



TESTING LABORATORY
CERTIFICATE #4820.01



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

For

MFOURTEL MEXICO S.A. DE C.V.

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Mexico

FCC ID: CLNM4WILINK4

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:		M4 WiLink4
EUT Model:		M4 WiLink4
Operation modes:		WCDMA(R99 (Data), HSDPA/HSUPA/HSPA+) FDD-LTE
Operation Frequency:		WCDMA Band 2: 1850-1910 MHz(TX); 1930-1990 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 7: 2500-2570 MHz(TX) ; 2620-2690 MHz(RX) LTE Band 66:1710-1780 MHz(TX); 2110-2180 MHz(RX)
Maximum Output Power: (Conducted)		WCDMA Band 2: 22.78 dBm; WCDMA Band 5: 22.17 dBm LTE Band 2: 22.84 dBm; LTE Band 4: 22.66 dBm LTE Band 5: 22.77 dBm; LTE Band 7: 21.44 dBm LTE band 66: 22.33 dBm
Modulation Type:		BPSK, QPSK, 16QAM
Adapter Information	Model:	ZL-A012W1201000
	Input:	AC 100-240V 50/60Hz 0.5A
	Output:	DC 12V 1A
Rated Input Voltage:		DC12V from adapter
Serial Number:		RDG191031008-RF-S1
EUT Received Date:		2019.10.31
EUT Received Status:		Good

Objective

This report is prepared on behalf of **MFOURTEL MEXICO S.A. DE C.V.** in accordance with: Part 2-Subpart J, Part 22-Subpart H, and Part 24-Subpart E Part 27 of the Federal Communication Commissions 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 15C DTS submissions with FCC ID: CLNM4WILINK4.
FCC Part 15E NII submissions with FCC ID: CLNM4WILINK4.

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 °C
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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This report may contain data that are not covered by the accreditation scope and shall be marked with an asterisk “★”.

SYSTEM TEST CONFIGURATION

Justification

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

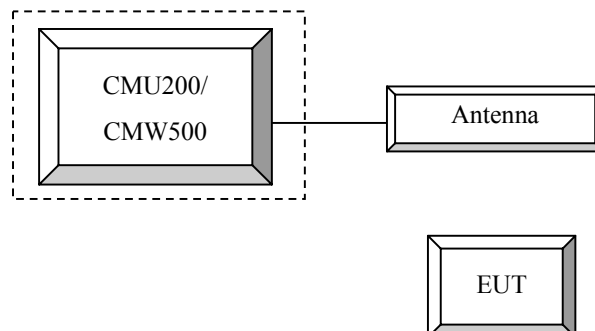
Equipment Modifications

No modification was made to the EUT.

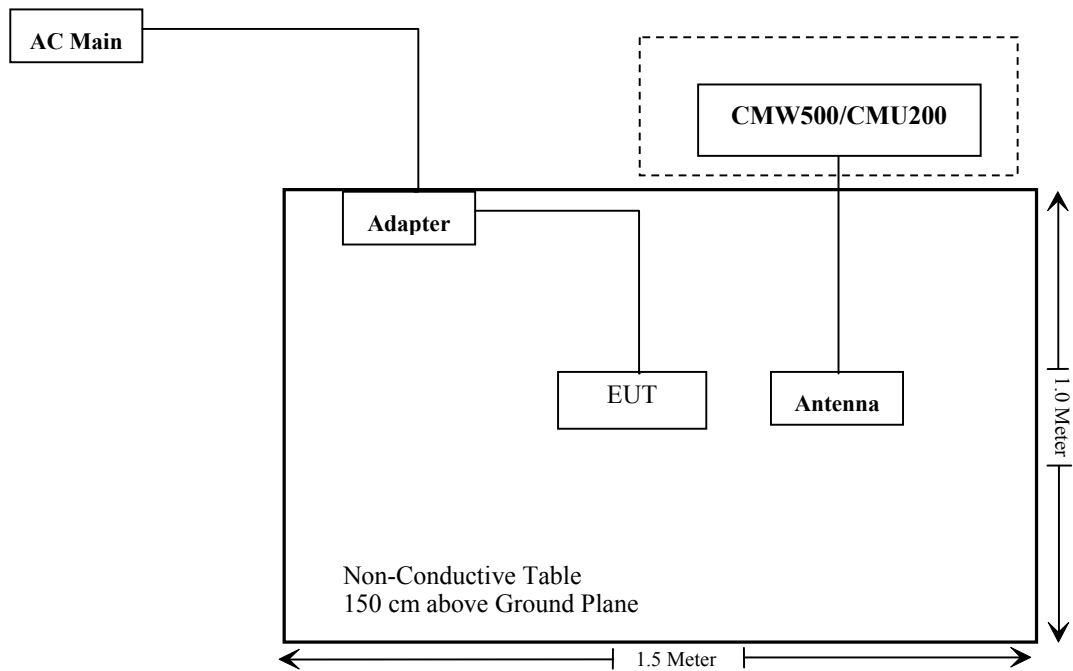
Support Equipment List and Details

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

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

Rules	Description of Test	Result
§1.1310, §2.1091	Maximum Permissible 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

§1.1310 & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

(B) Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

f = frequency in MHz; * = Plane-wave equivalent power density;

According to §1.1310 and §2.1091 RF exposure is calculated.

Calculation formula:

Prediction of power density at the distance of the applicable MPE limit

$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. mW/cm²);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

Calculated Data:

Mode	Frequency (MHz)	Antenna Gain		Conducted output power including Tune-up Tolerance		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBi)	(numeric)	(dBm)	(mW)			
WLAN	2412-2462	4.2	2.63	25	316.23	20.00	0.17	1.0
WLAN	5150-5250	4.2	2.63	14	25.12	20.00	0.01	1.0
WLAN	5725-5850	4.2	2.63	14	25.12	20.00	0.01	1.0
WCDMA band 2	1850-1910	3.5	2.24	23	199.53	20.00	0.09	1.0
WCDMA Band 5	824-849	2.3	1.70	23	199.53	20.00	0.07	0.55
LTE Band 2	1850-1910	3.5	2.24	23	199.53	20.00	0.09	1.0
LTE band 4	1710-1755	3.5	2.24	23	199.53	20.00	0.09	1.0
LTE Band 5	824-849	2.3	1.70	23	199.53	20.00	0.07	0.55
LTE Band 7	2500-2570	4.3	2.69	22	158.49	20.00	0.08	1.0
LTE Band 66	1710-1780	3.5	2.24	23	199.53	20.00	0.09	1.0

The WLAN and WWAN can transmit simultaneously:

$$\sum_i \frac{S_i}{S_{Limit,i}}$$

$$=S_{WLAN}/S_{limit-WLAN} + S_{WWAN}/S_{limit-WWAN}$$

$$=0.17/1+0.07/0.55$$

$$=0.3$$

$$< 1.0$$

Result: The device meet FCC MPE at 20 cm distance

FCC §2.1047 - MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 22H & 24E, Part 27 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

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
	β_c / β_d	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			
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	β_d (SF)	64			
	β_c / β_d	2/15	12/15	15/8	15/4
	β_{hs}	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			
	$A_{hs} = \beta_{hs} / \beta_c$	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				
	β_c	11/15	6/15	15/15	2/15	15/15
	β_d	15/15	15/15	9/15	15/15	0
	β_{ec}	209/225	12/15	30/15	2/15	5/15
	β_c/β_d	11/15	6/15	15/9	2/15	-
	β_{hs}	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				
	$A_{hs}=\beta_{hs}/\beta_c$	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_FCI	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-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 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 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 (Note 3)	β_d	β_{HS} (Note 1)	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	β_{ed1} : 30/15 β_{ed2} : 30/15	β_{ed3} : 24/15 β_{ed4} : 24/15	3.5	2.5	14	105	105

Note 1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$.

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 $\beta_d = 0$ 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
64 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	13	10	Table 6.2.4-2	Table 6.2.4-2
	6.6.3.3.2				
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
R&S	Universal Radio Communication Tester	CMU200	106 891	2018-12-14	2019-12-14
R&S	Wideband Radio Communication Tester	CMW500	149216	2018-12-10	2019-12-10
Agilent	Signal Generator	E8247C	MY43321350	2018-12-10	2019-12-10
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
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41010013	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
Temperature:	23.3 °C	23.3 °C
Relative Humidity:	42%	42%
ATM Pressure:	102.6 kPa	102.6 kPa
Tester:	Davy Wang	Neil Liao
Test Date:	2019-11-26~2019-12-05	2019-11-26~2019-12-05

Conducted Output Power**WCDMA Band II**

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	22.78	2.46	22.49	2.93	22.53	2.43
HSDPA	1	21.59	3.16	21.32	3.68	21.27	3.94
	2	21.51	3.21	21.27	3.57	21.21	3.84
	3	21.53	3.14	21.2	3.47	21.17	3.63
	4	21.47	3.08	21.17	3.41	21.3	3.45
HSUPA	1	21.05	3.71	20.84	4.00	20.71	3.54
	2	21.54	3.67	20.73	3.97	20.67	3.41
	3	21.21	3.57	20.67	3.74	20.61	3.3
	4	20.71	3.54	20.57	3.57	20.57	3.2
DC-HSDPA	5	20.45	3.14	20.41	3.47	20.47	3.17
	1	21.24	3.54	21.37	4.24	21.67	3.3
	2	21.17	3.64	21.27	4.1	21.41	3.7
	3	21.07	3.33	21.17	3.57	20.57	3.21
HSPA+ (16QAM)	4	21.01	3.27	21.11	3.5	20.37	3.57
	1	21.21	3.71	21.17	4.12	20.87	3.57

WCDMA Band V

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	22.06	3.42	22.17	3.28	22.11	3.33
HSDPA	1	20.98	4.06	21.09	4.20	21.02	3.94
	2	20.91	4.01	21.05	4.12	20.87	3.74
	3	20.9	4.02	21.03	3.27	20.54	3.78
	4	20.87	4.03	20.97	3.21	20.64	3.75
HSUPA	1	20.43	3.74	20.62	2.81	20.51	3.51
	2	20.41	3.73	20.6	3.5	20.53	3.47
	3	20.40	3.52	20.57	3.15	20.41	3.54
	4	20.37	3.42	20.54	3.21	20.34	3.57
DC-HSDPA	5	20.35	3.34	20.42	3.24	20.34	3.34
	1	20.87	3.71	20.88	3.57	20.71	3.4
	2	20.84	3.54	20.81	3.47	20.67	3.54
	3	20.81	3.24	20.64	3.54	20.54	3.67
HSPA+ (16QAM)	4	20.78	3.27	20.54	3.51	20.43	3.17
	1	20.81	3.3	21.07	3.4	20.34	3.24

LTE Band 2

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4MHz	QPSK	RB1#0	22.43	22.20	22.12
		RB1#3	22.51	22.24	22.09
		RB1#5	22.42	22.17	22.10
		RB3#0	22.52	22.19	22.17
		RB3#3	22.51	22.21	22.15
		RB6#0	21.46	21.28	21.09
	16QAM	RB1#0	21.58	21.28	21.25
		RB1#3	21.67	21.32	21.16
		RB1#5	21.54	21.26	21.13
		RB3#0	21.34	21.30	21.27
		RB3#3	21.36	21.30	21.29
		RB6#0	20.53	20.22	20.11
3MHz	QPSK	RB1#0	22.50	22.34	22.12
		RB1#8	22.40	22.25	22.12
		RB1#14	22.44	22.26	22.09
		RB6#0	21.60	21.36	21.17
		RB6#9	21.54	21.32	21.16
		RB15#0	21.60	21.32	21.21
	16QAM	RB1#0	22.06	21.47	21.31
		RB1#8	21.98	21.44	21.19
		RB1#14	21.97	21.39	21.26
		RB6#0	20.67	20.37	20.19
		RB6#9	20.66	20.39	20.20
		RB15#0	20.64	20.31	20.30
5MHz	QPSK	RB1#0	22.45	22.41	22.12
		RB1#13	22.47	22.35	22.13
		RB1#24	22.40	22.30	22.06
		RB15#0	21.61	21.37	21.22
		RB15#10	21.57	21.33	21.20
		RB25#0	21.55	21.33	21.20
	16QAM	RB1#0	21.38	21.66	21.35
		RB1#13	21.43	21.68	21.27
		RB1#24	21.38	21.61	21.28
		RB15#0	20.70	20.33	20.29
		RB15#10	20.63	20.31	20.27
		RB25#0	20.64	20.31	20.24

10MHz	QPSK	RB1#0	22.79	22.65	22.31
		RB1#25	22.49	22.26	22.16
		RB1#49	22.67	22.46	22.08
		RB25#0	21.68	21.39	21.34
		RB25#25	21.56	21.34	21.27
		RB50#0	21.64	21.38	21.29
	16QAM	RB1#0	22.35	21.80	21.46
		RB1#25	21.98	21.43	21.28
		RB1#49	22.17	21.60	21.25
		RB25#0	20.72	20.47	20.40
		RB25#25	20.61	20.38	20.37
		RB50#0	20.63	20.38	20.36
15MHz	QPSK	RB1#0	22.67	22.51	22.53
		RB1#38	22.47	22.26	22.24
		RB1#74	22.50	22.29	22.25
		RB36#0	21.67	21.47	21.36
		RB36#39	21.55	21.34	21.28
		RB75#0	21.60	21.38	21.25
	16QAM	RB1#0	22.21	21.72	21.94
		RB1#38	22.06	21.42	21.57
		RB1#74	22.03	21.42	21.67
		RB36#0	20.70	20.50	20.40
		RB36#39	20.56	20.39	20.25
		RB75#0	20.63	20.43	20.31
20MHz	QPSK	RB1#0	22.84	22.80	22.59
		RB1#50	22.49	22.34	22.28
		RB1#99	22.61	22.52	22.22
		RB50#0	21.73	21.55	21.60
		RB50#50	21.52	21.34	21.38
		RB100#0	21.62	21.43	21.46
	16QAM	RB1#0	22.37	22.07	22.17
		RB1#50	21.85	21.59	21.85
		RB1#99	21.98	21.74	21.91
		RB50#0	20.76	20.56	20.57
		RB50#50	20.52	20.39	20.42
		RB100#0	20.66	20.46	20.49

LTE Band 4

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4MHz	QPSK	RB1#0	22.55	22.56	22.53
		RB1#3	22.60	22.62	22.62
		RB1#5	22.55	22.58	22.54
		RB3#0	22.58	22.56	22.54
		RB3#3	22.57	22.54	22.56
		RB6#0	21.59	21.55	21.54
	16QAM	RB1#0	21.54	21.67	21.60
		RB1#3	21.58	21.74	21.64
		RB1#5	21.54	21.65	21.62
		RB3#0	21.71	21.55	21.67
		RB3#3	21.78	21.53	21.66
		RB6#0	20.58	20.58	20.50
3MHz	QPSK	RB1#0	22.58	22.64	22.66
		RB1#8	22.57	22.61	22.64
		RB1#14	22.56	22.61	22.62
		RB6#0	21.67	21.62	21.69
		RB6#9	21.66	21.61	21.65
		RB15#0	21.66	21.63	21.68
	16QAM	RB1#0	22.05	21.81	21.73
		RB1#8	22.10	21.76	21.69
		RB1#14	22.05	21.74	21.71
		RB6#0	20.78	20.72	20.65
		RB6#9	20.71	20.71	20.61
		RB15#0	20.72	20.63	20.75
5MHz	QPSK	RB1#0	21.73	21.87	21.89
		RB1#13	21.78	21.88	21.92
		RB1#24	21.75	21.84	21.91
		RB15#0	20.81	20.79	20.93
		RB15#10	20.80	20.79	20.91
		RB25#0	20.75	20.78	20.87
	16QAM	RB1#0	20.68	21.12	21.04
		RB1#13	20.70	21.17	21.00
		RB1#24	20.69	21.13	20.99
		RB15#0	19.83	19.76	19.97
		RB15#10	19.81	19.78	19.98
		RB25#0	19.83	19.80	19.96

10MHz	QPSK	RB1#0	21.77	22.48	22.41
		RB1#25	21.68	22.40	22.24
		RB1#49	21.75	22.46	22.25
		RB25#0	20.80	21.43	21.24
		RB25#25	20.81	21.34	21.34
		RB50#0	20.79	21.40	21.35
	16QAM	RB1#0	20.91	21.52	21.79
		RB1#25	20.86	21.37	21.81
		RB1#49	20.90	21.47	21.80
		RB25#0	19.85	20.48	20.32
		RB25#25	19.81	20.49	20.36
		RB50#0	20.46	20.40	20.35
15MHz	QPSK	RB1#0	22.28	22.37	22.41
		RB1#38	22.07	22.15	22.20
		RB1#74	22.26	22.30	22.35
		RB36#0	21.26	21.25	21.35
		RB36#39	21.23	21.21	21.36
		RB75#0	21.18	21.23	21.27
	16QAM	RB1#0	21.79	21.53	21.83
		RB1#38	21.65	21.34	21.64
		RB1#74	21.79	21.45	21.76
		RB36#0	20.25	20.34	20.32
		RB36#39	20.30	20.24	20.38
		RB75#0	20.17	20.28	20.27
20MHz	QPSK	RB1#0	22.30	22.44	22.33
		RB1#50	22.11	22.22	22.19
		RB1#99	22.30	22.40	22.35
		RB50#0	21.33	21.32	21.42
		RB50#50	21.29	21.31	21.40
		RB100#0	21.26	21.26	21.35
	16QAM	RB1#0	21.72	21.67	21.91
		RB1#50	21.47	21.44	21.78
		RB1#99	21.61	21.61	21.94
		RB50#0	20.28	20.33	20.40
		RB50#50	20.26	20.30	20.41
		RB100#0	20.26	20.29	20.36

LTE Band 5

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4MHz	QPSK	RB1#0	22.69	22.70	22.34
		RB1#3	22.77	22.75	22.38
		RB1#5	22.71	22.71	22.33
		RB3#0	22.75	22.75	22.38
		RB3#3	22.71	22.76	22.37
		RB6#0	21.73	21.69	21.37
	16QAM	RB1#0	21.78	21.84	21.47
		RB1#3	21.85	21.89	21.47
		RB1#5	21.72	21.40	21.40
		RB3#0	21.93	21.46	21.55
		RB3#3	21.93	21.41	21.59
3MHz	QPSK	RB1#0	22.43	22.45	22.46
		RB1#8	22.44	22.40	22.41
		RB1#14	22.41	22.42	22.40
		RB6#0	21.49	21.46	21.46
		RB6#9	21.50	21.43	21.45
		RB15#0	21.48	21.45	21.46
	16QAM	RB1#0	22.05	21.61	21.56
		RB1#8	22.03	21.56	21.50
		RB1#14	21.99	21.57	21.48
		RB6#0	20.56	20.48	20.47
5MHz	QPSK	RB1#0	22.51	22.53	22.50
		RB1#13	22.59	22.54	22.50
		RB1#24	22.47	22.47	22.43
		RB15#0	21.52	21.43	21.53
		RB15#10	21.49	21.43	21.51
		RB25#0	21.47	21.46	21.46
	16QAM	RB1#0	21.46	21.80	21.59
		RB1#13	21.53	21.83	21.57
		RB1#24	21.42	21.75	21.56
		RB15#0	20.57	20.44	20.55
10MHz	QPSK	RB1#0	22.50	22.52	22.57
		RB1#25	22.40	22.41	22.47
		RB1#49	22.47	22.41	22.42
		RB25#0	21.50	21.51	21.57
		RB25#25	21.52	21.46	21.52
		RB50#0	21.46	21.50	21.55
	16QAM	RB1#0	22.06	21.71	21.61
		RB1#25	22.04	21.64	21.50
		RB1#49	22.04	21.57	21.50
		RB25#0	20.56	20.54	20.66
	QPSK	RB25#25	20.59	20.50	20.65
		RB50#0	20.49	20.48	20.57

LTE Band 7

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5MHz	QPSK	RB1#0	21.21	21.26	21.24
		RB1#13	21.23	21.24	21.22
		RB1#24	21.14	21.18	21.10
		RB15#0	20.31	20.23	20.24
		RB15#10	20.31	20.18	20.21
		RB25#0	20.27	20.23	20.25
	16QAM	RB1#0	20.14	20.60	20.34
		RB1#13	20.24	20.59	20.35
		RB1#24	20.08	20.46	20.22
		RB15#0	19.34	19.24	19.29
		RB15#10	19.30	19.18	19.22
		RB25#0	19.34	19.22	19.25
10MHz	QPSK	RB1#0	21.28	21.37	21.31
		RB1#25	21.17	21.16	21.21
		RB1#49	21.20	21.09	21.14
		RB25#0	20.30	20.24	20.30
		RB25#25	20.21	20.20	20.22
		RB50#0	20.31	20.24	20.30
	16QAM	RB1#0	20.88	20.46	20.42
		RB1#25	20.80	20.26	20.27
		RB1#49	20.72	20.29	20.22
		RB25#0	19.36	19.30	19.44
		RB25#25	19.33	19.21	19.30
		RB50#0	19.33	19.22	19.34
15MHz	QPSK	RB1#0	21.41	21.43	21.35
		RB1#38	21.20	21.18	21.24
		RB1#74	21.22	21.13	21.16
		RB36#0	20.31	20.32	20.30
		RB36#39	20.29	20.18	20.26
		RB75#0	20.23	20.23	20.28
	16QAM	RB1#0	20.95	20.53	20.78
		RB1#38	20.75	20.30	20.64
		RB1#74	20.76	20.25	20.57
		RB36#0	19.34	19.33	19.31
		RB36#39	19.30	19.23	19.22
		RB75#0	19.27	19.24	19.32
20MHz	QPSK	RB1#0	21.42	21.44	21.27
		RB1#50	21.20	21.24	21.16
		RB1#99	21.24	21.32	21.04
		RB50#0	20.37	20.35	20.27
		RB50#50	20.27	20.14	20.16
		RB100#0	20.26	20.26	20.27
	16QAM	RB1#0	20.81	20.68	21.12
		RB1#50	20.57	20.48	20.89
		RB1#99	20.53	20.50	20.82
		RB50#0	19.37	19.37	19.74
		RB50#50	19.27	19.20	19.63
		RB100#0	19.29	19.30	19.76

LTE Band 66

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4MHz	QPSK	RB1#0	21.99	22.08	22.02
		RB1#13	22.03	22.15	22.14
		RB1#24	22.00	22.09	21.98
		RB15#0	22.02	22.13	22.05
		RB15#10	21.98	22.11	22.06
		RB25#0	20.96	21.12	21.07
	16QAM	RB1#0	21.00	21.23	21.12
		RB1#13	21.16	21.30	21.19
		RB1#24	20.96	21.19	21.07
		RB15#0	21.09	21.12	21.20
		RB15#10	21.18	21.11	21.18
3MHz	QPSK	RB1#0	21.95	22.20	22.11
		RB1#25	21.94	22.15	22.09
		RB1#49	21.95	22.12	22.08
		RB25#0	21.03	21.17	21.16
		RB25#25	20.96	21.13	21.12
	16QAM	RB50#0	21.03	21.19	21.13
		RB1#0	21.48	21.29	21.23
		RB1#25	21.49	21.32	21.19
		RB1#49	21.45	21.27	21.19
		RB25#0	20.09	20.22	20.15
5MHz	QPSK	RB25#25	20.08	20.24	20.16
		RB50#0	20.07	20.16	20.20
	16QAM	RB1#0	21.97	22.24	22.09
		RB1#38	22.01	22.24	22.13
		RB1#74	21.94	22.19	22.06
		RB36#0	21.03	21.19	21.19
		RB36#39	21.01	21.17	21.19
	16QAM	RB75#0	20.98	21.16	21.16
		RB1#0	20.92	21.53	21.22
		RB1#38	20.93	21.53	21.28
10MHz	QPSK	RB1#74	20.91	21.50	21.22
		RB36#0	20.07	20.16	20.21
		RB36#39	20.06	20.17	20.21
		RB75#0	20.11	20.18	20.22
	16QAM	RB1#0	22.06	22.25	22.17
		RB1#50	22.00	22.17	22.11
		RB1#99	22.14	22.18	22.10
		RB50#0	21.09	21.25	21.21
		RB50#50	21.18	21.21	21.22
	16QAM	RB100#0	21.09	21.19	21.21
		RB1#0	21.57	21.38	21.23
		RB1#50	21.50	21.31	21.21
		RB1#99	21.66	21.28	21.26
		RB50#0	20.13	20.29	20.30
		RB50#50	20.21	20.21	20.28
		RB100#0	20.07	20.20	20.25

15MHz	QPSK	RB1#0	22.10	22.27	22.33
		RB1#50	22.03	22.18	22.18
		RB1#99	22.18	22.22	22.21
		RB50#0	21.08	21.29	21.23
		RB50#50	21.13	21.23	21.25
		RB100#0	21.16	21.22	21.20
	16QAM	RB1#0	21.65	21.41	21.72
		RB1#50	21.60	21.31	21.55
		RB1#99	21.67	21.39	21.57
		RB50#0	20.07	20.30	20.28
		RB50#50	20.19	20.22	20.22
		RB100#0	20.19	20.27	20.23
20MHz	QPSK	RB1#0	22.15	22.31	22.18
		RB1#50	22.10	22.24	22.09
		RB1#99	22.32	22.27	22.13
		RB50#0	21.11	21.34	21.29
		RB50#50	21.14	21.23	21.25
		RB100#0	21.21	21.27	21.27
	16QAM	RB1#0	21.54	21.59	21.79
		RB1#50	21.42	21.45	21.65
		RB1#99	21.62	21.50	21.76
		RB50#0	20.13	20.34	20.27
		RB50#50	20.19	20.25	20.29
		RB100#0	20.21	20.26	20.26

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	3.46	4.13	4.01	13
	100 RB		5.16	5.19	5.13	13
16QAM	1 RB	20 MHz	4.42	5.06	4.90	13
	100 RB		6.12	6.19	6.03	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	3.81	4.33	4.26	13
	100 RB		5.19	5.32	5.38	13
16QAM	1 RB	20 MHz	4.68	5.26	5.22	13
	100 RB		6.06	6.22	6.31	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	4.81	4.46	4.74	13
	50 RB		5.38	5.51	5.38	13
16QAM	1 RB	10 MHz	5.90	5.42	5.74	13
	50 RB		6.41	6.41	6.35	13

PAR, Band 7

Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	20 MHz	3.59	3.49	3.88	13
	100 RB		5.06	5.10	5.29	13
16QAM	1 RB	20 MHz	4.62	4.39	4.78	13
	100 RB		5.96	5.99	6.12	13

PAR, Band 66

Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	10 MHz	3.91	4.01	3.81	13
	50 RB		5.22	5.26	5.22	13
16QAM	1 RB	10 MHz	4.90	4.94	4.74	13
	50 RB		6.09	6.19	6.09	13

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

ERP & EIRP

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 V Middle Channel								
836.60	H	94.70	19.78	0.00	0.97	18.81	38.45	19.64
836.60	V	90.81	19.02	0.00	0.97	18.05	38.45	20.40
WCDMA Band II Middle Channel								
1880.00	H	85.74	13.13	11.66	2.66	22.13	33.00	10.87
1880.00	V	93.10	20.63	11.66	2.66	29.63	33.00	3.37

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	83.65	11.04	11.66	2.66	20.04	33.00	12.96
1880.00			V	89.67	17.20	11.66	2.66	26.20	33.00	6.80
1880.00	3.00		H	83.14	10.53	11.66	2.66	19.53	33.00	13.47
1880.00			V	89.65	17.18	11.66	2.66	26.18	33.00	6.82
1880.00	5.00		H	83.01	10.40	11.66	2.66	19.40	33.00	13.60
1880.00			V	89.41	16.94	11.66	2.66	25.94	33.00	7.06
1880.00	10.00		H	82.65	10.04	11.66	2.66	19.04	33.00	13.96
1880.00			V	89.00	16.53	11.66	2.66	25.53	33.00	7.47
1880.00	15.00		H	82.59	9.98	11.66	2.66	18.98	33.00	14.02
1880.00			V	88.69	16.22	11.66	2.66	25.22	33.00	7.78
1880.00	20.00		H	82.87	10.26	11.66	2.66	19.26	33.00	13.74
1880.00			V	88.93	16.46	11.66	2.66	25.46	33.00	7.54
1880.00	1.40	16QAM	H	82.52	9.91	11.66	2.66	18.91	33.00	14.09
1880.00			V	88.85	16.38	11.66	2.66	25.38	33.00	7.62
1880.00	3.00		H	82.15	9.54	11.66	2.66	18.54	33.00	14.46
1880.00			V	88.54	16.07	11.66	2.66	25.07	33.00	7.93
1880.00	5.00		H	81.67	9.06	11.66	2.66	18.06	33.00	14.94
1880.00			V	88.23	15.76	11.66	2.66	24.76	33.00	8.24
1880.00	10.00		H	81.26	8.65	11.66	2.66	17.65	33.00	15.35
1880.00			V	88.01	15.54	11.66	2.66	24.54	33.00	8.46
1880.00	15.00		H	81.05	8.44	11.66	2.66	17.44	33.00	15.56
1880.00			V	87.63	15.16	11.66	2.66	24.16	33.00	8.84
1880.00	20.00		H	81.55	8.94	11.66	2.66	17.94	33.00	15.06
1880.00			V	87.91	15.44	11.66	2.66	24.44	33.00	8.56

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	83.21	9.16	10.90	2.51	17.55	30.00	12.45
1732.50			V	89.34	14.97	10.90	2.51	23.36	30.00	6.64
1732.50	3.00		H	83.01	8.96	10.90	2.51	17.35	30.00	12.65
1732.50			V	89.00	14.63	10.90	2.51	23.02	30.00	6.98
1732.50	5.00		H	82.76	8.71	10.90	2.51	17.10	30.00	12.90
1732.50			V	88.76	14.39	10.90	2.51	22.78	30.00	7.22
1732.50	10.00		H	82.45	8.40	10.90	2.51	16.79	30.00	13.21
1732.50			V	88.52	14.15	10.90	2.51	22.54	30.00	7.46
1732.50	15.00		H	82.12	8.07	10.90	2.51	16.46	30.00	13.54
1732.50			V	88.34	13.97	10.90	2.51	22.36	30.00	7.64
1732.50	20.00		H	82.54	8.49	10.90	2.51	16.88	30.00	13.12
1732.50			V	88.26	13.89	10.90	2.51	22.28	30.00	7.72
1732.50	1.40	16QAM	H	82.15	8.10	10.90	2.51	16.49	30.00	13.51
1732.50			V	88.97	14.60	10.90	2.51	22.99	30.00	7.01
1732.50	3.00		H	82.01	7.96	10.90	2.51	16.35	30.00	13.65
1732.50			V	88.64	14.27	10.90	2.51	22.66	30.00	7.34
1732.50	5.00		H	81.64	7.59	10.90	2.51	15.98	30.00	14.02
1732.50			V	88.32	13.95	10.90	2.51	22.34	30.00	7.66
1732.50	10.00		H	81.45	7.40	10.90	2.51	15.79	30.00	14.21
1732.50			V	88.01	13.64	10.90	2.51	22.03	30.00	7.97
1732.50	15.00		H	81.25	7.20	10.90	2.51	15.59	30.00	14.41
1732.50			V	87.64	13.27	10.90	2.51	21.66	30.00	8.34
1732.50	20.00		H	82.98	8.93	10.90	2.51	17.32	30.00	12.68
1732.50			V	88.20	13.83	10.90	2.51	22.22	30.00	7.78

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	95.69	20.76	0.00	0.97	19.79	38.45	18.66
836.50			V	91.41	19.62	0.00	0.97	18.65	38.45	19.80
836.50	3.00		H	94.02	19.09	0.00	0.97	18.12	38.45	20.33
836.50			V	89.16	17.37	0.00	0.97	16.40	38.45	22.05
836.50	5.00		H	93.86	18.93	0.00	0.97	17.96	38.45	20.49
836.50			V	87.58	15.79	0.00	0.97	14.82	38.45	23.63
836.50	10.00		H	93.26	18.33	0.00	0.97	17.36	38.45	21.09
836.50			V	86.56	14.77	0.00	0.97	13.80	38.45	24.65
836.50	1.40	16QAM	H	96.10	21.17	0.00	0.97	20.20	38.45	18.25
836.50			V	90.29	18.50	0.00	0.97	17.53	38.45	20.92
836.50	3.00		H	94.37	19.44	0.00	0.97	18.47	38.45	19.98
836.50			V	90.12	18.33	0.00	0.97	17.36	38.45	21.09
836.50	5.00		H	94.10	19.17	0.00	0.97	18.20	38.45	20.25
836.50			V	89.59	17.80	0.00	0.97	16.83	38.45	21.62
836.50	10.00		H	93.32	18.39	0.00	0.97	17.42	38.45	21.03
836.50			V	88.57	16.78	0.00	0.97	15.81	38.45	22.64

LTE Band 7

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)			
2535.00	5.00	QPSK	H	81.35	8.74	13.14	3.10	18.78	33.00	14.22
2535.00			V	87.23	16.08	13.14	3.10	26.12	33.00	6.88
2535.00	10.00		H	81.01	8.40	13.14	3.10	18.44	33.00	14.56
2535.00			V	87.01	15.86	13.14	3.10	25.90	33.00	7.10
2535.00	15.00		H	80.74	8.13	13.14	3.10	18.17	33.00	14.83
2535.00			V	86.35	15.20	13.14	3.10	25.24	33.00	7.76
2535.00	20.00		H	80.88	8.27	13.14	3.10	18.31	33.00	14.69
2535.00			V	86.73	15.58	13.14	3.10	25.62	33.00	7.38
2535.00	5.00	16QAM	H	80.64	8.03	13.14	3.10	18.07	33.00	14.93
2535.00			V	86.74	15.59	13.14	3.10	25.63	33.00	7.37
2535.00	10.00		H	80.54	7.93	13.14	3.10	17.97	33.00	15.03
2535.00			V	86.46	15.31	13.14	3.10	25.35	33.00	7.65
2535.00	15.00		H	80.20	7.59	13.14	3.10	17.63	33.00	15.37
2535.00			V	86.27	15.12	13.14	3.10	25.16	33.00	7.84
2535.00	20.00		H	80.59	7.98	13.14	3.10	18.02	33.00	14.98
2535.00			V	86.12	14.97	13.14	3.10	25.01	33.00	7.99

LTE Band 66

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)			
1745.00	1.40	QPSK	H	83.54	9.60	10.94	2.53	18.01	30.00	11.99
1745.00			V	90.66	16.38	10.94	2.53	24.79	30.00	5.21
1745.00	3.00		H	83.21	9.27	10.94	2.53	17.68	30.00	12.32
1745.00			V	90.34	16.06	10.94	2.53	24.47	30.00	5.53
1745.00	5.00		H	82.97	9.03	10.94	2.53	17.44	30.00	12.56
1745.00			V	90.10	15.82	10.94	2.53	24.23	30.00	5.77
1745.00	10.00		H	82.67	8.73	10.94	2.53	17.14	30.00	12.86
1745.00			V	89.54	15.26	10.94	2.53	23.67	30.00	6.33
1745.00	15.00		H	82.54	8.60	10.94	2.53	17.01	30.00	12.99
1745.00			V	89.32	15.04	10.94	2.53	23.45	30.00	6.55
1745.00	20.00		H	82.39	8.45	10.94	2.53	16.86	30.00	13.14
1745.00			V	89.21	14.93	10.94	2.53	23.34	30.00	6.66
1745.00	1.40	16QAM	H	82.84	8.90	10.94	2.53	17.31	30.00	12.69
1745.00			V	89.74	15.46	10.94	2.53	23.87	30.00	6.13
1745.00	3.00		H	82.62	8.68	10.94	2.53	17.09	30.00	12.91
1745.00			V	89.64	15.36	10.94	2.53	23.77	30.00	6.23
1745.00	5.00		H	82.37	8.43	10.94	2.53	16.84	30.00	13.16
1745.00			V	89.25	14.97	10.94	2.53	23.38	30.00	6.62
1745.00	10.00		H	82.03	8.09	10.94	2.53	16.50	30.00	13.50
1745.00			V	89.01	14.73	10.94	2.53	23.14	30.00	6.86
1745.00	15.00		H	82.75	8.81	10.94	2.53	17.22	30.00	12.78
1745.00			V	88.54	14.26	10.94	2.53	22.67	30.00	7.33
1745.00	20.00		H	82.44	8.50	10.94	2.53	16.91	30.00	13.09
1745.00			V	88.45	14.17	10.94	2.53	22.58	30.00	7.42

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

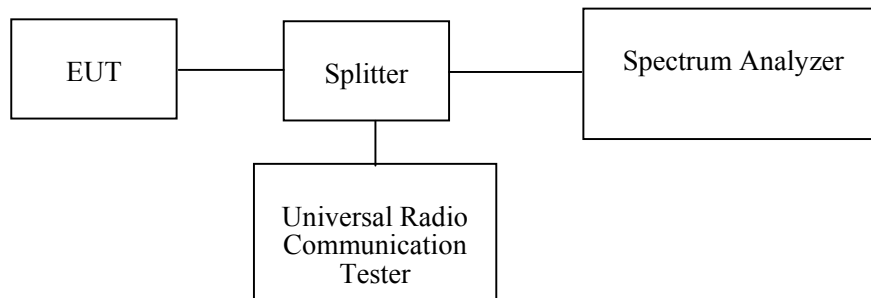
FCC §2.1049, §22.917, §22.905 & §24.238 & §27.53- OCCUPIED BANDWIDTH**Applicable Standard**

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	FSV40	101474	2019-01-09	2020-01-09
R&S	Spectrum Analyzer	FSU 26	200256	2019-05-09	2020-05-09
Unknown	Coaxial Cable	C-SJ00-0010	C0010/05	Each time	/
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41010013	Each time	/
E-Microwave	Two-way Splitter	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:	25.4~26.5°C
Relative Humidity:	44~60%
ATM Pressure:	100.2~100.6kPa
Test by:	Elena Lei, Vern Shen
Test Date:	2019-11-18 ~ 2019-11-21

Test Mode: Transmitting

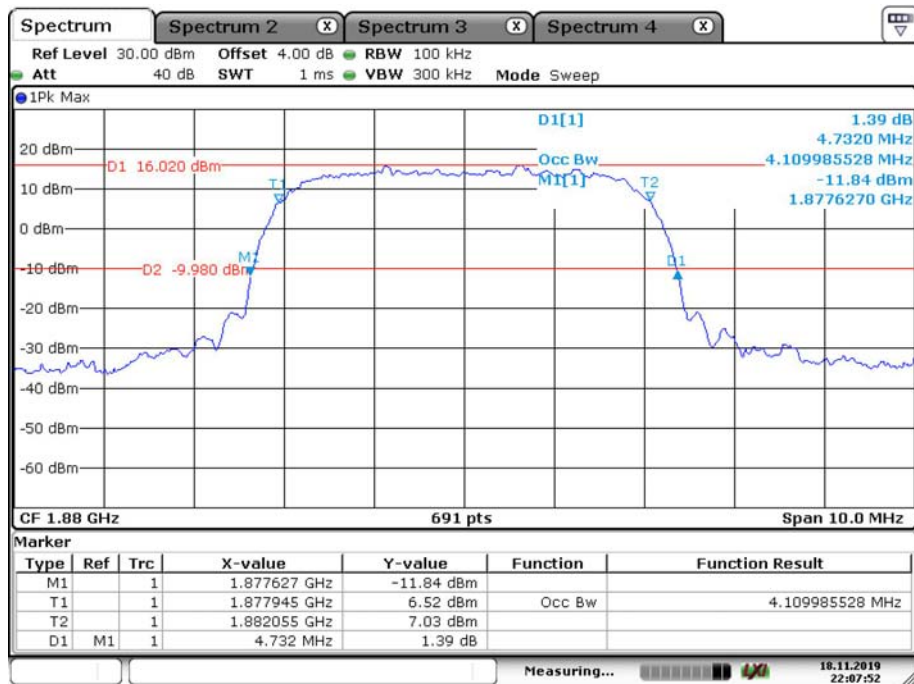
Test Result: Compliant. Please refer to the following table and plots.

Band	Test Channel	Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
WCDMA Band II	M	Rel 99	4.11	4.73
		HSDPA	4.12	4.73
		HSUPA	4.12	4.73
WCDMA Band V		Rel 99	4.12	4.73
		HSDPA	4.14	4.72
		HSUPA	4.12	4.73

Band	Bandwidth	Modulation	99% occupied bandwidth (MHz)	26 dB bandwidth (MHz)
LTE Band 2	1.4 MHz	QPSK	1.092	1.248
		16QAM	1.092	1.230
	3 MHz	QPSK	2.688	2.952
		16QAM	2.688	2.988
	5 MHz	QPSK	4.520	4.980
		16QAM	4.520	4.980
	10 MHz	QPSK	8.960	9.720
		16QAM	8.960	9.680
	15 MHz	QPSK	13.440	14.895
		16QAM	13.500	14.820
LTE Band 4	1.4 MHz	QPSK	1.098	1.248
		16QAM	1.098	1.248
	3 MHz	QPSK	2.688	2.940
		16QAM	2.688	2.976
	5 MHz	QPSK	4.540	4.960
		16QAM	4.520	4.980
	10 MHz	QPSK	8.960	9.760
		16QAM	8.960	9.600
	15 MHz	QPSK	13.560	14.820
		16QAM	13.500	14.760
LTE Band 5	1.4 MHz	QPSK	1.092	1.248
		16QAM	1.104	1.236
	3 MHz	QPSK	2.688	2.952
		16QAM	2.688	2.940
	5 MHz	QPSK	4.520	4.960
		16QAM	4.520	4.960
	10 MHz	QPSK	8.960	9.720
		16QAM	8.960	9.560

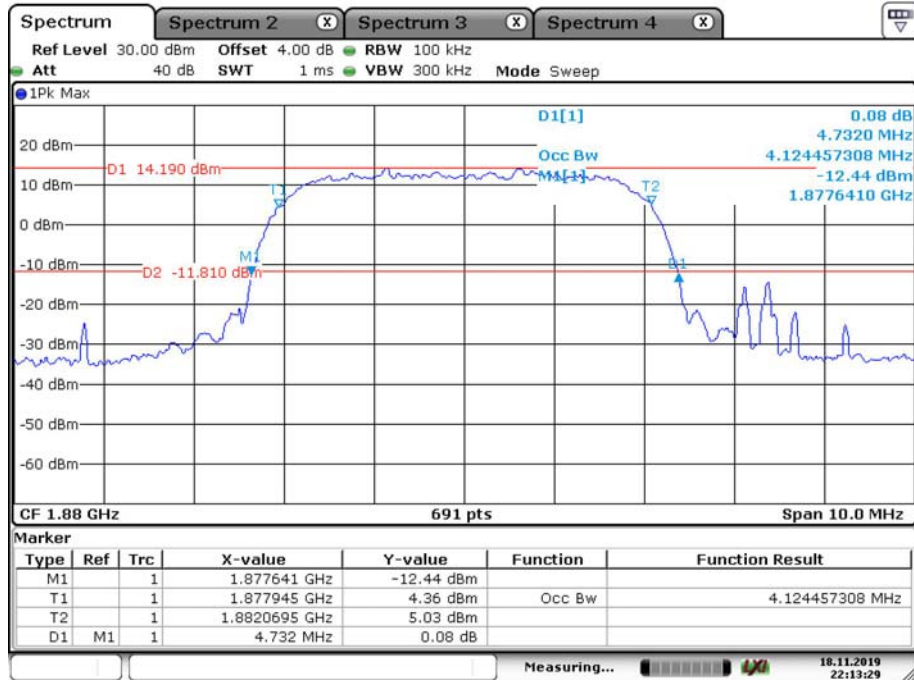
Band	Bandwidth	Modulation	99% occupied bandwidth (MHz)	26 dB bandwidth (MHz)
LTE Band 7	5 MHz	QPSK	4.540	4.980
		16QAM	4.520	4.980
	10 MHz	QPSK	8.960	9.760
		16QAM	8.960	9.680
	15 MHz	QPSK	13.560	14.880
		16QAM	13.560	14.820
	20 MHz	QPSK	17.920	19.360
		16QAM	17.920	19.520
LTE Band 66	1.4 MHz	QPSK	1.098	1.248
		16QAM	1.098	1.242
	3 MHz	QPSK	2.688	2.952
		16QAM	2.688	3.000
	5 MHz	QPSK	4.520	5.020
		16QAM	4.520	5.000
	10 MHz	QPSK	8.960	9.720
		16QAM	8.960	9.600
	15 MHz	QPSK	13.500	15.000
		16QAM	13.500	14.820
	20 MHz	QPSK	17.920	19.360
		16QAM	17.840	19.360

WCDMA Band II, Rel 99



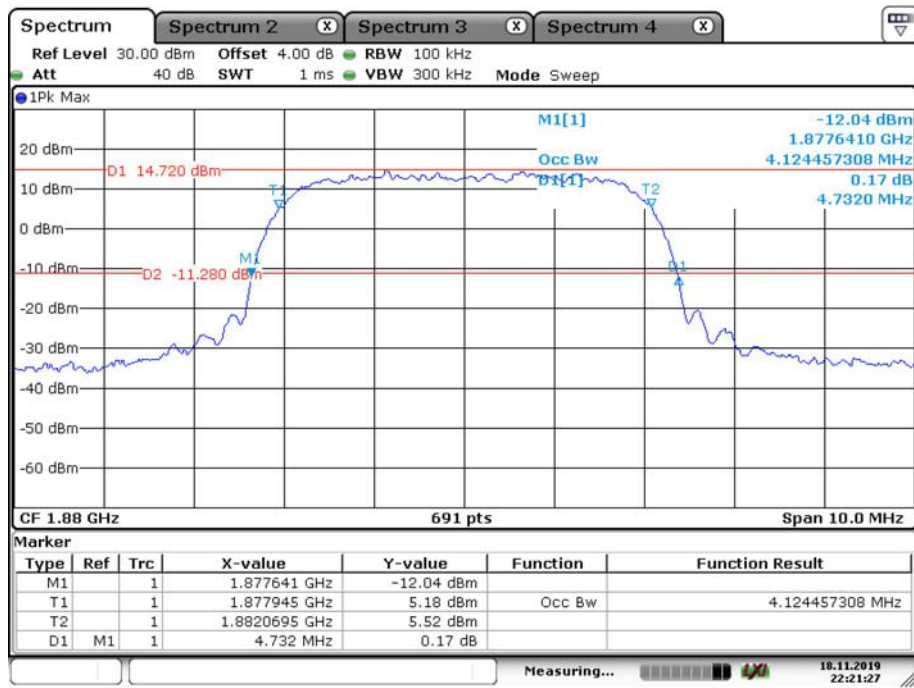
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WCDMA Band II, HSUPA



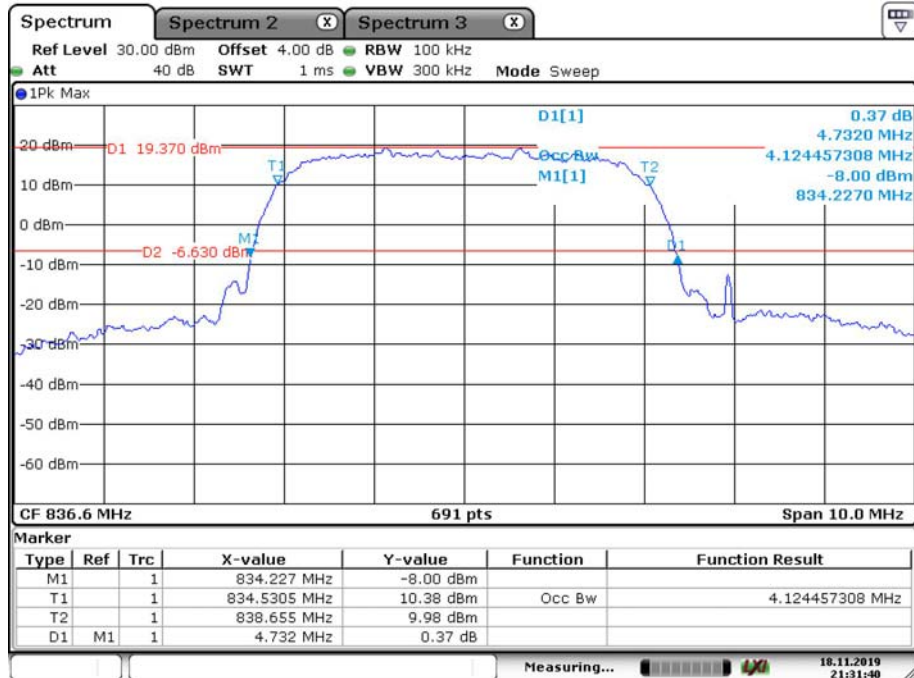
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WCDMA Band II, HSDPA



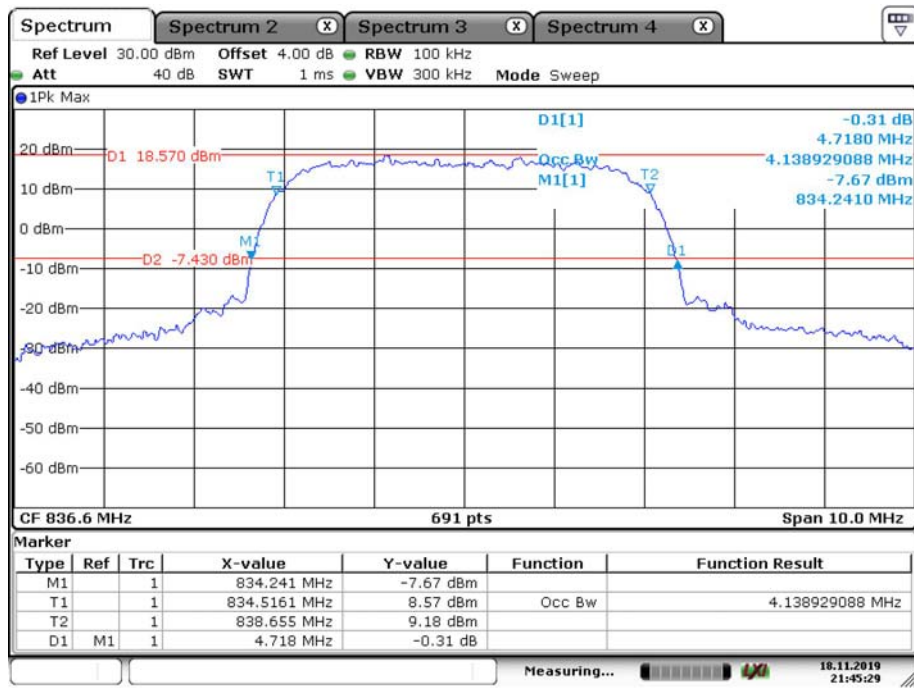
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WCDMA Band V, Rel 99



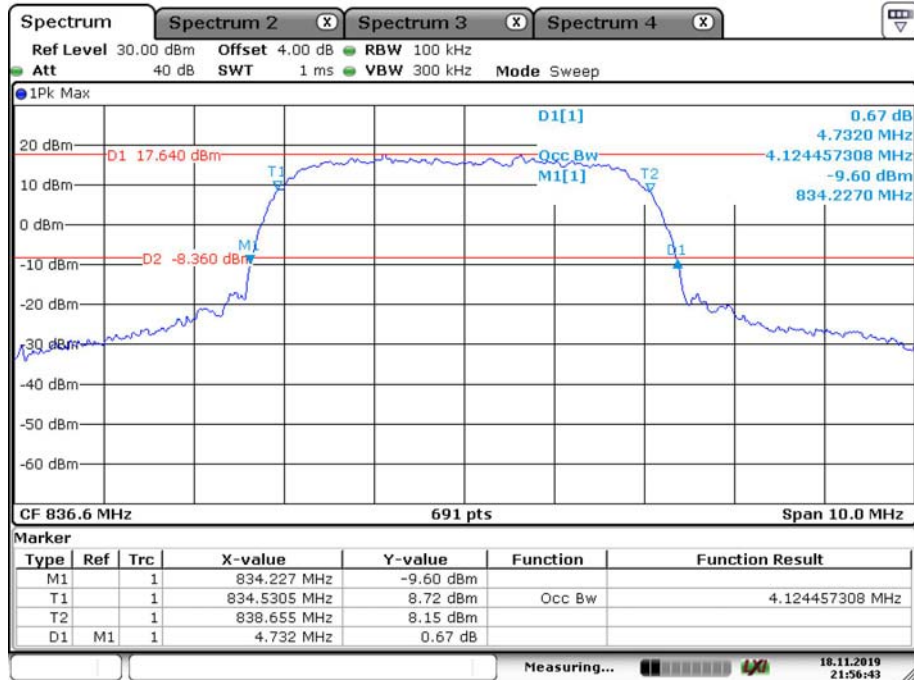
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WCDMA Band V, HSDPA



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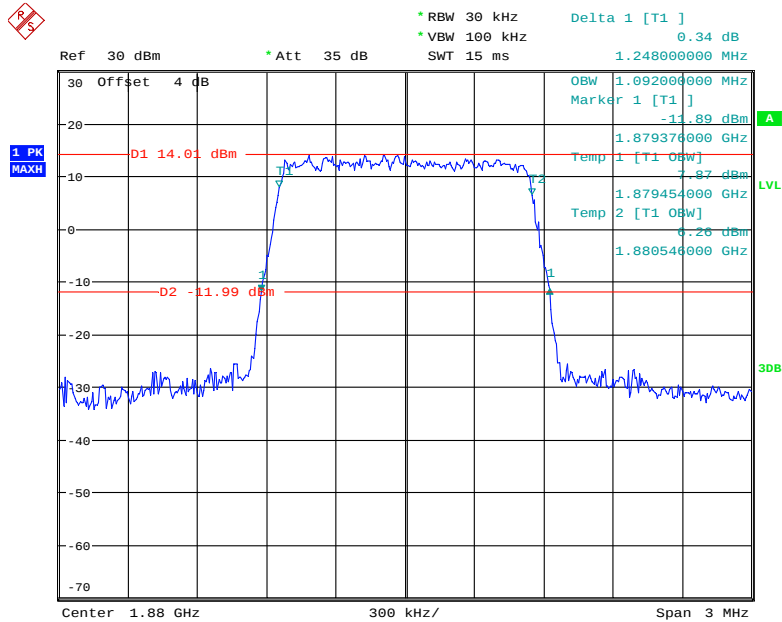
WCDMA Band V, HSUPA



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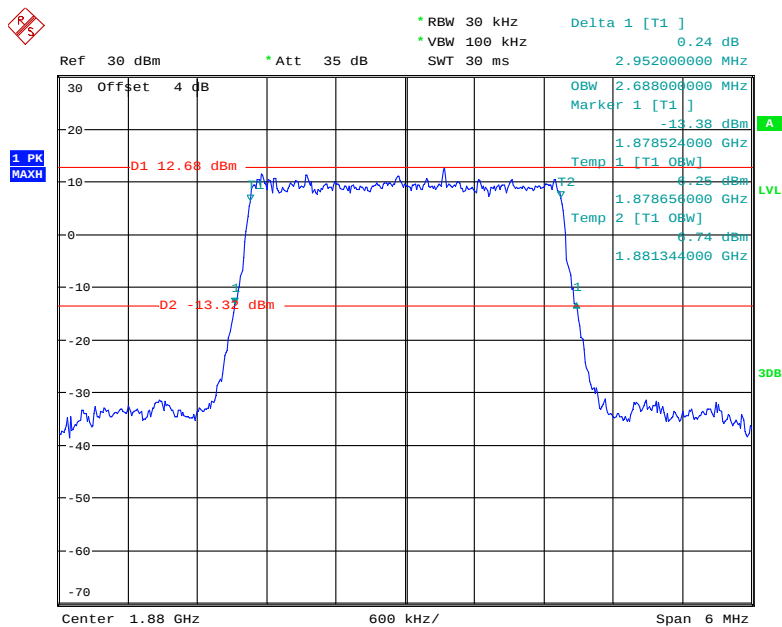
LTE Band 2

QPSK_1.4 MHz



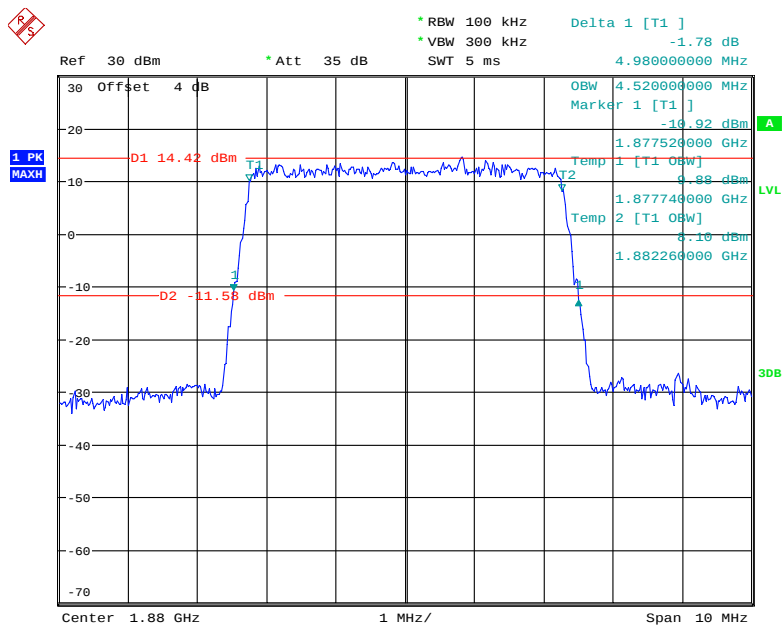
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QPSK_3 MHz



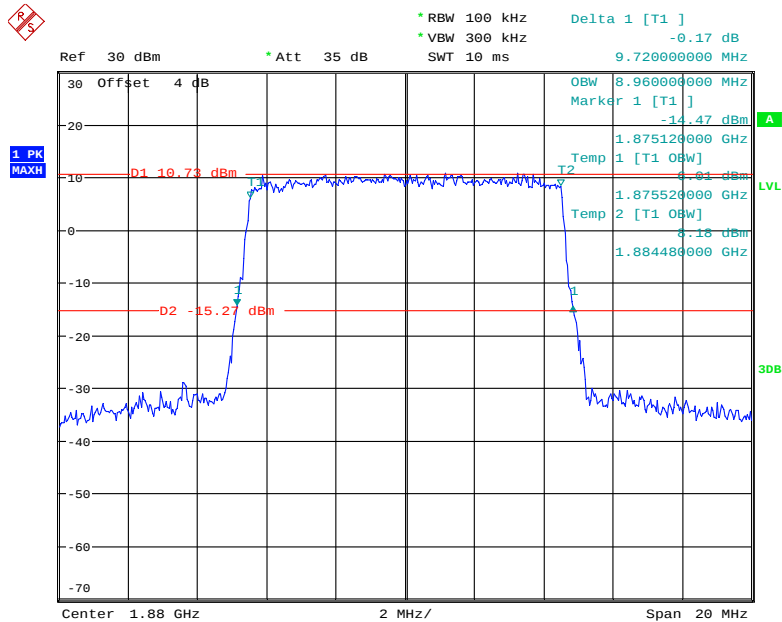
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QPSK_5 MHz



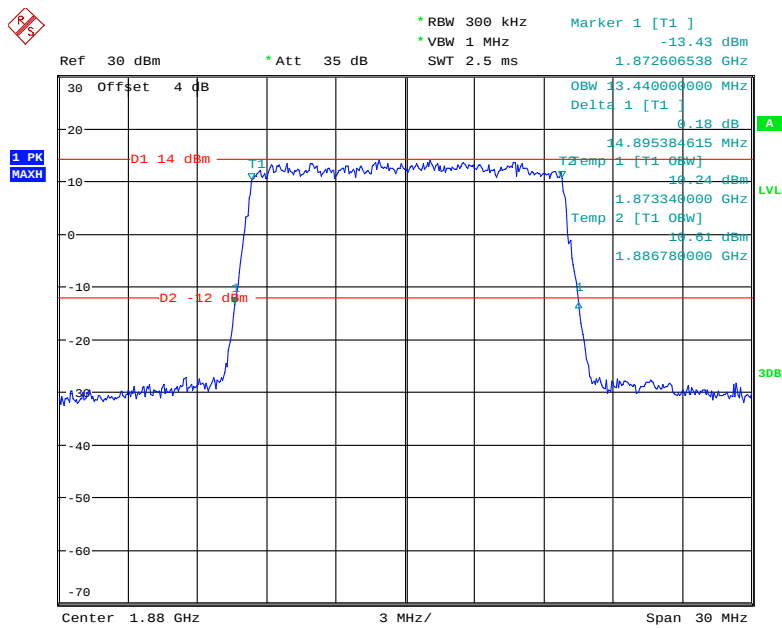
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QPSK_10 MHz



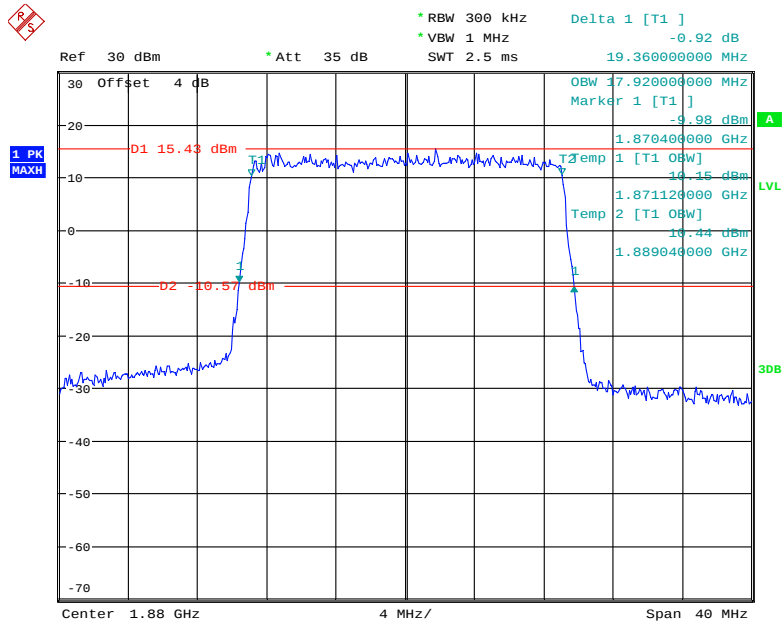
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QPSK_15 MHz



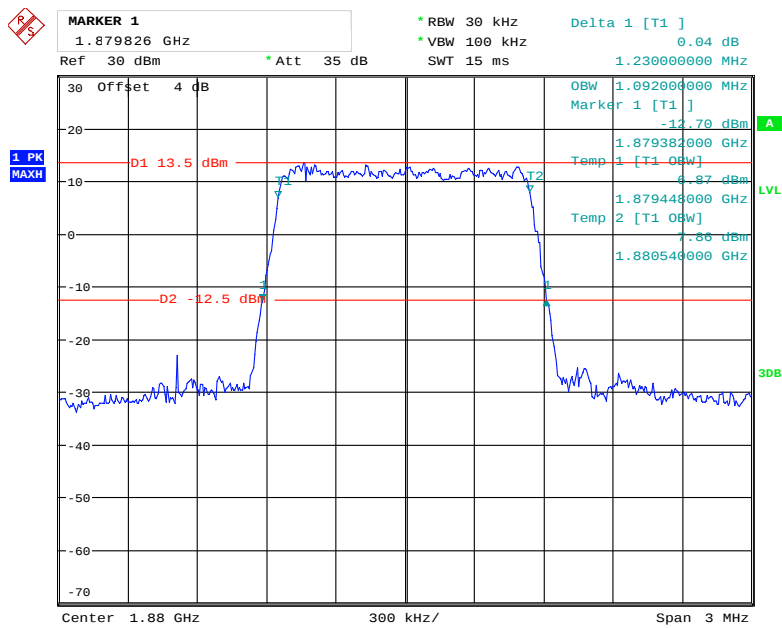
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QPSK_20 MHz



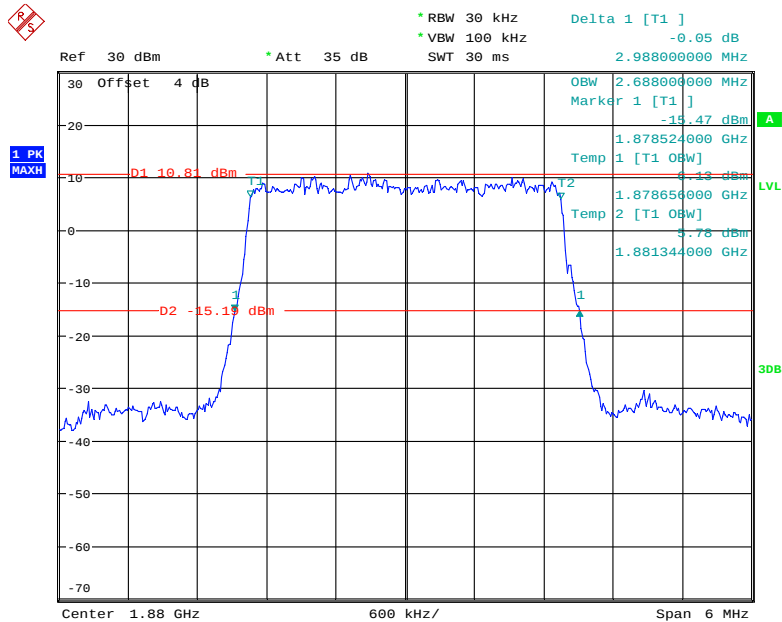
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16QAM_1.4 MHz



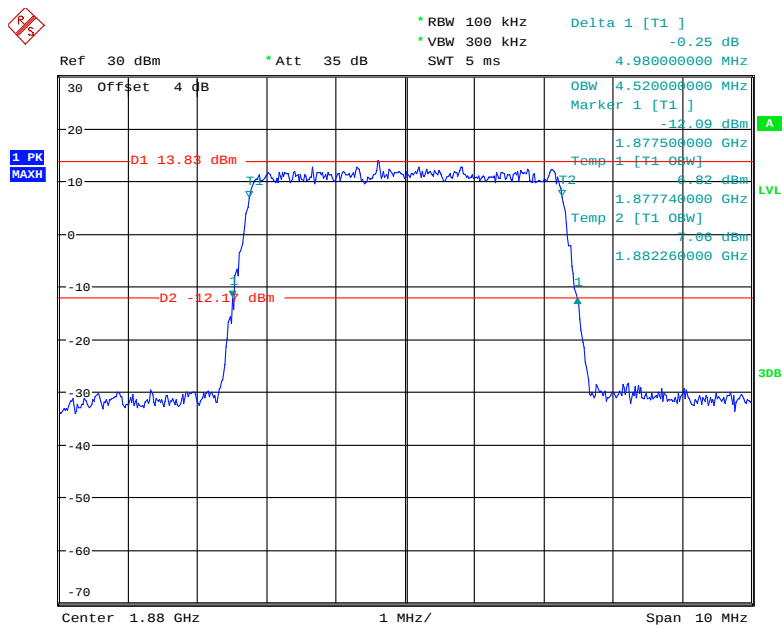
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16QAM_3 MHz



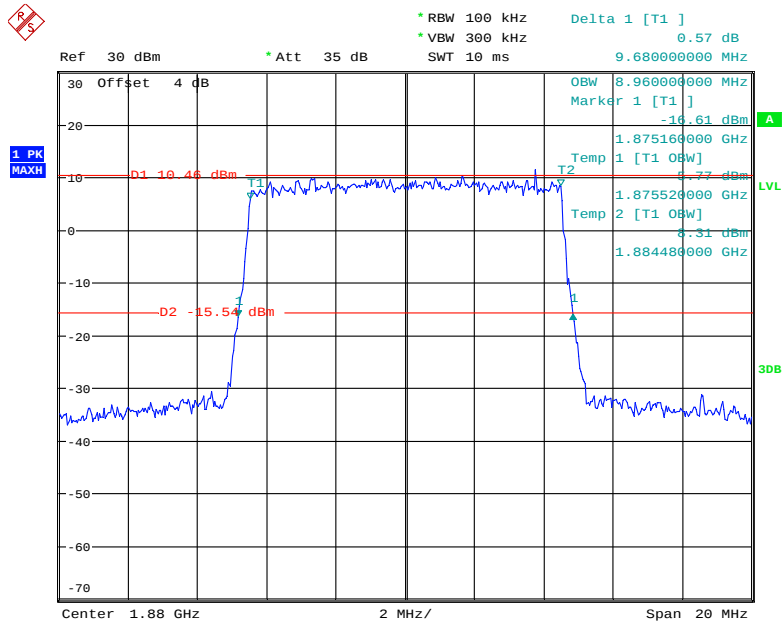
Date: 21.NOV.2019 09:19:44

16QAM_5 MHz



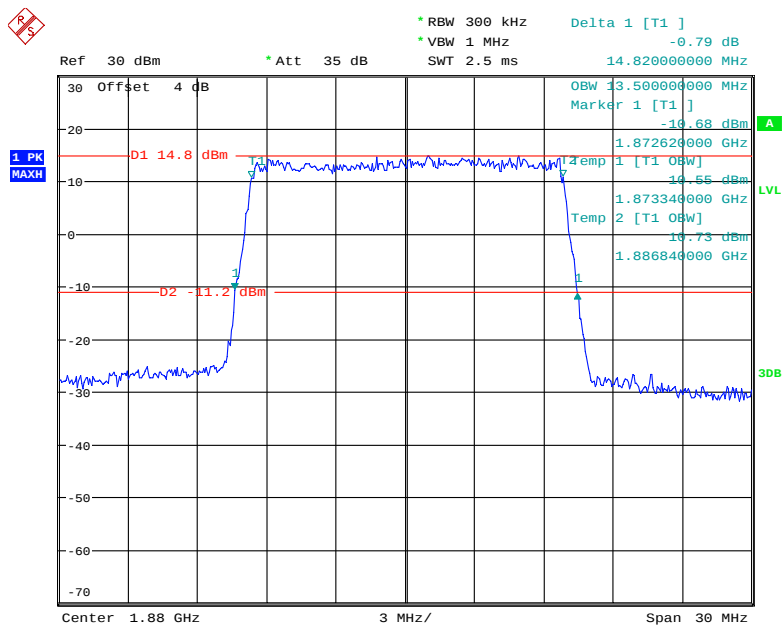
Date: 21.NOV.2019 09:20:33

16QAM_10 MHz



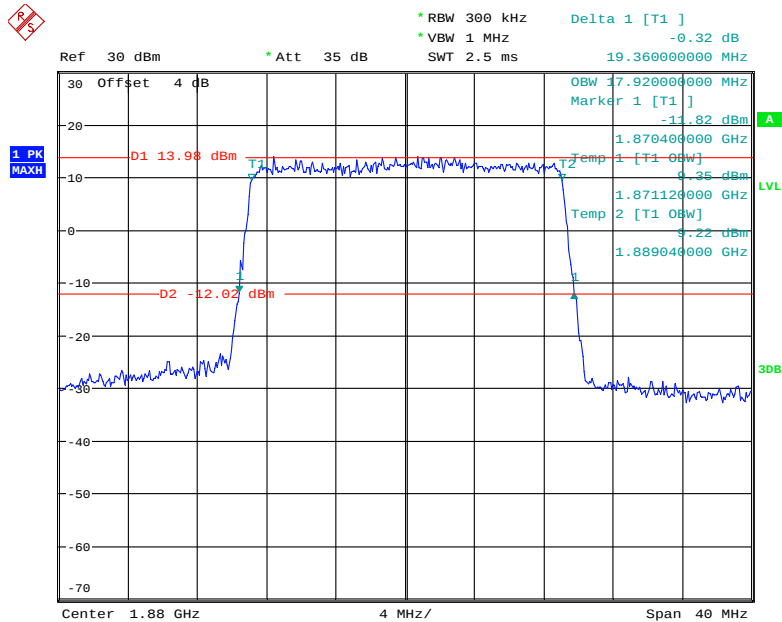
Date: 21.NOV.2019 09:21:20

16QAM_15 MHz



Date: 20.NOV.2019 16:10:02

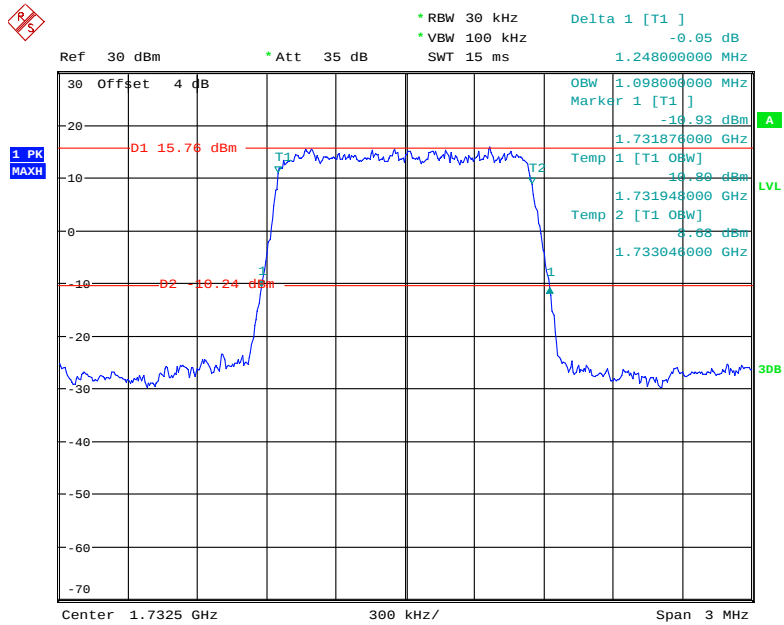
16QAM_20 MHz



Date: 20.NOV.2019 16:10:57

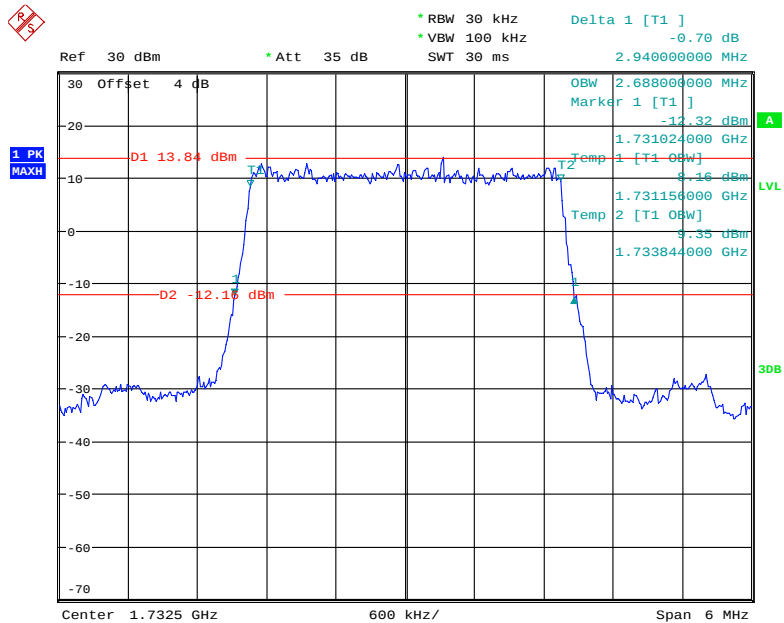
LTE Band 4

QPSK_1.4 MHz



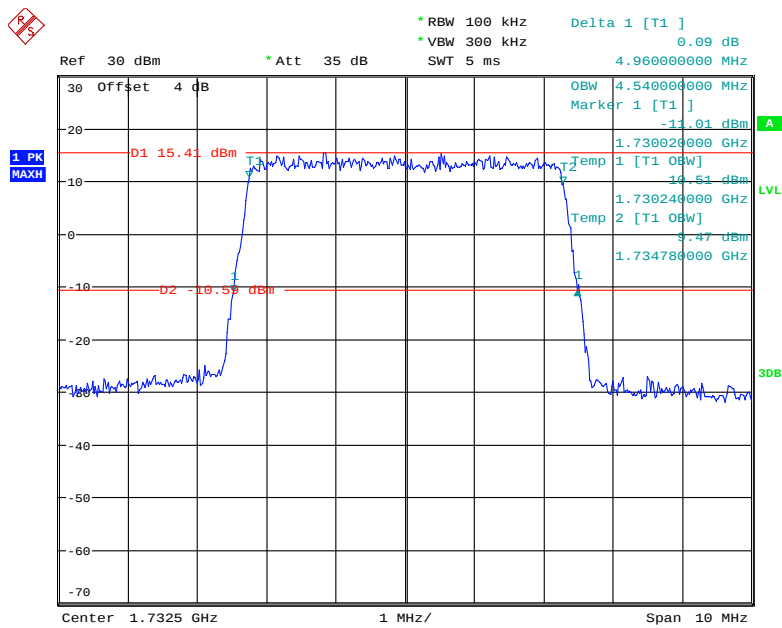
Date: 20.NOV.2019 16:12:07

QPSK_3 MHz



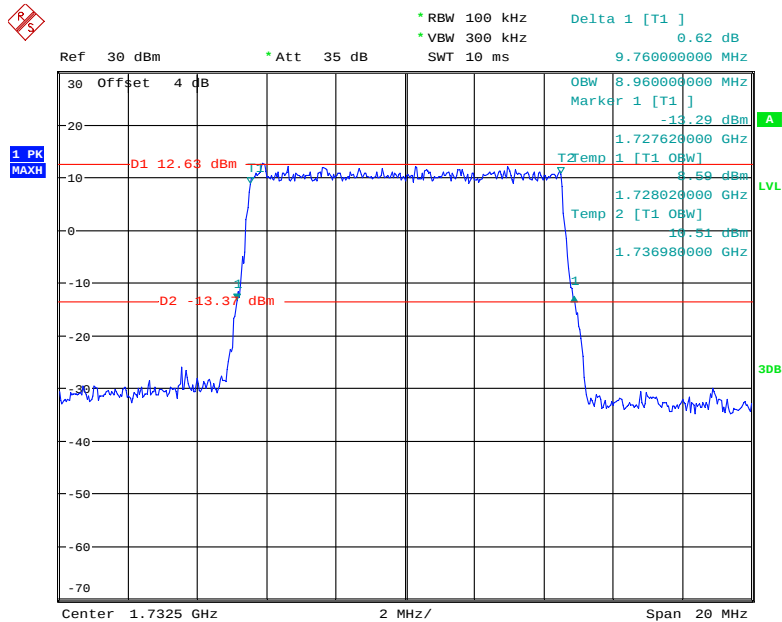
Date: 20.NOV.2019 16:12:49

QPSK_5 MHz



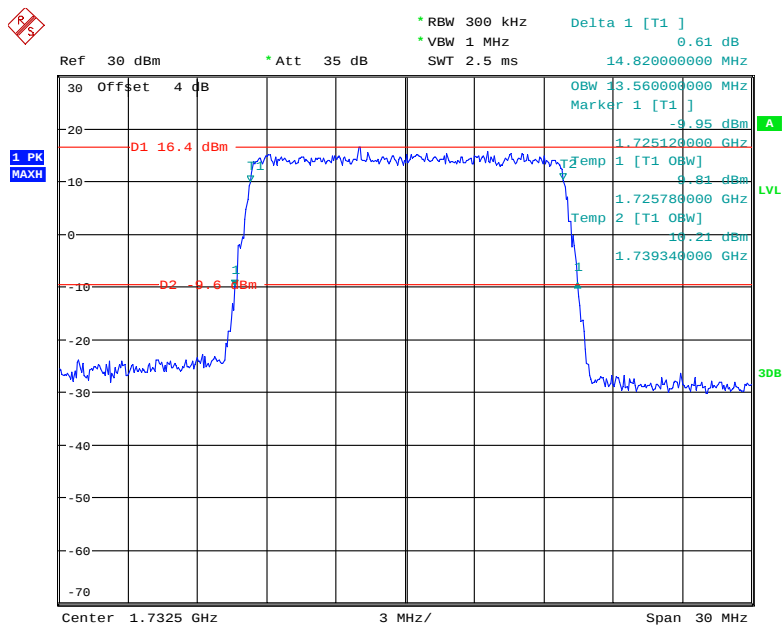
Date: 20.NOV.2019 16:13:29

QPSK_10 MHz



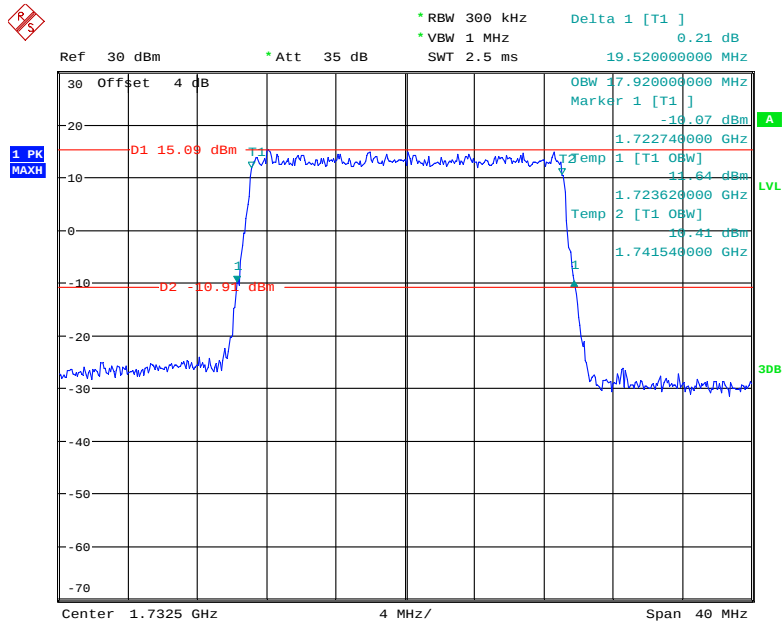
Date: 20.NOV.2019 16:14:13

QPSK_15 MHz



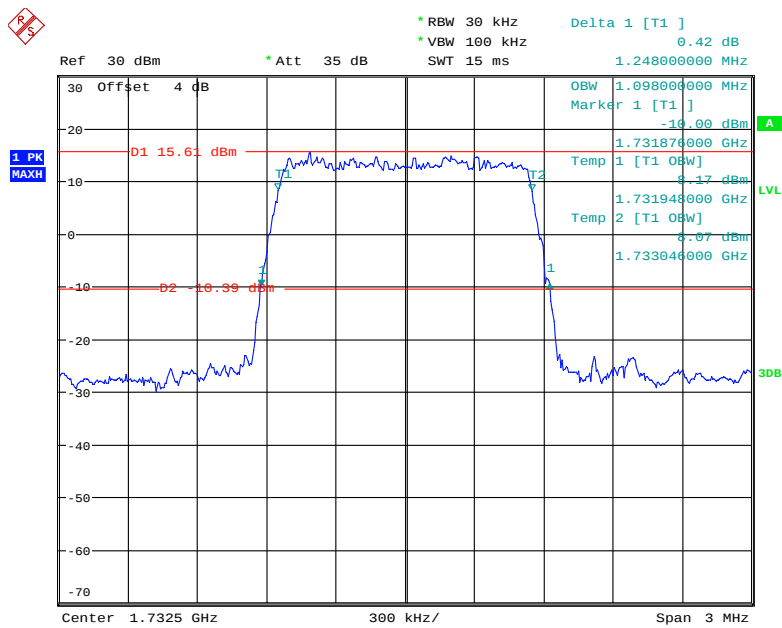
Date: 20.NOV.2019 16:15:01

QPSK_20 MHz



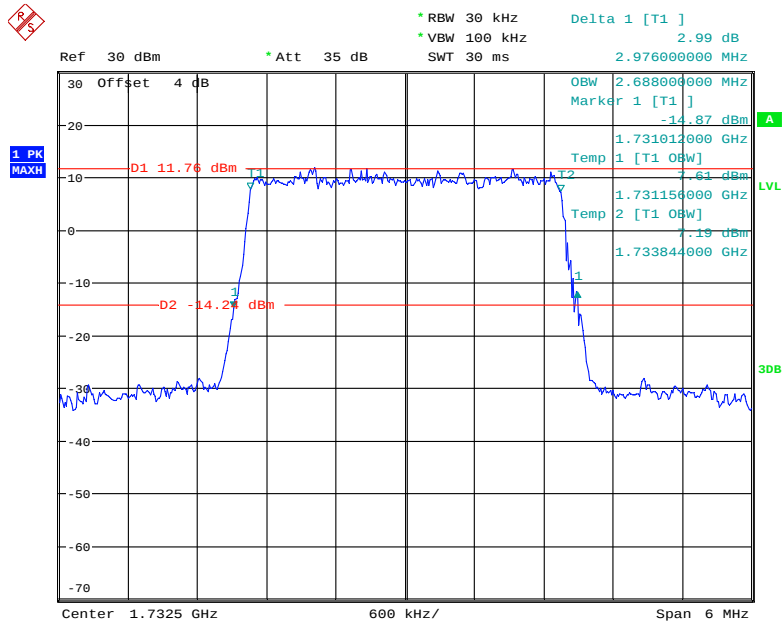
Date: 20.NOV.2019 16:15:56

16QAM_1.4 MHz



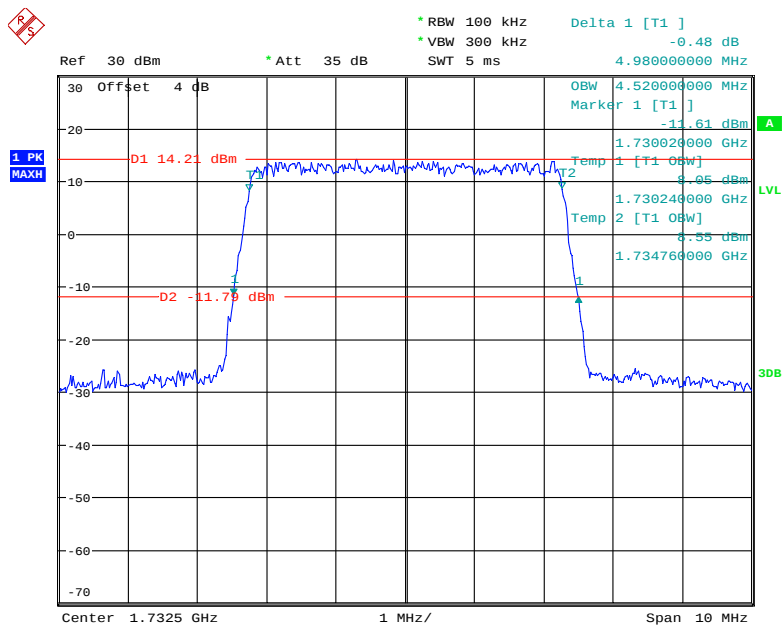
Date: 20.NOV.2019 16:12:28

16QAM_3 MHz



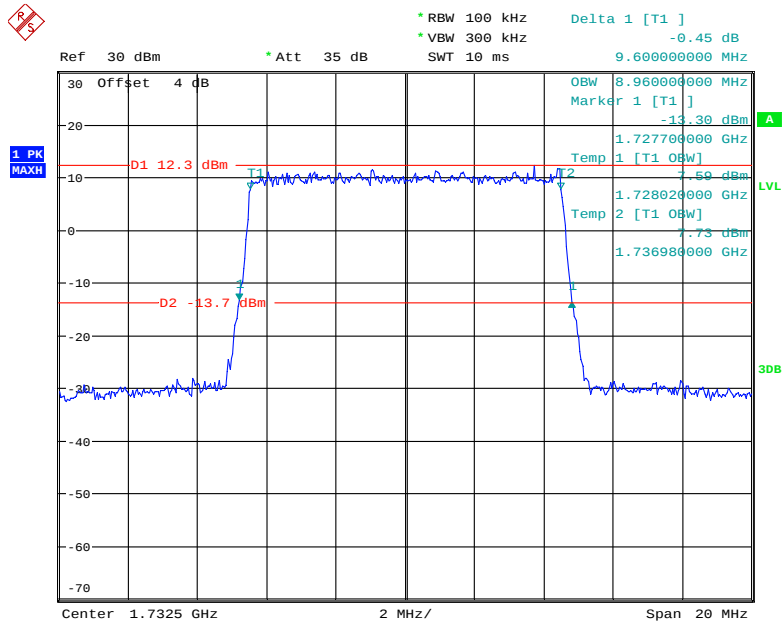
Date: 20.NOV.2019 16:13:06

16QAM_5 MHz



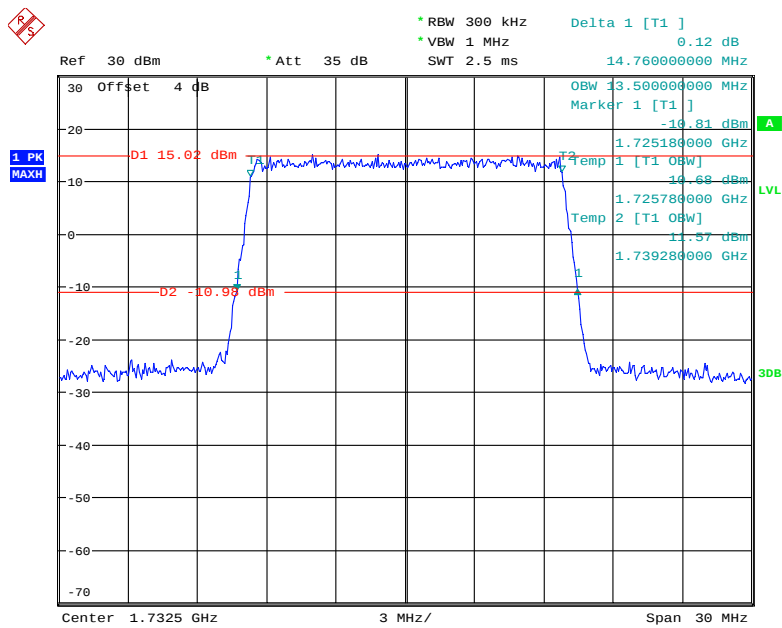
Date: 20.NOV.2019 16:13:51

16QAM_10 MHz



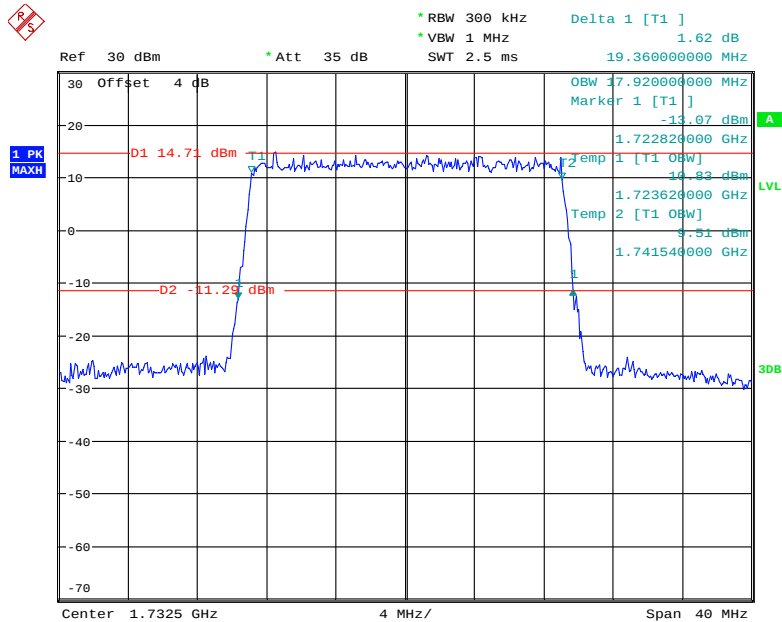
Date: 20.NOV.2019 16:14:35

16QAM_15 MHz

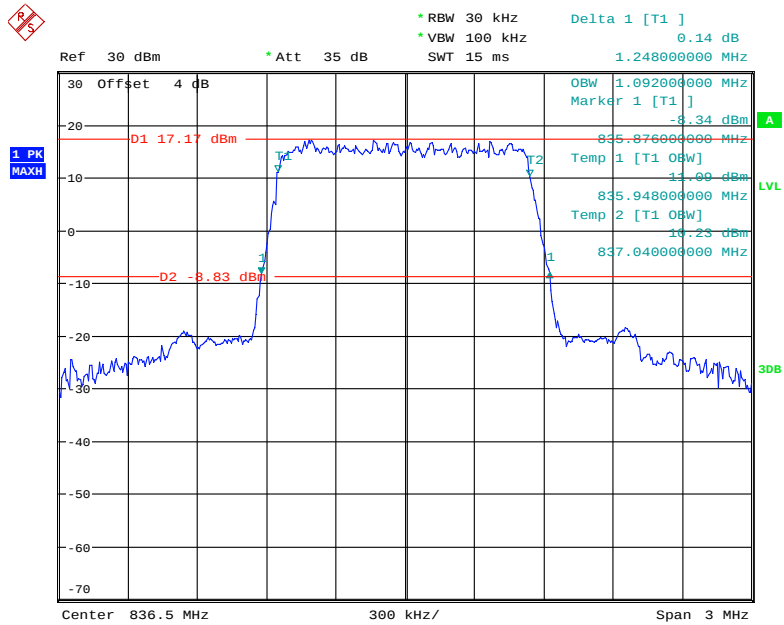


Date: 20.NOV.2019 16:15:27

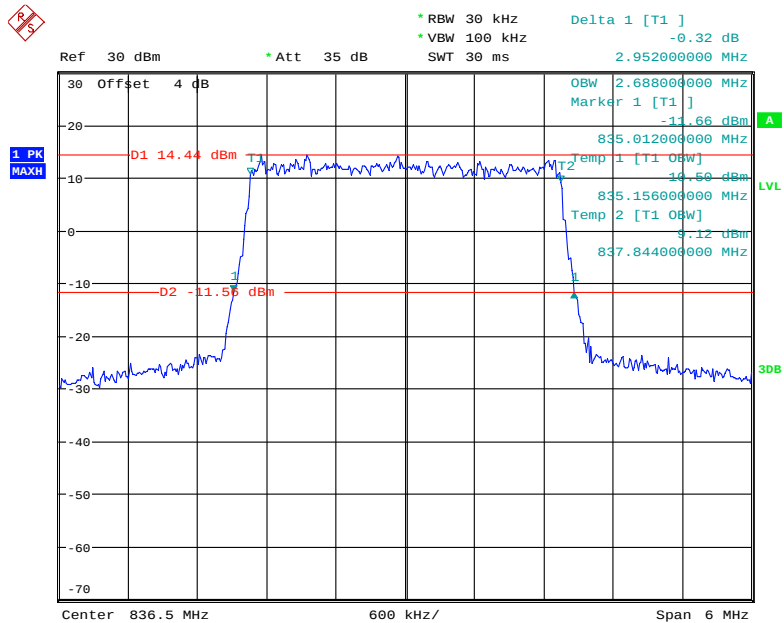
16QAM_20 MHz



Date: 20.NOV.2019 16:16:22

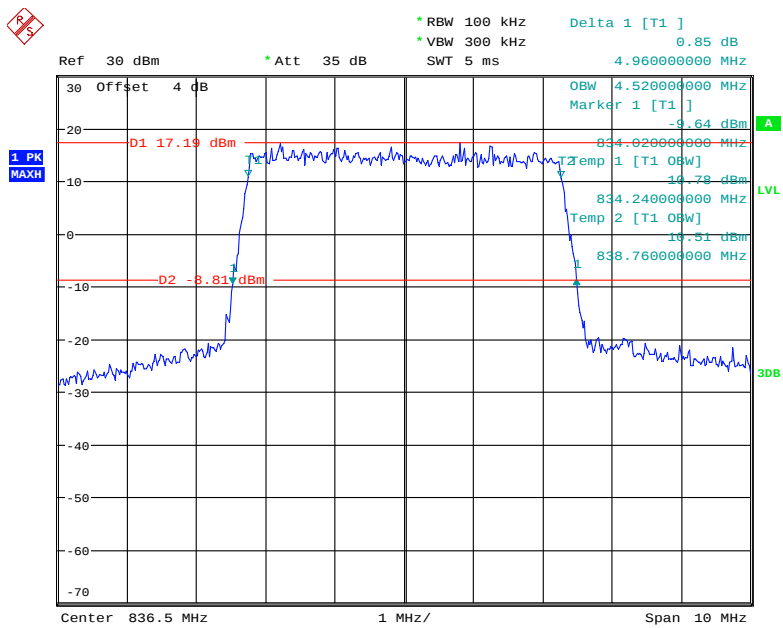
LTE Band 5:**QPSK_1.4 MHz**

Date: 20.NOV.2019 16:16:53

QPSK_3 MHz

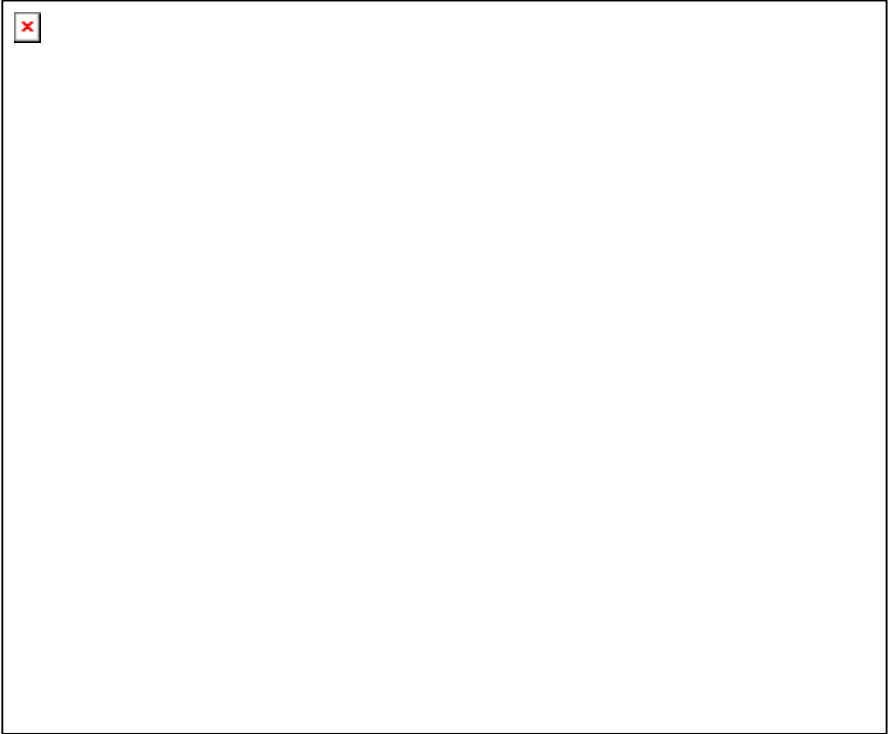
Date: 20.NOV.2019 16:17:32

QPSK_5 MHz

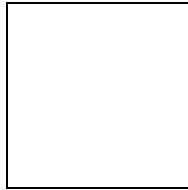


Date: 20.NOV.2019 16:18:15

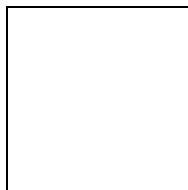
QPSK_10 MHz



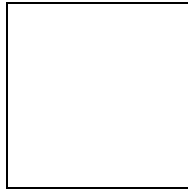
16QAM_1.4 MHz



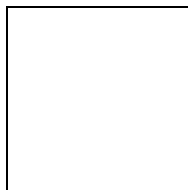
16QAM_3 MHz



16QAM_5 MHz

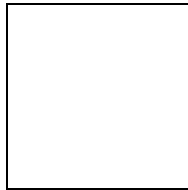


16QAM_10 MHz

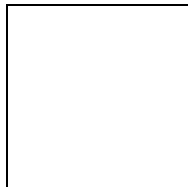


LTE Band 7:

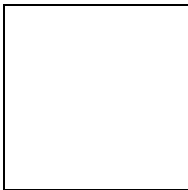
QPSK_5 MHz



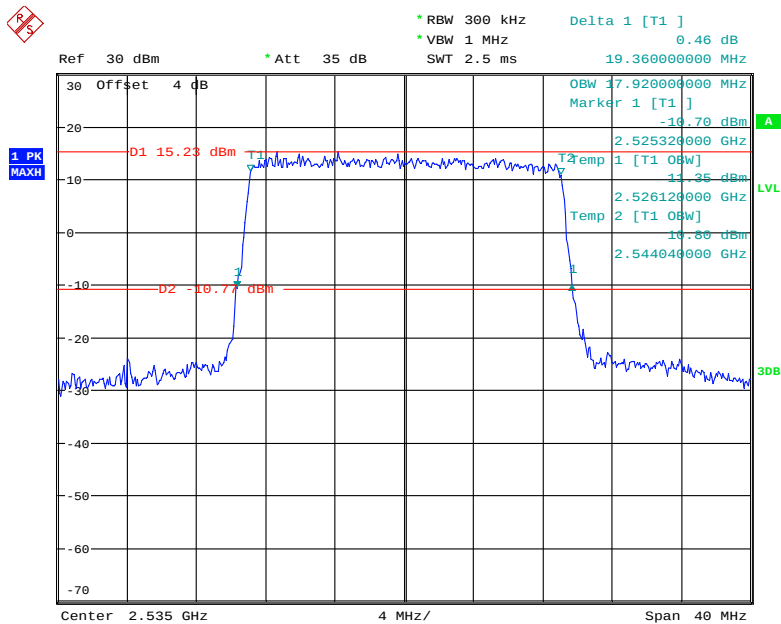
QPSK_10 MHz



QPSK_15 MHz

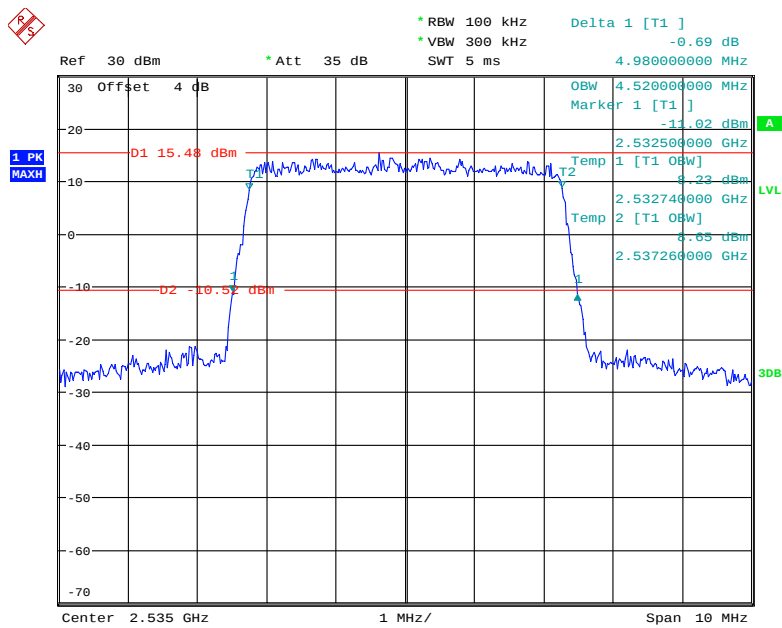


QPSK_20 MHz



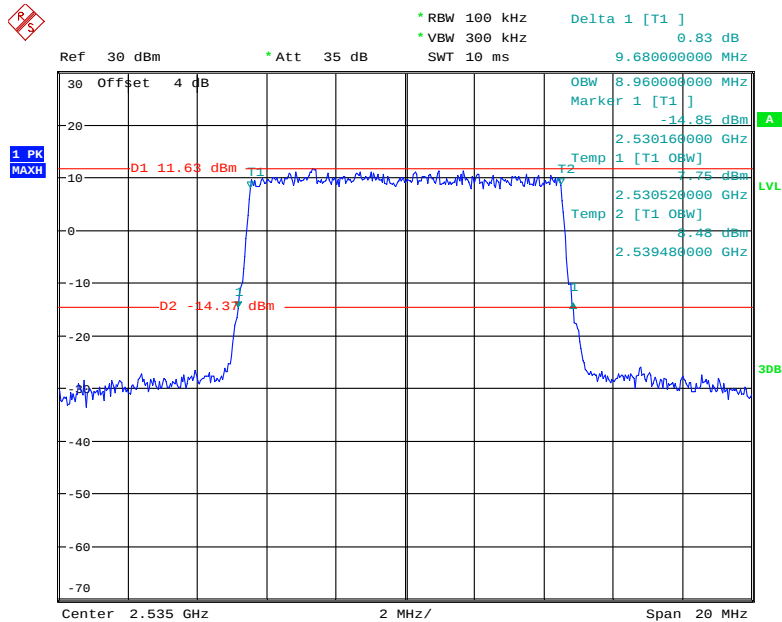
Date: 20.NOV.2019 16:22:16

16QAM_5 MHz



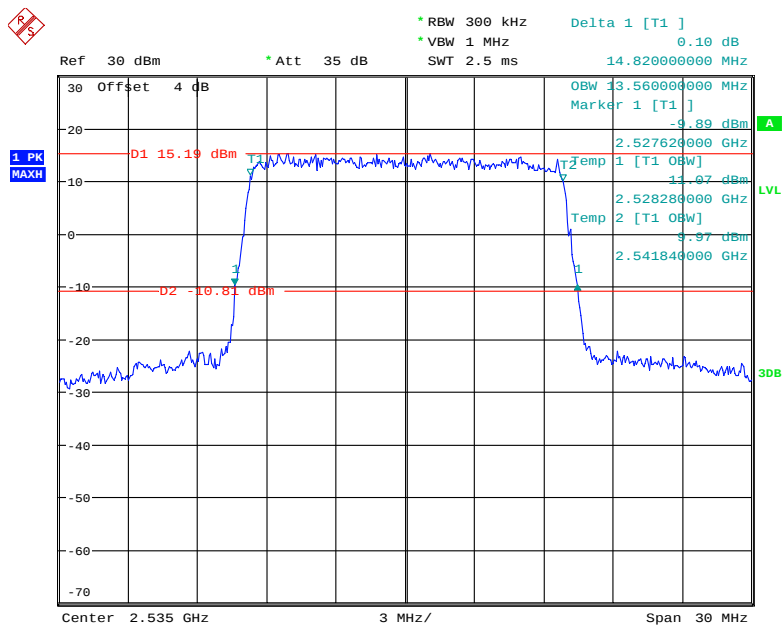
Date: 20.NOV.2019 16:20:12

16QAM_10 MHz



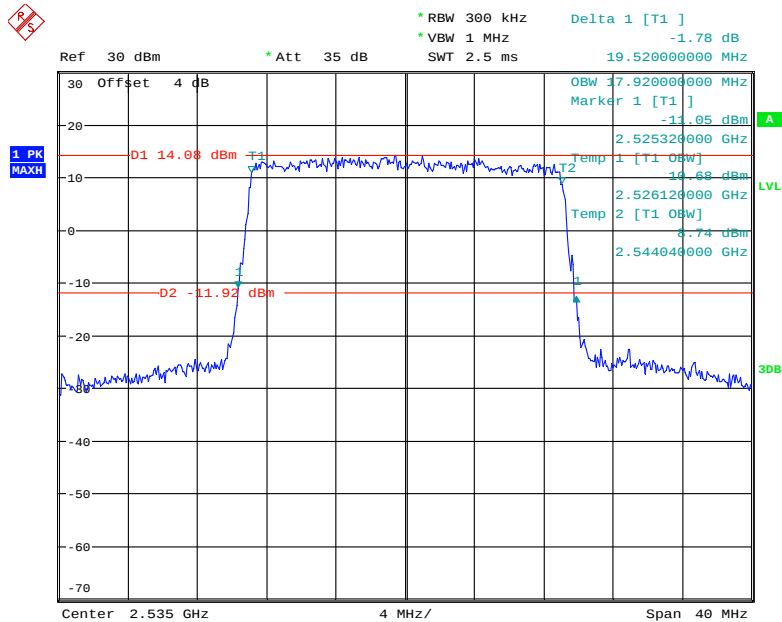
Date: 20.NOV.2019 16:20:57

16QAM_15 MHz



Date: 20.NOV.2019 16:21:51

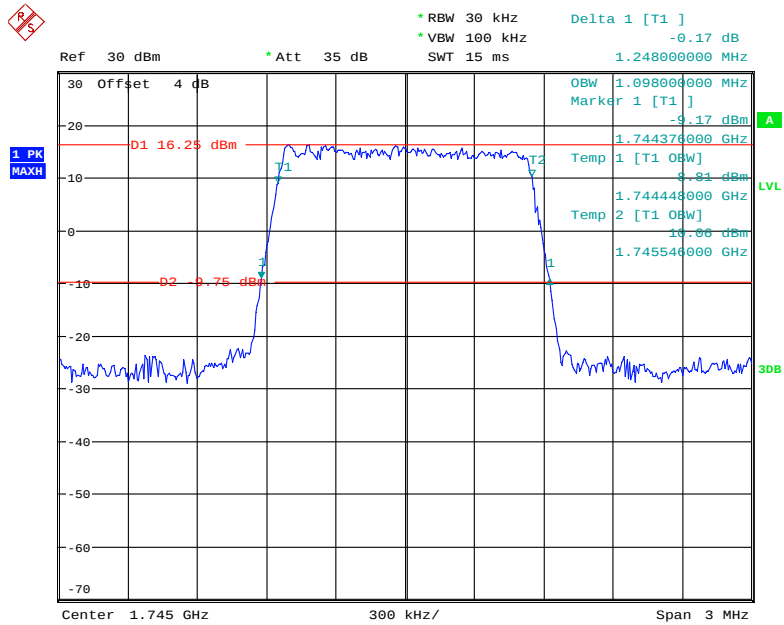
16QAM_20 MHz



Date: 20.NOV.2019 16:22:43

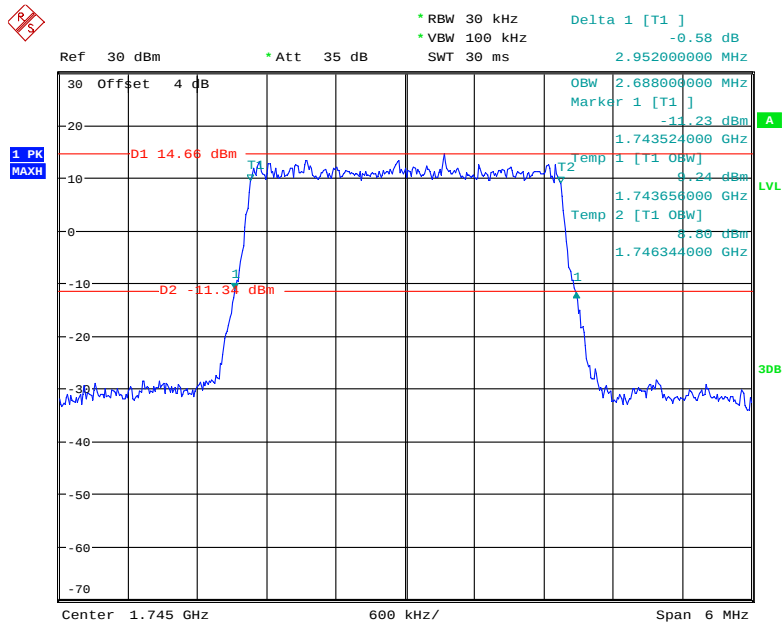
LTE Band 66

QPSK_1.4 MHz



Date: 21.NOV.2019 14:33:44

QPSK_3 MHz



Date: 21.NOV.2019 14:34:26

The screenshot displays a spectrum analyzer interface with a blue trace showing a signal. Two markers are present: D1 at 16 dBm and D2 at -10 dBm. The frequency range is from 1.745 GHz to 1.747 GHz, with a 1 MHz span. The power range is from -70 dBm to 30 dBm, with a 4 dB offset. The measurement parameters are: RBW 100 kHz, VBW 300 kHz, SWT 5 ms, and Delta 1 [T1]. The signal is identified as 'Temp 1 [T1 0BW]' and 'Temp 2 [T1 0BW]'. The signal is labeled 'A' and 'LVL'.

Ref 30 dBm

* Att 35 dB

* RBW 100 kHz

* VBW 300 kHz

SWT 5 ms

Delta 1 [T1] -0.21 dB

5.020000000 MHz

30 Offset 4 dB

OBW 4.520000000 MHz

Marker 1 [T1] -9.96 dBm

1.742500000 GHz

Temp 1 [T1 0BW] 9.71 dBm

1.742740000 GHz

Temp 2 [T1 0BW] 10.21 dBm

1.747260000 GHz

1 PK

MAXH

D1 16 dBm

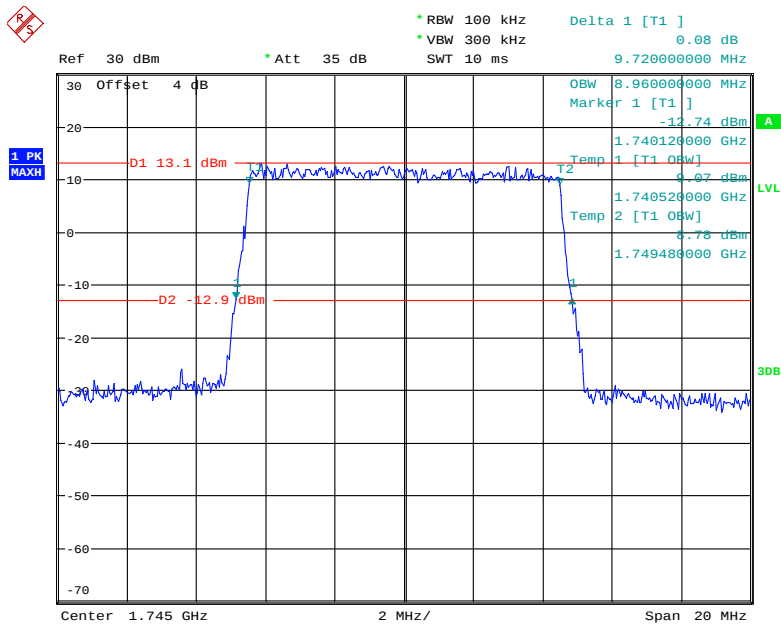
D2 -10 dBm

Center 1.745 GHz

1 MHz/

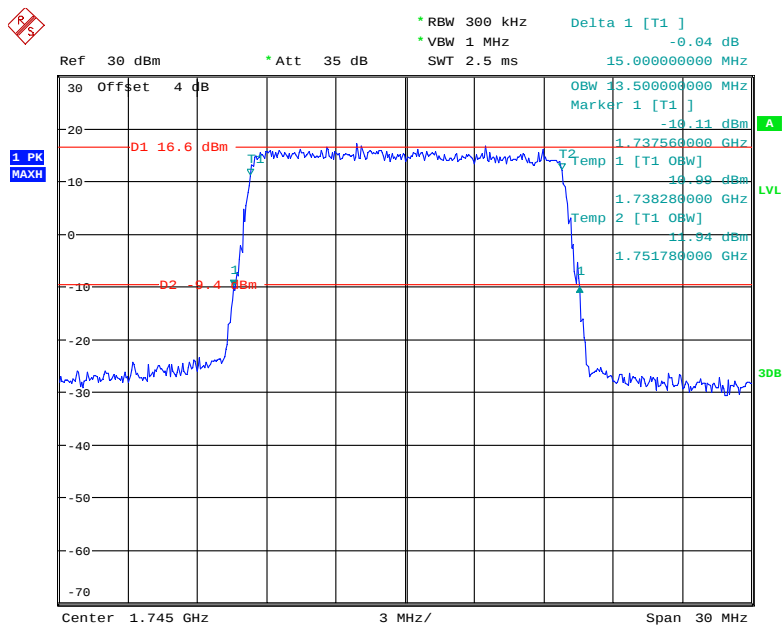
Span 10 MHz

QPSK_10 MHz



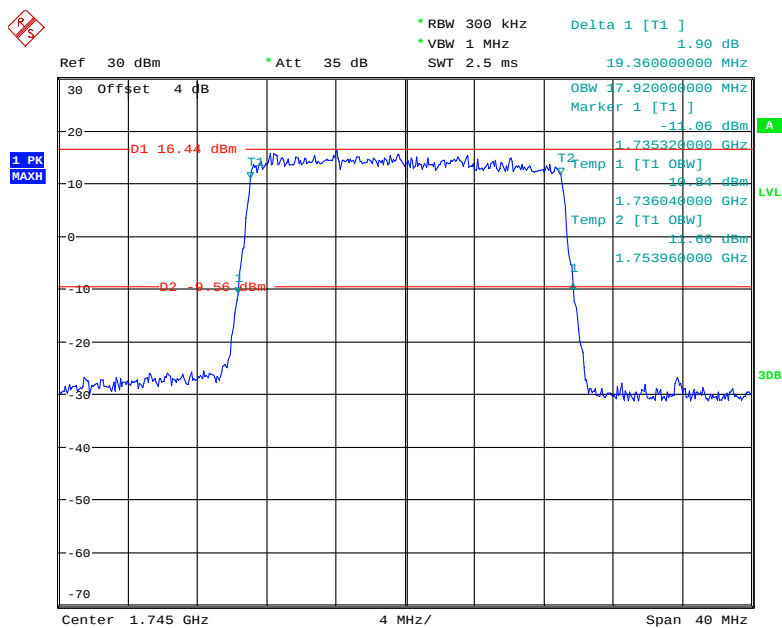
Page 60 of 166

QPSK_15 MHz



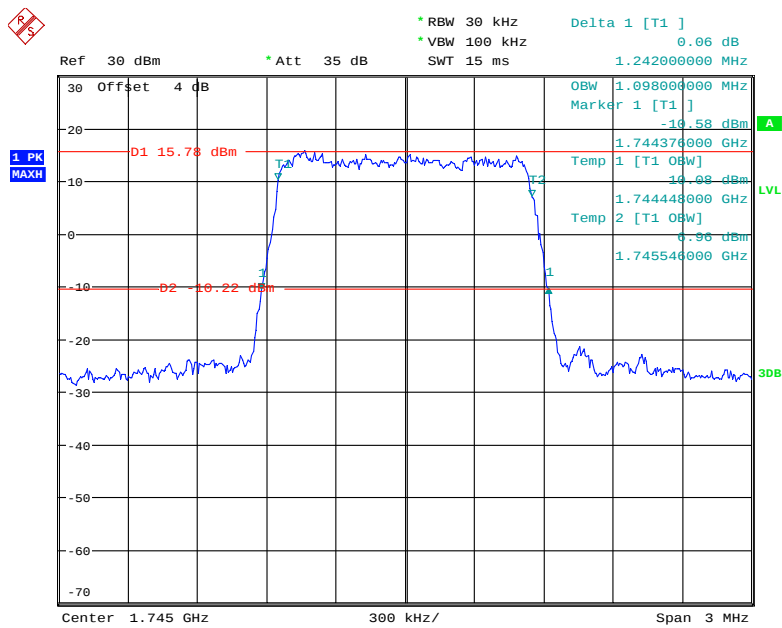
Date: 21.NOV.2019 14:36:41

QPSK_20 MHz



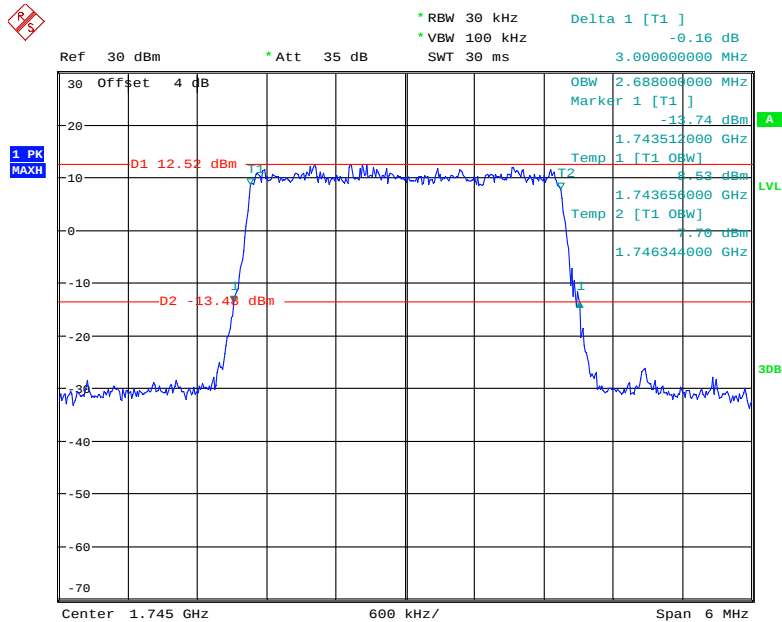
Date: 21.NOV.2019 14:37:35

16QAM_1.4 MHz



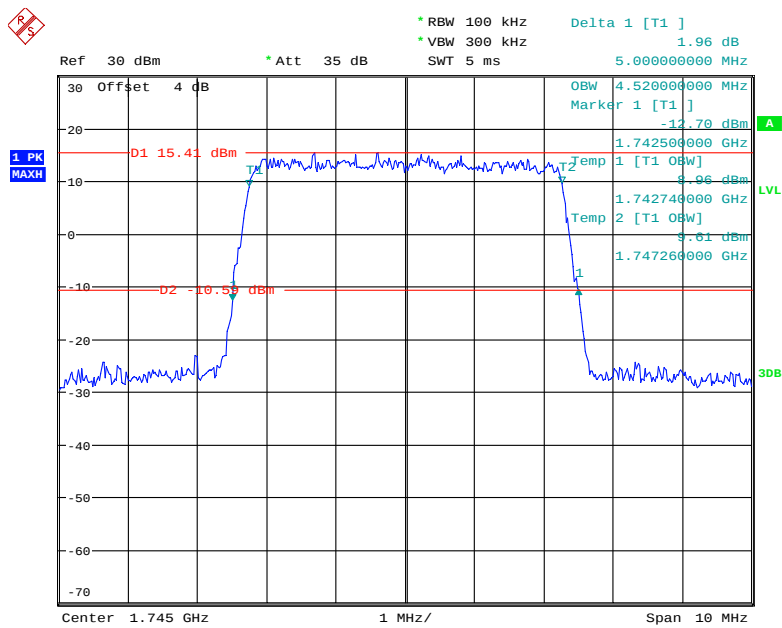
Date: 21.NOV.2019 14:34:05

16QAM_3 MHz



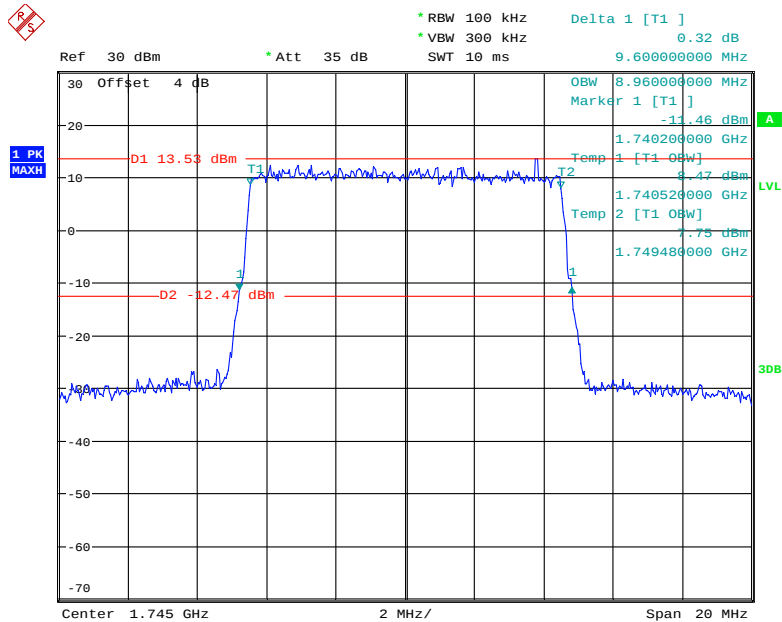
Date: 21.NOV.2019 14:34:44

16QAM_5 MHz



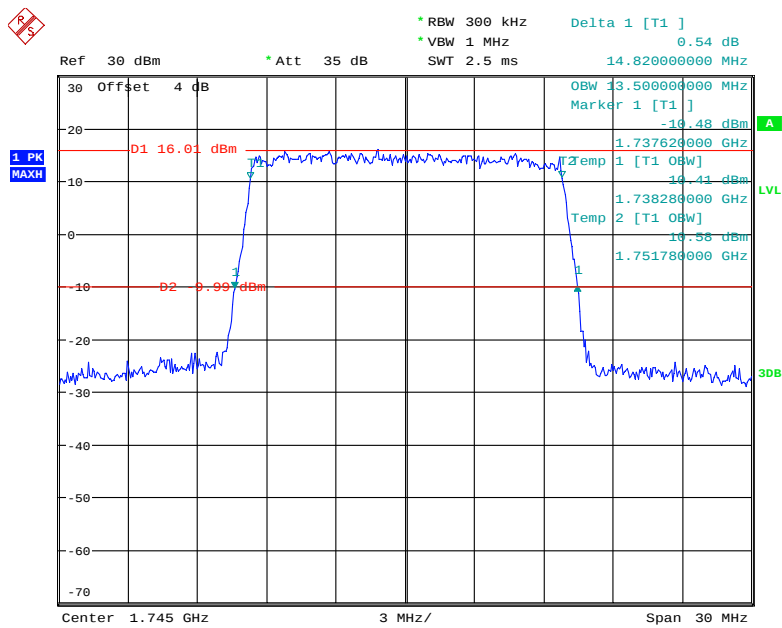
Date: 21.NOV.2019 14:35:31

16QAM_10 MHz



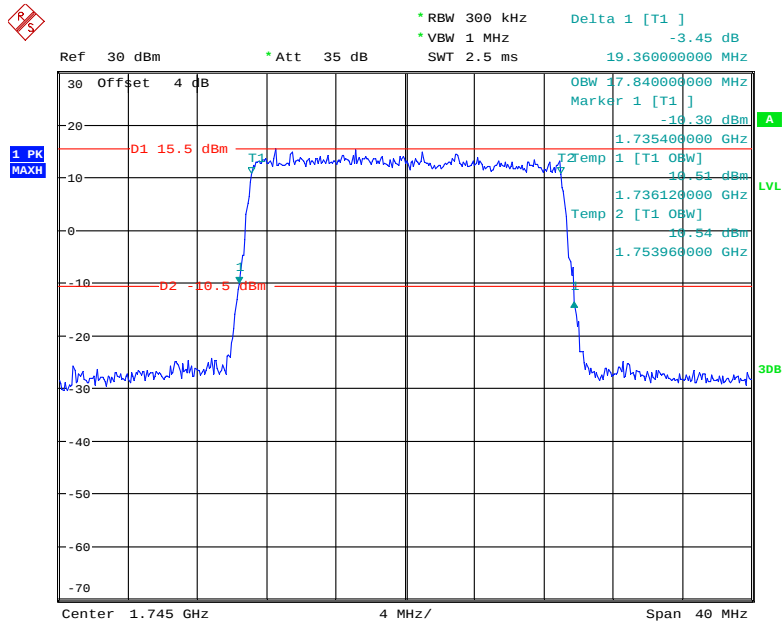
Date: 21.NOV.2019 14:36:15

16QAM_15 MHz



Date: 21.NOV.2019 14:37:06

16QAM_20 MHz



Date: 21.NOV.2019 14:37:57

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

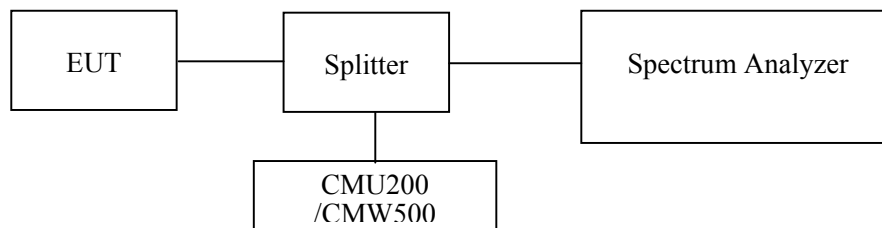
Applicable Standard

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	FSV40	101474	2019-01-09	2020-01-09
R&S	Spectrum Analyzer	FSU 26	200256	2019-05-09	2020-05-09
Unknown	Coaxial Cable	C-SJ00-0010	C0010/05	Each time	/
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41010013	Each time	/
E-Microwave	Two-way Splitter	ODP-1-6-2S	OE0120142	Each time	/

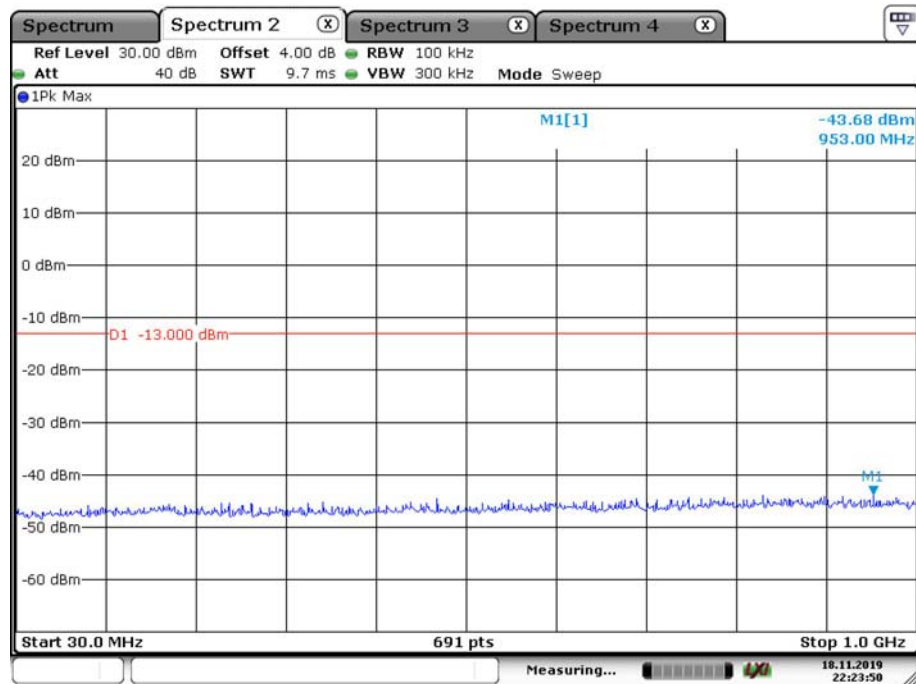
* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data

Temperature:	25.4~26.5°C
Relative Humidity:	44~60%
ATM Pressure:	100.2~100.6kPa
Test by:	Elena Lei, Vern Shen
Test Date:	2019-11-18~2019-11-21

Please refer to the following plots.

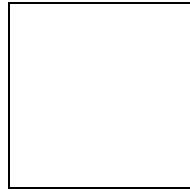
WCDMA Band II, Rel99



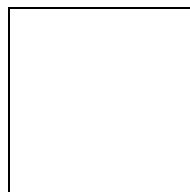
Date: 18.NOV.2019 22:23:50

Fundamental



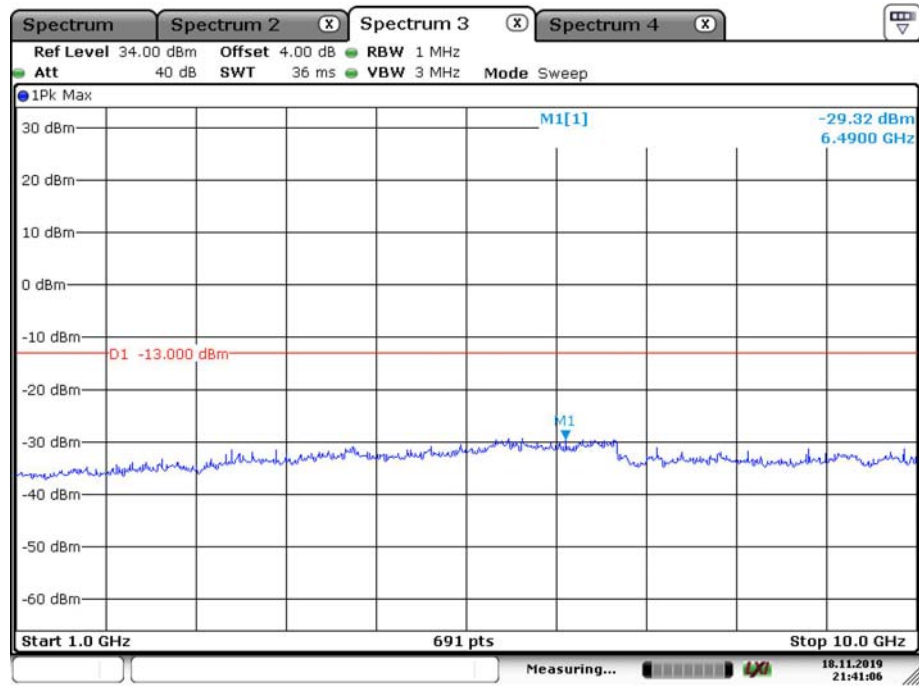


WCDMA Band V, Rel99



Fundamental

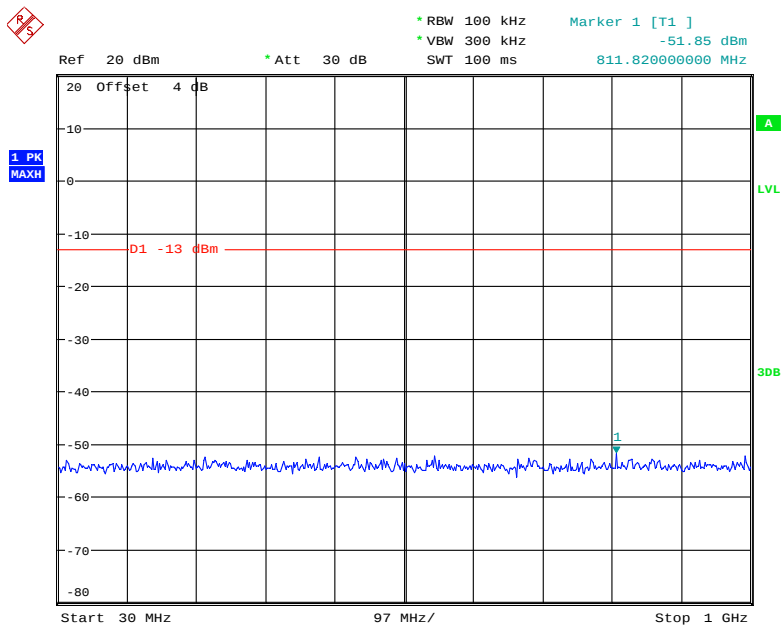




Date: 18.NOV.2019 21:41:06

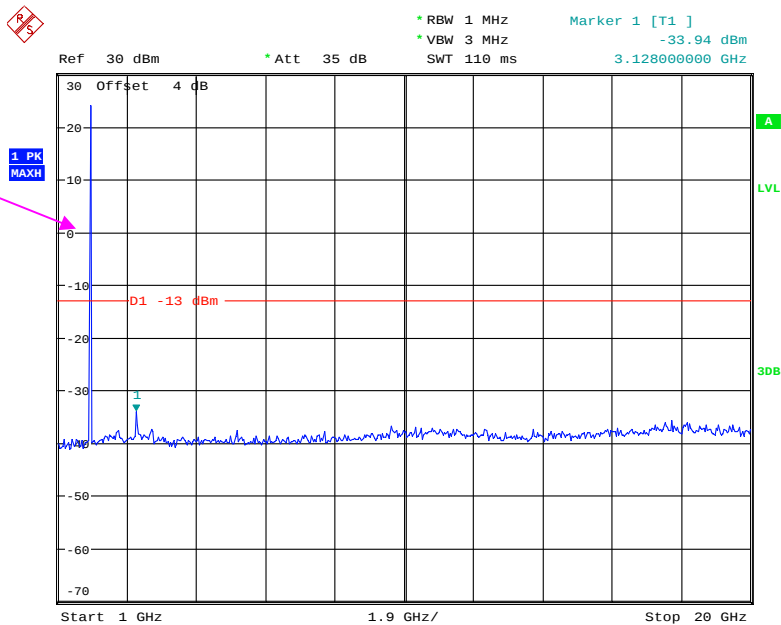
LTE Band 2 (Middle Channel)

QPSK_1.4 MHz



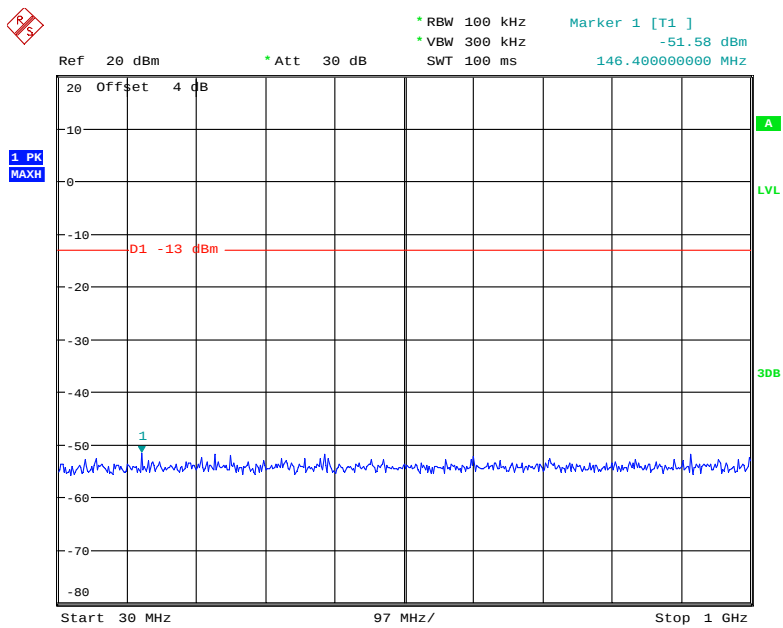
Date: 20.NOV.2019 16:23:53

Fundamental

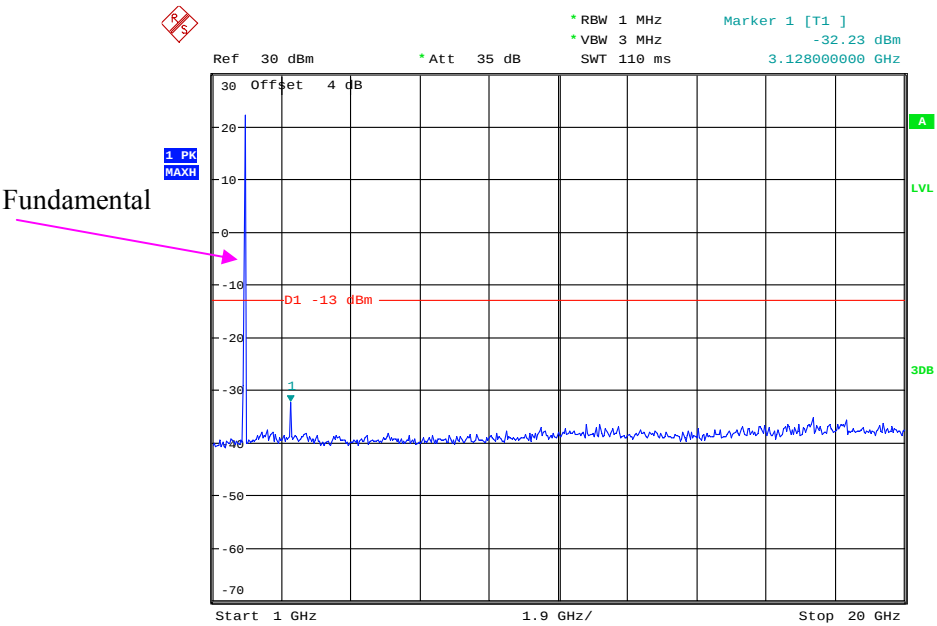


Date: 20.NOV.2019 16:24:05

QPSK_3 MHz

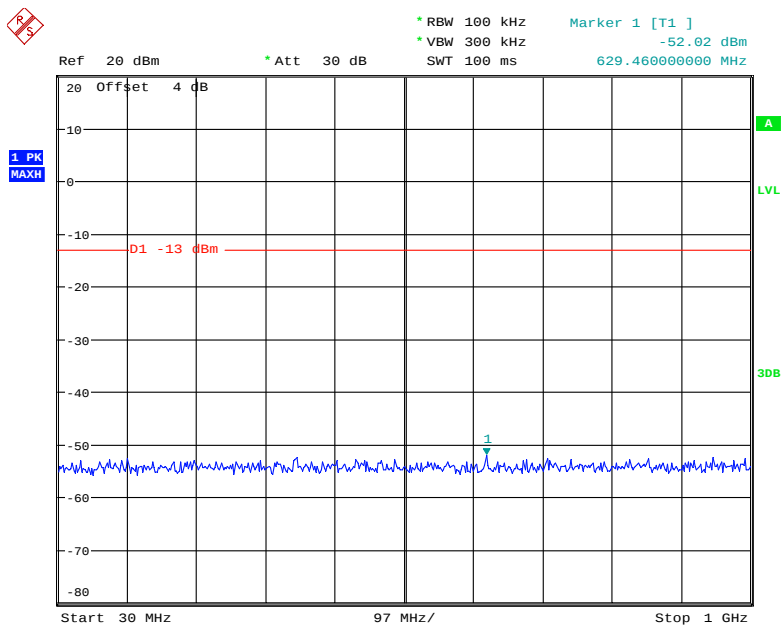


Date: 20.NOV.2019 16:24:25



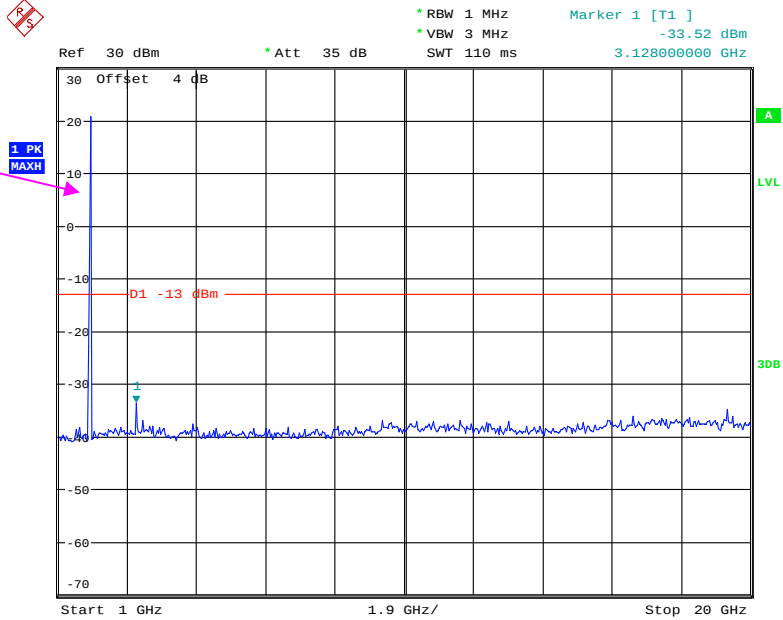
Date: 20.NOV.2019 16:24:36

QPSK_5 MHz



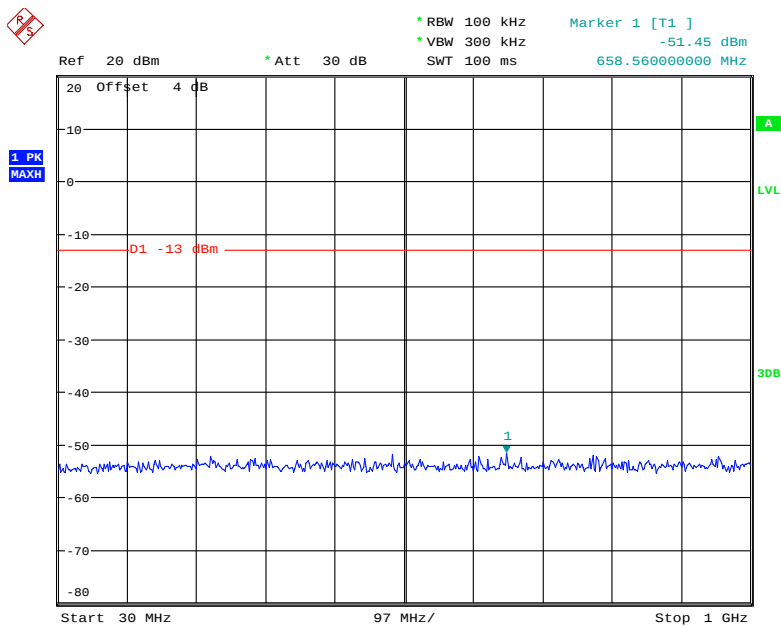
Date: 20.NOV.2019 16:24:57

Fundamental

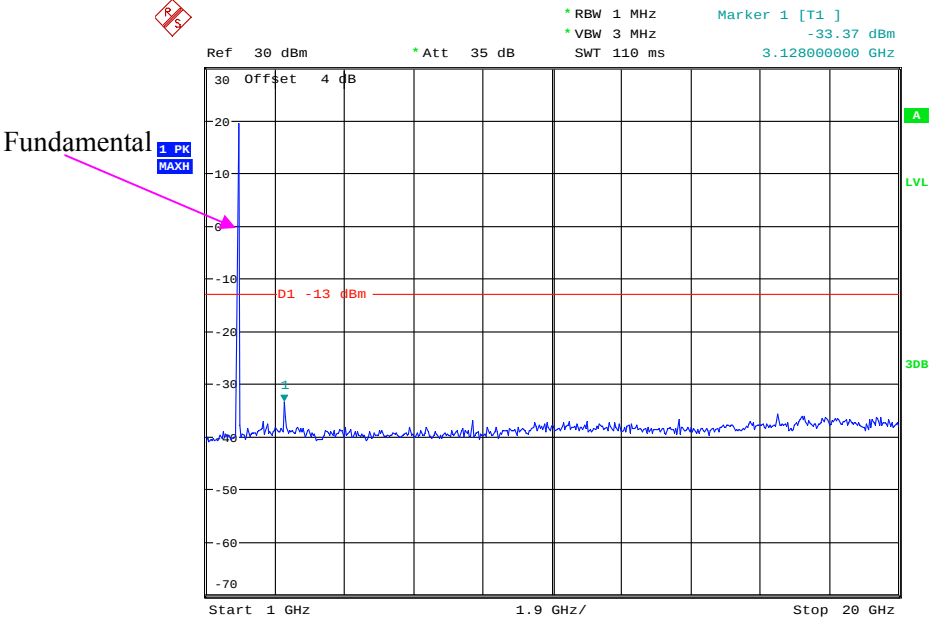


Date: 20.NOV.2019 16:25:08

QPSK_10 MHz

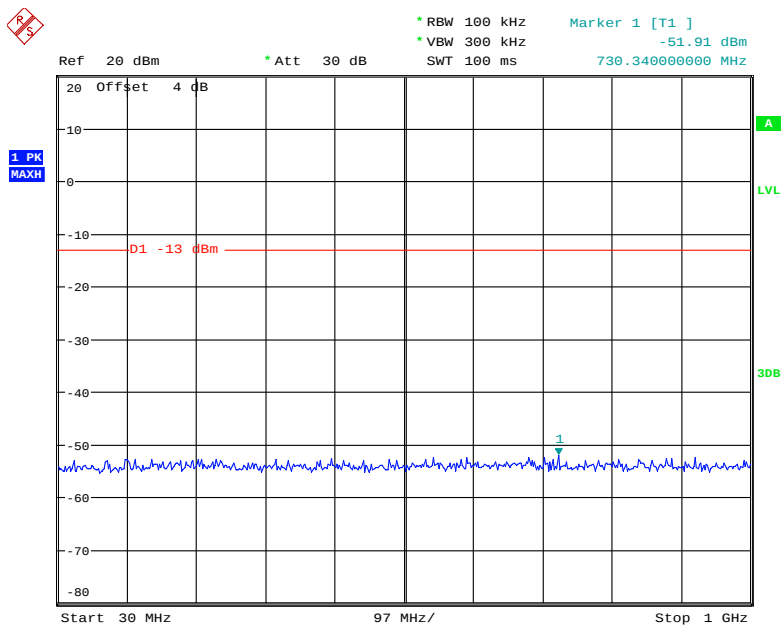


Date: 20.NOV.2019 16:25:32

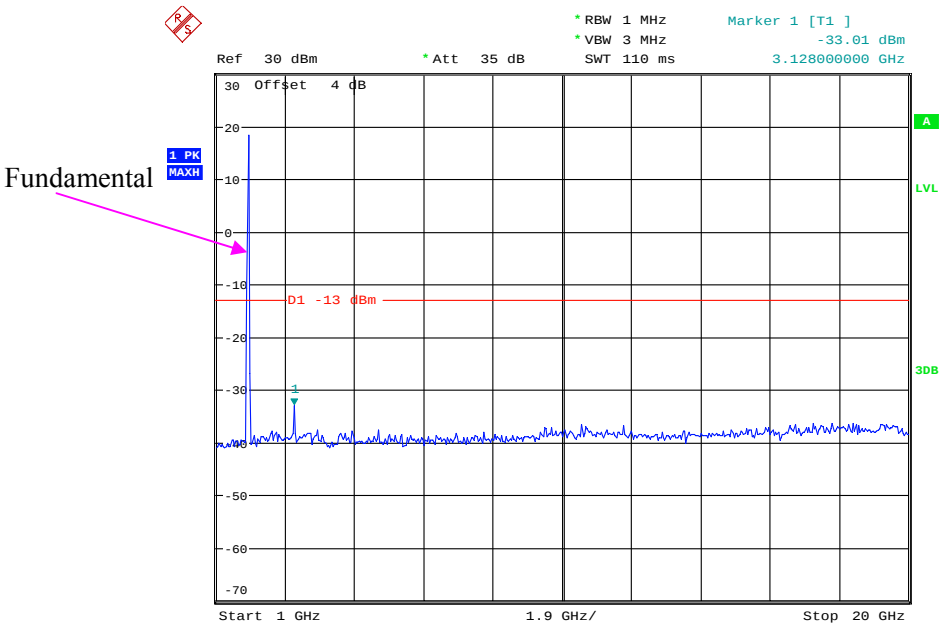


Date: 20.NOV.2019 16:25:44

QPSK_15 MHz

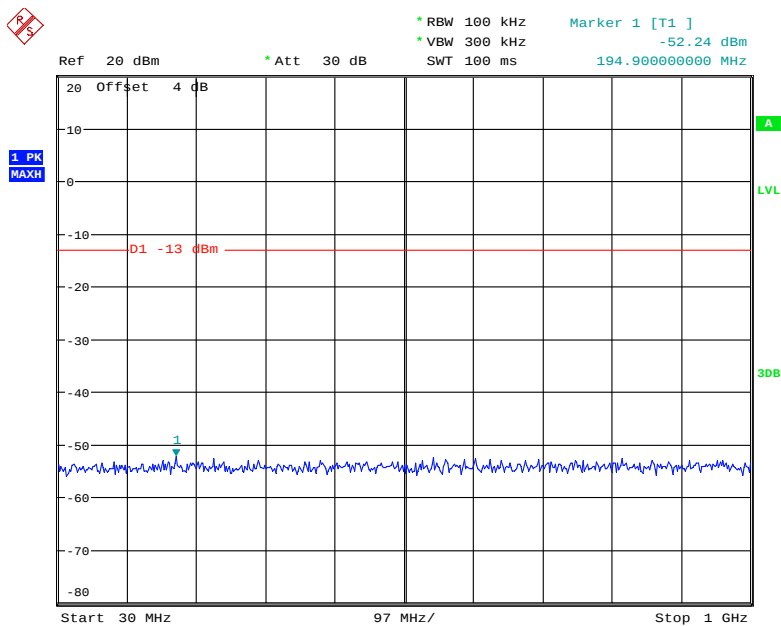


Date: 20.NOV.2019 16:26:11



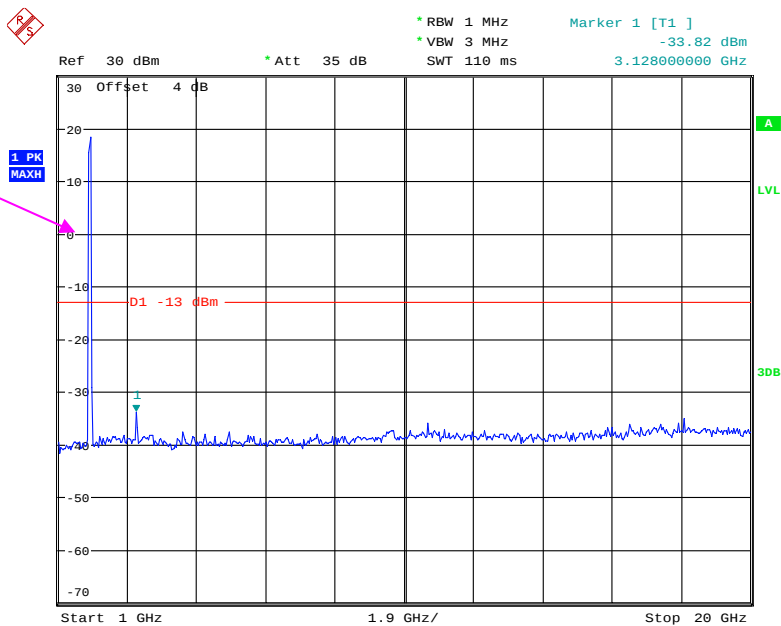
Date: 20.NOV.2019 16:26:22

QPSK_20 MHz



Date: 20.NOV.2019 16:26:47

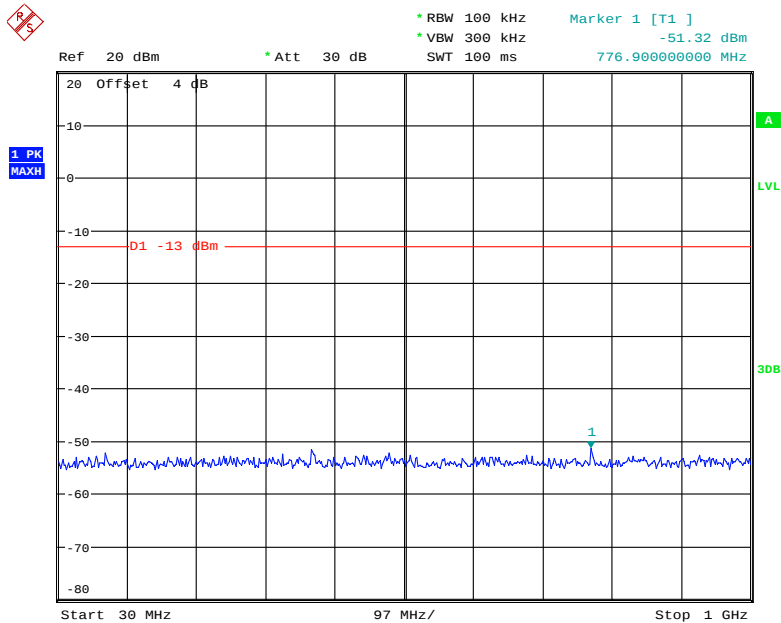
Fundamental



Date: 20.NOV.2019 16:26:58

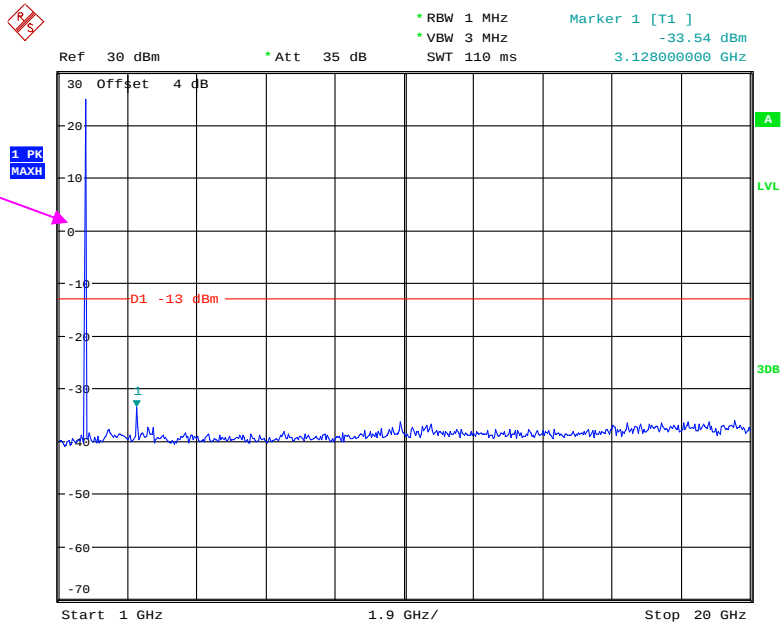
LTE Band 4 (Middle Channel)

QPSK_1.4 MHz



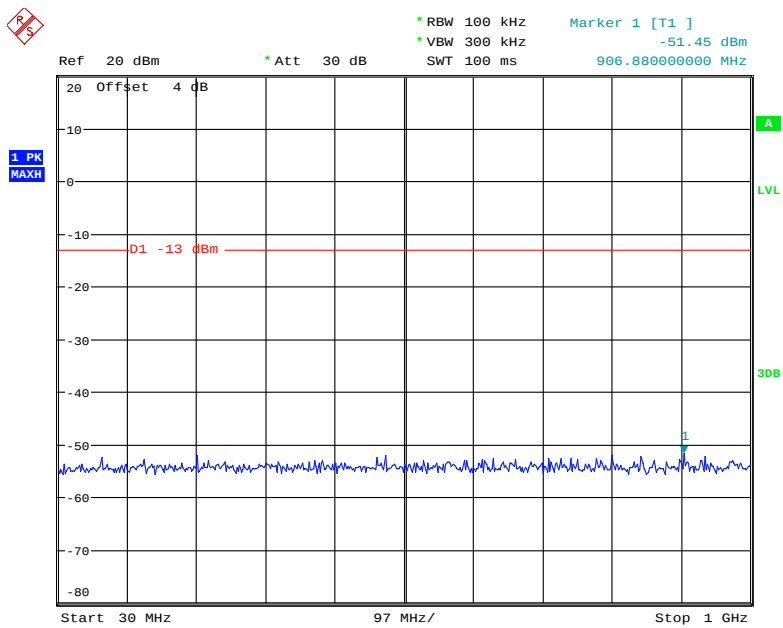
Date: 20.NOV.2019 16:27:21

Fundamental



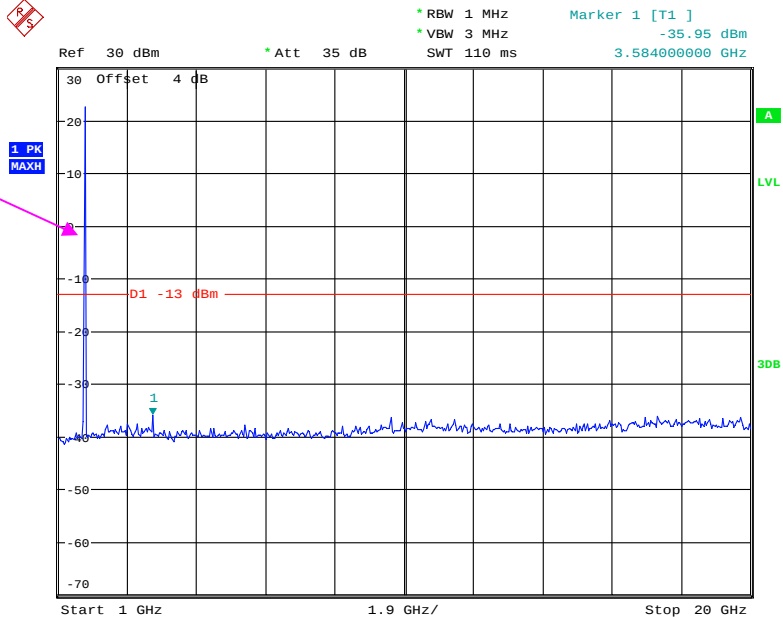
Date: 20.NOV.2019 16:27:33

QPSK_3 MHz



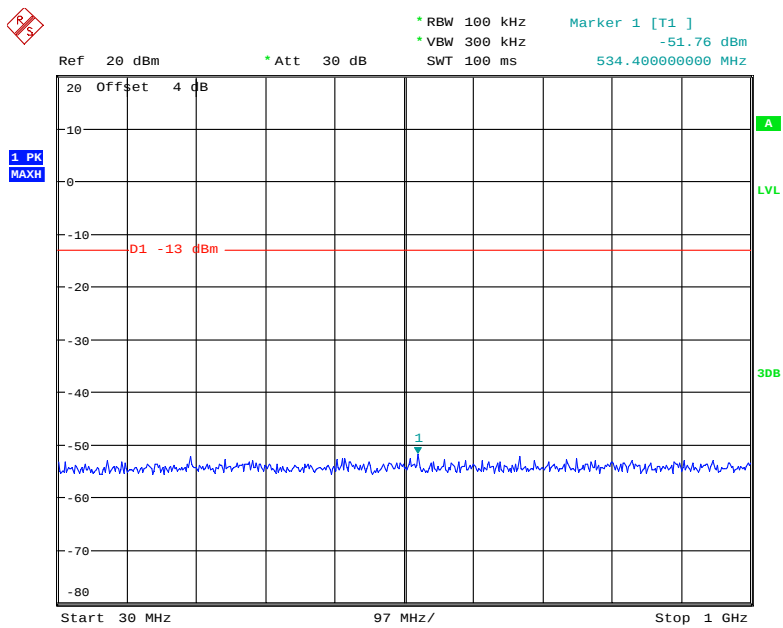
Date: 20.NOV.2019 16:27:52

Fundamental



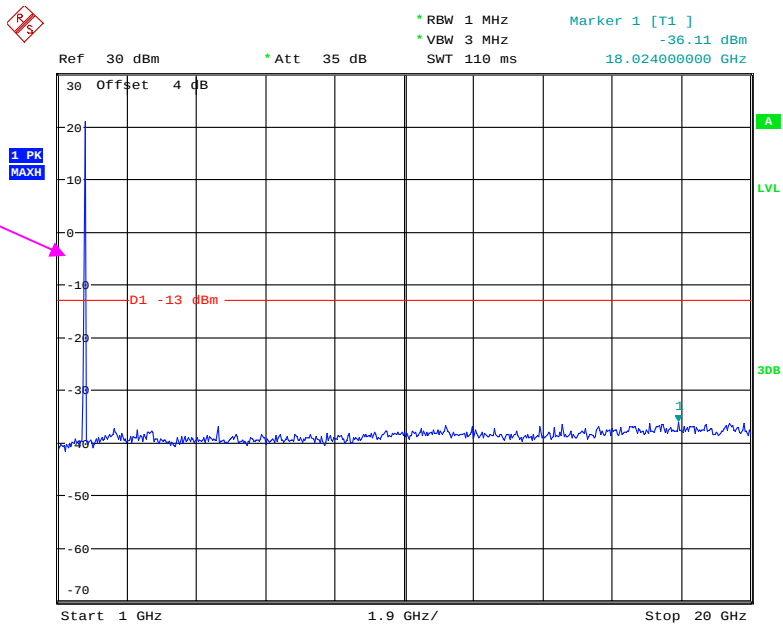
Date: 20.NOV.2019 16:28:04

QPSK_5 MHz



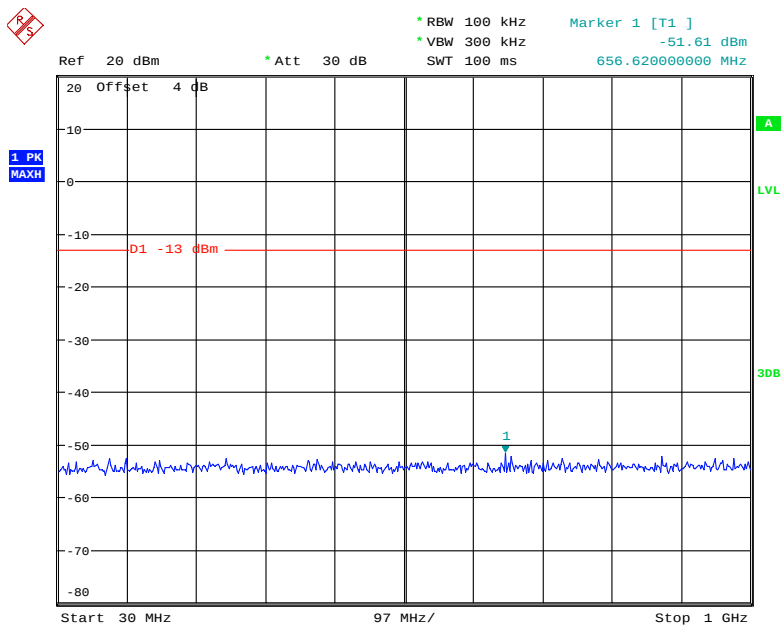
Date: 20.NOV.2019 16:28:24

Fundamental

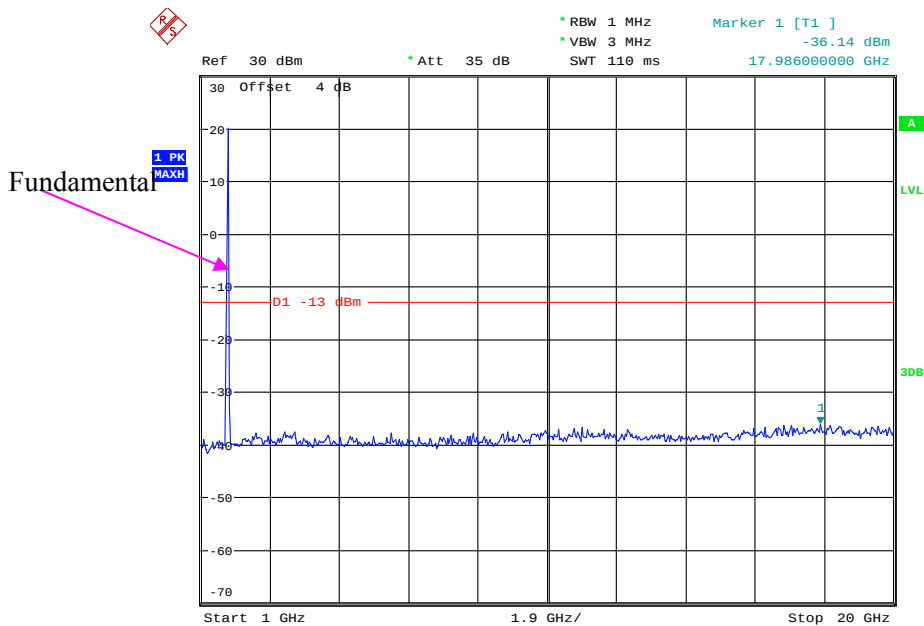


Date: 20.NOV.2019 16:28:36

QPSK_10 MHz

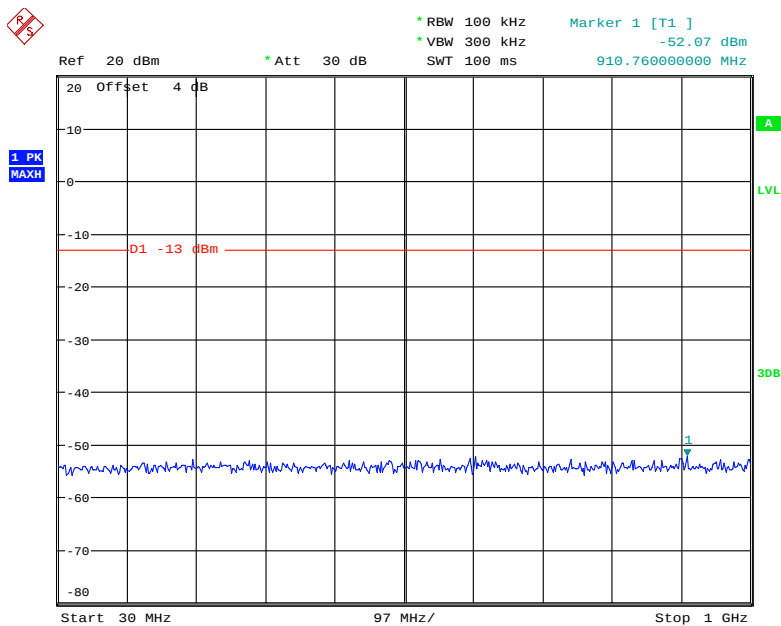


Date: 20.NOV.2019 16:28:56



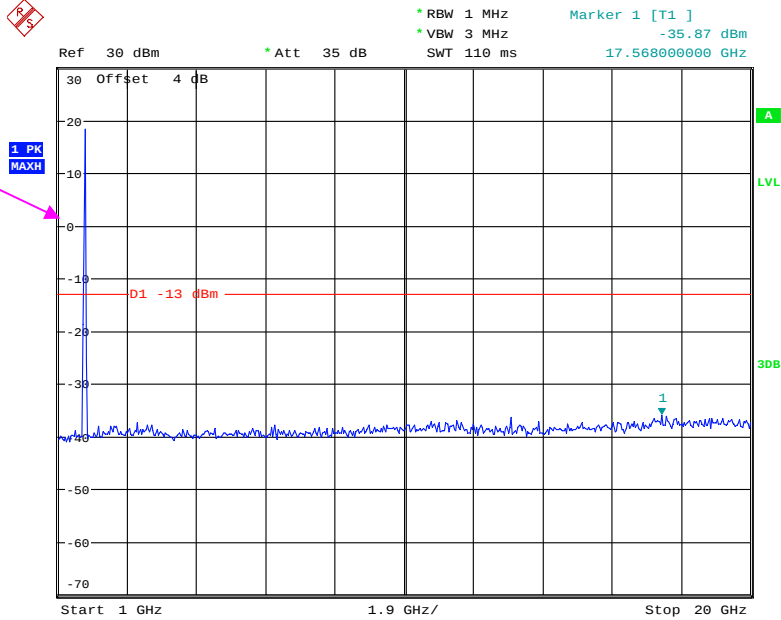
Date: 20.NOV.2019 16:29:08

QPSK_15 MHz



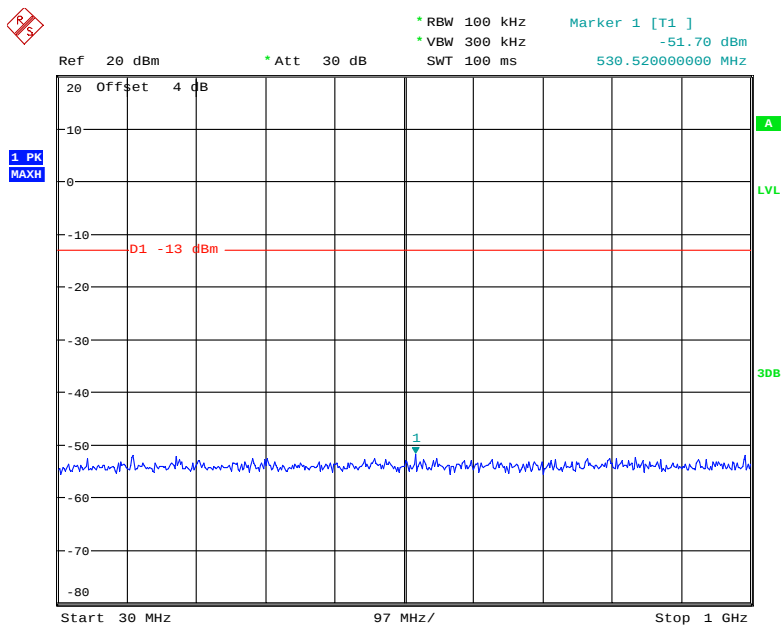
Date: 20.NOV.2019 16:29:32

Fundamental



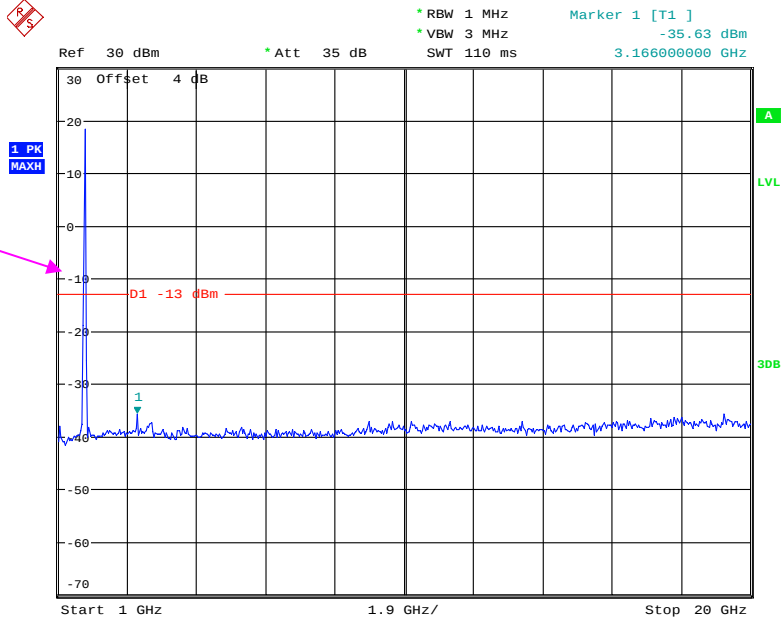
Date: 20.NOV.2019 16:29:44

QPSK_20 MHz



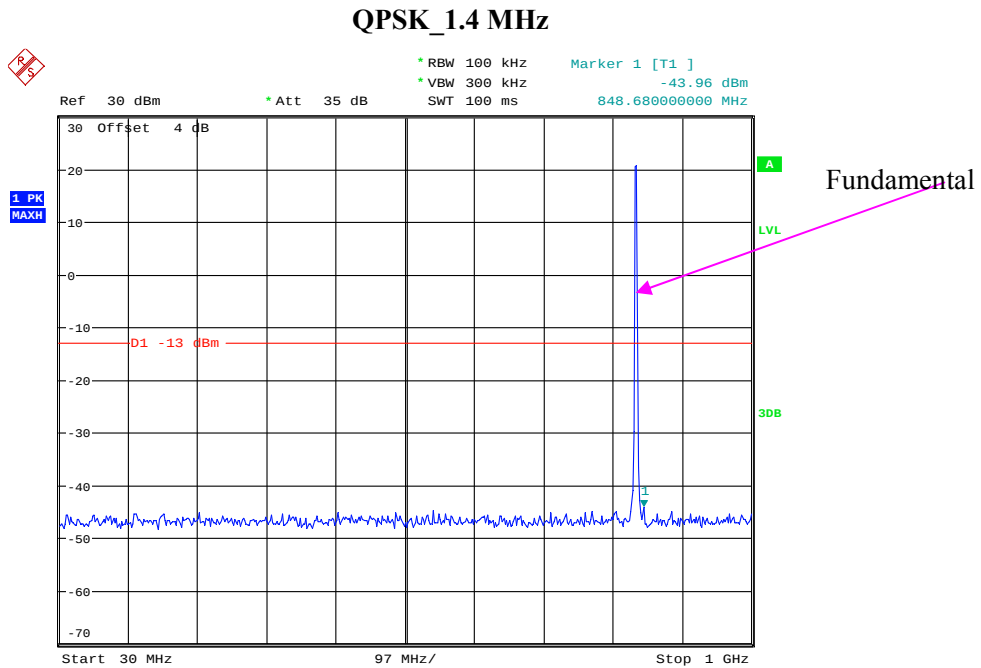
Date: 20.NOV.2019 16:30:11

Fundamental

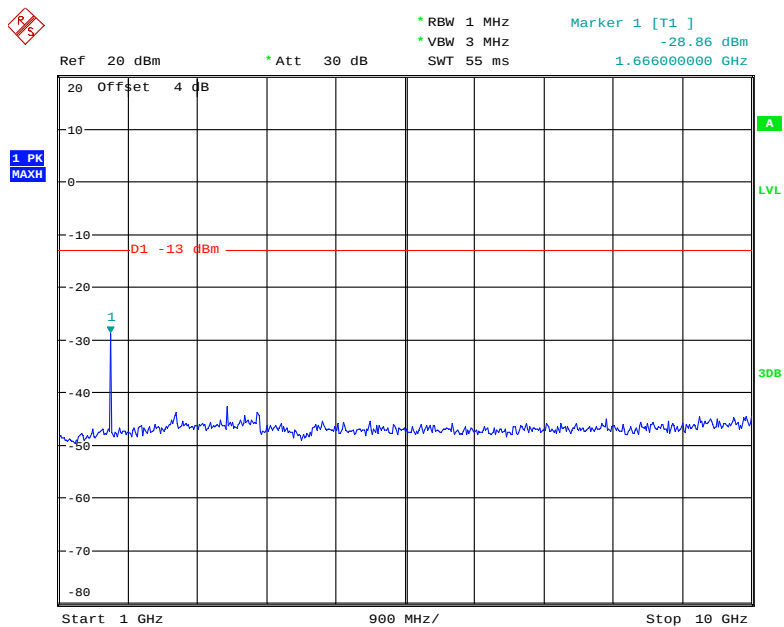


Date: 20.NOV.2019 16:30:23

LTE Band 5 (Middle Channel)

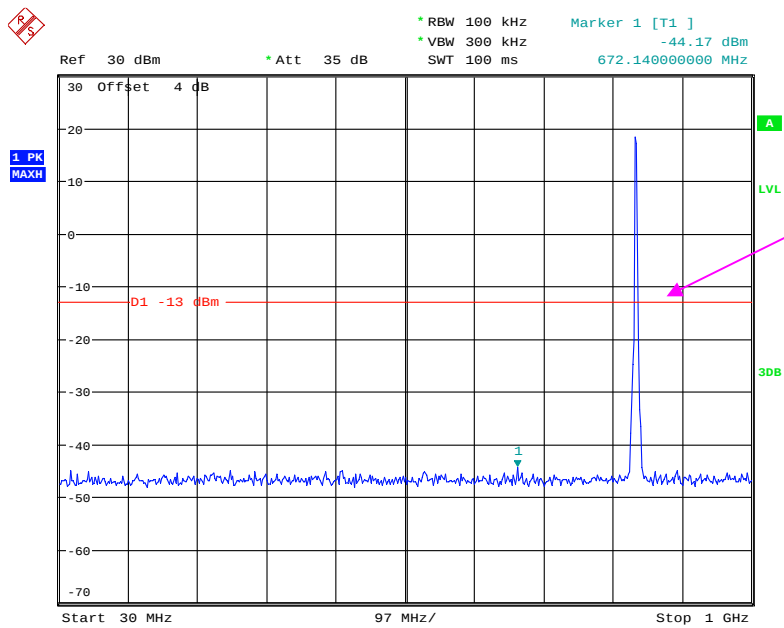


Date: 20.NOV.2019 16:30:42

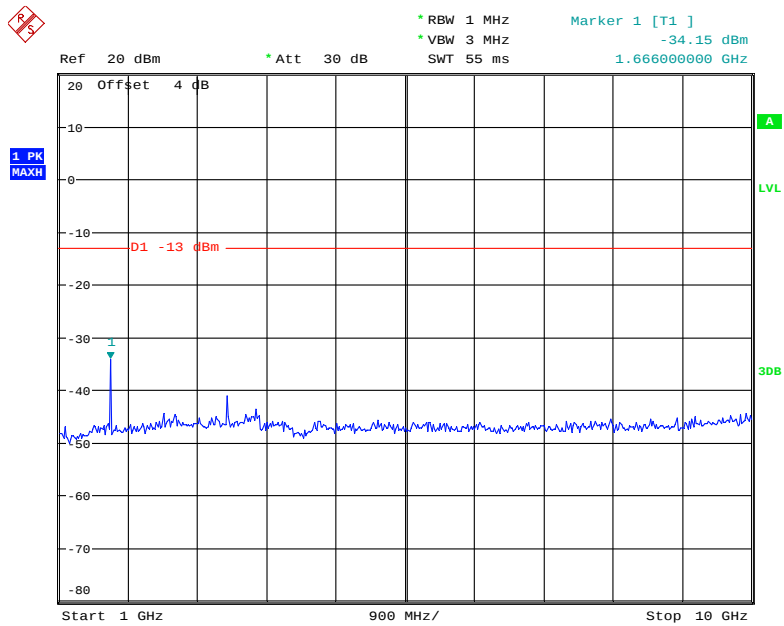


Date: 20.NOV.2019 16:30:54

QPSK_3 MHz

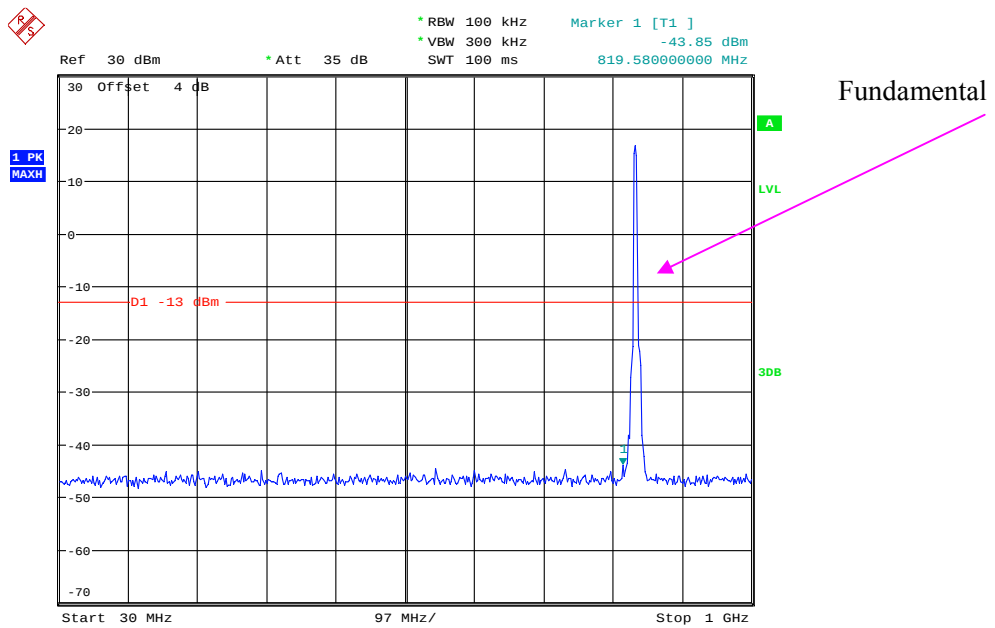


Date: 20.NOV.2019 16:31:13

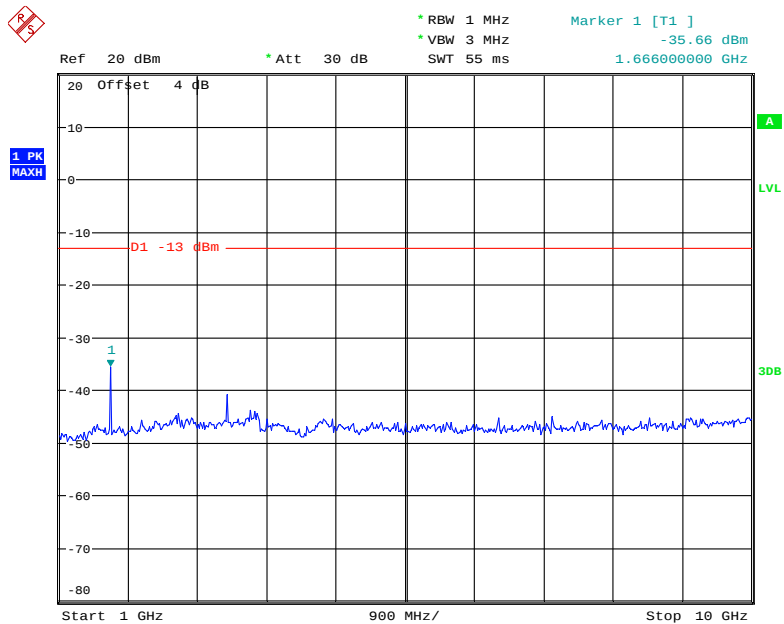


Date: 20.NOV.2019 16:31:25

QPSK_5 MHz

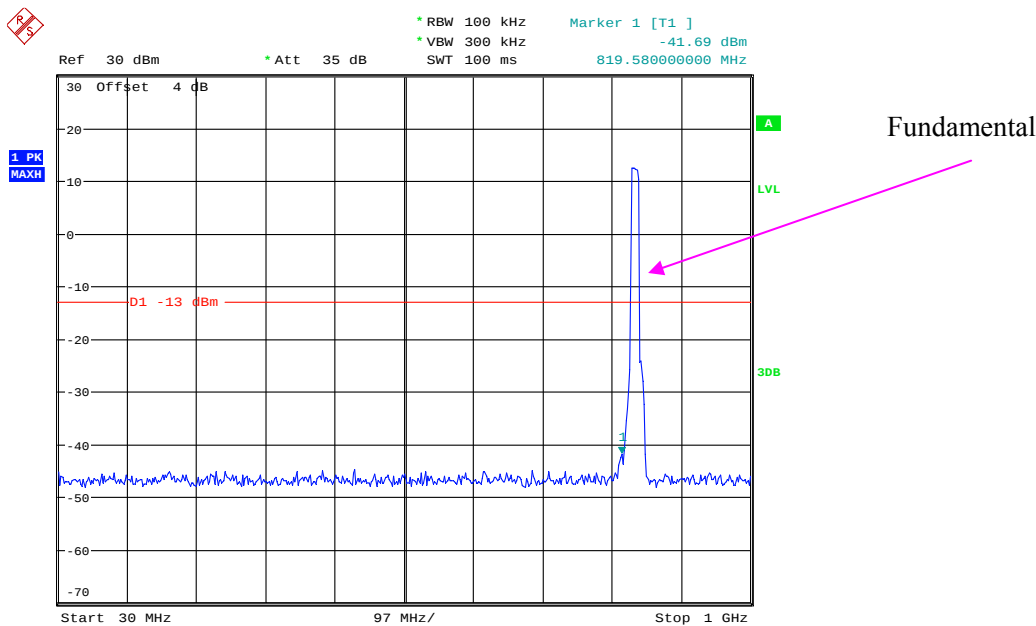


Date: 20.NOV.2019 16:31:45

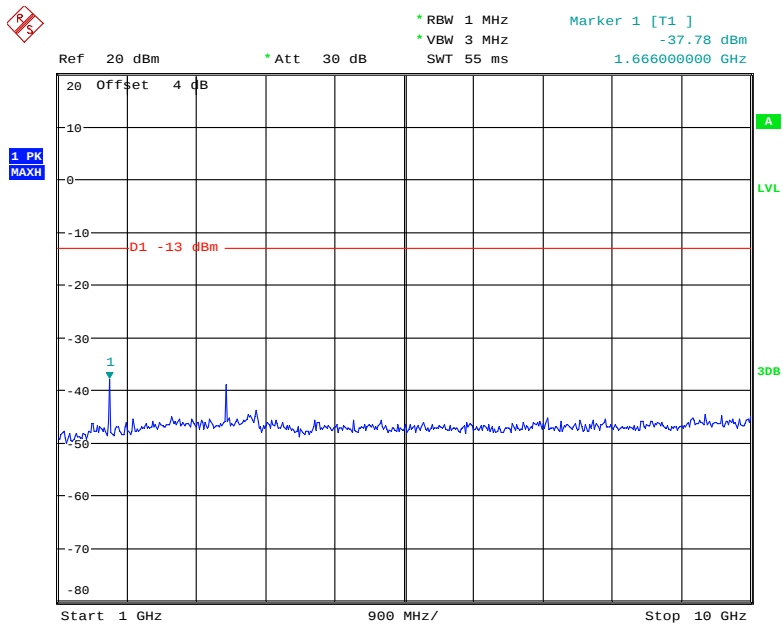


Date: 20.NOV.2019 16:31:57

QPSK_10 MHz



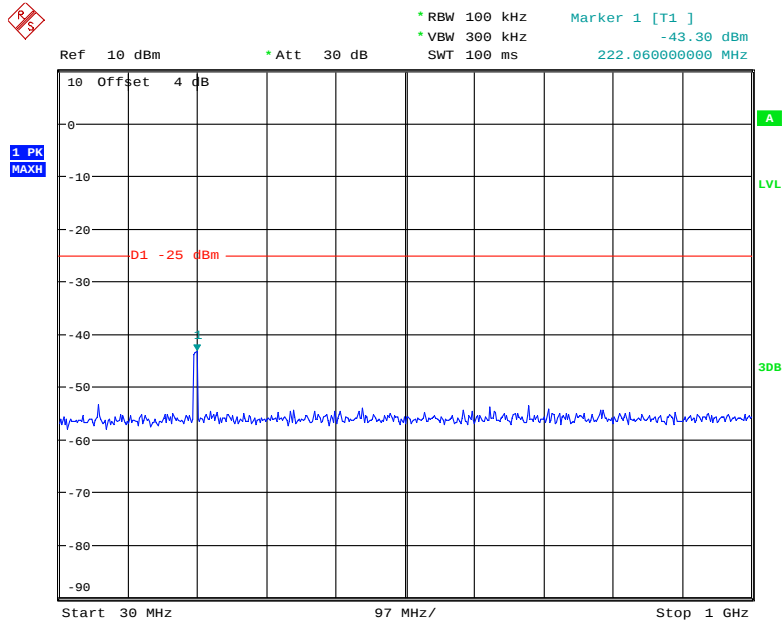
Date: 20.NOV.2019 16:32:17



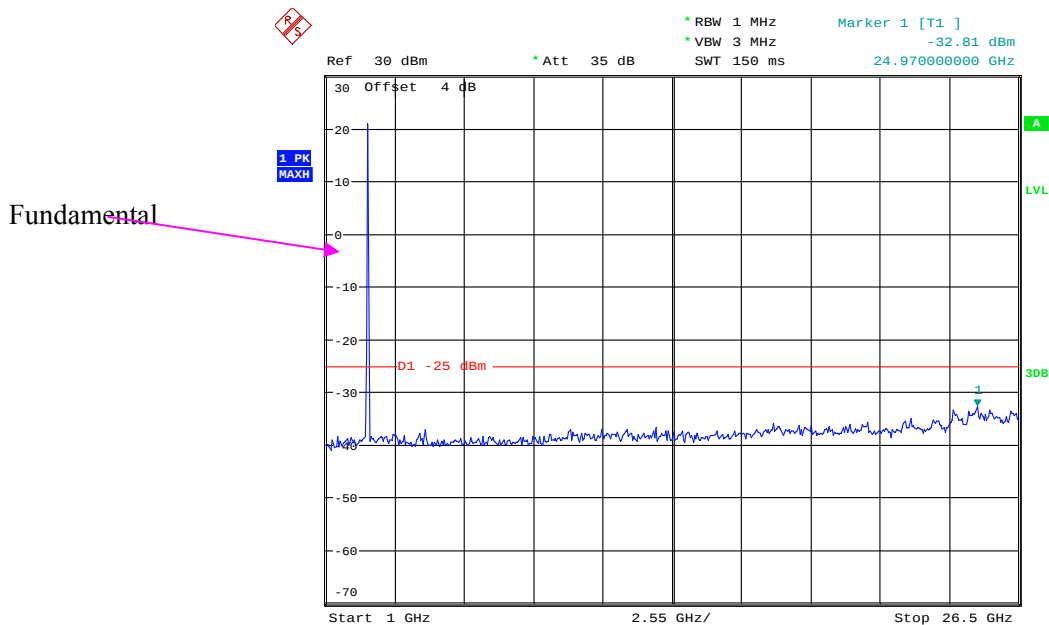
Date: 20.NOV.2019 16:32:29

LTE Band 7 (Middle Channel)

QPSK_5 MHz

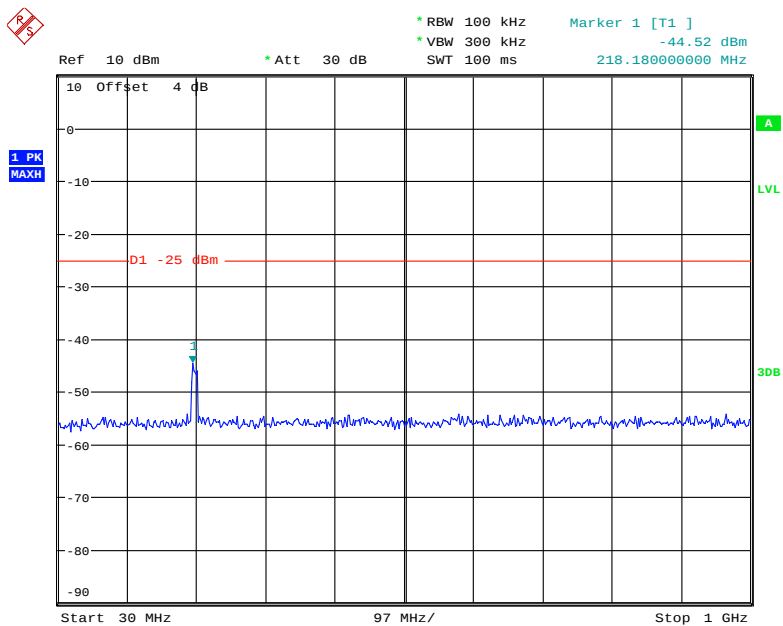


Date: 20.NOV.2019 16:32:50



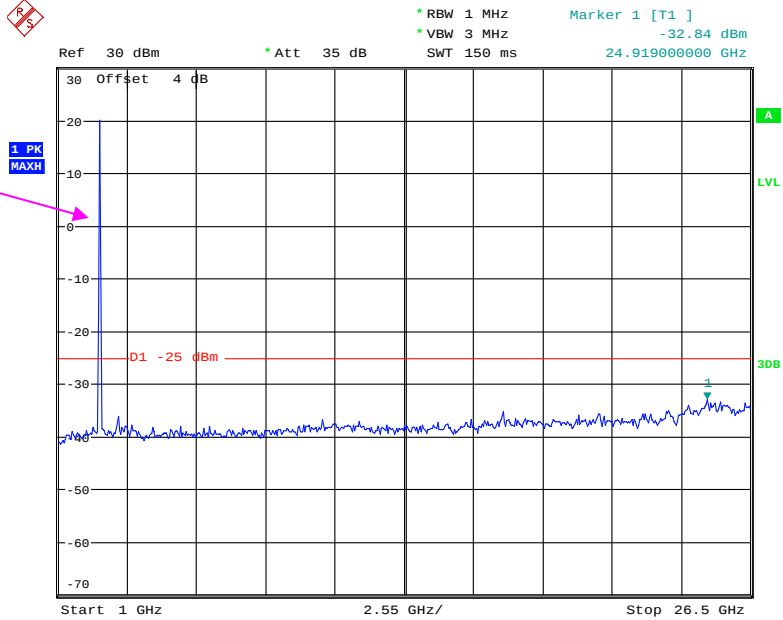
Date: 20.NOV.2019 16:33:02

QPSK_10 MHz



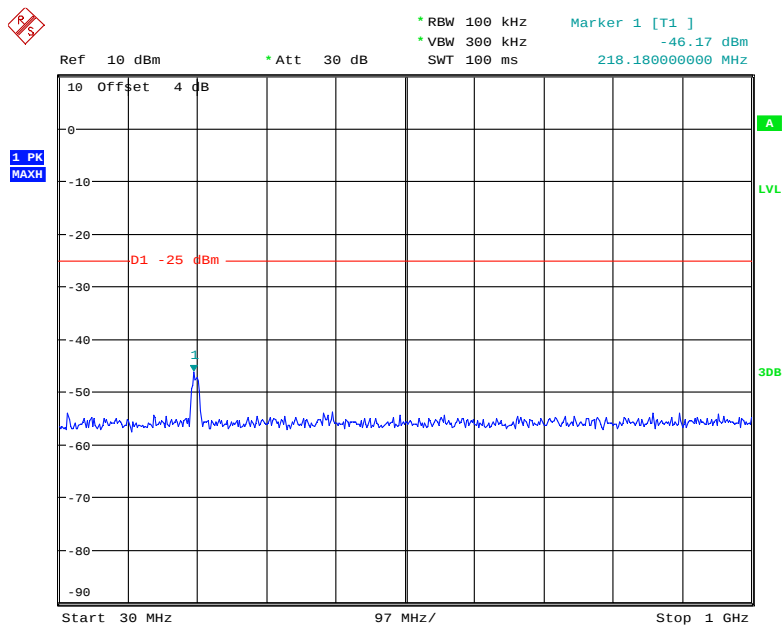
Date: 20.NOV.2019 16:33:26

Fundamental



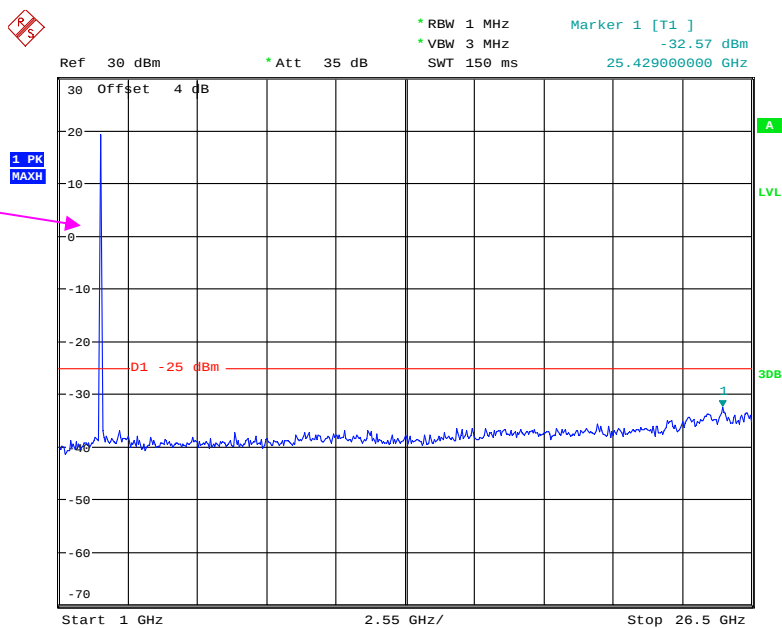
Date: 20.NOV.2019 16:33:38

QPSK_15 MHz



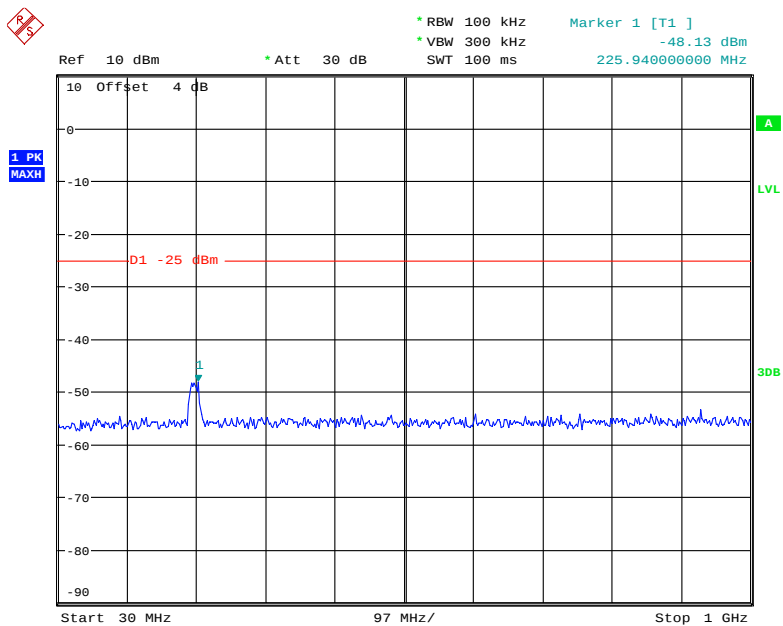
Date: 20.NOV.2019 16:34:05

Fundamental



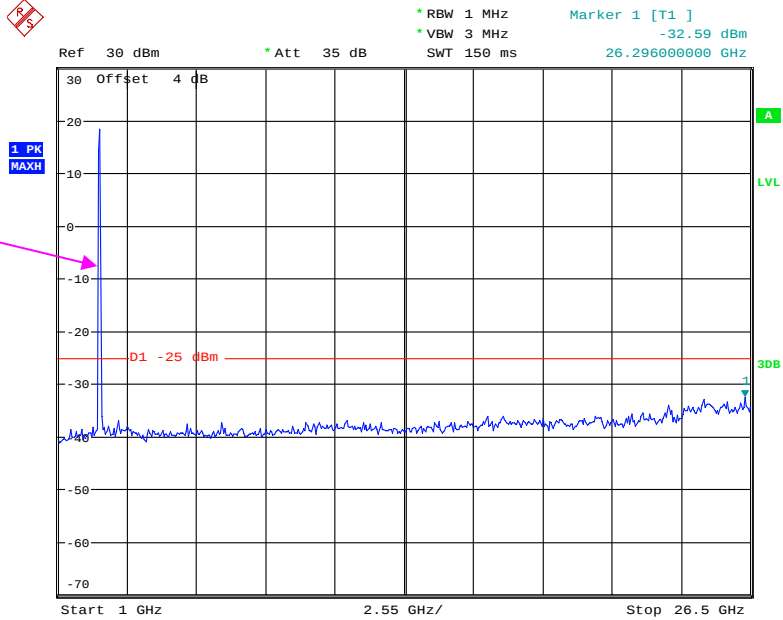
Date: 20.NOV.2019 16:34:16

QPSK_20 MHz



Date: 20.NOV.2019 16:34:44

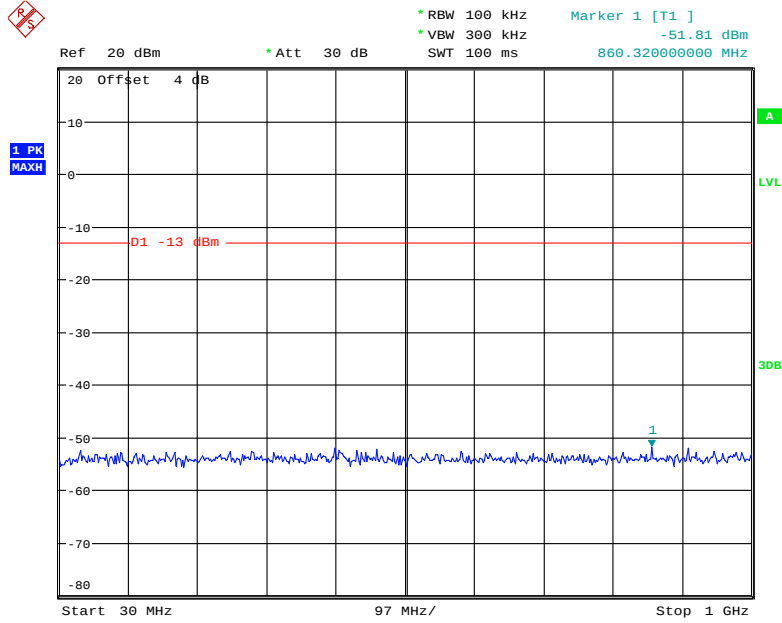
Fundamental



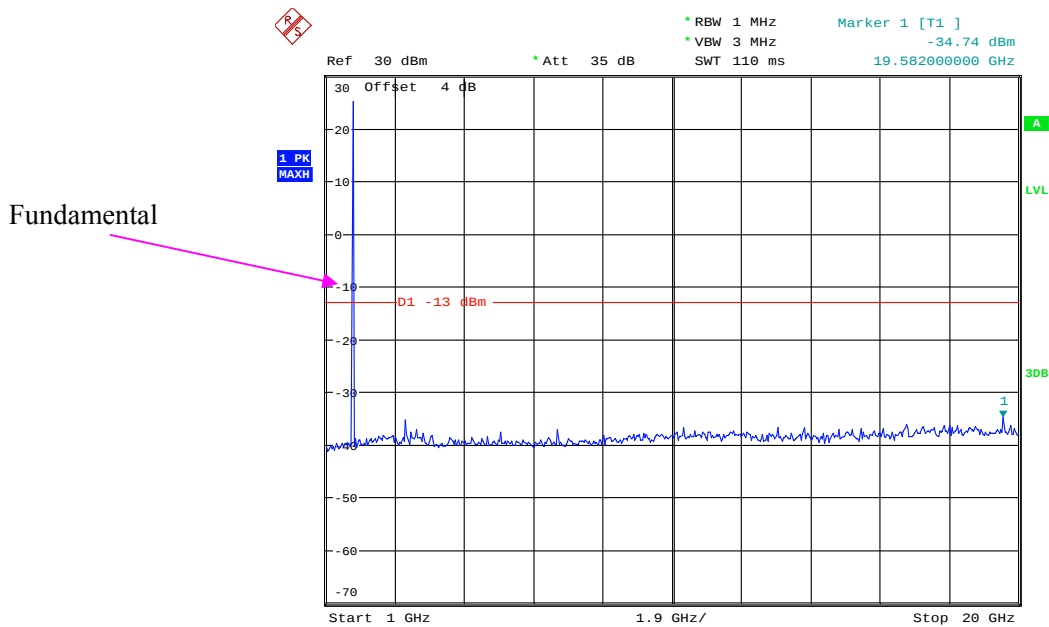
Date: 20.NOV.2019 16:34:56

LTE Band 66 (Middle Channel)

QPSK_1.4 MHz

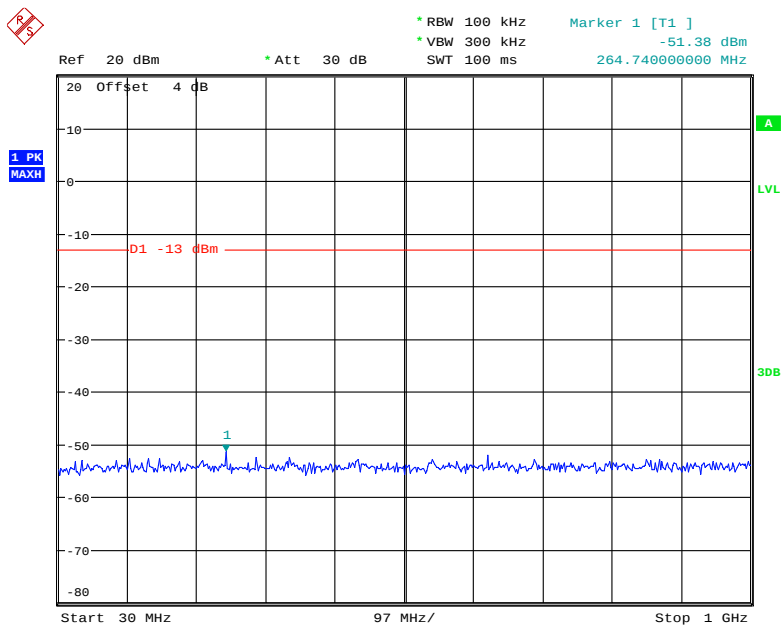


Date: 21.NOV.2019 14:27:18

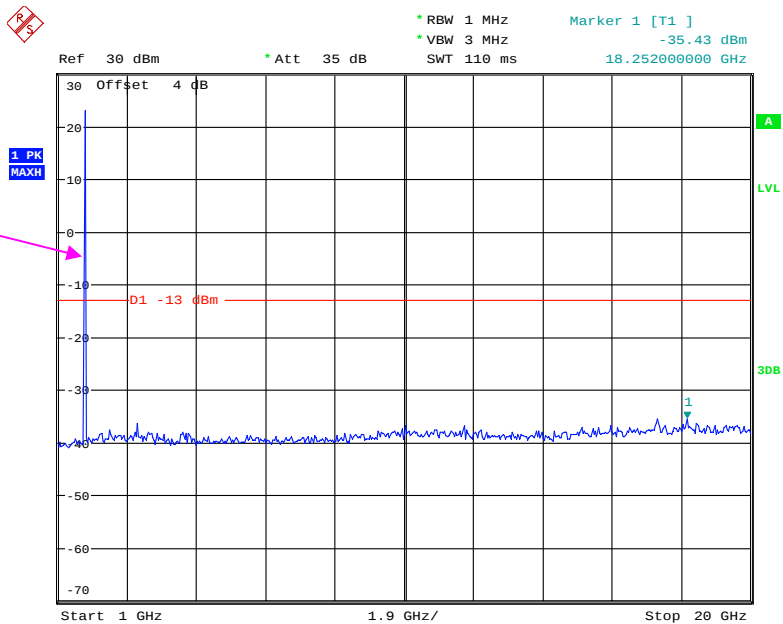


Date: 21.NOV.2019 14:27:30

QPSK_3 MHz

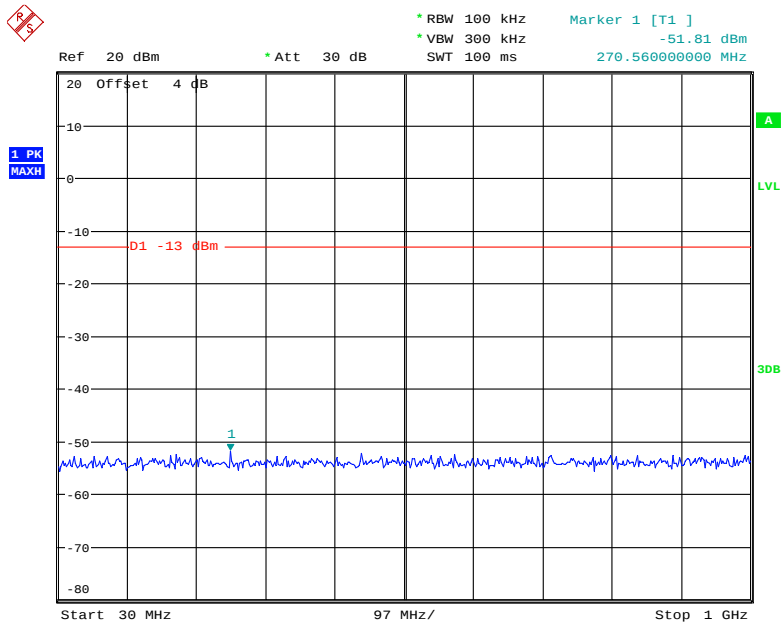


Date: 21.NOV.2019 14:27:49

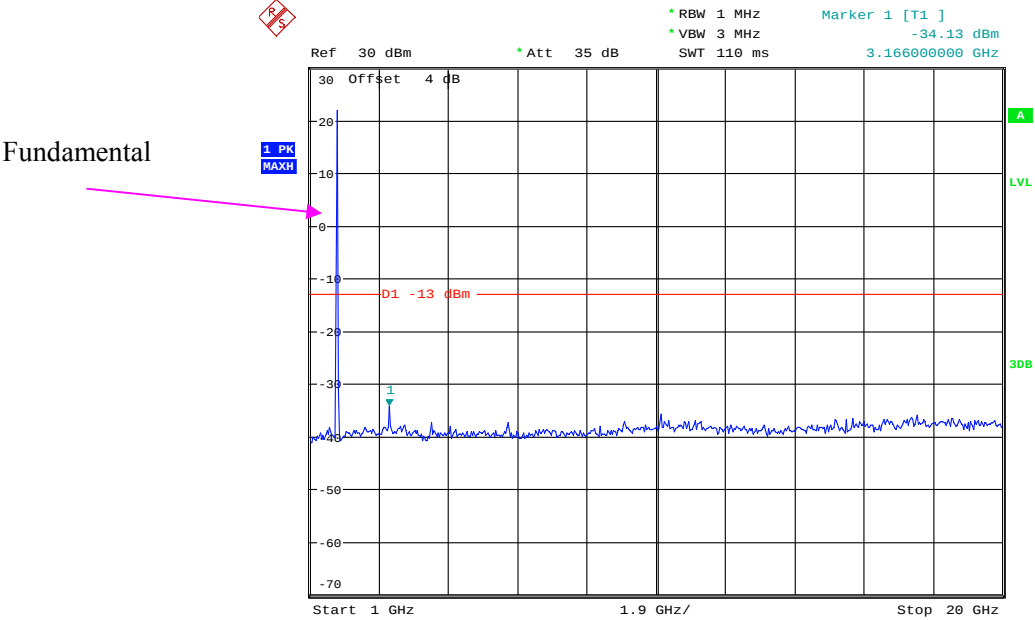


Date: 21.NOV.2019 14:28:01

QPSK_5 MHz

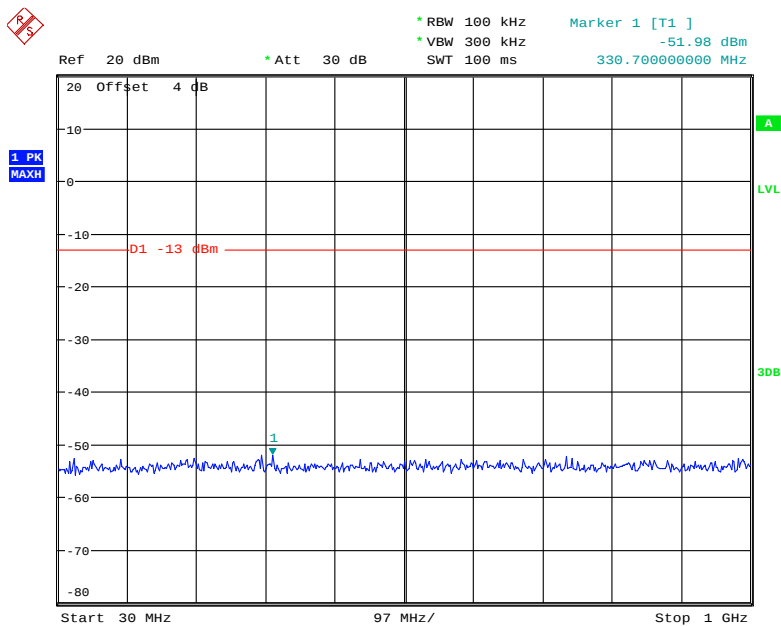


Date: 21.NOV.2019 14:28:24



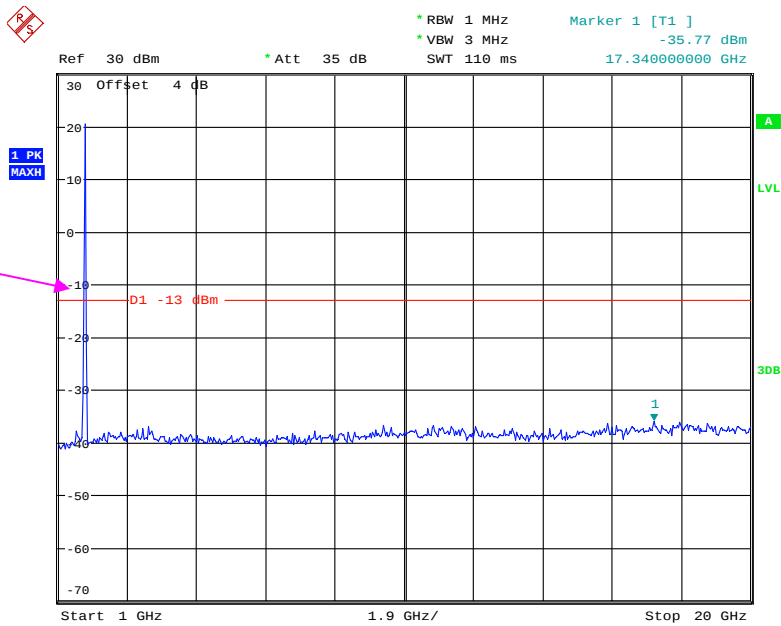
Date: 21.NOV.2019 14:28:36

QPSK_10 MHz



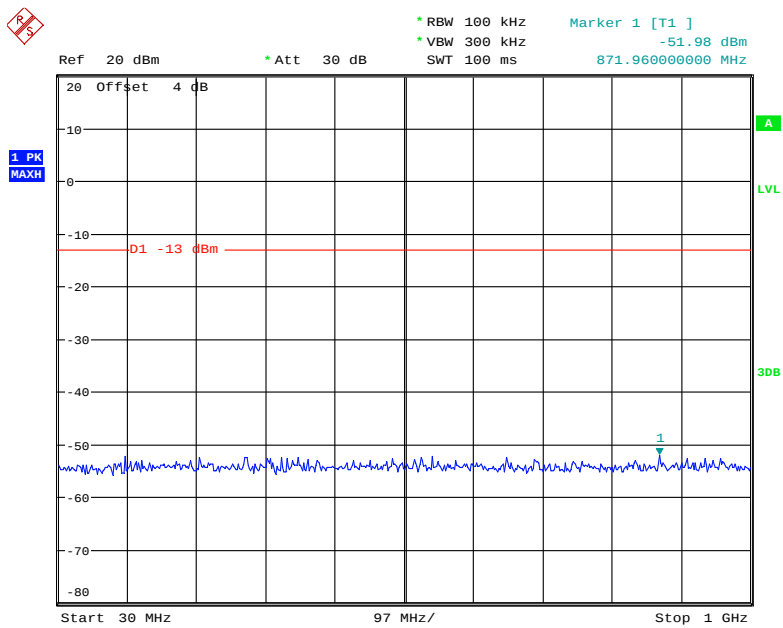
Date: 21.NOV.2019 14:28:56

Fundamental

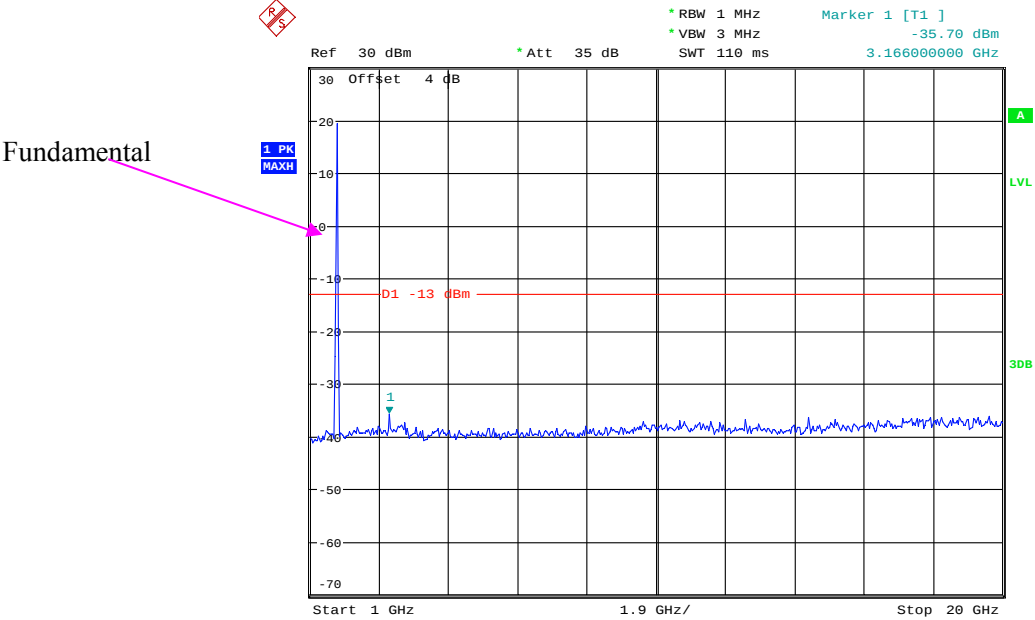


Date: 21.NOV.2019 14:29:07

QPSK_15 MHz

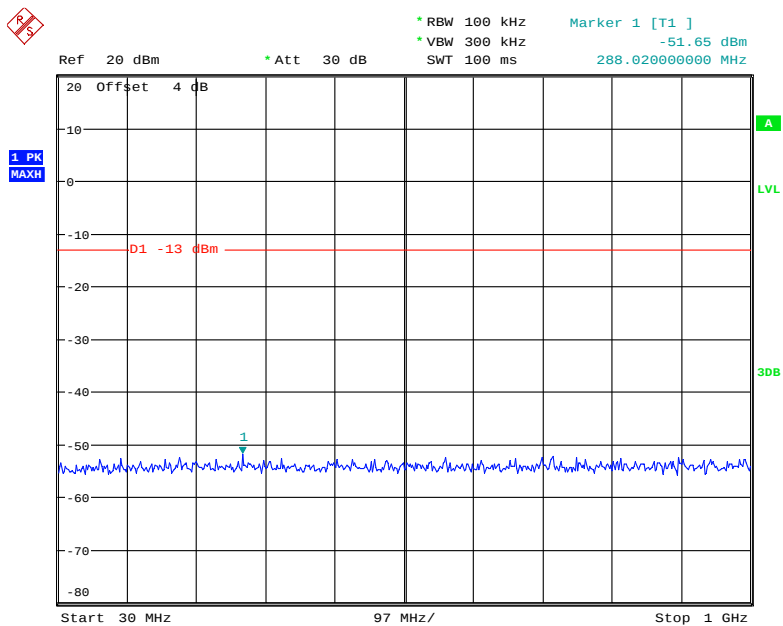


Date: 21.NOV.2019 14:29:31



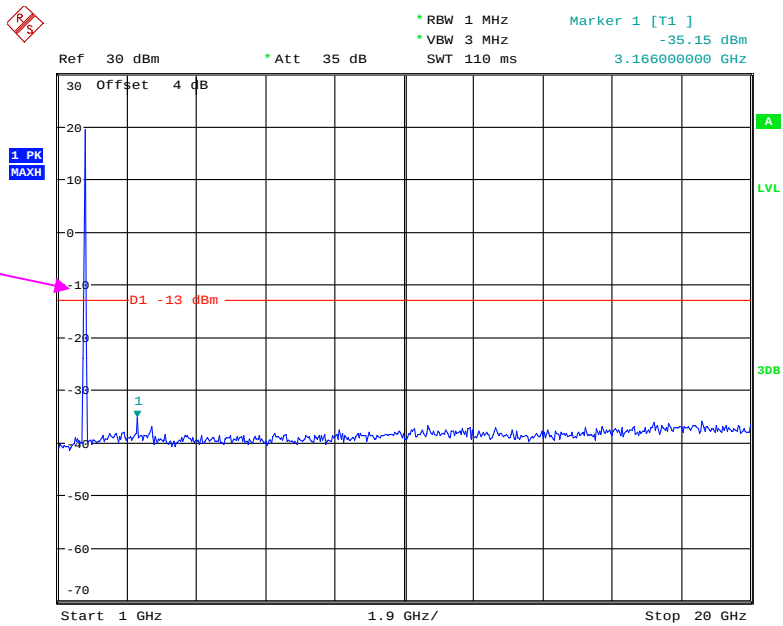
Date: 21.NOV.2019 14:29:43

QPSK_20 MHz



Date: 21.NOV.2019 14:30:06

Fundamental



Date: 21.NOV.2019 14:30:18

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 = $10 \lg (\text{TXpwr in Watts}/0.001)$ – the absolute level

Spurious attenuation limit in dB = $43 + 10 \text{Log}_{10} (\text{power out in Watts})$

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	2018-12-10	2019-12-10
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
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
Sinoscite	Band-stop filter	BSF2500-2750MS-1439-001	1437001	2019-06-16	2020-06-16
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-01 1304	2019-11-18	2022-11-18
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-02 1304	2019-11-18	2022-11-18
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:	23.3 °C	23.3 °C
Relative Humidity:	42%	42%
ATM Pressure:	102.6 kPa	102.6 kPa
Tester:	Davy Wang	Neil Liao
Test Date:	2019-11-26~2019-12-05	2019-11-26~2019-12-05

*EUT Operation Mode: Transmitting***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)			
WCDMA Band V R99,Frequency:836.600 MHz								
1673.200	H	36.74	-67.2	10.6	0.73	-57.3	-13.0	44.3
1673.200	V	37.98	-66.56	10.6	0.73	-56.7	-13.0	43.7
2509.800	H	37.45	-65.46	13.1	1.25	-53.6	-13.0	40.6
2509.800	V	36.98	-65.96	13.1	1.25	-54.1	-13.0	41.1
3346.400	H	36.41	-63.27	13.8	1.61	-51.1	-13.0	38.1
3346.400	V	35.33	-64.39	13.8	1.61	-52.2	-13.0	39.2
756.400	H	36.89	-62.97	0.0	0.93	-63.9	-13.0	50.9
531.800	V	37.56	-69.11	0.0	0.73	-69.8	-13.0	56.8

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 II R99,Frequency: 1880.000 MHz								
3760.000	H	36.74	-60.9	13.8	1.63	-48.8	-13.0	35.8
3760.000	V	37.65	-59.85	13.8	1.63	-47.7	-13.0	34.7
5640.000	H	36.25	-57.34	14.0	1.31	-44.6	-13.0	31.6
5640.000	V	37.48	-56	14.0	1.31	-43.3	-13.0	30.3
876.400	H	36.67	-60.83	0.0	1.02	-61.9	-13.0	48.9
665.480	V	37.04	-67.37	0.0	0.88	-68.3	-13.0	55.3

LTE Band 2 (30MHz-20GHz):

EPE Band 1 (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	38.64	-59.00	13.76	1.63	-46.87	-13.00	33.87
3760.00	V	37.54	-59.96	13.76	1.63	-47.83	-13.00	34.83
5640.00	H	36.63	-56.96	14.02	1.31	-44.25	-13.00	31.25
5640.00	V	36.14	-57.34	14.02	1.31	-44.63	-13.00	31.63
715.70	H	35.71	-65.28	0.00	0.94	-66.22	-13.00	53.22
753.60	V	34.65	-68.45	0.00	0.93	-69.38	-13.00	56.38

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	38.64	-60.55	13.91	1.62	-48.26	-13.00	35.26
3465.00	V	37.55	-61.67	13.91	1.62	-49.38	-13.00	36.38
5197.50	H	36.25	-58.44	14.00	1.52	-45.96	-13.00	32.96
5197.50	V	36.49	-58.27	14.00	1.52	-45.79	-13.00	32.79
844.90	H	36.87	-61.10	0.00	0.98	-62.08	-13.00	49.08
651.20	V	35.63	-69.00	0.00	0.85	-69.85	-13.00	56.85

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	41.84	-62.10	10.61	0.73	-52.22	-13.00	39.22
1673.00	V	44.52	-60.02	10.61	0.73	-50.14	-13.00	37.14
2509.50	H	38.74	-64.17	13.11	1.25	-52.31	-13.00	39.31
2509.50	V	39.50	-63.44	13.11	1.25	-51.58	-13.00	38.58
3346.00	H	36.10	-63.58	13.83	1.61	-51.36	-13.00	38.36
3346.00	V	36.97	-62.75	13.83	1.61	-50.53	-13.00	37.53
632.90	H	35.06	-66.84	0.00	0.82	-67.66	-13.00	54.66
522.00	V	34.39	-72.46	0.00	0.72	-73.18	-13.00	60.18

LTE Band 7 (30MHz-26.5GHz):

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: 2535.000 MHz								
5070.00	H	36.87	-58.24	13.93	1.34	-45.65	-25.00	20.65
5070.00	V	37.52	-57.40	13.93	1.34	-44.81	-25.00	19.81
7605.00	H	36.14	-52.74	13.21	1.40	-40.93	-25.00	15.93
7605.00	V	35.97	-53.31	13.21	1.40	-41.50	-25.00	16.50
437.80	H	36.36	-68.23	0.00	0.65	-68.88	-25.00	43.88
531.10	V	35.47	-71.21	0.00	0.73	-71.94	-25.00	46.94

LTE Band 66 (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:1745.000 MHz								
3490.00	H	38.53	-60.53	13.83	1.61	-48.31	-13.00	35.31
3490.00	V	37.54	-61.53	13.83	1.61	-49.31	-13.00	36.31
5235.00	H	36.84	-58.07	14.11	1.40	-45.36	-13.00	32.36
5235.00	V	36.13	-58.86	14.11	1.40	-46.15	-13.00	33.15
844.90	H	37.53	-60.44	0.00	0.98	-61.42	-13.00	48.42
620.30	V	36.65	-68.44	0.00	0.80	-69.24	-13.00	56.24

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

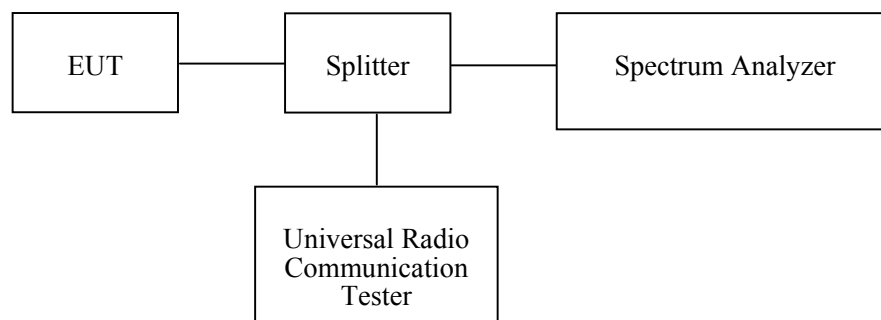
Applicable Standard

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	FSV40	101474	2019-01-09	2020-01-09
R&S	Spectrum Analyzer	FSU 26	200256	2019-05-09	2020-05-09
Unknown	Coaxial Cable	C-SJ00-0010	C0010/05	Each time	/
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41010013	Each time	/
E-Microwave	Two-way Splitter	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:	25.4~26.5°C
Relative Humidity:	44~60%
ATM Pressure:	100.2~100.6kPa
Test by:	Elena Lei, Vern Shen
Test Date:	2019-11-18~2019-11-21

Test Mode: Transmitting

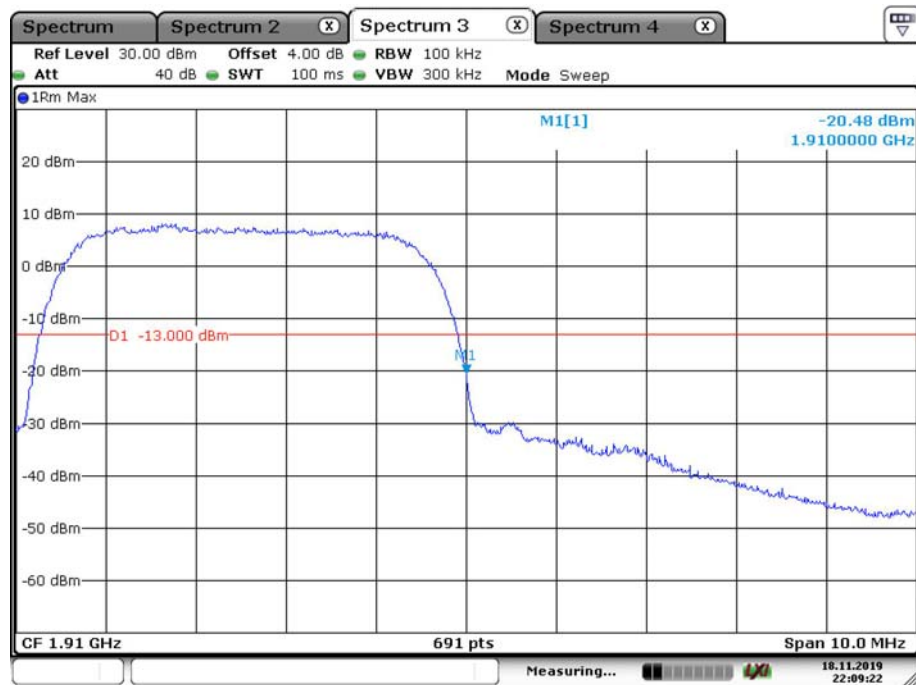
Test Result: Compliant. Please refer to the following plots.

WCDMA Band II Rel 99, Left Band Edge



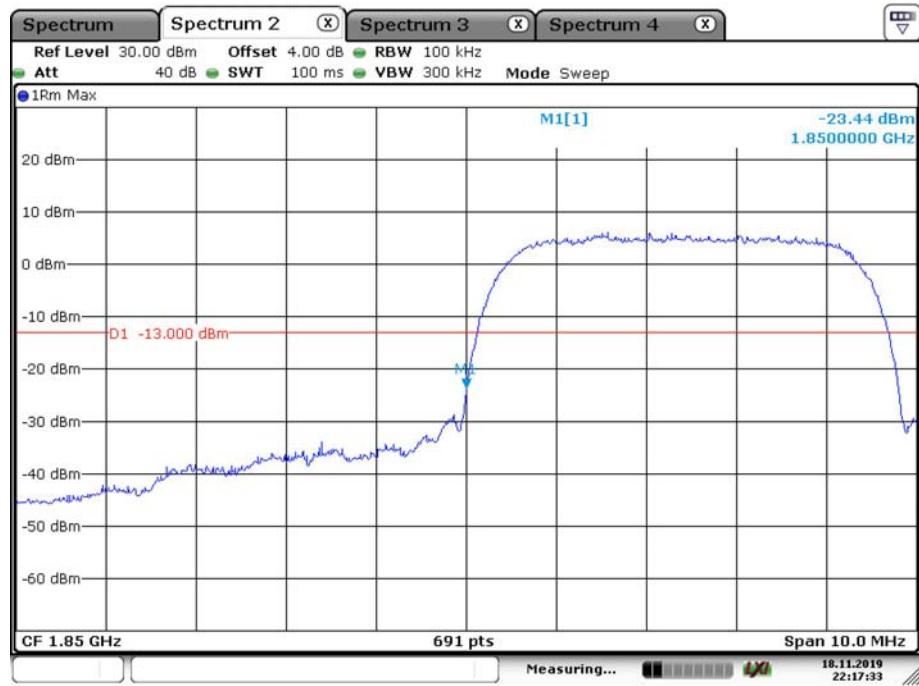
Date: 18.NOV.2019 22:04:32

WCDMA Band II Rel 99, Right Band Edge



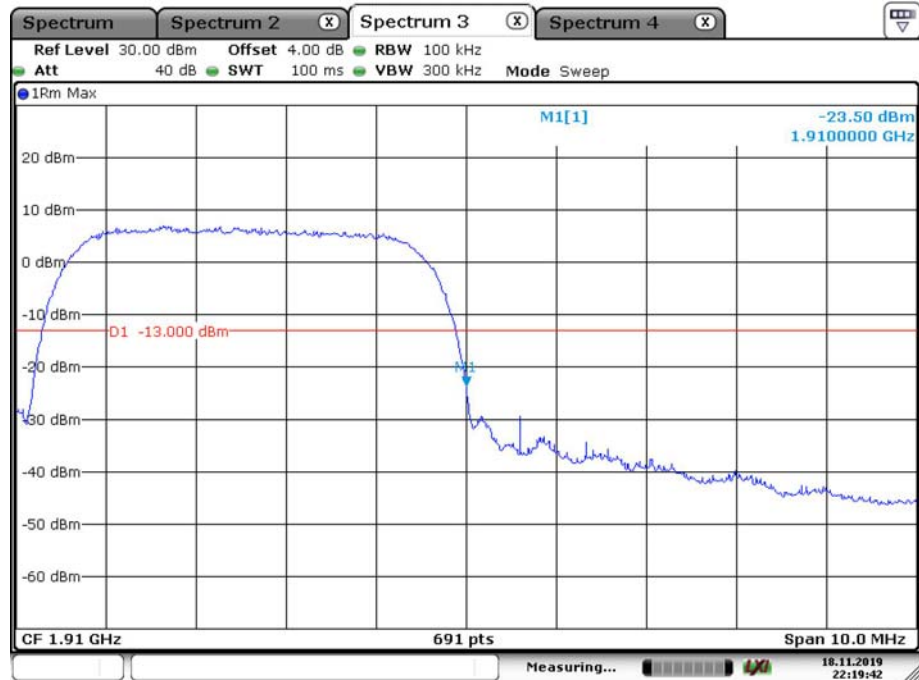
Date: 18.NOV.2019 22:09:22

WCDMA Band II HSDPA, Left Band Edge



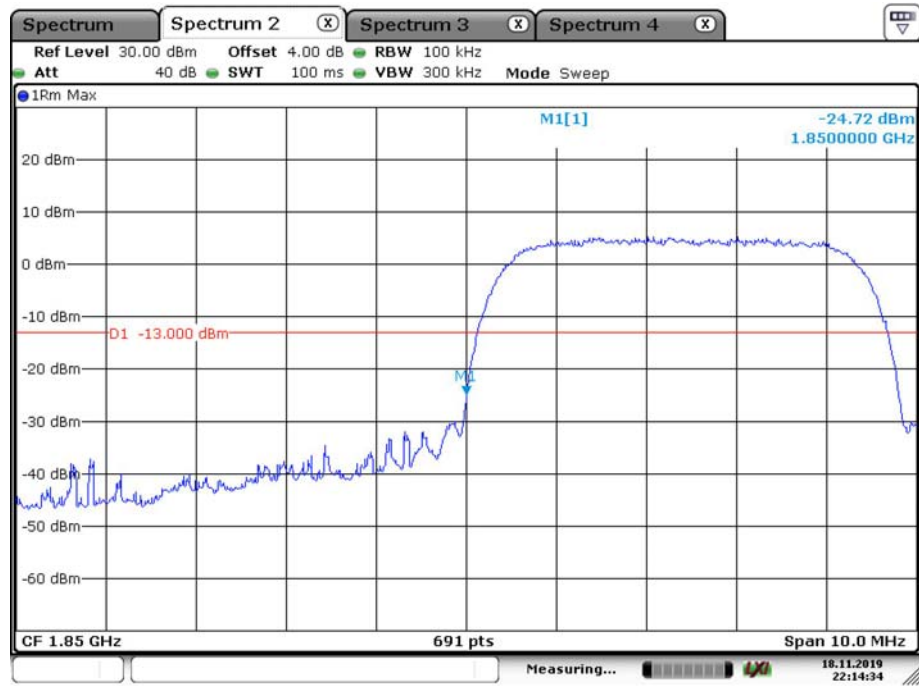
Date: 18.NOV.2019 22:17:33

WCDMA Band II HSDPA, Right Band Edge



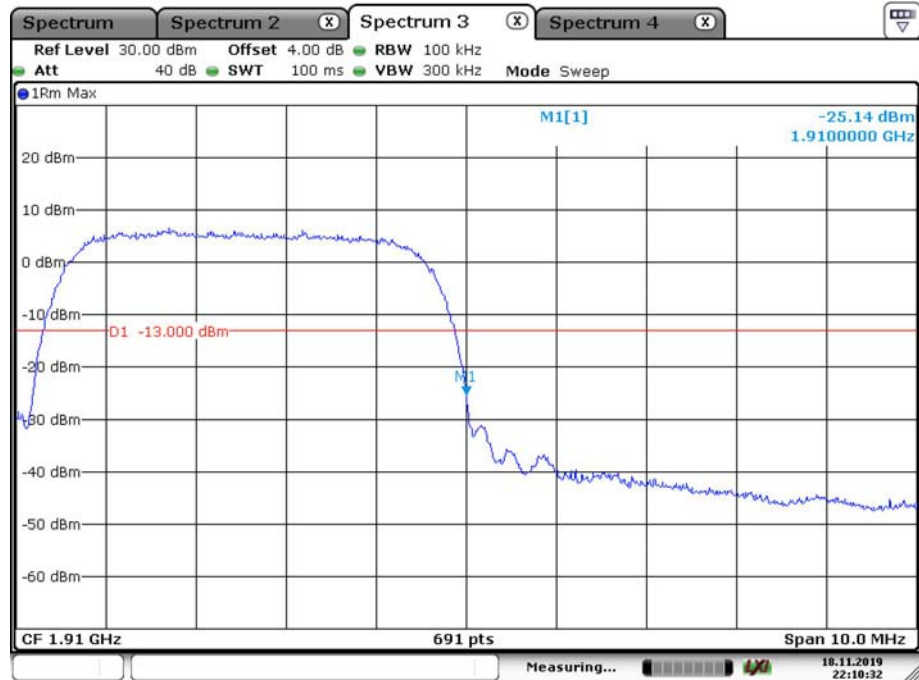
Date: 18.NOV.2019 22:19:42

WCDMA Band II HSUPA, Left Band Edge



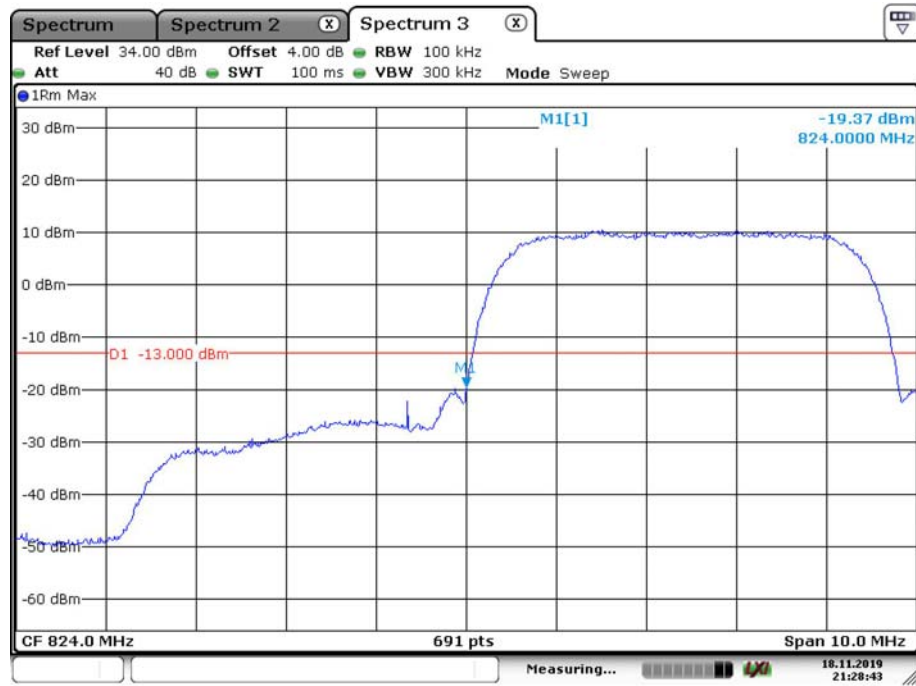
Date: 18.NOV.2019 22:14:34

WCDMA Band II HSUPA, Right Band Edge



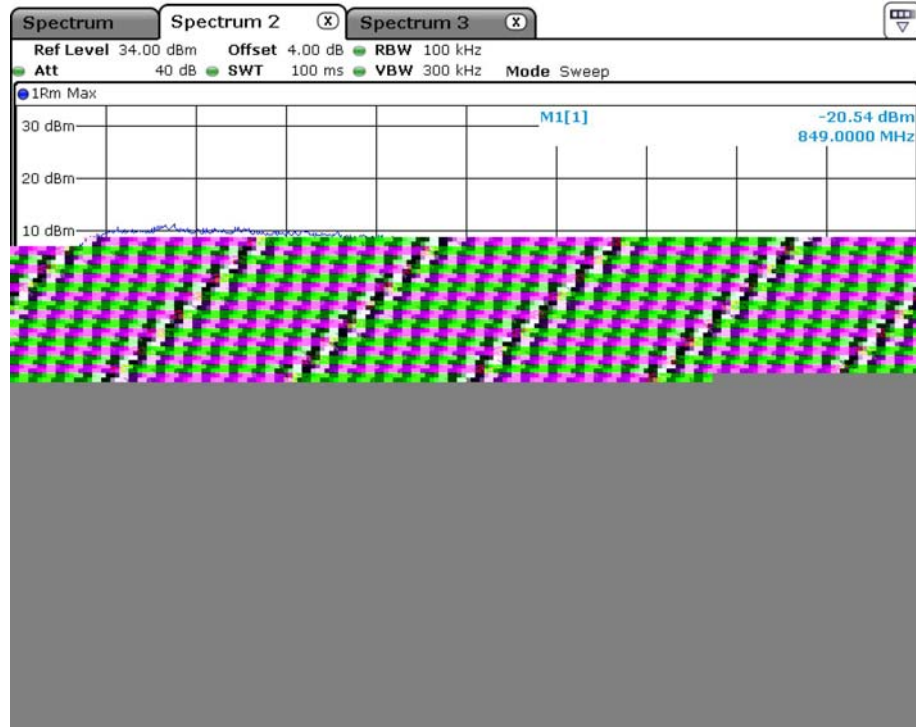
Date: 18.NOV.2019 22:10:32

WCDMA Band V Rel 99, Left Band Edge

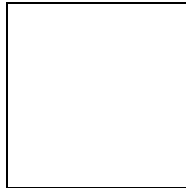


Date: 18.NOV.2019 21:28:43

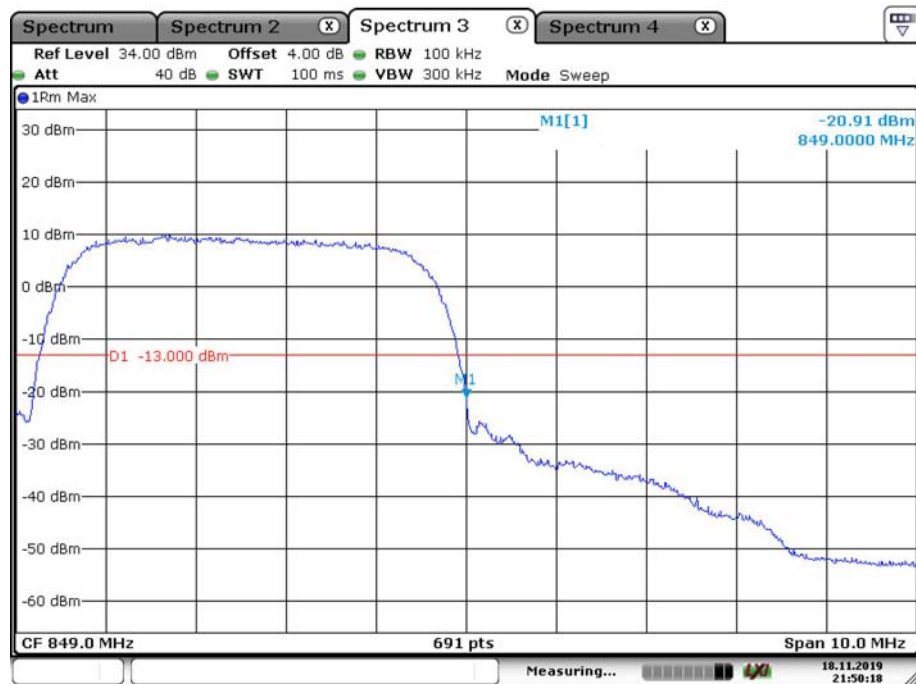
WCDMA Band V Rel 99, Right Band Edge



WCDMA Band V HSDPA, Left Band Edge

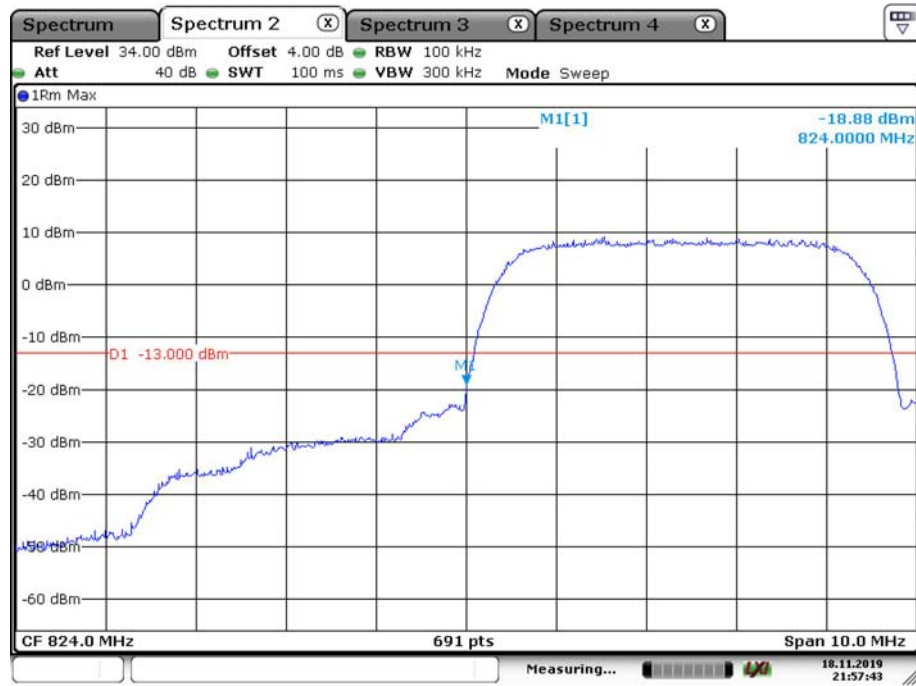


WCDMA Band V HSDPA, Right Band Edge



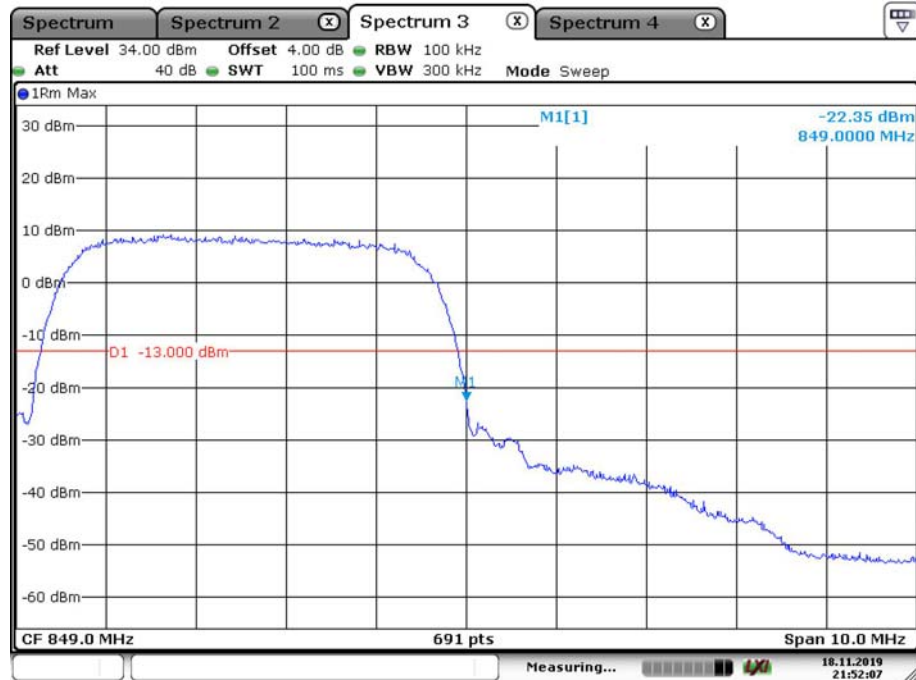
Date: 18.NOV.2019 21:50:18

WCDMA Band V HSUPA, Left Band Edge



Date: 18.NOV.2019 21:57:42

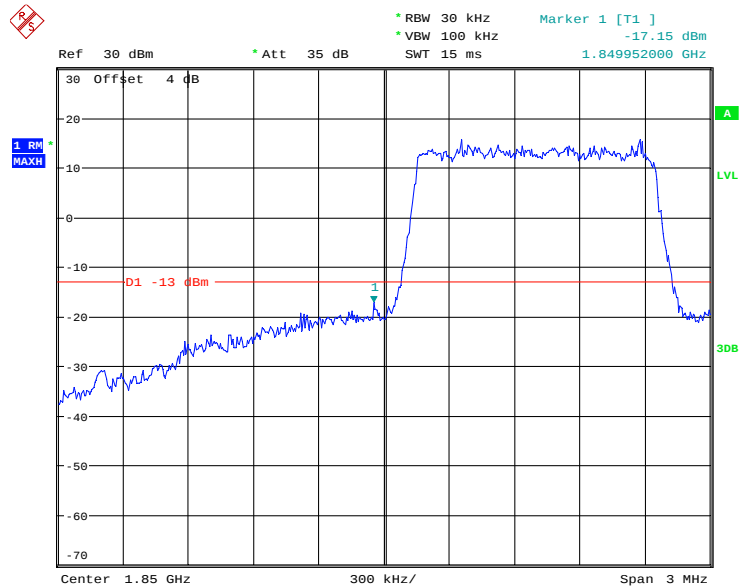
WCDMA Band V HSUPA, Right Band Edge



Date: 18.NOV.2019 21:52:07

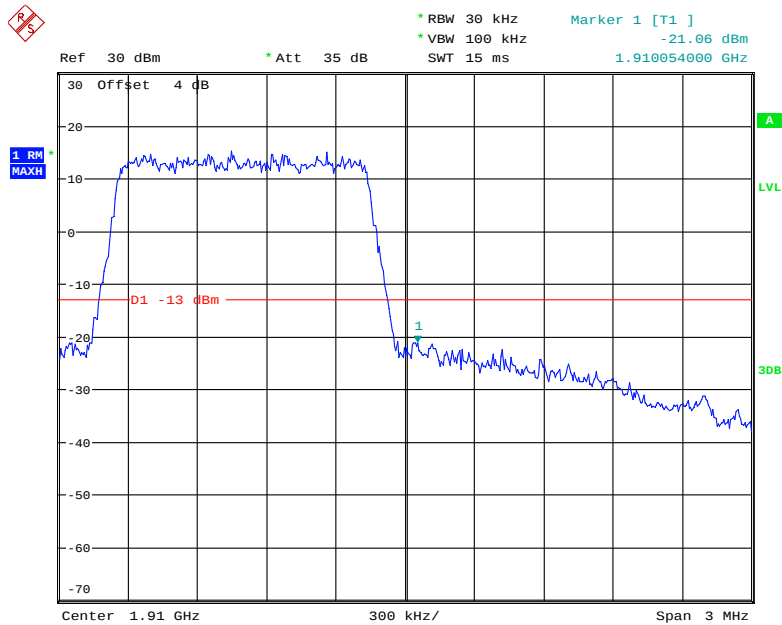
LTE Band 2

QPSK_1.4MHz_6 RB_ Left



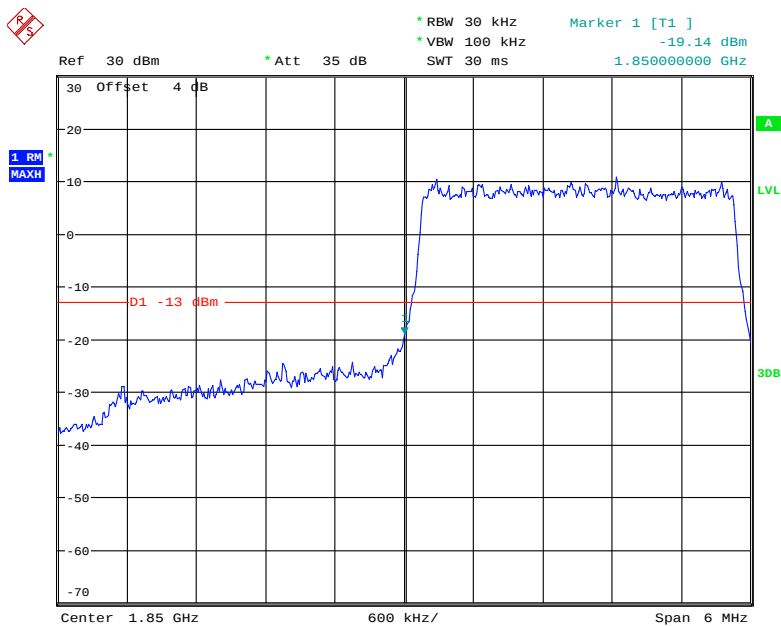
Date: 20.NOV.2019 16:38:34

QPSK_1.4MHz_6 RB_ Right



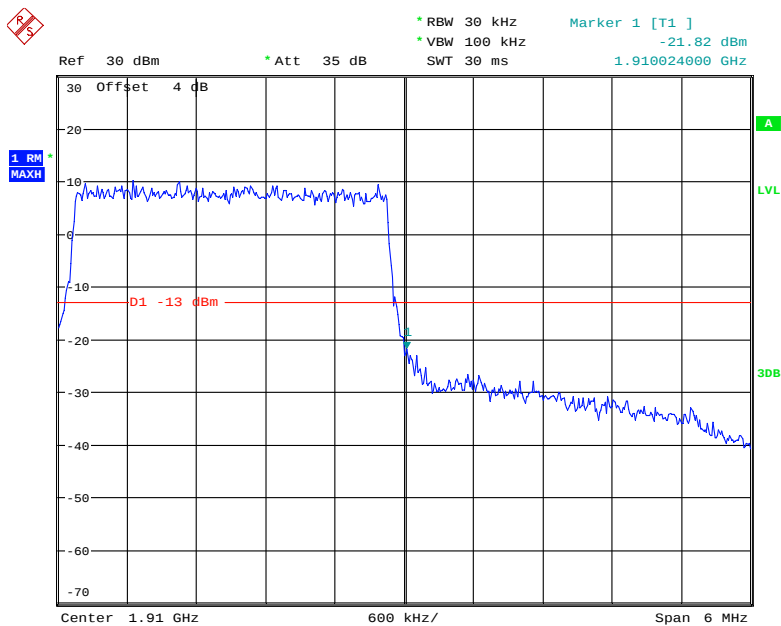
Date: 20.NOV.2019 16:39:15

QPSK_3MHz_15 RB_Left



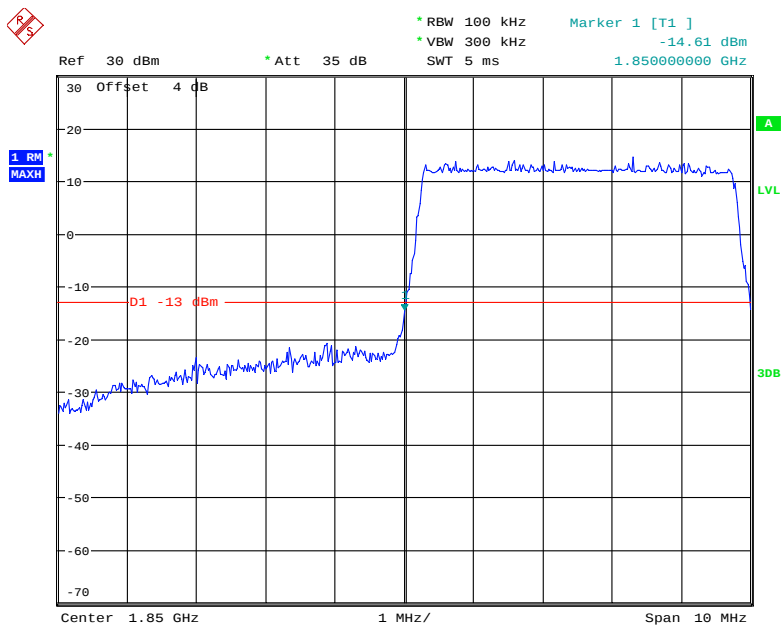
Date: 20.NOV.2019 16:39:59

QPSK_3MHz_15 RB_Right



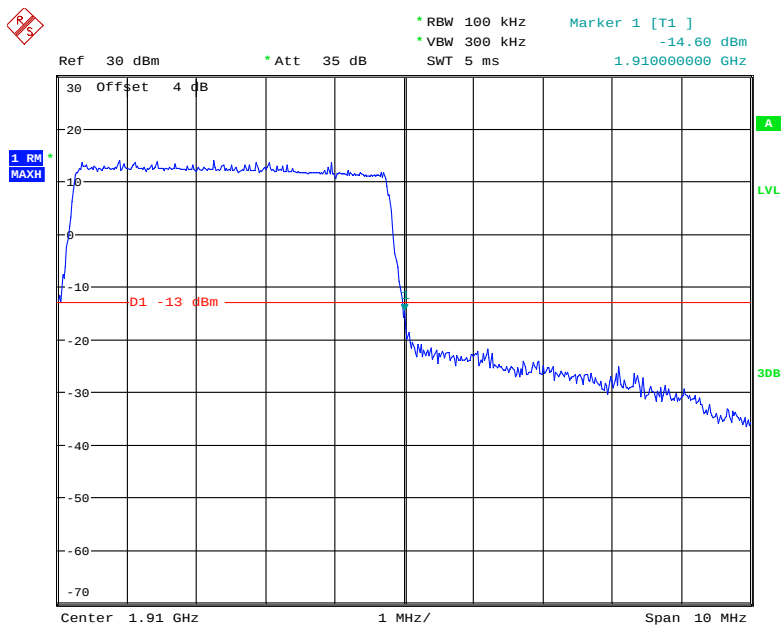
Date: 20.NOV.2019 16:40:34

QPSK_5MHz_25 RB_ Left



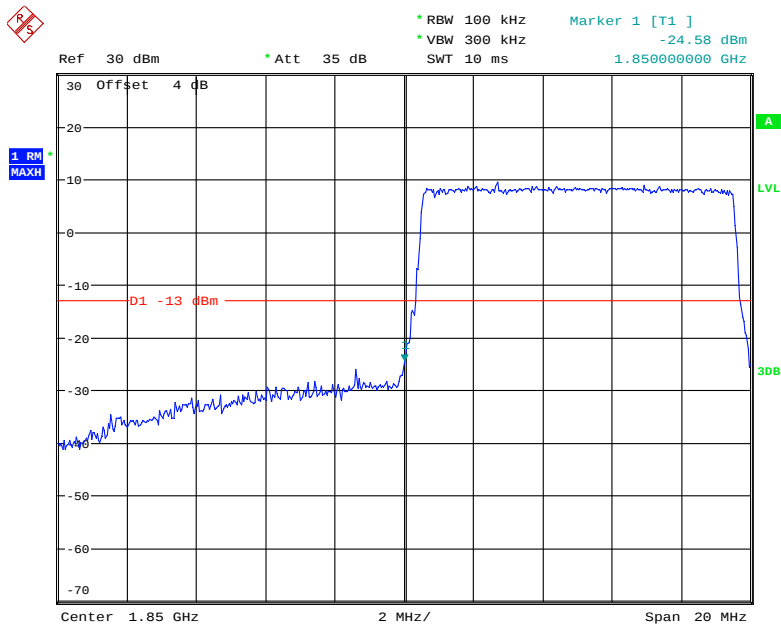
Date: 20.NOV.2019 16:41:13

QPSK_5MHz_25 RB_ Right



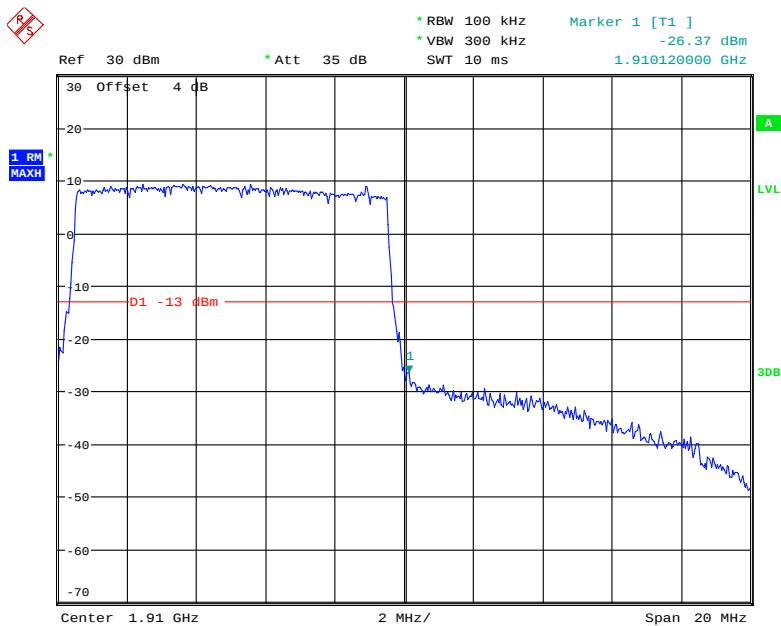
Date: 20.NOV.2019 16:41:56

QPSK_10MHz_50 RB_ Left



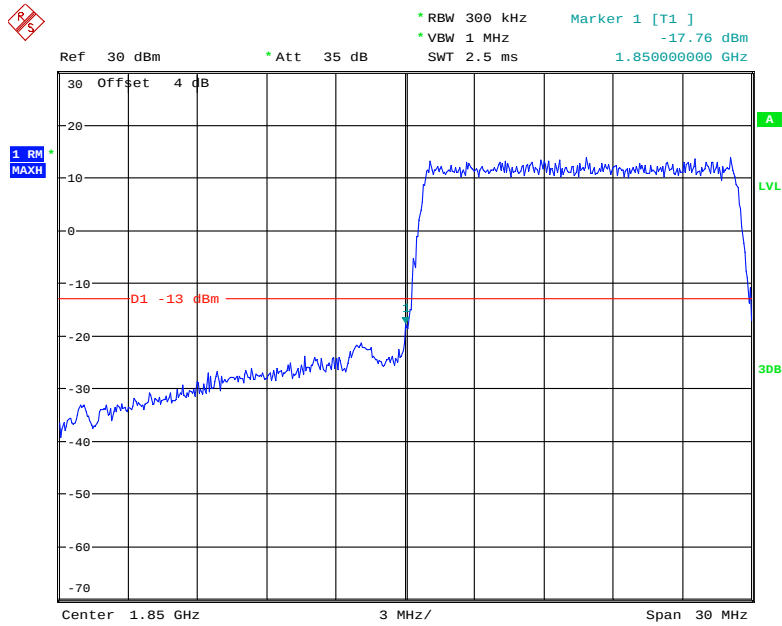
Date: 20.NOV.2019 16:42:39

QPSK_10MHz_50 RB_ Right



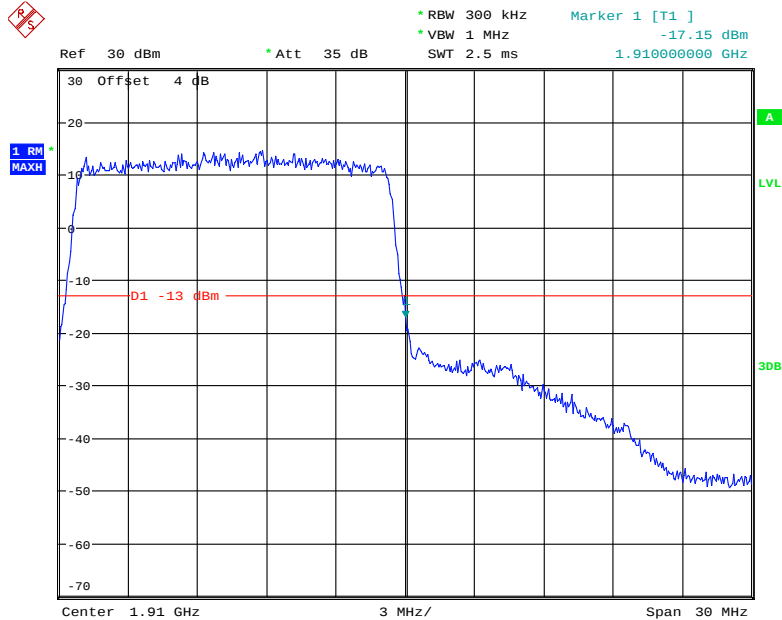
Date: 20.NOV.2019 16:43:15

QPSK_15MHz_75 RB_ Left



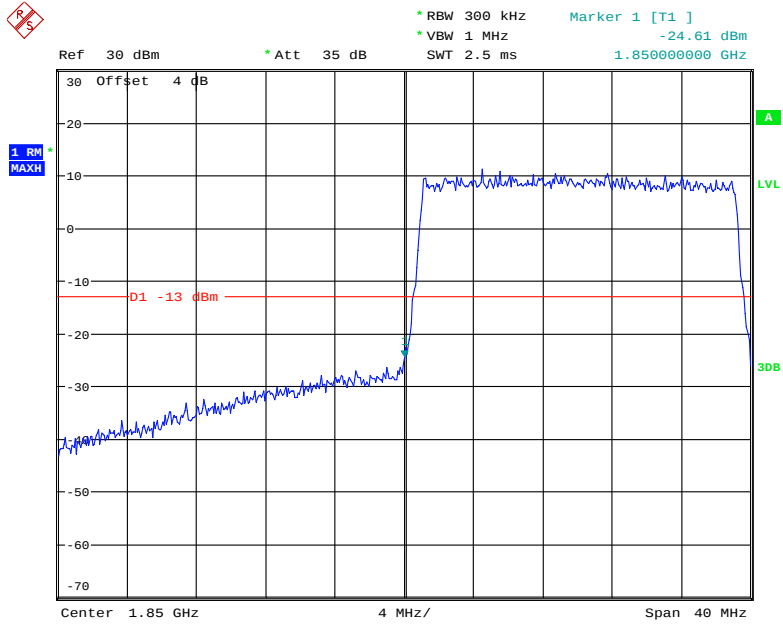
Date: 20.NOV.2019 16:43:59

QPSK_15MHz_75 RB_ Right



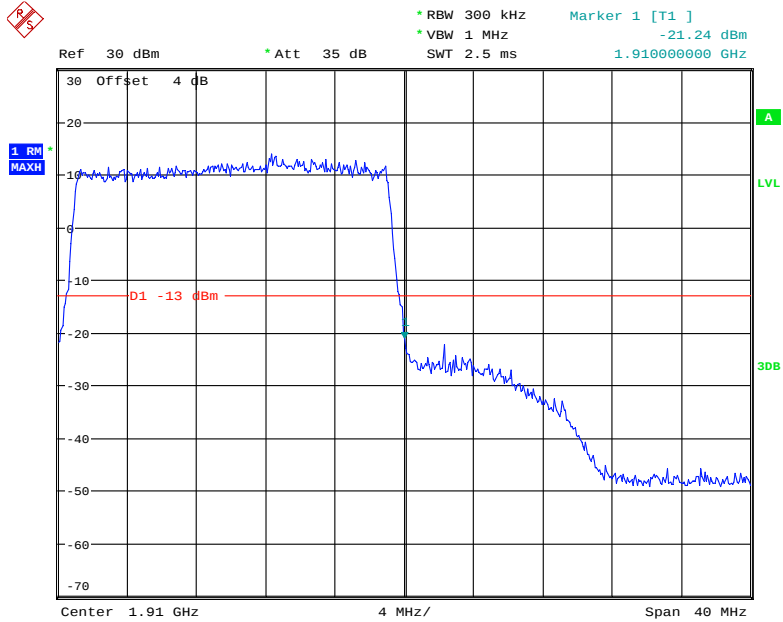
Date: 20.NOV.2019 16:44:42

QPSK_20MHz_FULL RB_Left

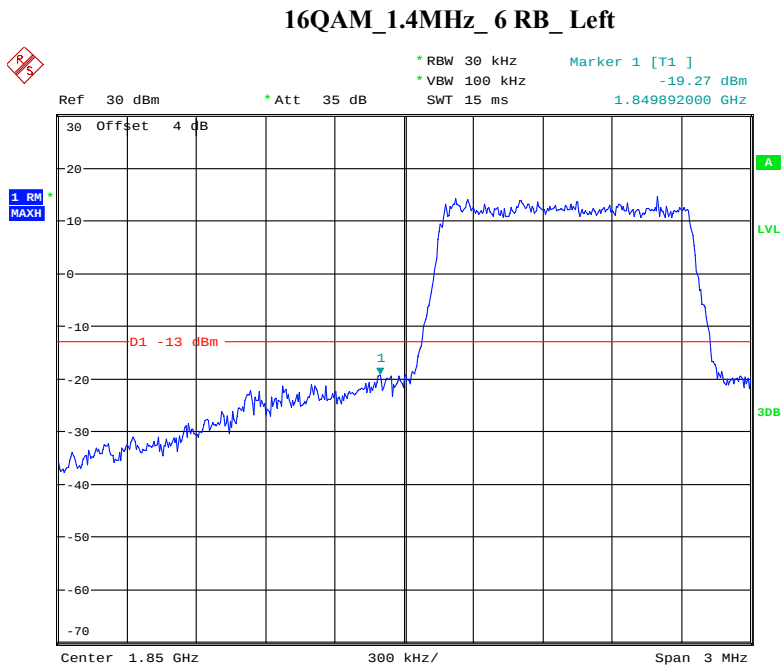


Date: 21.NOV.2019 09:10:32

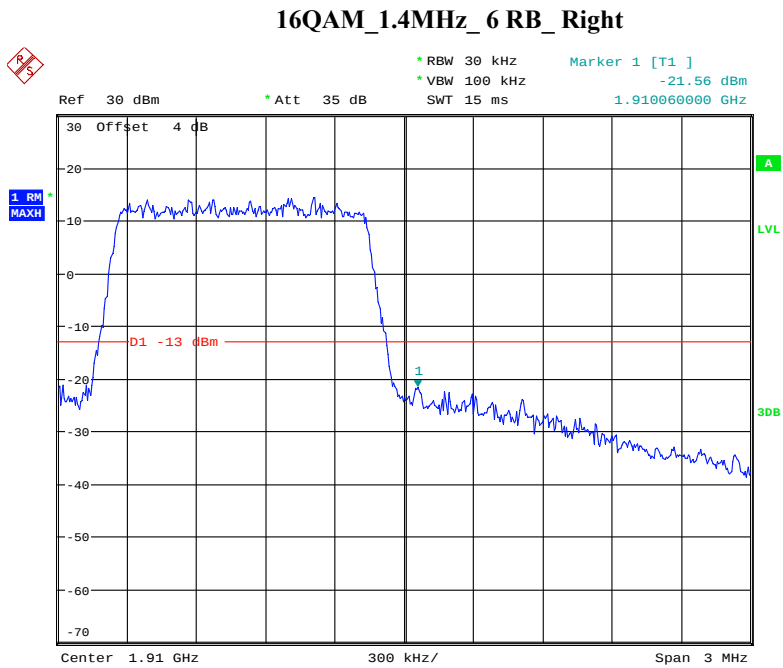
QPSK_20MHz_FULL RB_Right



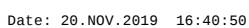
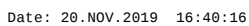
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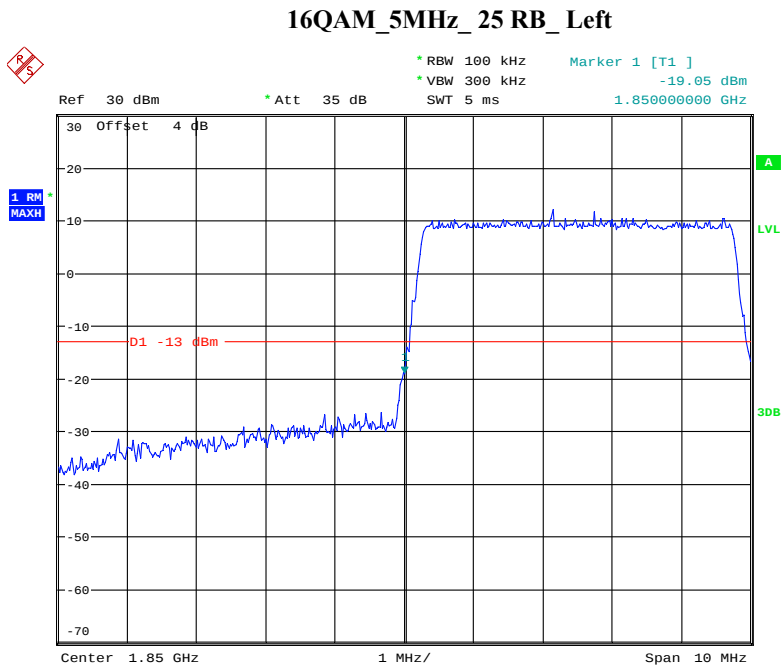


Date: 20.NOV.2019 16:38:54

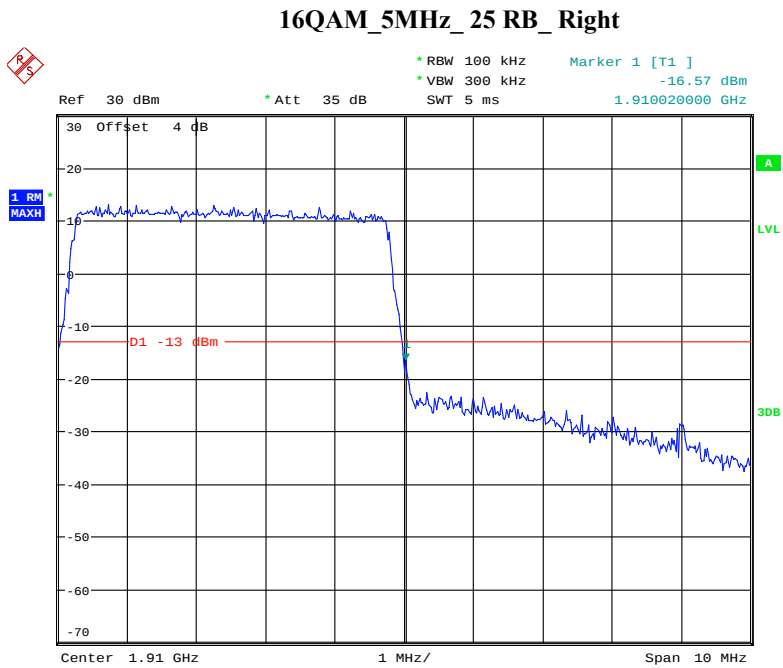


Date: 20.NOV.2019 16:39:35

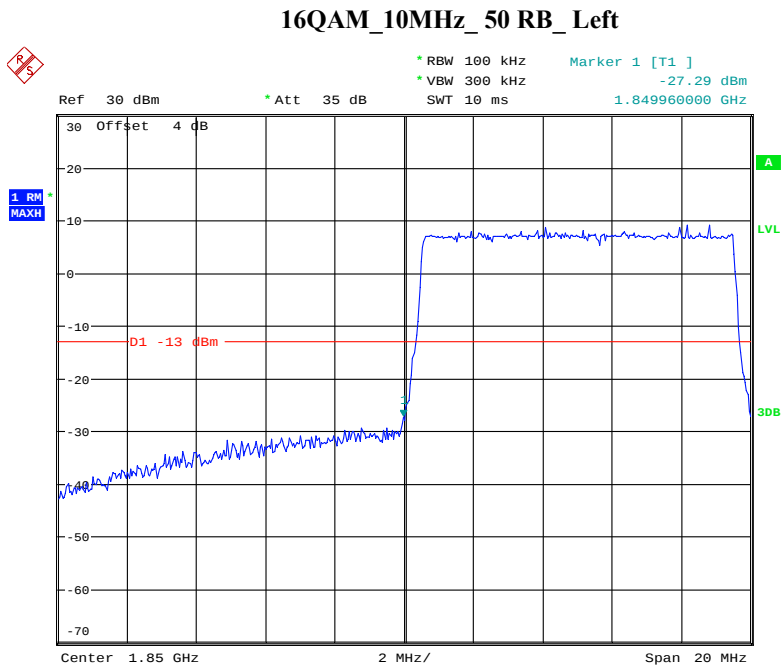




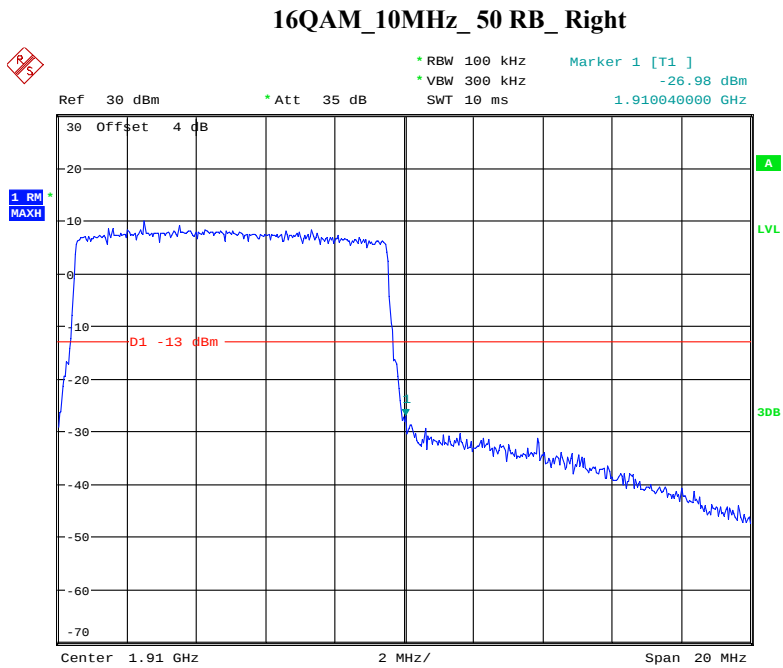
Date: 21.NOV.2019 09:09:32



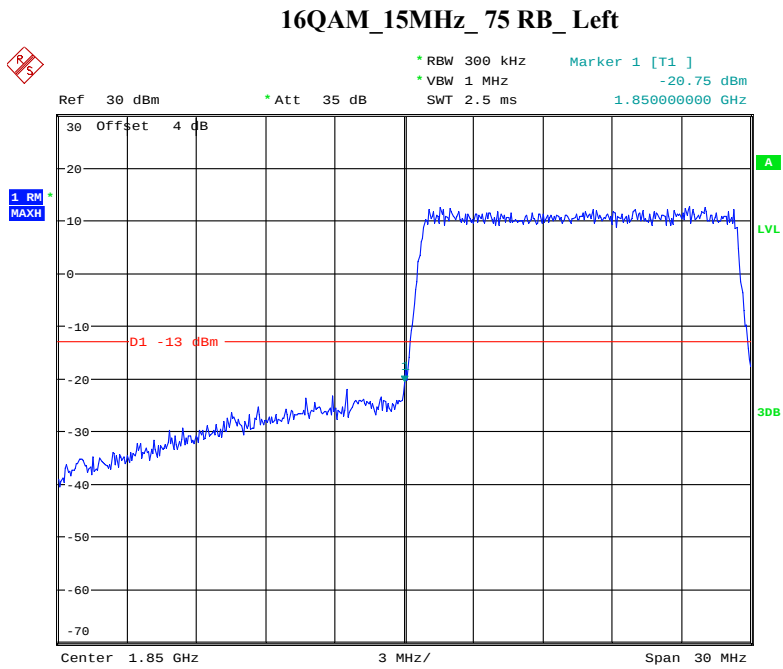
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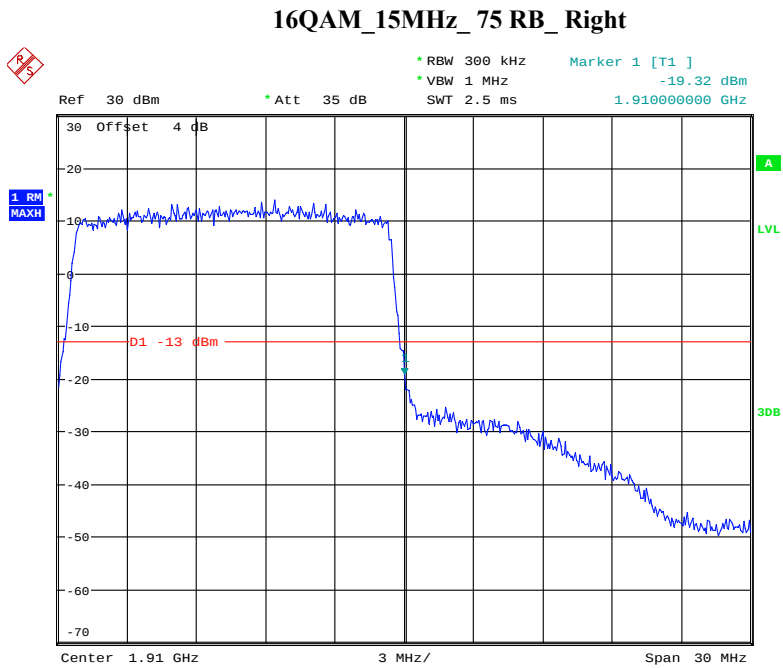
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Date: 20.NOV.2019 16:43:33

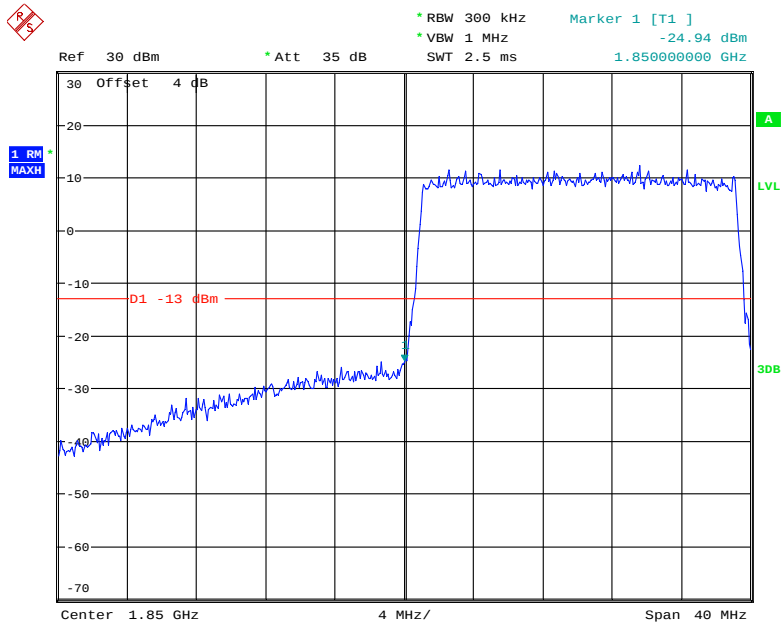


Date: 20.NOV.2019 16:44:20



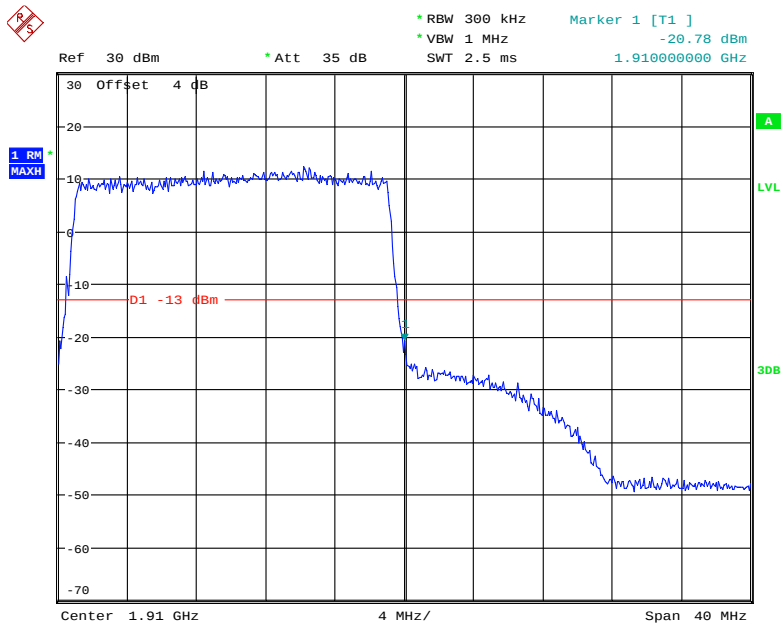
Date: 20.NOV.2019 16:45:03

16QAM_20MHz_FULL RB_Left



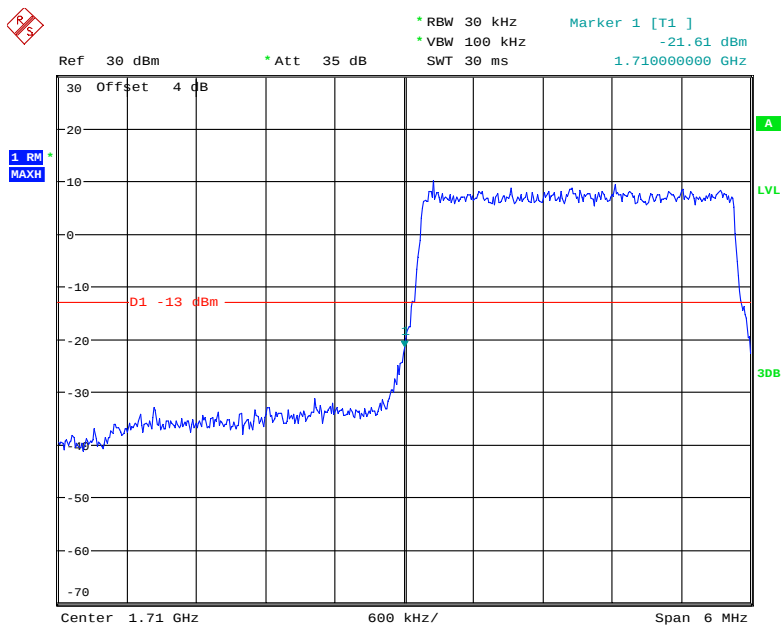
Date: 20.NOV.2019 16:45:51

16QAM_20MHz_FULL RB_Right



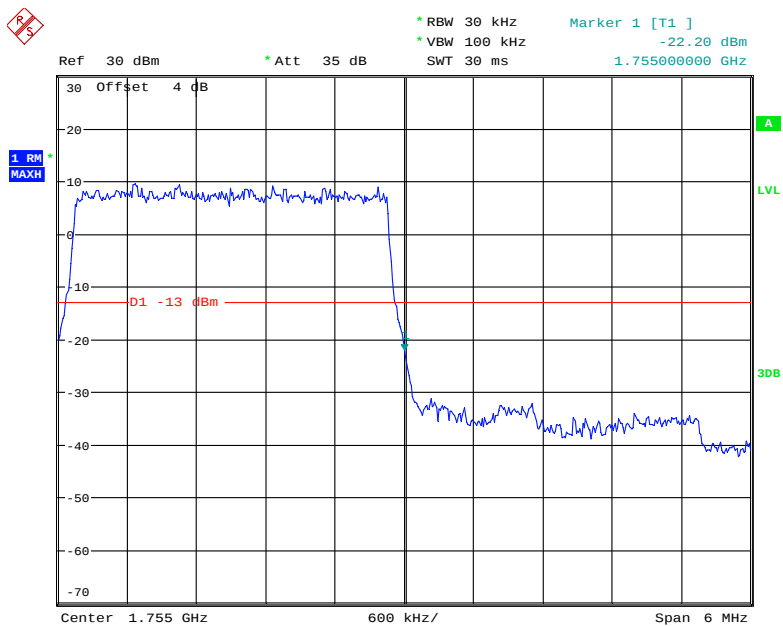
Date: 20.NOV.2019 16:46:37

QPSK_3MHz_15 RB_ Left



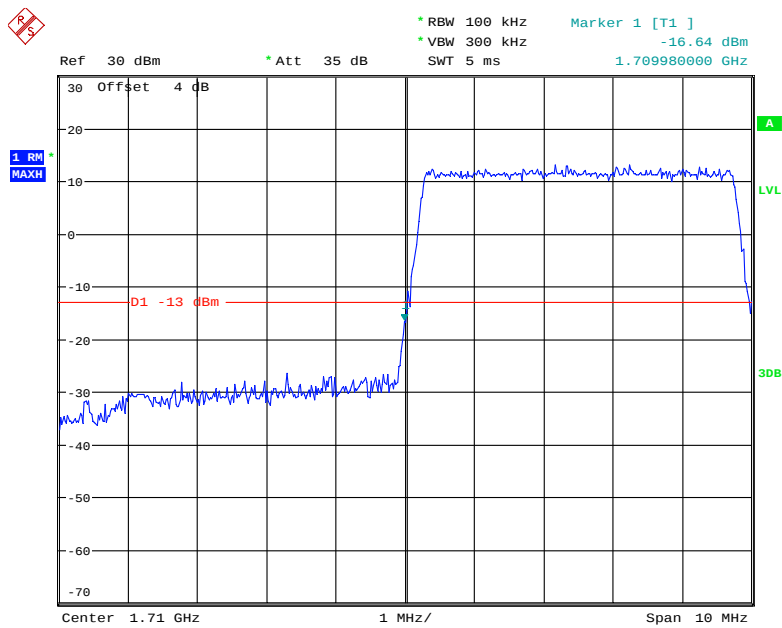
Date: 20.NOV.2019 16:48:41

QPSK_3MHz_15 RB_ Right



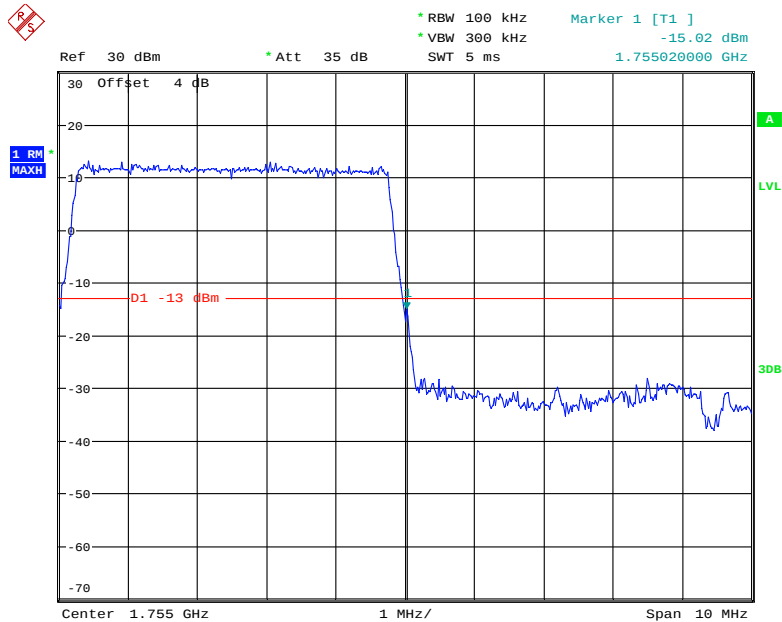
Date: 20.NOV.2019 16:49:19

QPSK_5MHz_25 RB_Left



Date: 20.NOV.2019 16:50:10

QPSK_5MHz_25 RB_Right

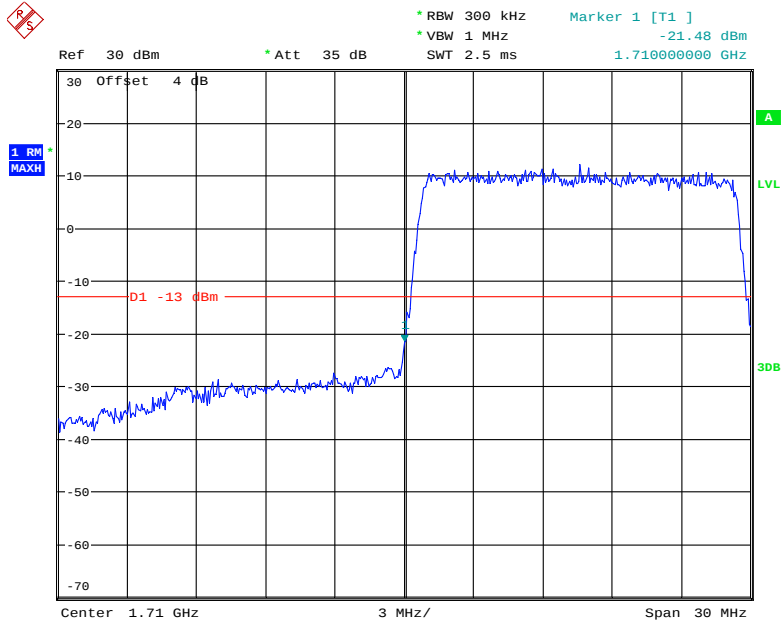


Date: 20.NOV.2019 16:50:50



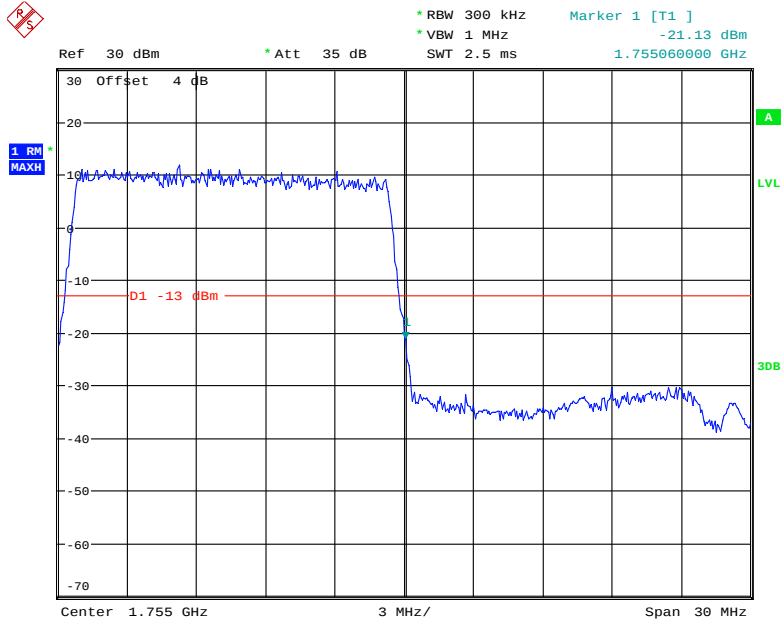
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QPSK_15MHz_75 RB_ Left



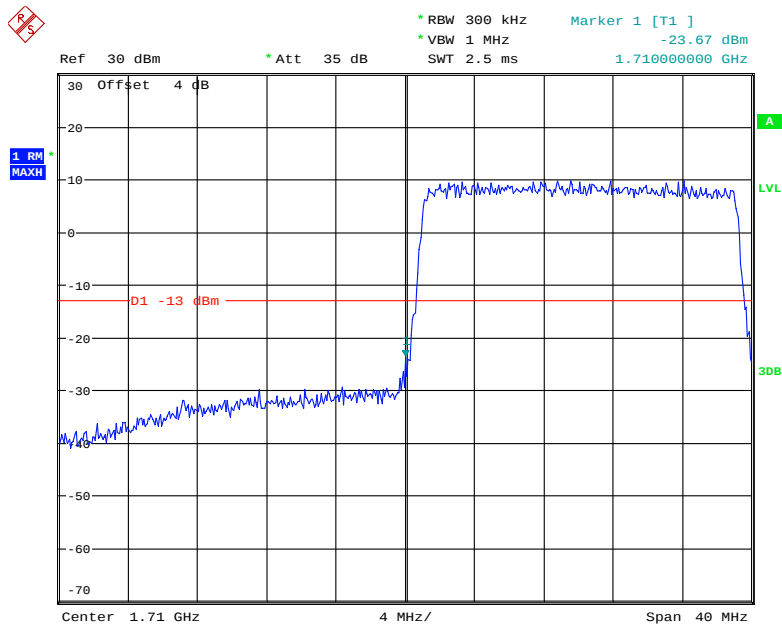
Date: 21.NOV.2019 08:51:28

QPSK_15MHz_75 RB_ Right



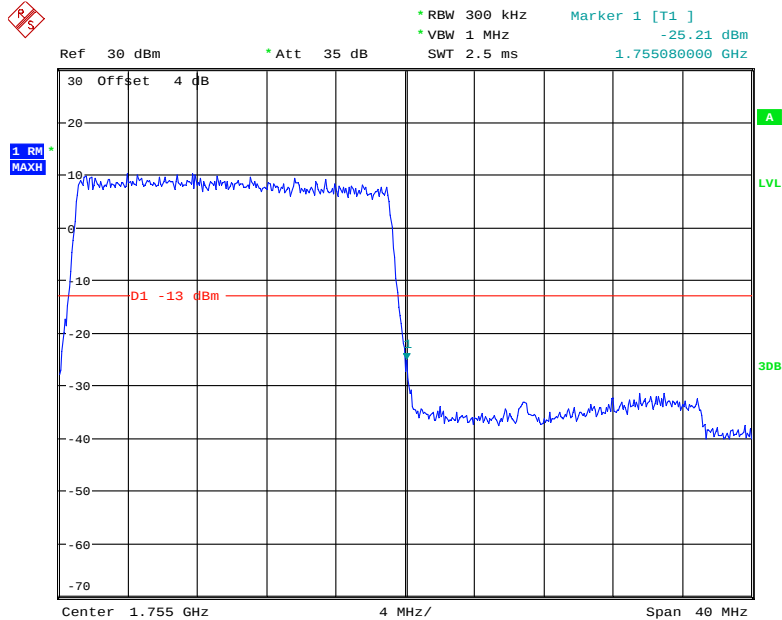
Date: 21.NOV.2019 08:52:11

QPSK_20MHz_FULL RB_Left

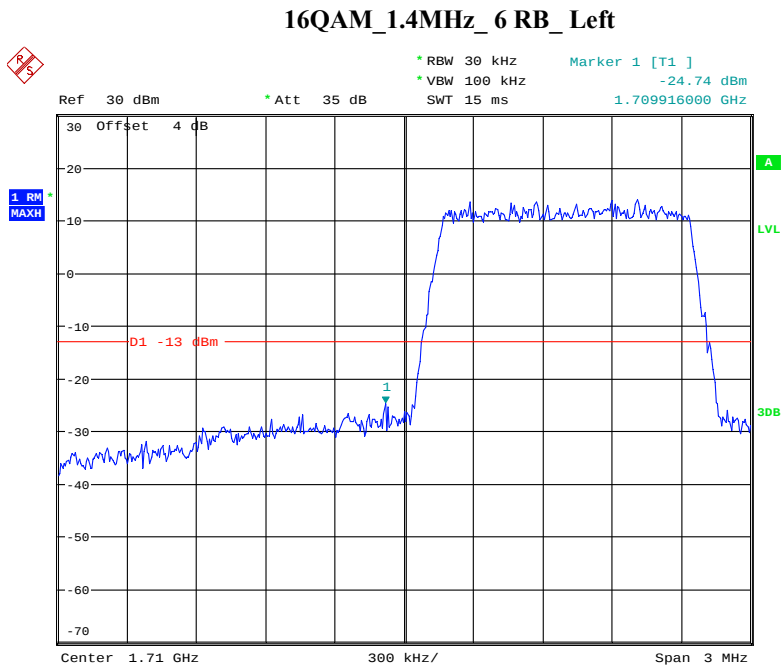


Date: 21.NOV.2019 08:53:10

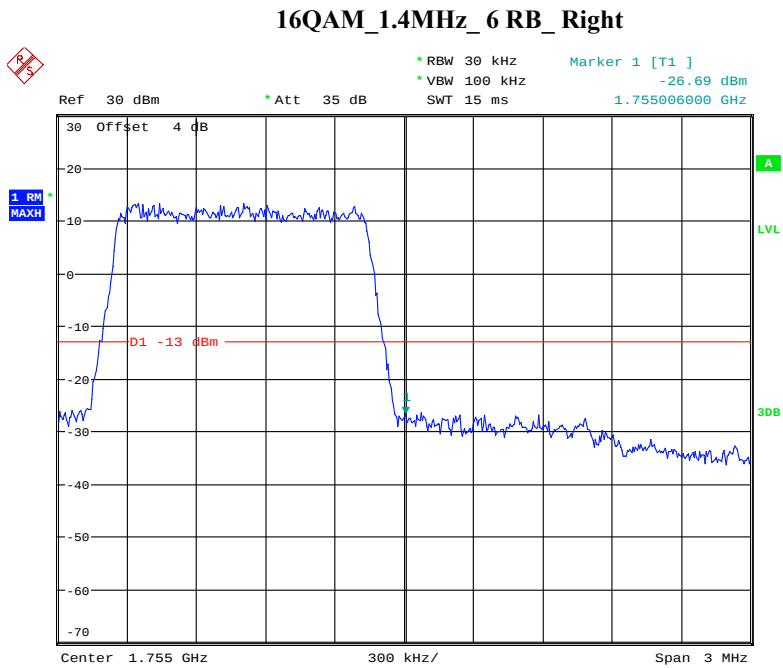
QPSK_20MHz_FULL RB_Right



Date: 21.NOV.2019 08:53:53

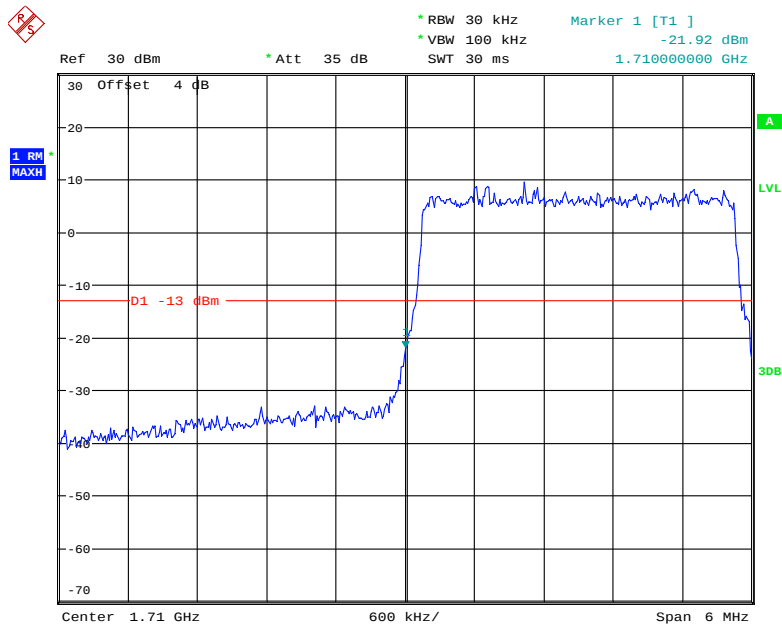


Date: 20.NOV.2019 16:47:33



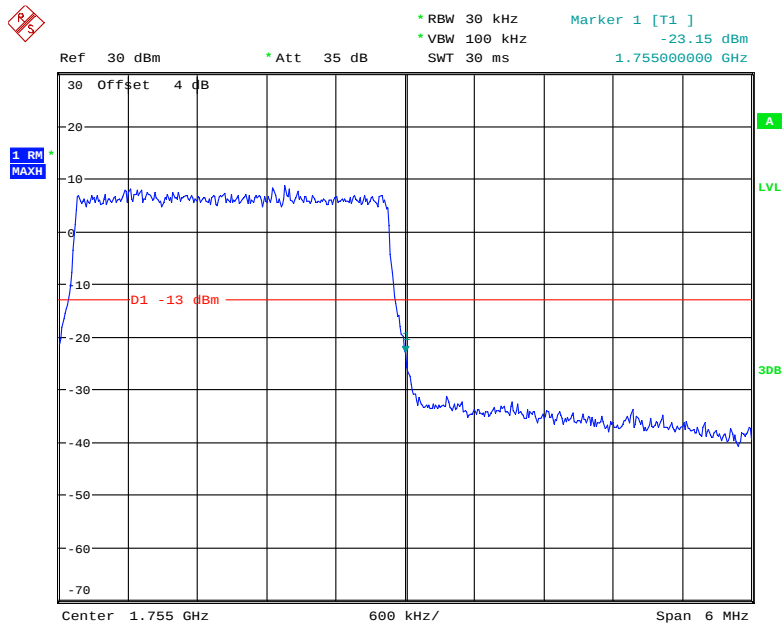
Date: 20.NOV.2019 16:48:08

16QAM_3MHz_15 RB_ Left

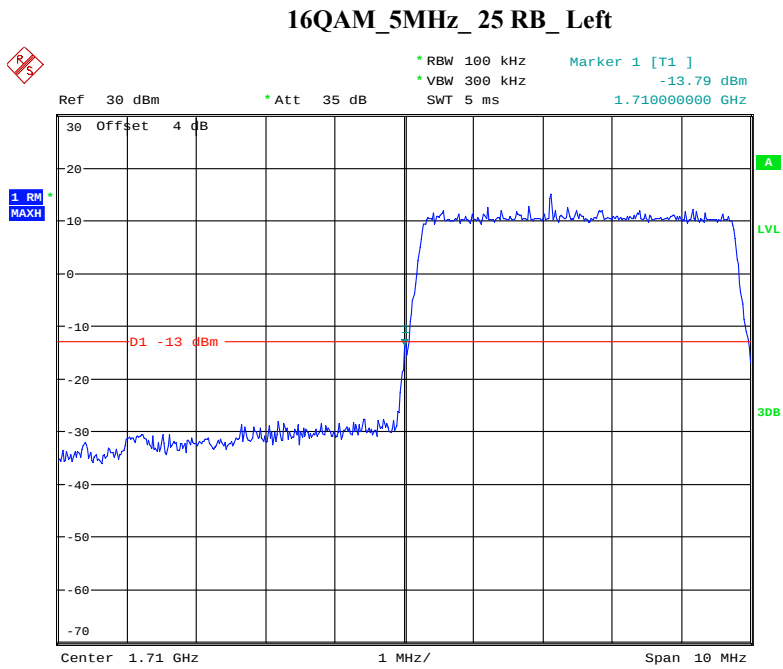


Date: 20.NOV.2019 16:49:01

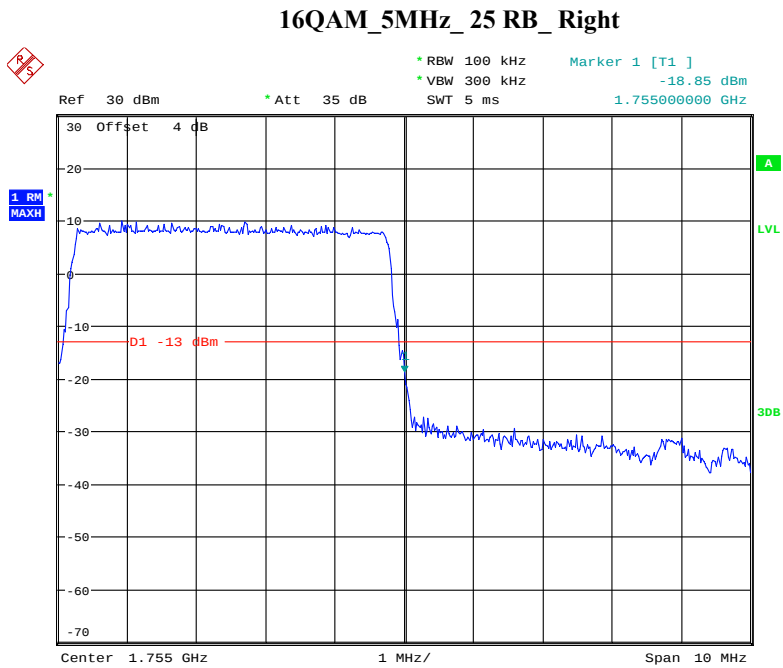
16QAM_3MHz_15 RB_ Right



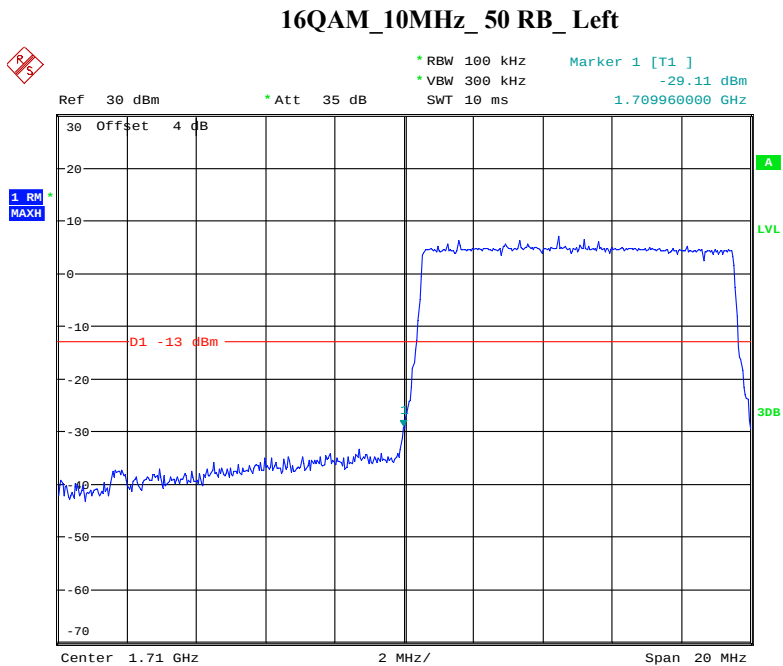
Date: 20.NOV.2019 16:49:36



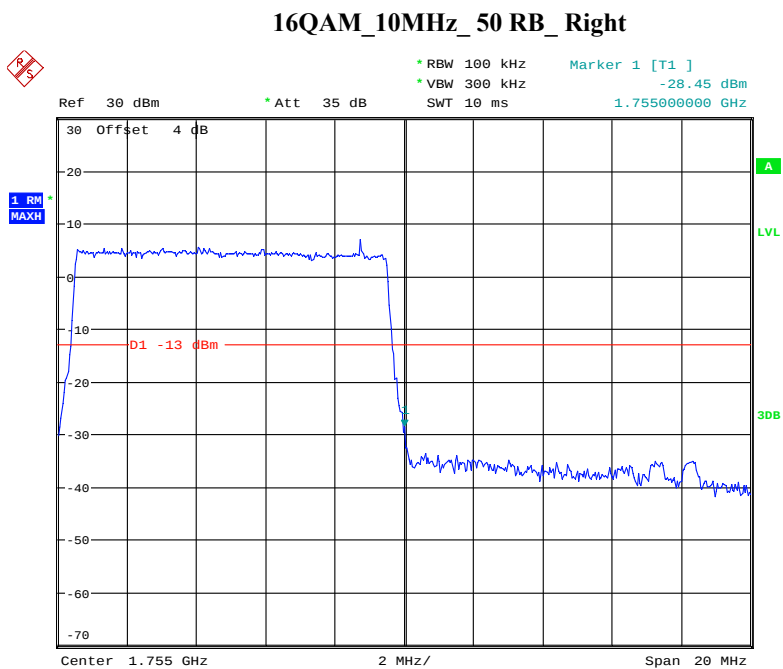
Date: 20.NOV.2019 16:50:31



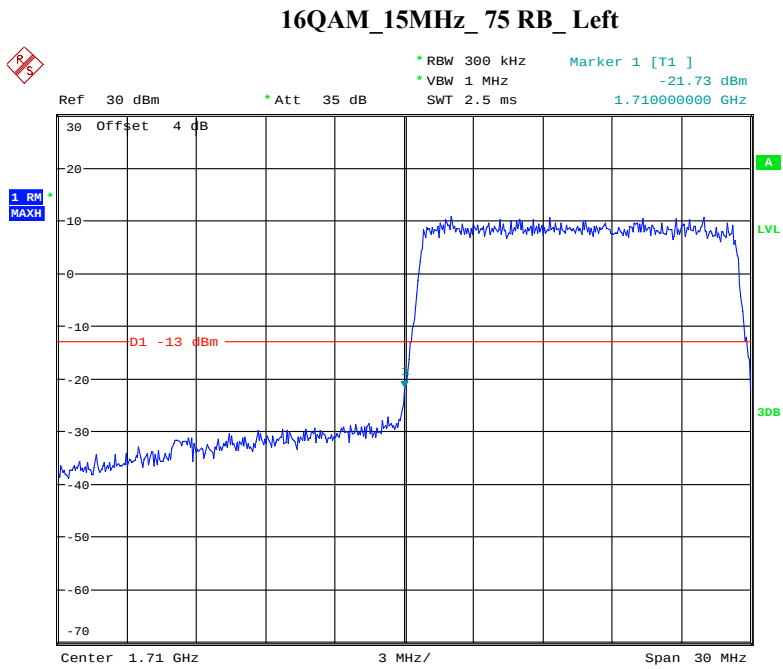
Date: 21.NOV.2019 08:48:54



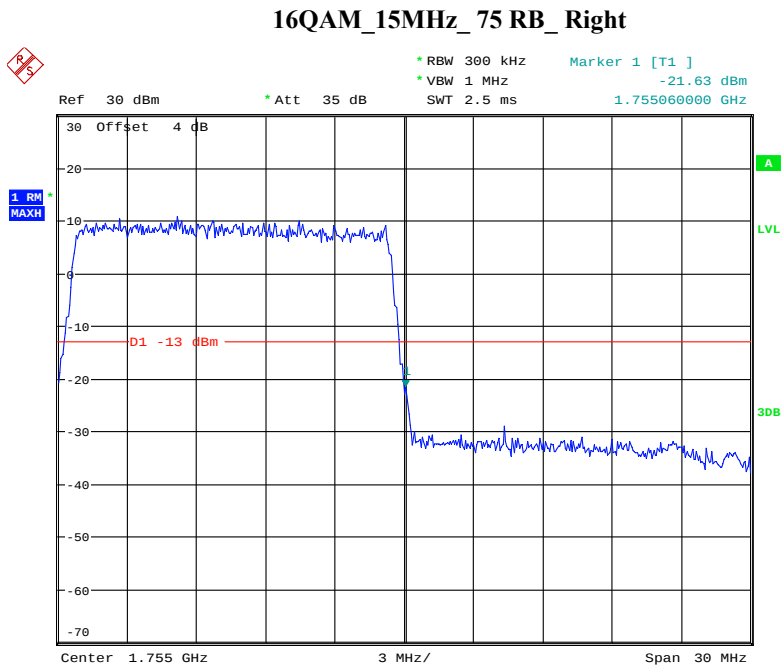
Date: 21.NOV.2019 08:50:14



Date: 21.NOV.2019 08:50:51

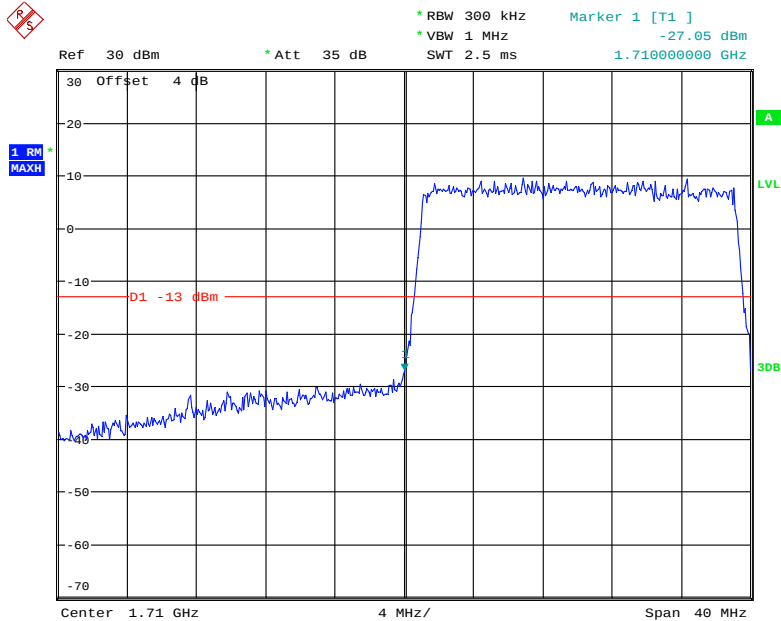


Date: 21.NOV.2019 08:51:49



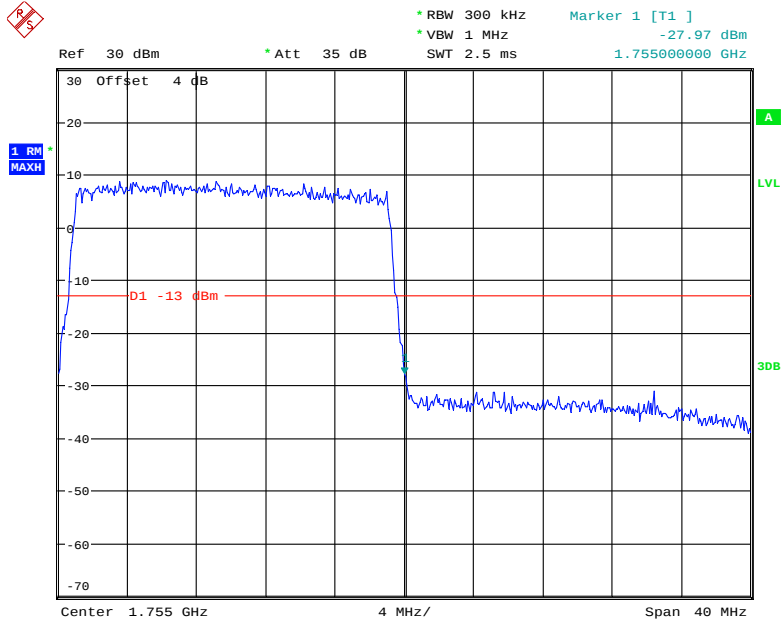
Date: 21.NOV.2019 08:52:32

16QAM_20MHz_FULL RB_Left



Date: 21.NOV.2019 08:53:31

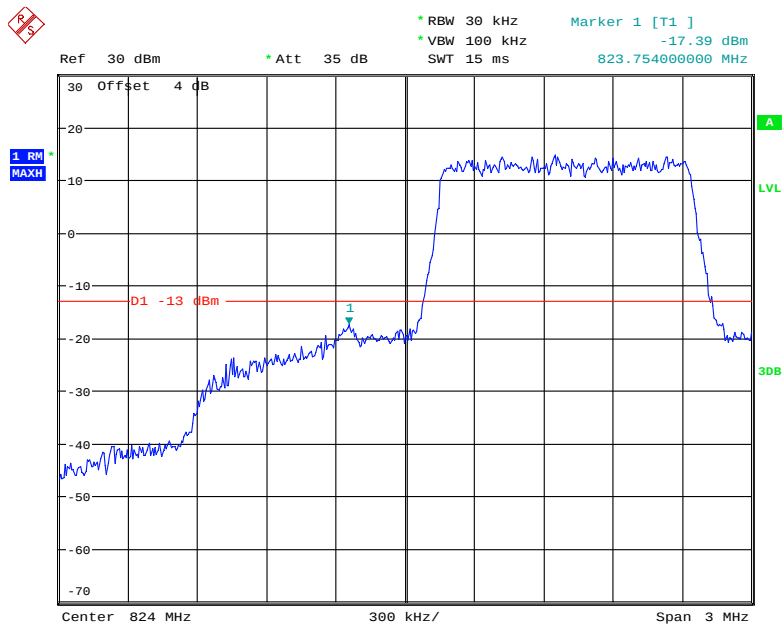
16QAM_20MHz_FULL RB_Right



Date: 21.NOV.2019 08:54:14

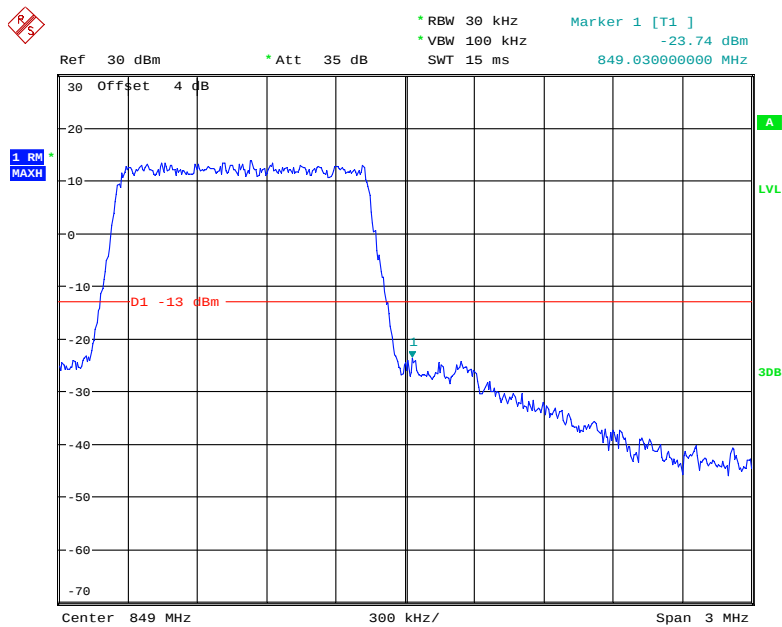
LTE Band 5

QPSK_1.4MHz_6 RB_ Left



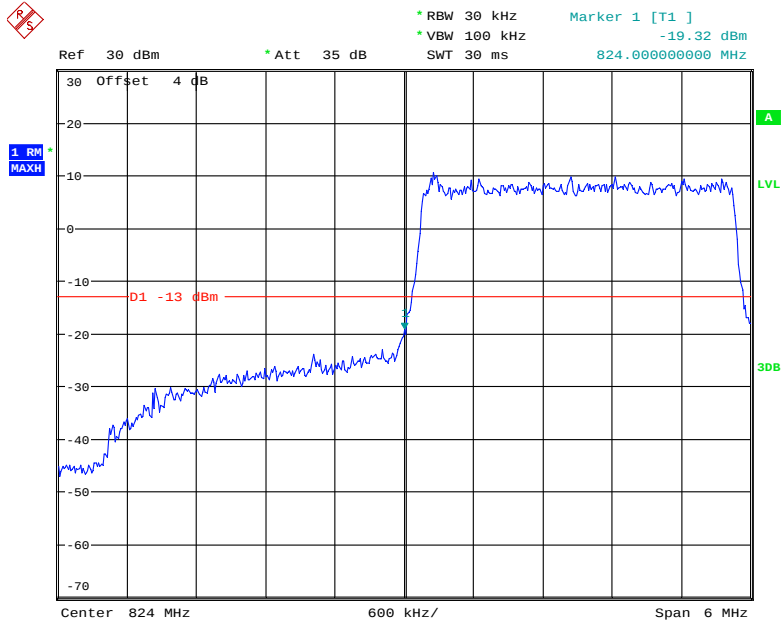
Date: 21.NOV.2019 08:54:44

QPSK_1.4MHz_6 RB_ Right



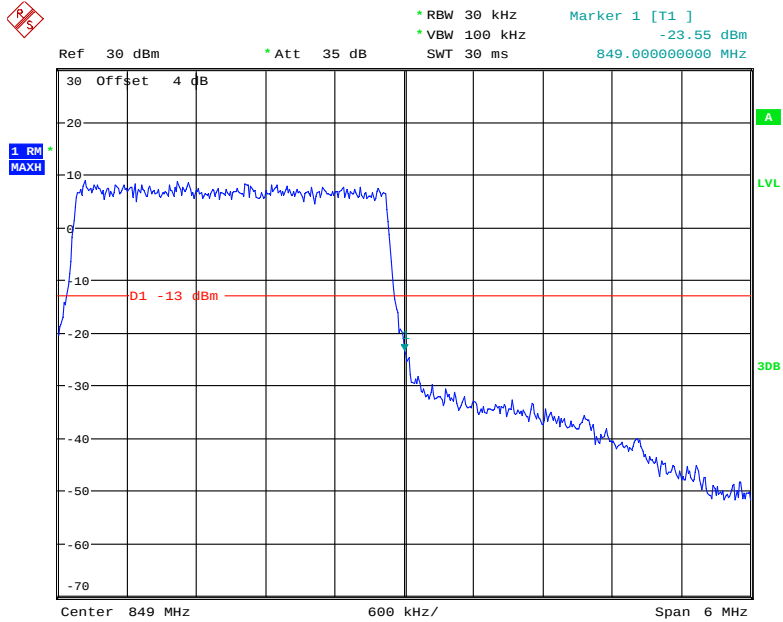
Date: 21.NOV.2019 08:55:21

QPSK_3MHz_15 RB_ Left



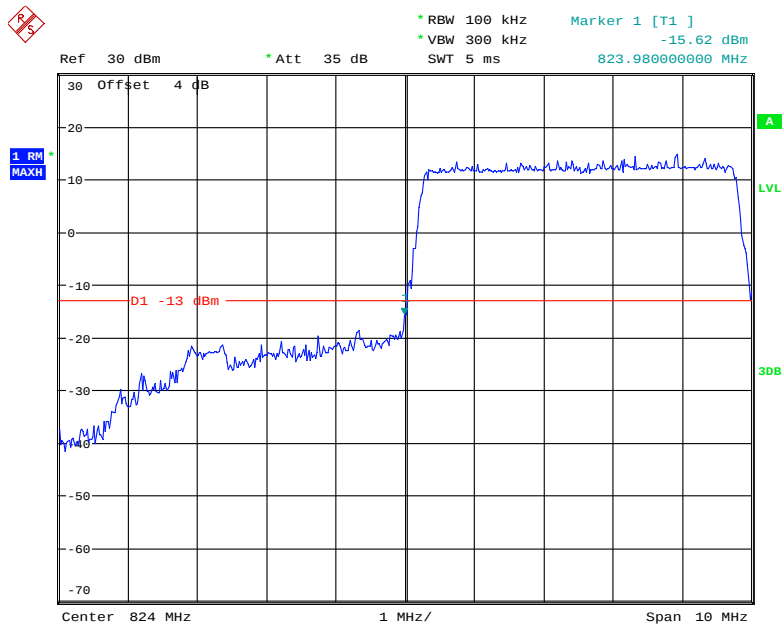
Date: 21.NOV.2019 08:56:10

QPSK_3MHz_15 RB_ Right



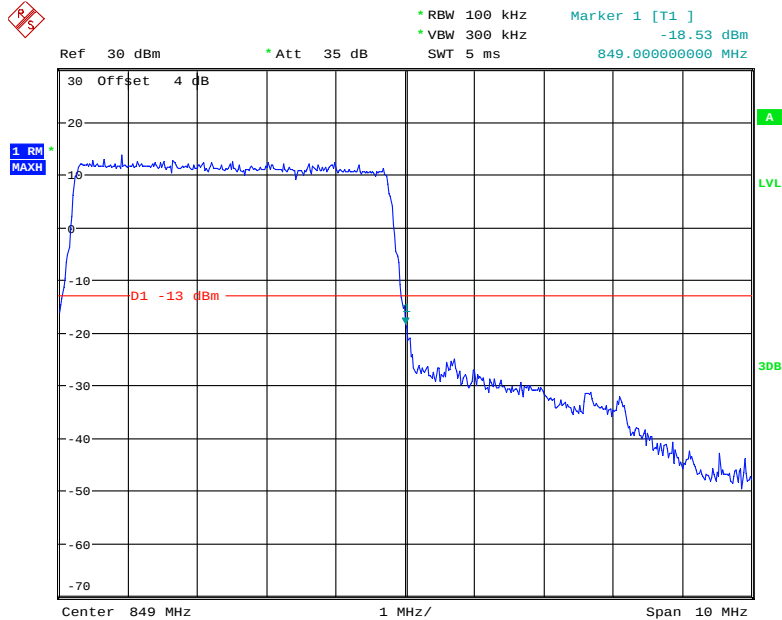
Date: 21.NOV.2019 08:56:47

QPSK_5MHz_25 RB_Left



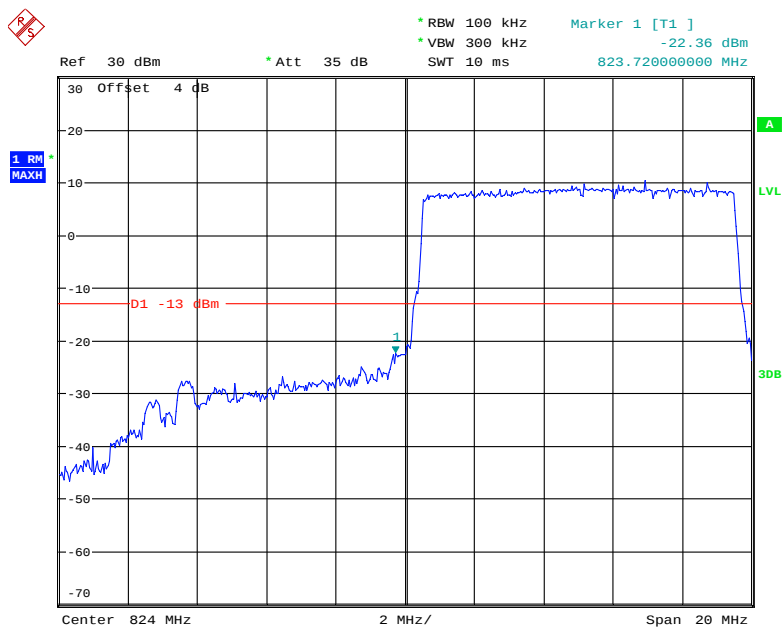
Date: 21.NOV.2019 08:57:36

QPSK_5MHz_25 RB_Right



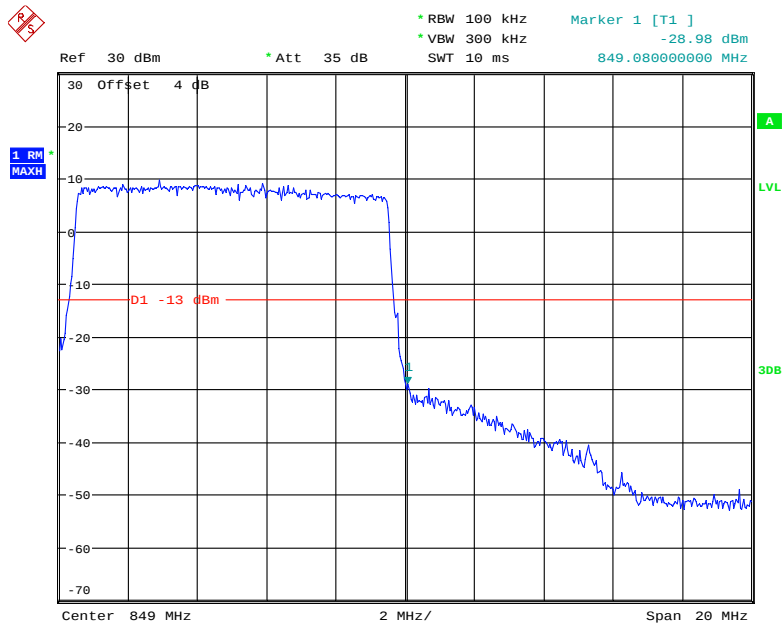
Date: 21.NOV.2019 08:58:12

QPSK_10MHz_50 RB_ Left

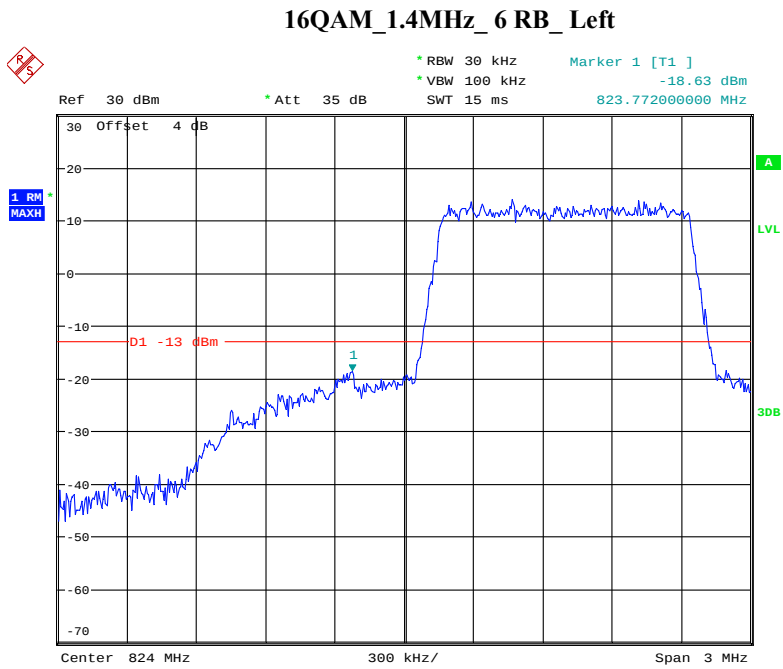


Date: 21.NOV.2019 08:59:01

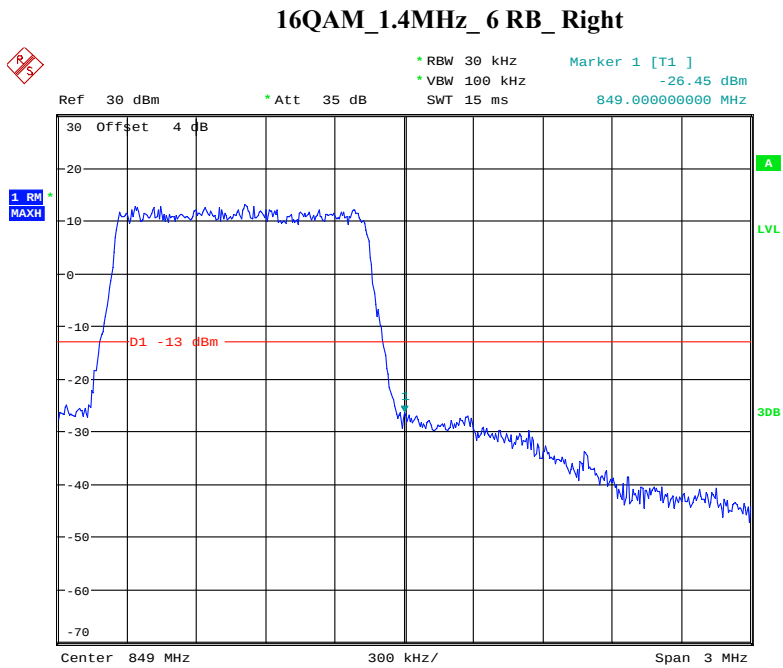
QPSK_10MHz_50 RB_ Right



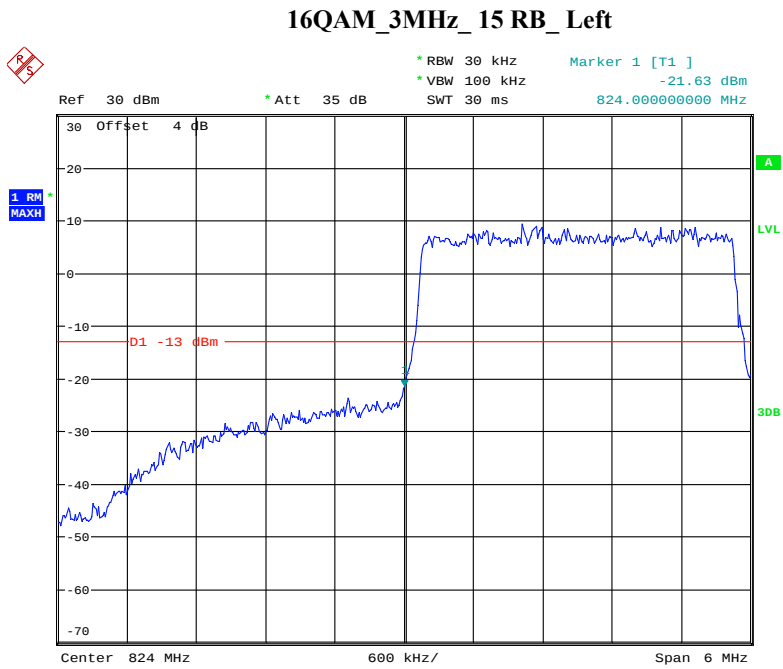
Date: 21.NOV.2019 08:59:40



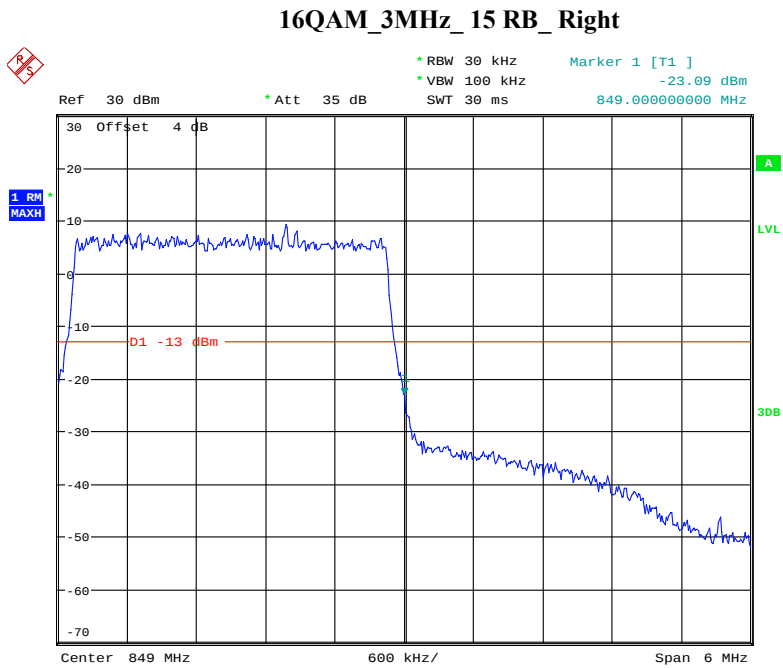
Date: 21.NOV.2019 08:55:00



Date: 21.NOV.2019 08:55:41

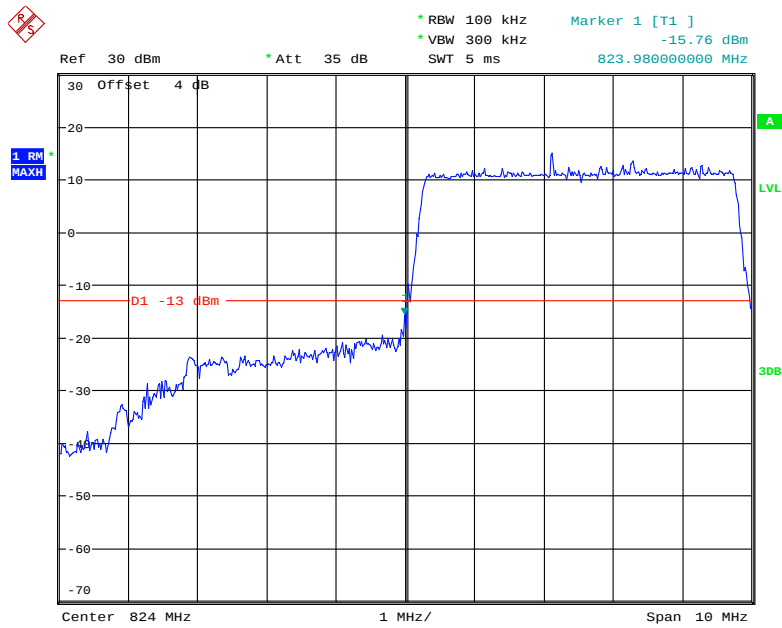


Date: 21.NOV.2019 08:56:30



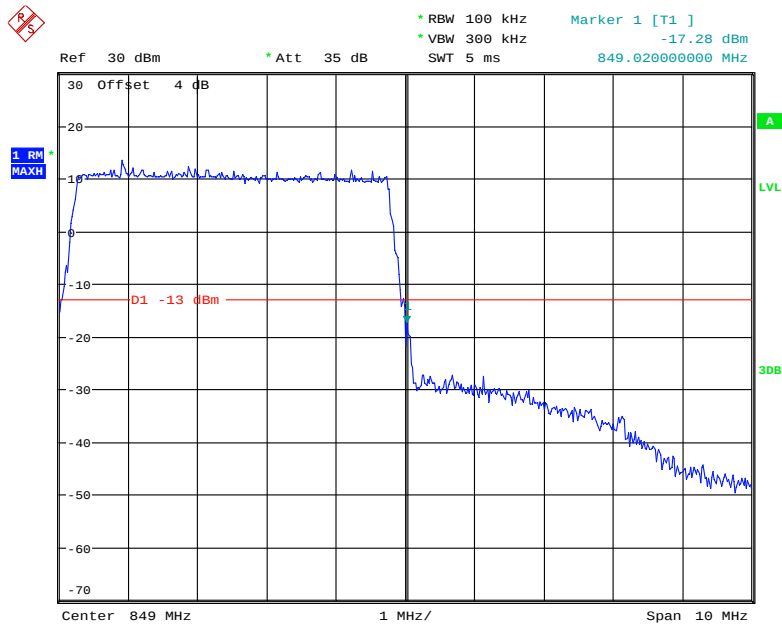
Date: 21.NOV.2019 08:57:04

16QAM_5MHz_25 RB_ Left



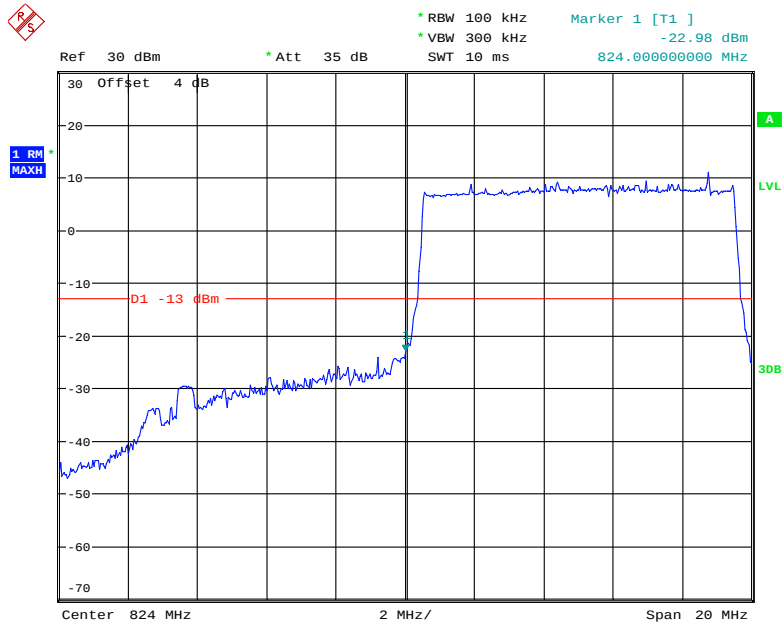
Date: 21.NOV.2019 08:57:53

16QAM_5MHz_25 RB_ Right



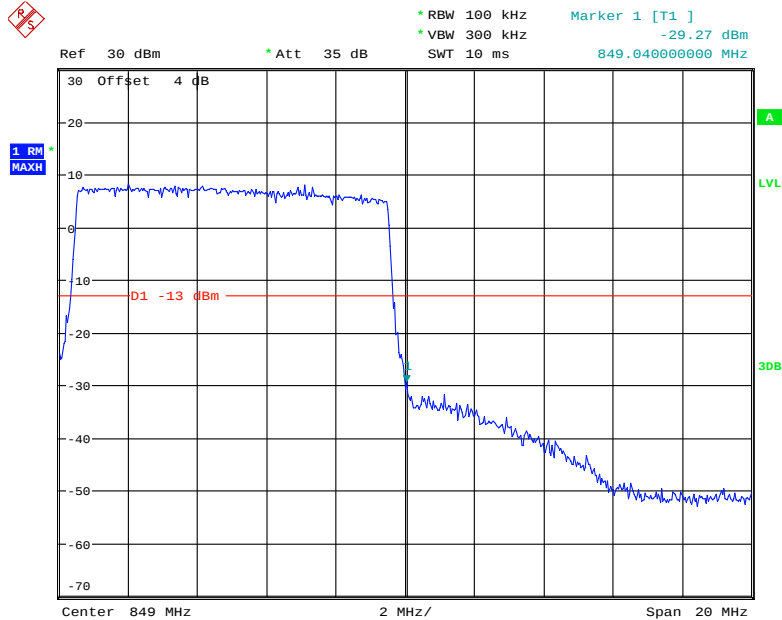
Date: 21.NOV.2019 08:58:30

16QAM_10MHz_ 50 RB_ Left



Date: 21.NOV.2019 08:59:22

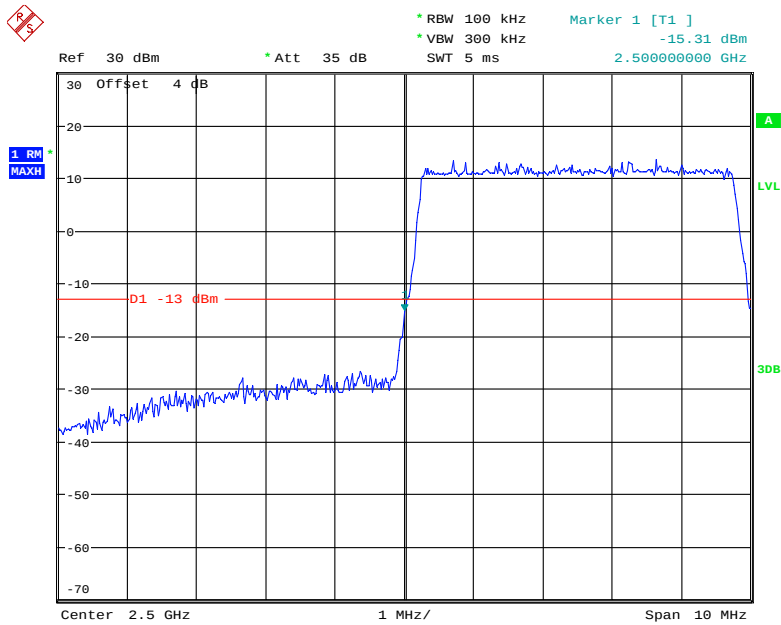
16QAM_10MHz_ 50 RB_ Right



Date: 21.NOV.2019 08:59:58

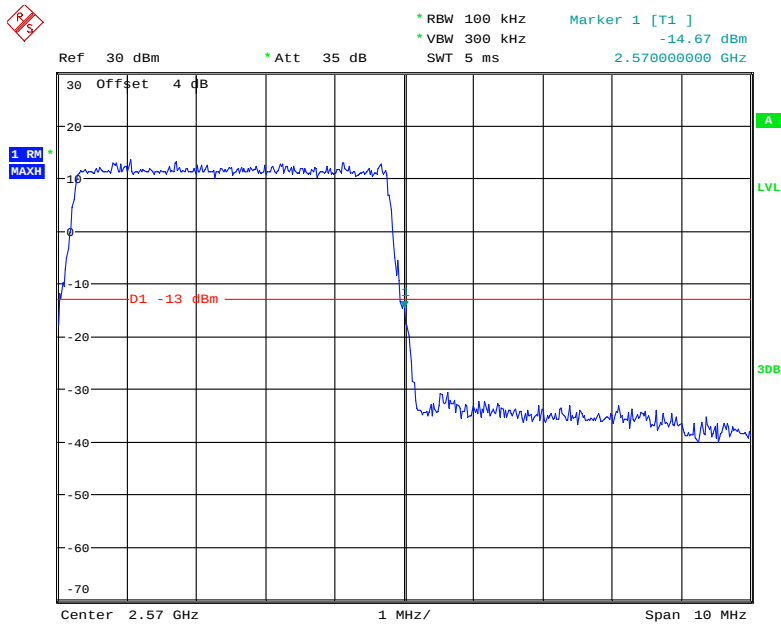
LTE Band 7

QPSK_5MHz_25 RB_ Left



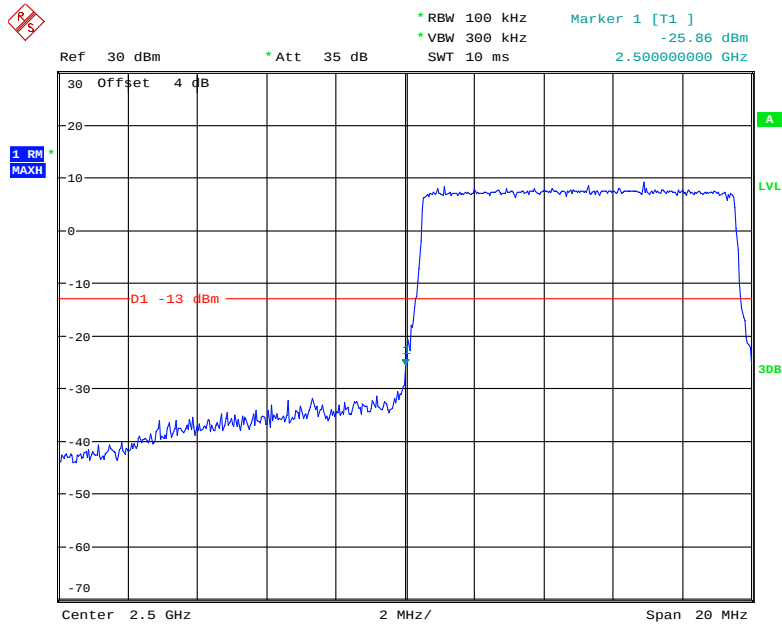
Date: 21.NOV.2019 09:00:25

QPSK_5MHz_25 RB_ Right



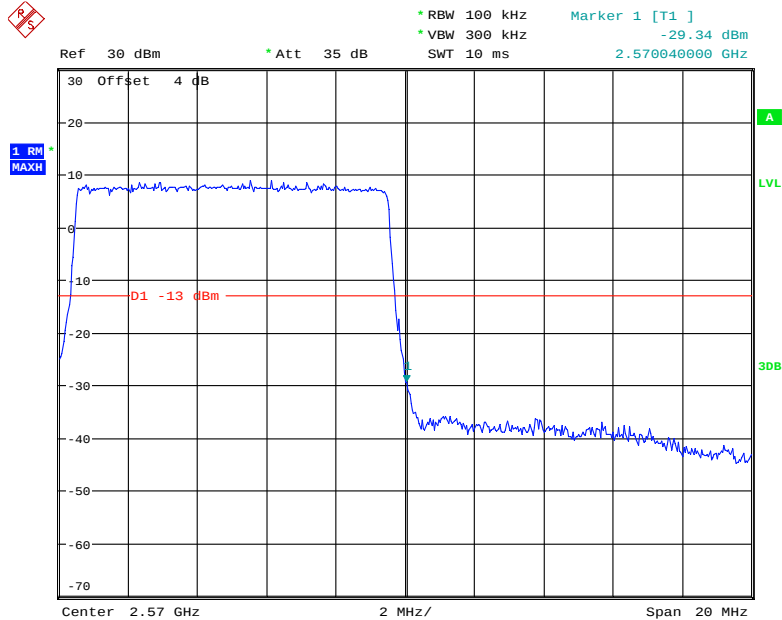
Date: 21.NOV.2019 09:01:13

QPSK_10MHz_50 RB_ Left



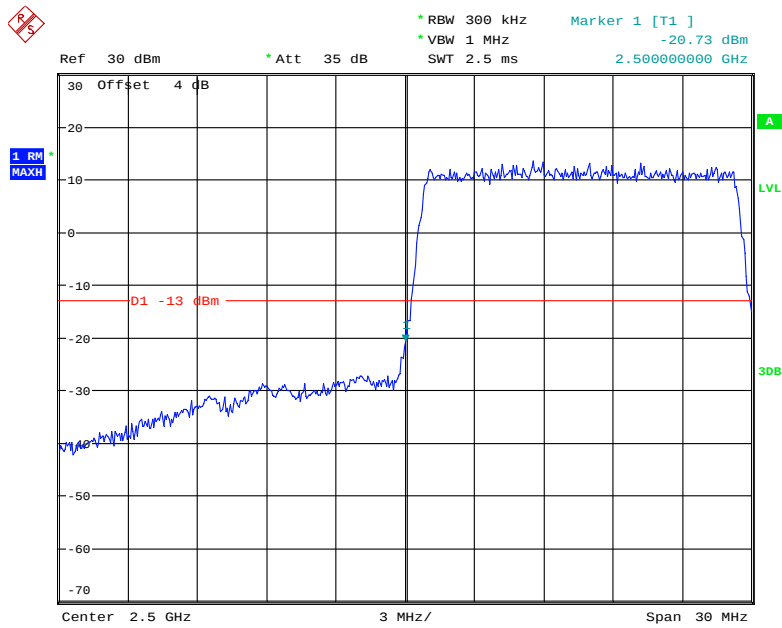
Date: 21.NOV.2019 09:01:57

QPSK_10MHz_50 RB_ Right



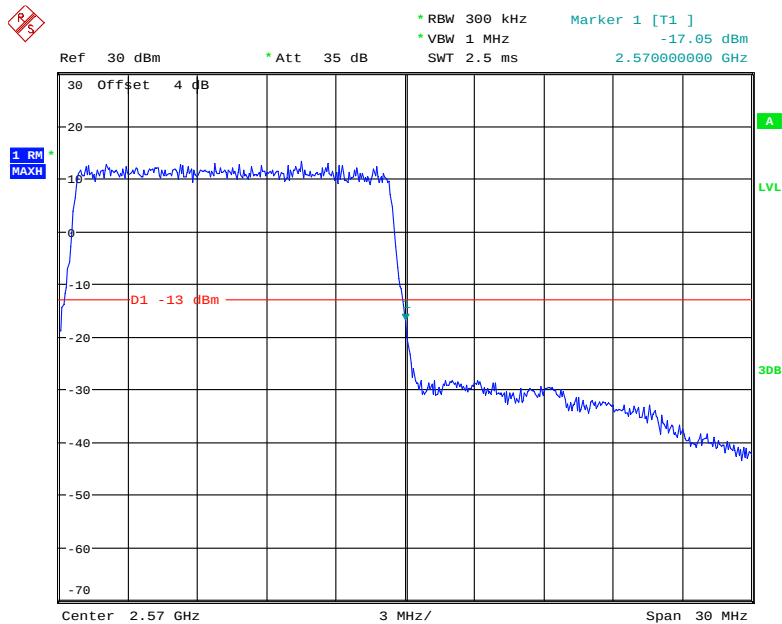
Date: 21.NOV.2019 09:02:36

QPSK_15MHz_75 RB_ Left



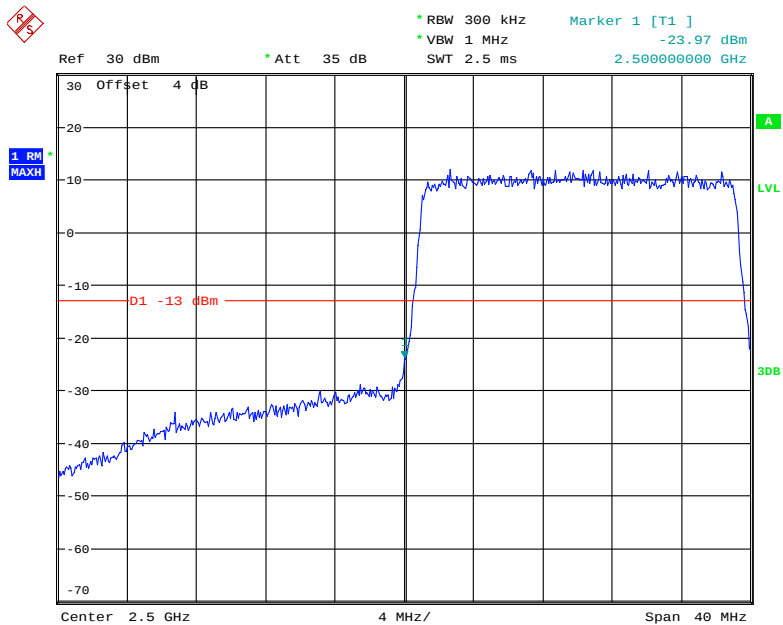
Date: 21.NOV.2019 09:03:20

QPSK_15MHz_75 RB_ Right



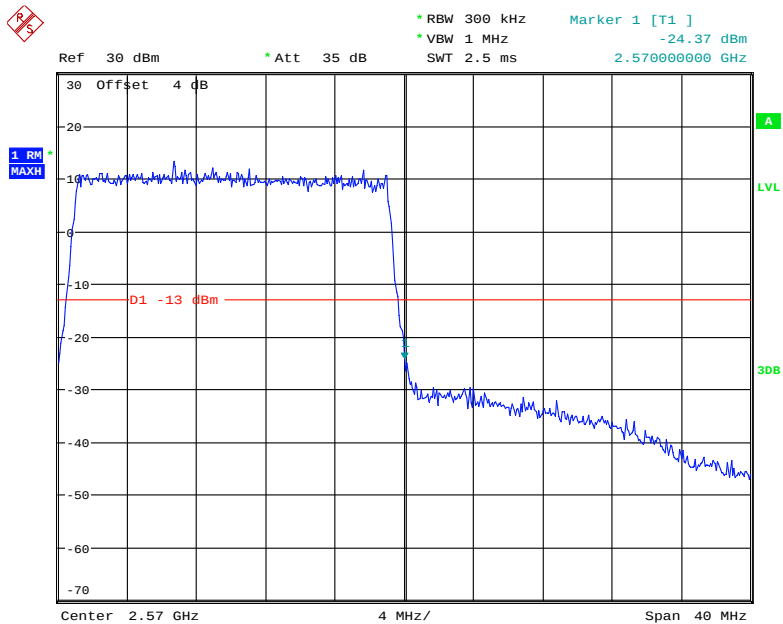
Date: 21.NOV.2019 09:04:06

QPSK_20MHz_FULL RB_Left

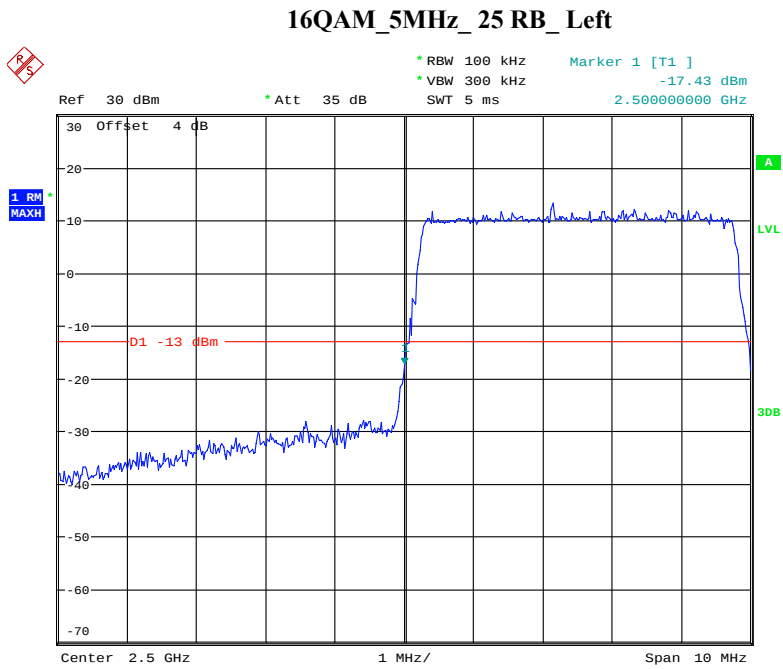


Date: 21.NOV.2019 09:04:54

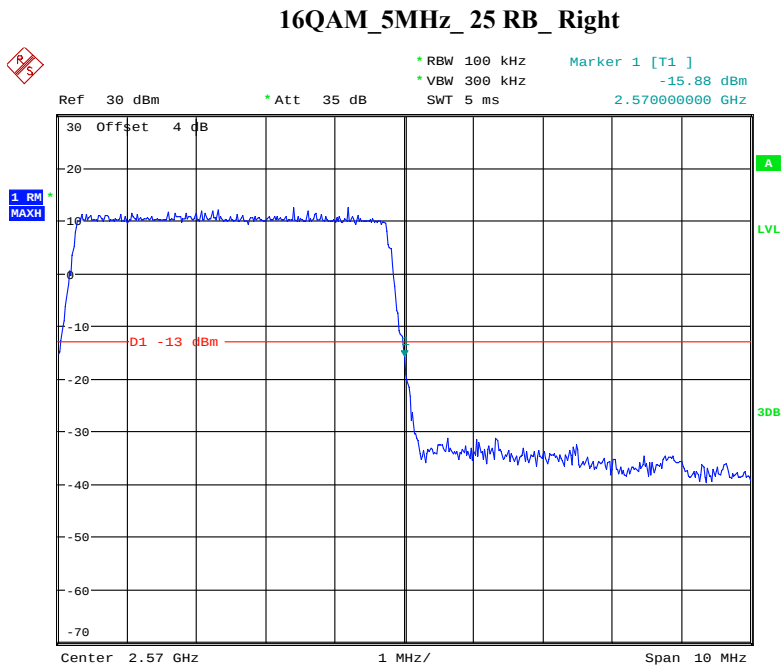
QPSK_20MHz_FULL RB_Right



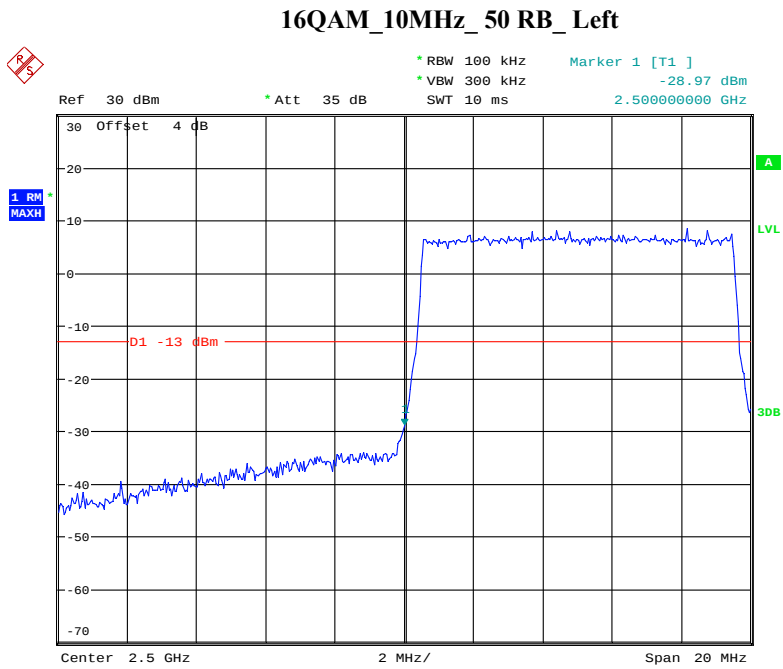
Date: 21.NOV.2019 09:05:37



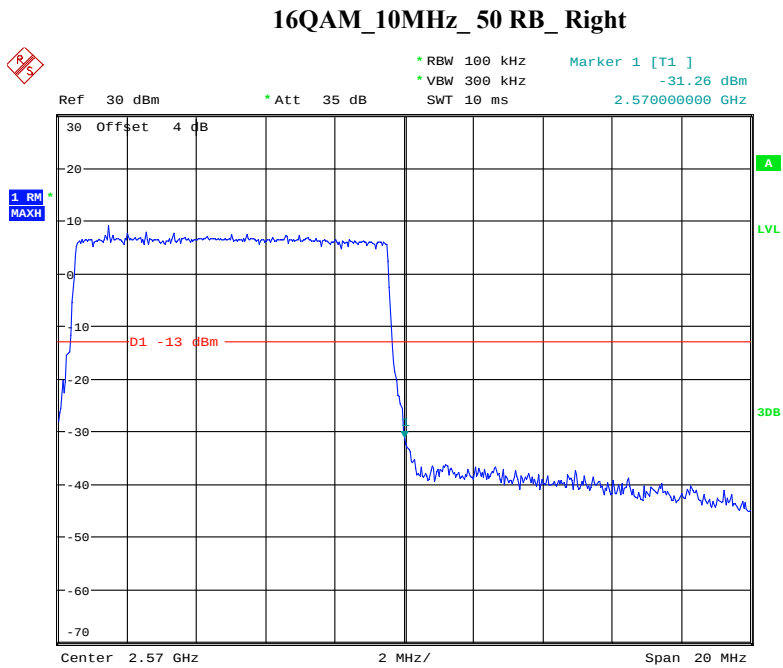
Date: 21.NOV.2019 09:00:46



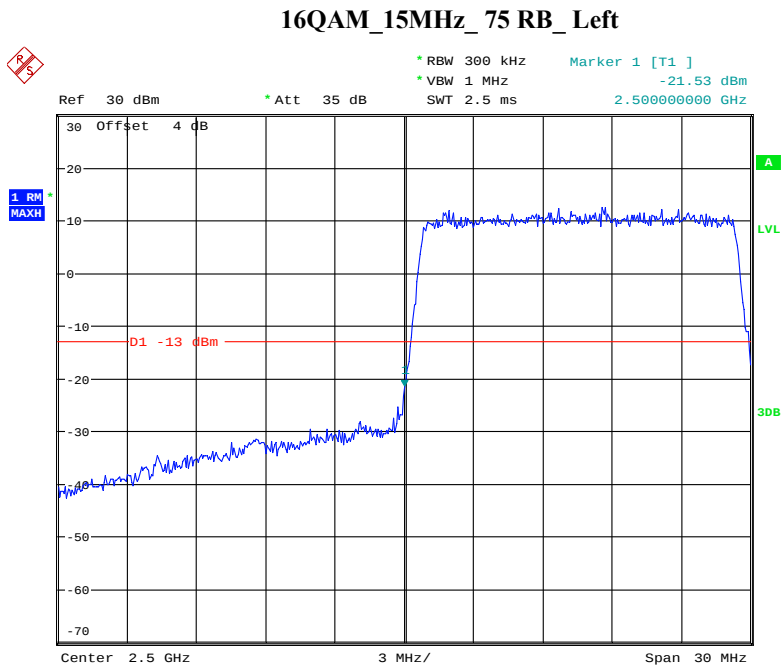
Date: 21.NOV.2019 09:01:34



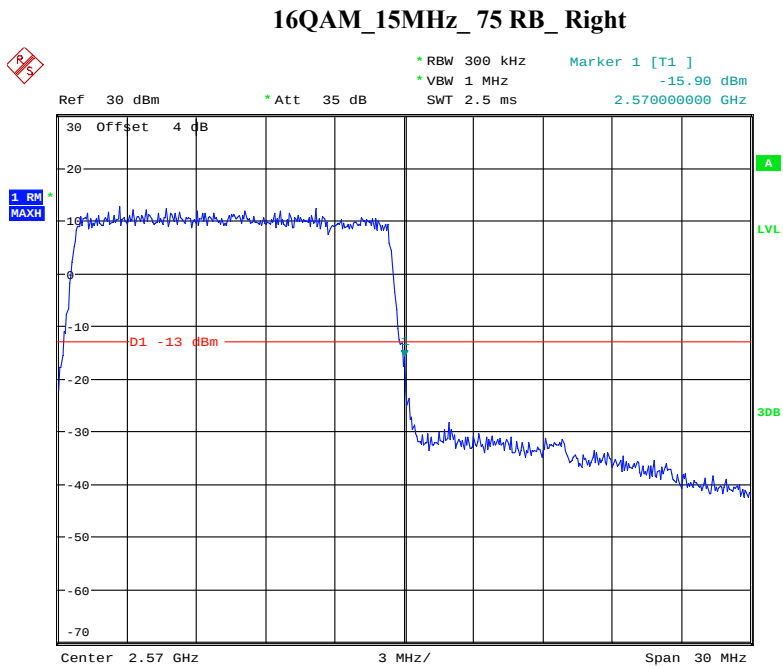
Date: 21.NOV.2019 09:02:15



Date: 21.NOV.2019 09:02:54

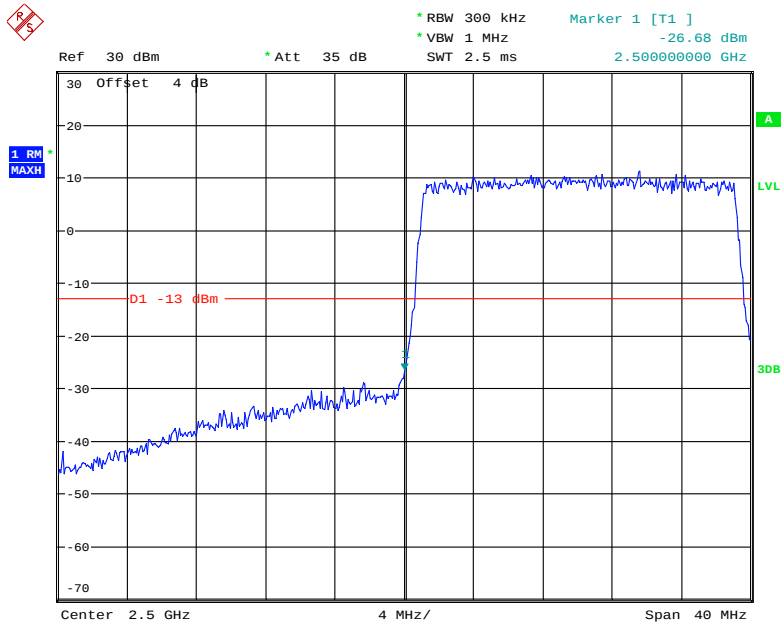


Date: 21.NOV.2019 09:03:44



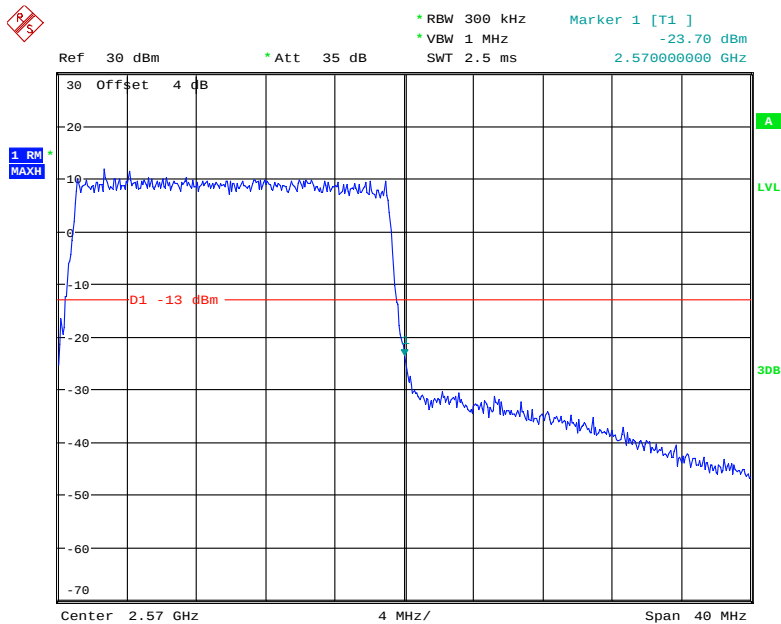
Date: 21.NOV.2019 09:04:28

16QAM_20MHz_FULL RB_Left



Date: 21.NOV.2019 09:05:16

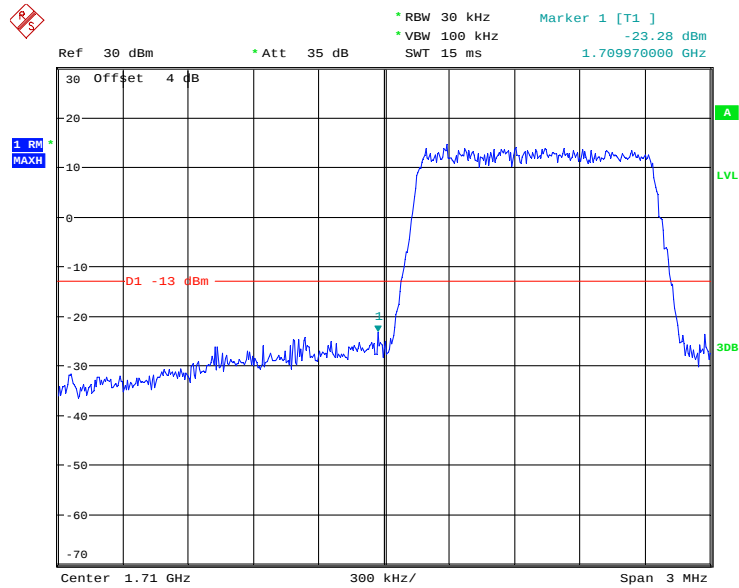
16QAM_20MHz_FULL RB_Right



Date: 21.NOV.2019 09:05:59

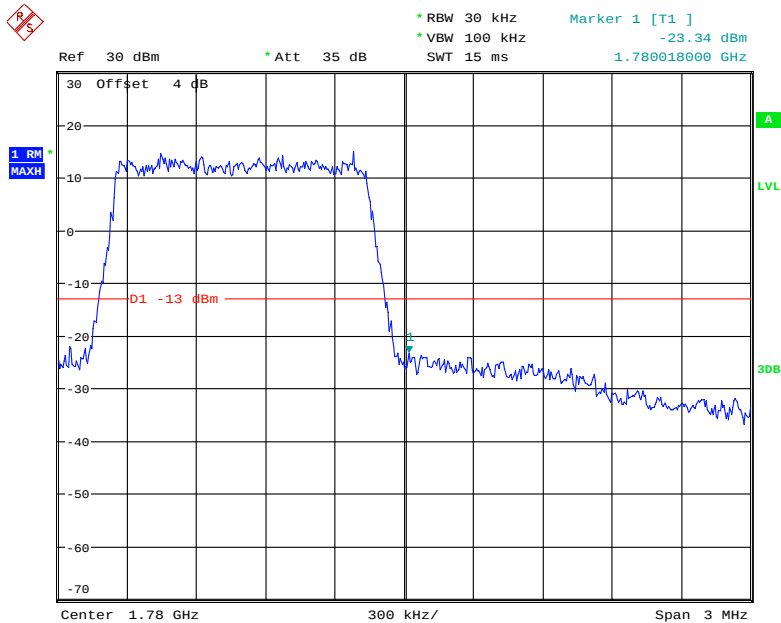
LTE Band 66

QPSK_1.4MHz_6 RB_ Left



Date: 21.NOV.2019 14:14:52

QPSK_1.4MHz_6 RB_ Right

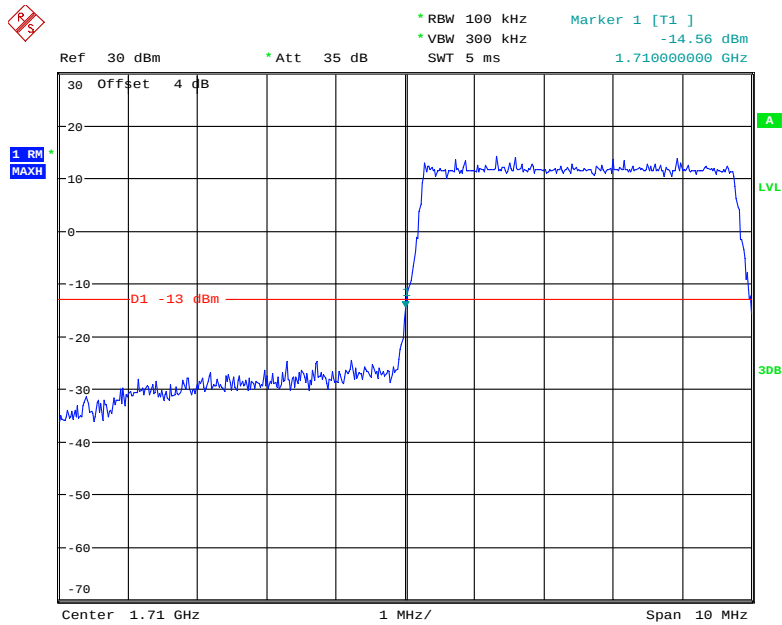


Date: 21.NOV.2019 14:15:30



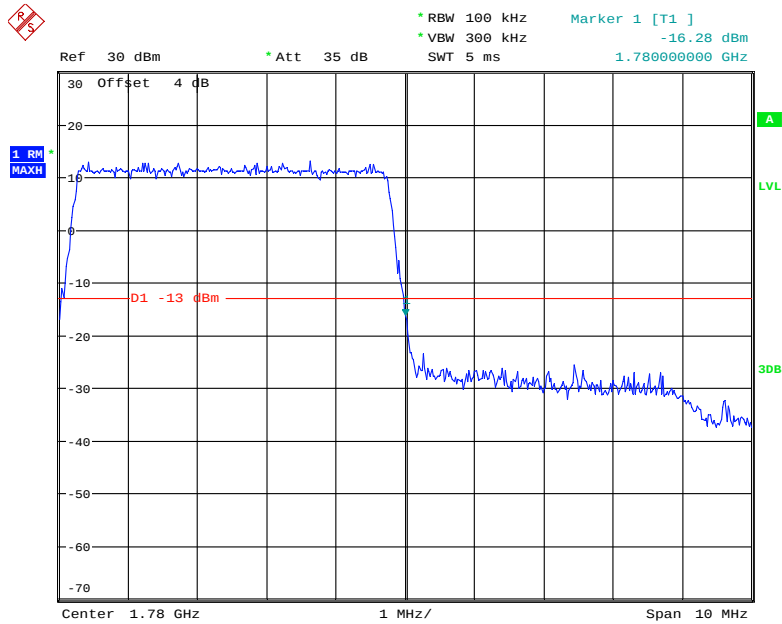
Page 148 of 166

QPSK_5MHz_25 RB_ Left



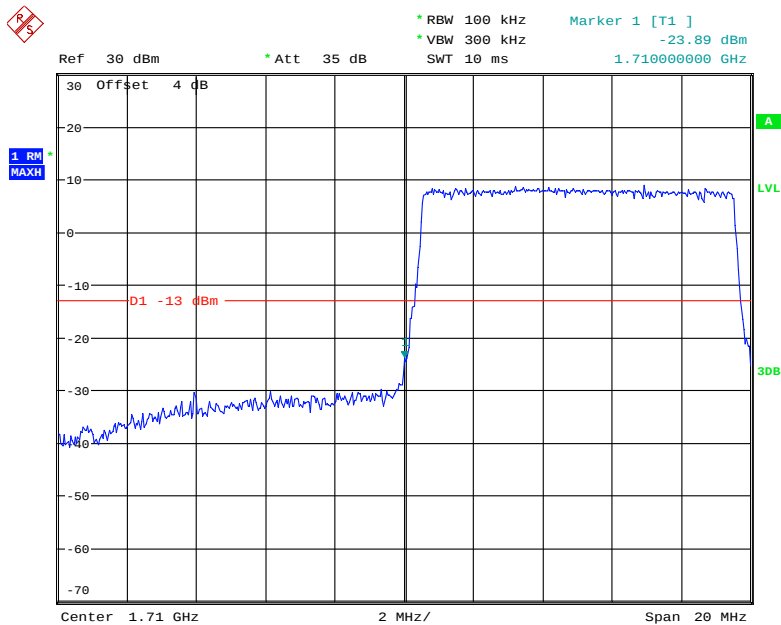
Date: 21.NOV.2019 14:17:27

QPSK_5MHz_25 RB_ Right



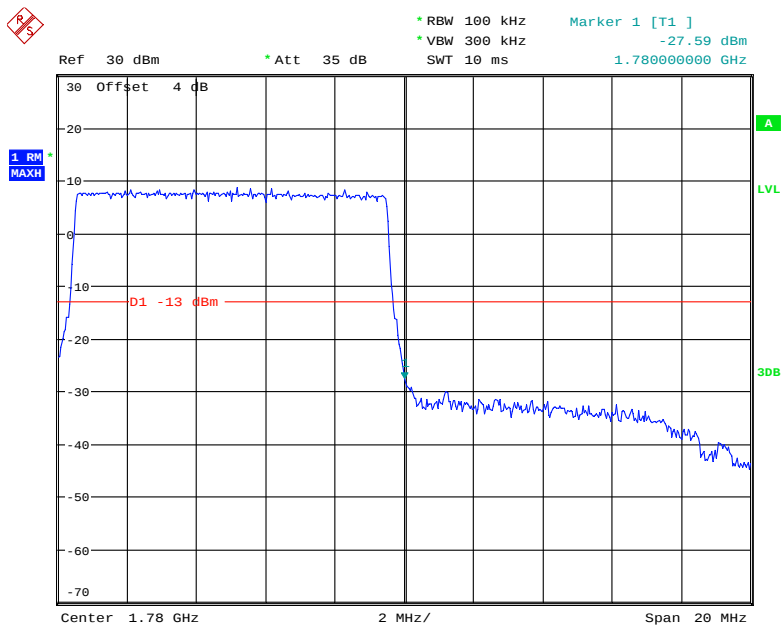
Date: 21.NOV.2019 14:18:07

QPSK_10MHz_50 RB_ Left



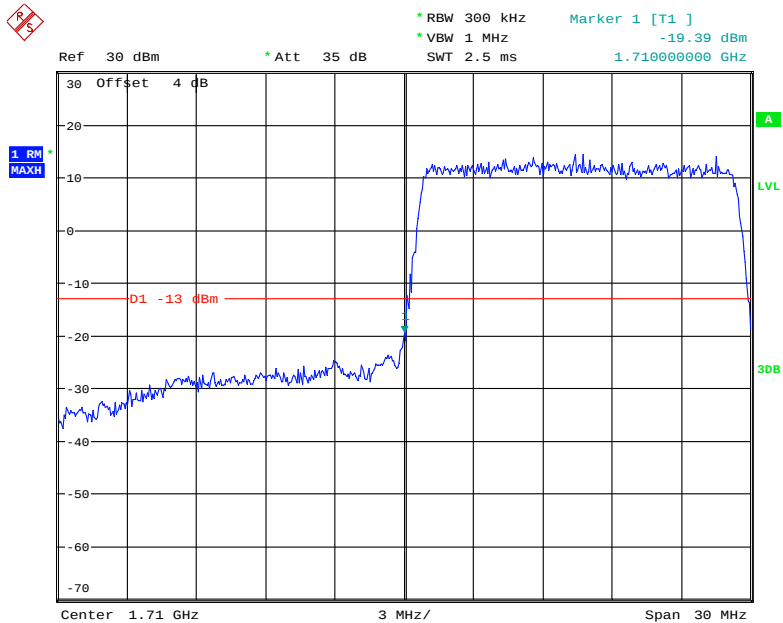
Date: 21.NOV.2019 14:18:47

QPSK_10MHz_50 RB_ Right



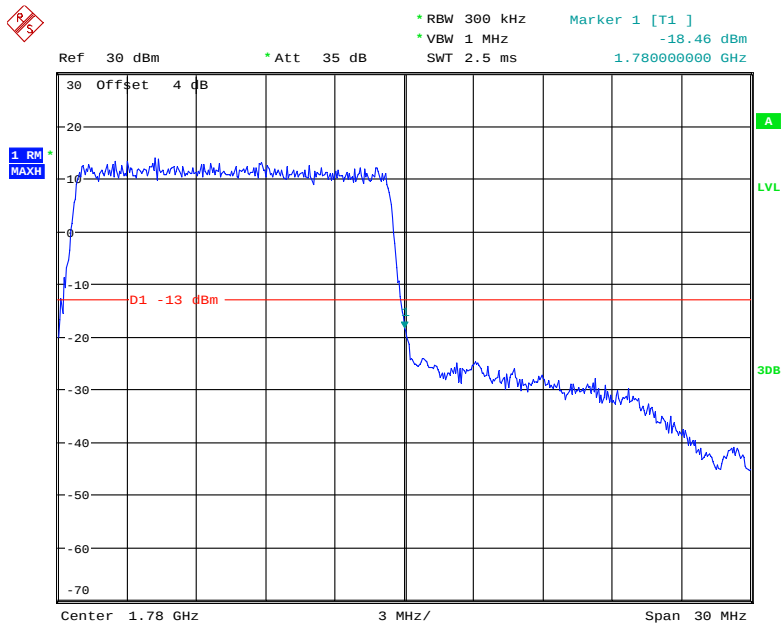
Date: 21.NOV.2019 14:19:27

QPSK_15MHz_75 RB_ Left



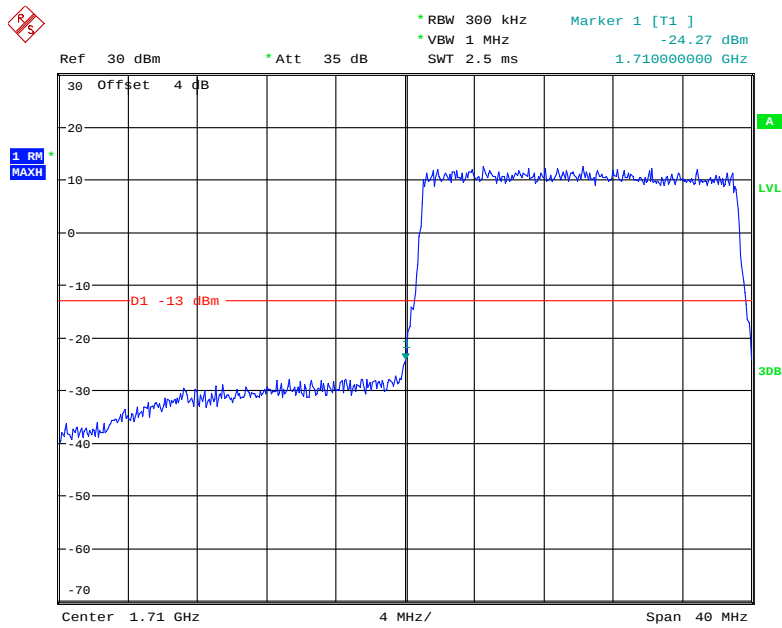
Date: 21.NOV.2019 14:20:10

QPSK_15MHz_75 RB_ Right



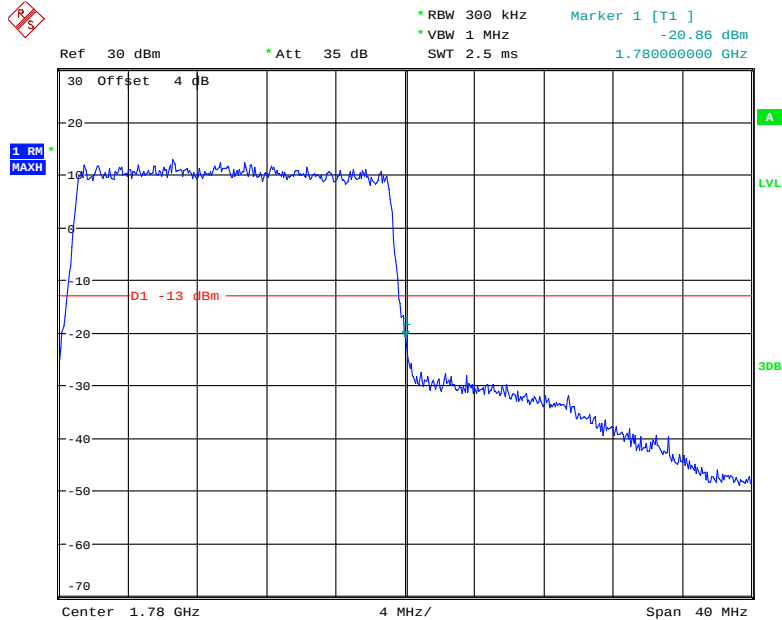
Date: 21.NOV.2019 14:20:53

QPSK_20MHz_FULL RB_Left



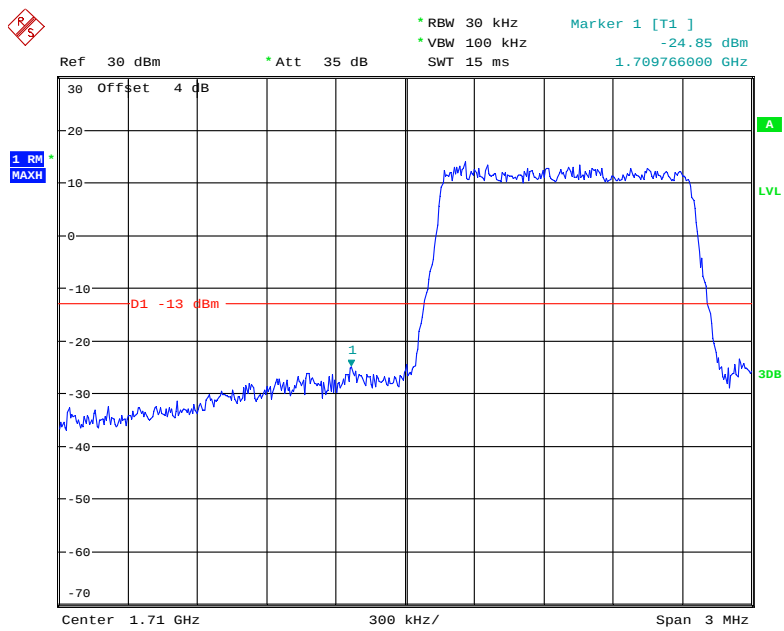
Date: 21.NOV.2019 14:21:43

QPSK_20MHz_FULL RB_Right



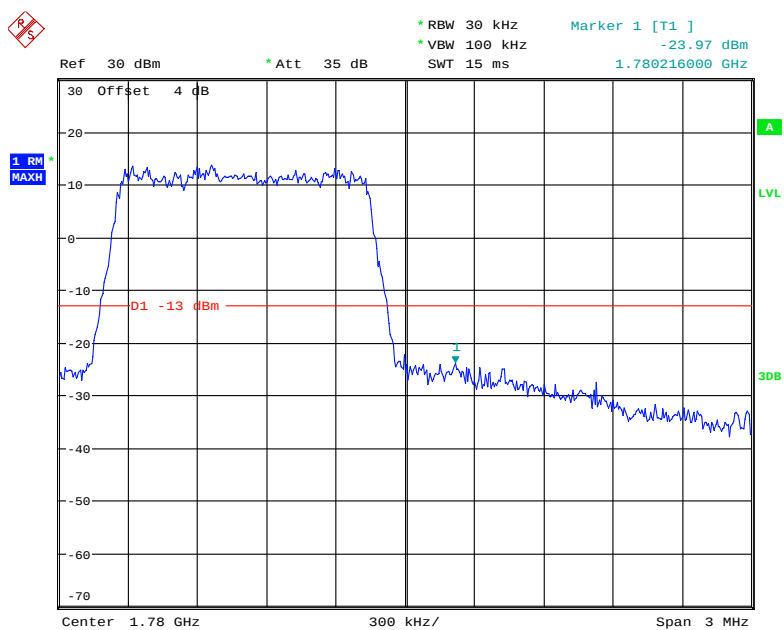
Date: 21.NOV.2019 14:22:29

16QAM_1.4MHz_6 RB_ Left



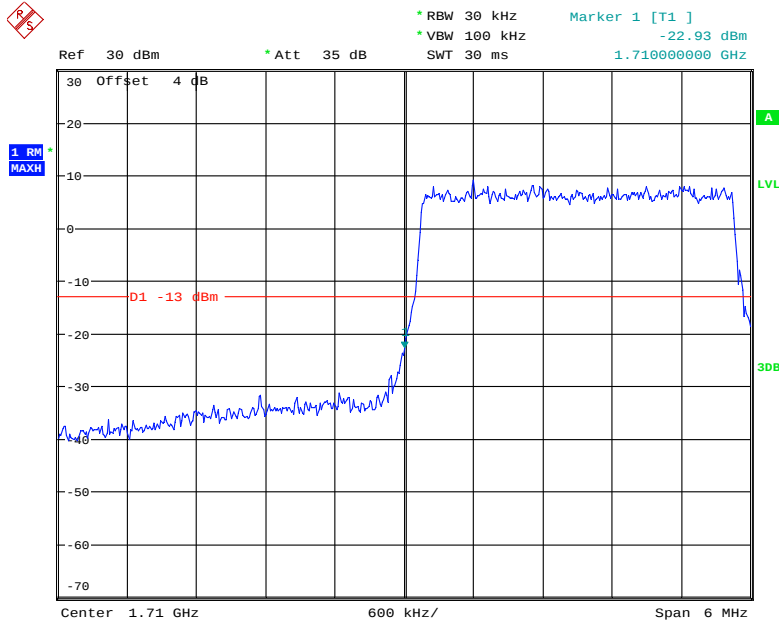
Date: 21.NOV.2019 14:15:13

16QAM_1.4MHz_6 RB_ Right



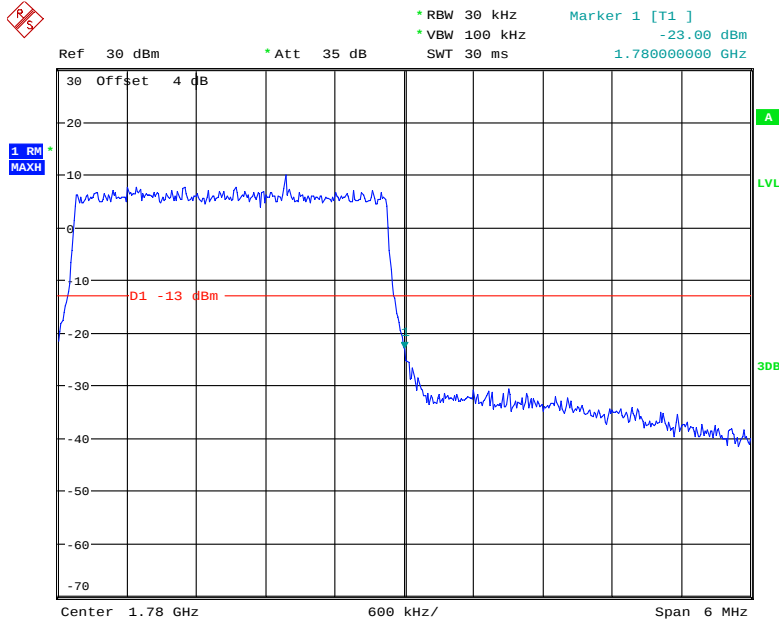
Date: 21.NOV.2019 14:15:50

16QAM_3MHz_15 RB_ Left

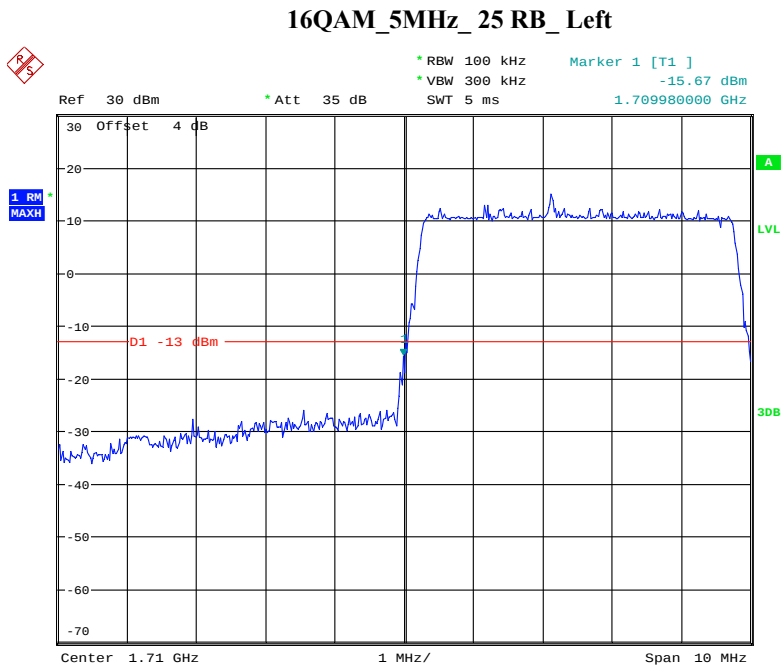


Date: 21.NOV.2019 14:16:31

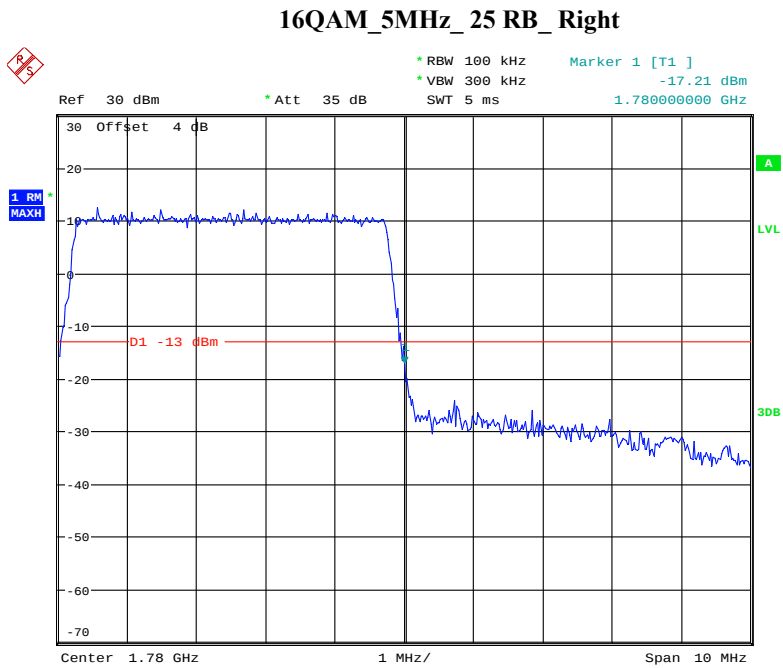
16QAM_3MHz_15 RB_ Right



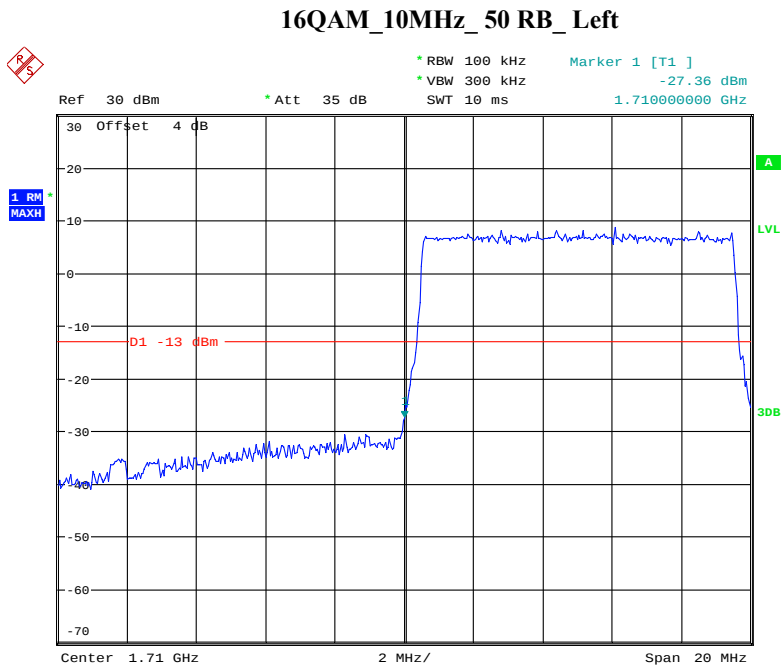
Date: 21.NOV.2019 14:17:05



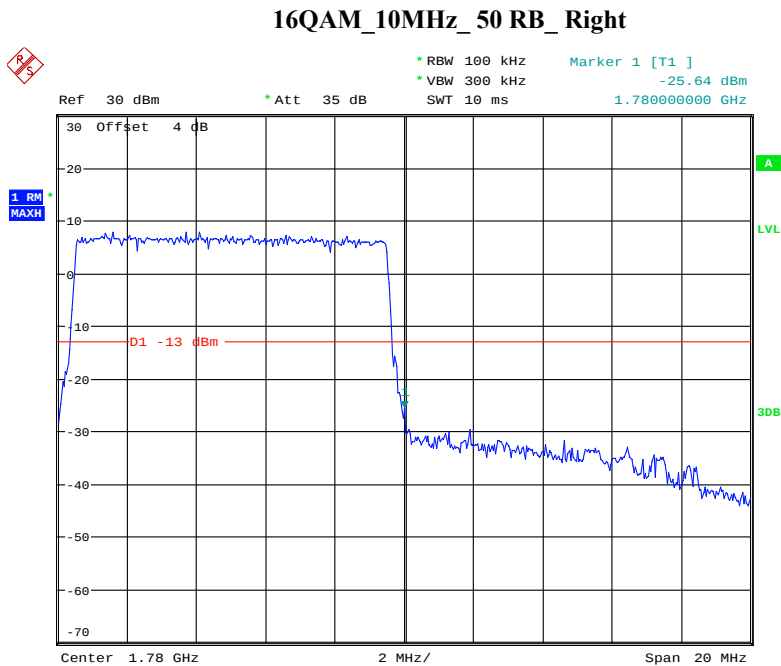
Date: 21.NOV.2019 14:17:48



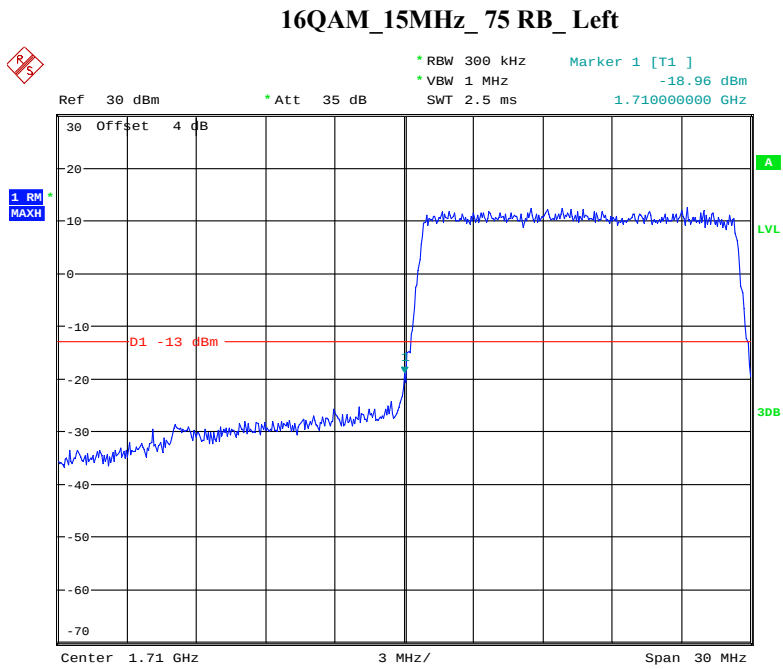
Date: 21.NOV.2019 14:18:25



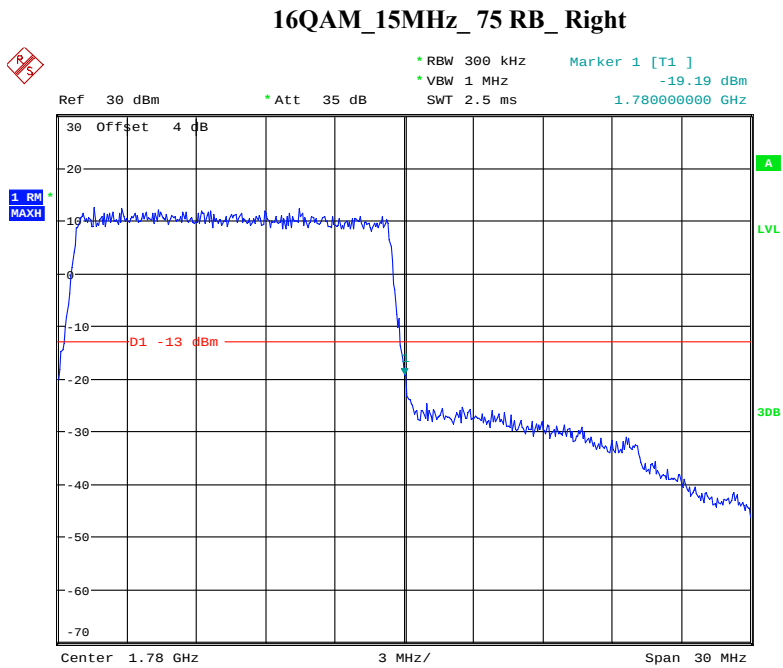
Date: 21.NOV.2019 14:19:05



Date: 21.NOV.2019 14:19:44

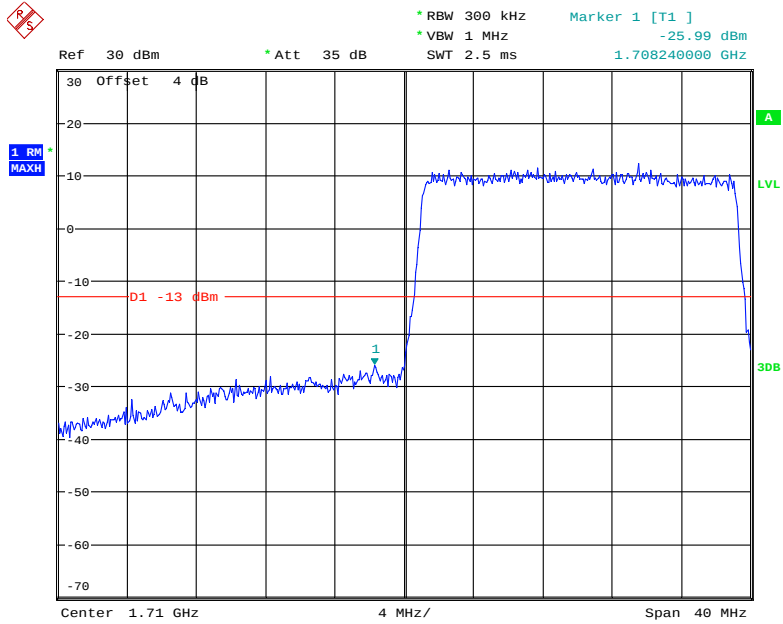


Date: 21.NOV.2019 14:20:31



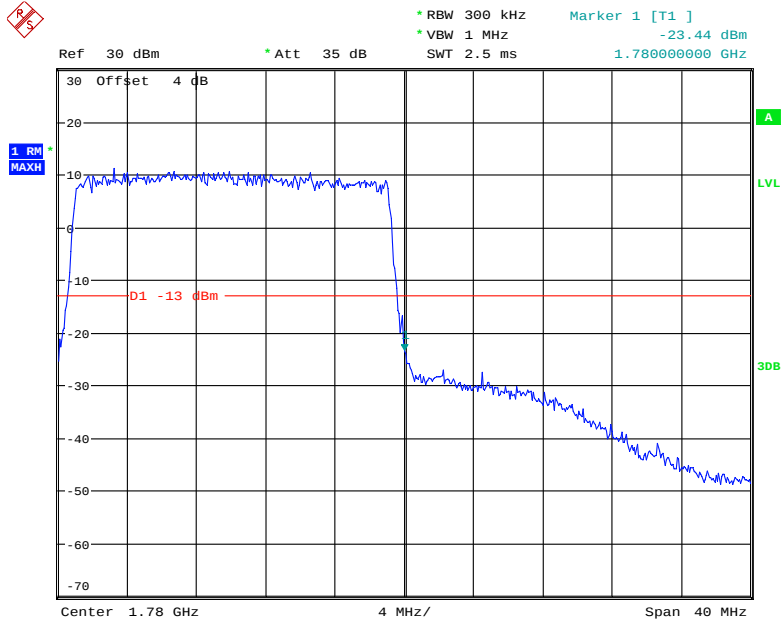
Date: 21.NOV.2019 14:21:14

16QAM_20MHz_FULL RB_Left



Date: 21.NOV.2019 14:22:04

16QAM_20MHz_FULL RB_Right



Date: 21.NOV.2019 14:22:50

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

According to §22.355, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table below:

Frequency Tolerance for Transmitters in the Public Mobile Services

Frequency Range (MHz)	Base, fixed (ppm)	Mobile > 3 watts (ppm)	Mobile ≤ 3 watts (ppm)
25 to 50	20.0	20.0	50.0
50 to 450	5.0	5.0	50.0
450 to 512	2.5	5.0	5.0
821 to 896	1.5	2.5	2.5
928 to 929.	5.0	N/A	N/A
929 to 960.	1.5	N/A	N/A
2110 to 2220	10.0	N/A	N/A

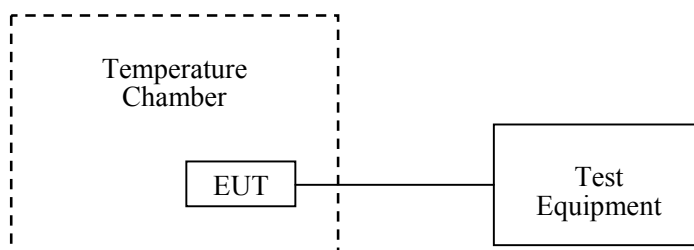
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external AC 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 AC 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 AC 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	Spectrum Analyzer	FSV40	101474	2019-01-09	2020-01-09
R&S	Spectrum Analyzer	FSU 26	200256	2019-05-09	2020-05-09
Unknown	Coaxial Cable	C-SJ00-0010	C0010/05	Each time	N/A
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41010013	Each time	N/A
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005011	Each time	N/A
R&S	Universal Radio Communication Tester	CMU200	106 891	2018-12-14	2019-12-14
R&S	Wideband Radio Communication Tester	CMW500	147473	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	2019-07-23	2020-07-23
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:	25.4~26.5°C
Relative Humidity:	44~60%
ATM Pressure:	100.2~100.6kPa
Test by:	Elena Lei, Vern Shen
Test Date:	2019-11-18~2019-11-21

WCDMA Band II: R99

Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V _{AC}	Hz	ppm	
-30	120	10	0.00532	Pass
-20		12	0.00638	
-10		11	0.00585	
0		10	0.00532	
10		12	0.00638	
20		13	0.00691	
30		13	0.00691	
40		11	0.00585	
50		13	0.00691	
25	138	12	0.00638	
25	102	13	0.00691	

WCDMA Band V: R99

Middle Channel, $f_c = 836.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	V _{AC}	Hz	ppm	ppm
-30	120	5	0.00598	2.5
-20		6	0.00717	
-10		4	0.00478	
0		3	0.00359	
10		5	0.00598	
20		4	0.00478	
30		4	0.00478	
40		5	0.00598	
50		4	0.00478	
25	138	4	0.00478	
25	102	4	0.00478	

LTE Band 2:

QPSK, Channel Bandwidth:10MHz Middle Channel, $f_c = 1880$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V _{AC}	Hz	ppm	
-30	120	9	0.0048	Pass
-20		3	0.0016	
-10		9	0.0048	
0		11	0.0059	
10		3	0.0016	
20		1	0.0005	
30		11	0.0059	
40		-5	-0.0027	
50		13	0.0069	
20	138	-7	-0.0037	
20	102	-7	-0.0037	

16QAM, Channel Bandwidth:10MHz Middle Channel, $f_c = 1880$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V _{AC}	Hz	ppm	
-30	120	13	0.0069	Pass
-20		11	0.0059	
-10		13	0.0069	
0		5	0.0027	
10		1	0.0005	
20		-1	-0.0005	
30		9	0.0048	
40		9	0.0048	
50		-3	-0.0016	
20	138	13	0.0069	
20	102	13	0.0069	

LTE Band 4:

QPSK, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
℃	V_{AC}	F_L	F_H	F_L	F_H
-30	120	1710.52	1754.49	1710	1755
-20		1710.56	1754.52	1710	1755
-10		1710.50	1754.48	1710	1755
0		1710.52	1754.48	1710	1755
10		1710.50	1754.47	1710	1755
20		1710.52	1754.48	1710	1755
30		1710.54	1754.48	1710	1755
40		1710.56	1754.50	1710	1755
50		1710.52	1754.44	1710	1755
20	138	1710.54	1754.48	1710	1755
20	102	1710.52	1754.45	1710	1755

16QAM, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
℃	V_{AC}	F_L	F_H	F_L	F_H
-30	120	1710.54	1754.46	1710	1755
-20		1710.54	1754.50	1710	1755
-10		1710.51	1754.49	1710	1755
0		1710.56	1754.48	1710	1755
10		1710.51	1754.50	1710	1755
20		1710.52	1754.48	1710	1755
30		1710.50	1754.50	1710	1755
40		1710.50	1754.48	1710	1755
50		1710.54	1754.50	1710	1755
20	138	1710.52	1754.48	1710	1755
20	102	1710.55	1754.51	1710	1755

LTE Band 5:

Middle Channel, $f_c = 836.5$ MHz, QPSK Channel Bandwidth:10MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	V _{AC}	Hz	ppm	ppm
-30	120	-5	-0.0060	2.5
-20		3	0.0036	
-10		-5	-0.0060	
0		9	0.0108	
10		11	0.0132	
20		5	0.0060	
30		13	0.0155	
40		-7	-0.0084	
50		9	0.0108	
20	138	-3	-0.0036	
20	102	13	0.0155	

Middle Channel, $f_c = 836.5$ MHz, 16QAM, Channel Bandwidth:10MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	V _{AC}	Hz	ppm	ppm
-30	120	5	0.0060	2.5
-20		7	0.0084	
-10		3	0.0036	
0		13	0.0155	
10		9	0.0108	
20		-7	-0.0084	
30		-5	-0.0060	
40		7	0.0084	
50		3	0.0036	
20	138	13	0.0155	
20	102	3	0.0036	

LTE Band 7:

QPSK, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
°C	V_{AC}	F_L	F_H	F_L	F_H
-30	120	2500.52	2569.46	2500	2570
-20		2500.48	2569.52	2500	2570
-10		2500.52	2569.47	2500	2570
0		2500.50	2569.46	2500	2570
10		2500.53	2569.49	2500	2570
20		2500.52	2569.48	2500	2570
30		2500.52	2569.44	2500	2570
40		2500.52	2569.46	2500	2570
50		2500.52	2569.44	2500	2570
20	138	2500.50	2569.48	2500	2570
20	102	2500.49	2569.48	2500	2570

16QAM, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
°C	V_{AC}	F_L	F_H	F_L	F_H
-30	120	2500.51	2569.49	2500	2570
-20		2500.52	2569.50	2500	2570
-10		2500.50	2569.49	2500	2570
0		2500.50	2569.46	2500	2570
10		2500.54	2569.46	2500	2570
20		2500.52	2569.48	2500	2570
30		2500.50	2569.50	2500	2570
40		2500.50	2569.46	2500	2570
50		2500.56	2569.44	2500	2570
20	138	2500.50	2569.48	2500	2570
20	102	2500.55	2569.51	2500	2570

LTE Band 66:

QPSK, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
°C	V_{AC}	F_L	F_H	F_L	F_H
-30	120	1710.51	1779.48	1710	1780
-20		1710.56	1779.46	1710	1780
-10		1710.50	1779.50	1710	1780
0		1710.52	1779.50	1710	1780
10		1710.51	1779.48	1710	1780
20		1710.52	1779.48	1710	1780
30		1710.50	1779.46	1710	1780
40		1710.54	1779.52	1710	1780
50		1710.52	1779.50	1710	1780
20	138	1710.48	1779.50	1710	1780
20	102	1710.49	1779.51	1710	1780

16QAM, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
°C	V_{AC}	F_L	F_H	F_L	F_H
-30	120	1710.50	1779.51	1710	1780
-20		1710.54	1779.46	1710	1780
-10		1710.51	1779.48	1710	1780
0		1710.54	1779.48	1710	1780
10		1710.52	1779.46	1710	1780
20		1710.52	1779.48	1710	1780
30		1710.50	1779.44	1710	1780
40		1710.48	1779.46	1710	1780
50		1710.50	1779.46	1710	1780
20	138	1710.48	1779.44	1710	1780
20	102	1710.52	1779.45	1710	1780

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 *******