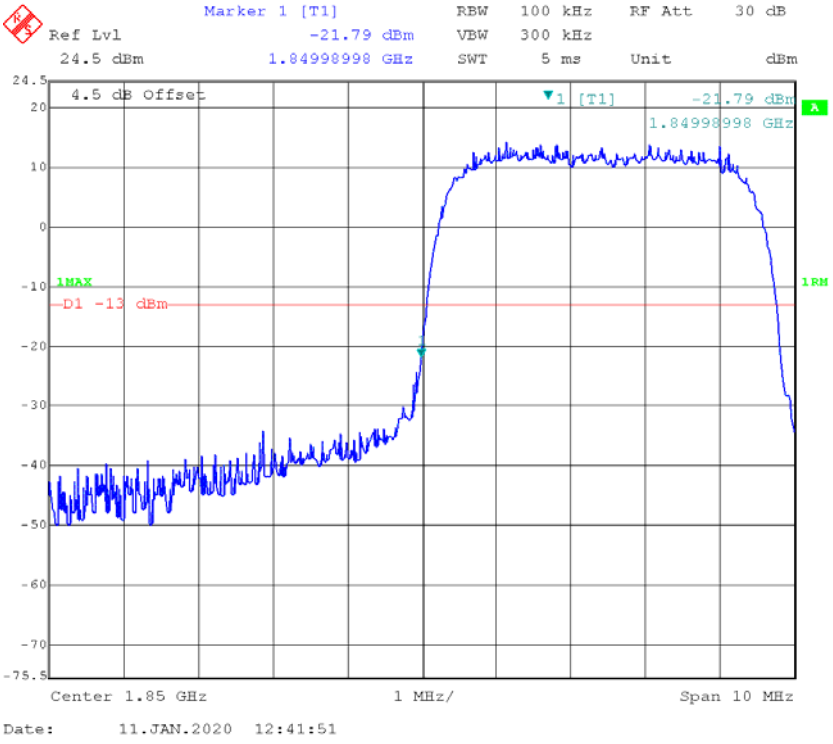
WCDMA Band 2 Rel 99, Left Band Edge



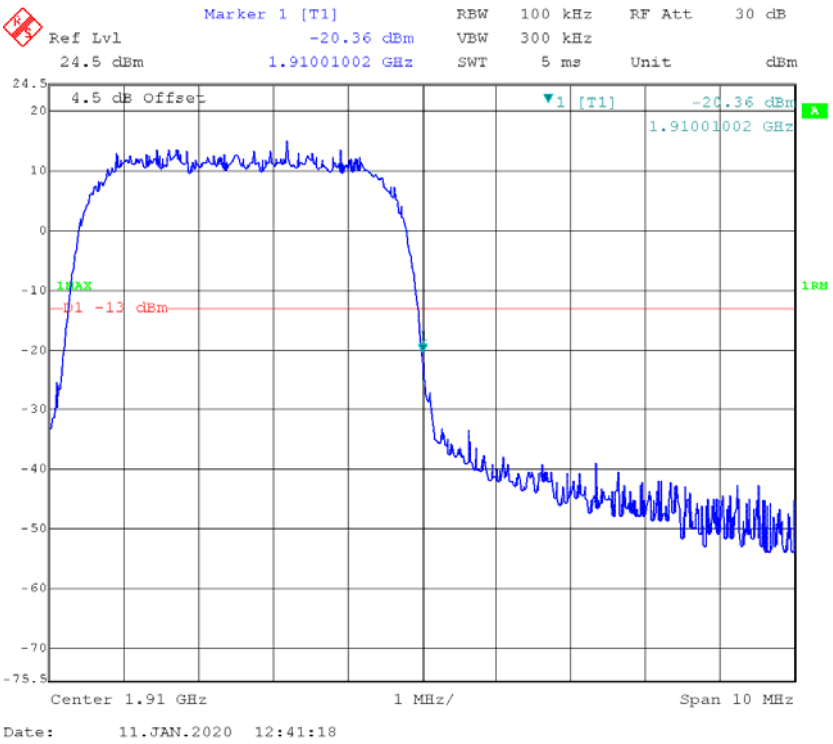
WCDMA Band 2 Rel 99, Right Band Edge



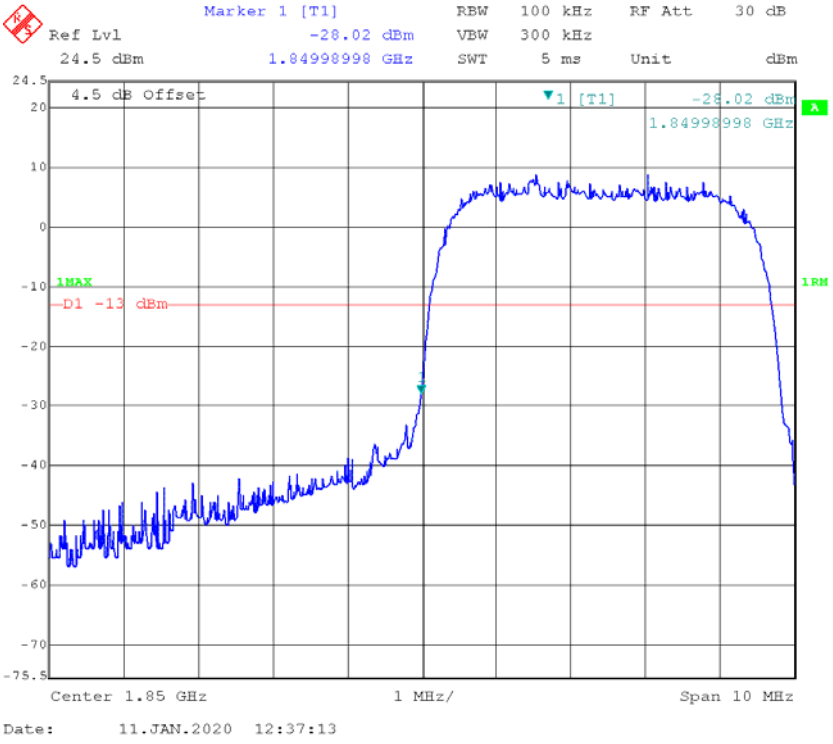
WCDMA Band 2 HSDPA, Left Band Edge



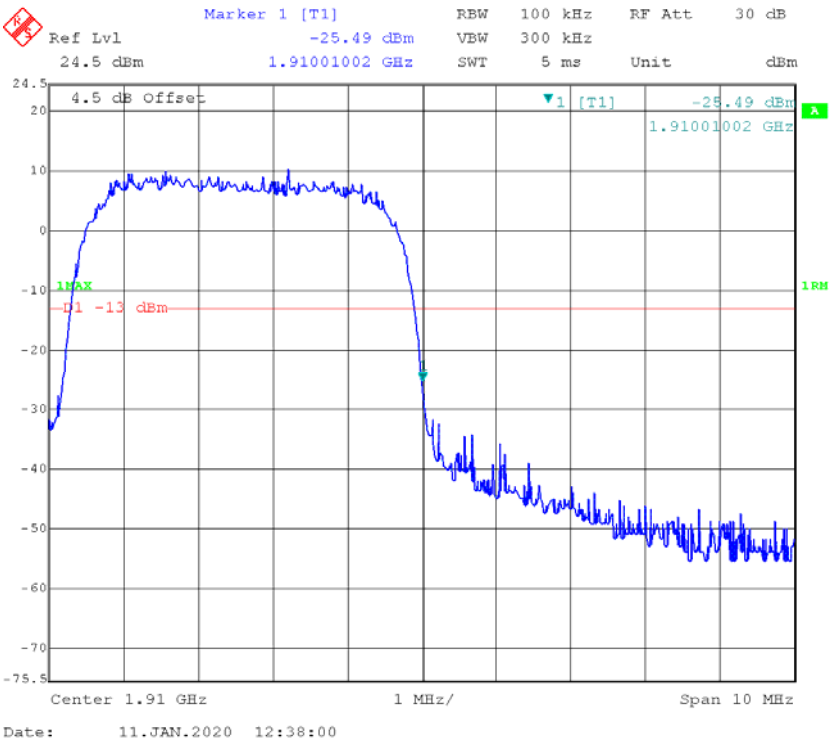
WCDMA Band 2 HSDPA, Right Band Edge



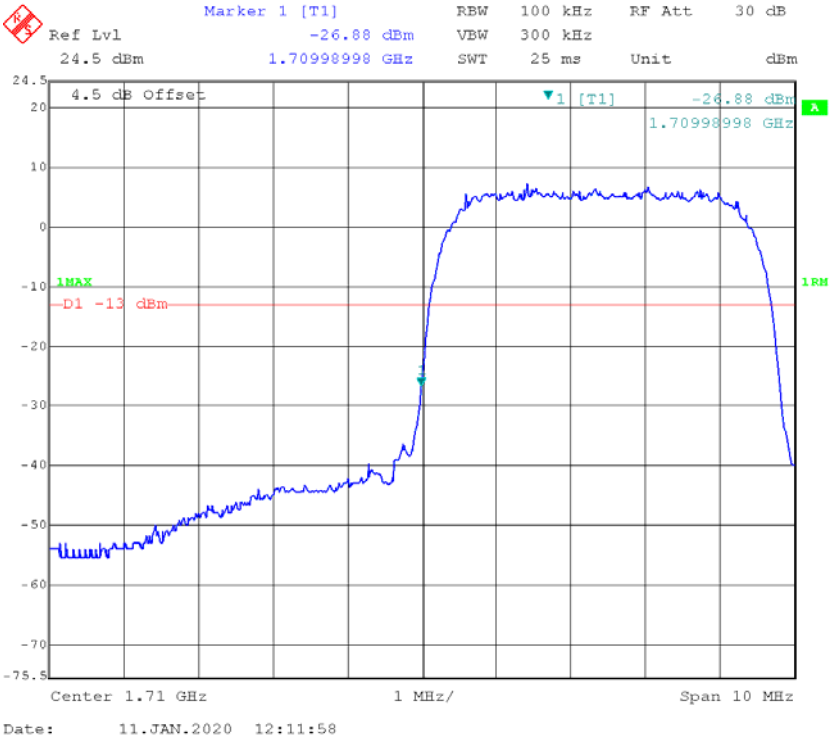
WCDMA Band 2 HSUPA, Left Band Edge



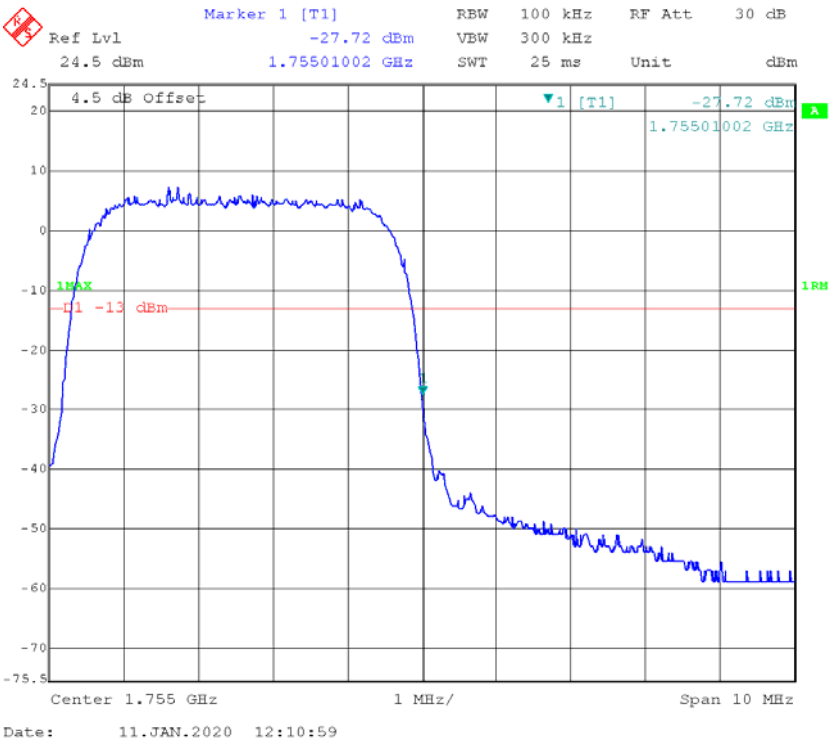
WCDMA Band 2 HSUPA, Right Band Edge



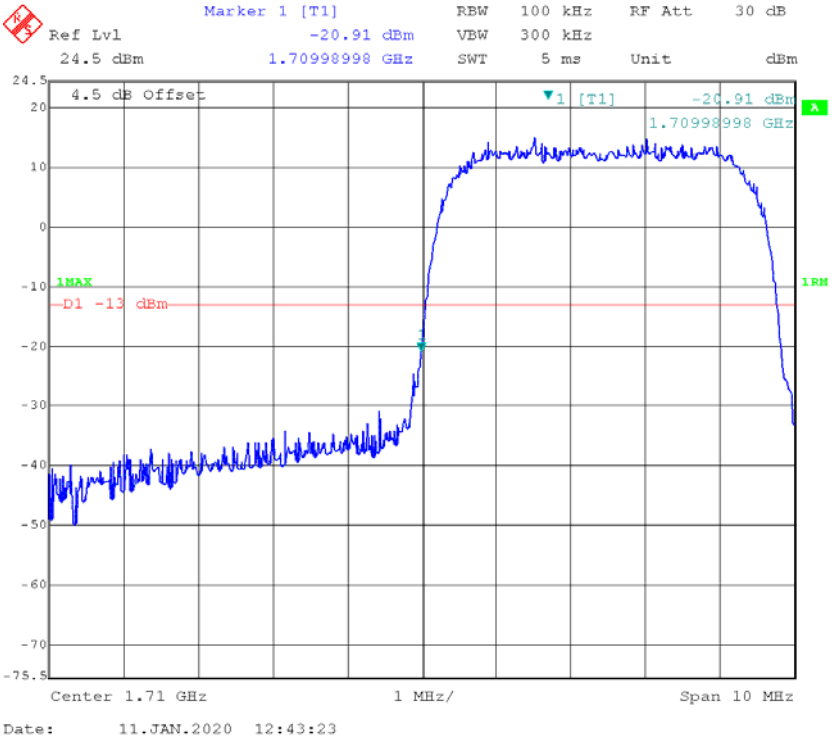
WCDMA Band 4 Rel 99, Left Band Edge



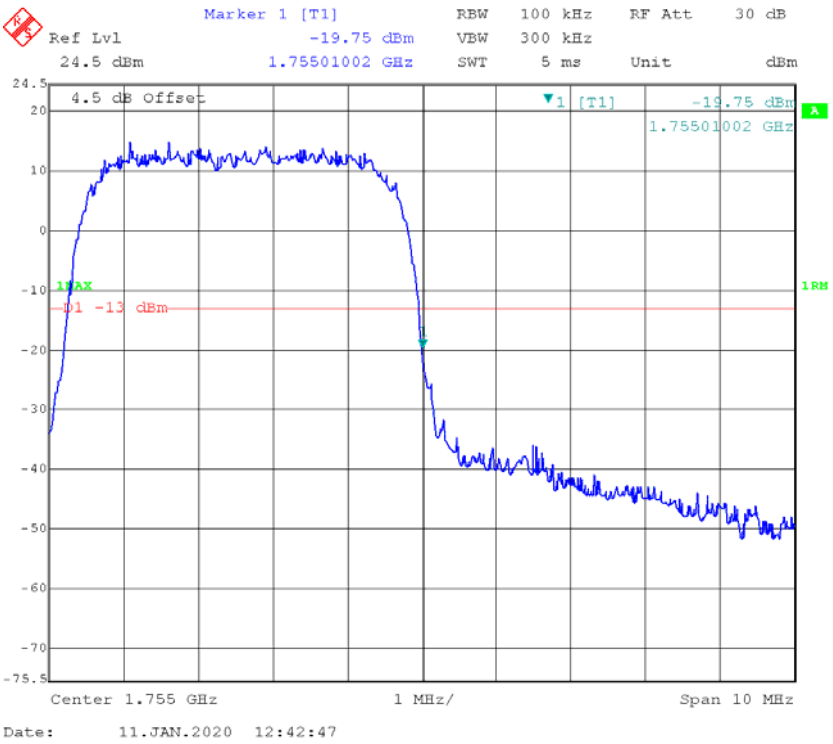
WCDMA Band 4 Rel 99, Right Band Edge



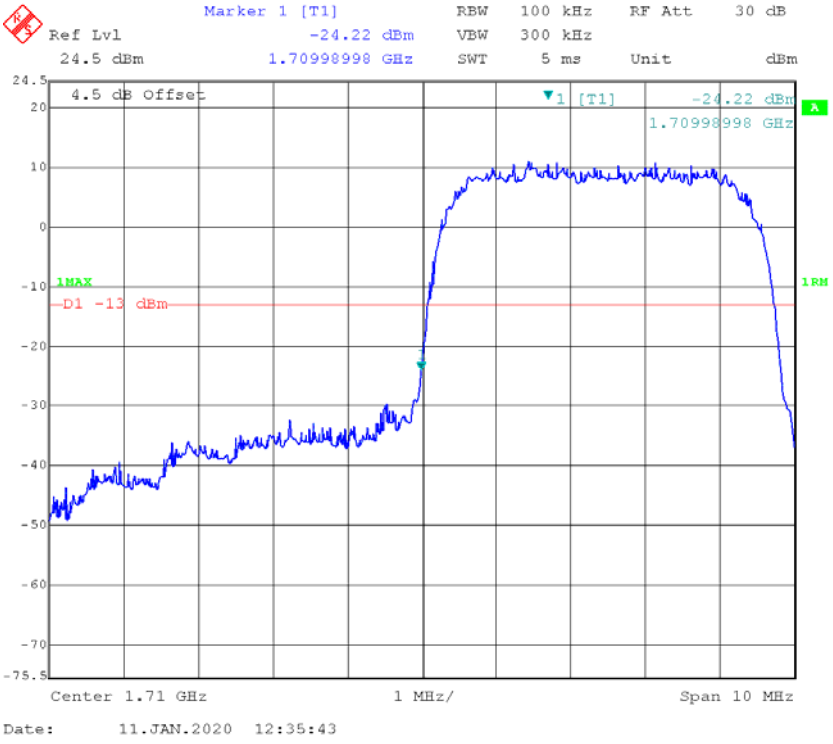
WCDMA Band 4 HSDPA, Left Band Edge



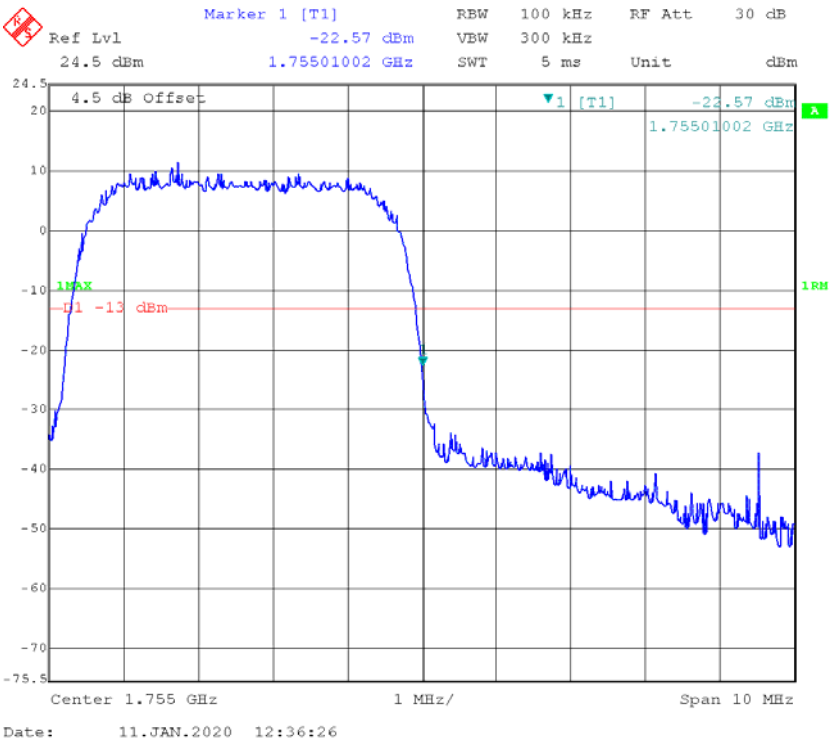
WCDMA Band 4 HSDPA, Right Band Edge



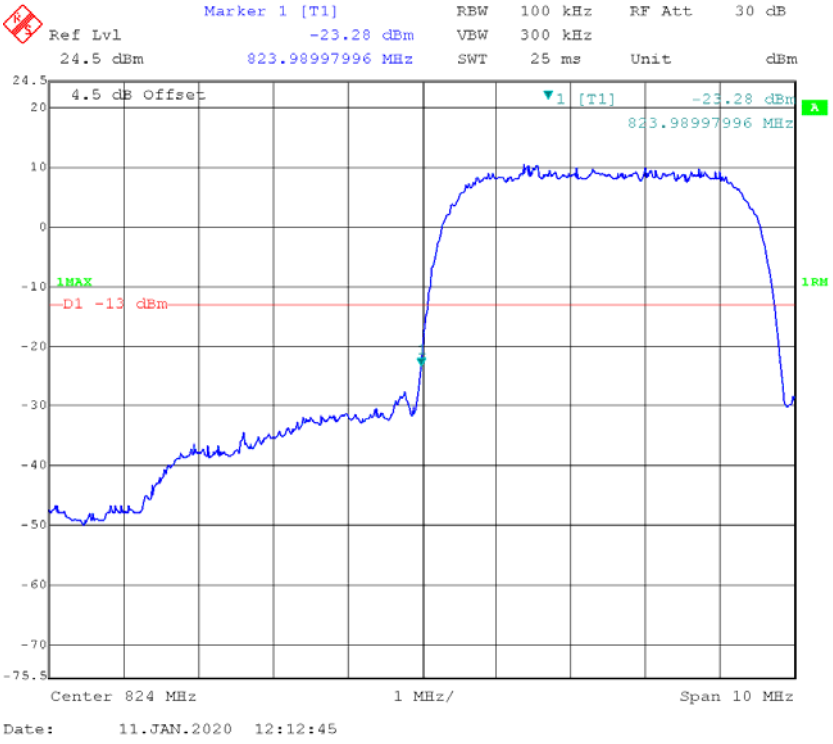
WCDMA Band 4 HSUPA, Left Band Edge



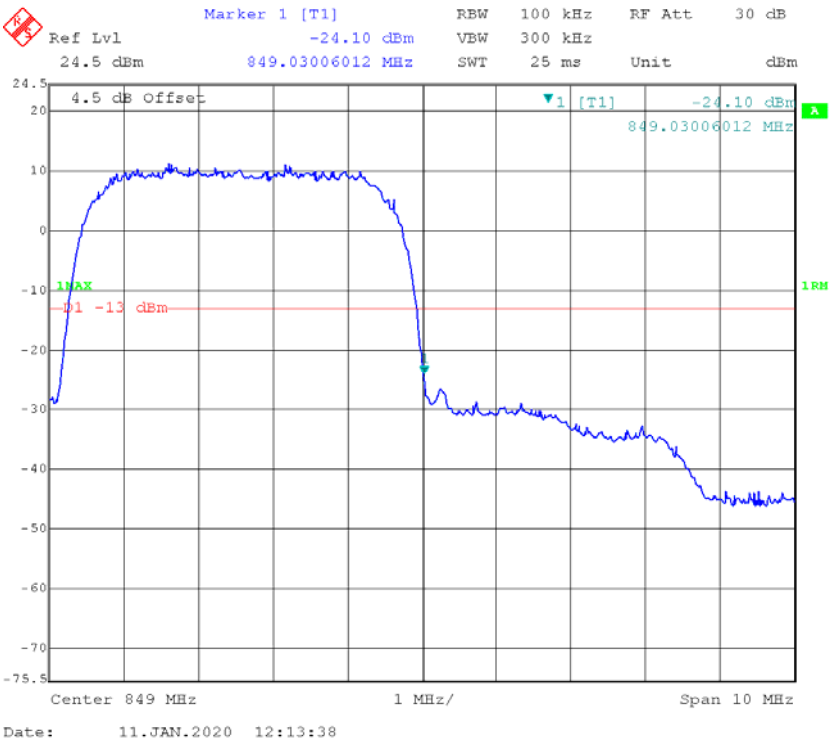
WCDMA Band 4 HSUPA, Right Band Edge



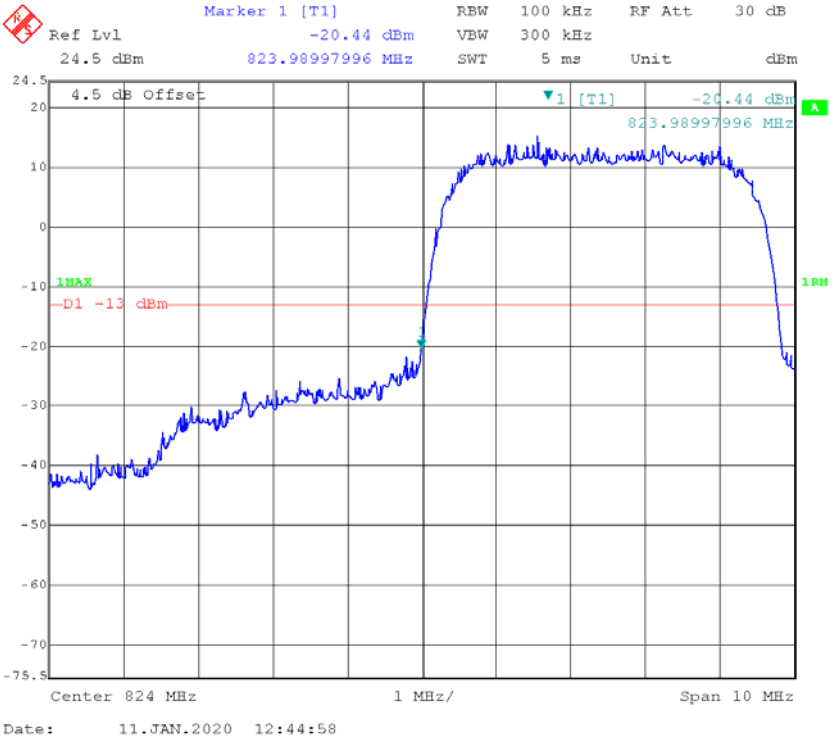
WCDMA Band 5 Rel 99, Left Band Edge



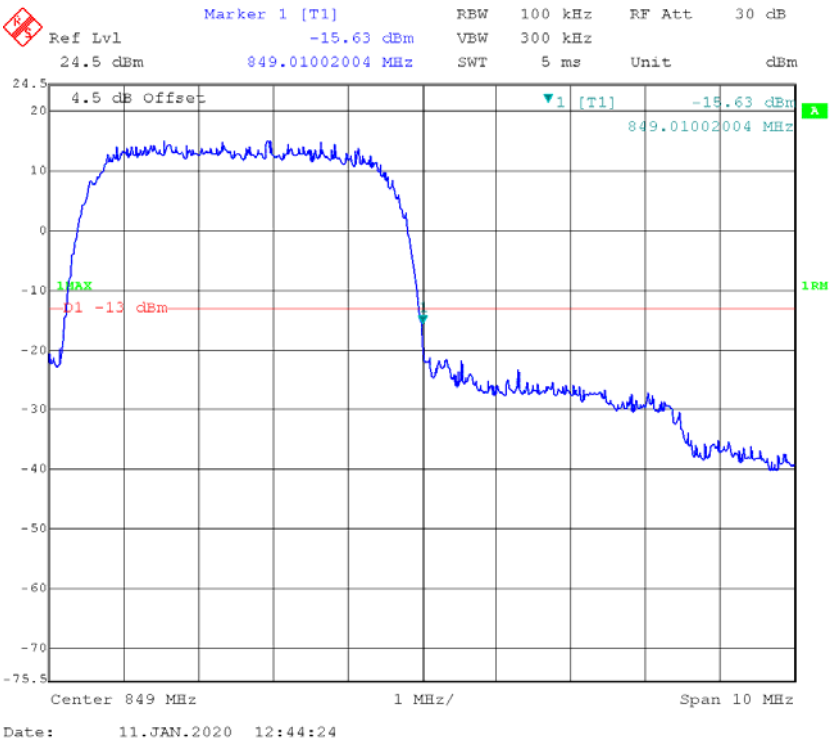
WCDMA Band 5 Rel 99, Right Band Edge



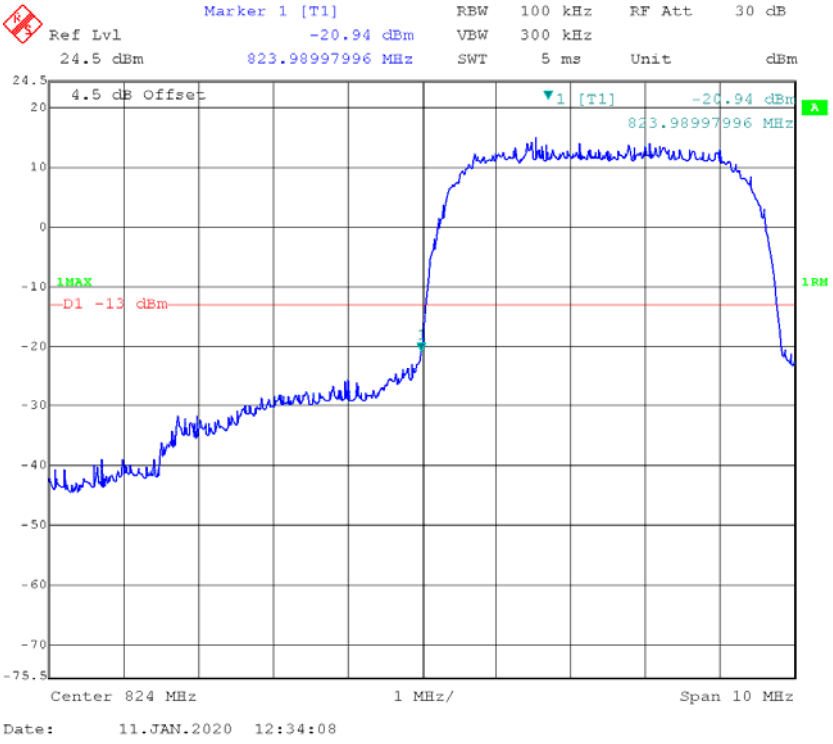
WCDMA Band 5 HSDPA, Left Band Edge



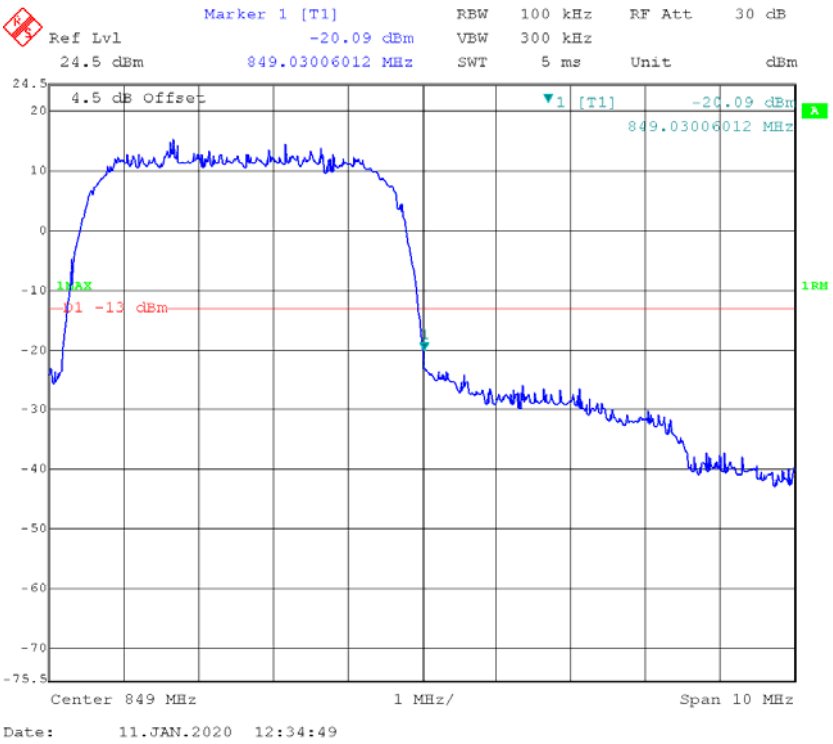
WCDMA Band 5 HSDPA, Right Band Edge



WCDMA Band 5 HSUPA, Left Band Edge

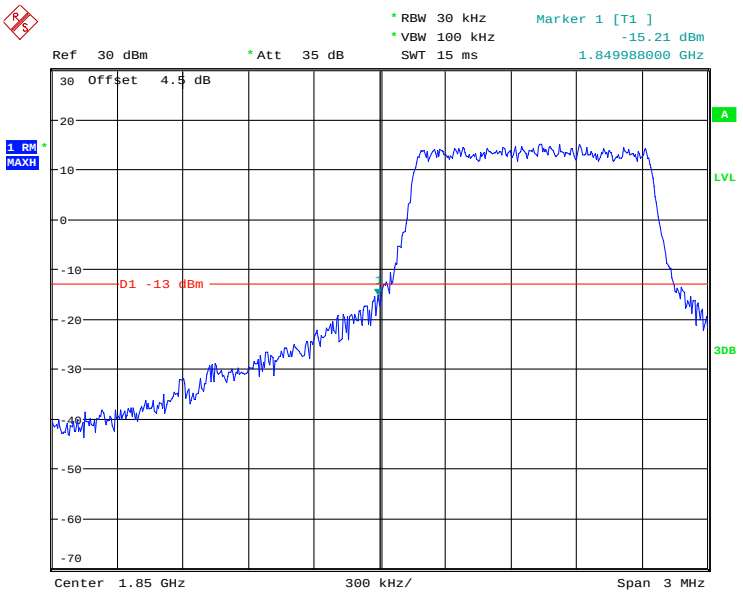


WCDMA Band 5 HSUPA, Right Band Edge



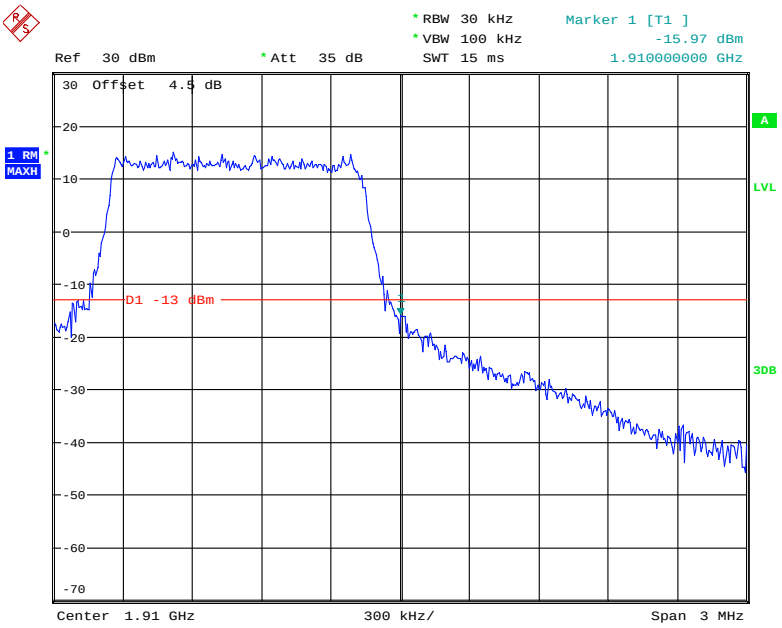
LTE Band 2

QPSK_1.4MHz_ 6 RB_ Left



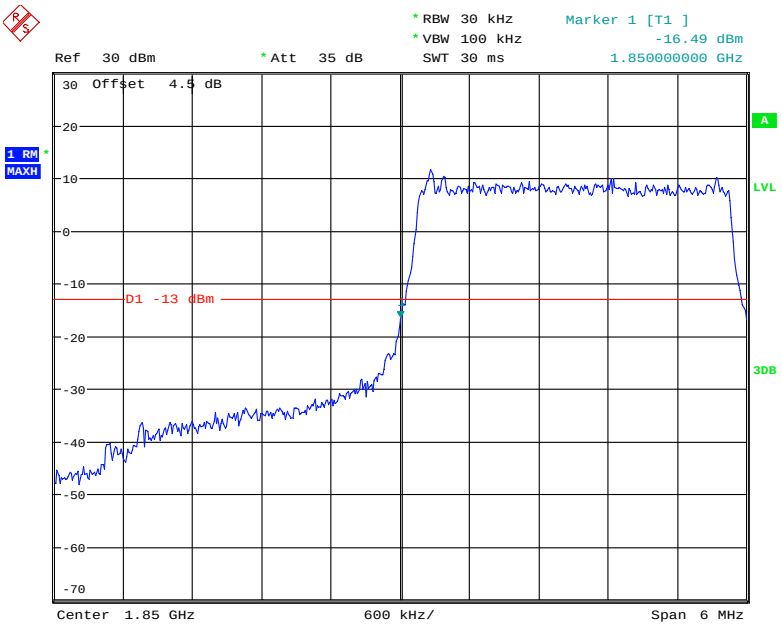
Date: 2.JAN.2020 22:32:49

QPSK_1.4MHz_ 6 RB_ Right



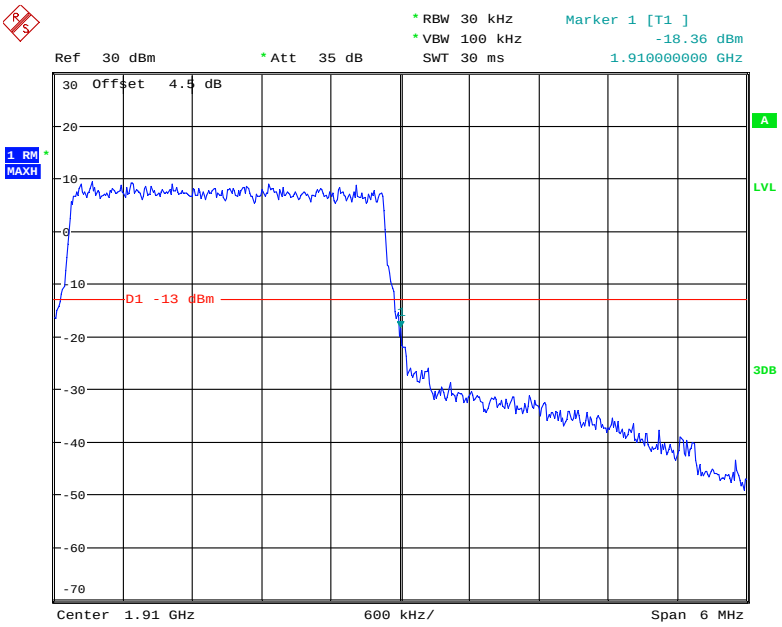
Date: 2.JAN.2020 22:33:33

QPSK_3MHz_ 15 RB_ Left



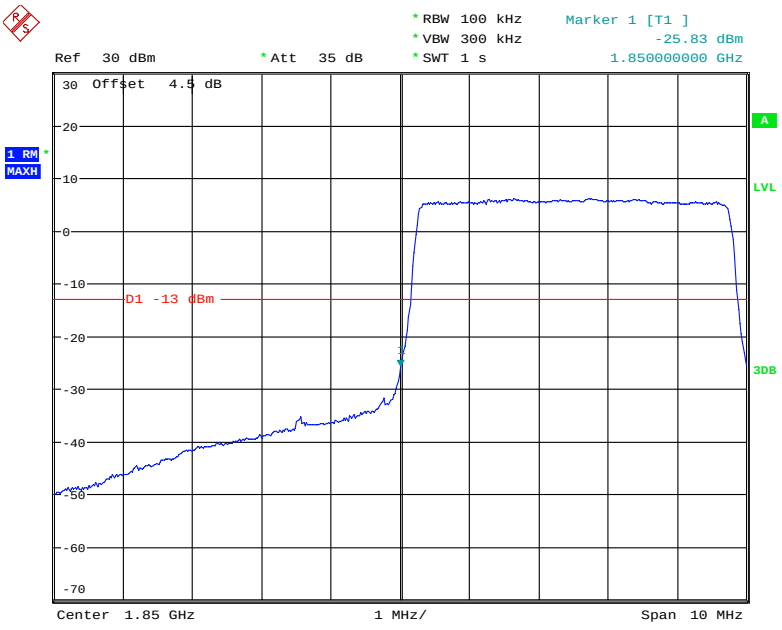
Date: 2.JAN.2020 22:34:15

QPSK_3MHz_ 15 RB_ Right



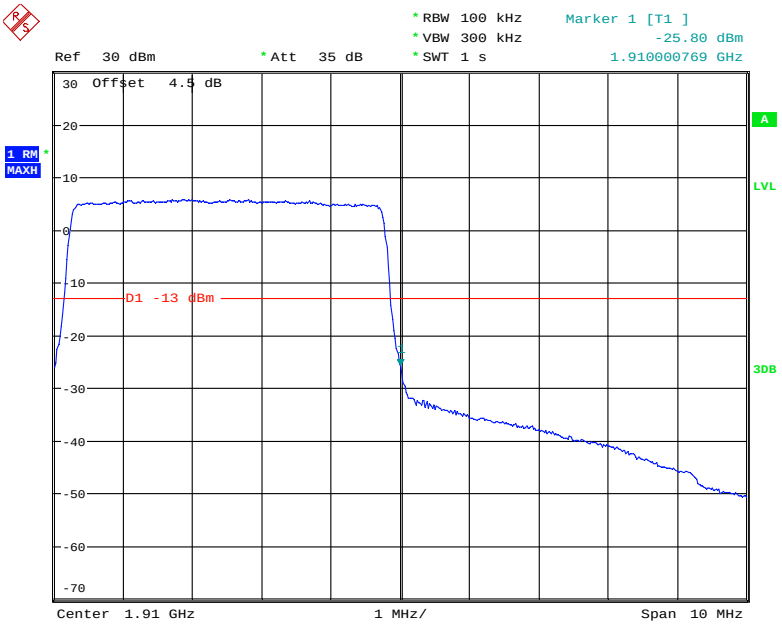
Date: 2.JAN.2020 22:34:53

QPSK_5MHz_ 25 RB_ Left



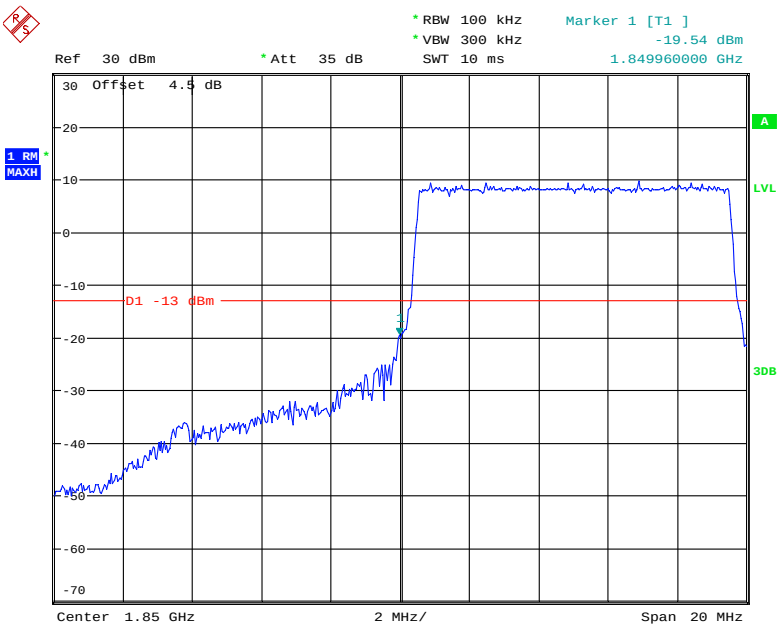
Date: 4.JAN.2020 00:32:30

QPSK_5MHz_ 25 RB_ Right



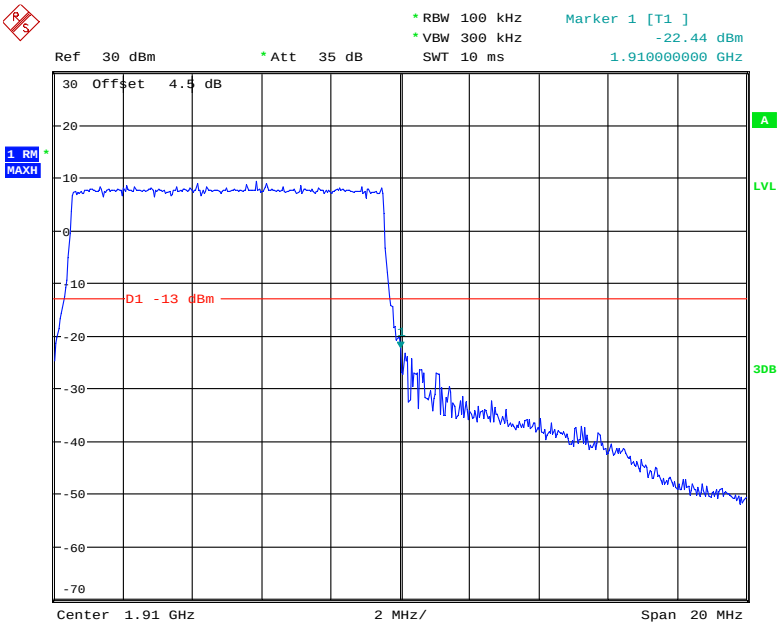
Date: 4.JAN.2020 00:34:55

QPSK_10MHz_ 50 RB_ Left



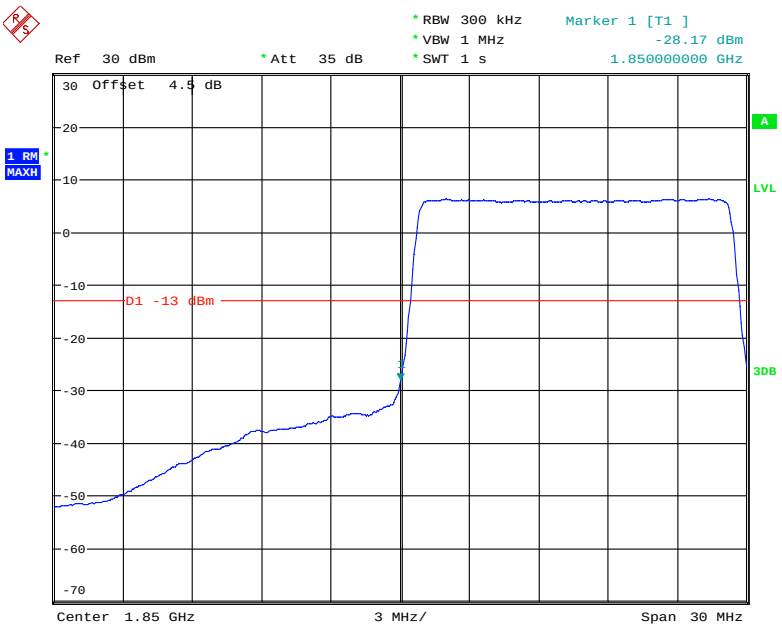
Date: 2.JAN.2020 22:37:23

QPSK_10MHz_ 50 RB_ Right



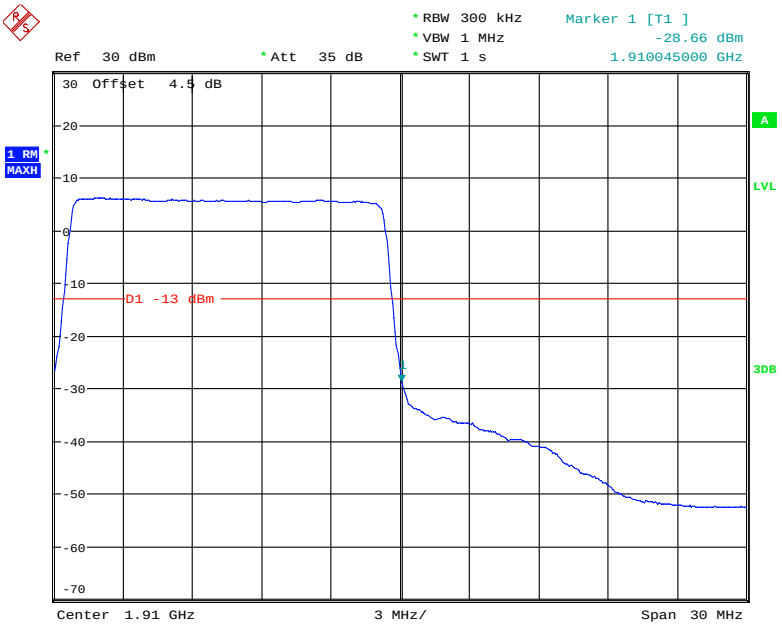
Date: 2.JAN.2020 22:38:05

QPSK_15MHz_ 75 RB_ Left



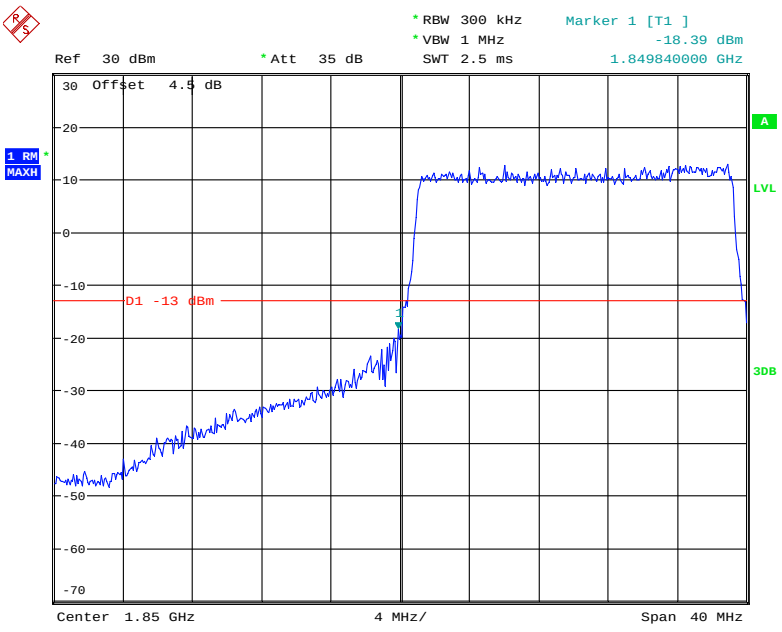
Date: 4.JAN.2020 00:38:14

QPSK_15MHz_ 75 RB_ Right



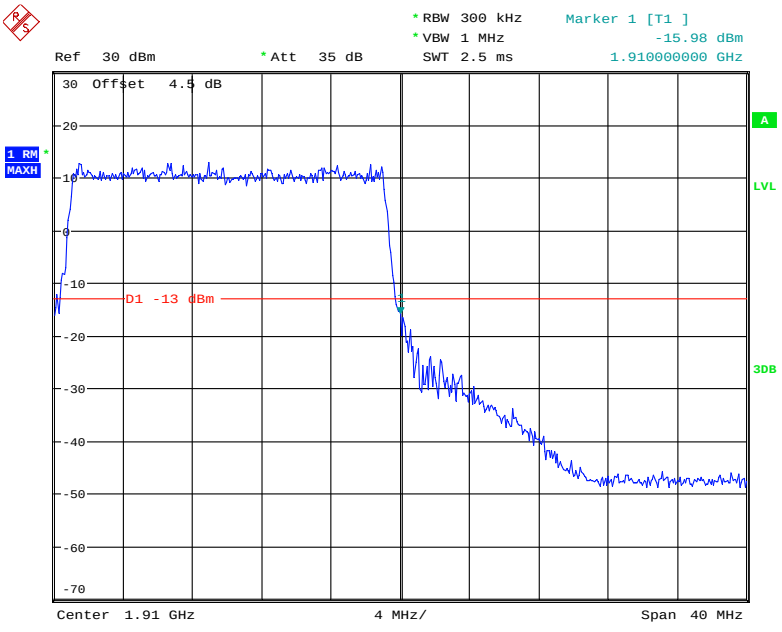
Date: 4.JAN.2020 00:39:31

QPSK_20MHz_ FULL RB_ Left



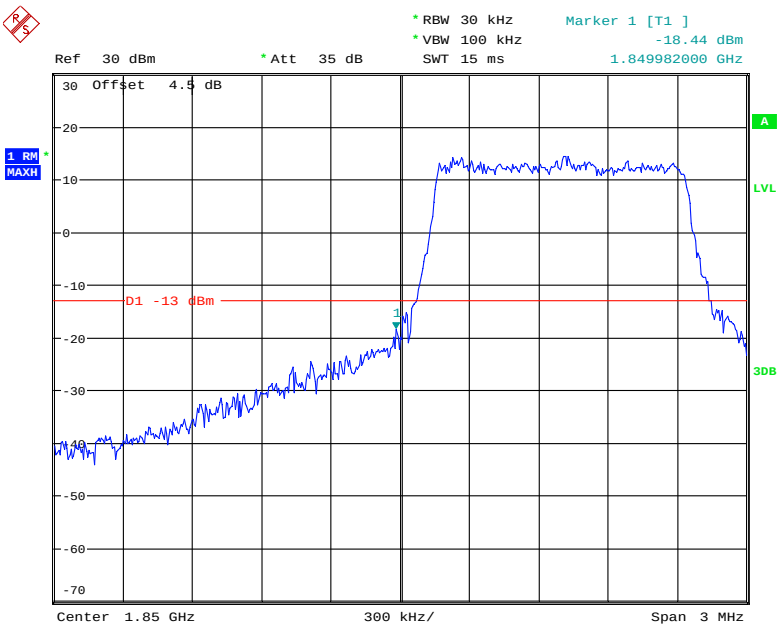
Date: 2.JAN.2020 22:40:32

QPSK_20MHz_ FULL RB_ Right



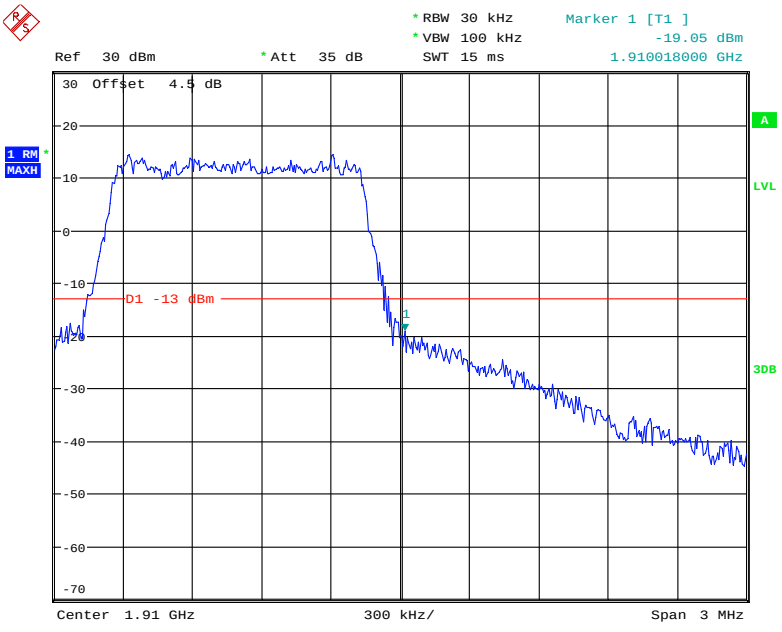
Date: 2.JAN.2020 22:41:21

16QAM_1.4MHz_ 6 RB_ Left



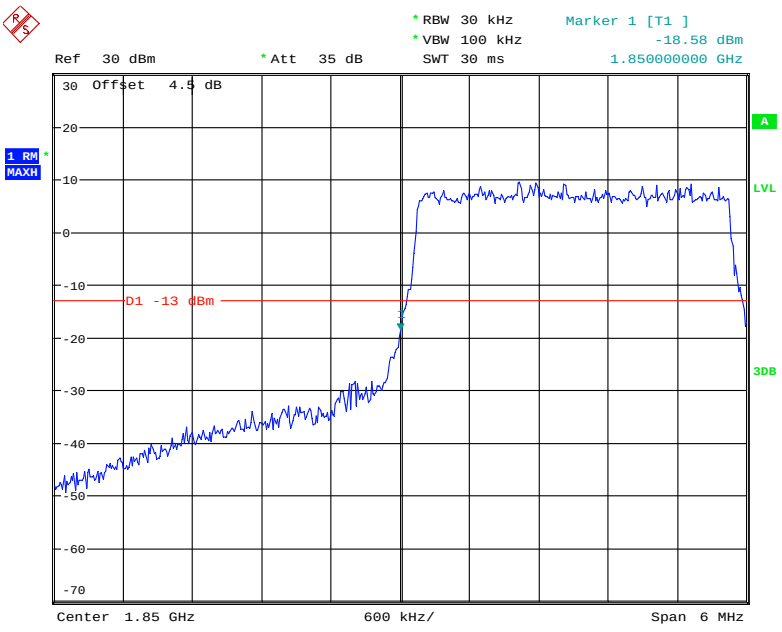
Date: 2.JAN.2020 22:33:09

16QAM_1.4MHz_ 6 RB_ Right



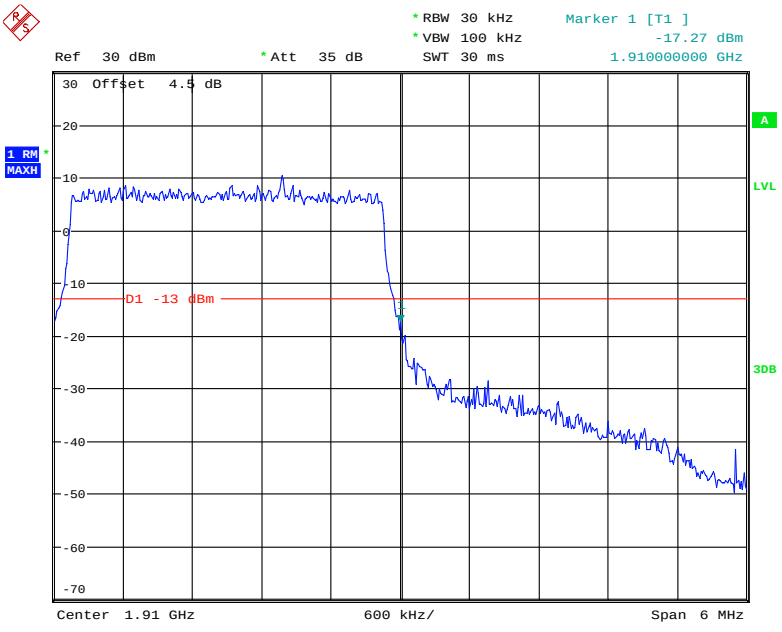
Date: 2.JAN.2020 22:33:53

16QAM_3MHz_ 15 RB_ Left



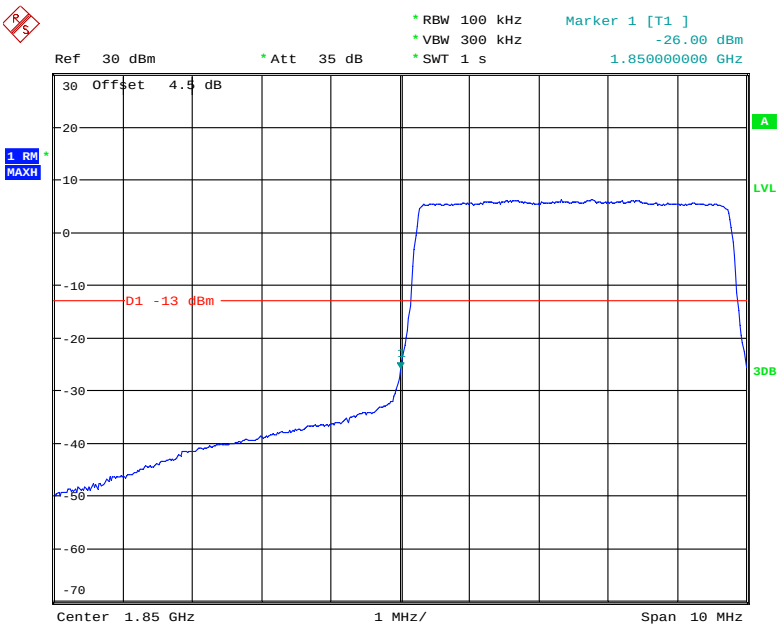
Date: 2.JAN.2020 22:34:32

16QAM_3MHz_ 15 RB_ Right



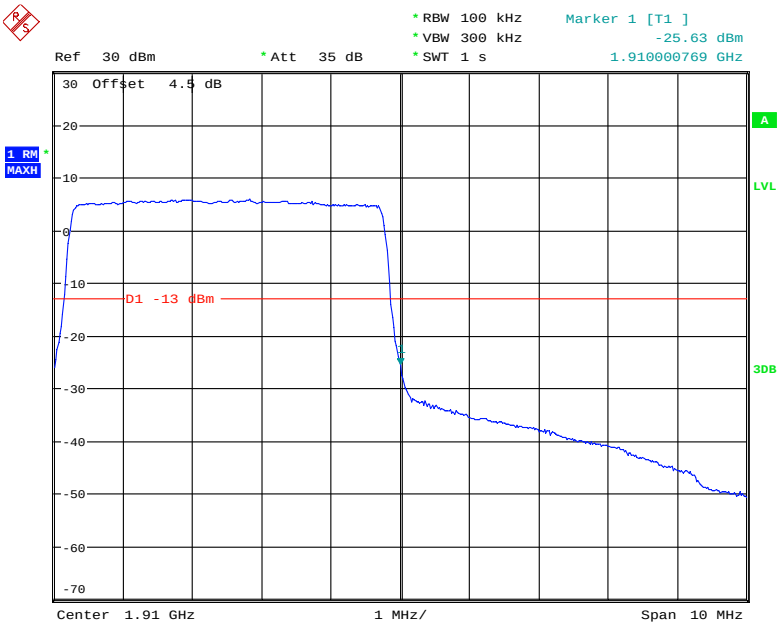
Date: 2.JAN.2020 22:35:13

16QAM_5MHz_ 25 RB_ Left



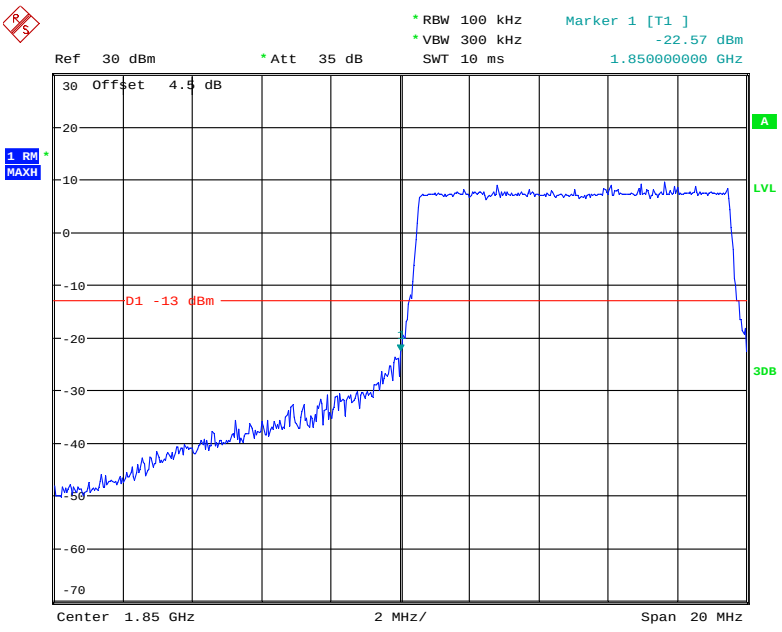
Date: 4.JAN.2020 00:32:56

16QAM_5MHz_ 25 RB_ Right



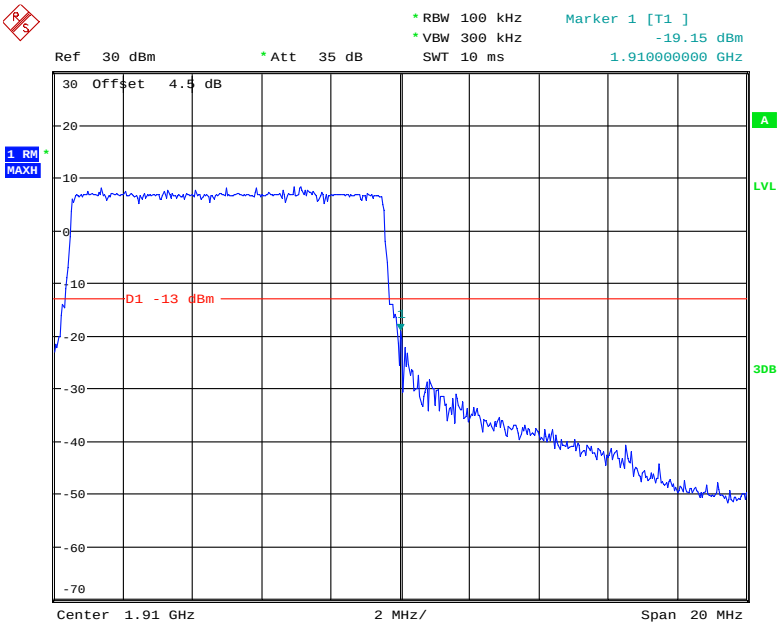
Date: 4.JAN.2020 00:35:28

16QAM_10MHz_ 50 RB_ Left



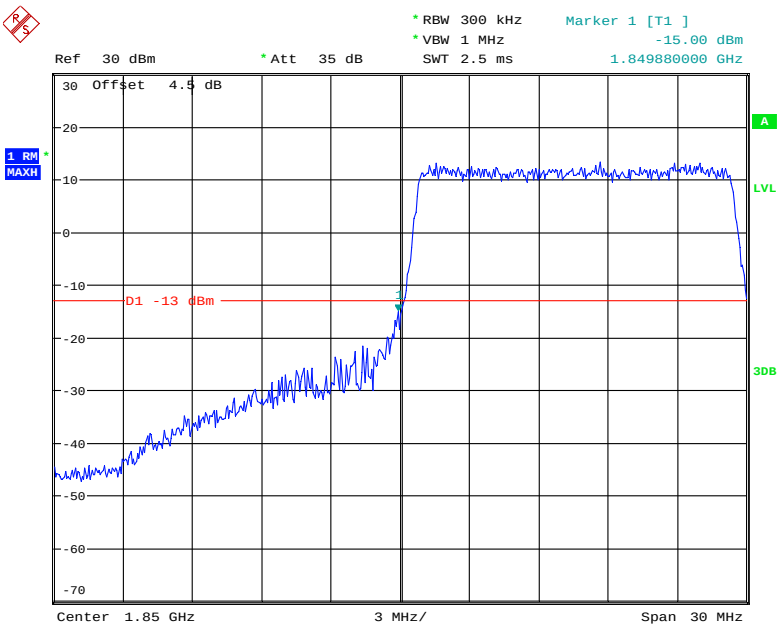
Date: 2.JAN.2020 22:37:44

16QAM_10MHz_ 50 RB_ Right



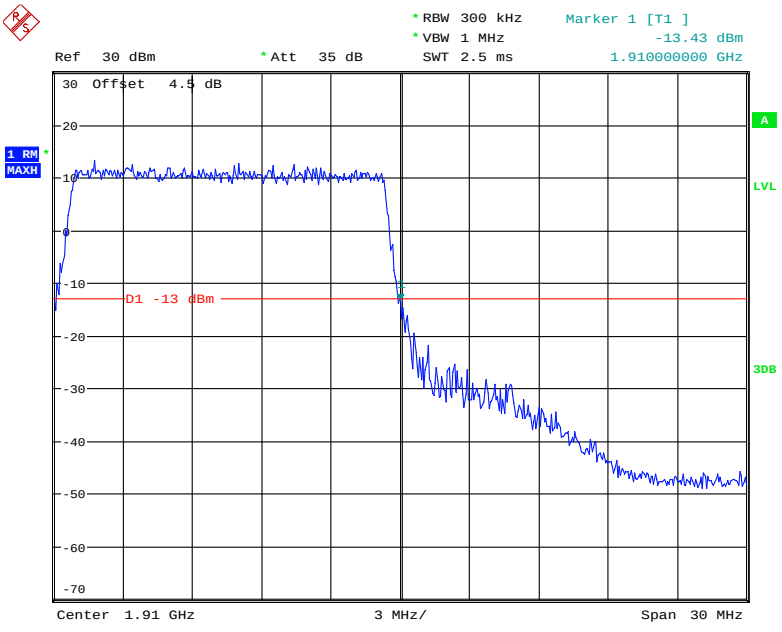
Date: 2.JAN.2020 22:38:26

16QAM_15MHz_ 75 RB_ Left



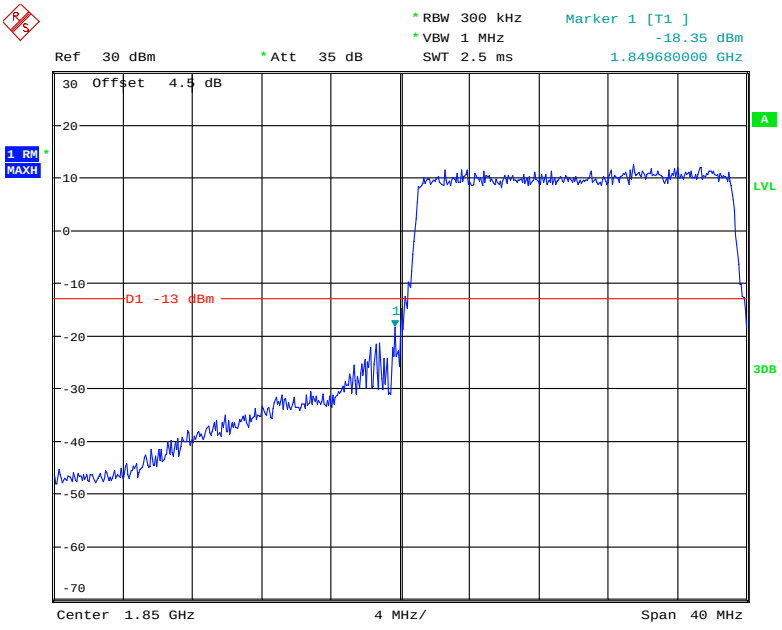
Date: 2.JAN.2020 22:39:21

16QAM_15MHz_ 75 RB_ Right



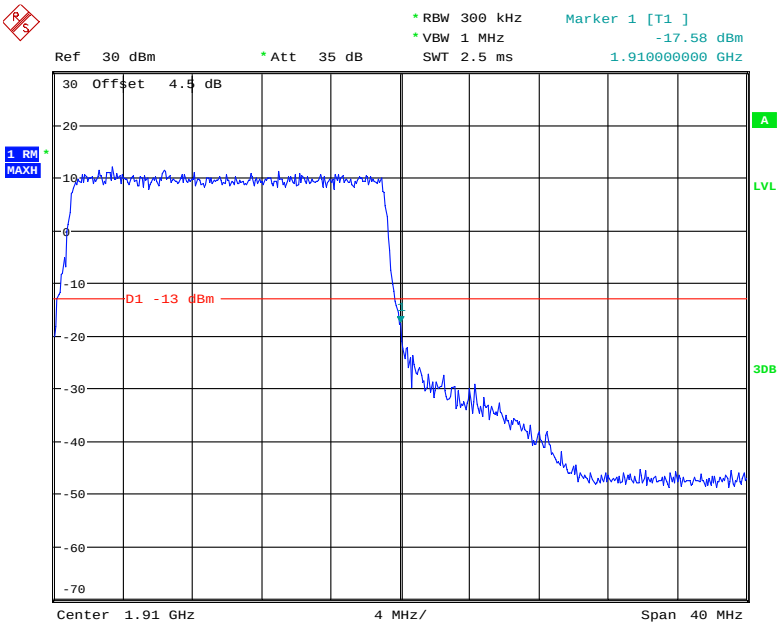
Date: 2.JAN.2020 22:40:04

16QAM_20MHz_ FULL RB_ Left



Date: 2.JAN.2020 22:40:56

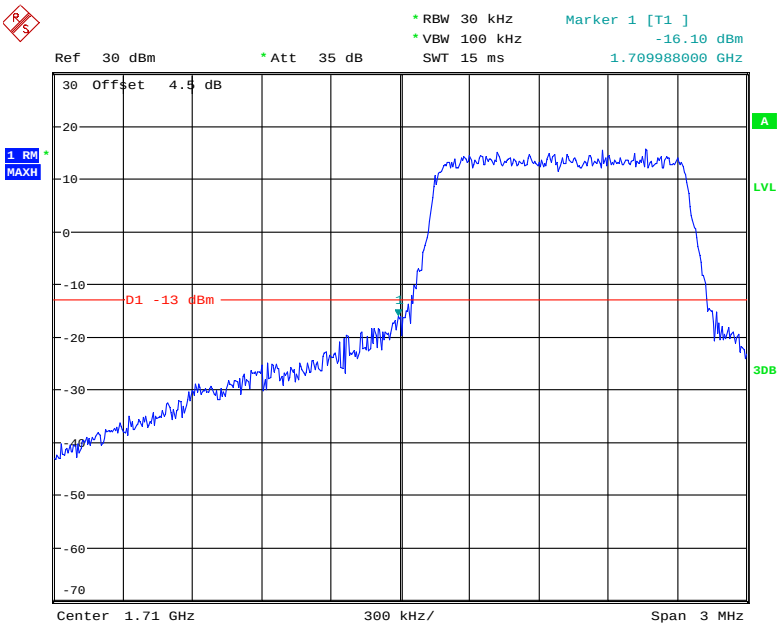
16QAM_20MHz_ FULL RB_ Right



Date: 2.JAN.2020 22:41:49

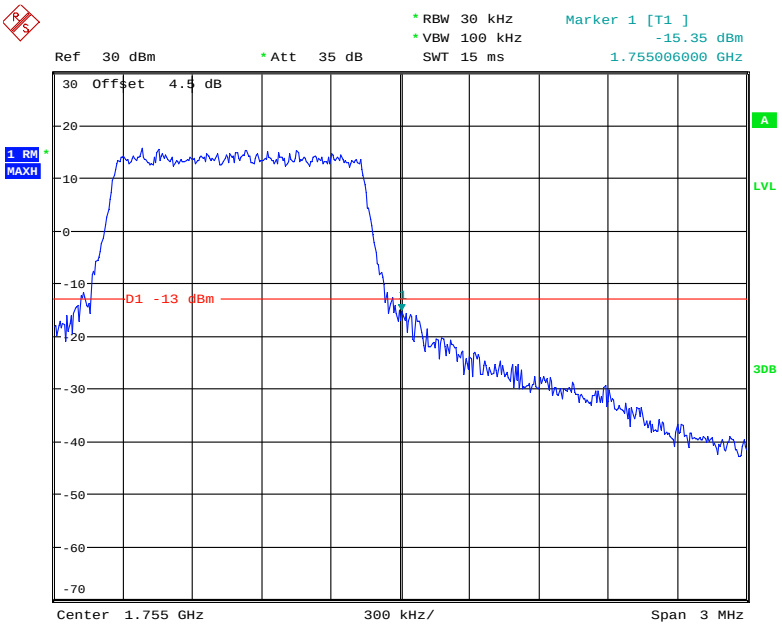
LTE Band 4

QPSK_1.4MHz_ 6 RB_ Left



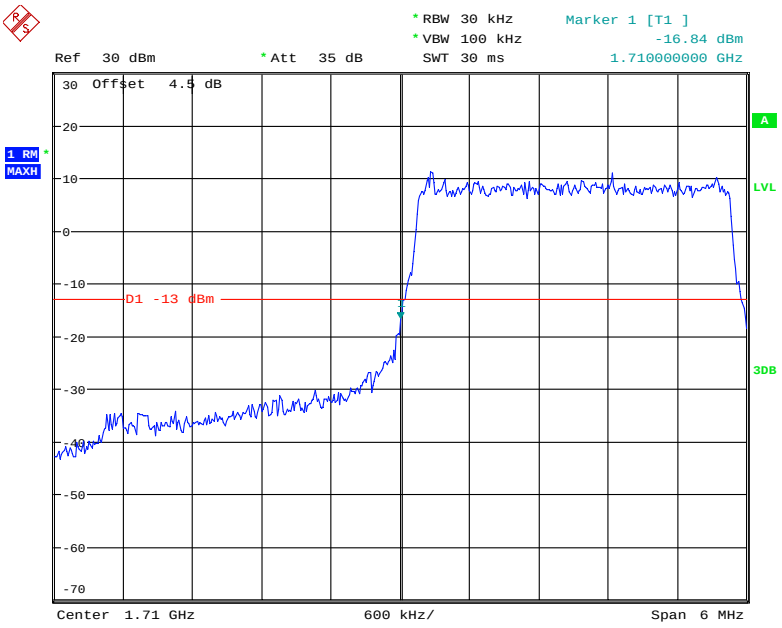
Date: 2.JAN.2020 22:42:15

QPSK_1.4MHz_ 6 RB_ Right



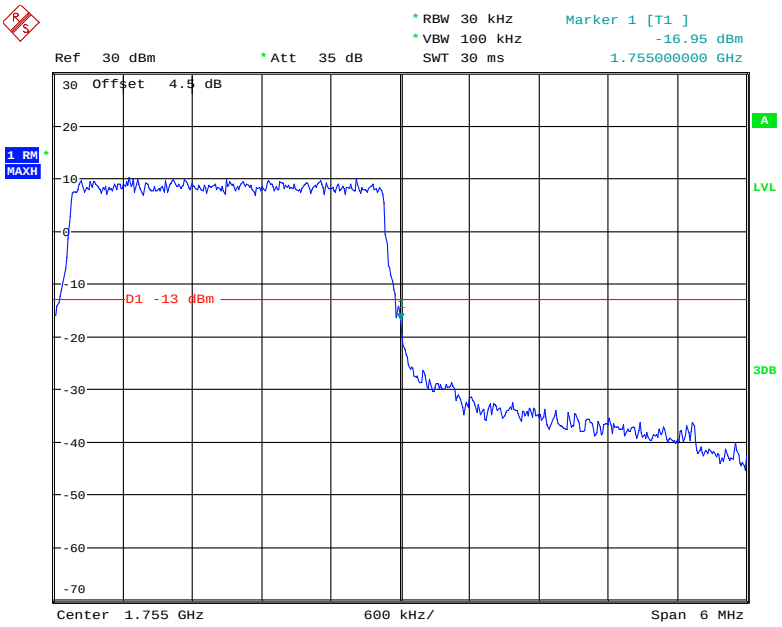
Date: 2.JAN.2020 22:42:58

QPSK_3MHz_ 15 RB_ Left



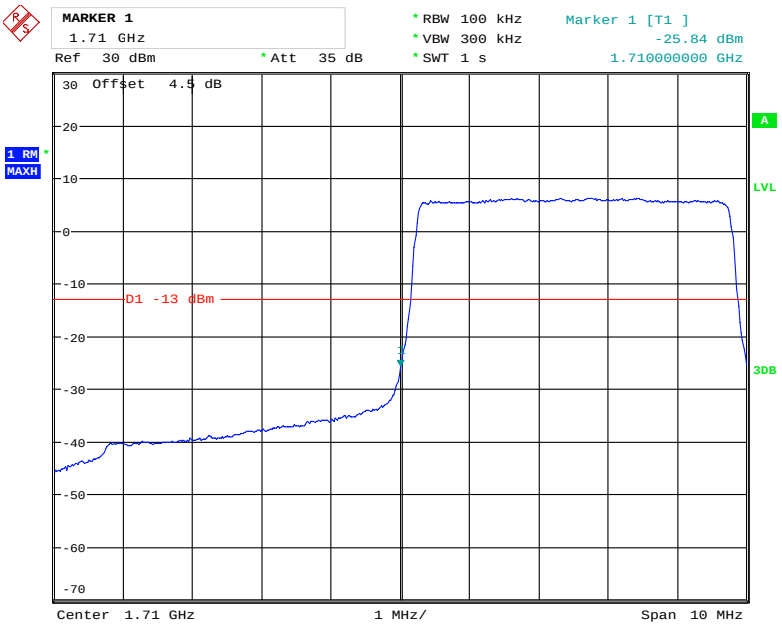
Date: 2.JAN.2020 22:43:41

QPSK_3MHz_ 15 RB_ Right



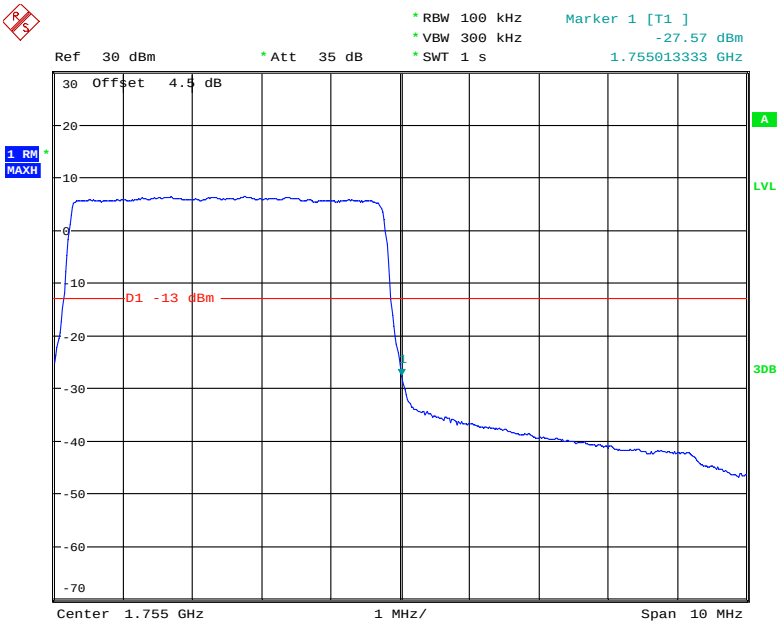
Date: 2.JAN.2020 22:44:19

QPSK_5MHz_ 25 RB_ Left



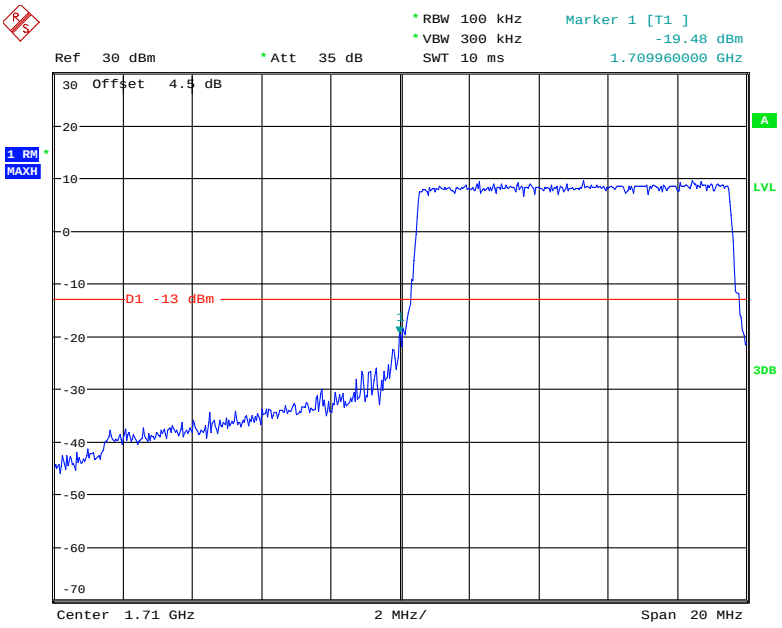
Date: 4.JAN.2020 00:41:55

QPSK_5MHz_ 25 RB_ Right



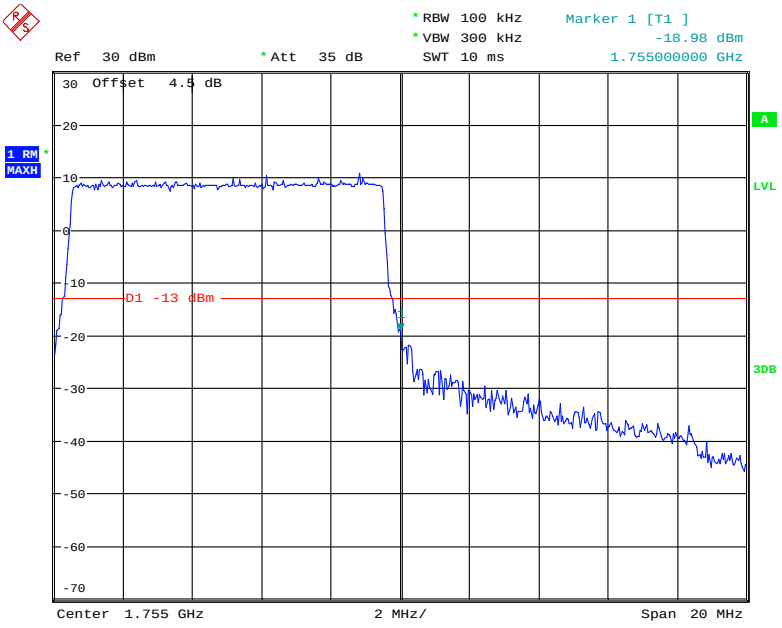
Date: 4.JAN.2020 00:46:12

QPSK_10MHz_ 50 RB_ Left



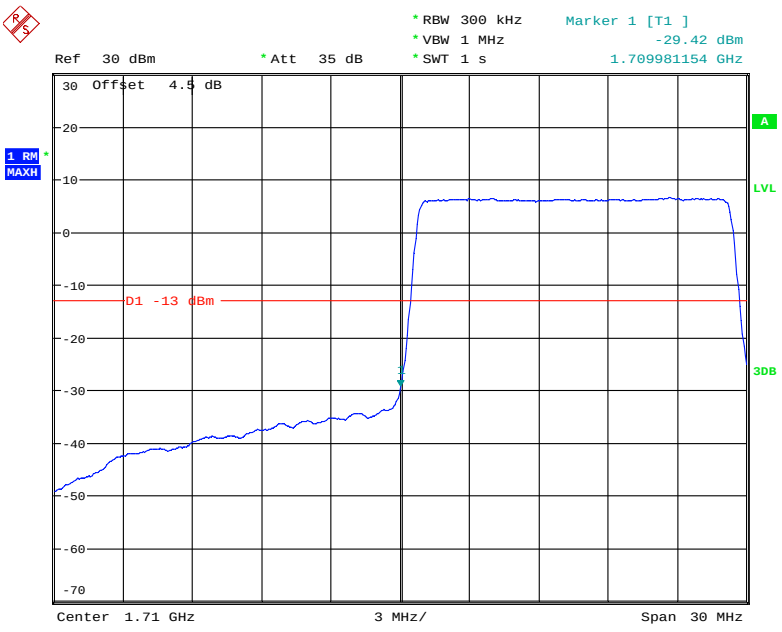
Date: 2.JAN.2020 22:46:40

QPSK_10MHz_ 50 RB_ Right



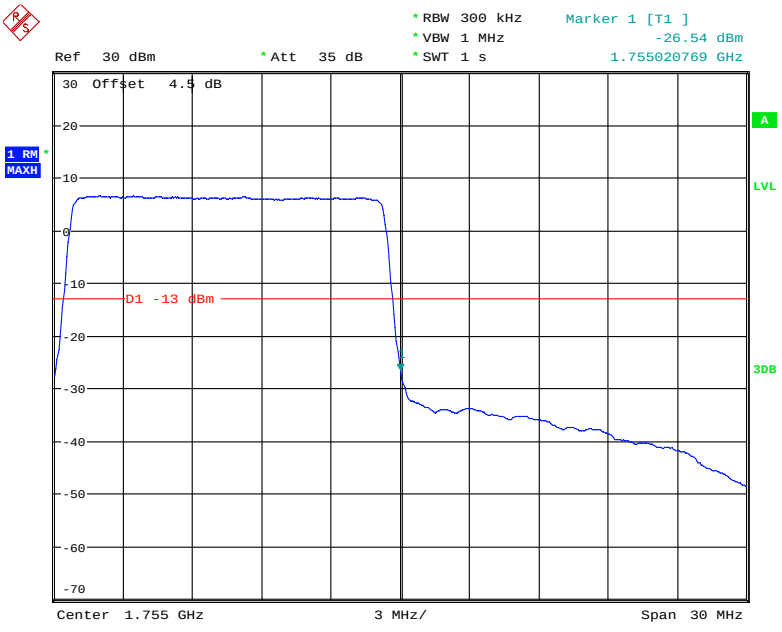
Date: 2.JAN.2020 22:47:23

QPSK_15MHz_ 75 RB_ Left



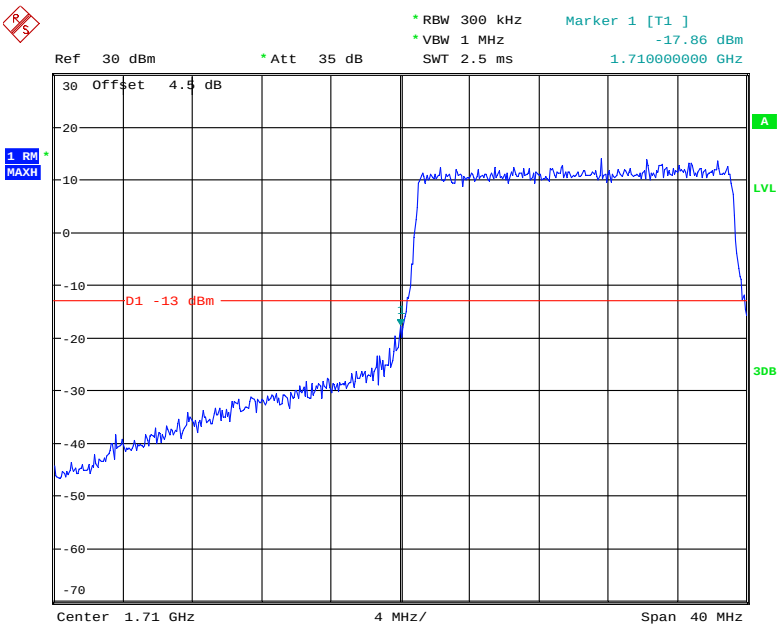
Date: 4.JAN.2020 00:48:33

QPSK_15MHz_ 75 RB_ Right



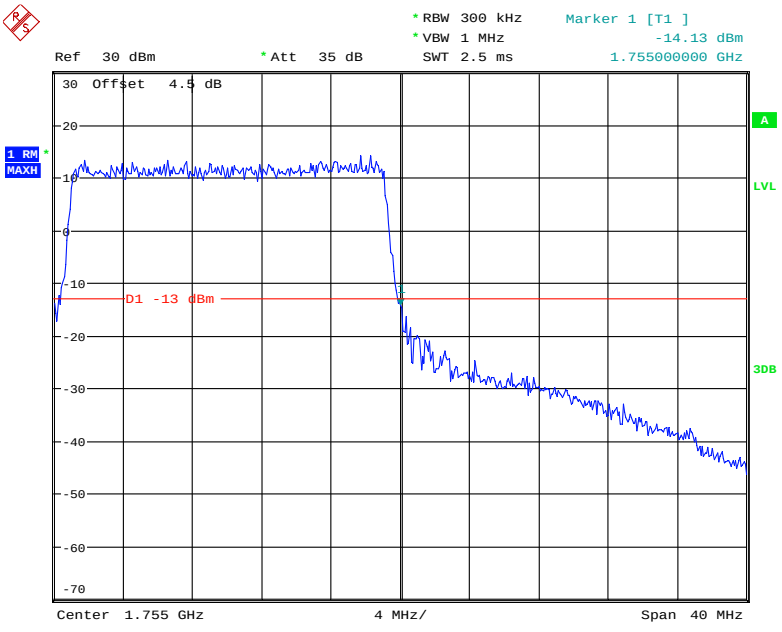
Date: 4.JAN.2020 00:50:14

QPSK_20MHz_ FULL RB_ Left



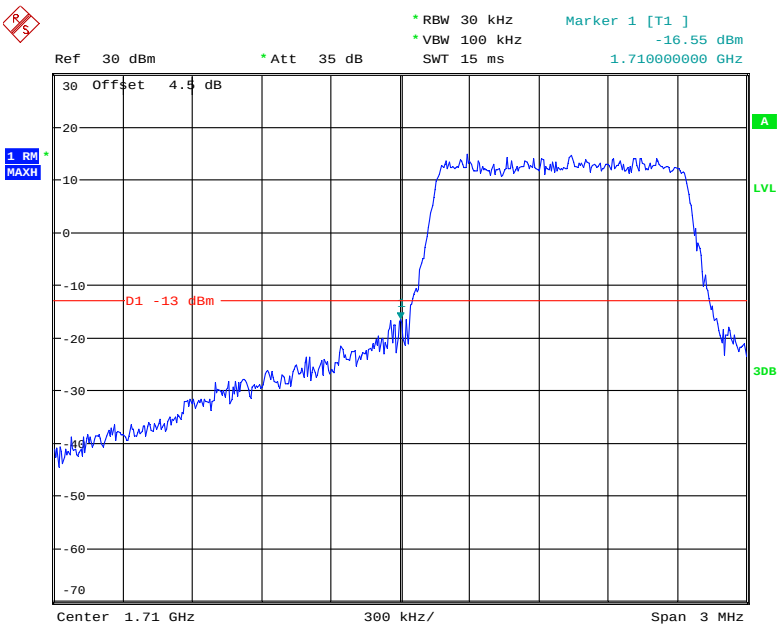
Date: 2.JAN.2020 22:49:53

QPSK_20MHz_ FULL RB_ Right



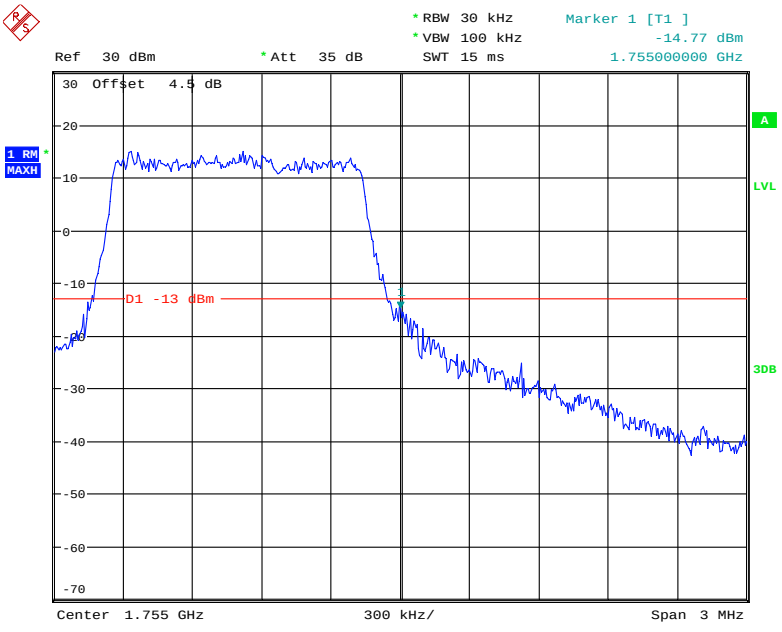
Date: 2.JAN.2020 22:50:42

16QAM_1.4MHz_ 6 RB_ Left



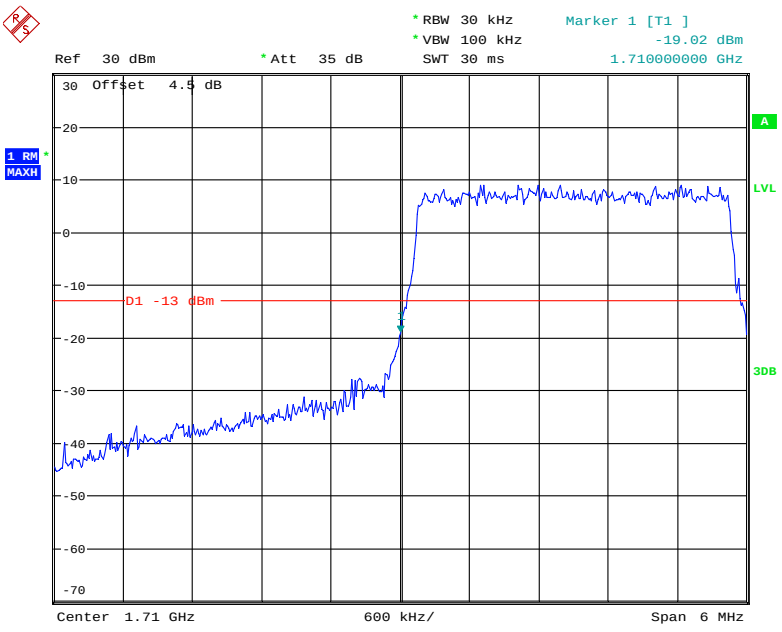
Date: 2.JAN.2020 22:42:38

16QAM_1.4MHz_ 6 RB_ Right



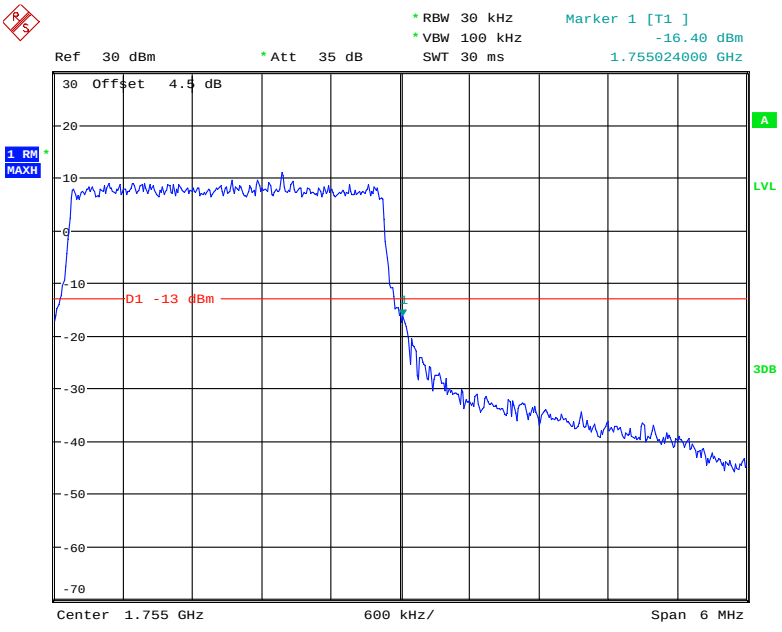
Date: 2.JAN.2020 22:43:18

16QAM_3MHz_ 15 RB_ Left



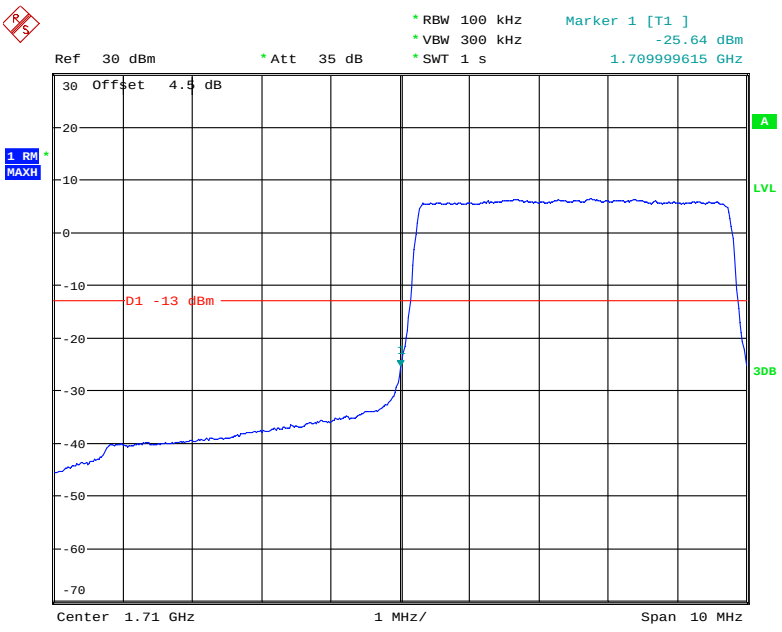
Date: 2.JAN.2020 22:43:58

16QAM_3MHz_ 15 RB_ Right



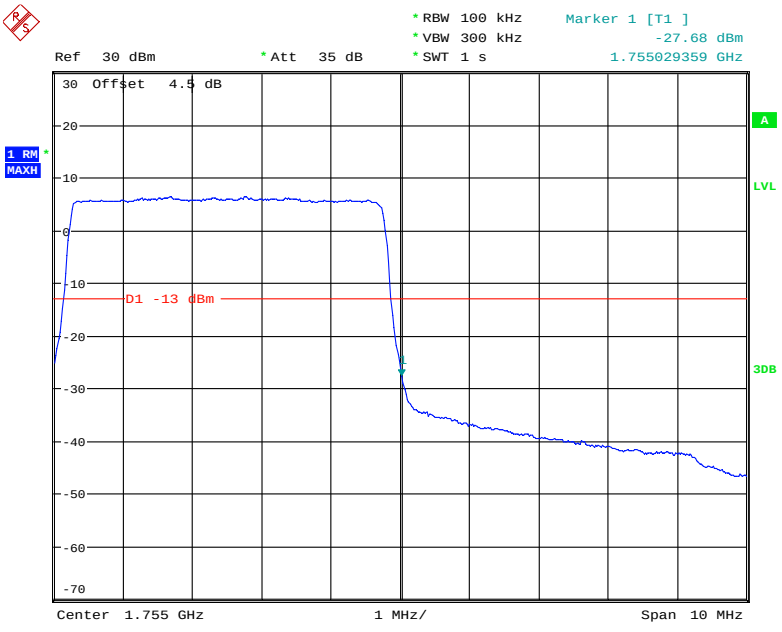
Date: 2.JAN.2020 22:44:35

16QAM_5MHz_ 25 RB_ Left



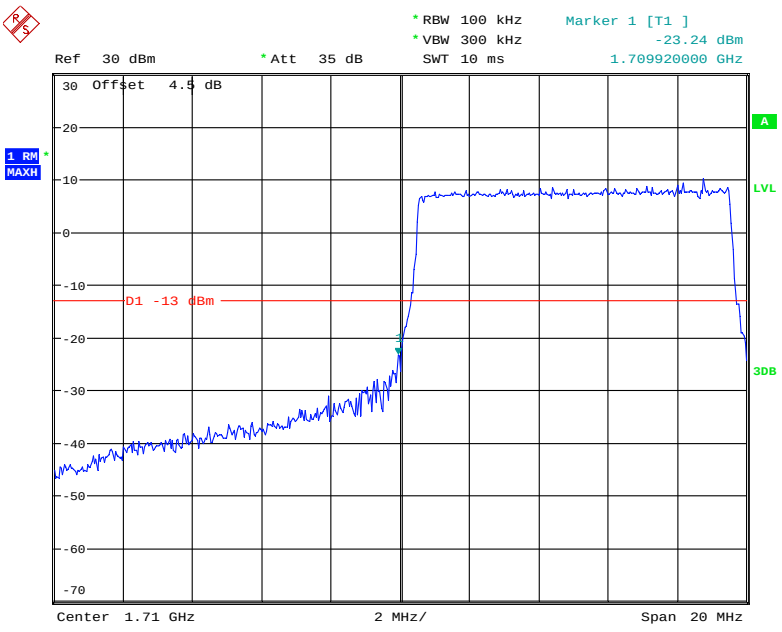
Date: 4.JAN.2020 00:42:34

16QAM_5MHz_ 25 RB_ Right



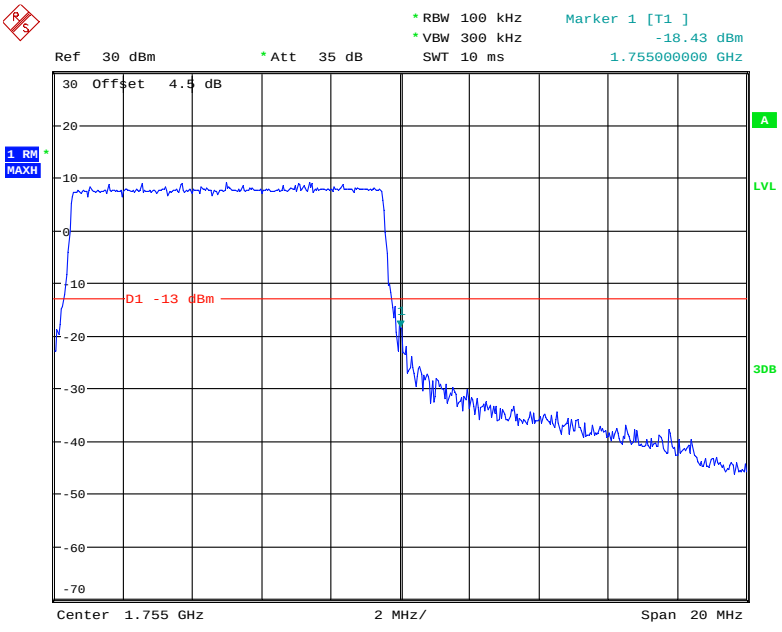
Date: 4.JAN.2020 00:46:46

16QAM_10MHz_ 50 RB_ Left



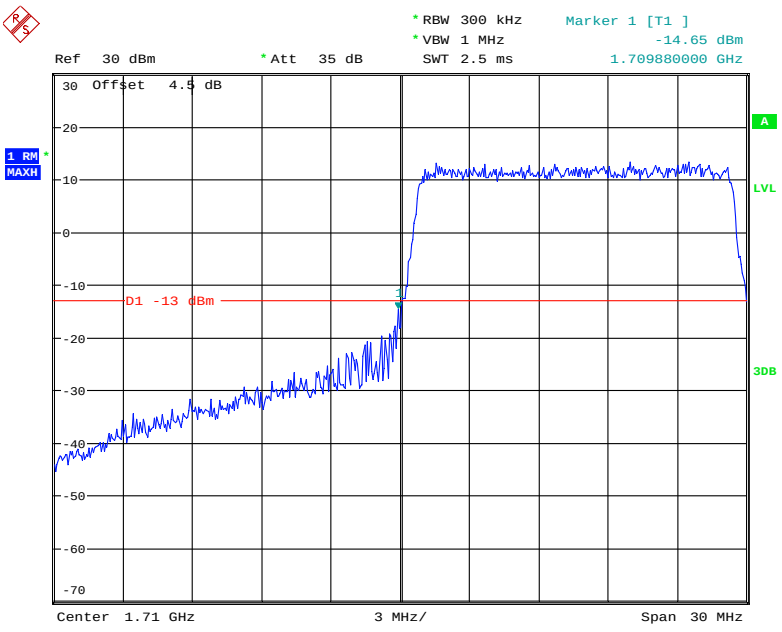
Date: 2.JAN.2020 22:47:01

16QAM_10MHz_ 50 RB_ Right



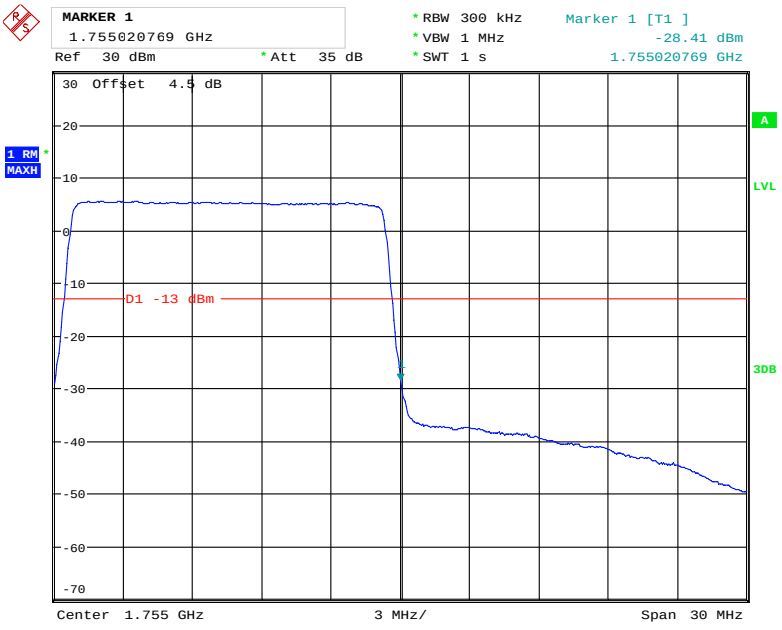
Date: 2.JAN.2020 22:47:44

16QAM_15MHz_ 75 RB_ Left



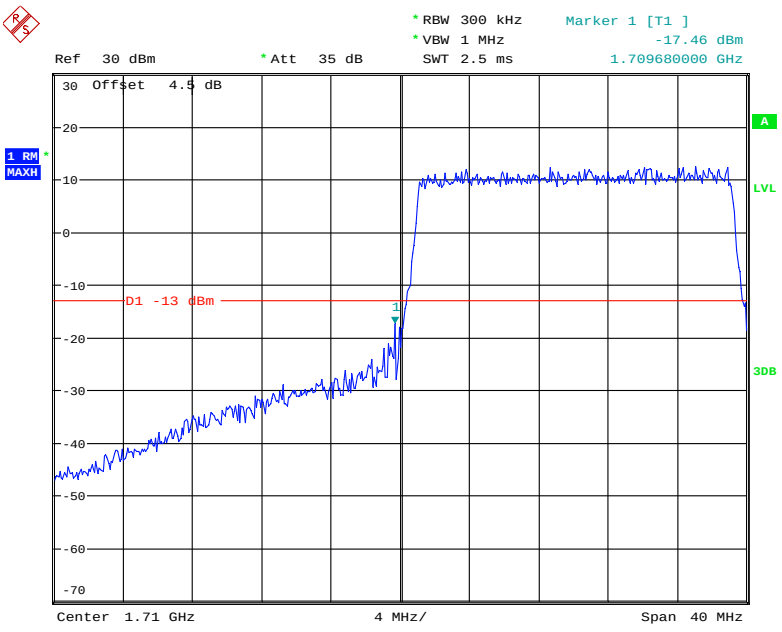
Date: 2.JAN.2020 22:48:36

16QAM_15MHz_ 75 RB_ Right



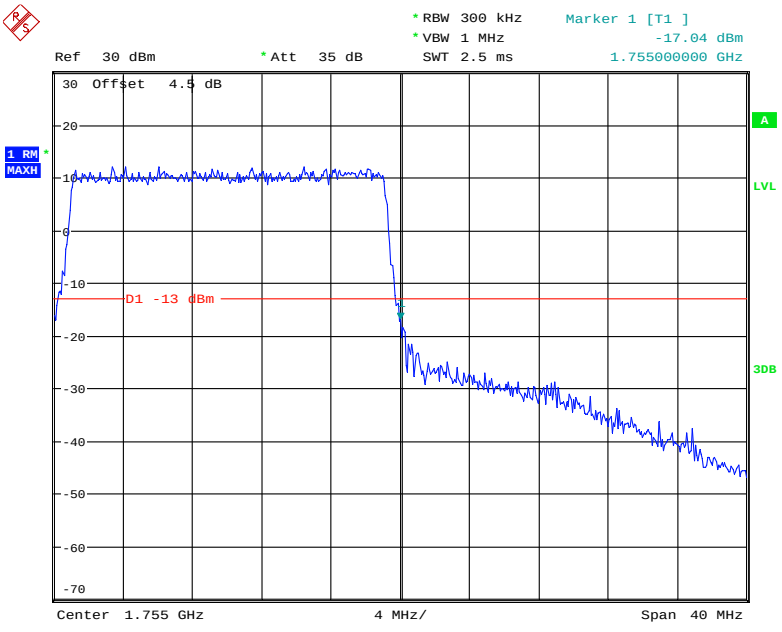
Date: 4.JAN.2020 00:51:41

16QAM_20MHz_ FULL RB_ Left



Date: 2.JAN.2020 22:50:17

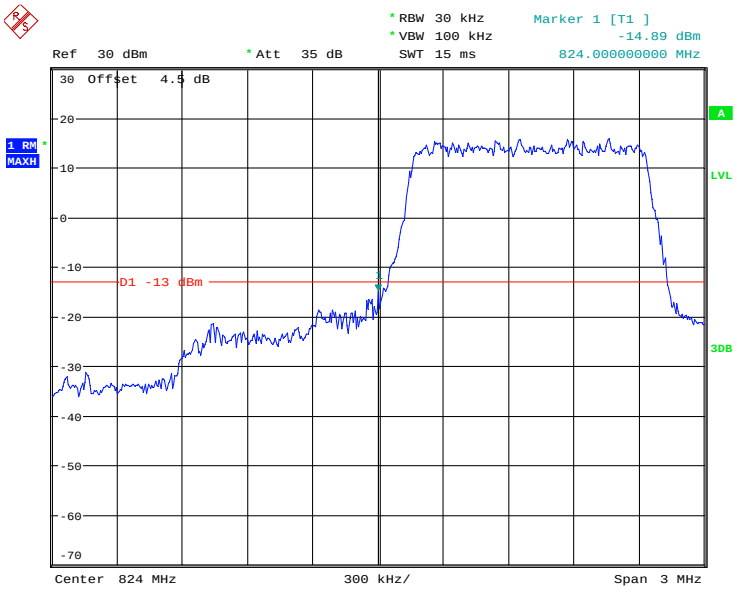
16QAM_20MHz_ FULL RB_ Right



Date: 2.JAN.2020 22:51:07

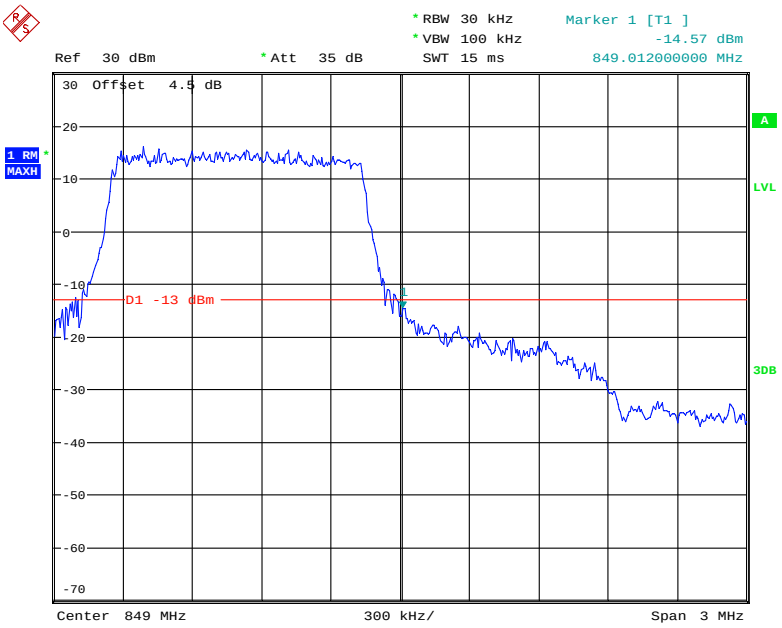
LTE Band 5

QPSK_1.4MHz_ 6 RB_ Left



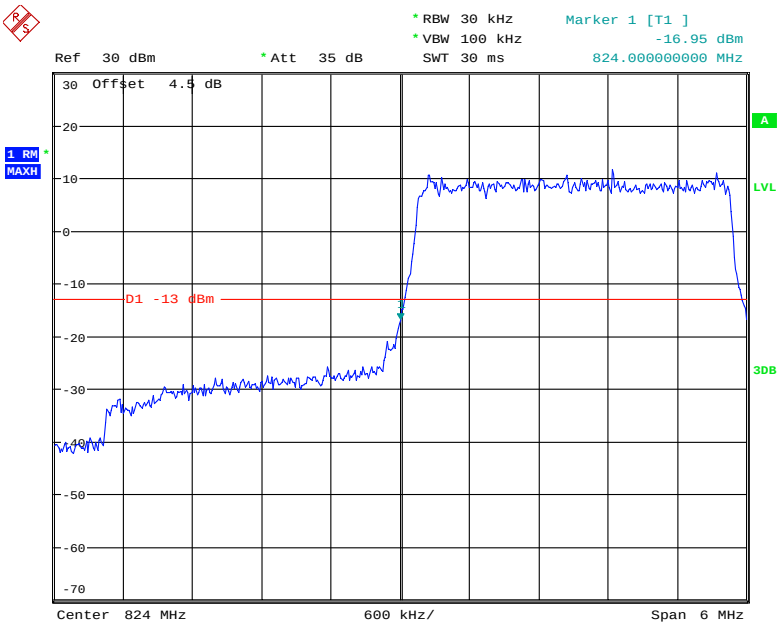
Date: 2.JAN.2020 22:51:30

QPSK_1.4MHz_ 6 RB_ Right



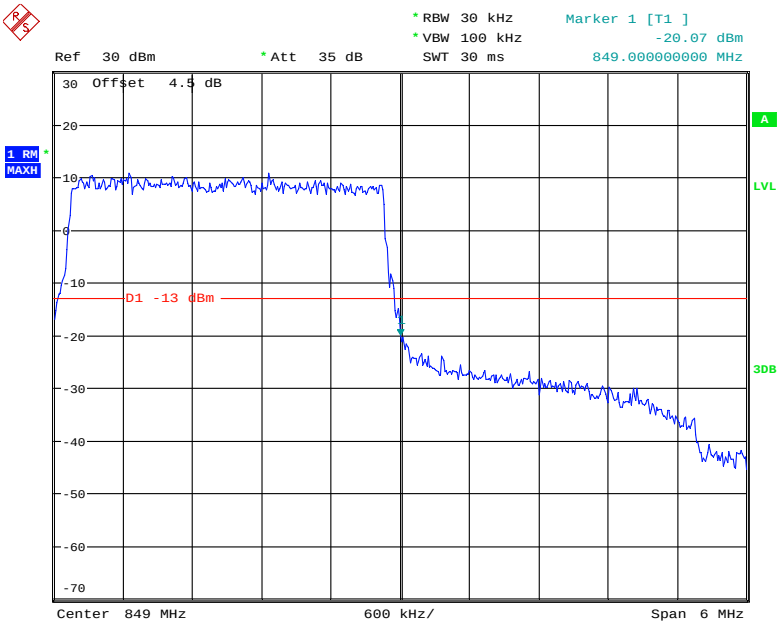
Date: 2.JAN.2020 22:52:10

QPSK_3MHz_ 15 RB_ Left



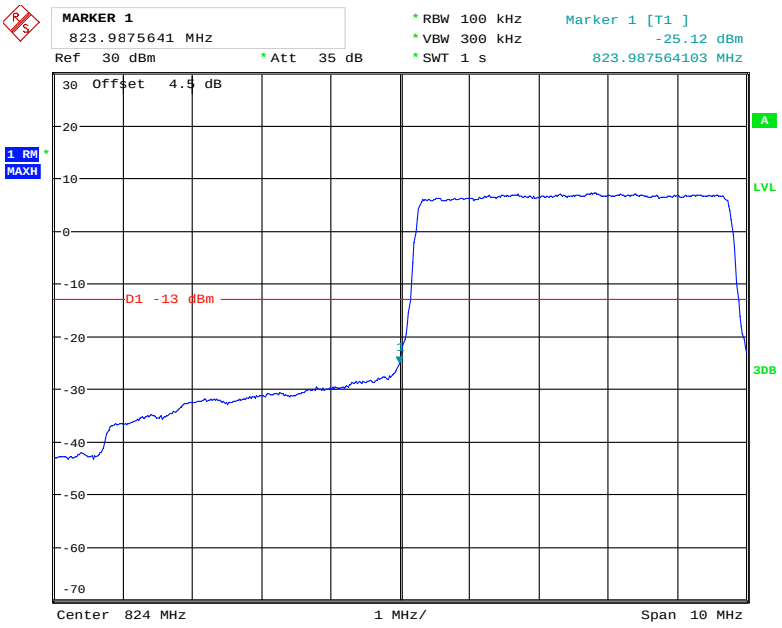
Date: 2.JAN.2020 22:52:47

QPSK_3MHz_ 15 RB_ Right



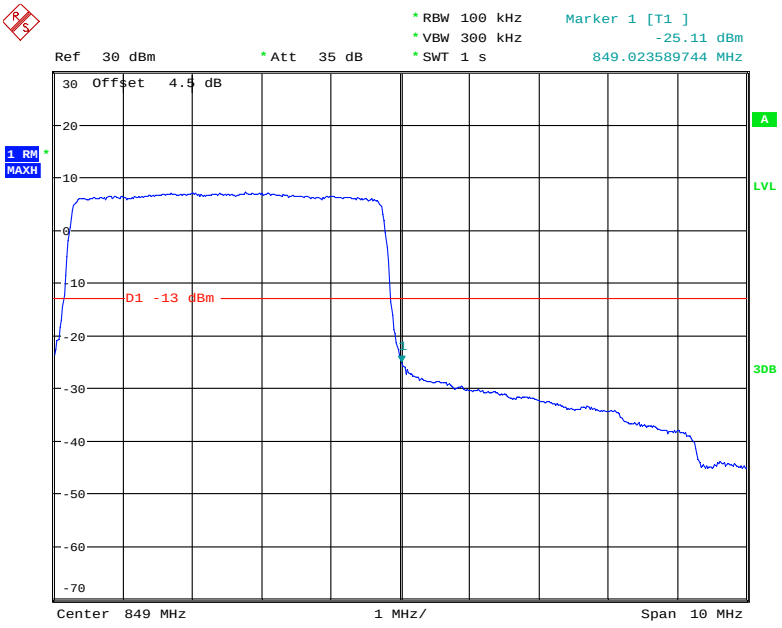
Date: 2.JAN.2020 22:53:21

QPSK_5MHz_ 25 RB_ Left



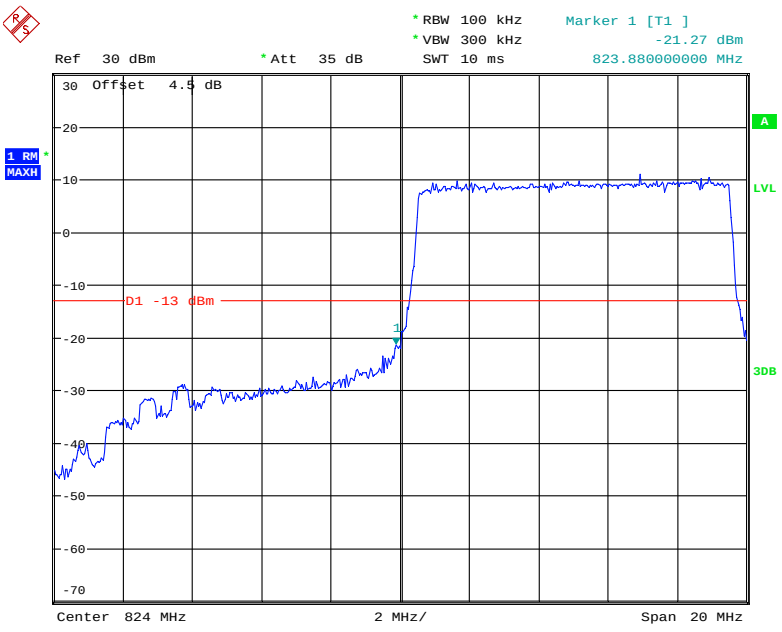
Date: 4.JAN.2020 00:58:22

QPSK_5MHz_ 25 RB_ Right



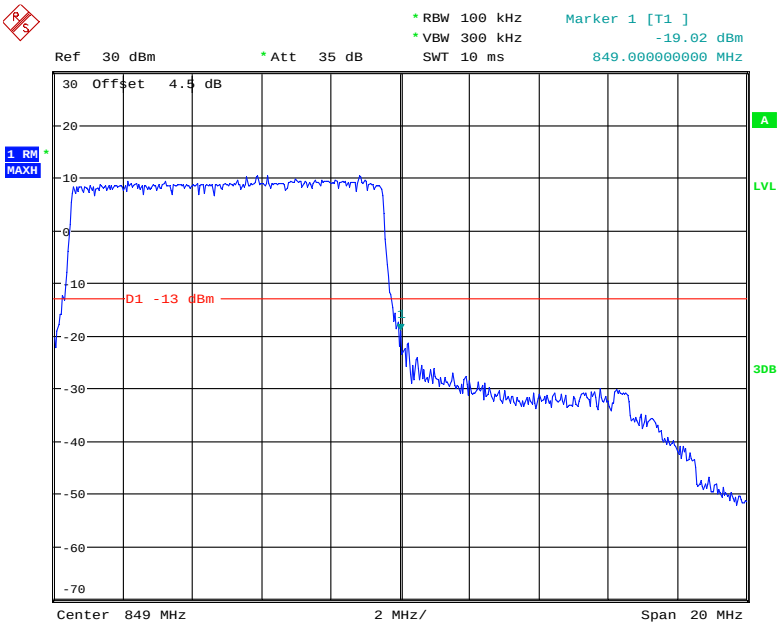
Date: 4.JAN.2020 01:00:58

QPSK_10MHz_ 50 RB_ Left



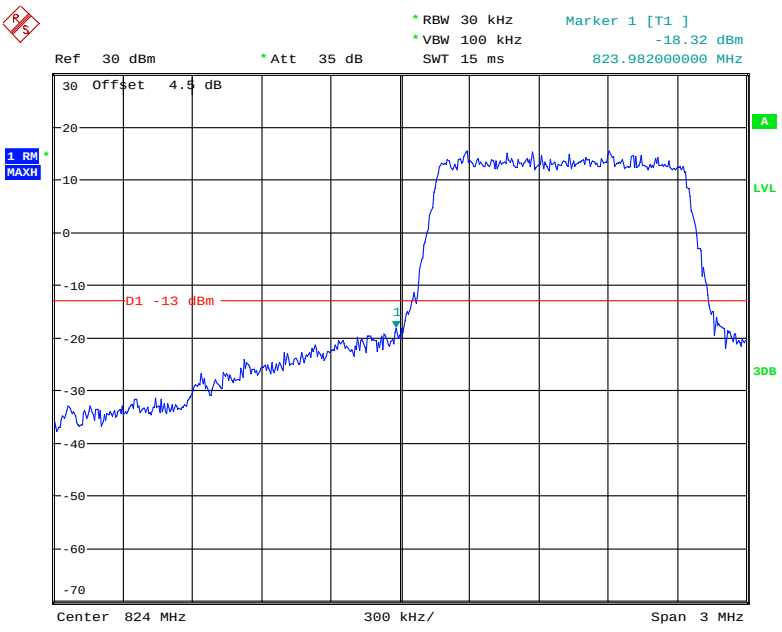
Date: 2.JAN.2020 22:55:24

QPSK_10MHz_ 50 RB_ Right



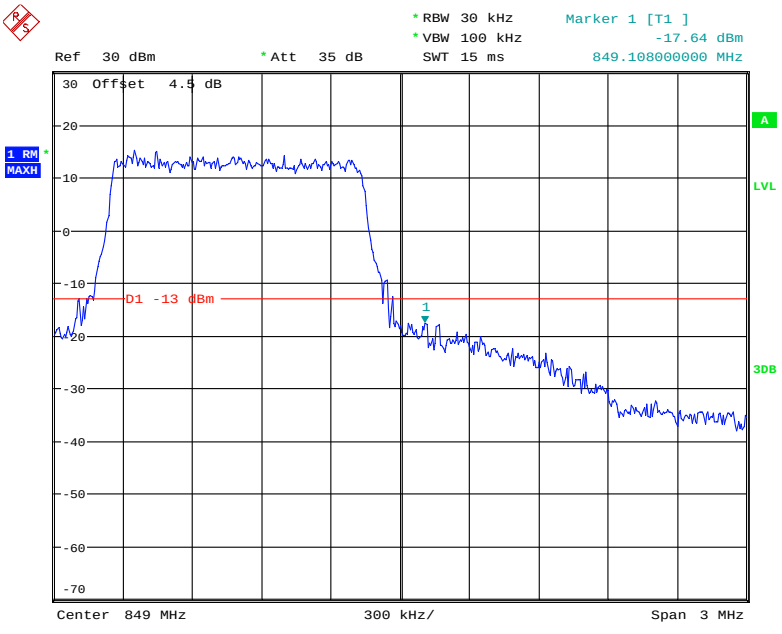
Date: 2.JAN.2020 22:56:00

16QAM_1.4MHz_ 6 RB_ Left



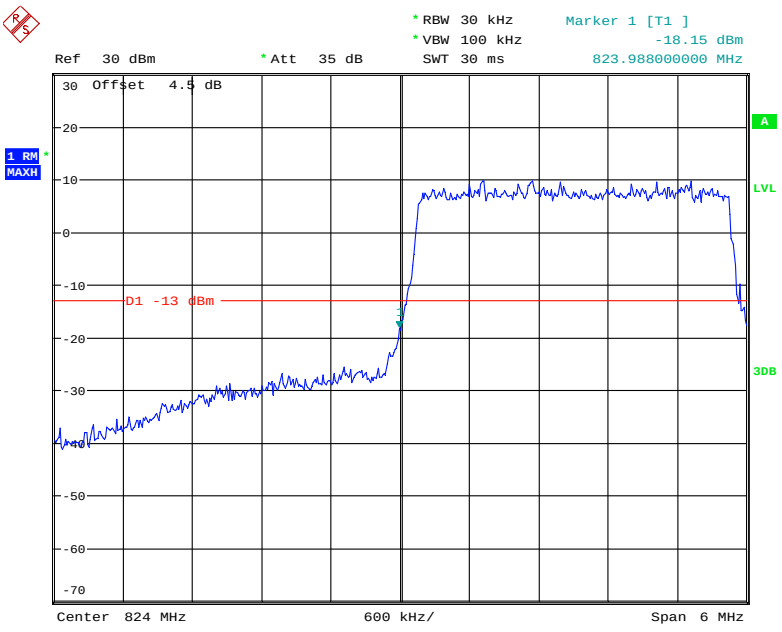
Date: 2.JAN.2020 22:51:50

16QAM_1.4MHz_ 6 RB_ Right



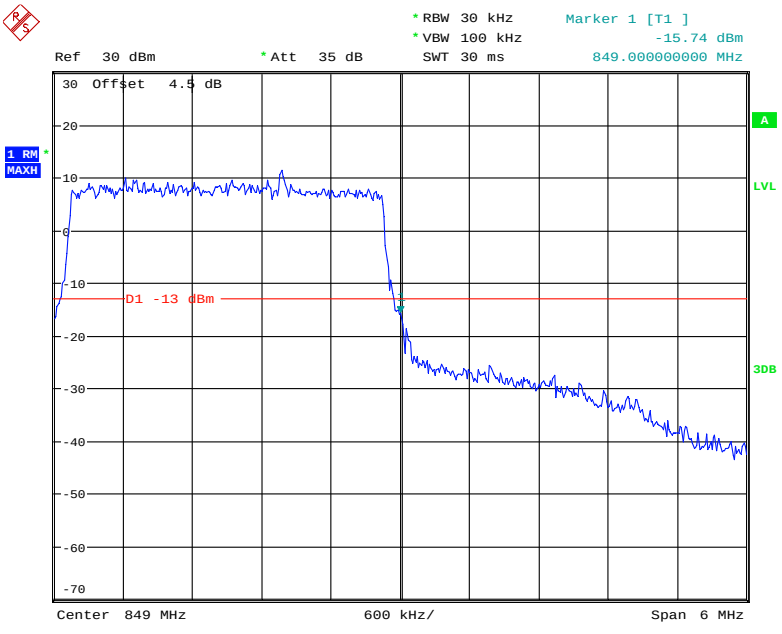
Date: 2.JAN.2020 22:52:27

16QAM_3MHz_ 15 RB_ Left



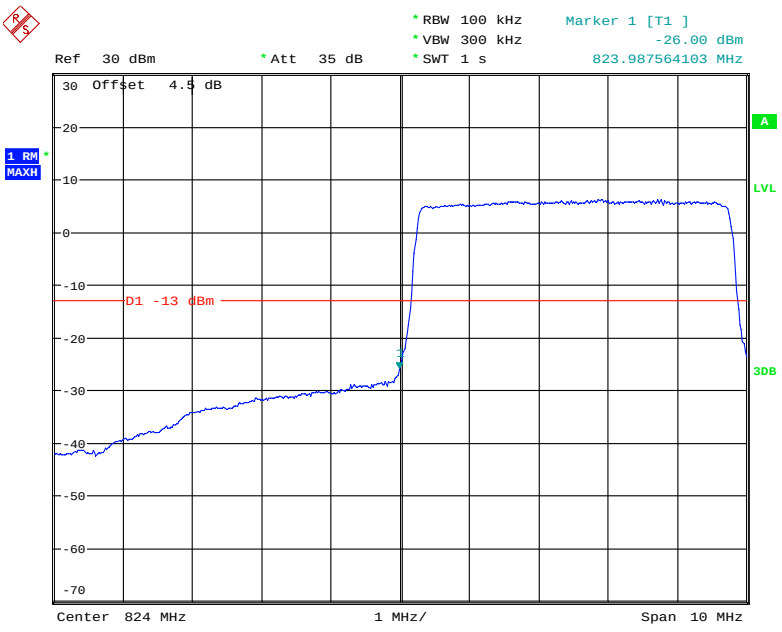
Date: 2.JAN.2020 22:53:04

16QAM_3MHz_ 15 RB_ Right



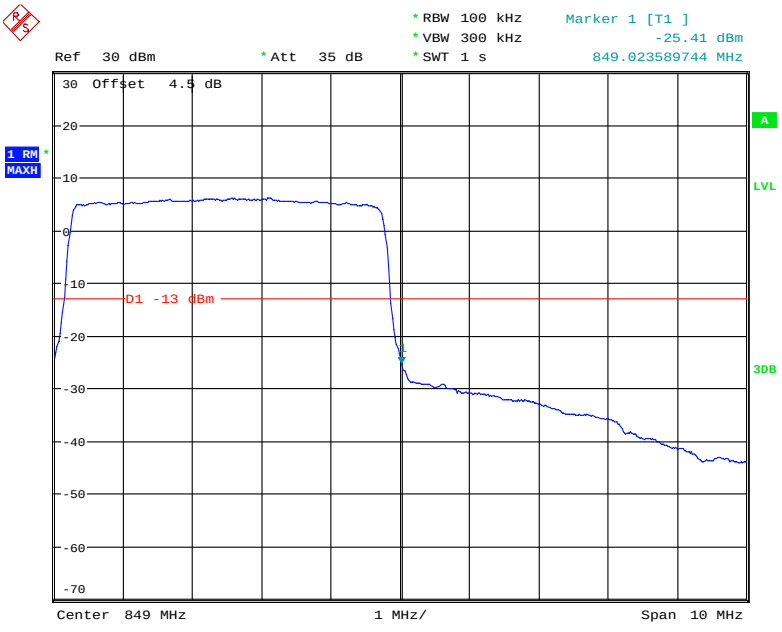
Date: 2.JAN.2020 22:53:38

16QAM_5MHz_ 25 RB_ Left



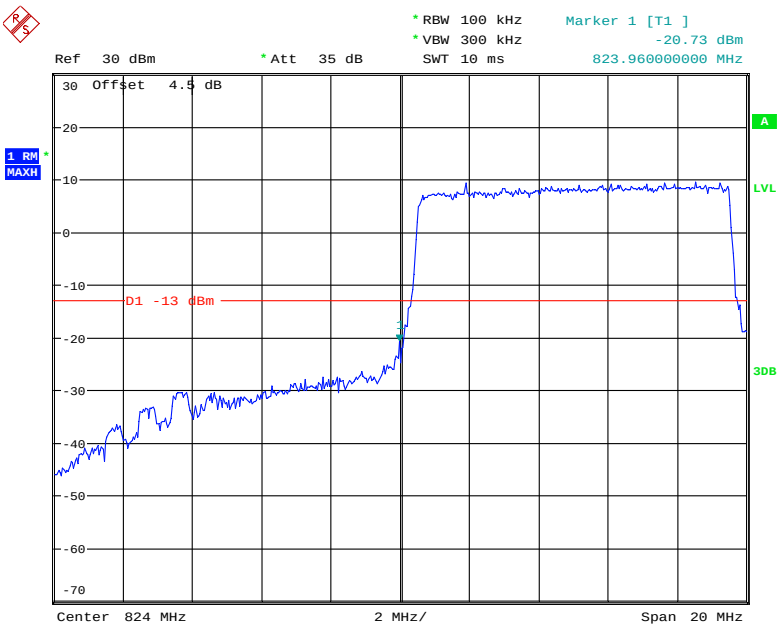
Date: 4.JAN.2020 00:58:42

16QAM_5MHz_ 25 RB_ Right



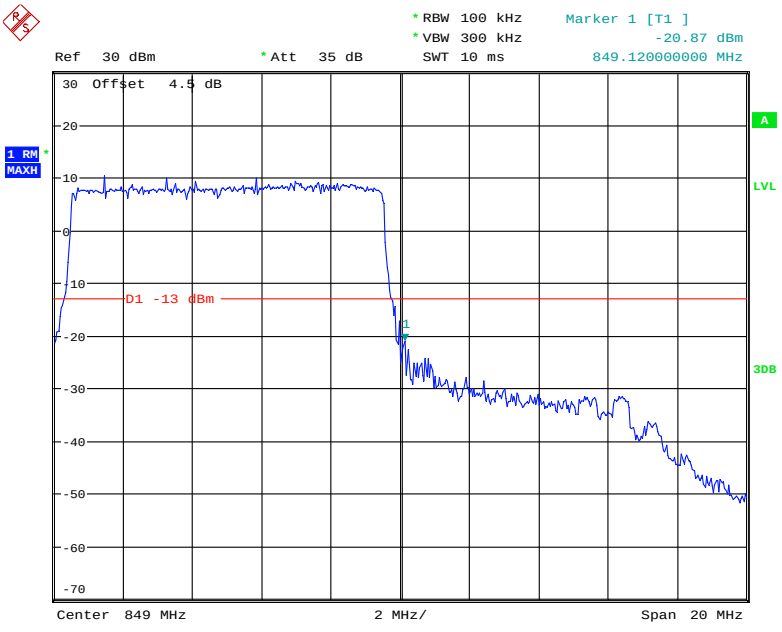
Date: 4.JAN.2020 01:00:31

16QAM_10MHz_ 50 RB_ Left



Date: 2.JAN.2020 22:55:42

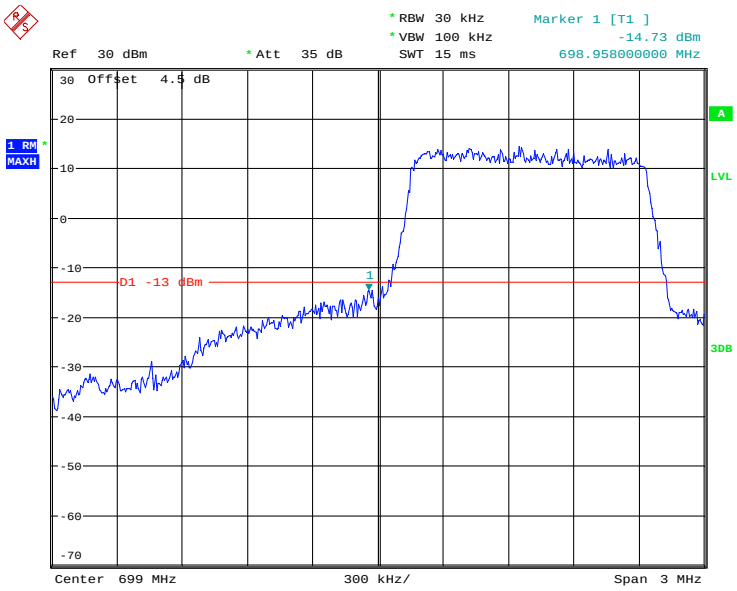
16QAM_10MHz_ 50 RB_ Right



Date: 2.JAN.2020 22:56:18

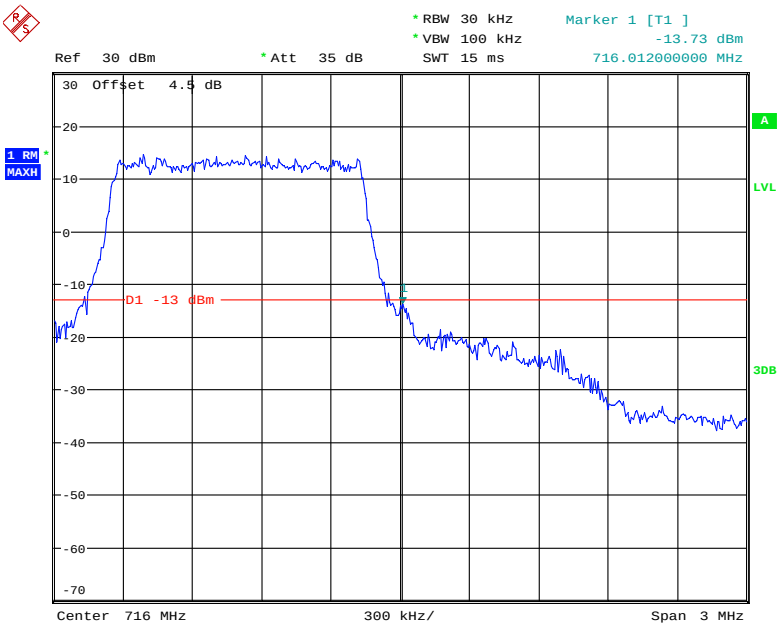
LTE Band 12

QPSK_1.4MHz_ 6 RB_ Left



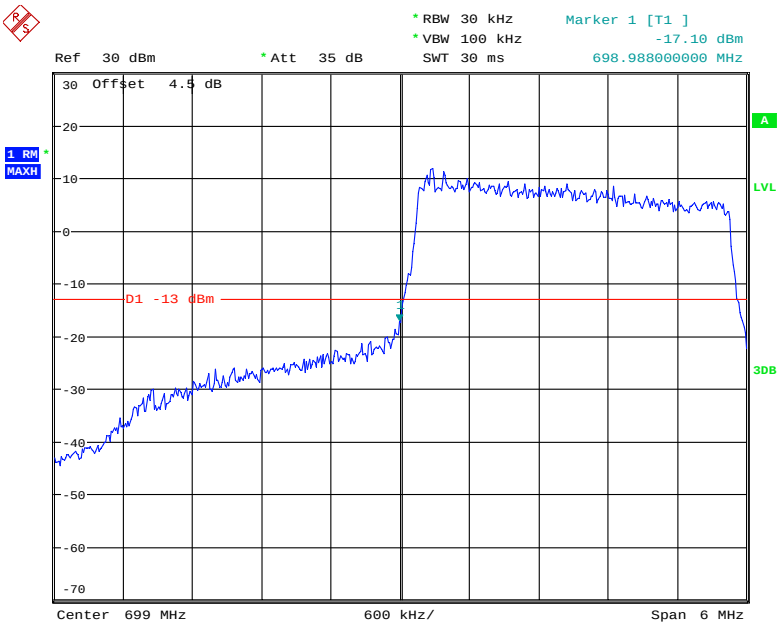
Date: 2.JAN.2020 22:56:38

QPSK_1.4MHz_ 6 RB_ Right



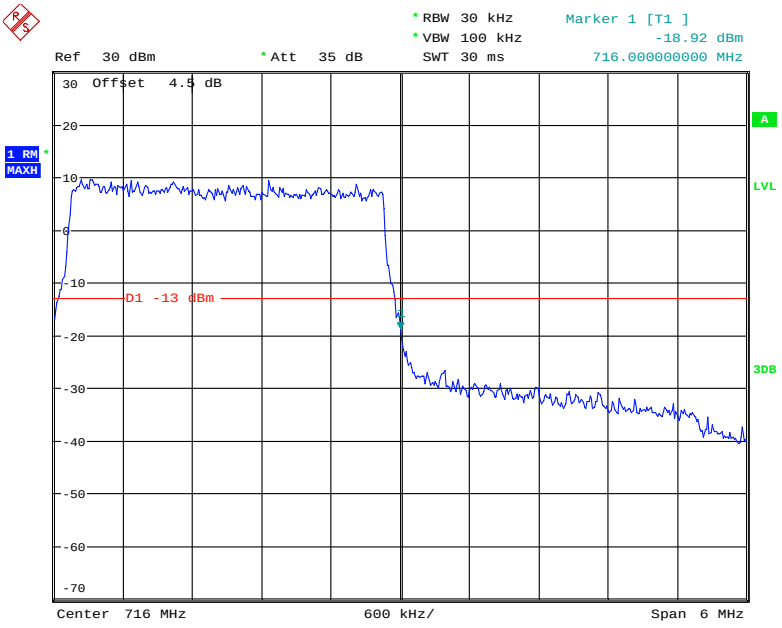
Date: 2.JAN.2020 22:57:22

QPSK_3MHz_ 15 RB_ Left



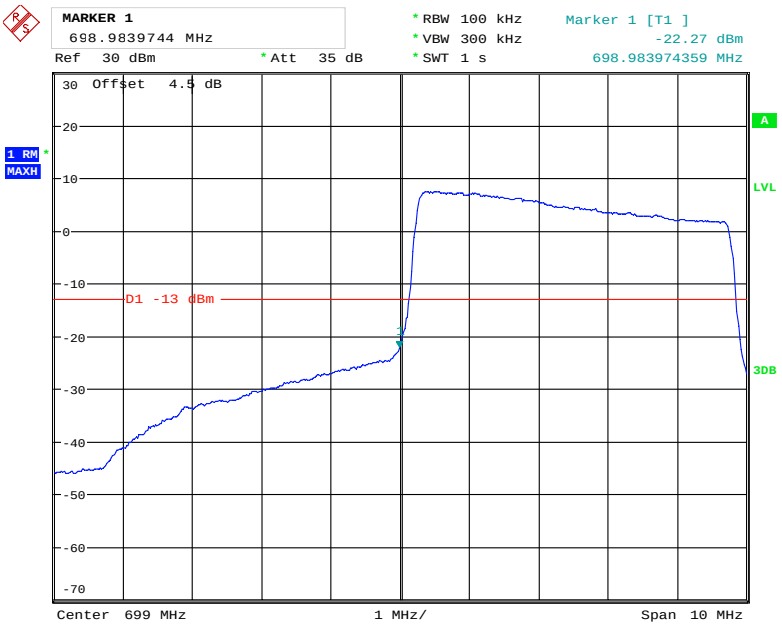
Date: 2.JAN.2020 22:58:04

QPSK_3MHz_ 15 RB_ Right



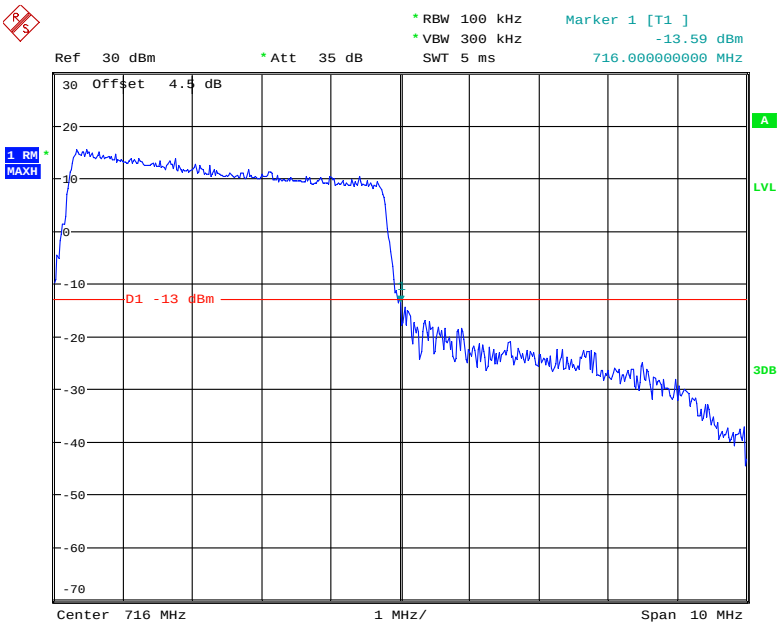
Date: 2.JAN.2020 22:58:45

QPSK_5MHz_ 25 RB_ Left



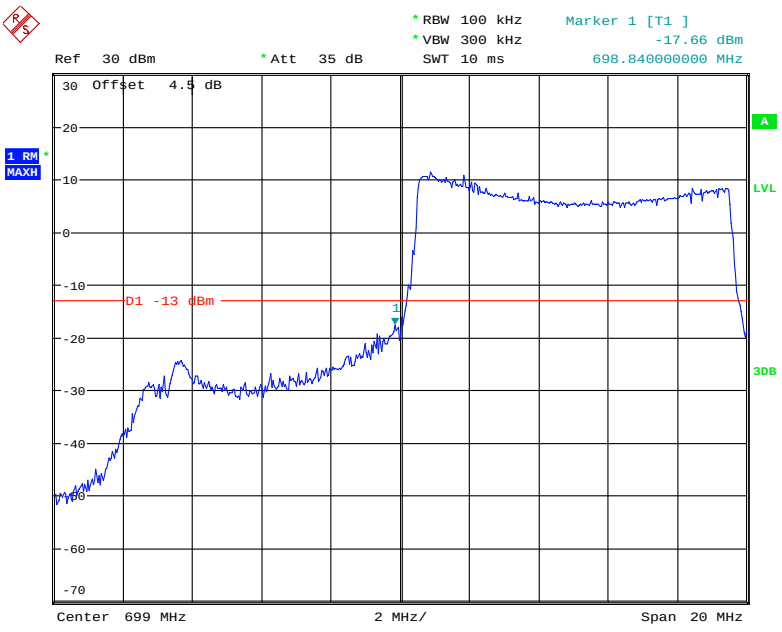
Date: 4.JAN.2020 01:02:04

QPSK_5MHz_ 25 RB_ Right



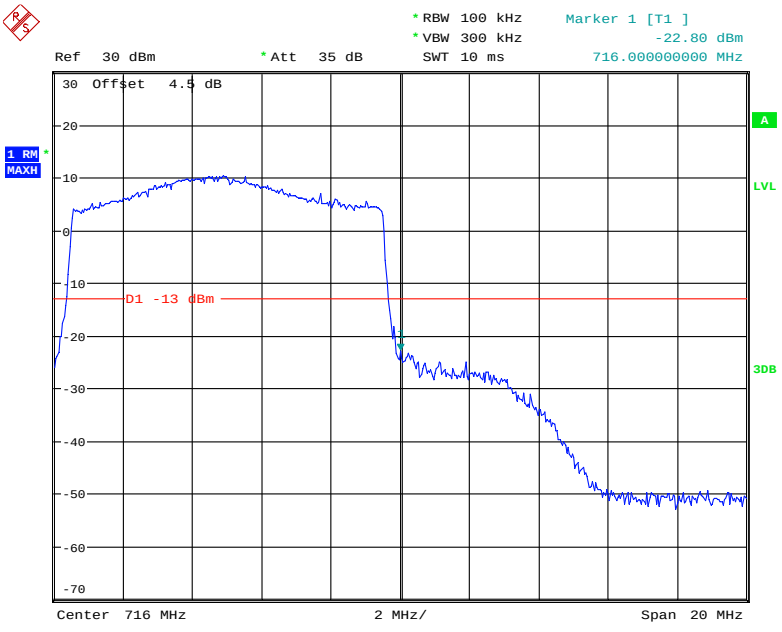
Date: 2.JAN.2020 23:00:12

QPSK_10MHz_ 50 RB_ Left



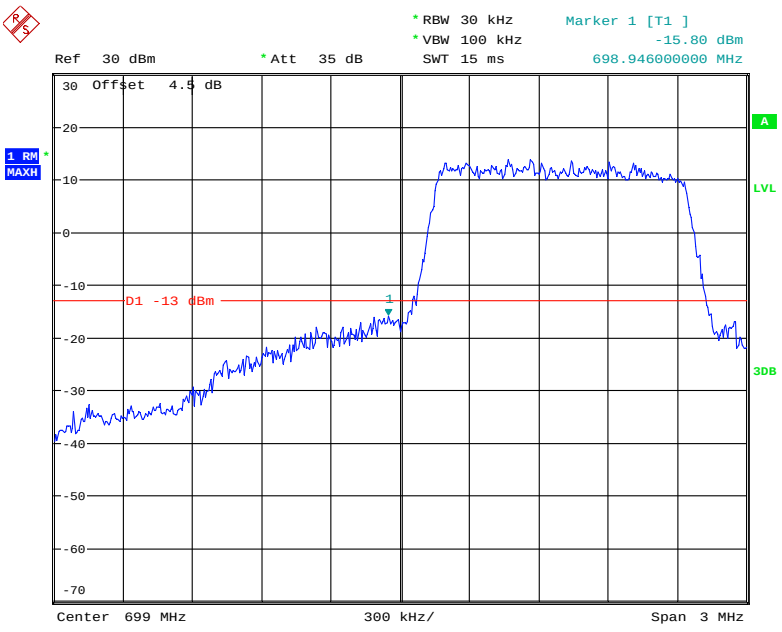
Date: 2.JAN.2020 23:01:00

QPSK_10MHz_ 50 RB_ Right



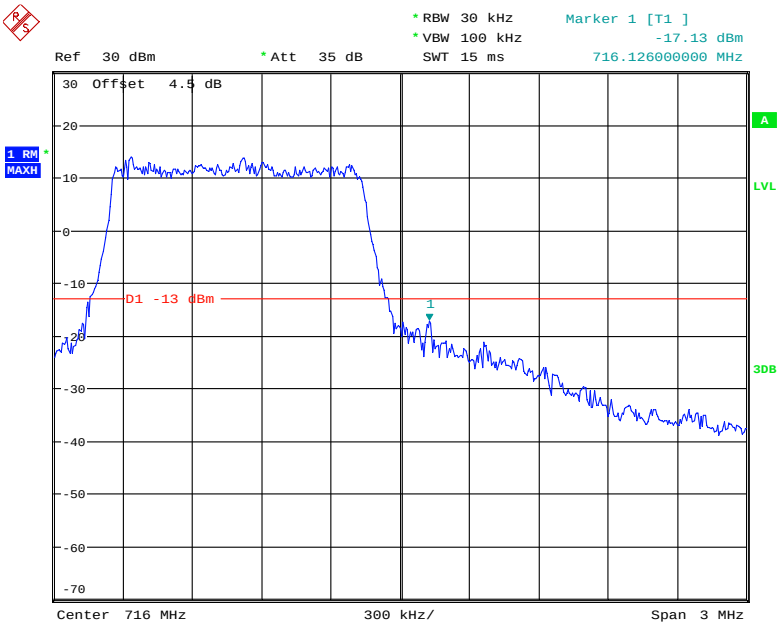
Date: 2.JAN.2020 23:01:37

16QAM_1.4MHz_ 6 RB_ Left



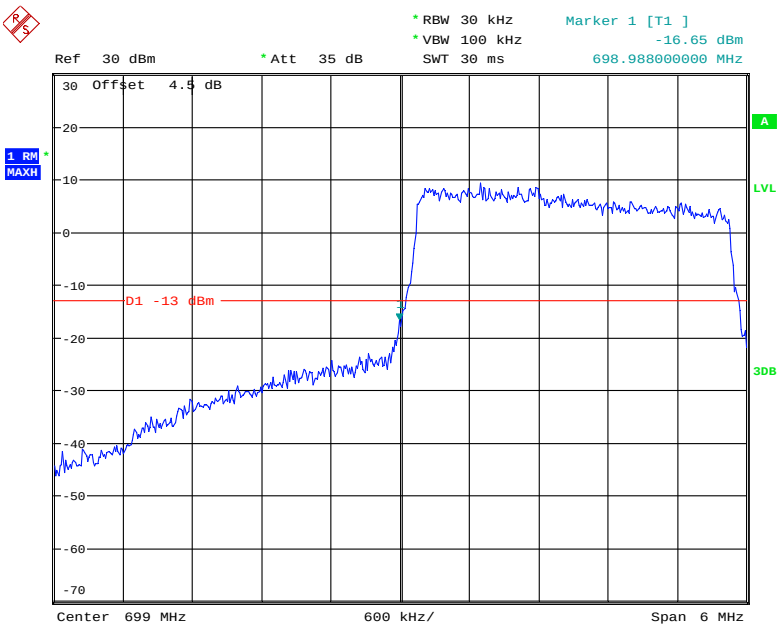
Date: 2.JAN.2020 22:56:58

16QAM_1.4MHz_ 6 RB_ Right



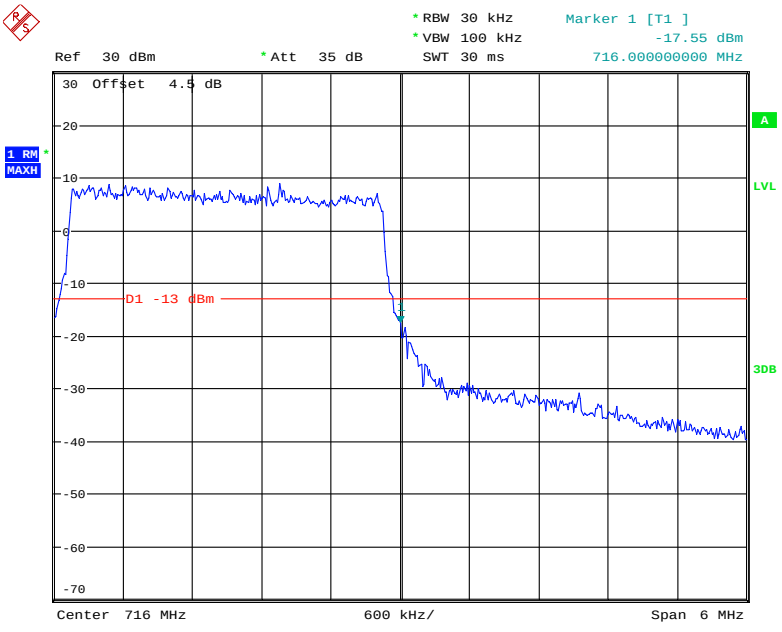
Date: 2.JAN.2020 22:57:41

16QAM_3MHz_ 15 RB_ Left



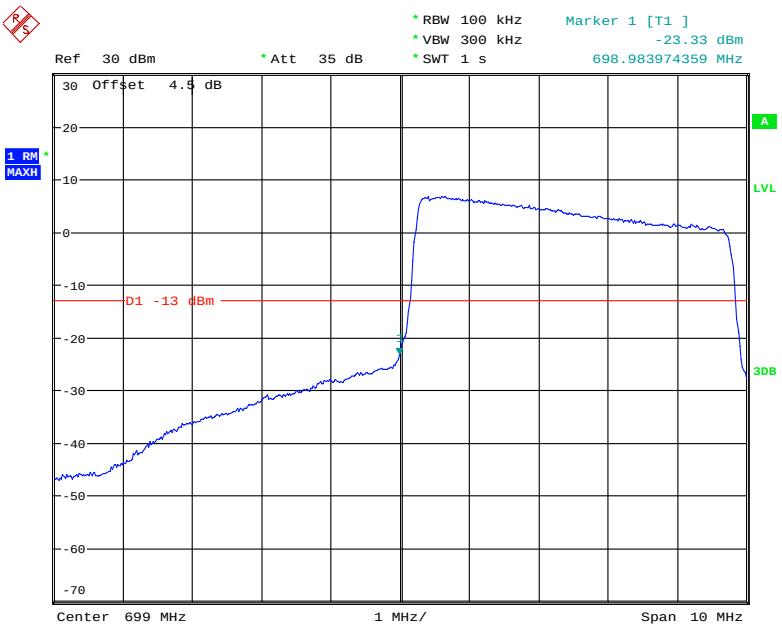
Date: 2.JAN.2020 22:58:24

16QAM_3MHz_ 15 RB_ Right



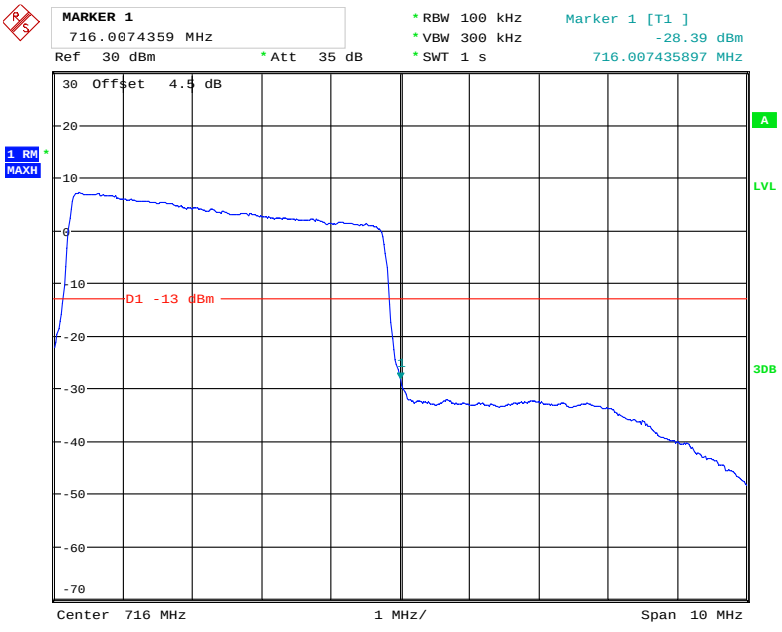
Date: 2.JAN.2020 22:59:02

16QAM_5MHz_ 25 RB_ Left



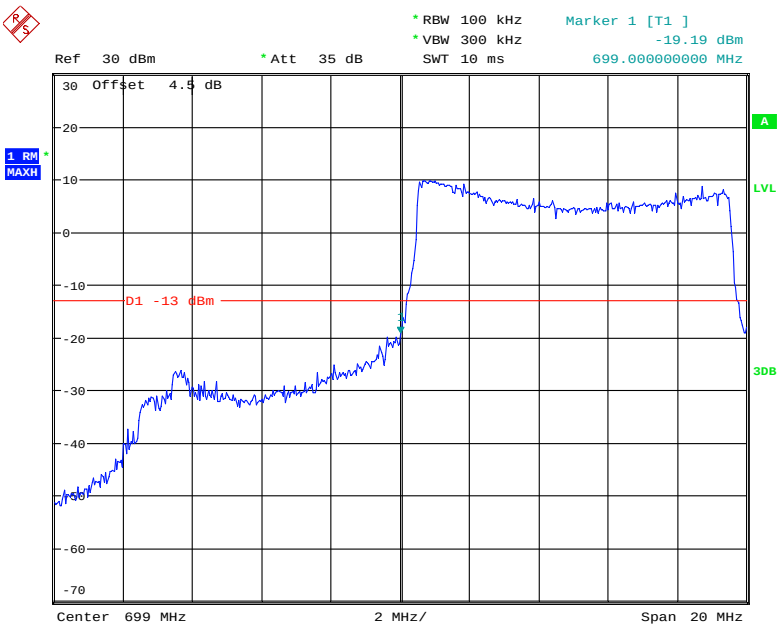
Date: 4.JAN.2020 01:02:23

16QAM_5MHz_ 25 RB_ Right



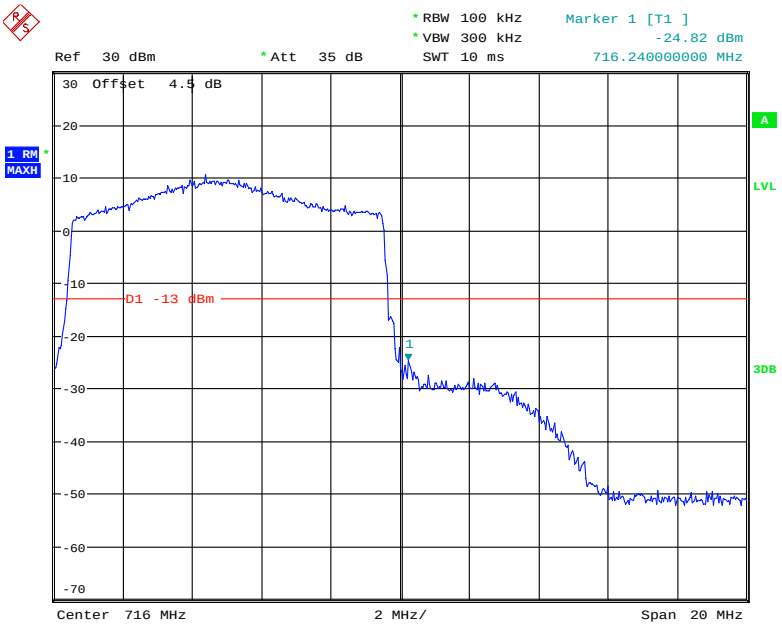
Date: 4.JAN.2020 01:03:37

16QAM_10MHz_ 50 RB_ Left



Date: 2.JAN.2020 23:01:18

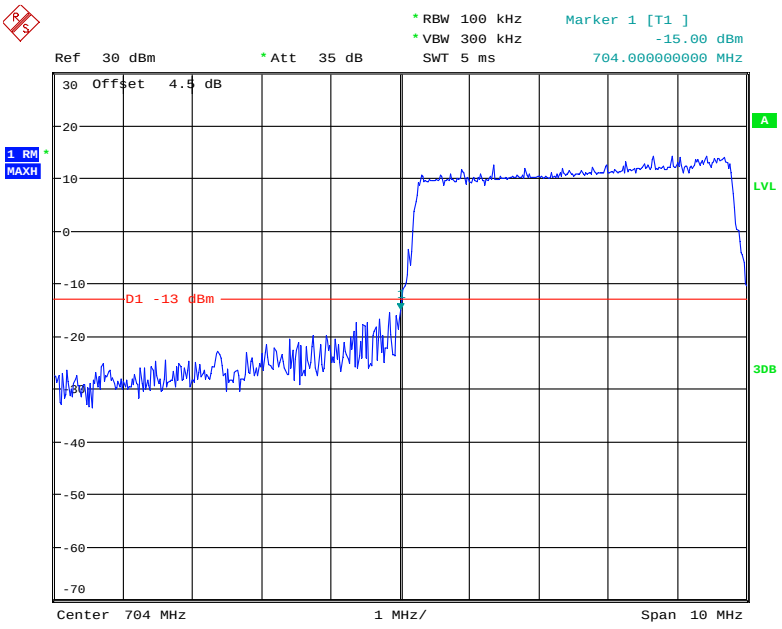
16QAM_10MHz_ 50 RB_ Right



Date: 2.JAN.2020 23:01:54

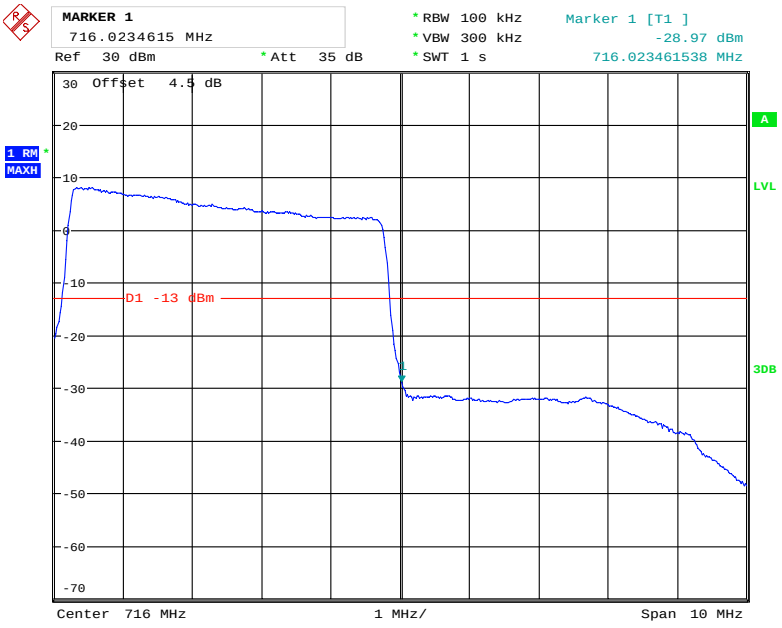
LTE Band 17

QPSK_5MHz_ 25 RB_ Left



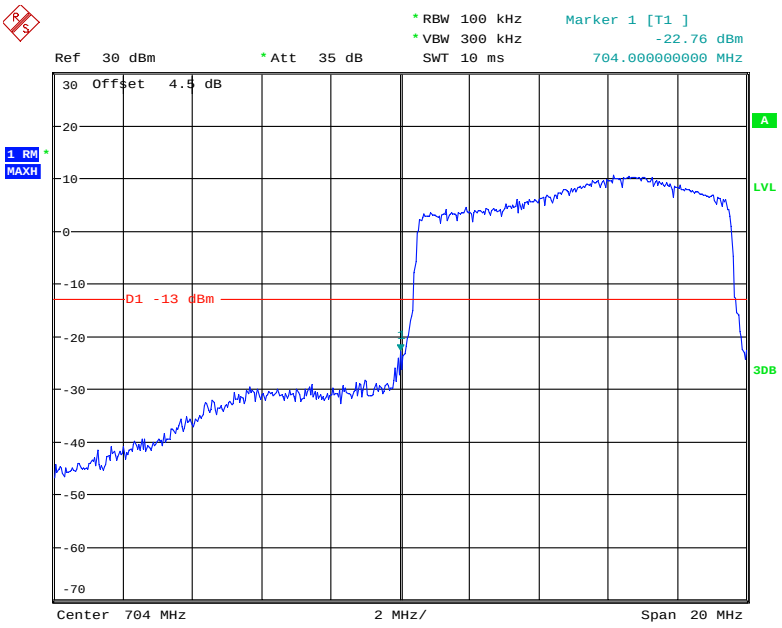
Date: 2.JAN.2020 23:02:19

QPSK_5MHz_ 25 RB_ Right



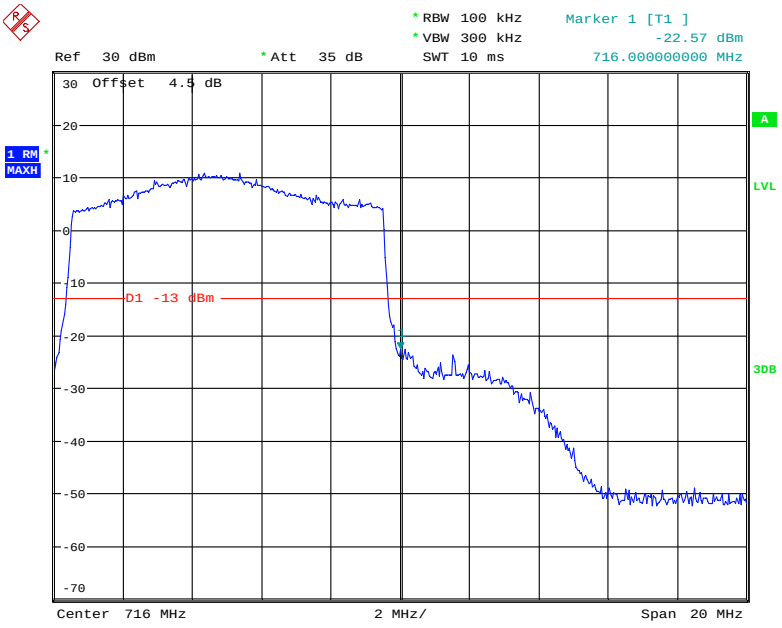
Date: 4.JAN.2020 01:08:05

QPSK_10MHz_ 50 RB_ Left



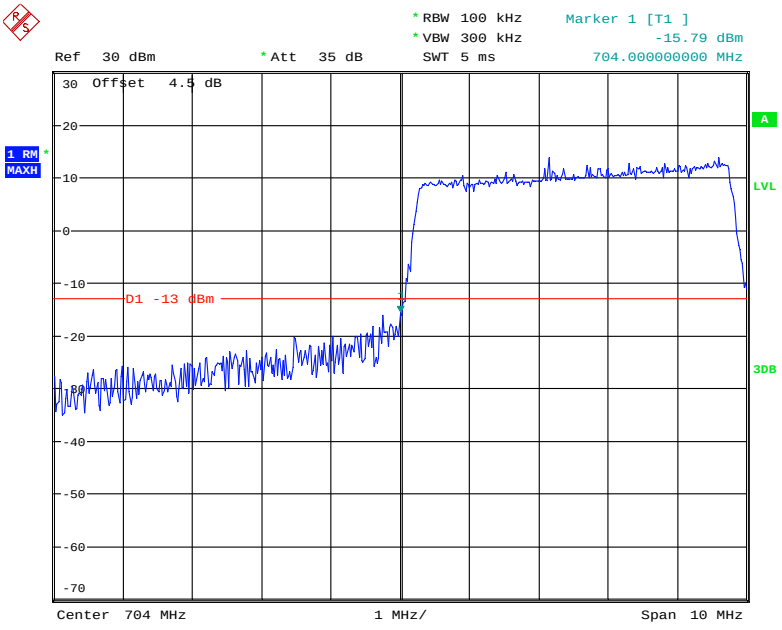
Date: 2.JAN.2020 23:03:44

QPSK_10MHz_ 50 RB_ Right



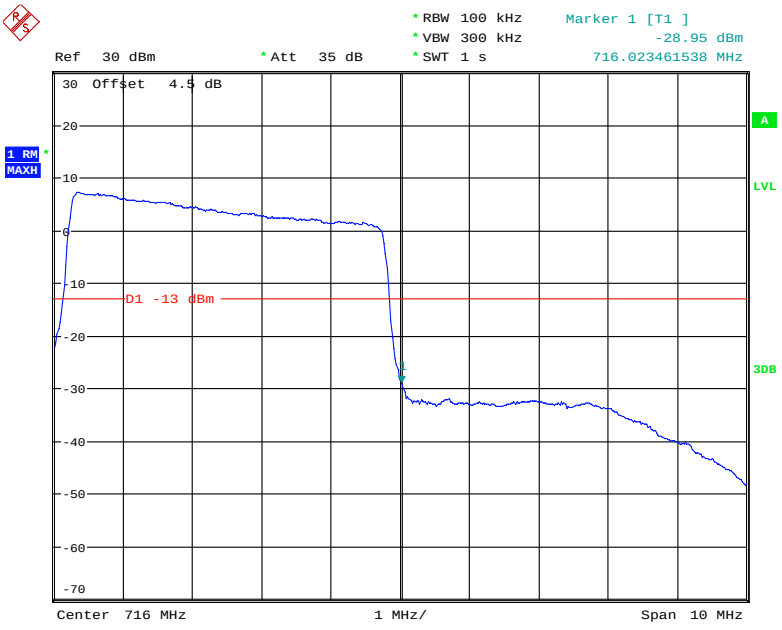
Date: 2.JAN.2020 23:04:20

16QAM_5MHz_ 25 RB_ Left



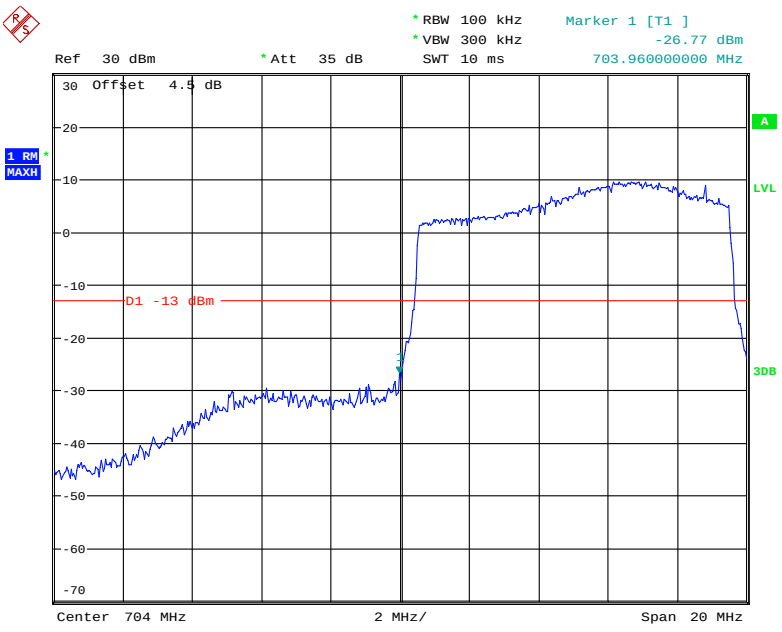
Date: 2.JAN.2020 23:02:40

16QAM_5MHz_ 25 RB_ Right



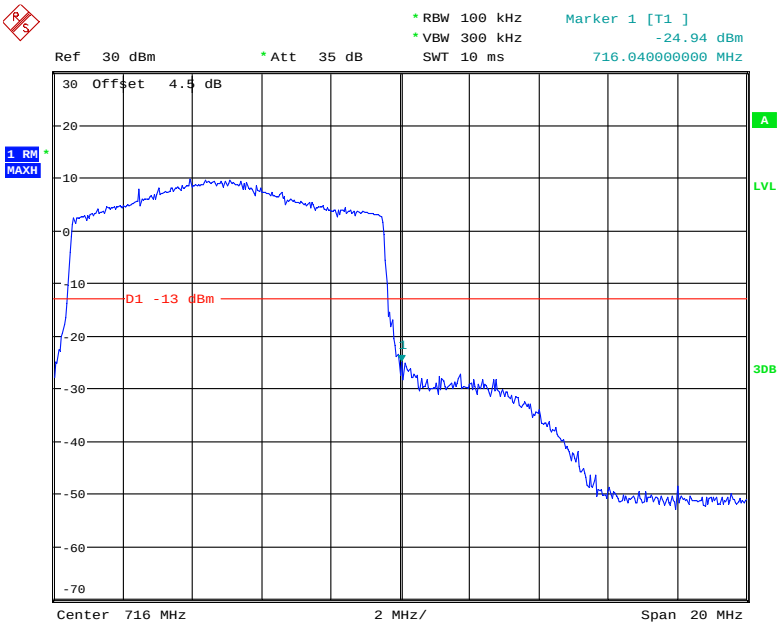
Date: 4.JAN.2020 01:07:43

16QAM_10MHz_ 50 RB_ Left



Date: 2.JAN.2020 23:04:01

16QAM_10MHz_ 50 RB_ Right



Date: 2.JAN.2020 23:04:38

FCC §2.1055, §22.355 & §24.235 & §27.54 - FREQUENCY STABILITY

Applicable Standard

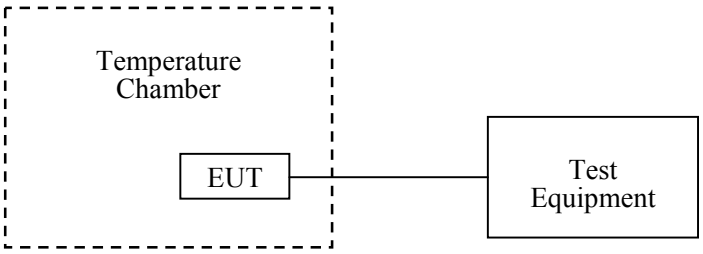
FCC § 2.1055 (a), § 2.1055 (d), §22.355, §24.235, §27.54

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: An external variable DC power supply was connected to the battery terminals of the equipment under test. The voltage was set from 85% to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the battery end point. The output frequency was recorded for each battery voltage.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100035	2019-09-19	2020-09-19
Rohde & Schwarz	Signal Analyzer	FSIQ26	831929/005	2019-09-12	2020-09-12
R&S	Spectrum Analyzer	FSU 26	200256	2019-05-09	2020-05-09
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005011	2018-09-05	2020-09-05
Unknown	Coaxial Cable	C-SJ00-0010	C0010/02	Each time	N/A
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41010013	Each time	N/A
Unknown	Coaxial Cable	C-SJ00-0010	C0010/03	Each time	N/A
E-Microwave	Blocking Control	EMDCB-00036	OE01203218	Each time	N/A
E-Microwave	Coaxial Attenuators	EMCA10-5RN-6	OE01203239	Each time	N/A
R&S	Universal Radio Communication Tester	CMU200	110 822	2019-09-12	2020-09-12
R&S	Wideband Radio Communication Tester	CMW500	149216	2019-09-12	2020-09-12
ESPEC	Constant temperature and humidity Tester	ESX-4CA	018 463	2019-03-26	2020-03-26
UNI-T	Multimeter	UT39A	M130199938	2019-07-24	2020-07-24
Pro instrument	DC Power Supply	pps3300	3300012	N/A	N/A

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Environmental Conditions

Temperature:	26.5 °C
Relative Humidity:	46 %
ATM Pressure:	101.2kPa
Tester:	Xia Yang & Lily Xie
Test Date:	2019-11-14

Test Result: Compliance.

Cellular Band

GMSK, Middle Channel, f_c = 836.6 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Limit**
℃	**V_{DC}**	**Hz**	**ppm**	**ppm**
-30	3.8	-8	-0.00956	2.5
-20		-10	-0.01195	
-10		-9	-0.01076	
0		-7	-0.00837	
10		-6	-0.00717	
20		-8	-0.00956	
30		-11	-0.01315	
40		-9	-0.01076	
50		-7	-0.00837	
20	3.6	-10	-0.01195	
20	4.35	-5	-0.00598	

EGPRS, Middle Channel, f_c = 836.6 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Limit**
℃	**V_{DC}**	**Hz**	**ppm**	**ppm**
-30	3.8	-10	-0.01195	2.5
-20		-7	-0.00837	
-10		-9	-0.01076	
0		-6	-0.00717	
10		-8	-0.00956	
20		-11	-0.01315	
30		-8	-0.00956	
40		-7	-0.00837	
50		-5	-0.00598	
20	3.6	-9	-0.01076	
20	4.35	-6	-0.00717	

PCS Band

GMSK, Middle Channel, f_c = 1880.0 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Results**
℃	**V_{DC}**	**Hz**	**ppm**	
-30	3.8	-7	-0.00372	Pass
-20		-10	-0.00532	
-10		-6	-0.00319	
0		-9	-0.00479	
10		-8	-0.00426	
20		-12	-0.00638	
30		-9	-0.00479	
40		-5	-0.00266	
50		-7	-0.00372	
20	3.6	-8	-0.00426	
20	4.35	-10	-0.00532	

EGPRS, Middle Channel, f_c = 1880.0 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Results
℃	V_{DC}	Hz	ppm	
-30	3.8	-5	-0.00266	Pass
-20		-11	-0.00585	
-10		-6	-0.00319	
0		-8	-0.00426	
10		-10	-0.00532	
20		-8	-0.00426	
30		-5	-0.00266	
40		-7	-0.00372	
50		-6	-0.00319	
20	3.6	-10	-0.00532	
20	4.35	-9	-0.00479	

WCDMA Band II: R99

Middle Channel, f_c = 1880.0 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
℃	V_{DC}	Hz	ppm	
-30	3.8	7	0.00372	Pass
-20		10	0.00532	
-10		5	0.00266	
0		8	0.00426	
10		6	0.00319	
20		9	0.00479	
30		8	0.00426	
40		7	0.00372	
50		11	0.00585	
20	3.6	6	0.00319	
20	4.35	8	0.00426	

WCDMA Band IV: R99

Rel 99_Middle Channel					
Power Supplied	Temperature	F_L	Limit	F_H	Limit
Vdc	℃	MHz	MHz	MHz	MHz
3.8	-30	1710.24	1710	1754.68	1755
	-20	1710.21		1754.83	
	-10	1710.18		1754.80	
	0	1710.21		1754.89	
	10	1710.23		1754.78	
	20	1710.66		1754.32	
	30	1710.16		1754.52	
	40	1710.34		1754.71	
	50	1710.28		1754.93	
3.6	20	1710.55		1754.93	
4.35	20	1710.13		1754.59	

WCDMA Band Ⅴ: R99

Middle Channel, f_c = 836.6 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
℃	V_{DC}	Hz	ppm	ppm
-30	3.8	6	0.00717	2.5
-20		9	0.01076	
-10		10	0.01195	
0		5	0.00598	
10		8	0.00956	
20		11	0.01315	
30		6	0.00717	
40		7	0.00837	
50		5	0.00598	
20	3.6	9	0.01076	
20	4.35	8	0.00956	

LTE Band 2:

QPSK, Channel Bandwidth:10MHz Middle Channel, f_c = 1880 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Result**
℃	**V_{DC}**	**Hz**	**ppm**	
-30	3.8	0.74	0.0004	Pass
-20		-8.39	-0.0045	
-10		-6.27	-0.0033	
0		-7.46	-0.004	
10		8.10	0.0043	
20		6.26	0.0033	
30		5.06	0.0027	
40		-7.01	-0.0037	
50		8.34	0.0044	
20	4.35	8.73	0.0046	
20	3.6	-9.94	-0.0053	

16QAM, Channel Bandwidth:10MHz Middle Channel, f_c =1880 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Result**
℃	**V_{DC}**	**Hz**	**ppm**	
-30	3.8	-6.39	-0.0034	Pass
-20		8.81	0.0047	
-10		-7.15	-0.0038	
0		8.33	0.0044	
10		6.63	0.0035	
20		-5.96	-0.0032	
30		5.76	0.0031	
40		5.52	0.0029	
50		7.07	0.0038	
20	4.35	7.19	0.0038	
20	3.6	-6.54	-0.0035	

LTE Band 4

QPSK, Channel Bandwidth:10MHz					
Power Supplied	**Temperature**	**F_L**	**Limit**	**F_H**	**Limit**
Vdc	**℃**	**MHz**	**MHz**	**MHz**	**MHz**
3.8	-30	1710.24	1710	1754.68	1755
	-20	1710.21		1754.83	
	-10	1710.18		1754.80	
	0	1710.21		1754.89	
	10	1710.23		1754.78	
	20	1710.66		1754.32	
	30	1710.16		1754.52	
	40	1710.34		1754.71	
	50	1710.28		1754.93	
3.6	20	1710.55		1754.93	
4.35	20	1710.13		1754.59	

16QAM, Channel Bandwidth:10MHz					
Power Supplied	**Temperature**	**F_L**	**Limit**	**F_H**	**Limit**
Vdc	**℃**	**MHz**	**MHz**	**MHz**	**MHz**
3.8	-30	1710.66	1710	1754.93	1755
	-20	1710.16		1754.59	
	-10	1710.66		1754.80	
	0	1710.34		1754.89	
	10	1710.28		1754.78	
	20	1710.66		1754.32	
	30	1710.16		1754.80	
	40	1710.34		1754.89	
	50	1710.28		1754.93	
3.6	20	1710.34		1754.68	
4.35	20	1710.28		1754.83	

LTE Band 5

QPSK, Channel Bandwidth:10MHz Middle Channel, f_c = 836.5 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Limit**
℃	**V_{DC}**	**Hz**	**ppm**	**ppm**
-30	3.8	3.10	0.0037	2.5
-20		9.63	0.0115	
-10		-5.25	-0.0063	
0		6.77	0.0081	
10		-6.74	-0.0081	
20		8.47	0.0101	
30		5.25	0.0063	
40		9.94	0.0119	
50		-8.73	-0.0104	
20	4.35	8.98	0.0107	
20	3.6	-7.08	-0.0085	

16QAM, Channel Bandwidth:10MHz Middle Channel, f_c =836.5 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Limit**
℃	**V_{DC}**	**Hz**	**ppm**	**ppm**
-30	3.8	3.81	0.0046	2.5
-20		-6.09	-0.0073	
-10		-8.03	-0.0096	
0		-7.31	-0.0087	
10		-6.75	-0.0081	
20		-8.93	-0.0107	
30		5.81	0.0069	
40		6.85	0.0082	
50		8.36	0.01	
20	4.35	5.96	0.0071	
20	3.6	8.81	0.0105	

LTE Band 12:

QPSK, Channel Bandwidth:10MHz					
Temperature	**Voltage**	**Test Result (MHz)**		**Limit (MHz)**	
℃	V_{DC}	F_L	F_H	F_L	F_H
-30	3.8	699.53	715.51	699	716
-20		699.49	715.52	699	716
-10		699.49	715.51	699	716
0		699.50	715.52	699	716
10		699.51	715.53	699	716
20		699.54	715.46	699	716
30		699.49	715.52	699	716
40		699.50	715.48	699	716
50		699.49	715.49	699	716
20	4.35	699.53	715.50	699	716
20	3.6	699.51	715.53	699	716

16QAM, Channel Bandwidth:10MHz					
Temperature	**Voltage**	**Test Result (MHz)**		**Limit (MHz)**	
℃	V_{DC}	F_L	F_H	F_L	F_H
-30	3.8	699.52	715.51	699	716
-20		699.51	715.50	699	716
-10		699.48	715.49	699	716
0		699.52	715.50	699	716
10		699.49	715.50	699	716
20		699.54	715.49	699	716
30		699.50	715.50	699	716
40		699.51	715.51	699	716
50		699.52	715.51	699	716
20	4.35	699.50	715.50	699	716
20	3.6	699.49	715.52	699	716

LTE Band 17:

QPSK, Channel Bandwidth:10MHz					
Temperature	**Voltage**	**Test Result (MHz)**		**Limit (MHz)**	
℃	V_{DC}	F_L	F_H	F_L	F_H
-30	3.8	704.53	715.52	699	716
-20		704.49	715.57	699	716
-10		704.49	715.58	699	716
0		704.52	715.52	699	716
10		704.51	715.53	699	716
20		704.58	715.46	699	716
30		704.46	715.53	699	716
40		704.57	715.48	699	716
50		704.45	715.48	699	716
20	4.35	704.53	715.55	699	716
20	3.6	704.53	715.57	699	716

16QAM, Channel Bandwidth:10MHz					
Temperature	**Voltage**	**Test Result (MHz)**		**Limit (MHz)**	
℃	V_{DC}	F_L	F_H	F_L	F_H
-30	3.8	704.52	715.55	699	716
-20		704.51	715.52	699	716
-10		704.48	715.49	699	716
0		704.52	715.57	699	716
10		704.42	715.72	699	716
20		704.54	715.42	699	716
30		704.52	715.52	699	716
40		704.51	715.58	699	716
50		704.58	715.55	699	716
20	4.35	704.50	715.52	699	716
20	3.6	704.49	715.53	699	716

Note: The fundamental emissions stay within the authorized bands of operation based on the frequency deviation measured is small, the extreme voltage was declared by applicant.

******* END OF REPORT *******