



TESTING LABORATORY
CERTIFICATE #4820.01



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

For

LUXPAD TABLET

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FCC ID:2ANIRGRAVITY7P

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:		TAB
EUT Model:		GRAVITY 7P
Operation modes:		GSM Voice, GPRS Data, WCDMA(R99 (Voice+Data), HSDPA/HSUPA),FDD-LTE
Operation Frequency:		GSM 850: 824-849 MHz(TX); 869-894 MHz(RX) PCS 1900: 1850-1910 MHz(TX); 1930-1990 MHz(RX) WCDMA Band 2: 1850-1910 MHz(TX); 1930-1990 MHz(RX) WCDMA Band 5: 824-849 MHz(TX); 869-894 MHz(RX) LTE Band 2:1850-1910 MHz(TX), 1930-1990 MHz(RX) LTE Band 4: 1710-1755 MHz(TX) ; 2110-2155 MHz(RX) LTE Band 5:824-849 MHz(TX), 869-894 MHz(RX) LTE Band 12: 699-716 MHz(TX); 729-746 MHz(RX)
Modulation Type:		GMSK, BPSK, QPSK, 16QAM
Rated Input Voltage:		DC 3.7V from Battery or DC 5V from adapter
Adapter Information:	Model:	GRAVITY 7P
	Input:	AC 100~240V, 0.3A ,50/60Hz
	Output:	DC 5V, 1500mA
Serial Number:		RDG200319007-RF-S9
EUT Received Date:		2020-03-19
EUT Received Status:		Good

Objective

This report is prepared on behalf of **LUXPAD TABLET** in accordance with: Part 2-Subpart J, Part 22-Subpart H, Part 24-Subpart E, Part 27of the Federal Communications Commission's rules.

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

Related Submittal(s)/Grant(s)

FCC Part 15C DSS submissions with FCC ID: 2ANIRGRAVITY7P
FCC Part 15C DTS submissions with FCC ID: 2ANIRGRAVITY7P

Test Methodology

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

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

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

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

Measurement Uncertainty

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

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

Test Facility

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

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

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

Declarations

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol “ $\triangle$ ”. 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.

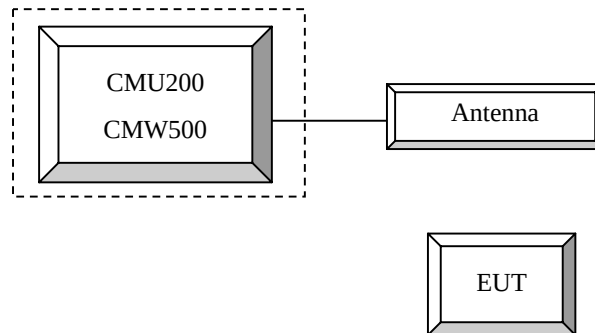
Equipment Modifications

No modification was made to the EUT.

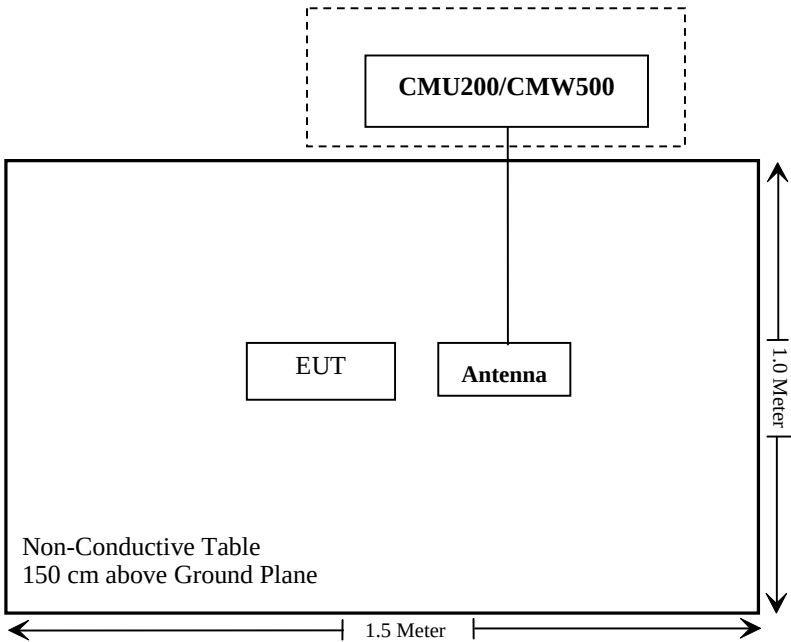
Support Equipment List and Details

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

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

Rules	Description of Test	Result
FCC§1.1310, §2.1093	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

Compliance, please refer to the SAR report: RDG200319007-20.

FCC §2.1047 - MODULATION CHARACTERISTIC

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

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

Applicable Standard

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

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

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

According to §27.50

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

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

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

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

Test Procedure

GSM/GPRS/EGPRS

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

Press Connection control to choose the different menus

Press RESET > choose all the reset all settings

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

Network Support > GSM + GPRS or GSM + EGSM

Main Service > Packet Data

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

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

> Slot configuration > Uplink/Gamma

> 33 dBm for GPRS 850

> 30 dBm for GPRS 1900

> 27 dBm for EGPRS 850

> 26 dBm for EGPRS 1900

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

Frequency Offset > + 0 Hz

Mode > BCCH and TCH

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

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

Channel Type > Off

P0 > 4 dB

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

TCH > choose desired test channel

Hopping > Off

Main Timeslot > 3

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

Bit Stream > 2E9-1 PSR Bit Stream

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

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

WCDMA-Release 99

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

WCDMA General Settings	Loopback Mode	Test Mode 1
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	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

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
Unknown	Coaxial Cable	C-NJNJ-50	C-0200-02	2019-09-05	2020-09-05
Agilent	Signal Generator	E8247C	MY43321350	2019-12-10	2020-12-10
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	2019-09-12	2020-09-12
R&S	Wideband Radio Communication Tester	CMW500	147473	2019-08-03	2020-08-03
Unknown	Coaxial Cable	C-SJ00-0010	C0010/03	Each time	/

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

Test Data**Environmental Conditions**

Test Items:	Radiation Below 1GHz	Radiation Above 1GHz	Conducted Output Power
Temperature:	23.5°C	22°C	23°C~ 26 °C
Relative Humidity:	50 %	55%	55%~65 %
ATM Pressure:	102.3 kPa	101.4 kPa	100.8kPa ~101.5kPa
Tester:	Jalon Liu	Bond Qin	Fay Hu
Test Date:	2020-04-04	2020-03-30	2020-03-25~2020-04-01

Test Result: Compliance

Conducted Output Power**Cellular Band & PCS Band****GSM&GPRS mode**

Band	Channel No.	Conducted Peak Output Power (dBm)				
		GSM	GPRS 1 uplink slot	GPRS 2 uplink slot	GPRS 3 uplink slot	GPRS 4 uplink slot
Cellular	128	31.10	31.63	31.29	29.68	28.47
	190	31.20	31.89	31.38	29.76	28.60
	251	31.40	32.00	31.54	30.02	28.86
PCS	512	29.90	28.94	27.92	25.72	24.51
	661	30.30	29.40	28.56	26.48	25.23
	810	30.70	29.82	29.23	27.51	26.38

WCDMA Band 2

Mode	3GPP Sub Test	Low Channel		Middle Channel		High Channel	
		Ave. Power (dBm)	PAR (dB)	Ave. Power (dBm)	PAR (dB)	Ave. Power (dBm)	PAR (dB)
Rel 99	1	23.17	2.93	23.74	3.07	24.10	2.99
HSDPA	1	22.21	3.25	22.67	3.80	22.98	4.06
	2	21.75	1.78	22.14	3.71	22.64	2.71
	3	21.21	1.80	21.85	5.76	22.05	0.17
	4	20.86	1.47	21.04	2.73	21.78	3.28
HSUPA	1	21.85	4.23	22.34	3.94	22.72	3.71
	2	21.42	1.86	21.96	2.87	22.45	1.14
	3	21.31	3.38	21.47	2.91	22.00	1.16
	4	21.03	2.70	21.01	2.23	21.46	5.86
	5	20.82	3.05	20.86	0.39	20.95	4.23
DC-HSDPA	1	21.76	5.77	22.34	3.42	22.71	4.53
	2	21.27	5.98	21.94	4.24	21.89	0.37
	3	21.00	4.08	21.32	3.76	21.15	2.46
	4	20.63	0.00	20.85	3.79	20.73	3.95
HSPA+ (16QAM)	1	21.74	4.33	22.12	2.41	22.58	5.15

WCDMA Band 5

Mode	3GPP Sub Test	Low Channel		Middle Channel		High Channel	
		Ave. Power (dBm)	PAR (dB)	Ave. Power (dBm)	PAR (dB)	Ave. Power (dBm)	PAR (dB)
Rel 99	1	23.26	2.38	23.41	2.09	23.38	1.8
HSDPA	1	22.27	3.25	22.36	3.42	22.41	3.25
	2	21.97	2.65	21.56	3.73	22.36	5.29
	3	21.43	3.55	21.02	1.56	21.75	0.81
	4	21.08	2.85	20.61	1.59	21.07	5.69
HSUPA	1	21.93	3.59	22.03	3.59	22.07	2.67
	2	21.36	2.35	21.75	4.69	21.81	4.26
	3	20.9	4.34	21.22	3.65	20.51	1.04
	4	20.25	1.96	20.65	1.38	20.05	2.25
	5	19.97	2.89	20.19	3.74	19.25	2.35
DC-HSDPA	1	20.44	2.56	21.91	3.86	21.37	1.78
	2	20.21	1.06	21.32	0.5	20.65	1.64
	3	19.73	1.12	20.86	2.54	20.18	2.22
	4	19.21	2.95	20.38	4.71	20.05	1.48
HSPA+ (16QAM)	1	20.41	3.28	21.80	1.97	21.29	2.77

LTE Band 2

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4MHz	QPSK	RB1#0	20.42	20.64	20.93
		RB1#3	20.53	20.77	21.15
		RB1#5	20.37	20.62	20.95
		RB3#0	20.45	20.68	21.04
		RB3#3	20.43	20.65	20.99
		RB6#0	19.41	19.62	20.07
	16QAM	RB1#0	19.33	19.53	20.05
		RB1#3	19.51	19.72	20.17
		RB1#5	19.35	19.53	20.02
		RB3#0	19.55	19.80	19.94
		RB3#3	19.45	19.80	19.96
		RB6#0	18.43	18.70	19.05
3MHz	QPSK	RB1#0	20.44	20.67	21.05
		RB1#8	20.36	20.65	21.02
		RB1#14	20.37	20.64	21.04
		RB6#0	19.32	19.58	19.89
		RB6#9	19.37	19.60	19.97
		RB15#0	19.39	19.62	19.98
	16QAM	RB1#0	19.94	19.73	19.97
		RB1#8	19.86	19.69	19.96
		RB1#14	19.84	19.75	19.92
		RB6#0	18.46	18.64	18.88
		RB6#9	18.49	18.66	18.93
		RB15#0	18.44	18.61	19.08
5MHz	QPSK	RB1#0	20.38	20.60	20.85
		RB1#13	20.40	20.70	20.99
		RB1#24	20.27	20.67	20.96
		RB15#0	19.27	19.65	20.04
		RB15#10	19.52	19.71	20.06
		RB25#0	19.36	19.69	19.99
	16QAM	RB1#0	19.20	19.84	19.90
		RB1#13	19.26	19.95	20.02
		RB1#24	19.21	19.89	19.97
		RB15#0	18.42	18.70	19.12
		RB15#10	18.70	18.73	19.09
		RB25#0	18.56	18.71	19.07

10MHz	QPSK	RB1#0	20.41	20.58	20.81
		RB1#25	20.51	20.76	21.14
		RB1#49	20.36	20.74	21.05
		RB25#0	19.17	19.64	20.16
		RB25#25	19.54	19.80	19.95
		RB50#0	19.43	19.75	20.11
	16QAM	RB1#0	19.89	19.66	19.81
		RB1#25	20.04	19.84	20.06
		RB1#49	19.98	19.78	19.97
		RB25#0	18.26	18.73	19.35
		RB25#25	18.54	18.87	19.11
		RB50#0	18.41	18.81	19.21
15MHz	QPSK	RB1#0	20.30	20.50	20.73
		RB1#38	20.35	20.71	20.88
		RB1#74	20.38	20.62	20.99
		RB36#0	19.24	19.63	20.04
		RB36#39	19.39	19.86	19.92
		RB75#0	19.58	19.75	20.06
	16QAM	RB1#0	19.79	19.63	20.02
		RB1#38	19.96	19.75	20.24
		RB1#74	19.95	19.74	20.28
		RB36#0	18.32	18.71	19.04
		RB36#39	18.57	18.94	18.97
		RB75#0	18.79	18.84	19.04
20MHz	QPSK	RB1#0	20.13	20.34	20.45
		RB1#50	20.48	20.86	20.89
		RB1#99	20.29	20.55	20.80
		RB50#0	19.15	19.68	19.76
		RB50#50	19.10	19.90	19.58
		RB100#0	19.13	19.81	19.79
	16QAM	RB1#0	19.40	19.51	19.92
		RB1#50	19.84	19.99	20.50
		RB1#99	19.58	19.65	20.25
		RB50#0	18.09	18.76	18.82
		RB50#50	18.14	18.94	18.65
		RB100#0	18.20	18.86	18.82

LTE Band 4

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4MHz	QPSK	RB1#0	20.22	20.15	20.29
		RB1#3	20.38	20.36	20.40
		RB1#5	20.21	20.16	20.20
		RB3#0	20.30	20.16	20.20
		RB3#3	20.23	20.16	20.23
		RB6#0	19.31	19.68	19.32
	16QAM	RB1#0	19.24	19.66	19.14
		RB1#3	19.49	19.93	19.40
		RB1#5	19.23	19.75	19.20
		RB3#0	19.51	19.62	19.34
		RB3#3	19.53	19.61	19.31
		RB6#0	18.32	18.77	18.18
3MHz	QPSK	RB1#0	20.20	20.19	20.51
		RB1#8	20.23	20.19	20.21
		RB1#14	20.24	20.44	20.18
		RB6#0	19.24	19.73	19.21
		RB6#9	19.28	19.71	19.21
		RB15#0	19.26	19.67	19.23
	16QAM	RB1#0	19.81	19.76	19.20
		RB1#8	19.78	19.78	19.20
		RB1#14	19.72	19.77	19.20
		RB6#0	18.27	18.63	18.09
		RB6#9	18.31	18.70	18.14
		RB15#0	18.28	18.56	18.24
5MHz	QPSK	RB1#0	20.16	20.12	20.10
		RB1#13	20.27	20.19	20.19
		RB1#24	20.15	20.06	20.09
		RB15#0	19.28	19.12	19.27
		RB15#10	19.29	19.20	19.27
		RB25#0	19.24	19.14	19.25
	16QAM	RB1#0	19.05	19.29	19.22
		RB1#13	19.19	19.42	19.29
		RB1#24	19.05	19.36	19.22
		RB15#0	18.28	18.05	18.25
		RB15#10	18.29	18.18	18.25
		RB25#0	18.26	18.18	18.24
10MHz	QPSK	RB1#0	20.15	20.18	20.13
		RB1#25	20.36	20.28	20.34
		RB1#49	20.25	20.14	20.18
		RB25#0	19.27	19.08	19.38
		RB25#25	19.35	19.17	19.25
		RB50#0	19.35	19.13	19.34
	16QAM	RB1#0	19.76	19.24	19.17
		RB1#25	19.89	19.48	19.38
		RB1#49	19.68	19.31	19.19
		RB25#0	18.26	18.05	18.44
		RB25#25	18.35	18.16	18.32
		RB50#0	18.30	18.06	18.33

15MHz	QPSK	RB1#0	20.12	20.28	20.57
		RB1#38	20.27	20.76	20.75
		RB1#74	20.24	20.65	20.72
		RB36#0	19.33	19.80	19.87
		RB36#39	19.48	19.72	19.76
		RB75#0	19.46	19.80	19.84
	16QAM	RB1#0	19.68	19.78	20.14
		RB1#38	19.74	19.81	20.27
		RB1#74	19.64	19.78	20.17
		RB36#0	18.30	18.72	18.89
		RB36#39	18.49	18.75	18.80
		RB75#0	18.60	18.72	18.85
20MHz	QPSK	RB1#0	20.53	20.53	20.31
		RB1#50	20.93	20.90	20.83
		RB1#99	20.61	20.57	20.54
		RB50#0	19.75	19.56	20.01
		RB50#50	19.95	19.55	19.61
		RB100#0	19.91	19.57	19.83
	16QAM	RB1#0	19.82	19.60	19.89
		RB1#50	20.11	19.95	20.38
		RB1#99	19.81	19.72	20.01
		RB50#0	18.68	18.46	19.06
		RB50#50	18.89	18.62	18.65
		RB100#0	18.84	18.54	18.86

LTE Band 5

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4MHz	QPSK	RB1#0	22.27	22.29	22.30
		RB1#3	22.42	22.41	22.60
		RB1#5	22.24	22.28	22.33
		RB3#0	22.26	22.33	22.28
		RB3#3	22.24	22.33	22.31
		RB6#0	21.35	21.38	21.42
	16QAM	RB1#0	21.15	21.35	21.16
		RB1#3	21.31	21.47	21.40
		RB1#5	21.16	21.35	21.23
		RB3#0	21.35	21.23	21.32
		RB3#3	21.37	21.22	21.30
		RB6#0	20.30	20.39	20.36
3MHz	QPSK	RB1#0	22.27	22.35	22.37
		RB1#8	22.28	22.36	22.39
		RB1#14	22.26	22.31	22.39
		RB6#0	21.21	21.33	21.32
		RB6#9	21.25	21.26	21.36
		RB15#0	21.21	21.29	21.30
	16QAM	RB1#0	21.64	21.39	21.24
		RB1#8	21.67	21.41	21.24
		RB1#14	21.68	21.40	21.22
		RB6#0	20.30	20.34	20.25
		RB6#9	20.32	20.38	20.25
		RB15#0	20.28	20.29	20.37
5MHz	QPSK	RB1#0	22.14	22.21	22.21
		RB1#13	22.32	22.37	22.40
		RB1#24	22.17	22.26	22.24
		RB15#0	21.22	21.30	21.27
		RB15#10	21.27	21.32	21.33
		RB25#0	21.21	21.25	21.26
	16QAM	RB1#0	20.98	21.43	21.13
		RB1#13	21.14	21.55	21.33
		RB1#24	21.03	21.45	21.19
		RB15#0	20.24	20.33	20.30
		RB15#10	20.29	20.29	20.37
		RB25#0	20.28	20.31	20.26
10MHz	QPSK	RB1#0	22.28	22.28	22.33
		RB1#25	22.42	22.49	22.42
		RB1#49	22.32	22.39	22.14
		RB25#0	21.24	21.34	21.19
		RB25#25	21.25	21.35	21.30
		RB50#0	21.24	21.37	21.12
	16QAM	RB1#0	21.60	21.39	21.13
		RB1#25	21.87	21.54	21.23
		RB1#49	21.78	21.42	21.03
		RB25#0	20.33	20.43	20.27
		RB25#25	20.33	20.39	20.38
		RB50#0	20.32	20.39	20.36

LTE Band 12

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4MHz	QPSK	RB1#0	22.04	21.78	21.62
		RB1#3	22.22	21.75	21.71
		RB1#5	21.98	21.53	21.55
		RB3#0	21.97	21.67	21.63
		RB3#3	21.82	21.71	21.64
		RB6#0	20.95	20.59	20.59
	16QAM	RB1#0	20.91	20.63	20.51
		RB1#3	20.92	20.80	20.74
		RB1#5	20.83	20.66	20.56
		RB3#0	21.12	20.61	20.69
		RB3#3	21.06	20.70	20.70
		RB6#0	19.89	19.68	19.82
3MHz	QPSK	RB1#0	21.85	21.82	22.04
		RB1#8	21.60	21.59	21.57
		RB1#14	21.59	21.57	21.58
		RB6#0	20.59	20.47	21.02
		RB6#9	20.52	20.81	20.64
		RB15#0	20.63	20.55	21.01
	16QAM	RB1#0	21.08	20.71	20.98
		RB1#8	21.15	20.67	20.71
		RB1#14	21.14	20.71	20.64
		RB6#0	19.69	19.60	19.93
		RB6#9	19.75	19.81	19.89
		RB15#0	19.91	19.68	20.10
5MHz	QPSK	RB1#0	21.82	21.52	21.83
		RB1#13	21.67	21.63	21.65
		RB1#24	21.54	21.51	21.52
		RB15#0	20.85	20.44	21.07
		RB15#10	20.58	20.78	20.88
		RB25#0	20.70	20.65	21.02
	16QAM	RB1#0	20.33	20.81	20.98
		RB1#13	20.51	20.91	21.02
		RB1#24	20.47	20.80	20.64
		RB15#0	19.94	19.51	20.24
		RB15#10	19.69	19.83	19.94
		RB25#0	19.83	19.72	20.05
10MHz	QPSK	RB1#0	21.99	21.55	21.56
		RB1#25	22.04	21.72	21.70
		RB1#49	21.52	21.57	21.66
		RB25#0	20.87	20.47	20.36
		RB25#25	20.94	21.13	20.84
		RB50#0	20.86	20.81	20.83
	16QAM	RB1#0	21.02	20.68	20.54
		RB1#25	21.33	20.90	21.16
		RB1#49	21.15	20.92	20.59
		RB25#0	20.01	19.59	19.81
		RB25#25	20.07	20.47	19.91
		RB50#0	19.99	19.88	19.84

PAR, Band 2

Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	20 MHz	2.99	5.04	4.78	13
	100 RB		4.72	5.28	5.33	13
16QAM	1 RB	20 MHz	4.12	5.88	5.77	13
	100 RB		5.86	6.23	6.20	13

PAR, Band 4

Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	20 MHz	5.28	2.81	5.22	13
	100 RB		5.10	4.23	5.10	13
16QAM	1 RB	20 MHz	6.38	4.03	5.94	13
	100 RB		6.00	5.22	6.12	13

PAR, Band 5

Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	10 MHz	4.38	4.49	4.09	13
	50 RB		4.93	4.52	4.55	13
16QAM	1 RB	10 MHz	5.10	5.42	4.99	13
	50 RB		5.83	5.45	5.54	13

PAR, Band 12

Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	10 MHz	4.75	5.10	10.03	13
	50 RB		5.62	5.65	5.16	13
16QAM	1 RB	10 MHz	5.80	6.03	6.99	13
	50 RB		6.55	6.49	6.14	13

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

ERP & EIRP

Part 22H

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
GSM 850 Middle Channel								
836.60	H	97.22	22.99	0.00	0.50	22.49	38.45	15.96
836.60	V	97.13	25.87	0.00	0.50	25.37	38.45	13.08
WCDMA R99 Band 5 middle channel								
836.60	H	90.15	15.92	0.00	0.50	15.42	38.45	23.03
836.60	V	90.12	18.86	0.00	0.50	18.36	38.45	20.09

Part 24E

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
PCS 1900 Middle Channel								
1880.00	H	90.41	17.80	11.66	2.66	26.80	33.00	6.20
1880.00	V	89.25	16.78	11.66	2.66	25.78	33.00	7.22
WCDMA R99 Band 2 middle channel								
1880.00	H	82.37	9.76	11.66	2.66	18.76	33.00	14.24
1880.00	V	81.35	8.88	11.66	2.66	17.88	33.00	15.12

Note:

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

LTE Band 2

Frequency (MHz)	BW (MHz)	Modulation	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)	
					Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)				
1880.00	1.40	QPSK	H	81.50	8.89	11.66	2.66	17.89	33.00	15.11	
1880.00			V	82.39	9.92	11.66	2.66	18.92	33.00	14.08	
1880.00	3.00		H	81.24	8.63	11.66	2.66	17.63	33.00	15.37	
1880.00			V	82.19	9.72	11.66	2.66	18.72	33.00	14.28	
1880.00	5.00		H	81.15	8.54	11.66	2.66	17.54	33.00	15.46	
1880.00			V	82.11	9.64	11.66	2.66	18.64	33.00	14.36	
1880.00	10.00		H	81.06	8.45	11.66	2.66	17.45	33.00	15.55	
1880.00			V	82.02	9.55	11.66	2.66	18.55	33.00	14.45	
1880.00	15.00		H	81.26	8.65	11.66	2.66	17.65	33.00	15.35	
1880.00			V	82.34	9.87	11.66	2.66	18.87	33.00	14.13	
1880.00	20.00		H	81.30	8.69	11.66	2.66	17.69	33.00	15.31	
1880.00			V	82.54	10.07	11.66	2.66	19.07	33.00	13.93	
1880.00	1.40		16QAM	H	80.63	8.02	11.66	2.66	17.02	33.00	15.98
1880.00				V	81.46	8.99	11.66	2.66	17.99	33.00	15.01
1880.00	3.00	H		80.24	7.63	11.66	2.66	16.63	33.00	16.37	
1880.00		V		81.07	8.60	11.66	2.66	17.60	33.00	15.40	
1880.00	5.00	H		80.04	7.43	11.66	2.66	16.43	33.00	16.57	
1880.00		V		80.96	8.49	11.66	2.66	17.49	33.00	15.51	
1880.00	10.00	H		79.97	7.36	11.66	2.66	16.36	33.00	16.64	
1880.00		V		80.86	8.39	11.66	2.66	17.39	33.00	15.61	
1880.00	15.00	H		80.24	7.63	11.66	2.66	16.63	33.00	16.37	
1880.00		V		81.25	8.78	11.66	2.66	17.78	33.00	15.22	
1880.00	20.00	H		80.38	7.77	11.66	2.66	16.77	33.00	16.23	
1880.00		V		80.59	8.12	11.66	2.66	17.12	33.00	15.88	

LTE Band 4

Frequency (MHz)	BW (MHz)	Modulation	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)	
					Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)				
1732.50	1.40	QPSK	H	84.57	10.52	10.90	2.51	18.91	30.00	11.09	
1732.50			V	81.42	7.05	10.90	2.51	15.44	30.00	14.56	
1732.50	3.00		H	84.48	10.43	10.90	2.51	18.82	30.00	11.18	
1732.50			V	81.30	6.93	10.90	2.51	15.32	30.00	14.68	
1732.50	5.00		H	84.32	10.27	10.90	2.51	18.66	30.00	11.34	
1732.50			V	81.14	6.77	10.90	2.51	15.16	30.00	14.84	
1732.50	10.00		H	84.34	10.29	10.90	2.51	18.68	30.00	11.32	
1732.50			V	81.20	6.83	10.90	2.51	15.22	30.00	14.78	
1732.50	15.00		H	84.92	10.87	10.90	2.51	19.26	30.00	10.74	
1732.50			V	81.41	7.04	10.90	2.51	15.43	30.00	14.57	
1732.50	20.00		H	85.05	11.00	10.90	2.51	19.39	30.00	10.61	
1732.50			V	81.33	6.96	10.90	2.51	15.35	30.00	14.65	
1732.50	1.40		16QAM	H	83.62	9.57	10.90	2.51	17.96	30.00	12.04
1732.50				V	80.20	5.83	10.90	2.51	14.22	30.00	15.78
1732.50	3.00	H		83.25	9.20	10.90	2.51	17.59	30.00	12.41	
1732.50		V		80.08	5.71	10.90	2.51	14.10	30.00	15.90	
1732.50	5.00	H		83.18	9.13	10.90	2.51	17.52	30.00	12.48	
1732.50		V		79.94	5.57	10.90	2.51	13.96	30.00	16.04	
1732.50	10.00	H		83.19	9.14	10.90	2.51	17.53	30.00	12.47	
1732.50		V		79.93	5.56	10.90	2.51	13.95	30.00	16.05	
1732.50	15.00	H		83.71	9.66	10.90	2.51	18.05	30.00	11.95	
1732.50		V		80.25	5.88	10.90	2.51	14.27	30.00	15.73	
1732.50	20.00	H		83.84	9.79	10.90	2.51	18.18	30.00	11.82	
1732.50		V		80.31	5.94	10.90	2.51	14.33	30.00	15.67	

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	92.99	18.06	0.00	0.97	17.09	38.45	21.36
836.50			V	82.52	10.73	0.00	0.97	9.76	38.45	28.69
836.50	3.00		H	92.21	17.28	0.00	0.97	16.31	38.45	22.14
836.50			V	82.01	10.22	0.00	0.97	9.25	38.45	29.20
836.50	5.00		H	92.56	17.63	0.00	0.97	16.66	38.45	21.79
836.50			V	81.34	9.55	0.00	0.97	8.58	38.45	29.87
836.50	10.00		H	93.02	18.09	0.00	0.97	17.12	38.45	21.33
836.50			V	80.98	9.19	0.00	0.97	8.22	38.45	30.23
836.50	1.40	16QAM	H	92.35	17.42	0.00	0.97	16.45	38.45	22.00
836.50			V	81.20	9.41	0.00	0.97	8.44	38.45	30.01
836.50	3.00		H	92.99	18.06	0.00	0.97	17.09	38.45	21.36
836.50			V	80.62	8.83	0.00	0.97	7.86	38.45	30.59
836.50	5.00		H	92.13	17.20	0.00	0.97	16.23	38.45	22.22
836.50			V	80.09	8.30	0.00	0.97	7.33	38.45	31.12
836.50	10.00		H	92.93	18.00	0.00	0.97	17.03	38.45	21.42
836.50			V	79.73	7.94	0.00	0.97	6.97	38.45	31.48

LTE Band 12

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)			
707.50	1.40	QPSK	H	95.01	18.15	0.00	0.94	17.21	34.77	17.56
707.50			V	85.12	10.70	0.00	0.94	9.76	34.77	25.01
707.50	3.00		H	94.24	17.38	0.00	0.94	16.44	34.77	18.33
707.50			V	84.39	9.97	0.00	0.94	9.03	34.77	25.74
707.50	5.00		H	93.88	17.02	0.00	0.94	16.08	34.77	18.69
707.50			V	83.54	9.12	0.00	0.94	8.18	34.77	26.59
707.50	10.00		H	93.05	16.19	0.00	0.94	15.25	34.77	19.52
707.50			V	83.11	8.69	0.00	0.94	7.75	34.77	27.02
707.50	1.40	16QAM	H	93.79	16.93	0.00	0.94	15.99	34.77	18.78
707.50			V	83.52	9.10	0.00	0.94	8.16	34.77	26.61
707.50	3.00		H	93.22	16.36	0.00	0.94	15.42	34.77	19.35
707.50			V	83.18	8.76	0.00	0.94	7.82	34.77	26.95
707.50	5.00		H	93.10	16.24	0.00	0.94	15.30	34.77	19.47
707.50			V	82.06	7.64	0.00	0.94	6.70	34.77	28.07
707.50	10.00		H	93.39	16.53	0.00	0.94	15.59	34.77	19.18
707.50			V	81.01	6.59	0.00	0.94	5.65	34.77	29.12

Note:

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

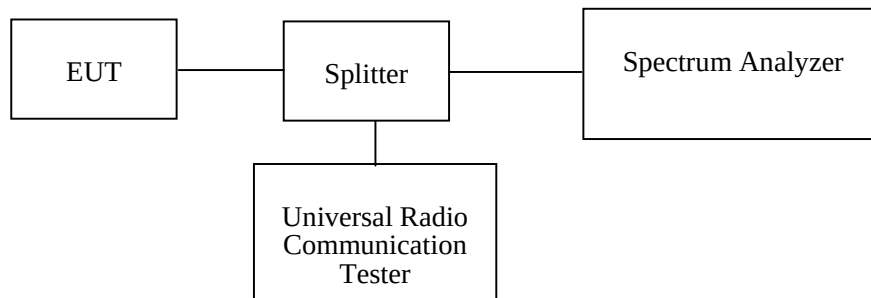
FCC §2.1049, §22.917, §22.905 & §24.238 & §27.53- OCCUPIED BANDWIDTH**Applicable Standard**

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

Test Procedure

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

The 26 dB & 99% bandwidth was recorded.

**Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101474	2020-01-09	2021-01-09
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41010013	Each time	/
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005011	Each time	/
Unknown	Coaxial Cable	C-SJ00-0010	C0010/03	Each time	/
E-Microwave	Two-way Splitter	ODP-1-6-2S	OE0120142	Each time	/

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

Test Data**Environmental Conditions**

Temperature:	23°C~ 26 °C
Relative Humidity:	55 %~65 %
ATM Pressure:	100.8kPa ~101.5kPa
Tester:	Fay Hu
Test Date:	2020-03-25~2020-04-01

Test Mode: Transmitting

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

Band	Test Channel	Mode	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
Cellular	Middle	GSM	0.25	0.31
PCS		GSM	0.25	0.32
WCDMA Band 2		Rel 99	4.17	4.74
		HSDPA	4.21	5.35
		HSUPA	4.21	5.12
WCDMA Band 5		Rel 99	4.19	4.82
		HSDPA	4.23	5.02
		HSUPA	4.21	4.89

Band	Bandwidth	Modulation	99% occupied bandwidth (MHz)	26 dB bandwidth (MHz)
LTE Band 2	1.4 MHz	QPSK	1.102	1.326
		16QAM	1.090	1.296
	3 MHz	QPSK	2.683	2.880
		16QAM	2.683	2.892
	5 MHz	QPSK	4.551	5.240
		16QAM	4.511	5.160
	10 MHz	QPSK	9.022	9.920
		16QAM	8.982	9.840
	15 MHz	QPSK	13.653	14.880
		16QAM	13.593	14.760
	20 MHz	QPSK	17.804	18.880
		16QAM	18.124	19.680
LTE Band 4	1.4 MHz	QPSK	1.108	1.392
		16QAM	1.114	1.542
	3 MHz	QPSK	2.695	2.868
		16QAM	2.683	2.892
	5 MHz	QPSK	4.551	5.360
		16QAM	4.531	5.420
	10 MHz	QPSK	8.902	9.320
		16QAM	8.982	9.680
	15 MHz	QPSK	13.413	14.700
		16QAM	13.413	14.760
	20 MHz	QPSK	17.884	19.120
		16QAM	17.804	19.600

Band	Bandwidth	Modulation	99% occupied bandwidth (MHz)	26 dB bandwidth (MHz)
LTE Band 5	1.4 MHz	QPSK	1.102	1.350
		16QAM	1.108	1.428
	3 MHz	QPSK	2.683	2.952
		16QAM	2.683	2.880
	5 MHz	QPSK	4.451	4.720
		16QAM	4.531	5.180
	10 MHz	QPSK	8.982	9.960
		16QAM	8.982	9.840
LTE Band 12	1.4 MHz	QPSK	1.096	1.296
		16QAM	1.102	1.332
	3 MHz	QPSK	2.683	2.880
		16QAM	2.683	2.892
	5 MHz	QPSK	4.551	5.240
		16QAM	4.531	5.180
	10 MHz	QPSK	8.942	9.800
		16QAM	8.942	9.600

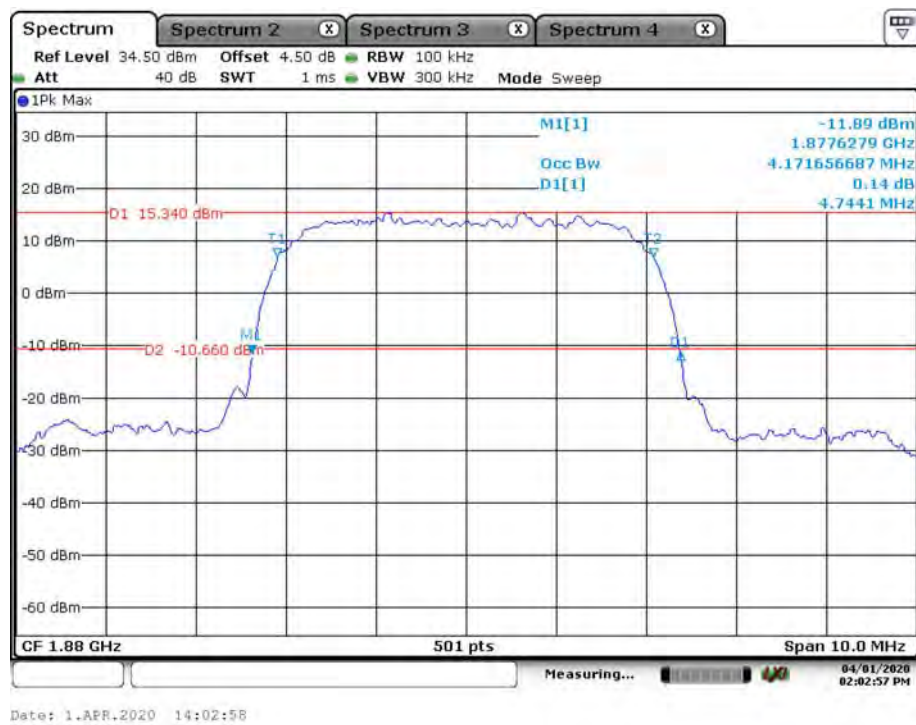
GSM Cellular 850



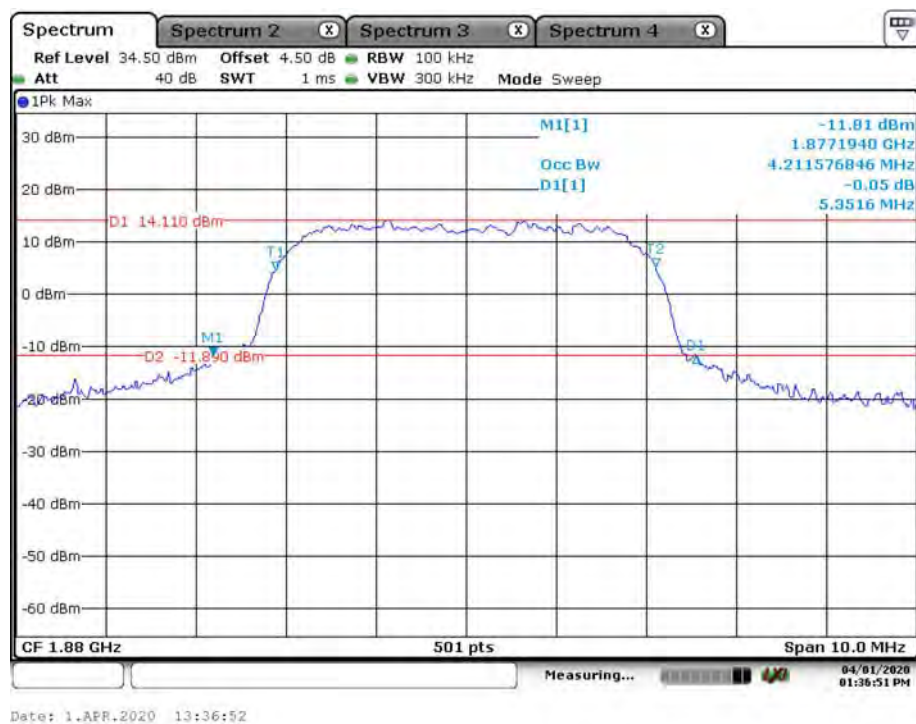
GSM PCS 1900



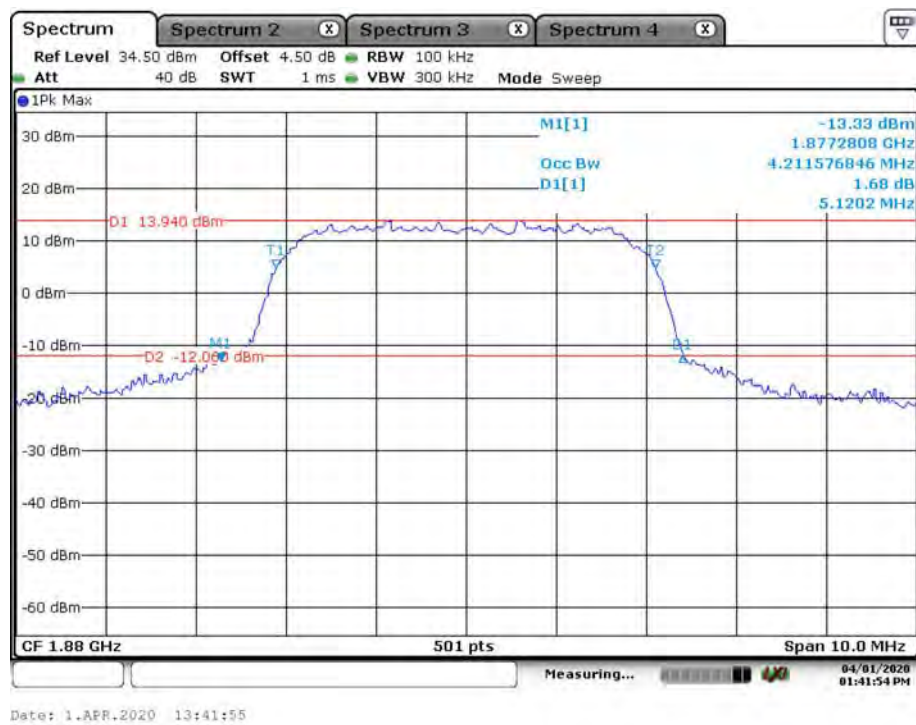
WCDMA Band 2 Rel 99



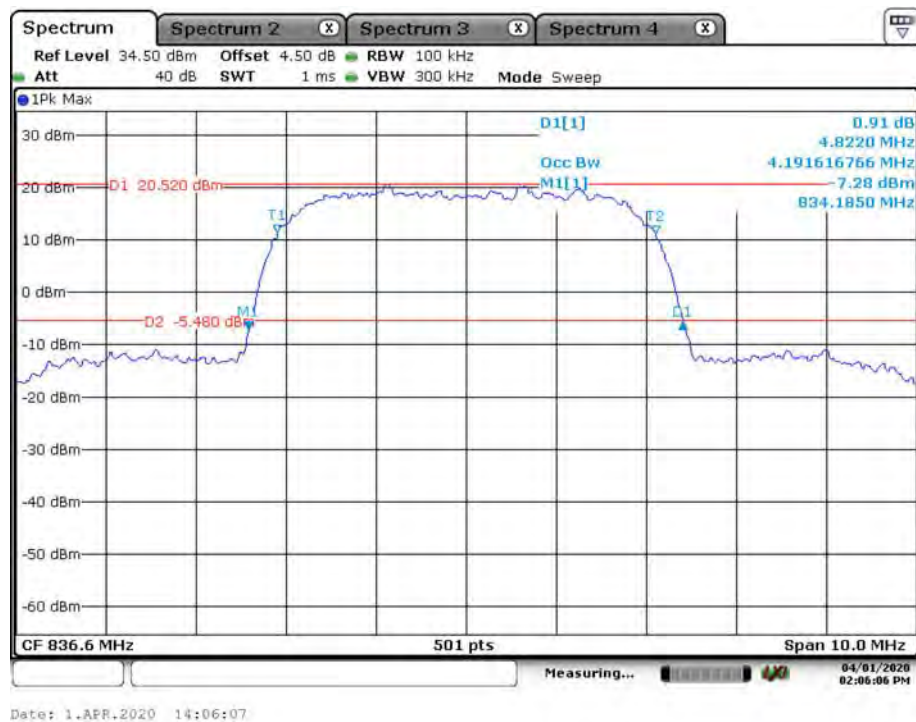
WCDMA Band 2 HSDPA



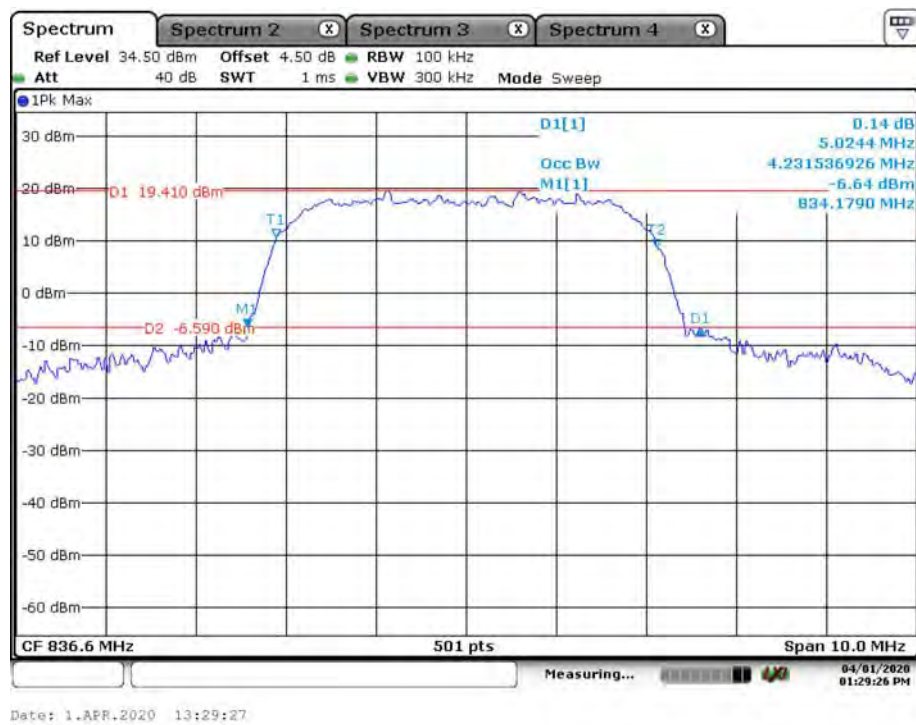
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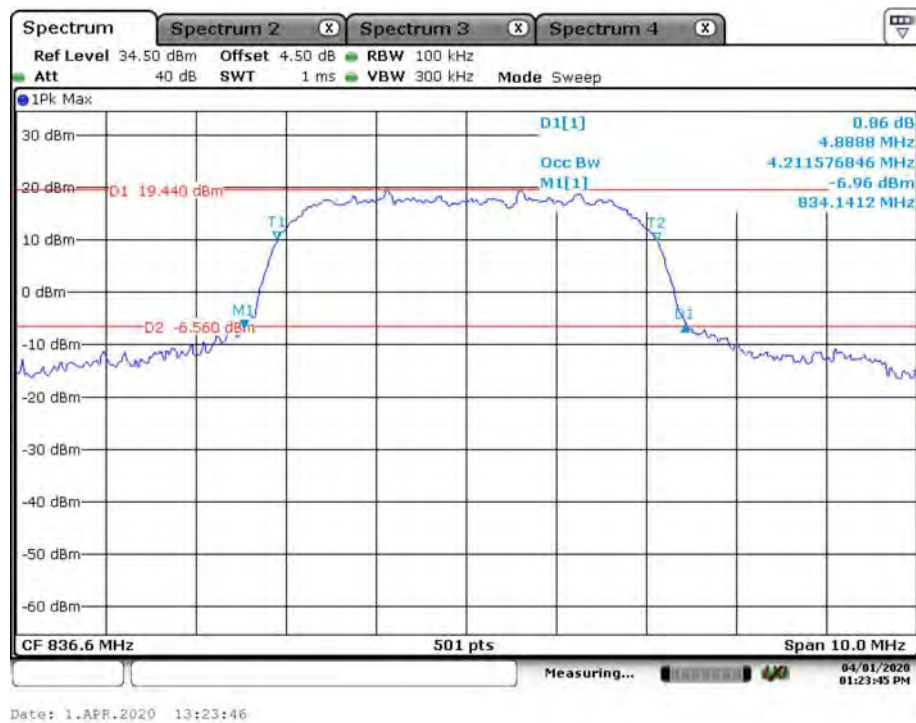
WCDMA Band 5 Rel 99



WCDMA Band 5 HSDPA

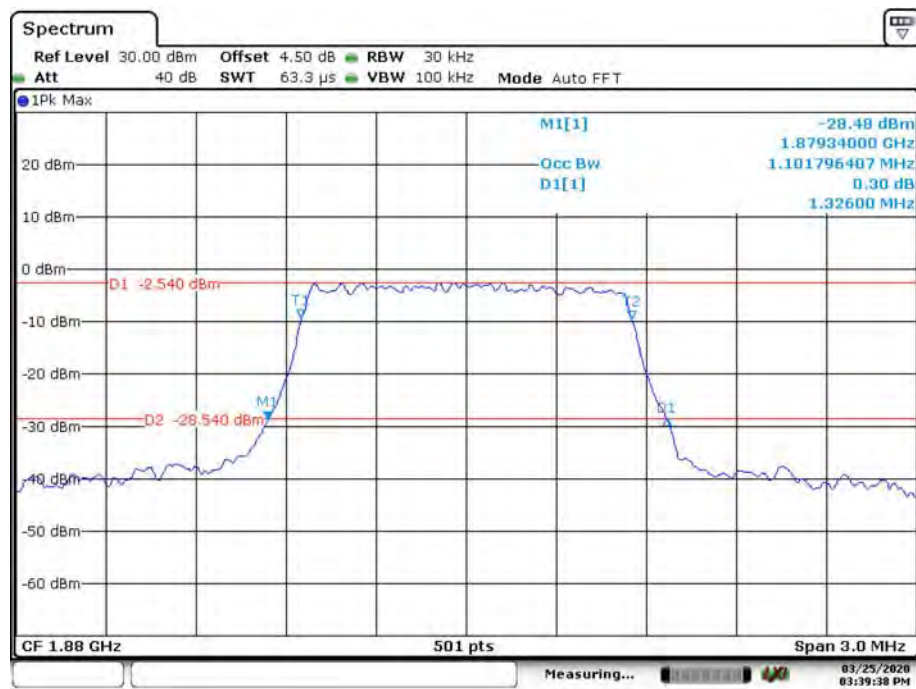


WCDMA Band 5 HSUPA

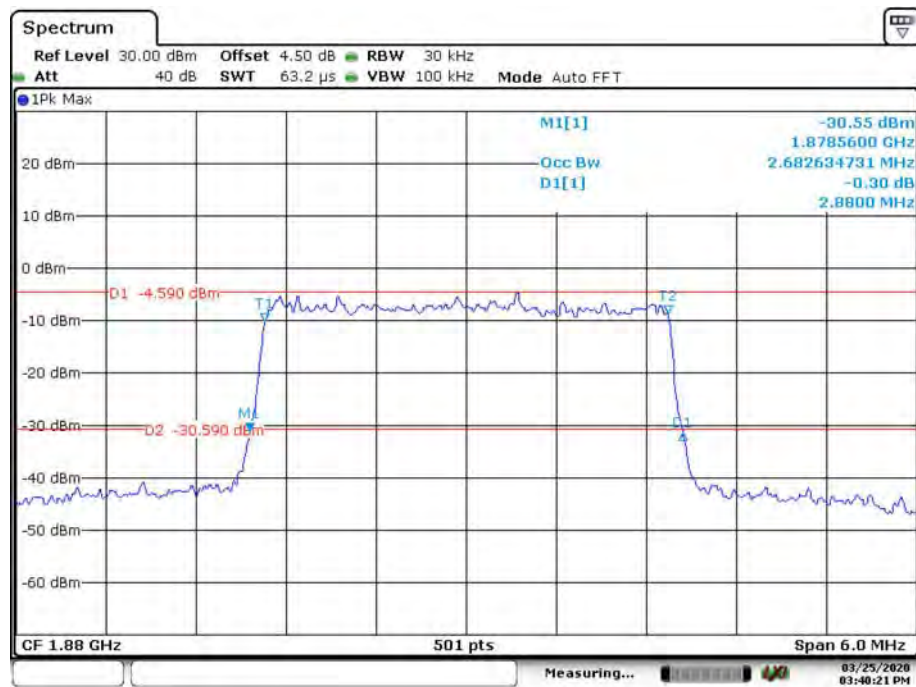


LTE Band 2

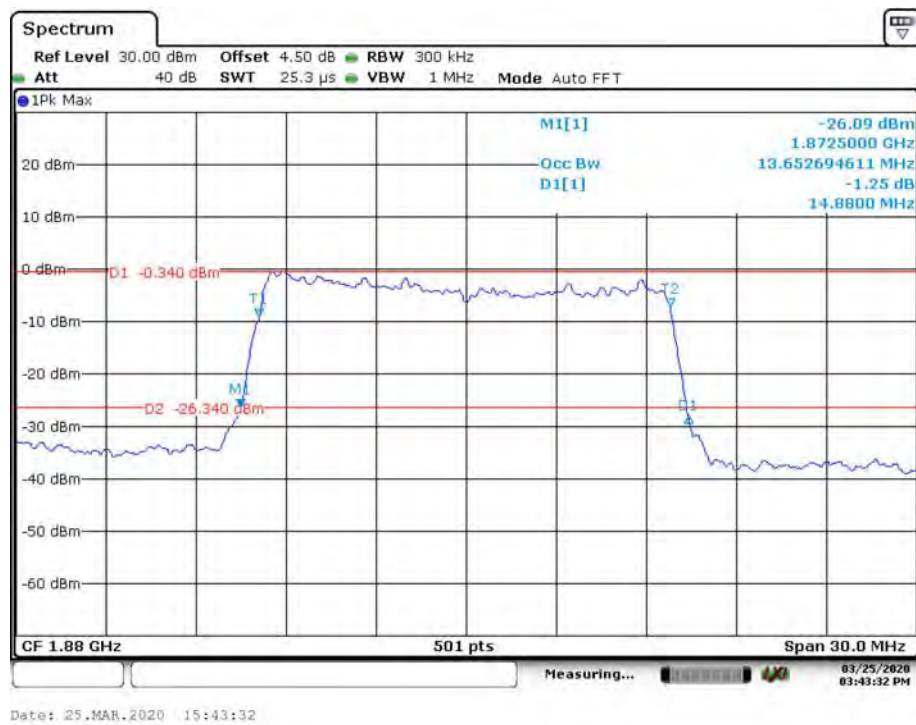
QPSK_1.4 MHz



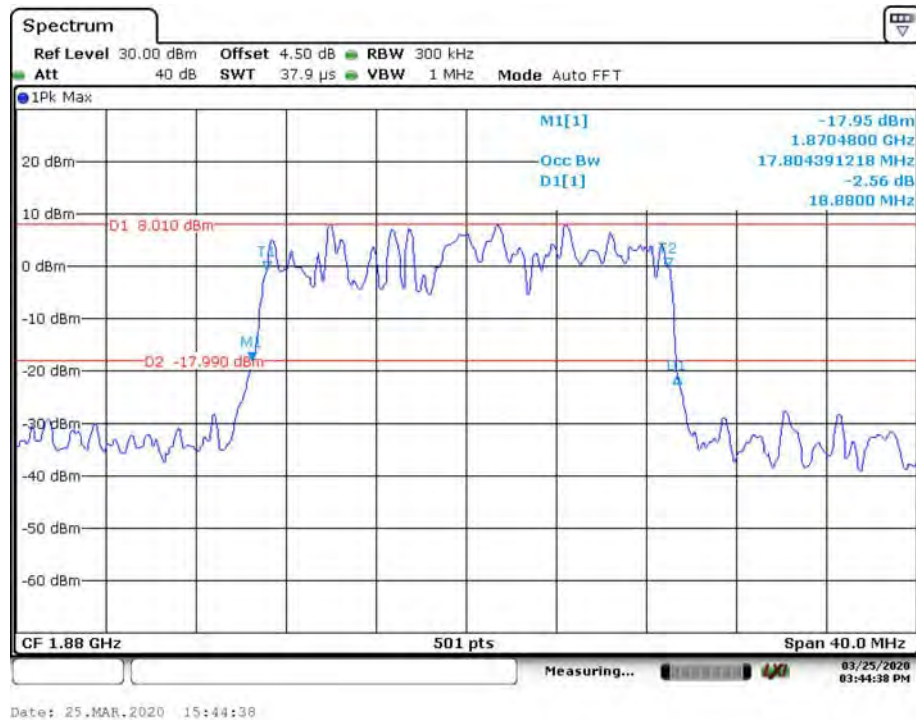
QPSK_3 MHz



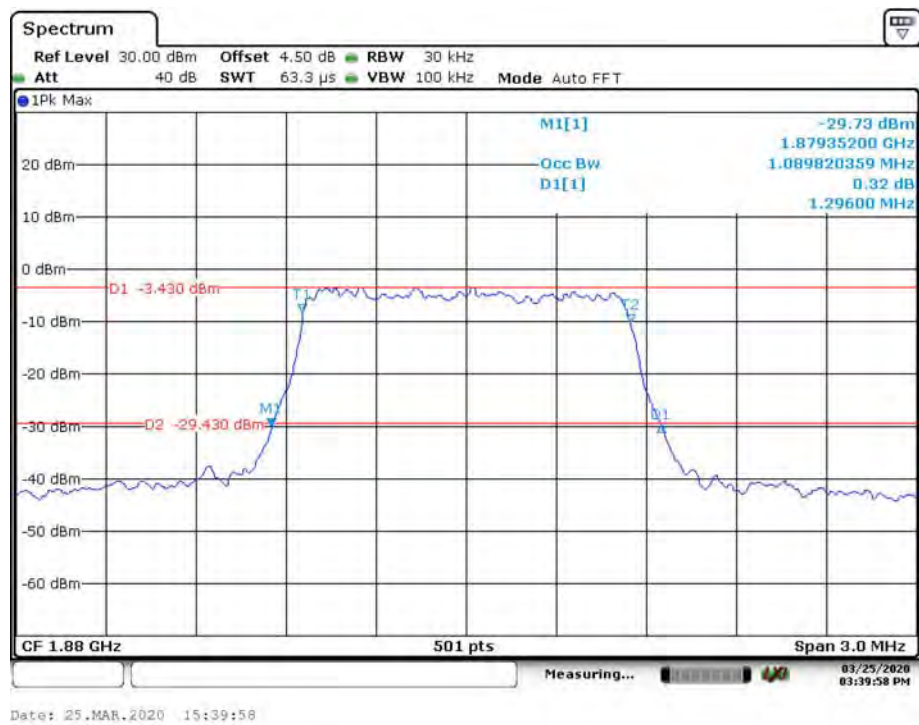
QPSK_15 MHz



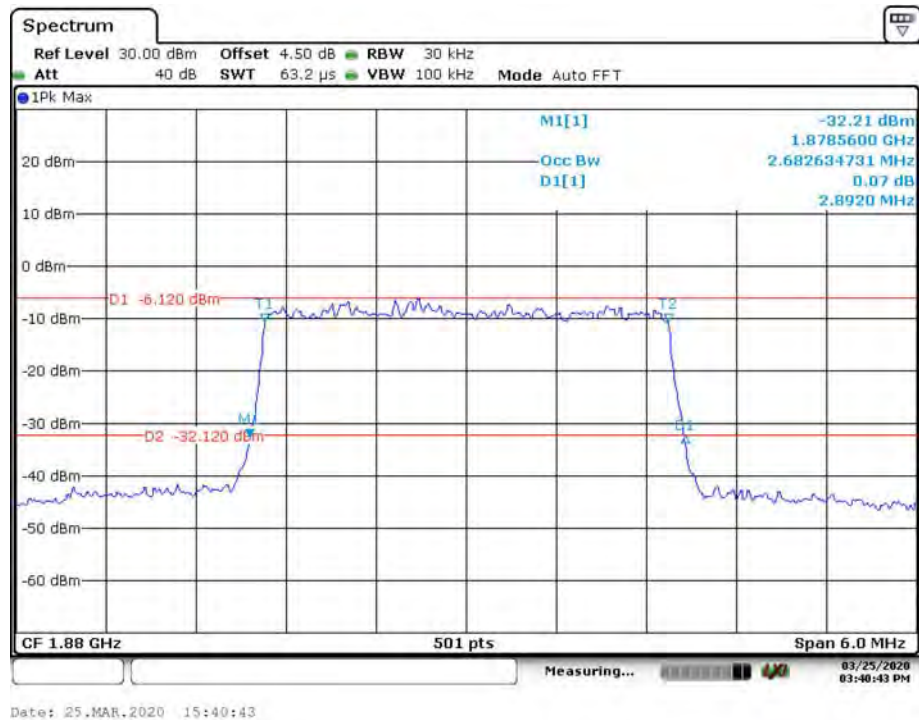
QPSK_20 MHz



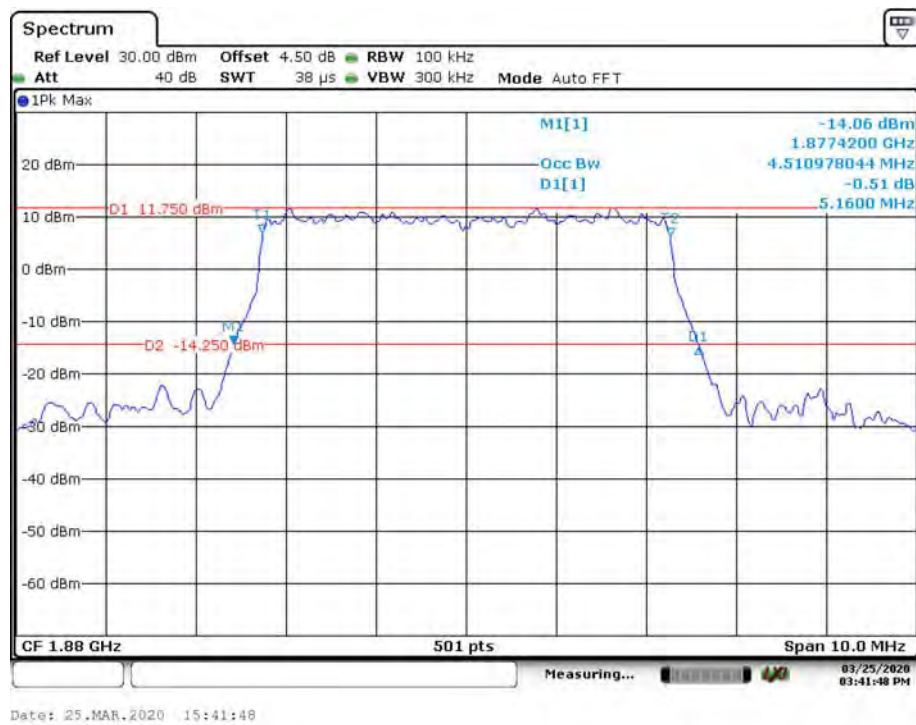
16QAM_1.4 MHz



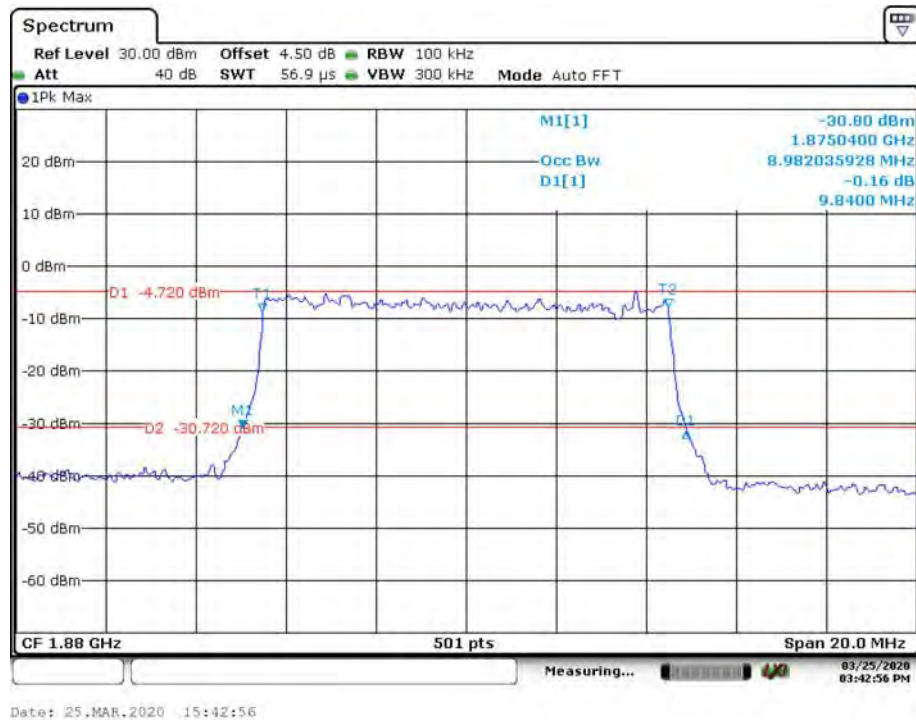
16QAM_3 MHz



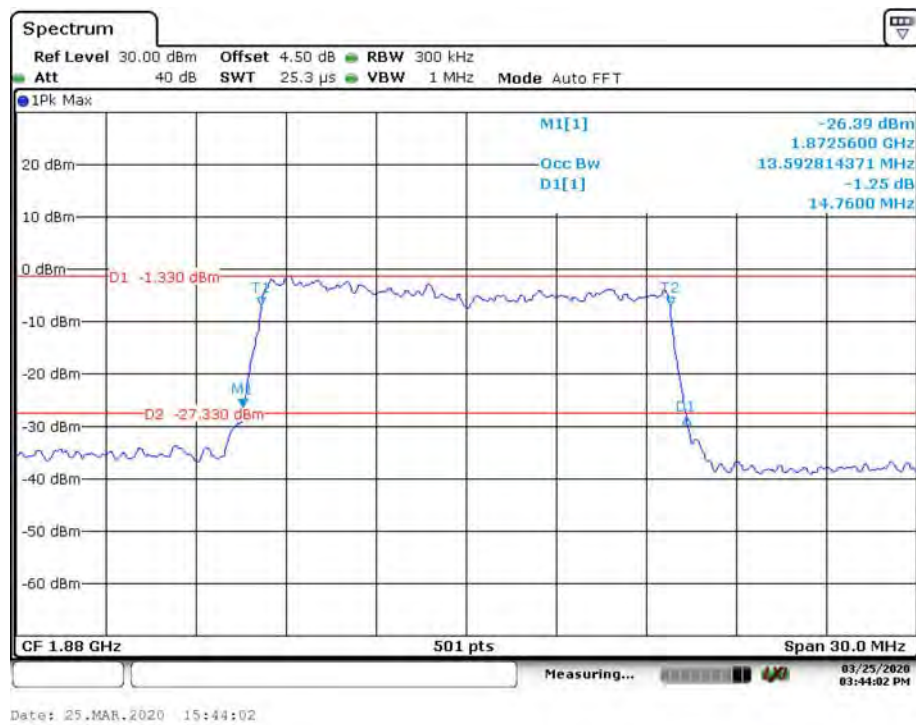
16QAM_5 MHz



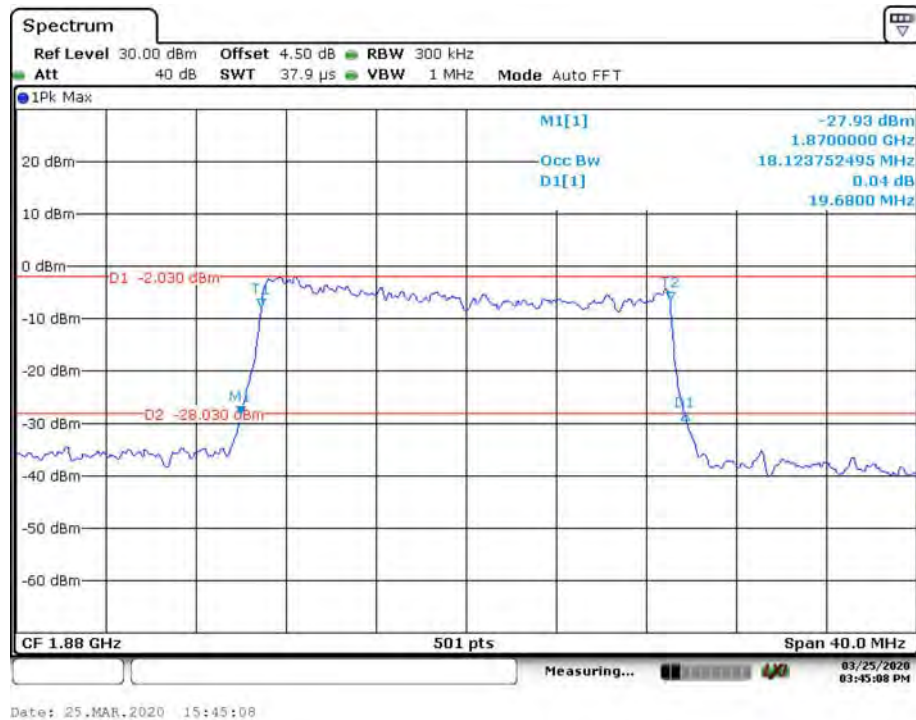
16QAM_10 MHz



16QAM_15 MHz

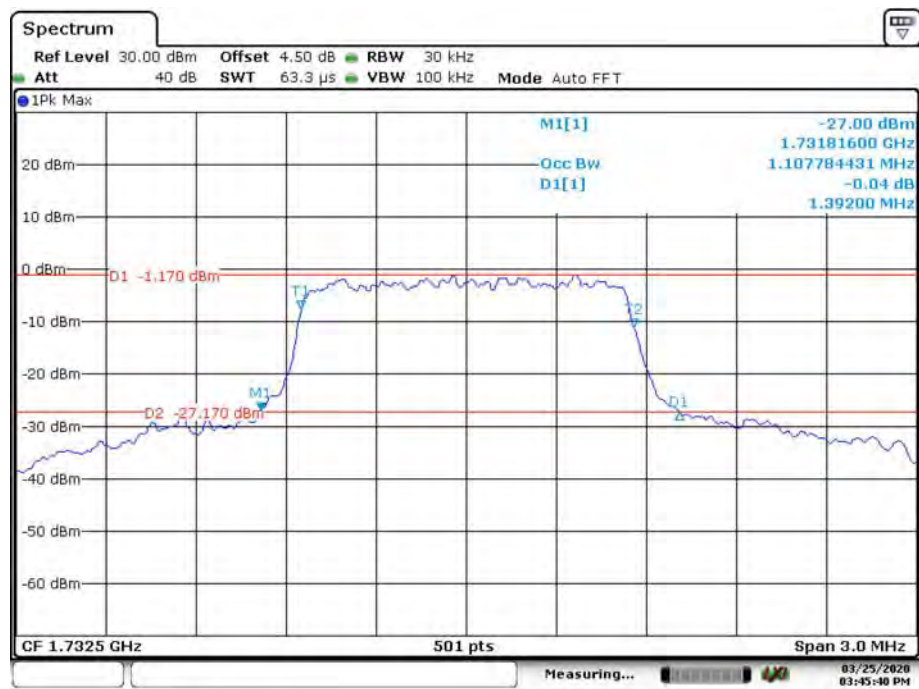


16QAM_20 MHz



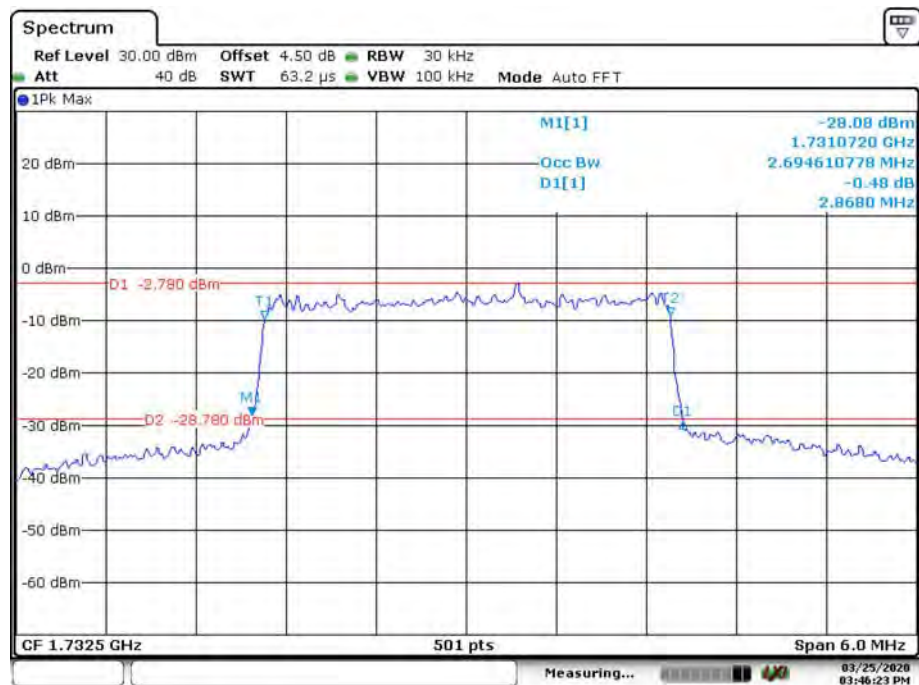
LTE Band 4

QPSK_1.4 MHz



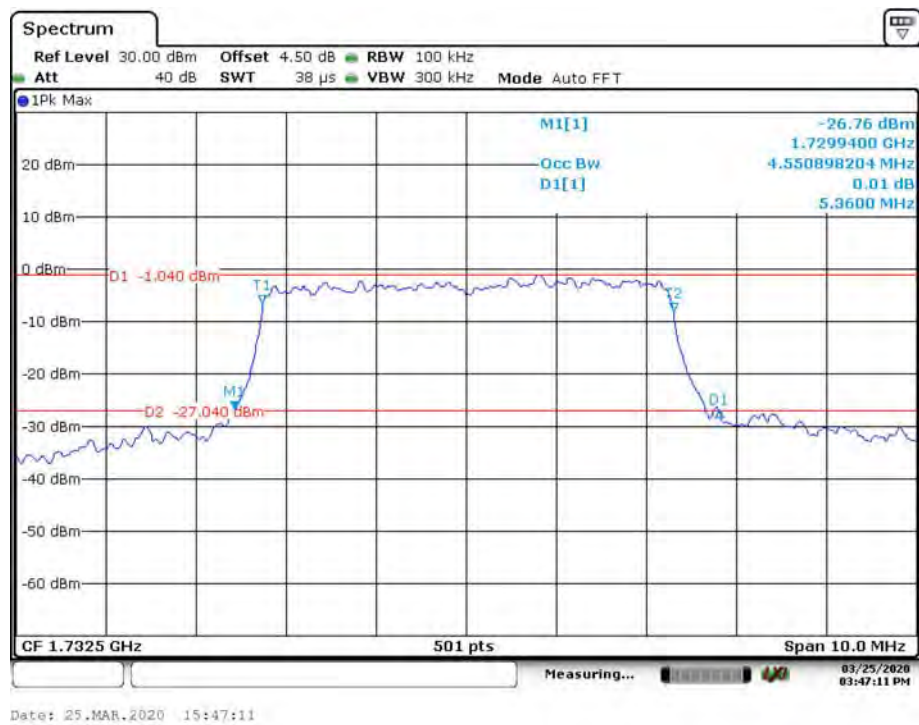
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QPSK_3 MHz

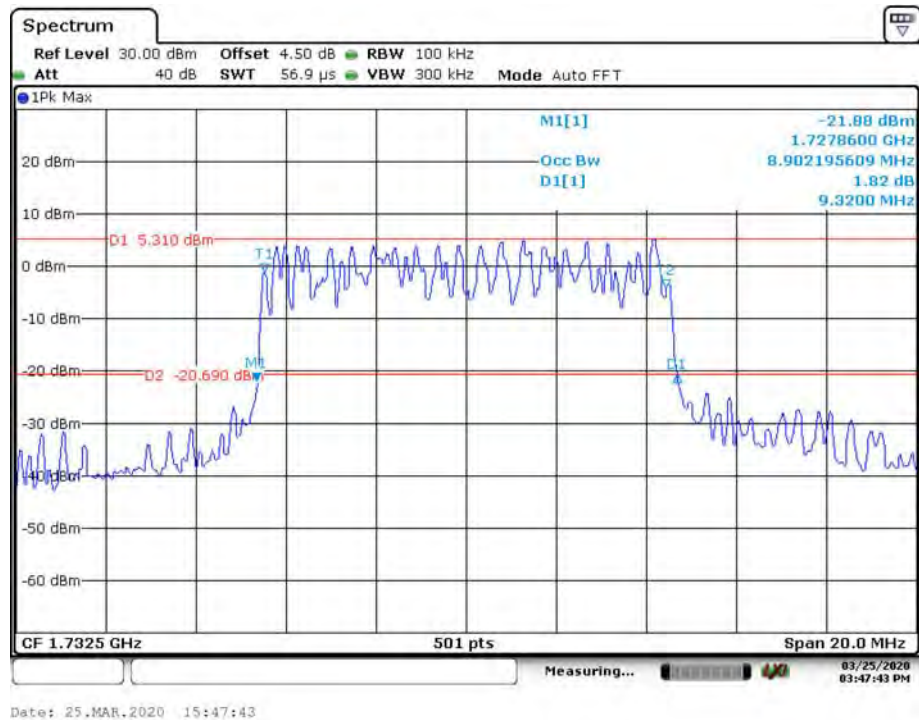


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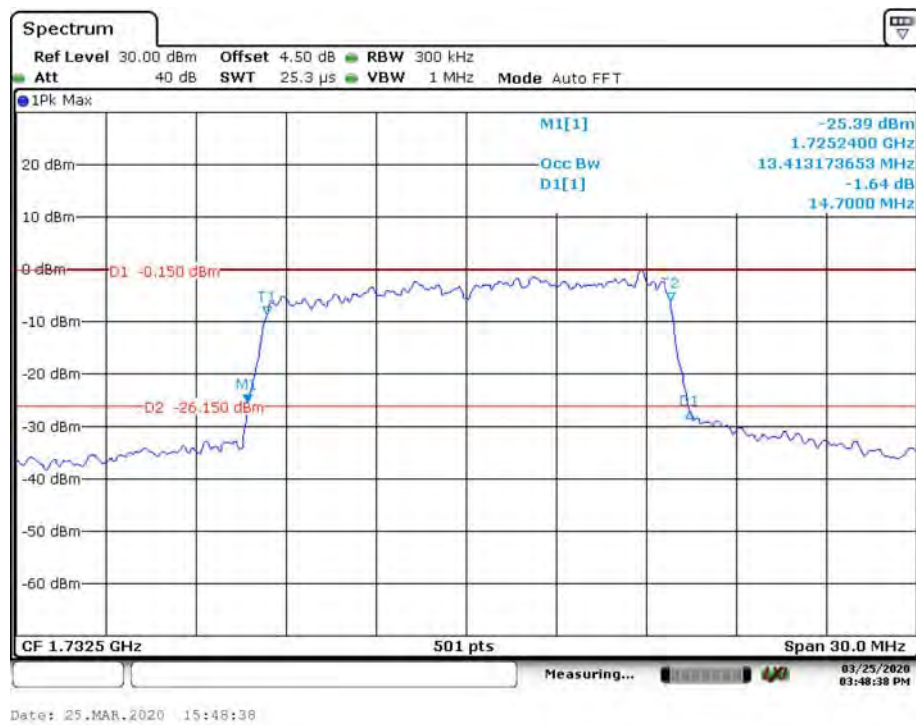
QPSK_5 MHz



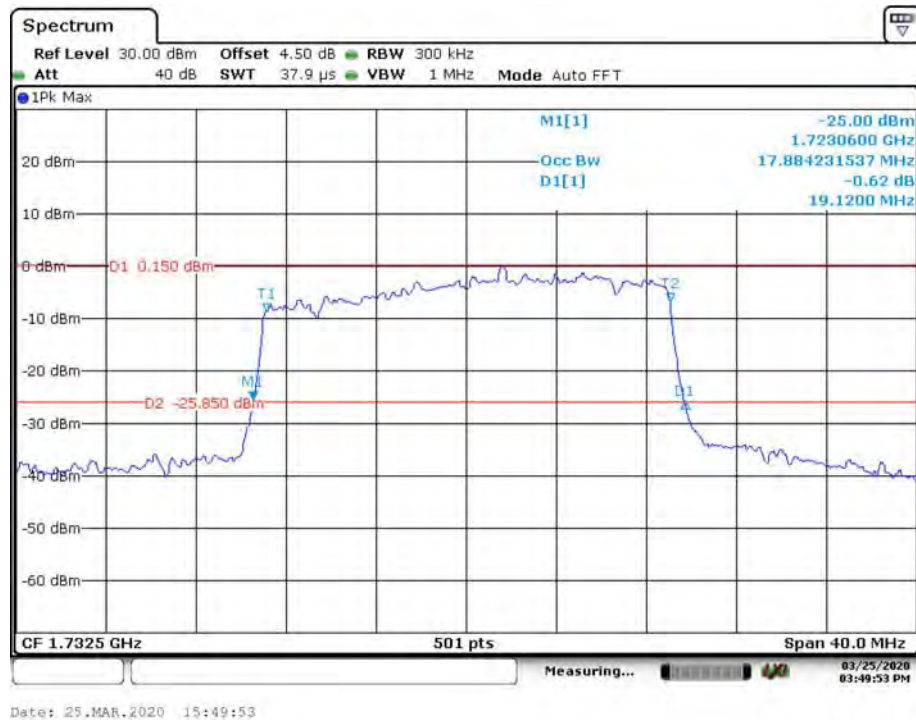
QPSK_10 MHz



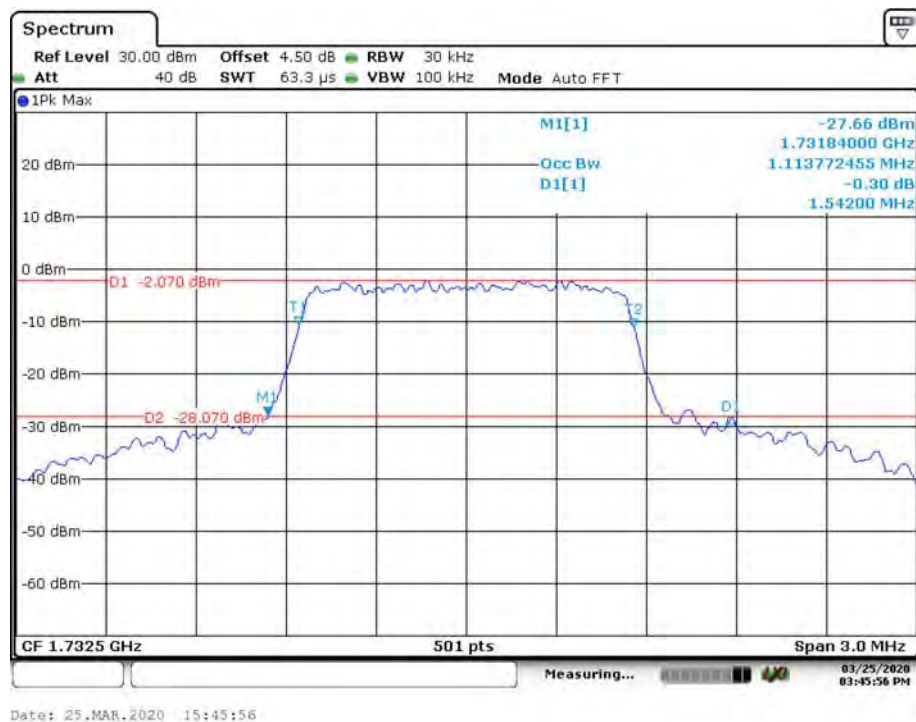
QPSK_15 MHz



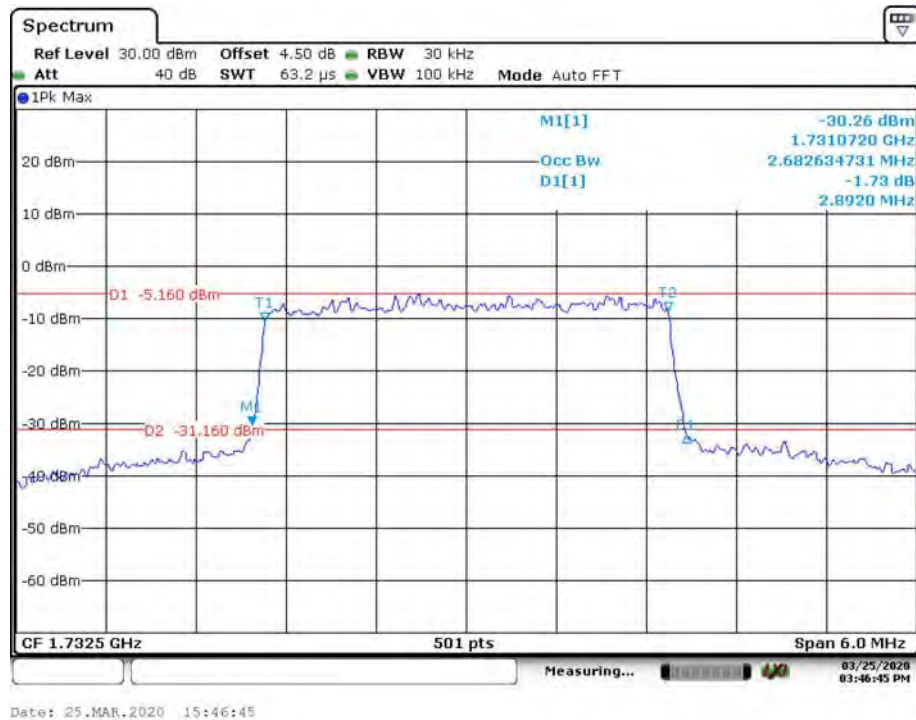
QPSK_20 MHz



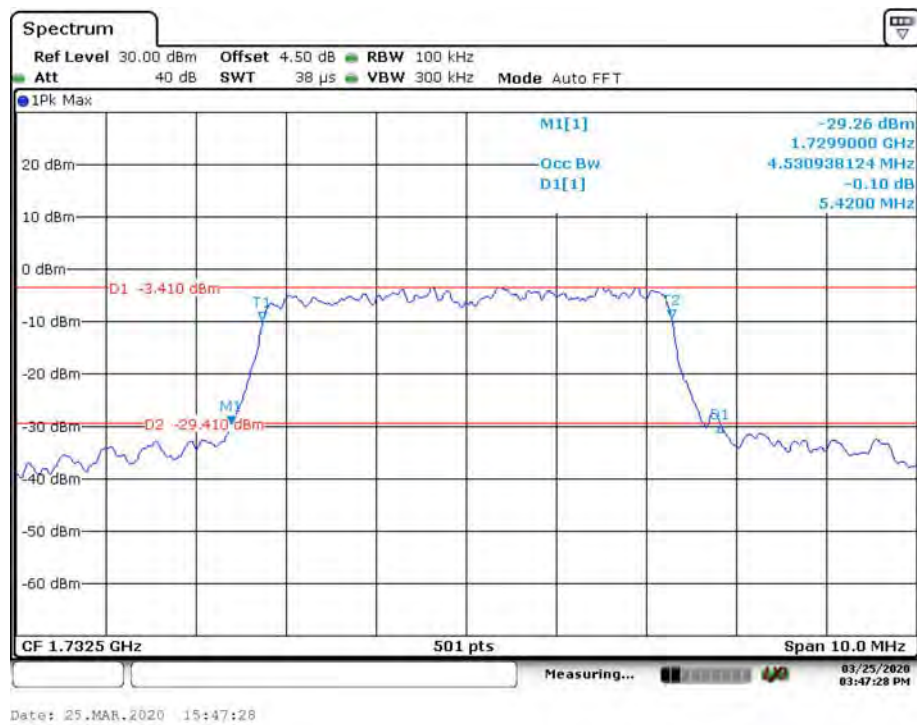
16QAM_1.4 MHz



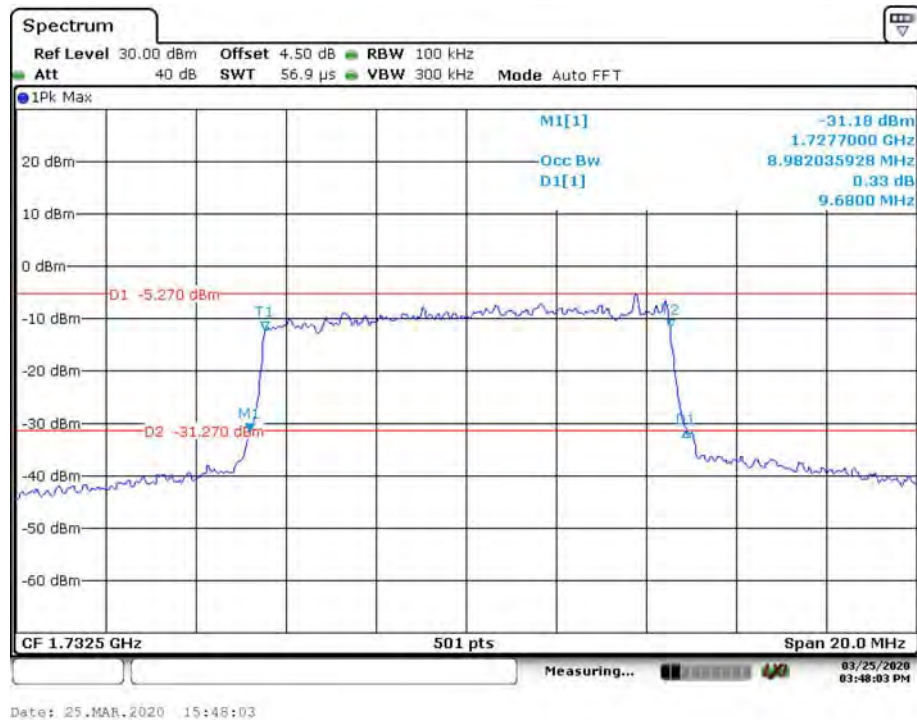
16QAM_3 MHz



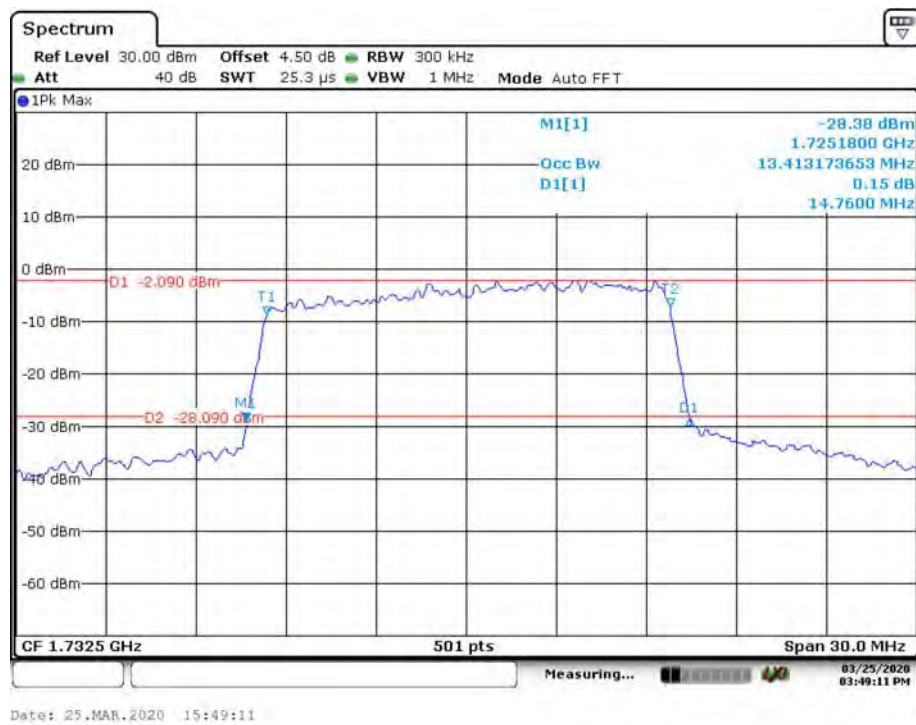
16QAM_5 MHz



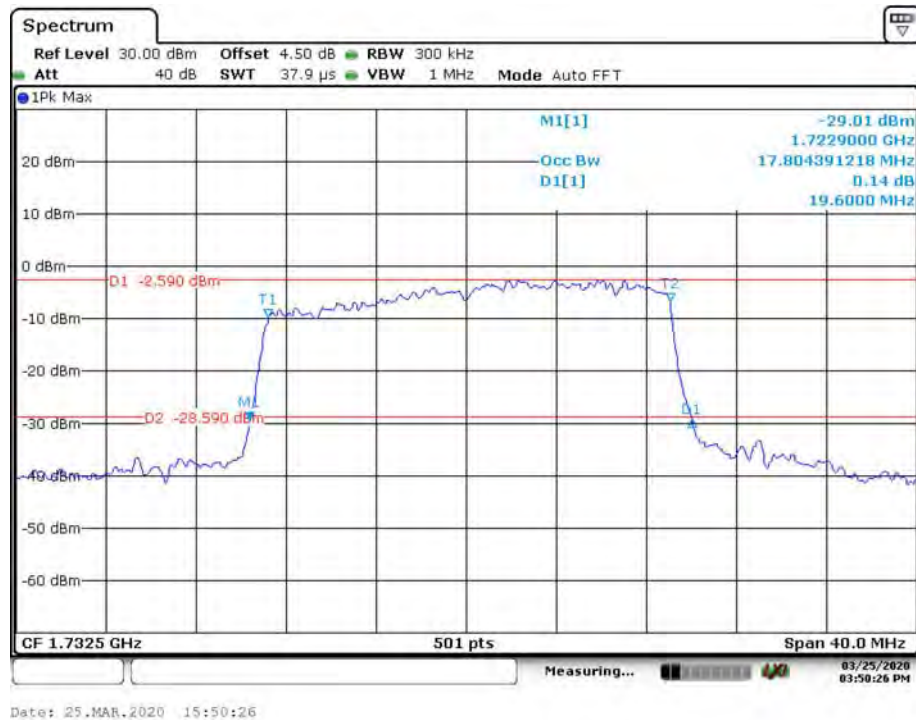
16QAM_10 MHz



16QAM_15 MHz



16QAM_20 MHz

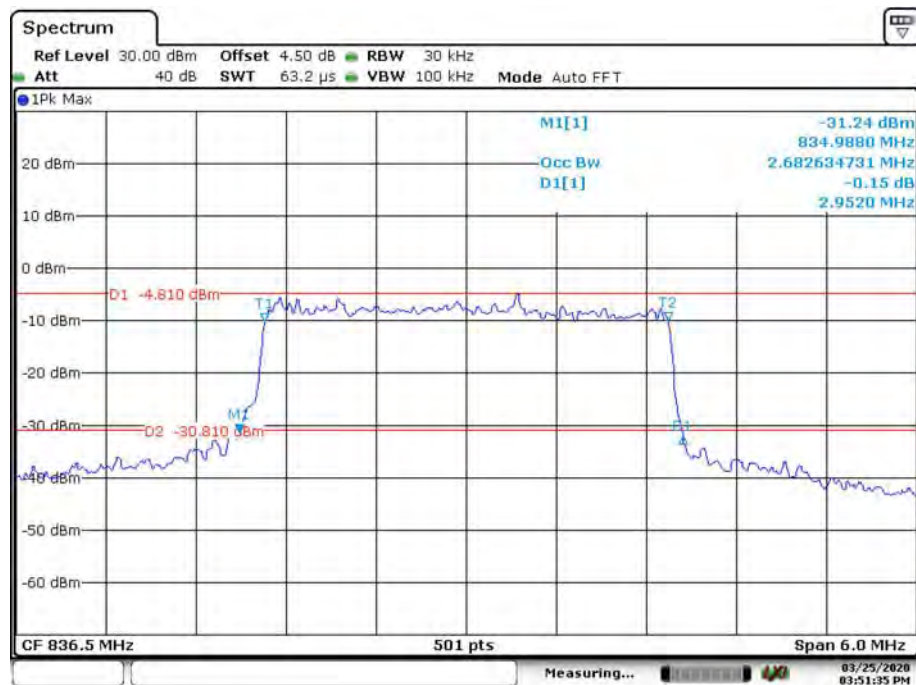


LTE Band 5:

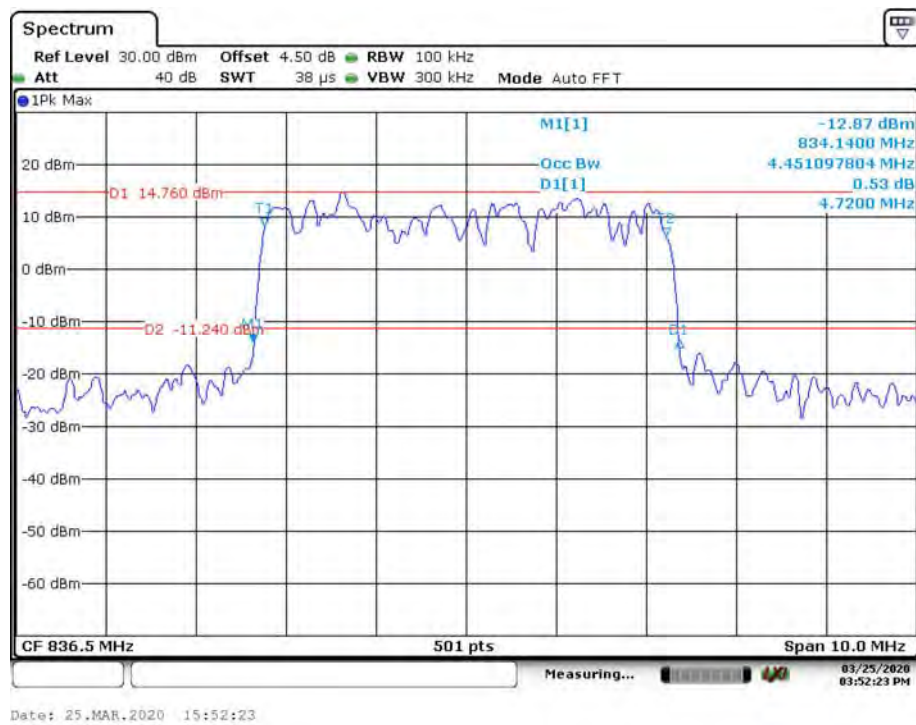
QPSK_1.4 MHz



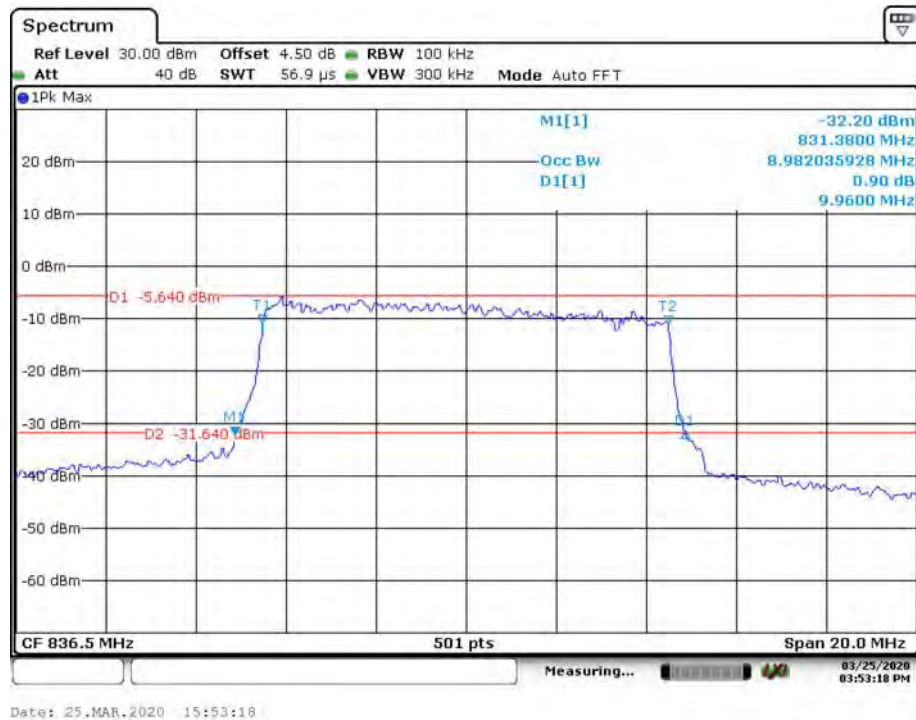
QPSK_3 MHz



QPSK_5 MHz



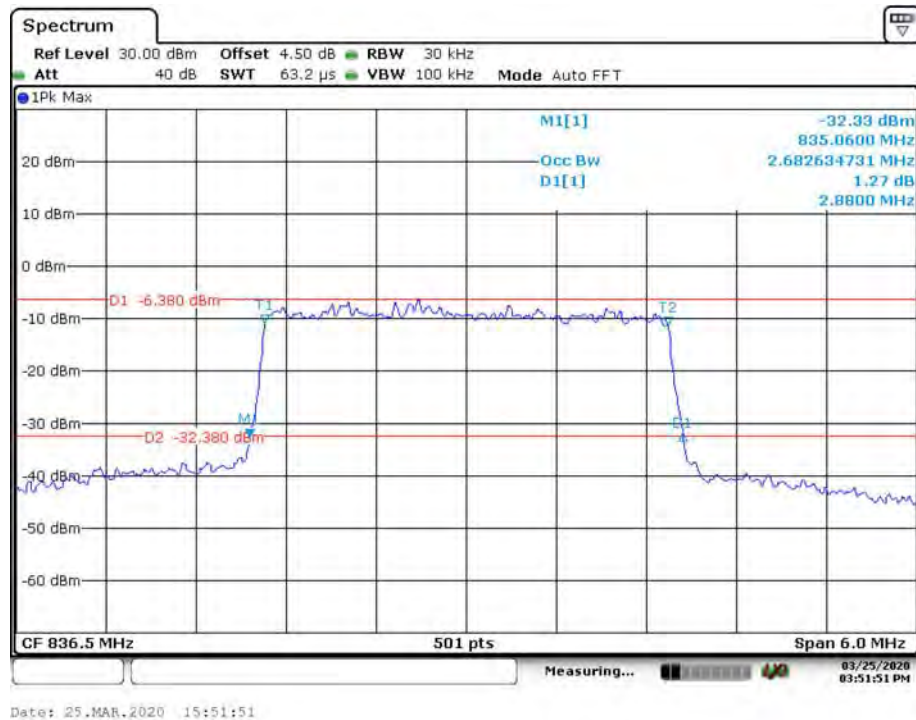
QPSK_10 MHz



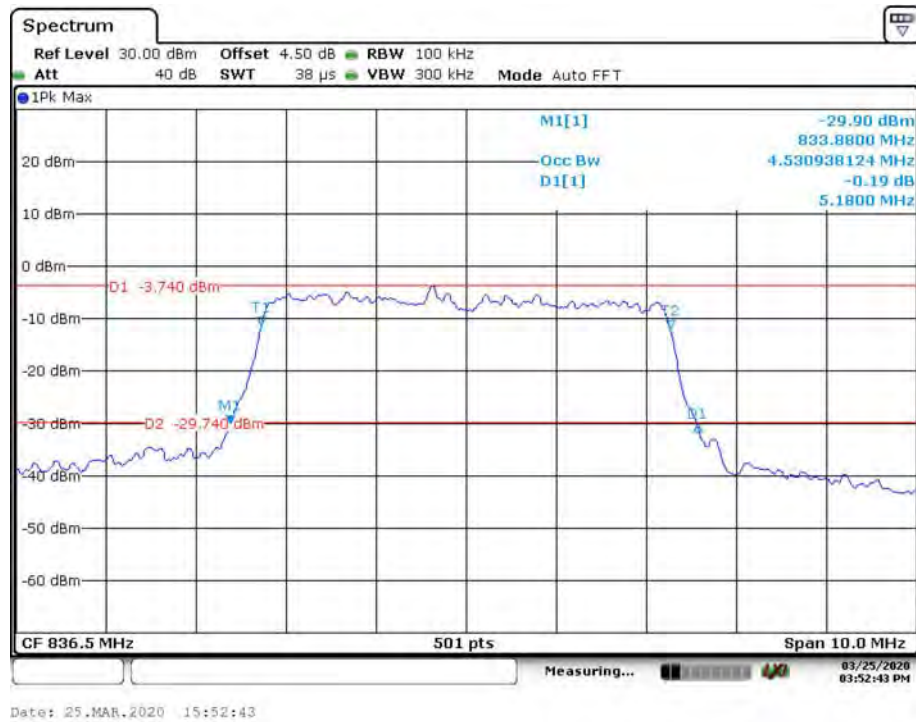
16QAM_1.4 MHz



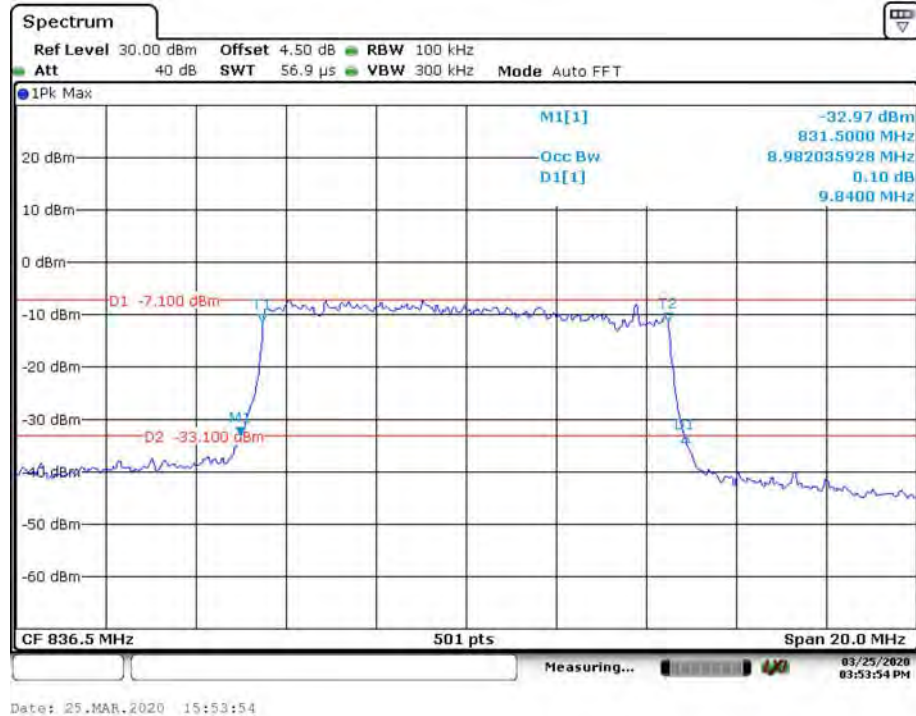
16QAM_3 MHz



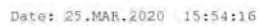
16QAM_5 MHz



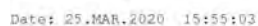
16QAM_10 MHz



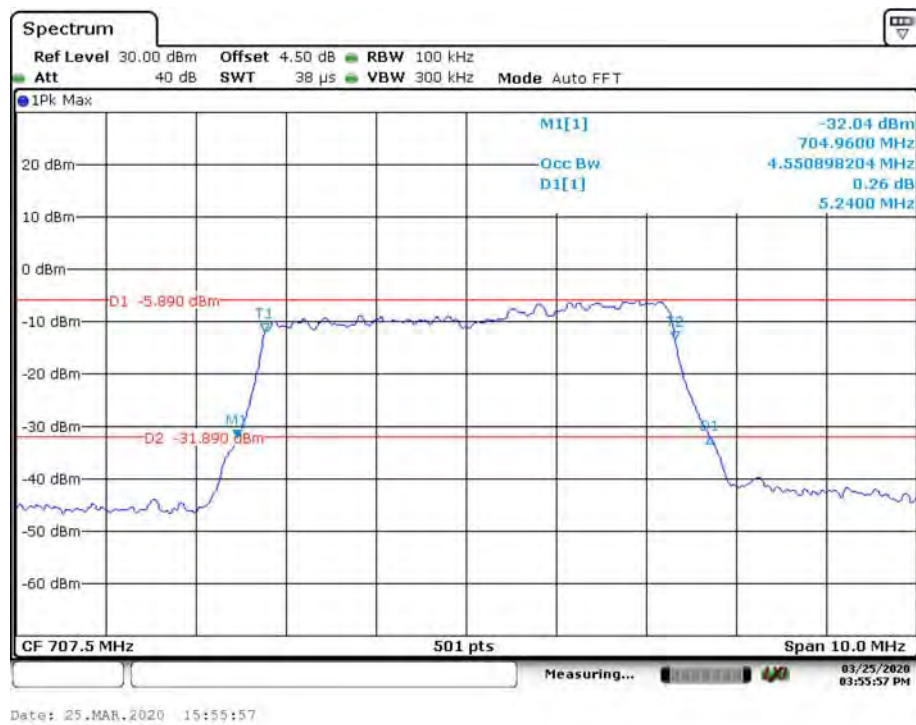
QPSK_1.4MHz



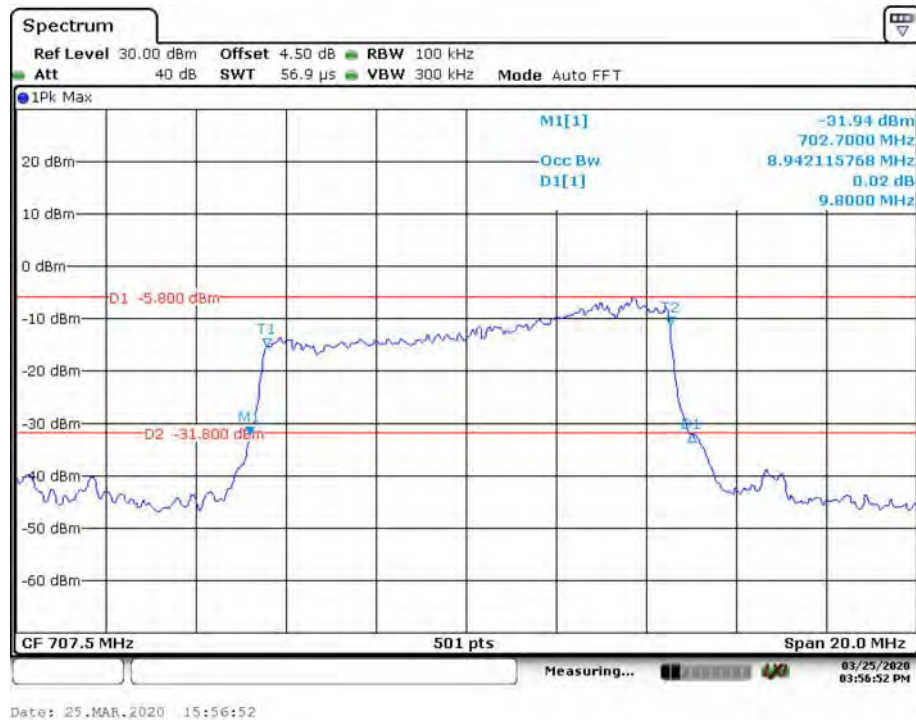
QPSK_3 MHz



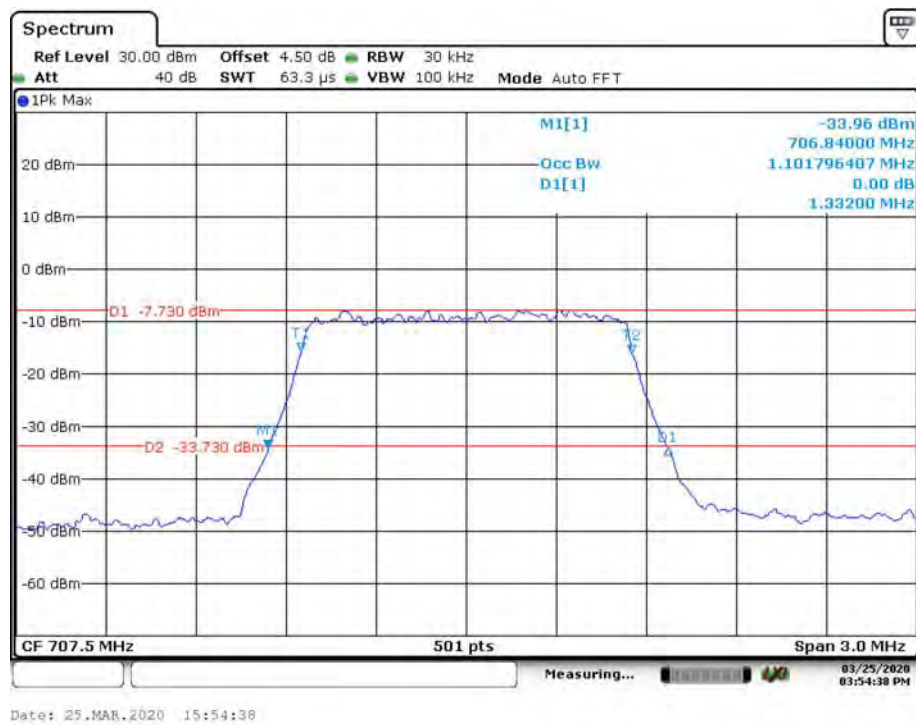
QPSK_5 MHz



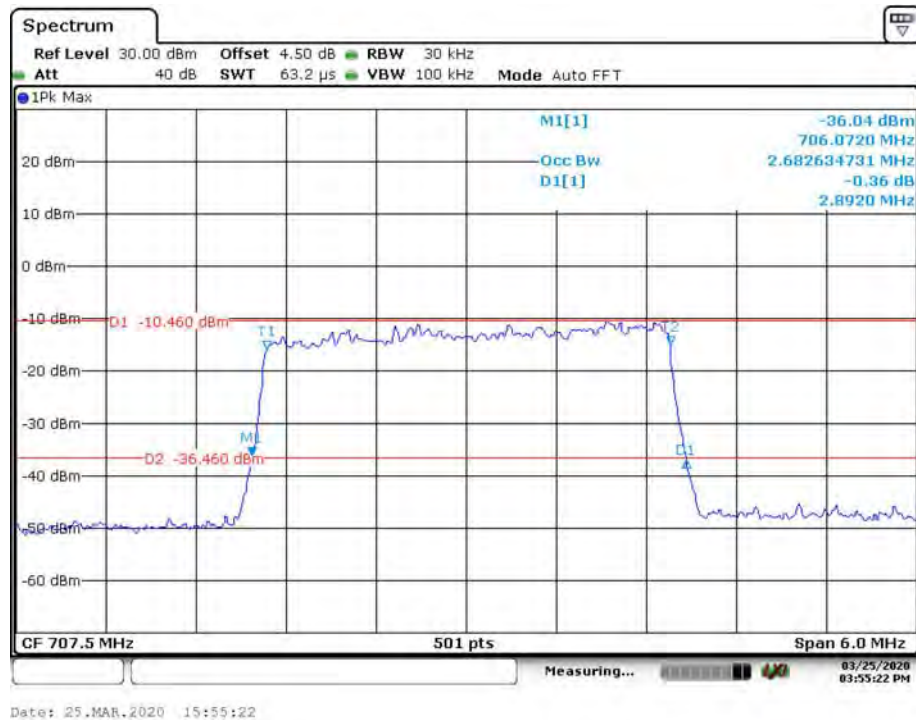
QPSK_10 MHz



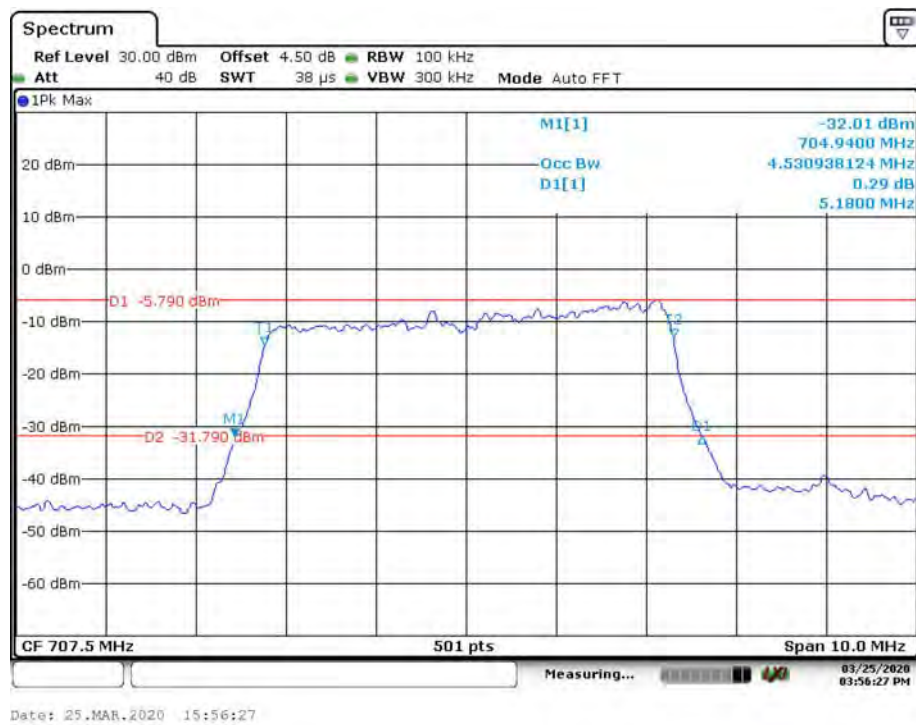
16QAM_1.4MHz



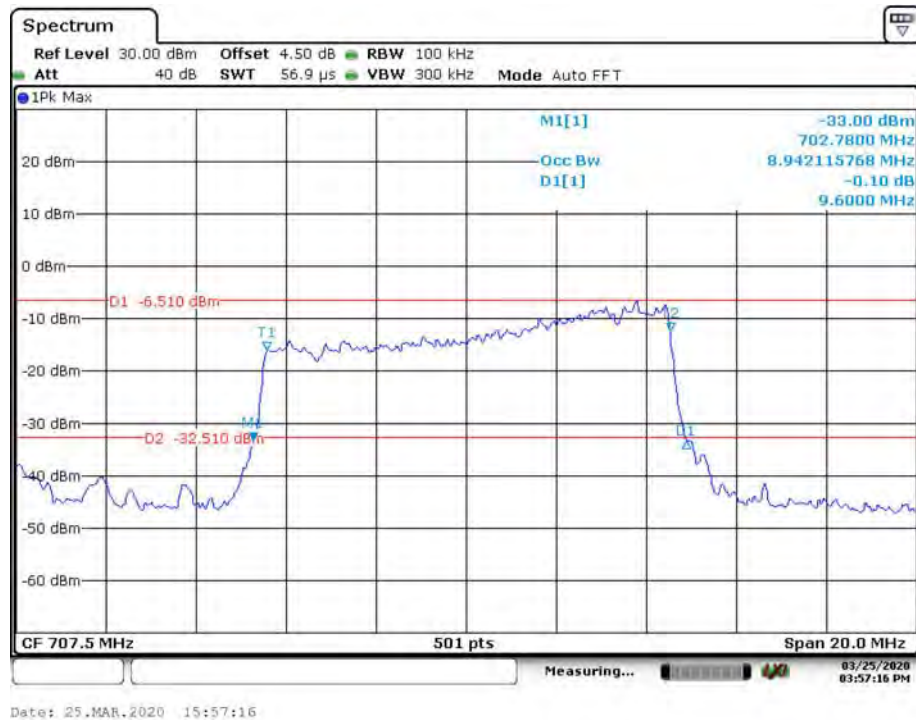
16QAM_3 MHz



16QAM_5 MHz



16QAM_10 MHz



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

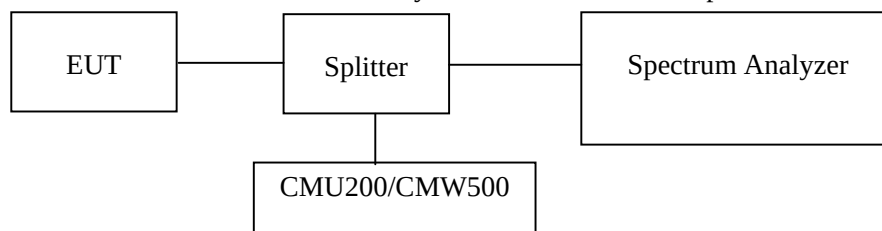
Applicable Standard

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

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

Test Procedure

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



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101474	2020-01-09	2021-01-09
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41010013	Each time	/
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005011	Each time	/
Unknown	Coaxial Cable	C-SJ00-0010	C0010/03	Each time	/
E-Microwave	Two-way Splitter	ODP-1-6-2S	OE0120142	Each time	/
Sinoscite	Band-stop filter	BSF1710-1785MN-0383-003	383003	2019-06-16	2020-06-16
Sinoscite	Band-stop filter	BSF1850-1910MS-0935V2	0935V2	2019-06-16	2020-06-16
Sinoscite	Band-stop filter	BSF824-862MS-1438-001	1438001	2019-06-16	2020-06-16

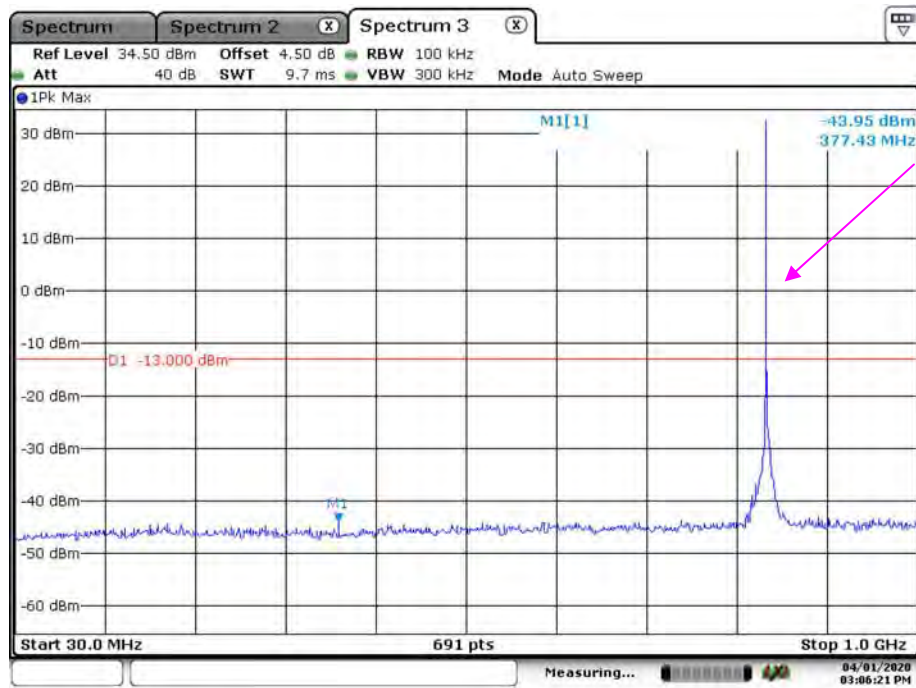
*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Test Data**Environmental Conditions**

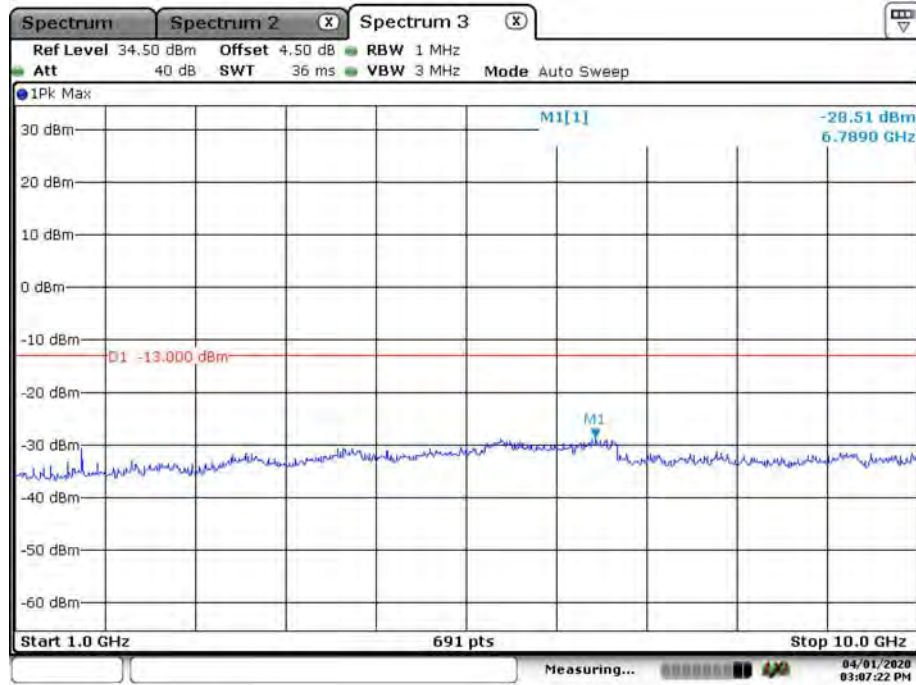
Temperature:	23°C~ 26 °C
Relative Humidity:	55%~65 %
ATM Pressure:	100.8kPa ~101.5kPa
Tester:	Fay Hu
Test Date:	2020-03-25~2020-04-01

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

GSM850 Middle Channel

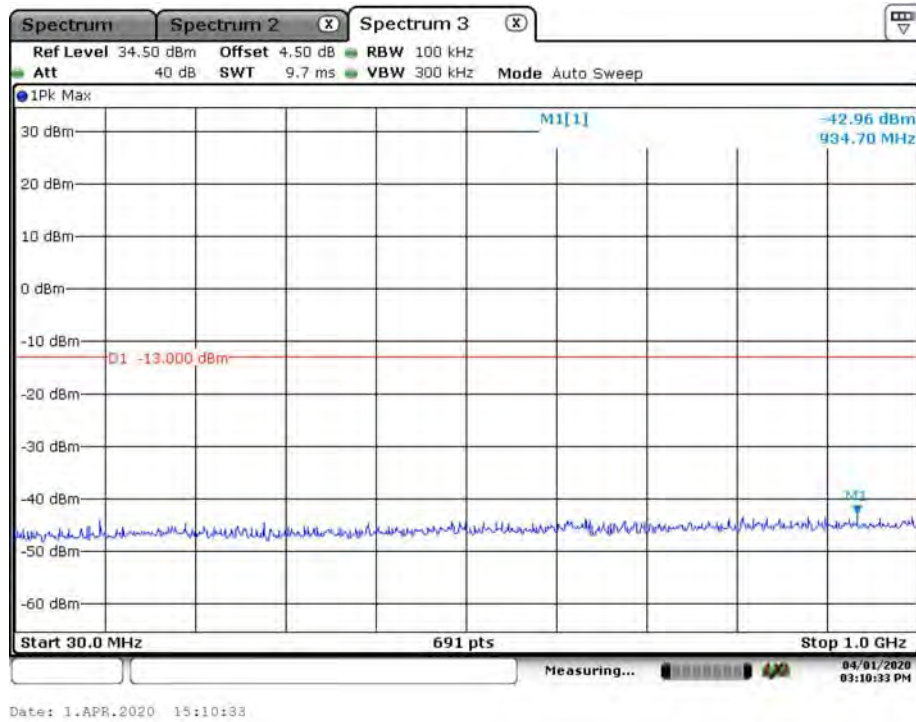


Fundamental

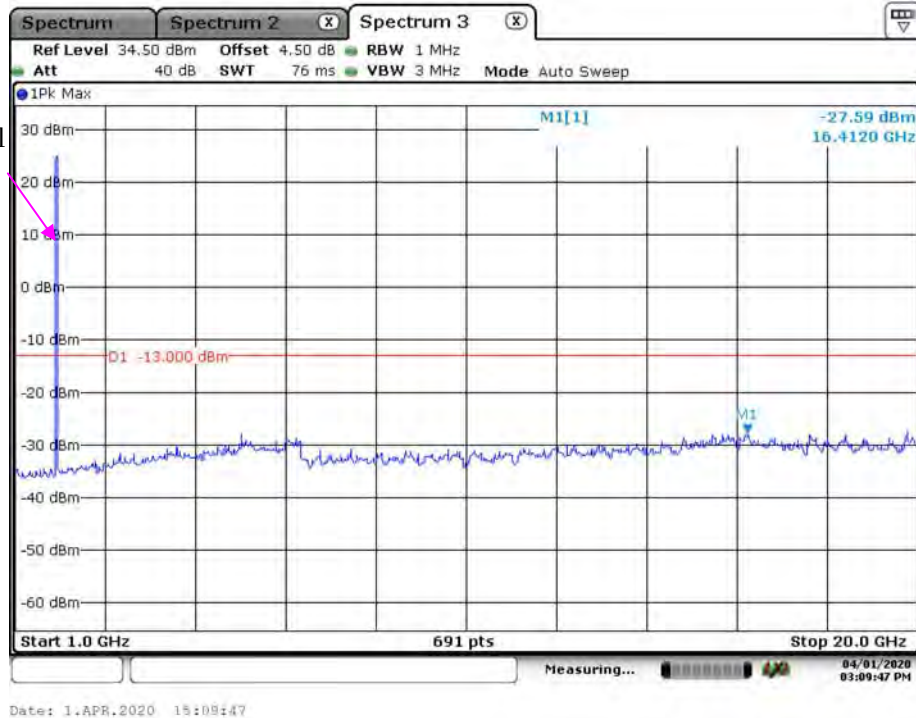


Date: 1.APR.2020 15:07:22

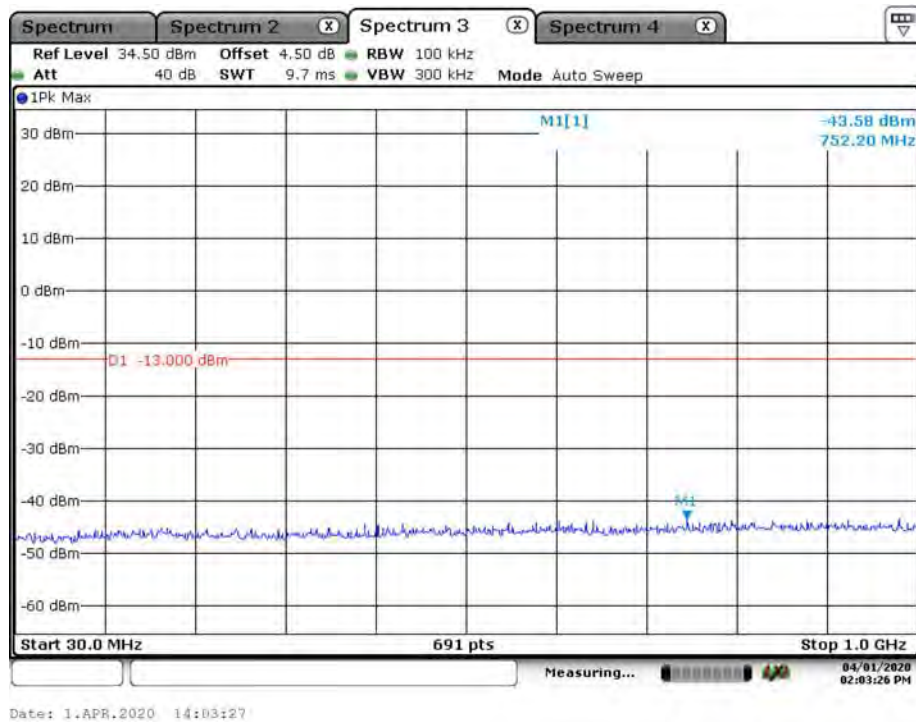
PCS 1900 Middle Channel



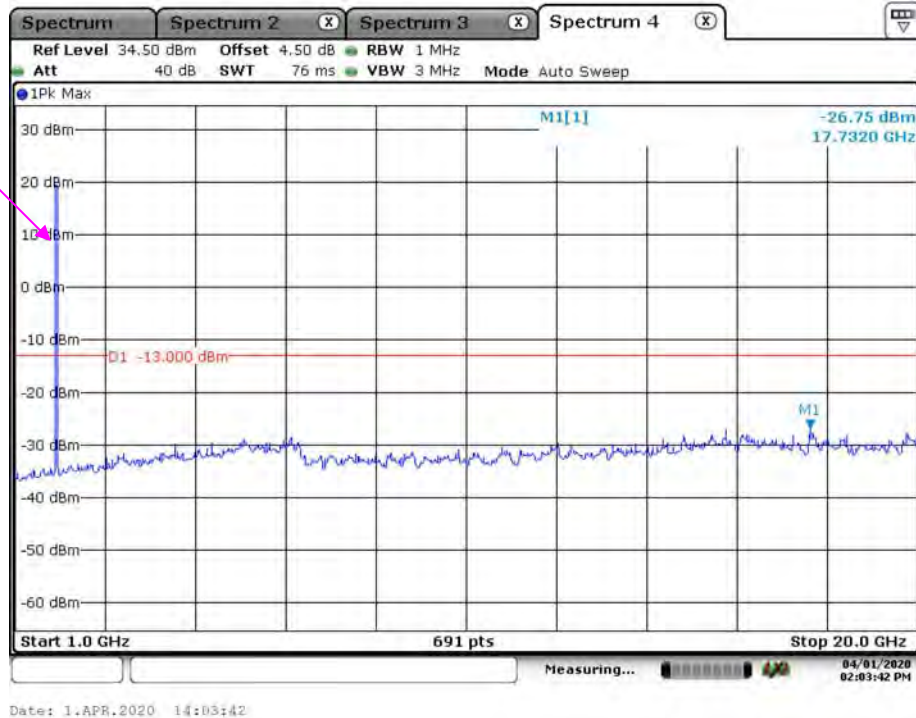
Fundamental



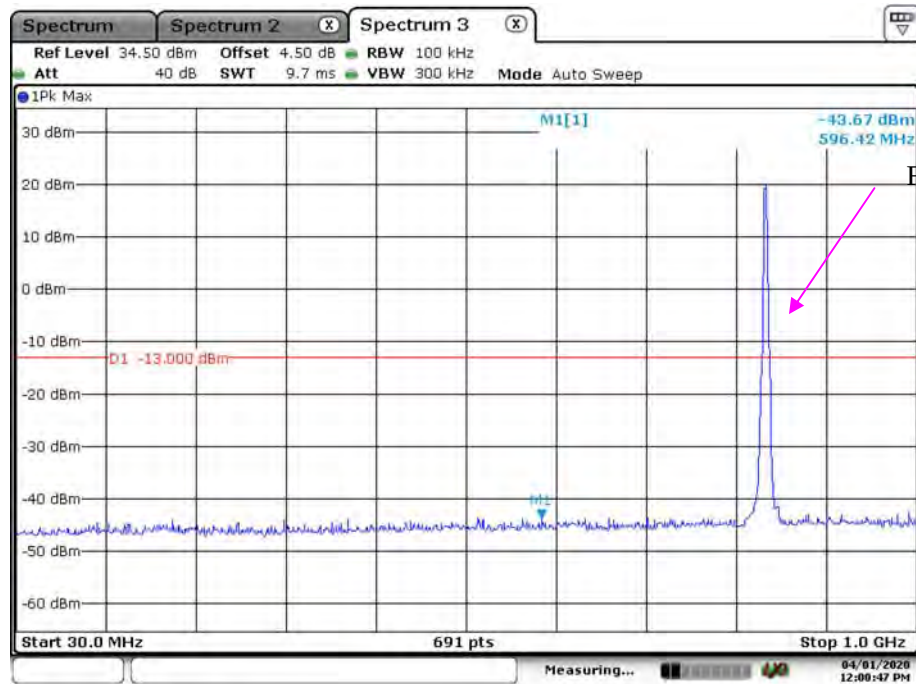
WCDMA Band 2 Rel 99 Middle Channel



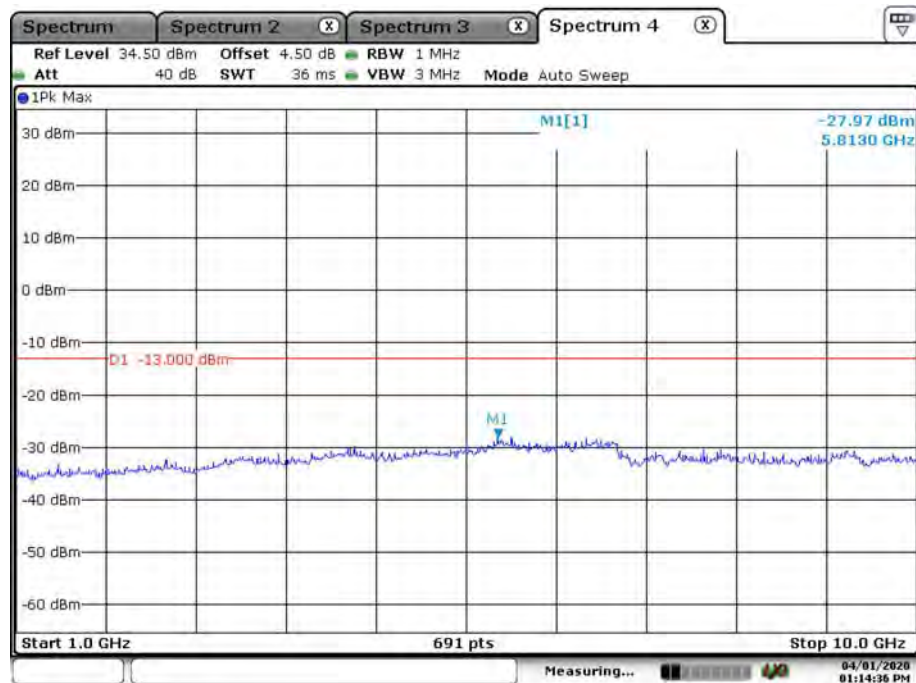
Fundamental



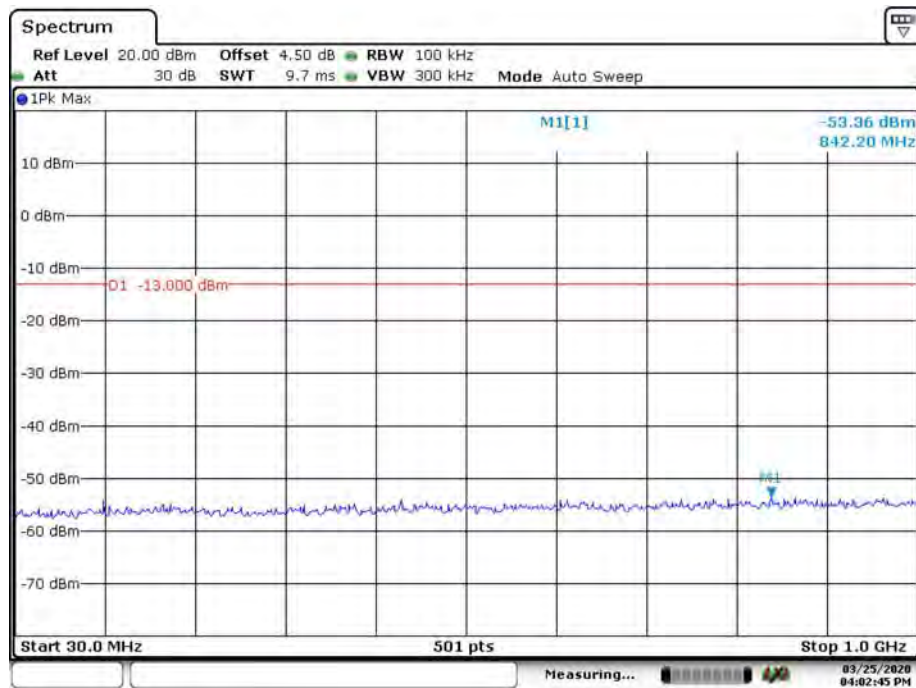
WCDMA Band 5 Rel 99 Middle Channel



Fundamental

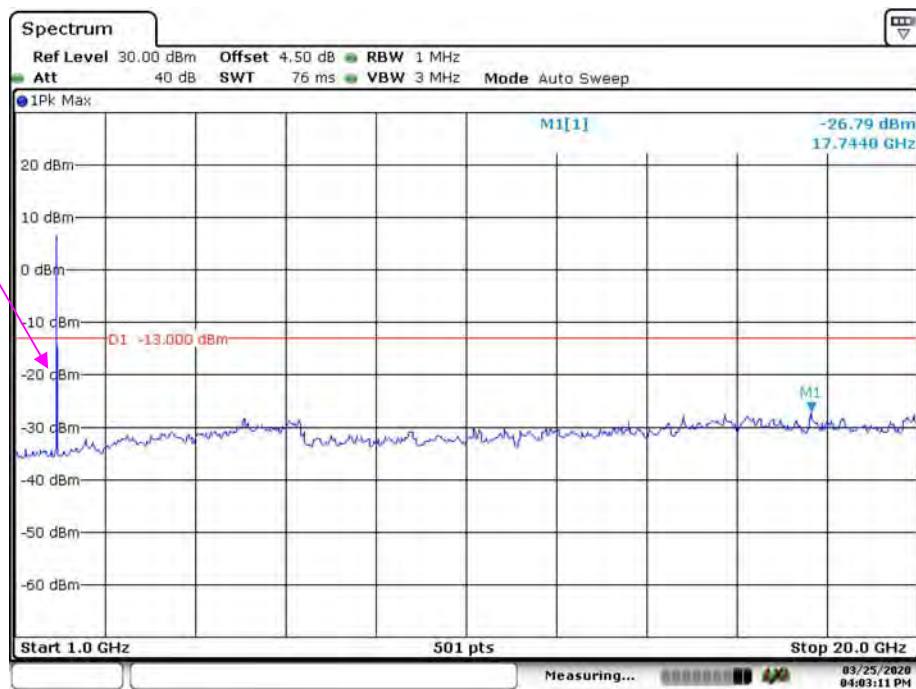


LTE Band 2_1.4 MHz_Middle Channel



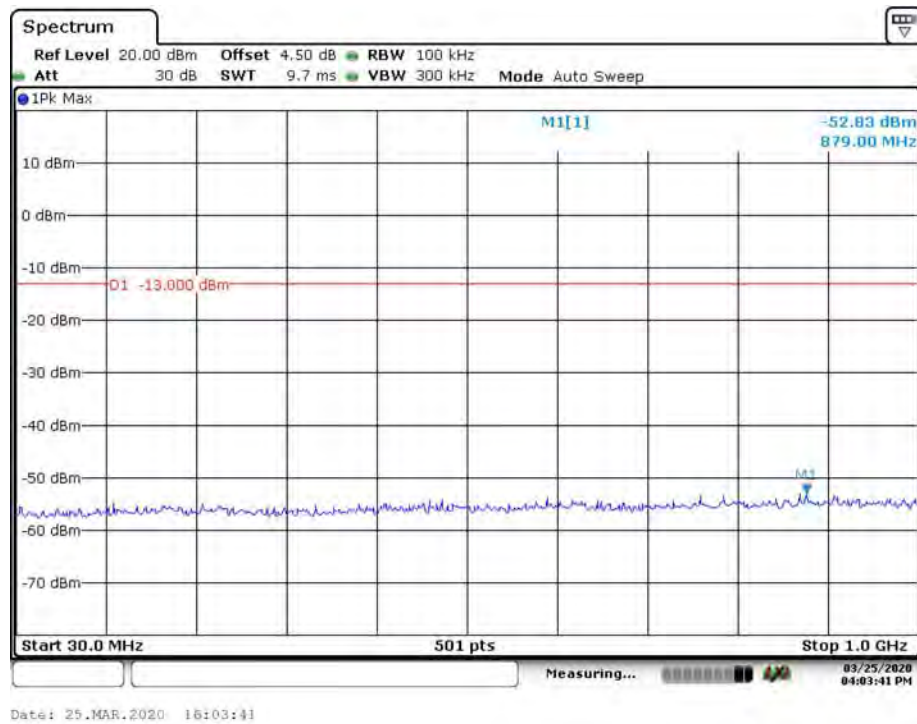
Date: 25.MAR.2020 16:02:45

Fundamental

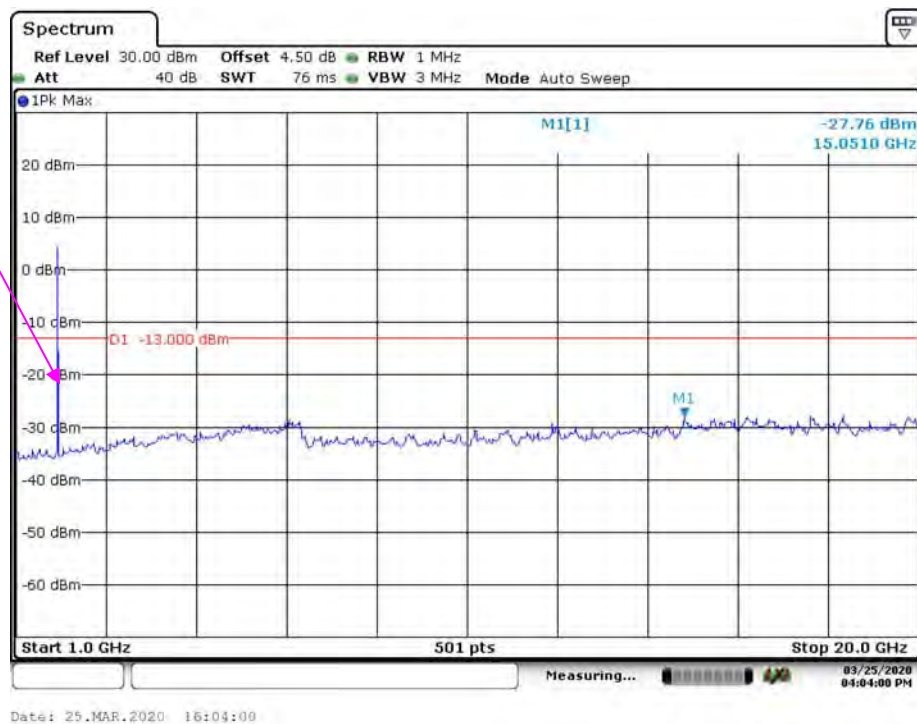


Date: 25.MAR.2020 16:03:11

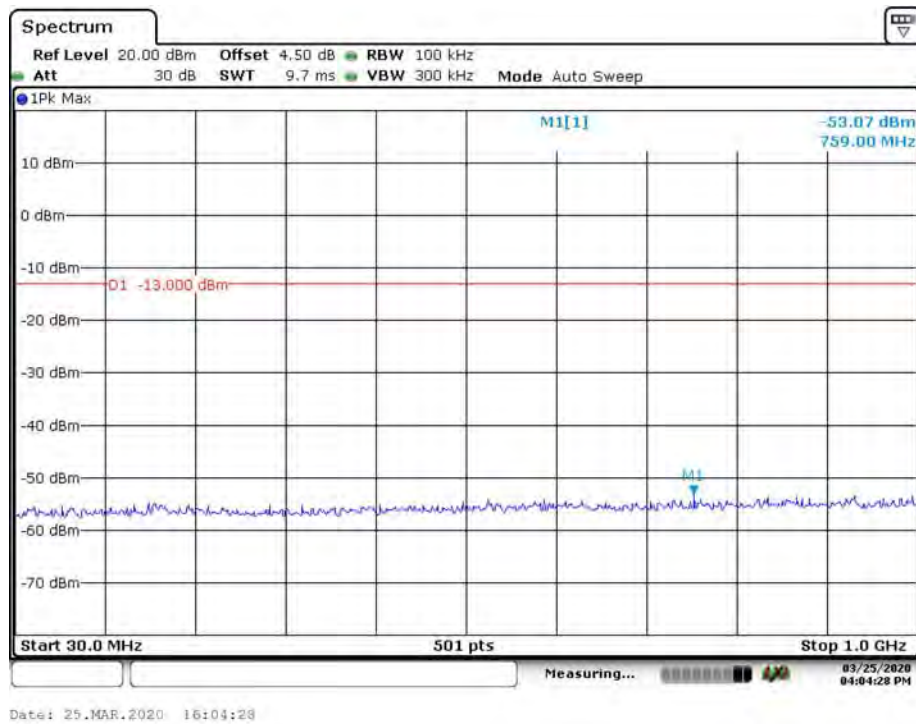
LTE Band 2_3 MHz_Middle Channel



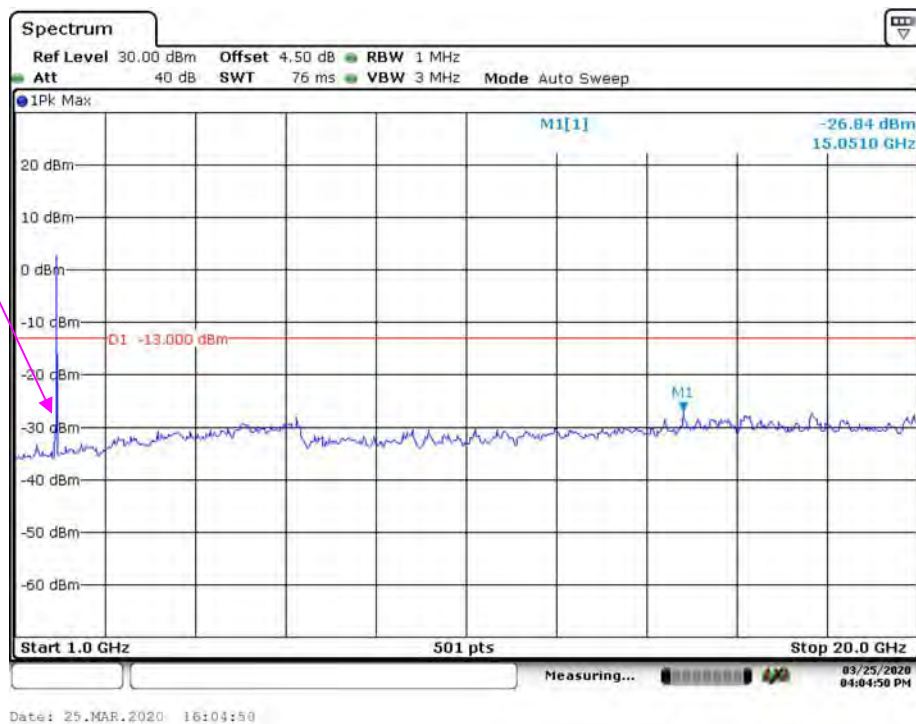
Fundamental



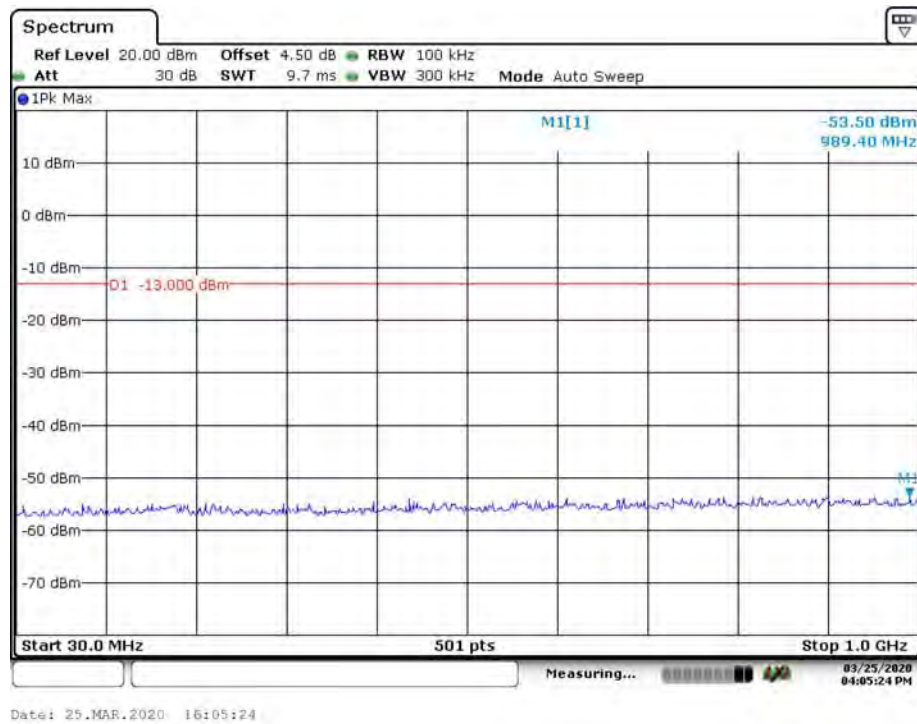
LTE Band 2_5 MHz_Middle Channel



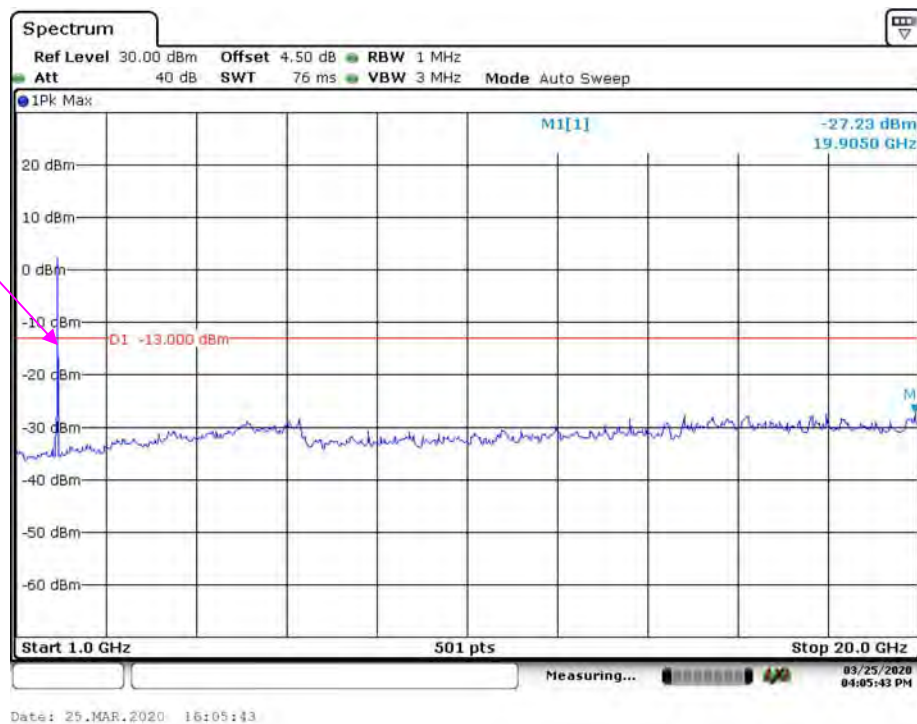
Fundamental



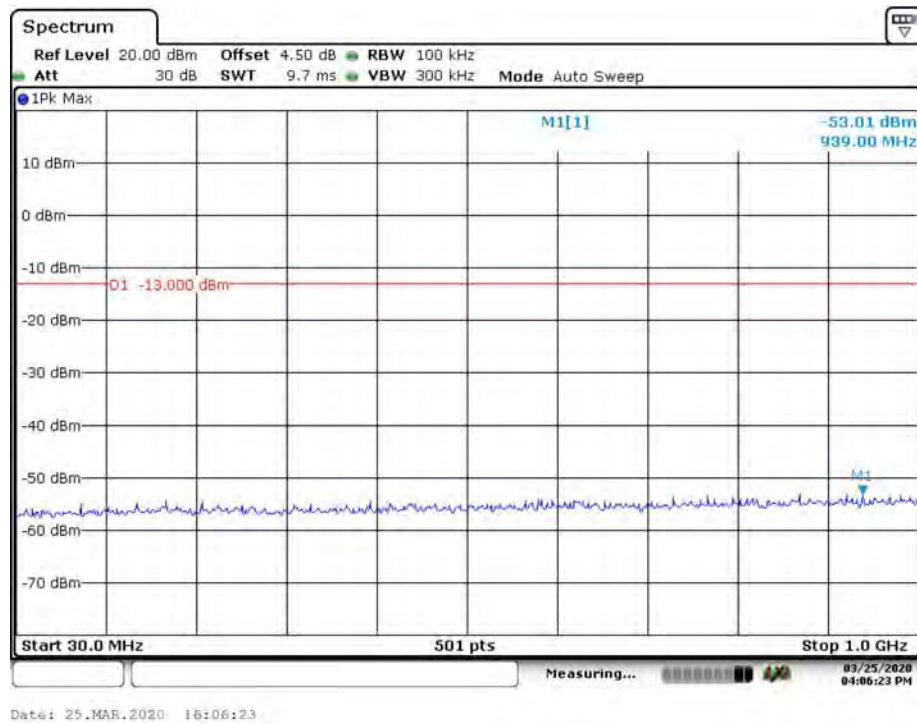
LTE Band 2_10 MHz_Middle Channel



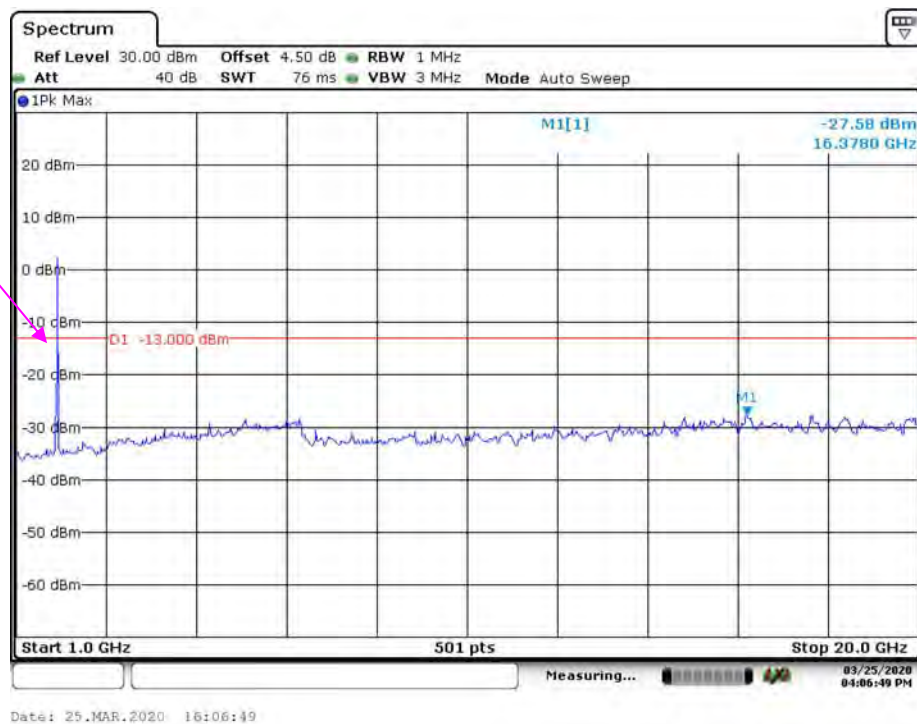
Fundamental



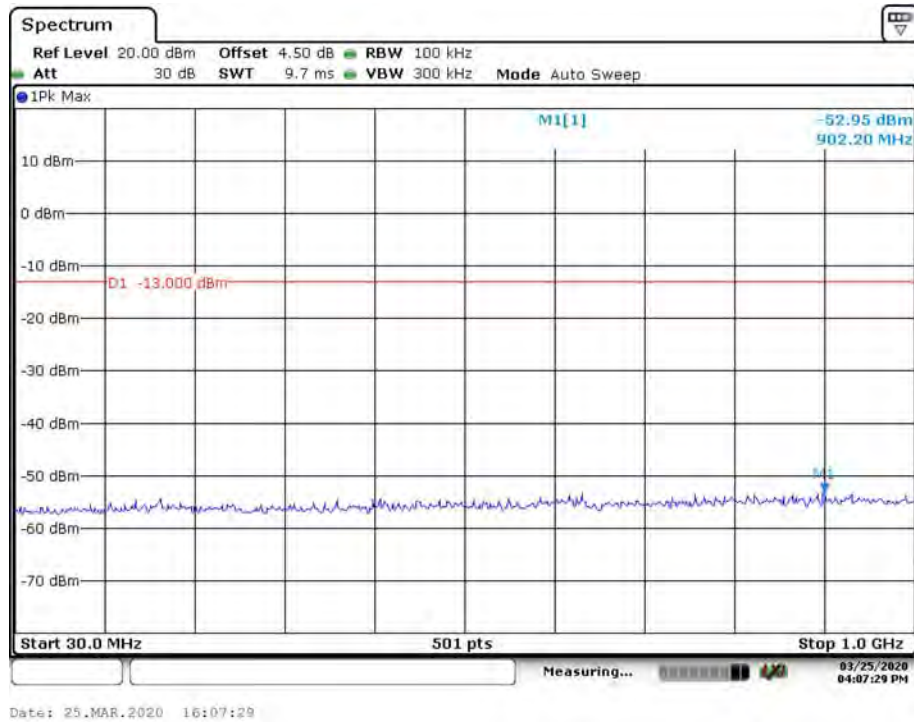
LTE Band 2_15 MHz_Middle Channel



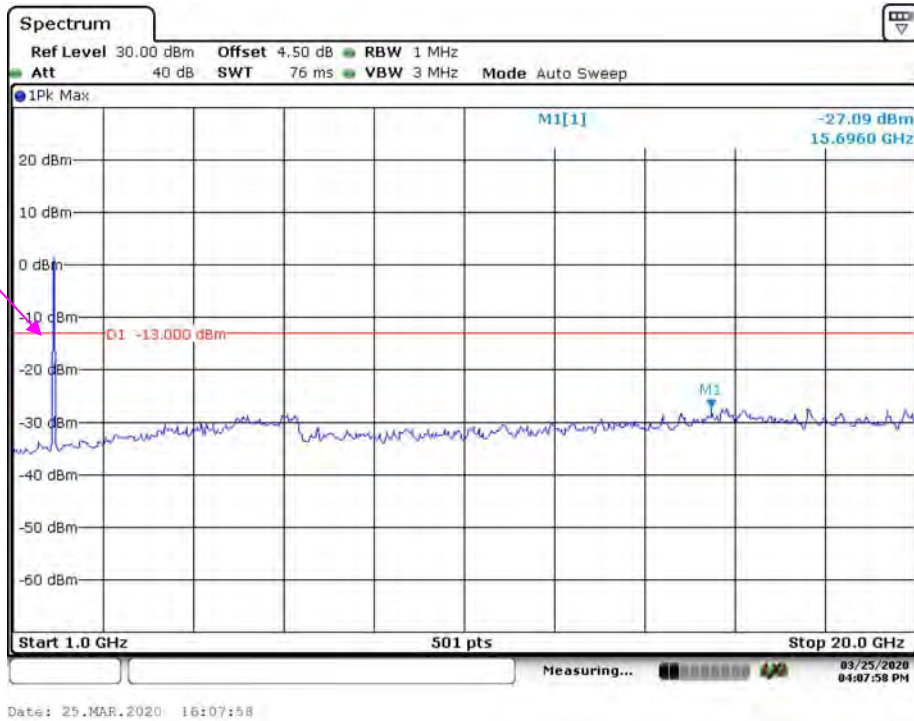
Fundamental



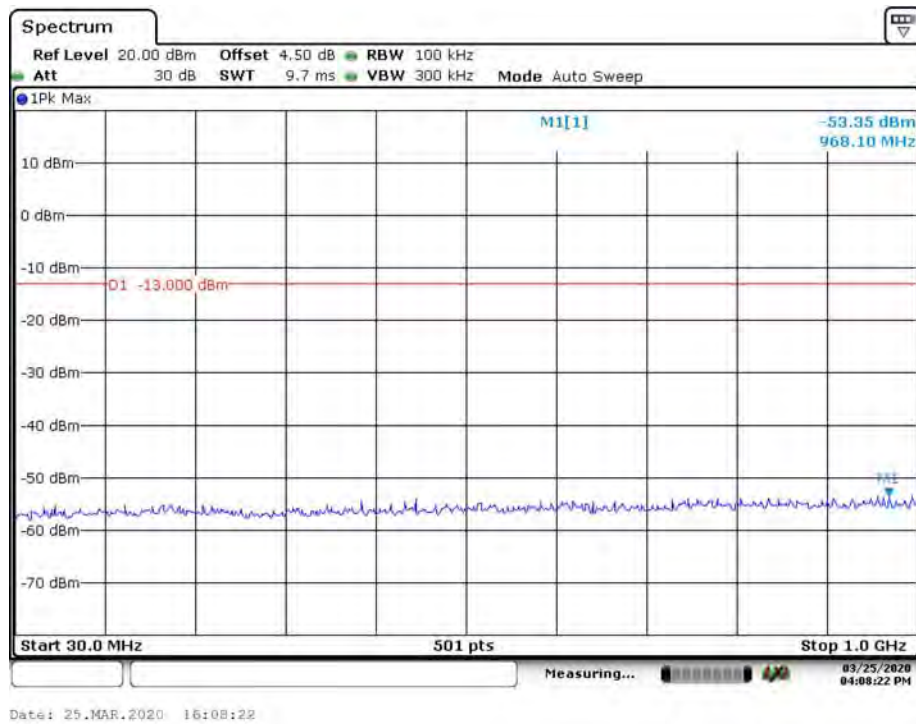
LTE Band 2_20 MHz_Middle Channel



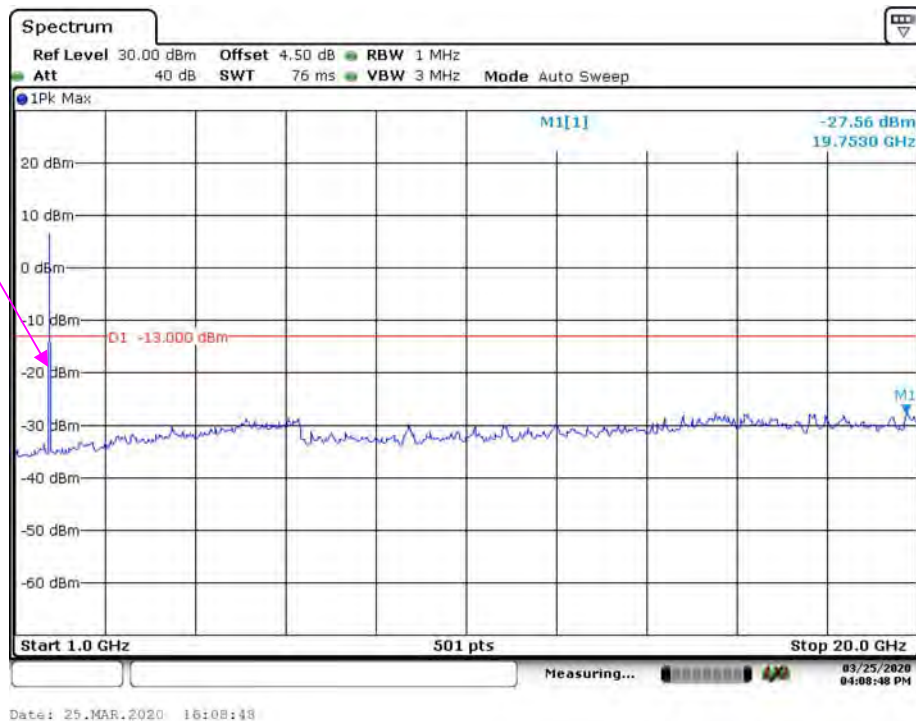
Fundamental



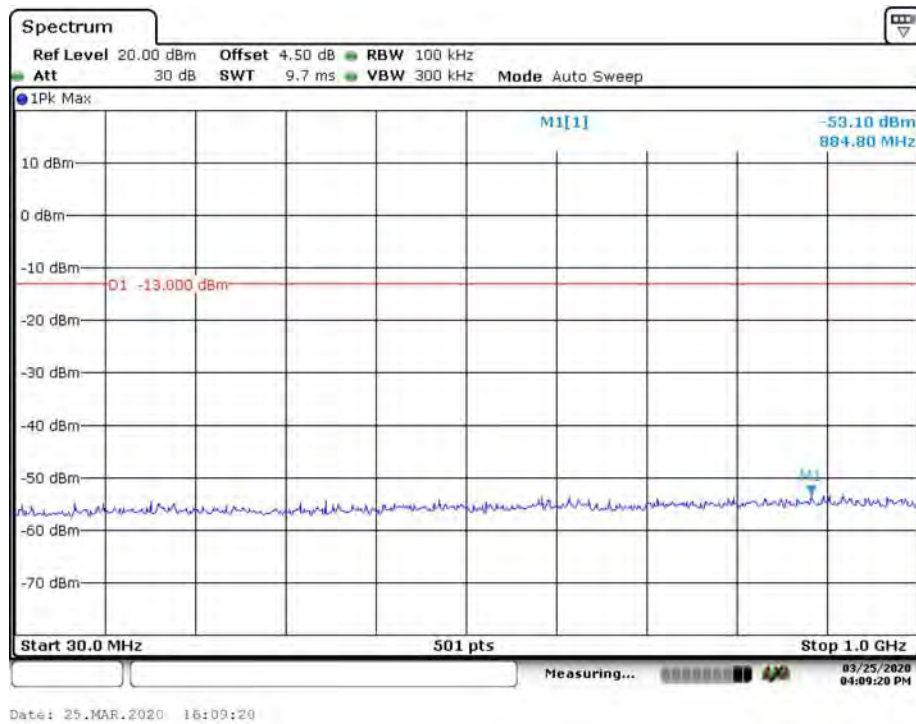
LTE Band 4_1.4 MHz_Middle Channel



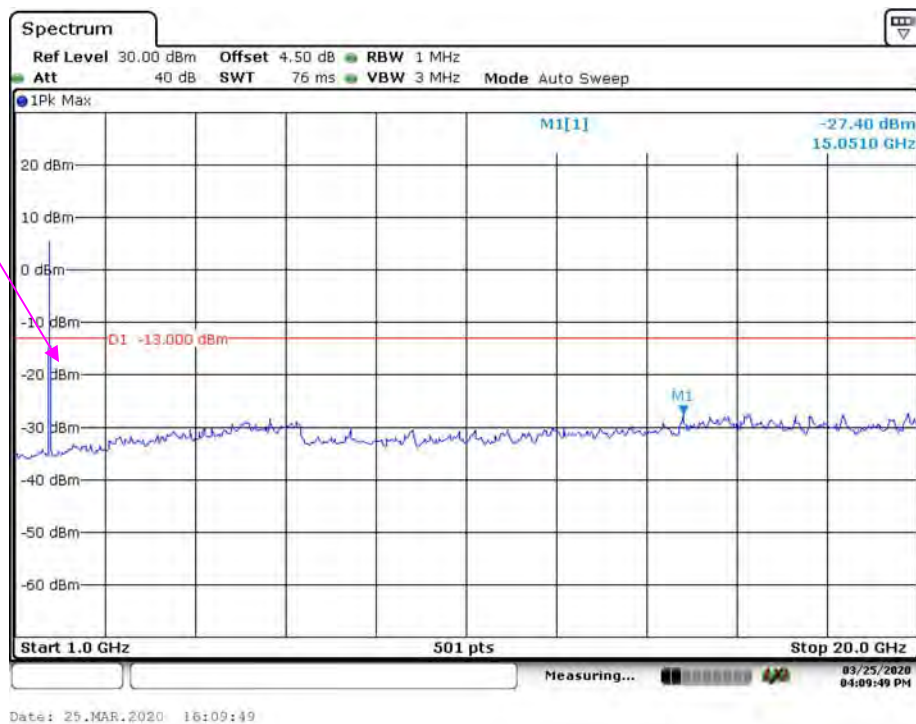
Fundamental



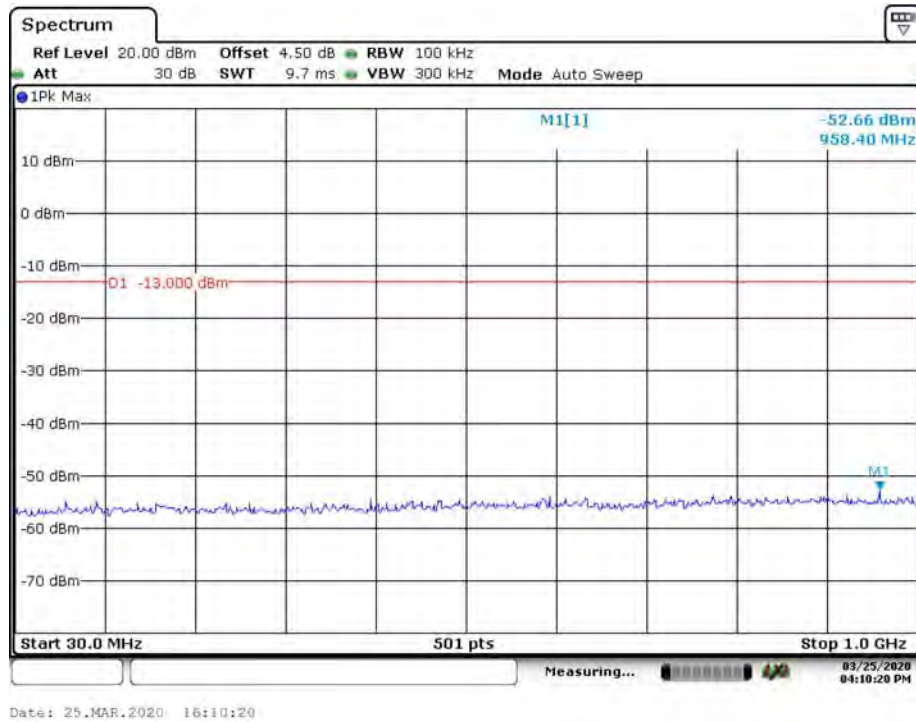
LTE Band 4_3 MHz_Middle Channel



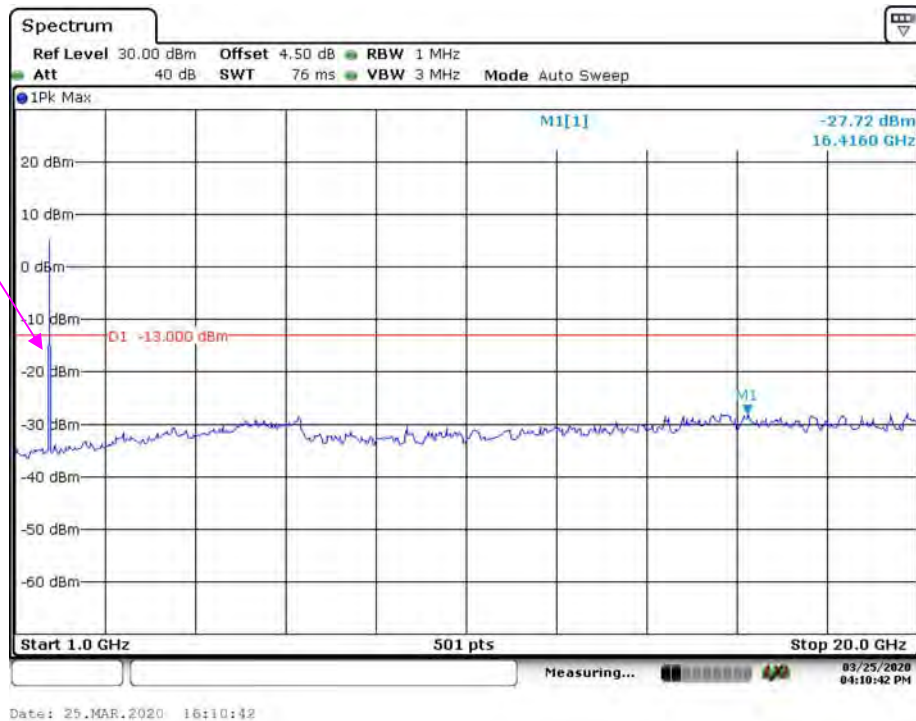
Fundamental



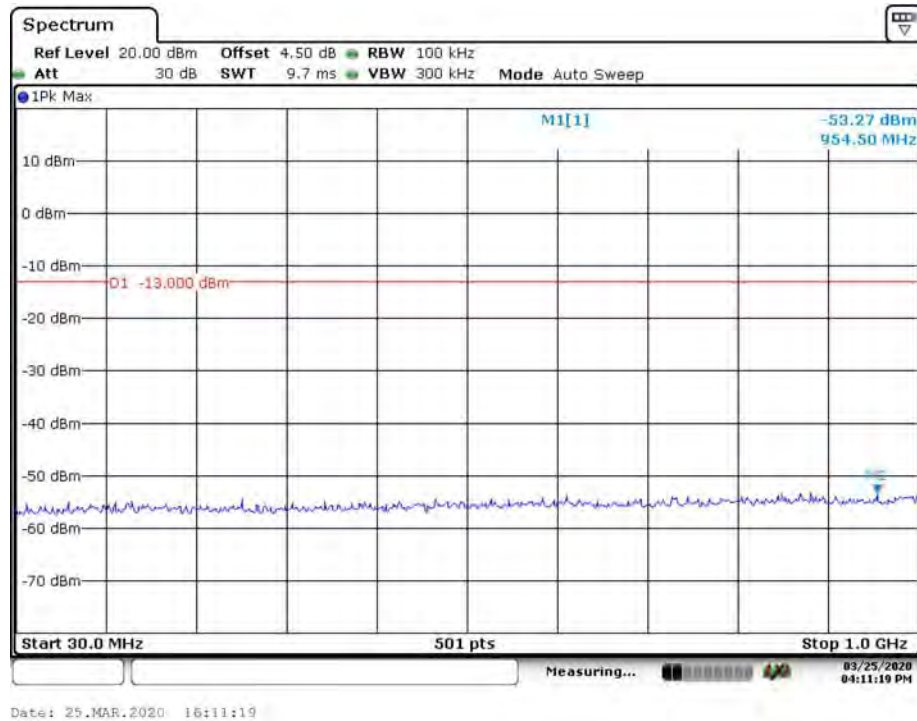
LTE Band 4_5 MHz_Middle Channel



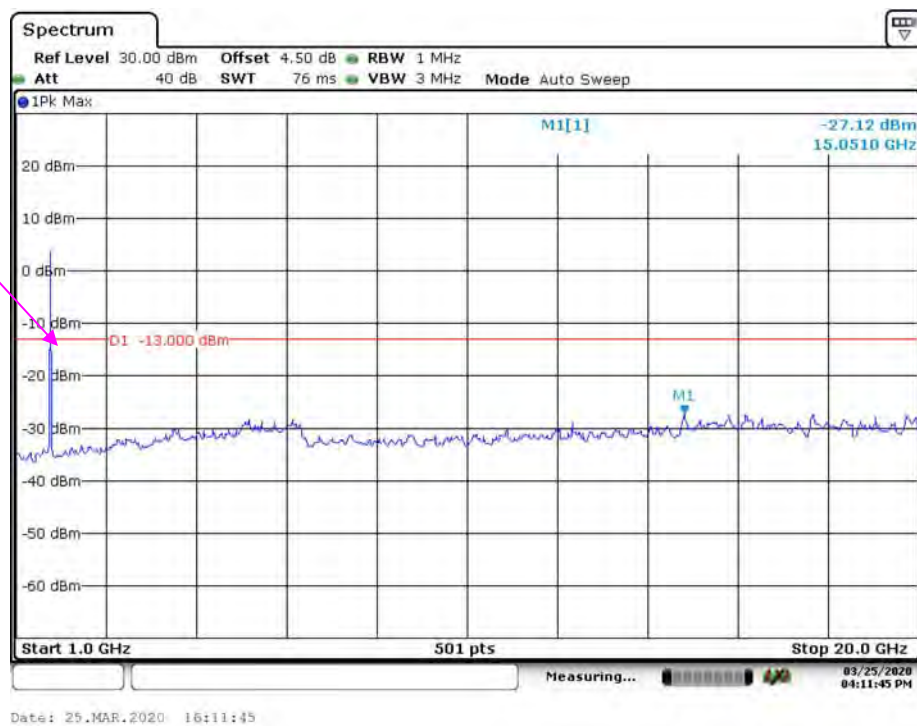
Fundamental



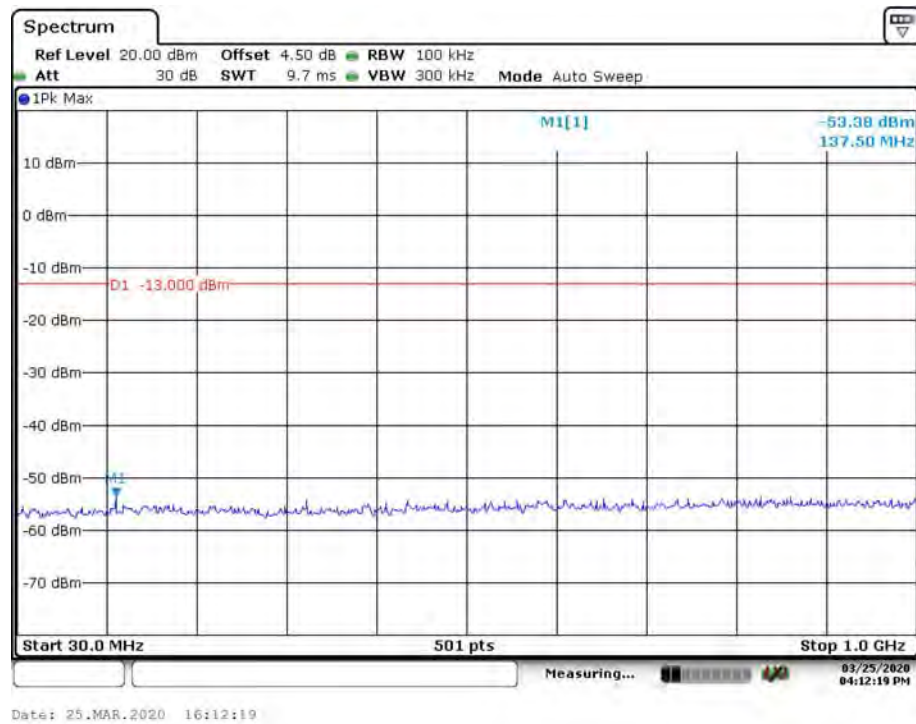
LTE Band 4_10 MHz_Middle Channel



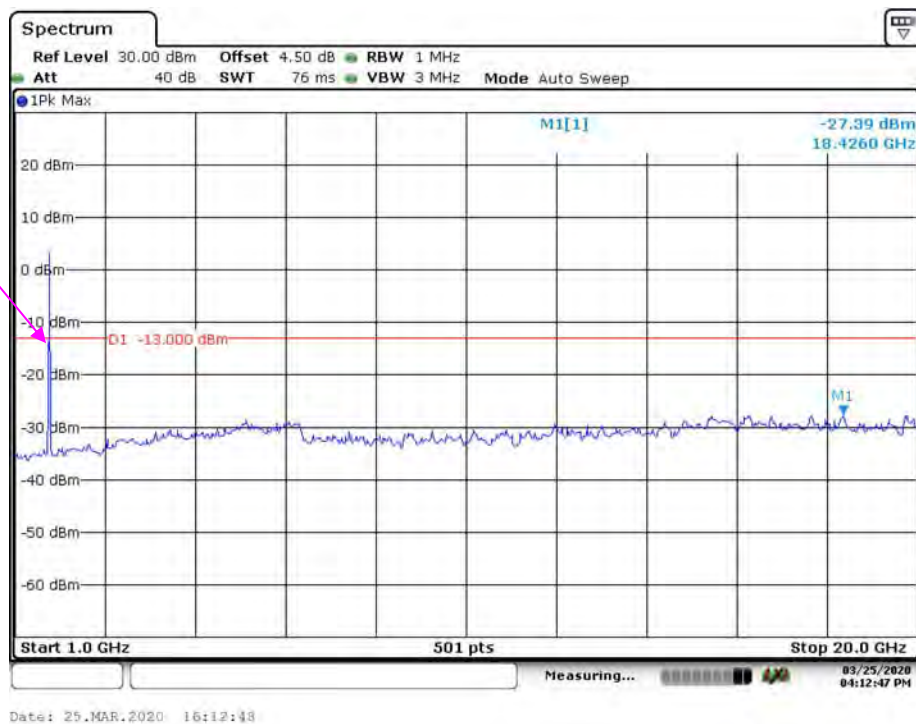
Fundamental



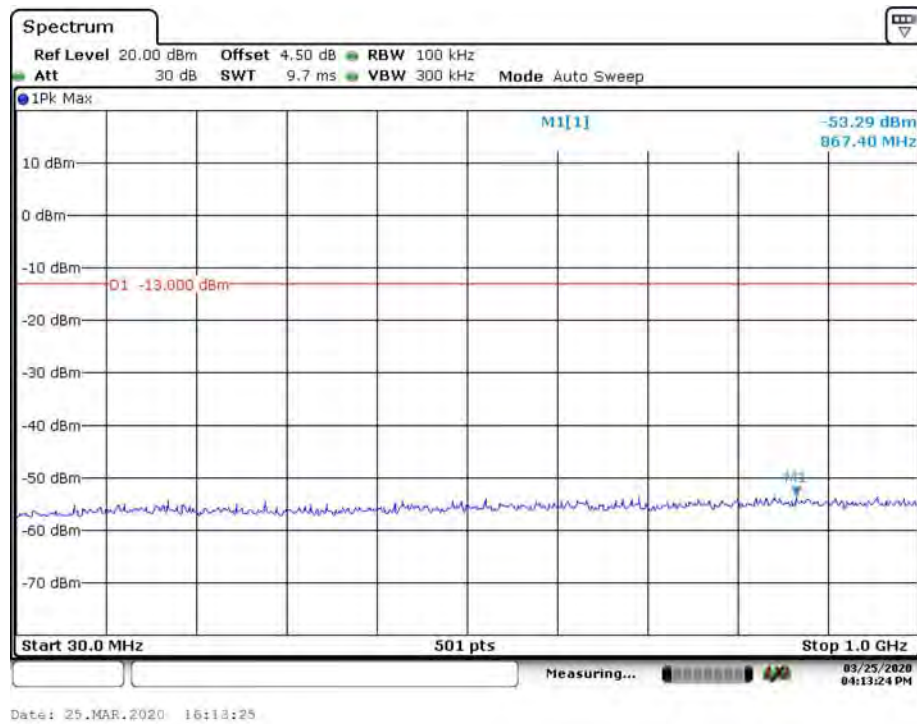
LTE Band 4_15 MHz_Middle Channel



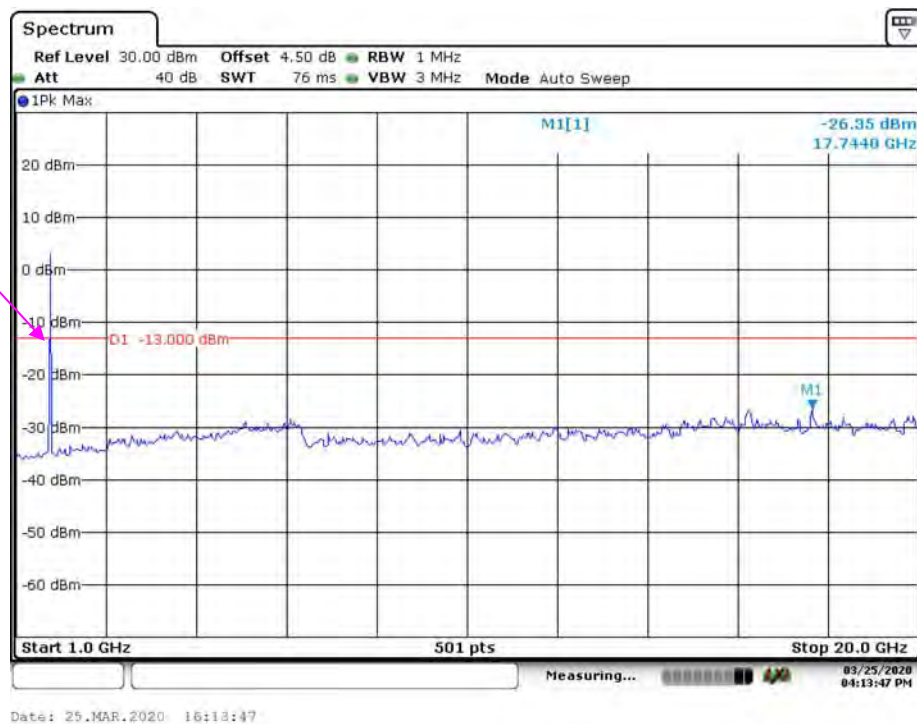
Fundamental



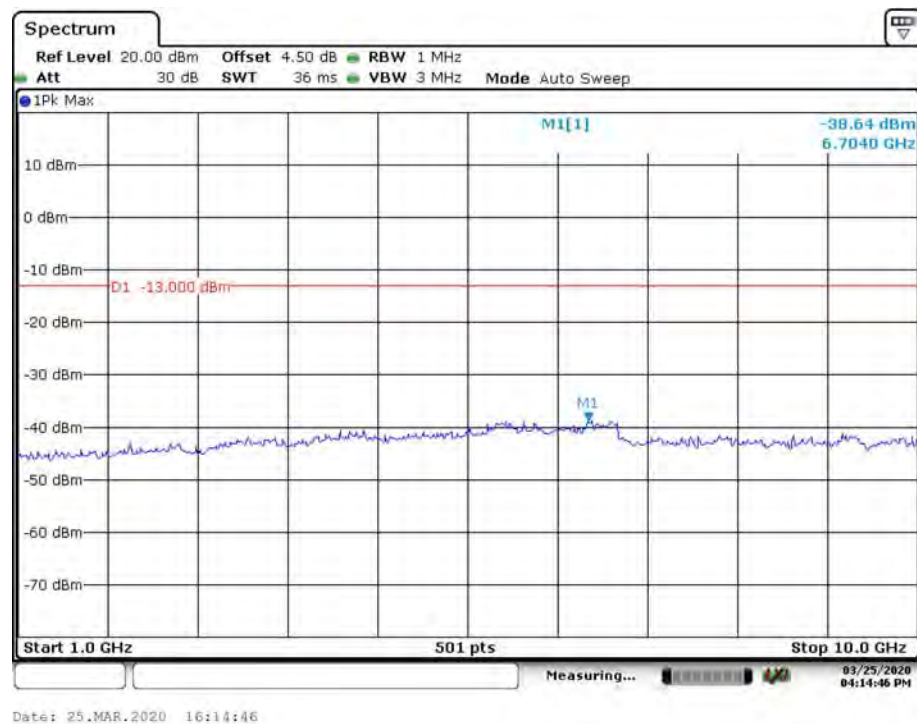
LTE Band 4_20 MHz_Middle Channel



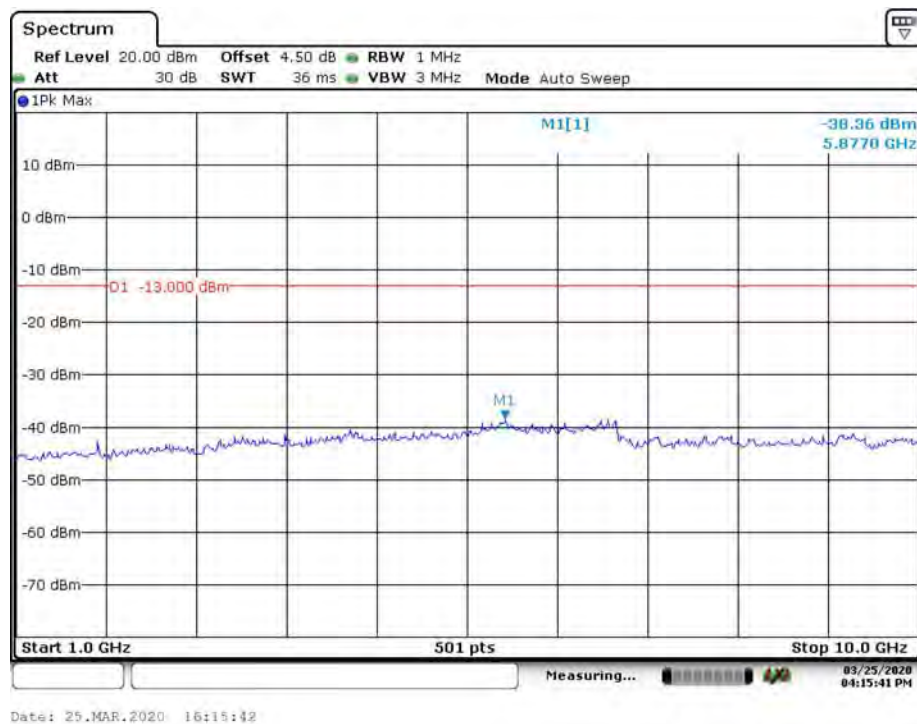
Fundamental



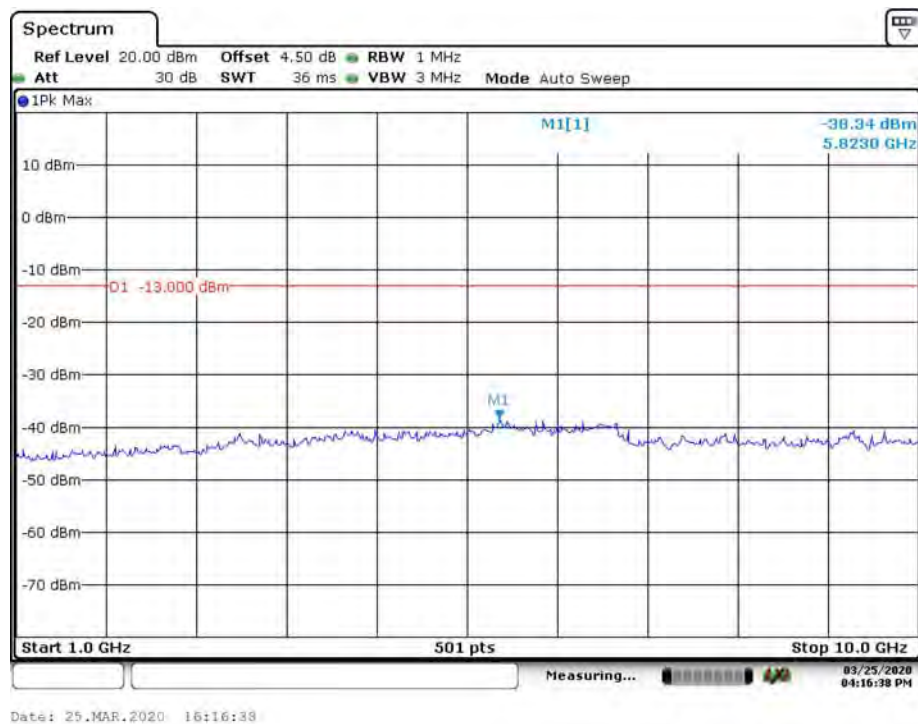
LTE Band 5_1.4 MHz_Middle Channel



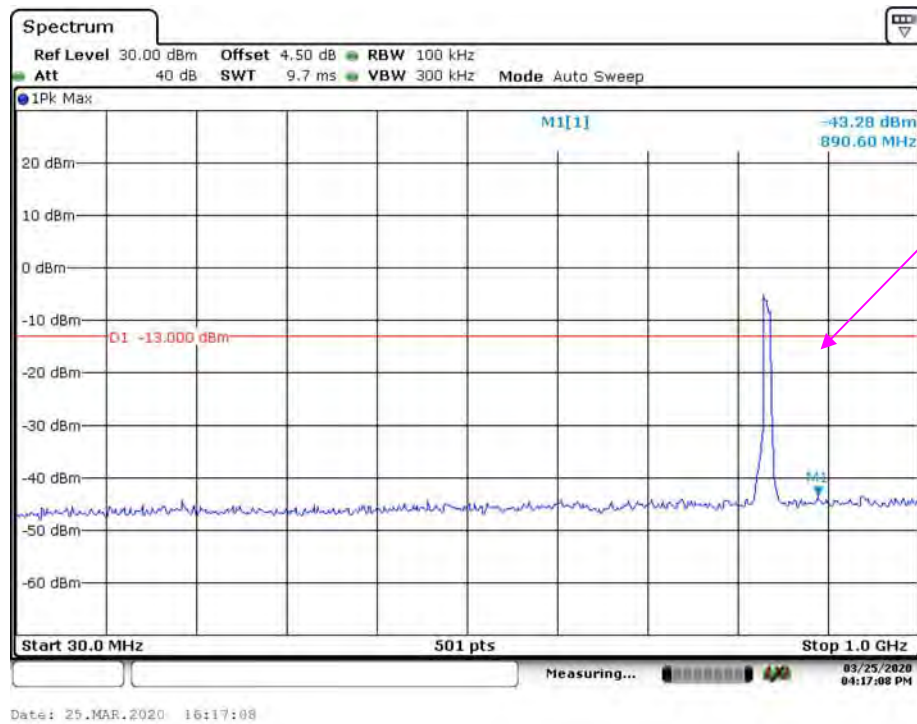
LTE Band 5_3 MHz_Middle Channel



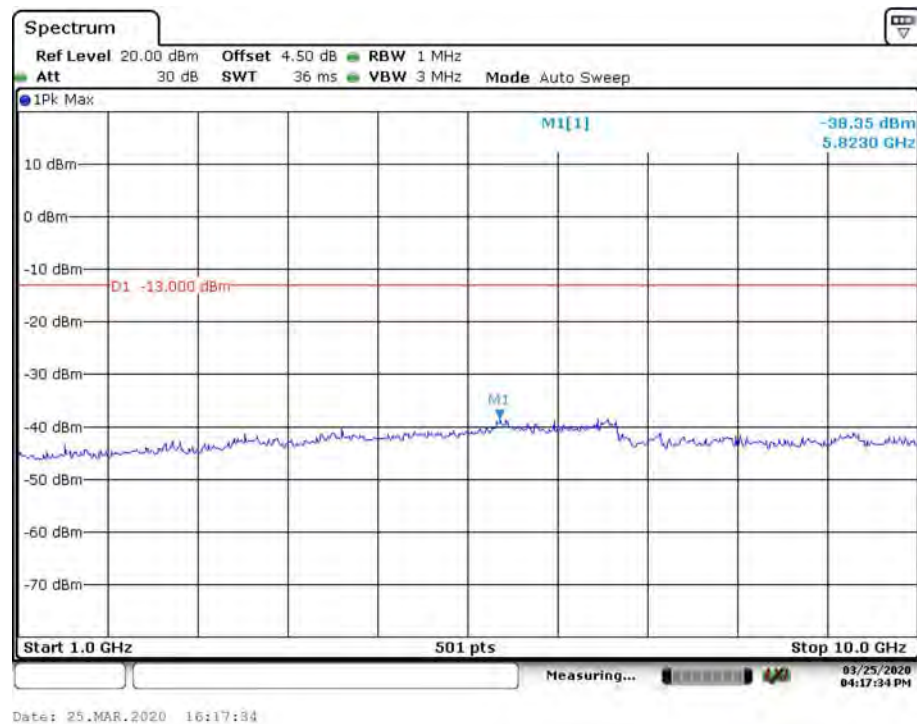
LTE Band 5_5 MHz_Middle Channel



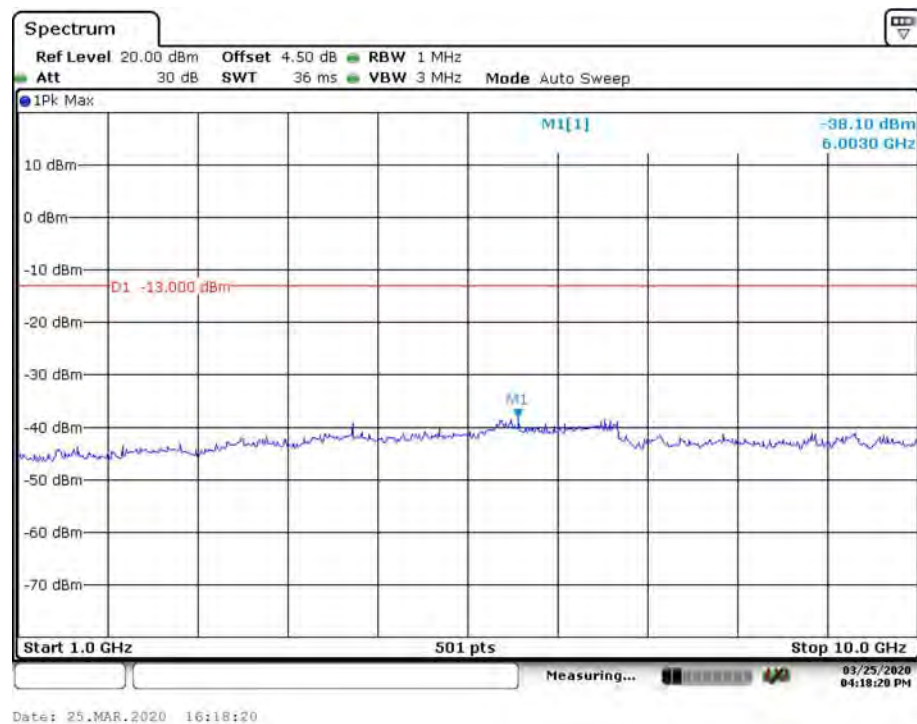
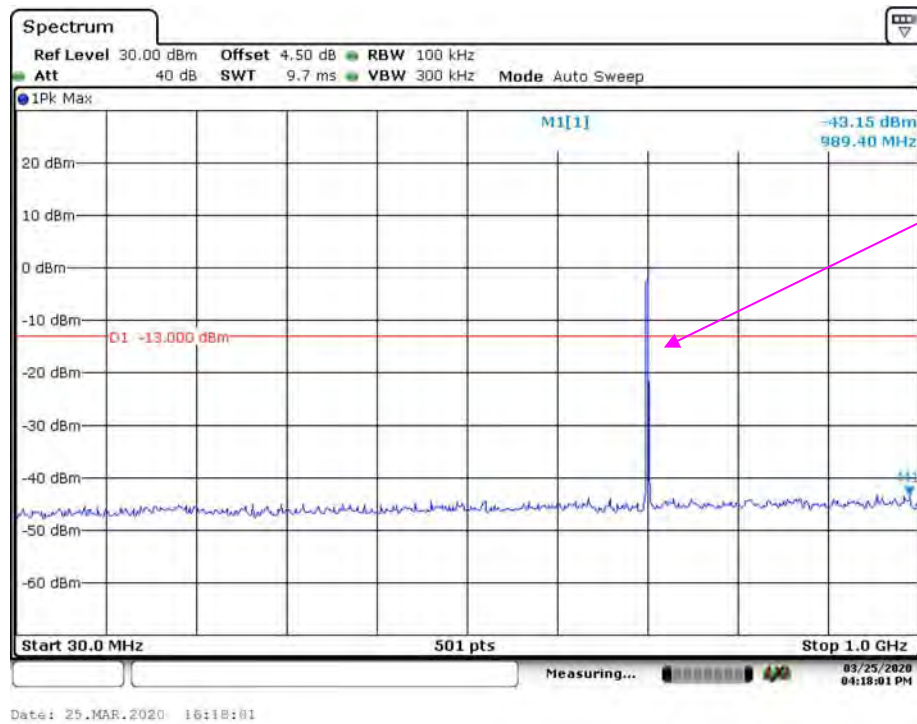
LTE Band 5_10 MHz_Middle Channel



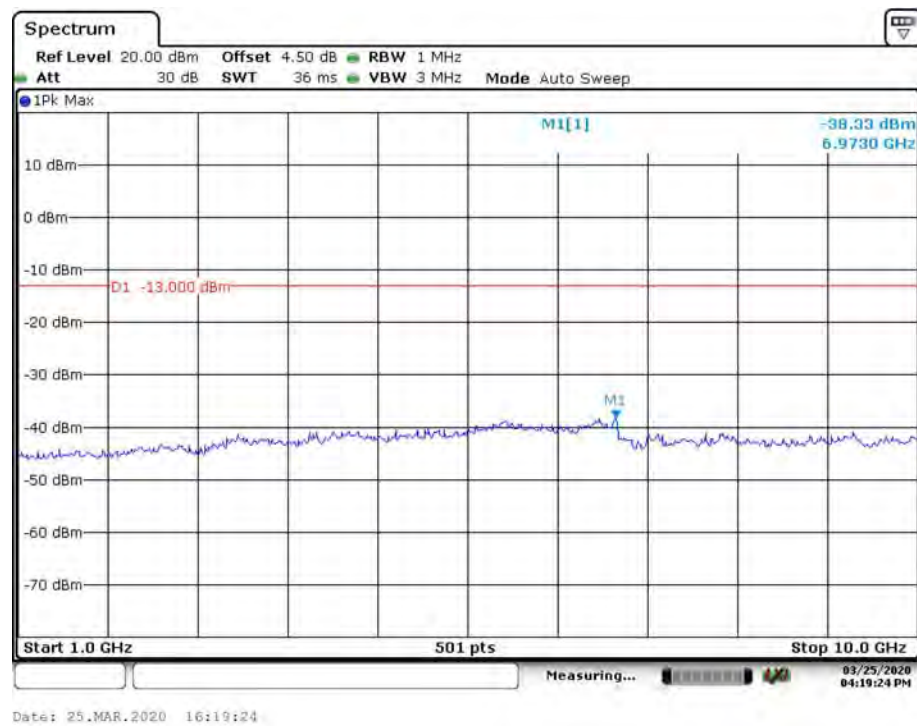
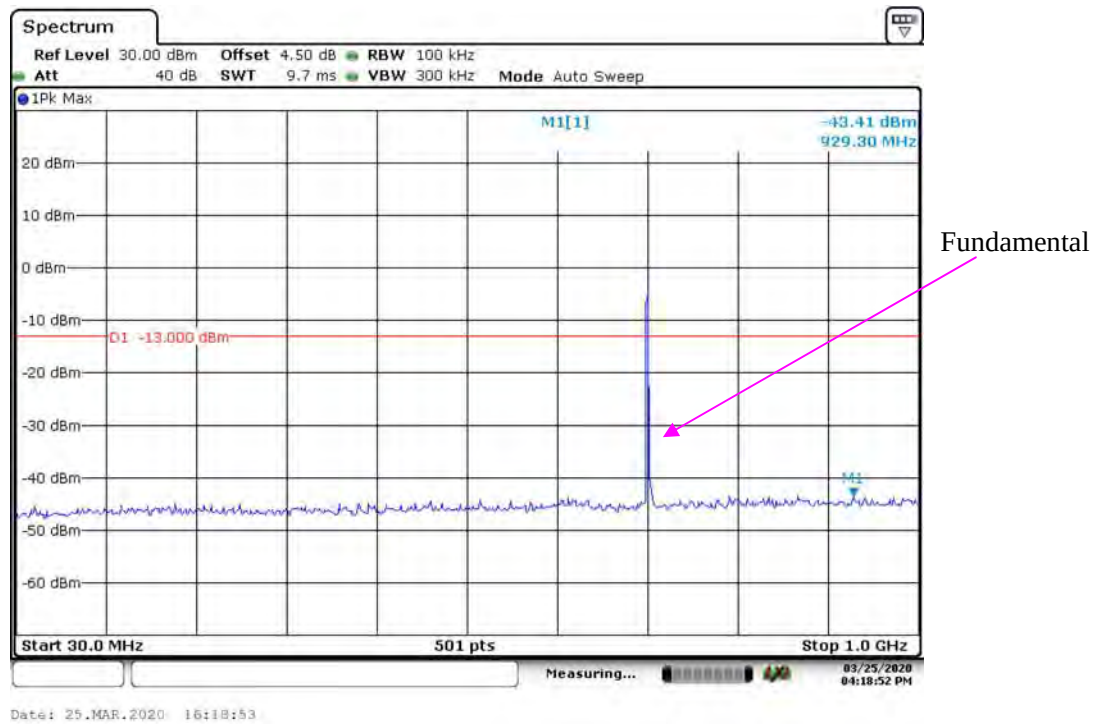
Fundamental



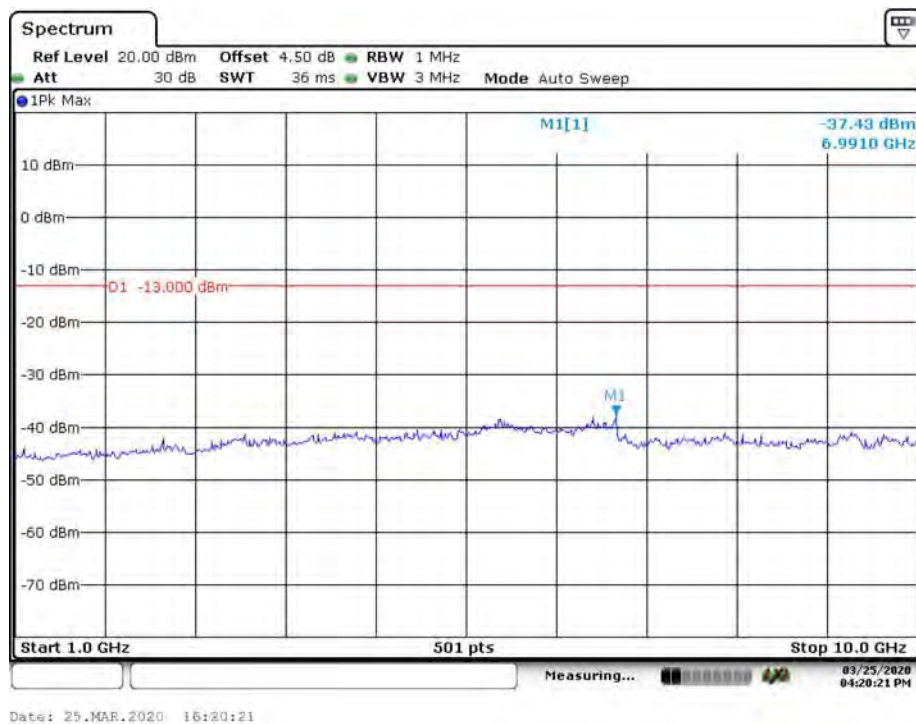
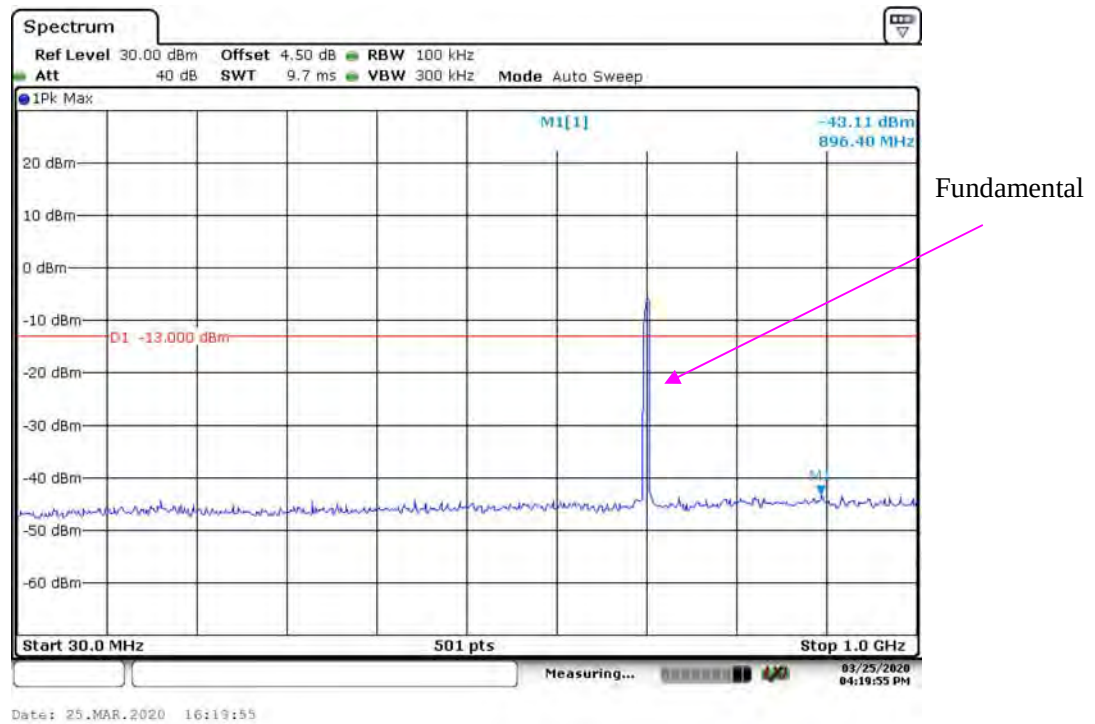
LTE Band 12_1.4 MHz_Middle Channel



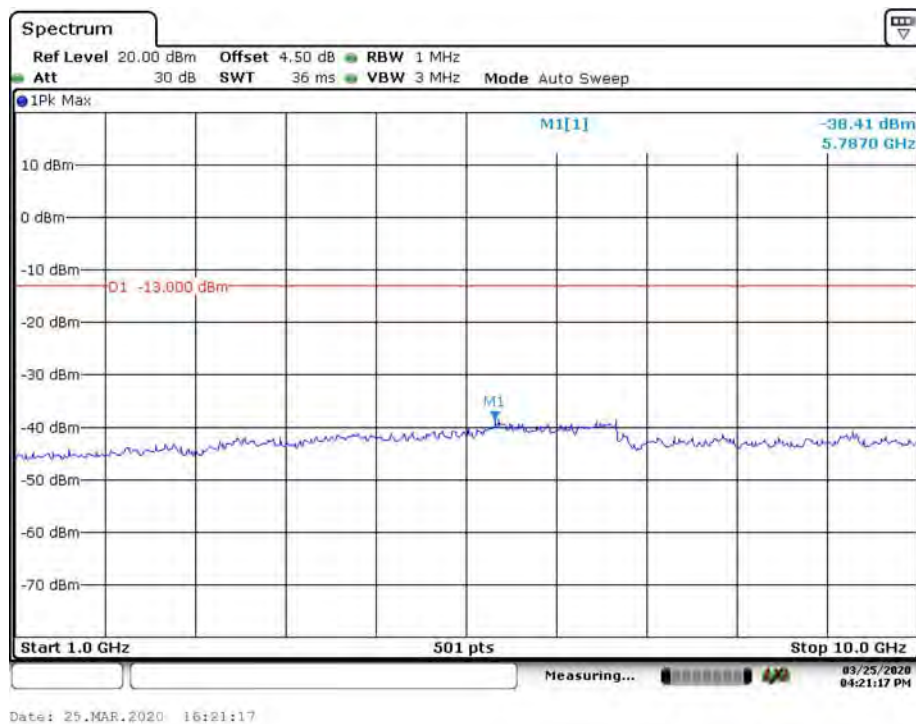
LTE Band 12_3 MHz_Middle Channel



LTE Band 12_5 MHz_Middle Channel



LTE Band 12_10 MHz_Middle Channel



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
Sinoscite	Band-stop filter	BSF824-862MS-1438-001	1438001	2019-06-16	2020-06-16
Agilent	Signal Generator	E8247C	MY43321350	2019-12-10	2020-12-10
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
Sinoscite	Band-stop filter	BSF1710-1785MN-0383-003	0383003	2019-06-16	2020-06-16
Sinoscite	Band-stop filter	BSF1850-1910MS-0935V2	0935V2	2019-06-16	2020-06-16
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-01 1304	2017-12-06	2020-12-05
Ducommun Technologies	Horn Antenna	ARH-4223-02	1007726-02 1304	2017-12-06	2020-12-05
Quinstar	Amplifier	QLW-18405536-JO	15964001001	2019-06-27	2020-06-27

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

Test Data**Environmental Conditions**

Test Items	Radiation Below 1GHz	Radiation Above 1GHz
Temperature:	23.2 °C	17°C
Relative Humidity:	51%	55 %
ATM Pressure:	101.4 kPa	101.4kPa
Tester:	Jalon Liu	Felix Wang
Test Date:	2020-04-01	2020-04-01

Test Result: Compliance.

*EUT Operation Mode: Transmitting***Cellular Band (PART 22H)****30 MHz-10 GHz:**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
GSM850, Frequency:836.600 MHz								
1673.200	H	56.57	-47.37	10.6	0.73	-37.5	-13.0	24.5
1673.200	V	51.70	-52.84	10.6	0.73	-43.0	-13.0	30.0
2509.800	H	46.59	-56.32	13.1	1.25	-44.5	-13.0	31.5
2509.800	V	47.40	-55.54	13.1	1.25	-43.7	-13.0	30.7
3346.400	H	41.50	-58.18	13.8	1.61	-46.0	-13.0	33.0
3346.400	V	41.42	-58.3	13.8	1.61	-46.1	-13.0	33.1
299.880	H	33.48	-75.16	0.0	0.52	-75.7	-13.0	62.7
76.030	V	32.63	-83.63	-2.0	0.32	-85.9	-13.0	72.9
WCDMA Band V, Frequency:836.600 MHz								
1673.200	H	37.58	-66.36	10.6	0.73	-56.5	-13.0	43.5
1673.200	V	40.00	-64.54	10.6	0.73	-54.7	-13.0	41.7
2509.800	H	40.81	-62.1	13.1	1.25	-50.2	-13.0	37.2
2509.800	V	42.48	-60.46	13.1	1.25	-48.6	-13.0	35.6
3346.400	H	39.58	-60.1	13.8	1.61	-47.9	-13.0	34.9
3346.400	V	37.90	-61.82	13.8	1.61	-49.6	-13.0	36.6
76.200	H	35.71	-78.96	-1.9	0.33	-81.2	-13.0	68.2
206.200	V	35.43	-75.31	0.0	0.49	-75.8	-13.0	62.8

PCS Band (PART 24E)**30 MHz-20 GHz:**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
GSM1900, Frequency:1880.000 MHz								
3760.000	H	42.37	-55.27	13.8	1.63	-43.1	-13.0	30.1
3760.000	V	41.45	-56.05	13.8	1.63	-43.9	-13.0	30.9
5640.000	H	40.29	-53.3	14.0	1.31	-40.6	-13.0	27.6
5640.000	V	40.23	-53.25	14.0	1.31	-40.5	-13.0	27.5
299.880	H	37.21	-71.43	0.0	0.52	-72.0	-13.0	59.0
176.810	V	31.83	-80.38	0.0	0.44	-80.8	-13.0	67.8
WCDMA Band II, Frequency:1880.000 MHz								
3760.000	H	43.04	-54.6	13.8	1.63	-42.5	-13.0	29.5
3760.000	V	39.11	-58.39	13.8	1.63	-46.3	-13.0	33.3
5640.000	H	36.27	-57.32	14.0	1.31	-44.6	-13.0	31.6
5640.000	V	35.28	-58.2	14.0	1.31	-45.5	-13.0	32.5
71.400	H	35.87	-77.47	-4.3	0.26	-82.0	-13.0	69.0
162.400	V	35.26	-77.06	0.0	0.4	-77.5	-13.0	64.5

LTE Band 2 (30MHz-20GHz):

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK,Frequency:1880.000 MHz								
3760.00	H	45.54	-52.10	13.76	1.63	-39.97	-13.00	26.97
3760.00	V	40.35	-57.15	13.76	1.63	-45.02	-13.00	32.02
5640.00	H	44.40	-49.19	14.02	1.31	-36.48	-13.00	23.48
5640.00	V	39.99	-53.49	14.02	1.31	-40.78	-13.00	27.78
362.00	H	35.17	-71.10	0.00	0.58	-71.68	-13.00	58.68
43.30	V	38.31	-52.79	-22.04	0.21	-75.04	-13.00	62.04

LTE Band 4(30MHz-20GHz):

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Substituted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK, Frequency: 1732.500 MHz								
3465.00	H	52.75	-46.44	13.91	1.62	-34.15	-13.00	21.15
3465.00	V	51.39	-47.83	13.91	1.62	-35.54	-13.00	22.54
5197.50	H	45.58	-49.11	14.00	1.52	-36.63	-13.00	23.63
5197.50	V	44.68	-50.08	14.00	1.52	-37.60	-13.00	24.60
362.00	H	38.29	-67.98	0.00	0.58	-68.56	-13.00	55.56
362.00	V	37.55	-71.31	0.00	0.58	-71.89	-13.00	58.89

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	38.79	-65.15	10.61	0.73	-55.27	-13.00	42.27
1673.00	V	41.01	-63.53	10.61	0.73	-53.65	-13.00	40.65
2509.50	H	41.48	-61.43	13.11	1.25	-49.57	-13.00	36.57
2509.50	V	42.81	-60.13	13.11	1.25	-48.27	-13.00	35.27
3346.00	H	40.39	-59.29	13.83	1.61	-47.07	-13.00	34.07
3346.00	V	38.25	-61.47	13.83	1.61	-49.25	-13.00	36.25
81.20	H	38.76	-76.34	0.00	0.38	-76.72	-13.00	63.72
85.40	V	38.81	-76.41	0.00	0.37	-76.78	-13.00	63.78

LTE Band 12 (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: 707.500 MHz								
1415.00	H	51.15	-52.46	9.08	1.22	-44.60	-13.00	31.60
1415.00	V	50.18	-53.95	9.08	1.22	-46.09	-13.00	33.09
2122.50	H	38.75	-63.26	11.27	1.11	-53.10	-13.00	40.10
2122.50	V	37.23	-64.76	11.27	1.11	-54.60	-13.00	41.60
2830.00	H	37.07	-64.35	13.34	1.36	-52.37	-13.00	39.37
2830.00	V	37.58	-64.07	13.34	1.36	-52.09	-13.00	39.09
362.20	H	38.37	-67.89	0.00	0.58	-68.47	-13.00	55.47
71.40	V	37.92	-76.37	-4.30	0.26	-80.93	-13.00	67.93

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

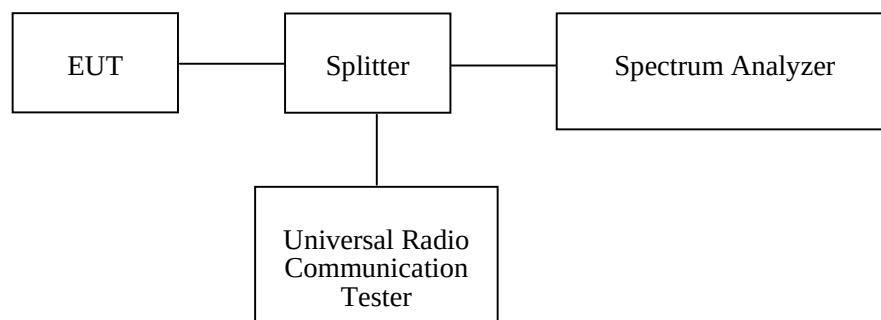
Applicable Standard

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	FSV40	101474	2019-01-09	2020-01-09
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41010013	Each time	/
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005011	Each time	/
Unknown	Coaxial Cable	C-SJ00-0010	C0010/03	Each time	/
E-Microwave	Two-way Splitter	ODP-1-6-2S	OE0120142	Each time	/

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

Test Data

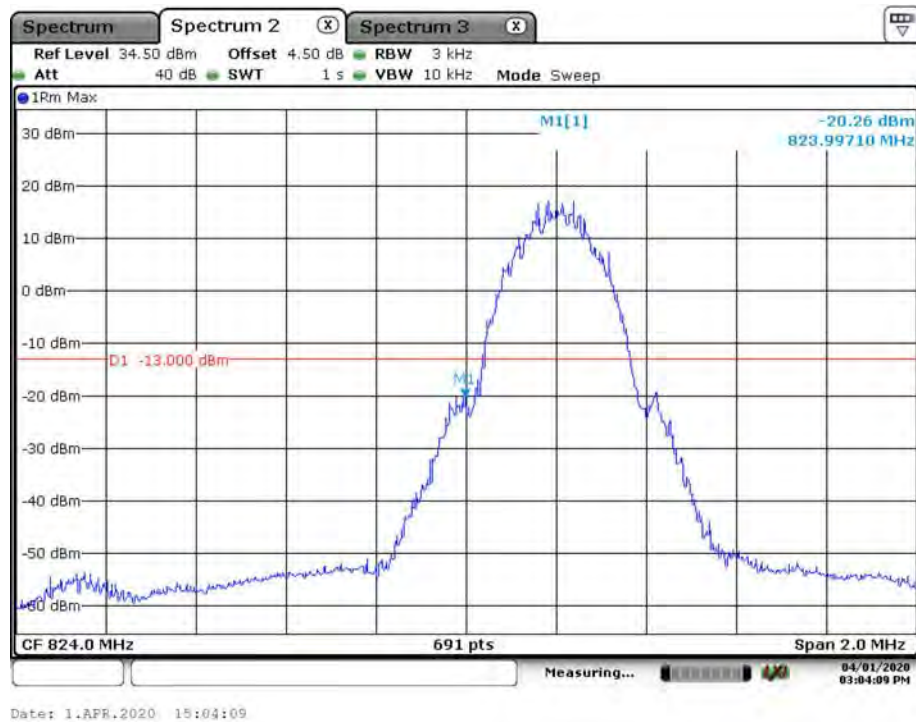
Environmental Conditions

Temperature:	22.7°C~ 23 °C
Relative Humidity:	55%~60 %
ATM Pressure:	101.4kPa ~101.8kPa
Tester:	Fay Hu
Test Date:	2020-04-01~2020-04-02

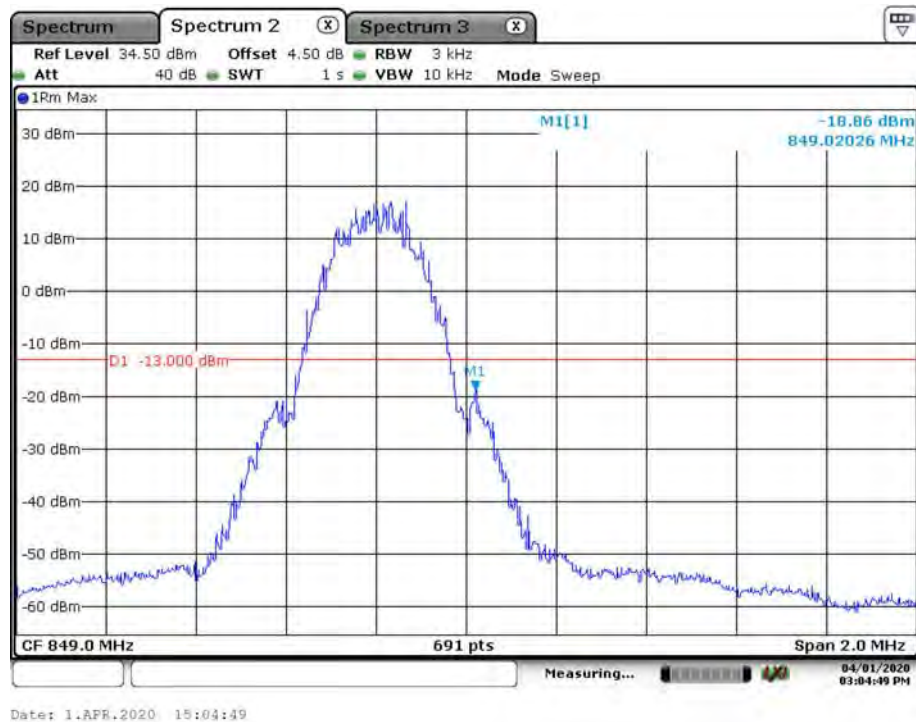
Test Mode: Transmitting

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

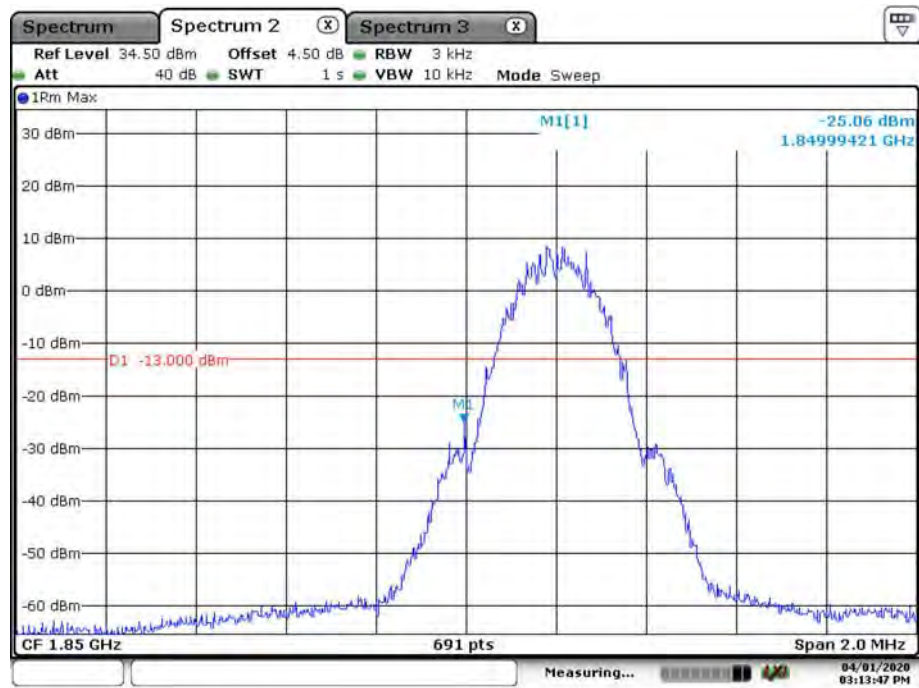
GSM 850, Left Band Edge



GSM 850, Right Band Edge

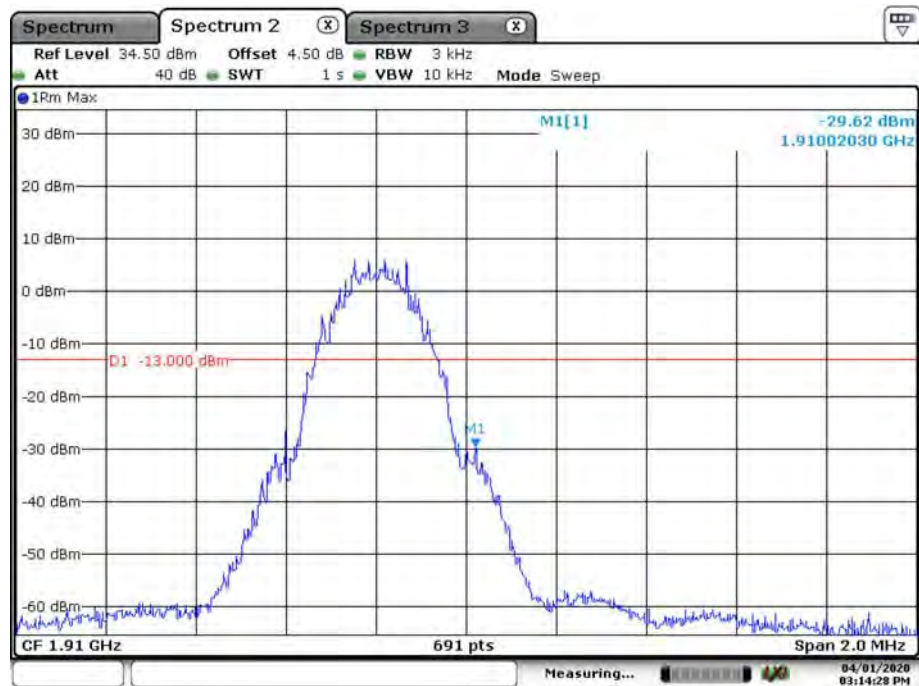


GSM 1900, Left Band Edge



Date: 1.APR.2020 15:13:47

GSM 1900, Right Band Edge



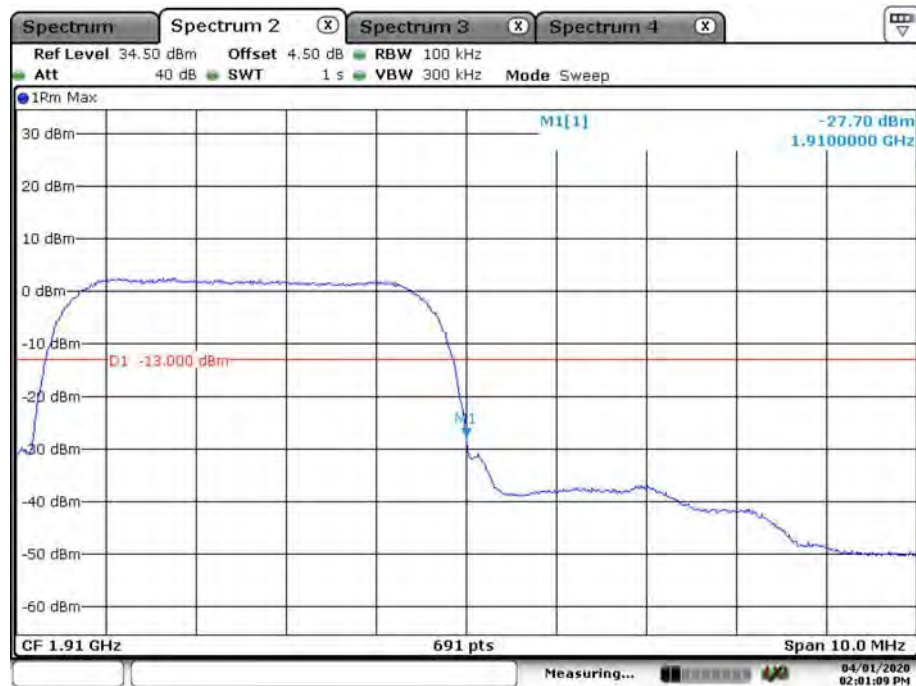
Date: 1.APR.2020 15:14:28

WCDMA Band 2 Rel 99, Left Band Edge



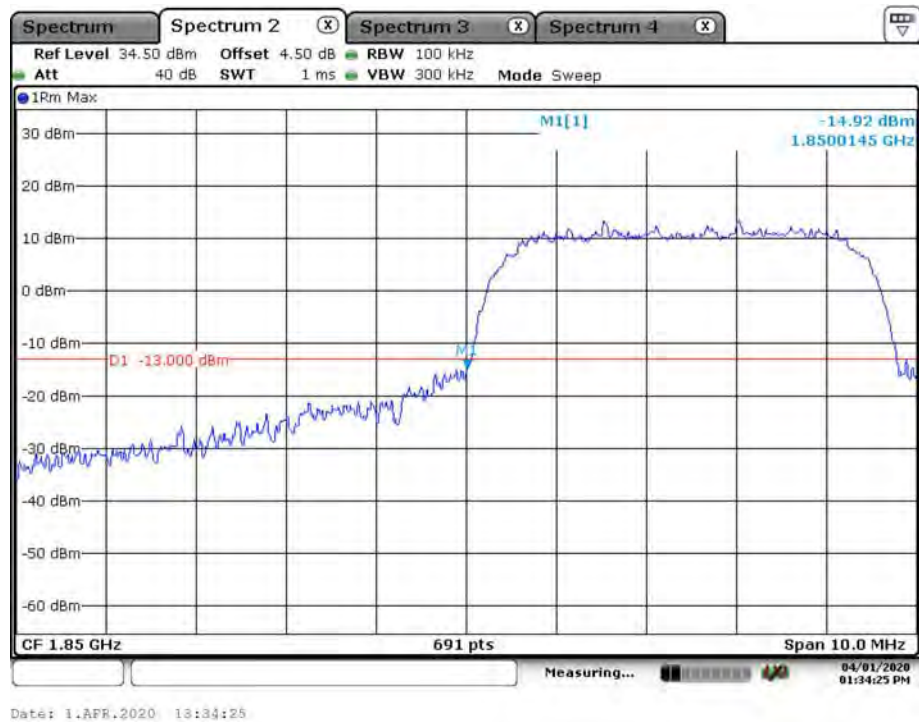
Date: 1.APR.2020 14:01:46

WCDMA Band 2 Rel 99, Right Band Edge

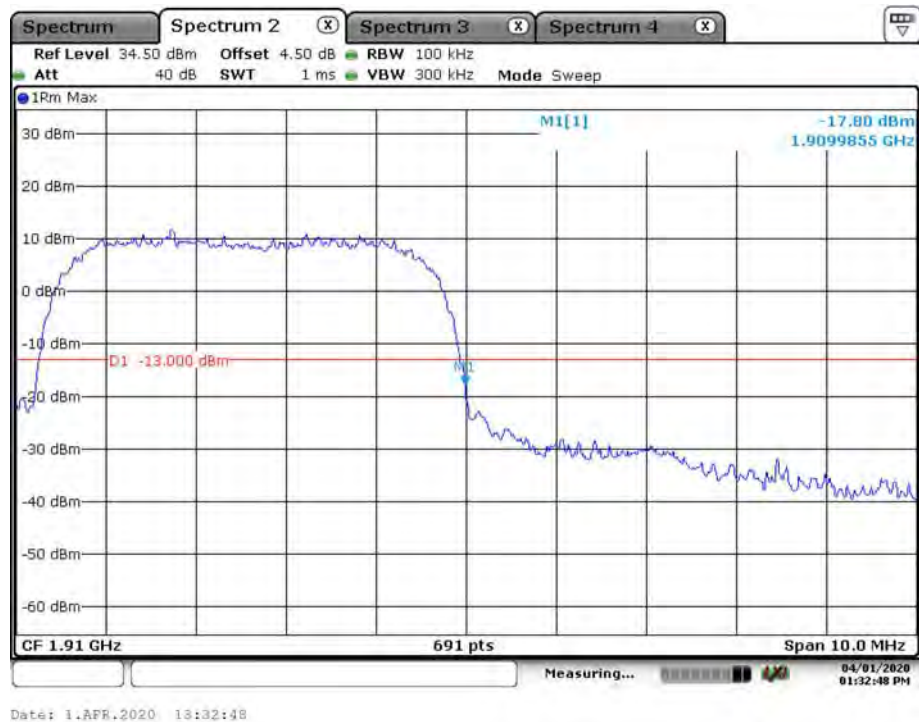


Date: 1.APR.2020 14:01:09

WCDMA Band 2 HSDPA, Left Band Edge



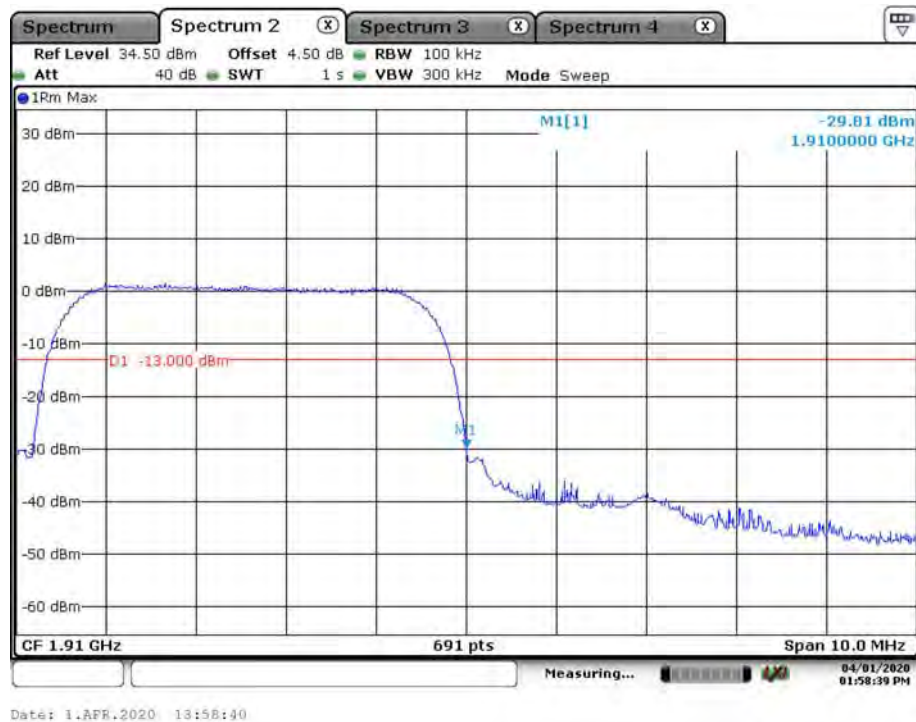
WCDMA Band 2 HSDPA, Right Band Edge



WCDMA Band 2 HSUPA, Left Band Edge



WCDMA Band 2 HSUPA, Right Band Edge



WCDMA Band 5 Rel 99, Left Band Edge



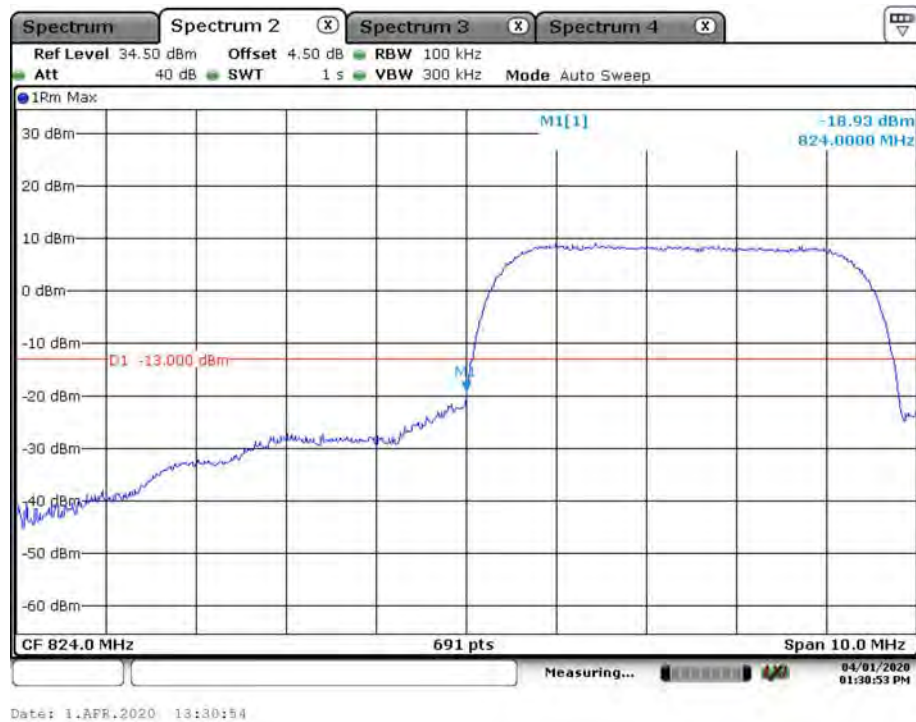
Date: 1.APR.2020 13:18:05

WCDMA Band 5 Rel 99, Right Band Edge



Date: 1.APR.2020 11:56:54

WCDMA Band 5 HSDPA, Left Band Edge



WCDMA Band 5 HSDPA, Right Band Edge



WCDMA Band 5 HSUPA, Left Band Edge



Date: 1.APR.2020 13:19:42

WCDMA Band 5 HSUPA, Right Band Edge



Date: 1.APR.2020 13:20:45

LTE Band 2

Band 2_1.4 MHz_Low_QPSK_RB6#0



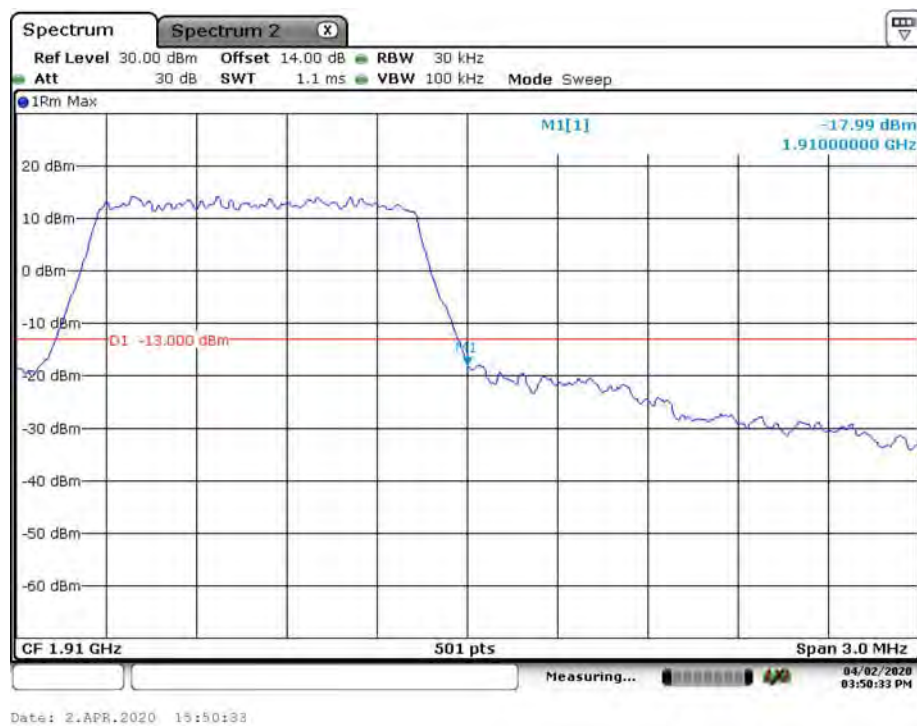
Band 2_1.4 MHz_Low_16QAM_RB6#0



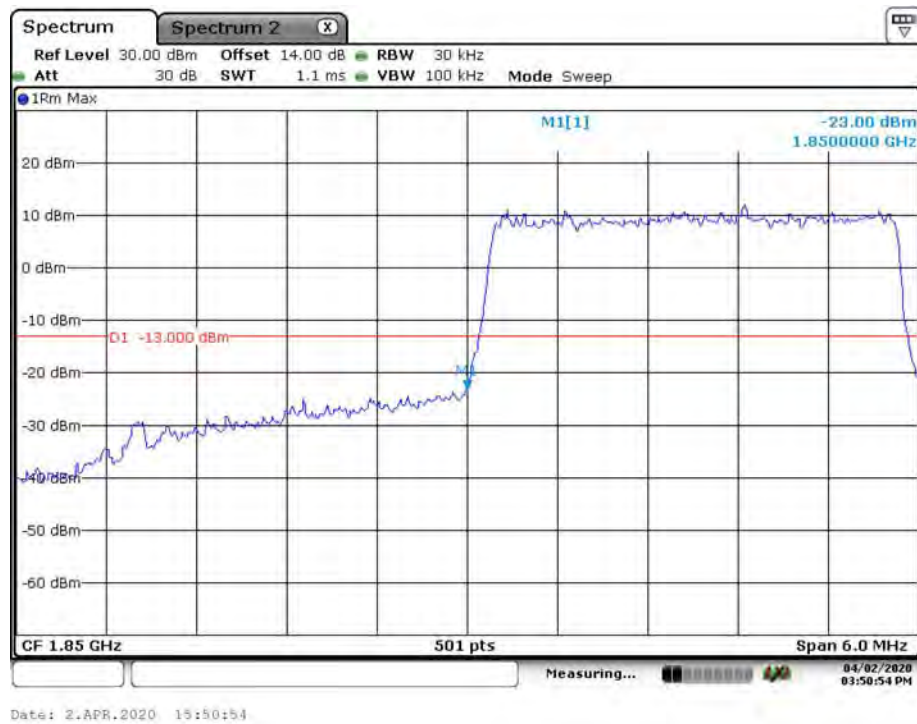
Band 2_1.4 MHz_High_QPSK_RB6#0



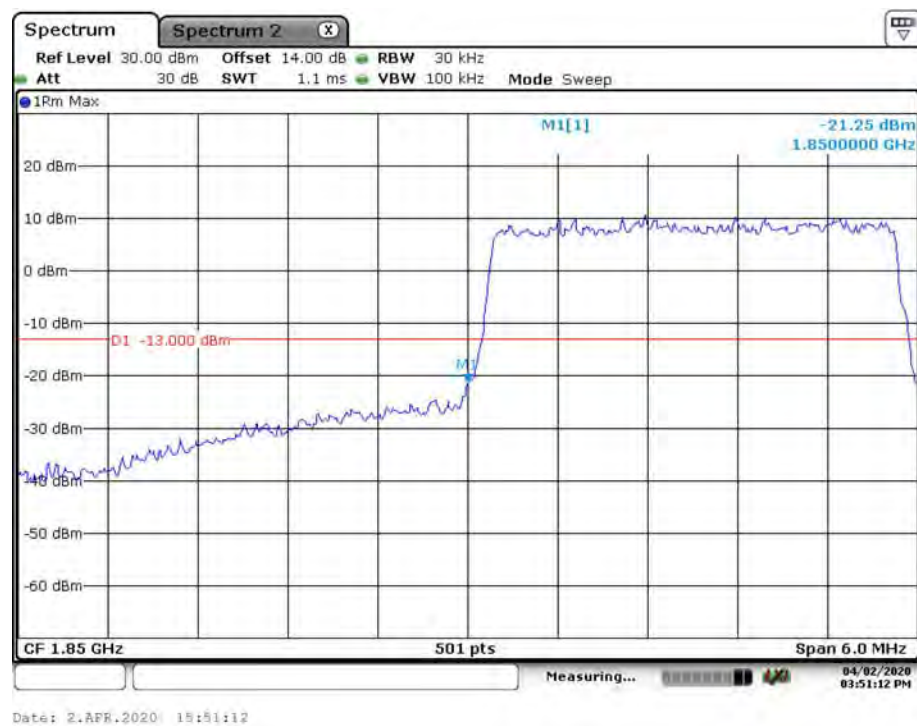
Band 2_1.4 MHz_High_16QAM_RB6#0



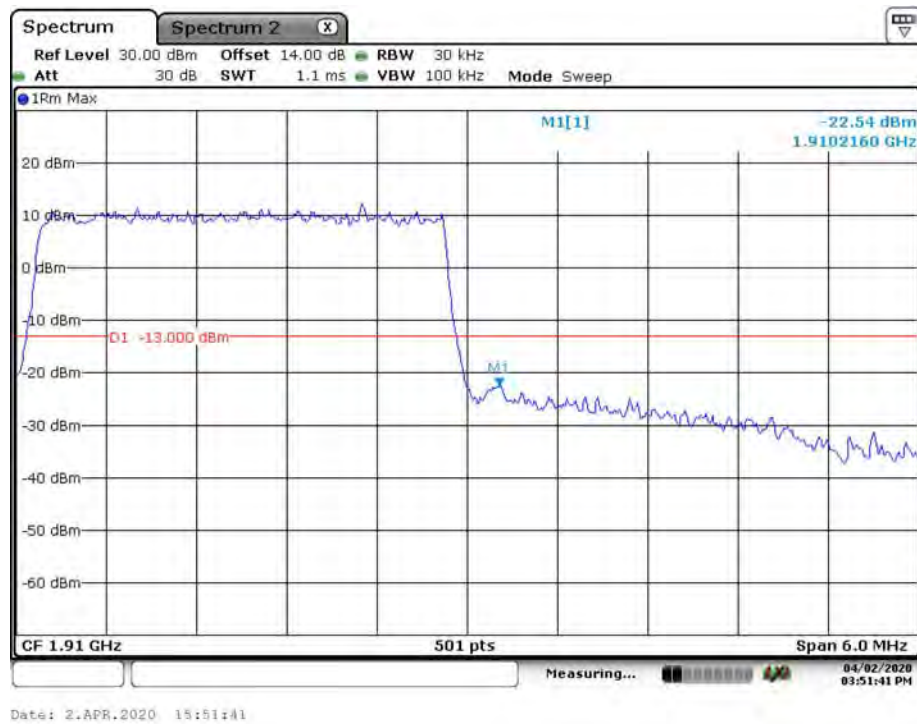
Band 2_3 MHz_Low_QPSK_RB15#0



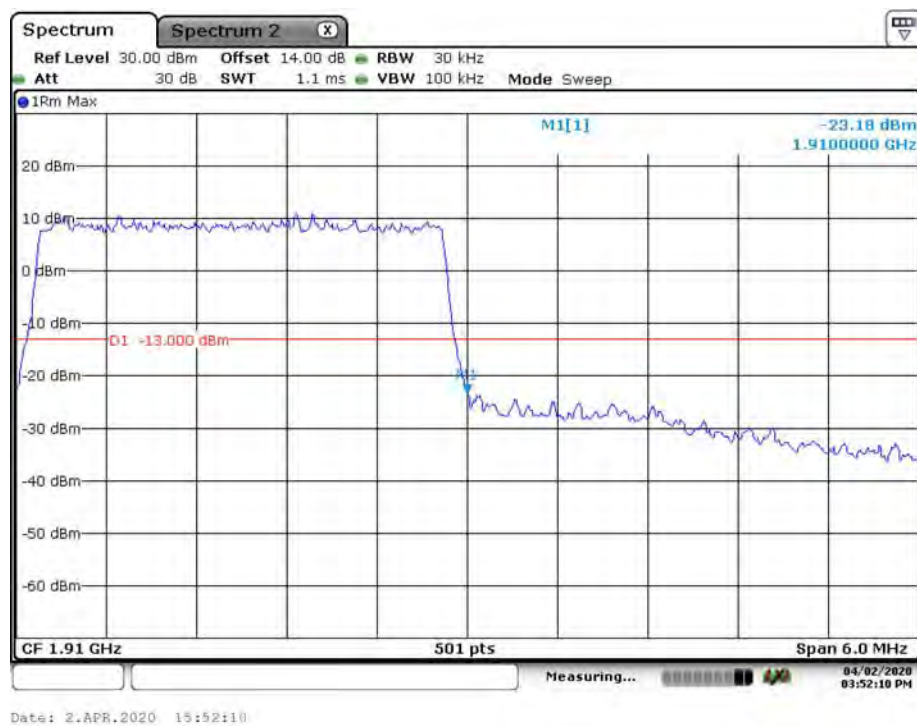
Band 2_3 MHz_Low_16QAM_RB15#0



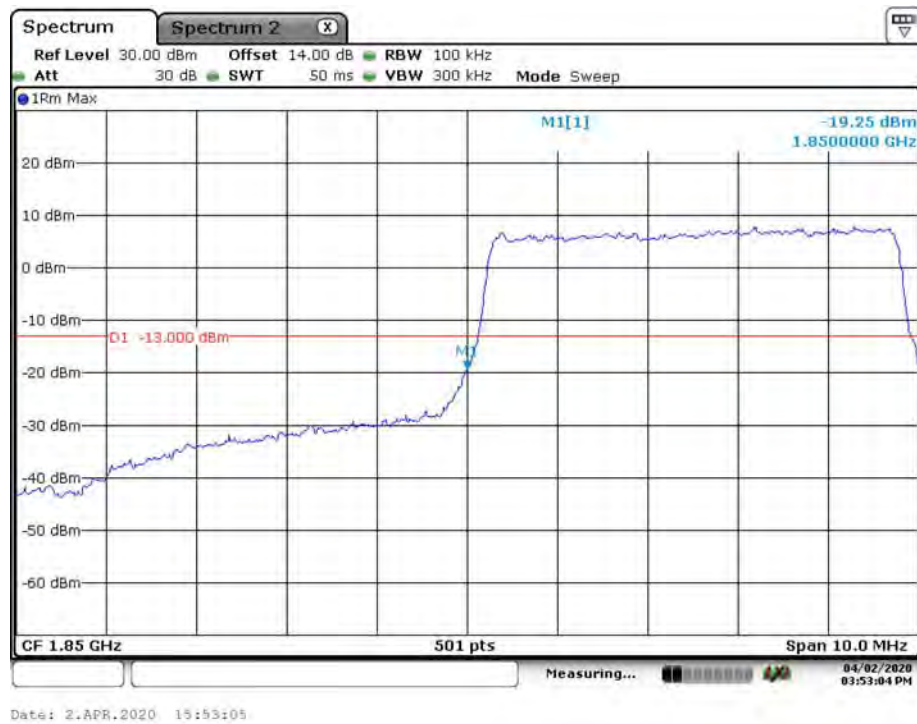
Band 2_3 MHz_High_QPSK_RB15#0



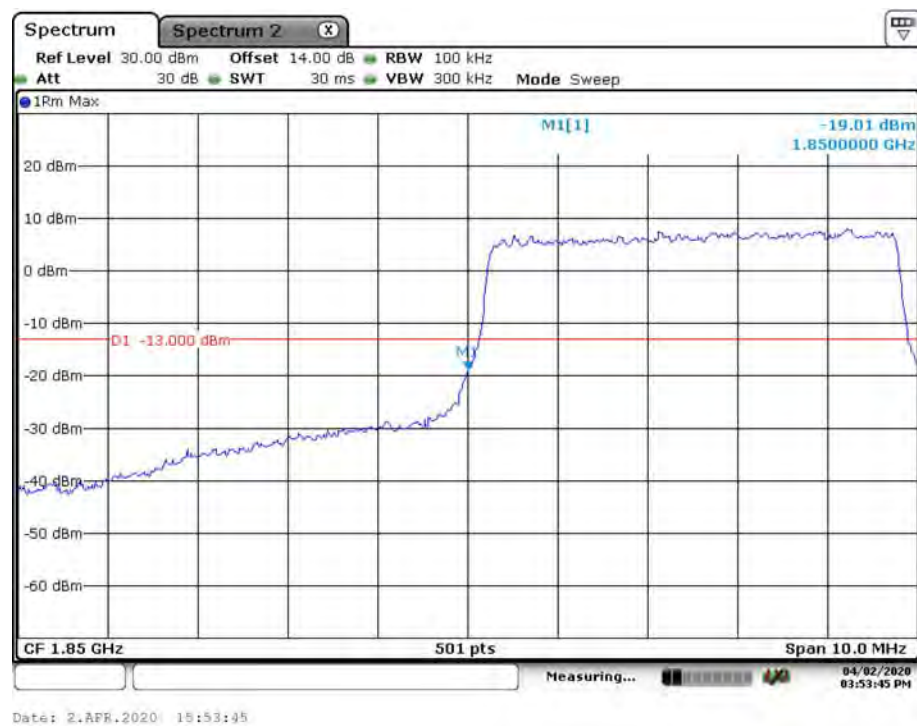
Band 2_3 MHz_High_16QAM_RB15#0



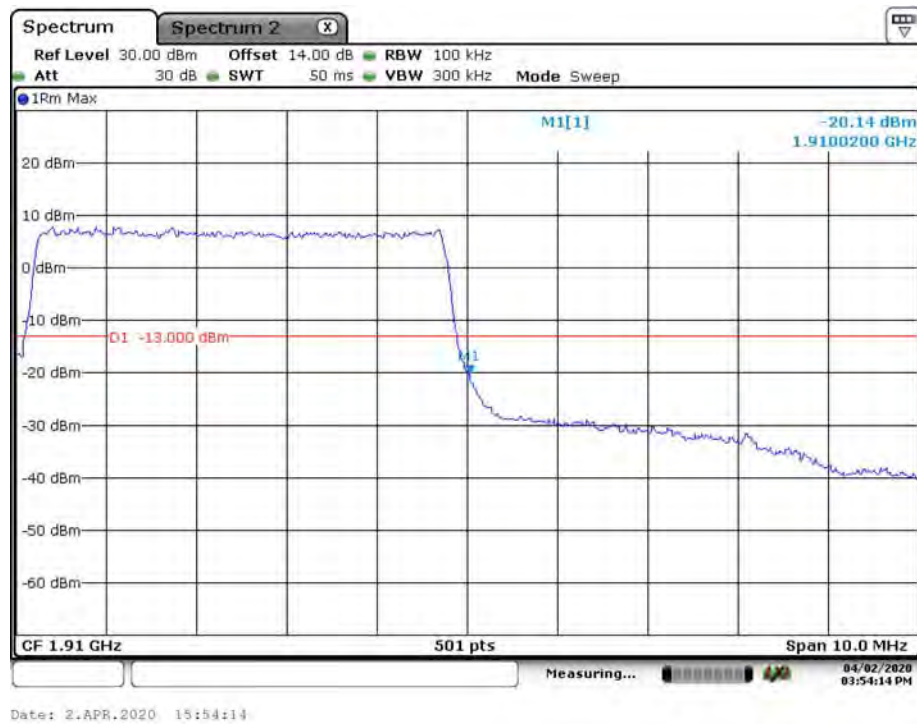
Band 2_5 MHz_Low_QPSK_RB25#0



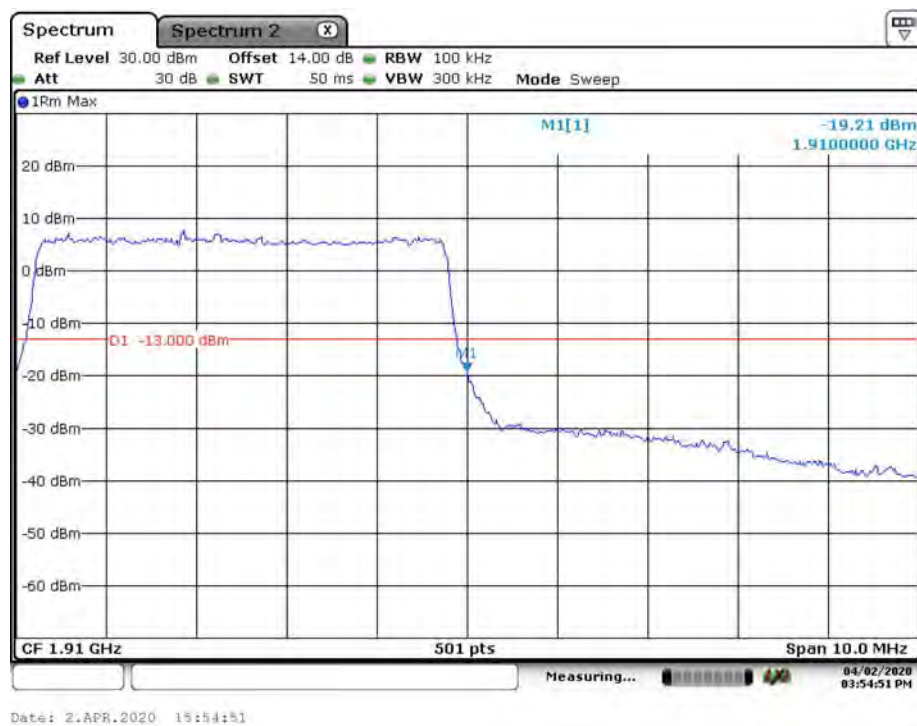
Band 2_5 MHz_Low_16QAM_RB25#0



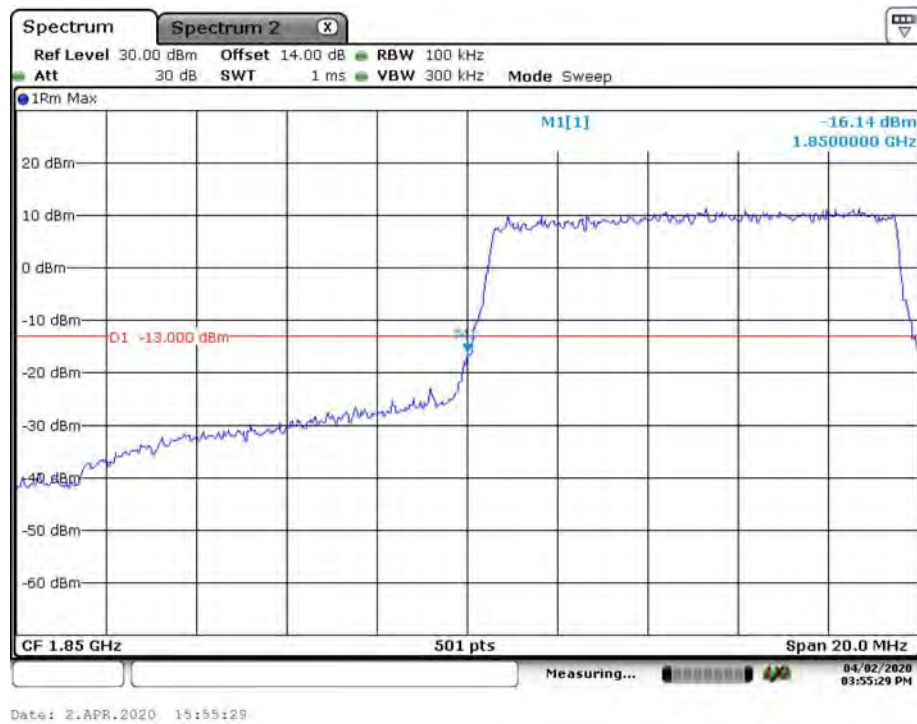
Band 2_5 MHz_High_QPSK_RB25#0



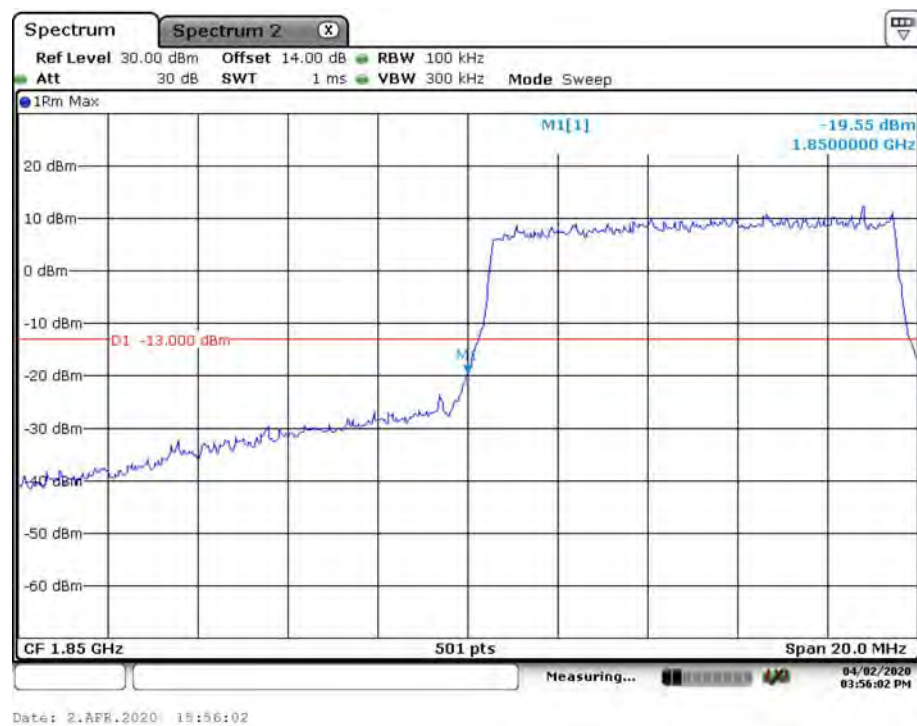
Band 2_5 MHz_High_16QAM_RB25#0



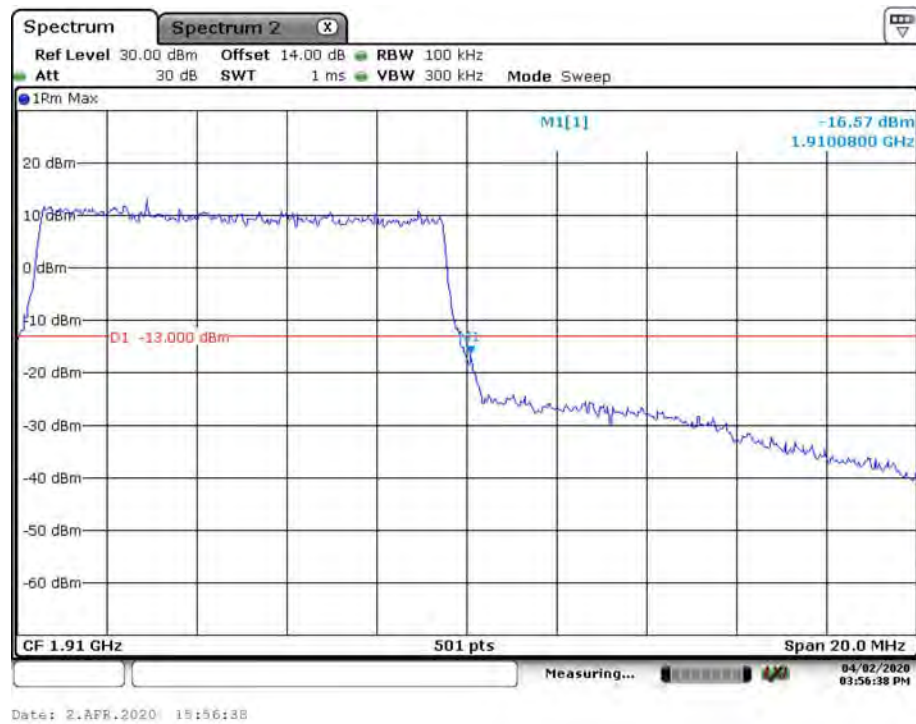
Band 2_10 MHz_Low_QPSK_RB50#0



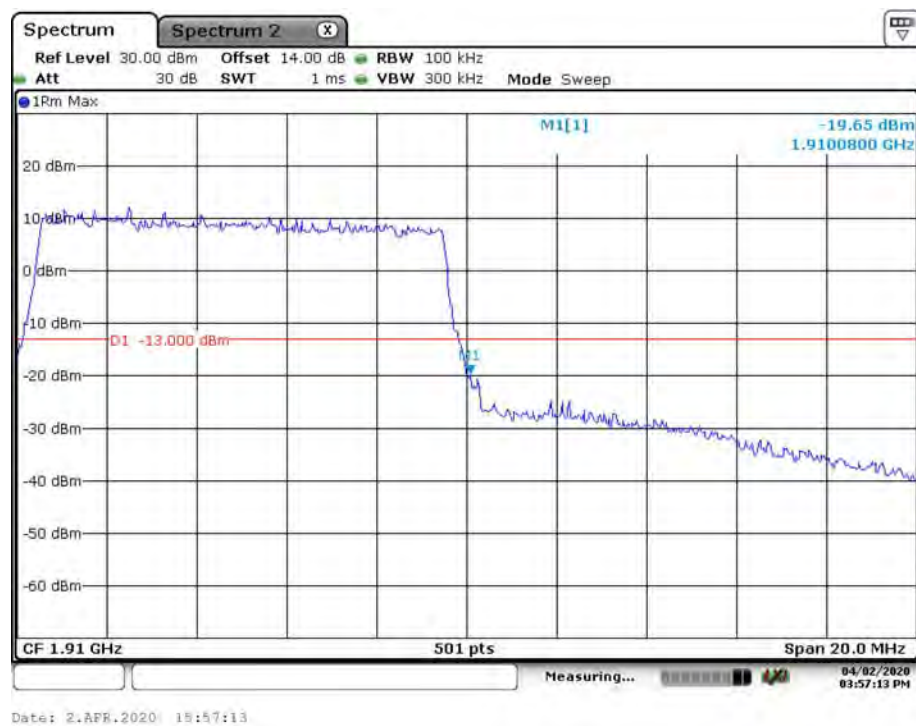
Band 2_10 MHz_Low_16QAM_RB50#0



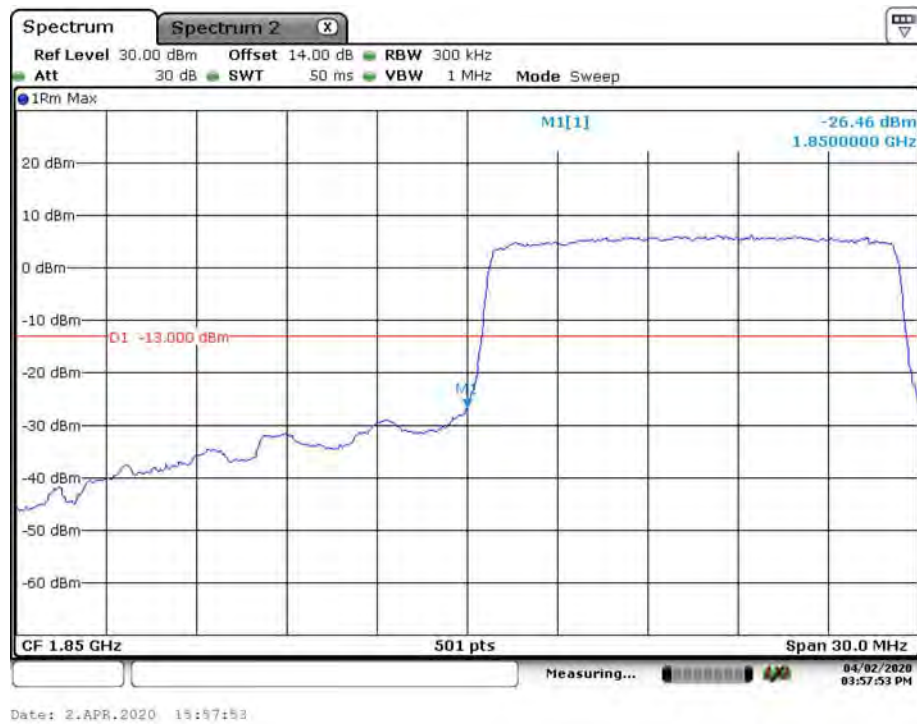
Band 2_10 MHz_High_QPSK_RB50#0



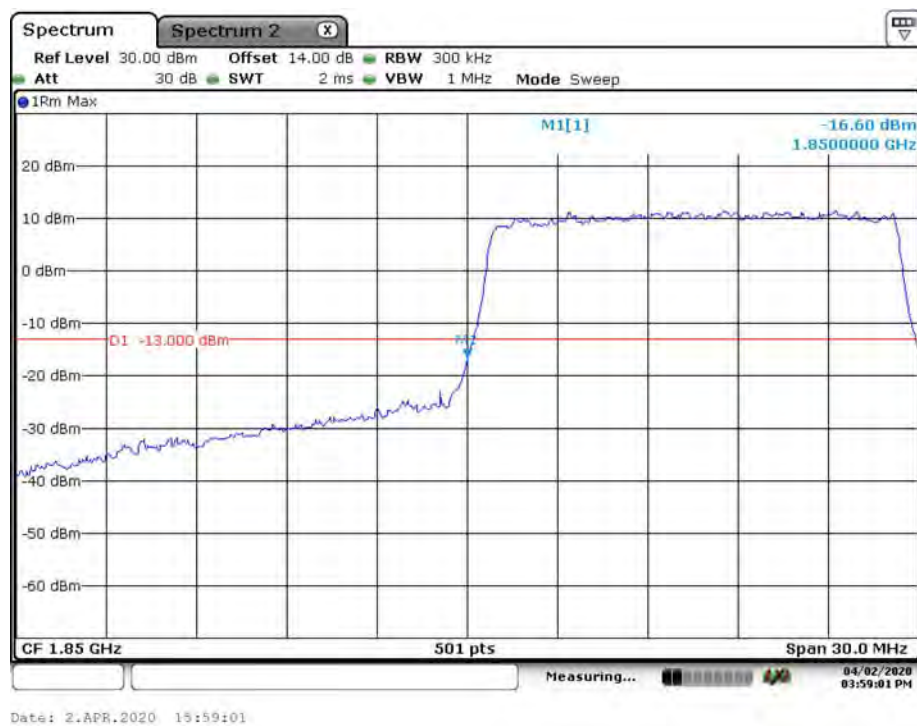
Band 2_10 MHz_High_16QAM_RB50#0



Band 2_15 MHz_Low_QPSK_RB75#0



Band 2_15 MHz_Low_16QAM_RB75#0



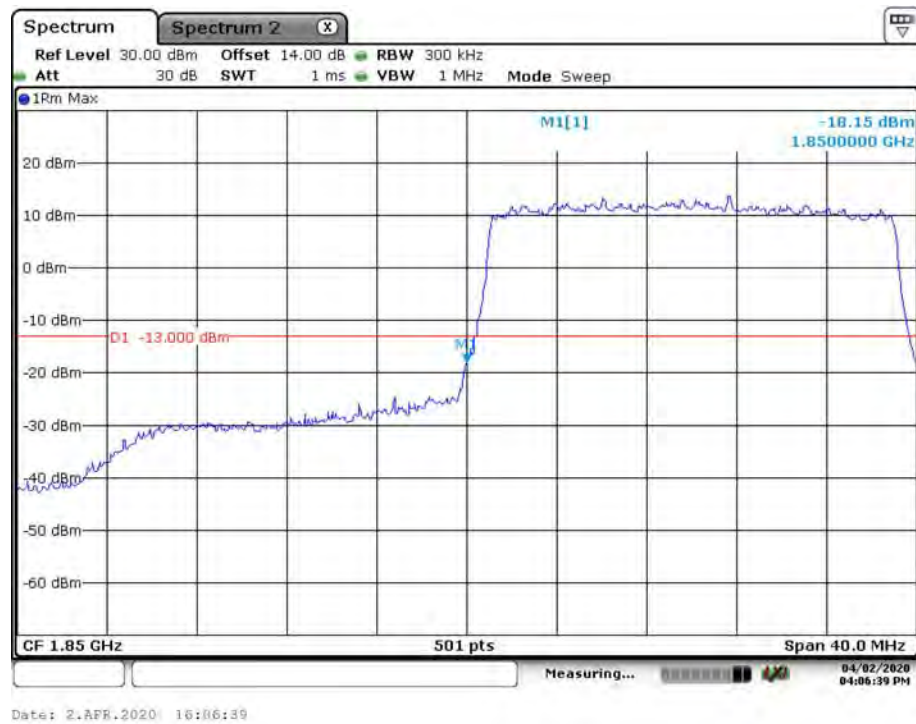
Band 2_15 MHz_High_QPSK_RB75#0



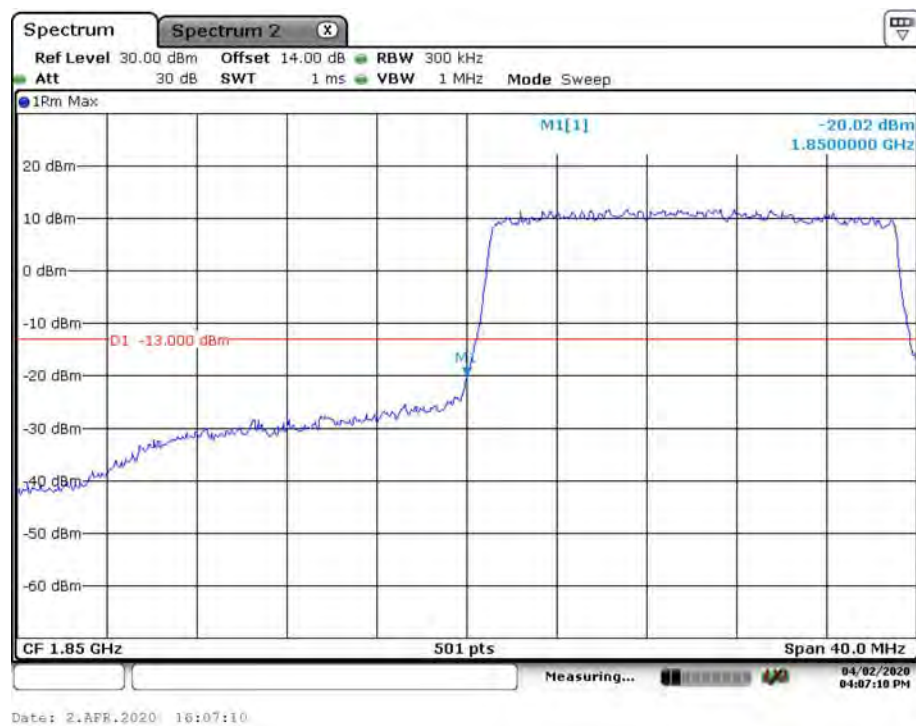
Band 2_15 MHz_High_16QAM_RB75#0



Band 2_20 MHz_Low_QPSK_RB100#0



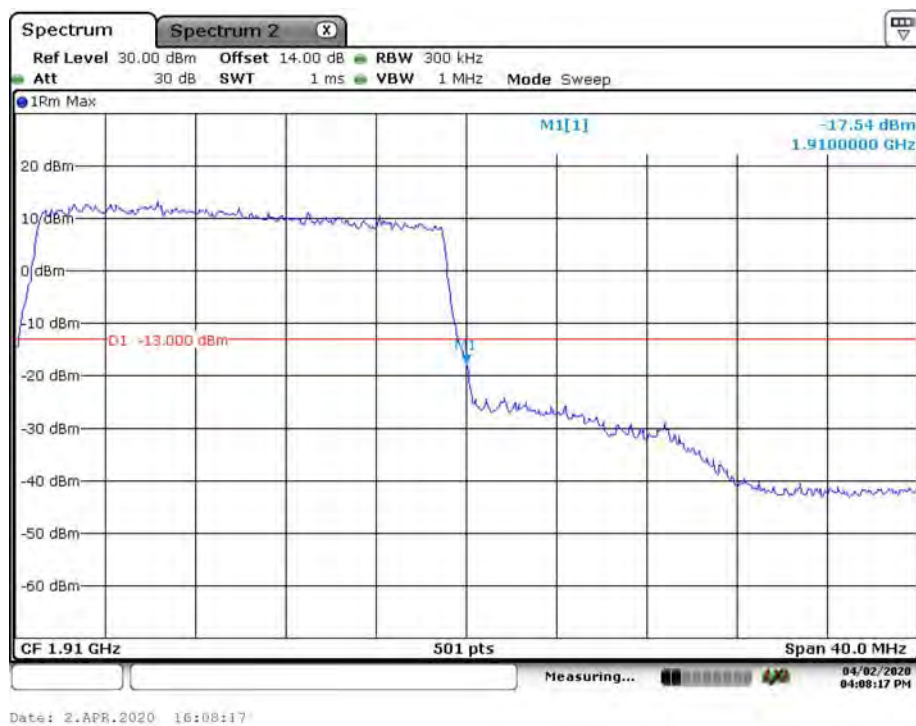
Band 2_20 MHz_Low_16QAM_RB100#0



Band 2_20 MHz_High_QPSK_RB100#0



Band 2_20 MHz_High_16QAM_RB100#0



LTE Band 4

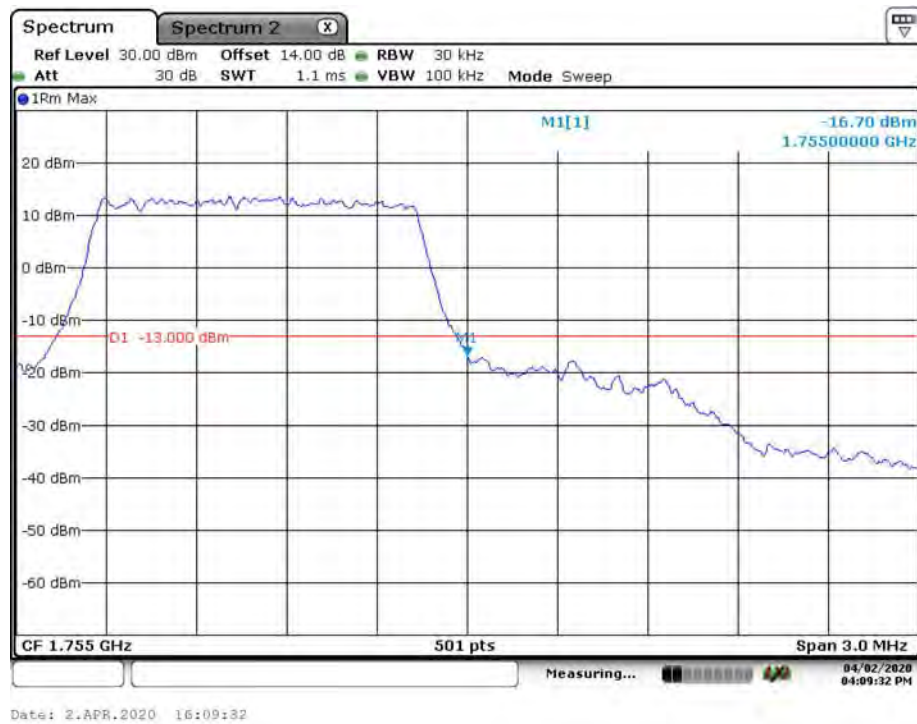
Band 4_1.4 MHz_Low_QPSK_RB6#0



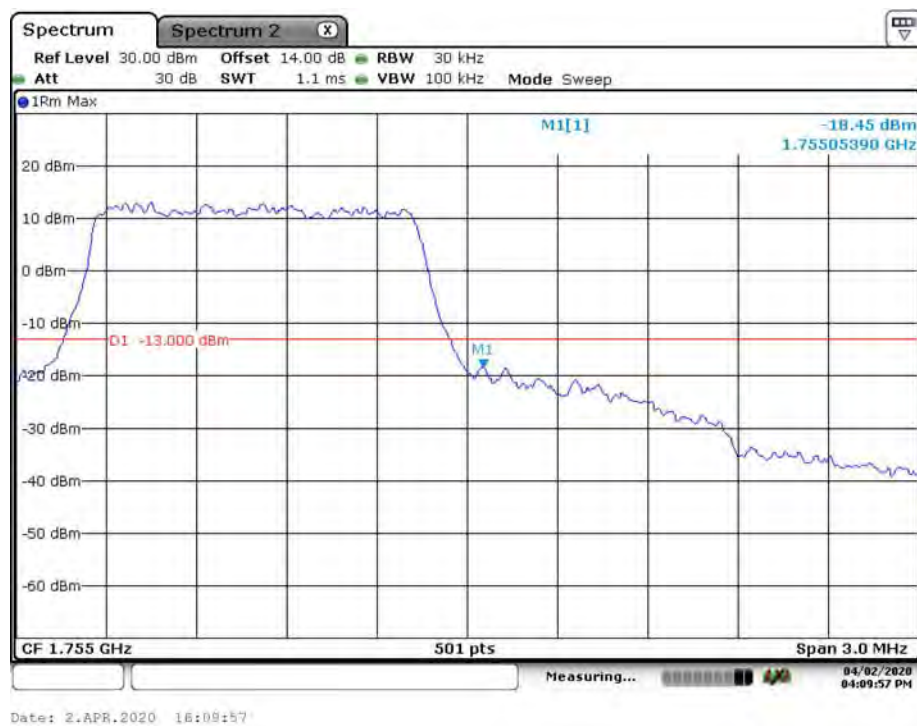
Band 4_1.4 MHz_Low_16QAM_RB6#0



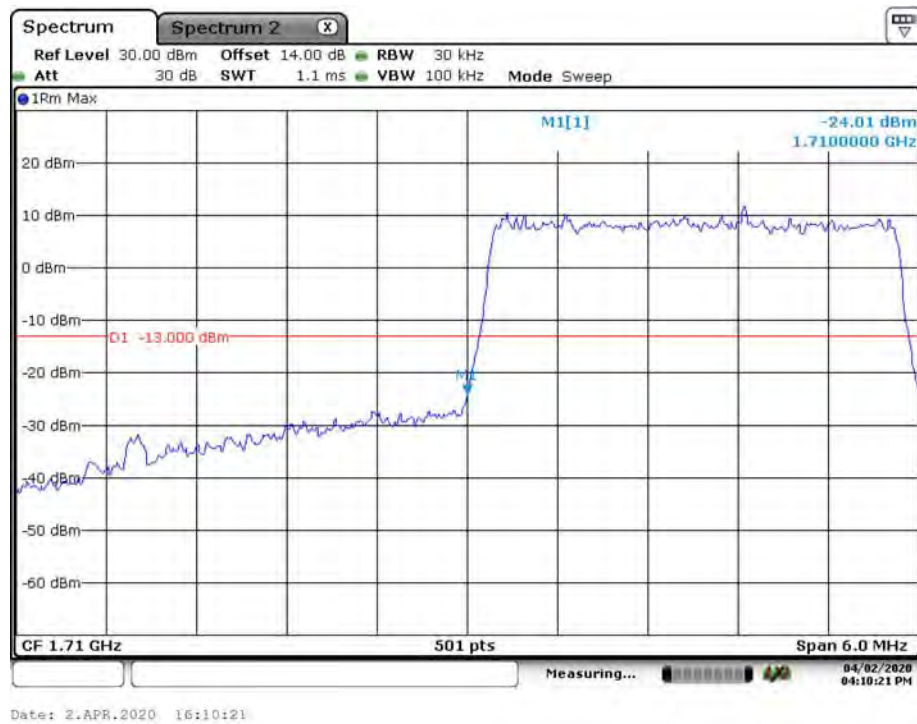
Band 4_1.4 MHz_High_QPSK_RB6#0



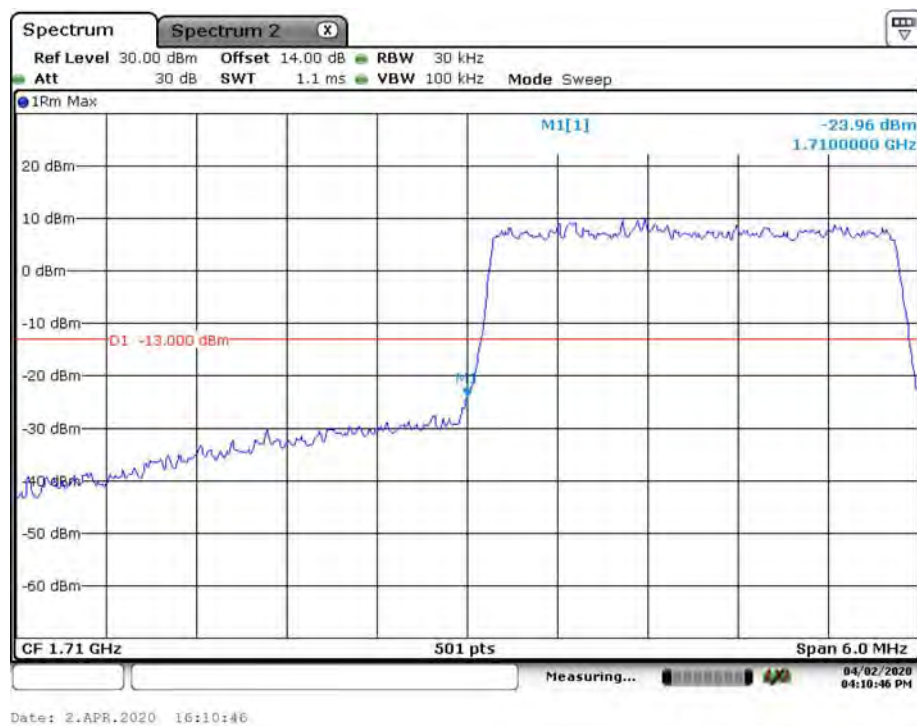
Band 4_1.4 MHz_High_16QAM_RB6#0



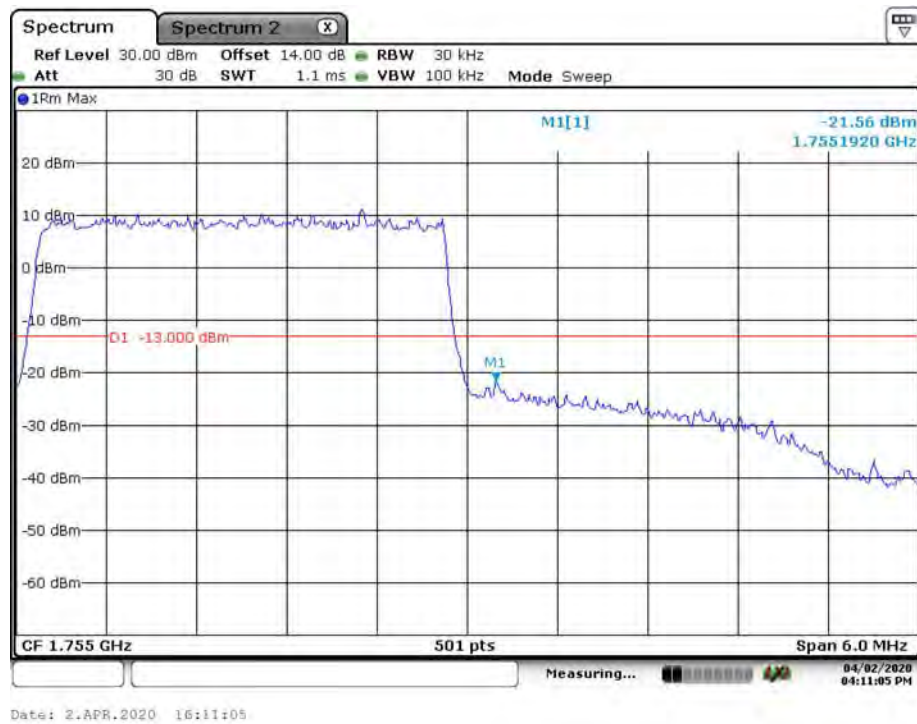
Band 4_3 MHz_Low_QPSK_RB15#0



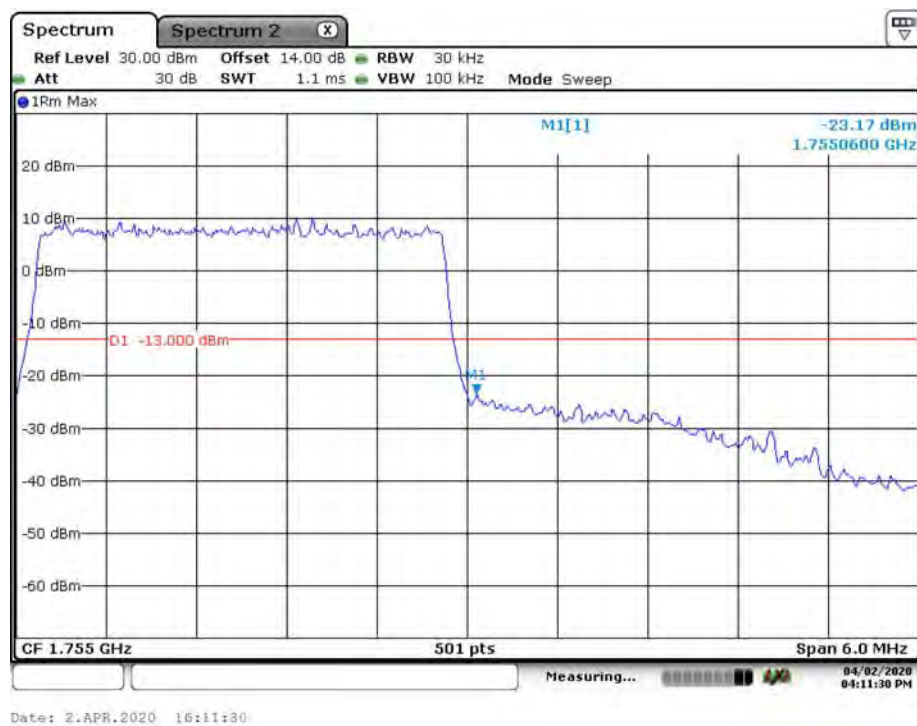
Band 4_3 MHz_Low_16QAM_RB15#0



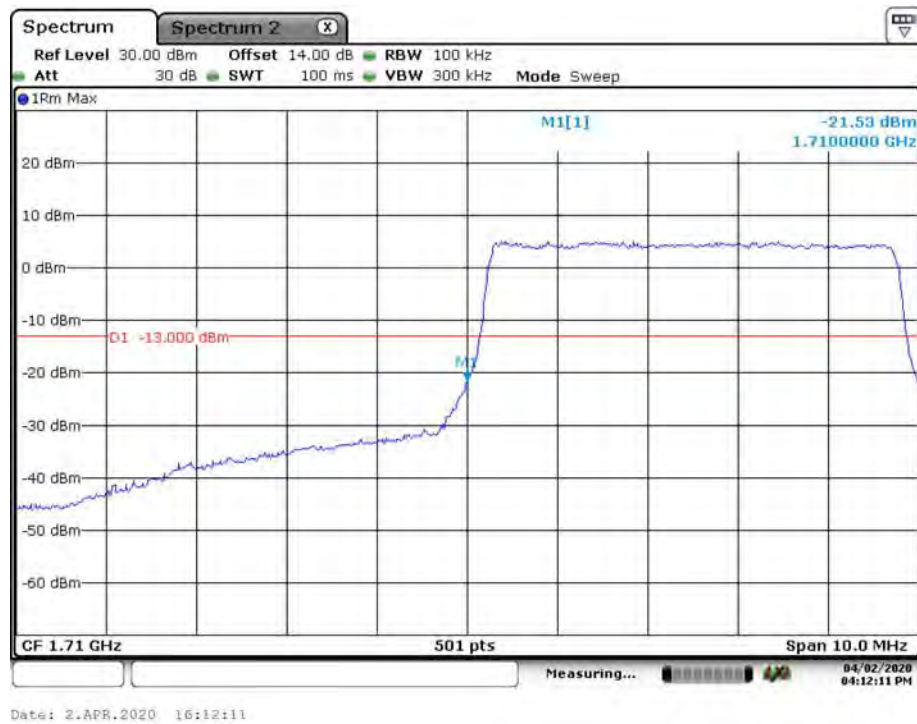
Band 4_3 MHz_High_QPSK_RB15#0



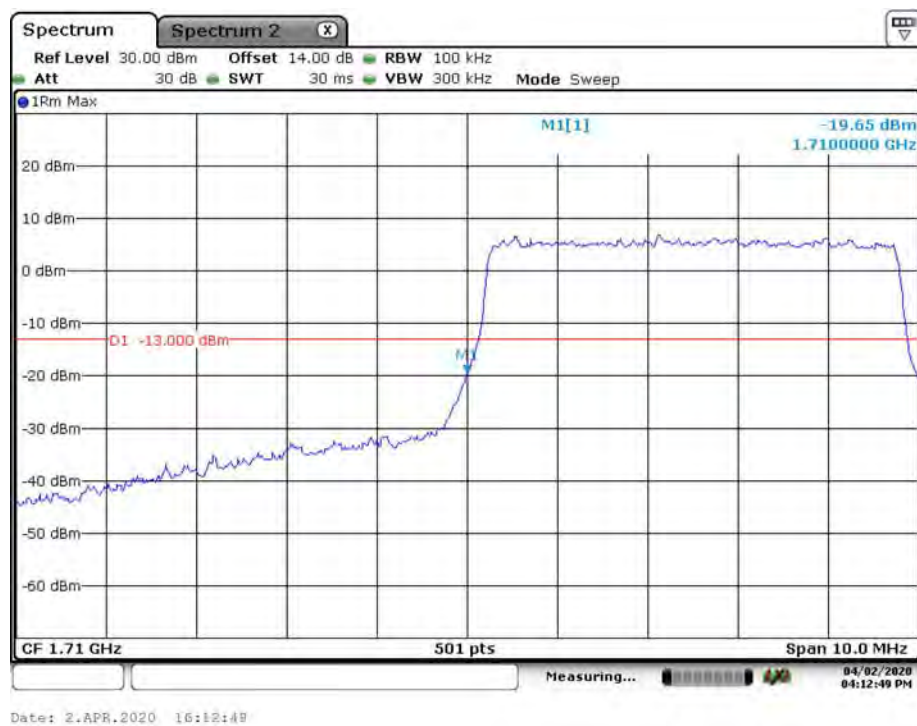
Band 4_3 MHz_High_16QAM_RB15#0



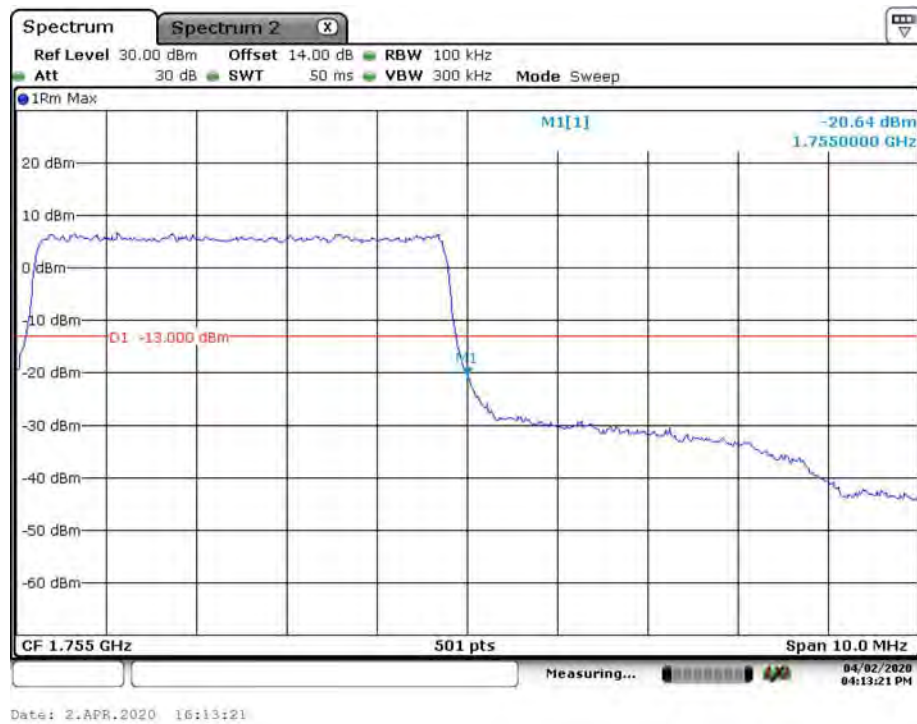
Band 4_5 MHz_Low_QPSK_RB25#0



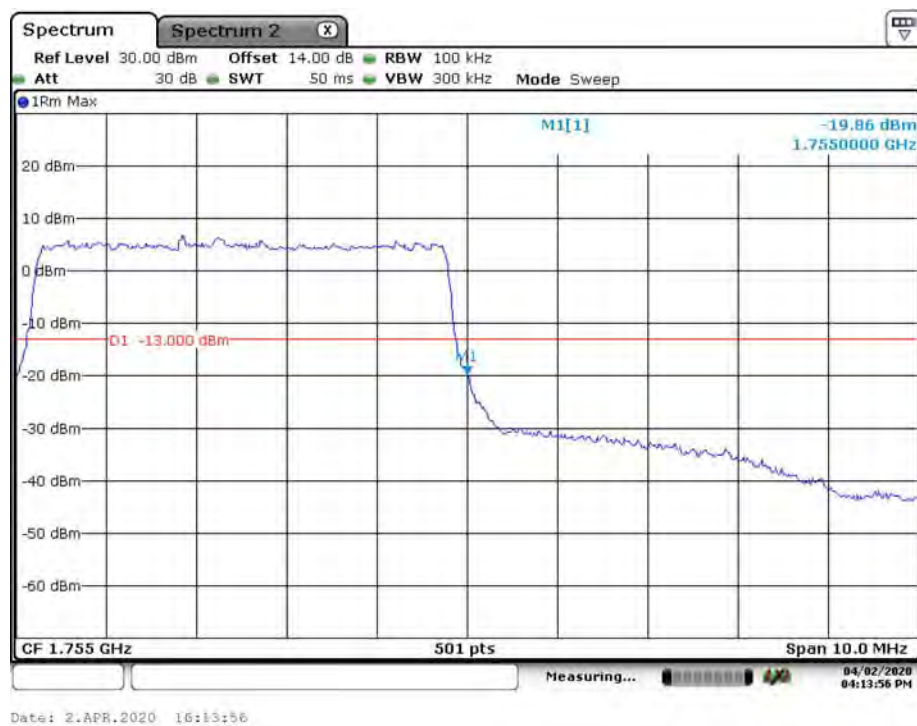
Band 4_5 MHz_Low_16QAM_RB25#0



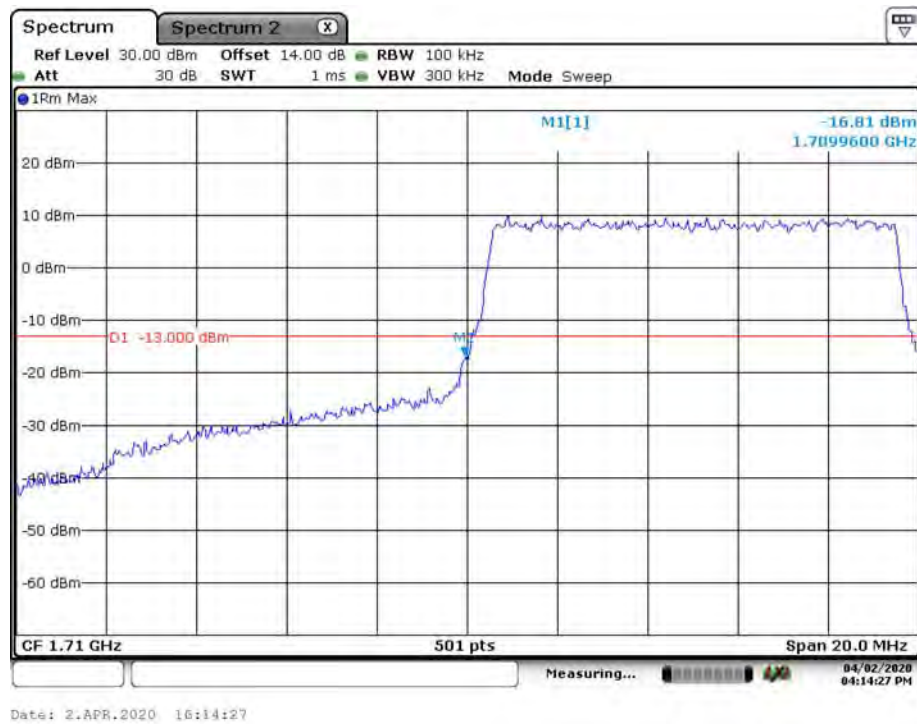
Band 4_5 MHz_High_QPSK_RB25#0



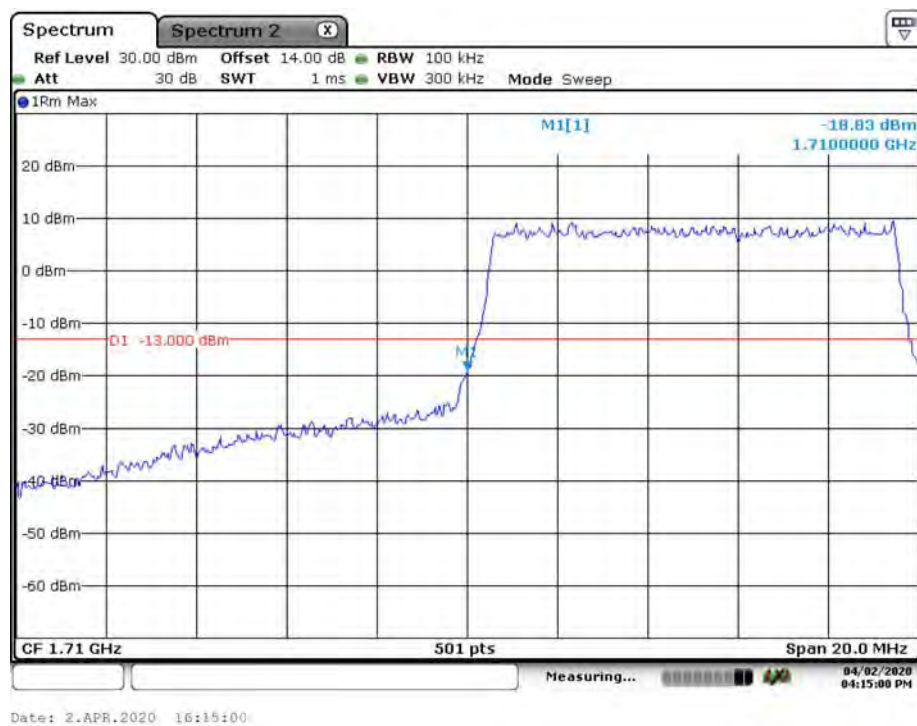
Band 4_5 MHz_High_16QAM_RB25#0



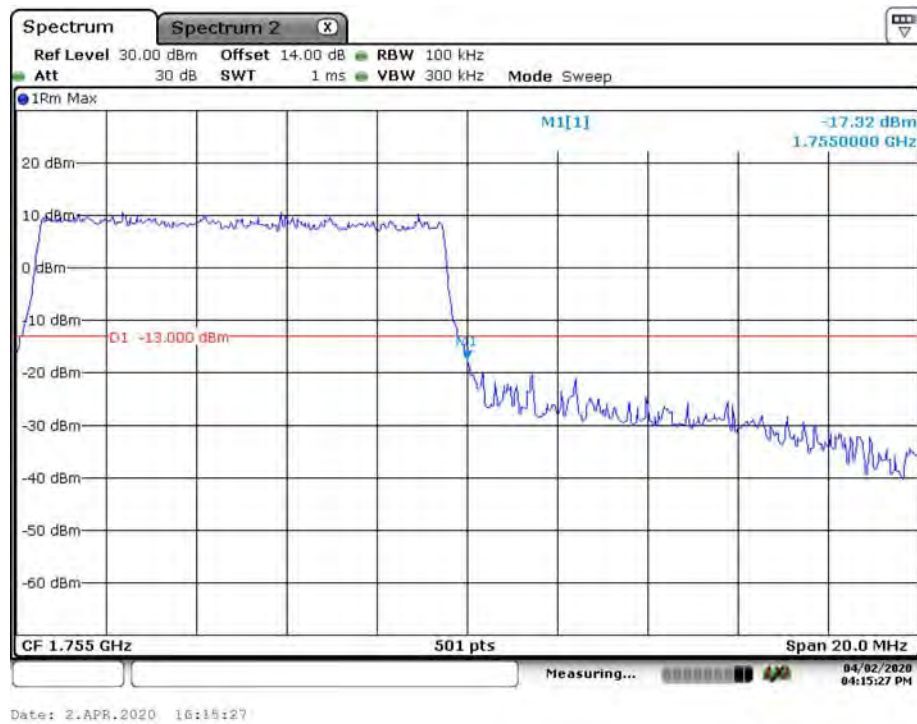
Band 4_10 MHz_Low_QPSK_RB50#0



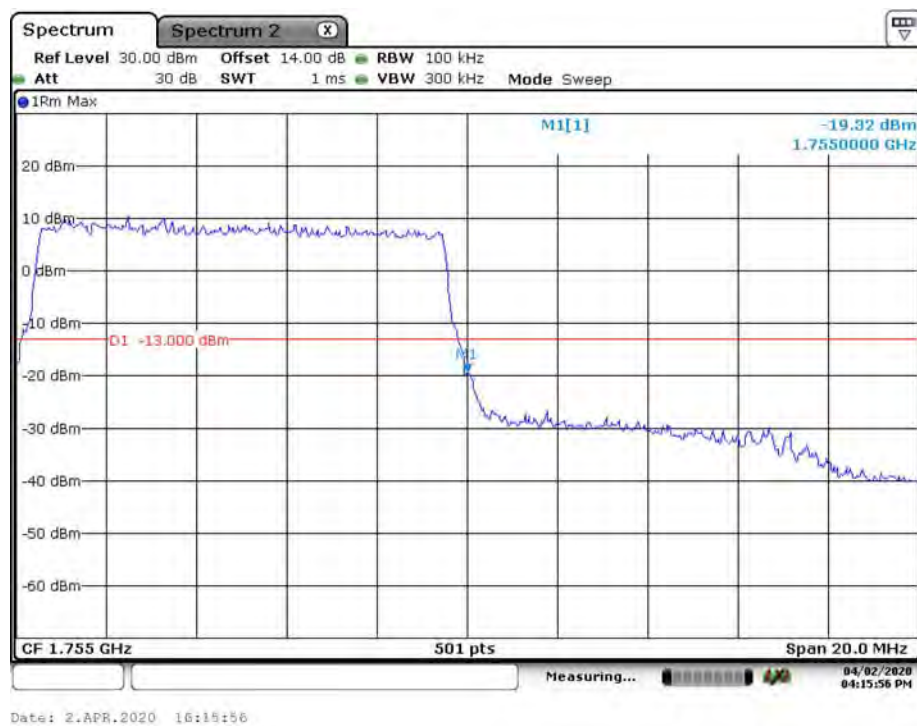
Band 4_10 MHz_Low_16QAM_RB50#0



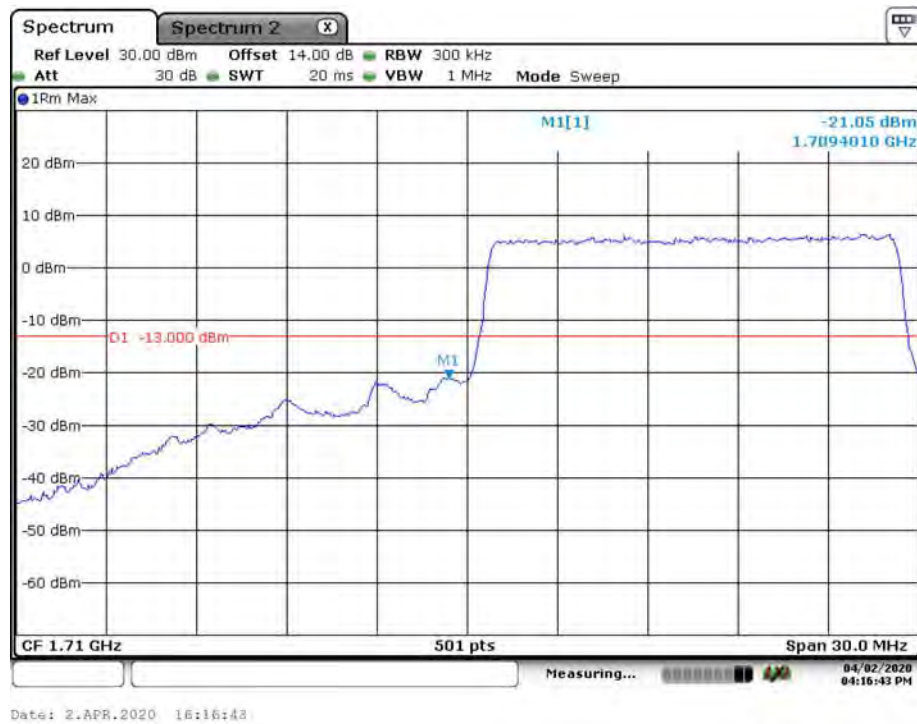
Band 4_10 MHz_High_QPSK_RB50#0



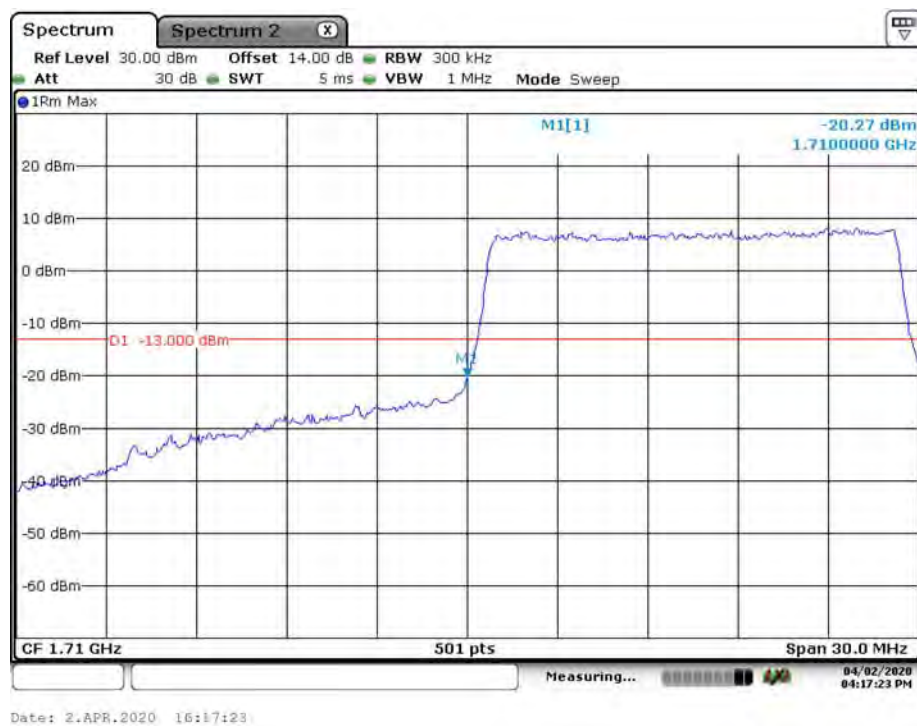
Band 4_10 MHz_High_16QAM_RB50#0



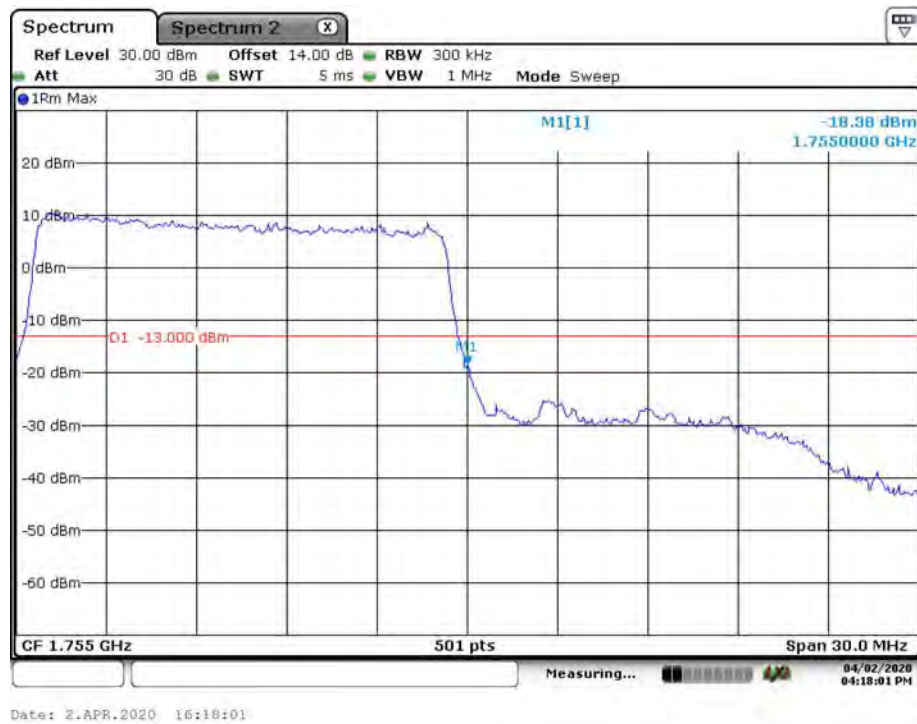
Band 4_15 MHz_Low_QPSK_RB75#0



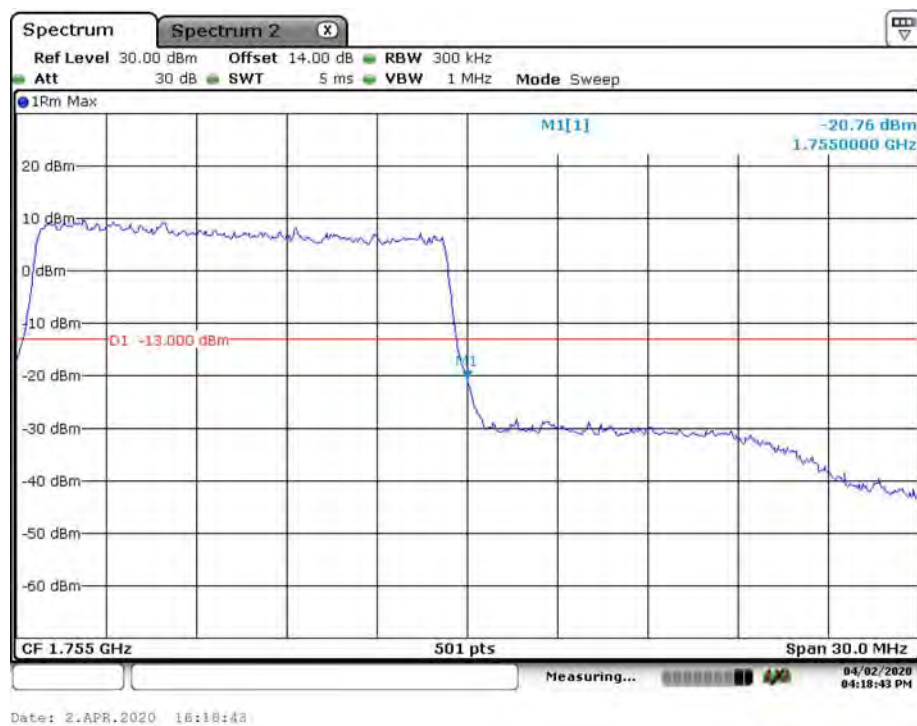
Band 4_15 MHz_Low_16QAM_RB75#0



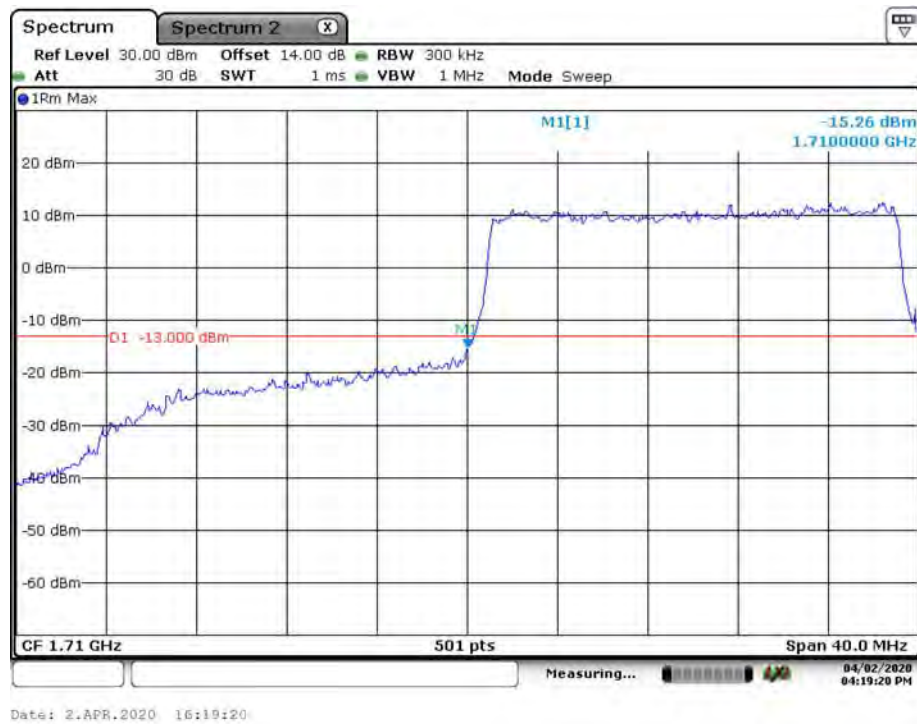
Band 4_15 MHz_High_QPSK_RB75#0



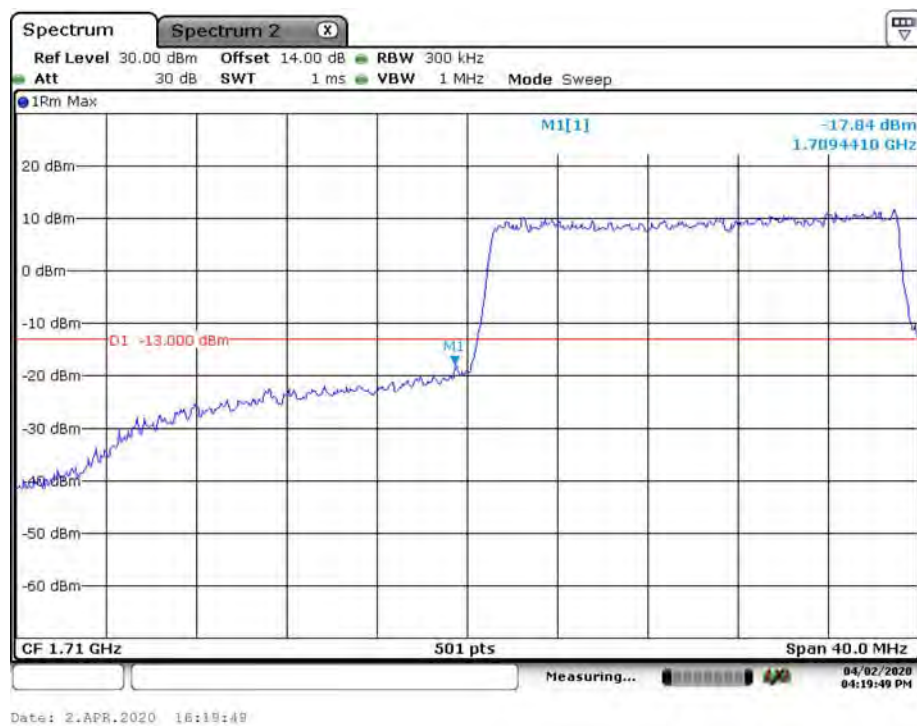
Band 4_15 MHz_High_16QAM_RB75#0



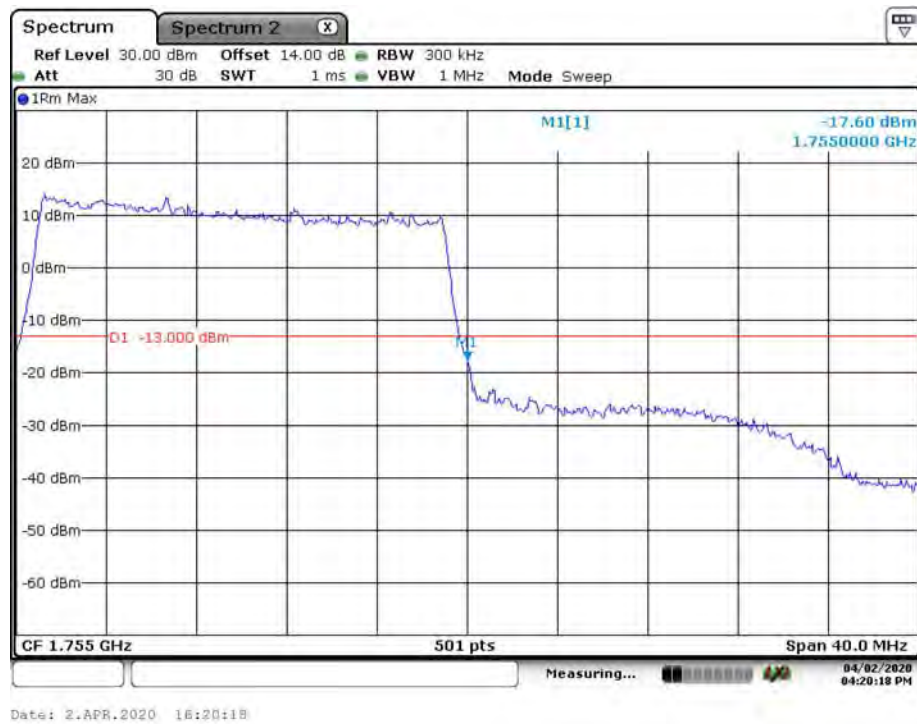
Band 4_20 MHz_Low_QPSK_RB100#0



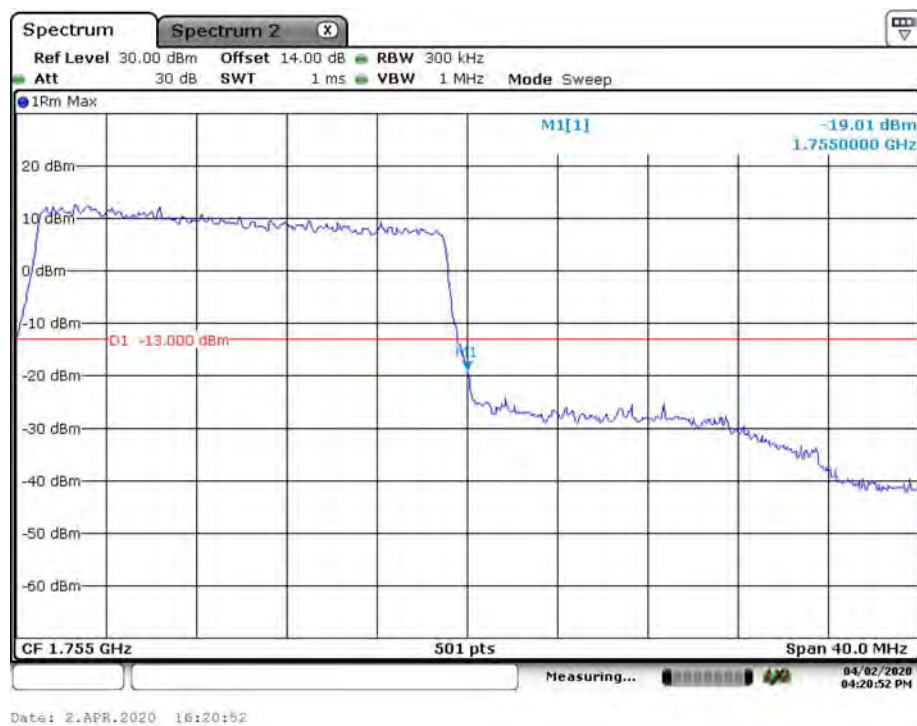
Band 4_20 MHz_Low_16QAM_RB100#0



Band 4_20 MHz_High_QPSK_RB100#0



Band 4_20 MHz_High_16QAM_RB100#0



LTE Band 5

Band 5_1.4 MHz_Low_QPSK_RB6#0



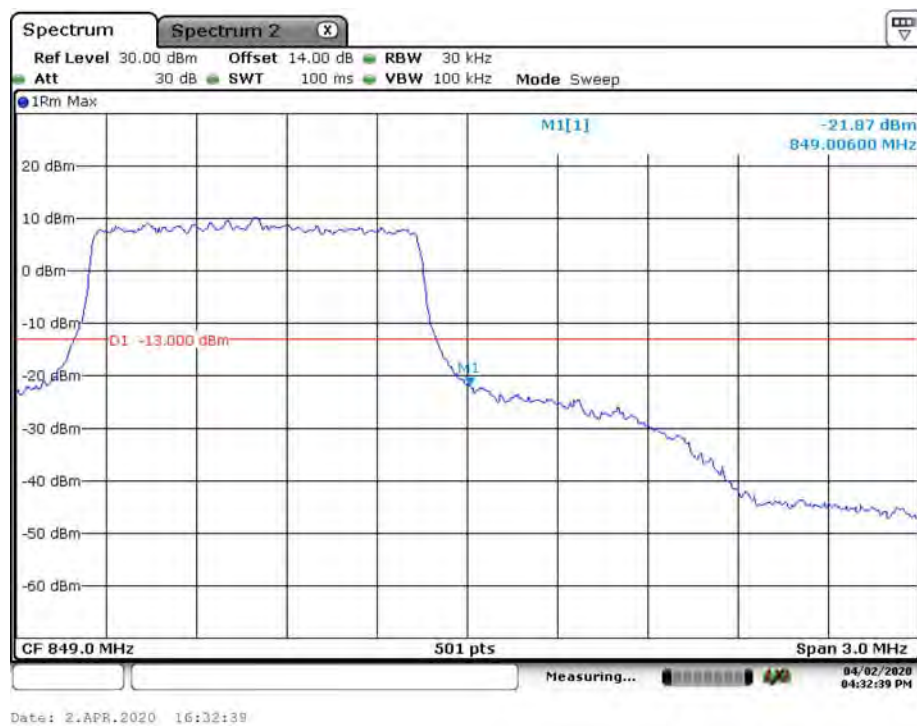
Band 5_1.4 MHz_Low_16QAM_RB6#0



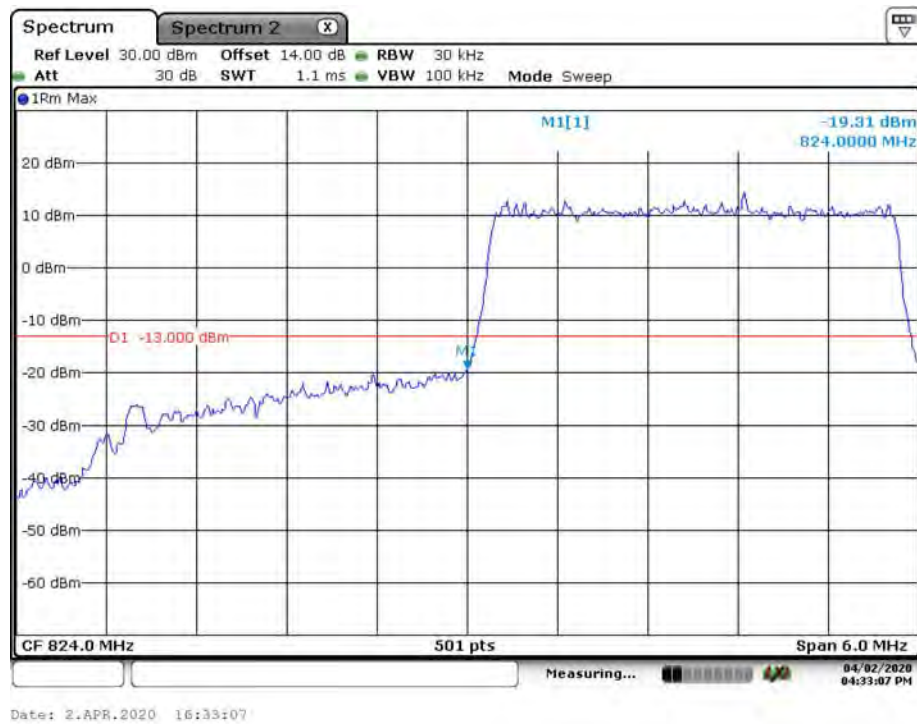
Band 5_1.4 MHz_High_QPSK_RB6#0



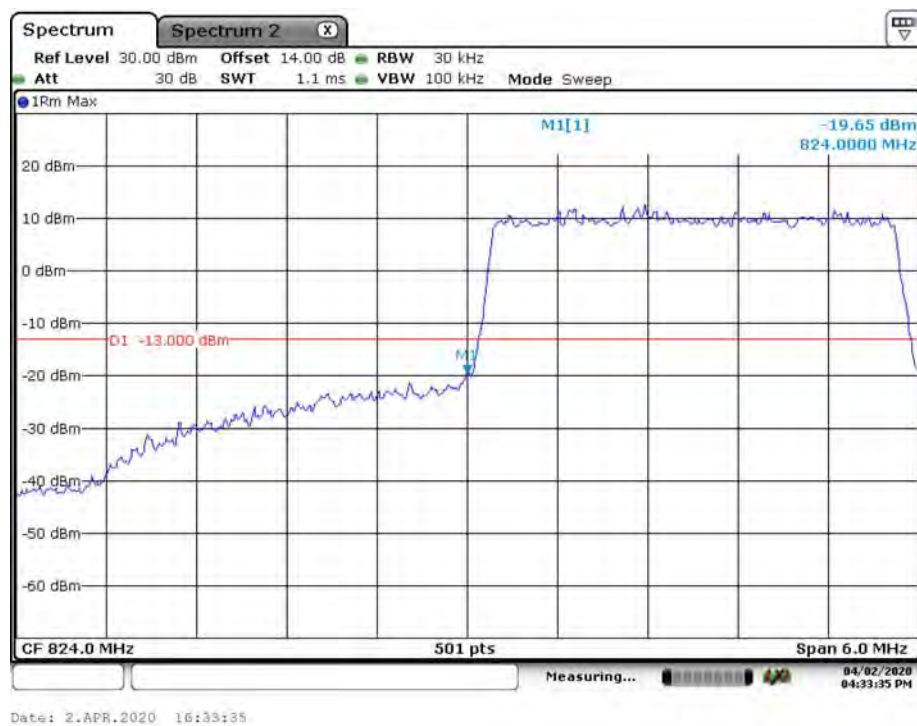
Band 5_1.4 MHz_High_16QAM_RB6#0



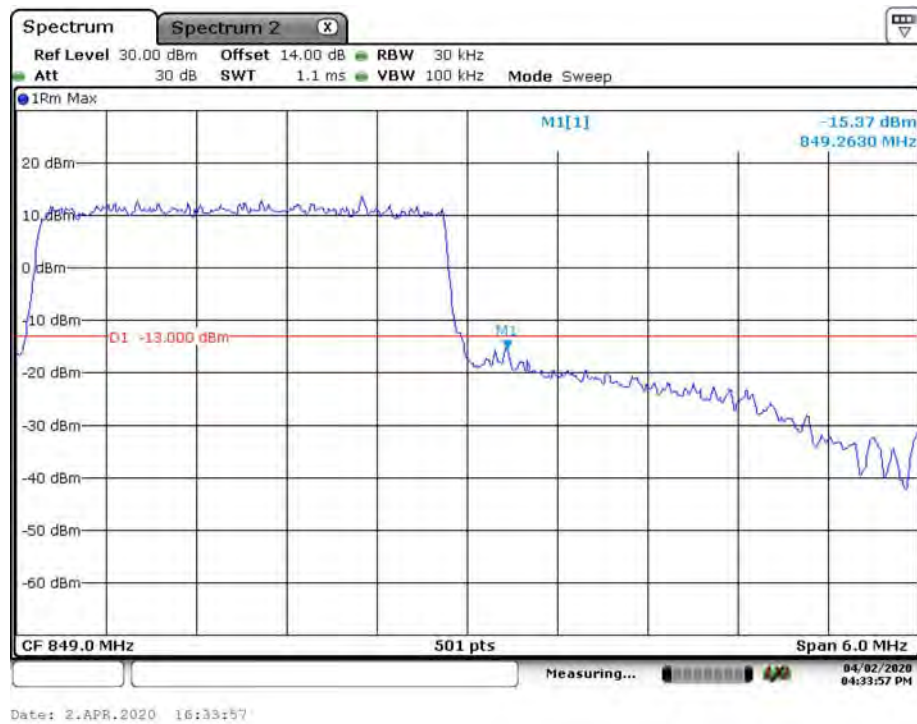
Band 5_3 MHz_Low_QPSK_RB15#0



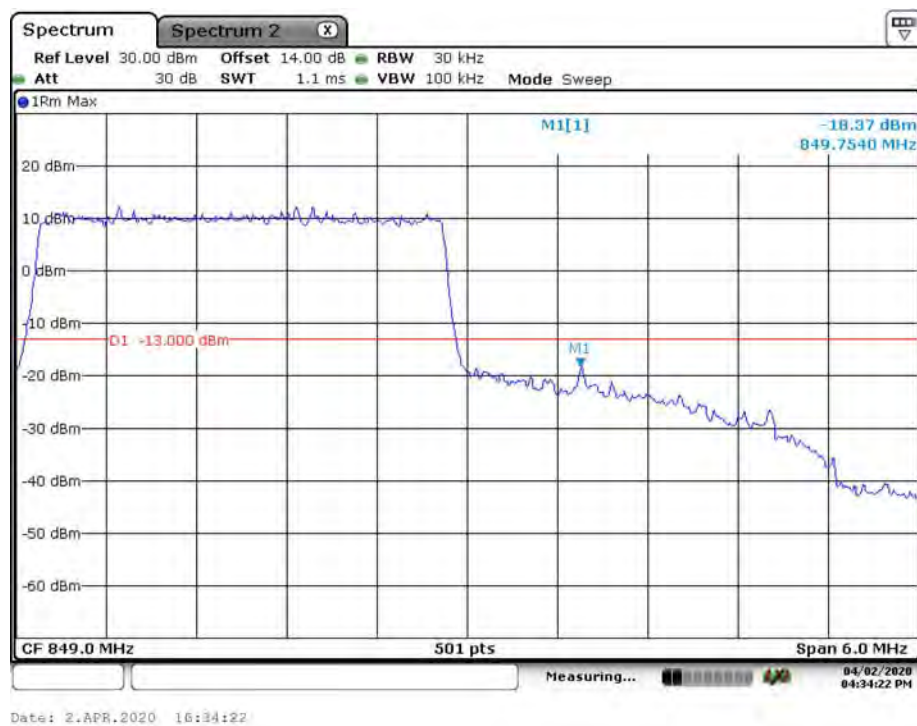
Band 5_3 MHz_Low_16QAM_RB15#0



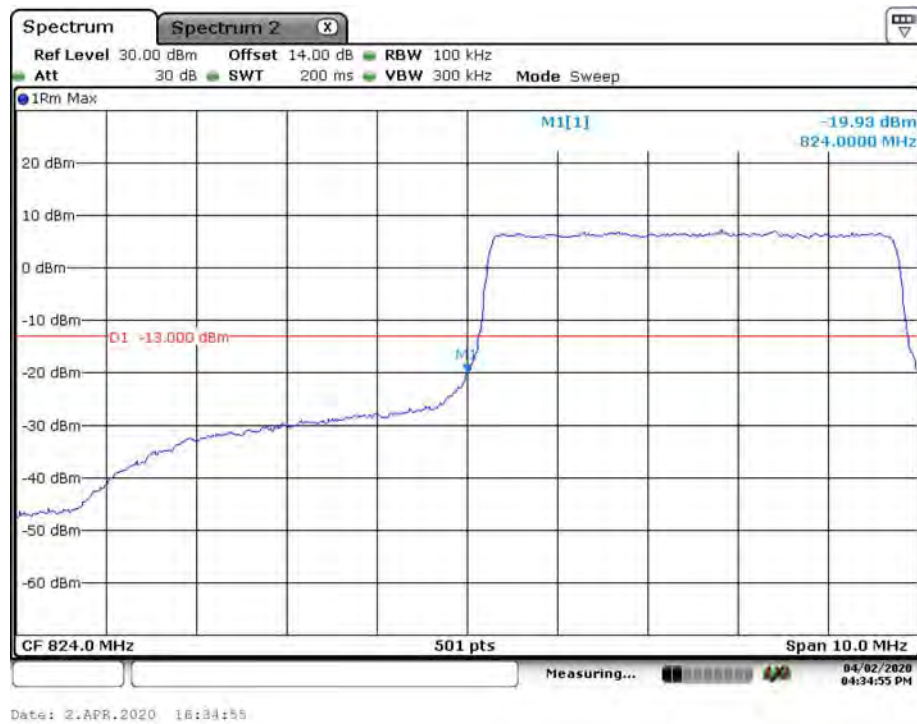
Band 5_3 MHz_High_QPSK_RB15#0



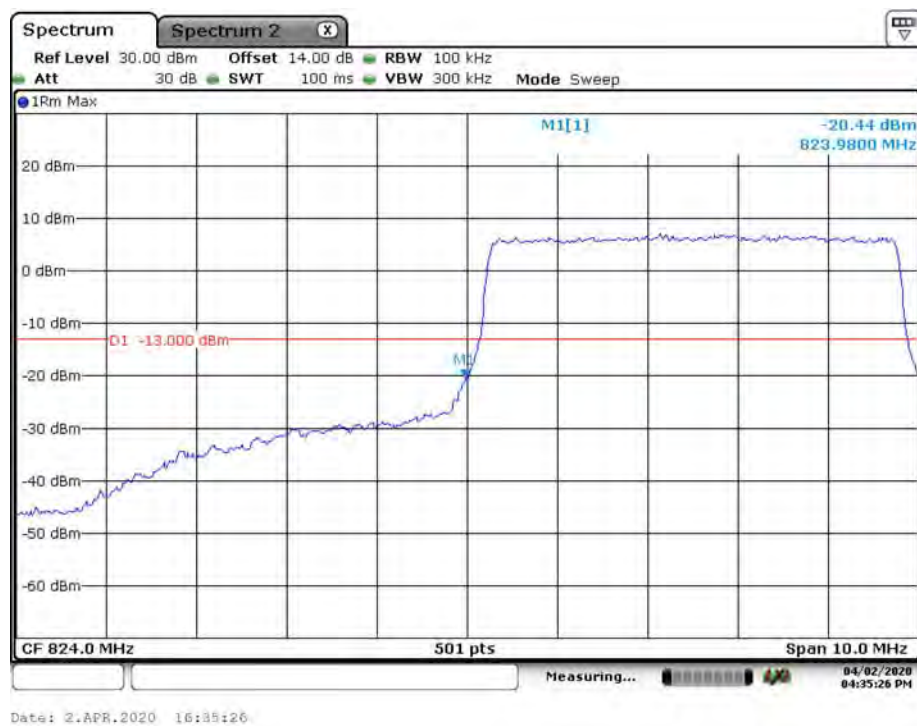
Band 5_3 MHz_High_16QAM_RB15#0



Band 5_5 MHz_Low_QPSK_RB25#0



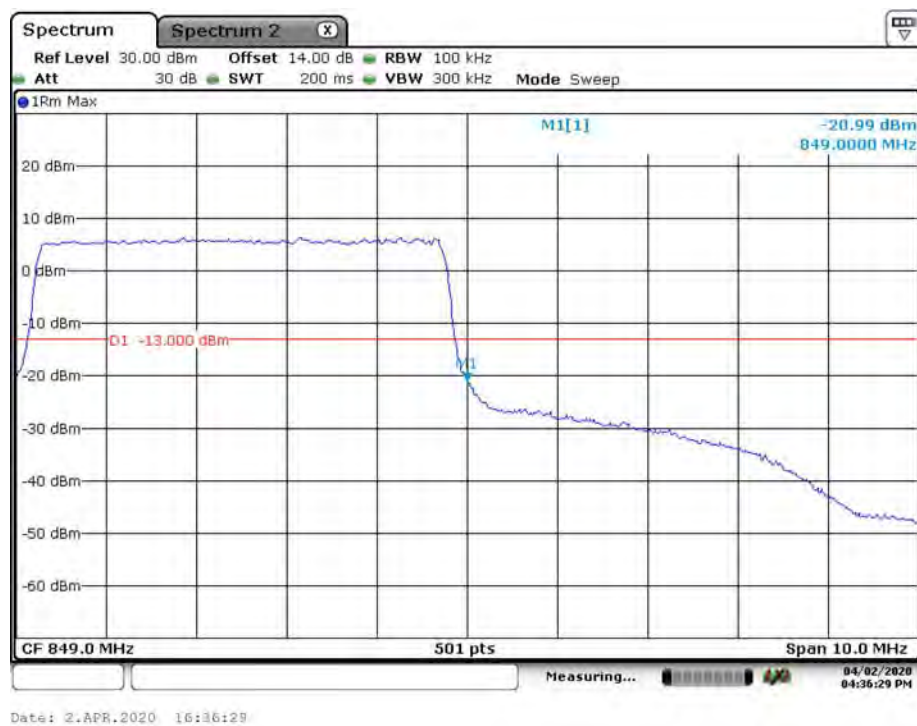
Band 5_5 MHz_Low_16QAM_RB25#0



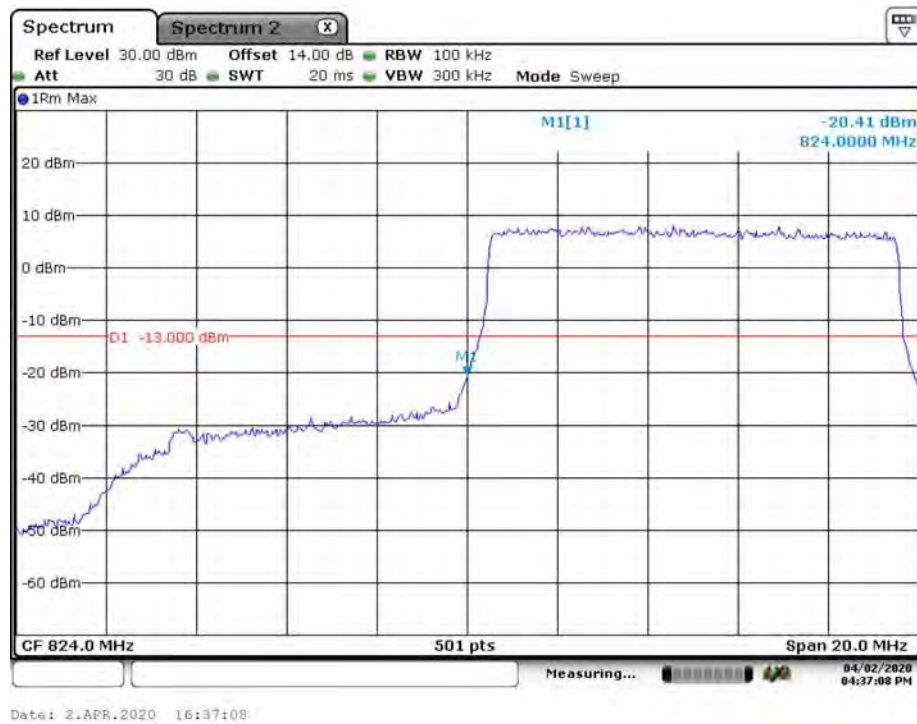
Band 5_5 MHz_High_QPSK_RB25#0



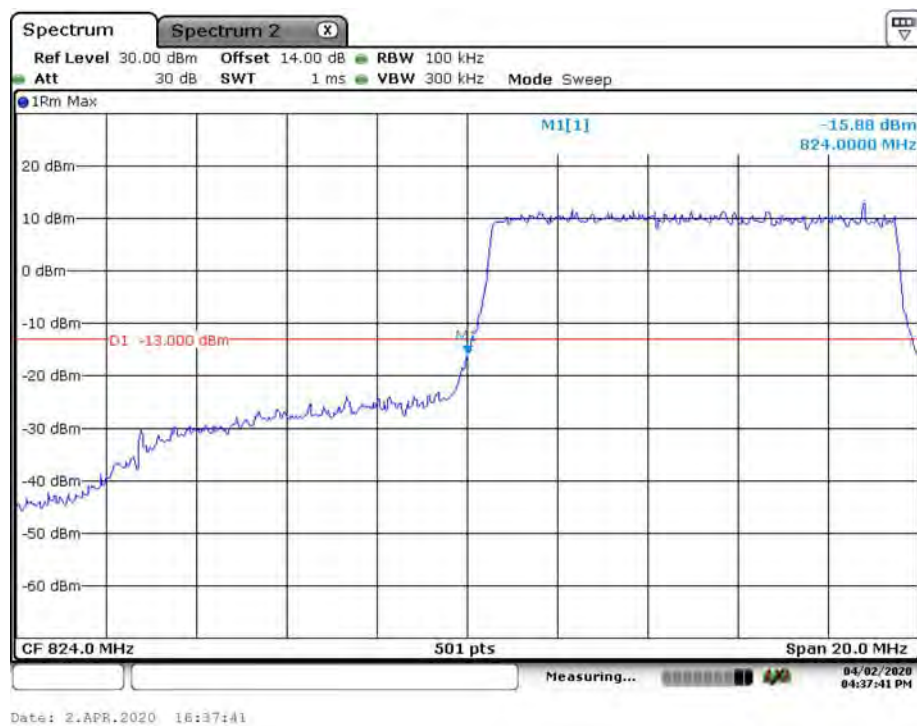
Band 5_5 MHz_High_16QAM_RB25#0



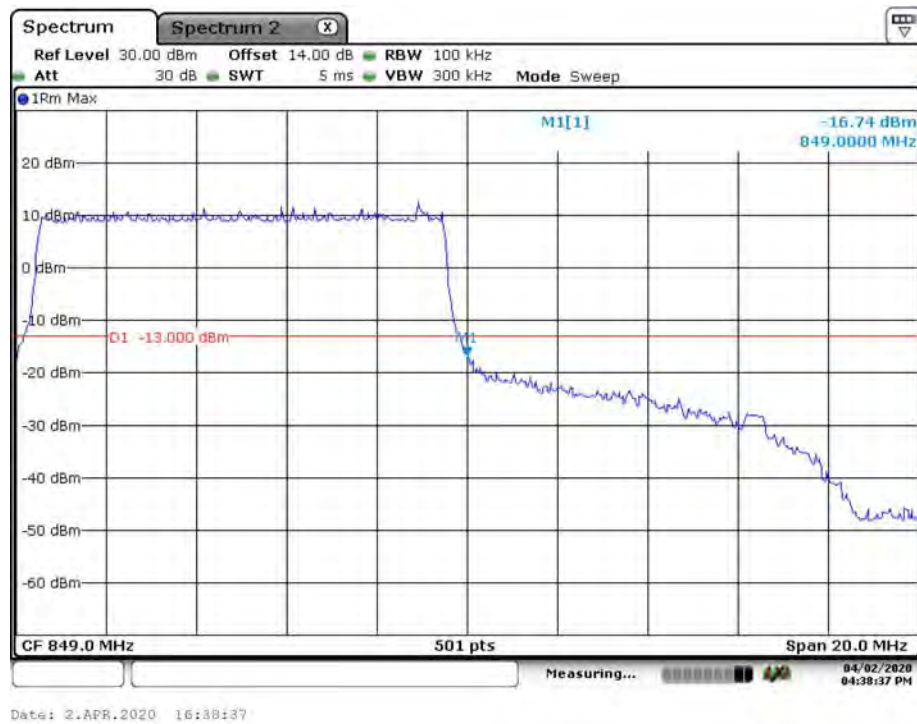
Band 5_10 MHz_Low_QPSK_RB50#0



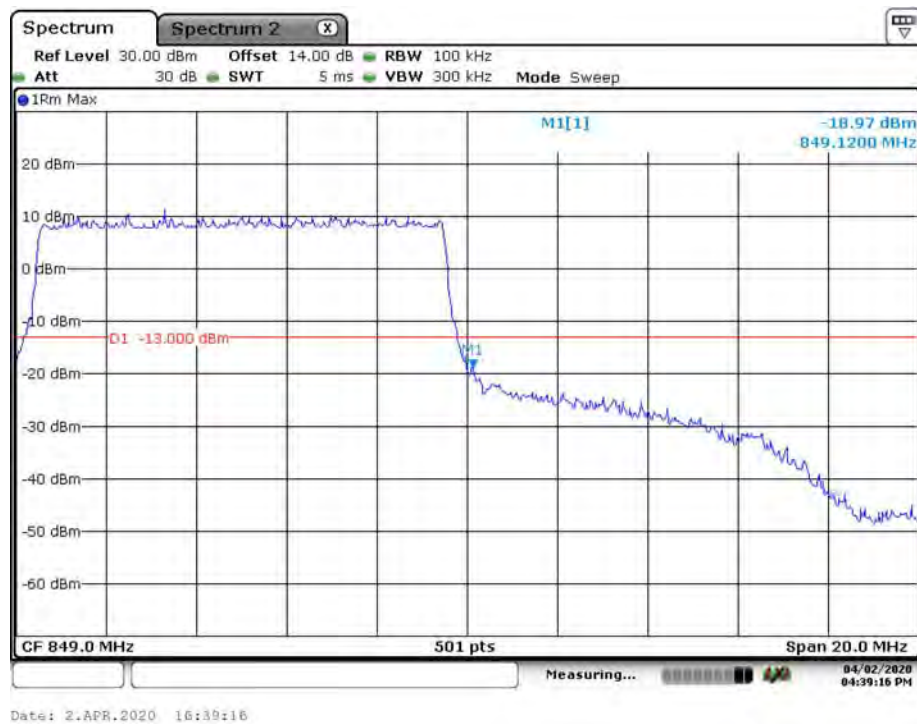
Band 5_10 MHz_Low_16QAM_RB50#0



Band 5_10 MHz_High_QPSK_RB50#0

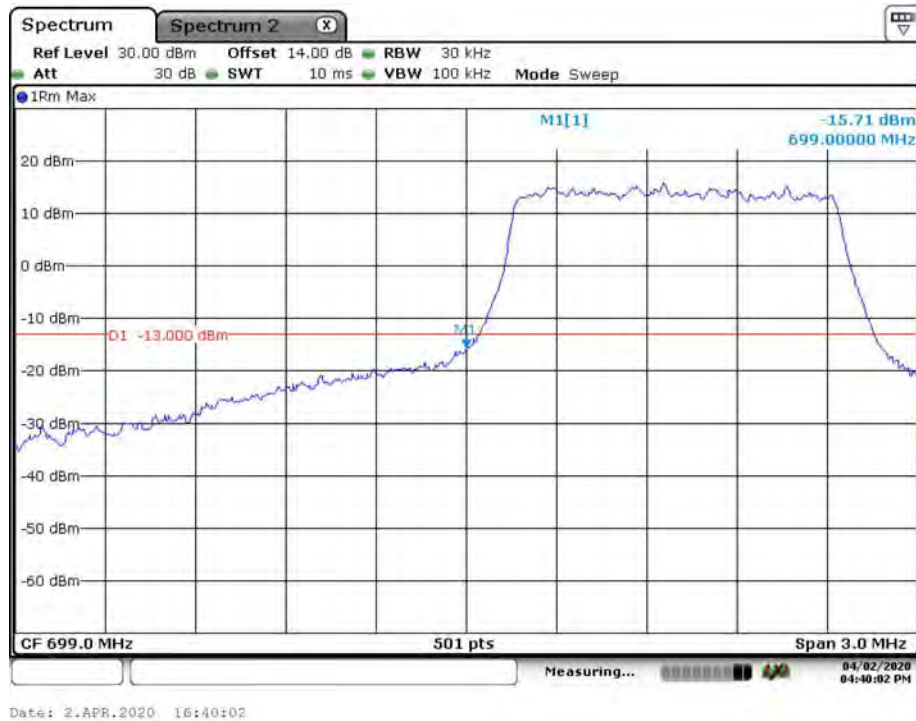


Band 5_10 MHz_High_16QAM_RB50#0



LTE Band 12

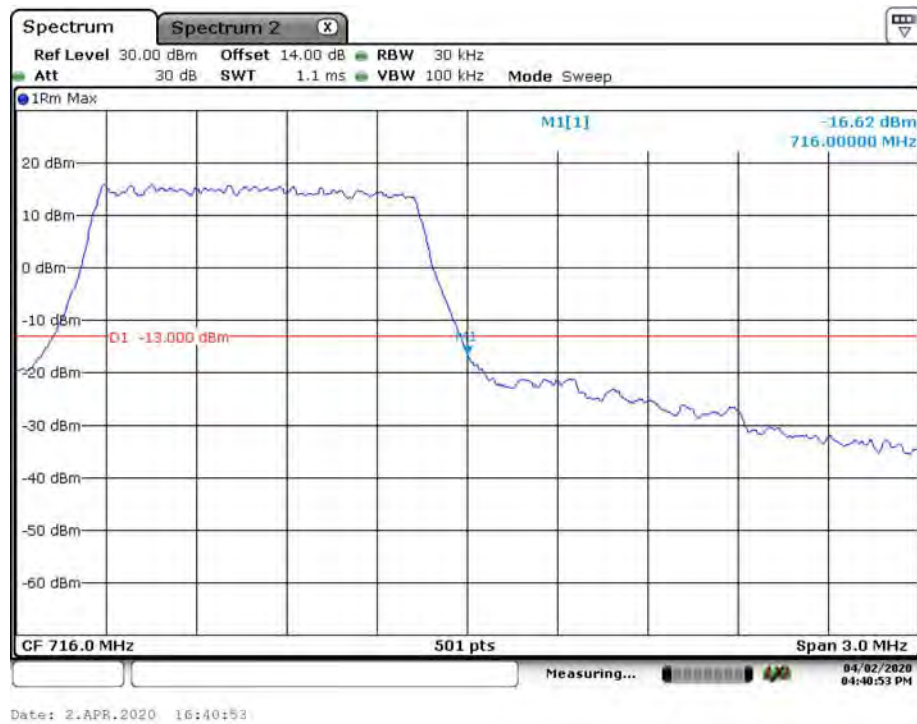
Band 12_1.4MHz_Low_QPSK_RB6#0



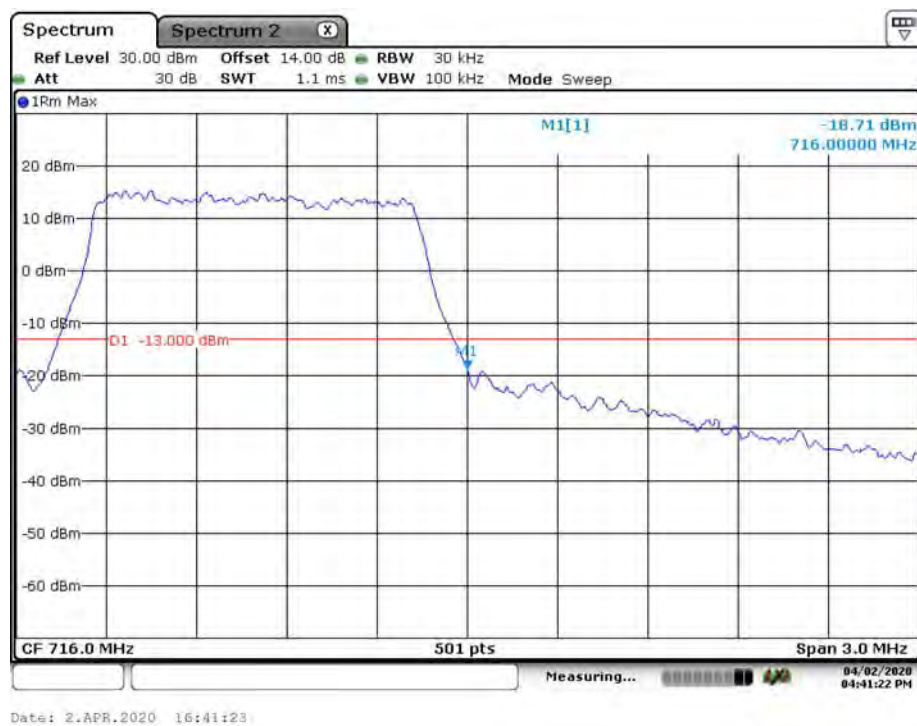
Band 12_1.4 MHz_Low_16QAM_RB6#0



Band 12_1.4MHz_High_QPSK_RB6#0



Band 12_1.4MHz_High_16QAM_RB6#0



Spectrum **Spectrum 2** X

Ref Level 30.00 dBm Offset 14.00 dB RBW 30 kHz
 Att 30 dB SWT 1.1 ms VBW 100 kHz Mode Sweep

1Rm Max

M1[1] -21.17 dBm
 699.0000 MHz

O1 -13.000 dBm

CF 699.0 MHz 501 pts Span 6.0 MHz

Measuring...

Spectrum Spectrum 2 X

Ref Level	30.00 dBm	Offset	14.00 dB	RBW	30 kHz
Att	30 dB	SWT	1.1 ms	VBW	100 kHz
Mode Sweep					

● IRm Max

Plot Area:

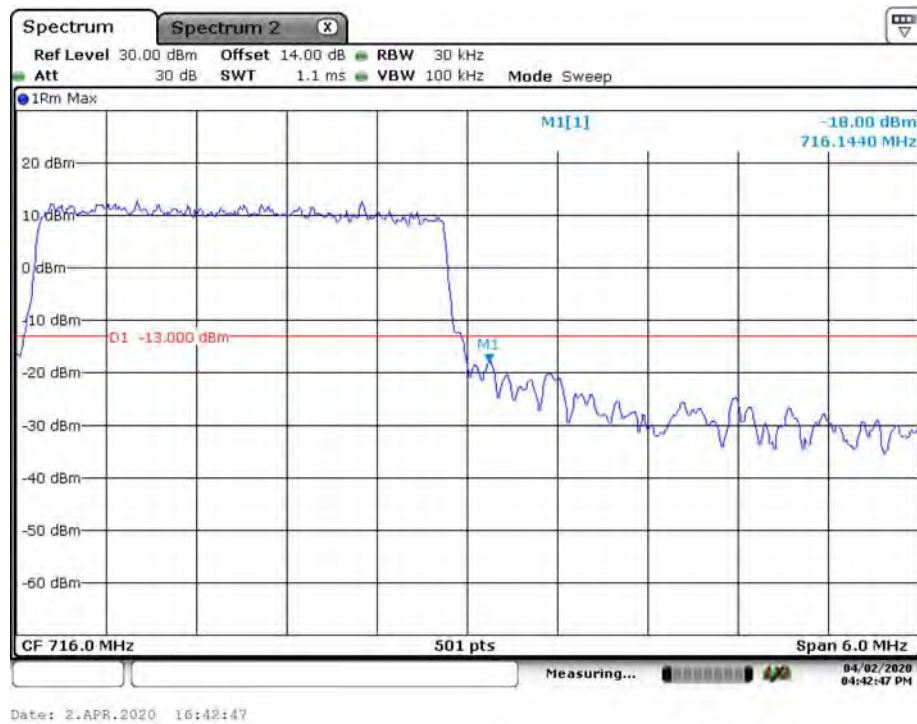
- Y-axis: Power (dBm) from -60 to 20.
- X-axis: Frequency (MHz) from 699.0 to 705.0.
- Trace: Blue line showing signal power.
- Marker M1[1] at 698.9640 MHz, -22.58 dBm.
- Marker O1 at -13.000 dBm.

CF 699.0 MHz 501 pts Span 6.0 MHz

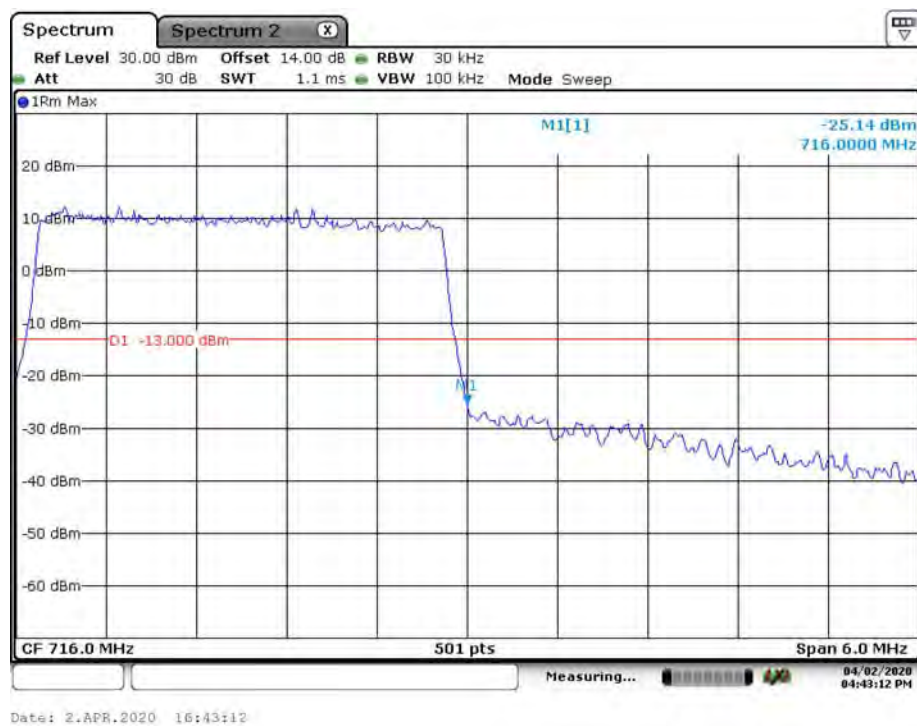
Measuring...

Date: 2.APR.2020 16:42:25

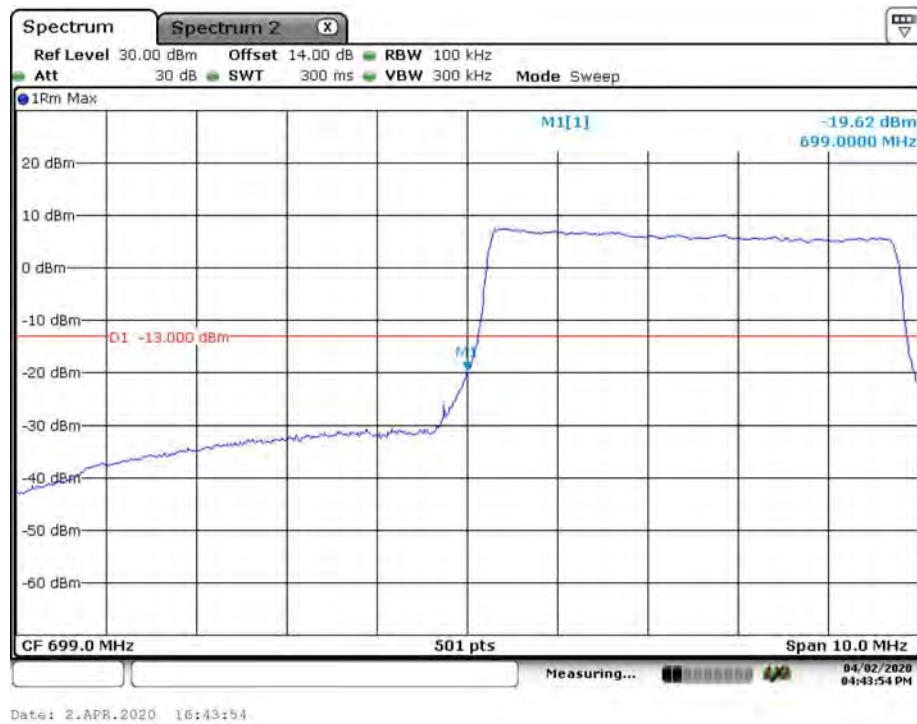
Band 12_3 MHz_High_QPSK_RB15#0



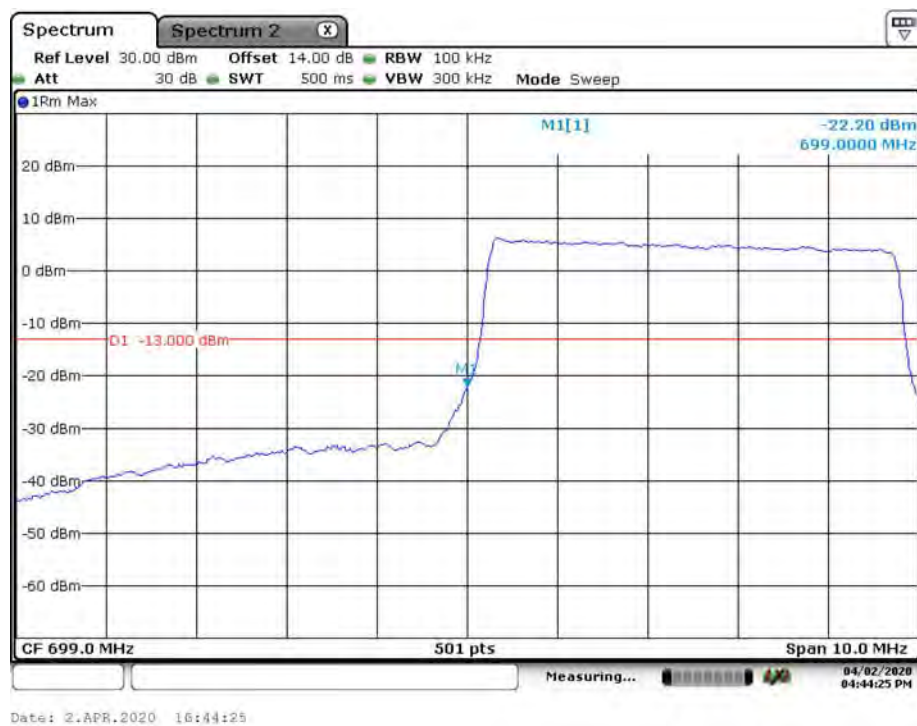
Band 12_3 MHz_High_16QAM_RB15#0



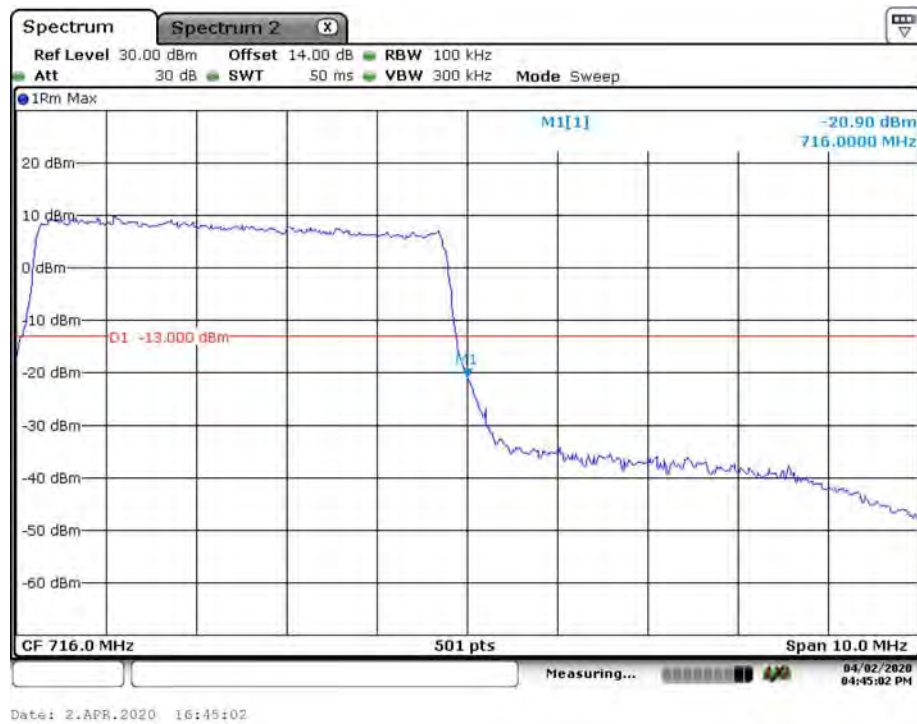
Band 12_5 MHz_Low_QPSK_RB25#0



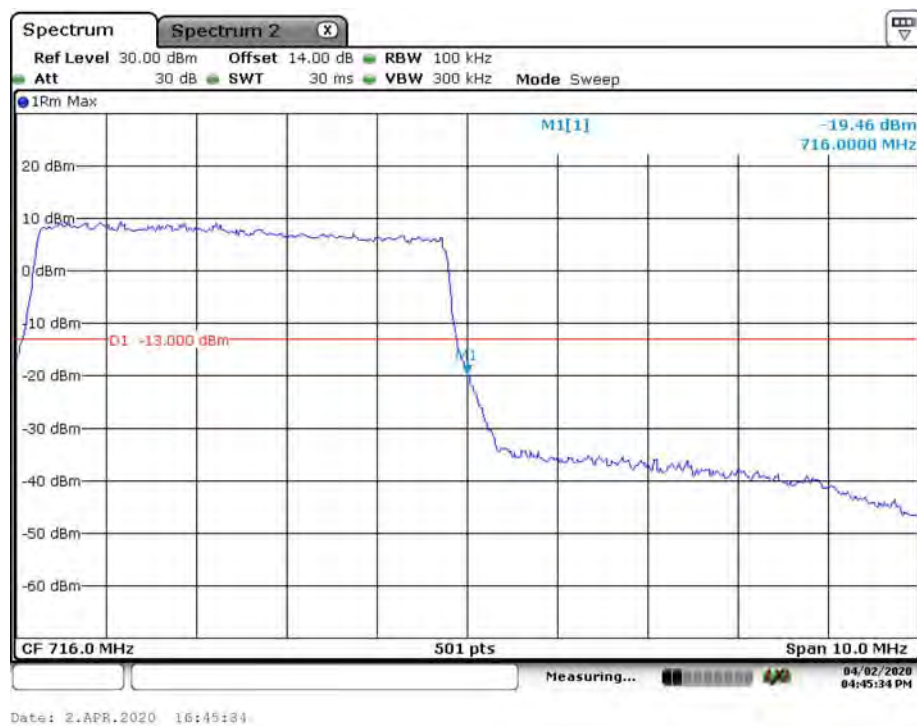
Band 12_5 MHz_Low_16QAM_RB25#0



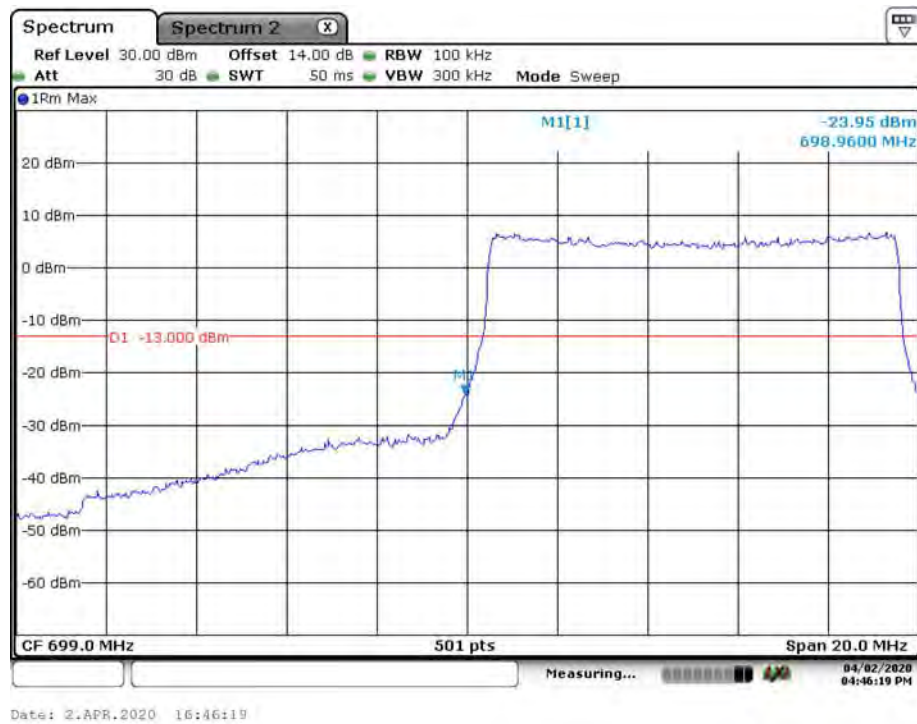
Band 12_5 MHz_High_QPSK_RB25#0



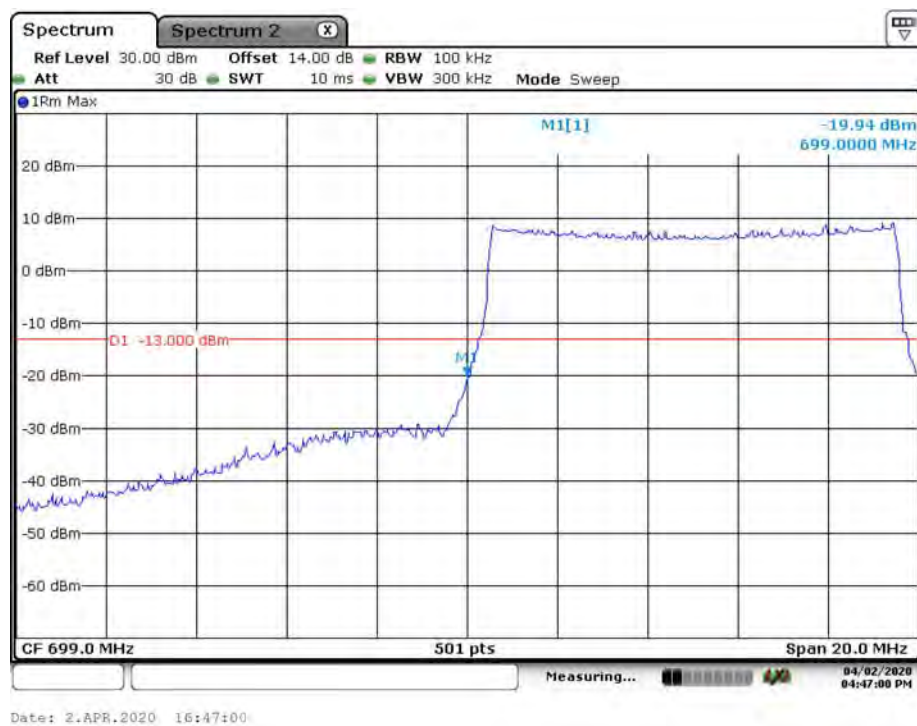
Band 12_5 MHz_High_16QAM_RB25#0



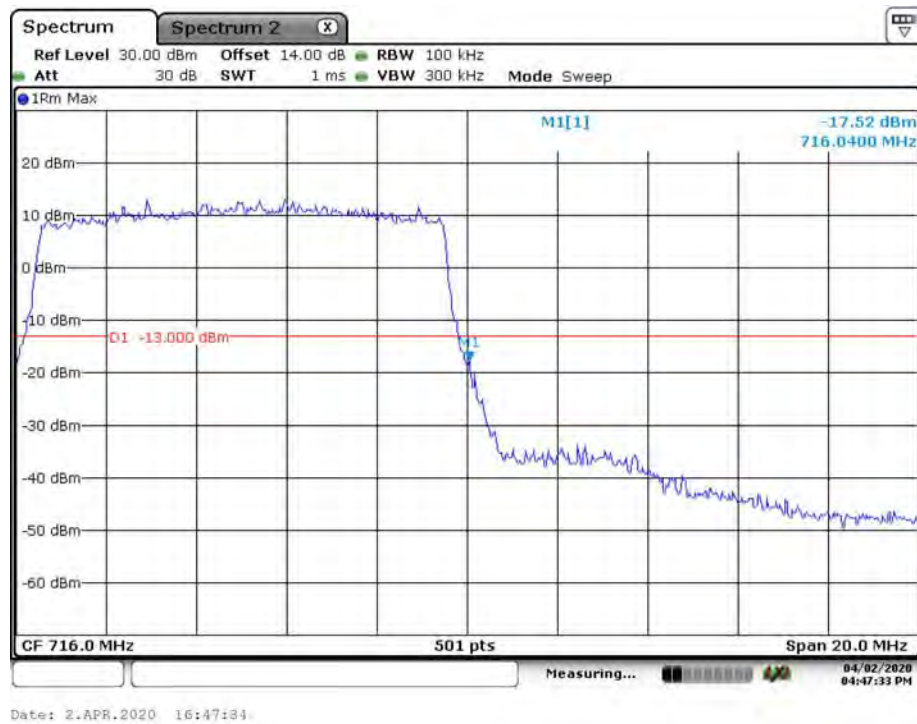
Band 12_10 MHz_Low_QPSK_RB50#0



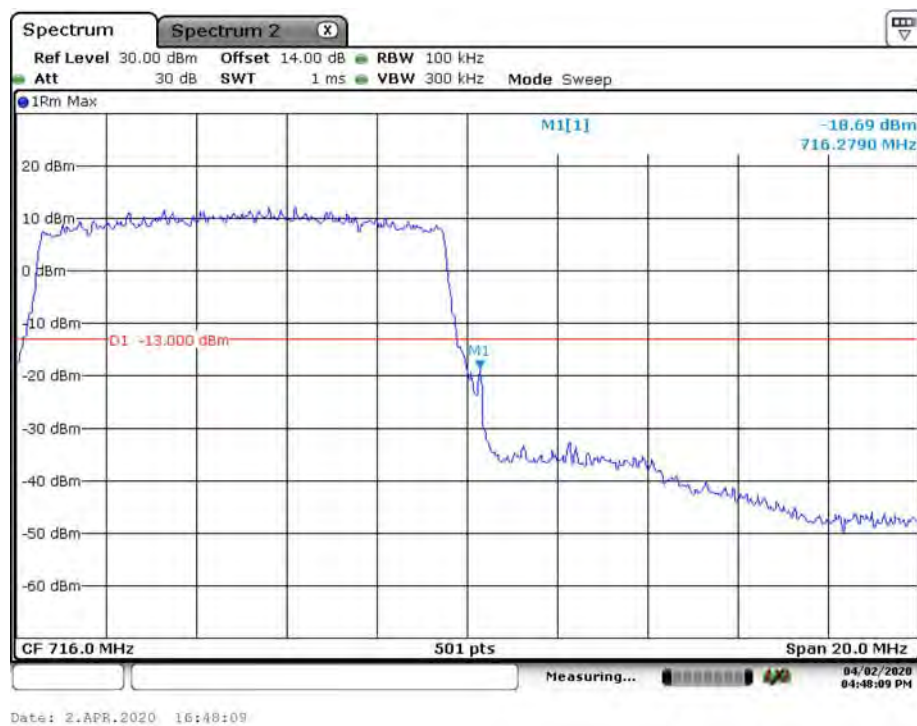
Band 12_10 MHz_Low_16QAM_RB50#0



Band 12_10 MHz_High_QPSK_RB50#0



Band 12_10 MHz_High_16QAM_RB50#0



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

Applicable Standard

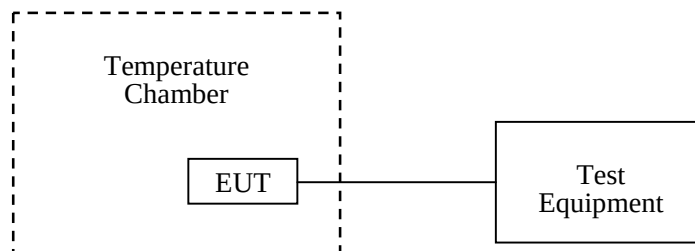
FCC § 2.1055 (a), § 2.1055 (d), §22.355, §24.235, §27.54

Test Procedure

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

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

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



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSV40	101474	2020-01-09	2021-01-09
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41005011	Each time	N/A
Unknown	Coaxial Cable	C-SJ00-0010	C0010/02	Each time	N/A
yzjingcheng	Coaxial Cable	KTRFBU-141-50	41010013	Each time	N/A
Unknown	Coaxial Cable	C-SJ00-0010	C0010/03	Each time	N/A
E-Microwave	Blocking Control	EMDCB-00036	OE01203218	Each time	N/A
E-Microwave	Coaxial Attenuators	EMCA10-5RN-6	OE01203239	Each time	N/A
R&S	Universal Radio Communication Tester	CMU200	110 822	2019-09-12	2020-09-12
R&S	Wideband Radio Communication Tester	CMW500	149216	2019-09-12	2020-09-12
ESPEC	Constant temperature and humidity Tester	ESX-4CA	018 463	2020-03-26	2021-03-26
UNI-T	Multimeter	UT39A	M130199938	2019-07-24	2020-07-24
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 °C
Relative Humidity:	55 %
ATM Pressure:	101.4kPa
Tester:	Fay Hu
Test Date:	2020-04-01

Test Result: Compliance.

Cellular Band

GMSK, Middle Channel, $f_c = 836.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	V _{DC}	Hz	ppm	ppm
-30	3.7	12	0.01434	2.5
-20		13	0.01554	
-10		15	0.01793	
0		8	0.00956	
10		12	0.01434	
20		20	0.02391	
30		24	0.02869	
40		29	0.03466	
50		56	0.06694	
20	3.5	24	0.02869	
20	4.2	53	0.06335	

PCS Band

GMSK, Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Results
°C	V _{DC}	Hz	ppm	
-30	3.7	27	0.01436	Pass
-20		58	0.03085	
-10		64	0.03404	
0		21	0.01117	
10		114	0.06064	
20		115	0.06117	
30		76	0.04043	
40		51	0.02713	
50		34	0.01809	
20	3.5	12	0.00638	
20	4.2	67	0.03564	

WCDMA Band II: R99

Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V _{DC}	Hz	ppm	
-30	3.7	45	0.02394	Pass
-20		54	0.02872	
-10		32	0.01702	
0		-64	-0.03404	
10		-1	-0.00053	
20		-12	-0.00638	
30		21	0.01117	
40		34	0.01809	
50		64	0.03404	
20	3.5	5	0.00266	
20	4.2	4	0.00213	

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	3.7	24	0.02869	2.5
-20		68	0.08128	
-10		75	0.08965	
0		74	0.08845	
10		21	0.02510	
20		-14	-0.01673	
30		54	0.06455	
40		-91	-0.10877	
50		-65	-0.07770	
20	3.5	-12	-0.01434	
20	4.2	-15	-0.01793	

LTE Band 2:

QPSK, Channel Bandwidth:10MHz Middle Channel, $f_c = 1880$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V _{DC}	Hz	ppm	
-30	3.7	-15.02	-0.008	Pass
-20		-9.97	-0.0053	
-10		-6.13	-0.0033	
0		6.17	0.0033	
10		7.92	0.0042	
20		6.46	0.0034	
30		-6.52	-0.0035	
40		7.18	0.0038	
50		-9.69	-0.0052	
20	3.5	-8.17	-0.0043	
20	4.2	-7.05	-0.0038	

16QAM, Channel Bandwidth:10MHz Middle Channel, $f_c = 1880$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V _{DC}	Hz	ppm	
-30	3.7	-10.34	-0.0055	Pass
-20		-6.68	-0.0036	
-10		9.77	0.0052	
0		-7.62	-0.0041	
10		-9.91	-0.0053	
20		-9.82	-0.0052	
30		-6.68	-0.0036	
40		-8.85	-0.0047	
50		5.67	0.003	
20	3.5	6.05	0.0032	
20	4.2	7.52	0.004	

LTE Band 4

QPSK, Channel Bandwidth:10MHz					
Power Supplied	Temperature	F_L	Limit	F_H	Limit
Vdc	°C	MHz	MHz	MHz	MHz
3.7	-30	1710.2424	1710	1754.6822	1755
	-20	1710.2128		1754.8374	
	-10	1710.1818		1754.8065	
	0	1710.2541		1754.8977	
	10	1710.2326		1754.748	
	20	1710.6226		1754.3474	
	30	1710.1652		1754.5102	
	40	1710.3402		1754.7111	
	50	1710.2828		1754.9133	
3.5	20	1710.5532	1710	1754.9470	1755
4.2	20	1710.1863		1754.5010	

16QAM, Channel Bandwidth:10MHz					
Power Supplied	Temperature	F_L	Limit	F_H	Limit
Vdc	°C	MHz	MHz	MHz	MHz
3.7	-30	1710.6652	1710	1754.9312	1755
	-20	1710.1566		1754.5929	
	-10	1710.6657		1754.8074	
	0	1710.3455		1754.8729	
	10	1710.2845		1754.7428	
	20	1710.6617		1754.3512	
	30	1710.1684		1754.8020	
	40	1710.3455		1754.8019	
	50	1710.2874		1754.9312	
3.5	20	1710.3426	1710	1754.6825	1755
4.2	20	1710.2888		1754.8342	

LTE Band 5

QPSK, Channel Bandwidth:10MHz Middle Channel, $f_c = 836.5$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	V_{DC}	Hz	ppm	ppm
-30	3.7	-7.81	-0.0093	2.5
-20		-6.97	-0.0083	
-10		-5.50	-0.0066	
0		6.06	0.0072	
10		9.80	0.0117	
20		5.03	0.006	
30		-6.62	-0.0079	
40		-8.73	-0.0104	
50		-7.05	-0.0084	
20	3.5	8.99	0.0107	
20	4.2	-7.17	-0.0086	

16QAM, Channel Bandwidth:10MHz Middle Channel, $f_c = 836.5$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	V_{DC}	Hz	ppm	ppm
-30	3.7	-5.75	-0.0069	2.5
-20		8.10	0.0097	
-10		-8.59	-0.0103	
0		9.33	0.0112	
10		-6.94	-0.0083	
20		7.54	0.009	
30		6.43	0.0077	
40		-6.17	-0.0074	
50		-6.44	-0.0077	
20	3.5	6.34	0.0076	
20	4.2	-6.89	-0.0082	

LTE Band 12:

QPSK, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
°C	V_{DC}	F_L	F_H	F_L	F_H
-30	3.7	699.5387	715.5112	699	716
-20		699.4982	715.5242	699	716
-10		699.4945	715.5144	699	716
0		699.5056	715.5222	699	716
10		699.5144	715.5123	699	716
20		699.5456	715.4677	699	716
30		699.4944	715.5211	699	716
40		699.5056	715.4450	699	716
50		699.4974	715.4470	699	716
20	3.5	699.5351	715.5788	699	716
20	4.2	699.5105	715.5222	699	716

16QAM, Channel Bandwidth:10MHz					
Temperature	Voltage	Test Result (MHz)		Limit (MHz)	
°C	V_{DC}	F_L	F_H	F_L	F_H
-30	3.7	699.5228	715.5125	699	716
-20		699.5117	715.5025	699	716
-10		699.4818	715.4910	699	716
0		699.5252	715.5010	699	716
10		699.4912	715.5077	699	716
20		699.5477	715.4977	699	716
30		699.5042	715.5012	699	716
40		699.5126	715.5112	699	716
50		699.5297	715.5112	699	716
20	3.5	699.5041	715.5087	699	716
20	4.2	699.4978	715.5271	699	716

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 *******