



TESTING LABORATORY
CERTIFICATE #4820.01



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

For

INGENICO

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FCC ID: XKB-APOSA8WULEWF

Report Type: Original Report	Product Type: Smart POS Terminal
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:		Smart POS Terminal
EUT Model:		APOS A8
Operation modes:		GPRS/EDGE Data, WCDMA(R99 (Data), HSDPA/HSUPA/HSPA+) FDD-LTE,TDD-LTE
Operation Frequency:		GSM 850: 824-849 MHz(TX); 869-894 MHz(RX) PCS 1900: 1850-1910 MHz(TX); 1930-1990 MHz(RX) WCDMA Band 2: 1850-1910 MHz(TX); 1930-1990 MHz(RX) WCDMA Band 5: 824-849 MHz(TX); 869-894 MHz(RX) LTE Band 5:824-849 MHz(TX), 869-894 MHz(RX) LTE Band 7:2500-2570 MHz(TX), 2620-2690 MHz(RX) LTE Band 38: 2570-2620 MHz(TX&RX) LTE Band 40 Lower: 2305-2315 MHz(TX&RX) LTE Band 40 Upper: 2350-2360 MHz(TX&RX) LTE Band 41: 2535-2655 MHz(TX&RX)
Modulation Type:		GMSK, 8PSK, BPSK, QPSK, 16QAM
Rated Input Voltage:		DC 7.2V from battery or DC 5V from Adapter
Adapter Information:	Model:	P12GUSB050200
	Input:	AC 100-240V, 50/60Hz, 0.3A
	Output:	DC 5.0V, 2.0A
Serial Number:		RXM200310053-RF-S4
EUT Received Date:		2020.03.15
EUT Received Status:		Good

Note: Per pre-test of FCC Part 15B test, the EUT configuration #1 was the worst, and was selected to perform the test items in this report. The EUT configuration information as below, and more please refer to the Product similarity declaration.

EUT Configuration	Screen Model	Manufacturer	Serial Number
#1	MDT0550B	SKYWORTH LCD MODULES(SHENZHEN) CO., LTD	RXM200310053-RF-S4
#2	MDT0550B	TIANMA MICRO-ELECTRONICS Corporation	RXM200310053-RF-S5

Objective

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

Related Submittal(s)/Grant(s)

FCC Part 15C DSS, DTS, DXX, 15B JBP submissions with FCC ID: XKB-APOSA8WULEWF.

Test Methodology

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

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

TIA/EIA 603-D-2010.

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

Measurement Uncertainty

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

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

Test Facility

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

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

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

Declarations

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

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

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SYSTEM TEST CONFIGURATION

Justification

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

The test items were performed with the EUT operating at testing mode. The device operates on GSM Band 850/1900MHz(only supports GPRS/EDGE), WCDMA Band 2/5, and LTE band5/7/38/40/41, test was performed with channels as below table:

Frequency Bands	Bandwidth (MHz)	Test Frequency(MHz)		
		Low	Middle	High
GPRS/EDGE850	0.25	824.2	836.6	848.8
GPRS/EDGE1900	0.25	1850.2	1880	1909.8
WCDMA Band 2	4.2	1852.4	1880	1907.6
WCDMA Band 5	4.2	826.4	836.6	846.6
LTE Band 5	1.4	824.7	836.5	848.3
	3	825.5	836.5	847.5
	5	826.5	836.5	846.5
	10	829	836.5	844
LTE Band 7	5	2502.5	2535	2567.5
	10	2505	2535	2565
	15	2507.5	2535	2562.5
	20	2510	2535	2560
LTE Band 38	5	2572.5	2595	2617.5
	10	2575	2595	2615
	15	2577.5	2595	2612.5
	20	2580	2595	2610
LTE Band 40 Lower 2305-2315MHz	5	2307.5	2310	2312.5
	10	/	2310	/
LTE Band 40 Upper 2350-2360MHz	5	2352.5	2355	2357.5
	10	/	2355	/
LTE Band 41	5	2537.5	2593	2652.5
	10	2540	2593	2650
	15	2542.5	2593	2647.5
	20	2545	2593	2645

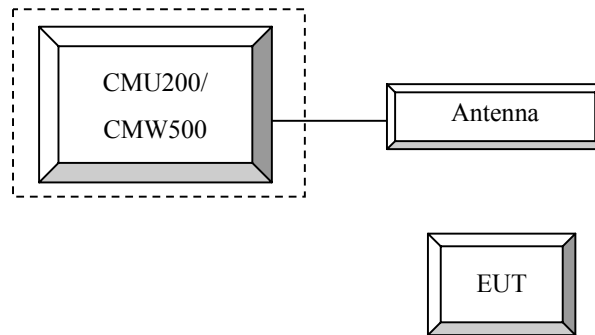
Equipment Modifications

No modification was made to the EUT.

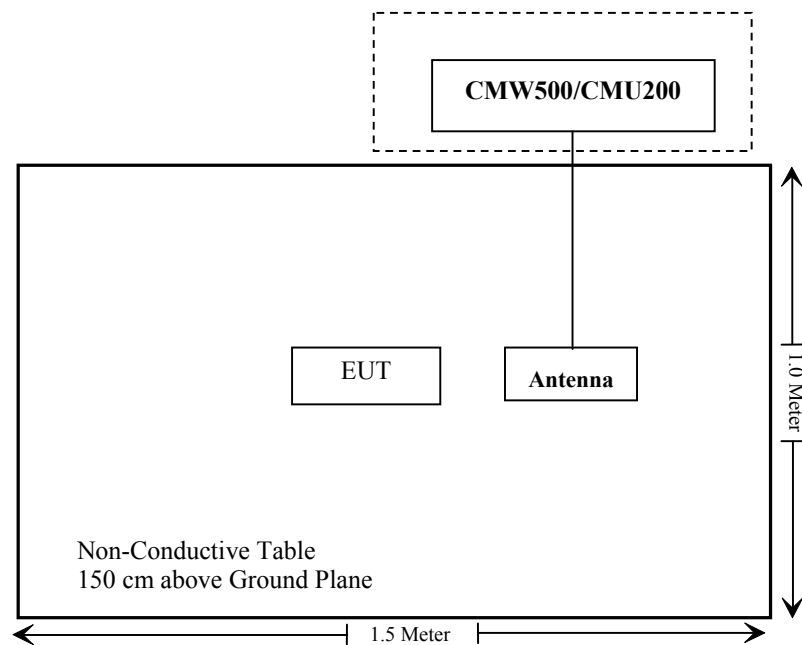
Support Equipment List and Details

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

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

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

FCC §1.1310 , §2.1093 - RF EXPOSURE

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliant, please refer to the SAR report: RXM200310053-20A.

FCC §2.1047 - MODULATION CHARACTERISTIC

According to FCC § 2.1047(d), Part 22H & 24E, Part 27 , Part 90 there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

FCC § 2.1046, § 22.913 (a) & § 24.232 (c) & § 27.50 - RF OUTPUT POWER

Applicable Standard

According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC §2.1046 and §24.232 (C), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

According to §24.232 (d) Power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

According to FCC §2.1046 and §27.50 (d), (4) Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP. Fixed stations operating in the 1710-1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

According to §27.50

(b)(10) Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

(c) (10) Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

(d), (4) Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP. Fixed stations operating in the 1710-1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

(h),(2) Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

Test Procedure

GSM/GPRS/EGPRS

Function: Menu select > GSM Mobile Station > GSM 850/1900

Press Connection control to choose the different menus

Press RESET > choose all the reset all settings

Connection Press Signal Off to turn off the signal and change settings

Network Support > GSM + GPRS or GSM + EGSM

Main Service > Packet Data

Service selection > Test Mode A – Auto Slot Config. off

MS Signal Press Slot Config Bottom on the right twice to select and change the number of time slots and power setting

> Slot configuration > Uplink/Gamma

> 33 dBm for GPRS 850

> 30 dBm for GPRS 1900

> 27 dBm for EGPRS 850

> 26 dBm for EGPRS 1900

BS Signal Enter the same channel number for TCH channel (test channel) and BCCH channel

Frequency Offset > + 0 Hz

Mode > BCCH and TCH

BCCH Level > -85 dBm (May need to adjust if link is not stable)

BCCH Channel > choose desire test channel [Enter the same channel number for TCH channel (test channel) and BCCH channel]

Channel Type > Off

P0 > 4 dB

Slot Config > Unchanged (if already set under MS signal)

TCH > choose desired test channel

Hopping > Off

Main Timeslot > 3

Network Coding Scheme > CS4 (GPRS) and MCS5 (EGPRS)

Bit Stream > 2E9-1 PSR Bit Stream

AF/Rf Enter appropriate offsets for Ext. Att. Output and Ext. Att. Input

Connection Press Signal on to turn on the signal and change settings

WCDMA-Release 99

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

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

WCDMA HSDPA

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

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

WCDMA HSUPA

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

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

HSPA+

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

Sub-test	β_c (Note 3)	β_d	β_{HS} (Note 1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{ed} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	β_{ed1} : 30/15 β_{ed2} : 30/15	β_{ed3} : 24/15 β_{ed4} : 24/15	3.5	2.5	14	105	105
Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$. Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0). Note 3: DPDCH is not configured, therefore the β_c is set to 1 and $\beta_d = 0$ by default. Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value. Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signalled to use the extrapolation algorithm.											

DC-HSDPA

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

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

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

LTE (FDD):

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

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

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

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

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

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

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

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

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

LTE(TDD):

Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS).

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$			$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	
9	$13168 \cdot T_s$			-	-	

Table 4.2-2: Uplink-downlink configurations.

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

Calculated Duty Cycle

Uplink-Downlink Configuration	Downlink-to-Uplink Switch-point Periodicity	Subframe Number										Calculated Duty Cycle (%)
		0	1	2	3	4	5	6	7	8	9	
0	5 ms	D	S	U	U	U	D	S	U	U	U	63.33
1	5 ms	D	S	U	U	D	D	S	U	U	D	43.33
2	5 ms	D	S	U	D	D	D	S	U	D	D	23.33
3	10 ms	D	S	U	U	U	D	D	D	D	D	31.67
4	10 ms	D	S	U	U	D	D	D	D	D	D	21.67
5	10 ms	D	S	U	D	D	D	D	D	D	D	11.67
6	5 ms	D	S	U	U	U	D	S	U	U	D	53.33

Calculated Duty Cycle = Extended cyclic prefix in uplink $\times (T_s) \times \#$ of S + $\#$ of U

Example for Calculated Duty Cycle for Uplink-Downlink Configuration 0:

Calculated Duty Cycle = $5120 \times [1/(15000 \times 2048)] \times 2 + 6 \text{ ms} = 63.33\%$

where

$T_s = 1/(15000 \times 2048)$ seconds

Radiated method:

ANSI/TIA-603-D section 2.2.17

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESR3	102453	2019-06-26	2020-06-26
Sunol Sciences	Antenna	JB3	A060611-1	2017-11-10	2020-11-10
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2019-05-06	2020-05-06
Agilent	Spectrum Analyzer	E4440A	SG43360054	2019-05-09	2020-05-09
TDK RF	Horn Antenna	HRN-0118	130 084	2018-10-12	2021-10-12
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2019-09-05	2020-09-05
R&S	Universal Radio Communication Tester	CMU200	106 891	2019-12-14	2020-12-14
R&S	Wideband Radio Communication Tester	CMW500	147473	2019-08-03	2020-08-03
Agilent	Signal Generator	E8247C	MY43321350	2019-12-10	2020-12-10
Unknown	Coaxial Cable	C-SJ00-0010	C0010/01	Each time	N/A

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

Test Data**Environmental Conditions**

Test Items:	Radiation Below 1GHz	Radiation Above 1GHz	Conducted Output Power
Temperature:	26°C	25°C	25.9 °C
Relative Humidity:	50%	47%	63 %
ATM Pressure:	101.4 kPa	101.4 kPa	101.4 kPa
Tester:	Vern Shen	FelixWang	Lucy Lu
Test Date:	2020-03-30	2020-03-30	2020-03-27

Conducted Output Power**Cellular Band & PCS Band**

Band	Channel No.	Conducted Peak Output Power (dBm)							
		GPRS 1 TX Slot	GPRS 2 TX Slots	GPRS 3 TX Slots	GPRS 4 TX Slots	EGPRS 1 uplink slot	EGPRS 2 uplink slots	EGPRS 3 uplink slots	EGPRS 4 uplink slots
Cellular	128	32.41	32.18	29.61	28.45	25.11	24.96	23.34	22.08
	190	32.69	32.35	29.76	28.69	25.38	25.12	23.48	22.15
	251	32.61	32.46	29.94	28.73	25.44	25.16	23.48	22.27
PCS	512	29.57	29.41	29.21	29.06	25.68	25.24	25.07	24.88
	661	30.01	29.91	29.75	29.53	25.86	25.64	25.33	25.05
	810	29.72	29.62	29.51	29.32	25.43	25.23	24.95	24.75

WCDMA Band II

Mode	3GPP Sub Test	Low Channel		Middle Channel		High Channel	
		Ave. Power (dBm)	PAR (dB)	Ave. Power (dBm)	PAR (dB)	Ave. Power (dBm)	PAR (dB)
Rel 99	1	23.63	3.08	23.52	2.68	23.77	2.60
HSDPA	1	22.76	5.44	22.61	5.72	22.81	4.88
	2	22.73	5.40	22.55	5.69	22.73	4.81
	3	22.70	5.39	22.53	5.65	22.68	4.79
	4	22.65	5.38	22.52	5.63	22.64	4.75
HSUPA	1	22.14	4.88	22.03	5.76	22.22	5.00
	2	22.06	4.80	22.01	5.75	22.14	4.94
	3	22.03	4.79	21.97	5.70	22.14	4.90
	4	21.99	4.78	21.94	5.67	22.09	4.87
	5	21.97	4.73	21.90	5.64	22.06	4.85
DC-HSDPA	1	21.96	4.68	21.87	5.59	22.06	4.82
	2	21.92	4.68	21.82	5.57	22.02	4.81
	3	21.92	4.63	21.80	5.53	22.01	4.80
	4	21.88	4.61	21.76	5.52	22.00	4.76
HSPA+ (16QAM)	1	21.88	4.56	21.72	5.49	21.98	4.75

WCDMA Band V

Mode	3GPP Sub Test	Low Channel		Middle Channel		High Channel	
		Ave. Power (dBm)	PAR (dB)	Ave. Power (dBm)	PAR (dB)	Ave. Power (dBm)	PAR (dB)
Rel 99	1	22.49	3.12	22.68	3.08	22.57	3.12
HSDPA	1	21.51	5.32	21.87	5.28	21.60	4.84
	2	21.47	5.27	21.80	5.21	21.56	4.79
	3	21.43	5.24	21.79	5.16	21.54	4.77
	4	21.41	5.21	21.78	5.13	21.54	4.74
HSUPA	1	20.87	6.44	21.07	6.16	20.91	5.12
	2	20.79	6.39	20.99	6.13	20.85	5.06
	3	20.76	6.35	20.94	6.10	20.84	5.01
	4	20.71	6.33	20.90	6.06	20.81	4.99
	5	20.70	6.31	20.90	6.05	20.77	4.95
DC-HSDPA	1	20.69	6.31	20.90	6.03	20.74	4.94
	2	20.65	6.28	20.89	6.03	20.73	4.94
	3	20.65	6.26	20.85	6.01	20.70	4.89
	4	20.60	6.24	20.82	5.98	20.68	4.86
HSPA+ (16QAM)	1	20.59	6.22	20.79	5.93	20.65	4.83

LTE Band 5

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4MHz	QPSK	RB1#0	22.44	22.53	22.50
		RB1#3	22.50	22.57	22.60
		RB1#5	22.55	22.30	22.58
		RB3#0	22.42	22.62	22.56
		RB3#3	22.54	22.59	22.54
		RB6#0	21.50	21.48	21.53
	16QAM	RB1#0	21.36	21.41	21.67
		RB1#3	21.48	21.46	21.73
		RB1#5	21.37	21.33	21.58
		RB3#0	21.63	21.27	21.43
		RB3#3	21.70	21.31	21.54
3MHz	QPSK	RB1#0	22.77	22.60	22.42
		RB1#8	22.47	22.62	22.43
		RB1#14	22.47	22.93	22.41
		RB6#0	21.66	21.54	21.54
		RB6#9	21.59	21.50	21.63
		RB15#0	21.51	21.59	21.52
	16QAM	RB1#0	21.77	22.10	21.76
		RB1#8	21.55	22.19	21.61
		RB1#14	21.55	22.38	21.85
		RB6#0	20.51	20.68	20.58
		RB6#9	20.56	20.76	20.70
5MHz	QPSK	RB1#0	22.70	22.14	22.31
		RB1#13	22.34	22.18	22.32
		RB1#24	22.47	22.32	22.61
		RB15#0	21.59	21.53	21.58
		RB15#10	21.46	21.51	21.54
		RB25#0	21.51	21.42	21.49
	16QAM	RB1#0	21.50	20.73	21.66
		RB1#13	21.01	20.40	20.98
		RB1#24	21.59	20.58	21.78
		RB15#0	20.61	20.38	20.44
		RB15#10	20.49	20.67	20.53
10MHz	QPSK	RB25#0	20.44	20.71	20.54
		RB1#0	21.52	22.68	22.45
		RB1#25	22.50	22.44	22.54
		RB1#49	22.65	22.51	22.52
		RB25#0	21.58	21.56	21.41
	16QAM	RB25#25	21.47	21.52	21.43
		RB50#0	21.52	21.59	21.53
		RB1#0	21.67	21.59	21.29
		RB1#25	21.71	21.78	20.91
		RB1#49	21.73	21.69	21.03
	16QAM	RB25#0	20.60	20.66	20.80
		RB25#25	20.50	20.64	20.74
		RB50#0	20.51	20.49	20.55

LTE Band 7

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5MHz	QPSK	RB1#0	21.66	22.06	21.53
		RB1#13	21.57	22.19	21.34
		RB1#24	21.73	22.17	21.38
		RB15#0	20.77	20.93	20.51
		RB15#10	20.77	20.84	20.47
		RB25#0	20.78	20.95	20.55
	16QAM	RB1#0	20.54	20.93	20.53
		RB1#13	19.95	20.50	20.25
		RB1#24	20.46	20.74	20.49
		RB15#0	19.95	19.84	19.56
		RB15#10	19.60	19.72	19.58
10MHz	QPSK	RB1#0	21.90	22.14	21.68
		RB1#25	21.77	21.92	21.59
		RB1#49	21.68	22.00	21.51
		RB25#0	20.85	20.99	20.67
		RB25#25	20.65	20.91	20.56
		RB50#0	20.79	21.00	20.54
	16QAM	RB1#0	21.14	21.88	20.69
		RB1#25	20.89	21.14	20.02
		RB1#49	20.59	20.98	20.06
		RB25#0	19.90	20.10	19.67
		RB25#25	19.68	19.78	19.55
15MHz	QPSK	RB1#0	21.93	21.97	21.78
		RB1#38	21.50	22.02	21.51
		RB1#74	21.56	22.06	21.65
		RB36#0	20.82	21.01	20.61
		RB36#39	20.44	20.88	20.62
		RB75#0	20.50	21.02	20.56
	16QAM	RB1#0	21.04	21.48	21.01
		RB1#38	20.51	21.32	20.74
		RB1#74	20.66	21.39	20.88
		RB36#0	19.81	20.13	19.72
		RB36#39	19.56	19.84	19.68
20MHz	QPSK	RB1#0	22.23	22.12	21.90
		RB1#50	21.74	22.12	21.55
		RB1#99	21.70	21.96	21.59
		RB50#0	20.71	20.95	20.76
		RB50#50	20.53	20.83	20.57
		RB100#0	20.68	21.05	20.74
	16QAM	RB1#0	21.37	21.49	21.92
		RB1#50	21.21	21.34	21.23
		RB1#99	20.46	21.07	21.00
		RB50#0	20.09	20.07	19.62
		RB50#50	19.65	19.94	19.55
		RB100#0	19.71	20.01	19.78

LTE Band 38

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5MHz	QPSK	RB1#0	21.46	21.90	21.42
		RB1#13	21.40	21.78	21.11
		RB1#24	21.39	21.60	21.21
		RB15#0	20.61	20.95	20.35
		RB15#10	20.46	20.73	20.30
		RB25#0	20.51	20.78	20.34
	16QAM	RB1#0	20.70	20.32	20.25
		RB1#13	20.61	20.43	20.17
		RB1#24	20.82	20.05	20.34
		RB15#0	19.33	19.68	19.35
		RB15#10	19.31	19.44	19.20
10MHz	QPSK	RB1#0	21.83	22.37	21.62
		RB1#25	21.59	22.12	21.36
		RB1#49	21.82	22.05	21.49
		RB25#0	20.65	20.92	20.31
		RB25#25	20.60	20.49	20.25
		RB50#0	20.73	20.83	20.28
	16QAM	RB1#0	20.73	21.13	20.30
		RB1#25	20.16	21.02	20.37
		RB1#49	20.52	20.85	20.39
		RB25#0	19.61	19.84	19.33
		RB25#25	19.57	19.51	19.27
15MHz	QPSK	RB1#0	21.79	22.22	21.67
		RB1#38	21.59	21.90	21.22
		RB1#74	21.89	21.98	21.59
		RB36#0	20.66	20.99	20.53
		RB36#39	20.80	20.58	20.32
		RB75#0	20.71	20.89	20.41
	16QAM	RB1#0	20.87	21.23	21.04
		RB1#38	20.27	20.84	20.41
		RB1#74	20.76	20.75	20.60
		RB36#0	19.70	20.15	19.58
		RB36#39	19.86	19.53	19.36
20MHz	QPSK	RB1#0	21.78	22.20	21.86
		RB1#50	21.88	22.16	21.63
		RB1#99	21.77	21.85	21.50
		RB50#0	20.83	21.05	20.49
		RB50#50	20.88	20.50	20.29
		RB100#0	20.91	20.75	20.47
	16QAM	RB1#0	20.89	21.08	21.08
		RB1#50	21.03	20.79	20.62
		RB1#99	20.90	20.62	20.61
		RB50#0	19.90	20.03	19.69
		RB50#50	20.08	19.66	19.45
		RB100#0	19.88	19.71	19.38

LTE Band 40 Lower

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5MHz	QPSK	RB1#0	23.49	23.46	23.45
		RB1#13	23.44	23.59	23.55
		RB1#24	23.3	23.51	23.42
		RB15#0	22.78	22.68	22.7
		RB15#10	22.8	22.64	22.61
		RB25#0	22.71	22.76	22.82
	16QAM	RB1#0	22.82	22.8	22.04
		RB1#13	23.13	23.21	22.22
		RB1#24	23.03	23.11	22.14
		RB15#0	21.74	21.57	21.63
		RB15#10	21.78	21.71	21.62
		RB25#0	21.82	21.47	21.73
10MHz	QPSK	RB1#0	\	23.69	\
		RB1#25	\	23.81	\
		RB1#49	\	23.81	\
		RB25#0	\	22.83	\
		RB25#25	\	22.77	\
		RB50#0	\	22.82	\
	16QAM	RB1#0	\	22.3	\
		RB1#25	\	22.61	\
		RB1#49	\	22.44	\
		RB25#0	\	21.64	\
		RB25#25	\	21.72	\
		RB50#0	\	21.84	\

Note: the device is a mobile station. For 5MHz mode, the channel power is equal to the test result in dBm/5MHz. For 10MHz mode, the PSD as below:

Channel Bandwidth	Modulation	Resource Block & RB offset	Middle Channel (dBm/5MHz)
10MHz	QPSK	RB1#0	21.23
		RB1#25	21.35
		RB1#49	20.89
		RB25#0	20.25
		RB25#25	20.29
		RB50#0	20.43
	16QAM	RB1#0	20.04
		RB1#25	20.1
		RB1#49	20.01
		RB25#0	19.17
		RB25#25	19.23
		RB50#0	19.26

LTE Band 40 Upper

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5MHz	QPSK	RB1#0	23.18	23.06	23.07
		RB1#13	23.2	23.22	23.27
		RB1#24	23.16	23.04	23.34
		RB15#0	22.51	22.36	22.32
		RB15#10	22.5	22.6	22.33
		RB25#0	22.38	22.45	22.36
	16QAM	RB1#0	22.05	22.84	22.36
		RB1#13	21.91	22.86	22.89
		RB1#24	21.88	22.81	22.9
		RB15#0	21.35	21.38	21.29
		RB15#10	21.36	21.42	21.27
		RB25#0	21.4	21.56	21.21
10MHz	QPSK	RB1#0	\	23.52	\
		RB1#25	\	23.53	\
		RB1#49	\	23.48	\
		RB25#0	\	22.54	\
		RB25#25	\	22.56	\
		RB50#0	\	22.52	\
	16QAM	RB1#0	\	22.1	\
		RB1#25	\	22.37	\
		RB1#49	\	22.19	\
		RB25#0	\	21.41	\
		RB25#25	\	21.51	\
		RB50#0	\	21.57	\

Note: the device is a mobile station. For 5MHz mode, the channel power is equal to the test result in dBm/5MHz. For 10MHz mode, the PSD as below:

Channel Bandwidth	Modulation	Resource Block & RB offset	Middle Channel (dBm/5MHz)
10MHz	QPSK	RB1#0	21
		RB1#25	20.89
		RB1#49	20.99
		RB25#0	20.14
		RB25#25	20.04
		RB50#0	20.02
	16QAM	RB1#0	19.26
		RB1#25	20.07
		RB1#49	20.02
		RB25#0	19.56
		RB25#25	19.59
		RB50#0	19.67

LTE Band 41

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5MHz	QPSK	RB1#0	21.97	21.81	21.65
		RB1#13	21.89	21.62	21.49
		RB1#24	21.93	21.78	21.63
		RB15#0	21.05	20.94	20.77
		RB15#10	20.95	20.94	20.60
		RB25#0	21.11	20.90	20.64
	16QAM	RB1#0	21.11	20.35	20.96
		RB1#13	21.31	20.34	20.65
		RB1#24	21.21	20.32	20.78
		RB15#0	19.77	19.69	19.54
		RB15#10	19.60	19.68	19.40
10MHz	QPSK	RB1#0	21.98	22.32	22.02
		RB1#25	21.71	22.22	21.74
		RB1#49	21.70	22.19	21.62
		RB25#0	21.10	20.96	20.71
		RB25#25	20.95	20.87	20.51
		RB50#0	20.93	20.96	20.73
	16QAM	RB1#0	20.78	21.13	20.74
		RB1#25	20.83	21.08	20.74
		RB1#49	20.80	20.95	20.26
		RB25#0	19.88	19.88	19.85
		RB25#25	19.72	19.70	19.65
15MHz	QPSK	RB1#0	22.13	22.30	21.69
		RB1#38	21.84	22.09	21.68
		RB1#74	21.71	22.06	21.50
		RB36#0	20.99	21.07	20.95
		RB36#39	20.80	20.88	20.73
		RB75#0	21.02	20.95	20.80
	16QAM	RB1#0	21.26	21.29	21.10
		RB1#38	20.64	20.98	21.08
		RB1#74	20.50	20.78	21.24
		RB36#0	19.85	20.14	19.84
		RB36#39	19.92	19.74	19.75
20MHz	QPSK	RB1#0	22.43	22.36	22.01
		RB1#50	21.80	22.35	21.84
		RB1#99	21.68	22.03	21.69
		RB50#0	21.06	21.11	20.83
		RB50#50	20.89	20.76	20.80
		RB100#0	21.07	20.94	20.79
	16QAM	RB1#0	21.45	21.12	21.11
		RB1#50	21.04	20.91	20.99
		RB1#99	20.91	20.63	20.94
		RB50#0	20.12	20.16	19.93
		RB50#50	19.97	19.79	19.82
		RB100#0	19.95	19.83	19.78

PAR, Band 5

Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	10 MHz	9.20	4.64	4.68	13
	50 RB		9.48	5.44	5.40	13
16QAM	1 RB	10 MHz	5.64	5.64	5.64	13
	50 RB		6.32	6.40	6.40	13

PAR, Band 7

Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	20 MHz	4.32	4.40	4.36	13
	100 RB		5.20	5.28	5.24	13
16QAM	1 RB	20 MHz	5.28	5.44	5.32	13
	100 RB		6.16	6.24	6.20	13

PAR, LTE Band 38

Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	20 MHz	4.68	4.64	4.36	13
	100 RB		5.36	5.28	5.44	13
16QAM	1 RB	20 MHz	5.68	5.52	5.48	13
	100RB		6.40	6.36	6.36	13

PAR, LTE Band 41

Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	20 MHz	4.32	4.52	4.48	13
	100 RB		5.20	5.16	5.36	13
16QAM	1 RB	20 MHz	5.20	5.52	5.44	13
	100RB		6.20	6.24	6.32	13

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

Band 40 Duty cycle:**2305-2315MHz**

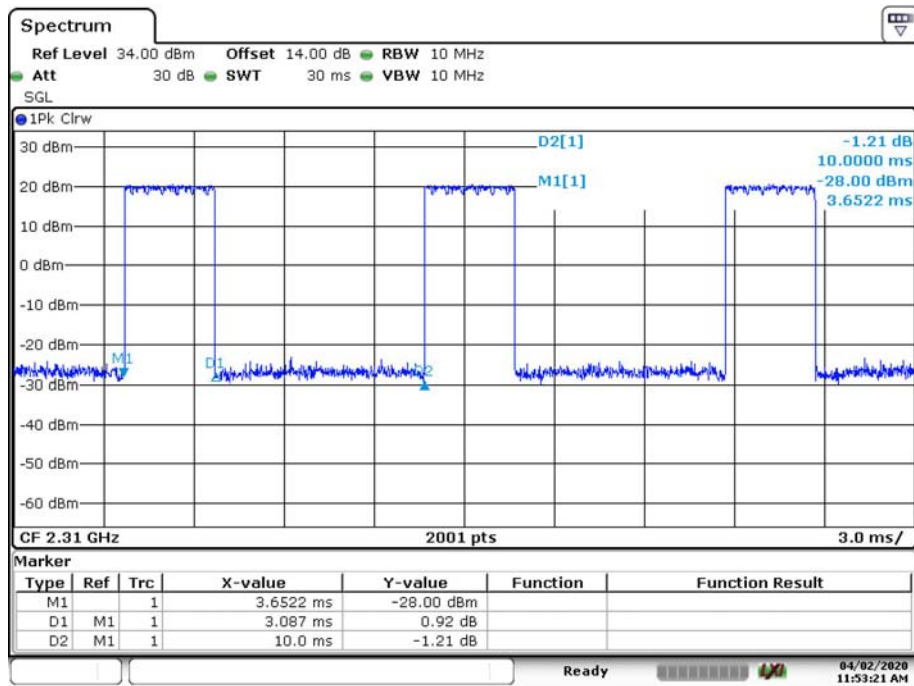
Test Modulation	Test Bandwidth	Ton (ms)	Total (ms)	Duty Cycle (%)	Limit (%)
QPSK	5M	3.087	10.000	36.52	38
	10M	3.030	9.998	30.31	
16-QAM	5M	3.030	9.983	30.35	
	10M	3.030	9.998	30.31	

2350-2360MHz

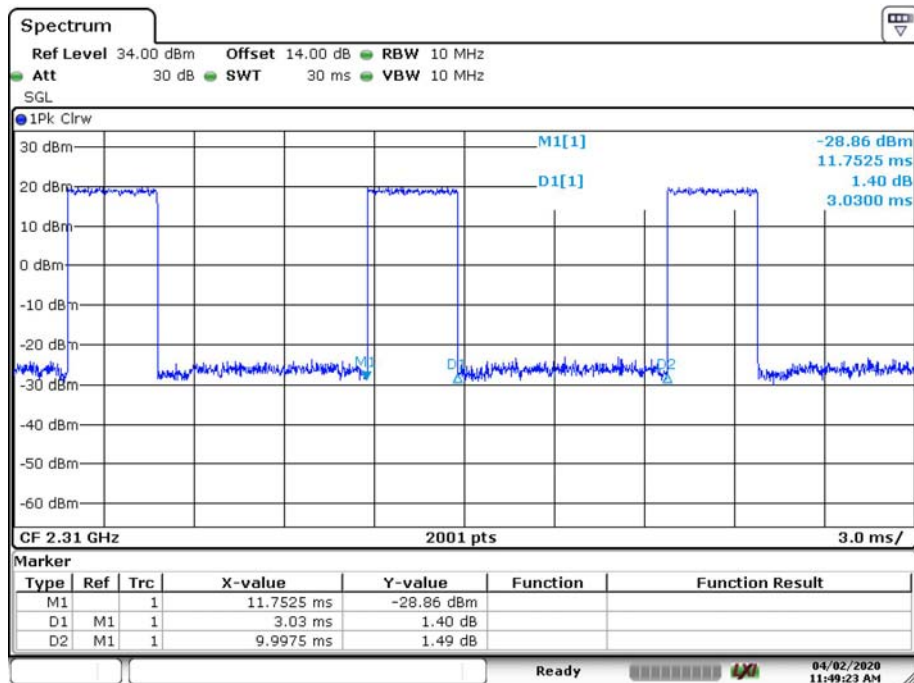
Test Modulation	Test Bandwidth	Ton (ms)	Total (ms)	Duty Cycle (%)	Limit (%)
QPSK	5M	3.044	10.000	30.44	38
	10M	3.087	10.057	30.70	
16-QAM	5M	3.087	10.029	30.78	
	10M	3.059	10.044	30.46	

Note: EUT setup is as following:

Uplink Downlink configuration	Subframe number									
	0	1	2	3	4	5	6	7	8	9
3	D	S	U	U	U	D	D	D	D	D

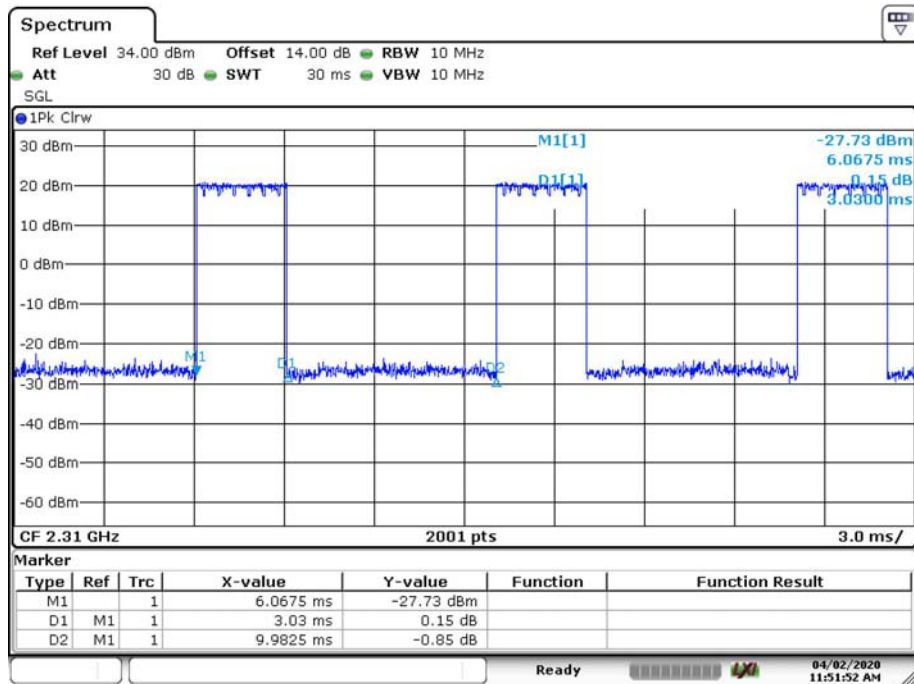
Band 40(2305-2315MHz)**QPSK, 5MHz**

Date: 2.APR.2020 11:53:21

QPSK, 10MHz

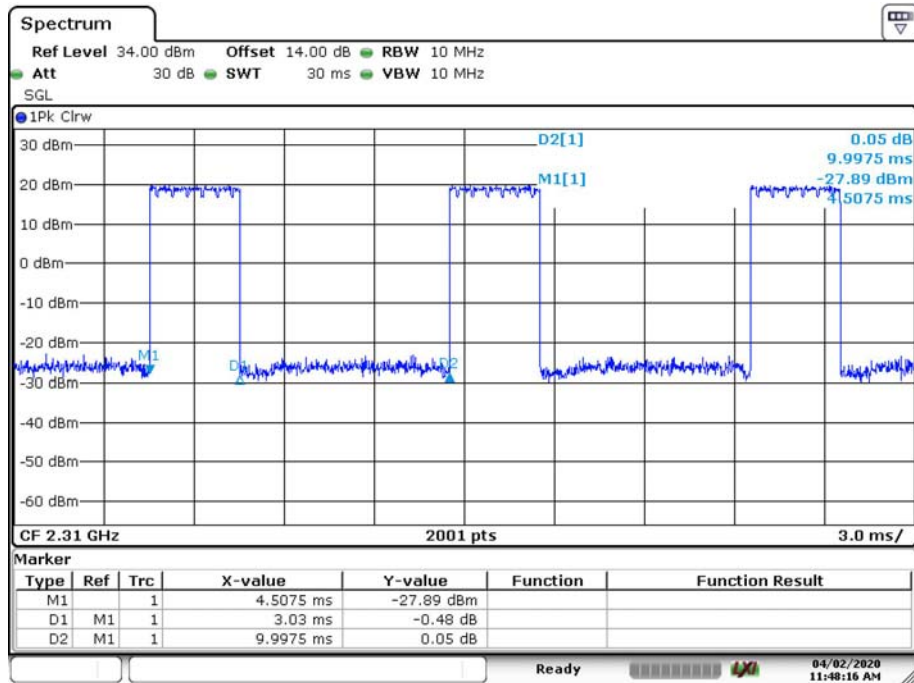
Date: 2.APR.2020 11:49:23

16-QAM, 5MHz

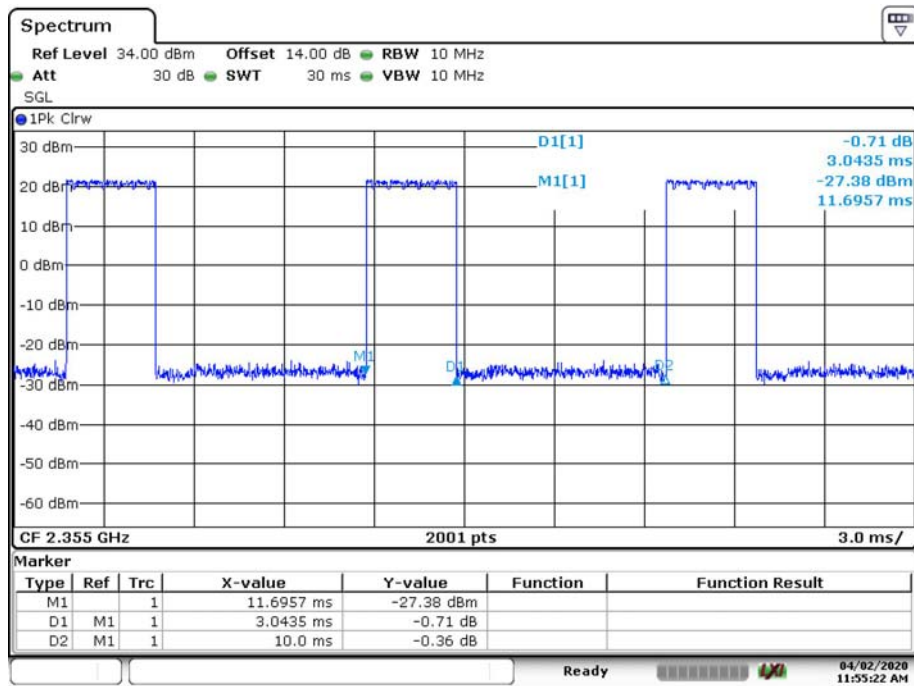


Date: 2.APR.2020 11:51:52

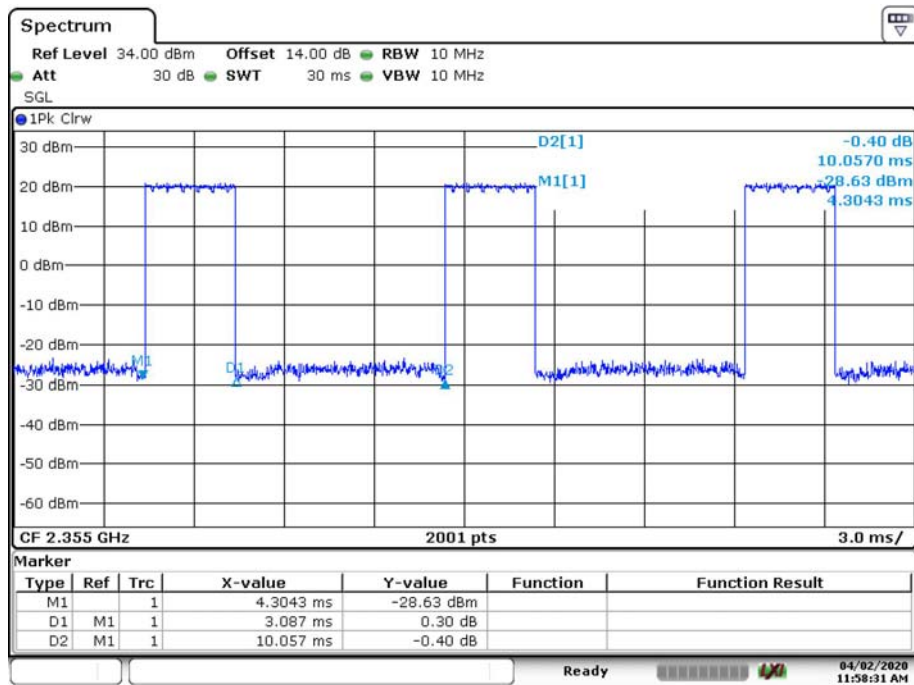
16-QAM, 10MHz



Date: 2.APR.2020 11:48:16

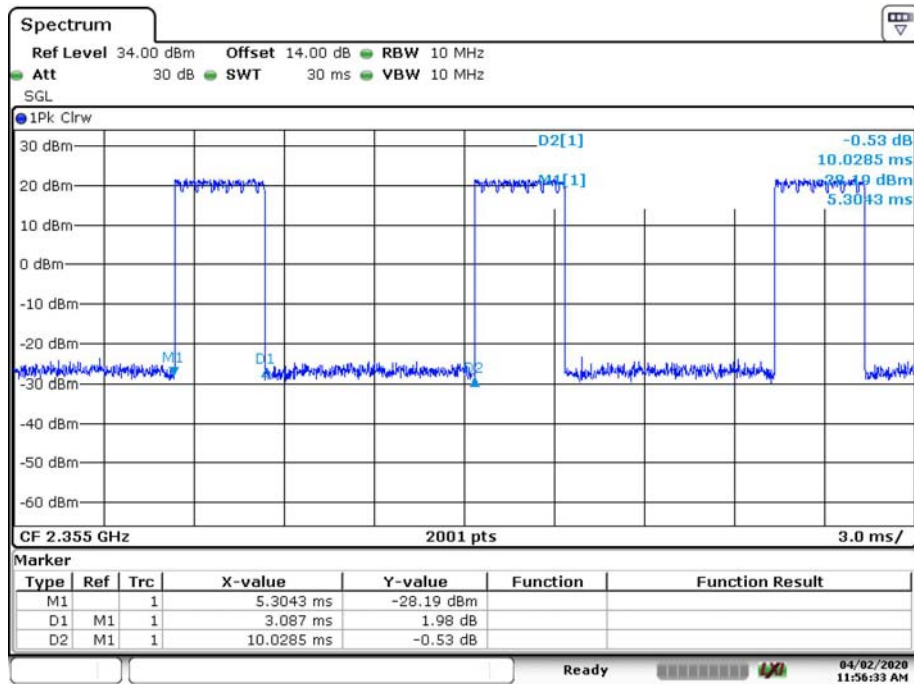
Band 40(2350-2360MHz)**QPSK, 5MHz**

Date: 2.APR.2020 11:55:22

QPSK, 10MHz

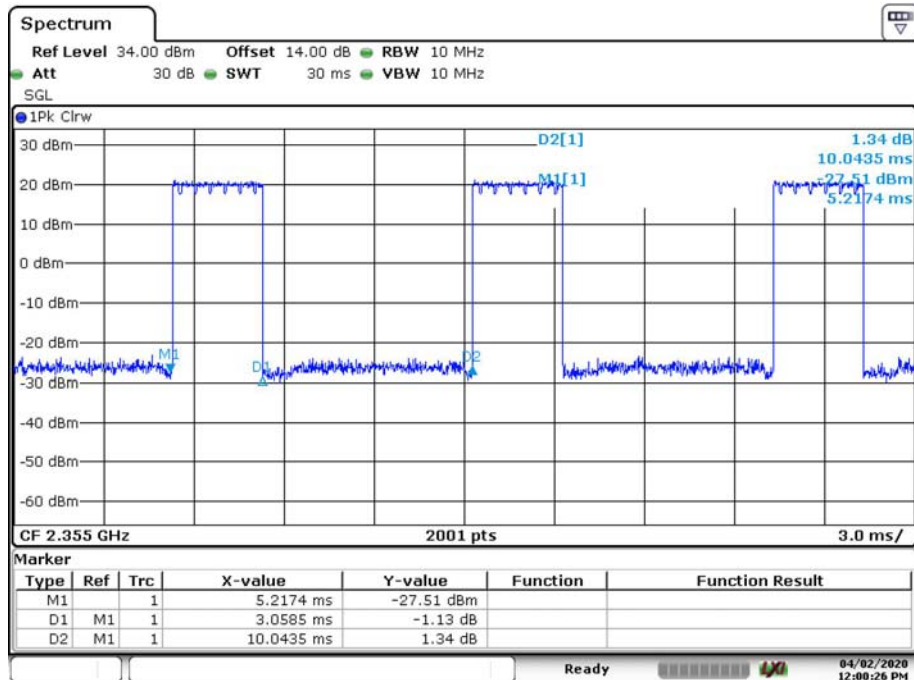
Date: 2.APR.2020 11:58:31

16-QAM, 5MHz



Date: 2.APR.2020 11:56:32

16-QAM, 10MHz



Date: 2.APR.2020 12:00:26

ERP & EIRP:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
GPRS 850 Middle Channel								
836.60	H	103.00	28.08	0.00	0.97	27.11	38.45	11.34
836.60	V	94.06	22.27	0.00	0.97	21.30	38.45	17.15
EDGE 850 Middle Channel								
836.60	H	98.38	23.46	0.00	0.97	22.49	38.45	15.96
836.60	V	92.56	20.77	0.00	0.97	19.80	38.45	18.65
WCDMA Band V Middle Channel								
836.60	H	95.01	20.09	0.00	0.97	19.12	38.45	19.33
836.60	V	85.14	13.35	0.00	0.97	12.38	38.45	26.07
PCS 1900 Middle Channel								
1880.00	H	89.80	17.19	11.66	2.66	26.19	33.00	6.81
1880.00	V	93.11	20.64	11.66	2.66	29.64	33.00	3.36
EDGE 1900 Middle Channel								
1880.00	H	86.52	13.91	11.66	2.66	22.91	33.00	10.09
1880.00	V	89.88	17.41	11.66	2.66	26.41	33.00	6.59
WCDMA Band II Middle Channel								
1880.00	H	84.22	11.61	11.66	2.66	20.61	33.00	12.39
1880.00	V	86.87	14.40	11.66	2.66	23.40	33.00	9.60

Note:

- 1) The unit of Antenna Gain is dBd for frequency below 1GHz, and the unit of Antenna Gain is dBi for frequency above 1GHz.
- 2) Absolute Level = Substituted Level - Cable loss + Antenna Gain
- 3) Margin = Limit-Absolute Level

LTE Band 5

Frequency (MHz)	BW (MHz)	Modulation	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)	
					Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)				
836.50	1.40	QPSK	H	92.10	17.17	0.00	0.97	16.20	38.45	22.25	
836.50			V	86.17	14.38	0.00	0.97	13.41	38.45	25.04	
836.50	3.00		H	93.50	18.57	0.00	0.97	17.60	38.45	20.85	
836.50			V	86.57	14.78	0.00	0.97	13.81	38.45	24.64	
836.50	5.00		H	93.17	18.24	0.00	0.97	17.27	38.45	21.18	
836.50			V	86.39	14.60	0.00	0.97	13.63	38.45	24.82	
836.50	10.00		H	92.89	17.96	0.00	0.97	16.99	38.45	21.46	
836.50			V	86.14	14.35	0.00	0.97	13.38	38.45	25.07	
836.50	1.40		16QAM	H	91.97	17.04	0.00	0.97	16.07	38.45	22.38
836.50				V	85.98	14.19	0.00	0.97	13.22	38.45	25.23
836.50	3.00	H		92.97	18.04	0.00	0.97	17.07	38.45	21.38	
836.50		V		86.44	14.65	0.00	0.97	13.68	38.45	24.77	
836.50	5.00	H		92.71	17.78	0.00	0.97	16.81	38.45	21.64	
836.50		V		86.00	14.21	0.00	0.97	13.24	38.45	25.21	
836.50	10.00	H		92.77	17.84	0.00	0.97	16.87	38.45	21.58	
836.50		V		86.01	14.22	0.00	0.97	13.25	38.45	25.20	

LTE Band 7

Frequency (MHz)	BW (MHz)	Modulation	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
					Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
2535.00	5.00	QPSK	H	80.56	7.95	13.14	3.10	17.99	33.00	15.01
2535.00			V	84.30	13.15	13.14	3.10	23.19	33.00	9.81
2535.00	10.00		H	80.36	7.75	13.14	3.10	17.79	33.00	15.21
2535.00			V	83.80	12.65	13.14	3.10	22.69	33.00	10.31
2535.00	15.00		H	80.44	7.83	13.14	3.10	17.87	33.00	15.13
2535.00			V	83.67	12.52	13.14	3.10	22.56	33.00	10.44
2535.00	20.00		H	81.42	8.81	13.14	3.10	18.85	33.00	14.15
2535.00			V	84.22	13.07	13.14	3.10	23.11	33.00	9.89
2535.00	5.00	16QAM	H	79.05	6.44	13.14	3.10	16.48	33.00	16.52
2535.00			V	83.10	11.95	13.14	3.10	21.99	33.00	11.01
2535.00	10.00		H	79.10	6.49	13.14	3.10	16.53	33.00	16.47
2535.00			V	83.14	11.99	13.14	3.10	22.03	33.00	10.97
2535.00	15.00		H	79.20	6.59	13.14	3.10	16.63	33.00	16.37
2535.00			V	83.26	12.11	13.14	3.10	22.15	33.00	10.85
2535.00	20.00		H	80.36	7.75	13.14	3.10	17.79	33.00	15.21
2535.00			V	83.75	12.60	13.14	3.10	22.64	33.00	10.36

LTE Band 38

Frequency (MHz)	BW (MHz)	Modulation	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
					Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
2595.00	5.00	QPSK	H	80.44	8.21	13.20	3.10	18.31	33.00	14.69
2595.00			V	82.27	11.90	13.20	3.10	22.00	33.00	11.00
2595.00	10.00		H	80.56	8.33	13.20	3.10	18.43	33.00	14.57
2595.00			V	82.06	11.69	13.20	3.10	21.79	33.00	11.21
2595.00	15.00		H	82.14	9.91	13.20	3.10	20.01	33.00	12.99
2595.00			V	83.63	13.26	13.20	3.10	23.36	33.00	9.64
2595.00	20.00		H	81.93	9.70	13.20	3.10	19.80	33.00	13.20
2595.00			V	83.52	13.15	13.20	3.10	23.25	33.00	9.75
2595.00	5.00	16QAM	H	79.12	6.89	13.20	3.10	16.99	33.00	16.01
2595.00			V	81.30	10.93	13.20	3.10	21.03	33.00	11.97
2595.00	10.00		H	78.82	6.59	13.20	3.10	16.69	33.00	16.31
2595.00			V	80.97	10.60	13.20	3.10	20.70	33.00	12.30
2595.00	15.00		H	80.98	8.75	13.20	3.10	18.85	33.00	14.15
2595.00			V	82.79	12.42	13.20	3.10	22.52	33.00	10.48
2595.00	20.00		H	80.91	8.68	13.20	3.10	18.78	33.00	14.22
2595.00			V	82.67	12.30	13.20	3.10	22.40	33.00	10.60

LTE Band 40:**Lower:**

Frequency (MHz)	BW (MHz)	Modulation	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm/5MHz)	Limit (dBm/5MHz)	Margin (dB)
					Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
2310.00	5.00	QPSK	H	80.01	9.63	11.31	2.98	17.96	24.00	6.04
2310.00			V	80.12	10.42	11.31	2.98	18.75	24.00	5.25
2310.00	10.00		H	80.65	10.27	11.31	2.98	18.60	24.00	5.40
2310.00			V	80.77	11.07	11.31	2.98	19.40	24.00	4.60
2310.00	5.00	16QAM	H	79.64	9.26	11.31	2.98	17.59	24.00	6.41
2310.00			V	79.45	9.75	11.31	2.98	18.08	24.00	5.92
2310.00	10.00		H	79.87	9.49	11.31	2.98	17.82	24.00	6.18
2310.00			V	79.45	9.75	11.31	2.98	18.08	24.00	5.92

Upper:

Frequency (MHz)	BW (MHz)	Modulation	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm/5MHz)	Limit (dBm/5MHz)	Margin (dB)
					Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
2355.00	5.00	QPSK	H	84.01	13.63	11.31	2.98	21.96	24.00	2.04
2355.00			V	84.12	14.42	11.31	2.98	22.75	24.00	1.25
2355.00	10.00		H	84.65	14.27	11.31	2.98	22.60	24.00	1.4
2355.00			V	84.77	15.07	11.31	2.98	23.40	24.00	0.6
2355.00	5.00	16QAM	H	83.64	13.26	11.31	2.98	21.59	24.00	2.41
2355.00			V	83.45	13.75	11.31	2.98	22.08	24.00	1.92
2355.00	10.00		H	83.87	13.49	11.31	2.98	21.82	24.00	2.18
2355.00			V	83.45	13.75	11.31	2.98	22.08	24.00	1.92

LTE Band 41

Frequency (MHz)	BW (MHz)	Modulation	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
					Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
2593.00	5.00	QPSK	H	81.50	9.26	13.19	3.10	19.35	33.00	13.65
2593.00			V	82.93	12.54	13.19	3.10	22.63	33.00	10.37
2593.00	10.00		H	82.58	10.34	13.19	3.10	20.43	33.00	12.57
2593.00			V	83.34	12.95	13.19	3.10	23.04	33.00	9.96
2593.00	15.00		H	82.02	9.78	13.19	3.10	19.87	33.00	13.13
2593.00			V	83.13	12.74	13.19	3.10	22.83	33.00	10.17
2593.00	20.00		H	81.91	9.67	13.19	3.10	19.76	33.00	13.24
2593.00			V	83.56	13.17	13.19	3.10	23.26	33.00	9.74
2593.00	5.00	16QAM	H	81.39	9.15	13.19	3.10	19.24	33.00	13.76
2593.00			V	82.86	12.47	13.19	3.10	22.56	33.00	10.44
2593.00	10.00		H	81.33	9.09	13.19	3.10	19.18	33.00	13.82
2593.00			V	82.22	11.83	13.19	3.10	21.92	33.00	11.08
2593.00	15.00		H	80.75	8.51	13.19	3.10	18.60	33.00	14.40
2593.00			V	82.28	11.89	13.19	3.10	21.98	33.00	11.02
2593.00	20.00		H	80.94	8.70	13.19	3.10	18.79	33.00	14.21
2593.00			V	82.61	12.22	13.19	3.10	22.31	33.00	10.69

Note:

- 1) The unit of Antenna Gain is dBd for frequency below 1GHz, and the unit of Antenna Gain is dBi for frequency above 1GHz.
- 2) Absolute Level = Substituted Level - Cable loss + Antenna Gain
- 3) Margin = Limit-Absolute Level

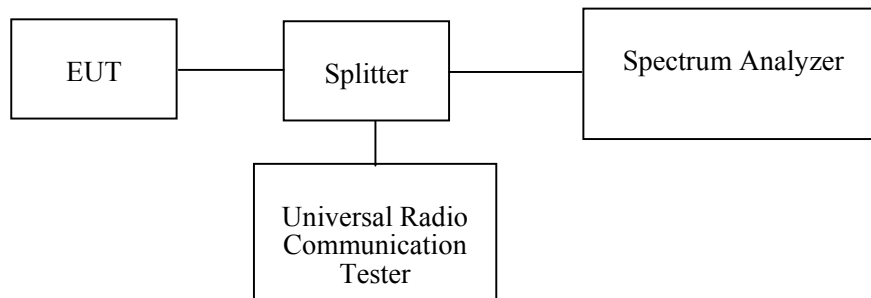
FCC §2.1049, §22.917, §22.905 & §24.238 & §27.53- OCCUPIED BANDWIDTH**Applicable Standard**

FCC §2.1049, §22.917, §22.905, §24.238, §27.53

Test Procedure

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

The 26 dB & 99% bandwidth was recorded.

**Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2019-05-09	2020-05-09
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005011	Each Time	/
E-Microwave	Two-way Splitter	ODP-1-6-2S	OE0120142	Each Time	/
Unknown	Coaxial Cable	C-SJ00-0010	C0010/04	Each Time	/
E-Microwave	Coaxial Attenuators	EMCA10-5RN-6	OE01203239	Each Time	/

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

Test Data**Environmental Conditions**

Temperature:	23~26°C
Relative Humidity:	50~65 %
ATM Pressure:	100.8~102.1 kPa
Tester:	Lucy Lu
Test Date:	2020-03-16~2020-04-01

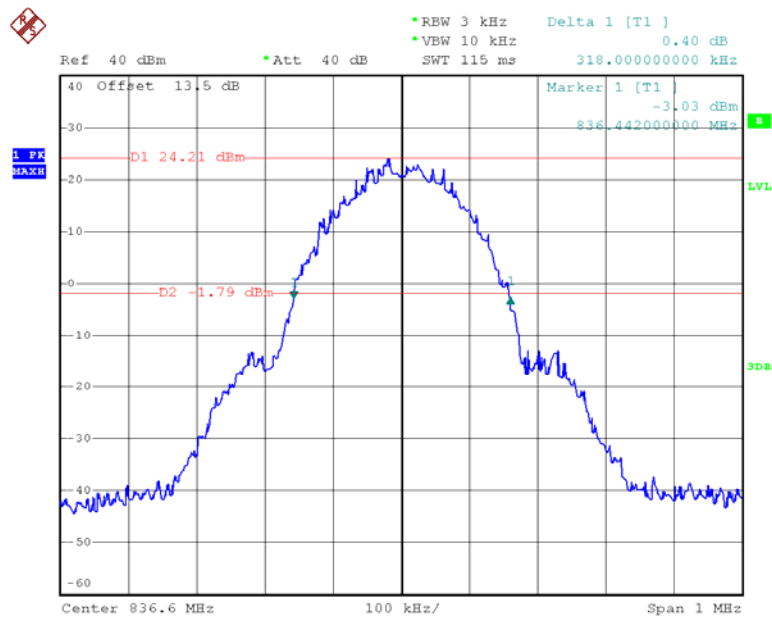
Test Mode: Transmitting

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

Band	Test Channel	Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
Cellular	M	GRRS	0.244	0.318
		EDGE	0.246	0.310
PCS		GRRS	0.244	0.318
		EDGE	0.250	0.316
WCDMA Band II		Rel 99	4.16	4.80
		HSDPA	4.16	4.78
		HSUPA	4.18	4.78
WCDMA Band V		Rel 99	4.16	4.78
		HSDPA	4.14	4.74
		HSUPA	4.15	4.76

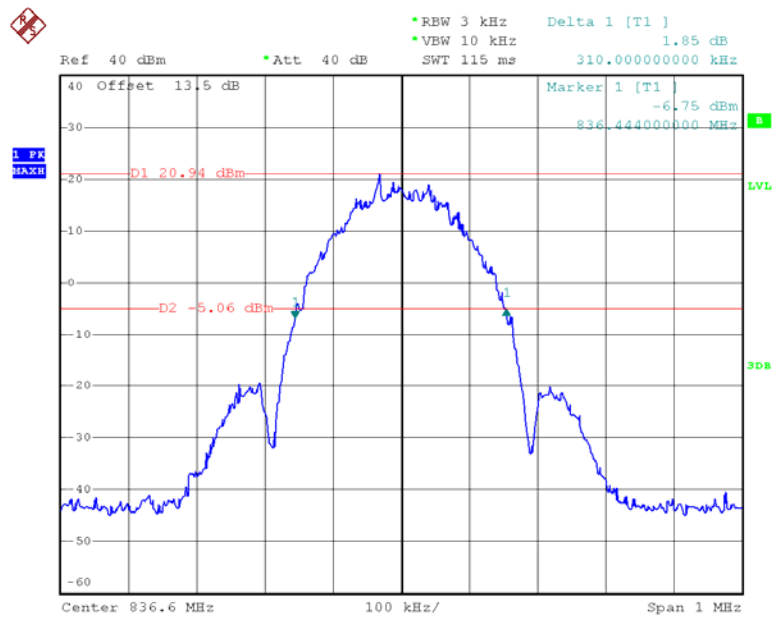
Band	Bandwidth	Modulation	99% occupied bandwidth (MHz)	26 dB bandwidth (MHz)
LTE Band 5	1.4 MHz	QPSK	1.104	1.308
		16QAM	1.104	1.290
	3 MHz	QPSK	2.700	2.952
		16QAM	2.688	2.964
	5 MHz	QPSK	4.540	5.040
		16QAM	4.520	5.020
	10 MHz	QPSK	8.960	9.720
		16QAM	8.960	9.640
LTE Band 7	5 MHz	QPSK	4.520	5.020
		16QAM	4.520	4.980
	10 MHz	QPSK	8.960	9.680
		16QAM	8.960	9.680
	15 MHz	QPSK	13.560	14.820
		16QAM	13.560	14.940
	20 MHz	QPSK	17.920	19.520
		16QAM	18.000	19.440
LTE Band 38	5 MHz	QPSK	4.520	4.960
		16QAM	4.520	5.000
	10 MHz	QPSK	8.960	9.800
		16QAM	8.960	9.560
	5 MHz	QPSK	13.560	16.020
		16QAM	13.500	15.600
	10 MHz	QPSK	17.920	19.440
		16QAM	18.000	19.520
LTE Band 40 Lower	5 MHz	QPSK	4.52	5.081
		16QAM	8.96	9.812
	10 MHz	QPSK	4.52	5.027
		16QAM	8.96	9.621
LTE Band 40 Upper	5 MHz	QPSK	4.52	5.08
		16QAM	8.96	9.8
	10 MHz	QPSK	4.52	5.04
		16QAM	8.96	9.68

LTE Band 41	5 MHz	QPSK	4.520	5.000
		16QAM	4.520	5.040
	10 MHz	QPSK	8.960	9.800
		16QAM	8.960	9.560
	15 MHz	QPSK	13.500	14.820
		16QAM	13.560	14.940
	20 MHz	QPSK	17.920	19.440
		16QAM	18.000	19.600

26 dB bandwidth**GPRS 850 Cellular Band**

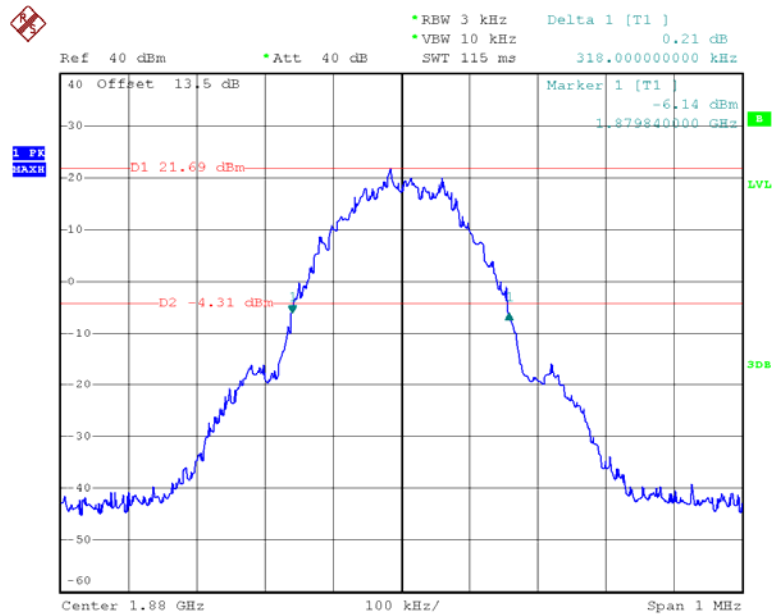
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EDGE 850 Cellular Band



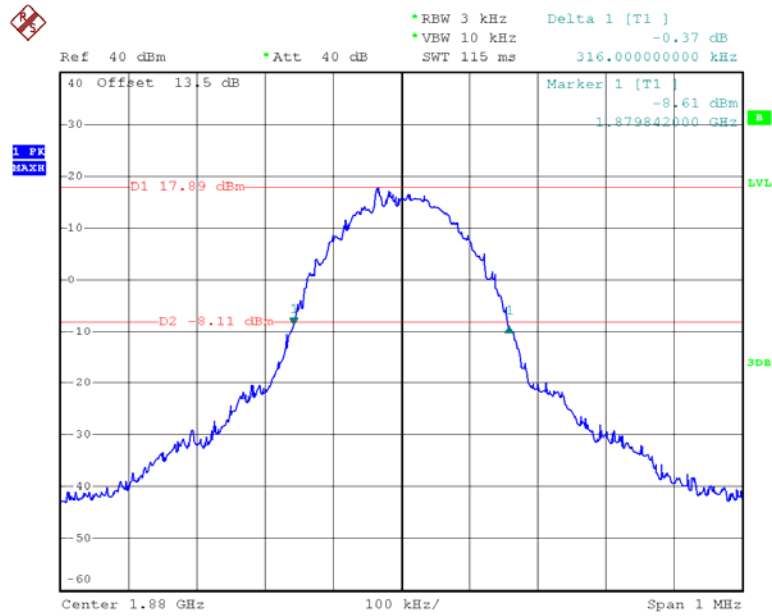
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GPRS 1900 Cellular Band



Date: 25.MAR.2020 17:28:35

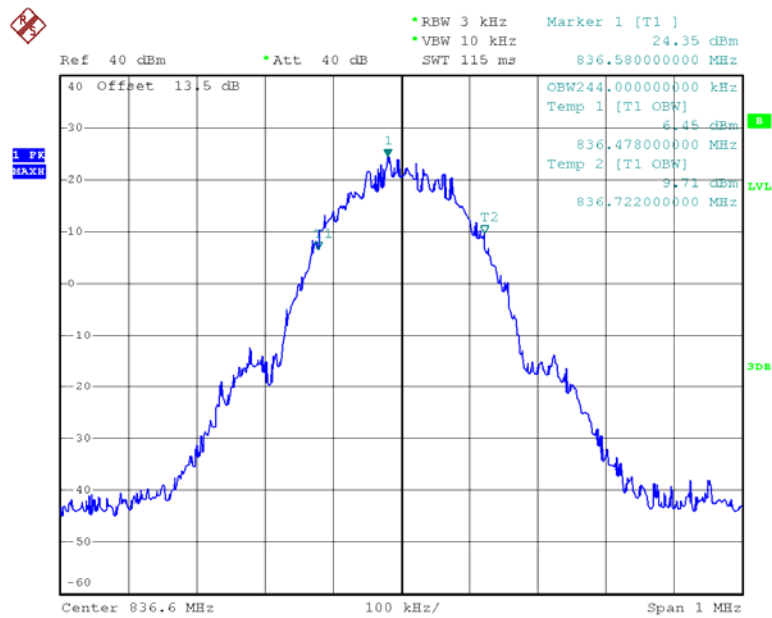
EDGE 1900 Cellular Band



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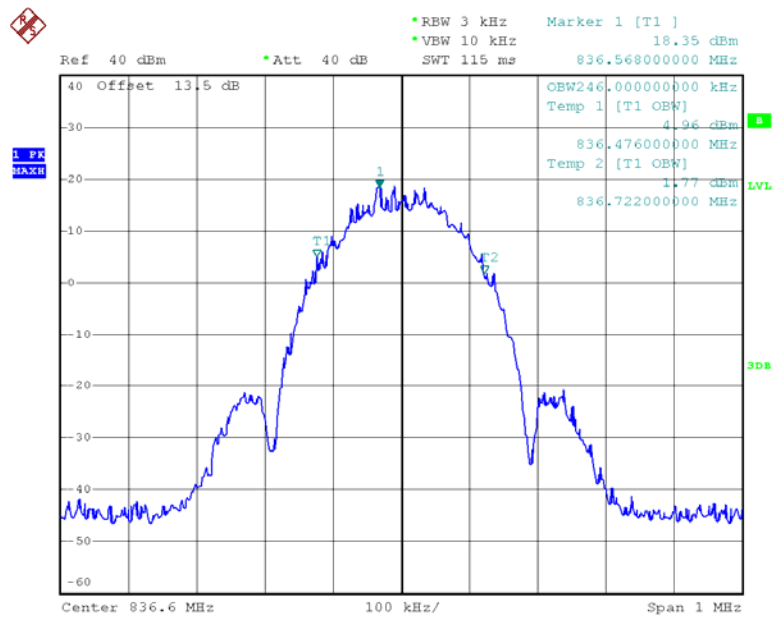
99% occupied bandwidth

GSM 850 Cellular Band



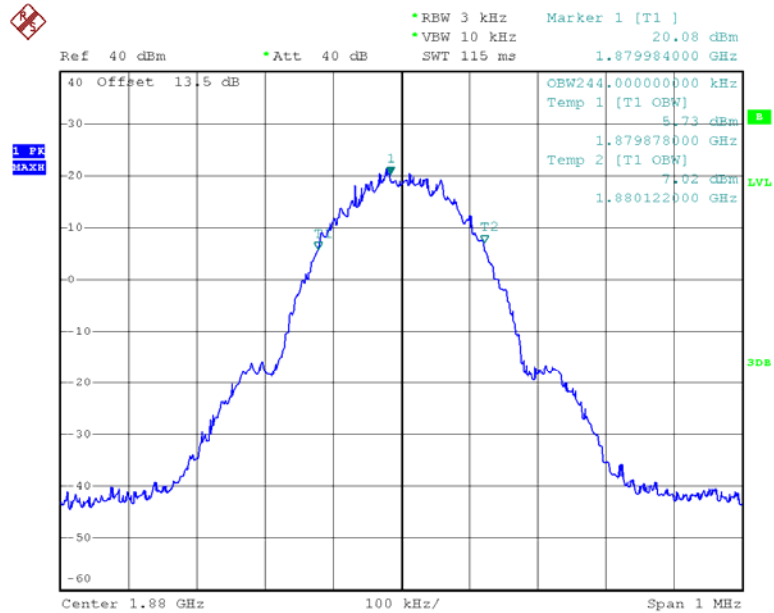
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EDGE 850 Cellular Band



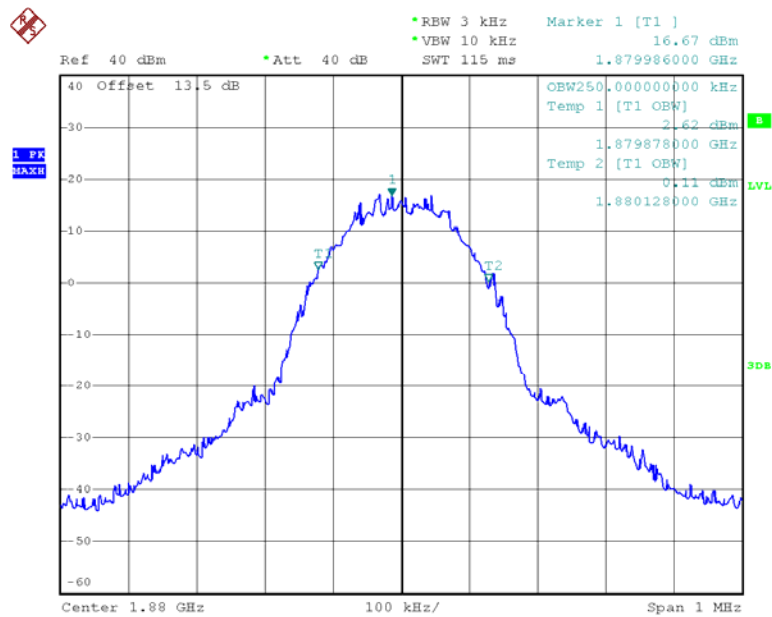
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GPRS 1900 Cellular Band



Date: 25.MAR.2020 17:31:45

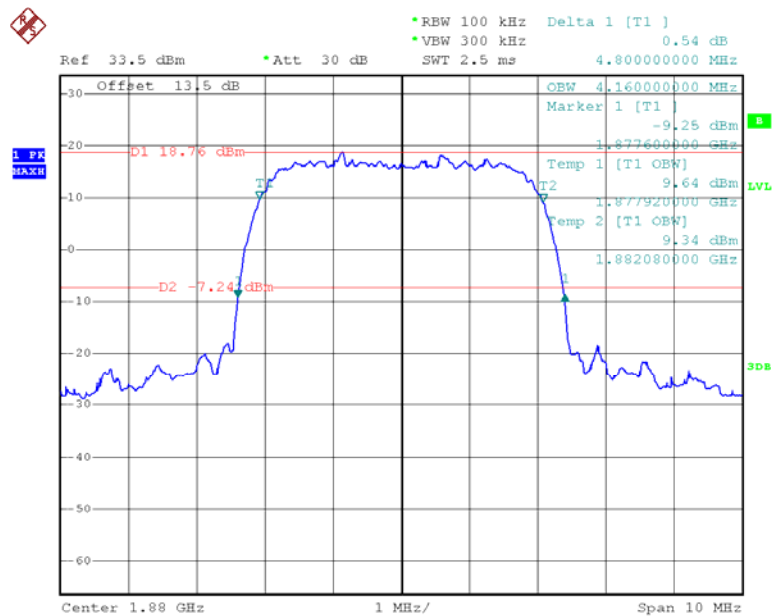
EDGE 1900 Cellular Band



Date: 25.MAR.2020 17:21:00

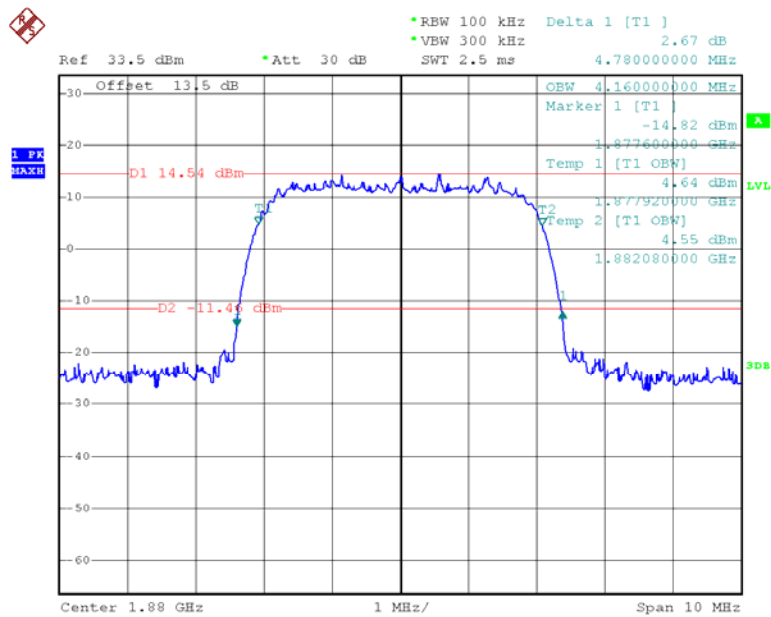
99% occupied bandwidth & 26 dB bandwidth

WCDMA Band II, Rel 99



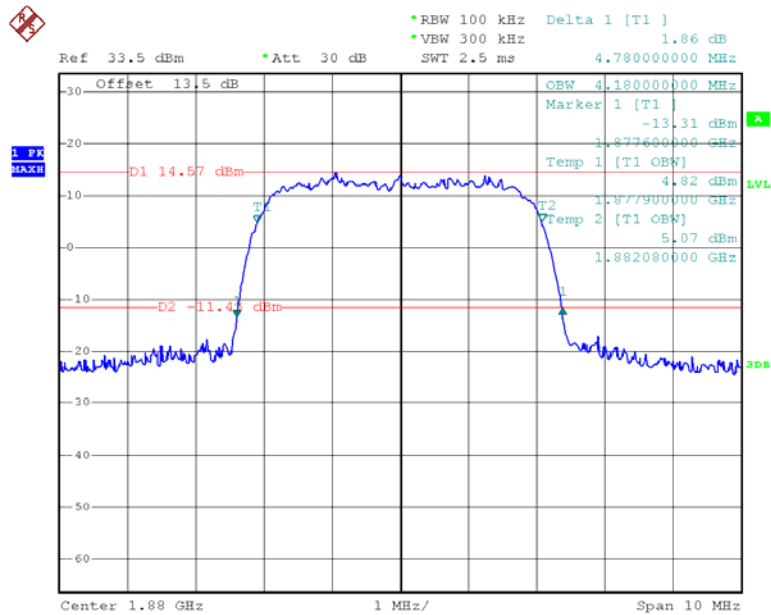
Date: 26.MAR.2020 10:16:53

WCDMA Band II, HSDPA



Date: 26.MAR.2020 14:27:34

WCDMA Band II, HSUPA

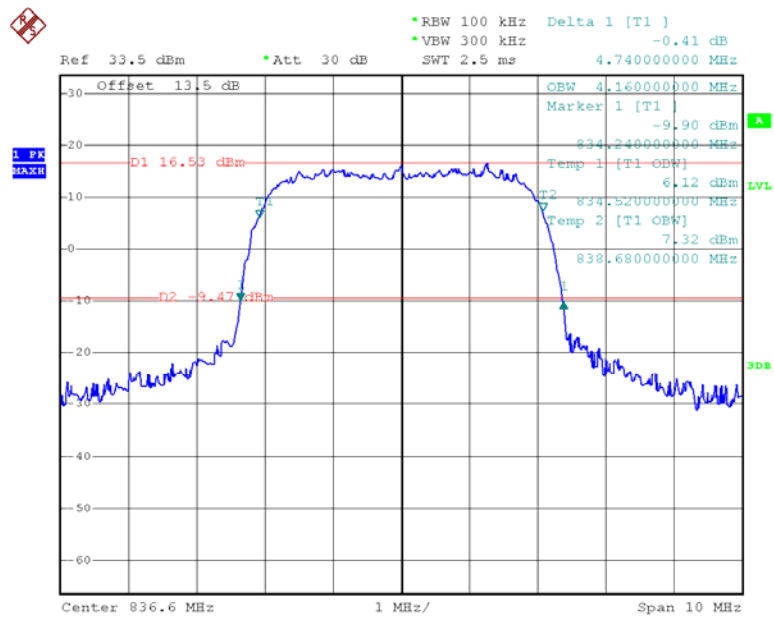


Date: 26.MAR.2020 15:04:43



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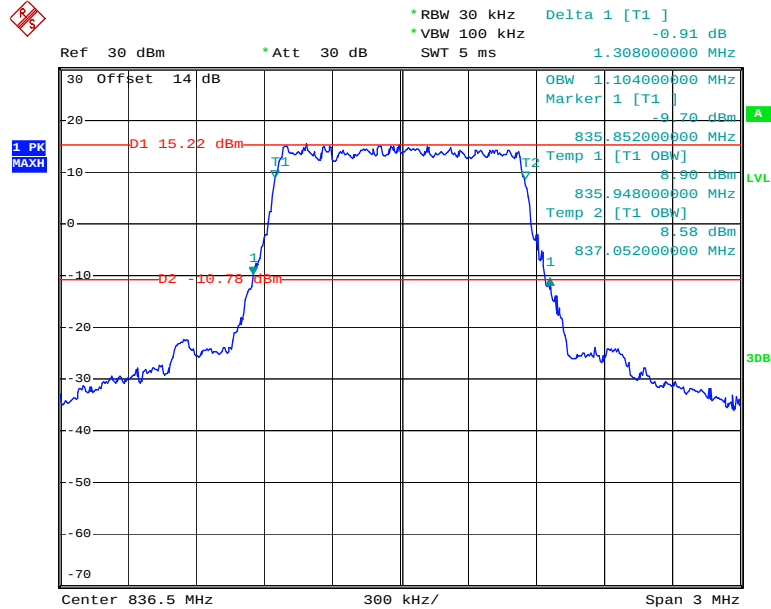
WCDMA Band V, HSUPA



Date: 26.MAR.2020 15:16:25

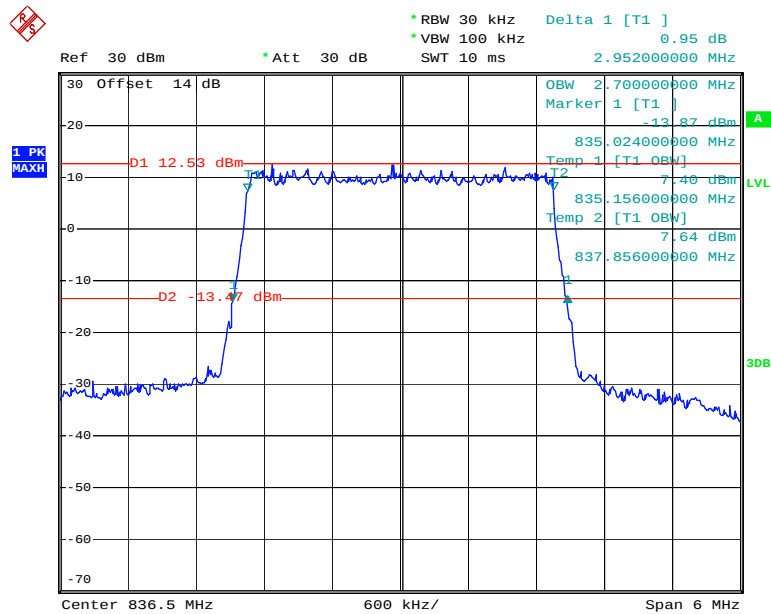
LTE Band 5

QPSK_1.4 MHz



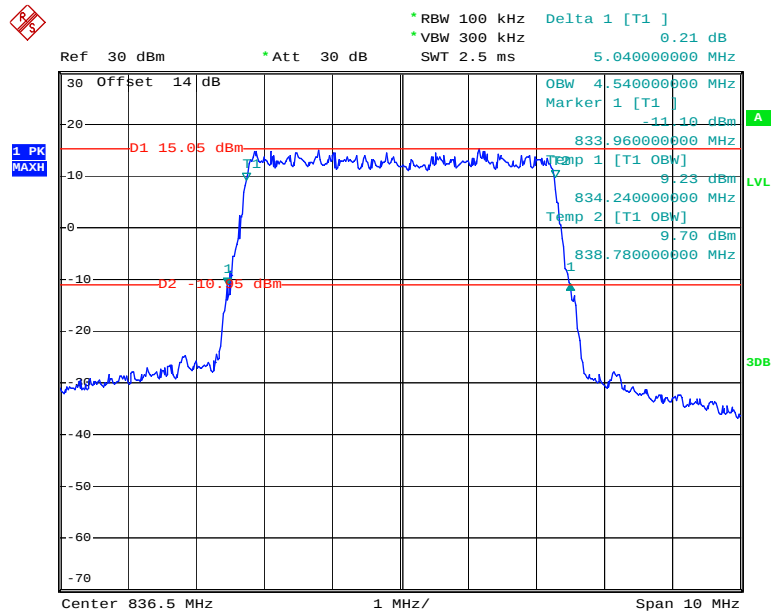
Date: 27.MAR.2020 17:46:46

QPSK_3 MHz



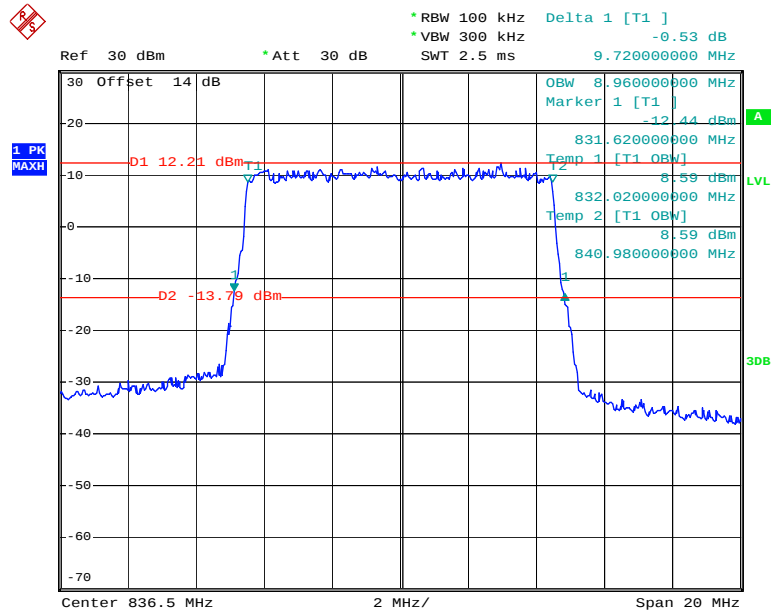
Date: 27.MAR.2020 17:47:29

QPSK_5 MHz



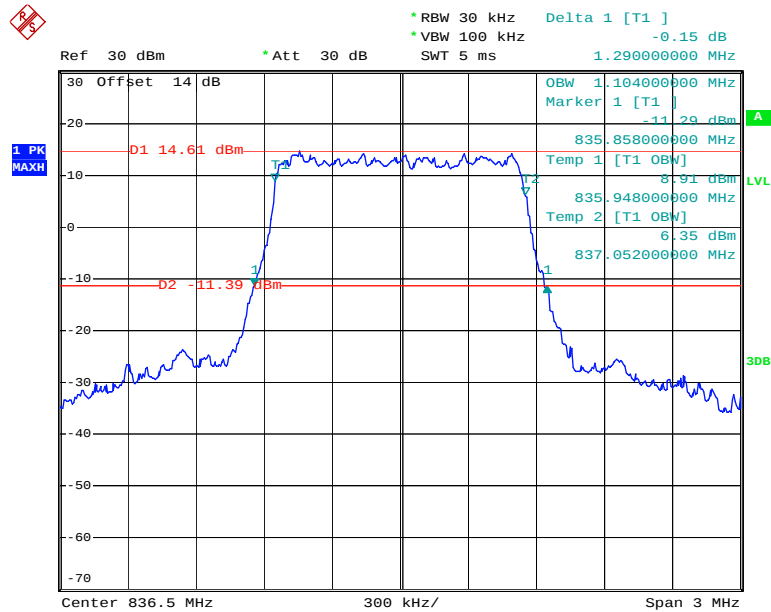
Date: 27.MAR.2020 17:48:14

QPSK_10 MHz



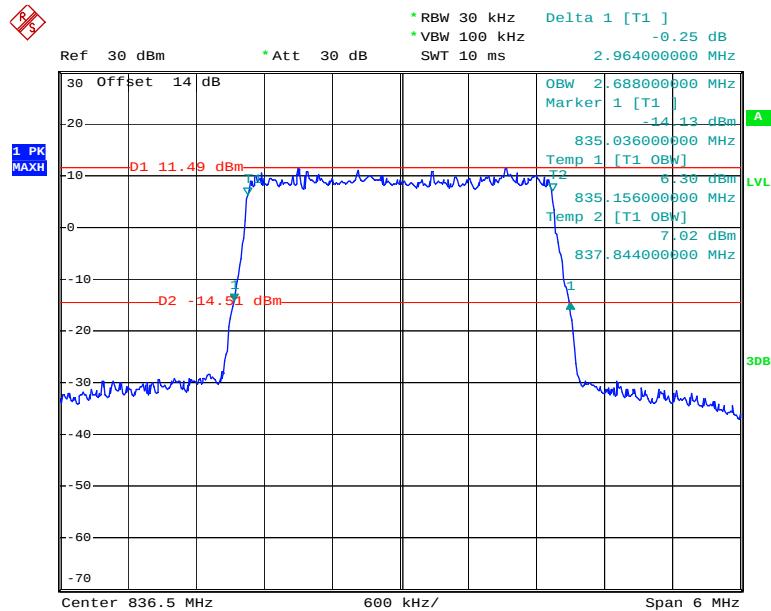
Date: 27.MAR.2020 17:49:01

16QAM_1.4 MHz



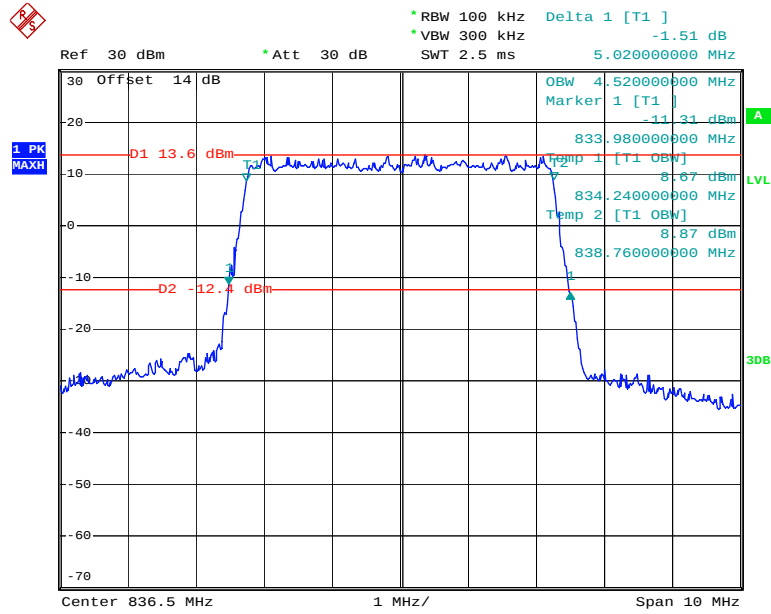
Date: 27.MAR.2020 17:47:08

16QAM_3 MHz



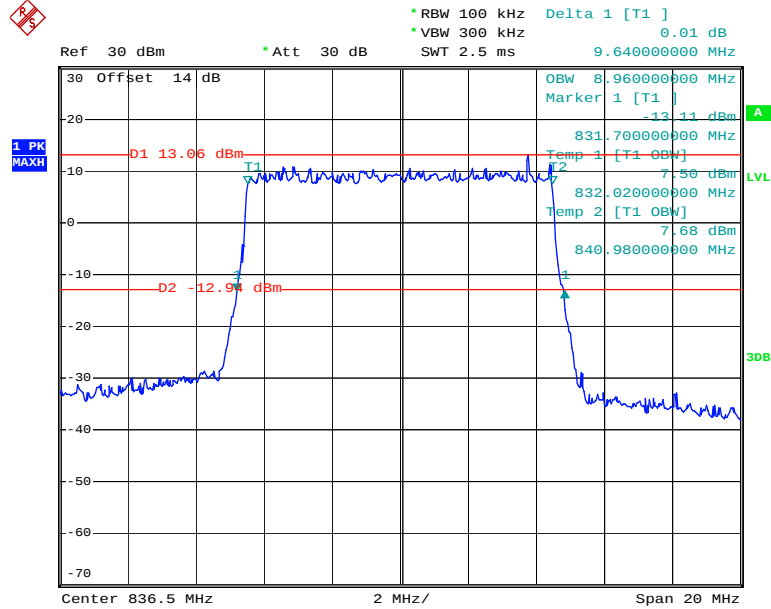
Date: 27.MAR.2020 17:47:50

16QAM_5 MHz



Date: 27.MAR.2020 17:48:35

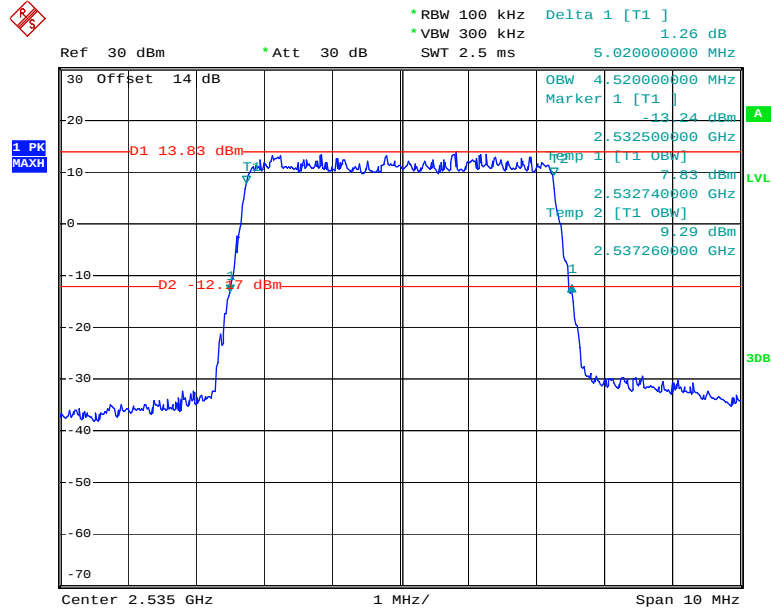
16QAM_10 MHz



Date: 27.MAR.2020 17:49:20

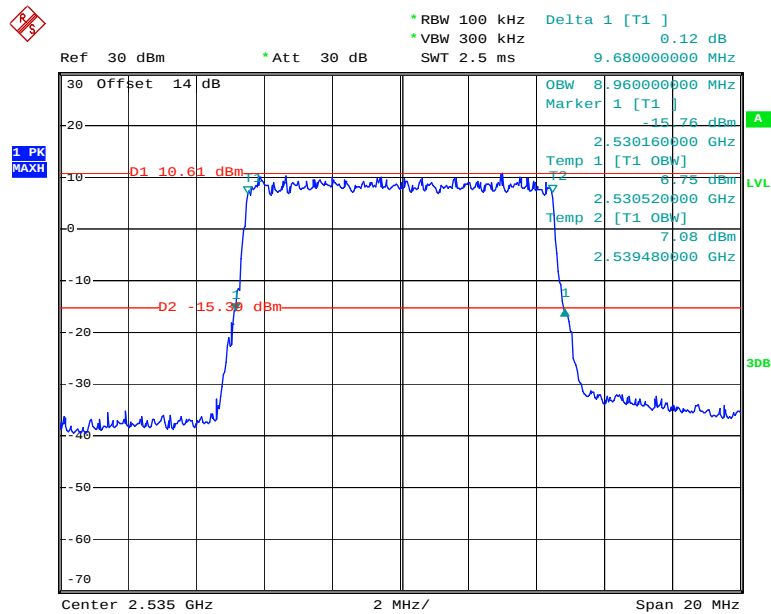
LTE Band 7

QPSK_5 MHz



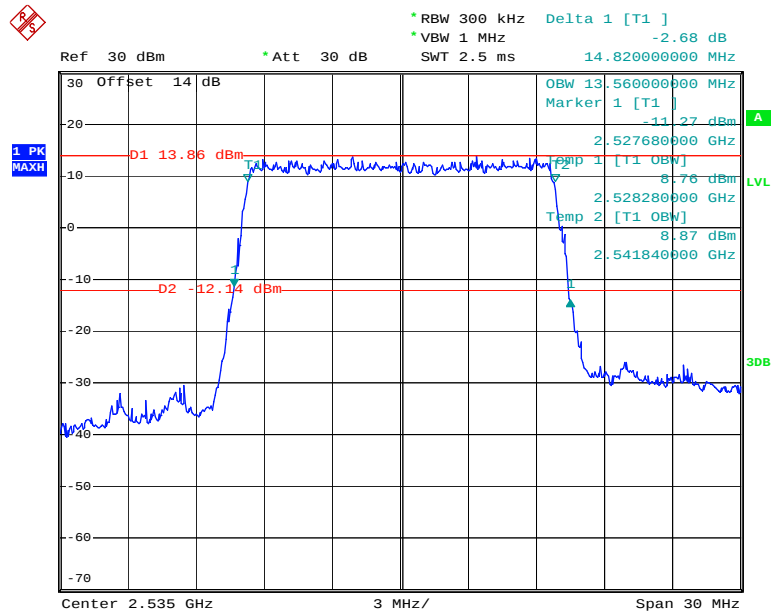
Date: 27.MAR.2020 17:49:51

QPSK_10 MHz



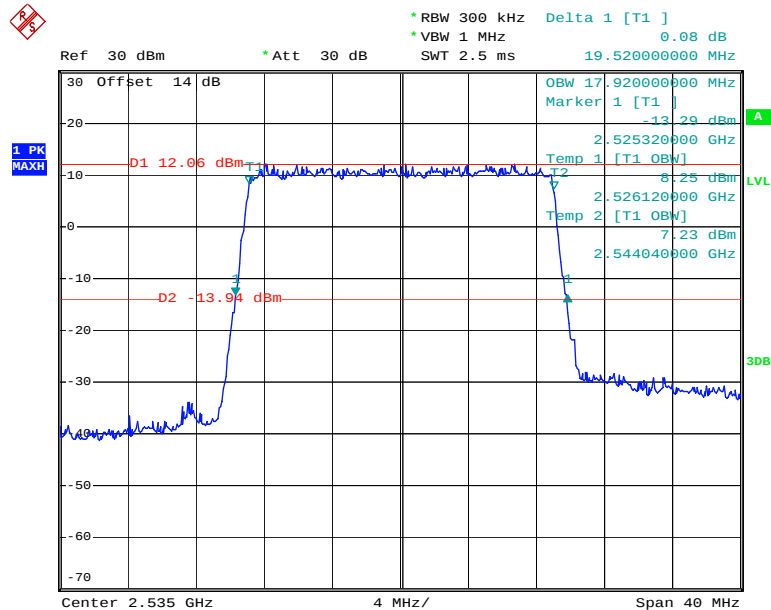
Date: 27.MAR.2020 17:50:42

QPSK_15 MHz



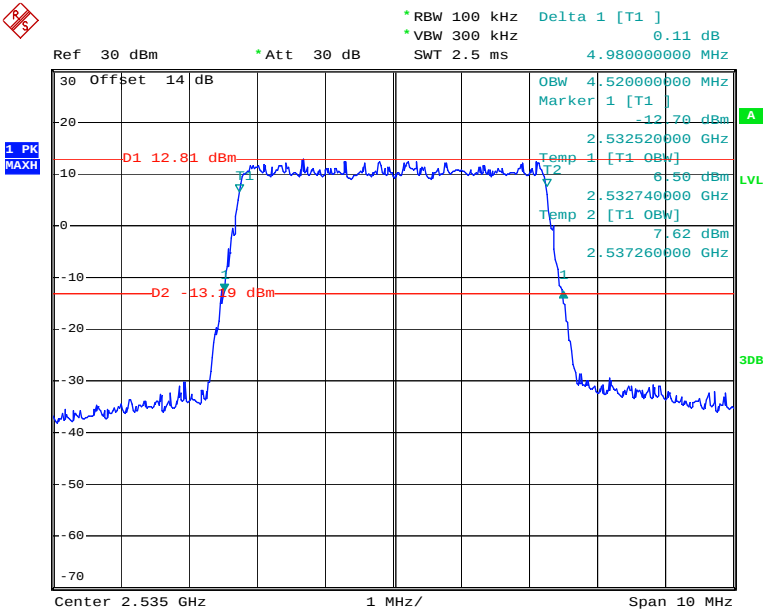
Date: 27.MAR.2020 17:51:29

QPSK_20 MHz



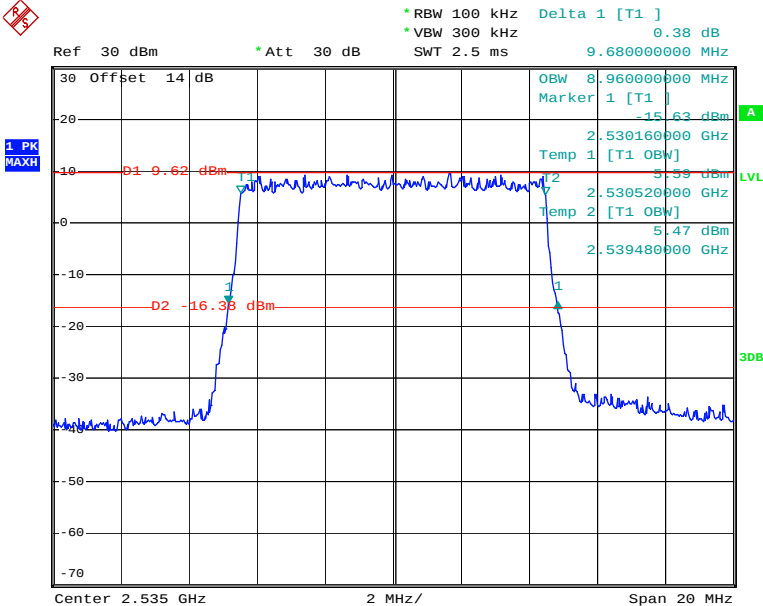
Date: 27.MAR.2020 17:52:23

16QAM_5 MHz



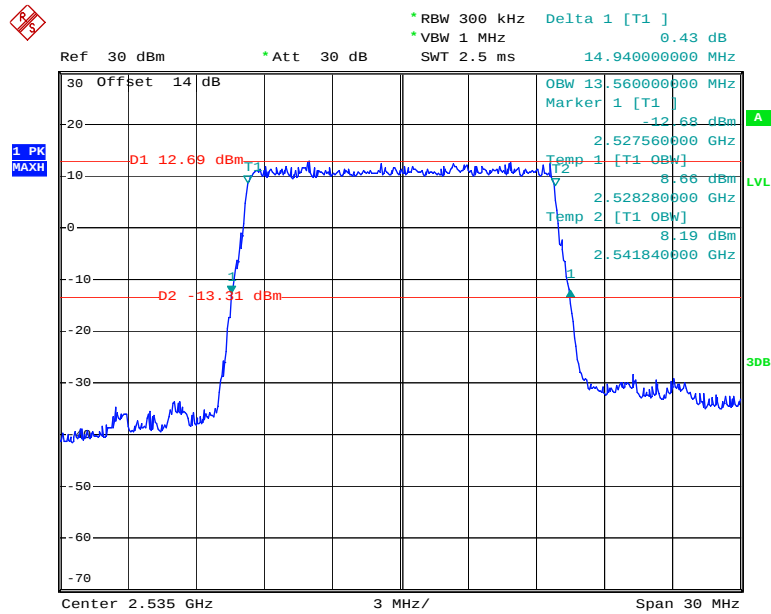
Date: 27.MAR.2020 17:50:16

16QAM_10 MHz



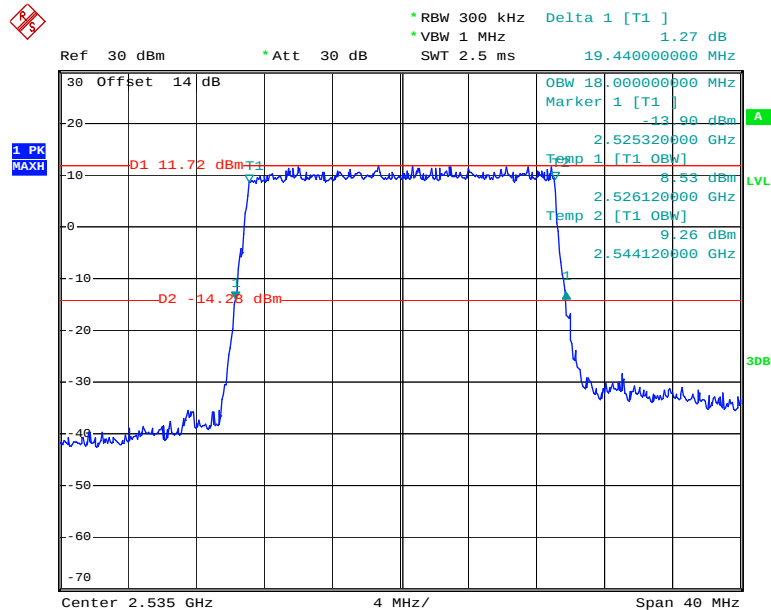
Date: 27.MAR.2020 17:51:04

16QAM_15 MHz

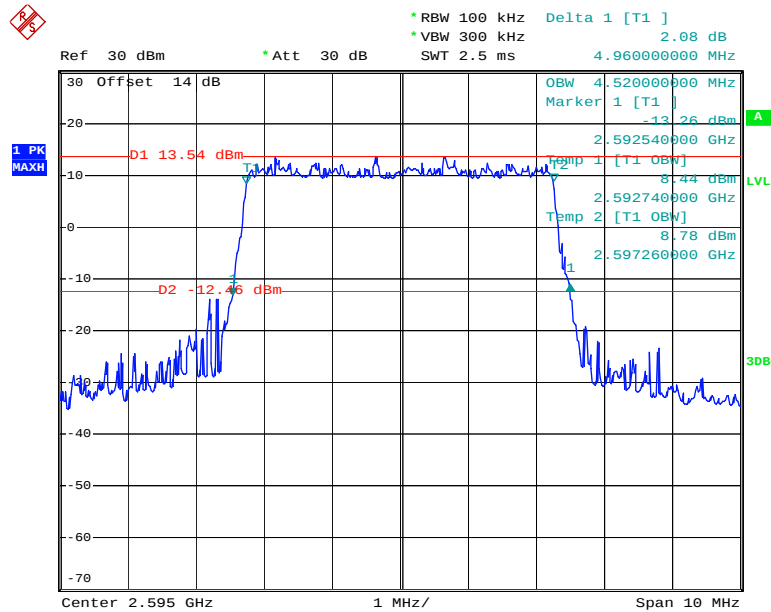


Date: 27.MAR.2020 17:51:54

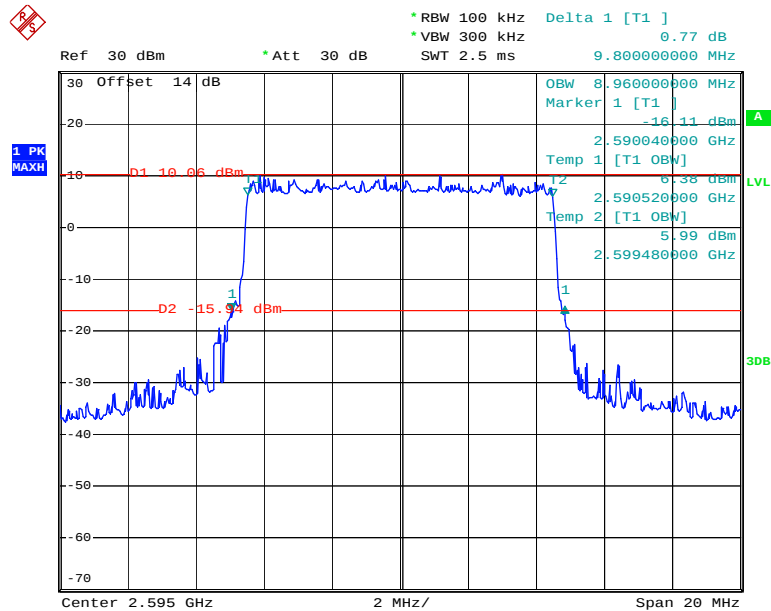
16QAM_20 MHz



Date: 27.MAR.2020 17:52:47

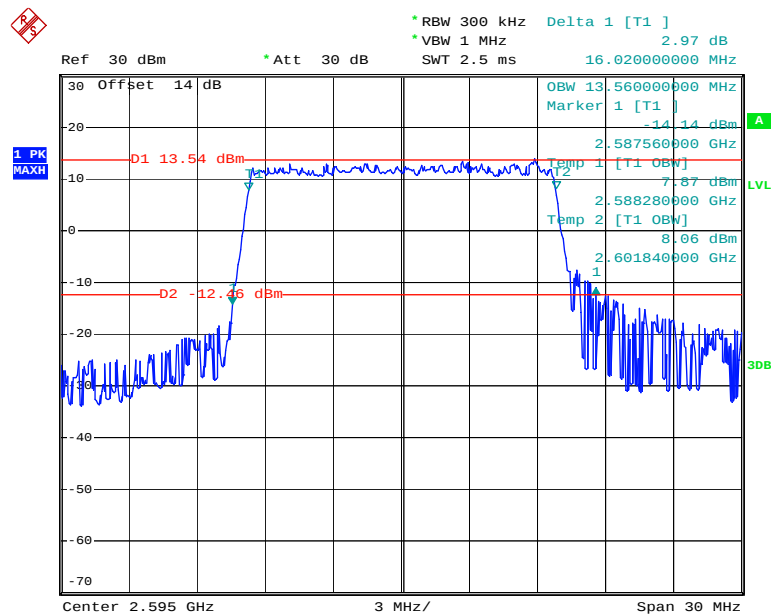
LTE Band 38:**QPSK_5 MHz**

Date: 27.MAR.2020 17:57:41

QPSK_10 MHz

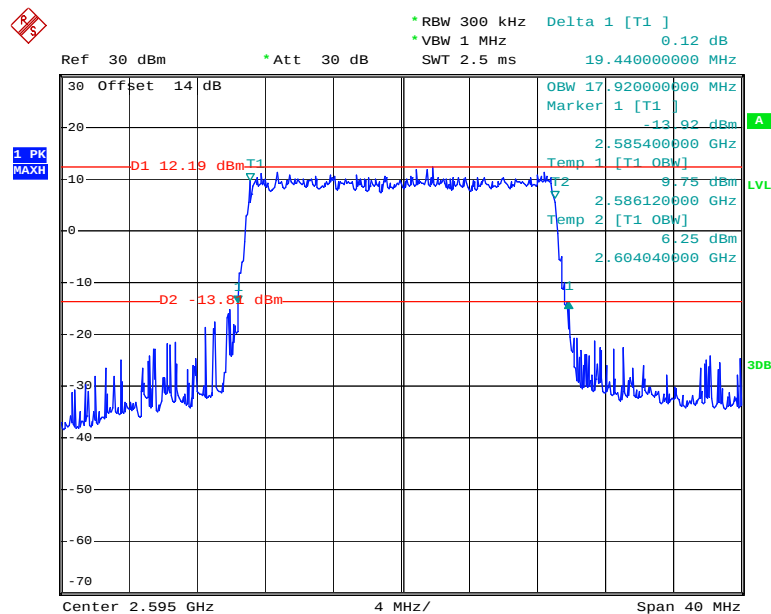
Date: 27.MAR.2020 17:58:31

QPSK_15 MHz



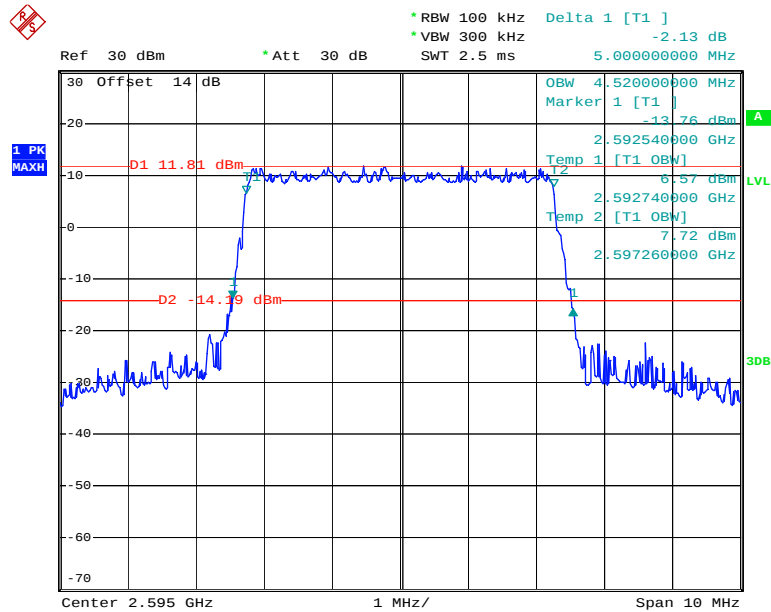
Date: 27.MAR.2020 17:59:37

QPSK_20 MHz



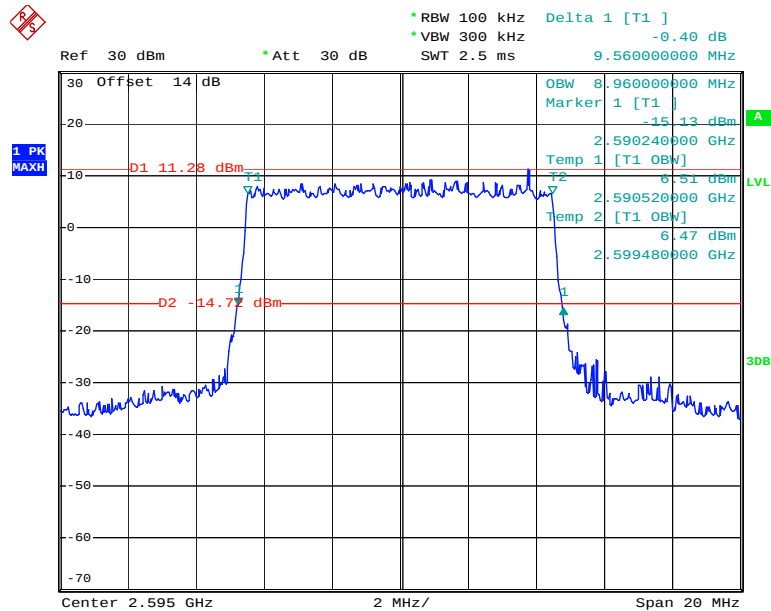
Date: 27.MAR.2020 18:00:55

16QAM_5 MHz



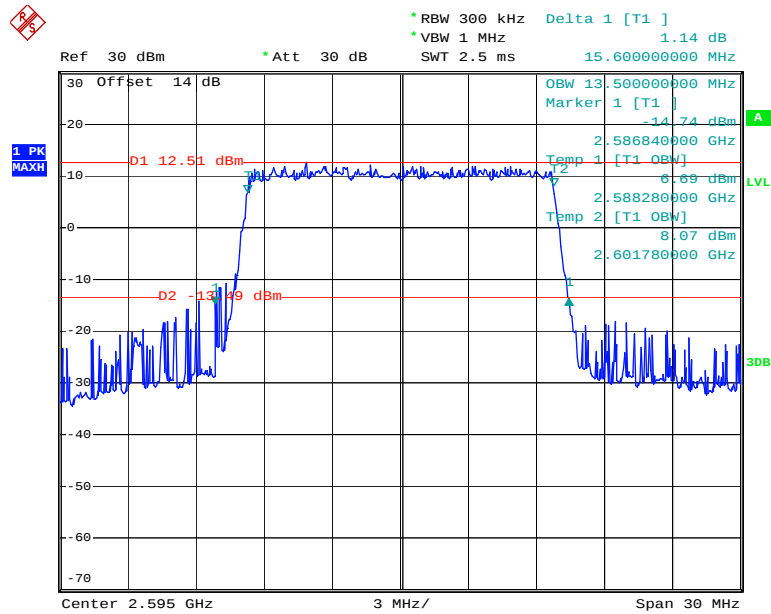
Date: 27.MAR.2020 17:58:06

16QAM_10MHz



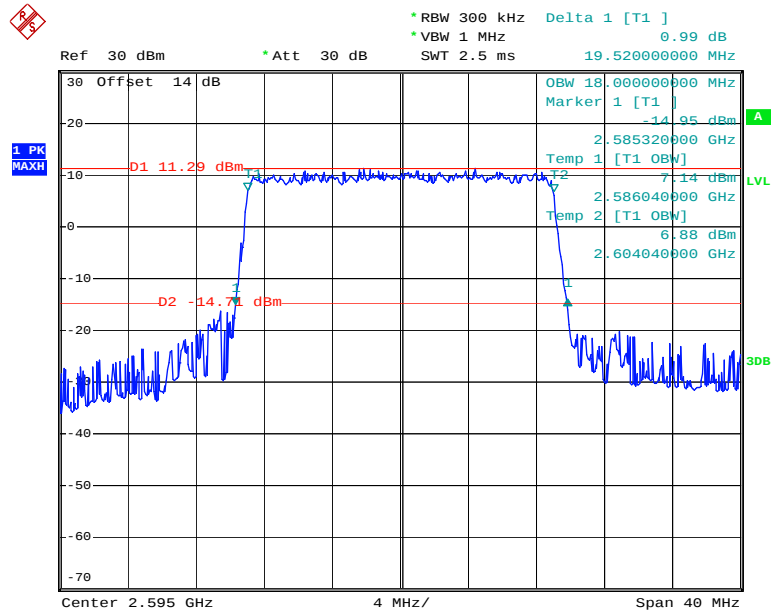
Date: 27.MAR.2020 17:58:54

16QAM_15 MHz

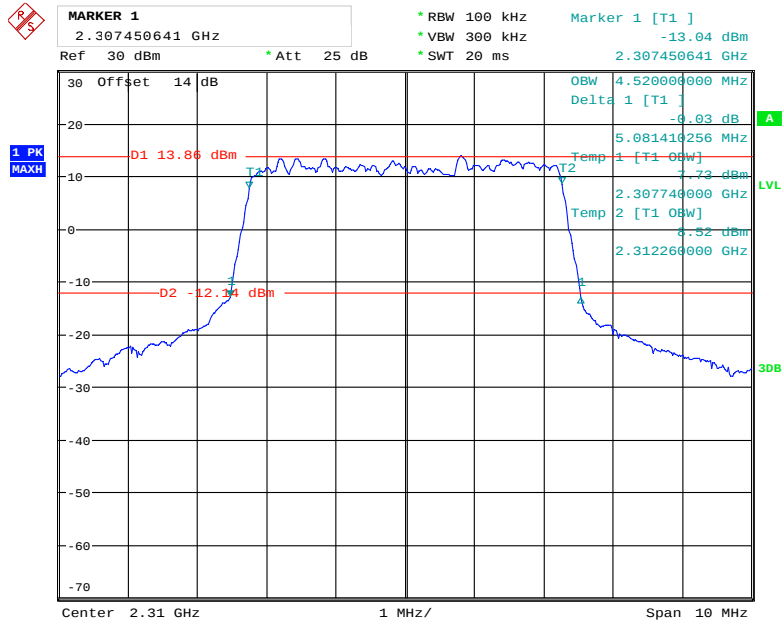


Date: 27.MAR.2020 18:00:05

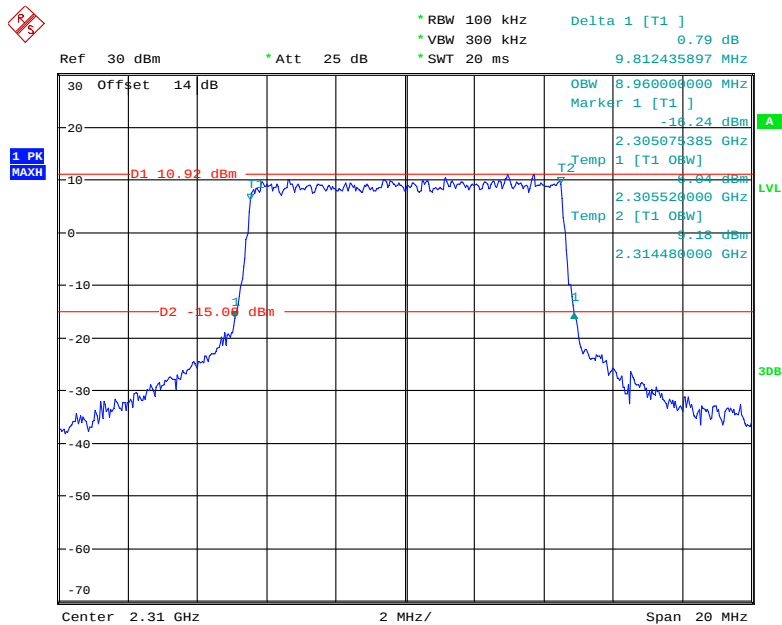
16QAM_20MHz



Date: 27.MAR.2020 18:01:59

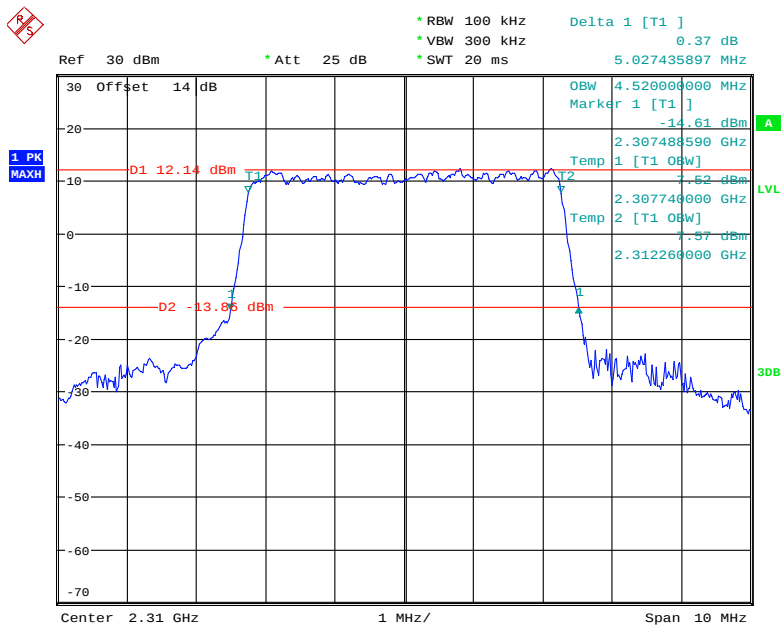
**LTE Band 40:
Lower:****QPSK_5 MHz**

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

QPSK_10 MHz

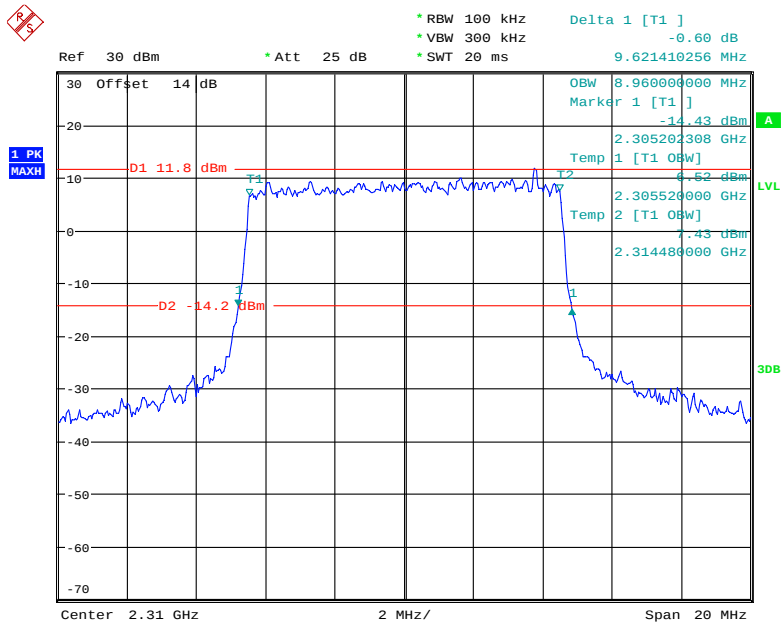
Date: 1.APR.2020 20:21:20

16QAM_5 MHz



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

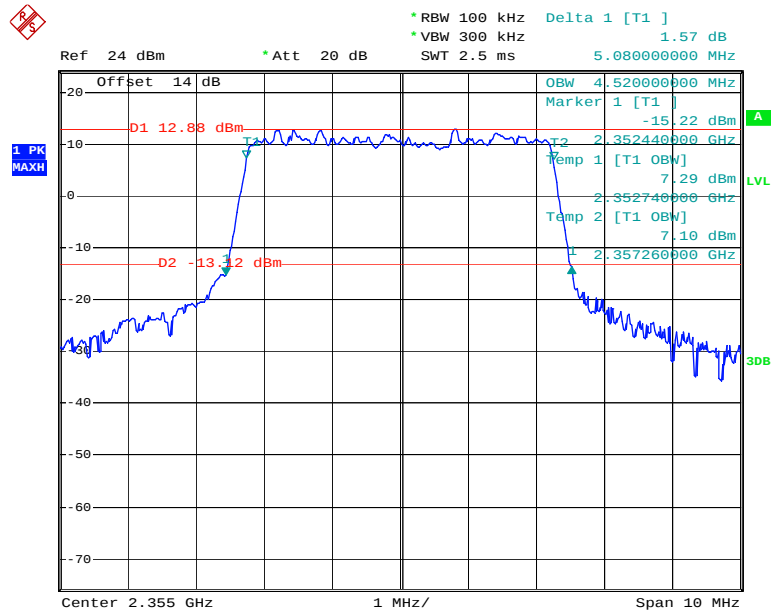
16QAM_10MHz



Date: 1.APR.2020 20:19:15

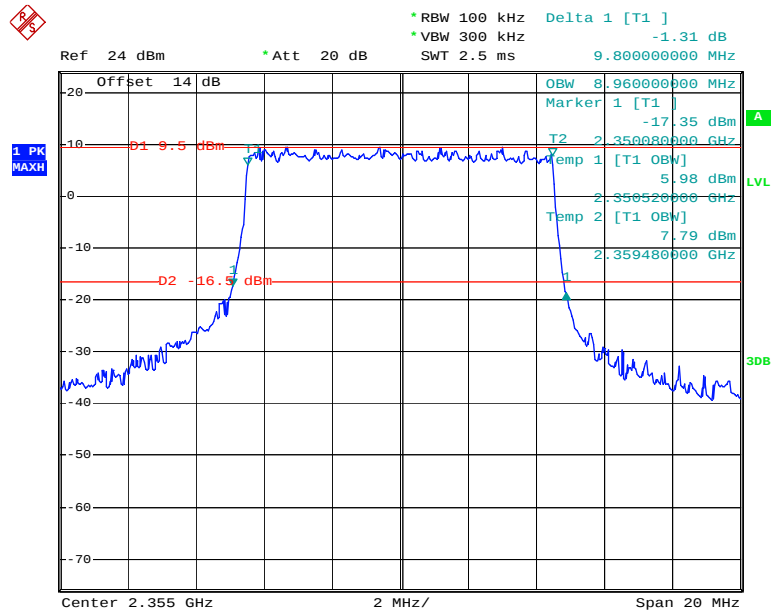
Upper:

QPSK_5 MHz



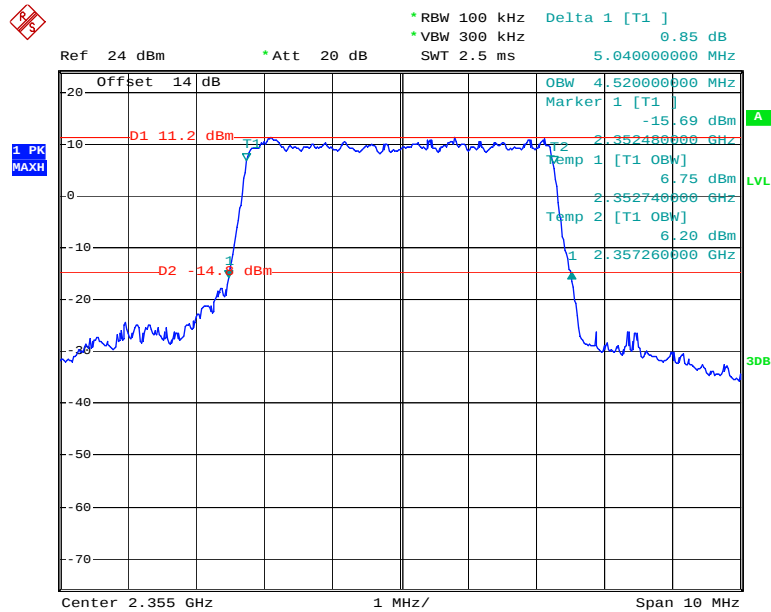
Date: 16.APR.2020 10:39:54

QPSK_10 MHz



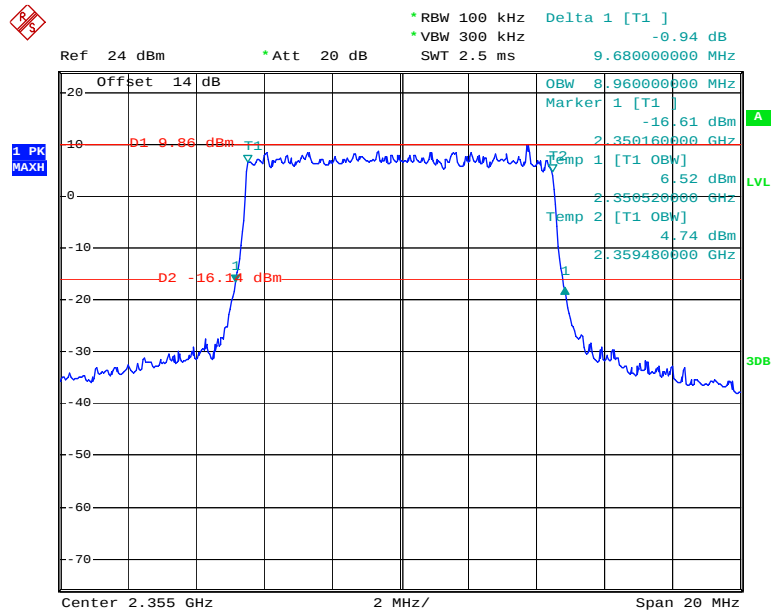
Date: 16.APR.2020 10:37:05

16QAM_5 MHz

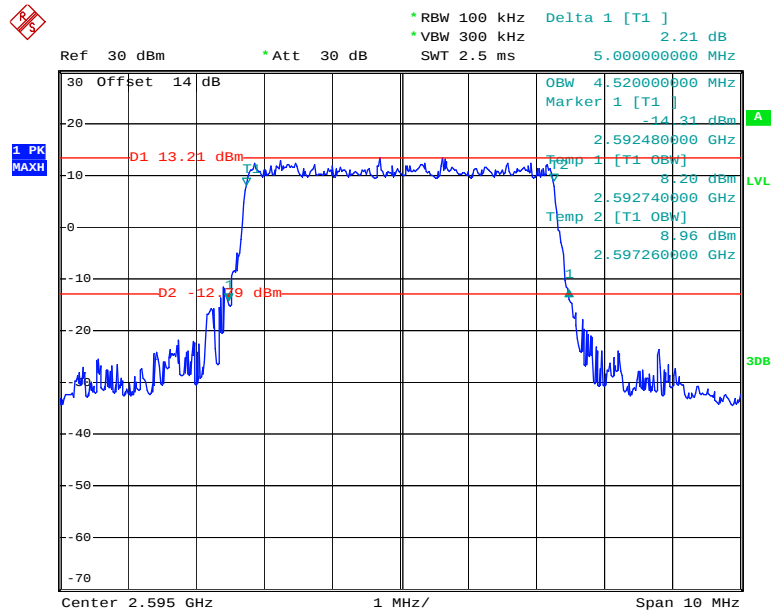


Date: 16.APR.2020 10:42:09

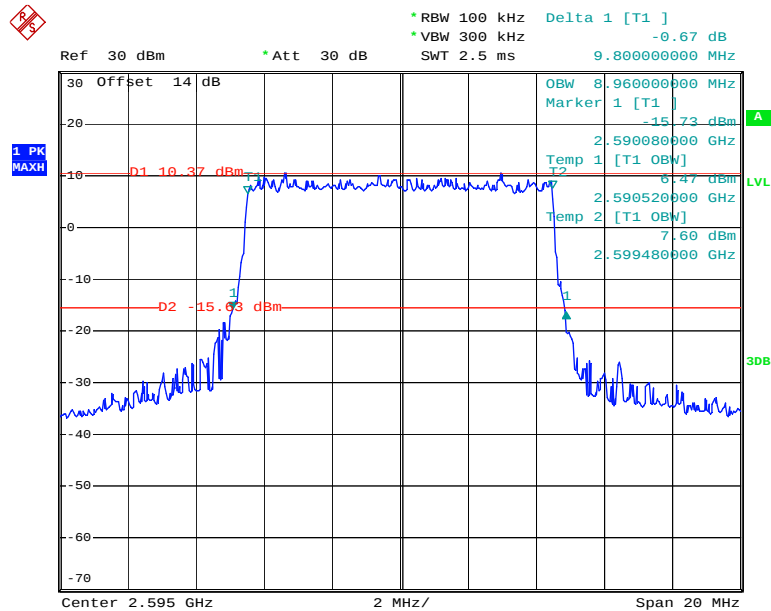
16QAM_10MHz



Date: 16.APR.2020 10:34:44

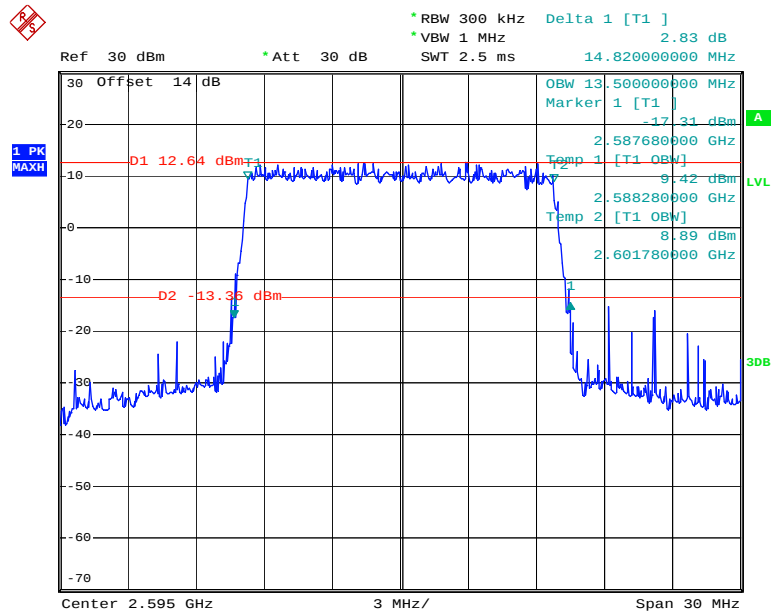
LTE Band 41:**QPSK_5 MHz**

Date: 27.MAR.2020 18:08:24

QPSK_10 MHz

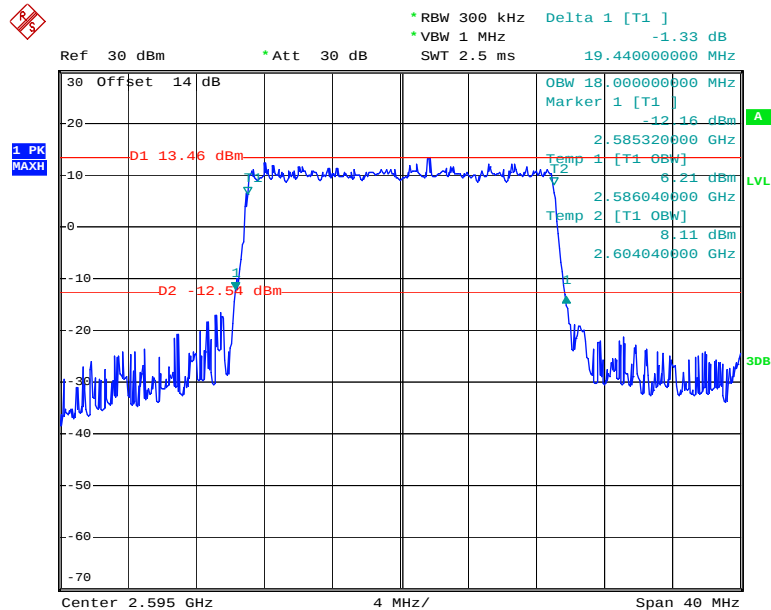
Date: 27.MAR.2020 18:09:31

QPSK_15 MHz



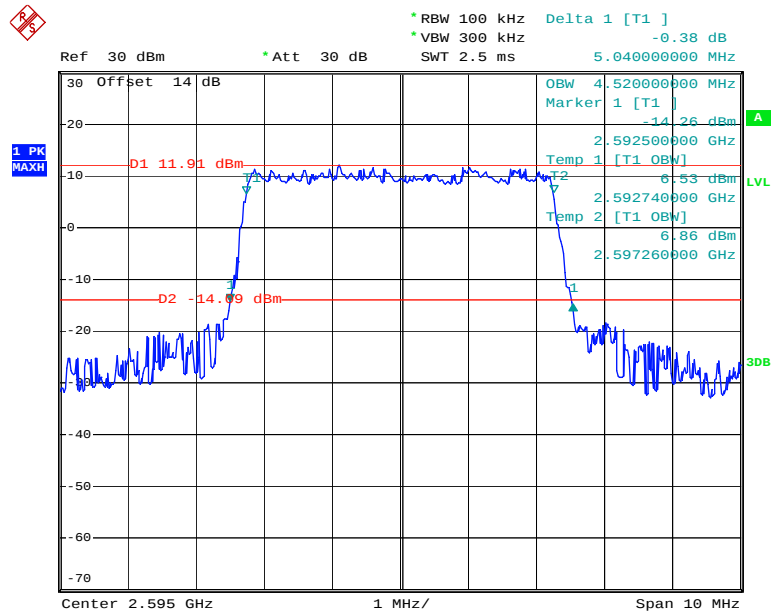
Date: 27.MAR.2020 18:10:59

QPSK_20MHz



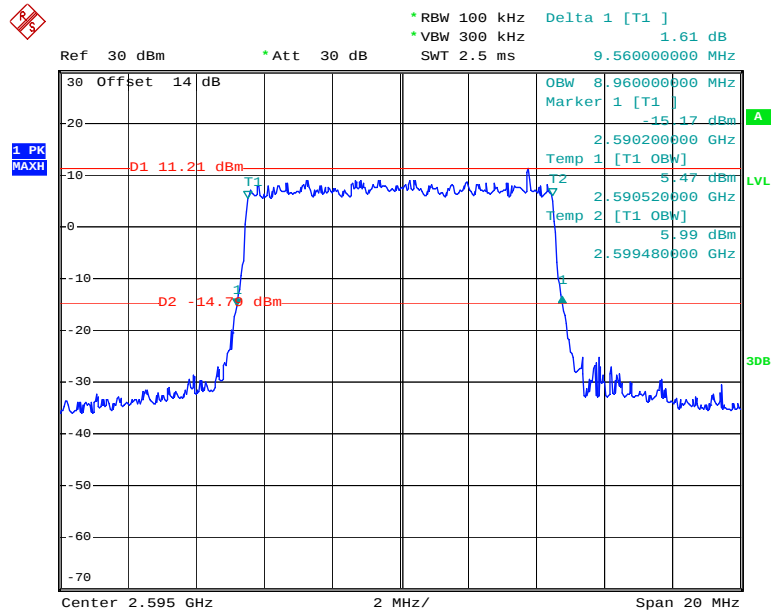
Date: 27.MAR.2020 18:13:26

16QAM_5 MHz



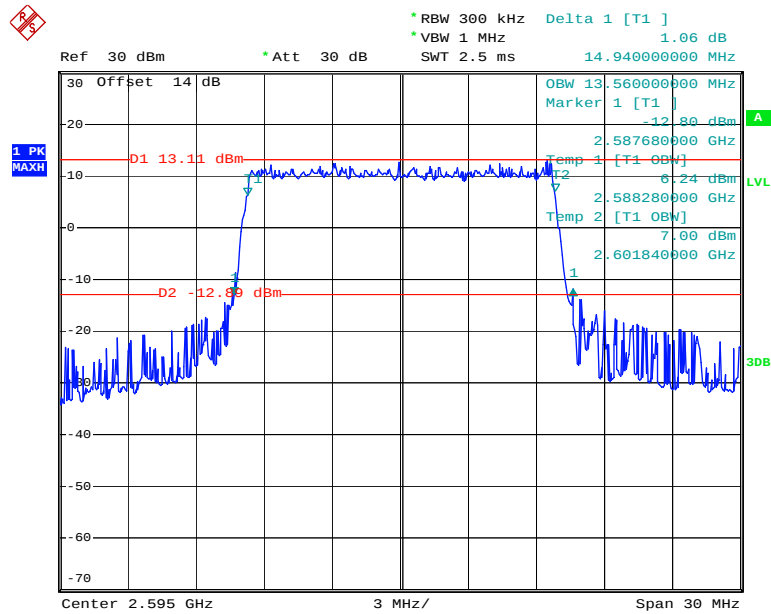
Date: 27.MAR.2020 18:08:58

16QAM_10 MHz



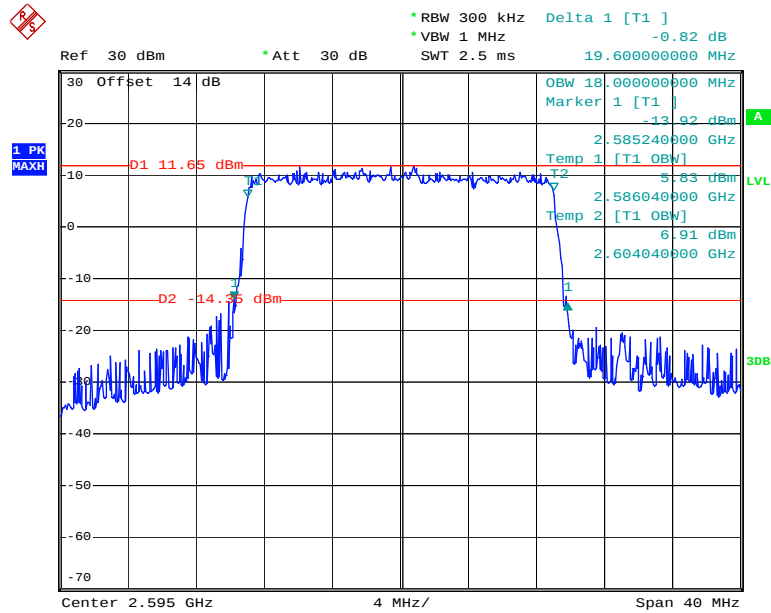
Date: 27.MAR.2020 18:10:03

16QAM_15 MHz



Date: 27.MAR.2020 18:12:55

16QAM_20 MHz



Date: 27.MAR.2020 18:13:57

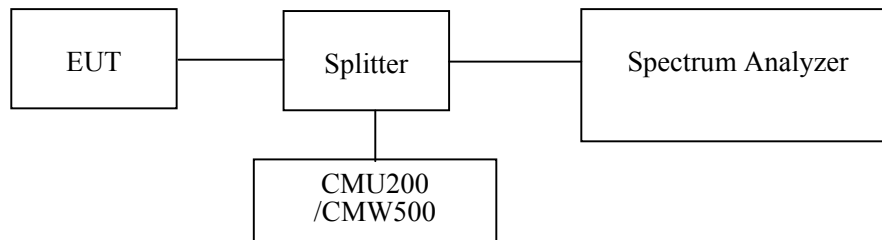
FCC §2.1051, §22.917(a) & §24.238(a) & §27.53- SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Applicable Standard

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

Test Procedure

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



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2019-05-09	2020-05-09
R&S	Spectrum Analyzer	FSU 26	200256	2020-01-04	2021-01-04
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005011	Each Time	/
E-Microwave	Two-way Splitter	ODP-1-6-2S	OE0120142	Each Time	/
Unknown	Coaxial Cable	C-SJ00-0010	C0010/04	Each Time	/
E-Microwave	Coaxial Attenuators	EMCA10-5RN-6	OE01203239	Each Time	/

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

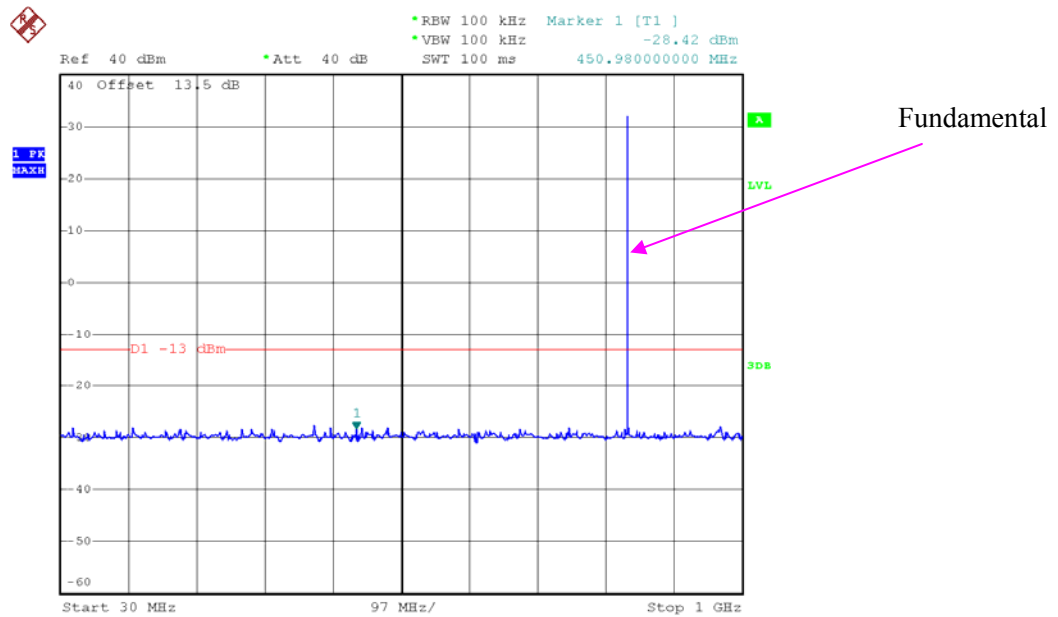
Test Data

Environmental Conditions

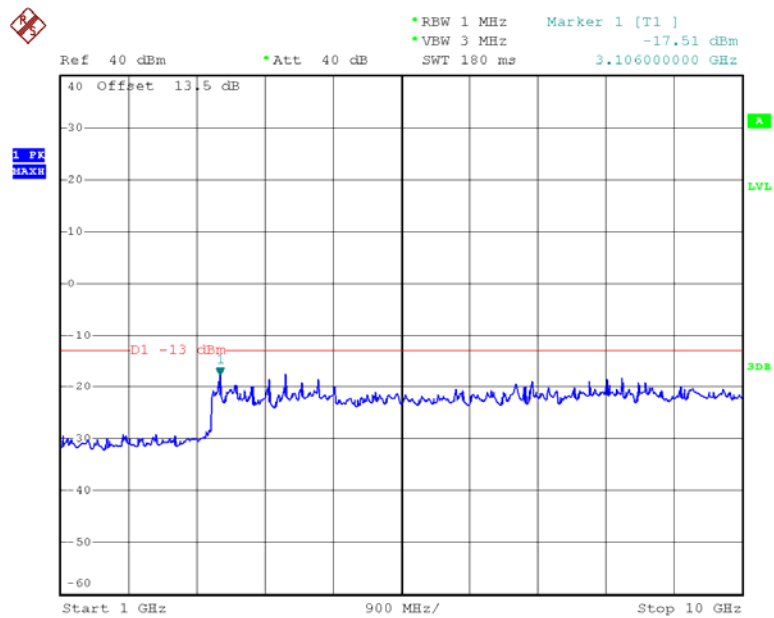
Temperature:	22.7~26°C
Relative Humidity:	55~65 %
ATM Pressure:	100.8~101.8 kPa
Tester:	Lucy Lu
Test Date:	2020-03-25~2020-04-02

Please refer to the following plots.

GPRS850_Middle Channel

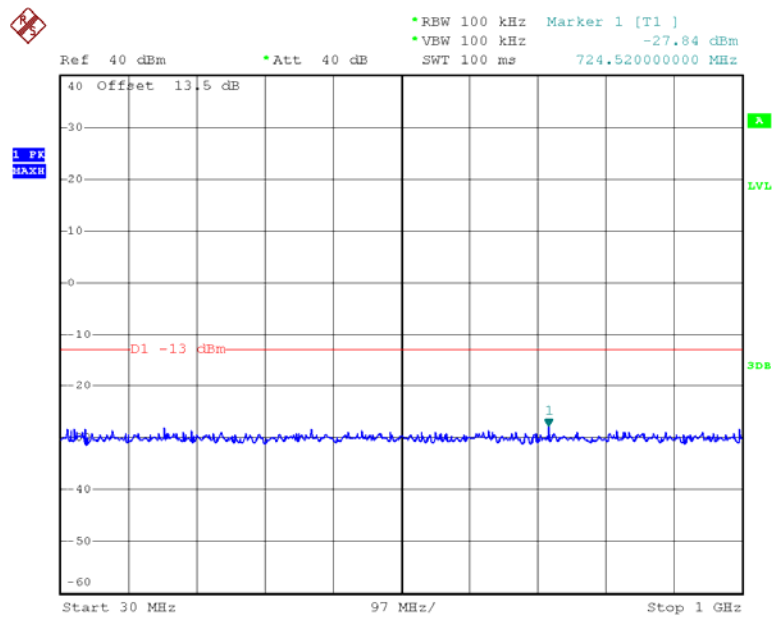


Date: 25.MAR.2020 16:02:33



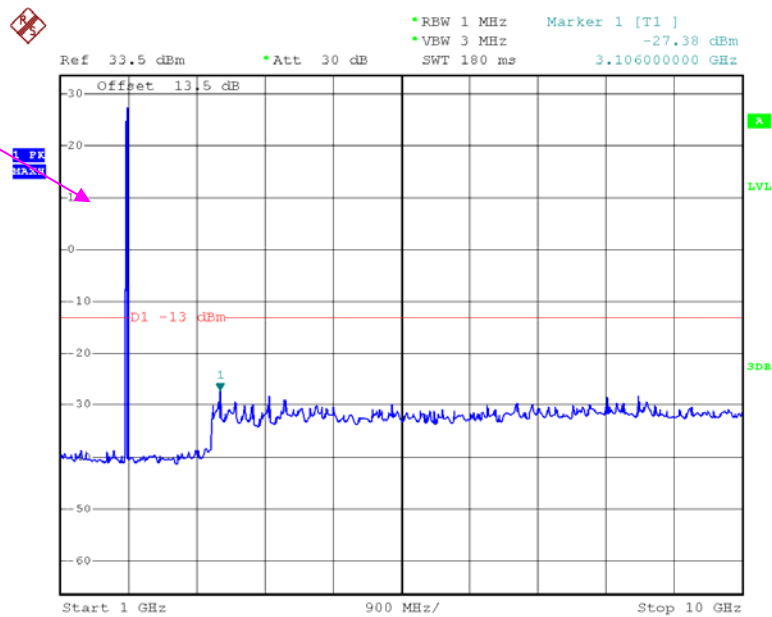
Date: 25.MAR.2020 16:03:45

PCS 1900_ Middle Channel

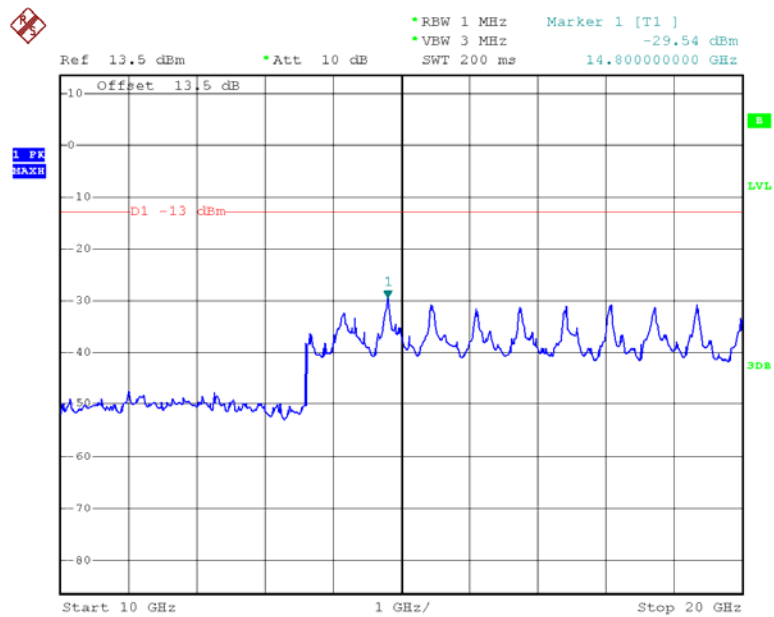


Date: 25.MAR.2020 17:33:30

Fundamental

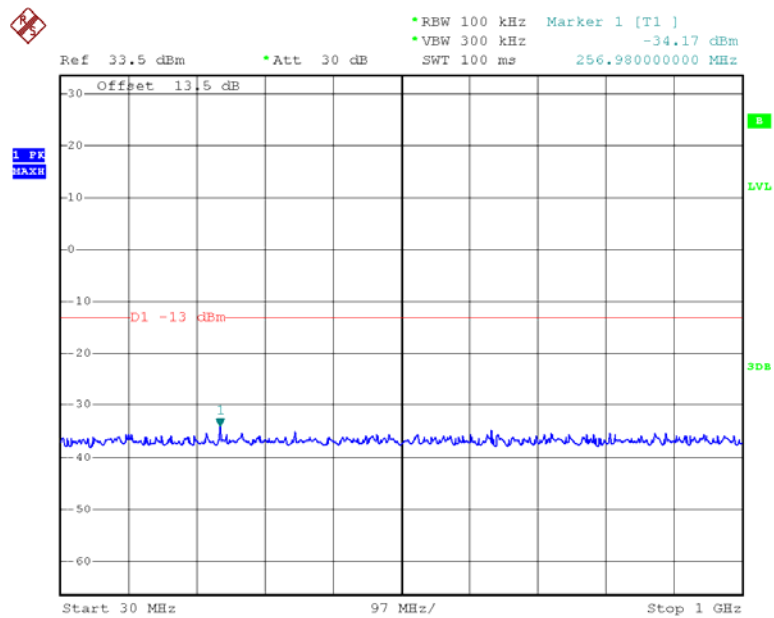


Date: 25.MAR.2020 17:37:37



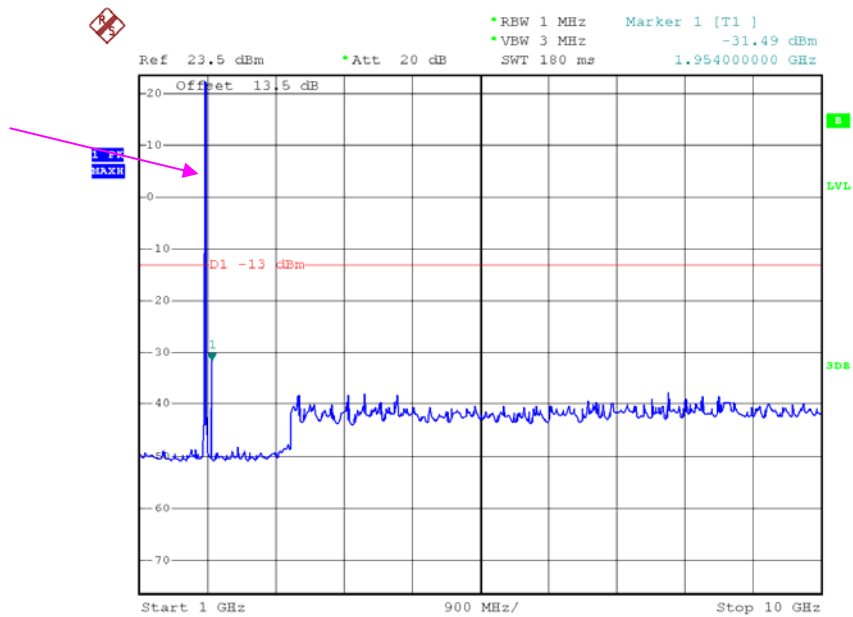
Date: 25.MAR.2020 18:27:25

WCDMA Band II, Rel99

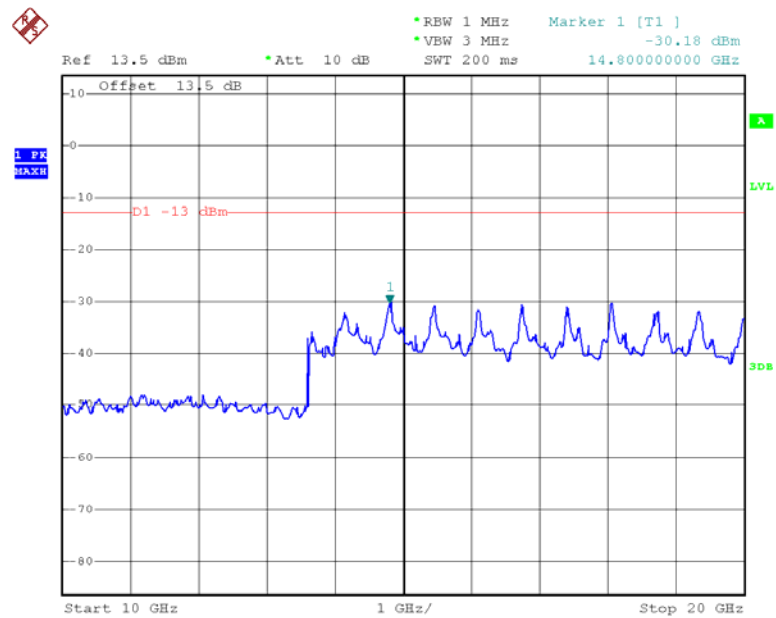


Date: 26.MAR.2020 10:22:30

Fundamental

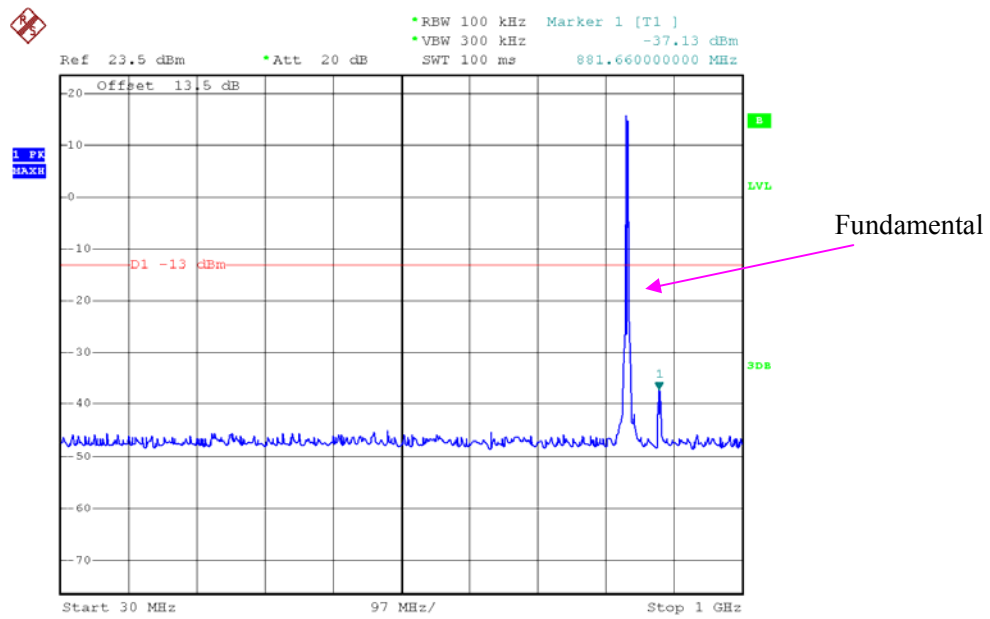


Date: 26.MAR.2020 10:23:18

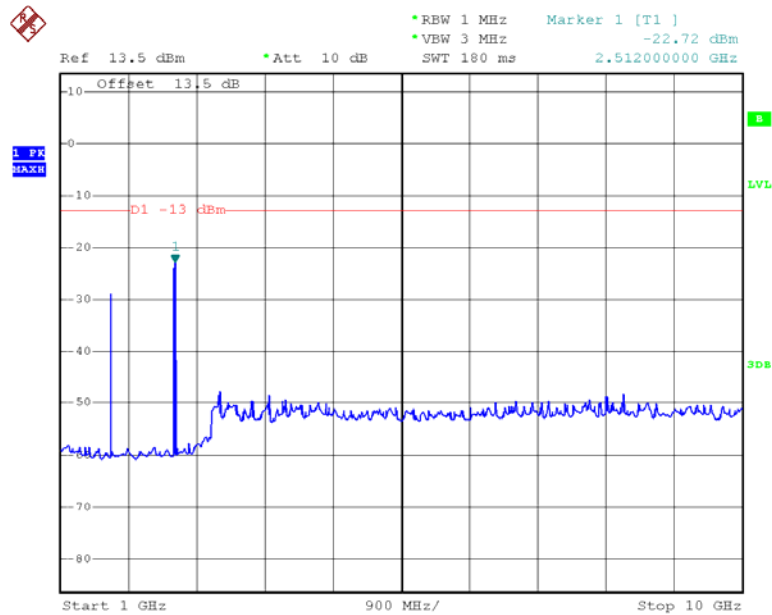


Date: 26.MAR.2020 09:48:29

WCDMA Band V, Rel99



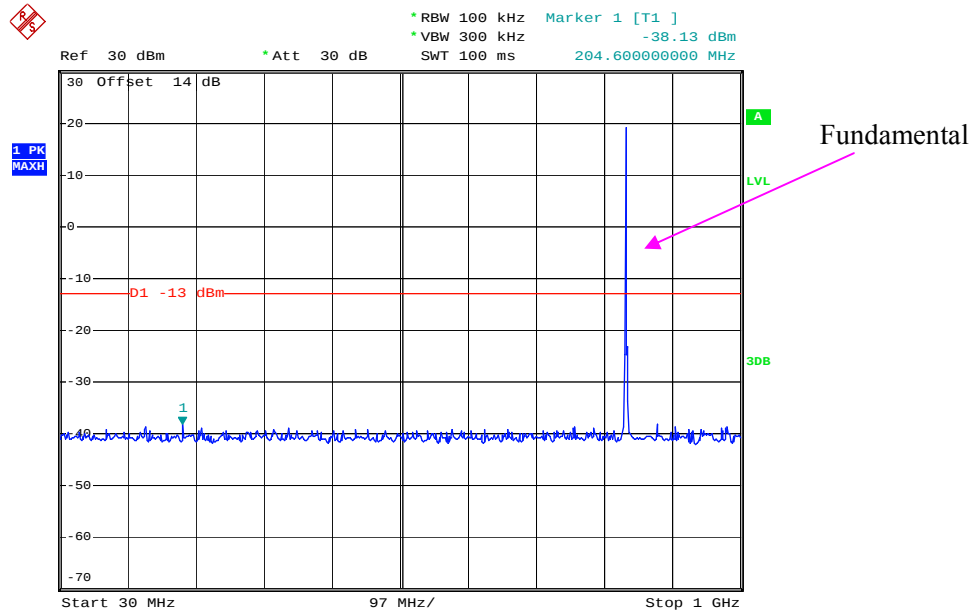
Date: 26.MAR.2020 10:55:02



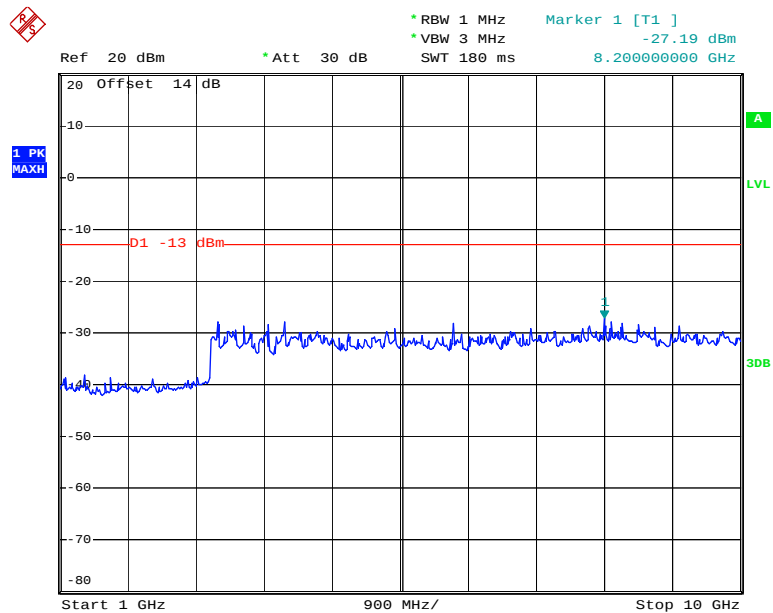
Date: 26.MAR.2020 10:53:48

LTE Band 5 (Middle Channel)

QPSK_1.4 MHz

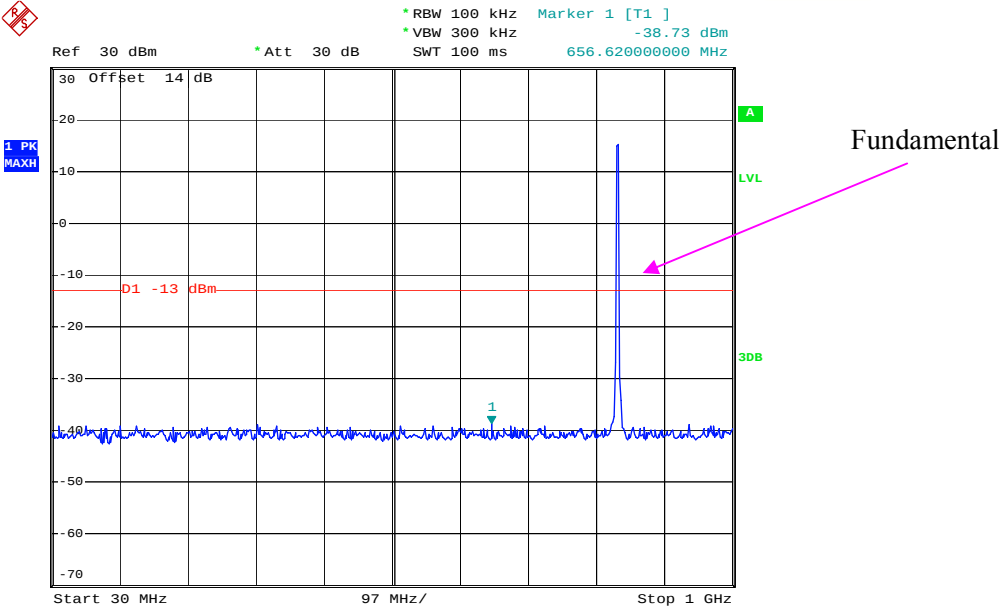


Date: 28.MAR.2020 10:18:42

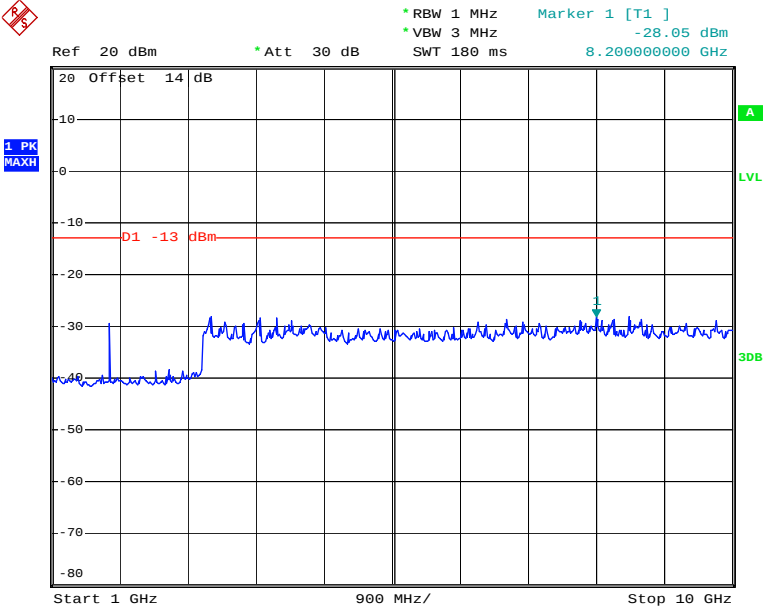


Date: 28.MAR.2020 10:18:56

QPSK_3 MHz

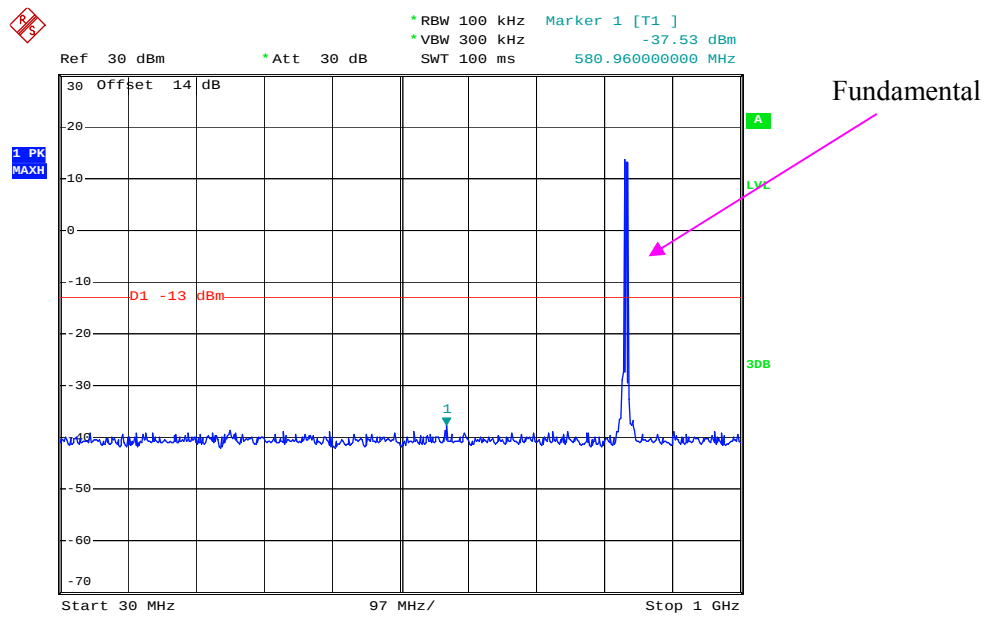


Date: 28.MAR.2020 10:19:16

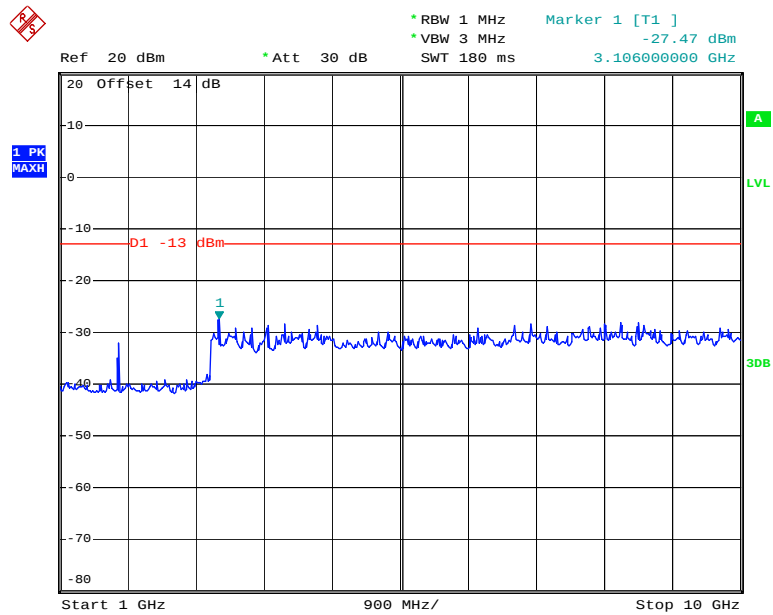


Date: 28.MAR.2020 10:19:32

QPSK_5 MHz

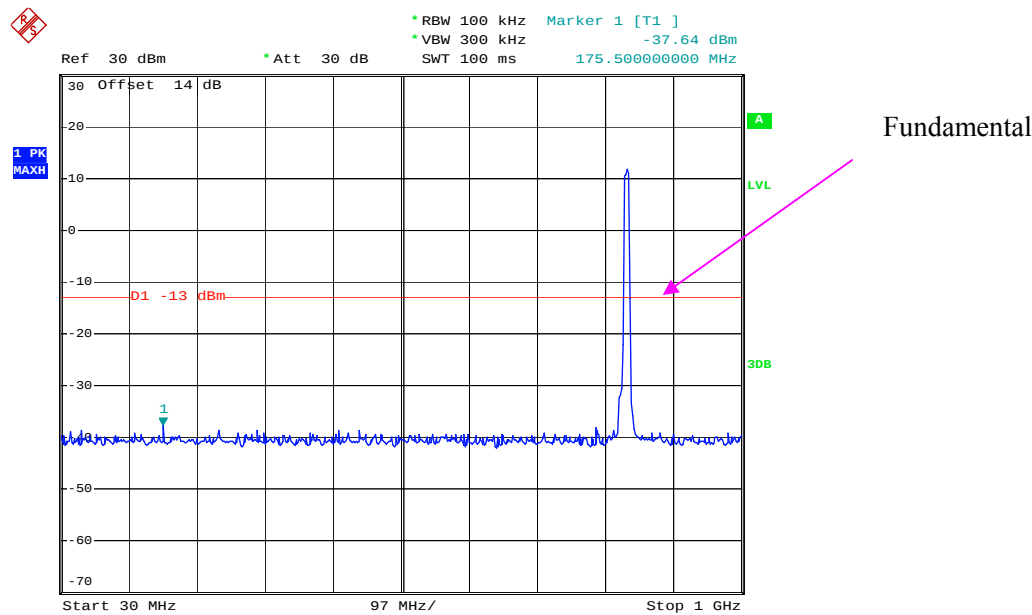


Date: 28.MAR.2020 10:19:56

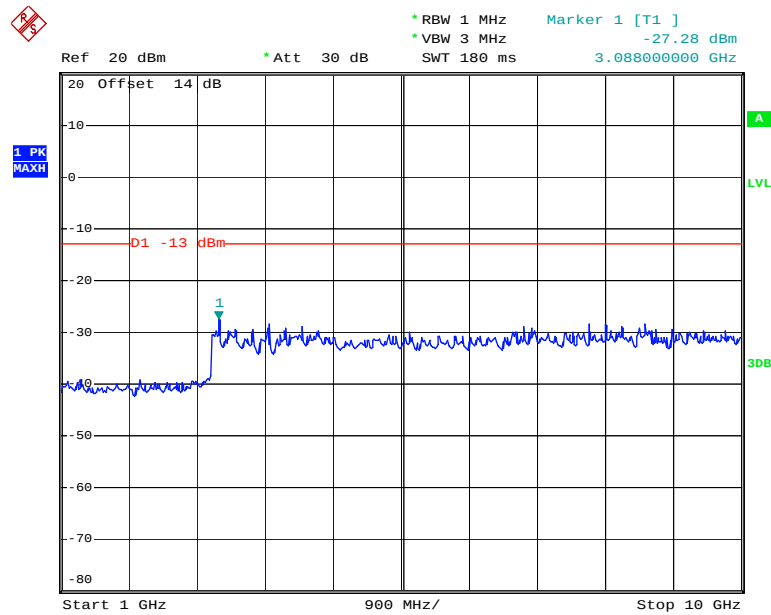


Date: 28.MAR.2020 10:20:09

QPSK_10 MHz



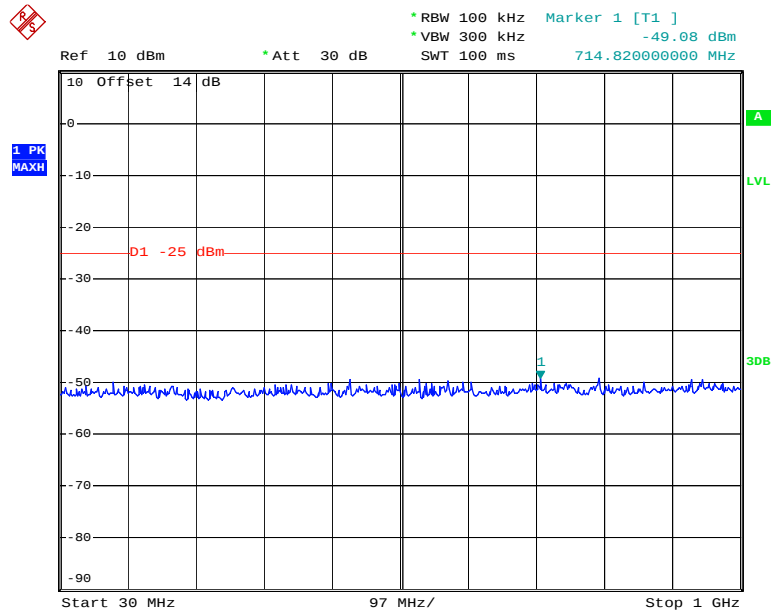
Date: 28.MAR.2020 10:20:33



Date: 28.MAR.2020 10:20:46

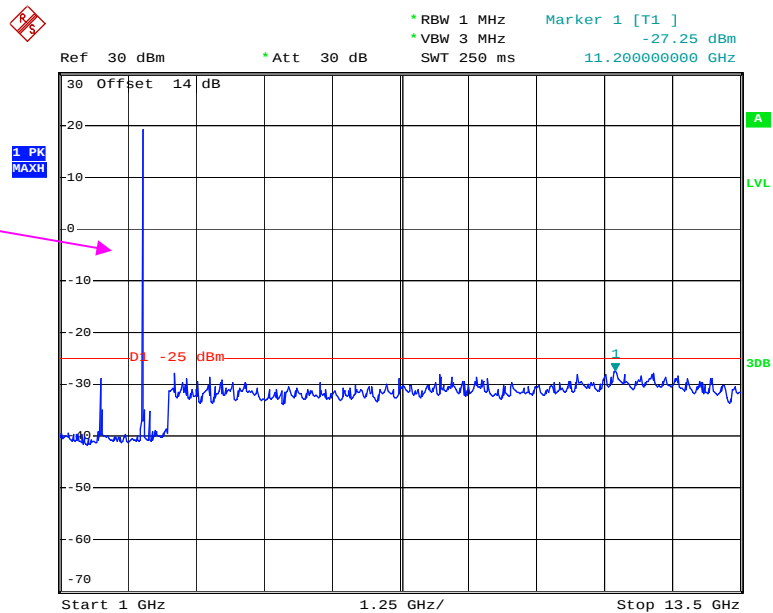
LTE Band 7 (Middle Channel)

QPSK_5 MHz

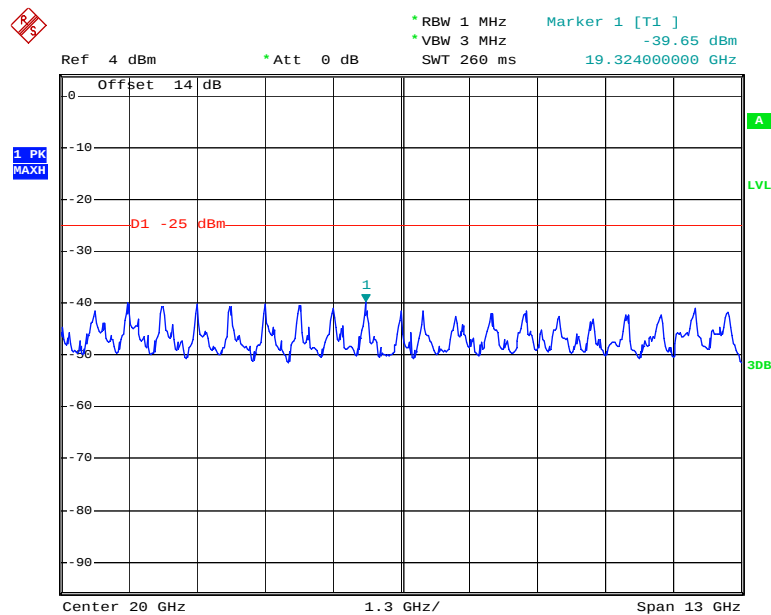


Date: 28.MAR.2020 10:21:16

Fundamental

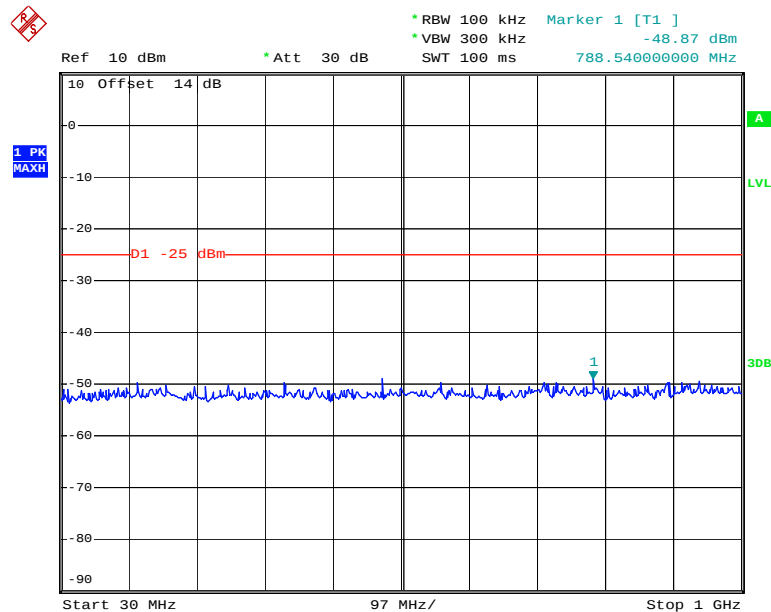


Date: 28.MAR.2020 10:21:29

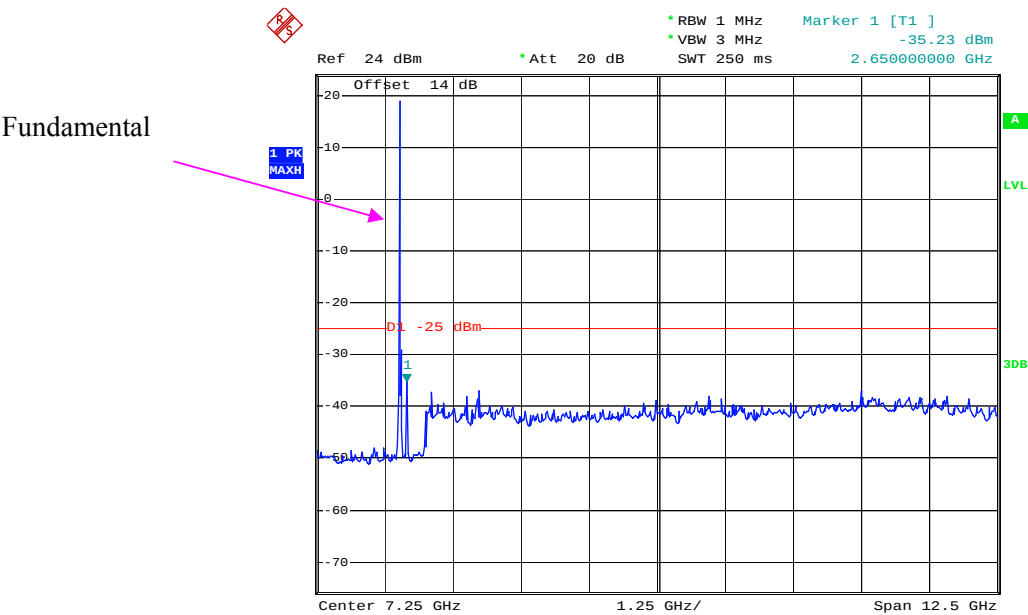


Date: 28.MAR.2020 10:22:30

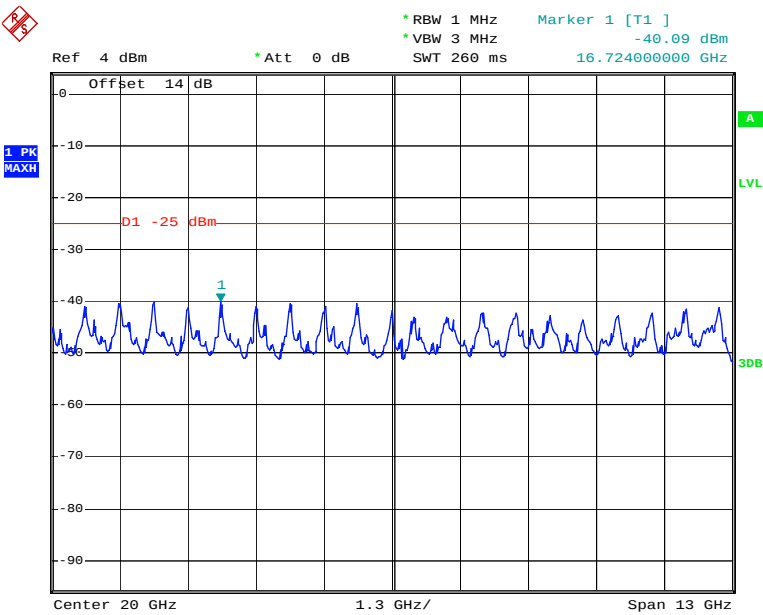
QPSK_10 MHz



Date: 28.MAR.2020 10:22:51

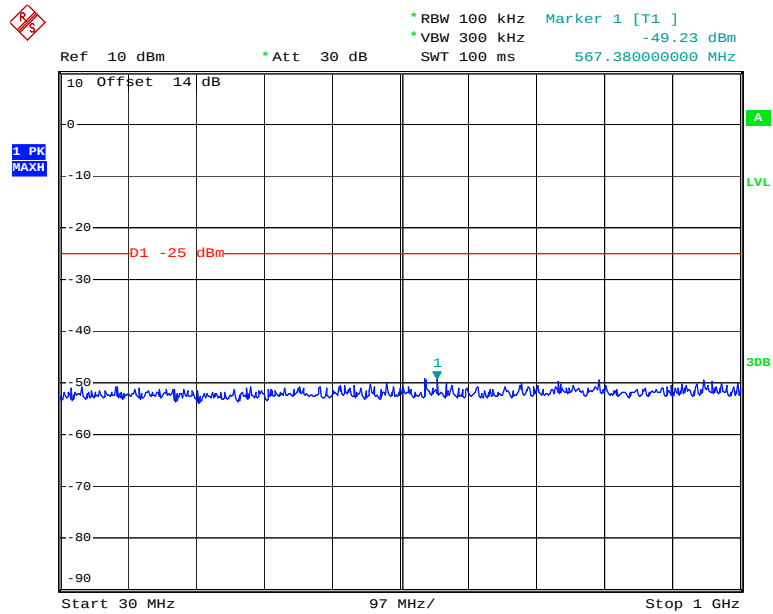


Date: 28.MAR.2020 10:24:10



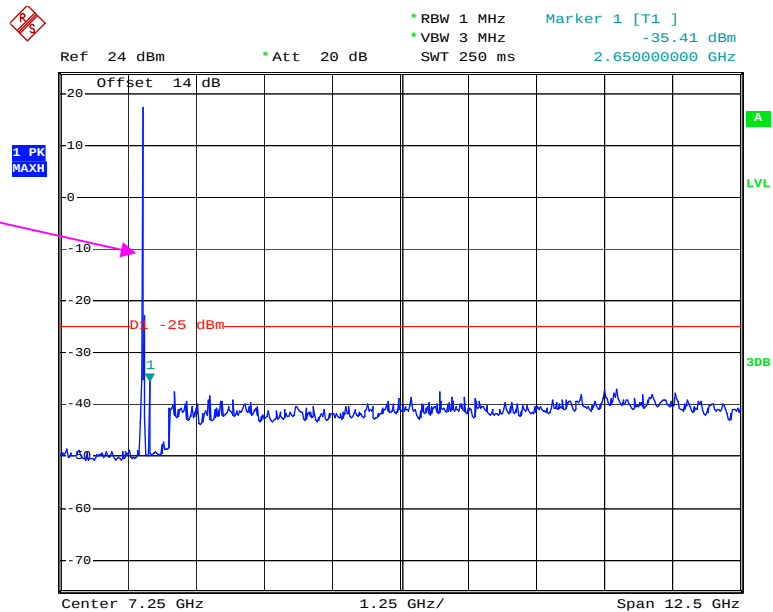
Date: 28.MAR.2020 10:24:46

QPSK_15 MHz

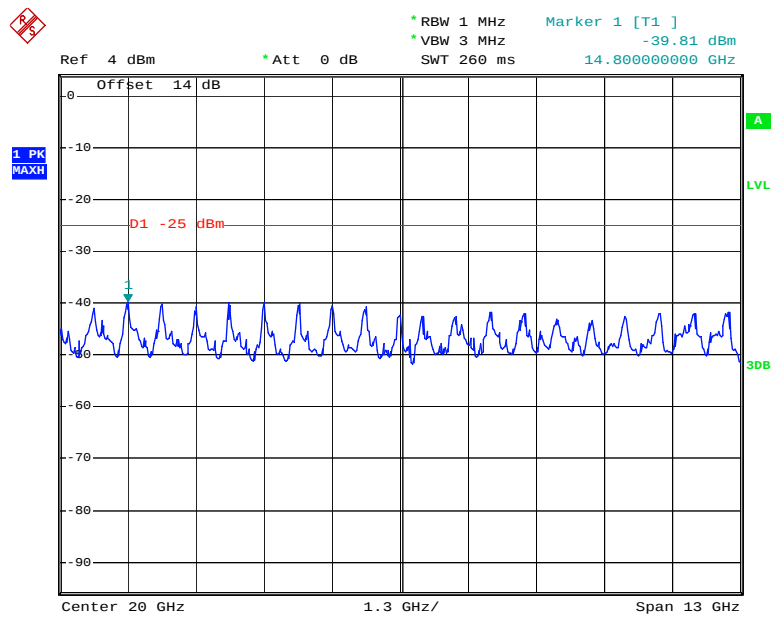


Date: 28.MAR.2020 10:25:09

Fundamental

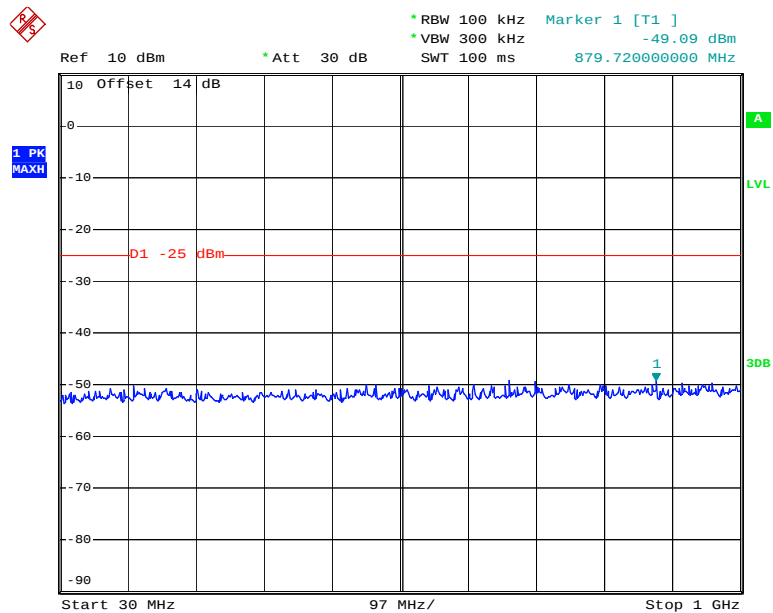


Date: 28.MAR.2020 10:25:45

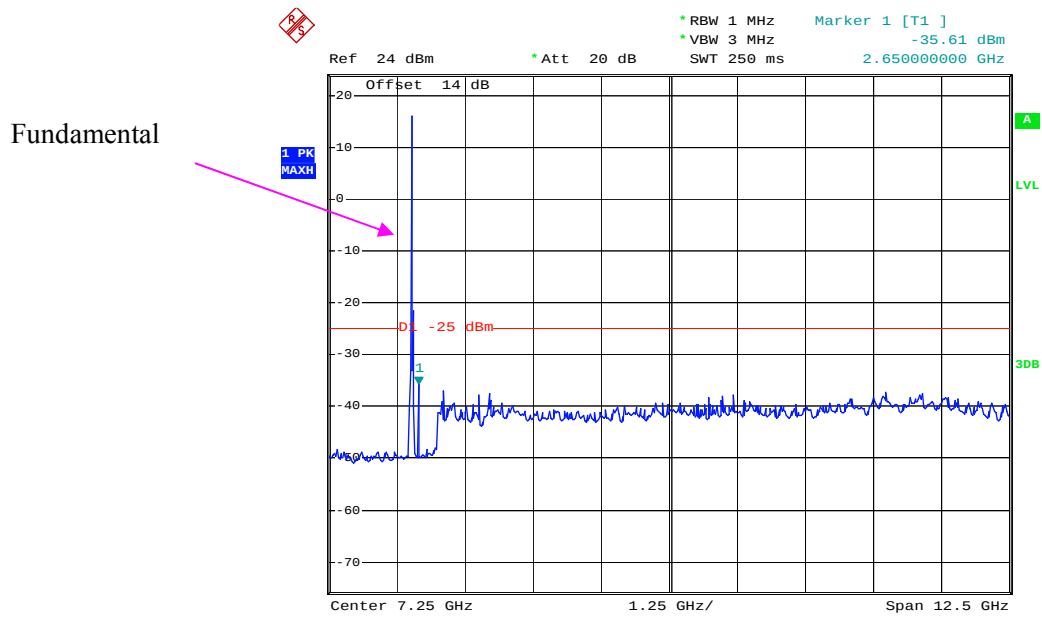


Date: 28.MAR.2020 10:27:28

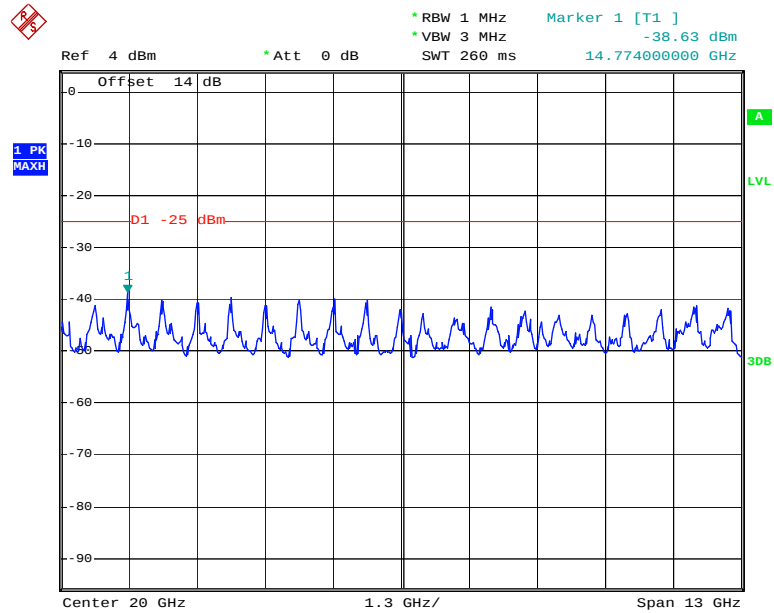
QPSK_20 MHz



Date: 28.MAR.2020 10:27:51



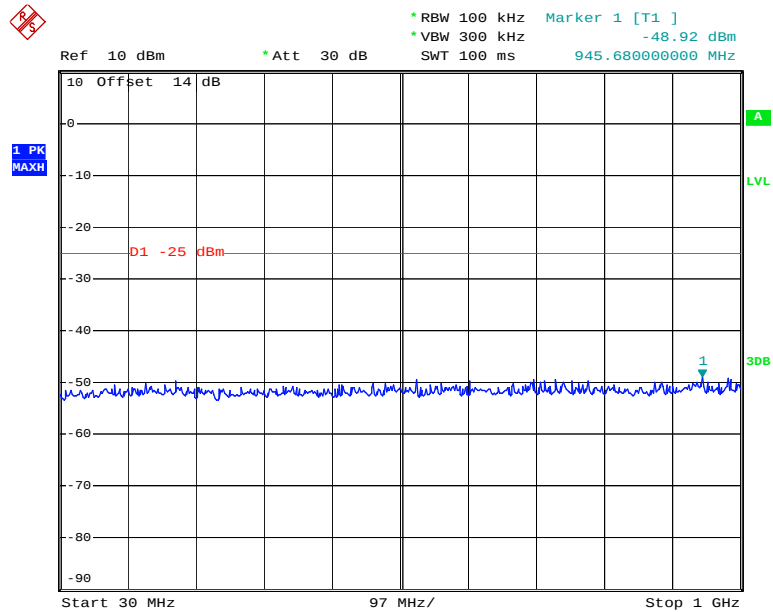
Date: 28.MAR.2020 10:28:19



Date: 28.MAR.2020 10:28:49

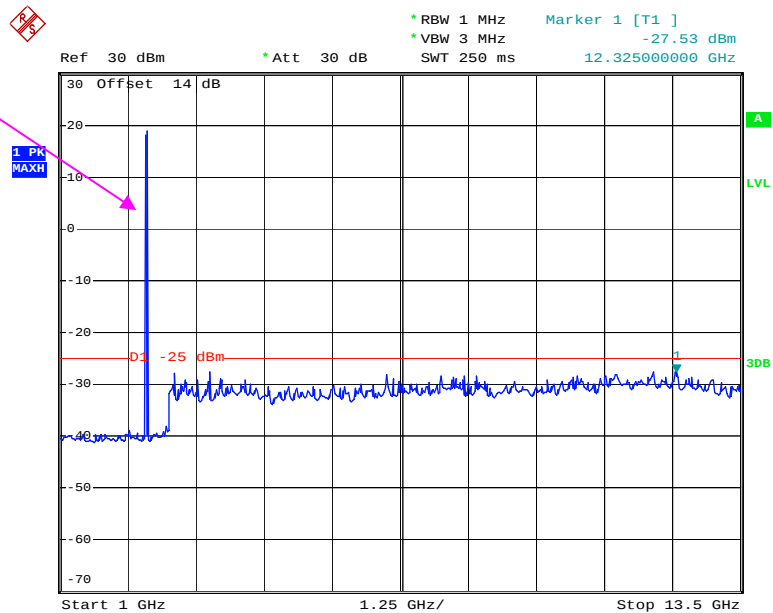
LTE Band 38 (Middle Channel)

QPSK_5 MHz

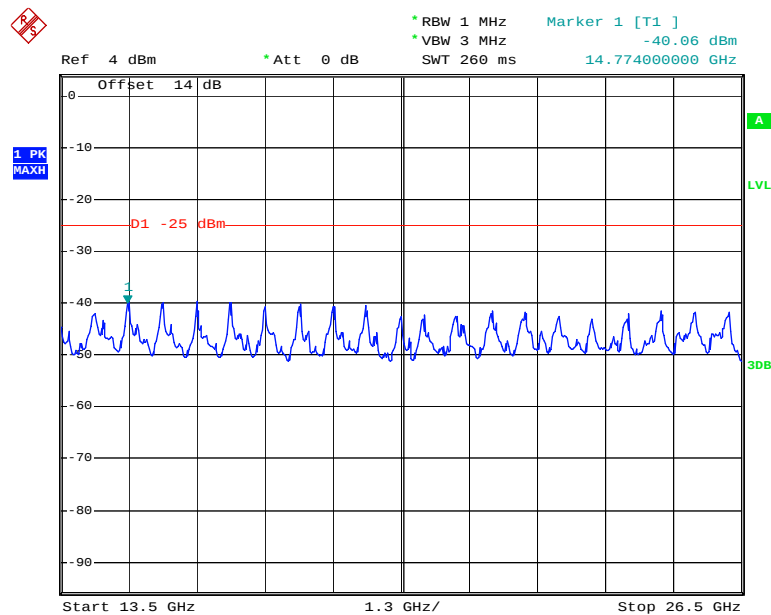


Date: 28.MAR.2020 10:33:39

Fundamental

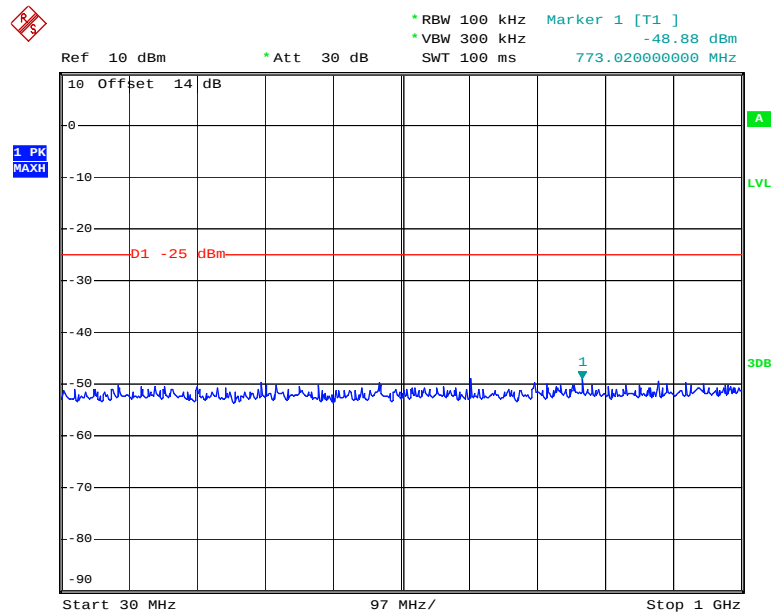


Date: 28.MAR.2020 10:33:55

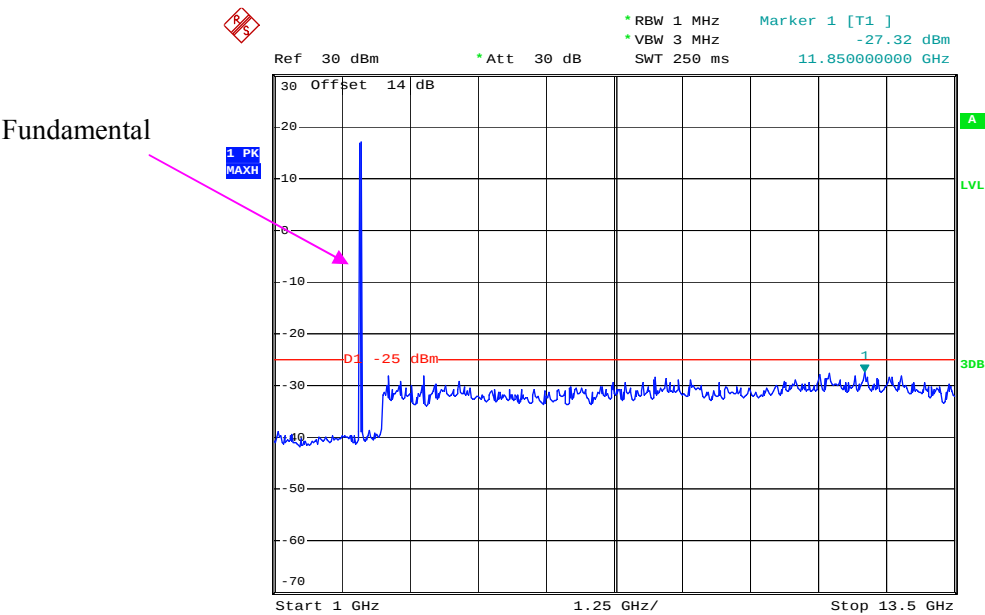


Date: 28.MAR.2020 17:35:38

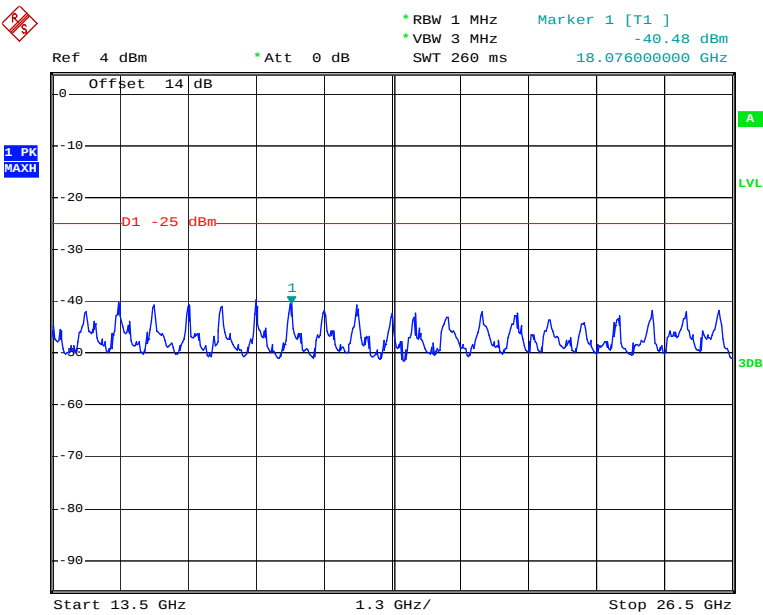
QPSK_10 MHz



Date: 28.MAR.2020 10:34:28

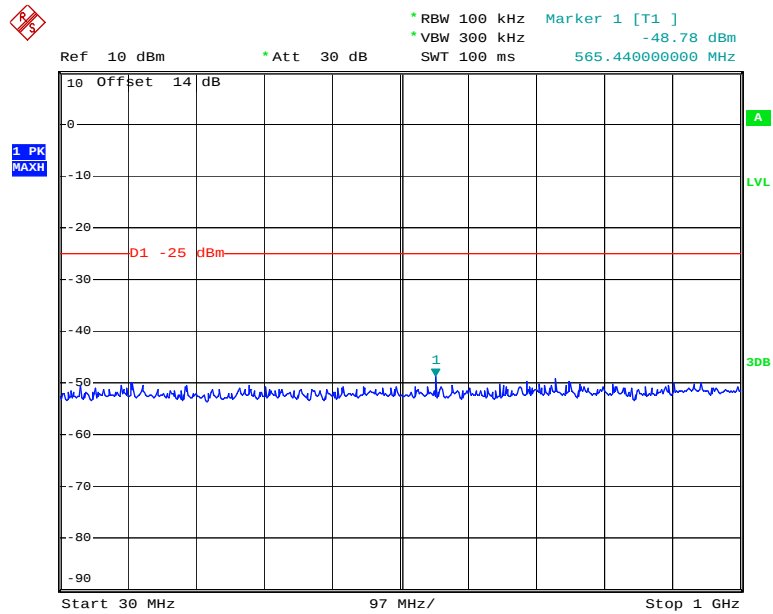


Date: 28.MAR.2020 10:34:41



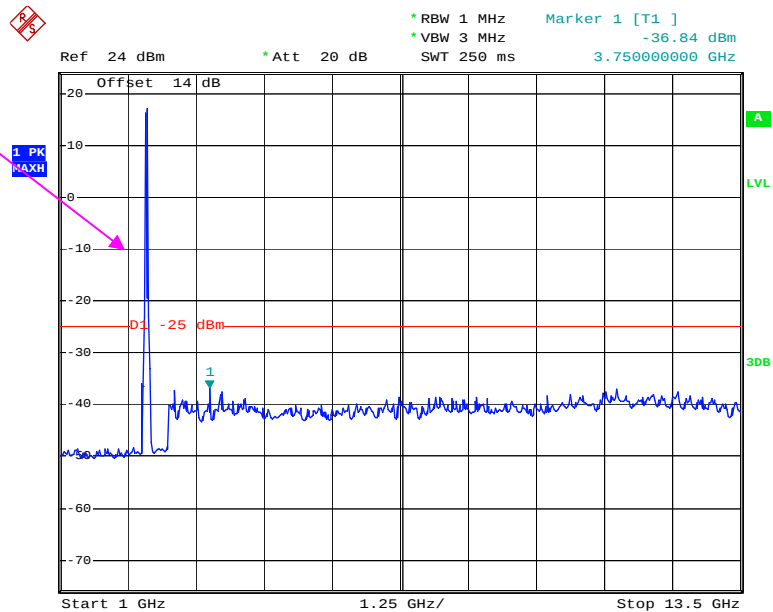
Date: 28.MAR.2020 17:35:12

QPSK_15 MHz

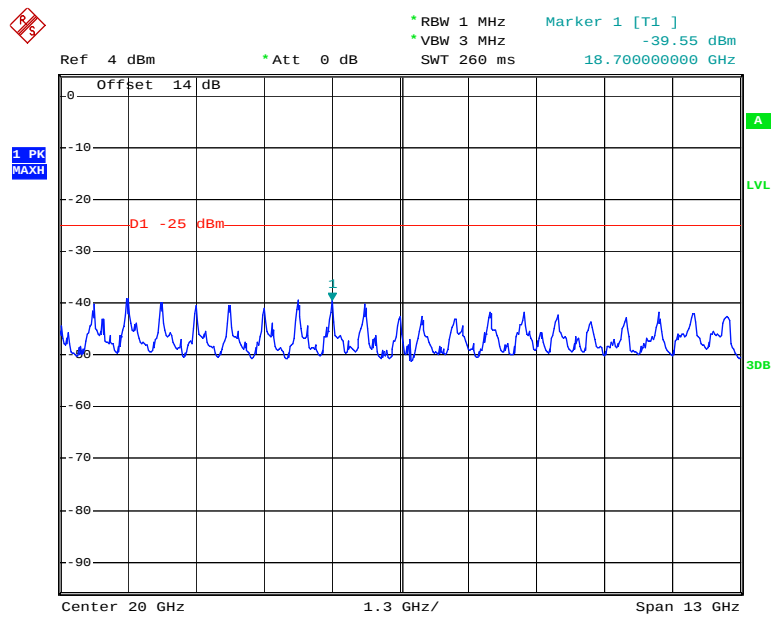


Date: 28.MAR.2020 10:35:16

Fundamental

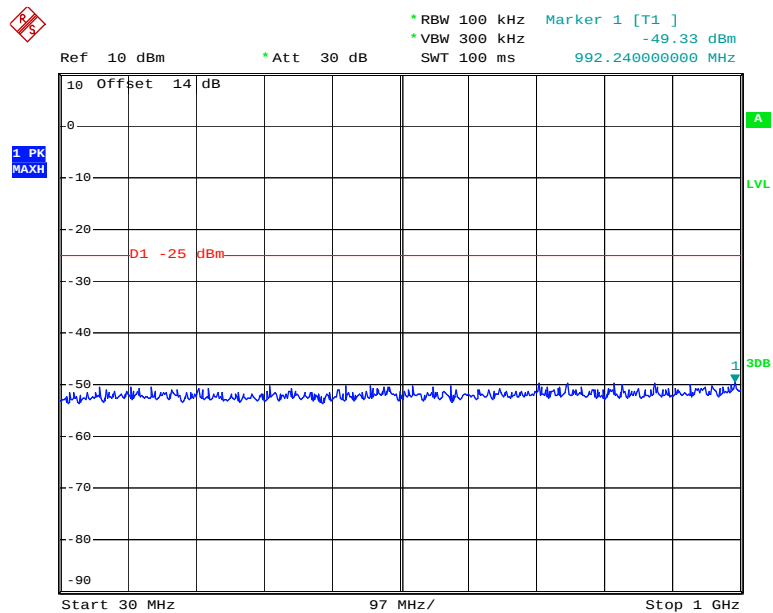


Date: 28.MAR.2020 10:36:08

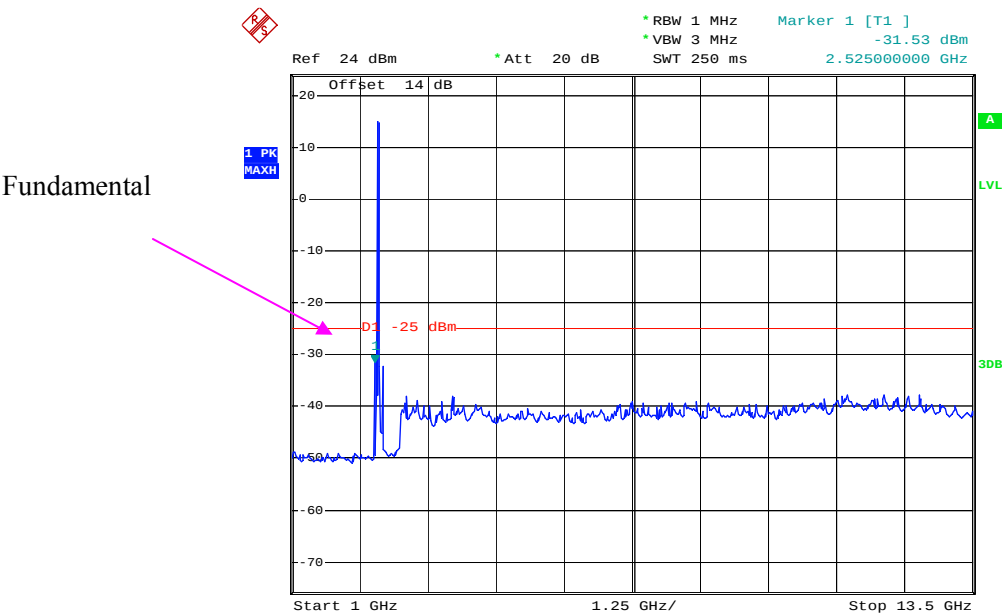


Date: 28.MAR.2020 17:32:59

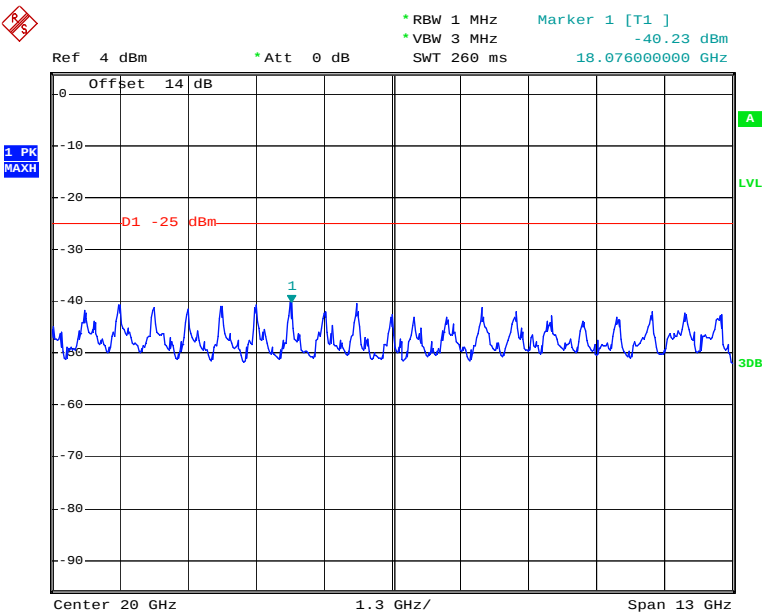
QPSK_20 MHz



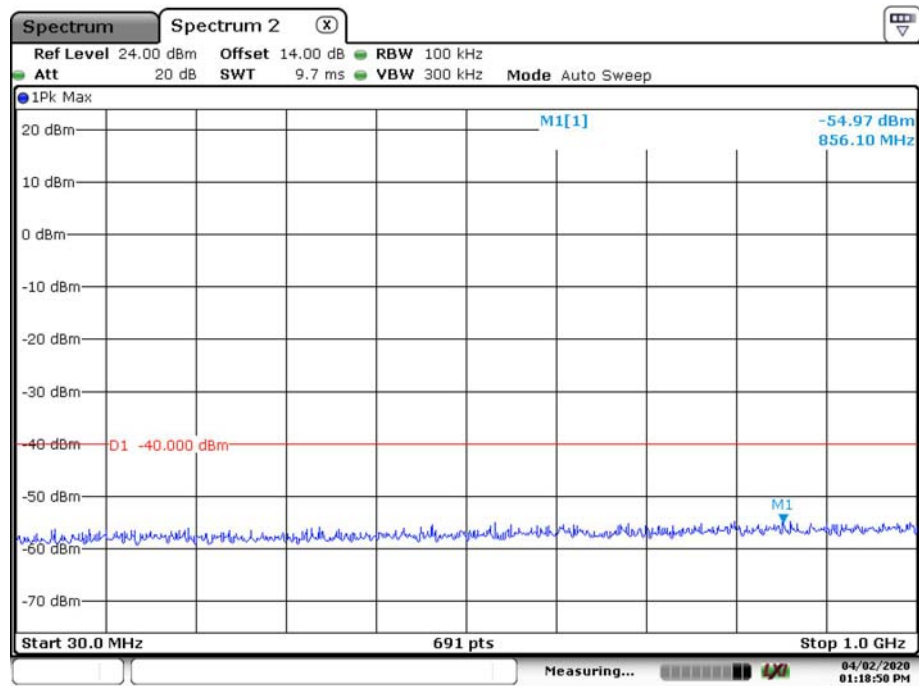
Date: 28.MAR.2020 10:36:44



Date: 28.MAR.2020 10:37:20

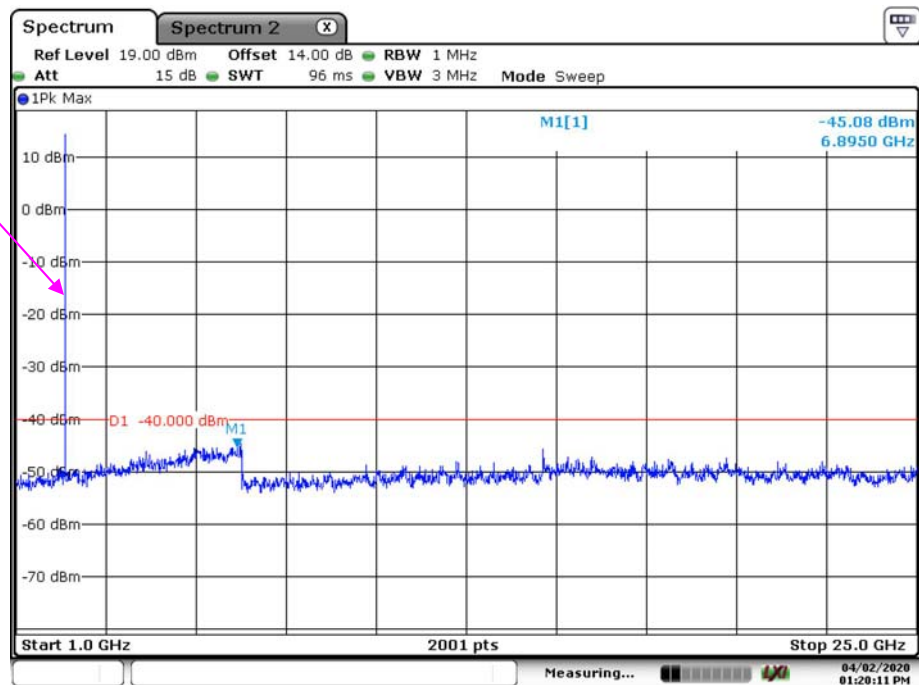


Date: 28.MAR.2020 17:32:27

LTE Band 40 Lower(Middle channel):**QPSK_5 MHz**

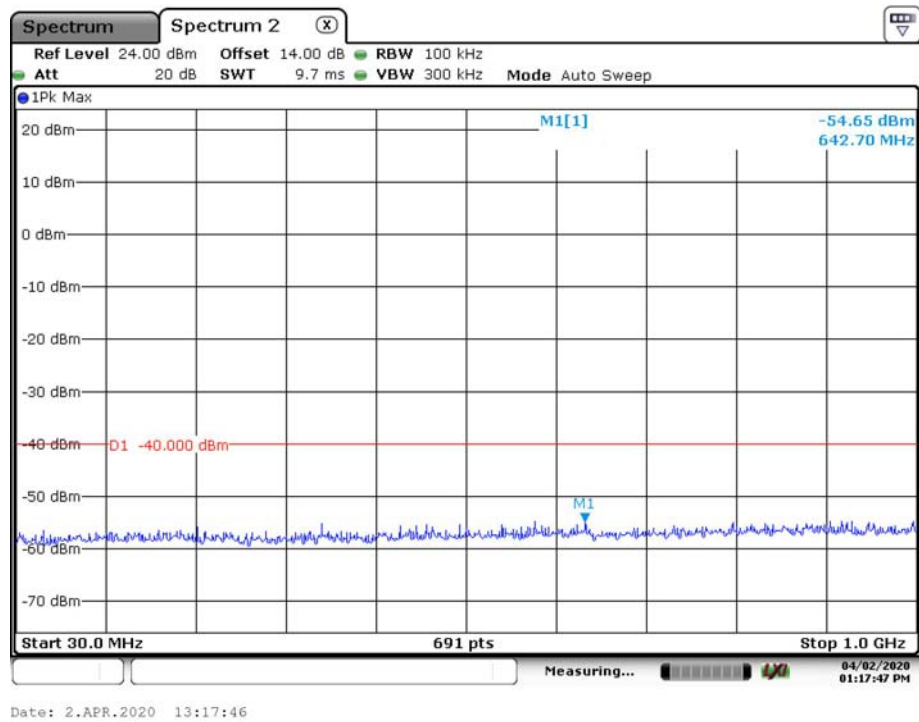
Date: 2.APR.2020 13:18:50

Fundamental

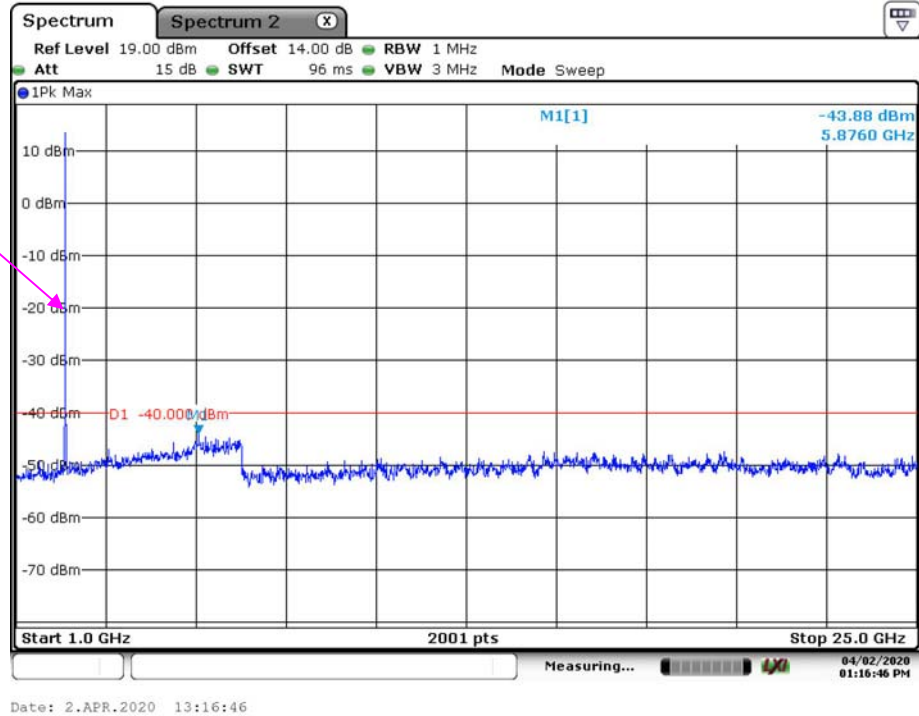


Date: 2.APR.2020 13:20:11

QPSK_10 MHz

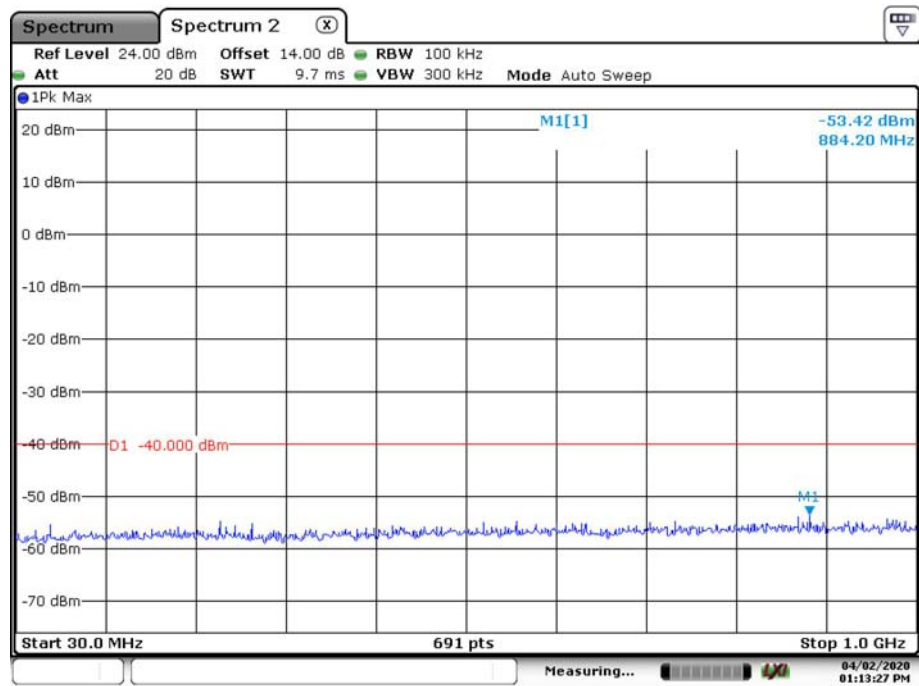


Fundamental



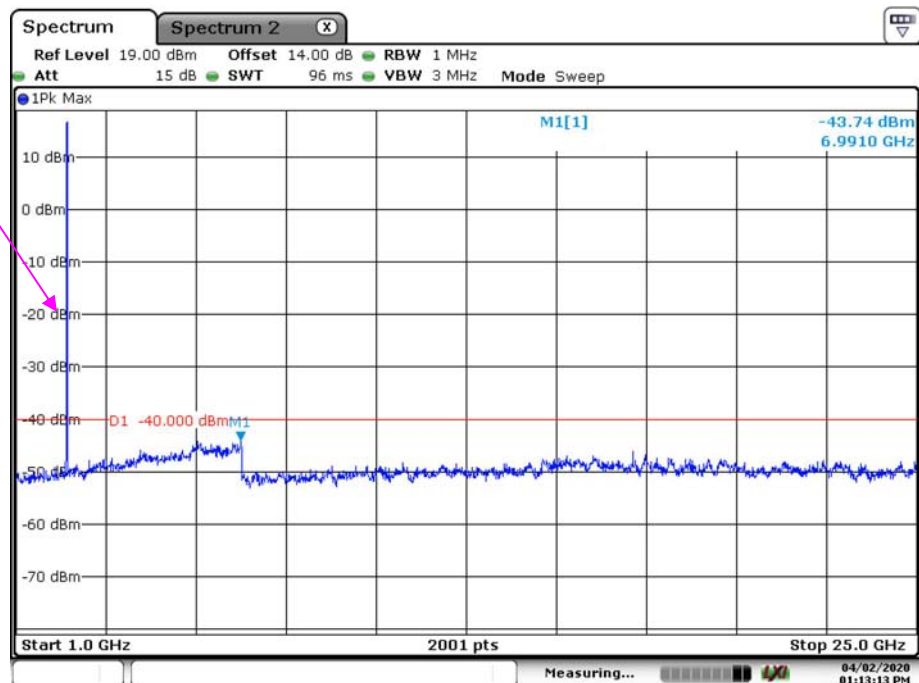
LTE Band 40 Upper (Middle Channel)

QPSK_5 MHz



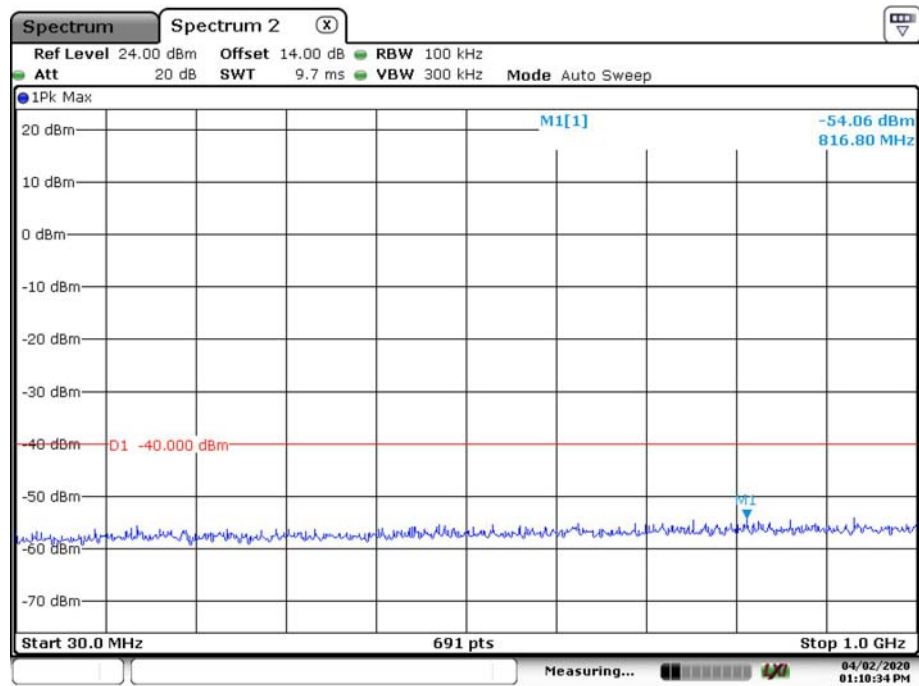
Date: 2.APR.2020 13:13:27

Fundamental



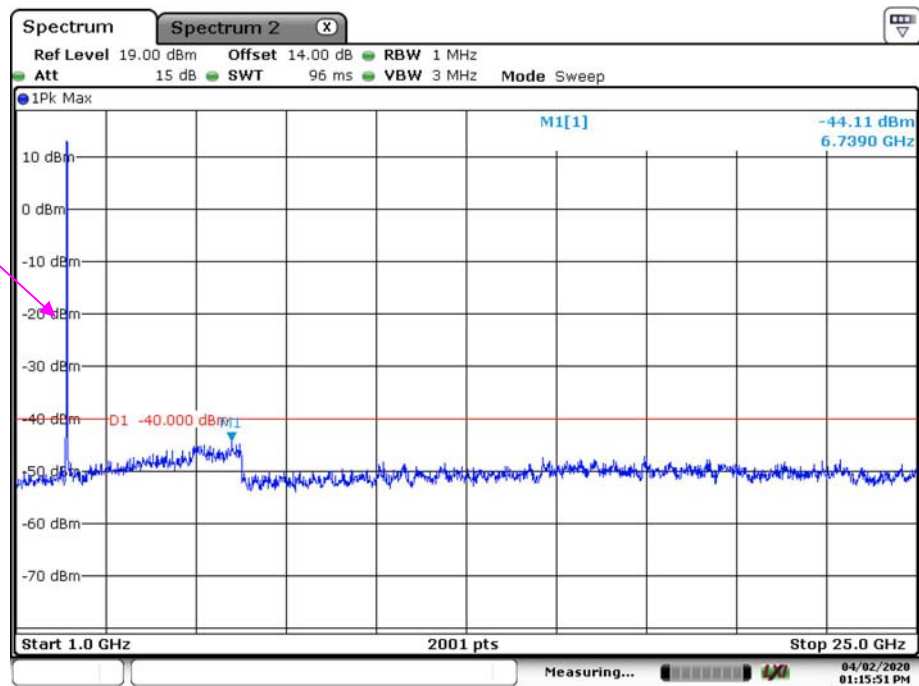
Date: 2.APR.2020 13:13:13

QPSK_10 MHz



Date: 2.APR.2020 13:10:34

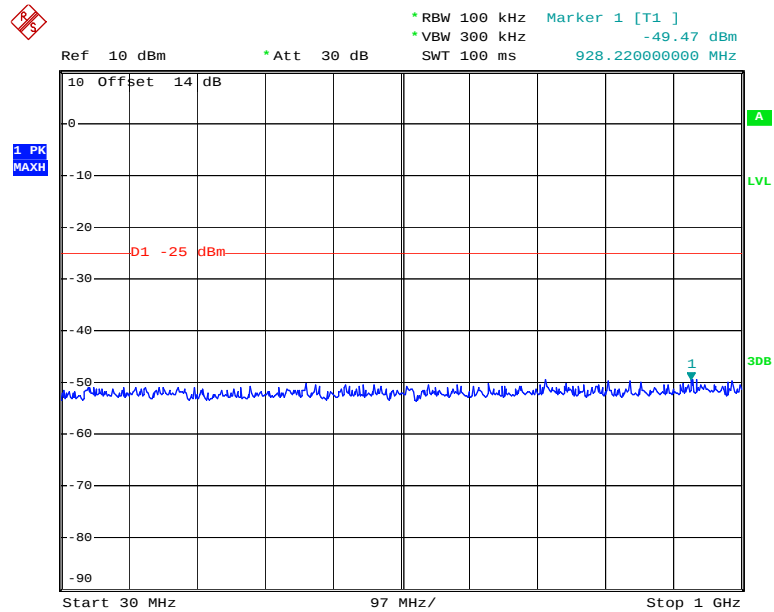
Fundamental



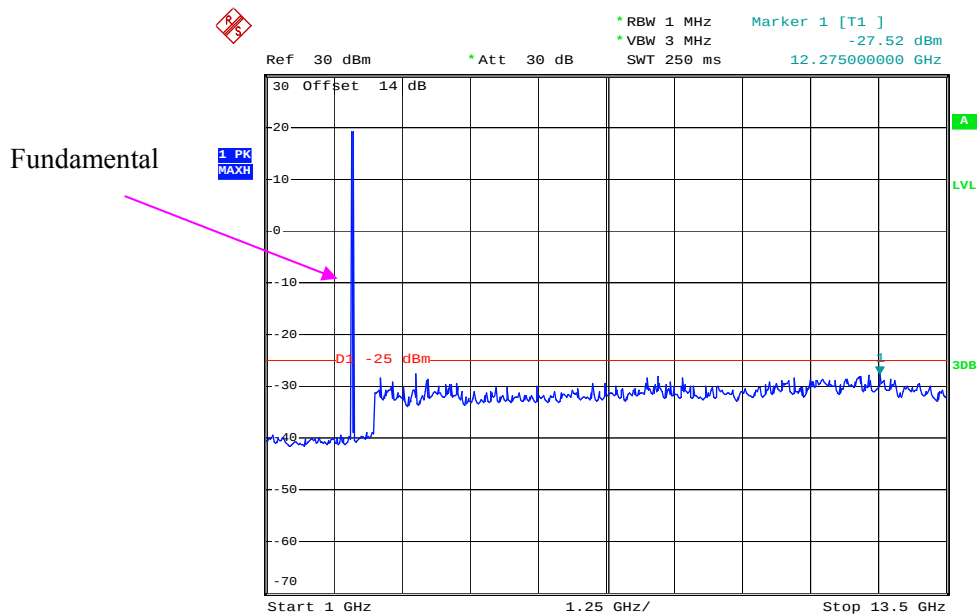
Date: 2.APR.2020 13:15:51

LTE Band 41 (Middle Channel)

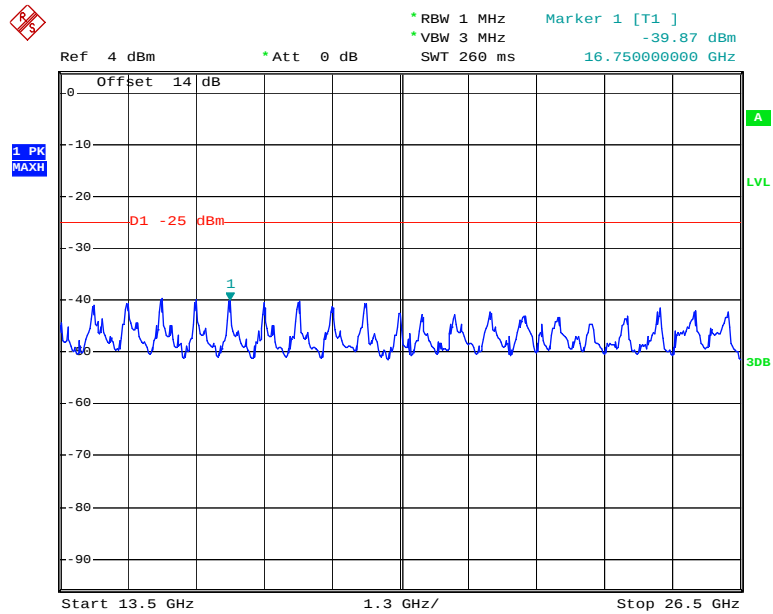
QPSK_5 MHz



Date: 28.MAR.2020 10:42:42

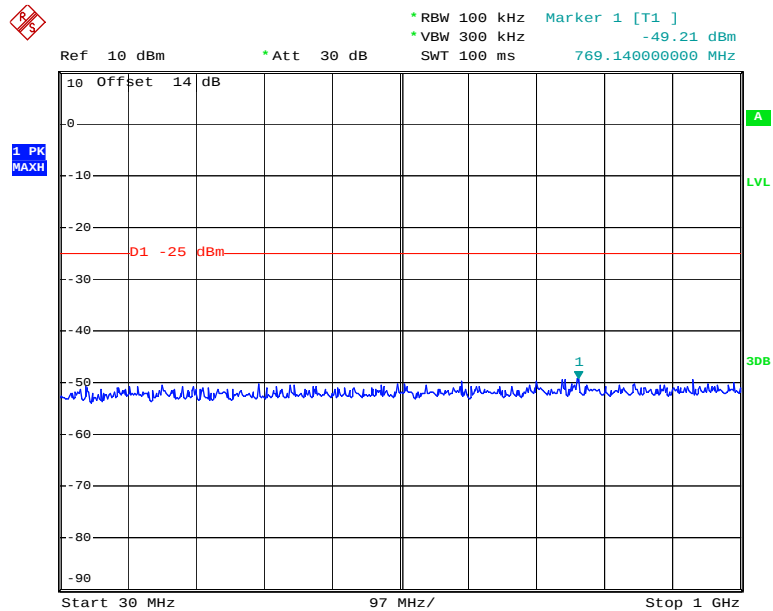


Date: 28.MAR.2020 10:42:54

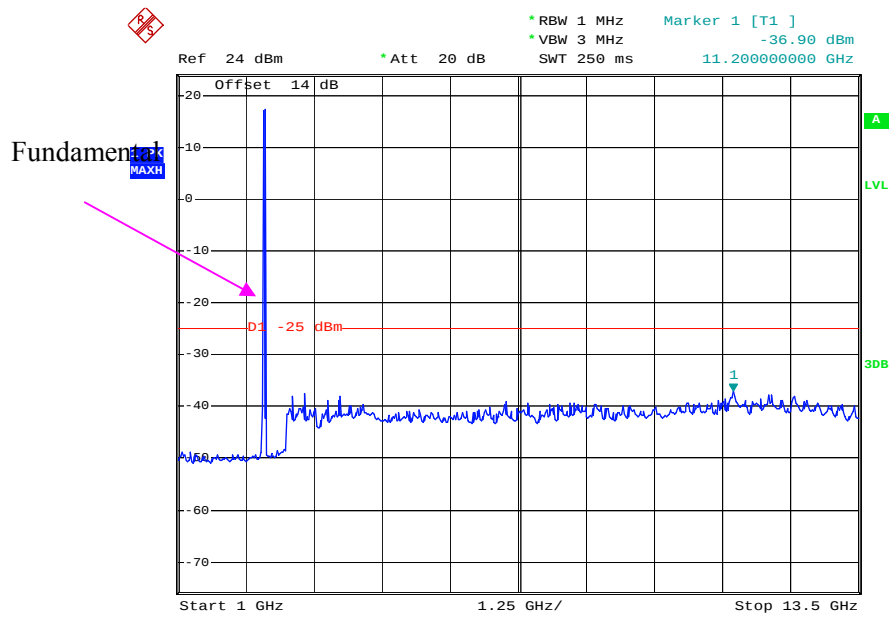


Date: 28.MAR.2020 17:31:48

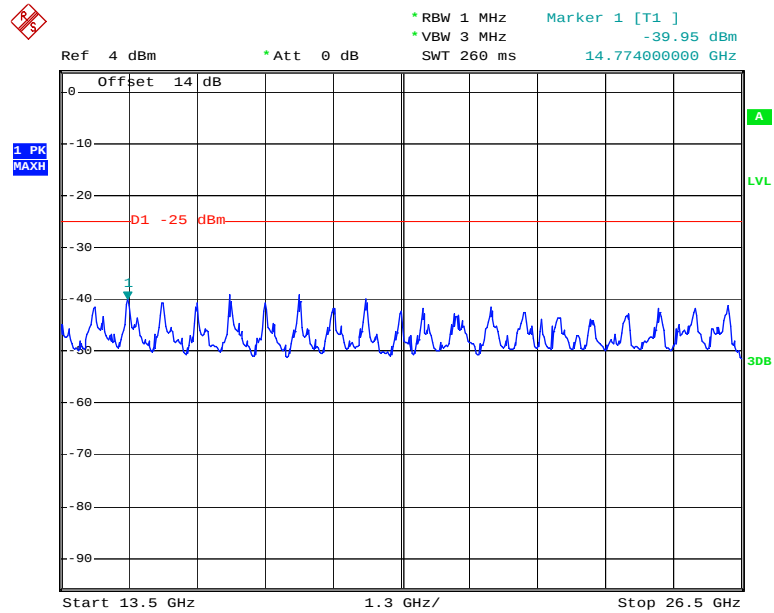
QPSK_10 MHz



Date: 28.MAR.2020 10:43:45

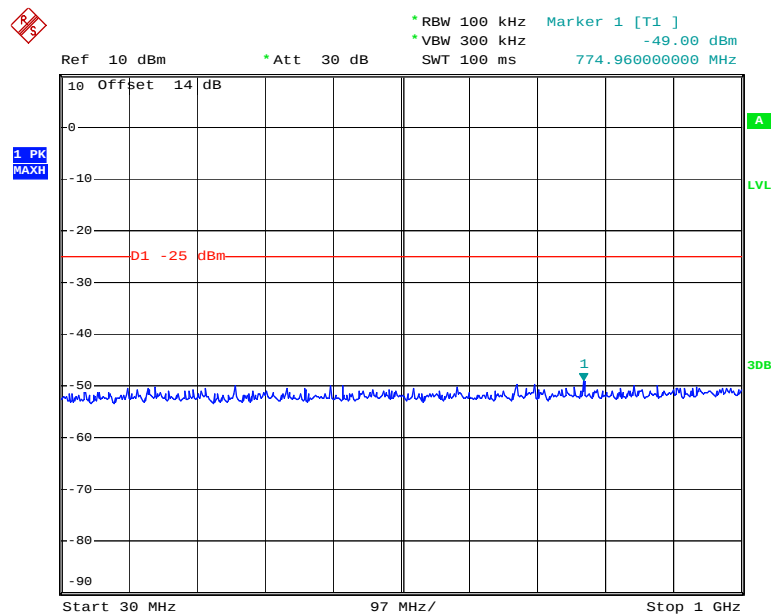


Date: 28.MAR.2020 10:44:15

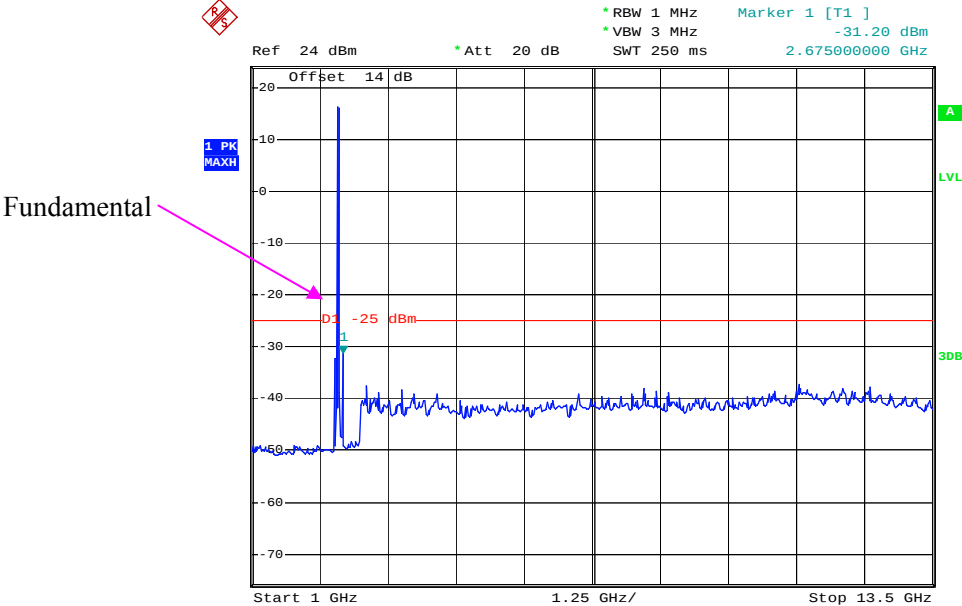


Date: 28.MAR.2020 17:31:21

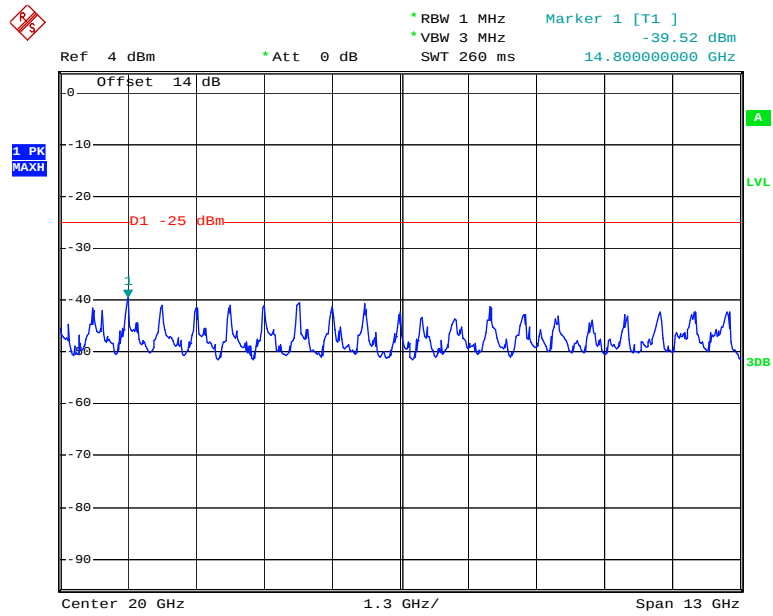
QPSK_15 MHz



Date: 28.MAR.2020 10:44:50

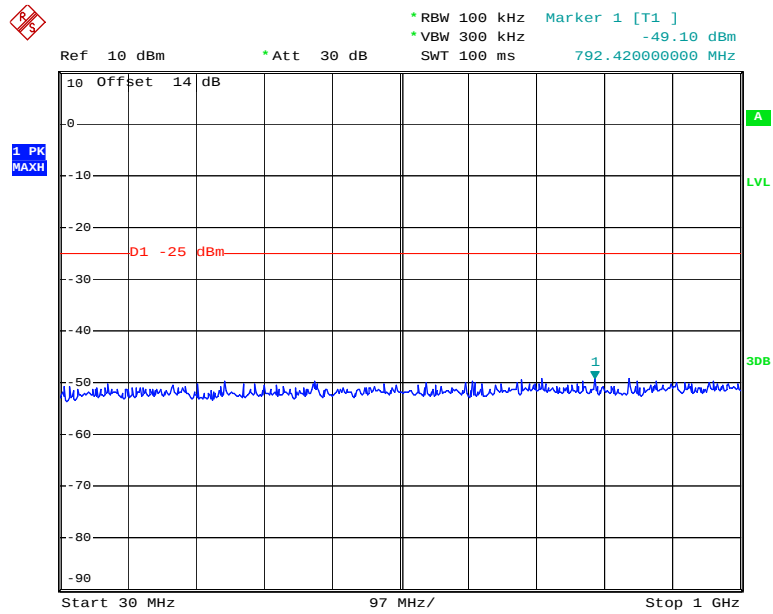


Date: 28.MAR.2020 10:45:13

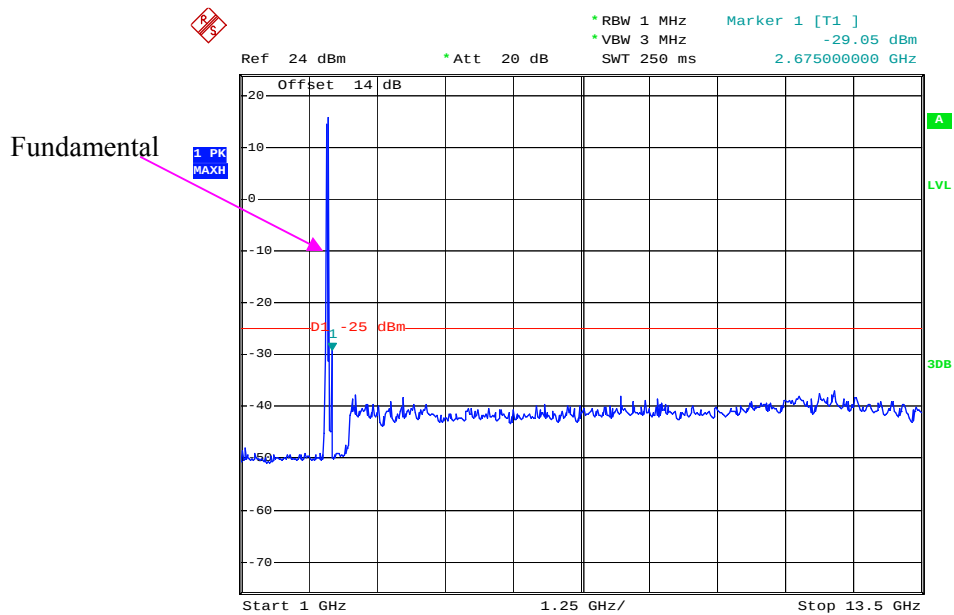


Date: 28.MAR.2020 17:30:55

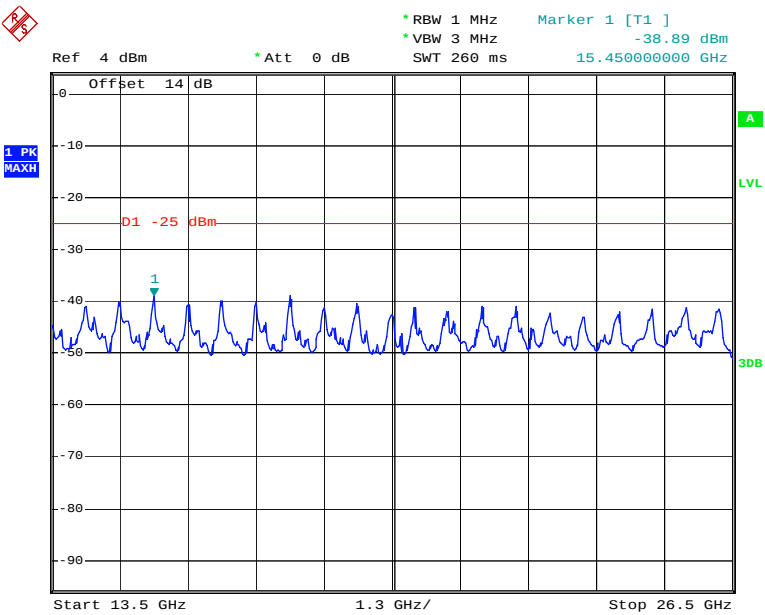
QPSK_20 MHz



Date: 28.MAR.2020 10:45:53



Date: 28.MAR.2020 10:46:21



Date: 28.MAR.2020 17:30:36

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

Applicable Standard

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

Test Procedure

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

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

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

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

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

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESR3	102453	2019-06-26	2020-06-26
Sunol Sciences	Antenna	JB3	A060611-1	2017-11-10	2020-11-10
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2019-05-06	2020-05-06
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2019-09-05	2020-09-05
HP	Amplifier	8447D	2727A05902	2019-09-05	2020-09-05
Agilent	Spectrum Analyzer	E4440A	SG43360054	2019-05-09	2020-05-09
TDK RF	Horn Antenna	HRN-0118	130 084	2018-10-12	2021-10-12
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2019-09-05	2020-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2019-09-05	2020-09-05
MITEQ	Amplifier	AFS42-00101800-25-S-42	2001271	2019-09-05	2020-09-05
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2019-06-27	2020-06-27
Agilent	Signal Generator	E8247C	MY43321350	2019-12-10	2020-12-10
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-01 1304	2019-11-18	2022-11-18
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-02 1304	2019-11-18	2022-11-18
Sinoscite	Band-stop filter	BSF1710-1785MN-0383-003	0383003	2019-06-16	2020-06-16
Sinoscite	Band-stop filter	BSF824-862MS-1438-001	1438001	2019-06-16	2020-06-16
Sinoscite	Band-stop filter	BSF2300-2400MS-0777-003	0777003	2019-06-16	2020-06-16
Sinoscite	Band-stop filter	BSF1850-1910MS-0935V2	0935V2	2019-06-16	2020-06-16
Sinoscite	Band-stop filter	BSF2500-2750MS-1439-001	1437001	2019-06-16	2020-06-16

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

Test Data**Environmental Conditions**

Temperature:	25~26°C
Relative Humidity:	47~50 %
ATM Pressure:	101.4 kPa
Tester:	Vern Shen, Felix Wang
Test Date:	2020-03-30

EUT Operation Mode: Transmitting

30 MHz-10 GHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
GPRS850, Frequency:836.600 MHz								
1673.200	H	37.99	-65.95	10.6	0.73	-56.1	-13.0	43.1
1673.200	V	37.92	-66.62	10.6	0.73	-56.7	-13.0	43.7
2509.800	H	37.19	-65.72	13.1	1.25	-53.9	-13.0	40.9
2509.800	V	36.82	-66.12	13.1	1.25	-54.3	-13.0	41.3
3346.400	H	36.86	-62.82	13.8	1.61	-50.6	-13.0	37.6
3346.400	V	37.04	-62.68	13.8	1.61	-50.5	-13.0	37.5
176.700	H	47.22	-62.11	0.0	0.44	-62.6	-13.0	49.6
44.700	V	48.99	-43.82	-20.2	0.21	-64.2	-13.0	51.2
WCDMA Band V R99,Frequency:836.600 MHz								
1673.200	H	39.15	-64.79	10.6	0.73	-54.9	-13.0	41.9
1673.200	V	38.45	-66.09	10.6	0.73	-56.2	-13.0	43.2
2509.800	H	44.45	-58.46	13.1	1.25	-46.6	-13.0	33.6
2509.800	V	45.98	-56.96	13.1	1.25	-45.1	-13.0	32.1
3346.400	H	36.80	-62.88	13.8	1.61	-50.7	-13.0	37.7
3346.400	V	36.47	-63.25	13.8	1.61	-51.0	-13.0	38.0
71.400	H	38.81	-74.53	-4.3	0.26	-79.1	-13.0	66.1
593.600	V	35.87	-69.64	0.0	0.76	-70.4	-13.0	57.4

30 MHz-20 GHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
GPRS1900, Frequency:1880.000 MHz								
3760.000	H	36.84	-60.8	13.8	1.63	-48.7	-13.0	35.7
3760.000	V	37.22	-60.28	13.8	1.63	-48.2	-13.0	35.2
5640.000	H	36.01	-57.58	14.0	1.31	-44.9	-13.0	31.9
5640.000	V	35.50	-57.98	14.0	1.31	-45.3	-13.0	32.3
227.200	H	48.87	-60.1	0.0	0.5	-60.6	-13.0	47.6
43.300	V	59.87	-31.23	-22.0	0.21	-53.5	-13.0	40.5
WCDMA Band II R99,Frequency: 1880.000 MHz								
3760.000	H	38.38	-59.26	13.8	1.63	-47.1	-13.0	34.1
3760.000	V	38.39	-59.11	13.8	1.63	-47.0	-13.0	34.0
5640.000	H	35.63	-57.96	14.0	1.31	-45.3	-13.0	32.3
5640.000	V	37.57	-55.91	14.0	1.31	-43.2	-13.0	30.2
37.700	H	43.13	-47.94	-25.3	0.22	-73.5	-13.0	60.5
41.900	V	41.50	-47.89	-23.9	0.21	-72.0	-13.0	59.0

LTE Band 5 (30MHz-10GHz):

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK, Frequency: 836.500 MHz								
1673.00	H	42.02	-61.92	10.61	0.73	-52.04	-13.00	39.04
1673.00	V	40.44	-64.10	10.61	0.73	-54.22	-13.00	41.22
2509.50	H	49.92	-52.99	13.11	1.25	-41.13	-13.00	28.13
2509.50	V	46.78	-56.16	13.11	1.25	-44.30	-13.00	31.30
3346.00	H	36.75	-62.93	13.83	1.61	-50.71	-13.00	37.71
3346.00	V	36.89	-62.83	13.83	1.61	-50.61	-13.00	37.61
187.54	H	38.70	-70.64	0.00	0.46	-71.10	-13.00	58.10
374.60	V	41.80	-66.83	0.00	0.59	-67.42	-13.00	54.42

LTE Band 7 (30MHz-26.5GHz):

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK,Frequency:2353.000 MHz								
5070.00	H	36.44	-58.67	13.93	1.34	-46.08	-25.00	21.08
5070.00	V	37.67	-57.25	13.93	1.34	-44.66	-25.00	19.66
7605.00	H	36.41	-52.47	13.21	1.40	-40.66	-25.00	15.66
7605.00	V	37.05	-52.23	13.21	1.40	-40.42	-25.00	15.42
189.90	H	37.14	-72.07	0.00	0.47	-72.54	-25.00	47.54
374.60	V	42.77	-65.86	0.00	0.59	-66.45	-25.00	41.45

LTE Band 38 (30MHz-26.5 GHz):

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK, Frequency: 2595.000 MHz								
5190.00	H	36.33	-58.36	13.99	1.51	-45.88	-25.00	20.88
5190.00	V	37.98	-56.76	13.99	1.51	-44.28	-25.00	19.28
7785.00	H	36.06	-53.26	13.32	1.53	-41.47	-25.00	16.47
7785.00	V	35.87	-53.70	13.32	1.53	-41.91	-25.00	16.91
187.90	H	39.69	-69.63	0.00	0.46	-70.09	-25.00	45.09
374.60	V	42.10	-66.53	0.00	0.59	-67.12	-25.00	42.12

LTE Band 40 (30MHz-25GHz):

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK, Frequency:2310.000 MHz								
4620.00	H	36.42	-60.68	14.24	1.81	-48.25	-40.00	8.25
4620.00	V	36.00	-61.20	14.24	1.81	-48.77	-40.00	8.77
6930.00	H	34.15	-56.54	13.64	1.81	-44.71	-40.00	4.71
6930.00	V	33.62	-56.94	13.64	1.81	-45.11	-40.00	5.11
362.00	H	36.25	-70.02	0.00	0.58	-70.60	-40.00	30.60
374.60	V	41.37	-67.26	0.00	0.59	-67.85	-40.00	27.85
QPSK, Frequency2350.000 MHz								
4700.00	H	35.45	-61.78	14.40	1.67	-49.05	-40.00	9.05
4700.00	V	35.18	-62.14	14.40	1.67	-49.41	-40.00	9.41
7050.00	H	34.02	-56.27	13.35	1.78	-44.70	-40.00	4.70
7050.00	V	33.45	-56.74	13.35	1.78	-45.17	-40.00	5.17
369.12	H	40.15	-65.84	0.00	0.58	-66.42	-40.00	26.42
388.25	V	37.45	-70.94	0.00	0.60	-71.54	-40.00	31.54

LTE Band 41 (30MHz-26.5GHz):

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK,Frequency:2593.000 MHz								
5186.00	H	36.39	-58.30	13.99	1.50	-45.81	-25.00	20.81
5186.00	V	37.94	-56.79	13.99	1.50	-44.30	-25.00	19.30
7779.00	H	35.62	-53.69	13.32	1.53	-41.90	-25.00	16.90
7779.00	V	36.07	-53.49	13.32	1.53	-41.70	-25.00	16.70
186.50	H	38.49	-70.91	0.00	0.46	-71.37	-25.00	46.37
374.60	V	42.87	-65.76	0.00	0.59	-66.35	-25.00	41.35

Note:

- 1) The unit of Antenna Gain is dBd for frequency below 1GHz, and the unit of Antenna Gain is dBi for frequency above 1GHz.
- 2) Absolute Level = Substituted Level - Cable loss + Antenna Gain
- 3) Margin = Limit-Absolute Level

FCC §22.917(a) & §24.238(a) & §27.53- BAND EDGES

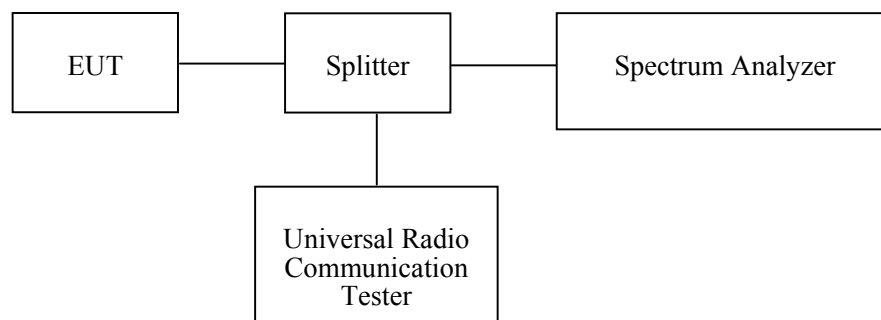
Applicable Standard

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

Test Procedure

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

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



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2019-05-09	2020-05-09
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005011	Each Time	/
E-Microwave	Two-way Splitter	ODP-1-6-2S	OE0120142	Each Time	/
Unknown	Coaxial Cable	C-SJ00-0010	C0010/04	Each Time	/
E-Microwave	Coaxial Attenuators	EMCA10-5RN-6	OE01203239	Each Time	/

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

Test Data

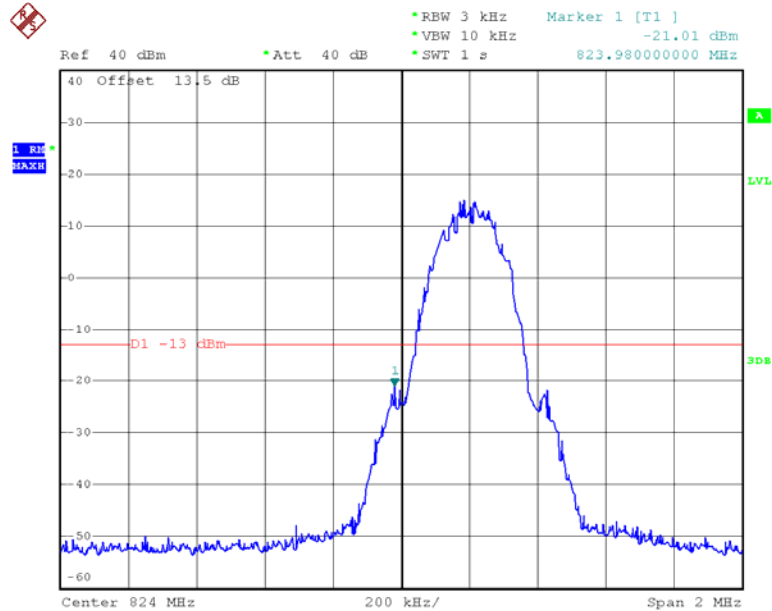
Environmental Conditions

Temperature:	22.5~26°C
Relative Humidity:	35~65 %
ATM Pressure:	100.8~101.9 kPa
Tester:	Lucy Lu
Test Date:	2020-03-25~2020-04-16

Test Mode: Transmitting

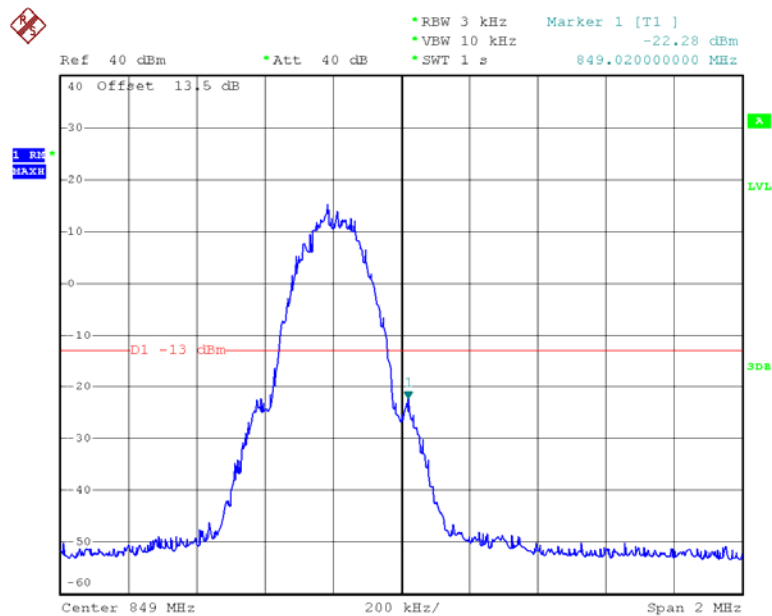
Test Result: Compliant. Please refer to the following plots.

GSM 850, Left Band Edge



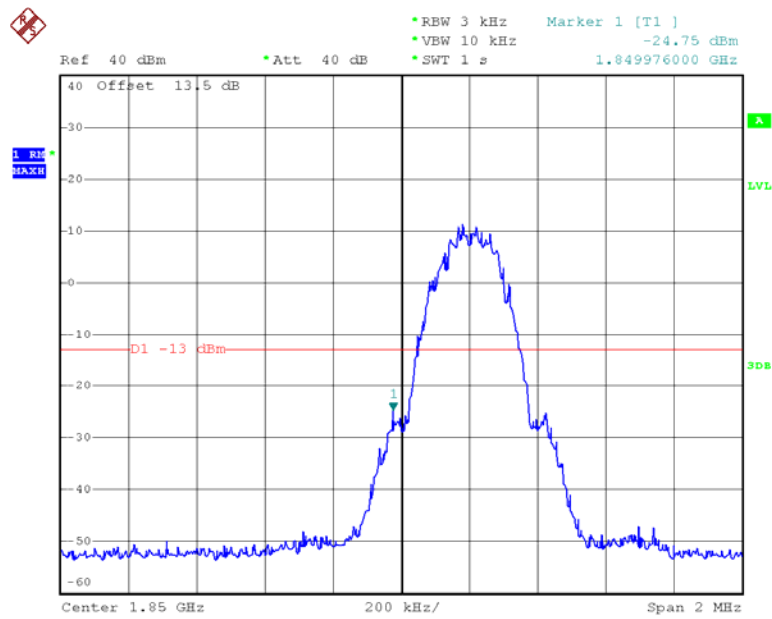
Date: 25.MAR.2020 16:08:18

GSM 850, Right Band Edge



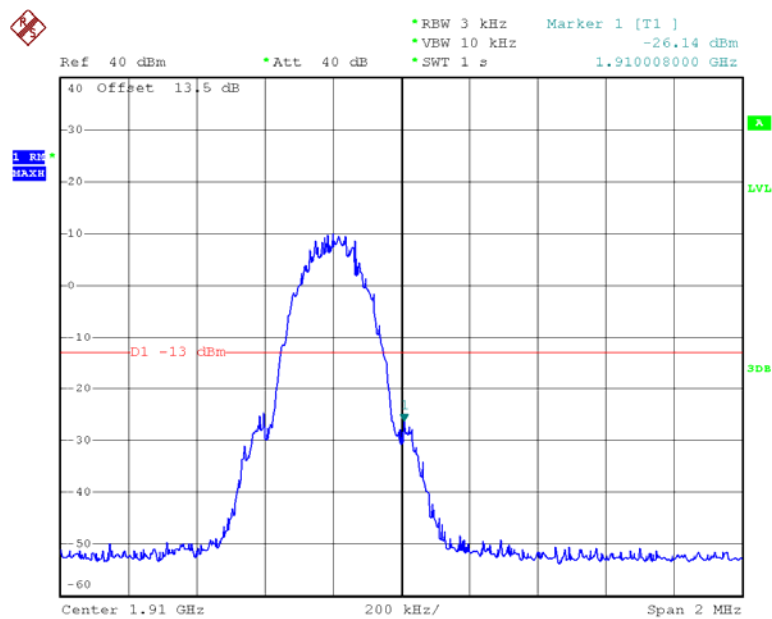
Date: 25.MAR.2020 16:09:47

GSM 1900, Left Band Edge



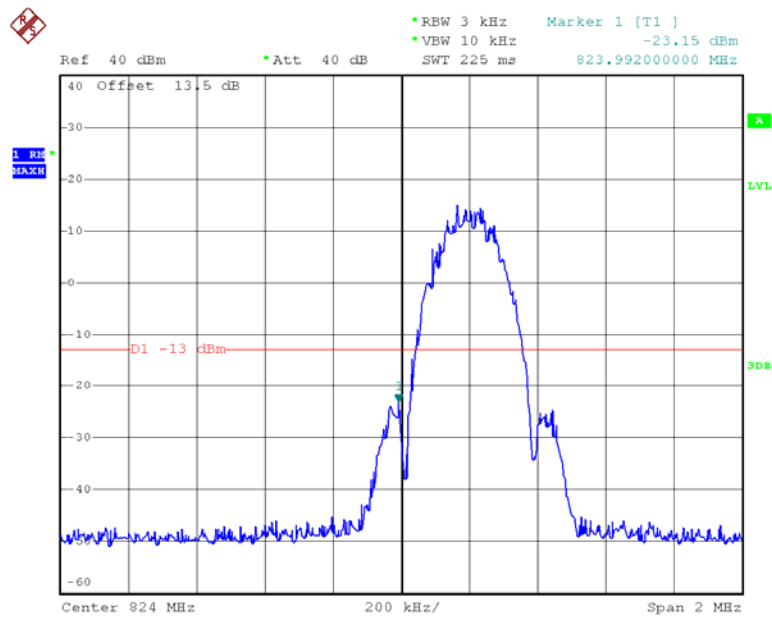
Date: 25.MAR.2020 17:42:35

GSM 1900, Right Band Edge



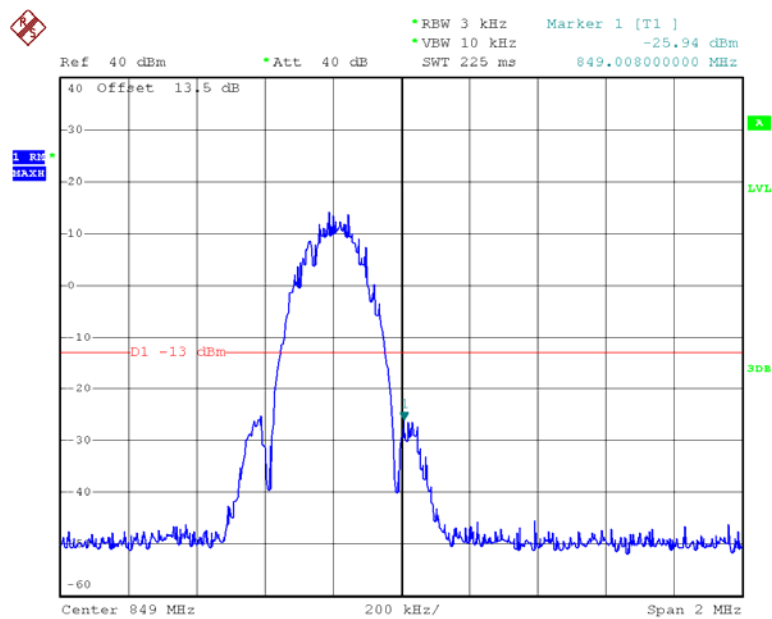
Date: 25.MAR.2020 17:43:26

EDGE 850, Left Band Edge



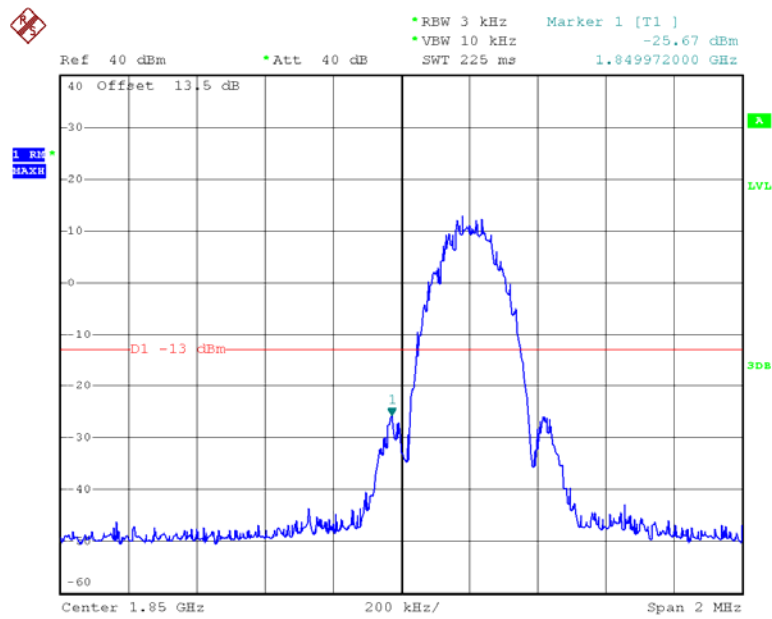
Date: 25.MAR.2020 19:10:17

EDGE 850, Right Band Edge



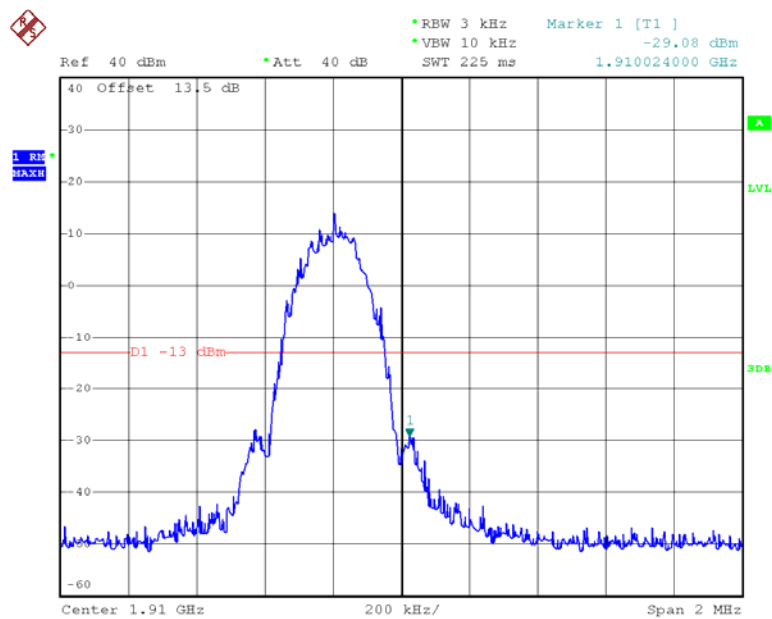
Date: 25.MAR.2020 19:11:04

EDGE 1900, Left Band Edge



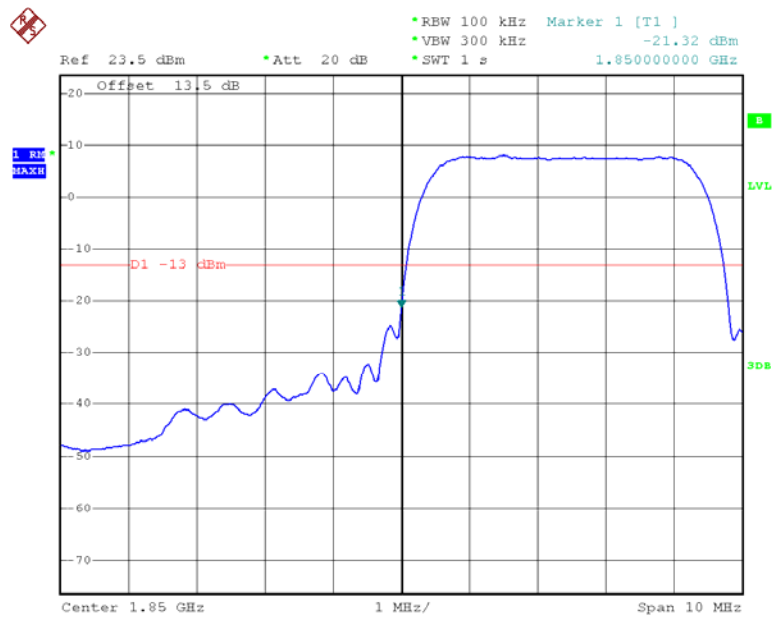
Date: 25.MAR.2020 19:05:00

EDGE 1900, Right Band Edge



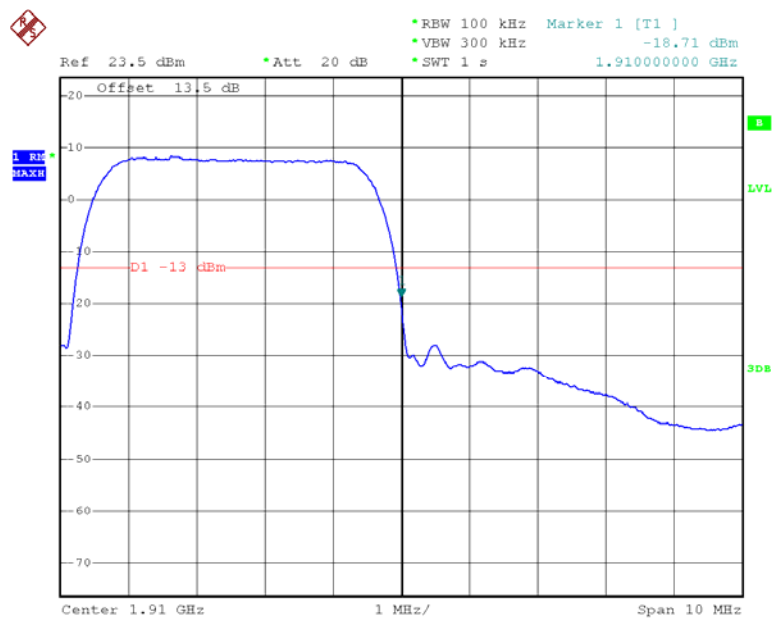
Date: 25.MAR.2020 19:05:44

WCDMA Band II Rel 99, Left Band Edge



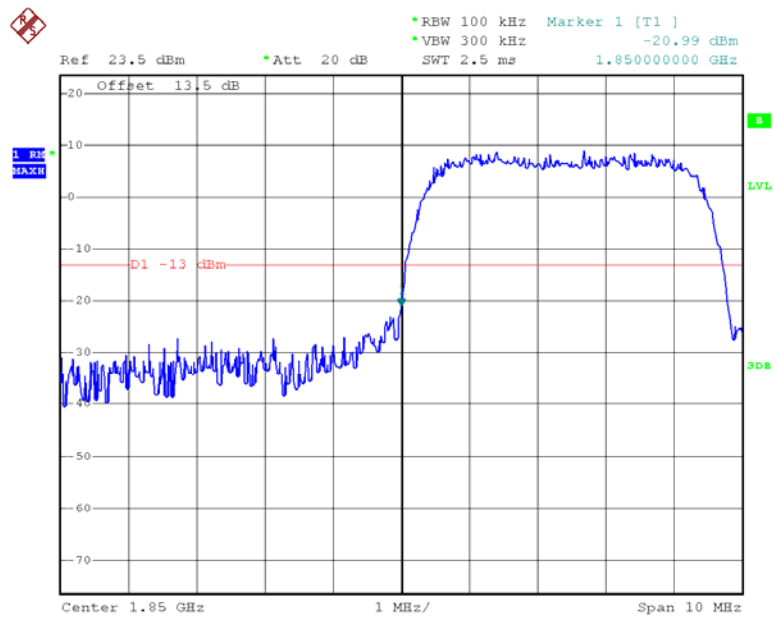
Date: 26.MAR.2020 10:32:50

WCDMA Band II Rel 99, Right Band Edge



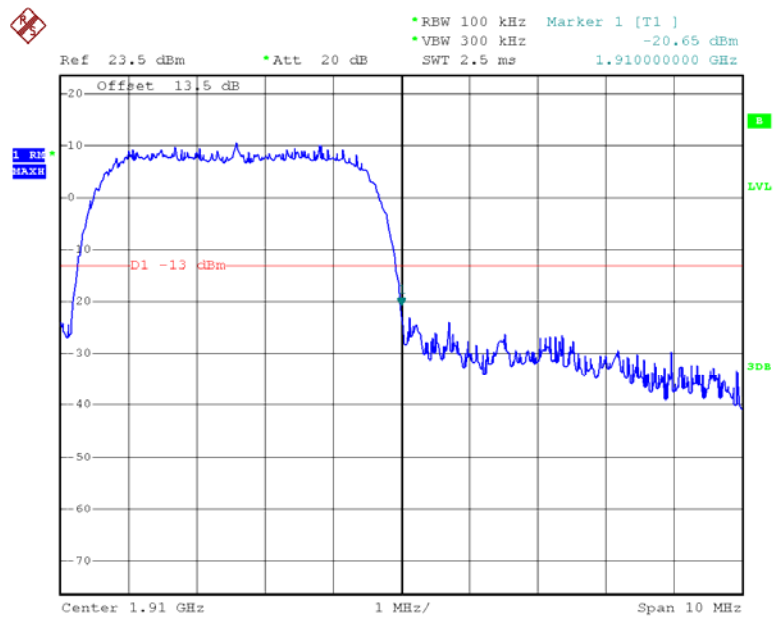
Date: 26.MAR.2020 10:35:14

WCDMA Band II HSDPA, Left Band Edge



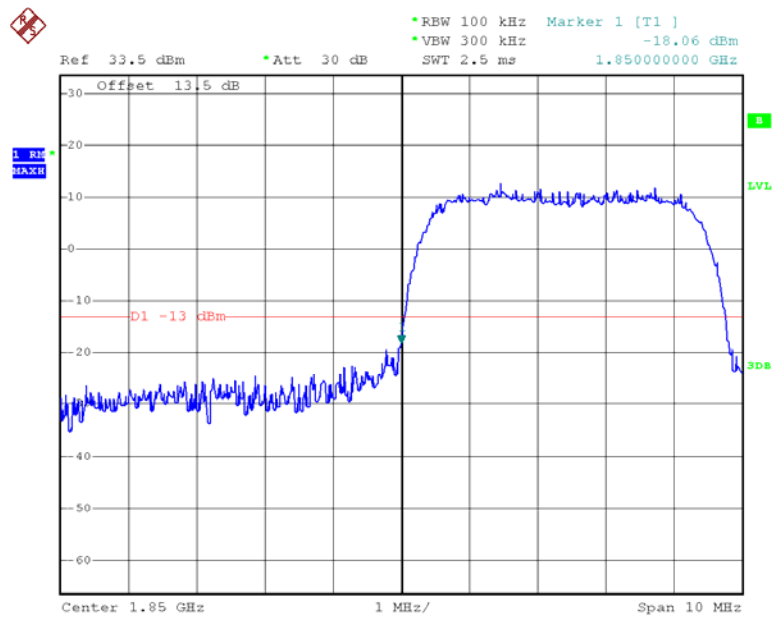
Date: 26.MAR.2020 14:00:29

WCDMA Band II HSDPA, Right Band Edge



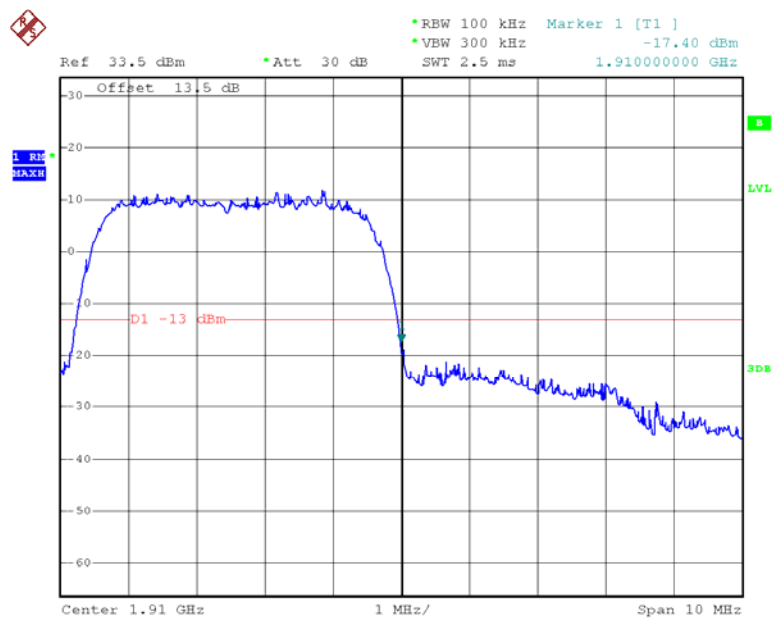
Date: 26.MAR.2020 13:59:37

WCDMA Band II HSUPA, Left Band Edge



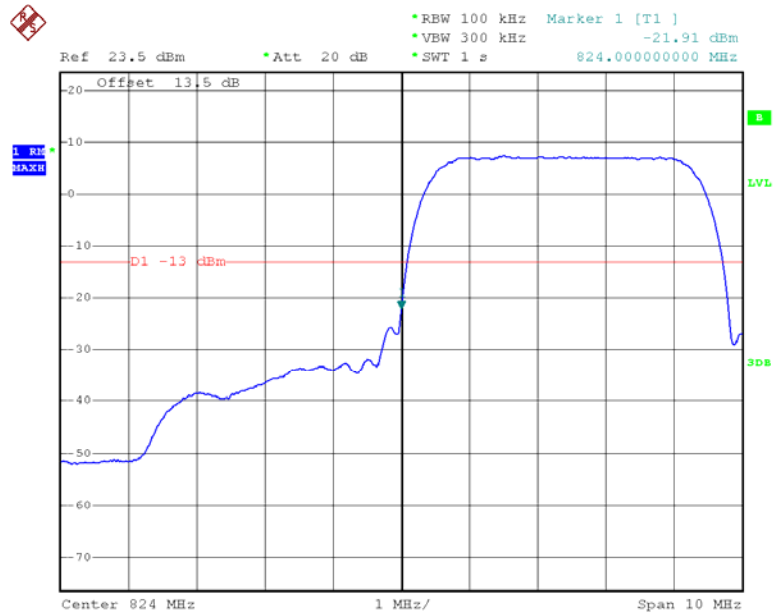
Date: 26.MAR.2020 15:09:30

WCDMA Band II HSUPA, Right Band Edge



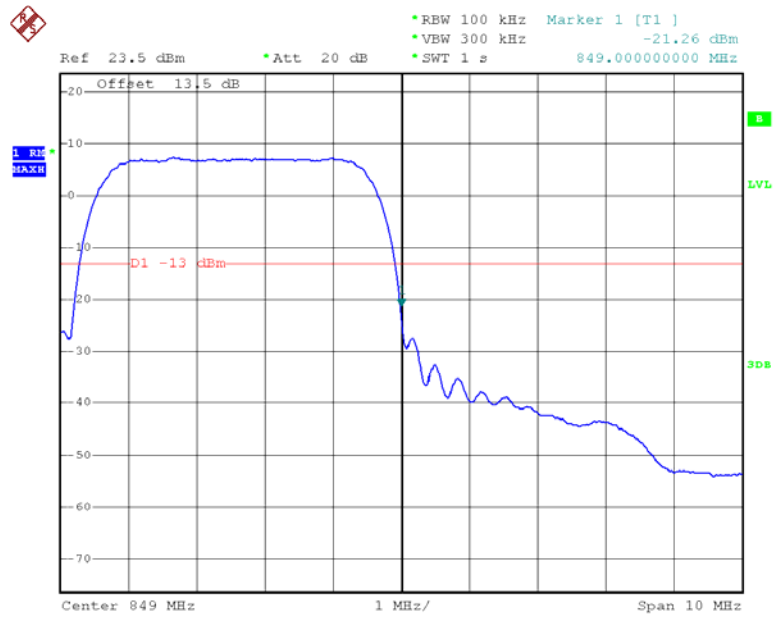
Date: 26.MAR.2020 15:08:48

WCDMA Band V Rel 99, Left Band Edge



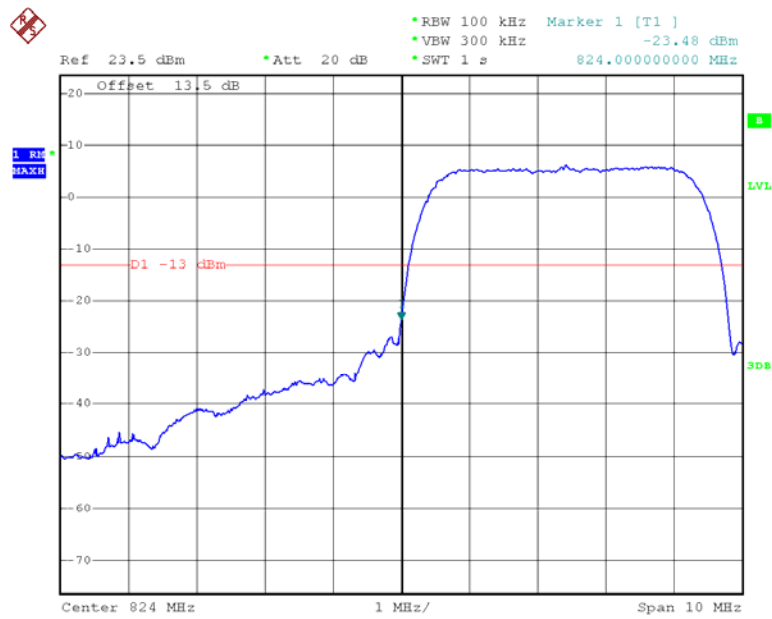
Date: 26.MAR.2020 10:48:52

WCDMA Band V Rel 99, Right Band Edge



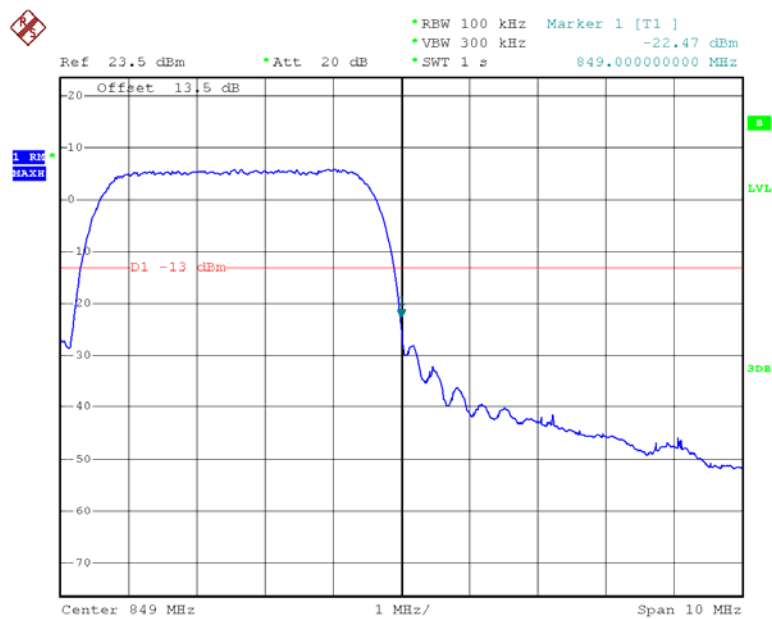
Date: 26.MAR.2020 10:49:58

WCDMA Band V HSDPA, Left Band Edge



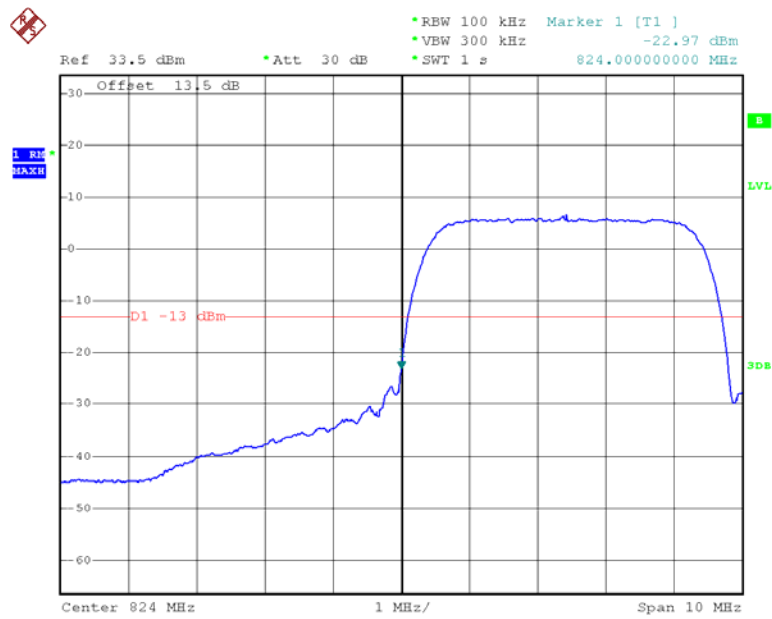
Date: 26.MAR.2020 13:49:18

WCDMA Band V HSDPA, Right Band Edge



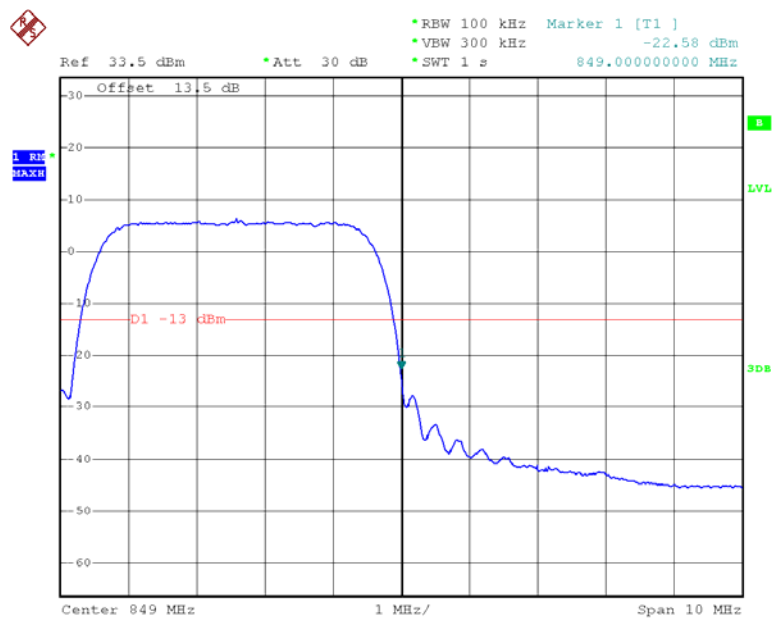
Date: 26.MAR.2020 13:50:12

WCDMA Band V HSUPA, Left Band Edge



Date: 26.MAR.2020 15:18:19

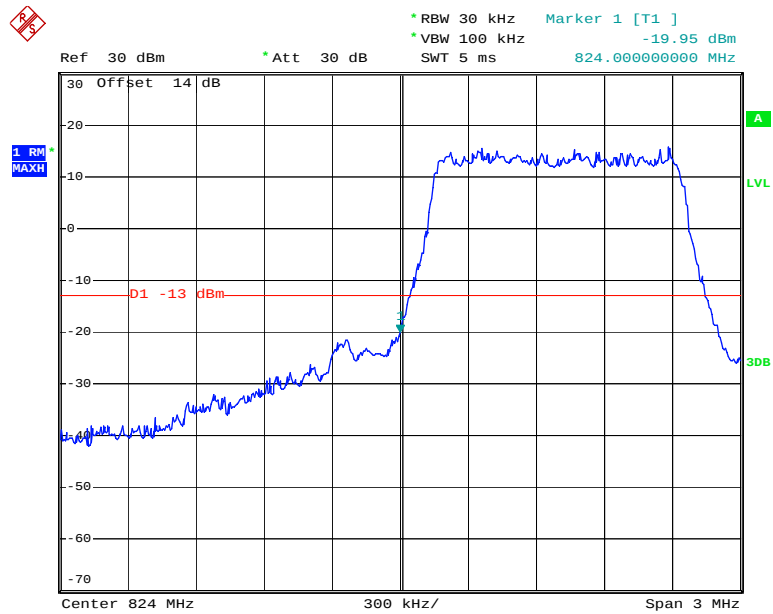
WCDMA Band V HSUPA, Right Band Edge



Date: 26.MAR.2020 15:19:36

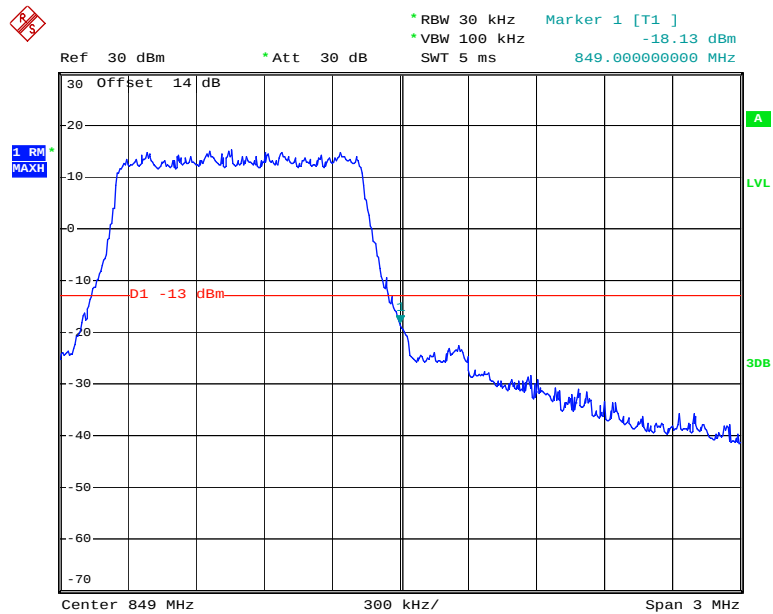
LTE Band 5

QPSK_1.4MHz_6 RB_ Left



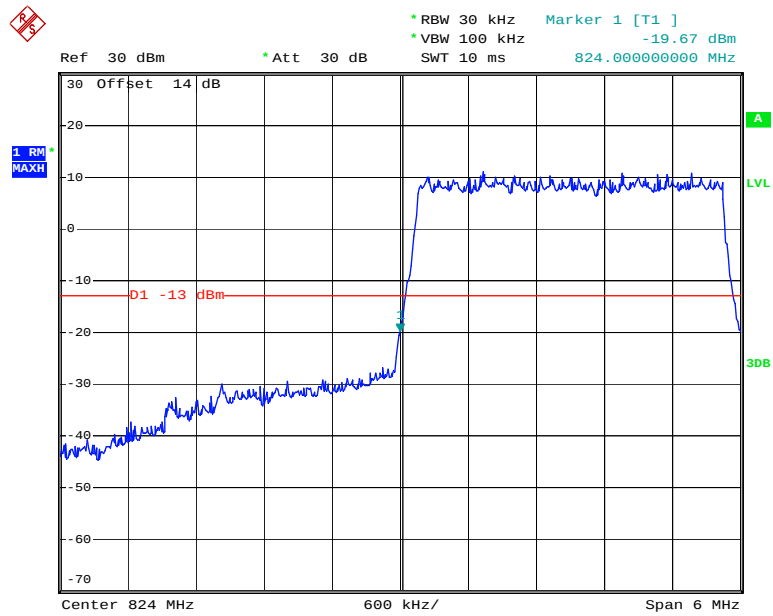
Date: 27.MAR.2020 19:52:20

QPSK_1.4MHz_6 RB_ Right



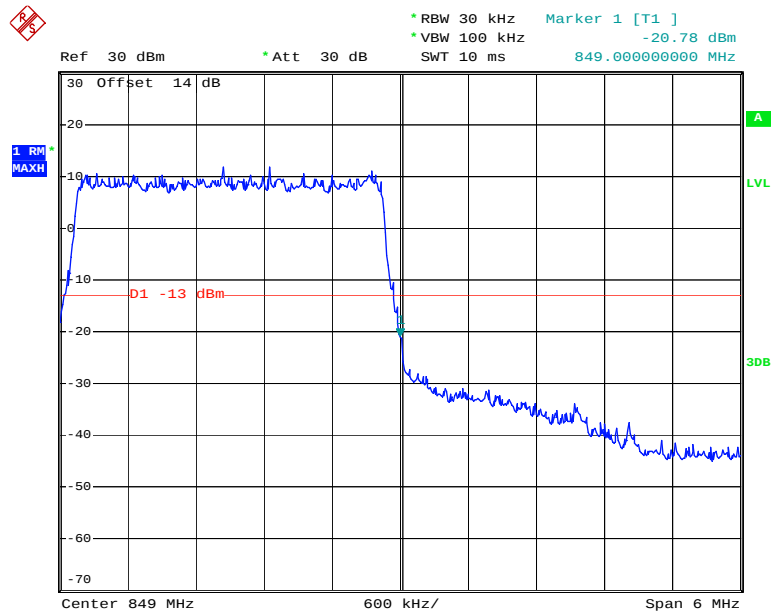
Date: 27.MAR.2020 19:52:59

QPSK_3MHz_15 RB_Left

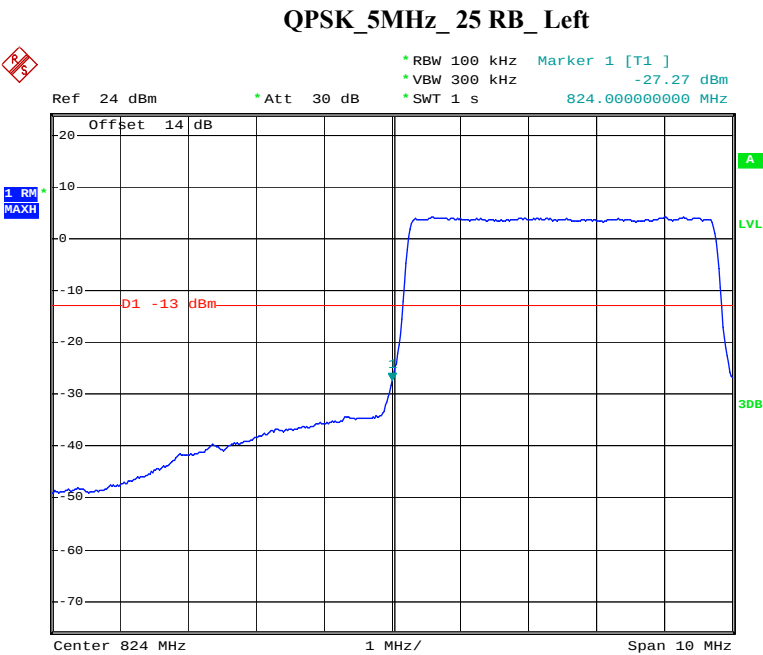


Date: 27.MAR.2020 20:16:20

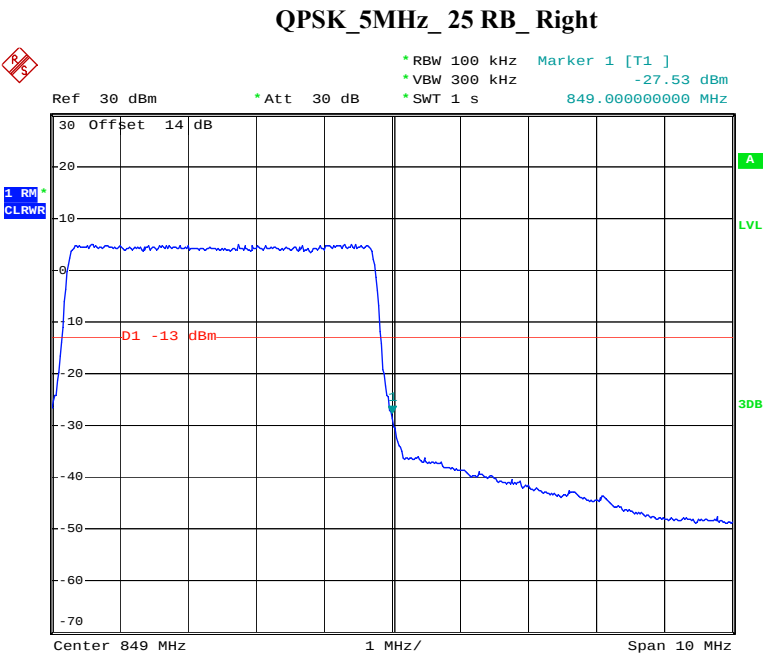
QPSK_3MHz_15 RB_Right



Date: 27.MAR.2020 20:17:02

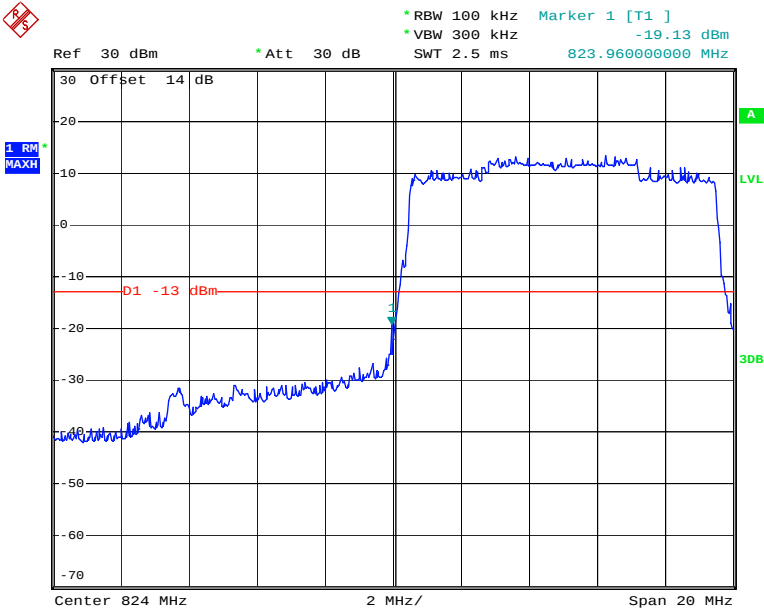


Date: 27.MAR.2020 20:23:57



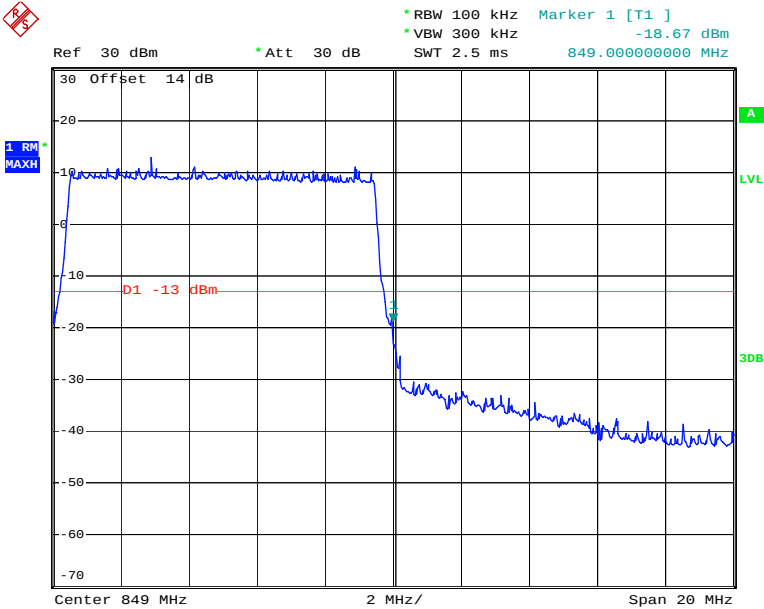
Date: 27.MAR.2020 20:26:37

QPSK_10MHz_50 RB_ Left



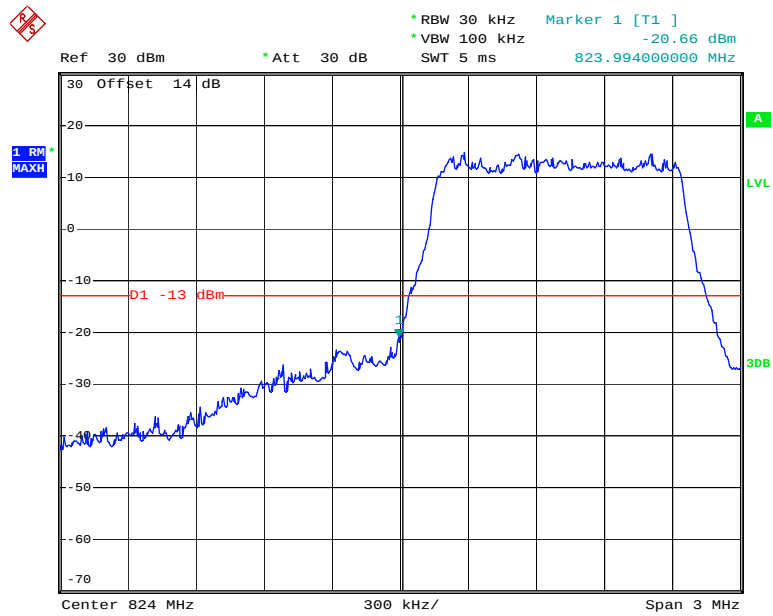
Date: 28.MAR.2020 10:52:33

QPSK_10MHz_50 RB_ Right



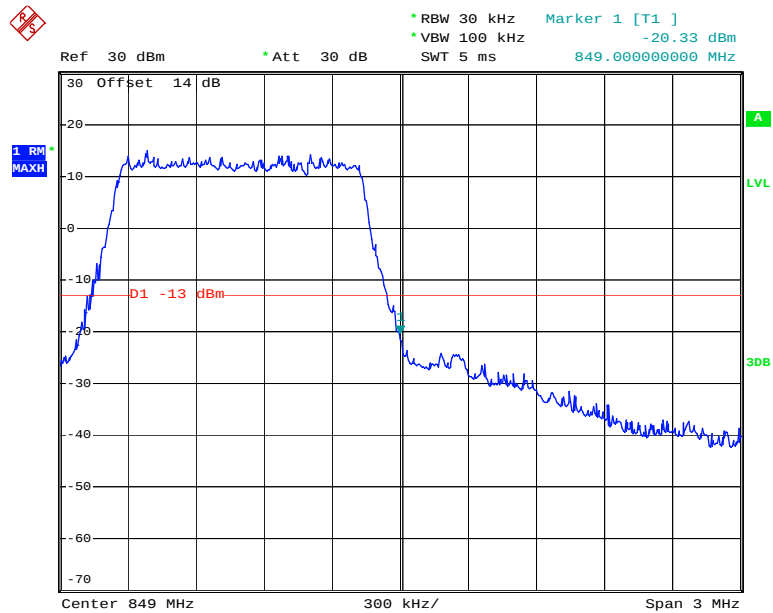
Date: 28.MAR.2020 10:53:11

16QAM_1.4MHz_6 RB_ Left



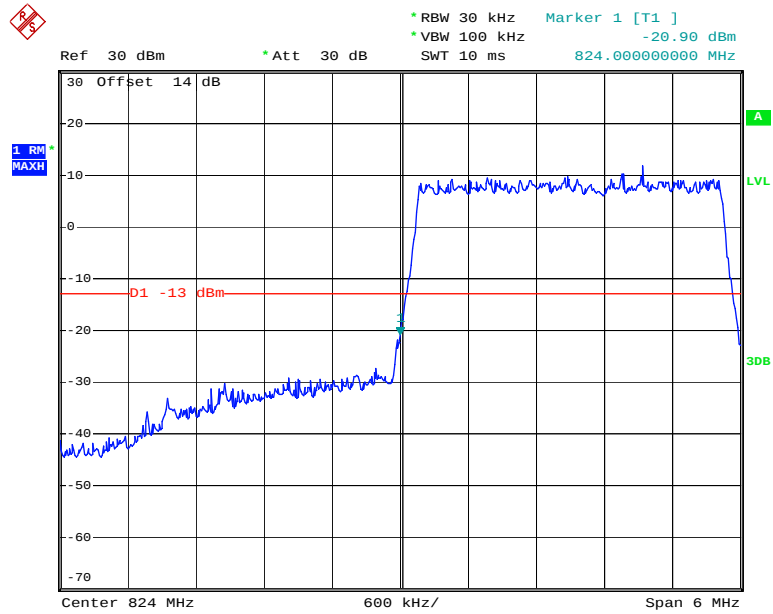
Date: 27.MAR.2020 19:52:41

16QAM_1.4MHz_6 RB_ Right



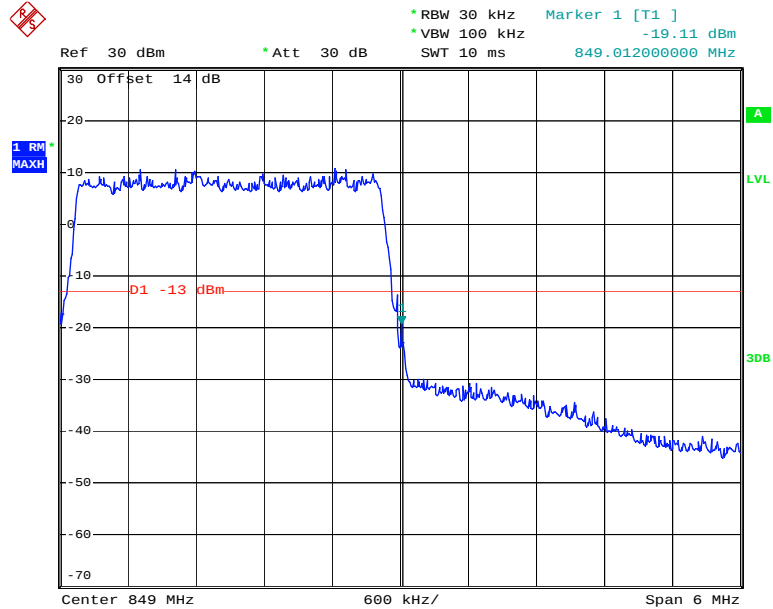
Date: 27.MAR.2020 19:53:16

16QAM_3MHz_15 RB_ Left

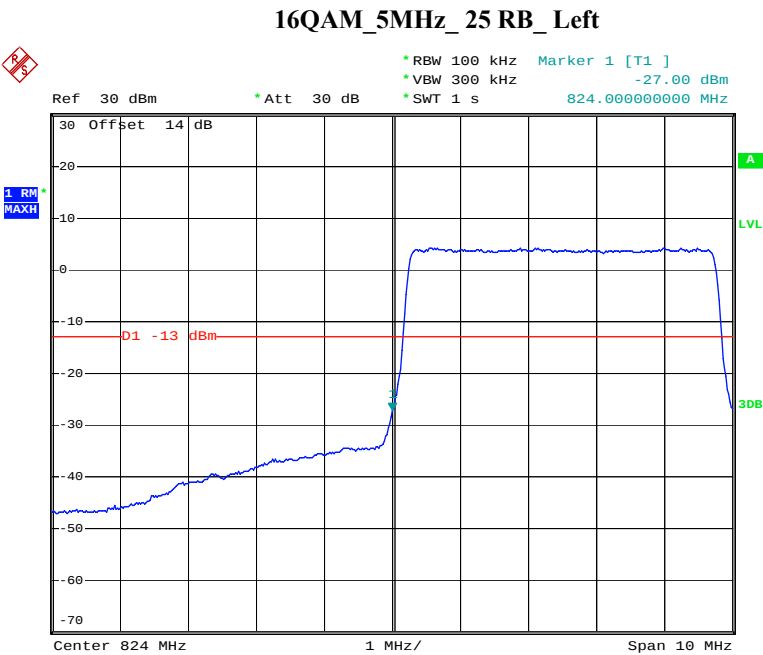


Date: 27.MAR.2020 20:16:41

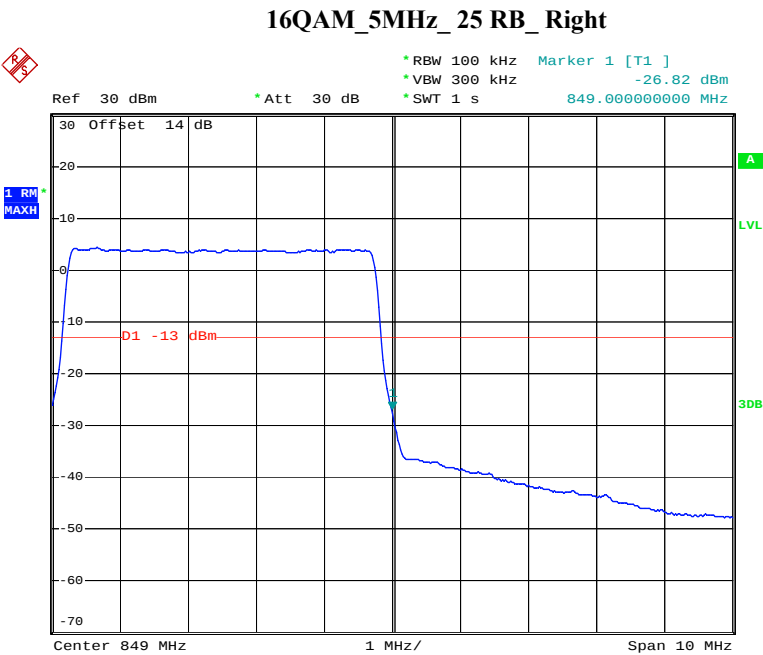
16QAM_3MHz_15 RB_ Right



Date: 27.MAR.2020 20:17:23

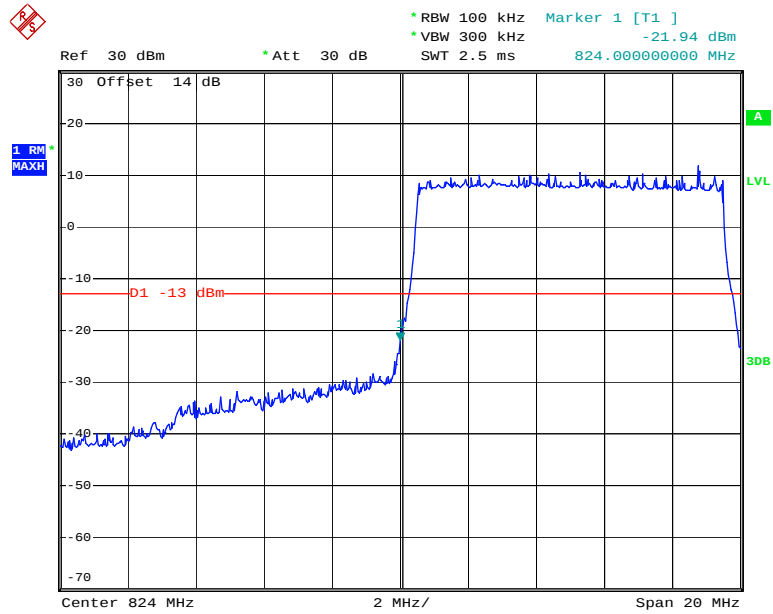


Date: 27.MAR.2020 20:25:24



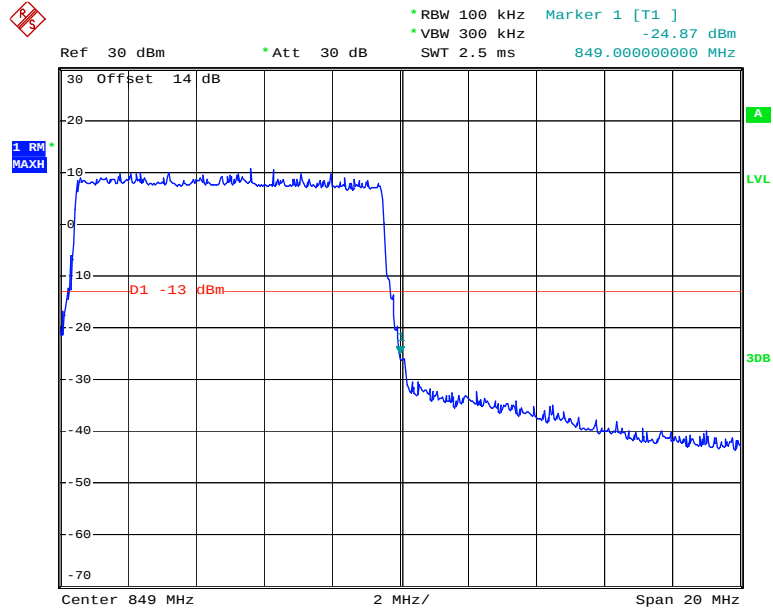
Date: 27.MAR.2020 20:28:42

16QAM_10MHz_ 50 RB_ Left



Date: 28.MAR.2020 10:52:52

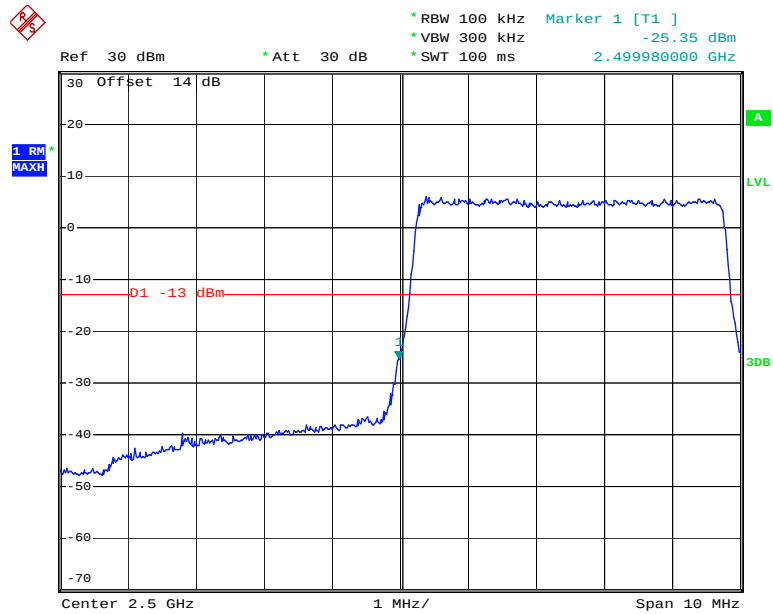
16QAM_10MHz_ 50 RB_ Right



Date: 28.MAR.2020 10:53:29

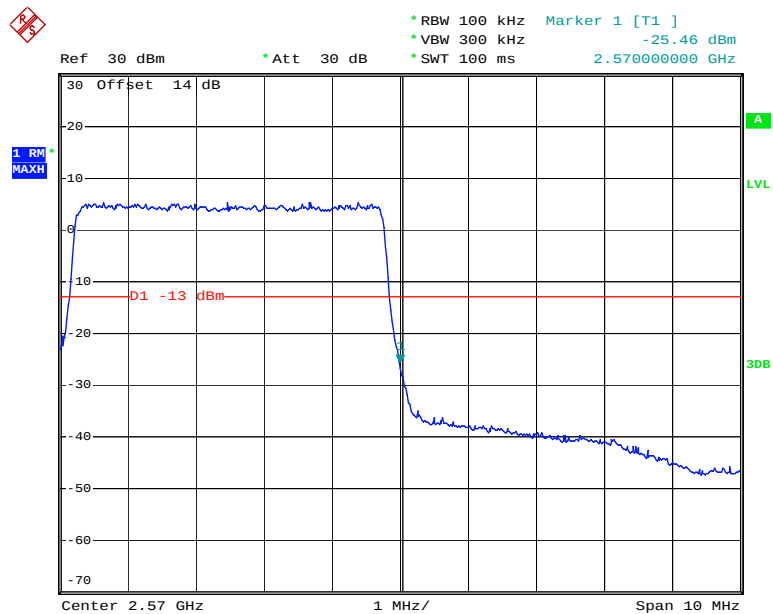
LTE Band 7

QPSK_5MHz_25 RB_Left

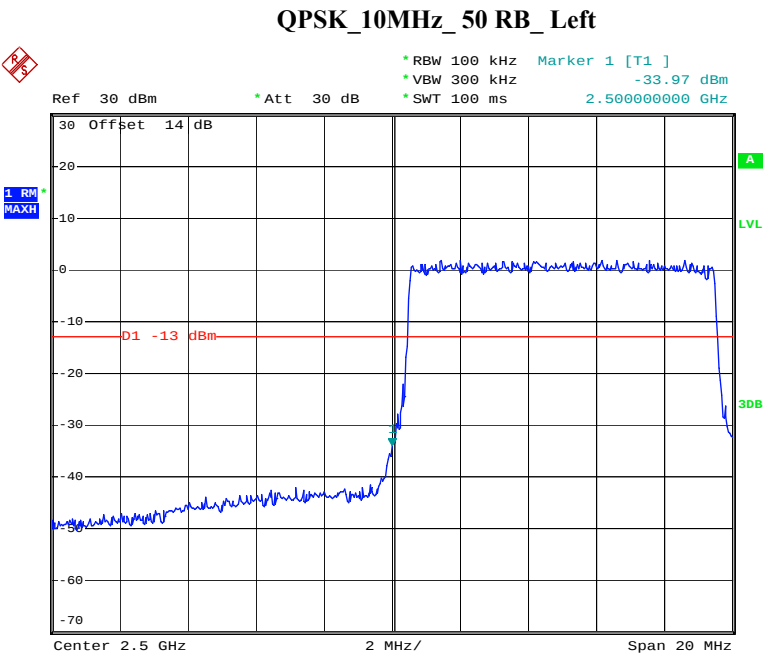


Date: 28.MAR.2020 10:54:31

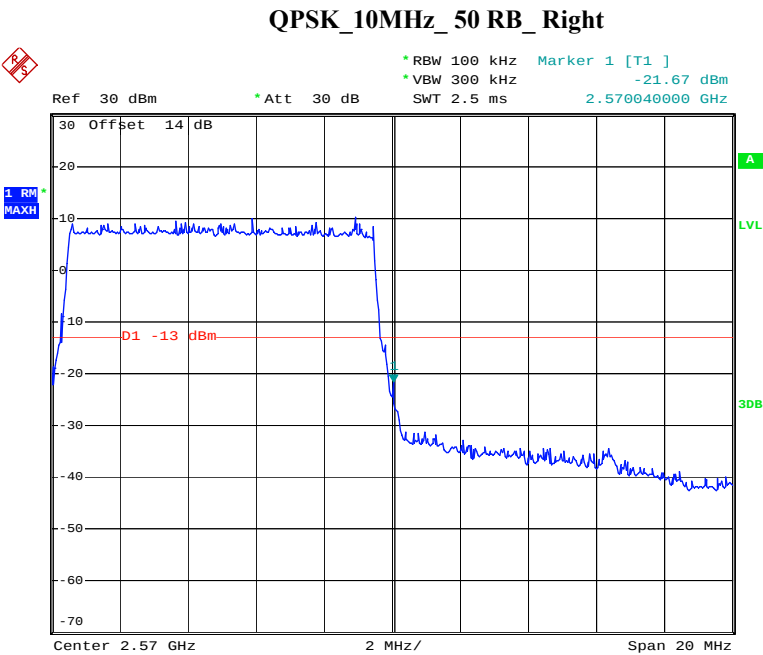
QPSK_5MHz_25 RB_Right



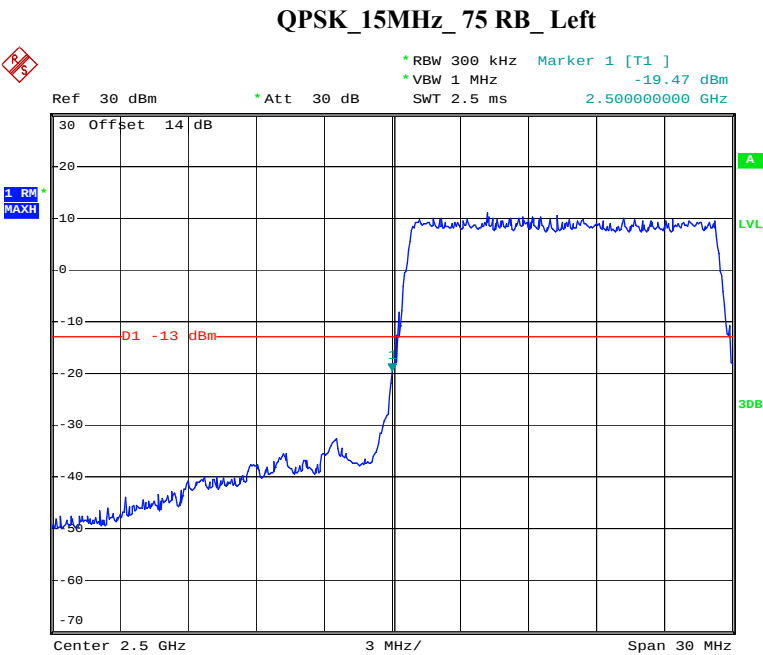
Date: 28.MAR.2020 10:55:31



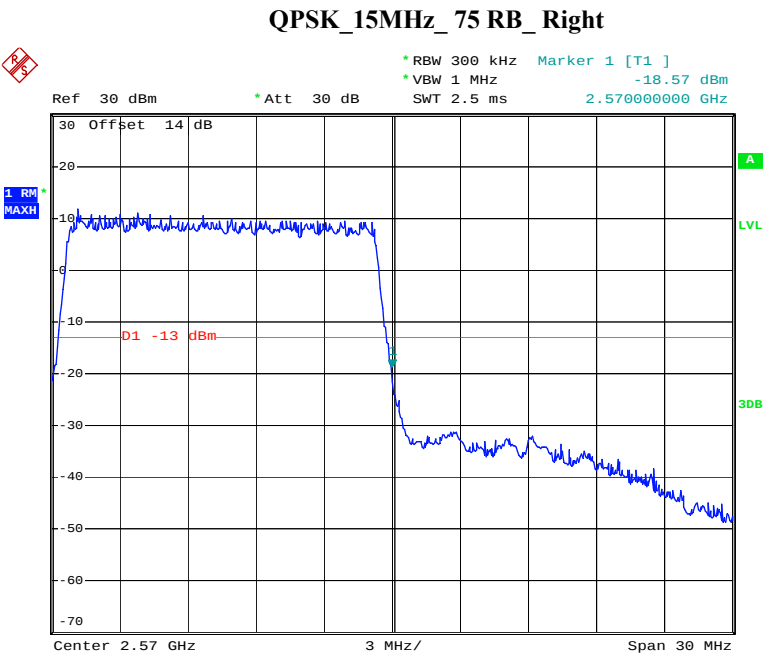
Date: 28.MAR.2020 10:56:37



Date: 28.MAR.2020 10:57:15

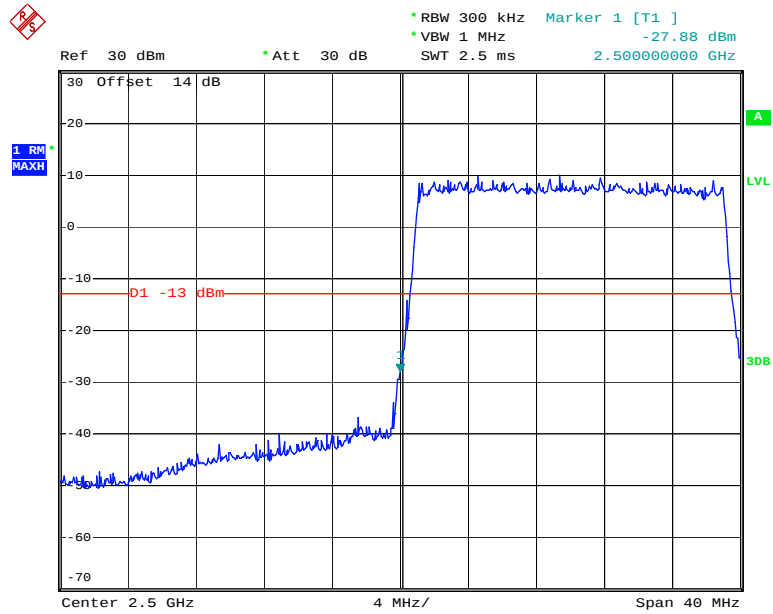


Date: 28.MAR.2020 10:58:01



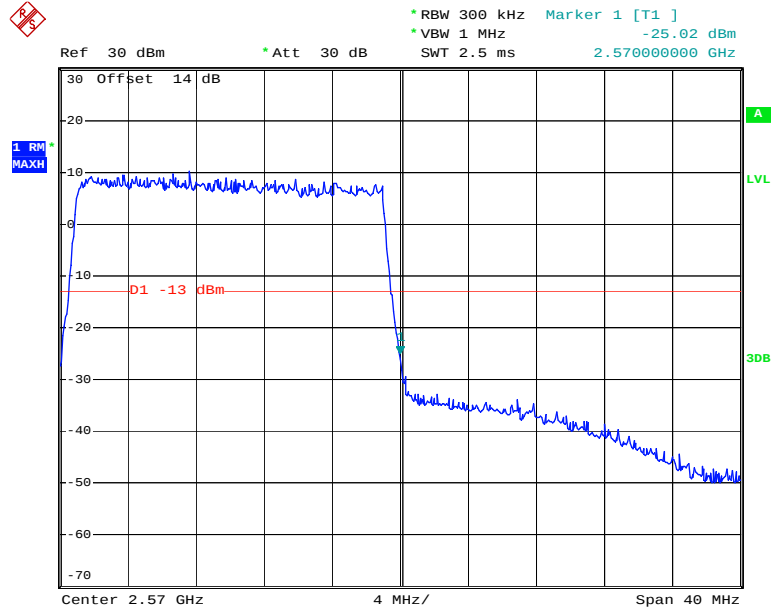
Date: 28.MAR.2020 10:58:43

QPSK_20MHz_FULL RB_Left

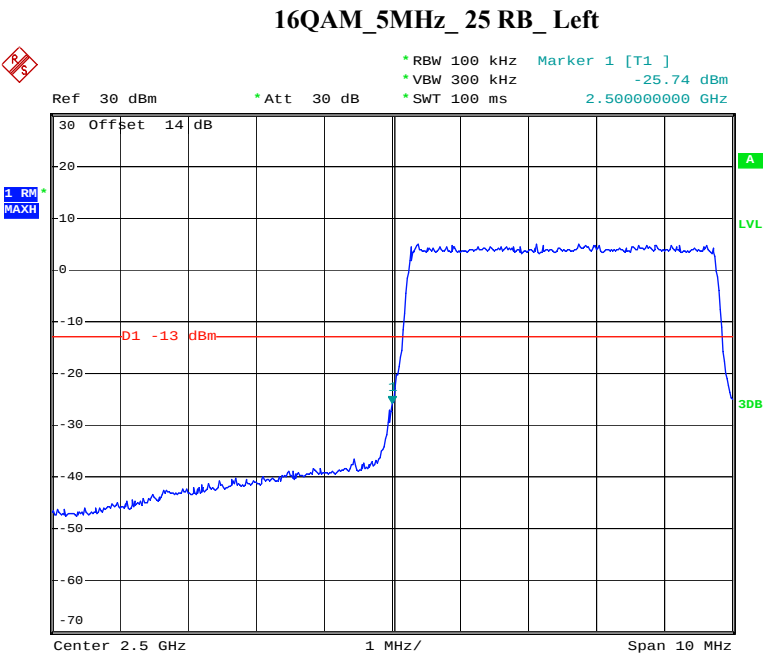


Date: 28.MAR.2020 10:59:32

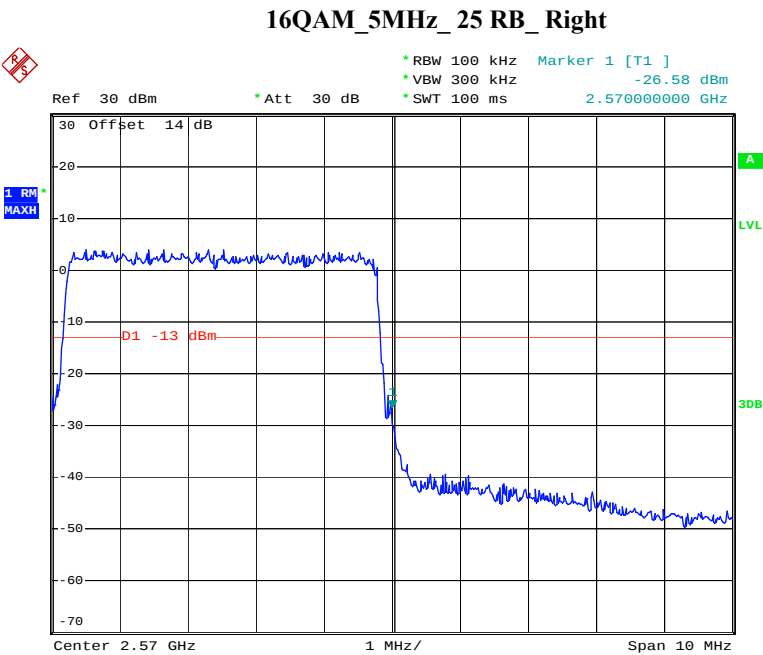
QPSK_20MHz_FULL RB_Right



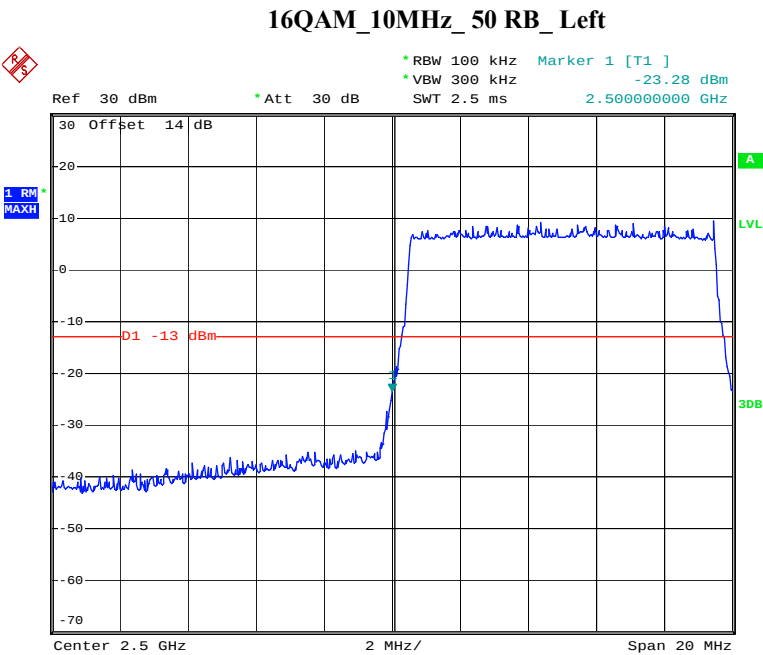
Date: 28.MAR.2020 11:00:14



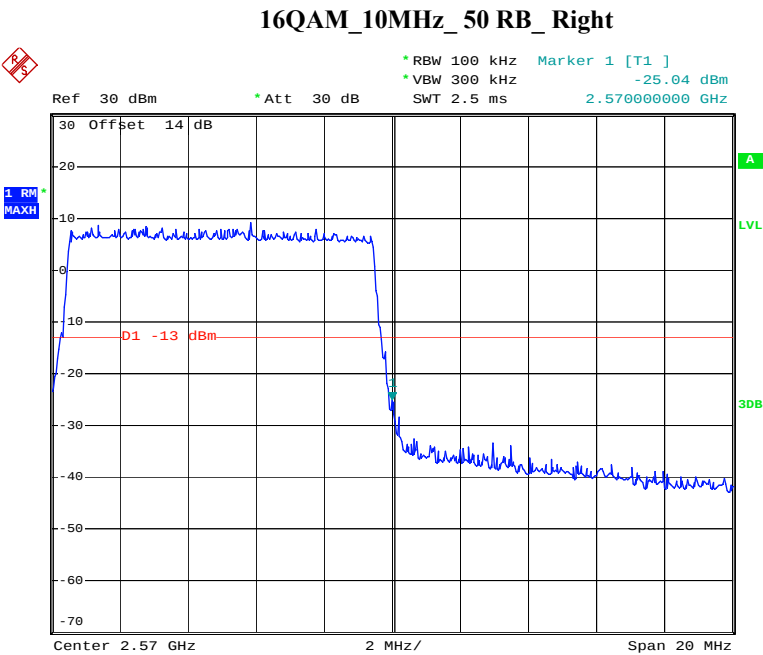
Date: 28.MAR.2020 10:55:03



Date: 28.MAR.2020 10:56:01

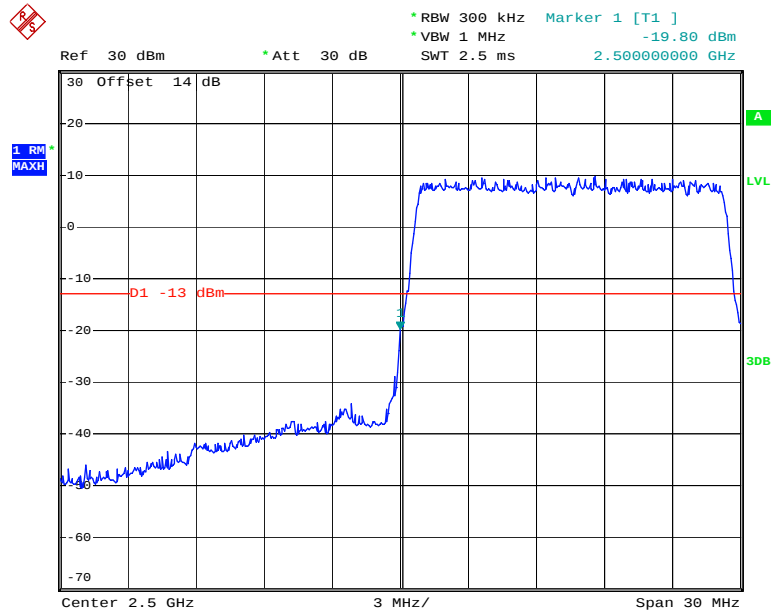


Date: 28.MAR.2020 10:56:56



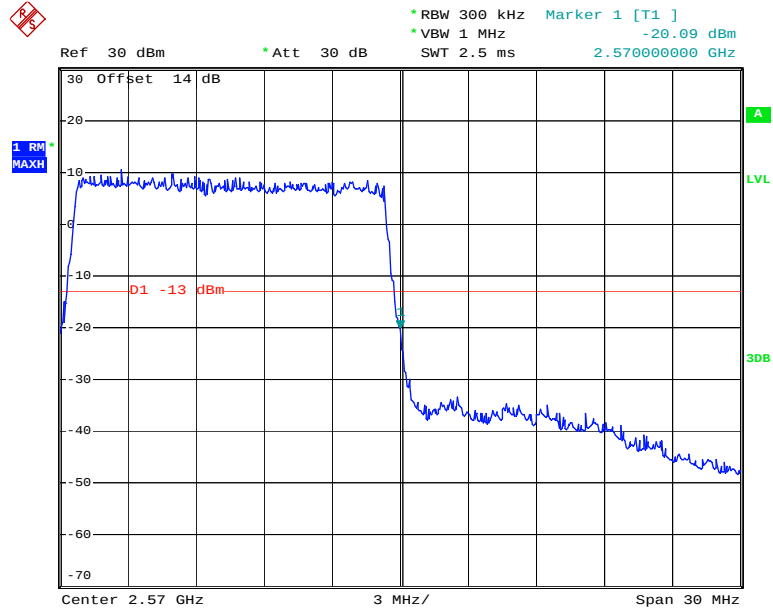
Date: 28.MAR.2020 10:57:34

16QAM_15MHz_ 75 RB_ Left



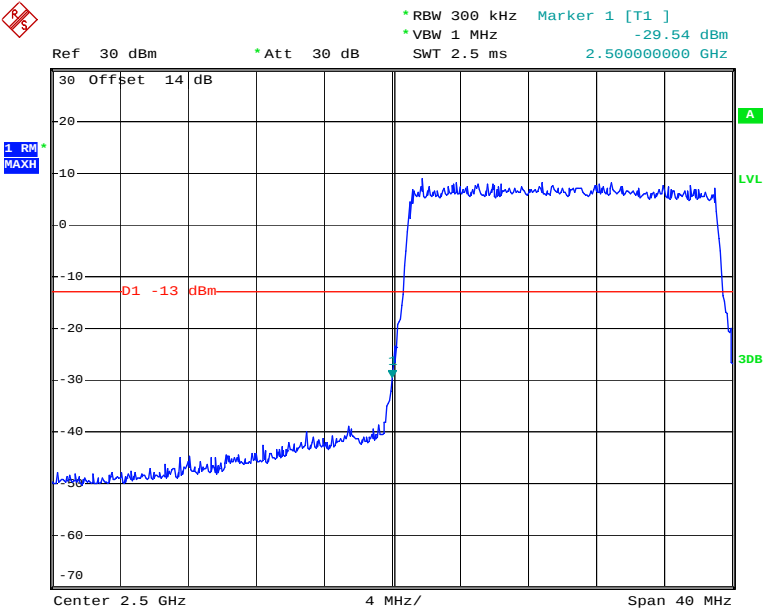
Date: 28.MAR.2020 10:58:21

16QAM_15MHz_ 75 RB_ Right



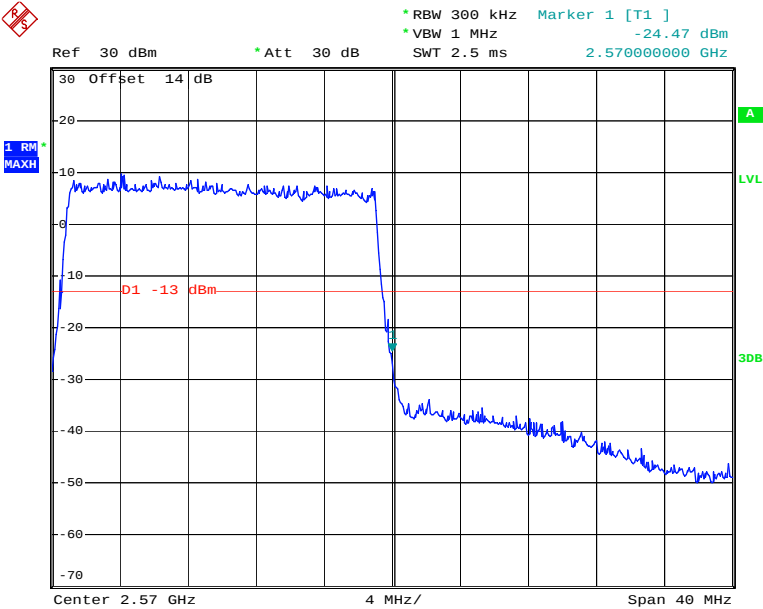
Date: 28.MAR.2020 10:59:03

16QAM_20MHz_ FULL RB_ Left



Date: 28.MAR.2020 10:59:52

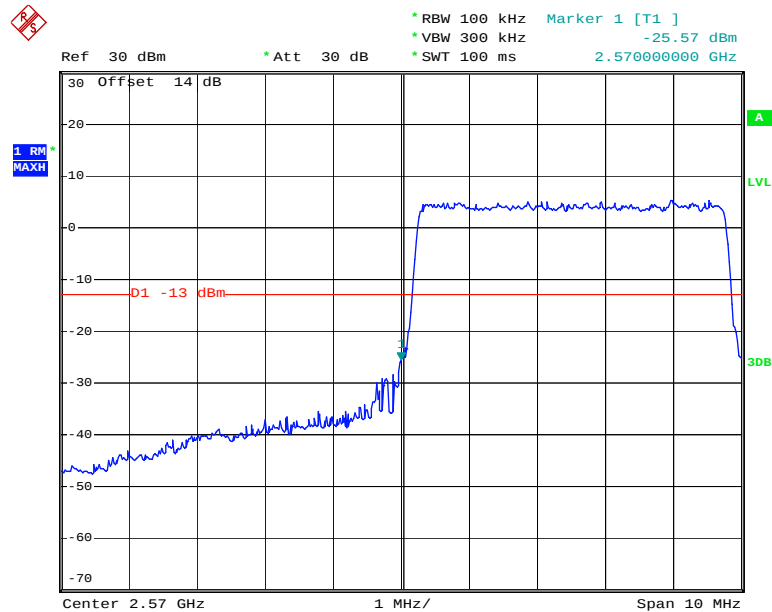
16QAM_20MHz_ FULL RB_ Right



Date: 28.MAR.2020 11:00:37

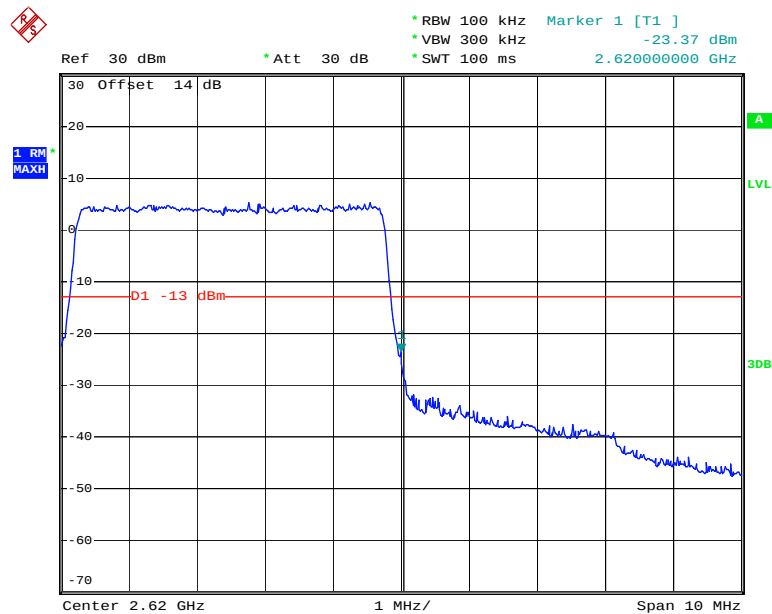
LTE Band 38

QPSK_5MHz_25 RB_ Left

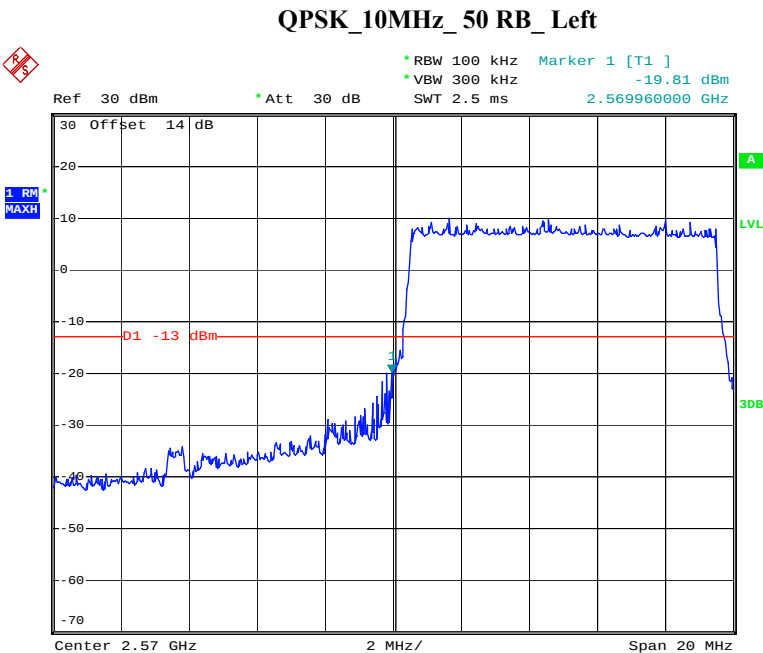


Date: 28.MAR.2020 11:09:32

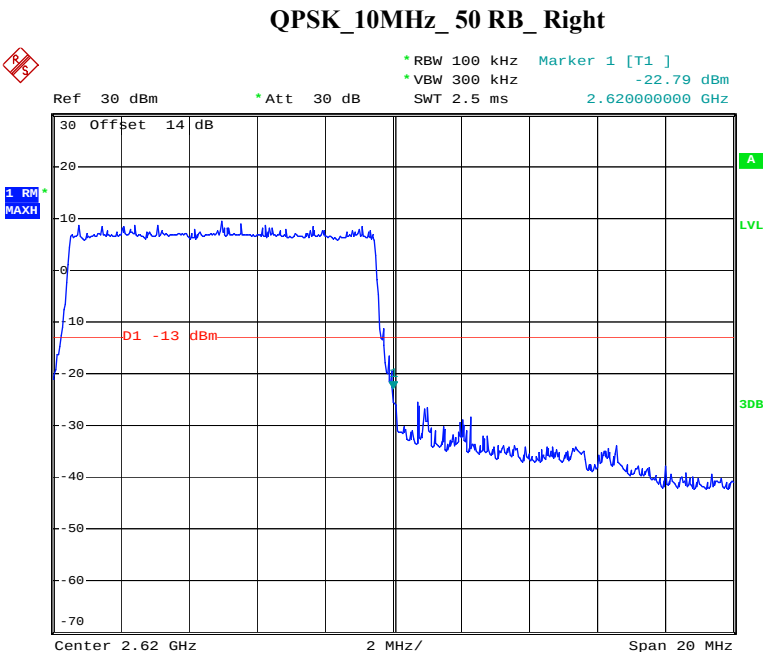
QPSK_5MHz_25 RB_ Right



Date: 28.MAR.2020 11:10:37

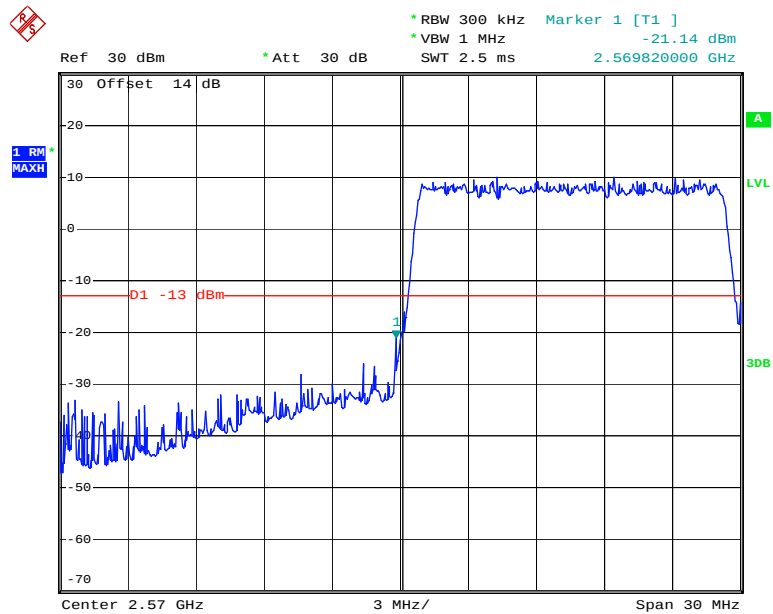


Date: 28.MAR.2020 11:11:34



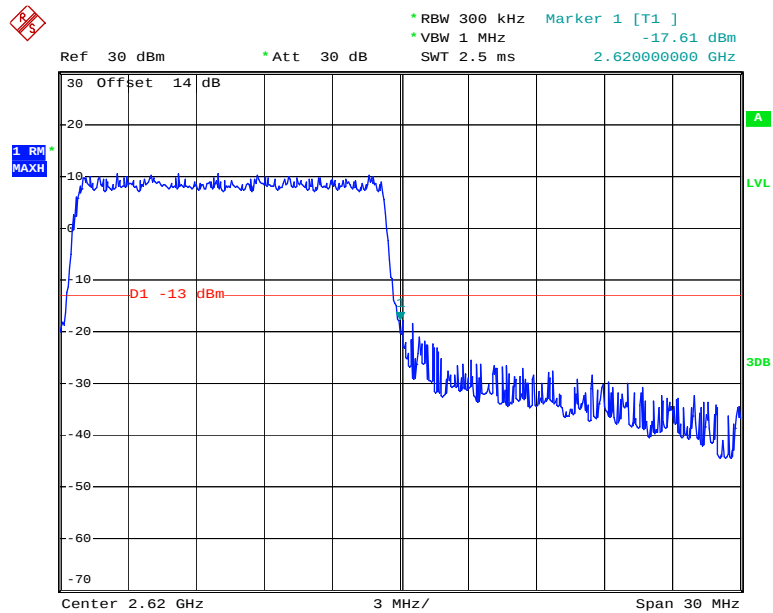
Date: 28.MAR.2020 11:12:18

QPSK_15MHz_75 RB_ Left



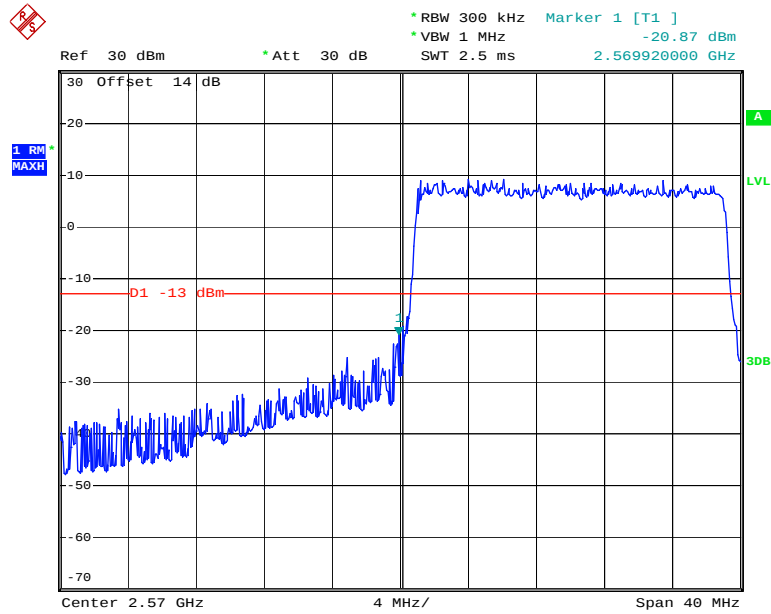
Date: 28.MAR.2020 11:13:12

QPSK_15MHz_75 RB_ Right



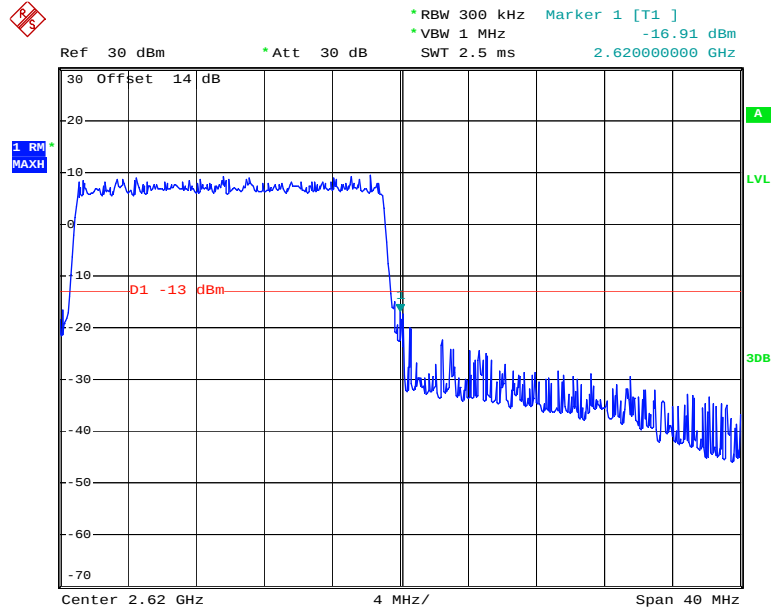
Date: 28.MAR.2020 11:14:09

QPSK_20MHz_100 RB_ Left



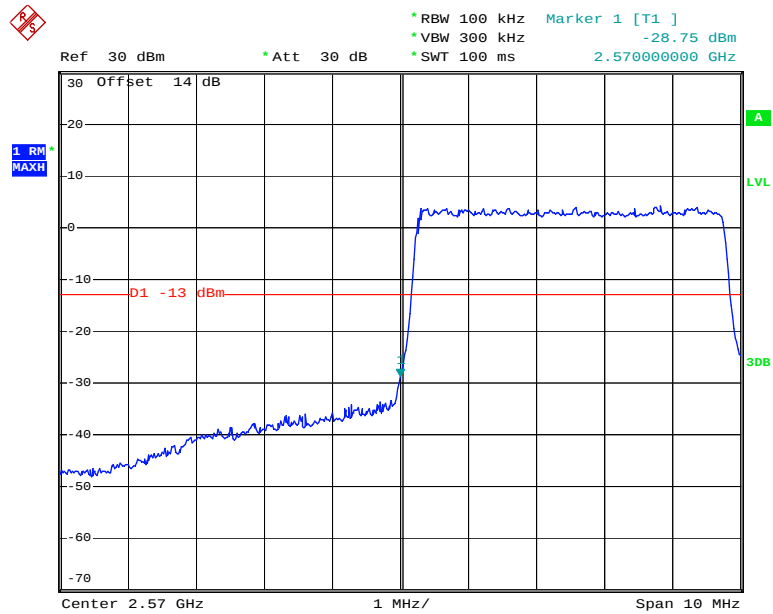
Date: 28.MAR.2020 11:15:13

QPSK_20MHz_100 RB_ Right



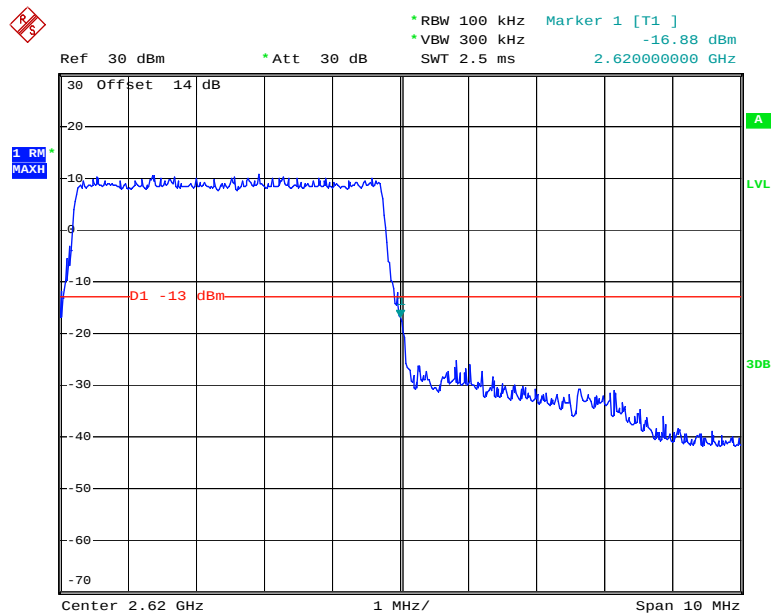
Date: 28.MAR.2020 11:16:17

16QAM_5MHz_25 RB_ Left



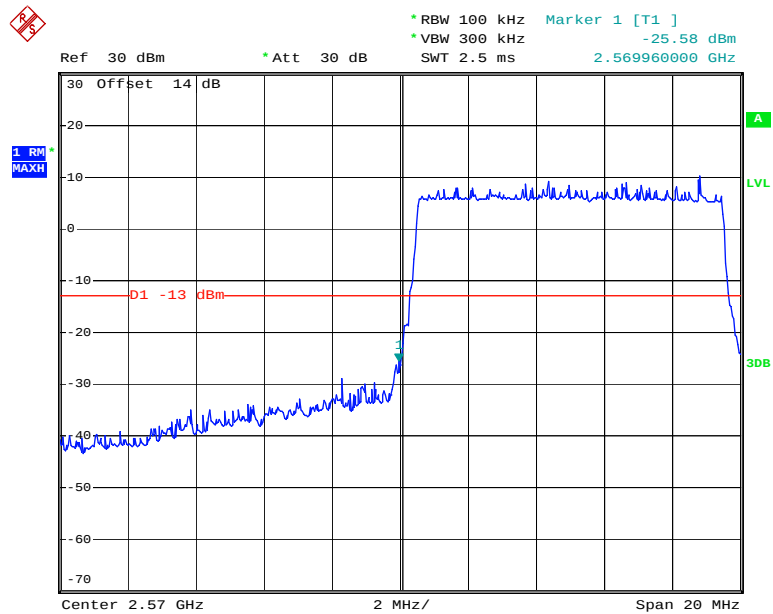
Date: 28.MAR.2020 11:10:01

16QAM_5MHz_25 RB_ Right



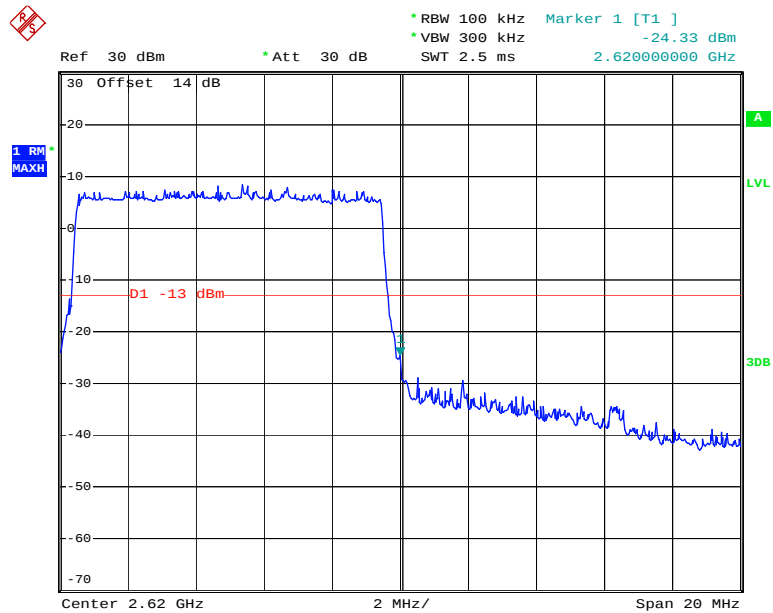
Date: 28.MAR.2020 11:10:57

16QAM_10MHz_ 50 RB_ Left



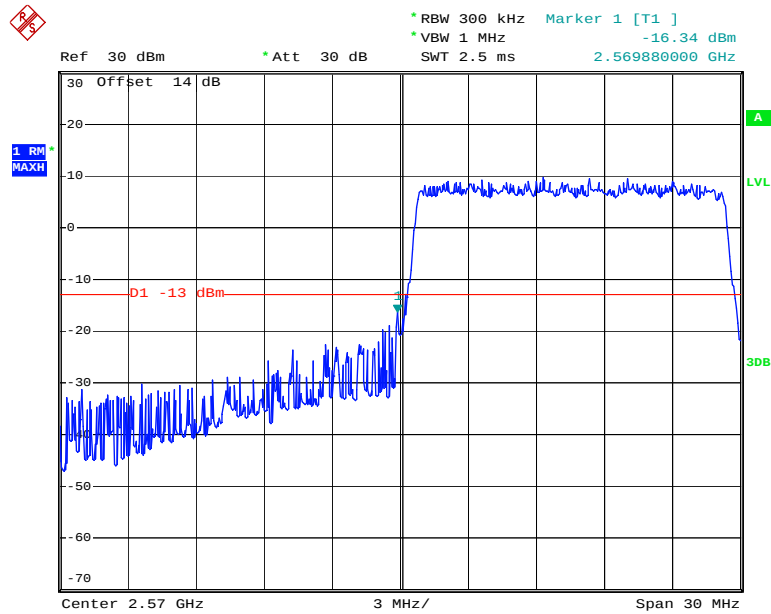
Date: 28.MAR.2020 11:11:55

16QAM_10MHz_ 50 RB_ Right



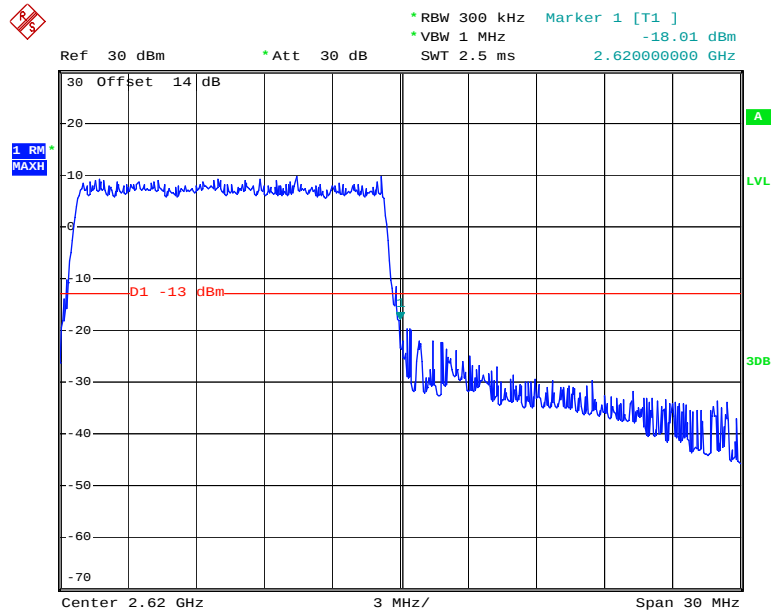
Date: 28.MAR.2020 11:12:39

16QAM_15MHz_ 75 RB_ Left



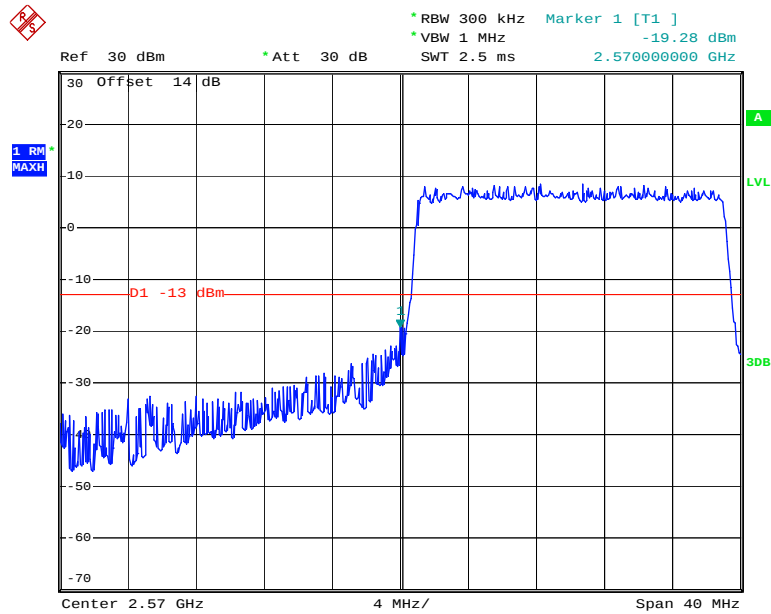
Date: 28.MAR.2020 11:13:38

16QAM_15MHz_ 75 RB_ Right



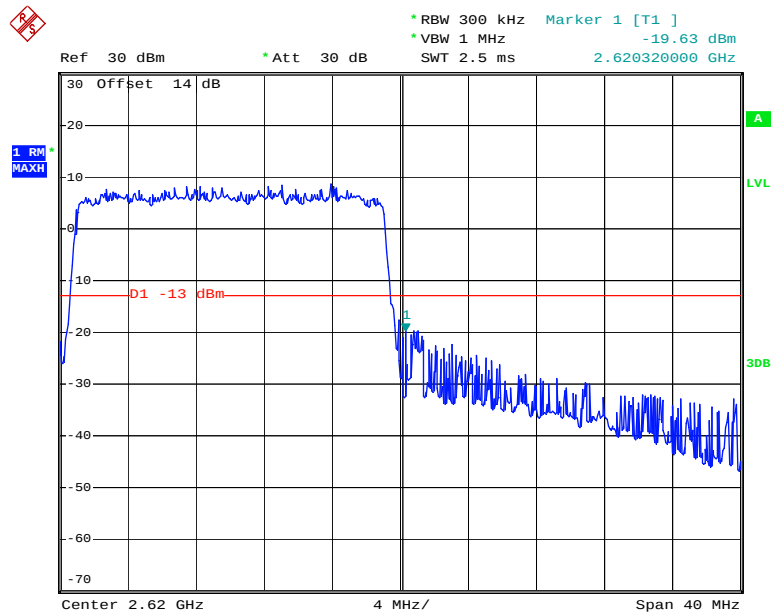
Date: 28.MAR.2020 11:14:36

16QAM_20MHz_100 RB_Left



Date: 28.MAR.2020 11:15:46

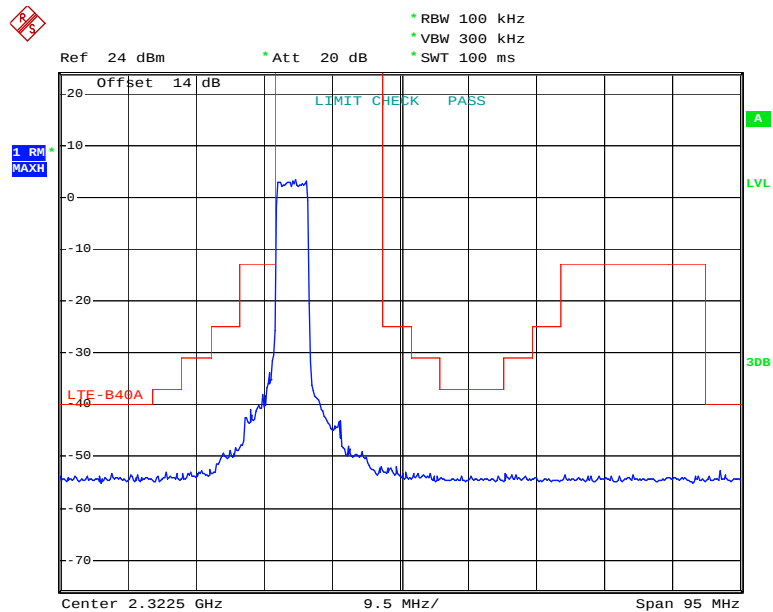
16QAM_20MHz_100 RB_Right



Date: 28.MAR.2020 11:16:47

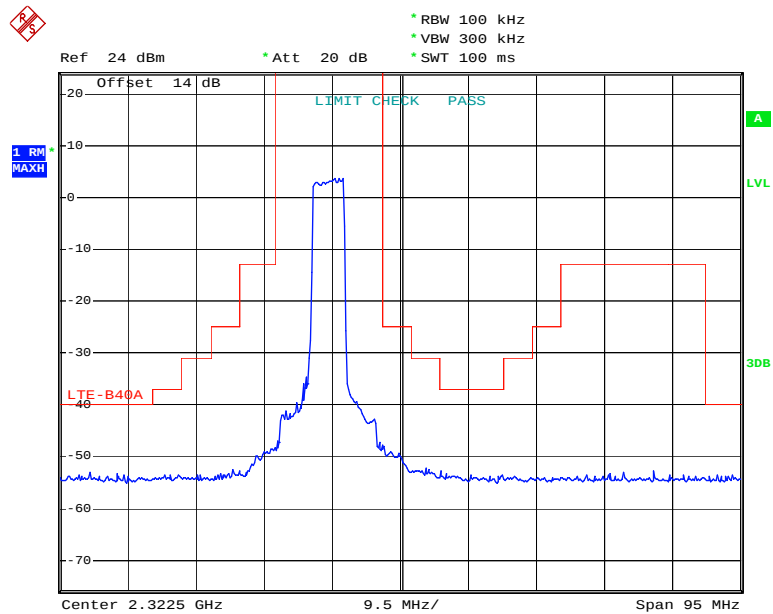
LTE Band40 Lower:

QPSK_5MHz_25 RB_ Left



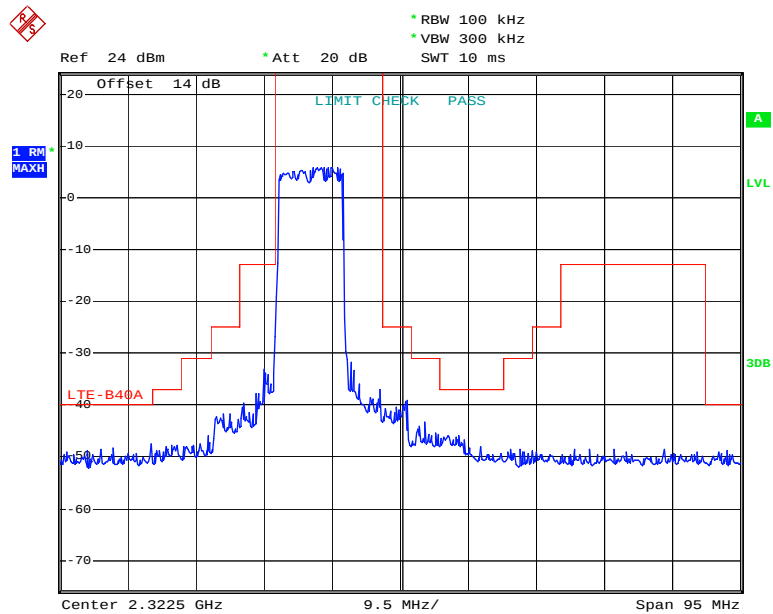
Date: 16.APR.2020 11:35:26

QPSK_5MHz_25 RB_ Right



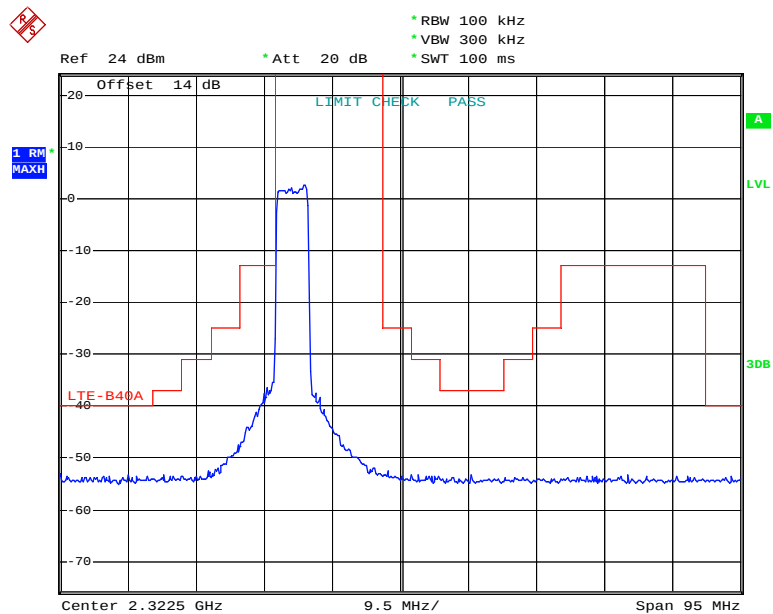
Date: 16.APR.2020 11:36:00

QPSK_10MHz_50 RB



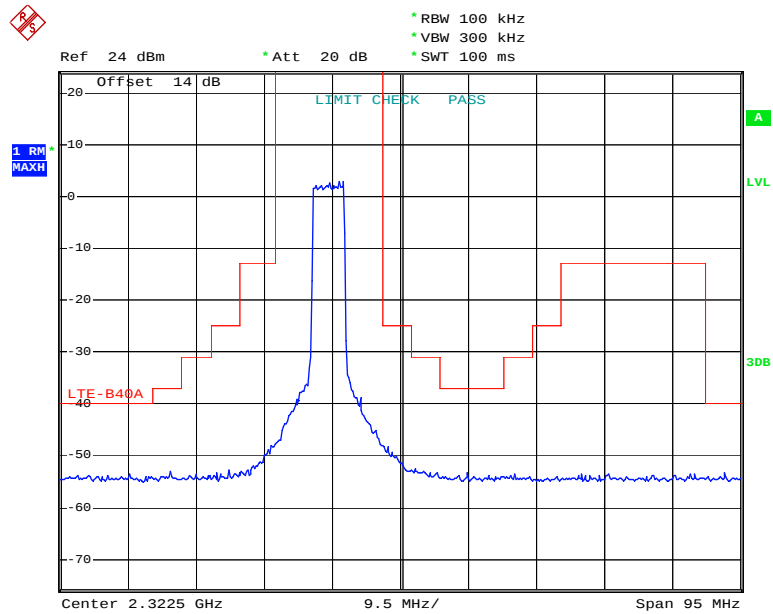
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16QAM_5MHz_25 RB_Left



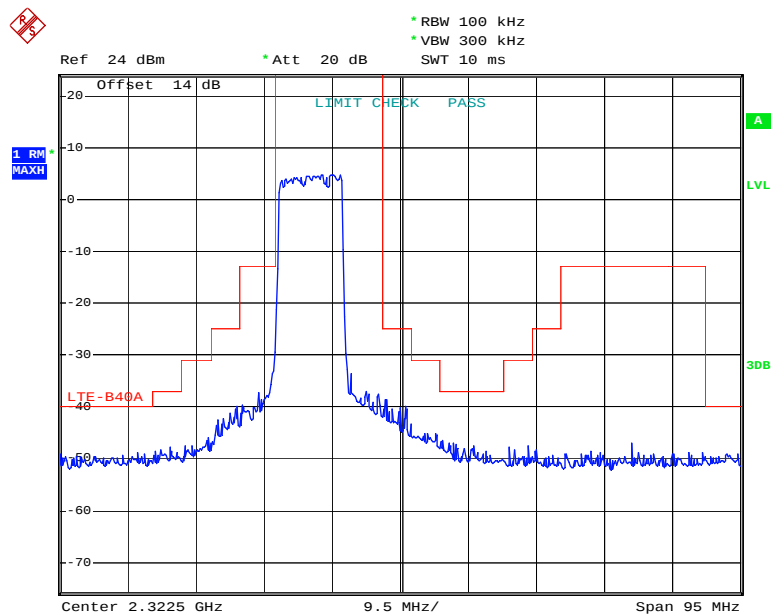
Date: 16.APR.2020 11:34:58

16QAM_5MHz_25 RB_Right



Date: 16.APR.2020 11:36:27

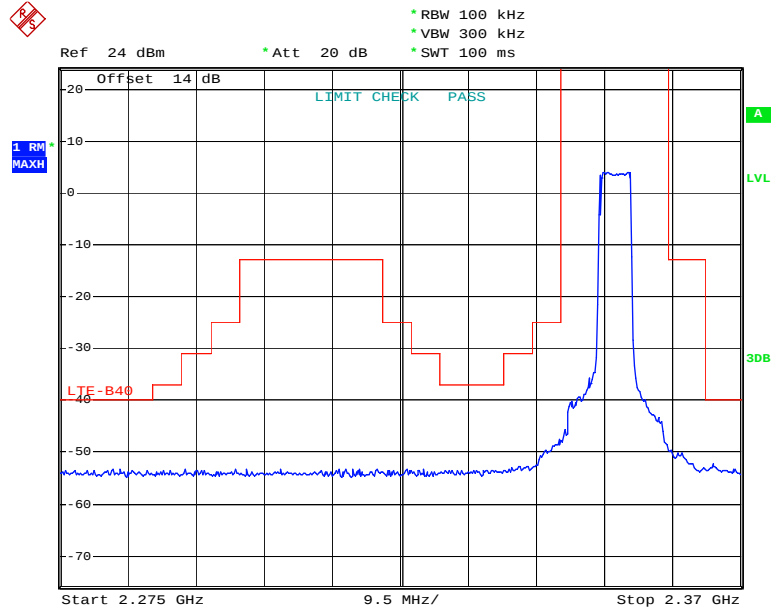
16QAM_10MHz_50 RB



Date: 16.APR.2020 11:37:15

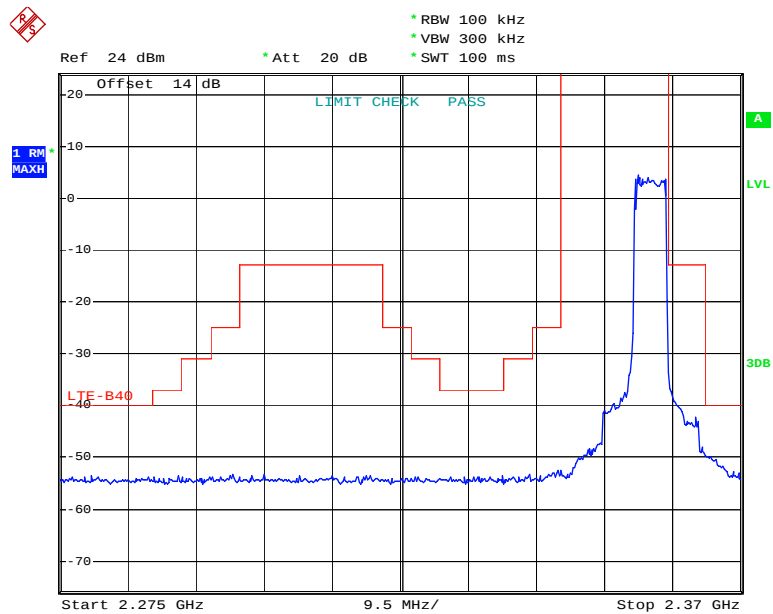
LTE Band40 Upper:

QPSK_5MHz_25 RB_ Left



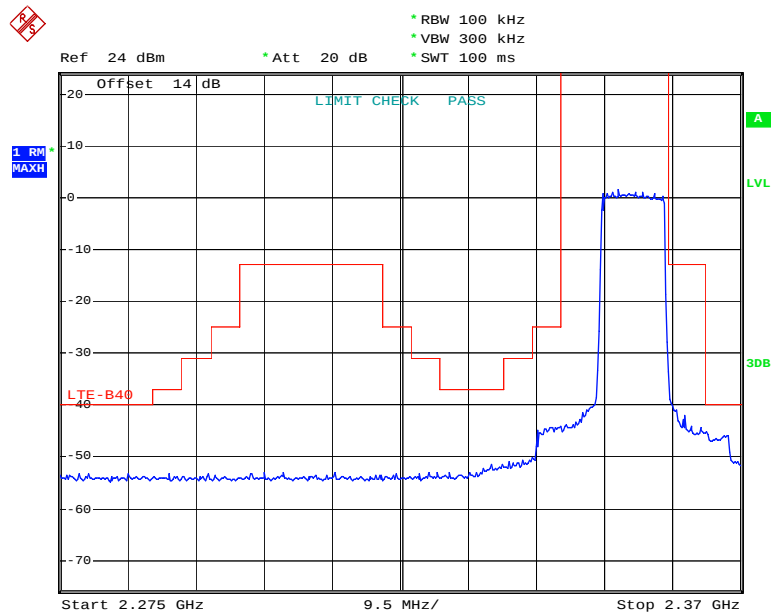
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QPSK_5MHz_25 RB_ Right



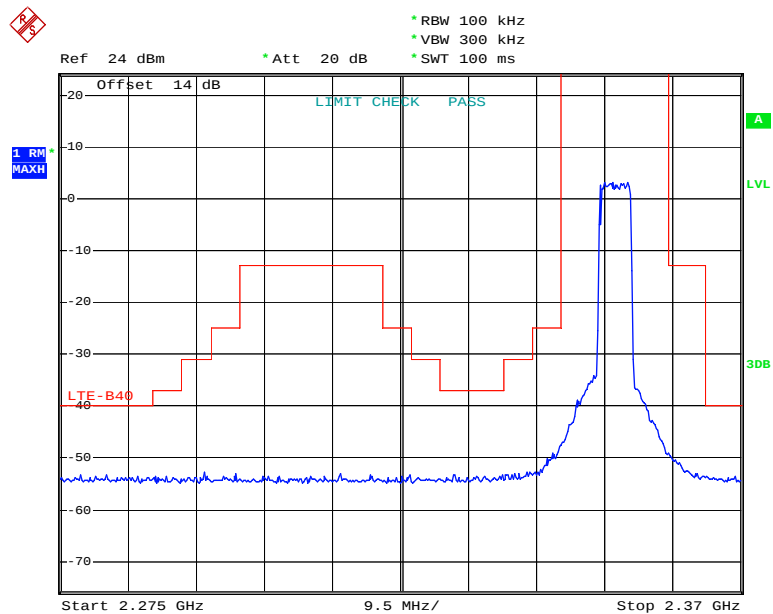
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QPSK_10MHz_50 RB_



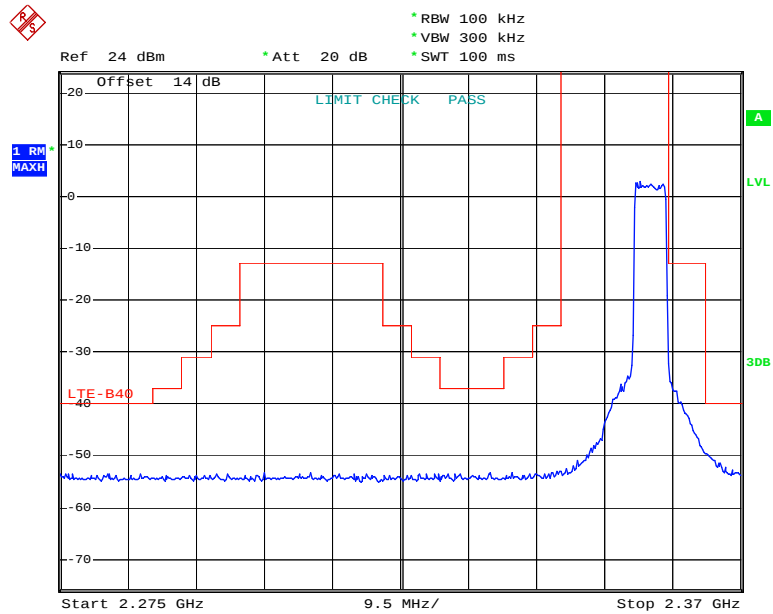
Date: 16.APR.2020 11:28:09

16QAM_5MHz_25 RB_Left



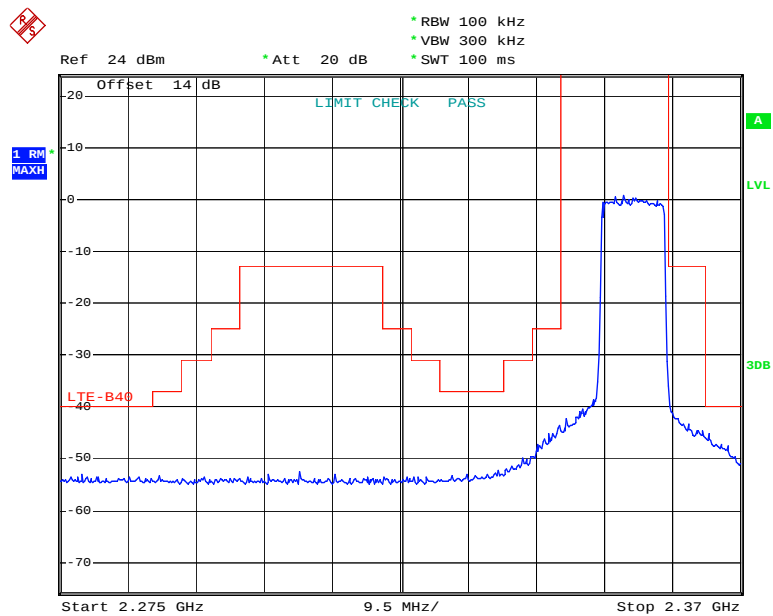
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16QAM_5MHz_25 RB_Right



Date: 16.APR.2020 11:31:33

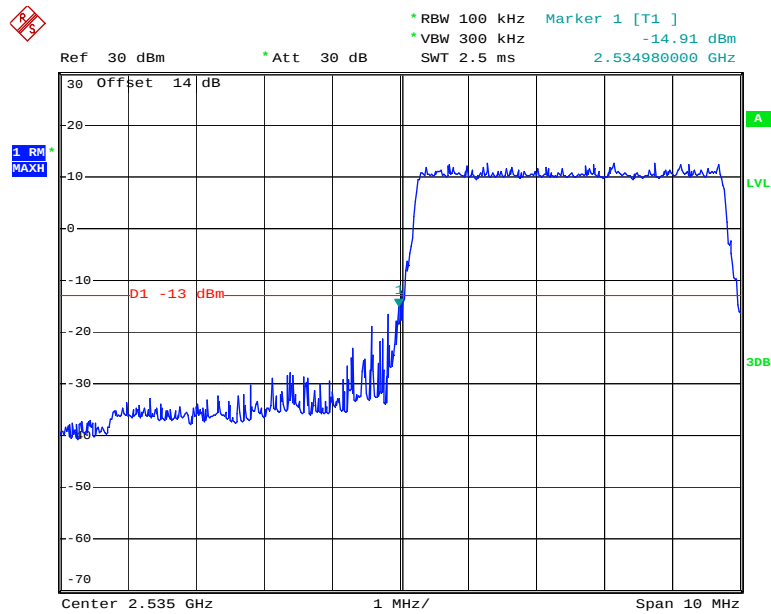
16QAM_10MHz_50 RB



Date: 16.APR.2020 11:29:44

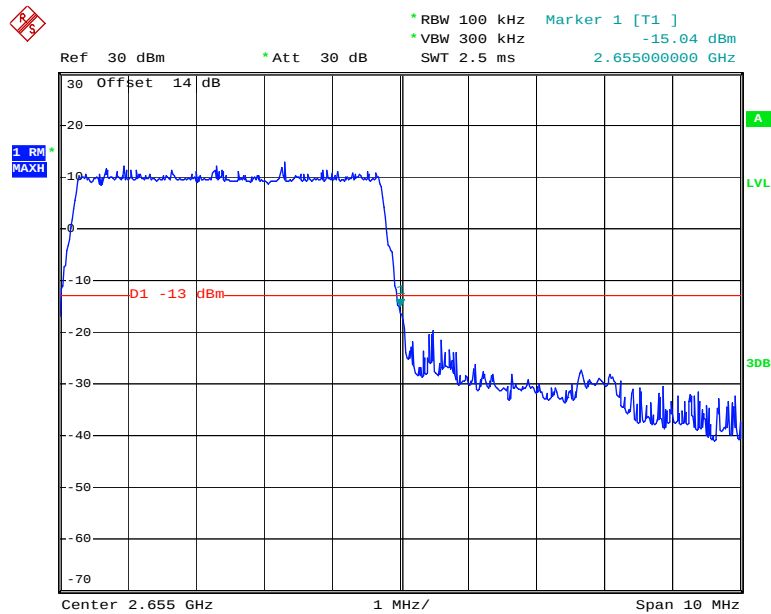
LTE Band 41

QPSK_5MHz_25 RB_Left

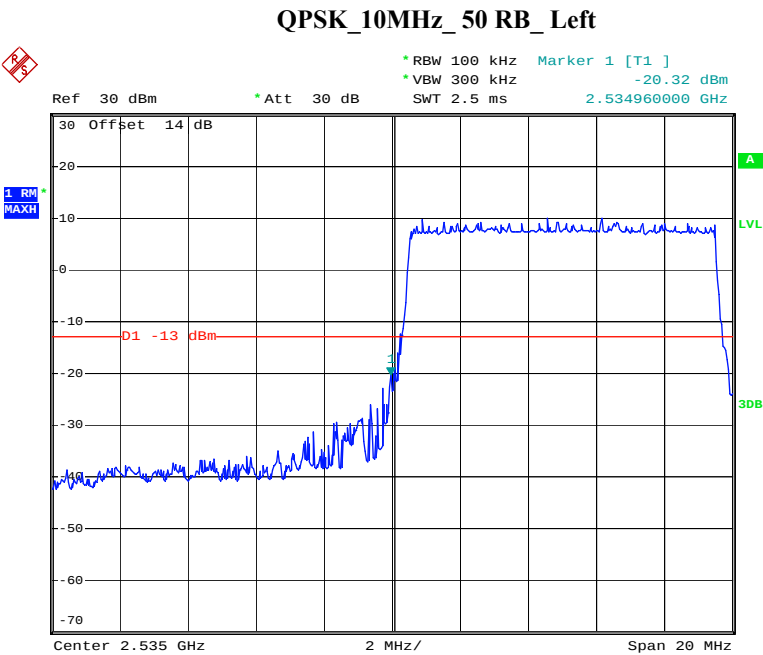


Date: 28.MAR.2020 11:25:04

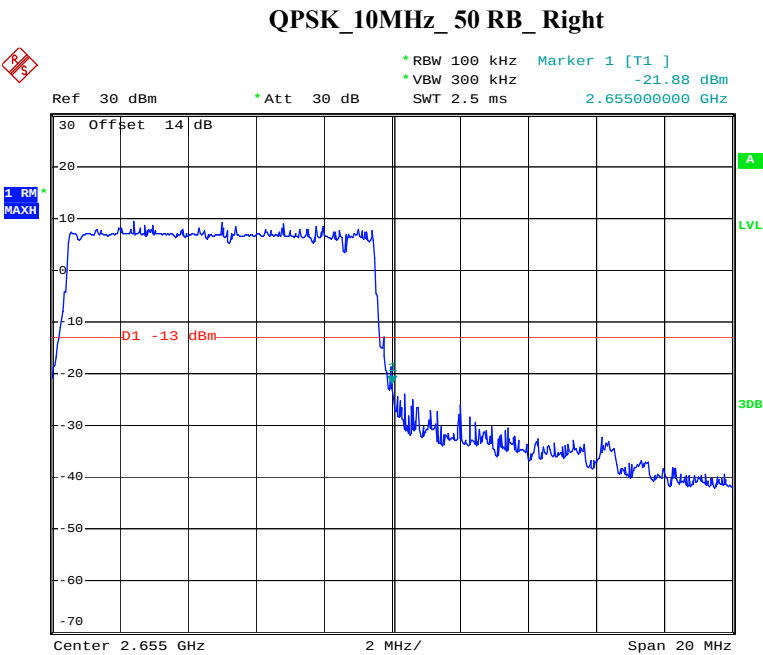
QPSK_5MHz_25 RB_Right



Date: 28.MAR.2020 11:25:49

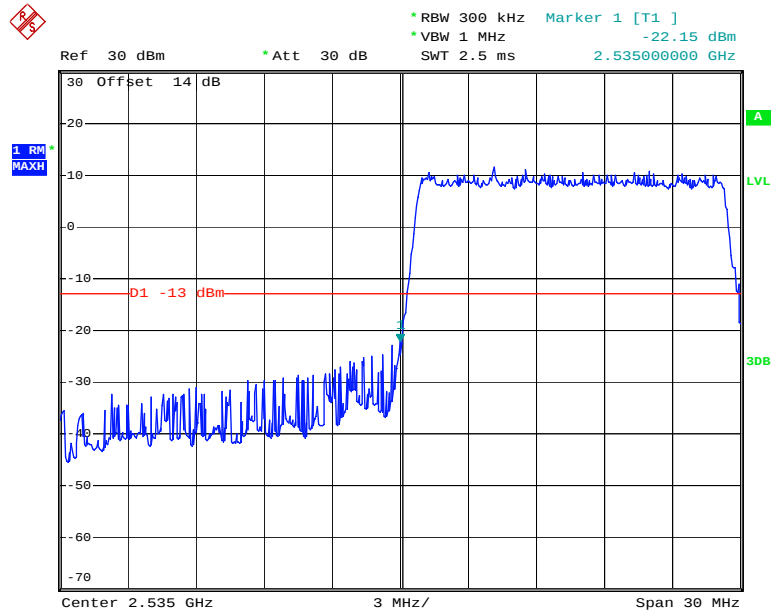


Date: 28.MAR.2020 11:26:45



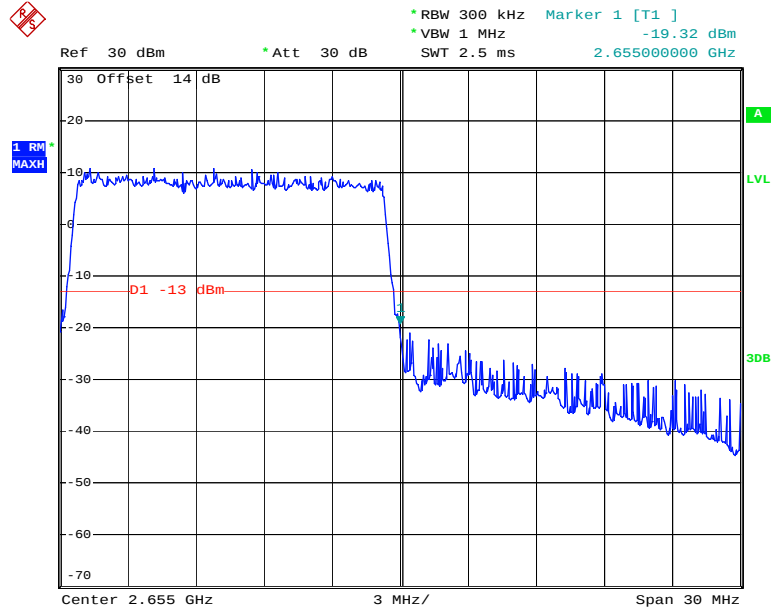
Date: 28.MAR.2020 11:27:26

QPSK_15MHz_75 RB_ Left



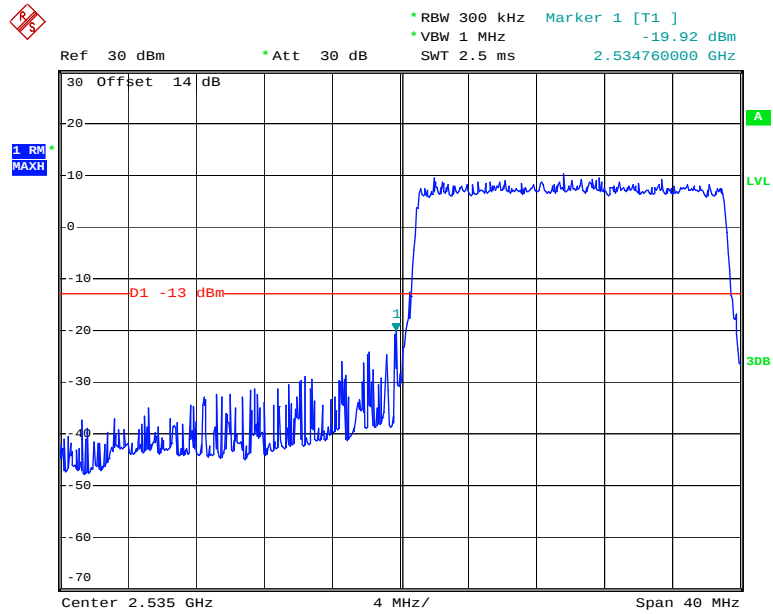
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QPSK_15MHz_75 RB_ Right



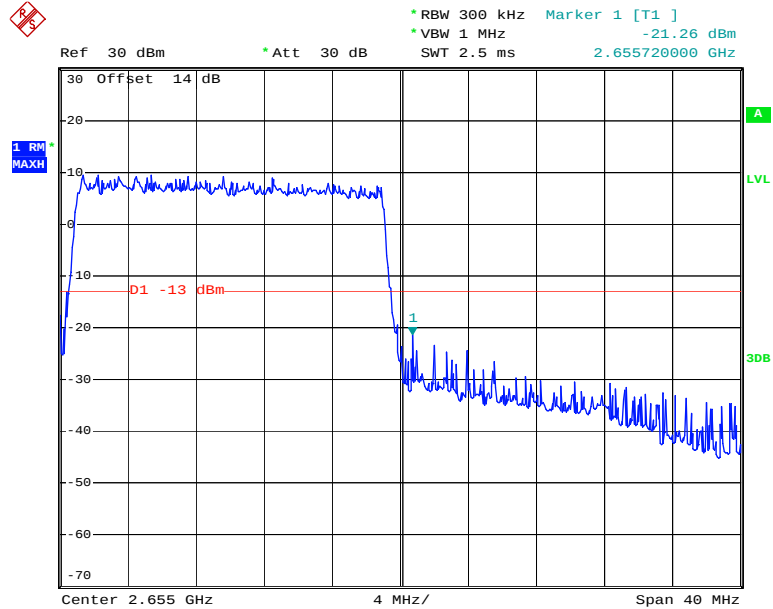
Date: 28.MAR.2020 11:29:19

QPSK_20MHz_FULL RB_Left



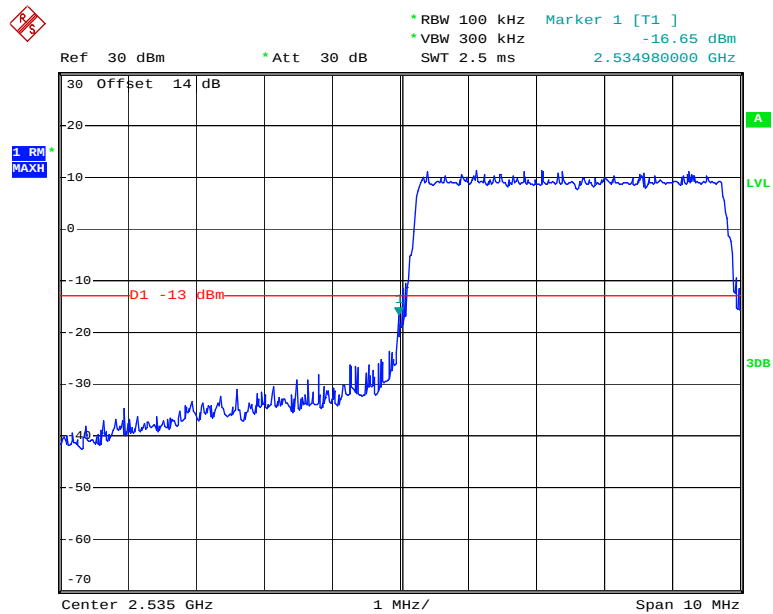
Date: 28.MAR.2020 11:30:19

QPSK_20MHz_FULL RB_Right



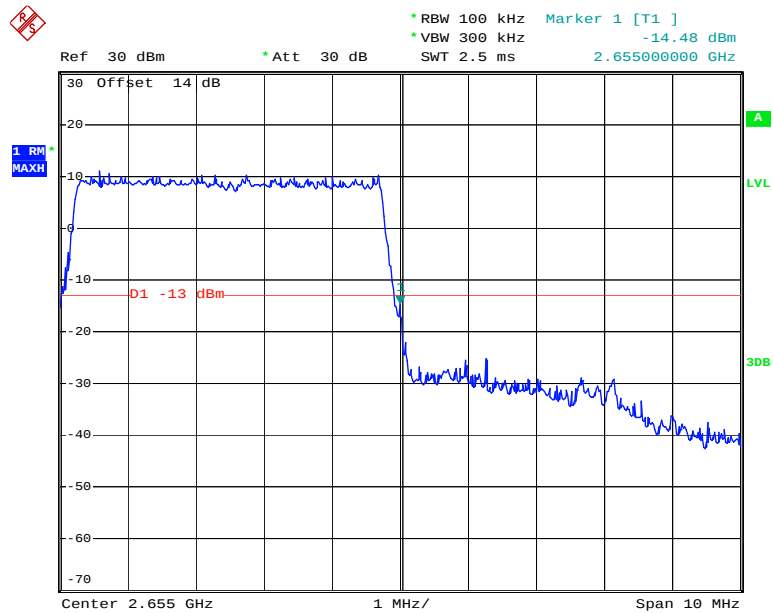
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16QAM_5MHz_25 RB_ Left

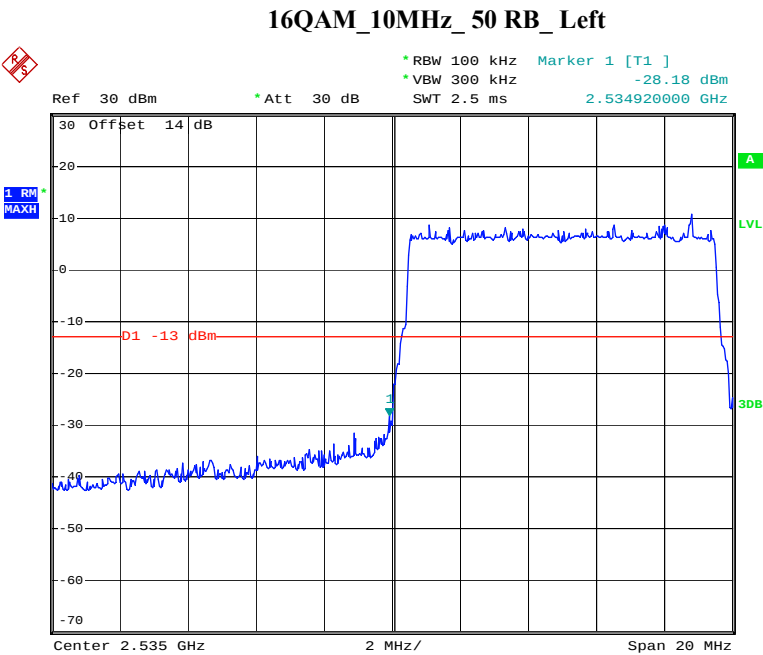


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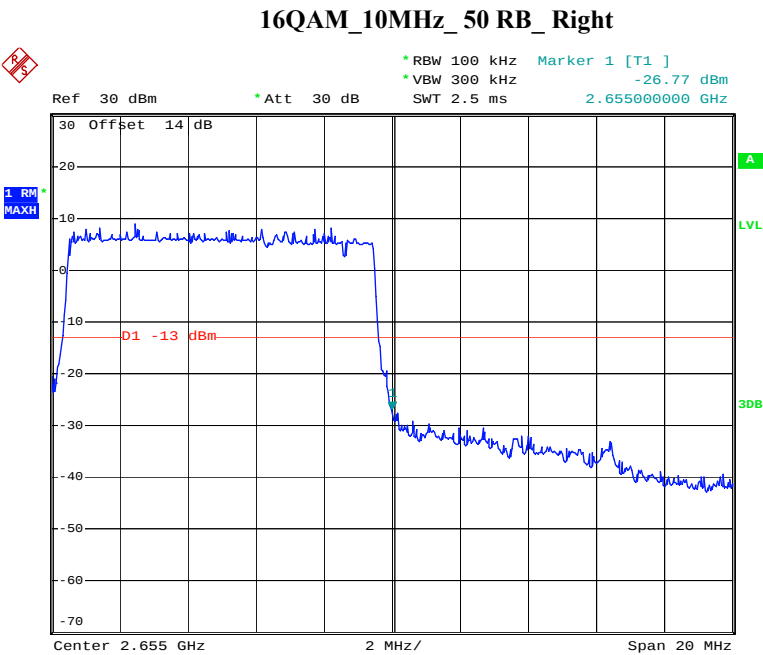
16QAM_5MHz_25 RB_ Right



Date: 28.MAR.2020 11:26:09

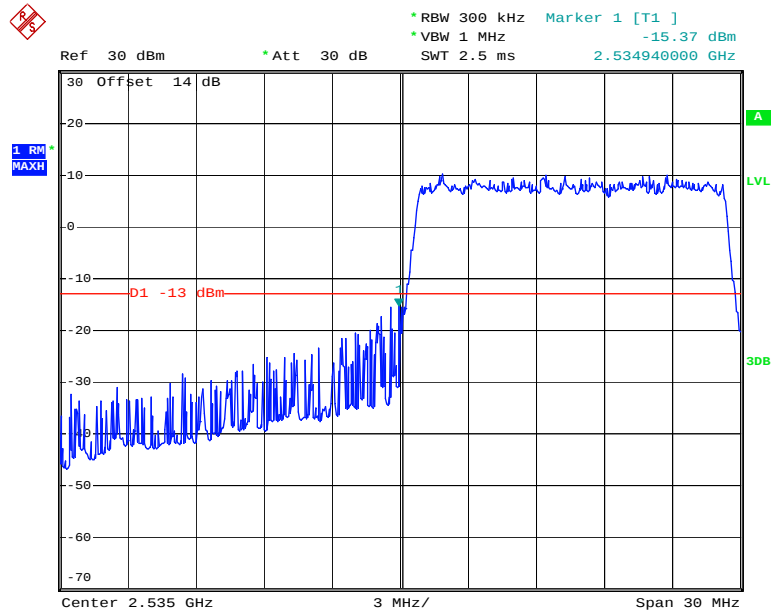


Date: 28.MAR.2020 11:27:03



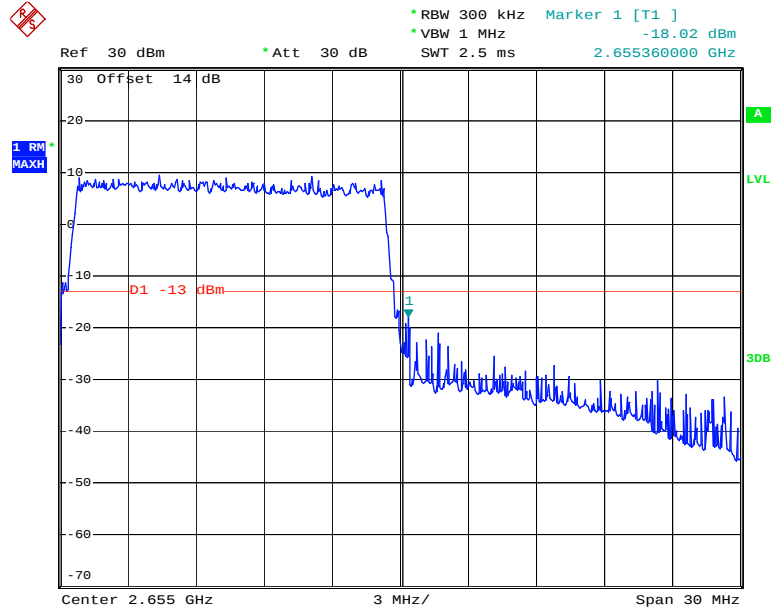
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16QAM_15MHz_ 75 RB_ Left



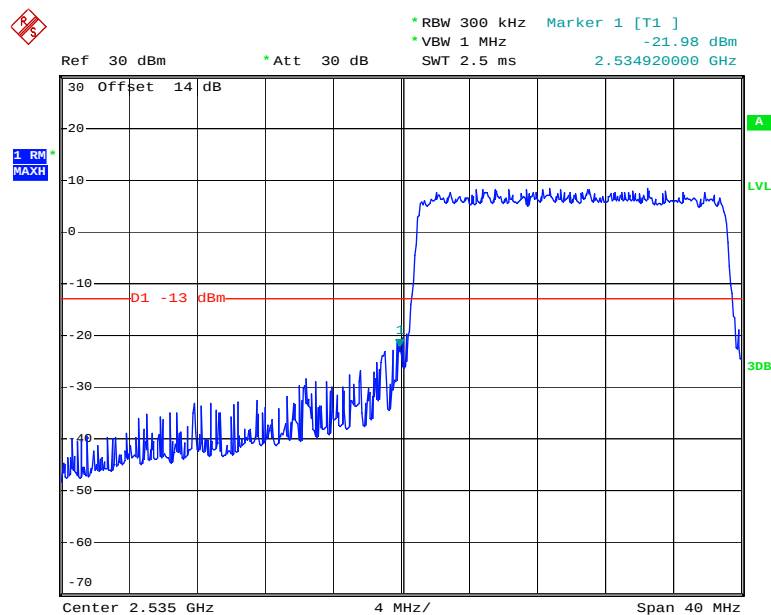
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16QAM_15MHz_ 75 RB_ Right



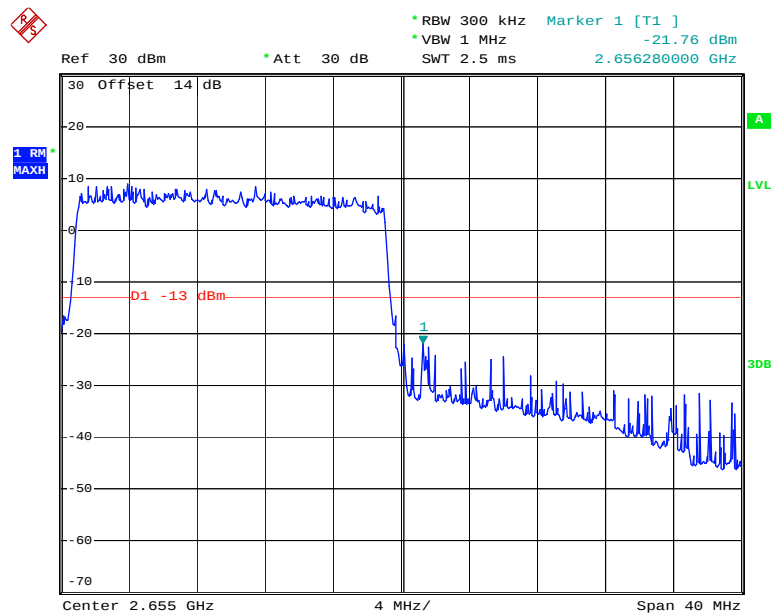
Date: 28.MAR.2020 11:29:46

16QAM_20MHz_ FULL RB_ Left



Date: 28.MAR.2020 11:30:46

16QAM_20MHz_ FULL RB_ Right



Date: 28.MAR.2020 11:31:43

FCC §2.1055, §22.355 & §24.235 & §27.54 - FREQUENCY STABILITY

Applicable Standard

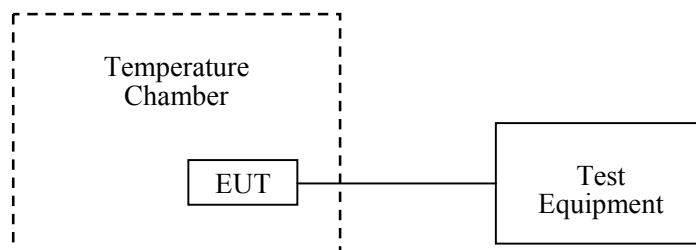
FCC § 2.1055 (a), § 2.1055 (d), §22.355, §24.235, §27.54.

Test Procedure

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

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

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



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2019-05-09	2020-05-09
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005011	Each time	N/A
Unknown	Coaxial Cable	C-SJ00-0010	C0010/01	Each time	N/A
E-Microwave	Blocking Control	EMDCB-00036	0E01201047	Each time	N/A
E-Microwave	Coaxial Attenuators	EMCA10-5RN-6	OE01203239	Each time	N/A
R&S	Universal Radio Communication Tester	CMU200	106 891	2019-09-12	2020-09-12
R&S	Wideband Radio Communication Tester	CMW500	147473	2019-08-03	2020-08-03
ESPEC	Constant temperature and humidity Tester	ESX-4CA	018 463	2019-03-26	2020-03-26
UNI-T	Multimeter	UT39A	M130199938	2019-07-23	2020-07-23
Pro instrument	DC Power Supply	pps3300	3300012	N/A	N/A

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

Test Data**Environmental Conditions**

Temperature:	23~26°C
Relative Humidity:	50~65 %
ATM Pressure:	100.8~102.1 kPa
Tester:	Lucy Lu
Test Date:	2020-03-16~2020-03-24

GPRS, Middle Channel, $f_c = 836.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	V _{DC}	Hz	ppm	ppm
-30	7.2	14	0.01673	2.5
-20		15	0.01793	
-10		15	0.01793	
0		16	0.01913	
10		18	0.02152	
20		15	0.01793	
30		16	0.01913	
40		12	0.01434	
50		13	0.01554	
20	6.4	16	0.01913	
20	8.4	19	0.02271	

EGPRS, Middle Channel, $f_c = 836.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	V _{DC}	Hz	ppm	ppm
-30	7.2	10	0.01195	2.5
-20		9	0.01076	
-10		6	0.00717	
0		11	0.01315	
10		12	0.01434	
20		8	0.00956	
30		10	0.01195	
40		12	0.01434	
50		12	0.01434	
20	6.4	15	0.01793	
20	8.4	8	0.00956	

GPRS1900, Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V _{DC}	Hz	ppm	
-30	7.2	13	0.00691	Pass
-20		16	0.00851	
-10		16	0.00851	
0		17	0.00904	
10		18	0.00957	
20		16	0.00851	
30		15	0.00798	
40		13	0.00691	
50		19	0.01011	
20	6.4	18	0.00957	
20	8.4	16	0.00851	

EGPRS1900, Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V _{DC}	Hz	ppm	
-30	7.2	9	0.00479	Pass
-20		7	0.00372	
-10		9	0.00479	
0		10	0.00532	
10		11	0.00585	
20		7	0.00372	
30		10	0.00532	
40		15	0.00798	
50		13	0.00691	
20	6.4	15	0.00798	
20	8.4	11	0.00585	

WCDMA Band II: R99

Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V _{DC}	Hz	ppm	
-30	7.2	-3	-0.00154	Pass
-20		3	0.00154	
-10		4	0.00205	
0		6	0.00308	
10		-3	-0.00154	
20		-2	-0.00103	
30		-4	-0.00205	
40		-3	-0.00154	
50		2	0.00103	
20	6.4	3	0.00154	
20	8.4	-4	-0.00205	

WCDMA Band V: R99

Middle Channel, $f_c = 836.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	V _{DC}	Hz	ppm	ppm
-30	7.2	-3	-0.00359	2.5
-20		-4	-0.00478	
-10		4	0.00478	
0		5	0.00598	
10		-2	-0.00239	
20		1	0.00120	
30		-5	-0.00598	
40		3	0.00359	
50		6	0.00717	
20	6.4	4	0.00478	
20	8.4	3	0.00359	

LTE Band 5:

Middle Channel, $f_c = 836.5$ MHz, Channel Bandwidth:10MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	V _{DC}	Hz	ppm	ppm
-30	7.2	-0.73	-0.0009	2.5
-20		-6.06	-0.0072	
-10		7.94	0.0095	
0		-8.47	-0.0101	
10		7.67	0.0092	
20		-6.72	-0.008	
30		7.98	0.0095	
40		8.92	0.0107	
50		-6.38	-0.0076	
20	6.4	-9.98	-0.0119	
20	8.4	-5.19	-0.0062	

Middle Channel, $f_c = 836.5$ MHz, Channel Bandwidth:10MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	V _{DC}	Hz	ppm	ppm
-30	7.2	-0.50	-0.0006	2.5
-20		-9.76	-0.0117	
-10		-6.32	-0.0076	
0		8.38	0.01	
10		-6.99	-0.0084	
20		-6.88	-0.0082	
30		5.62	0.0067	
40		5.83	0.007	
50		7.84	0.0094	
20	6.4	5.08	0.0061	
20	8.4	-8.63	-0.0103	

LTE Band 7:

QPSK, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
°C	V_{DC}	F_L	F_H	F_L	F_H
-30	7.2	2500.521300	2569.494901	2500	2570
-20		2500.523600	2569.491993	2500	2570
-10		2500.463500	2569.490362	2500	2570
0		2500.530600	2569.489576	2500	2570
10		2500.531500	2569.488777	2500	2570
20		2500.520000	2569.480000	2500	2570
30		2500.522430	2569.512049	2500	2570
40		2500.524310	2569.502765	2500	2570
50		2500.520060	2569.494679	2500	2570
20	6.4	2500.520155	2569.490812	2500	2570
20	8.4	2500.521060	2569.485988	2500	2570

16QAM, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
°C	V_{DC}	F_L	F_H	F_L	F_H
-30	7.2	2500.478436	2569.685729	2500	2570
-20		2500.502302	2569.636433	2500	2570
-10		2500.499069	2569.610020	2500	2570
0		2500.460322	2569.579789	2500	2570
10		2500.454946	2569.506191	2500	2570
20		2500.520000	2569.480000	2500	2570
30		2500.430371	2569.671399	2500	2570
40		2500.467884	2569.602320	2500	2570
50		2500.459608	2569.587208	2500	2570
20	6.4	2500.463342	2569.551928	2500	2570
20	8.4	2500.412143	2569.494857	2500	2570

LTE Band 38:

QPSK, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
°C	V _{DC}	F _L	F _H	F _L	F _H
-30	7.2	2570.824618	2619.407807	2570	2620
-20		2570.761664	2619.404944	2570	2620
-10		2570.678979	2619.401185	2570	2620
0		2570.667022	2619.397757	2570	2620
10		2570.598842	2619.390579	2570	2620
20		2570.520000	2619.480000	2570	2620
30		2570.773140	2619.439161	2570	2620
40		2570.721906	2619.435466	2570	2620
50		2570.676520	2619.431155	2570	2620
20	6.4	2570.610393	2619.425757	2570	2620
20	8.4	2570.536563	2619.419202	2570	2620

16QAM, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
°C	V _{DC}	F _L	F _H	F _L	F _H
-30	7.2	2570.817130	2619.742451	2570	2620
-20		2570.752761	2619.735730	2570	2620
-10		2570.665770	2619.722012	2570	2620
0		2570.628115	2619.637699	2570	2620
10		2570.603151	2619.549174	2570	2620
20		2570.520000	2619.480000	2570	2620
30		2570.824536	2619.757040	2570	2620
40		2570.809481	2619.682424	2570	2620
50		2570.719603	2619.584572	2570	2620
20	6.4	2570.628733	2619.573317	2570	2620
20	8.4	2570.592388	2619.513308	2570	2620

LTE Band 40:**Lower:**

QPSK, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
℃	V _{DC}	F _L	F _H	F _L	F _H
-30	7.2	2305.47232	2314.50671	2305	2315
-20		2305.47245	2314.50666	2305	2315
-10		2305.47532	2314.506617	2305	2315
0		2305.47623	2314.505738	2305	2315
10		2305.47539	2314.505786	2305	2315
20		2305.47422	2314.50622	2305	2315
30		2305.47432	2314.506224	2305	2315
40		2305.47532	2314.506067	2305	2315
50		2305.47324	2314.506366	2305	2315
20	6.4	2305.47643	2314.50584	2305	2315
20	8.4	2305.47439	2314.506196	2305	2315

16QAM, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
℃	V _{DC}	F _L	F _H	F _L	F _H
-30	7.2	2305.47443	2314.466366	2305	2315
-20		2305.47225	2314.466048	2305	2315
-10		2305.47421	2314.466146	2305	2315
0		2305.47325	2314.466632	2305	2315
10		2305.47522	2314.466383	2305	2315
20		2305.47123	2314.46614	2305	2315
30		2305.47562	2314.465663	2305	2315
40		2305.4743	2314.466341	2305	2315
50		2305.47323	2314.466325	2305	2315
20	6.4	2305.47553	2314.466348	2305	2315
20	8.4	2305.47432	2314.465788	2305	2315

Upper:

QPSK, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
℃	V _{DC}	F _L	F _H	F _L	F _H
-30	7.2	2350.528698	2359.466242	2350	2360
-20		2350.528433	2359.466247	2350	2360
-10		2350.528407	2359.466404	2350	2360
0		2350.528611	2359.465724	2350	2360
10		2350.527823	2359.465939	2350	2360
20		2350.52826	2359.46614	2350	2360
30		2350.528041	2359.465729	2350	2360
40		2350.528358	2359.466411	2350	2360
50		2350.528174	2359.466518	2350	2360
20	6.4	2350.528582	2359.466557	2350	2360
20	8.4	2350.527815	2359.465818	2350	2360

16QAM, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
°C	V _{DC}	F _L	F _H	F _L	F _H
-30	7.2	2350.528304	2359.466393	2350	2360
-20		2350.527841	2359.466293	2350	2360
-10		2350.528754	2359.466088	2350	2360
0		2350.528155	2359.46645	2350	2360
10		2350.528211	2359.465648	2350	2360
20		2350.52826	2359.46614	2350	2360
30		2350.527947	2359.465913	2350	2360
40		2350.528141	2359.466041	2350	2360
50		2350.528697	2359.466256	2350	2360
20	6.4	2350.528165	2359.466097	2350	2360
20	8.4	2350.527932	2359.466467	2350	2360

LTE Band 41:

QPSK, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
°C	V _{DC}	F _L	F _H	F _L	F _H
-30	7.2	2535.802315	2654.451991	2535	2655
-20		2535.752047	2654.451135	2535	2655
-10		2535.653275	2654.441330	2535	2655
0		2535.638611	2654.439595	2535	2655
10		2535.615080	2654.434009	2535	2655
20		2535.520000	2654.480000	2535	2655
30		2535.782686	2654.490230	2535	2655
40		2535.748865	2654.483303	2535	2655
50		2535.739086	2654.473837	2535	2655
20	6.4	2535.640453	2654.467014	2535	2655
20	8.4	2535.556470	2654.457822	2535	2655

16QAM, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
°C	V _{DC}	F _L	F _H	F _L	F _H
-30	7.2	2535.774669	2654.470854	2535	2655
-20		2535.743438	2654.470146	2535	2655
-10		2535.668257	2654.466386	2535	2655
0		2535.631058	2654.466122	2535	2655
10		2535.601011	2654.464773	2535	2655
20		2535.520000	2654.480000	2535	2655
30		2535.766792	2654.489286	2535	2655
40		2535.745660	2654.479595	2535	2655
50		2535.681560	2654.475328	2535	2655
20	6.4	2535.626155	2654.472647	2535	2655
20	8.4	2535.553076	2654.468556	2535	2655

Note: The fundamental emissions stay within the authorized bands of operation based on the frequency deviation measured is small, the extreme voltage was declared by applicant.

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