TESTING LABORATORY
CERTIFICATE #4820.01

FCC PART 22H, PART 24E

FCC PART 27

MEASUREMENT AND TEST REPORT

For

MOVILTELCO TRADE, S.L.

Street: ABTAO,25-1Floor A-office MADRID-SPAIN MADRID, Spain

FCC ID: 2ACQKTELCO019

Report Type:	**Product Type:**
Original Report	Mobile Phone

Report Number:	RDG181210009-00D
Report Date:	2018-12-25
Reviewed By:	Jerry Zhang EMC Manager
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product Type:		Mobile Phone
EUT Name:		L506
EUT Model:		L506 Single SIM
Multiple Model:		L506 Dual SIM
Rated Input Voltage:		DC3.7V from Battery or DC5V from adapter
Adapter #1 Information	**Model Name:**	HJ-0500500B2-AR
	Input:	AC 100-240V, 50/60Hz 0.15A
	Output:	DC5V, 500mA
Adapter #2 Information	**Model Name:**	L506
	Input:	AC100-240V, 50/60Hz, 150mA
	Output:	DC 5V, 500mA
External Dimension:		145mm(L)* 75mm(W)* 12 mm(H)
Serial Number:		181210009
EUT Received Date:		2018.12.13

Note: The series product, models L506 Single SIM, L506 Dual SIM are electrically identical, The difference between them please refer to the declaration letter for details. For marketing purpose, we selected L506 Single SIM for fully test.

Objective

This report is prepared on behalf of ***MOVILTELCO TRADE, S.L.*** in accordance with: Part 2-Subpart J, Part 22-Subpart H, and Part 24-Subpart E of the Federal Communications Commission's rules.
Part 2, 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: 2ACQKTELCO019.
FCC Part 15C DSS submissions with FCC ID: 2ACQKTELCO019.
FCC Part 15B JBP submissions with FCC ID: 2ACQKTELCO019.

Test Methodology

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

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

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

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

Measurement Uncertainty

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

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.

SYSTEM TEST CONFIGURATION

Justification

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

The test items were performed with the EUT operating at testing mode. The device support GSM/GPRS 850 band and 1900 band, WCDMA/HSUPA/HPDPA Band 2/5, LTE band 2,4,5,7.

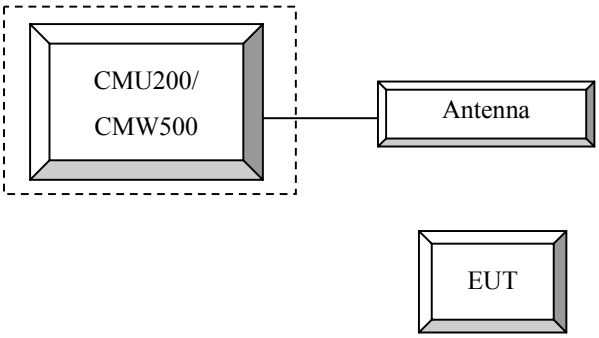
Equipment Modifications

No modification was made to the EUT.

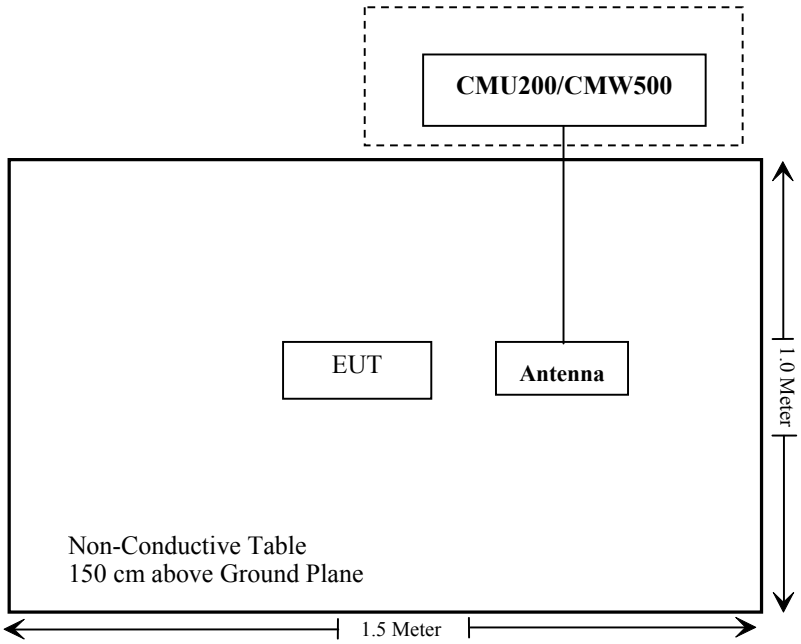
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
R&S	Universial Radio Communication Tester	CMU200	109038
R&S	Wideband Radio Communication Tester	CMW500	147473
N/A	ANTENNA	N/A	N/A

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

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

FCC §1.1310 & §2.1093- RF EXPOSURE

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliant, please refer to the SAR report: RDG181210009-20A.

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

GSM/GPRS/EGPRS

Function: Menu select > GSM Mobile Station > GSM 850/1900
Press Connection control to choose the different menus
Press RESET > choose all the reset all settings
Connection Press Signal Off to turn off the signal and change settings
Network Support > GSM + GPRS or GSM + EGSM
Main Service > Packet Data
Service selection > Test Mode A – Auto Slot Config. off
MS Signal Press Slot Config Bottom on the right twice to select and change the number of time slots and power setting
> Slot configuration > Uplink/Gamma
> 33 dBm for GPRS 850
> 30 dBm for GPRS 1900
> 27 dBm for EGPRS 850
> 26 dBm for EGPRS 1900
BS Signal Enter the same channel number for TCH channel (test channel) and BCCH channel
Frequency Offset > + 0 Hz
Mode > BCCH and TCH
BCCH Level > -85 dBm (May need to adjust if link is not stable)
BCCH Channel > choose desire test channel [Enter the same channel number for TCH channel (test channel) and BCCH channel]

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

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

WCDMA-Release 99

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

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

WCDMA HSDPA

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

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

WCDMA HSUPA

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

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

HSPA+

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

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

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c .

Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).

Note 3: DPDCH is not configured, therefore the β_c is set to 1 and β_d = 0 by default.

Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signalled to use the extrapolation algorithm.

DC-HSDPA

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

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

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

Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.

Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.

LTE (FDD):

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

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

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

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

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

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

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

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

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

Radiated method:

ANSI/TIA-603-D section 2.2.17

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2018-12-10	2019-12-10
Sunol Sciences	Antenna	JB3	A060611-1	2017-11-10	2020-11-10
R&S	Spectrum Analyzer	FSU 26	200256	2018-01-04	2019-01-04
ETS-Lindgren	Horn Antenna	3115	000 527 35	2016-01-05	2019-01-04
Agilent	Signal Generator	E8247C	MY43321350	2018-12-10	2019-12-10
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
TDK RF	Horn Antenna	HRN-0118	130 084	2016-01-05	2019-01-04
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2018-09-05	2019-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2018-09-05	2019-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2018-05-06	2019-05-06
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2018-09-05	2019-09-05
MICRO-COAX	Coaxial Cable	UFA147-1-2362-100100	64639 231029-001	2018-02-24	2019-02-28
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

*** 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:	21.5~23.9°C
Relative Humidity:	34~37 %
ATM Pressure:	99.7~99.8 kPa

** The testing was performed by Carrie He & Elena Lei & Vern Shen from 2018-12-15 to 2018-12-18.*

Conducted Output Power

Cellular Band & PCS Band

Band	Channel No.	Conducted Peak Output Power (dBm)				
		GSM	GPRS 1 TX Slot	GPRS 2 TX Slot	GPRS 3 TX Slot	GPRS 4 TX Slot
Cellular	128	31.90	31.82	30.10	28.46	26.54
	190	31.90	31.71	30.15	28.49	26.61
	251	31.90	31.70	30.17	28.51	26.65
PCS	512	30.50	30.25	28.70	27.30	25.40
	661	30.80	30.81	28.72	27.31	25.43
	810	31.00	31.01	28.67	27.22	25.34

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	24.47	2.68	24.37	2.92	24.37	2.60
HSDPA	1	24.00	4.04	24.18	3.28	23.34	3.40
	2	24.01	4.01	24.11	3.27	24.09	3.00
	3	24.06	4.03	24.06	3.22	23.99	3.10
	4	24.01	4.00	23.99	3.24	23.94	3.30
HSUPA	1	24.02	3.36	24.20	4.00	23.38	3.44
	2	24.03	3.35	24.05	3.97	23.01	3.46
	3	24.10	3.33	24.12	3.99	23.97	3.41
	4	24.12	3.34	24.12	4.00	24.09	3.42
	5	24.09	3.30	23.98	3.99	23.97	3.44

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	23.23	3.04	23.21	3.04	23.24	3.08
HSDPA	1	23.26	3.96	22.83	3.60	23.58	3.92
	2	23.26	3.94	23.28	3.40	23.21	3.89
	3	23.25	3.91	23.22	3.00	23.13	3.88
	4	23.30	3.98	23.29	3.10	23.32	3.91
HSUPA	1	23.31	3.80	22.92	4.00	23.68	3.36
	2	23.40	3.70	23.39	3.99	23.33	3.36
	3	23.38	3.79	23.33	3.97	23.35	3.33
	4	23.36	3.81	23.41	3.76	23.33	3.37
	5	23.33	3.77	23.38	4.01	23.31	3.38

LTE Band 2

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4MHz	QPSK	RB1#0	23.05	22.81	22.34
		RB1#3	23.13	22.86	22.02
		RB1#5	23.11	22.88	21.60
		RB3#0	23.16	23.04	21.82
		RB3#3	23.17	22.98	21.57
		RB6#0	22.16	21.93	21.40
	16QAM	RB1#0	22.72	22.38	21.26
		RB1#3	22.76	22.43	21.32
		RB1#5	22.80	22.43	21.17
		RB3#0	23.00	21.55	21.49
		RB3#3	23.04	21.63	21.27
		RB6#0	21.27	20.82	20.70
3MHz	QPSK	RB1#0	22.31	22.53	22.02
		RB1#8	22.17	22.56	21.39
		RB1#14	21.94	22.50	20.84
		RB6#0	21.68	21.63	21.47
		RB6#9	21.48	21.59	20.99
		RB15#0	21.65	21.59	21.25
	16QAM	RB1#0	21.88	22.05	21.37
		RB1#8	21.89	22.12	21.13
		RB1#14	21.88	22.08	20.65
		RB6#0	20.90	20.84	20.75
		RB6#9	20.91	20.84	20.75
		RB15#0	20.79	20.63	20.58
5MHz	QPSK	RB1#0	21.68	22.65	22.28
		RB1#13	21.81	22.62	21.64
		RB1#24	21.20	22.67	20.48
		RB15#0	21.65	21.61	21.49
		RB15#10	21.60	21.51	21.18
		RB25#0	21.61	21.53	21.40
	16QAM	RB1#0	21.01	21.74	21.21
		RB1#13	20.99	21.73	21.26
		RB1#24	21.07	21.79	20.35
		RB15#0	20.81	20.55	20.59
		RB15#10	20.85	20.54	20.60
		RB25#0	20.90	20.66	20.51

10MHz	QPSK	RB1#0	21.60	22.48	22.49
		RB1#25	21.43	22.50	22.48
		RB1#49	21.45	22.47	20.90
		RB25#0	21.48	21.48	21.58
		RB25#25	21.48	21.59	21.47
		RB50#0	21.45	21.57	21.54
	16QAM	RB1#0	21.82	21.87	21.06
		RB1#25	21.80	21.86	20.97
		RB1#49	21.87	21.91	20.82
		RB25#0	20.77	20.75	20.64
		RB25#25	20.81	20.70	20.72
		RB50#0	20.77	20.74	20.65
15MHz	QPSK	RB1#0	21.60	22.42	22.42
		RB1#38	21.27	22.48	22.44
		RB1#74	21.54	22.53	20.65
		RB36#0	21.37	21.57	21.57
		RB36#39	21.38	21.57	21.45
		RB75#0	21.32	21.53	21.52
	16QAM	RB1#0	21.79	21.88	21.95
		RB1#38	21.63	21.93	21.96
		RB1#74	21.92	21.91	20.91
		RB36#0	20.73	20.72	20.60
		RB36#39	20.70	20.70	20.66
		RB75#0	20.68	20.71	20.62
20MHz	QPSK	RB1#0	21.58	22.61	22.67
		RB1#50	21.30	22.54	22.64
		RB1#99	22.75	22.62	21.31
		RB50#0	21.09	21.64	21.46
		RB50#50	21.70	21.56	21.52
		RB100#0	21.45	21.54	21.50
	16QAM	RB1#0	21.45	21.69	22.37
		RB1#50	21.38	21.68	22.31
		RB1#99	21.92	21.63	21.77
		RB50#0	20.82	20.74	20.68
		RB50#50	20.80	20.76	20.65
		RB100#0	20.80	20.74	20.65

LTE Band 4

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4MHz	QPSK	RB1#0	22.62	22.71	22.98
		RB1#3	22.55	22.74	23.00
		RB1#5	22.30	22.77	22.88
		RB3#0	22.52	22.88	22.90
		RB3#3	22.43	22.99	22.96
		RB6#0	21.72	21.92	21.84
	16QAM	RB1#0	22.39	22.68	22.01
		RB1#3	22.42	22.73	22.02
		RB1#5	22.27	22.75	22.00
		RB3#0	21.87	21.75	21.87
		RB3#3	21.91	21.82	21.90
		RB6#0	21.06	20.88	21.20
3MHz	QPSK	RB1#0	22.69	22.77	23.01
		RB1#8	22.41	22.76	23.00
		RB1#14	22.10	22.78	22.95
		RB6#0	21.77	21.87	21.91
		RB6#9	21.69	21.95	21.87
		RB15#0	21.84	21.82	21.82
	16QAM	RB1#0	22.19	22.72	22.03
		RB1#8	22.19	22.77	21.99
		RB1#14	22.13	22.74	22.00
		RB6#0	20.81	20.90	21.26
		RB6#9	20.74	20.90	21.25
		RB15#0	20.91	21.00	21.09
5MHz	QPSK	RB1#0	22.52	22.93	22.70
		RB1#13	22.45	23.06	22.66
		RB1#24	21.71	23.01	22.79
		RB15#0	21.82	21.84	21.91
		RB15#10	21.80	21.82	21.93
		RB25#0	21.84	21.82	21.83
	16QAM	RB1#0	21.07	21.99	21.52
		RB1#13	21.16	22.04	21.53
		RB1#24	21.08	22.13	21.57
		RB15#0	20.94	20.77	21.00
		RB15#10	20.95	20.88	21.07
		RB25#0	21.01	20.89	21.00

10MHz	QPSK	RB1#0	22.58	22.78	22.84
		RB1#25	22.13	22.94	22.93
		RB1#49	22.12	22.92	22.96
		RB25#0	21.82	21.74	21.90
		RB25#25	21.73	21.94	21.85
		RB50#0	21.74	21.83	21.92
	16QAM	RB1#0	21.96	21.91	21.51
		RB1#25	21.99	21.98	21.52
		RB1#49	22.06	22.04	21.54
		RB25#0	20.87	20.99	21.10
		RB25#25	20.92	21.11	21.10
		RB50#0	20.93	21.00	21.07
15MHz	QPSK	RB1#0	22.65	22.37	22.89
		RB1#38	22.02	22.89	22.93
		RB1#74	22.17	22.97	23.00
		RB36#0	21.72	21.79	21.93
		RB36#39	21.88	21.86	21.87
		RB75#0	21.84	21.86	21.83
	16QAM	RB1#0	21.97	21.94	22.17
		RB1#38	21.98	21.97	22.28
		RB1#74	22.08	22.07	22.35
		RB36#0	20.96	20.96	21.07
		RB36#39	21.05	21.03	21.14
		RB75#0	20.94	20.95	20.96
20MHz	QPSK	RB1#0	22.74	22.32	22.77
		RB1#50	22.74	22.93	22.81
		RB1#99	22.91	23.07	22.91
		RB50#0	21.74	21.73	21.89
		RB50#50	21.75	21.96	21.89
		RB100#0	21.78	21.89	21.92
	16QAM	RB1#0	22.43	21.40	22.36
		RB1#50	22.46	21.55	22.44
		RB1#99	22.61	21.62	22.58
		RB50#0	20.89	20.92	20.99
		RB50#50	20.93	21.07	21.12
		RB100#0	20.98	20.91	20.96

LTE Band 5

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4MHz	QPSK	RB1#0	22.71	22.64	22.79
		RB1#3	22.74	22.84	22.77
		RB1#5	22.79	22.80	22.70
		RB3#0	22.82	22.82	22.88
		RB3#3	22.82	22.87	22.79
		RB6#0	21.50	21.70	21.66
	16QAM	RB1#0	22.36	21.27	22.27
		RB1#3	22.28	21.37	22.14
		RB1#5	22.32	21.43	22.20
		RB3#0	21.31	21.85	21.96
		RB3#3	21.37	21.82	21.87
		RB6#0	20.36	20.98	20.94
3MHz	QPSK	RB1#0	22.72	22.52	22.85
		RB1#8	22.75	22.69	22.93
		RB1#14	22.71	22.69	22.94
		RB6#0	21.38	21.76	21.82
		RB6#9	21.29	21.78	21.73
		RB15#0	21.51	21.63	21.86
	16QAM	RB1#0	21.63	22.40	21.44
		RB1#8	21.59	22.42	21.47
		RB1#14	21.65	22.42	21.46
		RB6#0	20.49	20.71	21.18
		RB6#9	20.49	20.84	20.98
		RB15#0	20.50	20.84	20.83
5MHz	QPSK	RB1#0	22.58	22.61	22.36
		RB1#13	22.59	22.79	22.75
		RB1#24	22.60	22.74	22.83
		RB15#0	21.39	21.62	21.45
		RB15#10	21.36	21.73	21.90
		RB25#0	21.43	21.73	21.85
	16QAM	RB1#0	20.64	21.78	21.05
		RB1#13	20.58	21.84	21.55
		RB1#24	20.53	21.86	21.50
		RB15#0	20.47	20.67	20.43
		RB15#10	20.48	20.72	20.89
		RB25#0	20.48	20.69	20.74
10MHz	QPSK	RB1#0	22.61	22.80	22.56
		RB1#25	22.65	22.80	22.73
		RB1#49	22.74	22.85	22.87
		RB25#0	21.44	21.67	21.30
		RB25#25	21.62	21.68	21.79
		RB50#0	21.48	21.74	21.83
	16QAM	RB1#0	21.77	21.75	21.25
		RB1#25	21.73	21.93	21.20
		RB1#49	22.09	21.57	21.31
		RB25#0	20.41	20.89	20.46
		RB25#25	20.65	20.53	20.97
		RB50#0	20.36	20.86	20.84

LTE Band 7

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5MHz	QPSK	RB1#0	19.05	20.18	19.17
		RB1#13	19.52	20.61	19.56
		RB1#24	19.19	20.17	19.07
		RB15#0	19.08	20.42	19.43
		RB15#10	19.23	20.43	19.40
		RB25#0	19.04	20.37	19.35
	16QAM	RB1#0	18.48	20.37	19.19
		RB1#13	19.19	20.85	19.59
		RB1#24	18.96	20.44	19.15
		RB15#0	19.07	20.45	19.50
		RB15#10	19.22	20.48	19.48
		RB25#0	19.08	20.43	19.44
10MHz	QPSK	RB1#0	18.51	19.96	19.11
		RB1#25	19.08	20.31	19.30
		RB1#49	19.29	20.35	19.40
		RB25#0	18.83	20.18	19.21
		RB25#25	19.26	20.42	19.45
		RB50#0	19.02	20.29	19.31
	16QAM	RB1#0	18.90	20.10	19.06
		RB1#25	19.61	20.52	19.32
		RB1#49	19.85	20.55	19.43
		RB25#0	18.94	20.30	19.37
		RB25#25	19.37	20.54	19.59
		RB50#0	19.11	20.38	19.41
15MHz	QPSK	RB1#0	18.45	19.90	20.77
		RB1#38	18.94	20.19	20.06
		RB1#74	18.94	19.83	19.64
		RB36#0	18.84	20.13	19.73
		RB36#39	19.08	20.15	19.60
		RB75#0	18.92	20.12	19.52
	16QAM	RB1#0	18.89	20.03	19.89
		RB1#38	19.50	20.39	19.95
		RB1#74	19.53	20.04	19.77
		RB36#0	18.93	20.27	19.51
		RB36#39	19.19	20.26	19.47
		RB75#0	19.03	20.24	19.44
20MHz	QPSK	RB1#0	18.69	19.87	19.42
		RB1#50	19.16	20.26	19.26
		RB1#99	19.85	20.23	19.53
		RB50#0	18.82	19.92	19.08
		RB50#50	19.40	20.21	19.32
		RB100#0	19.08	20.04	19.17
	16QAM	RB1#0	18.77	19.99	19.41
		RB1#50	19.35	20.43	19.47
		RB1#99	20.08	20.41	19.75
		RB50#0	18.84	20.00	19.15
		RB50#50	19.43	20.29	19.39
		RB100#0	19.16	20.14	19.27

PAR, Band 2

Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	20 MHz	4.23	4.33	4.17	13
	100 RB		5.35	5.32	5.22	13
16QAM	1 RB	20 MHz	4.97	5.51	5.42	13
	100 RB		5.99	6.12	5.96	13

PAR and 4

Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	20 MHz	4.42	4.52	3.85	13
	100 RB		5.35	5.22	5.32	13
16QAM	1 RB	20 MHz	4.94	4.97	5.10	13
	100 RB		5.99	5.99	6.09	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	5.29	5.51	5.45	13
	50 RB		5.58	5.71	5.45	13
16QAM	1 RB	10 MHz	6.31	6.67	6.03	13
	50 RB		6.44	6.57	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	4.84	4.97	5.13	13
	100 RB		5.26	5.26	5.35	13
16QAM	1 RB	20 MHz	4.94	5.10	5.35	13
	100 RB		5.90	5.96	5.93	13

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

ERP & EIRP

Part 22H

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBµV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
GSM 850 Middle Channel								
836.60	H	97.30	22.38	0.00	0.97	21.41	38.45	17.04
836.60	V	104.42	32.63	0.00	0.97	31.66	38.45	6.79
WCDMA Band V Middle Channel								
836.60	H	87.07	12.15	0.00	0.97	11.18	38.45	27.27
836.60	V	97.48	25.69	0.00	0.97	24.72	38.45	13.73

Part 24E

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBµV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
PCS 1900 Middle Channel								
1880.00	H	95.20	20.42	11.14	1.56	30.00	33.00	3.00
1880.00	V	91.09	16.12	11.14	1.56	25.70	33.00	7.30
WCDMA Band II Middle Channel								
1880.00	H	90.61	15.83	11.14	1.56	25.41	33.00	7.59
1880.00	V	87.43	12.46	11.14	1.56	22.04	33.00	10.96

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	90.03	15.25	11.14	1.56	**24.83**	33.00	8.17
1880.00			V	86.64	11.67	11.14	1.56	21.25	33.00	11.75
1880.00	3.00		H	89.35	14.57	11.14	1.56	24.15	33.00	8.85
1880.00			V	87.40	12.43	11.14	1.56	22.01	33.00	10.99
1880.00	5.00		H	89.20	14.42	11.14	1.56	24.00	33.00	9.00
1880.00			V	86.33	11.36	11.14	1.56	20.94	33.00	12.06
1880.00	10.00		H	88.47	13.69	11.14	1.56	23.27	33.00	9.73
1880.00			V	85.75	10.78	11.14	1.56	20.36	33.00	12.64
1880.00	15.00		H	88.60	13.82	11.14	1.56	23.40	33.00	9.60
1880.00			V	84.95	9.98	11.14	1.56	19.56	33.00	13.44
1880.00	20.00		H	89.21	14.43	11.14	1.56	**24.01**	33.00	8.99
1880.00			V	87.70	12.73	11.14	1.56	22.31	33.00	10.69
1880.00	1.40	16QAM	H	90.13	15.35	11.14	1.56	**24.93**	33.00	8.07
1880.00			V	86.98	12.01	11.14	1.56	21.59	33.00	11.41
1880.00	3.00		H	90.23	15.45	11.14	1.56	25.03	33.00	7.97
1880.00			V	87.87	12.90	11.14	1.56	22.48	33.00	10.52
1880.00	5.00		H	89.26	14.48	11.14	1.56	24.06	33.00	8.94
1880.00			V	86.68	11.71	11.14	1.56	21.29	33.00	11.71
1880.00	10.00		H	88.81	14.03	11.14	1.56	23.61	33.00	9.39
1880.00			V	85.88	10.91	11.14	1.56	20.49	33.00	12.51
1880.00	15.00		H	88.61	13.83	11.14	1.56	23.41	33.00	9.59
1880.00			V	84.97	10.00	11.14	1.56	19.58	33.00	13.42
1880.00	20.00		H	90.33	15.55	11.14	1.56	**25.13**	33.00	7.87
1880.00			V	85.68	10.71	11.14	1.56	20.29	33.00	12.71

LTE Band 4

Frequency (MHz)	BW (MHz)	Modulation	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
					Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
1732.50	1.40	QPSK	H	90.48	15.27	10.70	1.52	**24.45**	30.00	5.55
1732.50			V	86.70	11.19	10.70	1.52	20.37	30.00	9.63
1732.50	3.00		H	89.52	14.31	10.70	1.52	23.49	30.00	6.51
1732.50			V	85.10	9.59	10.70	1.52	18.77	30.00	11.23
1732.50	5.00		H	90.08	14.87	10.70	1.52	24.05	30.00	5.95
1732.50			V	84.53	9.02	10.70	1.52	18.20	30.00	11.80
1732.50	10.00		H	89.79	14.58	10.70	1.52	23.76	30.00	6.24
1732.50			V	85.77	10.26	10.70	1.52	19.44	30.00	10.56
1732.50	15.00		H	89.75	14.54	10.70	1.52	23.72	30.00	6.28
1732.50			V	88.13	12.62	10.70	1.52	21.80	30.00	8.20
1732.50	20.00		H	88.71	13.50	10.70	1.52	**22.68**	30.00	7.32
1732.50			V	86.01	10.50	10.70	1.52	19.68	30.00	10.32
1732.50	1.40	16QAM	H	90.00	14.79	10.70	1.52	**23.97**	30.00	6.03
1732.50			V	86.80	11.29	10.70	1.52	20.47	30.00	9.53
1732.50	3.00		H	90.00	14.79	10.70	1.52	23.97	30.00	6.03
1732.50			V	85.15	9.64	10.70	1.52	18.82	30.00	11.18
1732.50	5.00		H	90.56	15.35	10.70	1.52	24.53	30.00	5.47
1732.50			V	84.88	9.37	10.70	1.52	18.55	30.00	11.45
1732.50	10.00		H	89.93	14.72	10.70	1.52	23.90	30.00	6.10
1732.50			V	85.87	10.36	10.70	1.52	19.54	30.00	10.46
1732.50	15.00		H	89.48	14.27	10.70	1.52	23.45	30.00	6.55
1732.50			V	88.14	12.63	10.70	1.52	21.81	30.00	8.19
1732.50	20.00		H	89.05	13.84	10.70	1.52	**23.02**	30.00	6.98
1732.50			V	86.24	10.73	10.70	1.52	19.91	30.00	10.09

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	86.91	11.98	0.00	0.97	11.01	38.45	27.44
836.50			V	95.88	24.09	0.00	0.97	**23.12**	38.45	15.33
836.50	3.00		H	86.67	11.74	0.00	0.97	10.77	38.45	27.68
836.50			V	95.79	24.00	0.00	0.97	23.03	38.45	15.42
836.50	5.00		H	86.70	11.77	0.00	0.97	10.80	38.45	27.65
836.50			V	93.14	21.35	0.00	0.97	20.38	38.45	18.07
836.50	10.00		H	84.68	9.75	0.00	0.97	8.78	38.45	29.67
836.50			V	93.81	22.02	0.00	0.97	**21.05**	38.45	17.40
836.50	1.40	16QAM	H	86.95	12.02	0.00	0.97	11.05	38.45	27.40
836.50			V	95.89	24.10	0.00	0.97	**23.13**	38.45	15.32
836.50	3.00		H	86.70	11.77	0.00	0.97	10.80	38.45	27.65
836.50			V	95.80	24.01	0.00	0.97	23.04	38.45	15.41
836.50	5.00		H	86.80	11.87	0.00	0.97	10.90	38.45	27.55
836.50			V	93.35	21.56	0.00	0.97	20.59	38.45	17.86
836.50	10.00		H	84.91	9.98	0.00	0.97	9.01	38.45	29.44
836.50			V	93.97	22.18	0.00	0.97	**21.21**	38.45	17.24

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	85.06	11.97	12.21	1.79	**22.39**	33.00	10.61
2535.00			V	84.92	11.54	12.21	1.79	21.96	33.00	11.04
2535.00	10.00		H	84.79	11.70	12.21	1.79	22.12	33.00	10.88
2535.00			V	83.39	10.01	12.21	1.79	20.43	33.00	12.57
2535.00	15.00		H	83.23	10.14	12.21	1.79	20.56	33.00	12.44
2535.00			V	83.10	9.72	12.21	1.79	20.14	33.00	12.86
2535.00	20.00		H	82.22	9.13	12.21	1.79	**19.55**	33.00	13.45
2535.00			V	81.01	7.63	12.21	1.79	18.05	33.00	14.95
2535.00	5.00	16QAM	H	86.02	12.93	12.21	1.79	**23.35**	33.00	9.65
2535.00			V	85.00	11.62	12.21	1.79	22.04	33.00	10.96
2535.00	10.00		H	84.90	11.81	12.21	1.79	22.23	33.00	10.77
2535.00			V	83.90	10.52	12.21	1.79	20.94	33.00	12.06
2535.00	15.00		H	83.71	10.62	12.21	1.79	21.04	33.00	11.96
2535.00			V	83.25	9.87	12.21	1.79	20.29	33.00	12.71
2535.00	20.00		H	82.54	9.45	12.21	1.79	**19.87**	33.00	13.13
2535.00			V	81.25	7.87	12.21	1.79	18.29	33.00	14.71

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

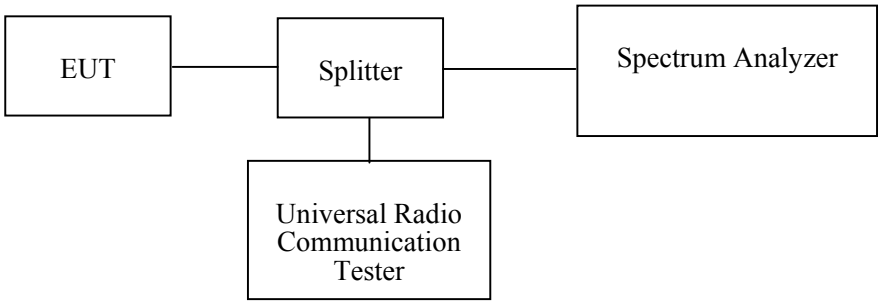
Applicable Standard

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	EMI Test Receiver	ESPI	100120	2018-12-10	2019-12-10
R&S	Spectrum Analyzer	FSU 26	200256	2018-01-04	2019-01-04
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005012	Each Time	/
Unknown	Coaxial Cable	C-SJ00-0010	C0010/01	Each Time	/
E-Microwave	Two-way Spliter	ODP-1-6-2S	OE0120142	Each Time	/

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

Test Data

Environmental Conditions

Temperature:	23.9~24.5 °C
Relative Humidity:	34~41 %
ATM Pressure:	99.7 kPa

The testing was performed by Carrie He, Elena Lei from 2018-12-18 to 2018-12-19.

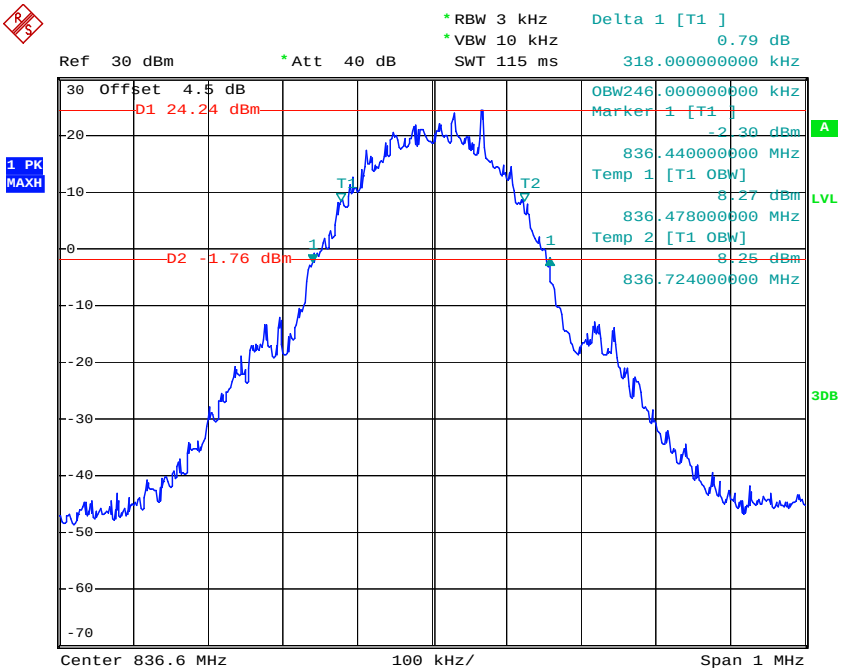
Test Mode: Transmitting

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

Band	Test Channel	Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
Cellular	M	GSM	0.246	0.318
PCS		PCS	0.244	0.314
WCDMA Band II		Rel 99	4.180	4.720
		HSDPA	4.180	4.720
		HSUPA	4.160	4.720
WCDMA Band V		Rel 99	4.160	4.720
		HSDPA	4.160	4.720
		HSUPA	4.160	4.720

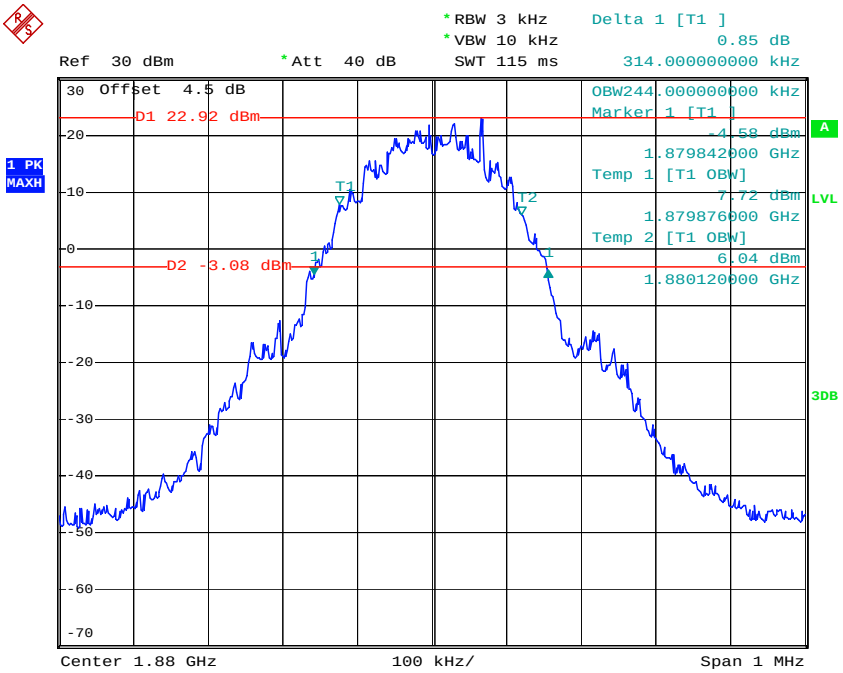
Band	Bandwidth	Modulation	99% occupied bandwidth (MHz)	26 dB bandwidth (MHz)
LTE Band 2	1.4 MHz	QPSK	1.110	1.341
		16QAM	1.104	1.389
	3 MHz	QPSK	2.712	3.030
		16QAM	2.712	3.006
	5 MHz	QPSK	4.560	5.371
		16QAM	4.540	5.331
	10 MHz	QPSK	9.000	9.699
		16QAM	8.960	9.780
	15 MHz	QPSK	13.560	15.271
		16QAM	13.560	14.850
	20 MHz	QPSK	18.000	19.479
		16QAM	17.920	19.639
LTE Band 4	1.4 MHz	QPSK	1.122	1.491
		16QAM	1.128	1.521
	3 MHz	QPSK	2.712	3.018
		16QAM	2.712	3.030
	5 MHz	QPSK	4.560	5.291
		16QAM	4.560	5.471
	10 MHz	QPSK	8.960	9.699
		16QAM	8.960	9.659
	15 MHz	QPSK	13.620	15.210
		16QAM	13.620	15.030
	20 MHz	QPSK	18.000	19.719
		16QAM	17.920	19.639
LTE Band 5	1.4 MHz	QPSK	1.110	1.329
		16QAM	1.116	1.335
	3 MHz	QPSK	2.700	3.018
		16QAM	2.700	3.018
	5 MHz	QPSK	4.540	5.251
		16QAM	4.540	5.311
	10 MHz	QPSK	9.000	9.699
		16QAM	9.000	9.699
LTE Band 7	5 MHz	QPSK	4.560	5.311
		16QAM	4.560	5.291
	10 MHz	QPSK	9.000	9.739
		16QAM	9.000	9.820
	15 MHz	QPSK	13.560	15.511
		16QAM	13.560	15.090
	20 MHz	QPSK	17.920	19.559
		16QAM	18.080	19.880

GSM 850 Cellular Band



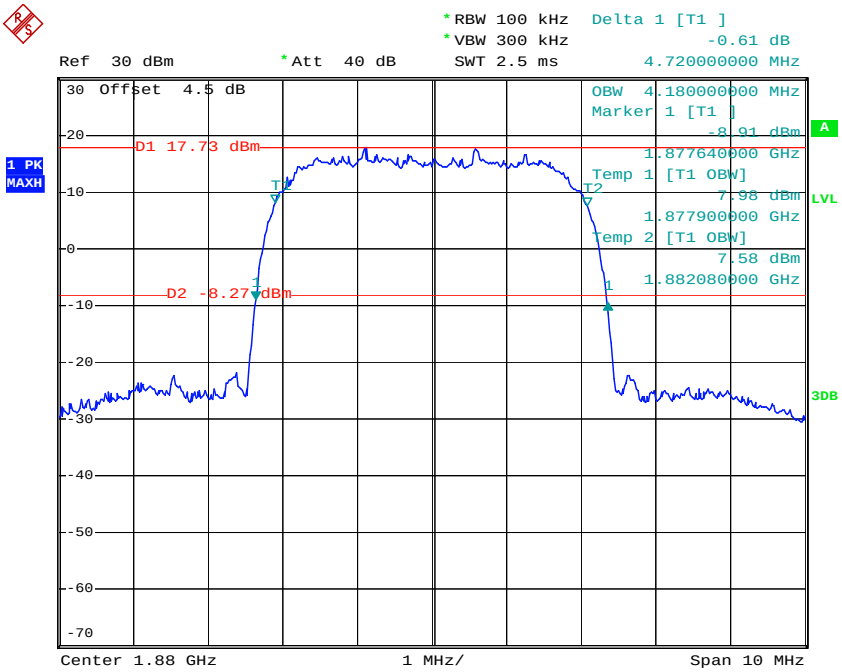
Date: 19.DEC.2018 09:27:12

GSM PCS1900 Cellular Band



Date: 19.DEC.2018 09:30:50

WCDMA Band II, Rel 99



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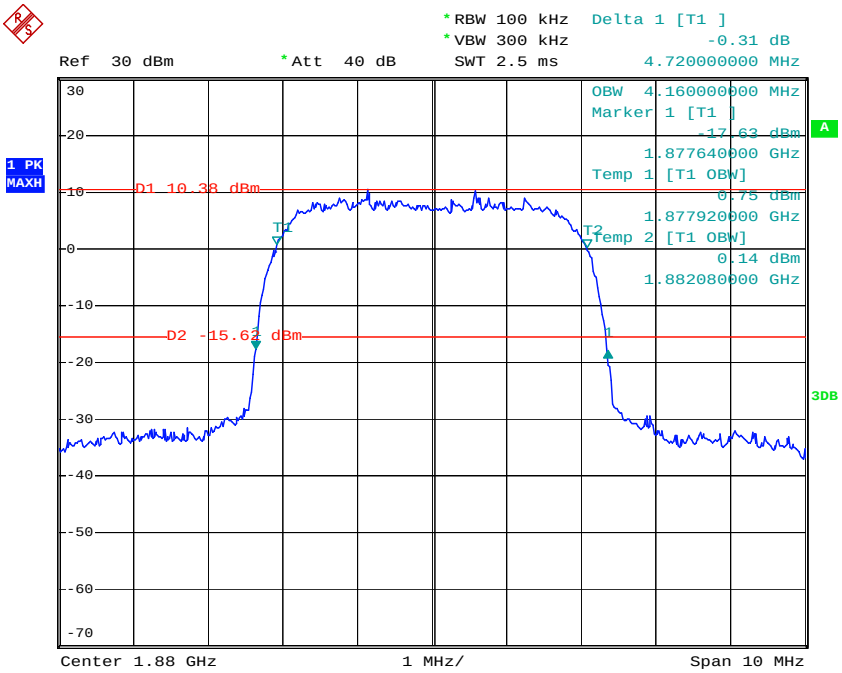
WCDMA Band II, HSUPA



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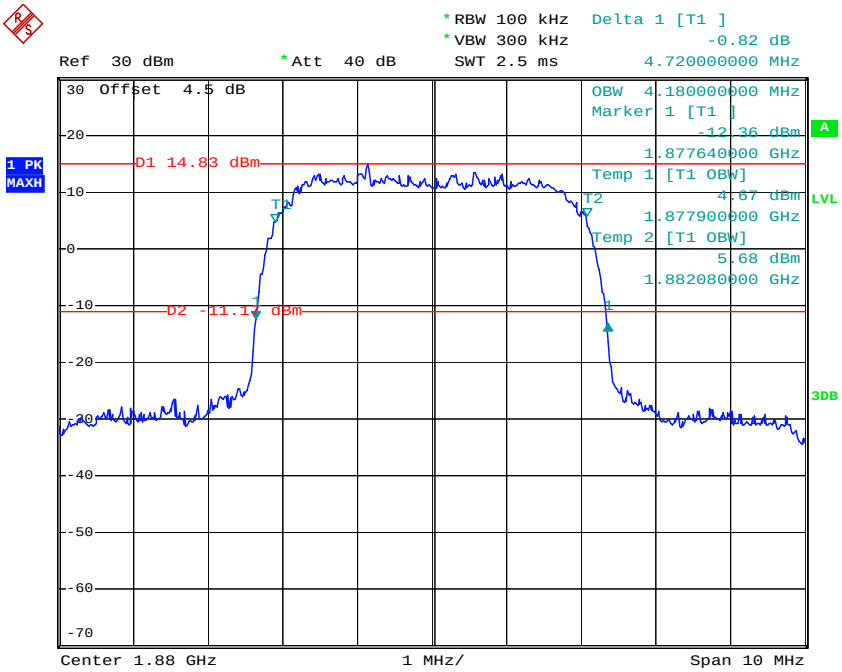
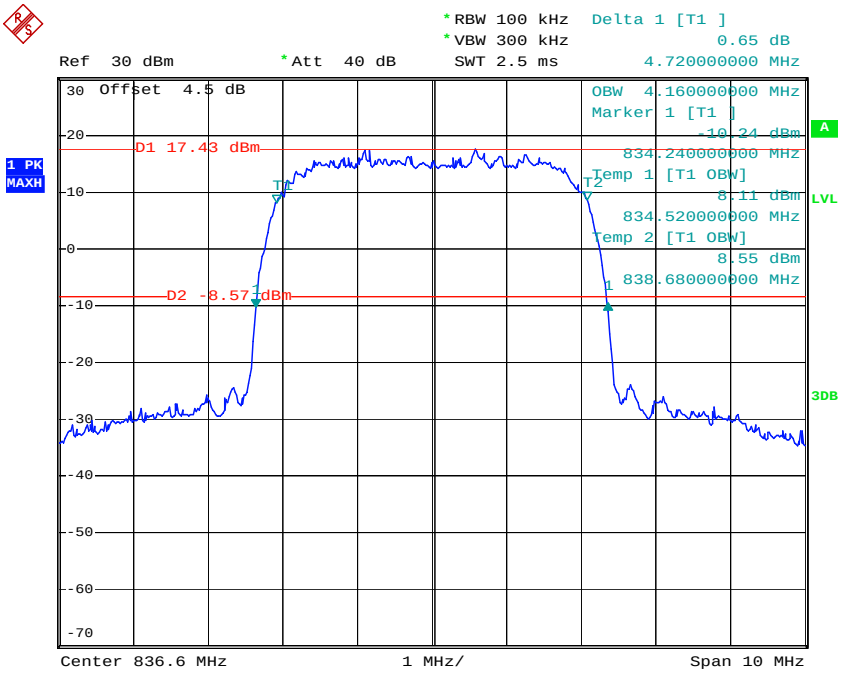
WCDMA Band II, HSDPA



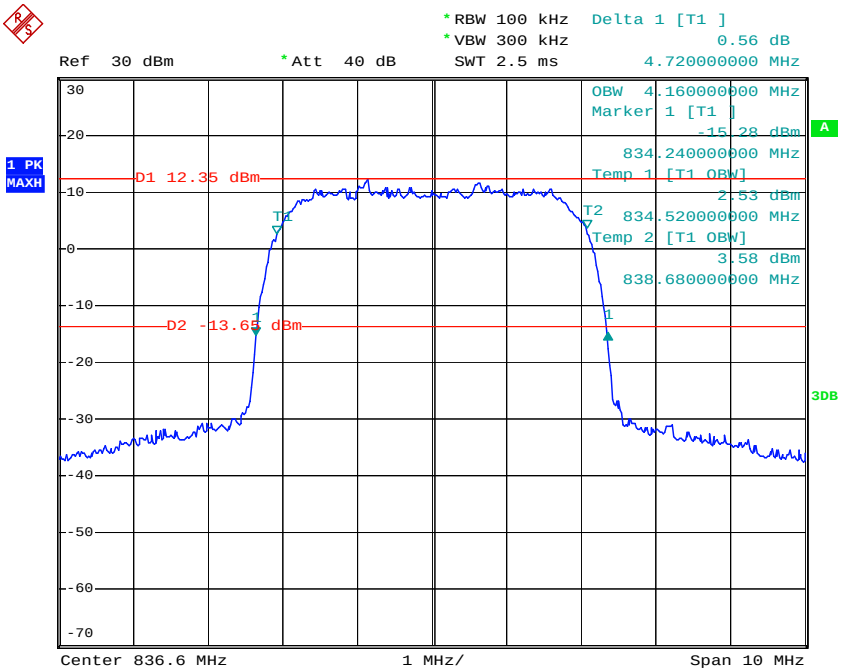
Date: 18.DEC.2018 17:52:40

WCDMA Band V, Rel 99



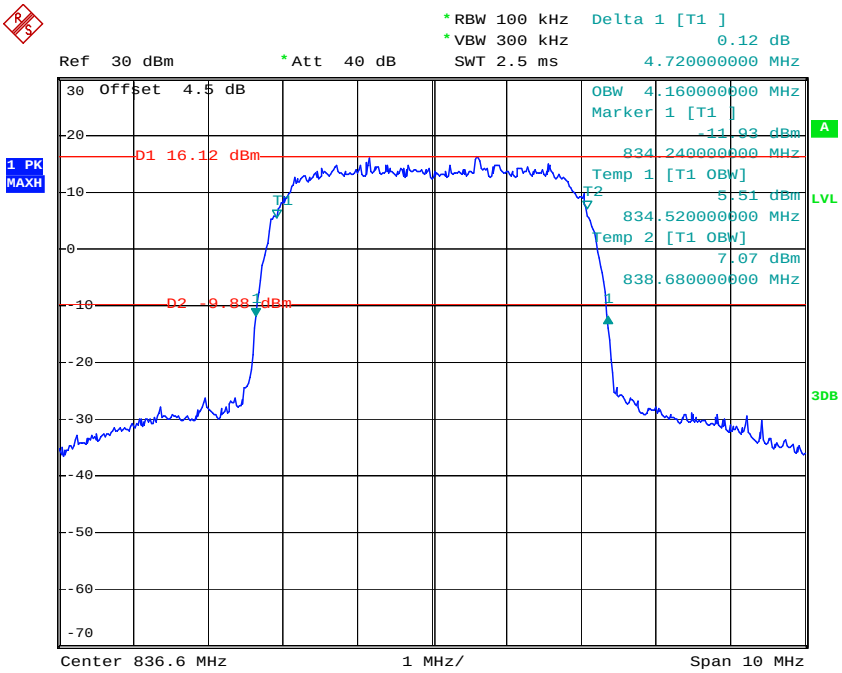
Date: 18.DEC.2018 17:34:20

WCDMA Band V, HSUPA



Date: 18.DEC.2018 18:19:34

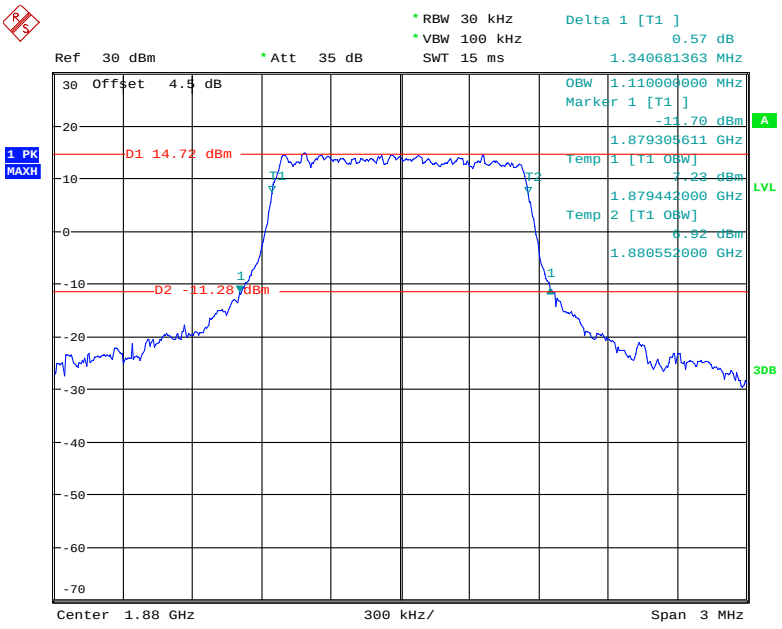
WCDMA Band V, HSDPA



Date: 18.DEC.2018 17:50:05

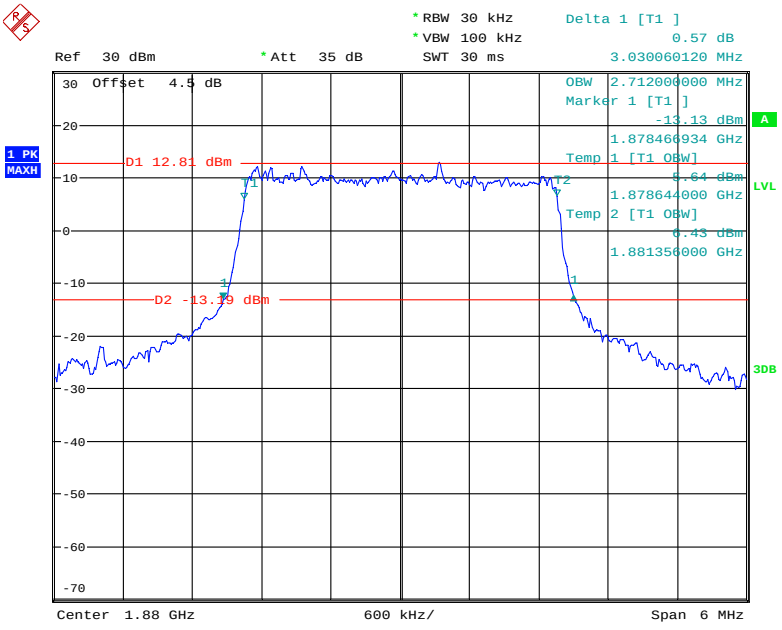
LTE Band 2

QPSK_1.4 MHz



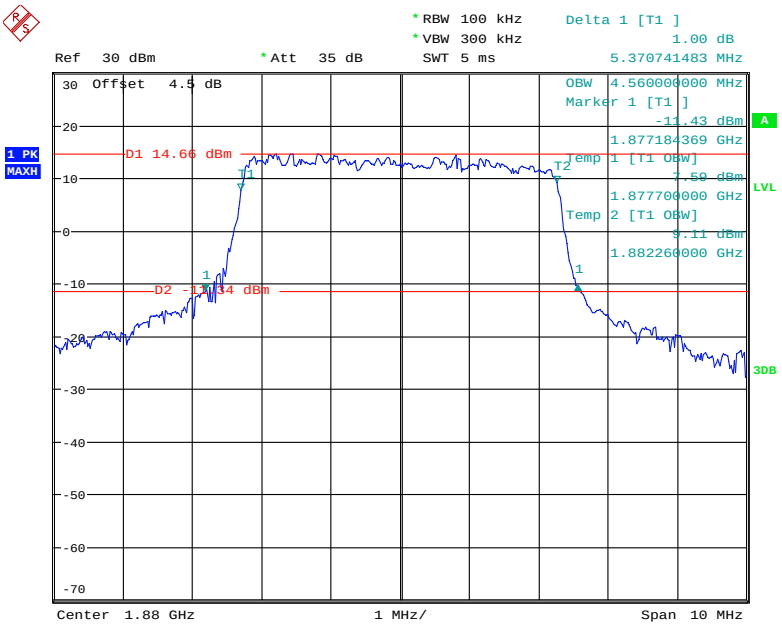
Date: 18.DEC.2018 13:22:07

QPSK_3 MHz



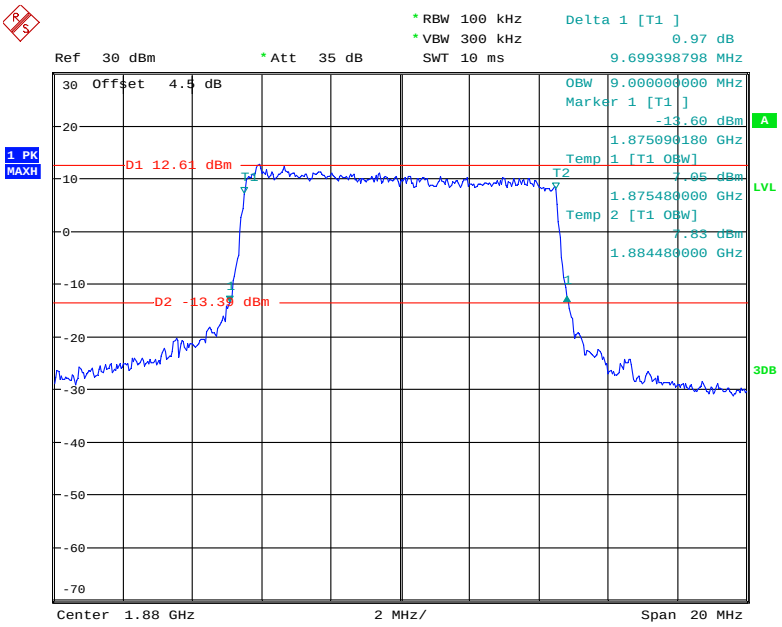
Date: 18.DEC.2018 13:23:04

QPSK_5 MHz



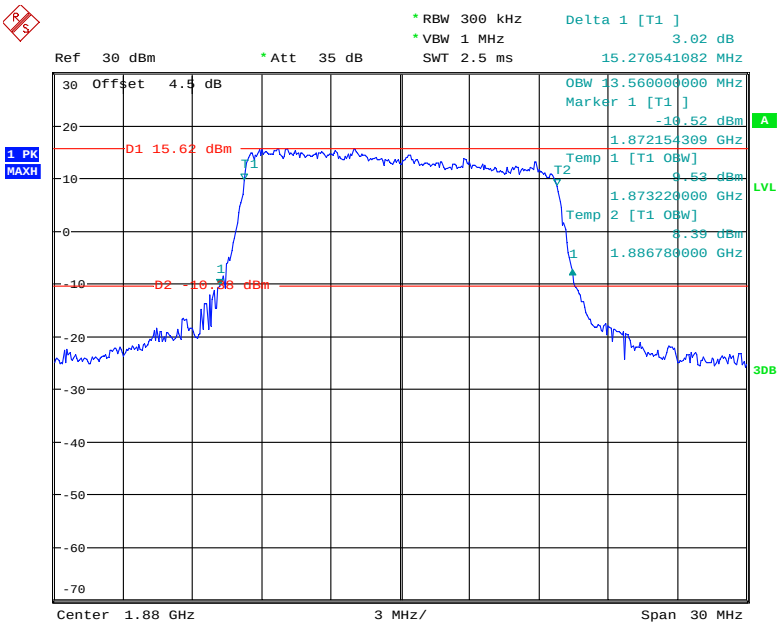
Date: 18.DEC.2018 13:24:18

QPSK_10 MHz



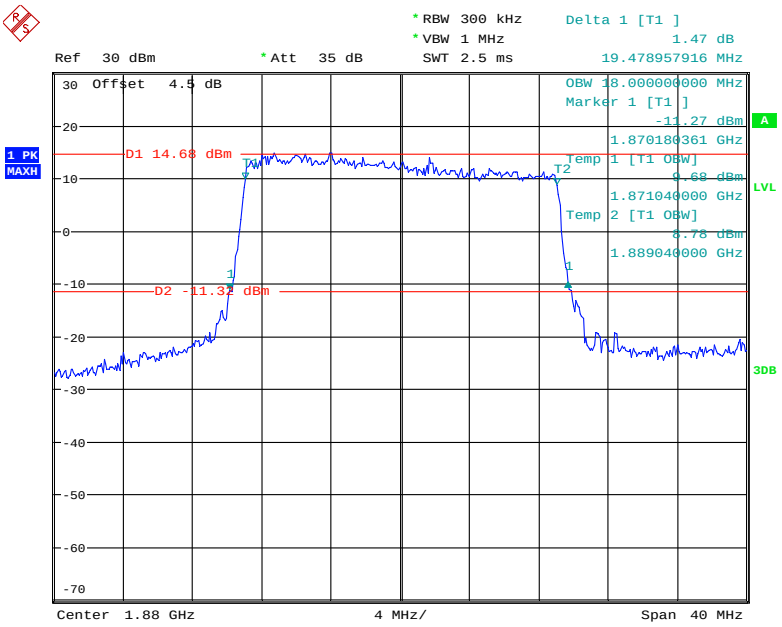
Date: 18.DEC.2018 13:25:50

QPSK_15 MHz



Date: 18.DEC.2018 13:27:15

QPSK_20 MHz



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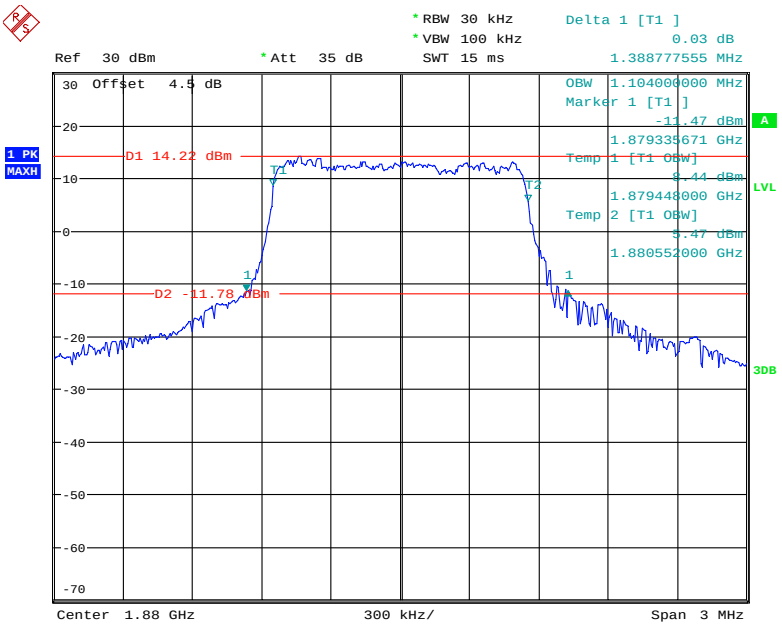
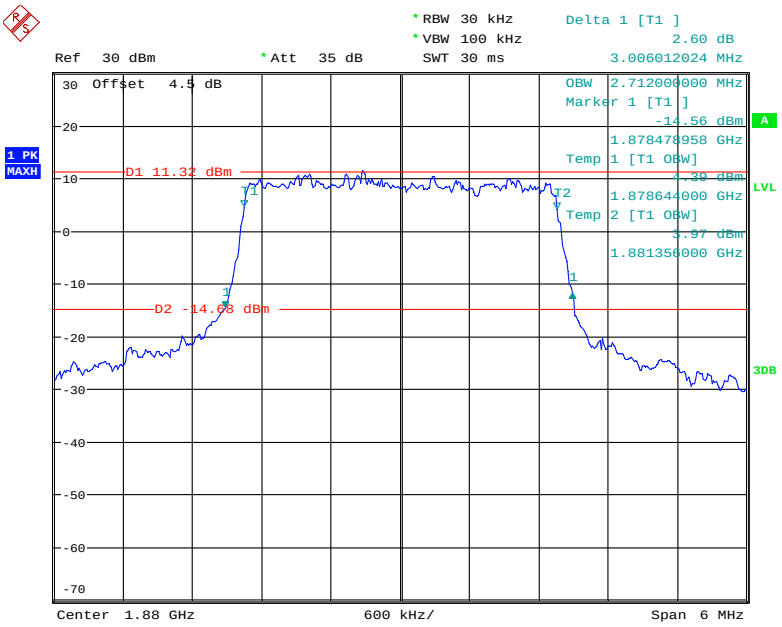
16QAM_1.4 MHz



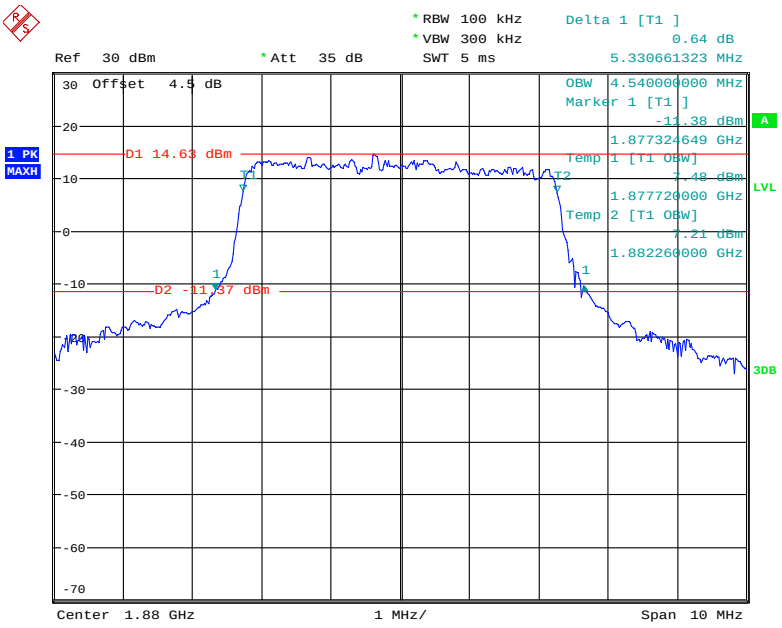
Date: 18.DEC.2018 13:22:31

16QAM_3 MHz



Date: 18.DEC.2018 13:23:31

16QAM_5 MHz



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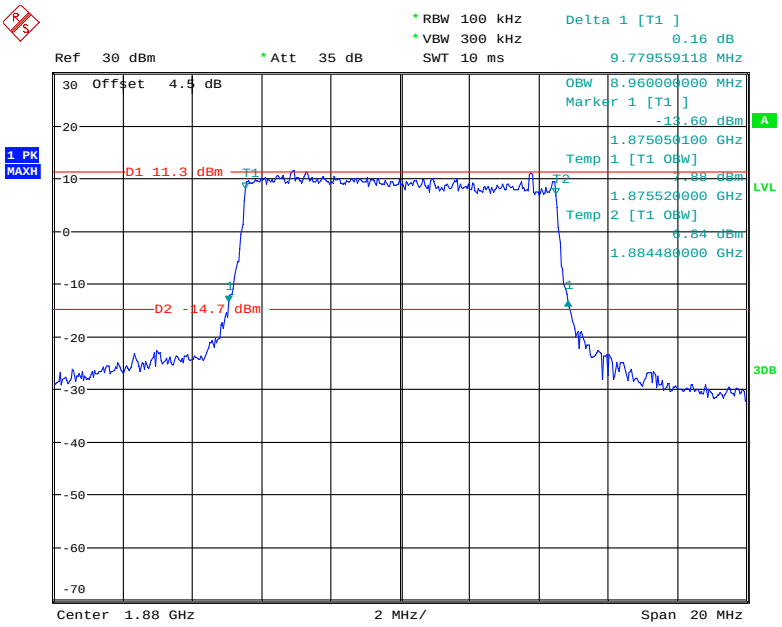
16QAM_10 MHz



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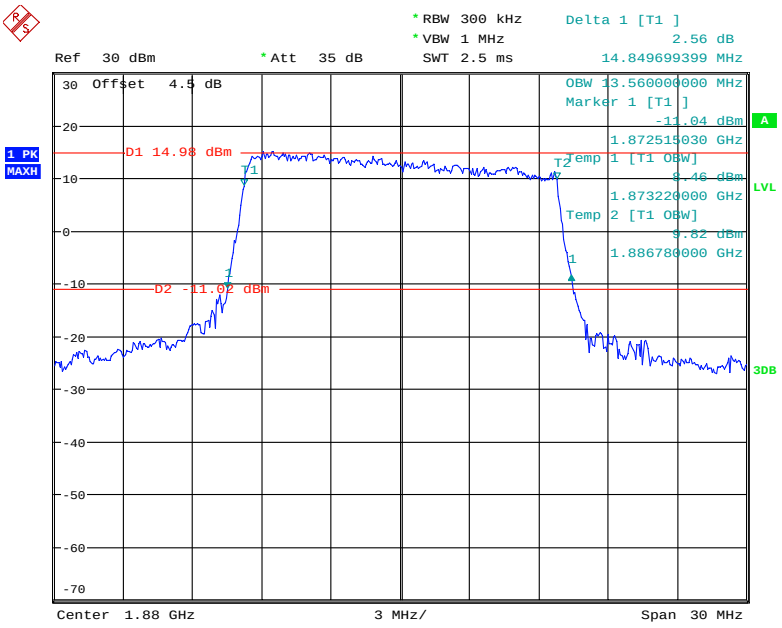
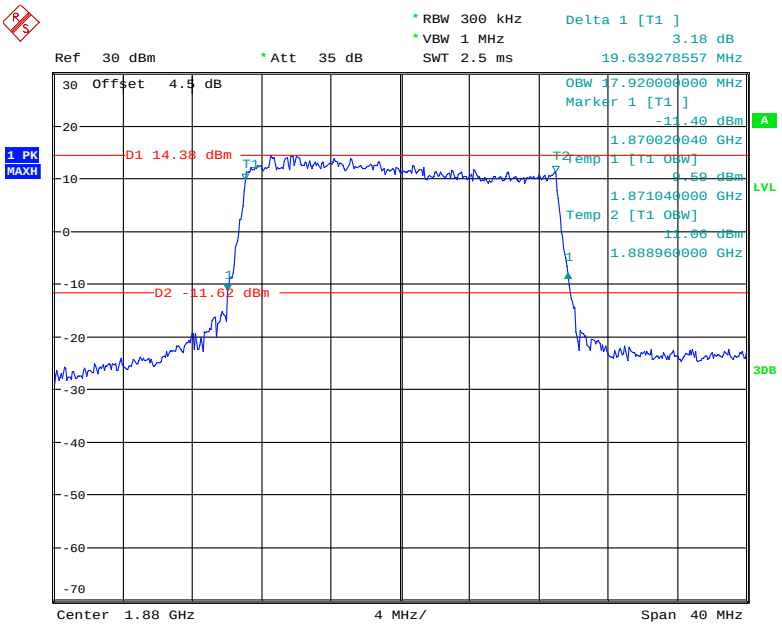
16QAM_15 MHz



Date: 18.DEC.2018 13:27:58

16QAM_20 MHz



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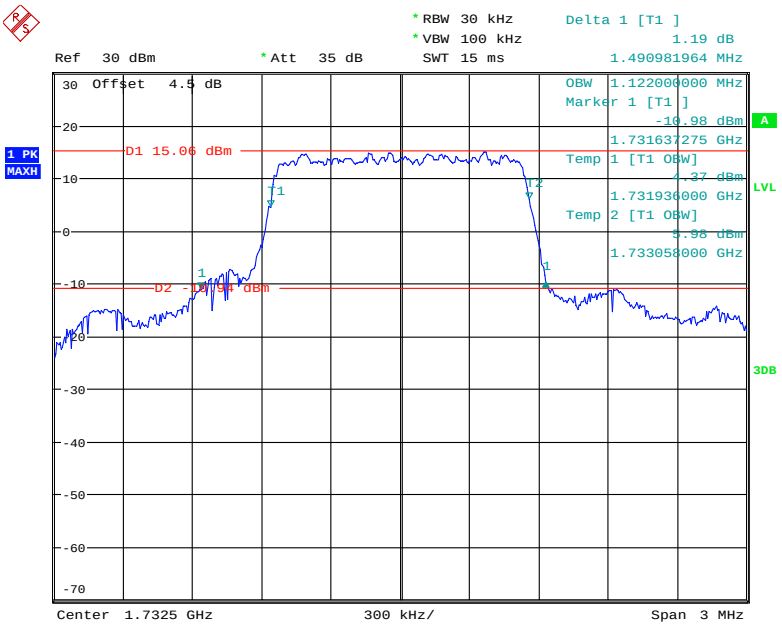
LTE Band 4

QPSK_1.4 MHz



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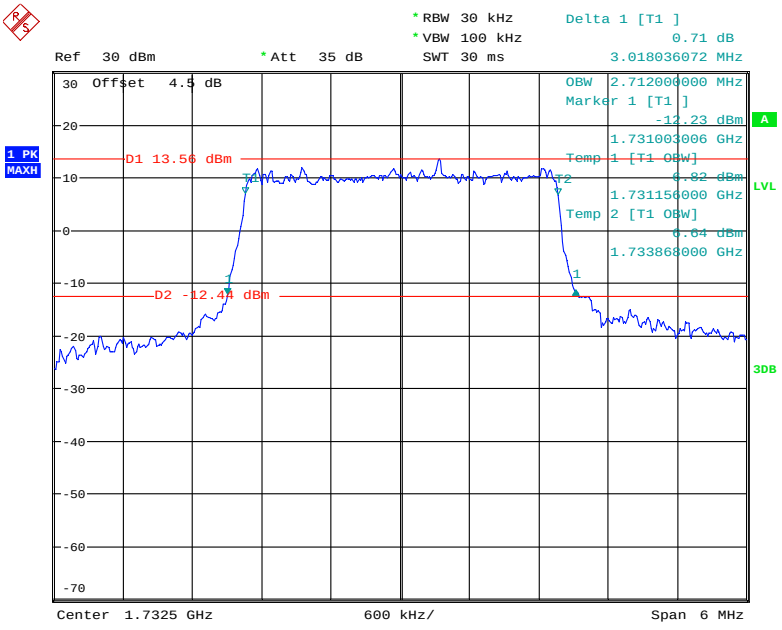
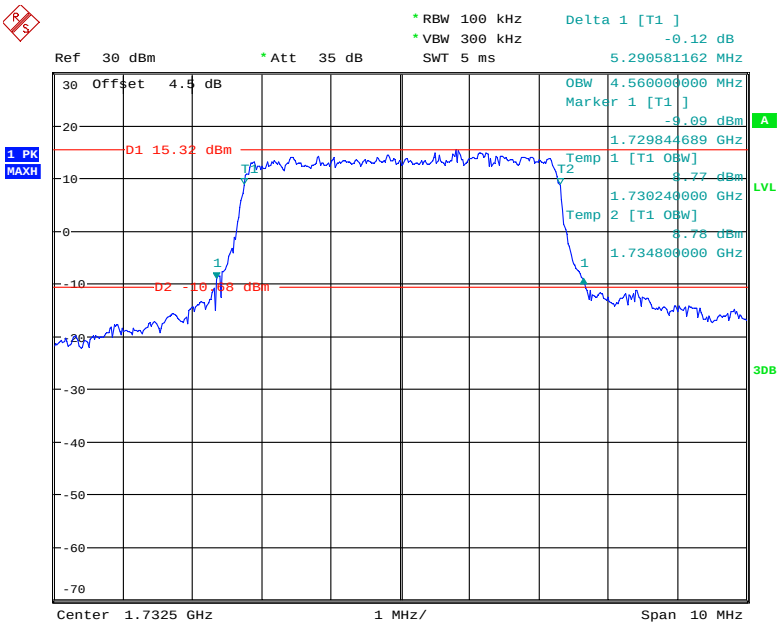
QPSK_3 MHz



Date: 18.DEC.2018 13:31:06

QPSK_5 MHz



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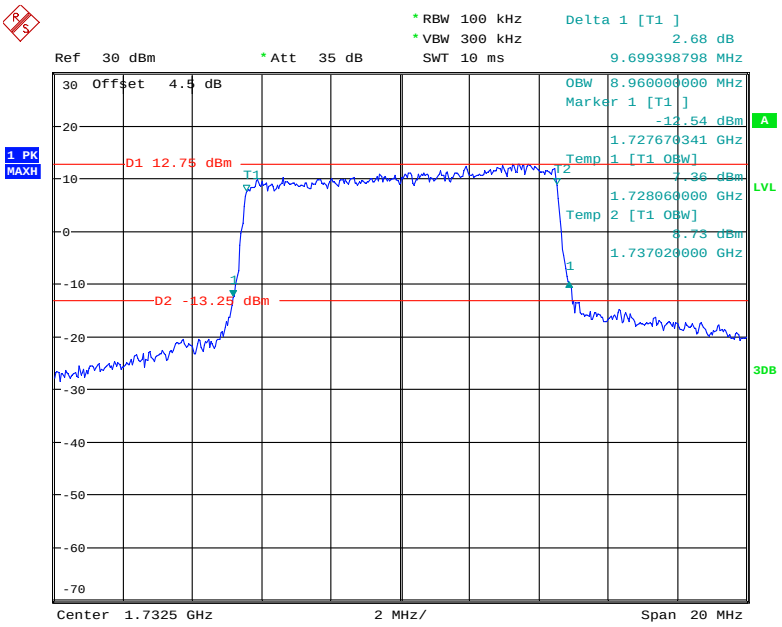
QPSK_10 MHz



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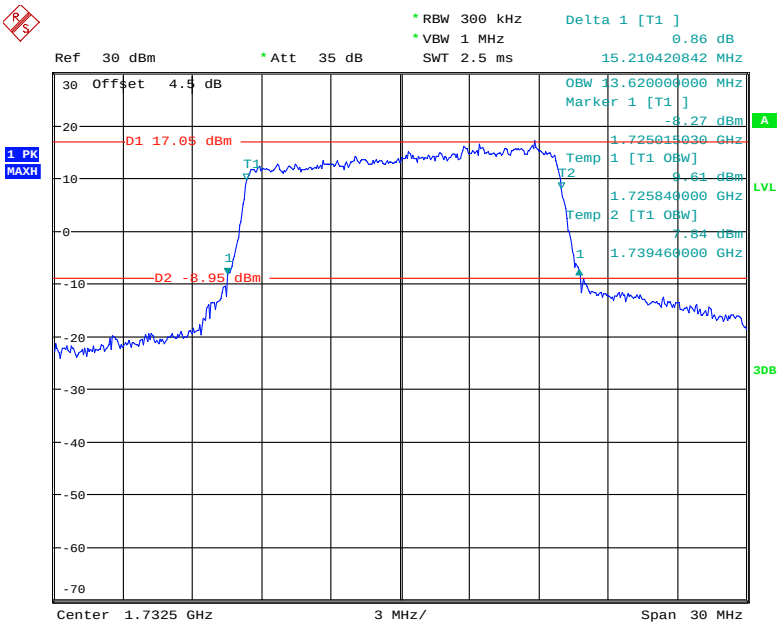
QPSK_15 MHz



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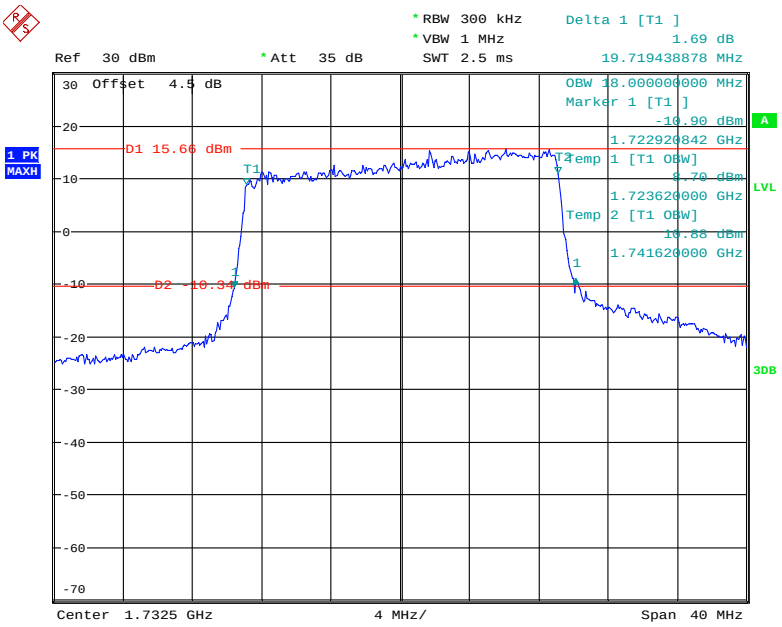
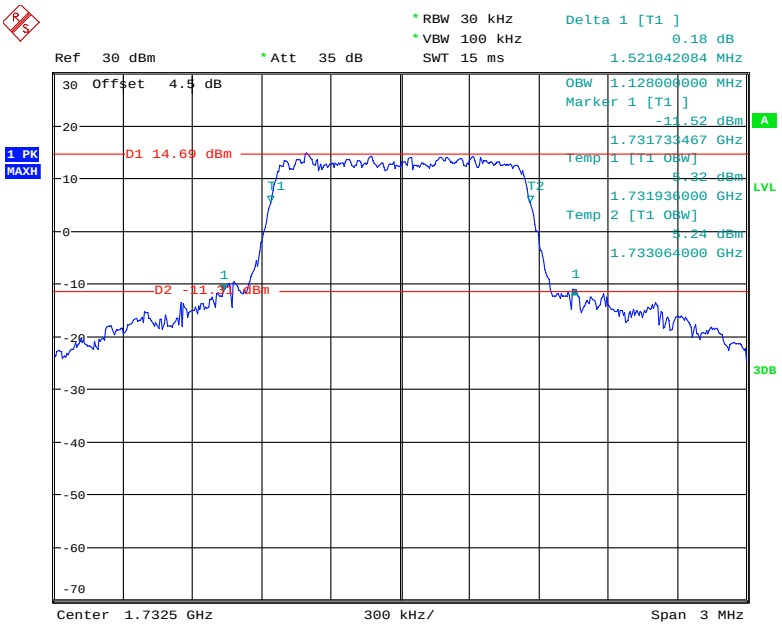
QPSK_20 MHz



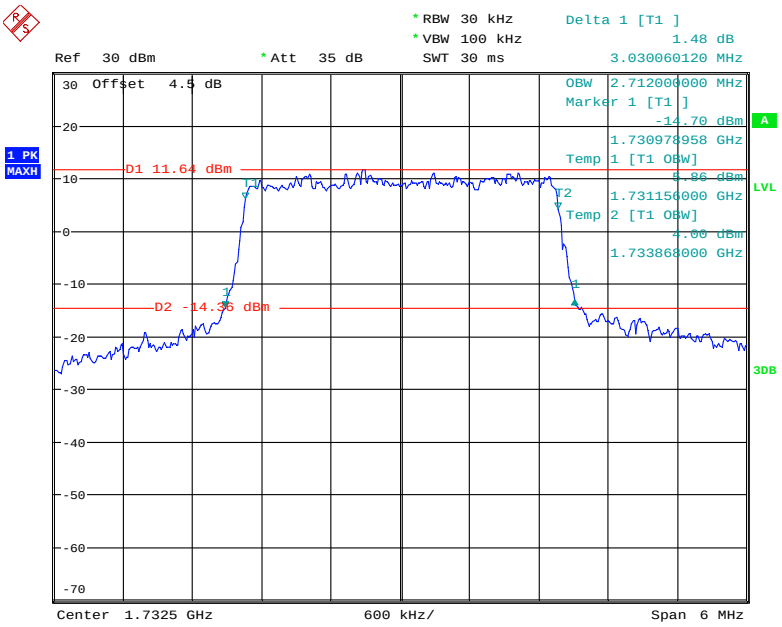
Date: 18.DEC.2018 13:36:35

16QAM_1.4 MHz



Date: 18.DEC.2018 13:30:29

16QAM_3 MHz



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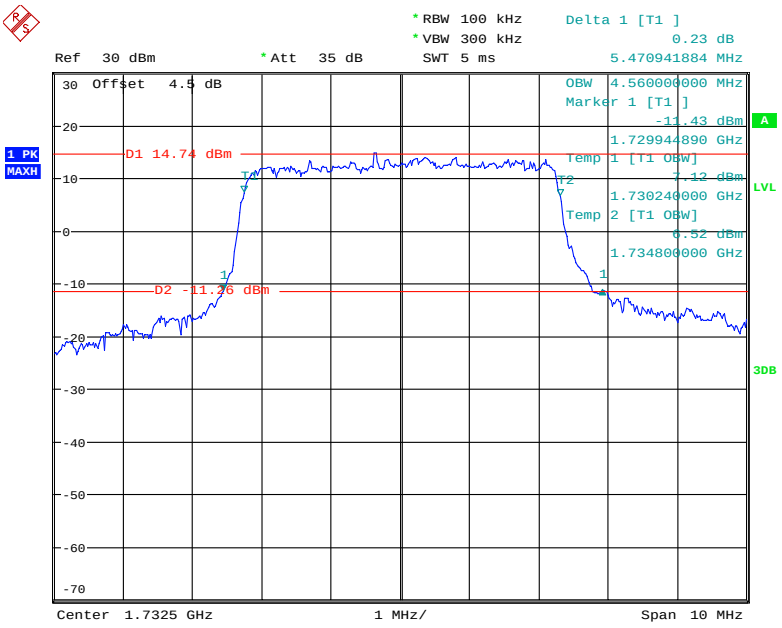
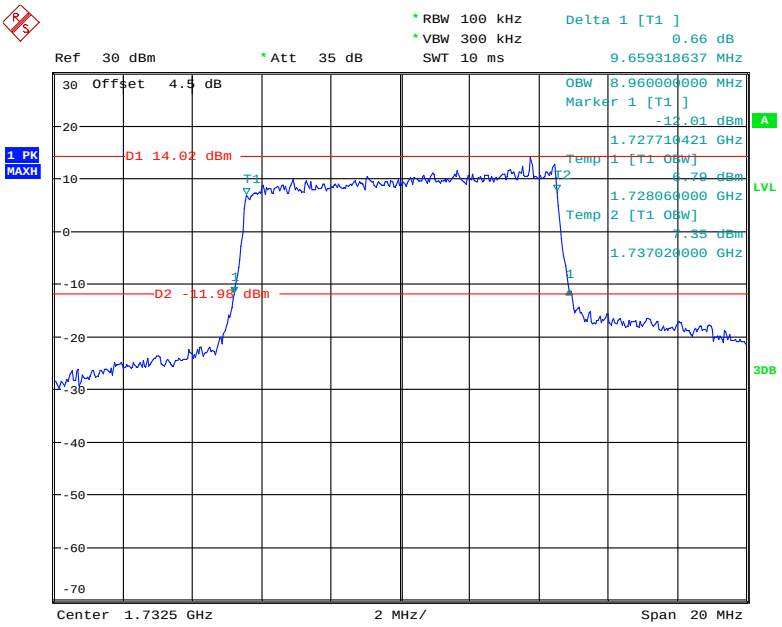
16QAM_5 MHz



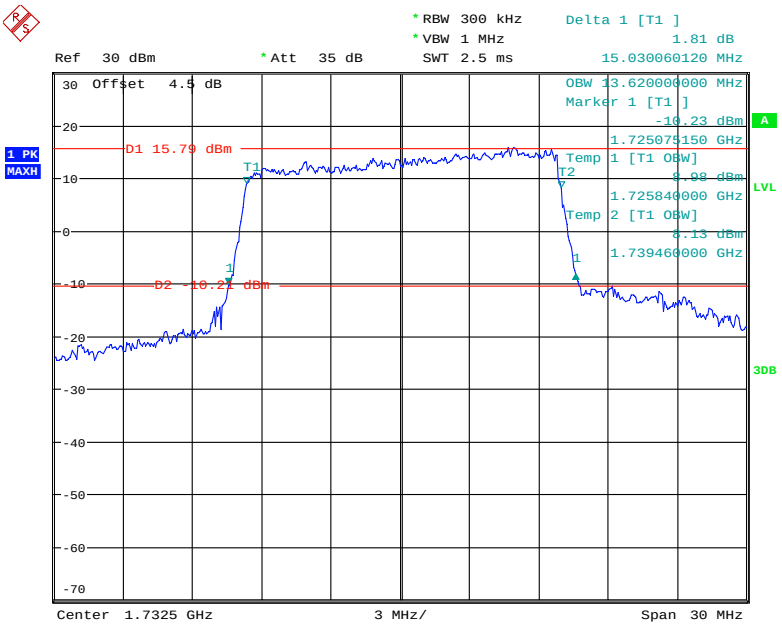
Date: 18.DEC.2018 13:33:06

16QAM_10 MHz



Date: 18.DEC.2018 13:34:20

16QAM_15 MHz



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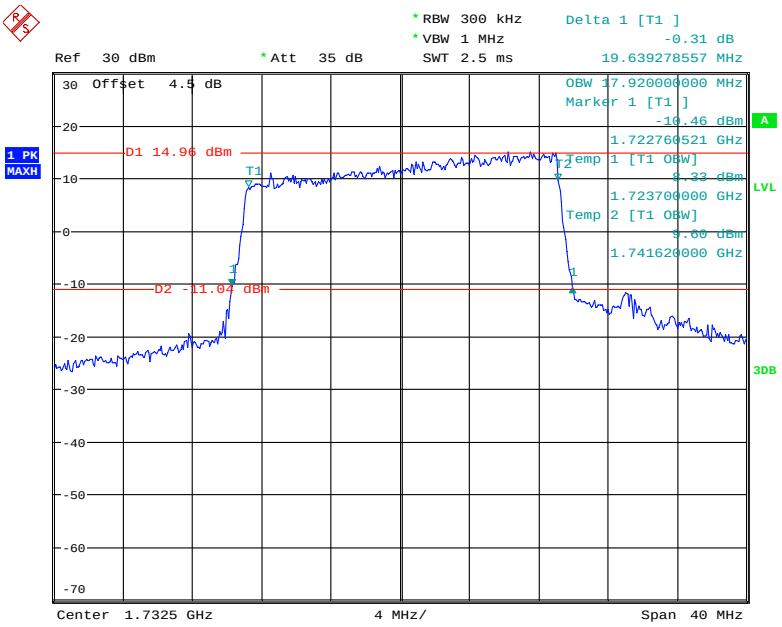
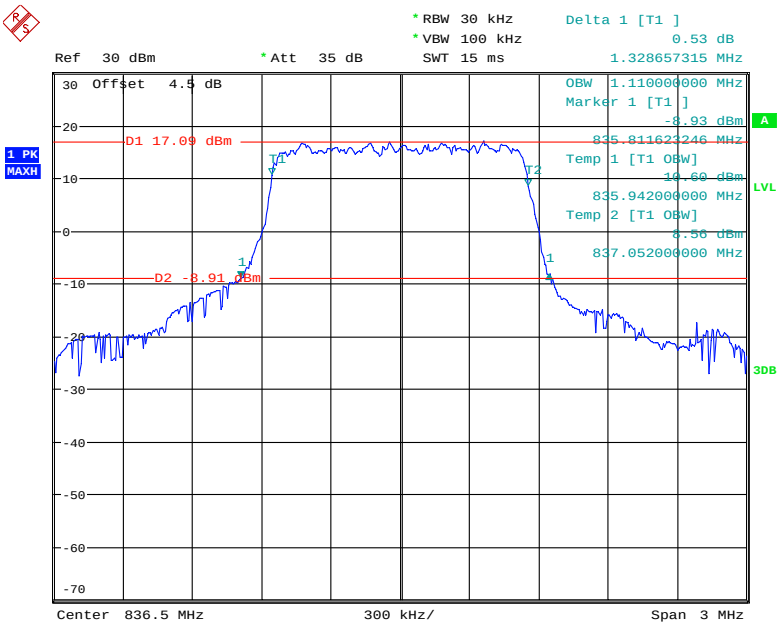
16QAM_20 MHz



Date: 18.DEC.2018 13:37:18

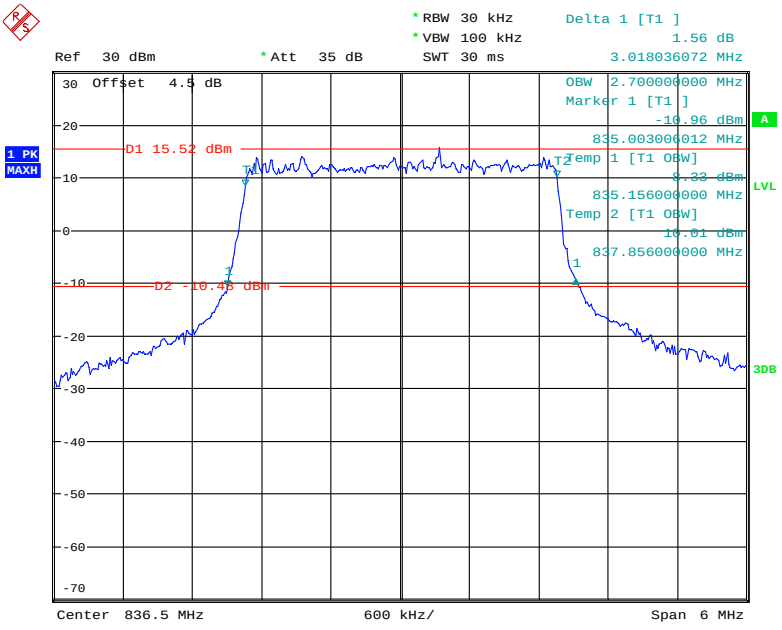
LTE Band 5:

QPSK_1.4 MHz



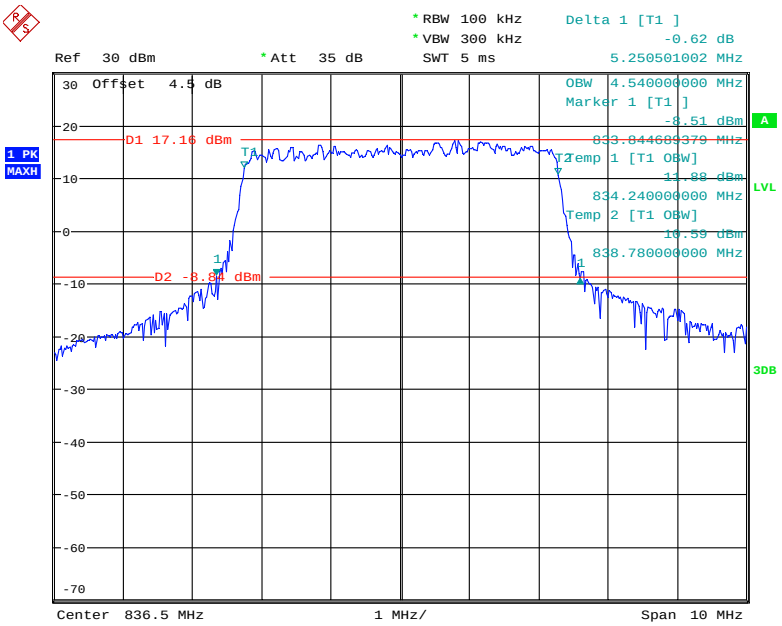
Date: 18.DEC.2018 13:38:00

QPSK_3 MHz



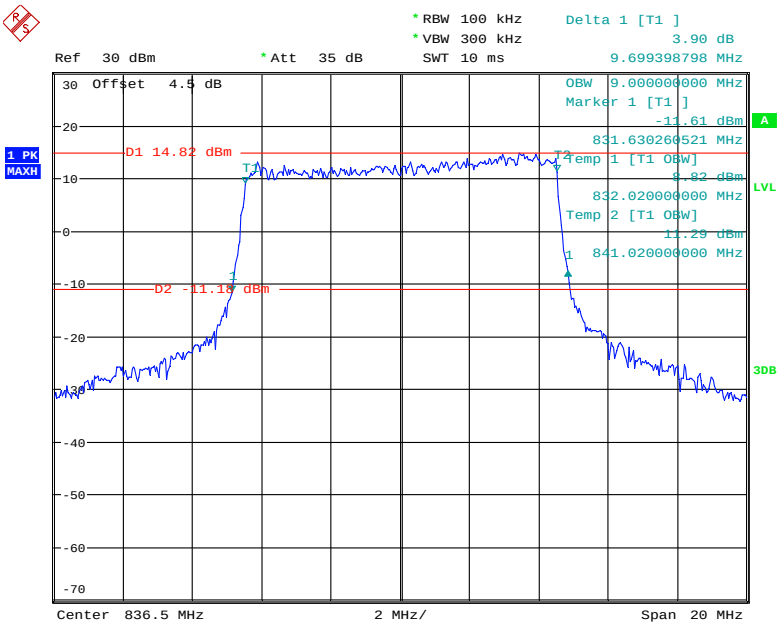
Date: 18.DEC.2018 13:39:23

QPSK_5 MHz



Date: 18.DEC.2018 13:41:05

QPSK_10 MHz



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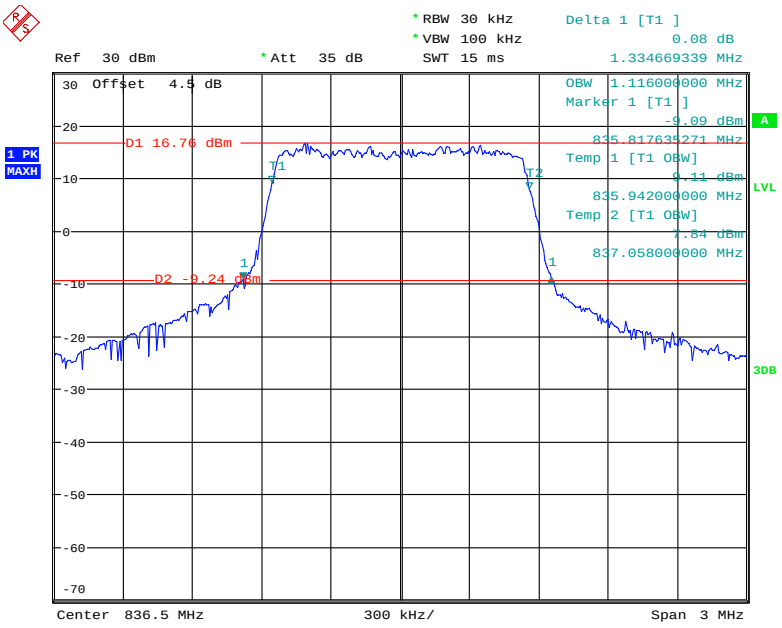
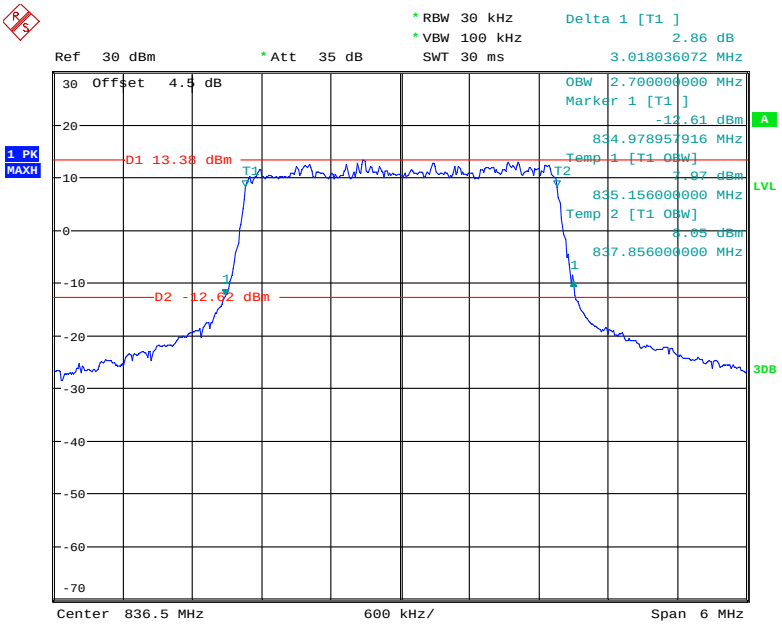
16QAM_1.4 MHz



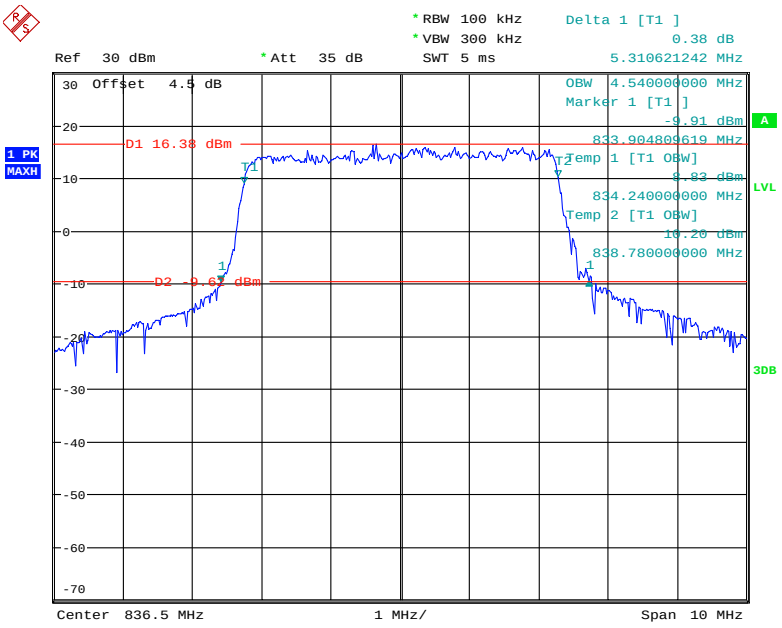
Date: 18.DEC.2018 13:38:42

16QAM_3 MHz



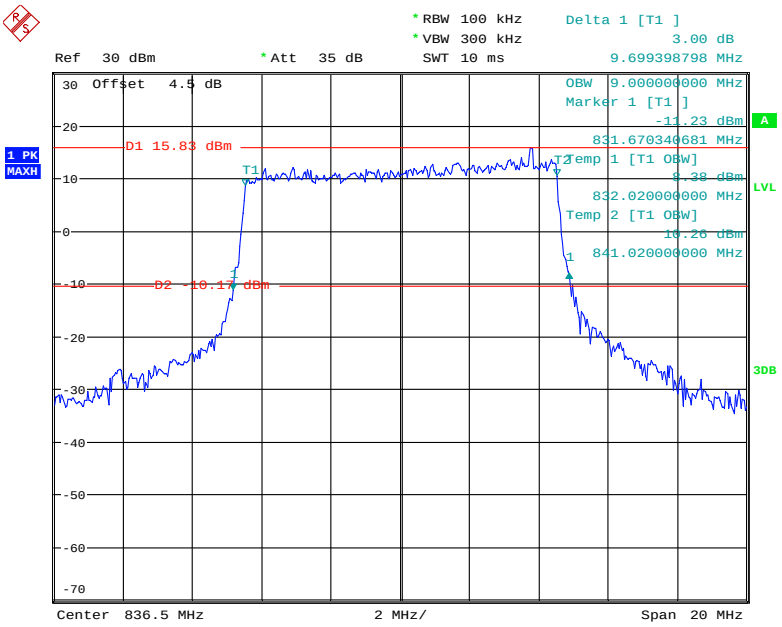
Date: 18.DEC.2018 13:40:01

16QAM_5 MHz



Date: 18.DEC.2018 13:42:10

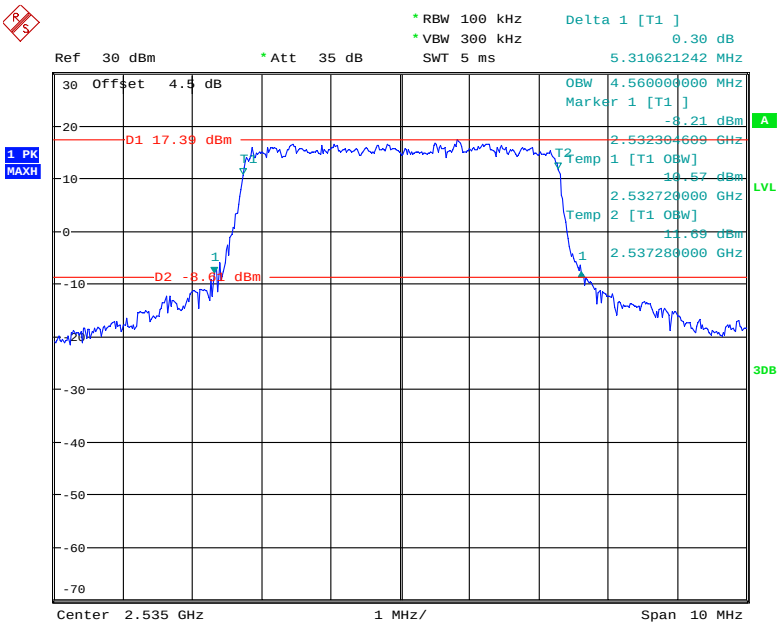
16QAM_10 MHz



Date: 18.DEC.2018 13:43:57

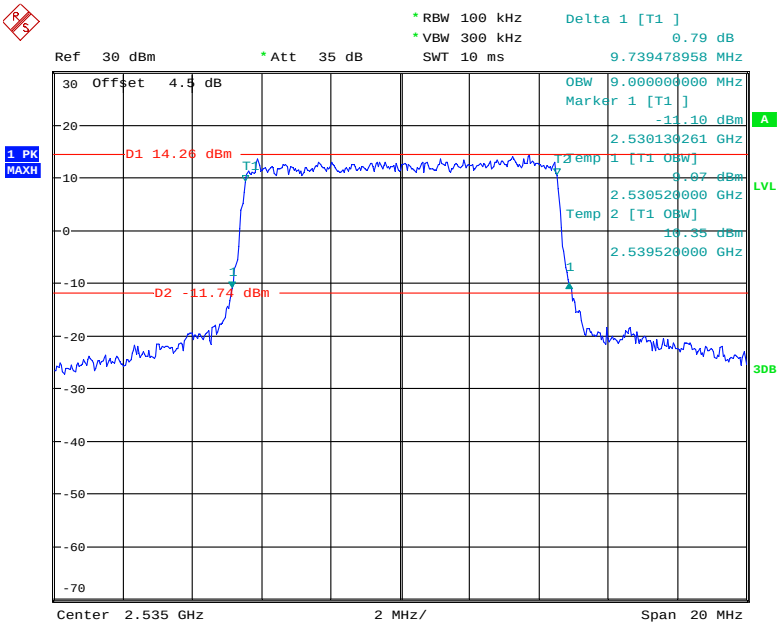
LTE Band 7:

QPSK_5 MHz



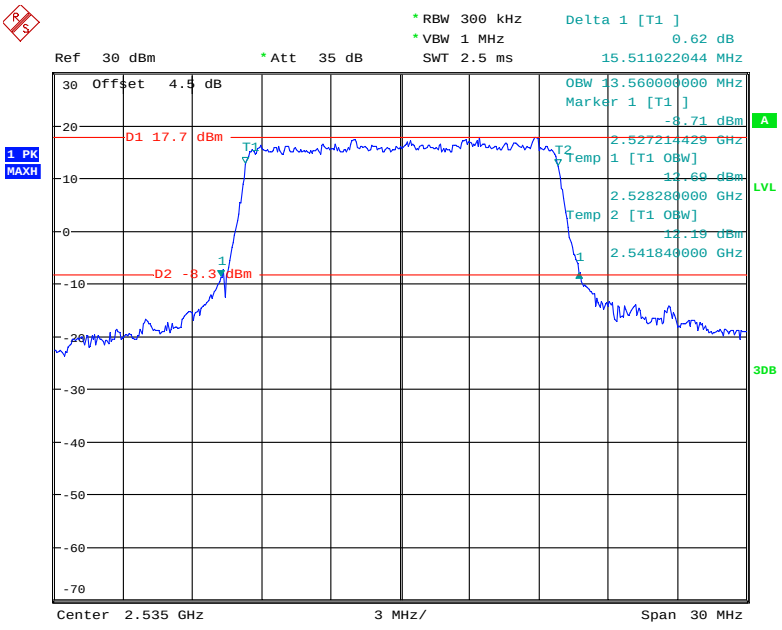
Date: 18.DEC.2018 13:44:58

QPSK_10 MHz



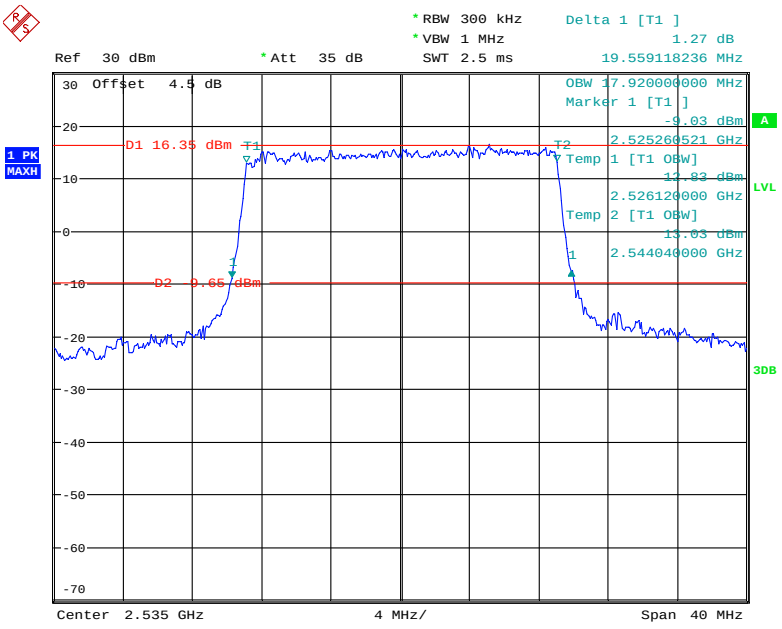
Date: 18.DEC.2018 13:46:38

QPSK_15 MHz



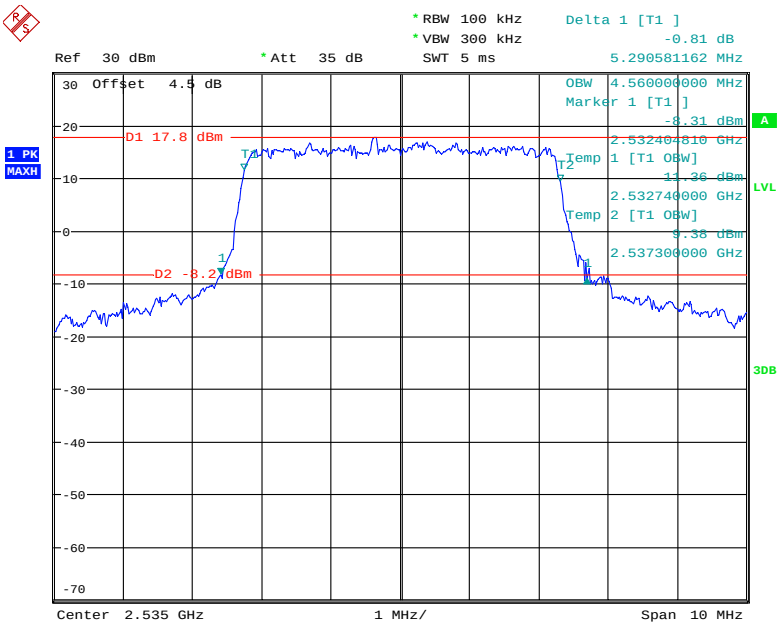
Date: 18.DEC.2018 13:48:14

QPSK_20 MHz



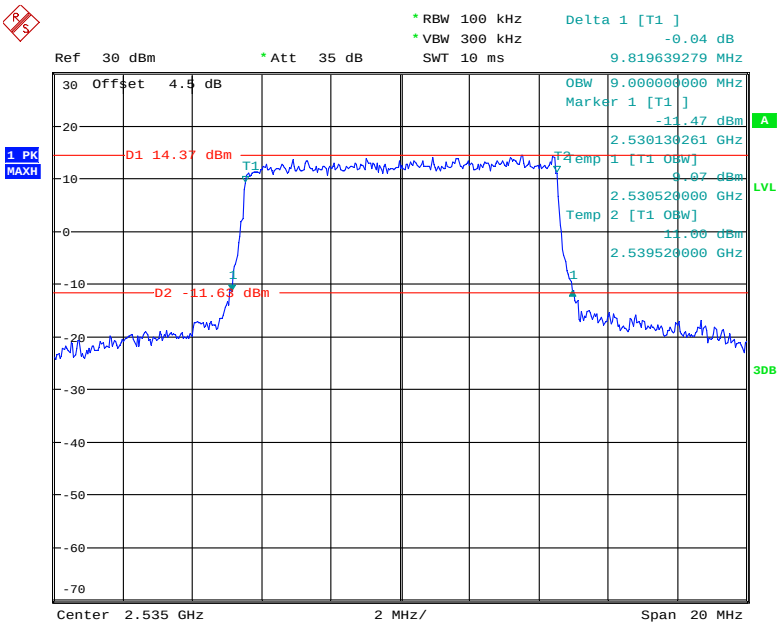
Date: 18.DEC.2018 13:50:01

16QAM_5 MHz



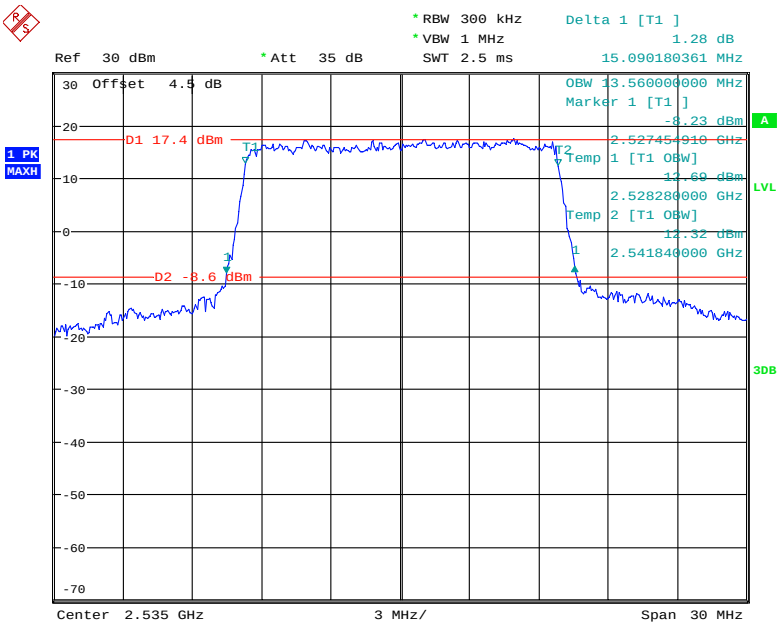
Date: 18.DEC.2018 13:46:03

16QAM_10 MHz



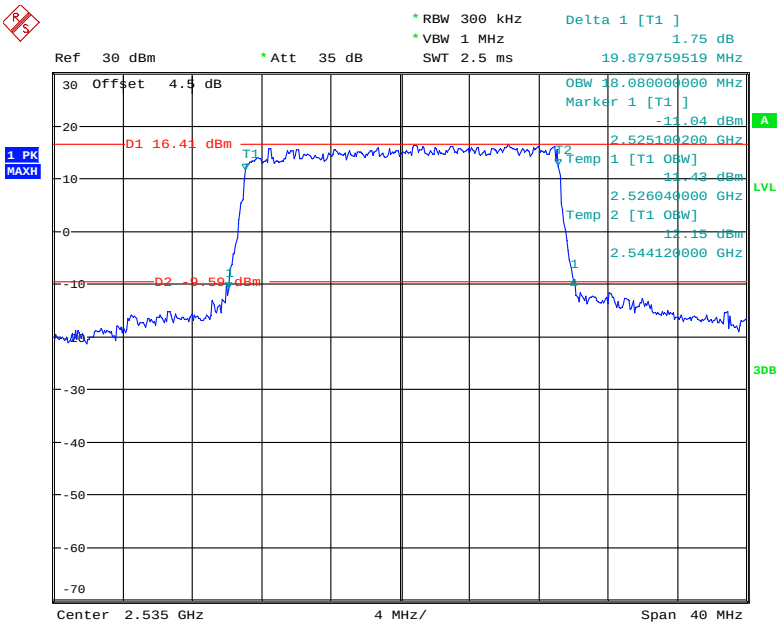
Date: 18.DEC.2018 13:47:14

16QAM_15 MHz



Date: 18.DEC.2018 13:49:12

16QAM_20 MHz



Date: 18.DEC.2018 13:50:55

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

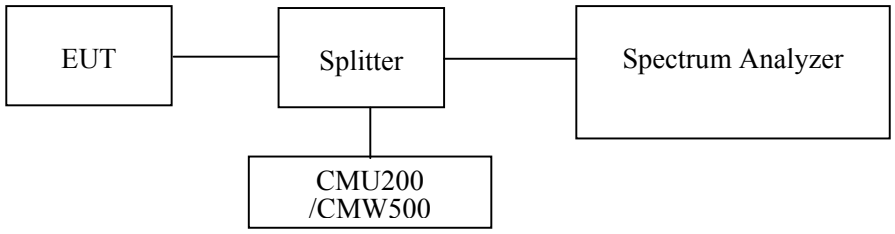
Applicable Standard

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	EMI Test Receiver	ESPI	100120	2018-12-10	2019-12-10
R&S	Spectrum Analyzer	FSU 26	200256	2018-01-04	2019-01-04
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005012	Each Time	/
Unknown	Coaxial Cable	C-SJ00-0010	C0010/01	Each Time	/
E-Microwave	Two-way Spliter	ODP-1-6-2S	OE0120142	Each Time	/

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

Test Data

Environmental Conditions

Temperature:	23.9~24.5 °C
Relative Humidity:	34~41 %
ATM Pressure:	99.7 kPa

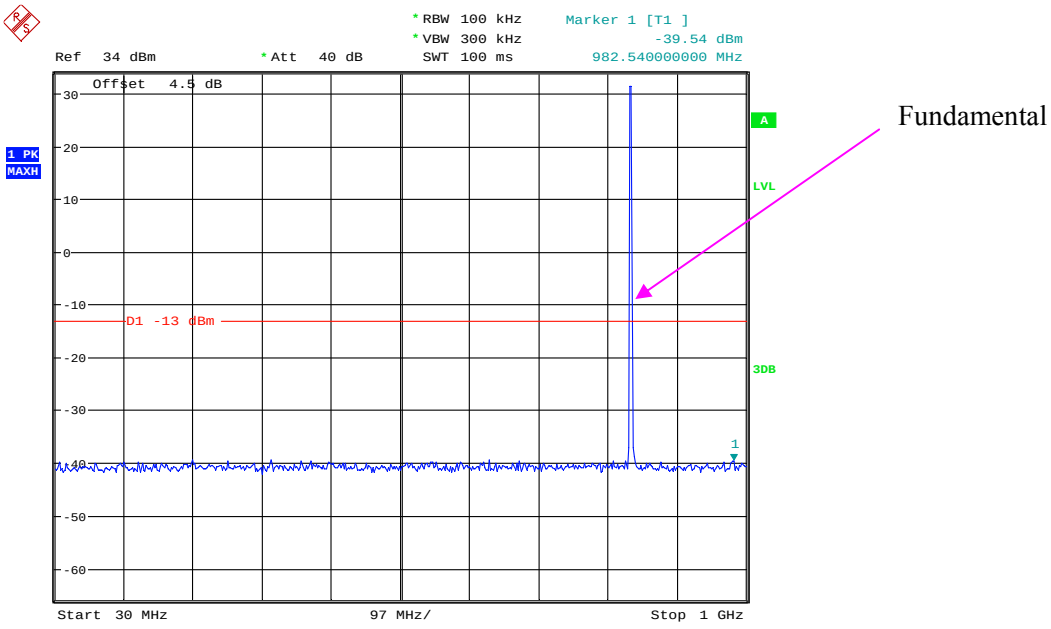
The testing was performed by Carrie He, Elena Lei from 2018-12-18 to 2018-12-19.

Test Mode: Transmitting(Middle channel was tested)

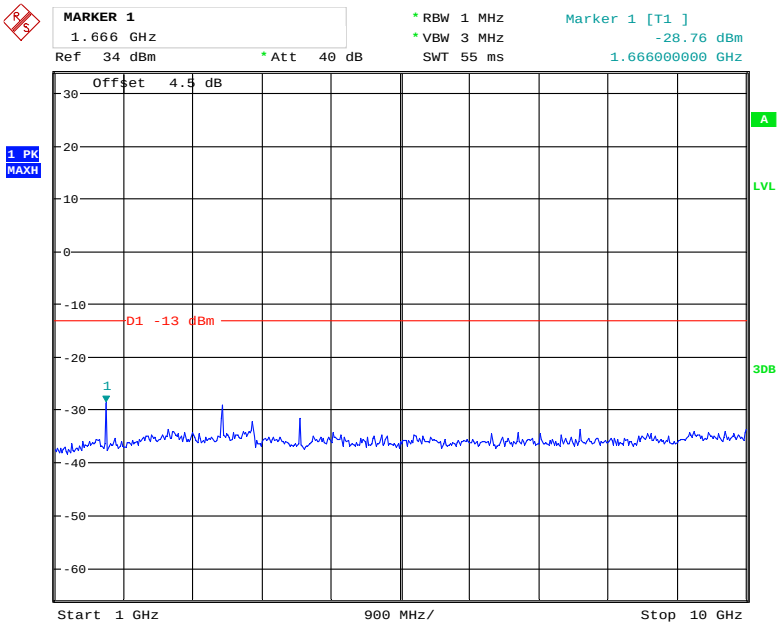
Test Result: Compliant. Please refer to the following table and plots.

Please refer to the following plots.

GSM850_Middle Channel

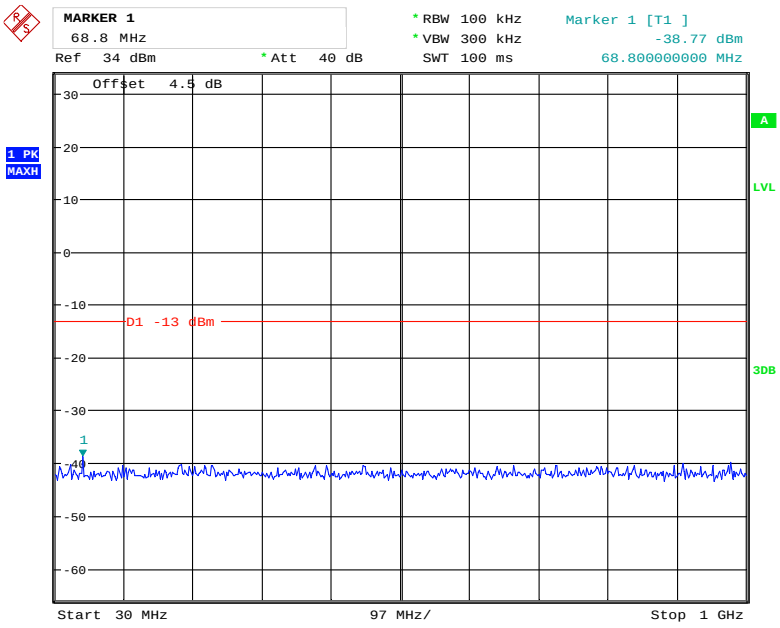


Date: 19.DEC.2018 17:10:56

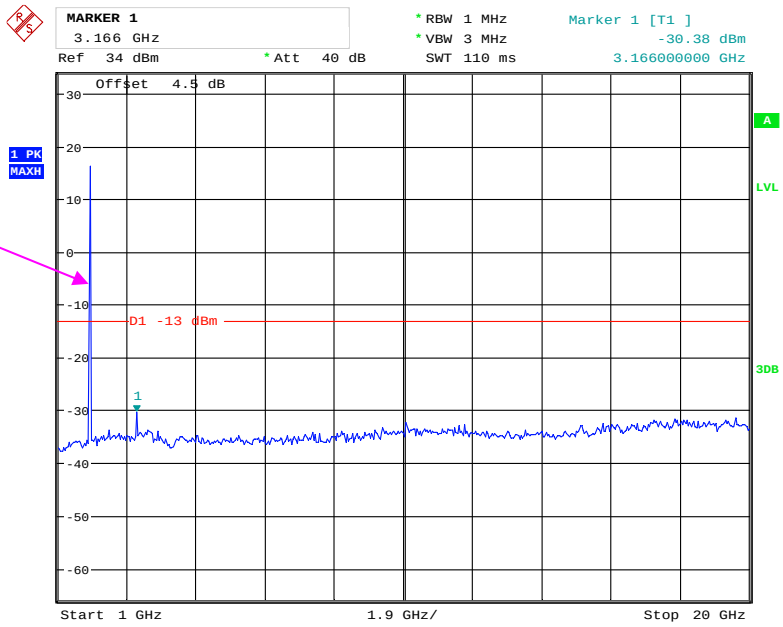


Date: 19.DEC.2018 17:11:52

PCS 1900_ Middle Channel



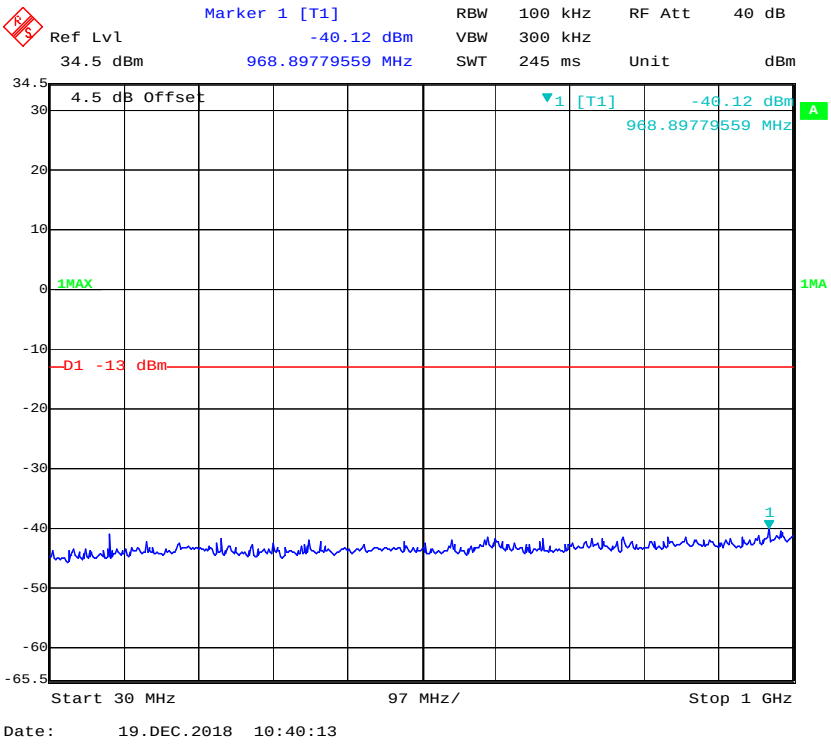
Date: 19.DEC.2018 17:13:57

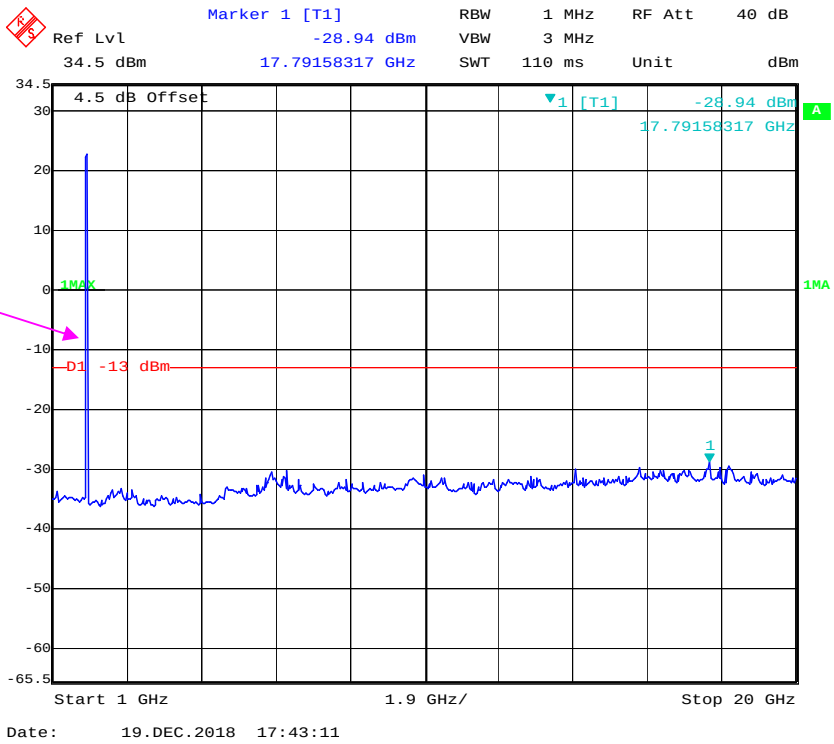


Fundamental

Date: 19.DEC.2018 17:15:29

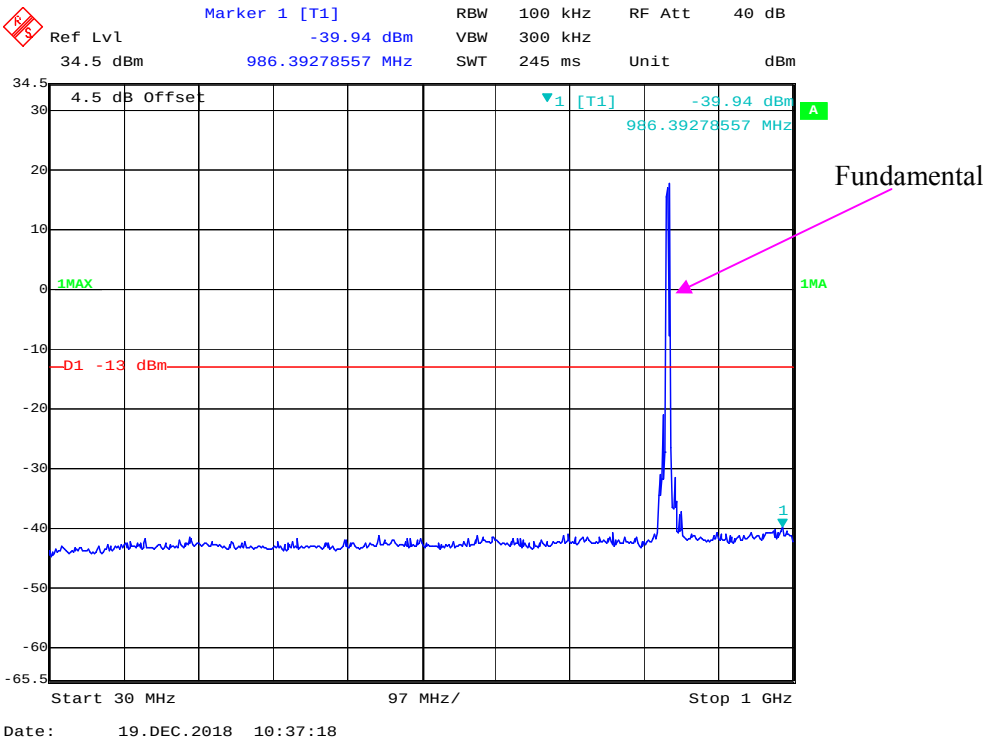
WCDMA Band II,Rel99

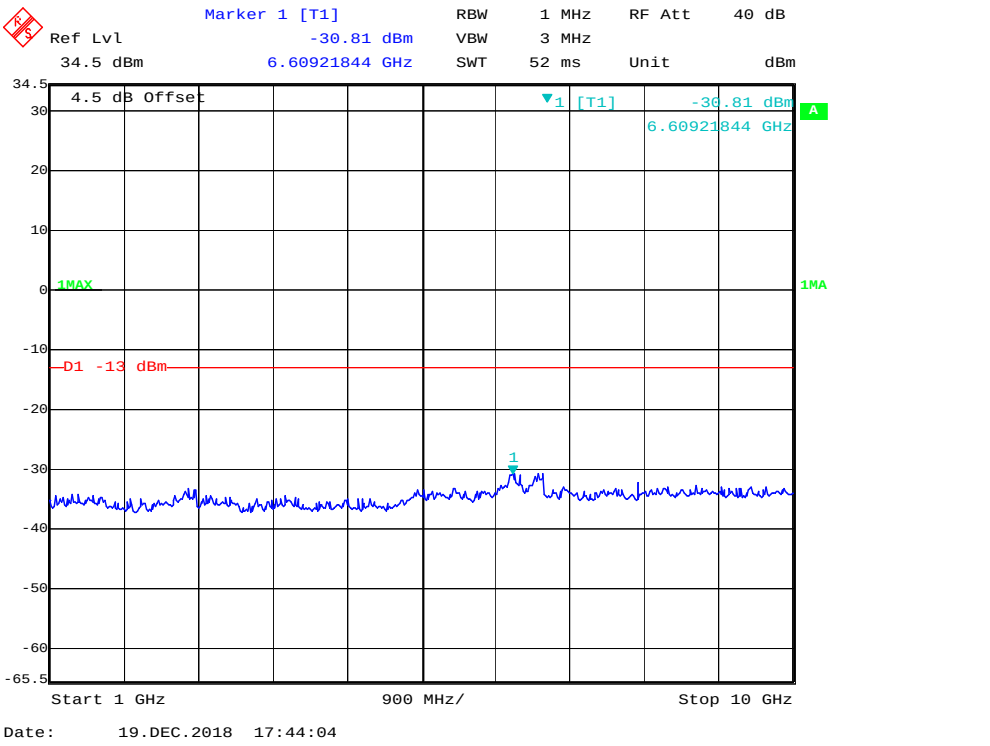




Fundamental

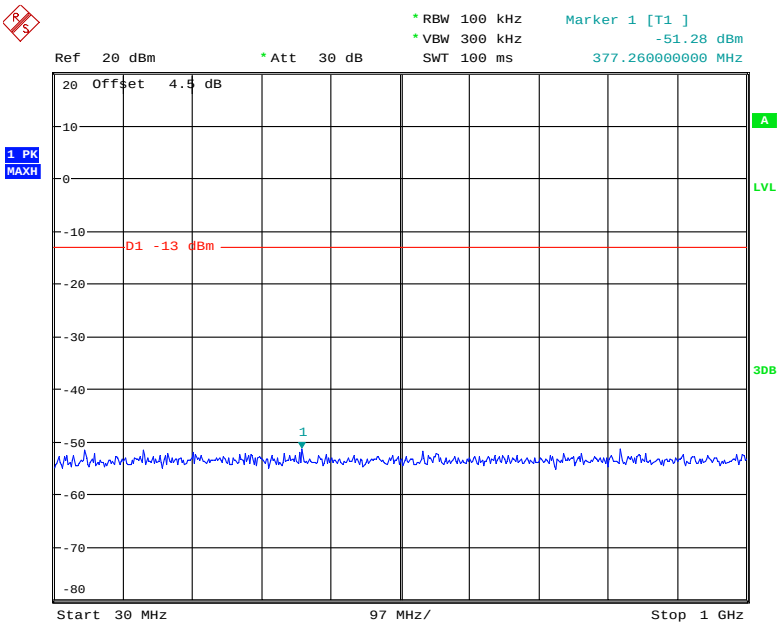
WCDMA Band V,Rel99



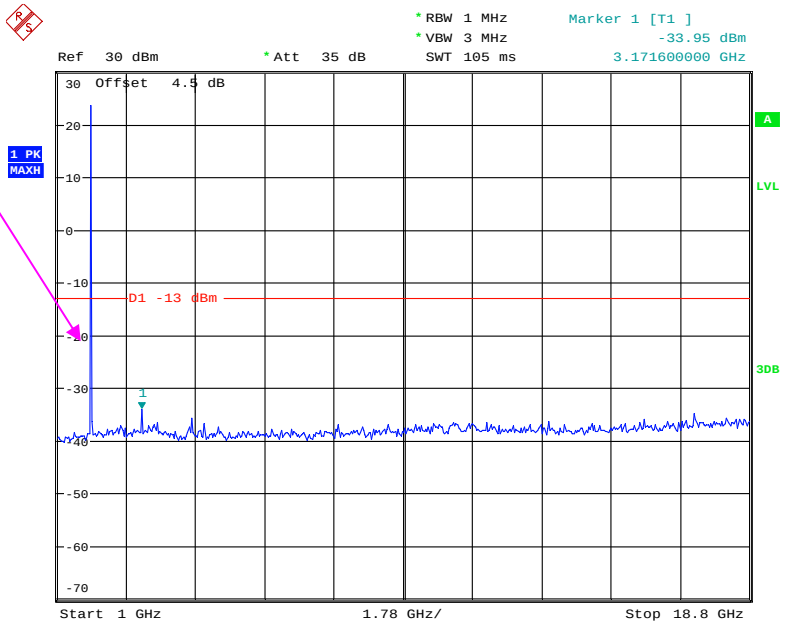


LTE Band 2 (Middle Channel)

QPSK_1.4 MHz



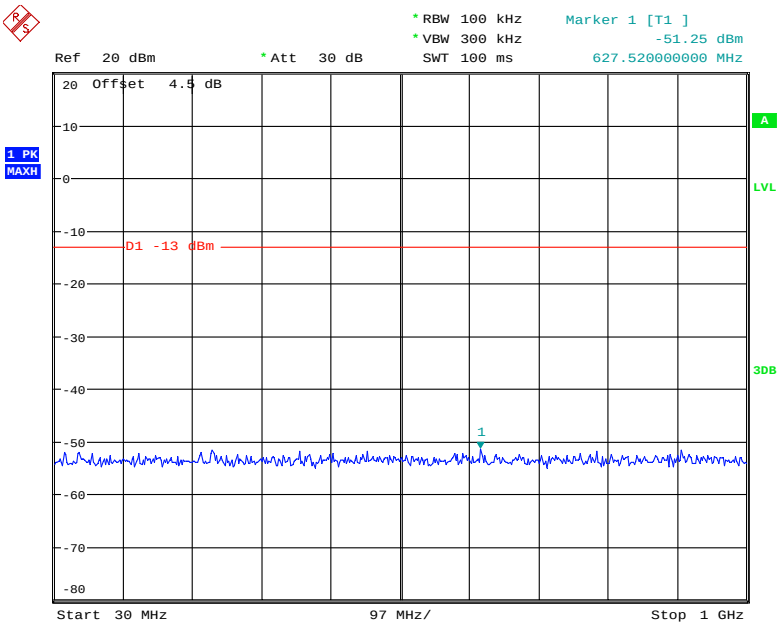
Date: 18.DEC.2018 16:10:07



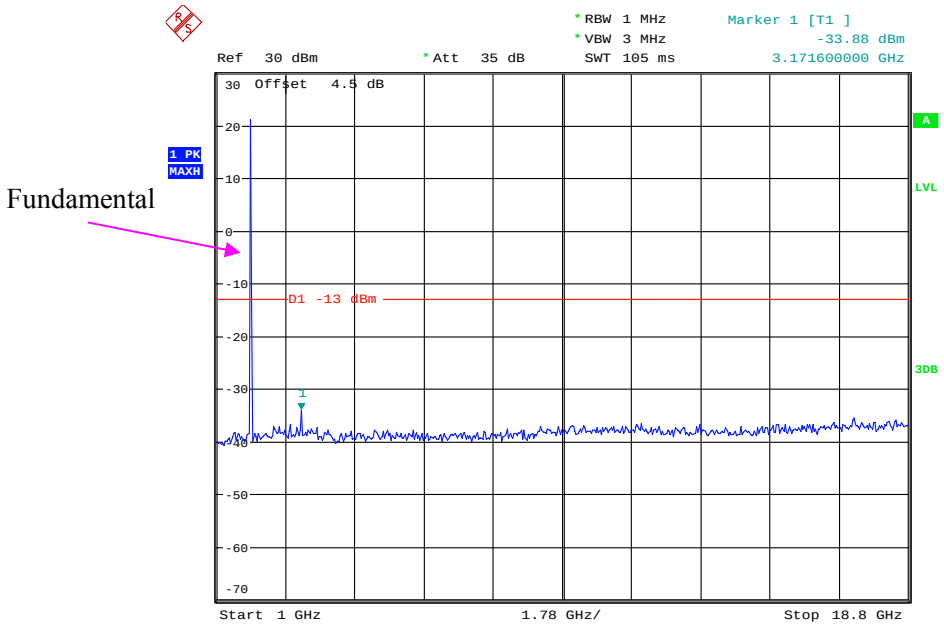
Fundamental

Date: 18.DEC.2018 16:10:22

QPSK_3 MHz

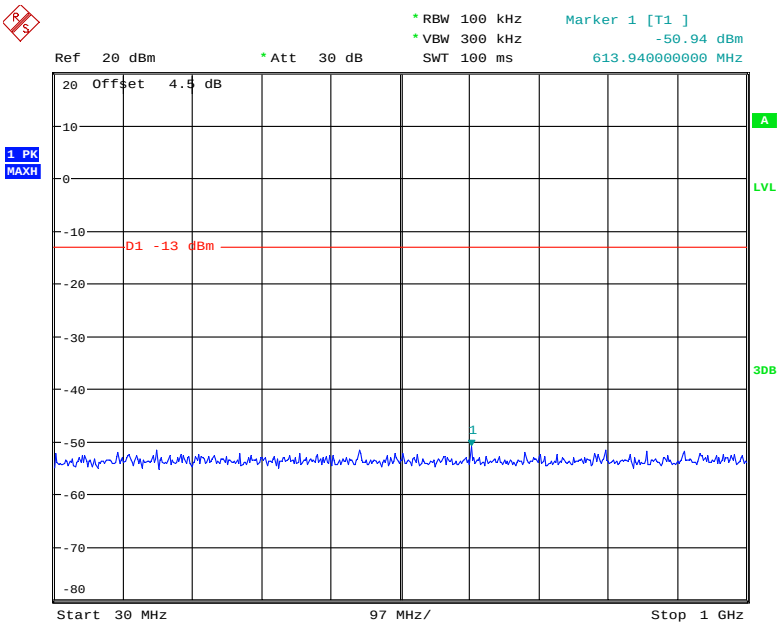


Date: 18.DEC.2018 16:10:43

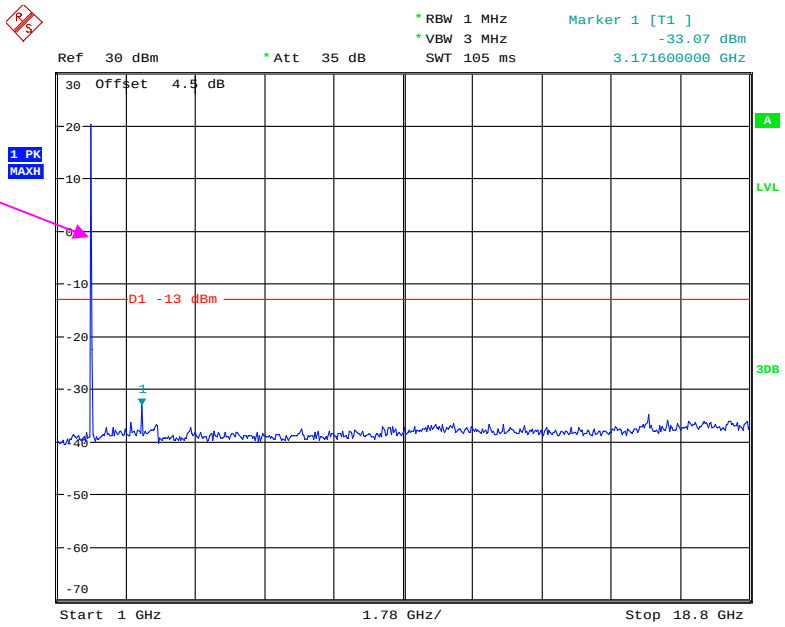


Date: 18.DEC.2018 16:10:54

QPSK_5 MHz



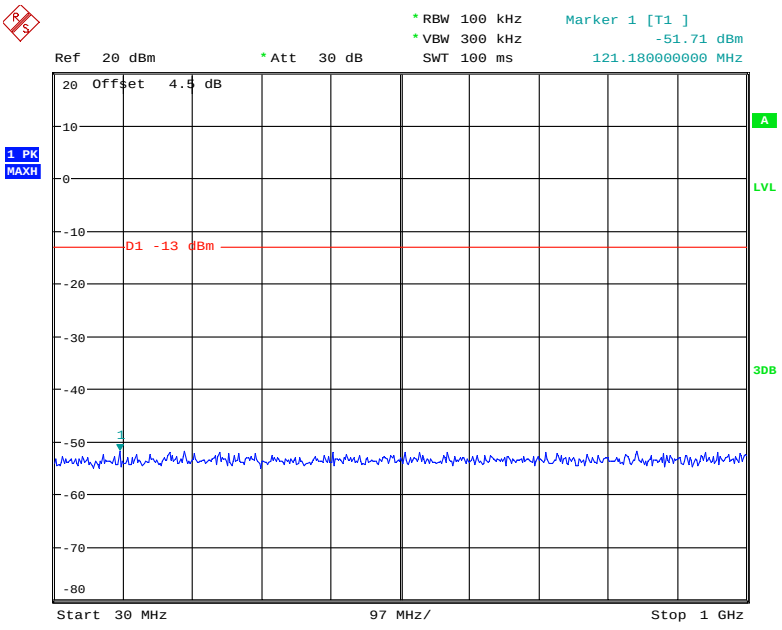
Date: 18.DEC.2018 16:11:15



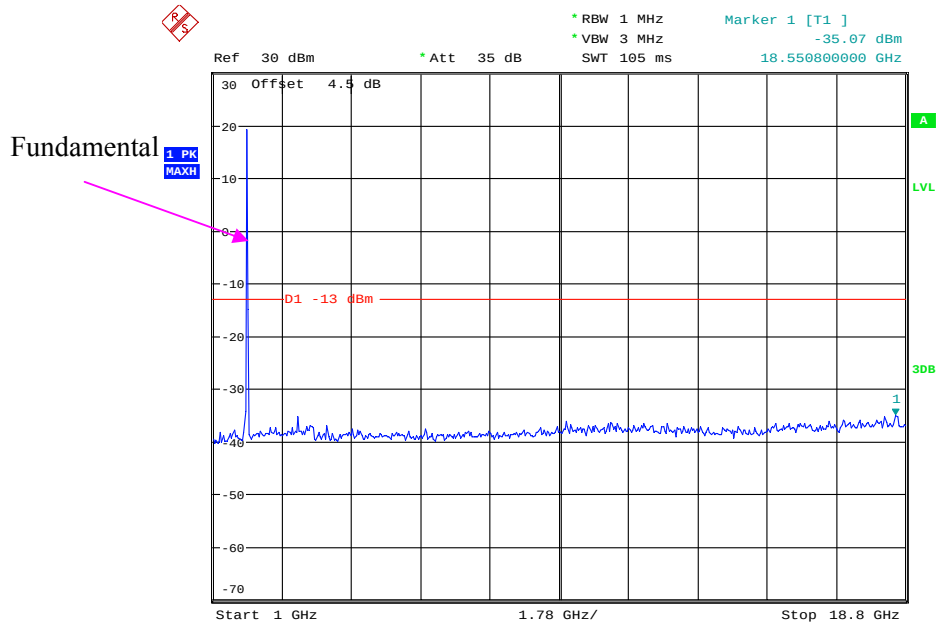
Fundamental

Date: 18.DEC.2018 16:11:26

QPSK_10 MHz

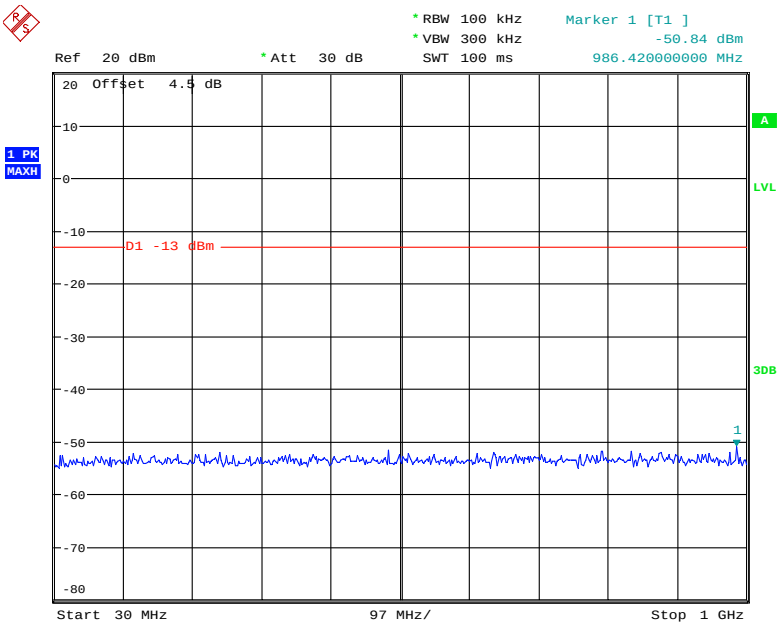


Date: 18.DEC.2018 16:11:48

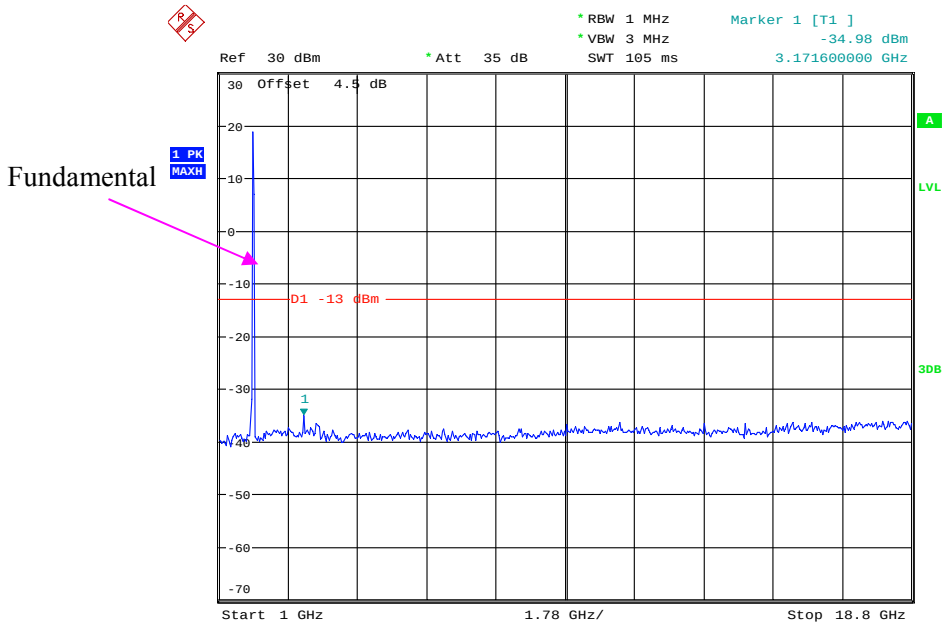


Date: 18.DEC.2018 16:12:03

QPSK_15 MHz

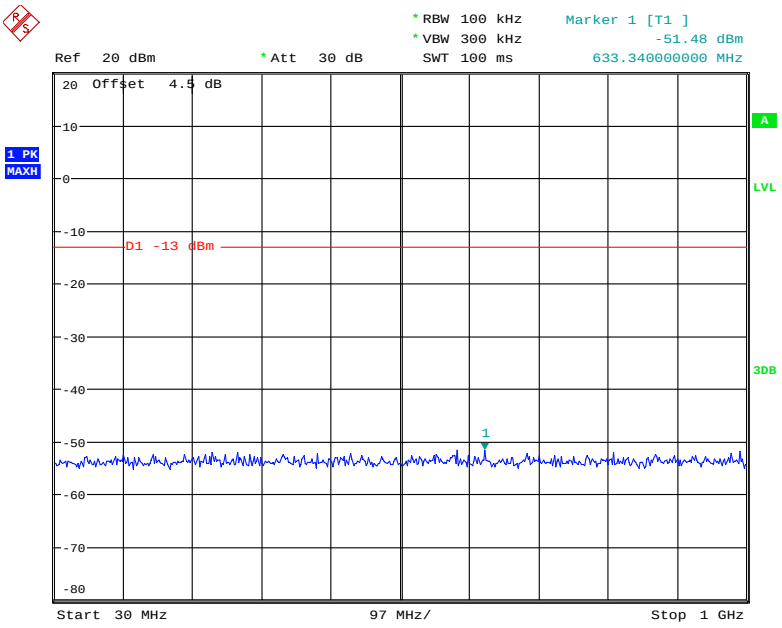


Date: 18.DEC.2018 16:12:27

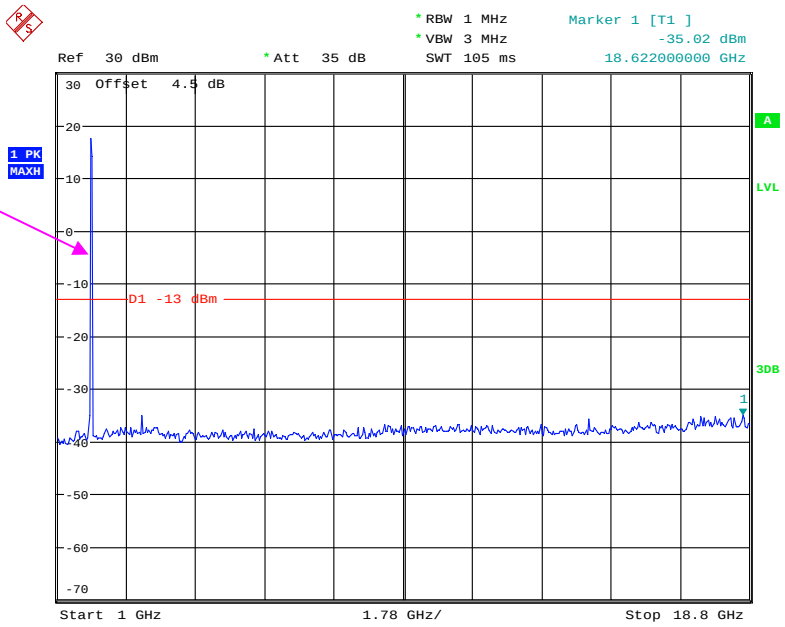


Date: 18.DEC.2018 16:12:38

QPSK_20 MHz



Date: 18.DEC.2018 16:12:59

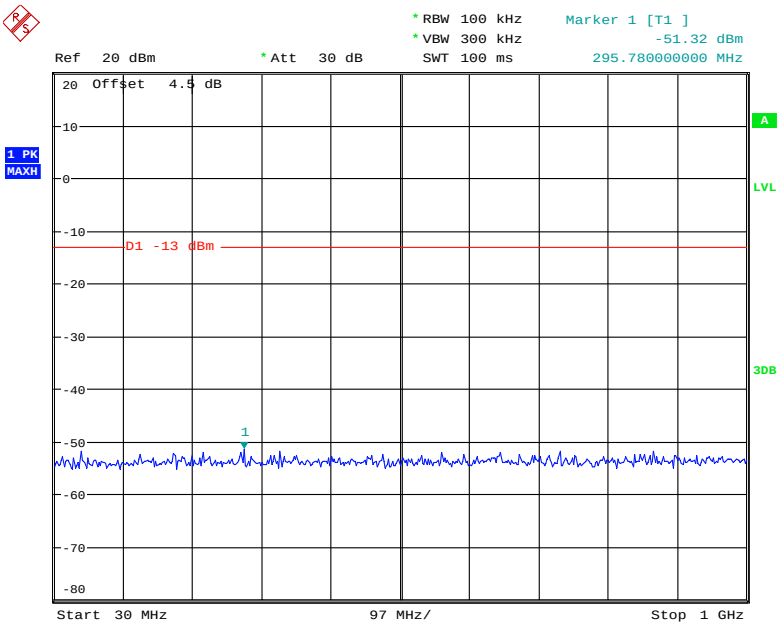


Fundamental

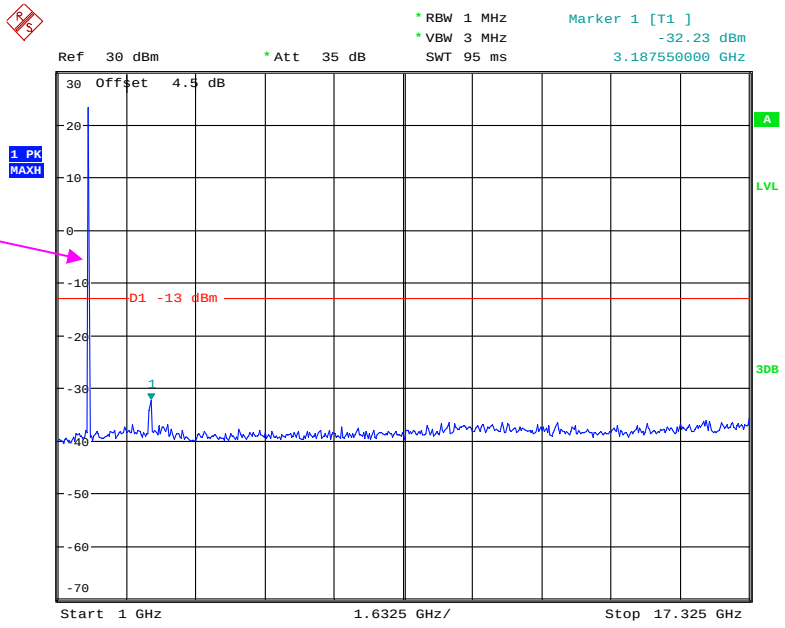
Date: 18.DEC.2018 16:13:13

LTE Band 4 (Middle Channel)

QPSK_1.4 MHz



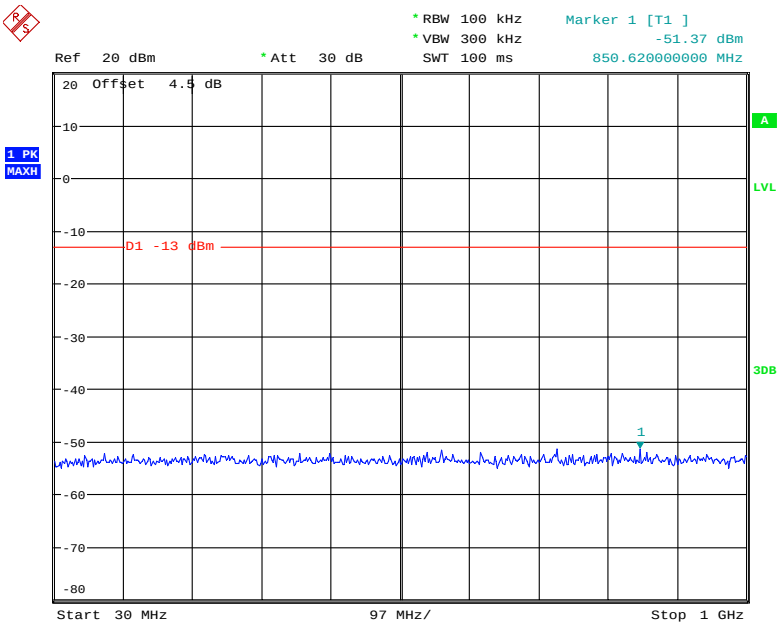
Date: 18.DEC.2018 16:13:32



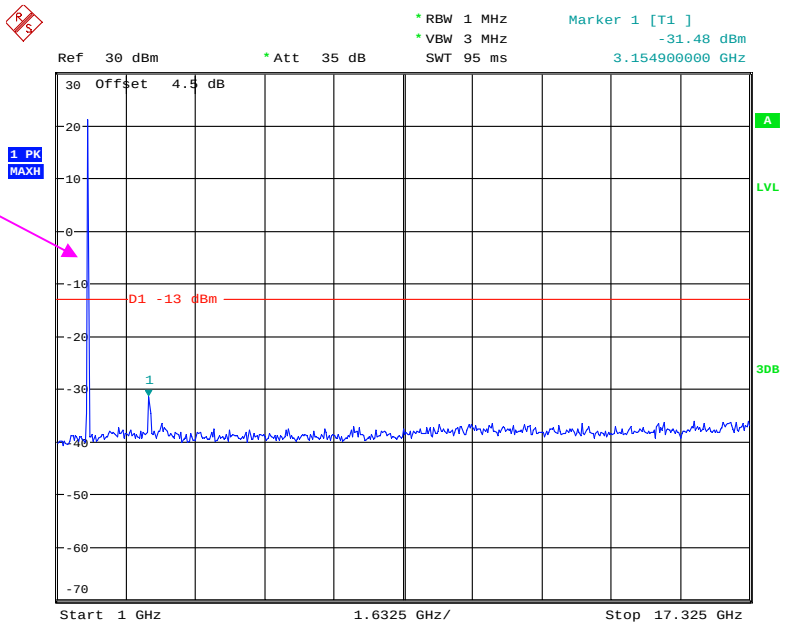
Fundamental

Date: 18.DEC.2018 16:13:43

QPSK_3 MHz



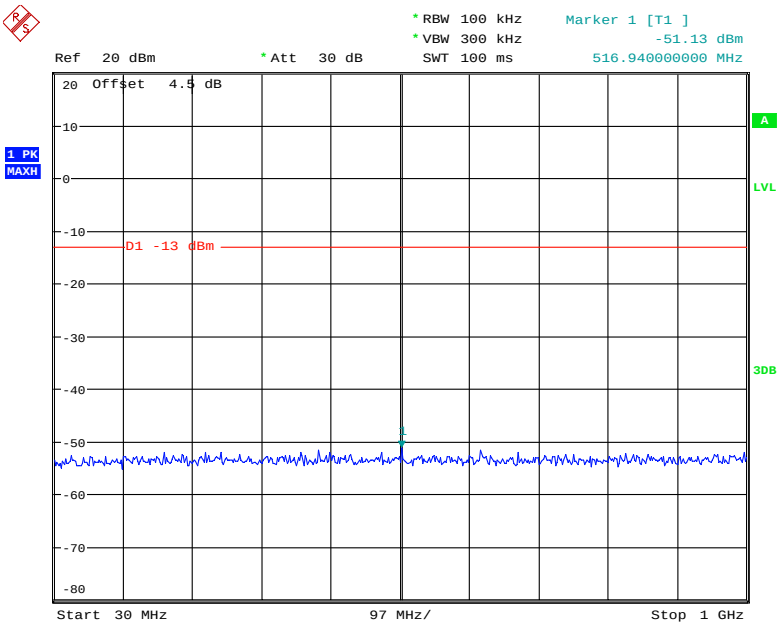
Date: 18.DEC.2018 16:14:04



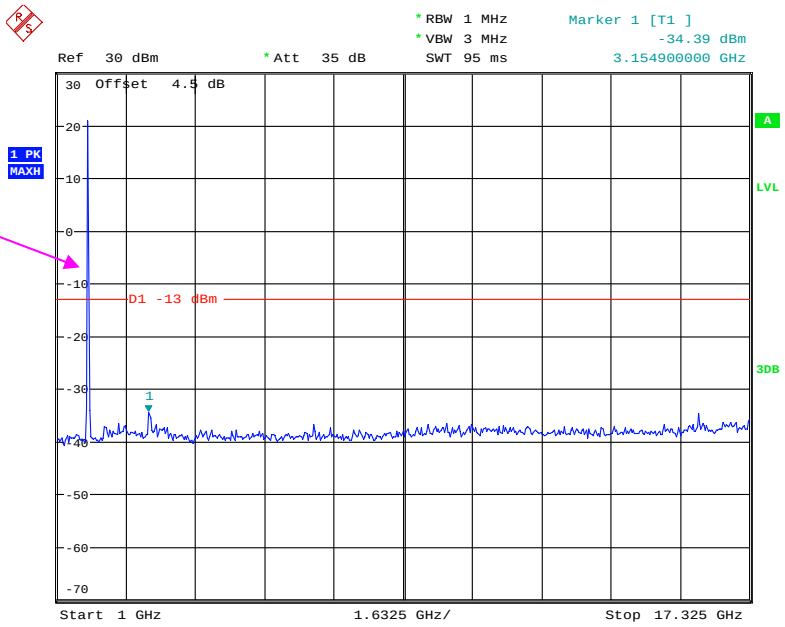
Fundamental

Date: 18.DEC.2018 16:14:15

QPSK_5 MHz



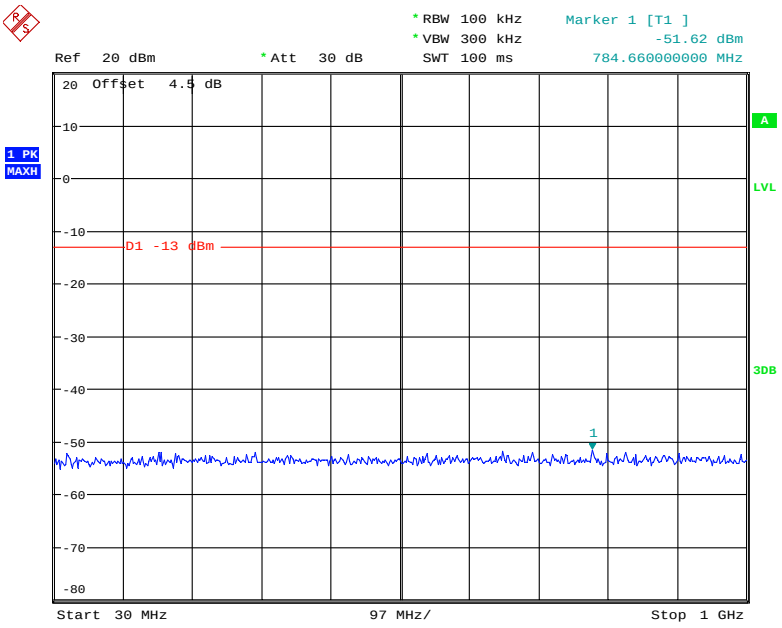
Date: 18.DEC.2018 16:14:37



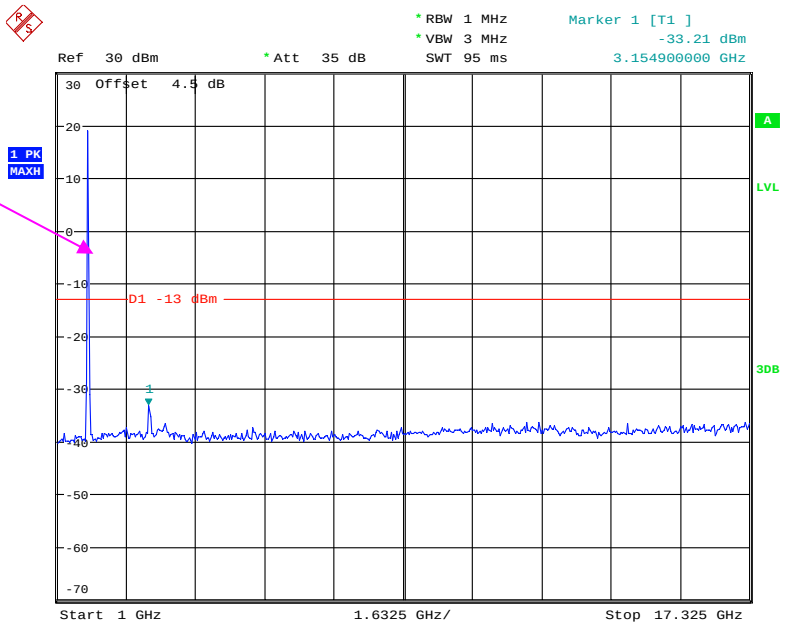
Fundamental

Date: 18.DEC.2018 16:14:48

QPSK_10 MHz



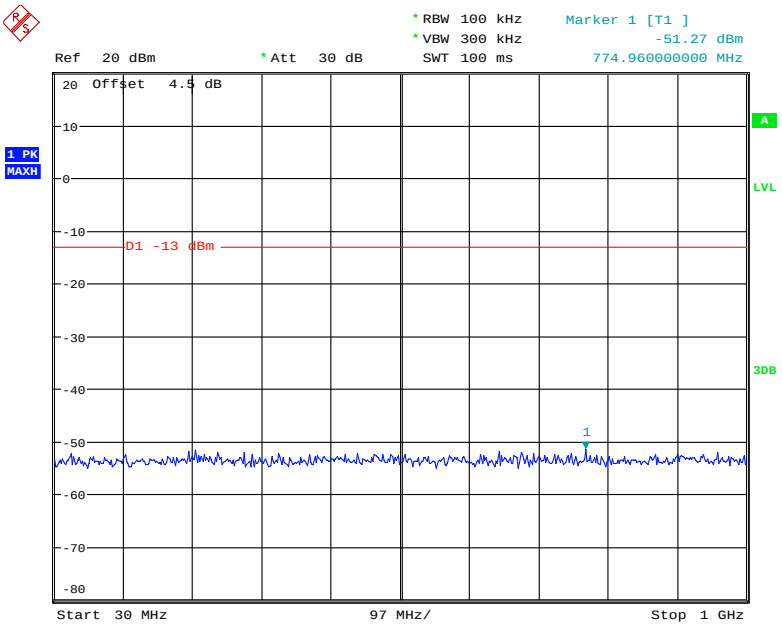
Date: 18.DEC.2018 16:15:10



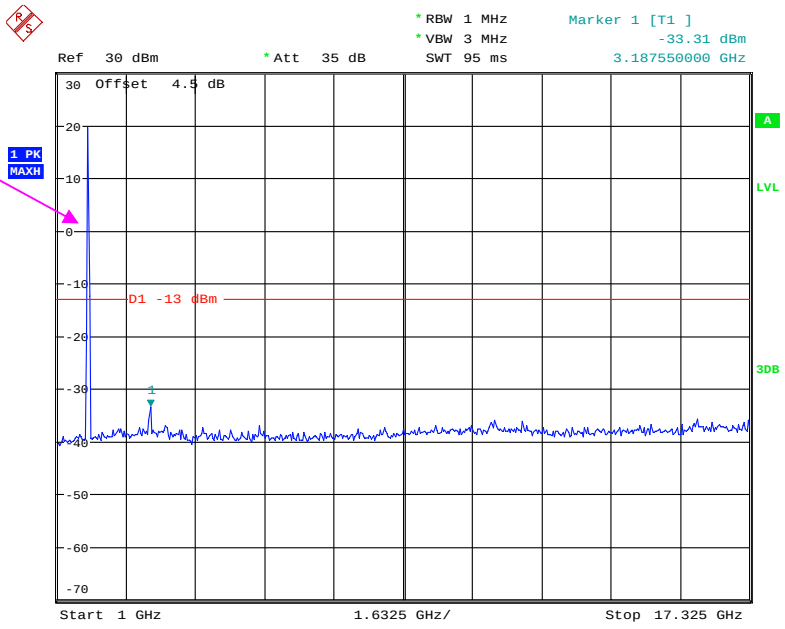
Fundamental

Date: 18.DEC.2018 16:15:21

QPSK_15 MHz



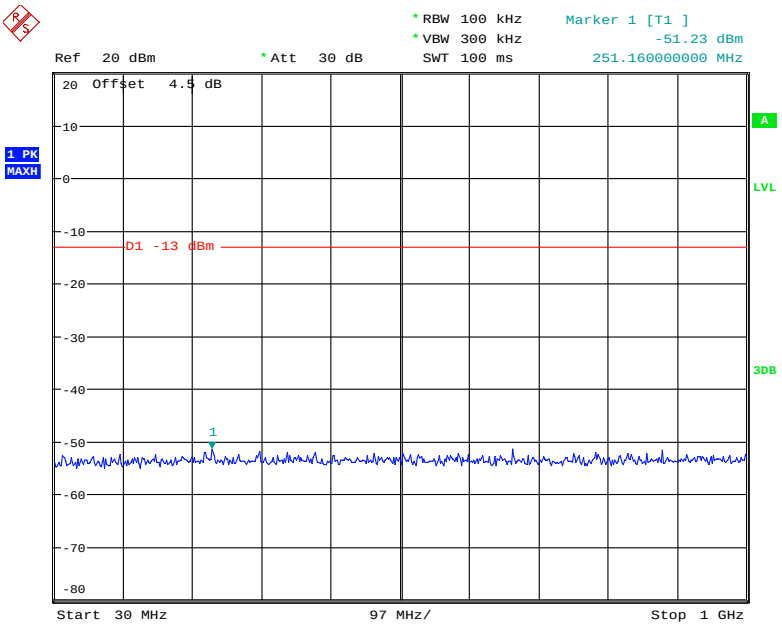
Date: 18.DEC.2018 16:15:45



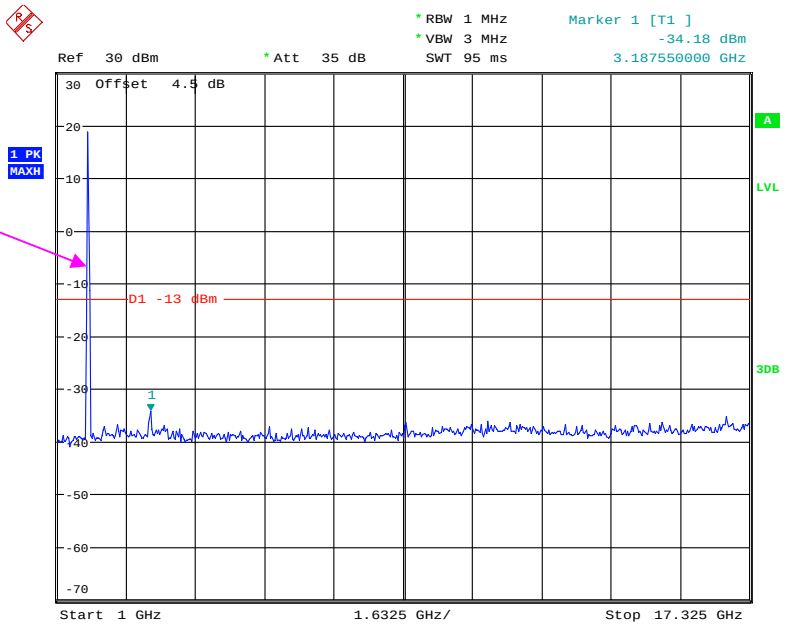
Fundamental

Date: 18.DEC.2018 16:15:56

QPSK_20 MHz



Date: 18.DEC.2018 16:16:21

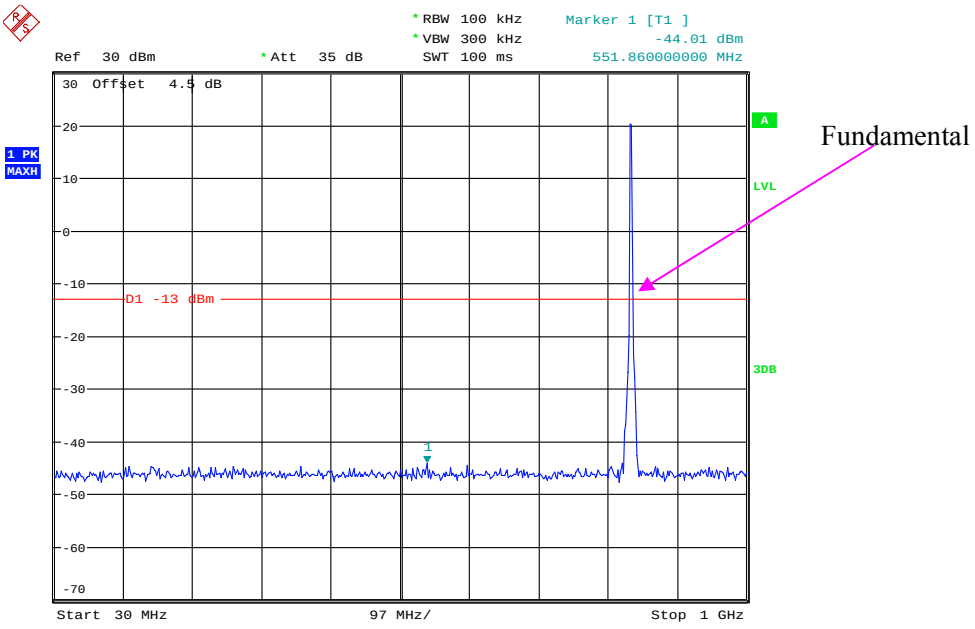


Fundamental

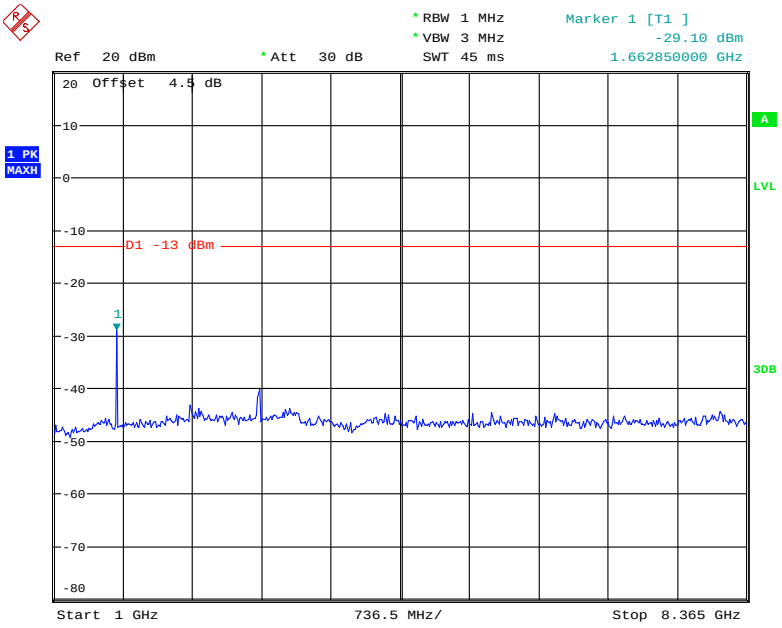
Date: 18.DEC.2018 16:16:32

LTE Band 5 (Middle Channel)

QPSK_1.4 MHz

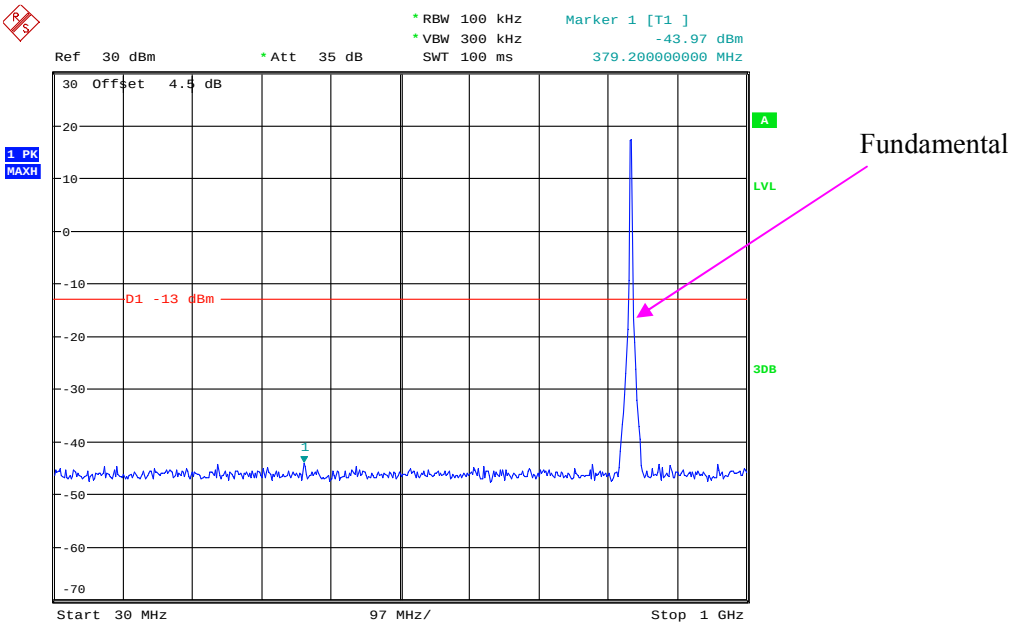


Date: 18.DEC.2018 16:16:52

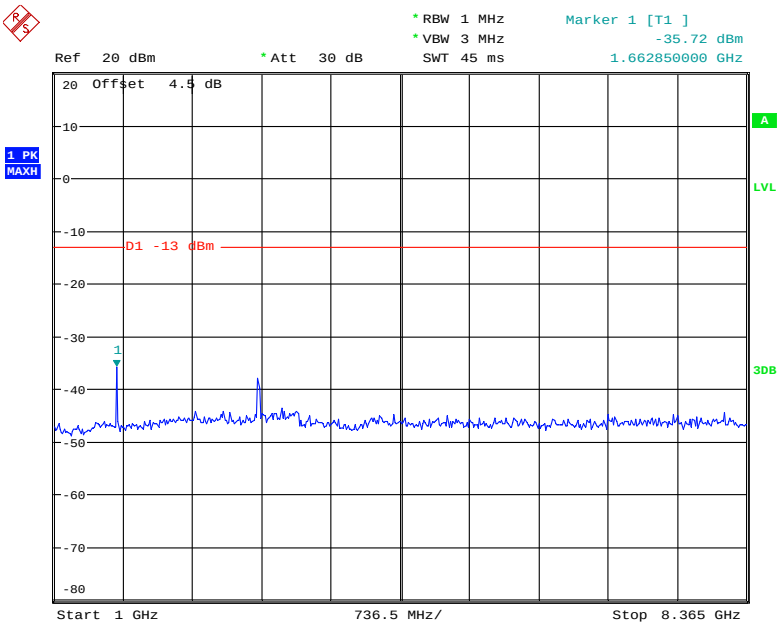


Date: 18.DEC.2018 16:17:07

QPSK_3 MHz

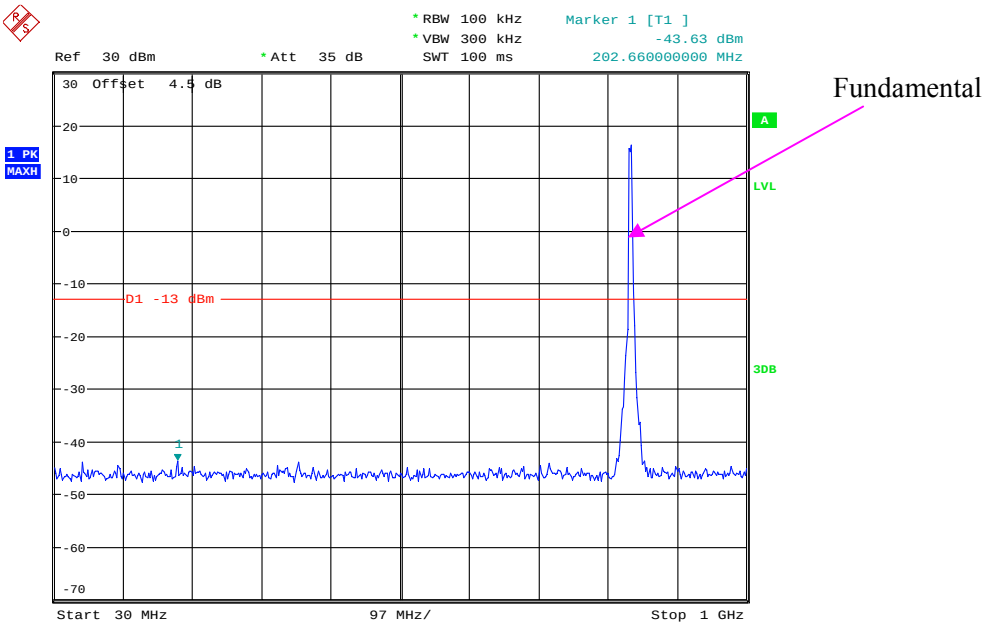


Date: 18.DEC.2018 16:17:28

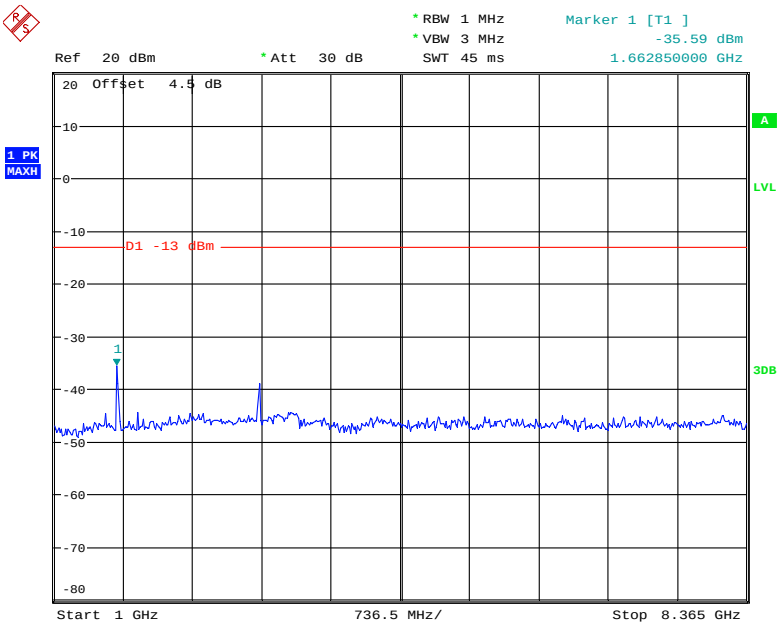


Date: 18.DEC.2018 16:17:43

QPSK_5 MHz

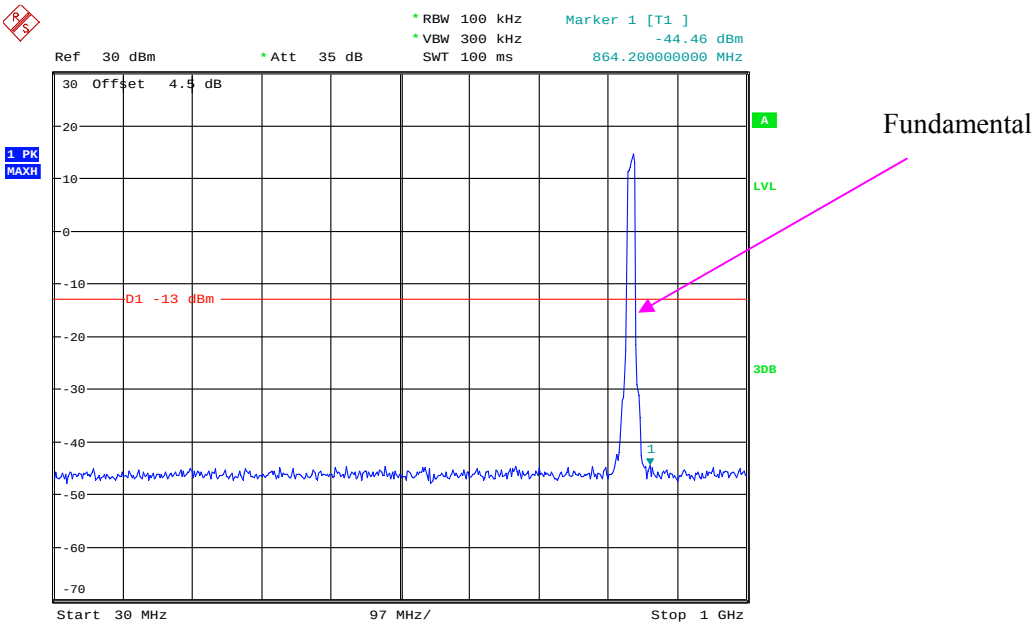


Date: 18.DEC.2018 16:18:04

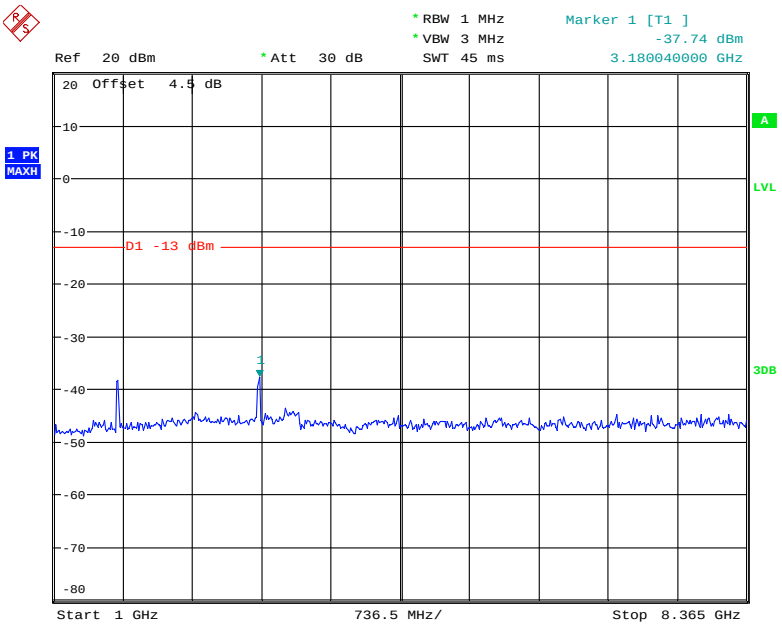


Date: 18.DEC.2018 16:18:15

QPSK_10 MHz



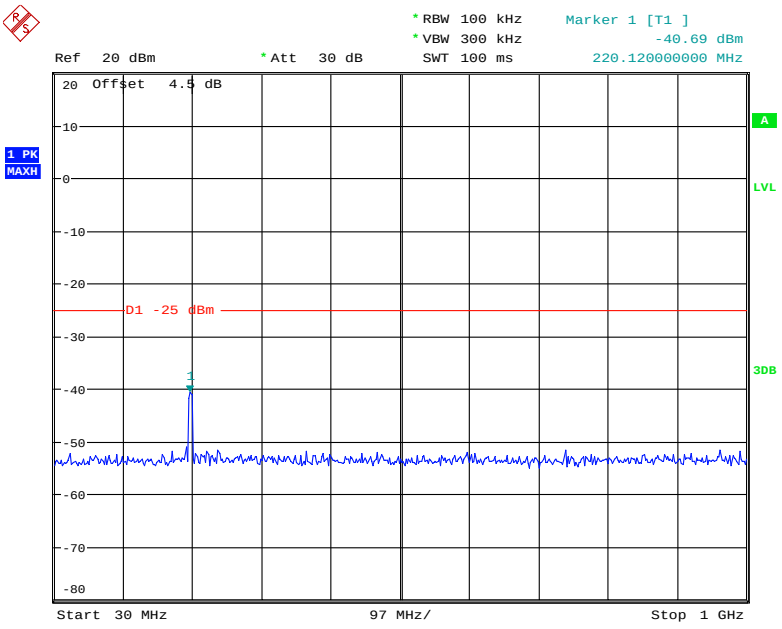
Date: 18.DEC.2018 16:18:37



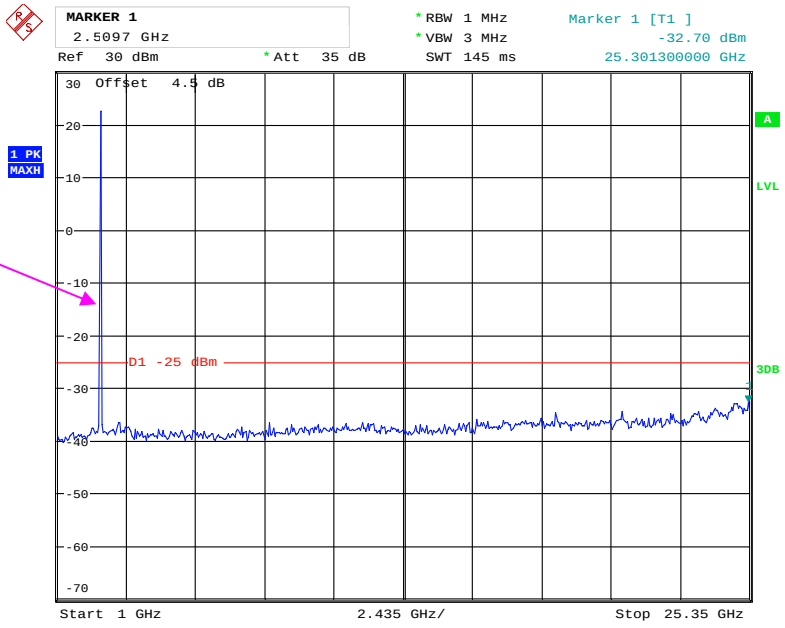
Date: 18.DEC.2018 16:18:48

LTE Band 7 (Middle Channel)

QPSK_5 MHz



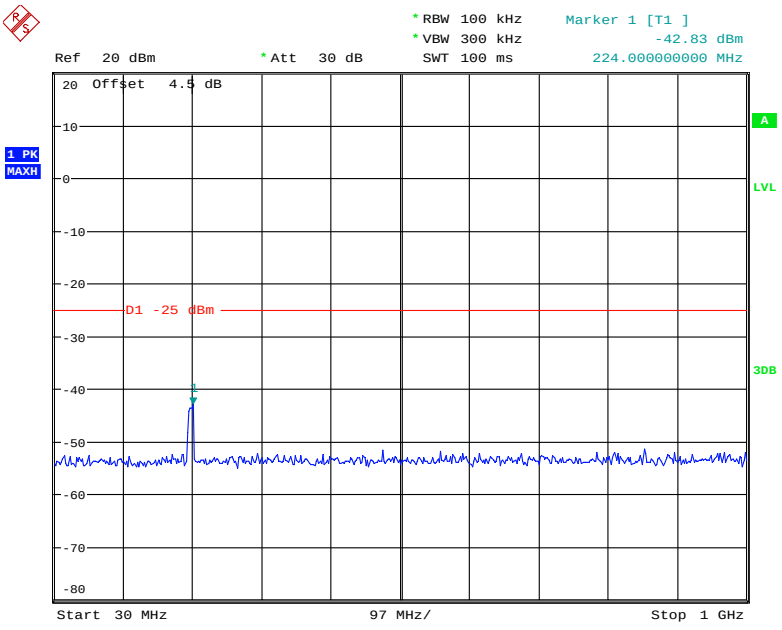
Date: 18.DEC.2018 16:19:11



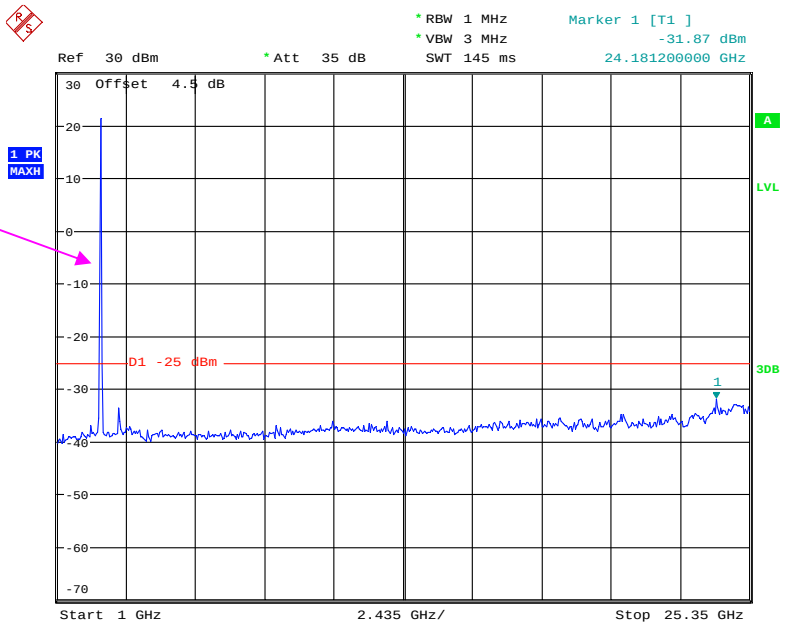
Fundamental

Date: 18.DEC.2018 16:19:23

QPSK_10 MHz



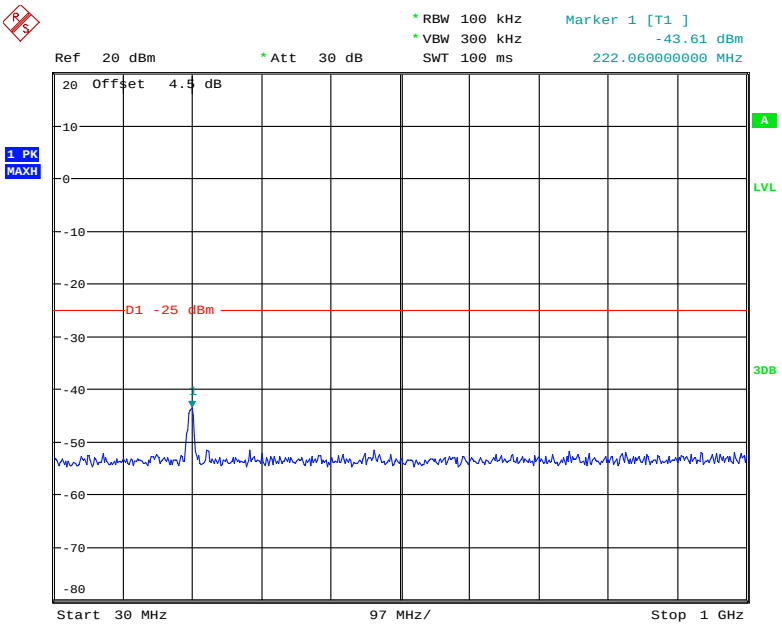
Date: 18.DEC.2018 16:19:47



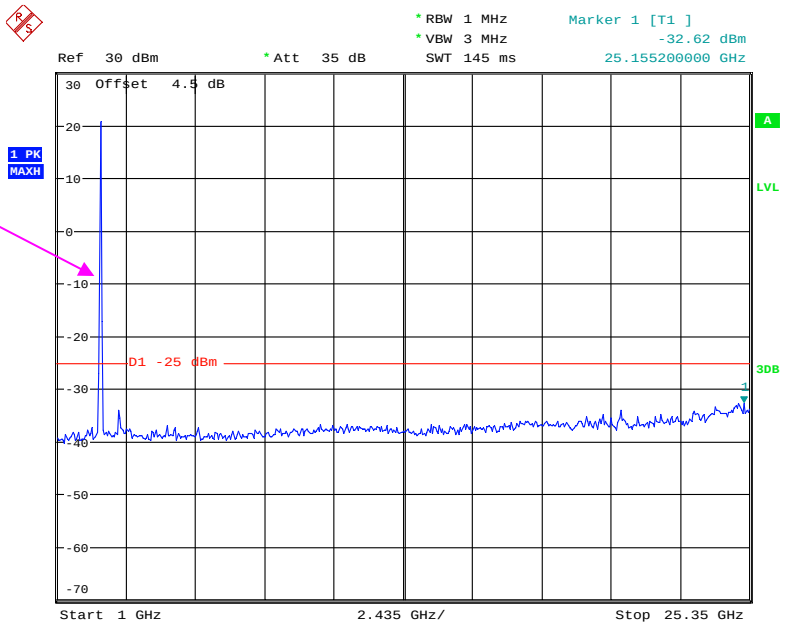
Fundamental

Date: 18.DEC.2018 16:20:03

QPSK_15 MHz



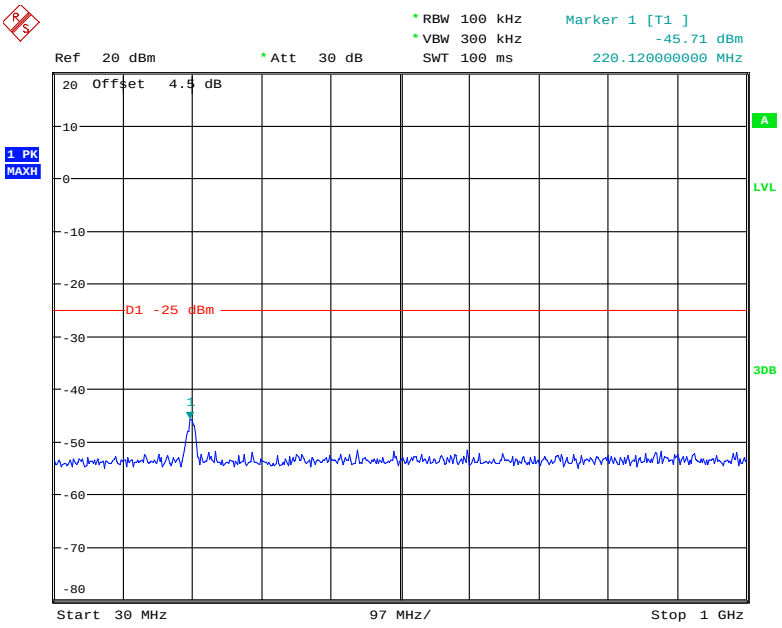
Date: 18.DEC.2018 16:20:27



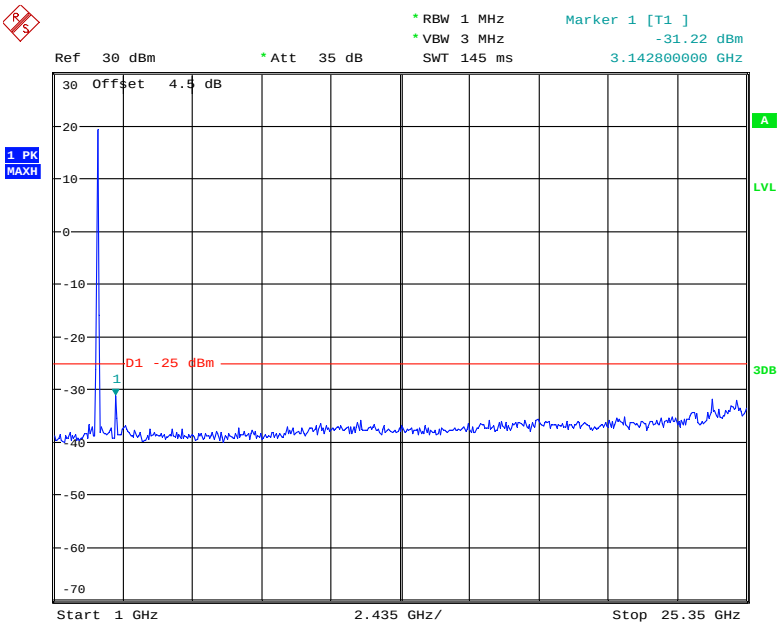
Fundamental

Date: 18.DEC.2018 16:20:42

QPSK_20 MHz



Date: 18.DEC.2018 16:21:06



Date: 18.DEC.2018 16:21:20

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

Applicable Standard

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

Test Procedure

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

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

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

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

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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2018-12-10	2019-12-10
Sunol Sciences	Antenna	JB3	A060611-1	2017-11-10	2020-11-10
HP	Amplifier	8447D	2727A05902	2018-09-05	2019-09-05
R&S	Spectrum Analyzer	FSP 38	100478	2018-12-10	2019-12-10
TDK RF	Horn Antenna	HRN-0118	130 084	2016-01-05	2019-01-04
ETS-Lindgren	Horn Antenna	3115	000 527 35	2016-01-05	2019-01-04
Ducommun Technolagies	Horn Antenna	ARH-4223-02	1007726-01 1304	2016-11-18	2019-11-18
Ducommun Technolagies	Horn Antenna	ARH-4223-02	1007726-02 1304	2016-11-18	2019-11-18
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2018-09-05	2019-09-05
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2018-06-27	2019-06-27
Sinoscite	Band-stop filter	BSF1710-1785MN-0383-003	0383003	2018-06-16	2019-06-16
Sinoscite	Band-stop filter	BSF824-862MS-1438-001	1438001	2018-06-16	2019-06-16
Sinoscite	Band-stop filter	BSF1850-1910MS-0935V2	0935V2	2018-06-16	2019-06-16
Sinoscite	Band-stop filter	BSF2500-2750MS-1439-001	1437001	2018-06-16	2019-06-16
Agilent	Signal Generator	E8247C	MY43321350	2018-12-10	2019-12-10
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2018-09-05	2019-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2018-09-05	2019-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2018-05-06	2019-05-06
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2018-09-05	2019-09-05
MICRO-COAX	Coaxial Cable	UFA147-1-2362-100100	64639 231029-001	2018-02-24	2019-02-28

*** 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:	21.3~21.5°C
Relative Humidity:	30~35 %
ATM Pressure:	99.9 kPa

** The testing was performed by Vern Shen on 2018-12-14.*

EUT Operation Mode: Transmitting

Cellular Band (PART 22H)

30 MHz-10 GHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
GSM850, Frequency:836.600 MHz								
1673.200	H	51.00	-53.38	10.5	1.27	-44.1	-13.0	31.1
1673.200	V	50.05	-54.26	10.5	1.27	-45.0	-13.0	32.0
2509.800	H	52.17	-50.6	12.2	1.25	-39.7	-13.0	26.7
2509.800	V	53.77	-50.39	12.2	1.25	-39.4	-13.0	26.4
3346.400	H	45.91	-55.28	12.3	1.58	-44.6	-13.0	31.6
3346.400	V	46.80	-53.32	12.3	1.58	-42.6	-13.0	29.6
365.620	H	60.35	-45.78	0.0	0.58	-46.4	-13.0	33.4
336.520	V	45.54	-63.78	0.0	0.55	-64.3	-13.0	51.3
WCDMA Band V R99,Frequency:836.600 MHz								
1673.200	H	44.60	-59.78	10.5	1.27	-50.5	-13.0	37.5
1673.200	V	45.54	-58.77	10.5	1.27	-49.5	-13.0	36.5
2509.800	H	40.21	-62.56	12.2	1.25	-51.6	-13.0	38.6
2509.800	V	43.00	-61.16	12.2	1.25	-50.2	-13.0	37.2
3346.400	H	42.40	-58.79	12.3	1.58	-48.1	-13.0	35.1
3346.400	V	42.35	-57.77	12.3	1.58	-47.1	-13.0	34.1
94.020	H	42.54	-66.32	0.0	0.32	-66.6	-13.0	53.6
600.360	V	46.25	-59.13	0.0	0.76	-59.9	-13.0	46.9

PCS Band (PART 24E)

30 MHz-20 GHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBµV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
GSM1900, Frequency:1880.000 MHz								
3760.000	H	60.96	-39.25	12.3	1.53	-28.5	-13.0	15.5
3760.000	V	63.24	-36.67	12.3	1.53	-26.0	-13.0	13.0
5640.000	H	49.50	-45.8	13.0	1.28	-34.1	-13.0	21.1
5640.000	V	48.67	-46.94	13.0	1.28	-35.2	-13.0	22.2
140.580	H	63.88	-42.04	0.0	0.35	-42.4	-13.0	29.4
140.580	V	46.01	-66.7	0.0	0.35	-67.1	-13.0	54.1
WCDMA Band II R99,Frequency: 1880.000 MHz								
3760.000	H	51.00	-49.21	12.3	1.53	-38.5	-13.0	25.5
3760.000	V	52.80	-47.11	12.3	1.53	-36.4	-13.0	23.4
5640.000	H	42.58	-52.72	13.0	1.28	-41.0	-13.0	28.0
5640.000	V	39.80	-55.81	13.0	1.28	-44.1	-13.0	31.1
363.680	H	37.39	-68.81	0.0	0.58	-69.4	-13.0	56.4
37.760	V	43.90	-40.27	-25.3	0.22	-65.8	-13.0	52.8

LTE Band 2 (30MHz-20GHz):

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBµV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK,Frequency:1880.000 MHz								
3760.00	H	59.34	-40.87	12.25	1.53	-30.15	-13.00	17.15
3760.00	V	58.41	-41.50	12.25	1.53	-30.78	-13.00	17.78
5640.00	H	49.96	-45.34	13.00	1.28	-33.62	-13.00	20.62
5640.00	V	48.69	-46.92	13.00	1.28	-35.20	-13.00	22.20
375.32	H	40.27	-65.49	0.00	0.59	-66.08	-13.00	53.08
39.70	V	42.02	-44.65	-26.26	0.21	-71.12	-13.00	58.12

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	59.43	-41.54	12.21	1.60	-30.93	-13.00	17.93
3465.00	V	56.92	-42.64	12.21	1.60	-32.03	-13.00	19.03
5197.50	H	47.97	-48.11	12.92	1.36	-36.55	-13.00	23.55
5197.50	V	51.31	-44.74	12.92	1.36	-33.18	-13.00	20.18
375.32	H	40.39	-65.37	0.00	0.59	-65.96	-13.00	52.96
39.70	V	42.62	-44.05	-26.26	0.21	-70.52	-13.00	57.52

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	42.00	-62.38	10.52	1.27	-53.13	-13.00	40.13
1673.00	V	43.90	-60.41	10.52	1.27	-51.16	-13.00	38.16
2509.50	H	41.83	-60.94	12.20	1.24	-49.98	-13.00	36.98
2509.50	V	41.77	-62.39	12.20	1.24	-51.43	-13.00	38.43
3346.00	H	40.84	-60.35	12.26	1.58	-49.67	-13.00	36.67
3346.00	V	56.37	-43.75	12.26	1.58	-33.07	-13.00	20.07
375.32	H	39.54	-66.22	0.00	0.59	-66.81	-13.00	53.81
35.82	V	42.73	-38.94	-24.39	0.24	-63.57	-13.00	50.57

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	49.09	-47.22	12.97	1.41	-35.66	-25.00	10.66
5070.00	V	49.30	-46.78	12.97	1.41	-35.22	-25.00	10.22
7605.00	H	48.50	-42.88	12.84	1.40	-31.44	-25.00	6.44
7605.00	V	48.83	-43.22	12.84	1.40	-31.78	-25.00	6.78
154.16	H	36.04	-70.70	0.00	0.38	-71.08	-25.00	46.08
37.76	V	40.93	-43.24	-25.32	0.22	-68.78	-25.00	43.78

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

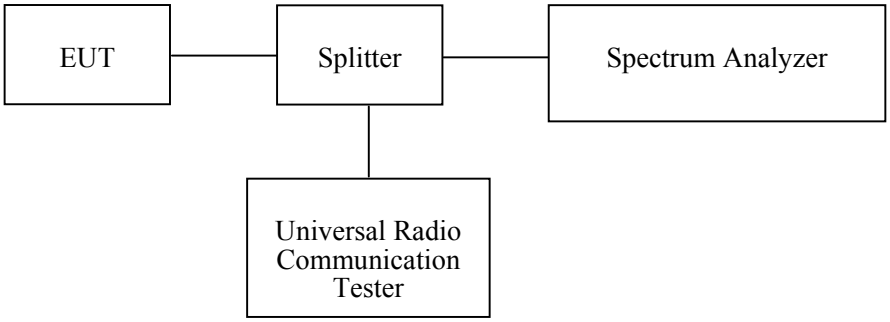
Applicable Standard

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	EMI Test Receiver	ESPI	100120	2018-12-10	2019-12-10
R&S	Spectrum Analyzer	FSU 26	200256	2018-01-04	2019-01-04
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005012	Each Time	/
Unknown	Coaxial Cable	C-SJ00-0010	C0010/01	Each Time	/
E-Microwave	Two-way Spliter	ODP-1-6-2S	OE0120142	Each Time	/

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

Test Data

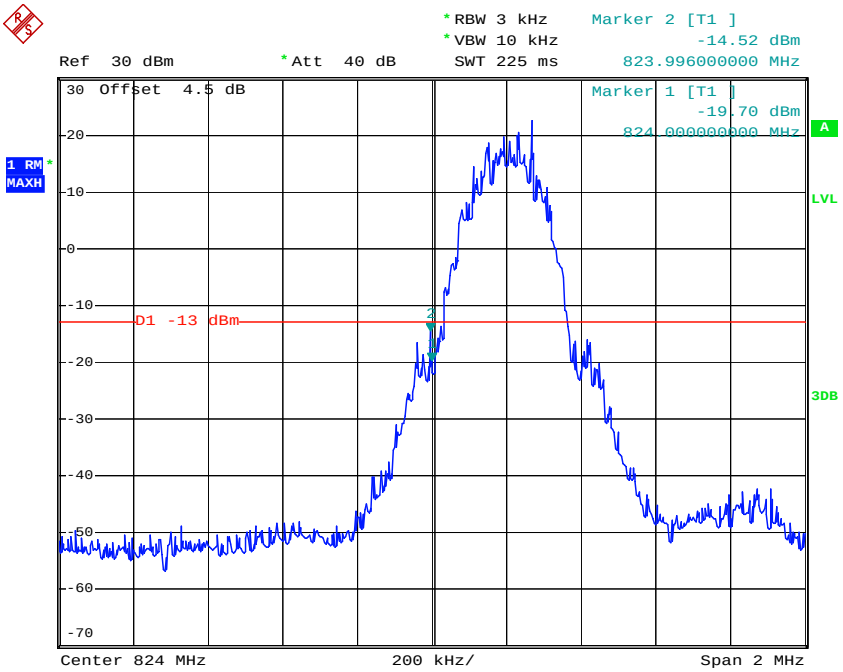
Environmental Conditions

Temperature:	23.9~25 °C
Relative Humidity:	34~44 %
ATM Pressure:	99.7~100.4 kPa

The testing was performed by Carrie He, Elena Lei from 2018-12-18 to 2018-12-25.

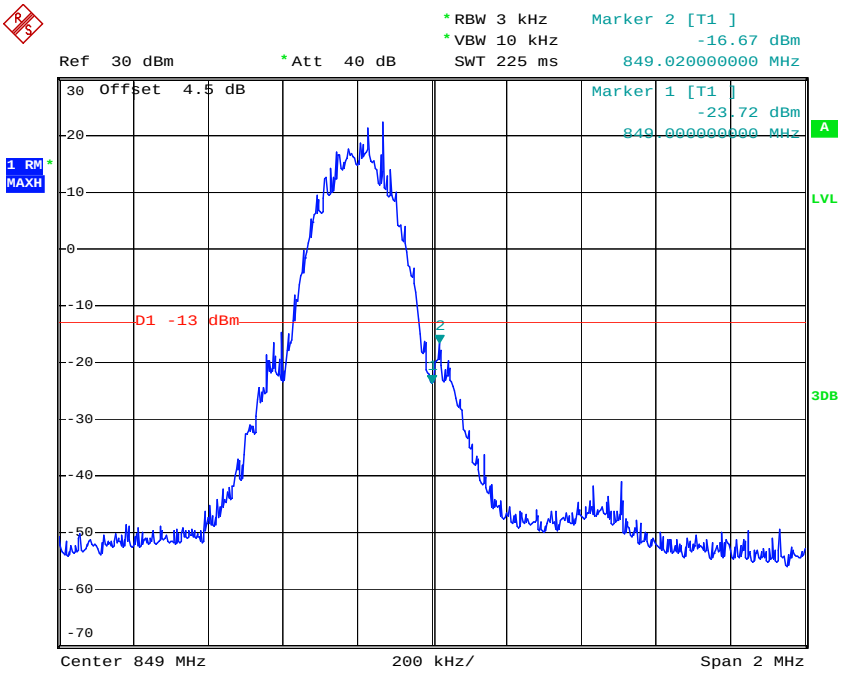
Test Mode: Transmitting
Test Result: Compliant. Please refer to the following plots.

GSM 850, Left Band Edge



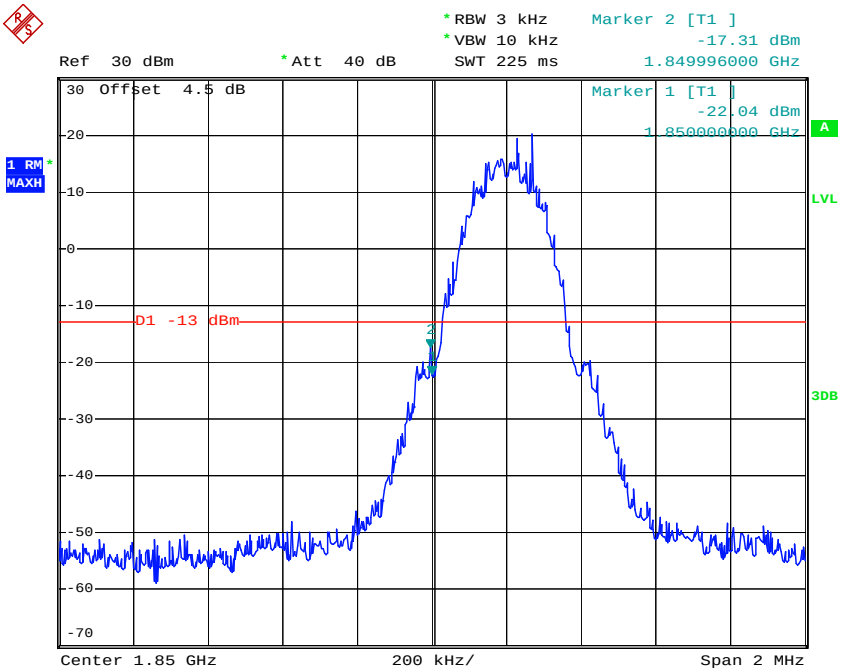
Date: 19.DEC.2018 09:22:31

GSM 850, Right Band Edge



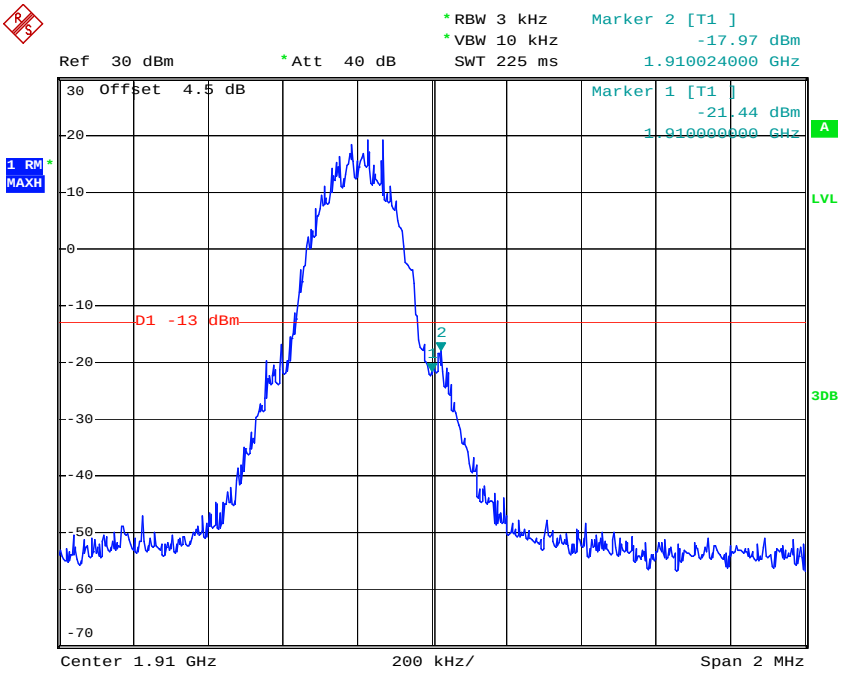
Date: 19.DEC.2018 09:23:42

GSM 1900, Left Band Edge



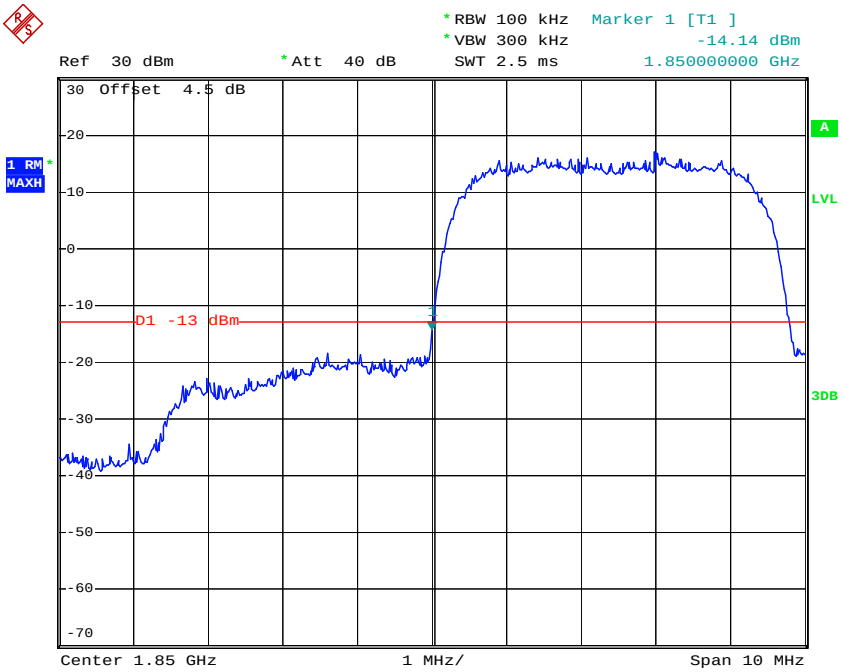
Date: 19.DEC.2018 09:32:35

GSM 1900, Right Band Edge



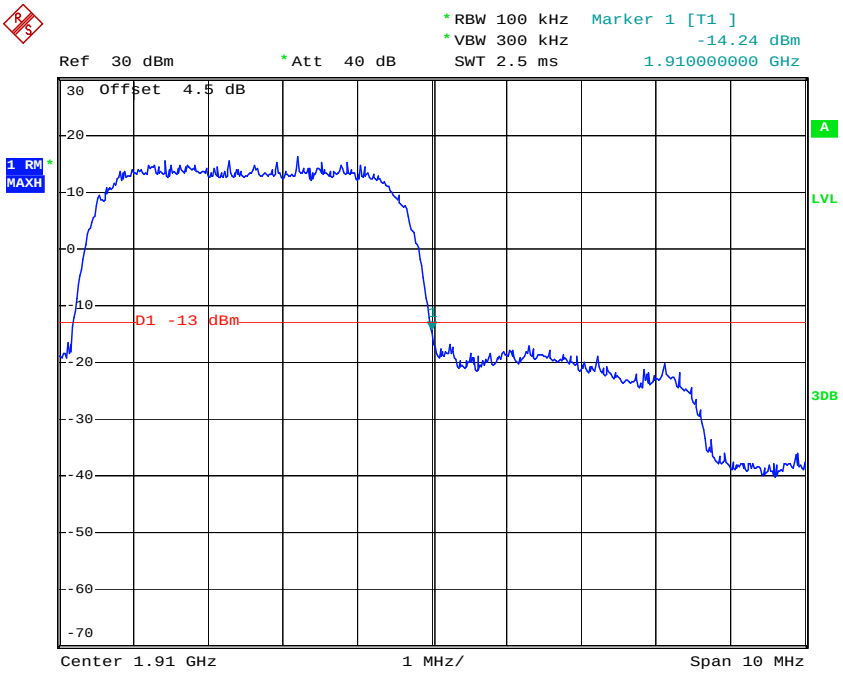
Date: 19.DEC.2018 09:33:42

WCDMA Band II Rel 99, Left Band Edge



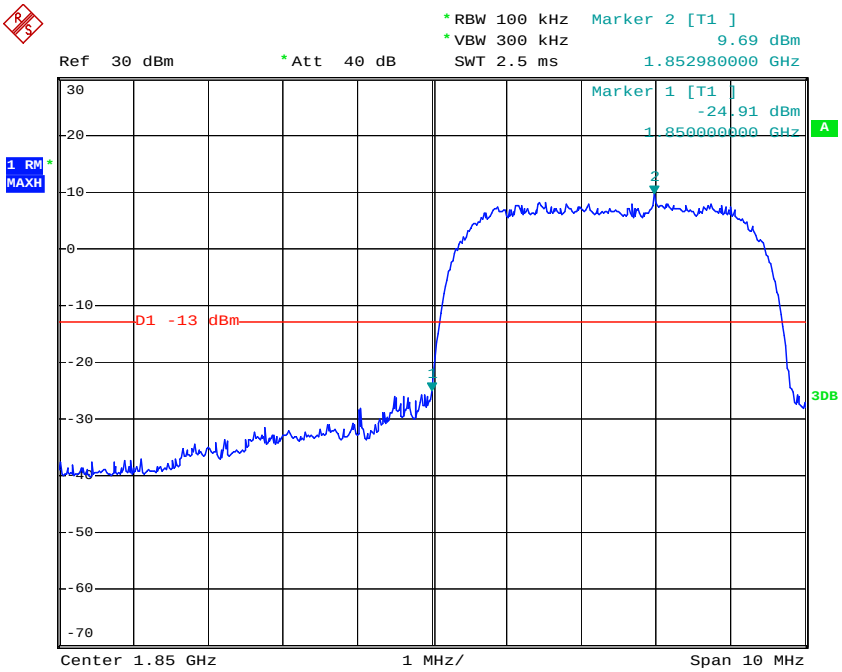
Date: 18.DEC.2018 17:17:31

WCDMA Band II Rel 99, Right Band Edge



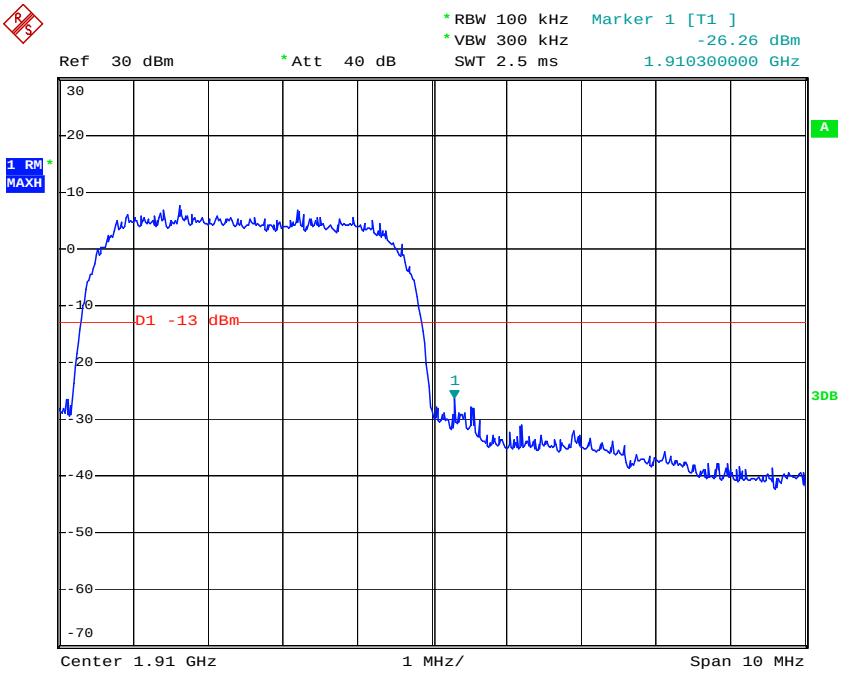
Date: 18.DEC.2018 17:18:22

WCDMA Band II HSUPA, Left Band Edge



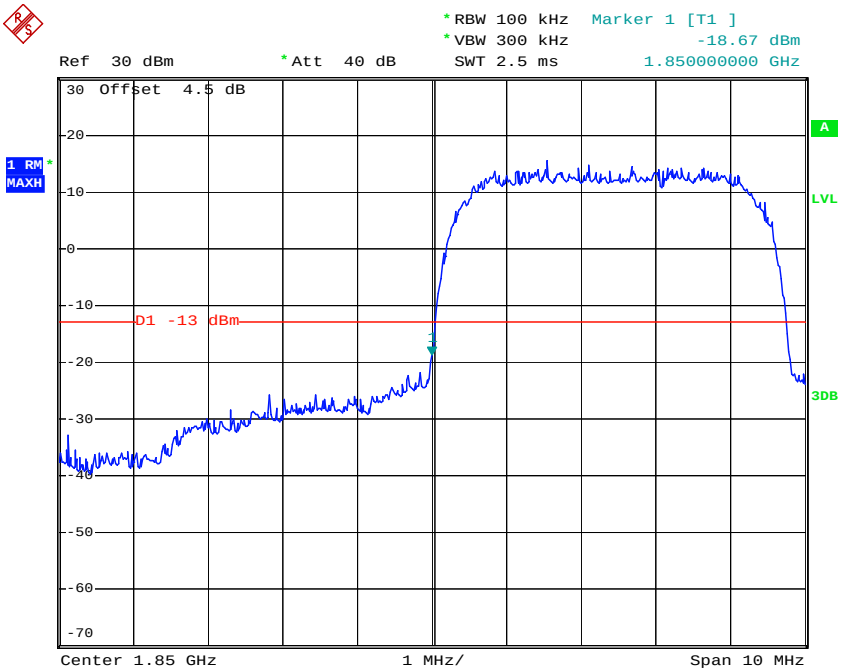
Date: 18.DEC.2018 18:10:23

WCDMA Band II HSUPA, Right Band Edge



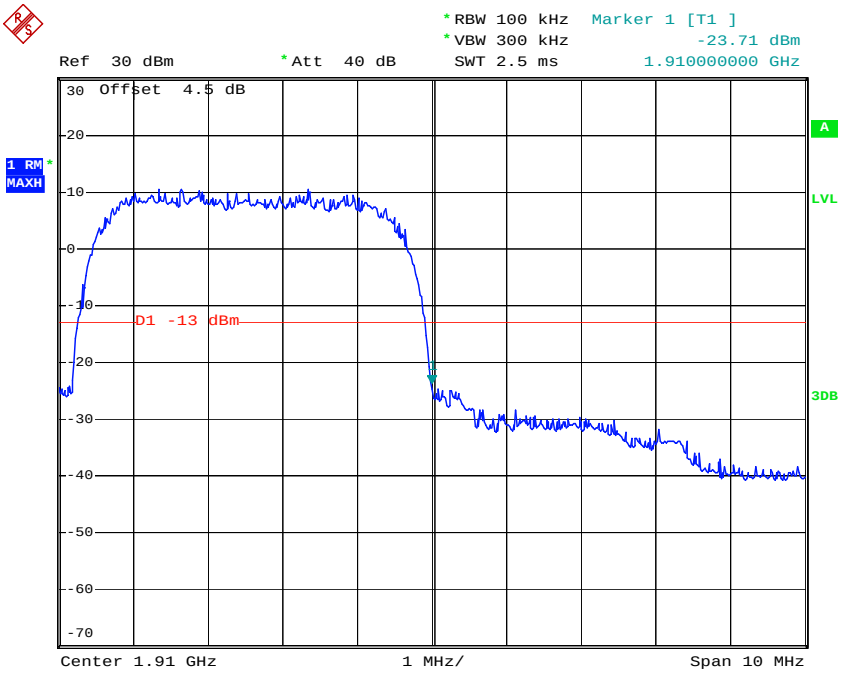
Date: 18.DEC.2018 18:11:49

WCDMA Band II HSDPA, Left Band Edge



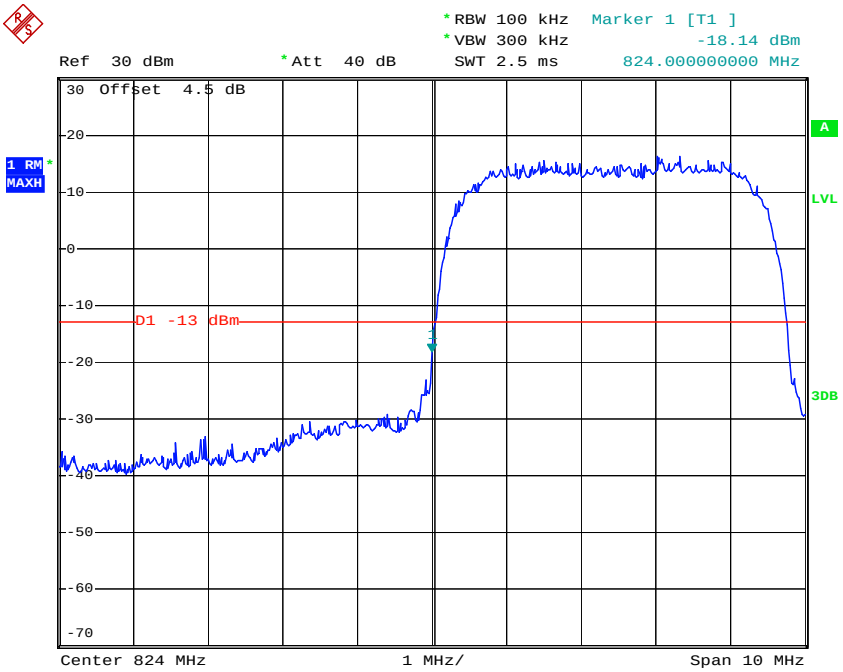
Date: 18.DEC.2018 17:40:57

WCDMA Band II HSDPA, Right Band Edge



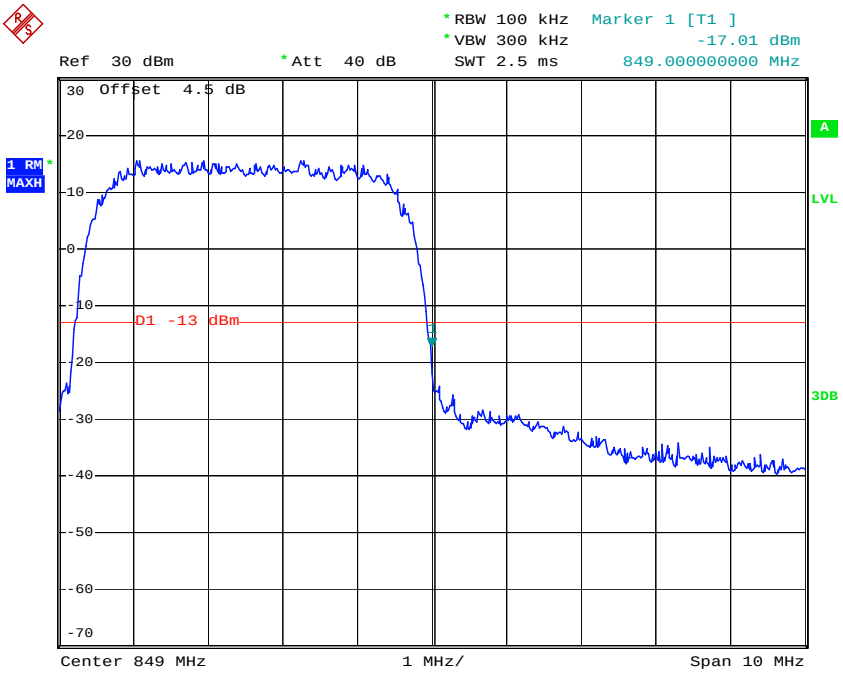
Date: 18.DEC.2018 17:43:30

WCDMA Band V Rel 99, Left Band Edge



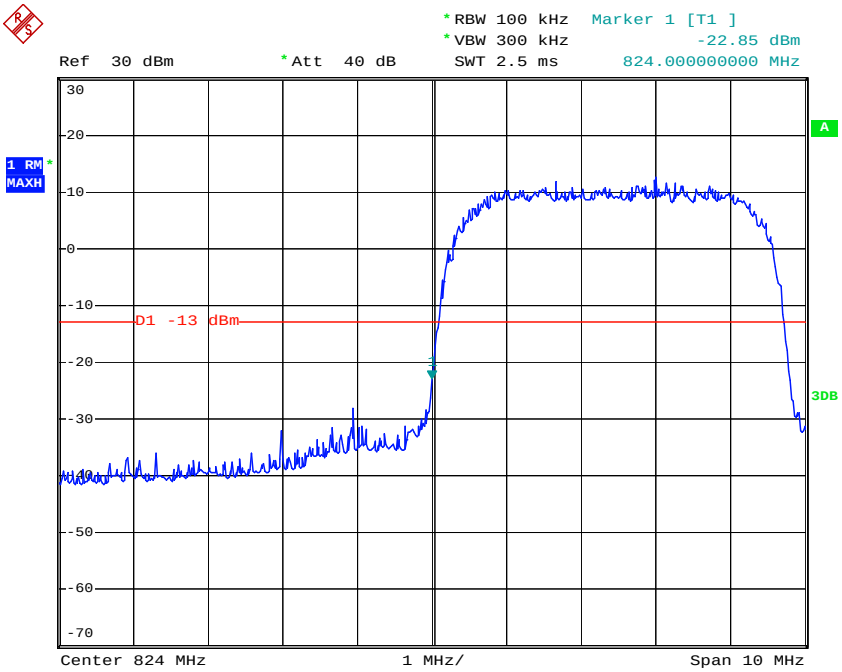
Date: 18.DEC.2018 17:36:24

WCDMA Band V Rel 99, Right Band Edge



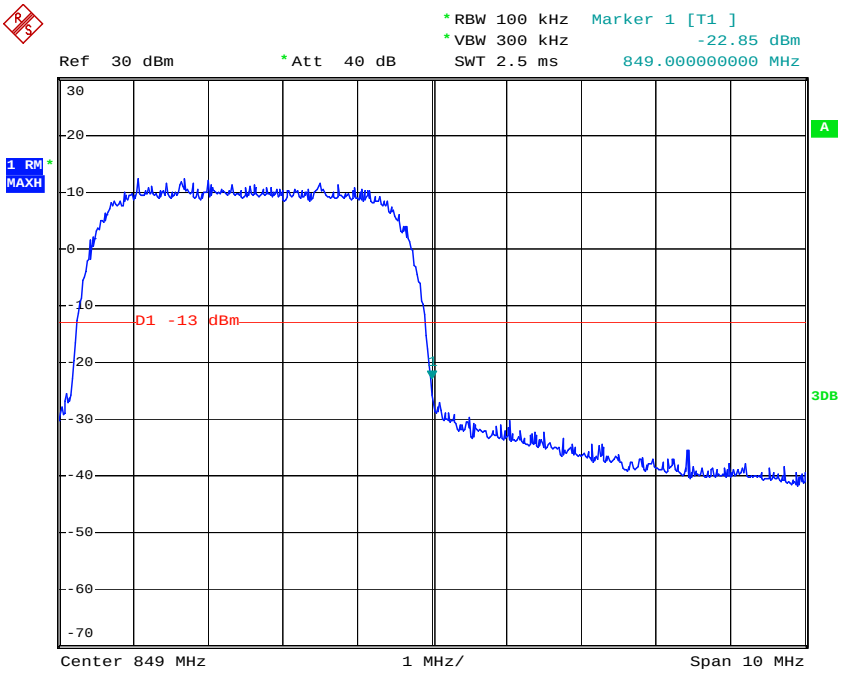
Date: 18.DEC.2018 17:37:03

WCDMA Band V HSUPA, Left Band Edge



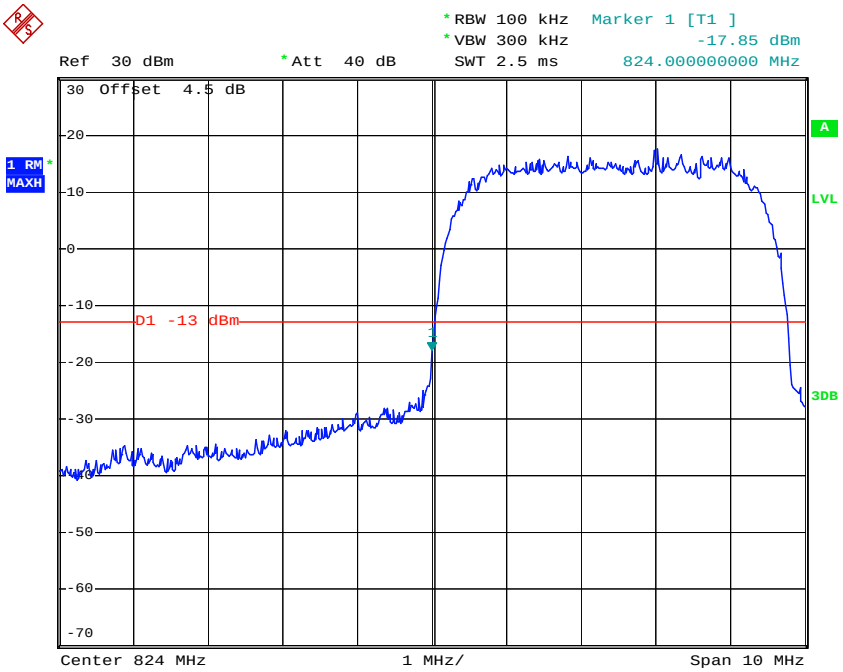
Date: 18.DEC.2018 18:13:12

WCDMA Band V HSUPA, Right Band Edge



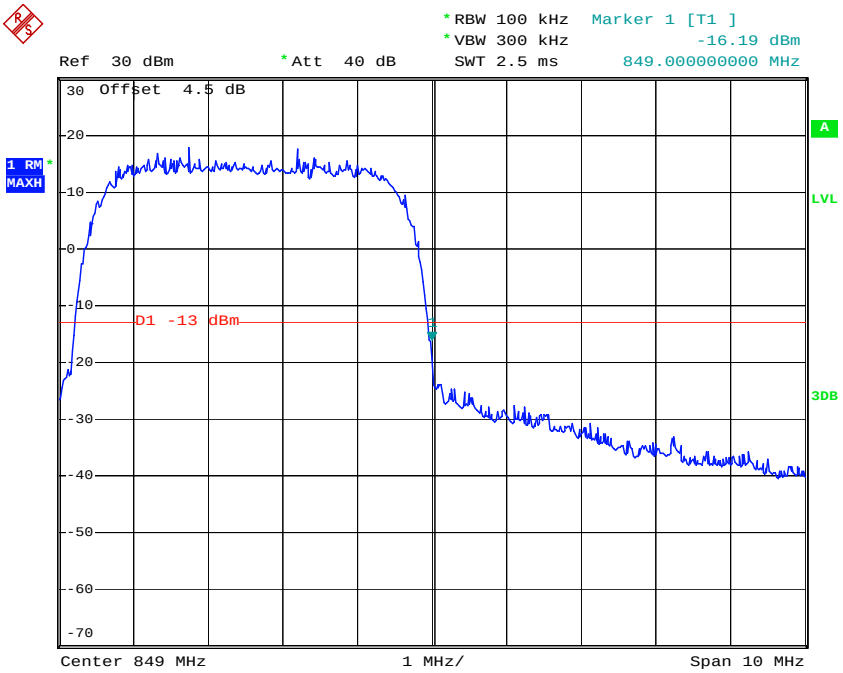
Date: 18.DEC.2018 18:13:53

WCDMA Band V HSDPA, Left Band Edge



Date: 18.DEC.2018 17:47:07

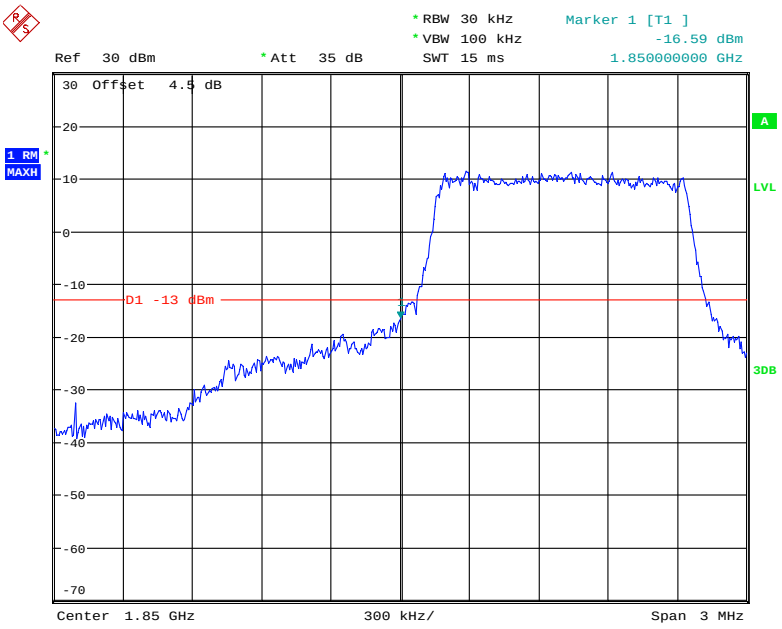
WCDMA Band V HSDPA, Right Band Edge



Date: 18.DEC.2018 17:47:50

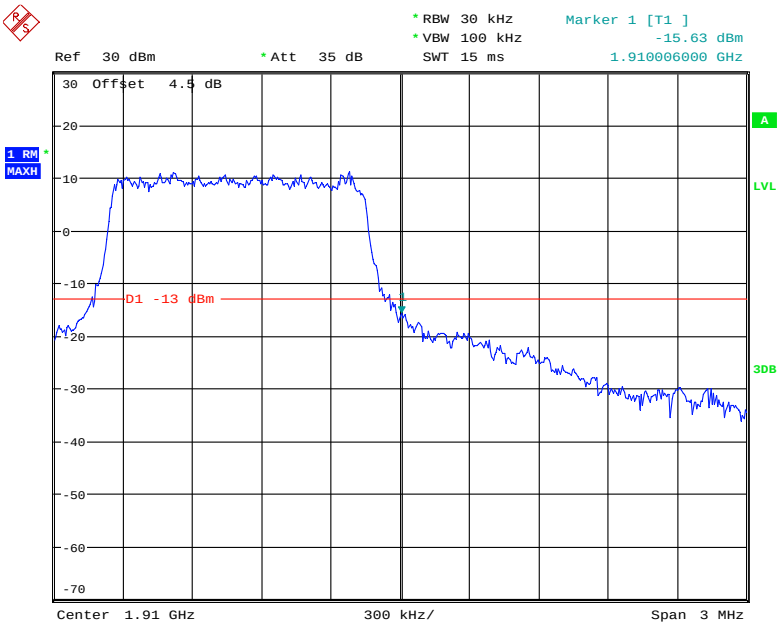
LTE Band II

QPSK_1.4MHz_ 6 RB_ Left



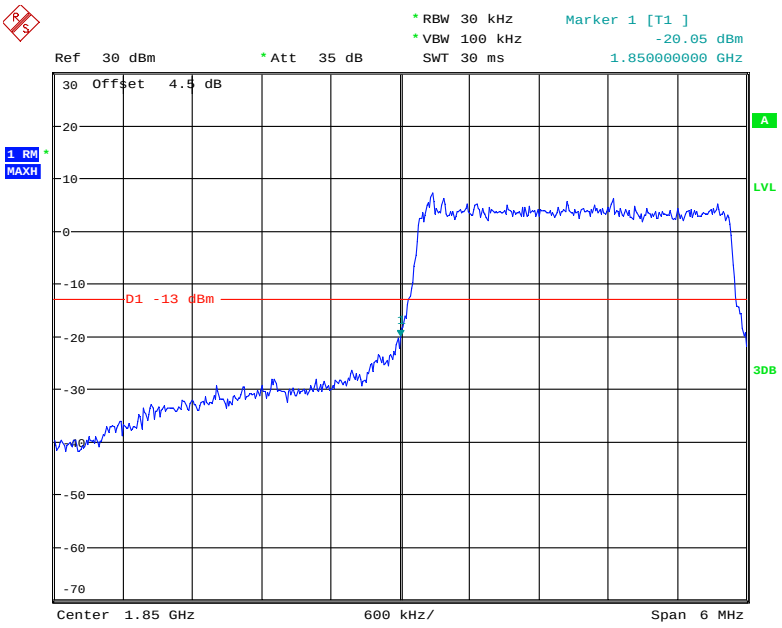
Date: 18.DEC.2018 13:59:05

QPSK_1.4MHz_ 6 RB_ Right



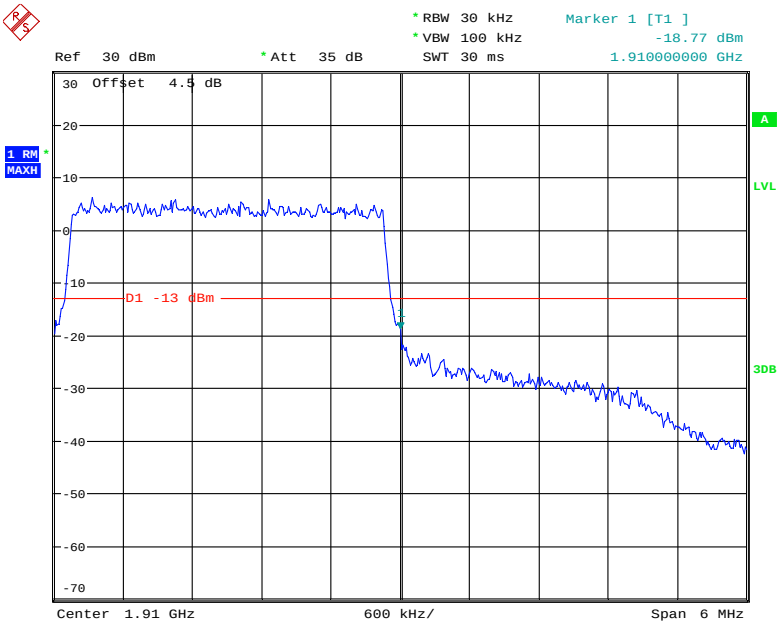
Date: 18.DEC.2018 14:00:16

QPSK_3MHz_ 15 RB_ Left



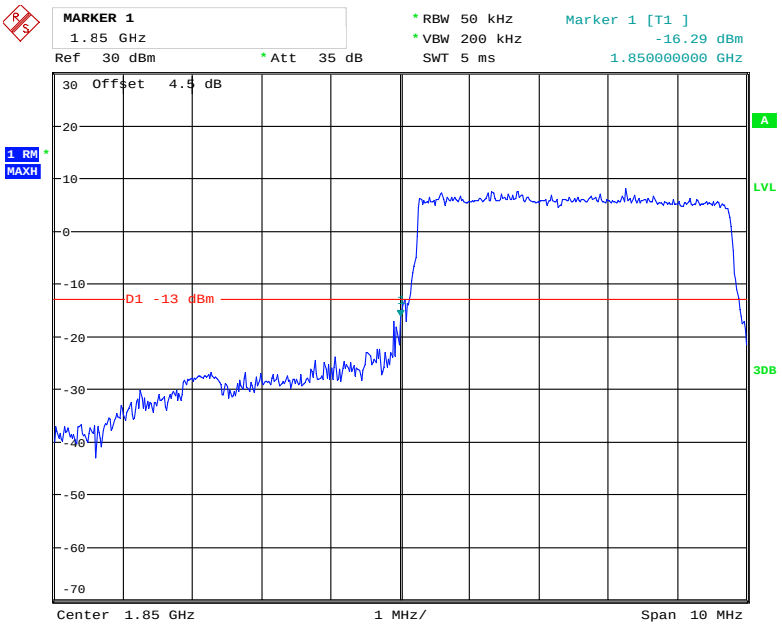
Date: 18.DEC.2018 14:01:21

QPSK_3MHz_ 15 RB_ Right



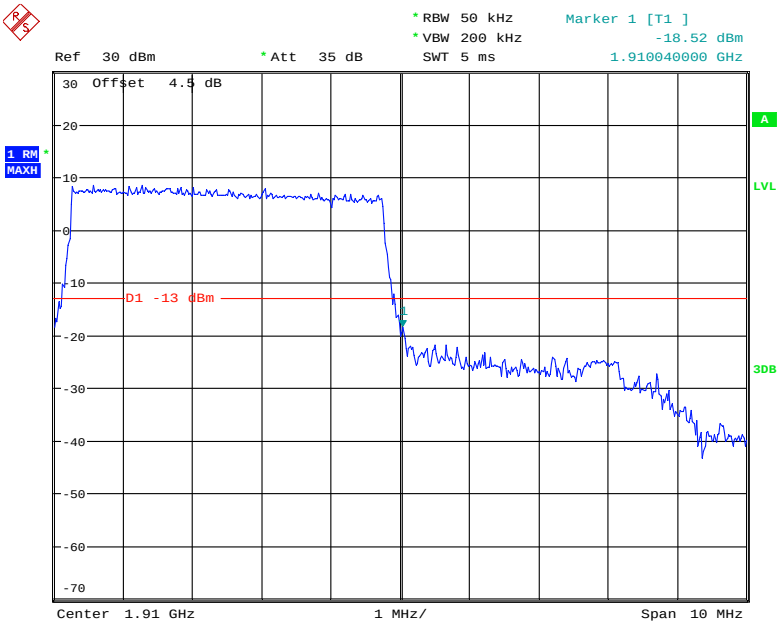
Date: 18.DEC.2018 14:02:24

QPSK_5MHz_ 25 RB_ Left



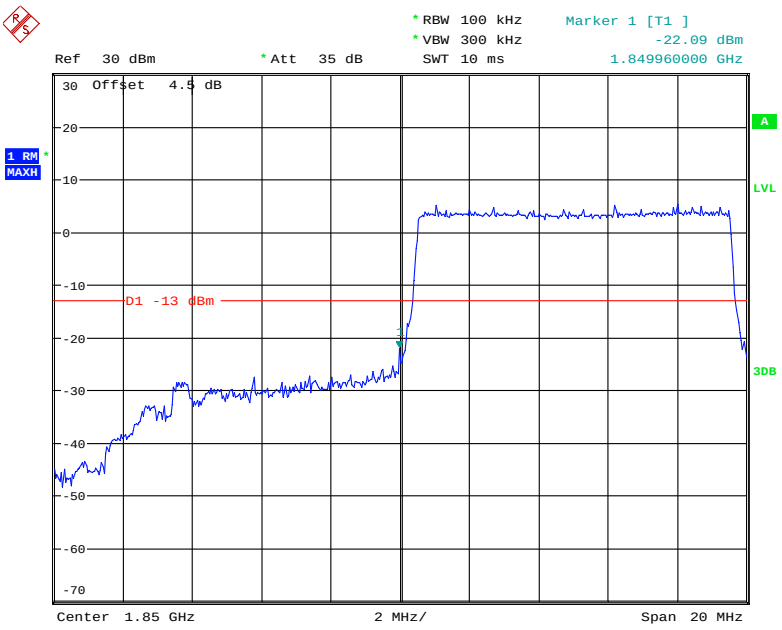
Date: 18.DEC.2018 14:04:09

QPSK_5MHz_ 25 RB_ Right



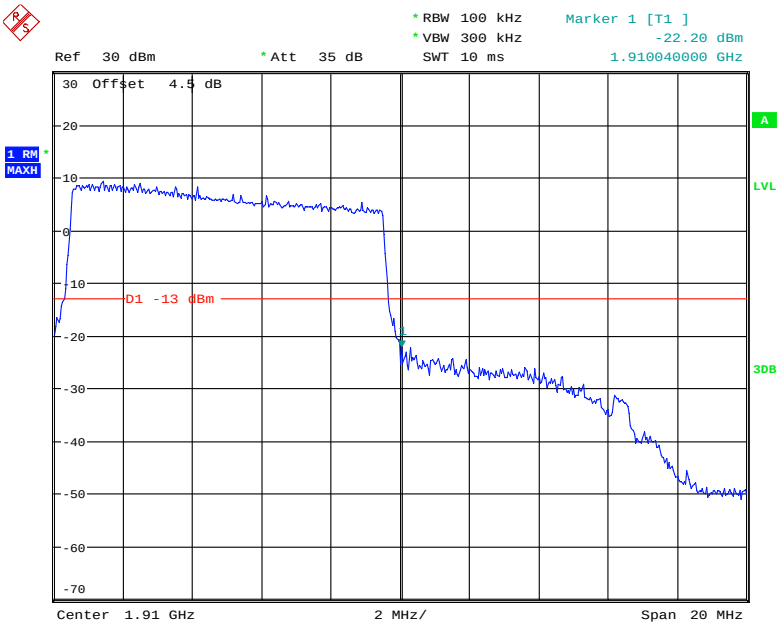
Date: 18.DEC.2018 14:05:31

QPSK_10MHz_ 50 RB_ Left



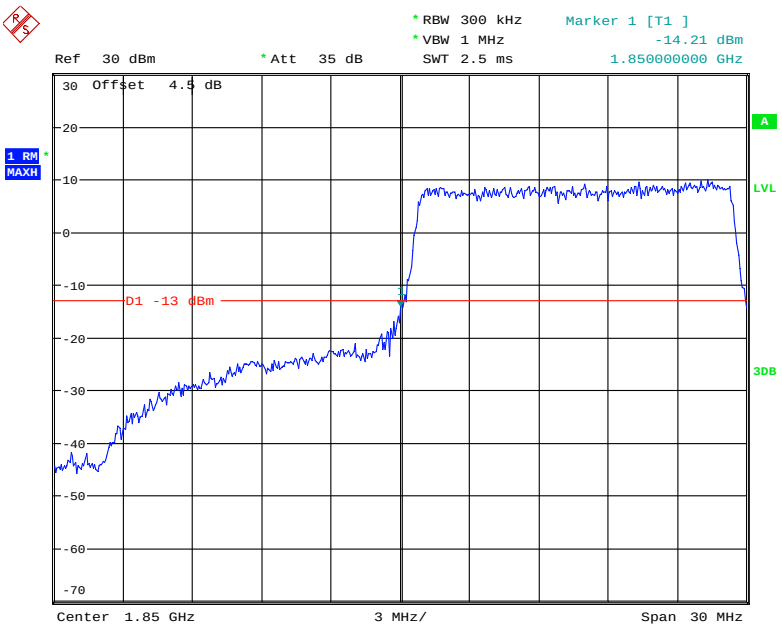
Date: 18.DEC.2018 14:06:43

QPSK_10MHz_ 50 RB_ Right



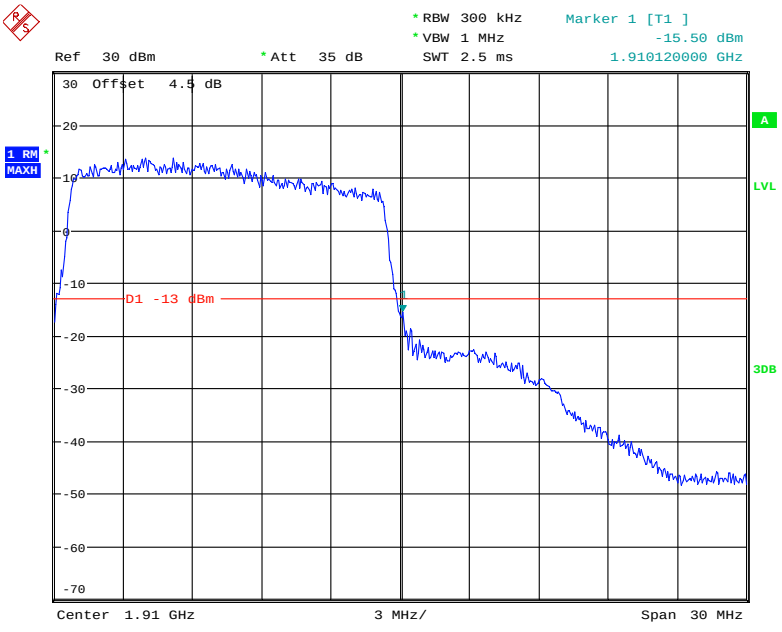
Date: 18.DEC.2018 14:07:42

QPSK_15MHz_ 75 RB_ Left



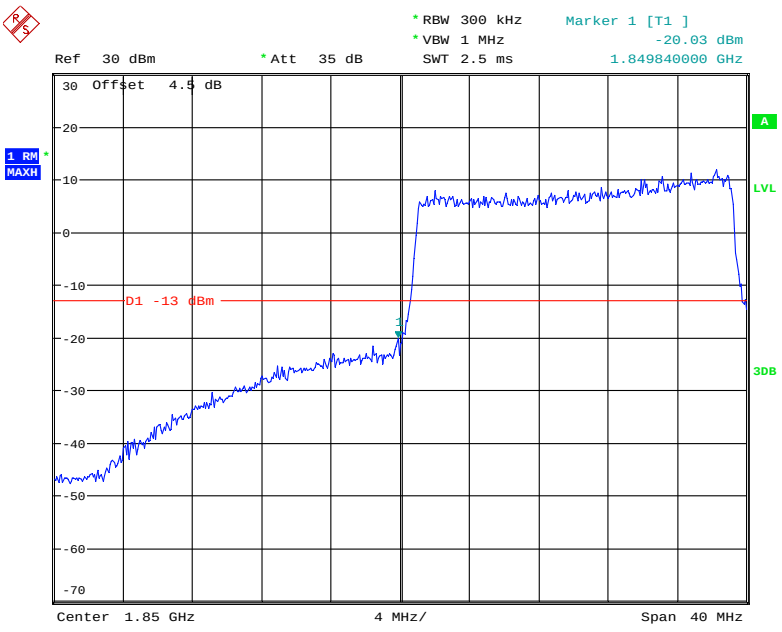
Date: 18.DEC.2018 14:09:06

QPSK_15MHz_ 75 RB_ Right



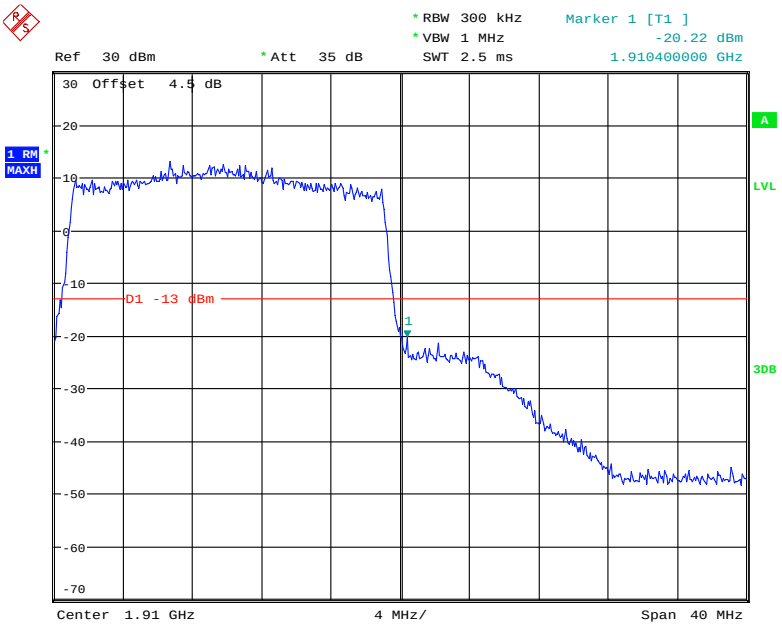
Date: 18.DEC.2018 14:10:29

QPSK_20MHz_ FULL RB_ Left



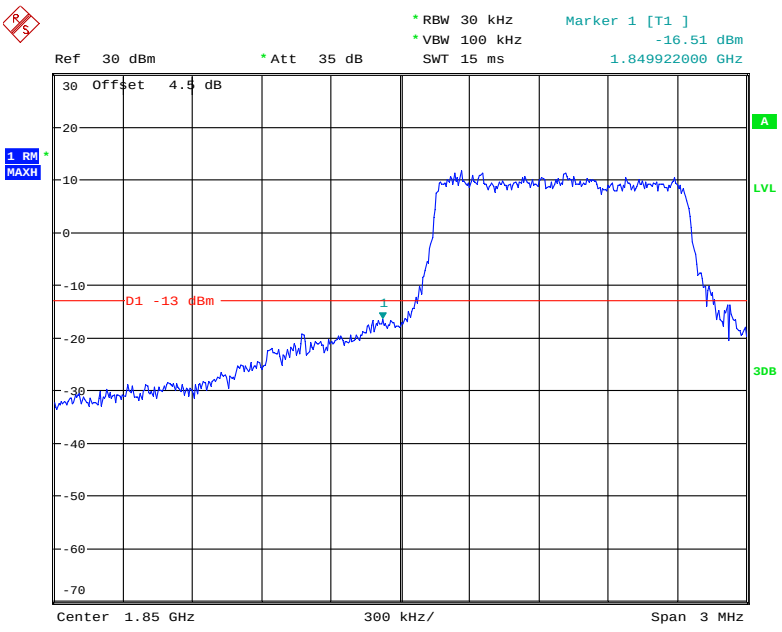
Date: 18.DEC.2018 14:11:48

QPSK_20MHz_ FULL RB_ Right



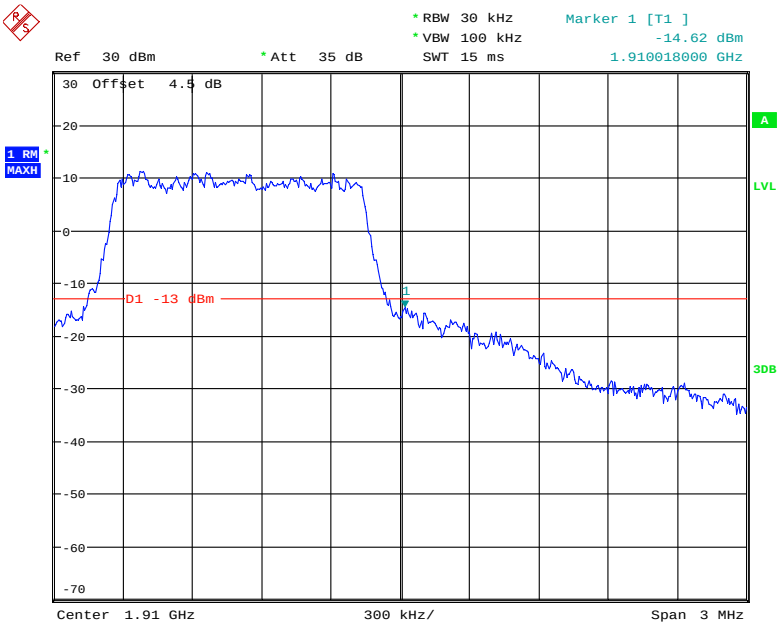
Date: 18.DEC.2018 14:13:08

16QAM_1.4MHz_ 6 RB_ Left



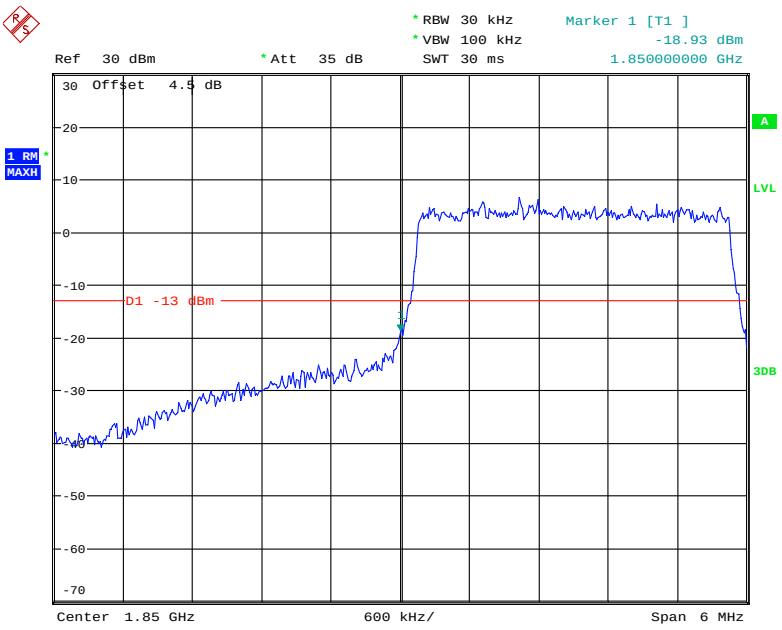
Date: 18.DEC.2018 13:59:34

16QAM_1.4MHz_ 6 RB_ Right



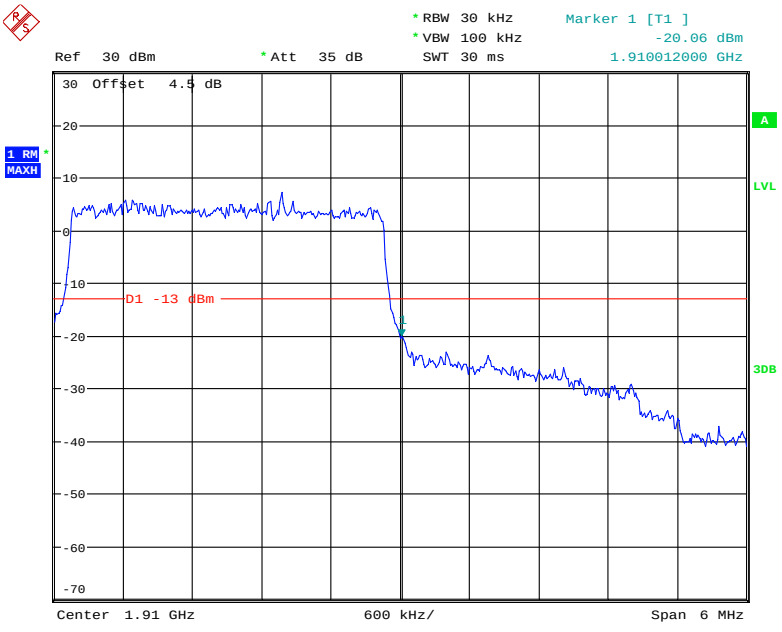
Date: 18.DEC.2018 14:00:52

16QAM_3MHz_ 15 RB_ Left



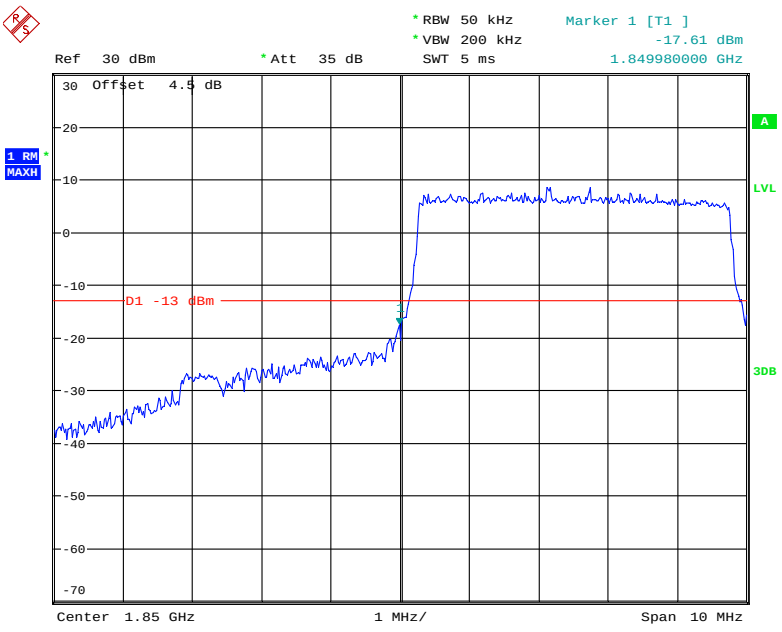
Date: 18.DEC.2018 14:01:50

16QAM_3MHz_ 15 RB_ Right



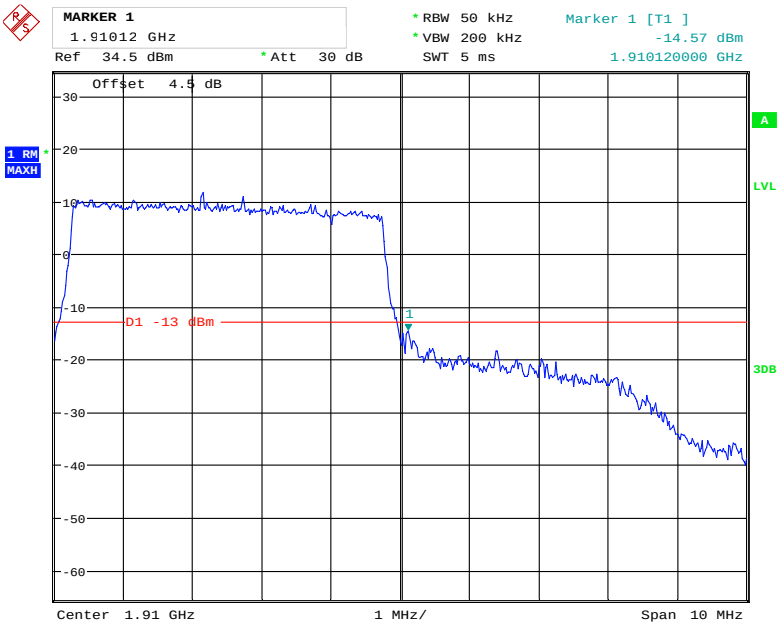
Date: 18.DEC.2018 14:02:57

16QAM_5MHz_ 25 RB_ Left



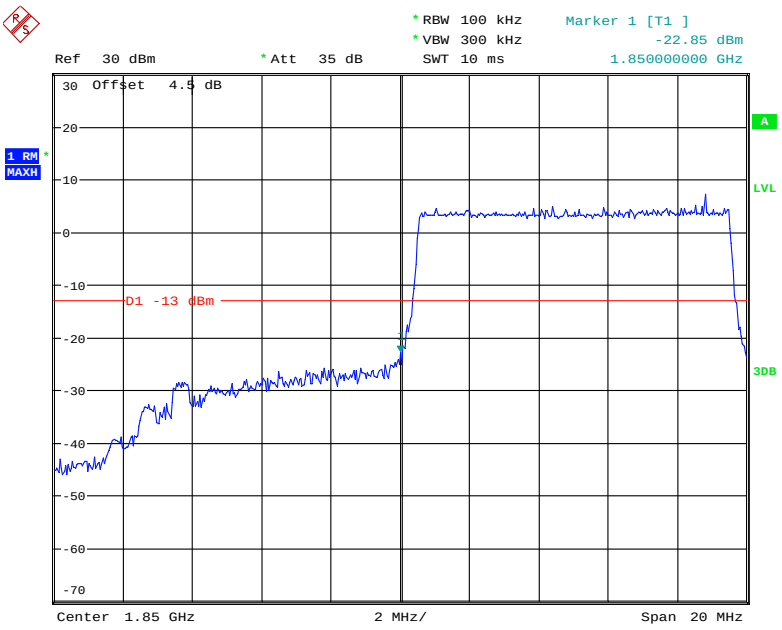
Date: 18.DEC.2018 14:04:52

16QAM_5MHz_ 25 RB_ Right



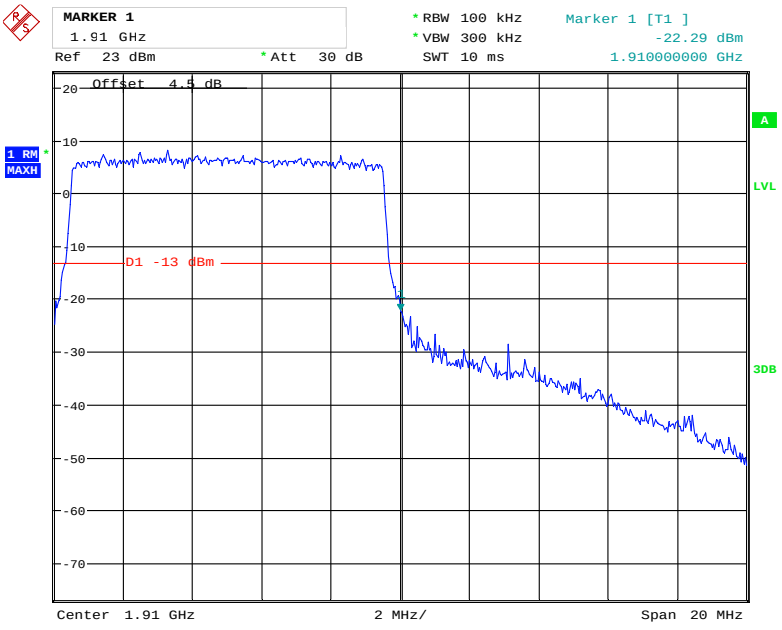
Date: 19.DEC.2018 11:25:48

16QAM_10MHz_ 50 RB_ Left



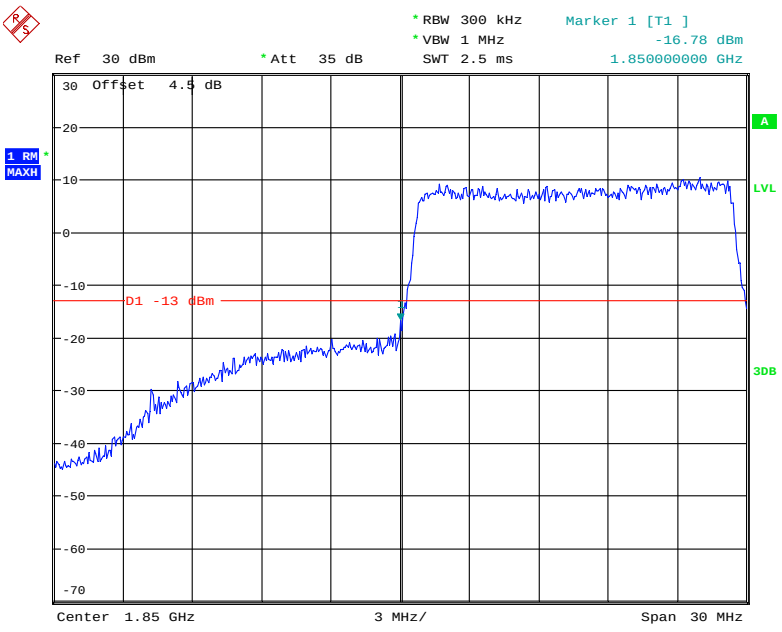
Date: 18.DEC.2018 14:07:14

16QAM_10MHz_ 50 RB_ Right



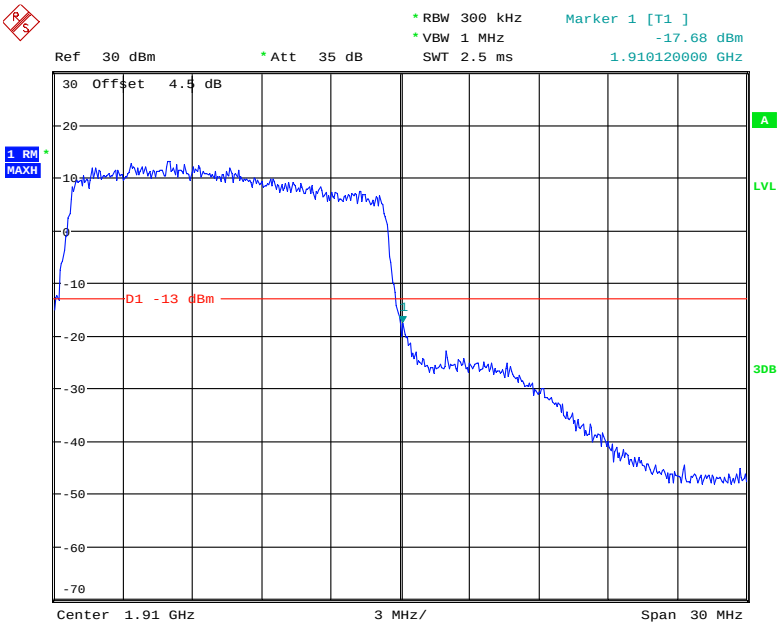
Date: 25.DEC.2018 16:51:32

16QAM_15MHz_ 75 RB_ Left



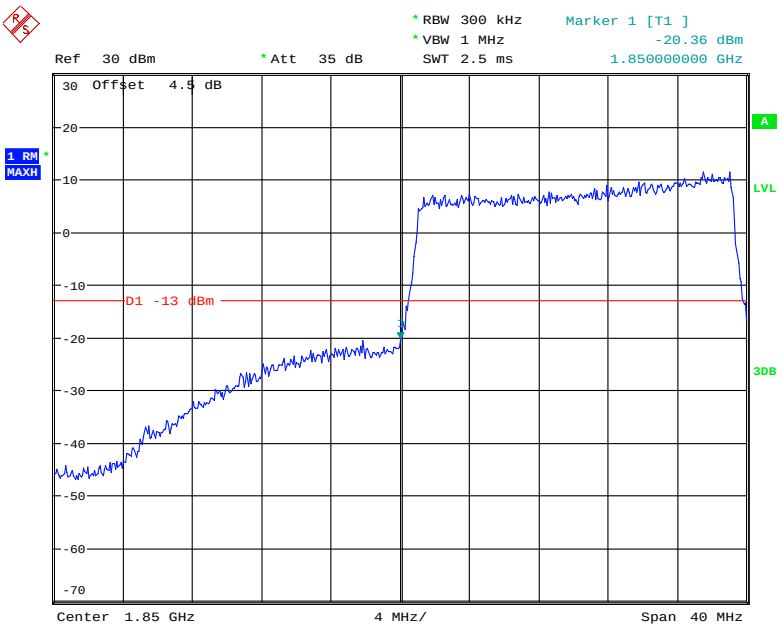
Date: 18.DEC.2018 14:09:51

16QAM_15MHz_ 75 RB_ Right



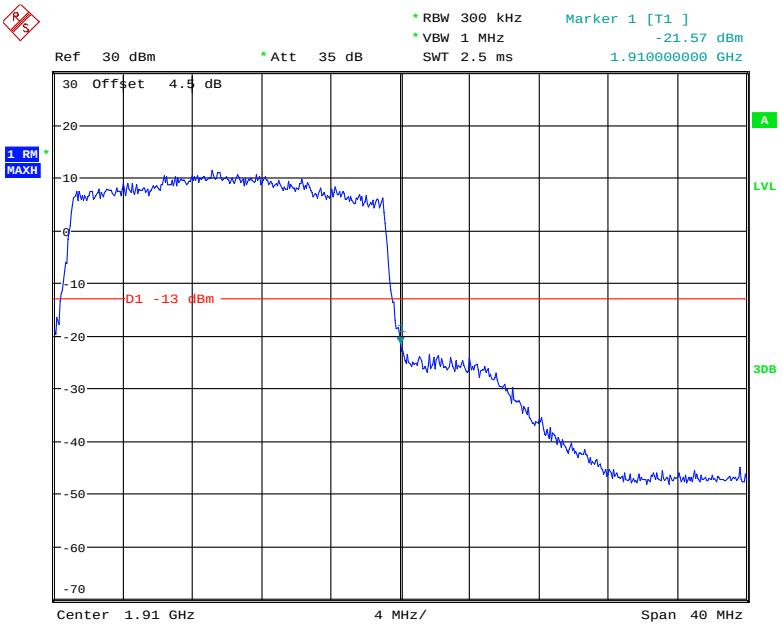
Date: 18.DEC.2018 14:11:11

16QAM_20MHz_ FULL RB_ Left



Date: 18.DEC.2018 14:12:29

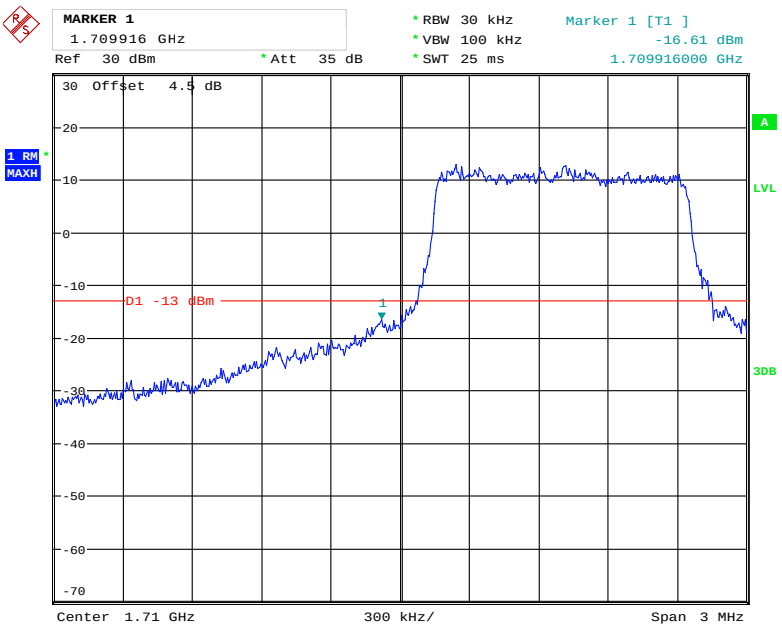
16QAM_20MHz_ FULL RB_ Right



Date: 18.DEC.2018 14:13:45

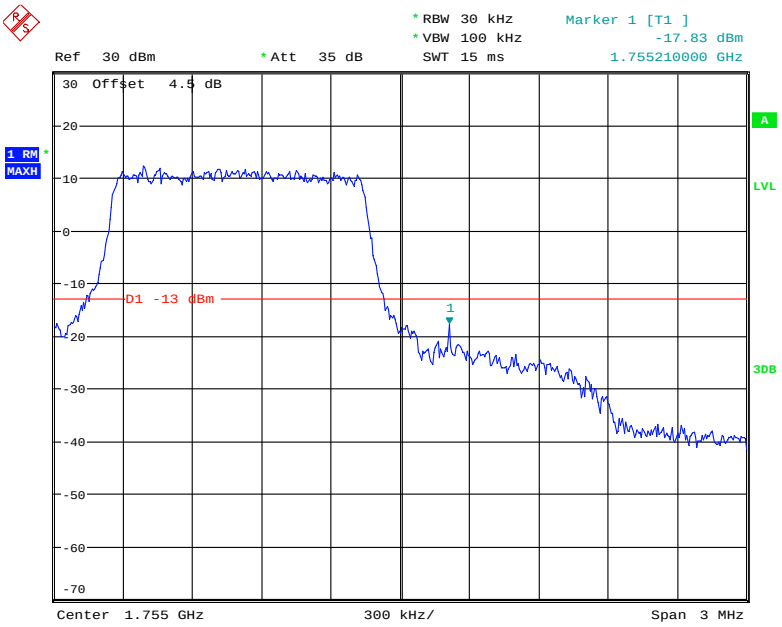
LTE Band IV

QPSK_1.4MHz_ 6 RB_ Left



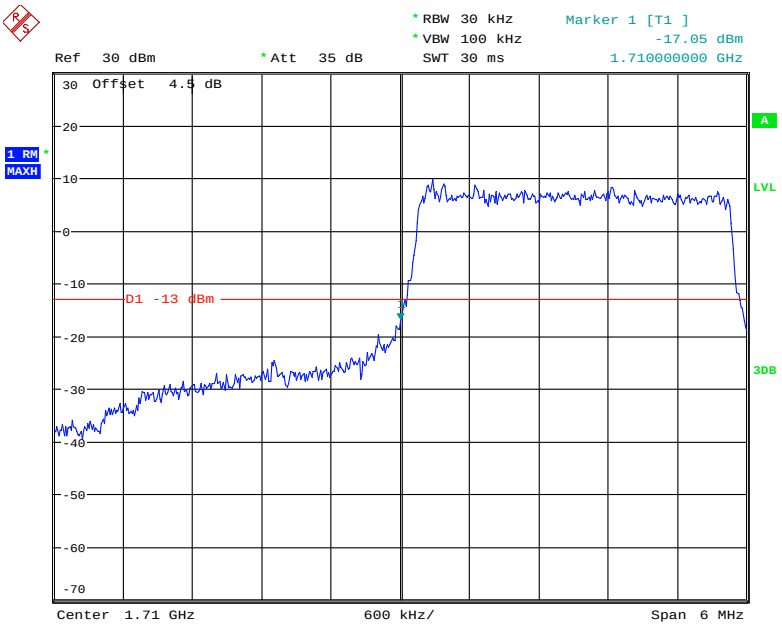
Date: 18.DEC.2018 15:23:40

QPSK_1.4MHz_ 6 RB_ Right



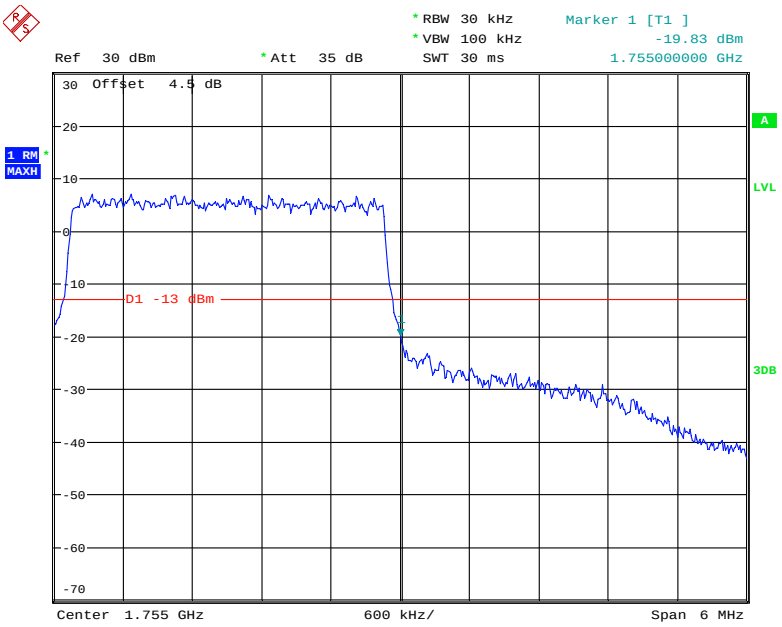
Date: 18.DEC.2018 14:15:56

QPSK_3MHz_ 15 RB_ Left



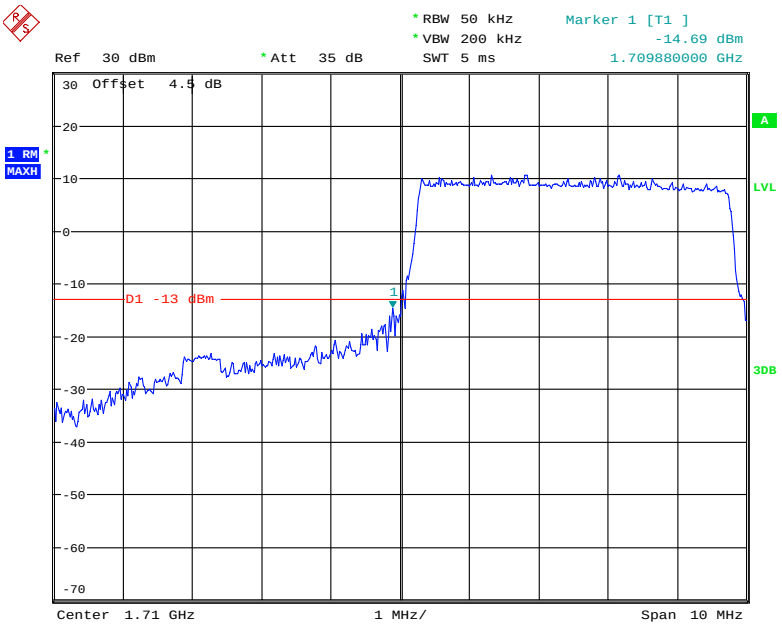
Date: 18.DEC.2018 14:17:05

QPSK_3MHz_ 15 RB_ Right



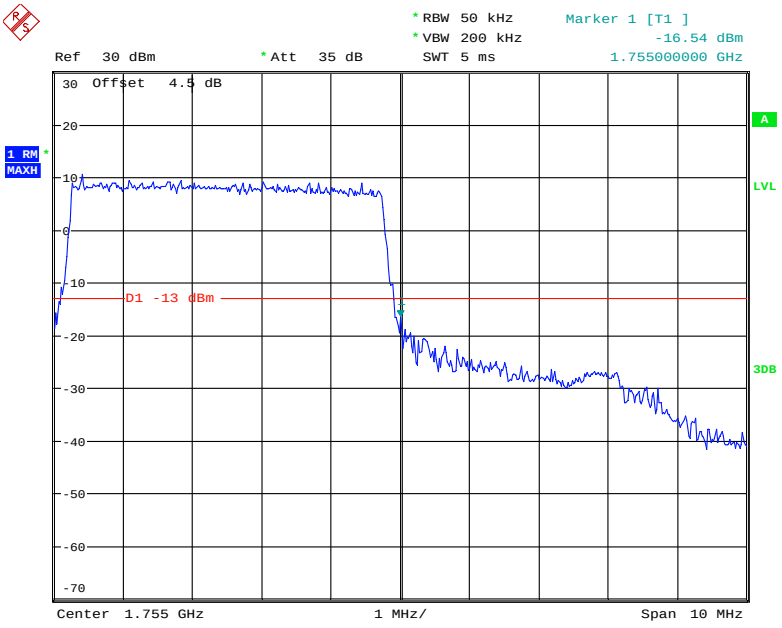
Date: 18.DEC.2018 14:18:08

QPSK_5MHz_ 25 RB_ Left



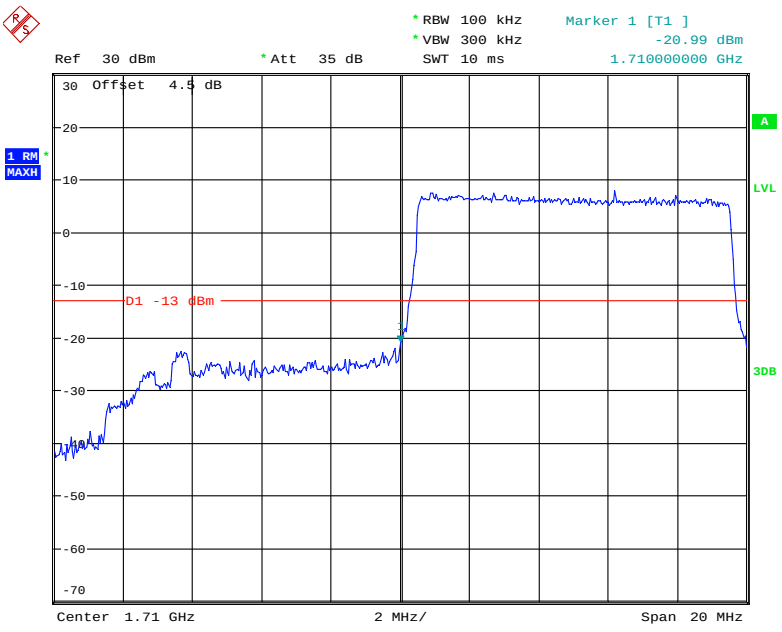
Date: 18.DEC.2018 14:19:33

QPSK_5MHz_ 25 RB_ Right



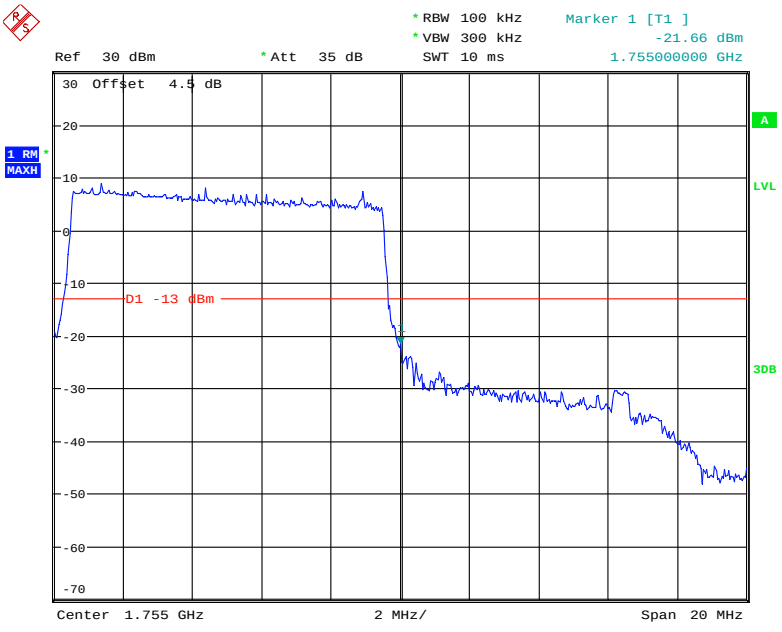
Date: 18.DEC.2018 14:21:04

QPSK_10MHz_ 50 RB_ Left



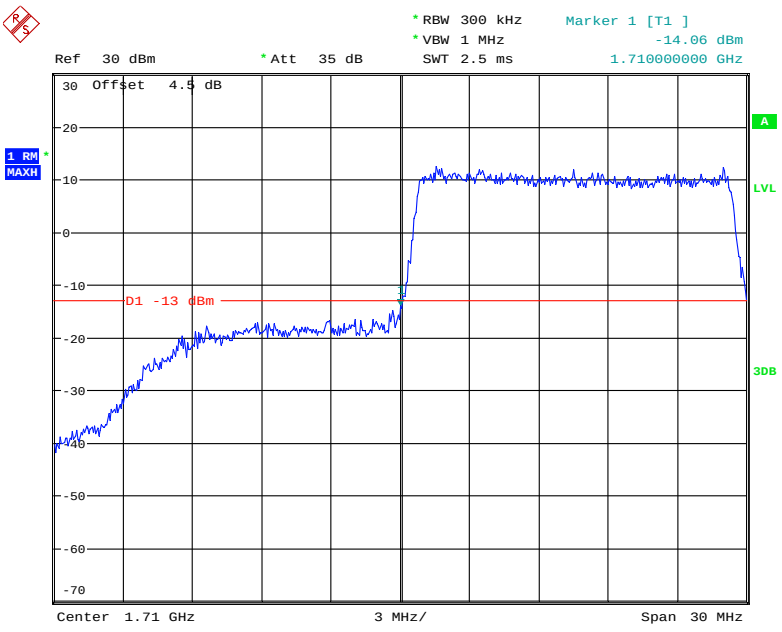
Date: 18.DEC.2018 14:22:22

QPSK_10MHz_ 50 RB_ Right



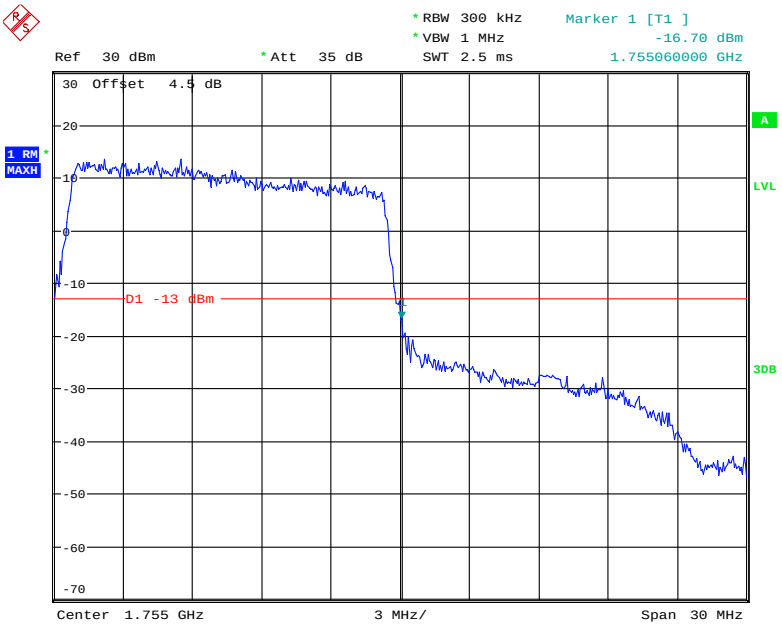
Date: 18.DEC.2018 14:23:24

QPSK_15MHz_ 75 RB_ Left



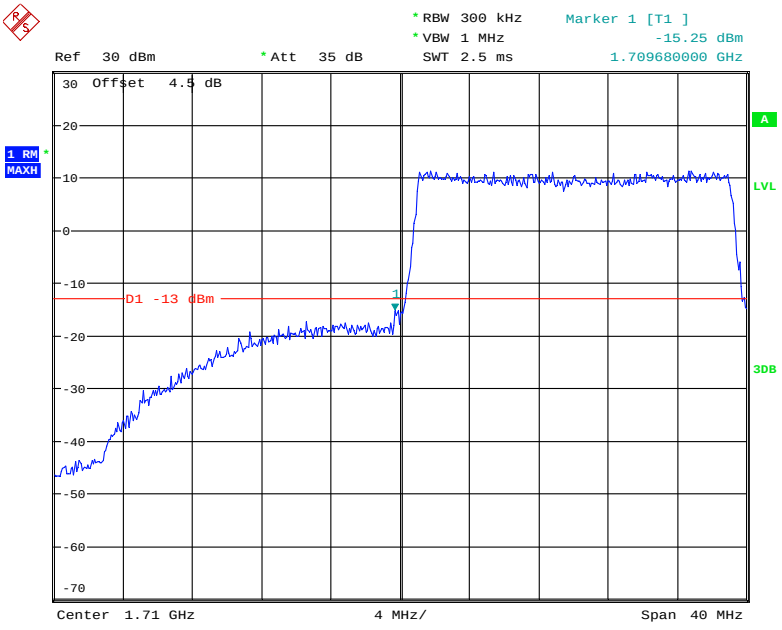
Date: 18.DEC.2018 14:26:39

QPSK_15MHz_ 75 RB_ Right



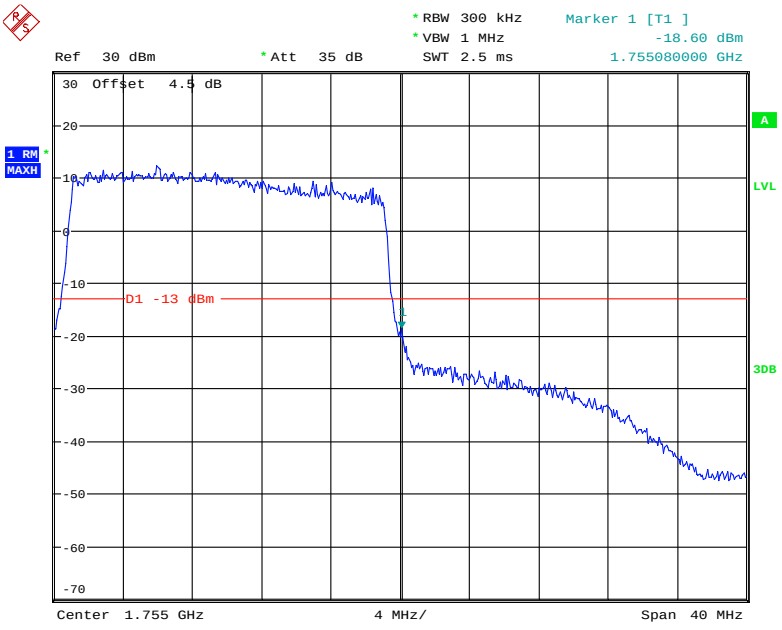
Date: 18.DEC.2018 14:27:48

QPSK_20MHz_ FULL RB_ Left



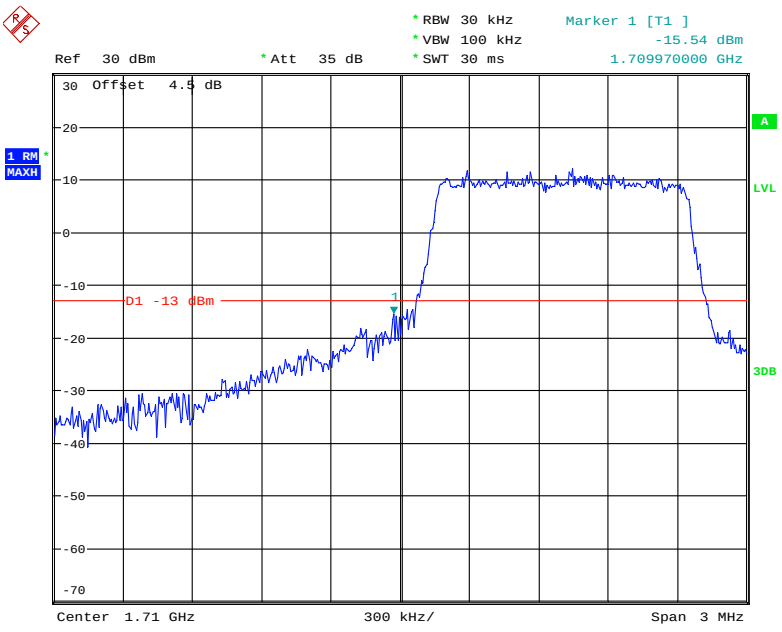
Date: 18.DEC.2018 14:33:43

QPSK_20MHz_ FULL RB_ Right



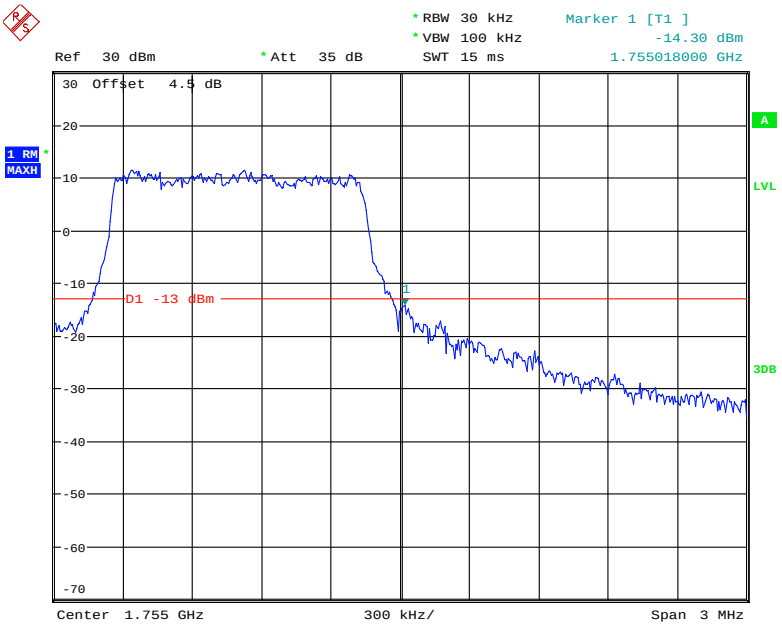
Date: 18.DEC.2018 14:35:00

16QAM_1.4MHz_ 6 RB_ Left



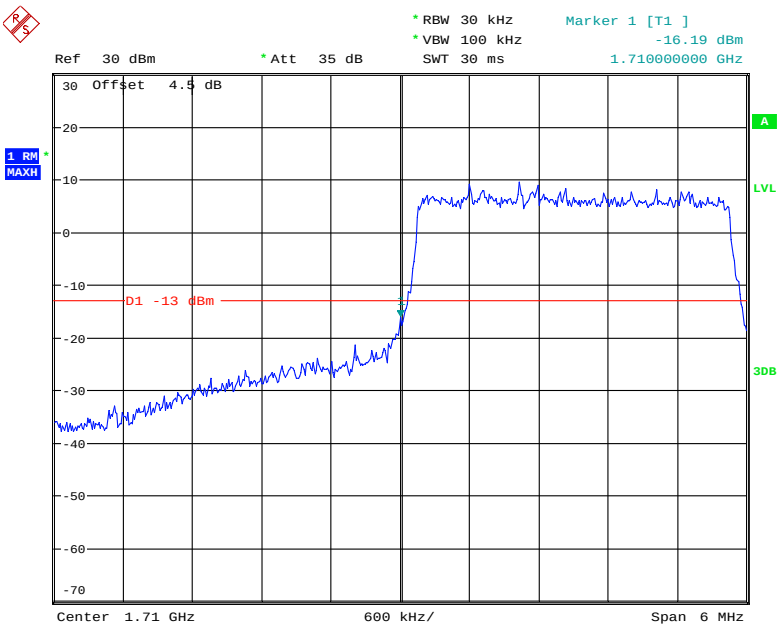
Date: 18.DEC.2018 14:15:18

16QAM_1.4MHz_ 6 RB_ Right



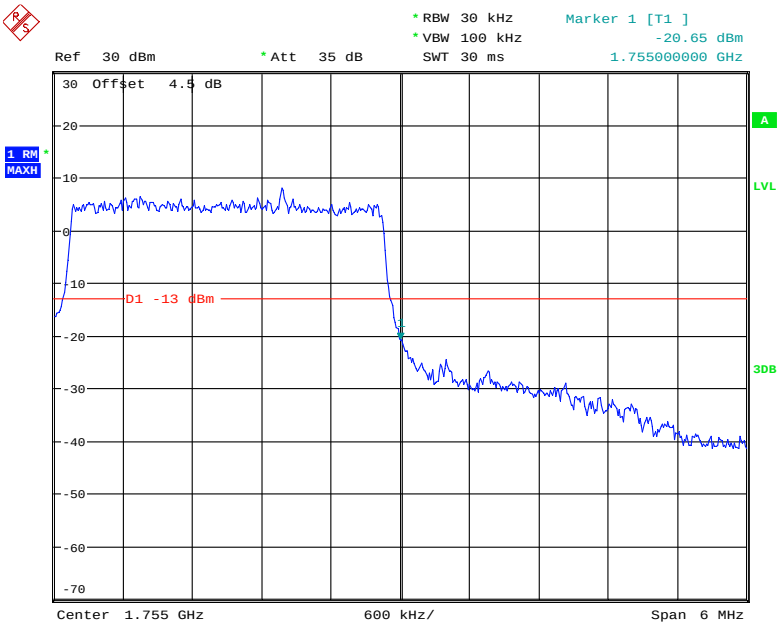
Date: 18.DEC.2018 14:16:32

16QAM_3MHz_ 15 RB_ Left



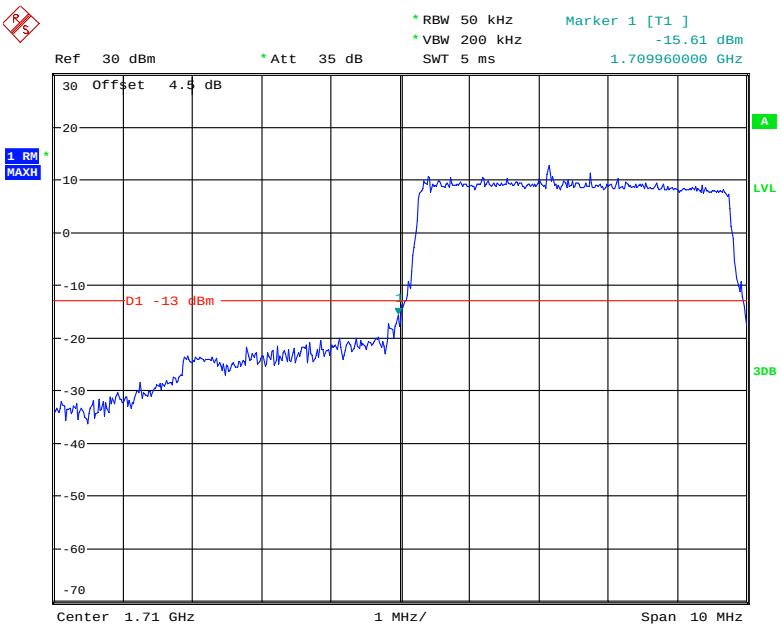
Date: 18.DEC.2018 14:17:38

16QAM_3MHz_ 15 RB_ Right



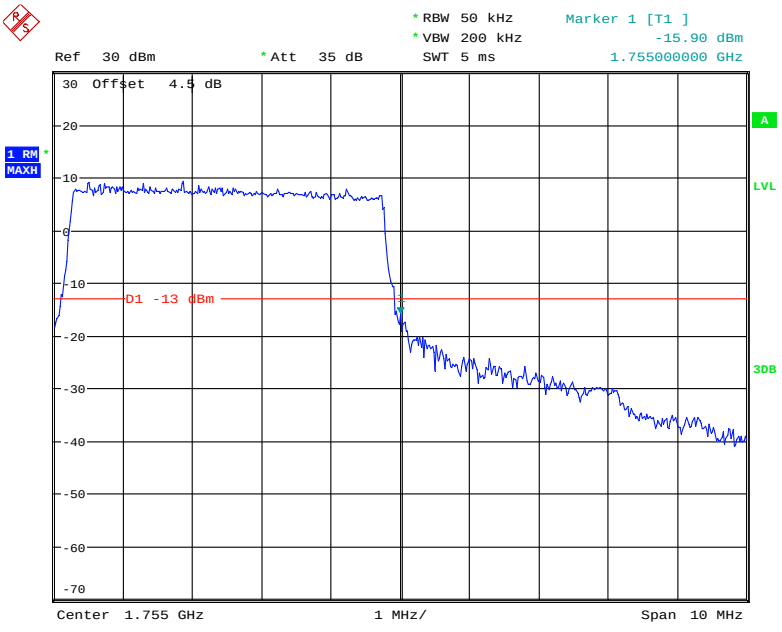
Date: 18.DEC.2018 14:18:37

16QAM_5MHz_ 25 RB_ Left



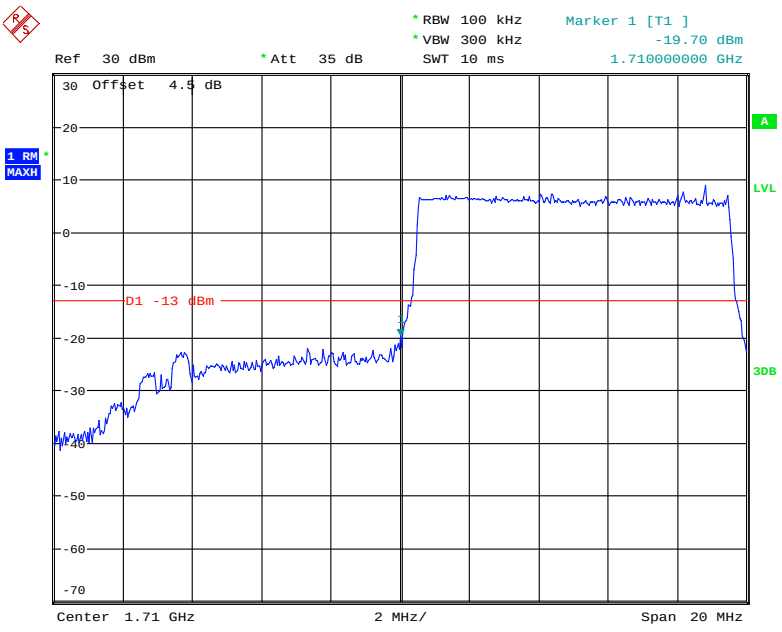
Date: 18.DEC.2018 14:20:25

16QAM_5MHz_ 25 RB_ Right



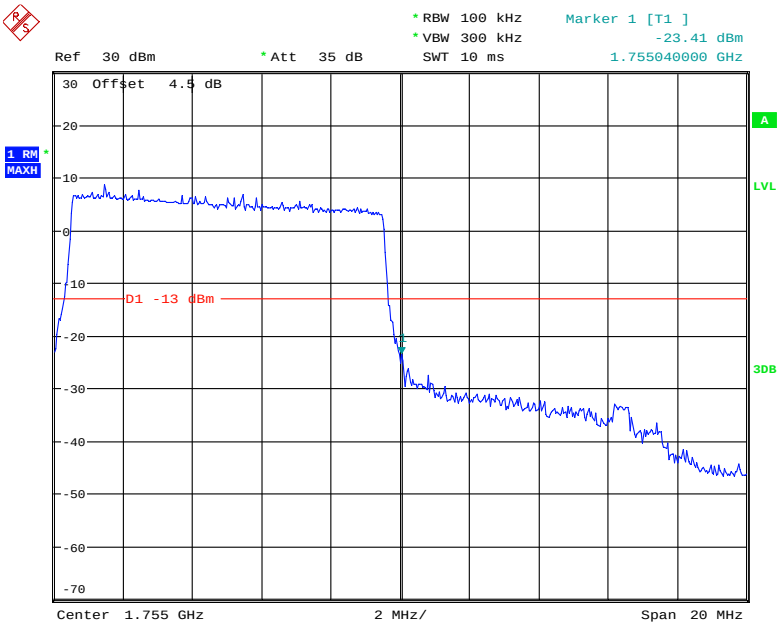
Date: 18.DEC.2018 14:21:49

16QAM_10MHz_ 50 RB_ Left



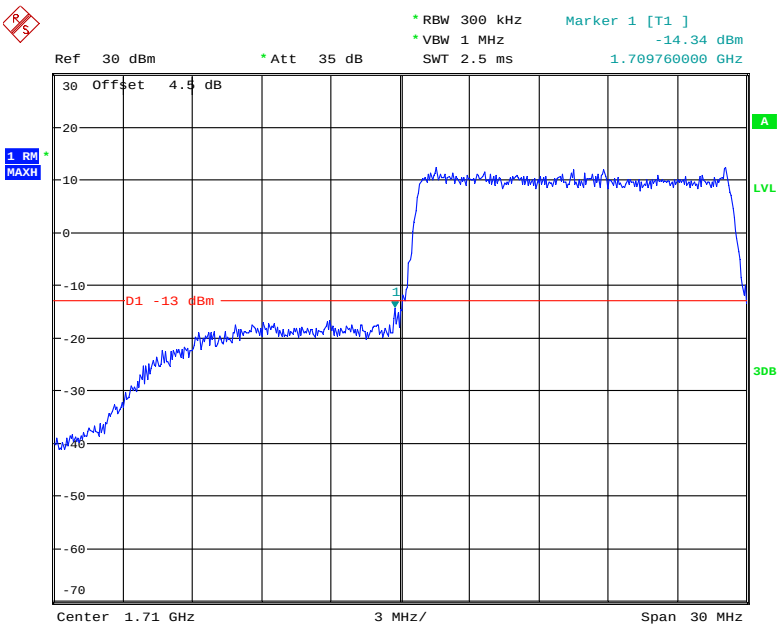
Date: 18.DEC.2018 14:22:53

16QAM_10MHz_ 50 RB_ Right



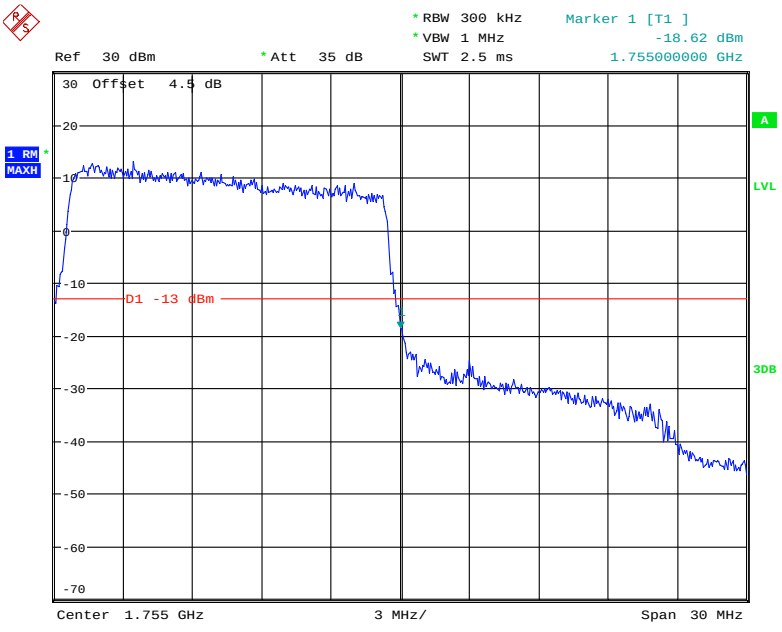
Date: 18.DEC.2018 14:23:55

16QAM_15MHz_ 75 RB_ Left



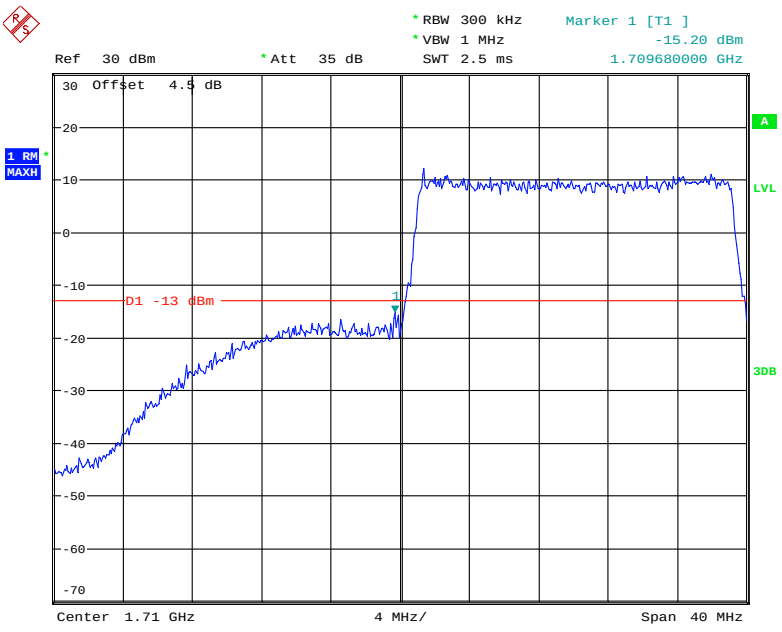
Date: 18.DEC.2018 14:27:16

16QAM_15MHz_ 75 RB_ Right



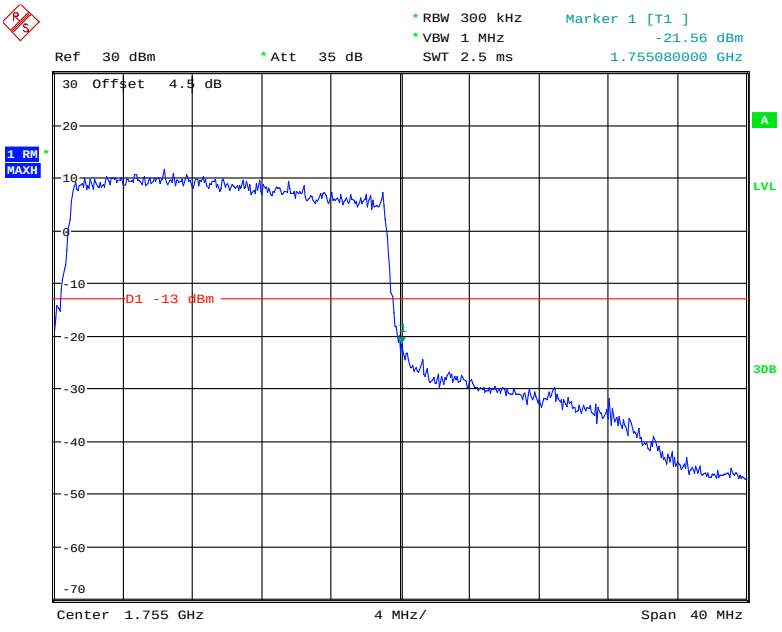
Date: 18.DEC.2018 14:28:36

16QAM_20MHz_ FULL RB_ Left



Date: 18.DEC.2018 14:34:19

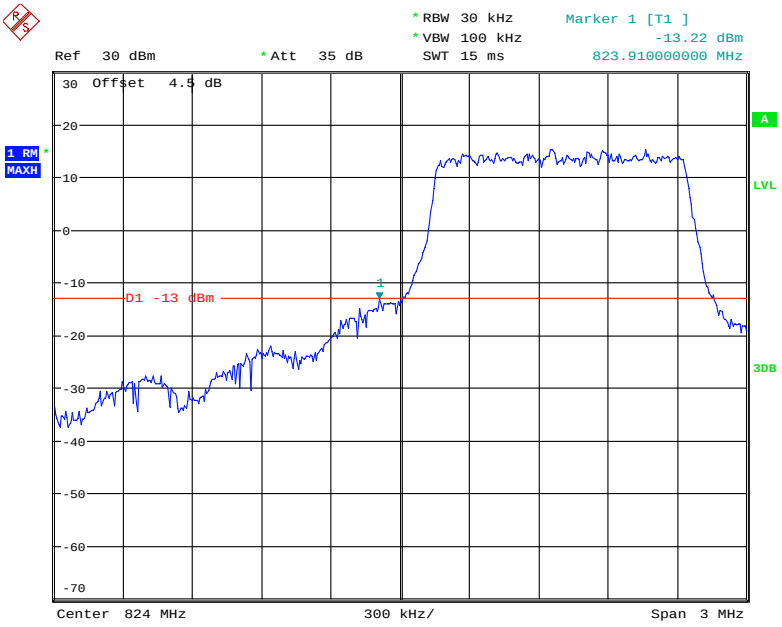
16QAM_20MHz_ FULL RB_ Right



Date: 18.DEC.2018 14:35:48

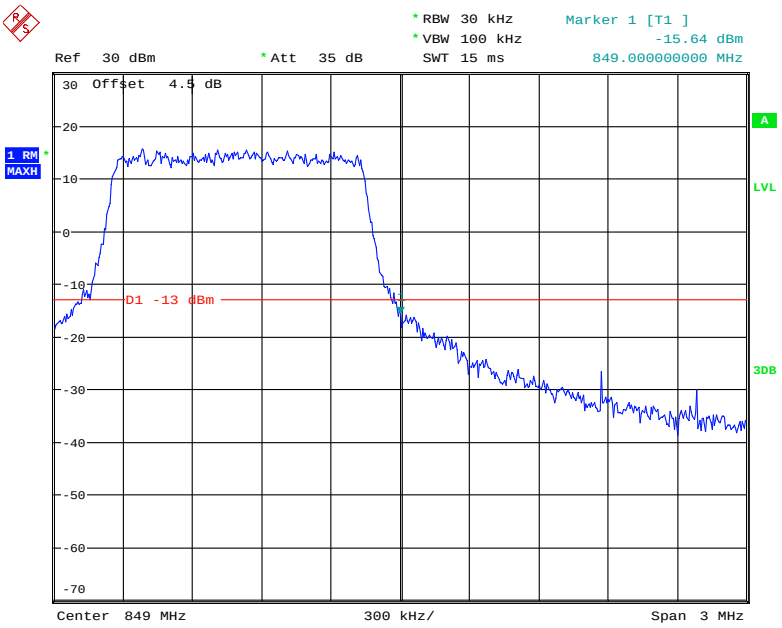
LTE Band V

QPSK_1.4MHz_ 6 RB_ Left



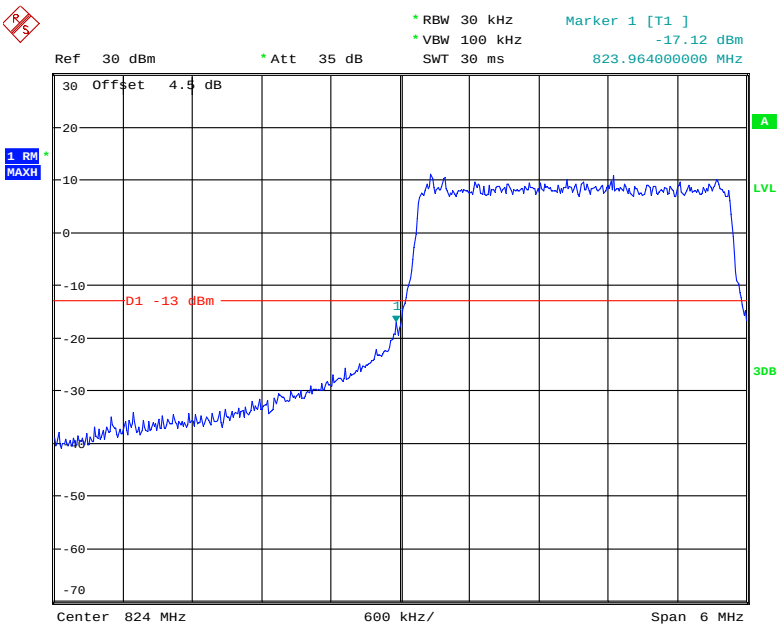
Date: 18.DEC.2018 14:36:35

QPSK_1.4MHz_ 6 RB_ Right



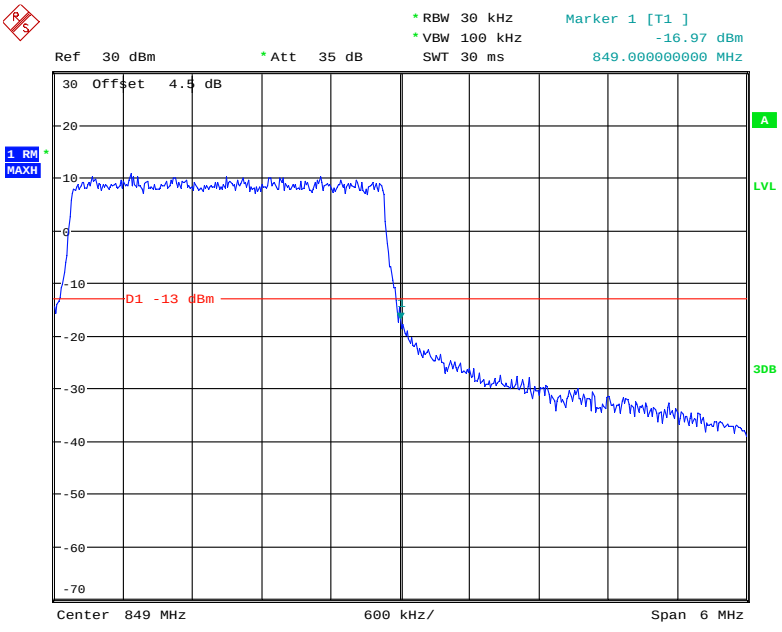
Date: 18.DEC.2018 14:37:54

QPSK_3MHz_ 15 RB_ Left



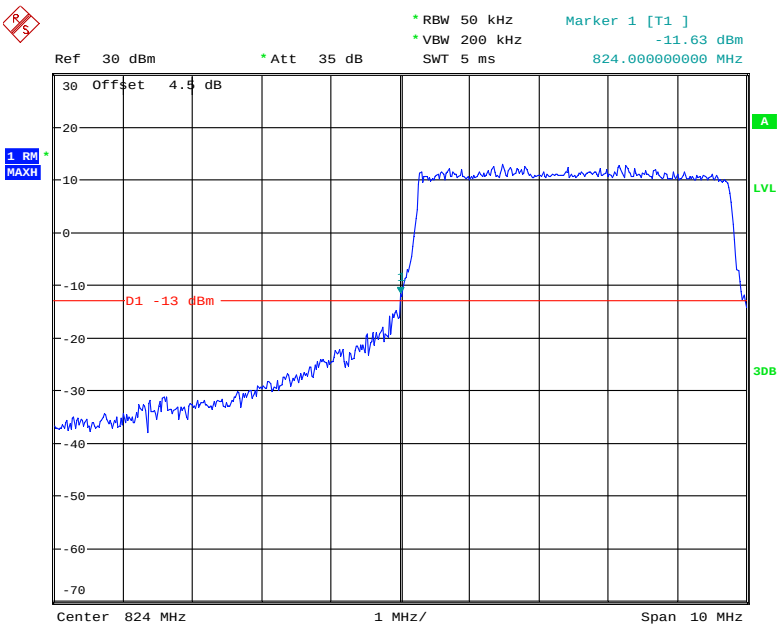
Date: 18.DEC.2018 14:38:56

QPSK_3MHz_ 15 RB_ Right



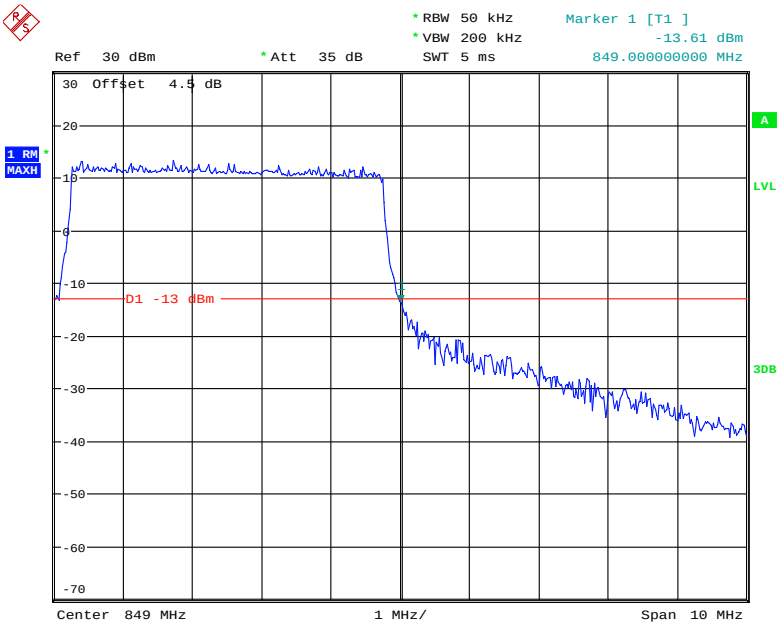
Date: 18.DEC.2018 14:39:59

QPSK_5MHz_ 25 RB_ Left



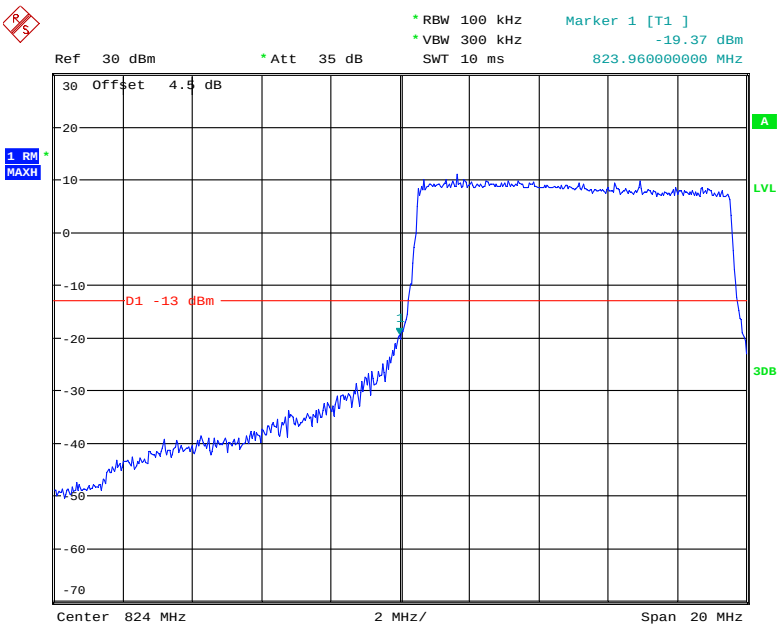
Date: 18.DEC.2018 14:41:46

QPSK_5MHz_ 25 RB_ Right



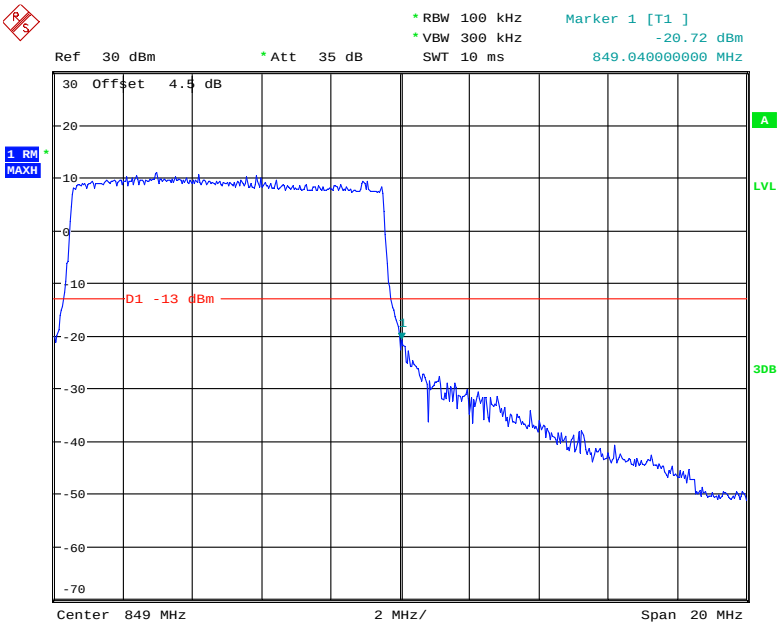
Date: 18.DEC.2018 14:43:47

QPSK_10MHz_ 50 RB_ Left



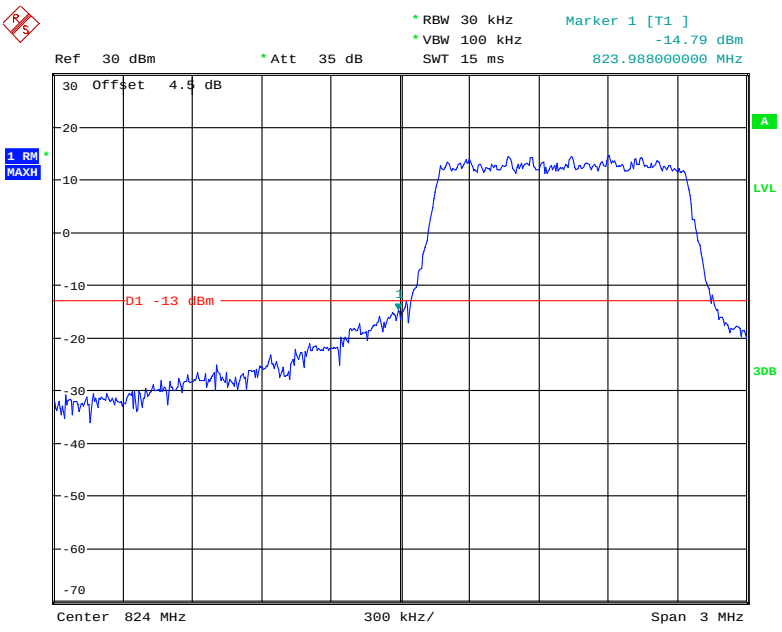
Date: 18.DEC.2018 14:45:32

QPSK_10MHz_ 50 RB_ Right



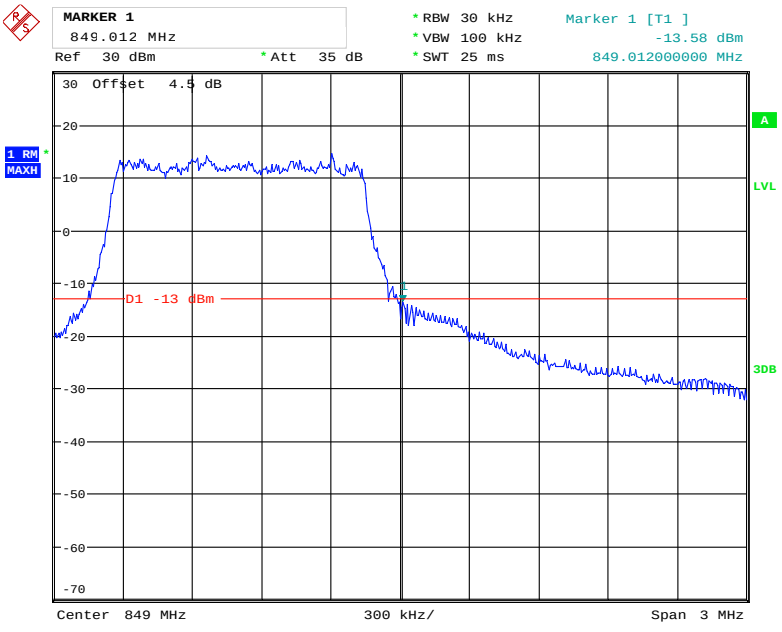
Date: 18.DEC.2018 14:46:52

16QAM_1.4MHz_ 6 RB_ Left



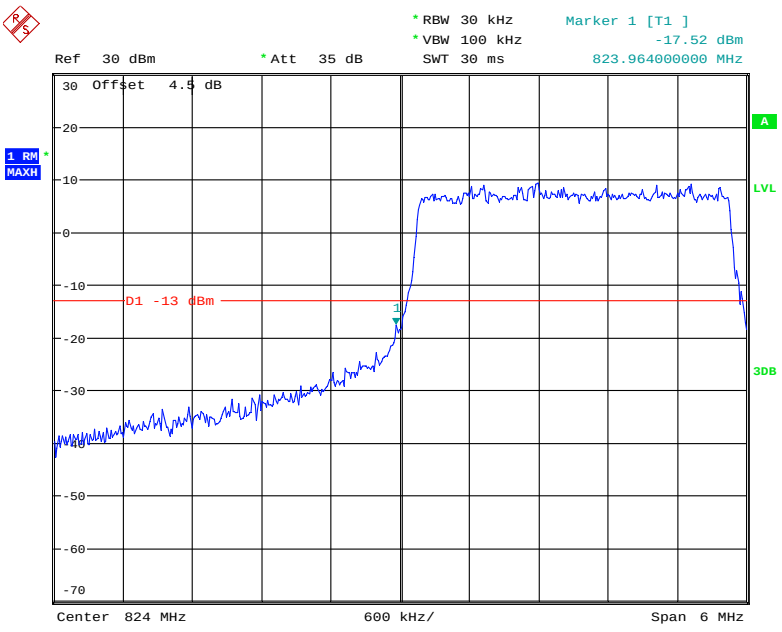
Date: 18.DEC.2018 14:37:16

16QAM_1.4MHz_ 6 RB_ Right



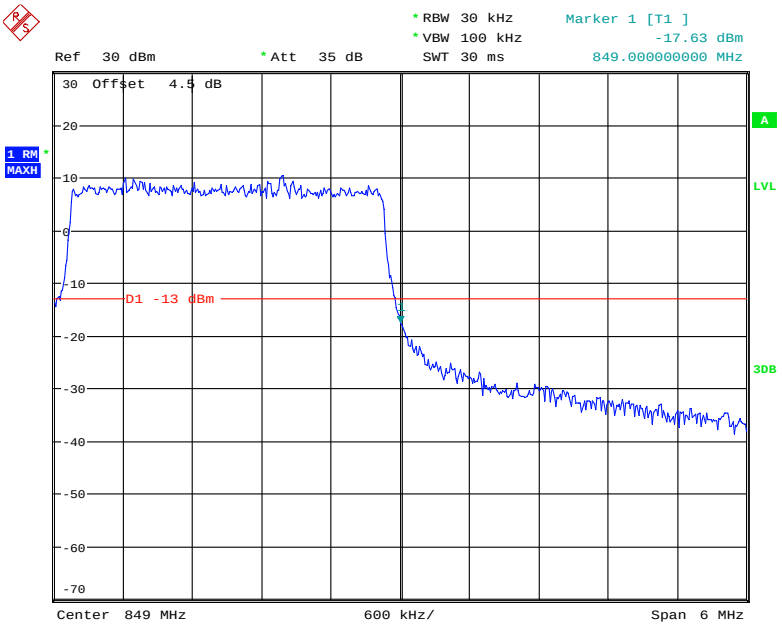
Date: 18.DEC.2018 15:24:46

16QAM_3MHz_ 15 RB_ Left



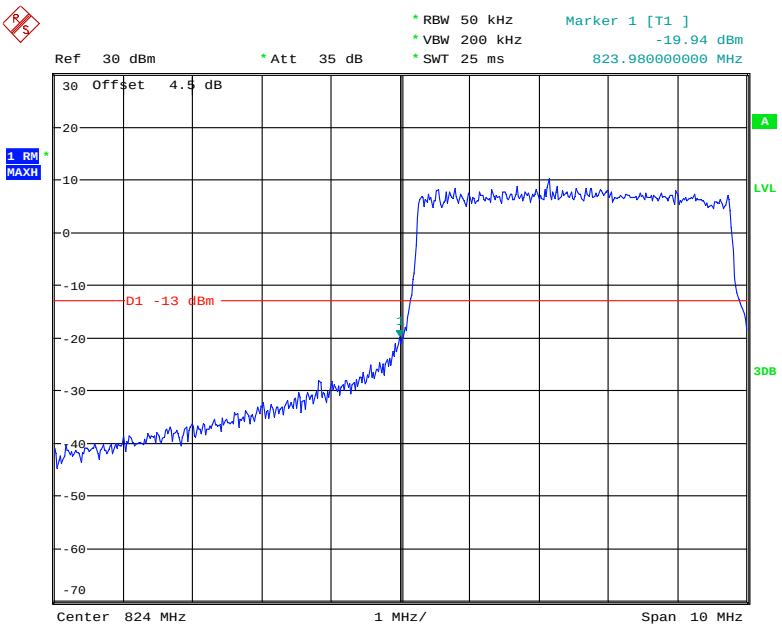
Date: 18.DEC.2018 14:39:22

16QAM_3MHz_ 15 RB_ Right



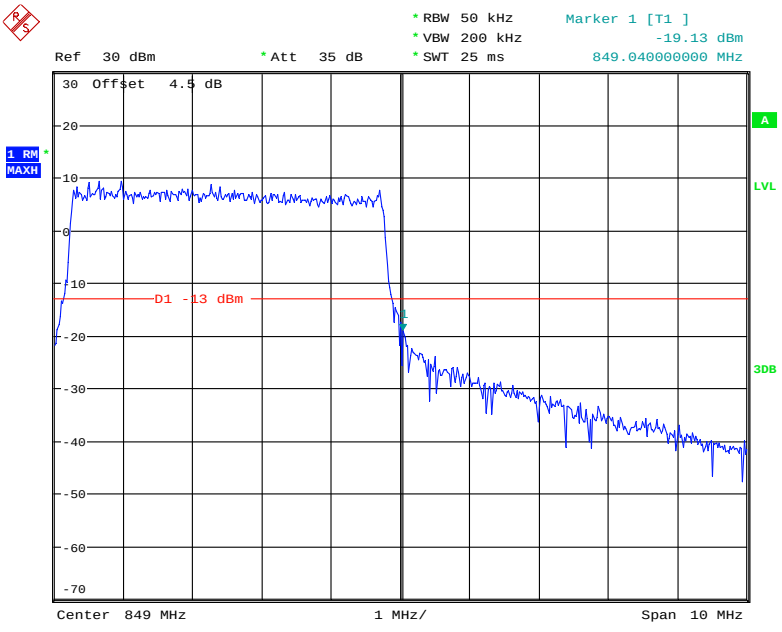
Date: 18.DEC.2018 14:40:36

16QAM_5MHz_ 25 RB_ Left



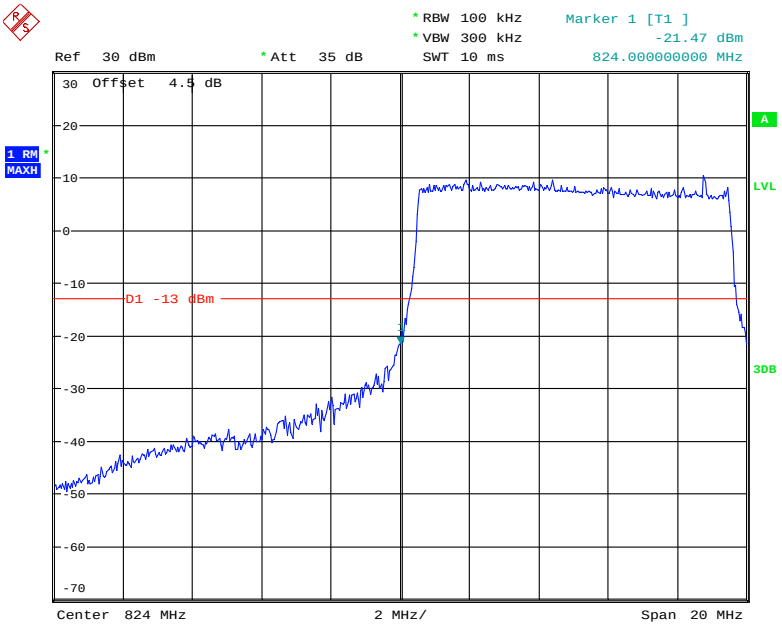
Date: 18.DEC.2018 14:42:51

16QAM_5MHz_ 25 RB_ Right



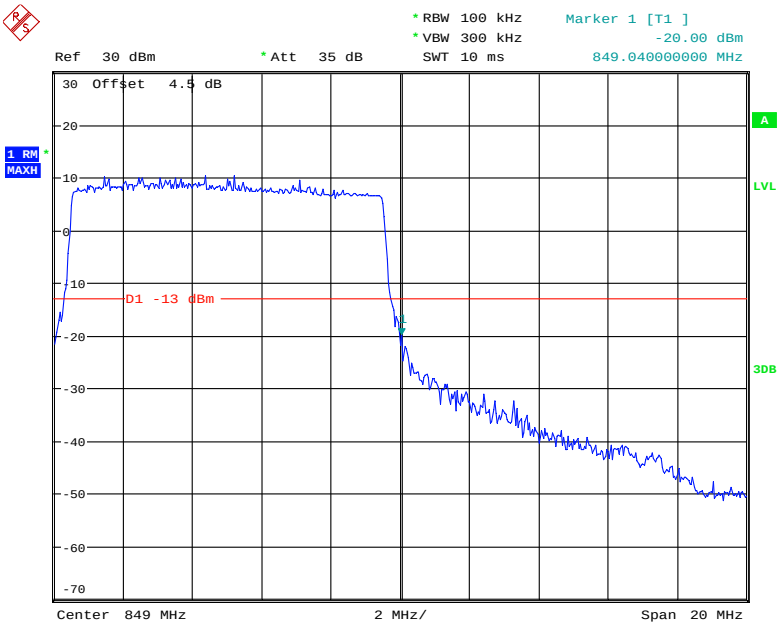
Date: 18.DEC.2018 14:44:54

16QAM_10MHz_ 50 RB_ Left



Date: 18.DEC.2018 14:46:13

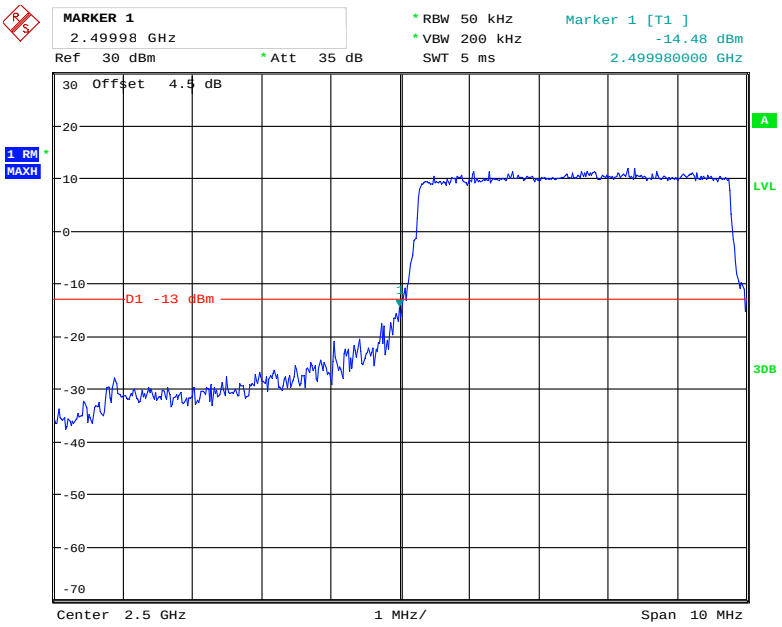
16QAM_10MHz_ 50 RB_ Right



Date: 18.DEC.2018 14:47:33

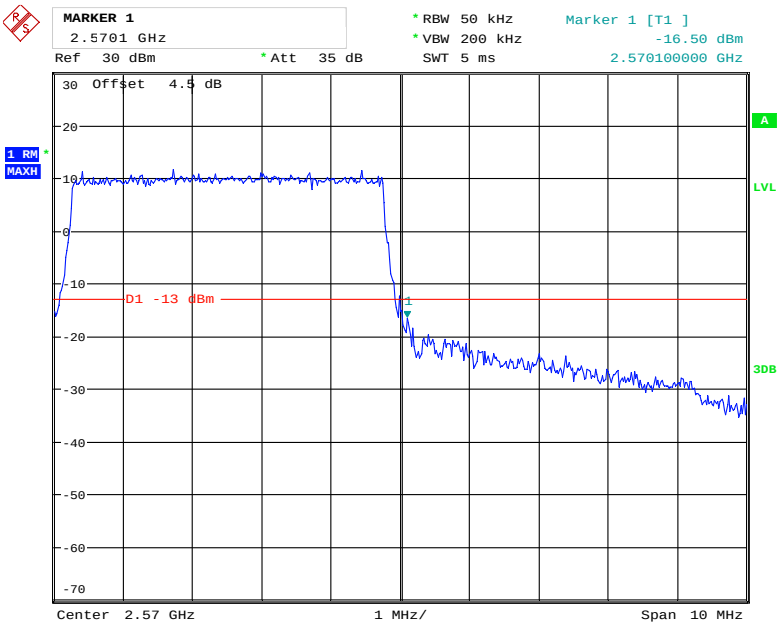
LTE Band 7

QPSK_5MHz_ 25 RB_ Left



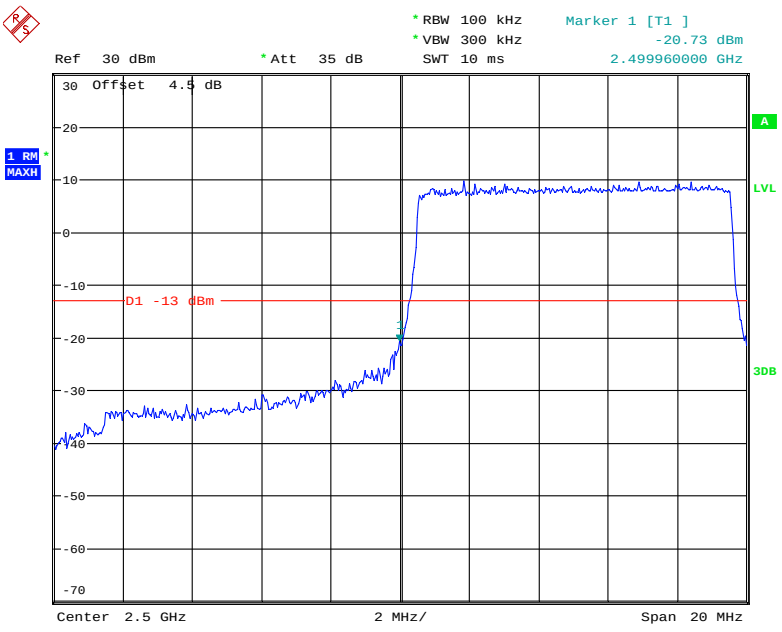
Date: 18.DEC.2018 15:28:25

QPSK_5MHz_ 25 RB_ Right



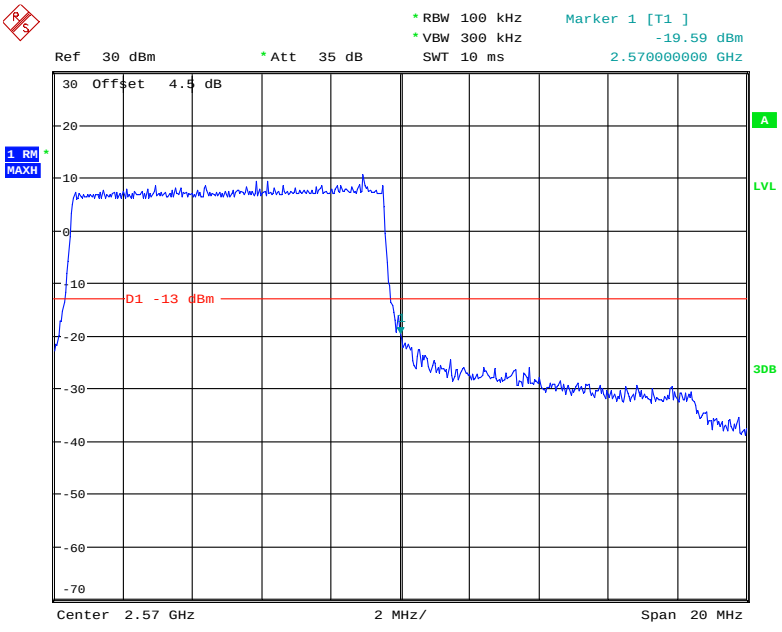
Date: 18.DEC.2018 15:27:15

QPSK_10MHz_ 50 RB_ Left



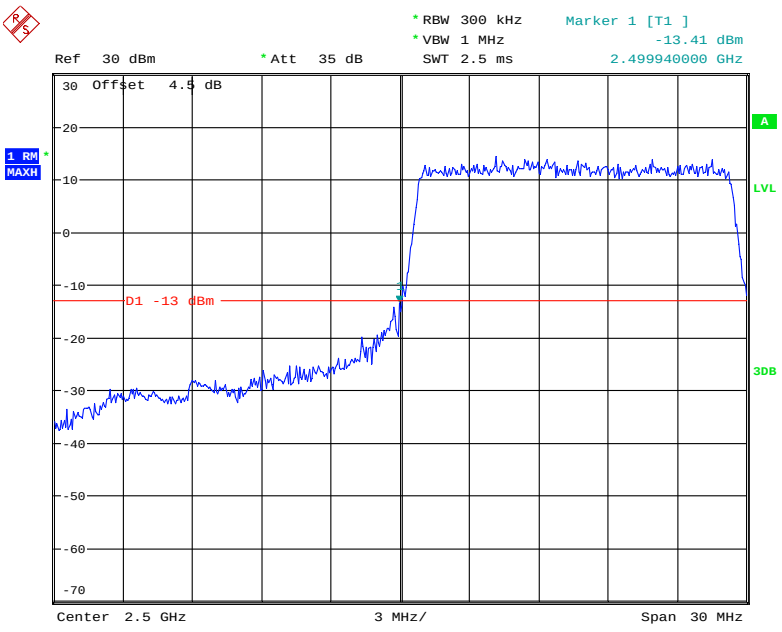
Date: 18.DEC.2018 14:51:58

QPSK_10MHz_ 50 RB_ Right



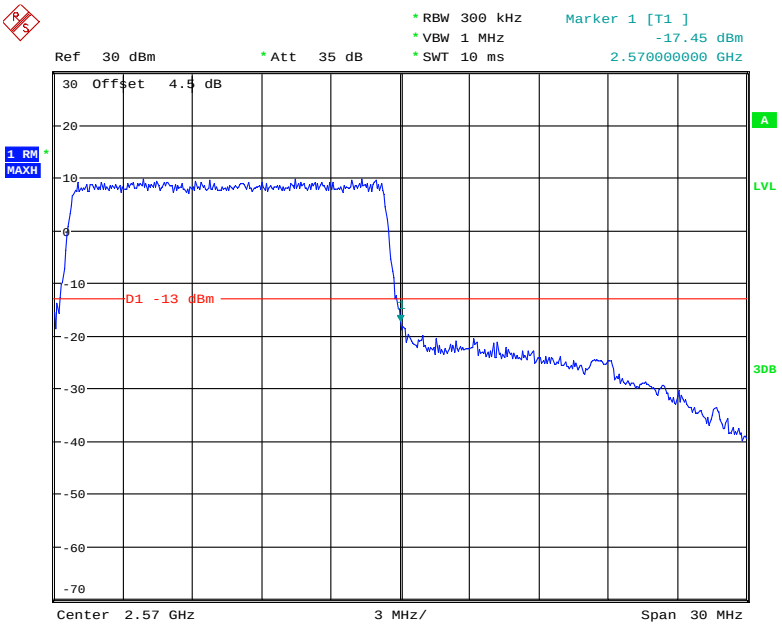
Date: 18.DEC.2018 14:53:06

QPSK_15MHz_ 75 RB_ Left



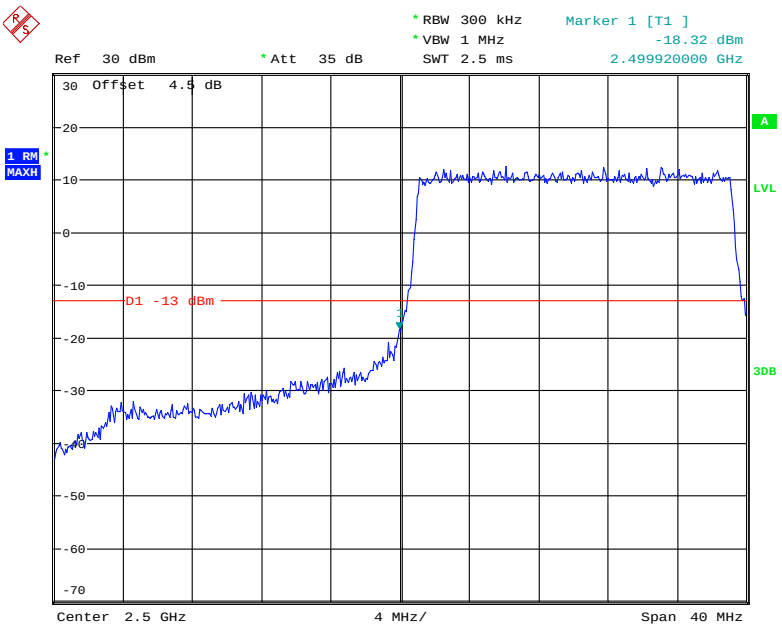
Date: 18.DEC.2018 14:54:20

QPSK_15MHz_ 75 RB_ Right



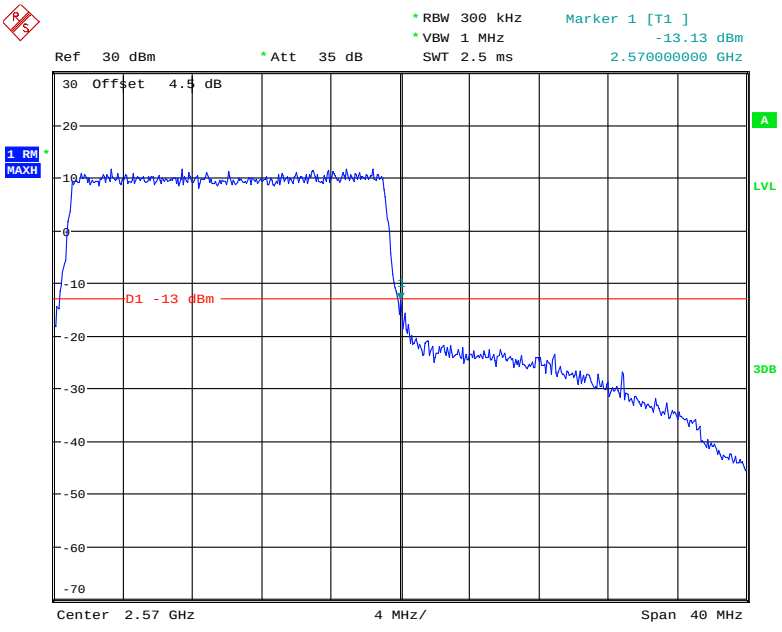
Date: 18.DEC.2018 15:29:44

QPSK_20MHz_ FULL RB_ Left



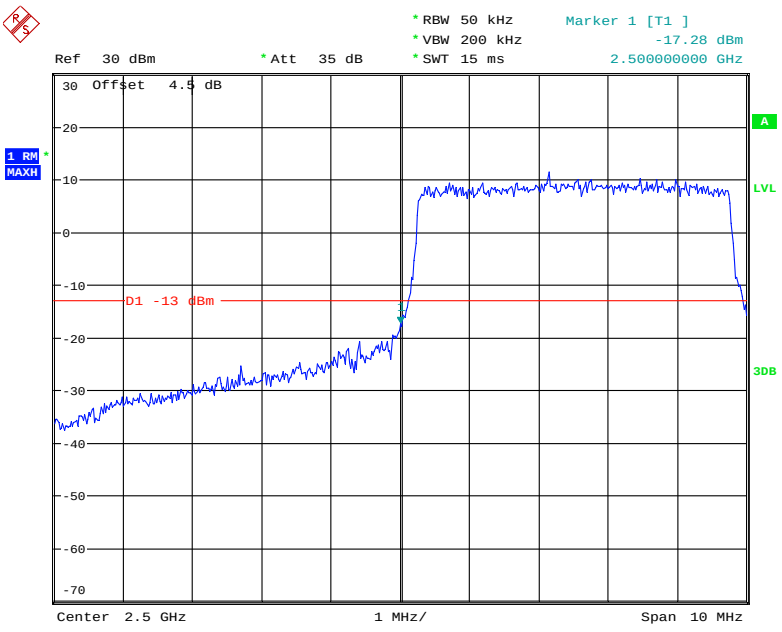
Date: 18.DEC.2018 14:57:16

QPSK_20MHz_ FULL RB_ Right



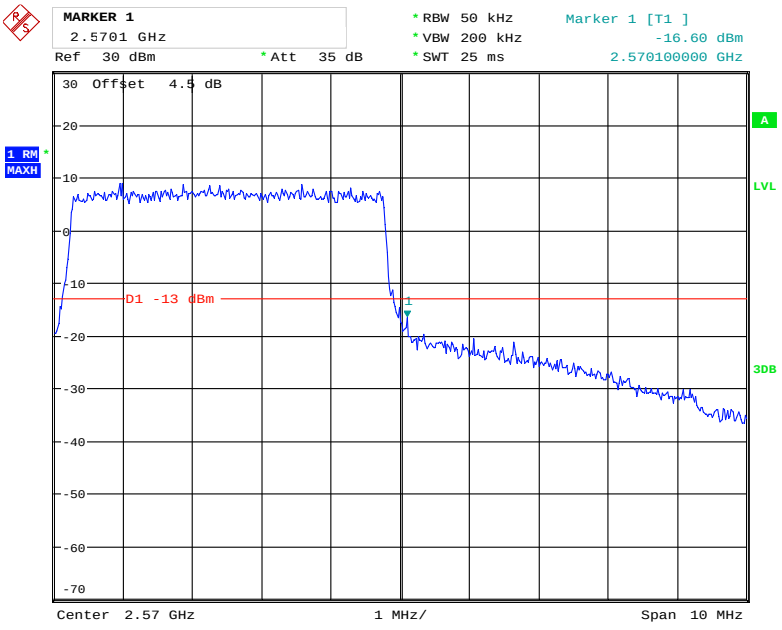
Date: 18.DEC.2018 14:58:52

16QAM_5MHz_ 25 RB_ Left



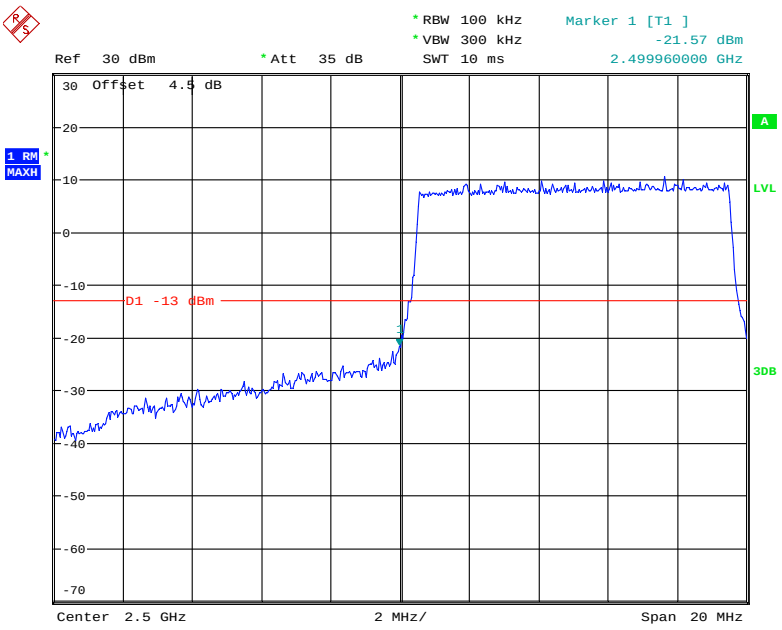
Date: 18.DEC.2018 14:49:40

16QAM_5MHz_ 25 RB_ Right



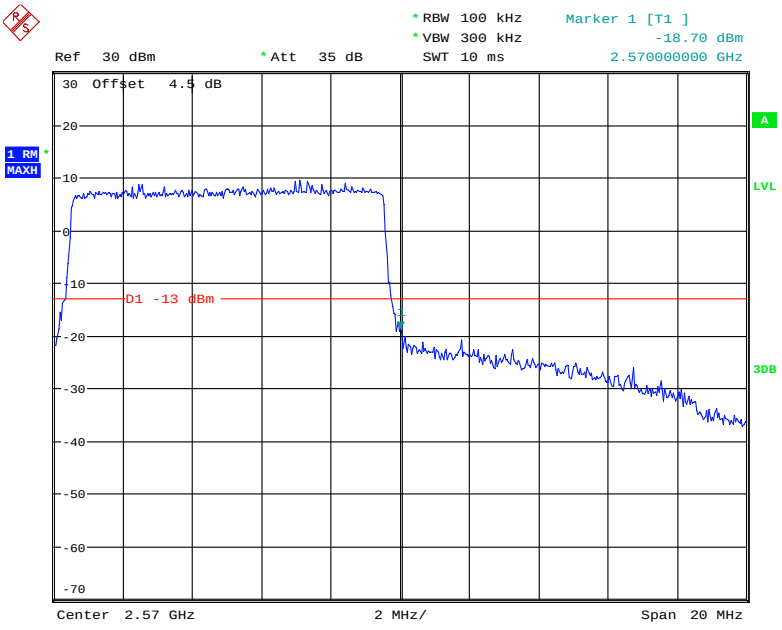
Date: 18.DEC.2018 15:26:09

16QAM_10MHz_ 50 RB_ Left



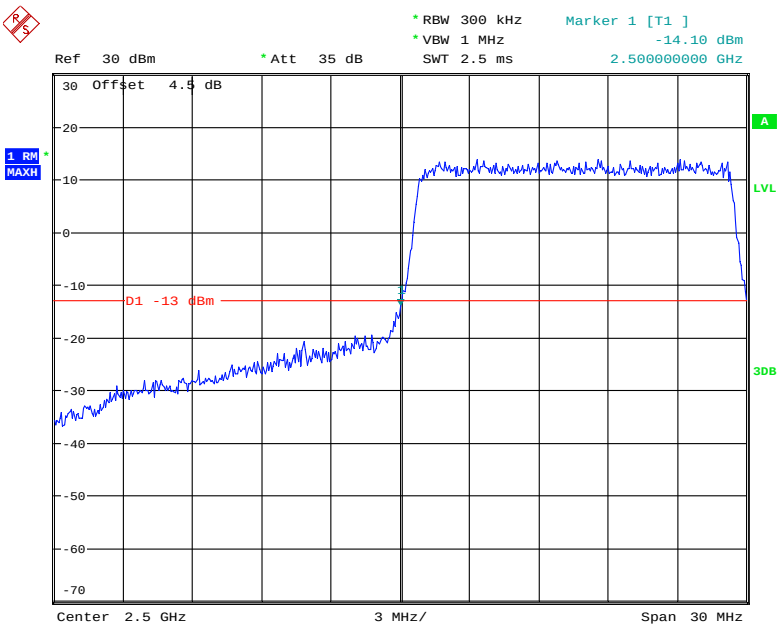
Date: 18.DEC.2018 14:52:28

16QAM_10MHz_ 50 RB_ Right



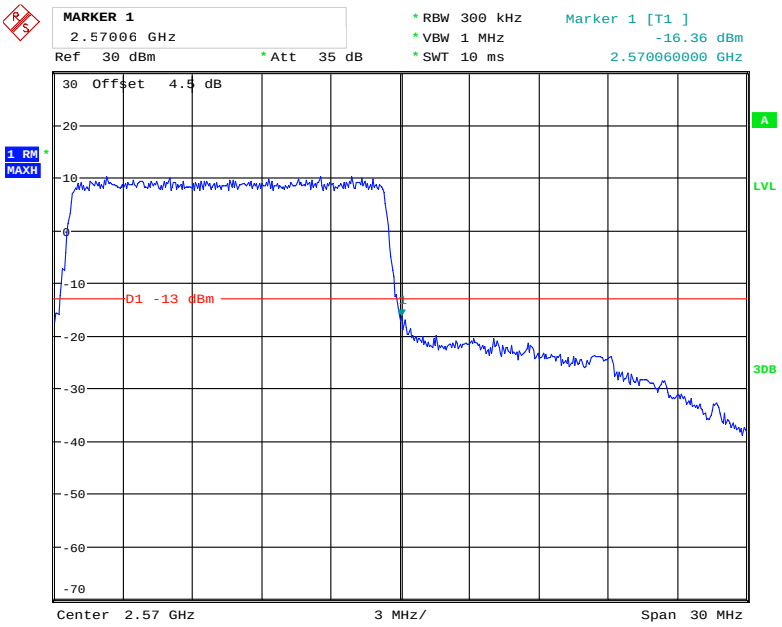
Date: 18.DEC.2018 14:53:37

16QAM_15MHz_ 75 RB_ Left



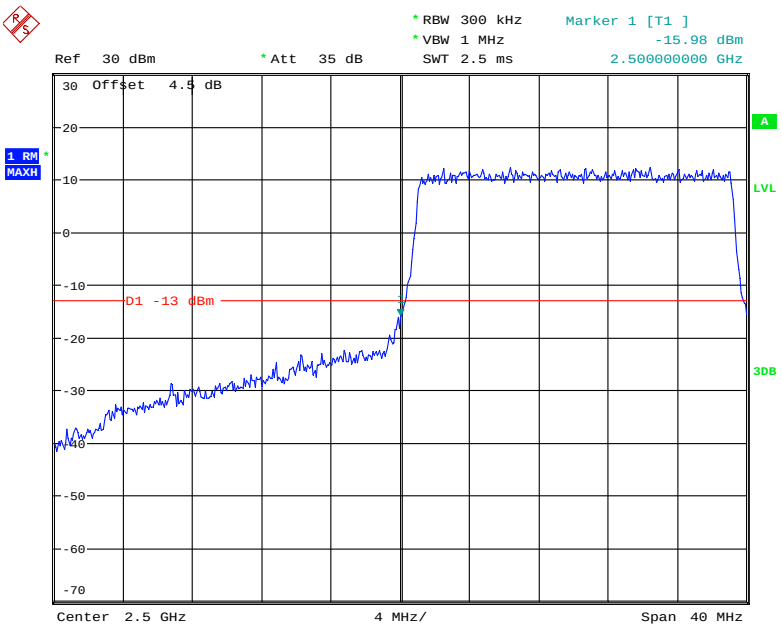
Date: 18.DEC.2018 14:55:08

16QAM_15MHz_ 75 RB_ Right



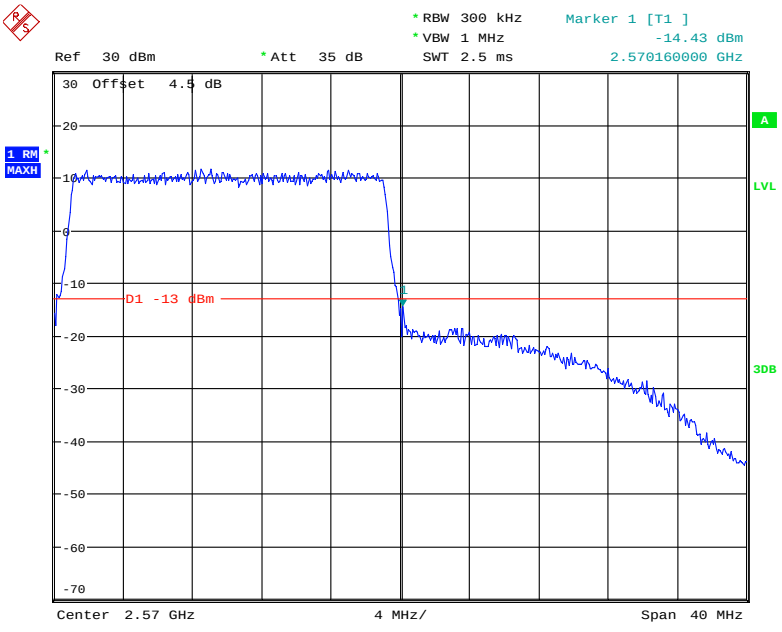
Date: 18.DEC.2018 15:31:06

16QAM_20MHz_ FULL RB_ Left



Date: 18.DEC.2018 14:58:11

16QAM_20MHz_ FULL RB_ Right



Date: 18.DEC.2018 14:59:29

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

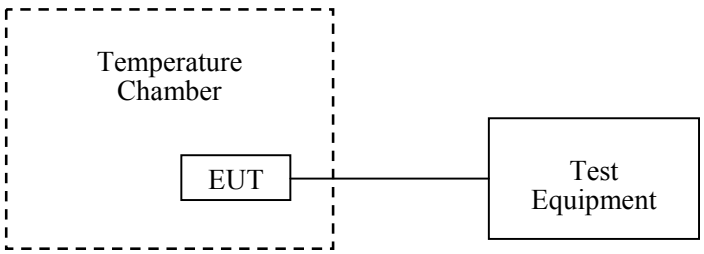
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

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

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

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



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
ESPEC	Constant temperature and humidity Tester	ESX-4CA	018 463	2018-03-26	2019-03-26
R&S	Universal Radio Communication Tester	CMU200	106 891	2018-12-14	2019-12-14
R&S	Wideband Radio Communication Tester	CMW500	147473	2018-08-03	2019-08-03
UNI-T	Multimeter	UT39A	M130199938	2018-07-24	2019-07-24
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005012	Each time	N/A
Unknown	Coaxial Cable	C-SJ00-0010	C0010/01	Each time	N/A
Pro instrument	DC Power Supply	pps3300	3300012	Each time	N/A
R&S	EMI Test Receiver	ESPI	100120	2018-12-10	2019-12-10
R&S	Spectrum Analyzer	FSU 26	200256	2018-01-04	2019-01-04

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

Test Data

Environmental Conditions

Temperature:	23.9~24.5 °C
Relative Humidity:	34~41 %
ATM Pressure:	99.7 kPa

The testing was performed by Carrie He, Elena Lei from 2018-12-18 to 2018-12-19.

Cellular Band (Part 22H)

GMSK, Middle Channel, f_c = 836.6 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Limit**
℃	**V_{DC}**	**Hz**	**ppm**	**ppm**
-30	3.7	-6	-0.00717	2.5
-20		1	0.00120	
-10		2	0.00239	
0		-6	-0.00717	
10		-5	-0.00598	
20		-8	-0.00956	
30		1	0.00120	
40		-7	-0.00837	
50		0	0.00000	
20	3.5	-2	-0.00239	
20	4.2	-1	-0.00120	

PCS Band (Part 24E)

GMSK, Middle Channel, f_c = 1880.0 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Results**
℃	**V_{DC}**	**Hz**	**ppm**	
-30	3.7	-1	-0.00053	Pass
-20		1	0.00053	
-10		3	0.00160	
0		-2	-0.00106	
10		3	0.00160	
20		0	0.00000	
30		1	0.00053	
40		2	0.00106	
50		2	0.00106	
20	3.5	1	0.00053	
20	4.2	-1	-0.00053	

WCDMA Band II: R99

Middle Channel, f_c = 1880.0 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Results**
℃	**V_{DC}**	**Hz**	**ppm**	
-30	3.7	8	0.00426	Pass
-20		3	0.00160	
-10		1	0.00053	
0		5	0.00266	
10		6	0.00319	
20		9	0.00479	
30		2	0.00106	
40		2	0.00106	
50		3	0.00160	
20	3.5	4	0.00213	
20	4.2	10	0.00532	

WCDMA Band Ⅴ: R99

Middle Channel, f_c = 836.6 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Limit**
℃	**V_{DC}**	**Hz**	**ppm**	**ppm**
-30	3.7	0	0.00000	2.5
-20		3	0.00359	
-10		1	0.00120	
0		6	0.00717	
10		2	0.00239	
20		5	0.00598	
30		4	0.00478	
40		7	0.00837	
50		1	0.00120	
20	3.5	0	0.00000	
20	4.2	8	0.00956	

LTE Band 2:

QPSK, Channel Bandwidth:10MHz Middle Channel, f_c = 1880 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Result**
℃	**V_{DC}**	**Hz**	**ppm**	
-30	3.7	-31.88	-0.0170	Pass
-20		-31.74	-0.0169	
-10		-31.69	-0.0169	
0		-31.70	-0.0169	
10		-31.46	-0.0167	
20		-31.71	-0.0169	
30		-31.58	-0.0168	
40		-31.71	-0.0169	
50		-31.68	-0.0169	
20	3.5	-31.72	-0.0169	
20	4.2	-31.70	-0.0169	

16QAM, Channel Bandwidth:10MHz Middle Channel, f_c =1880 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Result**
℃	**V_{DC}**	**Hz**	**ppm**	
-30	3.7	-21.55	-0.0115	Pass
-20		-21.49	-0.0114	
-10		-21.39	-0.0114	
0		-21.40	-0.0114	
10		-21.22	-0.0113	
20		-21.40	-0.0114	
30		-21.54	-0.0115	
40		-21.69	-0.0115	
50		-21.39	-0.0114	
20	3.5	-21.44	-0.0114	
20	4.2	-21.38	-0.0114	

LTE Band 4:

QPSK, Channel Bandwidth:10MHz					
Temperature	**Voltage**	**Test Result (MHz)**		**Limit (MHz)**	
℃	V_{DC}	F_L	F_H	F_L	F_H
-30	3.7	1710.53	1754.46	1710	1755
-20		1710.53	1754.42	1710	1755
-10		1710.51	1754.42	1710	1755
0		1710.51	1754.46	1710	1755
10		1710.54	1754.47	1710	1755
20		1710.52	1754.44	1710	1755
30		1710.56	1754.46	1710	1755
40		1710.51	1754.43	1710	1755
50		1710.54	1754.47	1710	1755
20	3.5	1710.51	1754.43	1710	1755
20	4.2	1710.57	1754.45	1710	1755

16QAM, Channel Bandwidth:10MHz					
Temperature	**Voltage**	**Test Result (MHz)**		**Limit (MHz)**	
℃	V_{DC}	F_L	F_H	F_L	F_H
-30	3.7	1710.54	1754.45	1710	1755
-20		1710.53	1754.48	1710	1755
-10		1710.51	1754.50	1710	1755
0		1710.52	1754.48	1710	1755
10		1710.55	1754.51	1710	1755
20		1710.52	1754.48	1710	1755
30		1710.54	1754.52	1710	1755
40		1710.50	1754.46	1710	1755
50		1710.56	1754.51	1710	1755
20	3.5	1710.51	1754.48	1710	1755
20	4.2	1710.57	1754.50	1710	1755

LTE Band 5:

Middle Channel, f_c = 836.5 MHz, Channel Bandwidth:10MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Limit**
℃	**V_{DC}**	**Hz**	**ppm**	**ppm**
-30	3.7	-6.85	-0.0082	2.5
-20		-6.36	-0.0076	
-10		-6.65	-0.0079	
0		-6.81	-0.0081	
10		-6.73	-0.0080	
20		-6.81	-0.0081	
30		-6.87	-0.0082	
40		-6.47	-0.0077	
50		-6.52	-0.0078	
20	3.5	-6.49	-0.0078	
20	4.2	-6.77	-0.0081	

Middle Channel, f_c = 836.5 MHz, Channel Bandwidth:10MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Limit**
℃	**V_{DC}**	**Hz**	**ppm**	**ppm**
-30	3.7	-17.56	-0.0210	2.5
-20		-17.63	-0.0211	
-10		-17.74	-0.0212	
0		-17.84	-0.0213	
10		-17.55	-0.0210	
20		-17.84	-0.0213	
30		-17.71	-0.0212	
40		-17.96	-0.0215	
50		-17.67	-0.0211	
20	3.5	-17.84	-0.0213	
20	4.2	-17.99	-0.0215	

LTE Band 7:

QPSK, Channel Bandwidth:10MHz					
Temperature	**Voltage**	**Test Result (MHz)**		**Limit (MHz)**	
℃	V_{DC}	F_L	F_H	F_L	F_H
-30	3.7	2500.50	2569.53	2500	2570
-20		2500.53	2569.53	2500	2570
-10		2500.50	2569.54	2500	2570
0		2500.54	2569.52	2500	2570
10		2500.52	2569.54	2500	2570
20		2500.52	2569.52	2500	2570
30		2500.56	2569.50	2500	2570
40		2500.50	2569.50	2500	2570
50		2500.51	2569.51	2500	2570
20	3.5	2500.51	2569.53	2500	2570
20	4.2	2500.55	2569.53	2500	2570

16QAM, Channel Bandwidth:10MHz					
Temperature	**Voltage**	**Test Result (MHz)**		**Limit (MHz)**	
℃	V_{DC}	F_L	F_H	F_L	F_H
-30	3.7	2500.50	2569.50	2500	2570
-20		2500.52	2569.52	2500	2570
-10		2500.51	2569.54	2500	2570
0		2500.52	2569.51	2500	2570
10		2500.52	2569.53	2500	2570
20		2500.52	2569.52	2500	2570
30		2500.48	2569.50	2500	2570
40		2500.51	2569.49	2500	2570
50		2500.54	2569.52	2500	2570
20	3.5	2500.52	2569.52	2500	2570
20	4.2	2500.57	2569.53	2500	2570

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 *******