



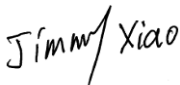
FCC PART 27
FCC PART 22H, PART 24E
TEST REPORT

For

KRIPTO MOBILE CORPORATION

7236 NW 31ST ST., MIAMI Florida United States

FCC ID:2APX7K57

Report Type: Original Report	Product Type: Smart Phone
Report Number: RSZ200519004-00D	
Report Date: 2020-06-15	
Jimmy Xiao 	
Reviewed By: RF Engineer	
Prepared By: Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn	

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Smart Phone
Model	K57
Frequency Range	EGSM850/WCDMA B5: 824-849MHz(TX)/869-894MHz(RX) PCS1900/WCDMA B2/LTE B2: 1850-1910MHz(TX)/1930-1990MHz(RX) LTE B4: 1710-1755MHz(TX)/2110-2155MHz(RX) LTE B7: 2500-2570MHz(TX)/2620-2690MHz(RX)
Maximum Target Output Power	EGSM850: 33.0dBm(GMSK), 26.5dBm(8PSK) PCS1900: 29.0dBm(GMSK), 24.0dBm(8PSK) WCDMA Band 2: 22.5dBm WCDMA Band 5: 23.0dBm LTE Band 2: 23.0dBm LTE Band 4: 23.0dBm LTE Band 7: 23.0dBm
Modulation Technique	2G: GMSK,8PSK 3G: BPSK, QPSK, 16QAM 4G: QPSK, 16QAM
Antenna Specification	FPC Antennas
Voltage Range	DC 3.8 V from battery or DC5.0V from Adapter
Date of Test	2020-05-26 to 2020-05-27
Sample serial number	RSZ200519004-RF-S1 (Assigned by BACL, Shenzhen)
Received date	2020/05/19
Sample/EUT Status	Good condition
Normal/Extreme Condition	N.V.: Nominal Voltage: 3.8V _{DC} L.V.: Low Voltage: 3.0V _{DC} H.V.: High Voltage: 4.35V _{DC}
Adapter Information	Model:C570 Input:100-240V~50/60Hz,0.5A Output:5.0V,1.0A

Objective

This test report is prepared on behalf of *KRIPTO MOBILE CORPORATION* in accordance with Part 2-Subpart J, Part 22-Subpart H and Part 24-Subpart E and Subpart 27 of the Federal Communication Commissions rules.

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

Related Submittal(s)/Grant(s)

FCC Part 15.247 DSS & DTS submissions with FCC ID: 2APX7K57.

Test Methodology

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

Part 22 Subpart H - Public Mobile Services

Part 24 Subpart E - Personal Communication Services

Part 27 – Miscellaneous wireless communications services

Applicable Standards: TIA-603-E.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		±5%
RF output power, conducted		±0.73dB
Unwanted Emission, conducted		±1.6dB
Emissions, Radiated	Below 1GHz	±4.75dB
	Above 1GHz	±4.88dB
Temperature		±1 °C
Humidity		±6%
Supply voltages		±0.4%

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

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 342867, the FCC Designation No.: CN1221.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062B.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The EUT was configured for testing according to TIA-603-E.

The final qualification test was performed with the EUT operating at normal mode.

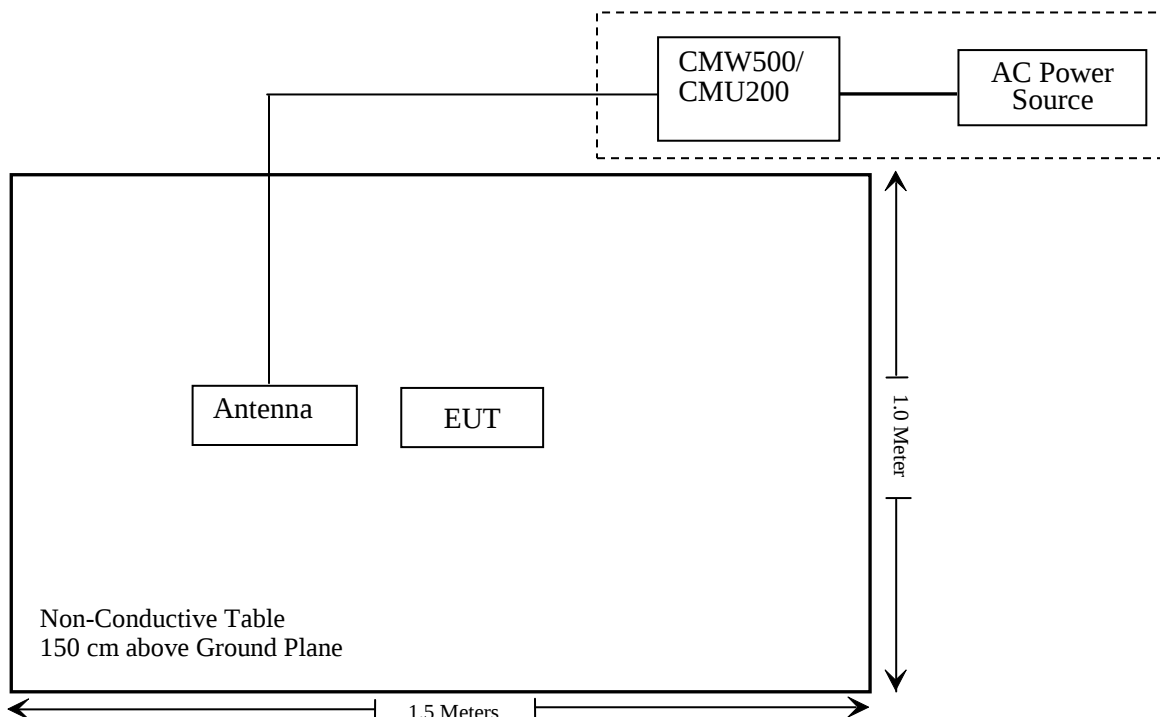
Equipment Modifications

No modification was made to the EUT.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-116218-UY
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	110605

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§ 1.1307 , §2.1093	RF Exposure (SAR)	Compliance*
§2.1046; § 22.913 (a); § 24.232 (c); §27.50 (d) (h)	RF Output Power	Compliance
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; § 22.905; § 22.917; § 24.238; §27.53	Occupied Bandwidth	Compliance
§ 2.1051; § 22.917 (a); § 24.238 (a); §27.53	Spurious Emissions at Antenna Terminal	Compliance
§ 2.1053; § 22.917 (a); § 24.238 (a); §27.53	Field Strength of Spurious Radiation	Compliance
§ 22.917 (a); § 24.238 (a); §27.53(h) (m)	Band Edge	Compliance
§ 2.1055; § 22.355; § 24.235; §27.54;	Frequency stability	Compliance

Note: * Please refer to SAR report released by BACL, report number: RSZ200519004-SA.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
R&S	EMI Test Receiver	ESR3	102455	2019/7/9	2020/7/8
Sonoma instrument	Pre-amplifier	310 N	186238	2020/4/20	2021/4/20
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2017/12/22	2020/12/21
COM-POWER	Dipole Antenna	AD-100	721027	NCR	NCR
Unknown	Cable 2	RF Cable 2	F-03-EM197	2019/11/29	2020/11/28
Unknown	Cable	Chamber Cable 1	F-03-EM236	2019/11/29	2020/11/28
Rohde & Schwarz	Spectrum Analyzer	FSV40-N	102259	2019/7/22	2020/07/21
COM-POWER	Pre-amplifier	PA-122	181919	2019/11/29	2020/11/28
Quinstar	Amplifier	QLW-18405536-J0	15964001002	2019/11/29	2020/11/28
Sunol Sciences	Horn Antenna	DRH-118	A052604	2017/12/22	2020/12/21
A.H.System	Horn Antenna	SAS-200/571	135	2018/9/1	2021/8/31
Insulted Wire Inc.	RF Cable	SPS-2503-3150	02222010	2019/11/29	2020/11/28
Unknown	RF Cable	W1101-EQ1 OUT	F-19-EM005	2019/11/29	2020/11/28
MICRO-TRONICS	Passband filter	HPM50111	F-19-EM006	2020/4/20	2021/4/20
Unknown	High Pass filter	1.3GHz	101120	2020/4/20	2021/4/20
Ducommun Technologies	Horn antenna	ARH-4223-02	1007726-02 1304	2017/12/6	2020/12/5
Ducommun Technologies	Horn antenna	ARH-2823-02	1007726-02 1302	2017/12/6	2020/12/5
Rohde & Schwarz	Wideband Radio Communication Tester	CMU200	106891	2019/9/12	2020/9/11
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-146520-wh	2019/7/9	2020/7/8
Agilent	Signal Generator	N5183A	MY51040755	2019/12/4	2020/12/4

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	SPECTRUM ANALYZER	FSU26	200120	2020/3/2	2021/3/1
Unknown	RF Cable	Unknown	2301 276	2019/11/29	2020/11/28
Weinschel	Power divider	1515	RH386	2020/4/20	2021/4/20
Rohde & Schwarz	SPECTRUM ANALYZER	FSU26	200982	2020/3/2	2021/3/1
Unknown	RF Cable	Unknown	DLO J5/W6102	2019/11/29	2020/11/28
Weinschel	Power divider	1515	MY628	2019/11/29	2020/11/28
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	115500	2019/7/22	2020/7/21
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50-146520-wh	2019/7/9	2020/7/8
instek	DC Power Supply	GPS-3030DD	EM832096	NCR	NCR
ESPEC	Temperature & Humidity Chamber	EL-10KA	9107726	2020/01/05	2021/01/05
Fluke	Digital Multimeter	287	19000011	2020/04/12	2021/04/12

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

FCC §1.1307(b) & §2.1093 - RF EXPOSURE INFORMATION

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliance, please refer to the SAR report: RSZ200519004-SA

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.

FCC § 2.1046, § 22.913 (a) & § 24.232 (c); §27.50 (d) (h) - 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.

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB.

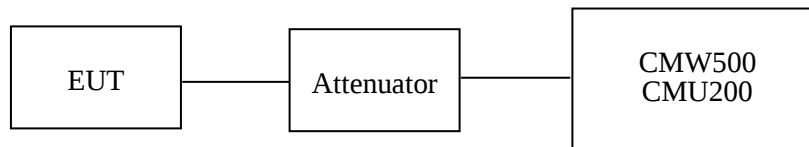
According to §27.50(d), the maximum EIRP must not exceed 1Watts (30dBm) for 1710-1755MHz.

According to §27.50(h), the maximum EIRP must not exceed 2Watts (33dBm) for 2500-2570MHz.

Test Procedure

Conducted method:

The RF output of the transmitter was connected to the CMW500/CMU200 through sufficient attenuation.



Radiated method:

TIA-603-E section 2.2.17

Test Data

Environmental Conditions

Temperature:	24~25 °C
Relative Humidity:	52~56 %
ATM Pressure:	101.0 kPa

The testing was performed by Alan He on 2020-05-27.

Conducted Power**Cellular Band (Part 22H)**

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	128	824.2	32.19	38.45
	190	836.6	32.11	38.45
	251	848.8	31.93	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	32.73	30.84	28.78	26.57	38.45
	190	836.6	32.65	30.67	28.41	26.48	38.45
	251	848.8	32.47	30.39	28.40	26.25	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	128	824.2	25.80	24.48	21.80	19.64	38.45
	190	836.6	25.82	24.62	21.96	19.70	38.45
	251	848.8	26.20	24.43	21.69	19.52	38.45

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band V)	Normal	RMC12.2k		22.69	22.76	22.78
		HSDPA	1	22.11	22.28	22.03
			2	20.88	21.84	21.89
			3	20.72	21.79	21.85
			4	20.70	21.77	21.81
		HSUPA	1	22.09	22.32	21.99
			2	21.78	21.72	21.96
			3	21.74	21.67	21.92
			4	21.68	21.63	21.89
			5	21.66	21.59	21.85

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	28.30	33
	661	1880.0	28.41	33
	810	1909.8	28.63	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	27.30	25.04	23.47	21.34	33
	661	1880.0	27.60	25.37	23.77	21.54	33
	810	1909.8	27.86	25.49	23.80	21.69	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	512	1850.2	23.12	20.95	17.17	15.35	33
	661	1880.0	23.85	21.89	18.17	16.16	33
	810	1909.8	23.06	20.67	16.72	15.04	33

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band II)	Normal	RMC12.2k		22.16	22.14	22.23
		HSDPA	1	21.42	21.63	21.54
			2	21.10	20.97	20.77
			3	21.06	20.93	20.70
			4	20.98	20.90	20.62
		HSUPA	1	21.48	21.7	21.54
			2	21.00	20.94	21.48
			3	20.96	20.91	21.44
			4	20.94	20.88	21.37
			5	20.92	20.85	21.33

Peak-to-average ratio (PAR)**Cellular Band**

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.28	13
	Middle	1.24	13
	High	1.22	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	1.65	13
	Middle	1.58	13
	High	1.32	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.31	13
	Middle	3.45	13
	High	3.18	13
HSDPA (16QAM)	Low	3.42	13
	Middle	3.55	13
	High	3.43	13
HSUPA (BPSK)	Low	3.30	13
	Middle	3.47	13
	High	3.20	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.47	13
	Middle	1.43	13
	High	1.41	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	1.74	13
	Middle	1.62	13
	High	1.51	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.18	13
	Middle	3.42	13
	High	3.14	13
HSDPA (16QAM)	Low	3.28	13
	Middle	3.14	13
	High	3.45	13
HSUPA (BPSK)	Low	3.17	13
	Middle	3.22	13
	High	3.13	13

Radiated Power**GSM Mode:**

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
ERP for Cellular Band (Part 22H), Middle Channel										
836.6	77.42	55	1.7	H	18.0	1.90	0.0	16.10	38.45	22.35
836.6	90.44	79	1.1	V	30.4	1.90	0.0	28.50	38.45	9.95
EIRP for PCS Band (Part 24E), Middle Channel										
1880.00	87.98	50	2.0	H	18.3	1.30	9.40	26.40	33	6.60
1880.00	87.01	359	2.0	V	17.1	1.30	9.40	25.20	33	7.80

EDGE Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBi)			
ERP, Cellular Band (Part 22H), Middle Channel										
836.5	75.71	104	2.1	H	16.3	1.90	0.0	14.40	38.45	24.05
836.5	85.56	111	1.9	V	25.6	1.90	0.0	23.70	38.45	14.75
EIRP, PCS Band (Part 24E), Middle Channel										
1880.00	86.23	48	1.8	H	16.2	1.30	8.50	23.40	33	9.60
1880.00	84.15	292	2.0	V	13.9	1.30	8.50	21.10	33	11.90

WCDMA Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
ERP for WCDMA Band V (Part 22H), Middle Channel										
836.6	71.46	191	1.5	H	12.1	1.90	0.0	10.20	38.45	28.25
836.6	82.57	226	2.2	V	22.6	1.90	0.0	20.70	38.45	17.75
EIRP for WCDMA Band II (Part 24E), Middle Channel										
1880.00	83.23	163	1.3	H	13.2	1.30	8.50	20.40	33	12.60
1880.00	82.36	307	2.4	V	12.1	1.30	8.50	19.30	33	13.70

Note:

Absolute Level = Substituted Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

dBd is for the ERP, dBi is for EIRP.

LTE Band 2:**Maximum Output Power**

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB1#0	21.86	21.55	21.57
		RB1#3	22.03	21.38	21.53
		RB1#5	22.06	21.28	21.64
		RB3#0	21.66	21.69	21.25
		RB3#3	21.67	21.48	21.68
		RB6#0	21.73	21.5	21.42
	16QAM	RB1#0	21.72	21.41	21.62
		RB1#3	21.71	21.73	21.76
		RB1#5	21.87	21.53	21.7
		RB3#0	22.08	21.59	21.7
		RB3#3	21.85	21.74	21.37
		RB6#0	21.61	21.37	21.45
3.0	QPSK	RB1#0	21.92	21.58	21.67
		RB1#8	22.19	21.65	21.36
		RB1#14	21.78	21.61	21.76
		RB6#0	22.21	21.7	21.61
		RB6#9	21.71	21.58	21.71
		RB15#0	21.64	21.49	21.35
		RB1#0	21.64	21.64	21.38
	16QAM	RB1#8	22.07	21.63	21.88
		RB1#14	22.11	21.3	21.54
		RB6#0	21.8	21.42	21.78
		RB6#9	21.78	21.71	21.72
		RB15#0	21.94	21.4	21.82

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB1#0	22.13	21.83	21.94
		RB1#13	21.89	21.95	21.97
		RB1#24	22.38	21.56	21.65
		RB15#0	22.42	21.98	21.89
		RB15#10	22.03	21.92	22.06
		RB25#0	22.34	21.74	21.92
		RB1#0	22.14	22.03	21.64
	16QAM	RB1#13	22.43	21.87	21.66
		RB1#24	22	21.62	21.92
		RB15#0	22.33	22.03	21.85
		RB15#10	21.94	21.68	22.12
		RB25#0	22.3	21.81	21.76
10.0	QPSK	RB1#0	22.06	21.86	21.91
		RB1#25	22.04	21.78	21.96
		RB1#49	21.87	21.78	21.88
		RB25#0	21.98	22.03	21.77
		RB25#25	21.87	21.85	21.61
		RB50#0	21.81	21.95	21.94
		RB1#0	22.02	21.85	21.92
	16QAM	RB1#25	22.35	21.92	21.92
		RB1#49	22.14	22.1	22.19
		RB25#0	22.04	21.87	21.91
		RB25#25	22.12	21.97	21.8
		RB50#0	22.24	21.82	22.18

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB1#0	22.21	22.27	22.31
		RB1#38	22.08	22.42	21.97
		RB1#74	22.04	22.39	22.25
		RB36#0	22.49	22.09	22.06
		RB36#39	22.38	22.09	22.01
		RB75#0	22.1	22.34	22.45
		RB1#0	22.47	22.34	22.41
	16QAM	RB1#38	22.49	22.27	22.23
		RB1#74	22.48	22.44	22.54
		RB36#0	22.1	22.18	22.57
		RB36#39	22.36	22.53	22.03
		RB75#0	22.18	22.31	22.27
20.0	QPSK	RB1#0	22.25	22.23	22.29
		RB1#50	22.03	22.41	21.96
		RB1#99	22.09	22.23	22.18
		RB50#0	22.43	22.15	22.2
		RB50#50	22.54	21.99	22.15
		RB100#0	22.17	22.32	21.97
		RB1#0	22.44	22.28	22.22
	16QAM	RB1#50	22.16	22.09	22.17
		RB1#99	22.32	22.27	22.55
		RB50#0	22.12	22.41	22.38
		RB50#50	22.29	22.25	22.17
		RB100#0	22.44	22.37	22.12

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	3.49	13	Pass
QPSK (100RB Size)	5.22	13	Pass
16QAM (1RB Size)	4.71	13	Pass
16QAM (100RB Size)	6.09	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	84.26	235	2.0	H	14.6	1.30	9.40	22.70	33
1880.00	84.08	54	2.2	V	14.2	1.30	9.40	22.30	33
3 MHz Bandwidth									
1880.00	83.39	154	1.7	H	13.7	1.30	9.40	21.80	33
1880.00	83.05	359	1.3	V	13.2	1.30	9.40	21.30	33
5 MHz Bandwidth									
1880.00	82.34	83	1.2	H	12.7	1.30	9.40	20.80	33
1880.00	82.26	340	1.9	V	12.4	1.30	9.40	20.50	33
10 MHz Bandwidth									
1880.00	84.95	46	1.0	H	15.3	1.30	9.40	23.40	33
1880.00	84.91	171	2.5	V	15.0	1.30	9.40	23.10	33
15 MHz Bandwidth									
1880.00	80.05	277	2.3	H	10.4	1.30	9.40	18.50	33
1880.00	80.38	313	2.2	V	10.5	1.30	9.40	18.60	33
20 MHz Bandwidth									
1880.00	83.63	214	2.5	H	13.9	1.30	9.40	22.00	33
1880.00	85.06	113	1.0	V	15.2	1.30	9.40	23.30	33

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	84.25	34	2.0	H	14.6	1.30	9.40	22.70	33
1880.00	83.95	336	1.7	V	14.1	1.30	9.40	22.20	33
3 MHz Bandwidth									
1880.00	84.12	188	1.5	H	14.4	1.30	9.40	22.50	33
1880.00	83.85	11	1.9	V	14.0	1.30	9.40	22.10	33
5 MHz Bandwidth									
1880.00	83.91	69	1.8	H	14.2	1.30	9.40	22.30	33
1880.00	83.68	275	2.4	V	13.8	1.30	9.40	21.90	33
10 MHz Bandwidth									
1880.00	83.83	240	2.5	H	14.2	1.30	9.40	22.30	33
1880.00	83.62	70	2.0	V	13.7	1.30	9.40	21.80	33
15 MHz Bandwidth									
1880.00	83.71	212	1.3	H	14.0	1.30	9.40	22.10	33
1880.00	83.55	263	2.2	V	13.7	1.30	9.40	21.80	33
20 MHz Bandwidth									
1880.00	83.52	246	2.0	H	13.8	1.30	9.40	21.90	33
1880.00	83.33	176	1.3	V	13.4	1.30	9.40	21.50	33

LTE Band 4:**Maximum Output Power**

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB1#0	22.28	22.23	22.31
		RB1#3	22.31	22.3	22.34
		RB1#5	22.05	22.04	22.19
		RB3#0	22.17	21.99	22.29
		RB3#3	22.36	22.43	22.29
		RB6#0	22.12	22.19	22.08
	16QAM	RB1#0	22.54	21.99	22.43
		RB1#3	22.18	22.26	22.6
		RB1#5	22.34	22.45	22.51
		RB3#0	22.05	22.09	22.03
		RB3#3	22.14	22.06	22.37
3.0	QPSK	RB6#0	22.22	22.29	22.13
		RB1#0	22.21	22.26	22.23
		RB1#8	22.07	22.42	22.3
		RB1#14	22.5	22.25	22.15
		RB6#0	22.44	22.18	22.37
		RB6#9	22.32	22.08	22.14
		RB15#0	22.12	22.34	21.93
	16QAM	RB1#0	22.14	22.06	22.02
		RB1#8	22.22	22.48	22.3
		RB1#14	22.47	22.19	22.31
		RB6#0	21.94	22.42	22.02
		RB6#9	22.51	22.35	22.25
		RB15#0	22.41	22.06	21.93

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB1#0	22.35	22.26	22.23
		RB1#13	22.48	22.4	22.35
		RB1#24	22.05	22.29	21.95
		RB15#0	22.23	22.21	22.15
		RB15#10	22.23	22.31	22.16
		RB25#0	22.33	22.07	21.92
		RB1#0	22.25	21.99	22.06
	16QAM	RB1#13	22.52	22.25	22.4
		RB1#24	22.55	22.21	22.07
		RB15#0	22.55	22.37	22.08
		RB15#10	22.26	22.1	22.05
		RB25#0	22.06	22.32	22.43
10.0	QPSK	RB1#0	22.32	22.29	22.21
		RB1#25	22.04	22.01	22.36
		RB1#49	22.19	22.42	22.04
		RB25#0	22.6	22.42	22.34
		RB25#25	22.16	22.2	22.32
		RB50#0	22.24	22.26	22.28
		RB1#0	22.6	22.41	22.3
	16QAM	RB1#25	22.14	22.19	22.43
		RB1#49	22.03	22.11	21.93
		RB25#0	22.2	22	22.03
		RB25#25	22.39	22.19	22.24
		RB50#0	22.28	22.27	22.3

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB1#0	22.29	22.34	22.32
		RB1#38	22.02	22.26	22.27
		RB1#74	22.43	22.32	22.18
		RB36#0	22.05	22.29	22.15
		RB36#39	22.3	22.49	22.1
		RB75#0	22.1	22.24	22.42
		RB1#0	22.39	22.24	22.15
	16QAM	RB1#38	22.5	22.39	22.59
		RB1#74	22.02	22.16	22.16
		RB36#0	22.1	22.43	22.31
20.0	QPSK	RB36#39	22.07	22.62	22.38
		RB75#0	22.04	22.48	22.58
		RB1#0	22.21	22.3	22.29
		RB1#50	22.24	22.18	22.37
		RB1#99	22.25	22.44	22.32
		RB50#0	22.51	22.05	22.26
		RB50#50	22.42	22.19	22.06
	16QAM	RB100#0	22.42	22.22	22.26
		RB1#0	22.11	22.26	22.27
		RB1#50	21.97	22.05	22.41
		RB1#99	22.47	22.46	22.06
		RB50#0	21.94	22.05	22.53
		RB50#50	22	22.56	22.52
		RB100#0	22.13	22.59	22.16

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.62	13	Pass
QPSK (100RB Size)	5.48	13	Pass
16QAM (1RB Size)	5.61	13	Pass
16QAM (100RB Size)	6.38	13	Pass

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	88.24	111	1.8	H	14.9	1.30	8.90	22.50	30
1732.50	87.97	4	1.8	V	15.2	1.30	8.90	22.80	30
3 MHz Bandwidth									
1732.50	87.97	251	1.3	H	14.6	1.30	8.90	22.20	30
1732.50	87.54	145	1.5	V	14.8	1.30	8.90	22.40	30
5 MHz Bandwidth									
1732.50	87.21	16	1.1	H	13.9	1.30	8.90	21.50	30
1732.50	87.33	92	2.4	V	14.6	1.30	8.90	22.20	30
10 MHz Bandwidth									
1732.50	83.76	82	1.3	H	10.4	1.30	8.90	18.00	30
1732.50	83.68	327	2.3	V	11.0	1.30	8.90	18.60	30
15 MHz Bandwidth									
1732.50	82.34	200	1.3	H	9.0	1.30	8.90	16.60	30
1732.50	83.31	83	1.7	V	10.6	1.30	8.90	18.20	30
20 MHz Bandwidth									
1732.50	84.86	190	2.1	H	11.5	1.30	8.90	19.10	30
1732.50	85.79	240	2.4	V	13.1	1.30	8.90	20.70	30

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	88.73	62	2.2	H	15.4	1.30	8.90	23.00	30
1732.50	88.59	214	1.2	V	15.9	1.30	8.90	23.50	30
3 MHz Bandwidth									
1732.50	88.42	157	2.3	H	15.1	1.30	8.90	22.70	30
1732.50	88.37	299	1.9	V	15.6	1.30	8.90	23.20	30
5 MHz Bandwidth									
1732.50	87.89	312	1.9	H	14.6	1.30	8.90	22.20	30
1732.50	87.92	260	1.9	V	15.2	1.30	8.90	22.80	30
10 MHz Bandwidth									
1732.50	84.02	32	1.5	H	10.7	1.30	8.90	18.30	30
1732.50	84.06	29	1.6	V	11.3	1.30	8.90	18.90	30
15 MHz Bandwidth									
1732.50	82.96	122	1.5	H	9.6	1.30	8.90	17.20	30
1732.50	83.18	219	1.8	V	10.5	1.30	8.90	18.10	30
20 MHz Bandwidth									
1732.50	84.96	21	1.4	H	11.6	1.30	8.90	19.20	30
1732.50	86.38	322	1.2	V	13.7	1.30	8.90	21.30	30

LTE Band 7:**Maximum Output Power**

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5	QPSK	RB1#0	22.11	21.89	21.96
		RB1#13	21.82	21.7	21.86
		RB1#24	22.25	21.95	22.05
		RB15#0	22.41	22.03	21.96
		RB15#10	22.18	21.99	21.79
		RB25#0	21.81	21.7	21.86
		RB1#0	22.29	21.6	21.97
	16QAM	RB1#13	22.21	21.66	22.24
		RB1#24	22.09	21.94	22.15
		RB15#0	22.35	22.1	21.95
		RB15#10	22.19	21.73	22.17
		RB25#0	22.26	21.64	21.95
10	QPSK	RB1#0	22.13	22.08	22.05
		RB1#25	22.03	22.27	21.86
		RB1#49	22.43	22.08	21.96
		RB25#0	22.12	22.11	22.18
		RB25#25	21.96	22.04	21.87
		RB50#0	21.92	22.18	21.89
		RB1#0	22.1	21.86	21.76
	16QAM	RB1#25	21.92	22.06	22.04
		RB1#49	21.97	22.06	22.08
		RB25#0	22.02	21.92	21.79
		RB25#25	22.35	22.31	22.05
		RB50#0	22.41	22.07	22.08

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15	QPSK	RB1#0	22.18	22.22	22.26
		RB1#38	21.91	22.26	22.18
		RB1#74	22.28	22.2	21.98
		RB36#0	21.9	22.24	22.11
		RB36#39	21.95	22.14	22.06
		RB75#0	21.98	21.92	22.28
	16QAM	RB1#0	22.26	22.36	22.06
		RB1#38	22.37	22.49	21.96
		RB1#74	22.05	22.18	22.03
		RB36#0	22.31	21.95	21.99
		RB36#39	22.2	22.17	22.54
20	QPSK	RB75#0	22.32	22.18	22.43
		RB1#0	22.19	22.18	22.15
		RB1#50	21.96	22.19	21.94
		RB1#99	22.17	22.07	22.24
		RB50#0	22.09	22.03	22.19
		RB50#50	22.27	22.04	22.06
		RB100#0	22.33	22.21	22.21
	16QAM	RB1#0	22.13	22.16	22.18
		RB1#50	22.29	22.26	22.25
		RB1#99	22.1	22.17	22.14
		RB50#0	22.14	22.4	21.94
		RB50#50	21.91	22.23	21.98
		RB100#0	22.06	22.03	22.1

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	3.97	13	Pass
QPSK (100RB Size)	5.35	13	Pass
16QAM (1RB Size)	4.84	13	Pass
16QAM (100RB Size)	6.09	13	Pass

EIRP:**QPSK:**

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
5 MHz Bandwidth									
2535.00	83.89	273	2.0	H	13.7	2.60	10.20	21.30	33
2535.00	82.33	108	1.0	V	12.8	2.60	10.20	20.40	33
10 MHz Bandwidth									
2535.00	83.14	84	1.4	H	13.0	2.60	10.20	20.60	33
2535.00	81.63	281	1.1	V	12.1	2.60	10.20	19.70	33
15 MHz Bandwidth									
2535.00	82.87	104	2.0	H	12.7	2.60	10.20	20.30	33
2535.00	80.99	46	2.4	V	11.4	2.60	10.20	19.00	33
20 MHz Bandwidth									
2535.00	81.72	283	2.5	H	11.6	2.60	10.20	19.20	33
2535.00	82.16	237	2.2	V	12.6	2.60	10.20	20.20	33

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBi)		
Middle Channel									
5 MHz Bandwidth									
2535.00	84.35	31	1.9	H	14.2	2.60	10.20	21.80	33
2535.00	83.11	113	2.2	V	13.6	2.60	10.20	21.20	33
10 MHz Bandwidth									
2535.00	84.07	20	1.4	H	13.9	2.60	10.20	21.50	33
2535.00	82.96	68	1.7	V	13.4	2.60	10.20	21.00	33
15 MHz Bandwidth									
2535.00	83.24	44	1.5	H	13.1	2.60	10.20	20.70	33
2535.00	81.46	94	1.5	V	11.9	2.60	10.20	19.50	33
20 MHz Bandwidth									
2535.00	82.27	23	2.0	H	12.1	2.60	10.20	19.70	33
2535.00	82.88	345	1.3	V	13.3	2.60	10.20	20.90	33

Note:

All above data were tested with no amplifier

Absolute Level = Substituted Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

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

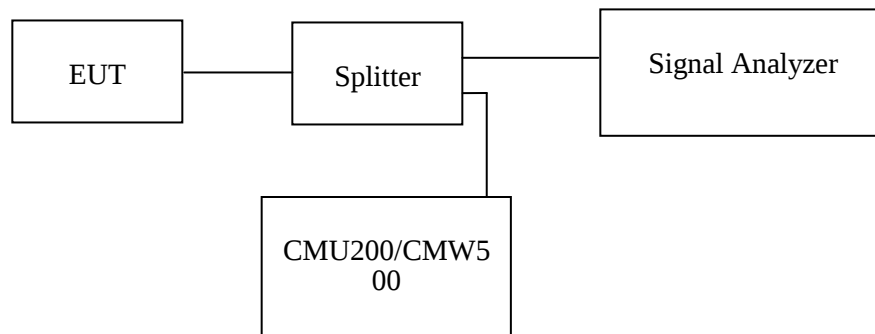
Applicable Standard

FCC 47 §2.1049, §22.917, §22.905, §24.238 and §27.53.

Test Procedure

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

The resolution bandwidth of the spectrum analyzer was set at 1% to 5% of the anticipated emission bandwidth and the 26 dB & 99% bandwidth was recorded.



Test Data

Environmental Conditions

Temperature:	24~25 °C
Relative Humidity:	52~55 %
ATM Pressure:	101.0 kPa

The testing was performed by Alan He on 2020-05-26.

EUT operation mode: Transmitting

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

Cellular Band (Part 22H)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	836.6	245.19	316.03
EGPRS(8PSK)	836.6	243.59	316.03

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	836.6	4.17	4.69
HSUPA (BPSK)	836.6	4.17	4.70
HSDPA (16QAM)	836.6	4.15	4.70

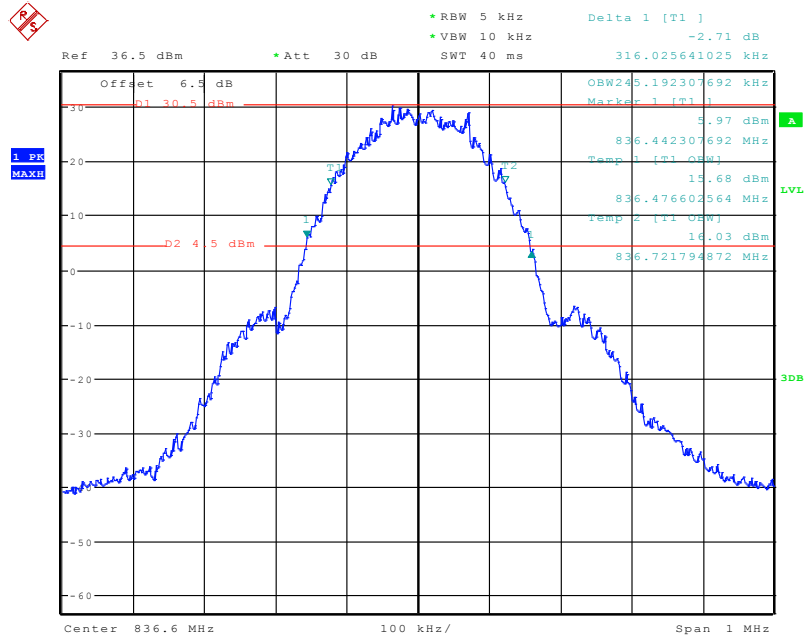
PCS Band (Part 24E)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	1880.0	243.59	316.03
EGPRS(8PSK)	1880.0	243.59	309.62

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1880.0	4.17	4.70
HSUPA (BPSK)	1880.0	4.17	4.69
HSDPA (16QAM)	1880.0	4.17	4.71

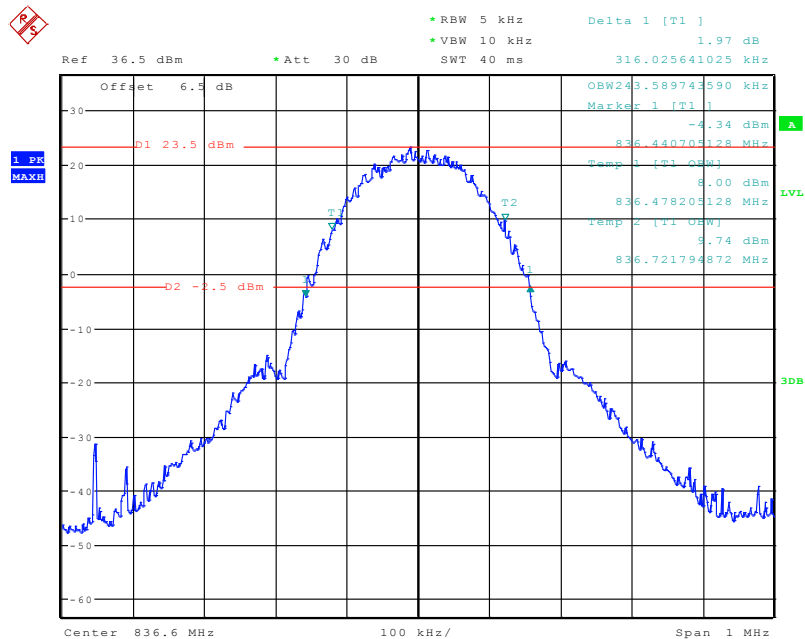
Cellular Band (Part 22H)

26 dB Emissions & 99% Occupied Bandwidth for GSM (GMSK) Mode

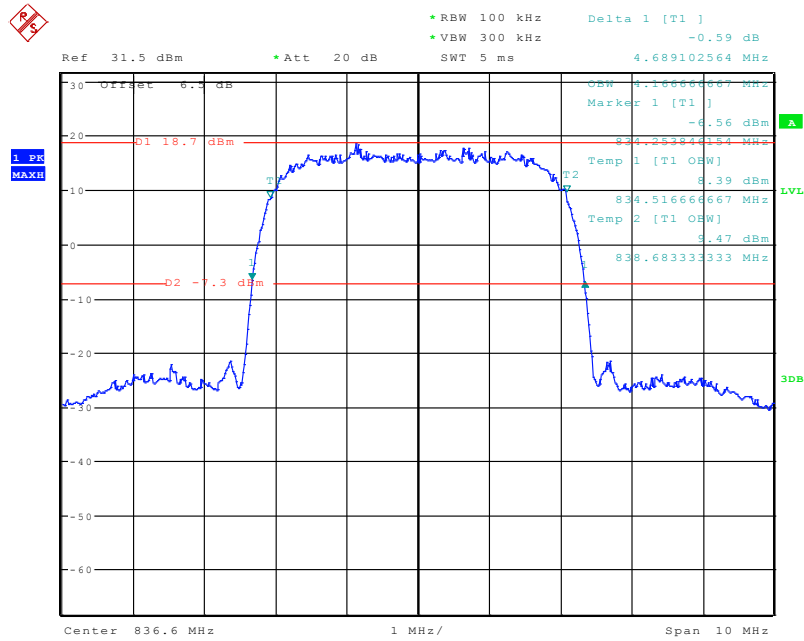


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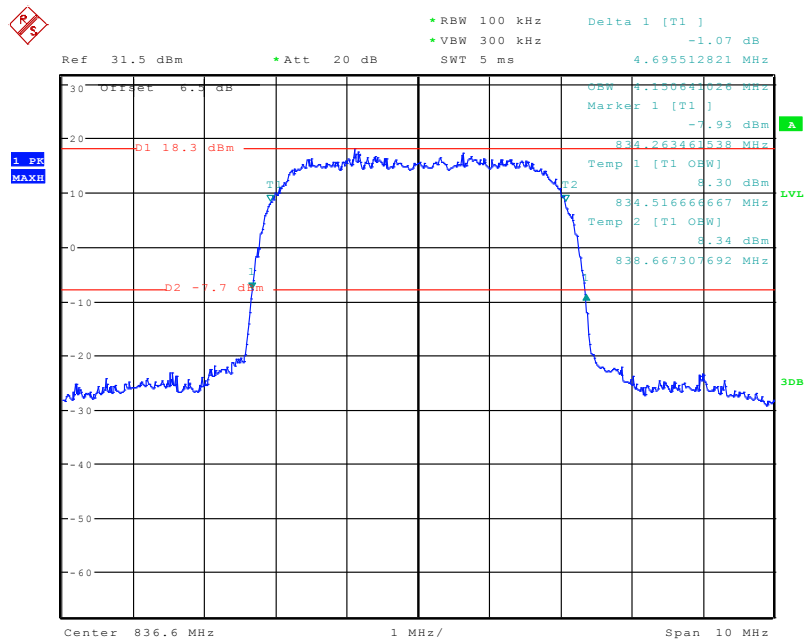
26 dB Emissions & 99% Occupied Bandwidth for EDGE Mode



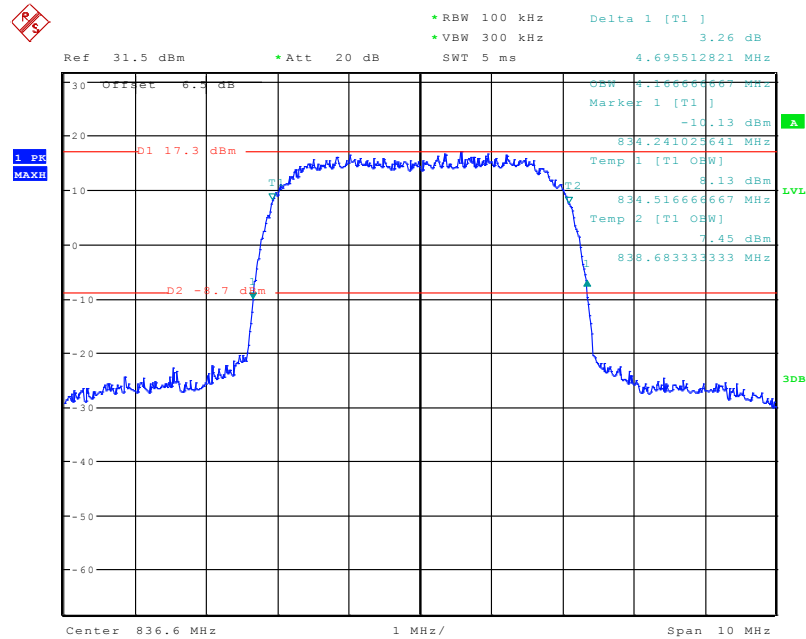
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26 dB Emissions & 99% Occupied Bandwidth for RMC (BPSK) Mode

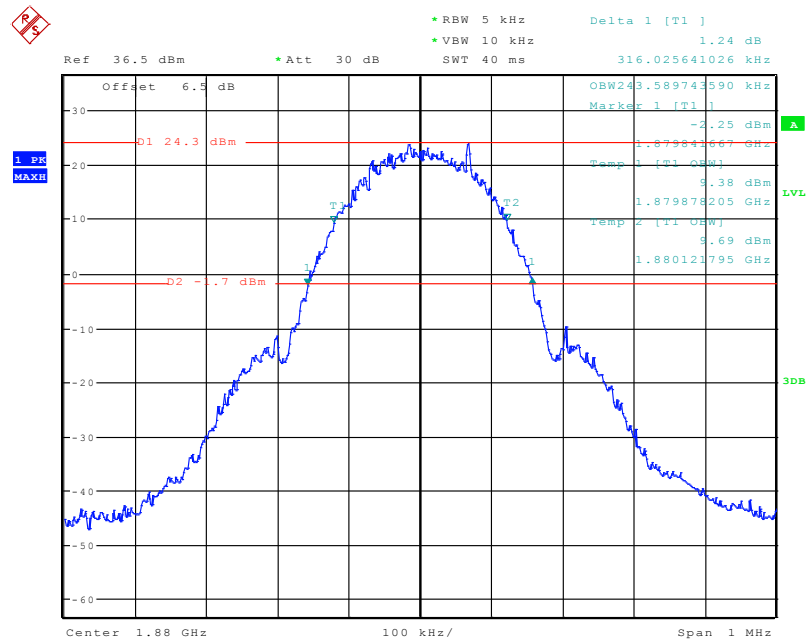
Date: 26.MAY.2020 16:10:09

26 dB Emissions & 99% Occupied Bandwidth for HSUPA (BPSK) Mode

Date: 26.MAY.2020 16:04:18

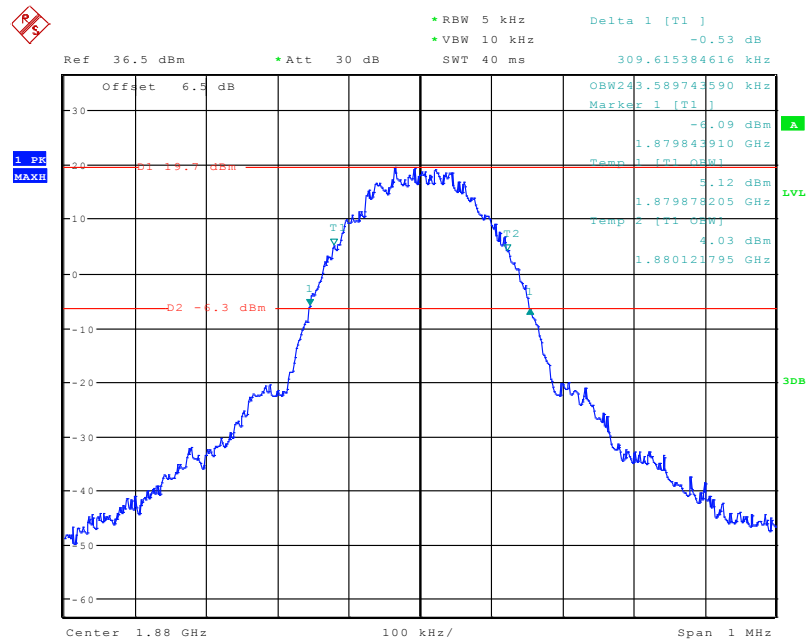
26 dB Emissions & 99% Occupied Bandwidth for HSDPA (16QAM) Mode

Date: 26.MAY.2020 16:01:02

PCS Band (Part 24E)**26 dB Emissions & 99% Occupied Bandwidth for GSM (GMSK) Mode**

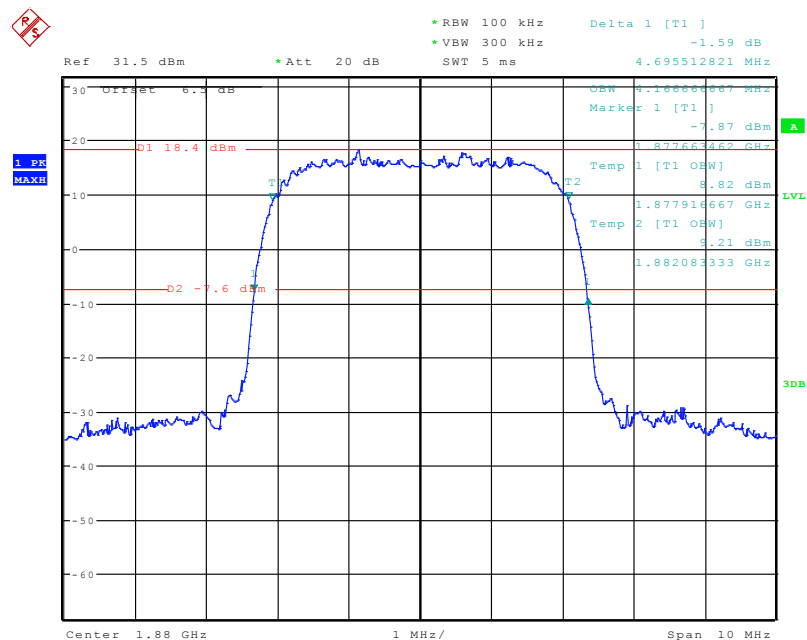
Date: 26.MAY.2020 13:12:35

26 dB Emissions & 99% Occupied Bandwidth for EDGE Mode

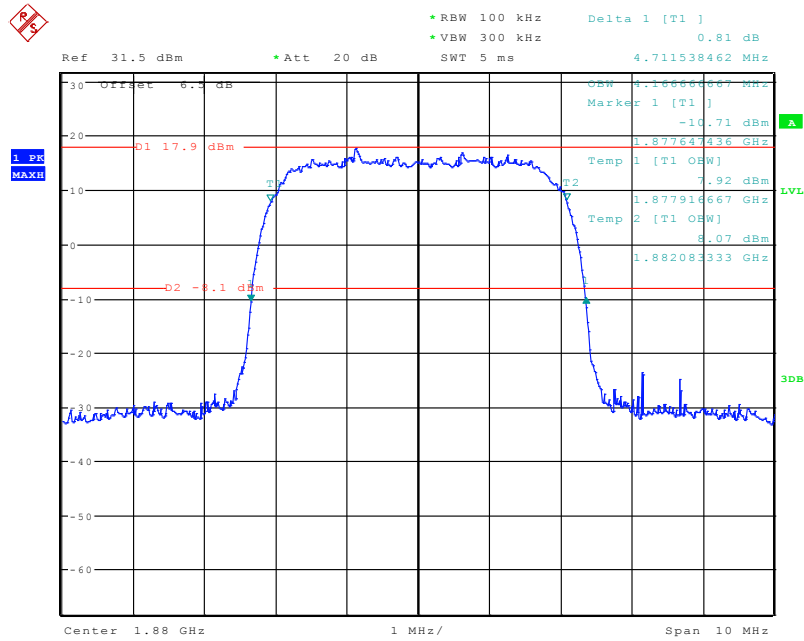


Date: 26.MAY.2020 13:09:41

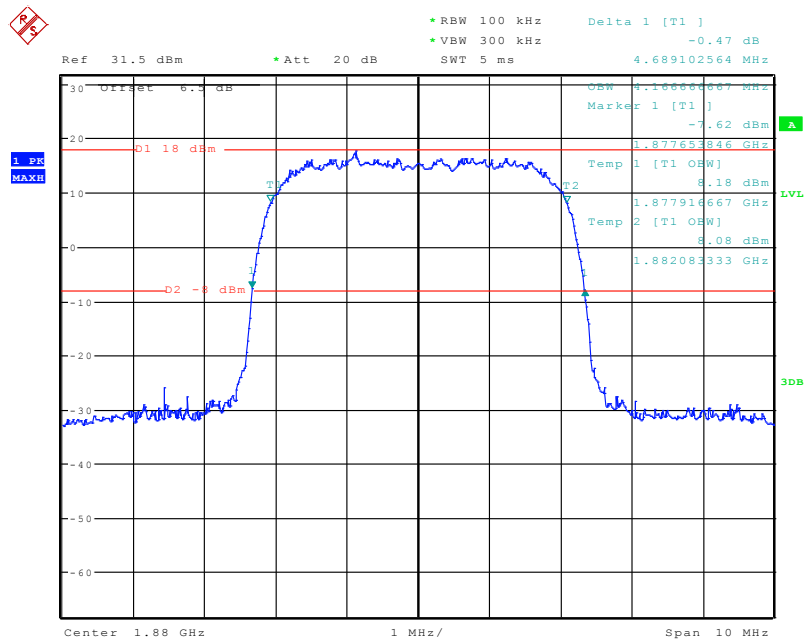
26 dB Emissions & 99% Occupied Bandwidth for RMC (BPSK) Mode



Date: 26.MAY.2020 16:08:27

26 dB Emissions & 99% Occupied Bandwidth for HSUPA (BPSK) Mode

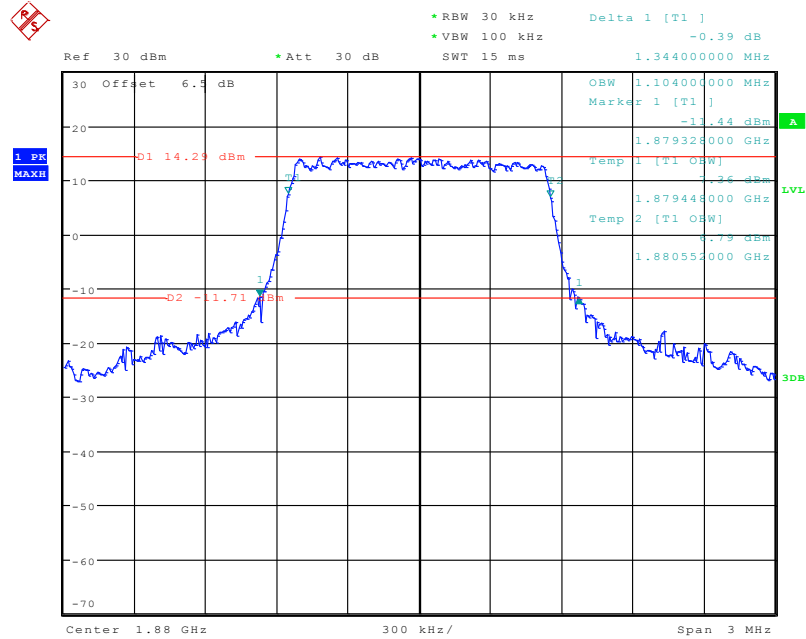
Date: 26.MAY.2020 16:05:38

26 dB Emissions & 99% Occupied Bandwidth for HSDPA (16QAM) Mode

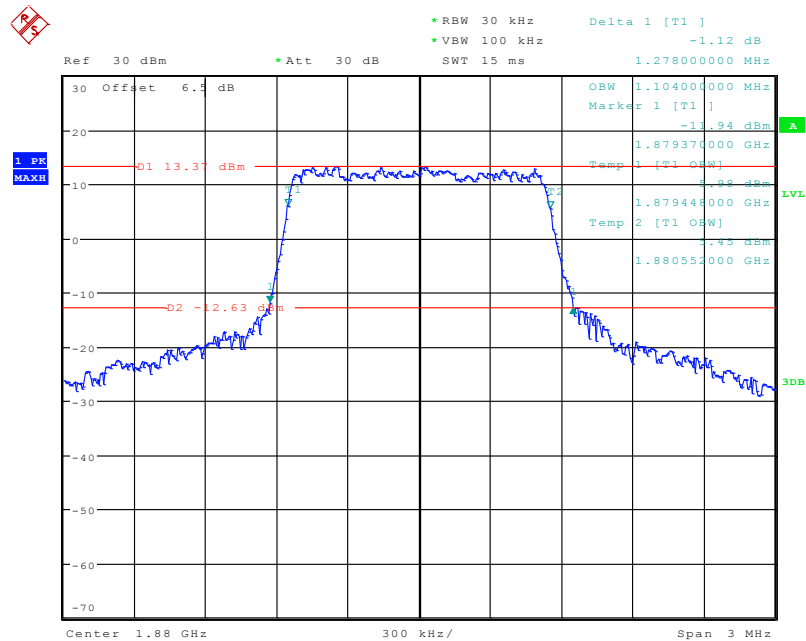
Date: 26.MAY.2020 15:59:12

LTE Band 2: (Middle Channel)

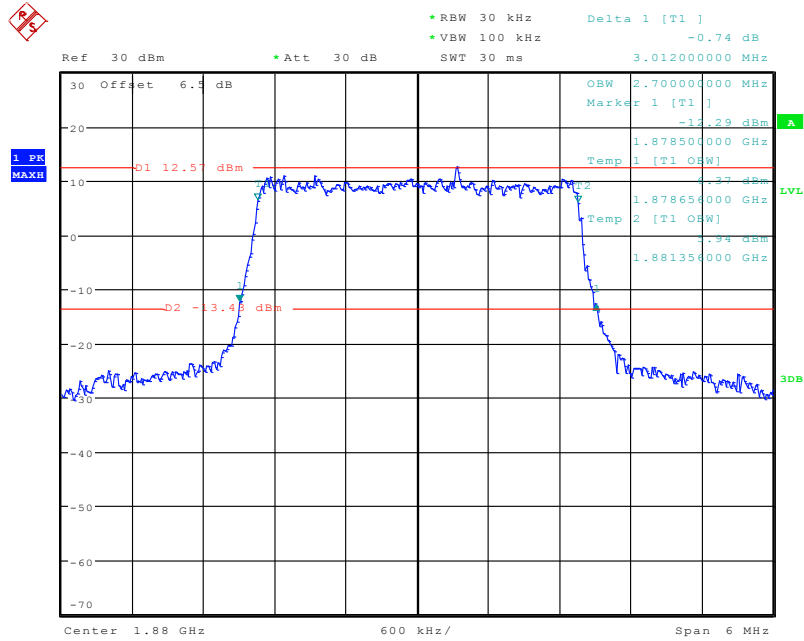
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.104	1.344
	16QAM	1.104	1.278
3.0	QPSK	2.700	3.012
	16QAM	2.700	3.036
5.0	QPSK	4.540	5.320
	16QAM	4.540	5.320
10.0	QPSK	9.000	9.800
	16QAM	8.960	9.840
15.0	QPSK	13.560	15.540
	16QAM	13.500	15.120
20.0	QPSK	18.080	19.840
	16QAM	18.000	20.160

QPSK (1.4 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

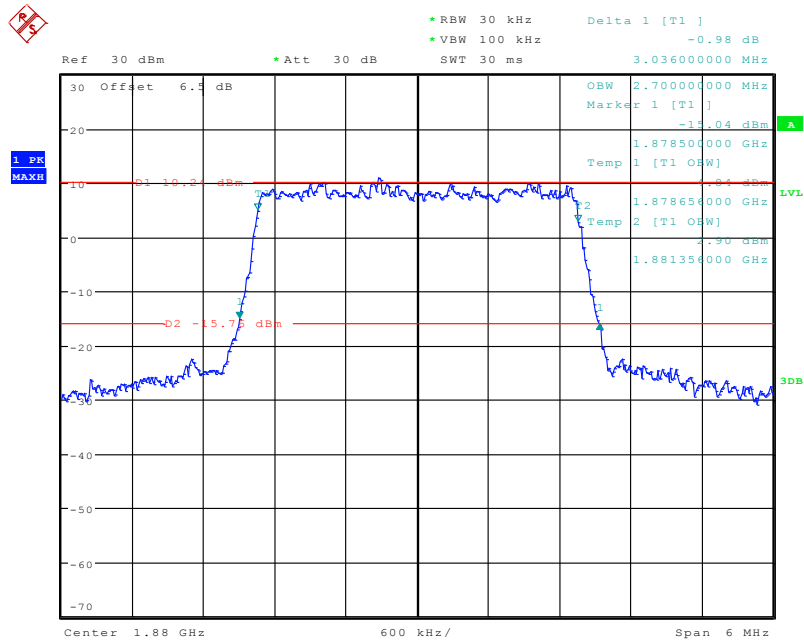
Date: 27.MAY.2020 09:16:02

16-QAM (1.4 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

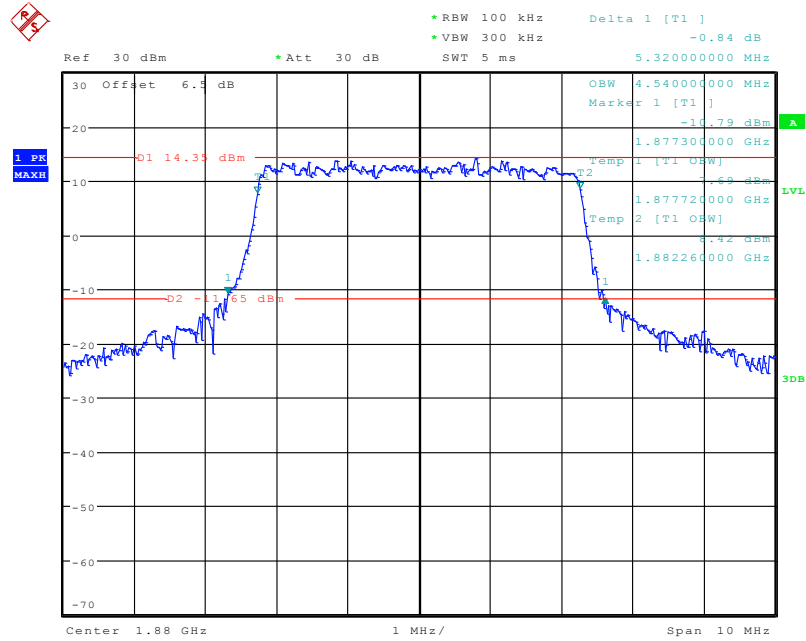
Date: 27.MAY.2020 09:16:18

QPSK (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

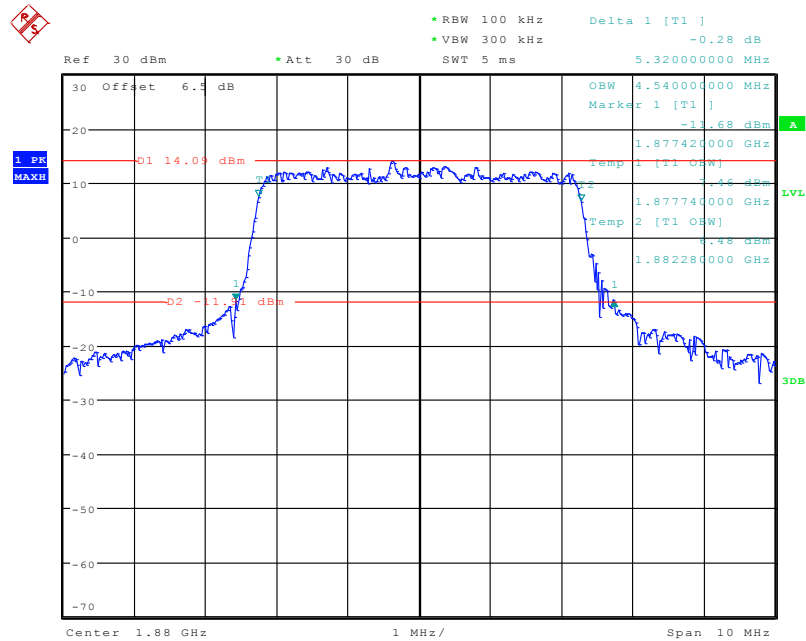
Date: 27.MAY.2020 09:16:37

16-QAM (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

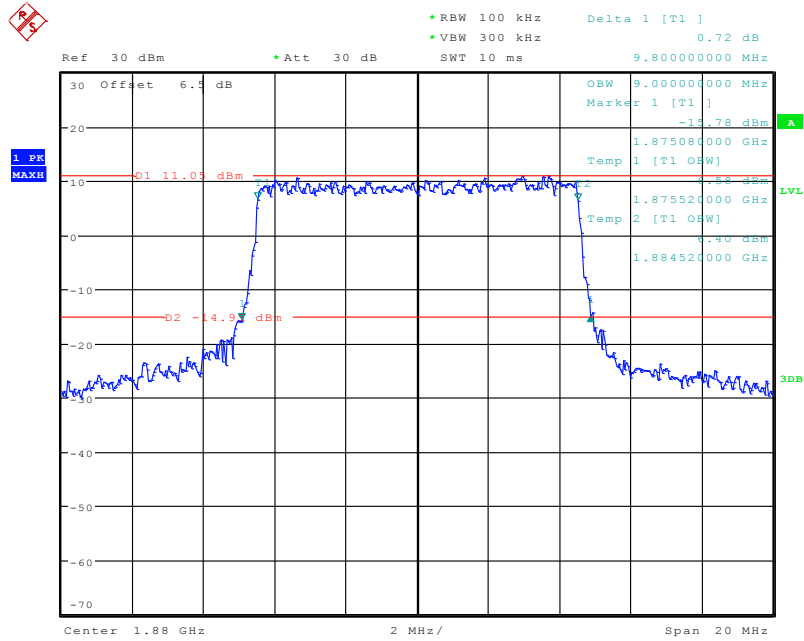
Date: 27.MAY.2020 09:16:53

QPSK (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

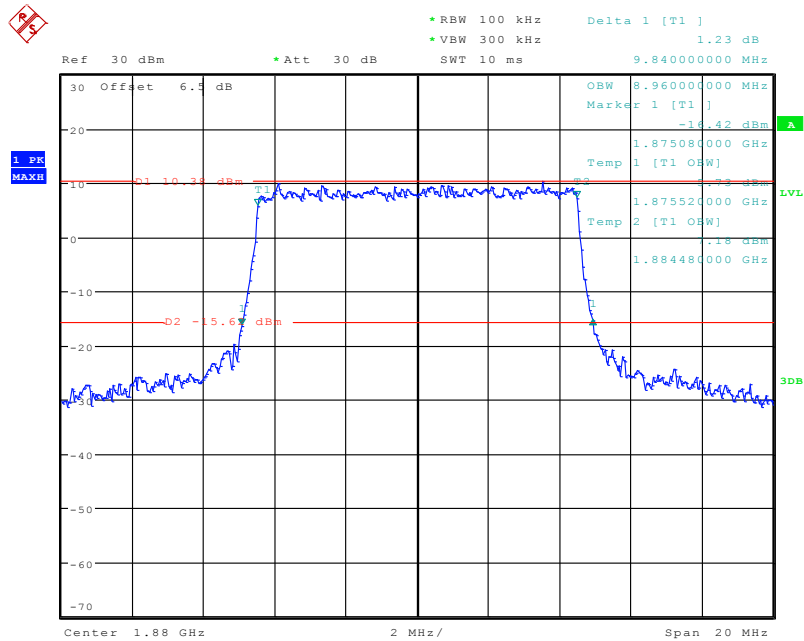
Date: 27.MAY.2020 09:17:16

16-QAM (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

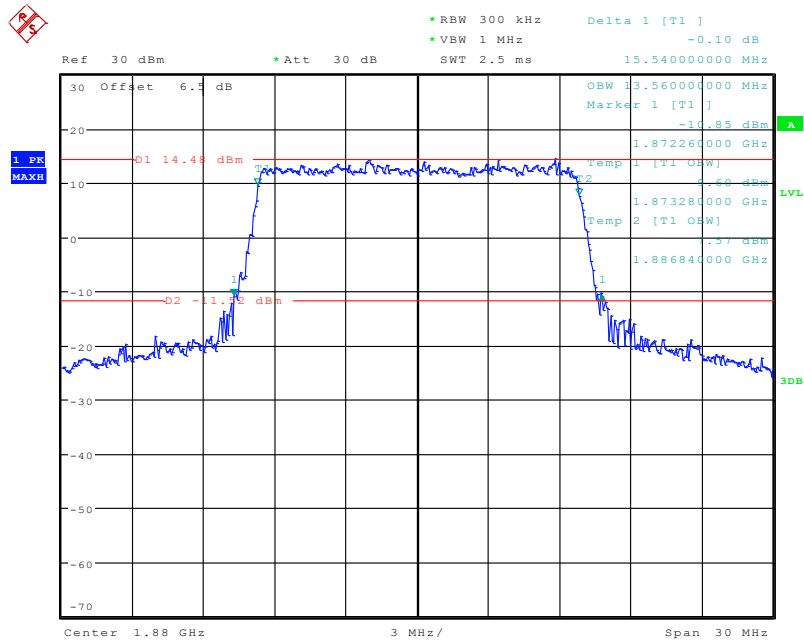
Date: 27.MAY.2020 09:17:40

QPSK (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

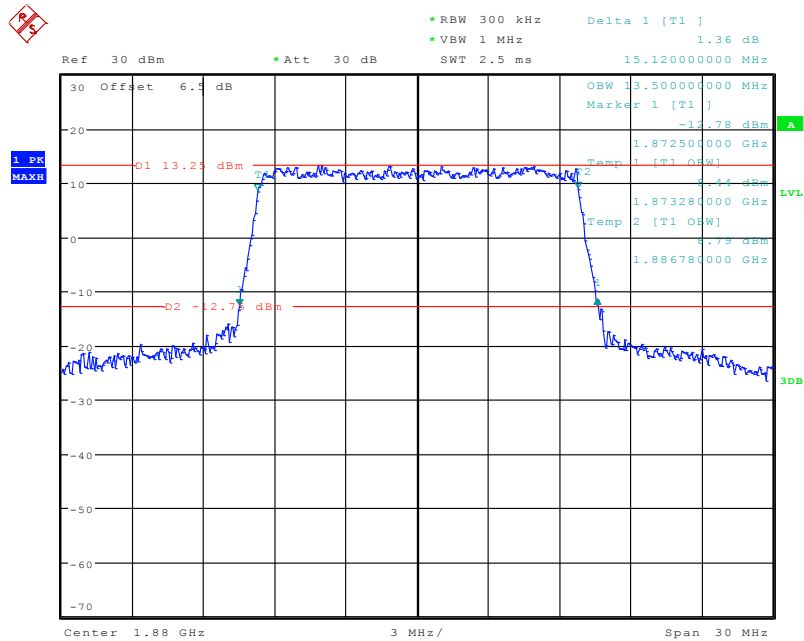
Date: 27.MAY.2020 09:18:00

16-QAM (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

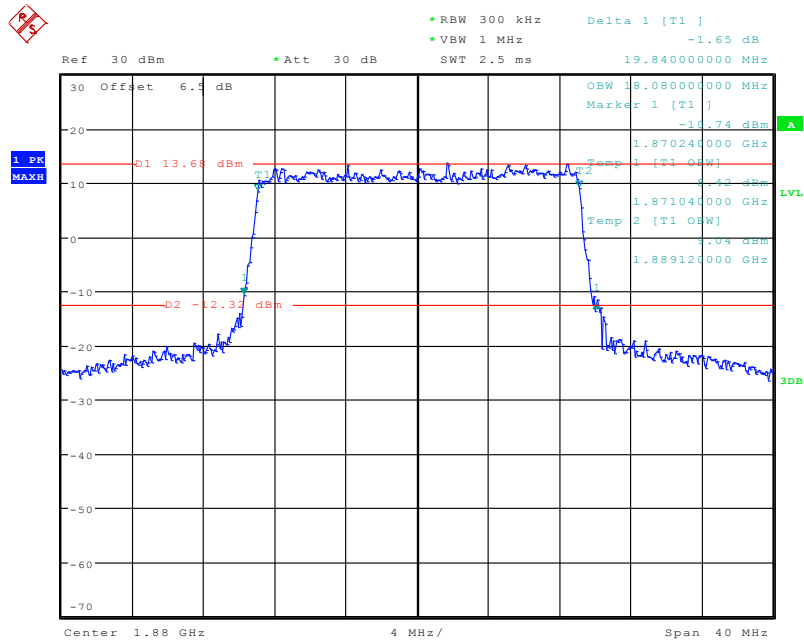
Date: 27.MAY.2020 09:18:20

QPSK (15.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

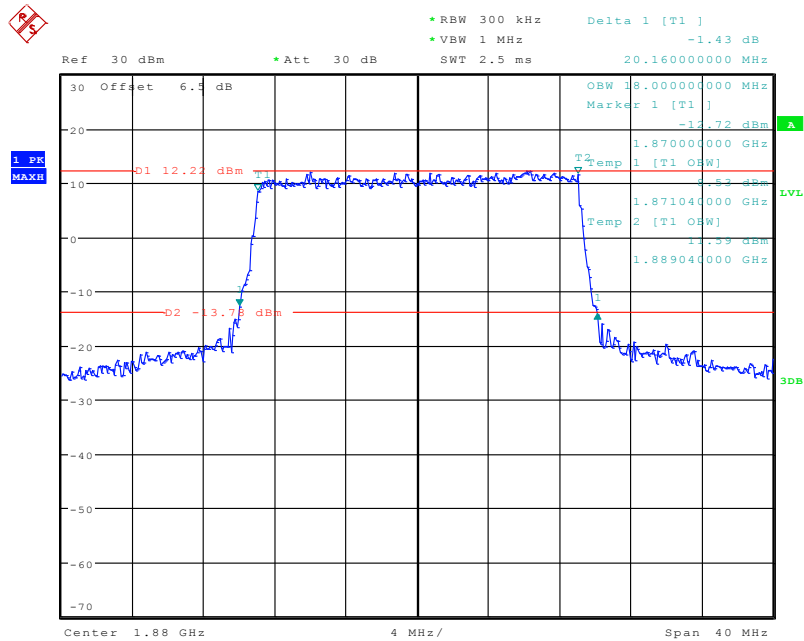
Date: 27.MAY.2020 09:18:46

16-QAM (15.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 27.MAY.2020 09:19:10

QPSK (20.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 27.MAY.2020 09:19:36

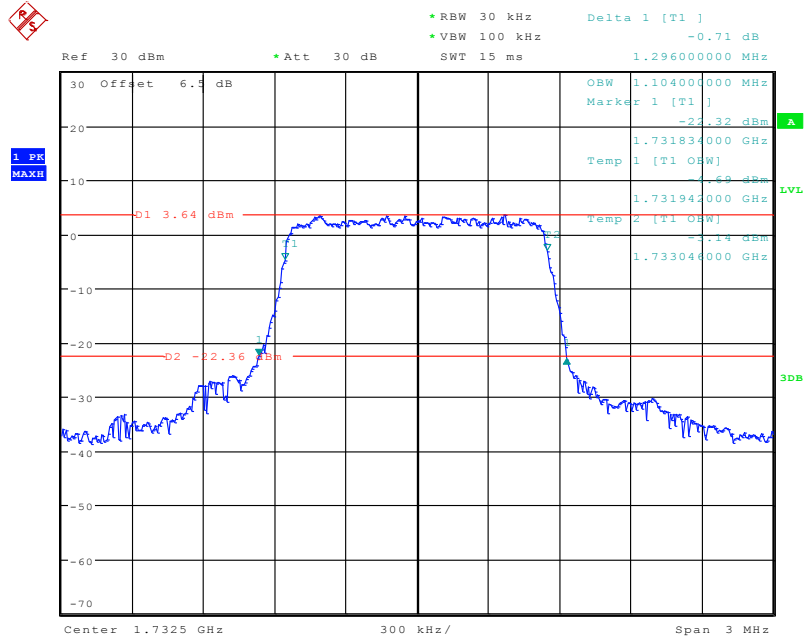
16-QAM (20.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 27.MAY.2020 09:20:00

LTE Band 4: (Middle Channel)

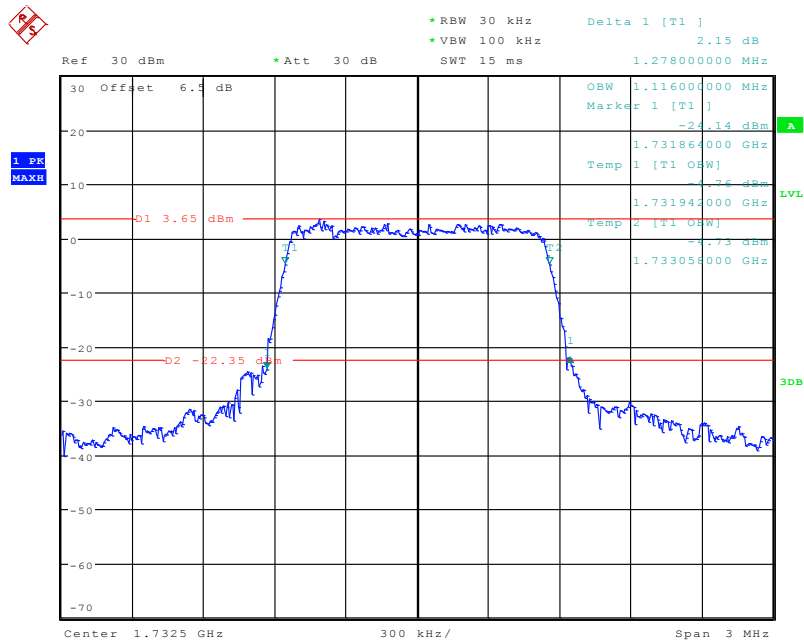
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.104	1.296
	16QAM	1.116	1.278
3.0	QPSK	2.700	3.012
	16QAM	2.700	3.036
5.0	QPSK	4.560	5.380
	16QAM	4.540	5.280
10.0	QPSK	9.000	9.760
	16QAM	9.000	9.720
15.0	QPSK	13.560	15.480
	16QAM	13.500	15.120
20.0	QPSK	17.920	19.680
	16QAM	18.000	19.840

QPSK (1.4 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

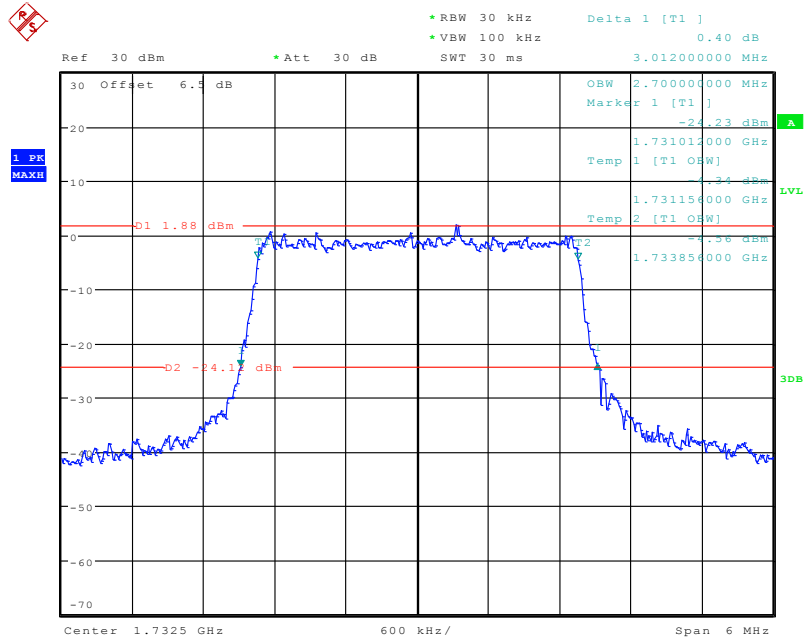


Date: 27.MAY.2020 09:20:22

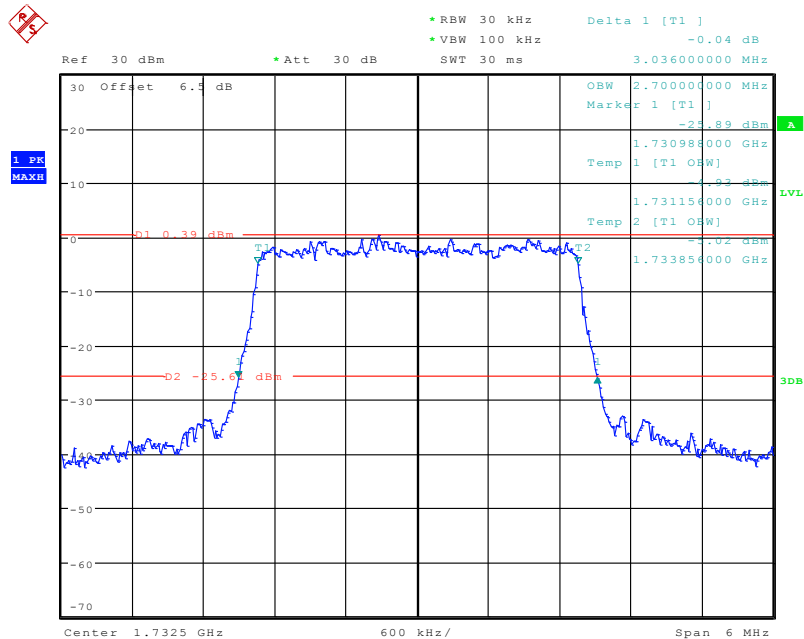
16-QAM (1.4 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



Date: 27.MAY.2020 09:20:41

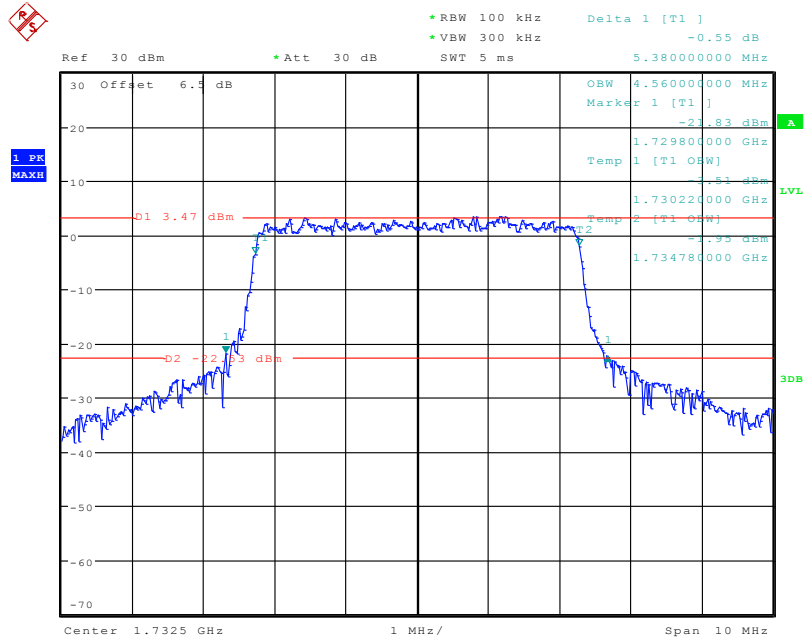
QPSK (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 27.MAY.2020 09:21:00

16-QAM (3.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

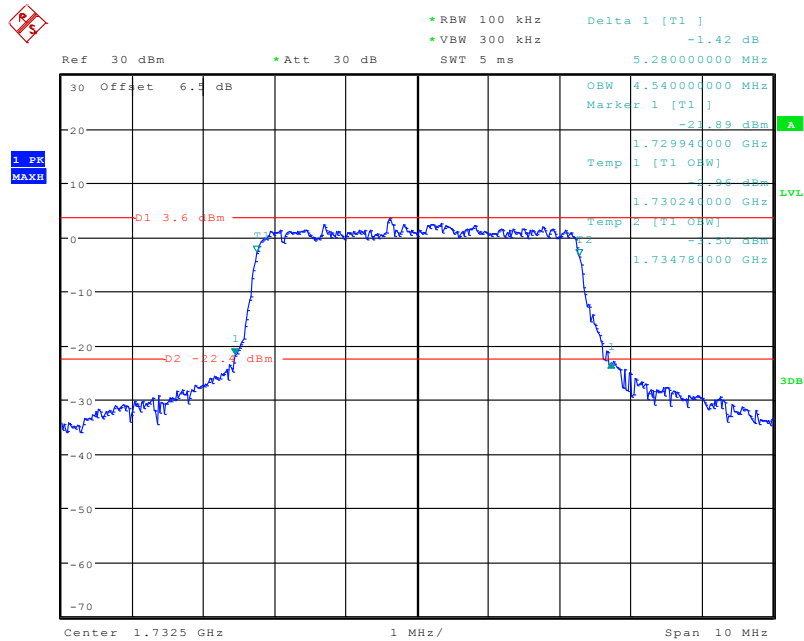
Date: 27.MAY.2020 09:21:19

QPSK (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

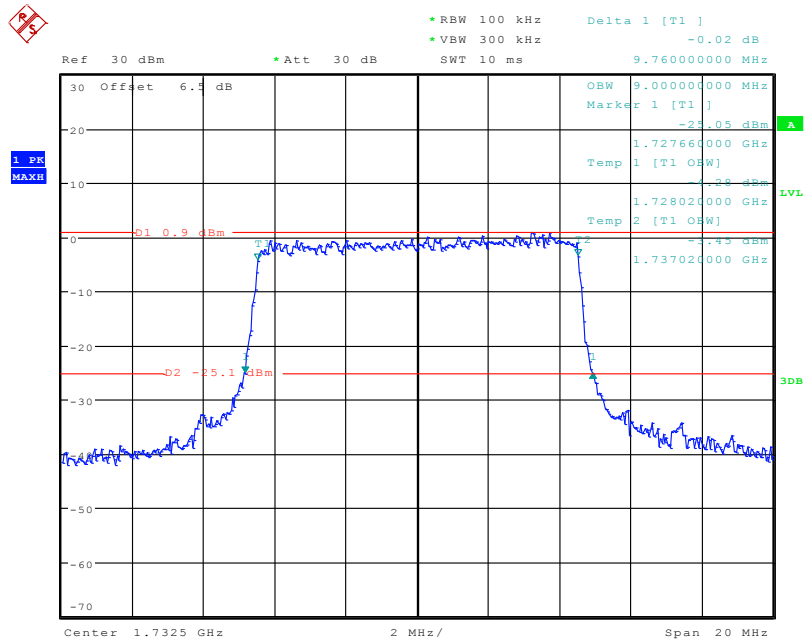


Date: 27.MAY.2020 09:21:42

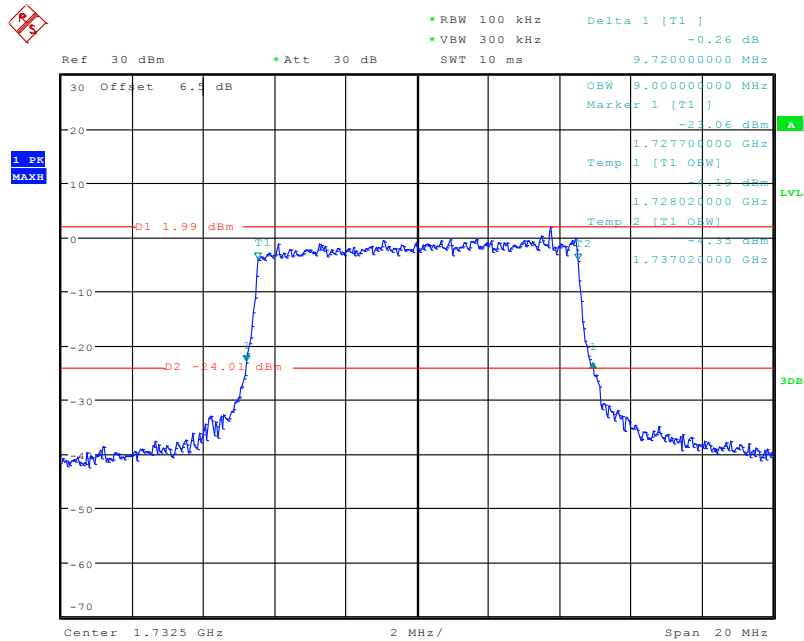
16-QAM (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



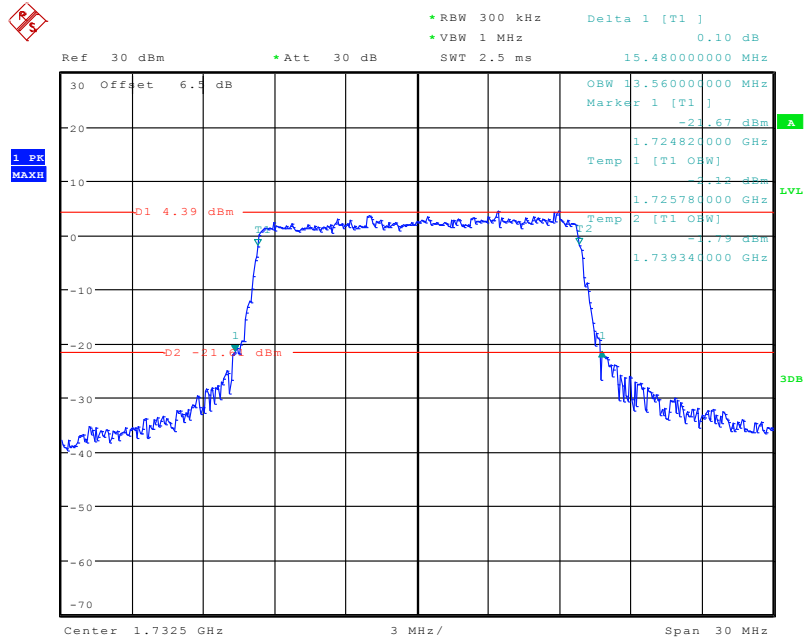
Date: 27.MAY.2020 09:22:06

QPSK (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

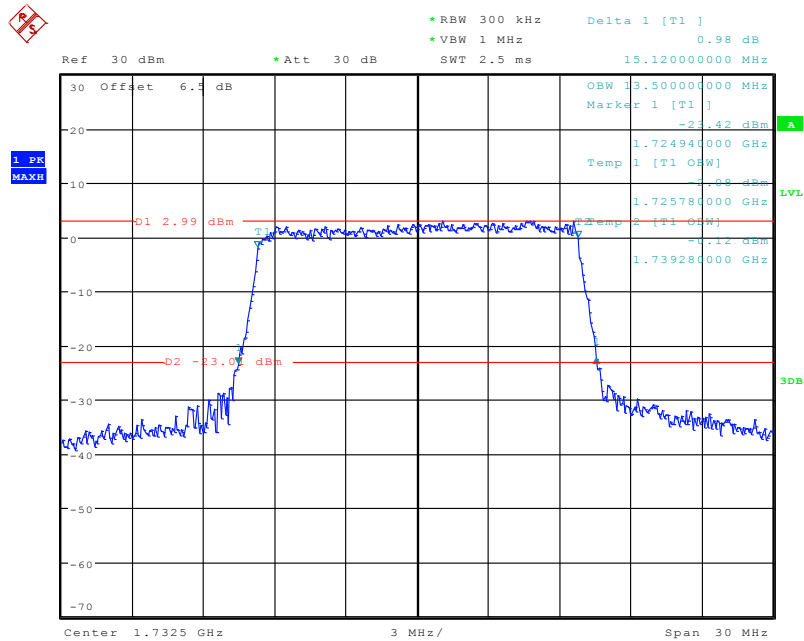
Date: 27.MAY.2020 09:22:29

16-QAM (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 27.MAY.2020 09:22:49

QPSK (15.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 27.MAY.2020 09:23:19

16-QAM (15.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 27.MAY.2020 09:23:42



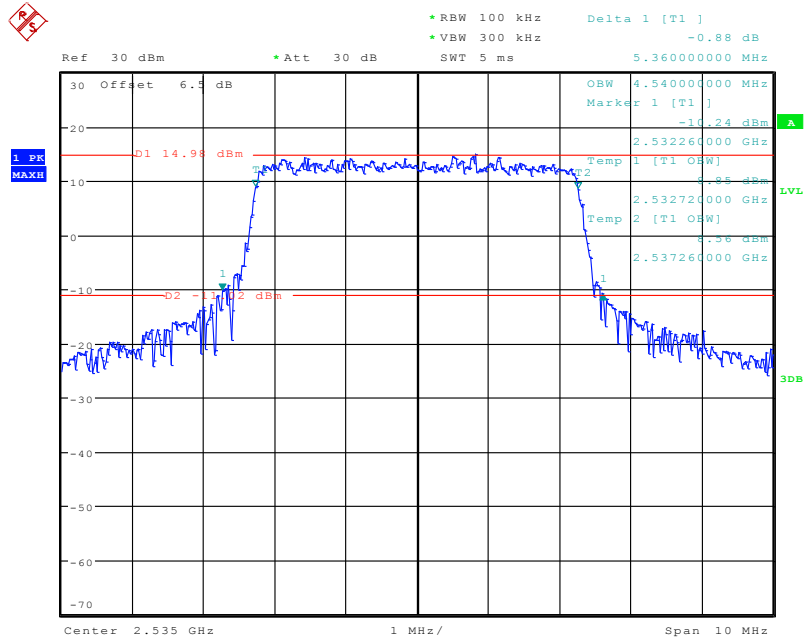
Date: 27.MAY.2020 09:24:09



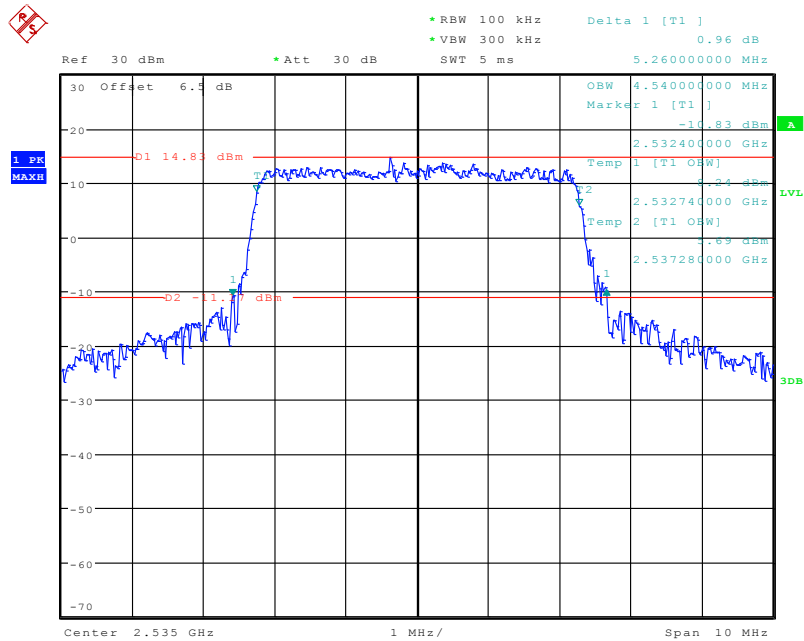
Date: 27.MAY.2020 09:24:33

LTE Band 7: (Middle Channel)

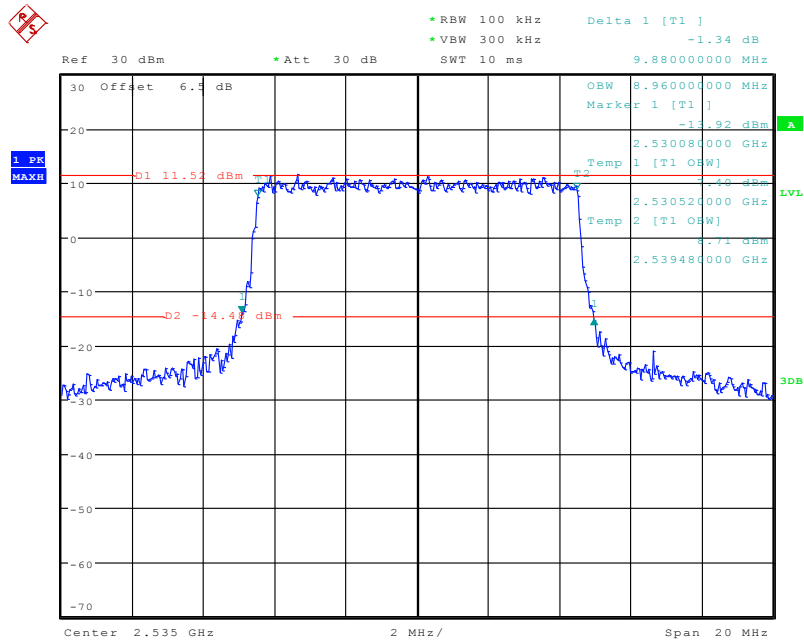
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.540	5.360
	16QAM	4.540	5.260
10.0	QPSK	8.960	9.880
	16QAM	8.960	9.800
15.0	QPSK	13.620	15.720
	16QAM	13.620	15.240
20.0	QPSK	18.000	20.000
	16QAM	18.000	20.000

QPSK (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

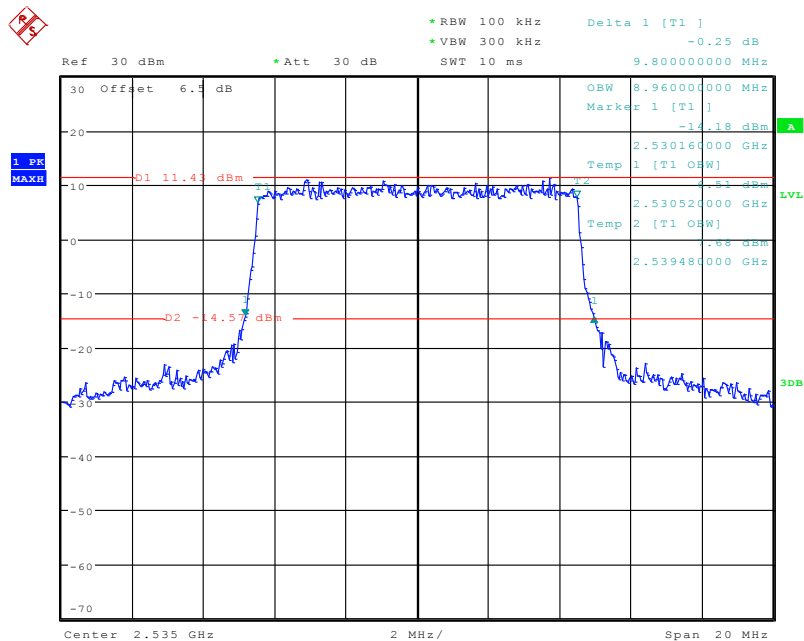
Date: 27.MAY.2020 09:24:59

16-QAM (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

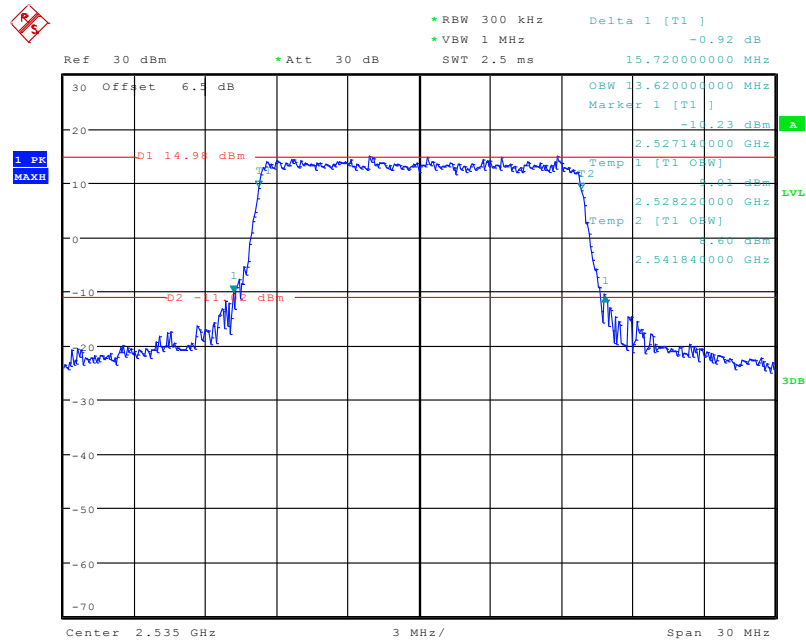
Date: 27.MAY.2020 09:25:23

QPSK (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

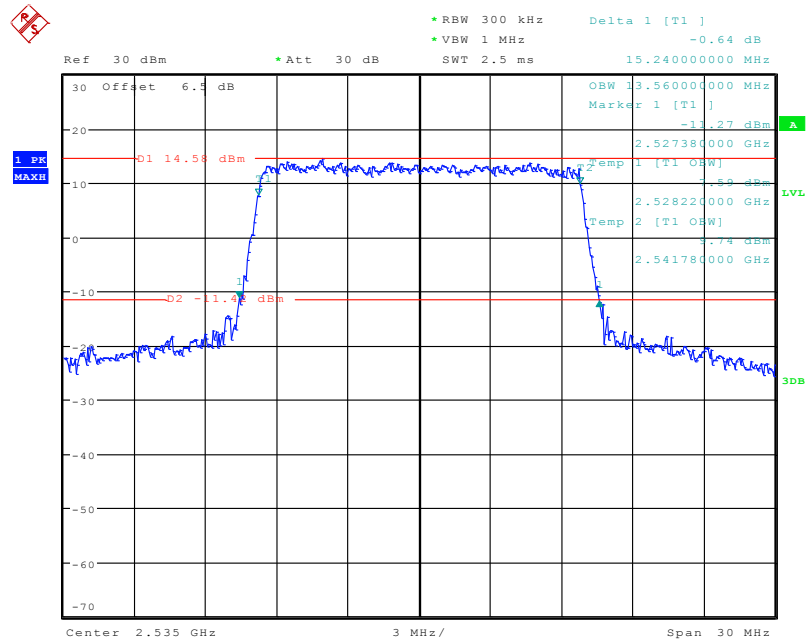
Date: 27.MAY.2020 09:25:43

16-QAM (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 27.MAY.2020 09:26:00

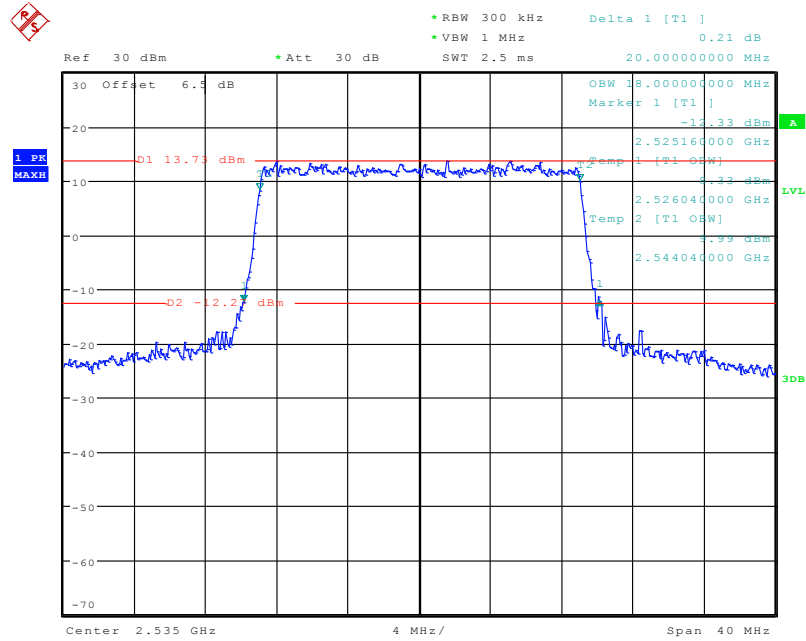
QPSK (15.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

Date: 27.MAY.2020 09:26:26

16-QAM (15.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel

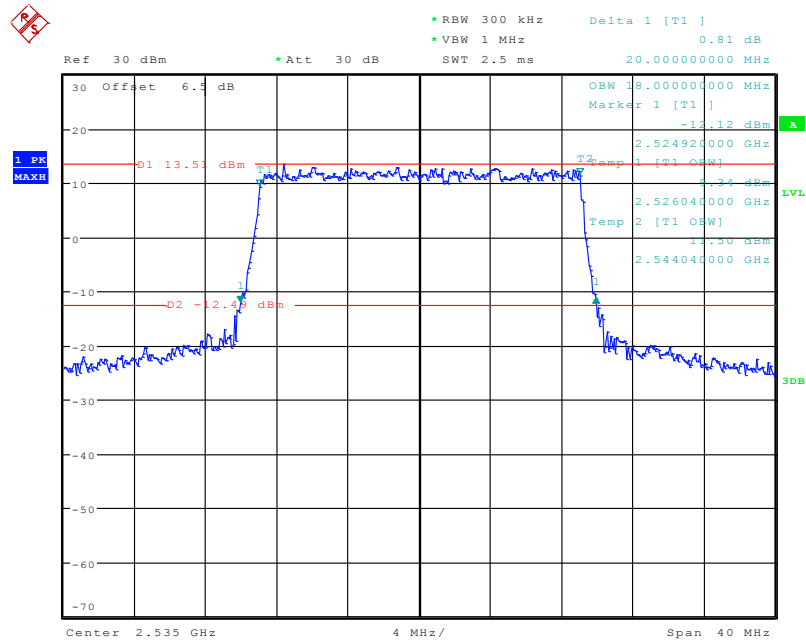
Date: 27.MAY.2020 09:26:50

QPSK (20.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



Date: 27.MAY.2020 09:27:14

16-QAM (20.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



Date: 27.MAY.2020 09:27:38

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

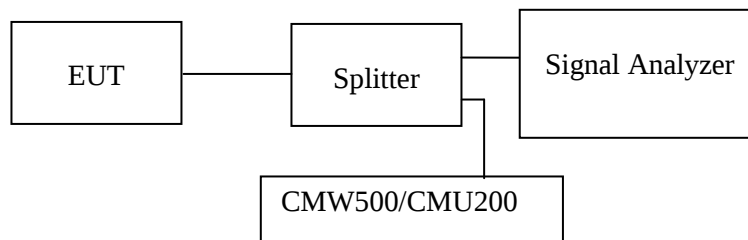
Applicable Standard

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

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

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.



Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56%
ATM Pressure:	101.0 kPa

The testing was performed by Alan He on 2020-05-27.

Test result: Compliance.

EUT operation mode: transmitting

Please refer to the following plots.

30 MHz – 1 GHz (GSM Mode)



Date: 26.MAY.2020 13:42:38

Ref 36.5 dBm * Att 30 dB RBW 1 MHz VBW 3 MHz SWT 55 ms Marker 1 [T1] -24.91 dBm 2.500000000 GHz

Offset 6.5 dB

1 PR MAXB

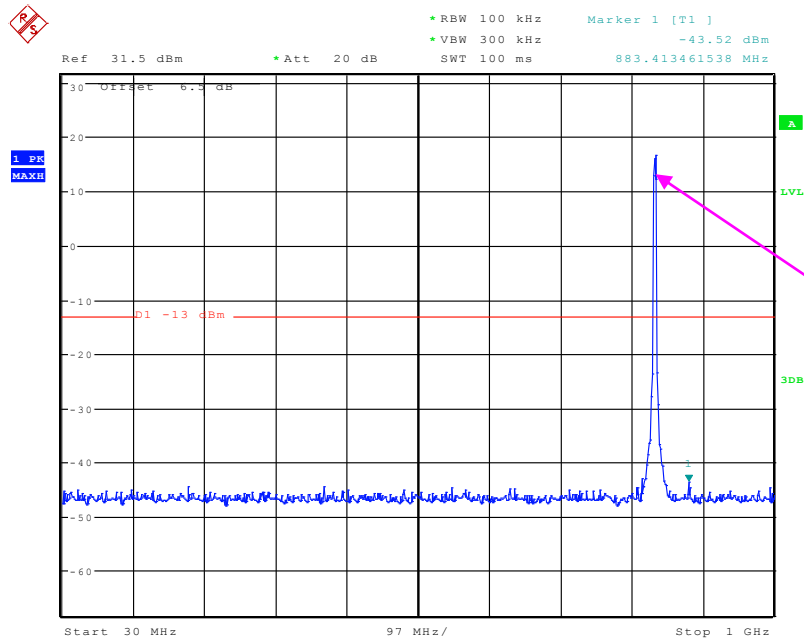
01 -13 dBm

1

Start 1 GHz 900 MHz/ Stop 10 GHz

Date: 26.MAY.2020 13:43:29

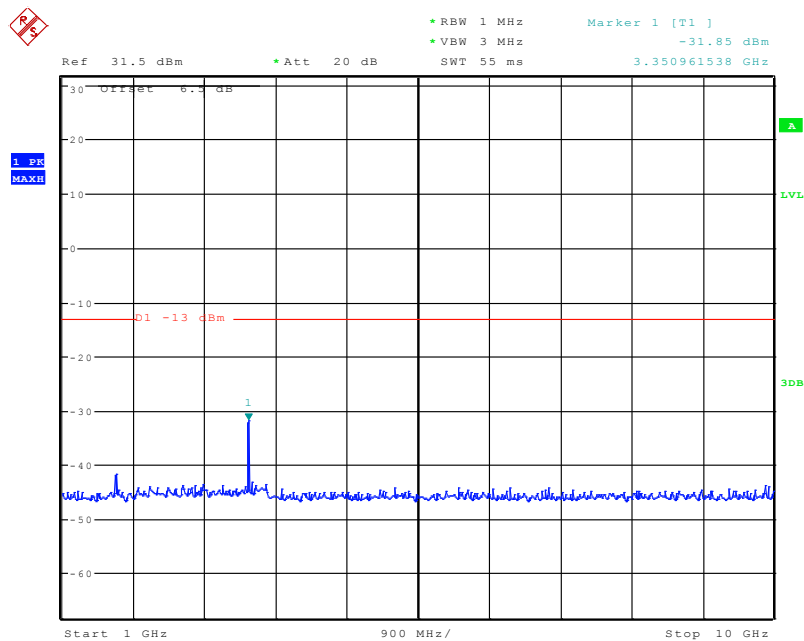
30 MHz – 1 GHz (WCDMA Mode)



Fundamental test
With filter

Date: 26.MAY.2020 16:37:47

1 GHz – 10 GHz (WCDMA Mode)



Date: 26.MAY.2020 16:37:14

30 MHz – 1 GHz (GSM Mode)



Ref 36.5 dBm * Att 30 dB RBW 1 MHz VBW 3 MHz SWT 2.5 ms Marker 1 [T1] -23.86 dBm 1.873397436 GHz

Offset 6.5 dB

1 PR
MAXH

01 -13 dBm

Start 1 GHz 100 MHz/ Stop 2 GHz

Date: 26.MAY.2020 13:46:02

Ref 36.5 dBm * Att 30 dB RBW 1 MHz VBW 3 MHz SWT 105 ms Marker 1 [T1] -37.80 dBm 2.605769231 GHz

Offset 6.5 dB

1.74 MAX II

30 dB

20

10

0

-10

-20

-30

-40

-50

-60

01 -13 dBm

1

Start 2 GHz 1.8 GHz/ Stop 20 GHz

Date: 26.MAY.2020 13:46:36

Ref 31.5 dBm * Att 20 dB

• RBW 100 kHz Marker 1 [T1] -44.65 dBm

• VBW 300 kHz

SWT 100 ms 878.75000000 MHz

Offset 6.5 dB

1. dB MAX II

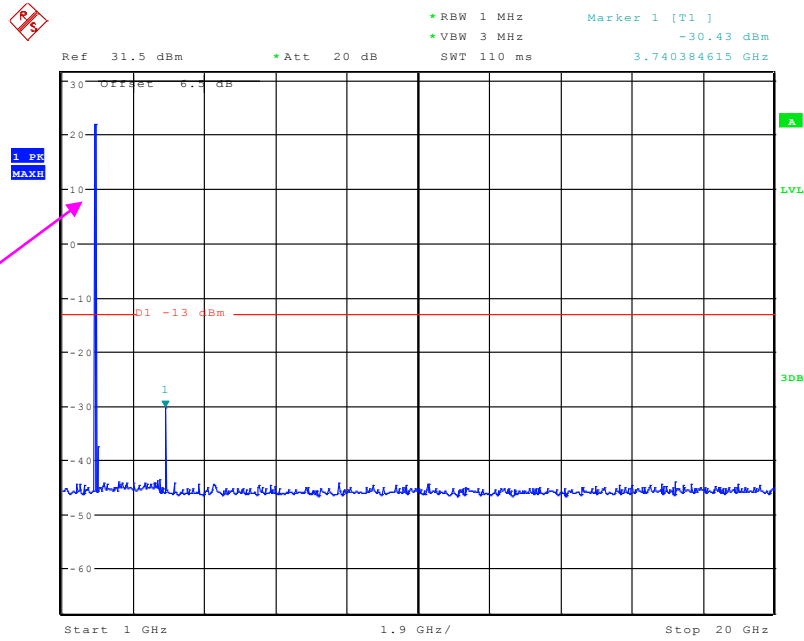
D1 -13 dBm

1

Start 30 MHz 97 MHz/ Stop 1 GHz

Date: 26.MAY.2020 16:35:24

1 GHz – 20GHz (WCDMA Mode)

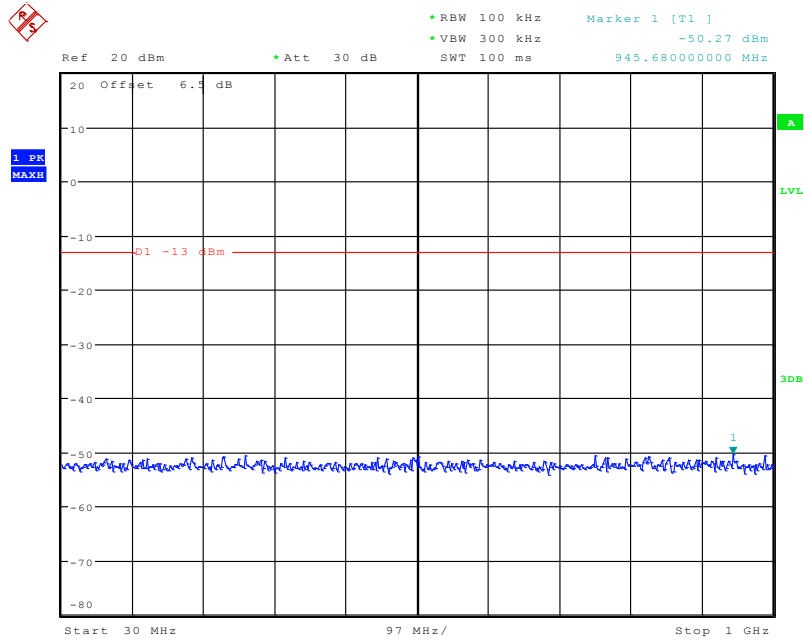


Fundamental test

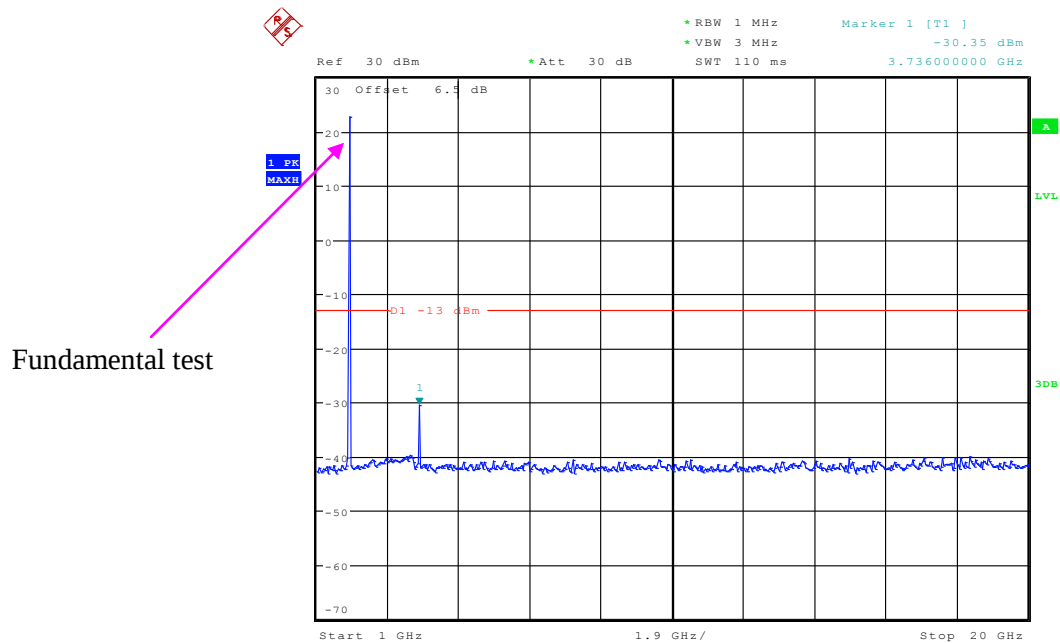
Date: 26.MAY.2020 16:36:22

LTE Band 2:

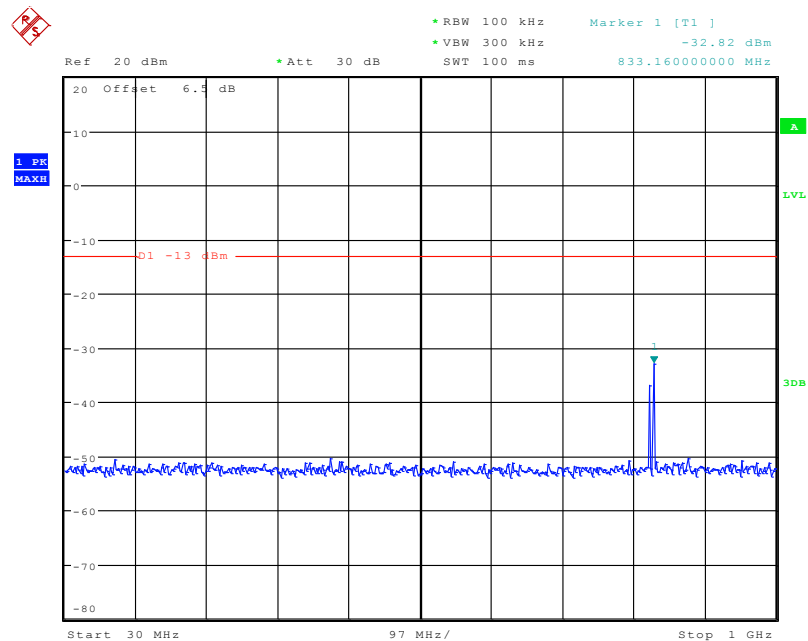
30 MHz - 1 GHz (1.4 MHz, Middle Channel)



Date: 27.MAY.2020 10:19:07

1 GHz – 20 GHz (1.4 MHz, Middle Channel)

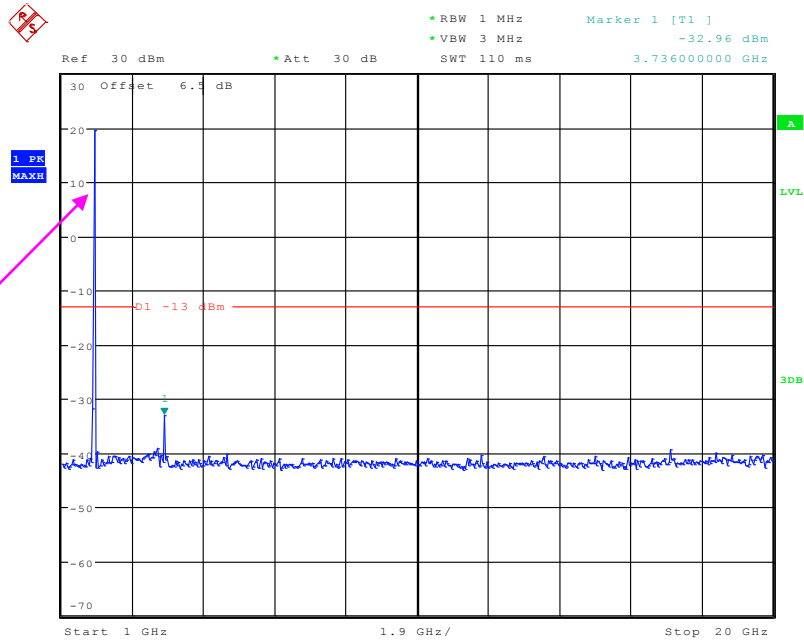
Date: 27.MAY.2020 10:19:17

30 MHz - 1 GHz (3.0 MHz, Middle Channel)

Date: 27.MAY.2020 10:19:35

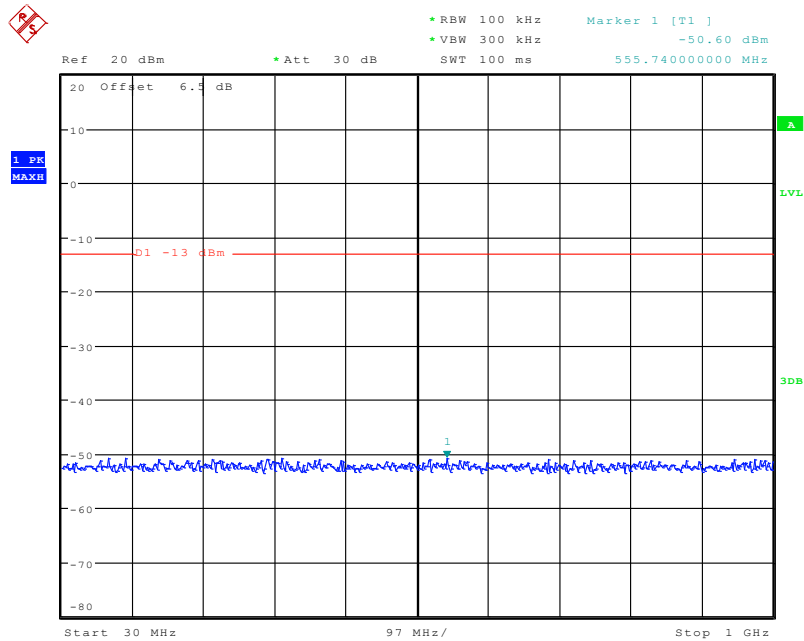


1 GHz – 20 GHz (5.0 MHz, Middle Channel)



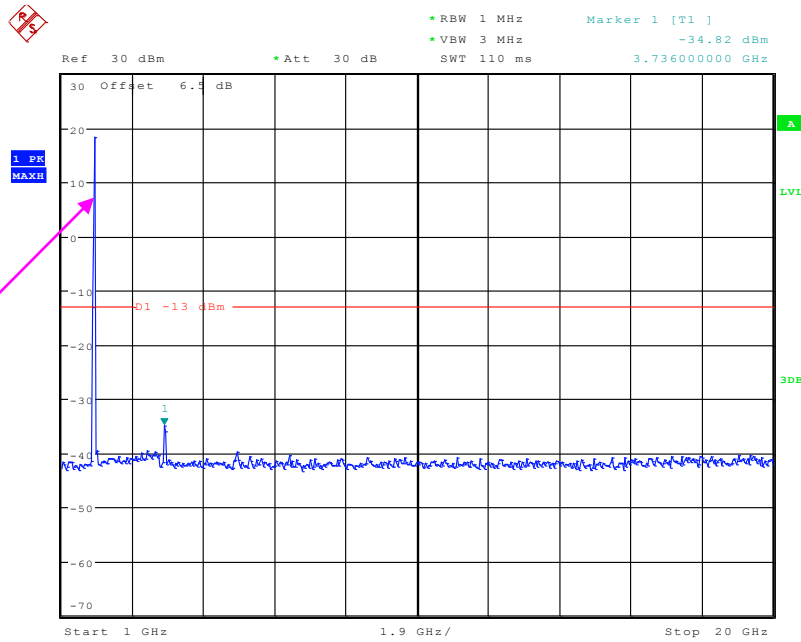
Date: 27.MAY.2020 10:20:19

30 MHz - 1 GHz (10.0 MHz, Middle Channel)



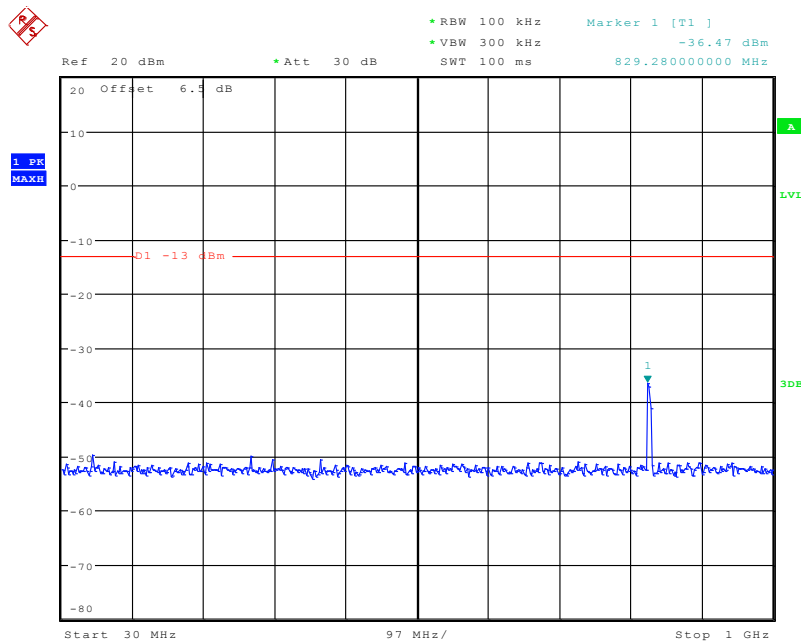
Date: 27.MAY.2020 10:20:41

1 GHz – 20 GHz (10.0 MHz, Middle Channel)



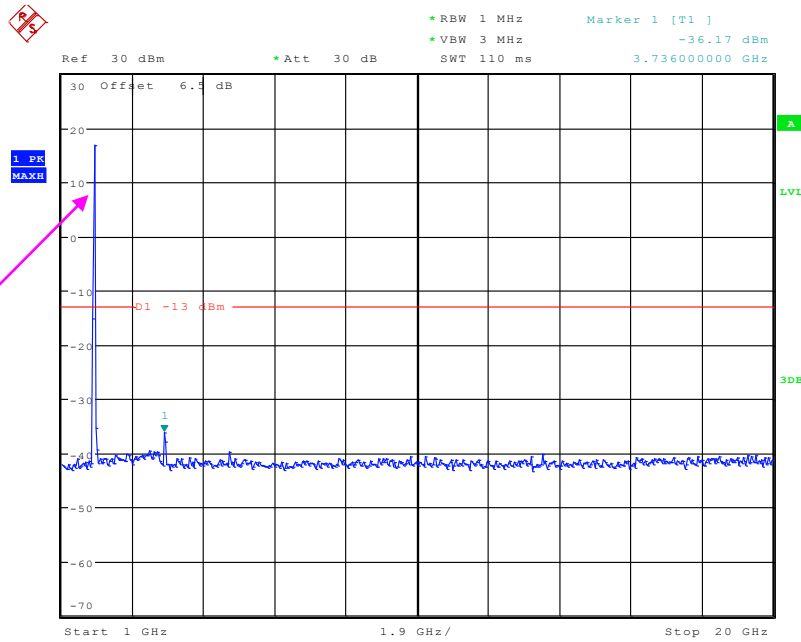
Date: 27.MAY.2020 10:20:51

30 MHz - 1 GHz (15.0 MHz, Middle Channel)



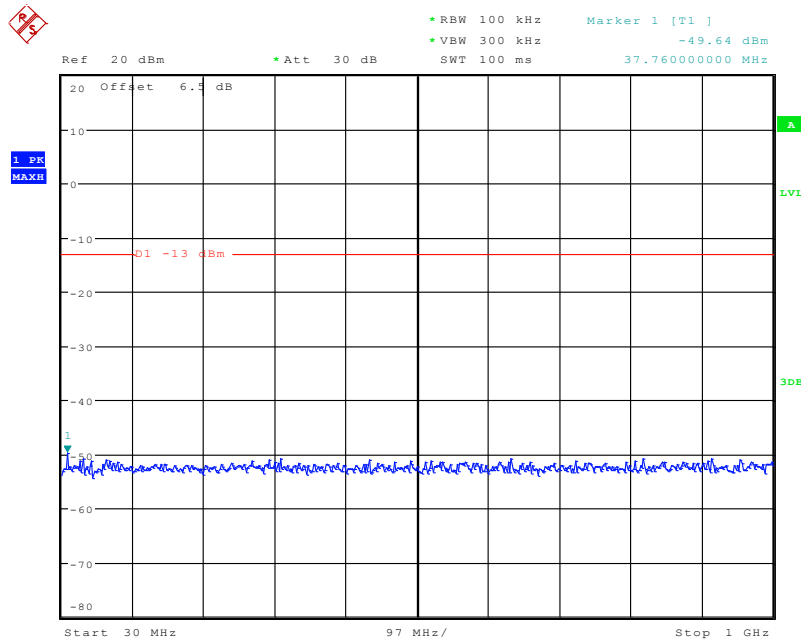
Date: 27.MAY.2020 10:21:14

1 GHz – 20 GHz (15.0 MHz, Middle Channel)



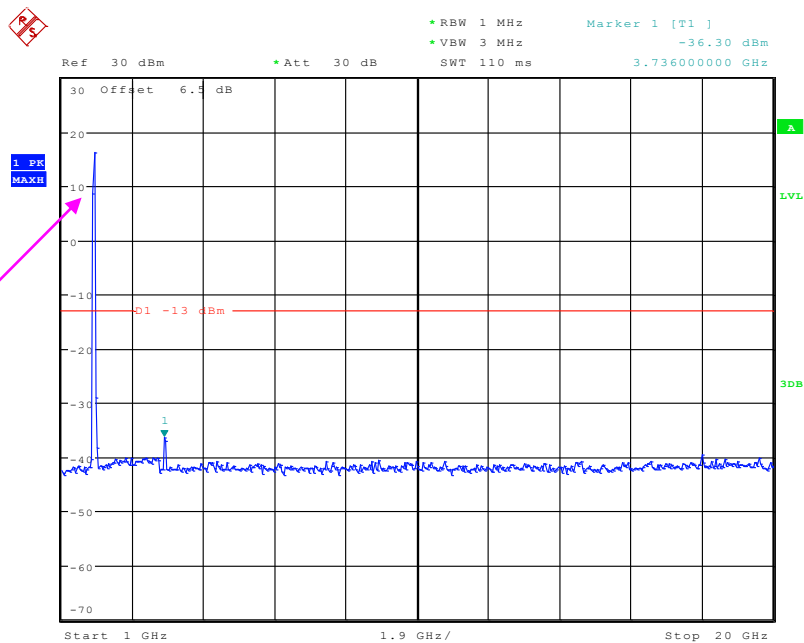
Date: 27.MAY.2020 10:21:24

30 MHz - 1 GHz (20.0 MHz, Middle Channel)



Date: 27.MAY.2020 10:21:47

1 GHz – 20 GHz (20.0 MHz, Middle Channel)

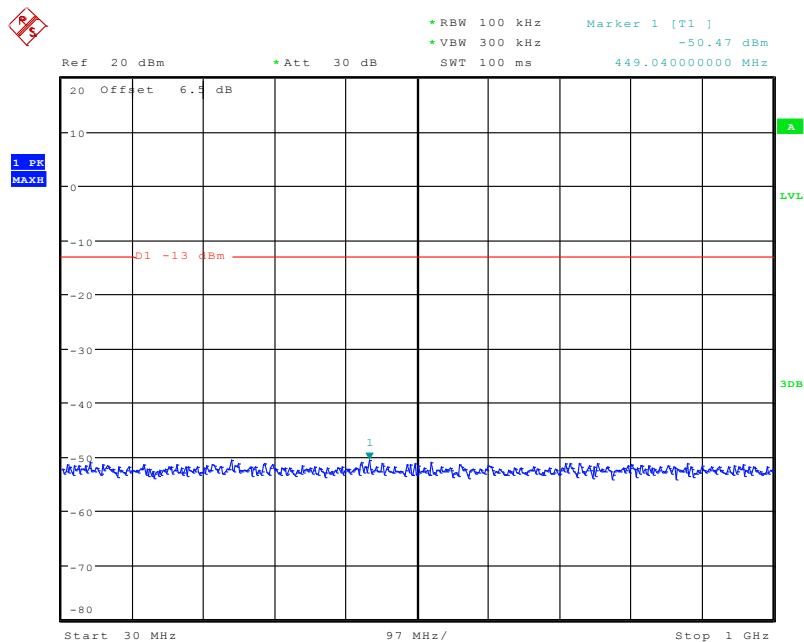


Fundamental test

Date: 27.MAY.2020 10:21:57

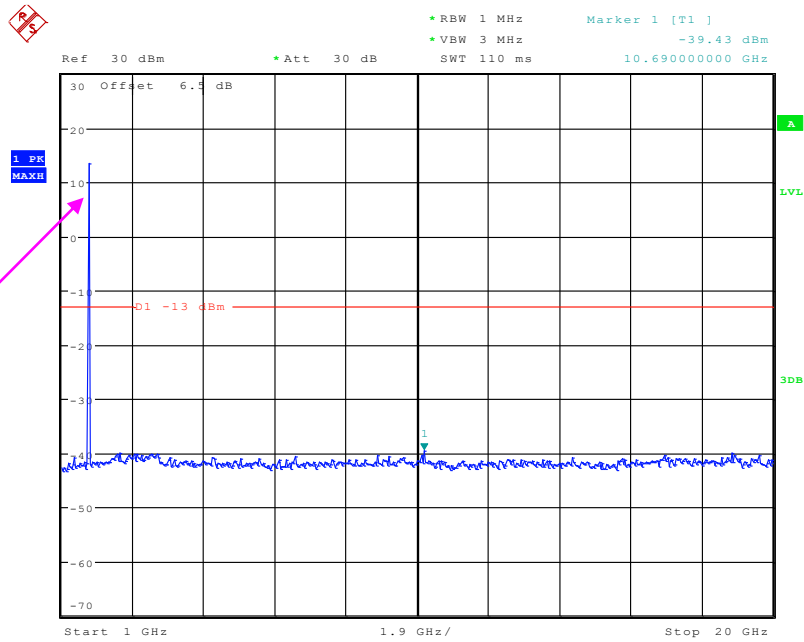
LTE Band 4:

30 MHz - 1 GHz (1.4 MHz, Middle Channel)



Date: 27.MAY.2020 10:22:15

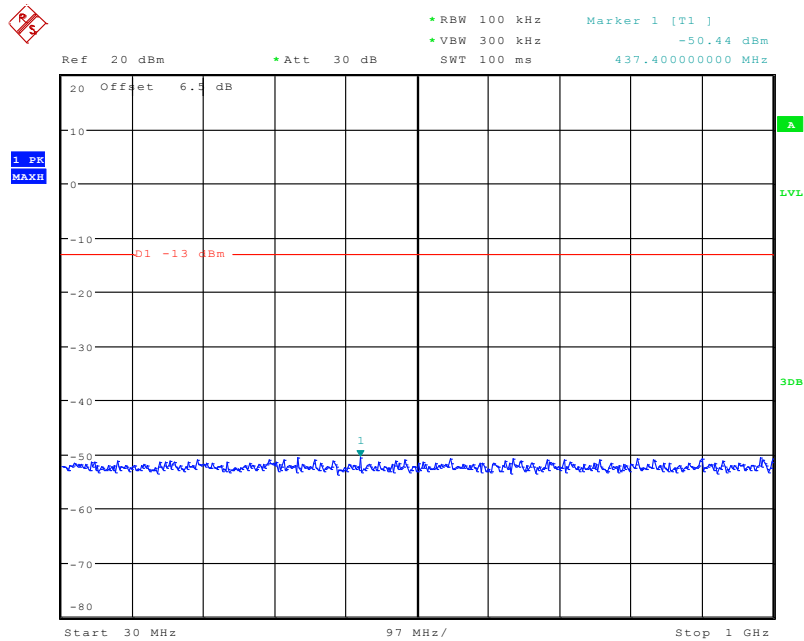
1 GHz – 20 GHz (1.4 MHz, Middle Channel)



Fundamental test

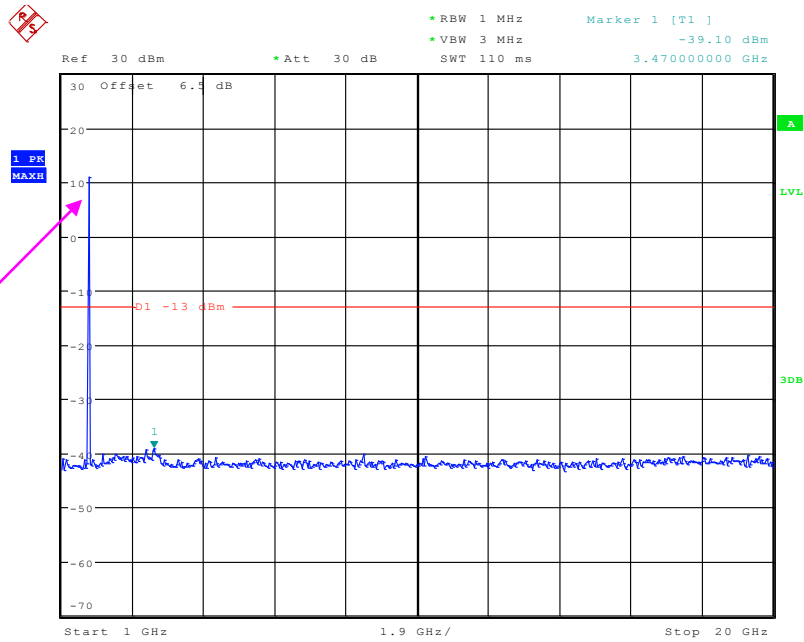
Date: 27.MAY.2020 10:22:26

30 MHz - 1 GHz (3.0 MHz, Middle Channel)



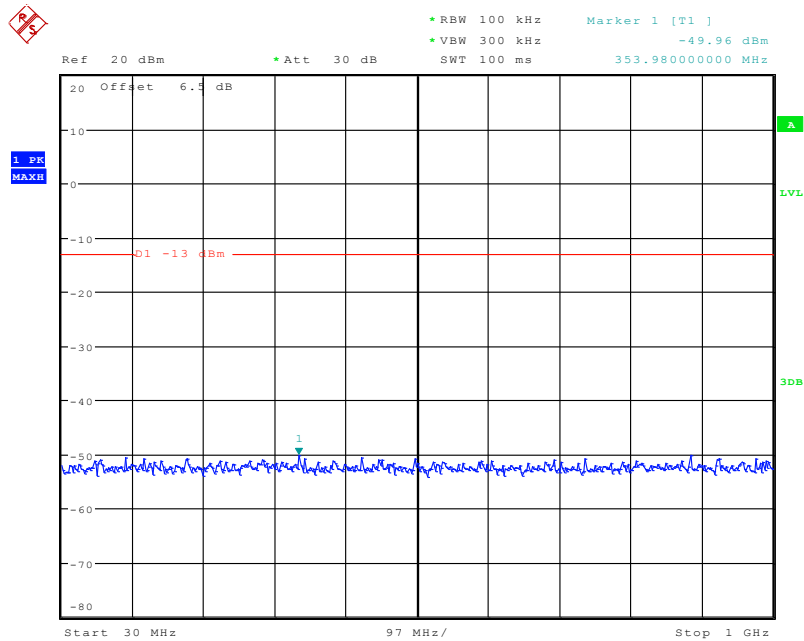
Date: 27.MAY.2020 10:22:47

1 GHz – 20 GHz (3.0 MHz, Middle Channel)



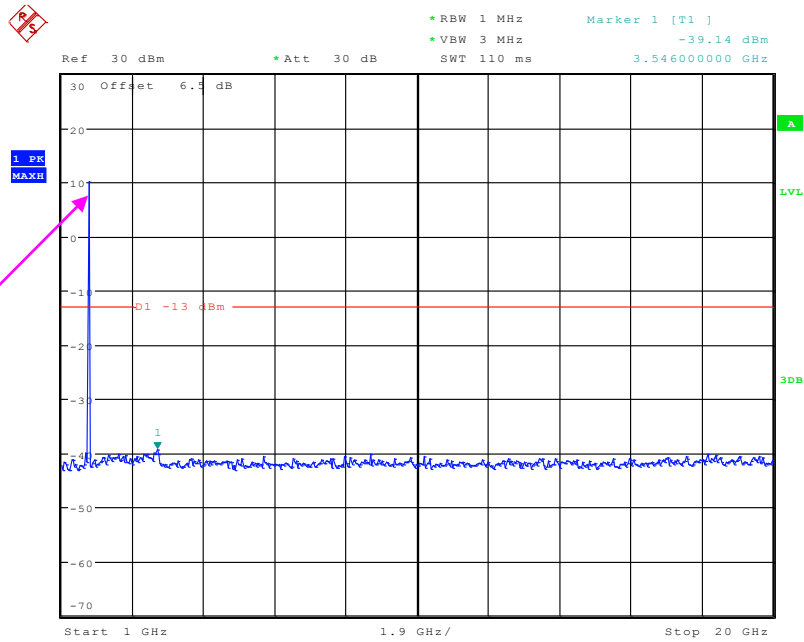
Date: 27.MAY.2020 10:22:57

30 MHz - 1 GHz (5.0 MHz, Middle Channel)



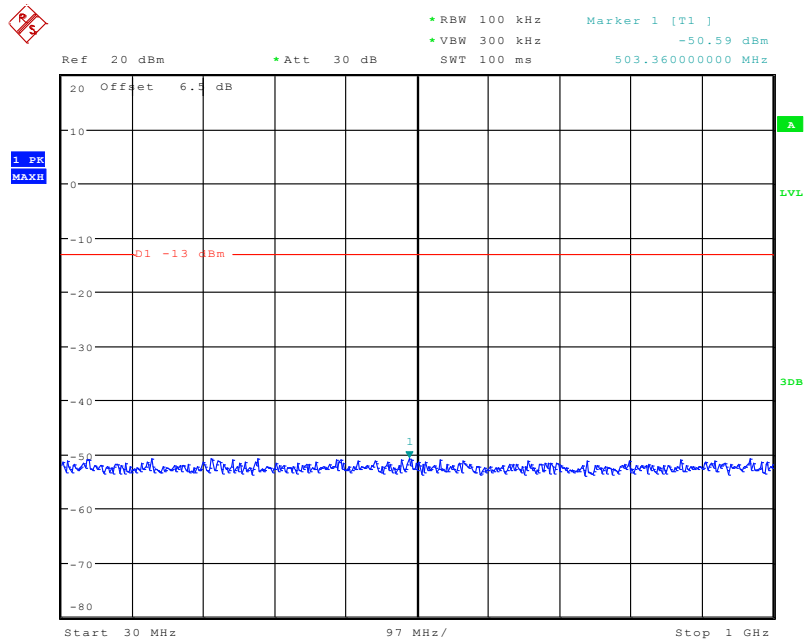
Date: 27.MAY.2020 10:23:17

1 GHz – 20 GHz (5.0 MHz, Middle Channel)



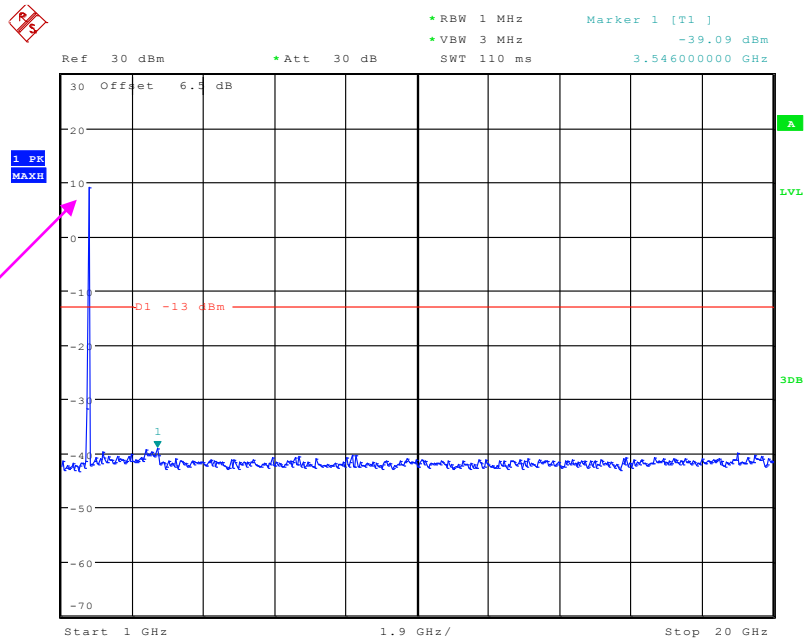
Date: 27.MAY.2020 10:23:27

30 MHz - 1 GHz (10.0 MHz, Middle Channel)



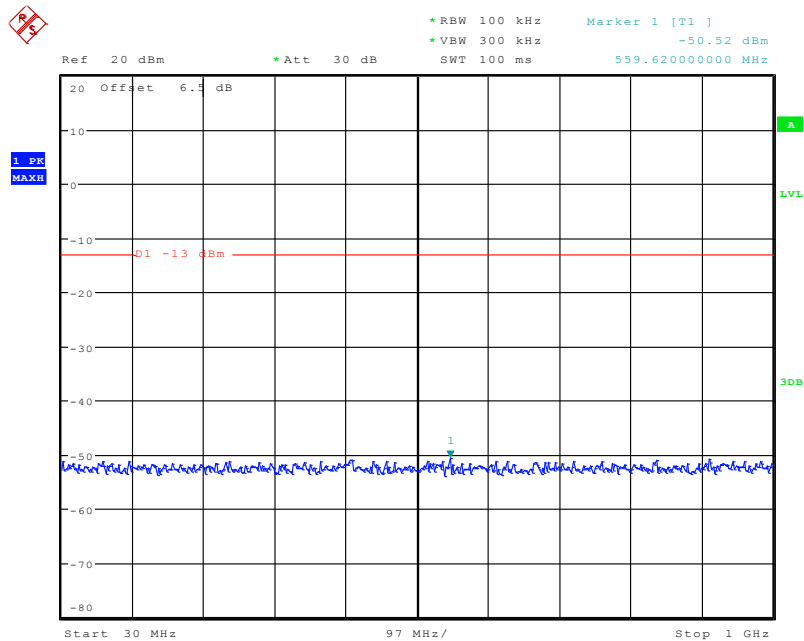
Date: 27.MAY.2020 10:23:45

1 GHz – 20 GHz (10.0 MHz, Middle Channel)



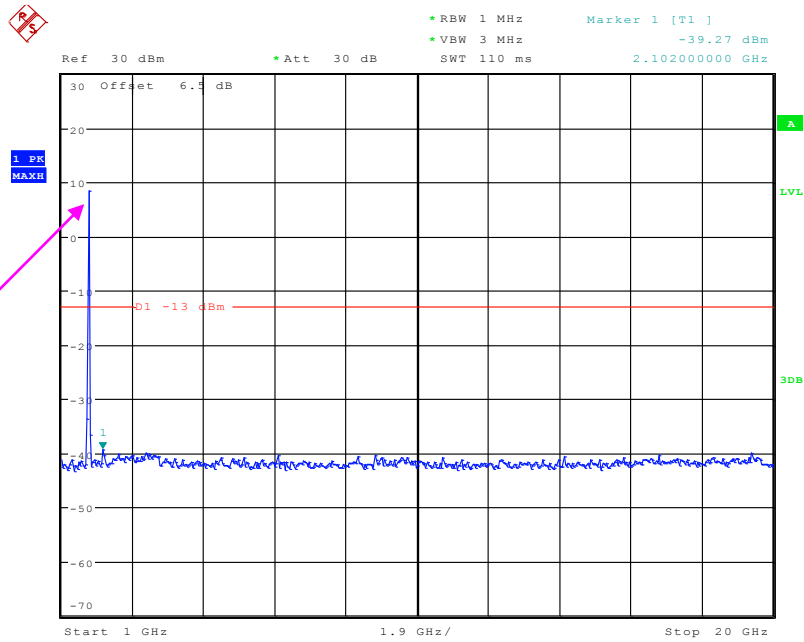
Date: 27.MAY.2020 10:23:56

30 MHz - 1 GHz (15.0 MHz, Middle Channel)



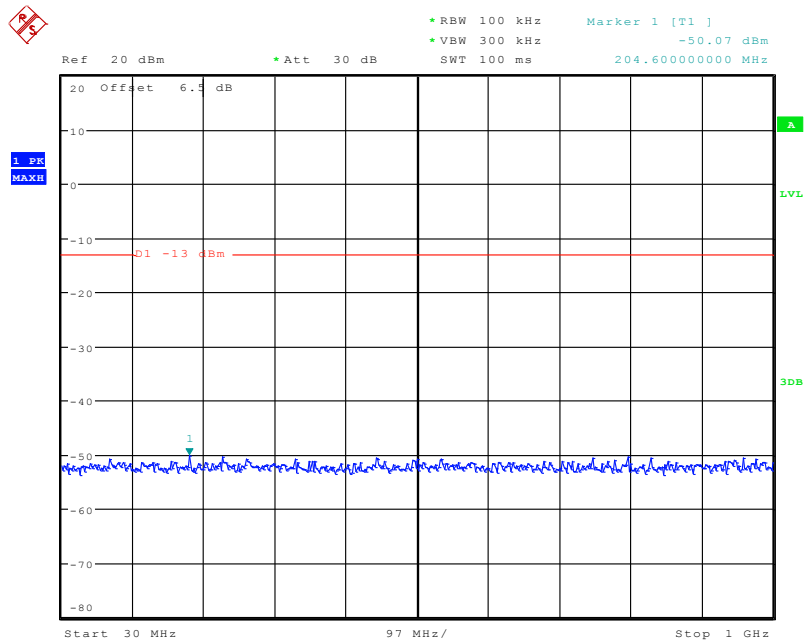
Date: 27.MAY.2020 10:24:17

1 GHz – 20 GHz (15.0 MHz, Middle Channel)

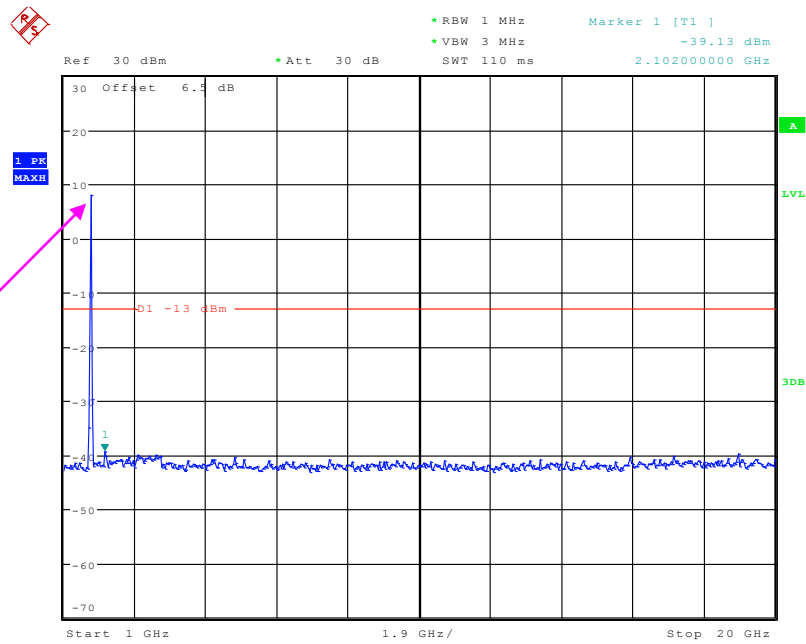


Date: 27.MAY.2020 10:24:27

30 MHz - 1 GHz (20.0 MHz, Middle Channel)

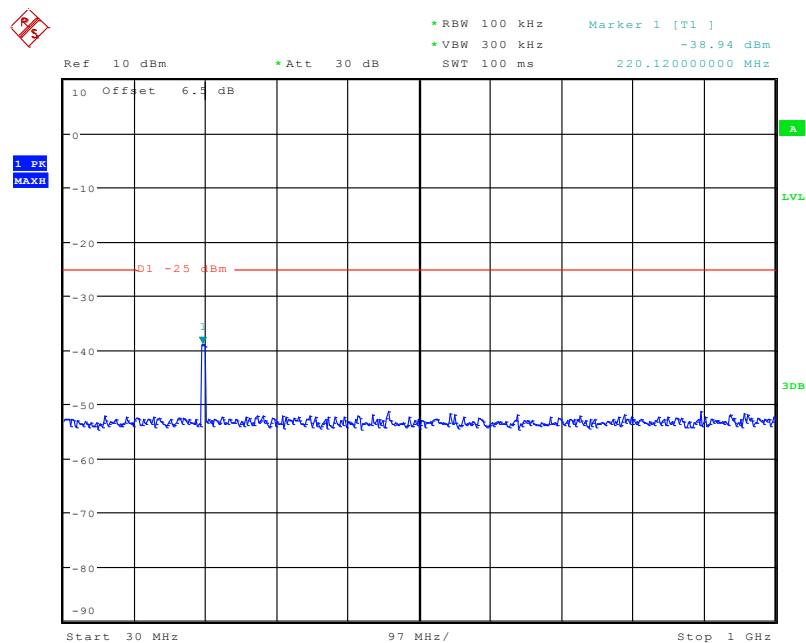


Date: 27.MAY.2020 10:24:53

1 GHz – 20 GHz (20.0 MHz, Middle Channel)

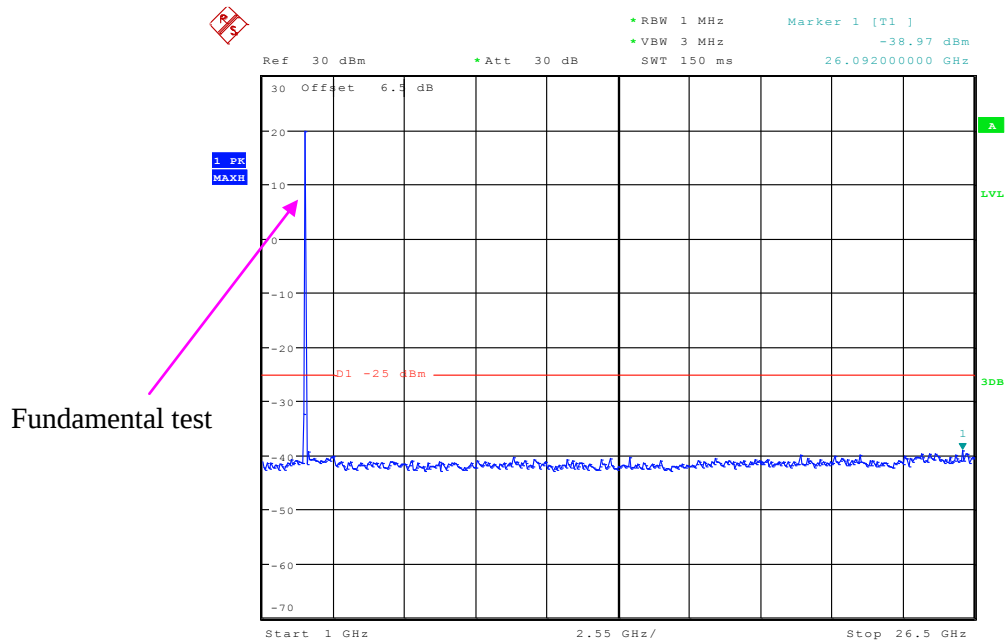
Fundamental test

Date: 27.MAY.2020 10:25:03

LTE Band 7:**30 MHz – 1 GHz (5.0 MHz, Middle Channel)**

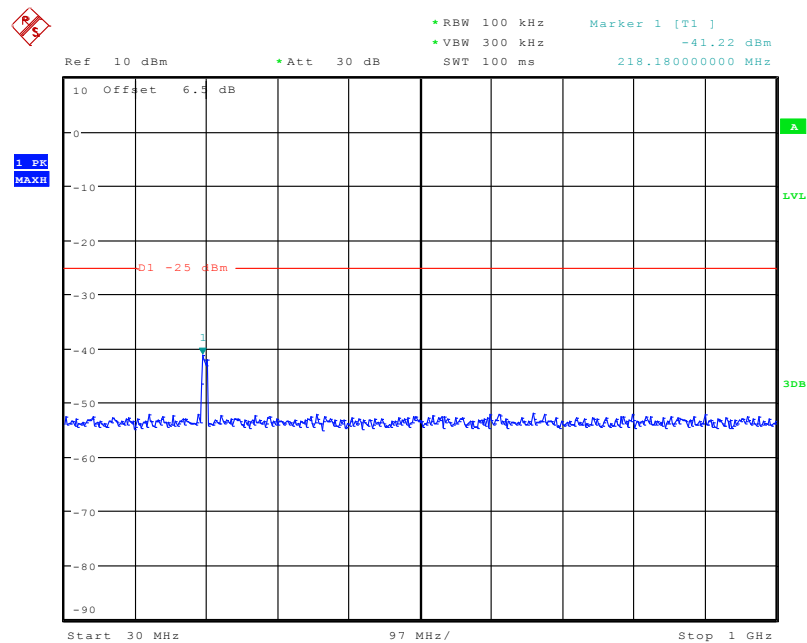
Date: 27.MAY.2020 10:25:26

1 GHz – 26.5 GHz (5.0 MHz, Middle Channel)



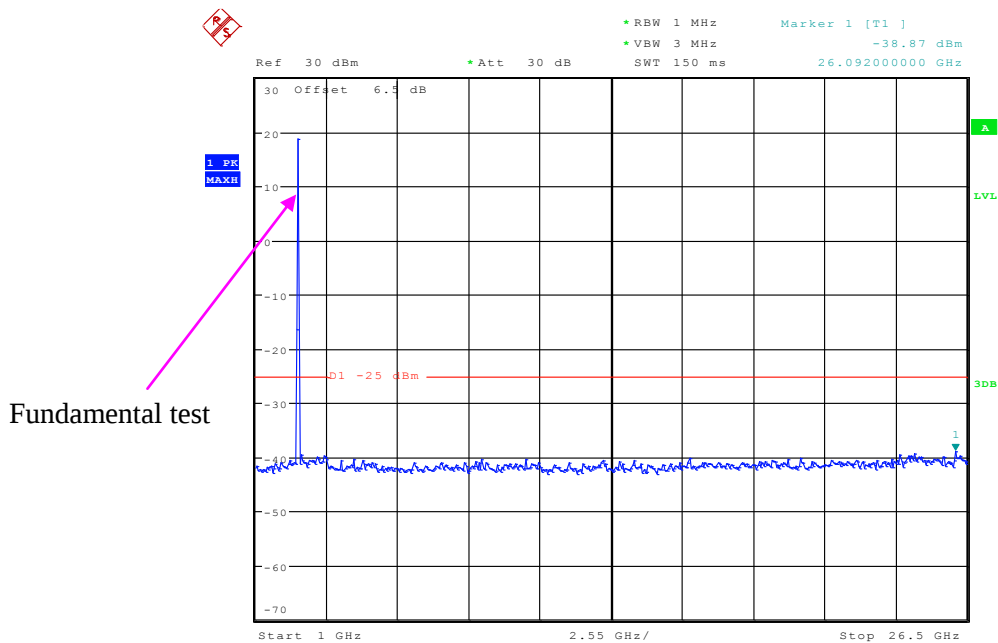
Date: 27.MAY.2020 10:25:36

30 MHz – 1.0 GHz (10.0 MHz, Middle Channel)



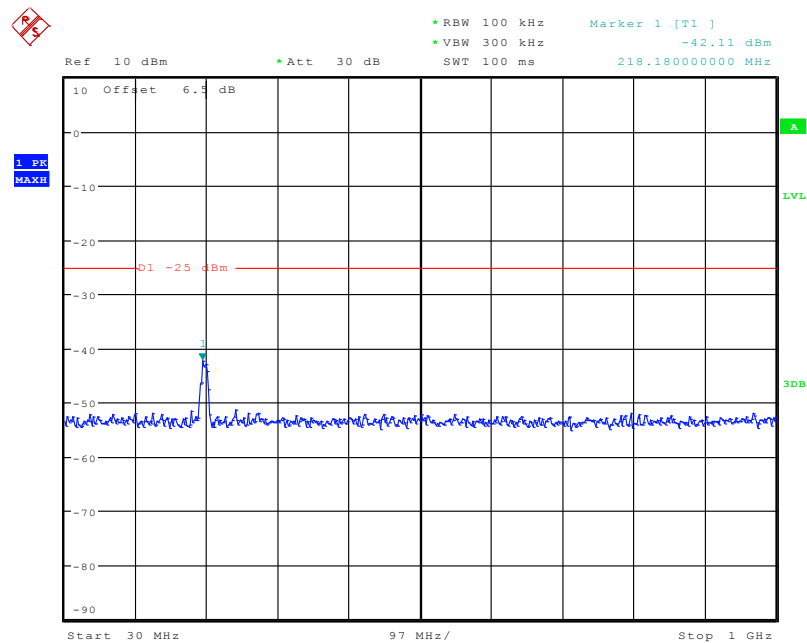
Date: 27.MAY.2020 10:25:55

1 GHz – 26.5 GHz (10.0 MHz, Middle Channel)



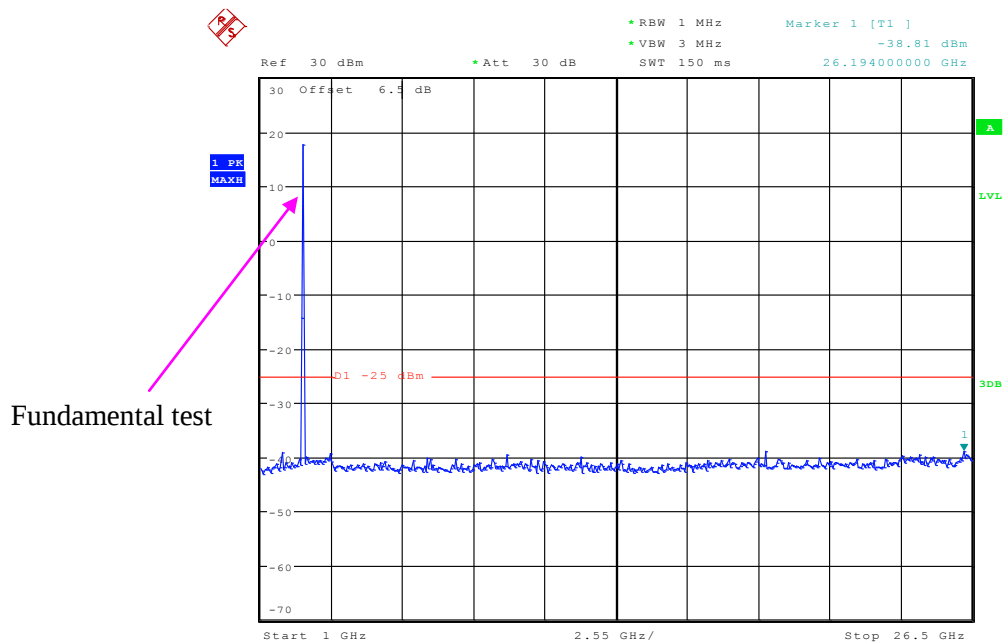
Date: 27.MAY.2020 10:26:06

30 MHz – 1 GHz (15.0 MHz, Middle Channel)



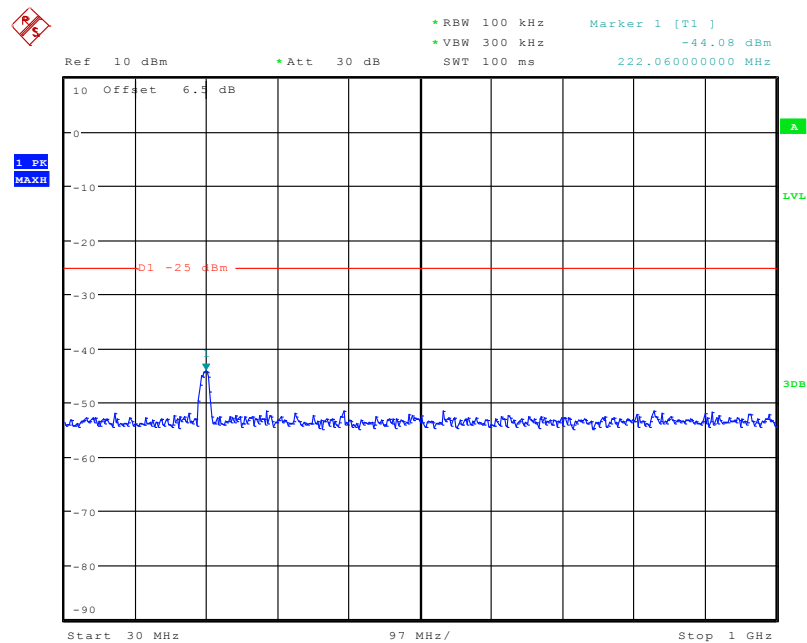
Date: 27.MAY.2020 10:26:28

1 GHz – 26.5 GHz (15.0 MHz, Middle Channel)



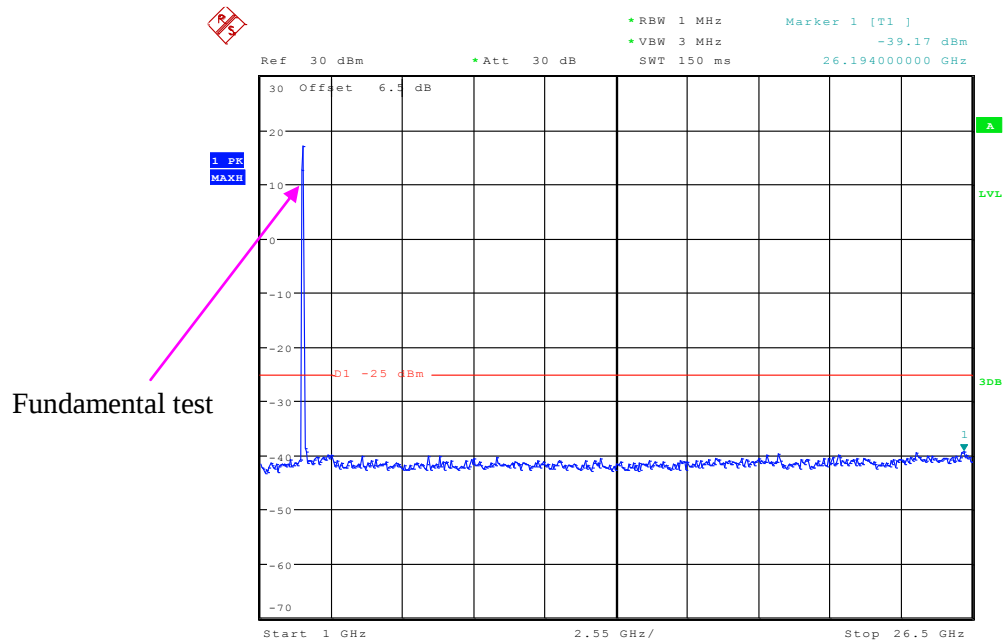
Date: 27.MAY.2020 10:26:39

30 MHz – 1 GHz (20.0 MHz, Middle Channel)



Date: 27.MAY.2020 10:27:01

1 GHz – 26.5 GHz (20.0 MHz, Middle Channel)



Date: 27.MAY.2020 10:27:12

FCC § 2.1053; § 22.917 (a); § 24.238 (a); § 27.53 SPURIOUS RADIATED EMISSIONS

Applicable Standard

FCC § 2.1053, § 22.917(a) and § 24.238(a) and § 27.53

Test Procedure

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

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the receiving 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.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Harris He on 2020-05-26 for below 1GHz and Leven Gan on 2020-05-26 for above 1GHz.

EUT operation mode: Transmitting

Pre-scan with Low, Middle and High channel, the worst case as below:

30 MHz ~ 10 GHz:

Cellular Band (Part 22H)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		Limit (dBm)	Margin (dB)
GSM Mode, middle channel										
957.6	37.42	348	2.1	H	-63.2	1.37	0.0	-64.57	-13	51.57
957.6	38.21	162	2.2	V	-61.1	1.37	0.0	-62.47	-13	49.47
1673.20	57.13	138	2.1	H	-49.2	1.30	8.90	-41.60	-13	28.60
1673.20	54.05	106	1.6	V	-51.7	1.30	8.90	-44.10	-13	31.10
2509.80	55.01	19	2.1	H	-48.3	2.60	10.20	-40.70	-13	27.70
2509.80	56.59	308	1.9	V	-46.2	2.60	10.20	-38.60	-13	25.60
3346.40	53.99	183	1.8	H	-46.9	1.50	11.70	-36.70	-13	23.70
3346.40	53.07	103	1.8	V	-47.9	1.50	11.70	-37.70	-13	24.70
4183.00	47.17	348	1.8	H	-54.8	1.50	11.80	-44.50	-13	31.50
4183.00	49.54	139	2.2	V	-51.6	1.50	11.80	-41.30	-13	28.30
5019.60	42.53	106	2.0	H	-56.3	1.70	12.00	-46.00	-13	33.00
5019.60	44.12	351	2.4	V	-54.1	1.70	12.00	-43.80	-13	30.80
WCDMA Mode, Middle channel										
965.7	37.38	354	1.3	H	-63.2	1.37	0.0	-64.57	-13	51.57
965.7	38.26	126	2.2	V	-61.1	1.37	0.0	-62.47	-13	49.47
1673.20	44.38	134	1.4	H	-62.0	1.30	8.90	-54.40	-13	41.40
1673.20	43.41	96	1.8	H	-62.9	1.30	8.90	-55.30	-13	42.30
1673.20	44.45	89	2.2	V	-61.3	1.30	8.90	-53.70	-13	40.70
2509.80	43.24	138	1.7	H	-60.1	2.60	10.20	-52.50	-13	39.50
2509.80	44.78	347	2.5	V	-58.0	2.60	10.20	-50.40	-13	37.40
3346.40	48.98	95	1.3	H	-51.9	1.50	11.70	-41.70	-13	28.70
3346.40	53.36	207	1.5	V	-47.6	1.50	11.70	-37.40	-13	24.40

30 MHz ~ 20 GHz:**PCS Band (Part 24E)**

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 24E	
			Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)		Limit (dBm)	Margin (dB)
GSM Mode, middle channel										
960.4	37.82	223	2.3	H	-62.8	1.37	0.0	-64.17	-13	51.17
960.4	38.57	283	1.8	V	-60.8	1.37	0.0	-62.17	-13	49.17
3760.00	45.91	66	1.0	H	-56.1	1.50	11.80	-45.80	-13	32.80
3760.00	46.01	226	1.8	V	-55.6	1.50	11.80	-45.30	-13	32.30
5640.00	47.43	10	1.4	H	-52.3	1.70	12.40	-41.60	-13	28.60
5640.00	47.74	231	1.7	V	-51.6	1.70	12.40	-40.90	-13	27.90
7520.00	43.37	239	2.0	H	-52.6	1.90	10.70	-43.80	-13	30.80
7520.00	43.54	218	1.5	V	-52.0	1.90	10.70	-43.20	-13	30.20
WCDMA Mode Band II, Middle channel										
956.4	37.66	228	1.1	H	-62.9	1.37	0.0	-64.27	-13	51.27
956.4	38.92	181	1.7	V	-60.4	1.37	0.0	-61.77	-13	48.77
3760.00	50.29	108	2.0	H	-51.8	1.50	11.80	-41.50	-13	28.50
3760.00	50.70	285	1.4	V	-50.9	1.50	11.80	-40.60	-13	27.60

LTE Band: (Pre-scan with all the bandwidths, and worse case is lowest bandwidth QPSK mode as below)

Frequency	Receiver	Turntable	Rx Antenna		Substituted			Absolute Level	Limit	Margin
(MHz)	Reading (dBμV)	Angle Degree	Height (m)	Polar (H/V)	Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)	(dBm)	(dBm)	(dB)
Band 2, Middle channel										
Test frequency range:30 MHz ~ 20 GHz										
958.6	37.59	133	2.5	H	-63.0	1.37	0.0	-64.37	-13	51.37
958.6	38.28	113	2.0	V	-61.1	1.37	0.0	-62.47	-13	49.47
3760.00	49.94	26	1.1	H	-52.1	1.50	11.80	-41.80	-13	28.80
3760.00	46.84	6	1.4	V	-54.7	1.50	11.80	-44.40	-13	31.40
Band 4, Middle channel										
Test frequency range:30 MHz ~ 20 GHz										
962.2	36.56	182	1.6	H	-64.0	1.37	0.0	-65.37	-13	52.37
962.2	38.17	102	1.2	V	-61.2	1.37	0.0	-62.57	-13	49.57
3465.00	43.16	328	1.2	H	-57.6	1.50	12.00	-47.10	-13	34.10
3465.00	43.84	23	1.4	V	-57.7	1.50	12.00	-47.20	-13	34.20
Band 7, Middle channel										
Test frequency range:30 MHz ~ 26.5 GHz										
963.5	37.34	167	1.9	H	-63.3	1.37	0.0	-64.67	-25	39.67
963.5	38.79	148	1.9	V	-60.6	1.37	0.0	-61.97	-25	36.97
5070.00	47.11	136	1.7	H	-52.9	1.60	12.10	-42.40	-25	17.40
5070.00	48.57	83	1.5	V	-51.4	1.60	12.10	-40.90	-25	15.90

Note:

Absolute Level = Substituted Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

dBd is for the ERP, dBi is for EIRP.

FCC § 22.917 (a); § 24.238 (a); §27.53 (h)(m) - BAND EDGES**Applicable Standard**

According to § 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

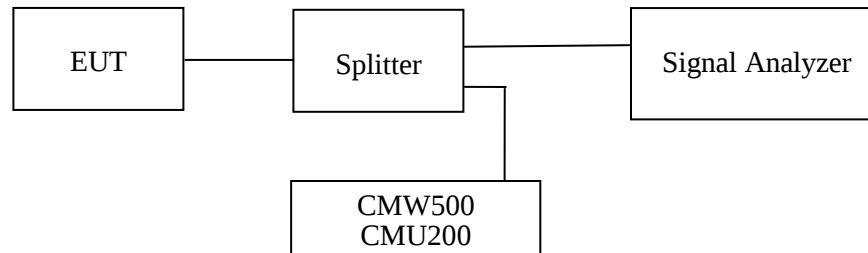
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to FCC §27.53 (h)(m), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

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 Data****Environmental Conditions**

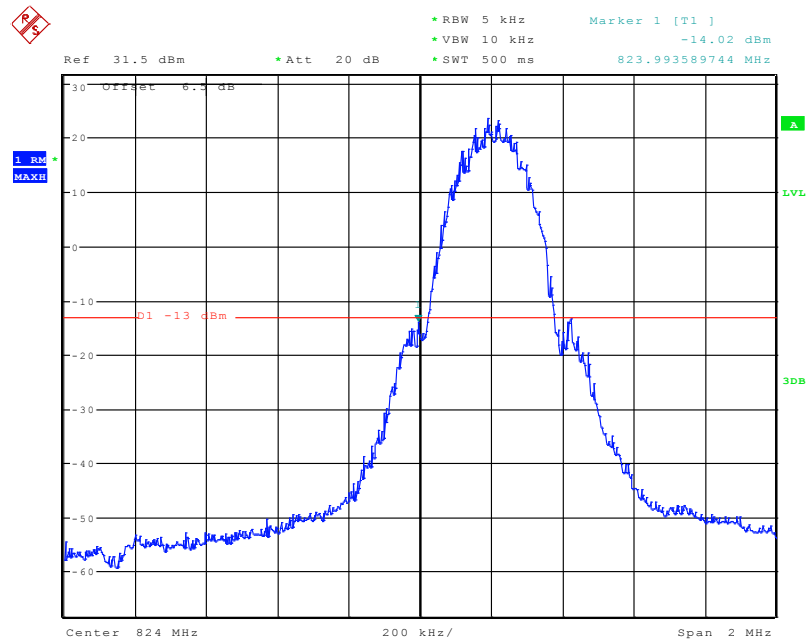
Temperature:	25 °C
Relative Humidity:	56%
ATM Pressure:	101.0 kPa

The testing was performed by Alan He from 2020-05-27 to 2020-07-02.

EUT operation mode: Transmitting

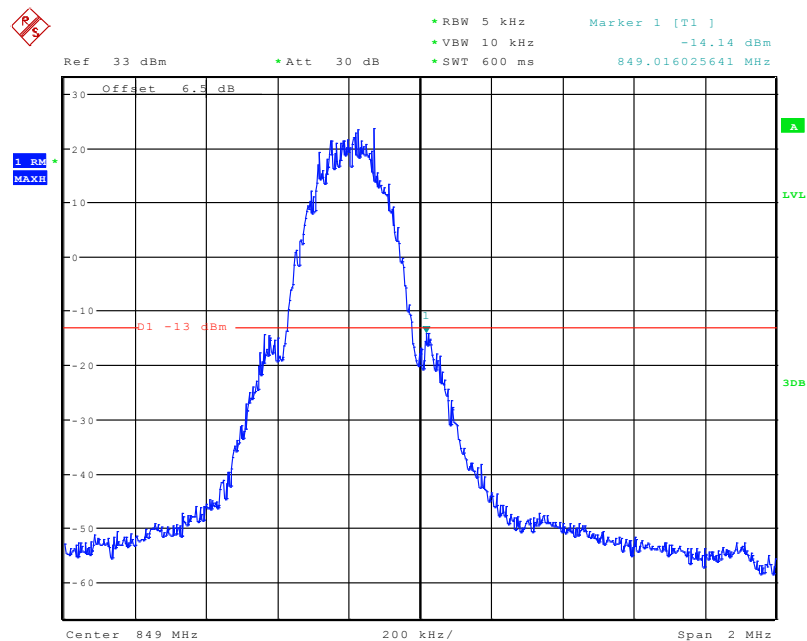
Test Result: Compliance. Please refer to the following plots.

Cellular Band, Left Band Edge for GSM (GMSK) Mode



Date: 26.MAY.2020 13:35:58

Cellular Band, Right Band Edge for GSM (GMSK) Mode



Date: 26.MAY.2020 13:38:59

Ref 36.5 dBm * Att 30 dB SWT 80 ms Marker 1 [T1] -18.11 dBm 823.974358974 MHz

Offset 6.5 dB

1 dBm MAX

01 -13 dBm

Center 824 MHz 200 kHz/ Span 2 MHz

Date: 26.MAY.2020 13:21:01

Ref 36.5 dBm Att 30 dB RBW 5 kHz VBW 10 kHz SWT 80 ms

Marker 1 [T1] -16.47 dBm 849.012820513 MHz

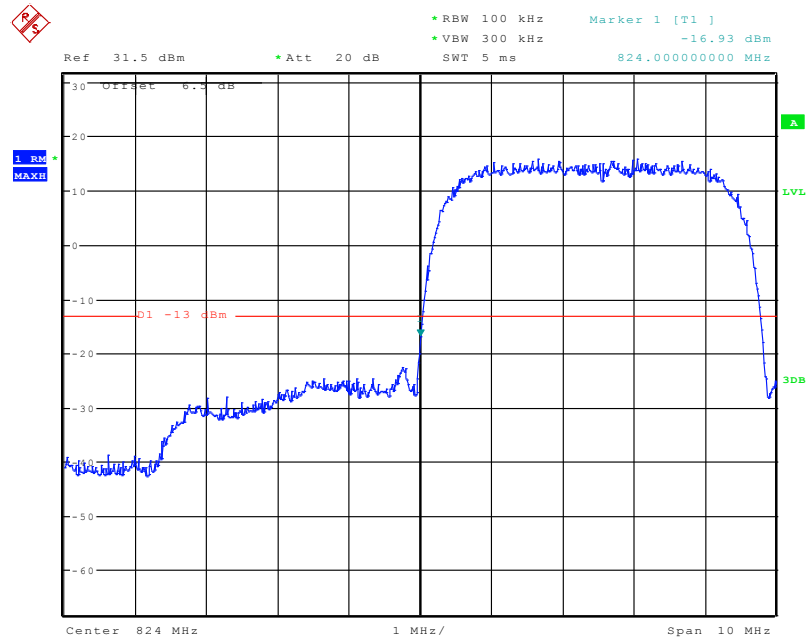
Offset 6.5 dB

1 dB MAX

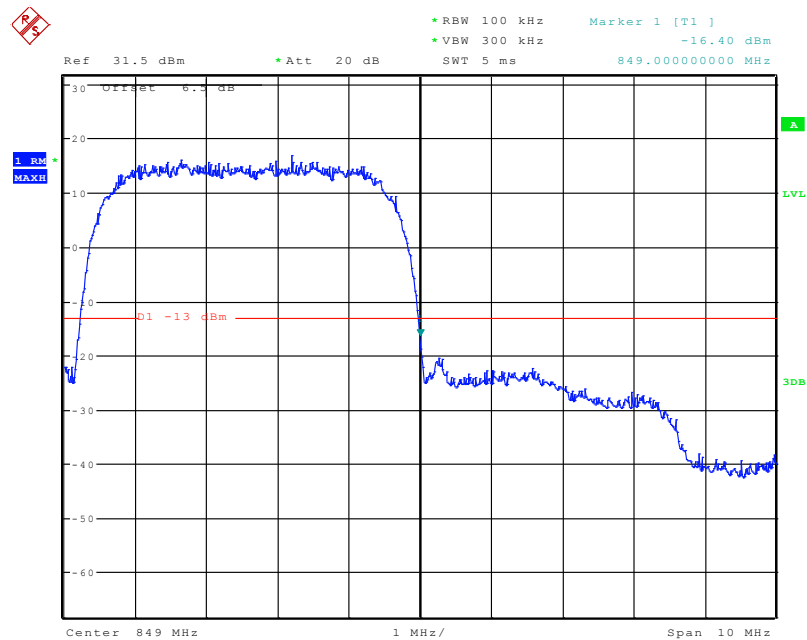
01 -13 dBm

Center 849 MHz Span 2 MHz

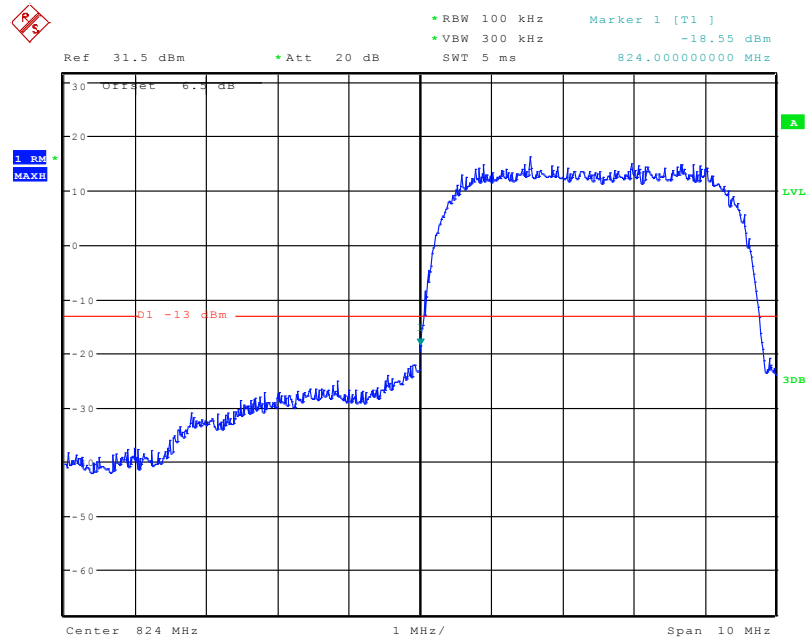
Date: 26.MAY.2020 13:22:07

Cellular Band, Left Band Edge for WCDMA (BPSK) Mode

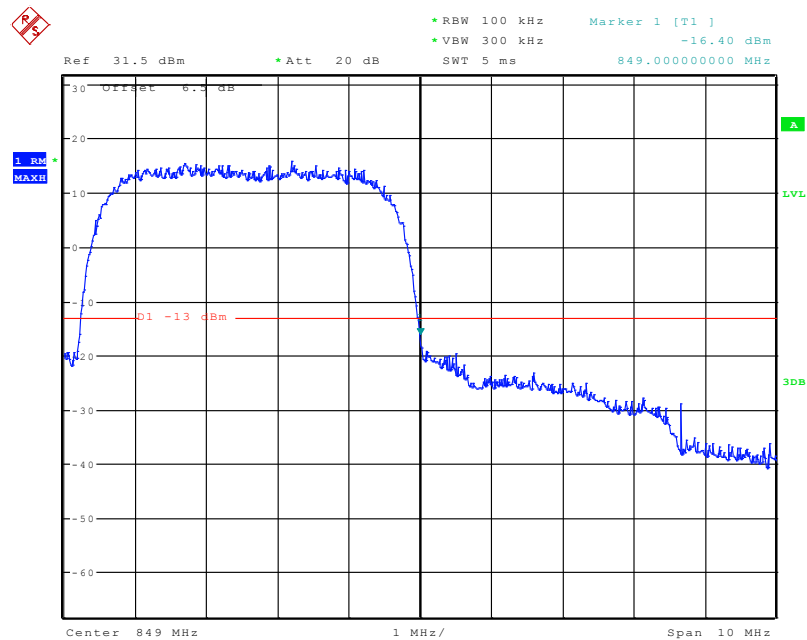
Date: 26.MAY.2020 16:12:30

Cellular Band, Right Band Edge for WCDMA (BPSK) Mode

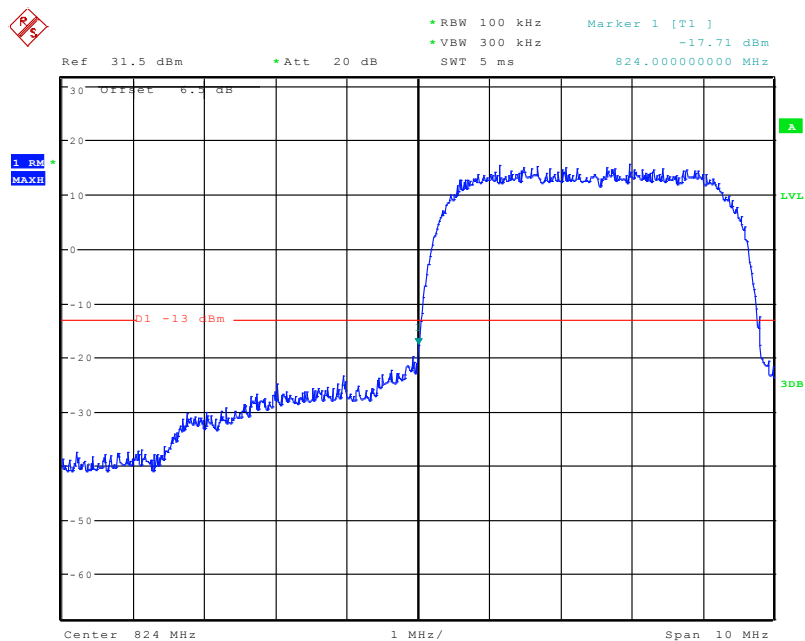
Date: 26.MAY.2020 16:13:33

Cellular Band, Left Band Edge for HSDPA (16QAM) Mode

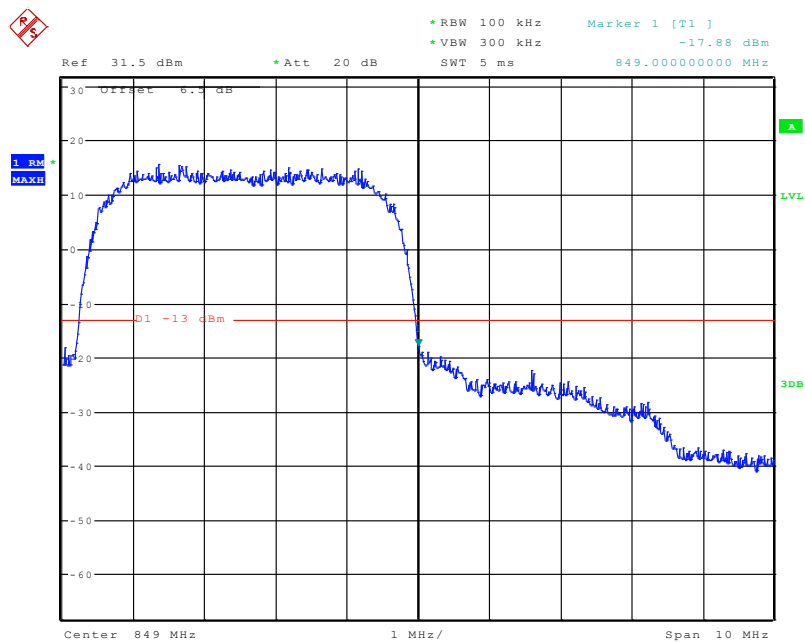
Date: 26.MAY.2020 16:21:40

Cellular Band, Right Band Edge for HSDPA (16QAM) Mode

Date: 26.MAY.2020 16:22:34

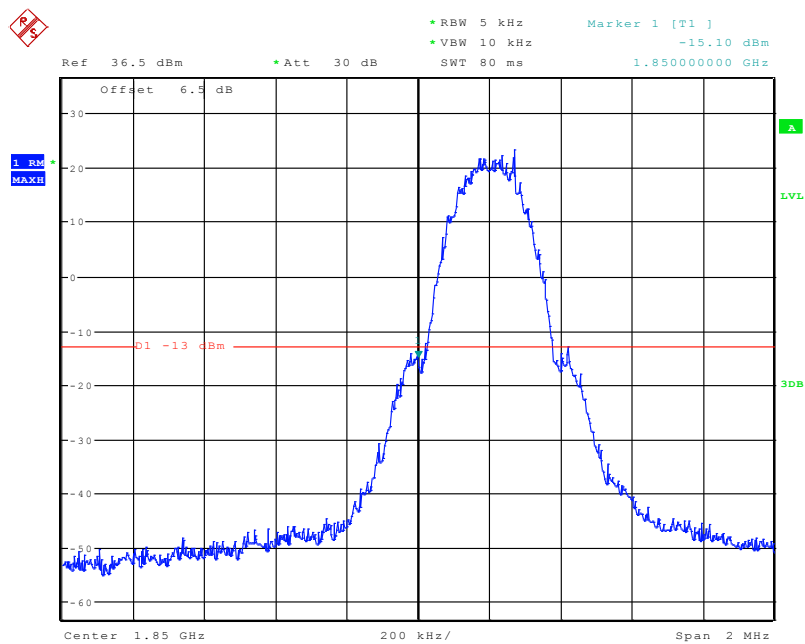
Cellular Band, Left Band Edge for HSUPA (BPSK) Mode

Date: 26.MAY.2020 16:18:14

Cellular Band, Right Band Edge for HSUPA (BPSK) Mode

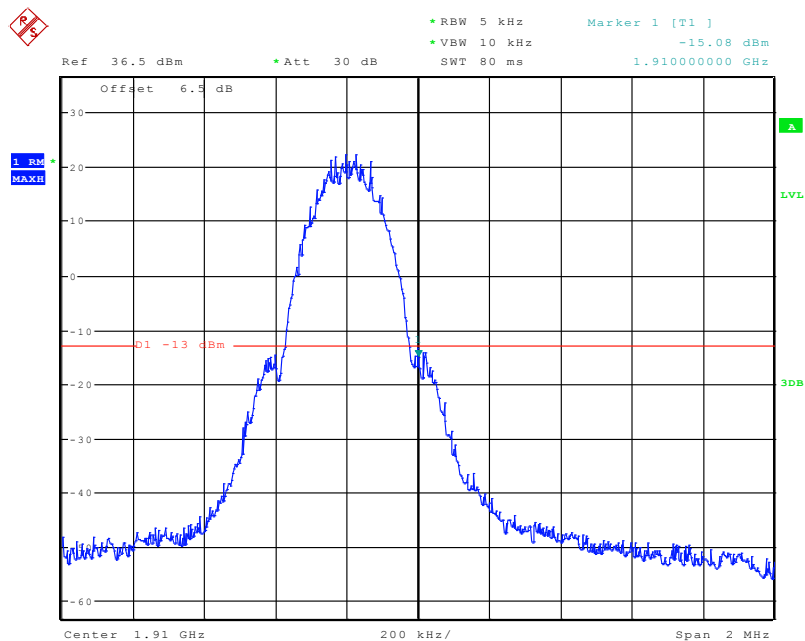
Date: 26.MAY.2020 16:17:27

PCS Band, Left Band Edge for GSM (GMSK) Mode



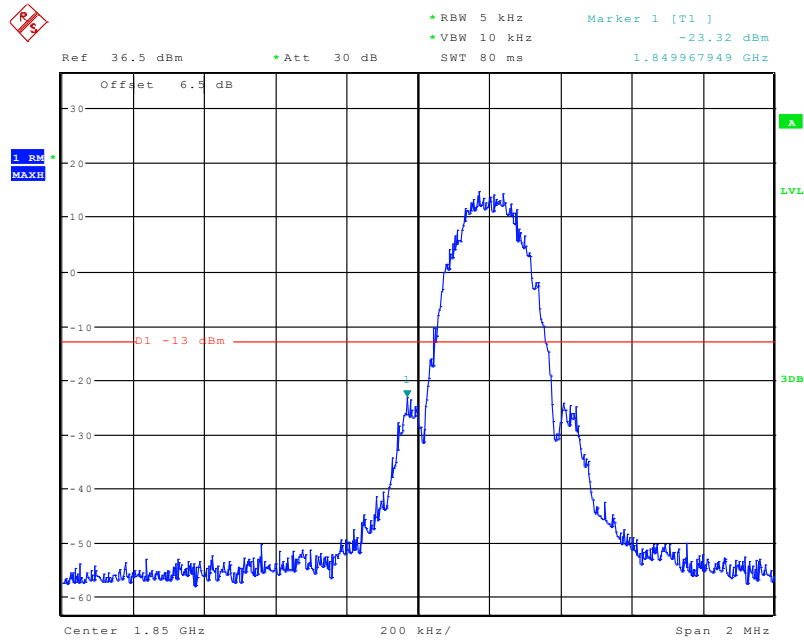
Date: 26.MAY.2020 13:29:48

PCS Band, Right Band Edge for GSM (GMSK) Mode



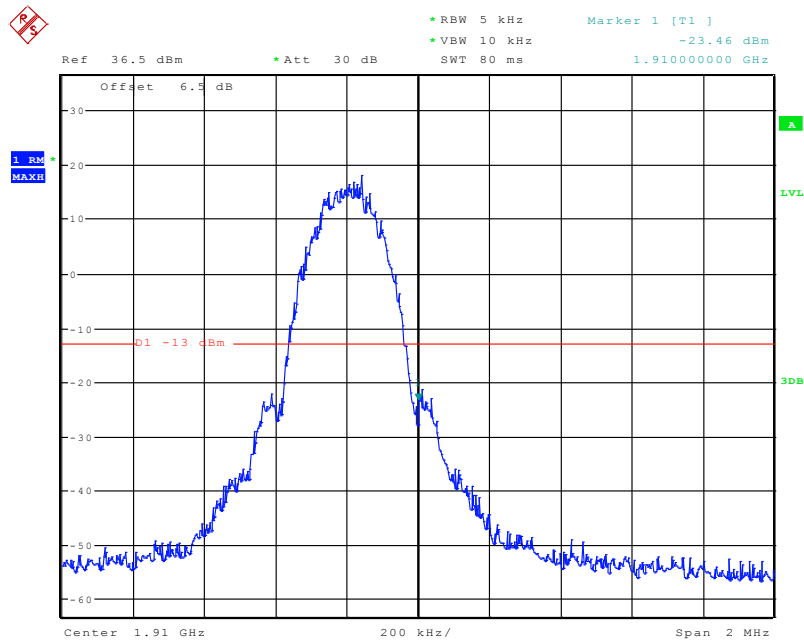
Date: 26.MAY.2020 13:30:50

PCS Band, Left Band Edge for EDGE Mode



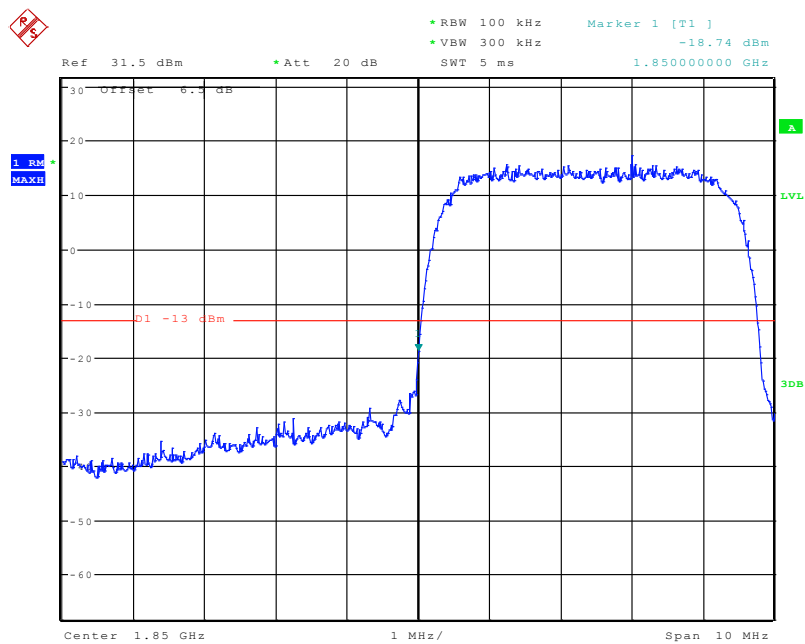
Date: 26.MAY.2020 13:24:45

PCS Band, Right Band Edge for EDGE Mode



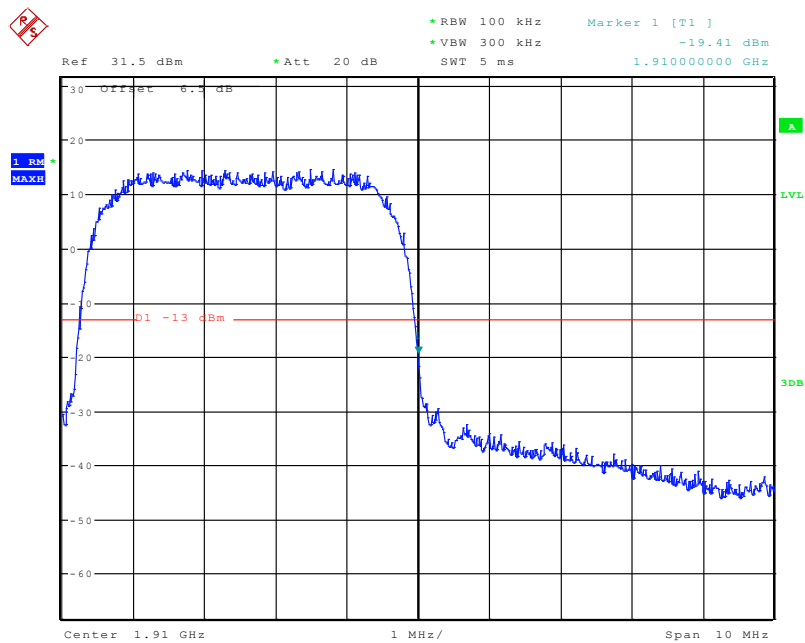
Date: 26.MAY.2020 13:26:01

PCS Band, Left Band Edge for WCDMA (BPSK) Mode



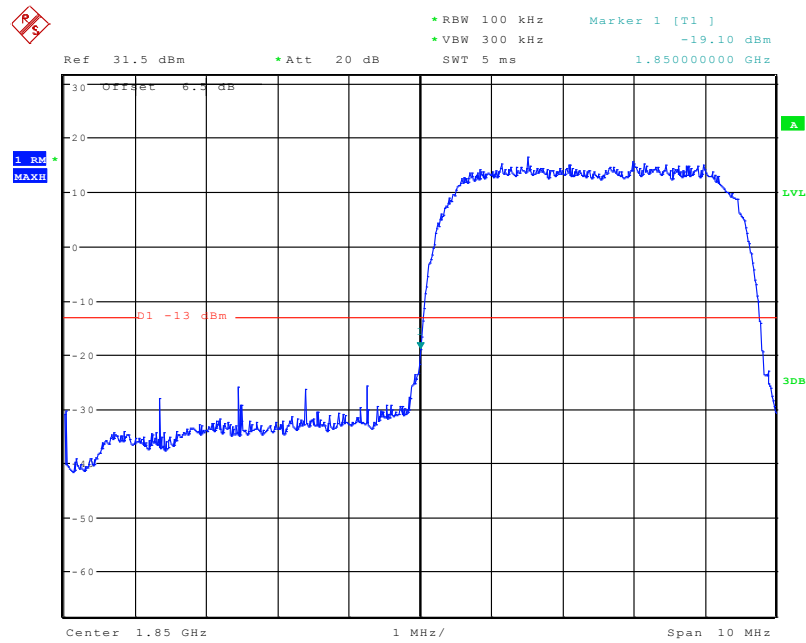
Date: 26.MAY.2020 16:14:20

PCS Band, Right Band Edge for WCDMA (BPSK) Mode



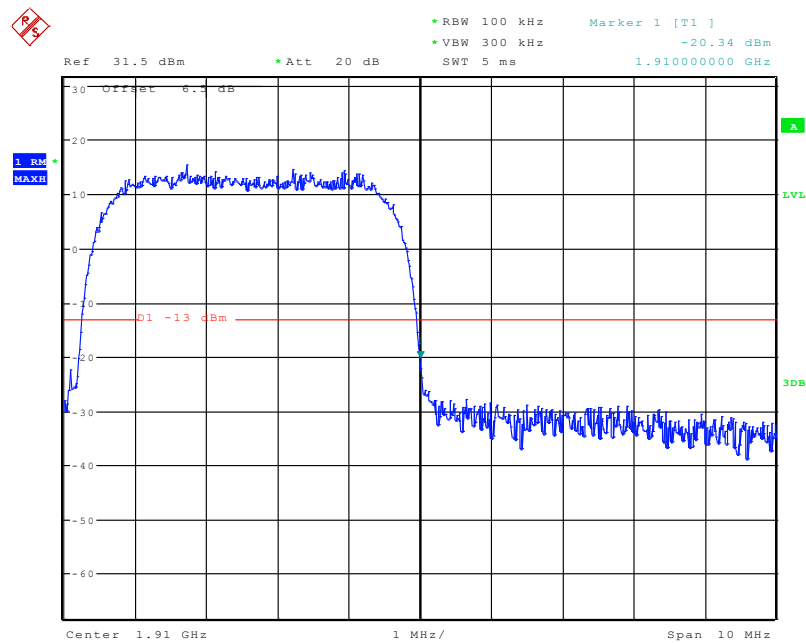
Date: 26.MAY.2020 16:14:51

PCS Band, Left Band Edge for HSDPA (16QAM) Mode



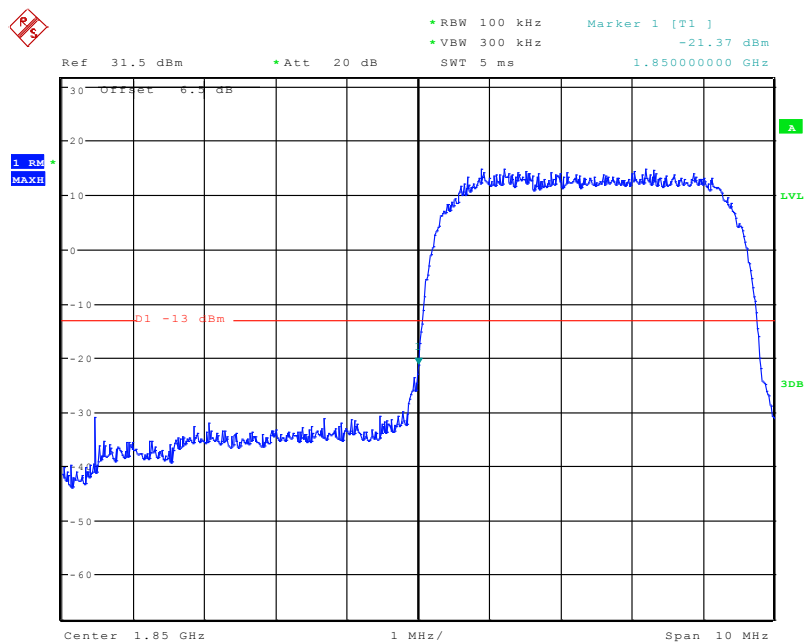
Date: 26.MAY.2020 16:25:05

PCS Band, Right Band Edge for HSDPA (16QAM) Mode



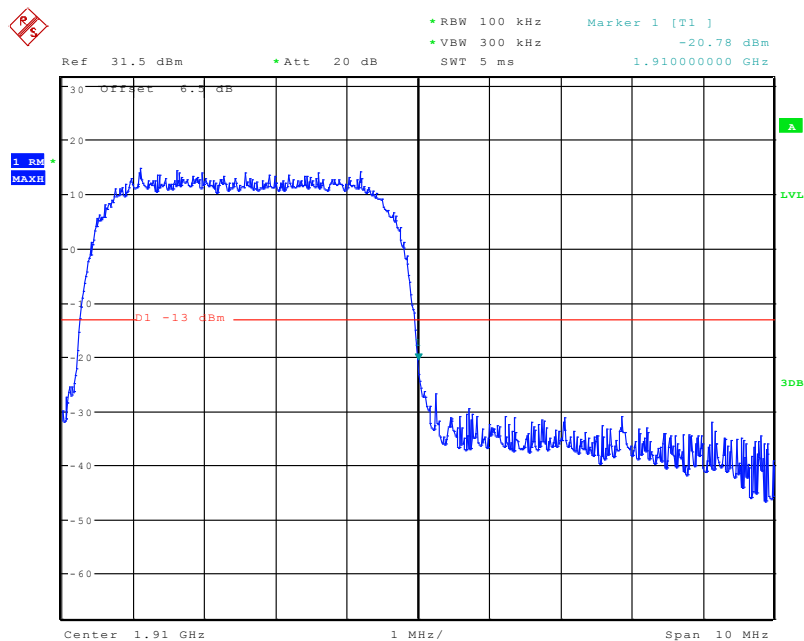
Date: 26.MAY.2020 16:26:15

PCS Band, Left Band Edge for HSUPA (BPSK) Mode

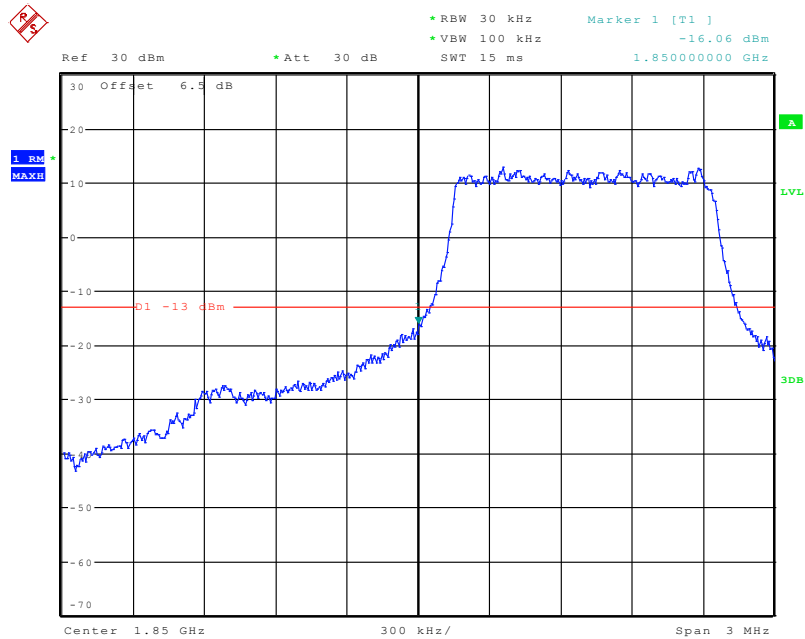


Date: 26.MAY.2020 16:16:21

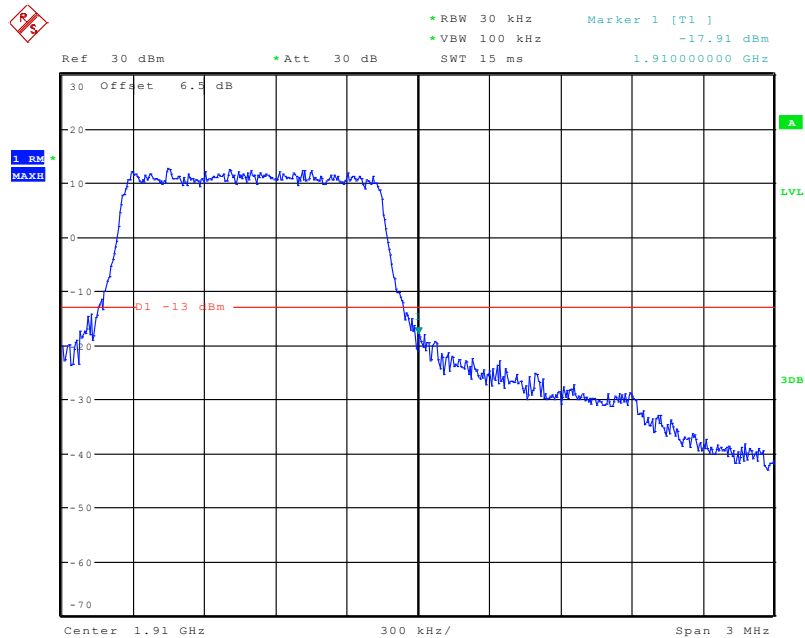
PCS Band, Right Band Edge for HSUPA (BPSK) Mode



Date: 26.MAY.2020 16:15:51

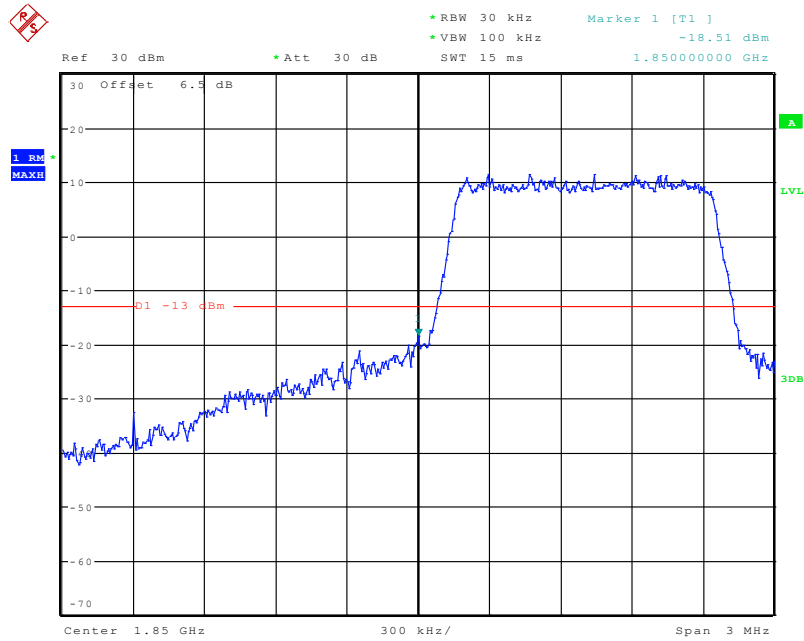
Band 2:**QPSK (1.4 MHz, FULL RB) - Left Band Edge**

Date: 27.MAY.2020 10:34:23

QPSK (1.4 MHz, FULL RB) - Right Band Edge

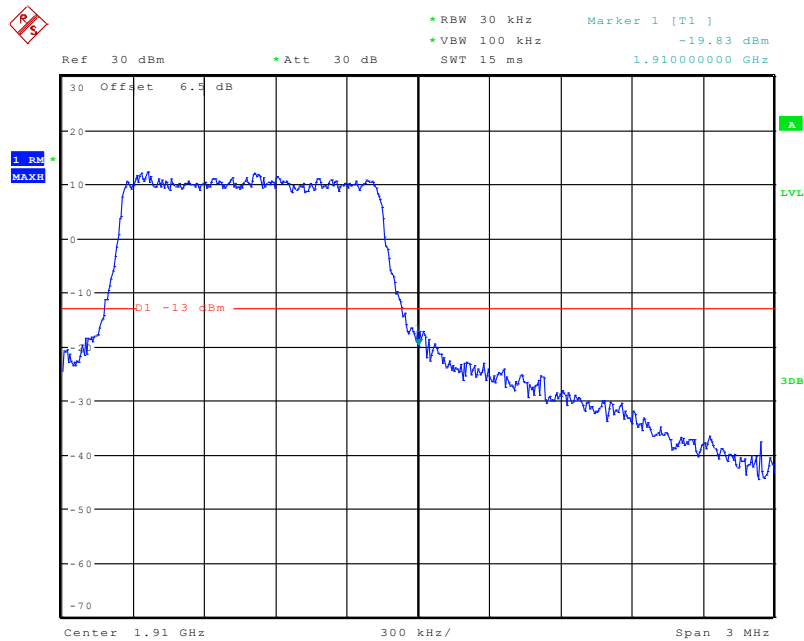
Date: 27.MAY.2020 10:59:12

16-QAM (1.4 MHz, FULL RB) - Left Band Edge



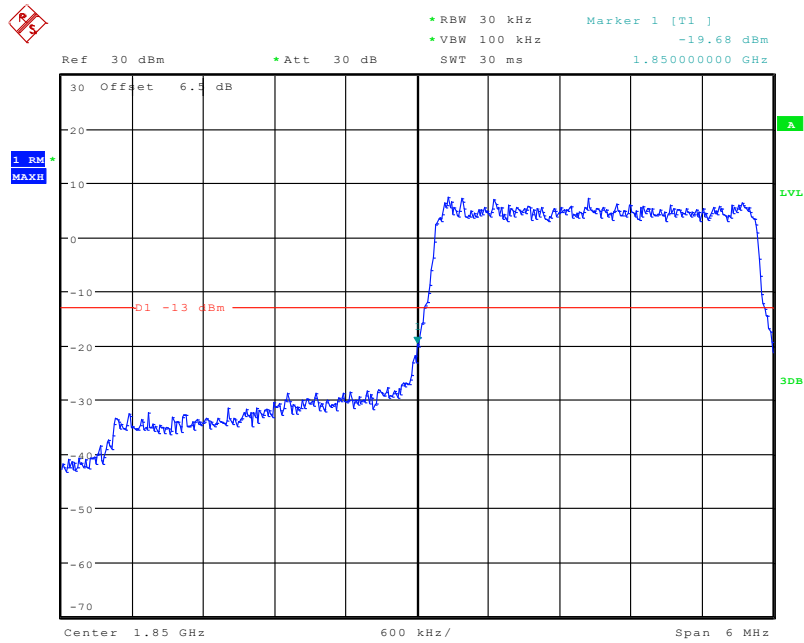
Date: 27.MAY.2020 10:57:37

16-QAM (1.4 MHz, FULL RB) - Right Band Edge



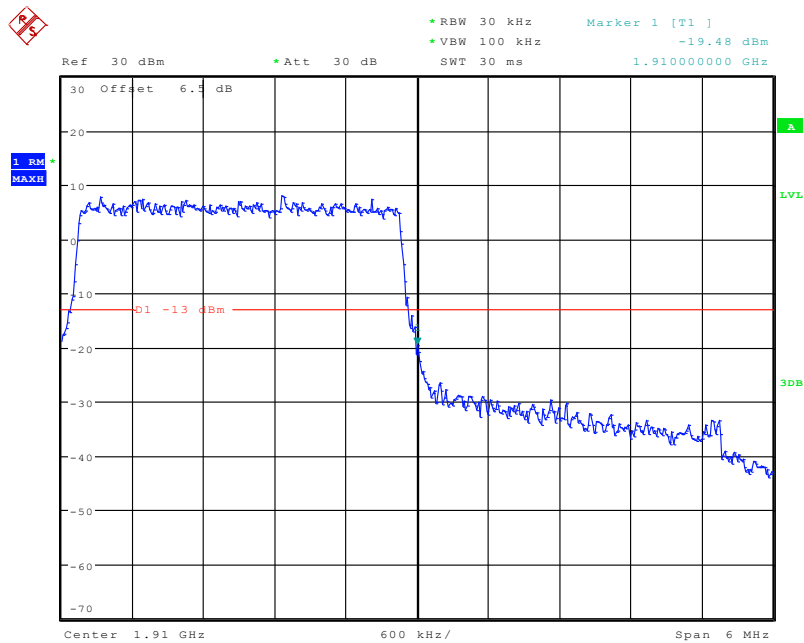
Date: 27.MAY.2020 11:00:47

QPSK (3.0 MHz, FULL RB) - Left Band Edge

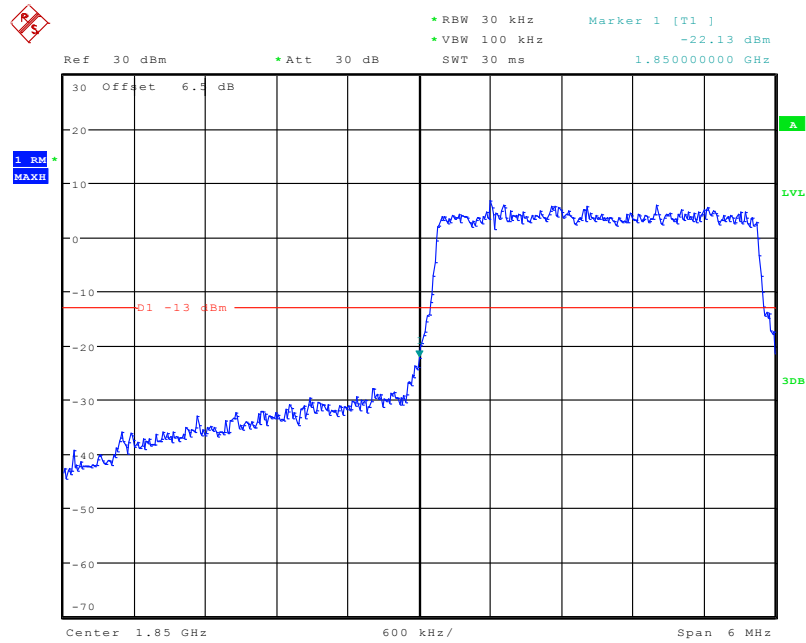


Date: 27.MAY.2020 09:57:47

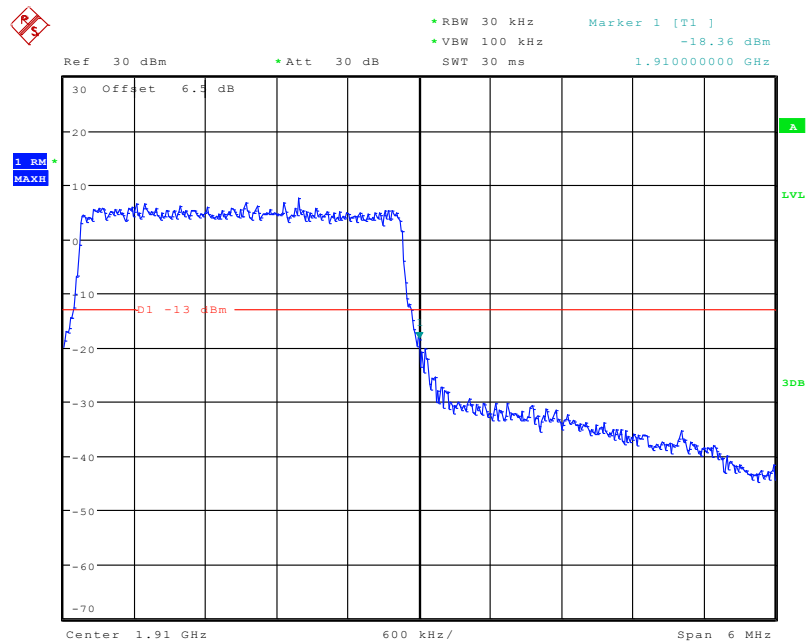
QPSK (3.0 MHz, FULL RB) - Right Band Edge



Date: 27.MAY.2020 09:58:22

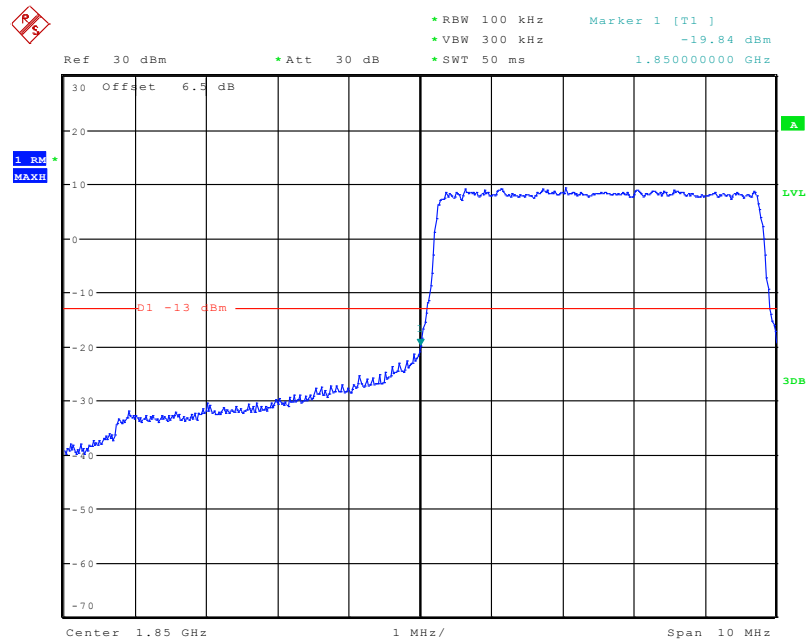
16-QAM (3.0 MHz, FULL RB) - Left Band Edge

Date: 27.MAY.2020 09:58:03

16-QAM (3.0 MHz, FULL RB) - Right Band Edge

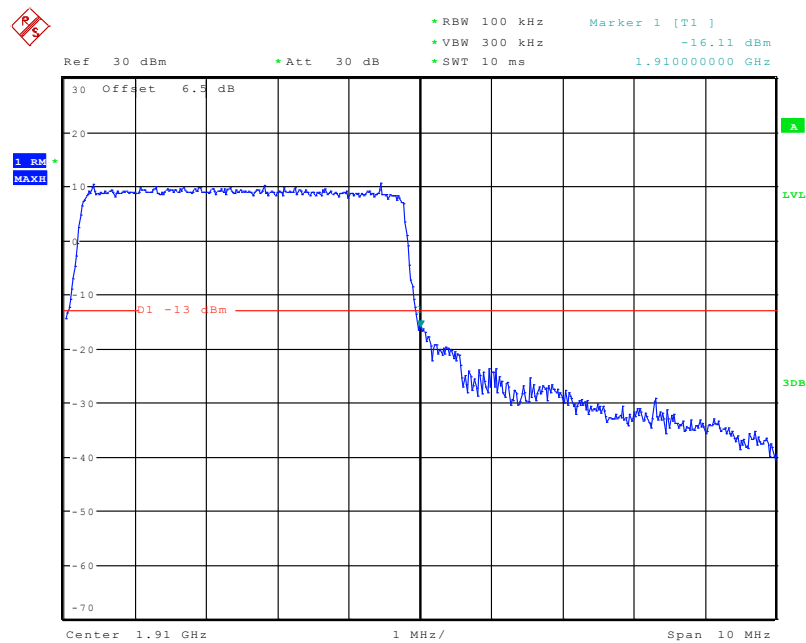
Date: 27.MAY.2020 09:58:38

QPSK (5.0 MHz, FULL RB) - Left Band Edge



Date: 19.JUN.2020 22:14:43

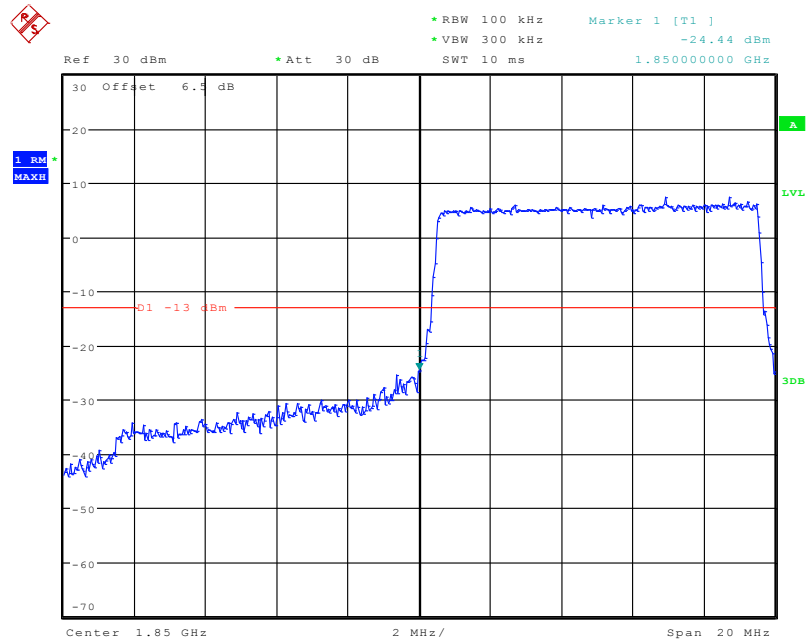
QPSK (5.0 MHz, FULL RB) - Right Band Edge



Date: 27.MAY.2020 11:12:13

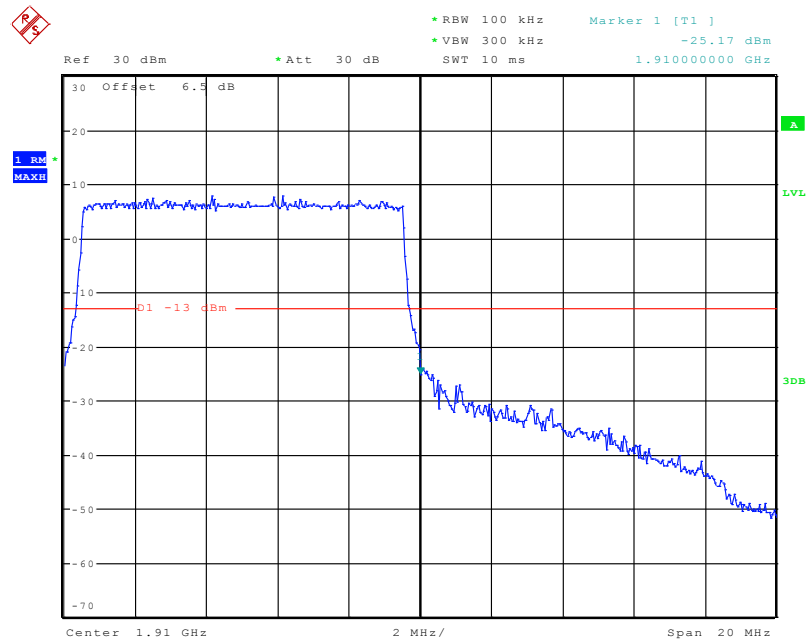


QPSK (10.0 MHz, FULL RB) - Left Band Edge



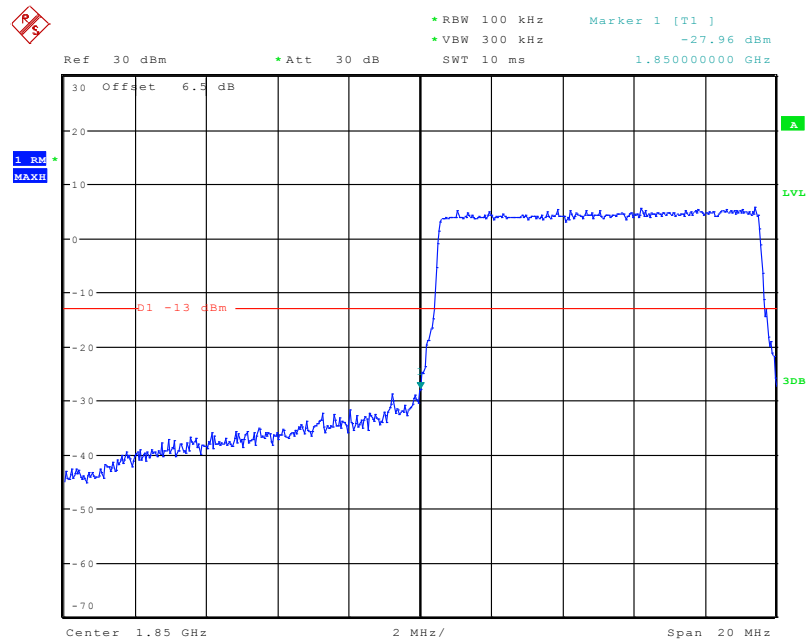
Date: 27.MAY.2020 10:00:23

QPSK (10.0 MHz, FULL RB) - Right Band Edge



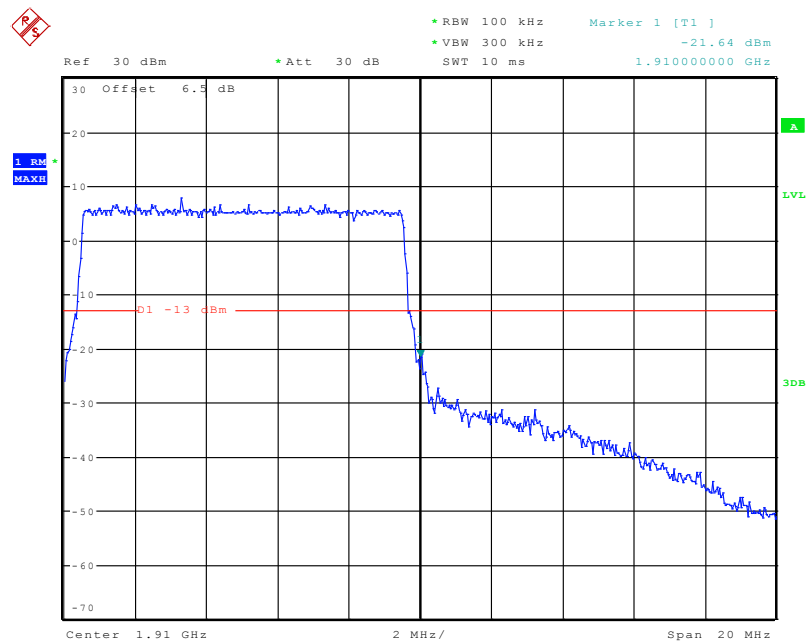
Date: 27.MAY.2020 11:16:01

16-QAM (10.0 MHz, FULL RB) - Left Band Edge



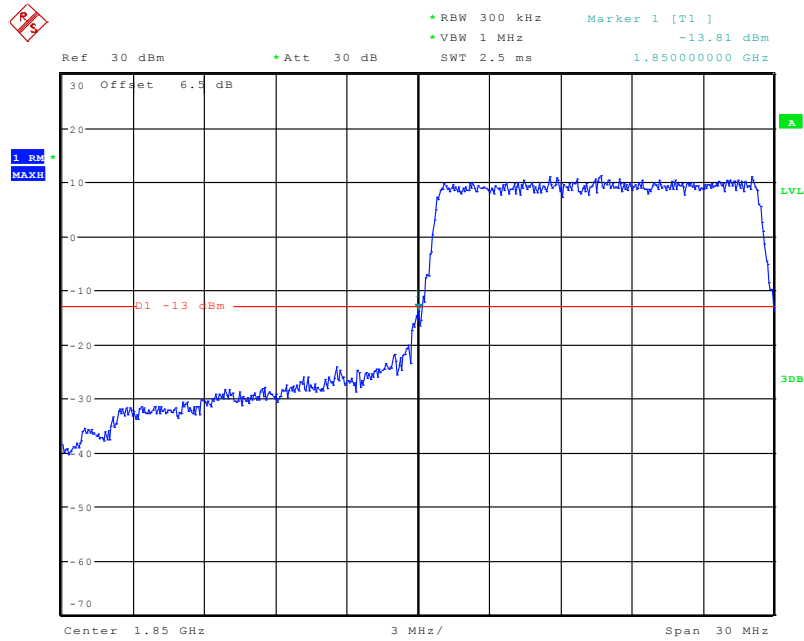
Date: 27.MAY.2020 11:14:55

16-QAM (10.0 MHz, FULL RB) - Right Band Edge



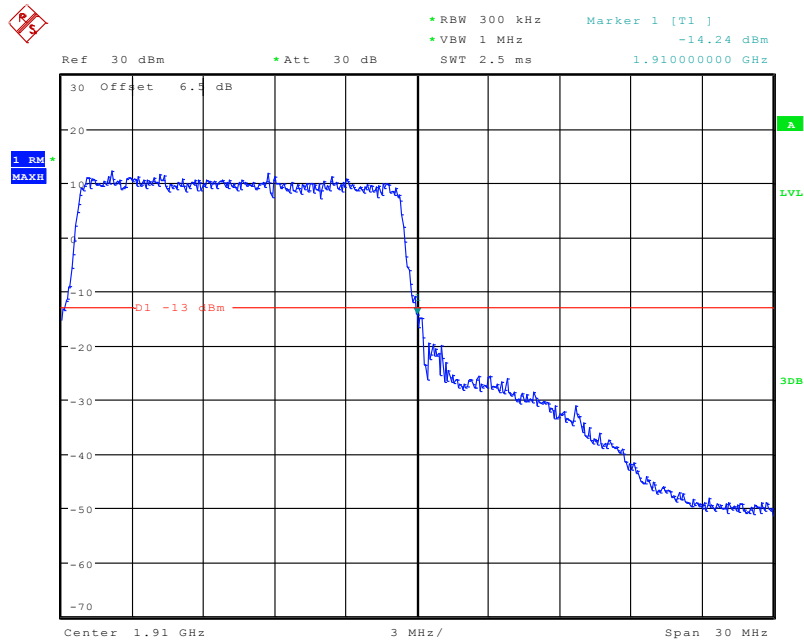
Date: 27.MAY.2020 11:16:58

QPSK (15.0 MHz, FULL RB) - Left Band Edge



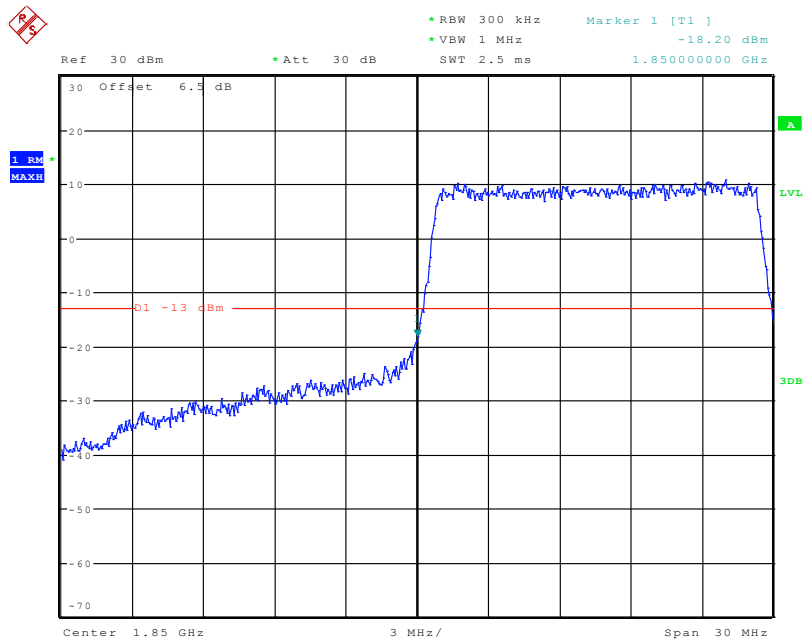
Date: 27.MAY.2020 11:18:29

QPSK (15.0 MHz, FULL RB) - Right Band Edge



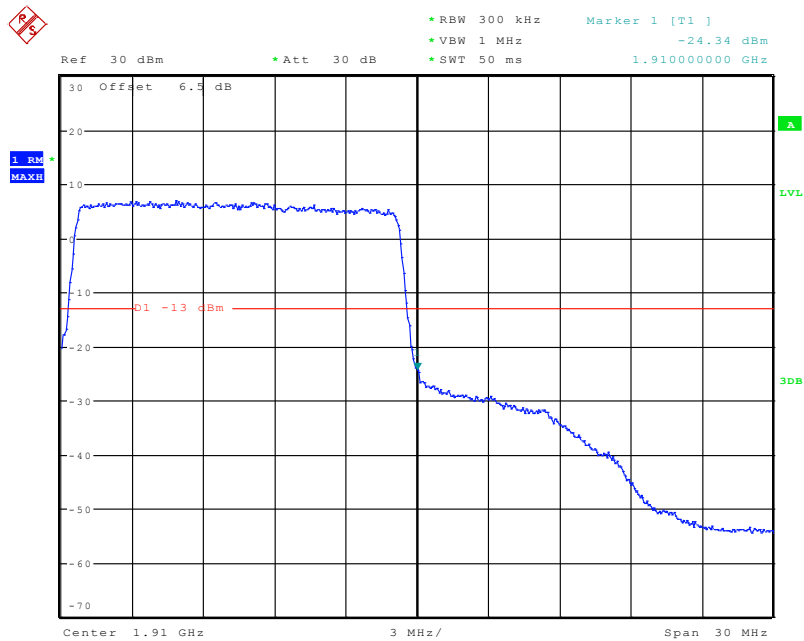
Date: 27.MAY.2020 10:02:21

16-QAM (15.0 MHz, FULL RB) - Left Band Edge



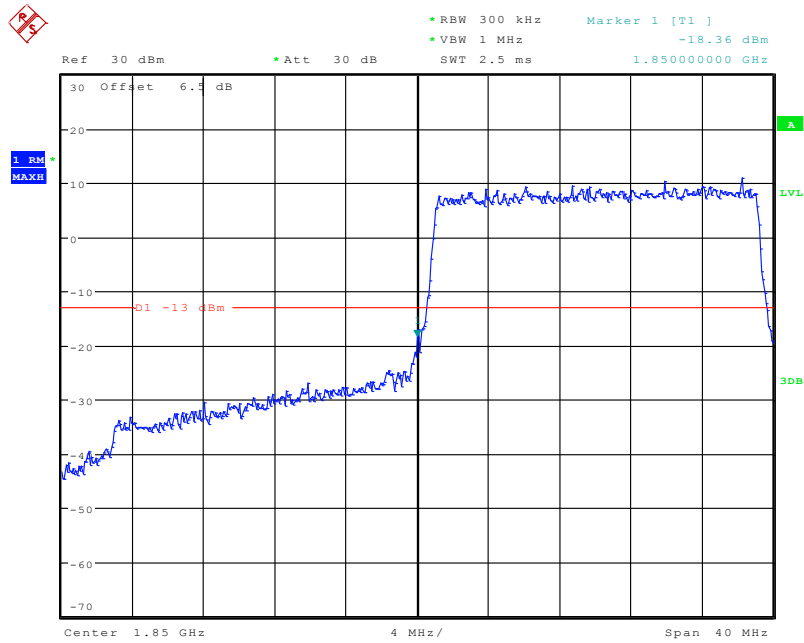
Date: 27.MAY.2020 11:20:19

16-QAM (15.0 MHz, FULL RB) - Right Band Edge



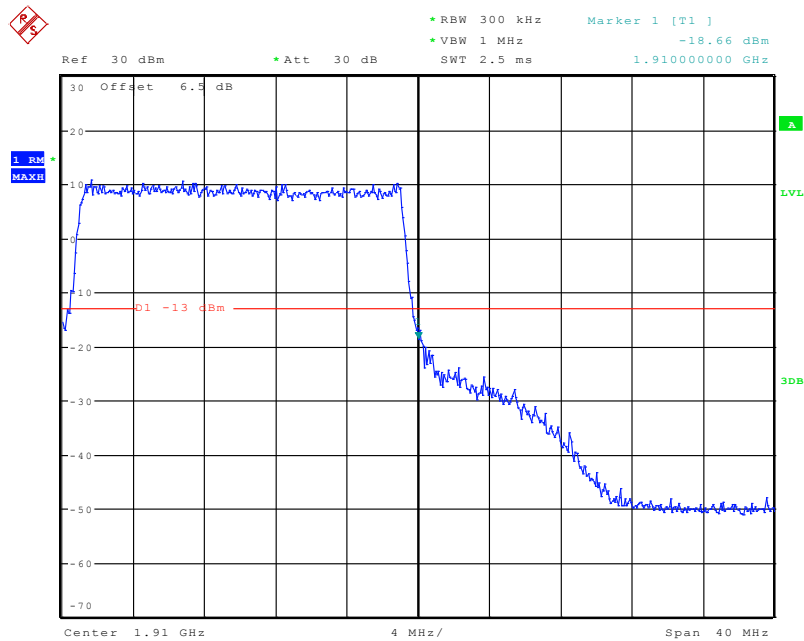
Date: 19.JUN.2020 22:18:36

QPSK (20.0 MHz, FULL RB) - Left Band Edge

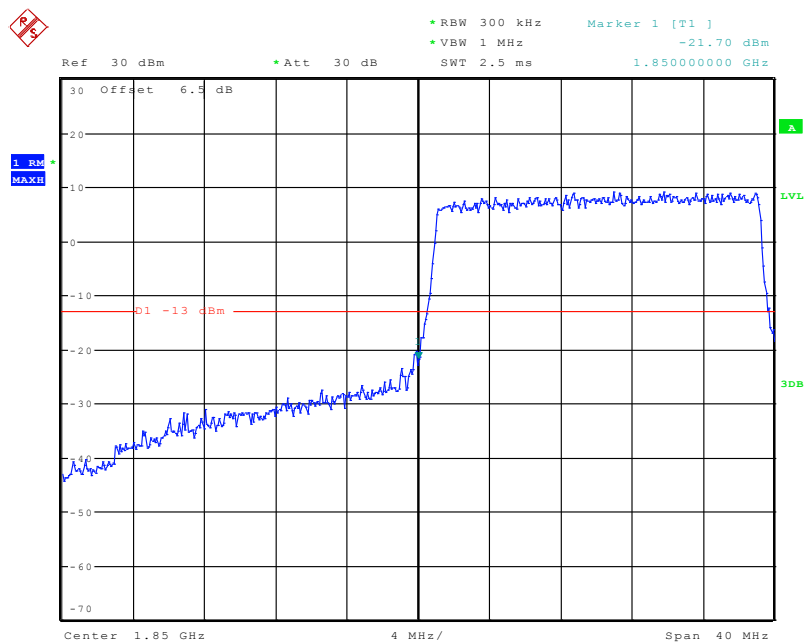


Date: 27.MAY.2020 10:03:08

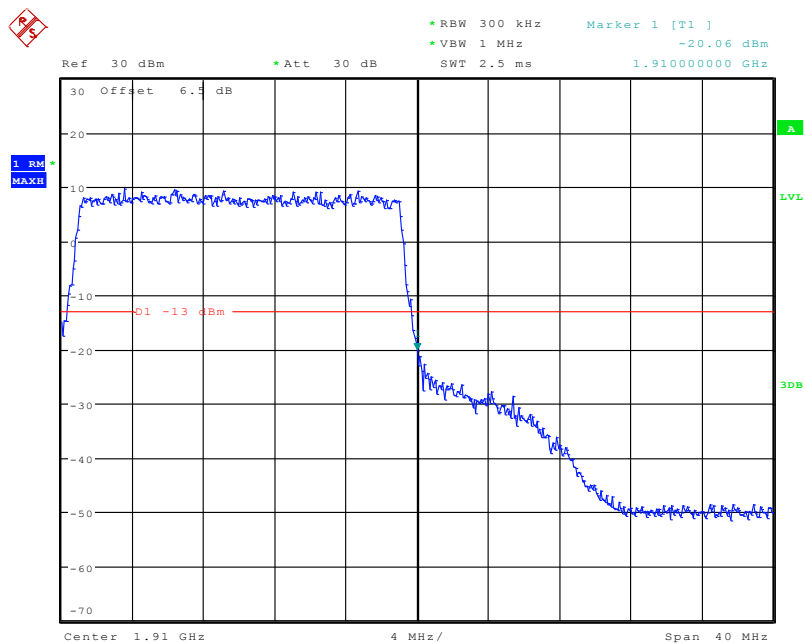
QPSK (20.0 MHz, FULL RB) - Right Band Edge



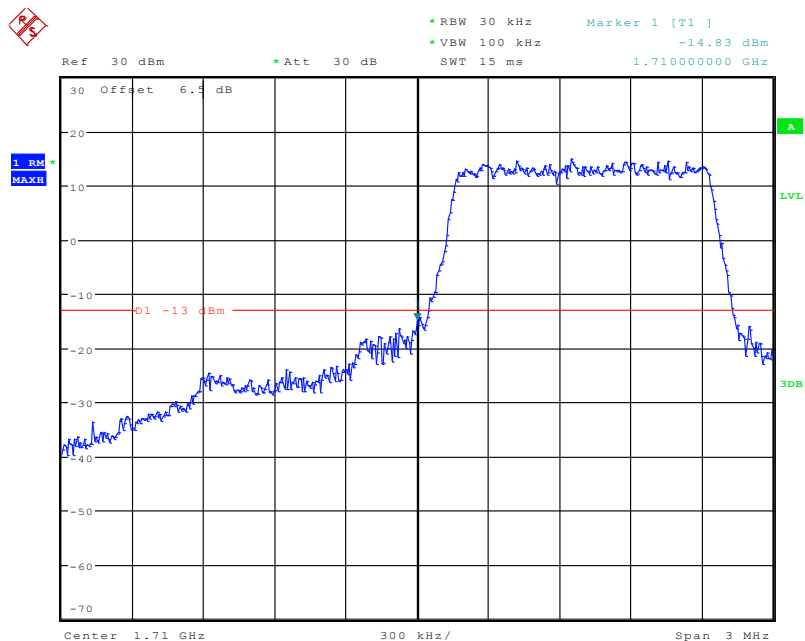
Date: 27.MAY.2020 11:23:39

16-QAM (20.0 MHz, FULL RB) - Left Band Edge

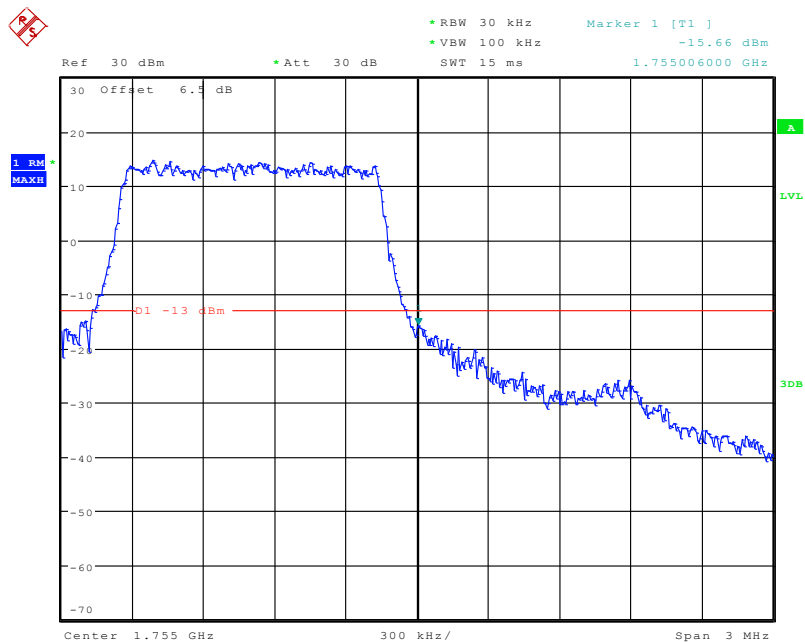
Date: 27.MAY.2020 11:22:31

16-QAM (20.0 MHz, FULL RB) - Right Band Edge

Date: 27.MAY.2020 10:04:18

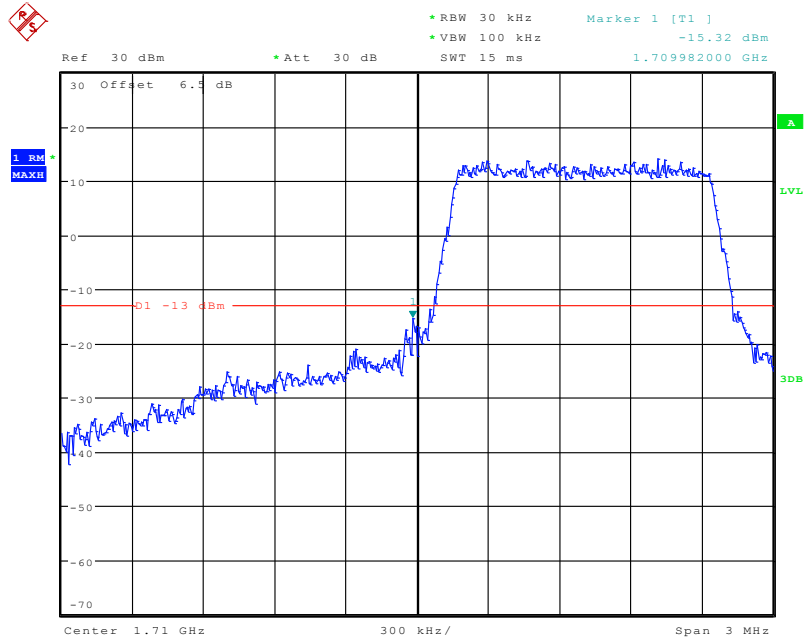
Band 4:**QPSK (1.4 MHz, FULL RB) - Left Band Edge**

Date: 2.JUL.2020 13:29:17

QPSK (1.4 MHz, FULL RB) - Right Band Edge

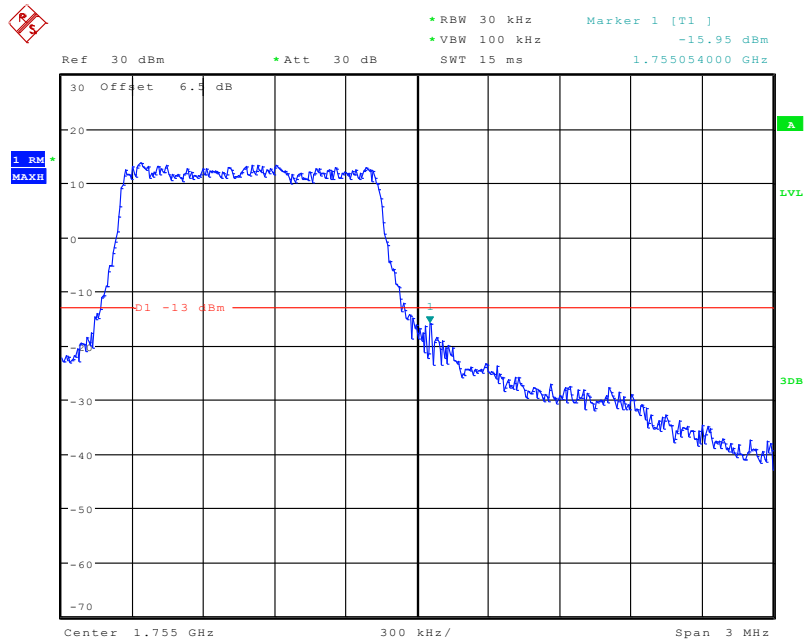
Date: 2.JUL.2020 13:29:56

16-QAM (1.4 MHz, FULL RB) - Left Band Edge



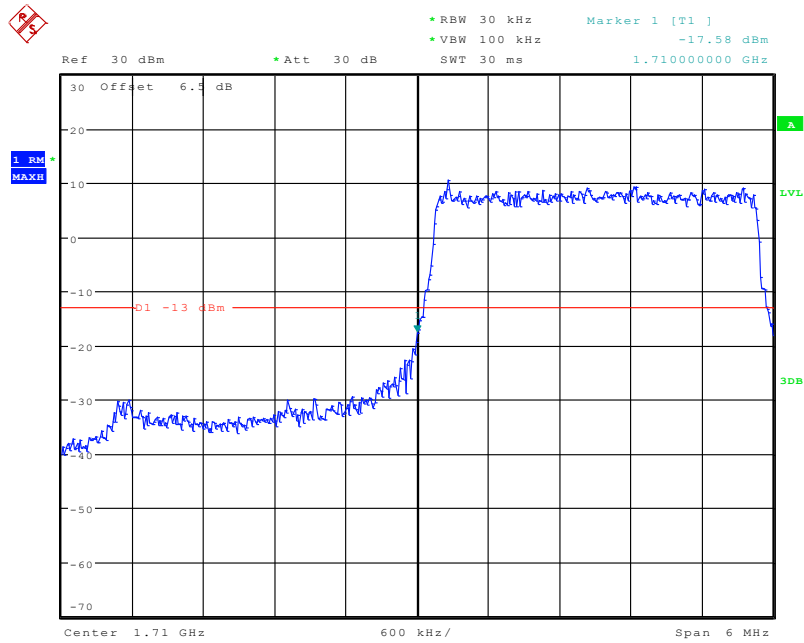
Date: 2.JUL.2020 13:29:36

16-QAM (1.4 MHz, FULL RB) - Right Band Edge



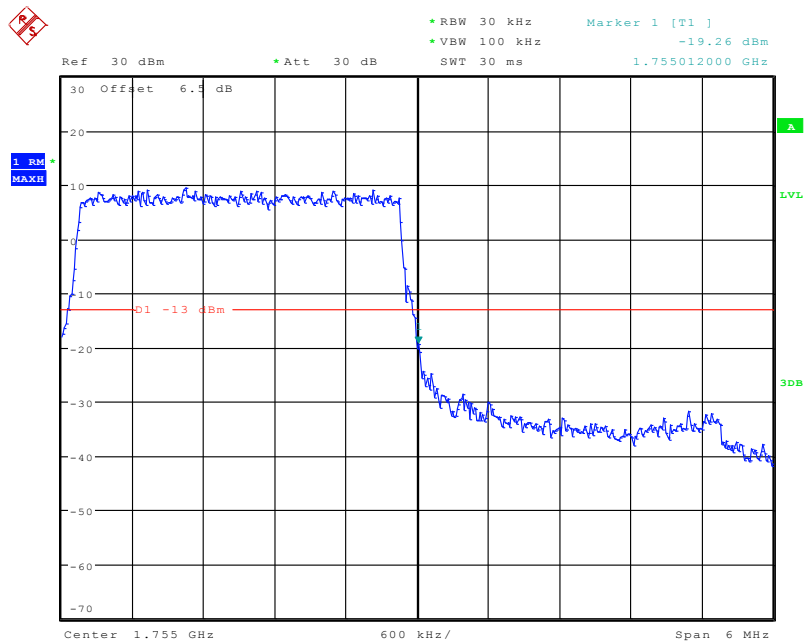
Date: 2.JUL.2020 13:30:11

QPSK (3.0 MHz, FULL RB) - Left Band Edge



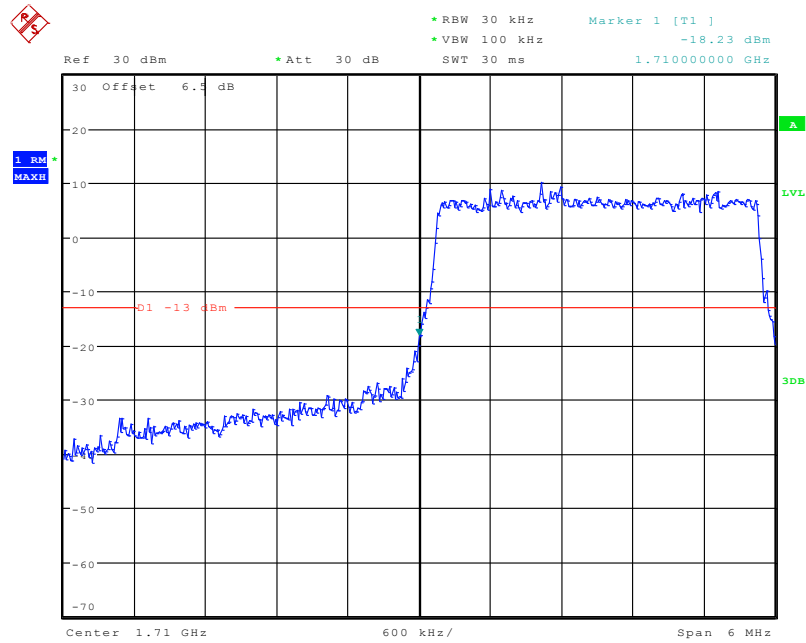
Date: 2.JUL.2020 13:30:31

QPSK (3.0 MHz, FULL RB) - Right Band Edge



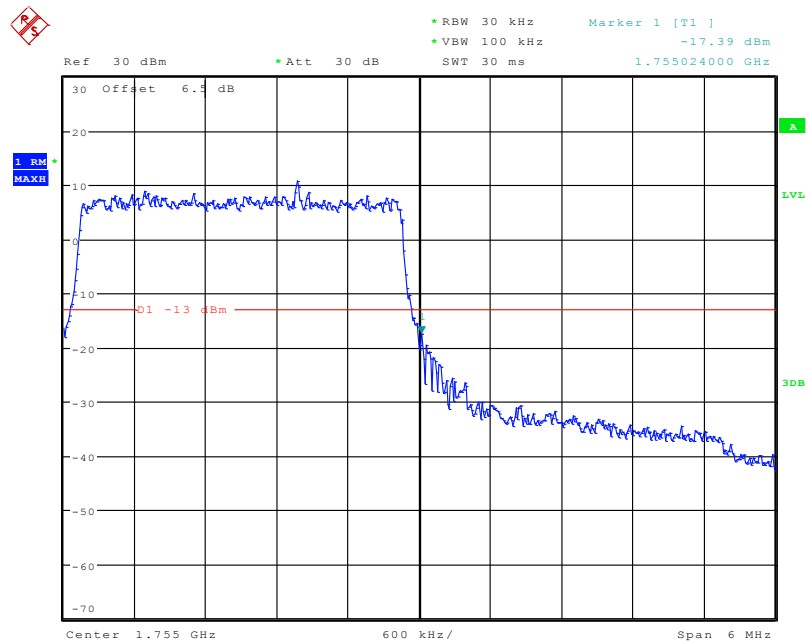
Date: 2.JUL.2020 13:31:05

16-QAM (3.0 MHz, FULL RB) - Left Band Edge



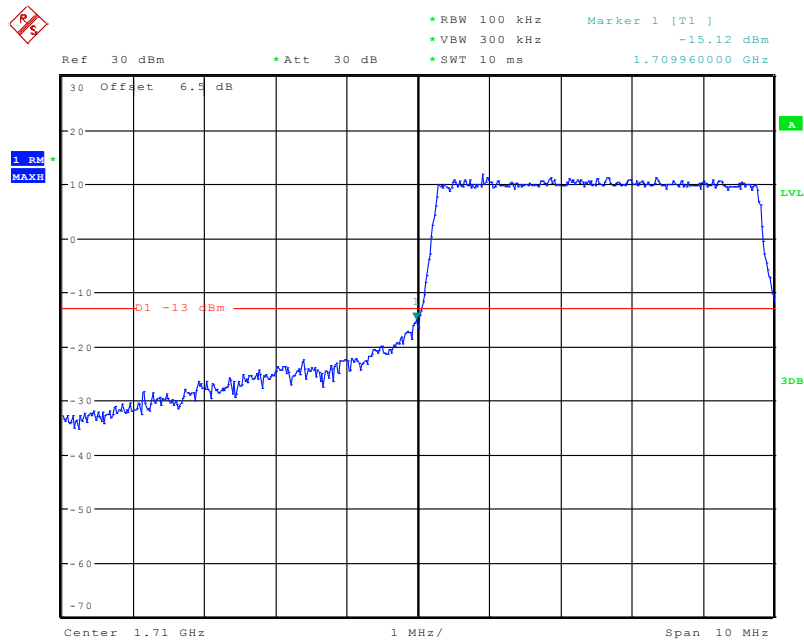
Date: 2.JUL.2020 13:30:46

16-QAM (3.0 MHz, FULL RB) - Right Band Edge



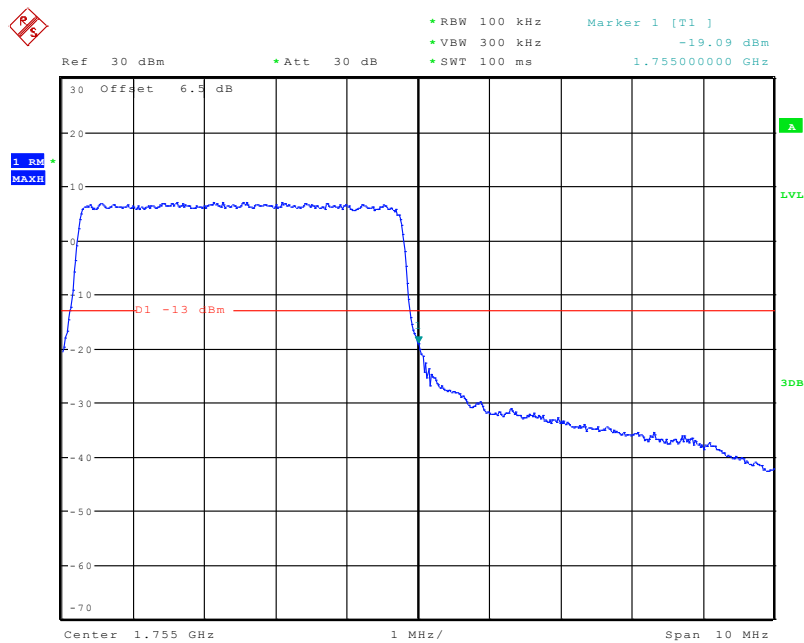
Date: 2.JUL.2020 13:31:20

QPSK (5.0 MHz, FULL RB) - Left Band Edge



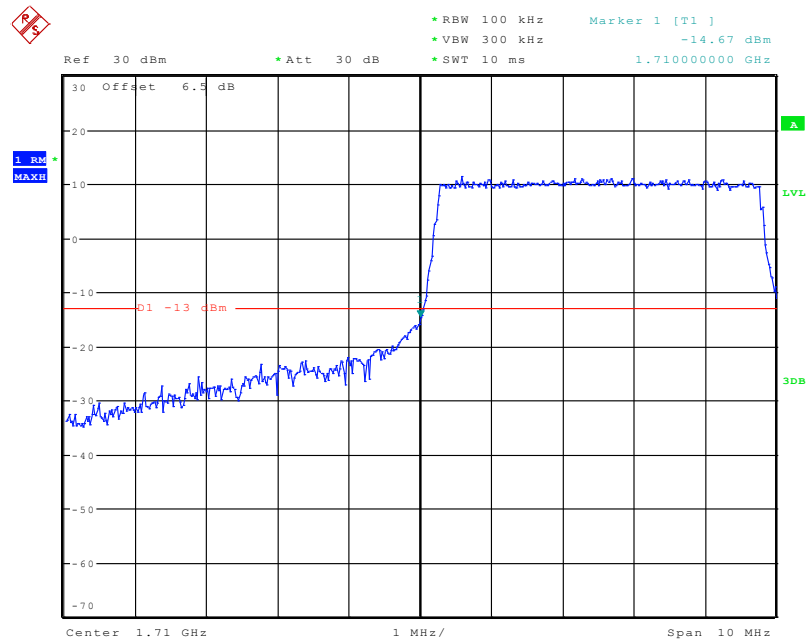
Date: 2.JUL.2020 13:45:18

QPSK (5.0 MHz, FULL RB) - Right Band Edge



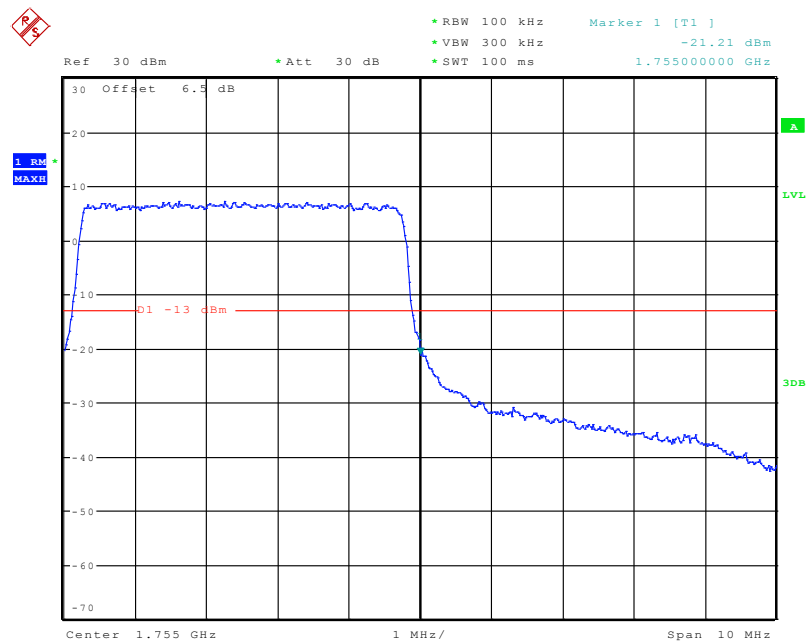
Date: 2.JUL.2020 13:46:15

16-QAM (5.0 MHz, FULL RB) - Left Band Edge



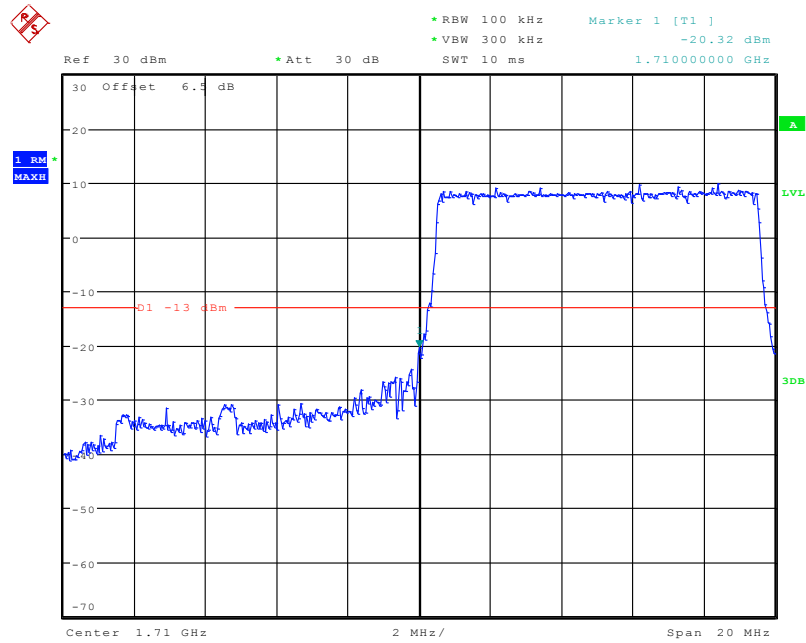
Date: 2.JUL.2020 13:43:13

16-QAM (5.0 MHz, FULL RB) - Right Band Edge



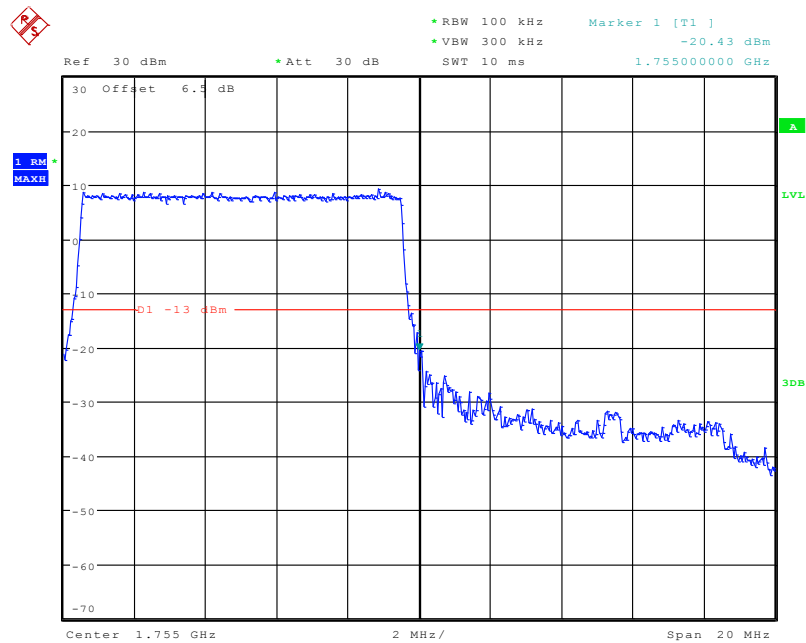
Date: 2.JUL.2020 13:47:16

QPSK (10.0 MHz, FULL RB) - Left Band Edge



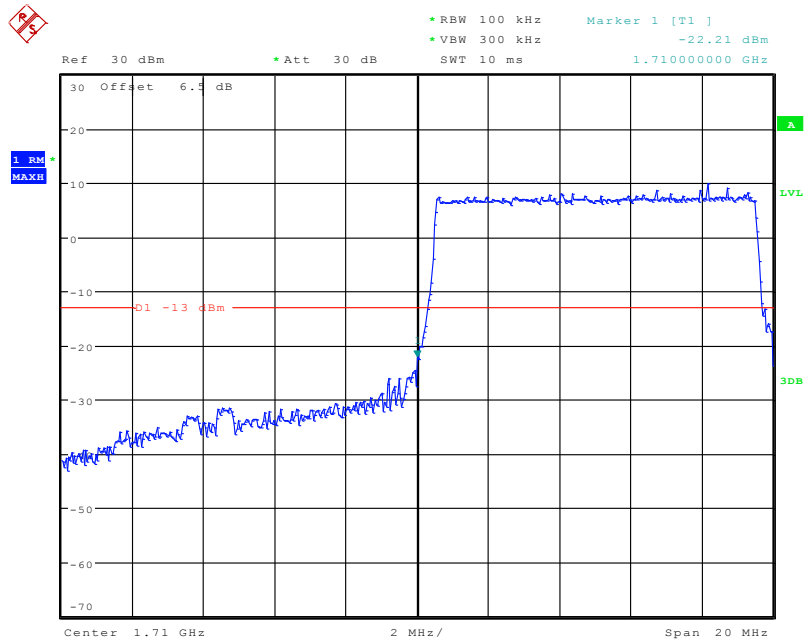
Date: 2.JUL.2020 13:33:06

QPSK (10.0 MHz, FULL RB) - Right Band Edge



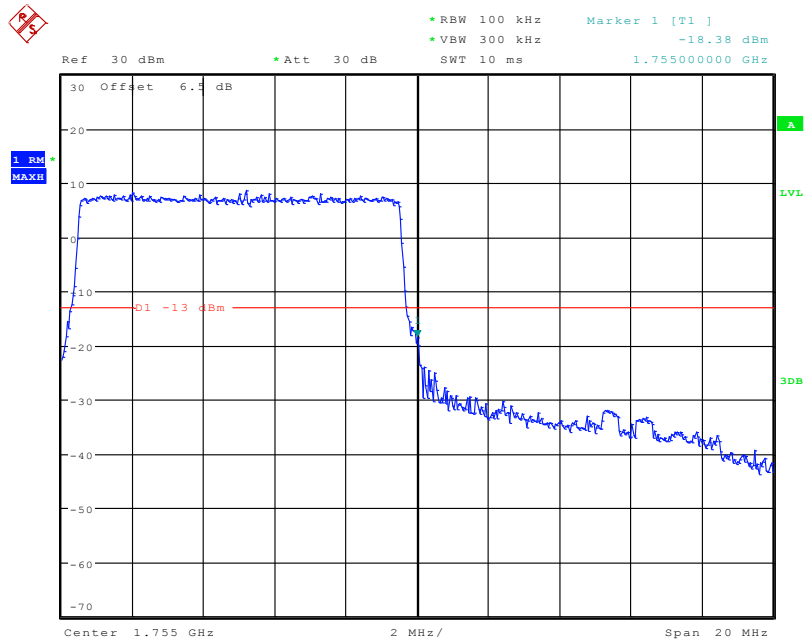
Date: 2.JUL.2020 13:33:43

16-QAM (10.0 MHz, FULL RB) - Left Band Edge



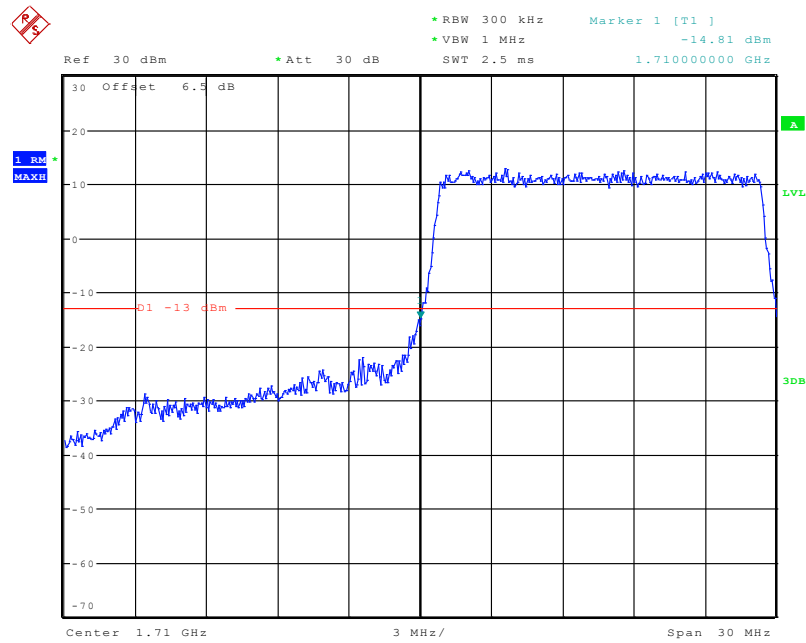
Date: 2.JUL.2020 13:33:26

16-QAM (10.0 MHz, FULL RB) - Right Band Edge



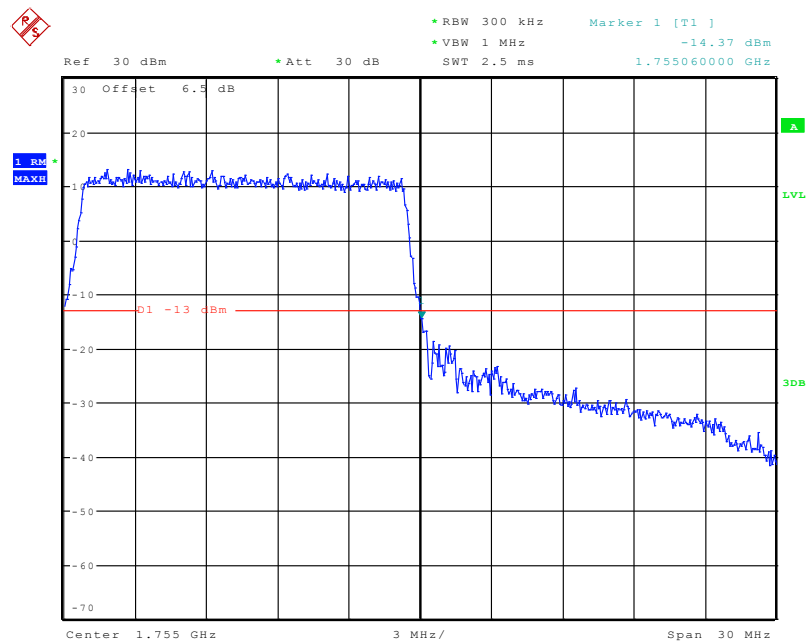
Date: 2.JUL.2020 13:34:00

QPSK (15.0 MHz, FULL RB) - Left Band Edge

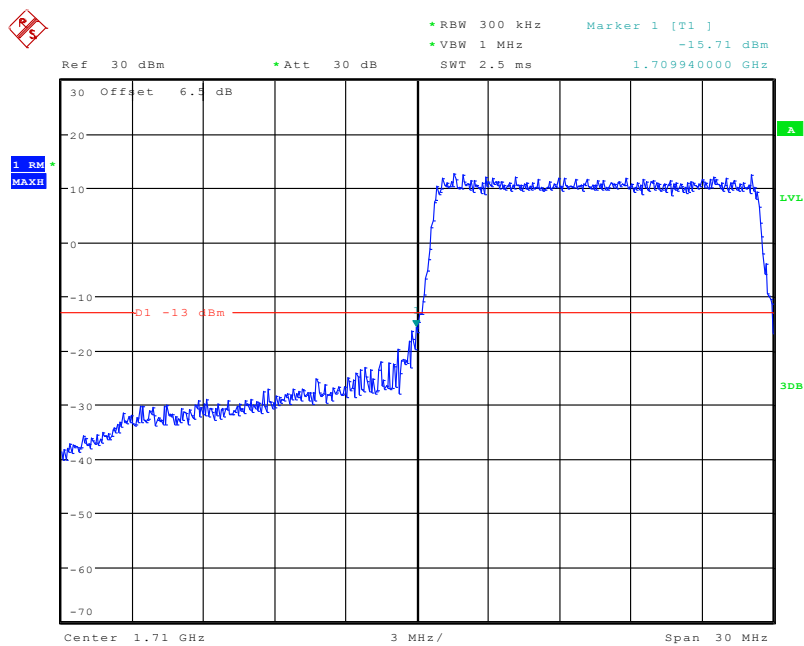


Date: 2.JUL.2020 13:49:04

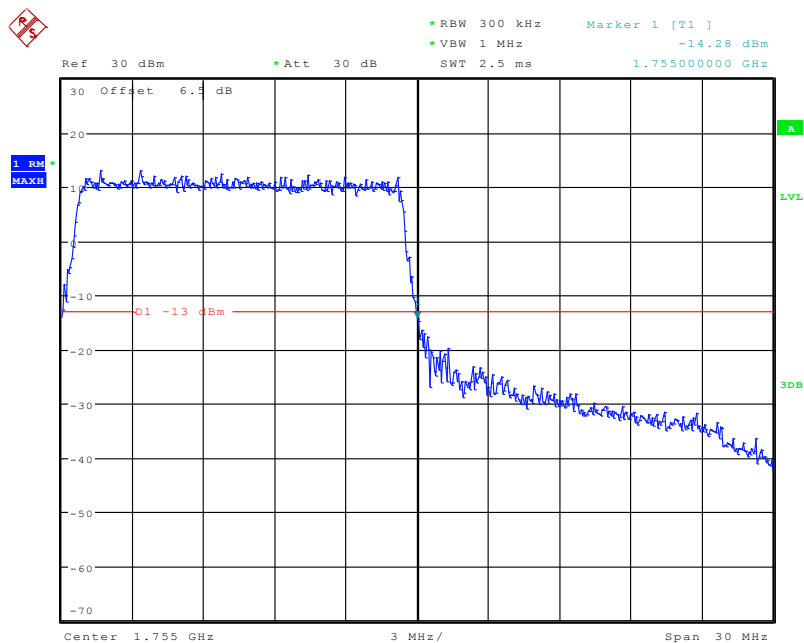
QPSK (15.0 MHz, FULL RB) - Right Band Edge



Date: 2.JUL.2020 13:50:06

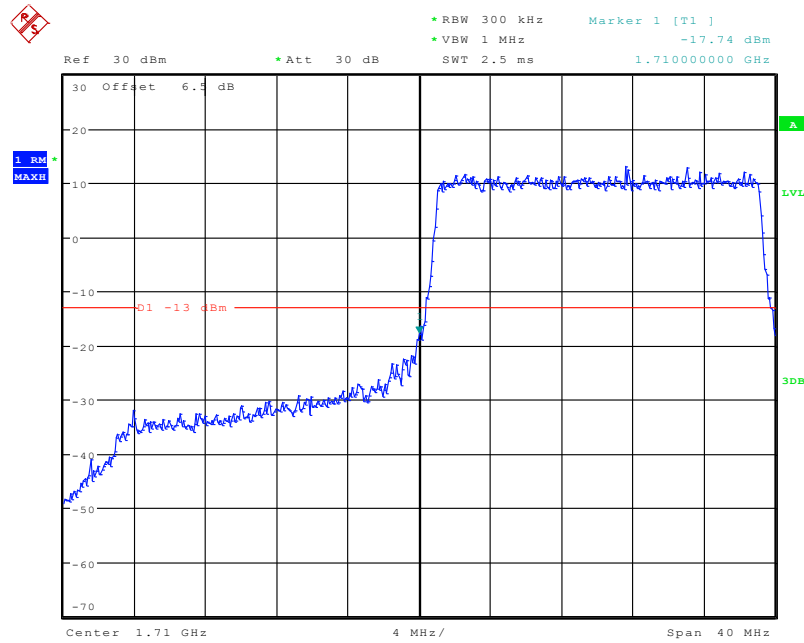
16-QAM (15.0 MHz, FULL RB) - Left Band Edge

Date: 2.JUL.2020 13:34:44

16-QAM (15.0 MHz, FULL RB) - Right Band Edge

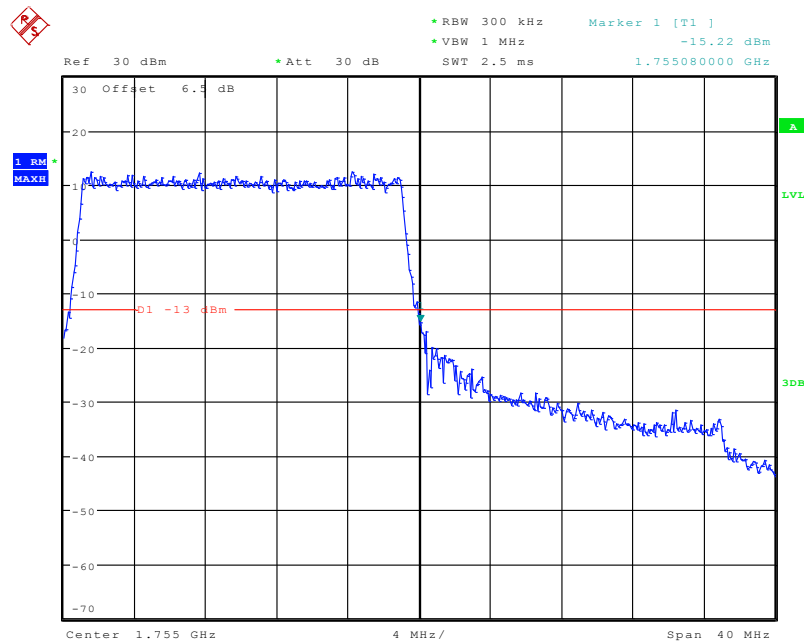
Date: 2.JUL.2020 13:35:23

QPSK (20.0 MHz, FULL RB) - Left Band Edge



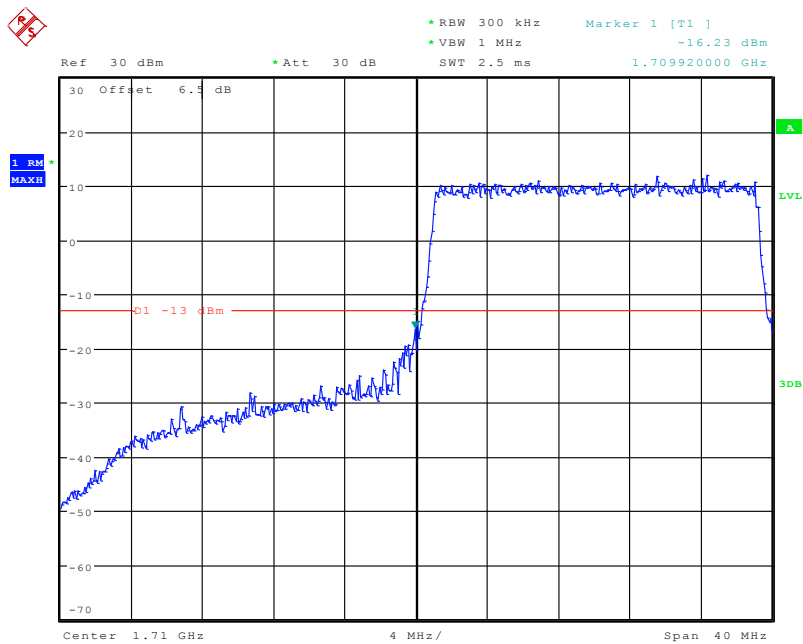
Date: 2.JUL.2020 13:35:45

QPSK (20.0 MHz, FULL RB) - Right Band Edge



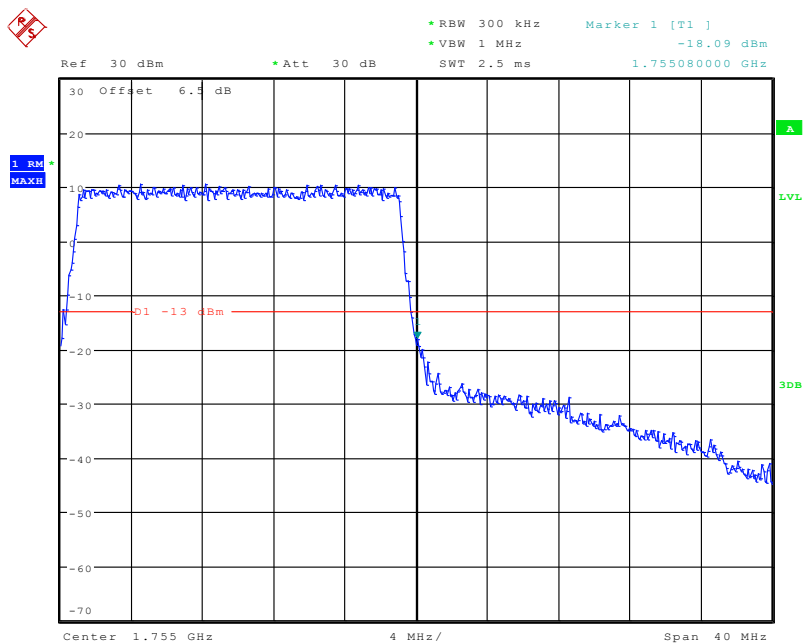
Date: 2.JUL.2020 13:36:30

16-QAM (20.0 MHz, FULL RB) - Left Band Edge

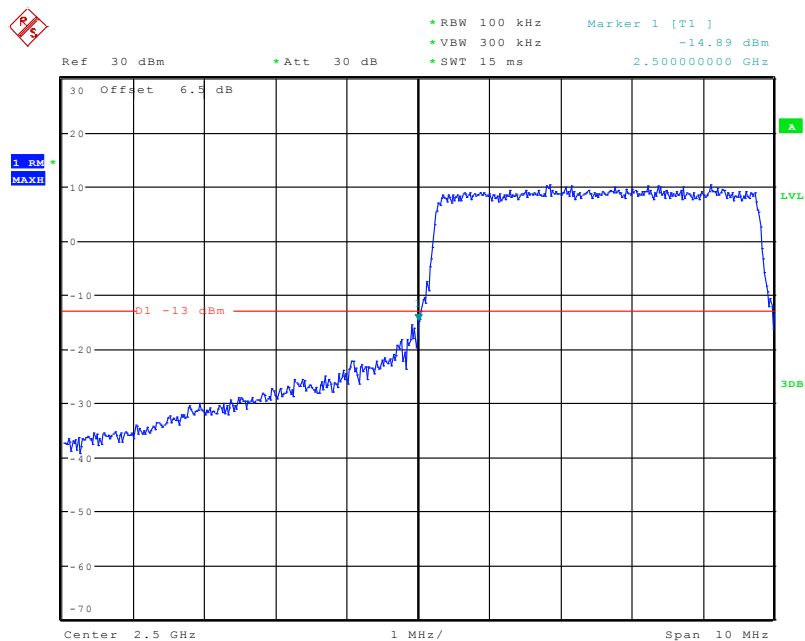


Date: 2.JUL.2020 13:36:07

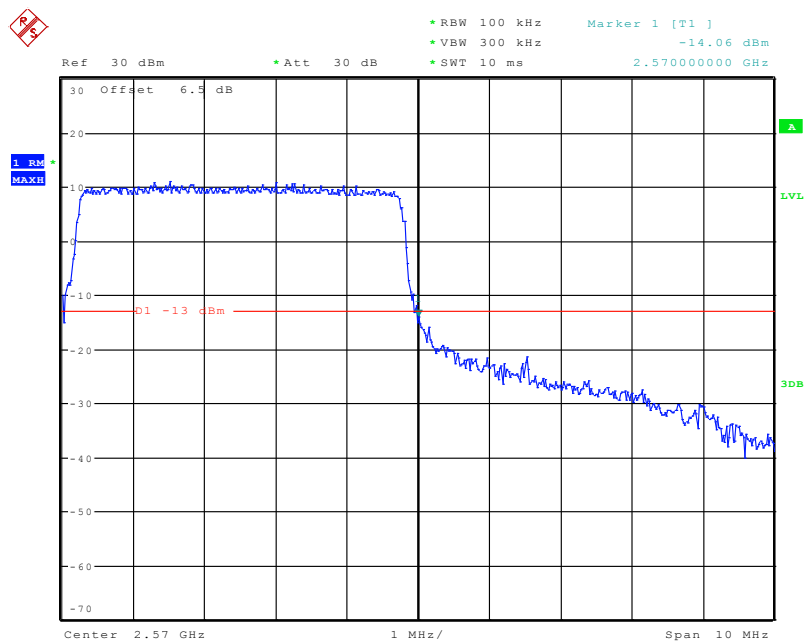
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



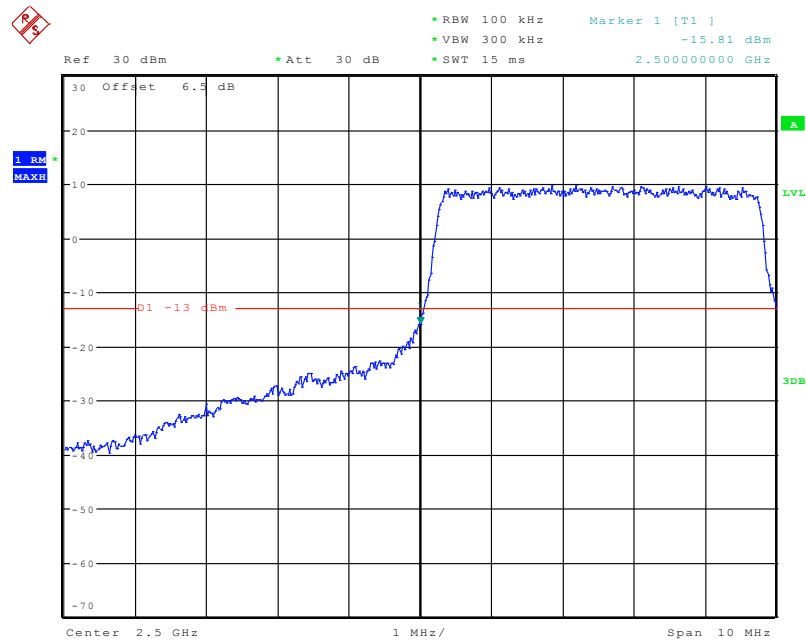
Date: 2.JUL.2020 13:36:49

Band 7:**QPSK (5.0 MHz, FULL RB) - Left Band Edge**

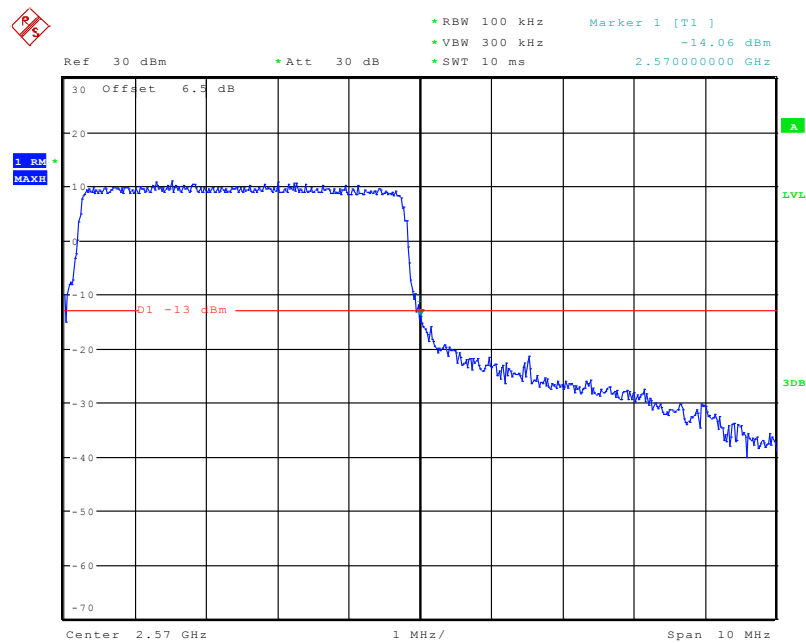
Date: 27.MAY.2020 11:48:06

QPSK (5.0 MHz, FULL RB) - Right Band Edge

Date: 27.MAY.2020 11:52:57

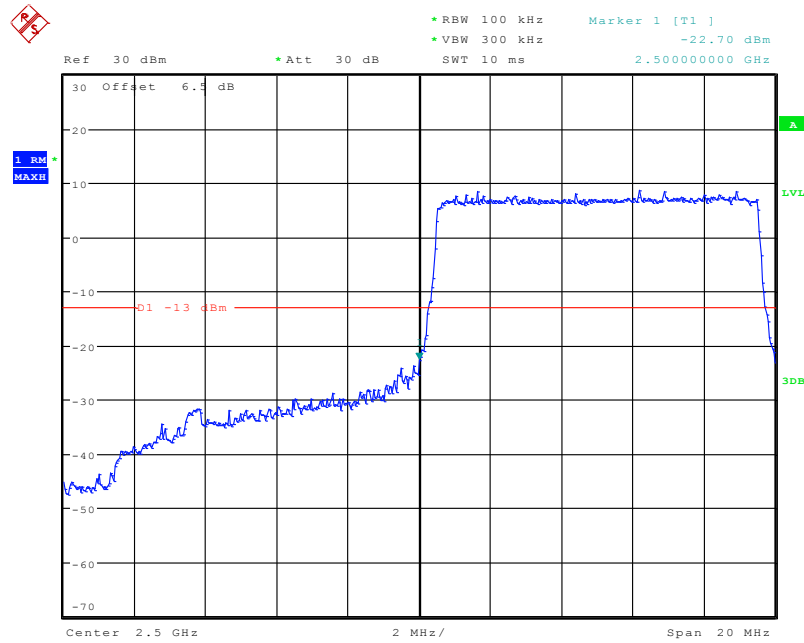
16-QAM (5.0 MHz, FULL RB) - Left Band Edge

Date: 27.MAY.2020 11:51:15

16-QAM (5.0 MHz, FULL RB) - Right Band Edge

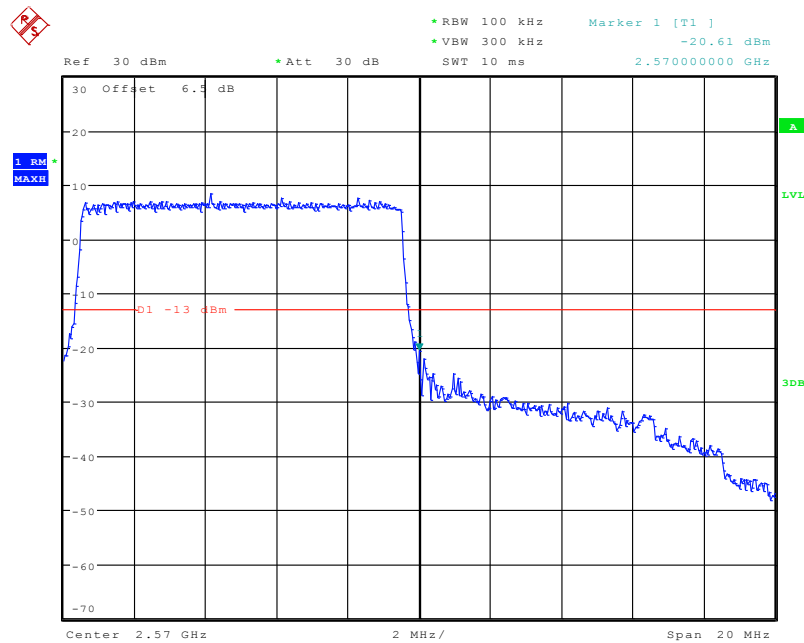
Date: 27.MAY.2020 11:52:57

QPSK (10.0 MHz, FULL RB) - Left Band Edge

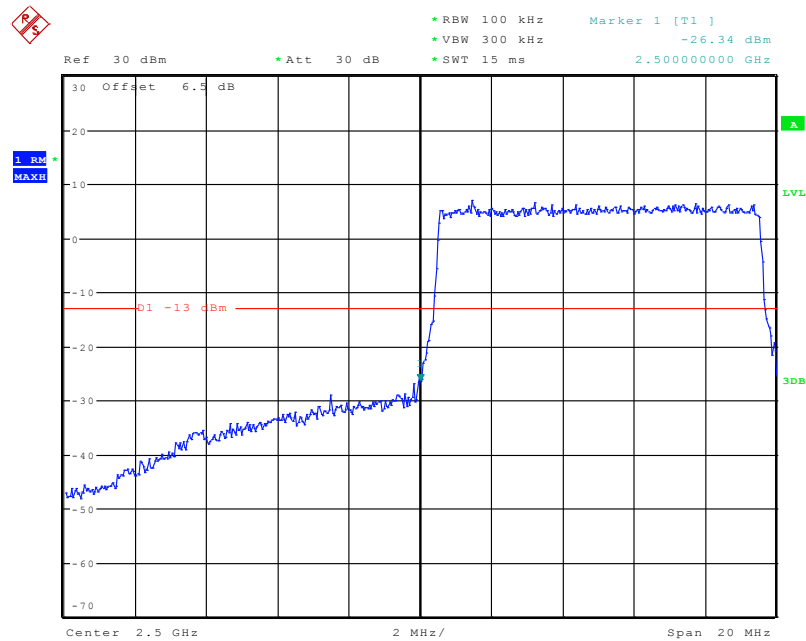


Date: 27.MAY.2020 10:14:23

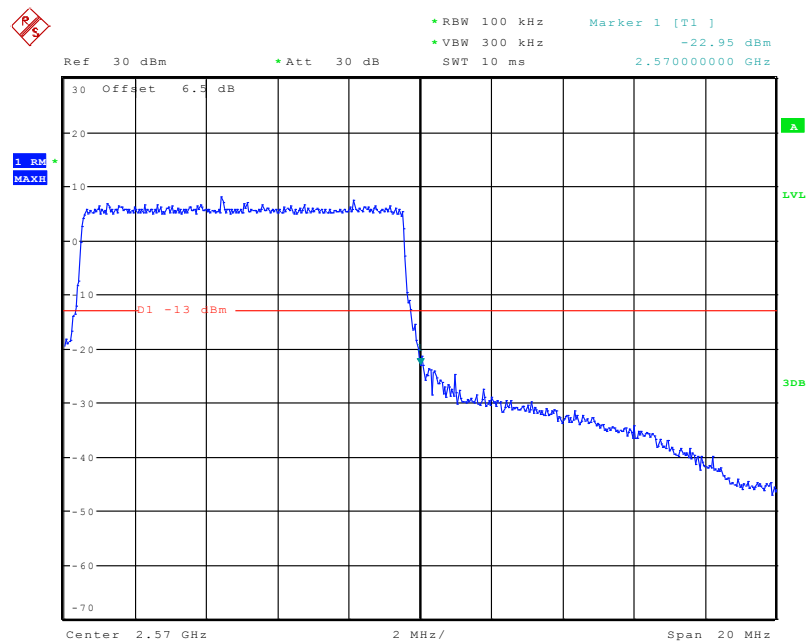
QPSK (10.0 MHz, FULL RB) - Right Band Edge



Date: 27.MAY.2020 10:14:57

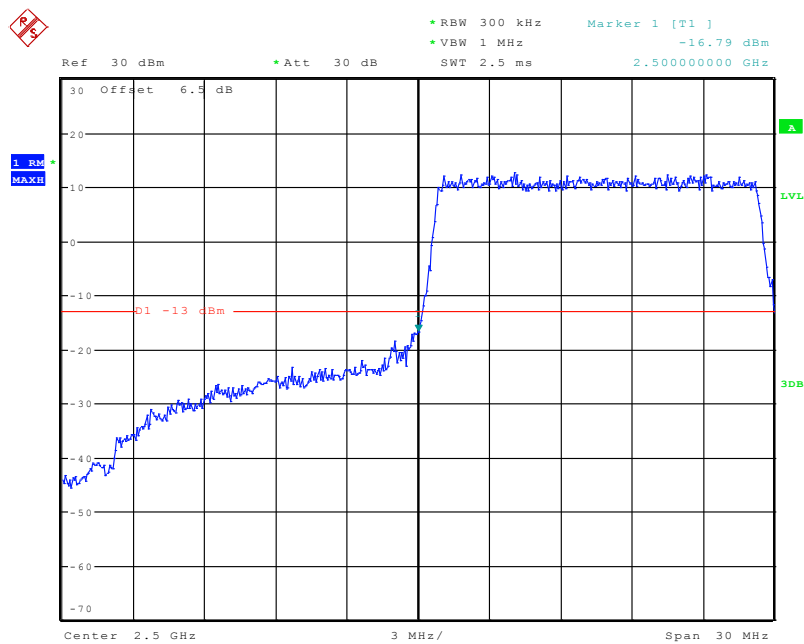
16-QAM (10.0 MHz, FULL RB) - Left Band Edge

Date: 27.MAY.2020 11:58:31

16-QAM (10.0 MHz, FULL RB) - Right Band Edge

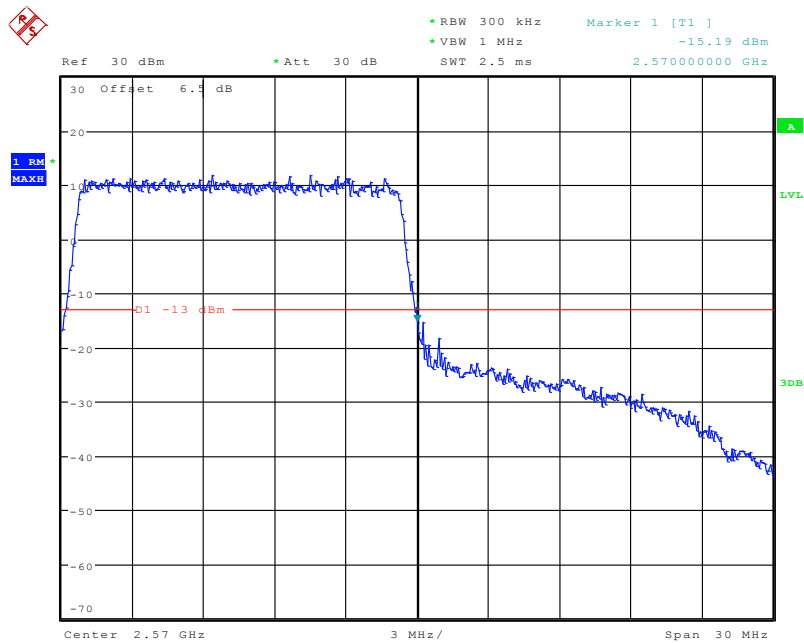
Date: 27.MAY.2020 11:59:56

QPSK (15.0 MHz, FULL RB) - Left Band Edge



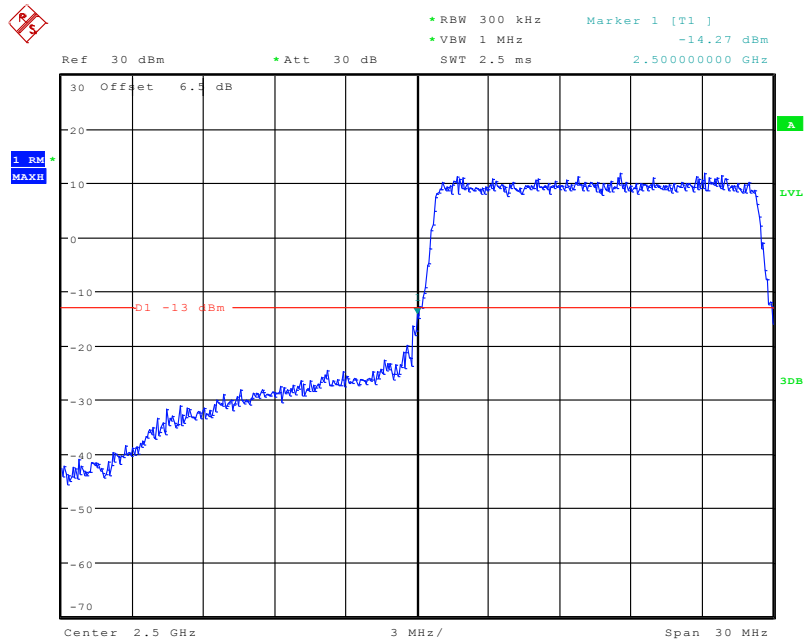
Date: 27.MAY.2020 12:01:36

QPSK (15.0 MHz, FULL RB) - Right Band Edge



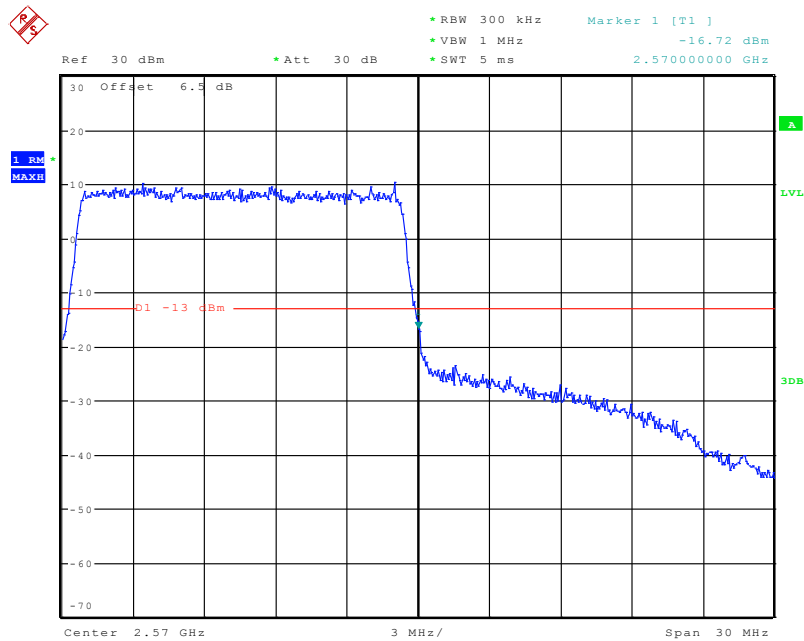
Date: 27.MAY.2020 10:16:18

16-QAM (15.0 MHz, FULL RB) - Left Band Edge



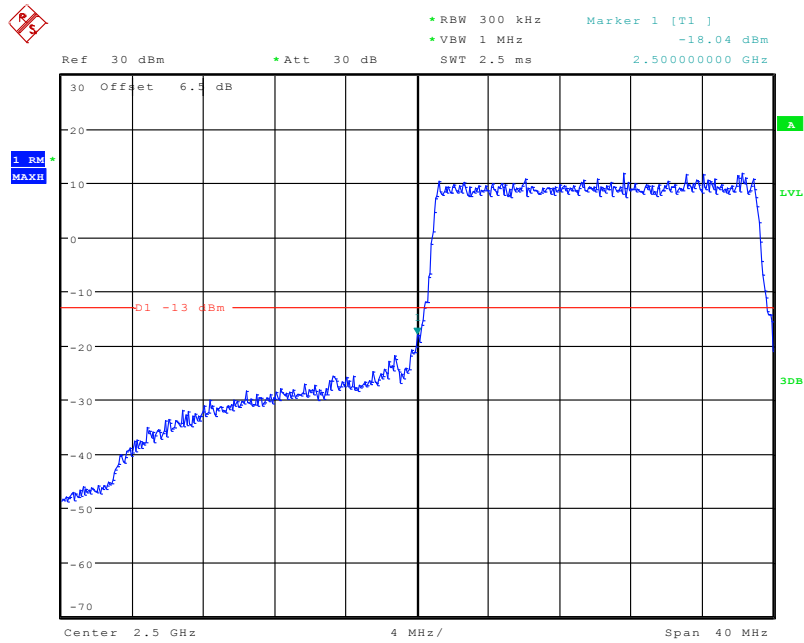
Date: 27.MAY.2020 10:15:57

16-QAM (15.0 MHz, FULL RB) - Right Band Edge



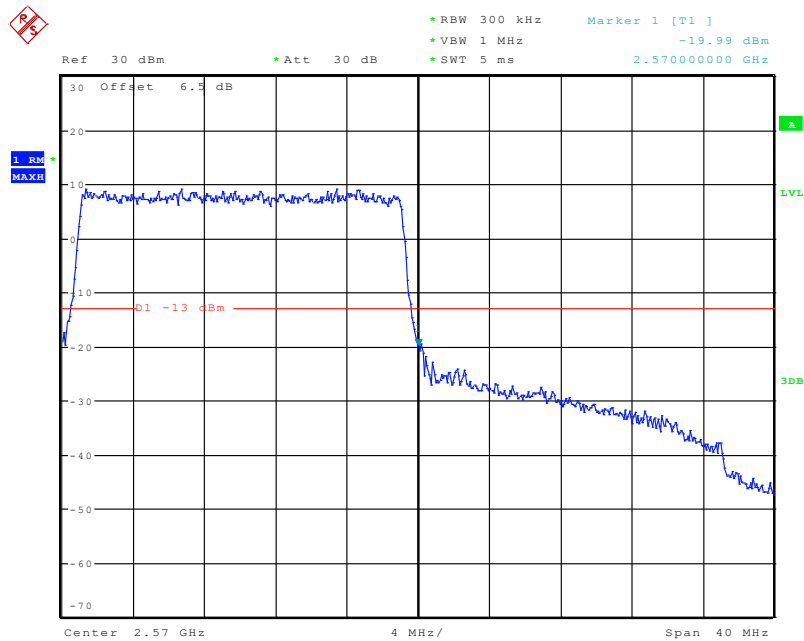
Date: 27.MAY.2020 12:02:50

QPSK (20.0 MHz, FULL RB) - Left Band Edge



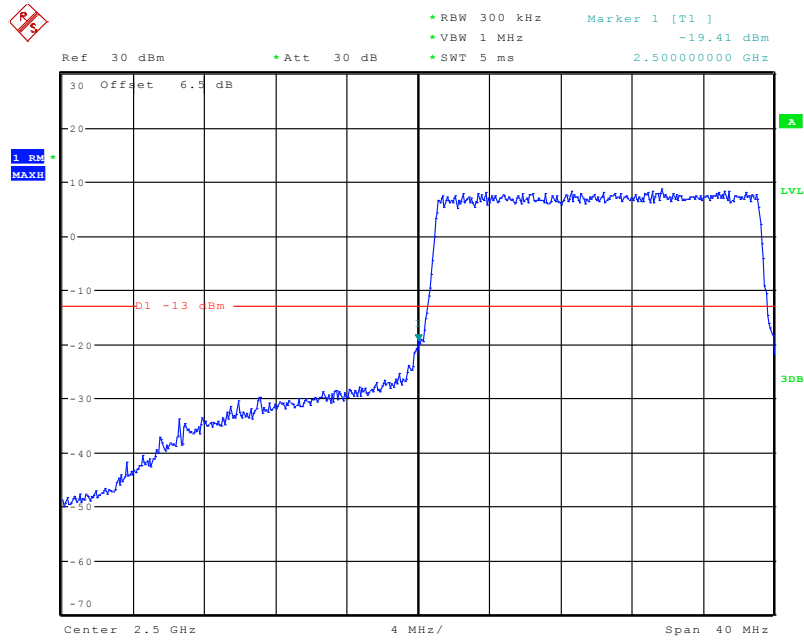
Date: 27.MAY.2020 10:17:04

QPSK (20.0 MHz, FULL RB) - Right Band Edge



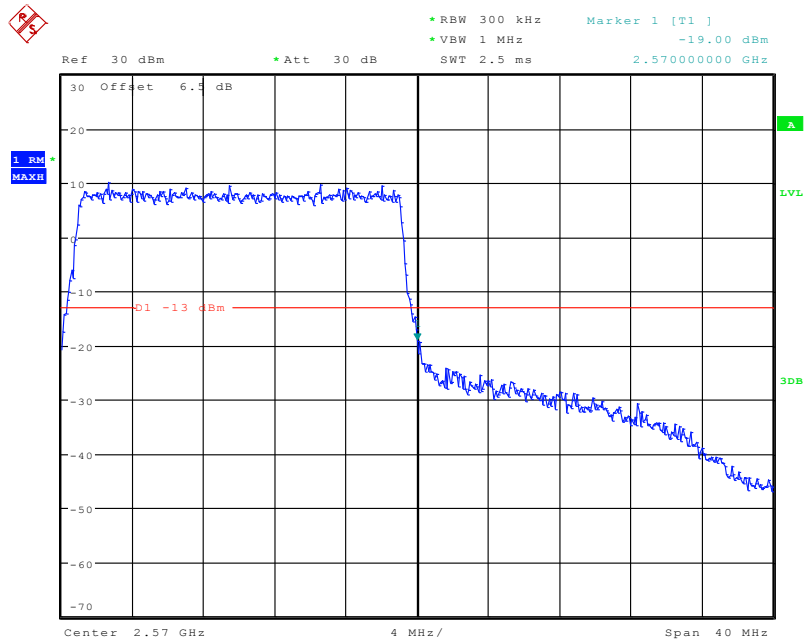
Date: 27.MAY.2020 12:04:51

16-QAM (20.0 MHz, FULL RB) - Left Band Edge



Date: 27.MAY.2020 12:03:52

16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 27.MAY.2020 10:18:05

FCC § 2.1055; § 22.355; § 24.235; § 27.54 - FREQUENCY STABILITY**Applicable Standard**

FCC § 2.1055, § 22.355, § 24.235 and § 27.54.

According to FCC § 2.1055, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

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

Frequency Tolerance for Transmitters in the Public Mobile Services

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

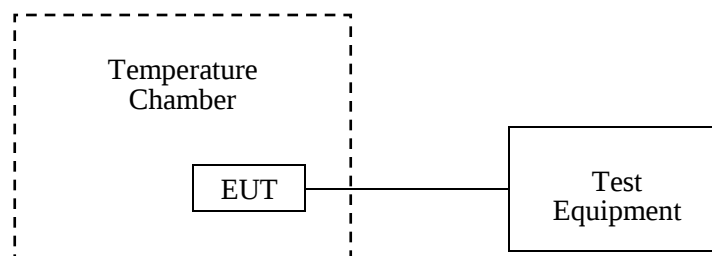
According to § 24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

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

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

Frequency Stability vs. Voltage: For hand carried, battery powered equipment; reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.



Test Data**Environmental Conditions**

Temperature:	20 °C
Relative Humidity:	52 %
ATM Pressure:	101.0 kPa

The testing was performed by Alan He on 2020-05-27.

EUT operation mode: Transmitting

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

Cellular Band (Part 22H)**GSM Mode**

Middle Channel, $f_0 = 836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	NV	-3	-0.0036	2.5
-20		-2	-0.0024	2.5
-10		-2	-0.0024	2.5
0		-1	-0.0012	2.5
10		-2	-0.0024	2.5
20		-1	-0.0012	2.5
30		0	0.0000	2.5
40		0	0.0000	2.5
50		-2	-0.0024	2.5
20	LV	1	0.0012	2.5
	HV	-3	-0.0036	2.5

EDGE Mode

Middle Channel, $f_0 = 836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	NV	2	0.0024	2.5
-20		4	0.0048	2.5
-10		3	0.0036	2.5
0		1	0.0012	2.5
10		2	0.0024	2.5
20		0	0.0000	2.5
30		-2	-0.0024	2.5
40		1	0.0012	2.5
50		-3	-0.0036	2.5
20	LV	-1	-0.0012	2.5
	HV	3	0.0036	2.5

WCDMA Mode

Middle Channel, $f_0 = 836.6\text{MHz}$				
Temperature (°C)	Voltage Supplied	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	NV	2	0.0024	2.5
-20		1	0.0012	2.5
-10		-3	-0.0036	2.5
0		-5	-0.006	2.5
10		1	0.0012	2.5
20		0	0.0000	2.5
30		-3	-0.0036	2.5
40		-4	-0.0048	2.5
50		3	0.0036	2.5
20	LV	5	0.006	2.5
	HV	-2	-0.0024	2.5

PCS Band (Part 24E)**GSM Mode**

Middle Channel, $f_o = 1880.0$ MHz				
Temperature (°C)	Voltage Supplied	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	NV	-6	-0.0032	pass
-20		-3	-0.0016	pass
-10		-2	-0.0011	pass
0		-3	-0.0016	pass
10		-4	-0.0021	pass
20		-3	-0.0016	pass
30		-4	-0.0021	pass
40		-2	-0.0011	pass
50		-4	-0.0021	pass
20	LV	-2	-0.0011	pass
	HV	-6	-0.0032	pass

EDGE Mode

Middle Channel, $f_o = 1880.0$ MHz				
Temperature (°C)	Voltage Supplied	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	NV	-3	-0.0016	pass
-20		-4	-0.0021	pass
-10		-2	-0.0011	pass
0		-3	-0.0016	pass
10		-1	-0.0005	pass
20		-1	-0.0005	pass
30		-2	-0.0011	pass
40		2	0.0011	pass
50		1	0.0005	pass
20	LV	0	0.0000	pass
	HV	-3	-0.0016	pass

WCDMA Mode

Middle Channel, f_0 =1880.0 MHz				
Temperature (°C)	Voltage Supplied	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	N.V.	-5	-0.0027	pass
-20		-2	-0.0011	pass
-10		-4	-0.0021	pass
0		-3	-0.0016	pass
10		-2	-0.0011	pass
20		-2	-0.0011	pass
30		-4	-0.0021	pass
40		-1	-0.0005	pass
50		0	0.0000	pass
20	L.V.	-3	-0.0016	pass
	H.V.	-5	-0.0027	pass

LTE:**Band 2:**

Modulation	Test condition	Channel	Frequency (MHz)	Frequency error (Hz)	Frequency error (ppm)
QPSK	-30°C/ N.V.	Middle	1880	25.31	0.0135
	-20°C/ N.V.	Middle	1880	-9.97	-0.0053
	-10°C/ N.V.	Middle	1880	-6.13	-0.0033
	0°C/ N.V.	Middle	1880	6.17	0.0033
	10°C/ N.V.	Middle	1880	7.92	0.0042
	20°C/ N.V.	Middle	1880	6.46	0.0034
	30°C/ N.V.	Middle	1880	-6.52	-0.0035
	40°C/ N.V.	Middle	1880	7.18	0.0038
	50°C/ N.V.	Middle	1880	-9.69	-0.0052
	20°C/ L.V.	Middle	1880	-8.17	-0.0043
	20°C/ H.V.	Middle	1880	-7.05	-0.0038
16QAM	-30°C/ N.V.	Middle	1880	-30.26	-0.0161
	-20°C/ N.V.	Middle	1880	-6.68	-0.0036
	-10°C/ N.V.	Middle	1880	9.77	0.0052
	0°C/ N.V.	Middle	1880	-7.62	-0.0041
	10°C/ N.V.	Middle	1880	-9.91	-0.0053
	20°C/ N.V.	Middle	1880	-9.82	-0.0052
	30°C/ N.V.	Middle	1880	-6.68	-0.0036
	40°C/ N.V.	Middle	1880	-8.85	-0.0047
	50°C/ N.V.	Middle	1880	5.67	0.003
	20°C/ L.V.	Middle	1880	6.05	0.0032
	20°C/ H.V.	Middle	1880	7.52	0.004

Band 4:

Modulation	Test condition	Channel	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
QPSK	-30°C/ N.V.	Low/High	1710.4811	1754.5015	1710	1755
	-20°C/ N.V.	Low/High	1710.4812	1754.5065	1710	1755
	-10°C/ N.V.	Low/High	1710.4886	1754.5008	1710	1755
	0°C/ N.V.	Low/High	1710.4866	1754.5062	1710	1755
	10°C/ N.V.	Low/High	1710.4836	1754.5028	1710	1755
	20°C/ N.V.	Low/High	1710.4872	1754.5063	1710	1755
	30°C/ N.V.	Low/High	1710.4818	1754.5075	1710	1755
	40°C/ N.V.	Low/High	1710.4858	1754.5055	1710	1755
	50°C/ N.V.	Low/High	1710.4886	1754.5104	1710	1755
	20°C/ L.V.	Low/High	1710.482	1754.5105	1710	1755
	20°C/ H.V.	Low/High	1710.4822	1754.5074	1710	1755
16QAM	-30°C/ N.V.	Low/High	1710.4895	1754.5041	1710	1755
	-20°C/ N.V.	Low/High	1710.4864	1754.4994	1710	1755
	-10°C/ N.V.	Low/High	1710.4907	1754.4998	1710	1755
	0°C/ N.V.	Low/High	1710.4904	1754.5745	1710	1755
	10°C/ N.V.	Low/High	1710.4872	1754.5012	1710	1755
	20°C/ N.V.	Low/High	1710.4849	1754.5038	1710	1755
	30°C/ N.V.	Low/High	1710.4881	1754.5034	1710	1755
	40°C/ N.V.	Low/High	1710.4872	1754.5023	1710	1755
	50°C/ N.V.	Low/High	1710.4877	1754.5031	1710	1755
	20°C/ L.V.	Low/High	1710.4915	1754.5026	1710	1755
	20°C/ H.V.	Low/High	1710.4872	1754.5005	1710	1755

Band 7:

Modulation	Test condition	Channel	F _L (MHz)	F _H (MHz)	F _L Limit (MHz)	F _H Limit (MHz)
QPSK	-30°C/ N.V.	Low/High	2500.5186	2569.4402	2500.00	2570
	-20°C/ N.V.	Low/High	2500.5113	2569.4415	2500.00	2570
	-10°C/ N.V.	Low/High	2500.5128	2569.4404	2500.00	2570
	0°C/ N.V.	Low/High	2500.5111	2569.4355	2500.00	2570
	10°C/ N.V.	Low/High	2500.5141	2569.4378	2500.00	2570
	20°C/ N.V.	Low/High	2500.5176	2569.4408	2500.00	2570
	30°C/ N.V.	Low/High	2500.5147	2569.4381	2500.00	2570
	40°C/ N.V.	Low/High	2500.5112	2569.4407	2500.00	2570
	50°C/ N.V.	Low/High	2500.5214	2569.4384	2500.00	2570
	20°C/ L.V.	Low/High	2500.5195	2569.4374	2500.00	2570
	20°C/ H.V.	Low/High	2500.5153	2569.4407	2500.00	2570
16QAM	-30°C/ N.V.	Low/High	2500.5106	2569.4394	2500.00	2570
	-20°C/ N.V.	Low/High	2500.5126	2569.4423	2500.00	2570
	-10°C/ N.V.	Low/High	2500.5132	2569.4358	2500.00	2570
	0°C/ N.V.	Low/High	2500.5142	2569.4404	2500.00	2570
	10°C/ N.V.	Low/High	2500.5135	2569.4376	2500.00	2570
	20°C/ N.V.	Low/High	2500.5128	2569.435	2500.00	2570
	30°C/ N.V.	Low/High	2500.5122	2569.4417	2500.00	2570
	40°C/ N.V.	Low/High	2500.5135	2569.4423	2500.00	2570
	50°C/ N.V.	Low/High	2500.5129	2569.4353	2500.00	2570
	20°C/ L.V.	Low/High	2500.5157	2569.4464	2500.00	2570
	20°C/ H.V.	Low/High	2500.5134	2569.4365	2500.00	2570

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