



TESTING LABORATORY
CERTIFICATE #4820.01



**FCC Part 22H, Part 24E, Part 27
RSS-GEN, ISSUE 5, March 2019 Amendment 1
RSS-132 ISSUE 3, JANUARY 2013
RSS-133 ISSUE 6, JANUARY 2018, Amendment
RSS-199 ISSUE 3, DECEMBER 2016
Measurement and TEST REPORT**

For

Hammerhead Navigation Inc.

19 Morris Avenue Building 128, Brooklyn Navy Yard Brooklyn, NY 11205 United States

**FCC ID: 2ADMX-HK2
IC: 12534A-HK2**

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Report Number: RDG200827001-00E	
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:	KAROO 2
EUT Model:	KAROO 2
Operation modes:	GPRS/EDGE Data, WCDMA(R99 (Data), HSDPA/HSUPA/HSPA+) FDD-LTE
Operation Frequency:	GSM 850: 824-849 MHz(TX); 869-894 MHz(RX) PCS 1900: 1850-1910 MHz(TX); 1930-1990 MHz(RX) WCDMA Band 2: 1850-1910 MHz(TX); 1930-1990 MHz(RX) WCDMA Band 5: 824-849 MHz(TX); 869-894 MHz(RX) LTE Band 2:1850-1910 MHz(TX), 1930-1990 MHz(RX) LTE Band 5:824-849 MHz(TX), 869-894 MHz(RX) LTE Band 7:2500-2570 MHz(TX), 2620-2690 MHz(RX)
FVIN:	SMT_K2_00_012_EQ3001_HW01
Modulation Type:	GMSK, 8PSK, BPSK, QPSK, 16QAM
Rated Input Voltage:	DC 3.8V from battery or DC 5V from USB port
Serial Number:	RDG200827001-RF-S1
EUT Received Date:	2020.08.27
EUT Status:	Good

Objective

This report is prepared on behalf of **Hammerhead Navigation Inc.** in accordance with: Part 2-Subpart J, Part 22-Subpart H, Part 24-Subpart E, Part 27 of the Federal Communications Commission's rules, and RSS-132, Issue 3, January 2013, RSS-133, Issue 6, January 2018 Amendment, RSS-199, Issue 3, December 2016, RSS-Gen, Issue 5, March 2019 Amendment 1 of the Innovation, Science and Economic Development Canada.

Related Submittal(s)/Grant(s)

FCC Part 15C DSS/DTS, 15E NII submissions with FCC ID: 2ADMX-HK2
RSS-247 FHSs/DTSs/LE-LAN submissions with IC: 12534A-HK2

Test Methodology

All tests and measurements indicated in this document were performed in accordance with:

the Code of federal Regulations Title 47, Part 2, Part 22H, Part 24E, Part 27

ANSI C63.26-2015, American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

RSS-132, Issue 3, January 2013, Cellular Telephone Systems Operating in the Bands 824-849 MHz and 869-894 MHz

RSS-133, Issue 6, January 2018 Amendment, 2 GHz Personal Communication Services

RSS-199, Issue 3, December 2016, Broadband Radio Service (BRS) Equipment Operating in the Band 2500–2690 MHz

RSS-Gen, Issue 5, March 2019 Amendment 1 of the Innovation, Science and Economic Development Canada.

Measurement Uncertainty

Parameter	Measurement Uncertainty
Occupied Channel Bandwidth	$\pm 5\%$
RF output power, conducted	$\pm 0.61\text{ dB}$
Unwanted Emissions, radiated	30MHz ~ 1GHz: 5.85 dB 1G~26.5GHz: 5.23 dB
Unwanted Emissions, conducted	$\pm 1.5\text{ dB}$
Temperature	$\pm 1^\circ\text{C}$
Humidity	$\pm 5\%$
DC and low frequency voltages	$\pm 0.4\%$
Duty Cycle	1%

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

Test Facility

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

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

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

Declarations

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

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

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SYSTEM TEST CONFIGURATION

Justification

The EUT was configured for testing according to ANSI C63.26-2015.

The test items were performed with the EUT operating at testing mode. The device operates on GPRS/EDGE 850/1900 bands, WCDMA Band 2/5, and LTE band 2/5/7, test was performed with channels as below table:

Frequency Bands	Bandwidth (MHz)	Test Frequency(MHz)		
		Low	Middle	High
GPRS/EDGE 850	0.25	824.2	836.6	848.8
GPRS/EDGE 1900	0.25	1850.2	1880	1909.8
WCDMA Band 2	4.2	1852.4	1880	1907.6
WCDMA Band 5	4.2	826.4	836.6	846.6
LTE Band 2	1.4	1850.7	1880	1909.3
	3	1851.5	1880	1908.5
	5	1852.5	1880	1907.5
	10	1855	1880	1905
	15	1857.5	1880	1902.5
	20	1860	1880	1900
LTE Band 5	1.4	824.7	836.5	848.3
	3	825.5	836.5	847.5
	5	826.5	836.5	846.5
	10	829	836.5	844
LTE Band 7	5	2502.5	2535	2567.5
	10	2505	2535	2565
	15	2507.5	2535	2562.5
	20	2510	2535	2560

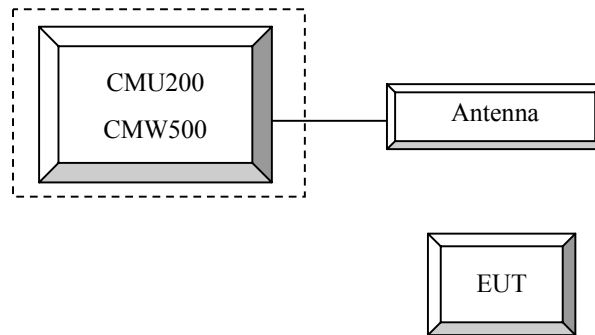
Equipment Modifications

No modification was made to the EUT.

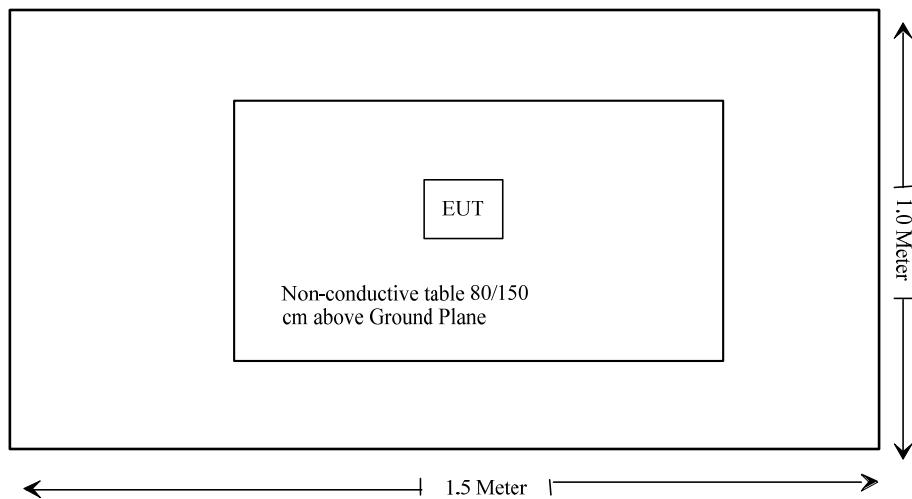
Support Equipment List and Details

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

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

Rules	Description of Test	Result
FCC§1.1310, §2.1093 RSS-102 Clause 4	RF Exposure	Compliance
FCC§2.1046; § 22.913 (a); § 24.232 (c); §27.50; RSS-132 Clause 5.4; RSS-133 Clause 6.4; RSS-199 Clause 4.4	RF Output Power	Compliance
FCC§ 2.1047	Modulation Characteristics	Not Applicable
RSS-132 Clause 5.2; RSS-133 Clause 6.2 RSS-199 Clause 4.1	Types of Modulation	Compliance
RSS-132 Clause 5.1; RSS-133 Clause 6.1; RSS-199 Clause 4.1	Frequency Plan	Compliance
FCC§ 2.1049; § 22.905; § 22.917; § 24.238; §27.53; RSS-Gen Clause 6.7	Occupied Bandwidth	Compliance
FCC§ 2.1051, § 22.917 (a); § 24.238 (a); §27.53 RSS-132 Clause 5.5; RSS-133 Clause 6.5; RSS-199 Clause 4.6	Spurious Emissions at Antenna Terminal	Compliance
FCC§ 2.1053 § 22.917 (a); § 24.238 (a); §27.53 RSS-132 Clause 5.5; RSS-133 Clause 6.5; RSS-199 Clause 4.6	Field Strength of Spurious Radiation	Compliance
FCC§ 22.917 (a); § 24.238 (a); §27.53 RSS-132 Clause 5.5; RSS-133 Clause 6.5; RSS-199 Clause 4.6	Out of band emission, Band Edge	Compliance
FCC§ 2.1055; § 22.355; § 24.235; §27.54 RSS-132 Clause 5.3; RSS-133 Clause 6.3; RSS-199 Clause 4.3	Frequency stability vs. temperature Frequency stability vs. voltage	Compliance

FCC §1.1310 & §2.1093, RSS-102 CLAUSE 4- RF Exposure**Applicable Standard**

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

According to RSS-102 Clause 4 Table 3, SAR limits for device used by the general public.

Body Region	Average SAR (W/Kg)	Averaging Time (minutes)	Mass Average (g)
Whole Body	0.08	6	Whole Body
Localized Head, Neck and Trunk	1.6	6	1
Localized Limbs	4	6	10

Test Result

Compliance, Please refer to the SAR report: RDG200827001-20.

FCC §2.1047 - MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 22H & 24E,27 there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

RSS-132 §5.1 & RSS-133 §6.1 & RSS-199 §2.2 - CHANNELLING ARRANGEMENTS & FREQUENCY PLAN

Applicable Standard

According to RSS-132 §5.1, the frequency bands 824-849 MHz and 869-894 MHz are divided into sub-bands as described in SRSP-503. These sub-bands are:

824-835 MHz, 835-845 MHz, 845-846.5 MHz, and 846.5-849 MHz for mobile transmit; and 869-880 MHz, 880-890 MHz, 890-891.5 MHz, and 891.5-894 MHz for base transmit.

According to RSS-133 §6.1, the frequency plan is described in SRSP-510.

According to RSS-199 §2.2, the frequency plan is described in SRSP-517.

Result

According to the test data, channeling arrangement meets all relevant conditions specified in SRSP-510, SRSP-513, SRSP-518.

RSS-132 §5.2 & RSS-133 §6.2 & RSS-199 §4.1 - TYPES OF MODULATION

Applicable Standard

According to RSS-132 §5.2, equipment certified under this standard shall use digital modulation.

According to RSS-133 §6.2, the devices shall employ digital modulation techniques.

According to RSS-199 §4.1, equipment certified under this standard shall employ digital modulation.

Test Result

The EUT uses GMSK, 8PSK, BPSK, QPSK, 16QAM modulation.

FCC § 2.1046, § 22.913 (a), § 24.232 (c), § 27.50, RSS-132 §5.4, RSS-133 §6.4, RSS-199 §4.4 - 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

(a) The following power limits and related requirements apply to stations transmitting in the 2305-2320 MHz band or the 2345-2360 MHz band.

(3) Mobile and portable stations. (i) For mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, except that for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth. For mobile and portable stations using time division duplexing (TDD) technology, the duty cycle must not exceed 38 percent in the 2305-2315 MHz and 2350-2360 MHz bands. Mobile and portable stations using FDD technology are restricted to transmitting in the 2305-2315 MHz band. Power averaging shall not include intervals in which the transmitter is off.

(ii) Mobile and portable stations are not permitted to transmit in the 2315-2320 MHz and 2345-2350 MHz bands.

(iii) Automatic transmit power control. Mobile and portable stations transmitting in the 2305-2315 MHz band or in the 2350-2360 MHz band must employ automatic transmit power control when operating so the stations operate with the minimum power necessary for successful communications.

(iv) Prohibition on external vehicle-mounted antennas. The use of external vehicle-mounted antennas for mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band is prohibited.

(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.

According to RSS-132 §5.4

The transmitter output power shall be measured in terms of average power. The equivalent isotropically radiated power (e.i.r.p.) for mobile equipment shall not exceed 11.5 watts. Refer to SRSP-503 for base station e.i.r.p. limits.

In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

Refer to SRSP-503 5.1.3 Mobile Stations

The maximum EIRP shall be 11.5 watts for mobile stations.

According to RSS-133 §6.4

The equivalent isotropically radiated power (e.i.r.p.) for transmitters shall not exceed the limits given in SRSP-510.

In addition, the transmitter's peak-to-average power ratio (PAPR) shall not exceed 13 dB for more than 0.1% of the time using a signal corresponding to the highest PAPR during periods of continuous transmission.

According to RSS-199 §4.4

The transmitter output power shall be measured in terms of average value.

For base station equipment, refer to SRSP-517 for the maximum permissible e.i.r.p.

For mobile subscriber equipment, the e.i.r.p. shall not exceed 2 W. For fixed subscriber equipment, the transmitter output power shall not exceed 2 W and the e.i.r.p. shall be limited to 40 W.

In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

For equipment with multiple antennas, the transmitter output power and e.i.r.p. shall be measured according to ANSI C63.26-2015.

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
	β_c / β_d	8/15

WCDMA HSDPA

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

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subset	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	Power Control Algorithm	Algorithm2			
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	β_d (SF)	64			
	β_c / β_d	2/15	12/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
	MPR(dB)	0	0	0.5	0.5
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	$A_{hs} = \beta_{hs} / \beta_c$	30/15			

WCDMA HSUPA

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

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

HSPA+

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

Sub-test	β_c (Note 3)	β_d	β_{HS} (Note 1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{ed} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	β_{ed1} : 30/15 β_{ed2} : 30/15	β_{ed3} : 24/15 β_{ed4} : 24/15	3.5	2.5	14	105	105

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

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

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

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

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

DC-HSDPA

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

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

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.		
Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

LTE (FDD):

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

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

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

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

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

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

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

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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
ERP/EIRP Test					
Sunol Sciences	Antenna	JB3	A060611-2	2020-08-25	2023-08-25
R&S	EMI Test Receiver	ESCI	100224	2020-09-12	2021-09-12
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-02	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0530-01	2020-09-24	2021-09-24
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
Agilent	Signal Generator	E8247C	MY43321350	2019-12-10	2020-12-10
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
TDK RF	Horn Antenna	HRN-0118	130 084	2018-10-12	2021-10-12
Agilent	Spectrum Analyzer	E4440A	SG43360054	2020-07-07	2021-07-07
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-2.4J2.4J-50	C-0700-02	2020-06-27	2021-06-27
Conducted Output Power Test					
R&S	Universal Radio Communication Tester	CMU200	106 891	2019-12-14	2020-12-14
R&S	Wideband Radio Communication Tester	CMW500	147473	2020-09-12	2021-09-12
E-Microwave	Coaxial Attenuators	EMCA10-5RN-6	OE01203239	Each time	/
Unknown	Coaxial Cable	C-SJ00-0010	C0010/03	Each time	/

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

Test Data**Environmental Conditions**

Test Items:	Radiation Below 1GHz	Radiation Above 1GHz	Conducted Output Power
Temperature:	24.5°C	30°C	26.2~27.8°C
Relative Humidity:	36%	43 %	50~51 %
ATM Pressure:	100.3 kPa	100.6 kPa	100.2~100.8 kPa
Tester:	Jackson Zhang, Asa Chen	Carlos Jia	Rita Huang
Test Date:	2020-09-17	2020-09-25	2020-09-29-2020-09-30

Test Result: Compliance

Conducted Output Power**GPRS/EGPRS**

Band	Channel No.	Conducted Peak Output Power (dBm)							
		GPRS 1 TX Slot	GPRS 2 TX Slots	GPRS 3 TX Slots	GPRS 4 TX Slots	EGPRS 1 TX Slot	EGPRS 2 TX Slots	EGPRS 3 TX Slots	EGPRS 4 TX Slots
Cellular	128	31.55	31.35	31.11	30.92	25.89	25.85	25.77	25.48
	190	31.59	31.37	31.13	30.89	26.01	25.77	25.69	25.46
	251	31.51	31.29	31.07	30.93	25.88	25.68	25.52	25.33
PCS	512	29.58	29.46	29.29	29.05	25.17	24.99	24.82	24.56
	661	29.61	29.45	29.38	29.26	25.35	25.22	25.01	24.79
	810	29.17	29.14	28.87	28.73	25.05	24.91	24.67	24.51

WCDMA Band 2

Mode	3GPP Sub Test	Low Channel		Middle Channel		High Channel	
		Ave. Power (dBm)	PAR (dB)	Ave. Power (dBm)	PAR (dB)	Ave. Power (dBm)	PAR (dB)
Rel 99	1	23.29	3.30	22.67	3.22	22.88	3.30
HSDPA	1	21.71	3.36	21.71	4.12	21.84	3.54
	2	21.65	3.18	21.53	4.09	21.43	3.63
	3	21.06	3.24	21.18	3.99	21.07	3.48
	4	20.78	3.42	20.74	4.06	20.54	3.69
HSUPA	1	21.26	3.51	21.38	3.36	21.29	4.14
	2	21.03	3.36	21.11	3.39	21.06	4.23
	3	20.86	3.45	20.89	3.18	20.74	4.11
	4	20.53	3.48	20.66	3.45	20.56	4.02
	5	20.41	3.48	20.42	3.24	20.42	4.02
DC-HSDPA	1	21.11	3.69	21.31	3.24	21.19	4.20
	2	21.02	3.63	21.04	3.36	21.02	4.26
	3	20.87	3.45	20.85	3.30	20.76	4.17
	4	20.55	3.69	20.66	3.21	20.42	4.14
HSPA+ (16QAM)	1	20.89	3.42	20.87	3.39	20.74	3.98

WCDMA Band 5

Mode	3GPP Sub Test	Low Channel		Middle Channel		High Channel	
		Ave. Power (dBm)	PAR (dB)	Ave. Power (dBm)	PAR (dB)	Ave. Power (dBm)	PAR (dB)
Rel 99	1	23.02	2.75	23.26	2.96	23.17	2.99
HSDPA	1	22.31	3.13	22.13	4.14	22.19	3.39
	2	22.03	3.19	21.99	3.96	22.11	3.57
	3	21.54	3.01	21.74	4.32	21.82	3.54
	4	20.99	3.01	21.22	4.11	21.26	3.39
HSUPA	1	21.59	3.77	21.55	3.68	21.63	3.42
	2	21.44	3.95	21.37	3.65	21.58	3.24
	3	21.08	3.77	21.15	3.65	21.24	3.33
	4	20.79	3.71	20.89	3.68	20.98	3.42
	5	20.52	3.92	20.47	3.59	20.54	3.57
DC-HSDPA	1	21.53	3.80	21.48	3.59	21.57	3.42
	2	21.17	3.83	21.22	3.71	21.19	3.39
	3	21.87	3.77	21.94	3.50	20.82	3.51
	4	21.22	3.95	21.45	3.86	20.48	3.48
HSPA+ (16QAM)	1	21.59	3.68	21.74	3.59	21.64	3.48

LTE Band 2

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4MHz	QPSK	RB1#0	22.91	23.26	23.57
		RB1#3	22.92	23.37	23.57
		RB1#5	22.85	23.23	23.61
		RB3#0	23.00	23.26	23.74
		RB3#3	23.13	23.36	23.60
		RB6#0	21.98	22.53	22.60
	16QAM	RB1#0	21.75	22.45	22.79
		RB1#3	21.81	22.46	22.87
		RB1#5	21.93	22.48	22.78
		RB3#0	21.74	22.29	22.43
		RB3#3	21.74	22.29	22.46
		RB6#0	20.94	21.52	21.68
3MHz	QPSK	RB1#0	22.83	23.37	23.56
		RB1#8	22.72	23.27	23.61
		RB1#14	22.80	23.43	23.66
		RB6#0	21.83	22.33	22.74
		RB6#9	21.85	22.34	22.69
		RB15#0	21.93	22.35	22.68
	16QAM	RB1#0	22.31	23.06	22.46
		RB1#8	21.79	22.99	22.18
		RB1#14	21.88	23.36	22.12
		RB6#0	20.79	21.64	21.62
		RB6#9	20.83	21.76	21.75
		RB15#0	21.09	21.43	21.86
5MHz	QPSK	RB1#0	22.68	23.14	23.26
		RB1#13	22.83	23.46	23.58
		RB1#24	22.80	23.42	23.54
		RB15#0	21.99	22.32	22.74
		RB15#10	22.08	22.43	22.64
		RB25#0	21.95	22.38	22.64
	16QAM	RB1#0	21.12	22.47	22.70
		RB1#13	20.88	21.95	22.32
		RB1#24	20.98	22.60	22.09
		RB15#0	20.75	21.27	21.49
		RB15#10	20.95	21.19	21.59
		RB25#0	21.11	21.35	21.55

10MHz	QPSK	RB1#0	23.09	23.45	23.92
		RB1#25	23.35	23.50	23.70
		RB1#49	23.25	23.38	23.70
		RB25#0	21.92	22.39	22.93
		RB25#25	22.13	22.59	22.68
		RB50#0	22.03	22.39	22.69
	16QAM	RB1#0	22.03	22.74	23.08
		RB1#25	22.36	23.07	22.55
		RB1#49	22.35	23.05	22.29
		RB25#0	20.96	21.60	22.00
		RB25#25	21.18	21.61	21.60
		RB50#0	21.03	21.51	21.65
15MHz	QPSK	RB1#0	22.95	23.40	23.73
		RB1#38	22.91	23.21	23.49
		RB1#74	23.13	23.65	23.64
		RB36#0	22.03	22.48	22.87
		RB36#39	22.28	22.59	22.68
		RB75#0	22.13	22.43	22.78
	16QAM	RB1#0	22.26	22.88	22.68
		RB1#38	22.37	22.36	22.55
		RB1#74	22.73	22.75	23.02
		RB36#0	21.05	21.55	21.80
		RB36#39	21.22	21.41	21.72
		RB75#0	21.19	21.33	21.92
20MHz	QPSK	RB1#0	23.28	23.63	23.77
		RB1#50	23.26	23.88	23.85
		RB1#99	23.37	23.69	23.65
		RB50#0	22.24	22.46	22.74
		RB50#50	22.30	22.59	22.70
		RB100#0	22.27	22.53	22.77
	16QAM	RB1#0	21.94	22.96	23.52
		RB1#50	22.22	23.15	23.42
		RB1#99	22.17	22.99	23.32
		RB50#0	21.25	21.56	21.83
		RB50#50	21.42	21.60	21.83
		RB100#0	21.33	21.54	21.87

LTE Band 5

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4MHz	QPSK	RB1#0	22.89	23.25	23.21
		RB1#3	23.28	23.32	23.07
		RB1#5	23.12	23.12	23.11
		RB3#0	23.14	23.25	23.25
		RB3#3	23.40	23.22	23.24
		RB6#0	22.44	22.31	22.26
	16QAM	RB1#0	22.81	22.42	22.45
		RB1#3	22.68	22.40	22.24
		RB1#5	22.55	22.31	22.55
		RB3#0	22.41	22.60	22.15
		RB3#3	22.44	22.10	22.02
		RB6#0	21.42	21.33	20.99
3MHz	QPSK	RB1#0	23.35	23.23	23.26
		RB1#8	23.20	23.26	23.16
		RB1#14	23.36	23.29	23.06
		RB6#0	22.30	22.42	22.52
		RB6#9	22.25	22.44	22.20
		RB15#0	22.37	22.55	22.52
	16QAM	RB1#0	22.57	21.65	22.42
		RB1#8	22.37	21.97	22.21
		RB1#14	22.69	22.06	22.34
		RB6#0	21.46	21.53	21.59
		RB6#9	21.51	21.47	21.18
		RB15#0	21.56	21.35	21.55
5MHz	QPSK	RB1#0	23.39	23.12	23.15
		RB1#13	23.32	23.21	23.29
		RB1#24	23.50	23.21	22.99
		RB15#0	22.34	22.42	22.47
		RB15#10	22.39	22.47	22.32
		RB25#0	22.39	22.36	22.42
	16QAM	RB1#0	22.53	22.37	21.66
		RB1#13	22.28	22.37	21.41
		RB1#24	22.69	22.39	21.43
		RB15#0	21.18	21.35	21.40
		RB15#10	21.29	21.41	21.17
		RB25#0	21.45	21.29	21.29
10MHz	QPSK	RB1#0	23.30	23.48	23.58
		RB1#25	23.46	23.19	23.29
		RB1#49	23.40	23.61	23.11
		RB25#0	22.46	22.45	22.42
		RB25#25	22.50	22.40	22.45
		RB50#0	22.46	22.52	22.41
	16QAM	RB1#0	22.79	22.78	22.81
		RB1#25	22.71	22.55	22.81
		RB1#49	22.64	22.69	22.20
		RB25#0	21.40	21.47	21.43
		RB25#25	21.43	21.56	21.43
		RB50#0	21.46	21.54	21.49

LTE Band 7

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5MHz	QPSK	RB1#0	22.34	22.39	22.35
		RB1#13	22.27	22.57	22.57
		RB1#24	22.27	22.58	22.32
		RB15#0	21.65	21.45	21.63
		RB15#10	21.56	21.43	21.56
		RB25#0	21.67	21.53	21.60
	16QAM	RB1#0	20.71	21.58	21.03
		RB1#13	20.68	21.32	20.97
		RB1#24	20.82	21.51	21.44
		RB15#0	20.69	20.39	20.45
		RB15#10	20.50	20.34	20.46
		RB25#0	20.82	20.51	20.47
10MHz	QPSK	RB1#0	22.67	22.51	22.44
		RB1#25	22.99	22.36	22.51
		RB1#49	22.82	22.34	22.37
		RB25#0	21.85	21.41	21.71
		RB25#25	21.89	21.43	21.51
		RB50#0	21.63	21.47	21.61
	16QAM	RB1#0	21.78	21.78	21.23
		RB1#25	21.81	21.39	21.20
		RB1#49	21.42	21.32	21.50
		RB25#0	20.69	20.44	20.71
		RB25#25	20.40	20.47	20.62
		RB50#0	20.49	20.62	20.61
15MHz	QPSK	RB1#0	22.67	21.71	21.61
		RB1#38	22.41	21.32	21.45
		RB1#74	22.44	21.44	21.61
		RB36#0	21.56	20.62	21.61
		RB36#39	21.33	20.42	21.52
		RB75#0	21.50	20.48	20.74
	16QAM	RB1#0	21.74	20.81	20.95
		RB1#38	21.55	20.35	20.50
		RB1#74	21.66	20.49	20.76
		RB36#0	20.69	20.51	20.61
		RB36#39	20.36	20.41	20.74
		RB75#0	20.58	20.44	20.74
20MHz	QPSK	RB1#0	21.92	22.58	22.50
		RB1#50	21.60	22.72	22.42
		RB1#99	21.38	22.45	22.30
		RB50#0	21.55	21.57	21.50
		RB50#50	21.48	21.43	21.52
		RB100#0	21.37	21.53	21.55
	16QAM	RB1#0	22.72	22.62	21.39
		RB1#50	21.99	21.90	21.16
		RB1#99	21.63	21.91	21.24
		RB50#0	20.69	20.56	20.77
		RB50#50	20.59	20.60	20.58
		RB100#0	20.57	20.68	20.66

PAR, Band 2

Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	20 MHz	3.13	3.51	3.33	13
	100 RB		4.35	4.23	3.97	13
16QAM	1 RB	20 MHz	4.03	4.55	4.49	13
	100 RB		5.30	5.19	5.01	13

PAR, Band 5

Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	10 MHz	4.58	4.14	4.38	13
	50 RB		4.93	4.61	4.90	13
16QAM	1 RB	10 MHz	5.65	5.30	5.10	13
	50 RB		5.86	5.68	5.88	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	4.12	4.41	4.26	13
	100 RB		4.84	4.87	4.75	13
16QAM	1 RB	20 MHz	4.99	5.45	5.25	13
	100 RB		5.80	5.80	5.83	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)			
GPRS850 Low channel								
824.20	H	101.85	27.43	0.00	0.49	26.94	38.45	11.51
824.20	V	95.43	23.93	0.00	0.49	23.44	38.45	15.01
GPRS850 middle channel								
836.60	H	101.56	27.33	0.00	0.50	26.83	38.45	11.62
836.60	V	95.42	24.16	0.00	0.50	23.66	38.45	14.79
GPRS850 High channel								
848.80	H	100.91	26.88	0.00	0.50	26.38	38.45	12.07
848.80	V	95.00	23.98	0.00	0.50	23.48	38.45	14.97
EGPRS850 Low channel								
824.20	H	98.01	23.59	0.00	0.49	23.10	38.45	15.35
824.20	V	91.35	19.85	0.00	0.49	19.36	38.45	19.09
EGPRS850 middle channel								
836.60	H	97.62	23.39	0.00	0.50	22.89	38.45	15.56
836.60	V	91.76	20.50	0.00	0.50	20.00	38.45	18.45
EGPRS850 High channel								
848.80	H	97.87	23.84	0.00	0.50	23.34	38.45	15.11
848.80	V	92.20	21.18	0.00	0.50	20.68	38.45	17.77
WCDMA R99 Band 5 Low channel								
826.40	H	96.27	21.88	0.00	0.50	21.38	38.45	17.07
826.40	V	89.67	18.21	0.00	0.50	17.71	38.45	20.74
WCDMA R99 Band 5 middle channel								
836.60	H	95.70	21.47	0.00	0.50	20.97	38.45	17.48
836.60	V	89.16	17.90	0.00	0.50	17.40	38.45	21.05
WCDMA R99 Band 5 High channel								
846.60	H	95.97	21.90	0.00	0.50	21.40	38.45	17.05
846.60	V	88.73	17.67	0.00	0.50	17.17	38.45	21.28

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)			
GPRS1900 low channel								
1850.20	H	87.94	13.23	11.45	0.85	23.83	33.00	9.17
1850.20	V	88.52	13.74	11.45	0.85	24.34	33.00	8.66
GPRS1900 middle channel								
1880.00	H	88.61	14.30	11.66	0.95	25.01	33.00	7.99
1880.00	V	86.18	12.01	11.66	0.95	22.72	33.00	10.28
GPRS1900 high channel								
1909.80	H	88.53	14.54	11.82	1.03	25.33	33.00	7.67
1909.80	V	87.12	13.42	11.82	1.03	24.21	33.00	8.79
EGPRS1900 low channel								
1850.20	H	87.63	12.92	11.45	0.85	23.52	33.00	9.48
1850.20	V	88.10	13.32	11.45	0.85	23.92	33.00	9.08
EGPRS1900 middle channel								
1880.00	H	86.74	12.43	11.66	0.95	23.14	33.00	9.86
1880.00	V	87.32	13.15	11.66	0.95	23.86	33.00	9.14
EGPRS1900 high channel								
1908.80	H	85.26	11.26	11.82	1.03	22.05	33.00	10.95
1908.80	V	86.59	12.89	11.82	1.03	23.68	33.00	9.32
WCDMA R99 Band 2 low channel								
1852.40	H	86.76	12.08	11.47	0.86	22.69	33.00	10.31
1852.40	V	85.11	10.37	11.47	0.86	20.98	33.00	12.02
WCDMA R99 Band 2 middle channel								
1880.00	H	85.42	11.11	11.66	0.95	21.82	33.00	11.18
1880.00	V	81.95	7.78	11.66	0.95	18.49	33.00	14.51
WCDMA R99 Band 2 high channel								
1907.60	H	85.69	11.69	11.82	1.03	22.48	33.00	10.52
1907.60	V	80.98	7.27	11.82	1.03	18.06	33.00	14.94

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:

BW (MHz)	Modulation	Test Channel	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)			
1.40	QPSK	Low	H	81.62	6.92	11.45	0.85	17.52	33.00	15.48
		Low	V	80.97	6.20	11.45	0.85	16.80	33.00	16.20
		Middle	H	81.87	7.56	11.66	0.95	18.27	33.00	14.73
		Middle	V	80.89	6.72	11.66	0.95	17.43	33.00	15.57
		High	H	79.89	5.90	11.82	1.03	16.69	33.00	16.31
		High	V	78.85	5.15	11.82	1.03	15.94	33.00	17.06
	16QAM	Low	H	81.26	6.56	11.45	0.85	17.16	33.00	15.84
		Low	V	80.59	5.82	11.45	0.85	16.42	33.00	16.58
		Middle	H	81.28	6.97	11.66	0.95	17.68	33.00	15.32
		Middle	V	80.26	6.09	11.66	0.95	16.80	33.00	16.20
		High	H	79.84	5.85	11.82	1.03	16.64	33.00	16.36
		High	V	78.59	4.89	11.82	1.03	15.68	33.00	17.32
3.00	QPSK	Low	H	81.61	6.92	11.46	0.86	17.52	33.00	15.48
		Low	V	80.92	6.17	11.46	0.86	16.77	33.00	16.23
		Middle	H	82.08	7.77	11.66	0.95	18.48	33.00	14.52
		Middle	V	81.12	6.95	11.66	0.95	17.66	33.00	15.34
		High	H	80.66	6.66	11.82	1.03	17.45	33.00	15.55
		High	V	79.47	5.76	11.82	1.03	16.55	33.00	16.45
	16QAM	Low	H	80.26	5.57	11.46	0.86	16.17	33.00	16.83
		Low	V	79.59	4.84	11.46	0.86	15.44	33.00	17.56
		Middle	H	82.12	7.81	11.66	0.95	18.52	33.00	14.48
		Middle	V	81.19	7.02	11.66	0.95	17.73	33.00	15.27
		High	H	80.56	6.56	11.82	1.03	17.35	33.00	15.65
		High	V	79.84	6.13	11.82	1.03	16.92	33.00	16.08
5.00	QPSK	Low	H	82.32	7.64	11.47	0.86	18.25	33.00	14.75
		Low	V	81.27	6.54	11.47	0.86	17.15	33.00	15.85
		Middle	H	81.84	7.53	11.66	0.95	18.24	33.00	14.76
		Middle	V	80.88	6.71	11.66	0.95	17.42	33.00	15.58
		High	H	79.83	5.82	11.82	1.03	16.61	33.00	16.39
		High	V	78.89	5.18	11.82	1.03	15.97	33.00	17.03
	16QAM	Low	H	81.45	6.77	11.47	0.86	17.38	33.00	15.62
		Low	V	80.29	5.56	11.47	0.86	16.17	33.00	16.83
		Middle	H	81.74	7.43	11.66	0.95	18.14	33.00	14.86
		Middle	V	80.89	6.72	11.66	0.95	17.43	33.00	15.57
		High	H	79.56	5.55	11.82	1.03	16.34	33.00	16.66
		High	V	78.48	4.77	11.82	1.03	15.56	33.00	17.44
10.0	QPSK	Low	H	80.99	6.35	11.49	0.87	16.97	33.00	16.03
		Low	V	79.89	5.21	11.49	0.87	15.83	33.00	17.17
		Middle	H	80.88	6.57	11.66	0.95	17.28	33.00	15.72
		Middle	V	79.45	5.28	11.66	0.95	15.99	33.00	17.01
		High	H	78.71	4.69	11.81	1.03	15.47	33.00	17.53
		High	V	77.58	3.85	11.81	1.03	14.63	33.00	18.37
	16QAM	Low	H	80.89	6.25	11.49	0.87	16.87	33.00	16.13
		Low	V	79.58	4.90	11.49	0.87	15.52	33.00	17.48
		Middle	H	80.57	6.26	11.66	0.95	16.97	33.00	16.03
		Middle	V	79.42	5.25	11.66	0.95	15.96	33.00	17.04
		High	H	78.88	4.86	11.81	1.03	15.64	33.00	17.36
		High	V	77.26	3.53	11.81	1.03	14.31	33.00	18.69

BW (MHz)	Modulation	Test Channel	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)			
15.0	QPSK	Low	H	81.33	6.72	11.50	0.88	17.34	33.00	15.66
		Low	V	80.16	5.53	11.50	0.88	16.15	33.00	16.85
		Middle	H	80.64	6.33	11.66	0.95	17.04	33.00	15.96
		Middle	V	79.24	5.07	11.66	0.95	15.78	33.00	17.22
		High	H	79.12	5.08	11.81	1.02	15.87	33.00	17.13
		High	V	78.09	4.35	11.81	1.02	15.14	33.00	17.86
	16QAM	Low	H	80.26	5.65	11.50	0.88	16.27	33.00	16.73
		Low	V	79.21	4.58	11.50	0.88	15.20	33.00	17.80
		Middle	H	80.89	6.58	11.66	0.95	17.29	33.00	15.71
		Middle	V	79.12	4.95	11.66	0.95	15.66	33.00	17.34
		High	H	79.58	5.54	11.81	1.02	16.33	33.00	16.67
		High	V	78.59	4.85	11.81	1.02	15.64	33.00	17.36
20.0	QPSK	Low	H	81.76	7.18	11.52	0.88	17.82	33.00	15.18
		Low	V	80.89	6.31	11.52	0.88	16.95	33.00	16.05
		Middle	H	81.02	6.71	11.66	0.95	17.42	33.00	15.58
		Middle	V	80.00	5.83	11.66	0.95	16.54	33.00	16.46
		High	H	79.62	5.57	11.80	1.02	16.35	33.00	16.65
		High	V	78.59	4.83	11.80	1.02	15.61	33.00	17.39
	16QAM	Low	H	80.32	5.74	11.52	0.88	16.38	33.00	16.62
		Low	V	79.13	4.55	11.52	0.88	15.19	33.00	17.81
		Middle	H	81.13	6.82	11.66	0.95	17.53	33.00	15.47
		Middle	V	80.22	6.05	11.66	0.95	16.76	33.00	16.24
		High	H	79.86	5.81	11.80	1.02	16.59	33.00	16.41
		High	V	78.89	5.13	11.80	1.02	15.91	33.00	17.09

LTE Band 5:

BW (MHz)	Modulation	Test Channel	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)			
1.40	QPSK	Low	H	92.3	17.89	0.00	0.49	17.4	38.45	21.05
		Low	V	85.96	14.47	0.00	0.49	13.98	38.45	24.47
		Middle	H	92.84	18.61	0.00	0.50	18.11	38.45	20.34
		Middle	V	86.61	15.35	0.00	0.50	14.85	38.45	23.6
		High	H	92.98	18.94	0.00	0.50	18.44	38.45	20.01
		High	V	86.45	15.42	0.00	0.50	14.92	38.45	23.53
	16QAM	Low	H	91.19	16.78	0.00	0.49	16.29	38.45	22.16
		Low	V	84.75	13.26	0.00	0.49	12.77	38.45	25.68
		Middle	H	90.92	16.69	0.00	0.50	16.19	38.45	22.26
		Middle	V	84.97	13.71	0.00	0.50	13.21	38.45	25.24
		High	H	91.39	17.35	0.00	0.50	16.85	38.45	21.6
		High	V	85.44	14.41	0.00	0.50	13.91	38.45	24.54
3.00	QPSK	Low	H	92.04	17.63	0.00	0.49	17.14	38.45	21.31
		Low	V	86.73	15.24	0.00	0.49	14.75	38.45	23.7
		Middle	H	92.66	18.43	0.00	0.50	17.93	38.45	20.52
		Middle	V	86.87	15.61	0.00	0.50	15.11	38.45	23.34
		High	H	91.78	17.74	0.00	0.50	17.24	38.45	21.21
		High	V	86.81	15.78	0.00	0.50	15.28	38.45	23.17
	16QAM	Low	H	91.84	17.43	0.00	0.49	16.94	38.45	21.51
		Low	V	85.23	13.74	0.00	0.49	13.25	38.45	25.2
		Middle	H	92.04	17.81	0.00	0.50	17.31	38.45	21.14
		Middle	V	85.33	14.07	0.00	0.50	13.57	38.45	24.88
		High	H	91.77	17.73	0.00	0.50	17.23	38.45	21.22
		High	V	85.59	14.56	0.00	0.50	14.06	38.45	24.39
5.00	QPSK	Low	H	91.05	16.64	0.00	0.49	16.15	38.45	22.3
		Low	V	84.42	12.93	0.00	0.49	12.44	38.45	26.01
		Middle	H	91.03	16.8	0.00	0.50	16.3	38.45	22.15
		Middle	V	84.28	13.02	0.00	0.50	12.52	38.45	25.93
		High	H	91.44	17.4	0.00	0.50	16.9	38.45	21.55
		High	V	84.72	13.69	0.00	0.50	13.19	38.45	25.26
	16QAM	Low	H	90.25	15.84	0.00	0.49	15.35	38.45	23.1
		Low	V	84.6	13.11	0.00	0.49	12.62	38.45	25.83
		Middle	H	90.38	16.15	0.00	0.50	15.65	38.45	22.8
		Middle	V	85.19	13.93	0.00	0.50	13.43	38.45	25.02
		High	H	90.54	16.5	0.00	0.50	16	38.45	22.45
		High	V	84.79	13.76	0.00	0.50	13.26	38.45	25.19
10.0	QPSK	Low	H	91.6	17.19	0.00	0.49	16.7	38.45	21.75
		Low	V	84.92	13.43	0.00	0.49	12.94	38.45	25.51
		Middle	H	91.59	17.36	0.00	0.50	16.86	38.45	21.59
		Middle	V	85.45	14.19	0.00	0.50	13.69	38.45	24.76
		High	H	91.6	17.56	0.00	0.50	17.06	38.45	21.39
		High	V	85.13	14.1	0.00	0.50	13.6	38.45	24.85
	16QAM	Low	H	89.11	14.7	0.00	0.49	14.21	38.45	24.24
		Low	V	84.31	12.82	0.00	0.49	12.33	38.45	26.12
		Middle	H	89.05	14.82	0.00	0.50	14.32	38.45	24.13
		Middle	V	84.71	13.45	0.00	0.50	12.95	38.45	25.5
		High	H	89.59	15.55	0.00	0.50	15.05	38.45	23.4
		High	V	84.98	13.95	0.00	0.50	13.45	38.45	25

LTE Band 7:

BW (MHz)	Modulation	Test Channel	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)			
5.00	QPSK	Low	H	77.88	3.21	13.10	1.24	15.07	33.00	17.93
		Low	V	78.84	5.4	13.10	1.24	17.26	33.00	15.74
		Middle	H	78.78	4.33	13.14	1.26	16.21	33.00	16.79
		Middle	V	79.61	6.62	13.14	1.26	18.5	33.00	14.5
		High	H	77.22	3	13.17	1.29	14.88	33.00	18.12
		High	V	78.39	5.85	13.17	1.29	17.73	33.00	15.27
	16QAM	Low	H	76.59	1.92	13.10	1.24	13.78	33.00	19.22
		Low	V	77.13	3.69	13.10	1.24	15.55	33.00	17.45
		Middle	H	77.26	2.81	13.14	1.26	14.69	33.00	18.31
		Middle	V	78.12	5.13	13.14	1.26	17.01	33.00	15.99
		High	H	75.51	1.29	13.17	1.29	13.17	33.00	19.83
		High	V	76.25	3.71	13.17	1.29	15.59	33.00	17.41
10.0	QPSK	Low	H	76.23	1.57	13.11	1.24	13.44	33.00	19.56
		Low	V	77.12	3.72	13.11	1.24	15.59	33.00	17.41
		Middle	H	77.26	2.81	13.14	1.26	14.69	33.00	18.31
		Middle	V	78.21	5.22	13.14	1.26	17.1	33.00	15.9
		High	H	76.75	2.51	13.17	1.29	14.39	33.00	18.61
		High	V	77.84	5.27	13.17	1.29	17.15	33.00	15.85
	16QAM	Low	H	75.01	0.35	13.11	1.24	12.22	33.00	20.78
		Low	V	76.12	2.72	13.11	1.24	14.59	33.00	18.41
		Middle	H	76.56	2.11	13.14	1.26	13.99	33.00	19.01
		Middle	V	77.59	4.6	13.14	1.26	16.48	33.00	16.52
		High	H	75.58	1.34	13.17	1.29	13.22	33.00	19.78
		High	V	76.48	3.91	13.17	1.29	15.79	33.00	17.21
15.0	QPSK	Low	H	76.26	1.62	13.11	1.25	13.48	33.00	19.52
		Low	V	77.22	3.85	13.11	1.25	15.71	33.00	17.29
		Middle	H	77.56	3.11	13.14	1.26	14.99	33.00	18.01
		Middle	V	78.69	5.7	13.14	1.26	17.58	33.00	15.42
		High	H	76.66	2.41	13.16	1.28	14.29	33.00	18.71
		High	V	77.56	4.95	13.16	1.28	16.83	33.00	16.17
	16QAM	Low	H	75.58	0.94	13.11	1.25	12.8	33.00	20.2
		Low	V	76.26	2.89	13.11	1.25	14.75	33.00	18.25
		Middle	H	76.87	2.42	13.14	1.26	14.3	33.00	18.7
		Middle	V	77.59	4.6	13.14	1.26	16.48	33.00	16.52
		High	H	75.29	1.04	13.16	1.28	12.92	33.00	20.08
		High	V	76.58	3.97	13.16	1.28	15.85	33.00	17.15
20.0	QPSK	Low	H	76.25	1.63	13.11	1.25	13.49	33.00	19.51
		Low	V	77.46	4.13	13.11	1.25	15.99	33.00	17.01
		Middle	H	77.55	3.1	13.14	1.26	14.98	33.00	18.02
		Middle	V	78.78	5.79	13.14	1.26	17.67	33.00	15.33
		High	H	76.28	2.01	13.16	1.28	13.89	33.00	19.11
		High	V	77.42	4.78	13.16	1.28	16.66	33.00	16.34
	16QAM	Low	H	75.26	0.64	13.11	1.25	12.5	33.00	20.5
		Low	V	76.37	3.04	13.11	1.25	14.9	33.00	18.1
		Middle	H	76.25	1.8	13.14	1.26	13.68	33.00	19.32
		Middle	V	77.56	4.57	13.14	1.26	16.45	33.00	16.55
		High	H	75.59	1.32	13.16	1.28	13.2	33.00	19.8
		High	V	76.26	3.62	13.16	1.28	15.5	33.00	17.5

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, RSS-GEN §6.7- OCCUPIED BANDWIDTH

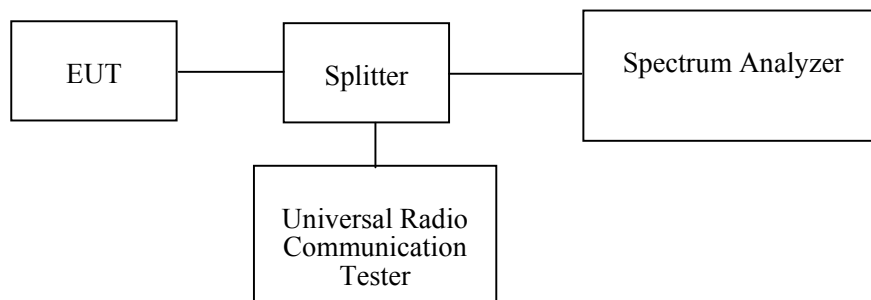
Applicable Standard

FCC §2.1049, §22.917, §22.905, §24.238, §27.53, and RSS-GEN §6.7

Test Procedure

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

The 26 dB & 99% bandwidth was recorded.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU 26	200256	2020-05-09	2021-05-09
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005011	Each time	/
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41002201	Each Time	/
E-Microwave	Two-way Splitter	ODP-1-6-2S	OE0120142	Each Time	/

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

Test Data

Environmental Conditions

Temperature:	26.2~27.8°C
Relative Humidity:	50~51 %
ATM Pressure:	100.2~100.8 kPa
Tester:	Rita Huang
Test Date:	2020-09-29-2020-09-30

Test Mode: Transmitting

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

GPRS&EGPRS:

Band	Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
		Low Channel	Middle Channel	High Channel	Low Channel	Middle Channel	High Channel
Cellular	GPRS	0.243	0.243	0.240	0.323	0.321	0.316
	EGPRS	0.245	0.245	0.243	0.314	0.316	0.316
PCS	GPRS	0.245	0.245	0.245	0.316	0.318	0.314
	EGPRS	0.245	0.246	0.246	0.317	0.314	0.313

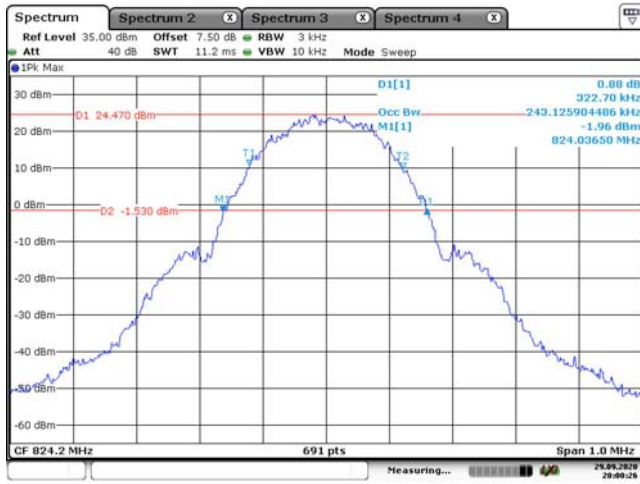
WCDMA:

Band	Operation Mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
		Low Channel	Middle Channel	High Channel	Low Channel	Middle Channel	High Channel
Cellular	Rel 99	4.168	4.139	4.124	4.747	4.718	4.703
	HSDPA	4.153	4.153	4.124	4.732	4.718	4.718
	HSUPA	4.168	4.139	4.110	4.718	4.718	4.718
PCS	Rel 99	4.168	4.168	4.168	4.732	4.732	4.718
	HSDPA	4.168	4.168	4.168	4.732	4.747	4.732
	HSUPA	4.168	4.168	4.168	4.732	4.747	4.718

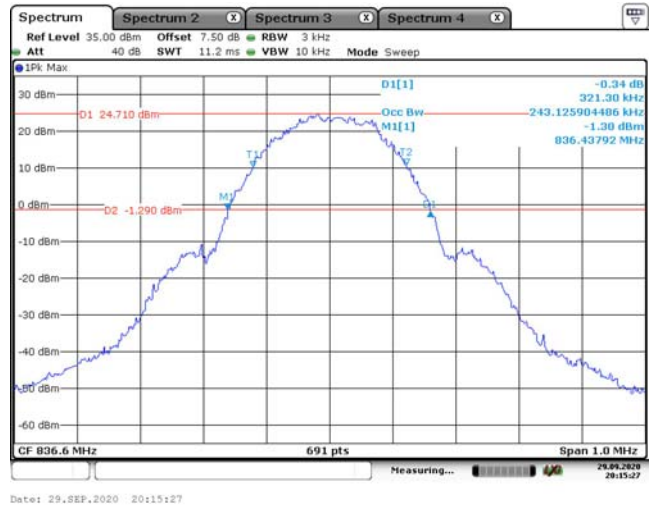
LTE Bands:

Band	Bandwidth (MHz)	Modulation mode	99% Occupied Bandwidth (MHz)			26 dB Occupied Bandwidth (MHz)		
			Low Channel	Middle Channel	High Channel	Low Channel	Middle Channel	High Channel
LTE Band 2	1.4 MHz	QPSK	1.110	1.104	1.116	1.339	1.338	1.317
		16QAM	1.104	1.104	1.104	1.333	1.326	1.328
	3 MHz	QPSK	2.700	2.700	2.700	2.961	2.952	2.948
		16QAM	2.688	2.688	2.700	2.969	2.976	2.979
	5 MHz	QPSK	4.540	4.540	4.560	5.095	5.020	5.095
		16QAM	4.520	4.520	4.540	5.027	5.020	5.047
	10 MHz	QPSK	8.960	8.960	9.000	9.748	9.800	9.872
		16QAM	8.960	8.960	8.960	9.808	9.680	9.737
	15 MHz	QPSK	13.560	13.560	13.560	14.916	15.060	15.023
		16QAM	13.560	13.500	13.560	14.938	14.940	14.997
	20 MHz	QPSK	18.000	18.000	17.920	19.511	19.360	19.420
		16QAM	18.000	18.000	18.000	19.555	19.520	19.469
LTE Band 5	1.4 MHz	QPSK	1.110	1.110	1.110	1.326	1.308	1.291
		16QAM	1.104	1.104	1.104	1.314	1.308	1.315
	3 MHz	QPSK	2.712	2.688	2.688	2.971	2.928	2.956
		16QAM	2.700	2.688	2.688	2.965	2.978	2.938
	5 MHz	QPSK	4.520	4.520	4.520	5.061	5.020	5.016
		16QAM	4.540	4.520	4.520	5.108	4.980	5.035
	10 MHz	QPSK	9.000	8.960	8.960	9.816	9.680	9.814
		16QAM	8.960	8.960	9.000	9.689	9.680	9.759
LTE Band 7	5 MHz	QPSK	4.520	4.520	4.520	5.011	5.020	5.039
		16QAM	4.540	4.520	4.540	5.068	5.020	5.070
	10 MHz	QPSK	8.960	8.960	8.960	9.744	9.840	9.767
		16QAM	8.960	8.960	8.960	9.735	9.720	9.759
	15 MHz	QPSK	13.560	13.560	13.500	14.998	14.940	14.802
		16QAM	13.620	13.620	13.560	15.008	14.880	14.919
	20 MHz	QPSK	18.000	18.000	18.000	19.791	19.440	19.435
		16QAM	18.000	18.000	17.920	19.614	19.440	19.357

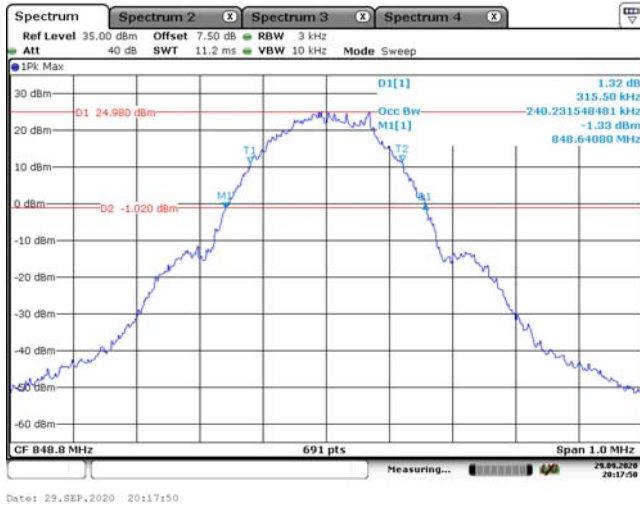
GPRS850, Low Channel



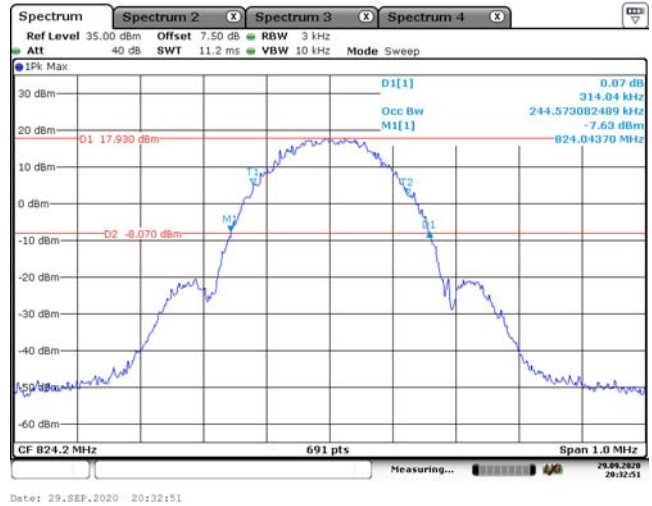
GPRS850, Middle Channel



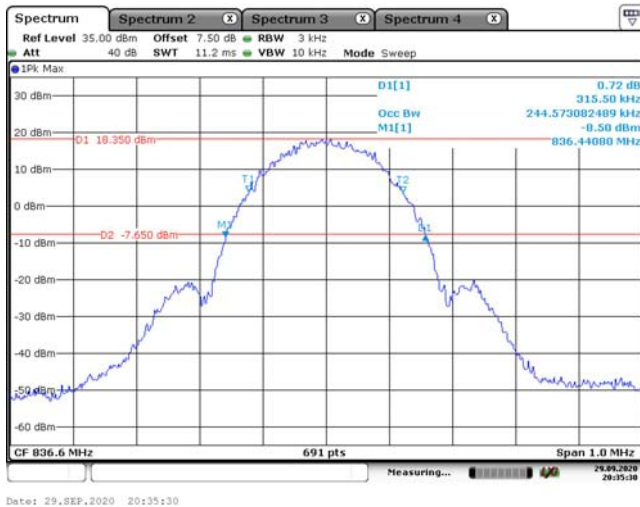
GPRS850, High Channel



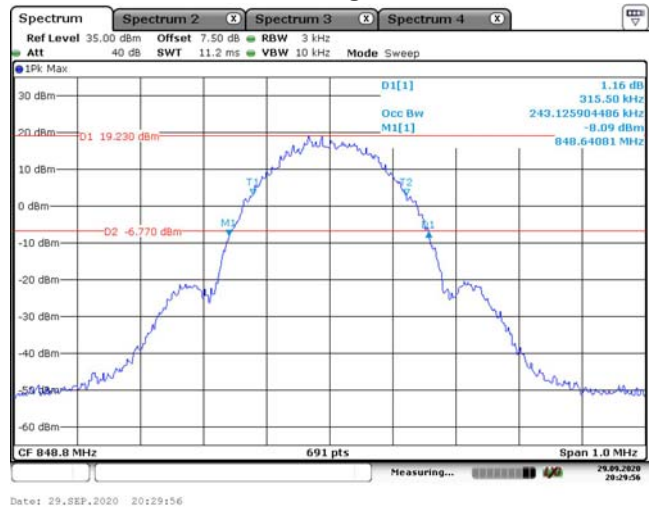
EGPRS850, Low Channel



EGPRS850, Middle Channel



EGPRS850, High Channel

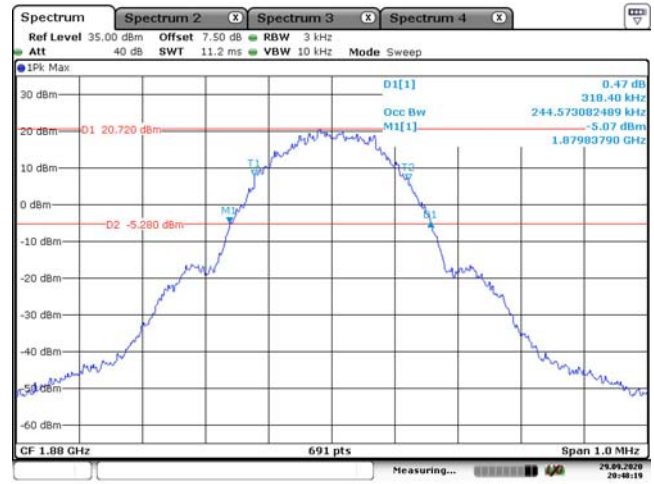


GPRS1900, Low Channel



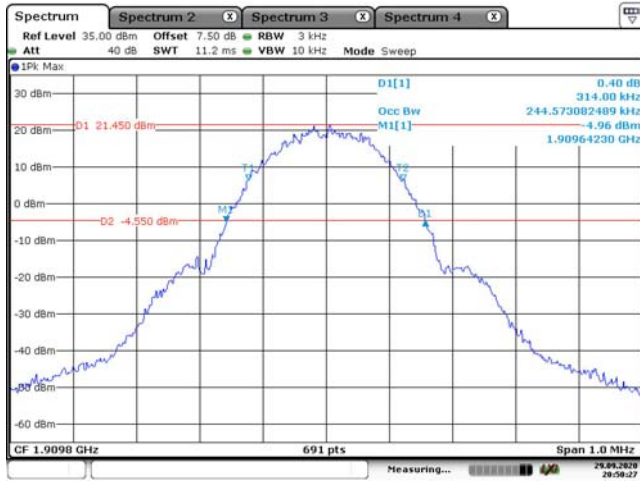
Date: 29.SEP.2020 20:44:26

GPRS1900, Middle Channel



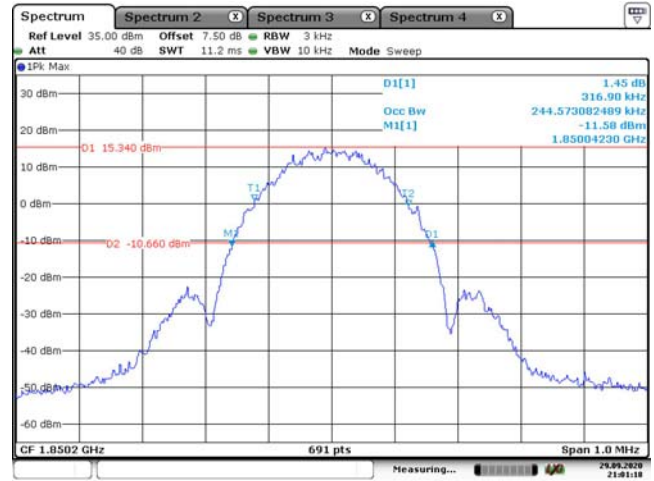
Date: 29.SEP.2020 20:48:19

GPRS1900, High Channel



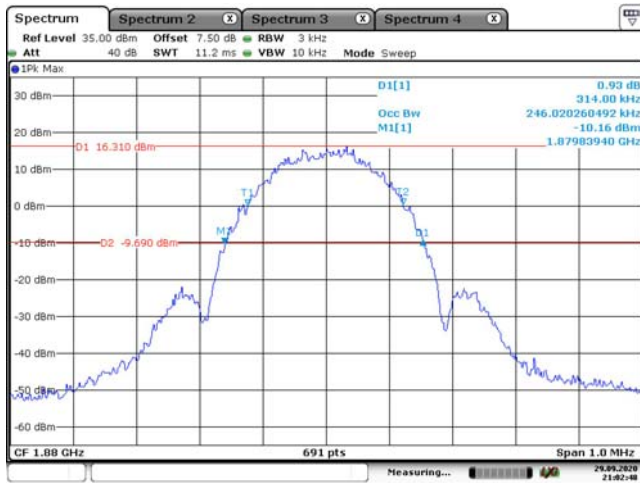
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EGPRS1900, Low Channel



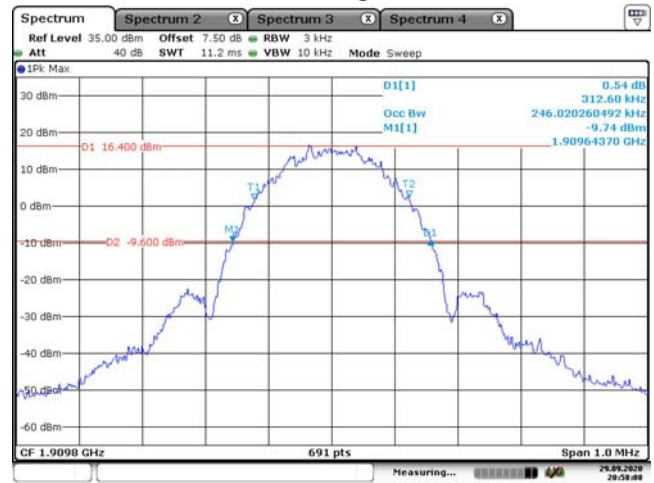
Date: 29.SEP.2020 21:01:19

EGPRS1900, Middle Channel



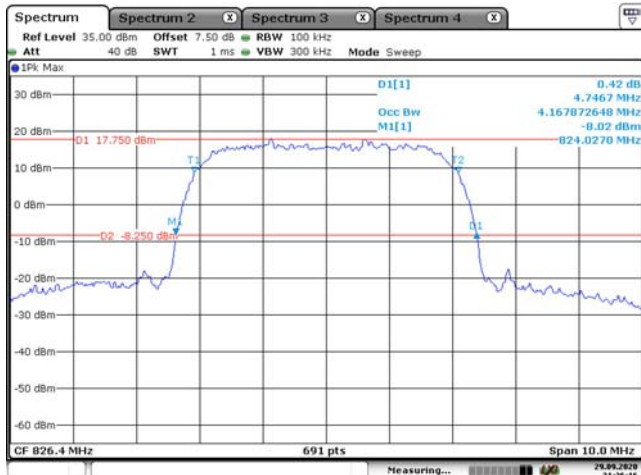
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EGPRS1900, High Channel

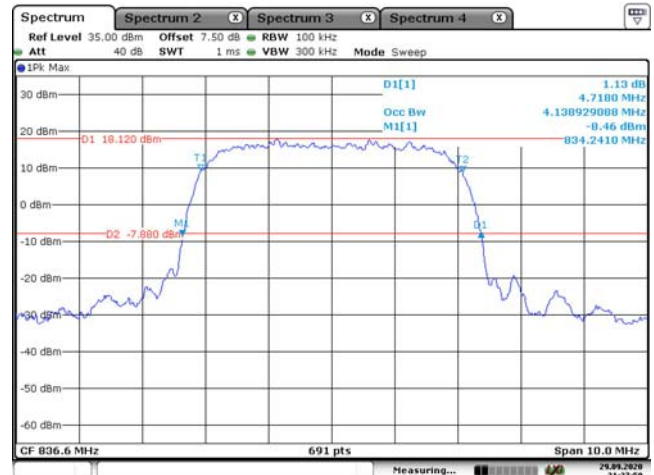


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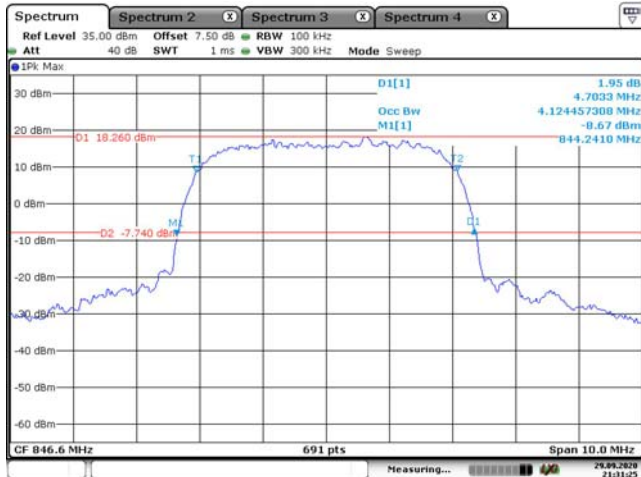
WCDMA Band V, Rel99, Low Channel



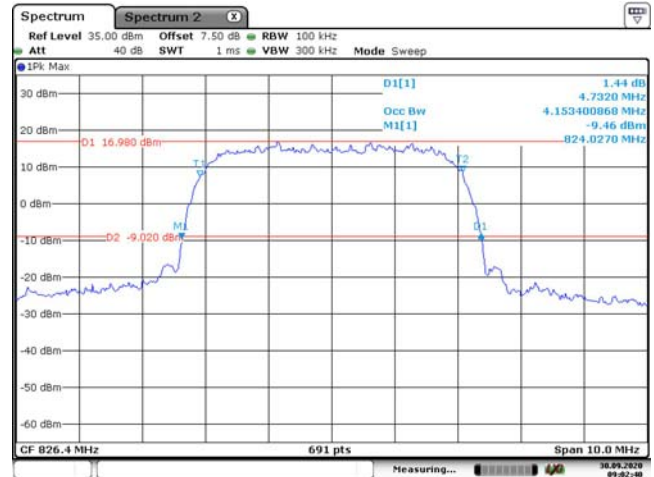
WCDMA Band V, Rel99, Middle Channel



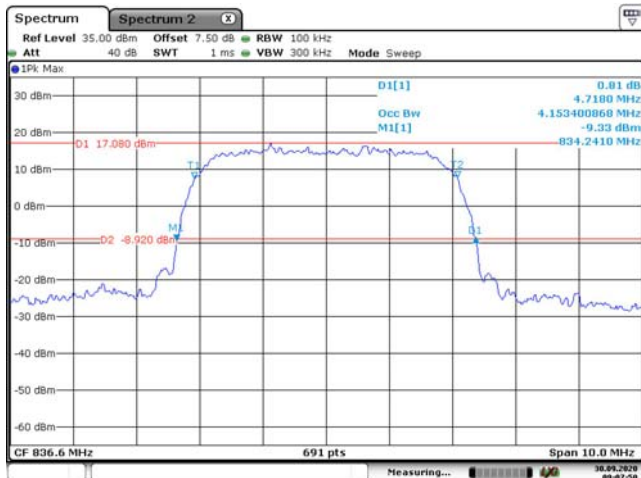
WCDMA Band V, Rel99, High Channel



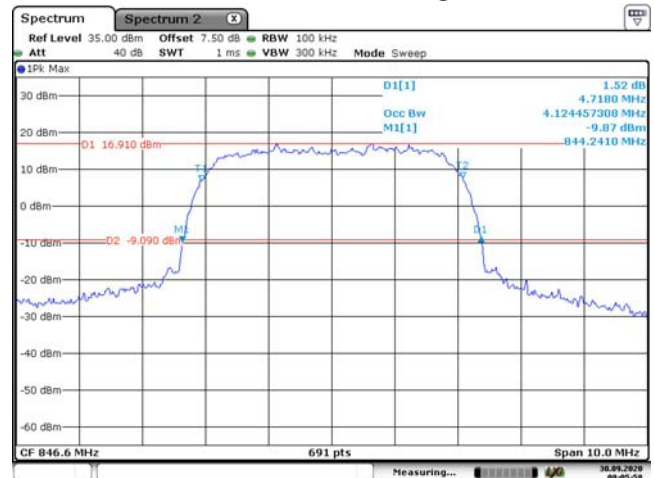
WCDMA Band V, HSDPA, Low Channel



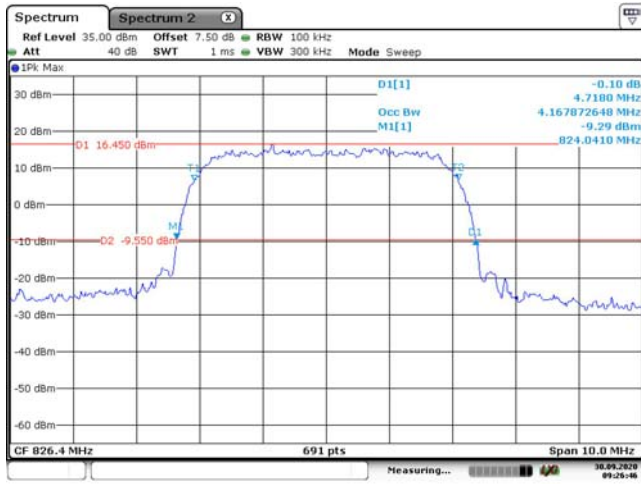
WCDMA Band V, HSDPA, Middle Channel



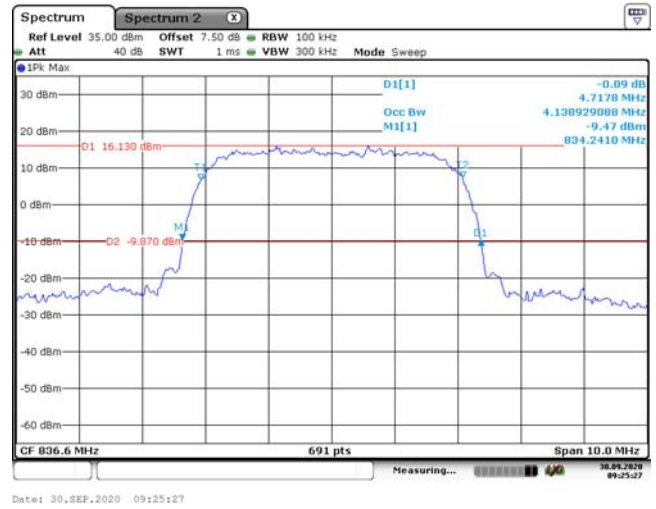
WCDMA Band V, HSDPA, High Channel



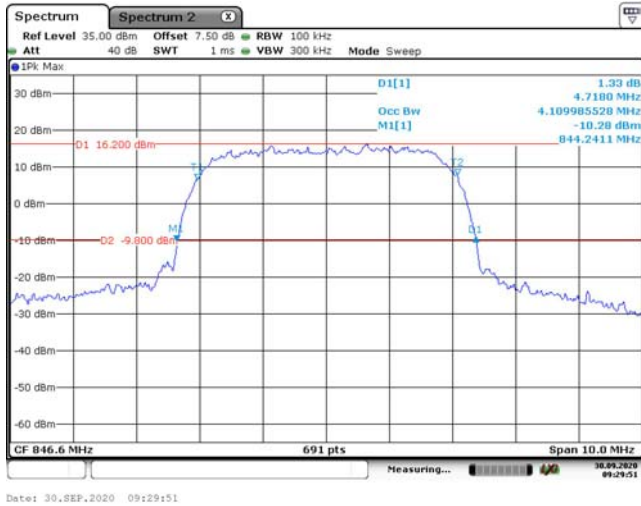
WCDMA Band V, HSUPA, Low Channel



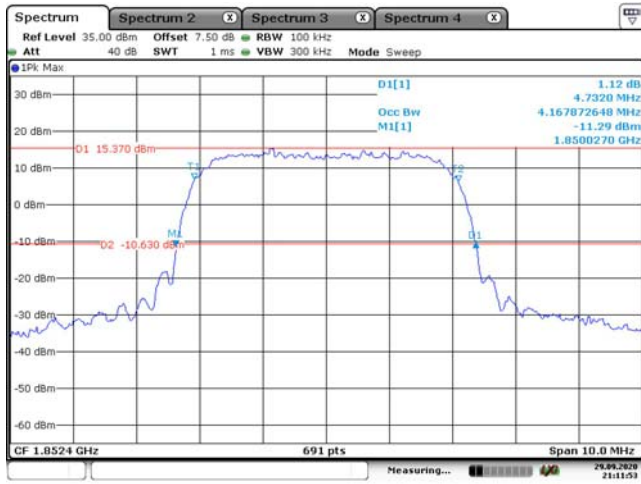
WCDMA Band V, HSUPA, Middle Channel



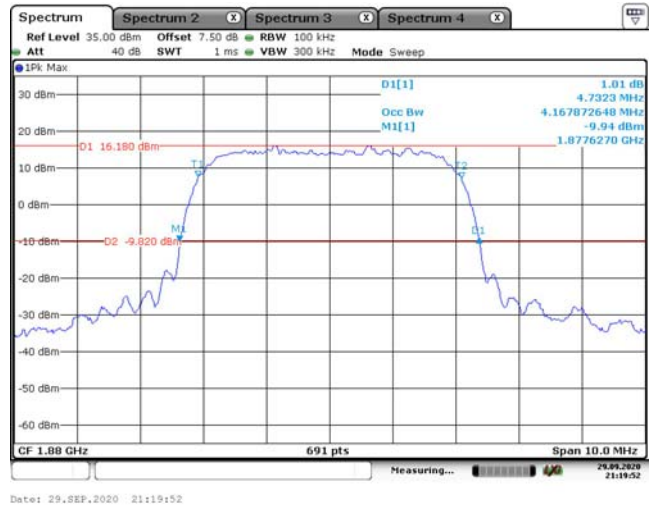
WCDMA Band V, HSUPA, High Channel



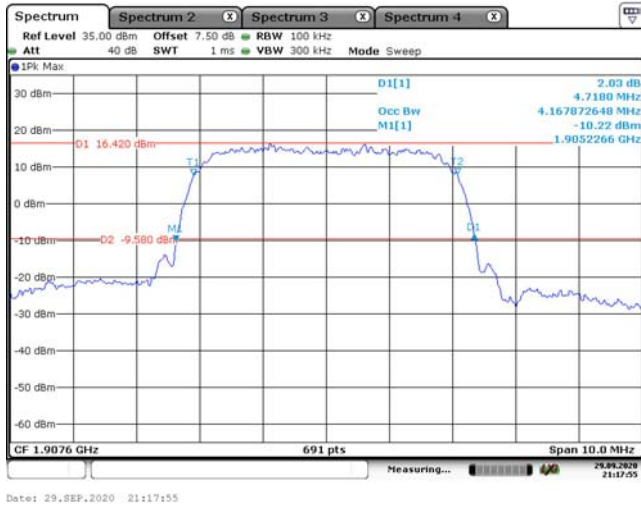
WCDMA Band II, Rel99, Low Channel



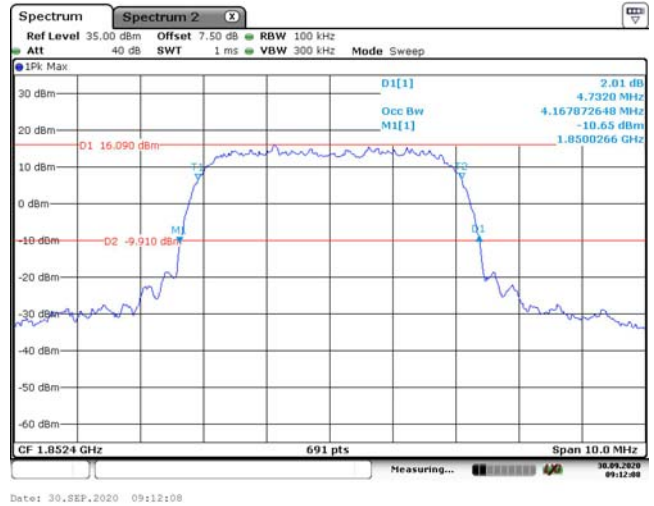
WCDMA Band II, Rel99, Middle Channel



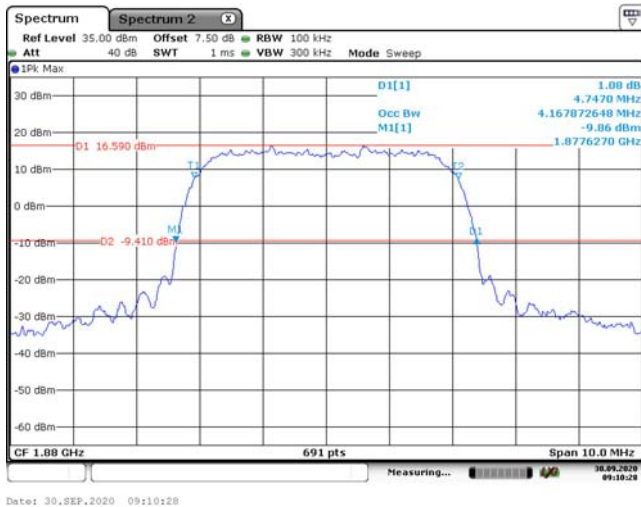
WCDMA Band II, Rel99, High Channel



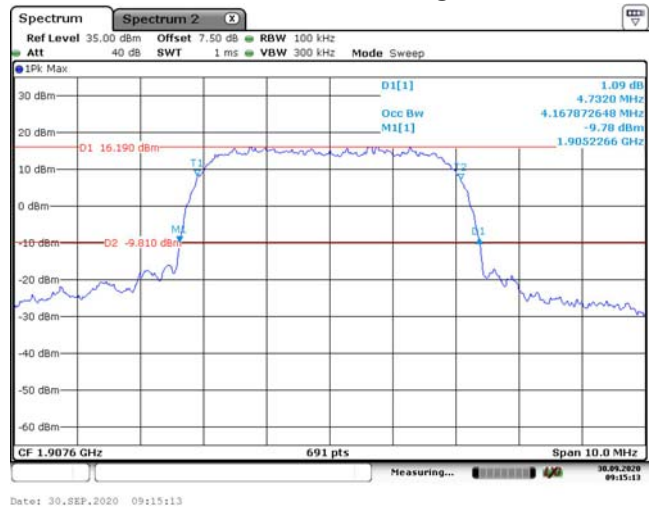
WCDMA Band II, HSDPA, Low Channel



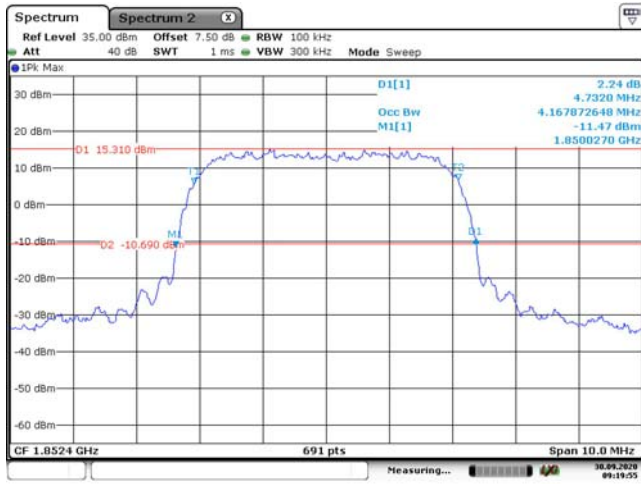
WCDMA Band II, HSDPA, Middle Channel



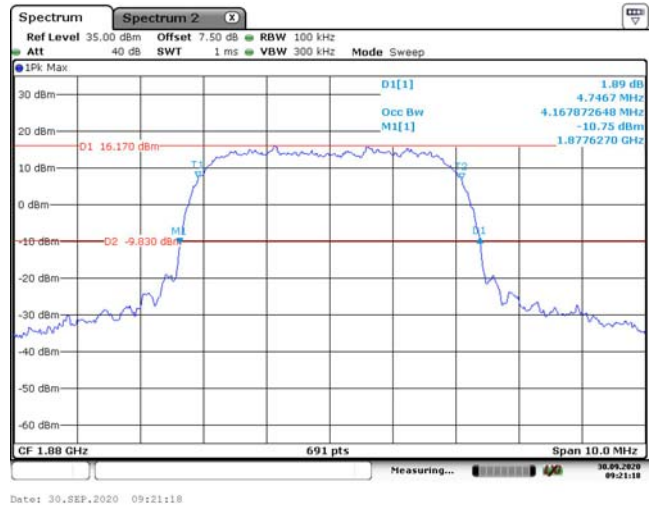
WCDMA Band II, HSDPA, High Channel



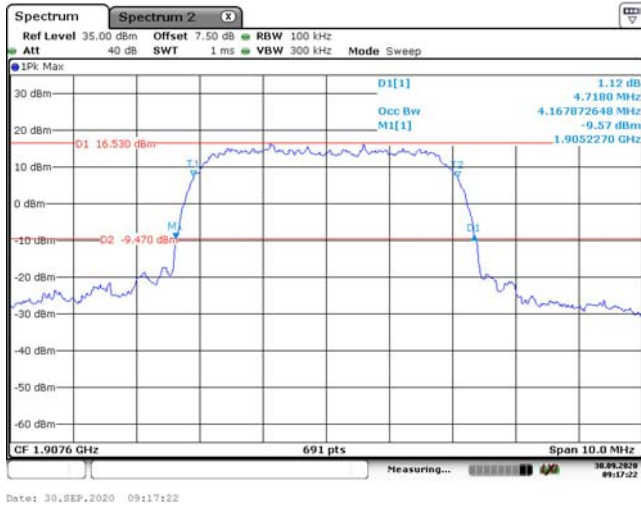
WCDMA Band II, HSUPA, Low Channel



WCDMA Band II, HSUPA, Middle Channel

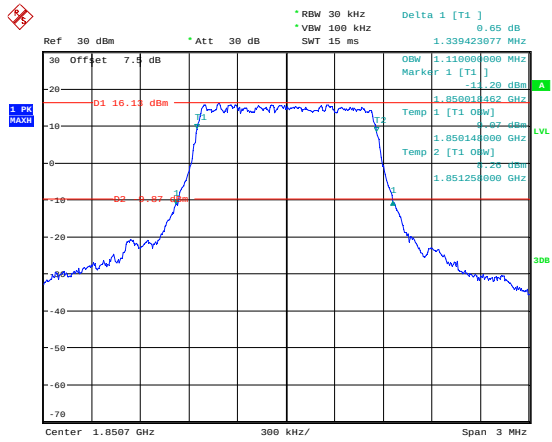


WCDMA Band II, HSUPA, High Channel



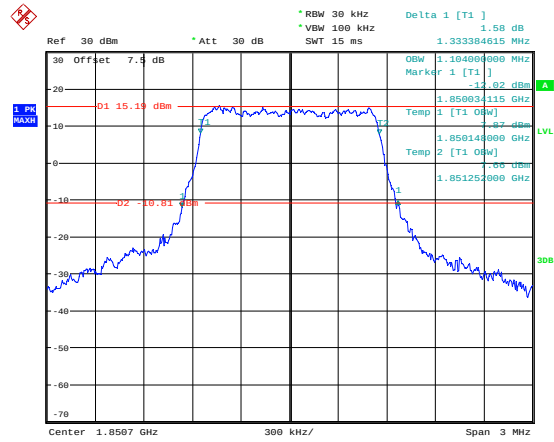
LTE Band 2

1.4M, QPSK, Low Channel



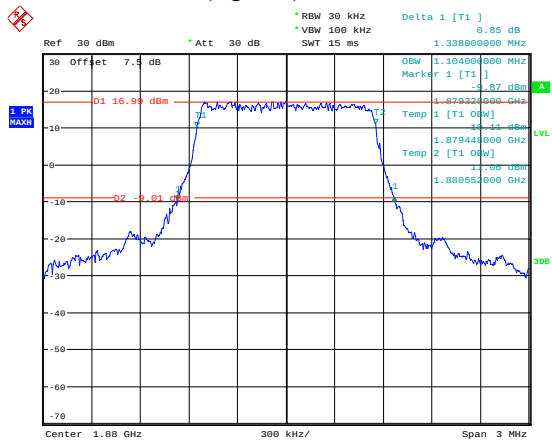
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1.4M, 16QAM, Low Channel



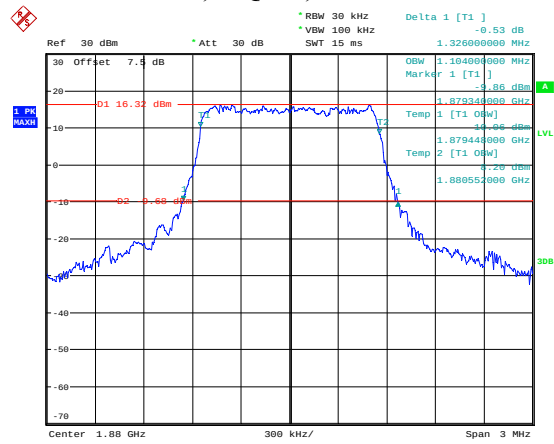
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1.4M, QPSK, Middle Channel



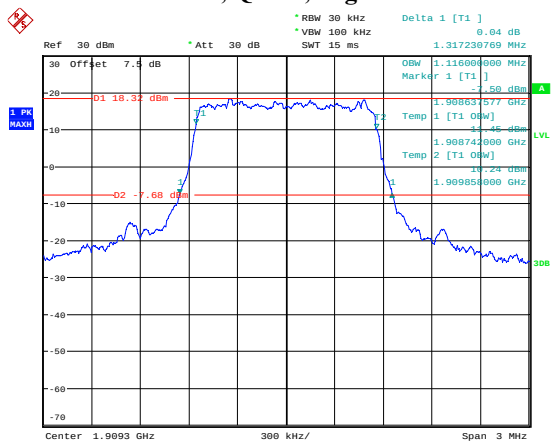
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1.4M, 16QAM, Middle Channel



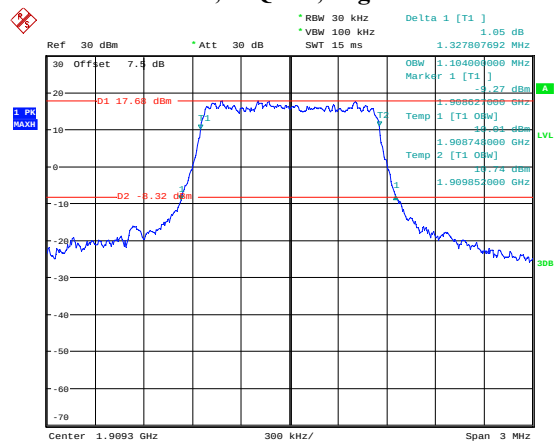
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1.4M, QPSK, High Channel



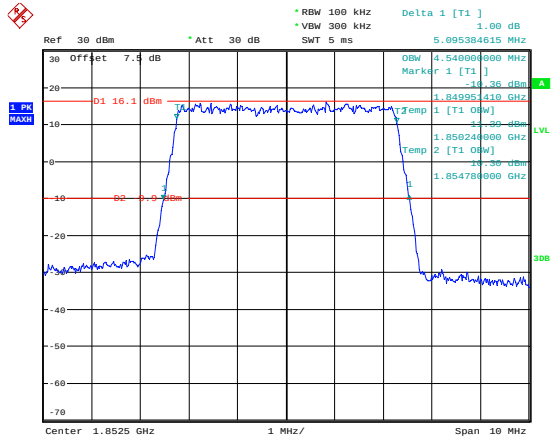
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1.4M, 16QAM, High Channel



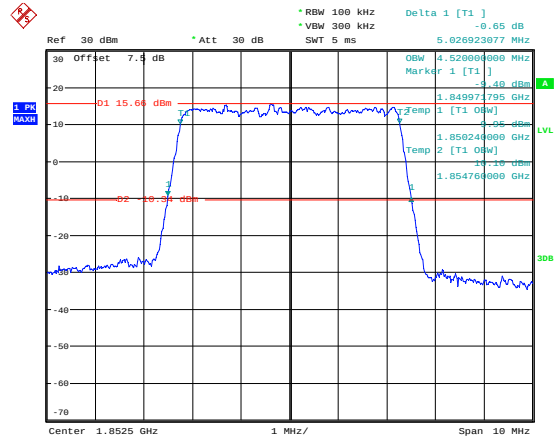
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5M, QPSK, Low Channel



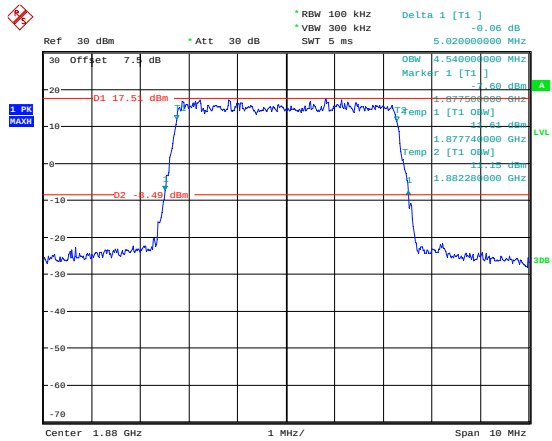
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5M, 16QAM, Low Channel



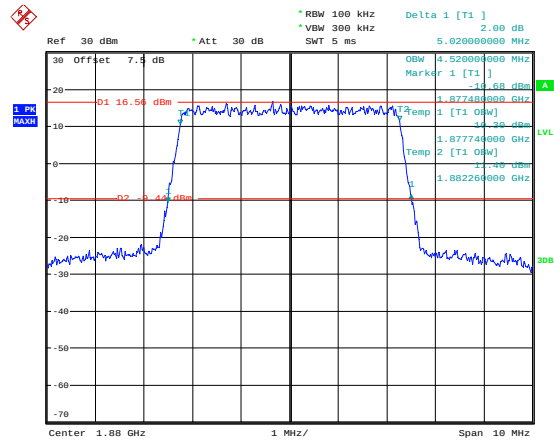
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5M, QPSK, Middle Channel



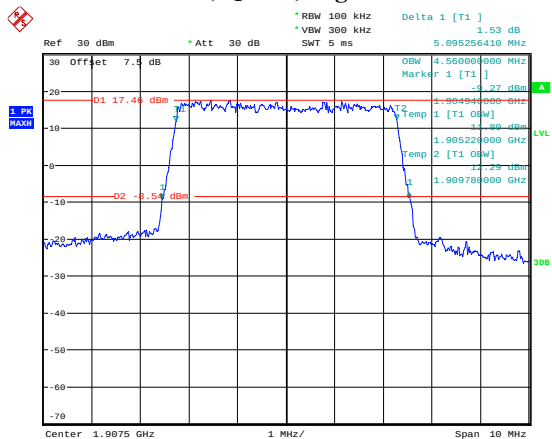
Date: 29.SEP.2020 09:08:17

5M, 16QAM, Middle Channel



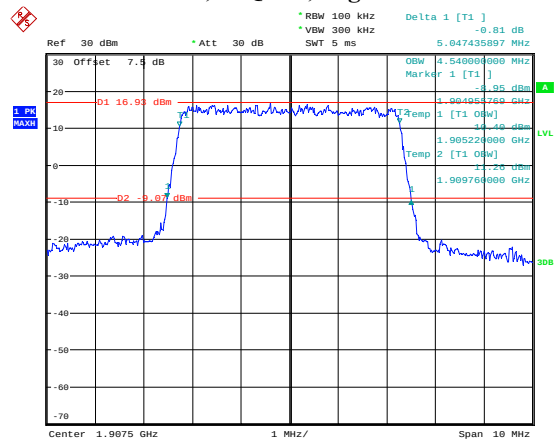
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5M, QPSK, High Channel



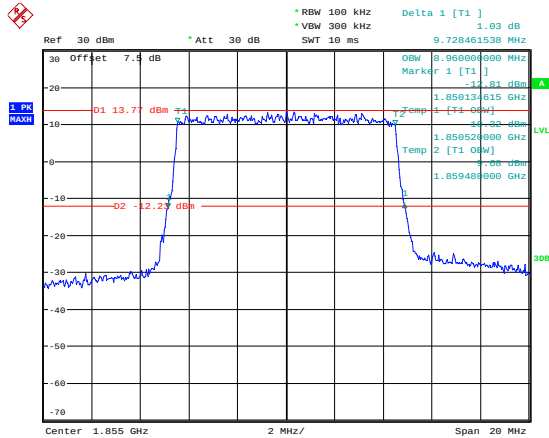
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5M, 16QAM, High Channel



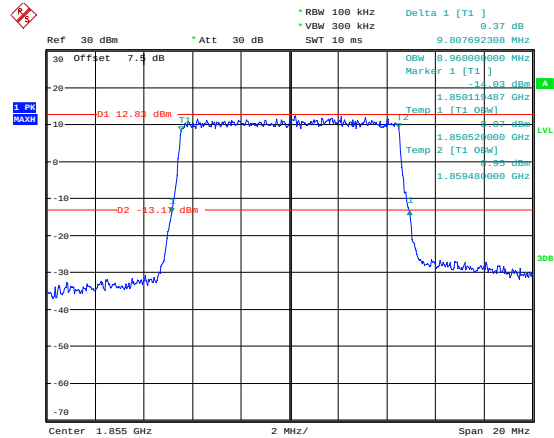
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10M, QPSK, Low Channel



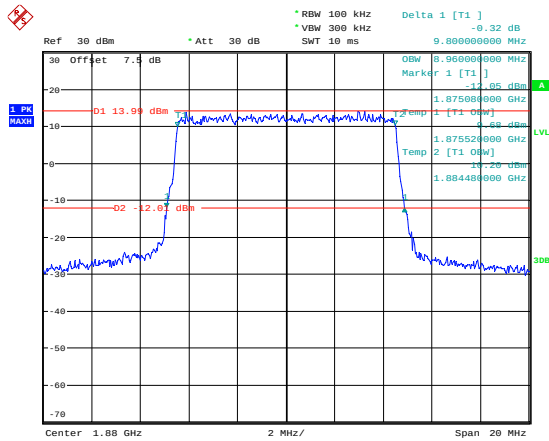
Date: 29.SEP.2020 11:00:31

10M, 16QAM, Low Channel



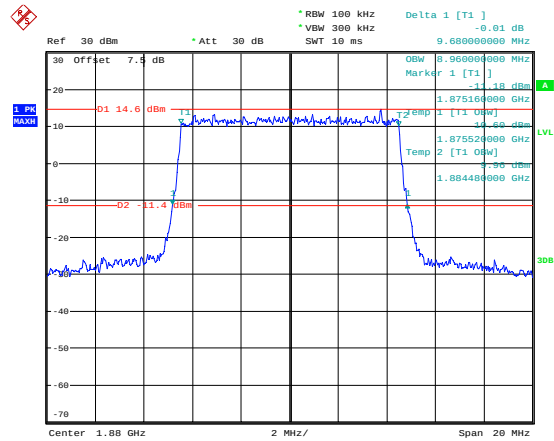
Date: 29.SEP.2020 10:58:55

10M, QPSK, Middle Channel



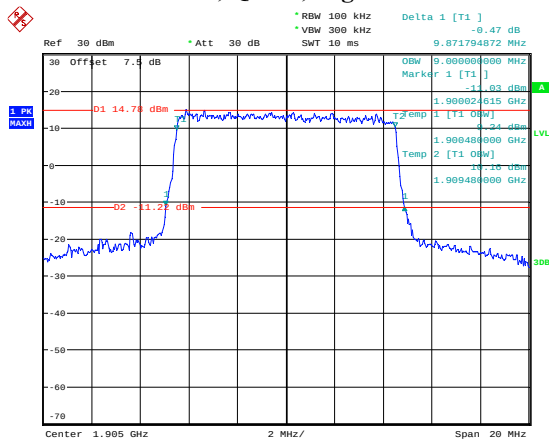
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10M, 16QAM, Middle Channel



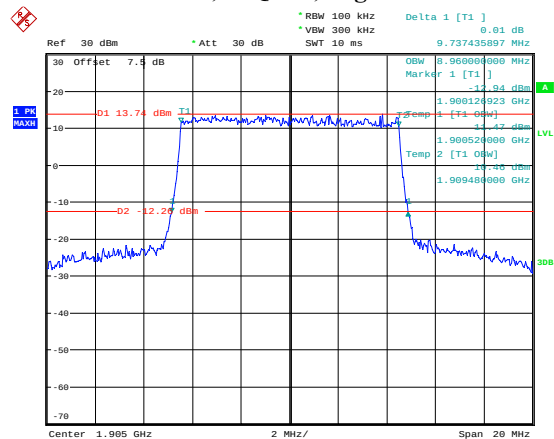
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10M, QPSK, High Channel



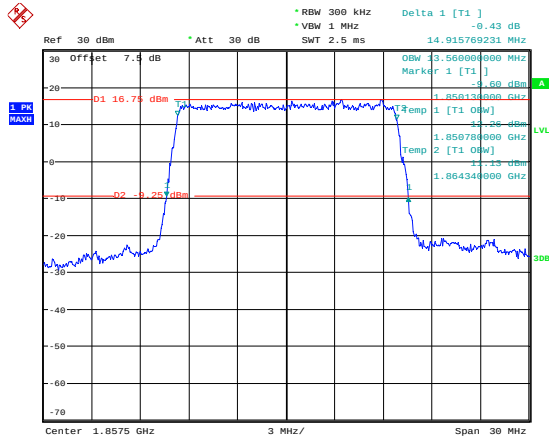
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10M, 16QAM, High Channel



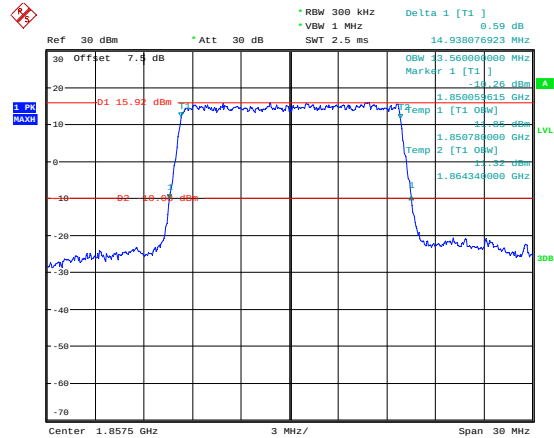
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15M, QPSK, Low Channel



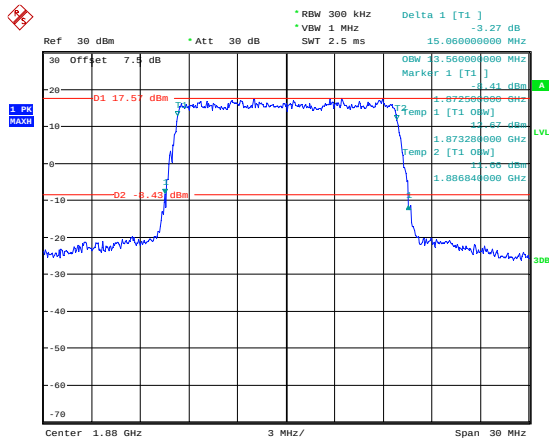
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15M, 16QAM, Low Channel



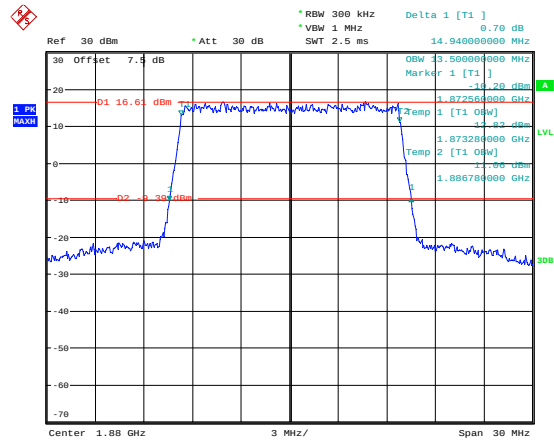
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15M, QPSK, Middle Channel



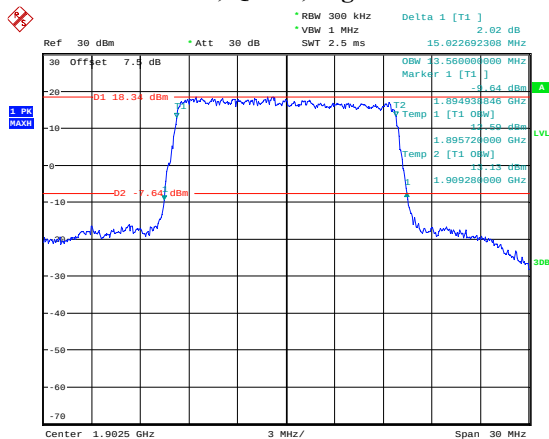
Date: 29.SEP.2020 09:09:51

15M, 16QAM, Middle Channel



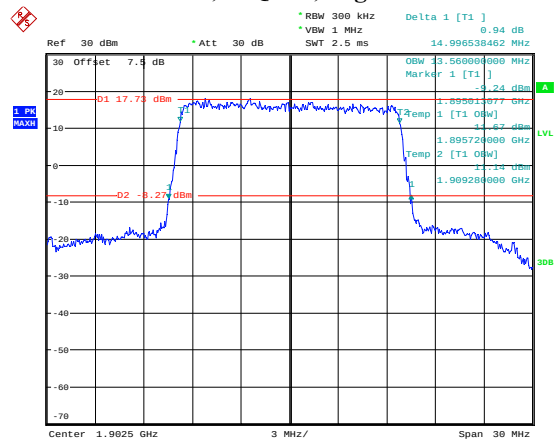
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15M, QPSK, High Channel



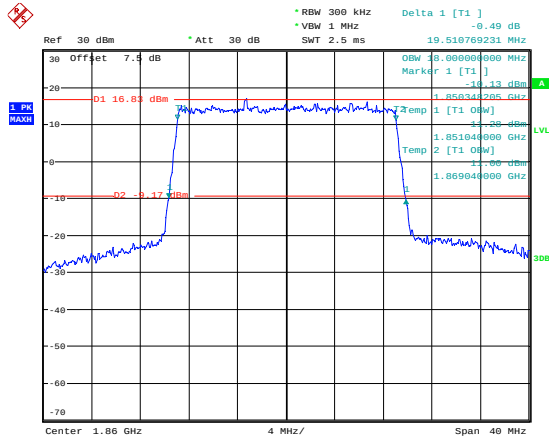
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15M, 16QAM, High Channel



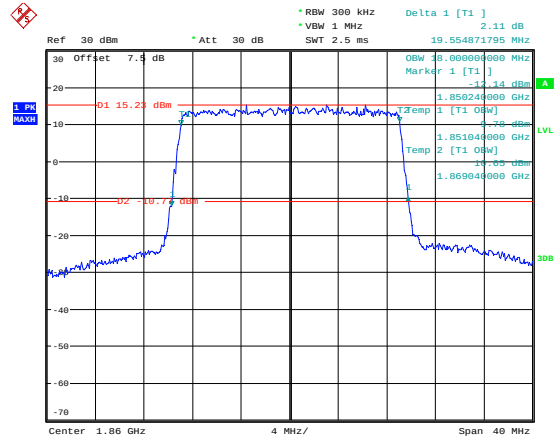
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20M, QPSK, Low Channel



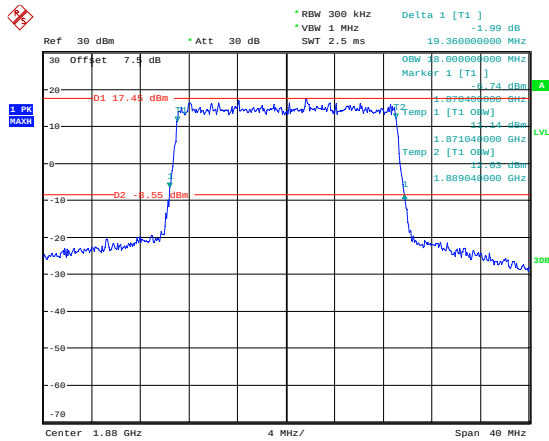
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20M, 16QAM, Low Channel



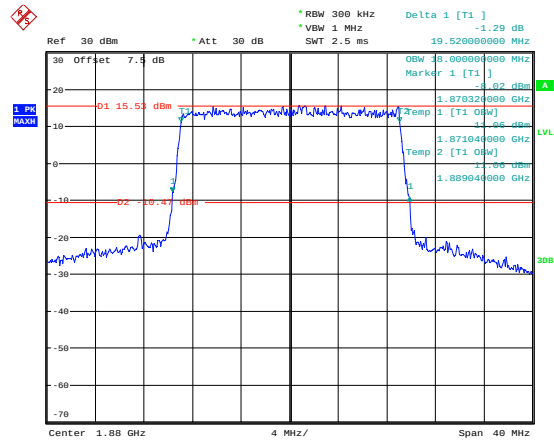
Date: 29.SEP.2020 11:22:59

20M, QPSK, Middle Channel



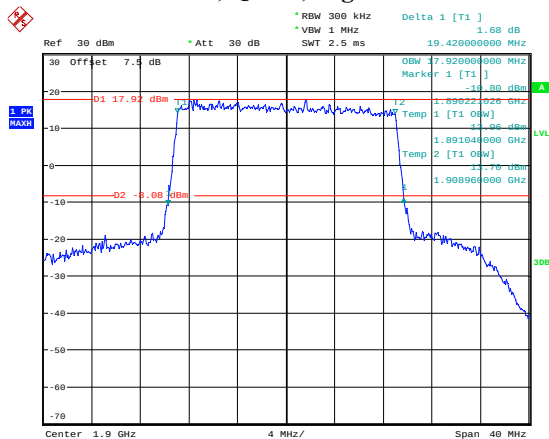
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20M, 16QAM, Middle Channel



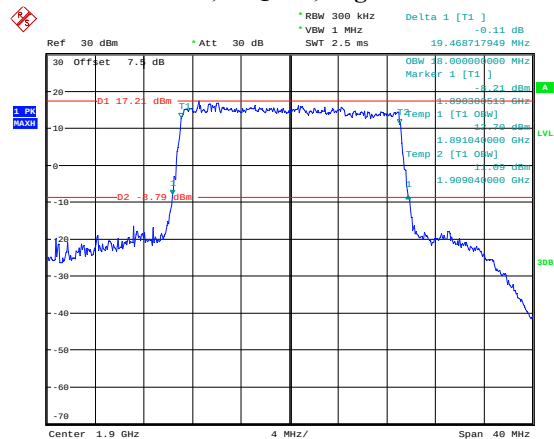
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20M, QPSK, High Channel

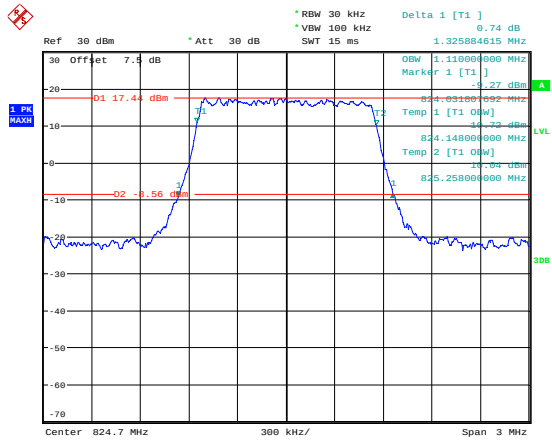


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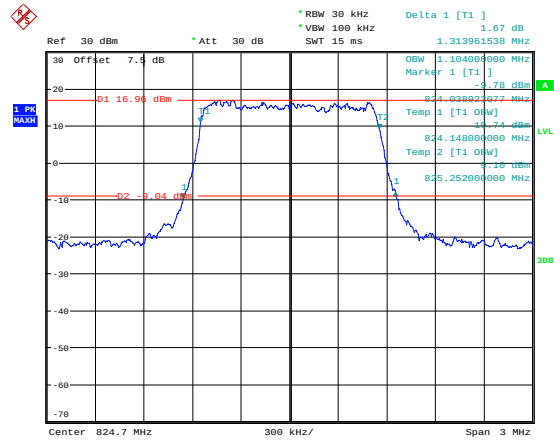
20M, 16QAM, High Channel



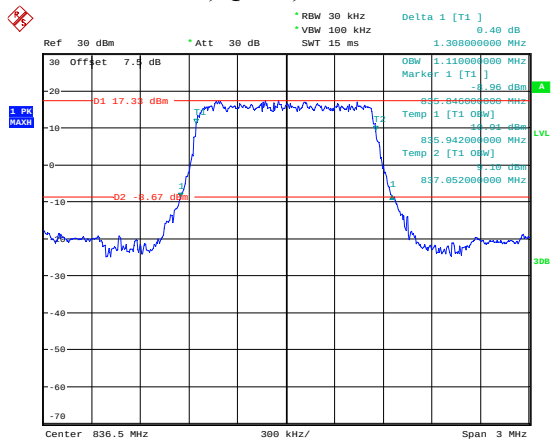
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LTE Band 5:**1.4M, QPSK, Low Channel**

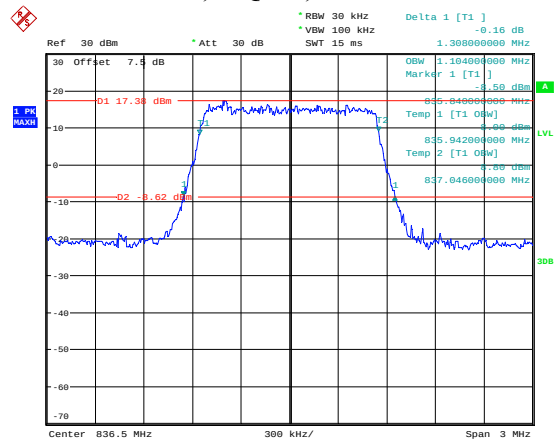
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1.4M, 16QAM, Low Channel

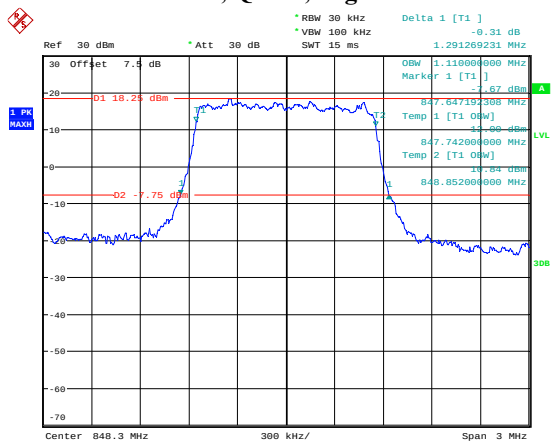
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1.4M, QPSK, Middle Channel

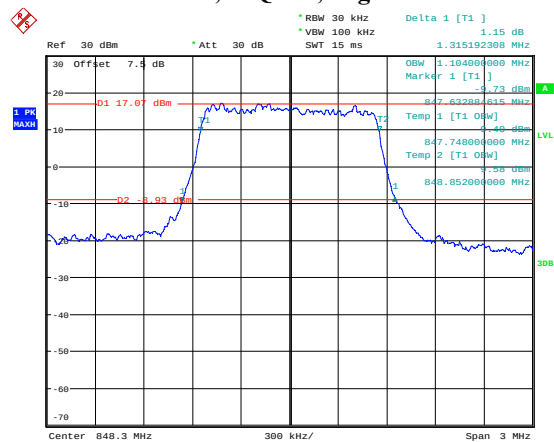
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1.4M, 16QAM, Middle Channel

Date: 29.SEP.2020 09:11:58

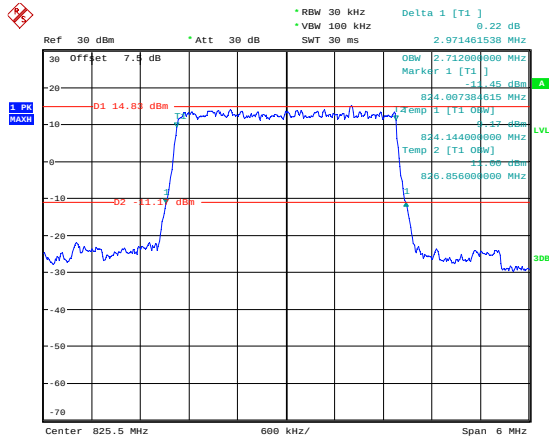
1.4M, QPSK, High Channel

Date: 29.SEP.2020 13:59:08

1.4M, 16QAM, High Channel

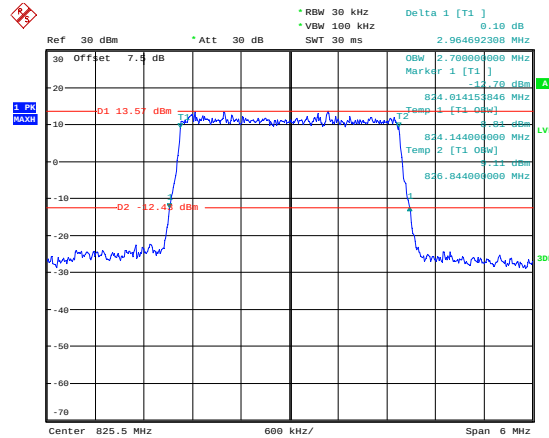
Date: 29.SEP.2020 13:58:01

3M, QPSK, Low Channel



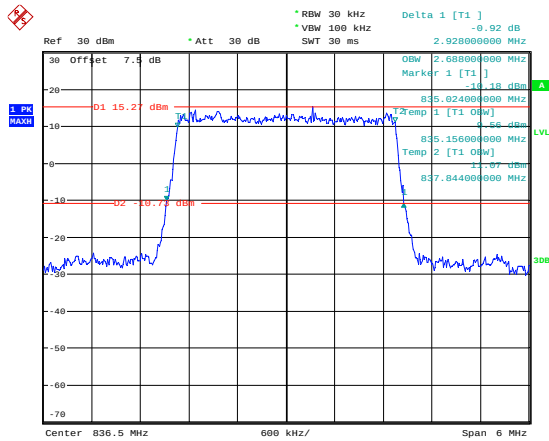
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3M, 16QAM, Low Channel



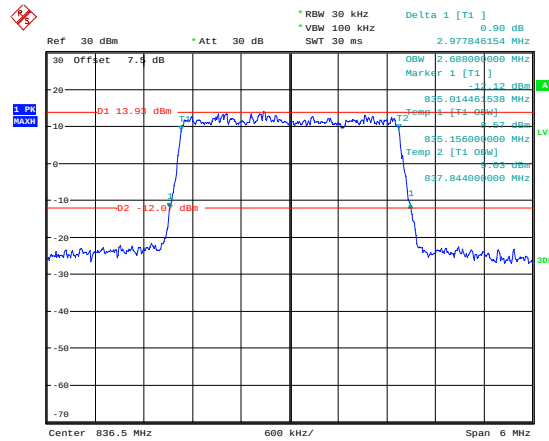
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3M, QPSK, Middle Channel



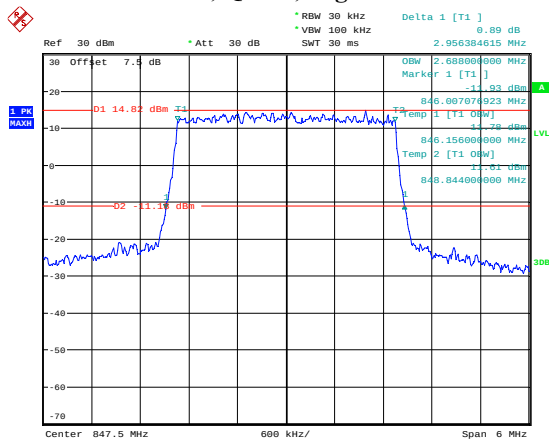
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3M, 16QAM, Middle Channel



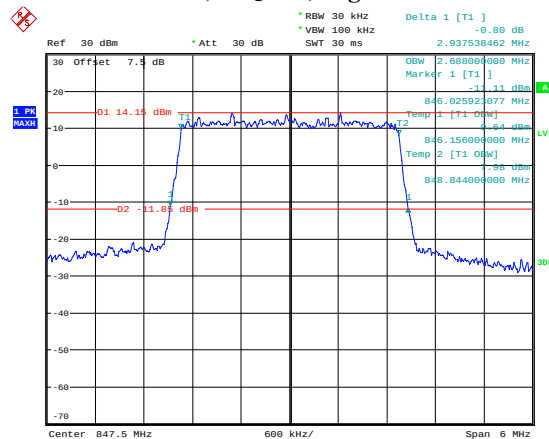
Date: 29.SEP.2020 13:51:24

3M, QPSK, High Channel



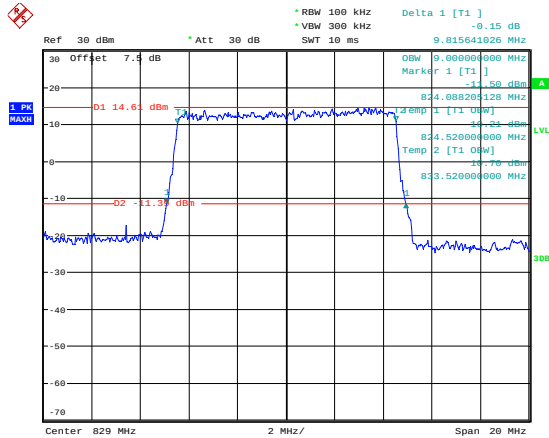
Date: 29.SEP.2020 13:48:03

3M, 16QAM, High Channel



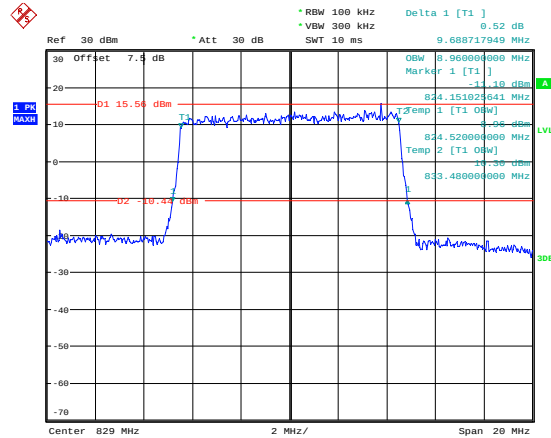
Date: 29.SEP.2020 13:49:16

10M, QPSK, Low Channel



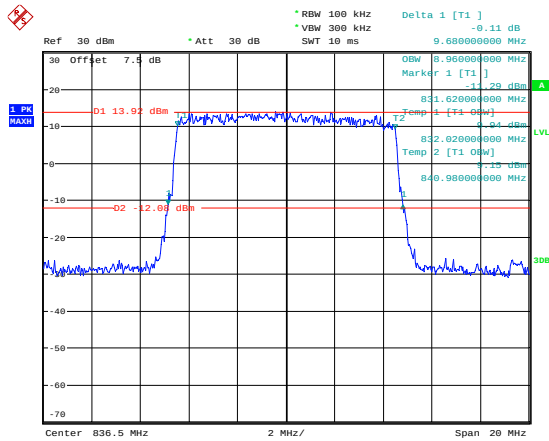
Date: 29.SEP.2020 13:19:55

10M, 16QAM, Low Channel



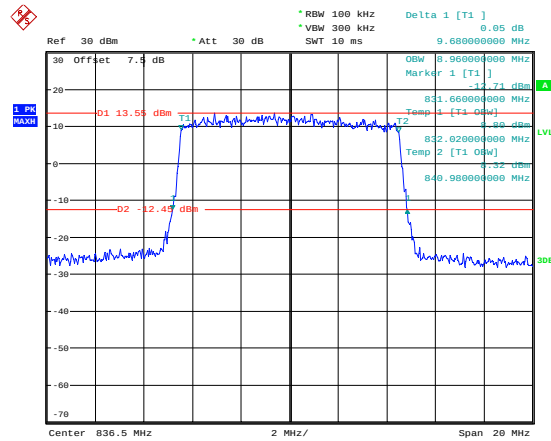
Date: 29.SEP.2020 13:21:21

10M, QPSK, Middle Channel



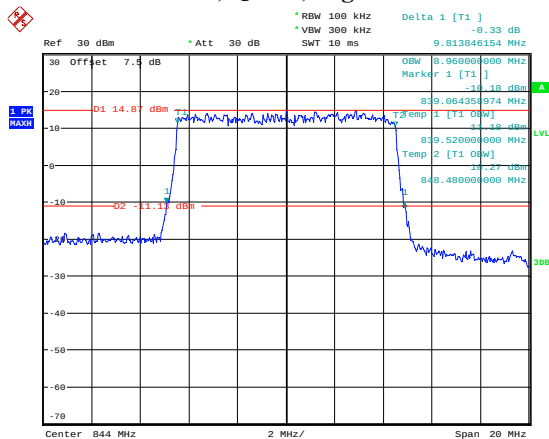
Date: 29.SEP.2020 09:13:50

10M, 16QAM, Middle Channel



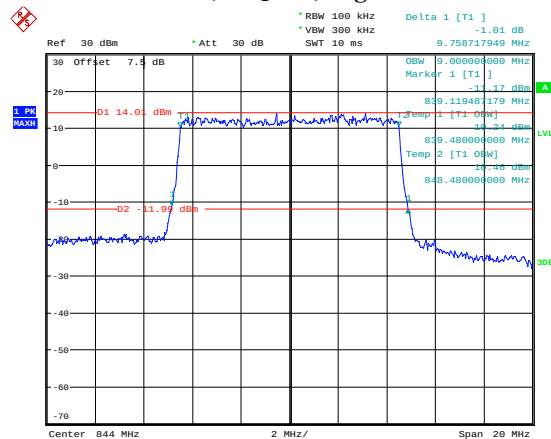
Date: 29.SEP.2020 09:14:12

10M, QPSK, High Channel



Date: 29.SEP.2020 13:38:10

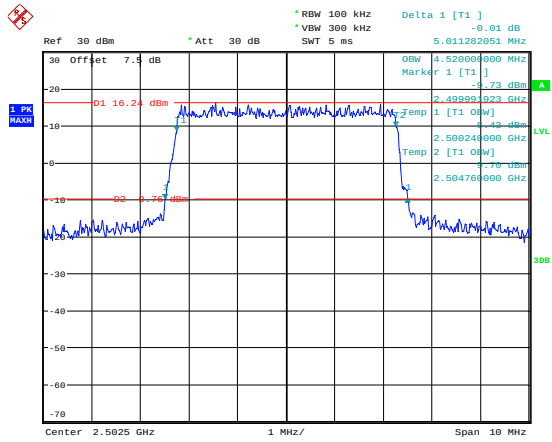
10M, 16QAM, High Channel



Date: 29.SEP.2020 13:28:45

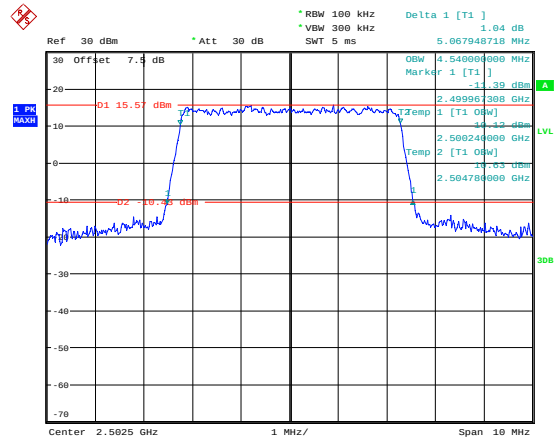
LTE Band 7:

5M, QPSK, Low Channel



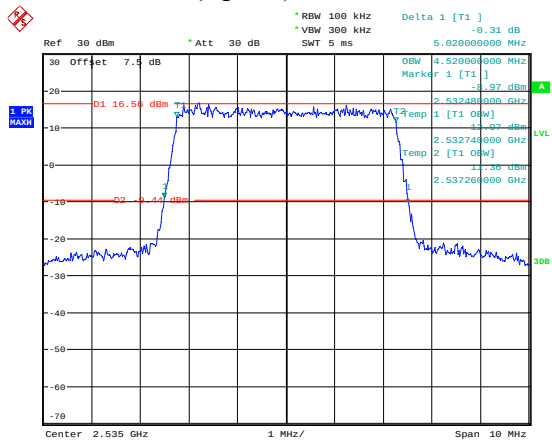
Date: 29.SEP.2020 13:12:20

5M, 16QAM, Low Channel



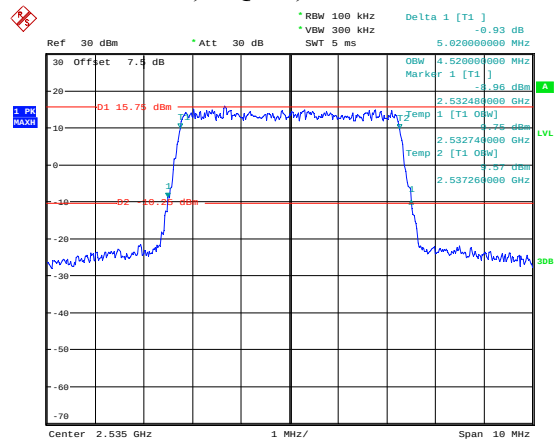
Date: 29.SEP.2020 13:11:02

5M, QPSK, Middle Channel



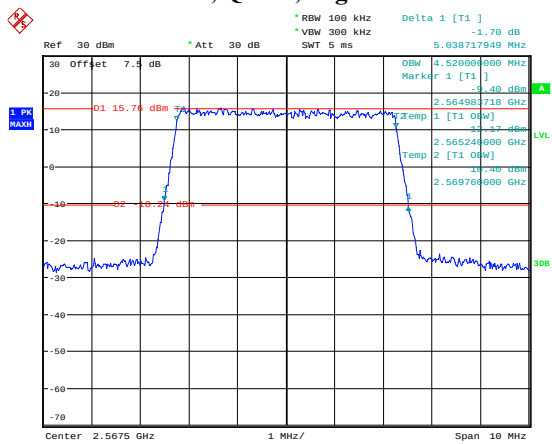
Date: 29.SEP.2020 09:14:36

5M, 16QAM, Middle Channel



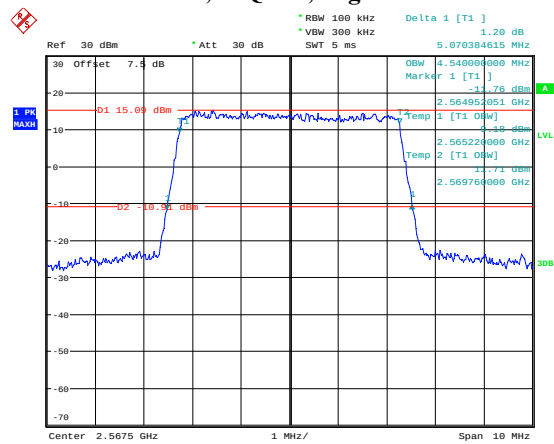
Date: 29.SEP.2020 09:14:57

5M, QPSK, High Channel



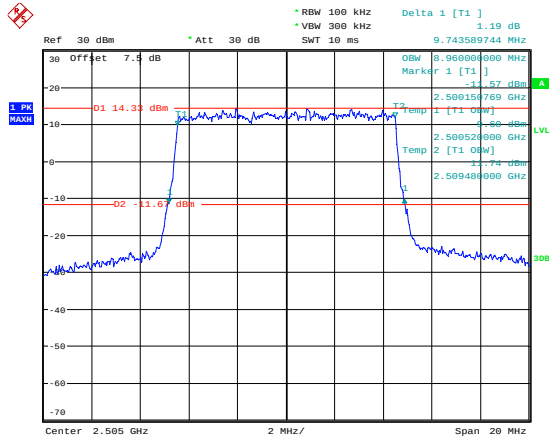
Date: 29.SEP.2020 13:06:23

5M, 16QAM, High Channel



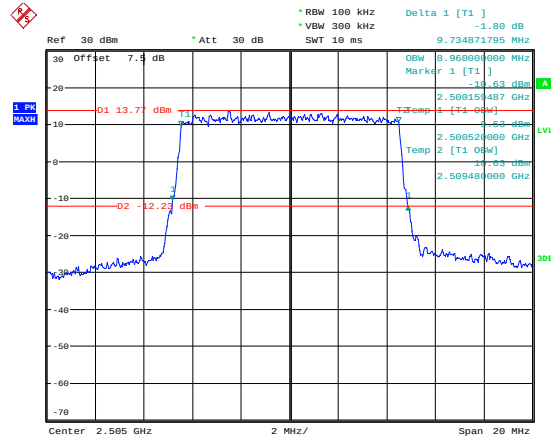
Date: 29.SEP.2020 13:08:41

10M, QPSK, Low Channel



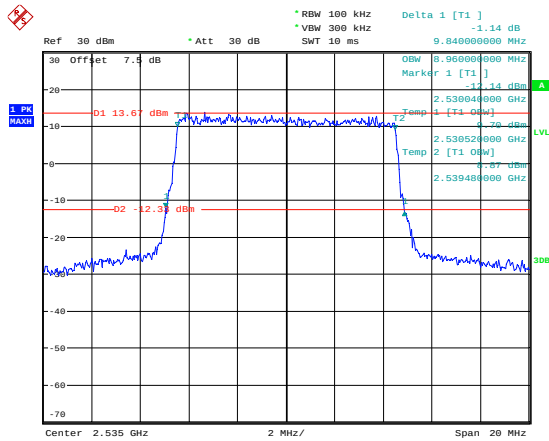
Date: 29.SEP.2020 11:48:57

10M, 16QAM, Low Channel



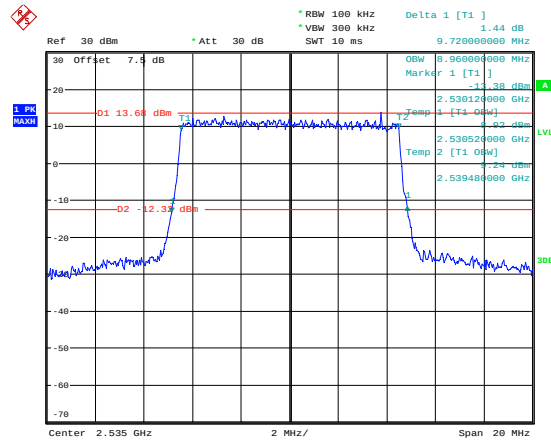
Date: 29.SEP.2020 11:50:55

10M, QPSK, Middle Channel



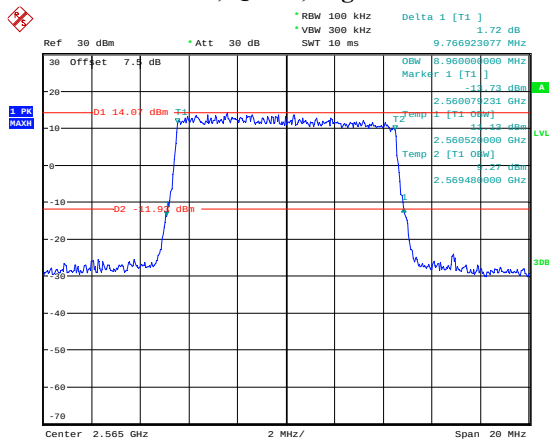
Date: 29.SEP.2020 09:15:22

10M, 16QAM, Middle Channel



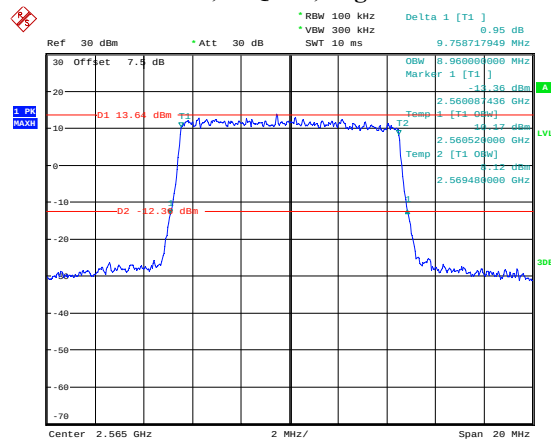
Date: 29.SEP.2020 09:15:46

10M, QPSK, High Channel



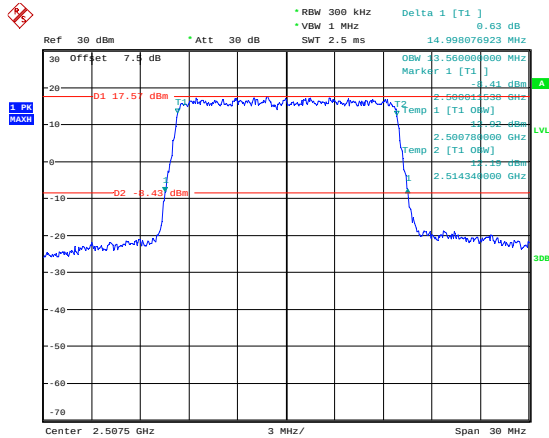
Date: 29.SEP.2020 11:55:48

10M, 16QAM, High Channel



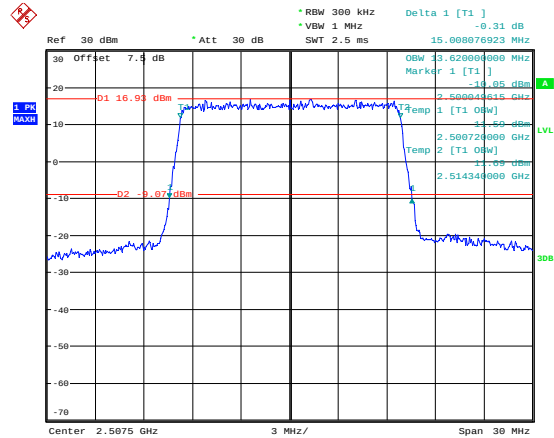
Date: 29.SEP.2020 11:54:36

15M, QPSK, Low Channel



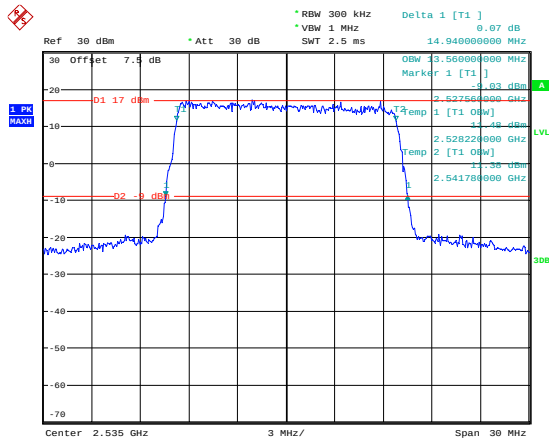
Date: 29.SEP.2020 11:46:07

15M, 16QAM, Low Channel



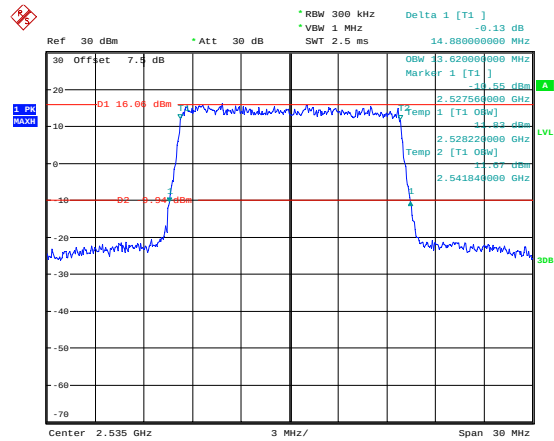
Date: 29.SEP.2020 11:44:42

15M, QPSK, Middle Channel



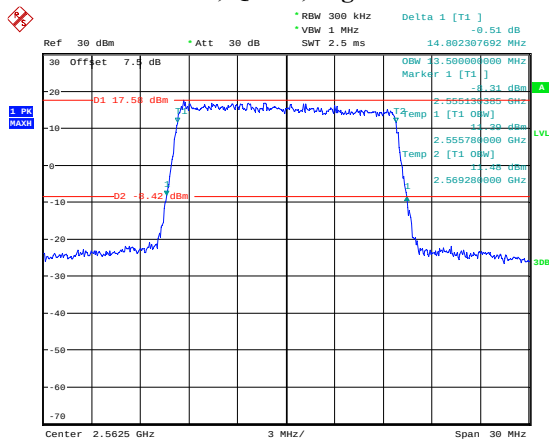
Date: 29.SEP.2020 09:16:13

15M, 16QAM, Middle Channel



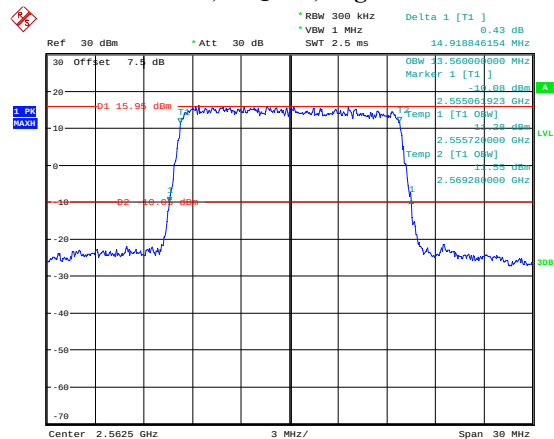
Date: 29.SEP.2020 09:16:34

15M, QPSK, High Channel



Date: 29.SEP.2020 11:46:18

15M, 16QAM, High Channel



Date: 29.SEP.2020 11:41:43

FCC §2.1051, §22.917(a), §24.238(a), §27.53, RSS-132 §5.5, RSS-133 §6.5, RSS-199 §4.6 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Applicable Standard

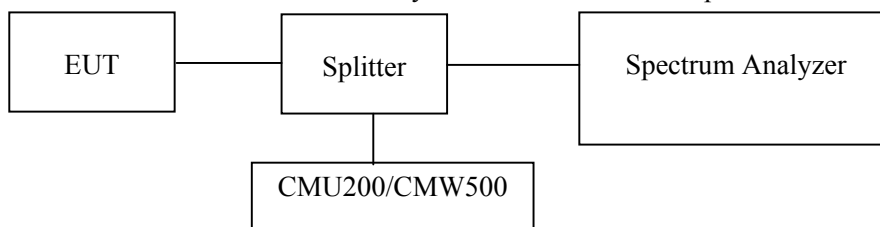
FCC §2.1051, §22.917(a), §24.238(a) and §27.53.

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

RSS-132 §5.5 & RSS-133 §6.5 & RSS-199 §4.6.

Test Procedure

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



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU 26	200256	2020-05-09	2021-05-09
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005011	Each time	/
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41002201	Each Time	/
E-Microwave	Two-way Splitter	ODP-1-6-2S	OE0120142	Each Time	/

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

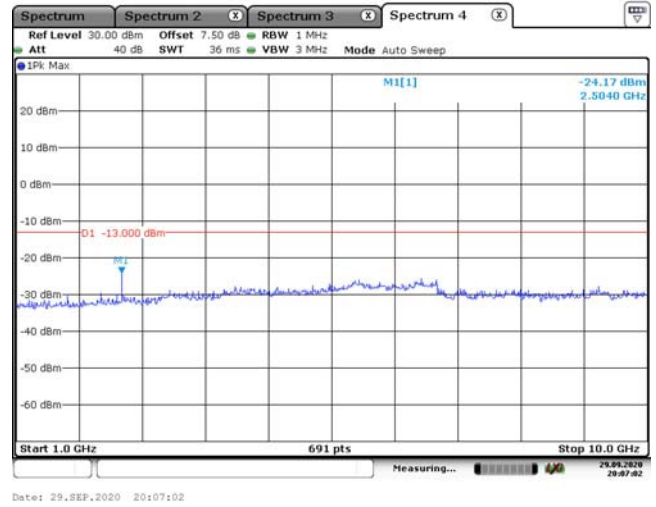
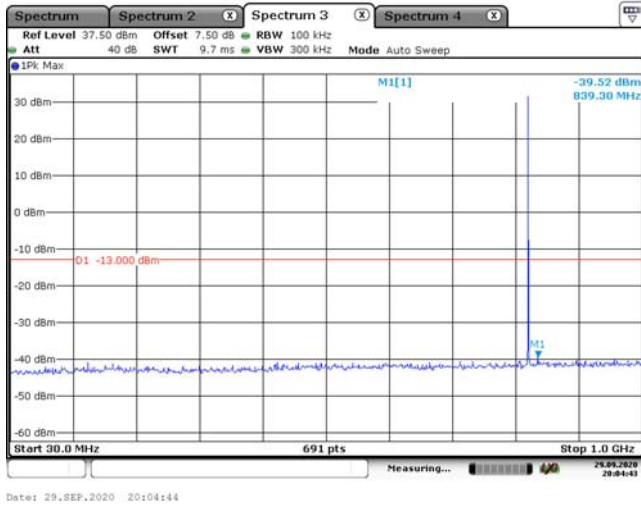
Test Data

Environmental Conditions

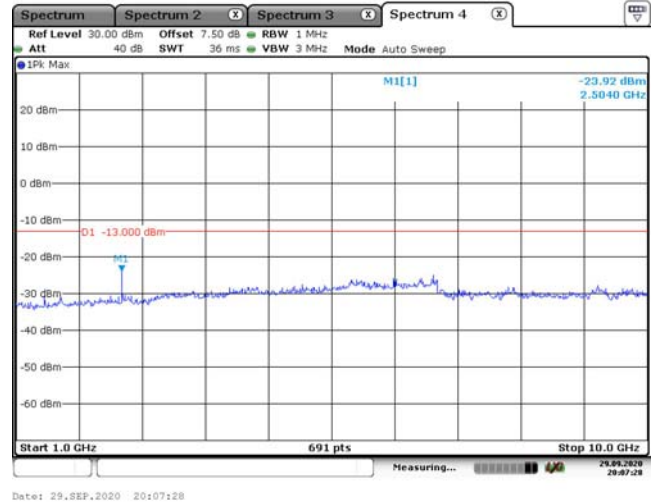
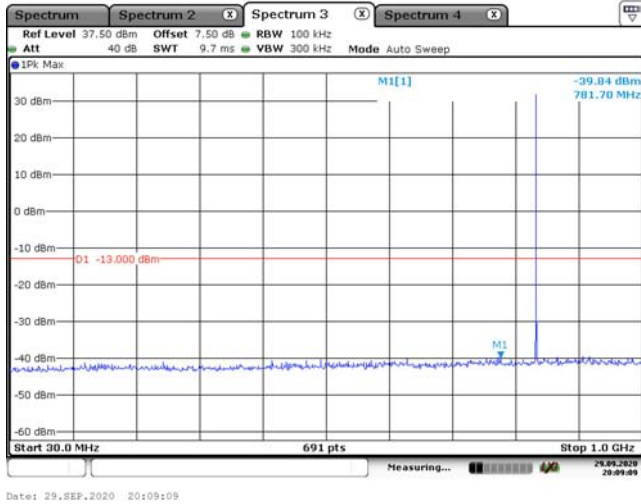
Temperature:	26.2~27.8°C
Relative Humidity:	50~51 %
ATM Pressure:	100.2~100.8 kPa
Tester:	Rita Huang
Test Date:	2020-09-29-2020-09-30

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

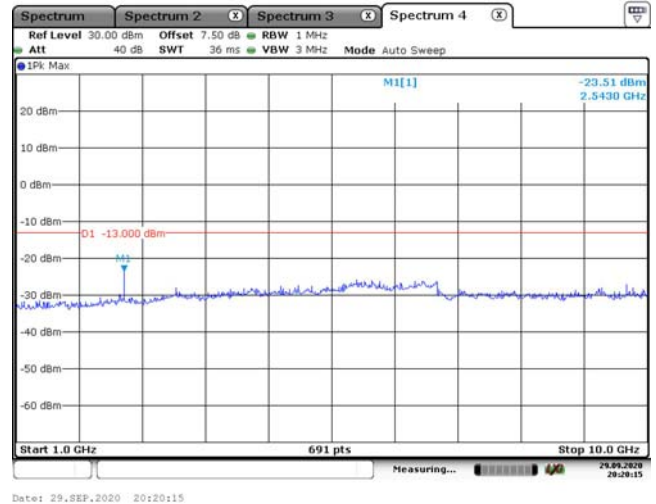
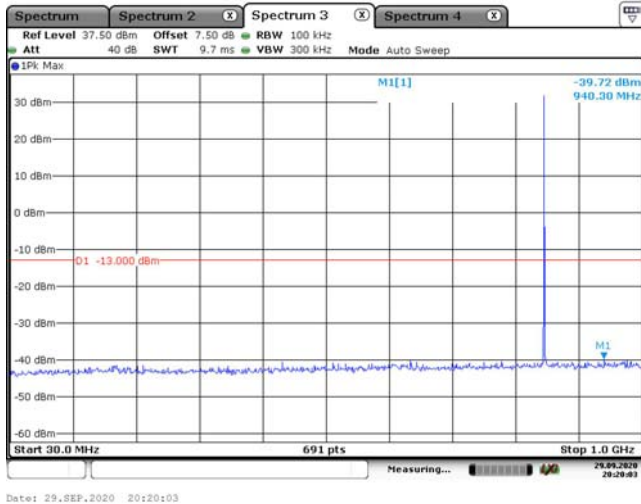
GPRS850, Low Channel



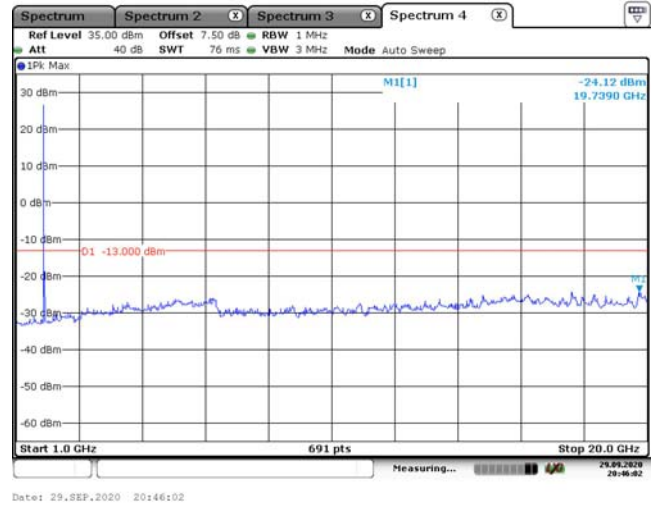
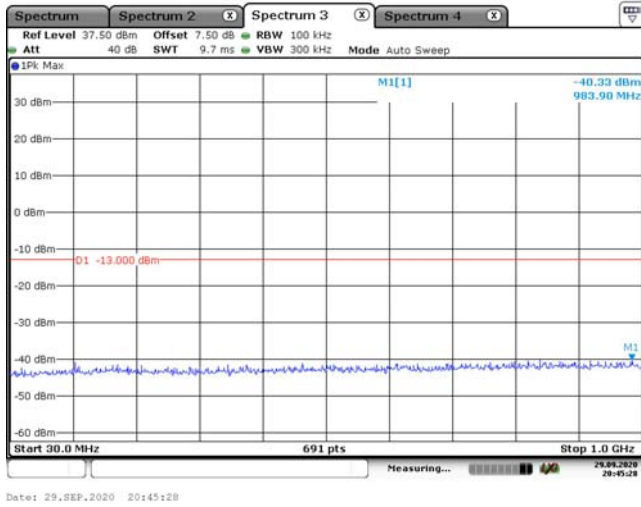
GPRS850, Middle Channel



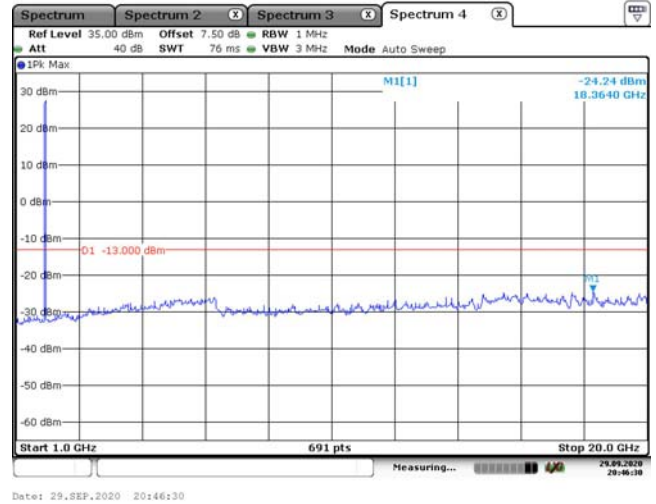
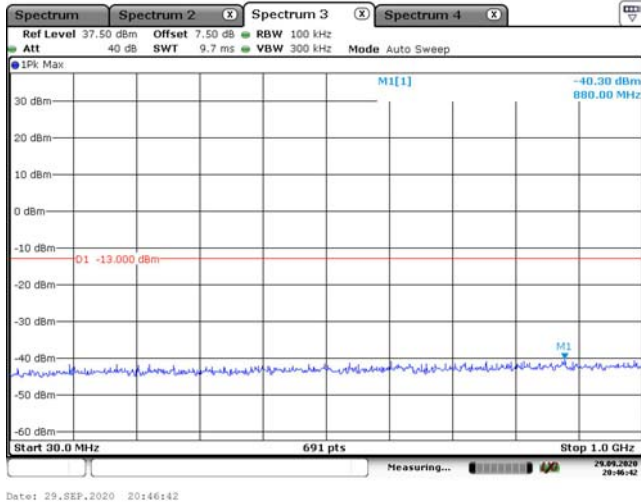
GPRS850, High Channel



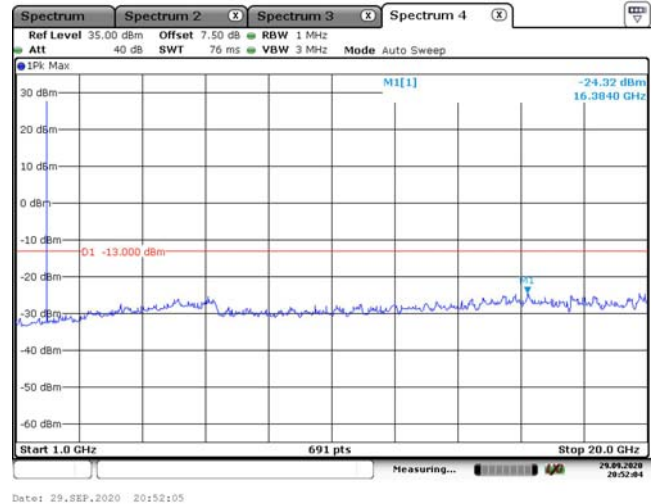
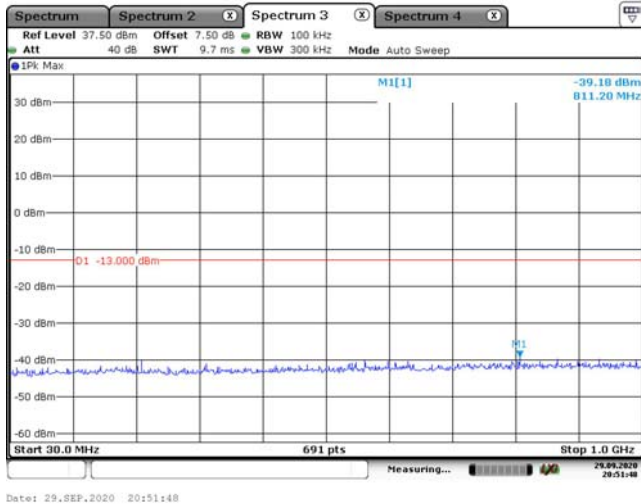
GPRS1900, Low Channel



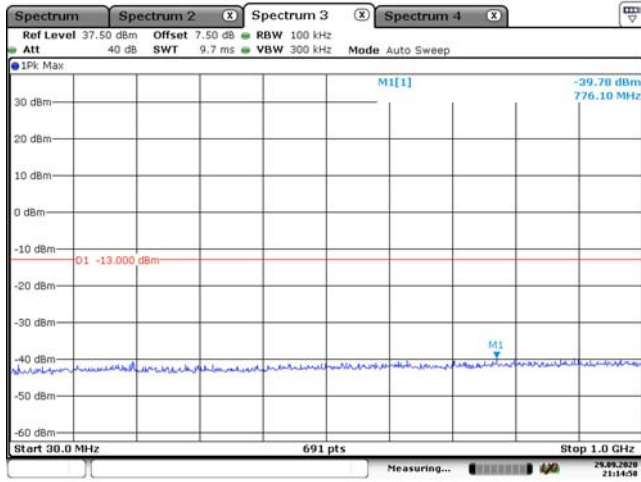
GPRS1900, Middle Channel



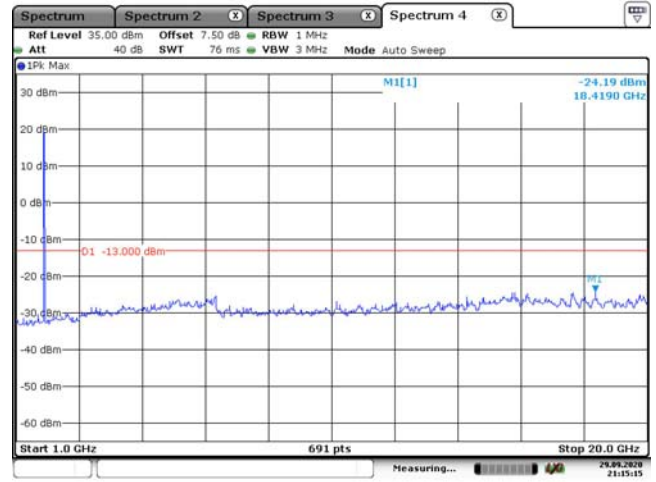
GPRS1900, High Channel



WCDMA Band II, R99, Low Channel

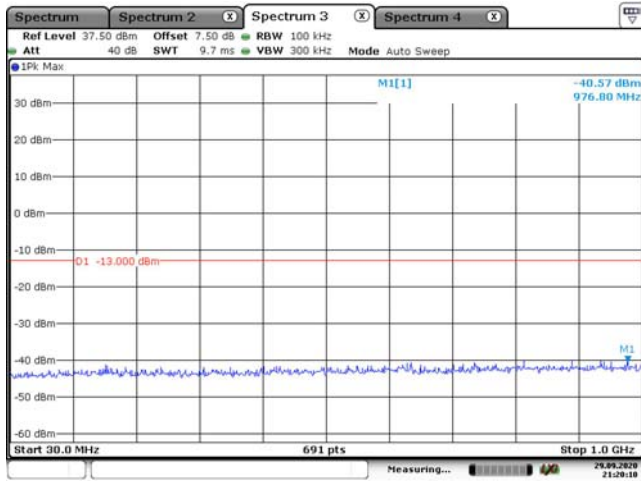


Date: 29.SEP.2020 21:14:59

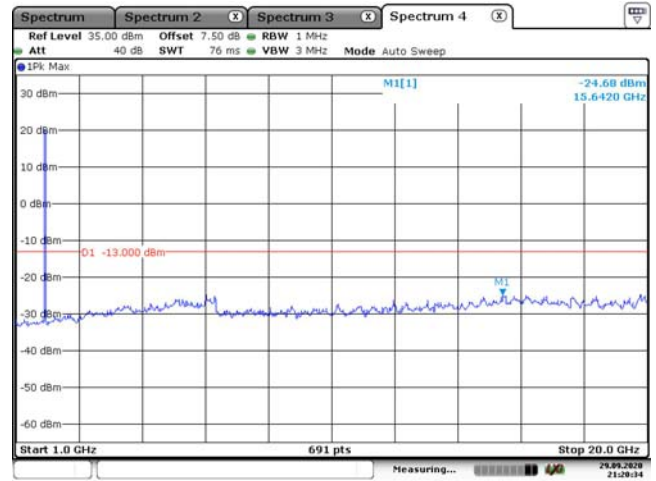


Date: 29.SEP.2020 21:15:15

WCDMA Band II, R99, Middle Channel

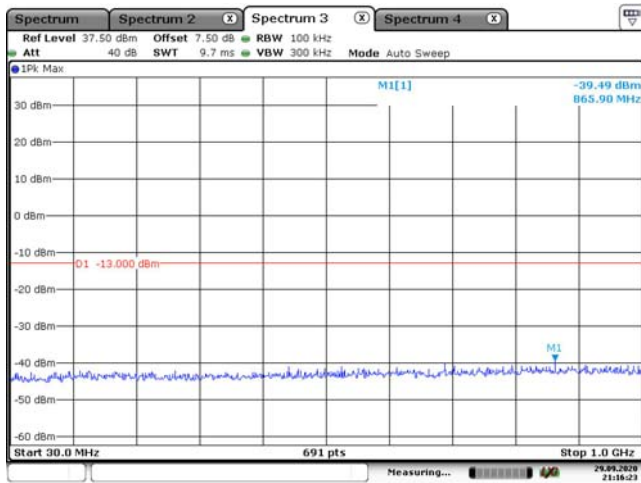


Date: 29.SEP.2020 21:20:10

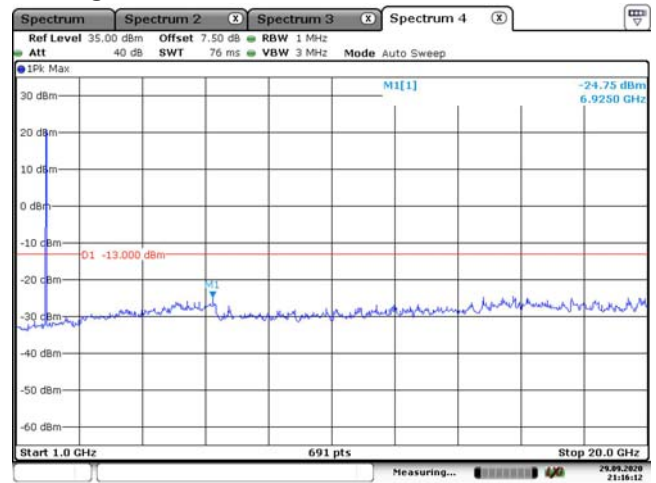


Date: 29.SEP.2020 21:20:35

WCDMA Band II, R99, High Channel

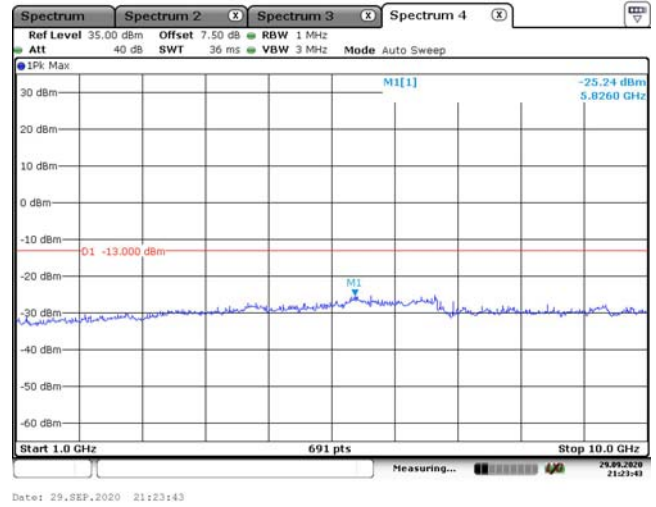
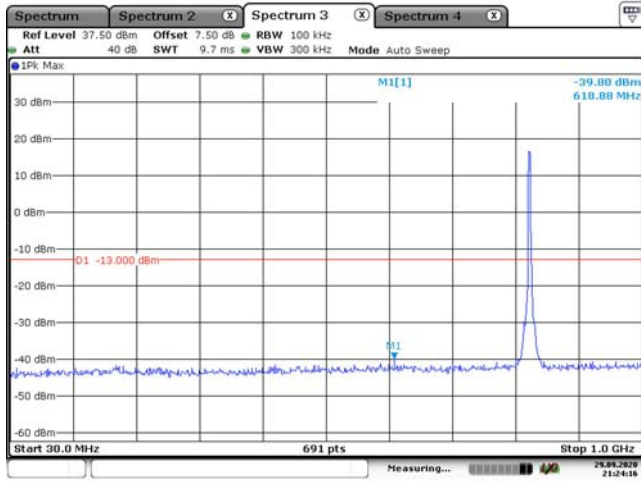


Date: 29.SEP.2020 21:16:23

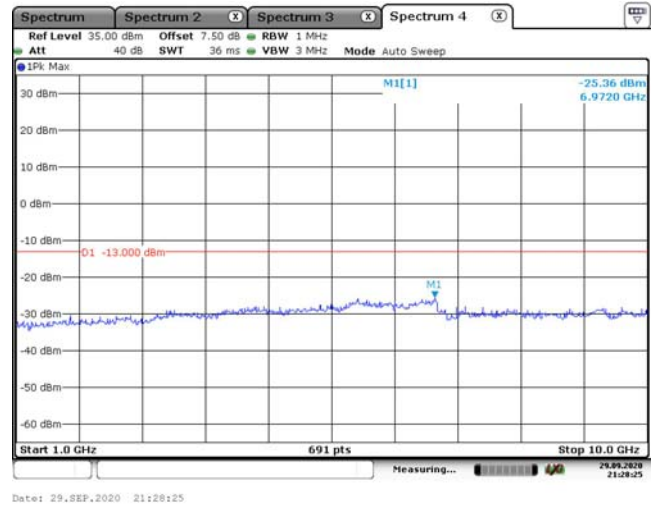
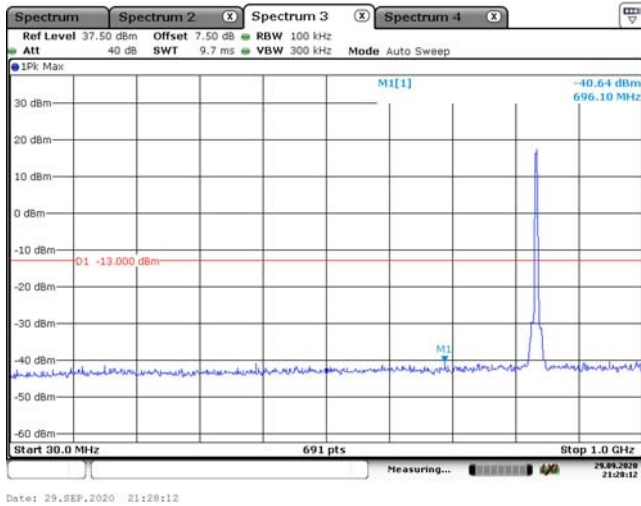


Date: 29.SEP.2020 21:16:12

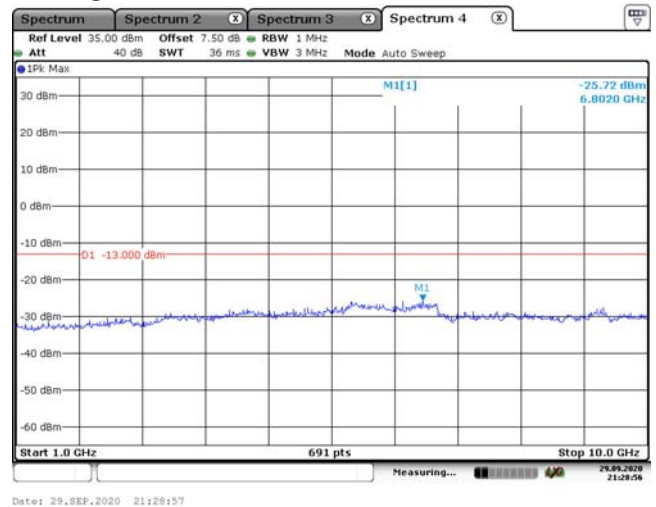
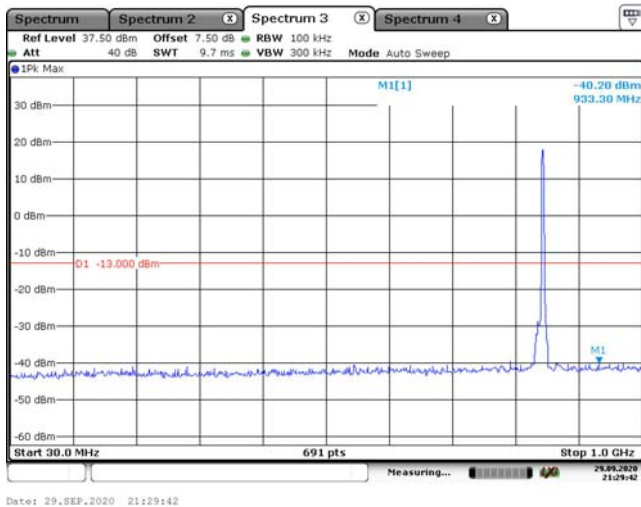
WCDMA Band V, R99, Low Channel



WCDMA Band V, R99, Middle Channel

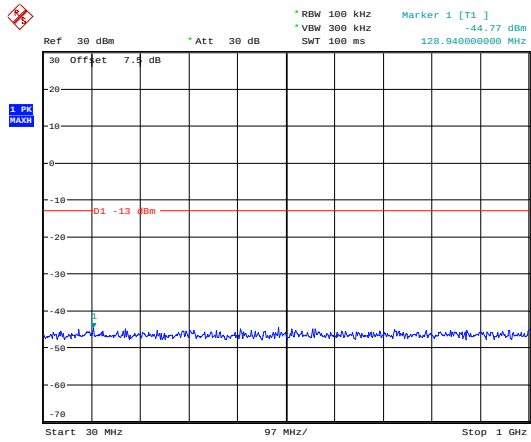


WCDMA Band V, R99, High Channel

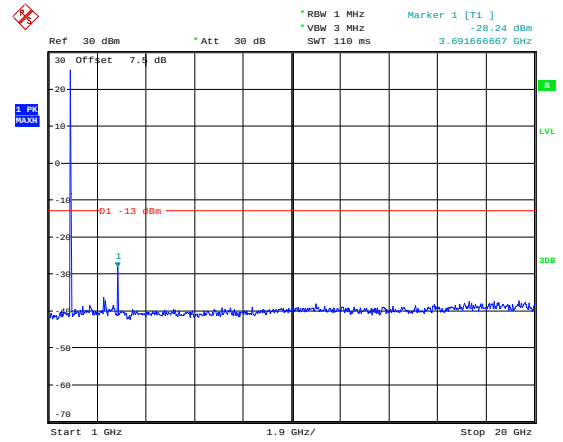


LTE Band 2:

1.4M, QPSK, Low Channel

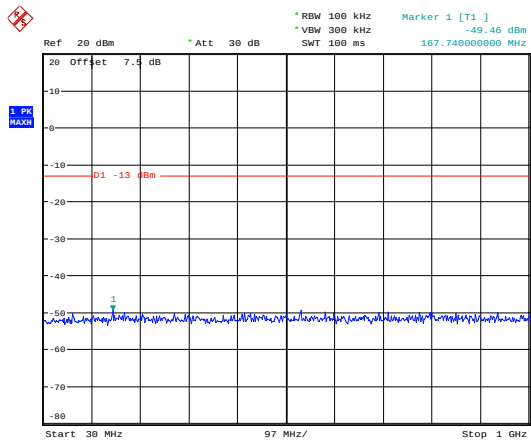


Date: 29.SEP.2020 14:54:34

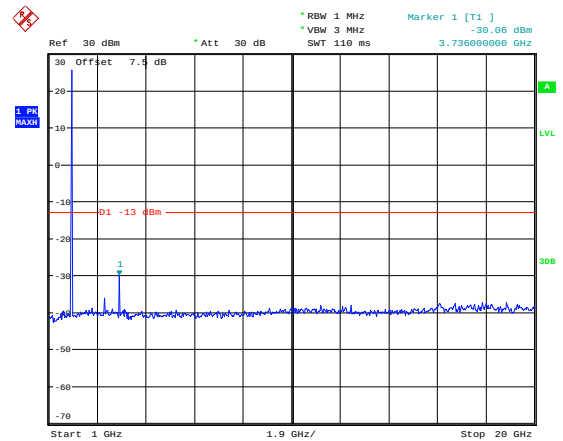


Date: 29.SEP.2020 15:18:08

1.4M, QPSK, Middle Channel

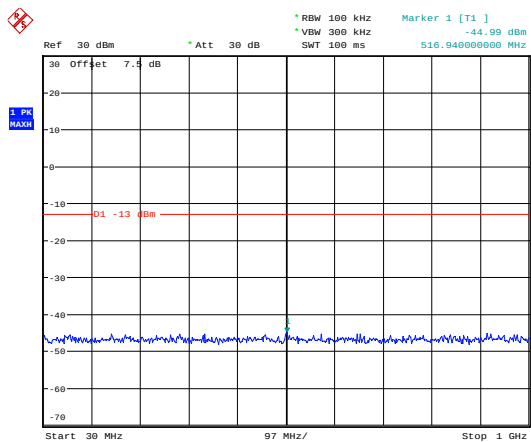


Date: 29.SEP.2020 09:53:57

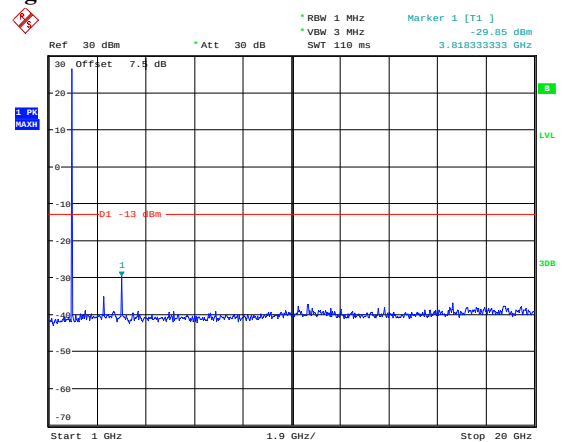


Date: 29.SEP.2020 09:54:09

1.4M, QPSK, High Channel

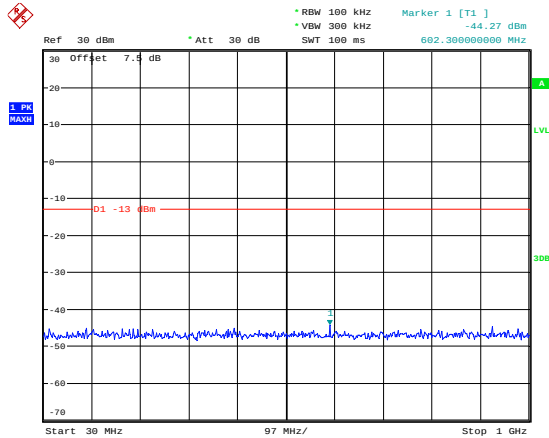


Date: 29.SEP.2020 14:58:01

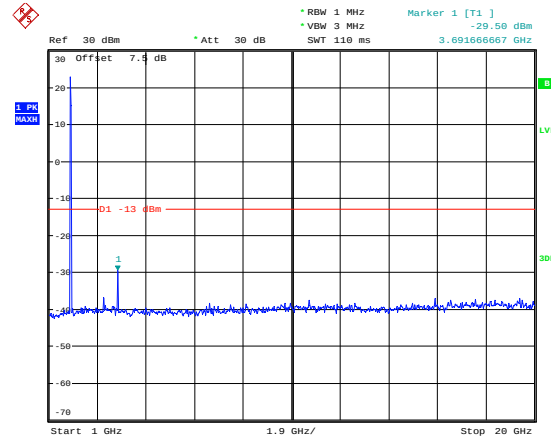


Date: 29.SEP.2020 15:15:28

3M, QPSK, Low Channel

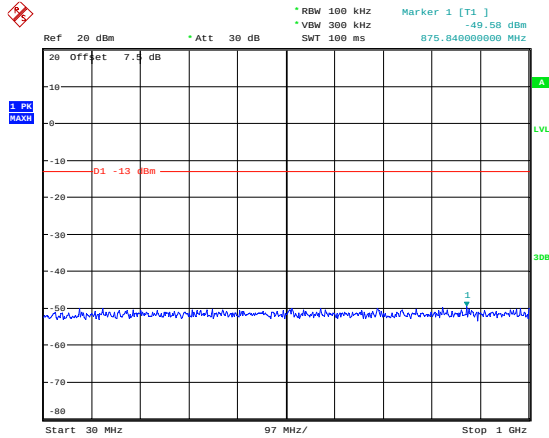


Date: 29.SEP.2020 14:59:52

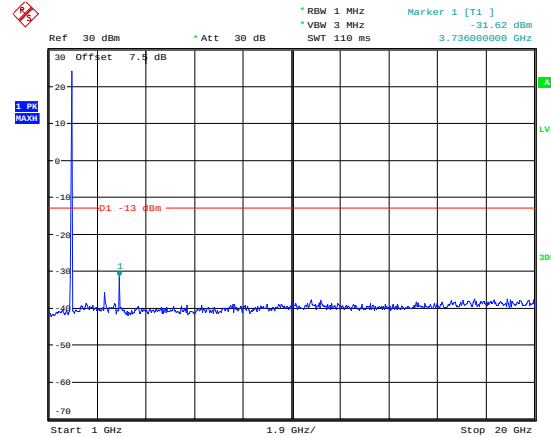


Date: 29.SEP.2020 15:18:42

3M, QPSK, Middle Channel

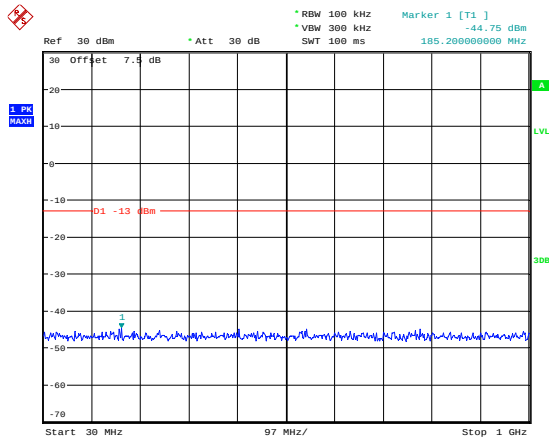


Date: 29.SEP.2020 09:54:28

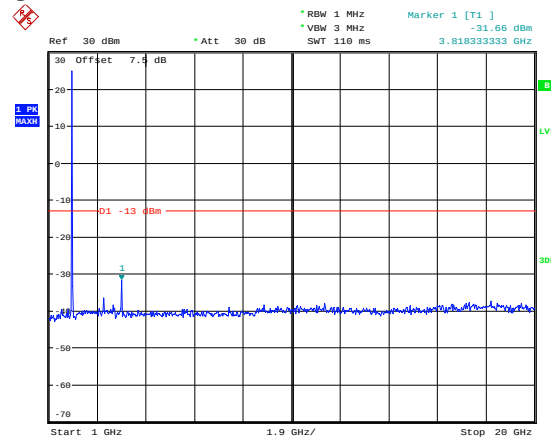


Date: 29.SEP.2020 09:54:40

3M, QPSK, High Channel

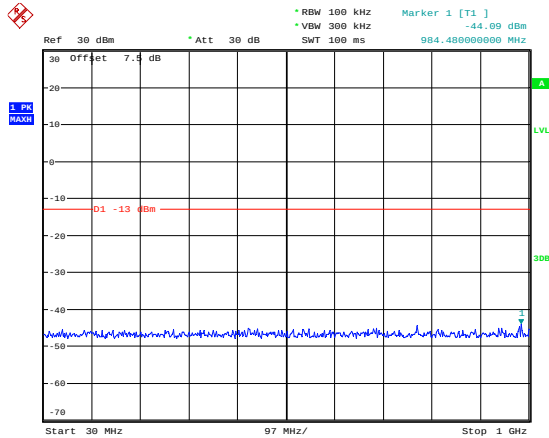


Date: 29.SEP.2020 14:58:36

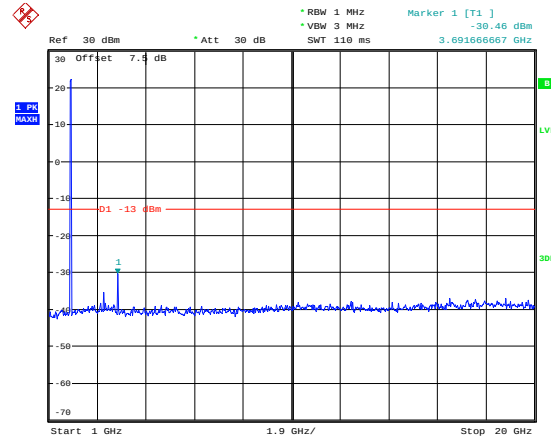


Date: 29.SEP.2020 15:17:03

5M, QPSK, Low Channel

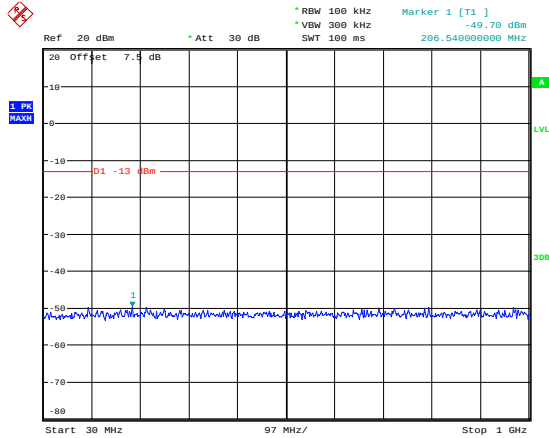


Date: 29.SEP.2020 15:00:31

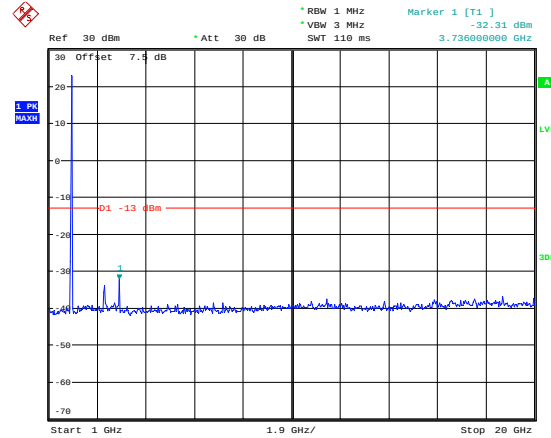


Date: 29.SEP.2020 15:19:43

5M, QPSK, Middle Channel

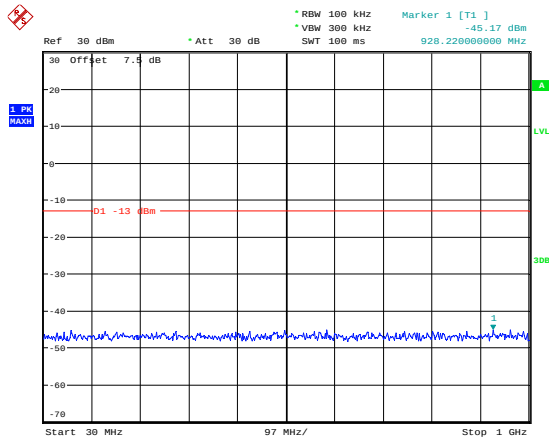


Date: 29.SEP.2020 09:54:59

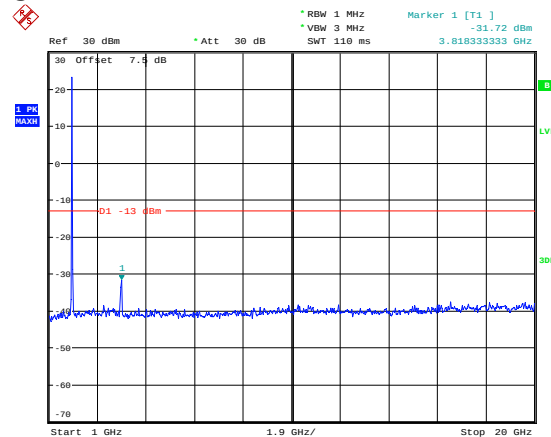


Date: 29.SEP.2020 09:55:10

5M, QPSK, High Channel

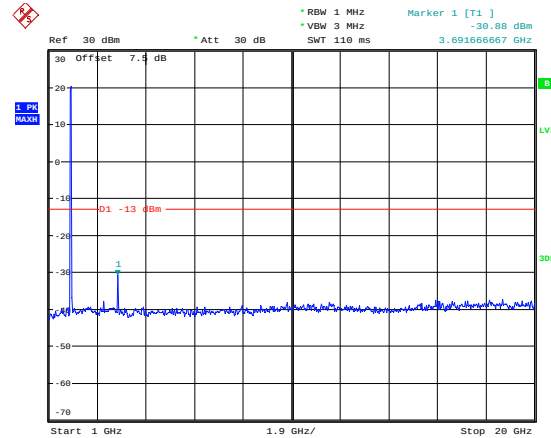
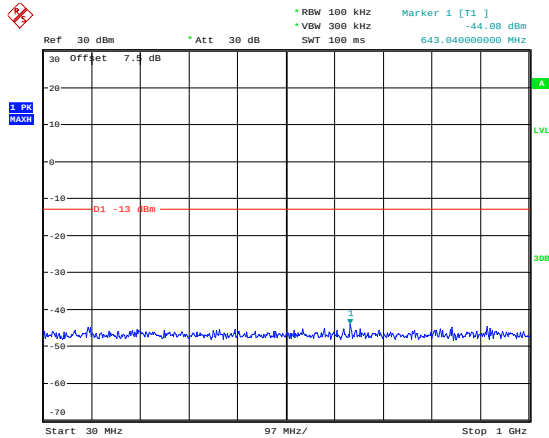


Date: 29.SEP.2020 15:01:57



Date: 29.SEP.2020 15:20:18

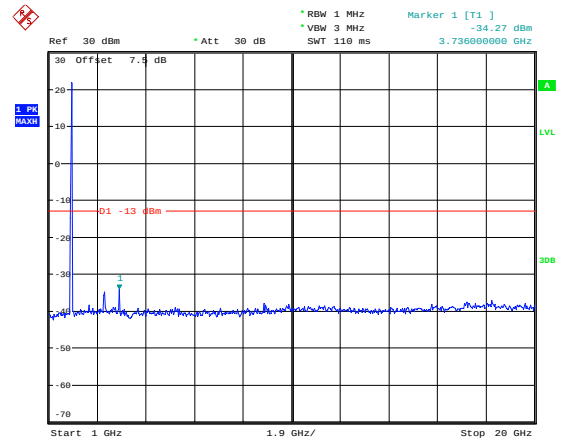
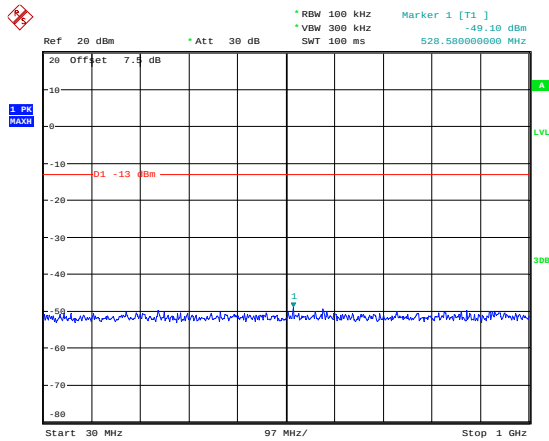
10M, QPSK, Low Channel



Date: 29.SEP.2020 15:03:50

Date: 29.SEP.2020 15:21:24

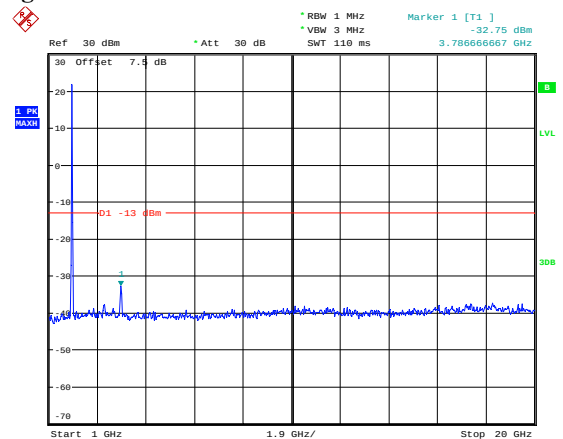
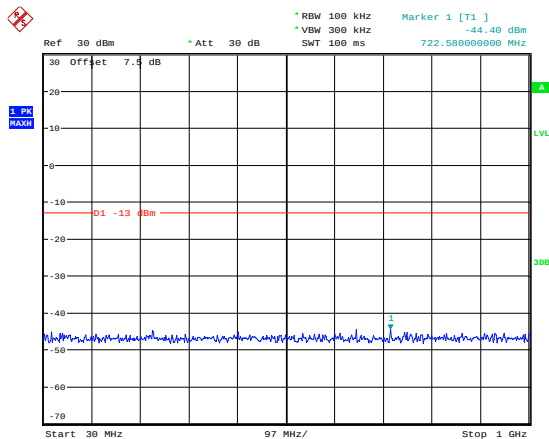
10M, QPSK, Middle Channel



Date: 29.SEP.2020 09:55:30

Date: 29.SEP.2020 09:55:42

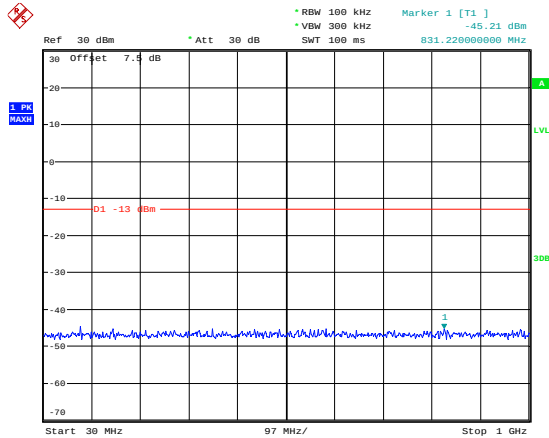
10M, QPSK, High Channel



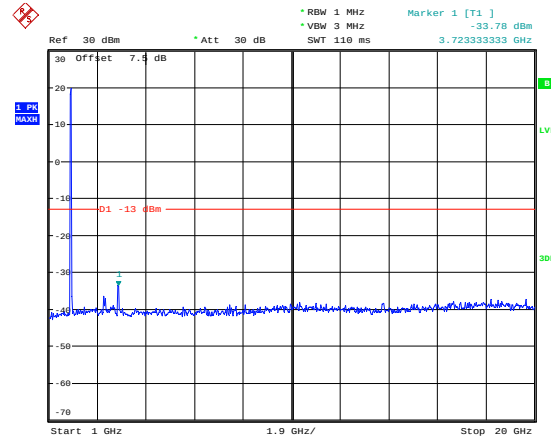
Date: 29.SEP.2020 15:02:30

Date: 29.SEP.2020 15:20:49

15M, QPSK, Low Channel

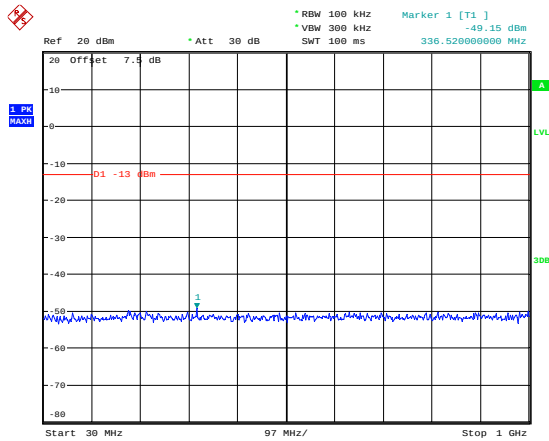


Date: 29.SEP.2020 15:04:24

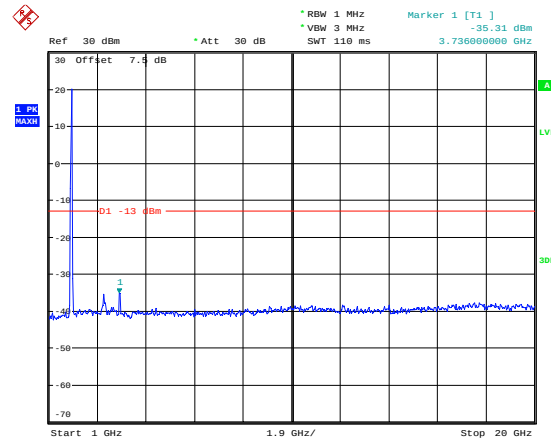


Date: 29.SEP.2020 15:21:49

15M, QPSK, Middle Channel

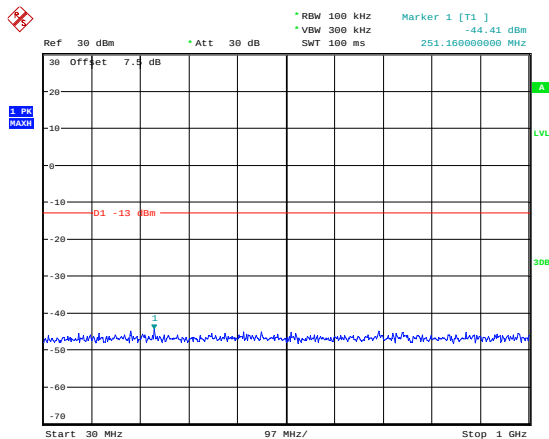


Date: 29.SEP.2020 09:56:05

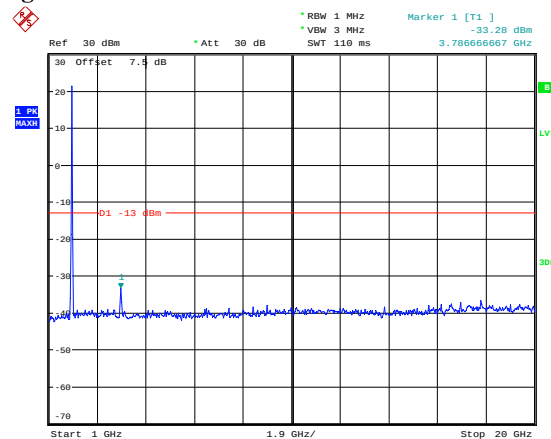


Date: 29.SEP.2020 09:56:16

15M, QPSK, High Channel

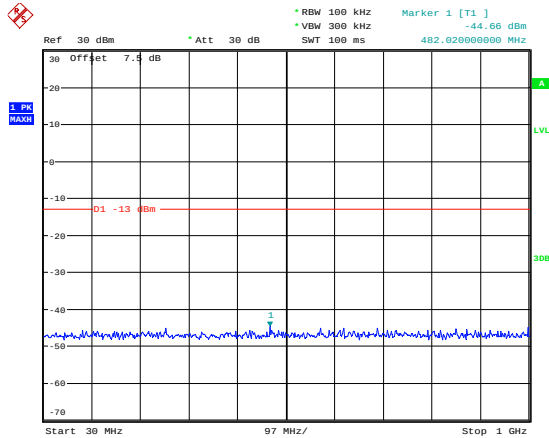


Date: 29.SEP.2020 15:05:47

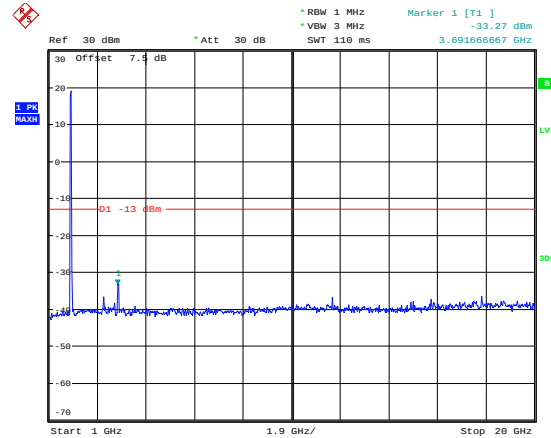


Date: 29.SEP.2020 15:22:19

20M, QPSK, Low Channel

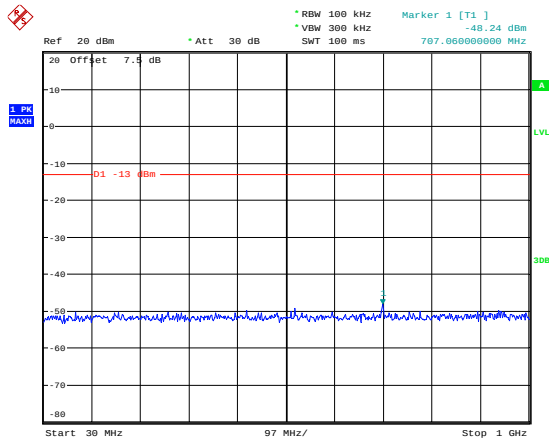


Date: 29.SEP.2020 15:09:21

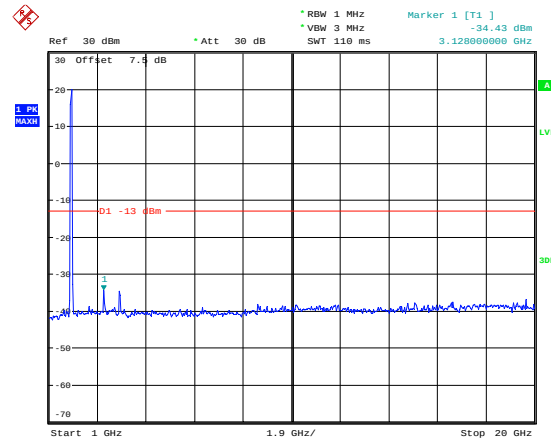


Date: 29.SEP.2020 15:23:20

20M, QPSK, Middle Channel

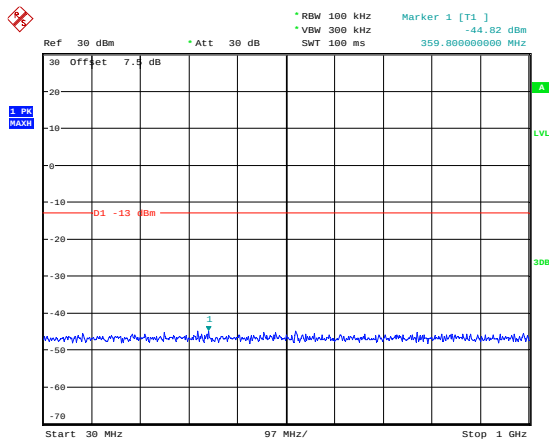


Date: 29.SEP.2020 09:56:39

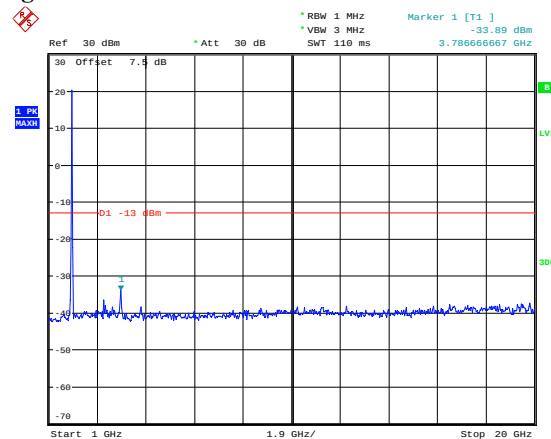


Date: 29.SEP.2020 09:56:51

20M, QPSK, High Channel



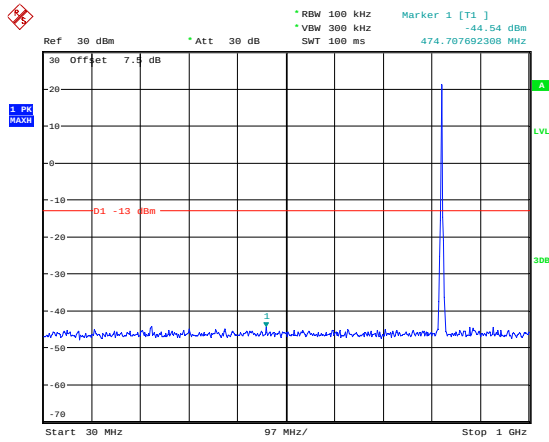
Date: 29.SEP.2020 15:06:22



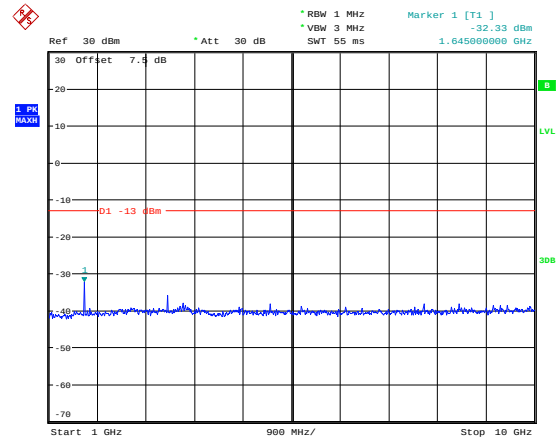
Date: 29.SEP.2020 15:22:50

LTE Band 5:

1.4M, QPSK, Low Channel

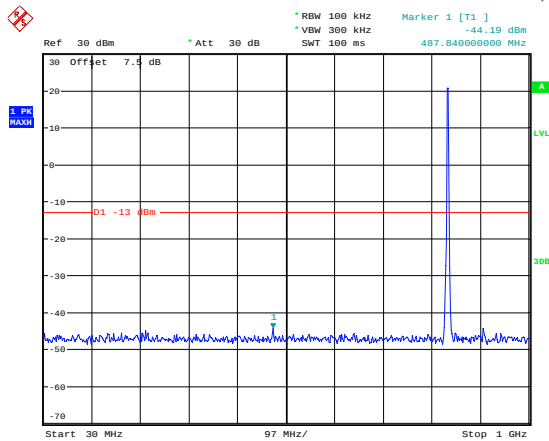


Date: 29.SEP.2020 15:11:46

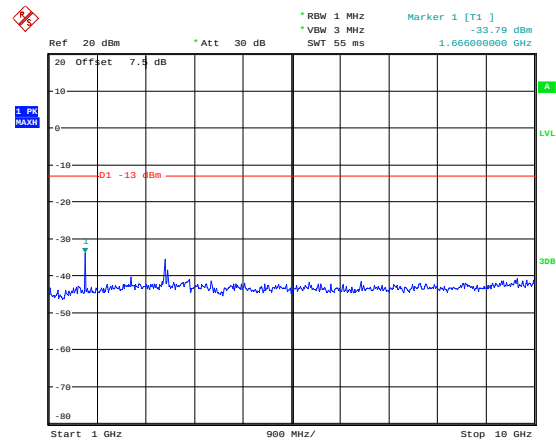


Date: 29.SEP.2020 15:13:10

1.4M, QPSK, Middle Channel

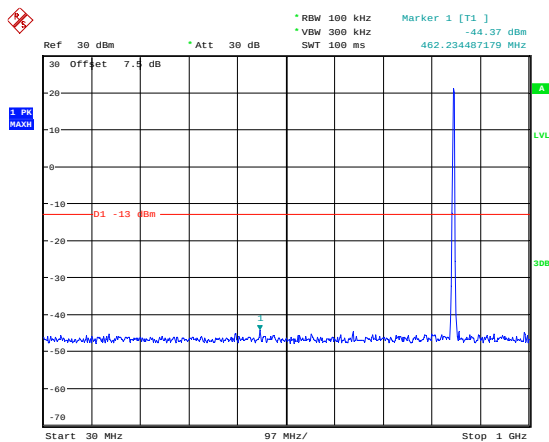


Date: 29.SEP.2020 09:57:19

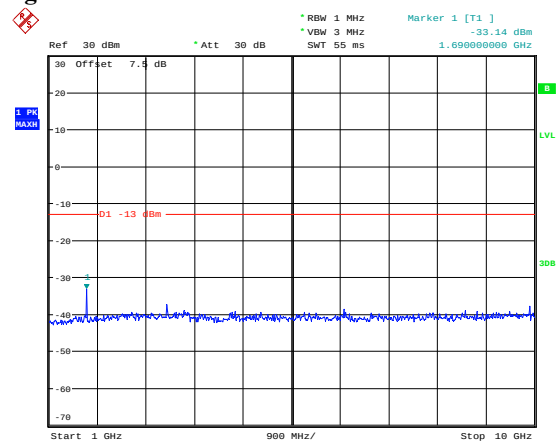


Date: 29.SEP.2020 09:57:31

1.4M, QPSK, High Channel

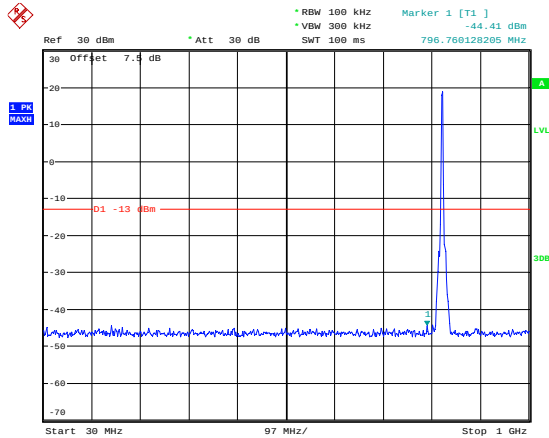


Date: 29.SEP.2020 15:25:28

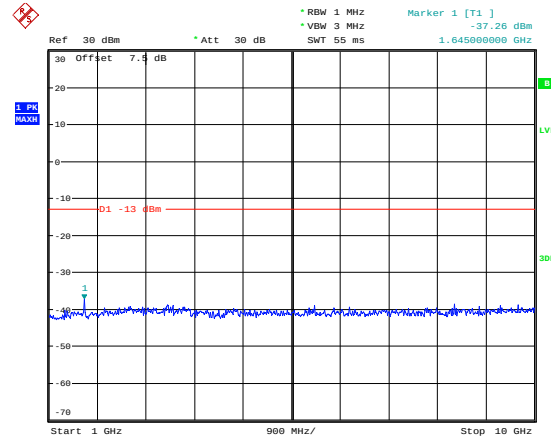


Date: 29.SEP.2020 15:24:58

3M, QPSK, Low Channel

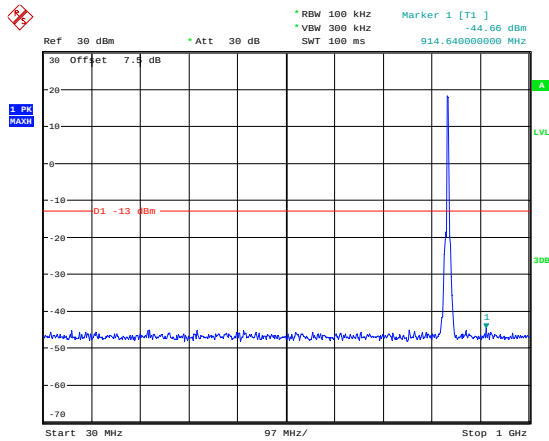


Date: 29.SEP.2020 15:27:55

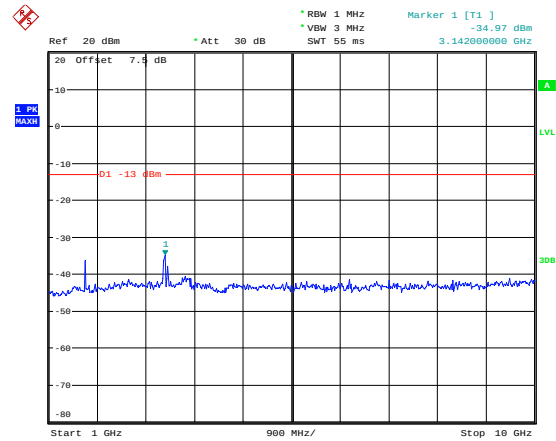


Date: 29.SEP.2020 15:27:17

3M, QPSK, Middle Channel

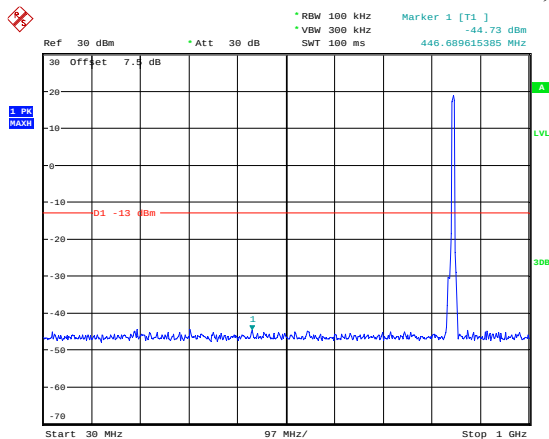


Date: 29.SEP.2020 09:57:53

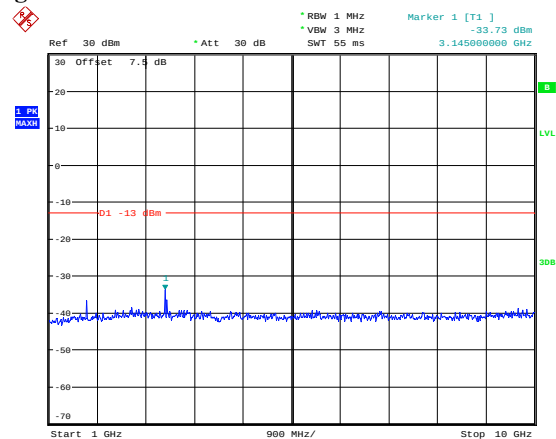


Date: 29.SEP.2020 09:58:05

3M, QPSK, High Channel

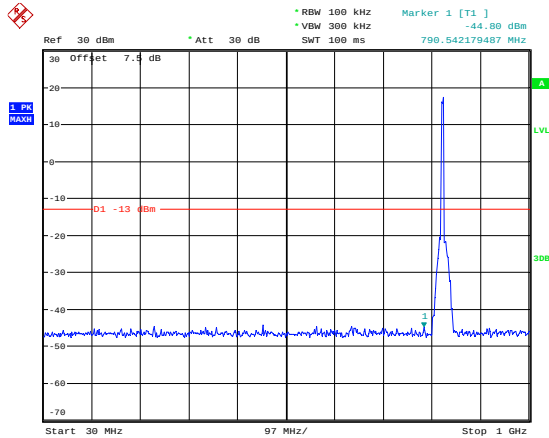


Date: 29.SEP.2020 15:26:22

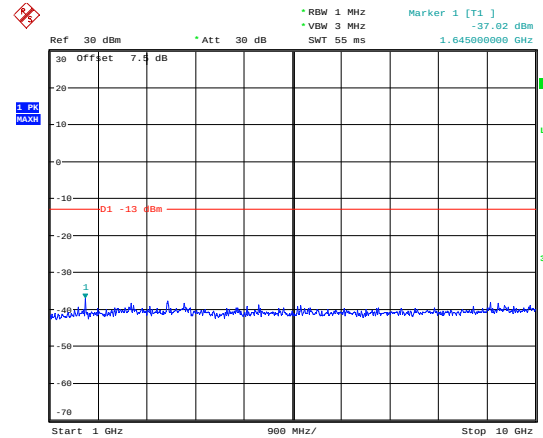


Date: 29.SEP.2020 15:26:36

5M, QPSK, Low Channel

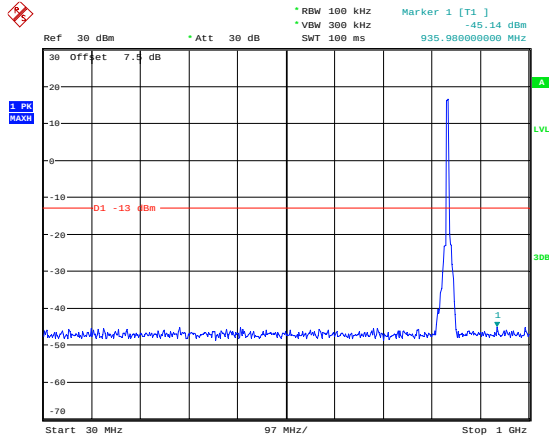


Date: 29.SEP.2020 15:28:40

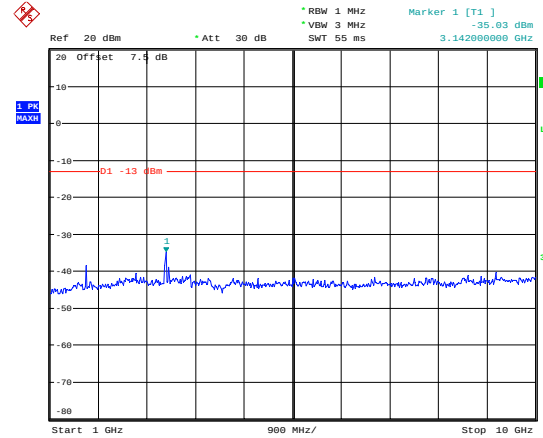


Date: 29.SEP.2020 15:28:58

5M, QPSK, Middle Channel

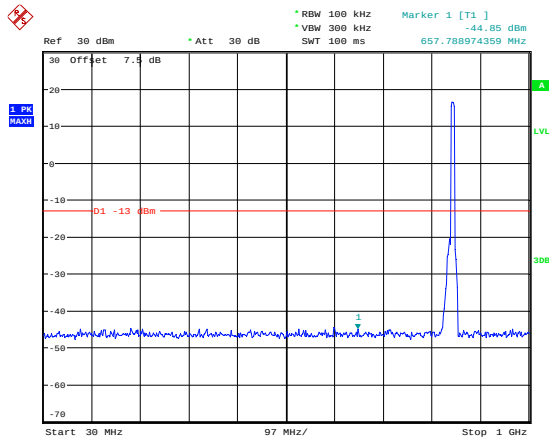


Date: 29.SEP.2020 09:58:24

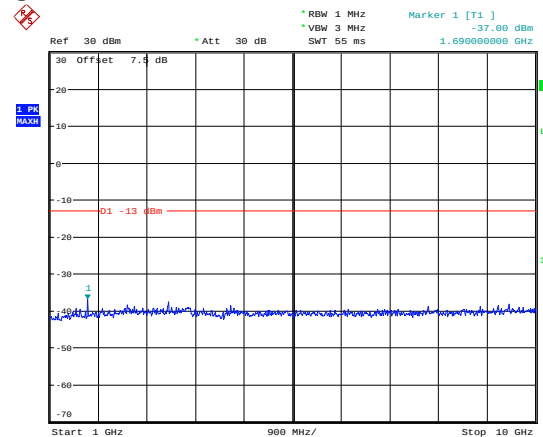


Date: 29.SEP.2020 09:58:35

5M, QPSK, High Channel

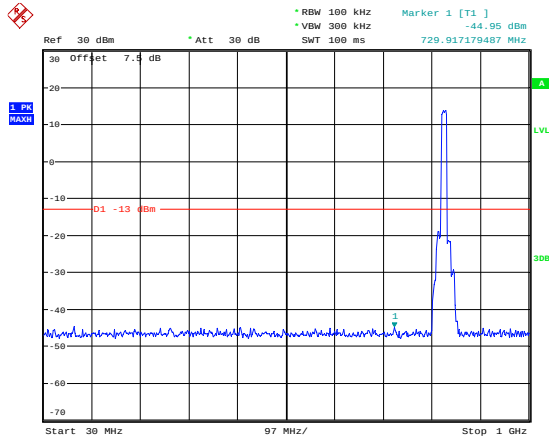


Date: 29.SEP.2020 15:30:12

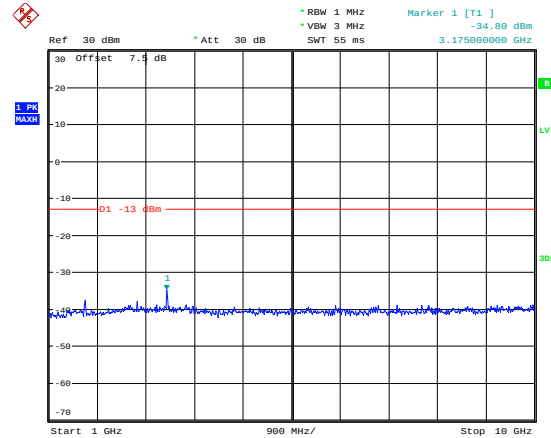


Date: 29.SEP.2020 15:29:29

10M, QPSK, Low Channel

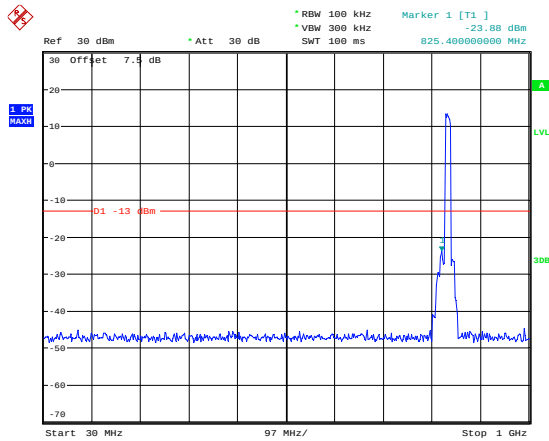


Date: 29.SEP.2020 15:33:00

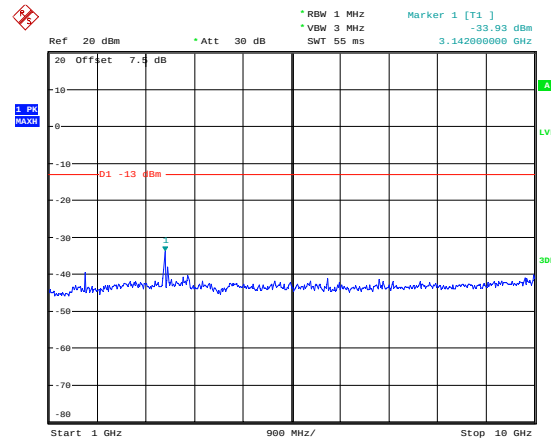


Date: 29.SEP.2020 15:32:35

10M, QPSK, Middle Channel

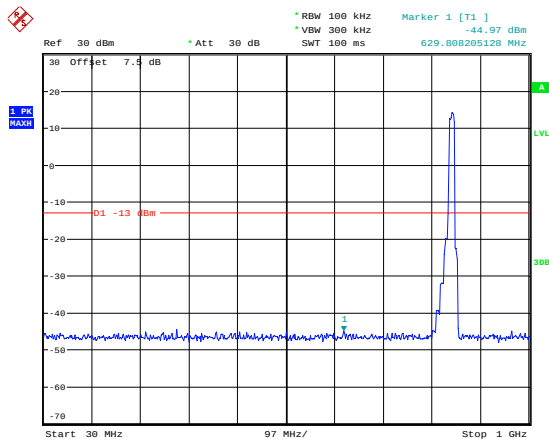


Date: 29.SEP.2020 09:58:55

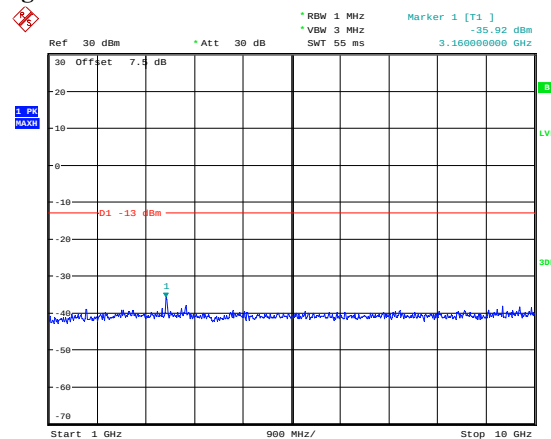


Date: 29.SEP.2020 09:59:07

10M, QPSK, High Channel



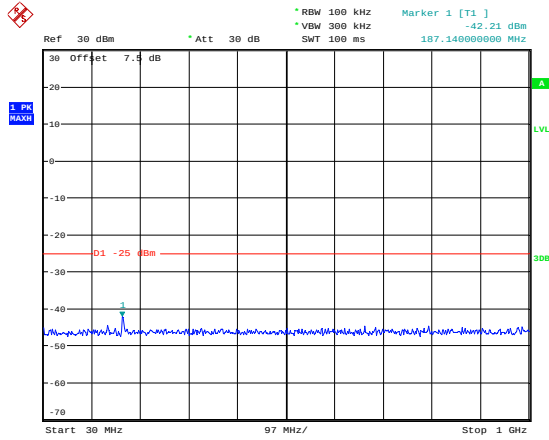
Date: 29.SEP.2020 15:31:32



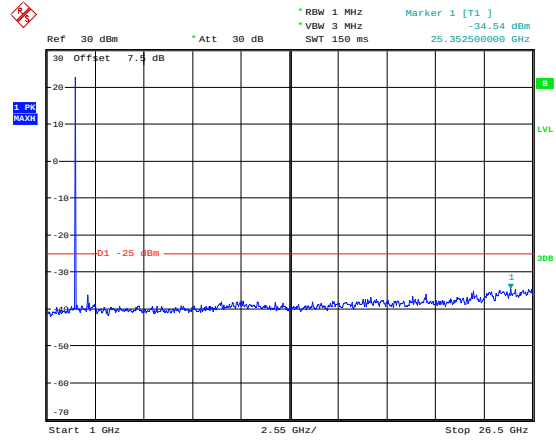
Date: 29.SEP.2020 15:31:50

LTE Band 7:

5M, QPSK, Low Channel

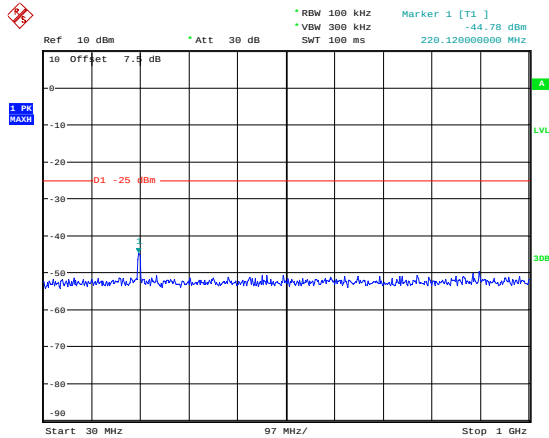


Date: 29.SEP.2020 15:37:46

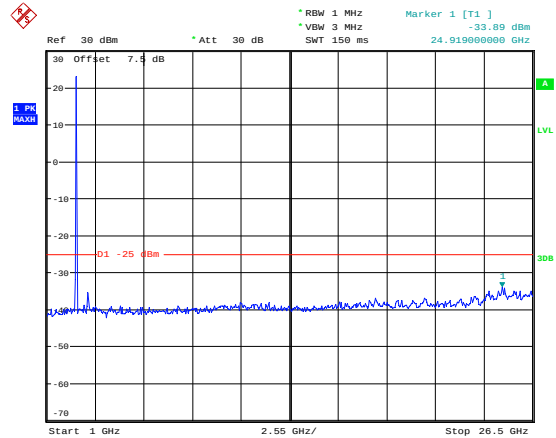


Date: 29.SEP.2020 15:38:29

5M, QPSK, Middle Channel

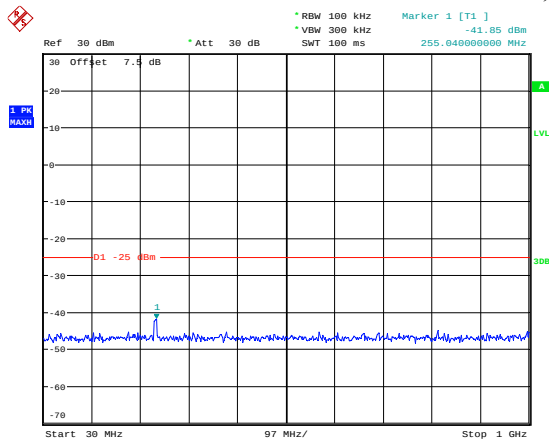


Date: 29.SEP.2020 09:59:36

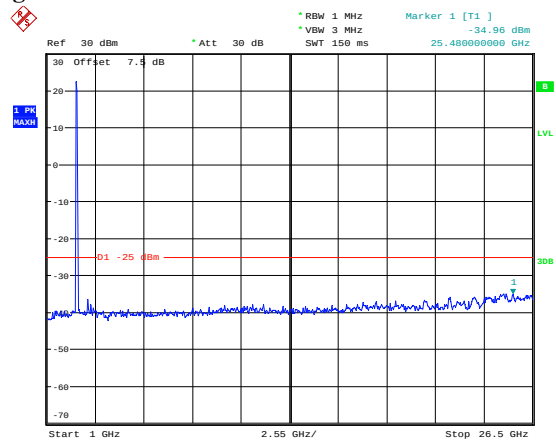


Date: 29.SEP.2020 09:59:47

5M, QPSK, High Channel

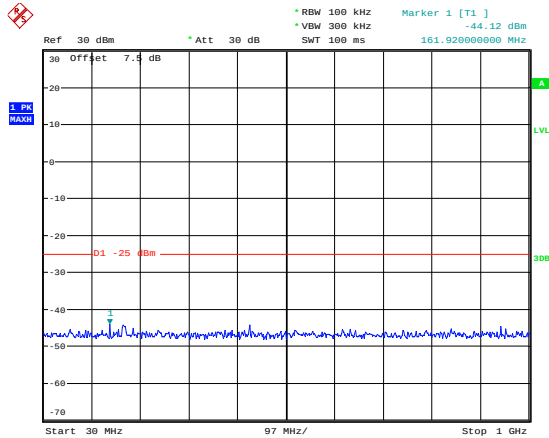


Date: 29.SEP.2020 15:39:24

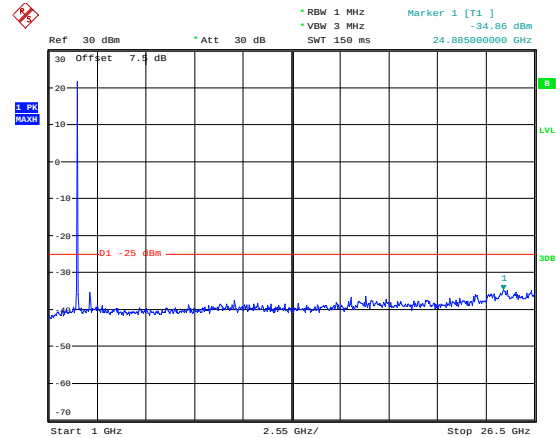


Date: 29.SEP.2020 15:39:05

10M, QPSK, Low Channel

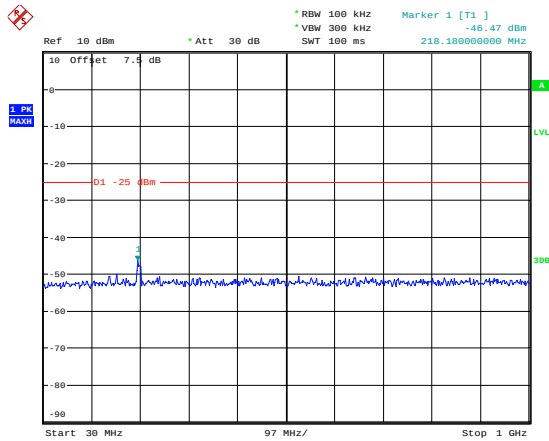


Date: 29.SEP.2020 15:42:34

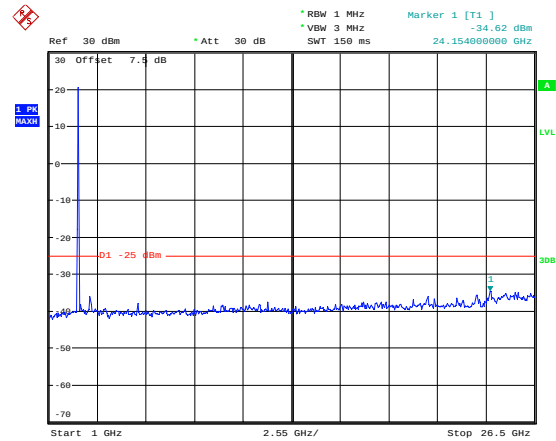


Date: 29.SEP.2020 15:42:06

10M, QPSK, Middle Channel

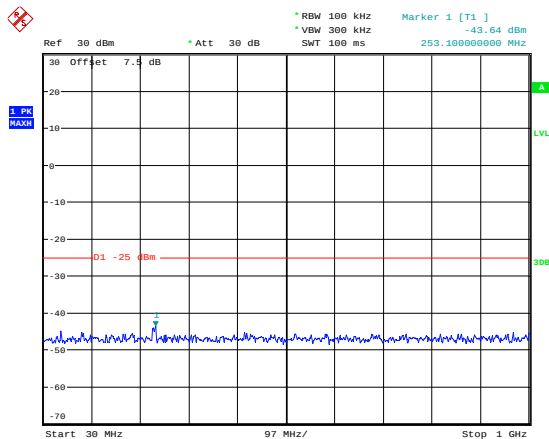


Date: 29.SEP.2020 10:00:10

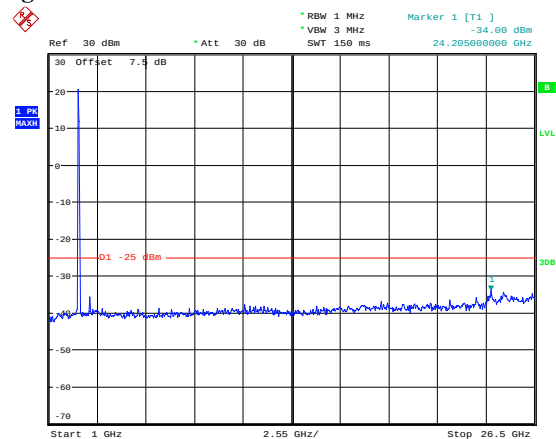


Date: 29.SEP.2020 10:00:22

10M, QPSK, High Channel

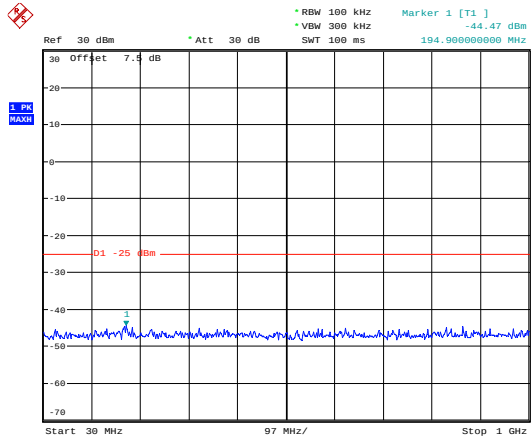


Date: 29.SEP.2020 15:39:59

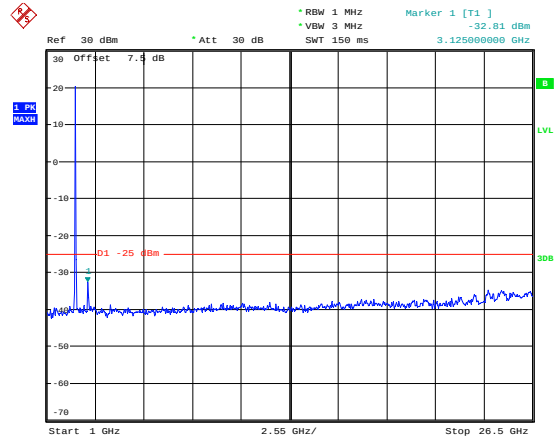


Date: 29.SEP.2020 15:40:19

15M, QPSK, Low Channel

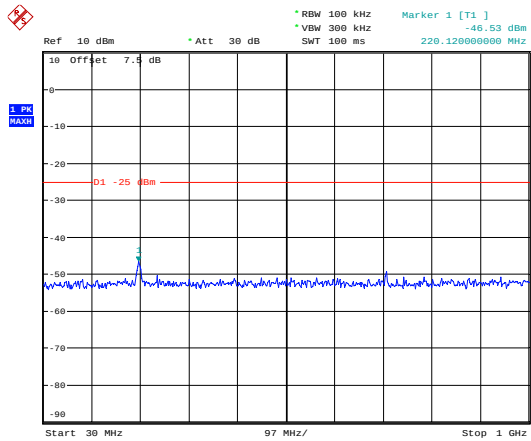


Date: 29.SEP.2020 15:43:04

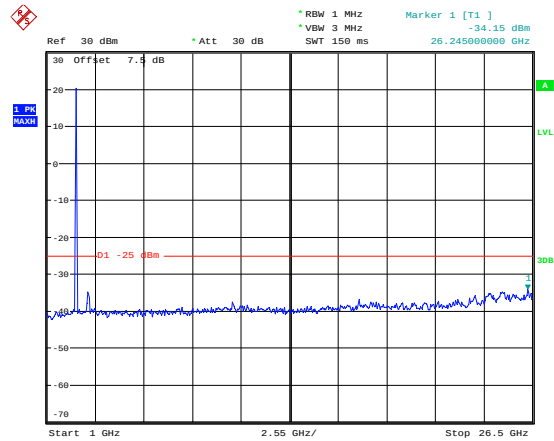


Date: 29.SEP.2020 15:43:23

15M, QPSK, Middle Channel

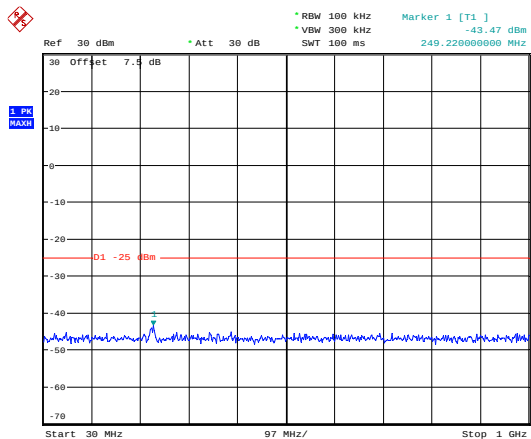


Date: 29.SEP.2020 10:00:45

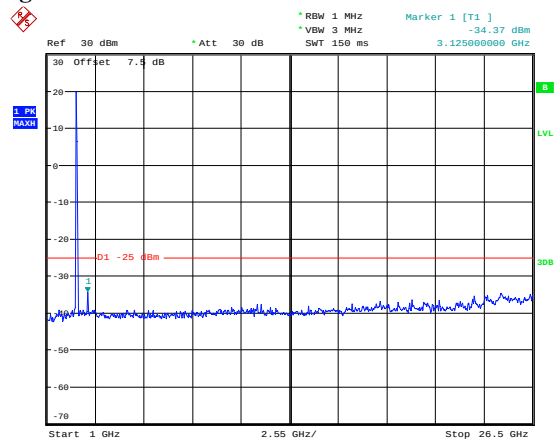


Date: 29.SEP.2020 10:00:57

15M, QPSK, High Channel

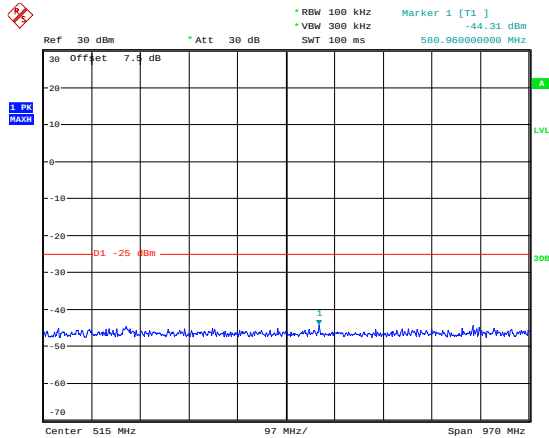


Date: 29.SEP.2020 15:44:09

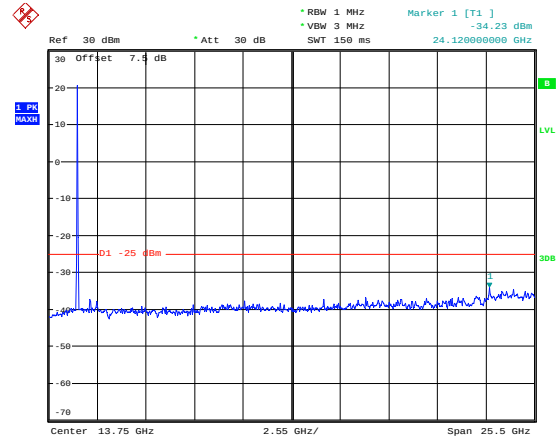


Date: 29.SEP.2020 15:43:52

20M, QPSK, Low Channel

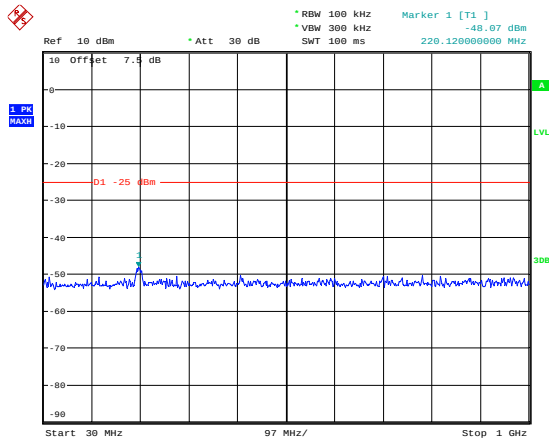


Date: 29.SEP.2020 15:48:35

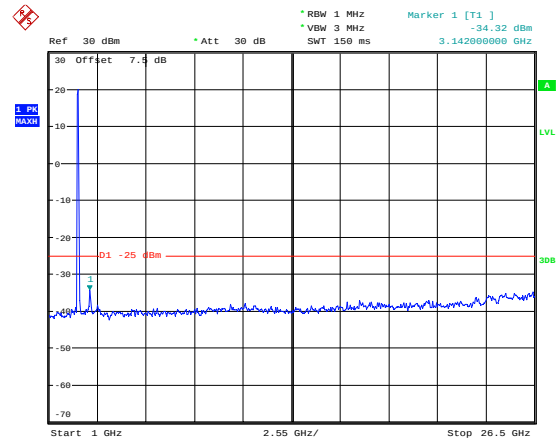


Date: 29.SEP.2020 15:48:01

20M, QPSK, Middle Channel

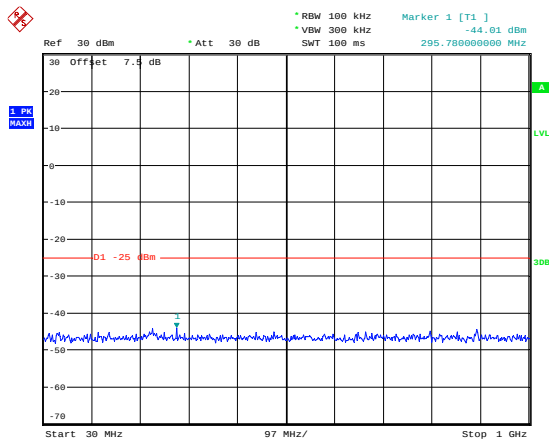


Date: 29.SEP.2020 10:03:13

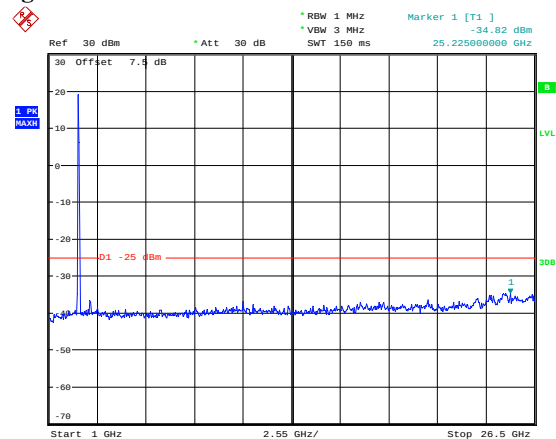


Date: 29.SEP.2020 10:03:24

20M, QPSK, High Channel



Date: 29.SEP.2020 15:47:04



Date: 29.SEP.2020 15:47:28

**FCC §2.1053, §22.917, §24.238, §27.53, RSS-132 §5.5, RSS-133 §6.5, RSS-199 §4.6
- SPURIOUS RADIATED EMISSIONS**

Applicable Standard

FCC § 2.1053, §22.917, § 24.238 and § 27.53
RSS-132 §5.5, RSS-133 §6.5, RSS-199 §4.6

Test Procedure

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

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

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

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

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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiation Below 1G Test					
Sunol Sciences	Antenna	JB3	A060611-2	2020-08-25	2023-08-25
R&S	EMI Test Receiver	ESCI	100224	2020-09-12	2021-09-12
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-02	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0530-01	2020-09-24	2021-09-24
Sonoma	Amplifier	310N	185914	2019-10-13	2020-10-13
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
Agilent	Signal Generator	E8247C	MY43321350	2019-12-10	2020-12-10
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2020-09-05	2021-09-05
Radiation Above 1G Test					
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
TDK RF	Horn Antenna	HRN-0118	130 084	2018-10-12	2021-10-12
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-01 1304	2017-12-06	2020-12-05
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-02 1304	2017-12-06	2020-12-05
Agilent	Spectrum Analyzer	E4440A	SG43360054	2020-07-07	2021-07-07
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-2.4J2.4J-50	C-0700-02	2020-06-27	2021-06-27
Mini-Circuit	Amplifier	ZVA-213-S+	54201245	2020-09-05	2021-09-05
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2020-06-27	2021-06-27
Sinoscite	Band-stop filter	BSF1850-1910MS-0935V2	0935V2	2020-06-16	2021-06-16
Sinoscite	Band-stop filter	BSF2500-2750MS-1439-001	1437001	2020-06-16	2021-06-16
Agilent	Signal Generator	E8247C	MY43321350	2019-12-10	2020-12-10
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2020-09-05	2021-09-05

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

Test Data**Environmental Conditions**

Test Items:	Radiation Below 1GHz	Radiation Above 1GHz
Temperature:	24.5 °C	30°C
Relative Humidity:	36%	43 %
ATM Pressure:	100.3 kPa	100.6 kPa
Tester:	Asa Chen,Jackson Zhang	Calor Jia
Test Date:	2020-09-17	2020-09-25

Test Result: Compliance.

EUT Operation Mode: Transmitting

Cellular Band (PART 22H)

30 MHz-10 GHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
GPRS850 Frequency:824.2MHz								
1648.40	H	37.22	-66.96	10.44	0.71	-57.23	-13.00	44.23
1648.40	V	38.08	-66.70	10.44	0.71	-56.97	-13.00	43.97
2472.60	H	38.28	-64.50	12.88	1.25	-52.87	-13.00	39.87
2472.60	V	37.56	-65.27	12.88	1.25	-53.64	-13.00	40.64
3296.80	H	36.56	-63.22	13.60	1.59	-51.21	-13.00	38.21
3296.80	V	37.12	-62.67	13.60	1.59	-50.66	-13.00	37.66
124.50	H	52.90	-56.81	0.00	0.21	-57.02	-13.00	44.02
61.50	V	64.30	-41.20	-9.51	0.17	-50.88	-13.00	37.88
GPRS850 Frequency:836.6MHz								
1673.20	H	36.83	-67.11	10.61	0.73	-57.23	-13.00	44.23
1673.20	V	36.86	-67.68	10.61	0.73	-57.80	-13.00	44.80
2509.80	H	37.48	-65.43	13.11	1.25	-53.57	-13.00	40.57
2509.80	V	38.25	-64.69	13.11	1.25	-52.83	-13.00	39.83
3346.40	H	37.64	-62.04	13.83	1.61	-49.82	-13.00	36.82
3346.40	V	37.87	-61.85	13.83	1.61	-49.63	-13.00	36.63
125.20	H	53.00	-56.72	0.00	0.22	-56.94	-13.00	43.94
62.10	V	65.30	-40.28	-9.19	0.17	-49.64	-13.00	36.64
GPRS850 Frequency:848.8MHz								
1697.60	H	37.04	-66.66	10.78	0.75	-56.63	-13.00	43.63
1697.60	V	36.43	-67.87	10.78	0.75	-57.84	-13.00	44.84
2546.40	H	37.23	-65.72	13.15	1.27	-53.84	-13.00	40.84
2546.40	V	37.46	-65.63	13.15	1.27	-53.75	-13.00	40.75
3395.20	H	36.29	-63.23	14.08	1.64	-50.79	-13.00	37.79
3395.20	V	36.78	-62.84	14.08	1.64	-50.40	-13.00	37.40
125.80	H	53.80	-55.93	0.00	0.22	-56.15	-13.00	43.15
62.30	V	66.00	-39.60	-9.08	0.17	-48.85	-13.00	35.85

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
WCDMA Band 5 Frequency:826.4 MHz								
1652.80	H	37.51	-66.62	10.47	0.72	-56.87	-13.00	43.87
1652.80	V	38.30	-66.43	10.47	0.72	-56.68	-13.00	43.68
2479.20	H	37.21	-65.60	12.93	1.25	-53.92	-13.00	40.92
2479.20	V	38.40	-64.45	12.93	1.25	-52.77	-13.00	39.77
3305.60	H	36.59	-63.21	13.63	1.59	-51.17	-13.00	38.17
3305.60	V	36.85	-62.96	13.63	1.59	-50.92	-13.00	37.92
126.20	H	51.50	-58.24	0.00	0.22	-58.46	-13.00	45.46
63.10	V	63.20	-42.50	-8.66	0.17	-51.33	-13.00	38.33
WCDMA Band 5 Frequency:836.6MHz								
1673.20	H	37.24	-66.70	10.61	0.73	-56.82	-13.00	43.82
1673.20	V	38.41	-66.13	10.61	0.73	-56.25	-13.00	43.25
2509.80	H	41.06	-61.85	13.11	1.25	-49.99	-13.00	36.99
2509.80	V	43.21	-59.73	13.11	1.25	-47.87	-13.00	34.87
3346.40	H	36.81	-62.87	13.83	1.61	-50.65	-13.00	37.65
3346.40	V	37.09	-62.63	13.83	1.61	-50.41	-13.00	37.41
126.30	H	51.70	-58.05	0.00	0.22	-58.27	-13.00	45.27
63.30	V	63.20	-42.53	-8.55	0.17	-51.25	-13.00	38.25
WCDMA Band 5 Frequency:846.6MHz								
1693.20	H	37.84	-65.91	10.75	0.75	-55.91	-13.00	42.91
1693.20	V	37.85	-66.50	10.75	0.75	-56.50	-13.00	43.50
2539.80	H	37.82	-65.12	13.14	1.27	-53.25	-13.00	40.25
2539.80	V	38.26	-64.80	13.14	1.27	-52.93	-13.00	39.93
3386.40	H	37.64	-61.91	14.03	1.63	-49.51	-13.00	36.51
3386.40	V	37.59	-62.05	14.03	1.63	-49.65	-13.00	36.65
127.00	H	52.10	-57.66	0.00	0.22	-57.88	-13.00	44.88
64.10	V	63.20	-42.62	-8.13	0.17	-50.92	-13.00	37.92

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)			
GPRS1900 Frequency:1850.2MHz								
3700.40	H	37.45	-60.54	14.00	1.83	-48.37	-13.00	35.37
3700.40	V	37.20	-60.77	14.00	1.83	-48.60	-13.00	35.60
5550.60	H	35.18	-58.79	13.95	1.27	-46.11	-13.00	33.11
5550.60	V	35.59	-58.23	13.95	1.27	-45.55	-13.00	32.55
126.80	H	54.00	-55.76	0.00	0.22	-55.98	-13.00	42.98
63.20	V	63.50	-42.21	-8.60	0.17	-50.98	-13.00	37.98
GPRS1900 Frequency:1880MHz								
3760.00	H	37.48	-60.16	13.76	1.63	-48.03	-13.00	35.03
3760.00	V	38.03	-59.47	13.76	1.63	-47.34	-13.00	34.34
5640.00	H	35.26	-58.33	14.02	1.31	-45.62	-13.00	32.62
5640.00	V	35.69	-57.79	14.02	1.31	-45.08	-13.00	32.08
127.70	H	54.50	-55.28	0.00	0.22	-55.50	-13.00	42.50
64.00	V	63.60	-42.21	-8.18	0.17	-50.56	-13.00	37.56
GPRS1900 Frequency:1909.8MHz								
3819.60	H	37.27	-59.98	13.56	1.50	-47.92	-13.00	34.92
3819.60	V	37.46	-59.61	13.56	1.50	-47.55	-13.00	34.55
5729.40	H	35.29	-58.42	13.96	1.31	-45.77	-13.00	32.77
5729.40	V	35.47	-58.21	13.96	1.31	-45.56	-13.00	32.56
127.50	H	54.50	-55.27	0.00	0.22	-55.49	-13.00	42.49
63.50	V	63.60	-42.15	-8.45	0.17	-50.77	-13.00	37.77
WCDMA Band II, Frequency:1852.4 MHz								
3704.80	H	37.22	-60.74	13.98	1.81	-48.57	-13.00	35.57
3704.80	V	39.48	-58.45	13.98	1.81	-46.28	-13.00	33.28
127.10	H	54.10	-55.66	0.00	0.22	-55.88	-13.00	42.88
64.00	V	63.90	-41.91	-8.18	0.17	-50.26	-13.00	37.26
WCDMA Band II, Frequency:1880 MHz								
3760.00	H	37.23	-60.41	13.76	1.63	-48.28	-13.00	35.28
3760.00	V	37.59	-59.91	13.76	1.63	-47.78	-13.00	34.78
127.50	H	54.70	-55.07	0.00	0.22	-55.29	-13.00	42.29
63.40	V	64.00	-41.74	-8.50	0.17	-50.41	-13.00	37.41
WCDMA Band II, Frequency:1907.6MHz								
3815.20	H	37.21	-60.07	13.57	1.50	-48.00	-13.00	35.00
3815.20	V	36.88	-60.22	13.57	1.50	-48.15	-13.00	35.15
126.80	H	54.30	-55.46	0.00	0.22	-55.68	-13.00	42.68
63.60	V	64.00	-41.76	-8.39	0.17	-50.32	-13.00	37.32

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:1850.7 MHz								
3701.40	H	37.94	-60.04	13.99	1.83	-47.88	-13.00	34.88
3701.40	V	37.59	-60.37	13.99	1.83	-48.21	-13.00	35.21
5552.10	H	35.16	-58.79	13.96	1.27	-46.10	-13.00	33.10
5552.10	V	35.59	-58.21	13.96	1.27	-45.52	-13.00	32.52
127.30	H	54.30	-55.47	0.00	0.22	-55.69	-13.00	42.69
63.20	V	63.80	-41.91	-8.60	0.17	-50.68	-13.00	37.68
QPSK,Frequency:1880 MHz								
3760.00	H	37.28	-60.36	13.76	1.63	-48.23	-13.00	35.23
3760.00	V	37.24	-60.26	13.76	1.63	-48.13	-13.00	35.13
5640.00	H	34.68	-58.91	14.02	1.31	-46.20	-13.00	33.20
5640.00	V	34.56	-58.92	14.02	1.31	-46.21	-13.00	33.21
127.20	H	54.90	-54.86	0.00	0.22	-55.08	-13.00	42.08
63.70	V	63.70	-42.08	-8.34	0.17	-50.59	-13.00	37.59
QPSK,Frequency:1909.3 MHz								
3818.60	H	37.59	-59.67	13.56	1.50	-47.61	-13.00	34.61
3818.60	V	37.86	-59.21	13.56	1.50	-47.15	-13.00	34.15
5727.90	H	35.12	-58.60	13.96	1.31	-45.95	-13.00	32.95
5727.90	V	35.26	-58.43	13.96	1.31	-45.78	-13.00	32.78
127.70	H	54.10	-55.68	0.00	0.22	-55.90	-13.00	42.90
63.60	V	64.20	-41.56	-8.39	0.17	-50.12	-13.00	37.12

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: 824.7 MHz								
1649.40	H	37.04	-67.13	10.45	0.71	-57.39	-13.00	44.39
1649.40	V	37.51	-67.26	10.45	0.71	-57.52	-13.00	44.52
2474.10	H	37.54	-65.25	12.89	1.25	-53.61	-13.00	40.61
2474.10	V	37.96	-64.88	12.89	1.25	-53.24	-13.00	40.24
3298.80	H	36.29	-63.52	13.60	1.59	-51.51	-13.00	38.51
3298.80	V	36.37	-63.44	13.60	1.59	-51.43	-13.00	38.43
127.00	H	52.40	-57.36	0.00	0.22	-57.58	-13.00	44.58
63.40	V	63.90	-41.84	-8.50	0.17	-50.51	-13.00	37.51
QPSK, Frequency: 836.5 MHz								
1673.00	H	37.56	-66.38	10.61	0.73	-56.50	-13.00	43.50
1673.00	V	37.89	-66.65	10.61	0.73	-56.77	-13.00	43.77
2509.50	H	42.88	-60.03	13.11	1.25	-48.17	-13.00	35.17
2509.50	V	44.67	-58.27	13.11	1.25	-46.41	-13.00	33.41
3346.00	H	36.59	-63.09	13.83	1.61	-50.87	-13.00	37.87
3346.00	V	36.77	-62.95	13.83	1.61	-50.73	-13.00	37.73
126.40	H	52.30	-57.45	0.00	0.22	-57.67	-13.00	44.67
63.80	V	64.00	-41.79	-8.29	0.17	-50.25	-13.00	37.25
QPSK, Frequency: 848.3 MHz								
1696.60	H	39.15	-64.56	10.78	0.75	-54.53	-13.00	41.53
1696.60	V	37.61	-66.70	10.78	0.75	-56.67	-13.00	43.67
2544.90	H	38.05	-64.90	13.14	1.27	-53.03	-13.00	40.03
2544.90	V	37.59	-65.49	13.14	1.27	-53.62	-13.00	40.62
3393.20	H	36.26	-63.27	14.07	1.64	-50.84	-13.00	37.84
3393.20	V	36.57	-63.05	14.07	1.64	-50.62	-13.00	37.62
126.20	H	51.70	-58.04	0.00	0.22	-58.26	-13.00	45.26
63.10	V	63.70	-42.00	-8.66	0.17	-50.83	-13.00	37.83

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: 2502.5 MHz								
5005.00	H	36.44	-59.63	14.00	1.43	-47.06	-25.00	22.06
5005.00	V	35.97	-59.86	14.00	1.43	-47.29	-25.00	22.29
7507.50	H	42.45	-46.19	13.20	1.33	-34.32	-25.00	9.32
7507.50	V	39.51	-49.61	13.20	1.33	-37.74	-25.00	12.74
271.20	H	49.30	-59.71	0.00	0.29	-60.00	-25.00	35.00
211.40	V	50.00	-56.82	0.00	0.20	-57.02	-25.00	32.02
QPSK, Frequency: 2535 MHz								
5070.00	H	36.89	-58.22	13.93	1.34	-45.63	-25.00	20.63
5070.00	V	36.47	-58.45	13.93	1.34	-45.86	-25.00	20.86
7605.00	H	39.62	-49.26	13.21	1.40	-37.45	-25.00	12.45
7605.00	V	38.70	-50.58	13.21	1.40	-38.77	-25.00	13.77
271.90	H	49.50	-59.50	0.00	0.29	-59.79	-25.00	34.79
211.90	V	50.60	-56.23	0.00	0.20	-56.43	-25.00	31.43
QPSK, Frequency: 2567.5 MHz								
5135.00	H	36.34	-58.34	13.94	1.38	-45.78	-25.00	20.78
5135.00	V	36.73	-57.86	13.94	1.38	-45.30	-25.00	20.30
7702.50	H	40.07	-49.05	13.40	1.47	-37.12	-25.00	12.12
7702.50	V	39.90	-49.54	13.40	1.47	-37.61	-25.00	12.61
271.40	H	49.80	-59.21	0.00	0.29	-59.50	-25.00	34.50
211.70	V	50.20	-56.63	0.00	0.20	-56.83	-25.00	31.83

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, RSS-132 §5.5, RSS-133 §6.5, RSS-199 §4.6 - BAND EDGES

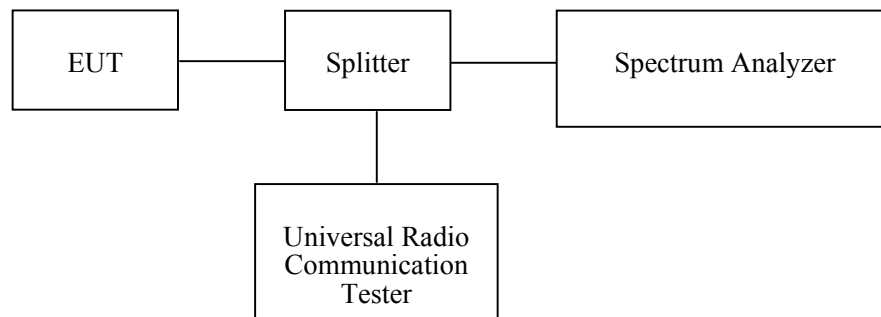
Applicable Standard

FCC § 2.1053, §22.917, § 24.238 and § 27.53, § 90.691;
RSS-132 §5.5, RSS-133 §6.5, RSS-199 §4.6

Test Procedure

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

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



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU 26	200256	2020-05-09	2021-05-09
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005011	Each time	/
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41002201	Each Time	/
E-Microwave	Two-way Splitter	ODP-1-6-2S	OE0120142	Each Time	/

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

Test Data

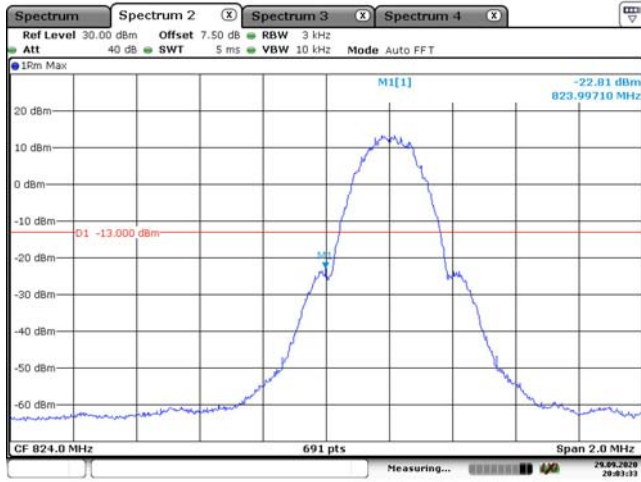
Environmental Conditions

Temperature:	26.2~27.8°C
Relative Humidity:	50~51 %
ATM Pressure:	100.2~100.8 kPa
Tester:	Rita Huang
Test Date:	2020-09-29-2020-09-30

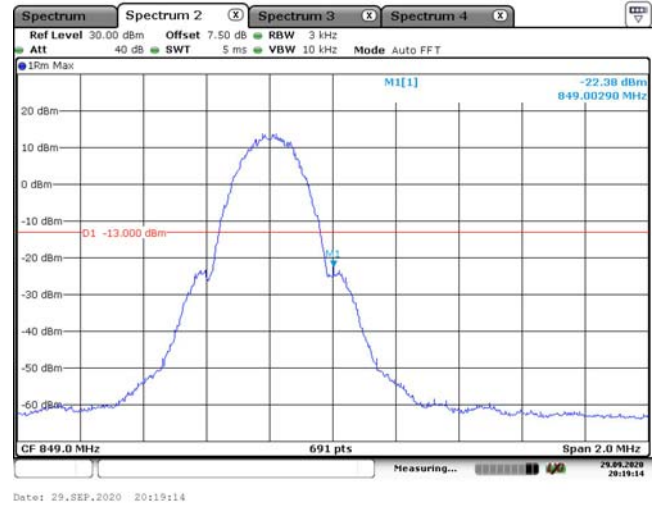
Test Mode: Transmitting

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

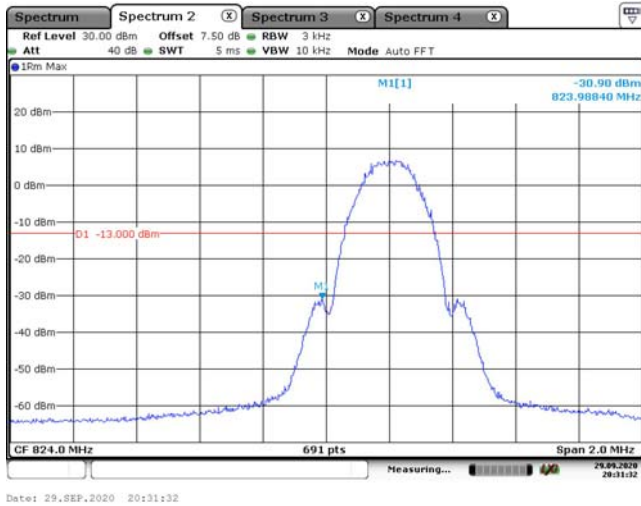
GPRS850, Left Band Edge



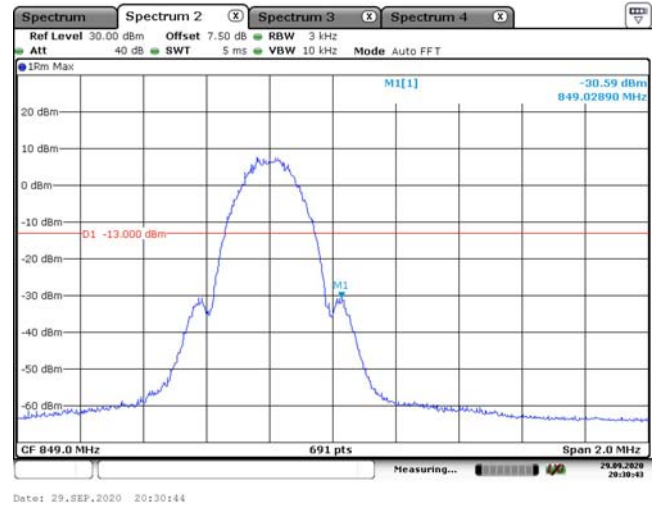
GPRS850, Right Band Edge



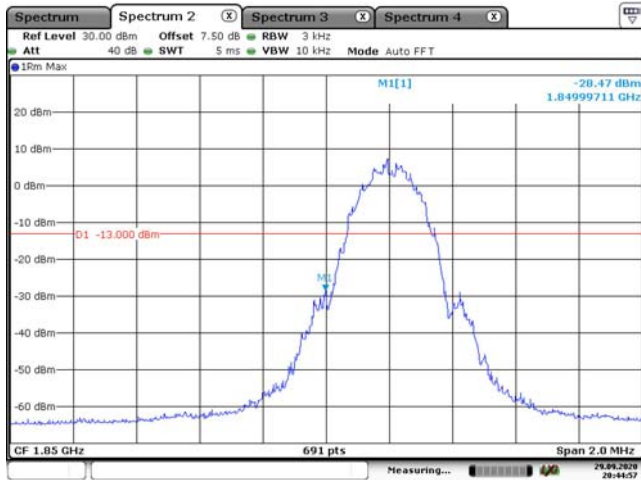
EGPRS850, Left Band Edge



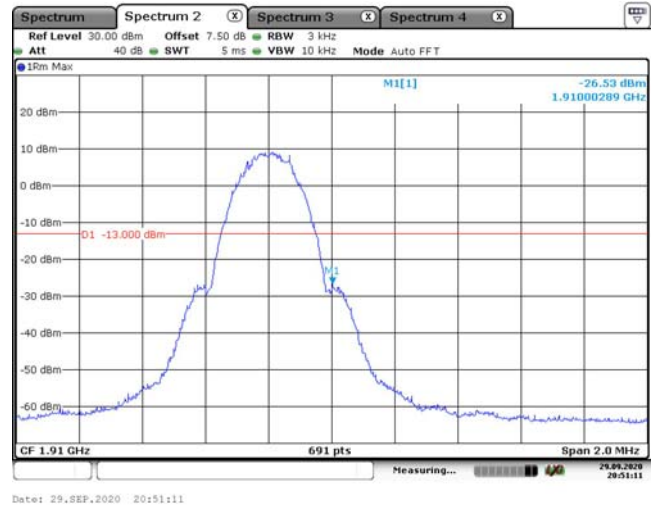
EGPRS850, Right Band Edge



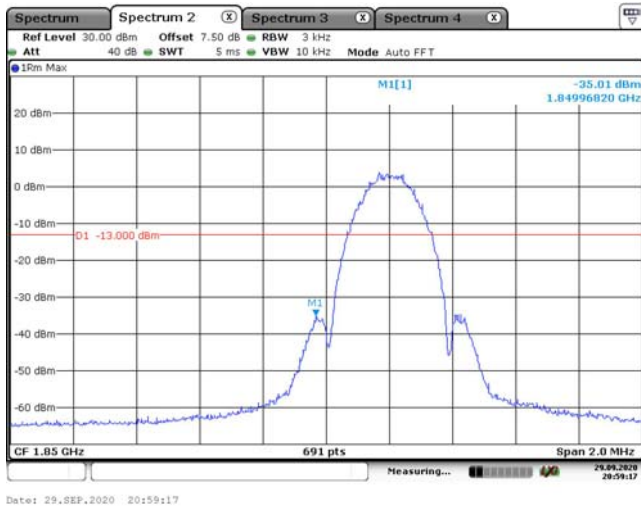
GPRS1900, Left Band Edge



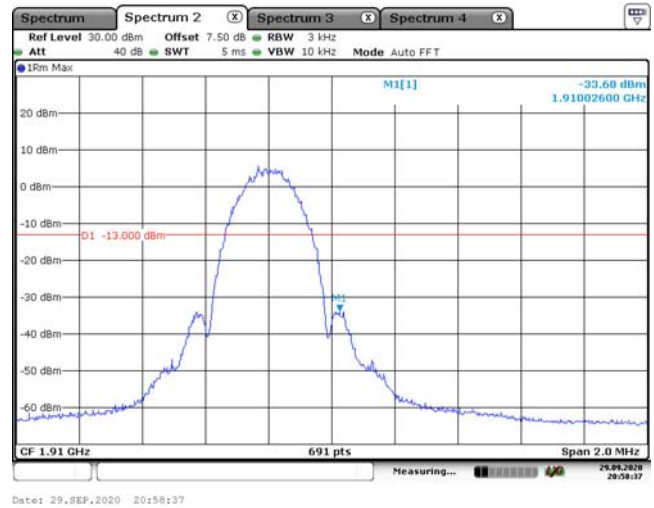
GPRS1900, Right Band Edge



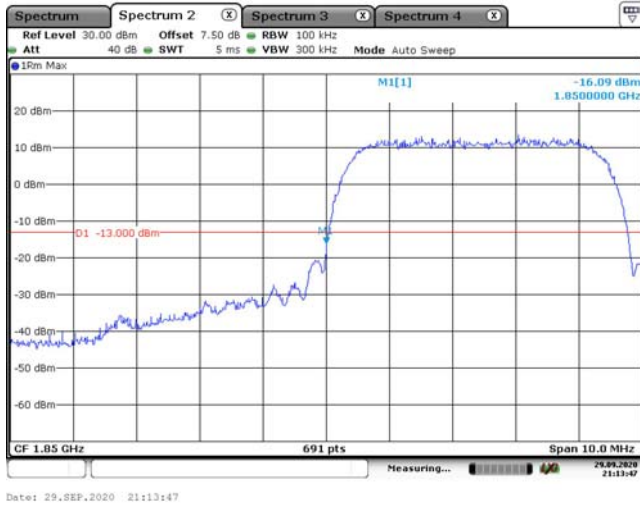
EGPRS1900, Left Band Edge



EGPRS1900, Right Band Edge



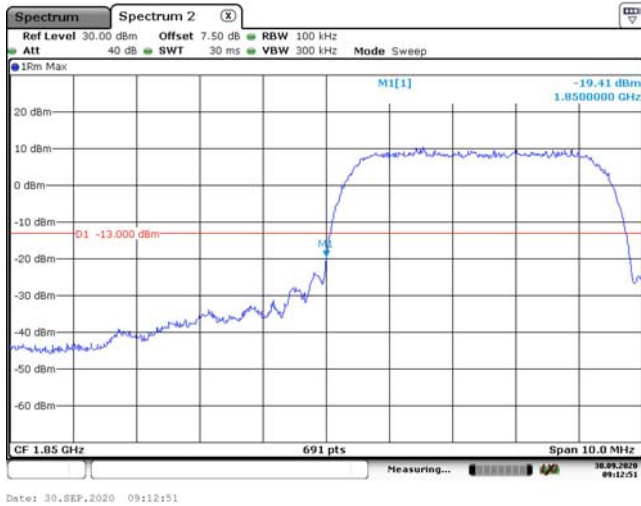
WCDMA Band II,Rel99, Left Band Edge



WCDMA Band II,Rel99, Right Band Edge



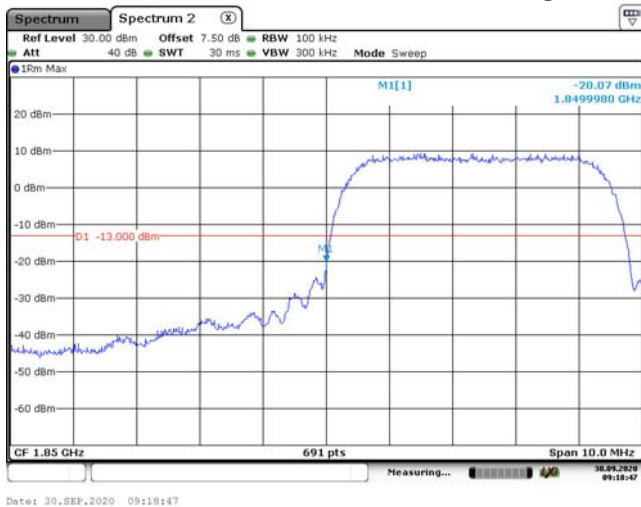
WCDMA Band II,HSDPA, Left Band Edge



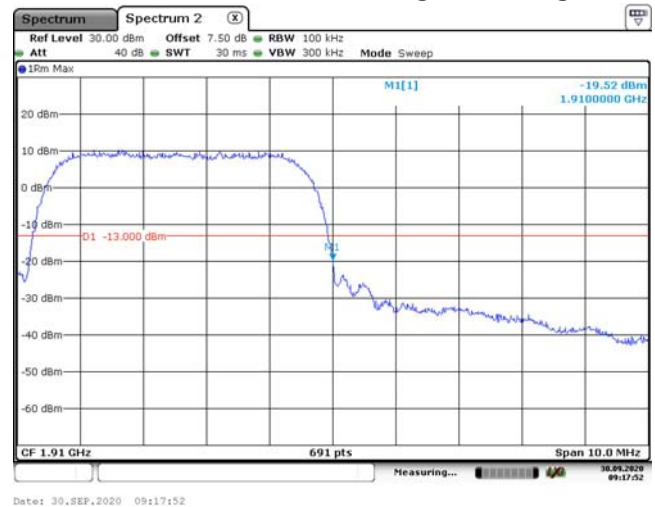
WCDMA Band II,HSDPA,Right Band Edge



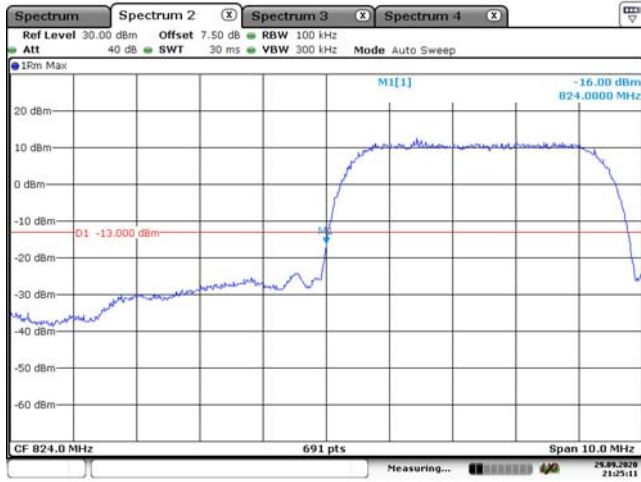
WCDMA Band II,HSUPA, Left Band Edge



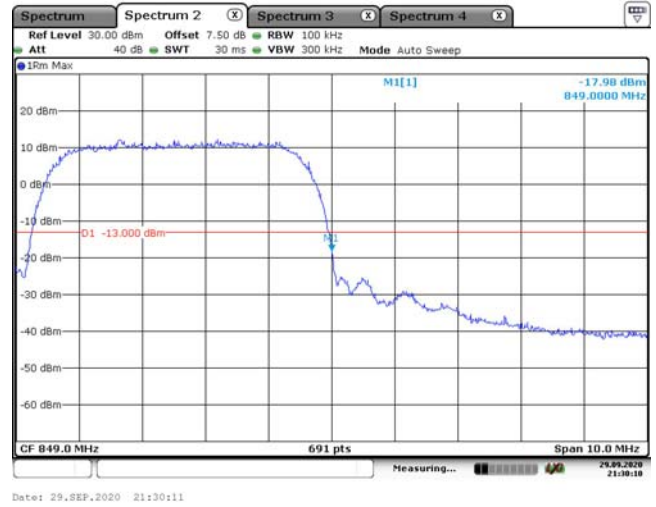
WCDMA Band II,HSUPA, Right Band Edge



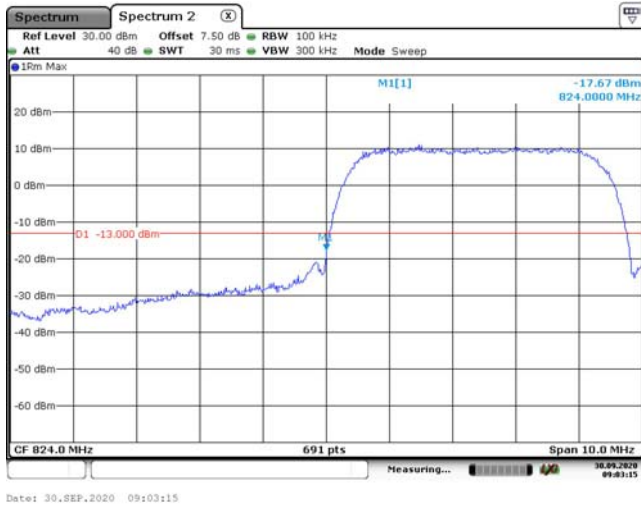
WCDMA Band V,Rel99, Left Band Edge



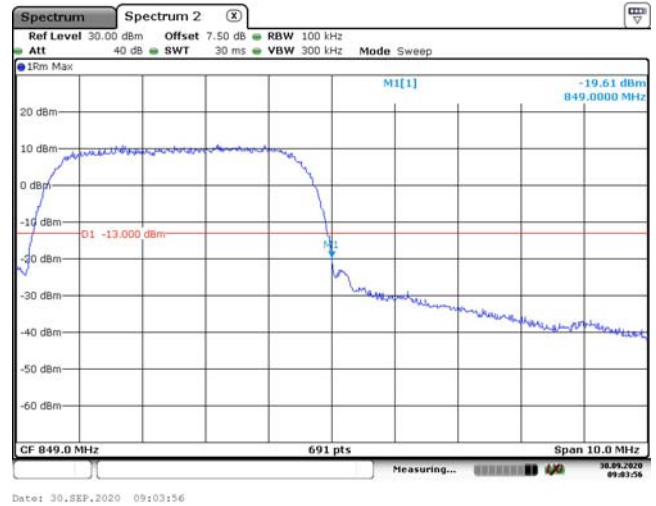
WCDMA Band V,Rel99, Right Band Edge



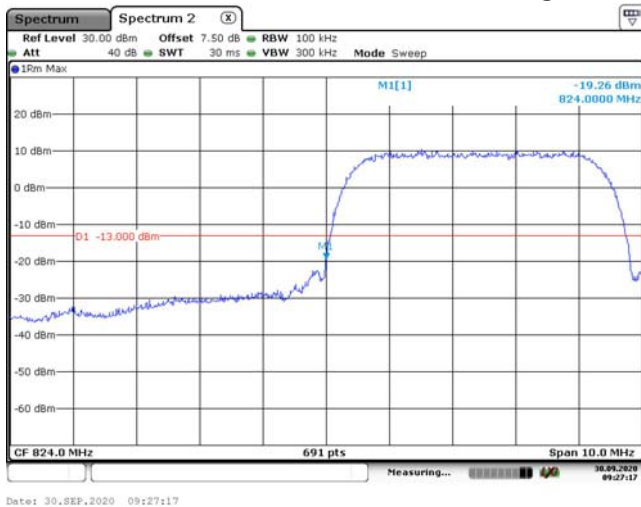
WCDMA Band V,HSDPA, Left Band Edge



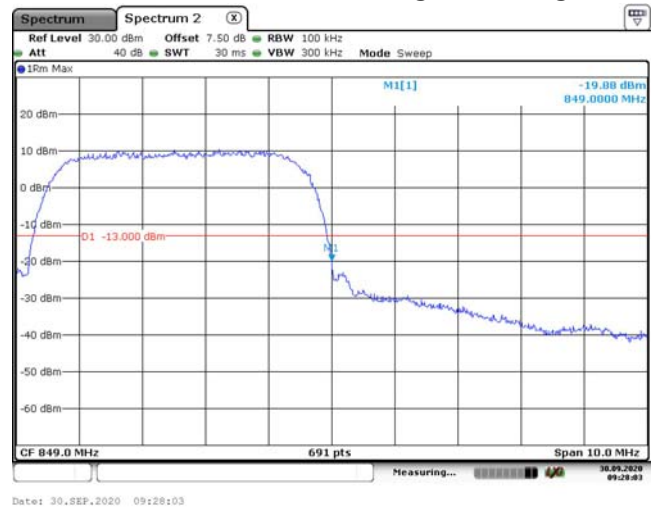
WCDMA Band V,HSDPA,Right Band Edge



WCDMA Band V,HSUPA, Left Band Edge

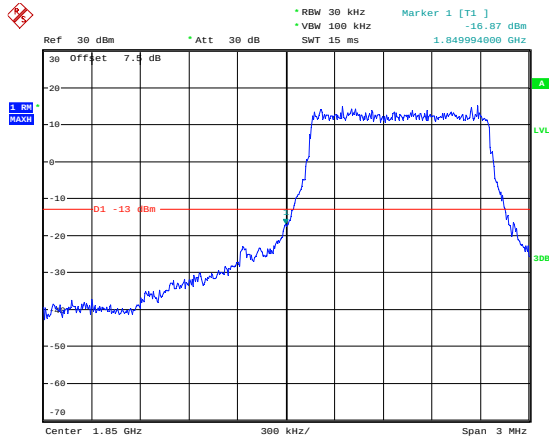


WCDMA Band V,HSUPA, Right Band Edge



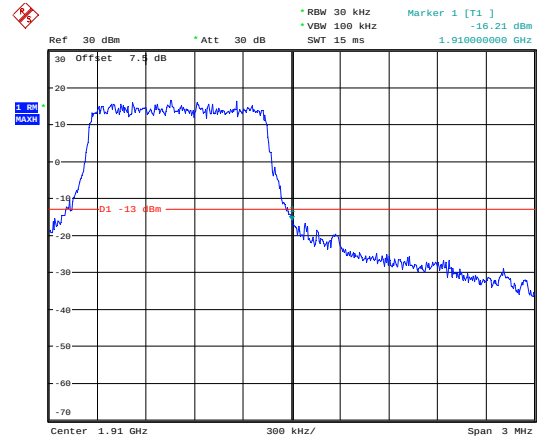
LTE Band 2:

1.4M, QPSK, Left Band Edge



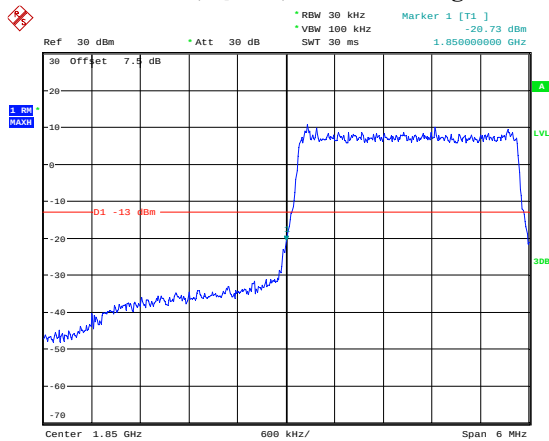
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1.4M, QPSK, Right Band Edge



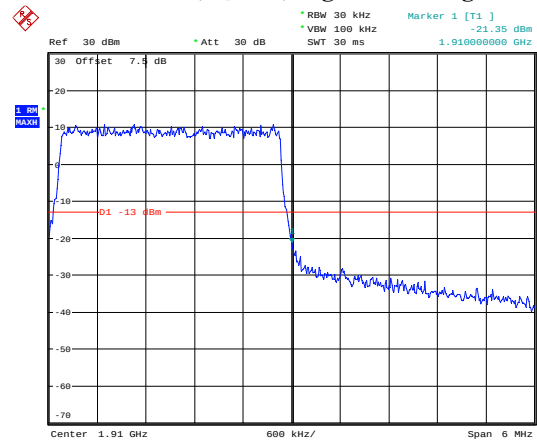
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3M, QPSK, Left Band Edge



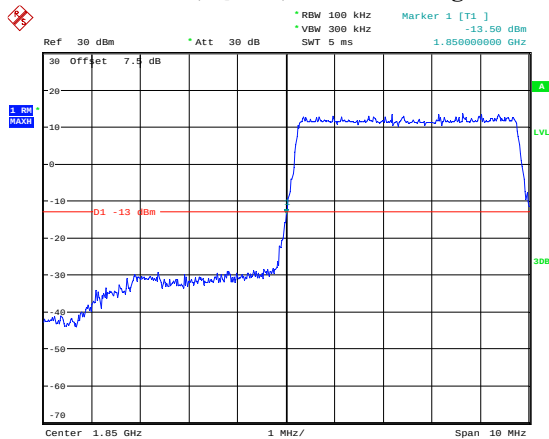
Date: 29.SEP.2020 09:33:42

3M, QPSK, Right Band Edge



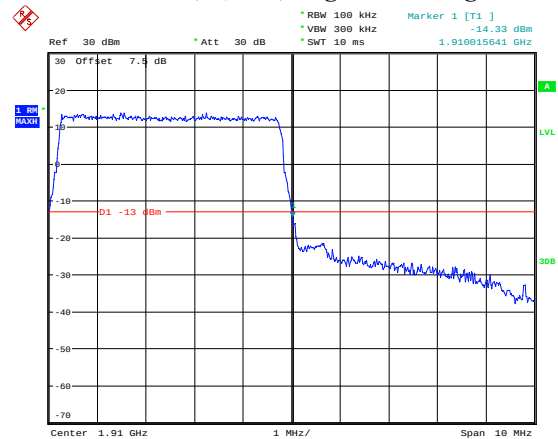
Date: 29.SEP.2020 09:34:17

5M, QPSK, Left Band Edge



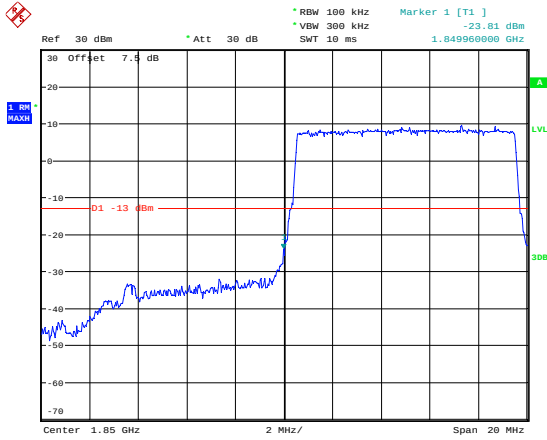
Date: 29.SEP.2020 09:34:59

5M, QPSK, Right Band Edge



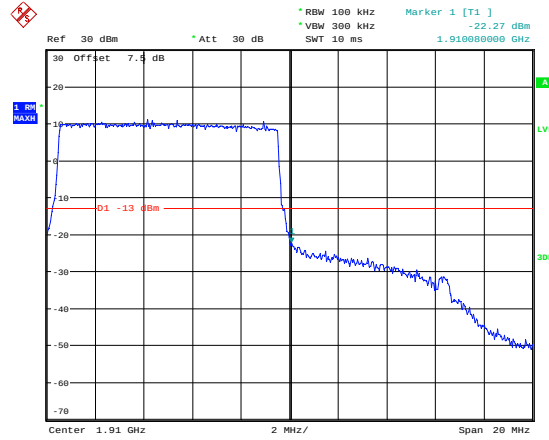
Date: 29.SEP.2020 14:36:12

10M, QPSK, Left Band Edge



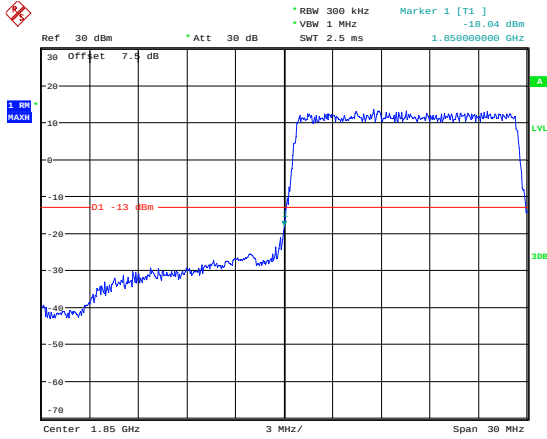
Date: 29.SEP.2020 09:36:15

10M, QPSK, Right Band Edge



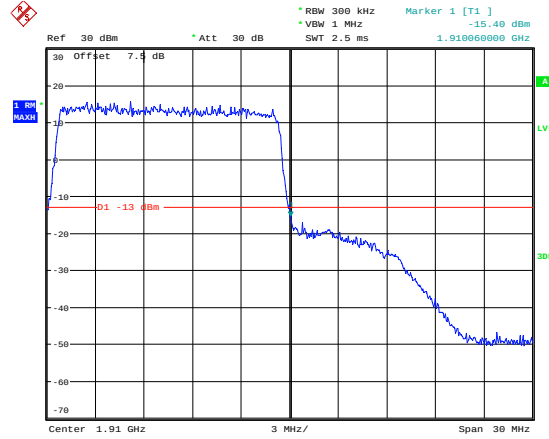
Date: 29.SEP.2020 09:36:58

15M, QPSK, Left Band Edge



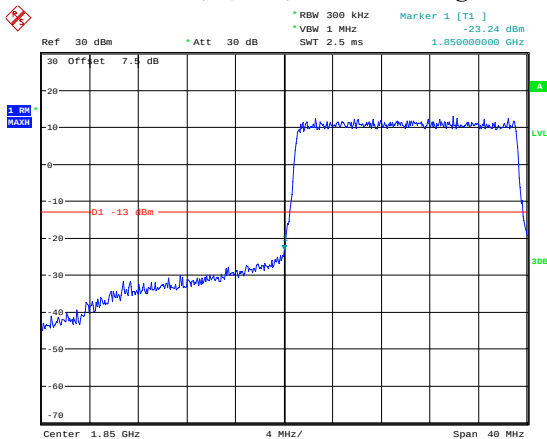
Date: 29.SEP.2020 09:37:41

15M, QPSK, Right Band Edge



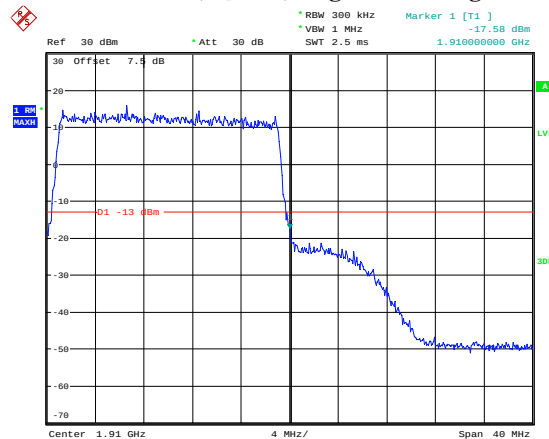
Date: 29.SEP.2020 09:38:28

20M, QPSK, Left Band Edge



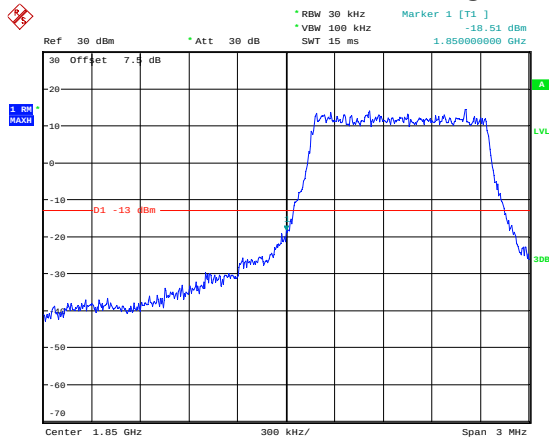
Date: 29.SEP.2020 09:39:17

20M, QPSK, Right Band Edge



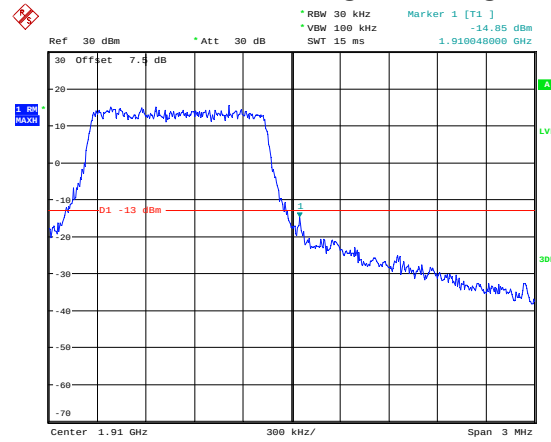
Date: 29.SEP.2020 09:39:58

1.4M, 16QAM, Left Band Edge



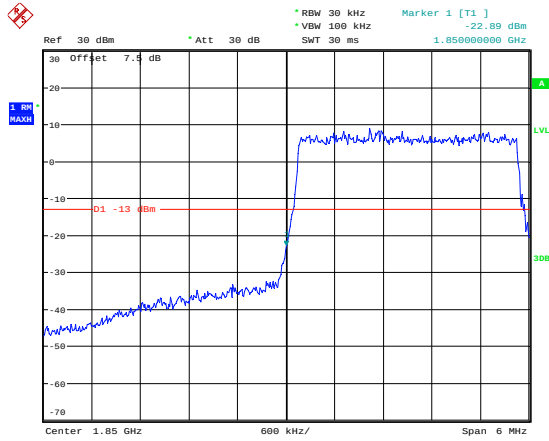
Date: 29.SEP.2020 09:32:42

1.4M, 16QAM, Right Band Edge



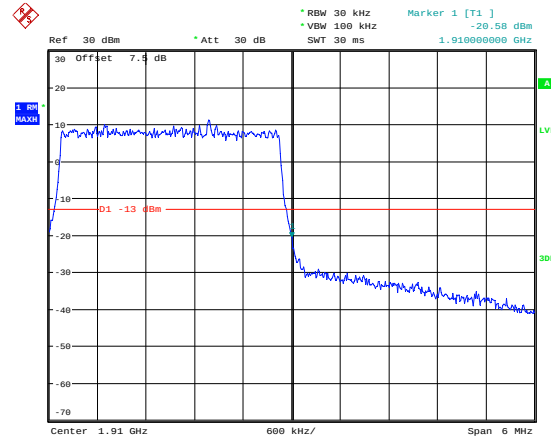
Date: 29.SEP.2020 09:33:20

3M, 16QAM, Left Band Edge



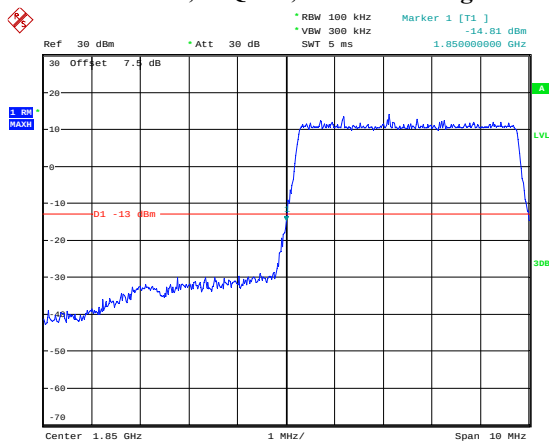
Date: 29.SEP.2020 09:33:59

3M, 16QAM, Right Band Edge



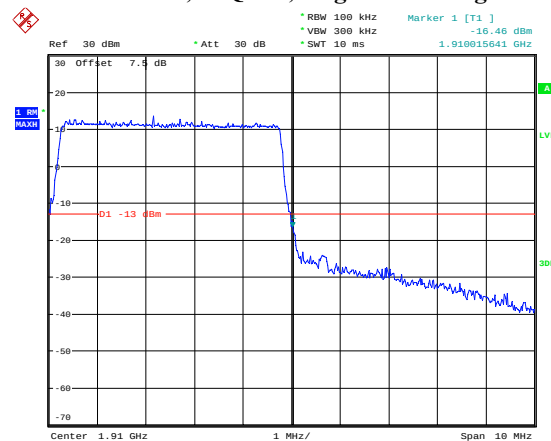
Date: 29.SEP.2020 09:34:37

5M, 16QAM, Left Band Edge



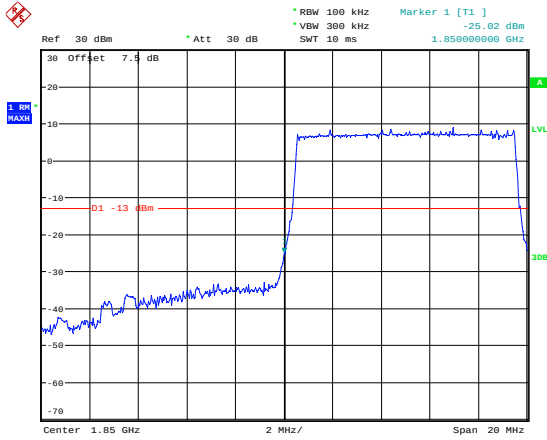
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5M, 16QAM, Right Band Edge



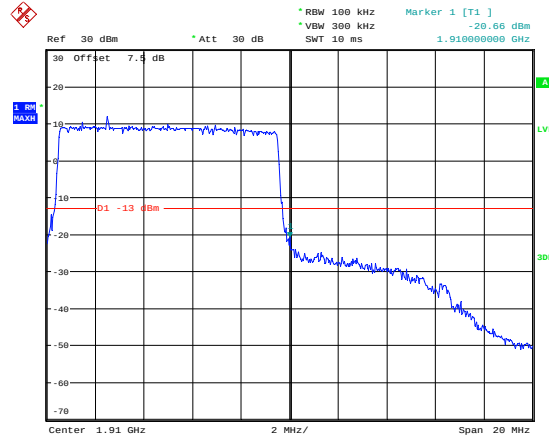
Date: 29.SEP.2020 14:37:47

10M, 16QAM, Left Band Edge



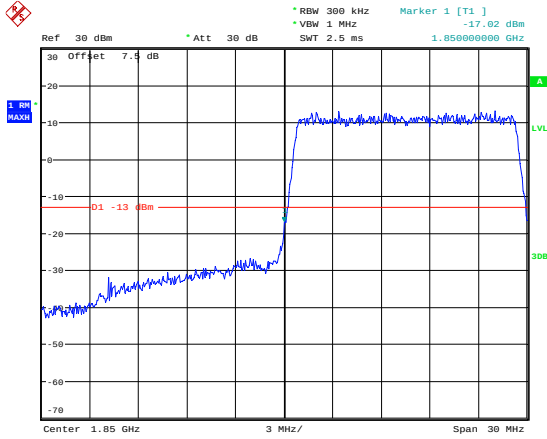
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10M, 16QAM, Right Band Edge



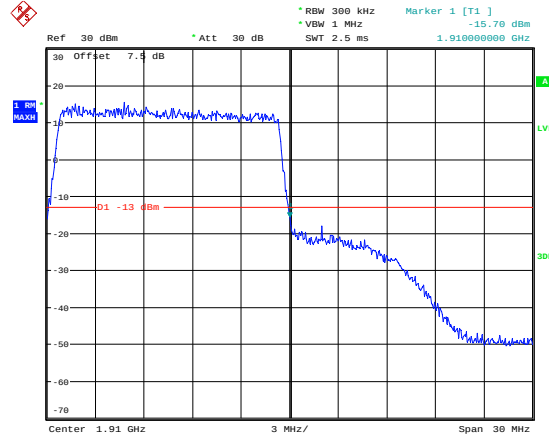
Date: 29.SEP.2020 09:37:16

15M, 16QAM, Left Band Edge



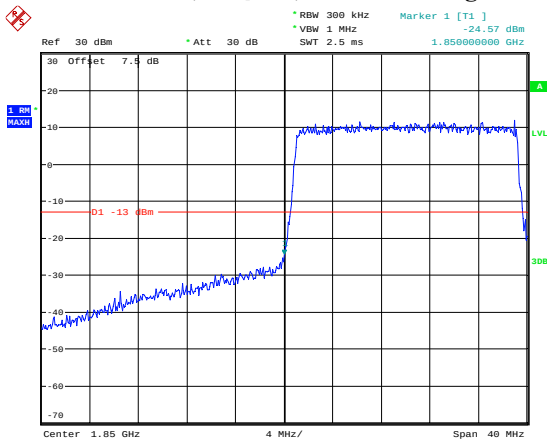
Date: 29.SEP.2020 09:38:06

15M, 16QAM, Right Band Edge



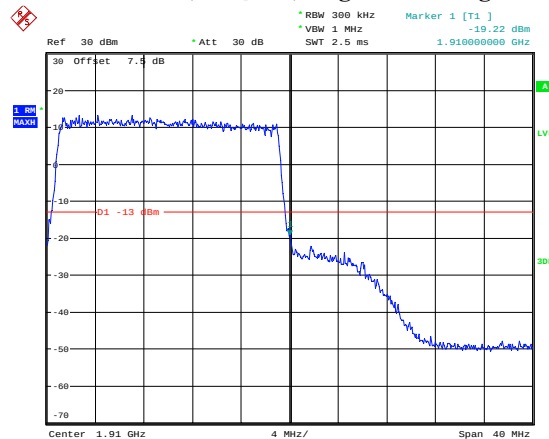
Date: 29.SEP.2020 09:38:48

20M, 16QAM, Left Band Edge



Date: 29.SEP.2020 09:39:37

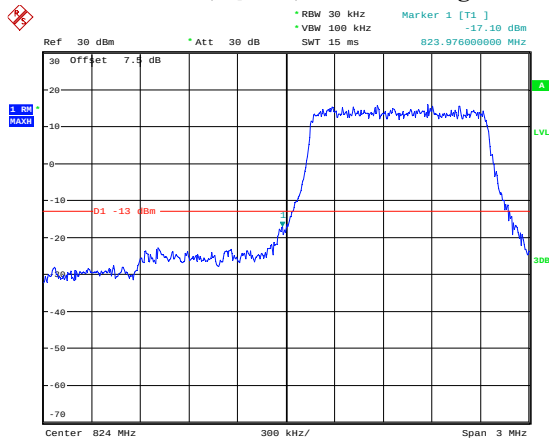
20M, 16QAM, Right Band Edge



Date: 29.SEP.2020 09:40:21

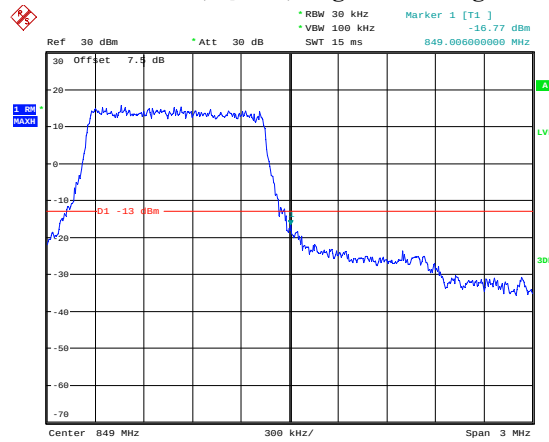
LTE Band 5:

1.4M, QPSK, Left Band Edge



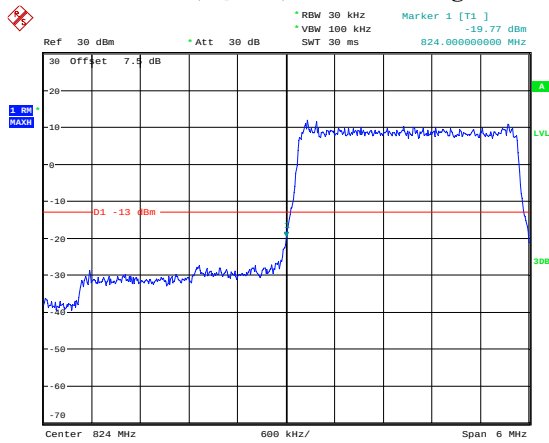
Date: 29.SEP.2020 09:48:49

1.4M, QPSK, Right Band Edge



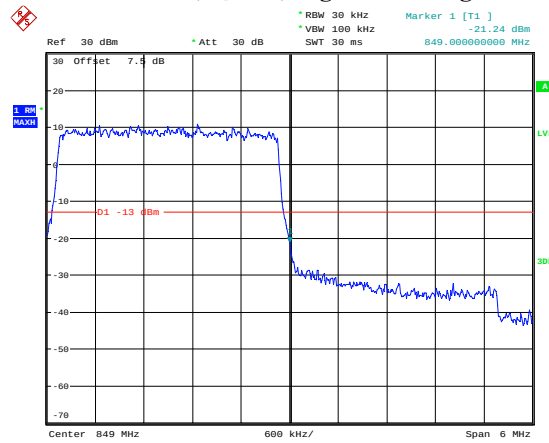
Date: 29.SEP.2020 09:41:24

3M, QPSK, Left Band Edge



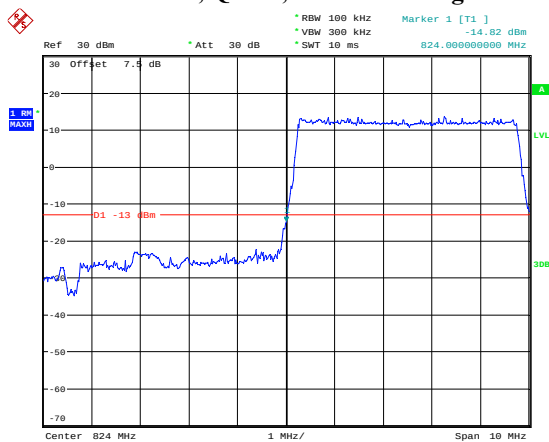
Date: 29.SEP.2020 09:42:07

3M, QPSK, Right Band Edge



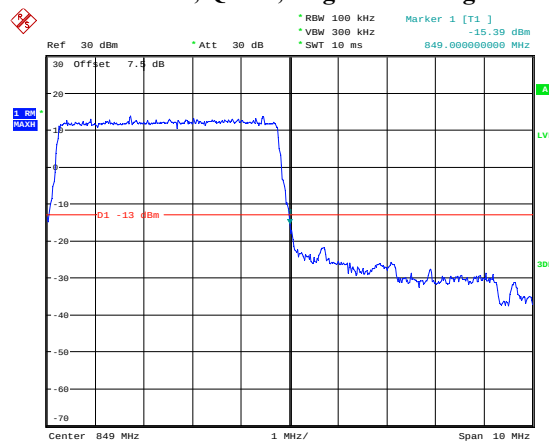
Date: 29.SEP.2020 09:42:43

5M, QPSK, Left Band Edge



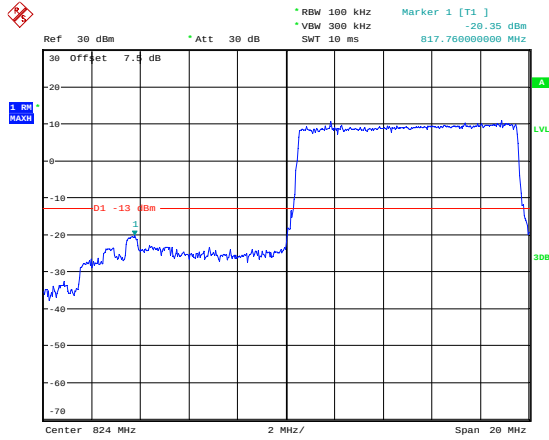
Date: 29.SEP.2020 14:41:42

5M, QPSK, Right Band Edge



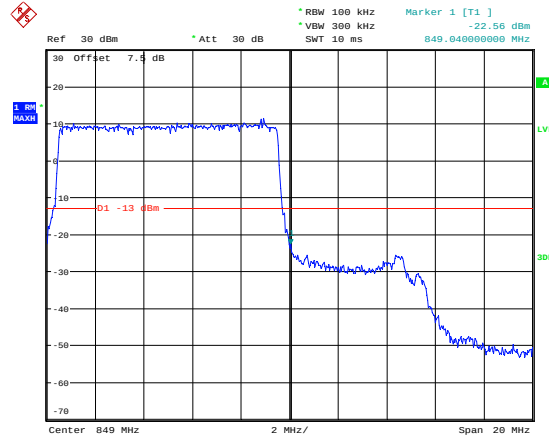
Date: 29.SEP.2020 14:43:16

10M, QPSK, Left Band Edge



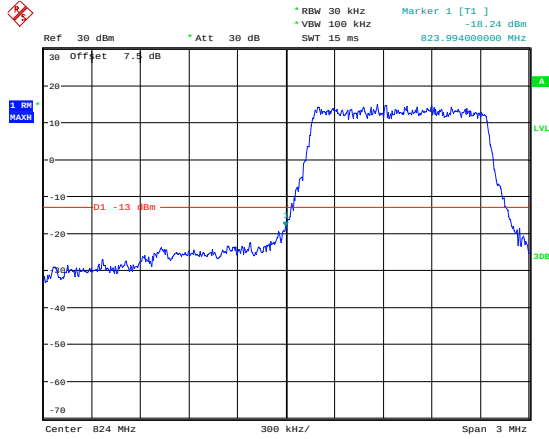
Date: 29.SEP.2020 09:44:42

10M, QPSK, Right Band Edge



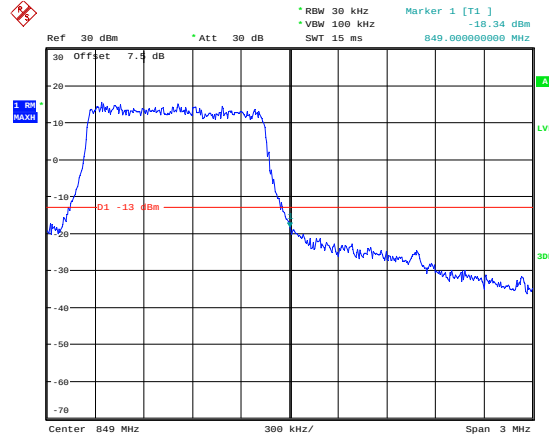
Date: 29.SEP.2020 09:45:20

1.4M, 16QAM, Left Band Edge



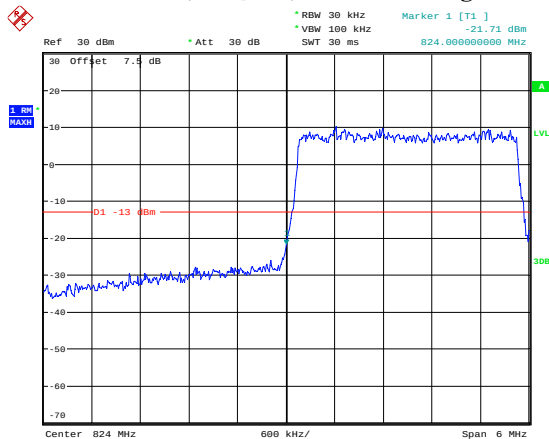
Date: 29.SEP.2020 09:41:06

1.4M, 16QAM, Right Band Edge



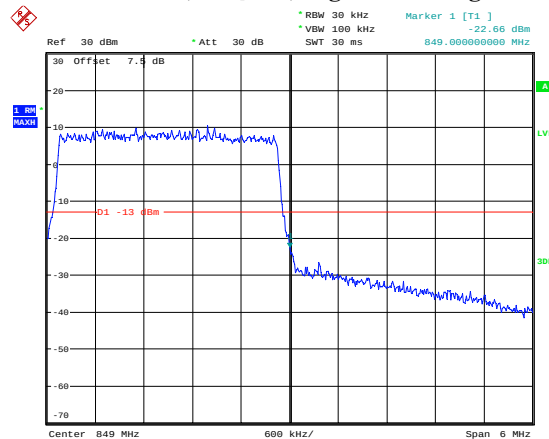
Date: 29.SEP.2020 09:41:44

3M, 16QAM, Left Band Edge



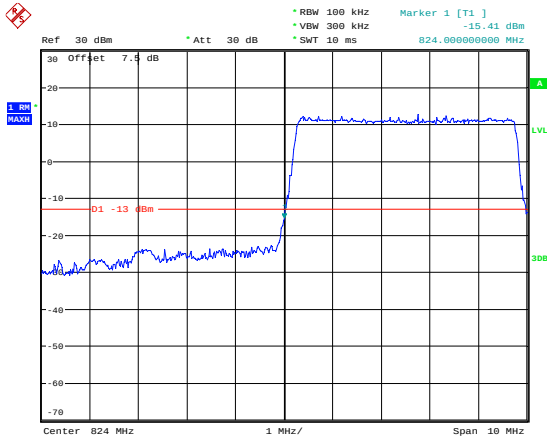
Date: 29.SEP.2020 09:42:25

3M, 16QAM, Right Band Edge



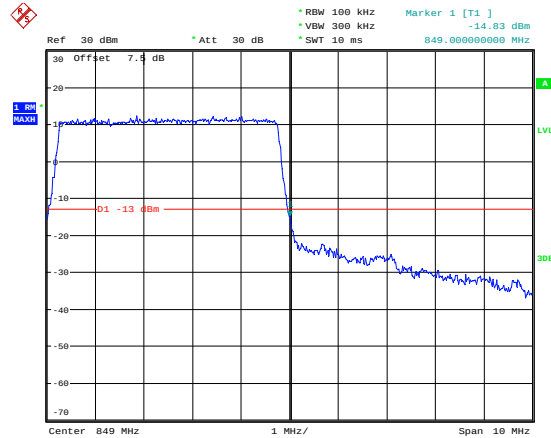
Date: 29.SEP.2020 09:43:00

5M, 16QAM, Left Band Edge



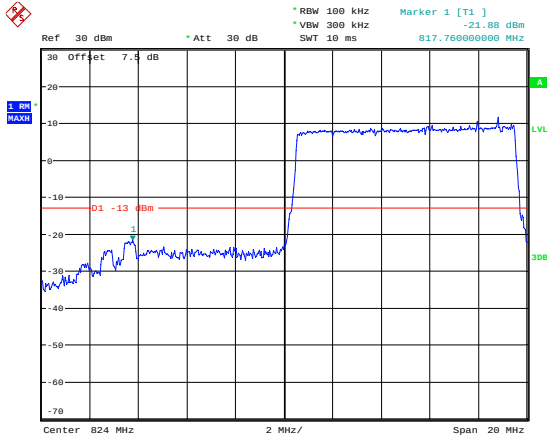
Date: 29.SEP.2020 14:40:23

5M, 16QAM, Right Band Edge



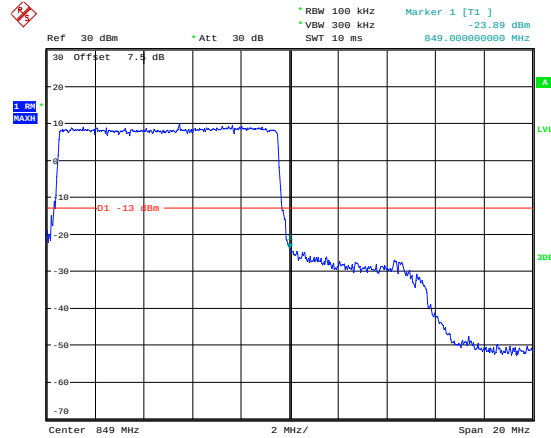
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10M, 16QAM, Left Band Edge



Date: 29.SEP.2020 09:45:01

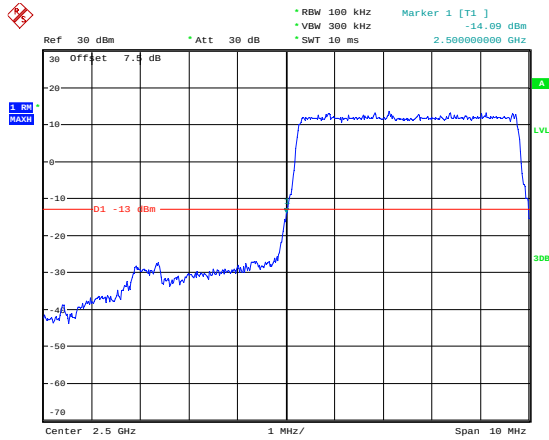
10M, 16QAM, Right Band Edge



Date: 29.SEP.2020 09:45:43

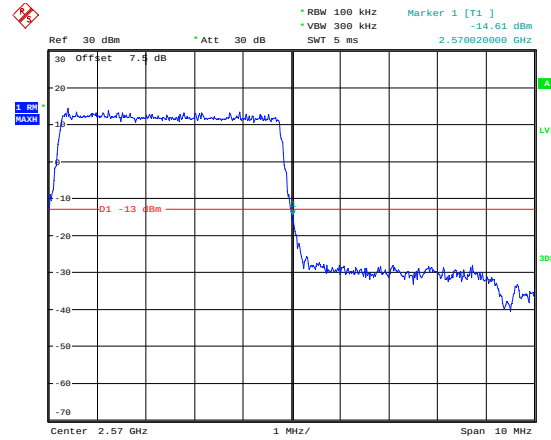
LTE Band 7:

5M, QPSK, Left Band Edge



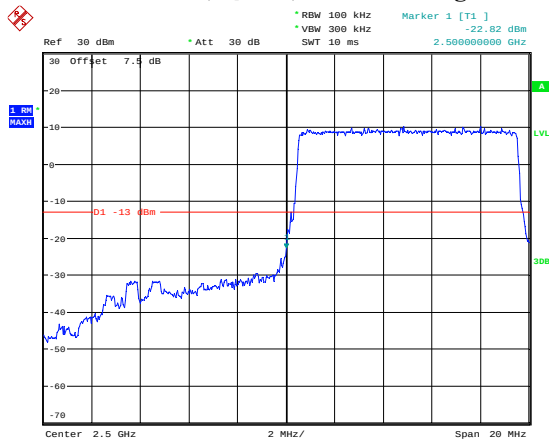
Date: 29.SEP.2020 14:45:02

5M, QPSK, Right Band Edge



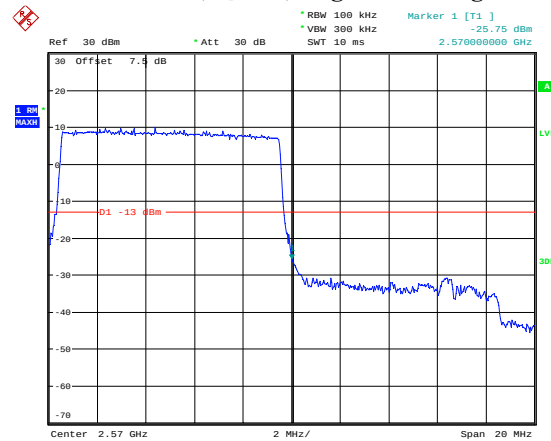
Date: 29.SEP.2020 09:46:48

10M, QPSK, Left Band Edge



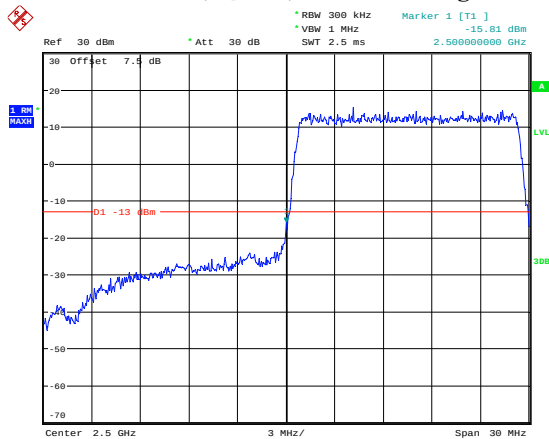
Date: 29.SEP.2020 09:47:29

10M, QPSK, Right Band Edge



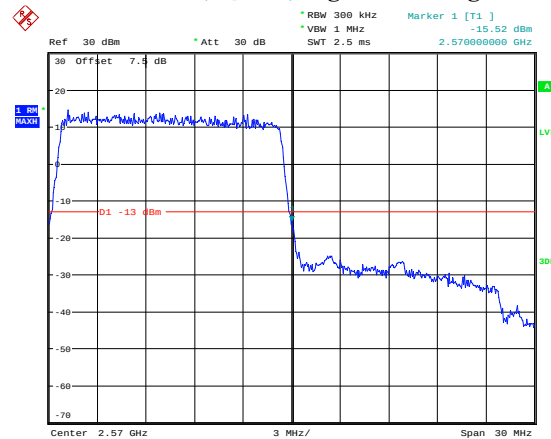
Date: 29.SEP.2020 09:48:10

15M, QPSK, Left Band Edge



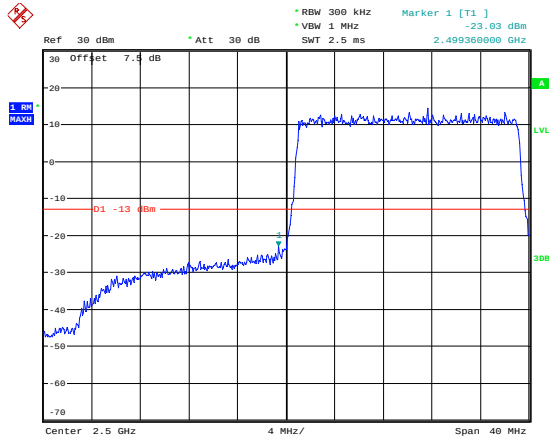
Date: 29.SEP.2020 09:48:55

15M, QPSK, Right Band Edge



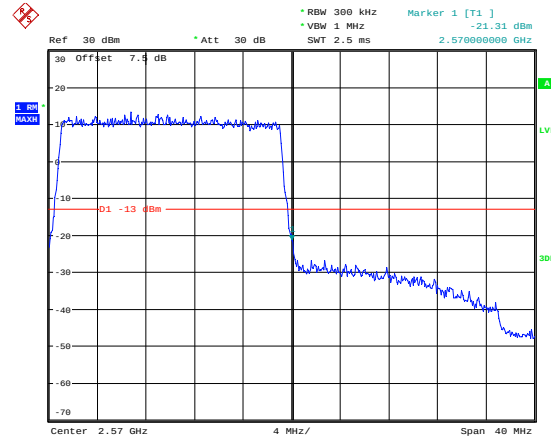
Date: 29.SEP.2020 09:49:36

20M, QPSK, Left Band Edge



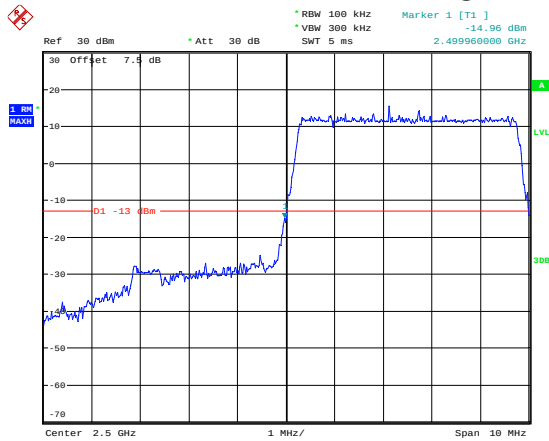
Date: 29.SEP.2020 09:58:28

20M, QPSK, Right Band Edge



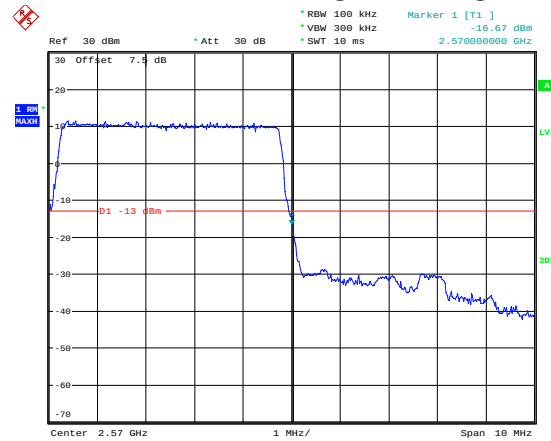
Date: 29.SEP.2020 09:51:13

5M, 16QAM, Left Band Edge



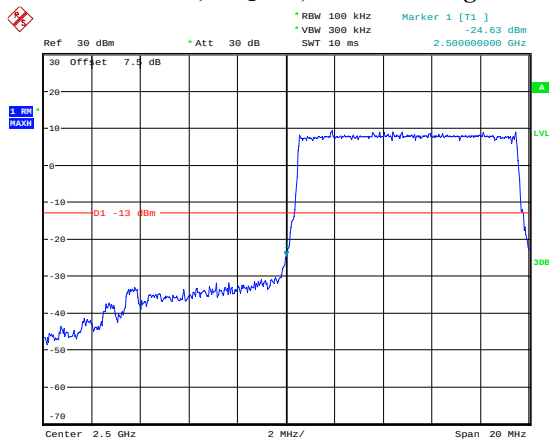
Date: 29.SEP.2020 09:46:30

5M, 16QAM, Right Band Edge



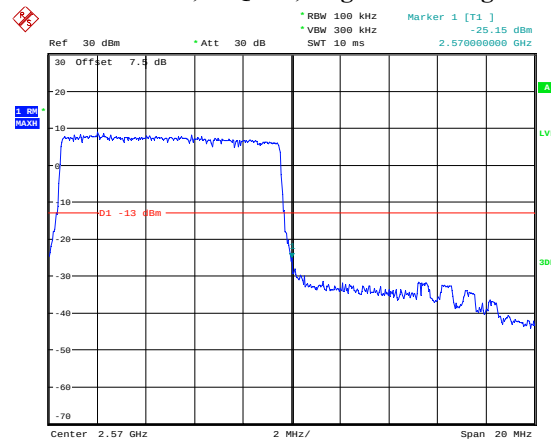
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10M, 16QAM, Left Band Edge

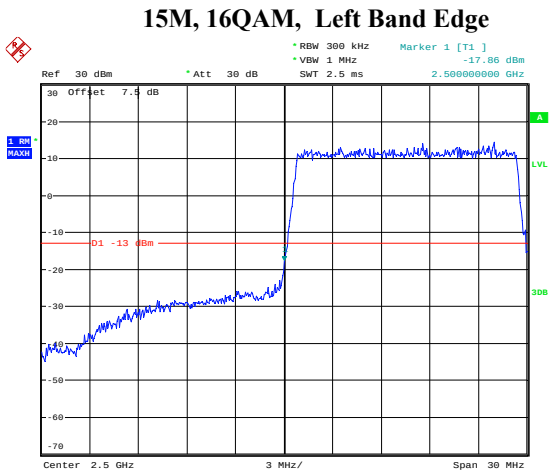


Date: 29.SEP.2020 09:47:47

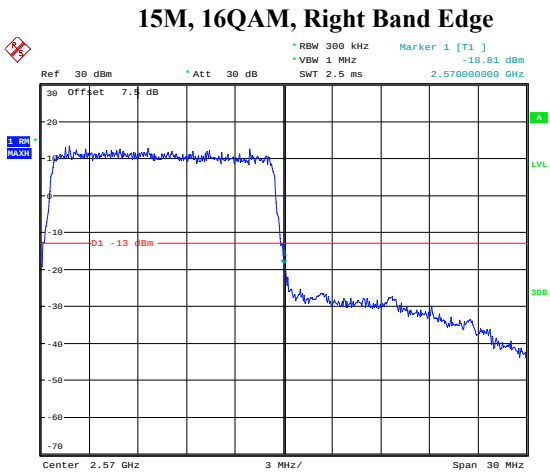
10M, 16QAM, Right Band Edge



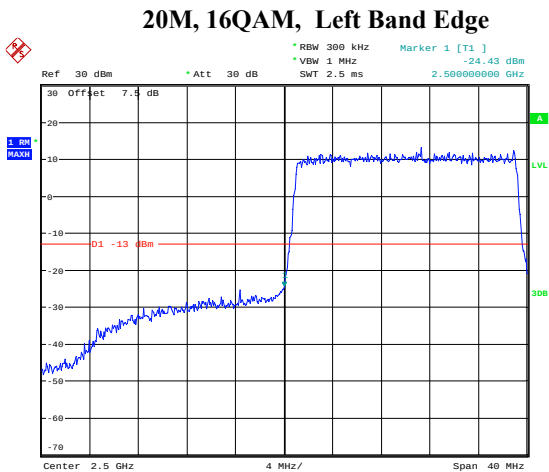
Date: 29.SEP.2020 09:48:28



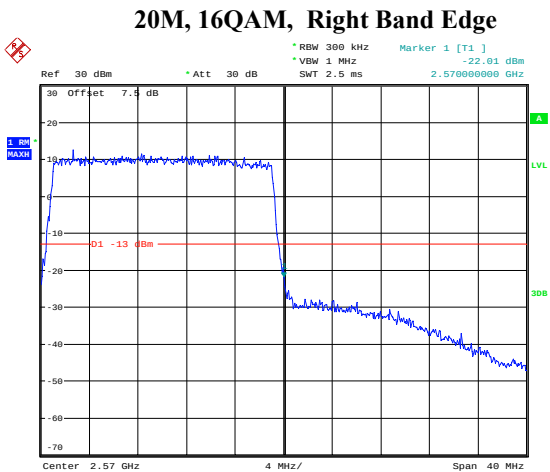
Date: 29.SEP.2020 09:49:15



Date: 29.SEP.2020 09:49:57



Date: 29.SEP.2020 09:50:51



Date: 29.SEP.2020 09:51:34

FCC §2.1055, §22.355 & §24.235 , §27.54, RSS-130 §4.3, RSS-132 §5.3, RSS-133 §6.3, RSS-199 §4.3 - FREQUENCY STABILITY

Applicable Standard

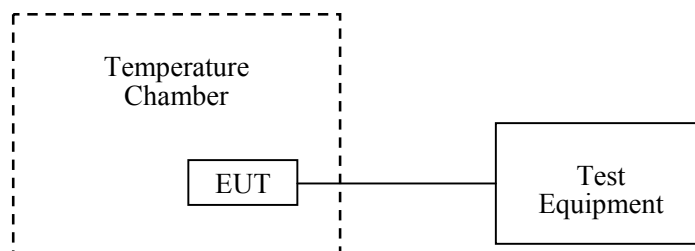
FCC § 2.1055 (a), § 2.1055 (d), §22.355, §24.235, §27.54, §90.213
RSS-132 §5.3, RSS-133 §6.3, RSS-199 §4.3

Test Procedure

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

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

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



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSU 26	200256	2020-05-09	2021-05-09
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005011	Each time	/
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41002201	Each Time	/
E-Microwave	Blocking Control	EMDCB-00036	0E01201048	Each time	/
E-Microwave	Coaxial Attenuators	EMCA10-5RN-6	OE01203239	Each time	/
E-Microwave	Two-way Splitter	ODP-1-6-2S	OE0120142	Each Time	/
ESPEC	Constant temperature and humidity Tester	ESX-4CA	018 463	2020-03-10	2021-03-09
UNI-T	Multimeter	UT39A	M130199938	2020-07-24	2021-07-24
Pro instrument	DC Power Supply	pps3300	3300012	N/A	N/A
R&S	Universal Radio Communication Tester	CMU200	106 891	2020-09-12	2021-09-12
R&S	Wideband Radio Communication Tester	CMW500	147473	2020-09-12	2021-09-12

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

Test Data**Environmental Conditions**

Temperature:	26.2~27.8°C
Relative Humidity:	50~51 %
ATM Pressure:	100.2~100.8 kPa
Tester:	Rita Huang
Test Date:	2020-09-29-2020-09-30

Test Result: Compliance.

GMSK, Middle Channel, $f_c = 836.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
$^{\circ}\text{C}$	V_{DC}	Hz	ppm	ppm
-30	3.8	9	0.01076	2.5
-20		-3	-0.00359	
-10		-5	-0.00598	
0		-6	-0.00717	
10		5	0.00598	
20		4	0.00478	
30		9	0.01076	
40		2	0.00239	
50		5	0.00598	
20	3.6	-3	-0.00359	
20	4.35	7	0.00837	

EGPRS, Middle Channel, $f_c = 836.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
$^{\circ}\text{C}$	V_{DC}	Hz	ppm	ppm
-30	3.8	6	0.00717	2.5
-20		4	0.00478	
-10		-8	-0.00956	
0		-6	-0.00717	
10		-5	-0.00598	
20		7	0.00837	
30		4	0.00478	
40		3	0.00359	
50		5	0.00598	
20	3.6	9	0.01076	
20	4.35	-4	-0.00478	

GMSK, Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	ISED Limit
$^{\circ}\text{C}$	V_{DC}	Hz	ppm	(ppm)
-30	3.8	-4	-0.00213	2.5
-20		-6	-0.00319	
-10		8	0.00426	
0		7	0.00372	
10		-9	-0.00479	
20		5	0.00266	
30		-3	-0.00160	
40		6	0.00319	
50		4	0.00213	
20	3.6	2	0.00106	
20	4.35	-3	-0.00160	

EGPRS, Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	ISED Limit (ppm)
°C	V _{DC}	Hz	ppm	
-30	3.8	2	0.00106	2.5
-20		-6	-0.00319	
-10		-3	-0.00160	
0		-4	-0.00213	
10		5	0.00266	
20		3	0.00160	
30		4	0.00213	
40		-8	-0.00426	
50		9	0.00479	
20	3.6	-4	-0.00213	
20	4.35	5	0.00266	

WCDMA Band II: R99

Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	ISED Limit (ppm)
°C	V _{DC}	Hz	ppm	
-30	3.8	-8	-0.00426	2.5
-20		5	0.00266	
-10		3	0.00160	
0		-4	-0.00213	
10		-7	-0.00372	
20		5	0.00266	
30		9	0.00479	
40		2	0.00106	
50		-5	-0.00266	
20	3.6	-2	-0.00106	
20	4.35	3	0.00160	

WCDMA Band V: R99

Frequency (MHz)	Temperature (°C)	Voltage	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
836.6	-30	3.8	6	0.00717	2.5
	-20		4	0.00478	
	-10		-5	-0.00598	
	0		5	0.00598	
	10		-8	-0.00956	
	20		2	0.00239	
	30		4	0.00478	
	40		-6	-0.00717	
	50		-4	-0.00478	
	20	3.6	2	0.00239	
	20	4.35	3	0.00359	

LTE Band 2:

QPSK, Channel Bandwidth:10MHz Middle Channel, $f_c = 1880$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	ISED Limit (ppm)
°C	V _{DC}	Hz	ppm	
-30	3.8	-8.83	-0.0047	2.5
-20		-9.97	-0.0053	
-10		-6.13	-0.0033	
0		6.17	0.0033	
10		7.92	0.0042	
20		6.46	0.0034	
30		-6.52	-0.0035	
40		7.18	0.0038	
50		-9.69	-0.0052	
20	3.6	-8.17	-0.0043	
20	4.35	-7.05	-0.0038	

16QAM, Channel Bandwidth:10MHz Middle Channel, $f_c = 1880$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	ISED Limit (ppm)
°C	V _{DC}	Hz	ppm	
-30	3.8	-7.24	-0.0039	2.5
-20		-6.68	-0.0036	
-10		9.77	0.0052	
0		-7.62	-0.0041	
10		-9.91	-0.0053	
20		-9.82	-0.0052	
30		-6.68	-0.0036	
40		-8.85	-0.0047	
50		5.67	0.003	
20	3.6	6.05	0.0032	
20	4.35	7.52	0.004	

LTE Band 5

QPSK, Channel Bandwidth:10MHz Middle Channel, $f_c = 836.5$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	V_{DC}	Hz	ppm	ppm
-30	3.8	-6.34	-0.0076	2.5
-20		-6.97	-0.0083	
-10		-5.50	-0.0066	
0		6.06	0.0072	
10		9.80	0.0117	
20		5.03	0.006	
30		-6.62	-0.0079	
40		-8.73	-0.0104	
50		-7.05	-0.0084	
20	3.6	8.99	0.0107	
20	4.35	-7.17	-0.0086	

16QAM, Channel Bandwidth:10MHz Middle Channel, $f_c = 836.5$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	V_{DC}	Hz	ppm	ppm
-30	3.8	-6.34	-0.0076	2.5
-20		-6.97	-0.0083	
-10		-5.50	-0.0066	
0		6.06	0.0072	
10		9.80	0.0117	
20		5.03	0.006	
30		-6.62	-0.0079	
40		-8.73	-0.0104	
50		-7.05	-0.0084	
20	3.6	8.99	0.0107	
20	4.35	-7.17	-0.0086	

LTE Band 7:

QPSK, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
°C	V _{DC}	F _L	F _H	F _L	F _H
-30	3.8	2500.460000	2569.510000	2500	2570
-20		2500.370000	2569.420000	2500	2570
-10		2500.490000	2569.480000	2500	2570
0		2500.370000	2569.420000	2500	2570
10		2500.430000	2569.330000	2500	2570
20		2500.520000	2569.480000	2500	2570
30		2500.460000	2569.540000	2500	2570
40		2500.700000	2569.480000	2500	2570
50		2500.700000	2569.390000	2500	2570
20	3.6	2500.430000	2569.600000	2500	2570
20	4.35	2500.700000	2569.360000	2500	2570

16QAM, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
°C	V _{DC}	F _L	F _H	F _L	F _H
-30	3.8	2500.610000	2569.570000	2500	2570
-20		2500.460000	2569.510000	2500	2570
-10		2500.430000	2569.600000	2500	2570
0		2500.370000	2569.300000	2500	2570
10		2500.370000	2569.420000	2500	2570
20		2500.520000	2569.480000	2500	2570
30		2500.580000	2569.330000	2500	2570
40		2500.700000	2569.450000	2500	2570
50		2500.610000	2569.330000	2500	2570
20	3.6	2500.610000	2569.420000	2500	2570
20	4.35	2500.460000	2569.630000	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 *******