

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

For

BBPOS International Limited

Suite 1903-04, 19/F, Tower 2, Nina Tower, No.8 Yeung UK Road, Tsuen Wan, N.T. HK

FCC ID: 2AB7X-WISEPOSE

Report Type: Original Report	Product Type: WisePOS E
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TABLE OF CONTENTS

GENERAL INFORMATION.....	4
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	4
OBJECTIVE	4
RELATED SUBMITTAL(S)/GRANT(S).....	4
TEST METHODOLOGY	5
MEASUREMENT UNCERTAINTY	5
TEST FACILITY	5
SYSTEM TEST CONFIGURATION	6
JUSTIFICATION	6
CHANNEL LIST	6
EQUIPMENT MODIFICATIONS	8
SUPPORT EQUIPMENT LIST AND DETAILS	8
EXTERNAL I/O CABLE.....	8
BLOCK DIAGRAM OF TEST SETUP	9
SUMMARY OF TEST RESULTS	10
TEST EQUIPMENT LIST	11
FCC §1.1307(B) & §2.1093 - RF EXPOSURE INFORMATION.....	13
TEST RESULT	13
FCC §2.1047 - MODULATION CHARACTERISTIC	14
FCC §2.1046; § 22.913 (A); § 24.232 (C); §27.50 H(2) - RF OUTPUT POWER	15
APPLICABLE STANDARDS.....	15
TEST PROCEDURE	15
TEST DATA	16
FCC §2.1049, §22.917, §22.905 & §24.238, §27.53- OCCUPIED BANDWIDTH	35
APPLICABLE STANDARDS.....	35
TEST PROCEDURE	35
TEST DATA	35
FCC § 2.1051; § 22.917 (A); § 24.238 (A); §27.53 (M) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS	64
APPLICABLE STANDARDS.....	64
TEST PROCEDURE	64
TEST DATA	64
FCC § 2.1053; § 22.917 (A); § 24.238 (A)& §27.53 (M) - SPURIOUS RADIATED EMISSIONS	109
APPLICABLE STANDARDS.....	109
TEST PROCEDURE	109
TEST DATA	110
FCC § 22.917 (A); § 24.238 (A); §27.53 (M) - BAND EDGES	116
APPLICABLE STANDARDS.....	116
TEST PROCEDURE	116
TEST DATA	116
FCC § 2.1055; § 22.355; § 24.235; §27.54- FREQUENCY STABILITY	161

APPLICABLE STANDARDS.....	161
TEST PROCEDURE	161
TEST DATA	162

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Applicant:	BBPOS International Limited
Tested Model:	WisePOS E
Product Type:	WisePOS E
Power Supply:	DC 3.7V from battery
RF Function:	GPRS/EGPRS, WCDMA, LTE
Operating Band/Frequency:	GPRS/EGPRS 850: 824-849 MHz(TX), 869-894 MHz(RX) PCS1900: 1850MHz-1910MHz(TX), 1930MHz-1990MHz(RX) WCDMA Band II: 1850-1910 MHz MHz(TX), 1930-1990 MHz(RX) WCDMA Band V: 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), 2570-2620 MHz(RX) LTE Band 41: 2555-2655 MHz(TX), 2555-2655MHz(RX)
Modulation Type:	GPRS/EGPRS: GMSK/8PSK; WCDMA: BPSK,QPSK,16QAM LTE: QPSK,16QAM
Antenna Type:	FPC Antenna
Maximum Antenna Gain:	0.5dBi

**All measurement and test data in this report was gathered from production sample serial number: 20200310001. (Assigned by the BACL. The EUT supplied by the applicant was received on 2020-03-10)*

Objective

This type approval report is prepared on behalf of *BBPOS International Limited* in accordance with Part 2, Part 22-Subpart H and Part 24-Subpart E , Part 27 of the Federal Communication Commission's rules.

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

Related Submittal(s)/Grant(s)

FCC Part 15.247 DSS submissions with FCC ID: 2AB7X-WISEPOSE
FCC Part 15.247 DTS submissions with FCC ID: 2AB7X-WISEPOSE
FCC Part 15.407 NII submissions with FCC ID: 2AB7X-WISEPOSE
FCC Part 15.225 DXX submissions with FCC ID: 2AB7X-WISEPOSE

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.

All radiated and conducted emissions measurements were performed at Bay Area Compliance Laboratories Corp. (Kunshan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Item		Uncertainty
AC Power Lines Conducted Emissions		3.19dB
RF conducted test with spectrum		0.9dB
RF Output Power with Power meter		0.5dB
Radiated emission	30MHz~1GHz	5.91dB
	1GHz~6GHz	4.68dB
	6GHz~18GHz	4.92dB
	18GHz~40GHz	5.21dB
Occupied Bandwidth		0.5kHz
Temperature		1.0°C
Humidity		6%

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan, Jiangsu province, China.

Bay Area Compliance Laboratories Corp. (Kunshan) Lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4323.01) and the FCC designation No. CN1185 under the FCC KDB 974614 D01. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

SYSTEM TEST CONFIGURATION

Justification

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

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

Channel List

Mode		Channel		Frequency (MHz)
GPRS/EGPRS 850		Low	128	824.2
		Middle	190	836.6
		High	251	848.8
WCDMA Band V		Low	4132	826.4
		Middle	4183	836.6
		High	4233	846.6
GPRS/EGPRS 1900		Low	512	1850.2
		Middle	661	1880.0
		High	810	1909.8
WCDMA Band II		Low	9262	1852.4
		Middle	9400	1880.0
		High	9538	1907.6
LTE Band 5	1.4M	Low	20407	824.7
		Middle	20525	836.5
		High	20643	848.3
	3M	Low	20415	825.5
		Middle	20525	836.5
		High	20635	847.5
	5M	Low	20425	826.5
		Middle	20525	836.5
		High	20625	846.5
	10M	Low	20450	829.0
		Middle	20525	836.5
		High	20600	844.0

Mode		Channel		Frequency (MHz)
LTE Band 7	5M	Low	20775	2502.5
		Middle	21100	2535.0
		High	21425	2567.5
	10M	Low	20800	2505.0
		Middle	21100	2535.0
		High	21400	2565.0
	15M	Low	20825	2507.5
		Middle	21100	2535.0
		High	21375	2562.5
	20M	Low	20850	2510.0
		Middle	21100	2535.0
		High	21350	2560.0
LTE Band 38	5M	Low	37775	2572.5
		Middle	38000	2595.0
		High	38225	2617.5
	10M	Low	37800	2575.0
		Middle	38000	2595.0
		High	38200	2615.0
	15M	Low	37825	2577.5
		Middle	38000	2595.0
		High	38175	2612.5
	20M	Low	37850	2580.0
		Middle	38000	2595.0
		High	38150	2610.0
LTE Band 41	5M	Low	40265	2557.5
		Middle	40740	2605.0
		High	41215	2652.5
	10M	Low	40290	2560.0
		Middle	40740	2605.0
		High	41190	2650.0
	15M	Low	40315	2562.5
		Middle	40740	2605.0
		High	41165	2647.5
	20M	Low	40340	2565.0
		Middle	40740	2605.0
		High	41140	2645.0

Equipment Modifications

No modifications were made to the EUT.

Support Equipment List and Details

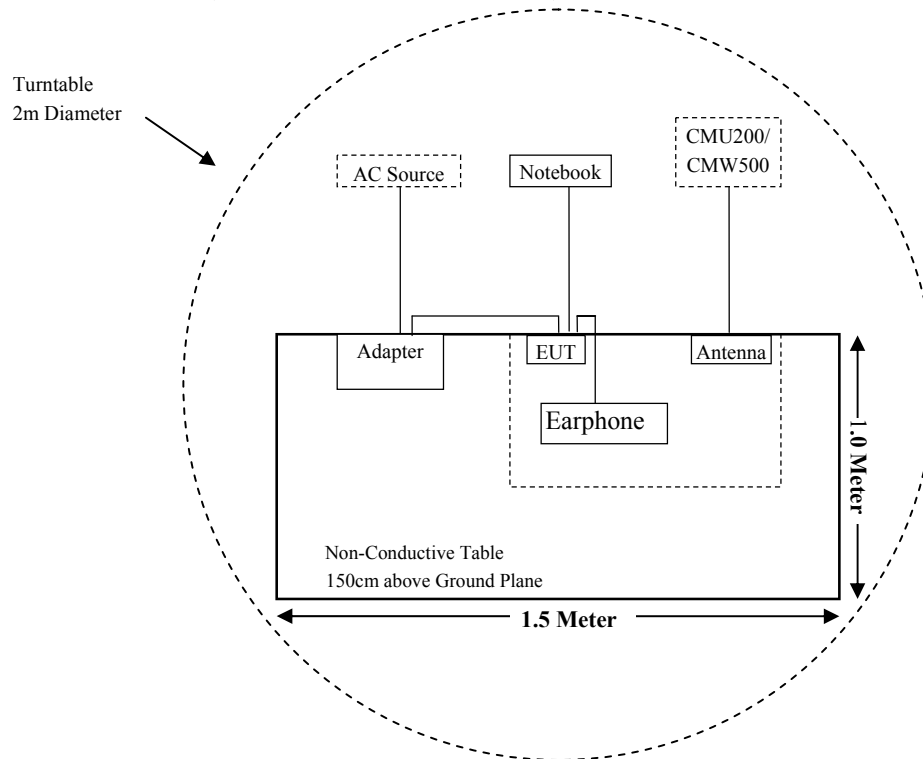
Manufacturer	Description	Model	Serial Number
Aihuaxin technology	Antenna	/	/
Rohde & Schwarz	UNIVERSAL RADIO COMMUNICATION TESTER	CMU200	110605
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	104478
MASON	Adapter	/	/
Bold	Earphone	/	/
DELL	Notebook	GX620	D65874152

External I/O Cable

Cable Description	Length (m)	From Port	To
USB Cable	1.2	EUT	Adapter
Power Cable	1.0	Adapter	AC Source

Block Diagram of Test Setup

For Radiated Emissions (Below 1GHz & Above 1GHz):



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§1.1307(b)(1)& §2.1093	RF Exposure Information	Compliant
§2.1046; § 22.913 (a); § 24.232 (c); 27.50 h(2)	RF Output Power	Compliant
§ 2.1047	Modulation Characteristics	Not Applicable
§ 2.1049; § 22.905;§ 22.917; § 24.238; §27.53	Occupied Bandwidth	Compliant
§ 2.1051; § 22.917 (a); § 24.238 (a); §27.53(m)	Spurious Emissions at Antenna Terminal	Compliant
§ 2.1053; § 22.917 (a) § 24.238 (a); §27.53 (m);	Spurious Radiated Emissions	Compliant
§ 22.917 (a); § 24.238 (a);	Band Edge	Compliant
§ 2.1055; § 22.355; § 24.235;§ 27.54	Frequency stability	Compliant

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test (Chamber 1#)					
Rohde & Schwarz	EMI Test Receiver	ESCI	100195	2019-12-14	2020-12-13
HP	Signal Generator	HP 8341B	2624A00116	2019-11-30	2020-11-29
Sunol Sciences	Broadband Antenna	JB3	A090413-1	2017-12-26	2020-12-25
Sunol Sciences	Bilog antenna	JB3	A060217	2017-08-04	2020-08-03
Sonoma Instrunent	Pre-amplifier	310N	171205	2019-08-14	2020-08-13
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-6	006	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-8	008	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-9	009	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-10	010	2019-08-15	2020-08-14
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	110605	2020-04-01	2021-03-31
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	104478	2019-08-05	2020-08-04
Radiated Emission Test (Chamber 2#)					
HP	Signal Generator	HP 8341B	2624A00116	2019-11-30	2020-11-29
Rohde & Schwarz	EMI Test Receiver	ESU40	100207	2020-04-01	2021-03-31
ETS-LINDGREN	Horn Antenna	3115	9207-3900	2017-07-15	2020-07-14
ETS-LINDGREN	Horn Antenna	3115	6229	2020-01-10	2023-01-09
ETS-LINDGREN	Horn Antenna	3116	00084159	2019-12-12	2022-12-11
ETS-LINDGREN	Horn Antenna	3116	2516	2020-01-17	2023-01-16
A.H.Systems,inc	Amplifier	PAM-0118P	512	2020-02-20	2021-02-19
EM Electronics Corporation	Amplifier	EM18G40G	060726	2020-03-22	2021-03-21
Rohde & Schwarz	Auto test Software	EMC32	100361	/	/
MICRO-COAX	Coaxial Cable	Cable-6	006	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-11	011	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-12	012	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-13	013	2019-08-15	2020-08-14
MICRO-COAX	Coaxial Cable	Cable-16	016	2019-08-15	2020-08-14
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	110605	2020-04-01	2021-03-31
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	104478	2019-08-05	2020-08-04

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde & Schwarz	Signal Analyzer	FSIQ26	836131/009	2019-12-14	2020-12-13
Rohde & Schwarz	EMI Test Receiver	ESIB26	100146	2019-12-14	2020-12-13
Narda	Attenuator	10dB	010	2019-08-15	2020-08-14
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	110605	2020-04-01	2021-03-31
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	104478	2019-08-05	2020-08-04
Mini-Circuits	Power splitter	ZFRSC-14-S+	SF019411452	2019-11-10	2020-11-09
BACL	Temperature & Humidity Chamber	BTH-150	30023	2019-12-20	2020-12-19
EAST	Regulated DC Power Supply	MCH-303D-II	14070562	2019-10-10	2020-10-09
BBPOS International Limited	RF Cable	BBPOS International Limited C01	C01	Each Time	/

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

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

Applicable Standard

FCC§1.1307,§2.1093.

Test Result

Compliance, please refer to the SAR report: RKSA200310001-20C.

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 h(2) - RF OUTPUT POWER**Applicable Standards**

According to FCC §2.1046 and §22.913 (a), the ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts (38.45dBm).

According to FCC §2.1046 and §24.232 (c), mobile and portable stations are limited to 2 watts (33dBm) EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

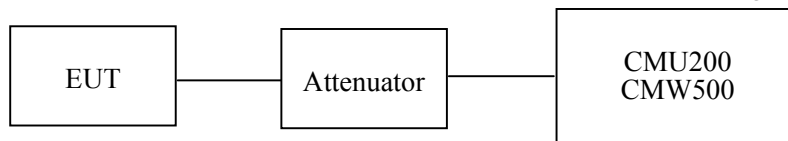
According to §27.50(h) (2), Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

According to FCC §2.1046, The maximum output power of the transmitter for mobile stations is 100 watts (20 dBw)

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

Test Procedure***Conducted method:***

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

***Radiated Output Power:***

The measurements procedures specified in ANSI/TIA-603-D were applied.

a) Connect the equipment as illustrated. Mount the equipment with the manufacturer specified antenna in a vertical orientation on a manufacturer specified mounting surface located on a non-conducting rotating platform of a RF anechoic chamber (preferred) or a standard radiation site.

b) Key the transmitter, then rotate the EUT 360o azimuthally and record spectrum analyzer power level (LVL) measurements at angular increments that are sufficiently small to permit resolution of all peaks. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading at each angular increment. (Note: several batteries may be needed to offset the effect of battery voltage droop, which should not exceed 5% of the manufactured specified battery voltage during transmission).

c) Replace the transmitter under test with a vertically polarized half-wave dipole (or an antenna whose gain is known relative to an ideal half-wave dipole). The center of the antenna should be at the same location as the center of the antenna under test.

d) Connect the antenna to a signal generator with a known output power and record the path loss (in dB) as LOSS. If a standard radiation test site is used, raise and lower the test antenna to obtain a maximum reading. $LOSS = \text{Generator Output Power (dBm)} - \text{Analyzer reading (dBm)}$

e) Determine the effective radiated output power at each angular position from the readings in steps b) and d) using the following equation:

$$\text{ERP (dBm)} = \text{LVL (dBm)} + \text{LOSS (dB)}$$

f) The maximum ERP is the maximum value determined in the preceding step.

(Note: Effective Isotropic Radiated Power (EIRP) can be computed using the following:

$$\text{EIRP (dBm)} = \text{ERP (dBm)} + 2.15 \text{ (dB)}$$

Test Data

Environmental Conditions

Temperature:	23.2℃
Relative Humidity:	53%
ATM Pressure:	101.3kPa

The testing was performed by Stone Zhang on 2020-04-28.

Conducted Power:

GPRS/EGPRS 850 Band

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.20	33.57	33.21	32.77	32.13	38.45
	190	836.60	33.14	32.69	32.29	31.50	38.45
	251	848.80	33.46	33.31	33.09	32.89	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	128	824.20	26.40	26.15	25.83	25.61	38.45
	190	836.60	26.21	26.06	25.76	25.35	38.45
	251	848.80	26.37	26.04	25.78	25.49	38.45

WCDMA Band V

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band V)	Normal	Rel 99	1	22.89	22.73	22.92
		HSDPA	1	22.16	22.03	22.18
			2	22.18	22.04	22.13
			3	22.10	21.97	22.27
			4	22.02	22.05	22.10
		HSUPA	1	22.03	22.12	22.07
			2	22.09	21.93	22.23
			3	22.09	22.01	22.14
			4	22.12	22.10	22.25
			5	22.06	21.95	22.11
		HSPA+	1	22.02	22.05	22.23

PCS 1900 Band

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	31.61	29.87	29.06	28.58	33
	661	1880.0	30.87	29.23	28.56	28.14	33
	810	1909.8	31.27	29.59	28.93	28.53	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	512	1850.2	24.68	23.96	23.40	22.83	33
	661	1880.0	25.09	24.60	23.76	23.20	33
	810	1909.8	25.77	25.20	24.58	24.12	33

WCDMA Band II

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band II)	Normal	Rel 99	1	22.91	22.69	22.86
		HSDPA	1	22.16	22.15	22.17
			2	22.28	22.00	22.06
			3	22.11	22.13	22.17
			4	22.34	21.97	22.14
		HSUPA	1	22.18	22.09	22.20
			2	22.28	22.12	22.10
			3	22.19	22.12	22.12
			4	22.24	22.03	22.18
			5	22.31	22.01	22.08
		HSPA+	1	22.18	22.12	22.21

Maximum Output Power:**LTE Band 5**

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4M	QPSK	1#0	21.68	21.98	21.85
		1#3	21.62	22.09	21.87
		1#5	21.50	22.05	21.95
		3#0	21.50	22.15	22.05
		3#1	21.46	22.18	22.12
		3#3	21.54	22.22	22.12
		6#0	21.51	22.24	22.10
	16-QAM	1#0	21.41	22.19	22.00
		1#3	21.40	22.27	21.93
		1#5	21.43	22.32	22.02
		3#0	21.45	22.28	21.99
		3#1	21.48	22.38	21.97
		3#3	21.47	22.47	22.04
		6#0	21.45	22.38	22.11
3M	QPSK	1#0	21.42	22.43	22.14
		1#7	21.34	22.49	22.07
		1#14	21.28	22.44	22.04
		8#0	21.30	22.46	22.10
		8#4	21.35	22.40	22.09
		8#7	21.33	22.40	22.19
		15#0	21.37	22.29	22.23
	16-QAM	1#0	21.39	22.29	22.27
		1#7	21.34	22.26	22.22
		1#14	21.34	22.19	22.33
		8#0	21.41	22.19	22.33
		8#4	21.46	22.10	22.25
		8#7	21.38	22.15	22.22
		15#0	21.37	22.15	22.15

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	21.37	22.07	22.08
		1#12	21.31	22.13	22.18
		1#24	21.37	22.08	22.21
		12#0	21.30	22.01	22.20
		12#6	21.22	21.98	22.19
		12#11	21.28	22.06	22.22
		25#0	21.16	22.07	22.30
	16-QAM	1#0	21.17	22.07	22.30
		1#12	21.12	22.06	22.38
		1#24	21.20	22.05	22.34
		12#0	21.14	22.12	22.36
		12#6	21.27	22.15	22.45
		12#11	21.32	22.16	22.52
		25#0	21.22	22.13	22.49
10M	QPSK	1#0	21.21	22.00	22.46
		1#24	21.23	21.97	22.43
		1#49	21.18	22.03	22.33
		25#0	21.17	22.06	22.30
		25#12	21.20	22.15	22.32
		25#24	21.19	22.23	22.38
		50#0	21.14	22.20	22.35
	16-QAM	1#0	21.22	22.31	22.24
		1#24	21.16	22.39	22.25
		1#49	21.17	22.46	22.28
		25#0	21.13	22.49	22.21
		25#12	21.12	22.38	22.28
		25#24	21.19	22.37	22.22
		50#0	21.10	22.28	22.23

LTE Band 7

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	22.11	21.51	21.28
		1#12	21.98	21.60	21.73
		1#24	21.70	21.64	21.79
		12#0	22.24	21.11	21.84
		12#6	21.37	22.02	21.80
		12#11	21.37	21.42	21.36
		25#0	21.76	21.42	21.31
	16-QAM	1#0	21.33	21.20	21.24
		1#12	22.11	21.73	21.69
		1#24	21.84	22.08	21.67
		12#0	21.28	21.24	21.53
		12#6	21.71	21.58	21.79
		12#11	21.41	21.60	21.40
		25#0	21.46	21.22	21.08
10M	QPSK	1#0	21.36	21.34	21.93
		1#24	21.88	21.39	21.46
		1#49	21.27	22.14	21.93
		25#0	21.83	21.67	22.17
		25#12	21.41	21.37	21.68
		25#24	21.19	21.57	21.68
		50#0	21.71	21.78	21.61
	16-QAM	1#0	21.15	21.79	21.78
		1#24	21.75	22.01	21.37
		1#49	21.28	21.35	21.60
		25#0	21.46	21.84	22.35
		25#12	21.97	21.31	22.03
		25#24	21.12	21.30	21.43
		50#0	21.48	21.69	21.77

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15M	QPSK	1#0	21.59	21.54	21.40
		1#37	21.51	21.83	21.31
		1#74	21.04	21.32	21.95
		36#0	21.51	21.62	21.94
		36#17	21.25	22.00	21.61
		36#35	21.22	21.25	21.34
		75#0	21.61	21.67	22.03
	16-QAM	1#0	21.51	21.10	21.72
		1#37	20.89	21.93	21.32
		1#74	21.55	21.43	22.04
		36#0	20.84	21.98	21.82
		36#17	20.86	21.42	21.59
		36#35	20.78	21.59	21.40
		75#0	21.56	21.43	21.99
20M	QPSK	1#0	21.69	21.24	21.43
		1#49	21.71	21.61	20.87
		1#99	21.19	21.50	21.75
		50#0	21.48	21.65	21.24
		50#24	21.56	21.14	21.35
		50#49	21.01	21.47	20.87
		100#0	21.54	21.84	21.80
	16-QAM	1#0	21.11	21.03	21.73
		1#49	21.56	21.04	21.04
		1#99	21.21	21.46	21.43
		50#0	21.77	21.87	21.76
		50#24	21.32	21.80	20.94
		50#49	21.57	21.39	21.74
		100#0	21.20	21.37	21.47

LTE Band 38

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	21.90	21.69	21.42
		1#12	22.22	21.29	21.81
		1#24	21.56	21.82	21.39
		12#0	21.97	21.99	21.79
		12#6	22.19	21.26	21.11
		12#11	21.68	21.91	21.88
		25#0	21.29	21.65	21.93
	16-QAM	1#0	21.86	21.60	21.38
		1#12	21.41	21.12	21.96
		1#24	22.06	21.87	21.68
		12#0	21.30	21.92	21.72
		12#6	21.27	22.04	21.50
		12#11	22.25	21.61	21.31
		25#0	22.23	21.91	21.59
10M	QPSK	1#0	21.69	21.24	21.60
		1#24	22.00	21.28	22.21
		1#49	21.13	21.73	22.25
		25#0	21.16	21.17	22.09
		25#12	21.81	21.16	22.10
		25#24	21.05	21.92	22.30
		50#0	21.55	22.03	21.76
	16-QAM	1#0	21.19	22.15	21.62
		1#24	21.19	21.94	22.32
		1#49	21.09	21.36	21.92
		25#0	21.93	21.25	21.85
		25#12	21.98	21.52	22.15
		25#24	21.07	21.47	21.94
		50#0	21.35	21.84	21.57

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15M	QPSK	1#0	20.80	21.87	21.84
		1#37	21.11	21.15	21.40
		1#74	21.38	21.59	21.63
		36#0	21.28	21.73	21.50
		36#17	21.12	21.56	21.49
		36#35	21.03	22.00	21.73
		75#0	21.17	21.73	22.00
	16-QAM	1#0	21.02	21.75	21.79
		1#37	21.61	21.46	21.74
		1#74	21.69	21.36	21.44
		36#0	21.19	21.41	21.26
		36#17	21.24	21.90	21.87
		36#35	21.51	21.53	21.94
		75#0	21.47	21.16	22.08
20M	QPSK	1#0	20.96	21.44	21.03
		1#49	21.22	21.25	21.45
		1#99	20.88	21.85	20.85
		50#0	21.25	21.63	21.24
		50#24	21.01	21.15	21.17
		50#49	21.24	21.76	21.59
		100#0	21.86	21.28	21.32
	16-QAM	1#0	21.60	21.83	21.75
		1#49	21.81	21.68	21.21
		1#99	21.67	20.97	21.68
		50#0	21.29	21.33	20.82
		50#24	21.20	21.10	21.22
		50#49	21.33	21.40	21.12
		100#0	20.89	21.63	21.45

LTE Band 41

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	21.41	21.84	21.54
		1#12	22.25	22.11	21.05
		1#24	21.76	22.02	21.32
		12#0	21.93	21.64	21.41
		12#6	21.75	21.33	21.48
		12#11	21.81	21.64	21.82
		25#0	22.13	21.99	21.83
	16-QAM	1#0	21.89	21.21	21.85
		1#12	21.55	21.62	21.89
		1#24	21.54	21.27	21.93
		12#0	21.32	22.04	21.14
		12#6	21.87	21.46	22.00
		12#11	22.16	21.81	21.70
		25#0	22.13	21.46	21.45
10M	QPSK	1#0	21.56	22.07	21.71
		1#24	22.00	22.06	21.72
		1#49	21.14	21.53	21.78
		25#0	21.51	21.95	22.19
		25#12	21.34	21.98	21.39
		25#24	21.37	21.37	21.75
		50#0	21.38	21.79	21.90
	16-QAM	1#0	22.00	21.89	21.60
		1#24	21.19	21.63	22.11
		1#49	21.79	21.95	22.08
		25#0	21.04	21.25	21.89
		25#12	21.44	21.22	22.16
		25#24	21.72	21.96	21.55
		50#0	21.85	21.73	22.29

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15M	QPSK	1#0	21.16	21.69	21.33
		1#37	21.05	21.69	21.92
		1#74	21.39	21.10	21.88
		36#0	21.26	21.38	22.05
		36#17	21.45	21.09	22.10
		36#35	21.52	21.64	21.72
		75#0	21.07	21.18	21.42
	16-QAM	1#0	21.03	21.50	21.34
		1#37	21.46	21.22	21.81
		1#74	21.21	22.06	21.70
		36#0	21.29	21.12	21.39
		36#17	21.16	21.62	21.57
		36#35	21.28	21.33	21.73
		75#0	21.04	21.88	21.80
20M	QPSK	1#0	21.10	21.30	21.65
		1#49	21.10	21.48	21.65
		1#99	21.60	21.06	21.75
		50#0	21.24	21.57	21.09
		50#24	21.08	21.34	21.35
		50#49	21.24	21.41	21.31
		100#0	21.48	21.38	21.33
	16-QAM	1#0	21.07	21.08	21.31
		1#49	21.44	21.24	21.10
		1#99	21.44	21.29	21.56
		50#0	21.82	21.84	21.69
		50#24	20.88	21.52	21.75
		50#49	21.61	21.50	21.21
		100#0	21.61	21.36	21.05

Peak-to-average ratio (PAR):**GPRS/ EGPRS 850 Band**

Mode	Channel	PAR (dB)	Limit (dB)
GPRS	Low	2.11	≤ 13
	Middle	1.97	≤ 13
	High	2.14	≤ 13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	2.07	≤ 13
	Middle	2.27	≤ 13
	High	2.01	≤ 13

WCDMA Band V

Mode	Channel	PAR (dB)	Limit (dB)
WCDMA (Rel99)	Low	2.09	≤ 13
	Middle	1.93	≤ 13
	High	2.19	≤ 13
WCDMA (HSDPA)	Low	2.16	≤ 13
	Middle	2.01	≤ 13
	High	1.98	≤ 13
WCDMA (HSUPA)	Low	1.99	≤ 13
	Middle	2.15	≤ 13
	High	2.09	≤ 13
WCDMA (HSPA+)	Low	1.92	≤ 13
	Middle	2.07	≤ 13
	High	1.99	≤ 13

PCS 1900

Mode	Channel	PAR (dB)	Limit (dB)
GPRS	Low	2.15	13
	Middle	2.05	13
	High	2.24	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	2.16	13
	Middle	2.19	13
	High	2.24	13

WCDMA Band II

Mode	Channel	PAR (dB)	Limit (dB)
WCDMA (Rel99)	Low	2.11	≤ 13
	Middle	1.98	≤ 13
	High	1.97	≤ 13
WCDMA (HSDPA)	Low	2.07	≤ 13
	Middle	2.21	≤ 13
	High	2.02	≤ 13
WCDMA (HSUPA)	Low	2.01	≤ 13
	Middle	2.12	≤ 13
	High	2.08	≤ 13
WCDMA (HSPA+)	Low	2.11	≤ 13
	Middle	2.09	≤ 13
	High	1.98	≤ 13

LTE Band 5

Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit(dB)
QPSK	1 RB	10M	3.19	3.19	3.11	≤ 13
	50 RB		5.04	5.17	5.18	≤ 13
16-QAM	1 RB	10M	4.00	4.12	4.08	≤ 13
	50 RB		6.19	6.10	6.20	≤ 13

LTE Band 7

Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit(dB)
QPSK	1 RB	20M	3.09	3.19	3.10	≤ 13
	100 RB		5.04	5.08	5.05	≤ 13
16-QAM	1 RB	20M	4.16	4.18	4.01	≤ 13
	100 RB		6.04	6.05	6.11	≤ 13

LTE Band 38

Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit(dB)
QPSK	1 RB	20M	3.12	3.17	3.09	≤ 13
	100 RB		5.03	5.07	5.04	≤ 13
16-QAM	1 RB	20M	4.10	4.17	4.11	≤ 13
	100 RB		6.09	6.17	6.15	≤ 13

LTE Band 41

Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit(dB)
QPSK	1 RB	20M	3.06	3.02	3.05	≤ 13
	100 RB		5.17	5.10	5.16	≤ 13
16-QAM	1 RB	20M	4.10	4.03	4.13	≤ 13
	100 RB		6.05	6.10	6.10	≤ 13

Radiated Power:**GPRS/EGPRS Mode**

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
GPRS 850, Middle Channel (ERP)										
836.6	99.16	199	100	H	34.30	0.63	-1.14	32.53	38.45	5.92
836.6	96.37	230	150	V	31.51	0.63	-1.14	29.74	38.45	8.71
EGPRS 850, Middle Channel (ERP)										
836.6	93.57	101	150	H	28.71	0.63	-1.14	26.94	38.45	11.51
836.6	90.65	176	100	V	25.79	0.63	-1.14	24.02	38.45	14.43
PCS 1900, Middle Channel (EIRP)										
836.6	90.46	113	150	H	20.33	0.85	8.81	28.29	33.00	4.71
836.6	87.55	182	100	V	17.42	0.85	8.81	25.38	33.00	7.62
EGPRS 1900, Middle Channel (EIRP)										
836.6	86.42	5	150	H	16.29	0.85	8.81	24.25	33.00	8.75
836.6	85.96	274	100	V	15.83	0.85	8.81	23.79	33.00	9.21

WCDMA Mode

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
WCDMA Band V, Middle Channel(ERP)										
836.6	89.47	63	200	H	24.61	0.63	-1.14	22.84	38.45	15.61
836.6	87.53	239	150	V	22.67	0.63	-1.14	20.9	38.45	17.55
WCDMA Band II, Middle Channel(EIRP)										
1880.0	85.46	66	200	H	15.33	0.85	8.81	23.29	33.00	9.71
1880.0	83.29	129	150	V	13.16	0.85	8.81	21.12	33.00	11.88

ERP:**LTE Band 5**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Submitted Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4M BW Middle Channel								
836.5	H	88.26	24.39	0.63	-1.14	22.62	38.45	15.83
836.5	V	88.01	24.14	0.63	-1.14	22.37	38.45	16.08
16-QAM 1.4M BW Middle Channel								
836.5	H	88.36	24.49	0.63	-1.14	22.72	38.45	15.73
836.5	V	87.56	23.69	0.63	-1.14	21.92	38.45	16.53
QPSK 3M BW Middle Channel								
836.5	H	88.56	24.69	0.63	-1.14	22.92	38.45	15.53
836.5	V	87.42	23.55	0.63	-1.14	21.78	38.45	16.67
16-QAM 3M BW Middle Channel								
836.5	H	88.39	24.52	0.63	-1.14	22.75	38.45	15.70
836.5	V	87.12	23.25	0.63	-1.14	21.48	38.45	16.97
QPSK 5M BW Middle Channel								
836.5	H	88.06	24.19	0.63	-1.14	22.42	38.45	16.03
836.5	V	87.59	23.72	0.63	-1.14	21.95	38.45	16.5
16-QAM 5M BW Middle Channel								
836.5	H	88.16	24.29	0.63	-1.14	22.52	38.45	15.93
836.5	V	87.67	23.8	0.63	-1.14	22.03	38.45	16.42
QPSK 10M BW Middle Channel								
836.5	H	88.46	24.59	0.63	-1.14	22.82	38.45	15.63
836.5	V	87.31	23.44	0.63	-1.14	21.67	38.45	16.78
16-QAM 10M BW Middle Channel								
836.5	H	87.96	24.09	0.63	-1.14	22.32	38.45	16.13
836.5	V	86.84	22.97	0.63	-1.14	21.2	38.45	17.25

EIRP:**LTE band 7**

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Submitted Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK 5M BW Middle Channel								
2535	H	88.75	12.86	0.89	10.05	22.02	33	10.98
2535	V	87.93	12.04	0.89	10.05	21.20	33	11.80
16-QAM 5M BW Middle Channel								
2535	H	88.5	12.61	0.89	10.05	21.77	33	11.23
2535	V	87.05	11.16	0.89	10.05	20.32	33	12.68
QPSK 10M BW Middle Channel								
2535	H	88.98	13.09	0.89	10.05	22.25	33	10.75
2535	V	87.94	12.05	0.89	10.05	21.21	33	11.79
16-QAM 10M BW Middle Channel								
2535	H	88.92	13.03	0.89	10.05	22.19	33	10.81
2535	V	87.9	12.01	0.89	10.05	21.17	33	11.83
QPSK 15M BW Middle Channel								
2535	H	88.52	12.63	0.89	10.05	21.79	33	11.21
2535	V	87.7	11.81	0.89	10.05	20.97	33	12.03
16-QAM 15M BW Middle Channel								
2535	H	88.12	12.23	0.89	10.05	21.39	33	11.61
2535	V	87.84	11.95	0.89	10.05	21.11	33	11.89
QPSK 20M BW Middle Channel								
2535	H	88.64	12.75	0.89	10.05	21.91	33	11.09
2535	V	87.4	11.51	0.89	10.05	20.67	33	12.33
16-QAM 20M BW Middle Channel								
2535	H	88.04	12.15	0.89	10.05	21.31	33	11.69
2535	V	87.59	11.70	0.89	10.05	20.86	33	12.14

LTE band 38

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Submitted Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5M BW Middle Channel								
2595	H	85.8	11.91	0.9	9.97	20.98	33	12.02
2595	V	84.55	10.66	0.9	9.97	19.73	33	13.27
16-QAM 5M BW Middle Channel								
2595	H	85.46	11.57	0.9	9.97	20.64	33	12.36
2595	V	84.99	11.10	0.9	9.97	20.17	33	12.83
QPSK 10M BW Middle Channel								
2595	H	85.51	11.62	0.9	9.97	20.69	33	12.31
2595	V	84.11	10.22	0.9	9.97	19.29	33	13.71
16-QAM 10M BW Middle Channel								
2595	H	85.11	11.22	0.9	9.97	20.29	33	12.71
2595	V	84.36	10.47	0.9	9.97	19.54	33	13.46
QPSK 15M BW Middle Channel								
2595	H	85.93	12.04	0.9	9.97	21.11	33	11.89
2595	V	84.29	10.40	0.9	9.97	19.47	33	13.53
16-QAM 15M BW Middle Channel								
2595	H	85.52	11.63	0.9	9.97	20.70	33	12.30
2595	V	84.49	10.60	0.9	9.97	19.67	33	13.33
QPSK 20M BW Middle Channel								
2595	H	85.87	11.98	0.9	9.97	21.05	33	11.95
2595	V	84.09	10.20	0.9	9.97	19.27	33	13.73
16-QAM 20M BW Middle Channel								
2595	H	85.76	11.87	0.9	9.97	20.94	33	12.06
2595	V	84.59	10.70	0.9	9.97	19.77	33	13.23

LTE Band 41

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Submitted Level (dBm)	Cable loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5M BW Middle Channel								
2605	H	85.39	12.40	0.9	9.95	21.45	33	11.55
2605	V	84.29	11.30	0.9	9.95	20.35	33	12.65
16-QAM 5M BW Middle Channel								
2605	H	85.46	12.47	0.9	9.95	21.52	33	11.48
2605	V	84.31	11.32	0.9	9.95	20.37	33	12.63
QPSK 10M BW Middle Channel								
2605	H	85.08	12.09	0.9	9.95	21.14	33	11.86
2605	V	84.67	11.68	0.9	9.95	20.73	33	12.27
16-QAM 10M BW Middle Channel								
2605	H	85.74	12.75	0.9	9.95	21.80	33	11.2
2605	V	84.76	11.77	0.9	9.95	20.82	33	12.18
QPSK 15M BW Middle Channel								
2605	H	85.77	12.78	0.9	9.95	21.83	33	11.17
2605	V	84.54	11.55	0.9	9.95	20.60	33	12.40
16-QAM 15M BW Middle Channel								
2605	H	85.57	12.58	0.9	9.95	21.63	33	11.37
2605	V	84.2	11.21	0.9	9.95	20.26	33	12.74
QPSK 20M BW Middle Channel								
2605	H	85.19	12.20	0.9	9.95	21.25	33	11.75
2605	V	84.51	11.52	0.9	9.95	20.57	33	12.43
16-QAM 20M BW Middle Channel								
2605	H	85.73	12.74	0.9	9.95	21.79	33	11.21
2605	V	84.23	11.24	0.9	9.95	20.29	33	12.71

Note:

All above data were tested without amplifier.

Absolute Level (dBm) = Submitted Level (dBm) - Cable loss (dB) + Antenna Gain (dBd/dBi)

Margin (dB) = Limit (dBm) - Absolute Level (dBm)

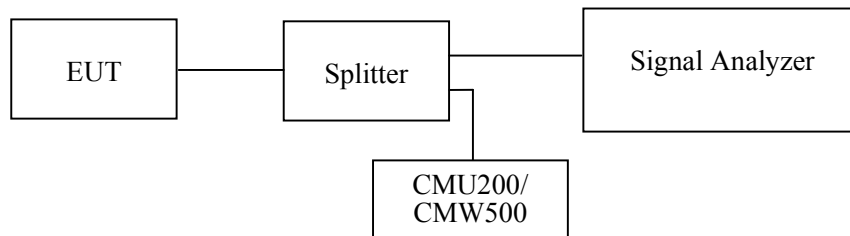
FCC §2.1049, §22.917, §22.905 & §24.238, §27.53- OCCUPIED BANDWIDTH**Applicable Standards**

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

Test Procedure

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

The resolution bandwidth of the spectrum analyzer was set at 5 kHz (Cellular /PCS) & 100 kHz (WCDMA) & 20 kHz/30 kHz/50 kHz/100 kHz/200 kHz (LTE), and the 26 dB & 99% bandwidth was recorded.

**Test Data****Environmental Conditions**

Temperature:	24.2~24.8 °C
Relative Humidity:	50~53 %
ATM Pressure:	100.7~101.5 kPa

The testing was performed by Stone Zhang from 2020-05-07 to 2020-05-27.

EUT operation mode: Transmitting

Test Result: Compliance.

GSM 850 Band

Mode	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
GSM (GMSK)	836.6	0.317	0.240
EGPRS (8PSK)	836.6	0.311	0.244

WCDMA Band V

Mode	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
WCDMA (Rel 99)	836.6	4.709	4.148
WCDMA (HSDPA)	836.6	4.709	4.148
WCDMA (HSUPA)	836.6	4.709	4.148
WCDMA (HSPA+)	836.6	4.709	4.148

PCS 1900

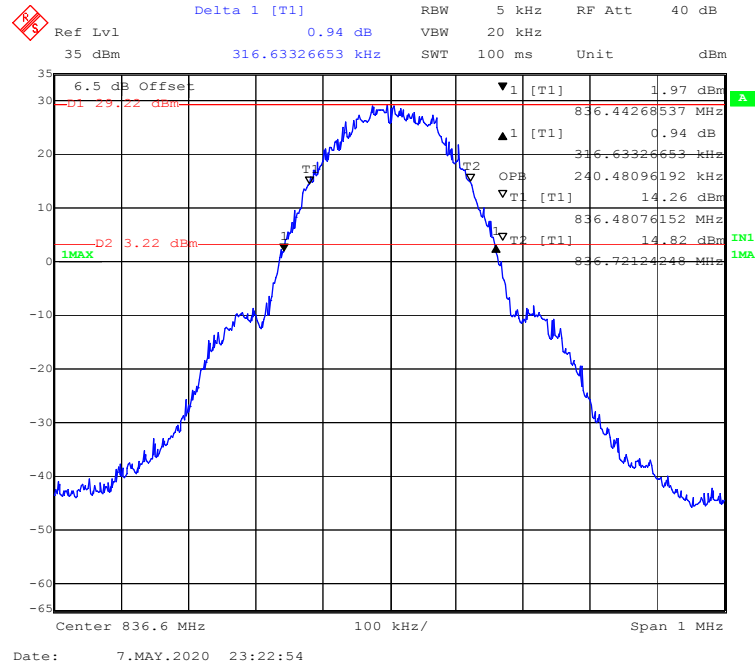
Mode	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
GPRS (GMSK)	1880	0.319	0.246
EGPRS (8PSK)	1880	0.311	0.246

WCDMA Band II

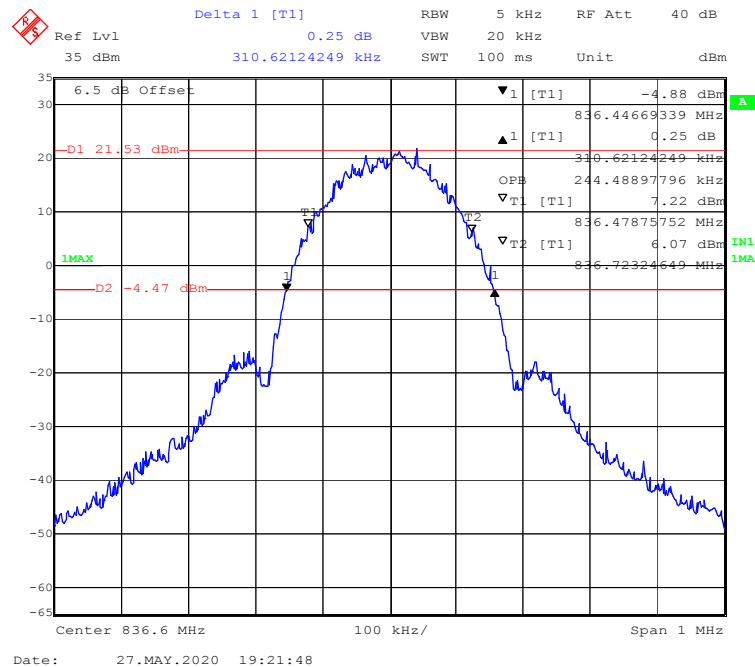
Mode	Frequency (MHz)	26 dB Emission Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
WCDMA (Rel 99)	1880	4.749	4.148
WCDMA (HSDPA)	1880	4.729	4.148
WCDMA (HSUPA)	1880	4.709	4.168
WCDMA (HSPA+)	1880	4.749	4.148

GPRS/EGPRS 850 Band

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

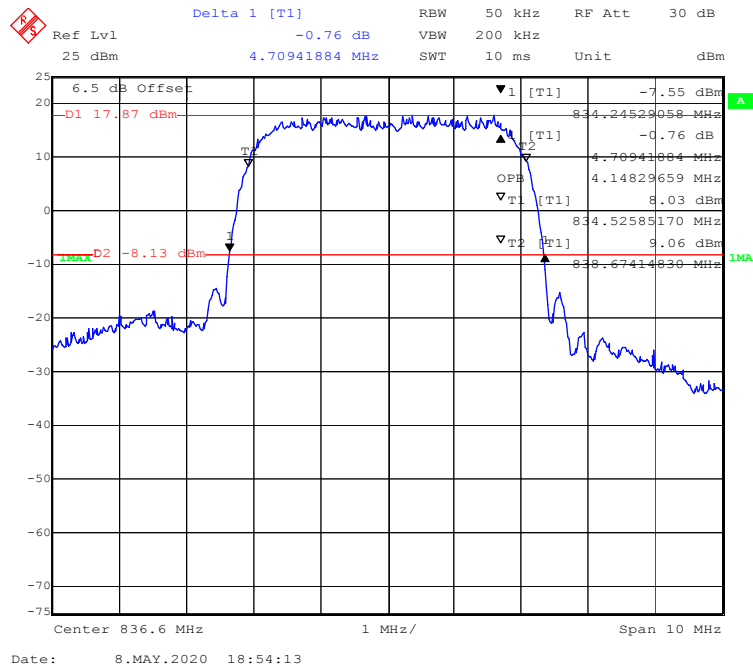


99% Occupied & 26 dB Emissions Bandwidth for EGPRS (GMSK) Mode

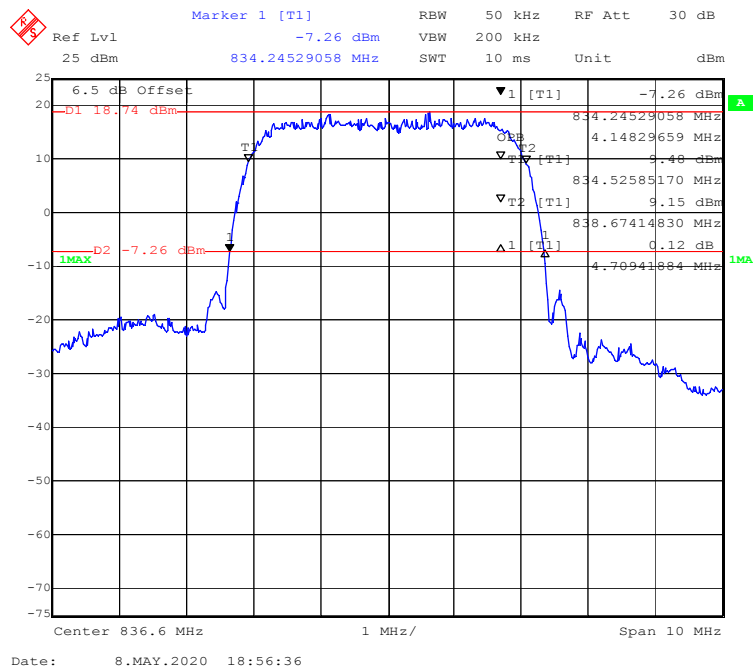


WCDMA Band V

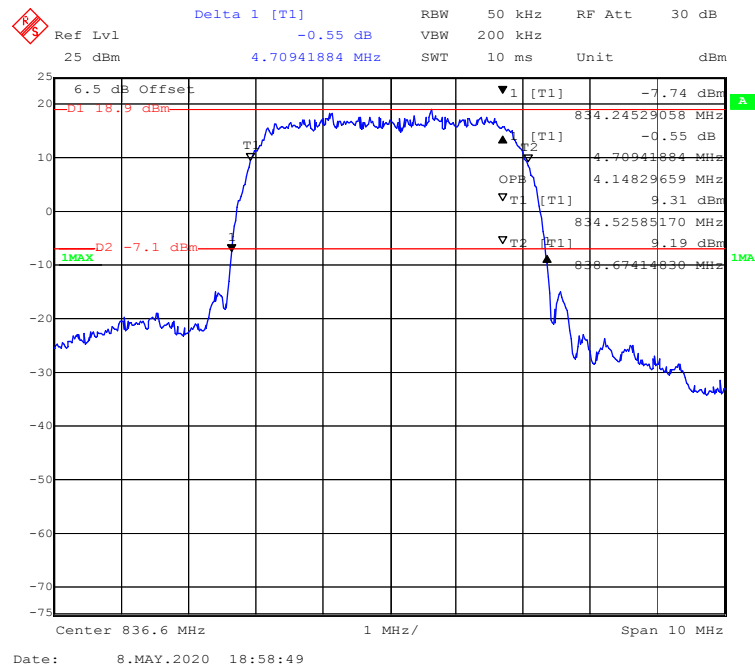
99% Occupied & 26 dB Emissions Bandwidth for WCDMA (Rel 99) Mode



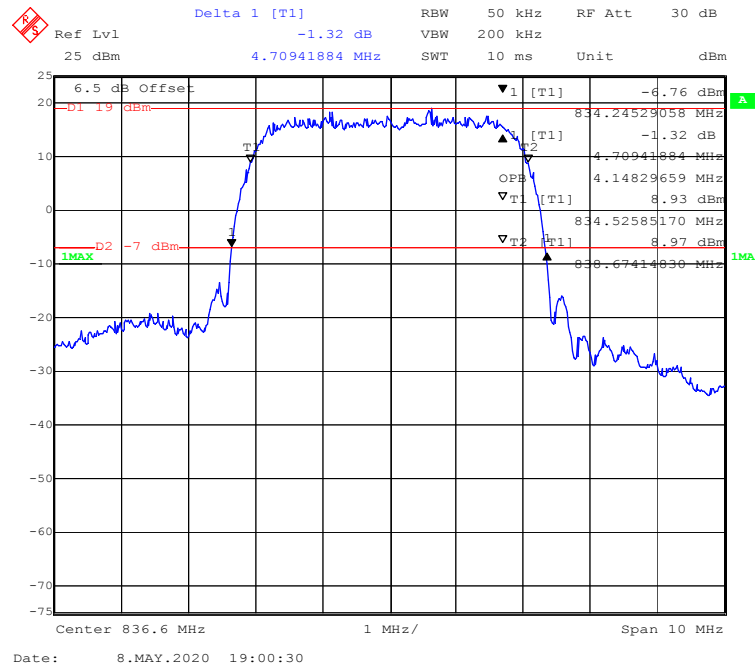
99% Occupied & 26 dB Emissions Bandwidth for WCDMA (HSDPA) Mode



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

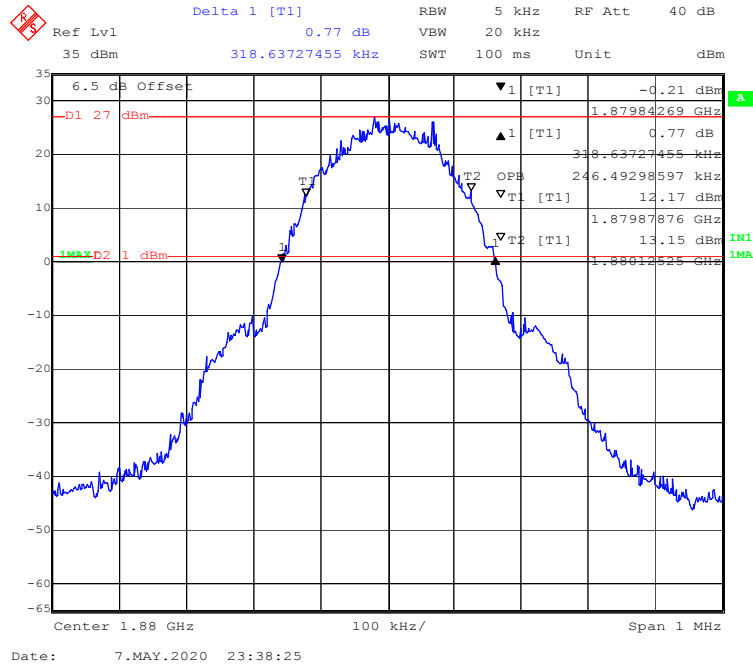


99% Occupied & 26 dB Emissions Bandwidth for WCDMA (HSPA+) Mode

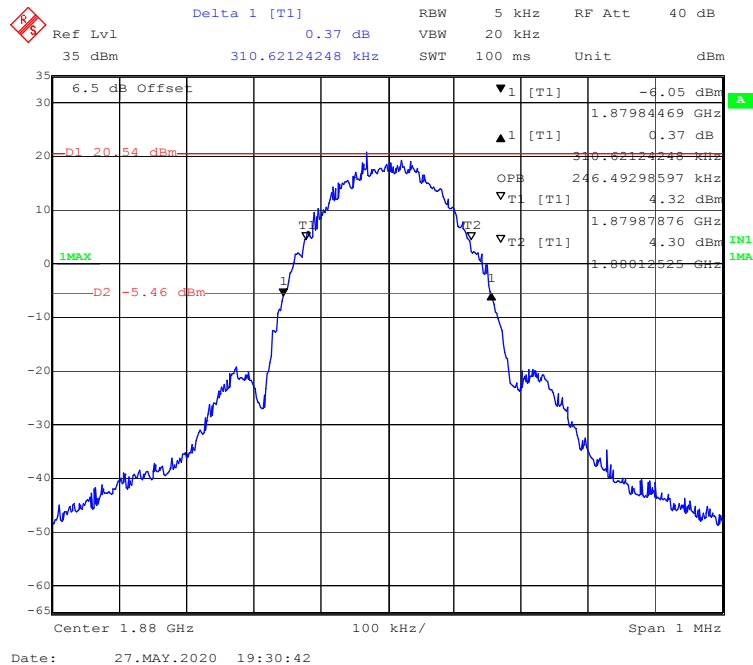


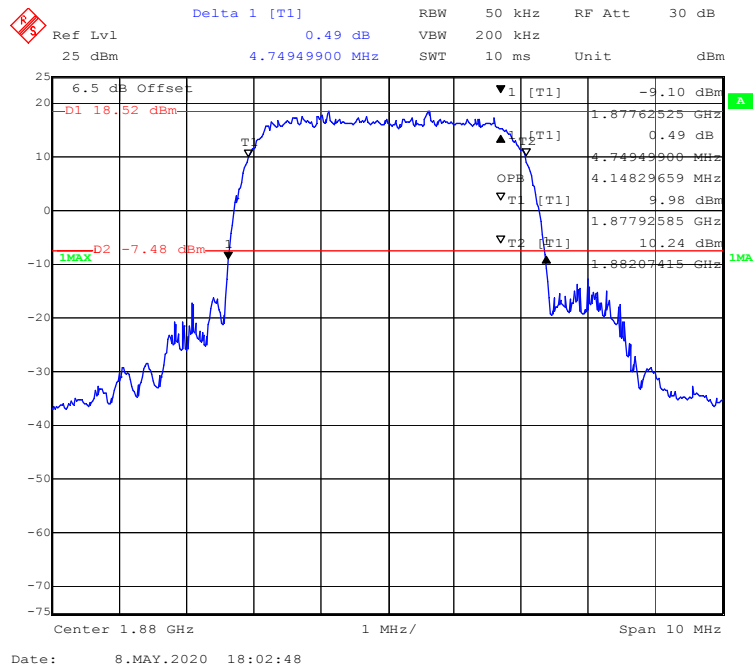
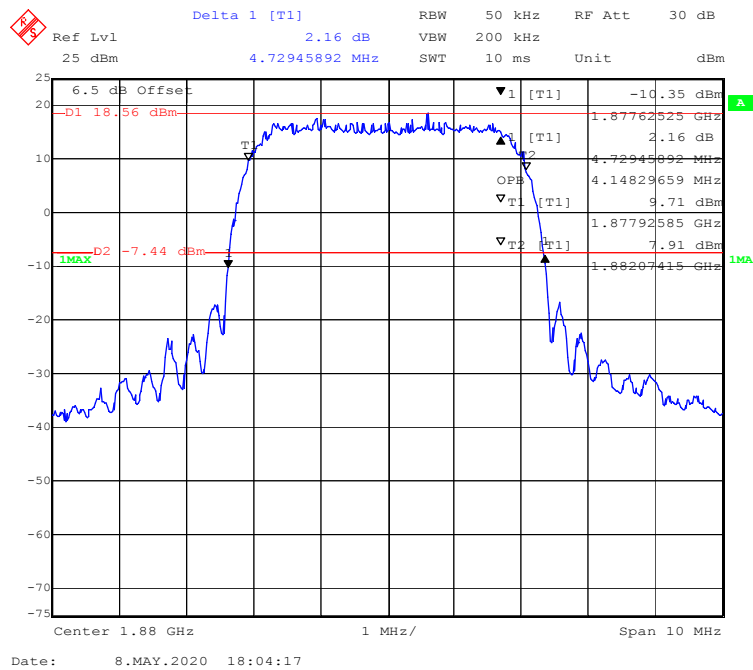
PCS 1900 Band

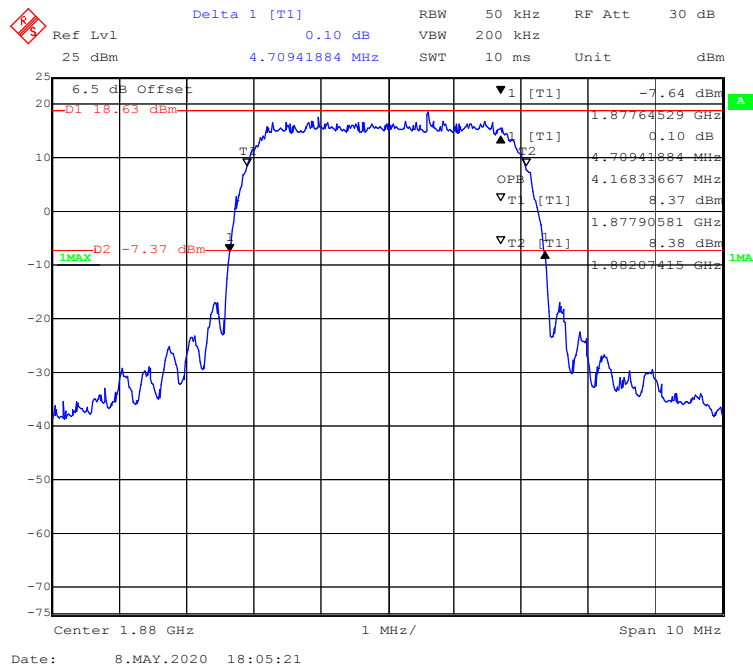
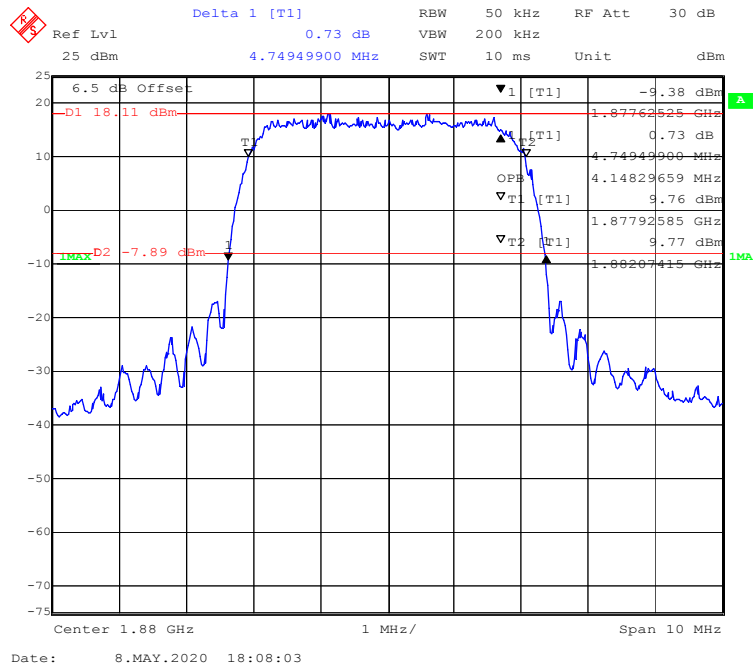
99% Occupied & 26 dB Emissions Bandwidth for GPRS (GMSK) Mode



99% Occupied & 26 dB Emissions Bandwidth for EGPRS (8PSK) Mode

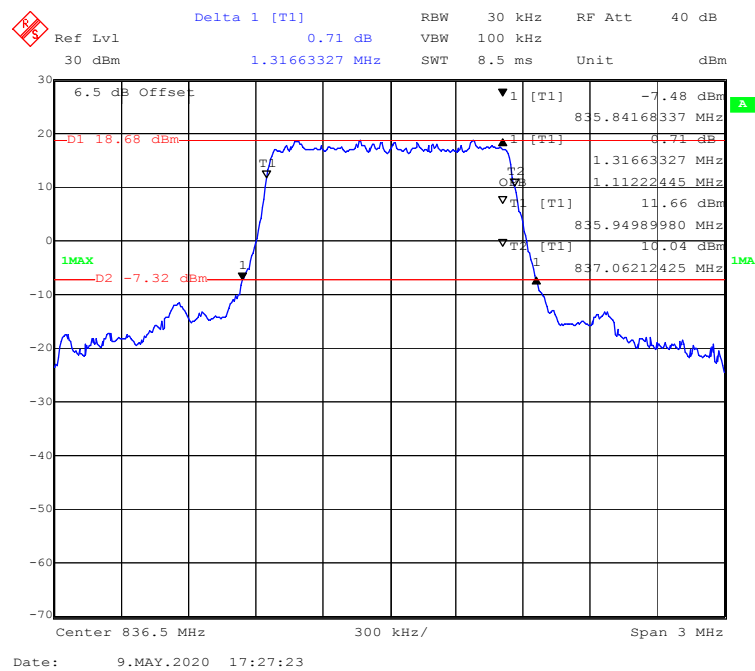


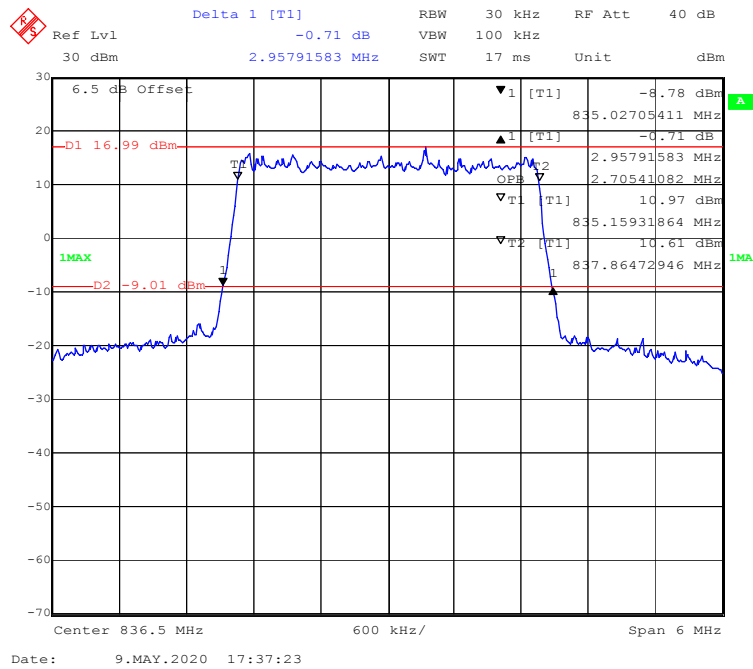
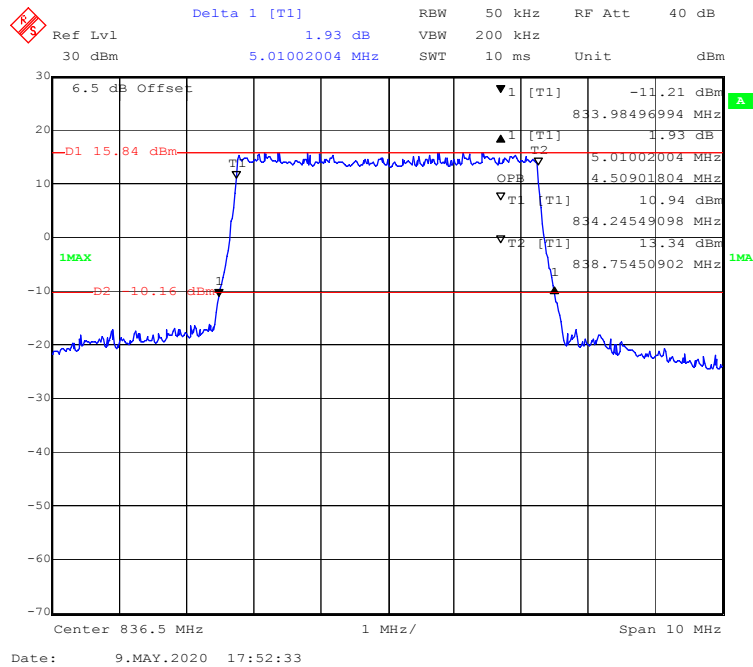
WCDMA Band II**99% Occupied & 26 dB Emissions Bandwidth for WCDMA (Rel 99) Mode****99% Occupied & 26 dB Emissions Bandwidth for WCDMA (HSDPA) Mode**

99% Occupied & 26 dB Emissions Bandwidth for WCDMA (HSUPA) Mode**99% Occupied & 26 dB Emissions Bandwidth for WCDMA (HSPA+) Mode**

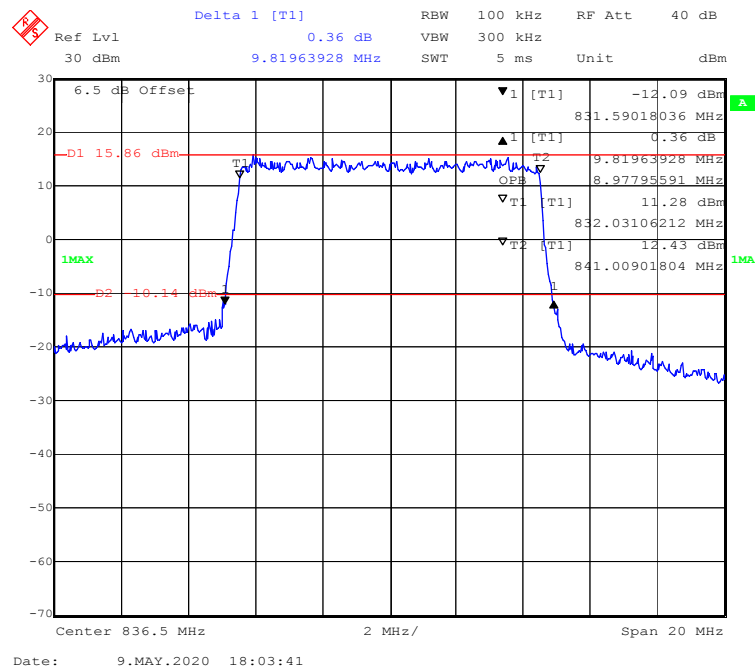
LTE Band 5:

Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth	99% Occupied Bandwidth
			MHz	MHz
QPSK	1.4M	Middle	1.317	1.112
	3M		2.958	2.705
	5M		5.010	4.509
	10M		9.820	8.978
16-QAM	1.4M	Middle	1.317	1.112
	3M		2.958	2.705
	5M		4.990	4.529
	10M		9.820	8.978

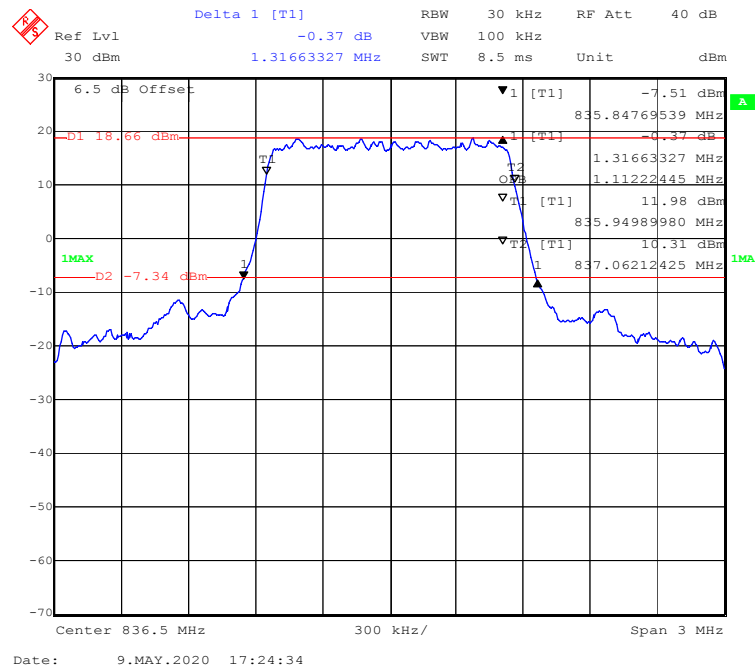
QPSK (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel

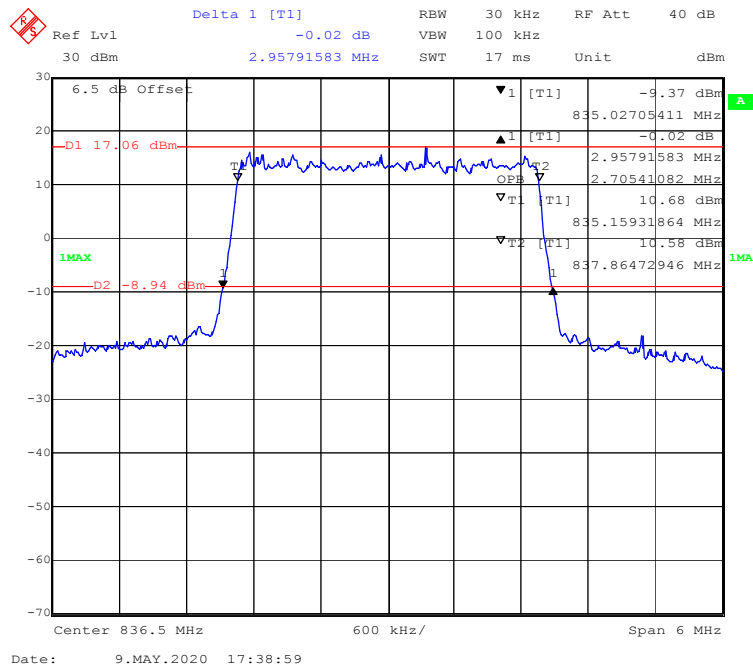
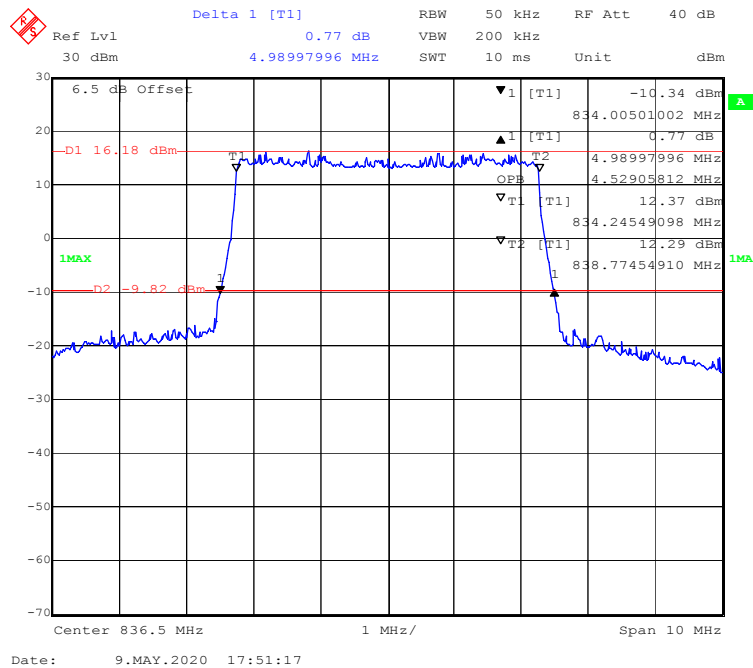
QPSK (3.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**QPSK (5.0MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

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

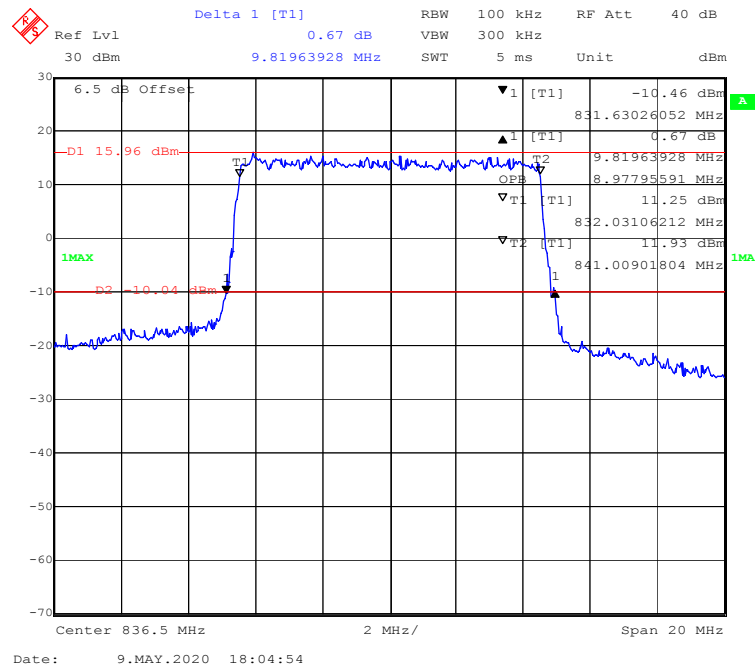


16-QAM (1.4 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



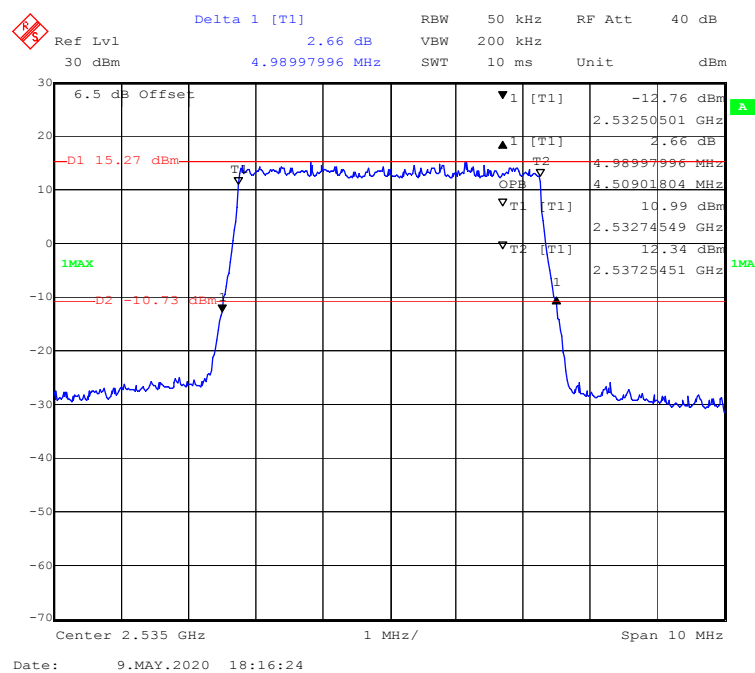
16-QAM (3.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**16-QAM (5.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

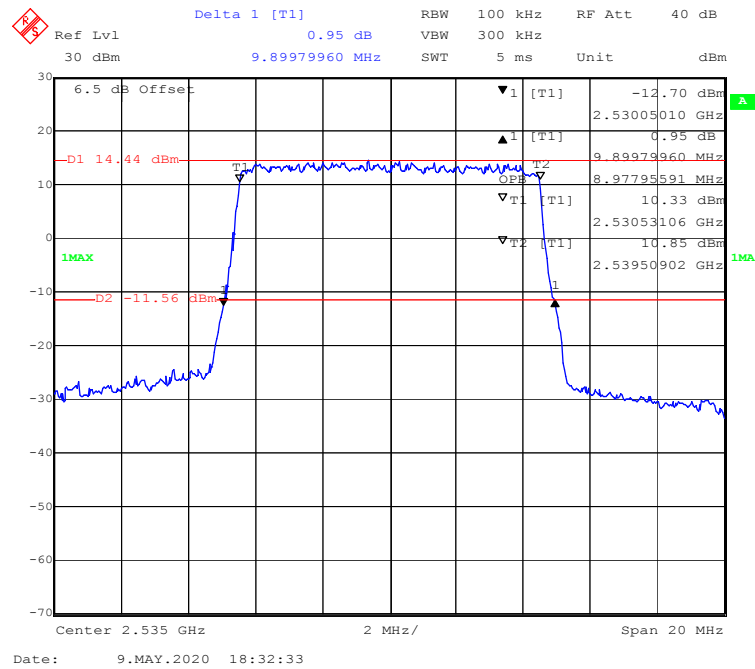
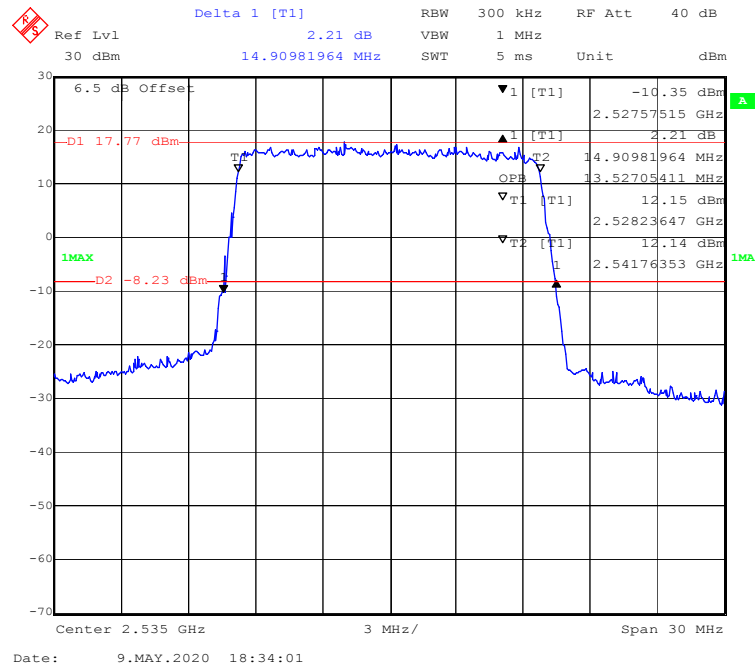
16-QAM (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



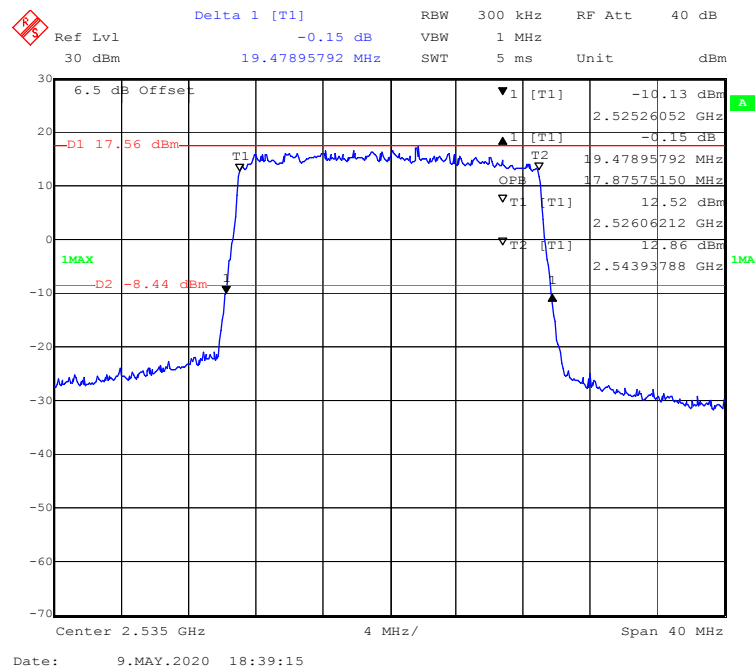
LTE Band 7:

Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth	99% Occupied Bandwidth
			MHz	MHz
QPSK	5M	Middle	4.990	4.509
	10M		9.900	8.978
	15M		14.910	13.527
	20M		19.479	17.876
16-QAM	5M	Middle	4.990	4.489
	10M		9.900	8.978
	15M		14.970	13.527
	20M		19.399	17.876

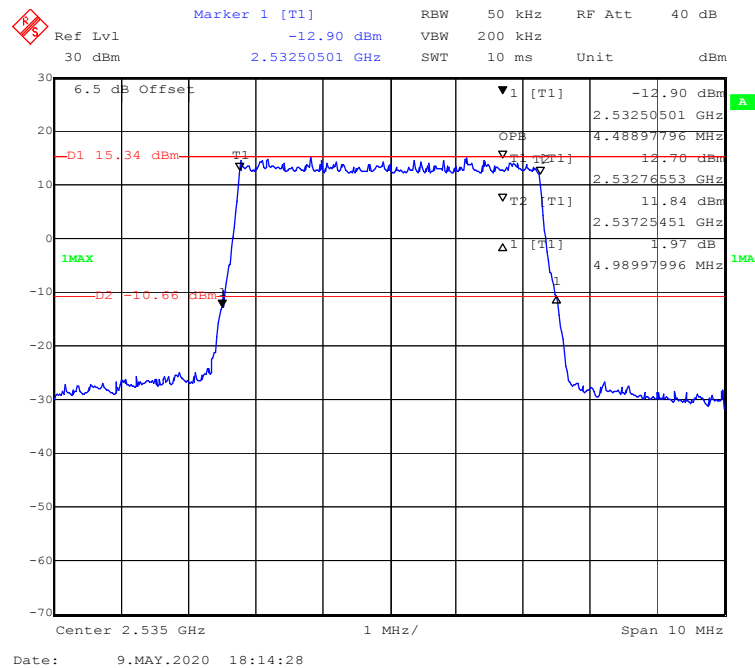
QPSK (5.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel

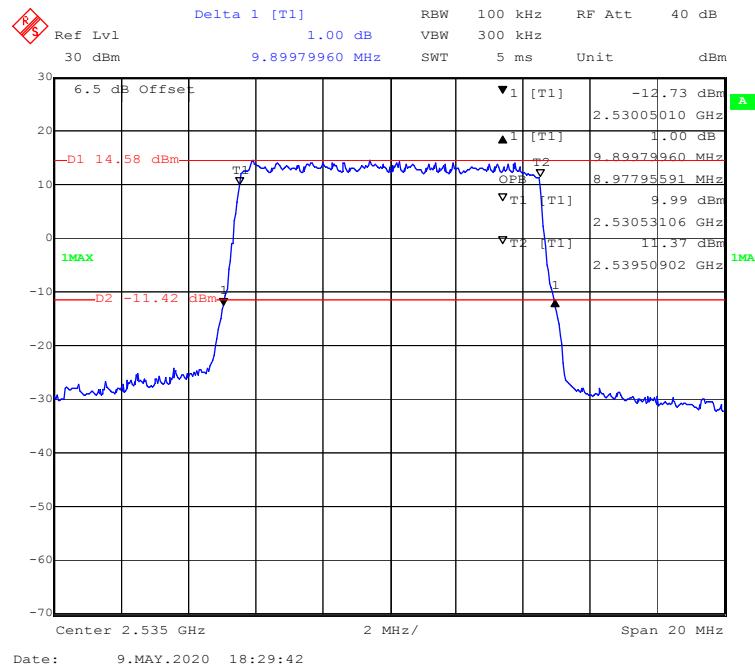
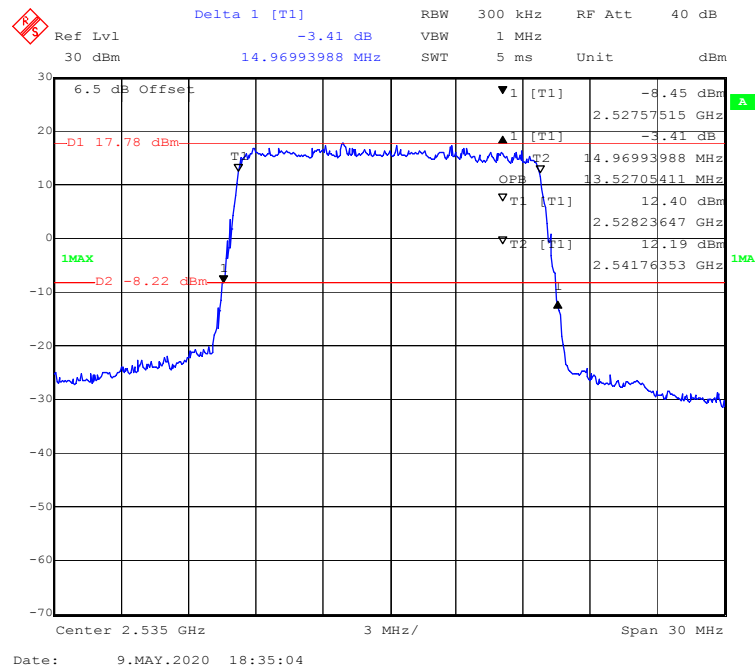
QPSK (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**QPSK (15.0MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

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

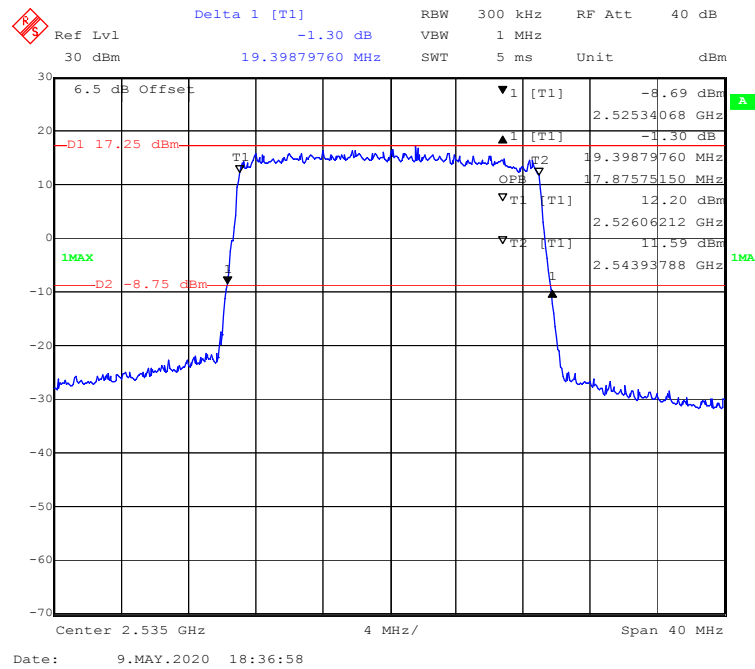


16-QAM (5.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



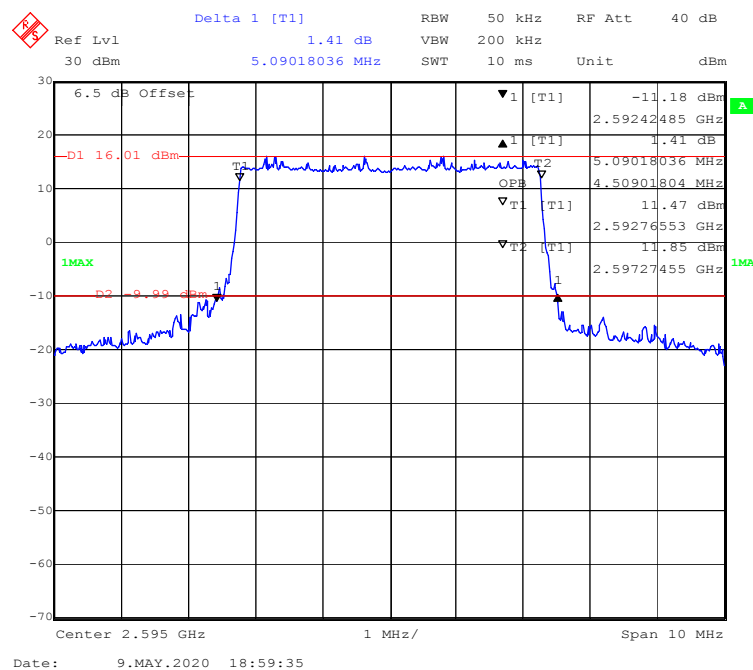
16-QAM (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**16-QAM (15.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

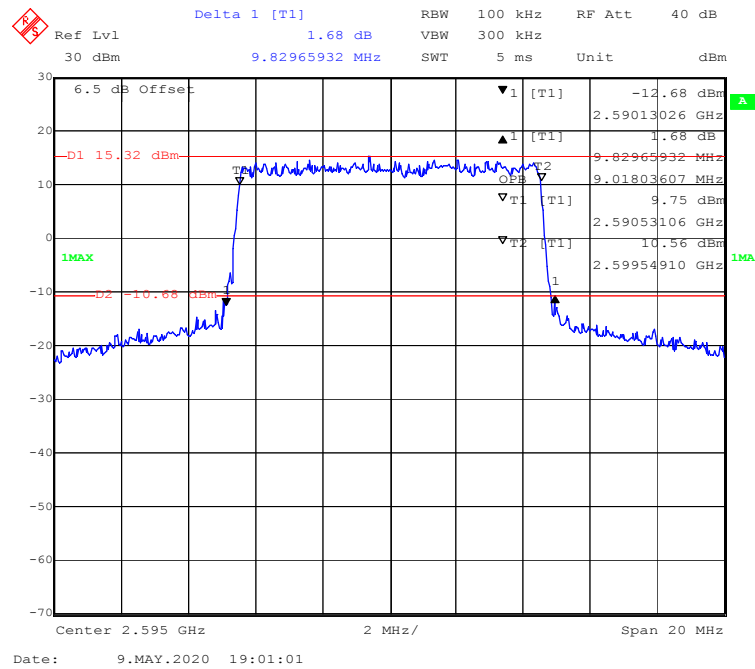
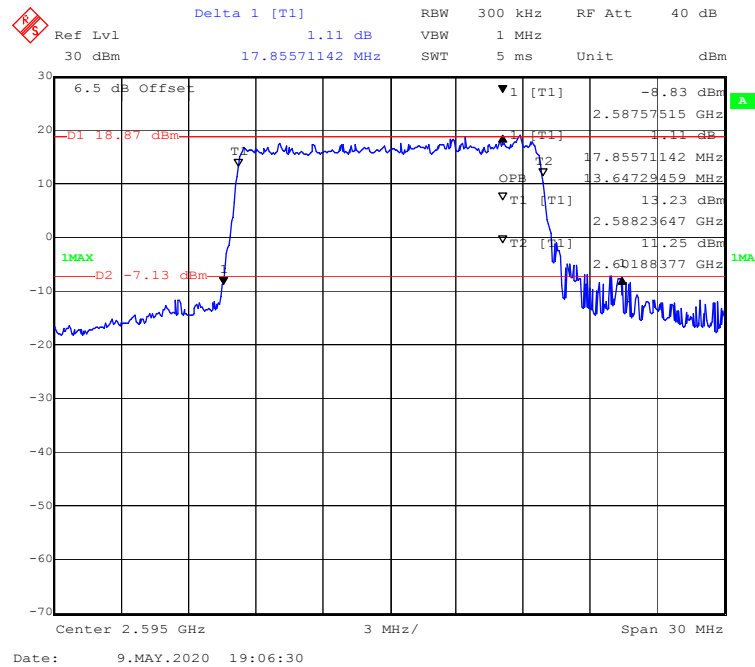
16-QAM (20.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



LTE Band 38:

Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth	99% Occupied Bandwidth
			MHz	MHz
QPSK	5M	Middle	5.090	4.509
	10M		9.830	9.018
	15M		17.856	13.647
	20M		19.449	17.956
16-QAM	5M	Middle	5.090	4.509
	10M		9.870	8.978
	15M		17.856	13.587
	20M		19.529	18.036

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

QPSK (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**QPSK (15.0MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

Delta 1 [T1] 0.56 dB

Ref Lvl 30 dBm

RBW 300 kHz

VBW 1 MHz

SWT 5 ms

RF Att 40 dB

Unit dBm

6.5 dB Offset

D1 18.31 dBm

T1

1 [T1] 0.56 dB

OPB 19.44889780 MHz

T2 17.95591182 MHz

T1 [T1] 14.04 dBm

T2 [T1] 2.58606212 GHz

D2 -7.69 dBm

1MAX

1 2.60401804 GHz

1MA

Center 2.595 GHz

4 MHz/

Span 40 MHz

Date: 9.MAY.2020 19:08:46

Delta 1 [T1]

Ref Lvl 30 dBm

0.92 dB

5.09018036 MHz

RBW 50 kHz

SWT 10 ms

RF Att 40 dB

Unit dBm

6.5 dB Offset

D1 16.41 dBm

1MAX

D2 -9.59 dBm

▼1 [T1] -10.14 dBm

▲1 [T1] 0.92 dB

▼2 [T1] 5.09018036 MHz

▲2 [T1] 4.50901804 MHz

▼T1 [T1] 11.37 dBm

▼T2 [T1] 11.07 dBm

1 2

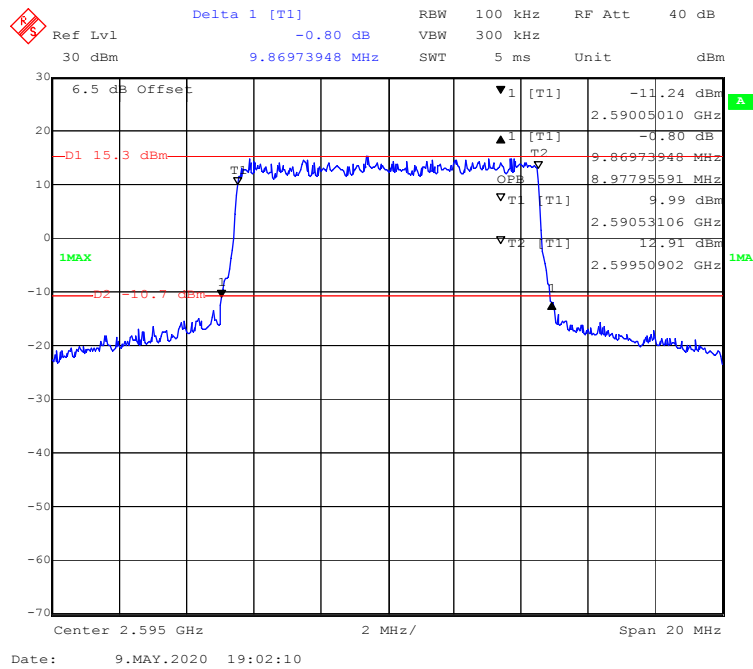
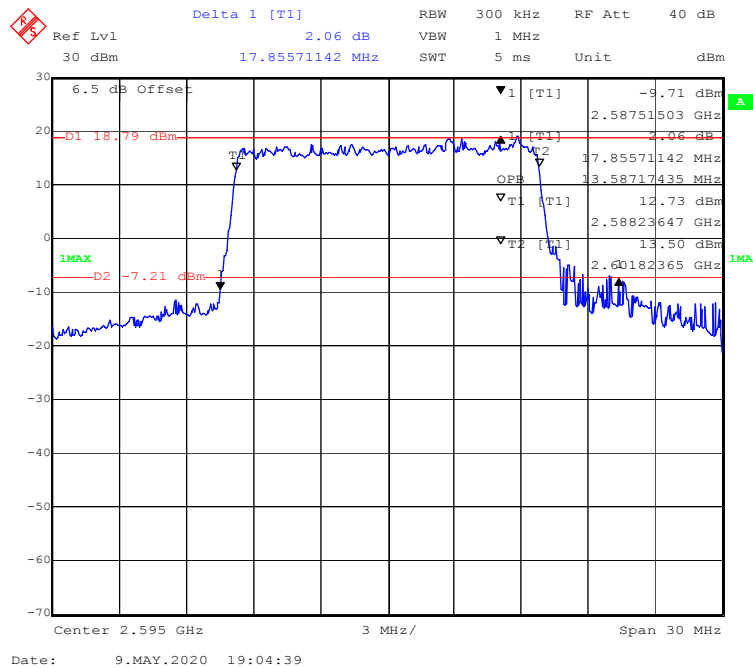
1 2

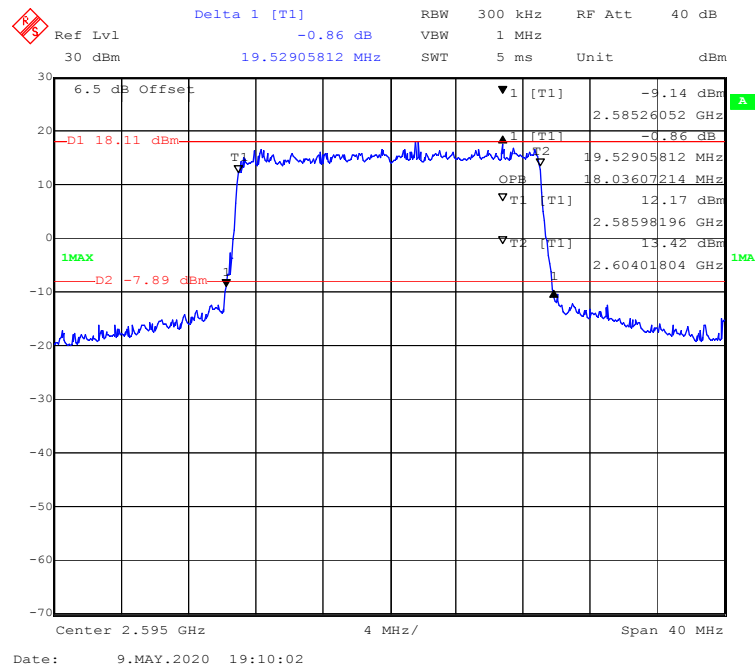
Center 2.595 GHz

1 MHz/

Span 10 MHz

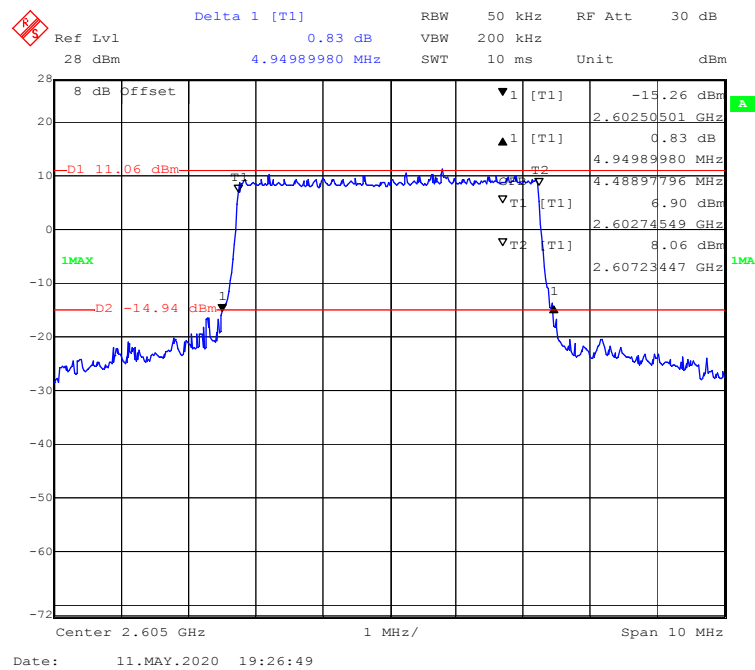
Date: 9.MAY.2020 18:57:40

16-QAM (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**16-QAM (15.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

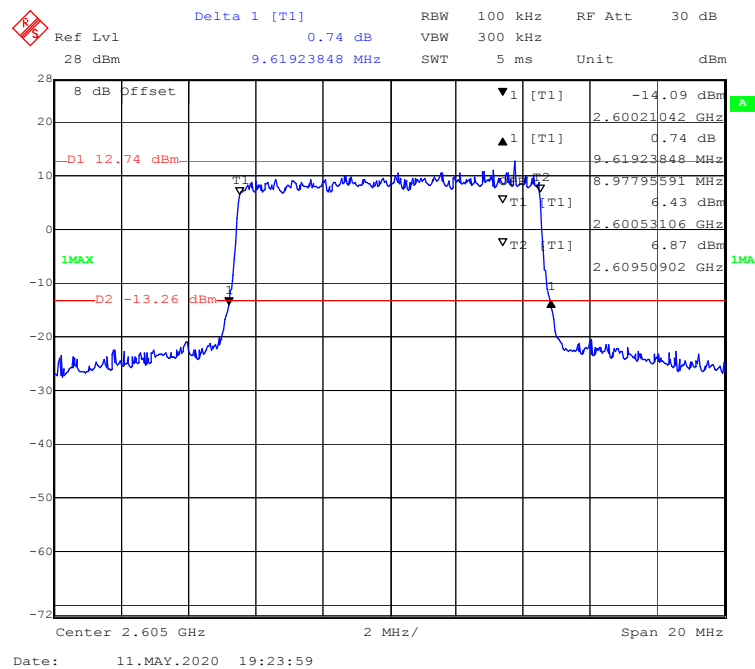
16-QAM (20.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel

LTE Band 41:

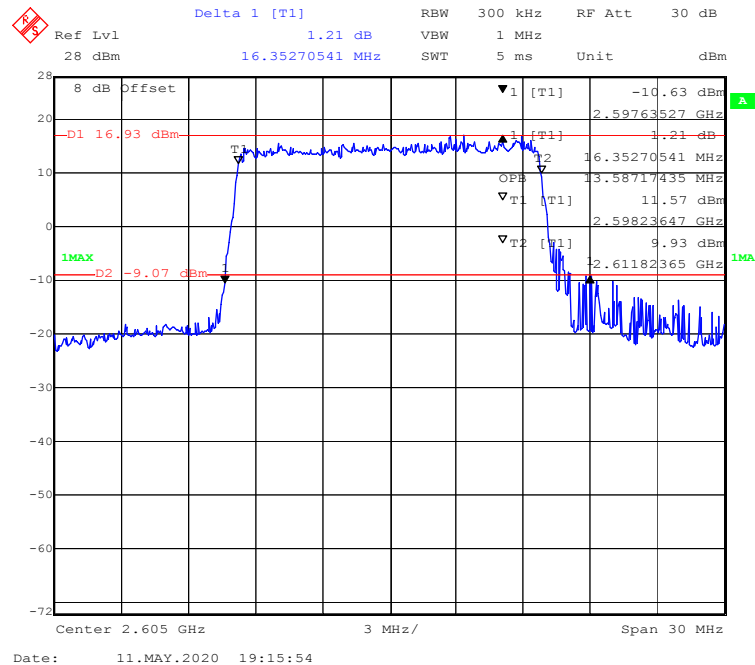
Test Modulation	Test Bandwidth	Test Channel	26 dB Bandwidth	99% Occupied Bandwidth
			MHz	MHz
QPSK	5M	Middle	4.950	4.489
	10M		9.619	8.978
	15M		16.353	13.587
	20M		20.681	17.956
16-QAM	5M	Middle	5.030	4.489
	10M		9.659	8.978
	15M		15.511	13.587
	20M		19.719	17.956

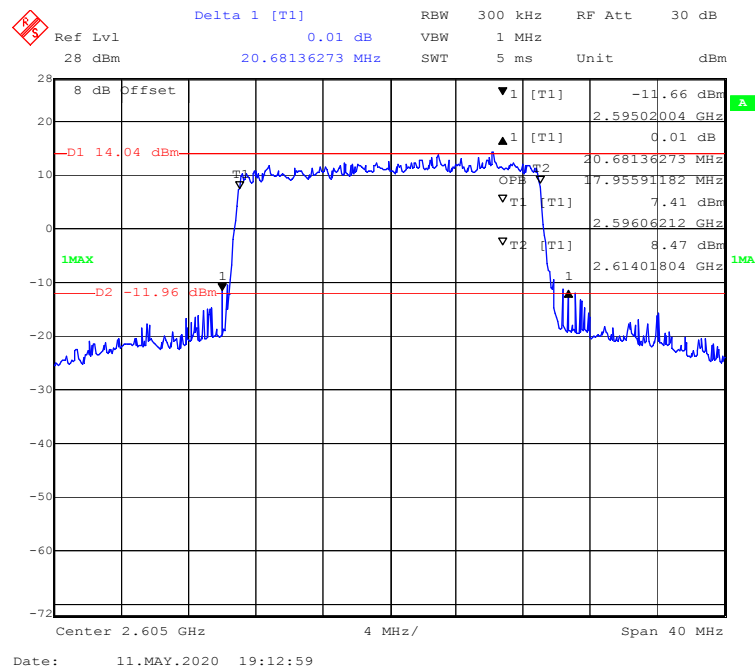
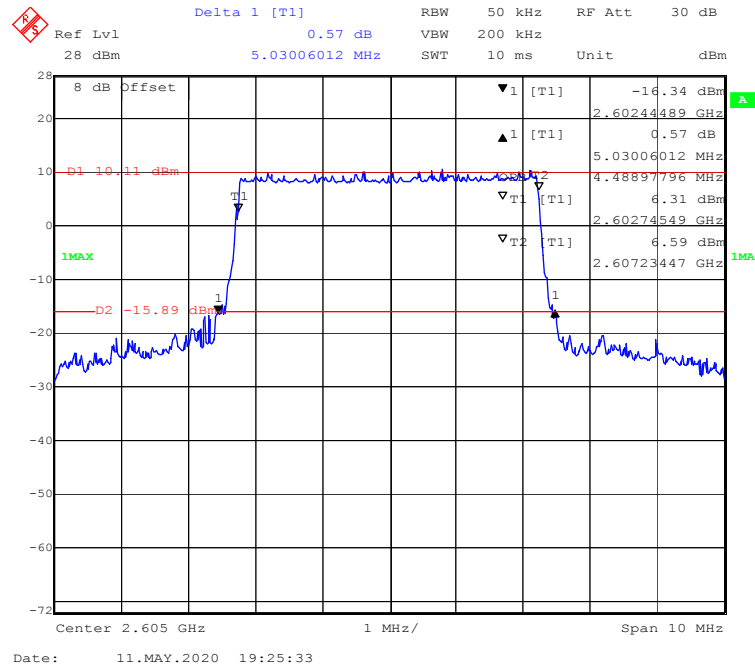
QPSK (5.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel

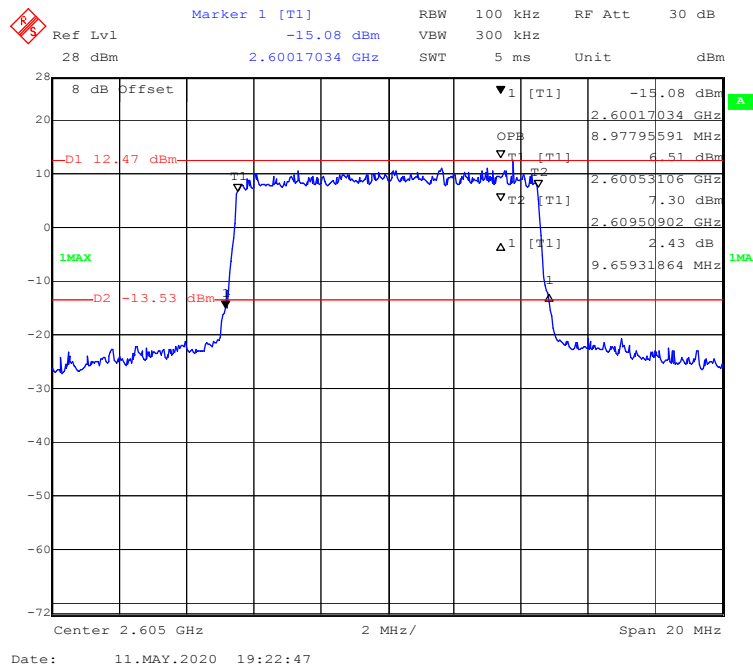
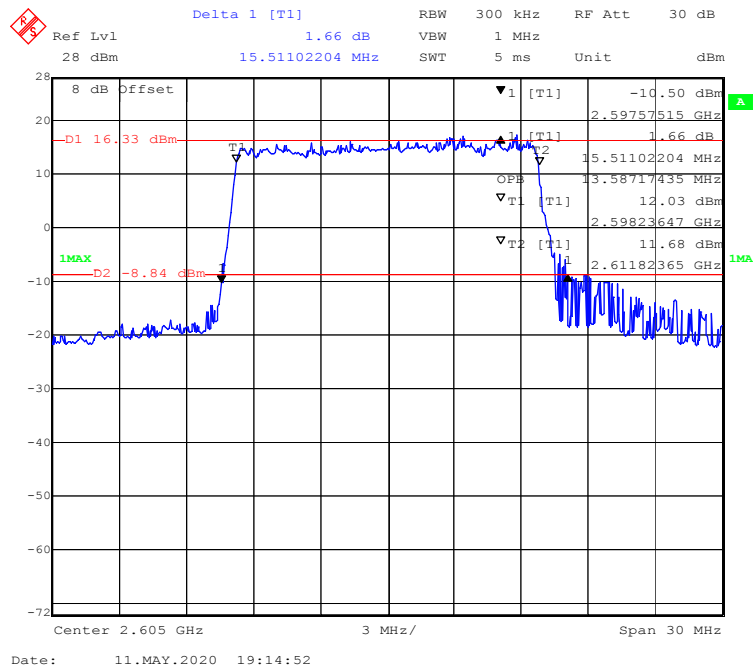
QPSK (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



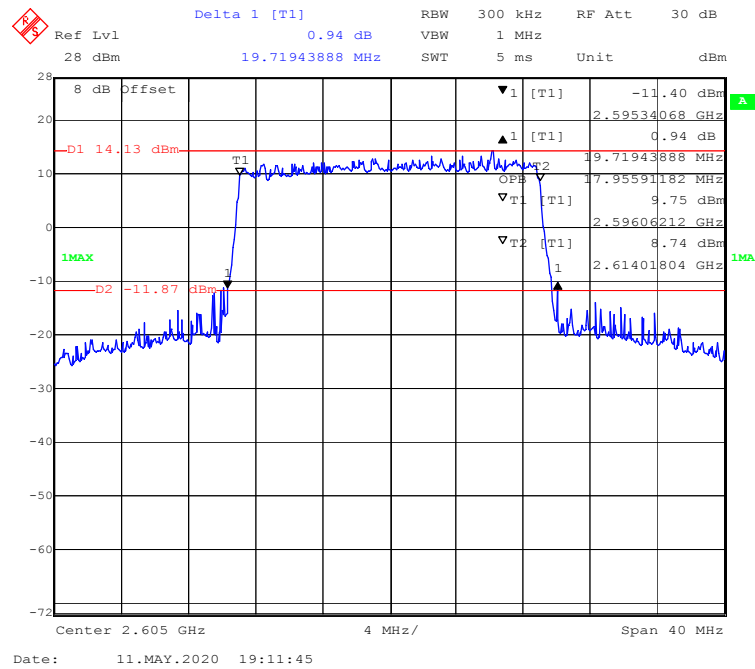
QPSK (15.0MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel



QPSK (20.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**16-QAM (5.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

16-QAM (10.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**16-QAM (15.0 MHz) - 99% Occupied & 26 dB Emissions Bandwidth, Middle channel**

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



FCC § 2.1051; § 22.917 (a); § 24.238 (a); §27.53 (m) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS**Applicable Standards**

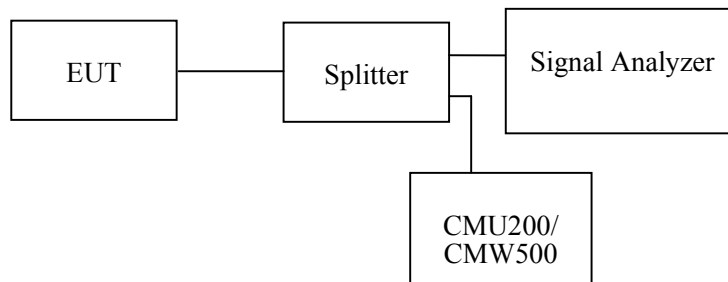
FCC §2.1051, §22.917(a), §24.238(a) and §27.53 (m).

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

According to §27.53(m), for mobile digital stations, any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $55 + 10 \log(P)$ dB.

Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz for below 1GHz & 1MHz for above 1GHz. sufficient scans were taken to show any out of band emissions up to 10th harmonic.

**Test Data****Environmental Conditions**

Temperature:	23.5~24.8 °C
Relative Humidity:	50~53 %
ATM Pressure:	100.7~101.5 kPa

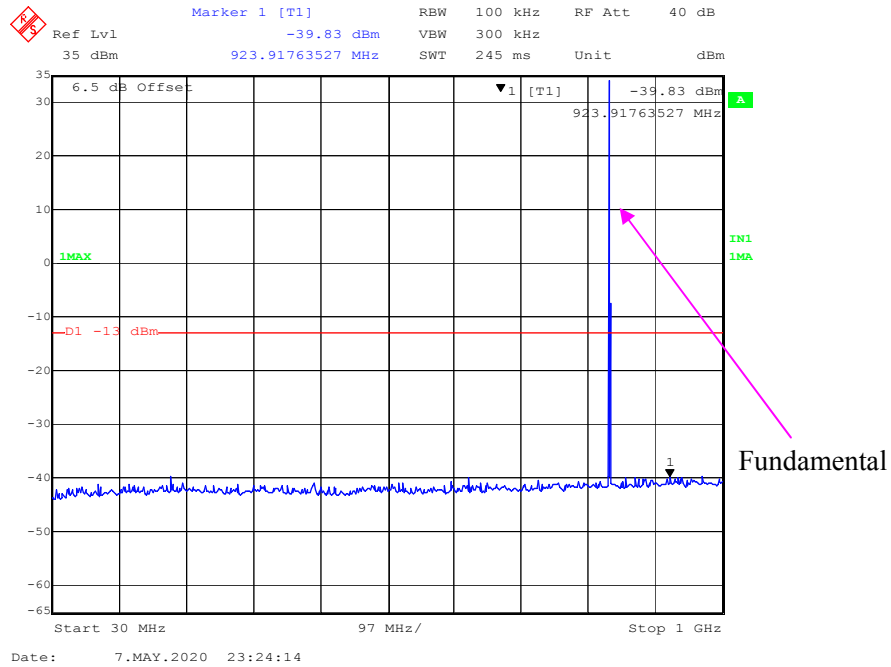
The testing was performed by Stone Zhang from 2020-04-28 to 2020-05-29.

EUT operation mode: Transmitting

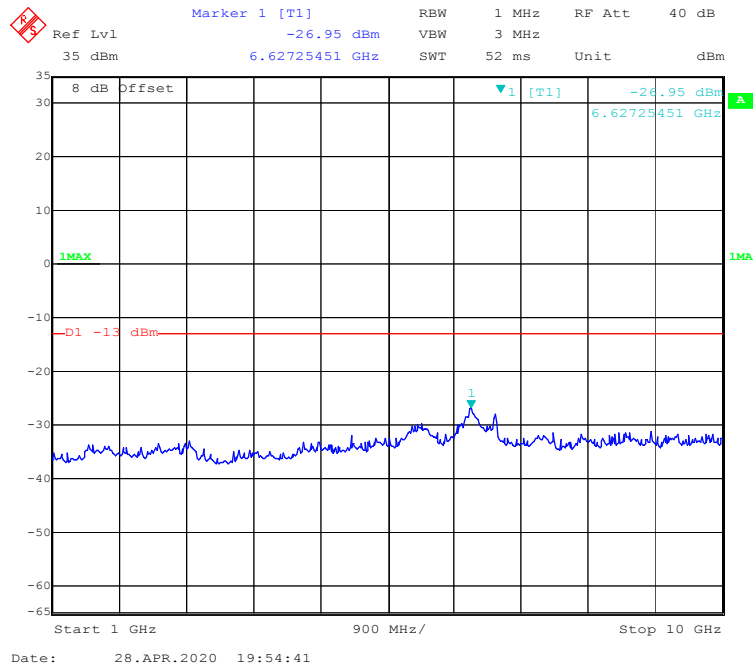
Test Result: Compliance.

GSM 850 Band:

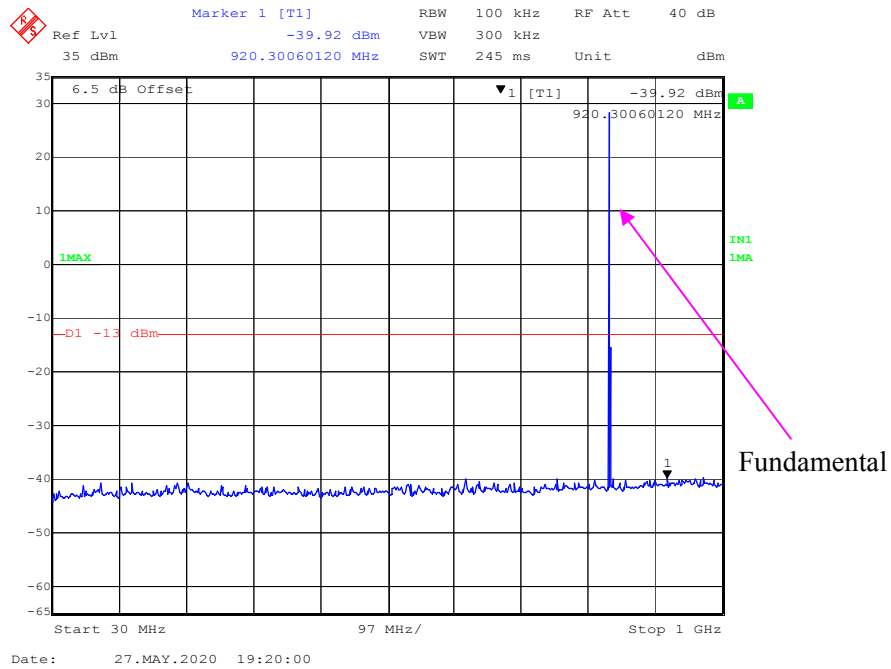
30 MHz – 1GHz(GPRS Mode)



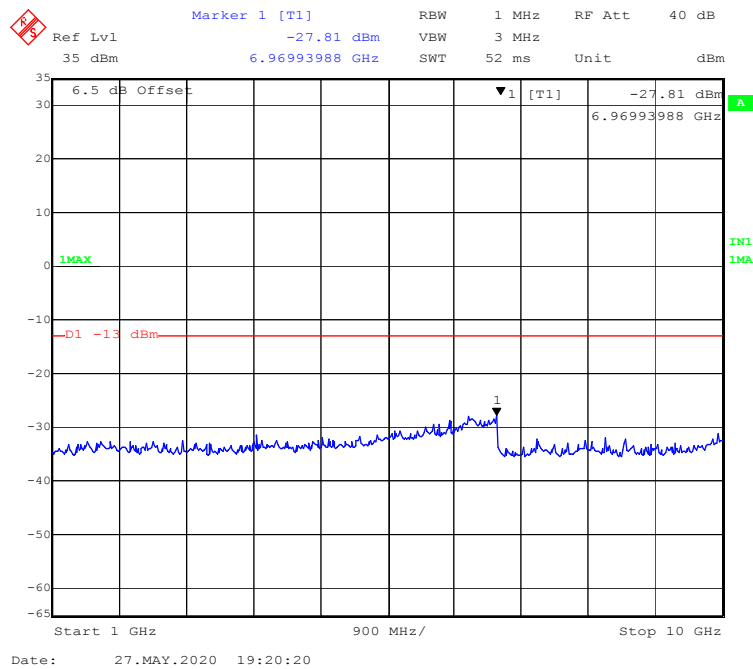
1 GHz – 10 GHz (GPRS Mode)

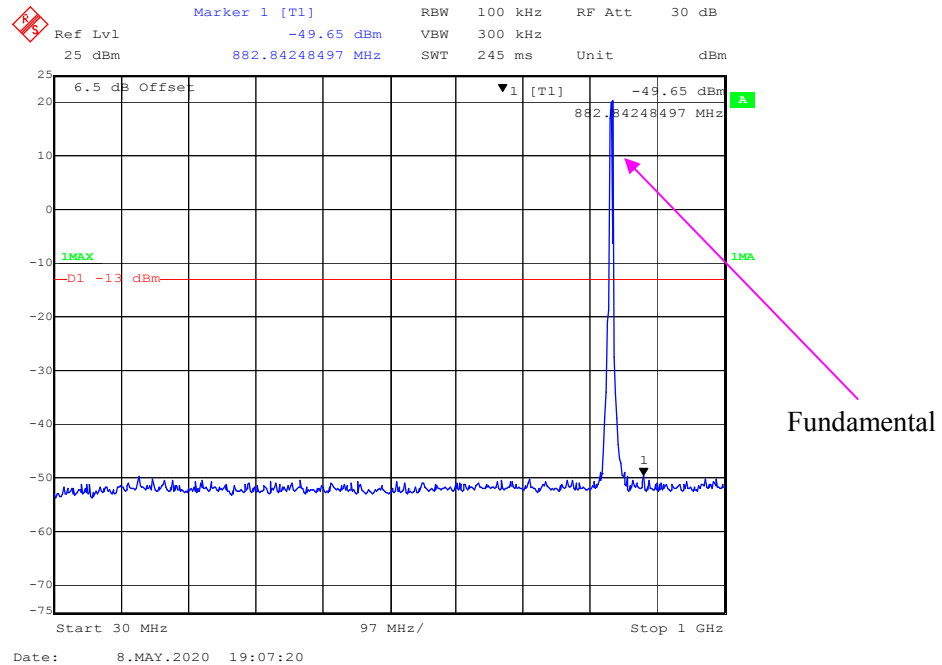
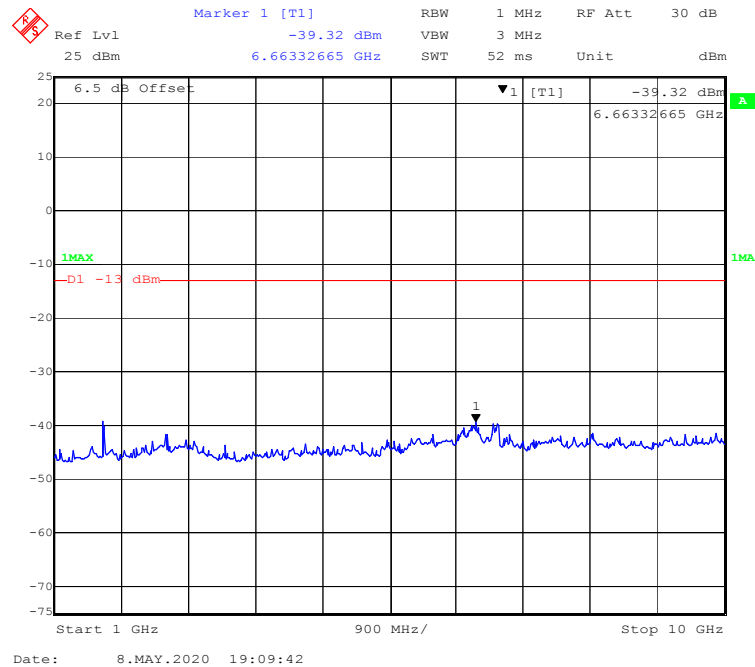


30 MHz – 1GHz(EGPRS Mode)

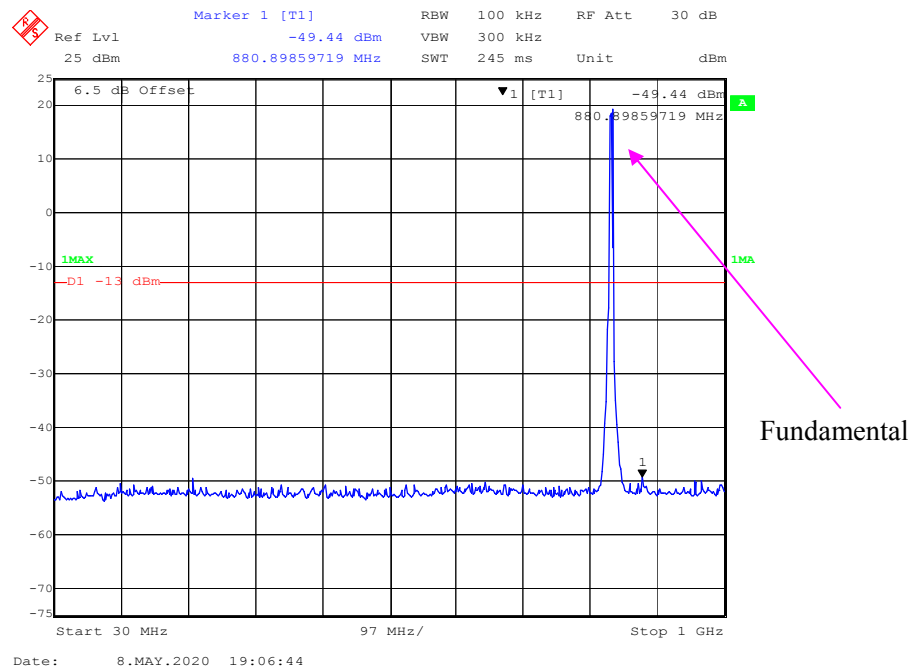


1 GHz – 10 GHz (EGPRS Mode)

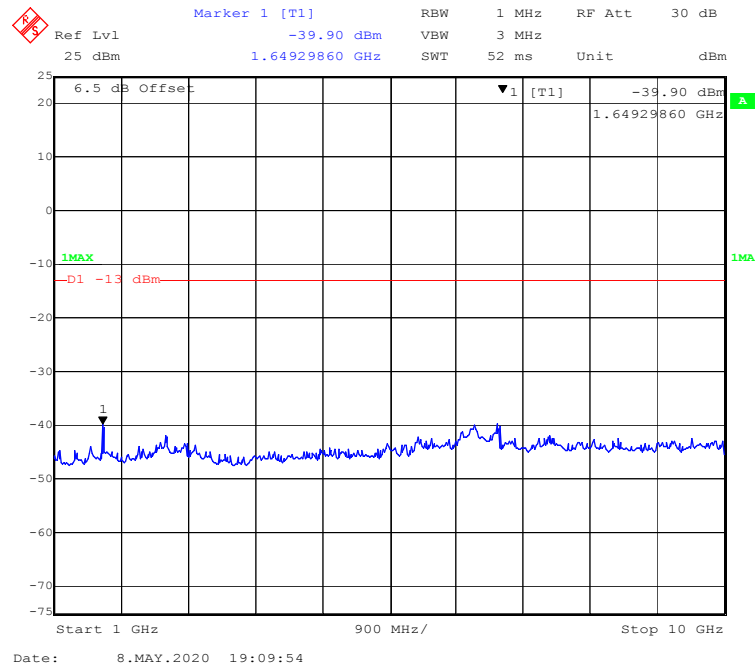


WCDMA Band V:**30 MHz – 1GHz WCDMA (Rel 99) Mode****1 GHz – 10 GHz WCDMA (Rel 99) Mode**

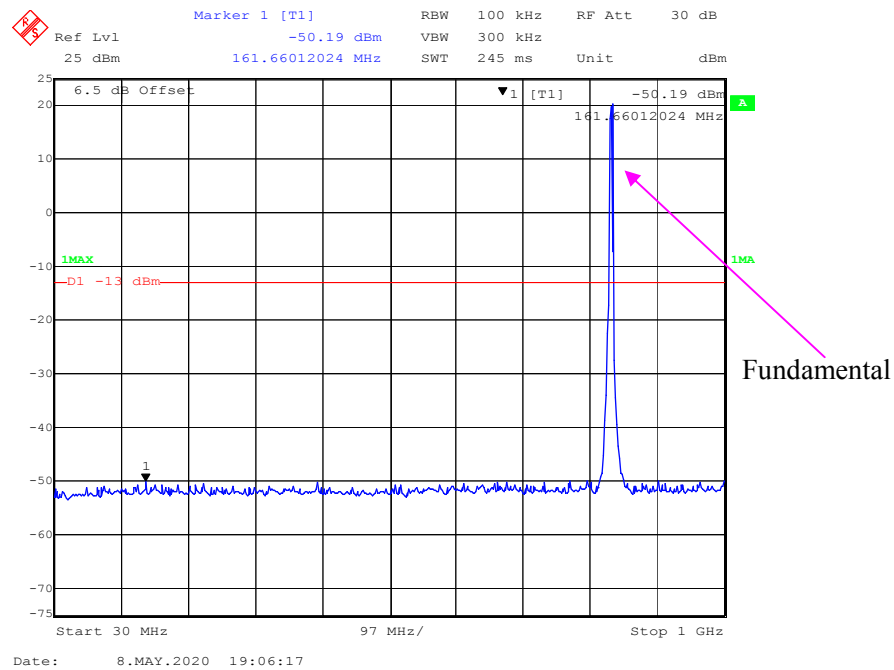
30 MHz – 1GHz WCDMA (HSDPA) Mode



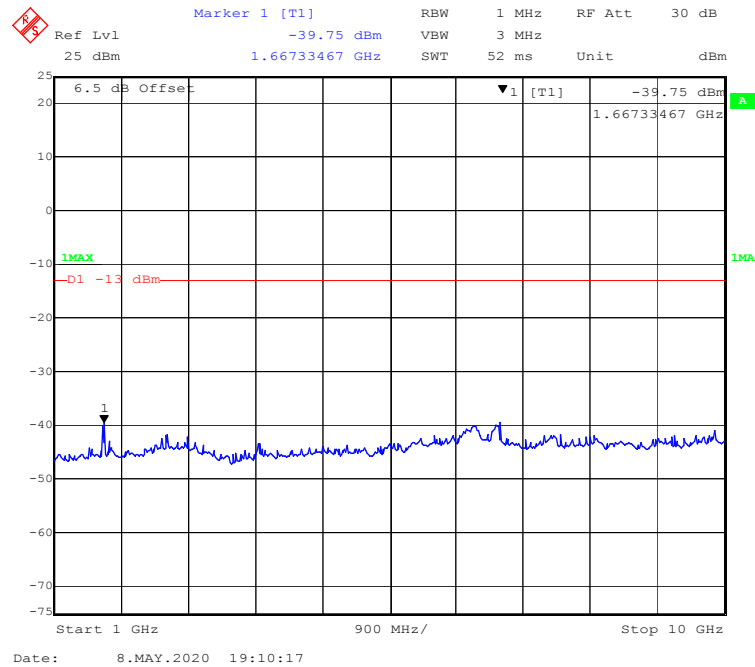
1 GHz – 10 GHz WCDMA (HSDPA) Mode

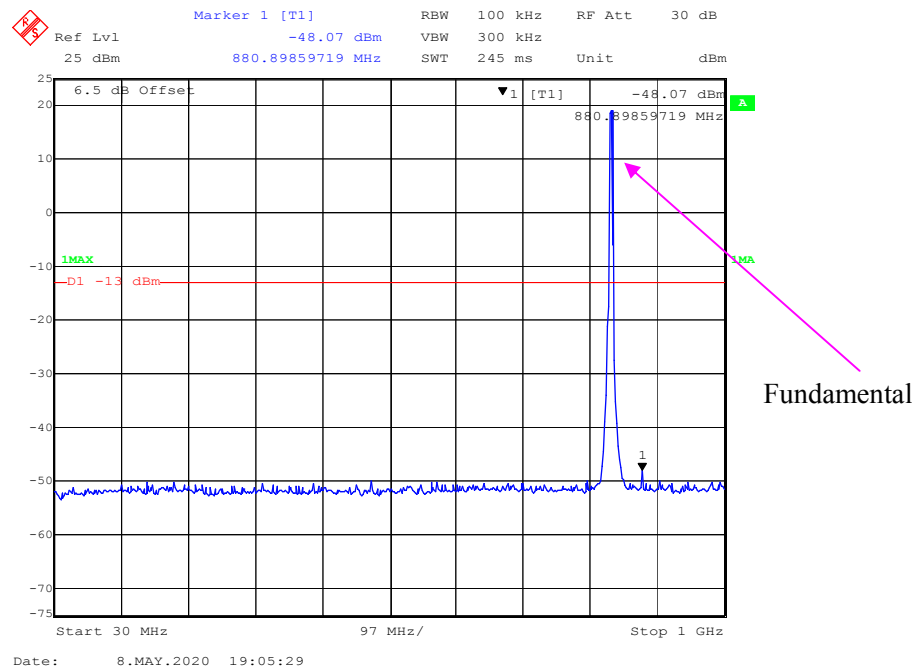
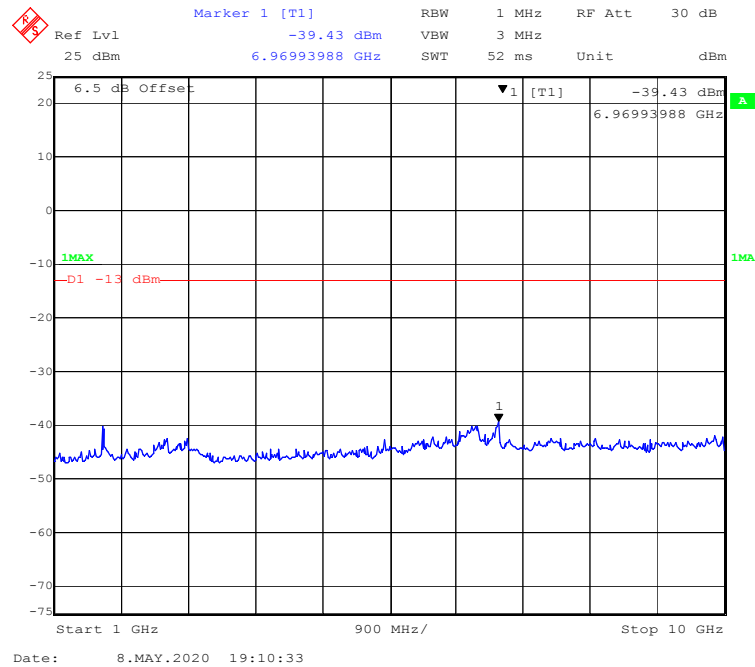


30 MHz – 1GHz WCDMA (HSUPA) Mode



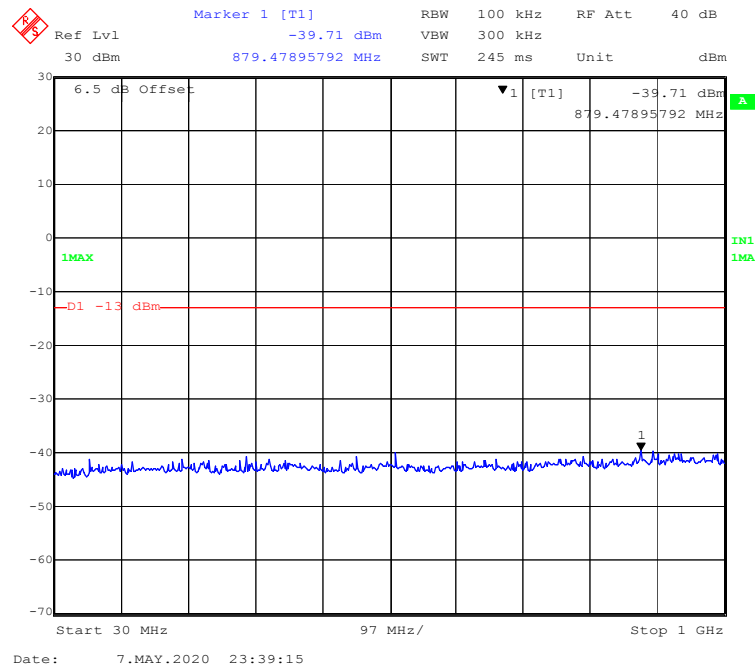
1 GHz – 10 GHz WCDMA (HSUPA) Mode



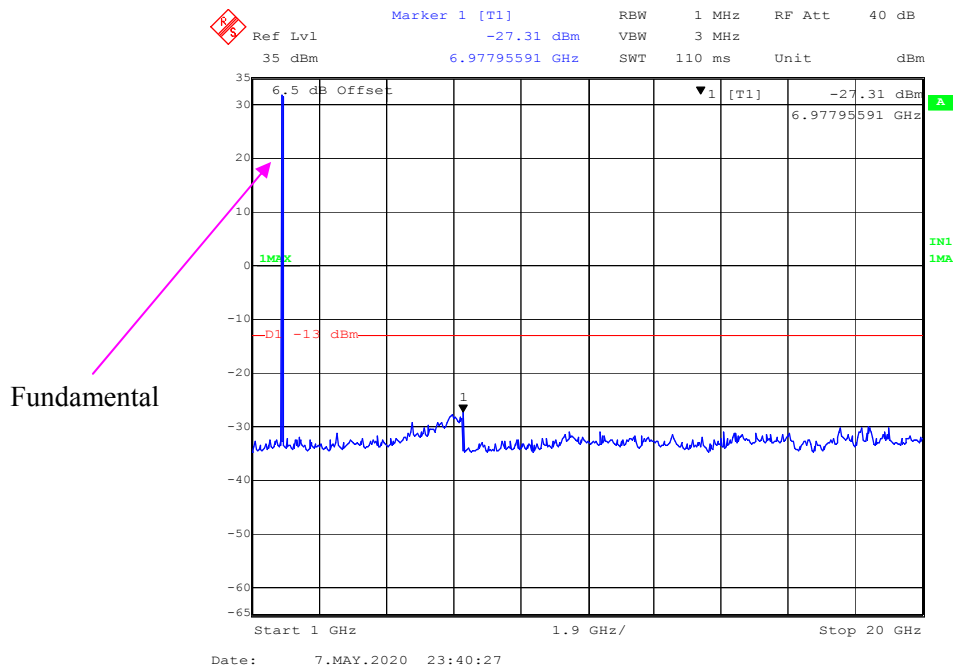
30 MHz – 1GHz WCDMA (HSPA+) Mode**1 GHz – 10 GHz WCDMA (HSPA+) Mode**

PCS 1900 Band:

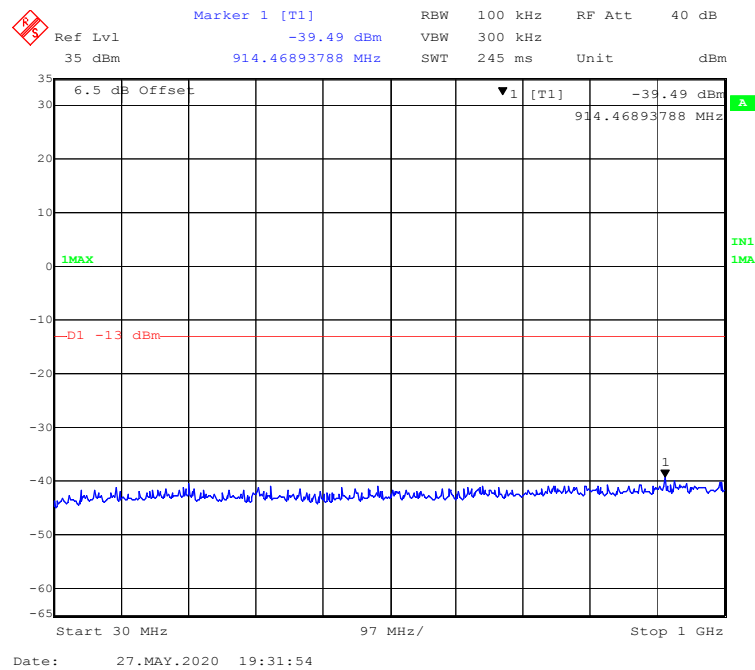
30 MHz – 1GHz(GPRS Mode)



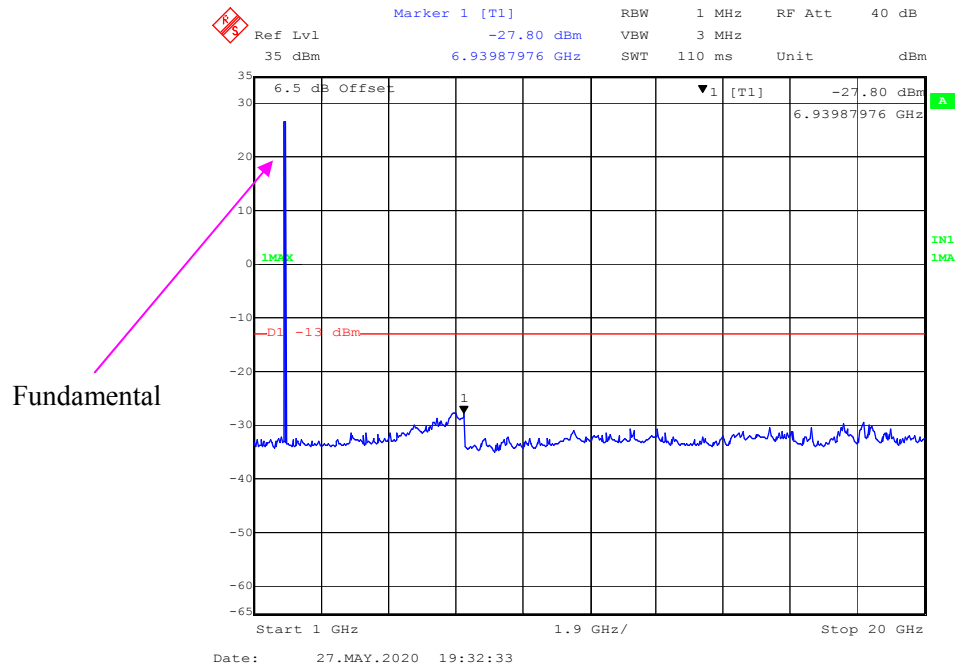
1 GHz – 20 GHz (GPRS Mode)

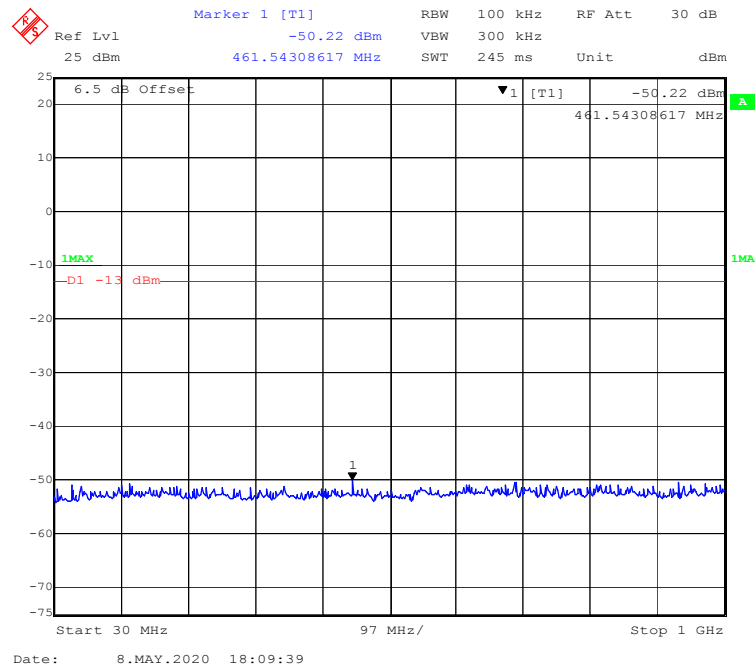
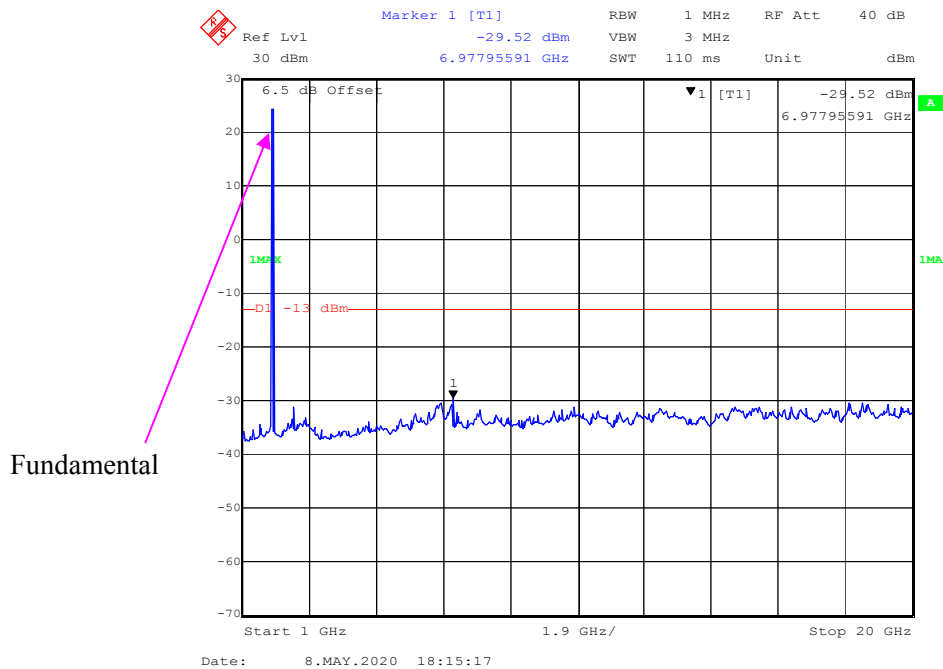


30 MHz – 1GHz(EGPRS Mode)



1 GHz – 20 GHz (EGPRS Mode)



WCDMA Band II:**30 MHz – 1GHz WCDMA (Rel 99) Mode****1 GHz – 20 GHz WCDMA (Rel 99) Mode**

Marker 1 [T1]

Ref Lvl -50.53 dBm RBW 100 kHz RF Att 30 dB

25 dBm 725.91182365 MHz SWT 245 ms Unit dBm

6.5 dB Offset

▼ 1 [T1] -50.53 dBm

725.91182365 MHz

1MAX

D1 -13 dBm

1

Start 30 MHz 97 MHz/ Stop 1 GHz

Date: 8.MAY.2020 18:09:20

Ref Lvl 30 dBm Marker 1 [T1] -31.03 dBm RBW 1 MHz RF Att 40 dB
 30 dBm 6.63527054 GHz VBW 3 MHz SWT 110 ms Unit dBm

6.5 dB Offset 1 [T1] -31.03 dBm
 6.63527054 GHz

1Max -13 dBm

Fundamental

Start 1 GHz 1.9 GHz/ Stop 20 GHz

Date: 8.MAY.2020 18:14:45

Marker 1 [T1]
 Ref Lvl -49.95 dBm
 25 dBm 725.91182365 MHz
 RBW 100 kHz RF Att 30 dB
 VBW 300 kHz
 SWT 245 ms Unit dBm

6.5 dB Offset
 1 [T1] -49.95 dBm
 725.91182365 MHz

1MAX
 D1 -13 dBm

Start 30 MHz 97 MHz/ Stop 1 GHz

Date: 8.MAY.2020 18:09:07

Ref Lvl 30 dBm Marker 1 [T1] -29.99 dBm RBW 1 MHz RF Att 40 dB

30 dBm 6.63527054 GHz VBW 3 MHz SWT 110 ms Unit dBm

6.5 dB Offset

▼1 [T1] -29.99 dBm 6.63527054 GHz

1MAX

-13 dBm

1

Start 1 GHz 1.9 GHz/ Stop 20 GHz

Date: 8.MAY.2020 18:14:27

Fundamental

Marker 1 [T1]

Ref Lvl	-49.21 dBm	RBW	100 kHz	RF Att	30 dB
25 dBm	986.39278557 MHz	SWT	245 ms	Unit	dBm

6.5 dB Offset

▼ 1 [T1] -49.21 dBm
986.39278557 MHz

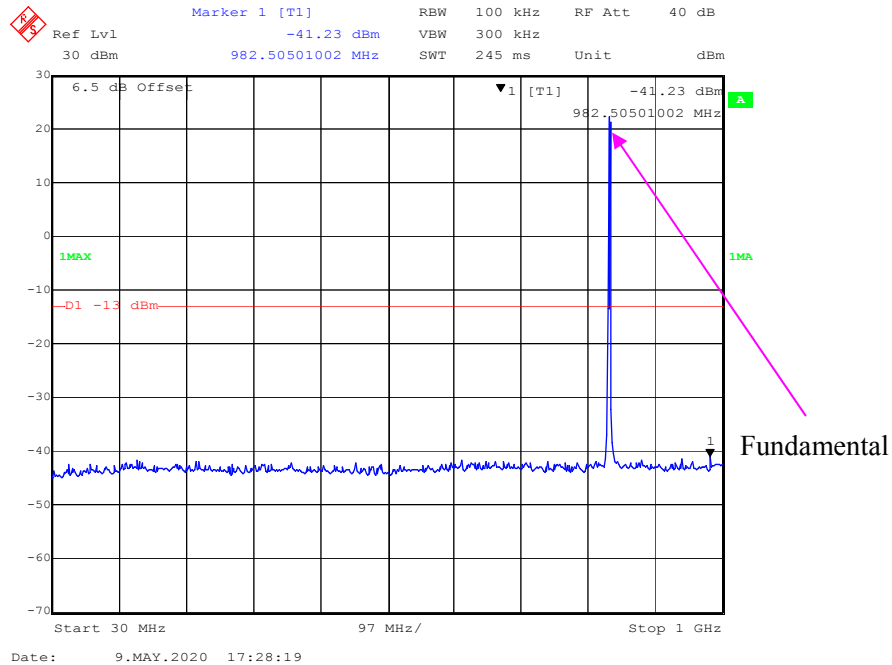
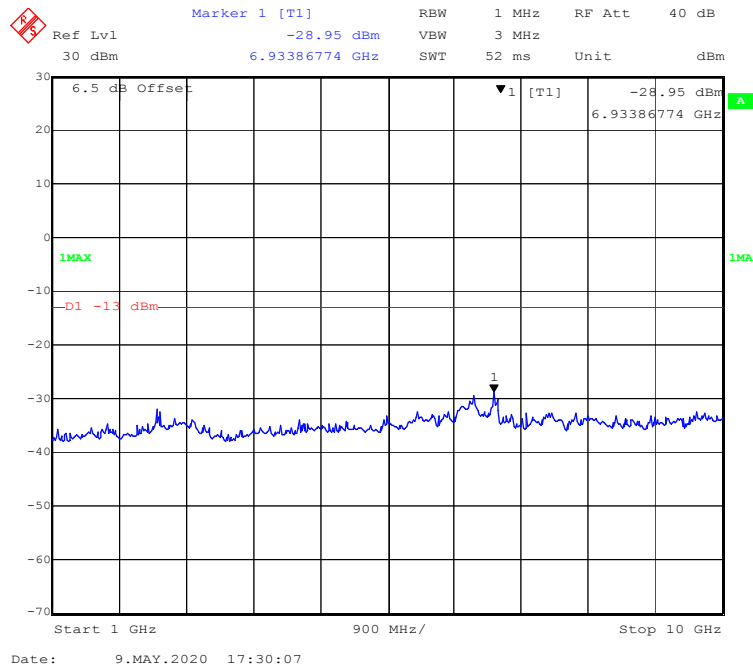
1MAX

D1 -13 dBm

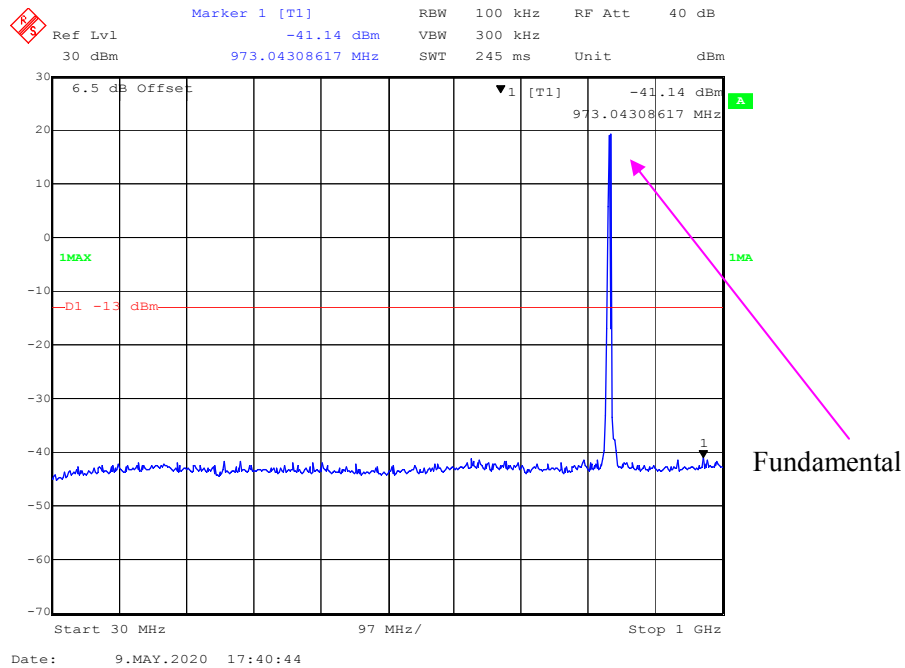
Start 30 MHz 97 MHz/ Stop 1 GHz

Date: 8.MAY.2020 18:08:48

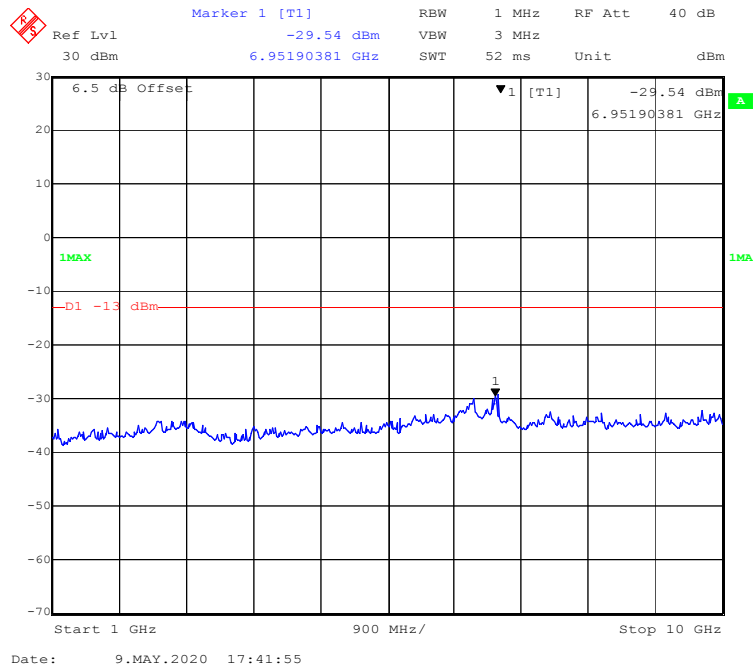
Ref Lvl 30 dBm
 30 dBm
 Marker 1 [T1]
 -30.40 dBm
 RBW 1 MHz
 VBW 3 MHz
 SWT 110 ms
 RF Att 40 dB
 Unit dBm
 6.93987976 GHz
 6.5 dB Offset
 [T1]
 -30.40 dBm
 6.93987976 GHz
 1Mpx
 -13 dBm
 1
 Start 1 GHz
 1.9 GHz/
 Stop 20 GHz
 Date: 8.MAY.2020 18:14:09

LTE Band 5:**30 MHz - 1 GHz (QPSK, 1.4 MHz, Middle Channel)****1 GHz – 10 GHz (QPSK, 1.4 MHz, Middle Channel)**

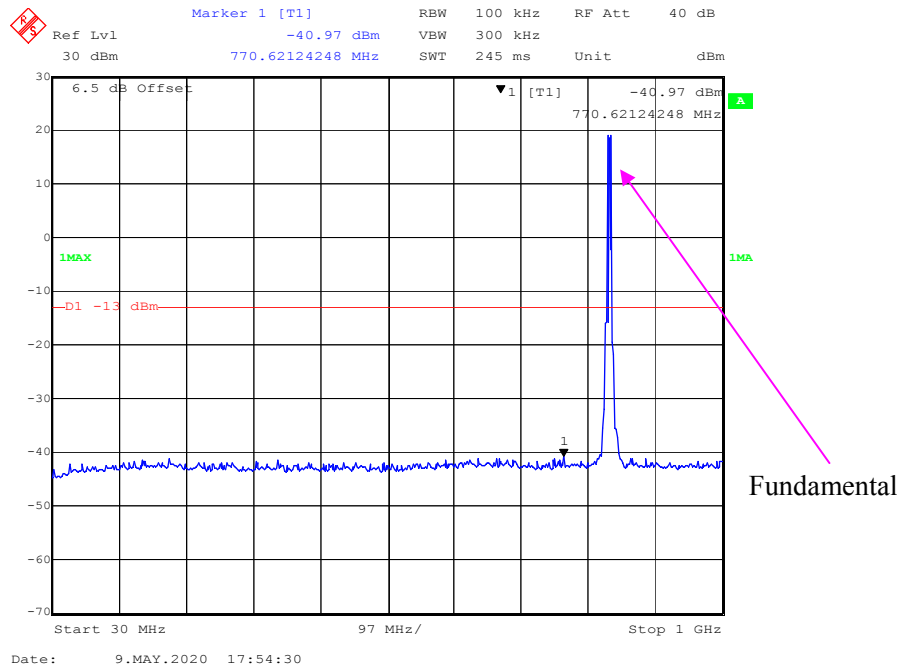
30 MHz - 1 GHz (QPSK, 3.0 MHz, Middle Channel)



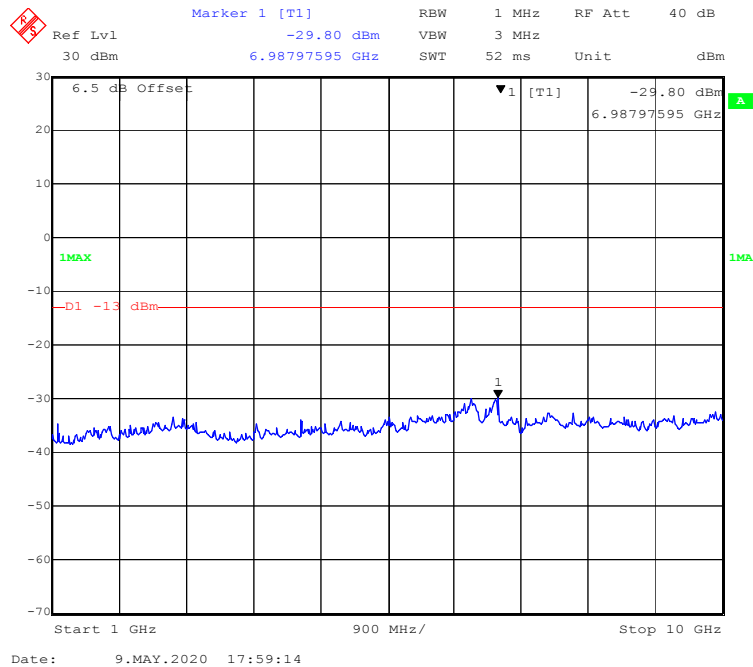
1 GHz – 26.5 GHz (QPSK, 3.0 MHz, Middle Channel)



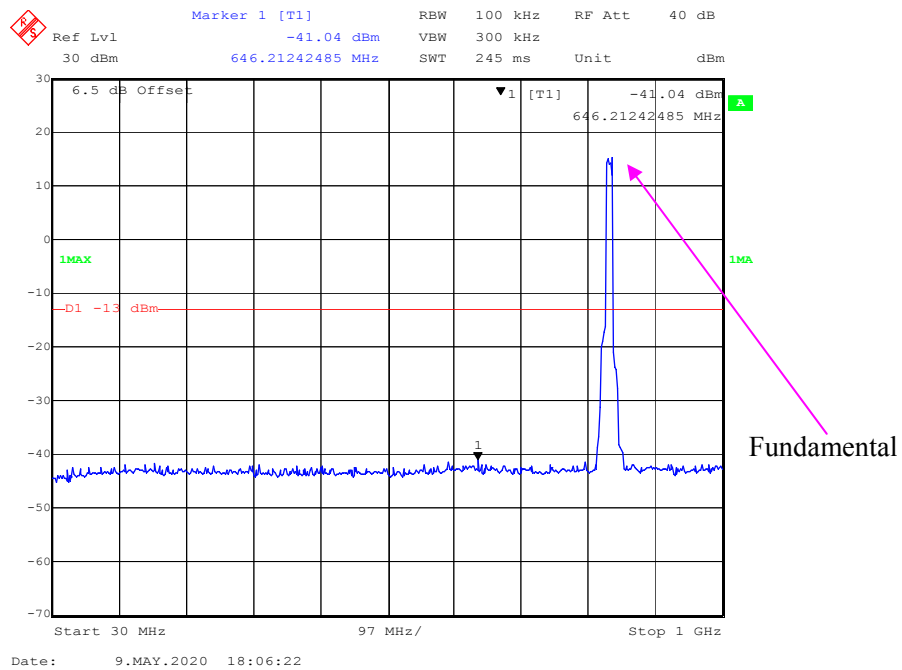
30 MHz - 1 GHz (QPSK, 5.0 MHz, Middle Channel)



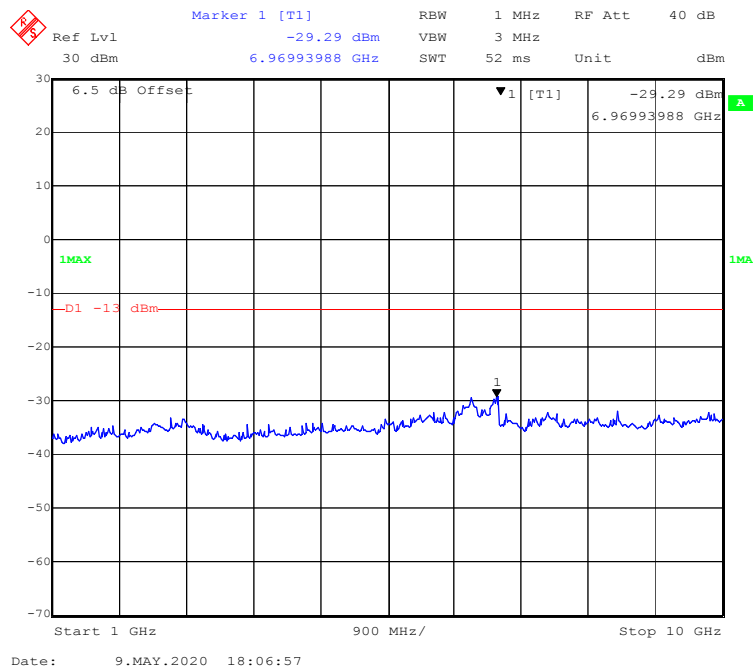
1 GHz – 10 GHz (QPSK, 5.0MHz, Middle Channel)



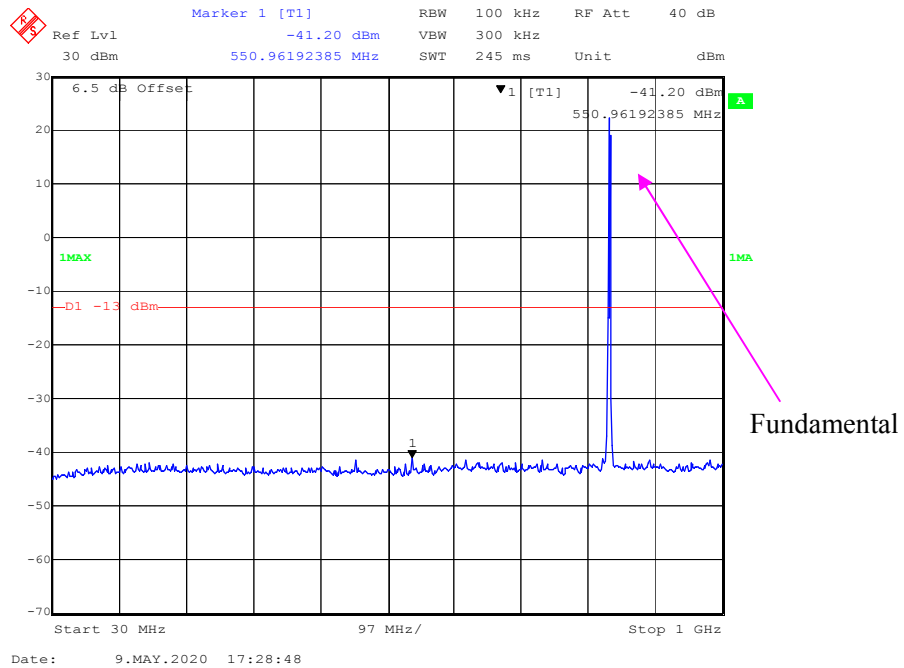
30 MHz - 1 GHz (QPSK, 10.0 MHz, Middle Channel)



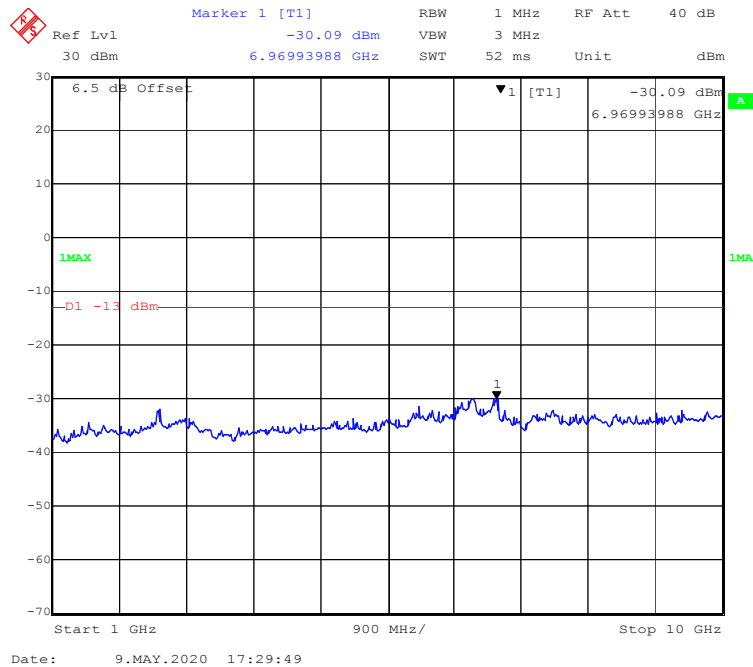
1 GHz – 26.5 GHz (QPSK, 10.0 MHz, Middle Channel)



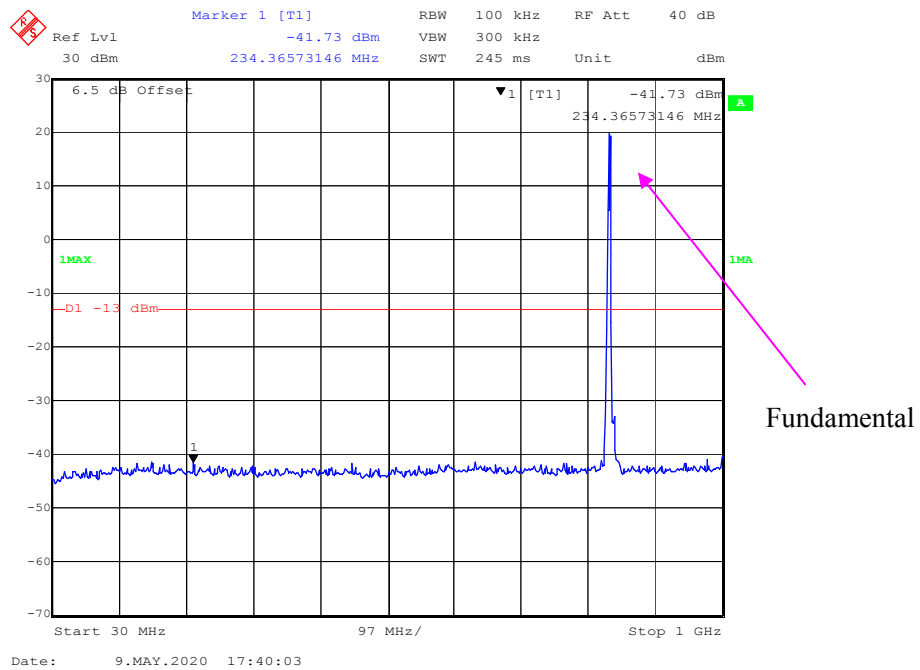
30 MHz - 1 GHz (16QAM, 1.4 MHz, Middle Channel)



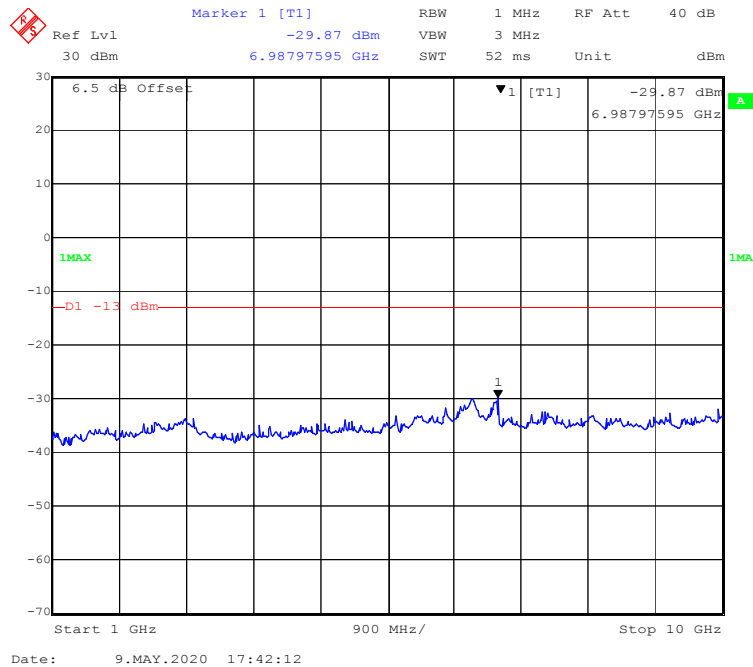
1 GHz – 10 GHz (16QAM, 1.4 MHz, Middle Channel)



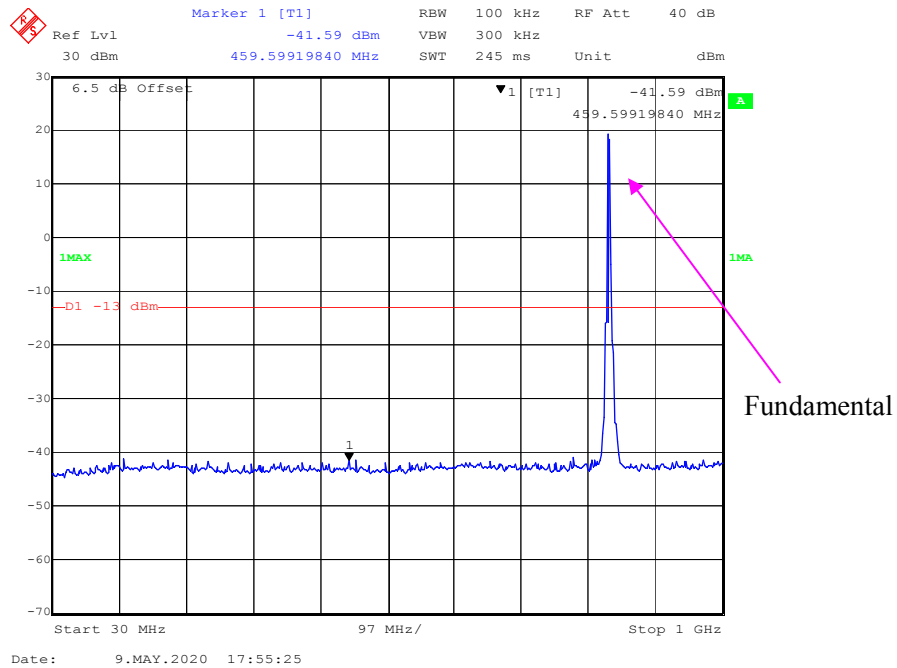
30 MHz - 1 GHz (16QAM, 3.0 MHz, Middle Channel)



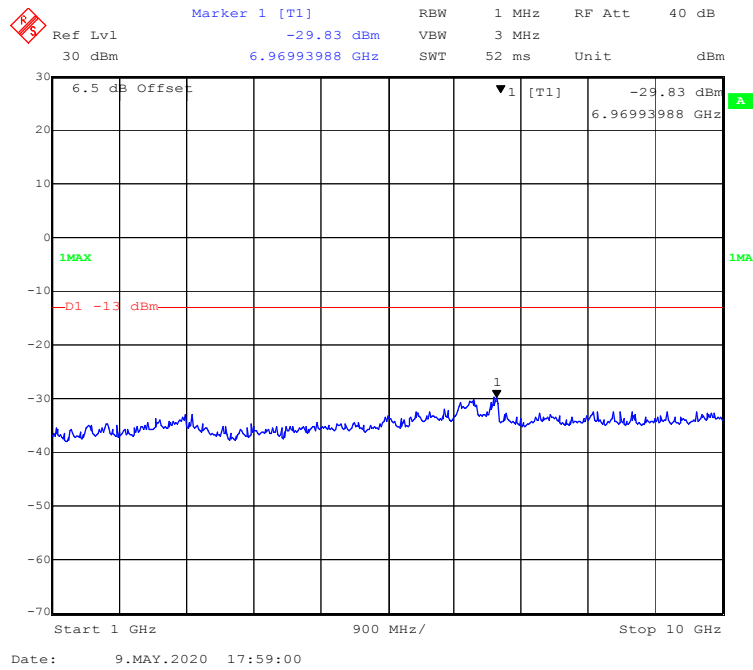
1 GHz – 10 GHz (16QAM, 3.0 MHz, Middle Channel)



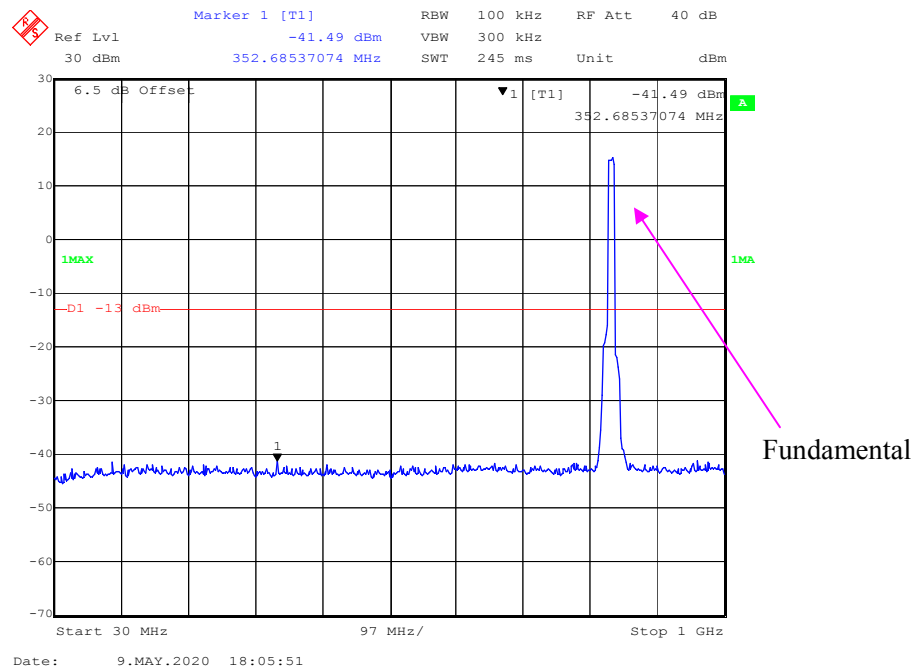
30 MHz - 1 GHz (16QAM, 5.0 MHz, Middle Channel)



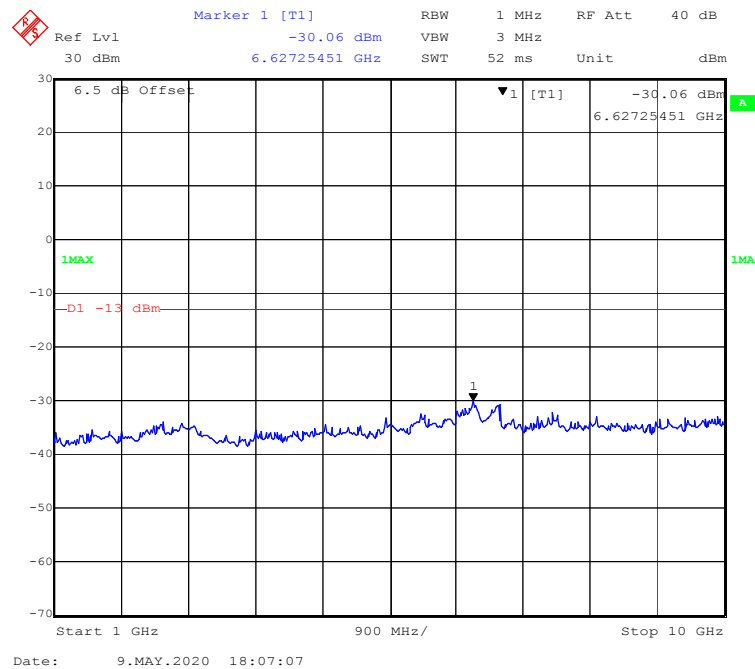
1 GHz – 10 GHz (16QAM, 5.0MHz, Middle Channel)



30 MHz - 1 GHz (16QAM, 10.0 MHz, Middle Channel)

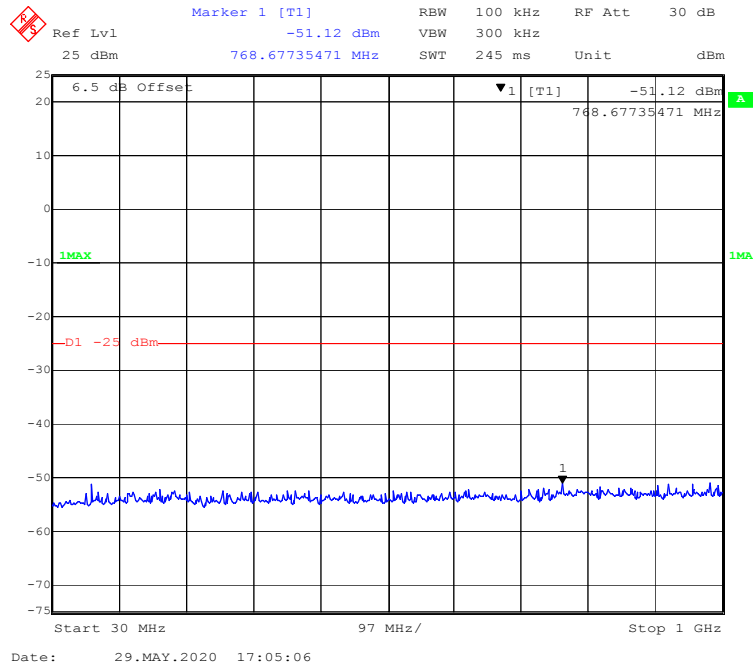


1 GHz – 10 GHz (16QAM, 10.0 MHz, Middle Channel)

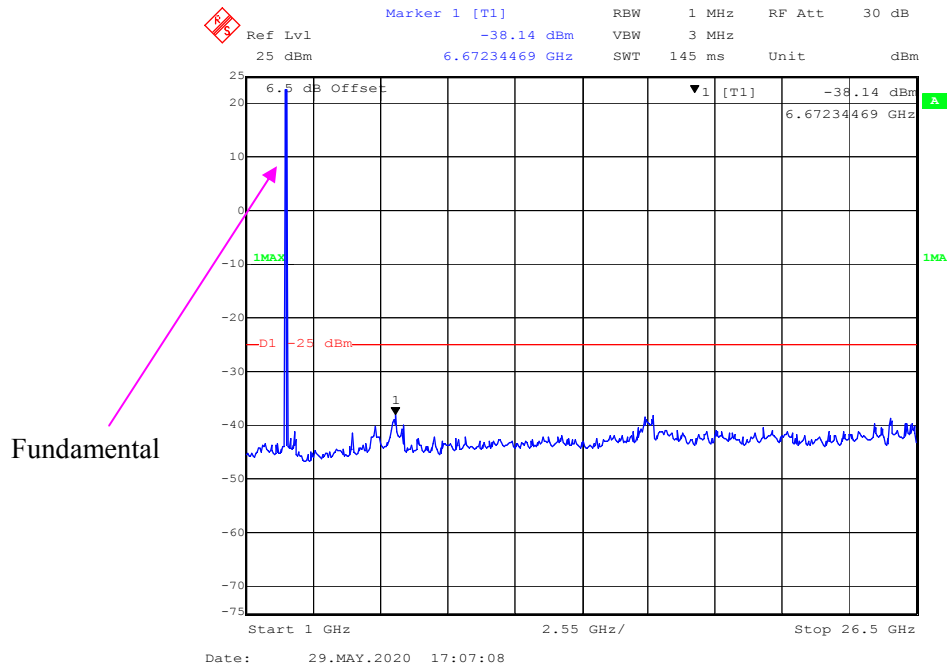


LTE Band 7

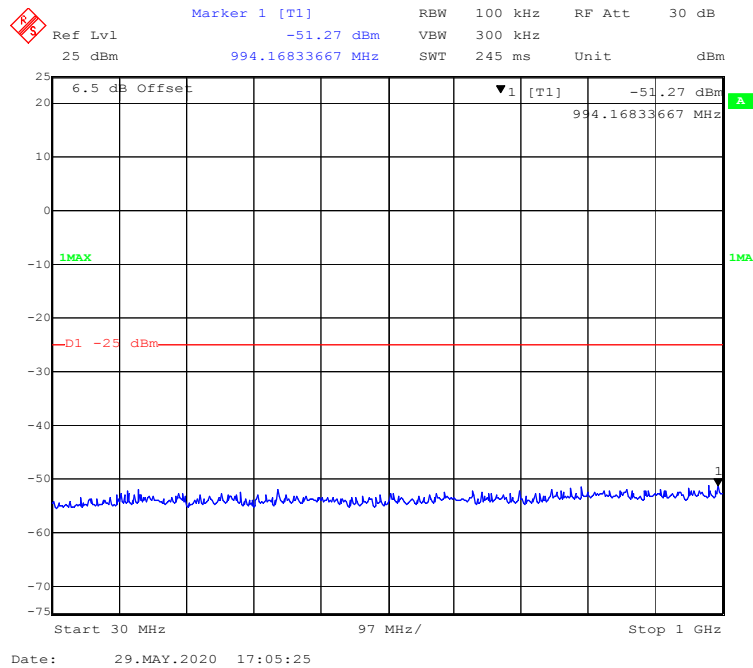
30 MHz - 1 GHz (QPSK, 5.0 MHz, Middle Channel)



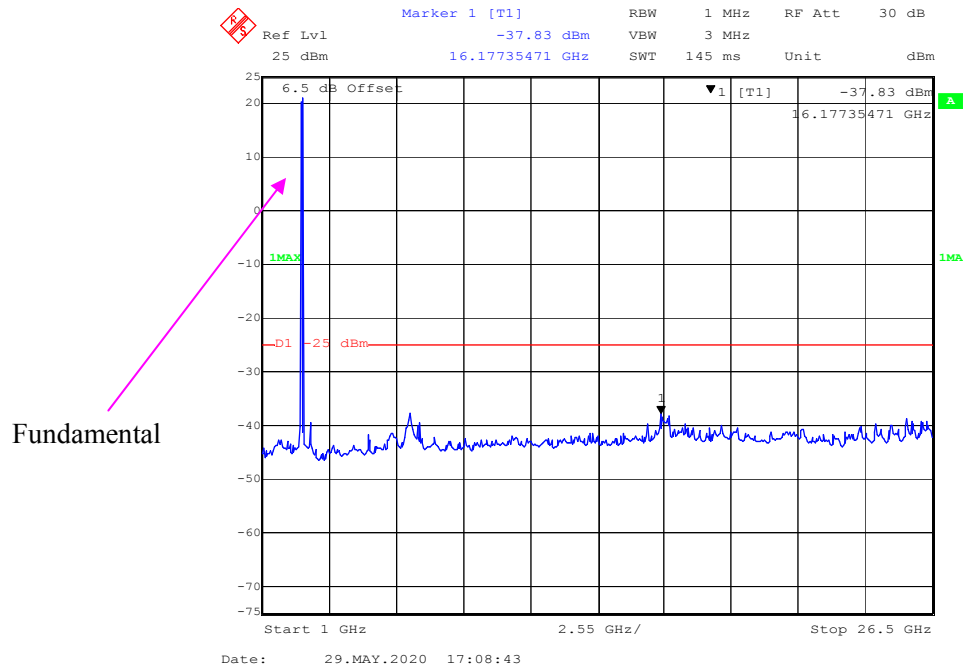
1 GHz – 26 GHz (QPSK, 5.0 MHz, Middle Channel)



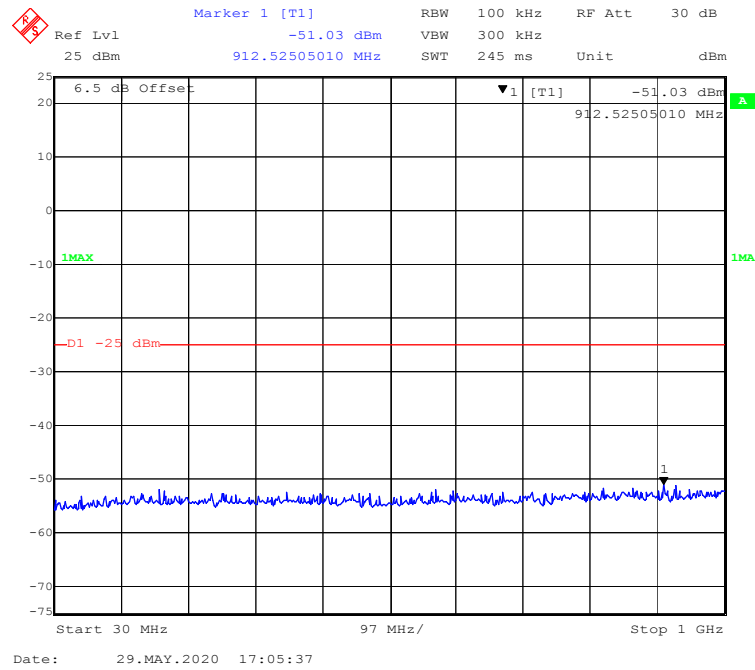
30 MHz - 1 GHz (QPSK, 10.0 MHz, Middle Channel)



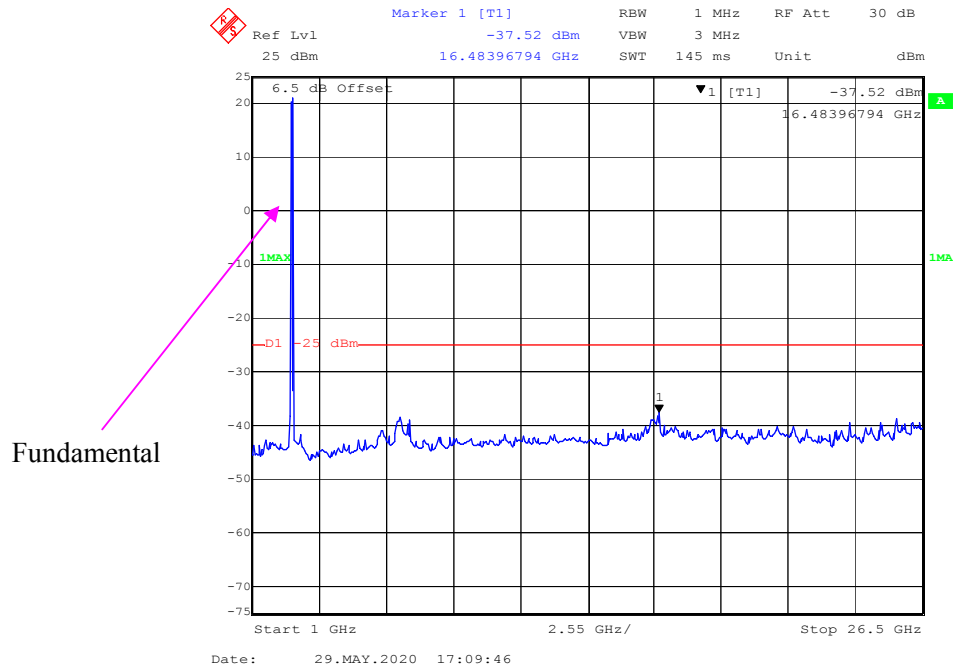
1 GHz – 26 GHz (QPSK, 10.0 MHz, Middle Channel)



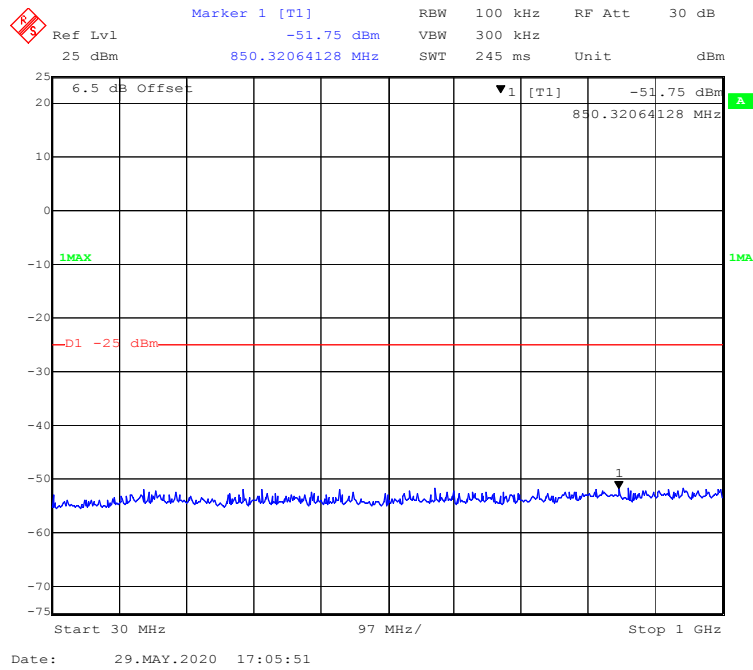
30 MHz - 1 GHz (QPSK, 15.0 MHz, Middle Channel)



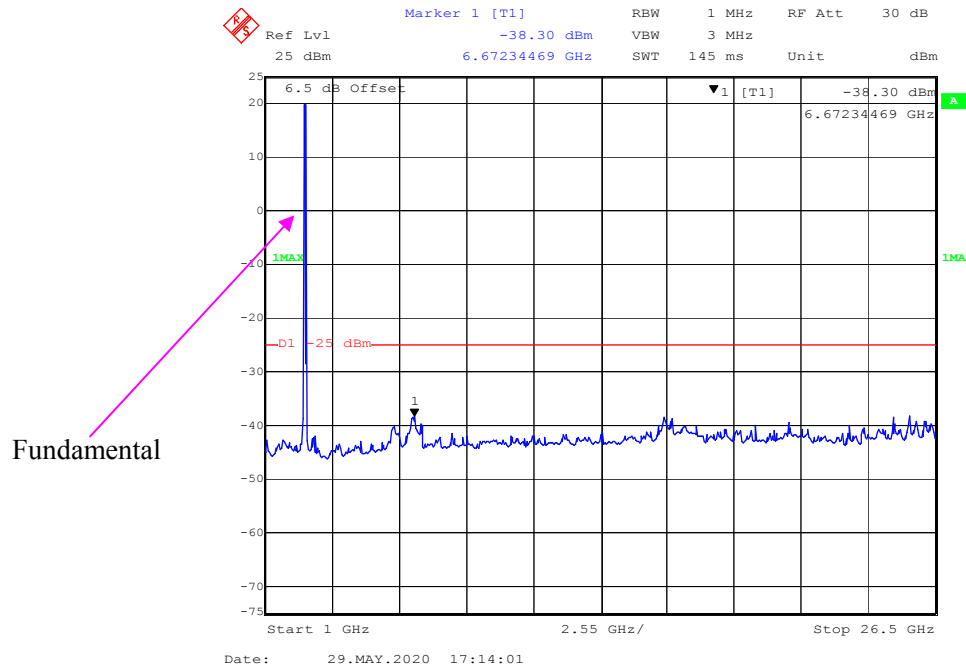
1 GHz – 26 GHz (QPSK, 15.0MHz, Middle Channel)



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



1 GHz – 26 GHz (QPSK, 20.0 MHz, Middle Channel)



Marker 1 [T1]
 Ref Lvl -50.74 dBm
 25 dBm 801.72344689 MHz
 RBW 100 kHz RF Att 30 dB
 VBW 300 kHz
 SWT 245 ms Unit dBm

6.5 dB Offset
 1MAX
 -D1 -25 dBm
 Start 30 MHz 97 MHz/ Stop 1 GHz

Ref Lvl 25 dBm

Marker 1 [T1] -38.54 dBm

RBW 1 MHz RF Att 30 dB

VBW 3 MHz

SWT 145 ms Unit dBm

6.5 dB Offset

1MAX

D1 -25 dBm

1

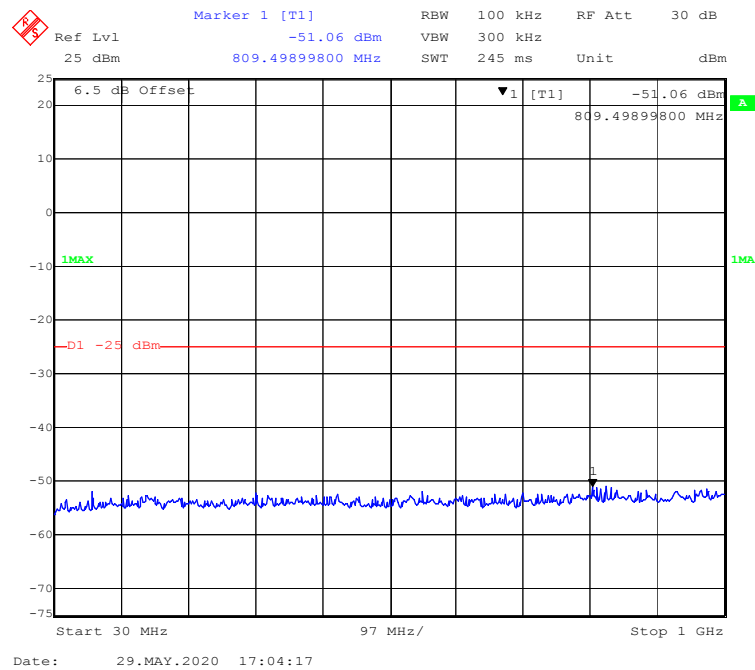
6.62124248 GHz

Start 1 GHz Stop 26.5 GHz

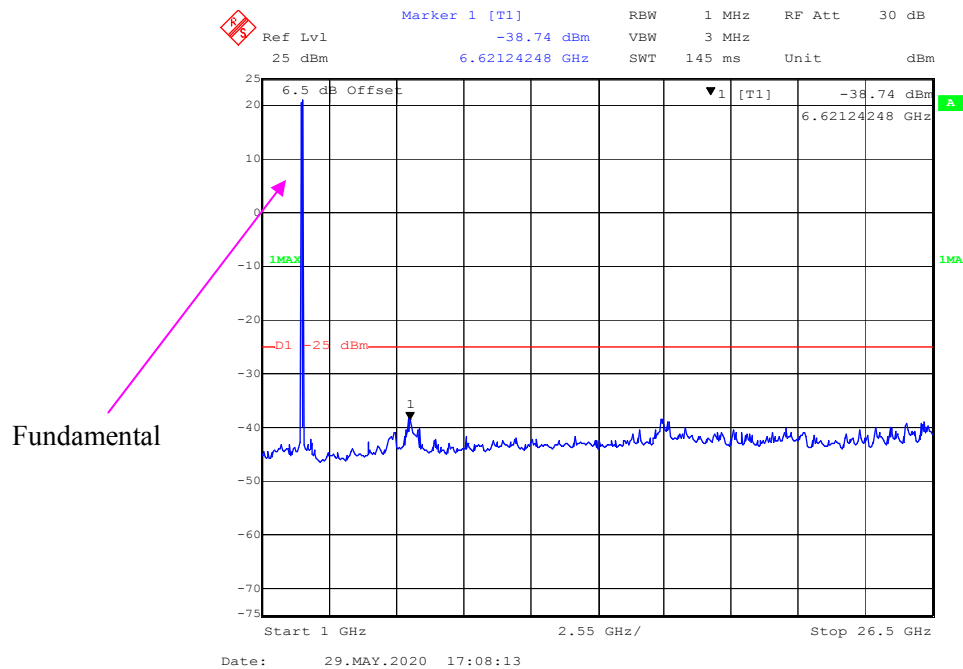
2.55 GHz/

Date: 29.MAY.2020 17:07:37

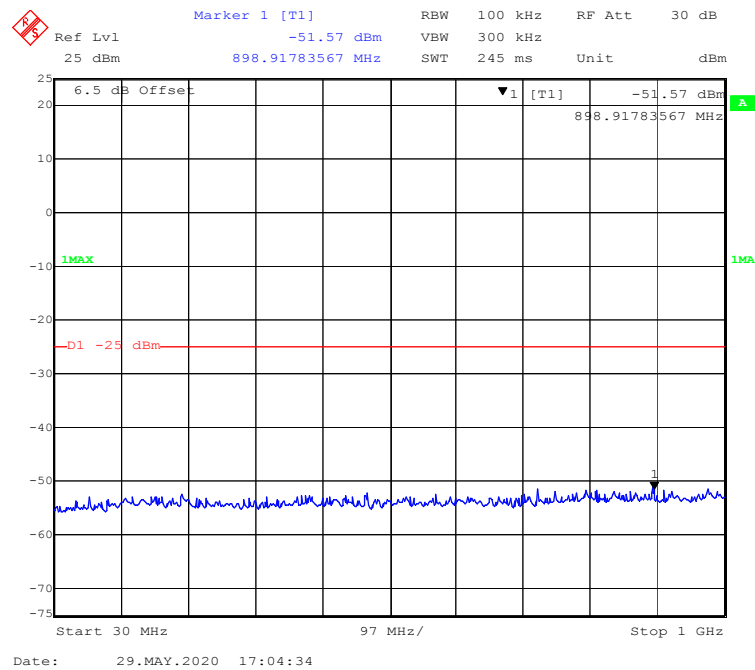
30 MHz - 1 GHz (16QAM, 10.0 MHz, Middle Channel)



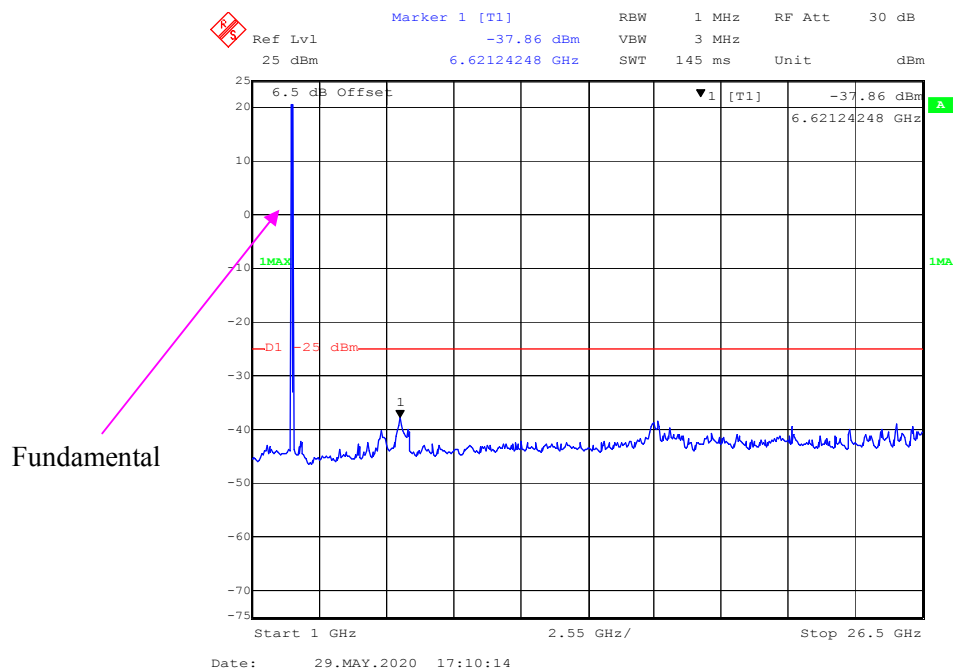
1 GHz – 26 GHz (16QAM, 10.0 MHz, Middle Channel)



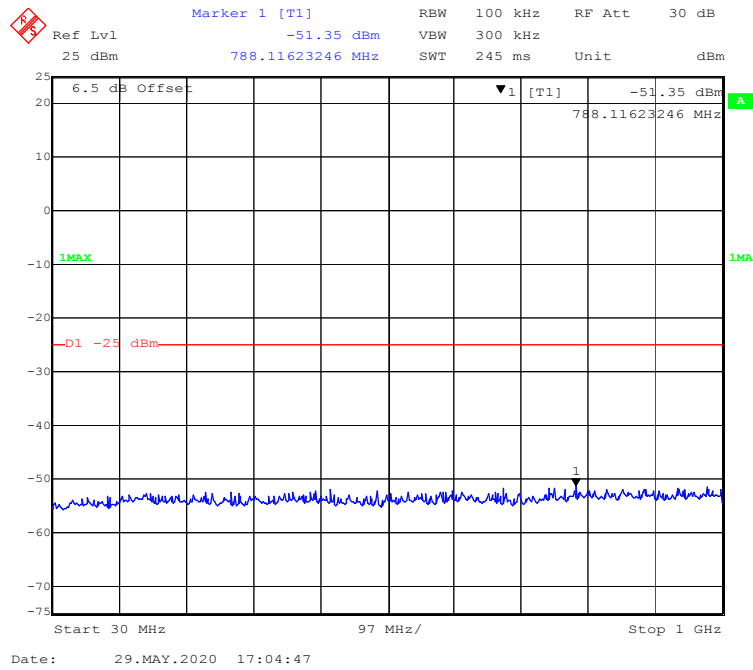
30 MHz - 1 GHz (16QAM, 15.0 MHz, Middle Channel)



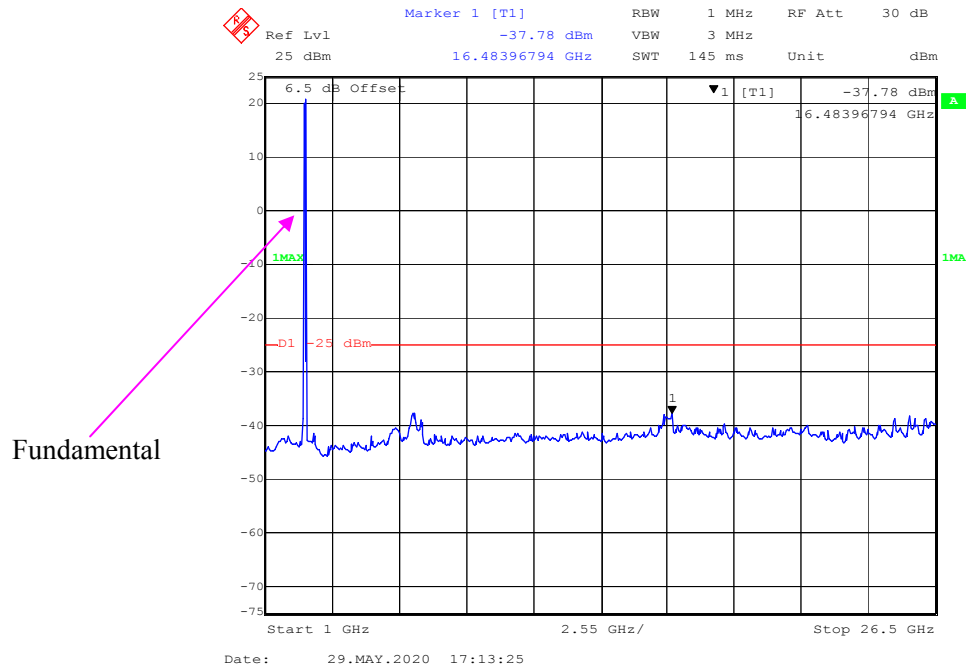
1 GHz – 26 GHz (16QAM, 15.0MHz, Middle Channel)



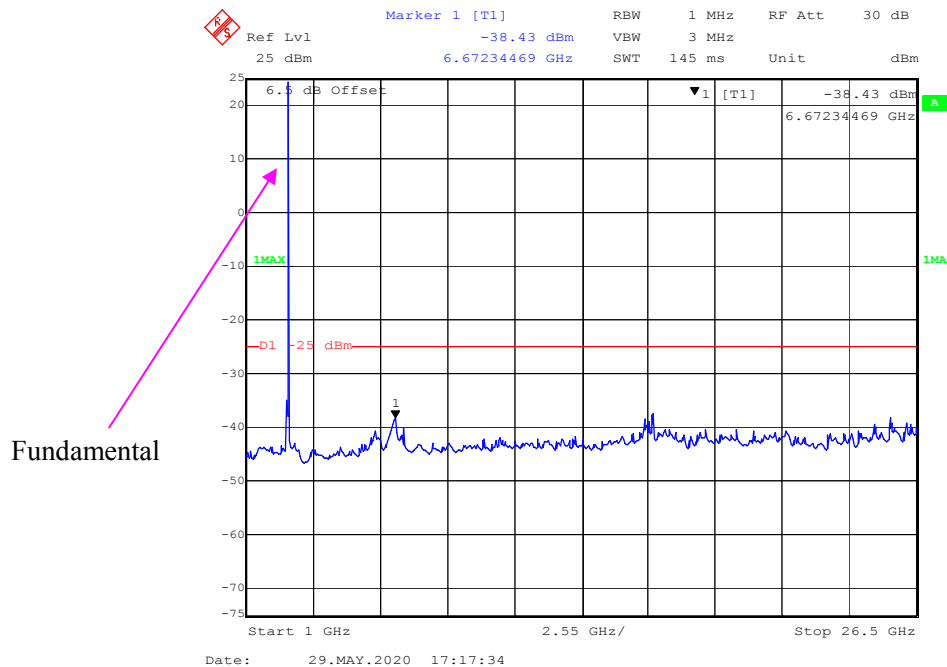
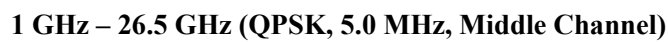
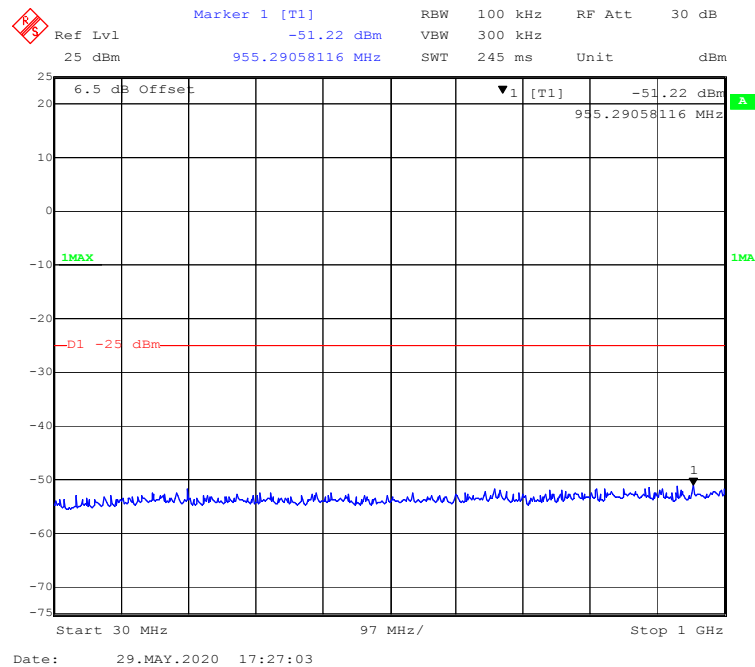
30 MHz - 1 GHz (16QAM, 20.0 MHz, Middle Channel)



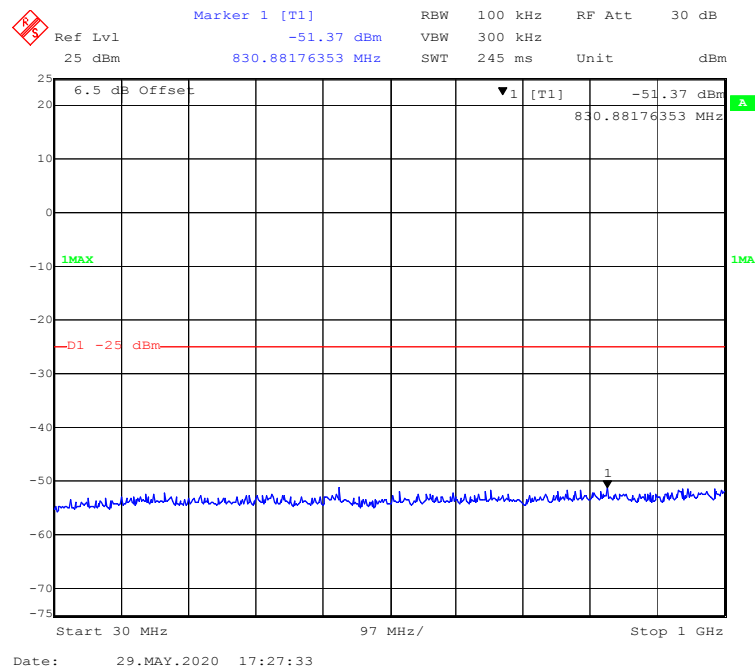
1 GHz – 26 GHz (16QAM, 20.0 MHz, Middle Channel)



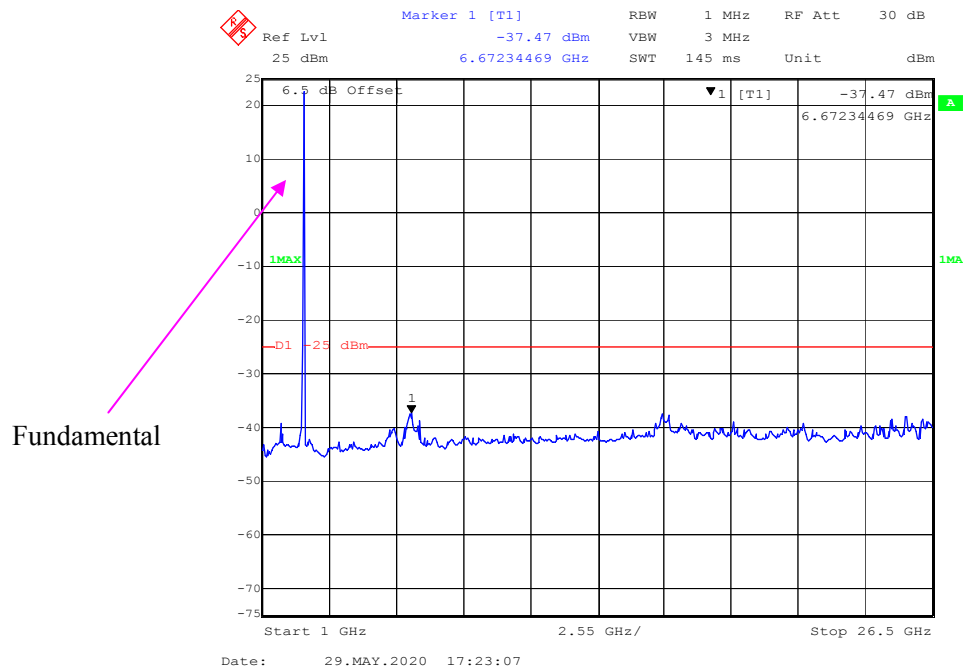
30 MHz - 1 GHz (QPSK, 5.0 MHz, Middle Channel)



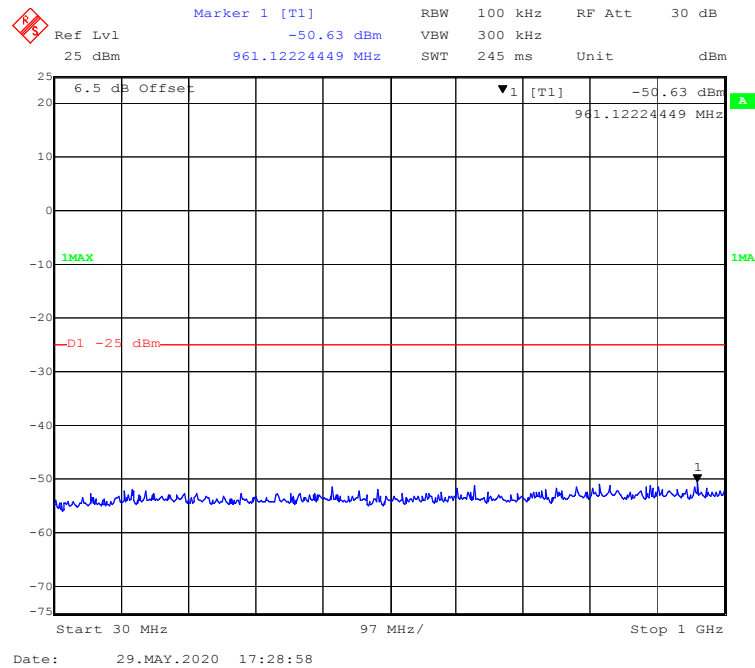
30 MHz - 1 GHz (QPSK, 10.0 MHz, Middle Channel)



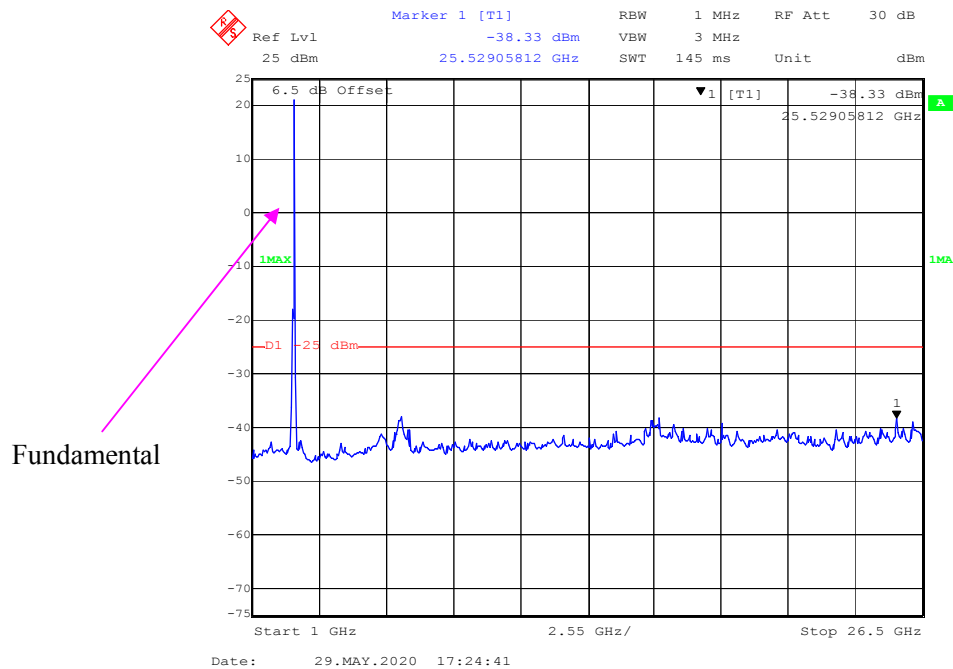
1 GHz – 26.5 GHz (QPSK, 10.0 MHz, Middle Channel)



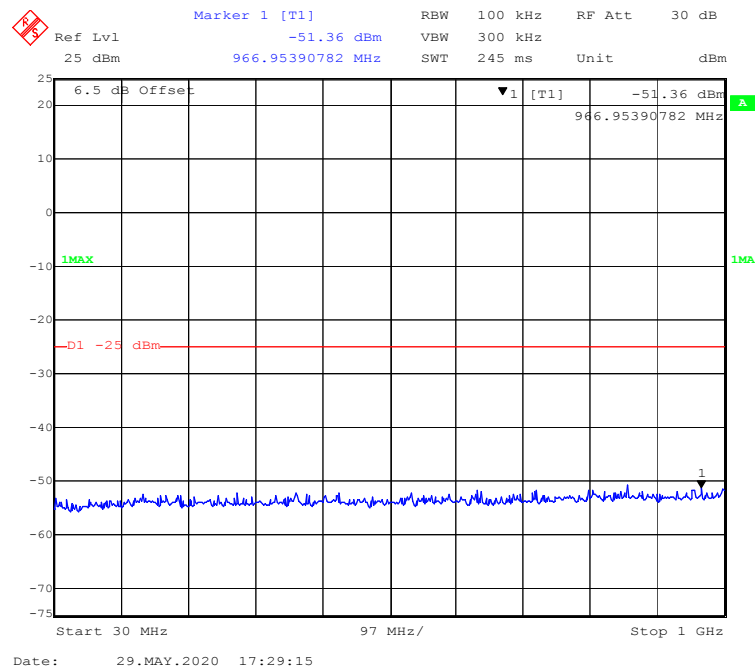
30 MHz - 1 GHz (QPSK, 15.0 MHz, Middle Channel)



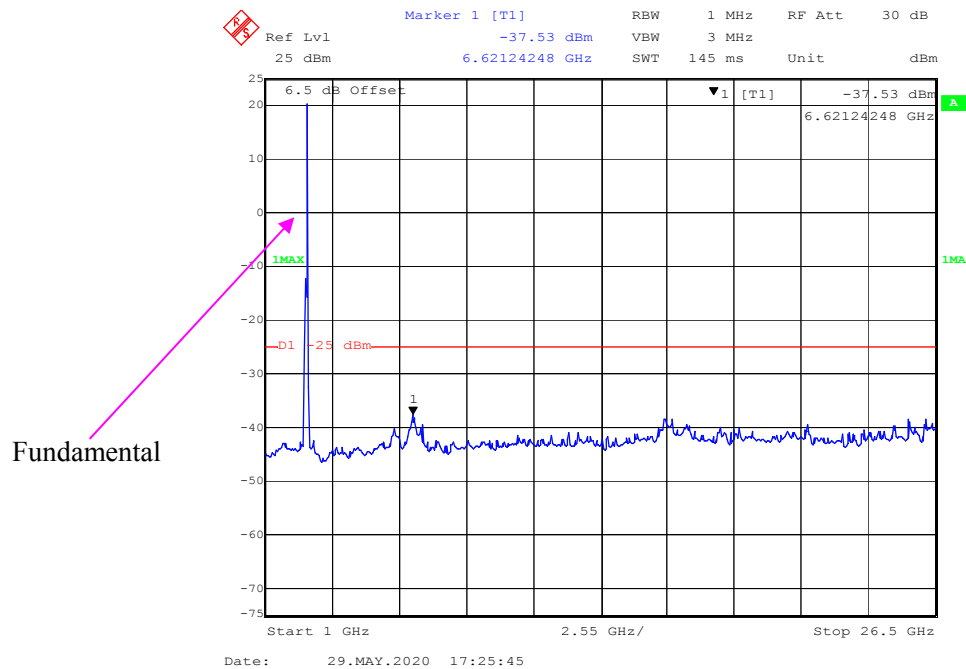
1 GHz – 26.5 GHz (QPSK, 15.0MHz, Middle Channel)



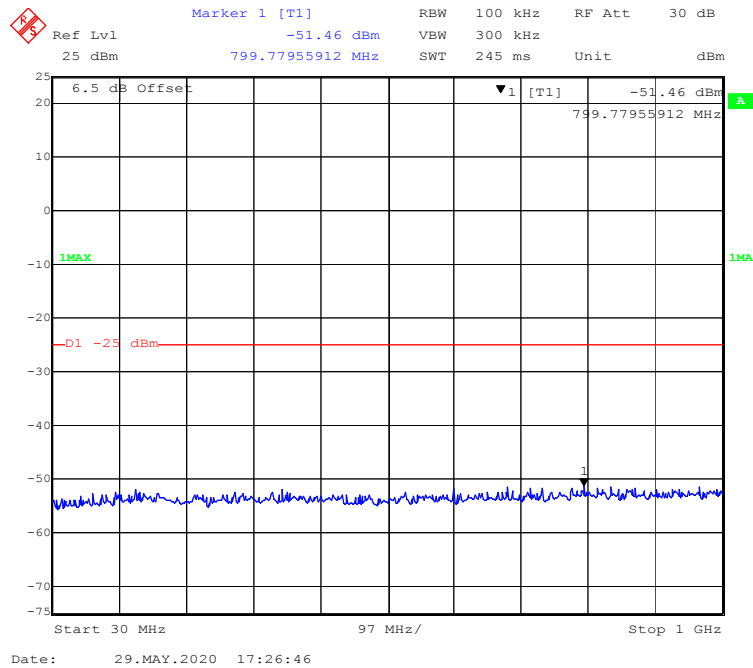
30 MHz - 1 GHz (QPSK, 20.0 MHz, Middle Channel)



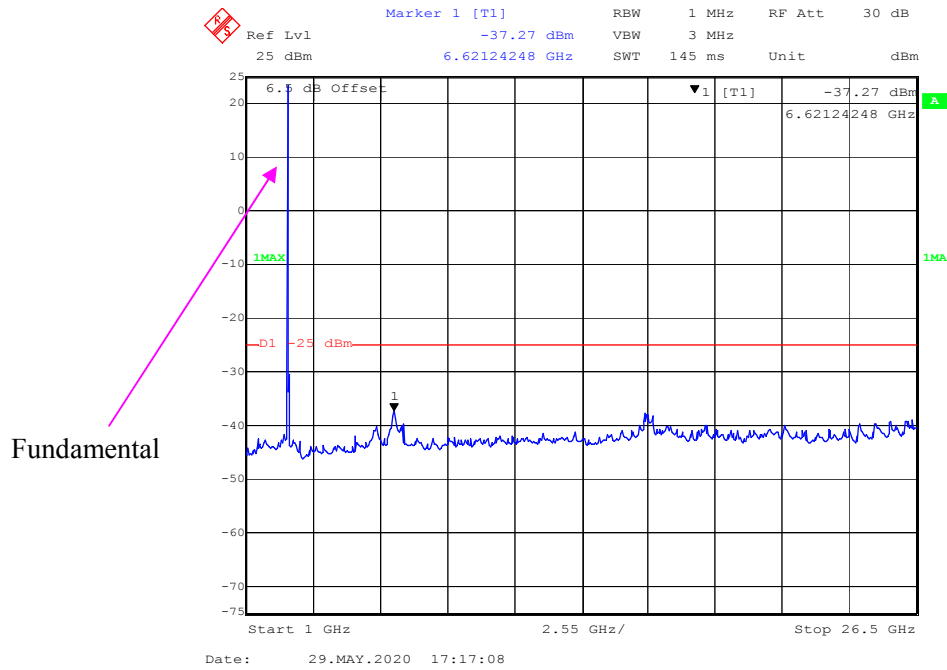
1 GHz – 26.5 GHz (QPSK, 20.0 MHz, Middle Channel)

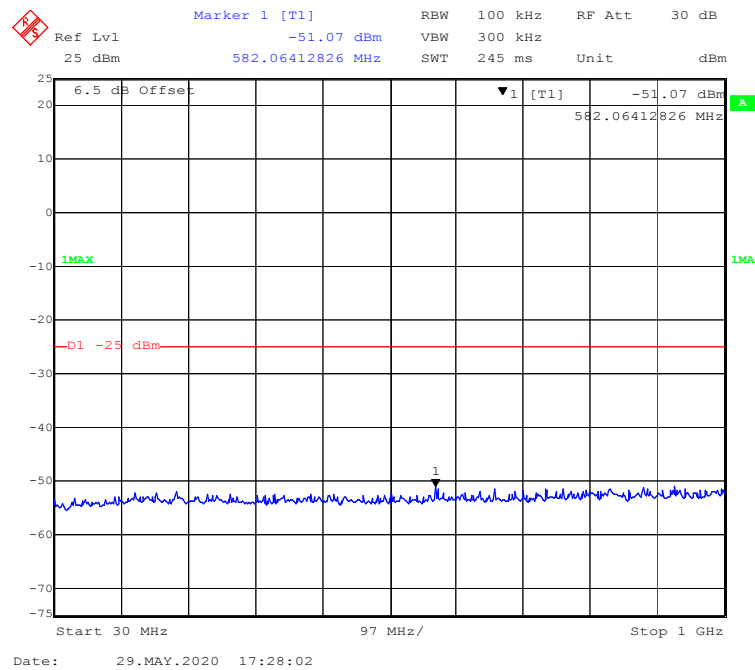
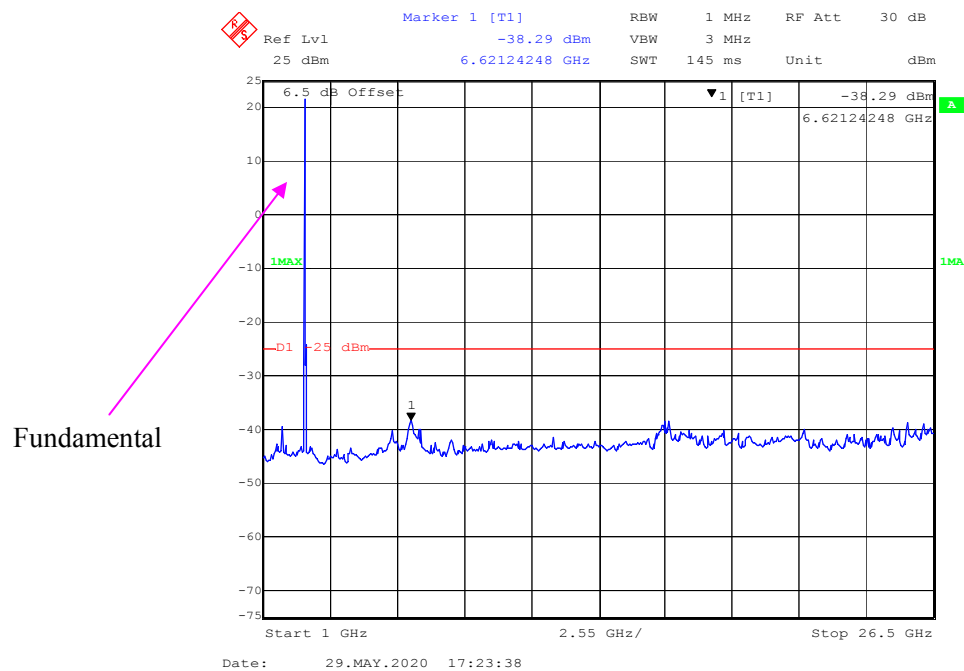


30 MHz - 1 GHz (16QAM, 5.0 MHz, Middle Channel)

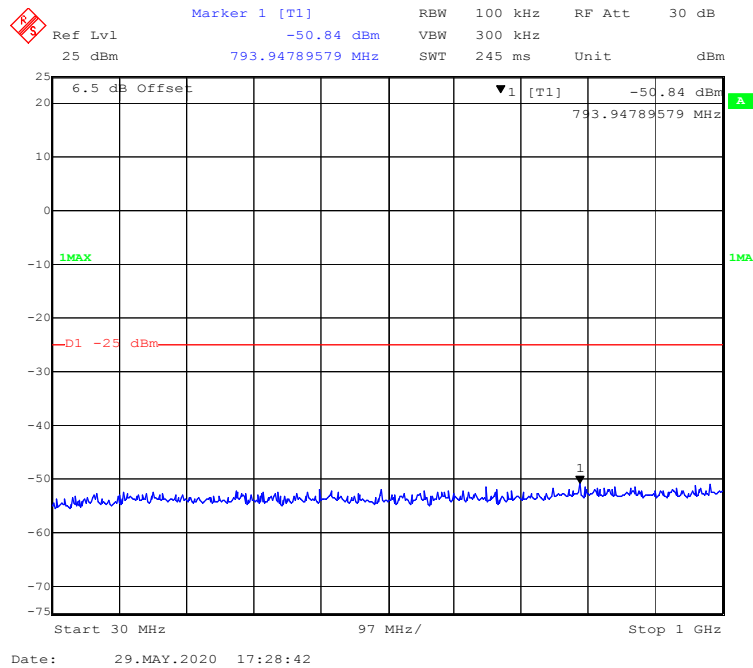


1 GHz – 26.5 GHz (16QAM, 5.0 MHz, Middle Channel)

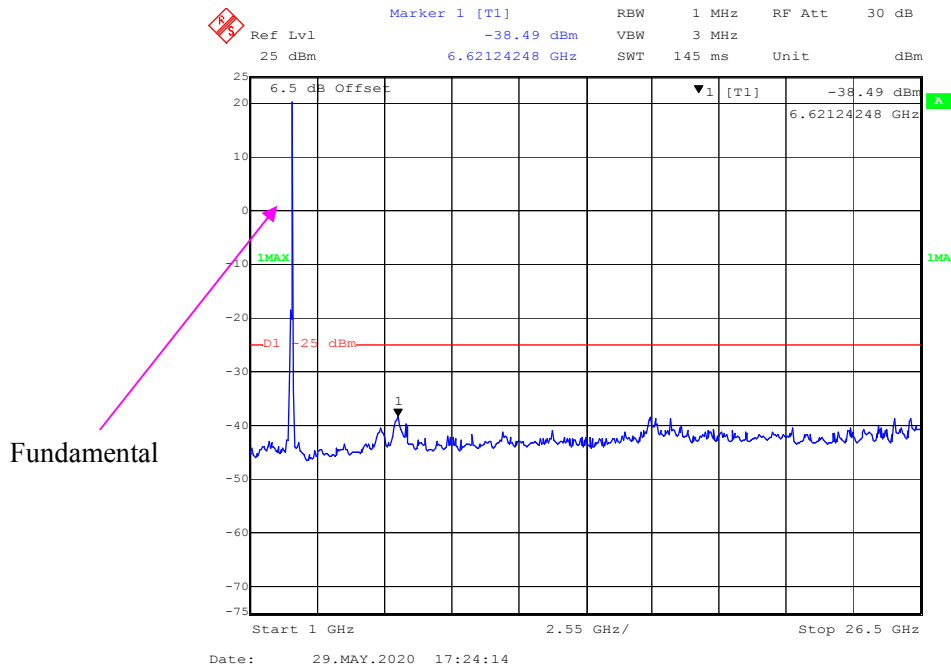


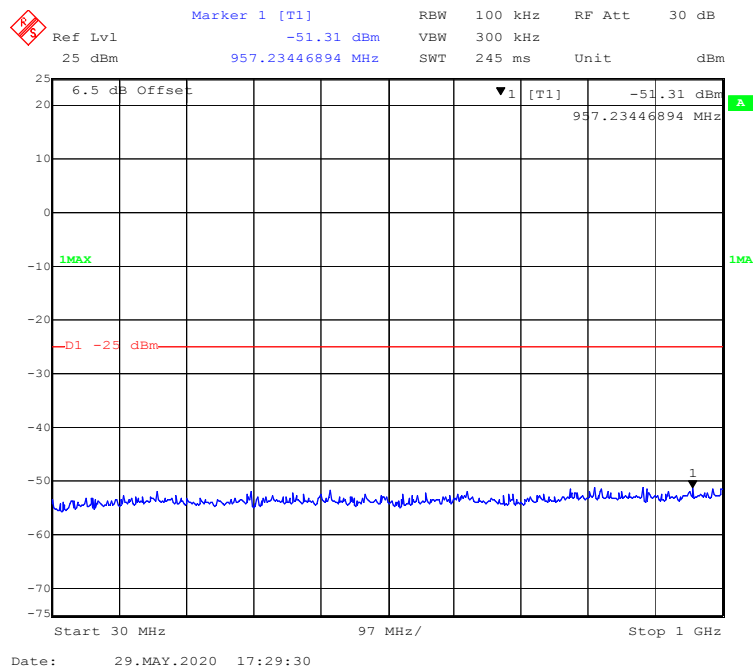
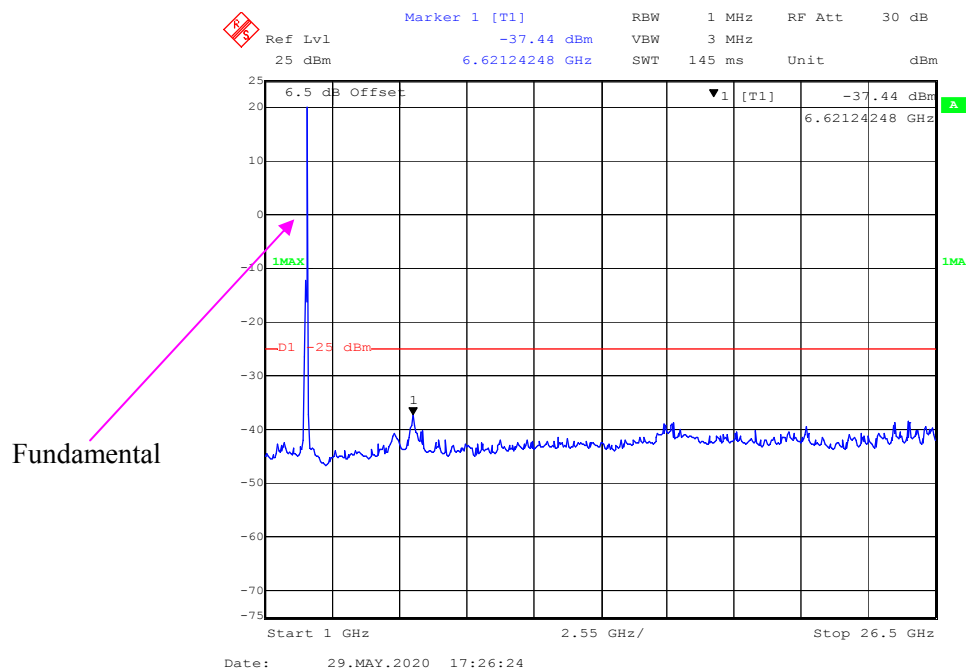
30 MHz - 1 GHz (16QAM, 10.0 MHz, Middle Channel)**1 GHz – 26.5 GHz (16QAM, 10.0 MHz, Middle Channel)**

30 MHz - 1 GHz (16QAM, 15.0 MHz, Middle Channel)



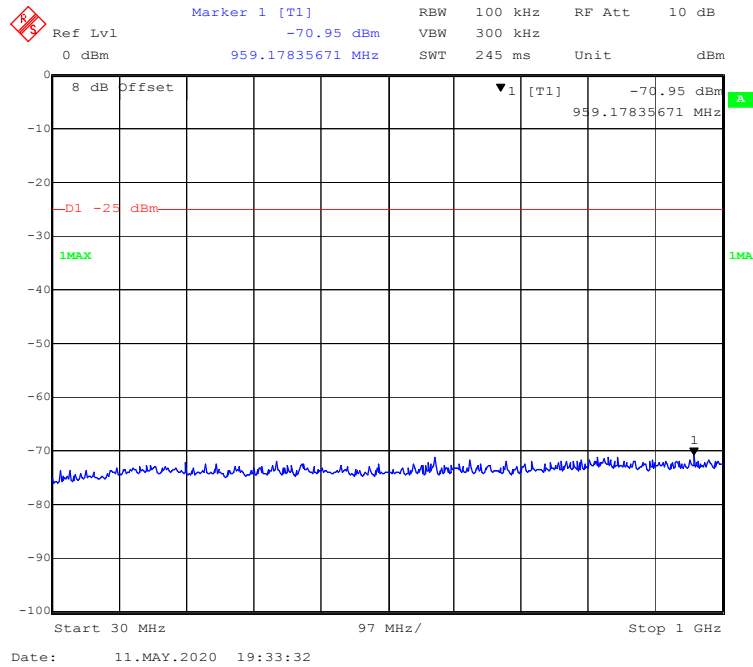
1 GHz – 26.5 GHz (16QAM, 15.0MHz, Middle Channel)



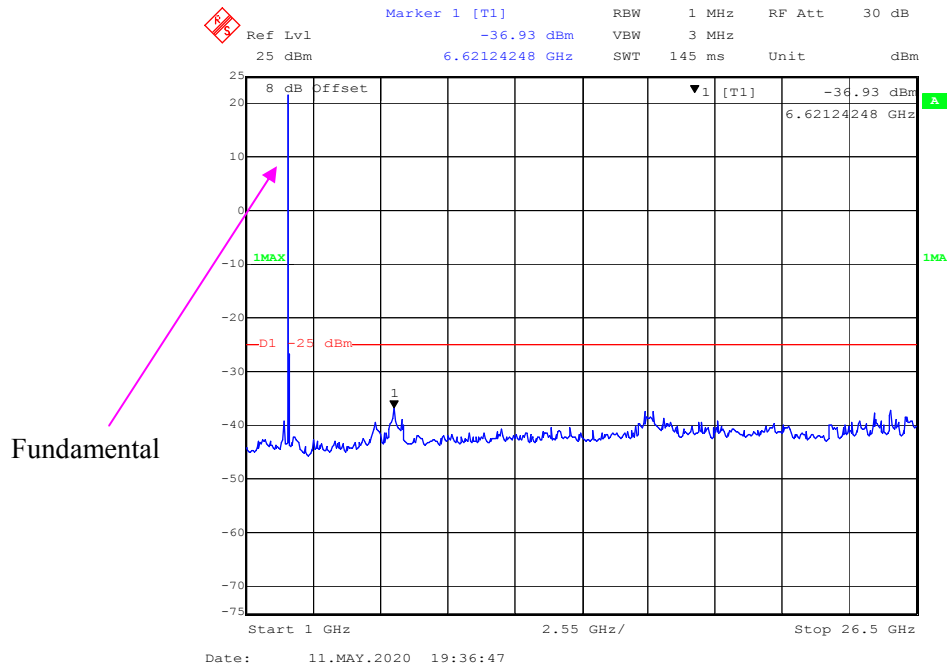
30 MHz - 1 GHz (16QAM, 20.0 MHz, Middle Channel)**1 GHz – 26.5 GHz (16QAM, 20.0 MHz, Middle Channel)**

LTE Band 41

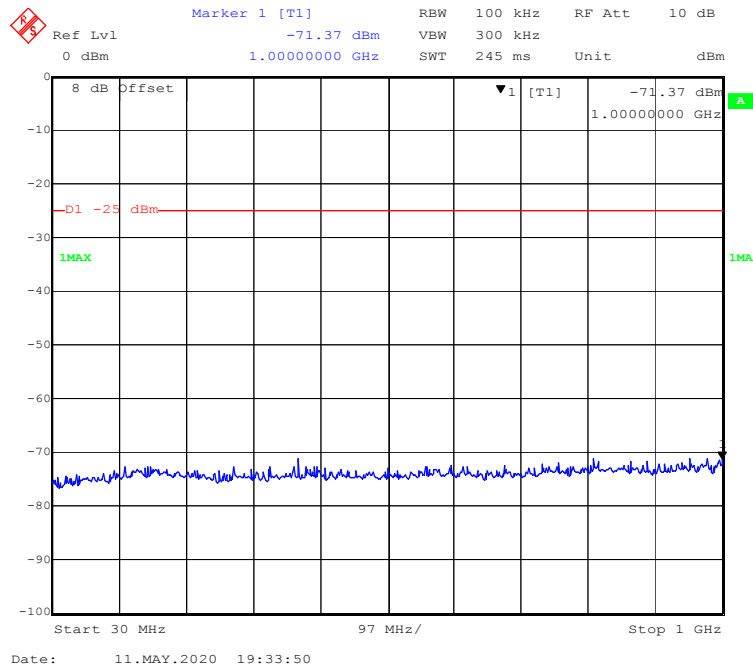
30 MHz - 1 GHz (QPSK, 5.0 MHz, Middle Channel)



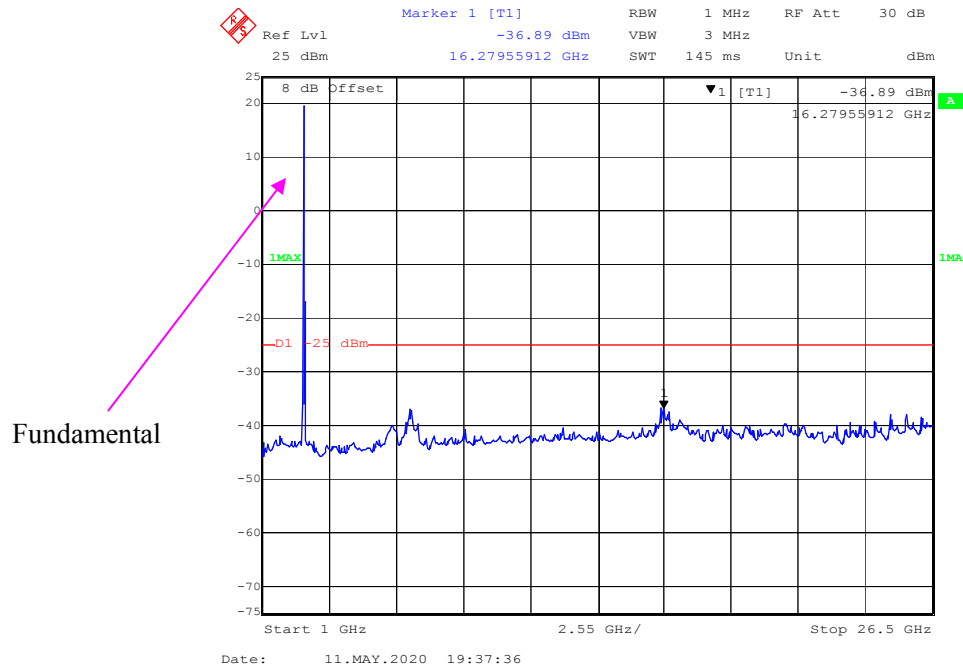
1 GHz – 26.5 GHz (QPSK, 5.0 MHz, Middle Channel)



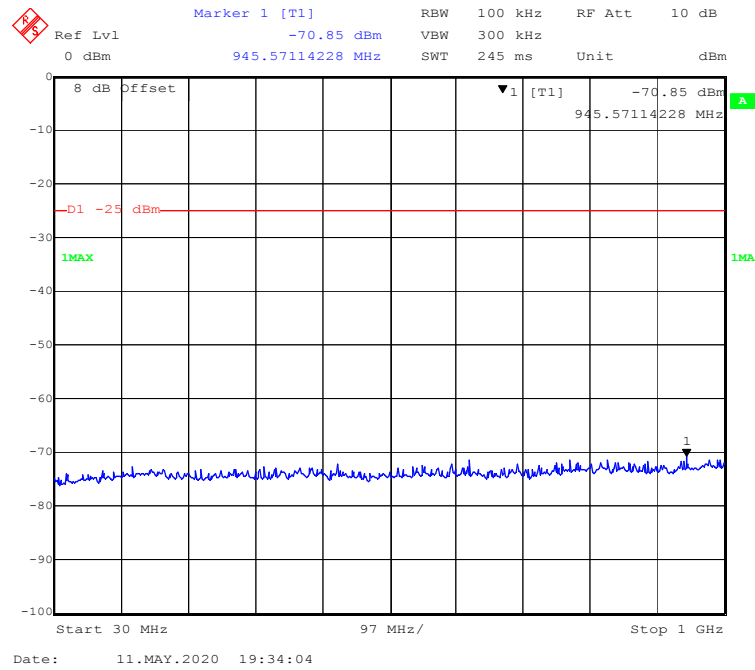
30 MHz - 1 GHz (QPSK, 10.0 MHz, Middle Channel)



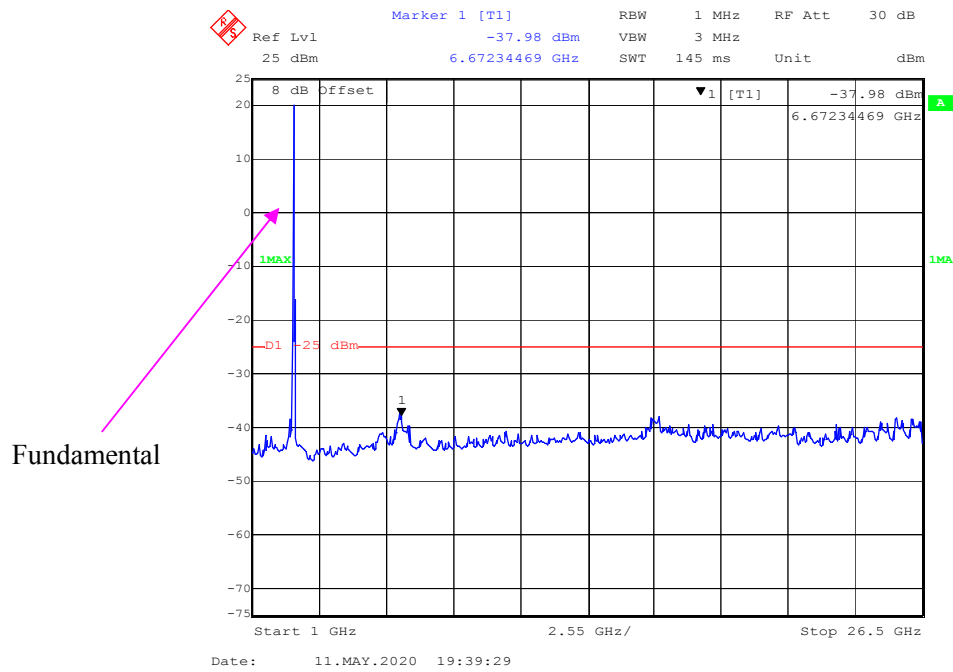
1 GHz – 26.5 GHz (QPSK, 10.0 MHz, Middle Channel)



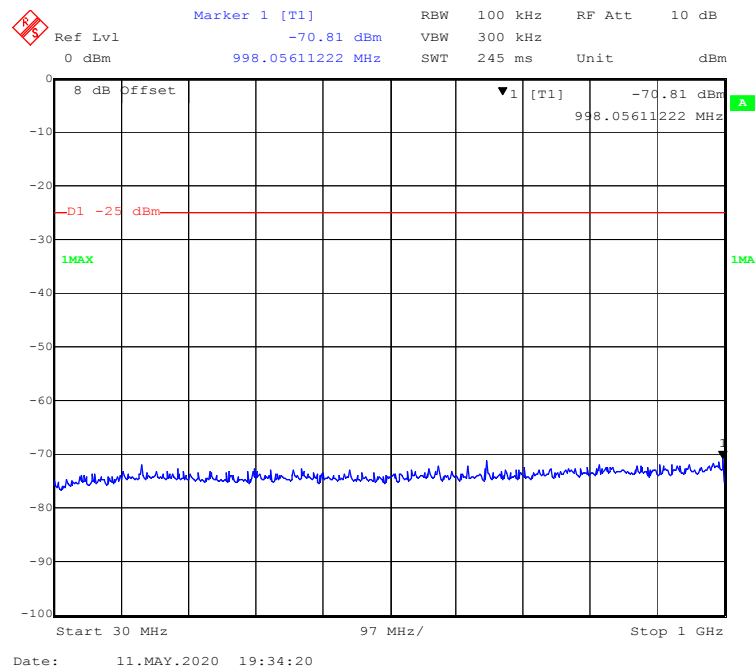
30 MHz - 1 GHz (QPSK, 15.0 MHz, Middle Channel)



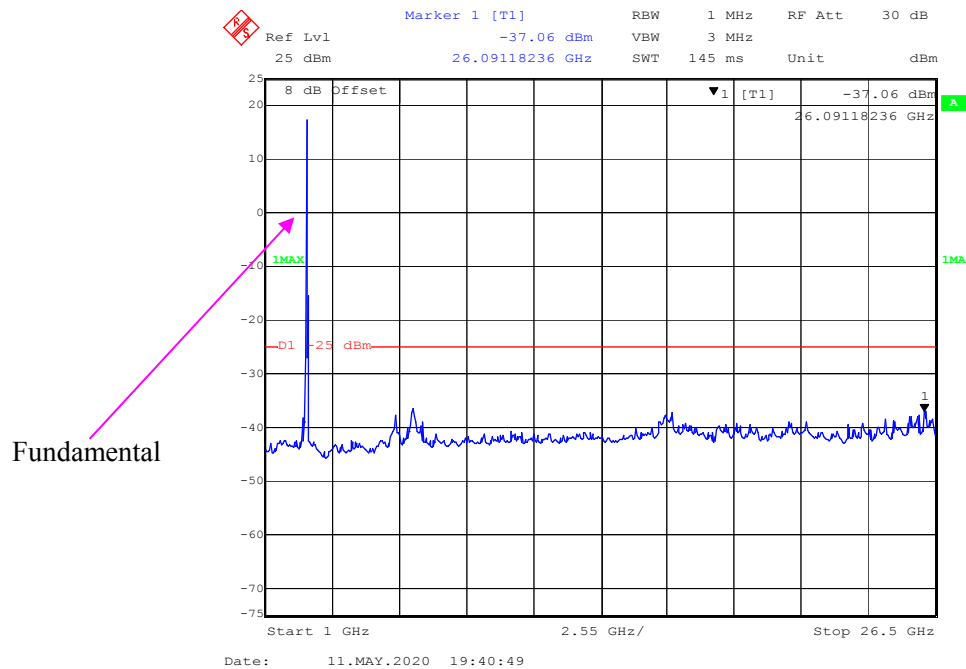
1 GHz – 26.5 GHz (QPSK, 15.0MHz, Middle Channel)



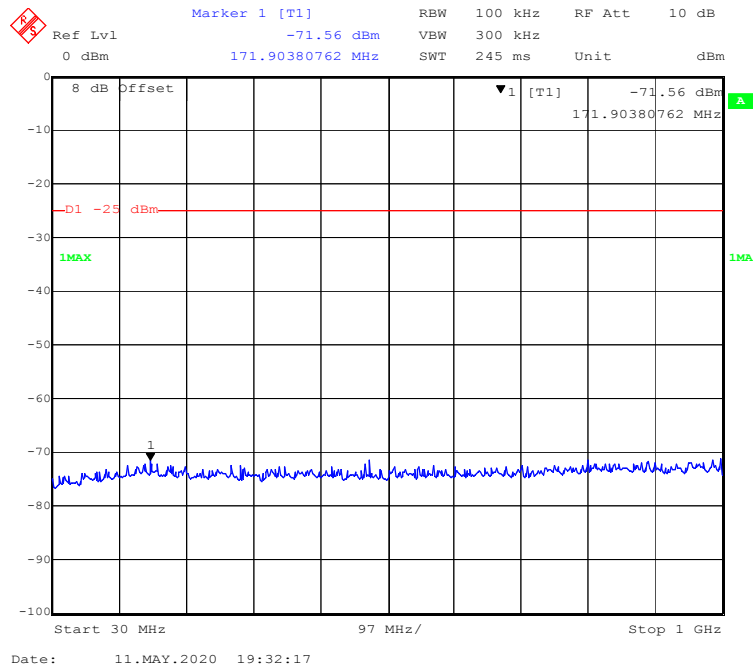
30 MHz - 1 GHz (QPSK, 20.0 MHz, Middle Channel)



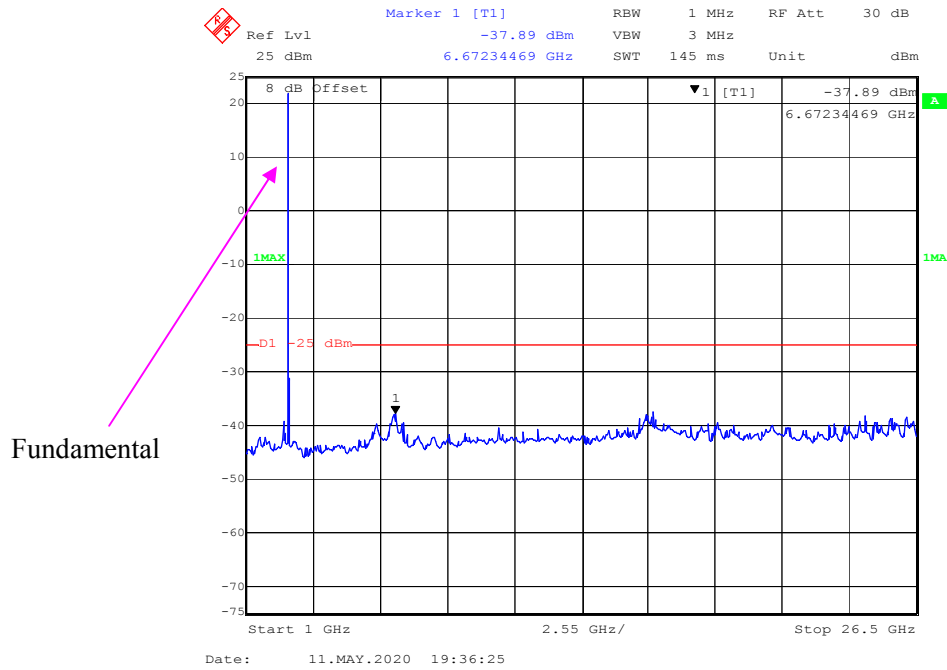
1 GHz – 26.5 GHz (QPSK, 20.0 MHz, Middle Channel)



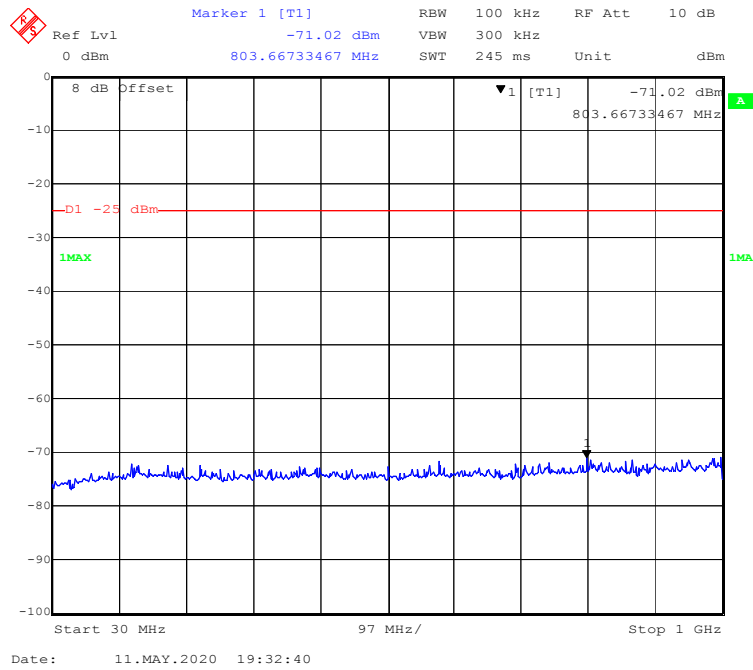
30 MHz - 1 GHz (16QAM, 5.0 MHz, Middle Channel)



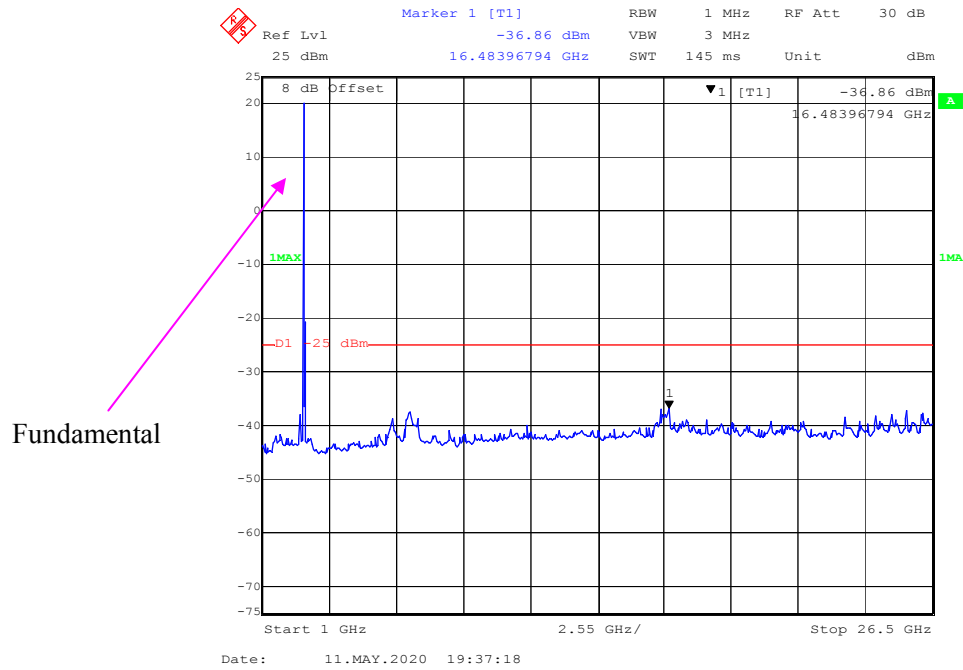
1 GHz – 26.5 GHz (16QAM, 5.0 MHz, Middle Channel)



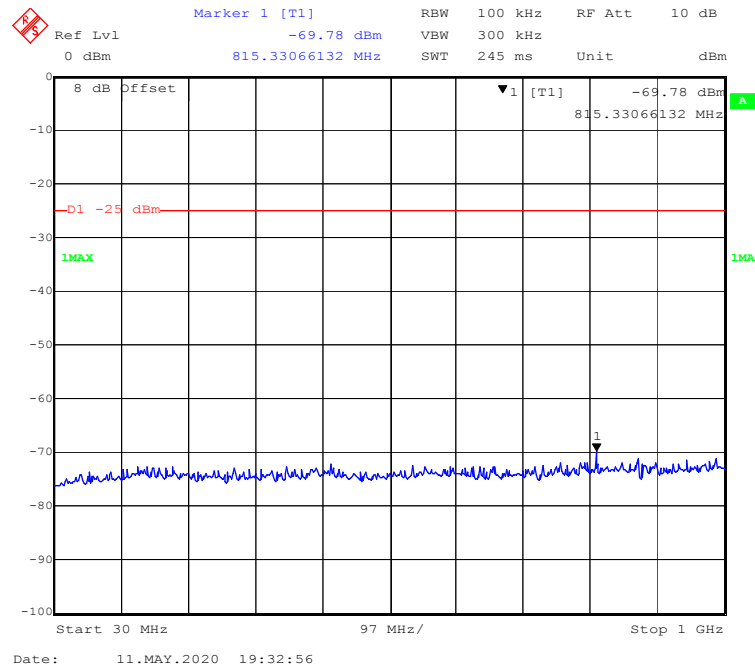
30 MHz - 1 GHz (16QAM, 10.0 MHz, Middle Channel)



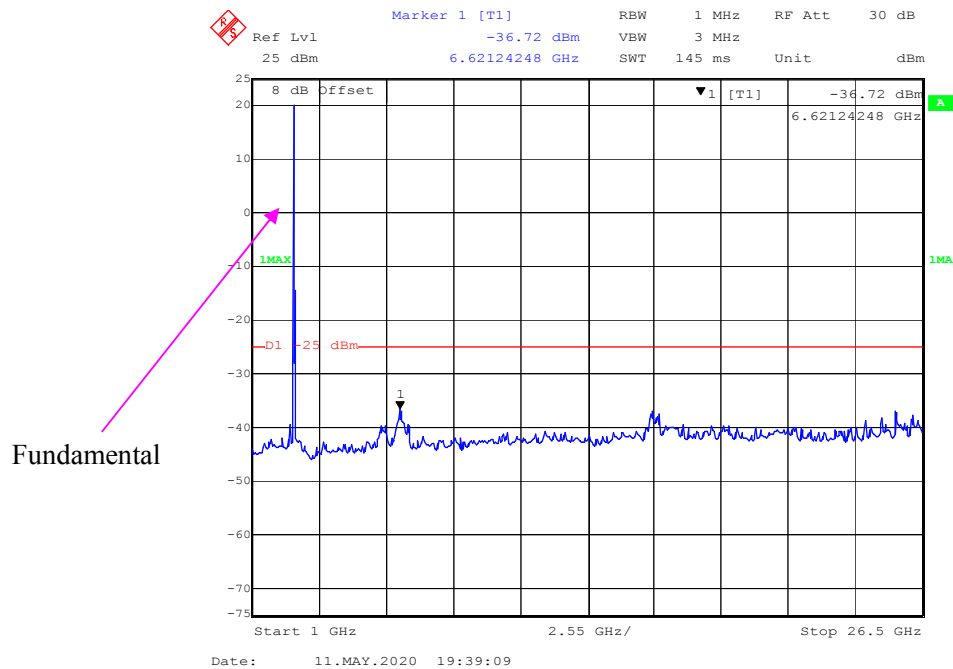
1 GHz – 26.5 GHz (16QAM, 10.0 MHz, Middle Channel)



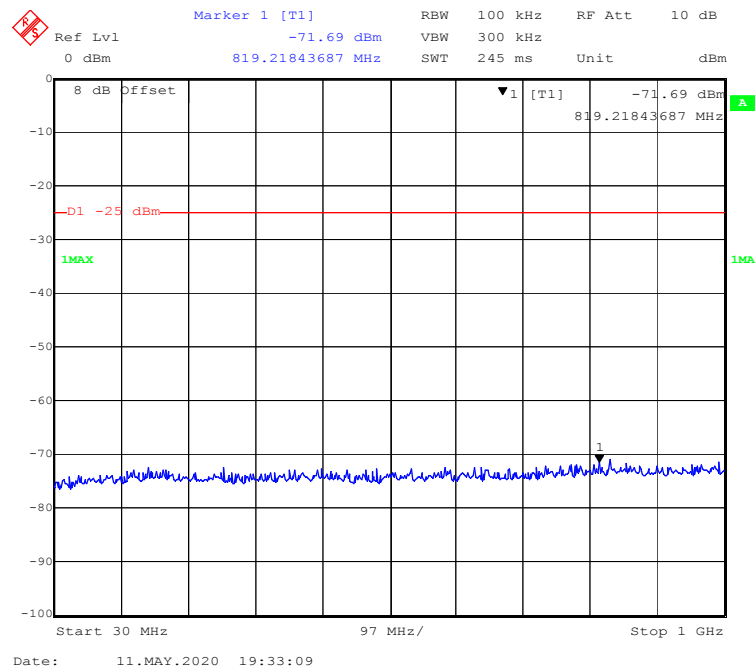
30 MHz - 1 GHz (16QAM, 15.0 MHz, Middle Channel)



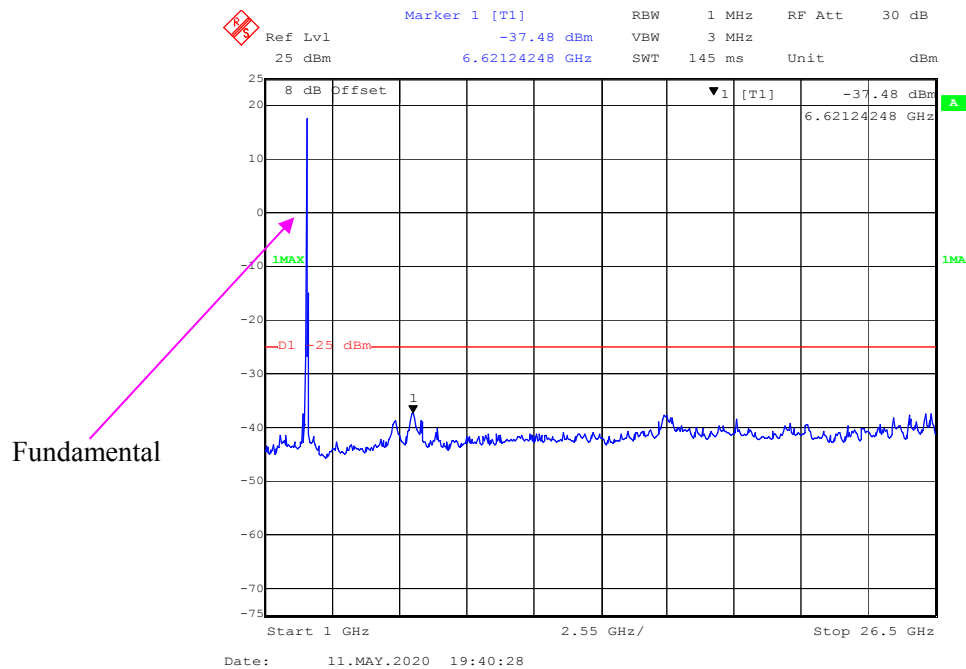
1 GHz – 26.5 GHz (16QAM, 15.0MHz, Middle Channel)



30 MHz - 1 GHz (16QAM, 20.0 MHz, Middle Channel)



1 GHz – 26.5 GHz (16QAM, 20.0 MHz, Middle Channel)



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

Applicable Standards

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

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

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

27.53 (m), for mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

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 = $10 \lg (\text{TX pwr in Watts}/0.001)$ – the absolute level

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

Test Data**Environmental Conditions**

Temperature:	24.2~24.8 °C
Relative Humidity:	50~53 %
ATM Pressure:	100.7~101.5 kPa

The testing was performed by Stone Zhang from 2020-05-07 to 2020-05-27.

Test mode: Transmitting (Pre-scan with low, middle and high channels, and the worse case data as below)

30 MHz ~ 10 GHz:**GPRS 850 Band**

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
GPRS Mode, Middle channel										
694.58	57.63	12	100	H	-42.2	0.62	-1.69	-44.51	-13	31.51
694.58	55.42	167	150	V	-44.41	0.62	-1.69	-46.72	-13	33.72
1673.2	60.43	280	150	H	-42.96	0.84	8.48	-39.89	-13	26.89
1673.2	57.68	337	150	V	-45.71	0.84	8.48	-42.54	-13	29.54
2509.8	55.62	152	100	H	-45.32	0.89	10.09	-37.83	-13	24.83
2509.8	52.19	73	200	V	-48.75	0.89	10.09	-39.64	-13	26.64

WCDMA Band V

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
WCDMA Mode, Middle channel										
694.58	58.06	170	150	H	-41.77	0.62	-1.69	-44.08	-13	31.08
694.58	56.16	80	150	V	-43.67	0.62	-1.69	-45.98	-13	32.98
1673.20	52.84	144	100	H	-50.55	0.84	8.48	-41.93	-13	28.93
1673.20	49.83	196	100	V	-53.56	0.84	8.48	-43.86	-13	30.86
2509.80	49.15	246	150	H	-51.79	0.89	10.09	-40.94	-13	27.94
2509.80	47.09	216	200	V	-53.85	0.89	10.09	-43.17	-13	30.17

30 MHz ~ 20 GHz:**PCS 1900 Band**

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
GPRS Mode, Middle channel										
49.01	59.27	309	100	H	-40.56	0.62	-1.69	-42.87	-13	29.87
49.01	57.06	177	100	V	-42.77	0.62	-1.69	-45.08	-13	32.08
3760.00	40.68	32	200	H	-66.1	0.95	9.74	-28.18	-13	15.18
3760.00	37.29	237	200	V	-69.81	0.95	9.74	-30.42	-13	17.42
5640.00	39.68	345	150	H	-63.49	1.15	10.74	-28.72	-13	15.72
5640.00	36.43	283	150	V	-67.04	1.15	10.74	-31.14	-13	18.14

WCDMA Band II

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
WCDMA Mode, Middle channel										
694.58	58.42	101	150	H	-41.41	0.62	-1.69	-43.72	-13	30.72
694.58	55.37	76	150	V	-44.46	0.62	-1.69	-46.77	-13	33.77
3760.00	43.75	325	200	H	-63.03	0.95	9.74	-41.19	-13	28.19
3760.00	40.06	309	100	V	-67.04	0.95	9.74	-43.65	-13	30.65
5640.00	41.37	212	100	H	-61.8	1.15	10.74	-36.66	-13	23.66
5640.00	37.43	37	150	V	-66.04	1.15	10.74	-39.07	-13	26.07

Note:

1) Absolute Level (dBm) = Submitted Level (dBm) - Cable loss (dB) + Antenna Gain (dBd/dBi)

2) Margin (dB) = Limit (dBm) - Absolute Level (dBm)

Test mode: Transmitting (Pre-scan with all the bandwidth, and worse case as below)

30 MHz ~ 10 GHz:

LTE Band 5:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 1.4MHz Bandwidth Middle Channel										
694.87	58.46	219	143	H	-46.75	0.53	-1.35	-48.63	-13	35.63
694.87	57.26	91	127	V	-47.95	0.53	-1.35	-49.83	-13	36.83
1673.00	37.64	351	200	H	-67.89	0.84	8.48	-60.25	-13	47.25
1673.00	36.40	300	200	V	-69.13	0.84	8.48	-61.49	-13	48.49
2509.50	34.02	44	200	H	-67.93	0.89	10.09	-58.73	-13	45.73
2509.50	33.29	13	100	V	-68.66	0.89	10.09	-59.46	-13	46.46
16-QAM 1.4MHz Bandwidth Middle Channel										
694.87	57.69	219	143	H	-47.52	0.53	-1.35	-49.40	-13	36.40
694.87	56.49	91	127	V	-48.72	0.53	-1.35	-50.60	-13	37.60
1673.00	38.57	342	200	H	-66.96	0.84	8.48	-59.32	-13	46.32
1673.00	39.47	106	200	V	-66.06	0.84	8.48	-58.42	-13	45.42
2509.50	35.07	275	200	H	-66.88	0.89	10.09	-57.68	-13	44.68
2509.50	36.01	83	100	V	-65.94	0.89	10.09	-56.74	-13	43.74

30MHz~26GHz:**LTE Band 7:**

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5MHz Bandwidth Middle Channel										
693.87	57.29	172	200	H	-42.47	0.62	-1.68	-40.17	-25	15.17
693.87	53.68	74	200	V	-46.08	0.62	-1.68	-43.78	-25	18.78
5070.00	34.69	29	100	H	-60.59	1.09	10.3	-51.38	-25	26.38
5070.00	32.43	153	150	V	-62.85	1.09	10.3	-53.64	-25	28.64
7605.00	32.72	221	150	H	-57.93	1.78	10.08	-49.63	-25	24.63
7605.00	29.98	239	150	V	-60.67	1.78	10.08	-52.37	-25	27.37
16-QAM 5MHz Bandwidth Middle Channel										
693.87	56.49	187	100	H	-43.27	0.62	-1.68	-40.97	-25	15.97
693.87	52.77	235	150	V	-46.99	0.62	-1.68	-44.69	-25	19.69
5070.00	34.61	302	150	H	-60.67	1.09	10.3	-51.46	-25	26.46
5070.00	32.21	208	200	V	-63.07	1.09	10.3	-53.86	-25	28.86
7605.00	33.59	242	100	H	-57.06	1.78	10.08	-48.76	-25	23.76
7605.00	32.08	248	150	V	-58.57	1.78	10.08	-50.27	-25	25.27

LTE Band 38:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5MHz Bandwidth Middle Channel										
694.87	58.42	258	100	H	-41.44	0.62	-1.69	-39.13	-25	14.13
694.87	55.97	245	200	V	-43.89	0.62	-1.69	-41.58	-25	16.58
5190.00	40.5	31	100	H	-54.39	1.1	10.3	-45.19	-25	20.19
5190.00	38.01	119	150	V	-56.88	1.1	10.3	-47.68	-25	22.68
7785.00	36.03	238	200	H	-54.09	1.81	10.04	-45.86	-25	20.86
7785.00	33.52	47	150	V	-56.6	1.81	10.04	-48.37	-25	23.37
16-QAM 5MHz Bandwidth Middle Channel										
694.87	57.68	280	100	H	-42.18	0.62	-1.69	-39.87	-25	14.87
694.87	54.39	172	150	V	-45.47	0.62	-1.69	-43.16	-25	18.16
5190.00	40.02	317	100	H	-54.87	1.1	10.3	-45.67	-25	20.67
5190.00	37.77	67	200	V	-57.12	1.1	10.3	-47.92	-25	22.92
7785.00	35.62	169	100	H	-54.5	1.81	10.04	-46.27	-25	21.27
7785.00	33.57	131	150	V	-56.55	1.81	10.04	-48.32	-25	23.32

LTE Band 41:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Submitted Level (dBm)	Cable Loss (dB)	Antenna Gain (dBd/dBi)			
QPSK 5MHz Bandwidth Middle Channel										
160.21	57.69	23	150	H	-42.17	0.62	-1.69	-39.86	-25	14.86
160.21	55.49	357	200	V	-44.37	0.62	-1.69	-42.06	-25	17.06
5210.00	41.84	295	100	H	-52.99	1.11	10.3	-43.8	-25	18.8
5210.00	40.48	218	100	V	-54.35	1.11	10.3	-45.16	-25	20.16
7815.00	36.65	287	150	H	-53.39	1.82	10.04	-45.17	-25	20.17
7815.00	33.13	288	200	V	-56.91	1.82	10.04	-48.69	-25	23.69
16-QAM 5MHz Bandwidth Middle Channel										
160.21	56.86	10	200	H	-43	0.62	-1.69	-40.69	-25	15.69
160.21	53.47	231	150	V	-46.39	0.62	-1.69	-44.08	-25	19.08
5210.00	41.97	161	150	H	-52.86	1.11	10.3	-43.67	-25	18.67
5210.00	39.56	307	100	V	-55.27	1.11	10.3	-46.08	-25	21.08
7815.00	35.6	186	100	H	-54.44	1.82	10.04	-46.22	-25	21.22
7815.00	32.9	8	200	V	-57.14	1.82	10.04	-48.92	-25	23.92

Note:

1) Absolute Level (dBm) = Submitted Level (dBm) - Cable loss (dB) + Antenna Gain (dBd/dBi)

2) Margin (dB) = Limit (dBm) - Absolute Level (dBm)

FCC § 22.917 (a); § 24.238 (a); §27.53 (m) - BAND EDGES

Applicable Standards

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

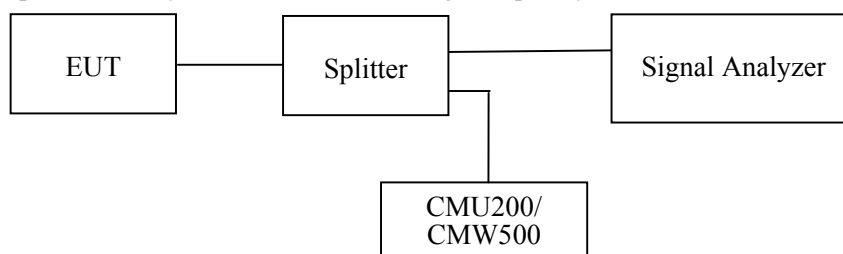
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to FCC §27.53 (m), for mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log(P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log(P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log(P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log(P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log(P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Test Procedure

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

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



Test Data

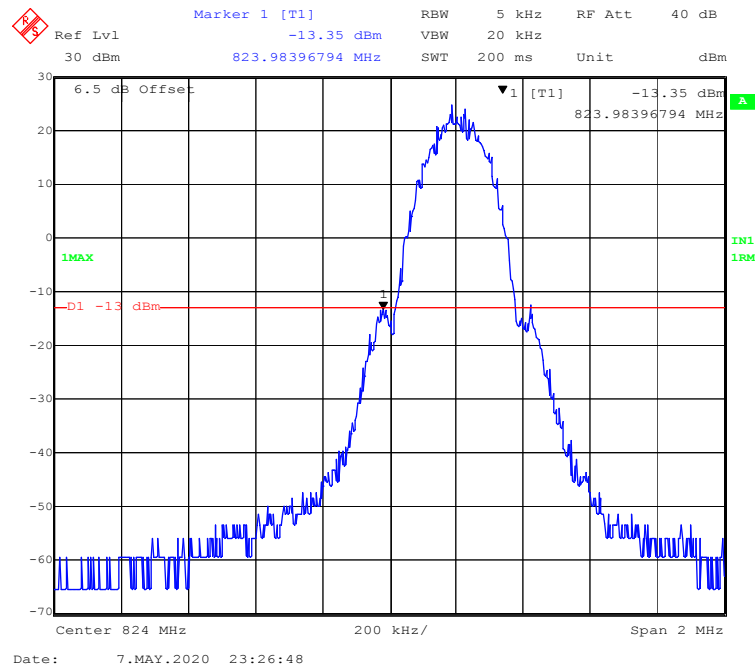
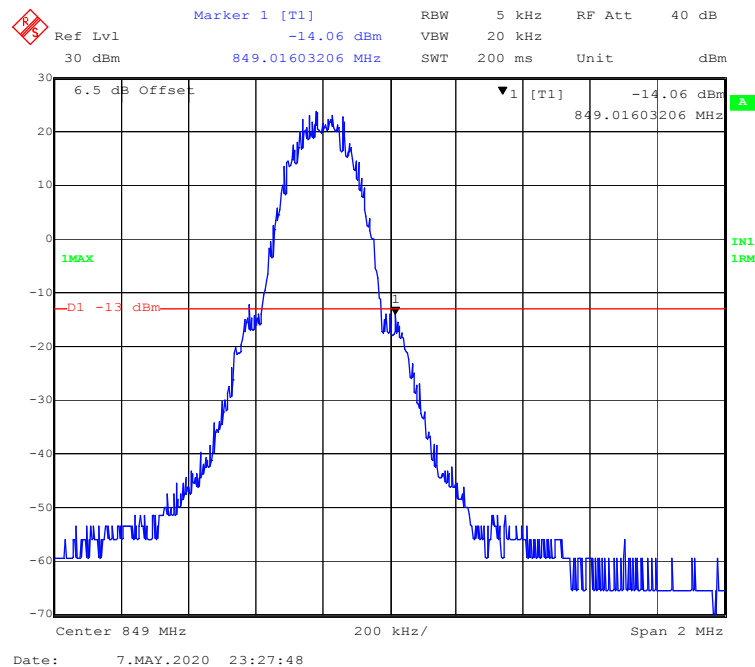
Environmental Conditions

Temperature:	24.2~24.8 °C
Relative Humidity:	50~53 %
ATM Pressure:	100.7~101.5 kPa

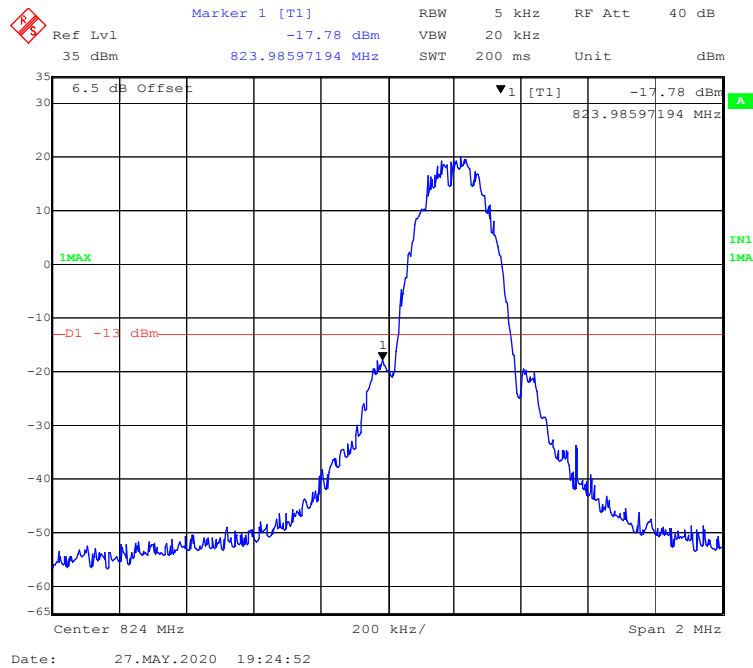
The testing was performed by Stone Zhang from 2020-05-07 to 2020-05-27.

EUT operation mode: Transmitting

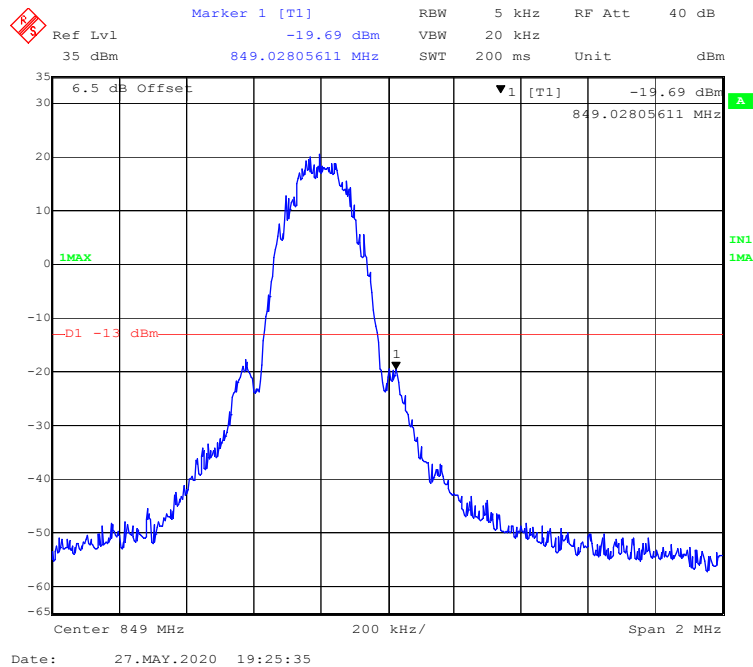
Test Result: Compliance.

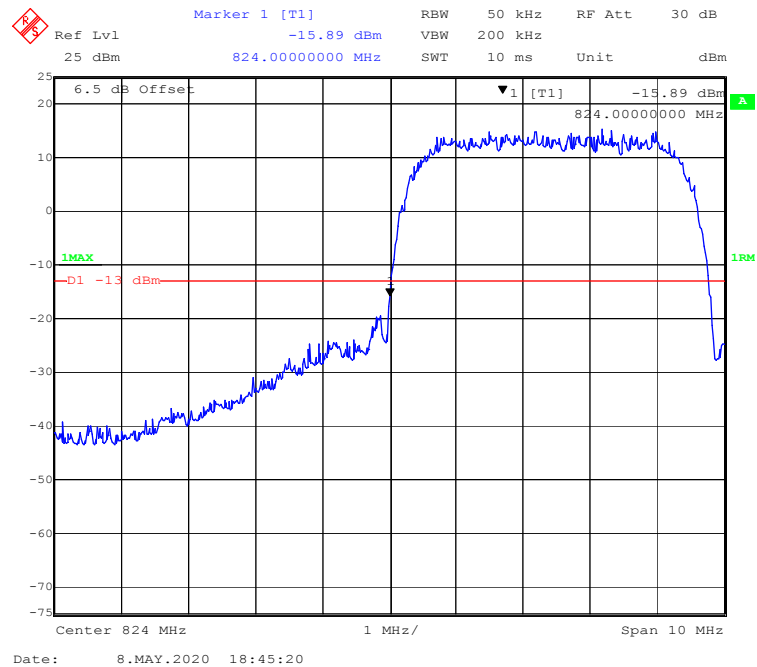
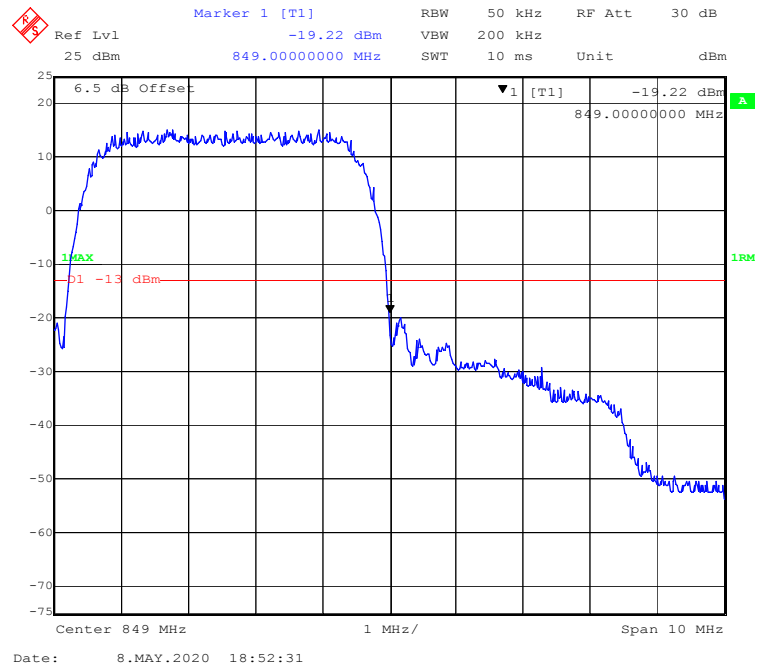
GSM 850 Band:**GPRS Mode, Left Band Edge****GPRS Mode, Right Band Edge**

EGPRS Mode, Left Band Edge

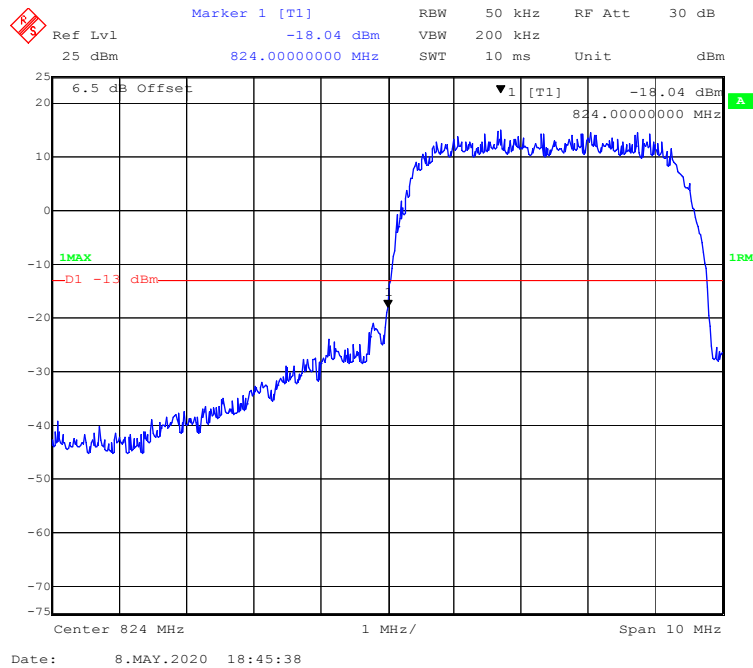


EGPRS Mode, Right Band Edge

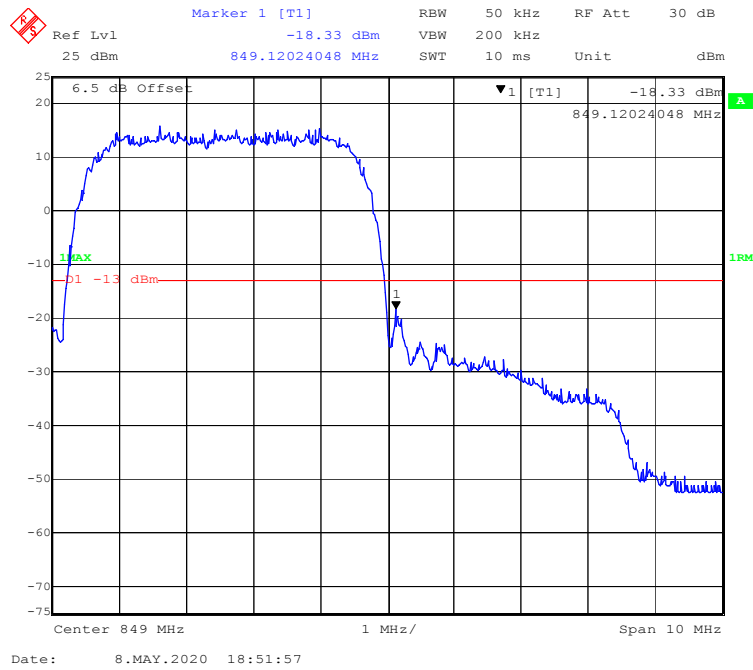


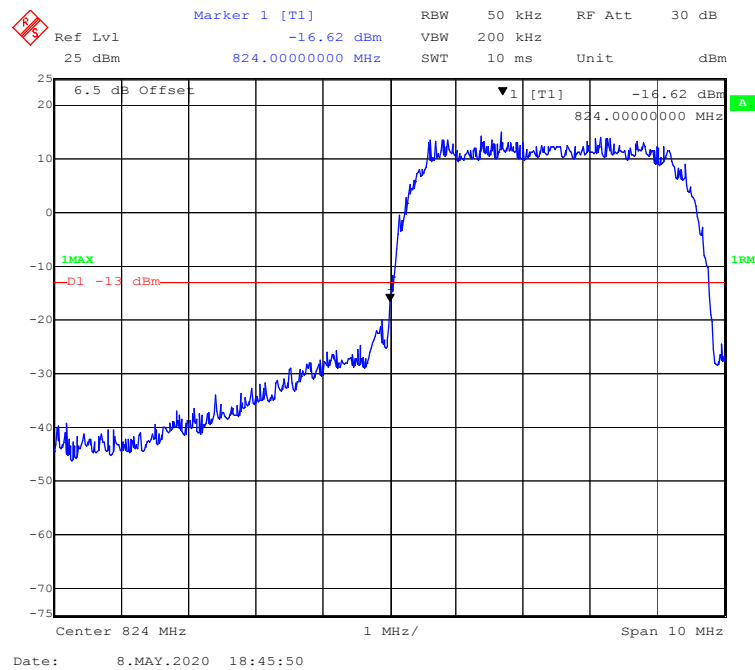
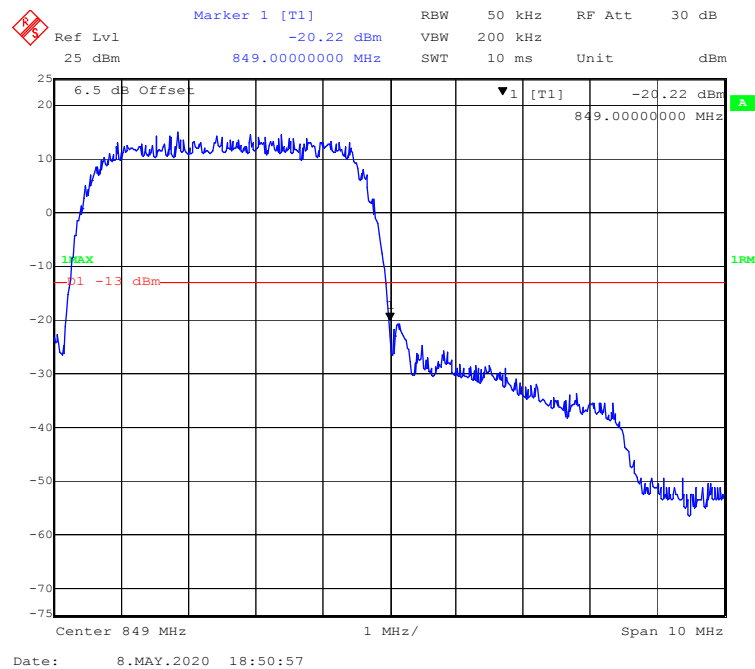
WCDMA Band V**WCDMA (Rel 99) Mode, Left Band Edge****WCDMA (Rel 99) Mode, Right Band Edge**

WCDMA (HSDPA) Mode, Left Band Edge

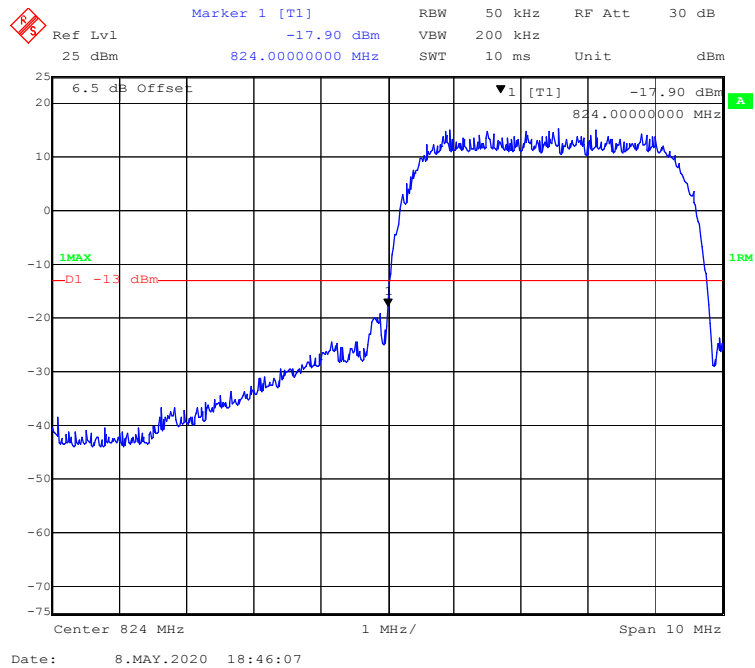


WCDMA (HSDPA) Mode, Right Band Edge

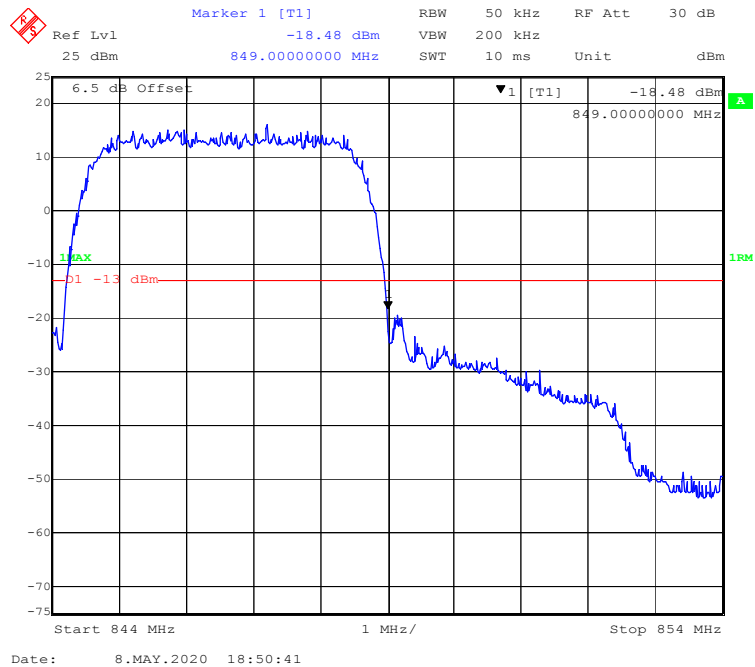


WCDMA (HSUPA) Mode, Left Band Edge**WCDMA (HSUPA) Mode, Right Band Edge**

WCDMA (HSPA+) Mode, Left Band Edge

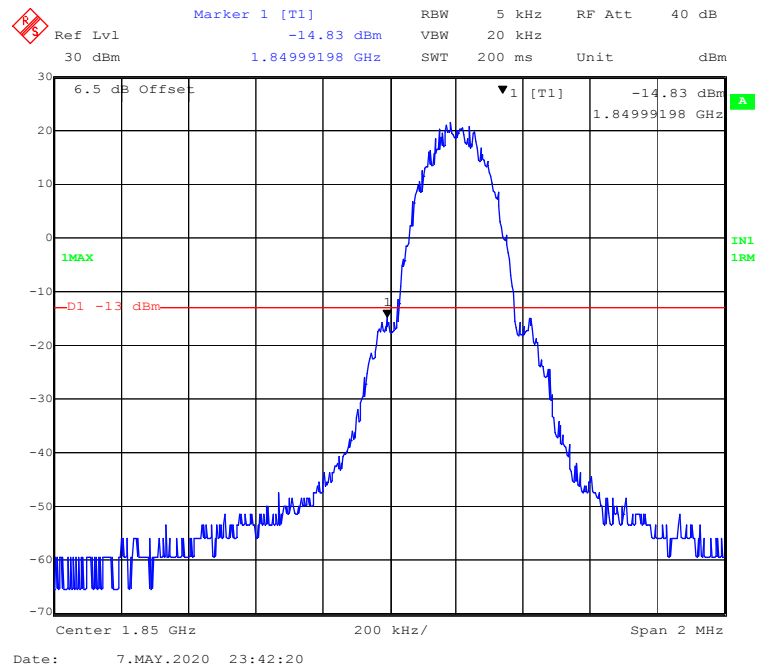


WCDMA (HSPA+) Mode, Right Band Edge

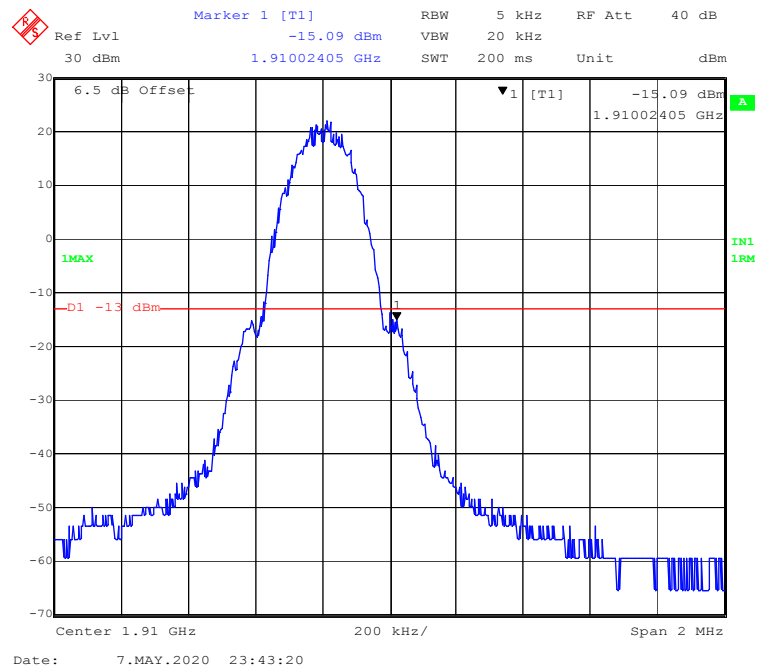


PCS 1900 Band:

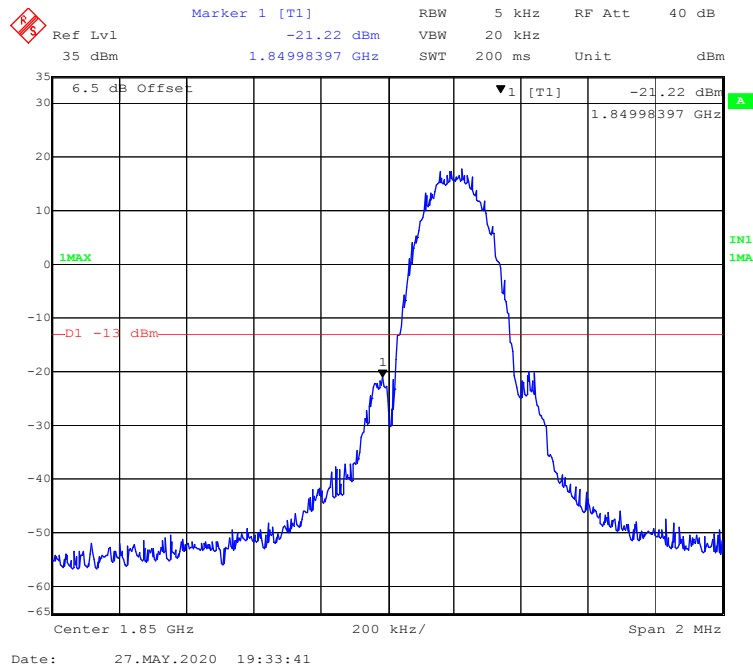
GPRS Mode, Left Band Edge



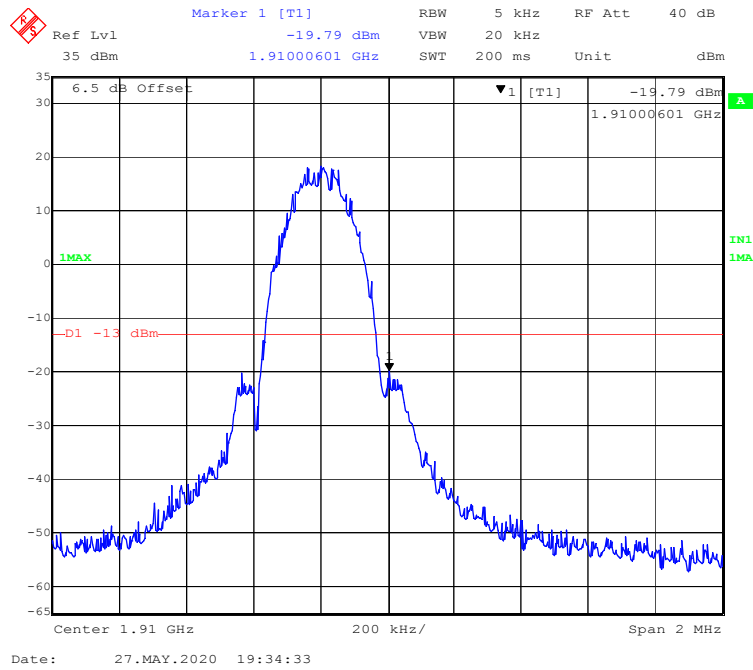
GPRS Mode, Right Band Edge

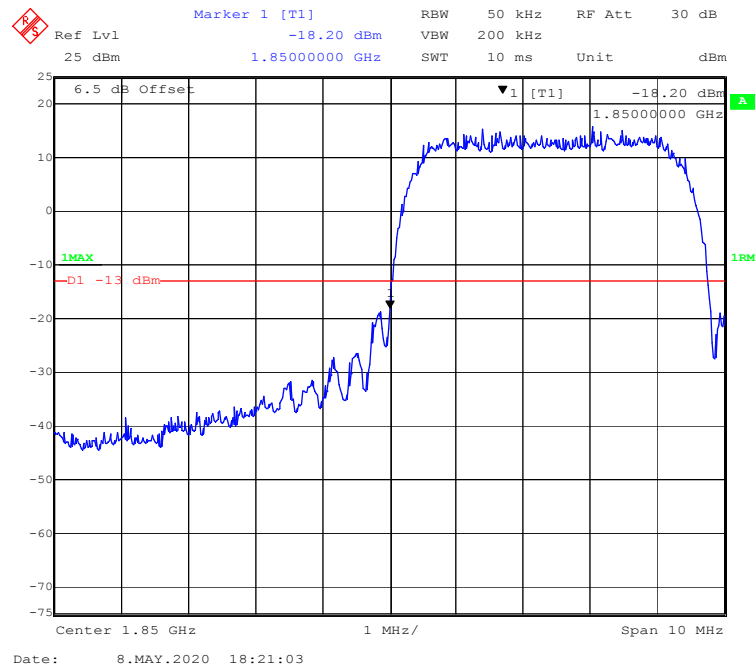
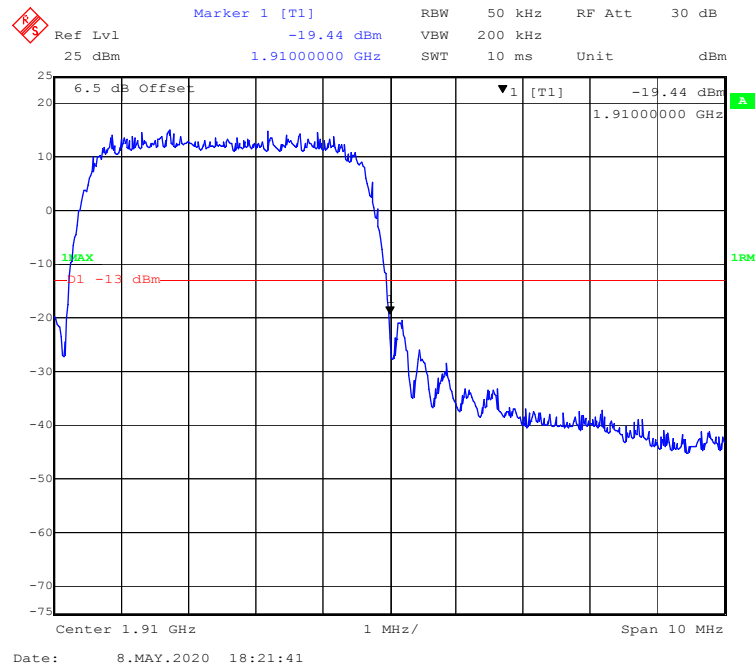


EGPRS Mode, Left Band Edge

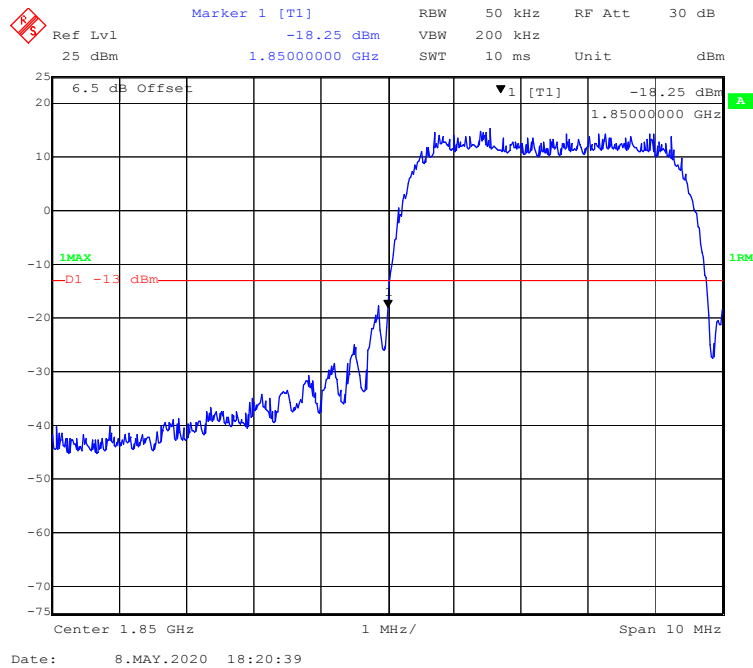


EGPRS Mode, Right Band Edge

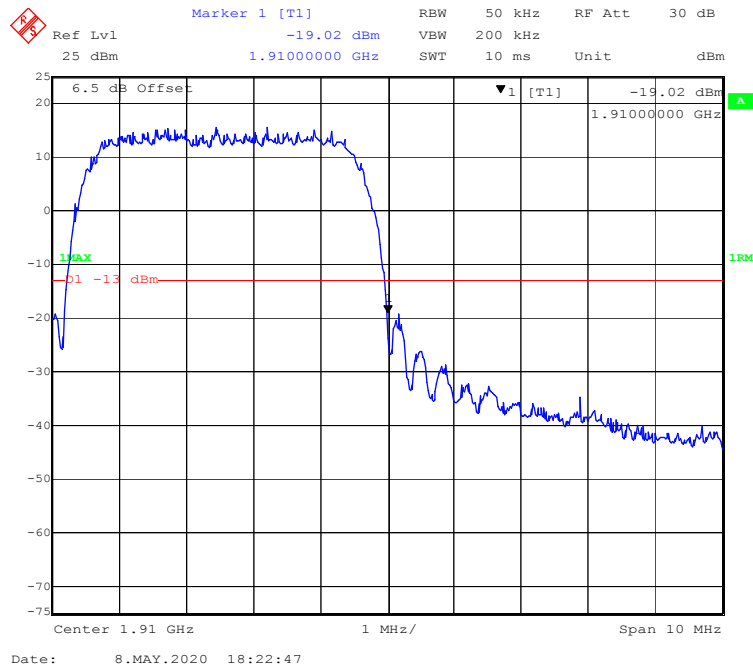


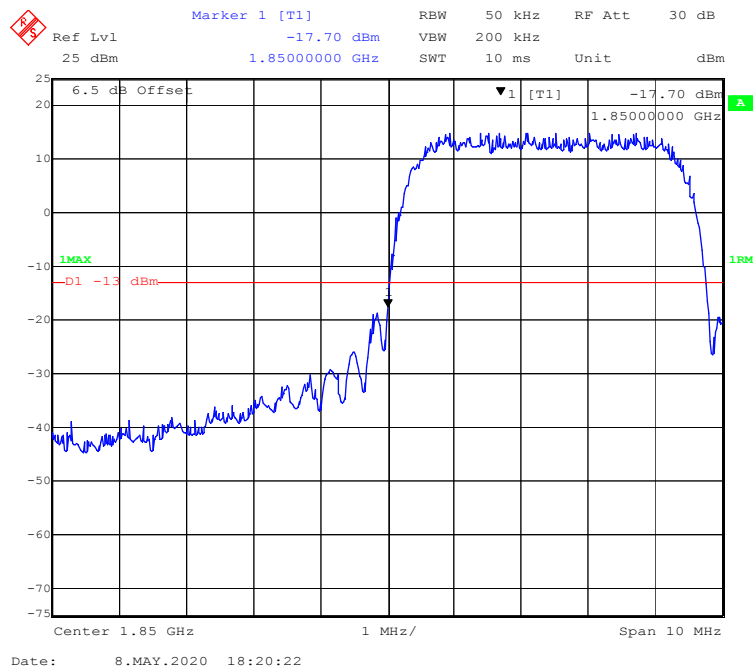
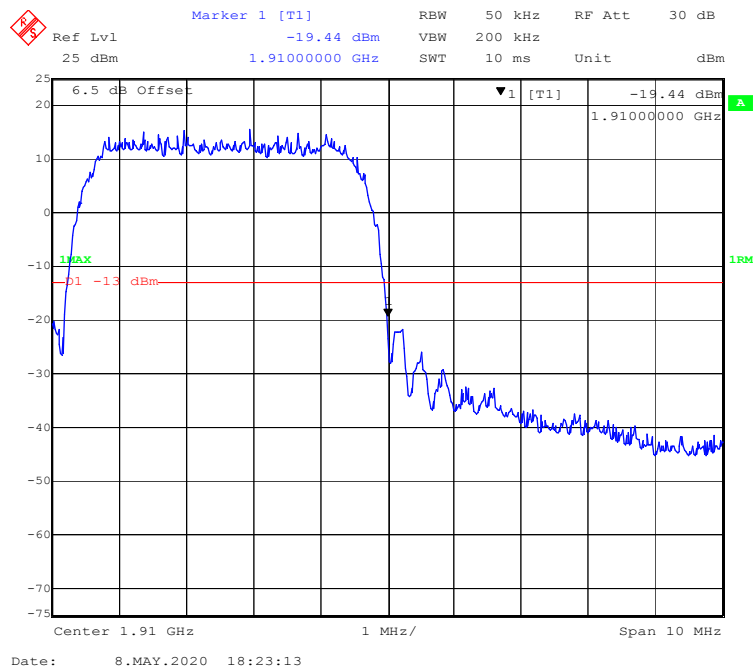
WCDMA Band II**WCDMA (Rel 99) Mode, Left Band Edge****WCDMA (Rel 99) Mode, Right Band Edge**

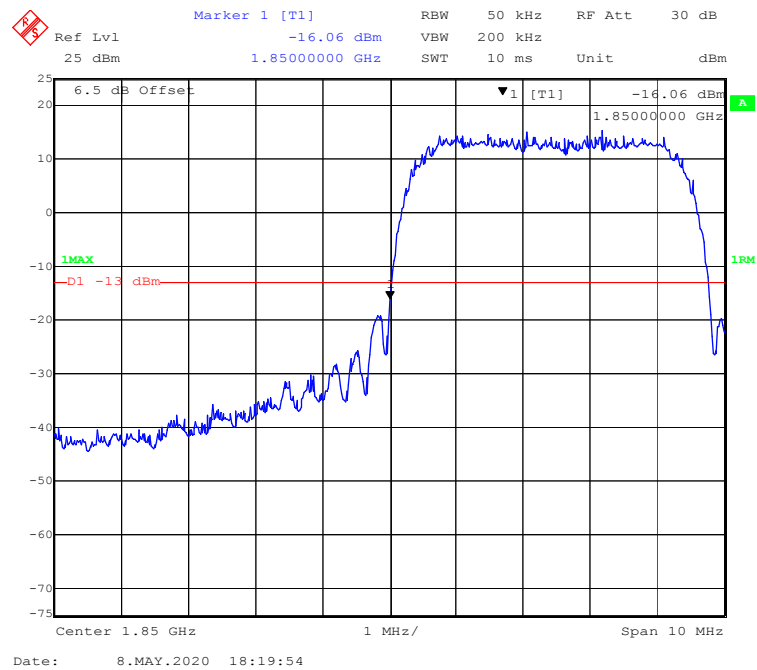
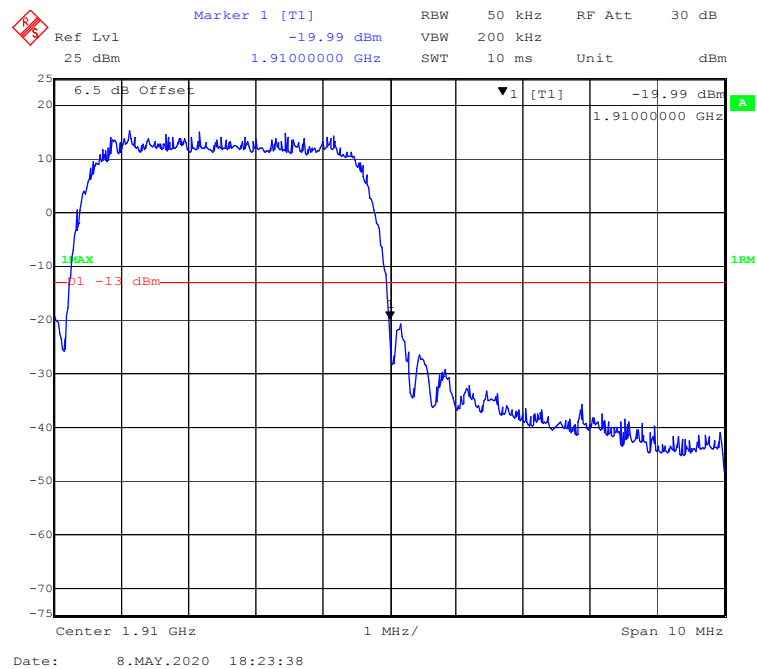
WCDMA (HSDPA) Mode, Left Band Edge



WCDMA (HSDPA) Mode, Right Band Edge

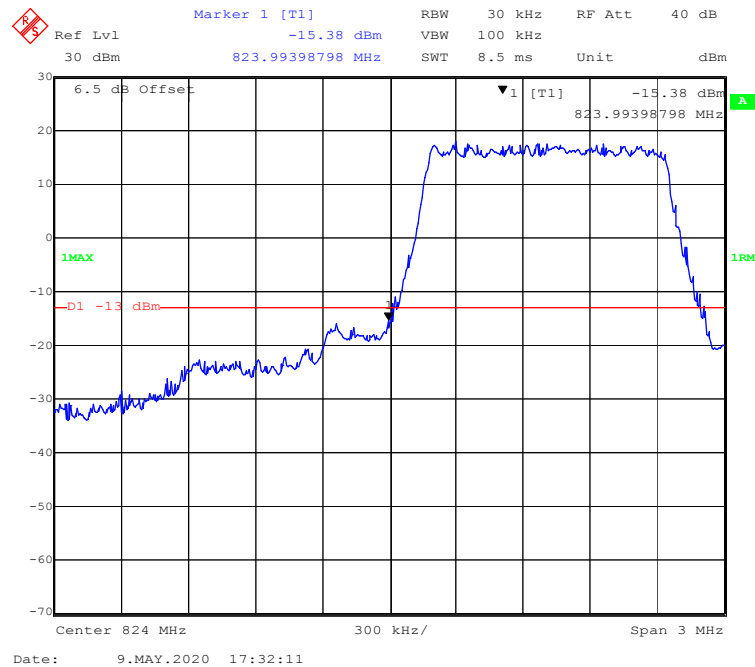


WCDMA (HSUPA) Mode, Left Band Edge**WCDMA (HSUPA) Mode, Right Band Edge**

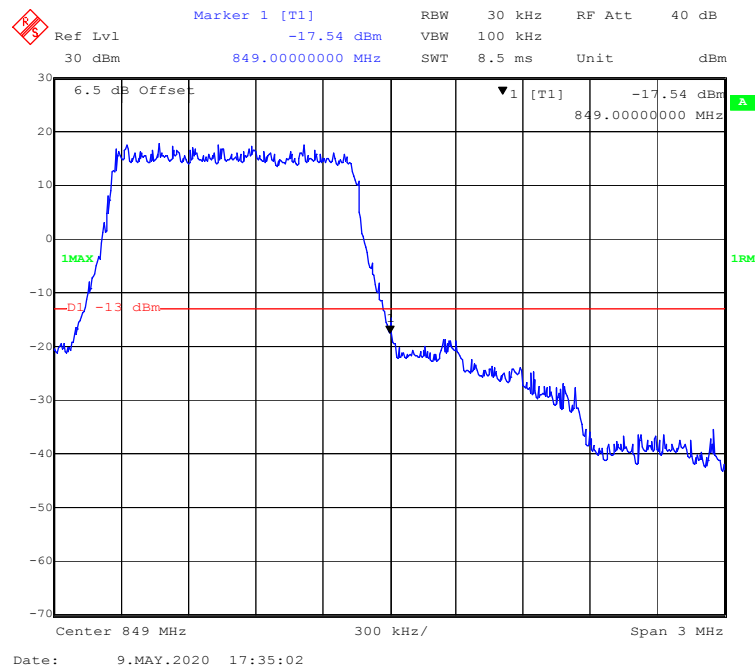
WCDMA (HSPA+) Mode, Left Band Edge**WCDMA (HSPA+) Mode, Right Band Edge**

LTE Band 5:

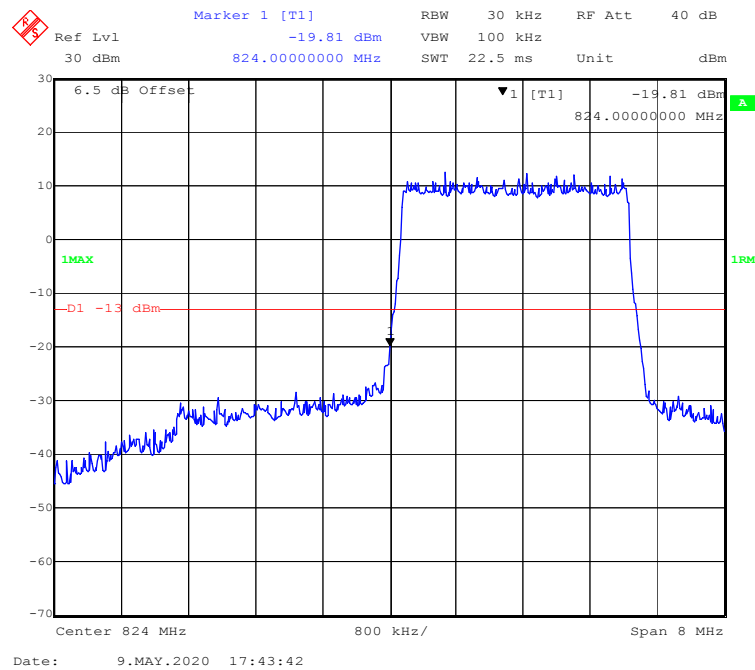
QPSK (1.4 MHz, FULL RB) - Left Band Edge



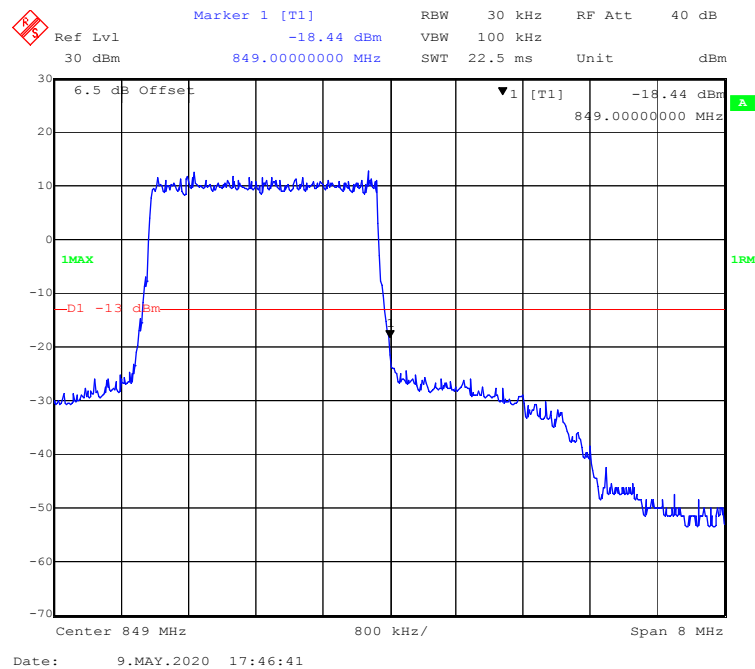
QPSK (1.4 MHz, FULL RB) - Right Band Edge



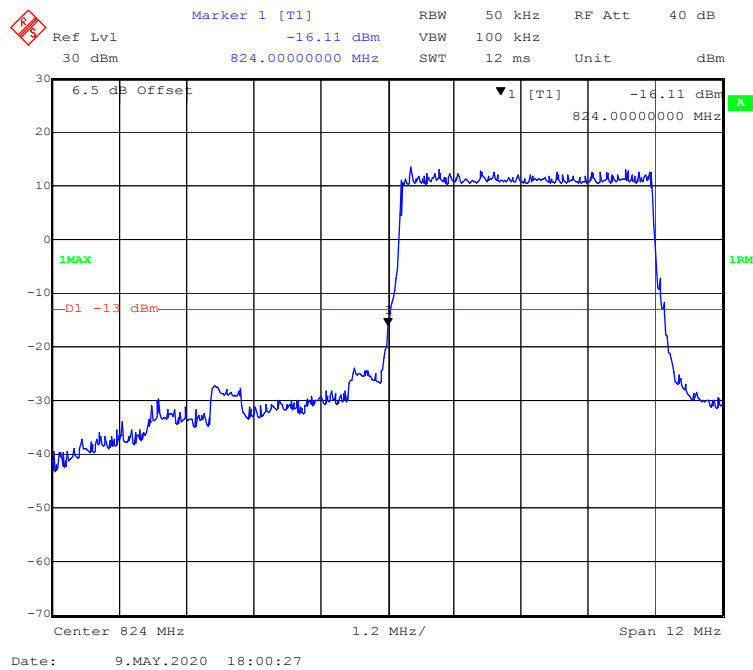
QPSK (3.0 MHz, FULL RB) - Left Band Edge



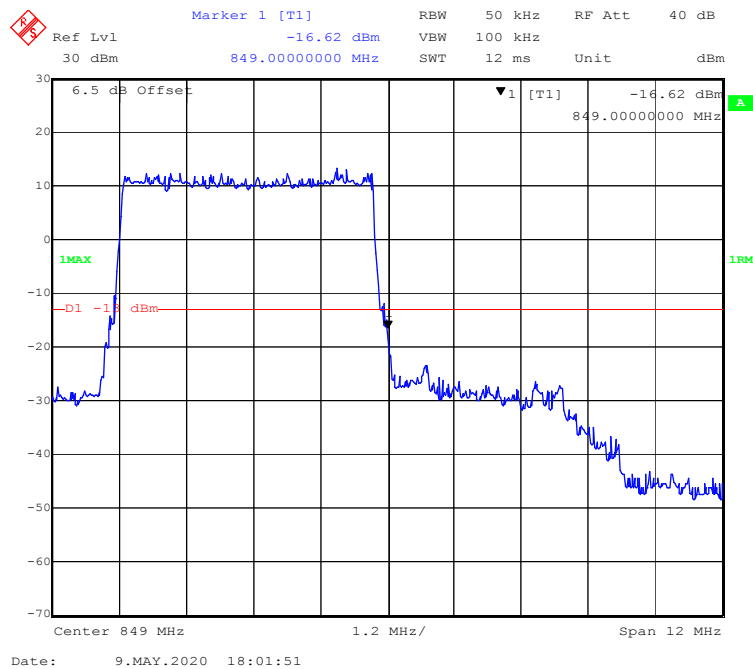
QPSK (3.0 MHz, FULL RB) - Right Band Edge



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



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



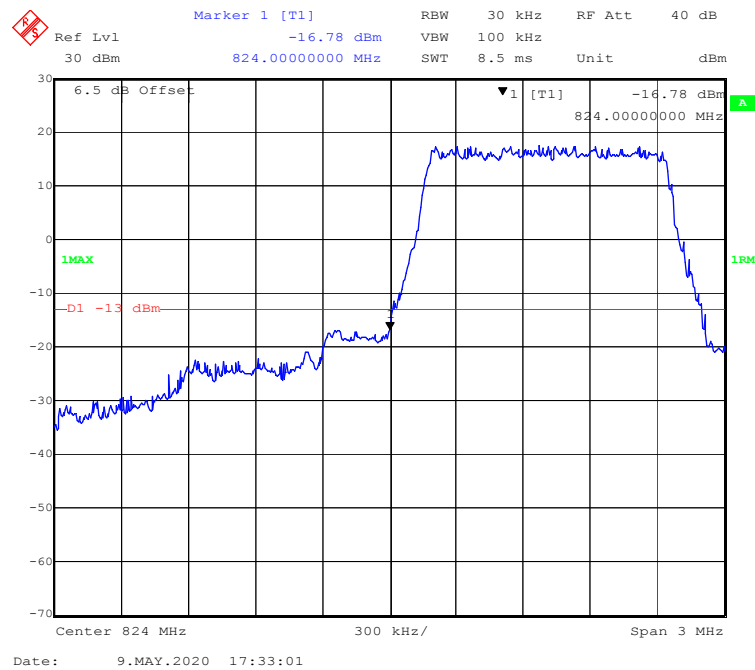
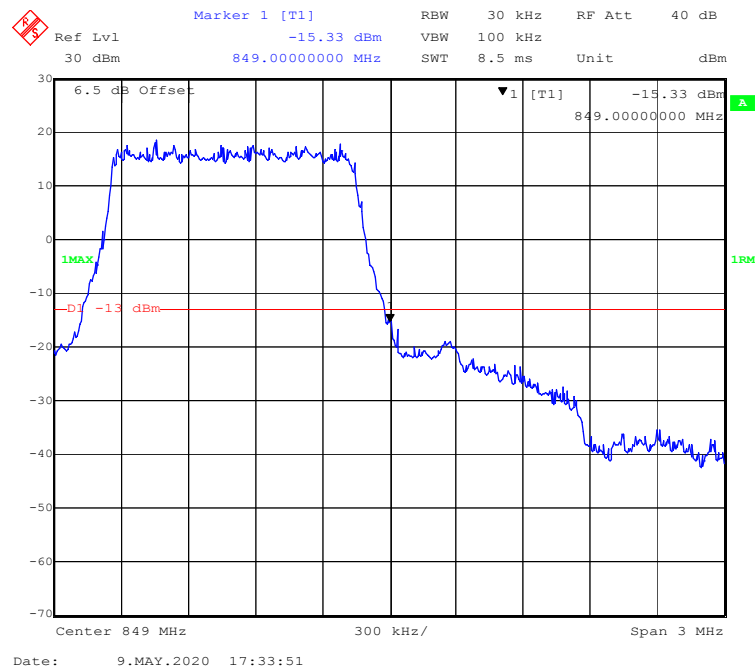
A
 Ref Lvl 30 dBm
 Marker 1 [T1] -20.13 dBm
 RBW 100 kHz
 RF Att 40 dB
 Unit dBm
 SWT 5.5 ms
 824.00000000 MHz

6.5 dB Offset
 1MAX
 -D1 -13 dBm
 1
 1 [T1] -20.13 dBm
 824.00000000 MHz
 1RM

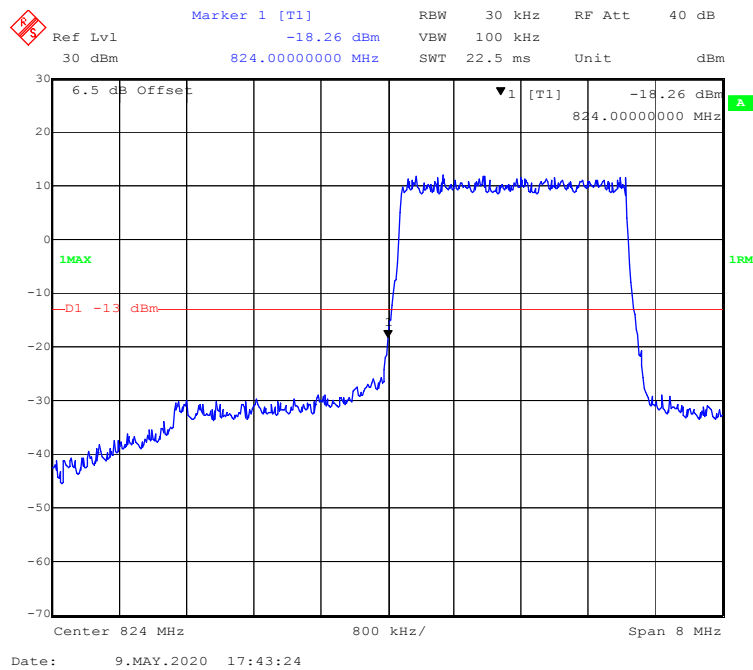
Center 824 MHz
 2.2 MHz/
 Span 22 MHz

Date: 9.MAY.2020 18:08:38

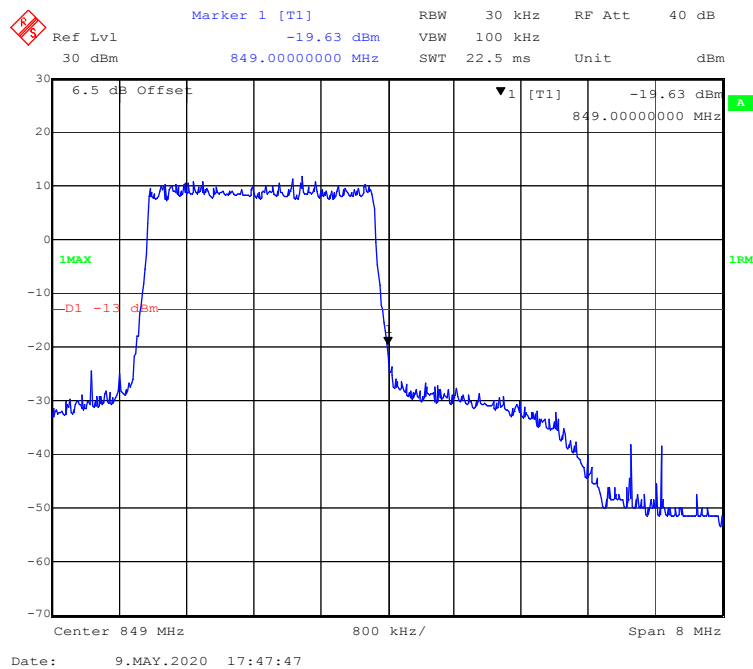
The screenshot displays a spectrum analyzer interface. At the top, a red 'A' icon is in the upper left corner. The main display area shows a blue trace of a signal. A red horizontal line is drawn across the plot at -13 dBm, labeled 'D1 -13 dBm'. A blue trace shows a signal that is flat at approximately 10 dBm from 849.000000 MHz to 849.000000 MHz, then drops sharply to approximately -50 dBm. A blue trace is also visible at the bottom of the plot, labeled '1MAX'. The plot has a grid with major lines every 10 dB and minor lines every 2 dB. The x-axis is labeled 'Center 849 MHz' and 'Span 22 MHz'. The y-axis is labeled 'dBm' and ranges from -70 to 30. The top status bar shows the following parameters: Ref Lvl 30 dBm, Marker 1 [T1] -20.13 dBm, RBW 100 kHz, RF Att 40 dB, VBW 300 kHz, SWT 5.5 ms, Unit dBm, and 849.00000000 MHz. The bottom status bar shows the date and time: Date: 9.MAY.2020 18:11:49.

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

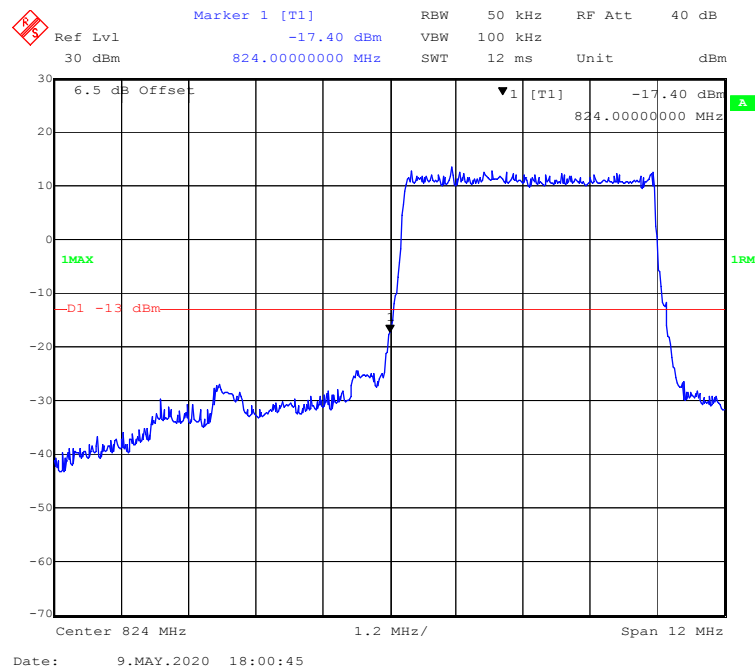
16-QAM (3.0 MHz, FULL RB) - Left Band Edge



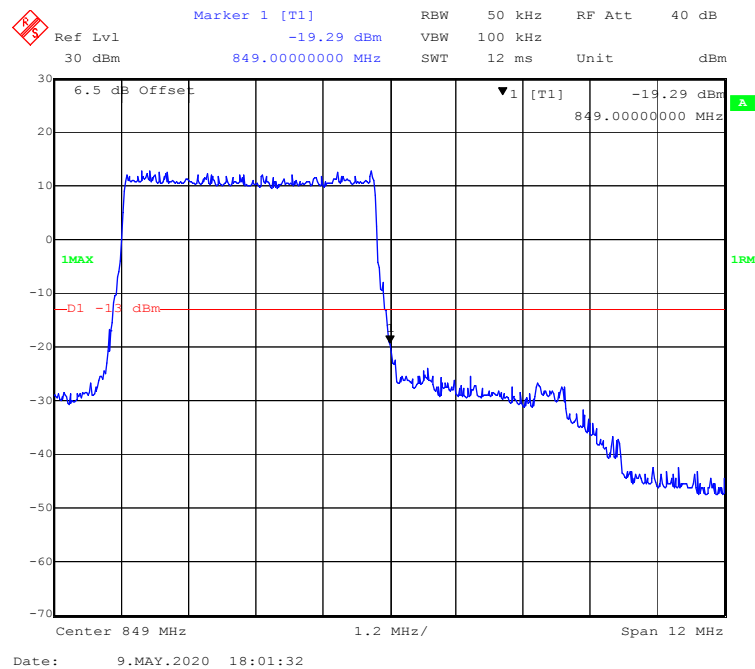
16-QAM (3.0 MHz, FULL RB) - Right Band Edge



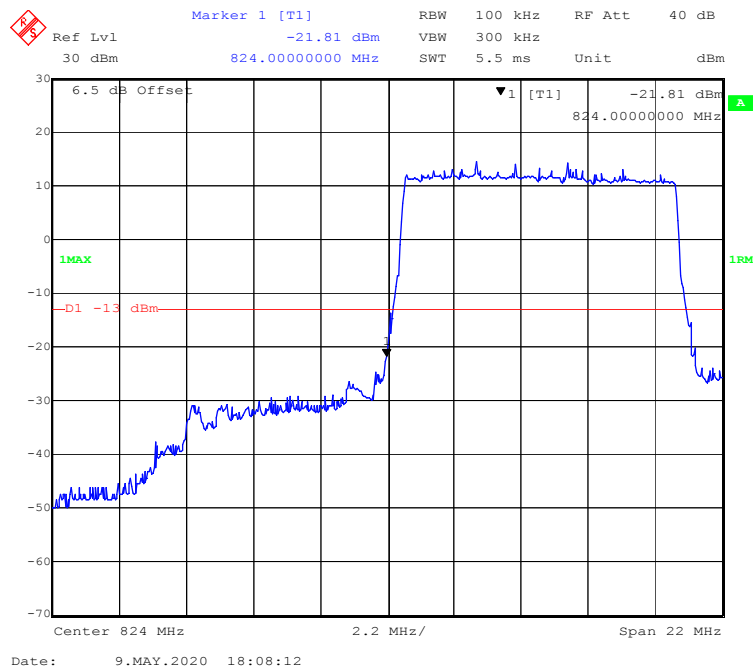
16-QAM (5.0 MHz, FULL RB) - Left Band Edge



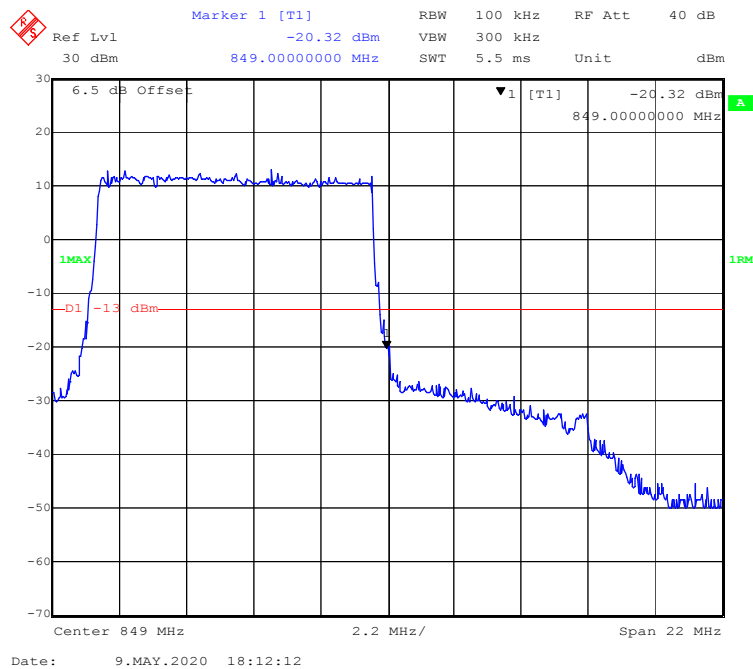
16-QAM (5.0 MHz, FULL RB) - Right Band Edge

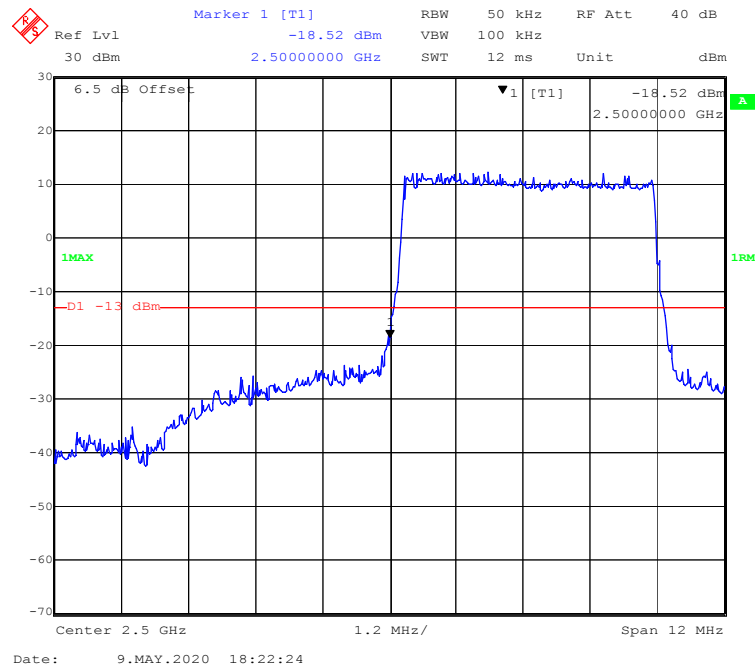
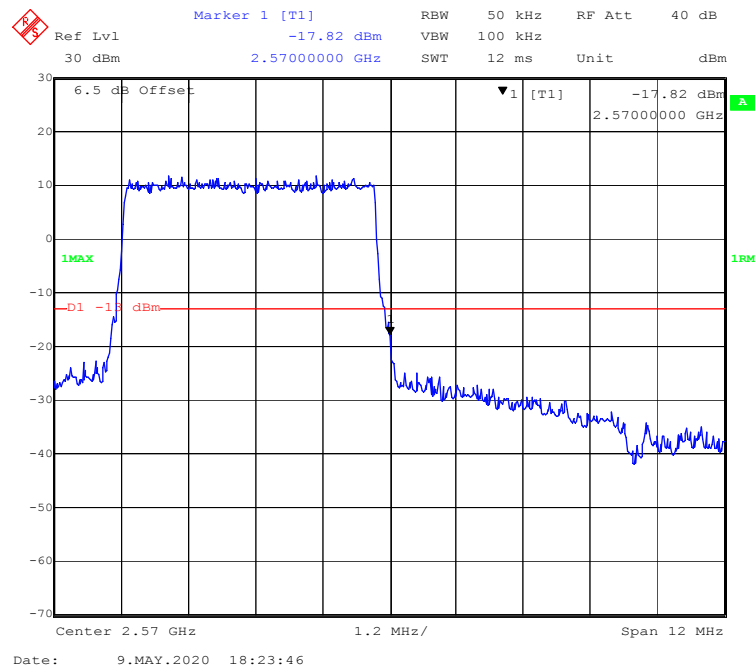


16-QAM (10.0 MHz, FULL RB) - Left Band Edge

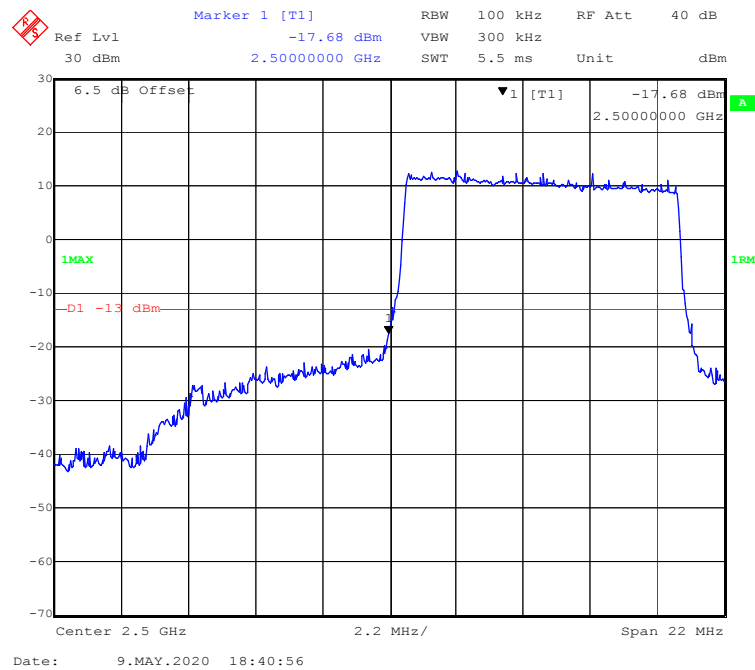


16-QAM (10.0 MHz, FULL RB) - Right Band Edge

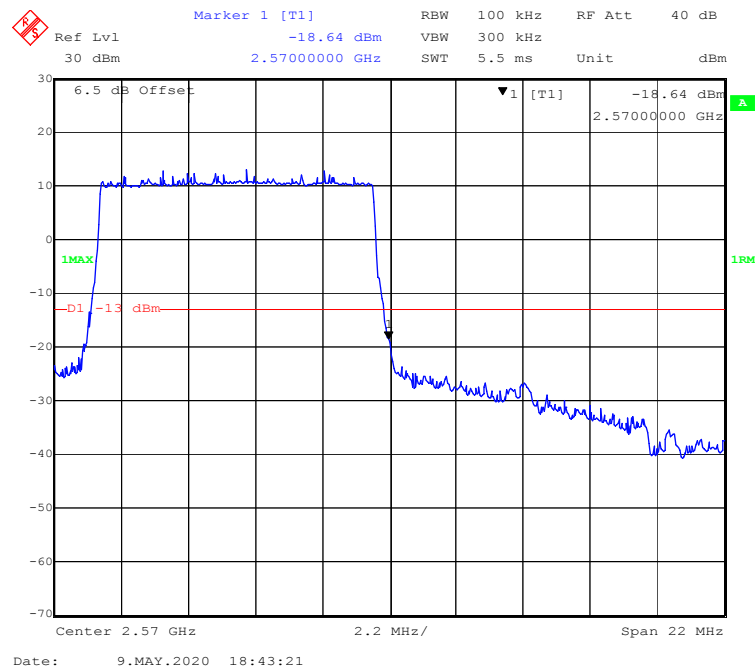


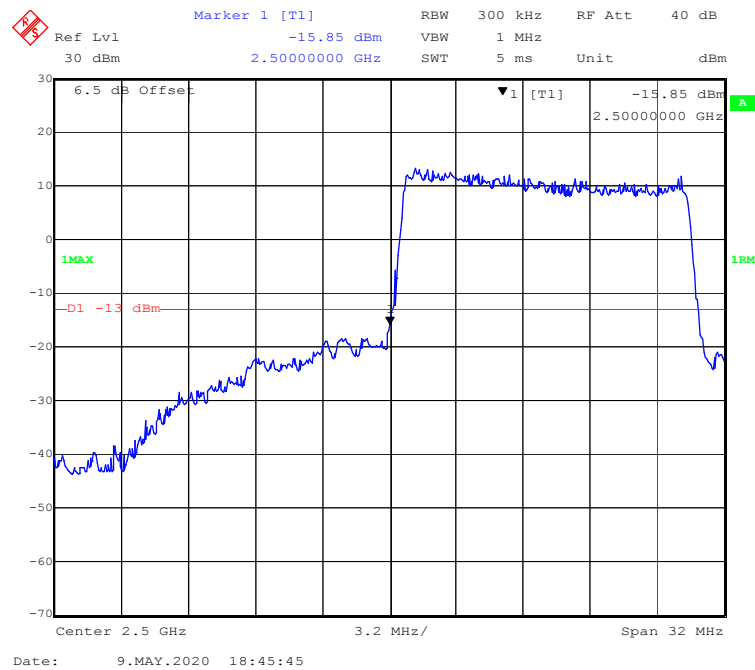
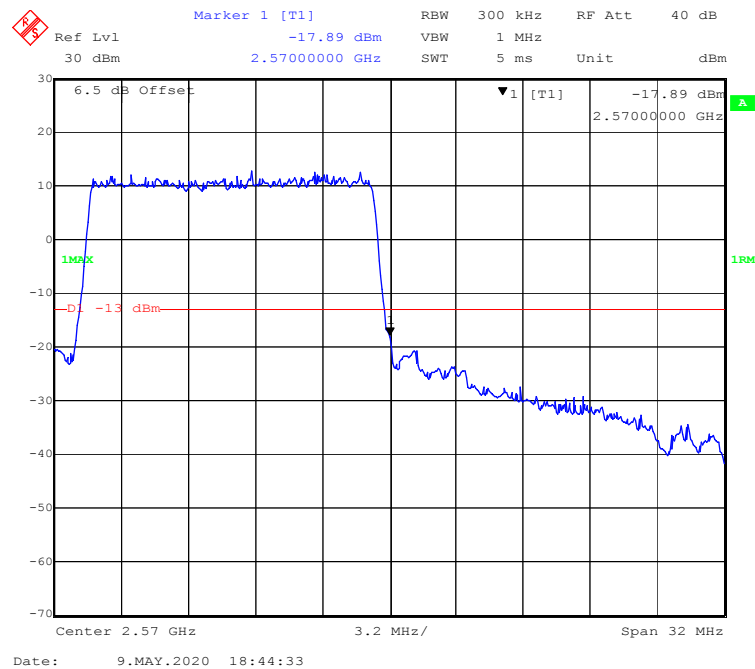
LTE Band 7:**QPSK (5.0 MHz, FULL RB) - Left Band Edge****QPSK (5.0 MHz, FULL RB) - Right Band Edge**

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

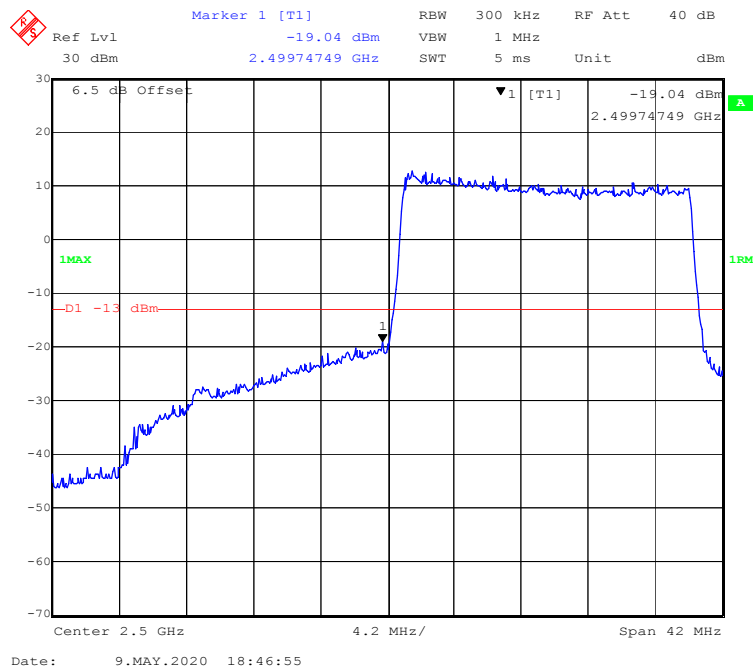


QPSK (10.0 MHz, FULL RB) - Right Band Edge

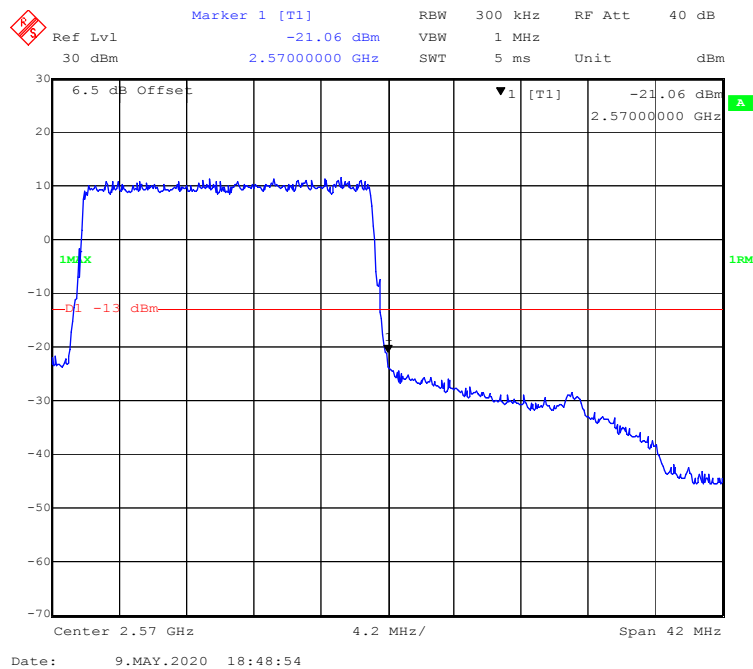


QPSK (15.0 MHz, FULL RB) - Left Band Edge**QPSK (15.0 MHz, FULL RB) - Right Band Edge**

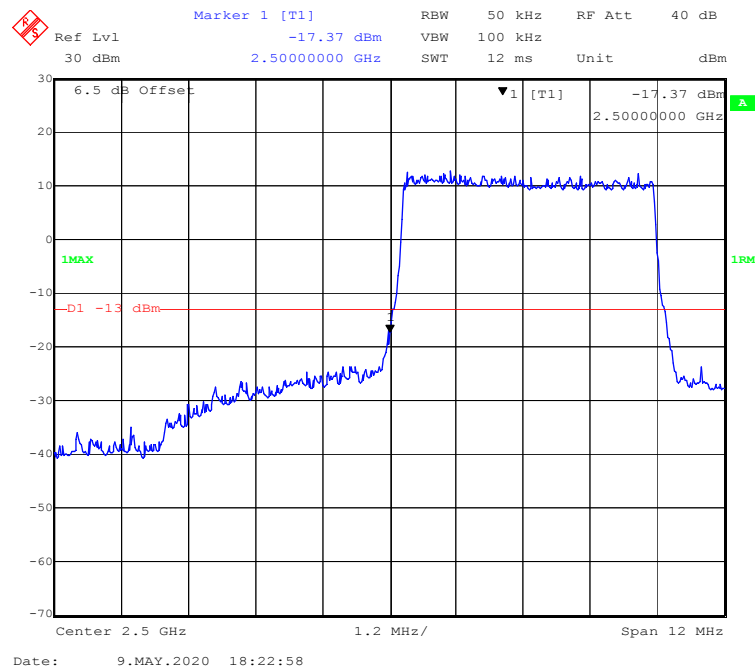
QPSK (20.0 MHz, FULL RB) - Left Band Edge



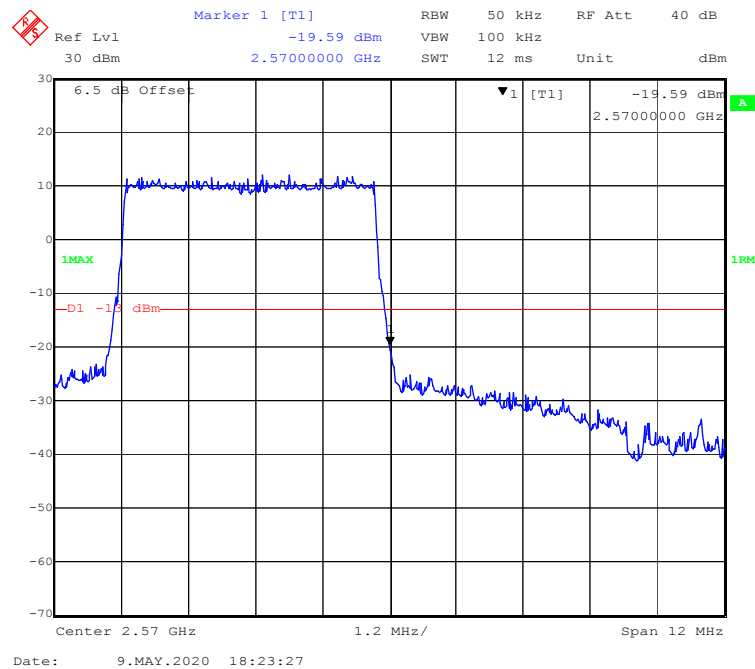
QPSK (20.0 MHz, FULL RB) - Right Band Edge

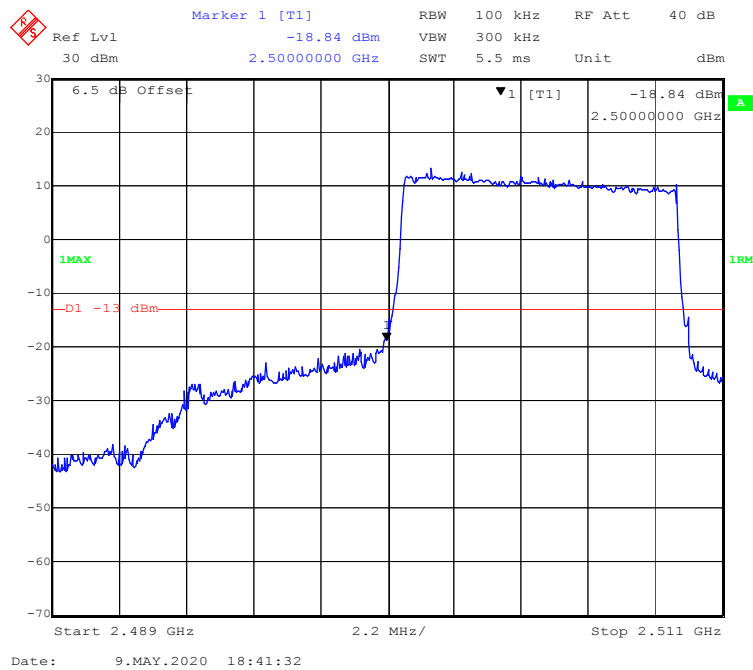
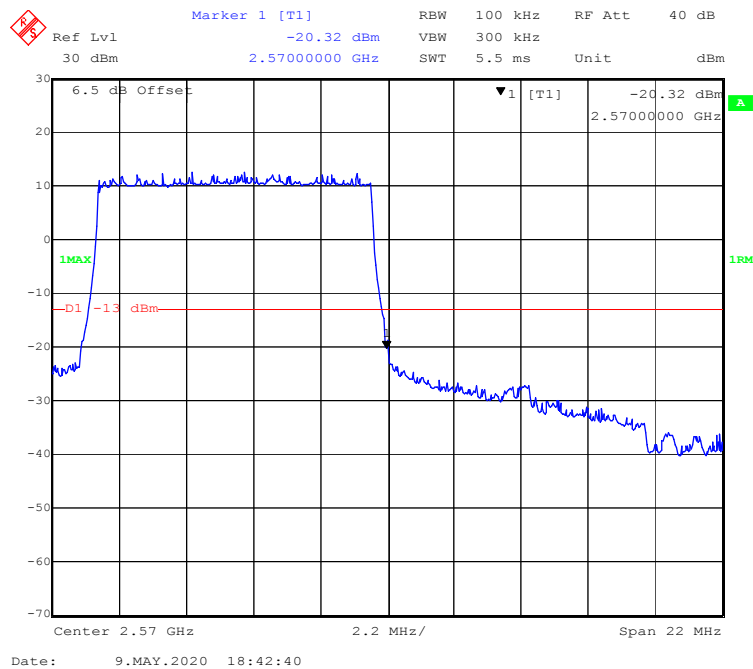


16-QAM (5.0 MHz, FULL RB) - Left Band Edge

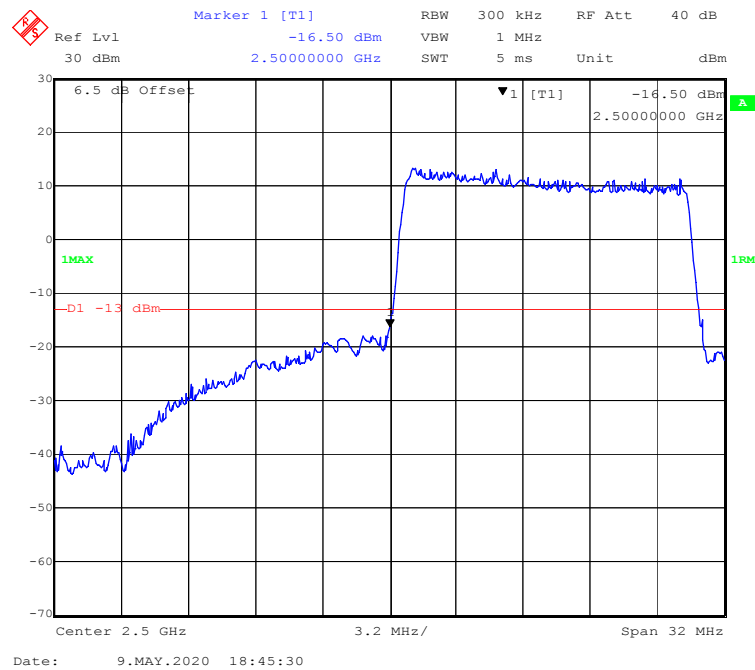


16-QAM (5.0 MHz, FULL RB) - Right Band Edge

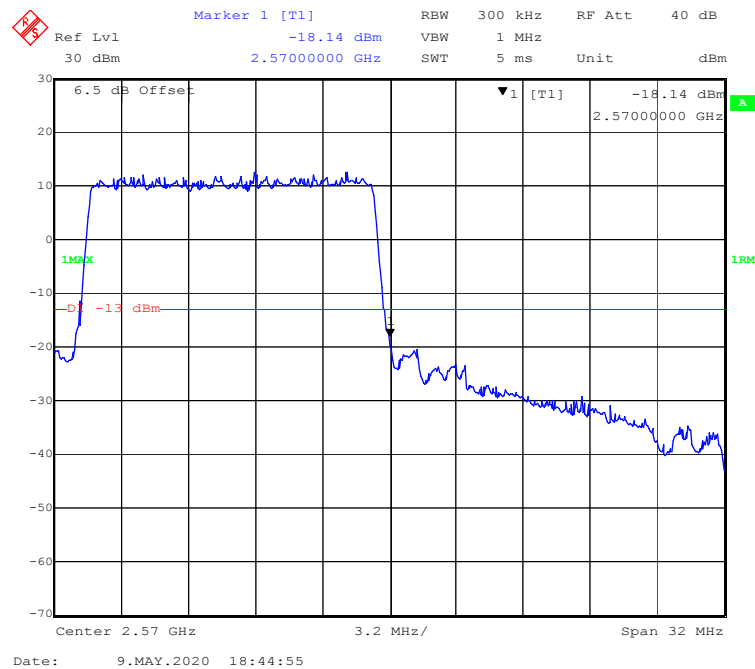


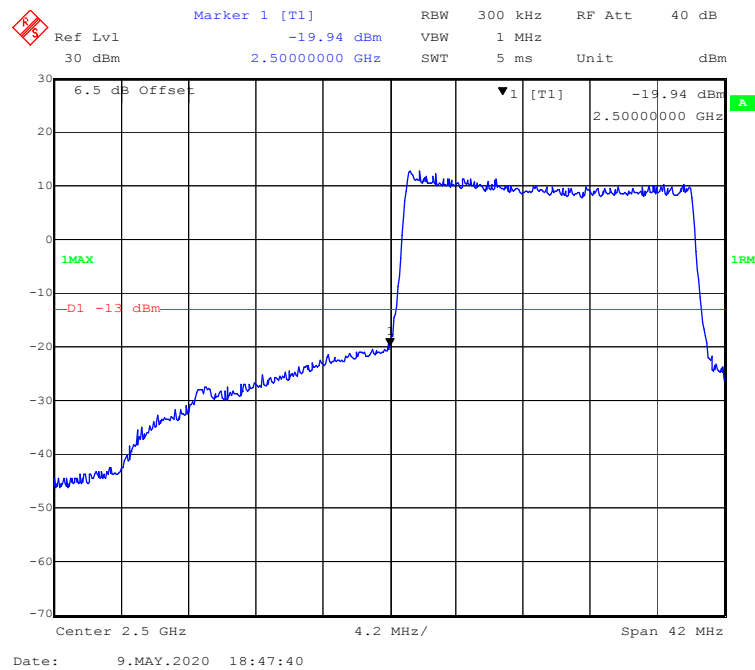
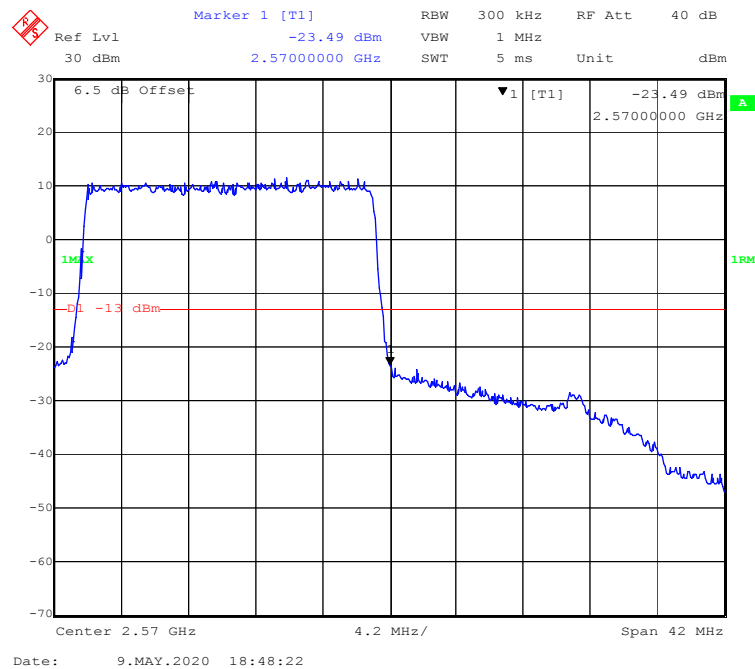
16-QAM (10.0 MHz, FULL RB) - Left Band Edge**16-QAM (10.0 MHz, FULL RB) - Right Band Edge**

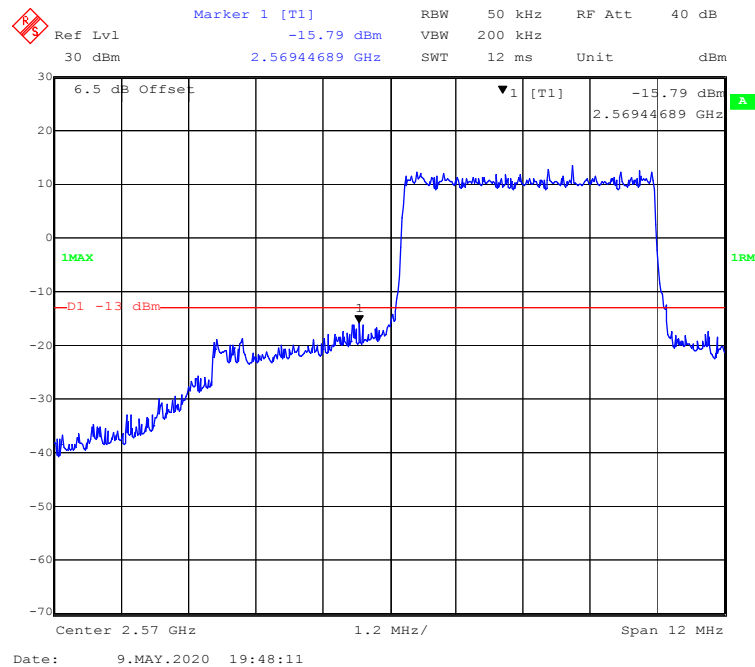
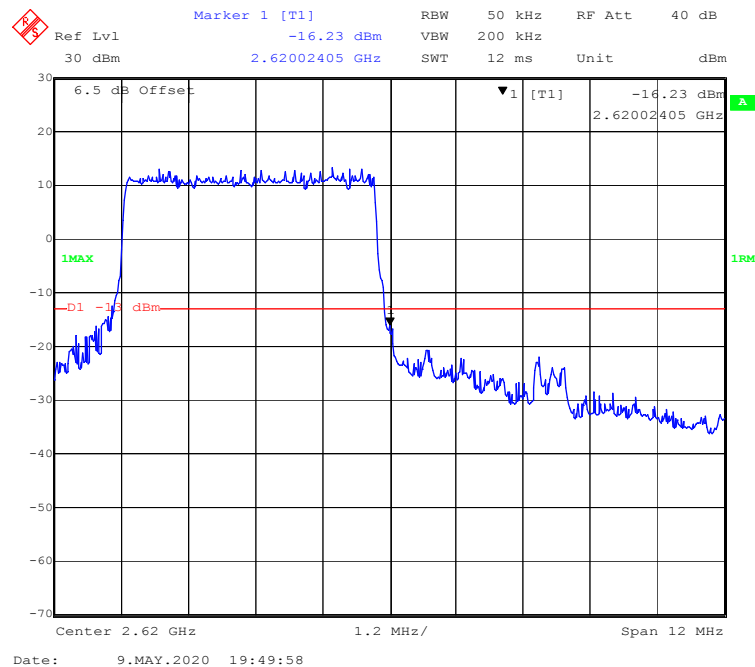
16-QAM (15.0 MHz, FULL RB) - Left Band Edge



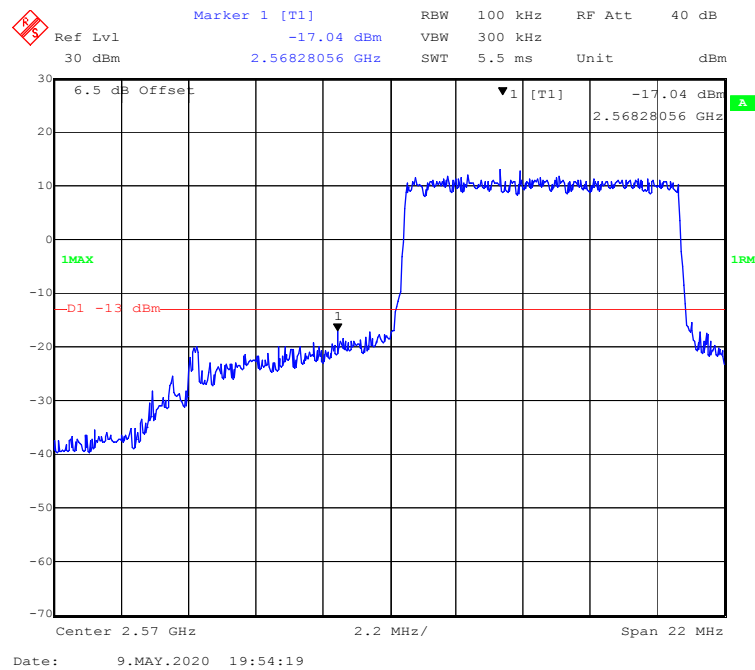
16-QAM (15.0 MHz, FULL RB) - Right Band Edge



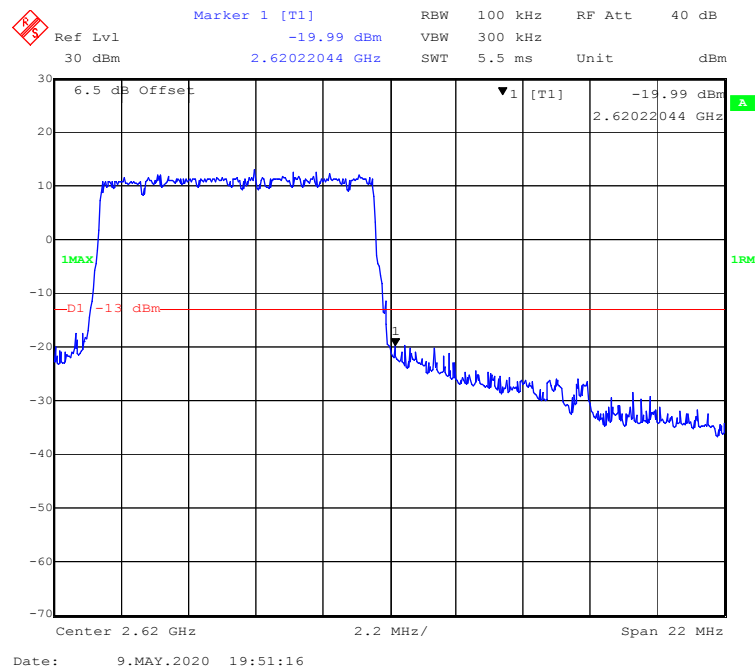
16-QAM (20.0 MHz, FULL RB) - Left Band Edge**16-QAM (20.0 MHz, FULL RB) - Right Band Edge**

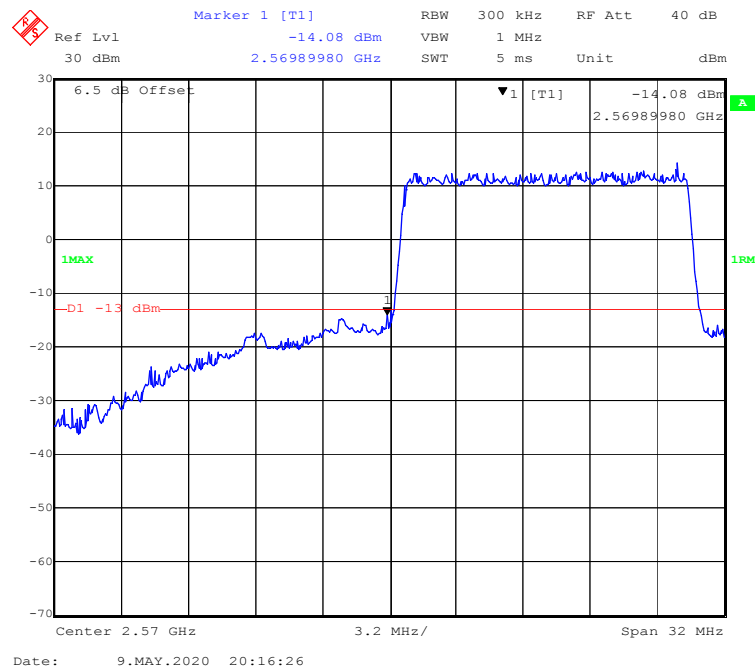
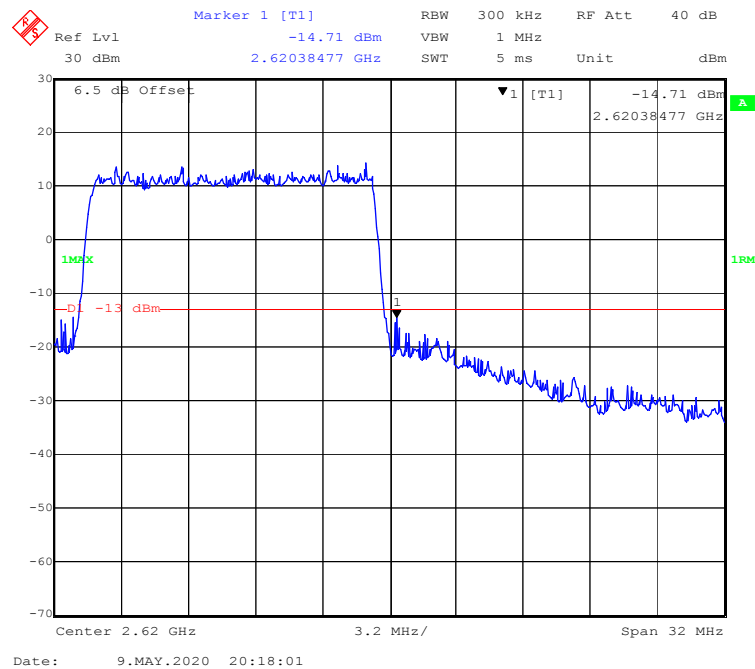
LTE Band 38:**QPSK (5.0 MHz, FULL RB) - Left Band Edge****QPSK (5.0 MHz, FULL RB) - Right Band Edge**

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

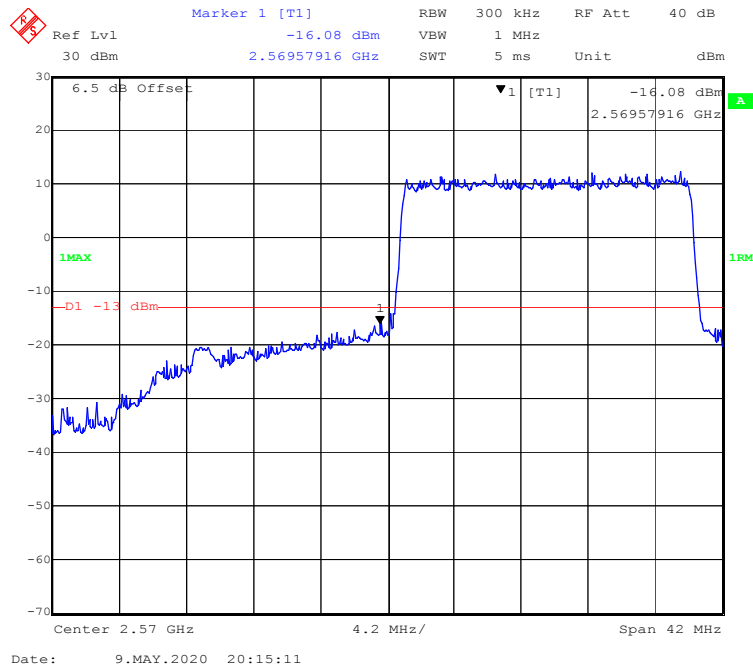


QPSK (10.0 MHz, FULL RB) - Right Band Edge

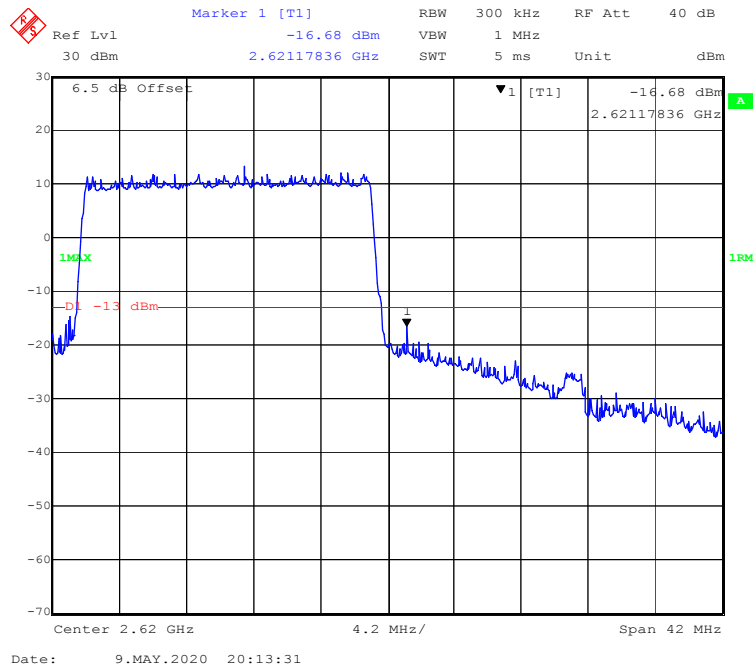


QPSK (15.0 MHz, FULL RB) - Left Band Edge**QPSK (15.0 MHz, FULL RB) - Right Band Edge**

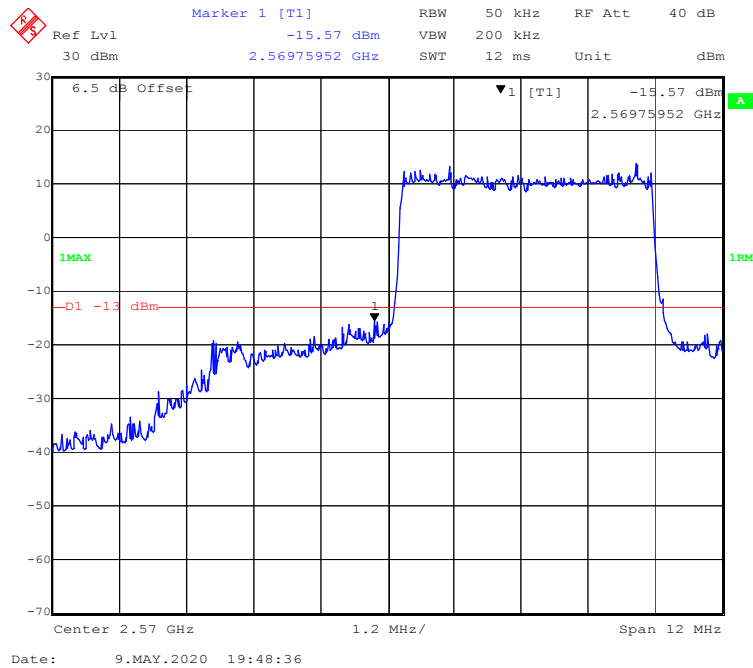
QPSK (20.0 MHz, FULL RB) - Left Band Edge



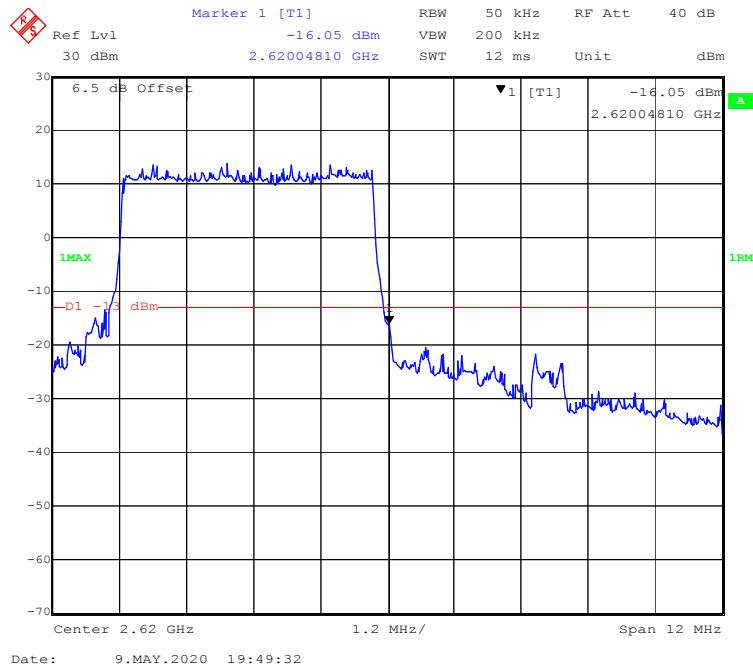
QPSK (20.0 MHz, FULL RB) - Right Band Edge



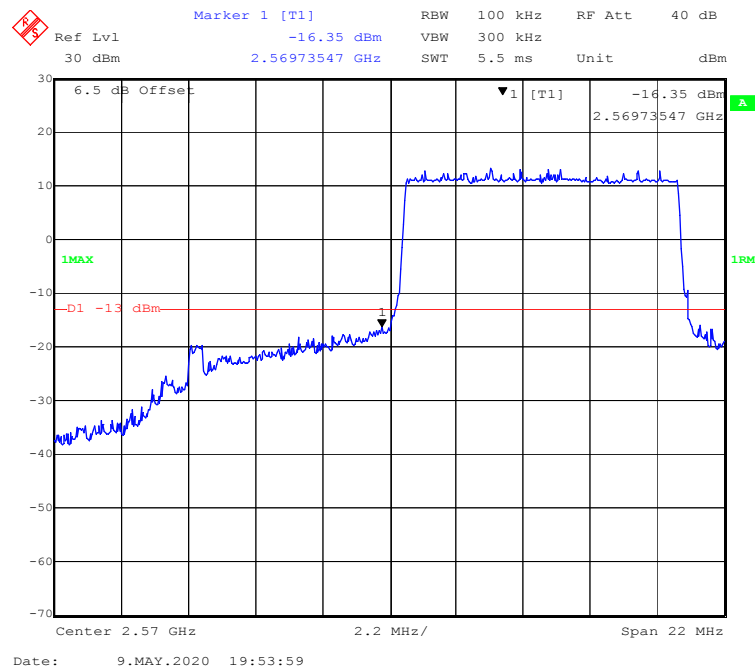
16-QAM (5.0 MHz, FULL RB) - Left Band Edge



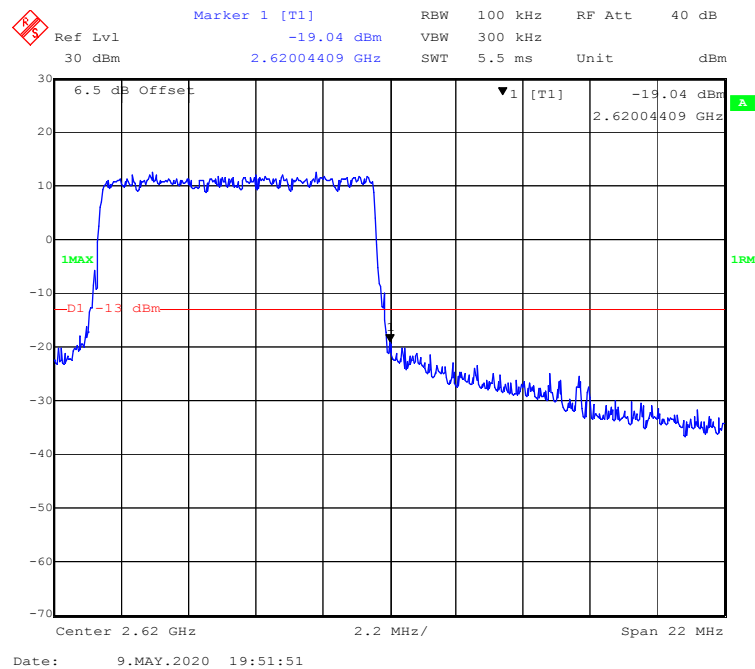
16-QAM (5.0 MHz, FULL RB) - Right Band Edge

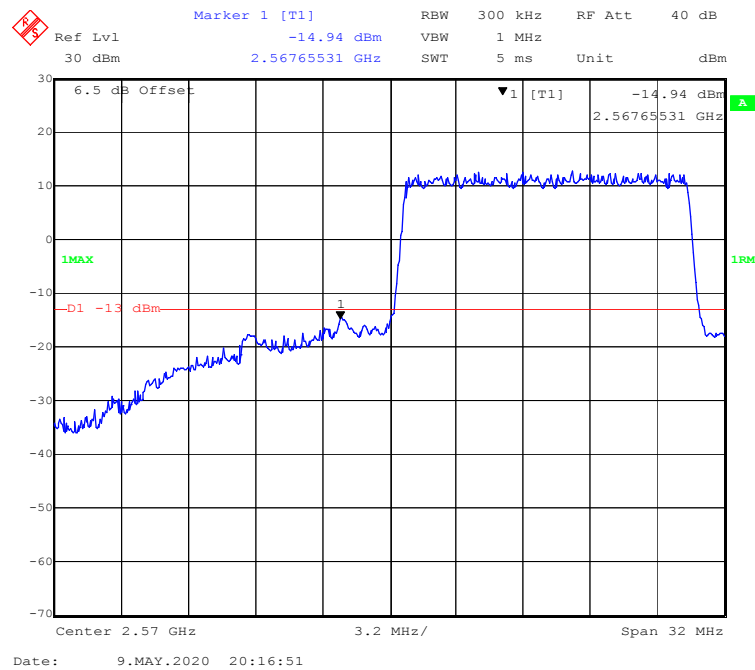
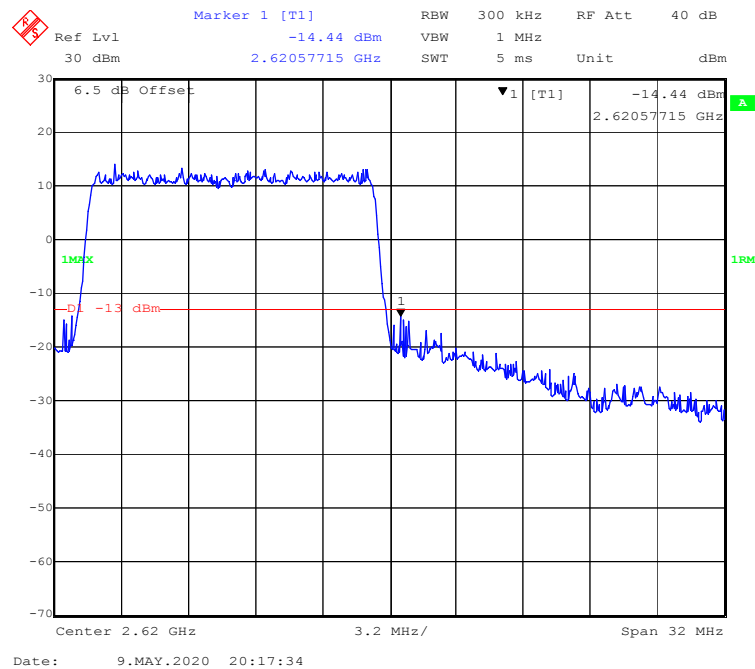


16-QAM (10.0 MHz, FULL RB) - Left Band Edge

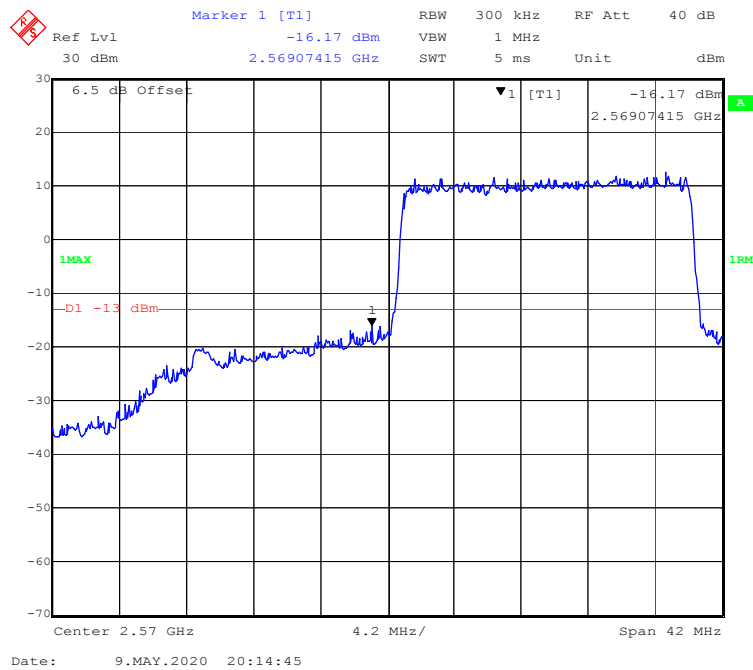


16-QAM (10.0 MHz, FULL RB) - Right Band Edge

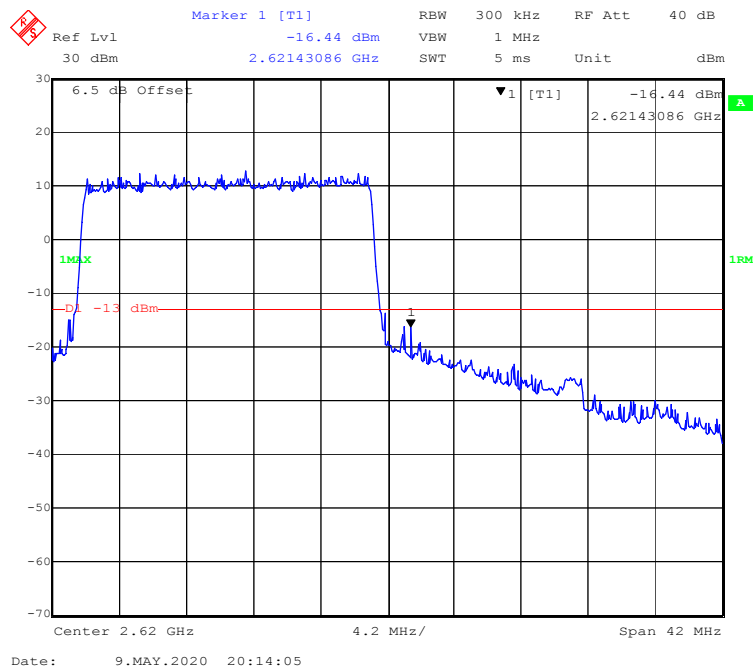


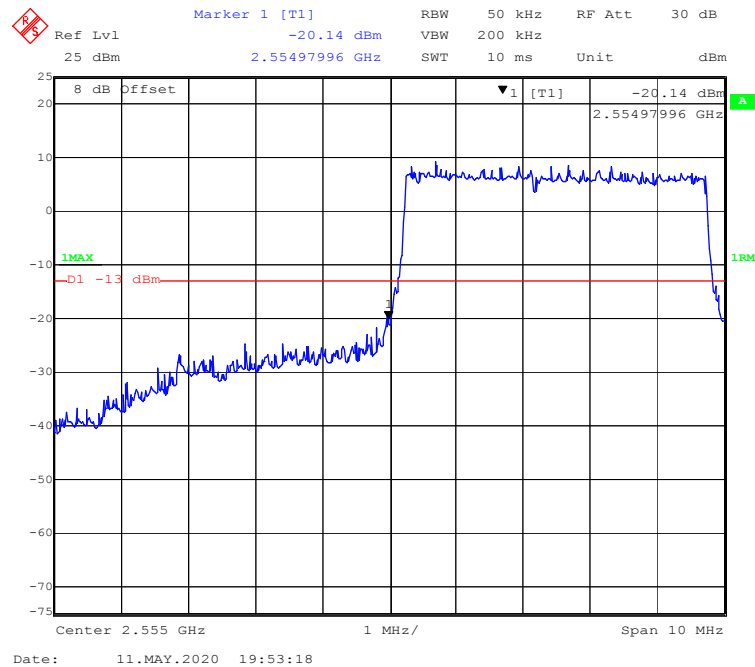
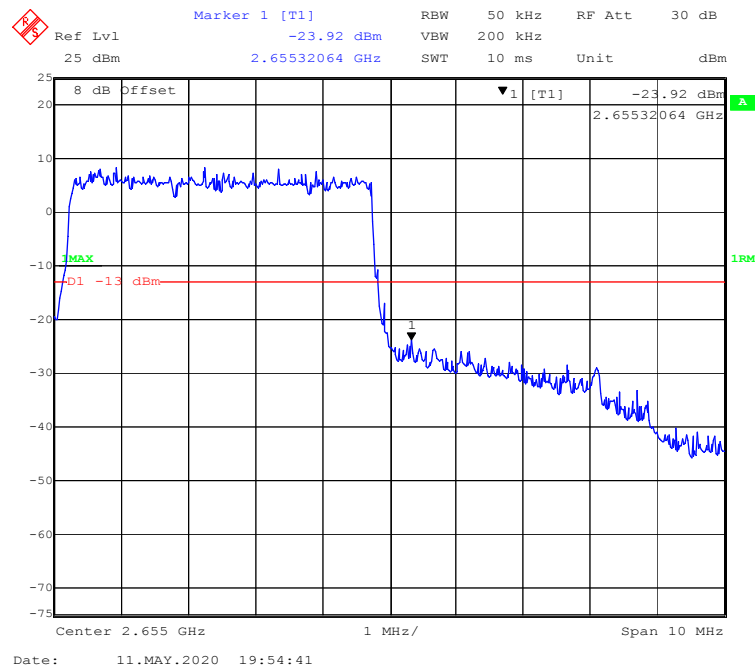
16-QAM (15.0 MHz, FULL RB) - Left Band Edge**16-QAM (15.0 MHz, FULL RB) - Right Band Edge**

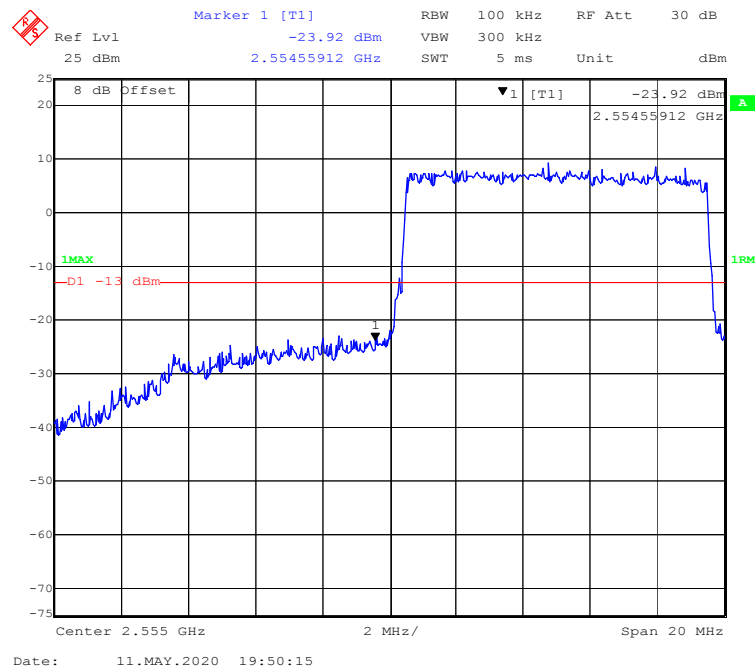
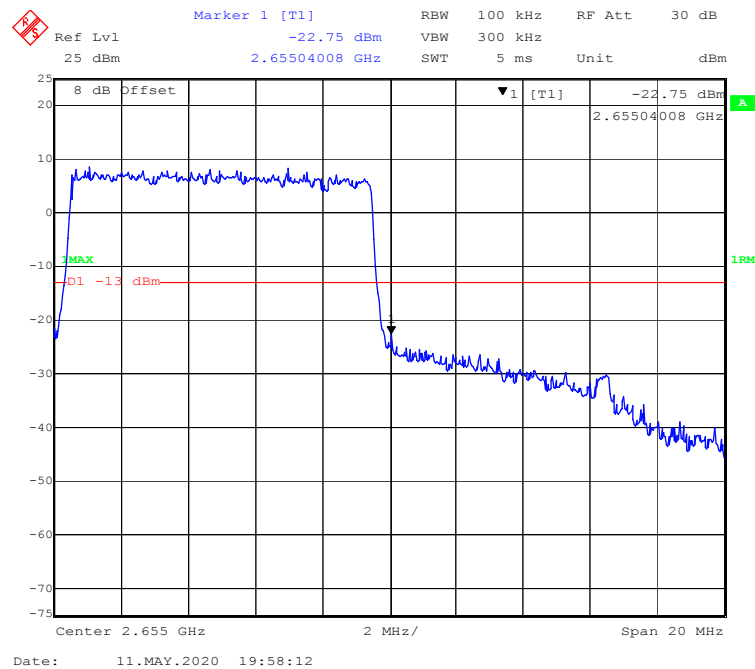
16-QAM (20.0 MHz, FULL RB) - Left Band Edge



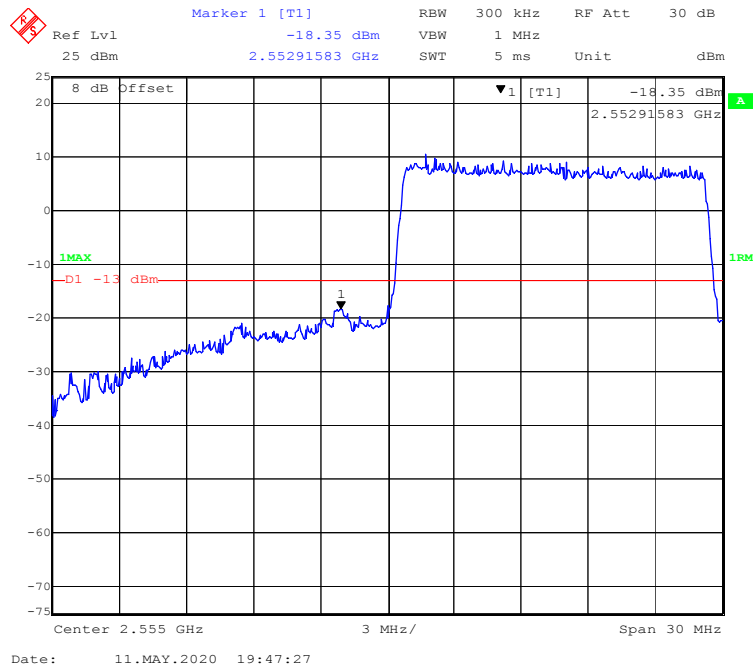
16-QAM (20.0 MHz, FULL RB) - Right Band Edge



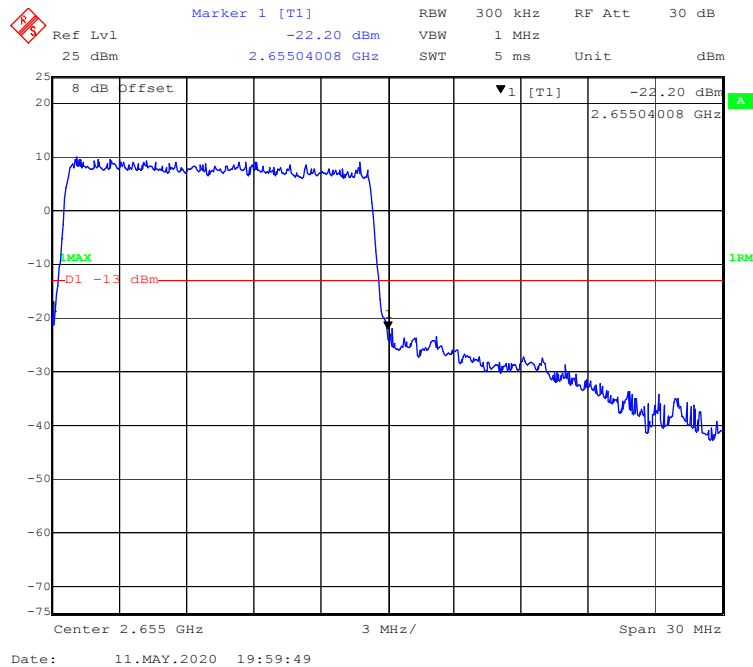
LTE Band 41:**QPSK (5.0 MHz, FULL RB) - Left Band Edge****QPSK (5.0 MHz, FULL RB) - Right Band Edge**

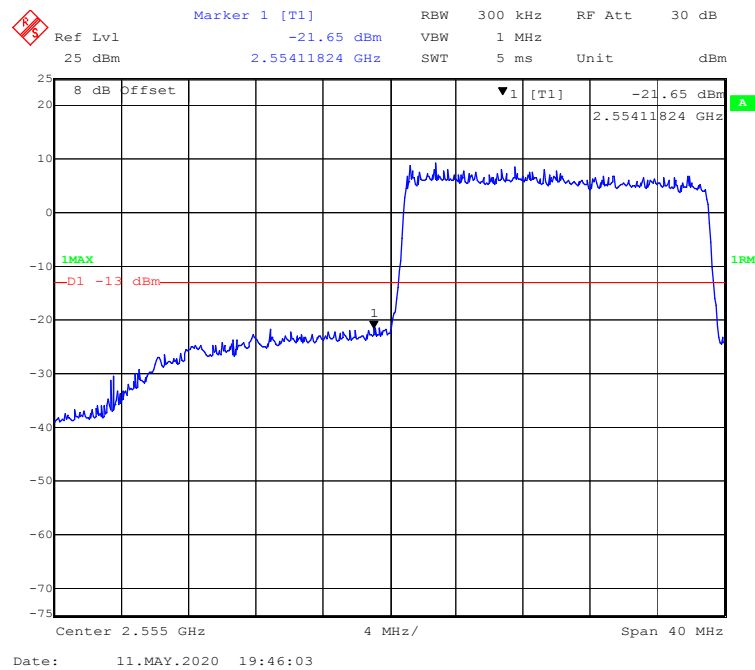
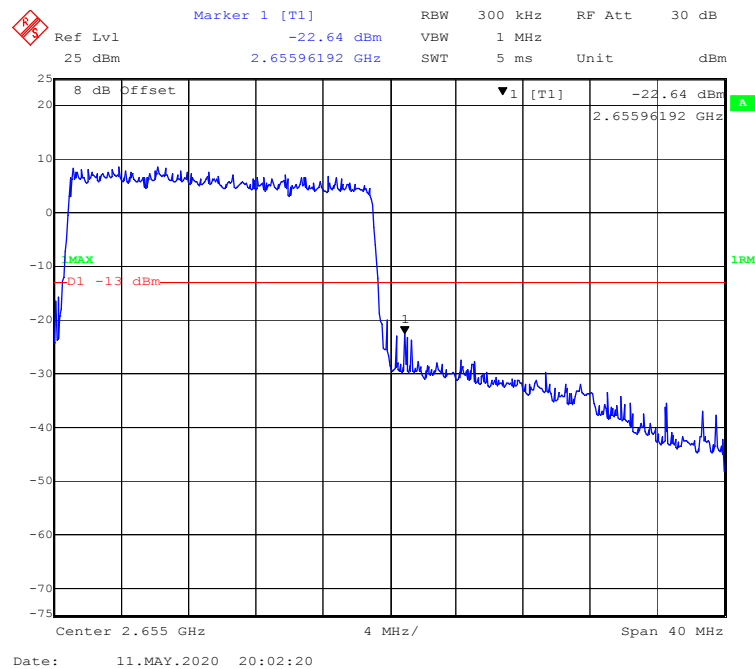
QPSK (10.0 MHz, FULL RB) - Left Band Edge**QPSK (10.0 MHz, FULL RB) - Right Band Edge**

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

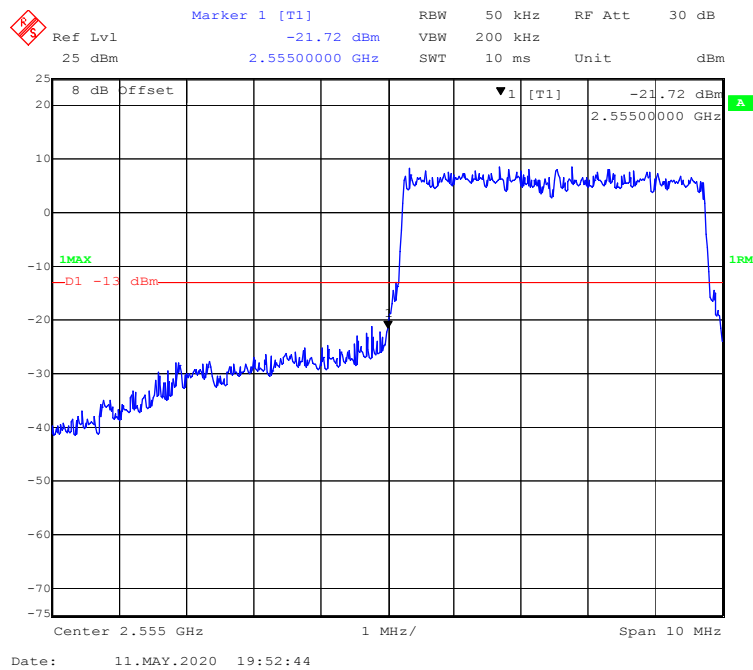


QPSK (15.0 MHz, FULL RB) - Right Band Edge

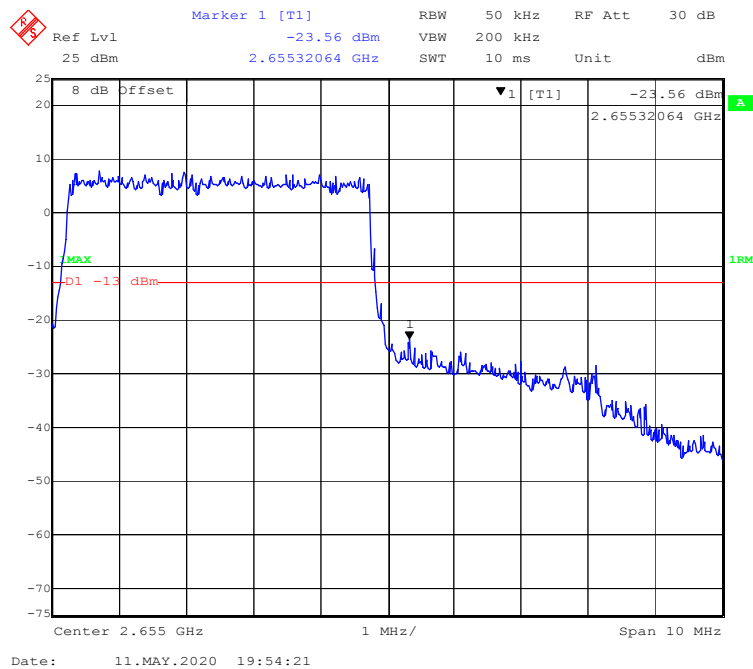


QPSK (20.0 MHz, FULL RB) - Left Band Edge**QPSK (20.0 MHz, FULL RB) - Right Band Edge**

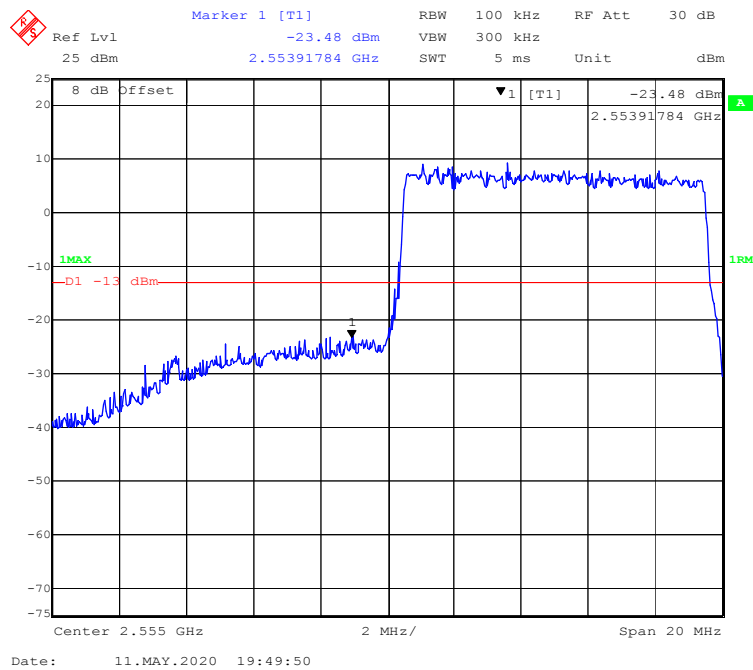
16-QAM (5.0 MHz, FULL RB) - Left Band Edge



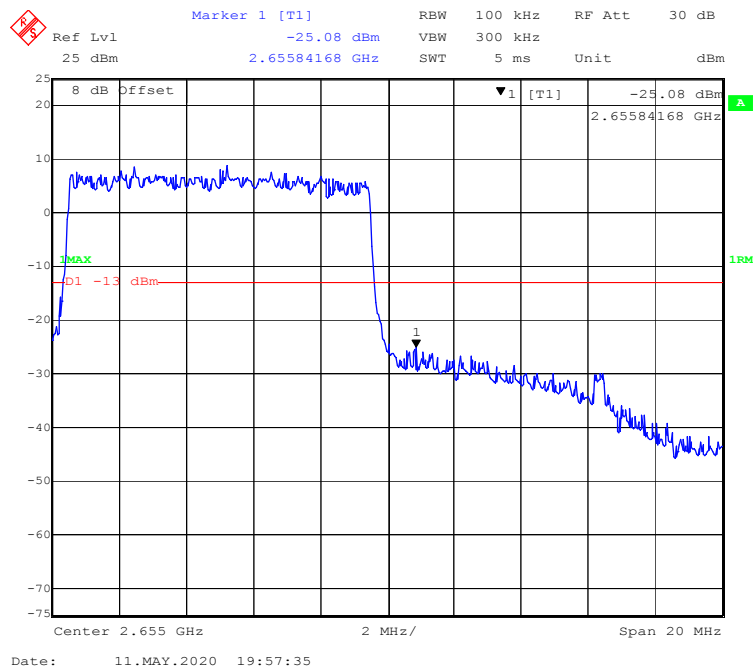
16-QAM (5.0 MHz, FULL RB) - Right Band Edge



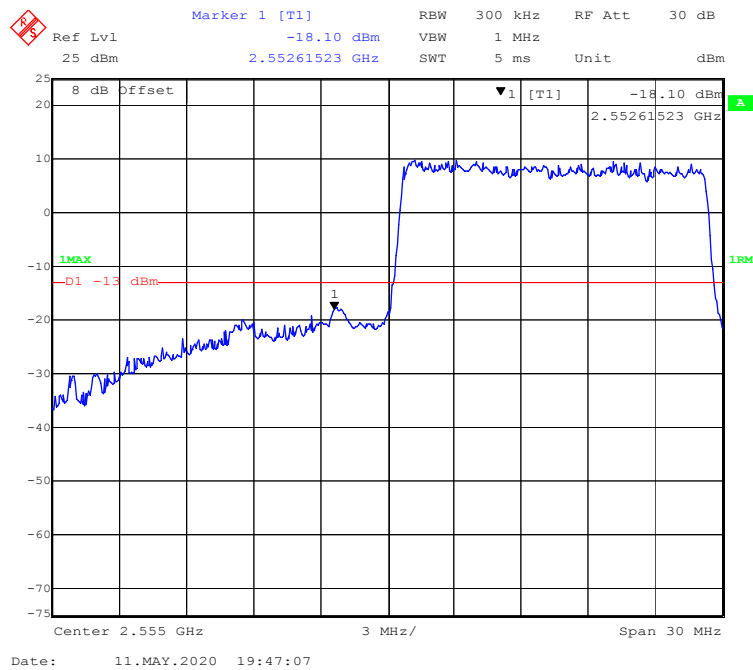
16-QAM (10.0 MHz, FULL RB) - Left Band Edge



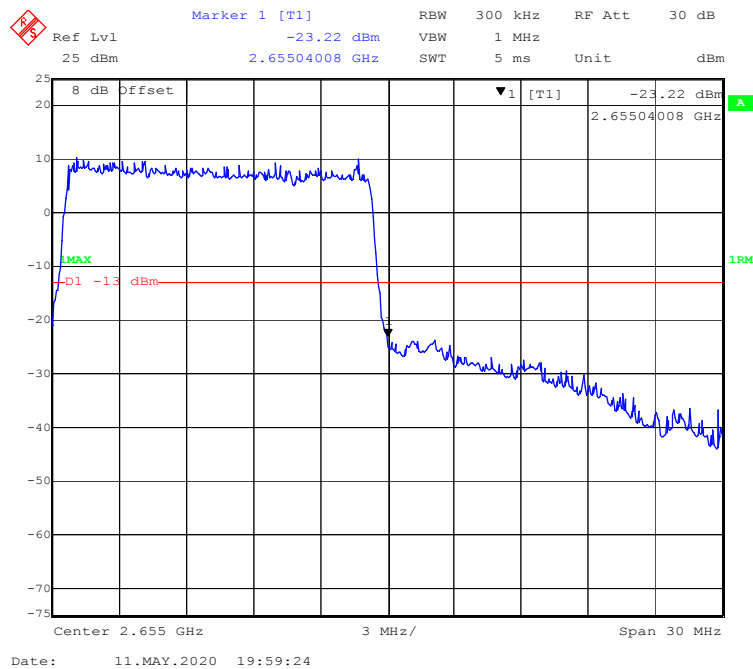
16-QAM (10.0 MHz, FULL RB) - Right Band Edge

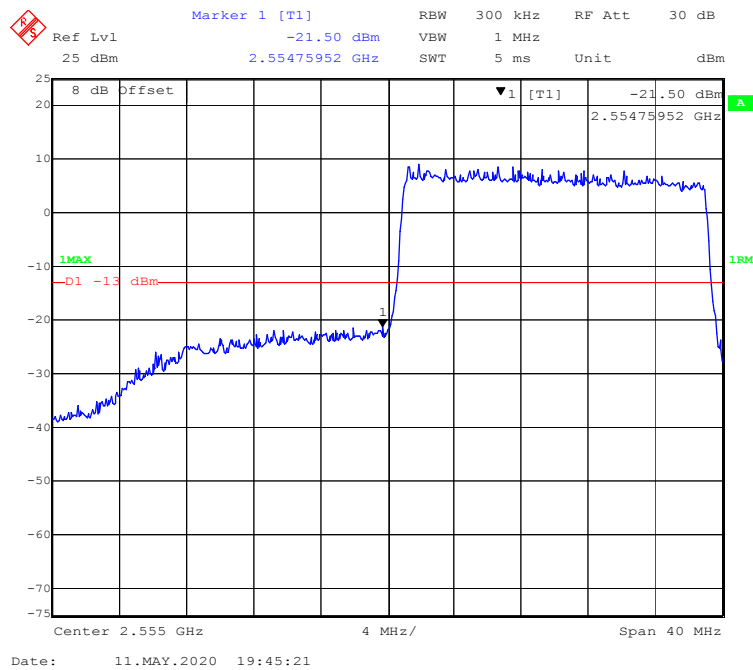
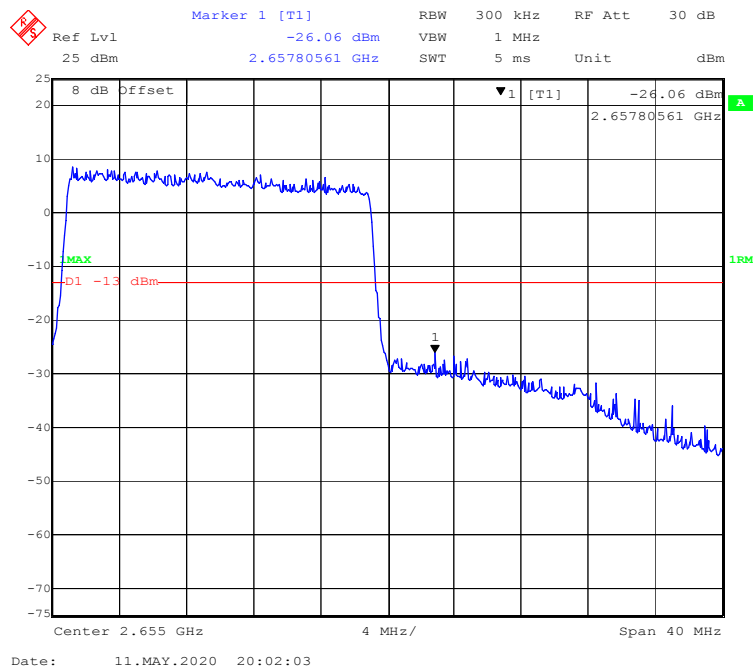


16-QAM (15.0 MHz, FULL RB) - Left Band Edge



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



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

FCC § 2.1055; § 22.355; § 24.235; §27.54- FREQUENCY STABILITY

Applicable Standards

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

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

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

Frequency Tolerance for Transmitters in the Public Mobile Services

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

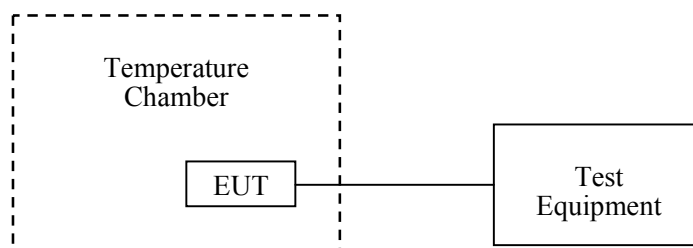
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

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

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

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



Test Data**Environmental Conditions**

Temperature:	23.9 °C
Relative Humidity:	53 %
ATM Pressure:	101.5 kPa

The testing was performed by Stone Zhang on 2020-04-28.

EUT operation mode: Transmitting

Test Result: Compliance.

GPRS 850 Band:

GPRS Mode, Middle Channel, $f_o=836.6$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.7	20	0.023906	2.5
-20		18	0.021516	2.5
-10		16	0.019125	2.5
0		13	0.015539	2.5
10		11	0.013148	2.5
20		12	0.014344	2.5
30		11	0.013148	2.5
40		15	0.017930	2.5
50		10	0.011953	2.5
20	V min.= 3.33	11	0.013148	2.5
20	V max.= 4.07	13	0.015539	2.5

EGPRS Mode, Middle Channel, $f_0 = 836.6$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.7	20	0.010638	2.5
-20		18	0.009574	2.5
-10		14	0.007447	2.5
0		18	0.009574	2.5
10		17	0.009043	2.5
20		15	0.007979	2.5
30		11	0.005851	2.5
40		13	0.006915	2.5
50		12	0.006383	2.5
20	V min.= 3.33	14	0.007447	2.5
20	V max.= 4.07	16	0.008511	2.5

WCDMA Band V:

WCDMA Mode, Middle Channel, $f_0 = 836.6$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.7	19	0.022711	2.5
-20		16	0.019125	2.5
-10		15	0.017930	2.5
0		17	0.020320	2.5
10		16	0.019125	2.5
20		11	0.013148	2.5
30		9	0.010758	2.5
40		8	0.009563	2.5
50		10	0.011953	2.5
20	V min.= 3.33	11	0.013148	2.5
20	V max.= 4.07	12	0.014344	2.5

PCS 1900 Band

GPRS Mode, Middle Channel, $f_0=1880.0$ MHz				
Temperature (°C)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.7	20	0.010638	pass
-20		18	0.009574	pass
-10		14	0.007447	pass
0		18	0.009574	pass
10		17	0.009043	pass
20		15	0.007979	pass
30		11	0.005851	pass
40		13	0.006915	pass
50		12	0.006383	pass
20	V min.= 3.33	14	0.007447	pass
20	V max.= 4.07	16	0.008511	pass

EGPRS Mode, Middle Channel, $f_0=1880.0$ MHz				
Temperature (°C)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-30	3.7	16	0.008511	pass
-20		18	0.009574	pass
-10		17	0.009043	pass
0		15	0.007979	pass
10		11	0.005851	pass
20		13	0.006915	pass
30		12	0.006383	pass
40		13	0.006915	pass
50		12	0.006383	pass
20	V min.= 3.33	14	0.007447	pass
20	V max.= 4.07	16	0.008511	pass

WCDMA Band II:

WCDMA Mode, Middle Channel, $f_0 = 1880.0$ MHz				
Temperature (°C)	Power Supplied (V_{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-30	3.7	25	0.013298	2.5
-20		22	0.011702	2.5
-10		20	0.010638	2.5
0		23	0.012234	2.5
10		19	0.010106	2.5
20		11	0.005851	2.5
30		13	0.006915	2.5
40		13	0.006915	2.5
50		12	0.006383	2.5
20	V min.= 3.33	11	0.005851	2.5
20	V max.= 4.07	16	0.008511	2.5

LTE Band 5:

Middle Channel, $f_0 = 836.5$ MHz (QPSK)				
Temperature	Power Supplied	Frequency Error	Frequency Error	Limit
(°C)	(V _{DC})	(Hz)	(ppm)	(ppm)
-30	3.7	18	0.0215	2.5
-20		15	0.0179	2.5
-10		14	0.0167	2.5
0		13	0.0155	2.5
10		10	0.0120	2.5
20		8	0.0096	2.5
30		6	0.0072	2.5
40		9	0.0108	2.5
50		9	0.0108	2.5
20	V min.= 3.33	11	0.0132	2.5
20	V max.= 4.07	10	0.0120	2.5

Middle Channel, $f_0 = 836.5$ MHz (16-QAM)				
Temperature	Power Supplied	Frequency Error	Frequency Error	Limit
(°C)	(V _{DC})	(Hz)	(ppm)	(ppm)
-30	3.7	20	0.0239	2.5
-20		18	0.0215	2.5
-10		16	0.0191	2.5
0		13	0.0155	2.5
10		9	0.0108	2.5
20		12	0.0143	2.5
30		10	0.0120	2.5
40		8	0.0096	2.5
50		9	0.0108	2.5
20	V min.= 3.33	11	0.0132	2.5
20	V max.= 4.07	13	0.0155	2.5

LTE Band 7:

Low Channel & High Channel (QPSK) /Channel Bandwidth:20MHz					
Temperature	Power Supplied	F _L	F _H	F _L Limit	F _H Limit
(°C)	(V _{DC})	(MHz)	(MHz)	(MHz)	(MHz)
-30	3.7	2500.0461	2569.9508	2500	2570
-20		2500.044	2569.9518	2500	2570
-10		2500.044	2569.9572	2500	2570
0		2500.042	2569.9517	2500	2570
10		2500.0496	2569.9515	2500	2570
20		2500.0494	2569.9589	2500	2570
30		2500.0475	2569.9593	2500	2570
40		2500.0403	2569.9528	2500	2570
50		2500.0487	2569.9544	2500	2570
20	V min.= 3.33	2500.0500	2569.9551	2500	2570
20	V max.= 4.07	2500.0475	2569.9525	2500	2570

Low Channel & High Channel (16-QAM) /Channel Bandwidth:20MHz					
Temperature	Power Supplied	F _L	F _H	F _L Limit	F _H Limit
(°C)	(V _{DC})	(MHz)	(MHz)	(MHz)	(MHz)
-30	3.7	2500.0404	2569.9523	2500	2570
-20		2500.0478	2569.9581	2500	2570
-10		2500.0458	2569.9552	2500	2570
0		2500.0453	2569.9537	2500	2570
10		2500.0466	2569.9550	2500	2570
20		2500.0438	2569.9508	2500	2570
30		2500.0468	2569.9594	2500	2570
40		2500.0453	2569.9557	2500	2570
50		2500.0480	2569.9543	2500	2570
20	V min.= 3.33	2500.0451	2569.9585	2500	2570
20	V max.= 4.07	2500.0434	2569.9515	2500	2570

LTE Band 38:

Low Channel & High Channel (QPSK) /Channel Bandwidth:20MHz					
Temperature	Power Supplied	F _L	F _H	F _L Limit	F _H Limit
(°C)	(V _{DC})	(MHz)	(MHz)	(MHz)	(MHz)
-30	3.7	2570.045	2619.965	2570	2620
-20		2570.041	2619.969	2570	2620
-10		2570.047	2619.966	2570	2620
0		2570.050	2619.965	2570	2620
10		2570.041	2619.970	2570	2620
20		2570.044	2619.970	2570	2620
30		2570.045	2619.962	2570	2620
40		2570.042	2619.961	2570	2620
50		2570.049	2619.967	2570	2620
20	V min.= 3.33	2570.043	2619.969	2570	2620
20	V max.= 4.07	2570.046	2619.964	2570	2620

Low Channel & High Channel (16-QAM) /Channel Bandwidth:20MHz					
Temperature	Power Supplied	F _L	F _H	F _L Limit	F _H Limit
(°C)	(V _{DC})	(MHz)	(MHz)	(MHz)	(MHz)
-30	3.7	2570.049	2619.963	2570	2620
-20		2570.042	2619.962	2570	2620
-10		2570.048	2619.965	2570	2620
0		2570.041	2619.964	2570	2620
10		2570.043	2619.961	2570	2620
20		2570.040	2619.961	2570	2620
30		2570.042	2619.967	2570	2620
40		2570.046	2619.968	2570	2620
50		2570.043	2619.96	2570	2620
20	V min.= 3.33	2570.048	2619.965	2570	2620
20	V max.= 4.07	2570.049	2619.969	2570	2620

LTE Band 41:

Low Channel & High Channel (QPSK) /Channel Bandwidth:20MHz					
Temperature	Power Supplied	F _L	F _H	F _L Limit	F _H Limit
(°C)	(V _{DC})	(MHz)	(MHz)	(MHz)	(MHz)
-30	3.7	2555.059	2654.959	2555	2655
-20		2555.053	2654.950	2555	2655
-10		2555.057	2654.954	2555	2655
0		2555.055	2654.952	2555	2655
10		2555.052	2654.954	2555	2655
20		2555.051	2654.959	2555	2655
30		2555.058	2654.956	2555	2655
40		2555.057	2654.954	2555	2655
50		2555.056	2654.959	2555	2655
20	V min.= 3.33	2555.054	2654.957	2555	2655
20	V max.= 4.07	2555.051	2654.952	2555	2655

Low Channel & High Channel (16-QAM) /Channel Bandwidth:20MHz					
Temperature	Power Supplied	F _L	F _H	F _L Limit	F _H Limit
(°C)	(V _{DC})	(MHz)	(MHz)	(MHz)	(MHz)
-30	3.7	2555.057	2654.959	2555	2655
-20		2555.051	2654.955	2555	2655
-10		2555.057	2654.955	2555	2655
0		2555.058	2654.956	2555	2655
10		2555.051	2654.953	2555	2655
20		2555.057	2654.957	2555	2655
30		2555.052	2654.953	2555	2655
40		2555.054	2654.956	2555	2655
50		2555.053	2654.955	2555	2655
20	V min.= 3.33	2555.057	2654.958	2555	2655
20	V max.= 4.07	2555.057	2654.958	2555	2655

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