



## FCC PART 27

## FCC PART 22H, PART 24E

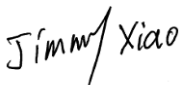
## TEST REPORT

For

# SENWA GLOBAL INTERNATIONAL SA DE CV

Carretera Mexico Toluca 5324 – PB Col. El Yaqui, Cuajimalpa de Morelos, CDMX  
C.P. 05320

**FCC ID:2AAA6-LS5018F**

<b>Report Type:</b> Original Report	<b>Product Type:</b> Mobile Phone
<b>Report Number:</b> RSZ200522009-00D	
<b>Report Date:</b> 2020-06-18	
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## GENERAL INFORMATION

### Product Description for Equipment under Test (EUT)

Product	Mobile Phone
Model	LS5018F
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) LTE B66: 1710-1780MHz(TX)/2110-2200MHz(RX)
Maximum Target Output Power	EGSM850: 33.08dBm(GMSK) PCS1900: 28.96dBm(GMSK) WCDMA Band 2: 22.14dBm WCDMA Band 5: 22.09dBm LTE Band 2: 22.99dBm LTE Band 4: 22.71dBm LTE Band 7: 21.70dBm LTE Band 66: 22.80dBm
Modulation Technique	2G: GMSK 3G: BPSK, QPSK, 16QAM 4G: QPSK, 16QAM
Antenna Specification	2G/3G/4G: FPC Antennas
Voltage Range	DC 3.8 V from battery or DC5.0V from adapter
Date of Test	2020-05-28 to 2020-06-10
Sample serial number	RSZ200522009-RF-S1 (Assigned by BA CL, Shenzhen)
Received date	2020-05-22
Sample/EUT Status	Good condition
Normal/Extreme Condition	N.V.: Nominal Voltage: 3.8V <sub>DC</sub> L.V.: Low Voltage: 3.6V <sub>DC</sub> H.V.: High Voltage: 4.35V <sub>DC</sub>
Adapter Information	Modelo:SENWAC1A Entrada:100-240Vca,50/60Hz,0.2A Salida:5.0Vcc,1A

### Objective

This test report is prepared on behalf of *SENWA GLOBAL INTERNATIONAL SA DE CV* 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: 2AAA6-LS5018F.

## 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/EIA 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/EIA-603-E.

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

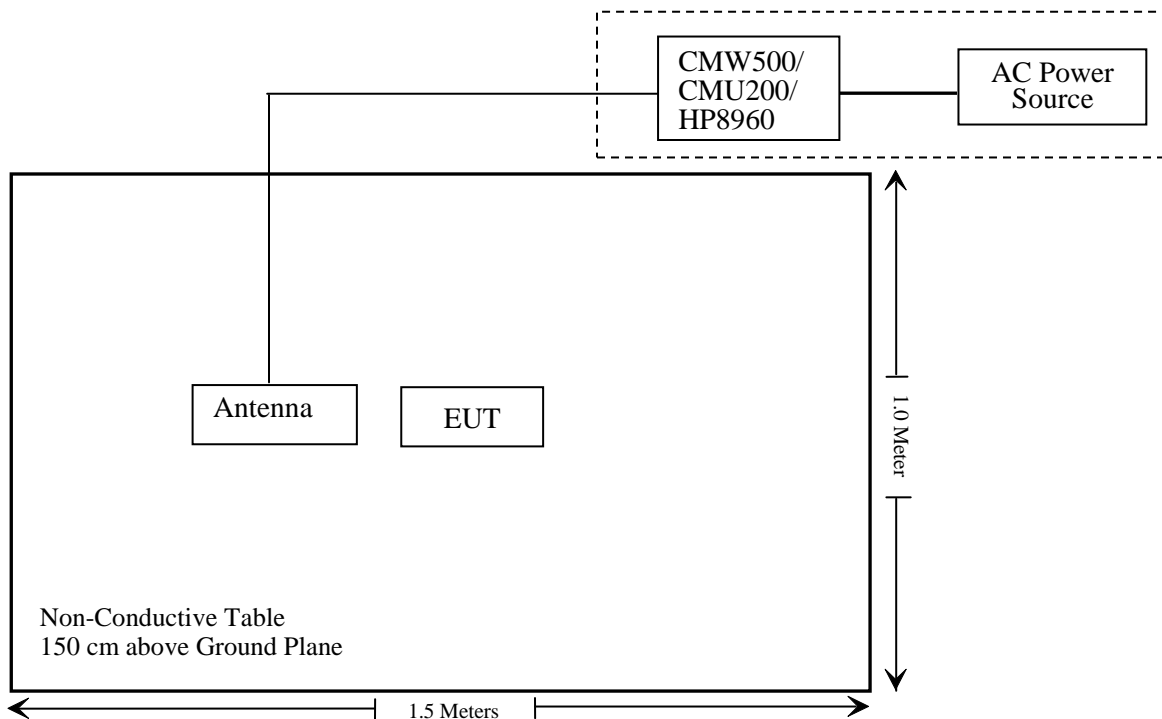
### Equipment Modifications

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
Agilent	Wireless communication tester	HP8960	MY50266471

### 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: RSZ200522009-20A.

**TEST EQUIPMENT LIST**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
<b>Radiated Emission Test</b>					
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	Wireless communication tester	HP8960	MY50266471	2020/4/24	2021/4/24
Agilent	Signal Generator	N5183A	MY51040755	2019/12/4	2020/12/4

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
<b>RF Conducted Test</b>					
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
Agilent	Wireless communication tester	HP8960	MY50266471	2020/4/24	2021/4/24
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).



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

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### **Applicable Standard**

FCC§1.1310 and §2.1093.

### **Test Result**

Compliance, please refer to the SAR report: RSZ200522009-20A

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## **FCC §2.1047 - MODULATION CHARACTERISTIC**

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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.

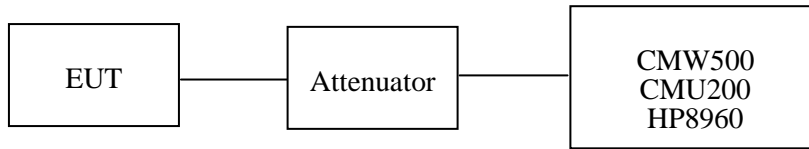
According to §27.50(d), the maximum EIRP must not exceed 1Watts (30dBm) for 1710-1755MHz and 1755-1780MHz.

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/HP8960 through sufficient attenuation.



*Radiated method:*

TIA 603-E section 2.2.17

**Test Data**

**Environmental Conditions**

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

*The testing was performed by Black Chen from 2020-05-28 to 2020-06-02.*

**Conducted Power**

**Cellular Band (Part 22H)**

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	128	824.2	32.91	38.45
	190	836.6	32.97	38.45
	251	848.8	33.08	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	32.89	30.62	28.58	26.28	38.45
	190	836.6	32.96	30.66	28.65	26.37	38.45
	251	848.8	33.07	30.71	28.65	26.42	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		21.95	22.09	22.06
		HSDPA	1	21.05	21.07	20.95
			2	21.01	21.05	20.94
			3	21.02	21.08	20.91
			4	21.05	21.07	20.98
		HSUPA	1	20.94	20.95	20.81
			2	20.88	20.81	20.74
			3	20.81	22.87	20.72
			4	20.89	20.85	20.71
			5	20.87	20.83	20.70

**PCS Band (Part 24E)**

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	28.75	33
	661	1880.0	28.96	33
	810	1909.8	28.79	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	28.81	26.78	25.21	23.09	33
	661	1880.0	28.96	26.80	25.23	23.10	33
	810	1909.8	28.81	26.53	24.97	22.83	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		21.46	21.78	22.14
		HSDPA	1	19.83	20.01	20.01
			2	19.63	19.78	19.67
			3	19.76	19.82	19.75
			4	19.69	19.81	19.68
		HSUPA	1	19.68	19.81	19.79
			2	19.81	19.89	19.85
			3	19.77	19.82	19.71
			4	19.68	19.77	19.67
			5	19.71	19.75	19.65

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

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	1.41	13
	Middle	1.35	13
	High	1.33	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.09	13
	Middle	3.10	13
	High	2.86	13
HSDPA (16QAM)	Low	3.96	13
	Middle	3.81	13
	High	3.41	13
HSUPA (BPSK)	Low	4.03	13
	Middle	4.01	13
	High	4.05	13

**PCS Band**

<b>Mode</b>	<b>Channel</b>	<b>PAR (dB)</b>	<b>Limit (dB)</b>
GSM	Low	1.44	13
	Middle	1.28	13
	High	1.19	13

<b>Mode</b>	<b>Channel</b>	<b>PAR (dB)</b>	<b>Limit (dB)</b>
RMC (BPSK)	Low	3.39	13
	Middle	3.38	13
	High	3.31	13
HSDPA (16QAM)	Low	4.36	13
	Middle	4.35	13
	High	3.91	13
HSUPA (BPSK)	Low	4.31	13
	Middle	4.43	13
	High	4.32	13

**Radiated Power****GSM Mode:**

Frequency (MHz)	Receiver Reading (dB $\mu$ V)	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	78.89	263	2.4	H	19.5	1.90	0.0	17.60	38.45	20.85
836.6	91.66	190	2.0	V	31.7	1.90	0.0	29.80	38.45	8.65
EIRP for PCS Band (Part 24E), Middle Channel										
1880.00	87.54	60	2.3	H	17.9	1.30	9.40	26.00	33	7.00
1880.00	86.46	247	1.4	V	16.6	1.30	9.40	24.70	33	8.30

**WCDMA Mode:**

Frequency (MHz)	Receiver Reading (dB $\mu$ V)	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	67.68	341	1.7	H	8.3	1.90	0.0	6.40	38.45	32.05
836.6	79.95	143	2.0	V	20.0	1.90	0.0	18.10	38.45	20.35
EIRP for WCDMA Band II (Part 24E), Middle Channel										
1880.00	80.14	205	2.0	H	10.5	1.30	9.40	18.60	33	14.40
1880.00	77.31	277	1.9	V	7.4	1.30	9.40	15.50	33	17.50



**LTE Band 2:****Maximum Output Power**

<b>Bandwidth (MHz)</b>	<b>Modulation</b>	<b>RB size/RB Offset</b>	<b>Low Channel (dBm)</b>	<b>Middle Channel (dBm)</b>	<b>High Channel (dBm)</b>
1.4	QPSK	RB Size=1, RB Offset=0	22.65	22.69	22.75
		RB Size=1, RB Offset=2	22.64	22.79	22.67
		RB Size=1, RB Offset=5	22.93	22.65	22.86
		RB Size=3, RB Offset=0	22.86	22.99	22.85
		RB Size=3, RB Offset=1	22.72	22.71	22.84
		RB Size=3, RB Offset=2	22.73	22.97	22.87
		RB Size=6, RB Offset=0	22.92	22.78	22.77
	16QAM	RB Size=1, RB Offset=0	22.11	22.14	22.15
		RB Size=1, RB Offset=2	22.20	22.03	22.23
		RB Size=1, RB Offset=5	22.14	22.26	22.23
		RB Size=3, RB Offset=0	22.30	22.15	22.20
		RB Size=3, RB Offset=1	22.21	22.30	22.14
		RB Size=3, RB Offset=2	22.06	22.16	22.17
		RB Size=6, RB Offset=0	22.11	22.22	22.04
3.0	QPSK	RB Size=1, RB Offset=0	22.64	22.80	22.76
		RB Size=1, RB Offset=7	22.72	22.64	22.90
		RB Size=1, RB Offset=14	22.79	22.76	22.71
		RB Size=8, RB Offset=0	22.76	22.95	22.90
		RB Size=8, RB Offset=4	22.94	22.82	22.85
		RB Size=8, RB Offset=7	22.80	22.91	22.89
		RB Size=15, RB Offset=0	22.80	22.76	22.91
	16QAM	RB Size=1, RB Offset=0	22.20	22.17	22.07
		RB Size=1, RB Offset=7	22.03	22.07	22.09
		RB Size=1, RB Offset=14	22.05	22.02	22.02
		RB Size=8, RB Offset=0	22.15	22.18	22.00
		RB Size=8, RB Offset=4	22.13	22.09	22.02
		RB Size=8, RB Offset=7	22.24	22.26	22.28
		RB Size=15, RB Offset=0	22.27	22.03	22.08

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.70	22.91	22.64
		RB Size=1, RB Offset=12	22.91	22.88	22.81
		RB Size=1, RB Offset=24	22.64	22.62	22.98
		RB Size=12, RB Offset=0	22.73	22.98	22.69
		RB Size=12, RB Offset=6	22.63	22.79	22.70
		RB Size=12, RB Offset=11	22.76	22.82	22.81
		RB Size=25, RB Offset=0	22.80	22.81	22.61
	16QAM	RB Size=1, RB Offset=0	22.29	22.04	22.22
		RB Size=1, RB Offset=12	22.12	22.12	22.28
		RB Size=1, RB Offset=24	22.28	22.08	22.07
		RB Size=12, RB Offset=0	22.05	22.20	22.27
		RB Size=12, RB Offset=6	22.12	22.29	22.08
		RB Size=12, RB Offset=11	22.11	22.10	22.14
		RB Size=25, RB Offset=0	22.12	22.10	22.09
10.0	QPSK	RB Size=1, RB Offset=0	22.82	22.96	22.63
		RB Size=1, RB Offset=24	22.66	22.61	22.66
		RB Size=1, RB Offset=49	22.90	22.95	22.85
		RB Size=25, RB Offset=0	22.82	22.70	22.73
		RB Size=25, RB Offset=12	22.64	22.93	22.73
		RB Size=25, RB Offset=24	22.86	22.84	22.77
		RB Size=50, RB Offset=0	22.62	22.74	22.92
	16QAM	RB Size=1, RB Offset=0	22.28	22.03	22.26
		RB Size=1, RB Offset=24	22.01	22.15	22.04
		RB Size=1, RB Offset=49	22.05	22.23	22.02
		RB Size=25, RB Offset=0	22.27	22.28	22.29
		RB Size=25, RB Offset=12	22.27	22.01	22.12
		RB Size=25, RB Offset=24	22.15	22.14	22.24
		RB Size=50, RB Offset=0	22.00	22.00	22.09

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	22.68	22.92	22.69
		RB Size=1, RB Offset=37	22.82	22.75	22.98
		RB Size=1, RB Offset=74	22.82	22.74	22.73
		RB Size=36, RB Offset=0	22.87	22.87	22.78
		RB Size=36, RB Offset=18	22.83	22.87	22.72
		RB Size=36, RB Offset=37	22.94	22.89	22.62
		RB Size=75, RB Offset=0	22.71	22.98	22.75
	16QAM	RB Size=1, RB Offset=0	22.18	22.01	22.16
		RB Size=1, RB Offset=37	22.25	22.10	22.04
		RB Size=1, RB Offset=74	22.10	22.18	22.20
		RB Size=36, RB Offset=0	22.04	22.20	22.17
		RB Size=36, RB Offset=18	22.22	22.18	22.24
		RB Size=36, RB Offset=37	22.07	22.22	22.07
		RB Size=75, RB Offset=0	22.03	22.09	22.17
20.0	QPSK	RB Size=1, RB Offset=0	22.65	22.80	22.93
		RB Size=1, RB Offset=49	22.74	22.71	22.97
		RB Size=1, RB Offset=99	22.61	22.90	22.87
		RB Size=50, RB Offset=0	22.94	22.80	22.69
		RB Size=50, RB Offset=24	22.61	22.79	22.61
		RB Size=50, RB Offset=49	22.95	22.79	22.92
		RB Size=100, RB Offset=0	22.74	22.96	22.93
	16QAM	RB Size=1, RB Offset=0	22.30	22.23	22.29
		RB Size=1, RB Offset=49	22.15	22.19	22.05
		RB Size=1, RB Offset=99	22.07	22.06	22.07
		RB Size=50, RB Offset=0	22.27	22.17	22.11
		RB Size=50, RB Offset=24	22.10	22.24	22.03
		RB Size=50, RB Offset=49	22.02	22.27	22.19
		RB Size=100, RB Offset=0	22.03	22.09	22.04

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

Modulation	Middle channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.42	13	Pass
QPSK (100RB Size)	5.45	13	Pass
16QAM (1RB Size)	5.61	13	Pass
16QAM (100RB Size)	6.25	13	Pass

**QPSK:**

Frequency (MHz)	Receiver Reading (dB $\mu$ V)	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	78.92	133	1.0	H	9.5	1.30	9.40	17.56	33
1880.00	74.17	318	1.9	V	4.5	1.30	9.40	12.64	33
3 MHz Bandwidth									
1880.00	79.08	236	1.9	H	9.8	1.30	9.40	17.89	33
1880.00	74.57	64	1.2	V	4.6	1.30	9.40	12.65	33
5 MHz Bandwidth									
1880.00	79.38	46	1.8	H	10.0	1.30	9.40	18.15	33
1880.00	74.62	310	1.0	V	4.5	1.30	9.40	12.56	33
10 MHz Bandwidth									
1880.00	79.43	288	1.1	H	9.2	1.30	9.40	17.34	33
1880.00	74.07	53	1.6	V	4.3	1.30	9.40	12.37	33
15 MHz Bandwidth									
1880.00	79.41	61	1.7	H	9.4	1.30	9.40	17.47	33
1880.00	74.21	9	1.1	V	4.9	1.30	9.40	12.98	33
20 MHz Bandwidth									
1880.00	78.96	11	1.3	H	9.3	1.30	9.40	17.38	33
1880.00	74.49	225	1.6	V	5.0	1.30	9.40	13.10	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	78.78	222	2.1	H	9.1	1.30	9.40	17.20	33
1880.00	73.85	254	2.4	V	4.0	1.30	9.40	12.10	33
3 MHz Bandwidth									
1880.00	79.14	239	1.5	H	10.1	1.3	9.4	18.19	33
1880.00	74.48	293	1.1	V	4.2	1.3	9.4	12.28	33
5 MHz Bandwidth									
1880.00	79.62	303	1.1	H	9.3	1.3	9.4	17.37	33
1880.00	73.97	165	1.7	V	4.9	1.3	9.4	12.96	33
10 MHz Bandwidth									
1880.00	79.59	45	1.5	H	9.9	1.3	9.4	18.03	33
1880.00	73.95	230	1.0	V	4.7	1.3	9.4	12.81	33
15 MHz Bandwidth									
1880.00	78.82	337	1.7	H	9.5	1.3	9.4	17.63	33
1880.00	74.49	45	1.6	V	4.4	1.3	9.4	12.49	33
20 MHz Bandwidth									
1880.00	78.81	96	1.2	H	9.8	1.3	9.4	17.94	33
1880.00	74.64	303	1.5	V	4.8	1.3	9.4	12.89	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	RB Size=1, RB Offset=0	22.07	22.14	22.13
		RB Size=1, RB Offset=2	22.24	22.09	22.25
		RB Size=1, RB Offset=5	22.20	22.15	22.24
		RB Size=3, RB Offset=0	22.06	22.30	22.20
		RB Size=3, RB Offset=1	22.02	22.19	22.23
		RB Size=3, RB Offset=2	22.28	22.09	22.19
		RB Size=6, RB Offset=0	22.21	22.18	22.04
	16QAM	RB Size=1, RB Offset=0	21.32	21.43	21.45
		RB Size=1, RB Offset=2	21.32	21.31	21.31
		RB Size=1, RB Offset=5	21.34	21.42	21.47
		RB Size=3, RB Offset=0	21.31	21.46	21.40
		RB Size=3, RB Offset=1	21.43	21.48	21.41
		RB Size=3, RB Offset=2	21.48	21.33	21.38
		RB Size=6, RB Offset=0	21.49	21.46	21.49
3.0	QPSK	RB Size=1, RB Offset=0	22.26	22.15	22.13
		RB Size=1, RB Offset=7	22.01	22.25	22.15
		RB Size=1, RB Offset=14	22.01	22.28	22.22
		RB Size=8, RB Offset=0	22.05	22.12	22.24
		RB Size=8, RB Offset=4	22.04	22.26	22.19
		RB Size=8, RB Offset=7	22.04	22.07	22.08
		RB Size=15, RB Offset=0	22.13	22.71	22.50
	16QAM	RB Size=1, RB Offset=0	21.34	21.35	21.48
		RB Size=1, RB Offset=7	21.33	21.35	21.43
		RB Size=1, RB Offset=14	21.34	21.32	21.37
		RB Size=8, RB Offset=0	21.41	21.44	21.31
		RB Size=8, RB Offset=4	21.34	21.30	21.38
		RB Size=8, RB Offset=7	21.38	21.38	21.50
		RB Size=15, RB Offset=0	21.48	21.43	21.41

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.02	22.28	22.14
		RB Size=1, RB Offset=12	22.03	22.14	22.12
		RB Size=1, RB Offset=24	22.18	22.17	22.04
		RB Size=12, RB Offset=0	22.17	22.04	22.25
		RB Size=12, RB Offset=6	22.14	22.05	22.29
		RB Size=12, RB Offset=11	22.29	22.15	22.12
		RB Size=25, RB Offset=0	22.14	22.17	22.12
	16QAM	RB Size=1, RB Offset=0	21.49	21.49	21.48
		RB Size=1, RB Offset=12	21.49	21.35	21.42
		RB Size=1, RB Offset=24	21.36	21.31	21.33
		RB Size=12, RB Offset=0	21.41	21.47	21.46
		RB Size=12, RB Offset=6	21.36	21.37	21.40
		RB Size=12, RB Offset=11	21.31	21.40	21.47
		RB Size=25, RB Offset=0	21.50	21.33	21.33
10.0	QPSK	RB Size=1, RB Offset=0	22.22	22.08	22.02
		RB Size=1, RB Offset=24	22.25	22.11	22.27
		RB Size=1, RB Offset=49	22.13	22.23	22.28
		RB Size=25, RB Offset=0	22.29	22.22	22.16
		RB Size=25, RB Offset=12	22.03	22.05	22.21
		RB Size=25, RB Offset=24	22.22	22.03	22.12
		RB Size=50, RB Offset=0	22.27	22.19	22.25
	16QAM	RB Size=1, RB Offset=0	21.41	21.32	21.48
		RB Size=1, RB Offset=24	21.34	21.31	21.34
		RB Size=1, RB Offset=49	21.33	21.38	21.46
		RB Size=25, RB Offset=0	21.44	21.31	21.50
		RB Size=25, RB Offset=12	21.46	21.30	21.30
		RB Size=25, RB Offset=24	21.42	21.37	21.46
		RB Size=50, RB Offset=0	21.45	21.42	21.42

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	22.10	22.22	22.20
		RB Size=1, RB Offset=37	22.21	22.11	22.09
		RB Size=1, RB Offset=74	22.22	22.10	22.12
		RB Size=36, RB Offset=0	22.15	22.04	22.18
		RB Size=36, RB Offset=18	22.08	22.10	22.06
		RB Size=36, RB Offset=37	22.20	22.09	22.04
		RB Size=75, RB Offset=0	22.28	22.00	22.13
	16QAM	RB Size=1, RB Offset=0	21.42	21.37	21.33
		RB Size=1, RB Offset=37	21.33	21.39	21.41
		RB Size=1, RB Offset=74	21.37	21.33	21.42
		RB Size=36, RB Offset=0	21.35	21.39	21.36
		RB Size=36, RB Offset=18	21.32	21.47	21.39
		RB Size=36, RB Offset=37	21.38	21.47	21.49
		RB Size=75, RB Offset=0	21.33	21.41	21.38
20.0	QPSK	RB Size=1, RB Offset=0	22.03	22.00	22.24
		RB Size=1, RB Offset=49	22.21	22.24	22.23
		RB Size=1, RB Offset=99	22.11	22.11	22.11
		RB Size=50, RB Offset=0	22.19	22.10	22.09
		RB Size=50, RB Offset=24	22.25	22.16	22.06
		RB Size=50, RB Offset=49	22.05	22.06	22.09
		RB Size=100, RB Offset=0	22.02	22.12	22.01
	16QAM	RB Size=1, RB Offset=0	21.45	21.39	21.38
		RB Size=1, RB Offset=49	21.31	21.36	21.46
		RB Size=1, RB Offset=99	21.39	21.34	21.45
		RB Size=50, RB Offset=0	21.41	21.49	21.39
		RB Size=50, RB Offset=24	21.38	21.31	21.47
		RB Size=50, RB Offset=49	21.37	21.34	21.32
		RB Size=100, RB Offset=0	21.31	21.42	21.44



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

Modulation	Middle channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.33	13	Pass
QPSK (100RB Size)	5.48	13	Pass
16QAM (1RB Size)	5.48	13	Pass
16QAM (100RB Size)	6.35	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	80.63	69	1.9	H	7.0	1.30	8.90	14.62	30
1732.50	76.77	324	1.3	V	3.7	1.30	8.90	11.28	30
3 MHz Bandwidth									
1732.50	80.69	69	1.9	H	7.3	1.30	8.90	14.88	30
1732.50	76.70	324	1.3	V	3.1	1.30	8.90	10.72	30
5 MHz Bandwidth									
1732.50	80.60	69	1.9	H	6.8	1.30	8.90	14.42	30
1732.50	76.74	324	1.3	V	3.6	1.30	8.90	11.20	30
10 MHz Bandwidth									
1732.50	80.25	69	1.9	H	7.7	1.30	8.90	15.28	30
1732.50	76.51	324	1.3	V	2.9	1.30	8.90	10.55	30
15 MHz Bandwidth									
1732.50	80.11	69	1.9	H	7.5	1.30	8.90	15.08	30
1732.50	76.26	324	1.3	V	3.2	1.30	8.90	10.82	30
20 MHz Bandwidth									
1732.50	80.06	69	1.9	H	7.2	1.30	8.90	14.81	30
1732.50	76.69	324	1.3	V	3.8	1.30	8.90	11.38	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	80.08	69	1.9	H	6.8	1.30	8.90	14.40	30
1732.50	75.18	324	1.3	V	2.5	1.30	8.90	10.10	30
3 MHz Bandwidth									
1732.50	79.79	69	1.9	H	7.4	1.30	8.90	14.97	30
1732.50	76.79	324	1.3	V	2.9	1.30	8.90	10.48	30
5 MHz Bandwidth									
1732.50	80.06	69	1.9	H	7.5	1.30	8.90	15.05	30
1732.50	76.36	324	1.3	V	3.7	1.30	8.90	11.30	30
10 MHz Bandwidth									
1732.50	80.66	69	1.9	H	7.6	1.30	8.90	15.19	30
1732.50	75.89	324	1.3	V	3.0	1.30	8.90	10.64	30
15 MHz Bandwidth									
1732.50	80.64	69	1.9	H	7.8	1.30	8.90	15.36	30
1732.50	76.58	324	1.3	V	3.1	1.30	8.90	10.71	30
20 MHz Bandwidth									
1732.50	80.75	69	1.9	H	7.4	1.30	8.90	14.97	30
1732.50	76.83	324	1.3	V	3.0	1.30	8.90	10.62	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	RB Size=1, RB Offset=0	21.56	21.67	21.53
		RB Size=1, RB Offset=12	21.54	21.50	21.62
		RB Size=1, RB Offset=24	21.64	21.57	21.52
		RB Size=12, RB Offset=0	21.54	21.63	21.57
		RB Size=12, RB Offset=6	21.70	21.70	21.60
		RB Size=12, RB Offset=11	21.52	21.57	21.51
		RB Size=25, RB Offset=0	21.65	21.70	21.67
	16QAM	RB Size=1, RB Offset=0	20.69	20.81	20.77
		RB Size=1, RB Offset=12	20.71	20.69	20.69
		RB Size=1, RB Offset=24	20.81	20.80	20.71
		RB Size=12, RB Offset=0	20.71	20.81	20.67
		RB Size=12, RB Offset=6	20.69	20.72	20.69
		RB Size=12, RB Offset=11	20.72	20.82	20.66
		RB Size=25, RB Offset=0	20.73	20.77	20.79
10	QPSK	RB Size=1, RB Offset=0	21.51	21.65	21.56
		RB Size=1, RB Offset=24	21.60	21.70	21.67
		RB Size=1, RB Offset=49	21.56	21.52	21.59
		RB Size=25, RB Offset=0	21.50	21.57	21.61
		RB Size=25, RB Offset=12	21.63	21.52	21.68
		RB Size=25, RB Offset=24	21.69	21.66	21.63
		RB Size=50, RB Offset=0	21.62	21.55	21.59
	16QAM	RB Size=1, RB Offset=0	20.74	20.73	20.76
		RB Size=1, RB Offset=24	20.65	20.78	20.74
		RB Size=1, RB Offset=49	20.80	20.73	20.77
		RB Size=25, RB Offset=0	20.82	20.77	20.73
		RB Size=25, RB Offset=12	20.71	20.78	20.72
		RB Size=25, RB Offset=24	20.79	20.70	20.70
		RB Size=50, RB Offset=0	20.69	20.70	20.79

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15	QPSK	RB Size=1, RB Offset=0	21.55	21.55	21.63
		RB Size=1, RB Offset=37	21.63	21.64	21.66
		RB Size=1, RB Offset=74	21.51	21.67	21.69
		RB Size=36, RB Offset=0	21.63	21.62	21.66
		RB Size=36, RB Offset=18	21.58	21.61	21.62
		RB Size=36, RB Offset=37	21.57	21.59	21.66
		RB Size=75, RB Offset=0	21.68	21.55	21.53
	16QAM	RB Size=1, RB Offset=0	20.73	20.70	20.76
		RB Size=1, RB Offset=37	20.75	20.70	20.73
		RB Size=1, RB Offset=74	20.68	20.74	20.70
		RB Size=36, RB Offset=0	20.69	20.67	20.79
		RB Size=36, RB Offset=18	20.71	20.69	20.78
		RB Size=36, RB Offset=37	20.81	20.67	20.68
		RB Size=75, RB Offset=0	20.69	20.79	20.72
20	QPSK	RB Size=1, RB Offset=0	21.60	21.67	21.55
		RB Size=1, RB Offset=49	21.63	21.65	21.52
		RB Size=1, RB Offset=99	21.53	21.60	21.62
		RB Size=50, RB Offset=0	21.70	21.59	21.60
		RB Size=50, RB Offset=24	21.54	21.63	21.65
		RB Size=50, RB Offset=49	21.55	21.62	21.60
		RB Size=100, RB Offset=0	21.56	21.50	21.63
	16QAM	RB Size=1, RB Offset=0	20.82	20.79	20.67
		RB Size=1, RB Offset=49	20.80	20.70	20.74
		RB Size=1, RB Offset=99	20.75	20.71	20.71
		RB Size=50, RB Offset=0	20.69	20.76	20.80
		RB Size=50, RB Offset=24	20.72	20.79	20.74
		RB Size=50, RB Offset=49	20.76	20.74	20.71
		RB Size=100, RB Offset=0	20.81	20.70	20.71

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

Modulation	Middle channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	3.94	13	Pass
QPSK (100RB Size)	5.29	13	Pass
16QAM (1RB Size)	5.06	13	Pass
16QAM (100RB Size)	6.03	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	76.66	69	1.9	H	7.3	2.60	10.20	14.91	33
2535	76.29	324	1.3	V	6.0	2.60	10.20	13.65	33
10 MHz Bandwidth									
2535	76.53	69	1.9	H	6.9	2.60	10.20	14.51	33
2535	76.42	324	1.3	V	6.1	2.60	10.20	13.72	33
15 MHz Bandwidth									
2535	77.26	69	1.9	H	7.2	2.60	10.20	14.78	33
2535	76.42	324	1.3	V	6.2	2.60	10.20	13.79	33
20 MHz Bandwidth									
2535	76.77	69	1.9	H	7.1	2.60	10.20	14.68	33
2535	75.87	324	1.3	V	6.1	2.60	10.20	13.73	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	76.80	69	1.9	H	7.3	2.60	10.20	14.89	33
2535	75.68	324	1.3	V	6.1	2.60	10.20	13.71	33
10 MHz Bandwidth									
2535	76.68	69	1.9	H	7.0	2.60	10.20	14.55	33
2535	76.17	324	1.3	V	6.1	2.60	10.20	13.72	33
15 MHz Bandwidth									
2535	76.92	69	1.9	H	7.1	2.60	10.20	14.68	33
2535	75.92	324	1.3	V	6.0	2.60	10.20	13.63	33
20 MHz Bandwidth									
2535	77.35	69	1.9	H	7.0	2.60	10.20	14.55	33
2535	76.12	324	1.3	V	6.1	2.60	10.20	13.67	33

**LTE Band 66:**

**Maximum Output Power**

<b>Bandwidth (MHz)</b>	<b>Modulation</b>	<b>RB size/RB Offset</b>	<b>Low Channel (dBm)</b>	<b>Middle Channel (dBm)</b>	<b>High Channel (dBm)</b>
1.4	QPSK	RB Size=1, RB Offset=0	22.62	22.79	22.67
		RB Size=1, RB Offset=2	22.55	22.71	22.67
		RB Size=1, RB Offset=5	22.71	22.51	22.66
		RB Size=3, RB Offset=0	22.76	22.74	22.61
		RB Size=3, RB Offset=1	22.56	22.75	22.57
		RB Size=3, RB Offset=2	22.51	22.79	22.74
		RB Size=6, RB Offset=0	22.59	22.62	22.68
	16QAM	RB Size=1, RB Offset=0	21.99	21.92	21.87
		RB Size=1, RB Offset=2	21.89	21.81	22.03
		RB Size=1, RB Offset=5	22.02	21.91	21.81
		RB Size=3, RB Offset=0	21.85	21.97	21.82
		RB Size=3, RB Offset=1	21.94	21.97	21.92
		RB Size=3, RB Offset=2	22.05	21.81	22.04
		RB Size=6, RB Offset=0	21.87	21.95	22.03
3.0	QPSK	RB Size=1, RB Offset=0	22.78	22.75	22.61
		RB Size=1, RB Offset=7	22.74	22.68	22.59
		RB Size=1, RB Offset=14	22.50	22.77	22.54
		RB Size=8, RB Offset=0	22.69	22.59	22.55
		RB Size=8, RB Offset=4	22.51	22.76	22.63
		RB Size=8, RB Offset=7	22.50	22.53	22.78
		RB Size=15, RB Offset=0	22.69	22.61	22.71
	16QAM	RB Size=1, RB Offset=0	21.89	21.85	21.86
		RB Size=1, RB Offset=7	22.02	21.85	22.01
		RB Size=1, RB Offset=14	21.84	21.81	21.91
		RB Size=8, RB Offset=0	21.82	21.93	22.01
		RB Size=8, RB Offset=4	21.98	21.95	21.84
		RB Size=8, RB Offset=7	21.88	22.01	21.82
		RB Size=15, RB Offset=0	21.84	22.00	21.83

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.53	22.72	22.67
		RB Size=1, RB Offset=12	22.58	22.51	22.74
		RB Size=1, RB Offset=24	22.77	22.70	22.67
		RB Size=12, RB Offset=0	22.52	22.66	22.60
		RB Size=12, RB Offset=6	22.51	22.74	22.57
		RB Size=12, RB Offset=11	22.78	22.51	22.66
		RB Size=25, RB Offset=0	22.56	22.75	22.61
	16QAM	RB Size=1, RB Offset=0	22.00	21.92	21.87
		RB Size=1, RB Offset=12	21.80	21.92	21.97
		RB Size=1, RB Offset=24	21.94	21.99	21.99
		RB Size=12, RB Offset=0	21.87	21.97	21.91
		RB Size=12, RB Offset=6	21.97	21.86	22.00
		RB Size=12, RB Offset=11	21.84	22.00	21.98
		RB Size=25, RB Offset=0	21.90	21.88	21.82
10.0	QPSK	RB Size=1, RB Offset=0	22.71	22.59	22.54
		RB Size=1, RB Offset=24	22.62	22.76	22.64
		RB Size=1, RB Offset=49	22.52	22.69	22.55
		RB Size=25, RB Offset=0	22.66	22.62	22.79
		RB Size=25, RB Offset=12	22.71	22.68	22.73
		RB Size=25, RB Offset=24	22.69	22.58	22.58
		RB Size=50, RB Offset=0	22.74	22.64	22.76
	16QAM	RB Size=1, RB Offset=0	21.88	22.02	21.97
		RB Size=1, RB Offset=24	22.03	21.88	21.86
		RB Size=1, RB Offset=49	22.01	21.88	21.93
		RB Size=25, RB Offset=0	21.83	21.83	21.83
		RB Size=25, RB Offset=12	22.01	21.93	21.98
		RB Size=25, RB Offset=24	21.87	21.82	21.92
		RB Size=50, RB Offset=0	22.01	21.82	21.88



Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	22.54	22.51	22.80
		RB Size=1, RB Offset=37	22.64	22.67	22.65
		RB Size=1, RB Offset=74	22.52	22.71	22.60
		RB Size=36, RB Offset=0	22.75	22.68	22.68
		RB Size=36, RB Offset=18	22.53	22.63	22.65
		RB Size=36, RB Offset=37	22.80	22.69	22.68
		RB Size=75, RB Offset=0	22.63	22.67	22.51
	16QAM	RB Size=1, RB Offset=0	21.97	21.91	22.02
		RB Size=1, RB Offset=37	22.01	22.04	21.98
		RB Size=1, RB Offset=74	22.03	21.92	21.91
		RB Size=36, RB Offset=0	22.03	22.01	21.94
		RB Size=36, RB Offset=18	21.91	22.03	21.87
		RB Size=36, RB Offset=37	21.97	21.83	21.88
		RB Size=75, RB Offset=0	21.86	21.92	21.89
20.0	QPSK	RB Size=1, RB Offset=0	22.77	22.77	22.71
		RB Size=1, RB Offset=49	22.66	22.73	22.79
		RB Size=1, RB Offset=99	22.52	22.79	22.59
		RB Size=50, RB Offset=0	22.74	22.77	22.55
		RB Size=50, RB Offset=24	22.70	22.77	22.72
		RB Size=50, RB Offset=49	22.59	22.57	22.73
		RB Size=100, RB Offset=0	22.54	22.51	22.60
	16QAM	RB Size=1, RB Offset=0	21.92	21.91	21.98
		RB Size=1, RB Offset=49	21.97	22.01	22.01
		RB Size=1, RB Offset=99	22.00	21.99	21.86
		RB Size=50, RB Offset=0	22.05	21.90	21.94
		RB Size=50, RB Offset=24	21.81	21.84	21.90
		RB Size=50, RB Offset=49	21.84	22.02	21.97
		RB Size=100, RB Offset=0	22.00	21.88	21.96

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

Modulation	Middle channel (dB)	PAR Limit (dB)	Result
QPSK (1RB Size)	4.65	13	Pass
QPSK (100RB Size)	5.51	13	Pass
16QAM (1RB Size)	5.29	13	Pass
16QAM (100RB Size)	6.38	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									
1.4 MHz Bandwidth									
1745.00	80.35	110	1.3	H	7.0	1.30	8.90	14.60	30
1745.00	76.02	116	1.7	V	3.3	1.30	8.90	10.90	30
3 MHz Bandwidth									
1745.00	80.74	43	1.2	H	7.4	1.30	8.90	15.00	30
1745.00	76.53	88	1.6	V	3.8	1.30	8.90	11.40	30
5 MHz Bandwidth									
1745.00	80.62	157	2.5	H	7.3	1.30	8.90	14.90	30
1745.00	76.21	91	2.5	V	3.5	1.30	8.90	11.10	30
10 MHz Bandwidth									
1745.00	80.31	36	1.8	H	7.0	1.30	8.90	14.60	30
1745.00	76.32	243	1.1	V	3.6	1.30	8.90	11.20	30
15 MHz Bandwidth									
1745.00	80.34	215	2.5	H	7.0	1.30	8.90	14.60	30
1745.00	76.35	54	1.3	V	3.6	1.30	8.90	11.20	30
20 MHz Bandwidth									
1745.00	80.81	197	1.7	H	7.5	1.30	8.90	15.10	30
1745.00	76.87	280	2.0	V	4.1	1.30	8.90	11.70	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									
1745.00	80.05	23	1.1	H	6.7	1.30	8.90	14.30	30
1745.00	76.02	307	1.3	V	3.3	1.30	8.90	10.90	30
3 MHz Bandwidth									
1745.00	80.21	281	1.1	H	6.9	1.30	8.90	14.50	30
1745.00	76.25	171	2.5	V	3.5	1.30	8.90	11.10	30
5 MHz Bandwidth									
1745.00	80.54	331	2.0	H	7.2	1.30	8.90	14.80	30
1745.00	76.17	286	1.2	V	3.4	1.30	8.90	11.00	30
10 MHz Bandwidth									
1745.00	80.17	338	1.1	H	6.8	1.30	8.90	14.40	30
1745.00	75.92	163	2.5	V	3.2	1.30	8.90	10.80	30
15 MHz Bandwidth									
1745.00	80.44	61	1.2	H	7.1	1.30	8.90	14.70	30
1745.00	76.10	109	2.4	V	3.4	1.30	8.90	11.00	30
20 MHz Bandwidth									
1745.00	80.63	192	1.0	H	7.3	1.30	8.90	14.90	30
1745.00	76.23	13	2.3	V	3.5	1.30	8.90	11.10	30

**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**

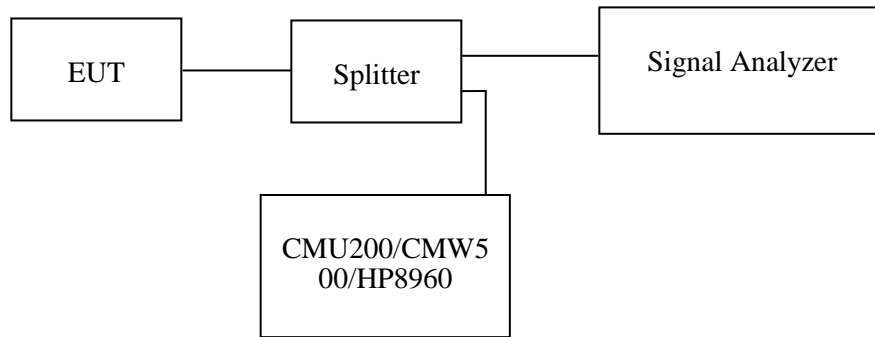
**Applicable Standard**

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**

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

*The testing was performed by Black Chen 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	250.00	317.31

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	836.6	4.15	4.70
HSUPA (BPSK)	836.6	4.17	4.71
HSDPA (16QAM)	836.6	4.17	4.71

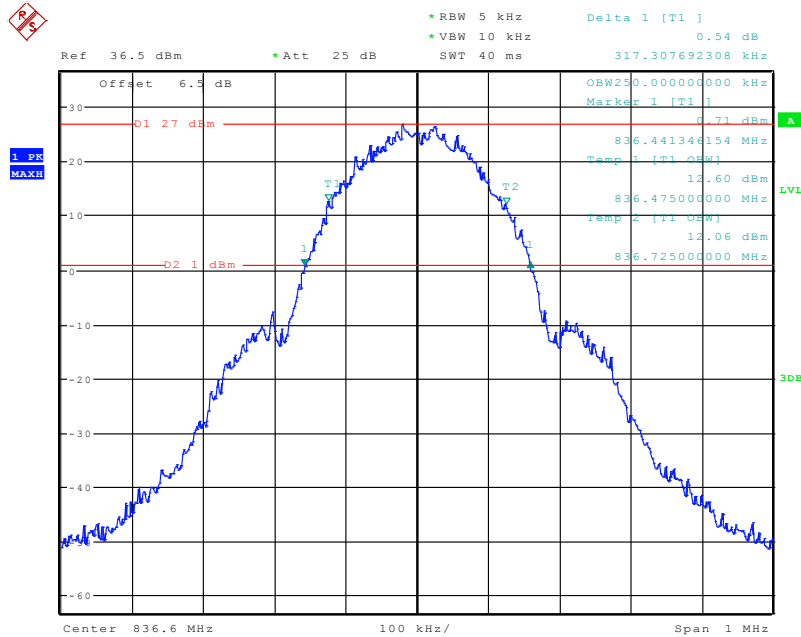
### PCS Band (Part 24E)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	1880.0	246.79	317.31

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	4.68
HSDPA (16QAM)	1880.0	4.15	4.70

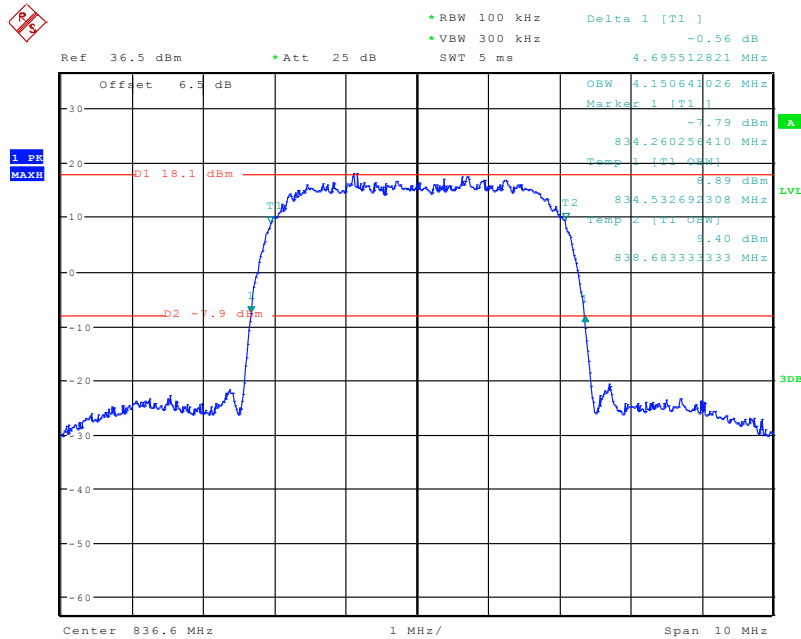
**Cellular Band (Part 22H)**

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



Date: 28.MAY.2020 22:04:17

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

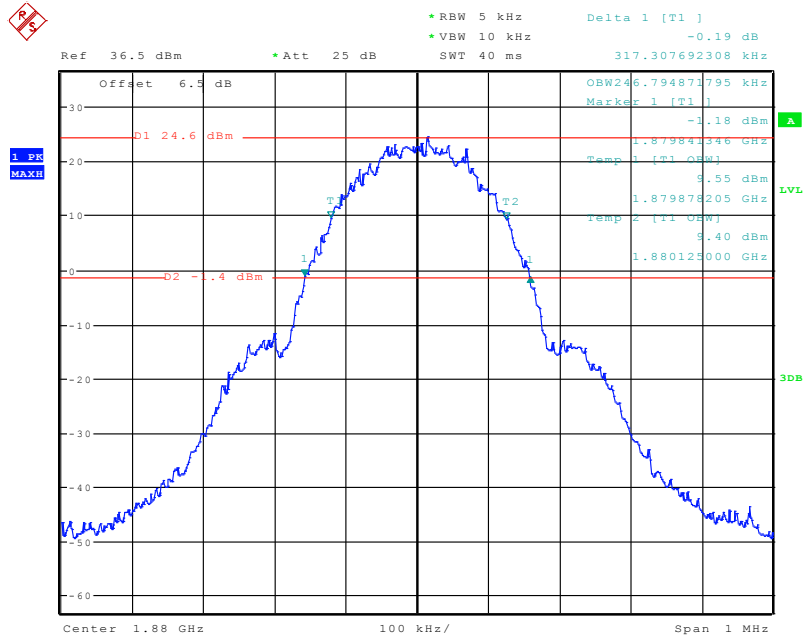


Date: 29.MAY.2020 00:08:27



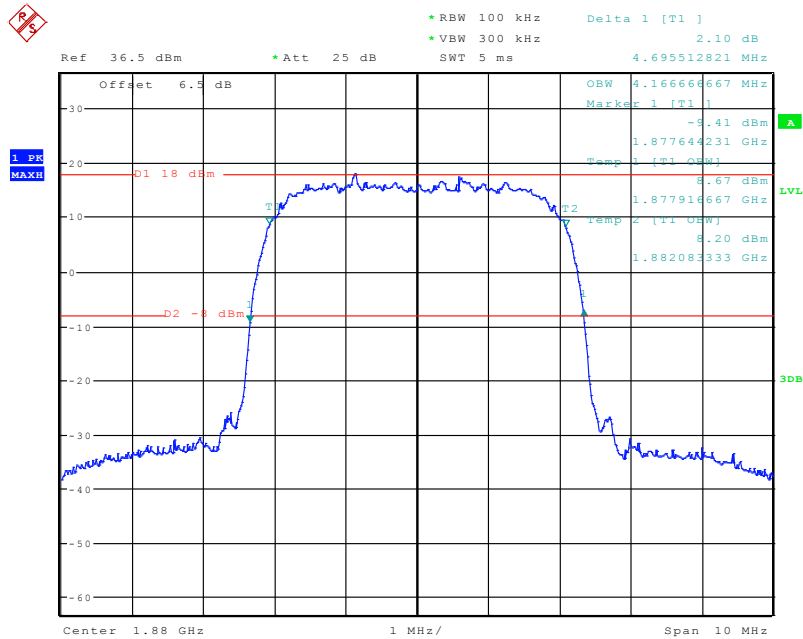
PCS Band (Part 24E)

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



Date: 28.MAY.2020 22:19:10

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



Date: 28.MAY.2020 23:19:27

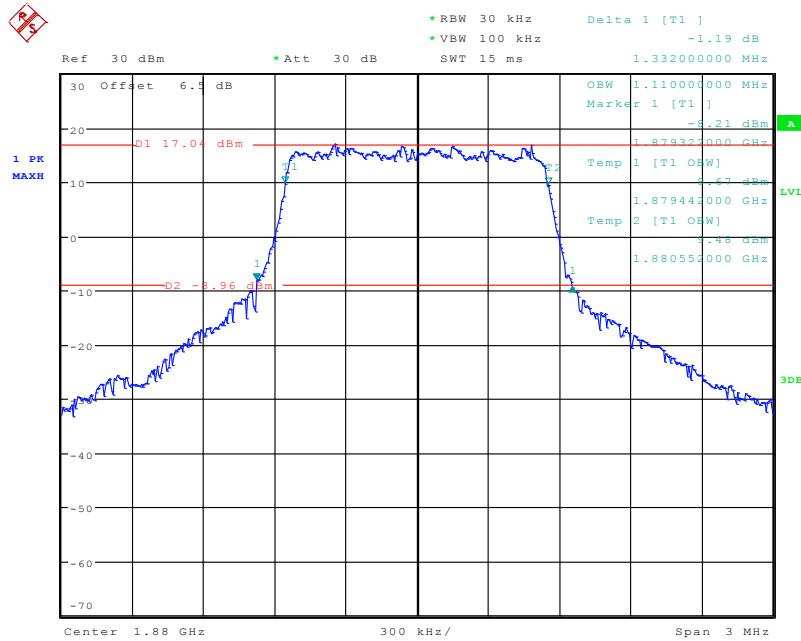




**LTE Band 2: (Middle Channel)**

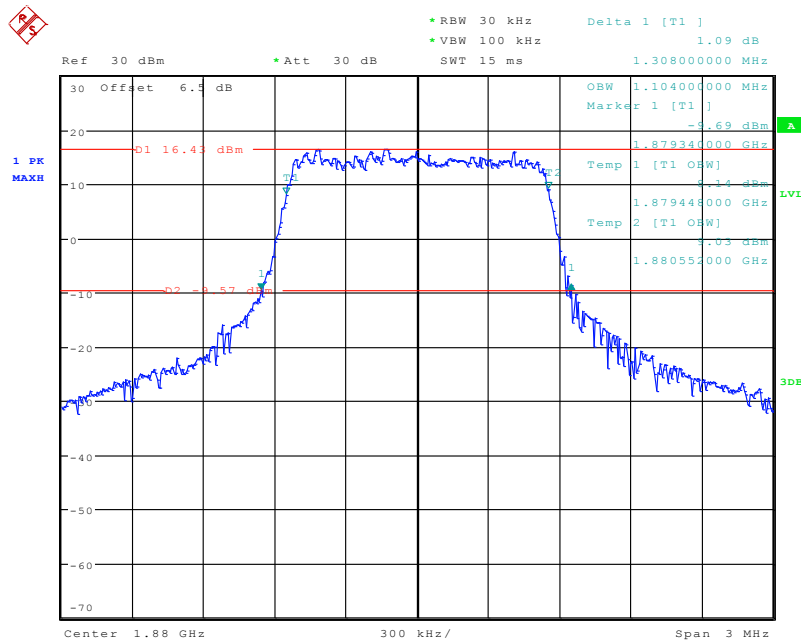
<b>Bandwidth (MHz)</b>	<b>Modulation</b>	<b>99% Occupied Bandwidth (MHz)</b>	<b>26 dB Emission Bandwidth (MHz)</b>
1.4	QPSK	1.110	1.332
	16QAM	1.104	1.308
3.0	QPSK	2.700	3.012
	16QAM	2.700	3.012
5.0	QPSK	4.560	5.360
	16QAM	4.540	5.340
10.0	QPSK	8.960	9.840
	16QAM	8.960	9.760
15.0	QPSK	13.560	15.300
	16QAM	13.560	15.000
20.0	QPSK	18.000	19.600
	16QAM	18.080	19.680

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



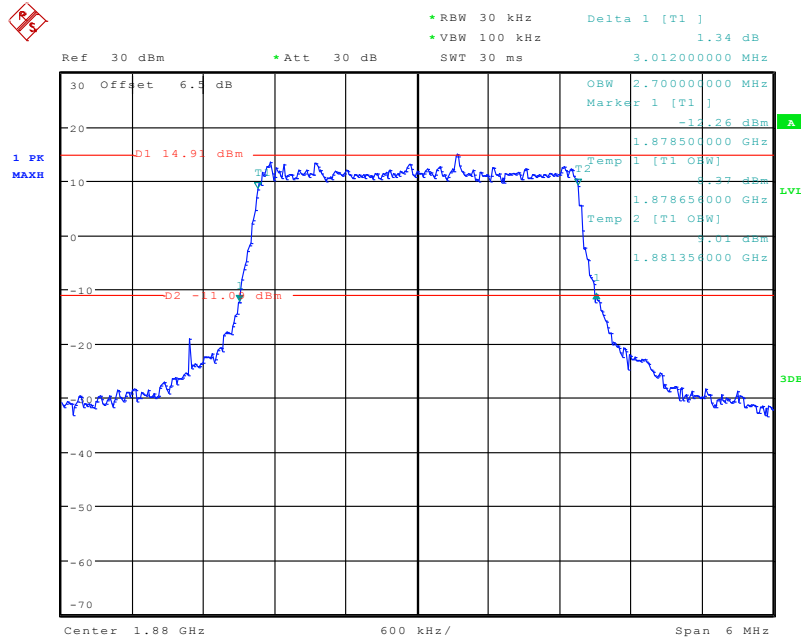
Date: 1.JUN.2020 18:52:30

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



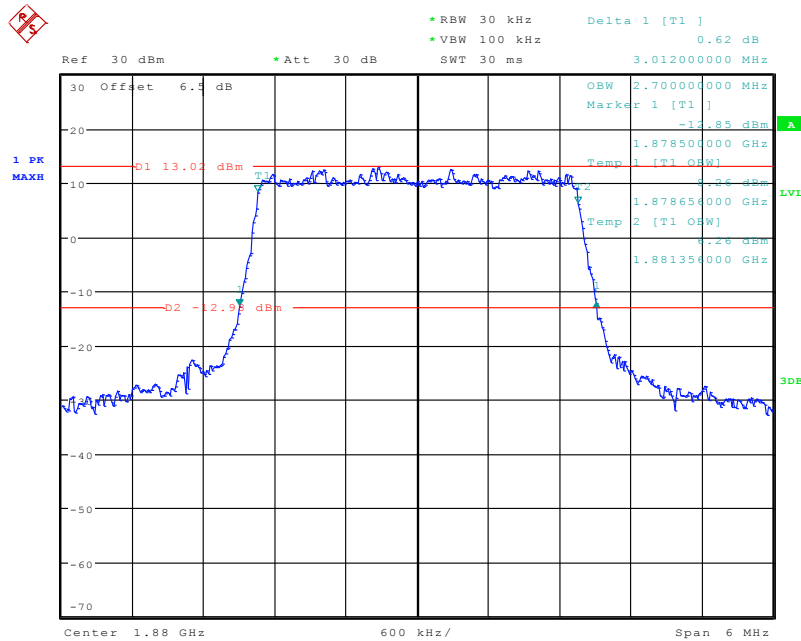
Date: 1.JUN.2020 18:52:53

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



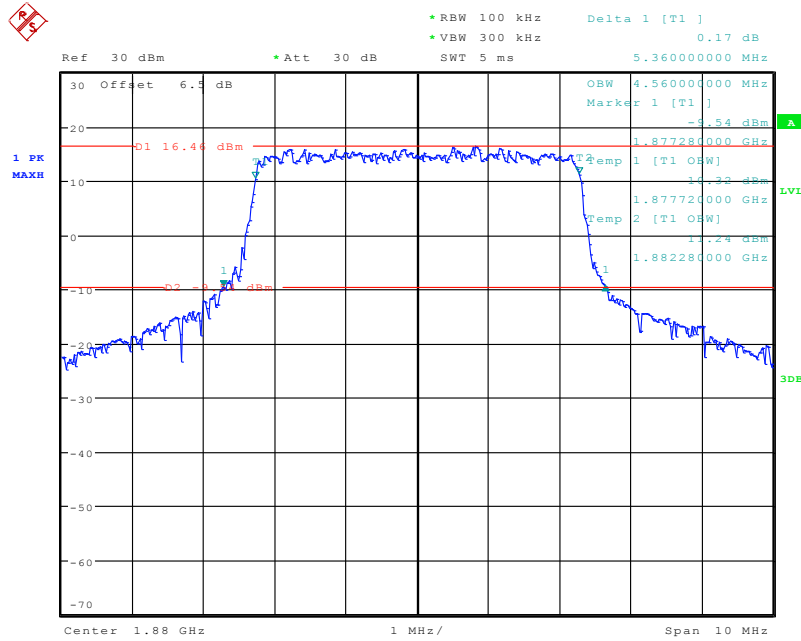
Date: 1.JUN.2020 18:53:16

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



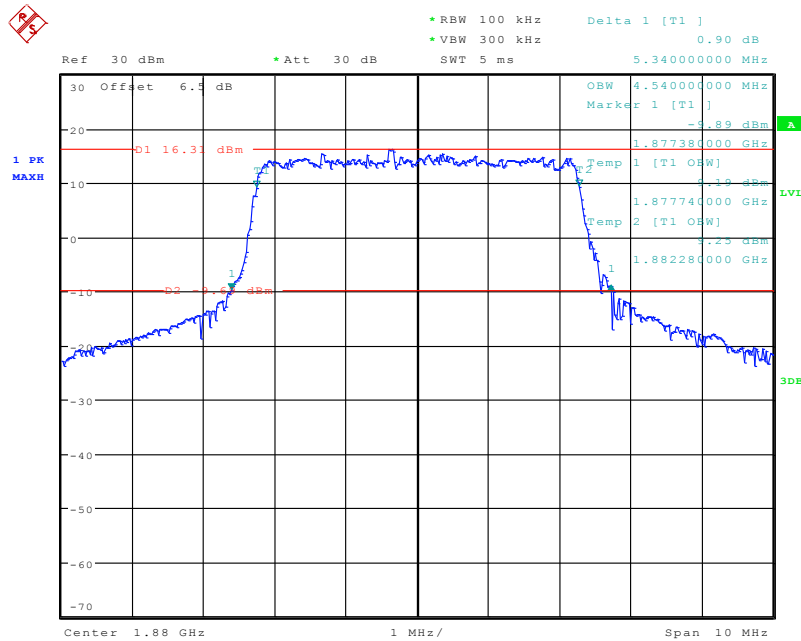
Date: 1.JUN.2020 18:53:37

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



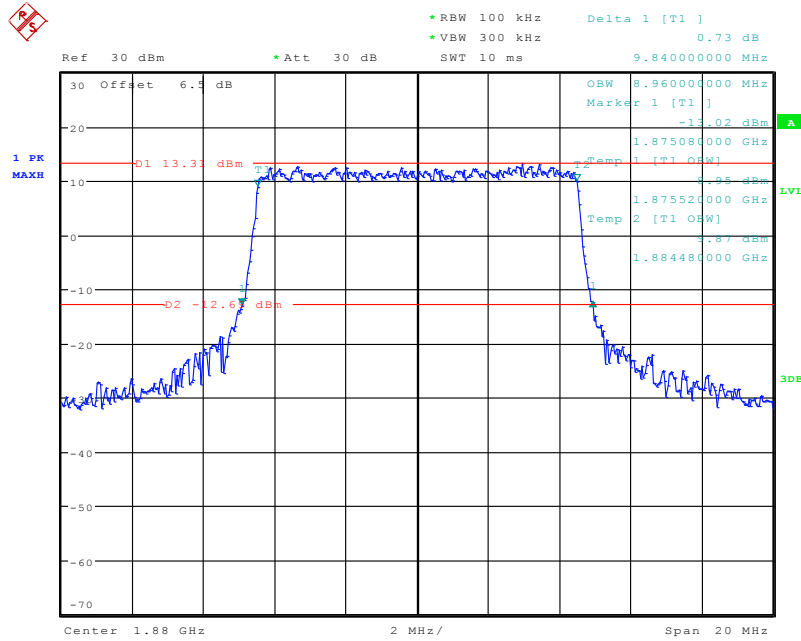
Date: 1.JUN.2020 18:54:10

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



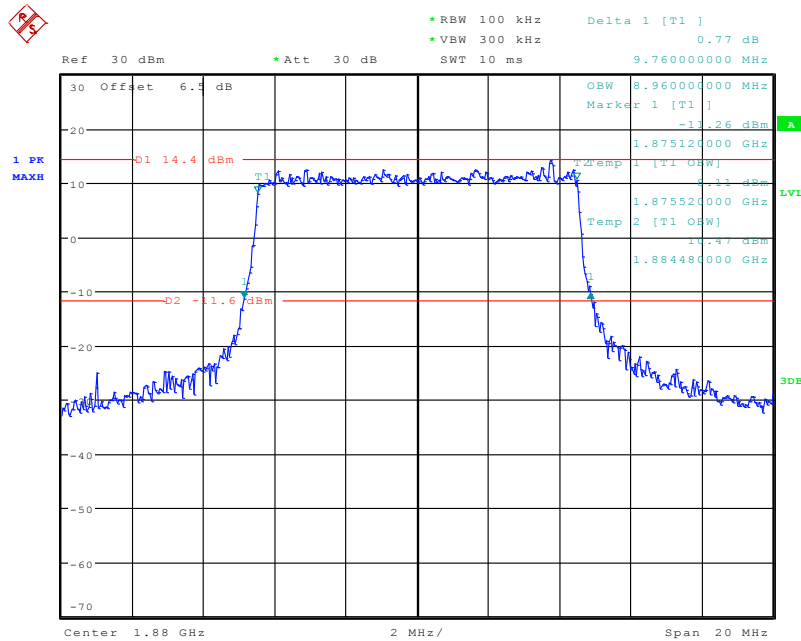
Date: 1.JUN.2020 18:54:41

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



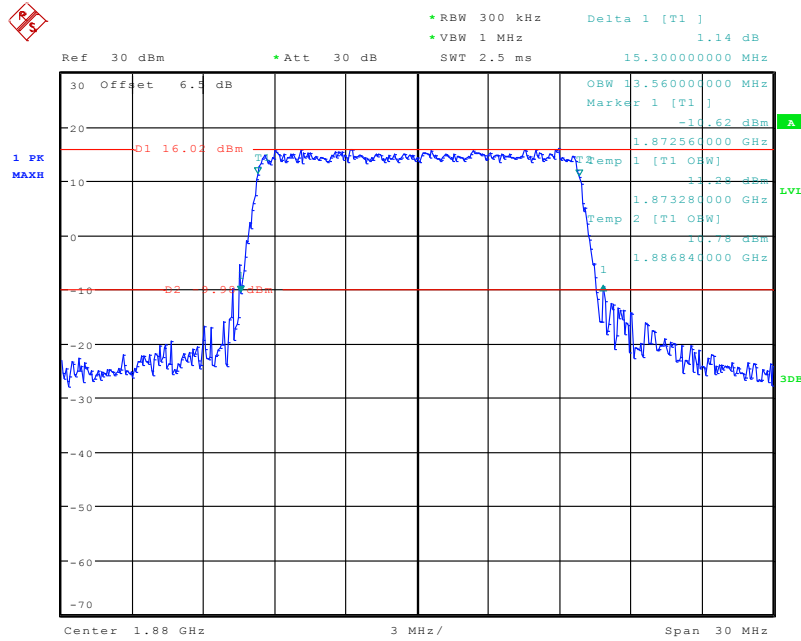
Date: 1.JUN.2020 18:55:07

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



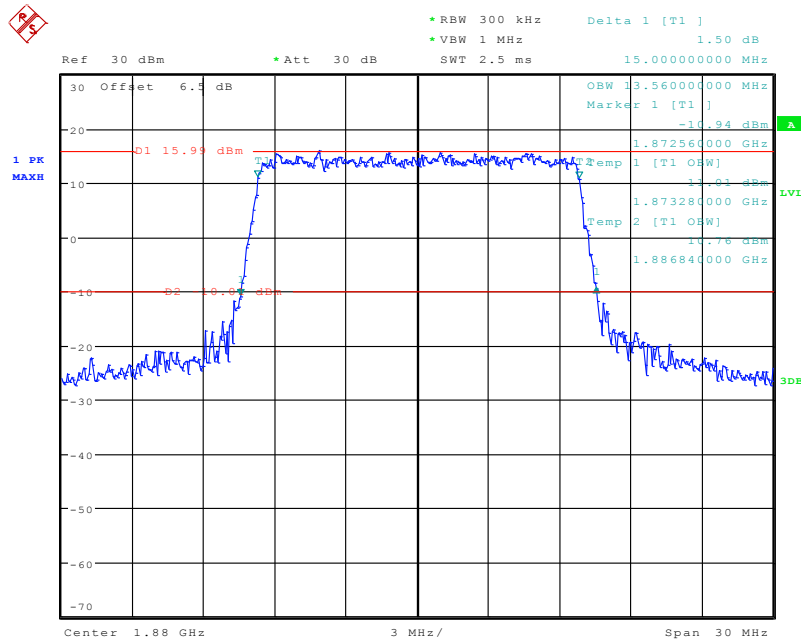
Date: 1.JUN.2020 18:55:32

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



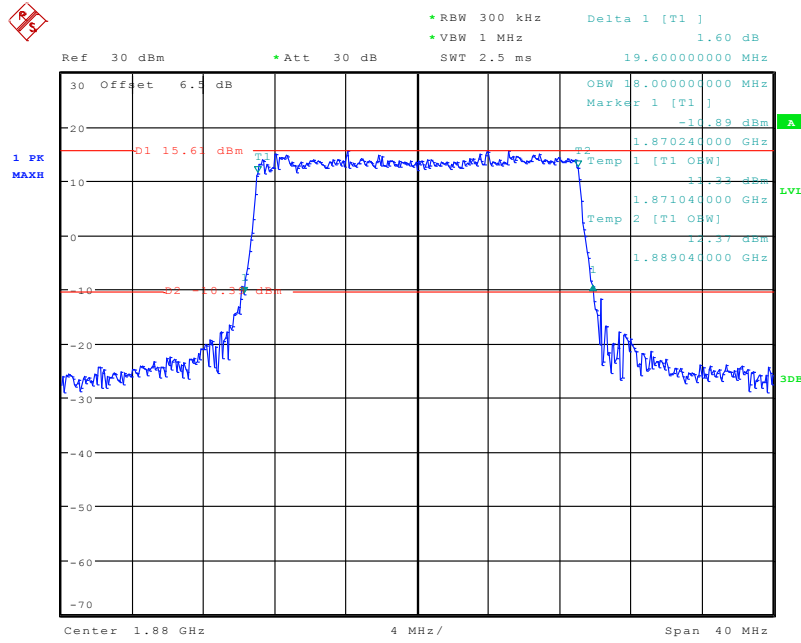
Date: 1.JUN.2020 18:55:56

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



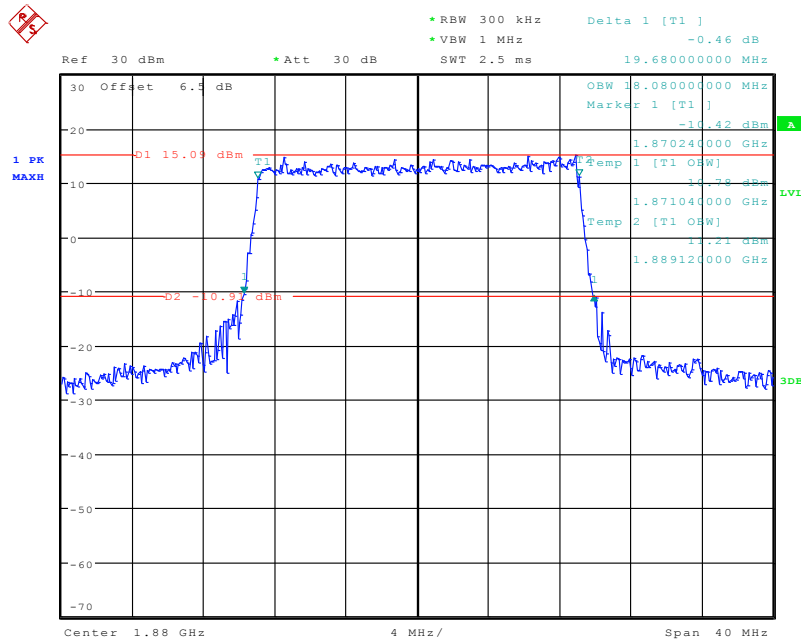
Date: 1.JUN.2020 18:56:20

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



Date: 1.JUN.2020 18:56:47

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



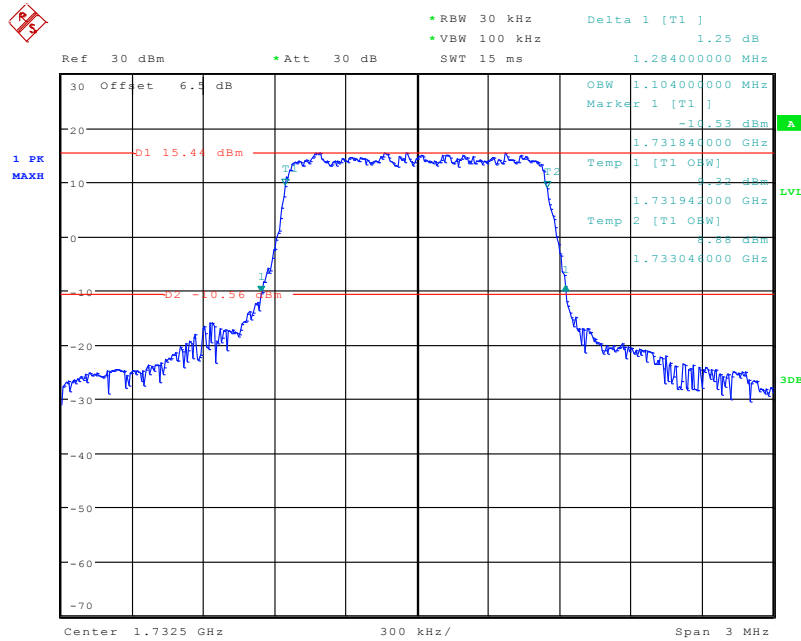
Date: 1.JUN.2020 18:57:11



**LTE Band 4: (Middle Channel)**

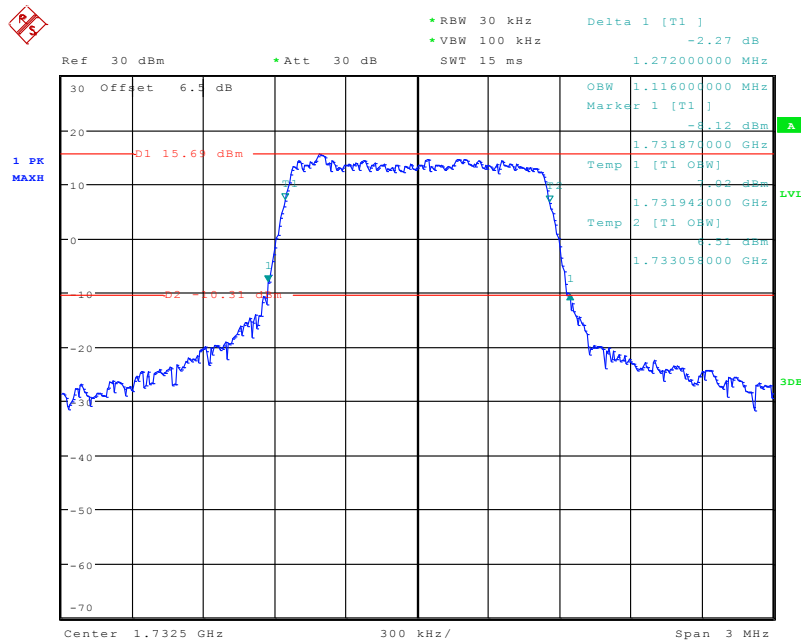
<b>Bandwidth (MHz)</b>	<b>Modulation</b>	<b>99% Occupied Bandwidth (MHz)</b>	<b>26 dB Emission Bandwidth (MHz)</b>
1.4	QPSK	1.104	1.284
	16QAM	1.116	1.272
3.0	QPSK	2.712	3.000
	16QAM	2.700	3.000
5.0	QPSK	4.560	5.280
	16QAM	4.560	5.360
10.0	QPSK	8.960	9.840
	16QAM	8.960	9.800
15.0	QPSK	13.500	15.600
	16QAM	13.500	15.060
20.0	QPSK	18.000	19.920
	16QAM	18.080	20.000

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



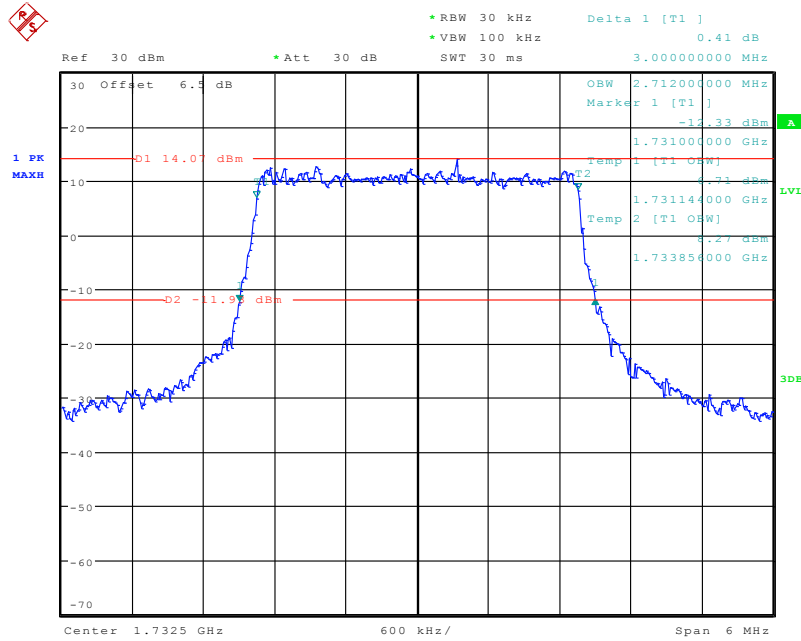
Date: 1.JUN.2020 18:57:37

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



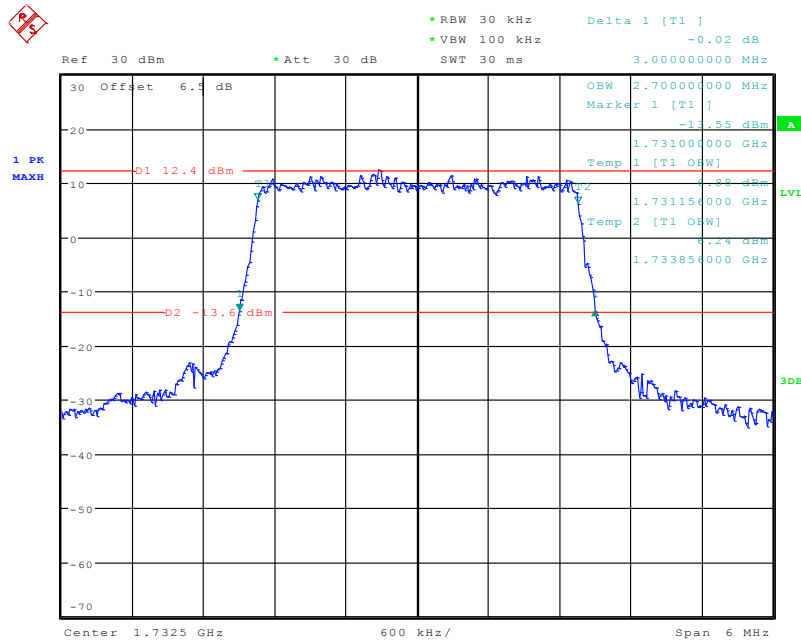
Date: 1.JUN.2020 18:58:04

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



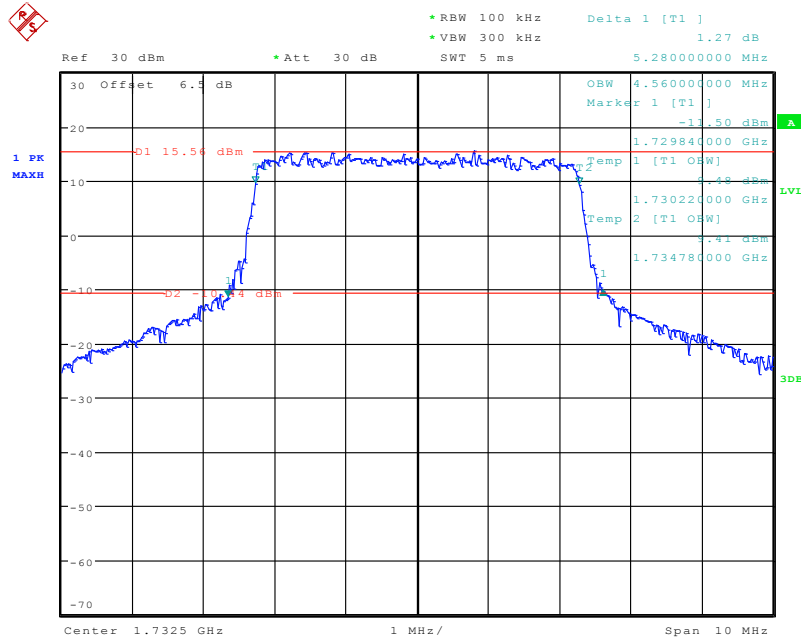
Date: 1.JUN.2020 18:58:27

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



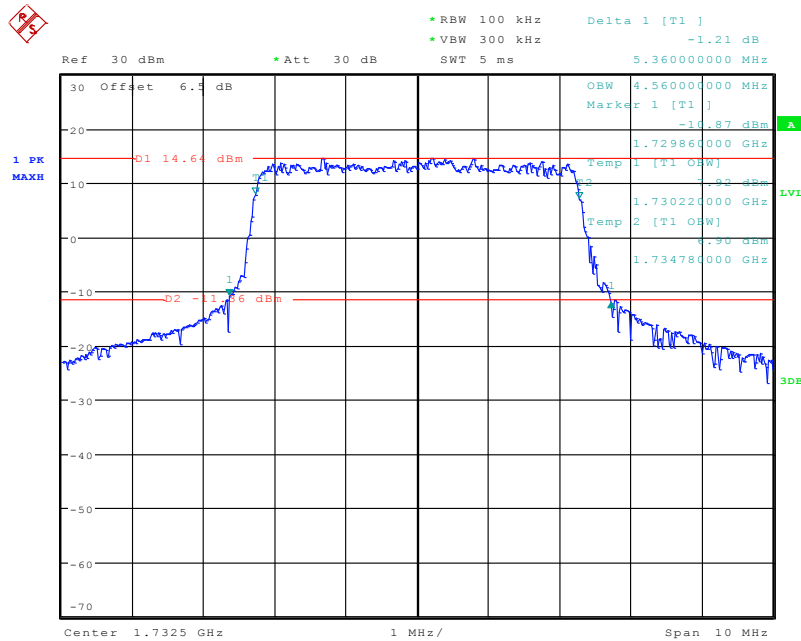
Date: 1.JUN.2020 18:58:48

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



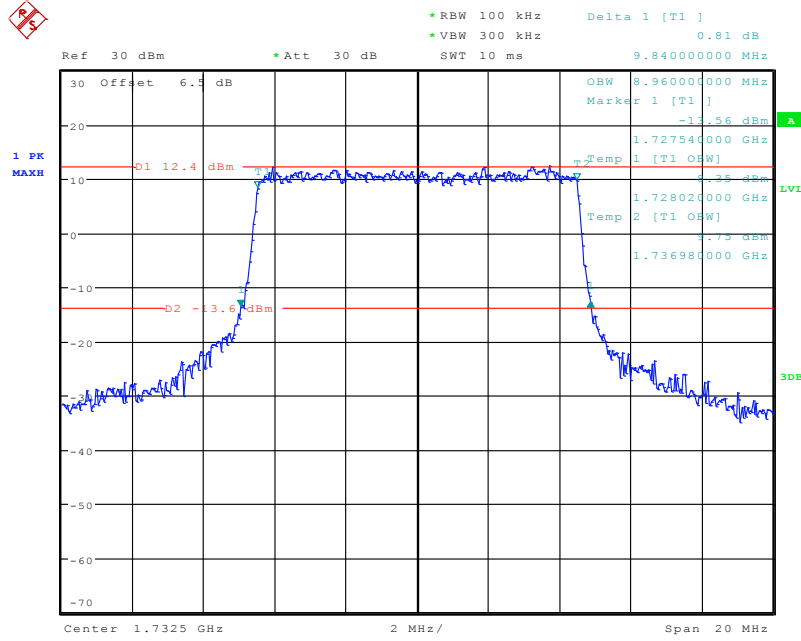
Date: 1.JUN.2020 18:59:22

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



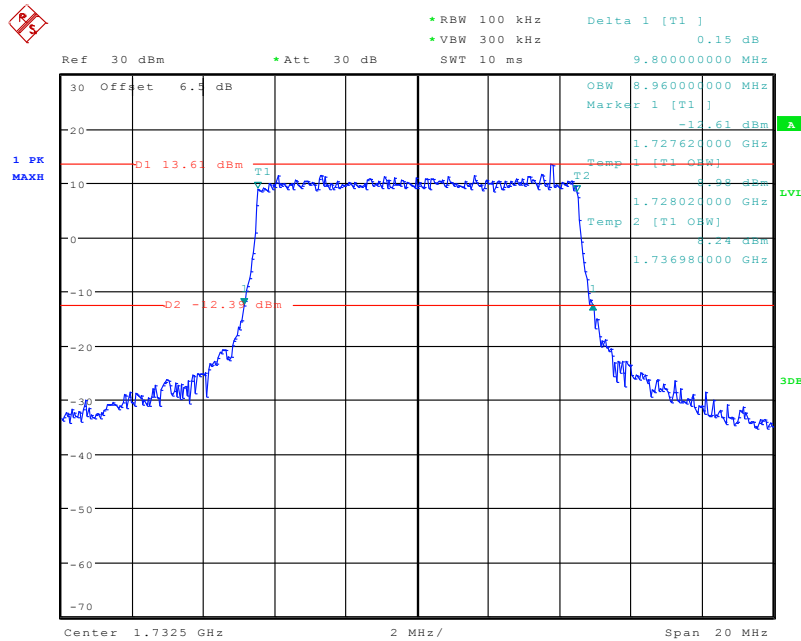
Date: 1.JUN.2020 18:59:49

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



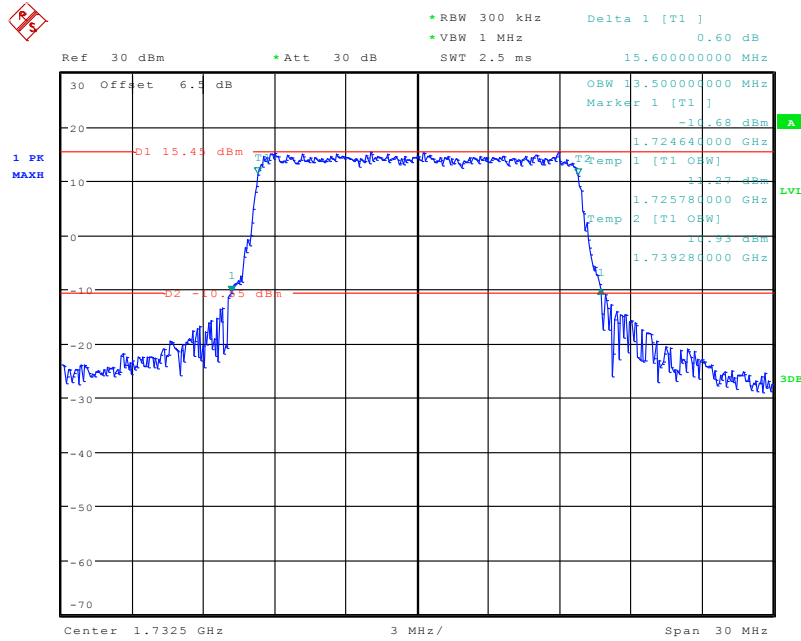
Date: 1.JUN.2020 19:00:14

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



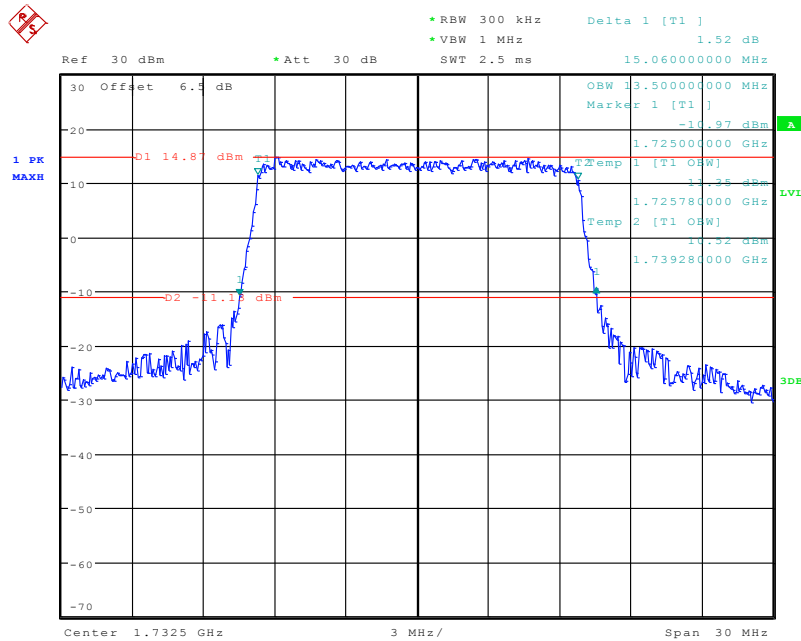
Date: 1.JUN.2020 19:00:36

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



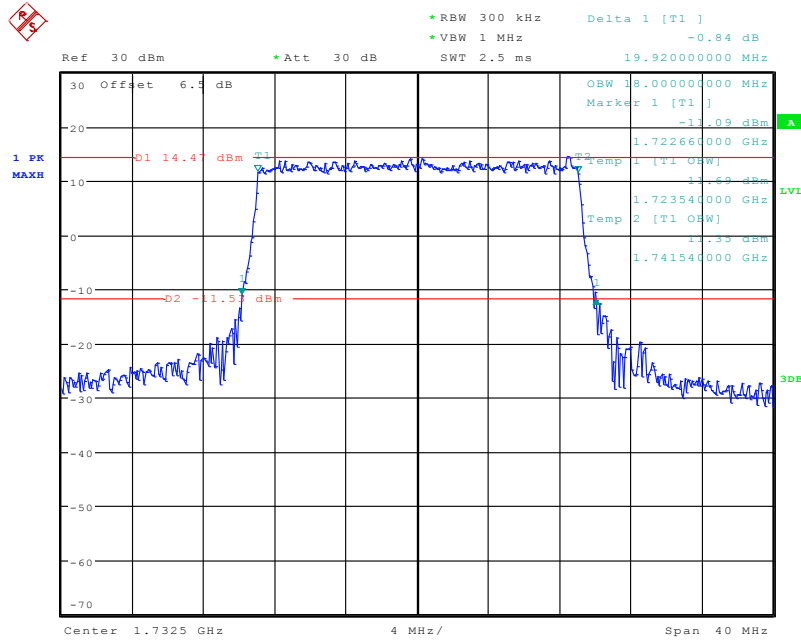
Date: 1.JUN.2020 19:01:06

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



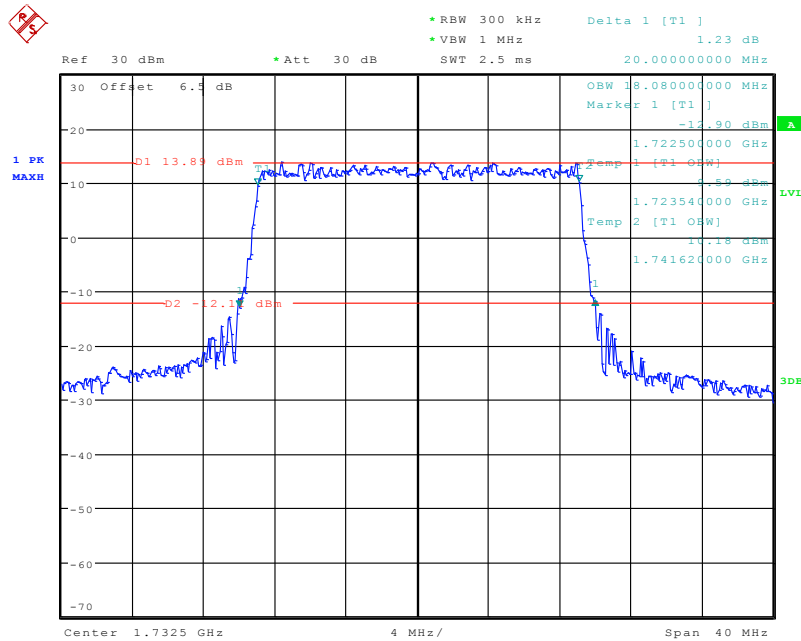
Date: 1.JUN.2020 19:01:30

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



Date: 1.JUN.2020 19:01:57

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



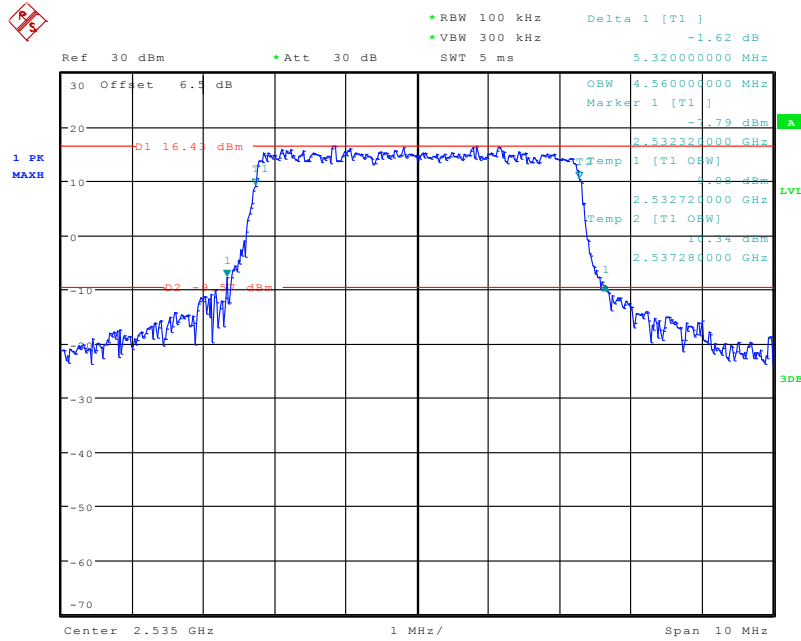
Date: 1.JUN.2020 19:02:24

**LTE Band 7: (Middle Channel)**

<b>Bandwidth (MHz)</b>	<b>Modulation</b>	<b>99% Occupied Bandwidth (MHz)</b>	<b>26 dB Emission Bandwidth (MHz)</b>
5.0	QPSK	4.560	5.320
	16QAM	4.520	5.240
10.0	QPSK	9.000	9.800
	16QAM	8.960	9.800
15.0	QPSK	13.560	15.660
	16QAM	13.500	15.180
20.0	QPSK	18.000	19.920
	16QAM	18.080	19.760

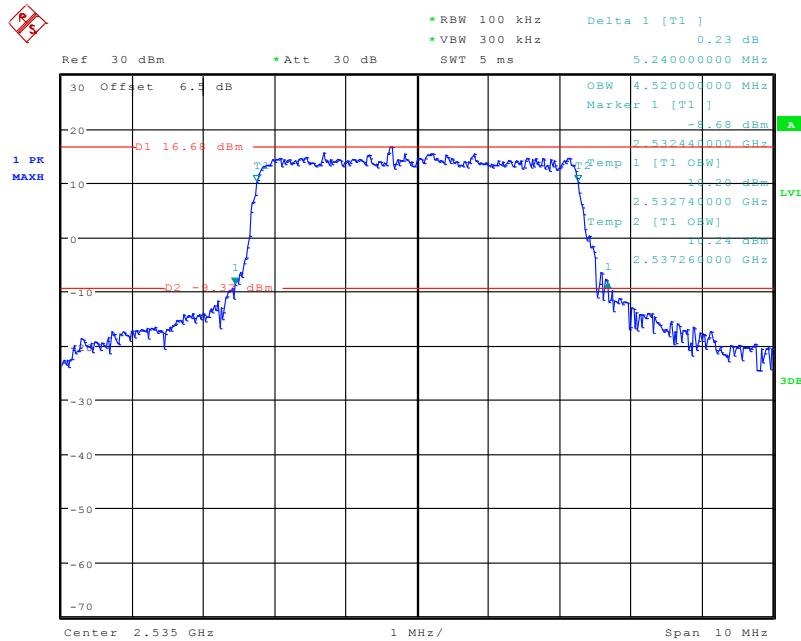


**QPSK (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel**



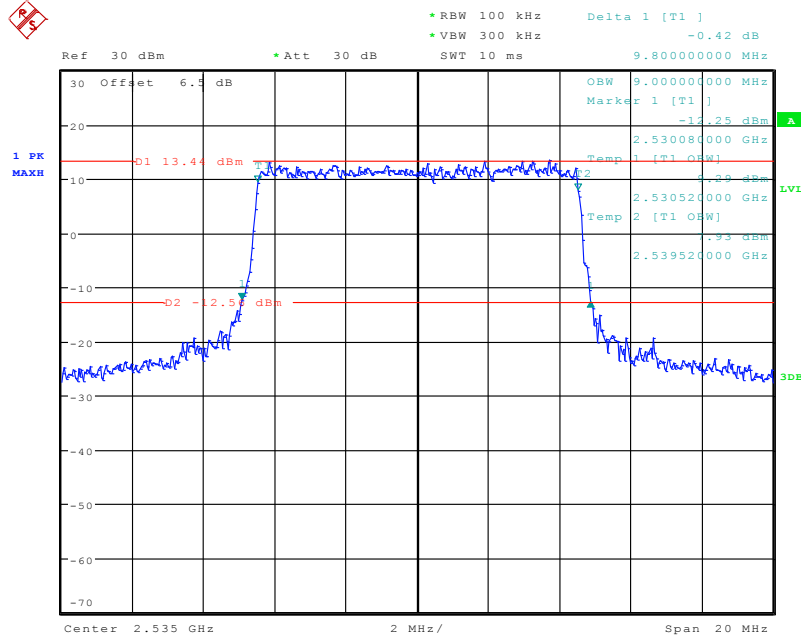
Date: 1.JUN.2020 19:03:00

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



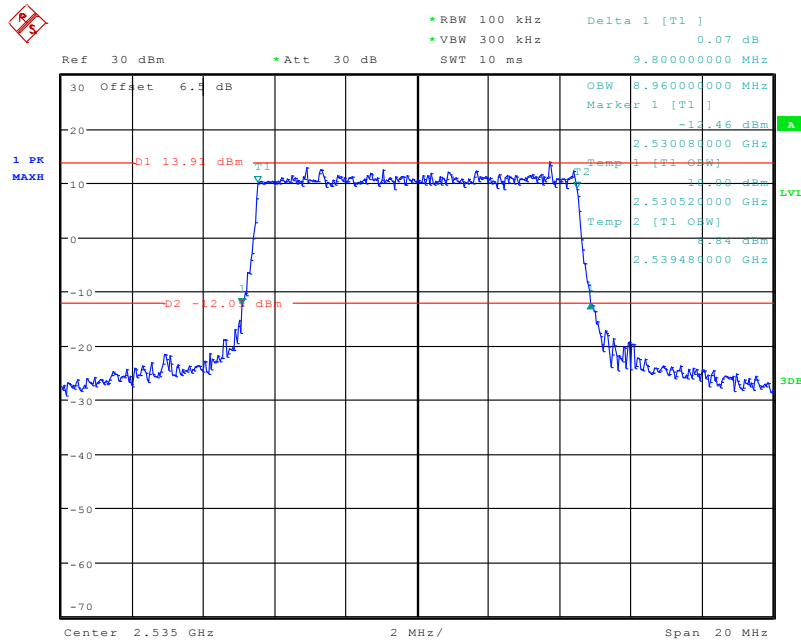
Date: 1.JUN.2020 19:03:36

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



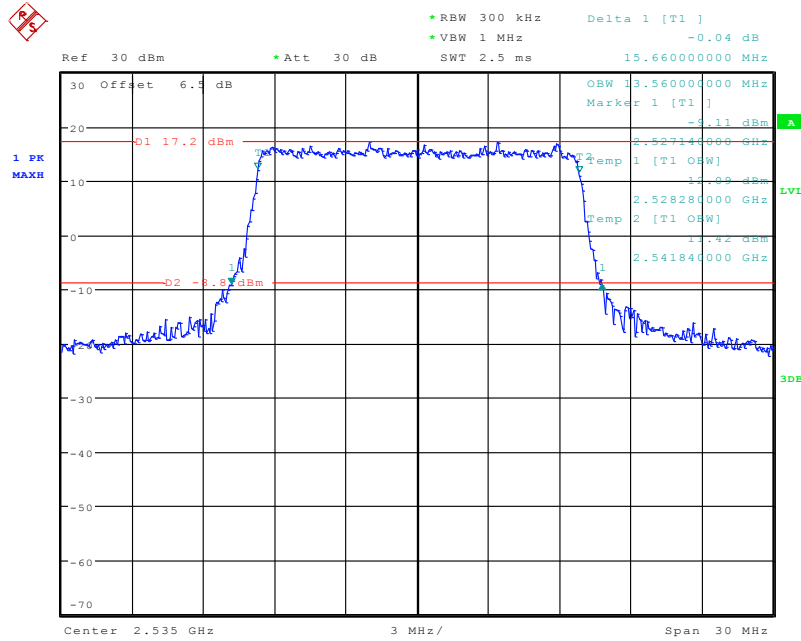
Date: 1.JUN.2020 19:04:00

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



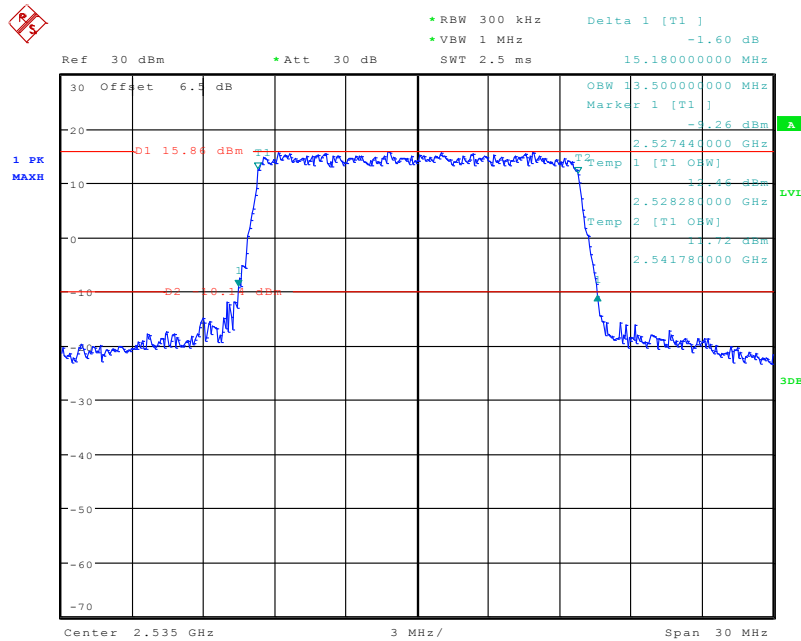
Date: 1.JUN.2020 19:04:22

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



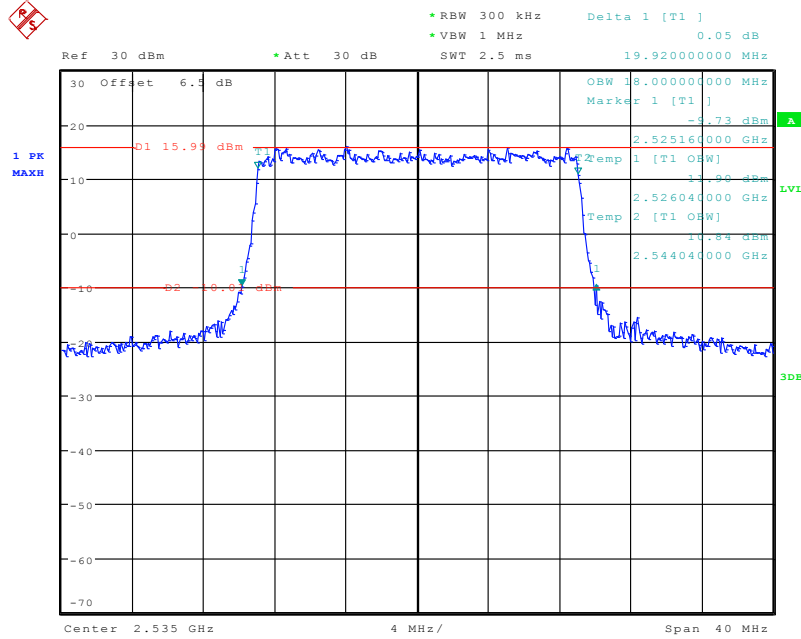
Date: 1.JUN.2020 19:04:57

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



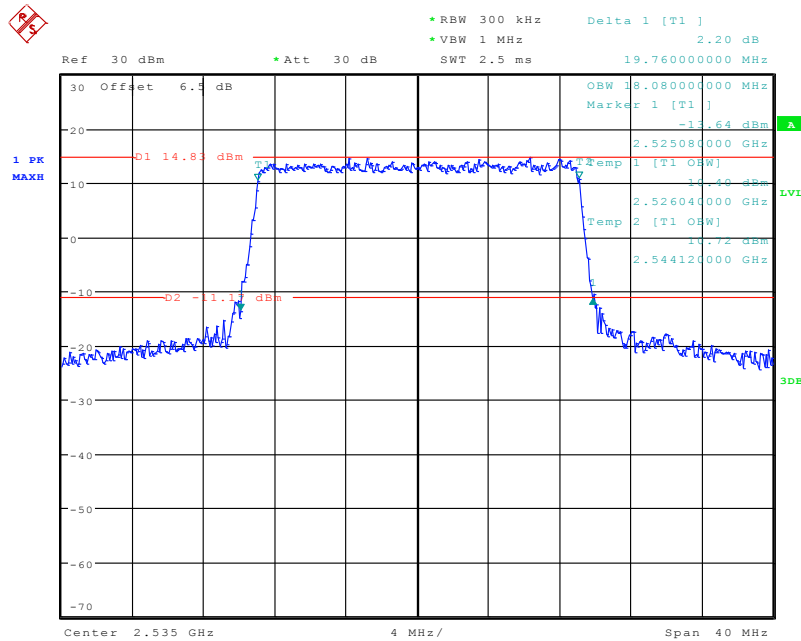
Date: 1.JUN.2020 19:05:24

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



Date: 1.JUN.2020 19:05:53

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

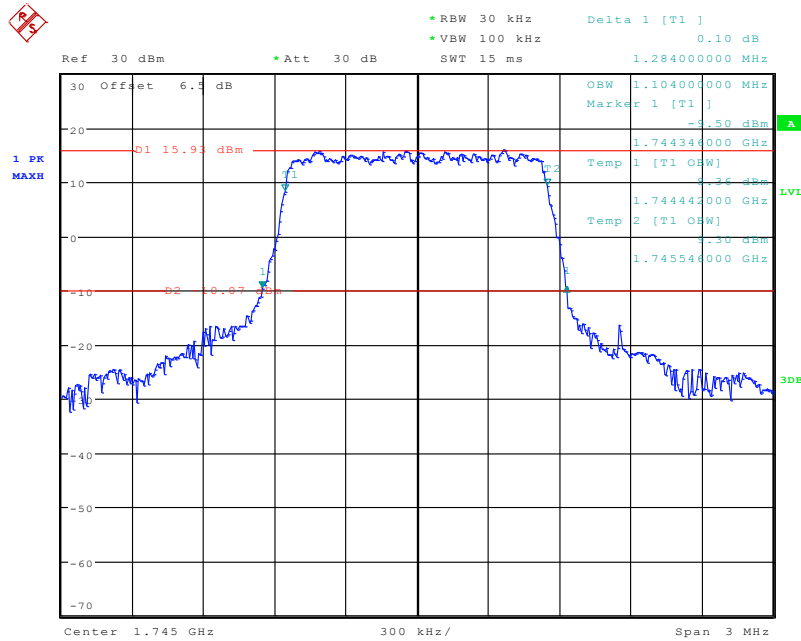


Date: 1.JUN.2020 19:06:17

**LTE Band 66: (Middle Channel)**

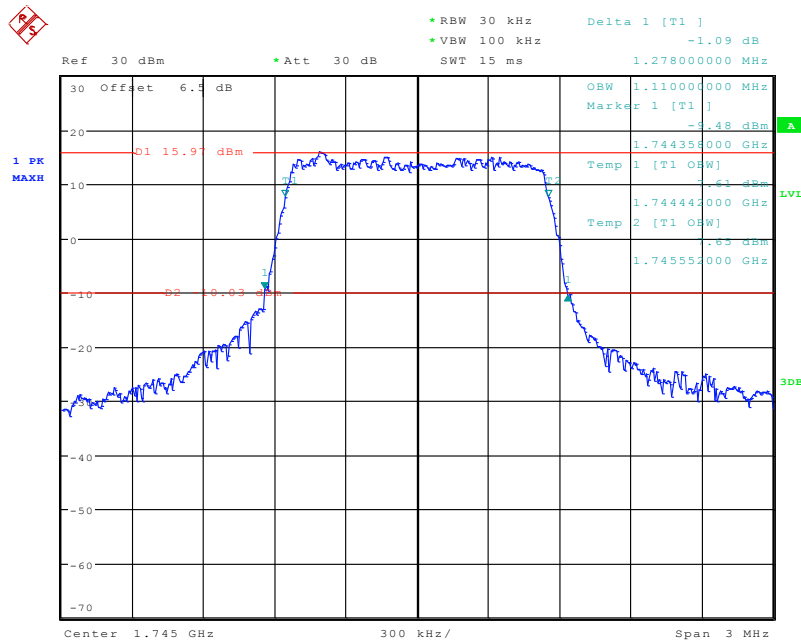
<b>Bandwidth (MHz)</b>	<b>Modulation</b>	<b>99% Occupied Bandwidth (MHz)</b>	<b>26 dB Emission Bandwidth (MHz)</b>
1.4	QPSK	1.104	1.284
	16QAM	1.110	1.278
3.0	QPSK	2.700	2.988
	16QAM	2.700	3.012
5.0	QPSK	4.540	5.240
	16QAM	4.520	5.340
10.0	QPSK	8.960	9.840
	16QAM	8.960	9.760
15.0	QPSK	13.560	15.480
	16QAM	13.500	15.180
20.0	QPSK	18.000	19.680
	16QAM	18.000	19.840

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



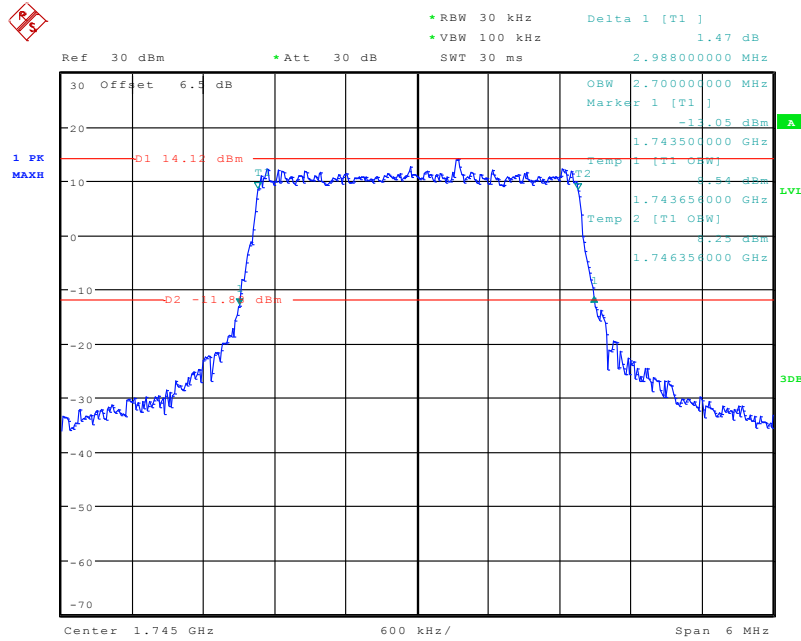
Date: 1.JUN.2020 19:11:29

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



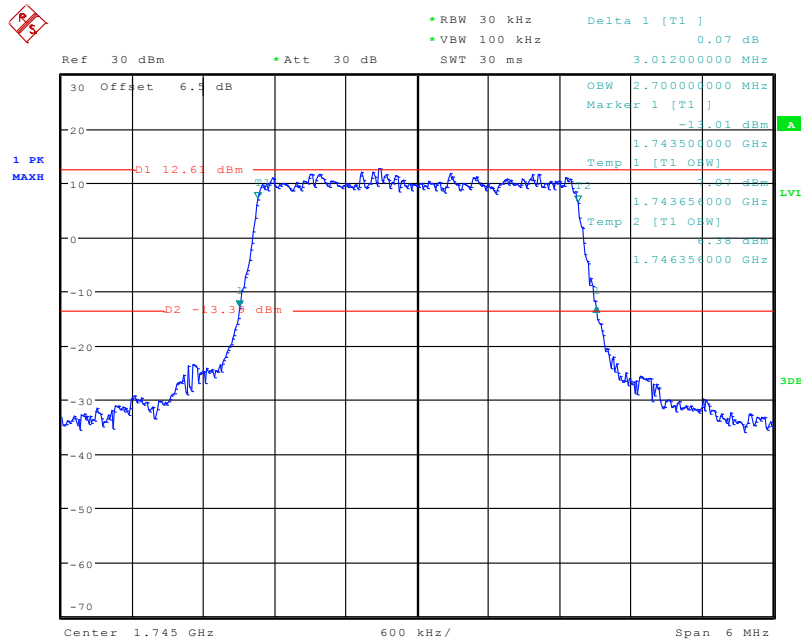
Date: 1.JUN.2020 19:11:53

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



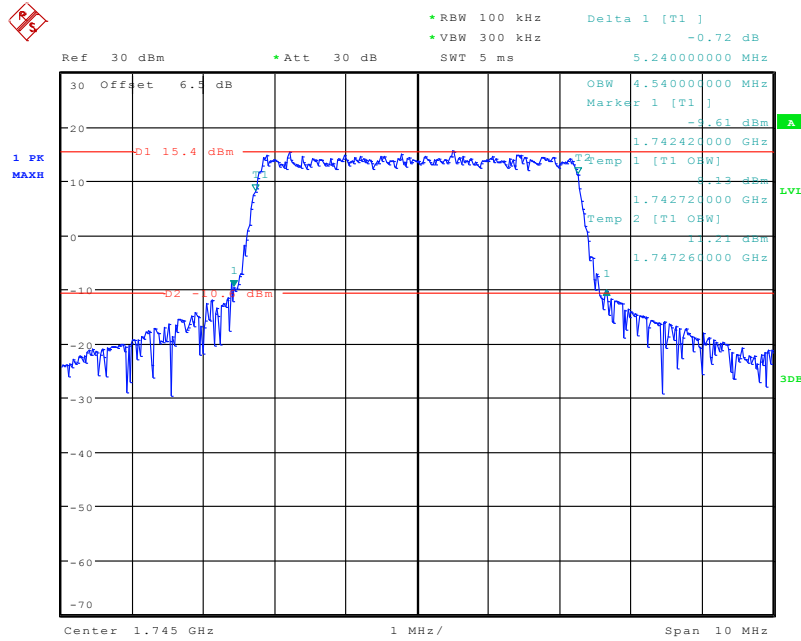
Date: 1.JUN.2020 19:12:12

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



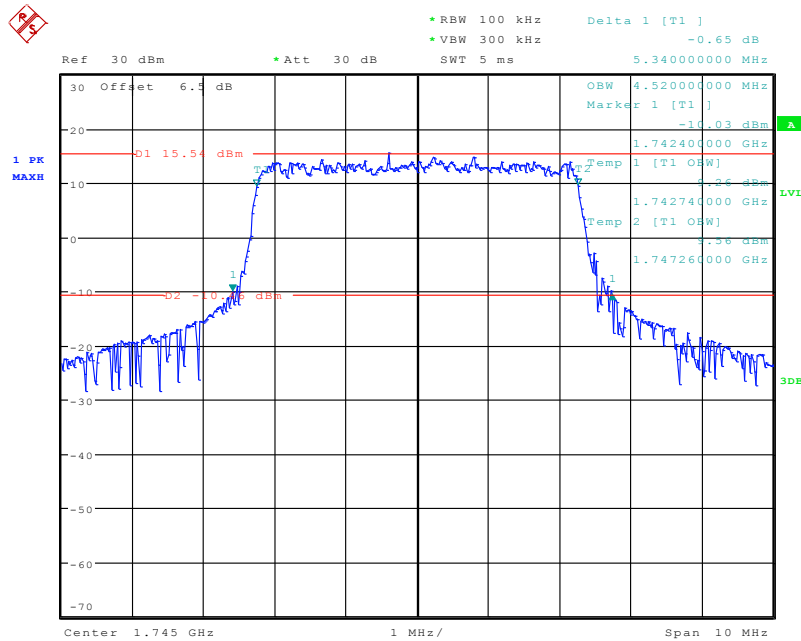
Date: 1.JUN.2020 19:12:33

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



Date: 1.JUN.2020 19:13:02

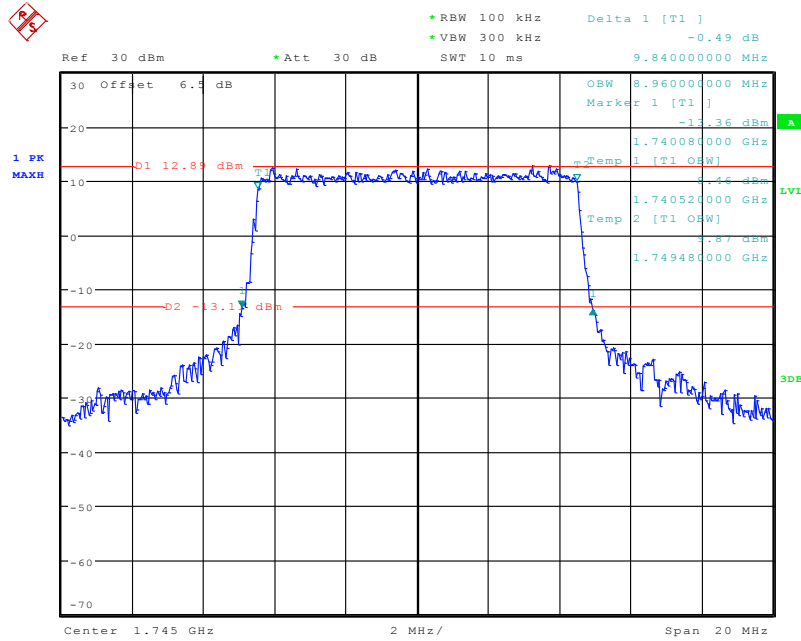
### 16-QAM (5.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



Date: 1.JUN.2020 19:13:26

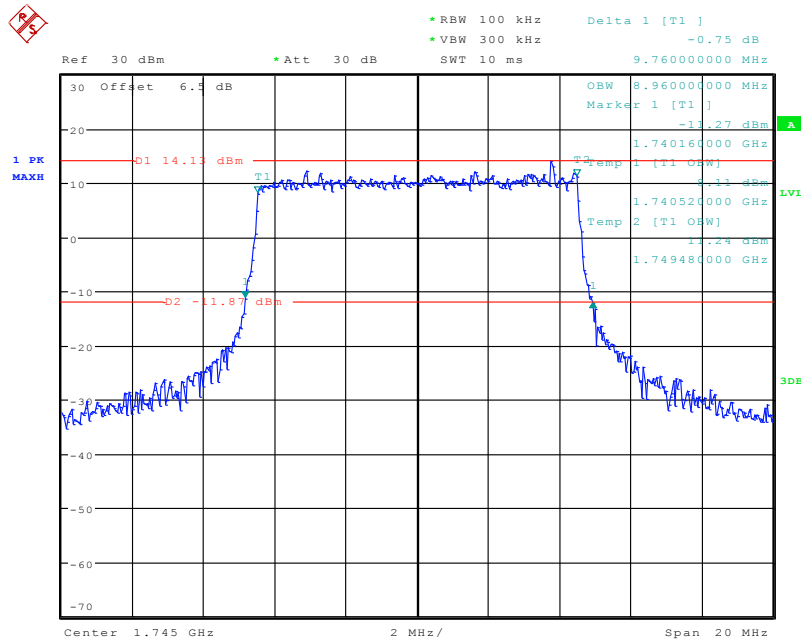


### QPSK (10.0 MHz) - 26 dB Bandwidth & 99% Occupied Bandwidth, Middle channel



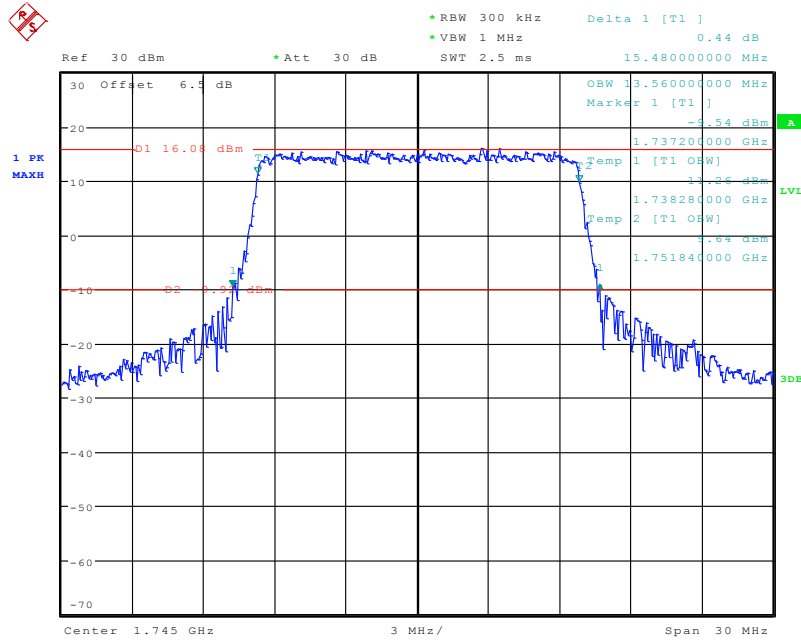
Date: 1.JUN.2020 19:13:50

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



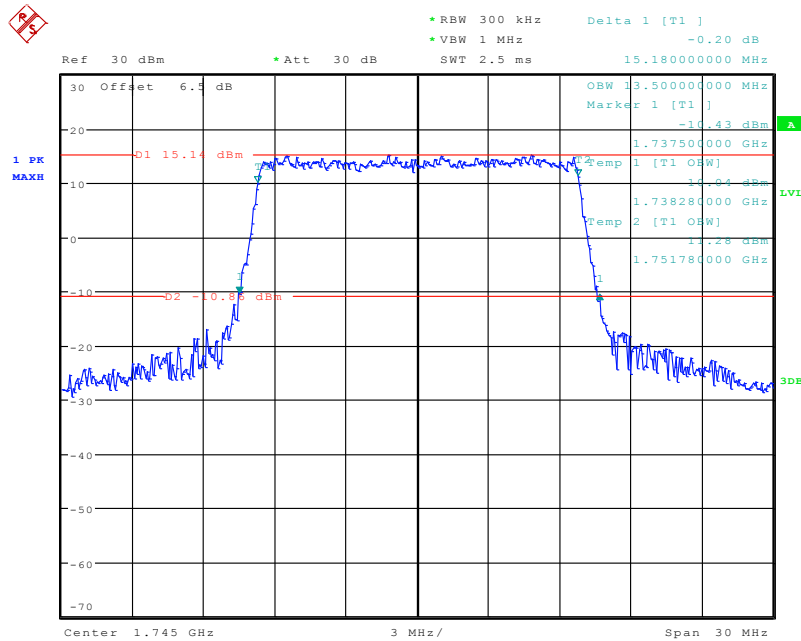
Date: 1.JUN.2020 19:14:11

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



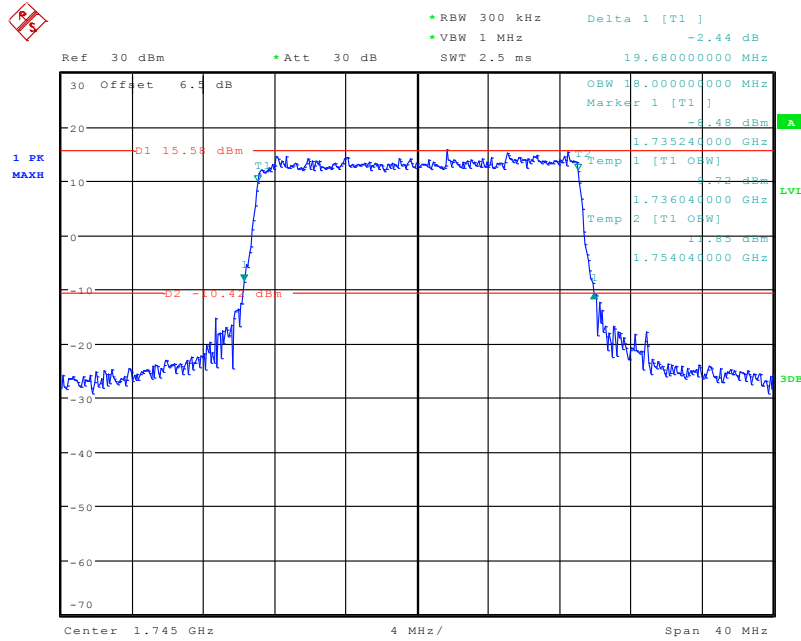
Date: 1.JUN.2020 19:14:41

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



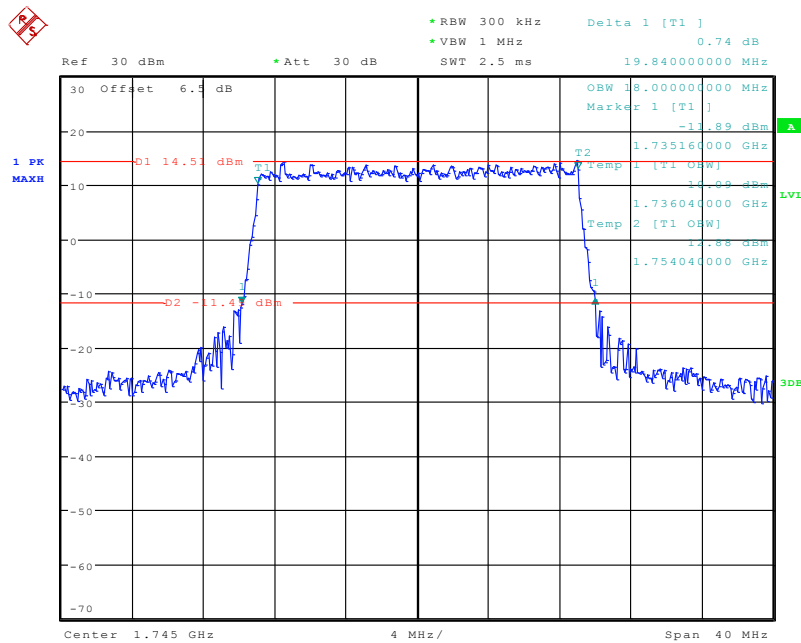
Date: 1.JUN.2020 19:15:08

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



Date: 1.JUN.2020 19:15:38

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



Date: 1.JUN.2020 19:16:01

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

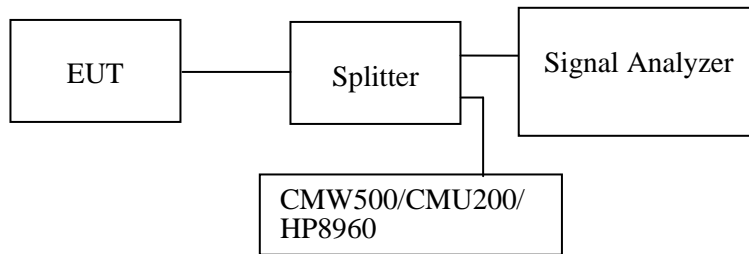
**Applicable Standard**

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 10<sup>th</sup> harmonic.



**Test Data**

**Environmental Conditions**

<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	56%
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Black Chen from 2020-05-28 to 2020-06-01.*

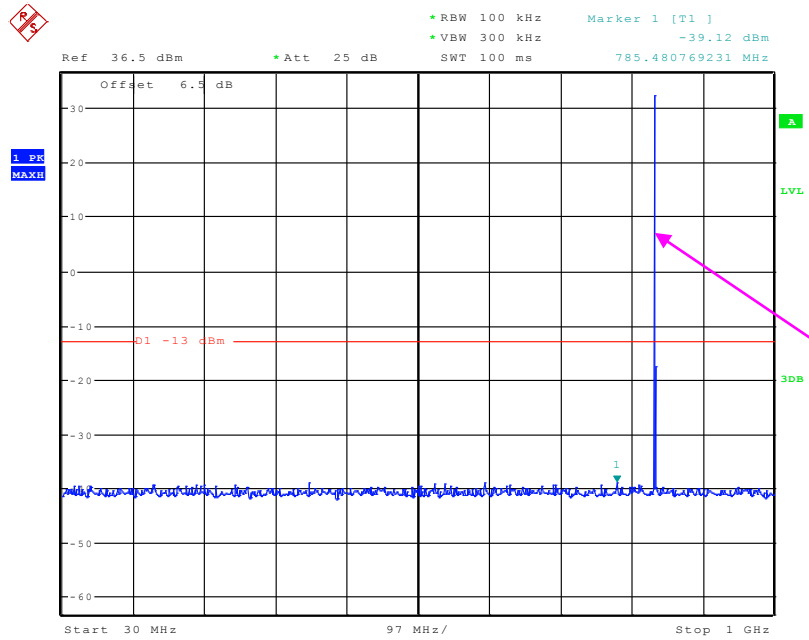
*Test result: Compliance.*

*EUT operation mode: transmitting*

*Please refer to the following plots.*

### Cellular Band (Part 22H)

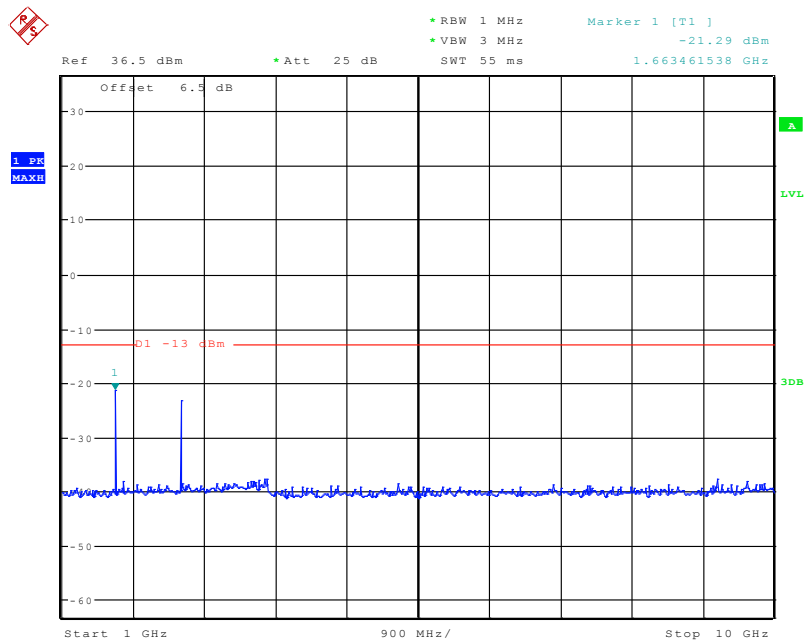
#### 30 MHz – 1 GHz (GSM Mode)



Fundamental test with filter

Date: 28.MAY.2020 22:09:09

#### 1 GHz – 10 GHz (GSM Mode)

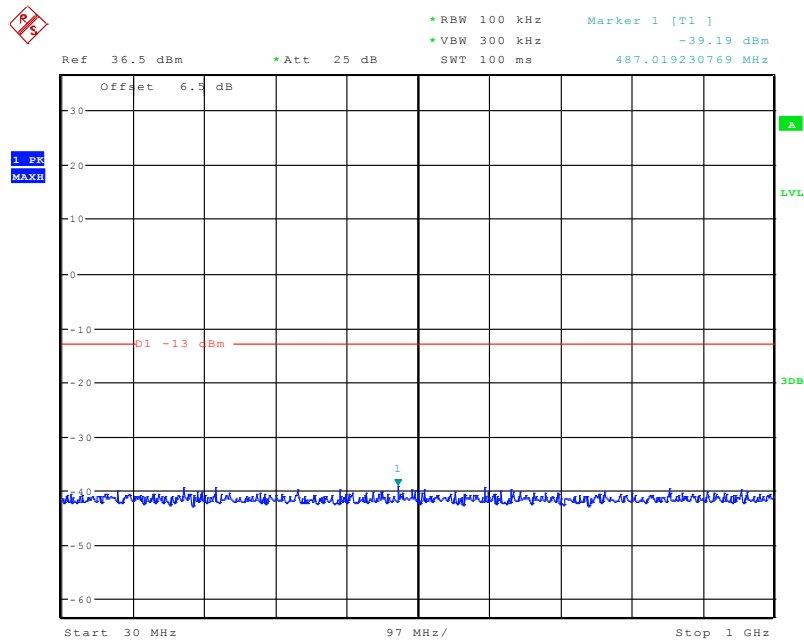


Date: 28.MAY.2020 22:09:59



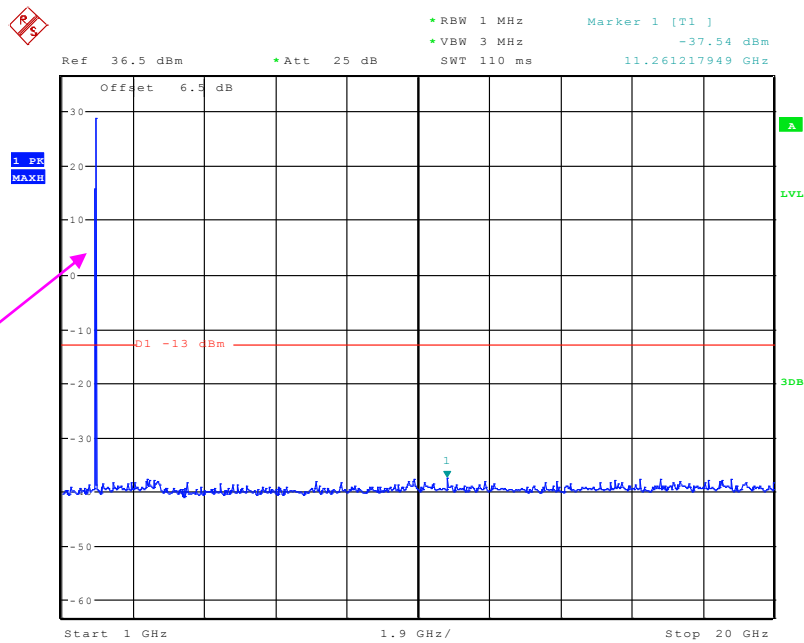
PCS Band (Part 24E)

30 MHz – 1 GHz (GSM Mode)



Date: 28.MAY.2020 22:14:11

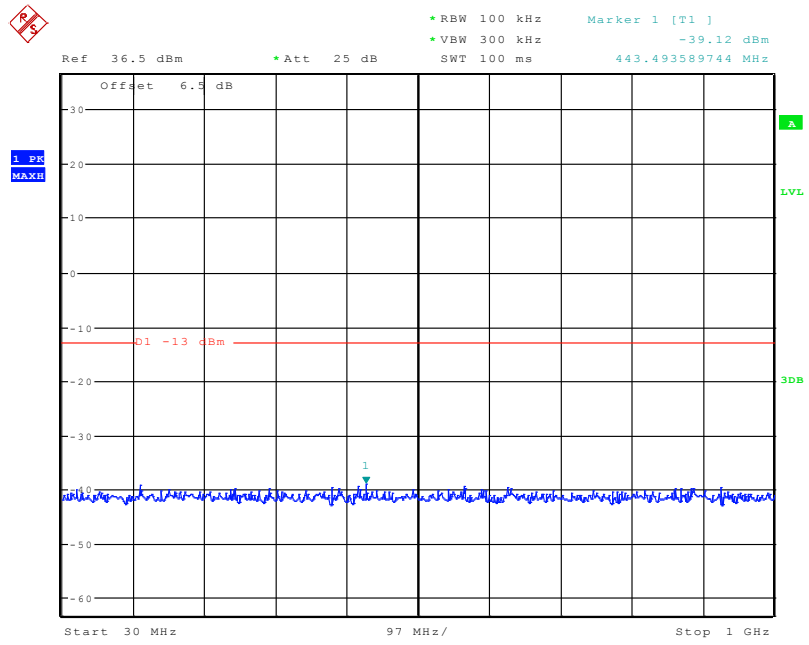
1 GHz – 20 GHz (GSM Mode)



Fundamenta  
l test  
With filter

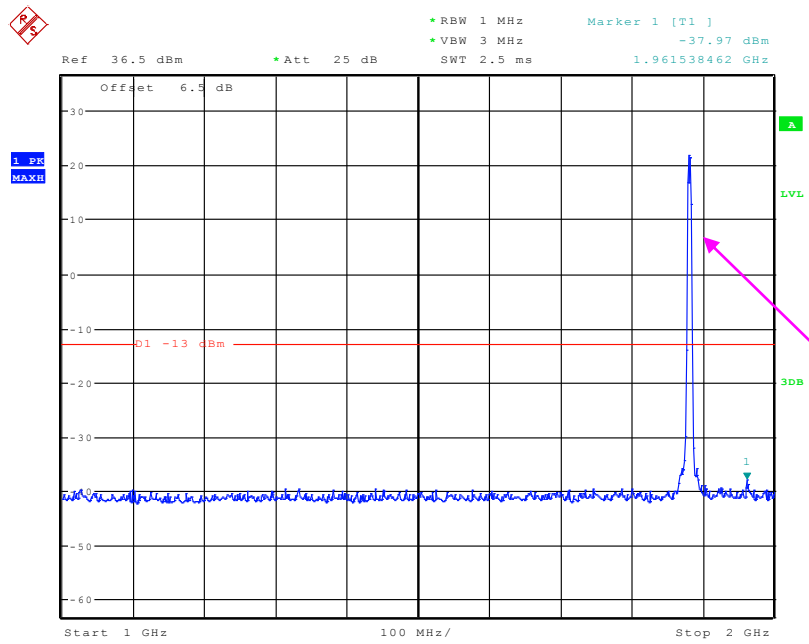
Date: 28.MAY.2020 22:13:47

### 30 MHz – 1 GHz (WCDMA Mode)



Date: 28.MAY.2020 23:22:00

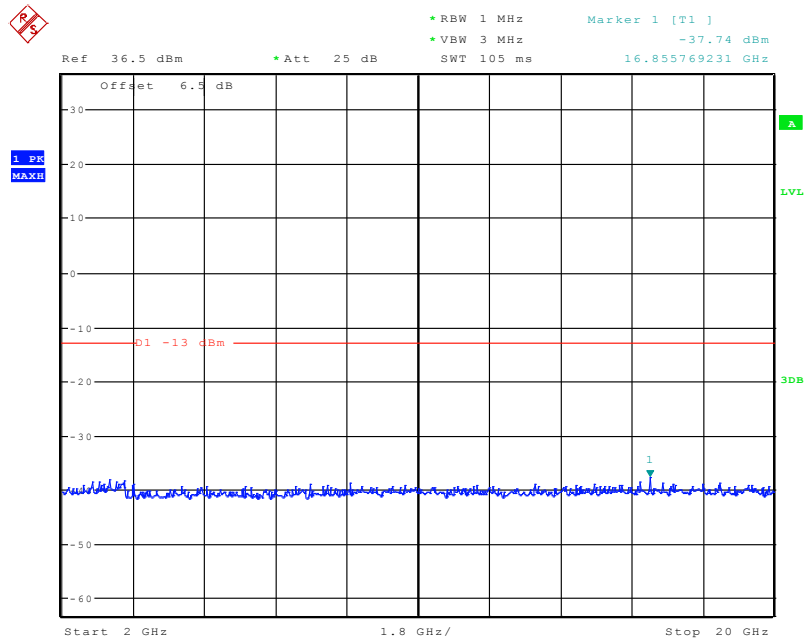
### 1 GHz – 2 GHz (WCDMA Mode)



Date: 28.MAY.2020 23:22:38



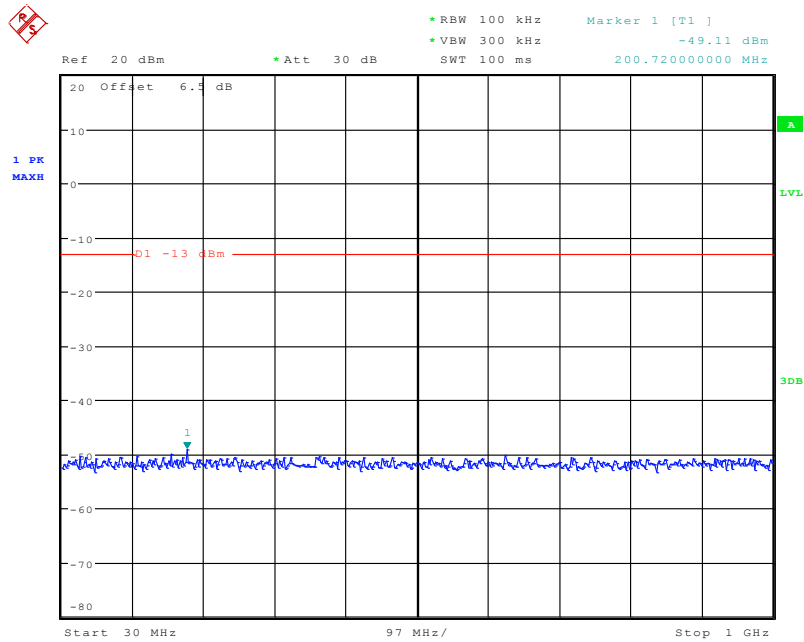
### 2 GHz – 20GHz (WCDMA Mode)



Date: 28.MAY.2020 23:23:00

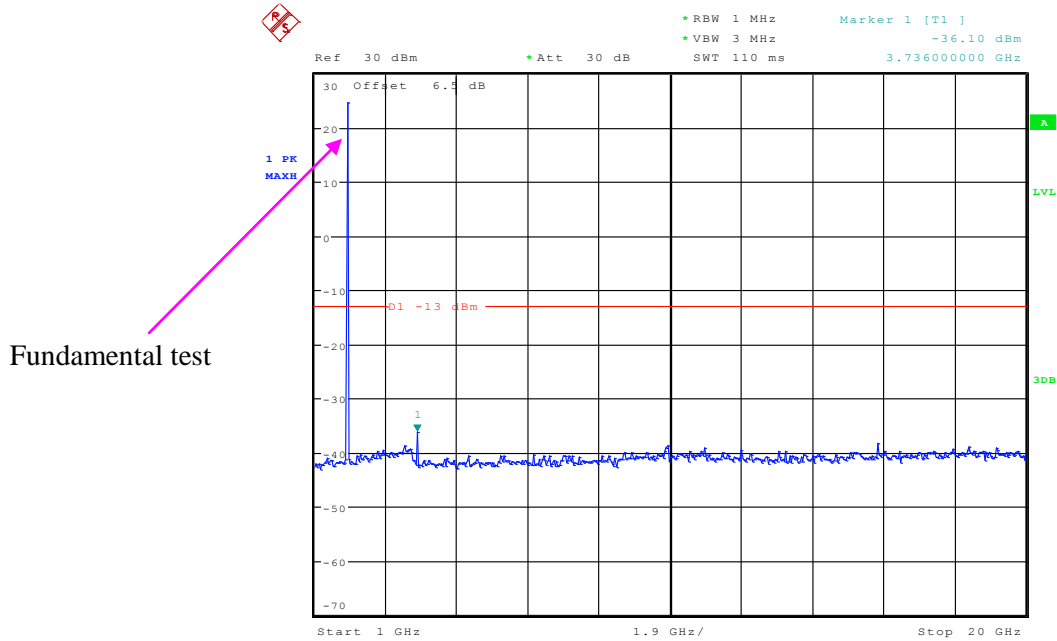
### LTE Band 2:

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



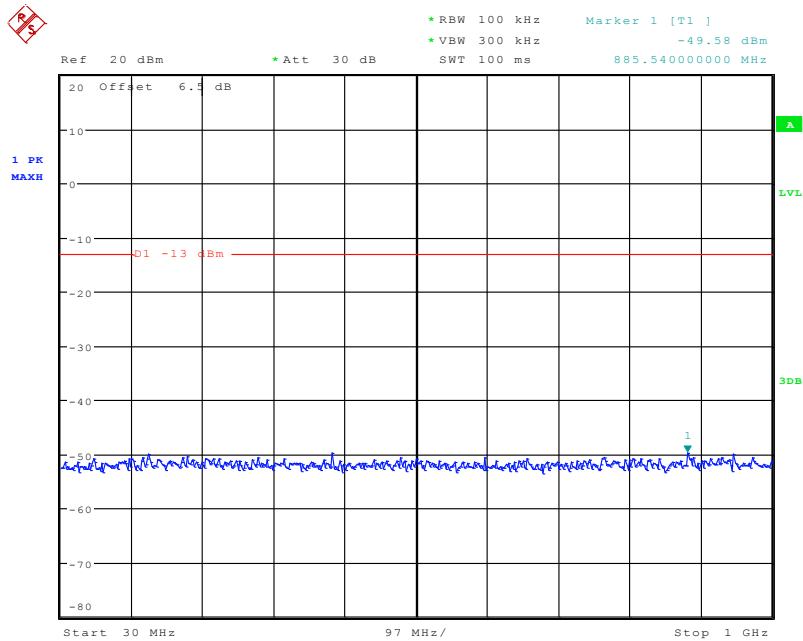
Date: 1.JUN.2020 20:18:03

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



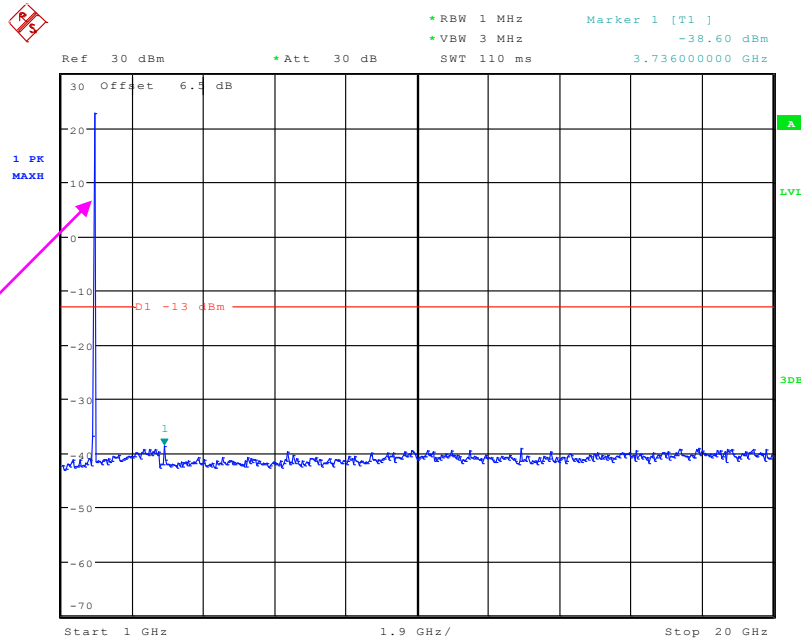
Date: 1.JUN.2020 20:18:15

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



Date: 1.JUN.2020 20:18:34

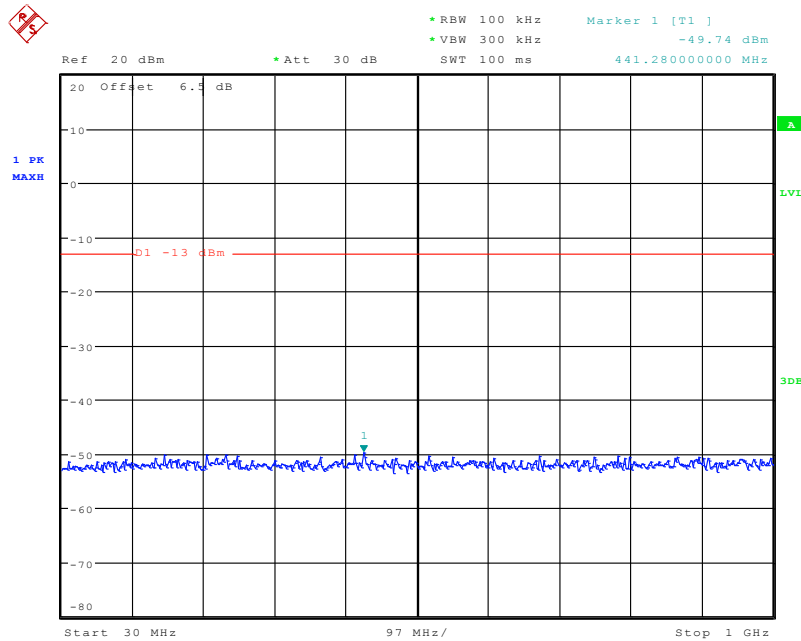
### 1 GHz – 20 GHz (3.0 MHz, Middle Channel)



Fundamental test

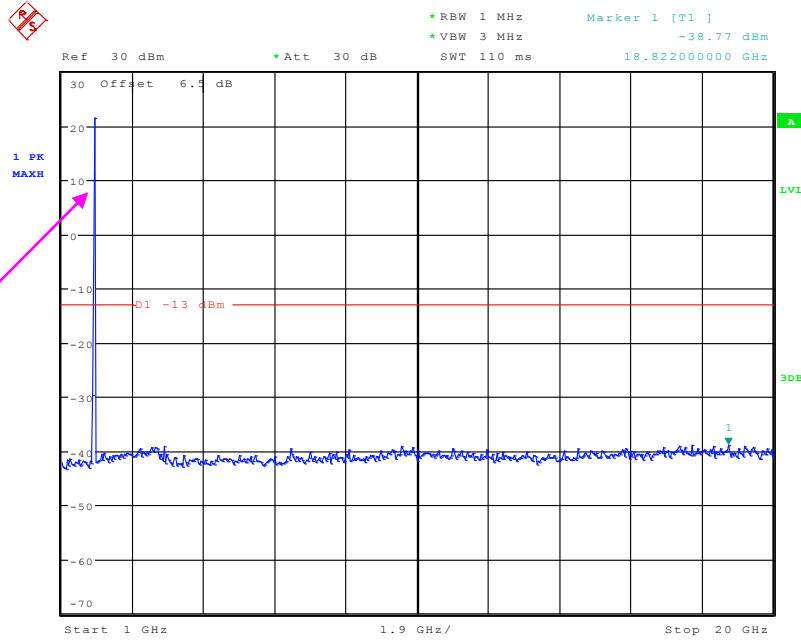
Date: 1.JUN.2020 20:18:45

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



Date: 1.JUN.2020 20:19:05

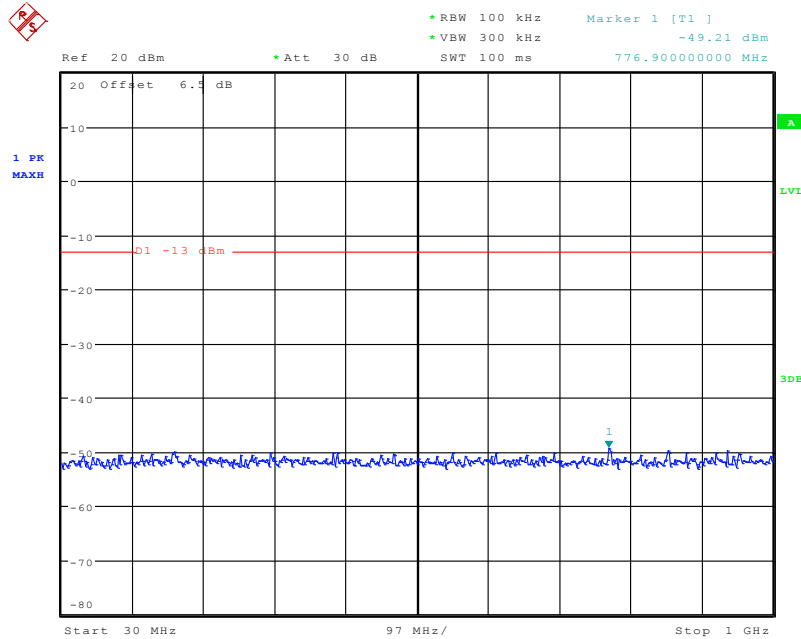
### 1 GHz – 20 GHz (5.0 MHz, Middle Channel)



Fundamental test

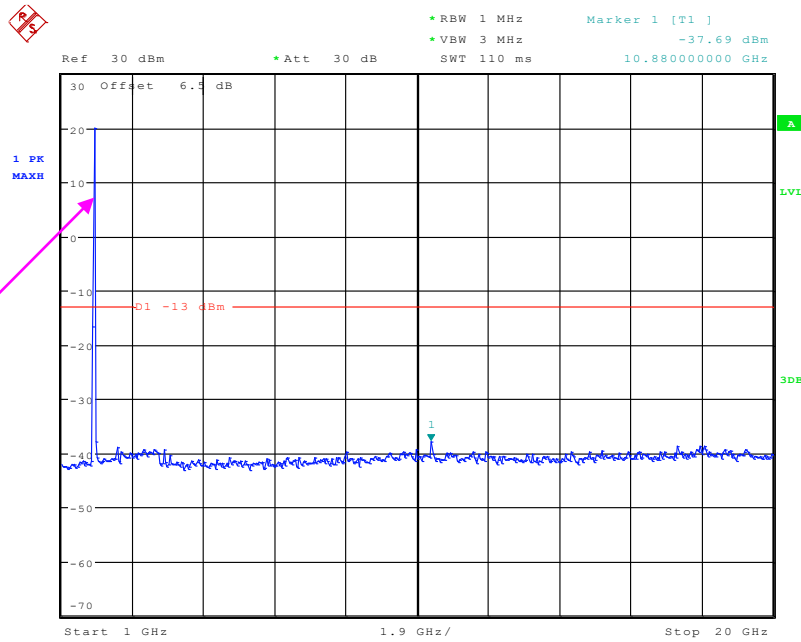
Date: 1.JUN.2020 20:19:16

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



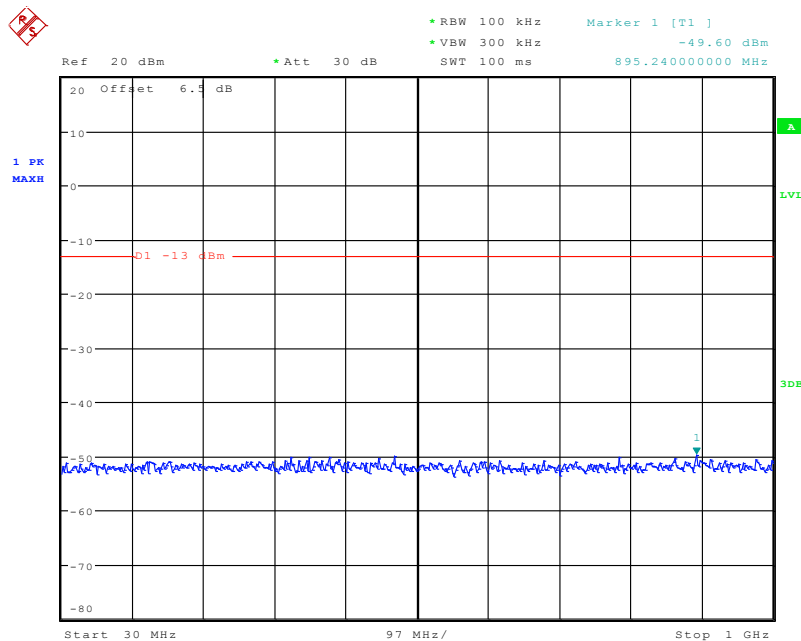
Date: 1.JUN.2020 20:19:40

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



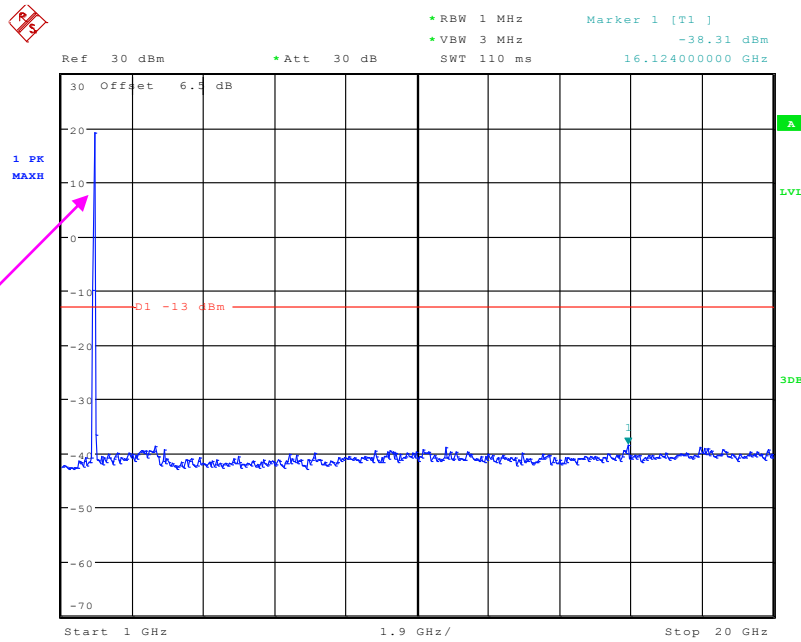
Date: 1.JUN.2020 20:19:51

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



Date: 1.JUN.2020 20:20:14

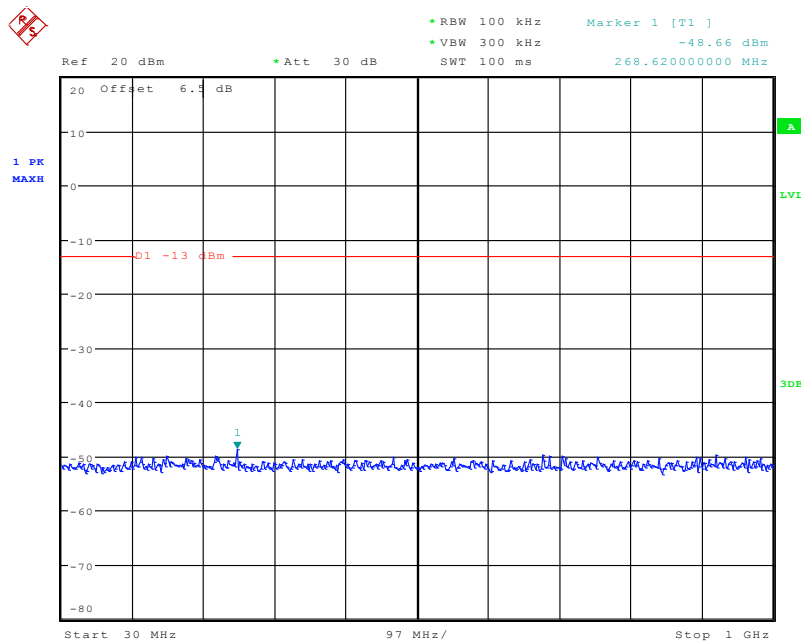
### 1 GHz – 20 GHz (15.0 MHz, Middle Channel)



Fundamental test

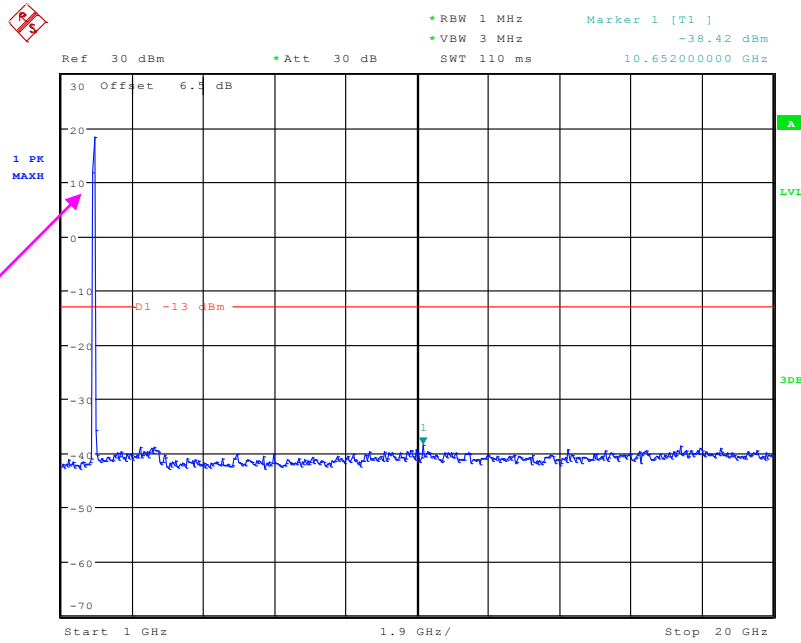
Date: 1.JUN.2020 20:20:25

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



Date: 1.JUN.2020 20:20:52

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

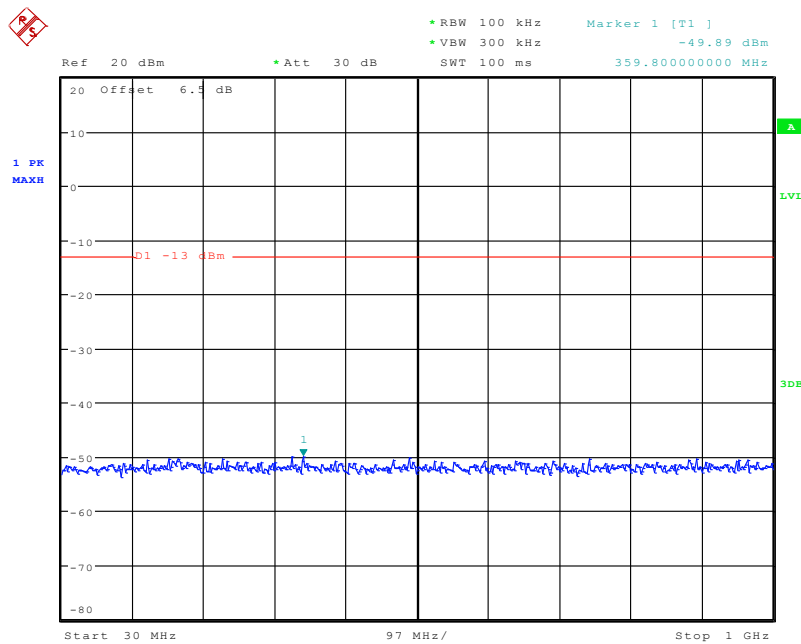


Fundamental test

Date: 1.JUN.2020 20:21:03

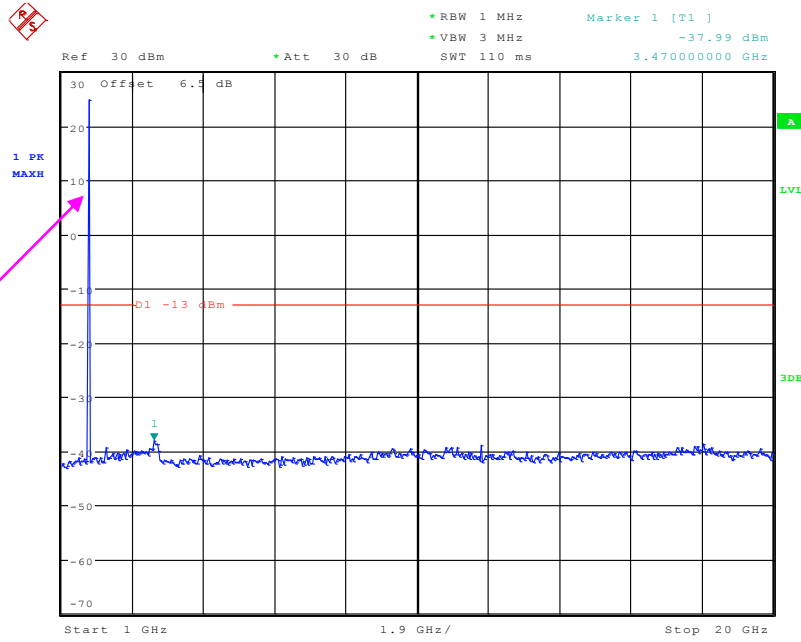
### LTE Band 4:

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



Date: 1.JUN.2020 20:21:22

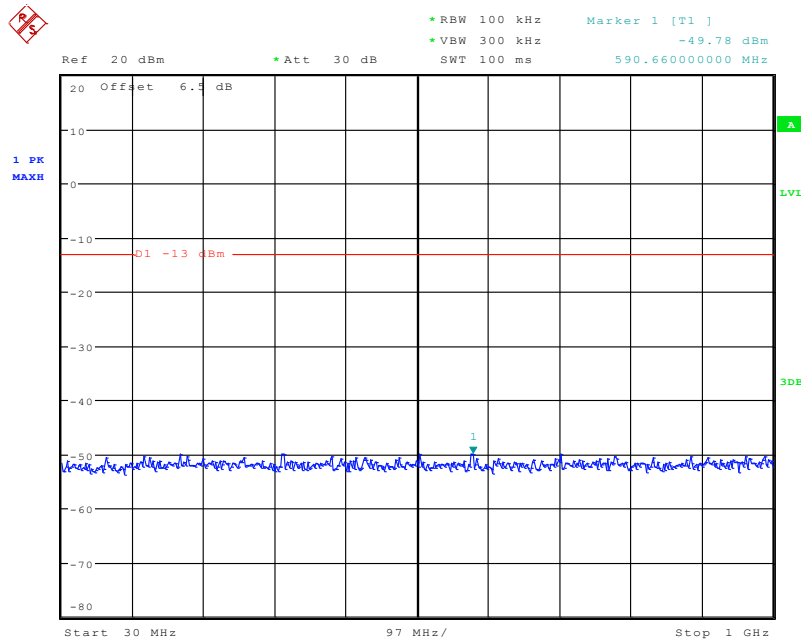
### 1 GHz – 20 GHz (1.4 MHz, Middle Channel)



Fundamental test

Date: 1.JUN.2020 20:21:34

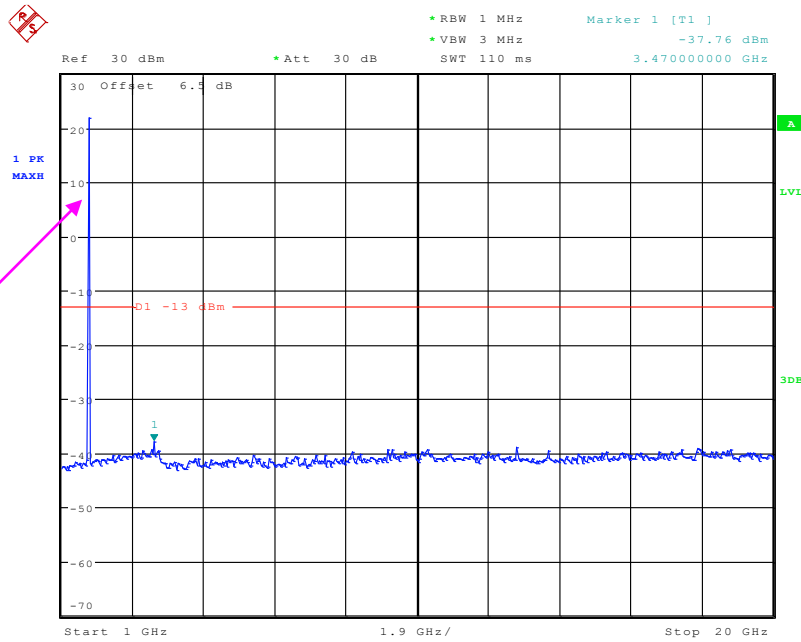
### 30 MHz - 1 GHz (3.0 MHz, Middle Channel)



Date: 1.JUN.2020 20:21:53

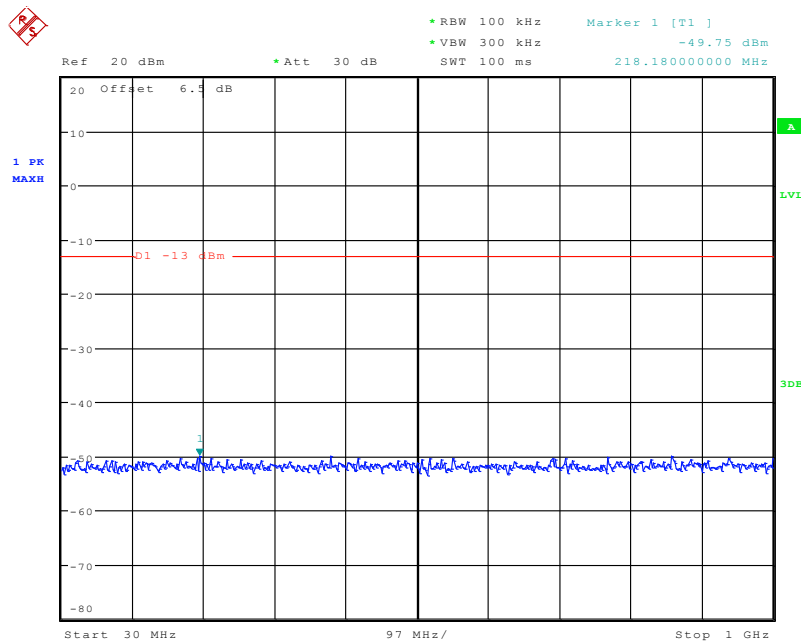


### 1 GHz – 20 GHz (3.0 MHz, Middle Channel)



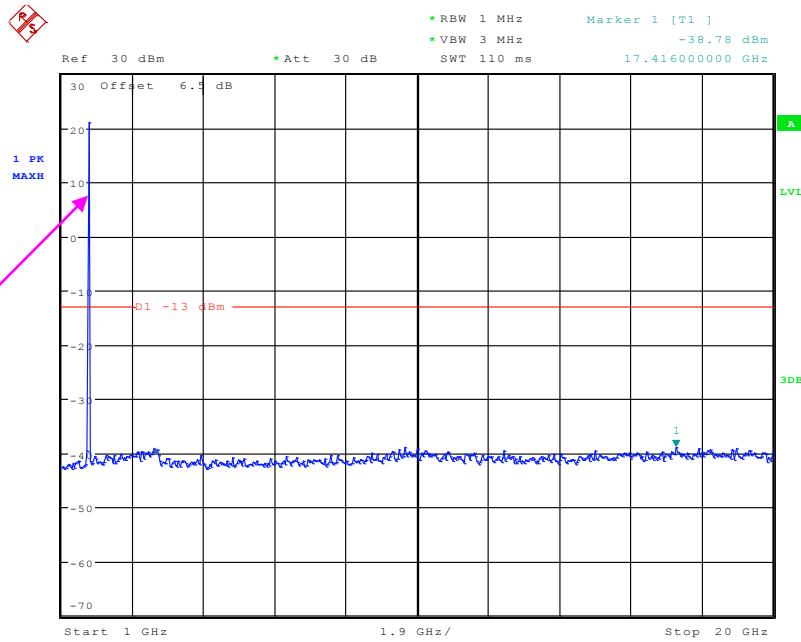
Date: 1.JUN.2020 20:22:05

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



Date: 1.JUN.2020 20:22:27

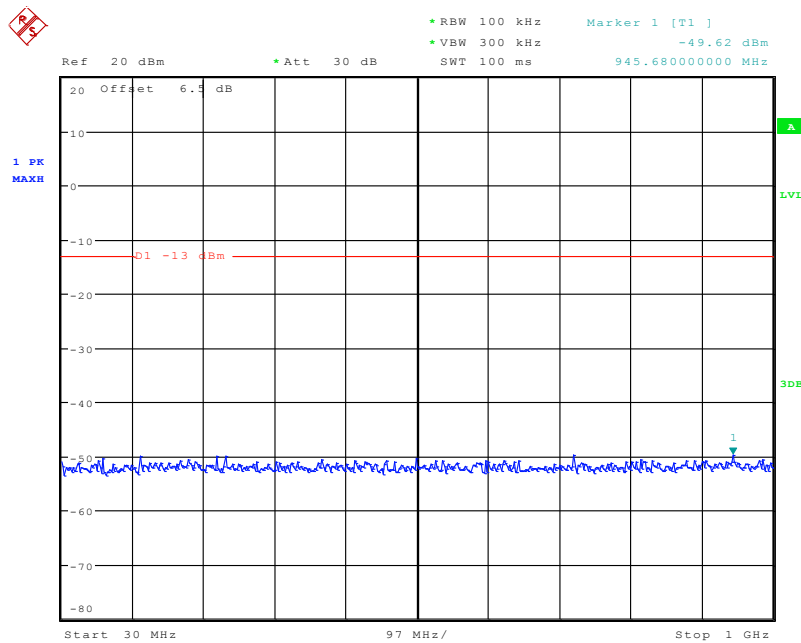
### 1 GHz – 20 GHz (5.0 MHz, Middle Channel)



Fundamental test

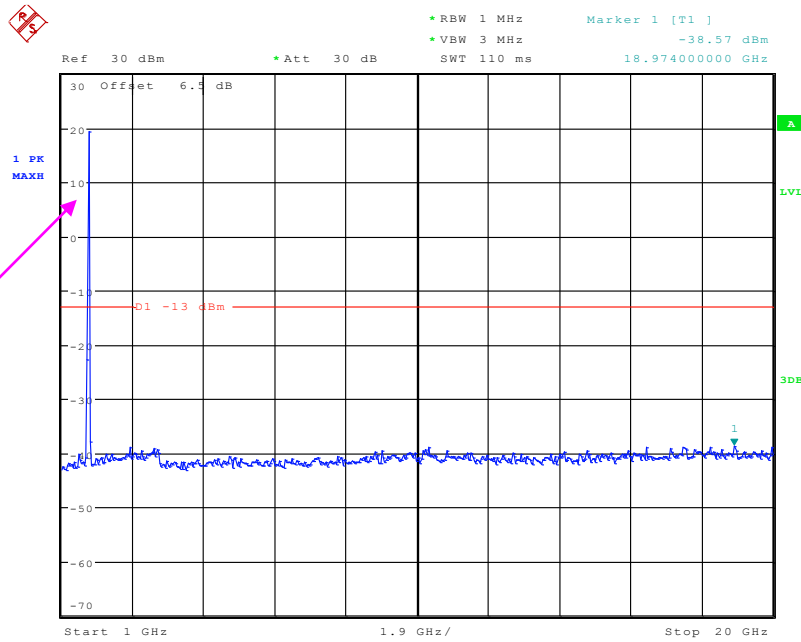
Date: 1.JUN.2020 20:22:38

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



Date: 1.JUN.2020 20:23:00

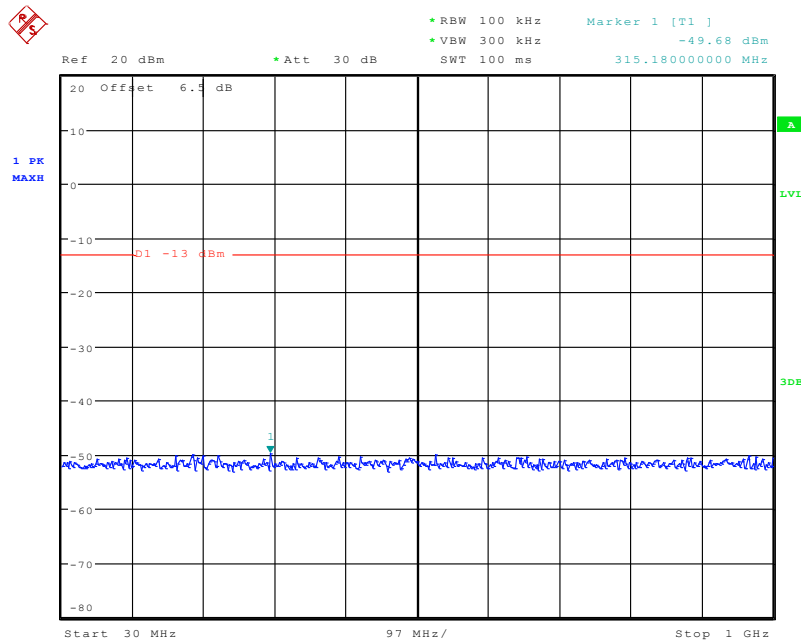
### 1 GHz – 20 GHz (10.0 MHz, Middle Channel)



Fundamental test

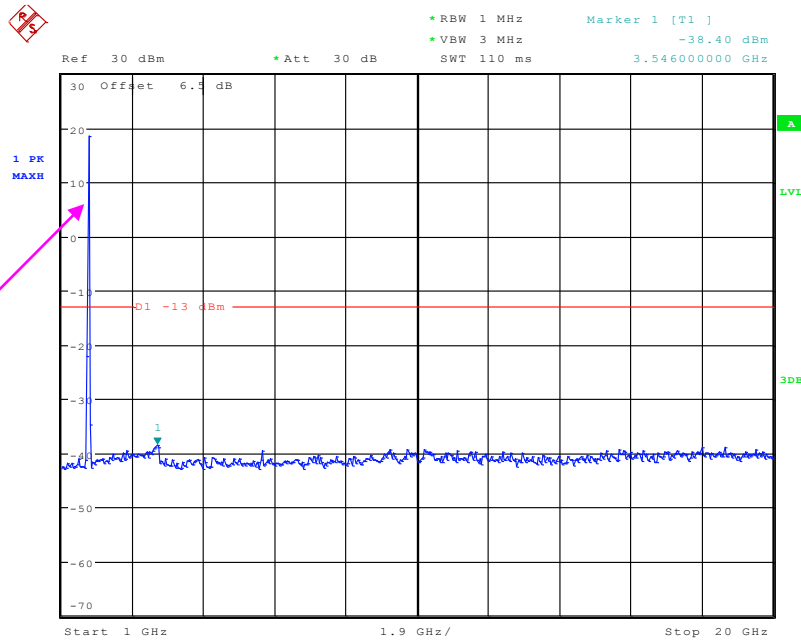
Date: 1.JUN.2020 20:23:12

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



Date: 1.JUN.2020 20:23:37

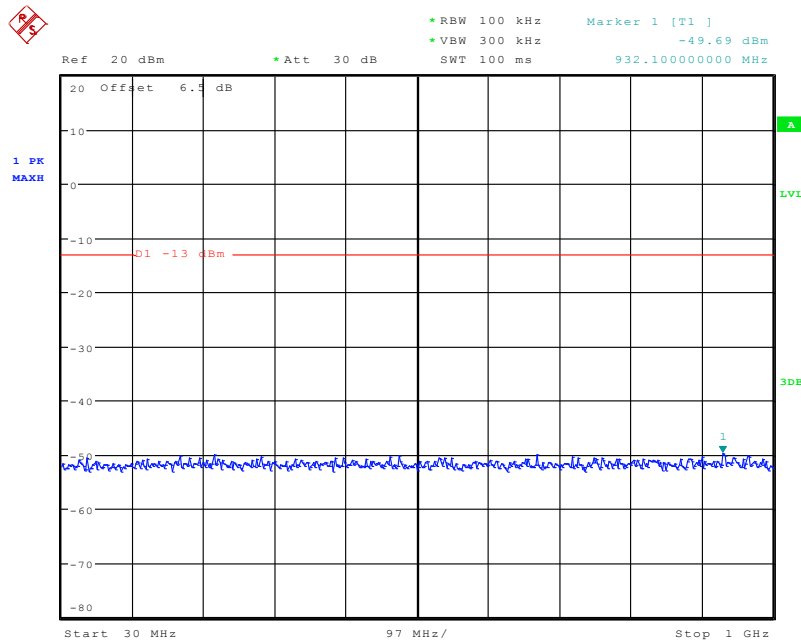
### 1 GHz – 20 GHz (15.0 MHz, Middle Channel)



Fundamental test

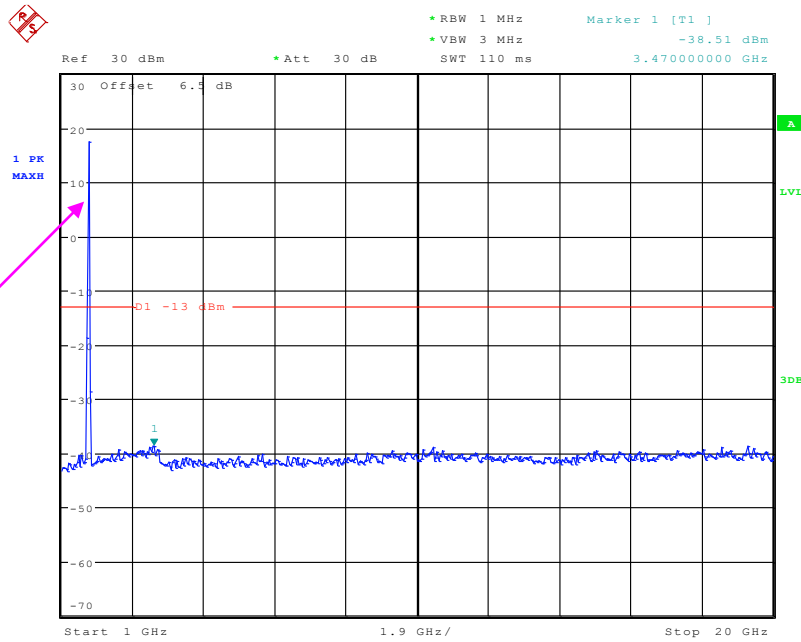
Date: 1.JUN.2020 20:23:49

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



Date: 1.JUN.2020 20:24:14

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

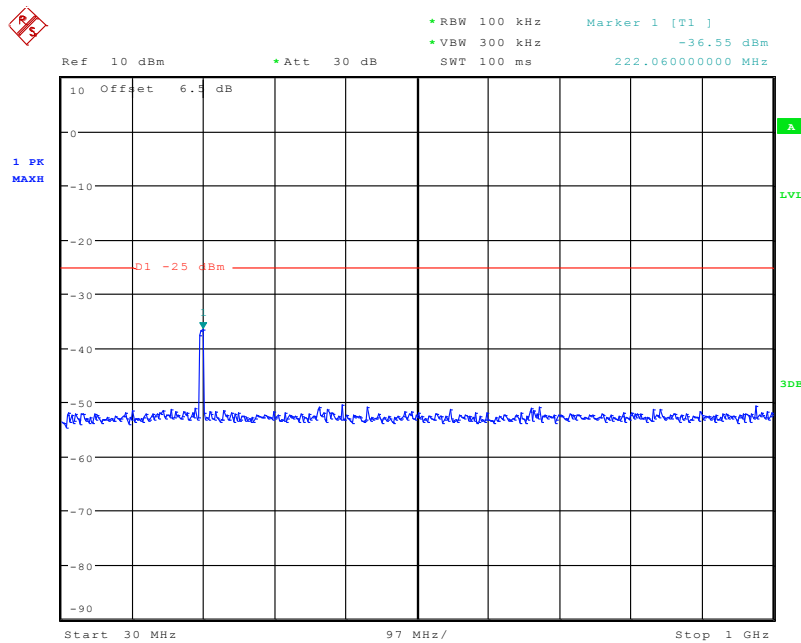


Fundamental test

Date: 1.JUN.2020 20:24:26

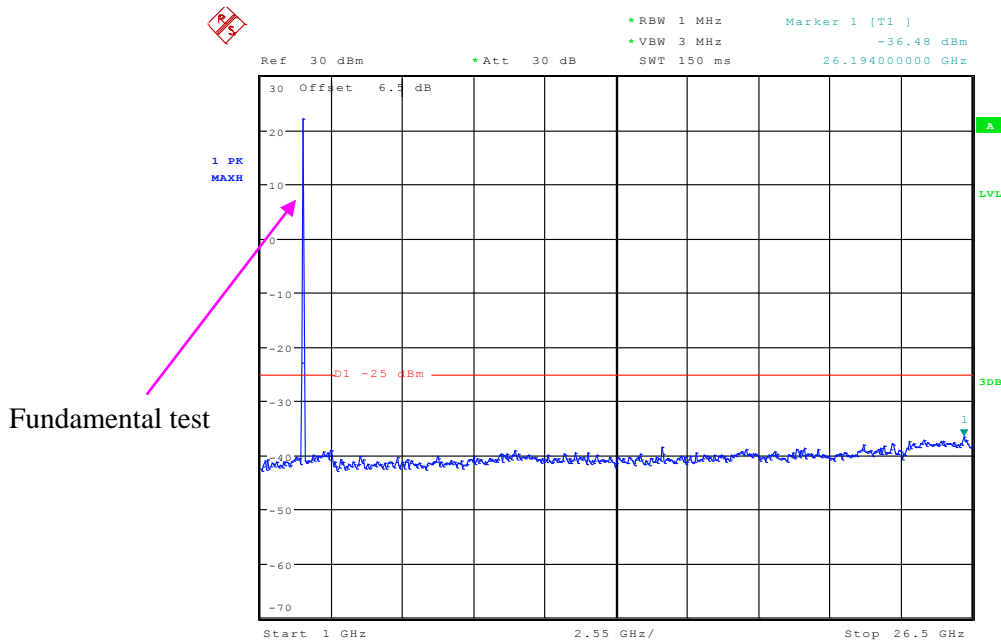
**LTE Band 7:**

**30 MHz – 1 GHz (5.0 MHz, Middle Channel)**



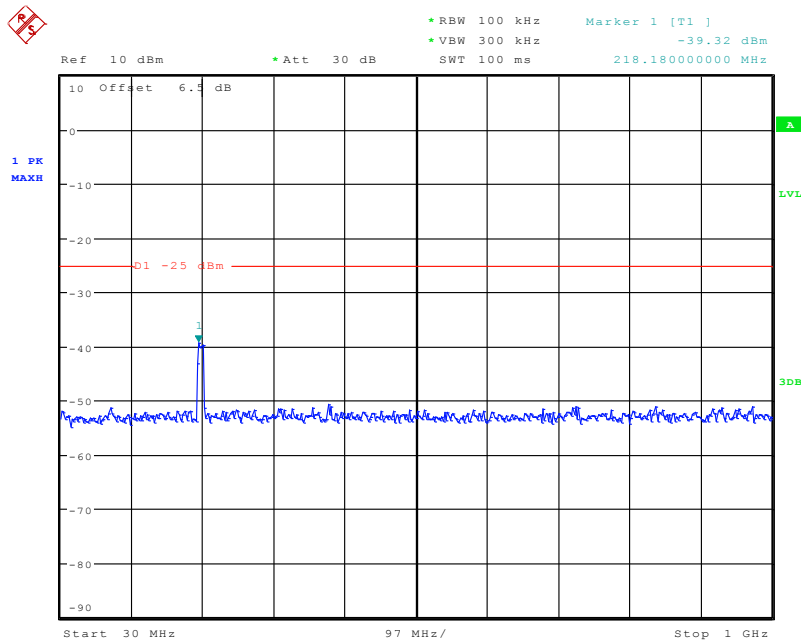
Date: 1.JUN.2020 20:24:48

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



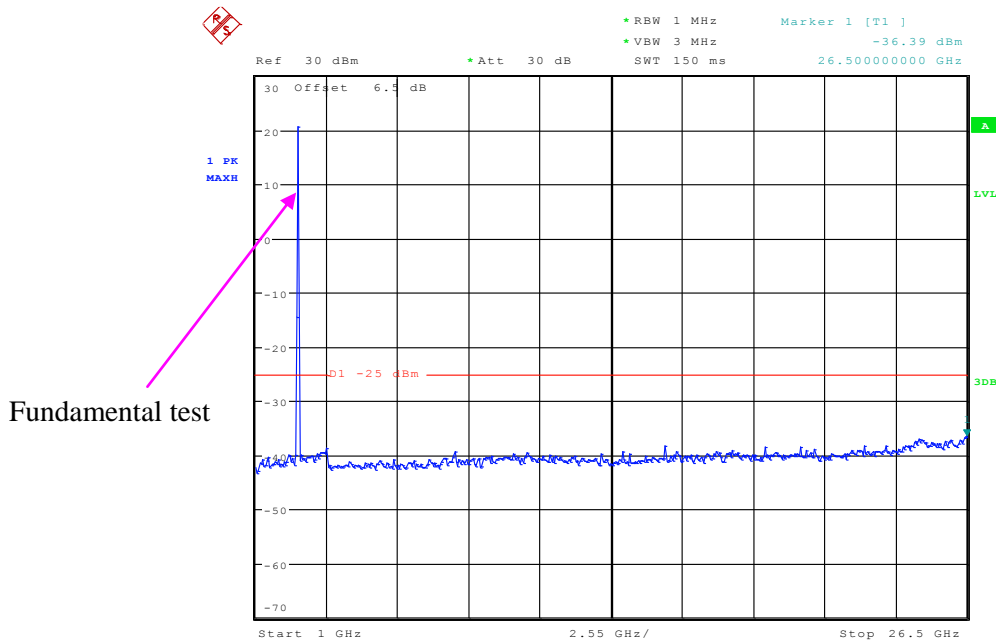
Date: 1.JUN.2020 20:25:00

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



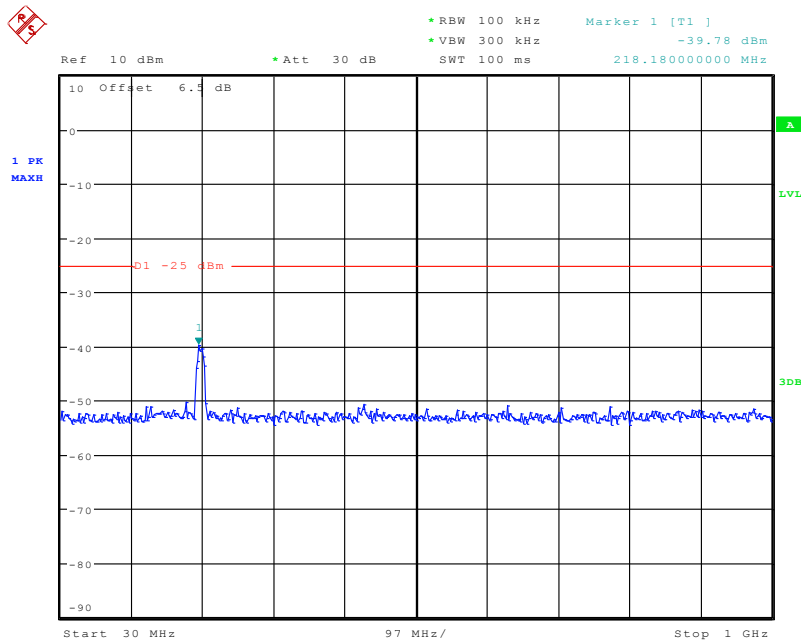
Date: 1.JUN.2020 20:25:20

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



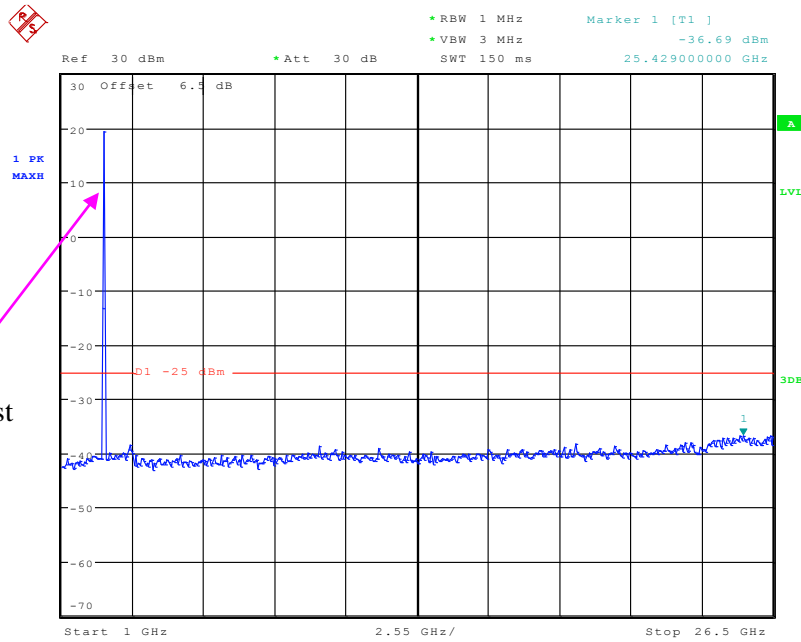
Date: 1.JUN.2020 20:25:31

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



Date: 1.JUN.2020 20:25:53

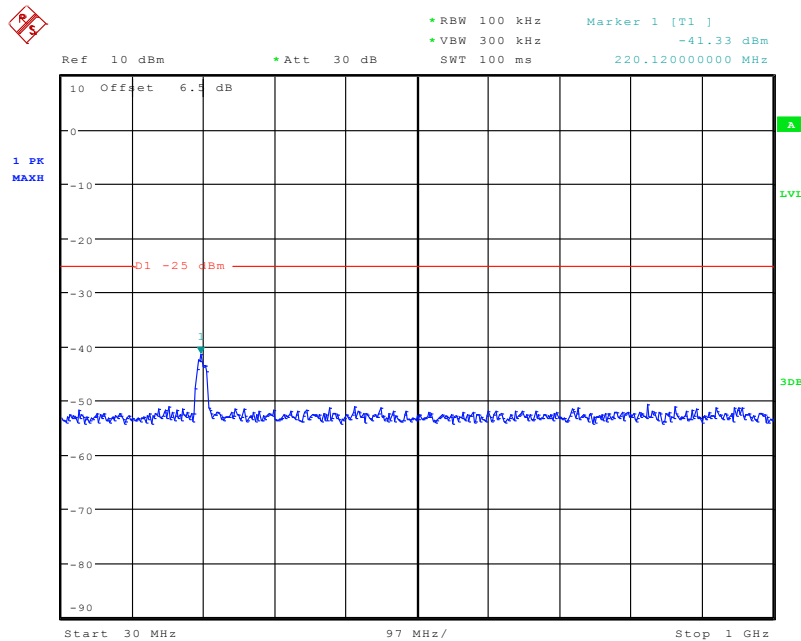
### 1 GHz – 26.5 GHz (15.0 MHz, Middle Channel)



Fundamental test

Date: 1.JUN.2020 20:26:05

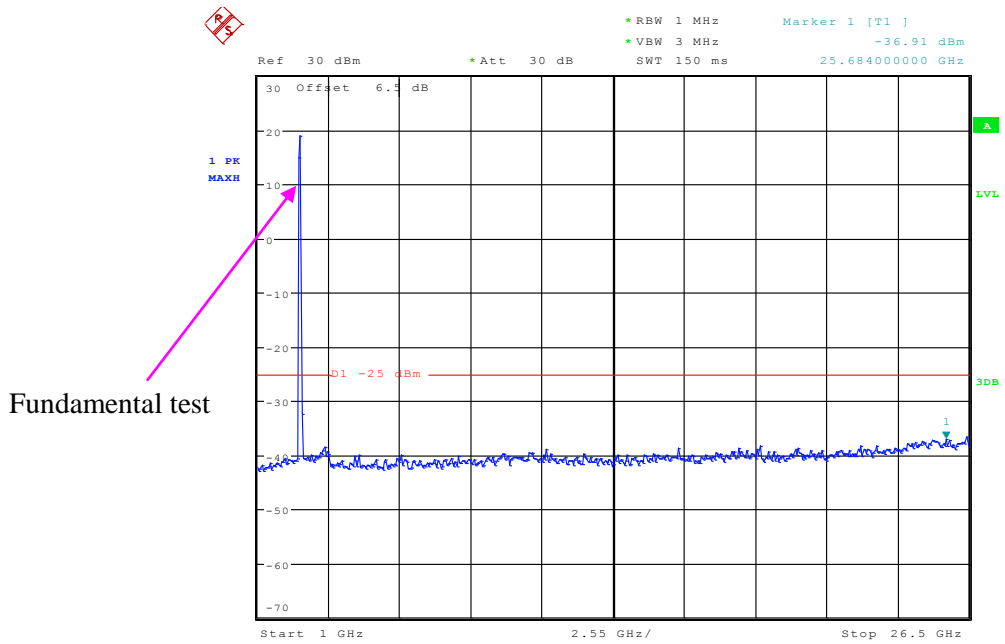
### 30 MHz – 1 GHz (20.0 MHz, Middle Channel)



Date: 1.JUN.2020 20:26:28



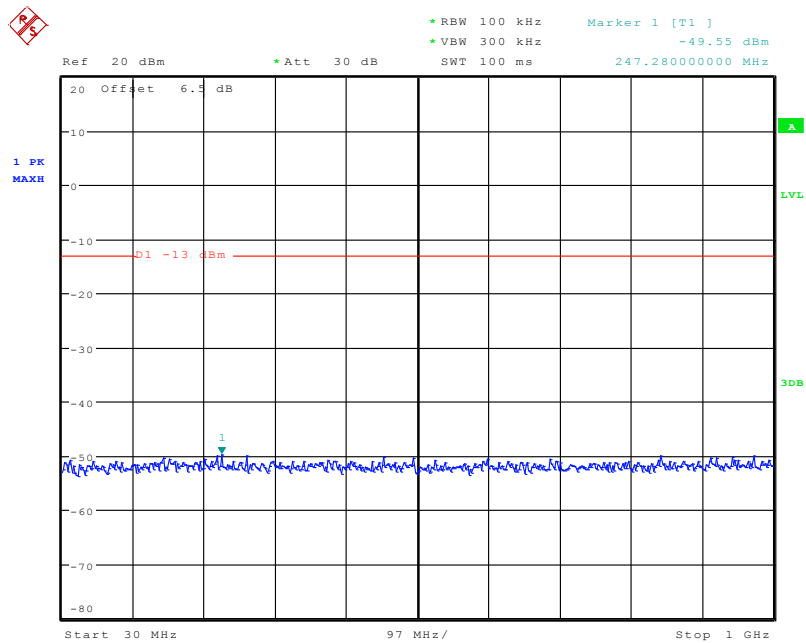
### 1 GHz – 26.5 GHz (20.0 MHz, Middle Channel)



Date: 1.JUN.2020 20:26:39

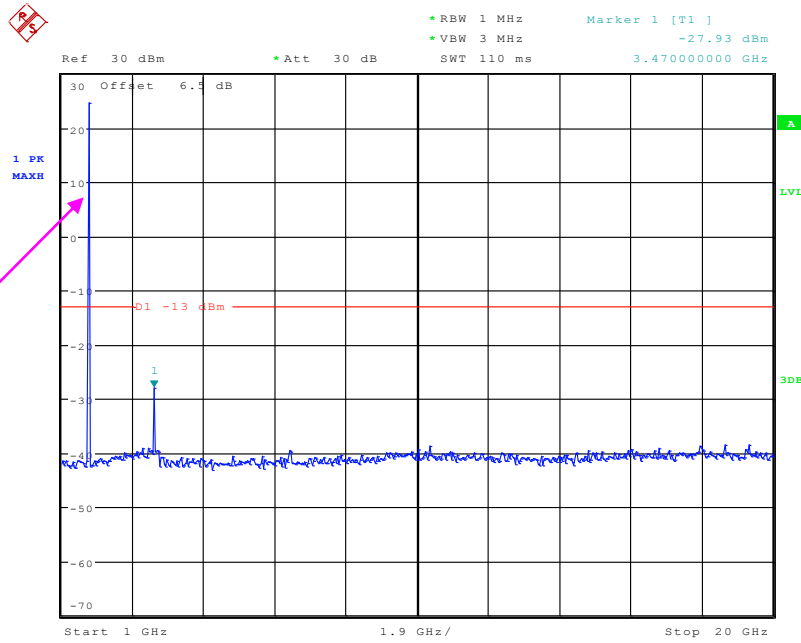
### LTE Band 66:

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



Date: 1.JUN.2020 20:30:13

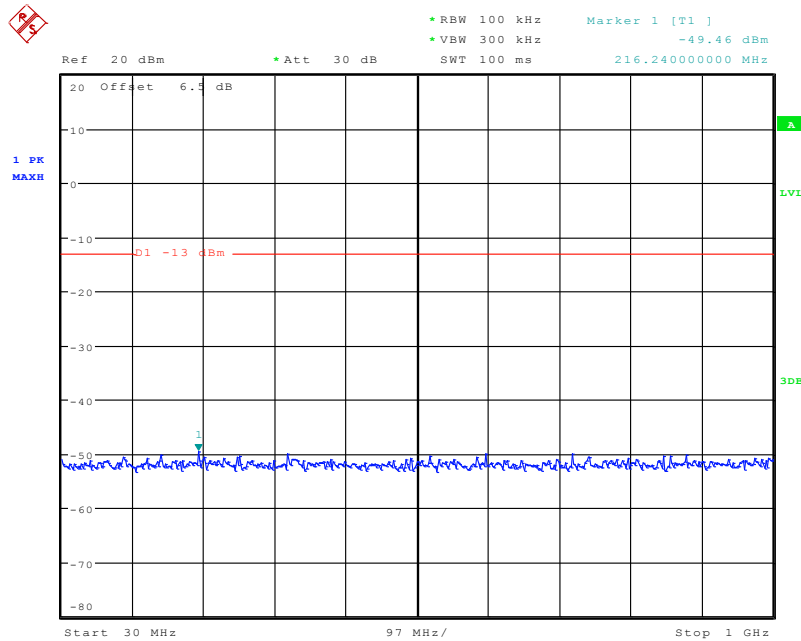
### 1 GHz – 20 GHz (1.4 MHz, Middle Channel)



Fundamental test

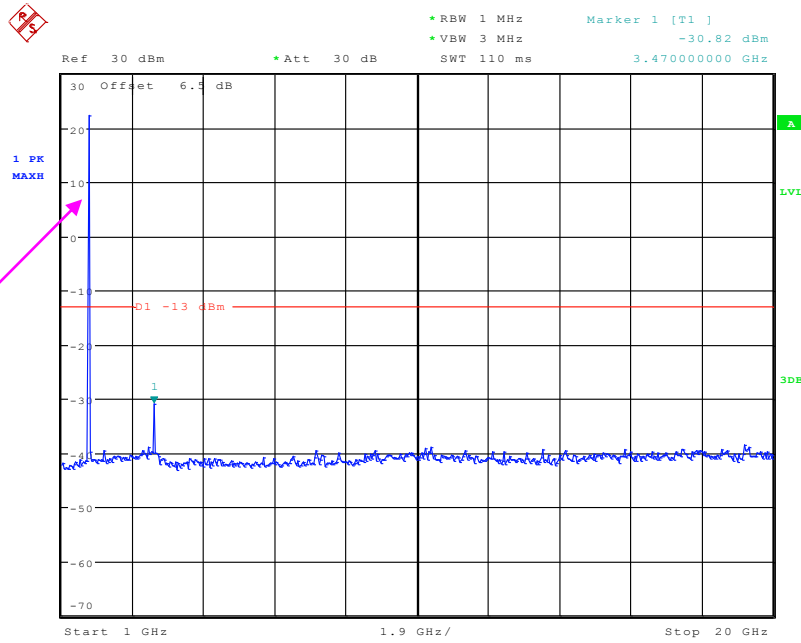
Date: 1.JUN.2020 20:30:25

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



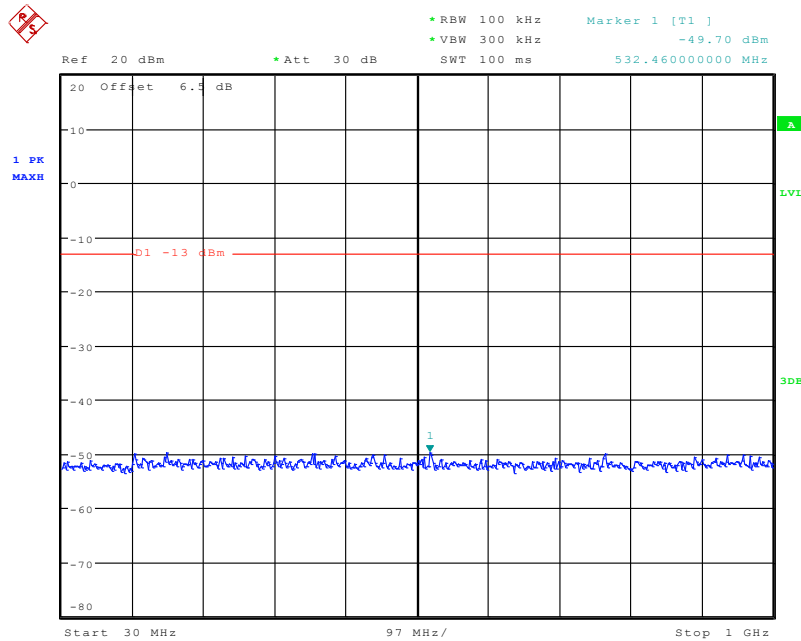
Date: 1.JUN.2020 20:30:44

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



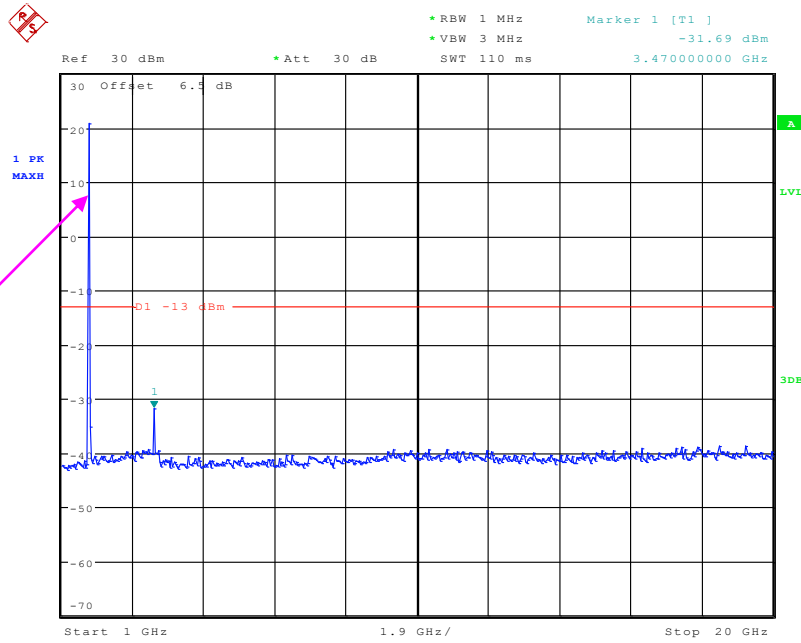
Date: 1.JUN.2020 20:30:55

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



Date: 1.JUN.2020 20:31:14

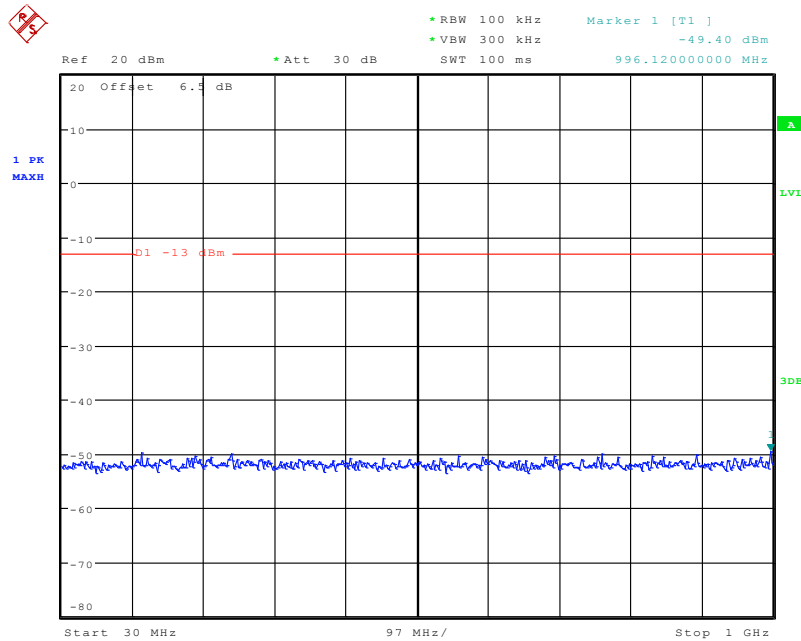
### 1 GHz – 20 GHz (5.0 MHz, Middle Channel)



Fundamental test

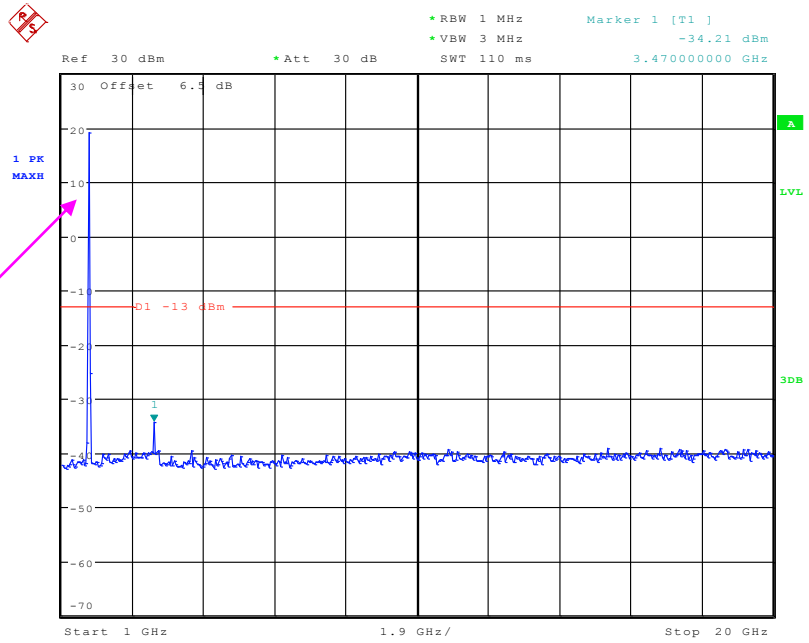
Date: 1.JUN.2020 20:31:26

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



Date: 1.JUN.2020 20:31:45

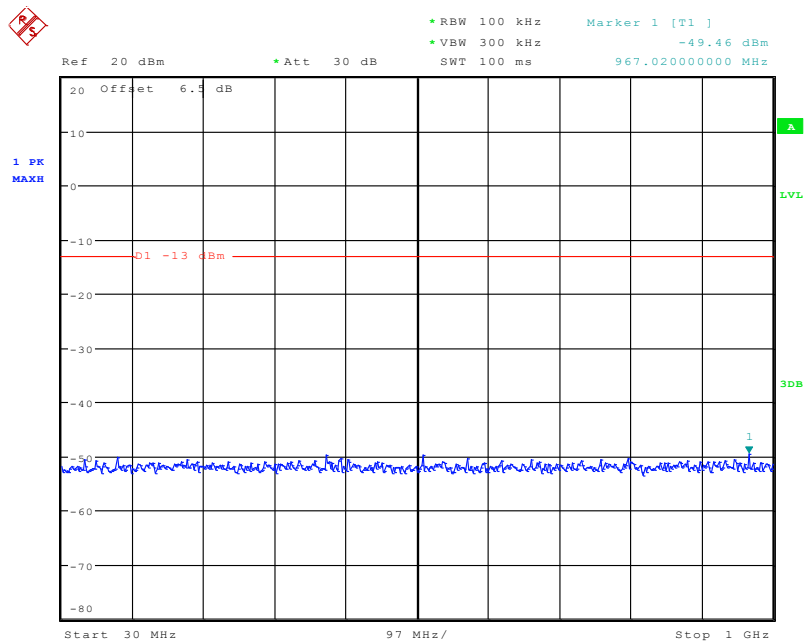
### 1 GHz – 20 GHz (10.0 MHz, Middle Channel)



Fundamental test

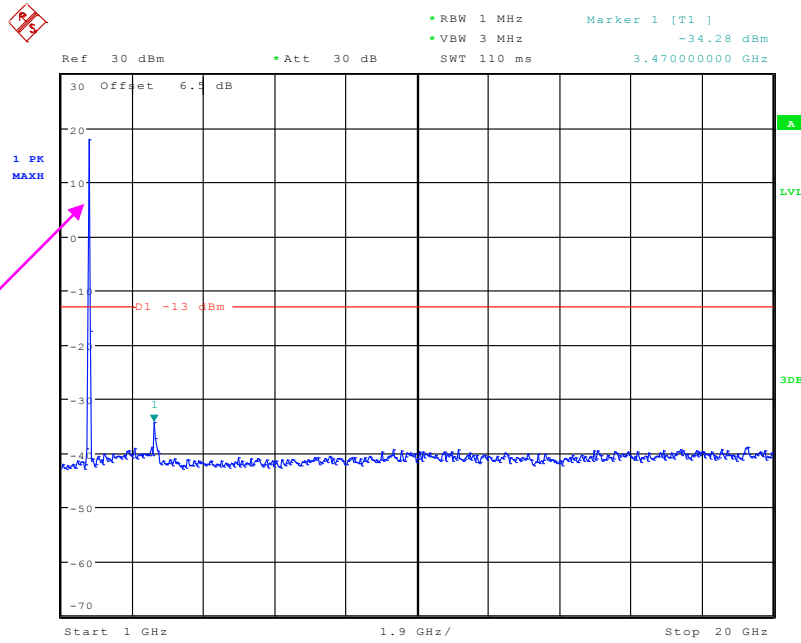
Date: 1.JUN.2020 20:31:57

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



Date: 1.JUN.2020 20:32:20

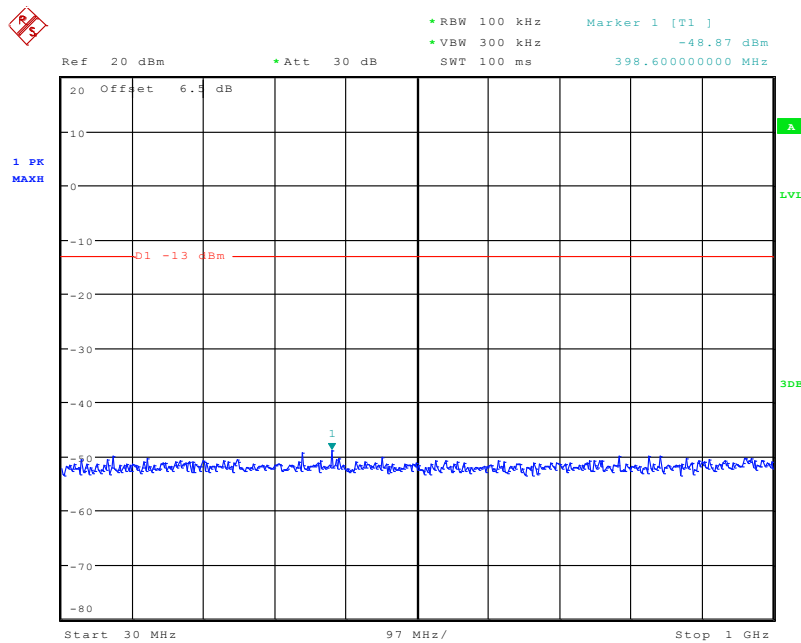
### 1 GHz – 20 GHz (15.0 MHz, Middle Channel)



Fundamental test

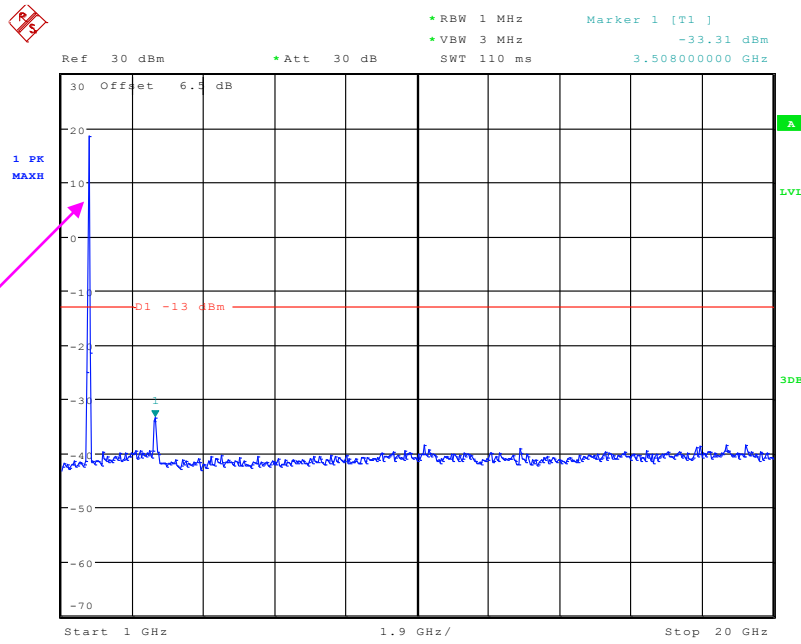
Date: 1.JUN.2020 20:32:31

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



Date: 1.JUN.2020 20:32:54

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



Fundamental test

Date: 1.JUN.2020 20:33:06

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

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### **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**

<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	52 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Harris He and Leven Gan from 2020-06-01 to 2020-06-02.*

*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 (dB $\mu$ V)	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										
955.6	37.62	58	1.5	H	-63.0	1.37	0.0	-64.37	-13	51.37
955.6	38.24	148	1.3	V	-61.1	1.37	0.0	-62.47	-13	49.47
1673.20	51.83	311	1.4	H	-54.5	1.30	8.90	-46.90	-13	33.90
1673.20	49.13	112	2.3	V	-56.6	1.30	8.90	-49.00	-13	36.00
2509.80	60.39	244	1.2	H	-43.0	2.60	10.20	-35.40	-13	22.40
2509.80	62.14	179	1.6	V	-40.6	2.60	10.20	-33.00	-13	20.00
3346.40	44.15	70	1.6	H	-56.7	1.50	11.70	-46.50	-13	33.50
3346.40	43.52	227	2.4	V	-57.4	1.50	11.70	-47.20	-13	34.20
WCDMA Mode, Middle channel										
965.4	36.72	274	1.4	H	-63.9	1.37	0.0	-65.27	-13	52.27
965.4	38.37	13	2.4	V	-61.0	1.37	0.0	-62.37	-13	49.37
1673.20	43.10	201	1.3	H	-63.2	1.30	8.90	-55.60	-13	42.60
1673.20	44.83	6	1.7	V	-60.9	1.30	8.90	-53.30	-13	40.30
2509.80	43.29	244	1.5	H	-60.1	2.60	10.20	-52.50	-13	39.50
2509.80	44.99	102	2.1	V	-57.8	2.60	10.20	-50.20	-13	37.20
3346.40	43.76	275	1.4	H	-57.1	1.50	11.70	-46.90	-13	33.90
3346.40	44.71	248	1.8	V	-56.2	1.50	11.70	-46.00	-13	33.00

**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										
962.4	37.63	191	2.3	H	-63.0	1.37	0.0	-64.37	-13	51.37
962.4	38.56	59	1.6	V	-60.8	1.37	0.0	-62.17	-13	49.17
3760.00	44.38	297	1.8	H	-57.7	1.50	11.80	-47.40	-13	34.40
3760.00	43.94	199	2.1	V	-57.6	1.50	11.80	-47.30	-13	34.30
5640.00	42.51	1	1.0	H	-57.2	1.70	12.40	-46.50	-13	33.50
5640.00	44.37	323	2.1	V	-55.0	1.70	12.40	-44.30	-13	31.30
WCDMA Mode Band II, Middle channel										
962.3	37.55	38	2.3	H	-63.0	1.37	0.0	-64.37	-13	51.37
962.3	38.72	180	1.6	V	-60.6	1.37	0.0	-61.97	-13	48.97
3760.00	42.14	161	1.5	H	-59.9	1.50	11.80	-49.60	-13	36.60
3760.00	42.40	166	2.2	V	-59.2	1.50	11.80	-48.90	-13	35.90

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

Frequency (MHz)	Receiver Reading (dB $\mu$ V)	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)			
Band 2 (1.4 MHz, 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	42.28	1	1.3	H	-59.8	1.50	11.80	-49.50	-13	36.50
3760.00	42.29	123	2.0	V	-59.3	1.50	11.80	-49.00	-13	36.00
Band 4 (1.4 MHz, 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	43.84	15	1.3	H	-56.9	1.50	12.00	-46.40	-13	33.40
3465.00	43.42	326	1.3	V	-58.1	1.50	12.00	-47.60	-13	34.60
Band 7 (5 MHz, 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	44.15	91	1.5	H	-55.9	1.60	12.10	-45.40	-25	20.40
5070.00	45.88	299	1.6	V	-54.1	1.60	12.10	-43.60	-25	18.60
Band66 (1.4 MHz, Middle Channel)										
Test frequency range:30 MHz ~ 20 GHz										
963.4	37.24	89	1.9	H	-63.4	1.37	0.0	-64.77	-13	51.77
963.4	38.11	127	1.1	V	-61.2	1.37	0.0	-62.57	-13	49.57
3490.00	42.89	255	1.4	H	-57.9	1.50	12.00	-47.40	-13	34.40
3490.00	42.57	288	2.2	V	-58.9	1.50	12.00	-48.40	-13	35.40

**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.

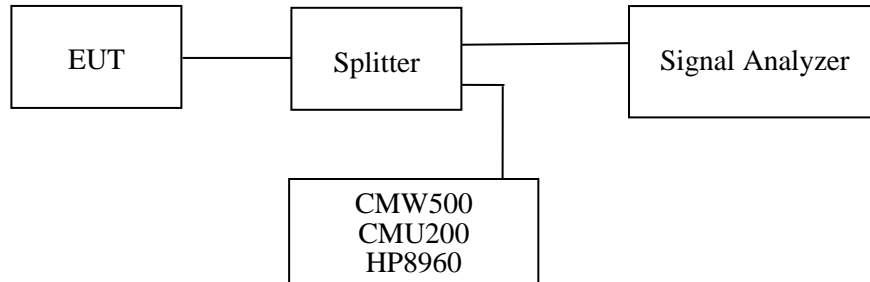
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

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**

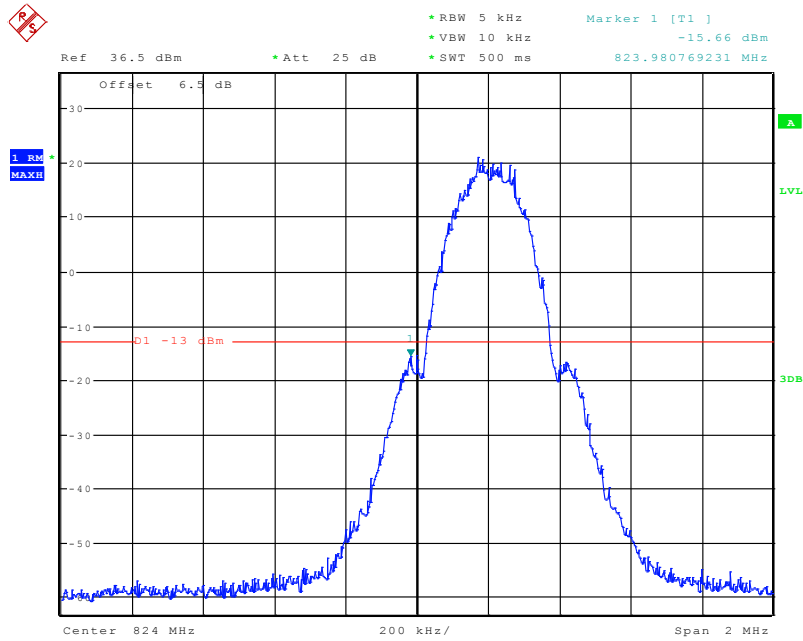
<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	56%
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Black Chen from 2020-05-28 to 2020-06-01.*

*EUT operation mode: Transmitting*

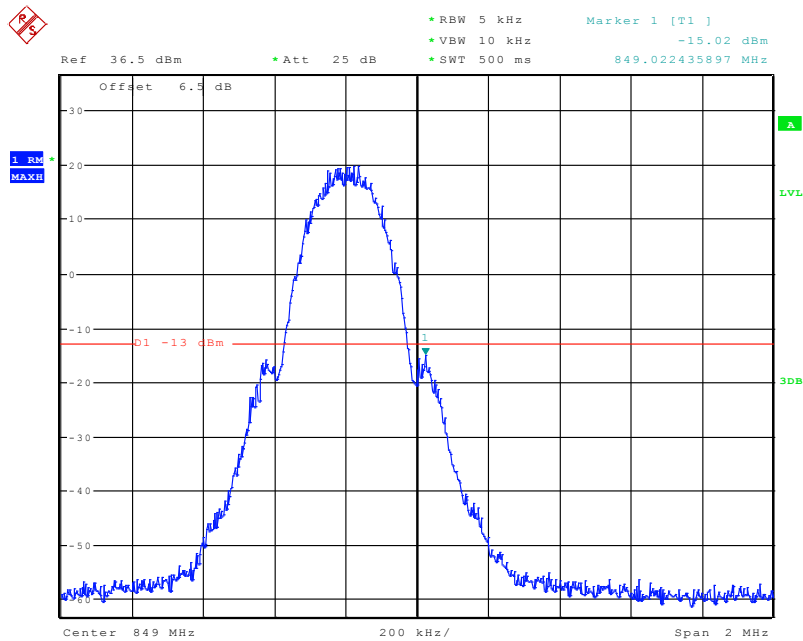
*Test Result: Compliance. Please refer to the following plots.*

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



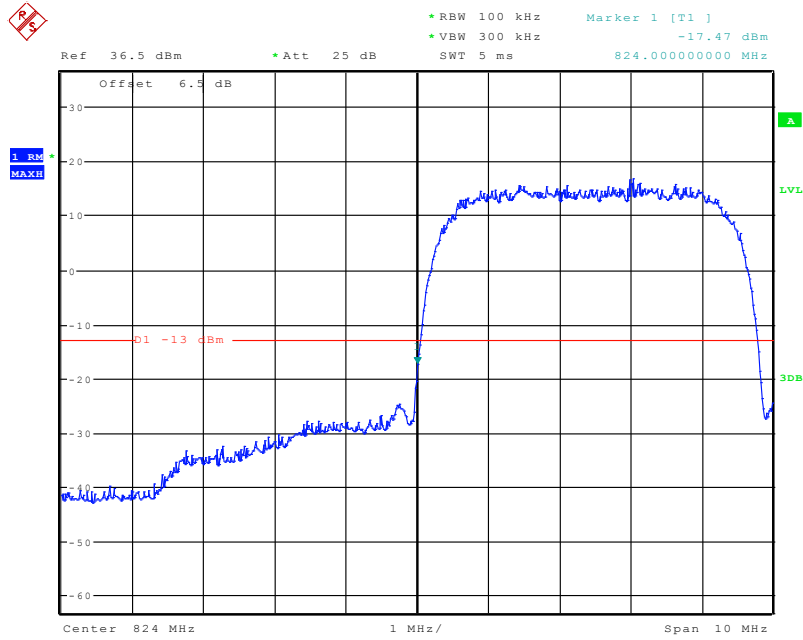
Date: 28.MAY.2020 22:00:45

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



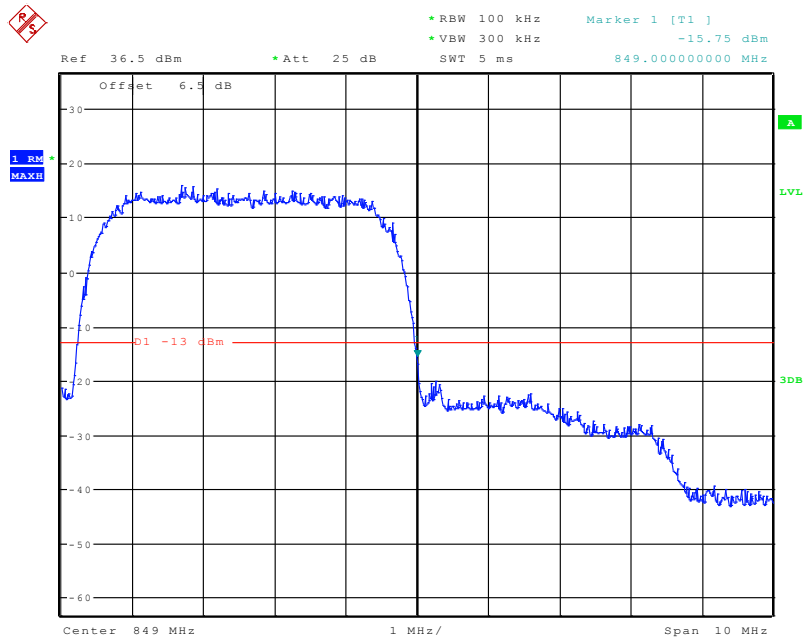
Date: 28.MAY.2020 22:02:31

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



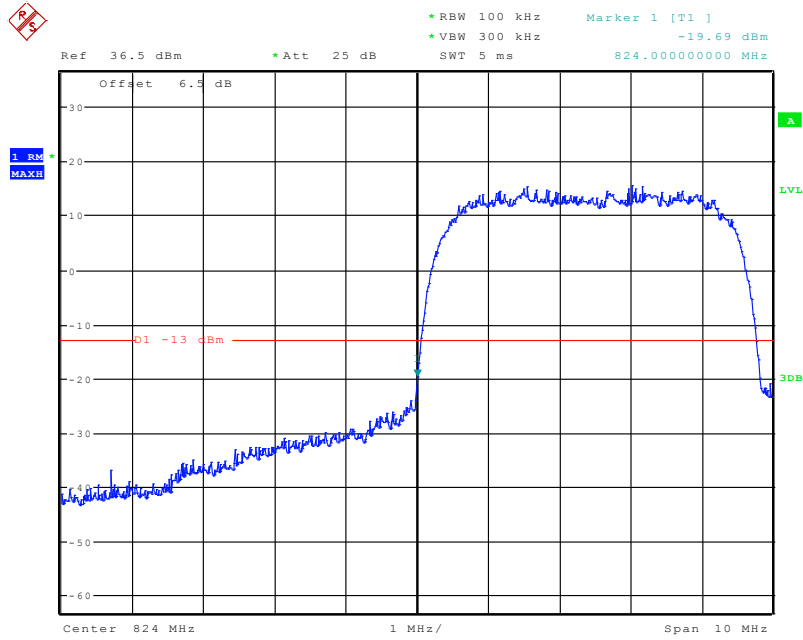
Date: 29.MAY.2020 00:02:10

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



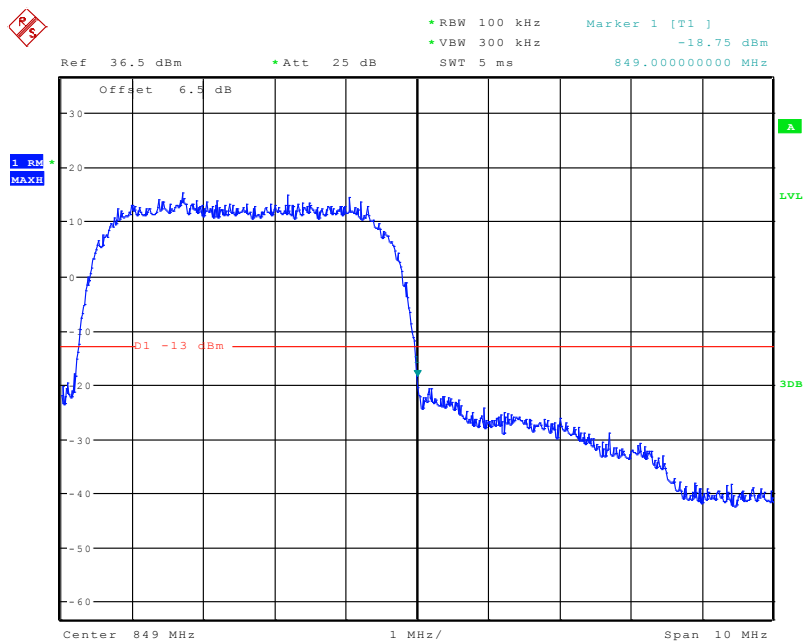
Date: 29.MAY.2020 00:02:47

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

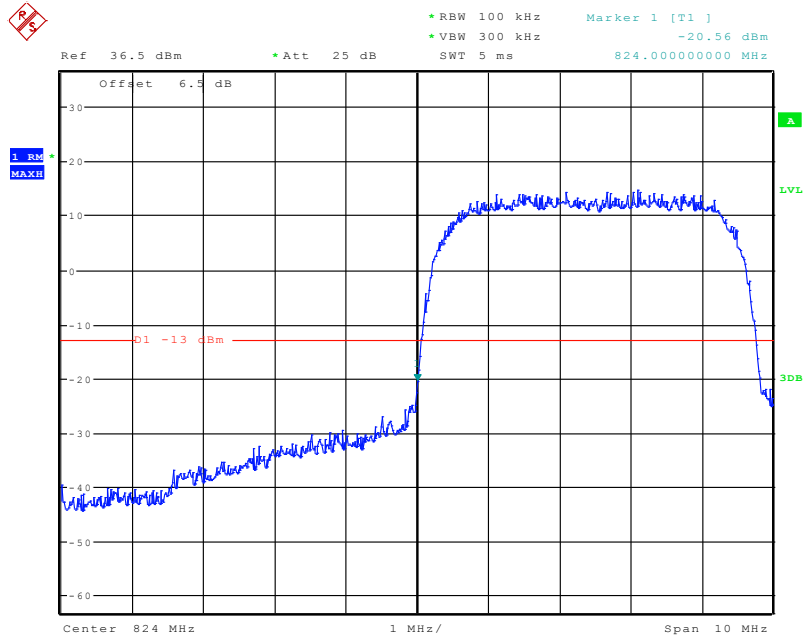


Date: 29.MAY.2020 00:00:54

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

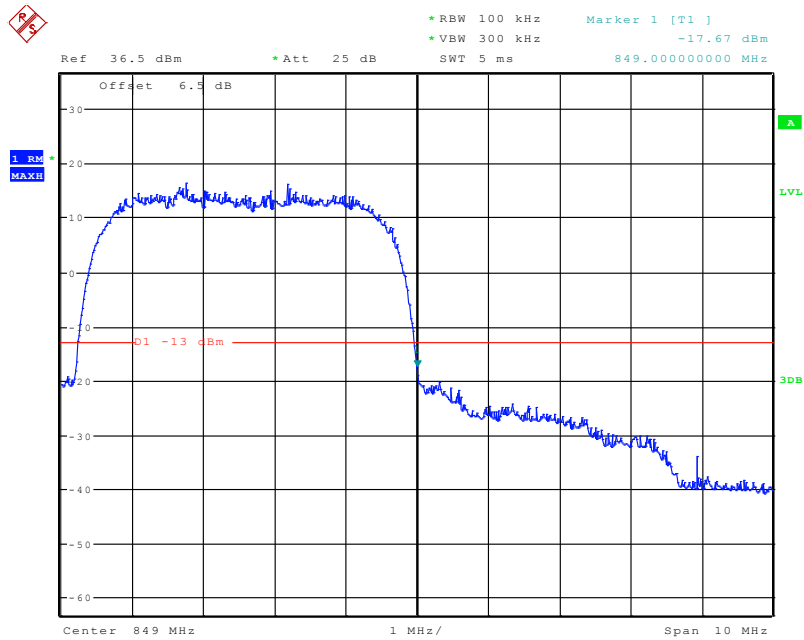


### Cellular Band, Left Band Edge for HSUPA (BPSK) Mode



Date: 28.MAY.2020 23:42:45

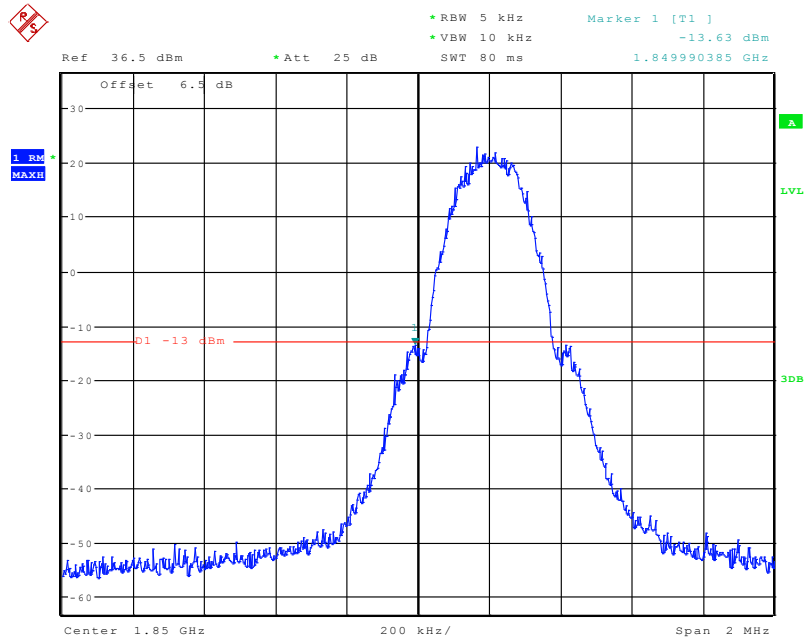
### Cellular Band, Right Band Edge for HSUPA (BPSK) Mode



Date: 28.MAY.2020 23:44:42

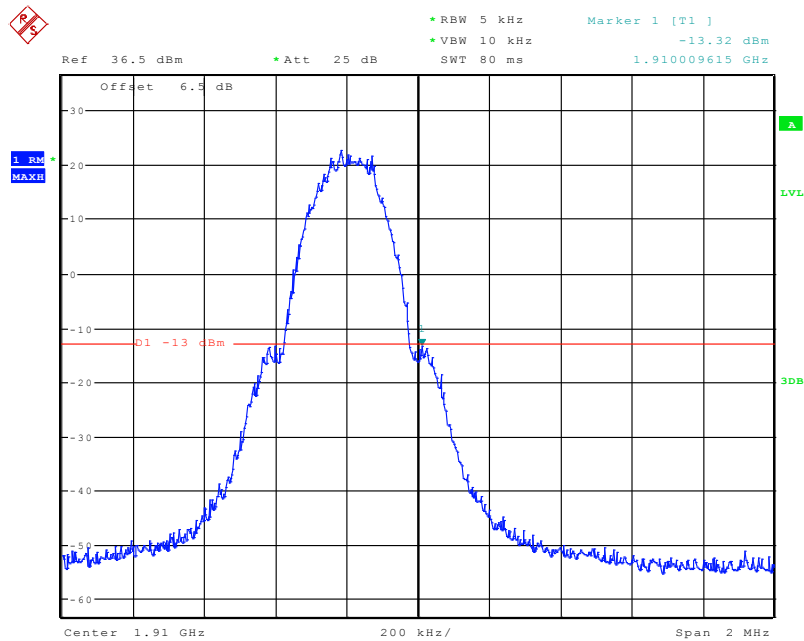


### PCS Band, Left Band Edge for GSM (GMSK) Mode



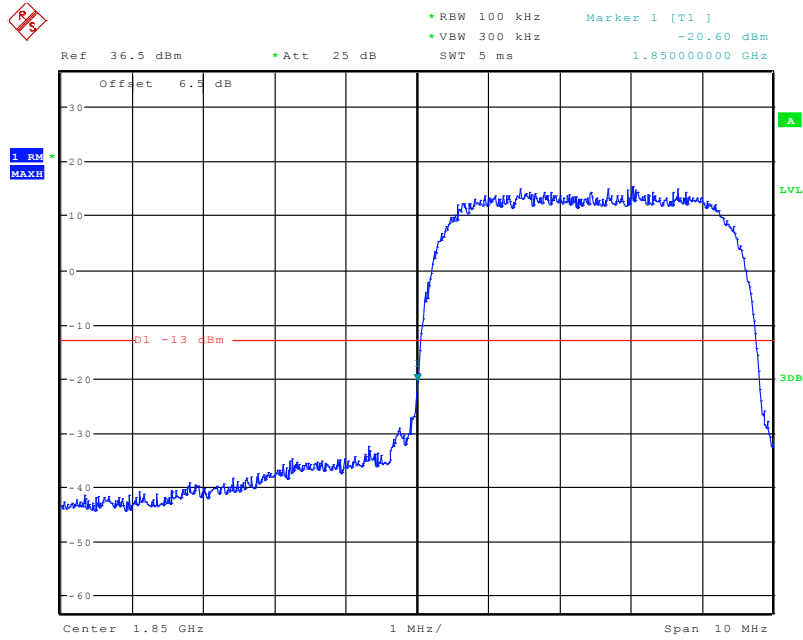
Date: 28.MAY.2020 22:22:08

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



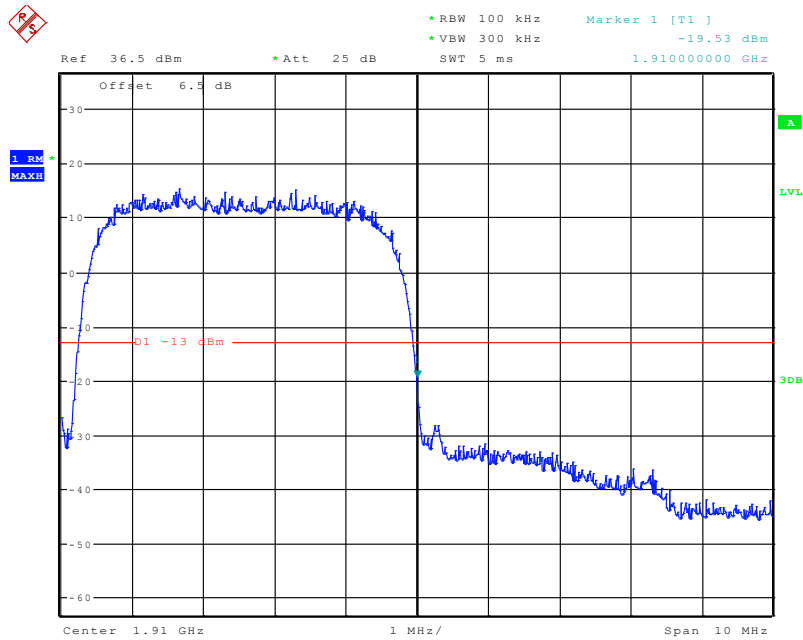
Date: 28.MAY.2020 22:25:57

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



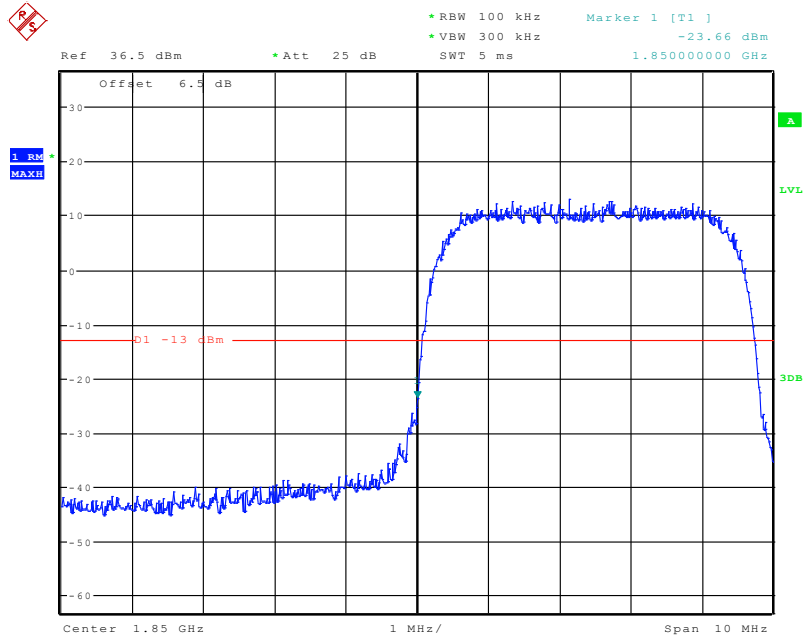
Date: 28.MAY.2020 23:25:47

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



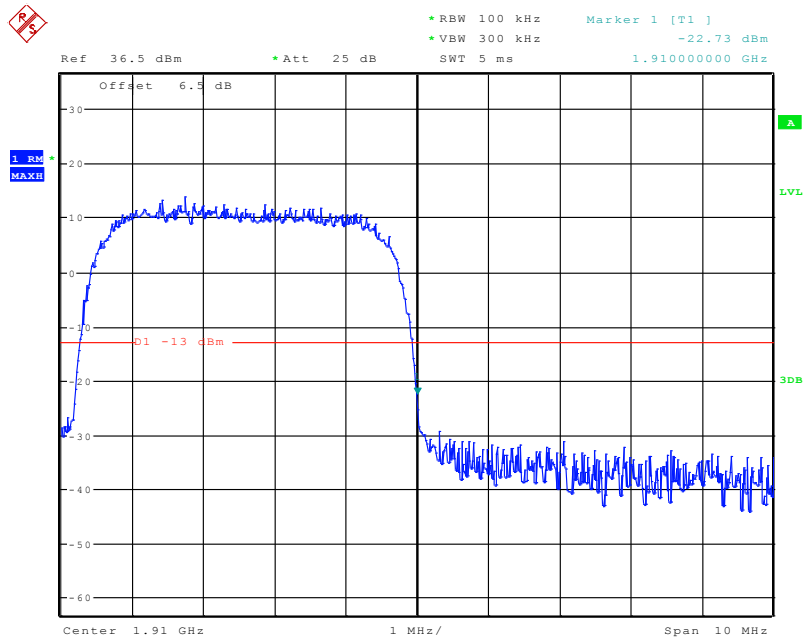
Date: 28.MAY.2020 23:26:08

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



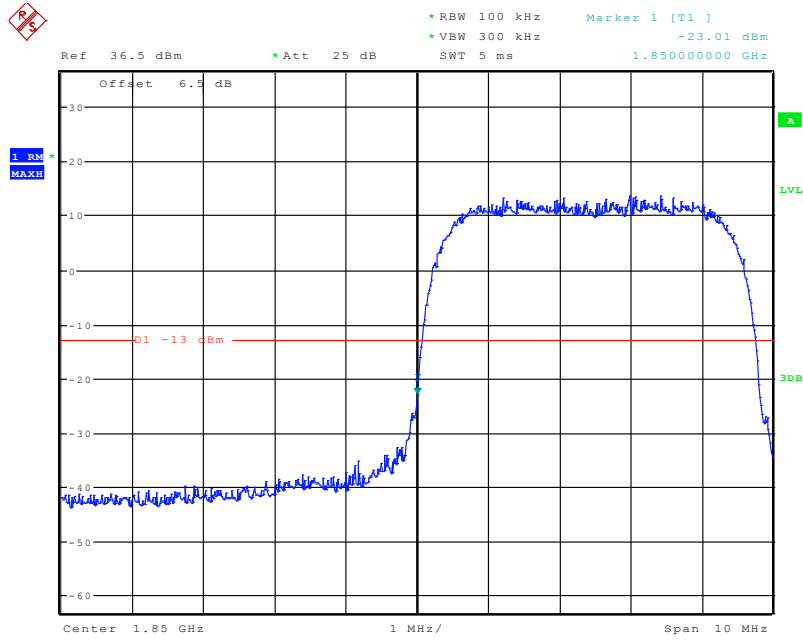
Date: 28.MAY.2020 23:27:37

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



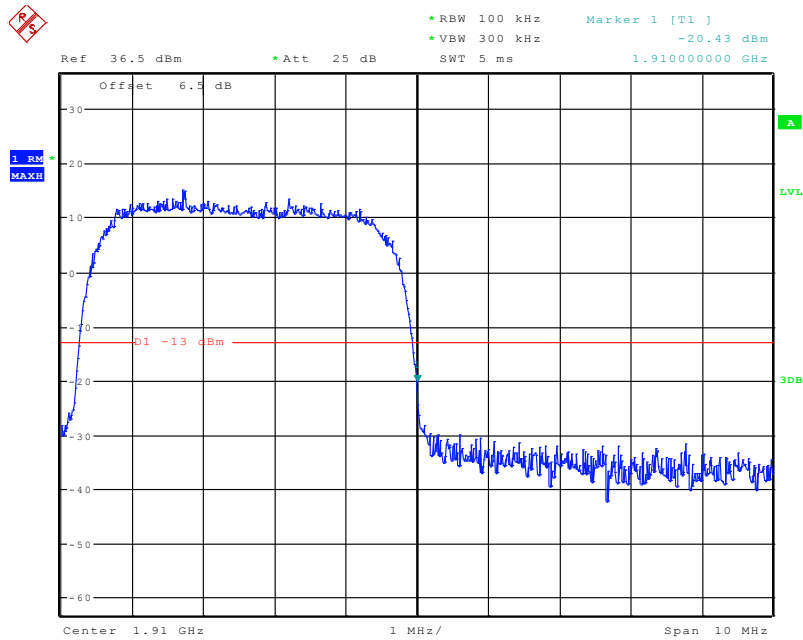
Date: 28.MAY.2020 23:27:15

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



Date: 28.MAY.2020 23:34:49

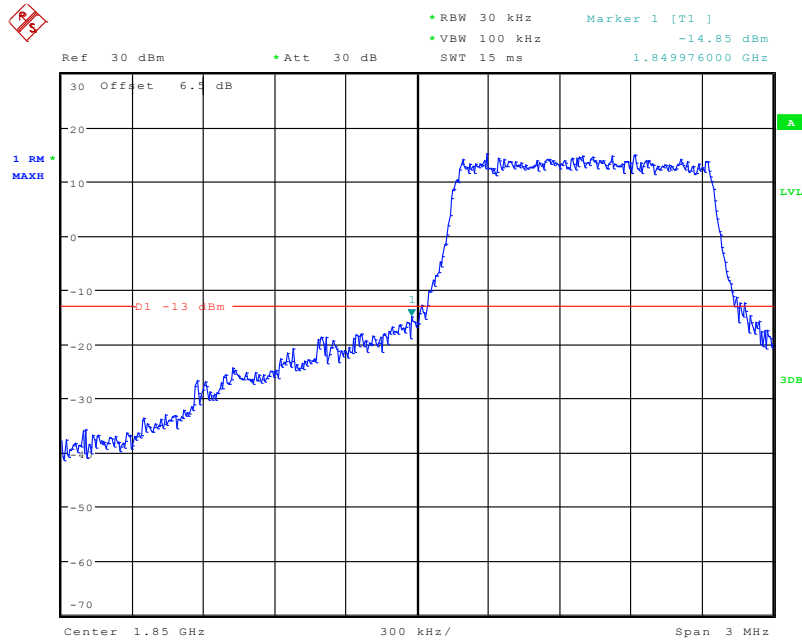
### PCS Band, Right Band Edge for HSUPA (BPSK) Mode



Date: 28.MAY.2020 23:36:56

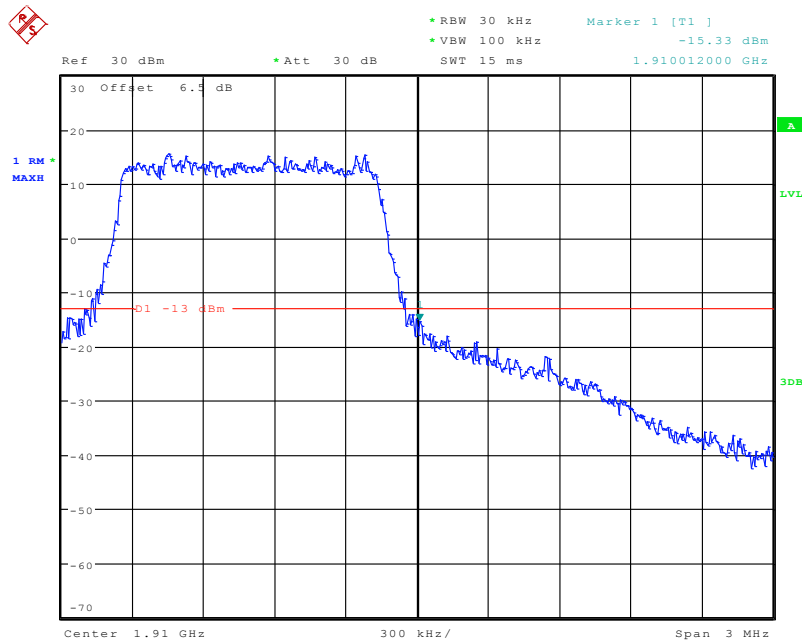
**Band 2:**

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



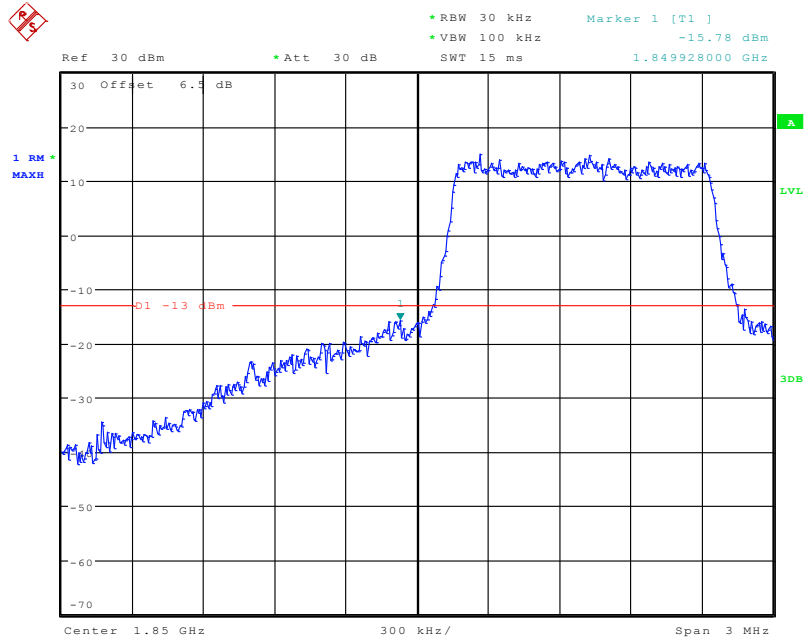
Date: 1.JUN.2020 19:38:54

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



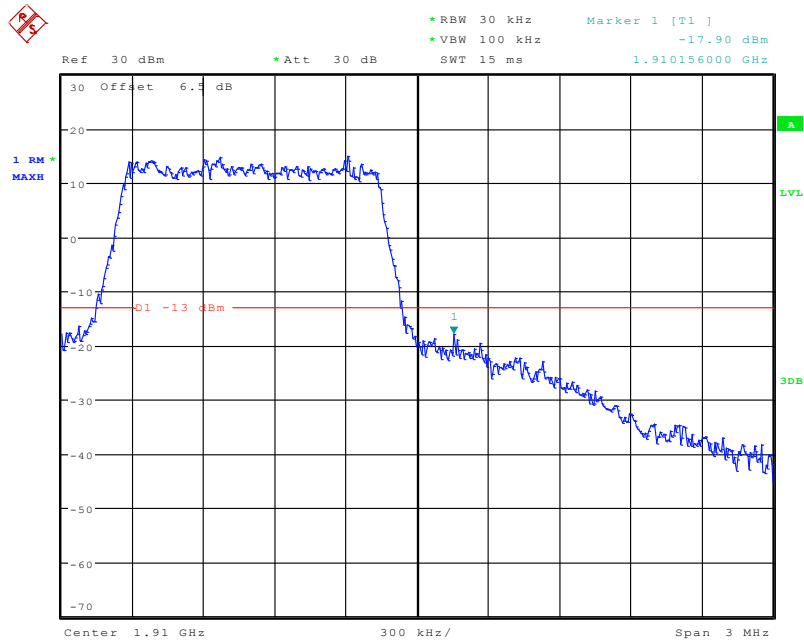
Date: 1.JUN.2020 19:39:34

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



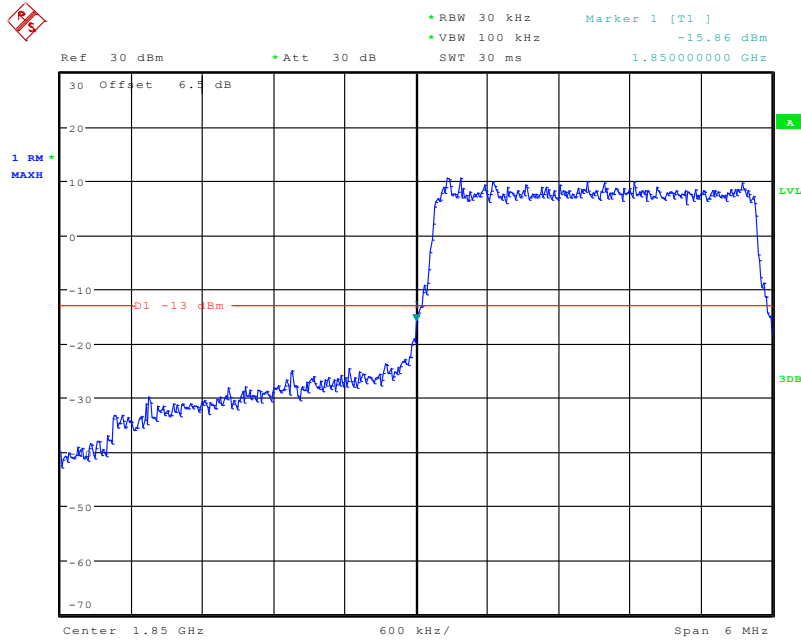
Date: 1.JUN.2020 19:39:14

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



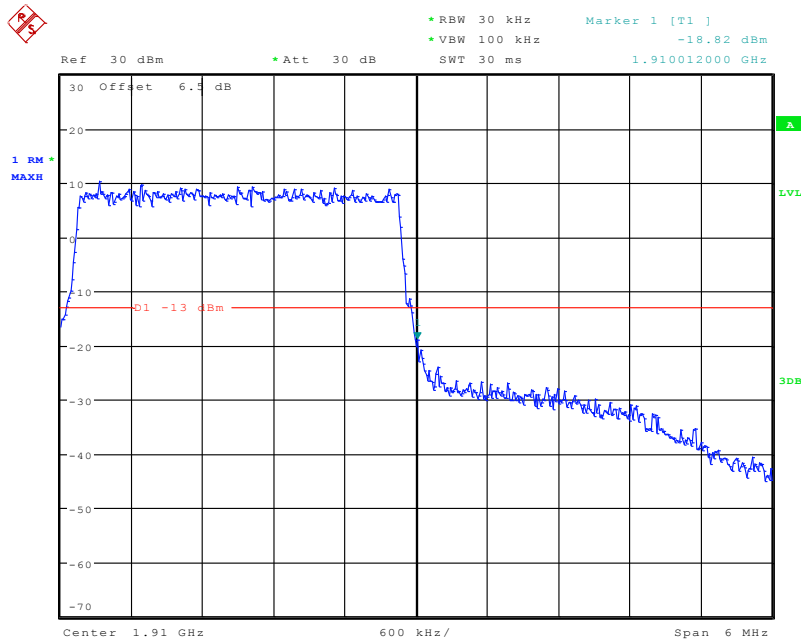
Date: 1.JUN.2020 19:39:57

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



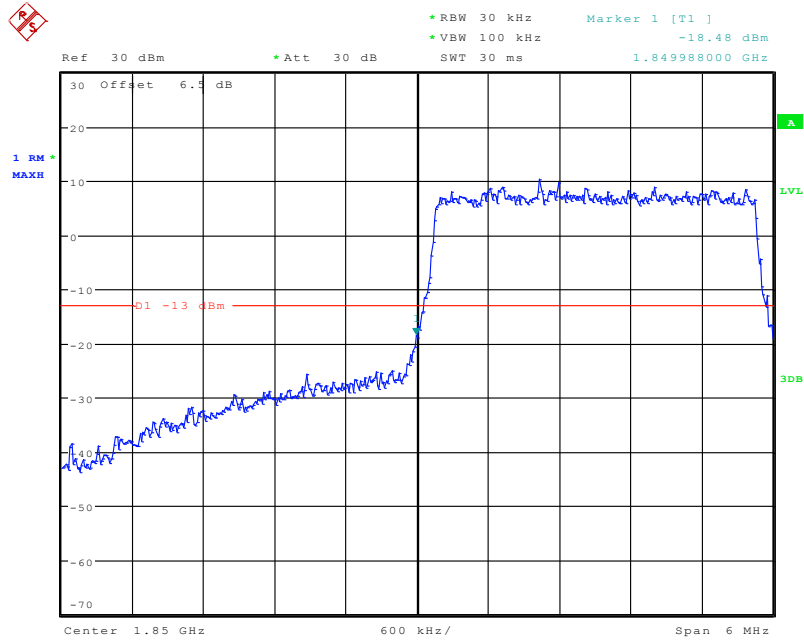
Date: 1.JUN.2020 19:40:16

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



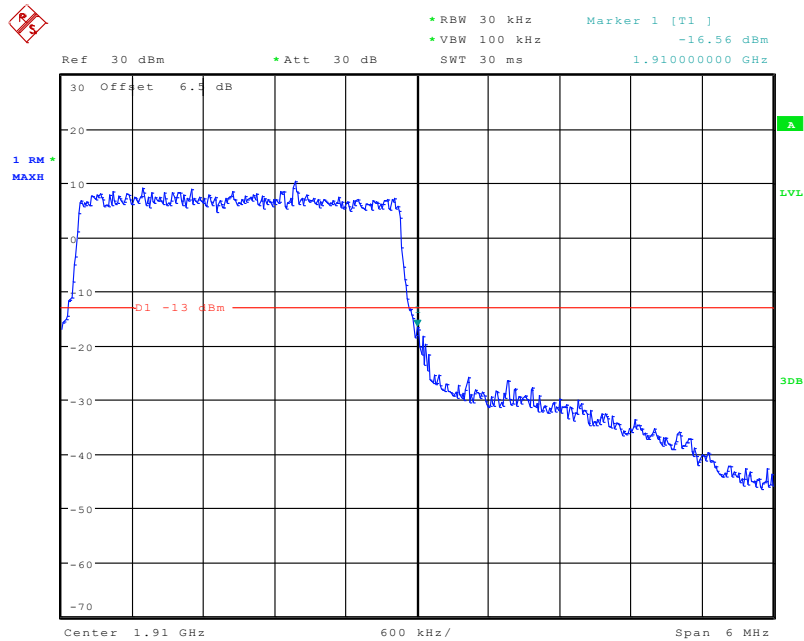
Date: 1.JUN.2020 19:40:53

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



Date: 1.JUN.2020 19:40:36

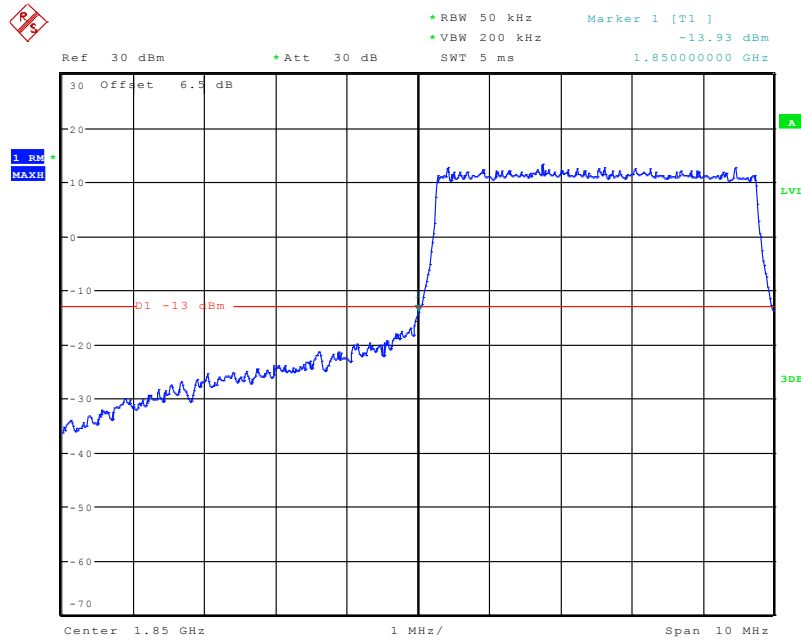
### 16-QAM (3.0 MHz, FULL RB) - Right Band Edge



Date: 1.JUN.2020 19:41:10

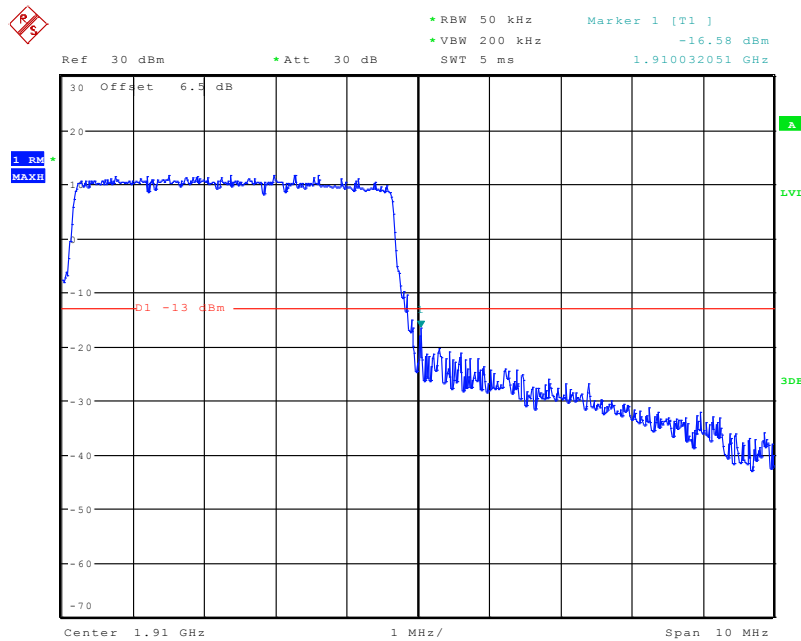


### QPSK (5.0 MHz, FULL RB) - Left Band Edge



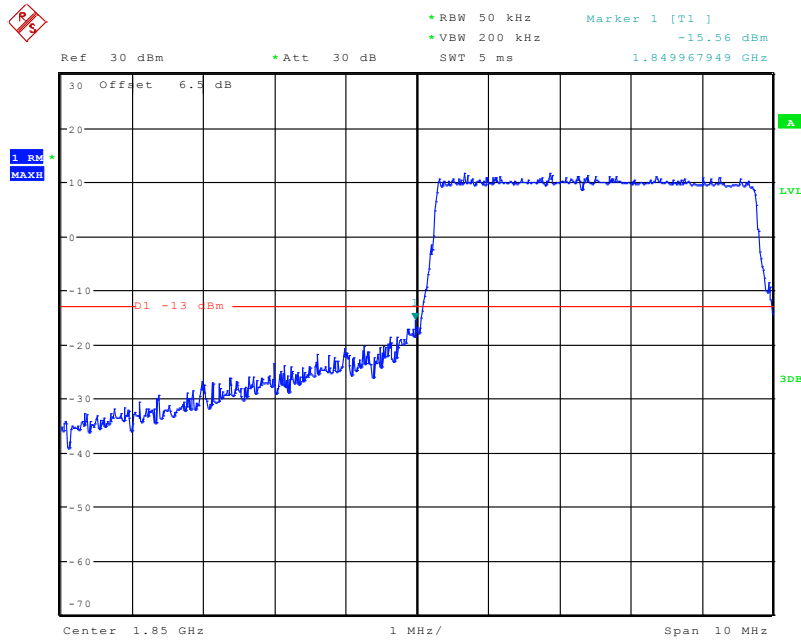
Date: 1.JUN.2020 20:55:15

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



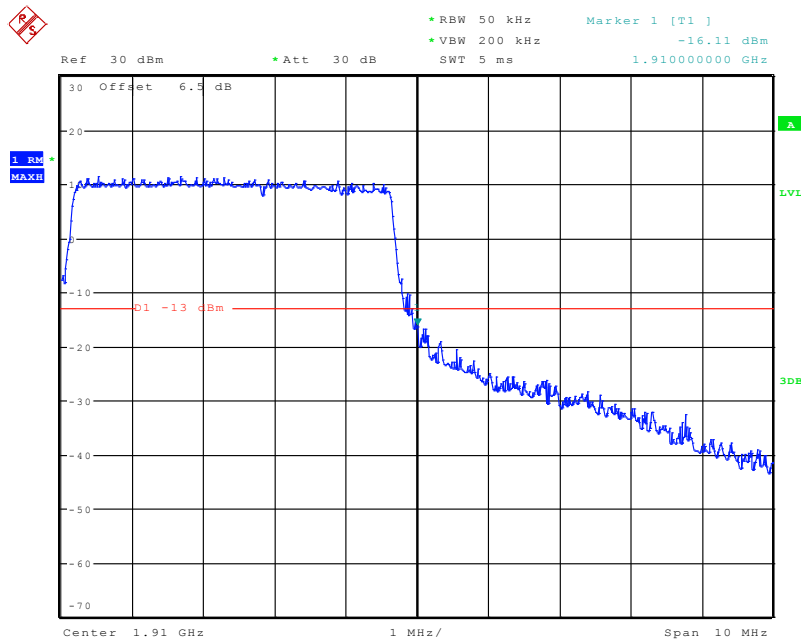
Date: 1.JUN.2020 21:06:21

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



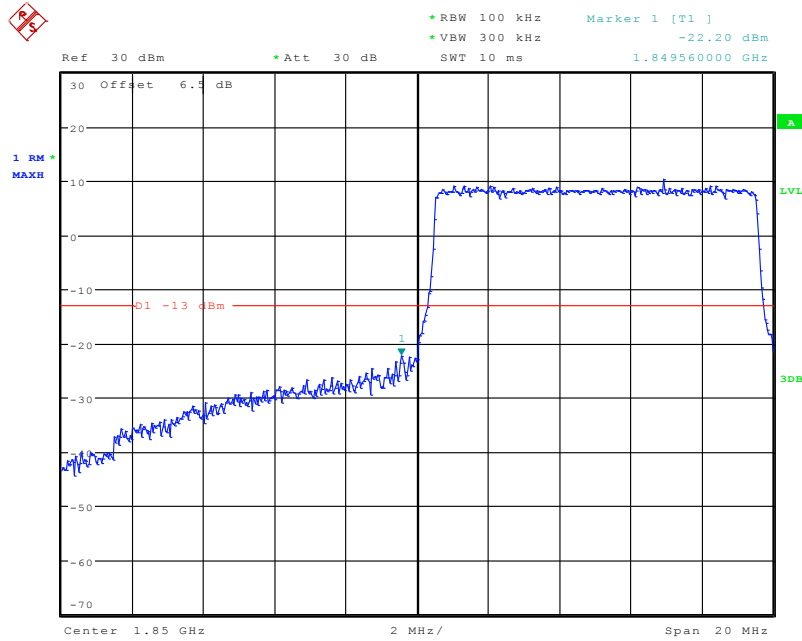
Date: 1.JUN.2020 20:57:06

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



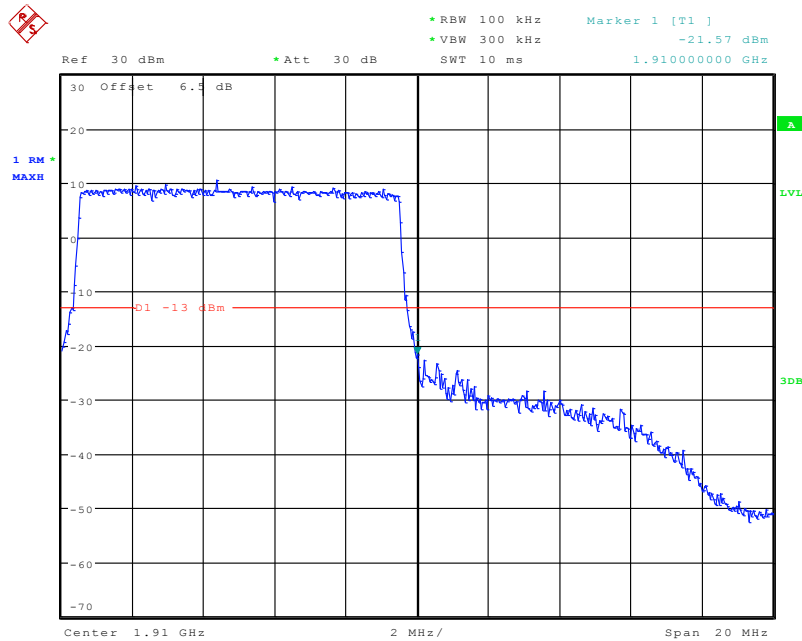
Date: 1.JUN.2020 21:05:33

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



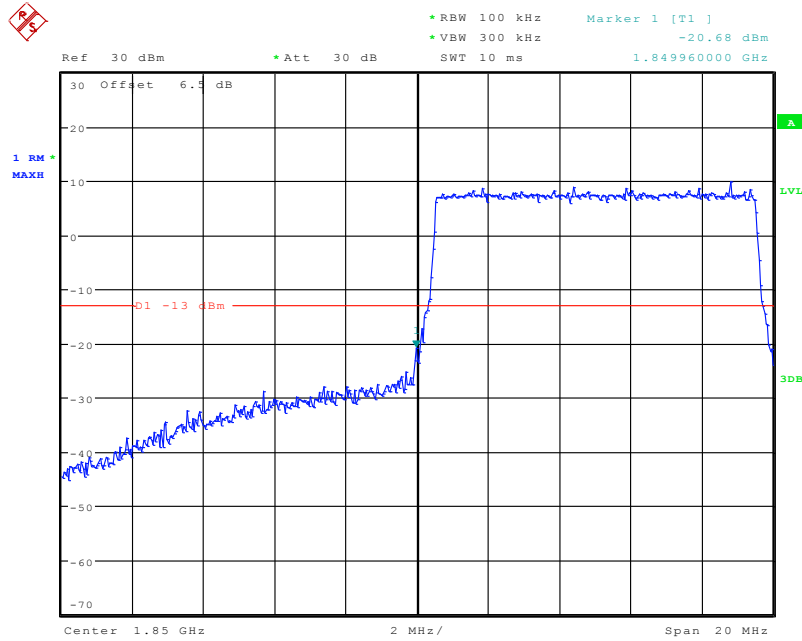
Date: 1.JUN.2020 19:42:55

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



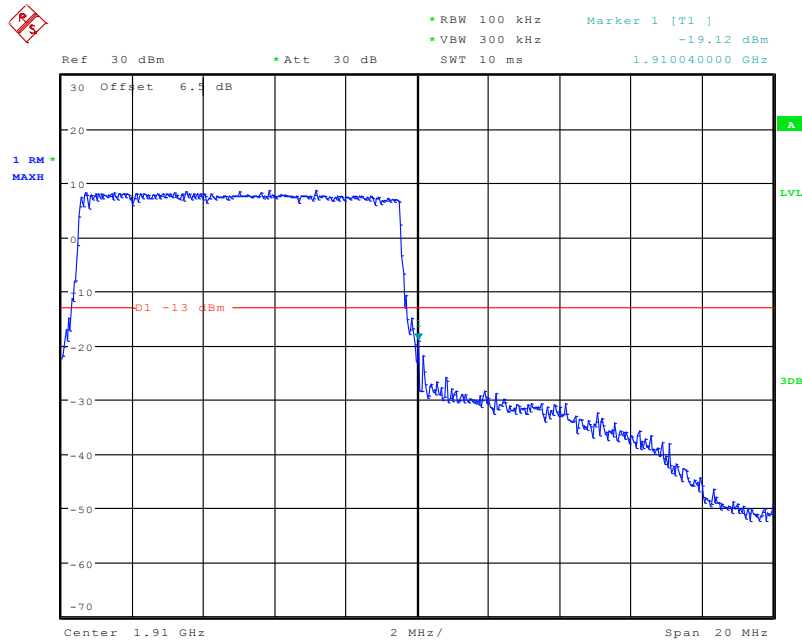
Date: 1.JUN.2020 19:43:31

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



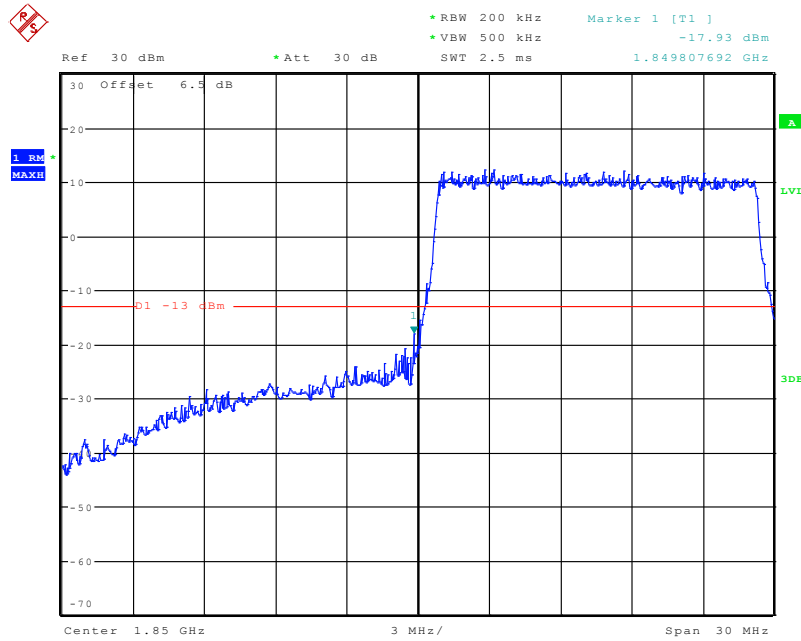
Date: 1.JUN.2020 19:43:13

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



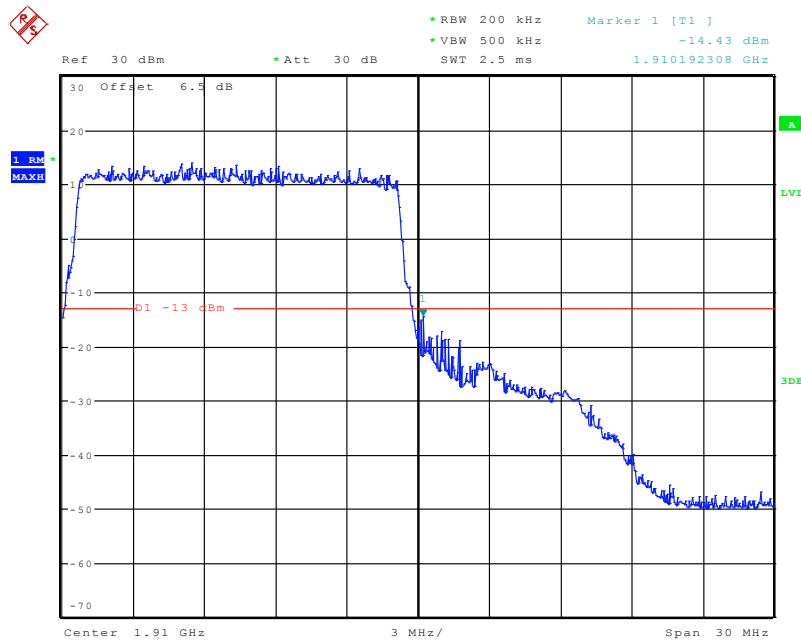
Date: 1.JUN.2020 19:43:49

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



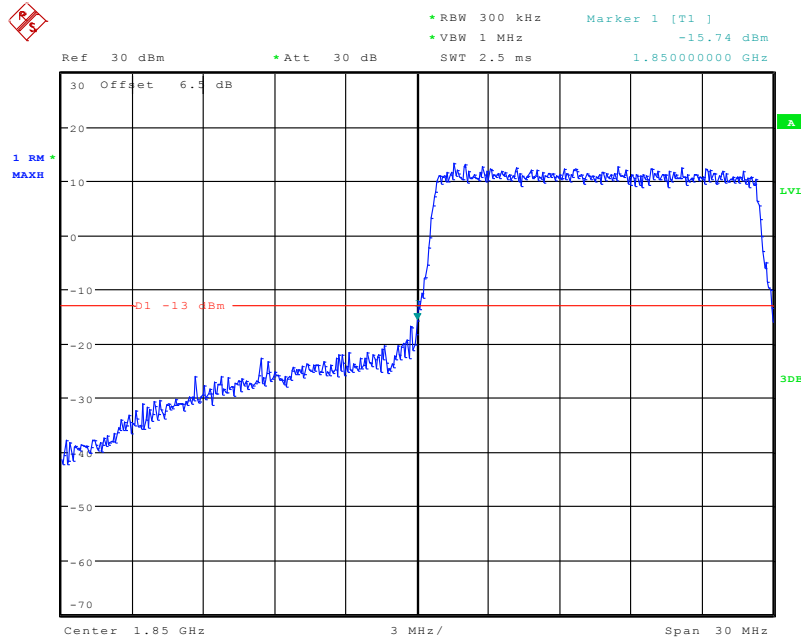
Date: 1.JUN.2020 22:27:25

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



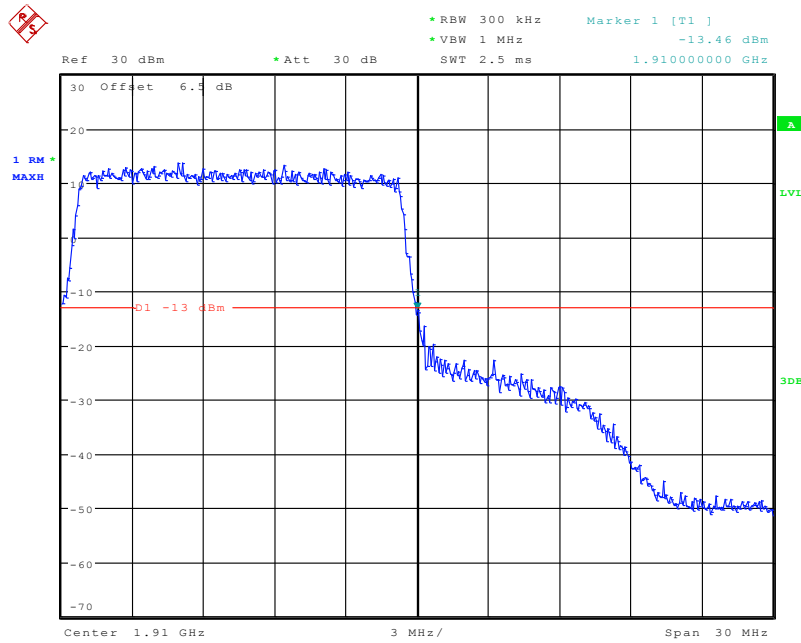
Date: 1.JUN.2020 22:28:39

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



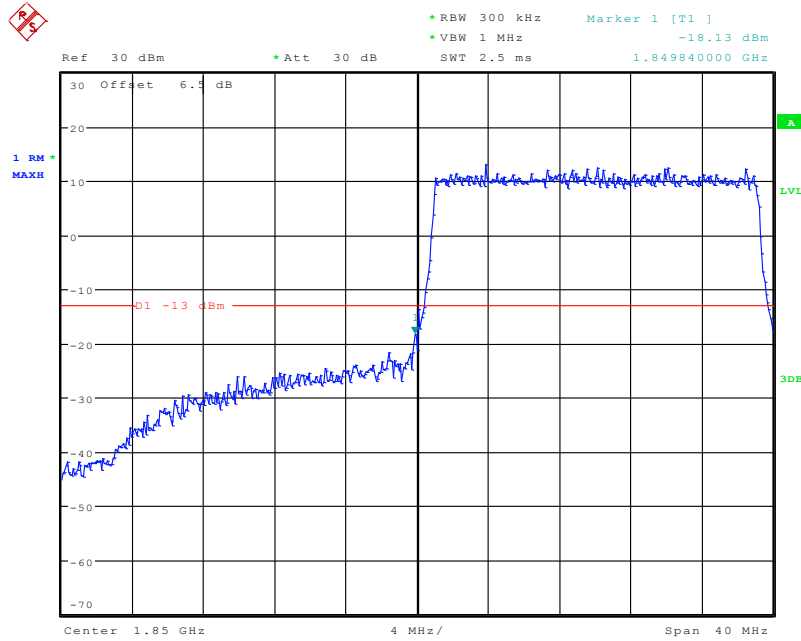
Date: 1.JUN.2020 19:44:39

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



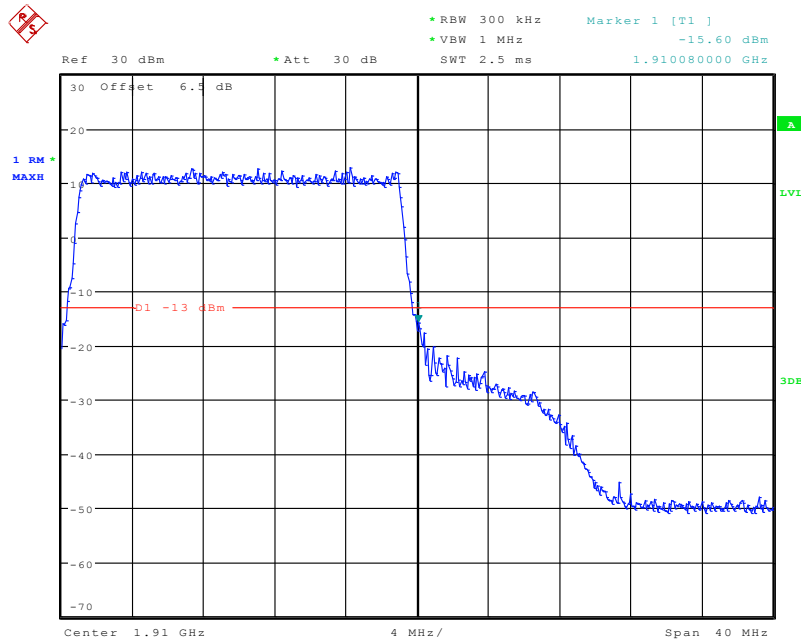
Date: 1.JUN.2020 19:45:23

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



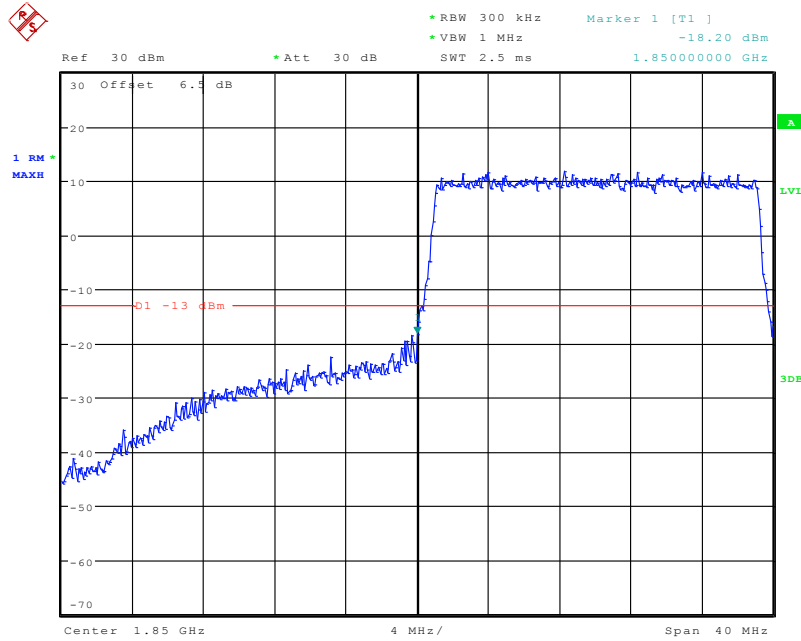
Date: 1.JUN.2020 19:45:46

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



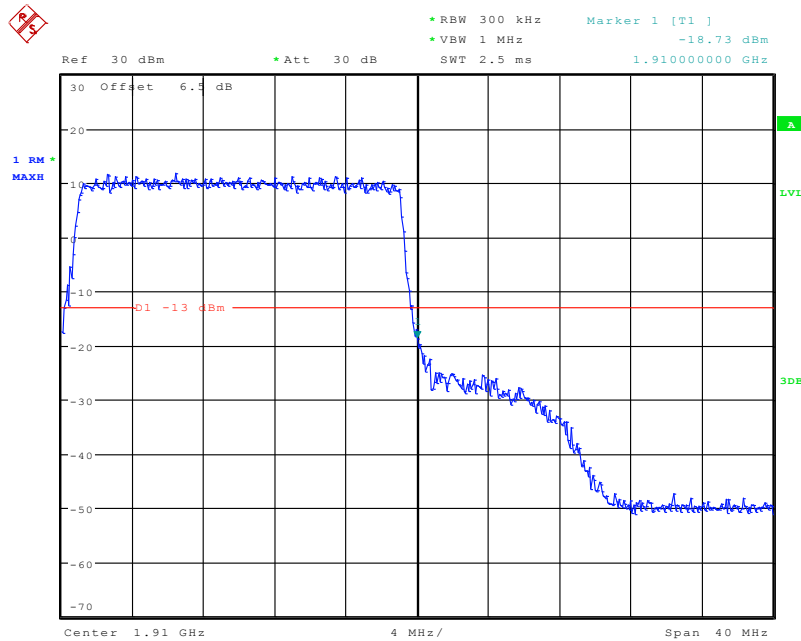
Date: 1.JUN.2020 19:46:32

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



Date: 1.JUN.2020 19:46:09

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

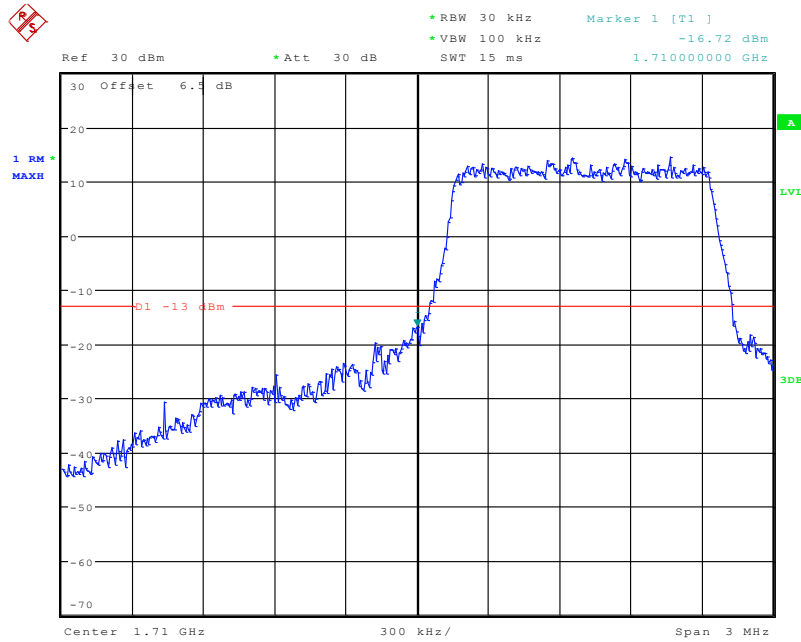


Date: 1.JUN.2020 19:46:55



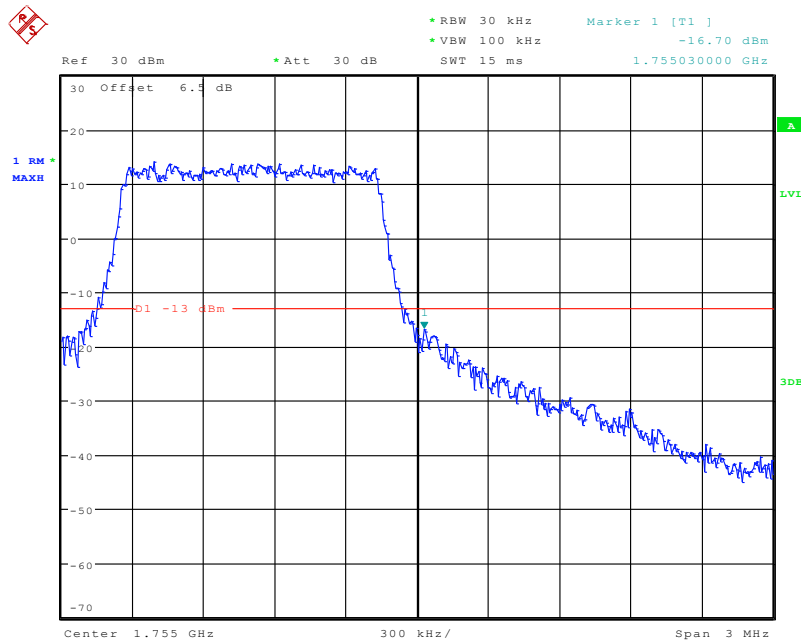
**Band 4:**

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



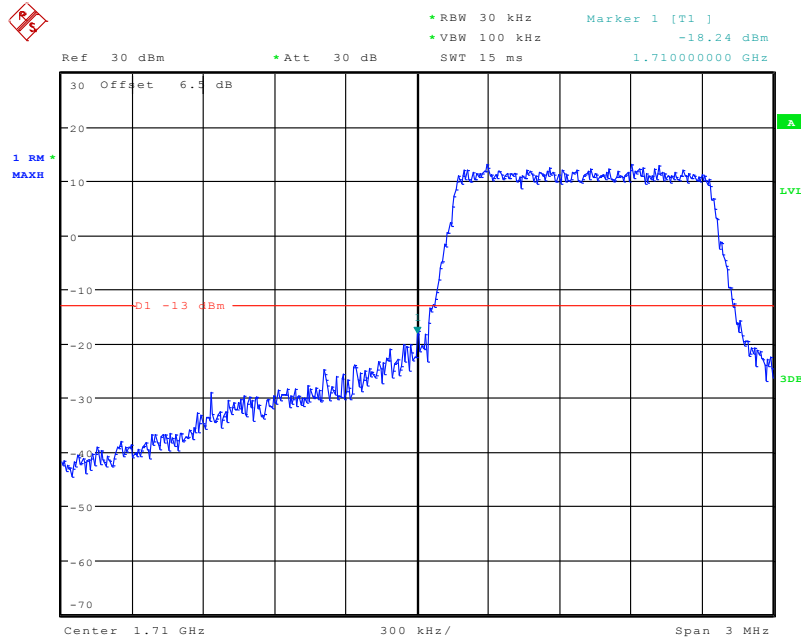
Date: 1.JUN.2020 19:47:19

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



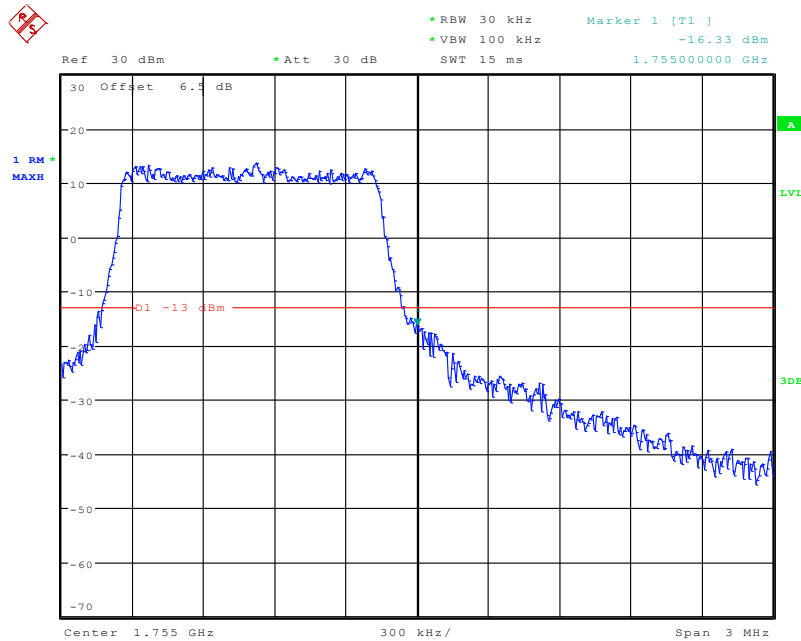
Date: 1.JUN.2020 19:48:00

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



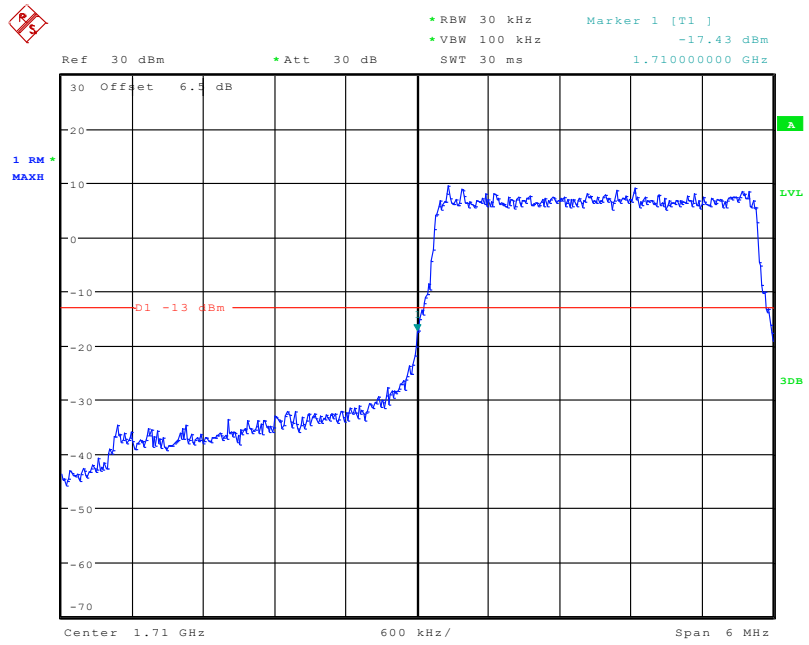
Date: 1.JUN.2020 19:47:39

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



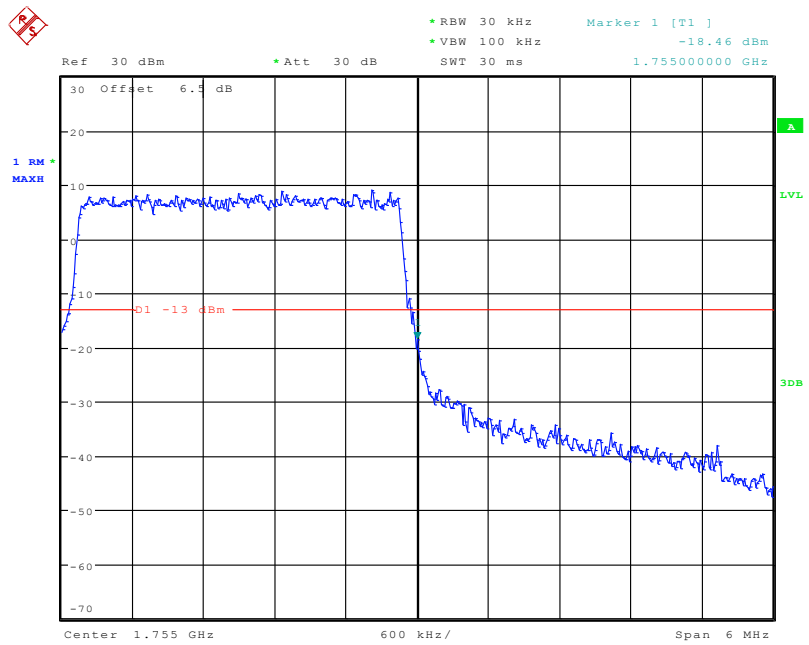
Date: 1.JUN.2020 19:48:19

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



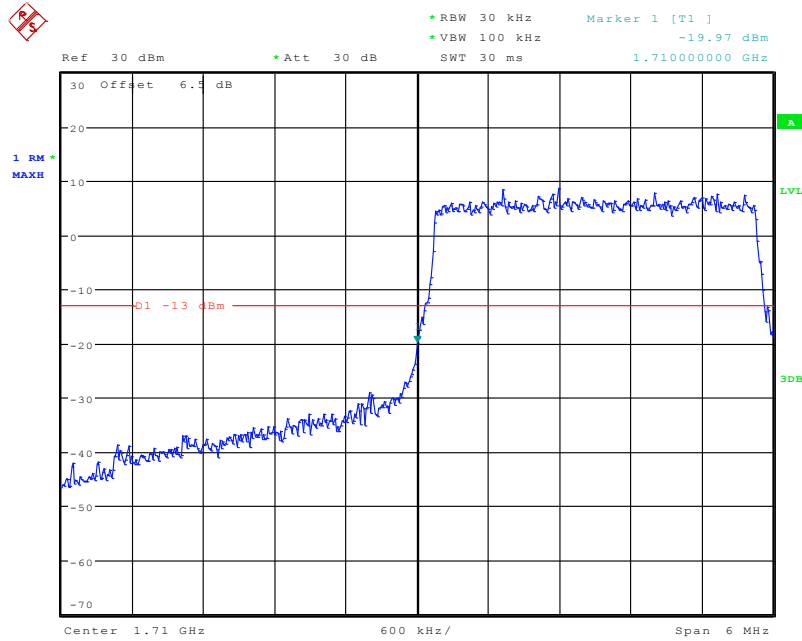
Date: 1.JUN.2020 19:48:42

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



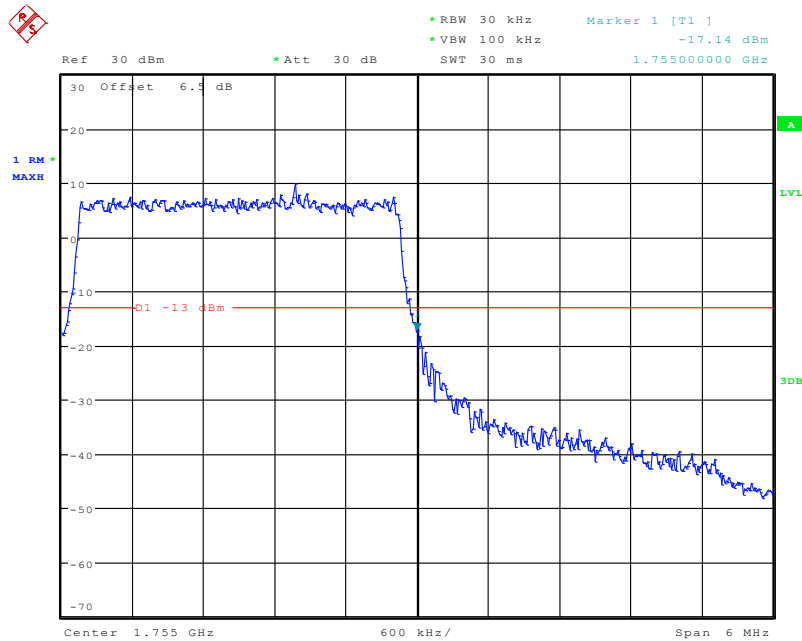
Date: 1.JUN.2020 19:49:16

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



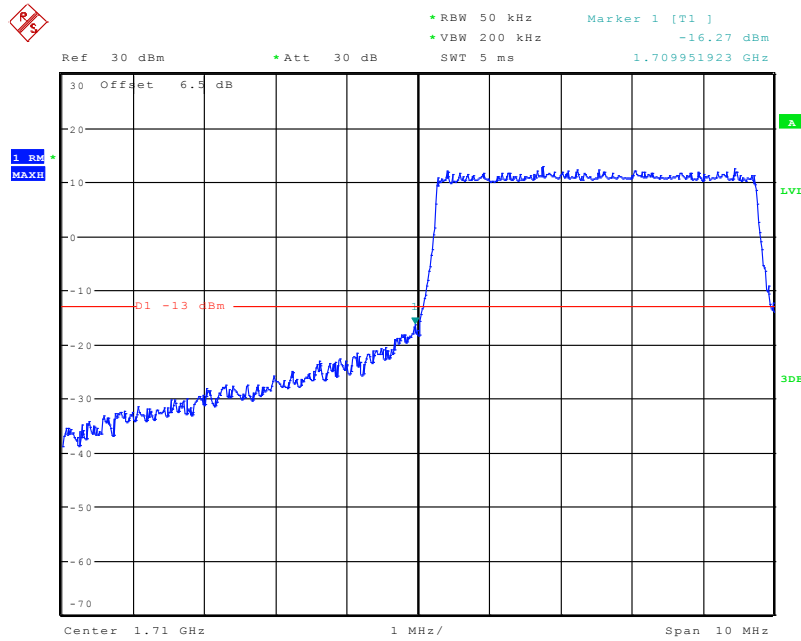
Date: 1.JUN.2020 19:48:58

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



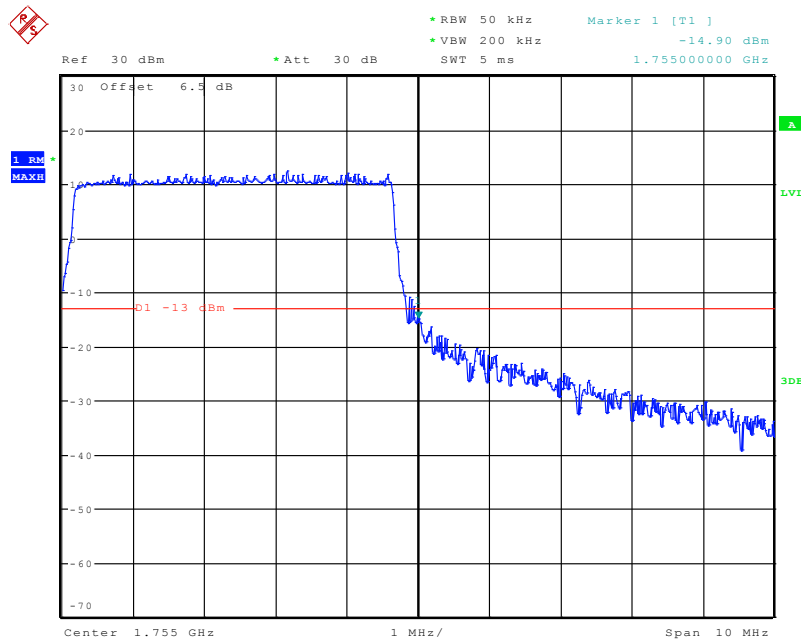
Date: 1.JUN.2020 19:49:32

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



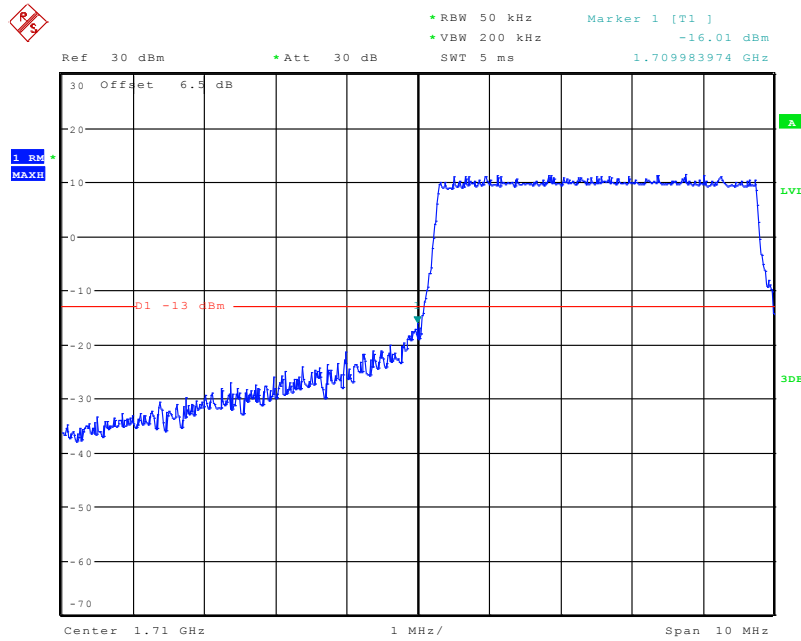
Date: 1.JUN.2020 21:13:54

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



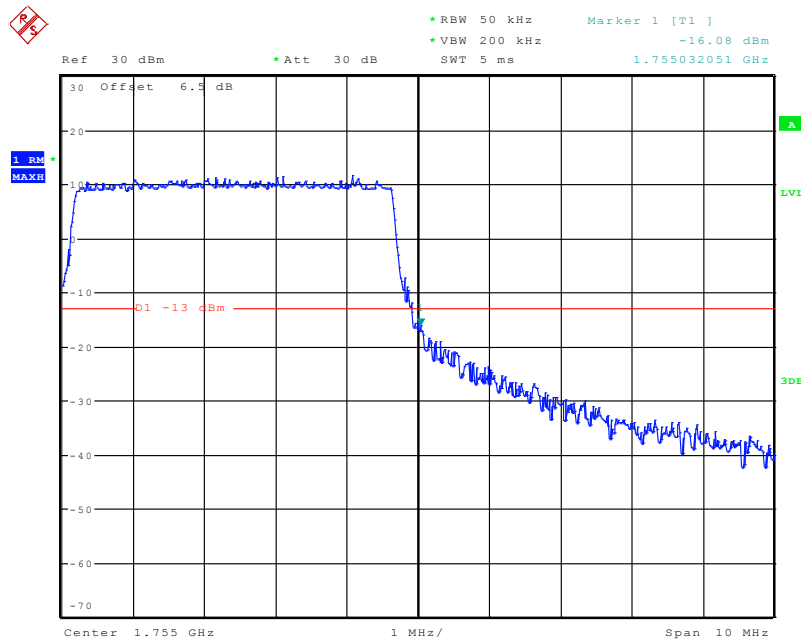
Date: 1.JUN.2020 21:16:41

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



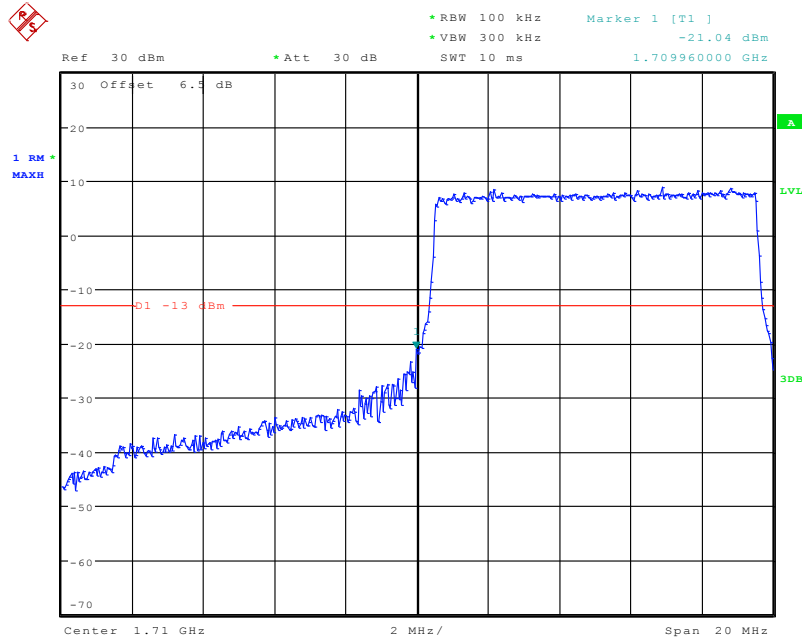
Date: 1.JUN.2020 21:15:16

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



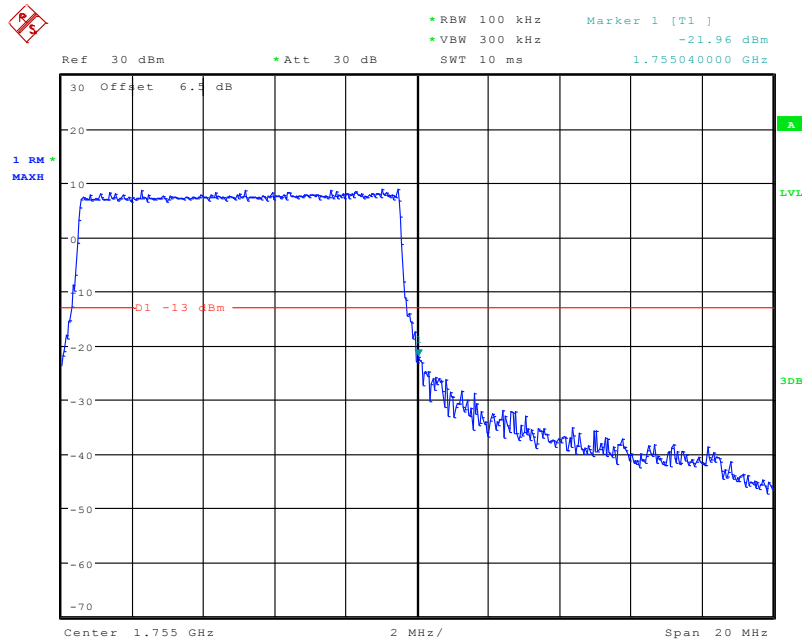
Date: 1.JUN.2020 21:17:52

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



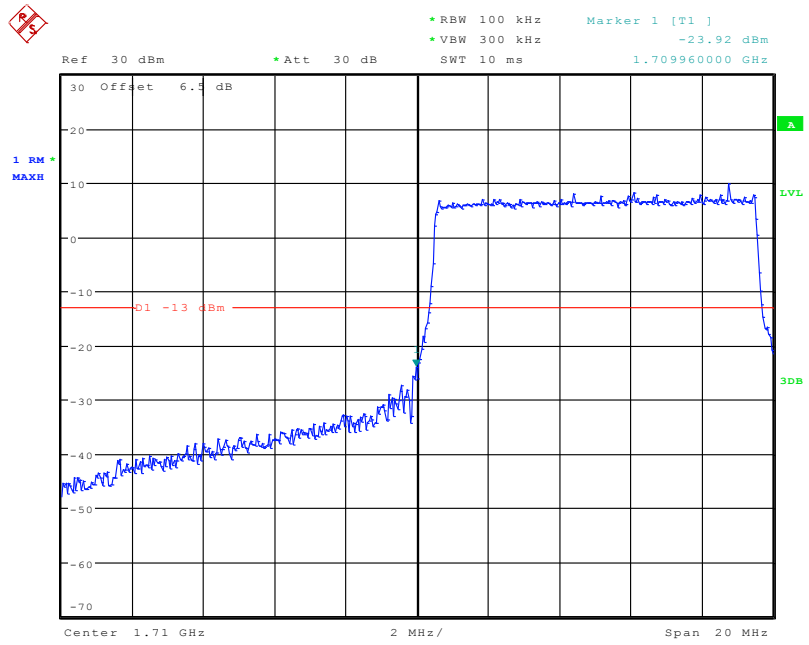
Date: 1.JUN.2020 19:51:28

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



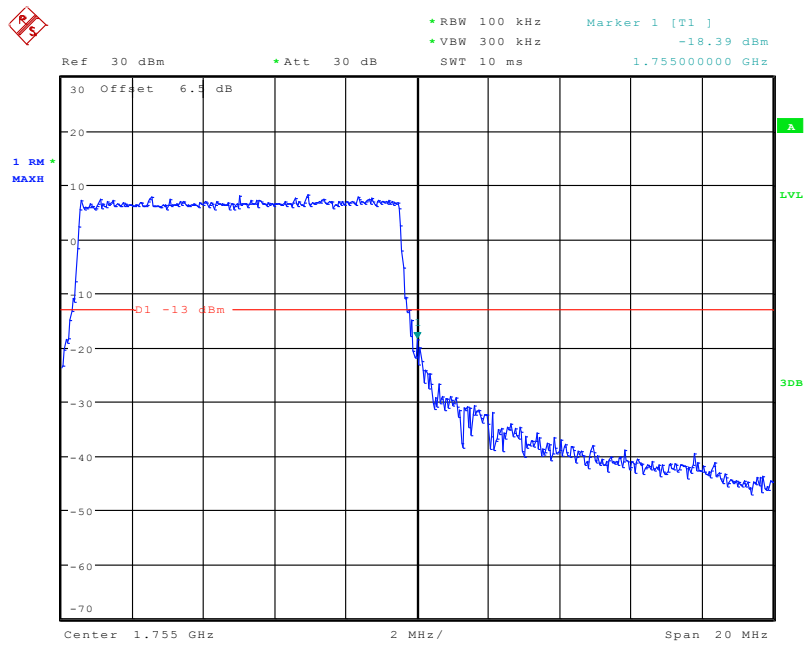
Date: 1.JUN.2020 19:52:10

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



Date: 1.JUN.2020 19:51:49

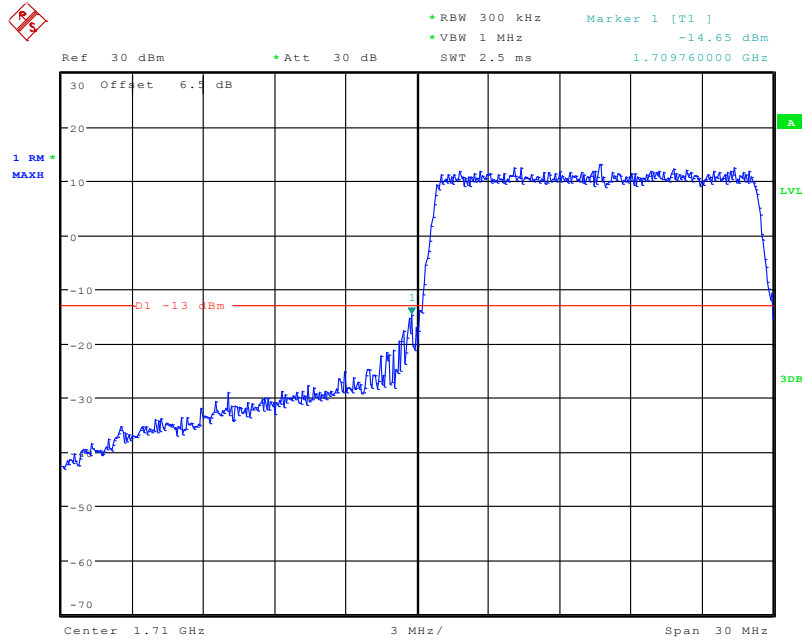
### 16-QAM (10.0 MHz, FULL RB) - Right Band Edge



Date: 1.JUN.2020 19:52:31

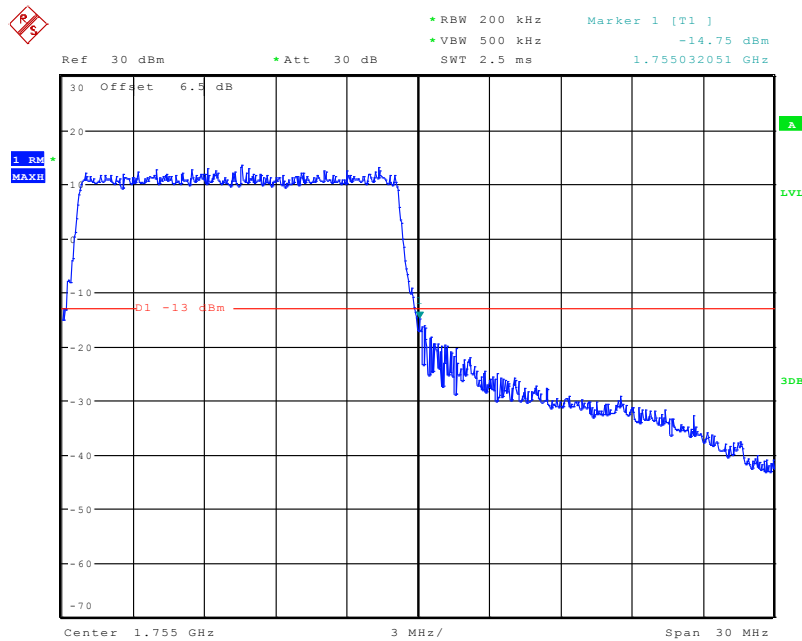


### QPSK (15.0 MHz, FULL RB) - Left Band Edge



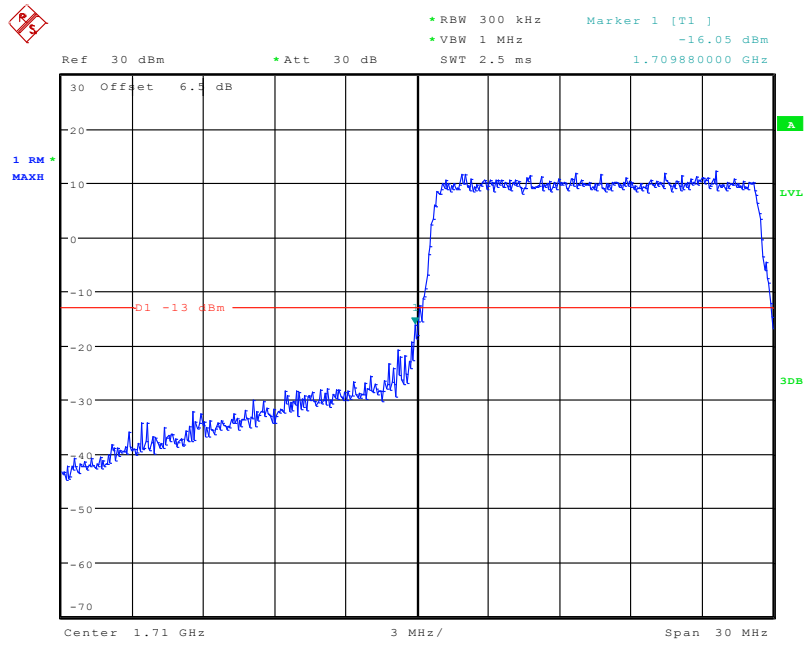
Date: 1.JUN.2020 19:52:54

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



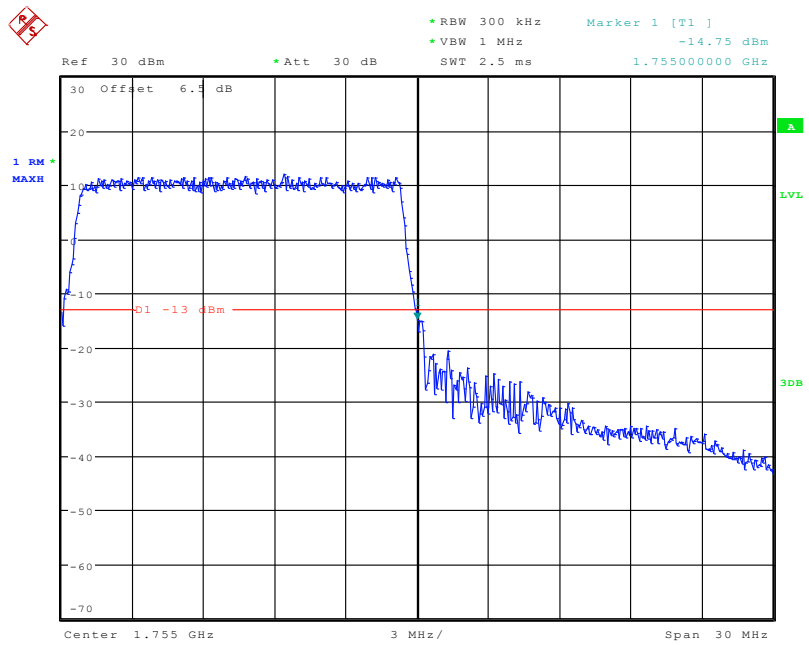
Date: 1.JUN.2020 21:20:40

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



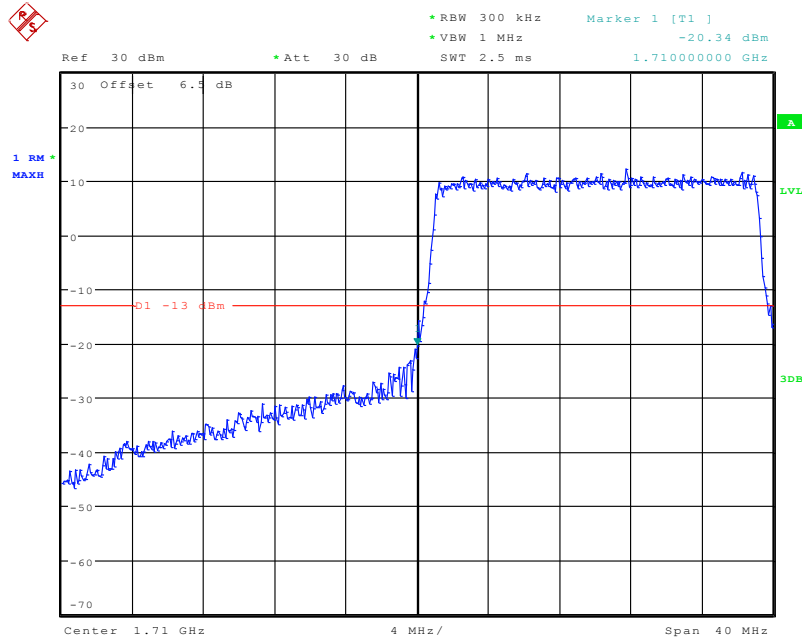
Date: 1.JUN.2020 19:53:13

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



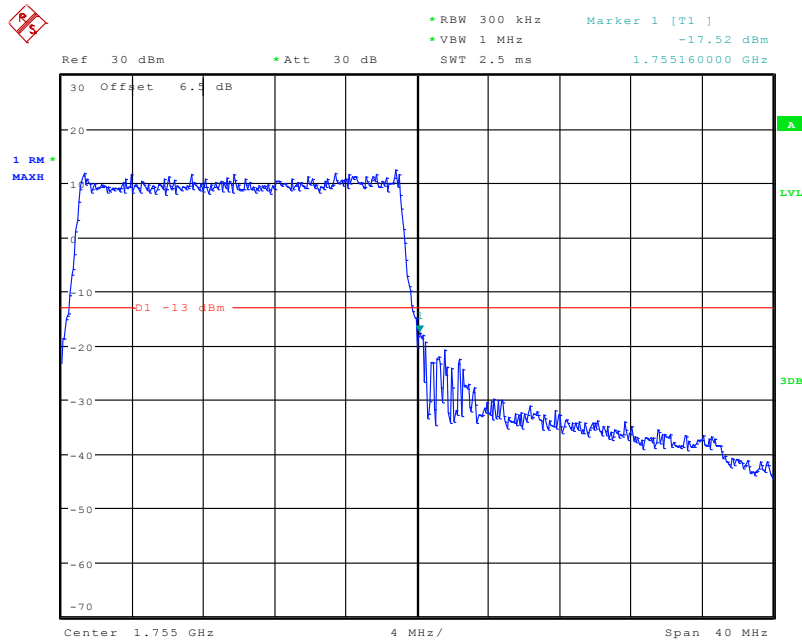
Date: 1.JUN.2020 19:54:00

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



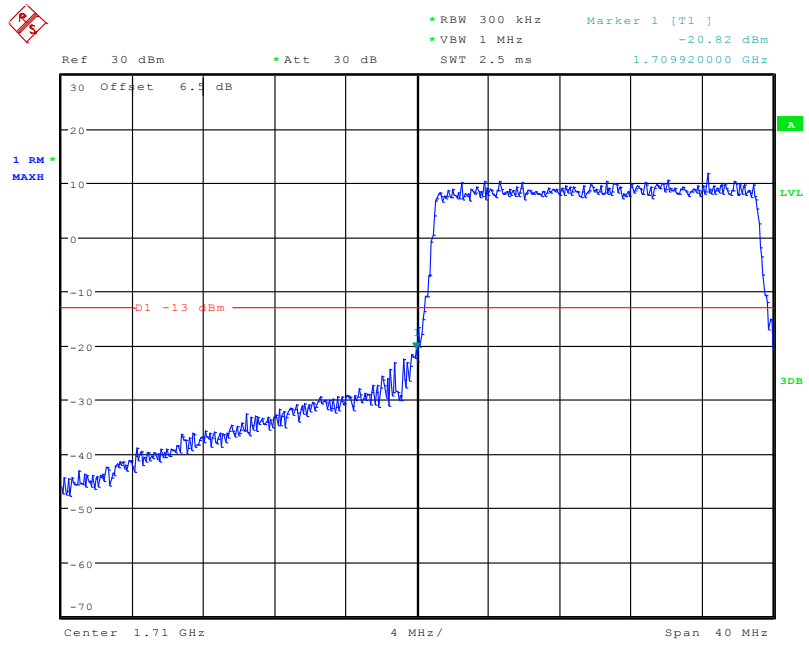
Date: 1.JUN.2020 19:54:26

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



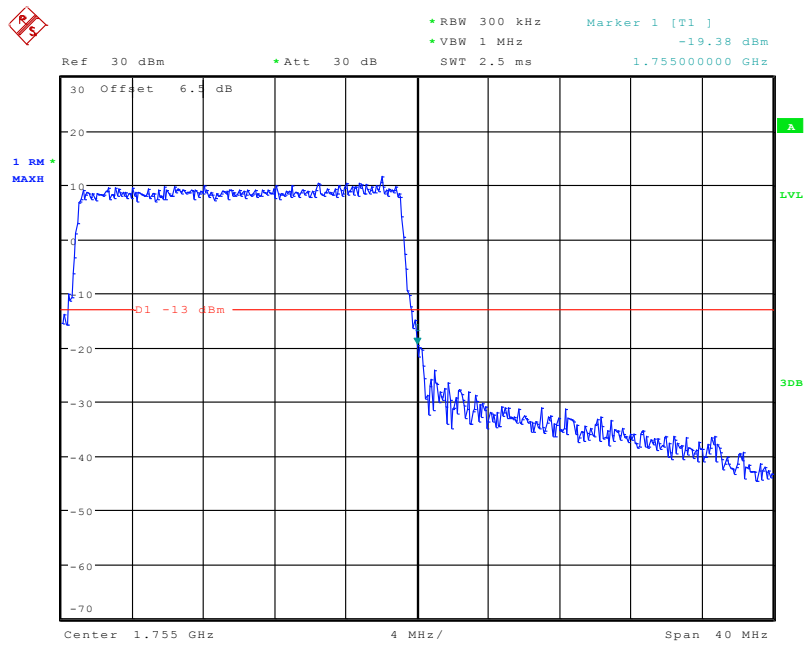
Date: 1.JUN.2020 19:55:07

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



Date: 1.JUN.2020 19:54:46

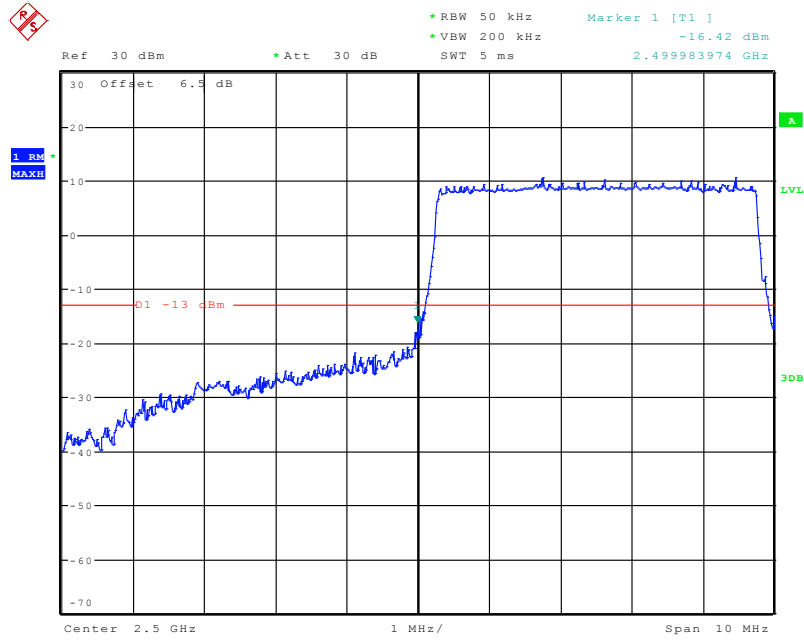
### 16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 1.JUN.2020 19:55:30

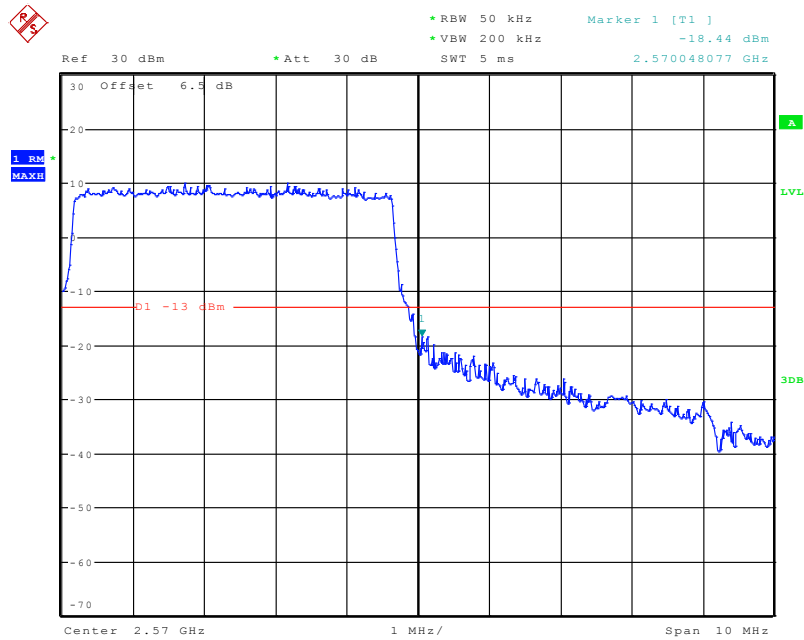
**Band 7:**

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



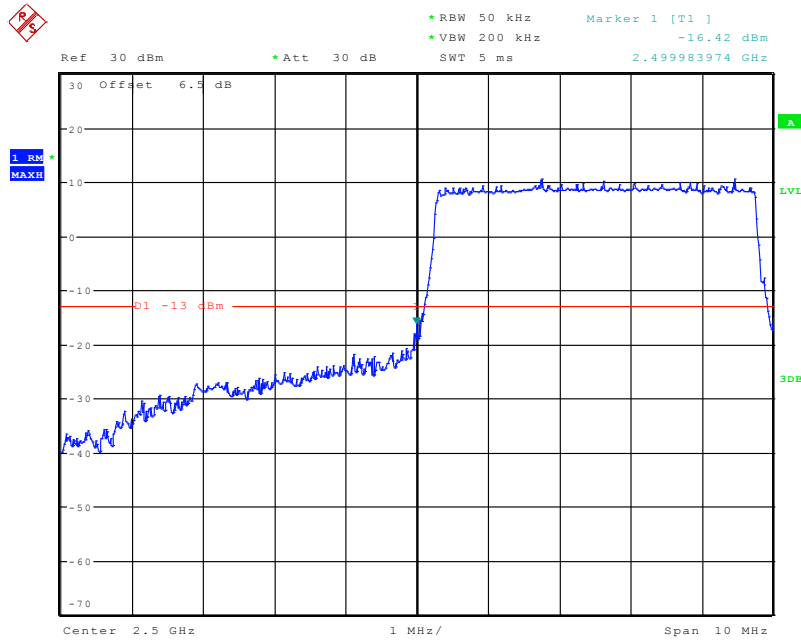
Date: 1.JUN.2020 21:23:46

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



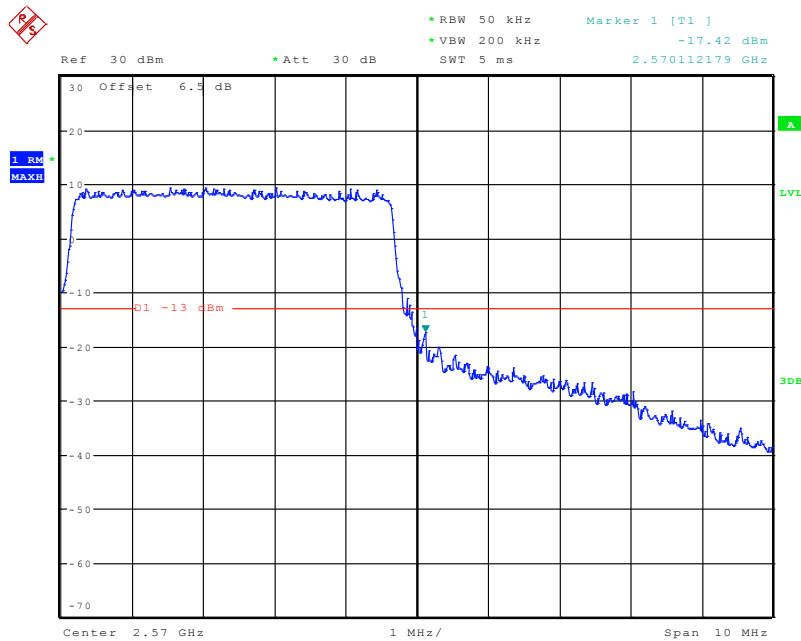
Date: 1.JUN.2020 21:27:19

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



Date: 1.JUN.2020 21:23:46

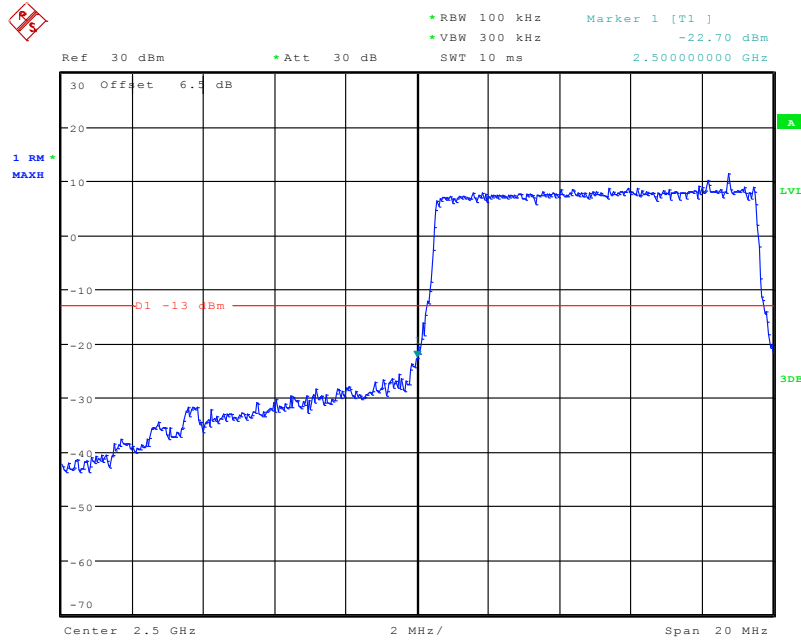
### 16-QAM (5.0 MHz, FULL RB) - Right Band Edge



Date: 1.JUN.2020 21:29:11

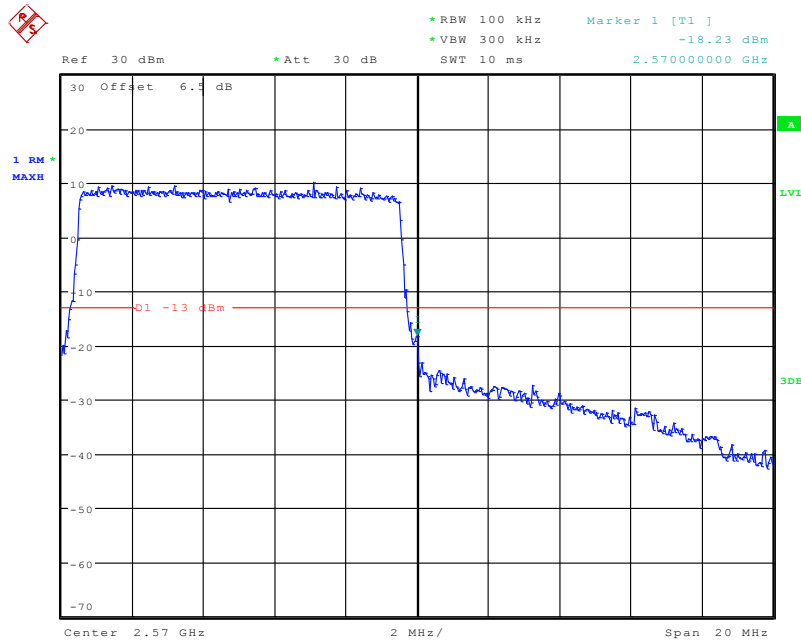


### 16-QAM (10.0 MHz, FULL RB) - Left Band Edge



Date: 1.JUN.2020 19:57:28

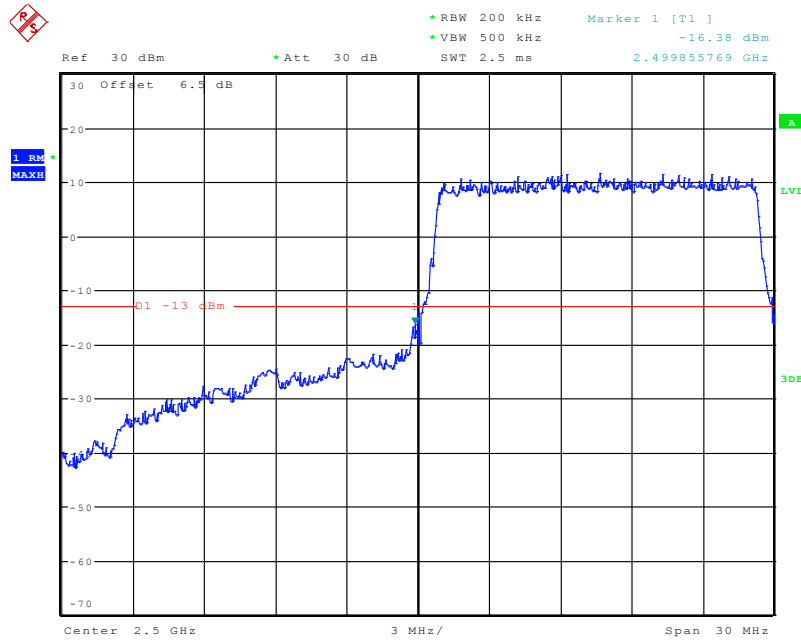
### 16-QAM (10.0 MHz, FULL RB) - Right Band Edge



Date: 1.JUN.2020 19:58:07

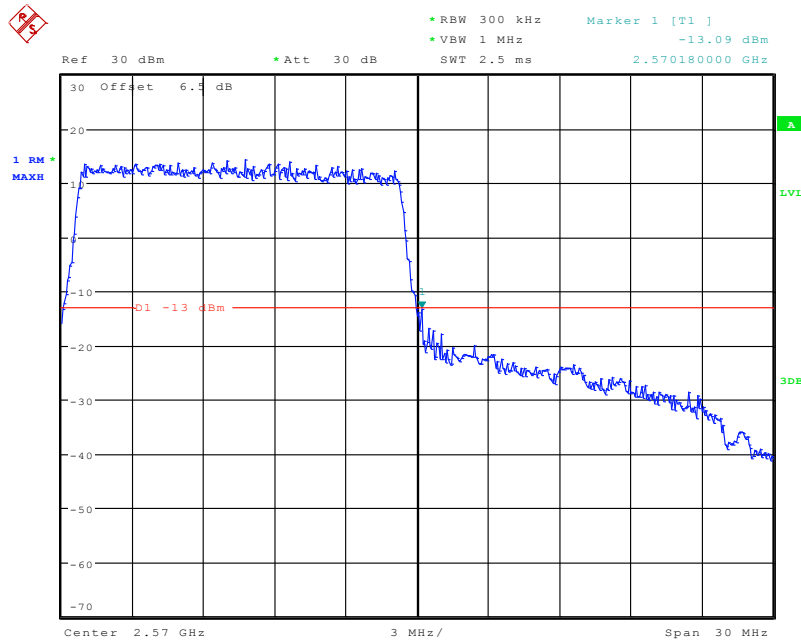


### QPSK (15.0 MHz, FULL RB) - Left Band Edge



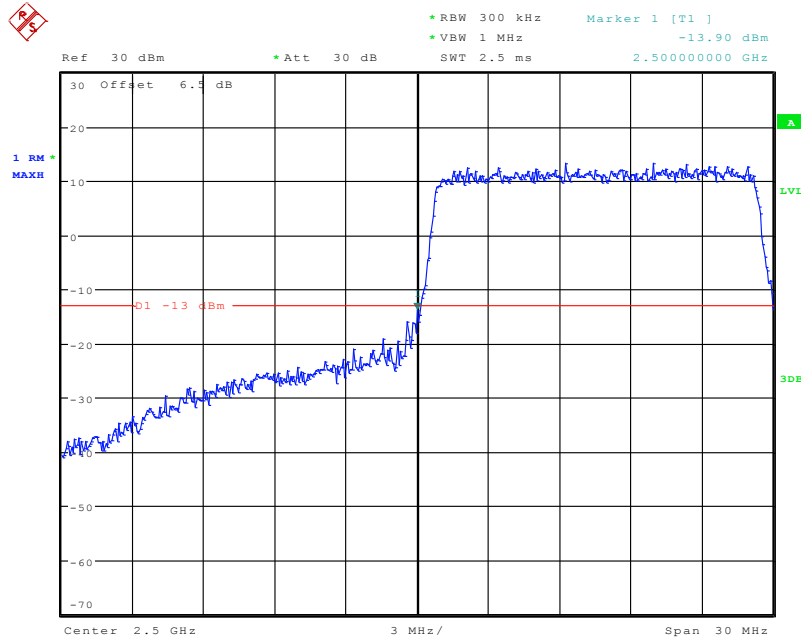
Date: 1.JUN.2020 22:00:13

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



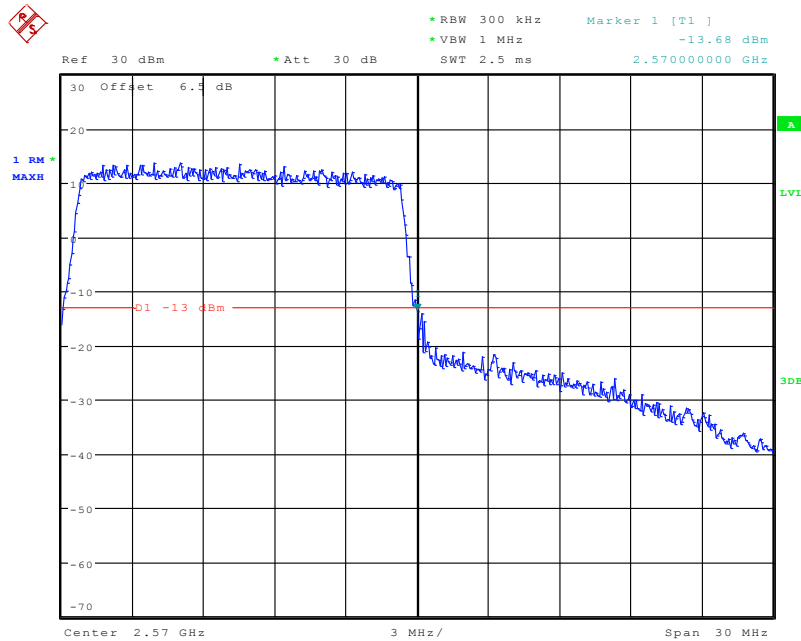
Date: 1.JUN.2020 19:59:14

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



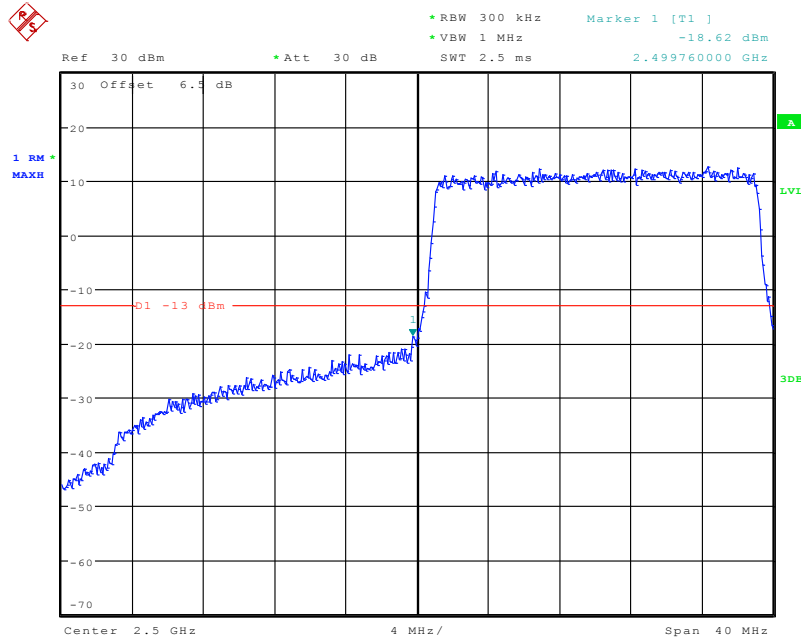
Date: 1.JUN.2020 19:58:53

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



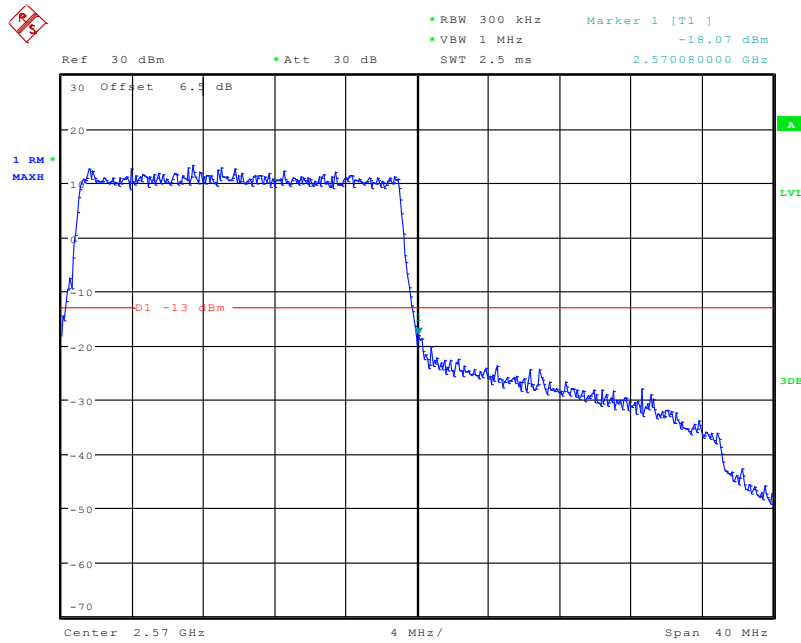
Date: 1.JUN.2020 19:59:37

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



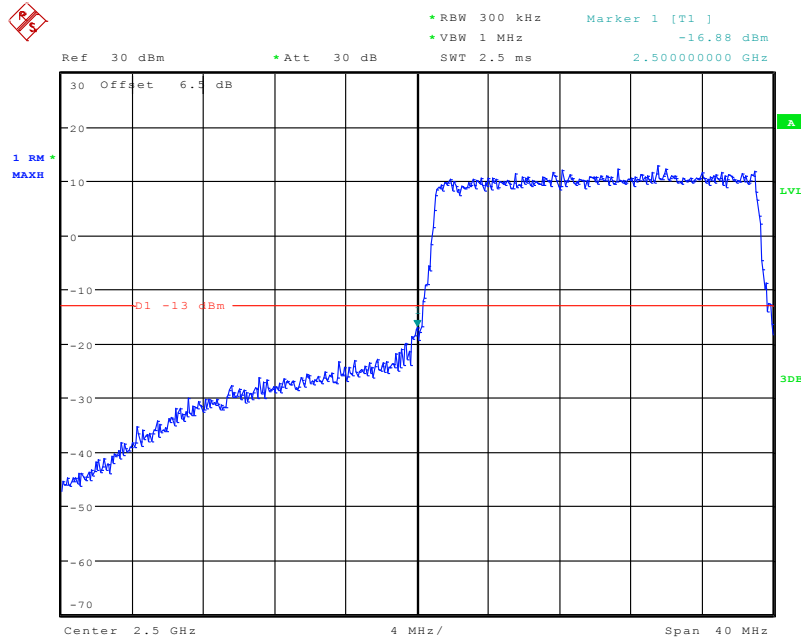
Date: 1.JUN.2020 20:00:00

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



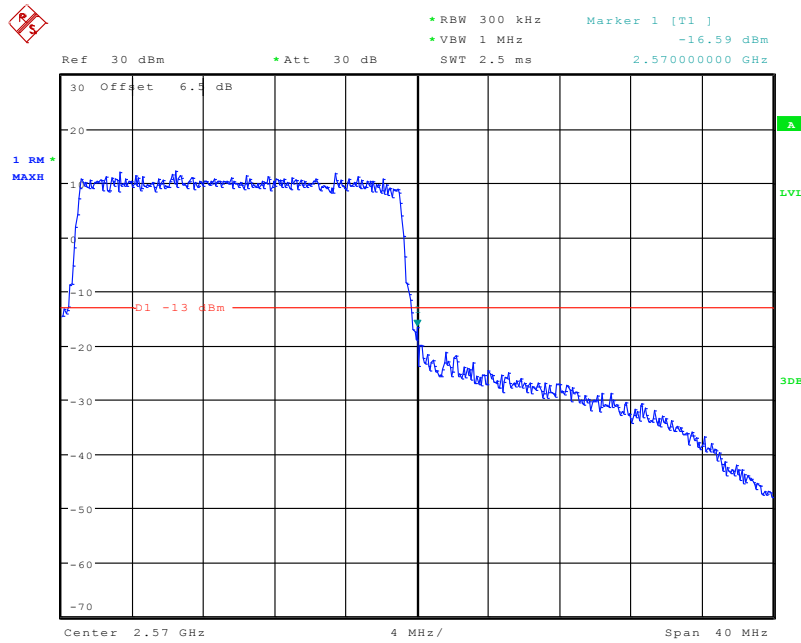
Date: 1.JUN.2020 20:00:44

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



Date: 1.JUN.2020 20:00:23

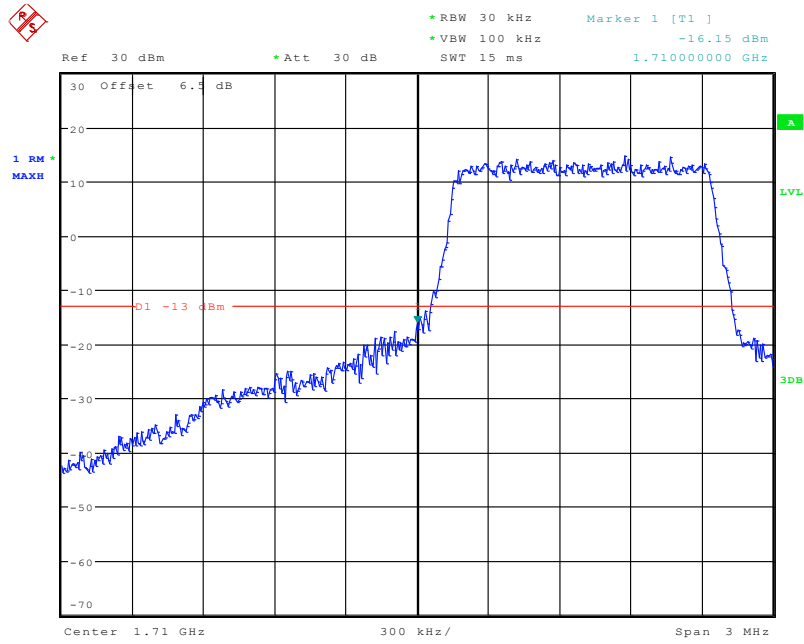
### 16-QAM (20.0 MHz, FULL RB) - Right Band Edge



Date: 1.JUN.2020 20:01:03

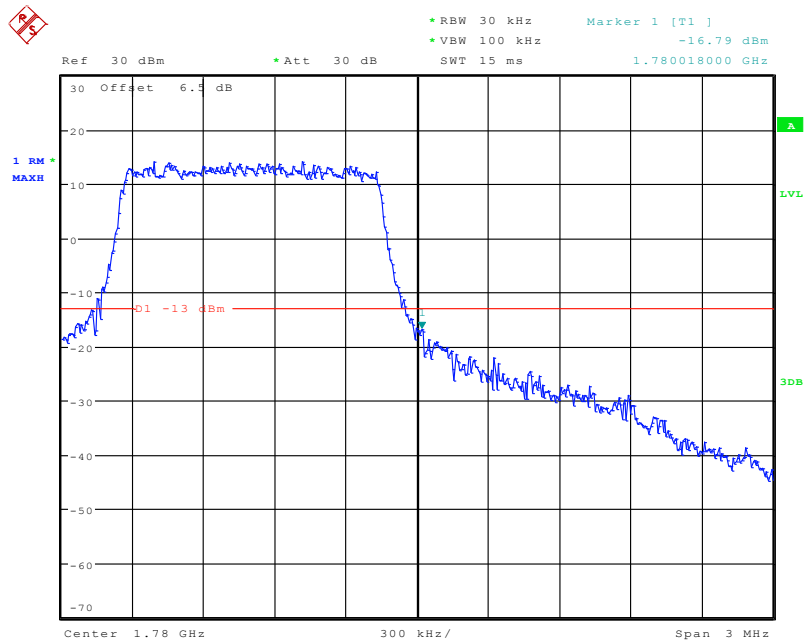
**Band 66:**

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



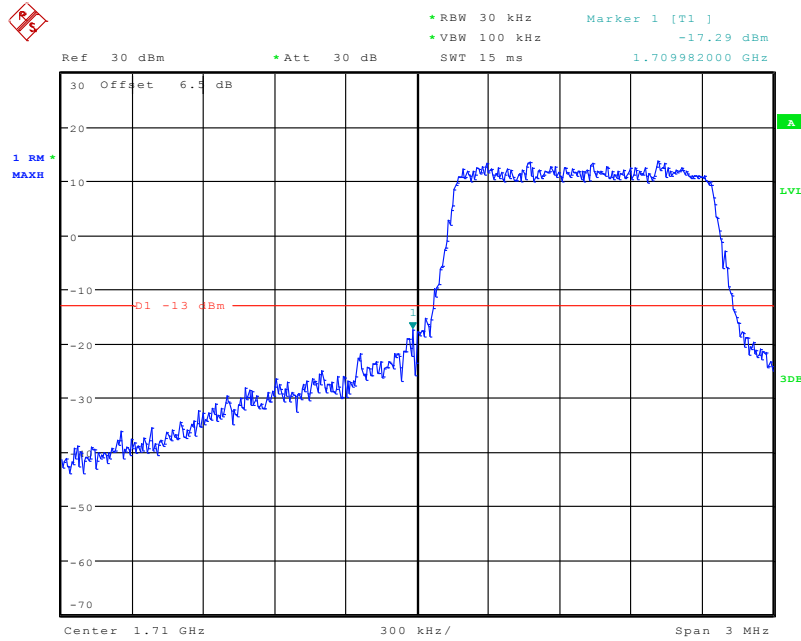
Date: 1.JUN.2020 20:09:25

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



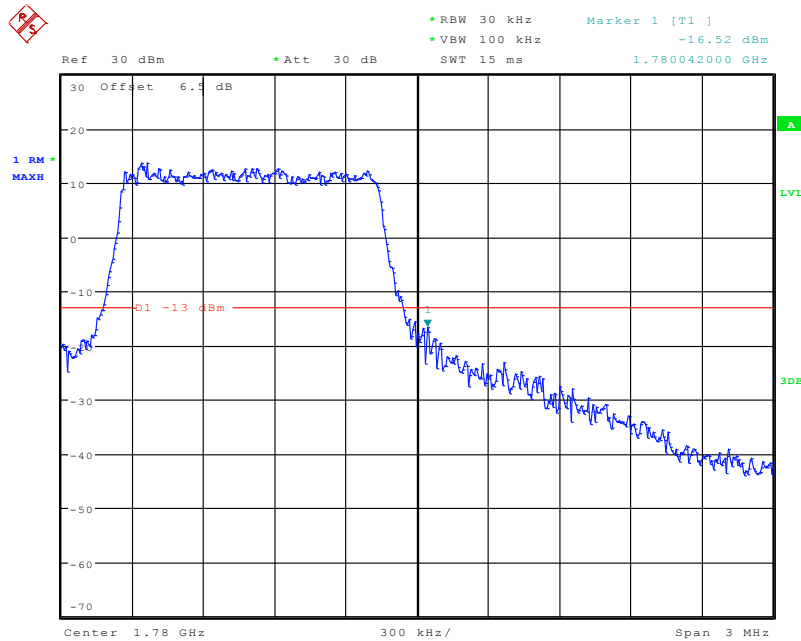
Date: 1.JUN.2020 20:10:08

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



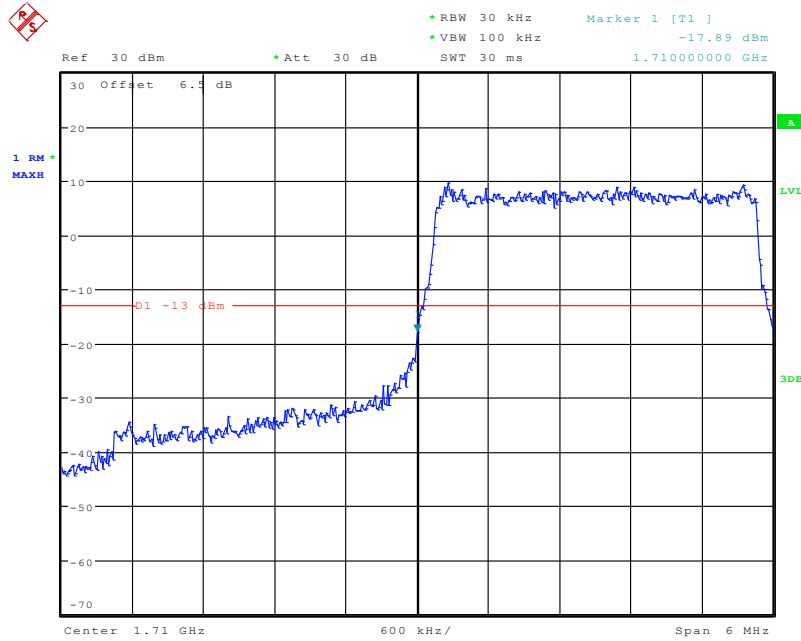
Date: 1.JUN.2020 20:09:44

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



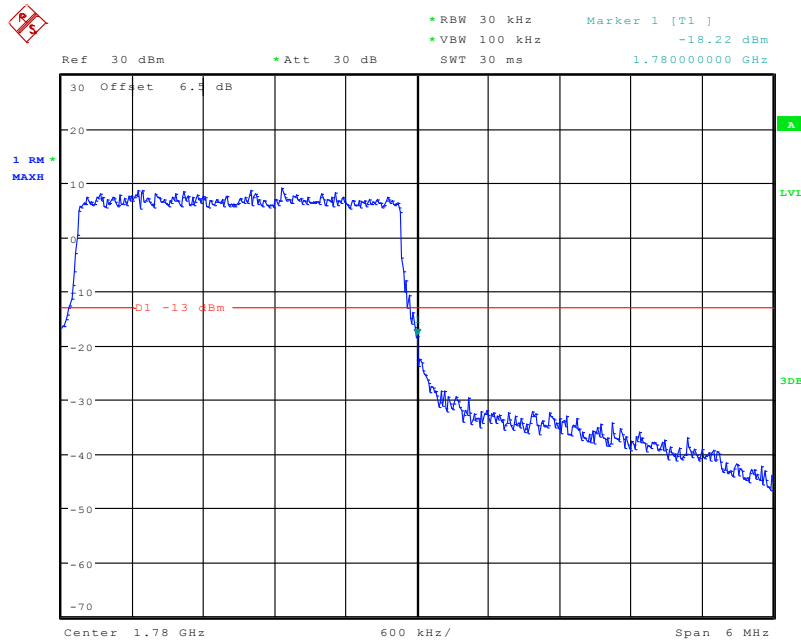
Date: 1.JUN.2020 20:10:27

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



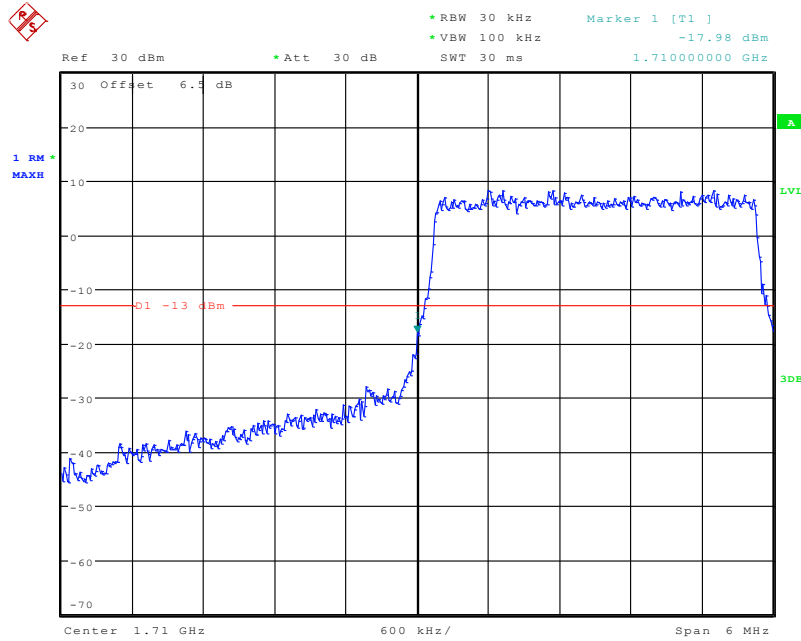
Date: 1.JUN.2020 20:10:50

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



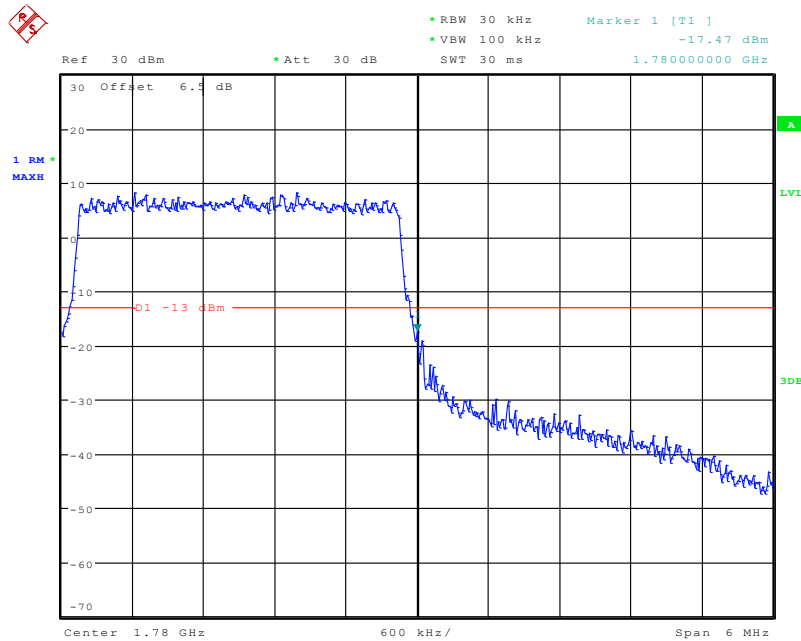
Date: 1.JUN.2020 20:11:27

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



Date: 1.JUN.2020 20:11:10

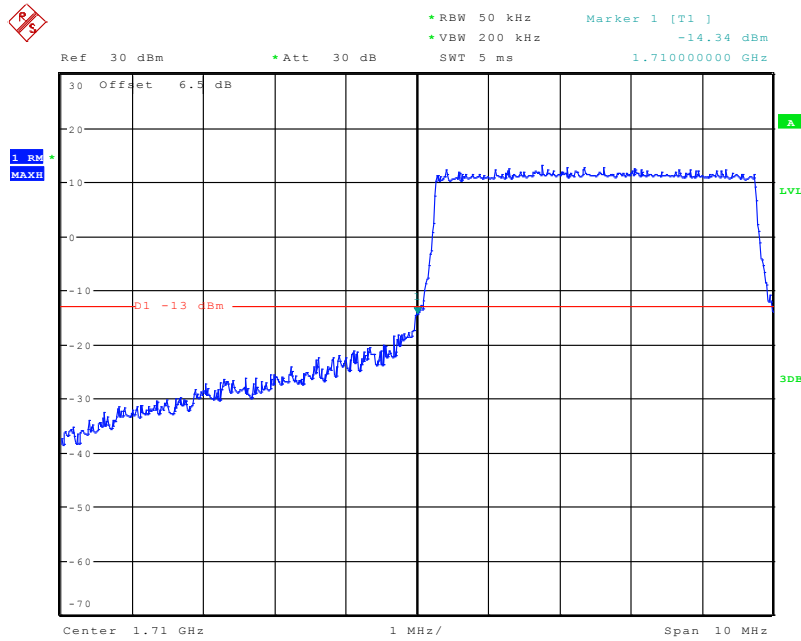
### 16-QAM (3.0 MHz, FULL RB) - Right Band Edge



Date: 1.JUN.2020 20:11:43

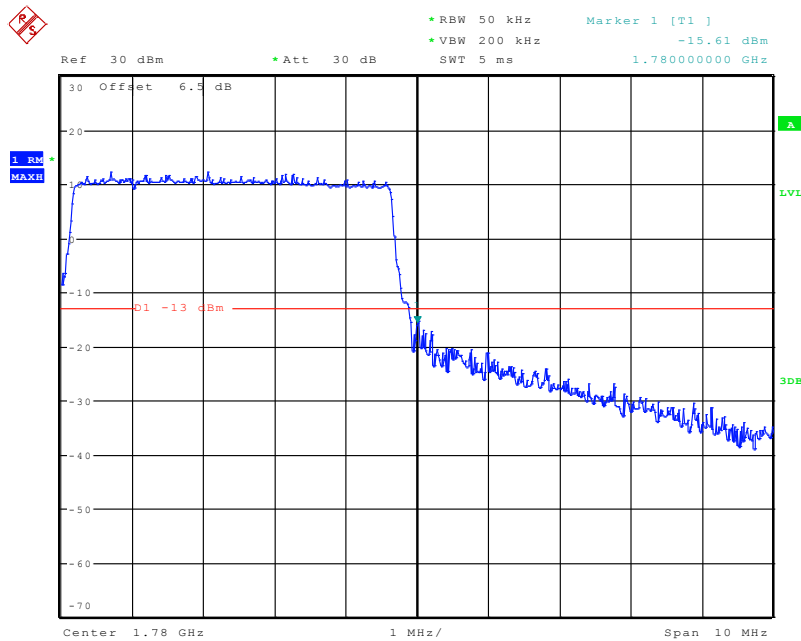


### QPSK (5.0 MHz, FULL RB) - Left Band Edge



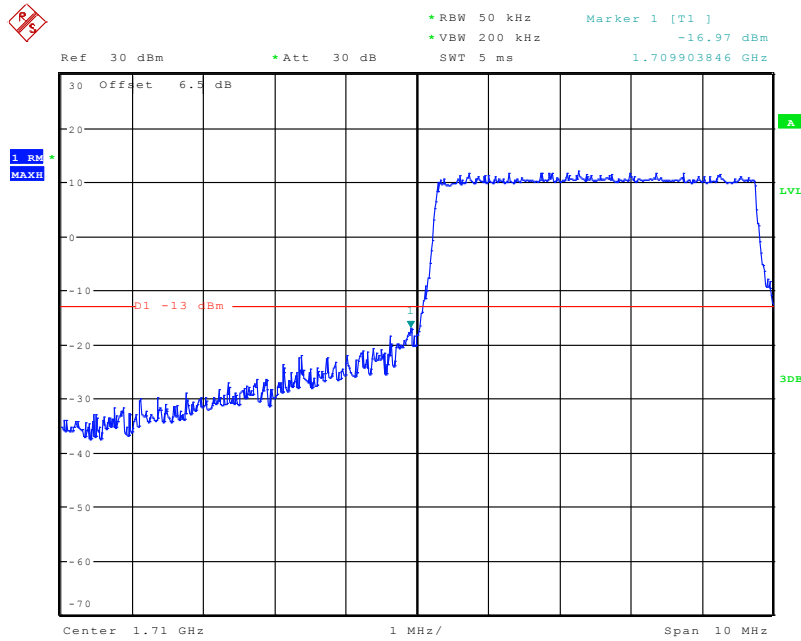
Date: 1.JUN.2020 22:17:22

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



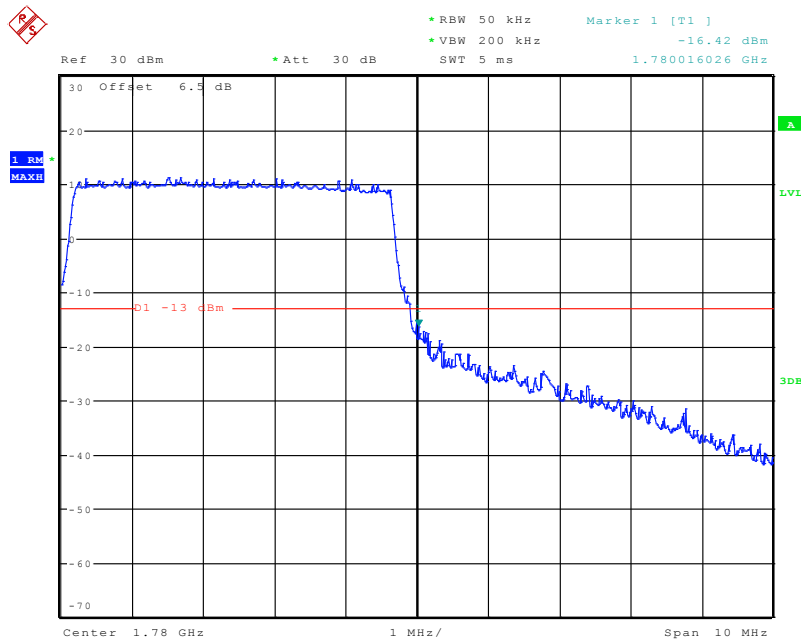
Date: 1.JUN.2020 22:23:51

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



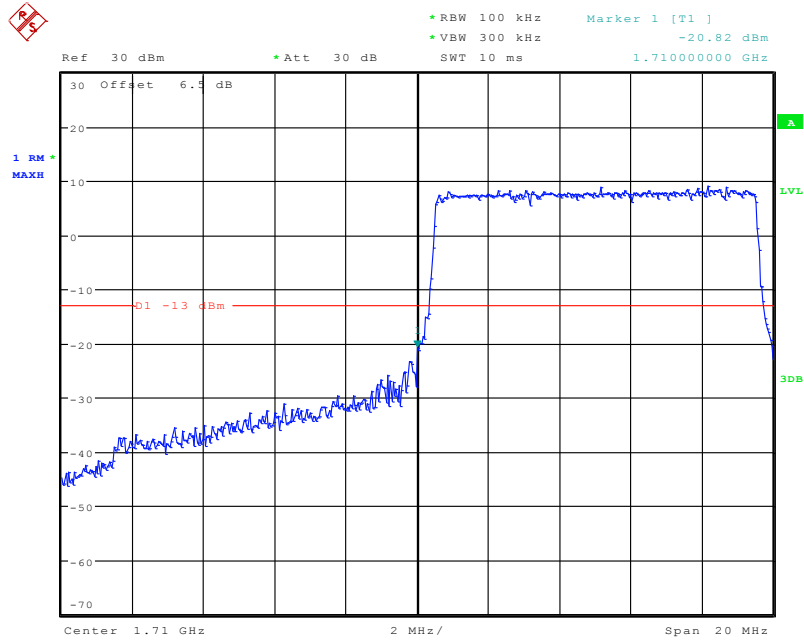
Date: 1.JUN.2020 22:18:20

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



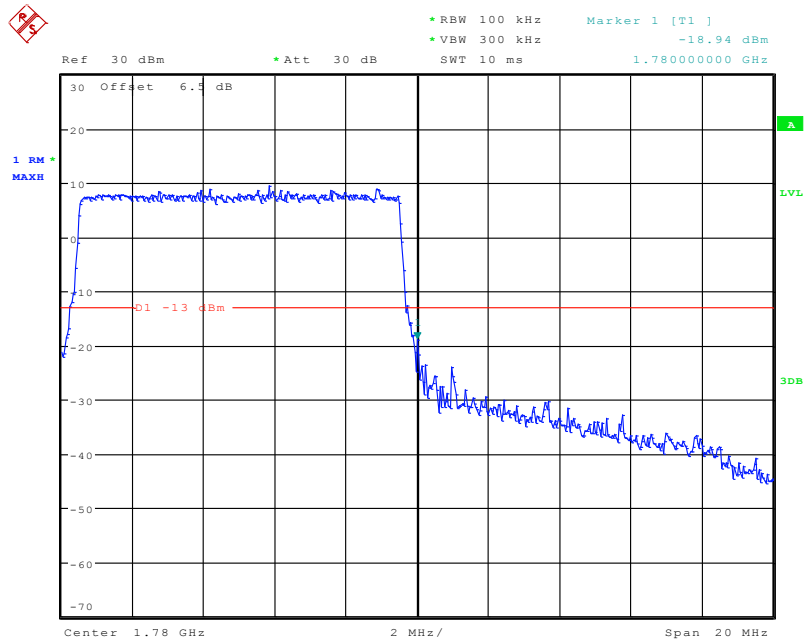
Date: 1.JUN.2020 22:25:23

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



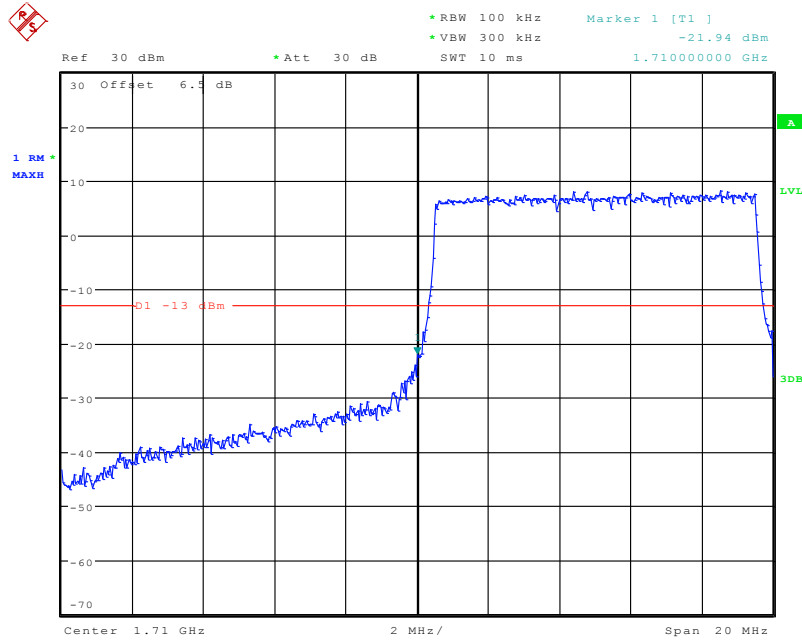
Date: 1.JUN.2020 20:13:33

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



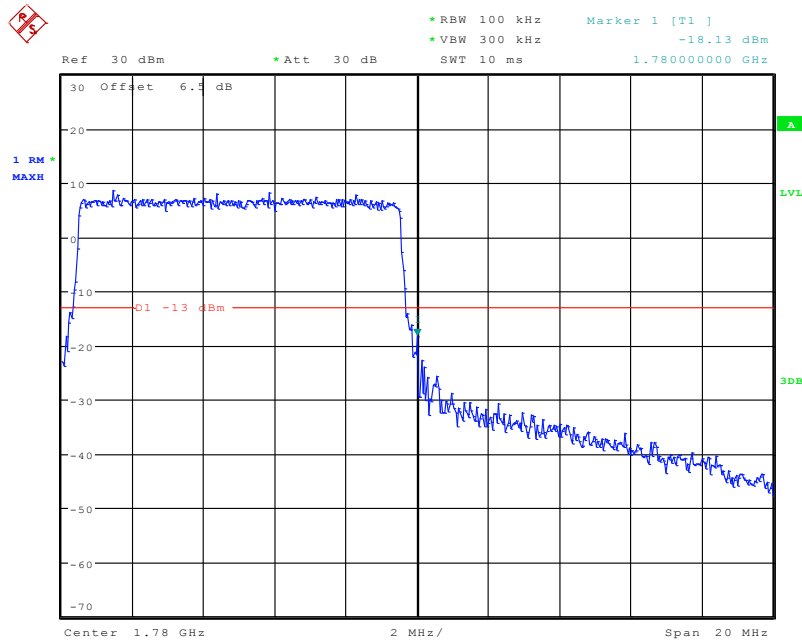
Date: 1.JUN.2020 20:14:12

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



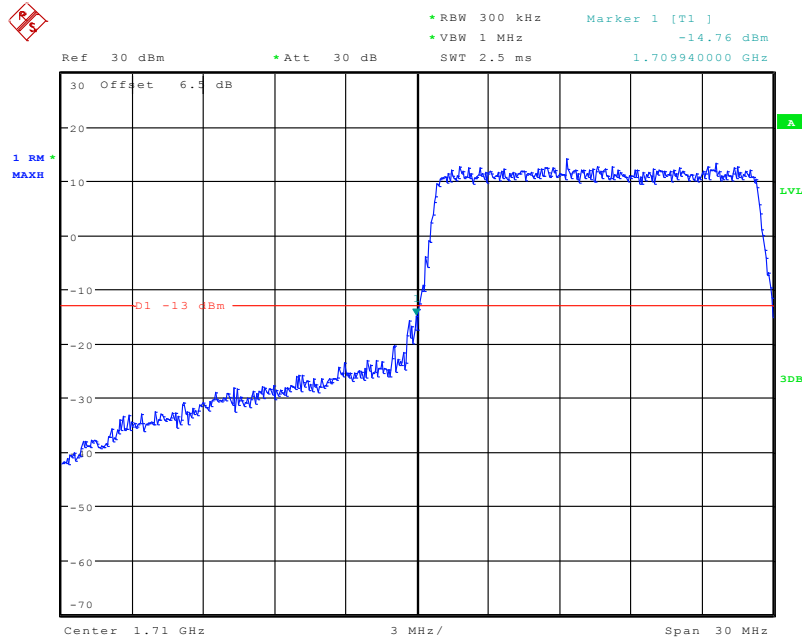
Date: 1.JUN.2020 20:13:50

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



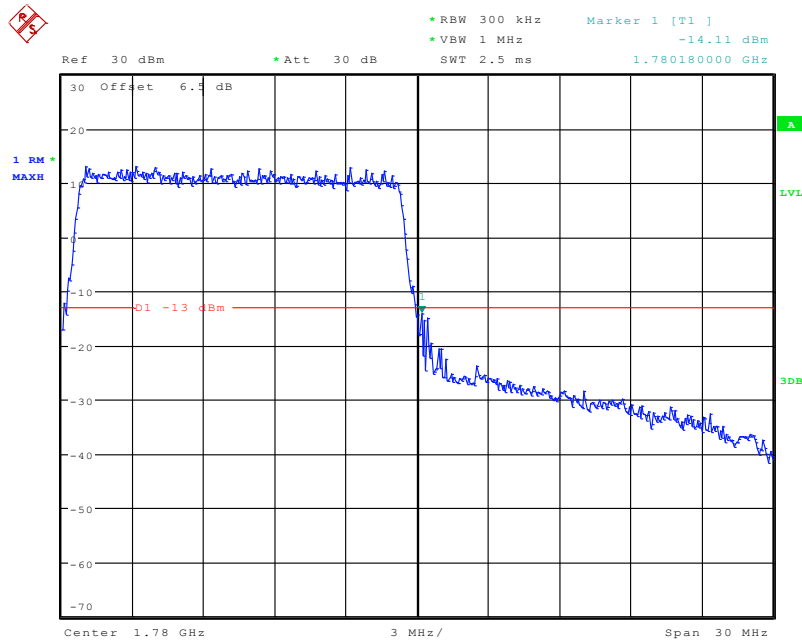
Date: 1.JUN.2020 20:14:29

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



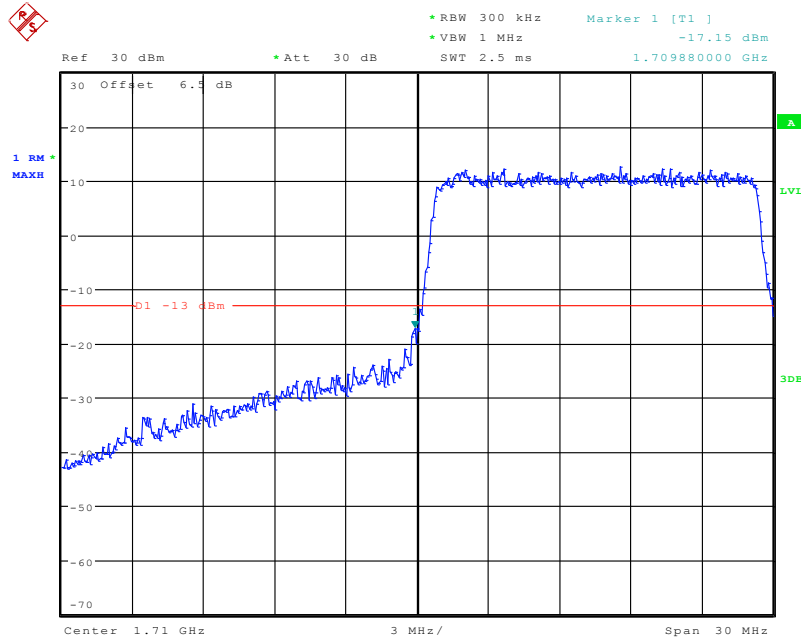
Date: 1.JUN.2020 20:14:55

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



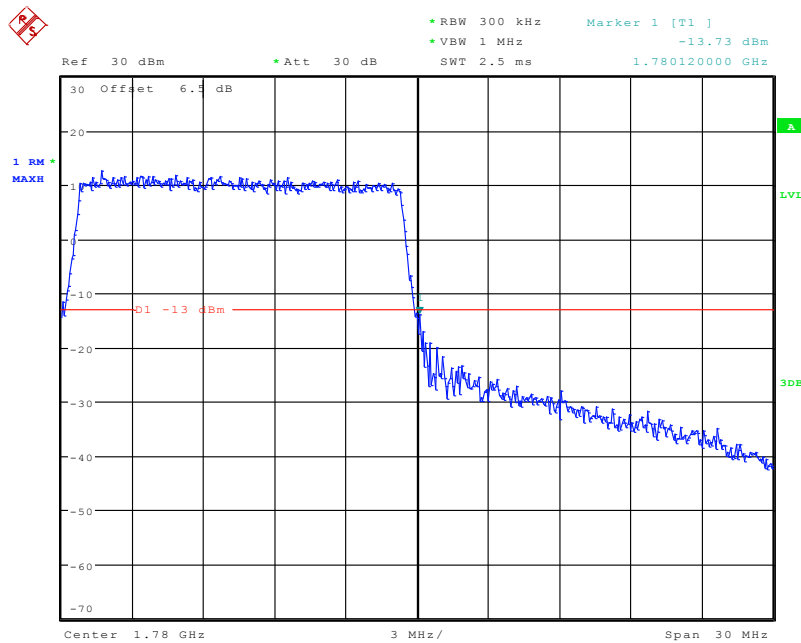
Date: 1.JUN.2020 20:15:39

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



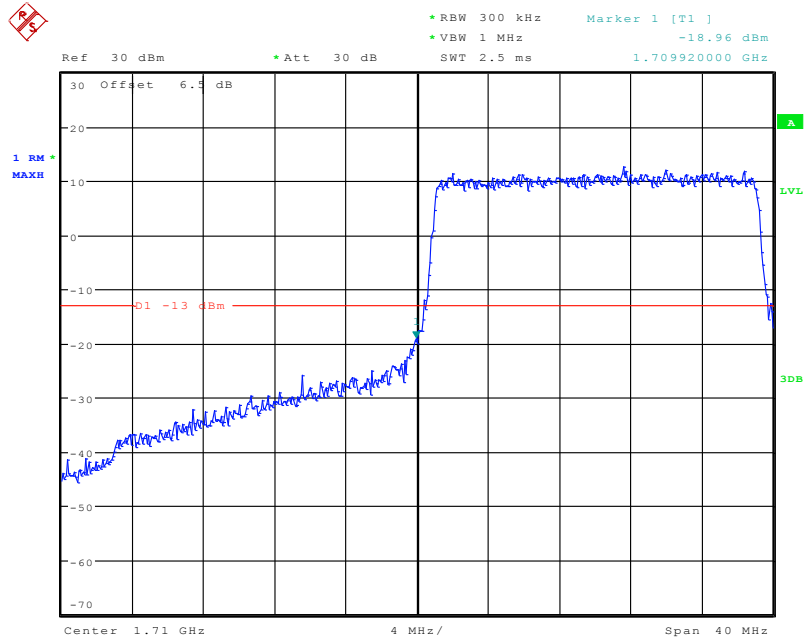
Date: 1.JUN.2020 20:15:18

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



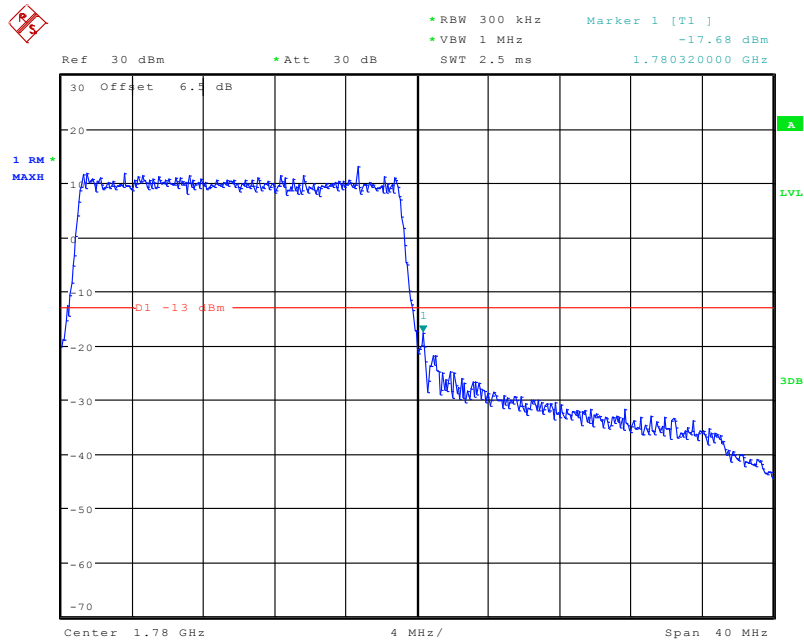
Date: 1.JUN.2020 20:16:02

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



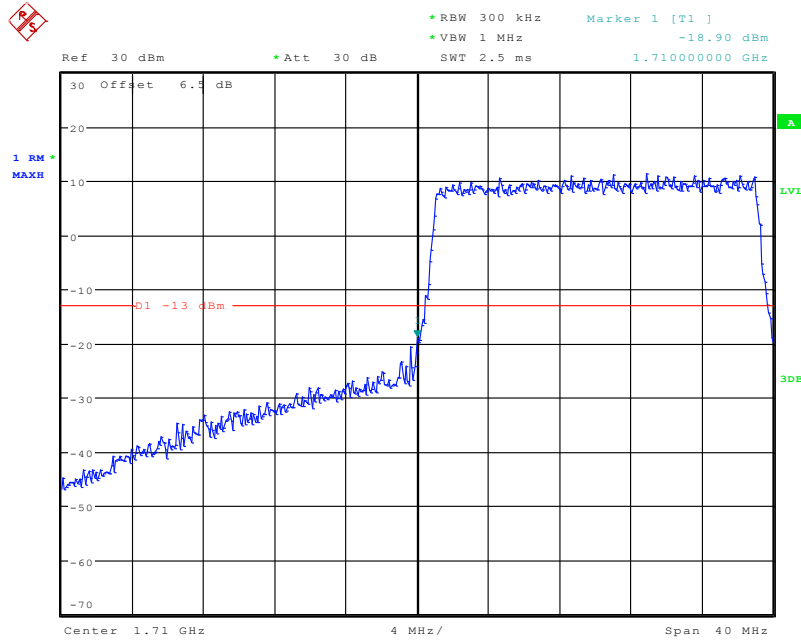
Date: 1.JUN.2020 20:16:32

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



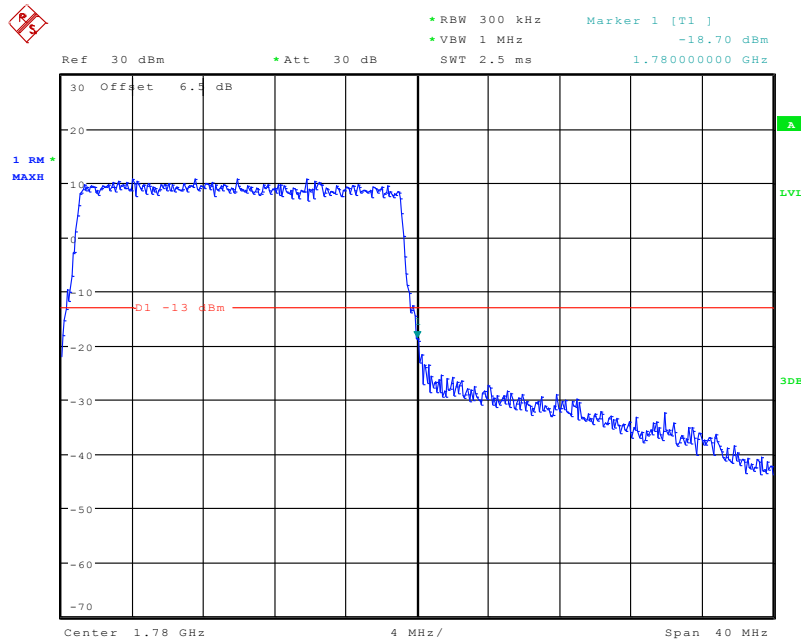
Date: 1.JUN.2020 20:17:12

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



Date: 1.JUN.2020 20:16:52

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



Date: 1.JUN.2020 20:17:35



**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

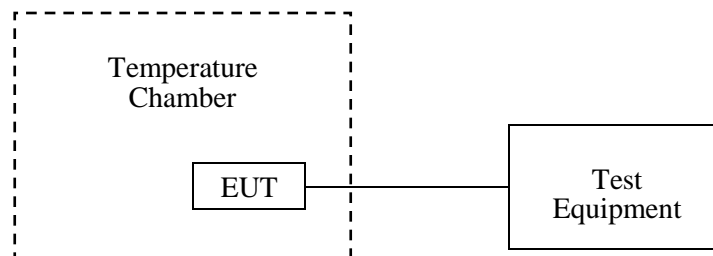
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

**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**

<b>Temperature:</b>	20 °C
<b>Relative Humidity:</b>	52 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Black Chen from 2020-05-28 to 2020-06-02.*

*EUT operation mode: Transmitting*

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

**Cellular Band (Part 22H)**

**GSM Mode**

<b>Middle Channel, <math>f_0 = 836.6\text{MHz}</math></b>				
<b>Temperature (°C)</b>	<b>Voltage Supplied</b>	<b>Frequency Error (Hz)</b>	<b>Frequency Error (ppm)</b>	<b>Limit (ppm)</b>
-30	NV	3	0.0036	2.5
-20		5	0.0060	2.5
-10		6	0.0072	2.5
0		5	0.0060	2.5
10		-9	-0.0108	2.5
20		-3	-0.0036	2.5
30		4	0.0048	2.5
40		3	0.0036	2.5
50		-4	-0.0048	2.5
20		LV	4	0.0048
	HV	8	0.0096	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	-5	-0.0060	2.5
-20		5	0.0060	2.5
-10		8	0.0096	2.5
0		-5	-0.0060	2.5
10		-3	-0.0036	2.5
20		-2	-0.0024	2.5
30		4	0.0048	2.5
40		-5	-0.0060	2.5
50		-3	-0.0036	2.5
20		LV	5	0.0060
	HV	-6	-0.0072	2.5

**PCS Band (Part 24E)**

**GSM Mode**

Middle Channel, $f_0 = 1880.0\text{ MHz}$				
Temperature (°C)	Voltage Supplied	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	NV	8	0.0043	pass
-20		6	0.0032	pass
-10		-7	-0.0037	pass
0		6	0.0032	pass
10		10	0.0053	pass
20		11	0.0059	pass
30		8	0.0043	pass
40		2	0.0011	pass
50		-6	-0.0032	pass
20		LV	-7	-0.0037
	HV	7	0.0037	pass

**WCDMA Mode**

<b>Middle Channel, <math>f_0 = 1880.0</math> MHz</b>				
<b>Temperature (°C)</b>	<b>Voltage Supplied</b>	<b>Frequency Error (Hz)</b>	<b>Frequency Error (ppm)</b>	<b>Result</b>
-30	N.V.	-11	-0.0059	pass
-20		9	0.0048	pass
-10		8	0.0043	pass
0		-15	-0.0080	pass
10		-11	-0.0059	pass
20		10	0.0053	pass
30		14	0.0074	pass
40		-7	-0.0037	pass
50		-10	-0.0053	pass
20	L.V.	5	0.0027	pass
	H.V.	-2	-0.0011	pass

**LTE:**  
**QPSK:**

**Band 2:**

10.0 MHz Middle Channel, $f_0=1880\text{MHz}$				
Temperature (°C)	Voltage Supplied	Frequency Error (Hz)	Frequency Error (ppm)	Result
-20	N.V.	-9.97	-0.0053	pass
-10		-6.13	-0.0033	pass
0		6.17	0.0033	pass
10		7.92	0.0042	pass
20		6.46	0.0034	pass
30		-6.52	-0.0035	pass
40		7.18	0.0038	pass
50		-9.69	-0.0052	pass
20	L.V.	-8.17	-0.0043	pass
	H.V.	-7.05	-0.0038	pass

**Band 4:**

10 MHz Bandwidth					
Temperature (°C)	Voltage Supplied	$F_L$ (MHz)	$F_H$ (MHz)	$F_L$ Limit (MHz)	$F_H$ Limit (MHz)
-20	N.V.	1710.160	1754.844	1710	1755
-10		1710.161	1754.843	1710	1755
0		1710.161	1754.844	1710	1755
10		1710.160	1754.845	1710	1755
20		1710.017	1754.843	1710	1755
30		1710.160	1754.844	1710	1755
40		1710.159	1754.844	1710	1755
50		1710.161	1754.844	1710	1755
20		L.V.	1710.159	1754.845	1710
	H.V.	1710.158	1754.844	1710	1755

**Band 7:**

10 MHz Bandwidth					
Temperature (°C)	Voltage Supplied	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	F <sub>L</sub> Limit (MHz)	F <sub>H</sub> Limit (MHz)
-20	N.V.	2500.700	2569.743	2500	2570
-10		2500.699	2569.743	2500	2570
0		2500.699	2569.743	2500	2570
10		2500.699	2569.743	2500	2570
20		2500.700	2569.743	2500	2570
30		2500.699	2569.743	2500	2570
40		2500.699	2569.743	2500	2570
50		2500.697	2569.742	2500	2570
20	L.V.	2500.69	2569.743	2500	2570
	H.V.	2500.700	2569.743	2500	2570

**Band 66**

10 MHz Bandwidth					
Temperature (°C)	Voltage Supplied	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	F <sub>L</sub> Limit (MHz)	F <sub>H</sub> Limit (MHz)
-20	N.V.	1710.015	1779.903	1710	1780
-10		1710.017	1779.905	1710	1780
0		1710.016	1779.905	1710	1780
10		1710.019	1779.904	1710	1780
20		1710.018	1779.903	1710	1780
30		1710.017	1779.902	1710	1780
40		1710.017	1779.904	1710	1780
50		1710.018	1779.902	1710	1780
20	L.V.	1710.017	1779.904	1710	1780
	H.V.	1710.019	1779.903	1710	1780

**16QAM:**

**Band 2:**

10.0 MHz Middle Channel, $f_0=1880\text{MHz}$				
Temperature (°C)	Voltage Supplied	Frequency Error (Hz)	Frequency Error (ppm)	Result
-20	N.V.	-6.68	-0.0036	pass
-10		9.77	0.0052	pass
0		-7.62	-0.0041	pass
10		-9.91	-0.0053	pass
20		-9.82	-0.0052	pass
30		-6.68	-0.0036	pass
40		-8.85	-0.0047	pass
50		5.67	0.003	pass
20	L.V.	6.05	0.0032	pass
	H.V.	7.52	0.004	pass

**Band 4:**

10 MHz Bandwidth					
Temperature (°C)	Voltage Supplied	$F_L$ (MHz)	$F_H$ (MHz)	$F_L$ Limit (MHz)	$F_H$ Limit (MHz)
-20	N.V.	1710.132	1754.874	1710	1755
-10		1710.132	1754.874	1710	1755
0		1710.132	1754.875	1710	1755
10		1710.131	1754.875	1710	1755
20		1710.133	1754.873	1710	1755
30		1710.131	1754.873	1710	1755
40		1710.132	1754.874	1710	1755
50		1710.132	1754.875	1710	1755
20	L.V.	1710.131	1754.874	1710	1755
	H.V.	1710.131	1754.874	1710	1755

**Band 7:**

10 MHz Bandwidth					
Temperature (°C)	Voltage Supplied	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	F <sub>L</sub> Limit (MHz)	F <sub>H</sub> Limit (MHz)
-20	N.V.	2500.875	2569.792	2500	2570
-10		2500.873	2569.794	2500	2570
0		2500.874	2569.794	2500	2570
10		2500.873	2569.793	2500	2570
20		2500.875	2569.795	2500	2570
30		2500.874	2569.794	2500	2570
40		2500.875	2569.795	2500	2570
50		2500.874	2569.795	2500	2570
20	L.V.	2500.875	2569.794	2500	2570
	H.V.	2500.876	2569.794	2500	2570

**Band 66:**

10 MHz Bandwidth					
Temperature (°C)	Voltage Supplied	F <sub>L</sub> (MHz)	F <sub>H</sub> (MHz)	F <sub>L</sub> Limit (MHz)	F <sub>H</sub> Limit (MHz)
-20	N.V.	1710.154	1779.892	1710	1780
-10		1710.155	1779.892	1710	1780
0		1710.156	1779.891	1710	1780
10		1710.157	1779.893	1710	1780
20		1710.153	1779.890	1710	1780
30		1710.152	1779.891	1710	1780
40		1710.154	1779.894	1710	1780
50		1710.155	1779.892	1710	1780
20	L.V.	1710.154	1779.892	1710	1780
	H.V.	1710.152	1779.891	1710	1780

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