

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

For

MFOURTEL MEXICO S.A. DE C.V.

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FCC ID: CLNHS1

Report Type: Original Report	Product Type: 4G Mobile Wifi
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Report Number: <u>RSZ160307004-00C</u>	
Report Date: <u>2016-04-01</u>	
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Note: This test report is prepared for the customer shown above and for the equipment described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.

TABLE OF CONTENTS

GENERAL INFORMATION	4
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	4
OBJECTIVE.....	4
RELATED SUBMITTAL(S)/GRANT(S).....	4
TEST METHODOLOGY.....	4
TEST FACILITY.....	5
SYSTEM TEST CONFIGURATION	6
JUSTIFICATION.....	6
EQUIPMENT MODIFICATIONS.....	6
SUPPORT EQUIPMENT LIST AND DETAILS.....	6
BLOCK DIAGRAM OF TEST SETUP.....	6
SUMMARY OF TEST RESULTS	7
FCC §1.1307(B) & §2.1093 - RF EXPOSURE INFORMATION	8
APPLICABLE STANDARD.....	8
TEST RESULT.....	8
FCC §2.1047 - MODULATION CHARACTERISTIC	9
FCC § 2.1046, § 22.913 (A) & § 24.232 (C) & § 27.50 - RF OUTPUT POWER	10
APPLICABLE STANDARDS.....	10
TEST PROCEDURE.....	10
TEST EQUIPMENT LIST AND DETAILS.....	11
TEST DATA.....	11
FCC §2.1049, §22.917, §22.905 & §24.238 & §27.53 - OCCUPIED BANDWIDTH	32
APPLICABLE STANDARDS.....	32
TEST PROCEDURE.....	32
TEST EQUIPMENT LIST AND DETAILS.....	32
TEST DATA.....	33
FCC §2.1051, §22.917(A) & §24.238(A) & §27.53 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS ..	74
APPLICABLE STANDARDS.....	74
TEST PROCEDURE.....	74
TEST EQUIPMENT LIST AND DETAILS.....	74
TEST DATA.....	75
FCC §2.1053, §22.917 & §24.238 & §27.53 - SPURIOUS RADIATED EMISSIONS	96
APPLICABLE STANDARDS.....	96
TEST PROCEDURE.....	96
TEST EQUIPMENT LIST AND DETAILS.....	97
TEST DATA.....	97
FCC §22.917(A) & §24.238(A) & §27.53 - BAND EDGES	101
APPLICABLE STANDARDS.....	101
TEST PROCEDURE.....	101
TEST EQUIPMENT LIST AND DETAILS.....	102
TEST DATA.....	102

FCC §2.1055, §22.355 & §24.235 & §27.54 - FREQUENCY STABILITY.....145
APPLICABLE STANDARDS.....145
TEST PROCEDURE145
TEST EQUIPMENT LIST AND DETAILS.....146
TEST DATA146

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *MFOURTEL MEXICO S.A. DE C.V.*'s product, model number: *HS1 (FCC ID: CLNHS1)* or the "EUT" in this report was a *4G Mobile Wifi*, which was measured approximately: 93 mm (L) × 60 mm (W) × 14 mm (H), rated with input voltage: DC 3.8V rechargeable Li-ion battery or DC 5V from adapter.

Adapter Information:

Model: M4

Input AC: 100-240V, 50/60Hz, 150mA

Output DC: 5V, 1000mA

**All measurement and test data in this report was gathered from production sample serial number: 1601533 (Assigned by Shenzhen BAACL). The EUT supplied by the applicant was received on 2016-03-07.*

Objective

This type approval report is prepared on behalf of *MFOURTEL MEXICO S.A. DE C.V.* in accordance with Part 2, Part 22-Subpart H, Part 24-Subpart E and 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)

Part 15.247 DTS submissions with FCC ID: CLNHS1.

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. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement uncertainty with radiated emission is 5.81 dB for 30MHz-1GHz and 4.88 dB for above 1GHz, 1.95dB for conducted measurement.

Test Facility

The Test site used by Bay Area Compliance Laboratories Corp.(Shenzhen) to collect test data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on October 31, 2103. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

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.

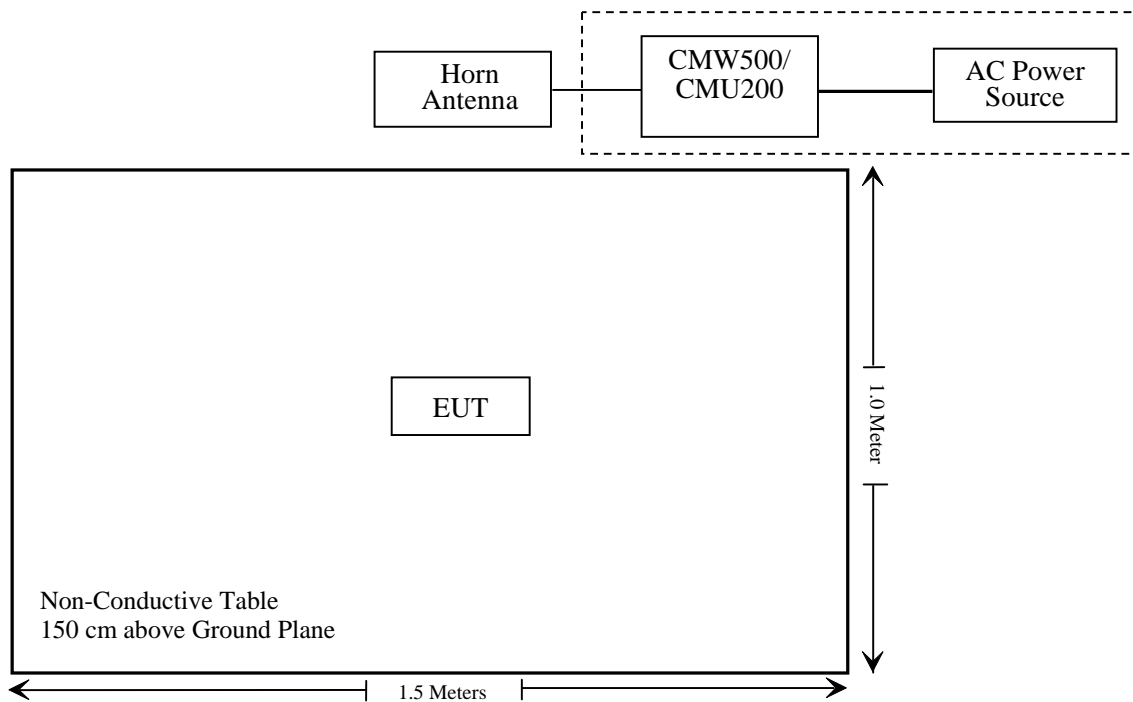
Equipment Modifications

No modifications were made to the EUT.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.002K50
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	106891

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

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

Note: * Please refer to SAR report released by BACL, report number: RSZ160307004-20.

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: RSZ160307004-20.

FCC §2.1047 - MODULATION CHARACTERISTIC

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

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

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

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

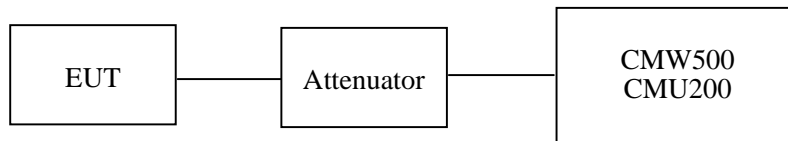
According to §27.50(d), the maximum EIRP must not exceed 1Watts (30dBm) for 1710-1755MHz. The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB.

According to §27.50(c), Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

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

Test Procedure*Conducted method:*

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

*Radiated method:*

TIA603-D section 2.2.17

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2015-11-03	2016-11-03
Sunol Sciences	Bi-log Antenna	JB1	A040904-2	2014-12-07	2017-12-06
HP	Synthesized Sweeper	HP 8341B	2624A00116	2015-07-02	2016-07-01
COM POWER	Dipole Antenna	AD-100	041000	2015-08-18	2016-08-18
A.H. System	Horn Antenna	SAS-200/571	135	2015-08-18	2018-08-17
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2015-12-11	2016-12-11
Sunol Sciences	Horn Antenna	DRH-118	A052604	2014-12-29	2017-12-28
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	106891	2015-11-23	2016-11-23
R&S	Wideband Radio Communication tester	CMW500	1201.002K50-146520-wh	2015-11-23	2016-11-23
Ducommun technologies	RF Cable	UFA210A-1-4724-30050U	MFR64369 223410-001	2015-06-15	2016-06-15
Ducommun technologies	RF Cable	104PEA	218124002	2015-06-15	2016-06-15
Ducommun technologies	RF Cable	RG-214	1	2015-06-15	2016-06-15
Ducommun technologies	RF Cable	RG-214	2	2015-06-15	2016-06-15
Ducommun technologies	RF Cable	RG-214	3	2015-06-15	2016-06-15
WEINSCHEL	10dB Attenuator	5324	AU0709	2015-06-18	2016-06-18

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

Test Data**Environmental Conditions**

Temperature:	23 °C
Relative Humidity:	50 %
ATM Pressure:	101.0kPa

The testing was performed by Simon Wang on 2016-03-26.

Conducted Power

Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	32.29	29.32	28.43	27.20	38.45
	190	836.6	32.23	29.13	28.17	27.05	38.45
	251	848.8	32.53	28.96	27.91	26.67	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	128	824.2	26.08	24.84	22.90	21.79	38.45
	190	836.6	26.22	25.01	23.01	21.96	38.45
	251	848.8	26.17	24.98	22.92	21.44	38.45

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band V)	Normal	RMC12.2k		21.85	21.89	21.89
		HSDPA	1	20.86	20.90	20.92
			2	20.87	20.87	20.90
			3	20.88	20.89	20.89
			4	20.89	20.91	20.93
		HSUPA	1	20.68	20.70	20.80
			2	20.70	20.73	20.82
			3	20.72	20.74	20.81
			4	20.69	20.76	20.83
			5	20.71	20.76	20.84
		HSPA+	1	21.34	21.29	21.30

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	32.51	29.66	27.46	26.28	33
	661	1880.0	32.07	29.72	27.08	25.66	33
	810	1909.8	31.46	29.72	26.86	25.43	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	512	1850.2	25.88	24.65	22.74	21.23	33
	661	1880.0	25.89	24.52	22.59	21.45	33
	810	1909.8	25.86	24.60	22.56	21.37	33

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band II)	Normal	RMC12.2k		22.69	22.65	22.51
		HSDPA	1	21.70	21.63	21.53
			2	21.69	21.65	21.51
			3	21.69	21.66	21.53
			4	21.68	21.64	21.52
		HSUPA	1	20.79	20.75	20.64
			2	20.76	20.76	20.67
			3	20.76	20.76	20.65
			4	20.78	20.77	20.66
			5	20.74	20.79	21.69
		HSPA+	1	21.80	21.78	21.68

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

Mode	Channel	PAR (dB)	Limit (dB)
GPRS	Low	0.29	13
	Middle	0.26	13
	High	0.34	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	2.37	13
	Middle	2.49	13
	High	2.63	13

Mode	Channel	PAR (dB)	Limit (dB)
RMC (BPSK)	Low	3.35	13
	Middle	3.39	13
	High	3.42	13
HSDPA (16QAM)	Low	3.36	13
	Middle	3.42	13
	High	3.48	13
HSUPA (BPSK)	Low	3.56	13
	Middle	3.61	13
	High	3.72	13
HSPA+ (16QAM)	Low	3.56	13
	Middle	3.85	13
	High	3.49	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GPRS	Low	0.29	13
	Middle	0.26	13
	High	0.21	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	2.27	13
	Middle	2.39	13
	High	2.27	13

Mode	Channel	PAR (dB)	Limit (dB)
WCDMA (BPSK)	Low	2.63	13
	Middle	3.25	13
	High	2.76	13
HSDPA (16QAM)	Low	3.32	13
	Middle	2.99	13
	High	3.45	13
HSUPA (BPSK)	Low	2.96	13
	Middle	2.79	13
	High	2.91	13
HSPA+ (16QAM)	Low	2.88	13
	Middle	2.86	13
	High	2.79	13

Radiated Power**ERP & EIRP****GSM Mode:**

Frequency (MHz)	Receiver Reading (dB μ V)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	S.G. Level (dBm)	Cable loss (dB)	Antenna Gain (dB)			
ERP for Cellular Band (Part 22H), Middle Channel										
848.8	96.29	282	1	H	29.9	0.67	0	29.23	38.45	9.22
848.8	95.87	128	2.4	V	29.5	0.67	0	28.83	38.45	9.62
EIRP for PCS Band (Part 24E), Middle Channel										
1880.00	89.72	331	1.5	H	21.0	1.40	7.30	26.90	33	6.1
1880.00	86.53	218	1.6	V	17.3	1.40	7.30	23.20	33	9.8

EDGE Mode:

Frequency (MHz)	Receiver Reading (dB μ V)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	S.G. Level (dBm)	Cable loss (dB)	Antenna Gain (dB)			
ERP for Cellular Band (Part 22H), Middle Channel										
836.6	92.67	27	1.5	H	24.7	0.67	0	24.03	38.45	14.42
836.6	89.27	258	1.8	V	22.3	0.67	0	21.63	38.45	16.82
EIRP for PCS Band (Part 24E), Middle Channel										
1880.0	85.35	139	1.4	H	16.7	1.40	7.30	22.60	33	10.40
1880.0	84.75	265	1.3	V	15.5	1.40	7.30	21.40	33	11.60

WCDMA Mode:

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	S.G. Level (dBm)	Cable loss (dB)	Antenna Gain (dB)			
ERP for WCDMA Band V (Part 22H), Middle Channel										
836.6	88.21	83	1	H	21.8	0.67	0	21.13	38.45	17.32
836.6	87.79	79	2.4	V	21.4	0.67	0	20.73	38.45	17.72
EIRP for WCDMA Band II (Part 24E), Middle Channel										
1880.00	82.32	88	1.3	H	13.6	1.40	7.30	19.50	33	13.5
1880.00	83.71	269	2.4	V	14.5	1.40	7.30	20.40	33	12.6

Note:

All above data were tested with no amplifier.

Absolute Level = SG Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

LTE Band 2:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	22.16	22.19	22.58
		RB Size=1, RB Offset=2	22.14	22.26	22.53
		RB Size=1, RB Offset=5	22.11	22.13	22.05
		RB Size=3, RB Offset=0	22.23	22.29	22.51
		RB Size=3, RB Offset=1	22.26	22.05	22.54
		RB Size=3, RB Offset=2	22.24	22.24	22.57
		RB Size=6, RB Offset=0	21.29	21.28	21.43
	16QAM	RB Size=1, RB Offset=0	21.43	21.39	21.67
		RB Size=1, RB Offset=2	21.26	20.97	22.62
		RB Size=1, RB Offset=5	21.30	21.28	21.29
		RB Size=3, RB Offset=0	21.41	21.44	21.28
		RB Size=3, RB Offset=1	21.47	21.53	21.2
		RB Size=3, RB Offset=2	21.35	21.42	21.32
		RB Size=6, RB Offset=0	21.08	21.29	21.14
3.0	QPSK	RB Size=1, RB Offset=0	22.39	22.22	22.75
		RB Size=1, RB Offset=7	22.27	22.25	22.69
		RB Size=1, RB Offset=14	22.29	22.09	21.97
		RB Size=8, RB Offset=0	22.33	22.36	22.31
		RB Size=8, RB Offset=4	22.41	22.3	22.25
		RB Size=8, RB Offset=7	22.26	22.4	22.52
		RB Size=15, RB Offset=0	21.16	21.24	21.73
	16QAM	RB Size=1, RB Offset=0	21.51	21.63	22.15
		RB Size=1, RB Offset=7	21.52	21.54	22.14
		RB Size=1, RB Offset=14	21.31	21.28	21.92
		RB Size=8, RB Offset=0	21.48	21.58	21.81
		RB Size=8, RB Offset=4	21.47	21.58	21.75
		RB Size=8, RB Offset=7	21.36	21.28	21.79
		RB Size=15, RB Offset=0	21.24	21.07	21.24

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.44	22.37	22.95
		RB Size=1, RB Offset=12	22.29	22.36	22.88
		RB Size=1, RB Offset=24	22.21	22.06	22.21
		RB Size=12, RB Offset=0	22.34	22.22	22.42
		RB Size=12, RB Offset=6	22.23	22.21	22.12
		RB Size=12, RB Offset=11	22.22	22.27	22.81
		RB Size=25, RB Offset=0	21.19	21.90	21.71
	16QAM	RB Size=1, RB Offset=0	21.64	21.88	22.02
		RB Size=1, RB Offset=12	21.37	21.49	22.28
		RB Size=1, RB Offset=24	21.86	21.67	21.63
		RB Size=12, RB Offset=0	21.58	21.76	21.56
		RB Size=12, RB Offset=6	21.85	21.67	21.58
		RB Size=12, RB Offset=11	21.52	21.51	21.45
		RB Size=25, RB Offset=0	21.28	21.27	21.29
10.0	QPSK	RB Size=1, RB Offset=0	21.67	21.72	22.44
		RB Size=1, RB Offset=24	21.75	21.91	22.47
		RB Size=1, RB Offset=49	21.78	21.75	22.33
		RB Size=25, RB Offset=0	21.86	21.78	22.39
		RB Size=25, RB Offset=12	21.63	21.67	22.52
		RB Size=25, RB Offset=24	21.71	21.69	22.51
		RB Size=50, RB Offset=0	21.81	21.64	22.44
	16QAM	RB Size=1, RB Offset=0	21.71	21.84	22.68
		RB Size=1, RB Offset=24	21.64	21.83	22.65
		RB Size=1, RB Offset=49	21.65	21.63	22.55
		RB Size=25, RB Offset=0	21.69	21.75	22.45
		RB Size=25, RB Offset=12	21.82	21.77	22.43
		RB Size=25, RB Offset=24	21.64	21.56	22.39
		RB Size=50, RB Offset=0	21.68	21.65	22.75

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	22.42	22.38	22.16
		RB Size=1, RB Offset=37	22.18	22.19	22.59
		RB Size=1, RB Offset=74	22.51	22.5	21.93
		RB Size=36, RB Offset=0	22.54	22.63	22.02
		RB Size=36, RB Offset=18	22.22	22.32	21.98
		RB Size=36, RB Offset=37	22.32	22.32	22.79
		RB Size=75, RB Offset=0	22.18	22.19	22.6
	16QAM	RB Size=1, RB Offset=0	22.23	22.34	21.82
		RB Size=1, RB Offset=37	22.1	22.23	22.01
		RB Size=1, RB Offset=74	22.31	22.22	22.57
		RB Size=36, RB Offset=0	22.05	22.05	22.55
		RB Size=36, RB Offset=18	21.93	22.06	22.11
		RB Size=36, RB Offset=37	21.94	21.97	21.81
		RB Size=75, RB Offset=0	21.87	21.94	21.86
20.0	QPSK	RB Size=1, RB Offset=0	22.71	22.69	22.63
		RB Size=1, RB Offset=49	22.32	22.38	22.39
		RB Size=1, RB Offset=99	22.31	22.38	22.41
		RB Size=50, RB Offset=0	22.27	22.27	22.21
		RB Size=50, RB Offset=24	22.27	22.35	22.19
		RB Size=50, RB Offset=49	22.24	22.14	22.33
		RB Size=100, RB Offset=0	22.30	22.33	22.14
	16QAM	RB Size=1, RB Offset=0	22.40	22.48	22.50
		RB Size=1, RB Offset=49	22.35	22.45	22.13
		RB Size=1, RB Offset=99	22.37	22.4	23.22
		RB Size=50, RB Offset=0	22.38	22.34	22.21
		RB Size=50, RB Offset=24	22.32	22.34	23.03
		RB Size=50, RB Offset=49	22.15	22.31	23.01
		RB Size=100, RB Offset=0	22.41	22.33	22.79

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK(1RB Size)	4.36	13	Pass
QPSK (100%RB Size)	4.62	13	Pass
16QAM (1RB Size)	4.45	13	Pass
16QAM (100%RB Size)	4.50	13	Pass

EIRP:

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	84.34	124	2.1	H	15.7	1.40	7.30	21.60	33
1880.00	81.19	70	2.3	V	12.0	1.40	7.30	17.90	33
3 MHz Bandwidth									
1880.00	84.45	146	2.0	H	15.8	1.40	7.30	21.70	33
1880.00	81.66	158	1.2	V	12.4	1.40	7.30	18.30	33
5 MHz Bandwidth									
1880.00	84.63	111	2.4	H	16.0	1.40	7.30	21.90	33
1880.00	81.94	265	2.0	V	12.7	1.40	7.30	18.60	33
10MHz Bandwidth									
1880.00	86.71	322	2.4	H	18.0	1.40	7.30	23.90	33
1880.00	83.39	73	2.5	V	14.2	1.40	7.30	20.10	33
15 MHz Bandwidth									
1880.00	86.41	132	1.0	H	17.7	1.40	7.30	23.60	33
1880.00	82.45	78	1.3	V	13.2	1.40	7.30	19.10	33
20 MHz Bandwidth									
1880.00	82.39	223	1.2	H	13.7	1.40	7.30	19.60	33
1880.00	81.07	348	1.9	V	11.8	1.40	7.30	17.70	33

16QAM:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
1.4 MHz Bandwidth									
1880.00	81.27	260	2.1	V	12.6	1.40	7.30	18.50	33
1880.00	86.09	125	2.4	H	16.9	1.40	7.30	22.80	33
3 MHz Bandwidth									
1880	81.36	260	2.1	V	12.7	1.4	7.3	18.6	33
1880	86.18	125	2.4	H	17.0	1.4	7.3	22.9	33
5 MHz Bandwidth									
1880.00	82.89	129	1.7	V	14.2	1.40	7.30	20.10	33
1880.00	86.02	307	1.6	H	16.8	1.40	7.30	22.70	33
10 MHz Bandwidth									
1880	81.29	260	2.1	V	12.6	1.4	7.3	18.5	33
1880	86.50	125	2.4	H	17.3	1.4	7.3	23.2	33
15 MHz Bandwidth									
1880	82.12	260	2.1	V	13.5	1.4	7.3	19.4	33
1880	86.07	125	2.4	H	16.9	1.4	7.3	22.8	33
20 MHz Bandwidth									
1880	82.06	260	2.1	V	13.4	1.4	7.3	19.3	33
1880	86.2	125	2.4	H	17.0	1.4	7.3	22.9	33

LTE Band 4:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4	QPSK	RB Size=1, RB Offset=0	21.12	21.07	21.23
		RB Size=1, RB Offset=2	21.72	21.89	21.27
		RB Size=1, RB Offset=5	21.93	21.98	21.33
		RB Size=3, RB Offset=0	21.99	21.04	21.22
		RB Size=3, RB Offset=1	21.87	21.81	21.10
		RB Size=3, RB Offset=2	21.58	21.82	21.16
		RB Size=6, RB Offset=0	21.75	21.86	21.23
	16QAM	RB Size=1, RB Offset=0	21.05	21.99	21.14
		RB Size=1, RB Offset=2	21.17	21.83	21.05
		RB Size=1, RB Offset=5	21.25	21.76	21.21
		RB Size=3, RB Offset=0	21.34	21.72	21.27
		RB Size=3, RB Offset=1	21.68	21.64	21.46
		RB Size=3, RB Offset=2	21.66	21.73	21.41
		RB Size=6, RB Offset=0	21.75	21.63	21.34
3.0	QPSK	RB Size=1, RB Offset=0	20.95	20.61	21.57
		RB Size=1, RB Offset=7	20.82	20.77	21.32
		RB Size=1, RB Offset=14	21.04	20.89	21.41
		RB Size=8, RB Offset=0	20.91	20.65	21.68
		RB Size=8, RB Offset=4	20.97	20.85	21.31
		RB Size=8, RB Offset=7	21.14	20.81	21.64
		RB Size=15, RB Offset=0	20.67	20.52	21.53
	16QAM	RB Size=1, RB Offset=0	21.36	21.08	21.52
		RB Size=1, RB Offset=7	21.29	21.07	21.34
		RB Size=1, RB Offset=14	21.16	20.77	21.53
		RB Size=8, RB Offset=0	20.91	20.88	21.15
		RB Size=8, RB Offset=4	20.77	20.77	21.59
		RB Size=8, RB Offset=7	21.20	20.91	21.28
		RB Size=15, RB Offset=0	20.86	21.04	21.51

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	20.75	21.78	21.21
		RB Size=1, RB Offset=12	21.06	21.79	21.02
		RB Size=1, RB Offset=24	21.03	21.98	21.23
		RB Size=12, RB Offset=0	21.01	22.04	21.02
		RB Size=12, RB Offset=6	21.01	21.86	21.12
		RB Size=12, RB Offset=11	20.88	21.88	20.97
		RB Size=25, RB Offset=0	20.84	21.96	20.91
	16QAM	RB Size=1, RB Offset=0	21.02	21.93	21.18
		RB Size=1, RB Offset=12	21.10	21.92	21.22
		RB Size=1, RB Offset=24	20.76	22.15	21.19
		RB Size=12, RB Offset=0	20.81	21.9	21.16
		RB Size=12, RB Offset=6	21.21	22.21	21.13
		RB Size=12, RB Offset=11	20.95	22.52	21.37
		RB Size=25, RB Offset=0	21.04	22.26	20.89
10.0	QPSK	RB Size=1, RB Offset=0	22.41	22.15	20.89
		RB Size=1, RB Offset=24	21.8	21.7	20.83
		RB Size=1, RB Offset=49	21.86	21.65	21.13
		RB Size=25, RB Offset=0	21.45	21.43	20.78
		RB Size=25, RB Offset=12	21.75	21.98	21.06
		RB Size=25, RB Offset=24	21.91	21.92	20.9
		RB Size=50, RB Offset=0	21.25	21.38	20.97
	16QAM	RB Size=1, RB Offset=0	21.24	21.54	20.85
		RB Size=1, RB Offset=24	21.63	21.48	20.76
		RB Size=1, RB Offset=49	21.77	21.36	20.74
		RB Size=25, RB Offset=0	22.03	21.91	20.61
		RB Size=25, RB Offset=12	21.88	21.76	20.78
		RB Size=25, RB Offset=24	21.59	21.59	20.75
		RB Size=50, RB Offset=0	21.81	21.86	20.93

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	22.02	22.21	21.78
		RB Size=1, RB Offset=37	21.76	22.15	22.78
		RB Size=1, RB Offset=74	21.84	21.61	21.42
		RB Size=36, RB Offset=0	21.59	22.14	22.36
		RB Size=36, RB Offset=18	21.59	21.76	22.17
		RB Size=36, RB Offset=37	21.84	21.65	22.15
		RB Size=75, RB Offset=0	21.98	22.17	21.64
	16QAM	RB Size=1, RB Offset=0	21.81	21.91	22.16
		RB Size=1, RB Offset=37	21.58	21.84	22.2
		RB Size=1, RB Offset=74	22.14	22.5	21.34
		RB Size=36, RB Offset=0	22.35	22.11	22.26
		RB Size=36, RB Offset=18	22.91	22.77	22.2
		RB Size=36, RB Offset=37	21.75	21.88	22.12
		RB Size=75, RB Offset=0	21.53	21.83	21.11
20.0	QPSK	RB Size=1, RB Offset=0	22.36	22.35	22.44
		RB Size=1, RB Offset=49	21.88	21.66	21.84
		RB Size=1, RB Offset=99	21.82	22.75	21.57
		RB Size=50, RB Offset=0	21.64	21.95	21.28
		RB Size=50, RB Offset=24	22.03	22.15	21.63
		RB Size=50, RB Offset=49	21.69	21.99	21.59
		RB Size=100, RB Offset=0	21.89	21.97	21.42
	16QAM	RB Size=1, RB Offset=0	21.91	21.98	21.45
		RB Size=1, RB Offset=49	21.51	21.59	21.66
		RB Size=1, RB Offset=99	21.26	21.99	21.34
		RB Size=50, RB Offset=0	21.41	21.56	22.60
		RB Size=50, RB Offset=24	21.12	21.85	22.45
		RB Size=50, RB Offset=49	21.45	21.96	21.60
		RB Size=100, RB Offset=0	21.24	21.12	21.62

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK(1RB Size)	5.22	13	Pass
QPSK (100%RB Size)	5.64	13	Pass
16QAM (1RB Size)	5.31	13	Pass
16QAM (100%RB Size)	5.47	13	Pass

EIRP:

QPSK:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
1.4 MHz Bandwidth									
1732.50	83.42	181	1.3	H	14.6	1.60	6.90	19.9	30
1732.50	80.65	151	2.4	V	11.4	1.60	6.90	16.7	30
3 MHz Bandwidth									
1732.50	83.88	320	1.9	H	15.1	1.60	6.90	20.4	30
1732.50	80.74	63	2.4	V	11.5	1.60	6.90	16.8	30
5 MHz Bandwidth									
1732.50	85.37	131	1.5	H	16.6	1.60	6.90	21.9	30
1732.50	82.27	87	2.5	V	13.1	1.60	6.90	18.4	30
10MHz Bandwidth									
1732.50	85.03	174	1.4	H	16.2	1.60	6.90	21.5	30
1732.50	83.22	283	1.3	V	14.0	1.60	6.90	19.3	30
15 MHz Bandwidth									
1732.5	85.24	174	1.4	H	16.1	1.6	6.9	21.4	30
1732.5	83.31	283	1.3	V	14.1	1.6	6.9	19.4	30
20 MHz Bandwidth									
1732.5	85.31	174	1.4	H	16.7	1.6	6.9	22.0	30
1732.5	83.43	283	1.3	V	14.2	1.6	6.9	19.5	30

16QAM:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
1.4 MHz Bandwidth									
1732.5	80.78	174	1.4	V	12.2	1.6	6.9	17.5	30
1732.5	84.91	283	1.3	H	15.7	1.6	6.9	21.0	30
3 MHz Bandwidth									
1732.5	80.91	174	1.4	V	12.3	1.6	6.9	17.6	30
1732.5	84.75	283	1.3	H	15.5	1.6	6.9	20.8	30
5 MHz Bandwidth									
1732.50	80.68	24	1.5	V	11.9	1.60	6.90	17.20	30
1732.50	87.89	201	2.0	H	16.7	1.60	6.90	22.00	30
10 MHz Bandwidth									
1732.5	81.28	174	1.4	V	12.7	1.6	6.9	18.0	30
1732.5	85.79	283	1.3	H	16.6	1.6	6.9	21.9	30
15 MHz Bandwidth									
1732.5	81.11	174	1.4	V	12.5	1.6	6.9	17.8	30
1732.5	86.2	283	1.3	H	17	1.6	6.9	22.3	30
20 MHz Bandwidth									
1732.5	81.24	174	1.4	V	12.6	1.6	6.9	17.9	30
1732.5	86.53	283	1.3	H	17.3	1.6	6.9	22.6	30

LTE Band 7:

Maximum Output Power

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5.0	QPSK	RB Size=1, RB Offset=0	22.42	21.69	22.85
		RB Size=1, RB Offset=12	22.12	21.96	22.79
		RB Size=1, RB Offset=24	22.77	22.7	22.38
		RB Size=12, RB Offset=0	22.59	22.8	22.27
		RB Size=12, RB Offset=6	22.26	22.99	22.21
		RB Size=12, RB Offset=11	22.48	22.75	22.78
		RB Size=25, RB Offset=0	21.15	21.07	22.04
	16QAM	RB Size=1, RB Offset=0	21.91	21.87	22.11
		RB Size=1, RB Offset=12	21.83	21.92	22.46
		RB Size=1, RB Offset=24	21.99	21.91	21.64
		RB Size=12, RB Offset=0	21.69	21.7	21.82
		RB Size=12, RB Offset=6	22.14	21.78	21.58
		RB Size=12, RB Offset=11	21.73	21.75	21.42
		RB Size=25, RB Offset=0	20.84	20.98	20.83
10.0	QPSK	RB Size=1, RB Offset=0	23.19	22.54	23.06
		RB Size=1, RB Offset=24	22.75	22.4	22.28
		RB Size=1, RB Offset=49	22.56	22.9	22.97
		RB Size=25, RB Offset=0	22.29	22.27	22.31
		RB Size=25, RB Offset=12	22.61	22.44	22.35
		RB Size=25, RB Offset=24	22.59	21.38	22.41
		RB Size=50, RB Offset=0	21.92	21.51	22.31
	16QAM	RB Size=1, RB Offset=0	22.6	21.87	21.71
		RB Size=1, RB Offset=24	22.48	21.84	21.35
		RB Size=1, RB Offset=49	21.48	21.97	21.39
		RB Size=25, RB Offset=0	21.62	21.48	21.52
		RB Size=25, RB Offset=12	21.62	21.72	21.65
		RB Size=25, RB Offset=24	22.21	21.51	21.63
		RB Size=50, RB Offset=0	20.93	20.81	20.66

Bandwidth (MHz)	Modulation	RB size/RB Offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15.0	QPSK	RB Size=1, RB Offset=0	22.57	22.08	22.59
		RB Size=1, RB Offset=37	22.72	22.24	22.79
		RB Size=1, RB Offset=74	22.66	21.99	22.23
		RB Size=36, RB Offset=0	22.71	22.46	22.22
		RB Size=36, RB Offset=18	22.44	22.2	22.09
		RB Size=36, RB Offset=37	22.54	22.26	22.79
		RB Size=75, RB Offset=0	22.56	22.10	22.65
	16QAM	RB Size=1, RB Offset=0	22.27	22.12	22.28
		RB Size=1, RB Offset=37	22.38	22.2	22.33
		RB Size=1, RB Offset=74	22.75	22.07	22.63
		RB Size=36, RB Offset=0	22.33	22.22	22.73
		RB Size=36, RB Offset=18	22.2	22.24	22.45
		RB Size=36, RB Offset=37	22.22	22.23	22.26
		RB Size=75, RB Offset=0	22.13	22.2	22.73
20.0	QPSK	RB Size=1, RB Offset=0	22.84	22.81	22.75
		RB Size=1, RB Offset=49	22.64	22.35	22.58
		RB Size=1, RB Offset=99	22.31	22.12	22.14
		RB Size=50, RB Offset=0	22.48	22.16	22.14
		RB Size=50, RB Offset=24	22.50	22.29	22.01
		RB Size=50, RB Offset=49	22.52	22.41	22.53
		RB Size=100, RB Offset=0	22.41	22.55	22.94
	16QAM	RB Size=1, RB Offset=0	22.77	22.37	22.78
		RB Size=1, RB Offset=49	22.48	22.22	22.21
		RB Size=1, RB Offset=99	22.46	22.92	23.35
		RB Size=50, RB Offset=0	22.52	22.42	22.56
		RB Size=50, RB Offset=24	22.64	22.47	22.49
		RB Size=50, RB Offset=49	22.41	22.65	22.41
		RB Size=100, RB Offset=0	22.53	22.66	22.38

Peak-to-average ratio (PAR)

Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
QPSK(1RB Size)	3.75	13	Pass
QPSK (100%RB Size)	6.02	13	Pass
16QAM (1RB Size)	3.32	13	Pass
16QAM (100%RB Size)	5.58	13	Pass

EIRP:

QPSK:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
5 MHz Bandwidth									
2535	82.24	337	1.1	H	15.9	1.70	8.60	22.80	33
2535	83.52	58	2.0	V	16.8	1.70	8.60	23.70	33
10MHz Bandwidth									
2535	82.26	337	1.1	H	15.9	1.7	8.6	22.8	33
2535	83.67	58	2.0	V	17	1.7	8.6	23.9	33
15 MHz Bandwidth									
2535	82.37	337	1.1	H	16	1.7	8.6	22.9	33
2535	83.61	58	2.0	V	16.9	1.7	8.6	23.8	33
20 MHz Bandwidth									
2535	82.18	337	1.1	H	15.8	1.7	8.6	22.7	33
2535	83.49	58	2.0	V	16.8	1.7	8.6	23.7	33

16QAM:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		
Middle Channel									
5 MHz Bandwidth									
2535	84.06	6	1.2	H	17.7	1.70	8.60	24.60	33
2535	84.44	195	1.6	V	17.7	1.70	8.60	24.60	33
10 MHz Bandwidth									
2535	82.81	337	1.1	H	16.5	1.7	8.6	23.4	33
2535	83.99	58	2.0	V	17.3	1.7	8.6	24.2	33
15 MHz Bandwidth									
2535	82.54	337	1.1	H	16.2	1.7	8.6	23.1	33
2535	83.2	58	2.0	V	16.5	1.7	8.6	23.4	33
20 MHz Bandwidth									
2535	82.72	337	1.1	H	16.4	1.7	8.6	23.3	33
2535	83.89	58	2.0	V	17.2	1.7	8.6	24.1	33

Note:

All above data were tested with no amplifier

Absolute Level = SG Level - Cable loss + Antenna Gain

Margin = Limit- Absolute Level

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

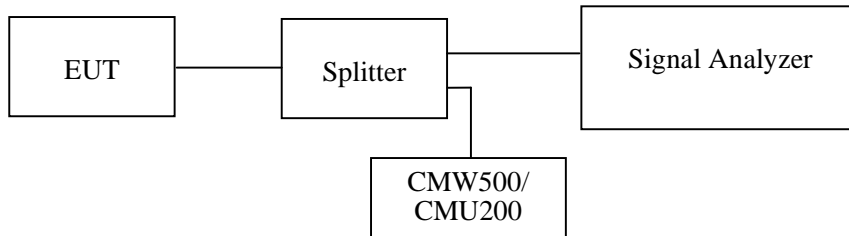
Applicable Standards

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) and the 26 dB & 99% bandwidth was recorded.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2015-12-11	2016-12-11
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	106891	2015-11-23	2016-11-23
R&S	Wideband Radio Communication tester	CMW500	1201.002K50-146520-wh	2015-11-23	2016-11-23
Ducommun technologies	RF Cable	RG-214	4	2015-06-15	2016-06-15
WEINSCHTEL	6dB Attenuator	1012	30187	2015-06-18	2016-06-18
WEINSCHTEL	3dB Attenuator	5321	AU0709	2015-06-18	2016-06-18

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

Test Data**Environmental Conditions**

Temperature:	23~24 °C
Relative Humidity:	51~54 %
ATM Pressure:	100.5~101.0kPa

The testing was performed by Simon Wang from 2016-03-18 to 2016-03-29.

EUT operation mode: Transmitting

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

Cellular Band (Part 22H)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	836.6	244.49	320.64
EGPRS(8PSK)	836.6	246.49	312.63

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	836.6	4.19	4.71
HSUPA (BPSK)	836.6	4.17	4.71
HSDPA (16QAM)	836.6	4.19	4.69

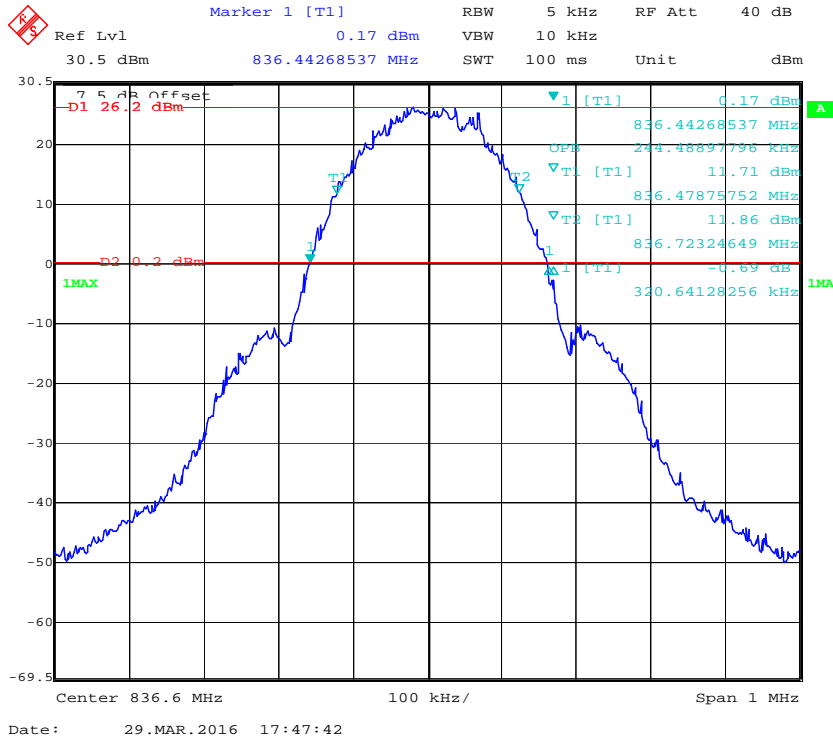
PCS Band (Part 24E)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	1880.0	244.49	314.63
EGPRS(8PSK)	1880.0	244.49	316.61

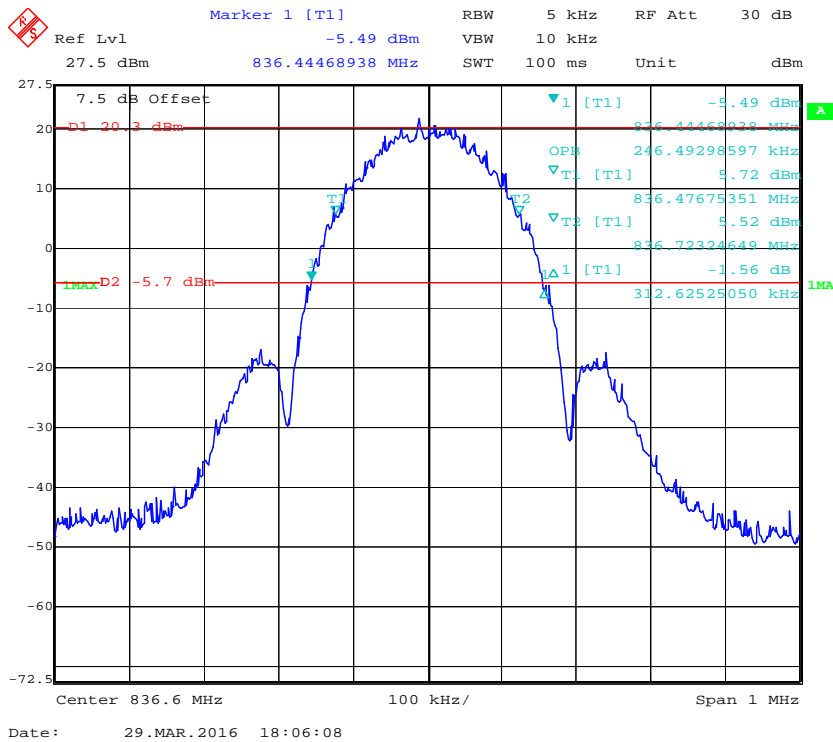
Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
RMC (BPSK)	1880.0	4.17	4.69
HSUPA (BPSK)	1880.0	4.19	4.71
HSDPA (16QAM)	1880.0	4.19	4.71

Cellular Band (Part 22H)

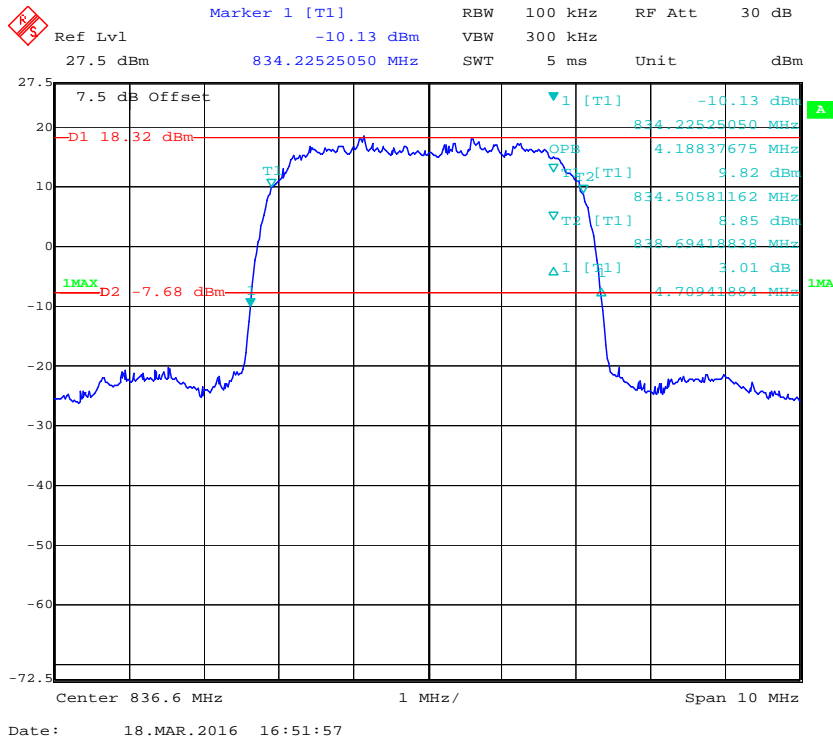
99% Occupied & 26 dB Emissions Bandwidth for GSM (GMSK) Mode



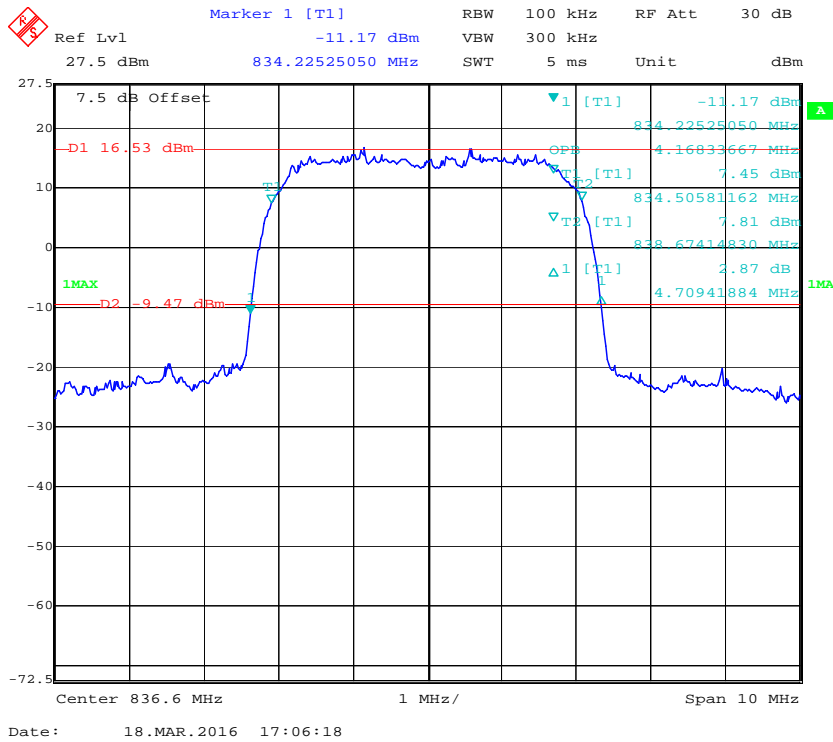
99% Occupied & 26 dB Emissions Bandwidth for EDGE Mode



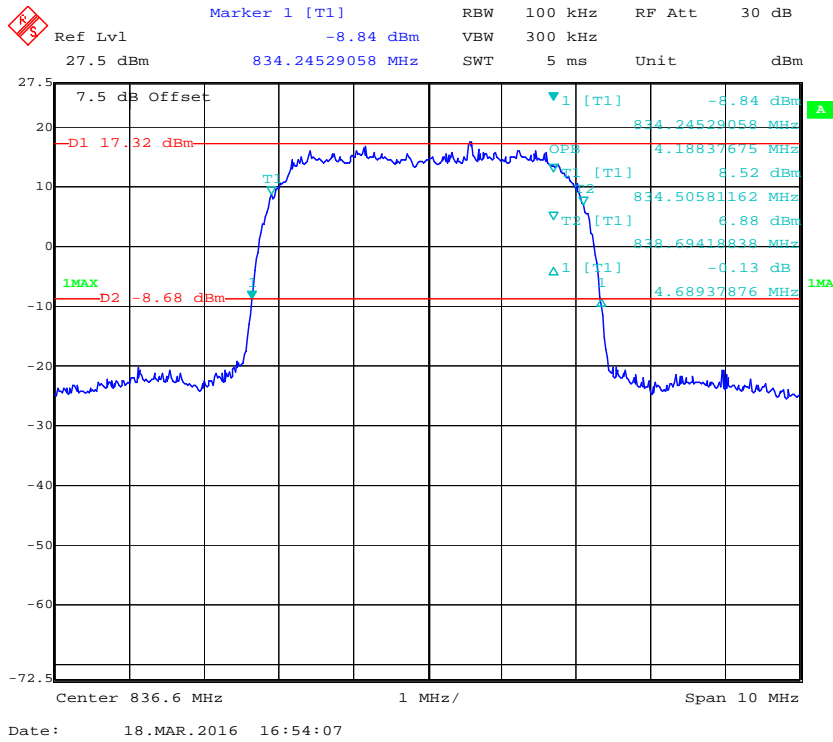
99% Occupied & 26 dB Emissions Bandwidth for RMC (BPSK) Mode



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

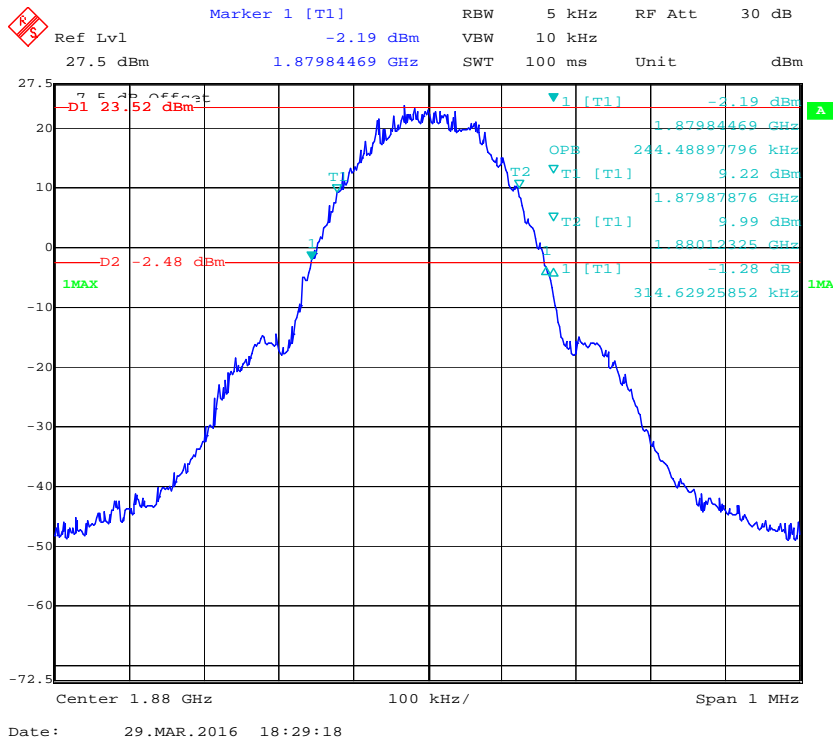


99% Occupied & 26 dB Emissions Bandwidth for HSDPA (16QAM) Mode

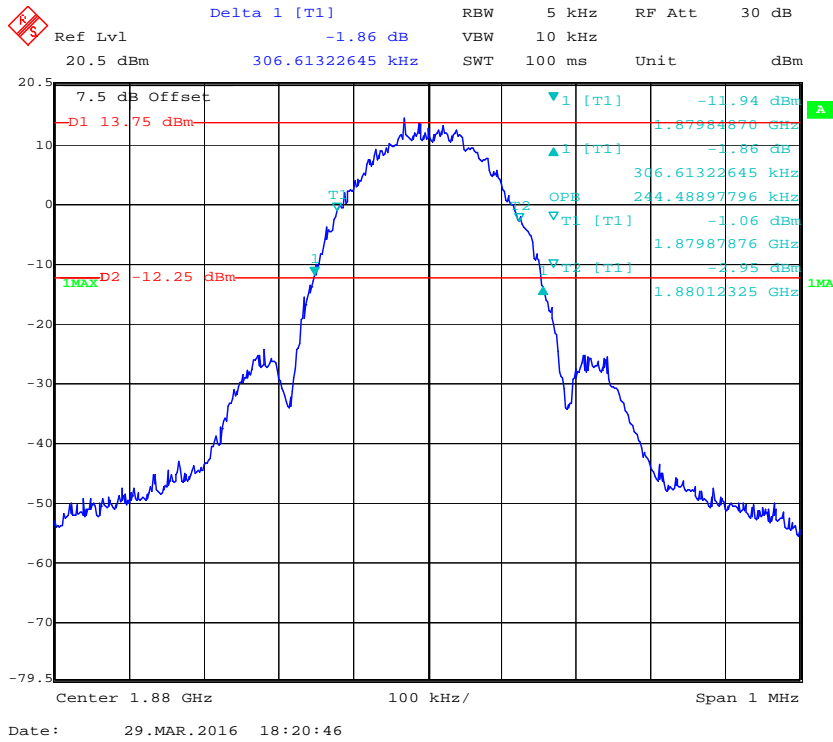


PCS Band (Part 24E)

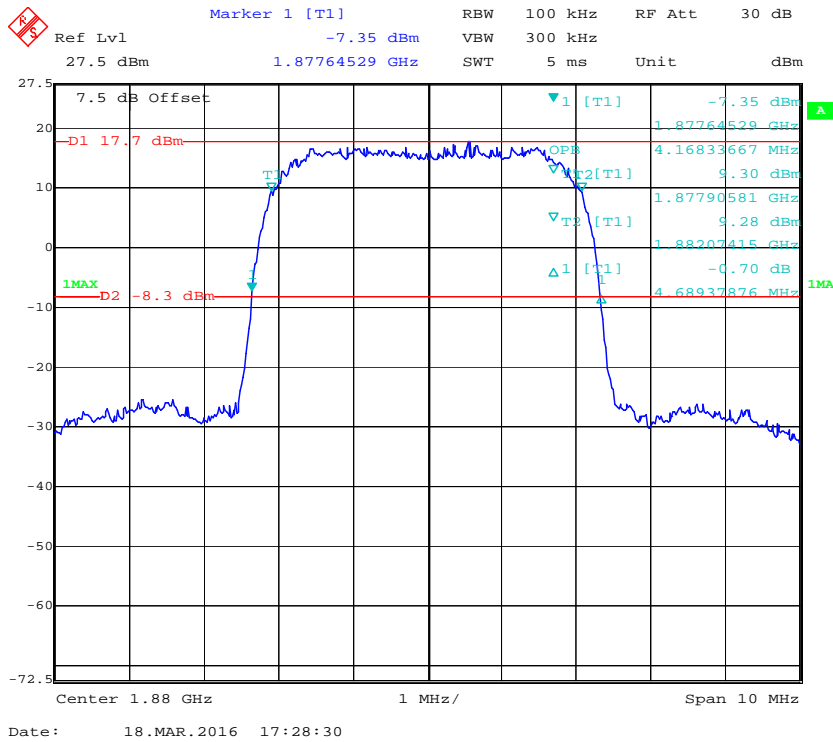
99% Occupied & 26 dB Emissions Bandwidth for GSM (GMSK) Mode



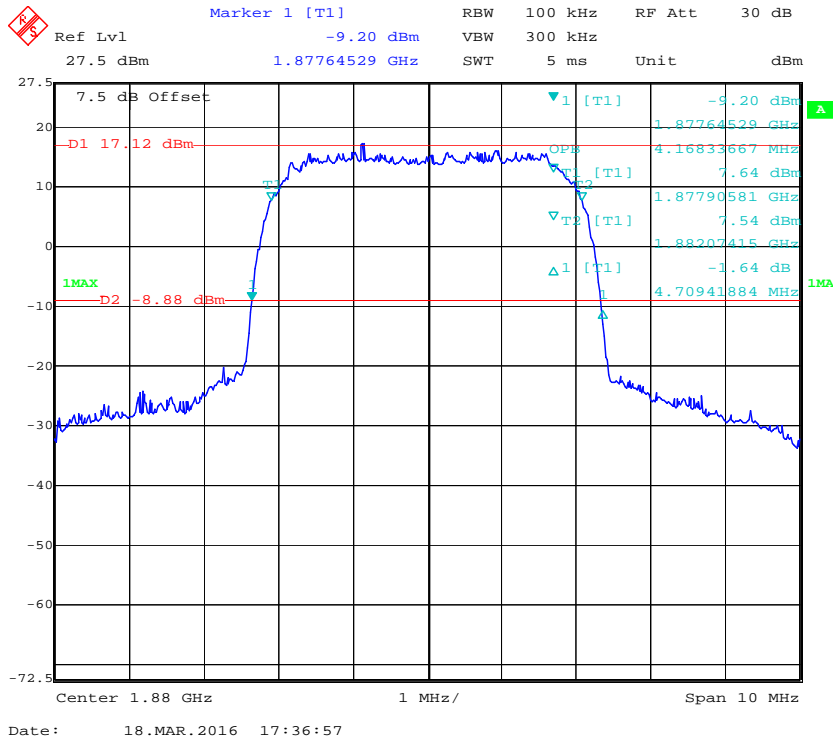
99% Occupied & 26 dB Emissions Bandwidth for EGPRS Mode



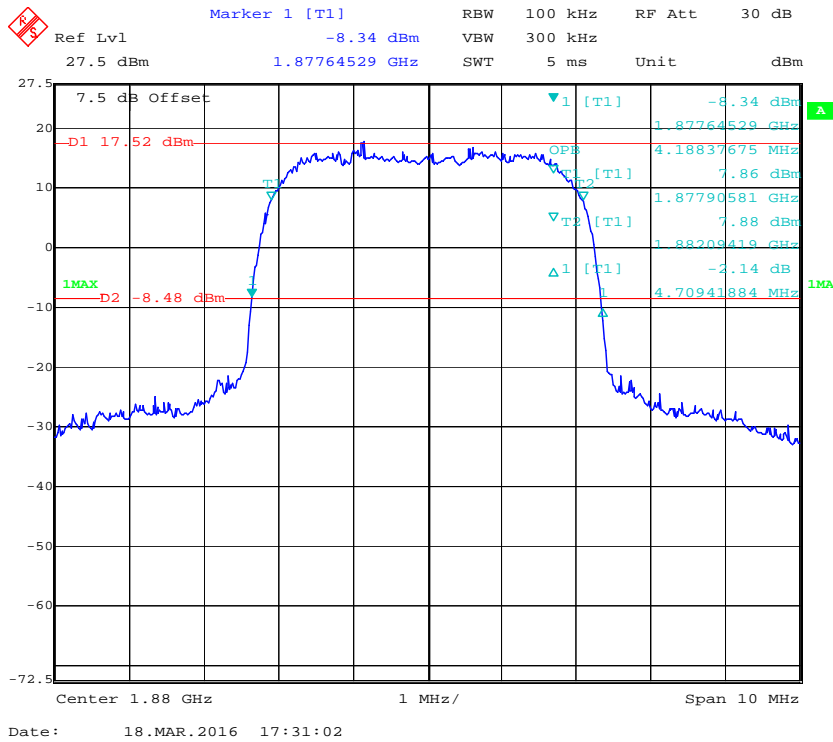
99% Occupied & 26 dB Emissions Bandwidth for RMC (BPSK) Mode



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



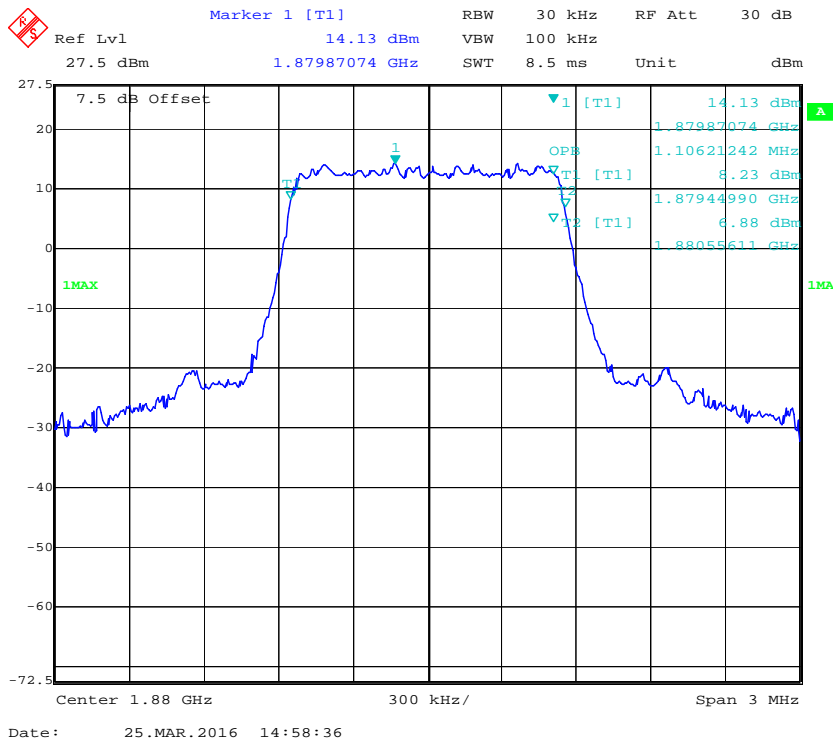
99% Occupied & 26 dB Emissions Bandwidth for HSDPA (16QAM) Mode



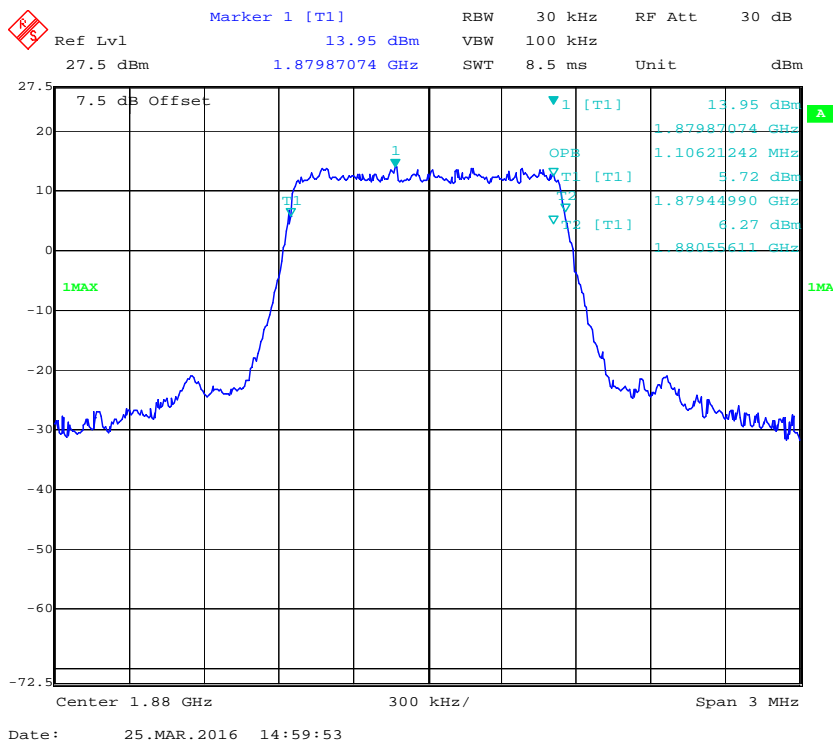
LTE Band 2: (Middle Channel)

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.11	1.31
	16QAM	1.11	1.30
3.0	QPSK	2.75	3.13
	16QAM	2.77	3.13
5.0	QPSK	4.53	5.07
	16QAM	4.53	5.03
10.0	QPSK	9.10	10.26
	16QAM	9.10	10.22
15.0	QPSK	13.47	14.91
	16QAM	13.53	15.09
20.0	QPSK	18.44	20.92
	16QAM	18.44	20.92

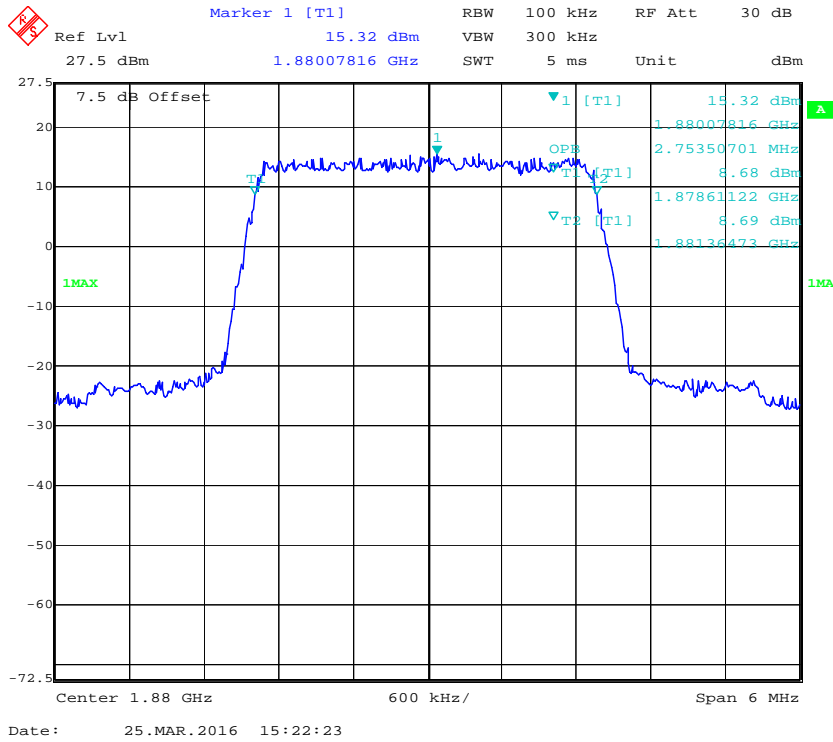
QPSK (1.4 MHz) - 99% Occupied Bandwidth, Middle channel



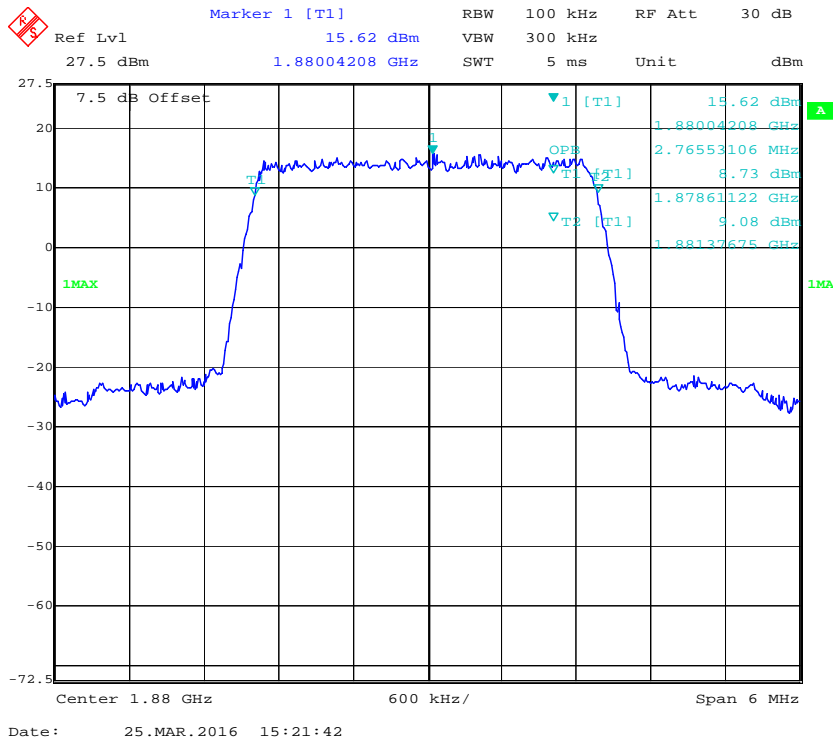
16-QAM (1.4 MHz) - 99% Occupied Bandwidth, Middle channel



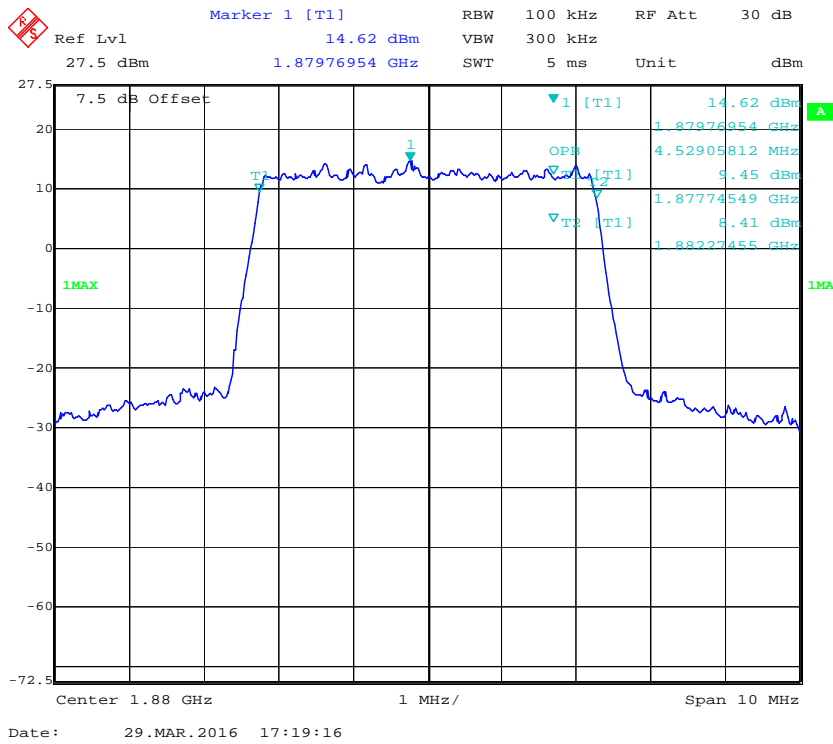
QPSK (3.0 MHz) - 99% Occupied Bandwidth, Middle channel



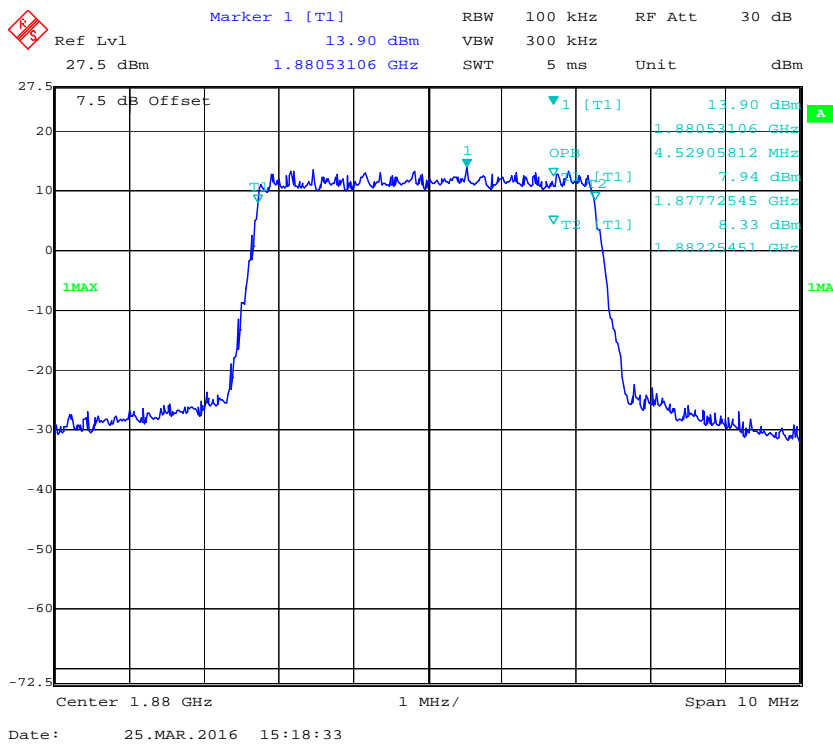
16-QAM (3.0 MHz) - 99% Occupied Bandwidth, Middle channel



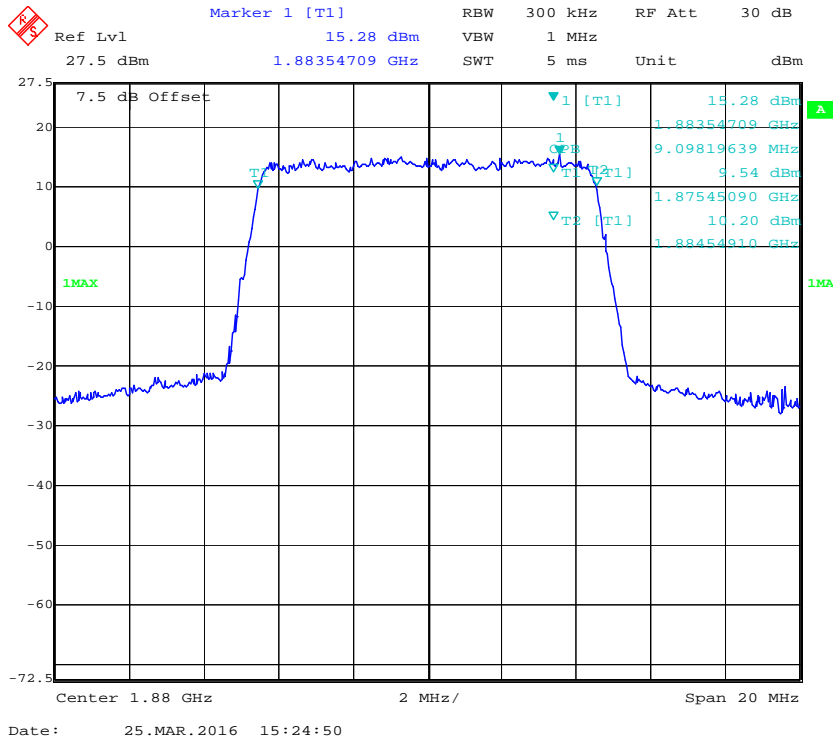
QPSK (5.0 MHz) - 99% Occupied Bandwidth, Middle channel



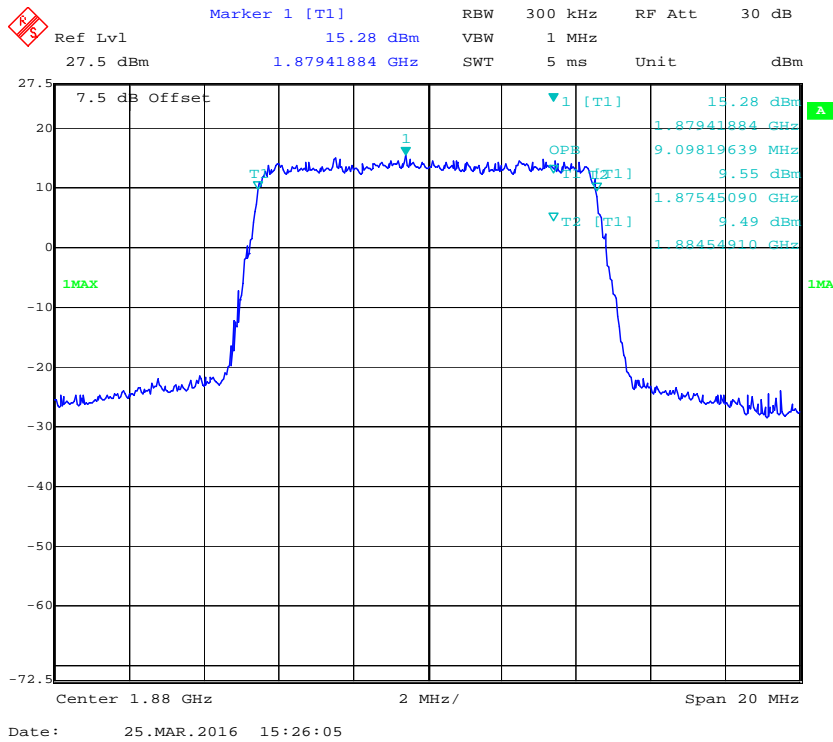
16-QAM (5.0 MHz) - 99% Occupied Bandwidth, Middle channel



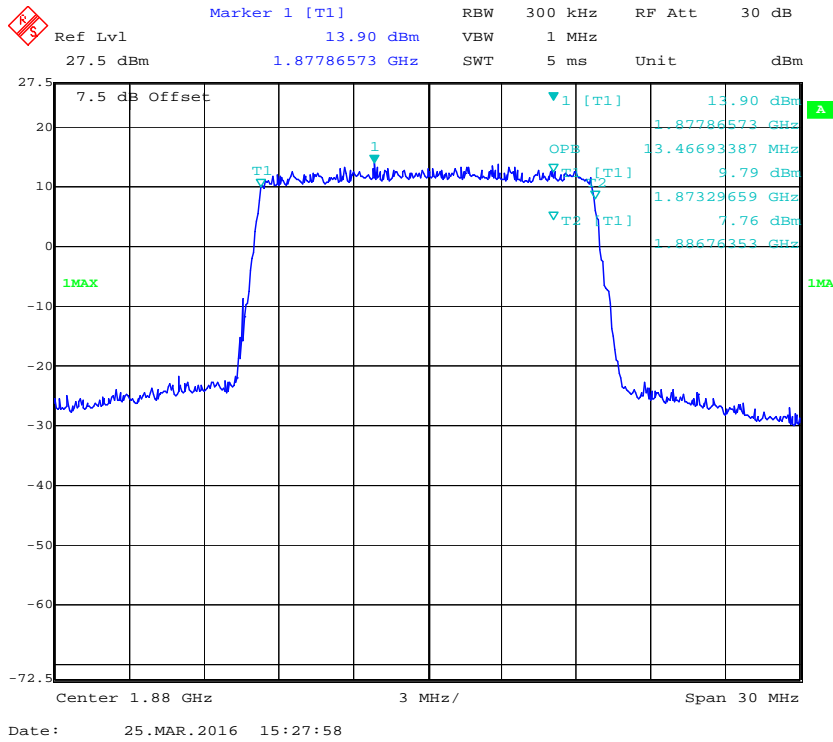
QPSK (10.0 MHz) - 99% Occupied Bandwidth, Middle channel



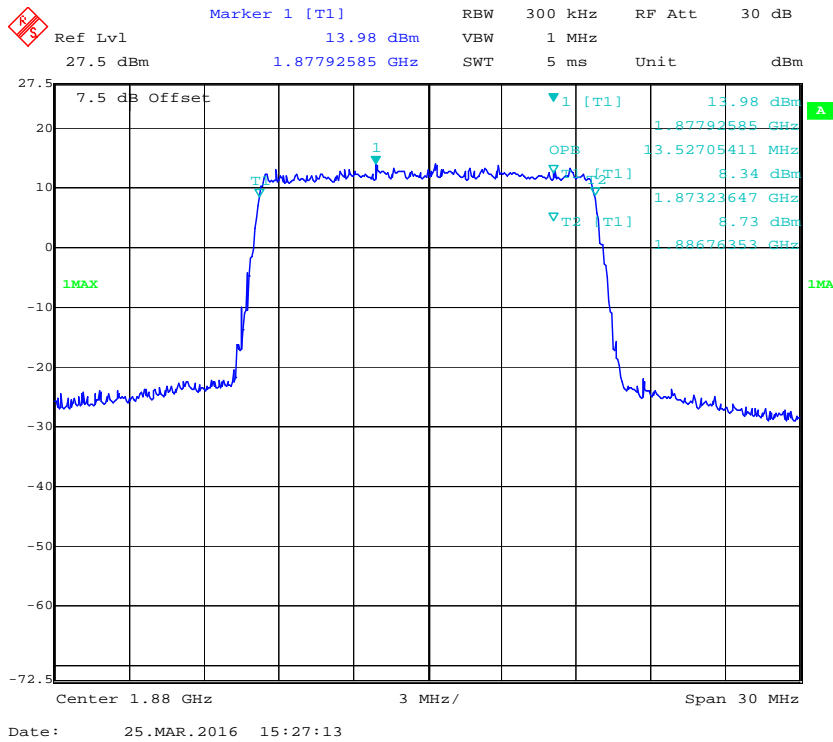
16-QAM (10.0 MHz) - 99% Occupied Bandwidth, Middle channel



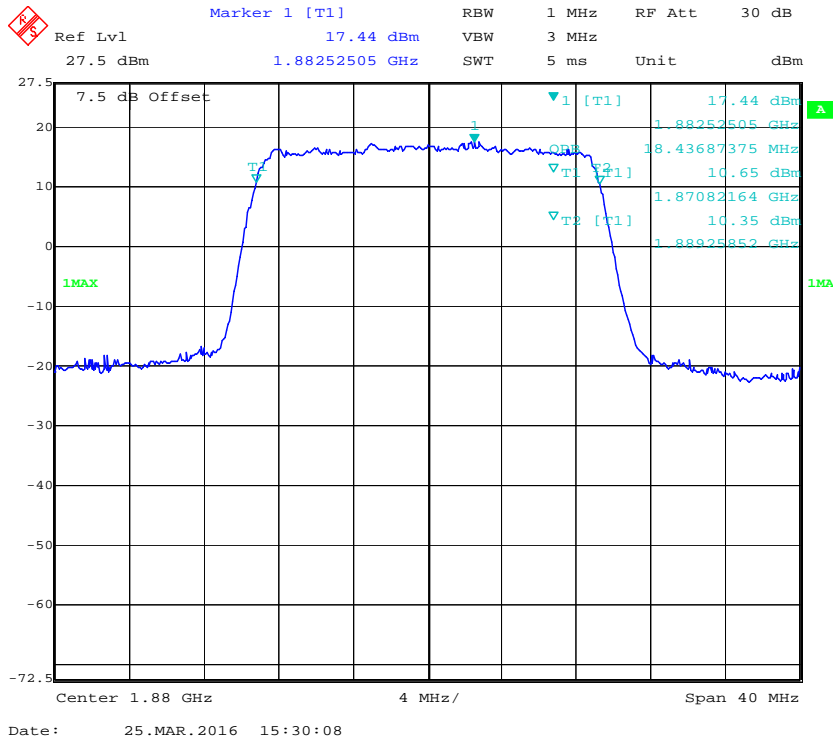
QPSK (15.0 MHz) - 99% Occupied Bandwidth, Middle channel



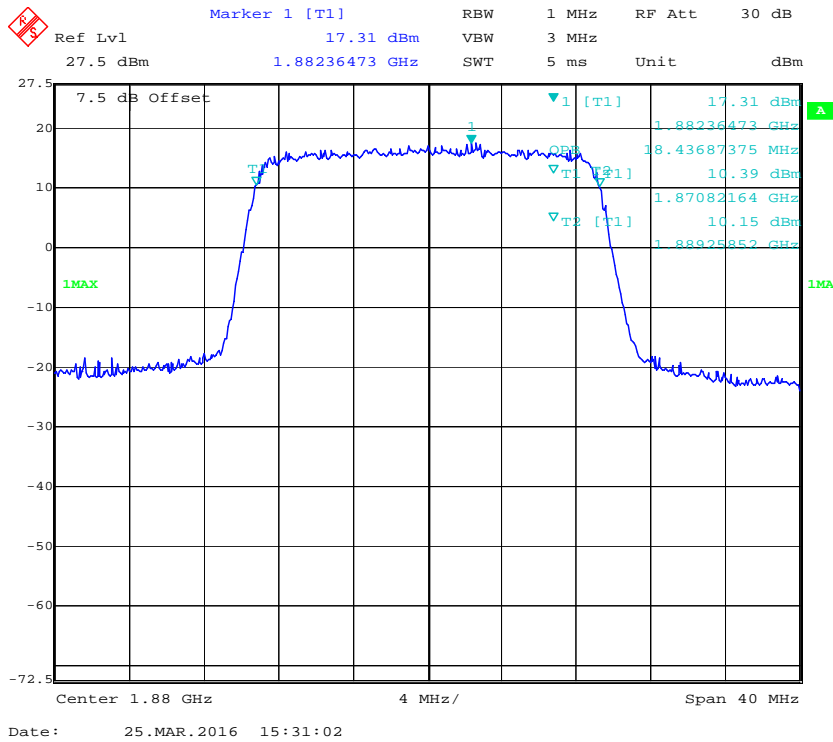
16-QAM (15.0 MHz) - 99% Occupied Bandwidth, Middle channel



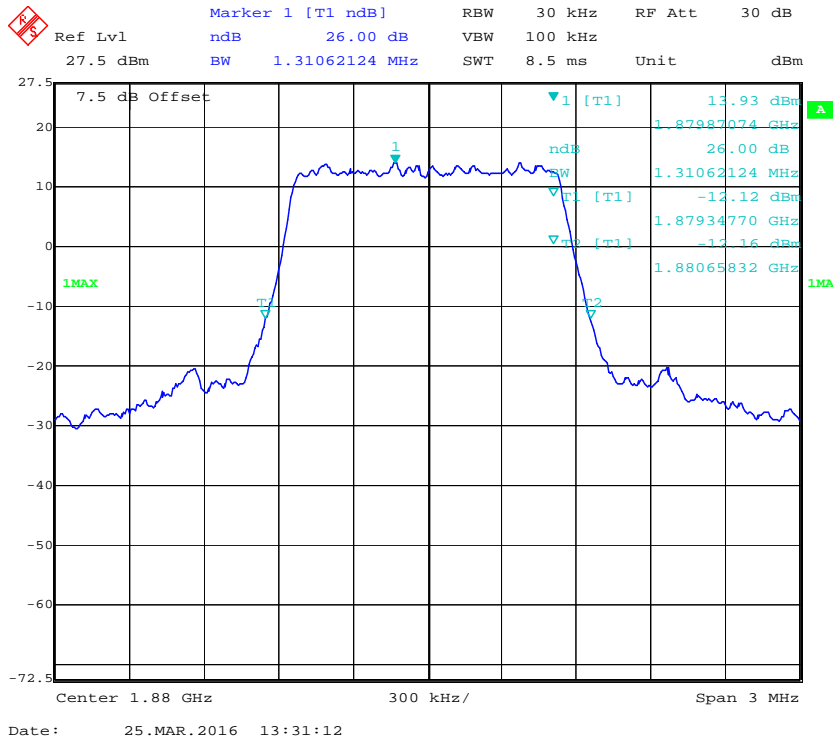
QPSK (20.0 MHz) - 99% Occupied Bandwidth, Middle channel



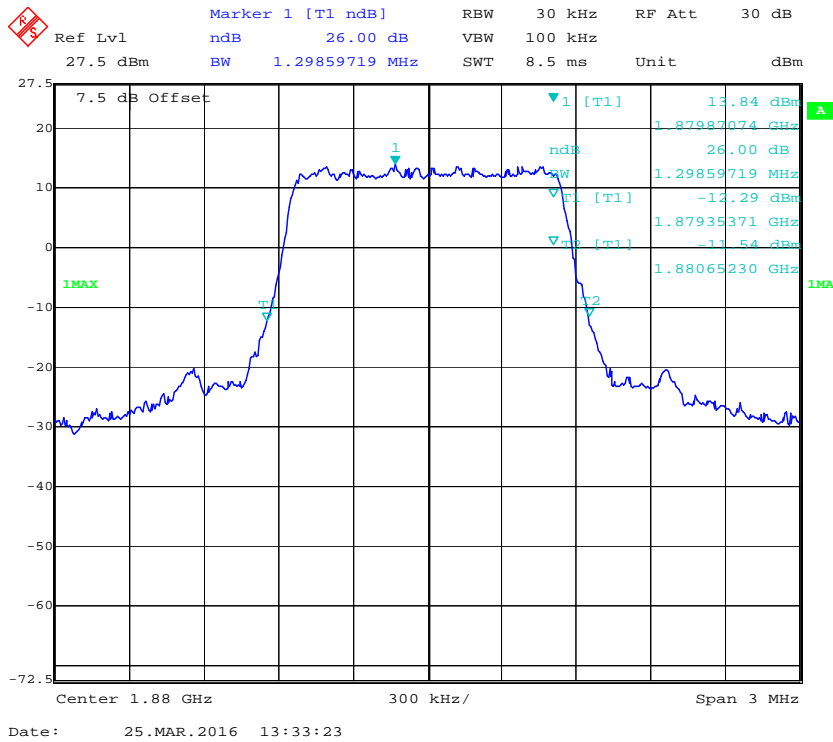
16-QAM (20.0 MHz) - 99% Occupied Bandwidth, Middle channel



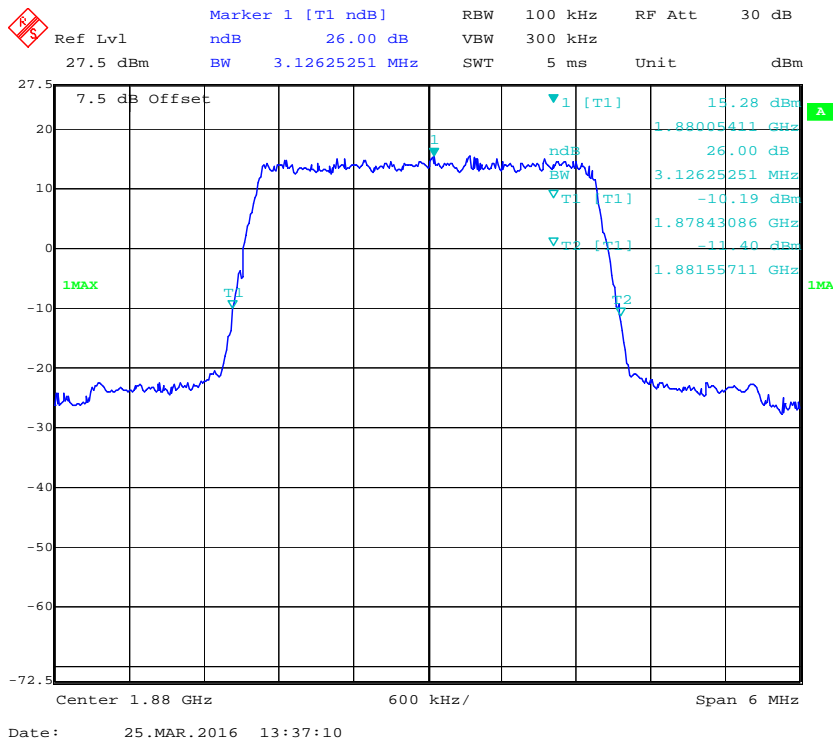
QPSK (1.4 MHz) - 26 dB Bandwidth, Middle channel



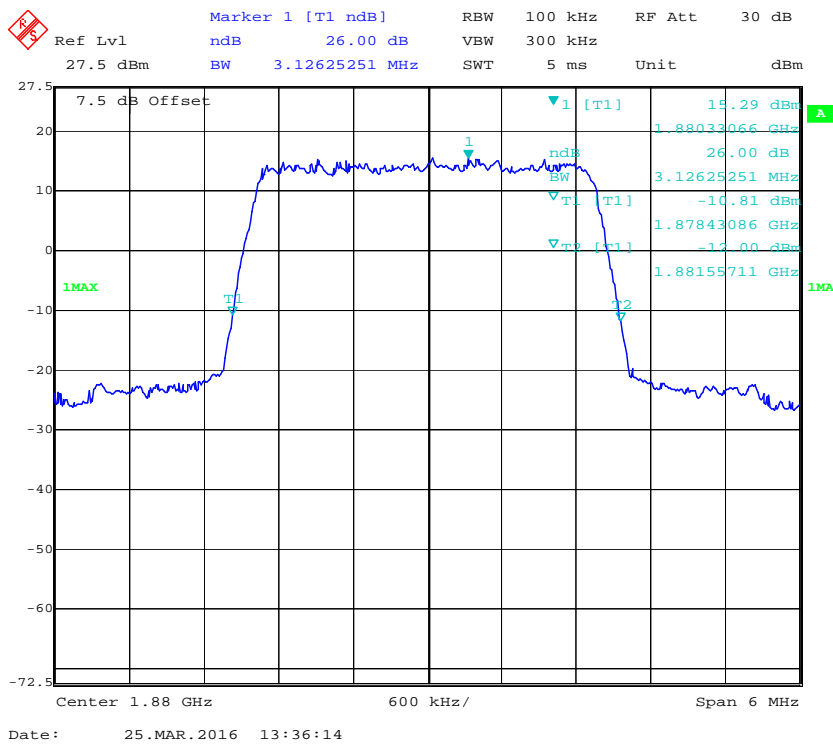
16-QAM (1.4 MHz) - 26 dB Bandwidth, Middle channel



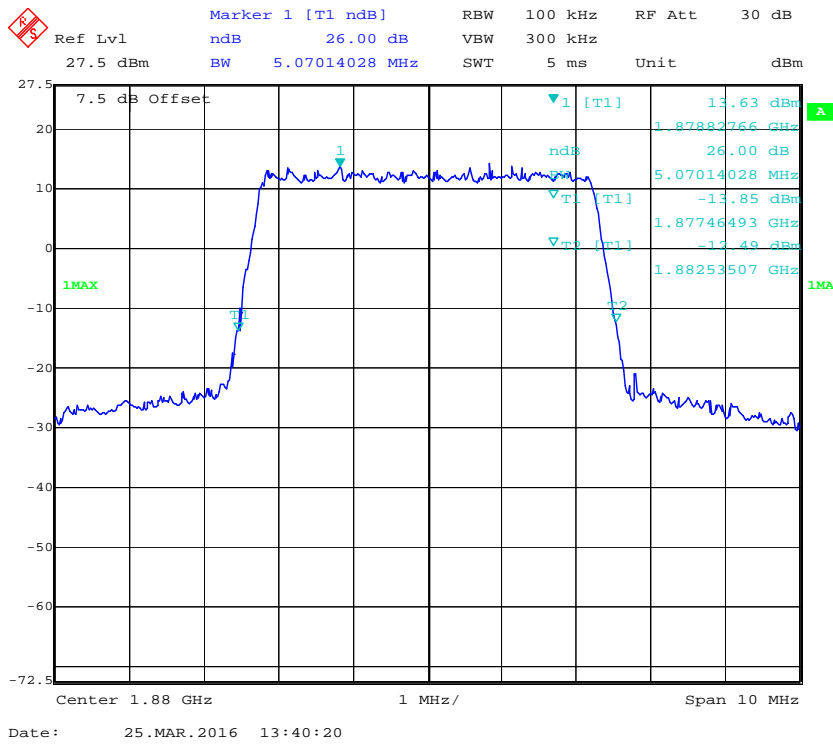
QPSK (3.0 MHz) - 26 dB Bandwidth, Middle channel



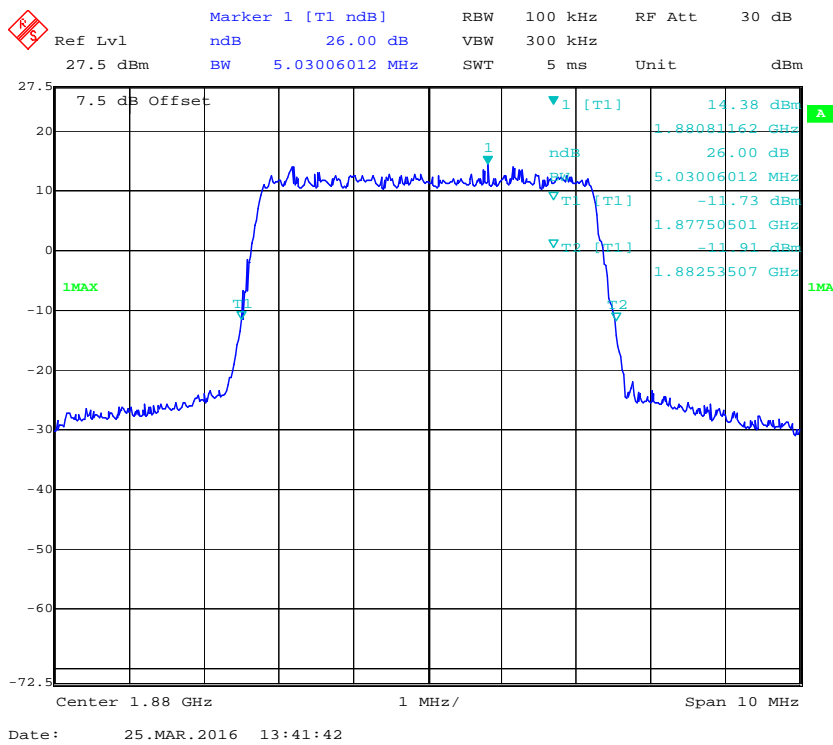
16-QAM (3.0 MHz) - 26 dB Bandwidth, Middle channel



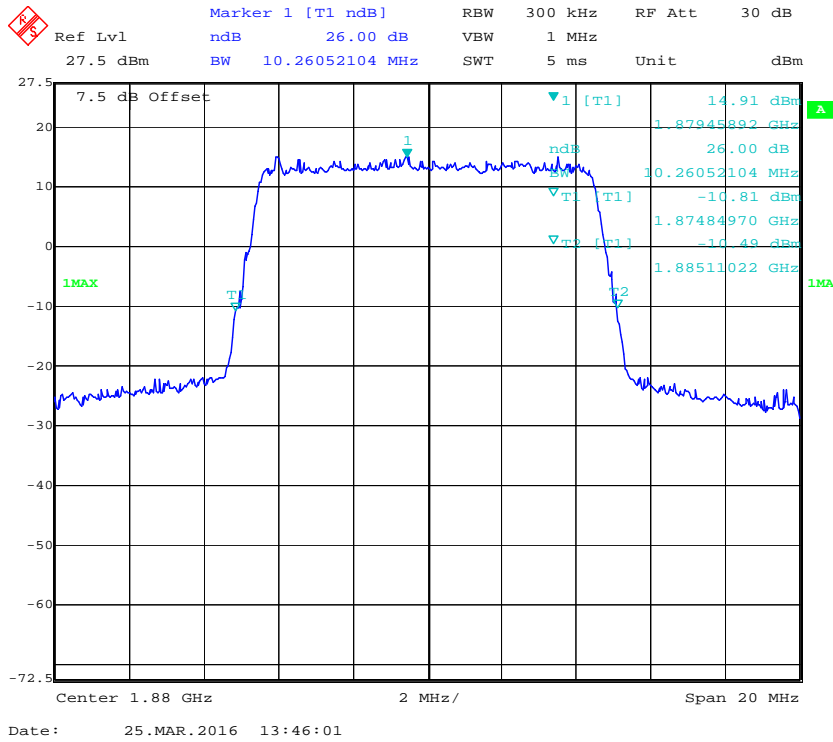
QPSK (5.0 MHz) - 26 dB Bandwidth, Middle channel



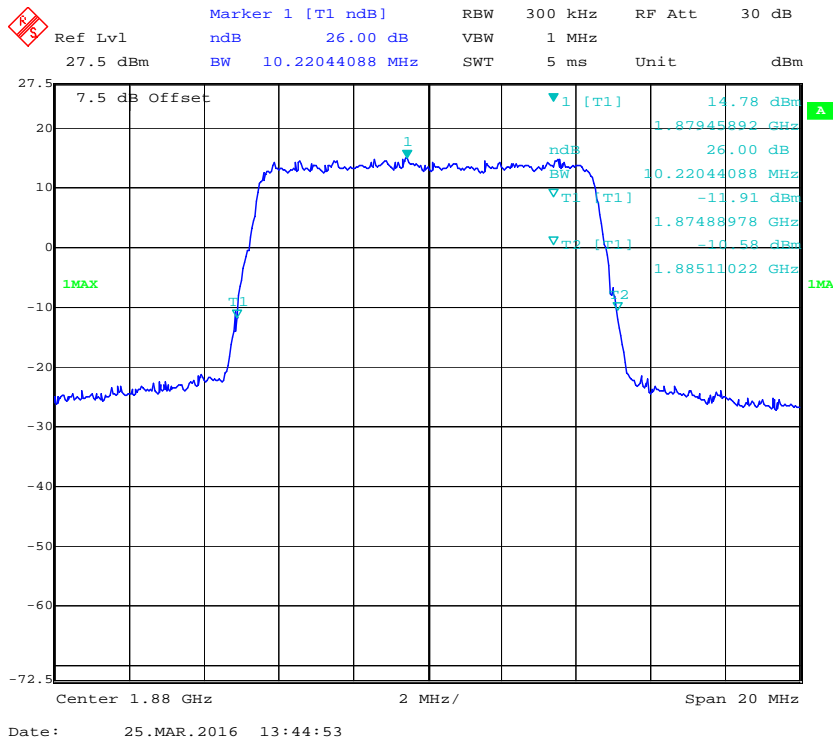
16-QAM (5.0 MHz) - 26 dB Bandwidth, Middle channel



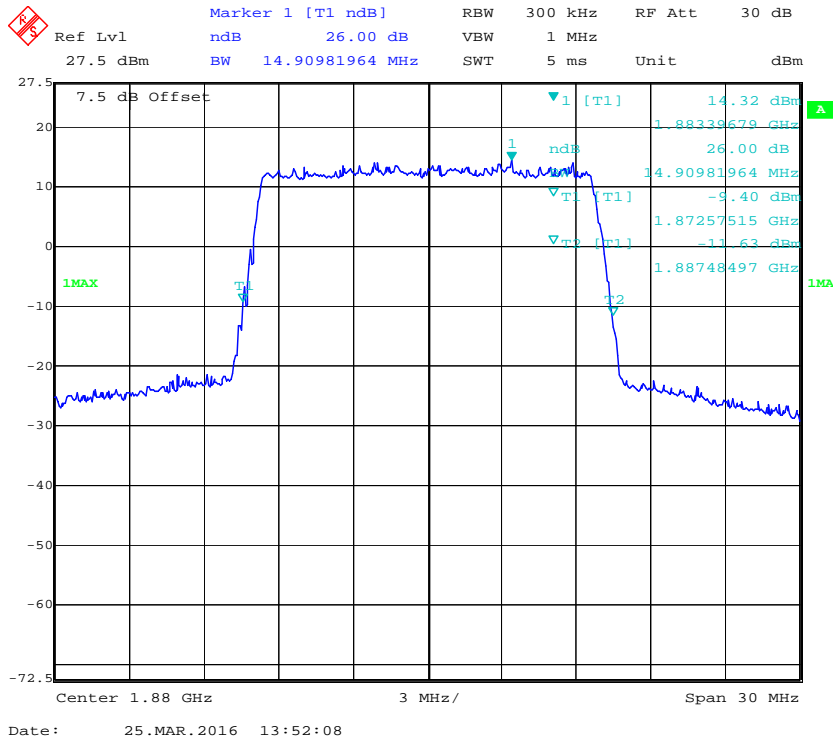
QPSK (10.0 MHz) - 26 dB Bandwidth, Middle channel



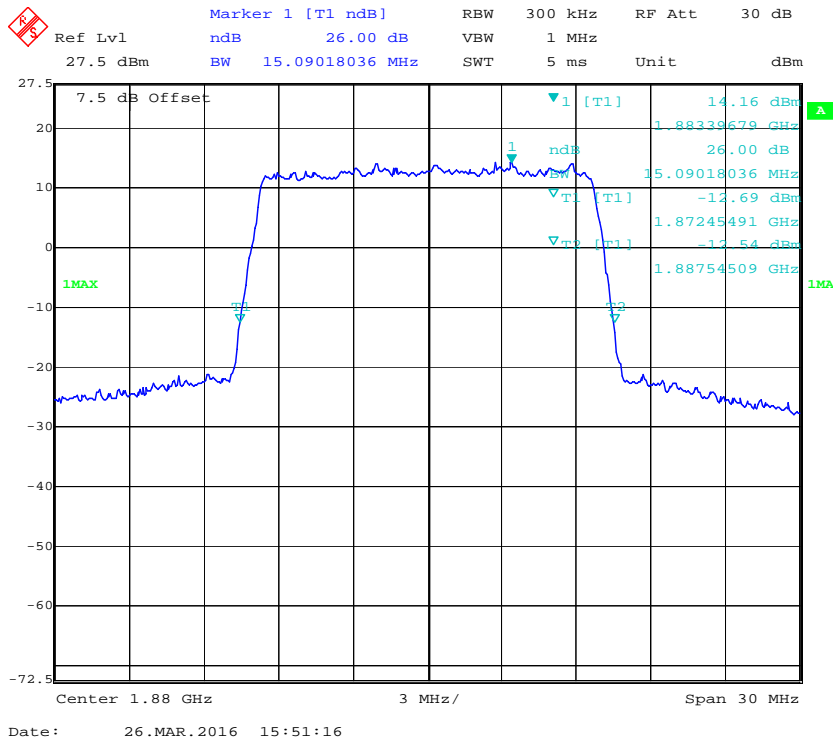
16-QAM (10.0 MHz) - 26 dB Bandwidth, Middle channel



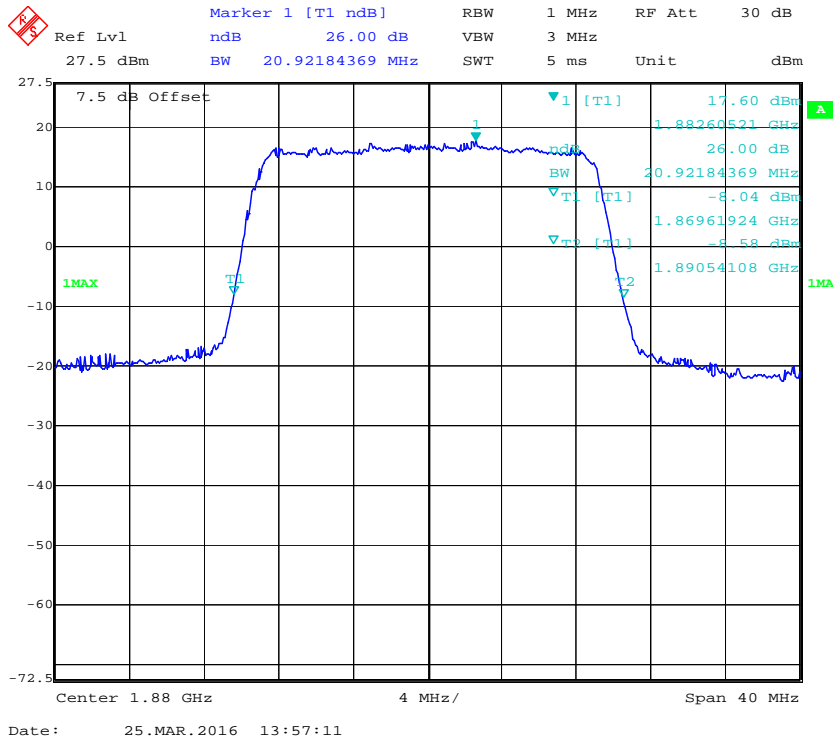
QPSK (15.0 MHz) - 26 dB Bandwidth, Middle channel



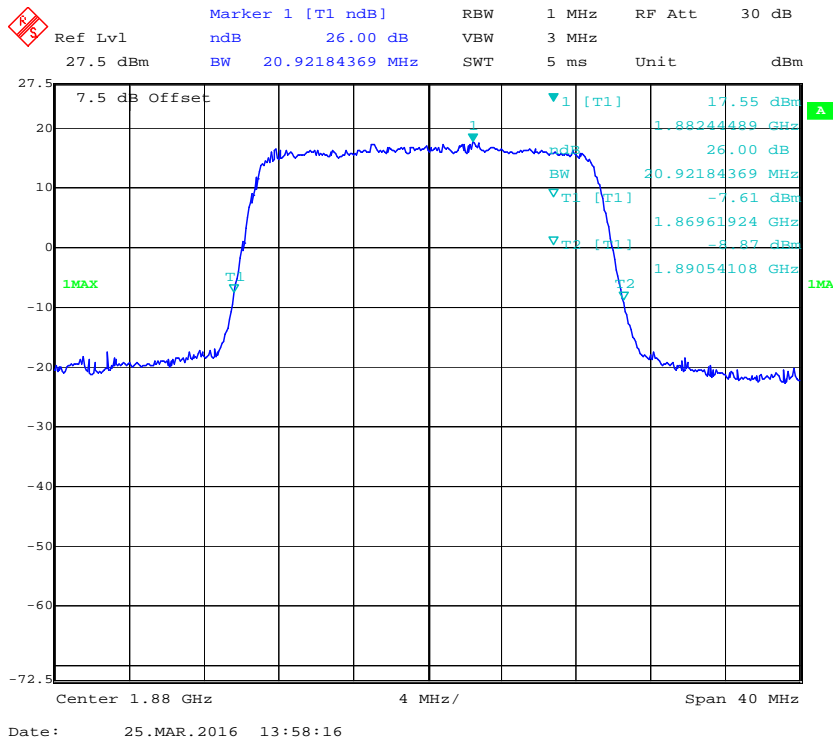
16-QAM (15.0 MHz) - 26 dB Bandwidth, Middle channel



QPSK (20.0 MHz) - 26 dB Bandwidth, Middle channel



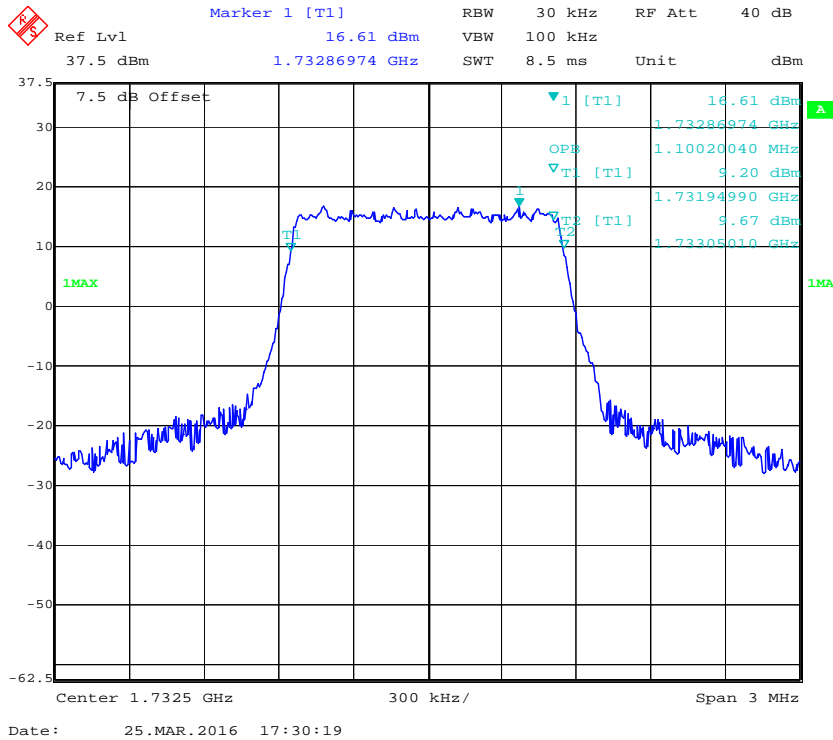
16-QAM (20.0 MHz) - 26 dB Bandwidth, Middle channel



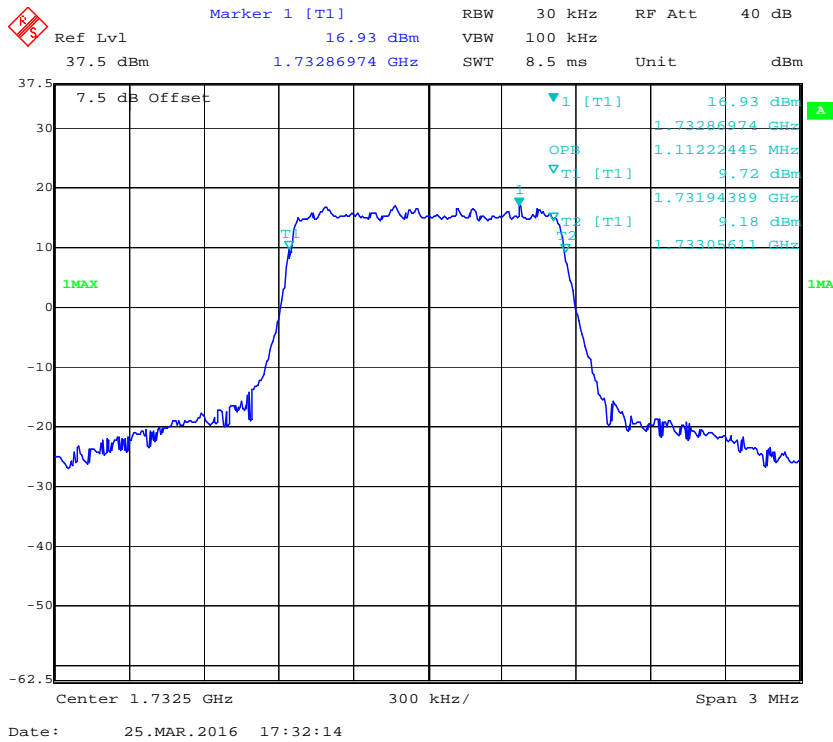
LTE Band 4: (Middle Channel)

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4	QPSK	1.10	1.31
	16QAM	1.11	1.30
3.0	QPSK	2.77	3.13
	16QAM	2.77	3.14
5.0	QPSK	4.53	5.05
	16QAM	4.53	5.05
10.0	QPSK	9.10	10.30
	16QAM	9.10	10.26
15.0	QPSK	13.53	14.97
	16QAM	13.53	14.97
20.0	QPSK	18.52	21.08
	16QAM	18.60	21.16

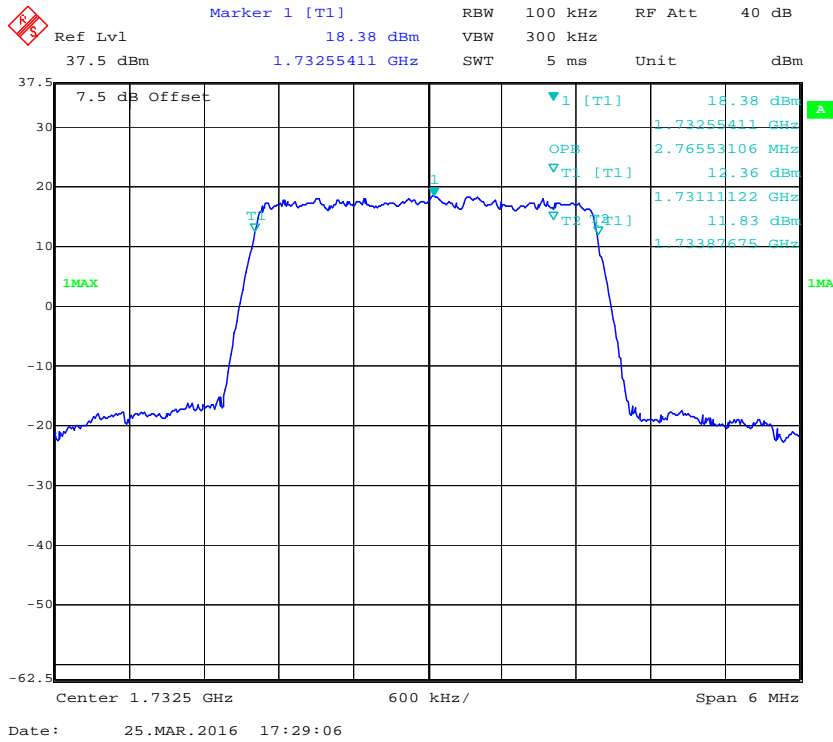
QPSK (1.4 MHz) - 99% Occupied Bandwidth, Middle channel



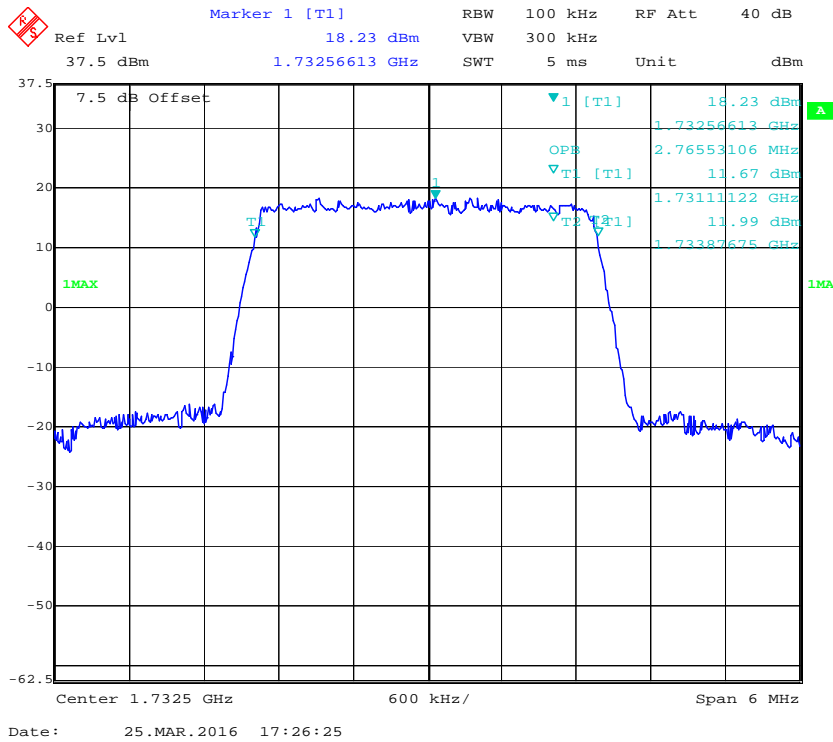
16-QAM (1.4 MHz) - 99% Occupied Bandwidth, Middle channel



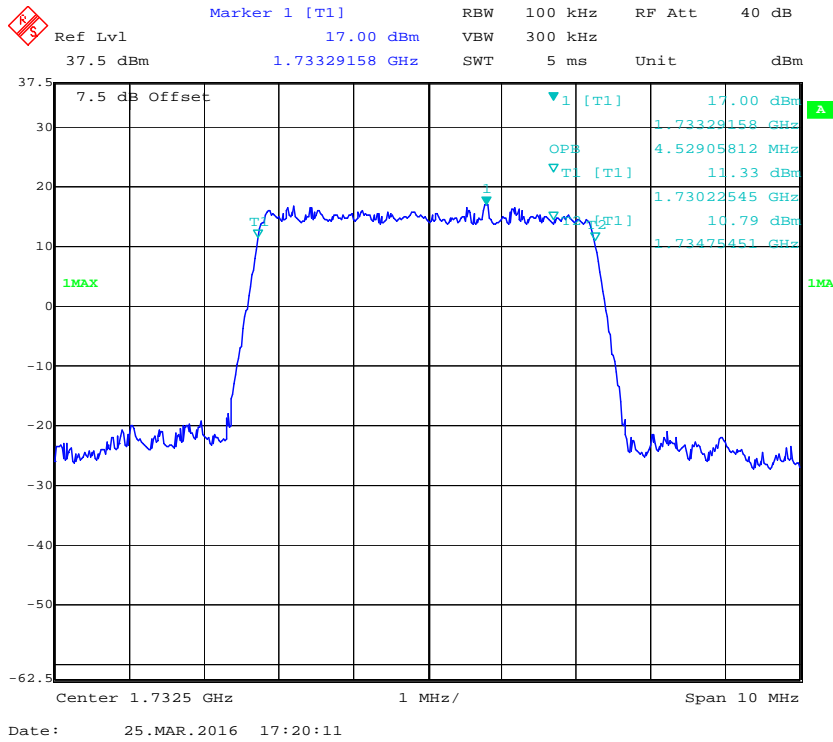
QPSK (3.0 MHz) - 99% Occupied Bandwidth, Middle channel



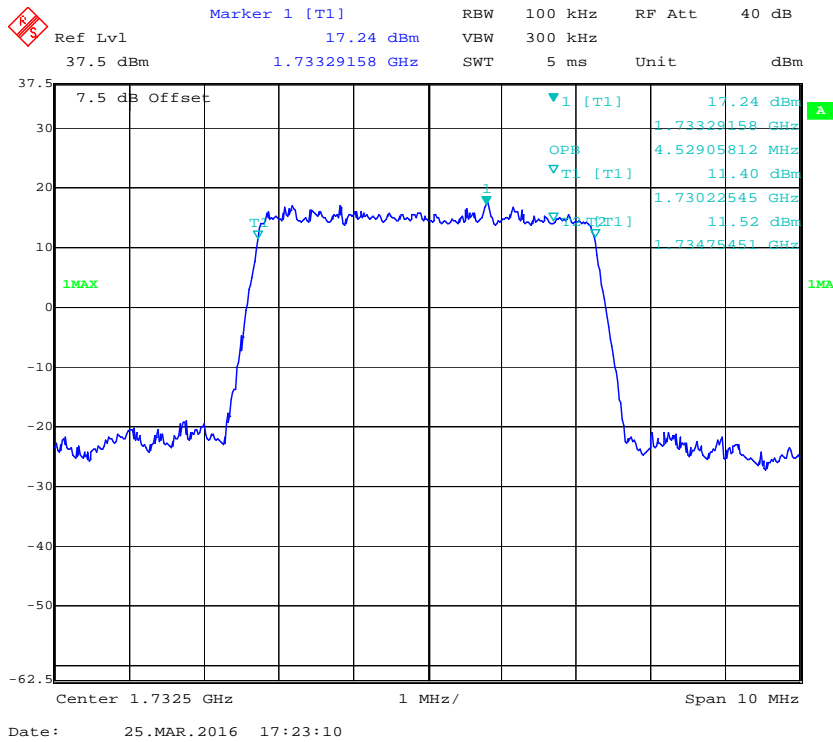
16-QAM (3.0 MHz) - 99% Occupied Bandwidth, Middle channel



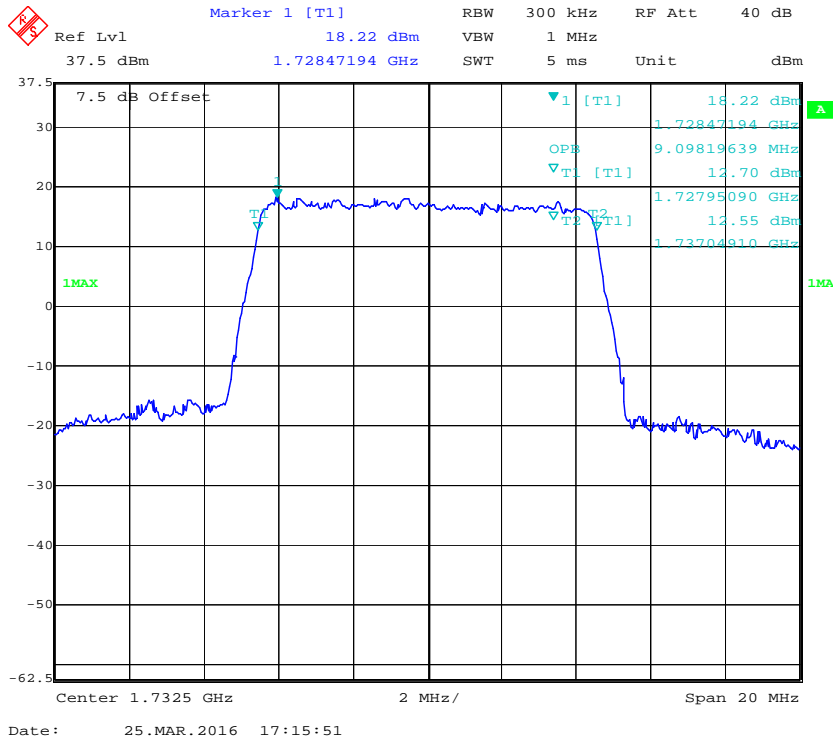
QPSK (5.0 MHz) - 99% Occupied Bandwidth, Middle channel



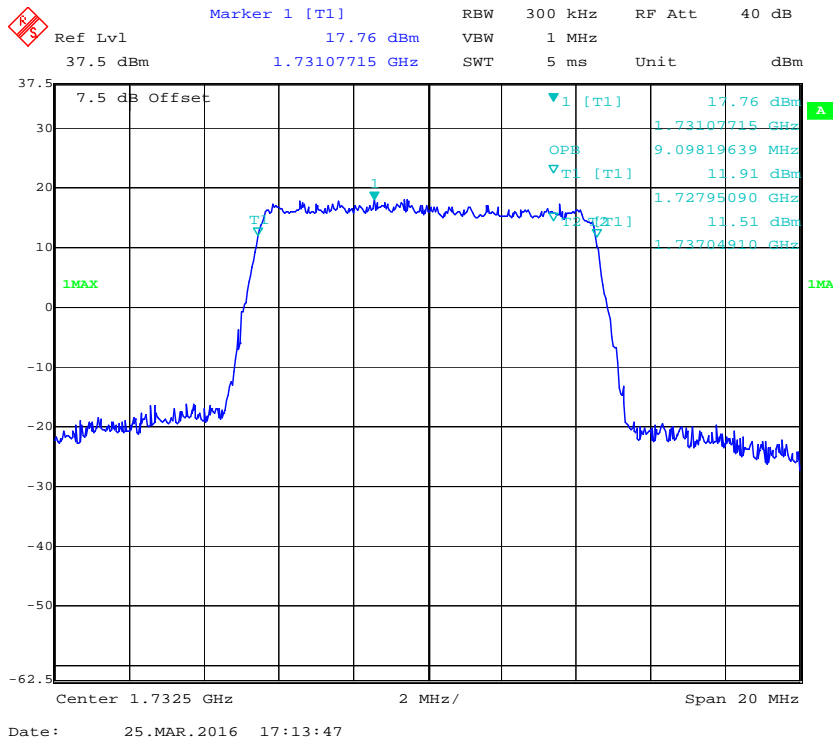
16-QAM (5.0 MHz) - 99% Occupied Bandwidth, Middle channel



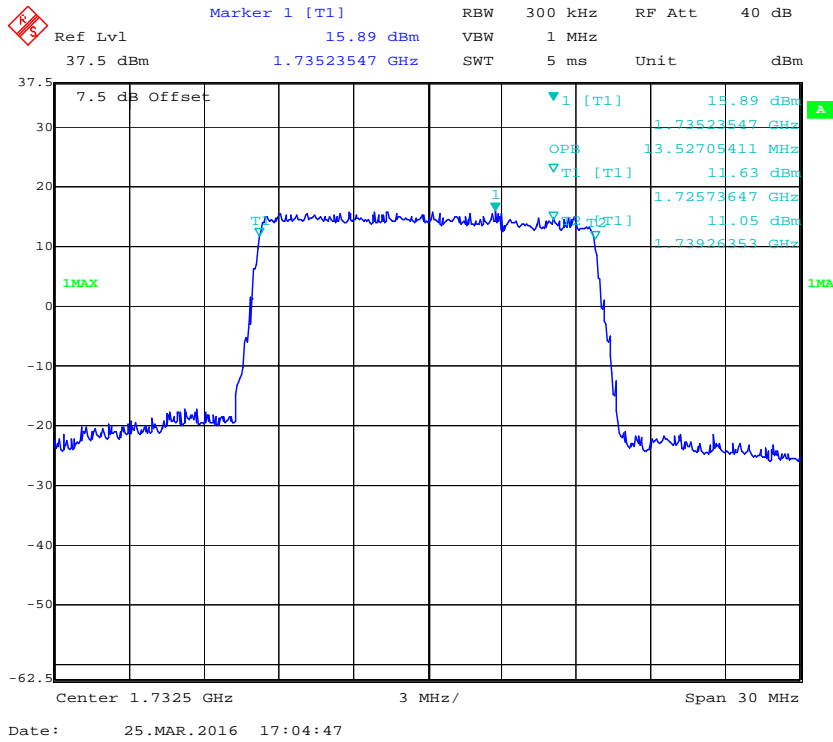
QPSK (10.0 MHz) - 99% Occupied Bandwidth, Middle channel



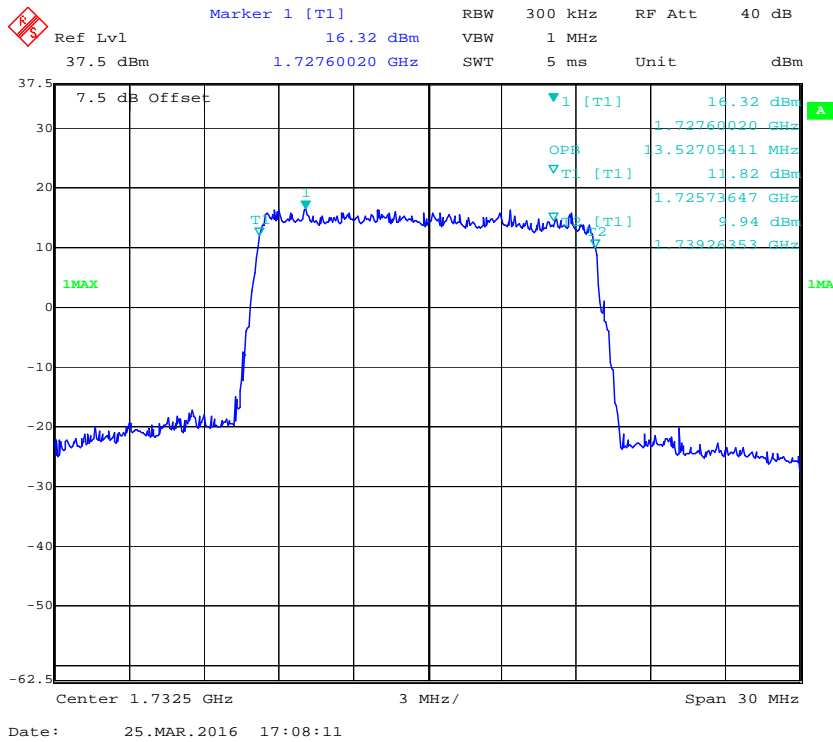
16-QAM (10.0 MHz) - 99% Occupied Bandwidth, Middle channel



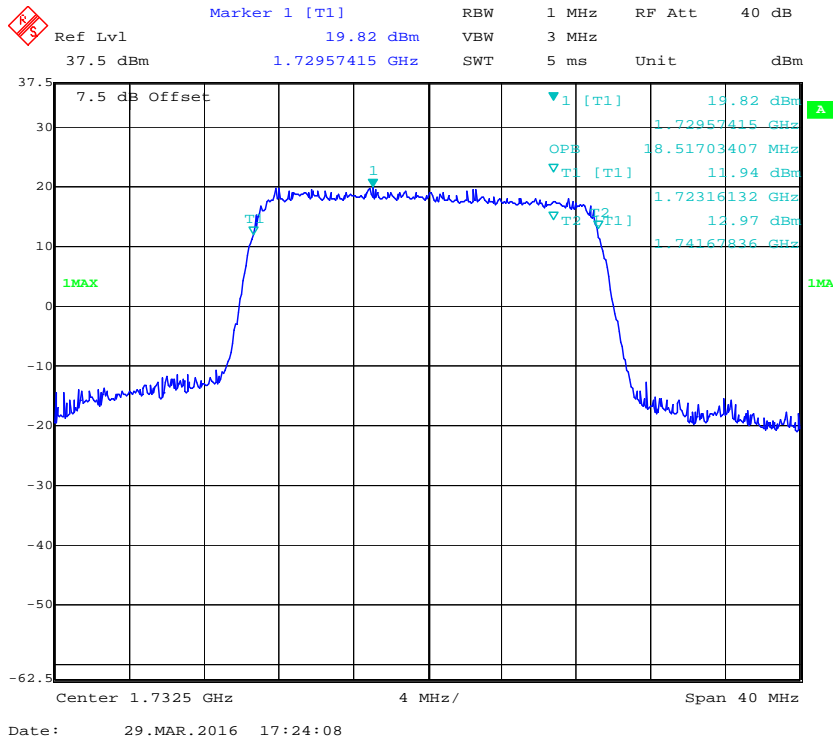
QPSK (15.0 MHz) - 99% Occupied Bandwidth, Middle channel



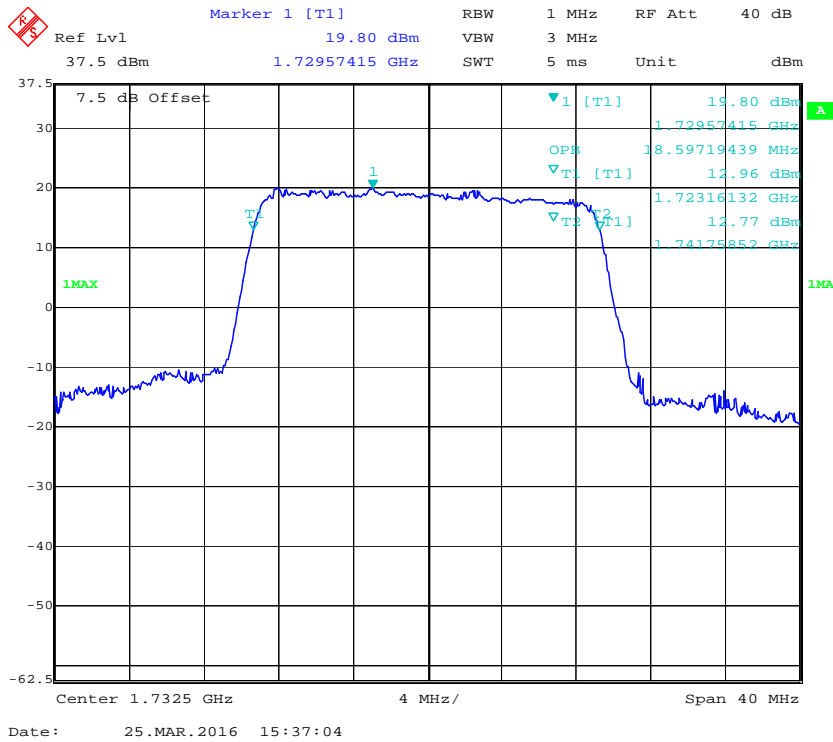
16-QAM (15.0 MHz) - 99% Occupied Bandwidth, Middle channel



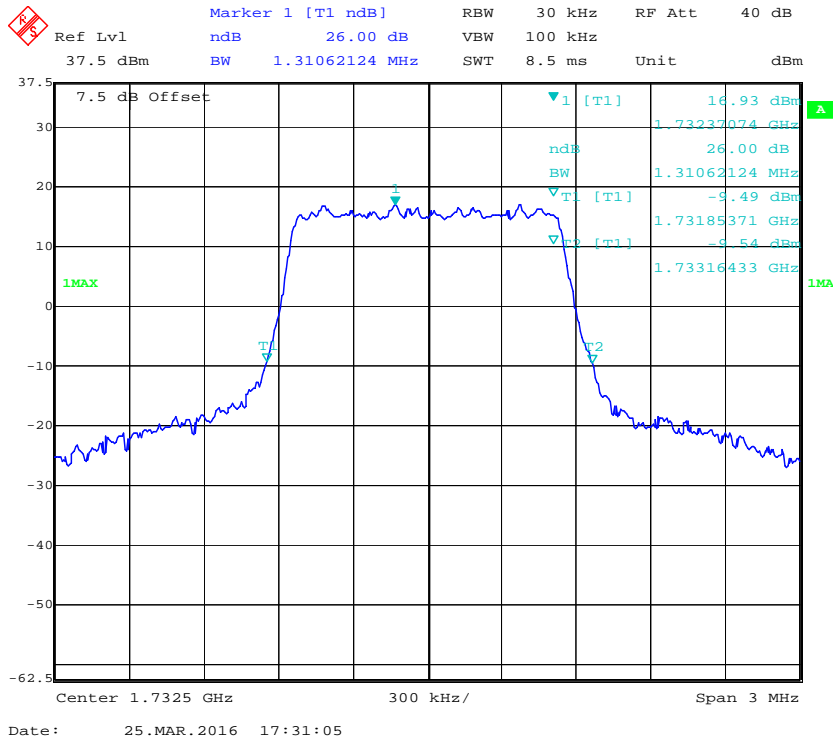
QPSK (20.0 MHz) - 99% Occupied Bandwidth, Middle channel



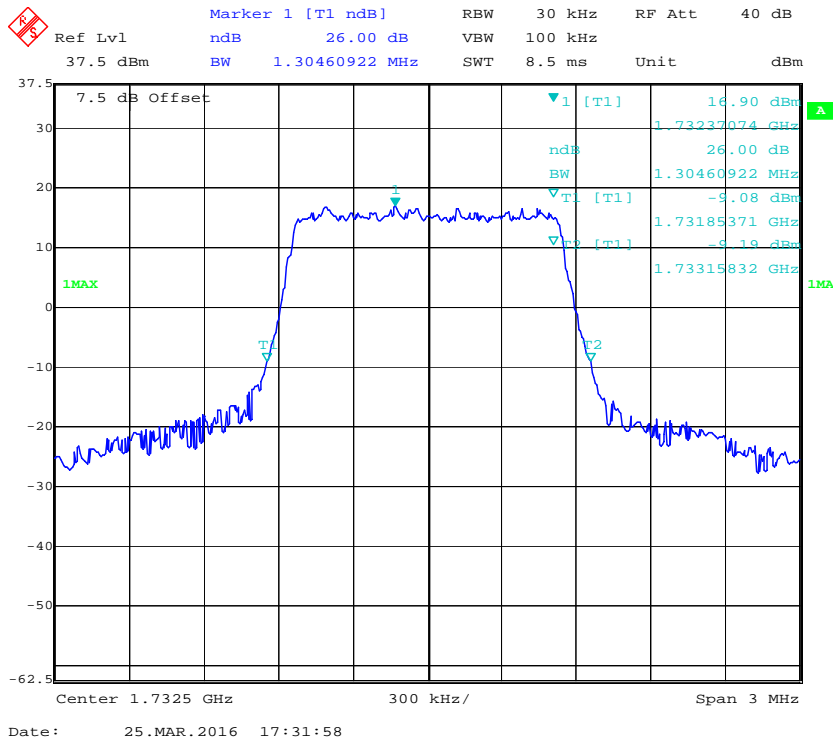
16-QAM (20.0 MHz) - 99% Occupied Bandwidth, Middle channel



QPSK (1.4 MHz) - 26 dB Bandwidth, Middle channel



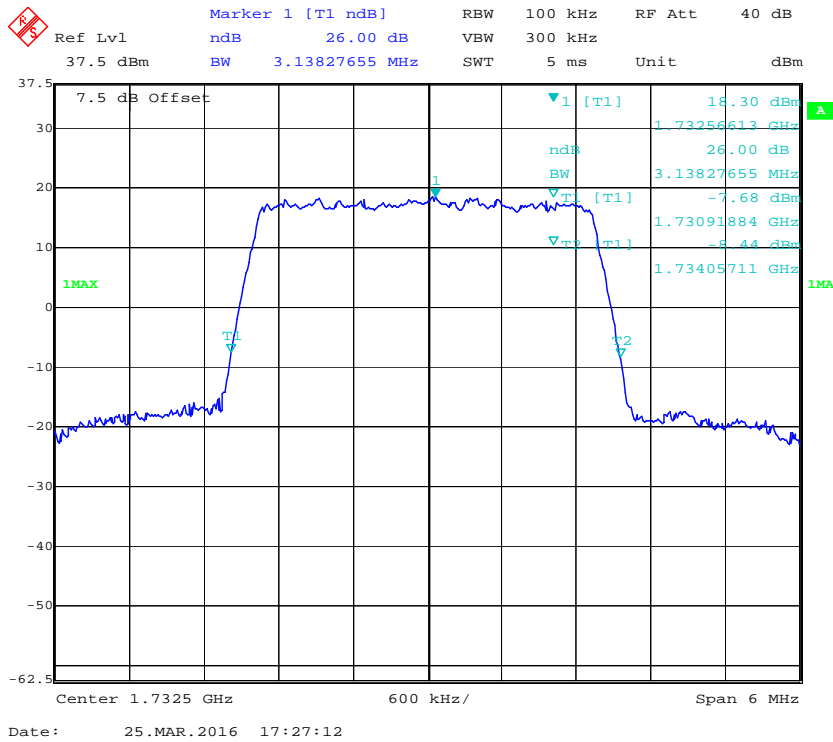
16-QAM (1.4 MHz) - 26 dB Bandwidth, Middle channel



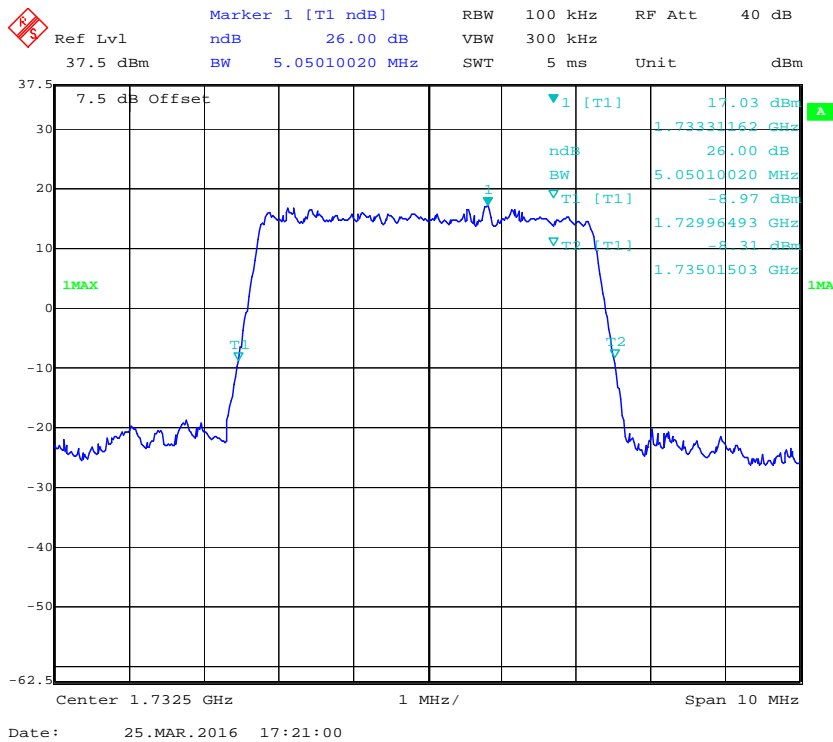
QPSK (3.0 MHz) - 26 dB Bandwidth, Middle channel



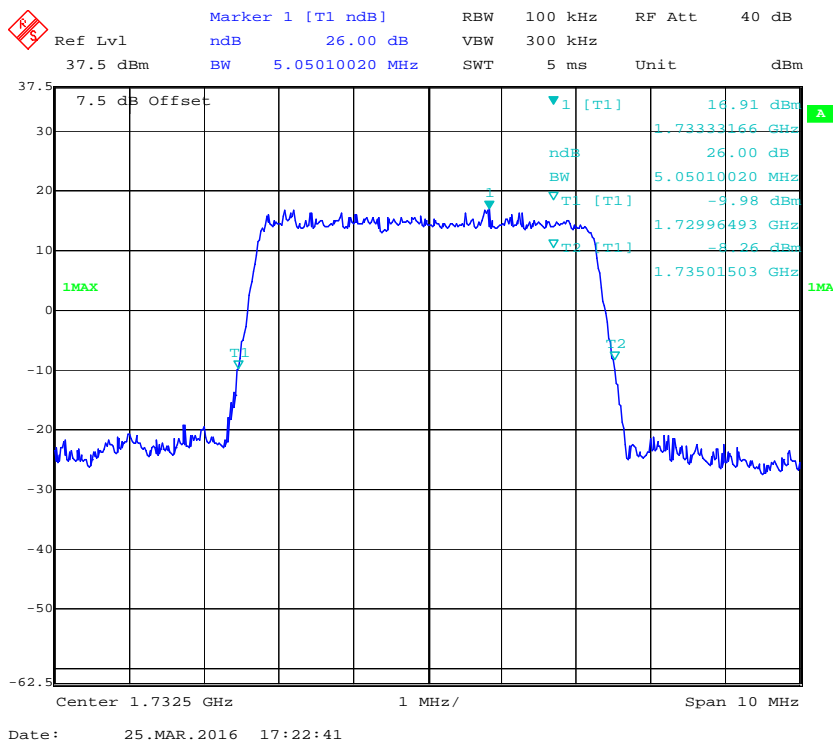
16-QAM (3.0 MHz) - 26 dB Bandwidth, Middle channel



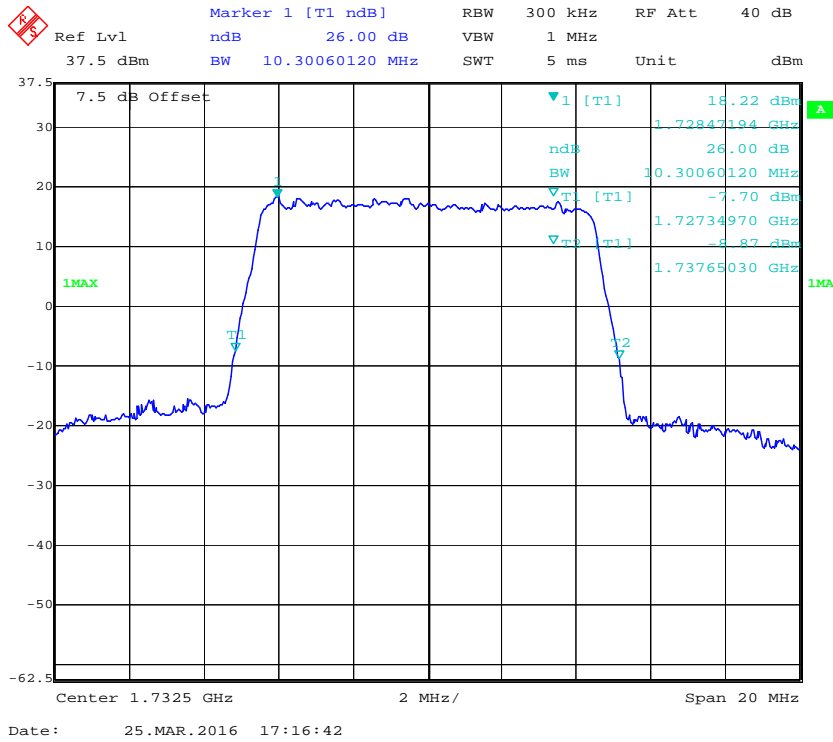
QPSK (5.0 MHz) - 26 dB Bandwidth, Middle channel



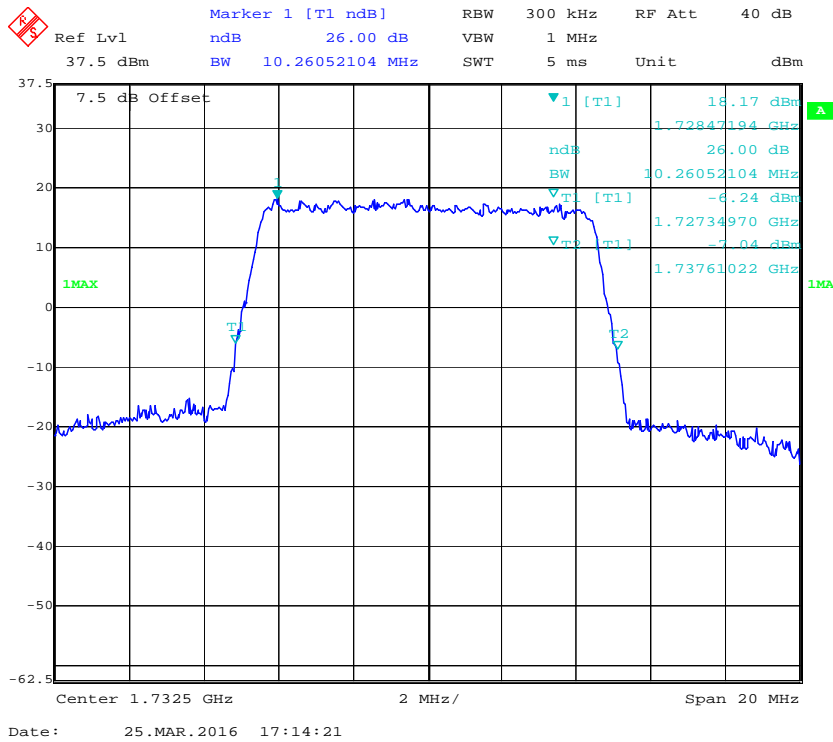
16-QAM (5.0 MHz) - 26 dB Bandwidth, Middle channel



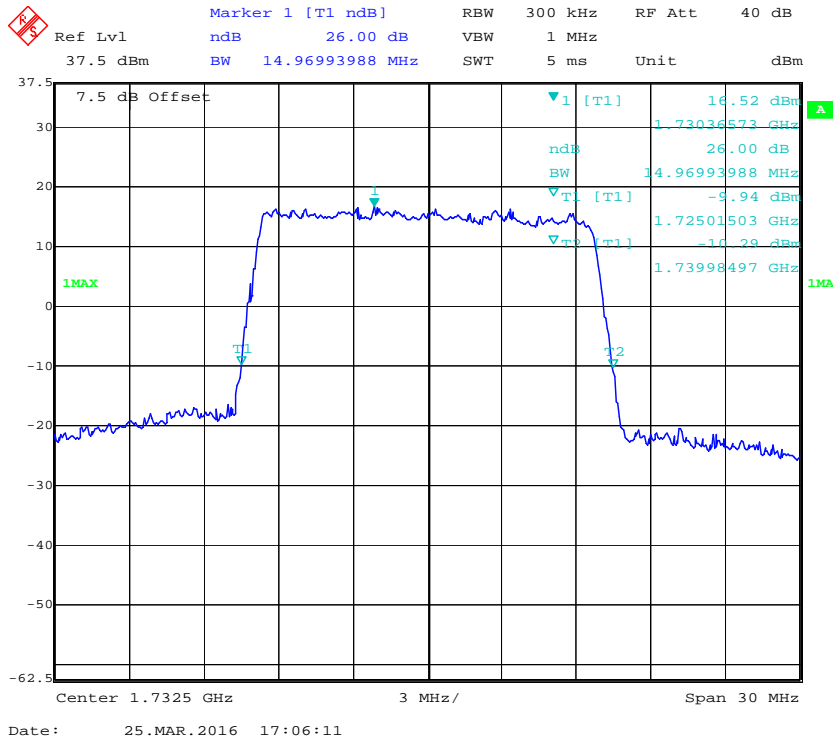
QPSK (10.0 MHz) - 26 dB Bandwidth, Middle channel



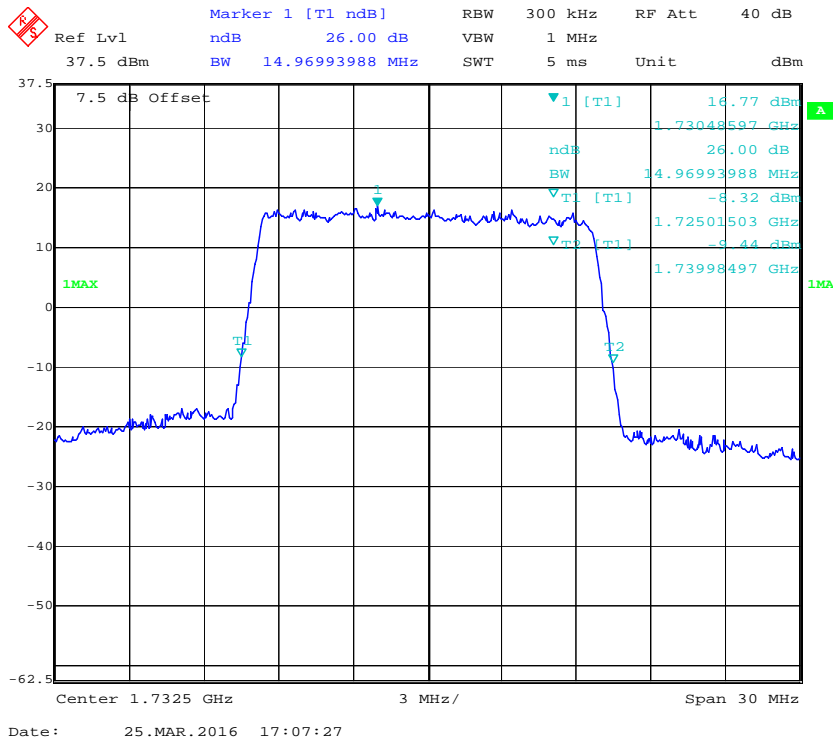
16-QAM (10.0 MHz) - 26 dB Bandwidth, Middle channel



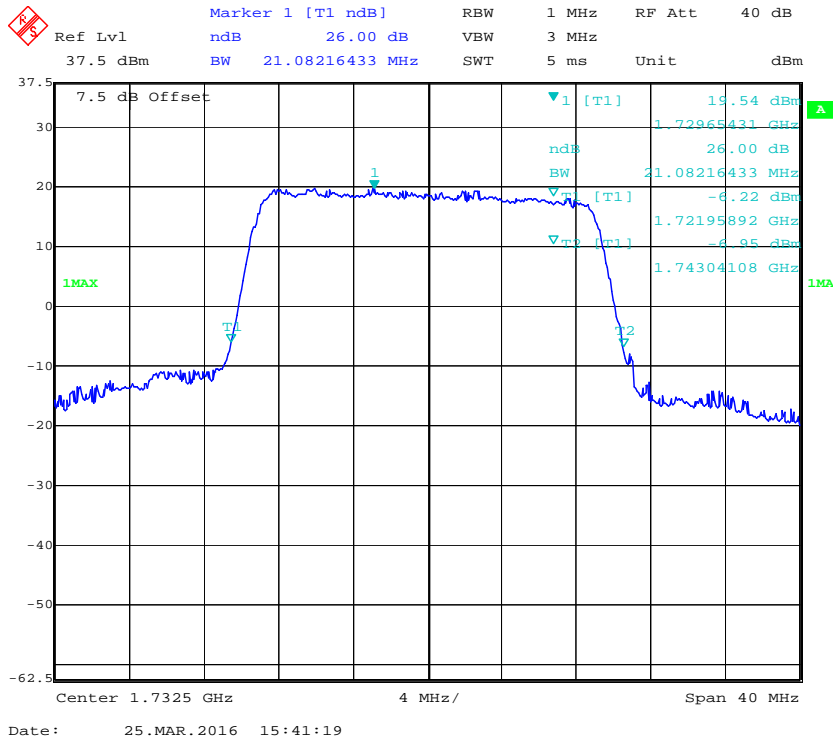
QPSK (15.0 MHz) - 26 dB Bandwidth, Middle channel



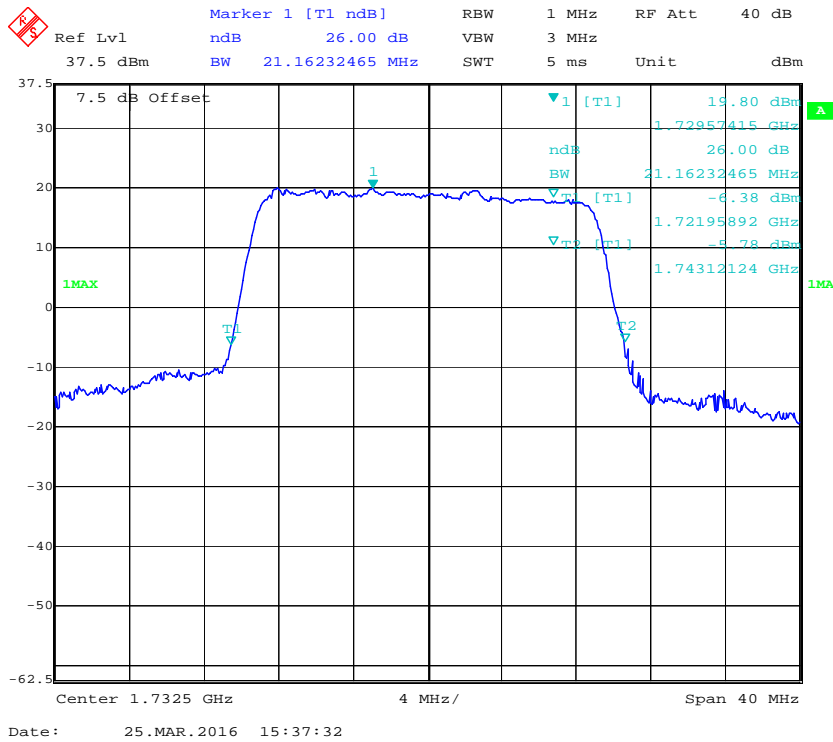
16-QAM (15.0 MHz) - 26 dB Bandwidth, Middle channel



QPSK (20.0 MHz) - 26 dB Bandwidth, Middle channel



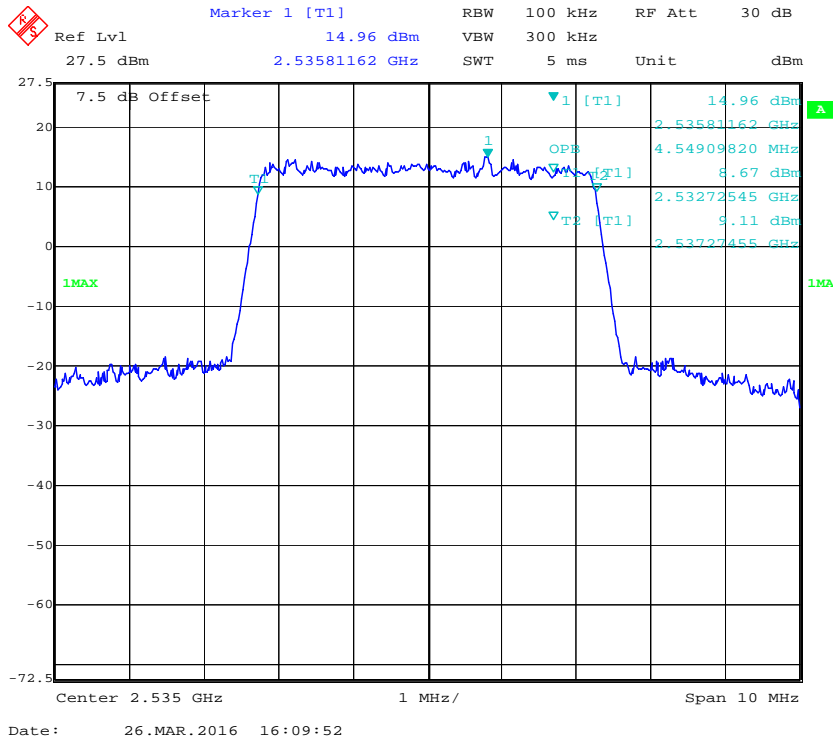
16-QAM (20.0 MHz) - 26 dB Bandwidth, Middle channel



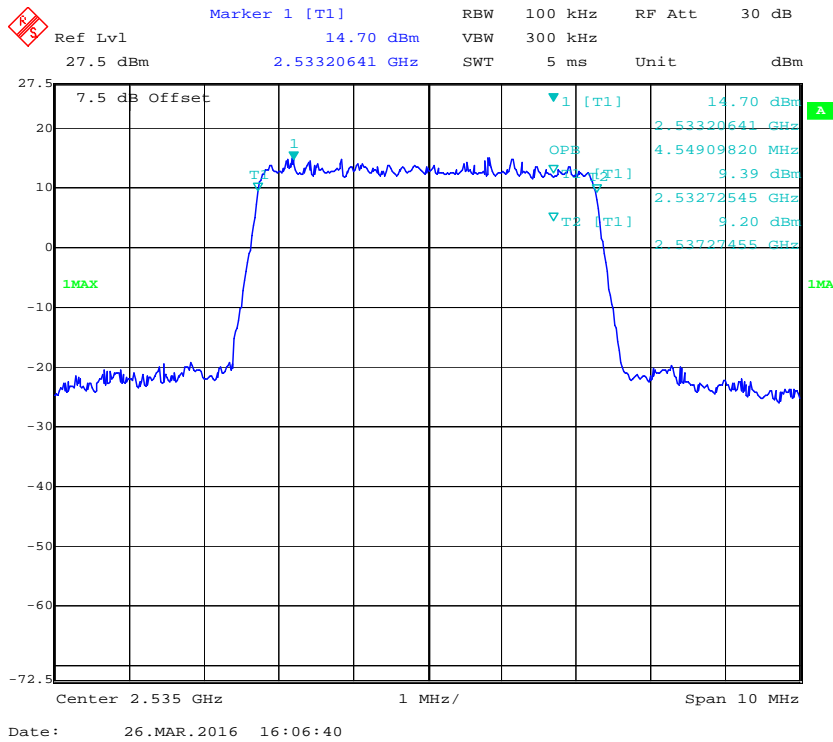
LTE Band 7: (Middle Channel)

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0	QPSK	4.55	5.03
	16QAM	4.55	5.03
10.0	QPSK	9.10	10.34
	16QAM	9.10	10.34
15.0	QPSK	13.53	14.91
	16QAM	13.53	14.97
20.0	QPSK	18.52	21.08
	16QAM	18.52	21.00

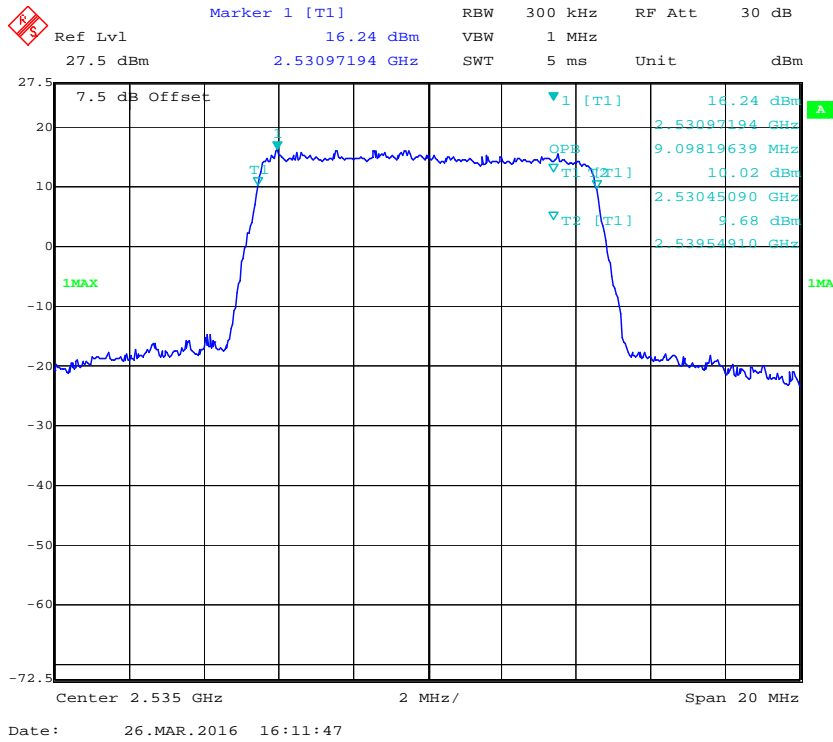
QPSK (5.0 MHz) - 99% Occupied Bandwidth, Middle channel



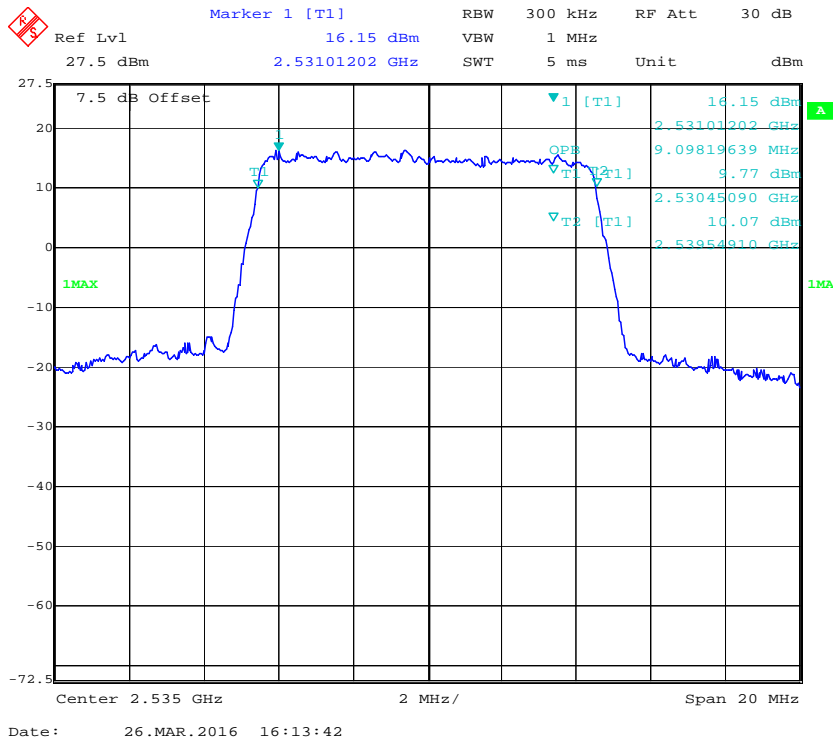
16-QAM (5.0 MHz) - 99% Occupied Bandwidth, Middle channel



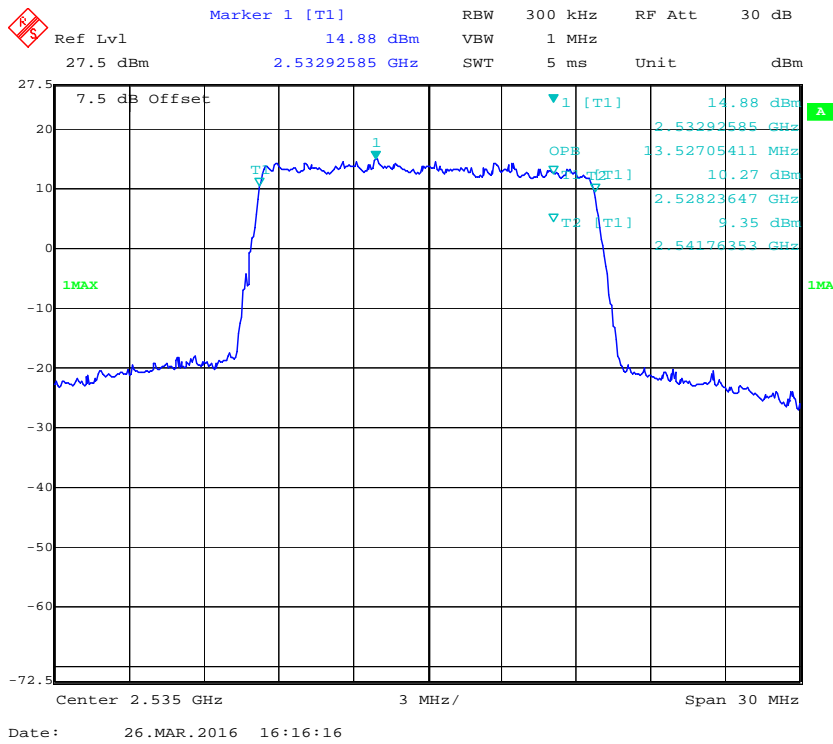
QPSK (10.0 MHz) - 99% Occupied Bandwidth, Middle channel



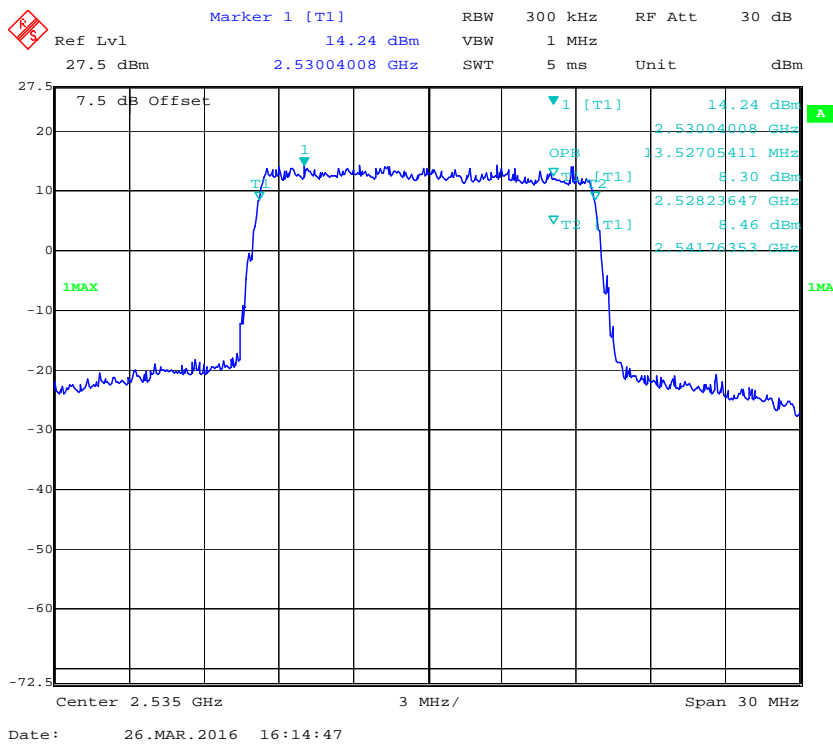
16-QAM (10.0MHz) - 99% Occupied Bandwidth, Middle channel



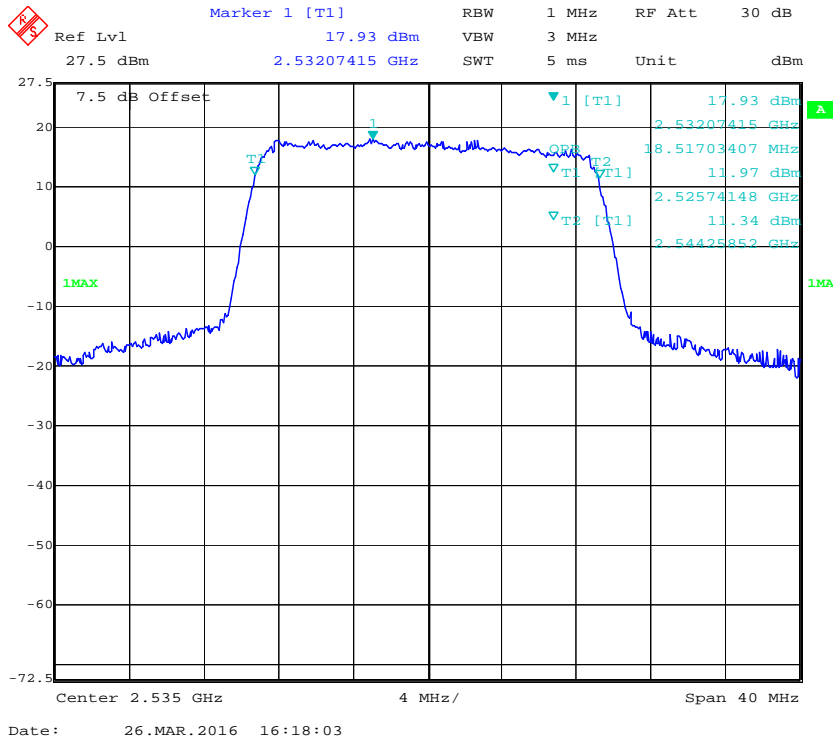
QPSK (15.0 MHz) - 99% Occupied Bandwidth, Middle channel



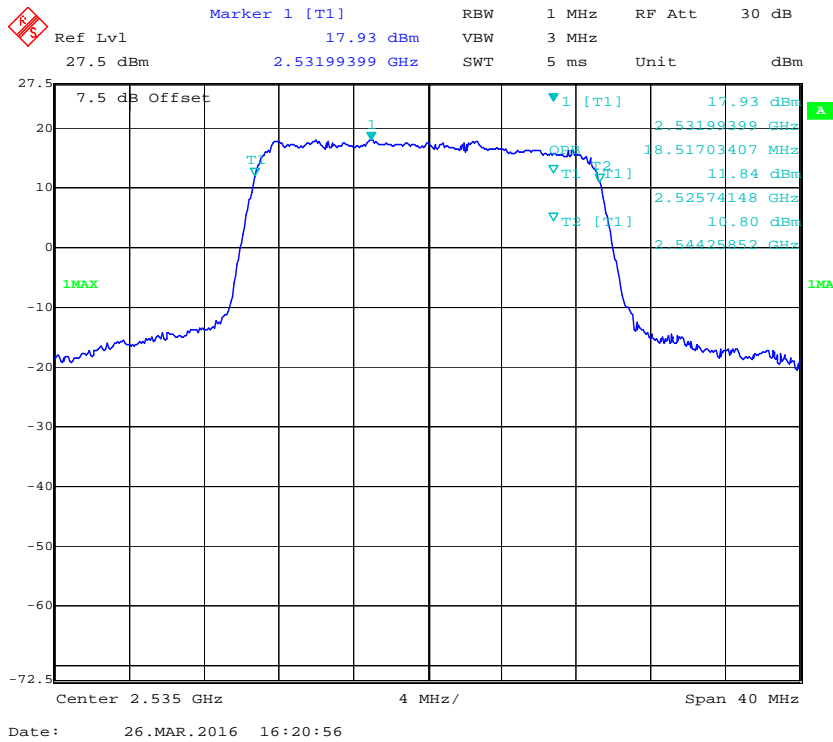
16-QAM (15.0 MHz) - 99% Occupied Bandwidth, Middle channel



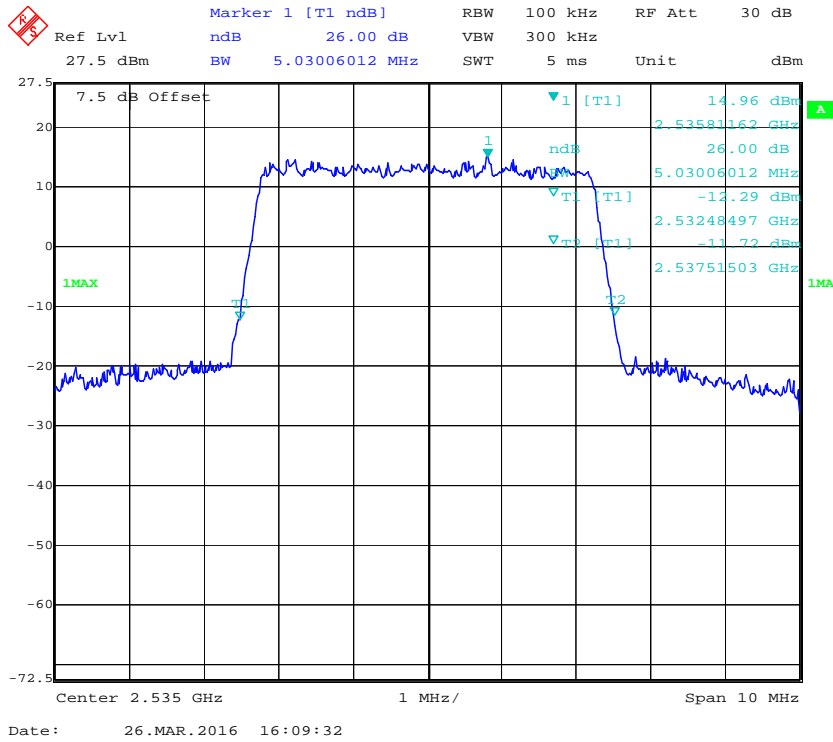
QPSK (20.0 MHz) - 99% Occupied Bandwidth, Middle channel



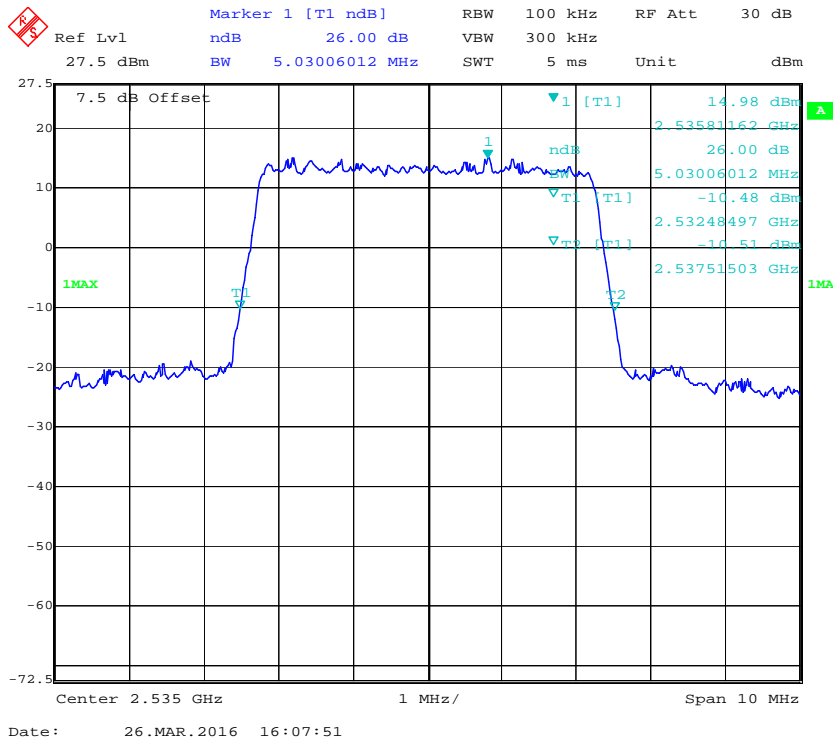
16-QAM (20.0 MHz) - 99% Occupied Bandwidth, Middle channel



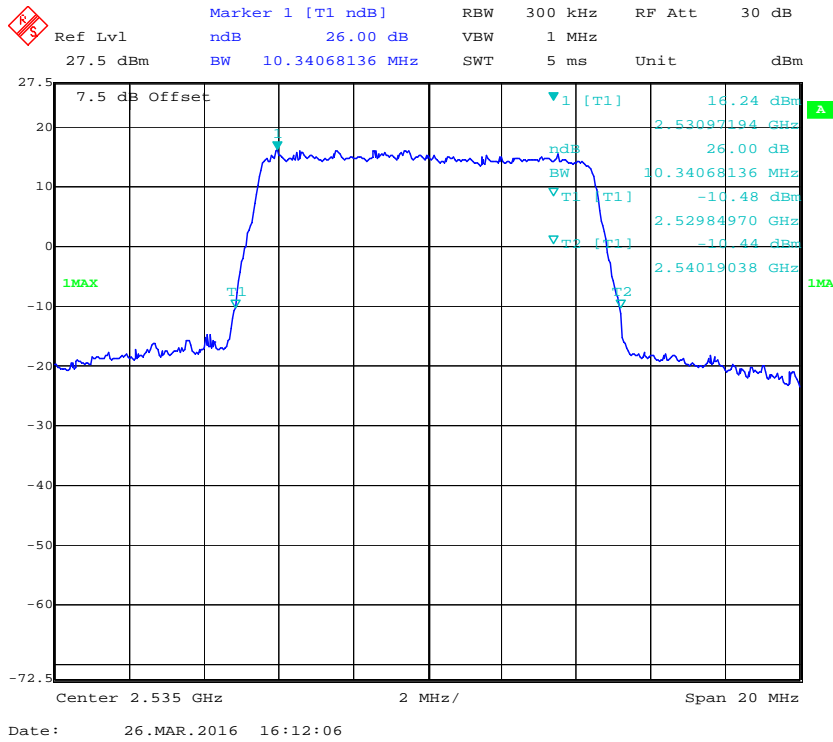
QPSK (5.0 MHz) - 26 dB Bandwidth, Middle channel



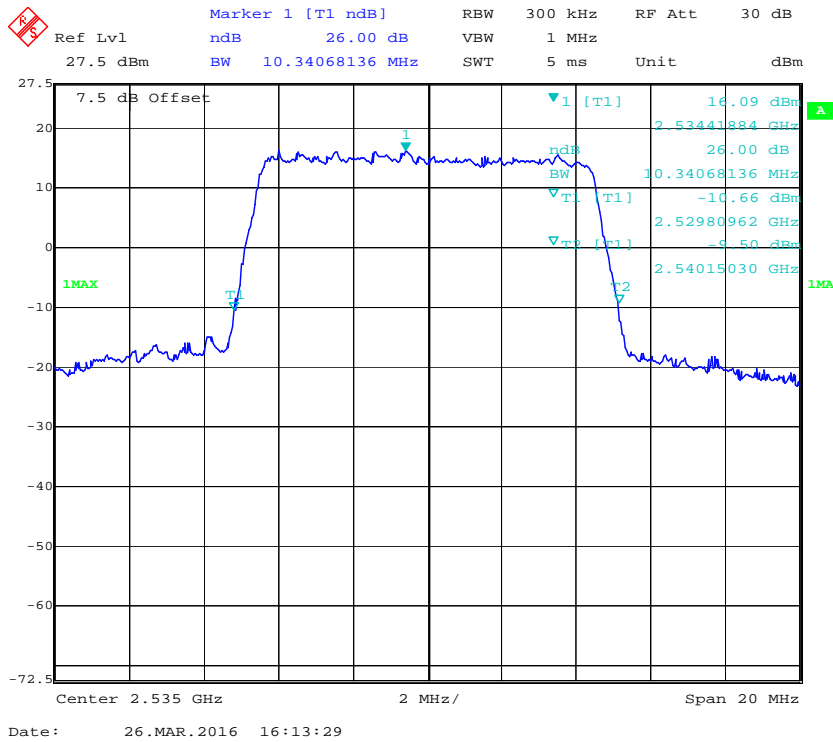
16-QAM (5.0 MHz) - 26 dB Bandwidth, Middle channel



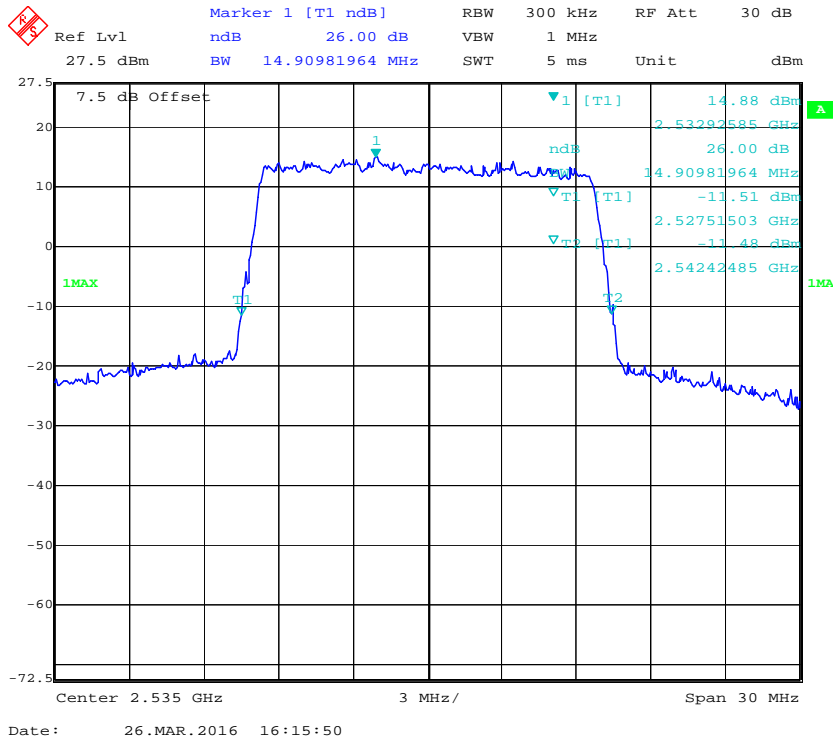
QPSK (10.0 MHz) - 26 dB Bandwidth, Middle channel



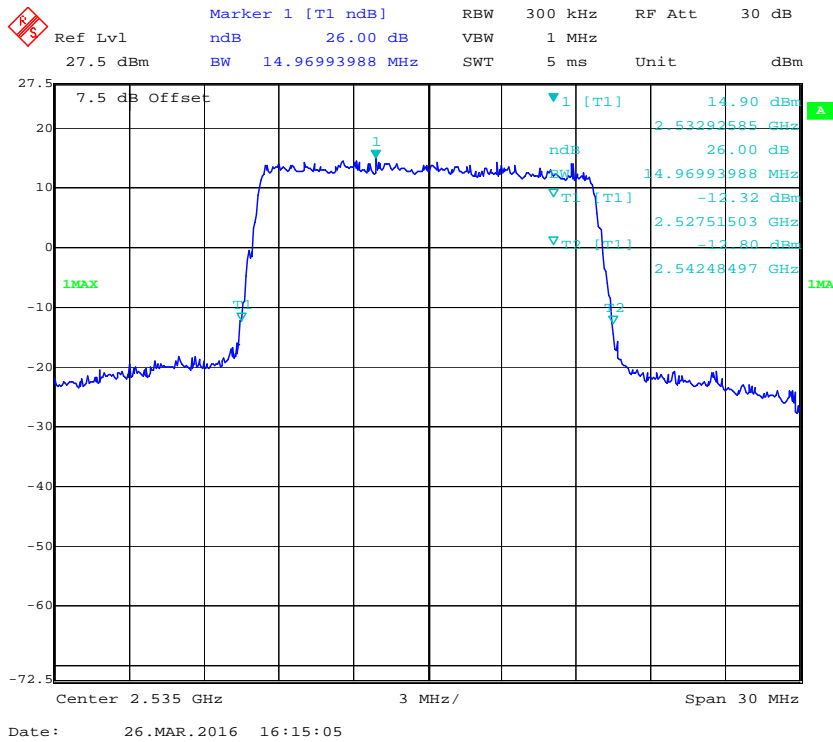
16-QAM (10.0 MHz) - 26 dB Bandwidth, Middle channel



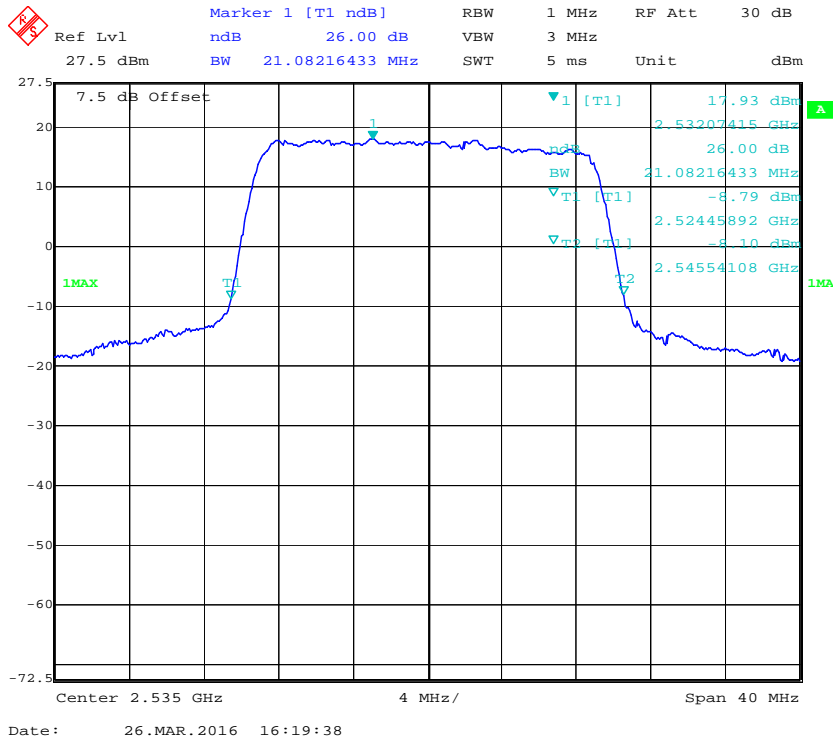
QPSK (15.0 MHz) - 26 dB Bandwidth, Middle channel



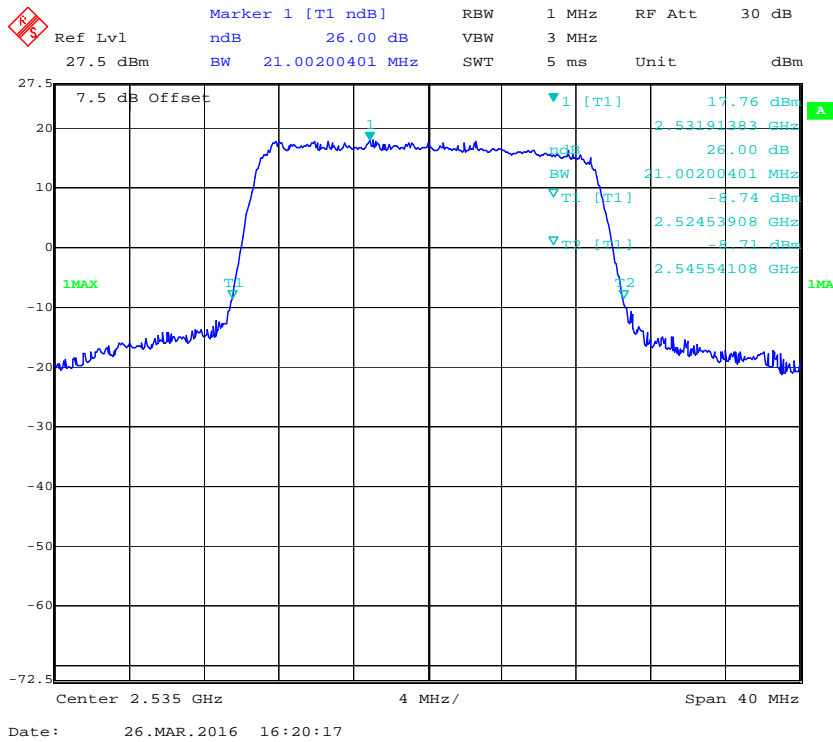
16-QAM (15.0 MHz) - 26 dB Bandwidth, Middle channel



QPSK (20.0 MHz) - 26 dB Bandwidth, Middle channel



16-QAM (20.0 MHz) - 26 dB Bandwidth, Middle channel



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

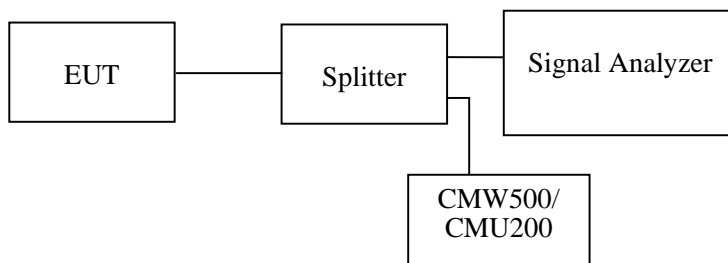
Applicable Standards

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

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

Test Procedure

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



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2015-12-11	2016-12-11
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	106891	2015-11-23	2016-11-23
R&S	Wideband Radio Communication tester	CMW500	1201.002K50-146520-wh	2015-11-23	2016-11-23
Ducommun technologies	RF Cable	RG-214	4	2015-06-15	2016-06-15
WEINSCHEL	6dB Attenuator	1012	30187	2015-06-18	2016-06-18
WEINSCHEL	3dB Attenuator	5321	AU0709	2015-06-18	2016-06-18

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

Test Data

Environmental Conditions

Temperature:	20~23 °C
Relative Humidity:	50~55 %
ATM Pressure:	100.0~101.0kPa

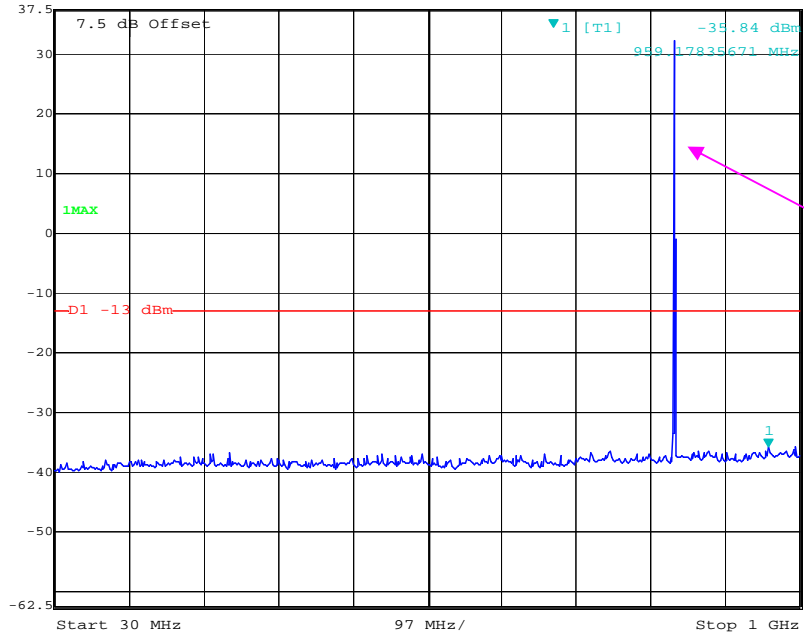
The testing was performed by Simon Wang from 2016-03-18 to 2016-03-29.

Please refer to the following plots.

Cellular Band (Part 22H)

30 MHz – 1 GHz (GSM Mode)

	Marker 1 [T1]	RBW	100 kHz	RF Att	40 dB
	Ref Lvl	-35.84 dBm	VBW	300 kHz	
	37.5 dBm	959.17835671 MHz	SWT	245 ms	Unit dBm

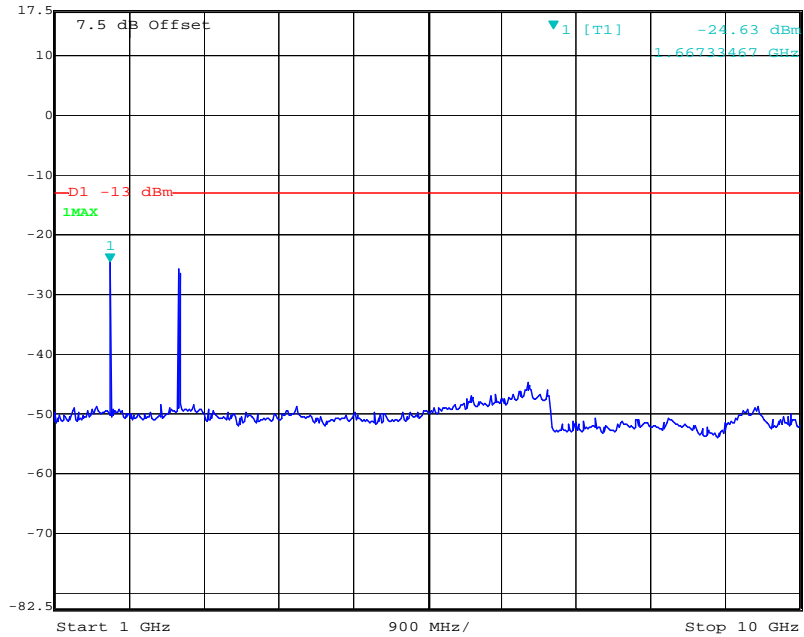


Fundamental test

Date: 29.MAR.2016 17:51:43

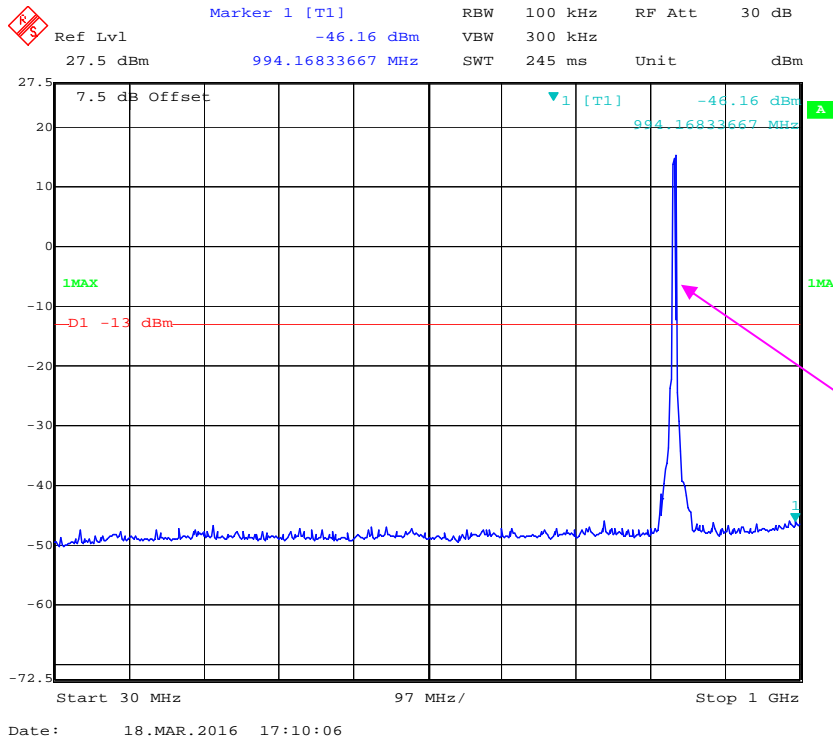
1 GHz – 10 GHz (GSM Mode)

	Marker 1 [T1]	RBW	1 MHz	RF Att	20 dB
	Ref Lvl	-24.63 dBm	VBW	3 MHz	
	17.5 dBm	1.66733467 GHz	SWT	52 ms	Unit dBm

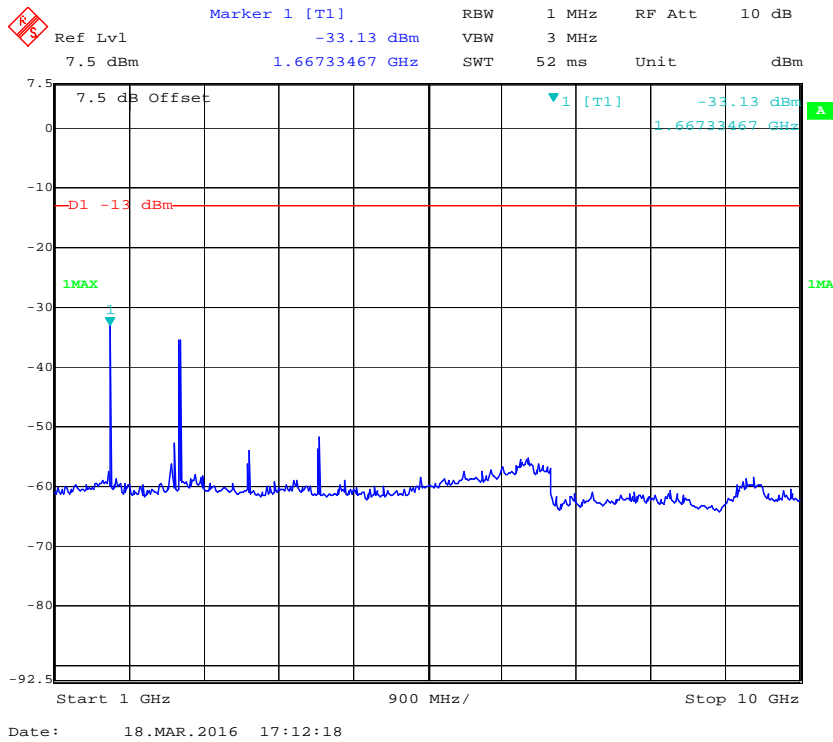


Date: 29.MAR.2016 17:49:49

30 MHz – 1 GHz (WCDMA Mode)

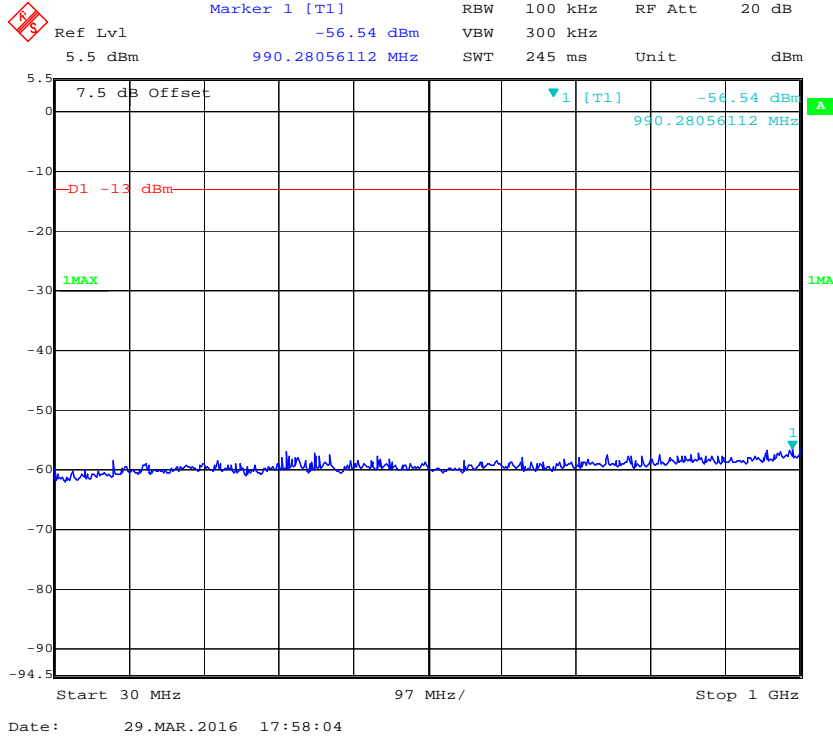


1 GHz – 10 GHz (WCDMA Mode)

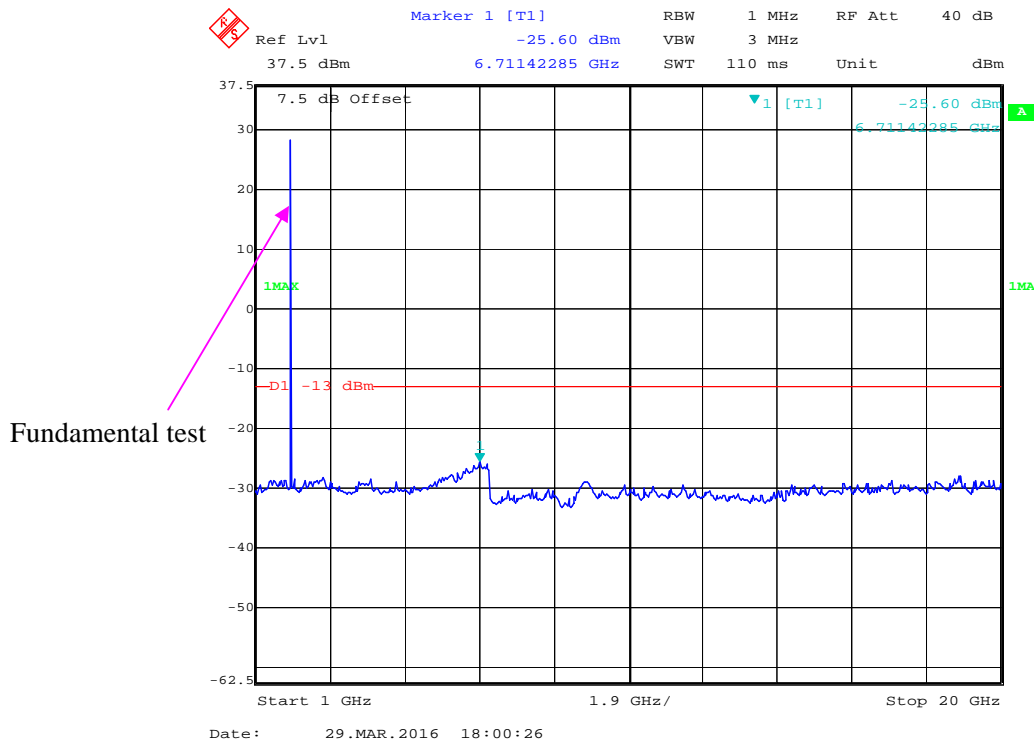


PCS Band (Part 24E)

30 MHz – 1 GHz (GSM Mode)

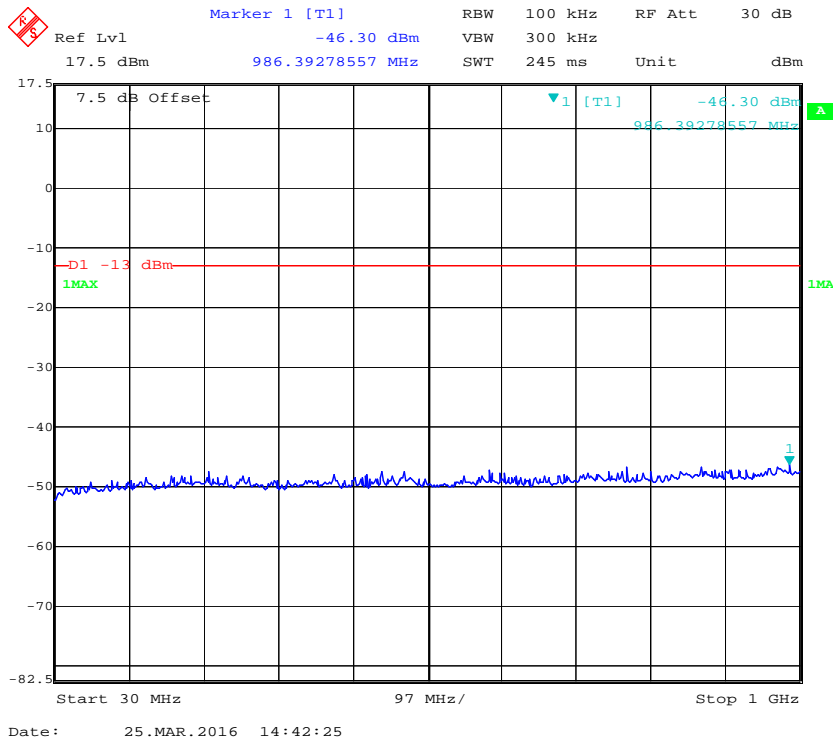


1 GHz – 20 GHz (GSM Mode)

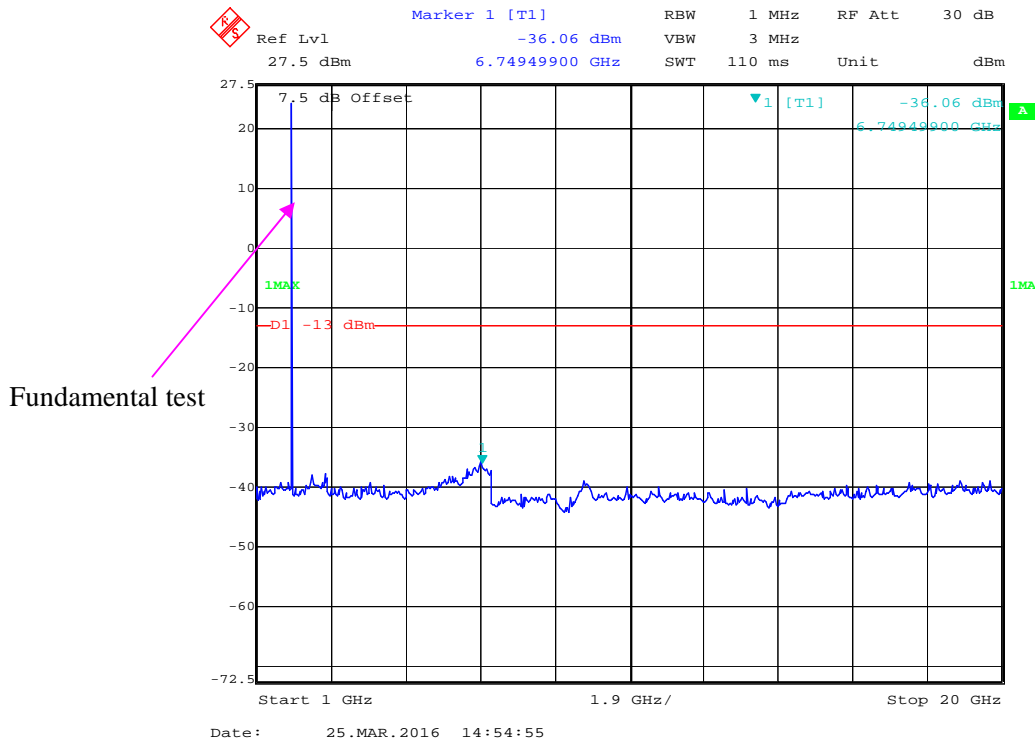


LTE Band 2:

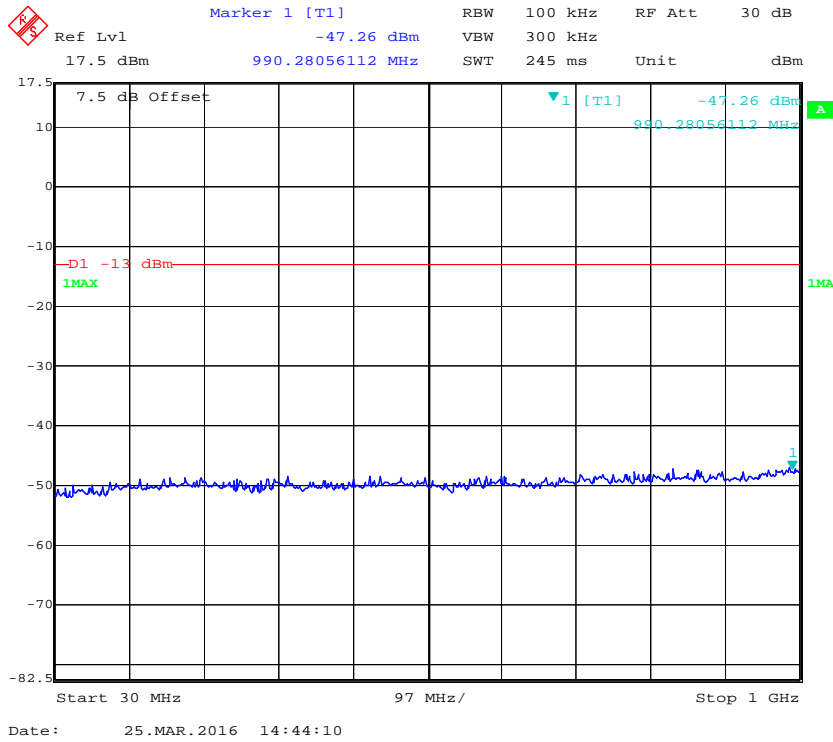
30 MHz - 1 GHz (1.4 MHz, Middle Channel)



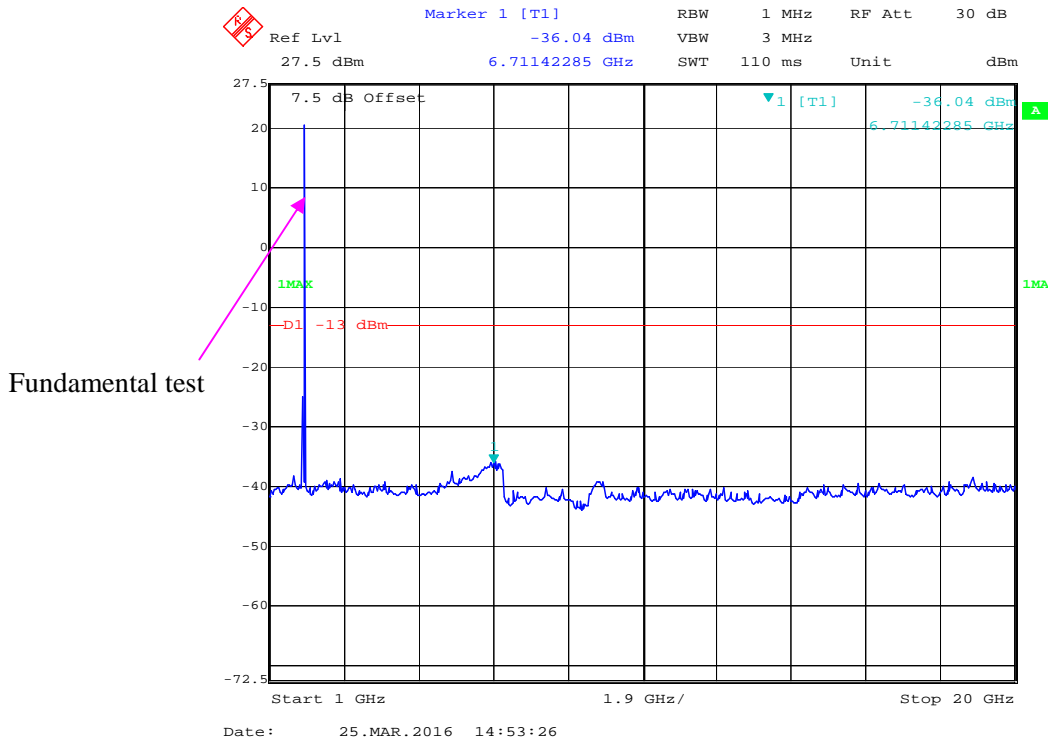
1 GHz - 20 GHz (1.4 MHz, Middle Channel)



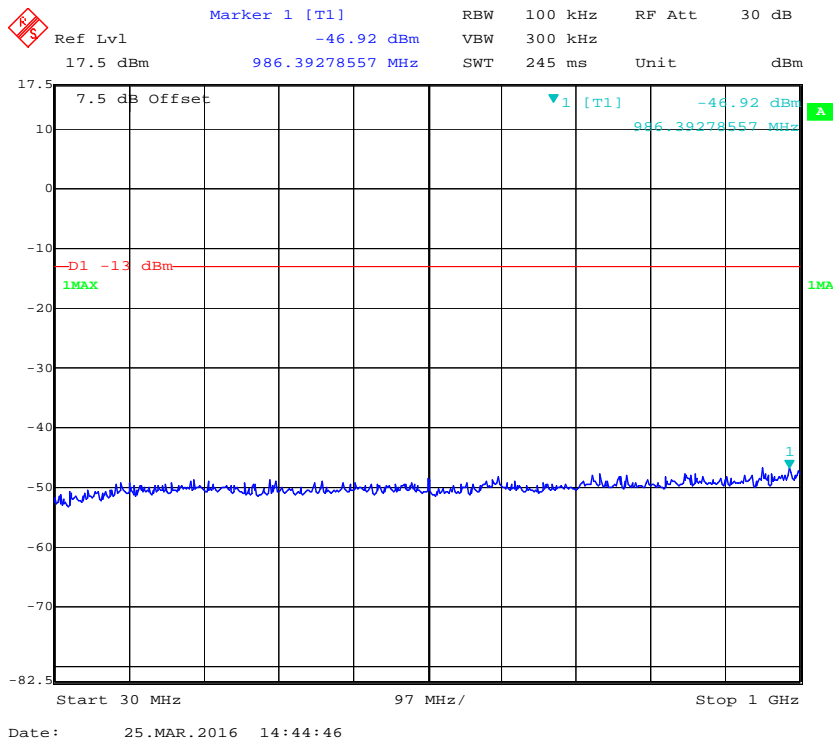
30 MHz - 1 GHz (3.0 MHz, Middle Channel)



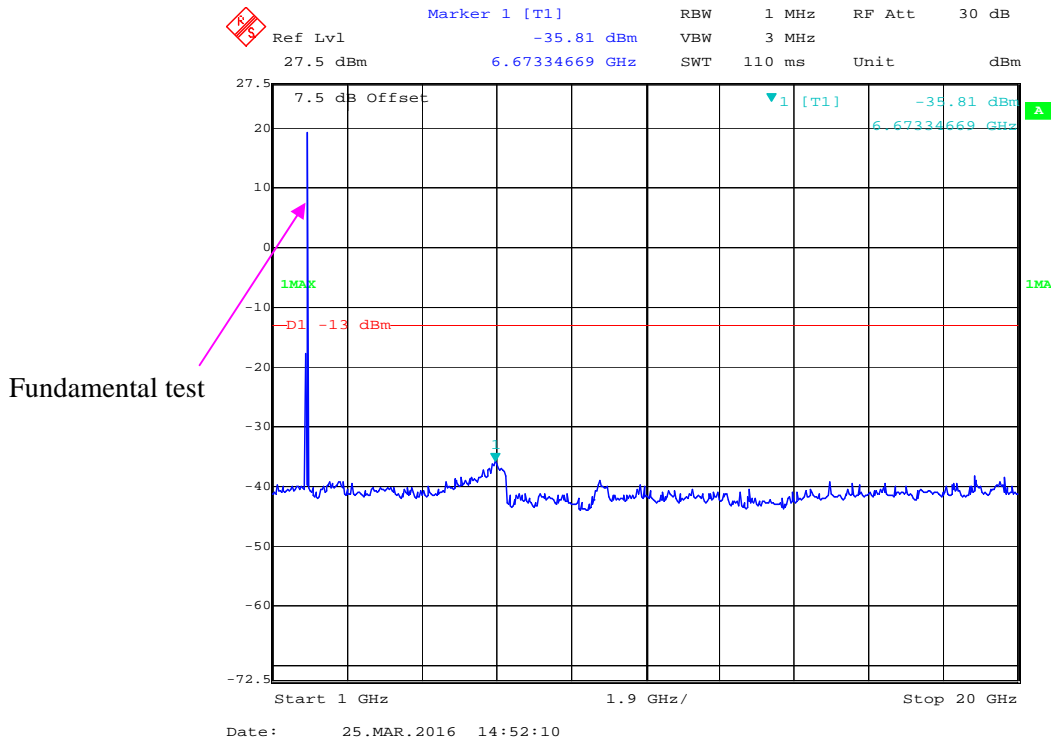
1 GHz - 20 GHz (3.0 MHz, Middle Channel)



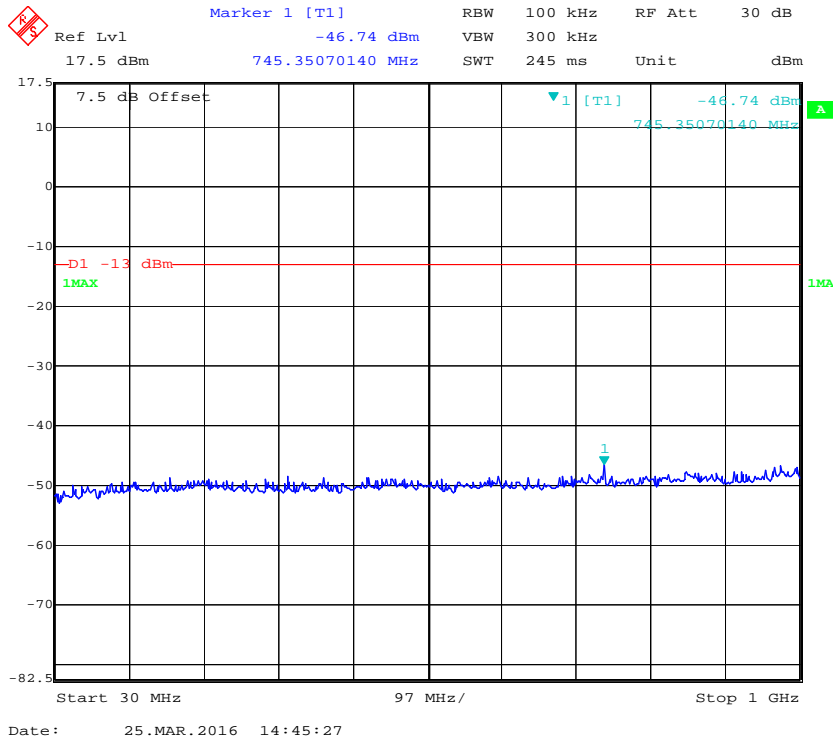
30 MHz - 1 GHz (5.0 MHz, Middle Channel)



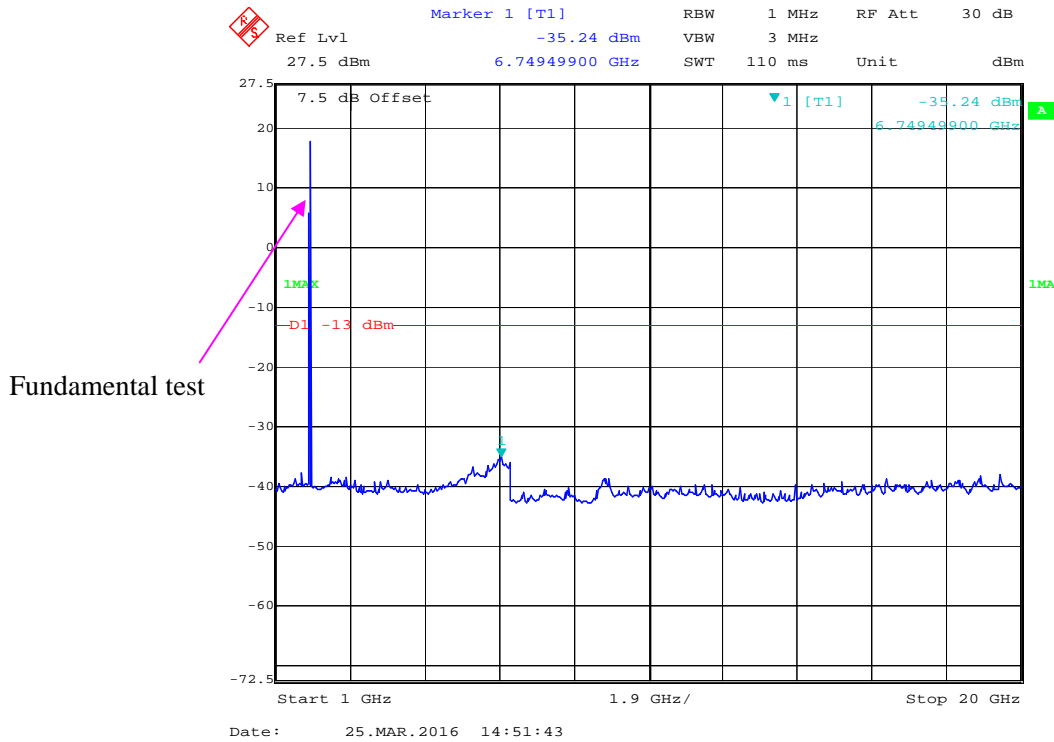
1 GHz – 20 GHz (5.0 MHz, Middle Channel)



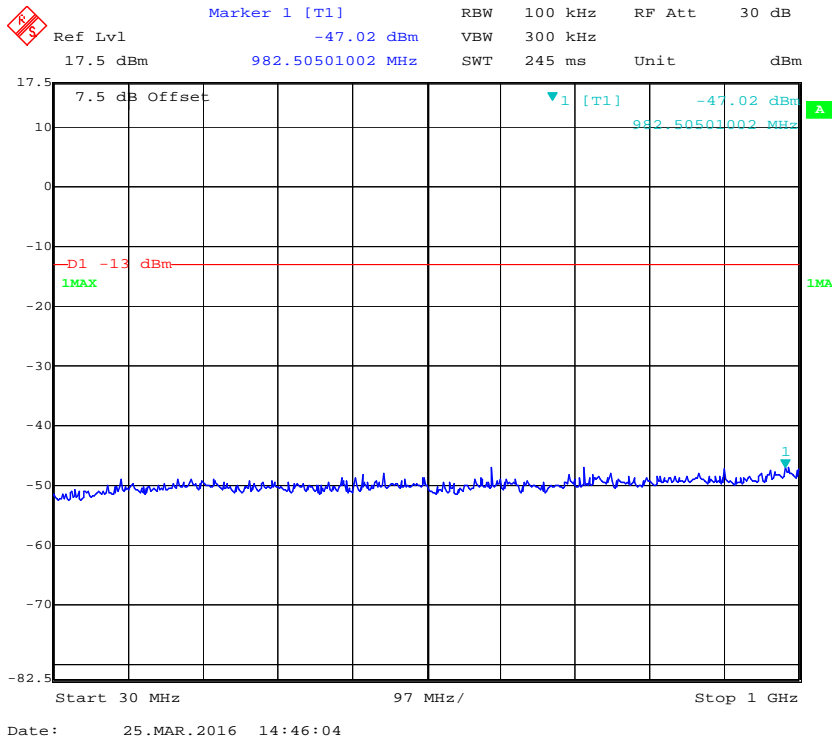
30 MHz - 1 GHz (10.0 MHz, Middle Channel)



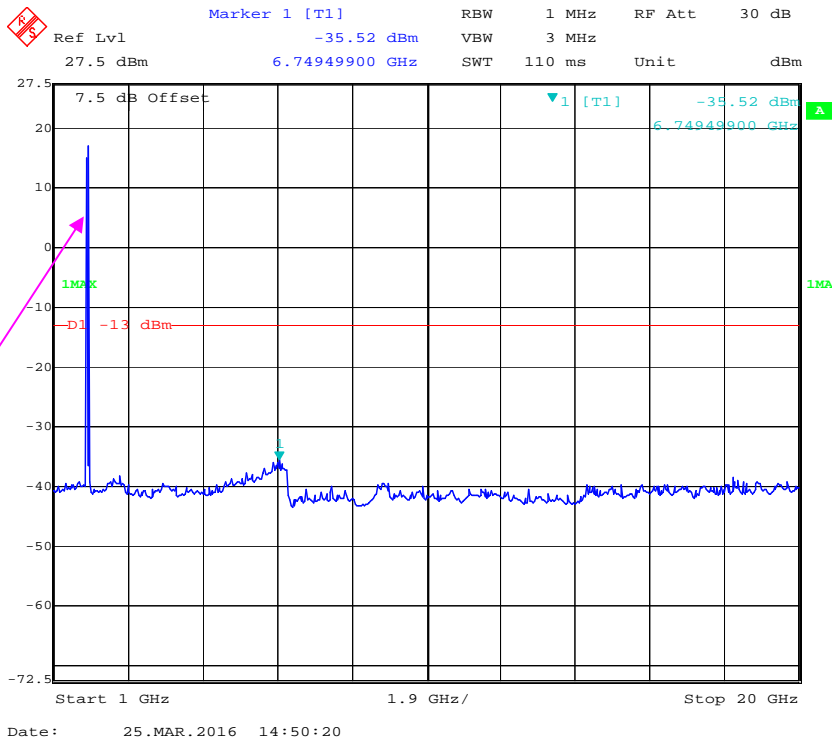
1 GHz - 20 GHz (10.0 MHz, Middle Channel)



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

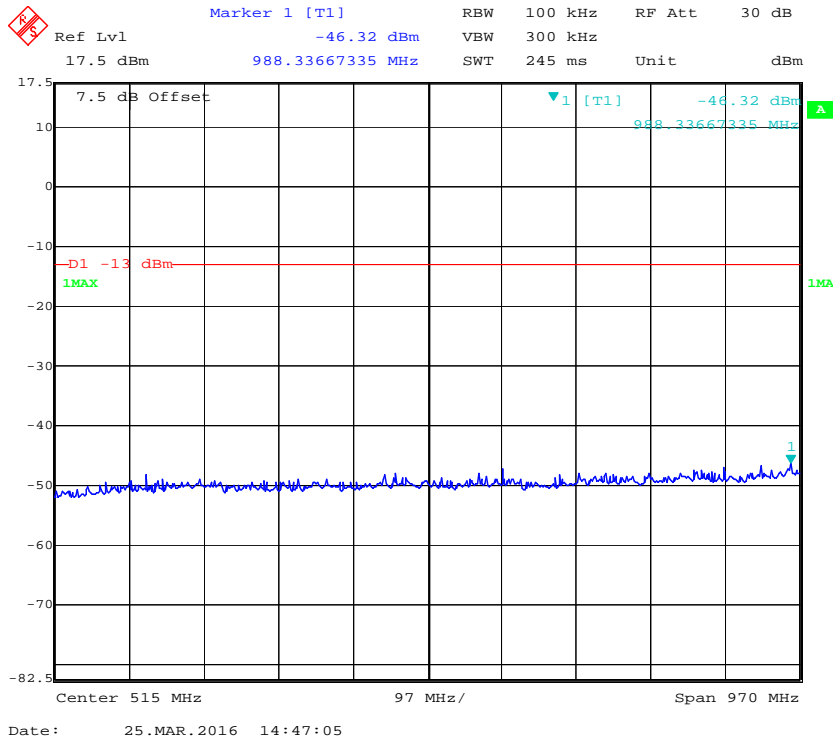


1 GHz - 20 GHz (15.0 MHz, Middle Channel)

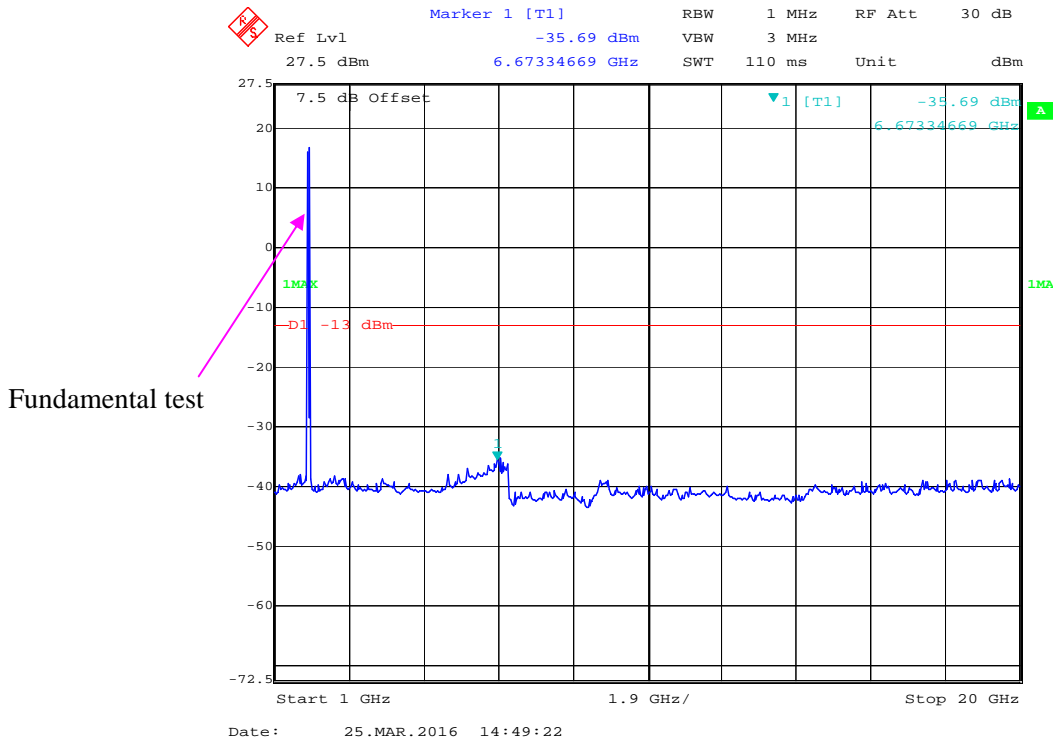


Fundamental test

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

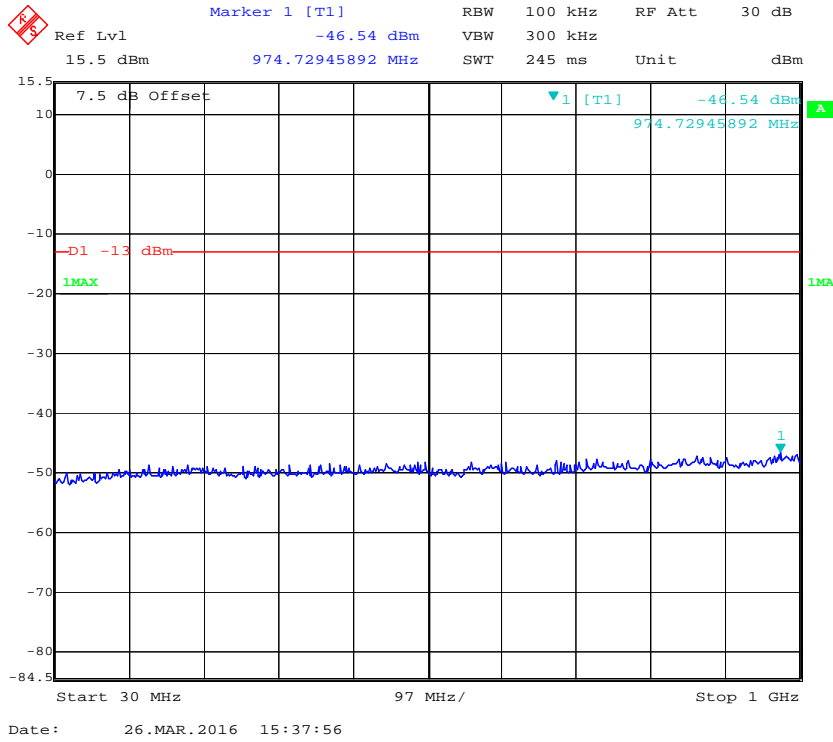


1 GHz - 20 GHz (20.0 MHz, Middle Channel)

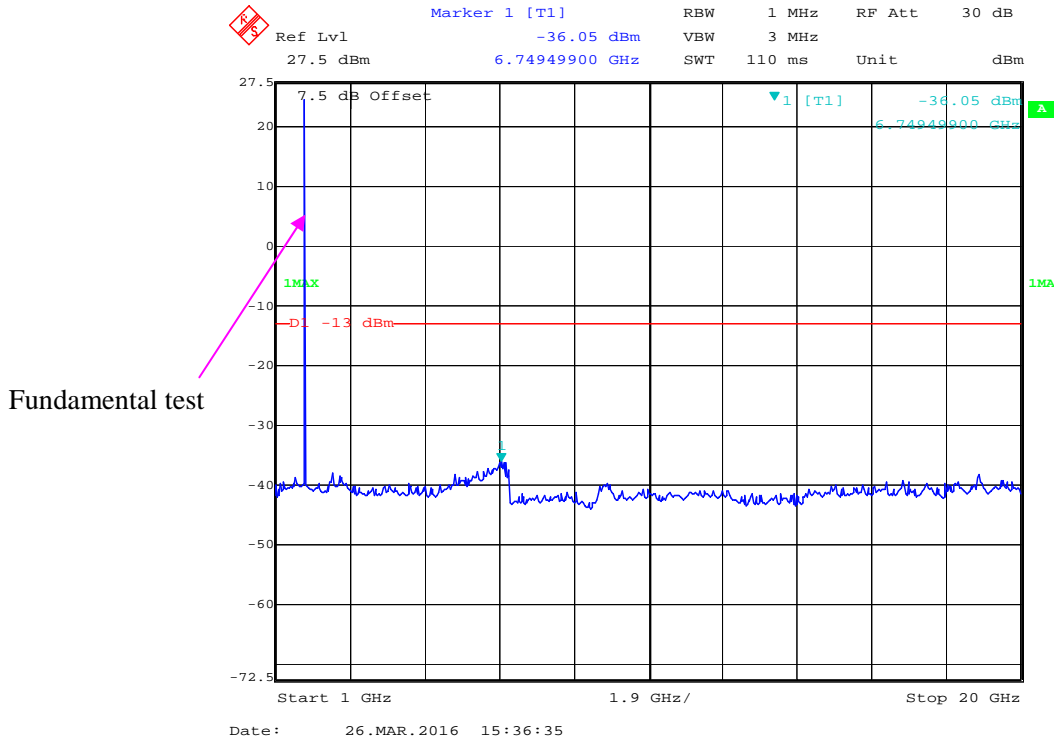


LTE Band 4:

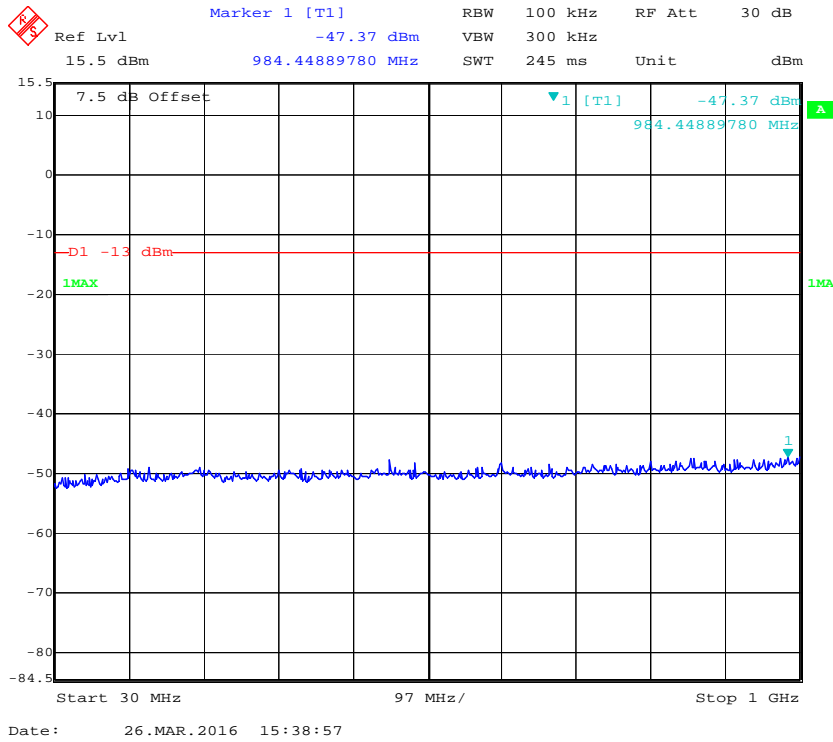
30 MHz - 1 GHz (1.4 MHz, Middle Channel)



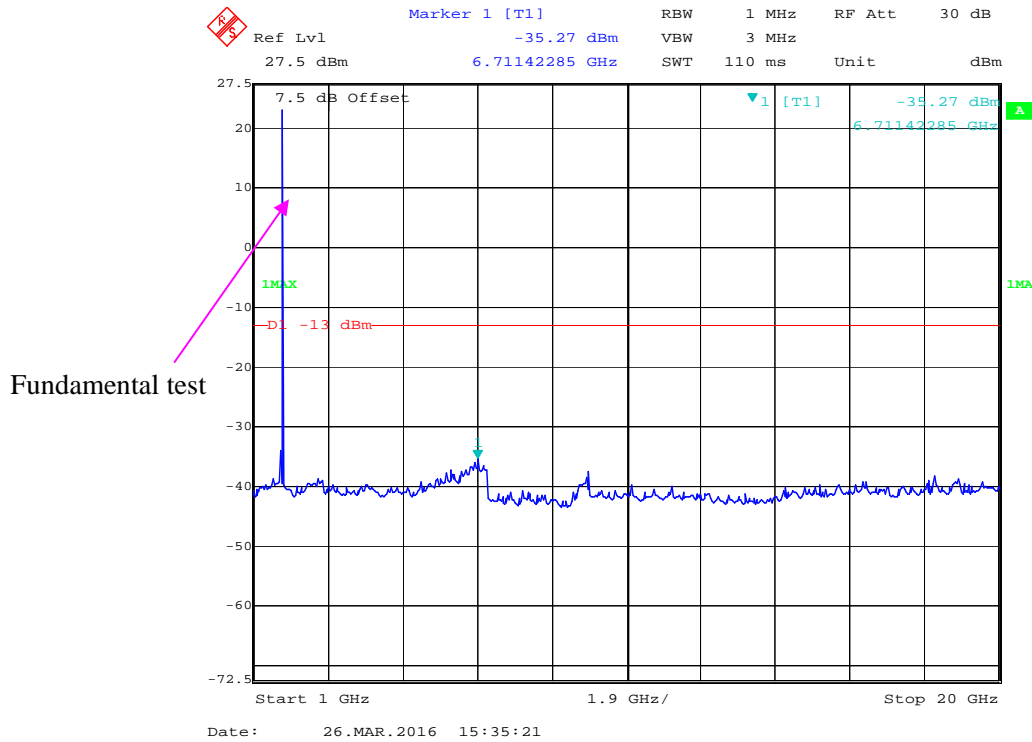
1 GHz - 20 GHz (1.4 MHz, Middle Channel)



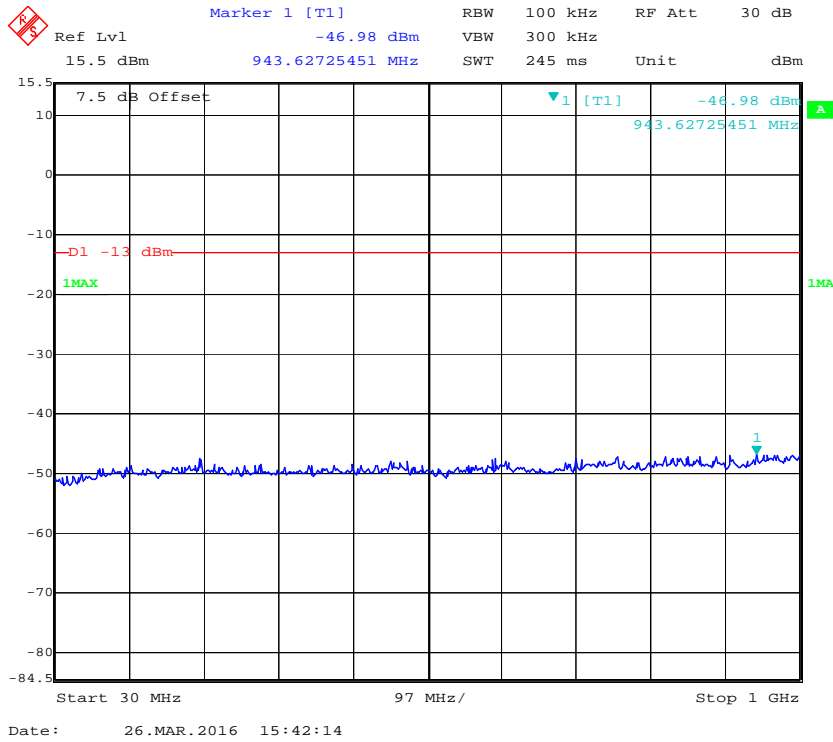
30 MHz - 1 GHz (3.0 MHz, Middle Channel)



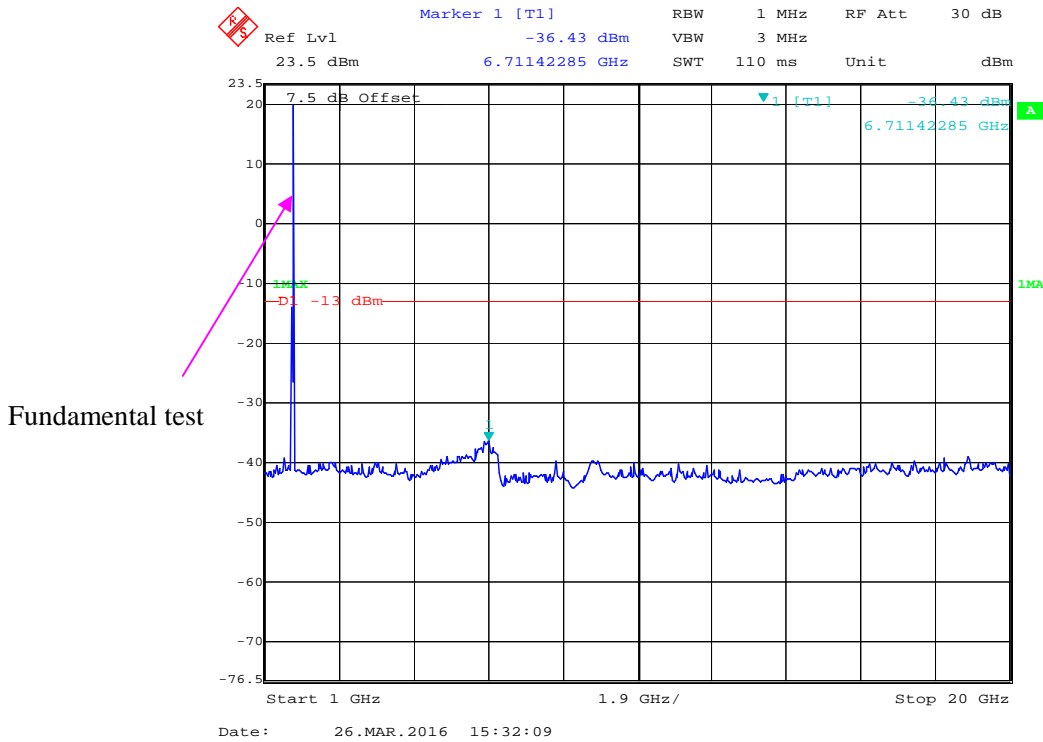
1 GHz – 20 GHz (3.0 MHz, Middle Channel)



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

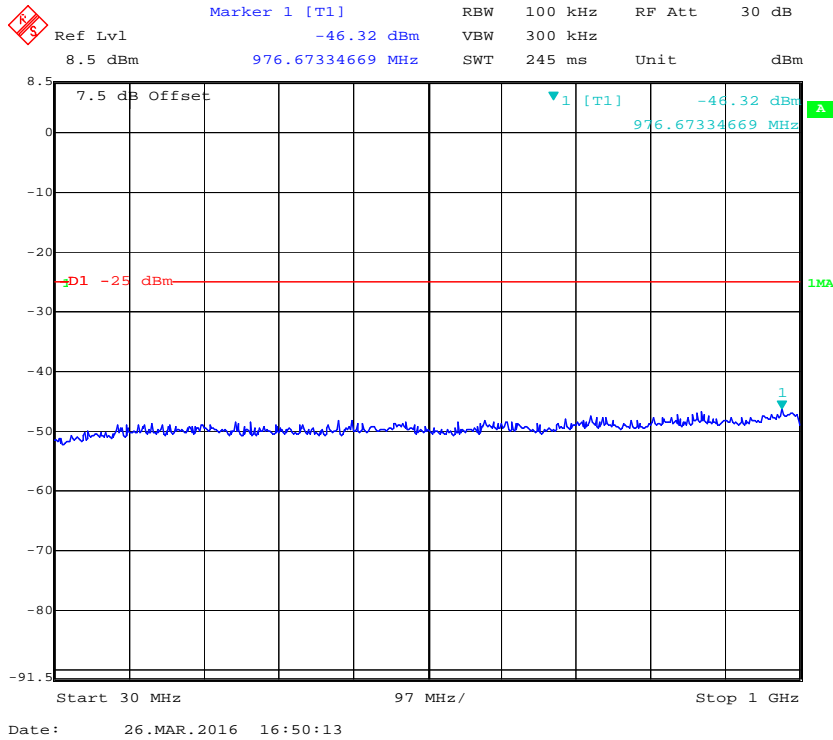


1 GHz - 20 GHz (15.0 MHz, Middle Channel)

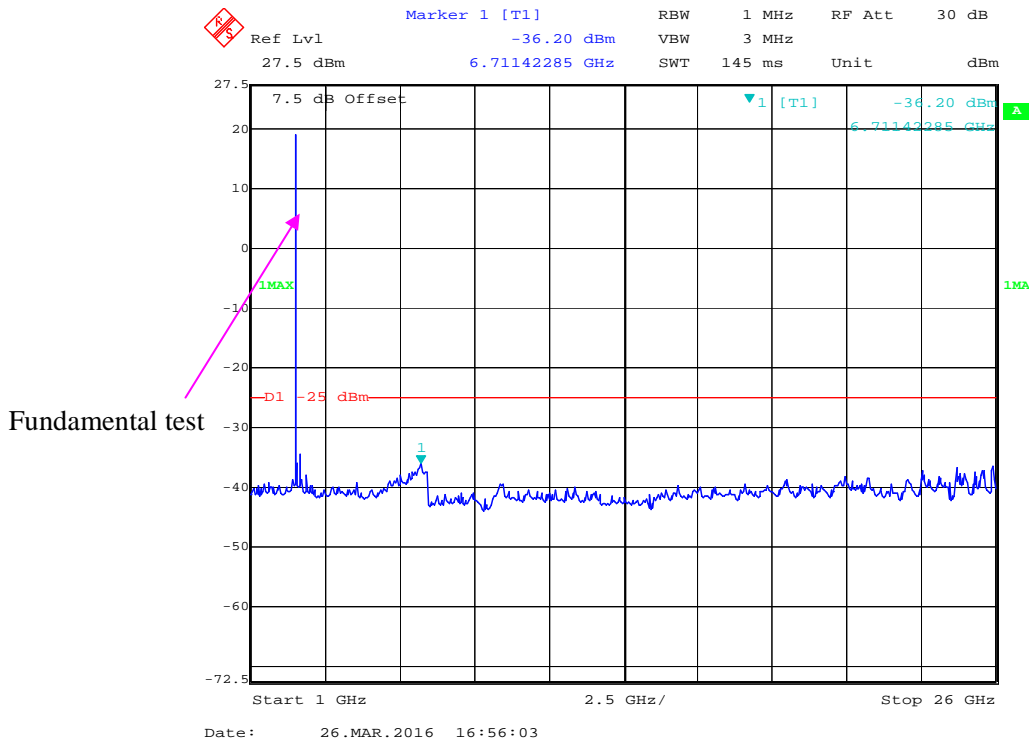


LTE Band 7:

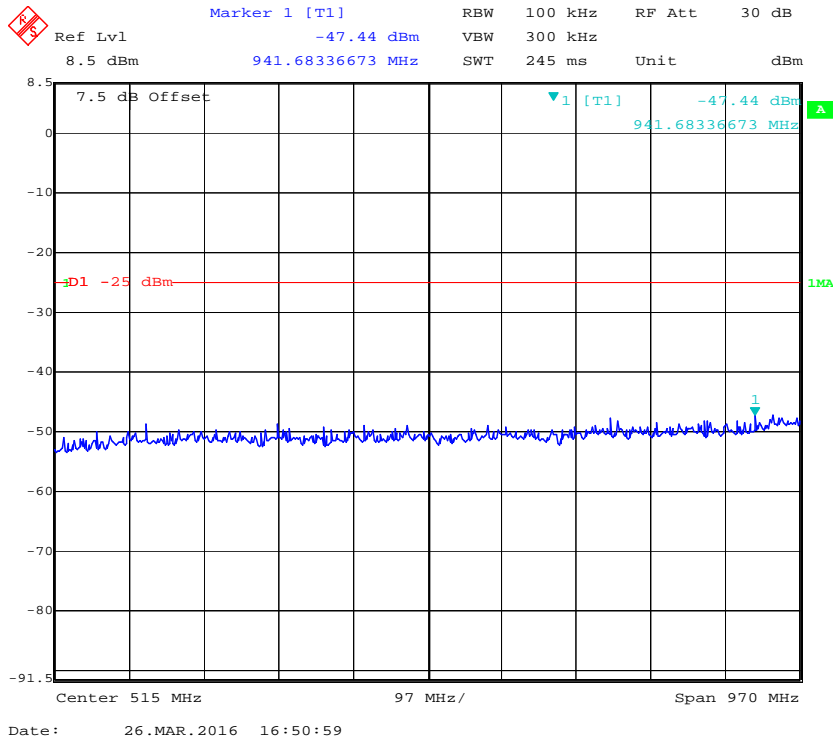
30 MHz - 1 GHz (5.0 MHz, Middle Channel)



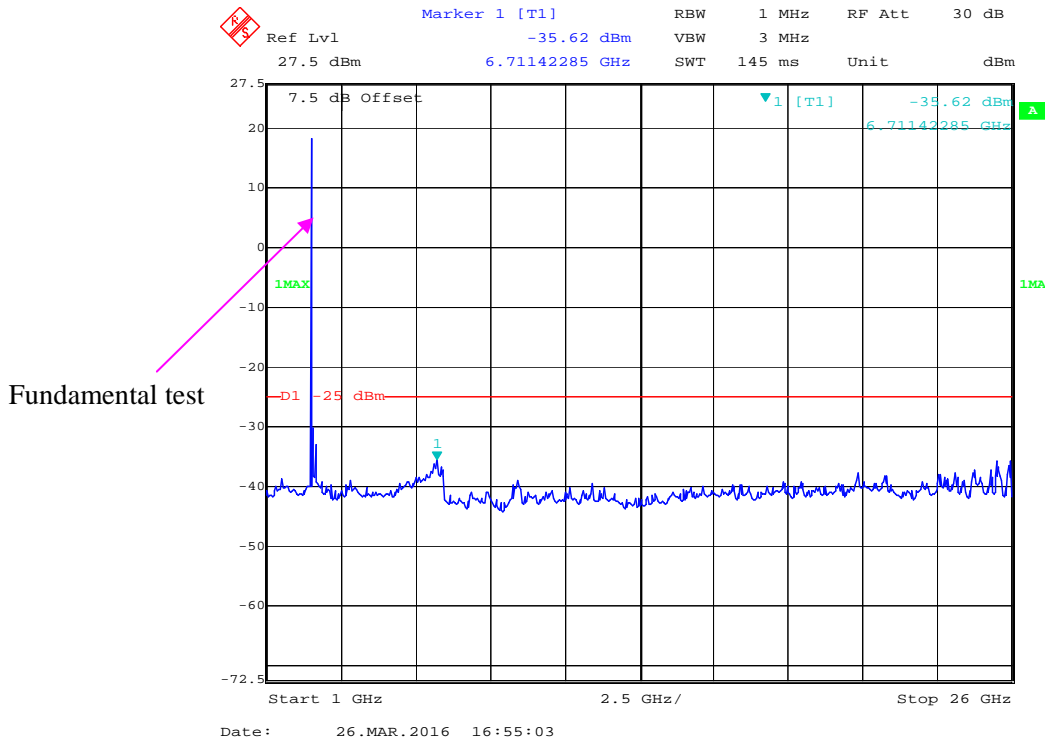
1 GHz - 26 GHz (5.0 MHz, Middle Channel)



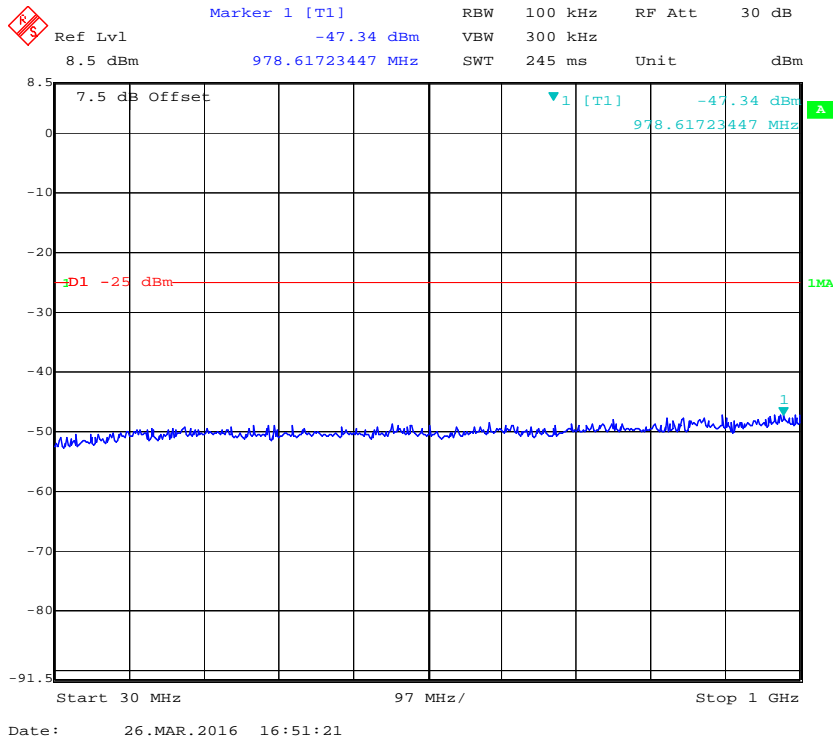
30 MHz - 1 GHz (15.0 MHz, Middle Channel)



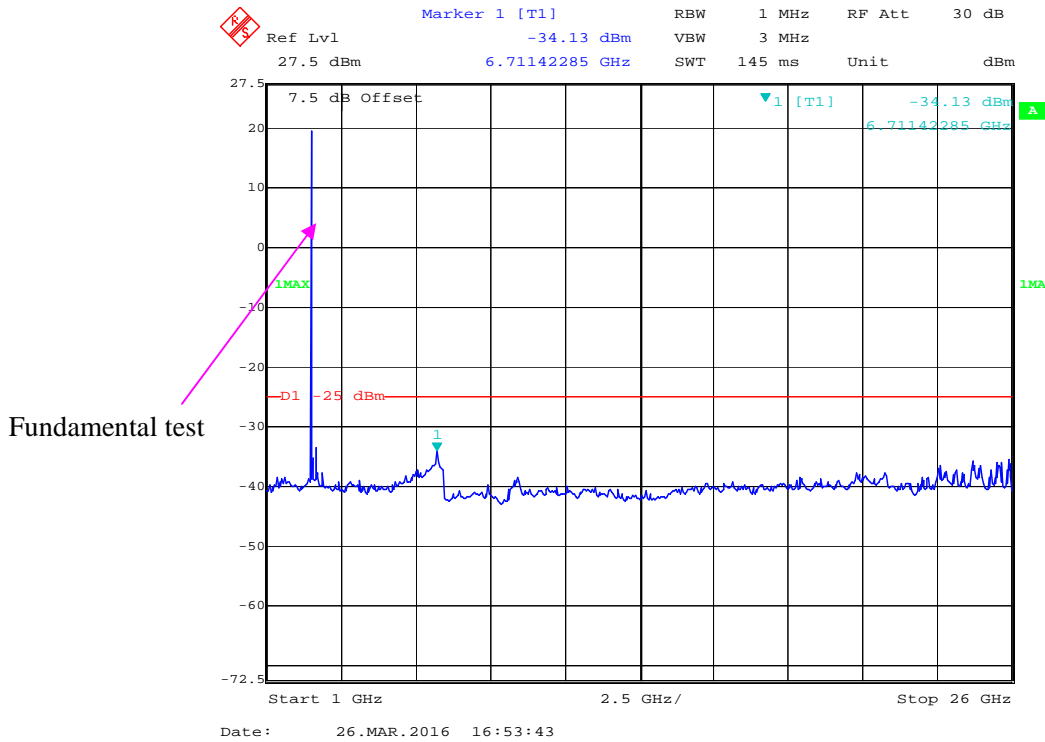
1 GHz - 26 GHz (15.0 MHz, Middle Channel)



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



1 GHz - 26 GHz (20.0 MHz, Middle Channel)



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

Applicable Standards

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

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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Horn Antenna	DRH-118	A052604	2014-12-29	2017-12-28
Sunol Sciences	Bi-log Antenna	JB1	A040904-2	2014-12-07	2017-12-06
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2015-12-11	2016-12-11
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2015-04-23	2016-04-23
HP	Amplifier	HP8447E	1937A01046	2015-05-06	2016-05-06
HP	Signal Generator	HP 8341B	2624A00116	2015-07-02	2016-07-01
COM POWER	Dipole Antenna	AD-100	041000	2015-08-18	2016-08-18
A.H. System	Horn Antenna	SAS-200/571	135	2015-08-18	2018-08-17
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2015-11-03	2016-11-03
Electro-Mechanics	Horn Antenna	3116	9510-2270	2013-10-14	2016-10-13
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	106891	2015-11-23	2016-11-23
R&S	Wideband Radio Communication tester	CMW500	1201.002K50-146520-wh	2015-11-23	2016-11-23
Ducommun technologies	RF Cable	UFA210A-1-4724-30050U	MFR64369223410-001	2015-06-15	2016-06-15
Ducommun technologies	RF Cable	104PEA	218124002	2015-06-15	2016-06-15
Ducommun technologies	RF Cable	RG-214	1	2015-06-15	2016-06-15
Ducommun technologies	RF Cable	RG-214	2	2015-06-15	2016-06-15

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

Test Data**Environmental Conditions**

Temperature:	23 °C
Relative Humidity:	50 %
ATM Pressure:	101.0kPa

The testing was performed by Simon Wang on 2016-03-26.

Test mode: Transmitting

Test mode: Transmitting (Pre-scan with Low, Middle, High channel, and the worse case as below)

30 MHz ~ 10 GHz:

Cellular Band (Part 22H)

Frequency (MHz)	Receiver Reading (dBµV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)			
GSM Mode, Middle channel										
302.57	31.85	116	1.8	H	-65.1	0.36	0	-65.46	-13	52.46
302.57	31.18	248	1.5	V	-65.8	0.36	0	-66.16	-13	53.16
1673.20	61.13	167	2.1	H	-46.3	1.60	6.90	-41.00	-13	28.00
1673.20	68.35	309	1.9	V	-39.5	1.60	6.90	-34.20	-13	21.20
2509.80	65.17	139	2.3	H	-39.4	1.70	8.60	-32.50	-13	19.50
2509.80	68.23	354	1.7	V	-36.7	1.70	8.60	-29.80	-13	16.80
3346.40	49.16	106	1.3	H	-52.3	1.90	9.80	-44.40	-13	31.40
3346.40	45.21	294	1.7	V	-56.8	1.90	9.80	-48.90	-13	35.90
4183.00	42.84	63	1.5	H	-58.5	2.00	9.80	-50.70	-13	37.70
4183.00	42.51	244	2.5	V	-59.3	2.00	9.80	-51.50	-13	38.50
WCDMA Mode, Middle channel										
352.90	31.56	272	1.6	H	-65.4	0.40	0	-65.80	-13	52.80
352.90	31.66	155	1.8	V	-65.3	0.40	0	-65.70	-13	52.70
1673.20	47.82	133	1.0	H	-59.6	1.60	6.90	-54.30	-13	41.30
1673.20	48.81	242	1.6	V	-59.0	1.60	6.90	-53.70	-13	40.70
2509.80	46.75	311	1.7	H	-57.8	1.70	8.60	-50.90	-13	37.90
2509.80	50.24	11	1.0	V	-54.7	1.70	8.60	-47.80	-13	34.80
3346.40	44.52	99	2.1	H	-56.9	1.90	9.80	-49.00	-13	36.00
3346.40	43.47	26	2.0	V	-58.6	1.90	9.80	-50.70	-13	37.70
4183.00	44.64	319	1.6	H	-56.7	2.00	9.80	-48.90	-13	35.90
4183.00	43.06	300	1.4	V	-58.7	2.00	9.80	-50.90	-13	37.90

30 MHz ~ 20 GHz:

PCS Band (Part 24E)

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)			
GSM Mode, Low channel										
302.57	31.61	223	1.1	H	-65.4	0.36	0	-65.76	-13	52.76
302.57	31.29	21	1.1	V	-65.7	0.36	0	-66.06	-13	53.06
3700.4	45.13	6	1.3	H	-54.3	1.90	9.90	-46.30	-13	33.30
3700.4	44.33	273	1.6	V	-54.7	1.90	9.90	-46.70	-13	33.70
WCDMA Mode, Low channel										
436.90	30.42	56	2.4	H	-66.6	0.44	0	-67.04	-13	54.04
436.90	31.87	241	1.1	V	-65.1	0.44	0	-65.54	-13	52.54
3704.80	43.16	197	2.4	H	-56.3	1.90	9.90	-48.30	-13	35.30
3704.80	42.76	54	1.6	V	-56.3	1.90	9.90	-48.30	-13	35.30

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

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)			
Band 2										
389.20	31.06	111	1.0	H	-65.9	0.42	0	-66.32	-13	53.32
389.20	31.19	275	1.7	V	-65.8	0.42	0	-66.22	-13	53.22
351.60	31.24	229	1.8	H	-65.8	0.40	0	-66.20	-13	53.20
351.60	31.12	55	2.4	V	-65.9	0.40	0	-66.30	-13	53.30
3760.00	43.61	12	1.3	H	-55.9	1.90	9.90	-47.90	-13	34.90
3760.00	41.51	280	2.1	V	-57.6	1.90	9.90	-49.60	-13	36.60
Band 4										
389.20	31.57	156	1.6	H	-65.4	0.42	0	-65.82	-13	52.82
389.20	31.39	314	2.4	V	-65.6	0.42	0	-66.02	-13	53.02
462.30	31.62	174	2.3	H	-65.4	0.47	0	-65.87	-13	52.87
462.30	31.87	104	1.9	V	-65.1	0.47	0	-65.57	-13	52.57
3465.00	42.13	212	1.9	H	-53.4	1.90	10.00	-45.30	-13	32.30
3465.00	41.78	243	1.2	V	-53.9	1.90	10.00	-45.80	-13	32.80
Band 7										
389.20	31.45	152	1.0	H	-65.5	0.42	0	-65.92	-25	40.92
389.20	31.19	315	2.4	V	-65.8	0.42	0	-66.22	-25	41.22
358.90	31.06	202	1.0	H	-65.9	0.40	0	-66.30	-25	41.30
358.90	31.29	225	2.4	V	-65.7	0.40	0	-66.10	-25	41.10
3465.00	40.45	338	1.2	H	-55.1	1.90	10.00	-47.0	-25	22.00
3465.00	41.67	9	1.2	V	-54.0	1.90	10.00	-45.9	-25	20.90

Note:

- 1) Absolute Level = SG Level - Cable loss + Antenna Gain
- 2) Margin = Limit- Absolute Level

FCC §22.917(a) & §24.238(a) & §27.53 - 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.

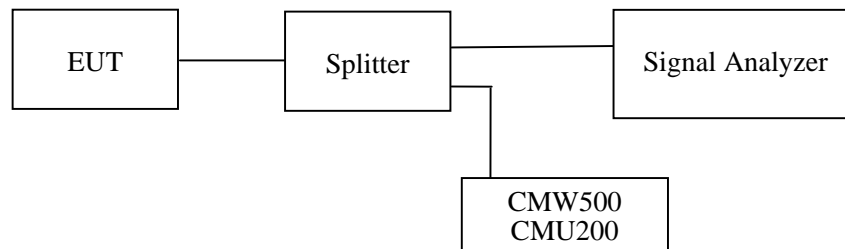
According to FCC §27.53, the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2015-12-11	2016-12-11
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	106891	2015-11-23	2016-11-23
R&S	Wideband Radio Communication tester	CMW500	1201.002K50-146520-wh	2015-11-23	2016-11-23
Ducommun technologies	RF Cable	RG-214	4	2015-06-15	2016-06-15
WEINSCHL	6dB Attenuator	1012	30187	2015-06-18	2016-06-18

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

Test Data

Environmental Conditions

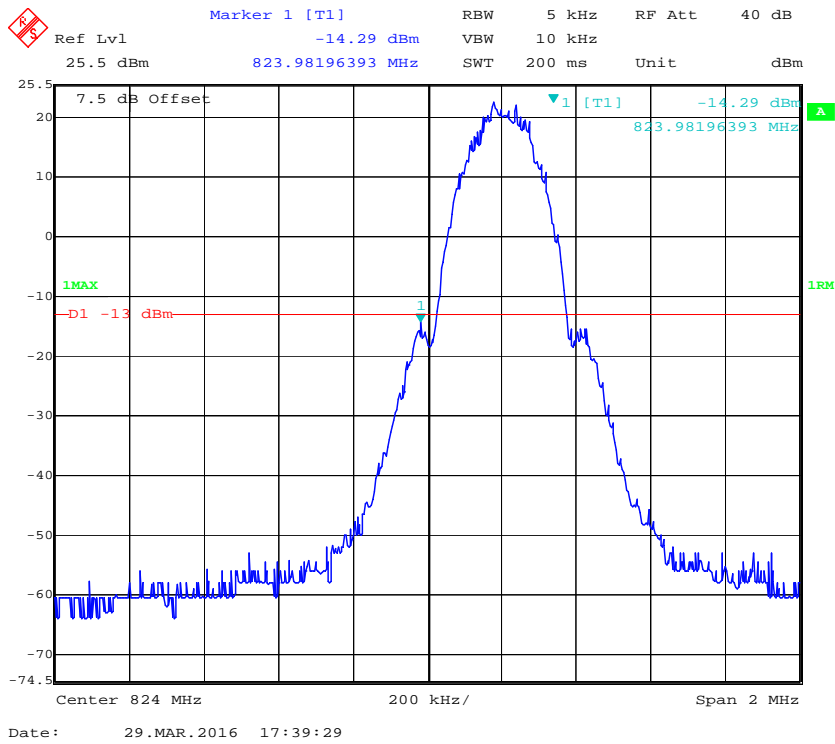
Temperature:	21~25 °C
Relative Humidity:	51~55 %
ATM Pressure:	100.5~101.0kPa

The testing was performed by Simon Wang from 2016-03-18 to 2016-03-30.

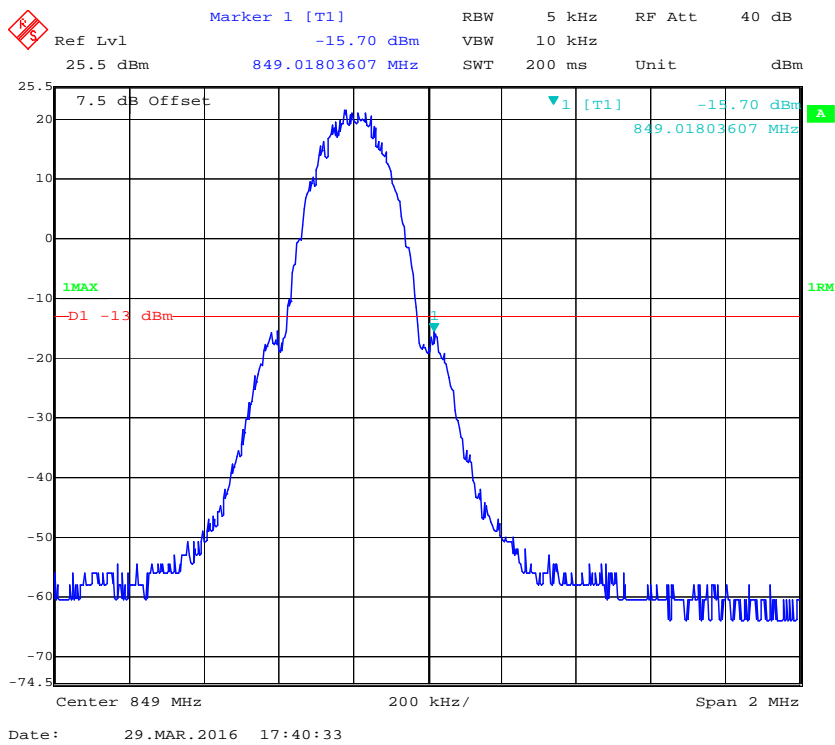
EUT operation mode: Transmitting

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

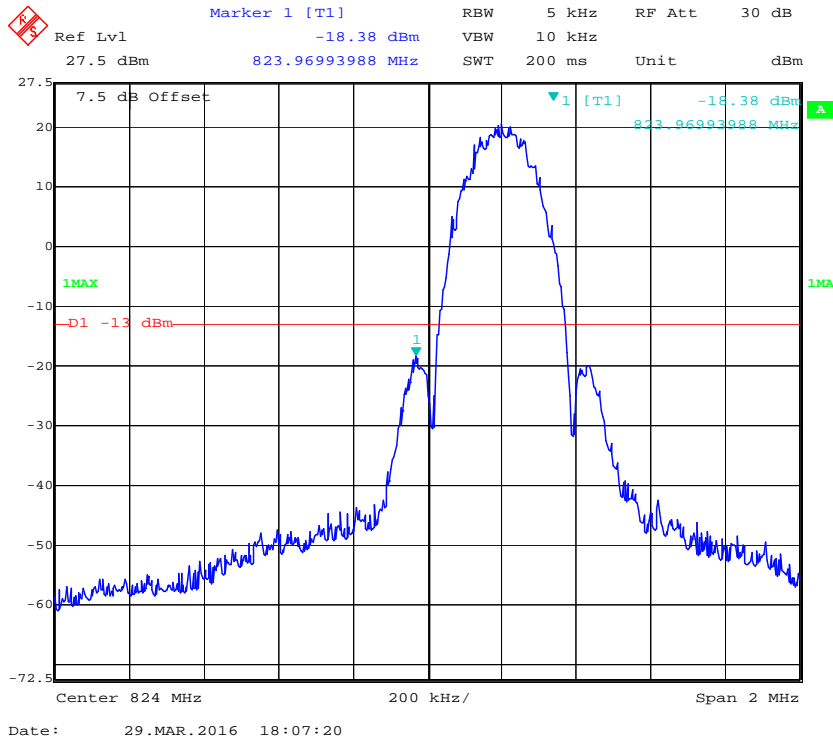
Cellular Band, Left Band Edge for GSM (GMSK) Mode



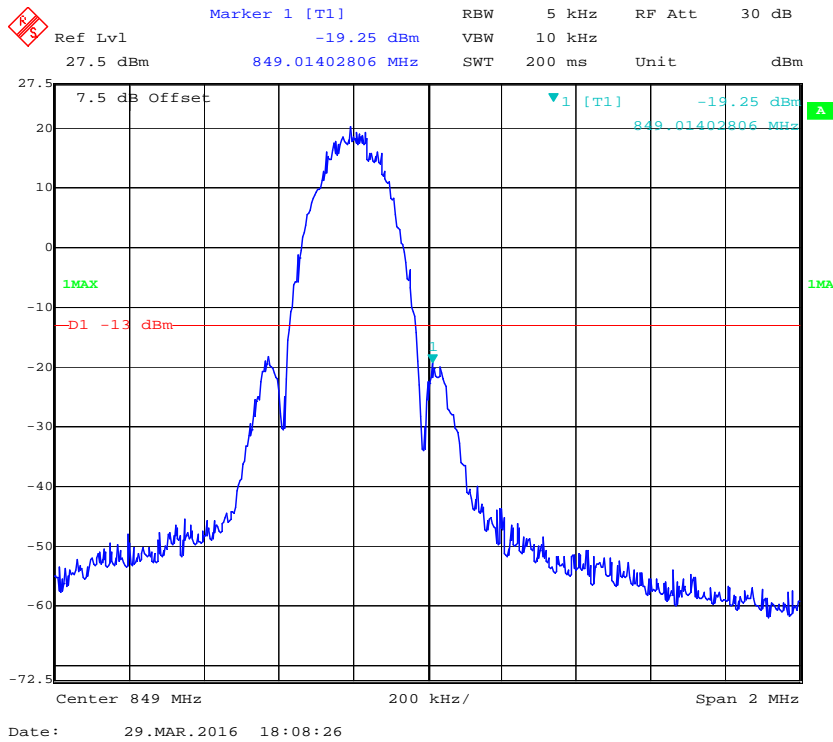
Cellular Band, Right Band Edge for GSM (GMSK) Mode



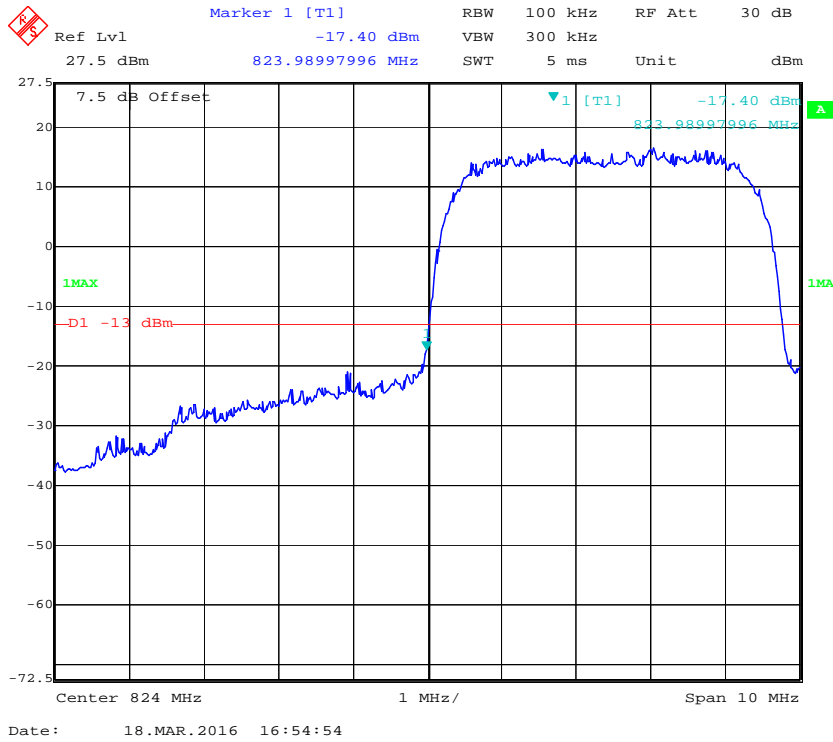
Cellular Band, Left Band Edge for EGPRS Mode



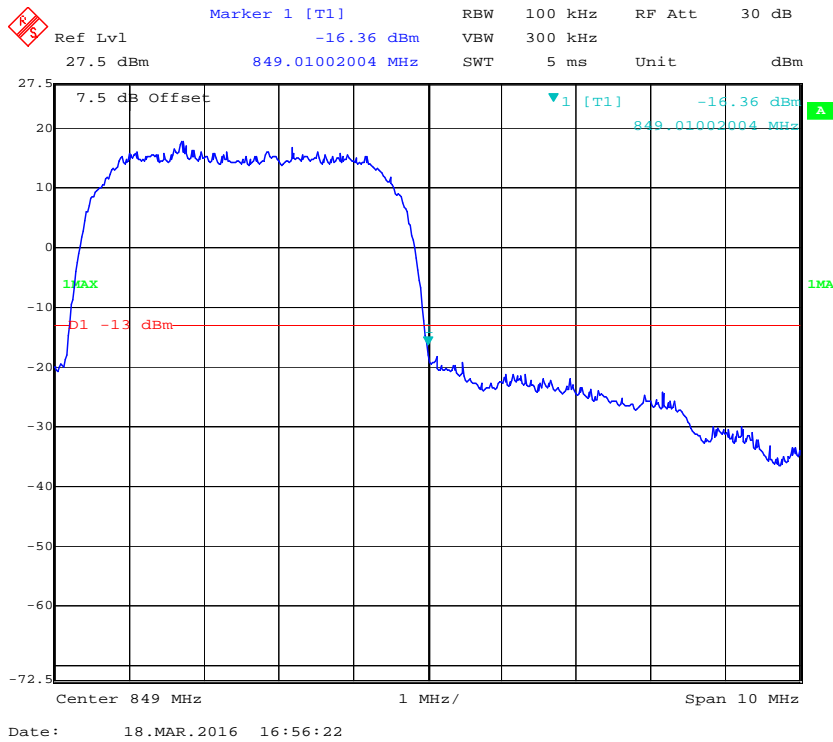
Cellular Band, Right Band Edge for EGPRS Mode



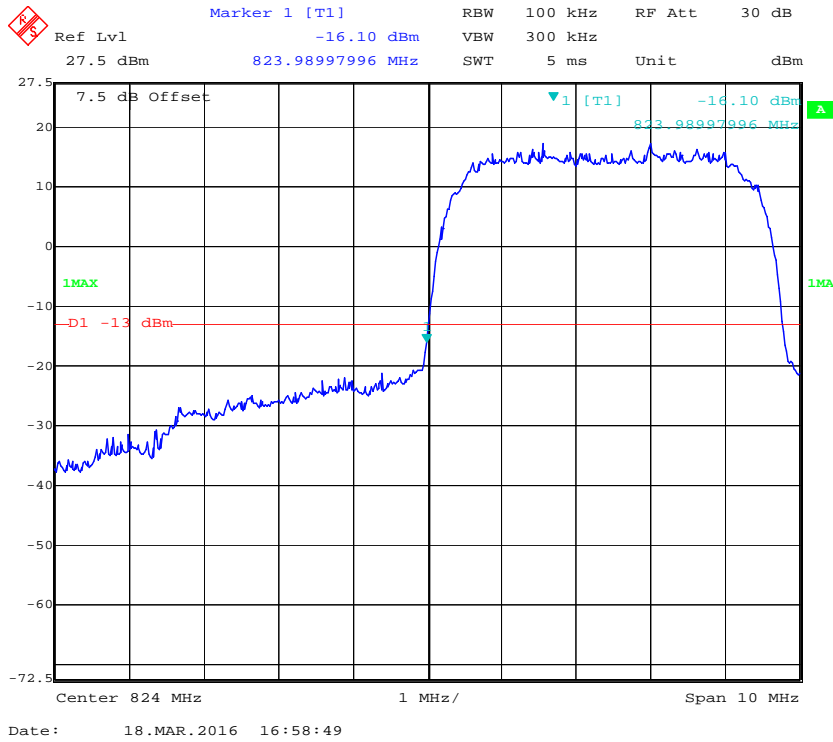
Cellular Band, Left Band Edge for RMC (BPSK) Mode



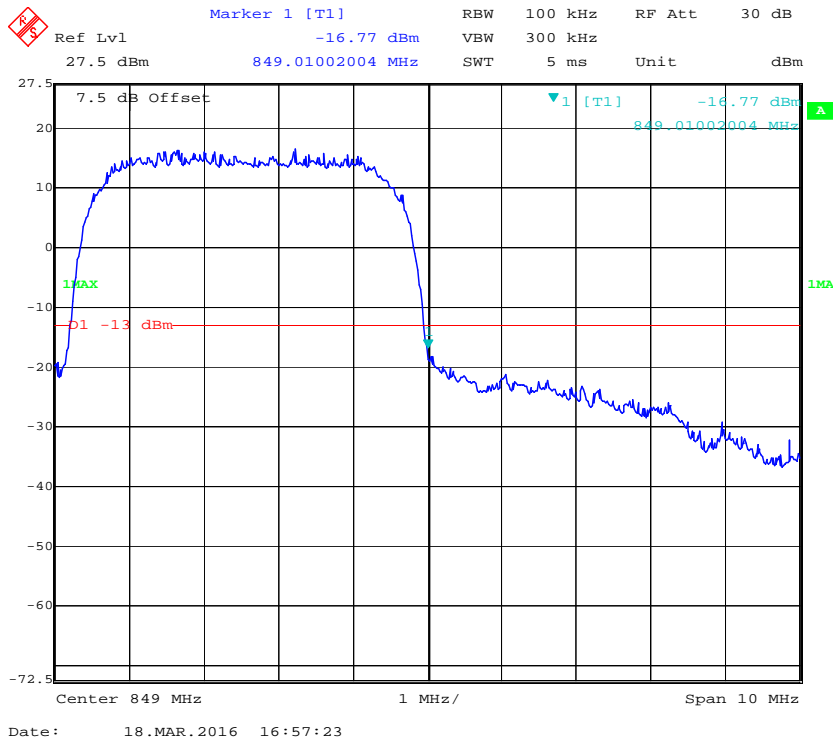
Cellular Band, Right Band Edge for RMC (BPSK) Mode



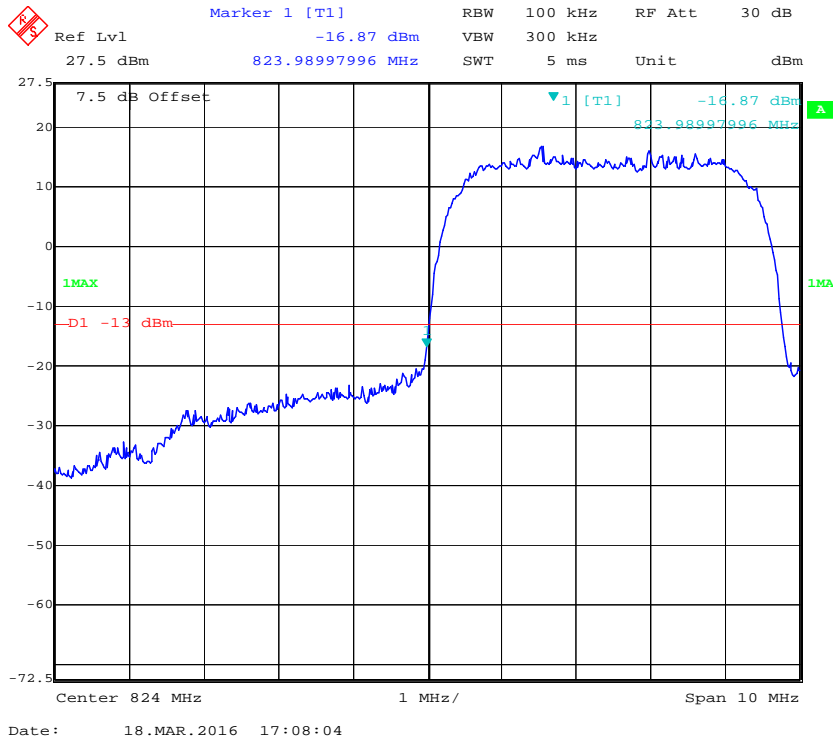
Cellular Band, Left Band Edge for HSDPA (16QAM) Mode



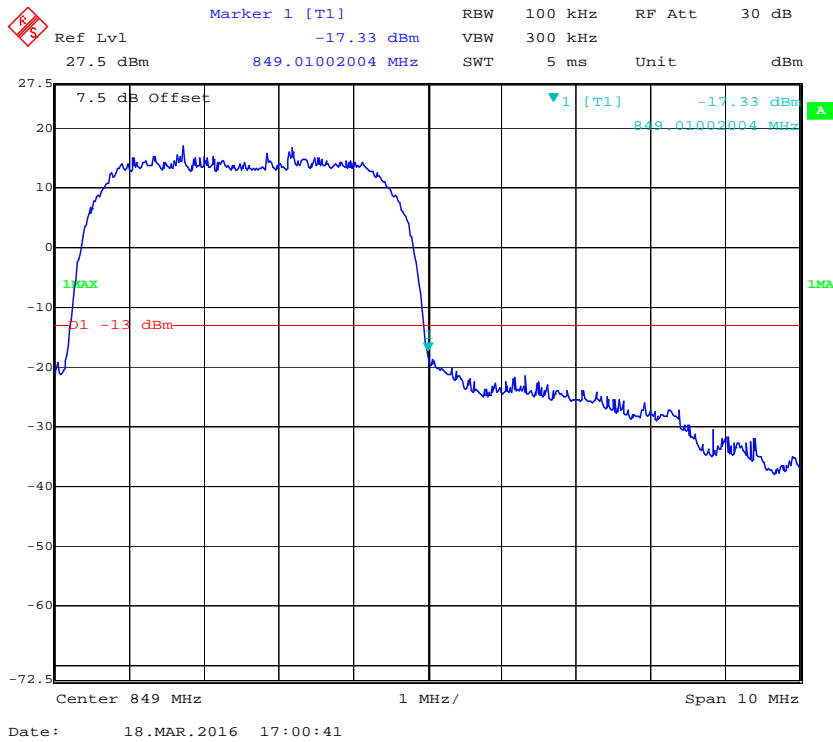
Cellular Band, Right Band Edge for HSDPA (16QAM) Mode



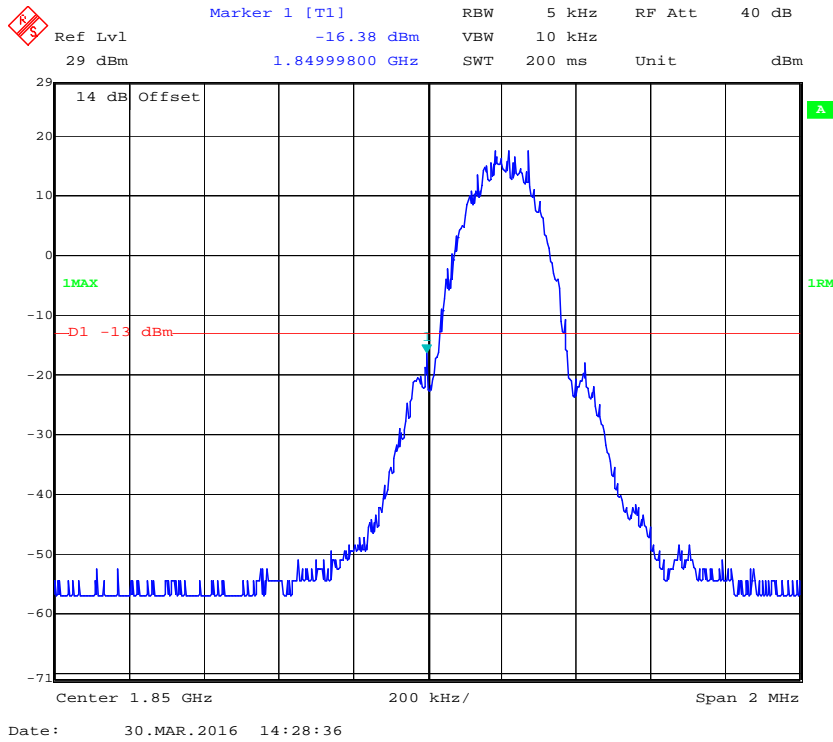
Cellular Band, Left Band Edge for HSUPA (BPSK) Mode



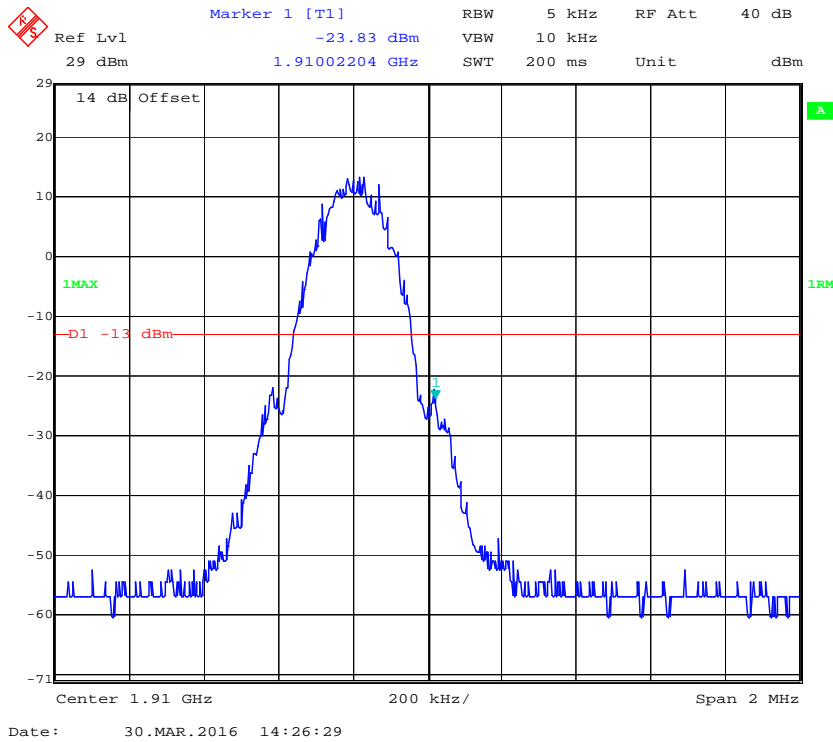
Cellular Band, Right Band Edge for HSUPA (BPSK) Mode



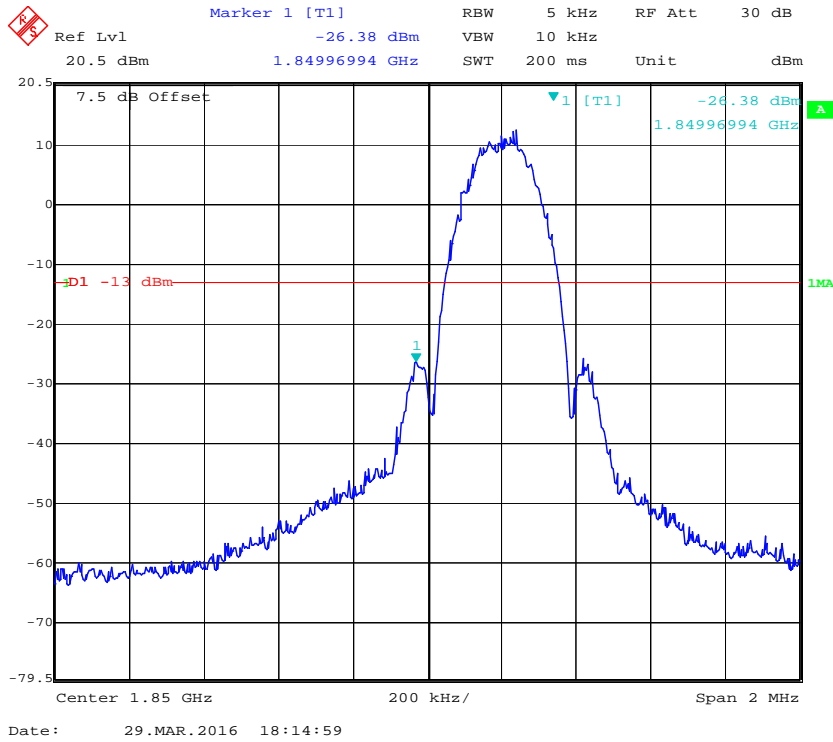
PCS Band, Left Band Edge for GSM (GMSK) Mode



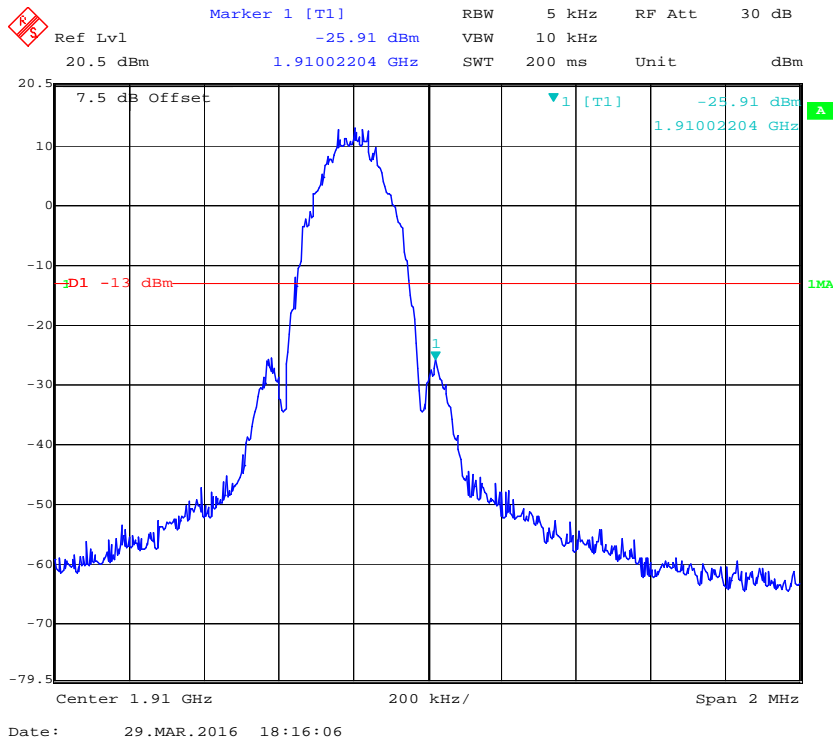
PCS Band, Right Band Edge for GSM (GMSK) Mode



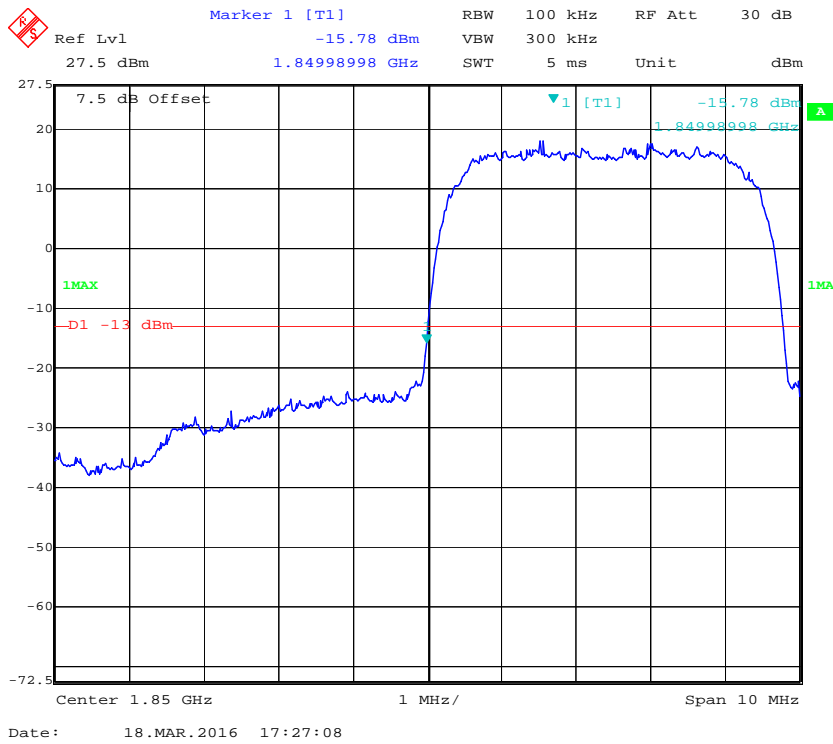
PCS Band, Left Band Edge for EGPRS Mode



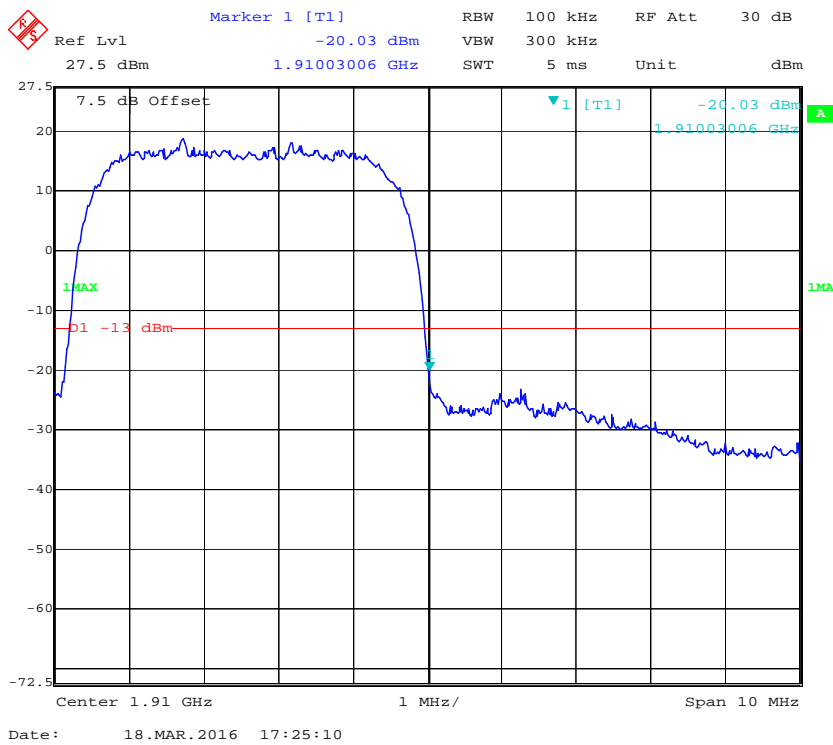
PCS Band, Right Band Edge for EGPRS Mode



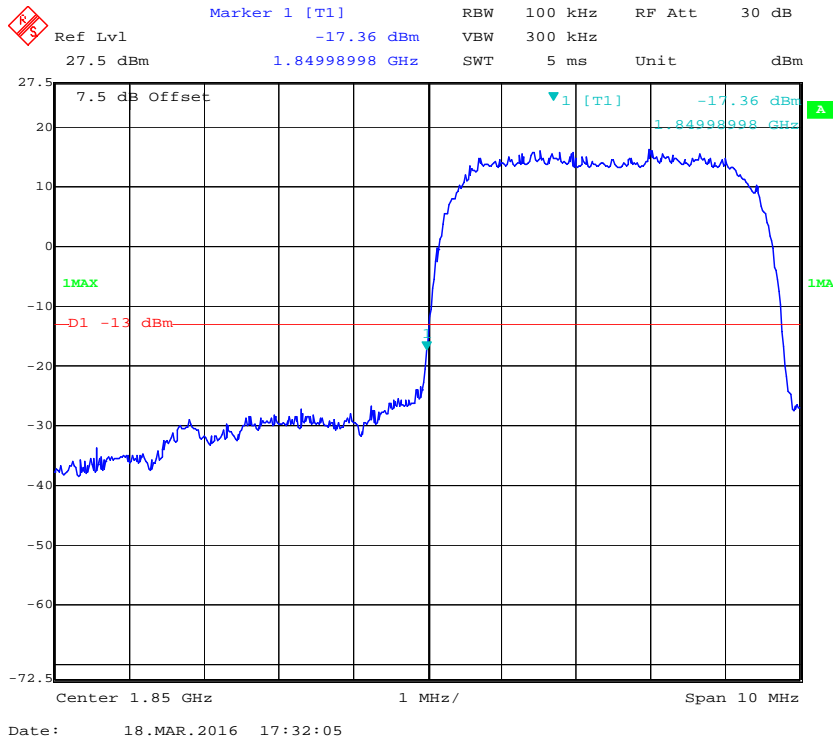
PCS Band, Left Band Edge for RMC (BPSK) Mode



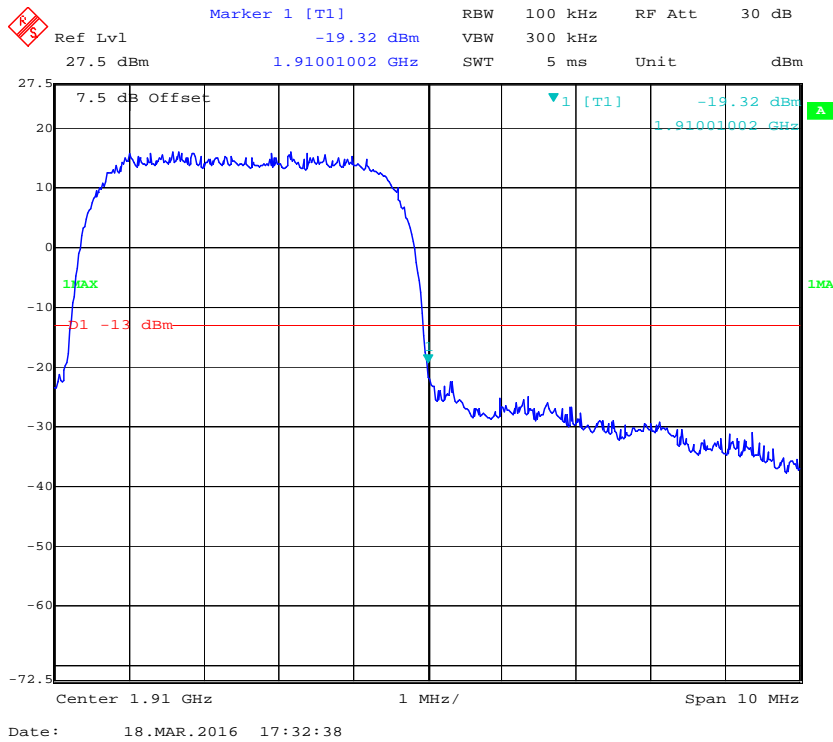
PCS Band, Right Band Edge for RMC (BPSK) Mode



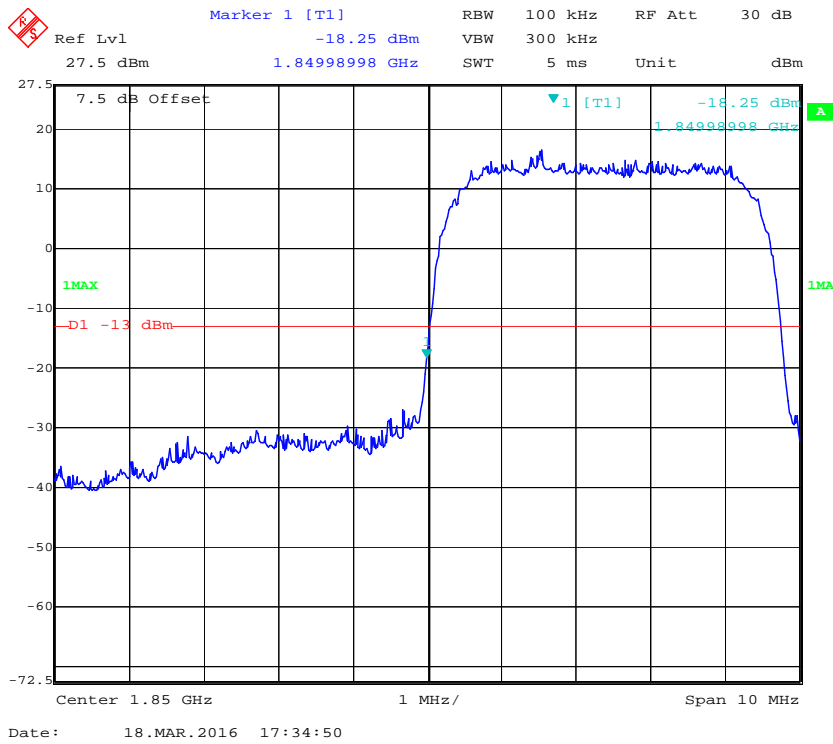
PCS Band, Left Band Edge for HSDPA (16QAM) Mode



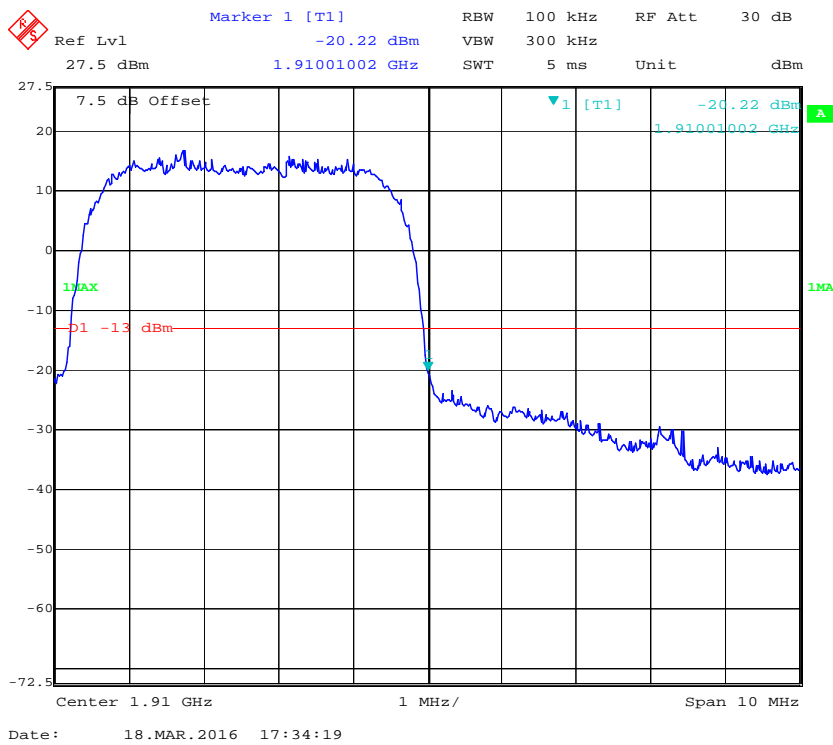
PCS Band, Right Band Edge for HSDPA (16QAM) Mode



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

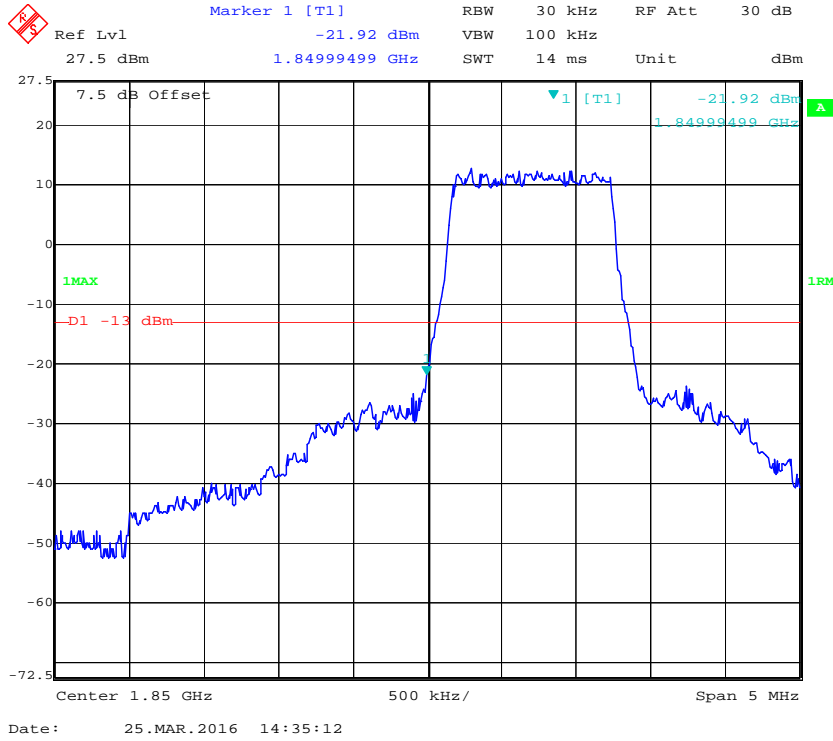


PCS Band, Right Band Edge for HSUPA (BPSK) Mode

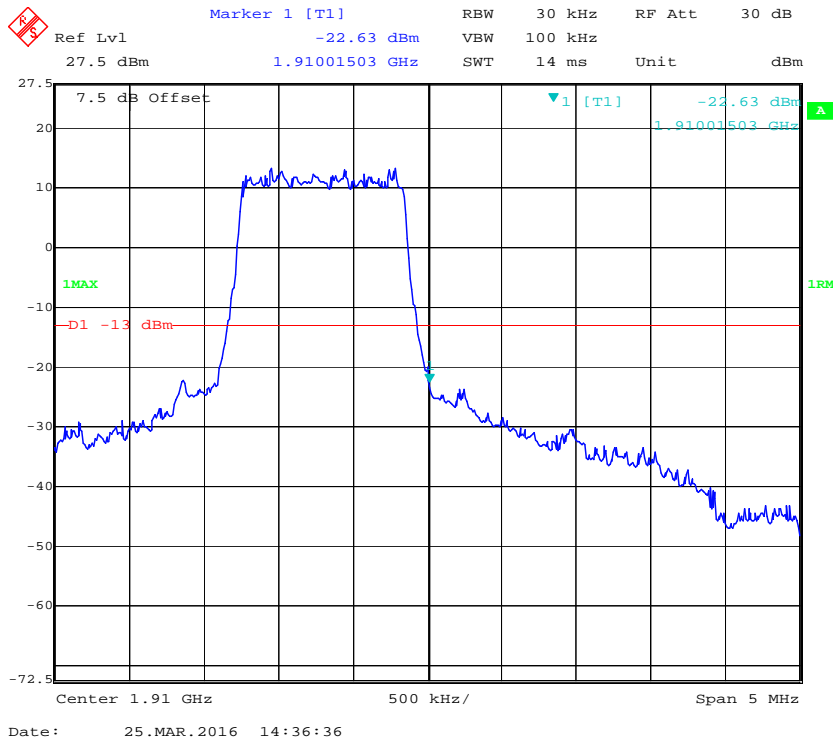


Band 2:

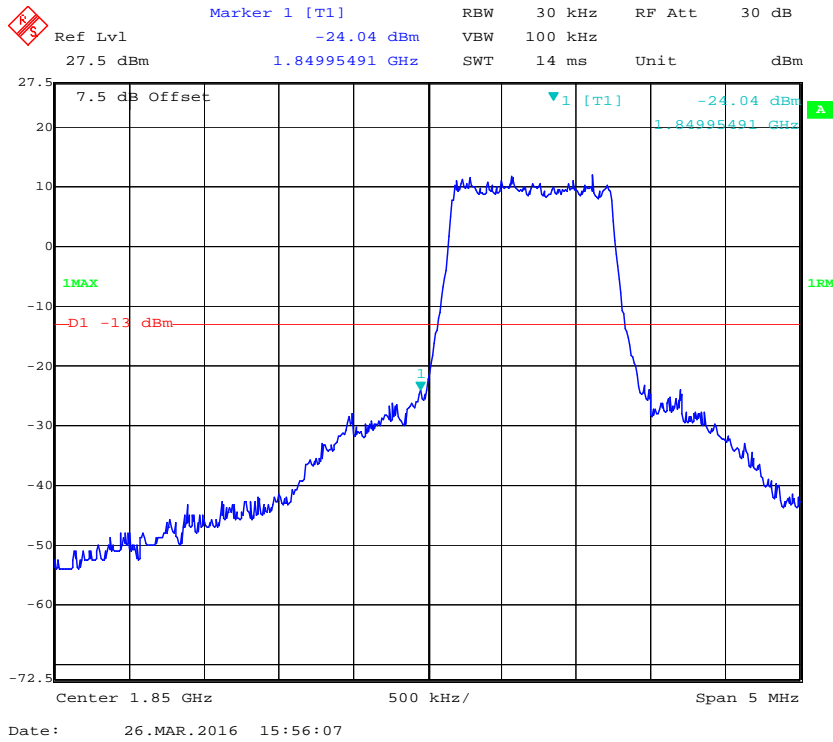
QPSK (1.4 MHz, FULL RB) - Left Band Edge



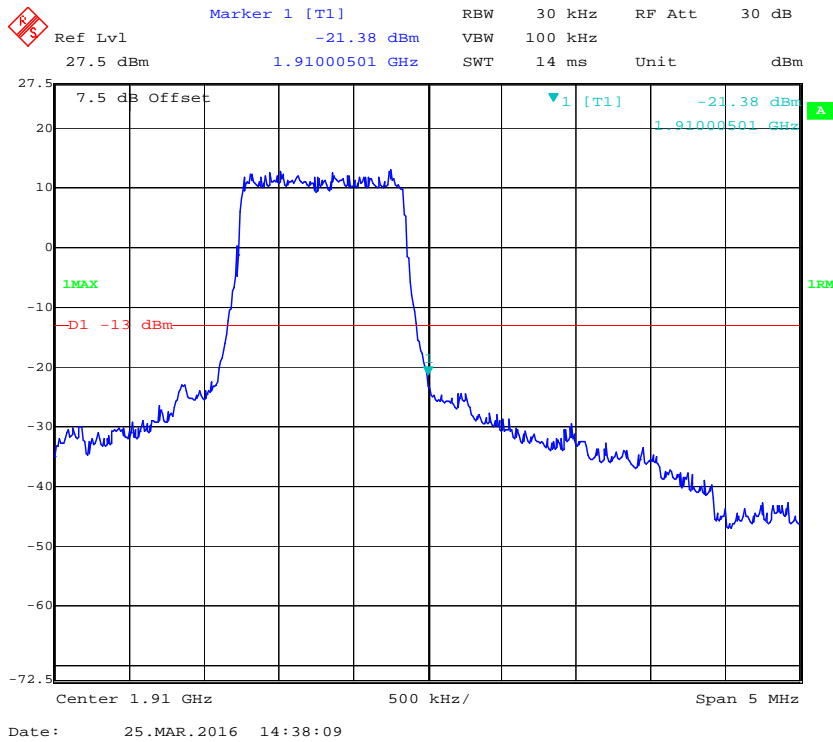
QPSK (1.4 MHz, FULL RB) - Right Band Edge



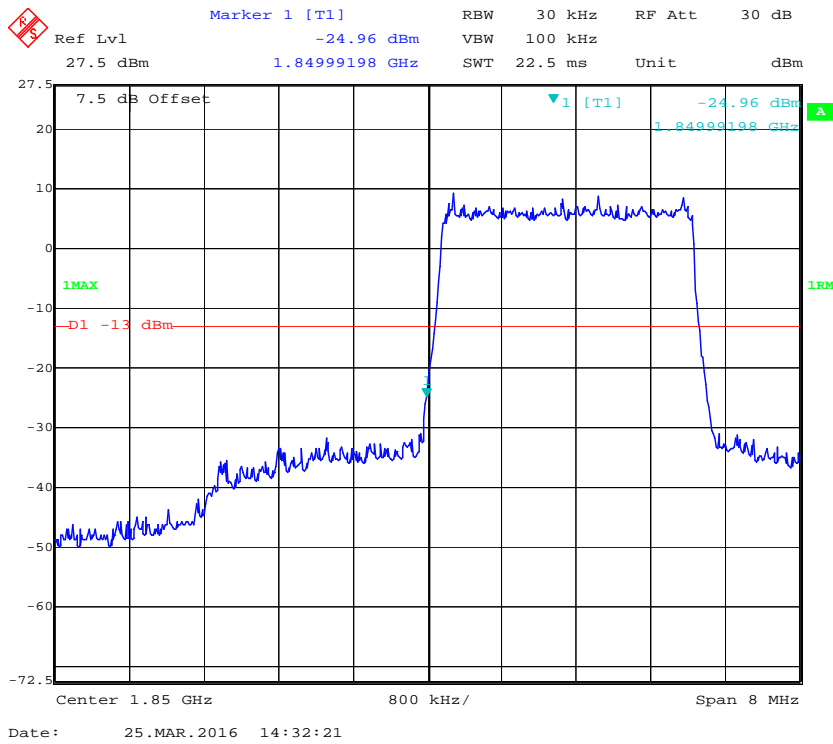
16-QAM (1.4 MHz, FULL RB) - Left Band Edge



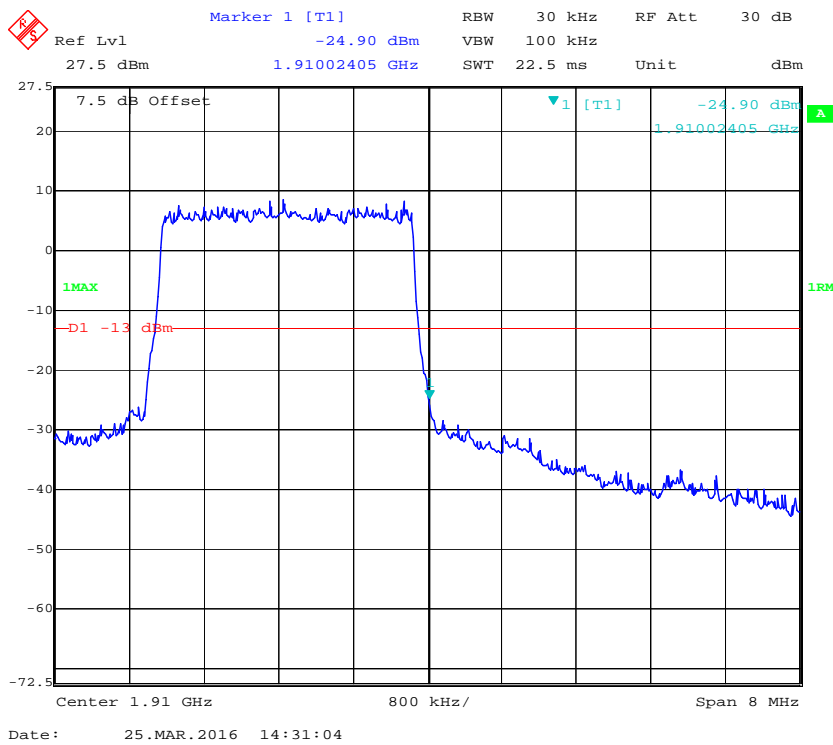
16-QAM (1.4 MHz, FULL RB) - Right Band Edge



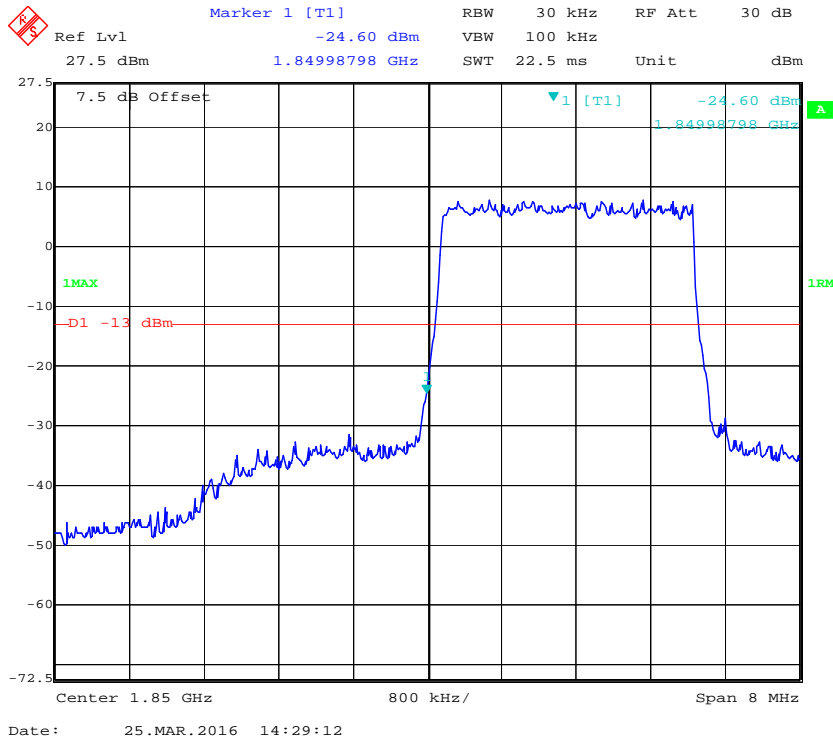
QPSK (3.0 MHz, FULL RB) - Left Band Edge



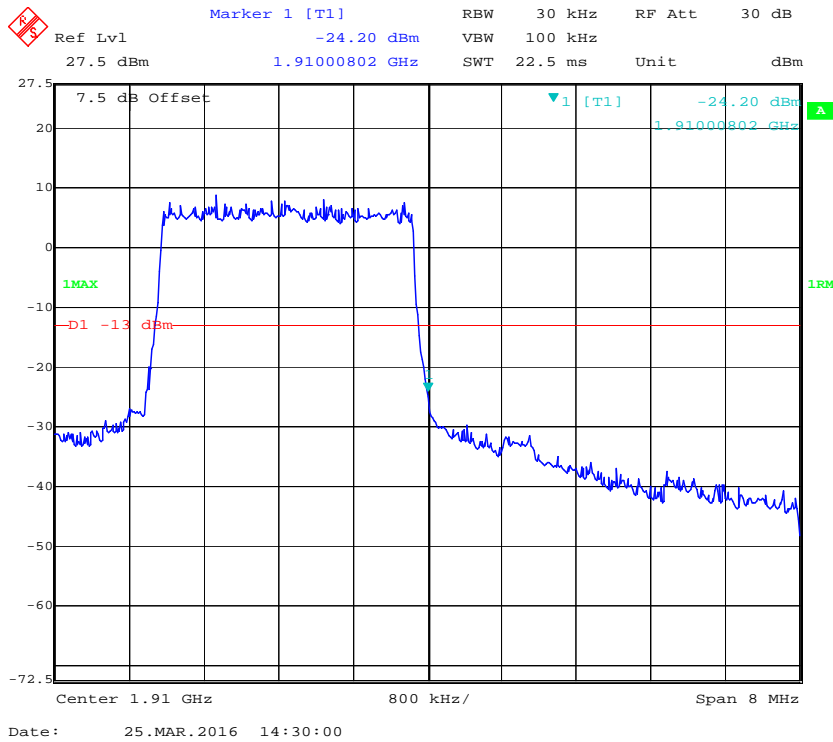
QPSK (3.0 MHz, FULL RB) - Right Band Edge



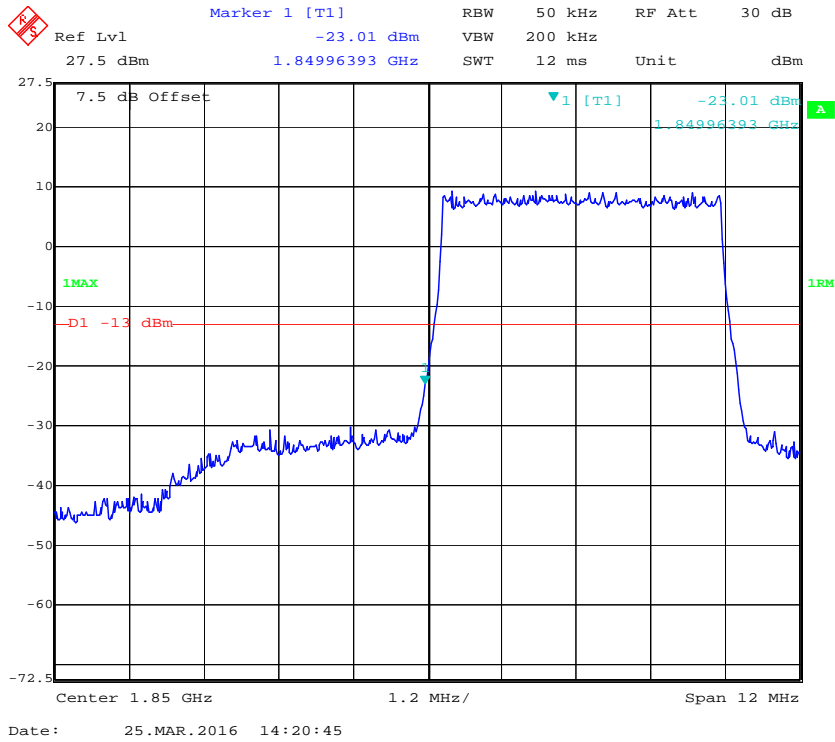
16-QAM (3.0 MHz, FULL RB) - Left Band Edge



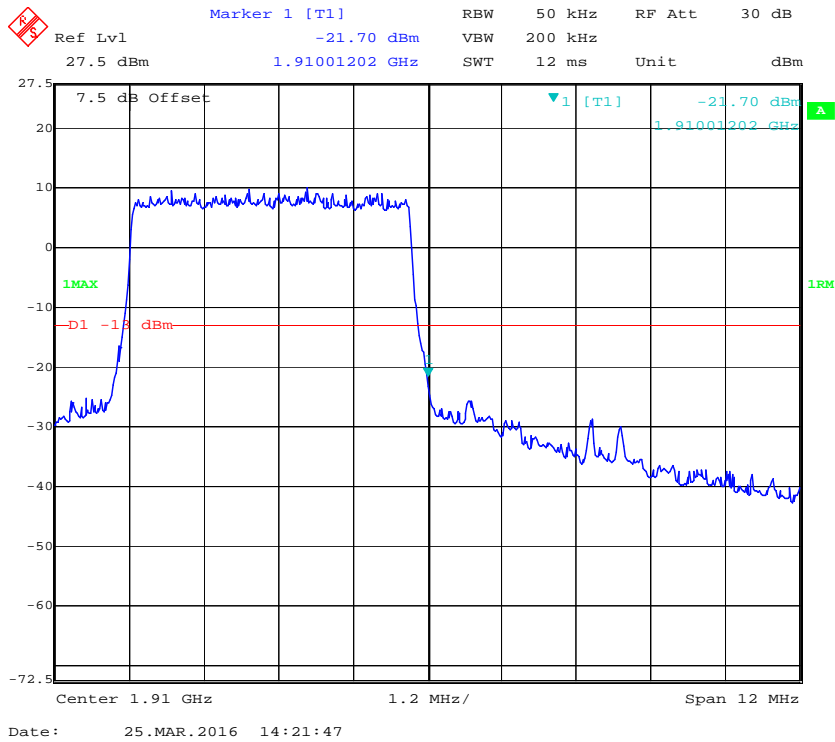
16-QAM (3.0 MHz, FULL RB) - Right Band Edge



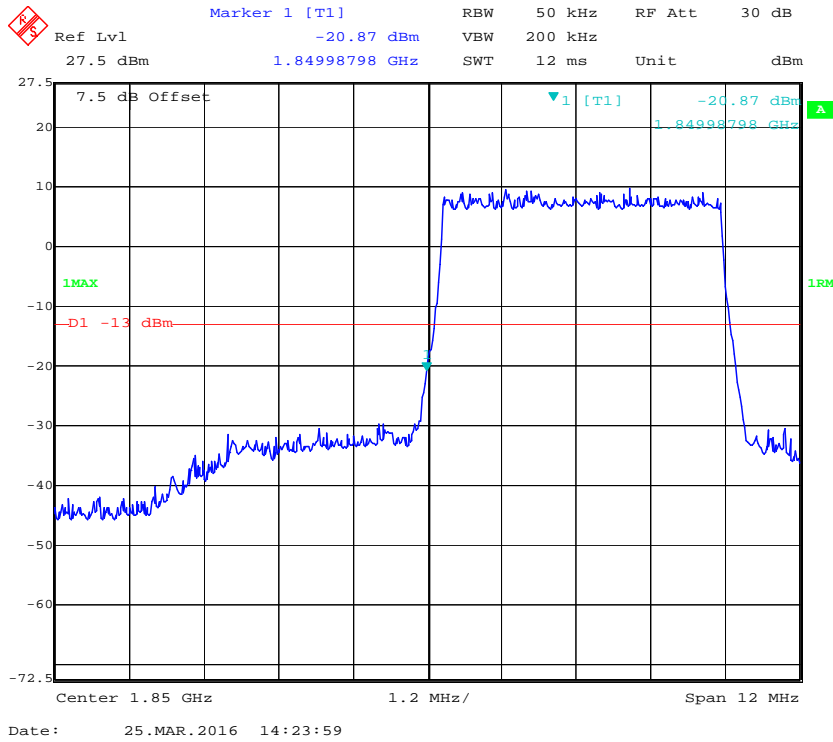
QPSK (5.0 MHz, FULL RB) - Left Band Edge



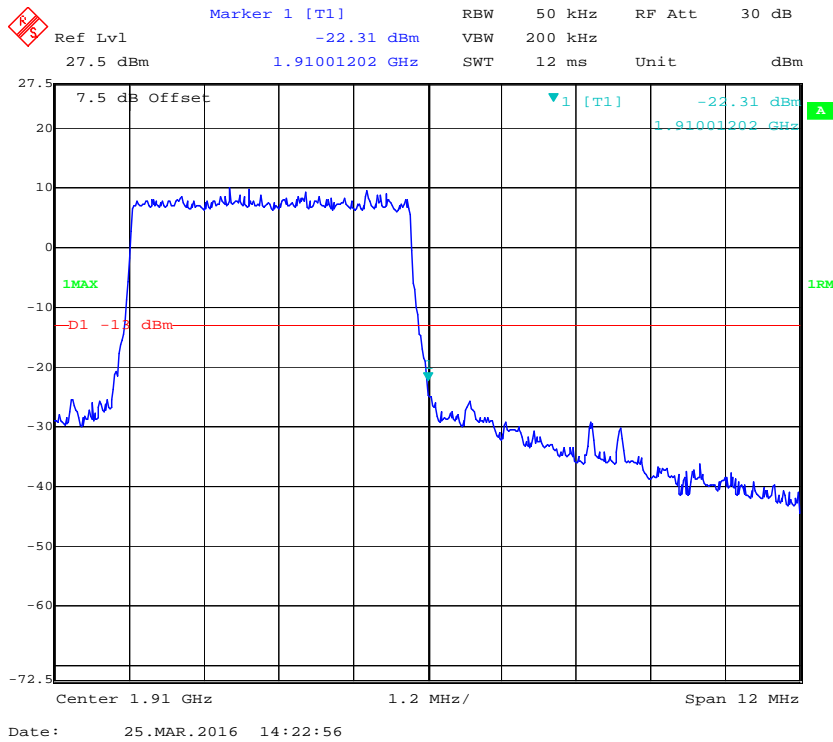
QPSK (5.0 MHz, FULL RB) - Right Band Edge



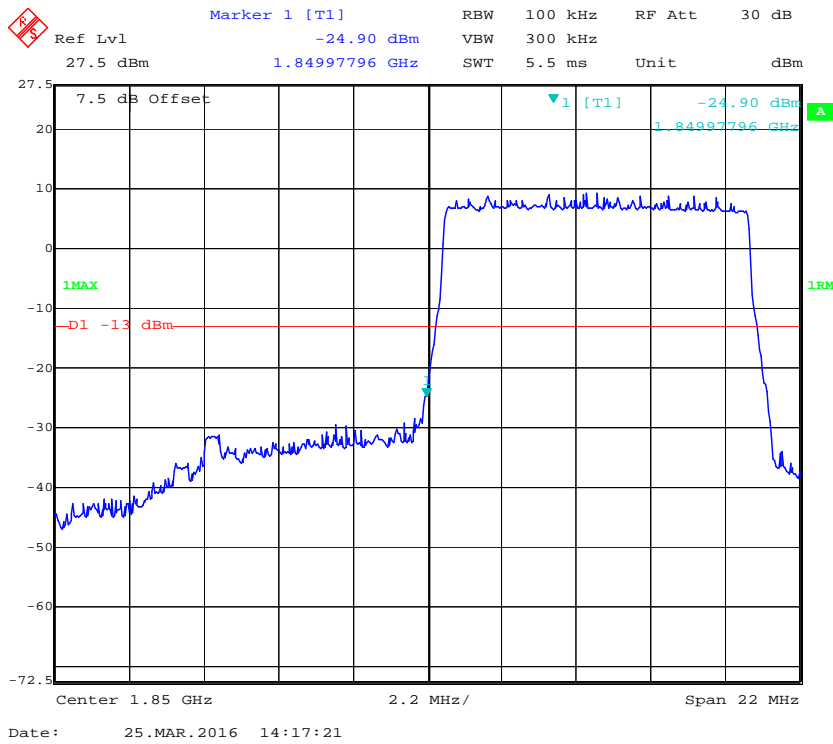
16-QAM (5.0 MHz, FULL RB) - Left Band Edge



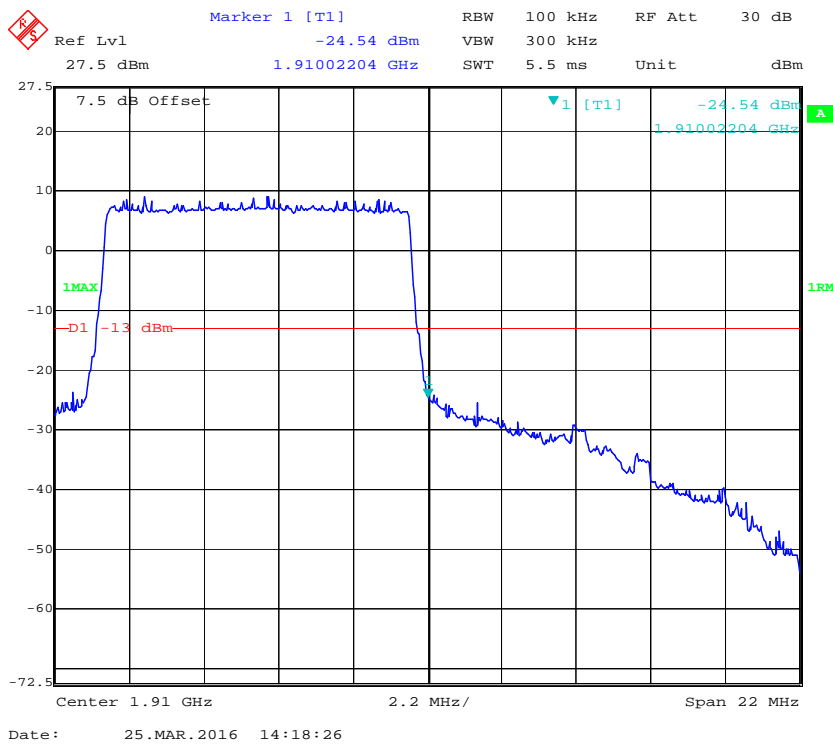
16-QAM (5.0 MHz, FULL RB) - Right Band Edge



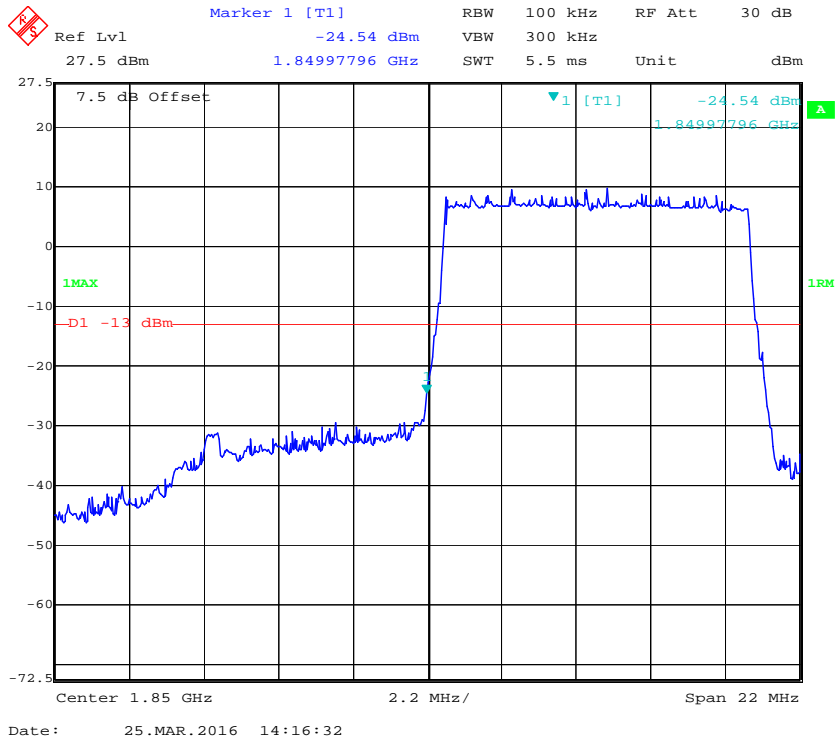
QPSK (10.0 MHz, FULL RB) - Left Band Edge



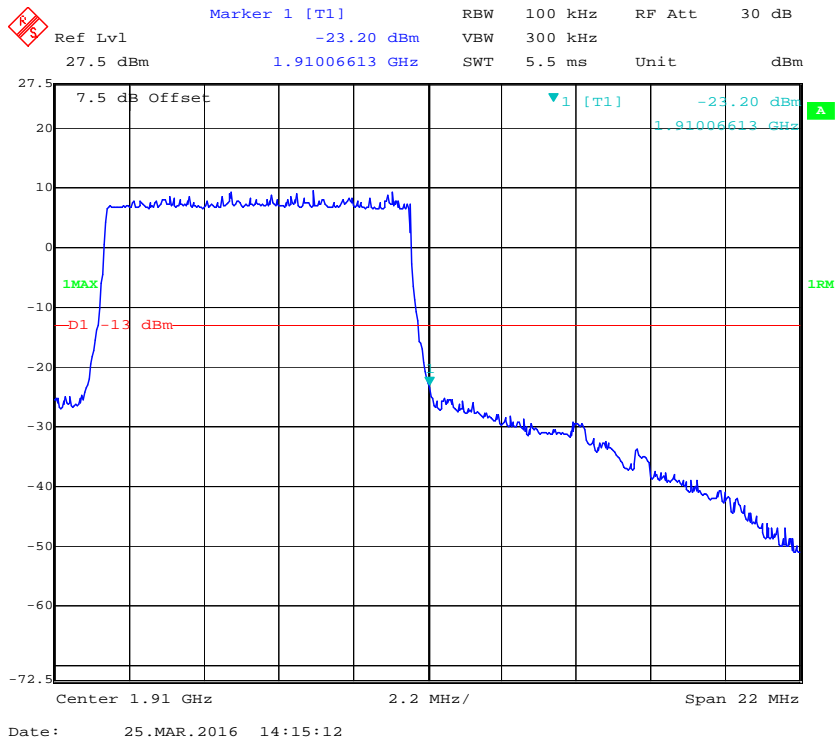
QPSK (10.0 MHz, FULL RB) - Right Band Edge



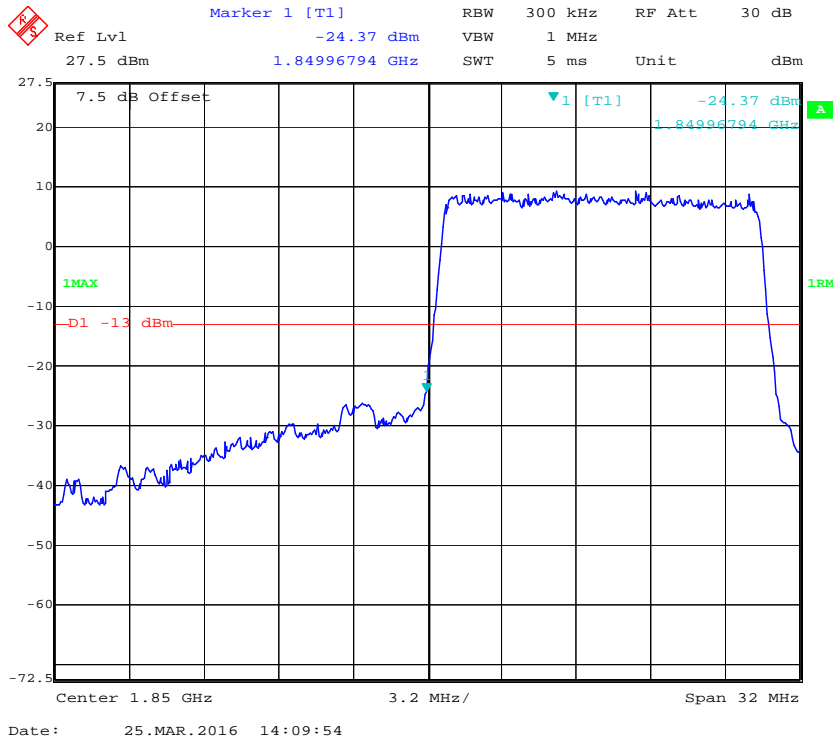
16-QAM (10.0 MHz, FULL RB) - Left Band Edge



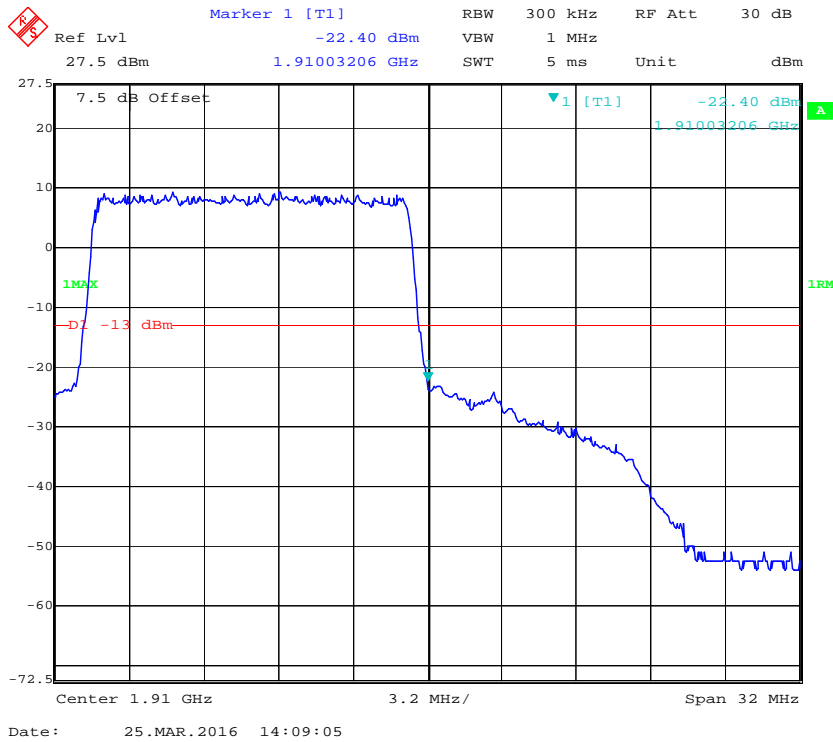
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



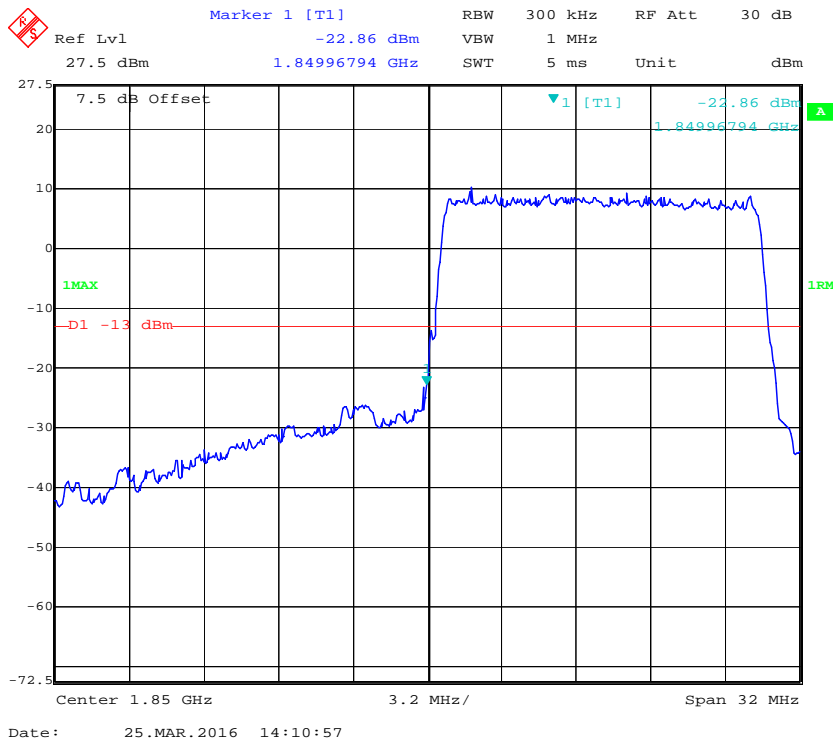
QPSK (15.0 MHz, FULL RB) - Left Band Edge



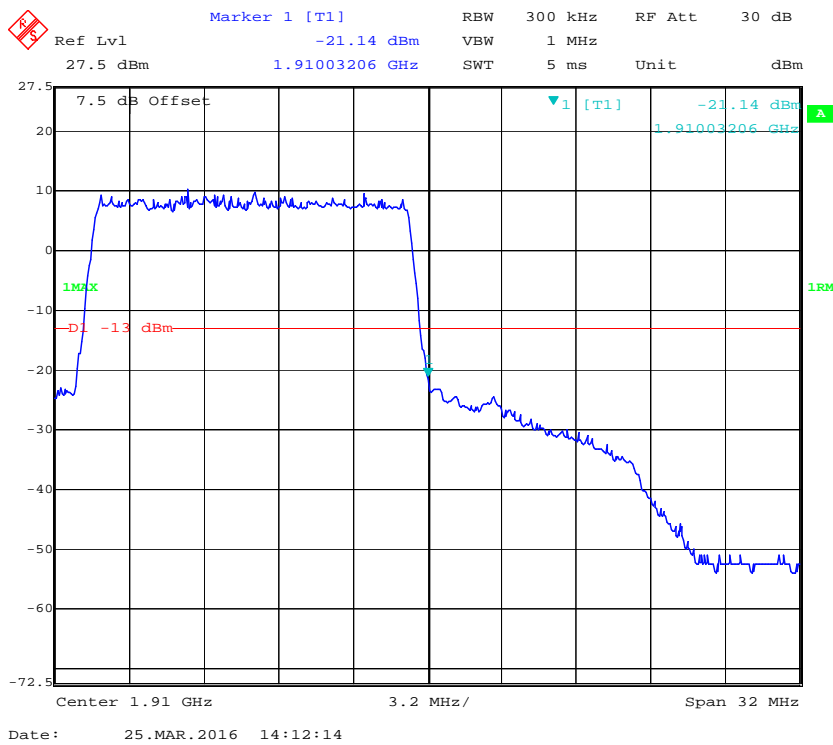
QPSK (15.0 MHz, FULL RB) - Right Band Edge



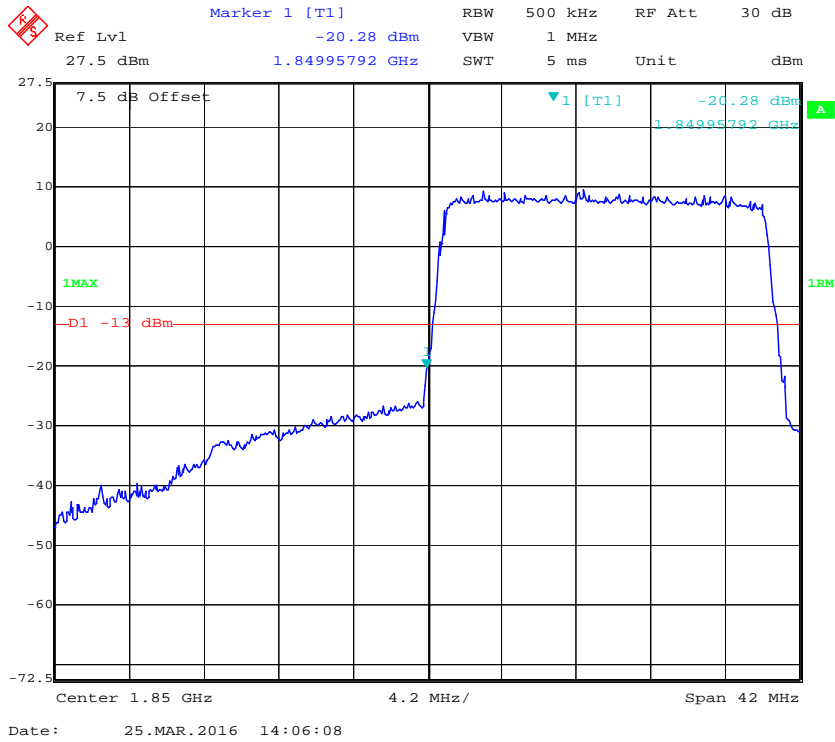
16-QAM (15.0 MHz, FULL RB) - Left Band Edge



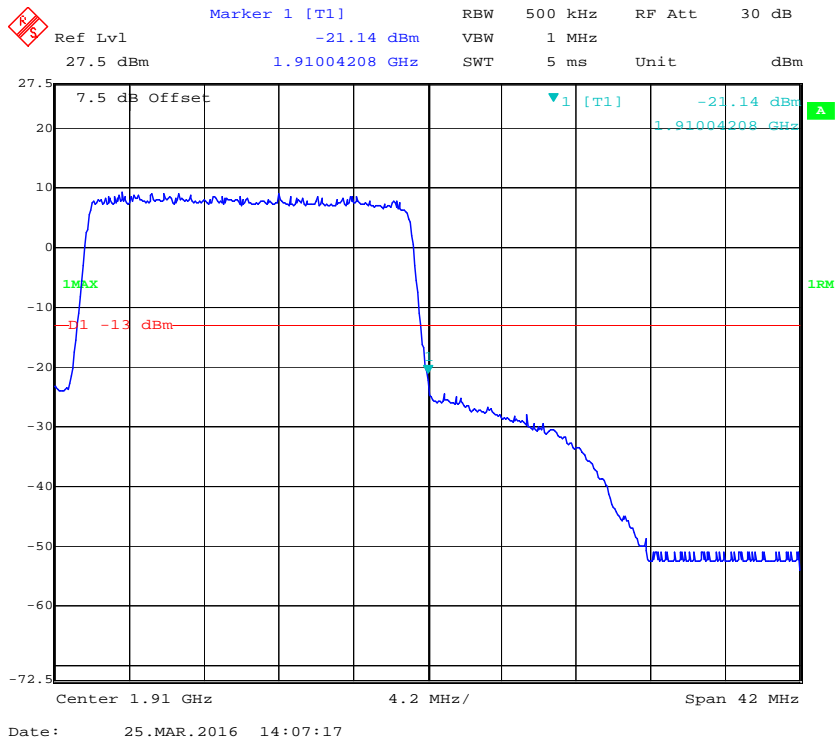
16-QAM (15.0 MHz, FULL RB) - Right Band Edge



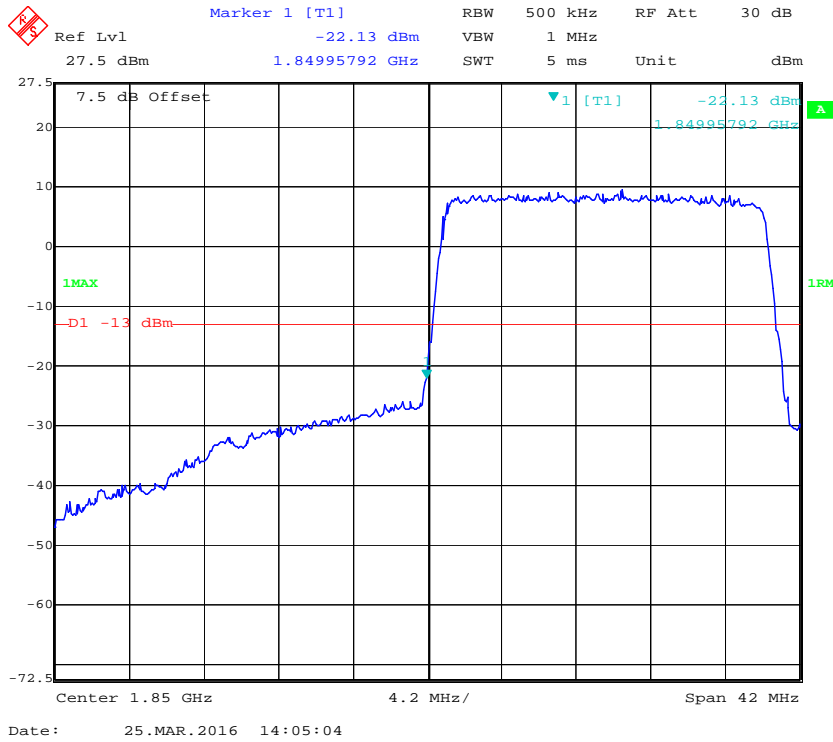
QPSK (20.0 MHz, FULL RB) - Left Band Edge



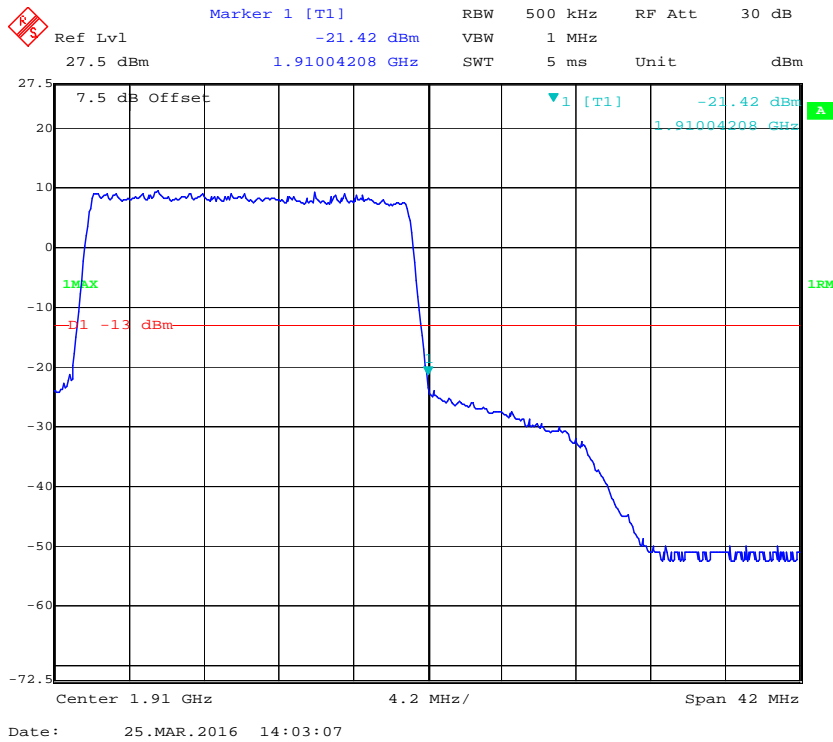
QPSK (20.0 MHz, FULL RB) - Right Band Edge



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

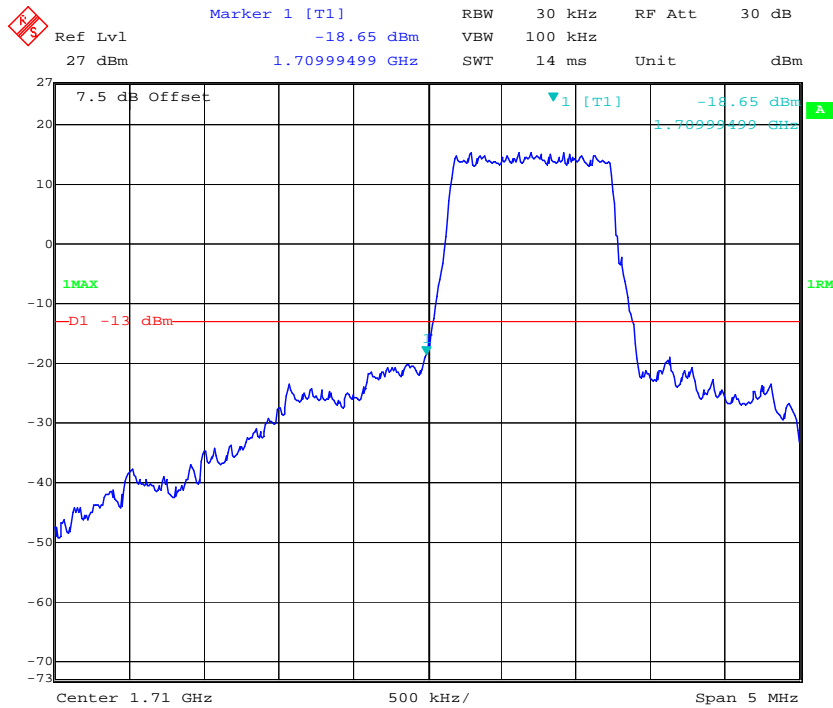


16-QAM (20.0 MHz, FULL RB) - Right Band Edge

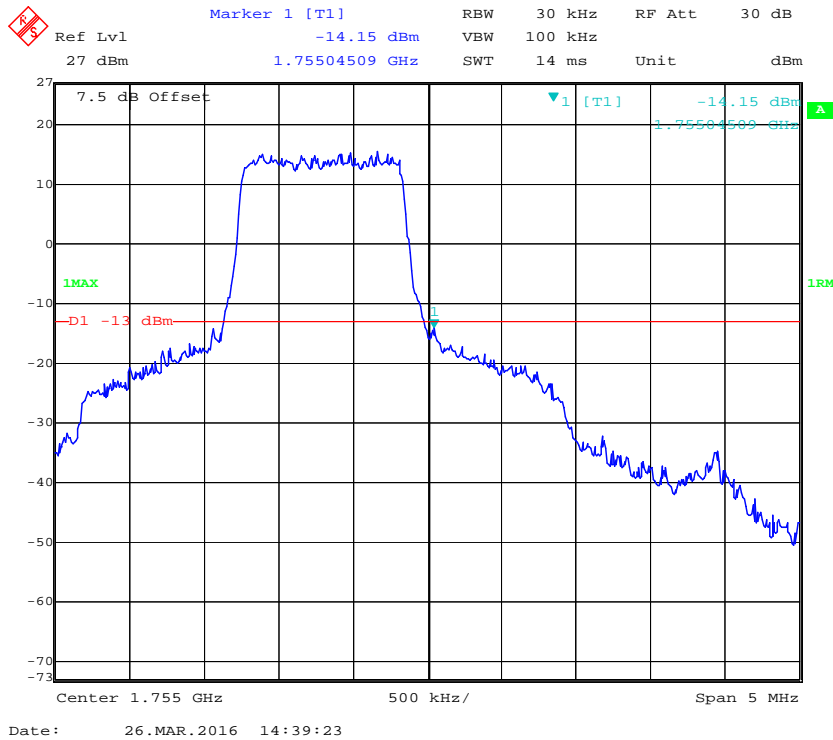


Band 4:

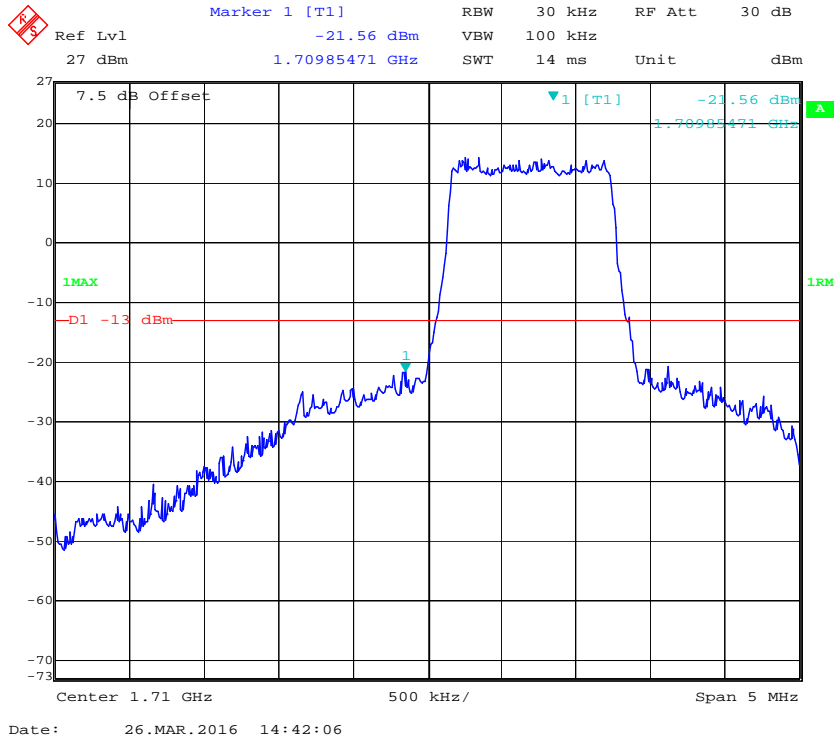
QPSK (1.4 MHz, FULL RB) - Left Band Edge



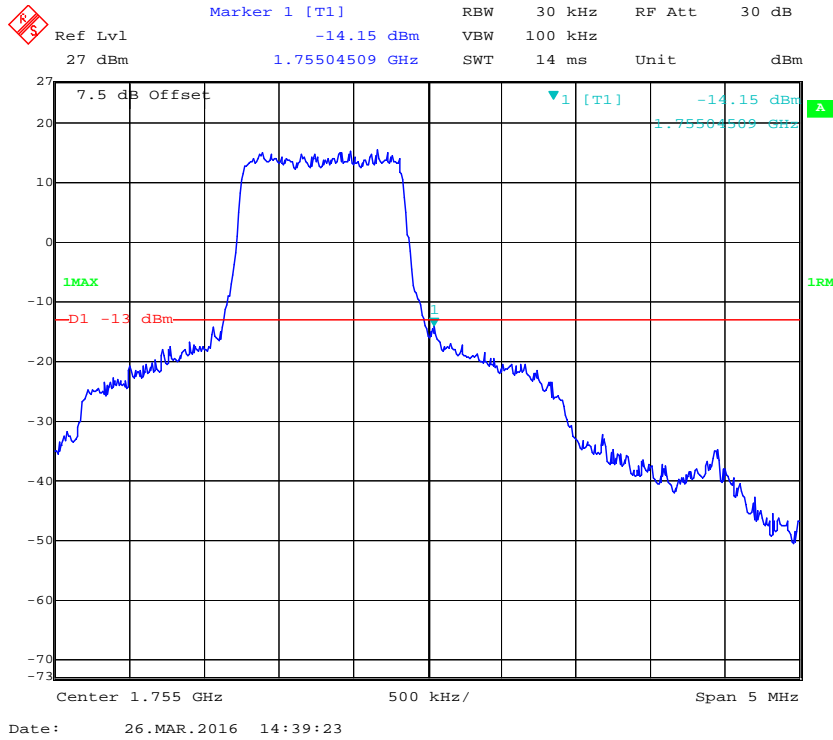
QPSK (1.4 MHz, FULL RB) - Right Band Edge



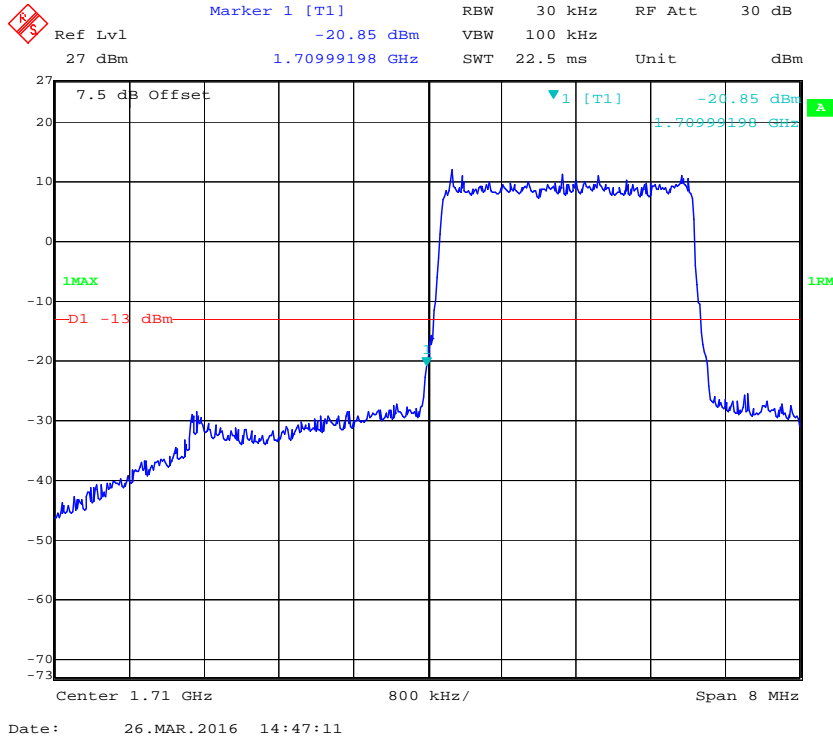
16-QAM (1.4 MHz, FULL RB) - Left Band Edge



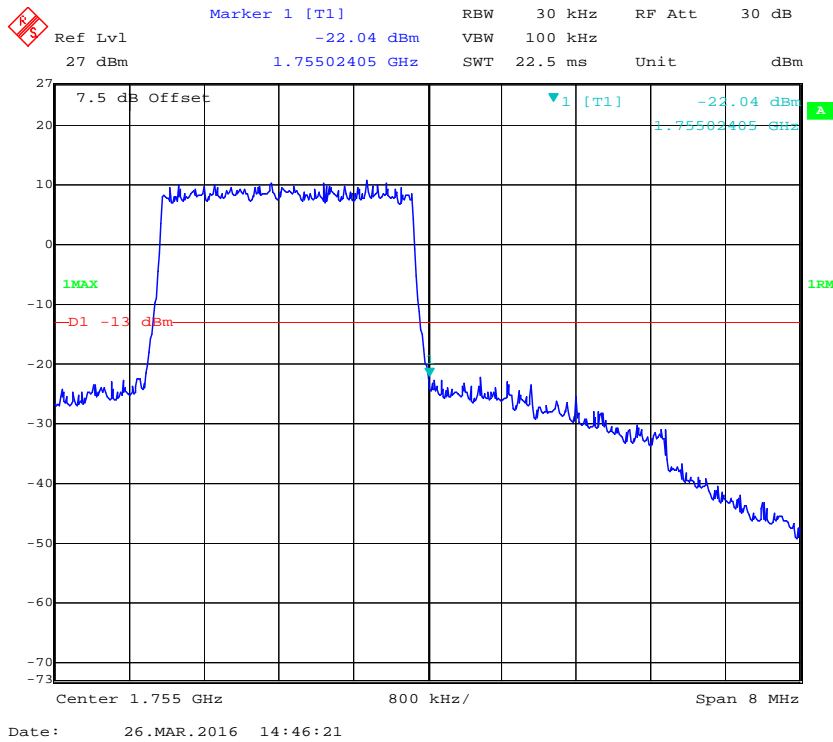
16-QAM (1.4 MHz, FULL RB) - Right Band Edge



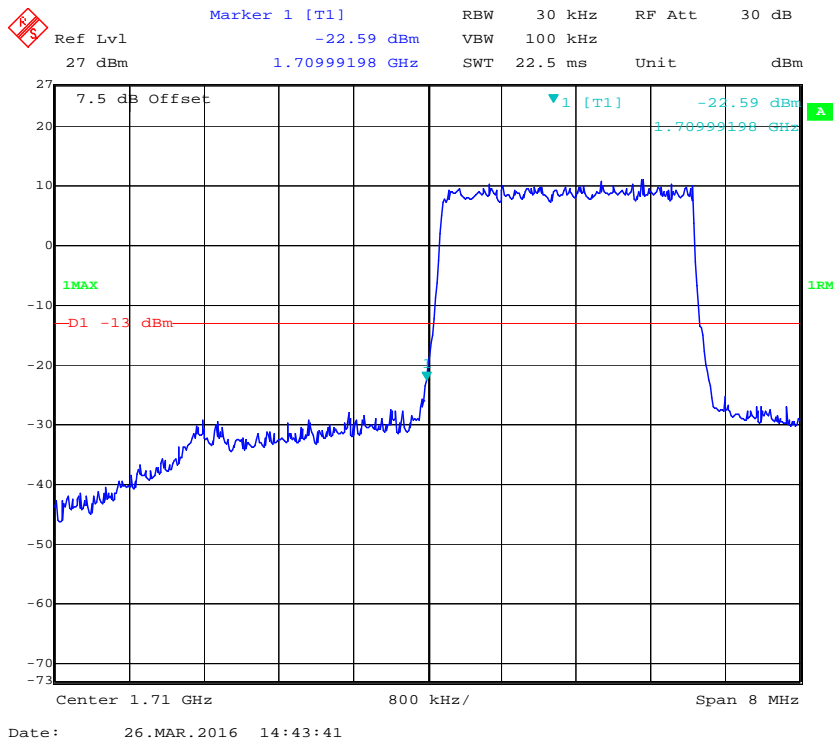
QPSK (3.0 MHz, FULL RB) - Left Band Edge



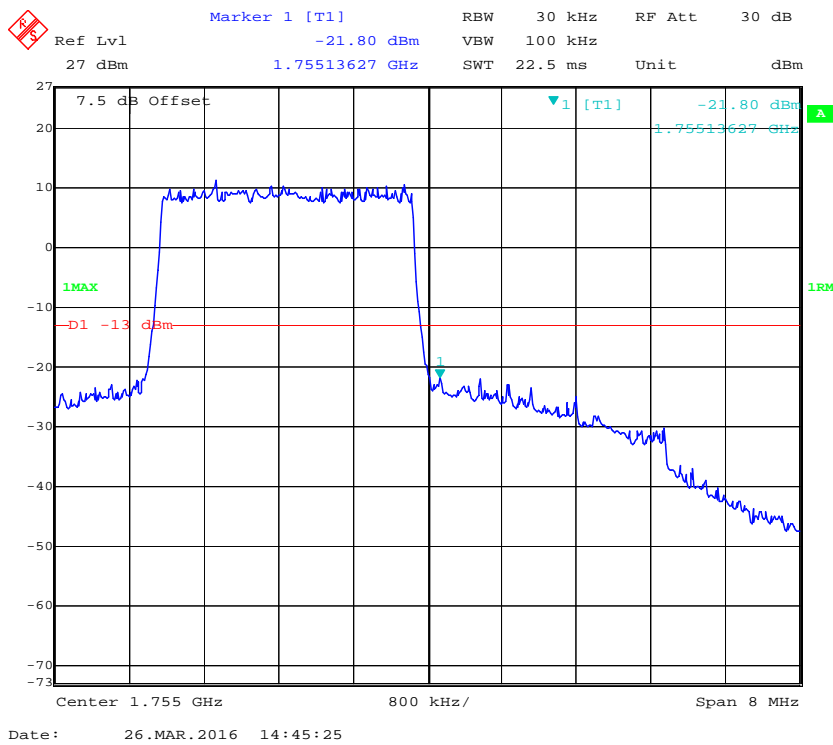
QPSK (3.0 MHz, FULL RB) - Right Band Edge



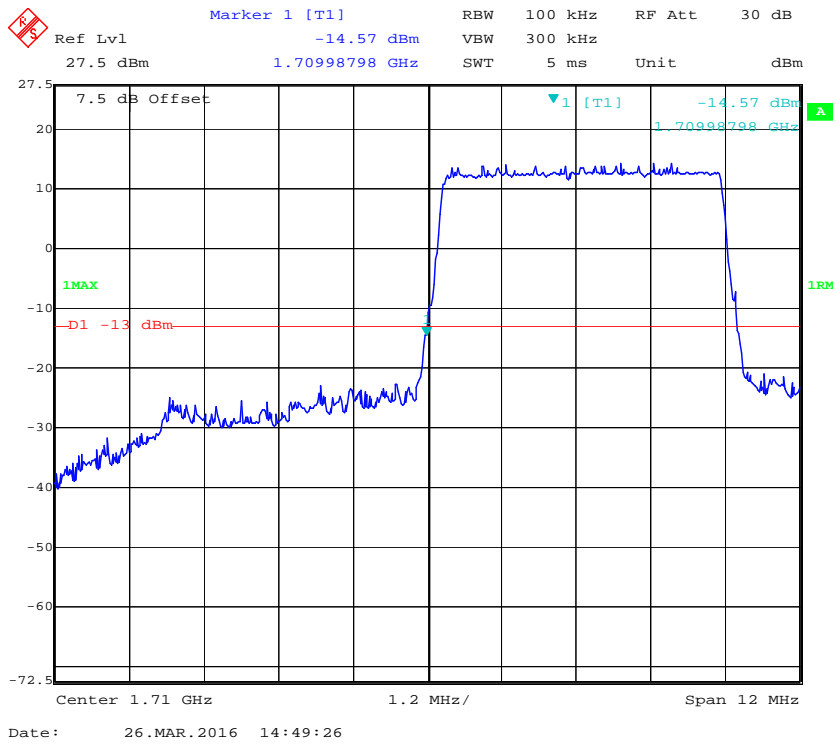
16-QAM (3.0 MHz, FULL RB) - Left Band Edge



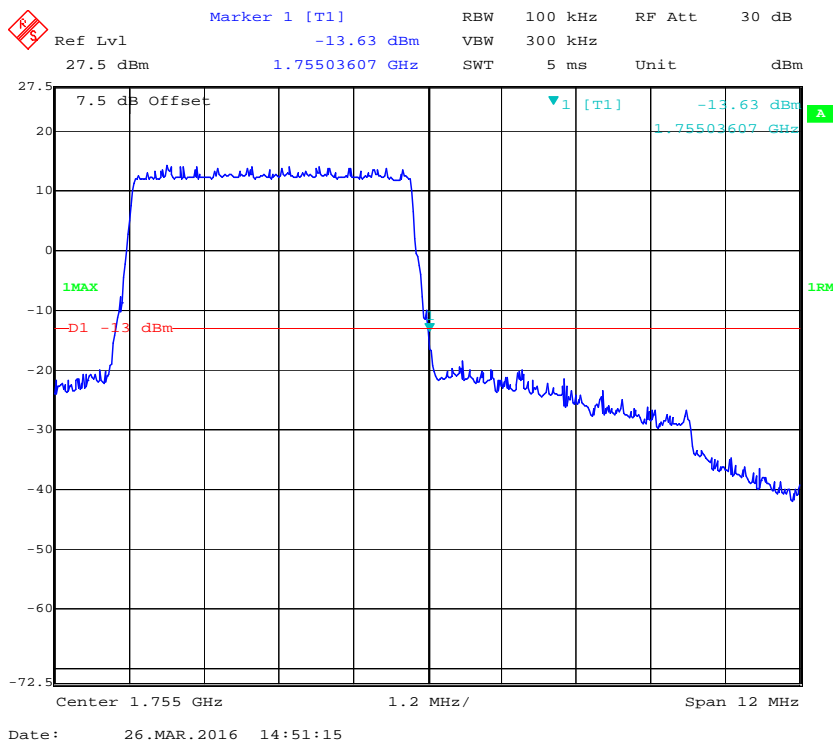
16-QAM (3.0 MHz, FULL RB) - Right Band Edge



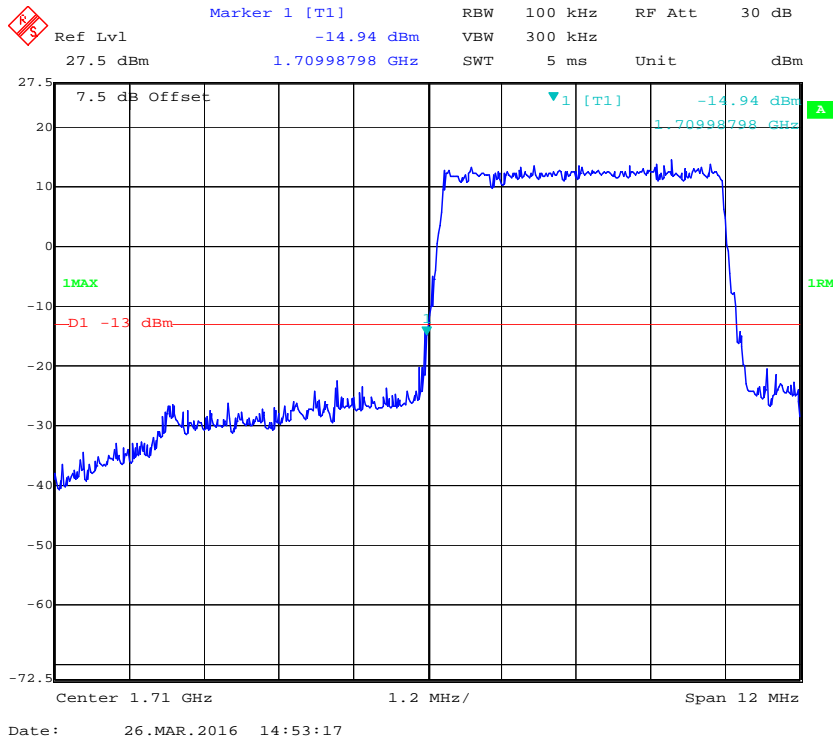
QPSK (5.0 MHz, FULL RB) - Left Band Edge



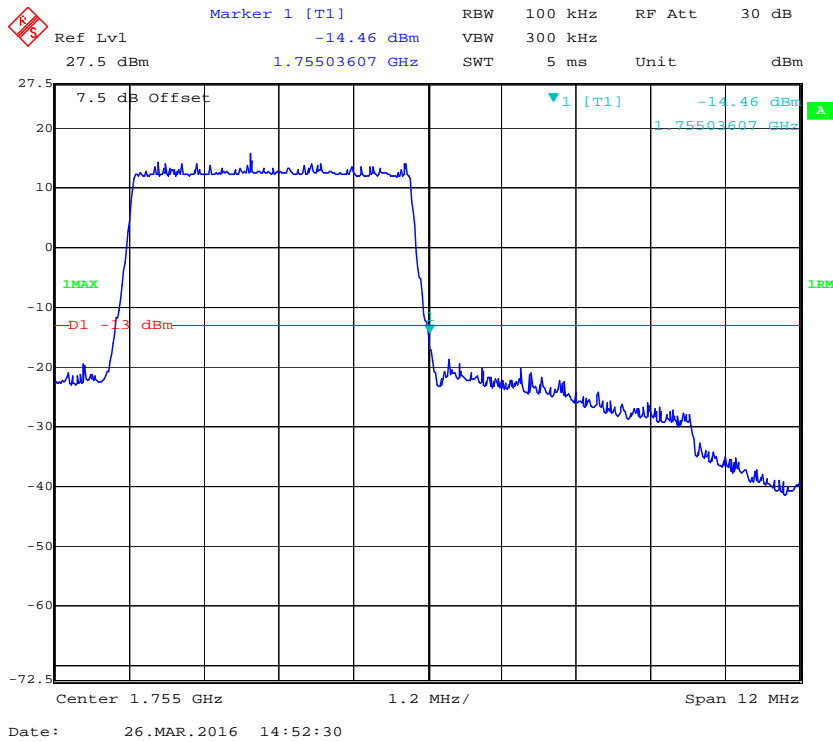
QPSK (5.0 MHz, FULL RB) - Right Band Edge



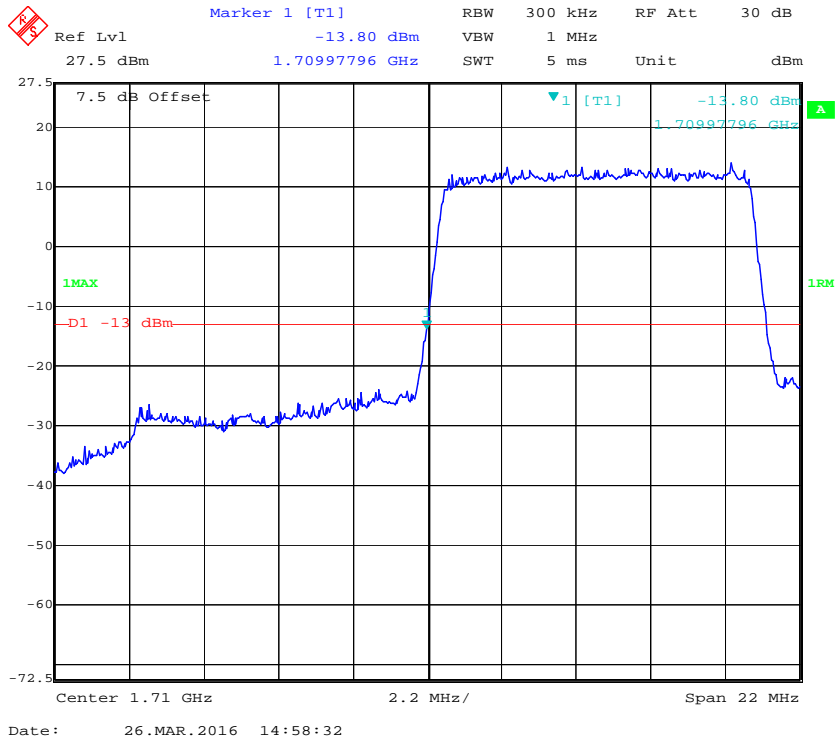
16-QAM (5.0 MHz, FULL RB) - Left Band Edge



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



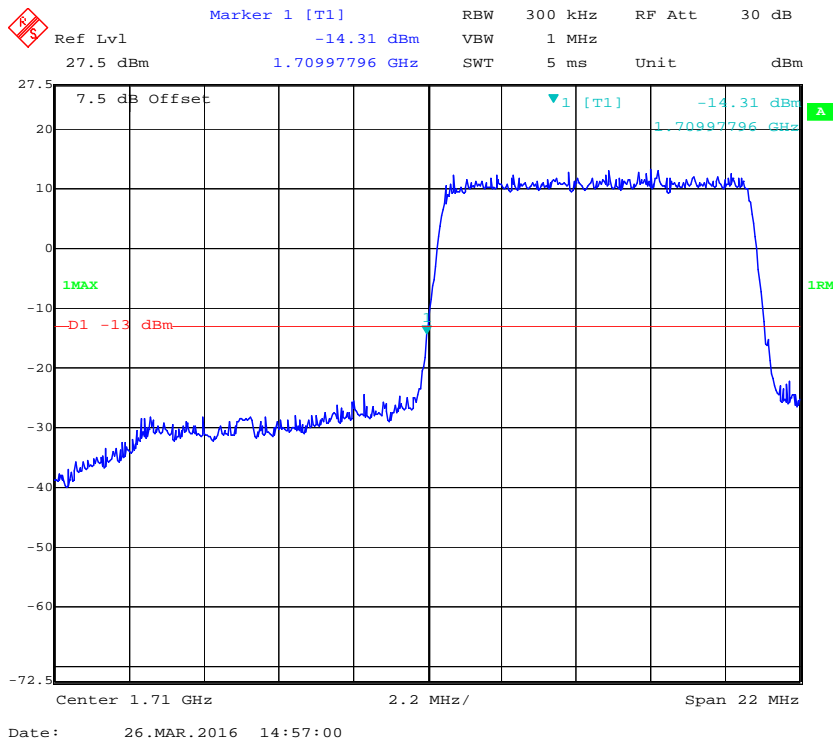
QPSK (10.0 MHz, FULL RB) - Left Band Edge



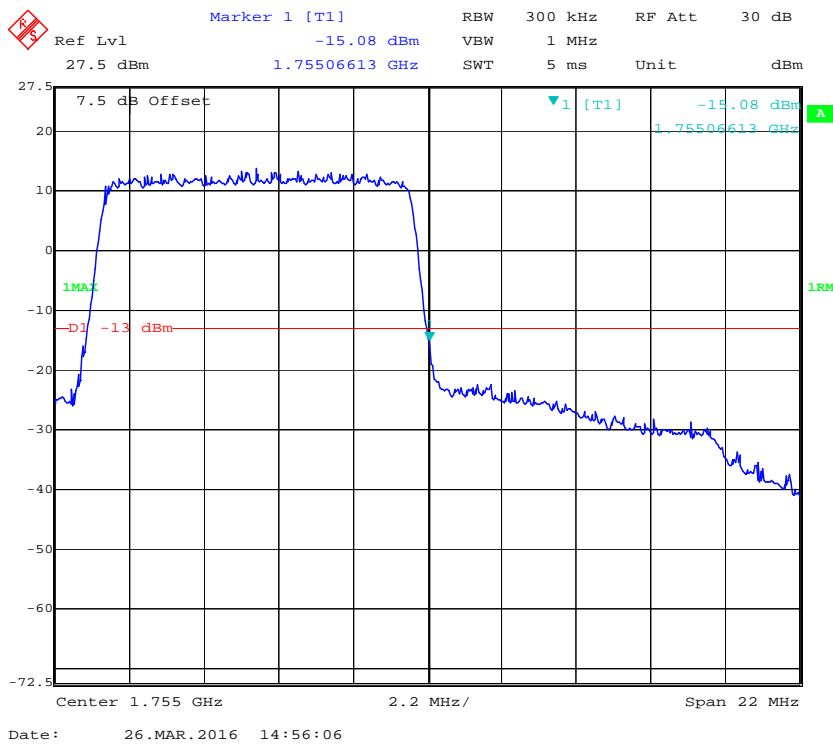
QPSK (10.0 MHz, FULL RB) - Right Band Edge



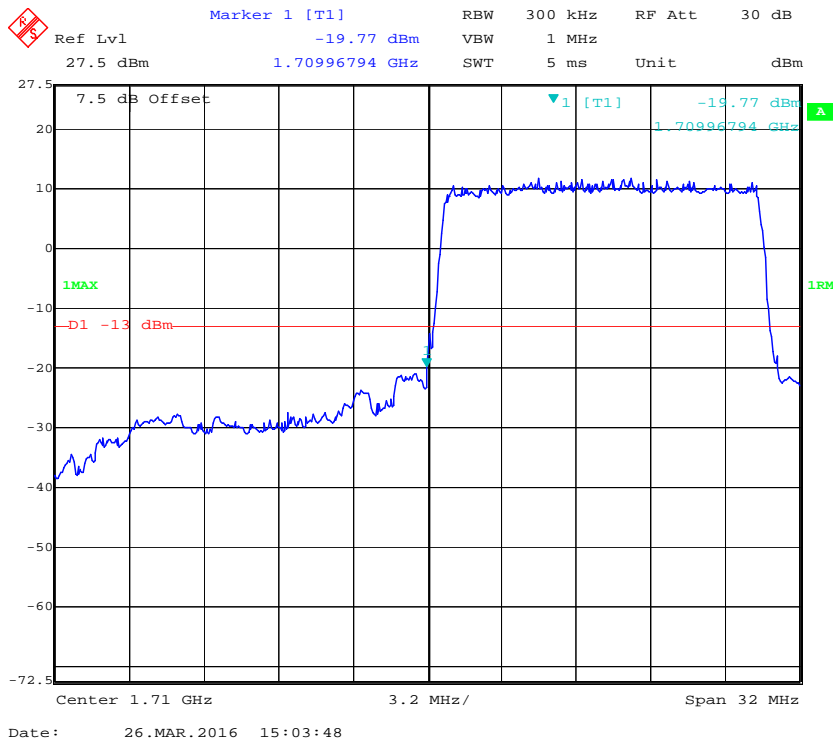
16-QAM (10.0 MHz, FULL RB) - Left Band Edge



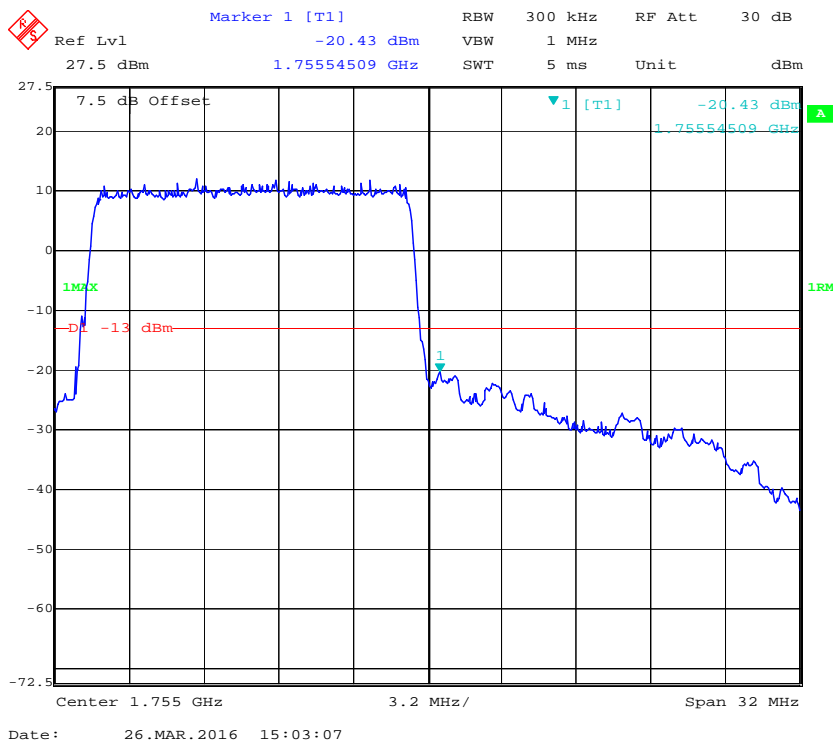
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



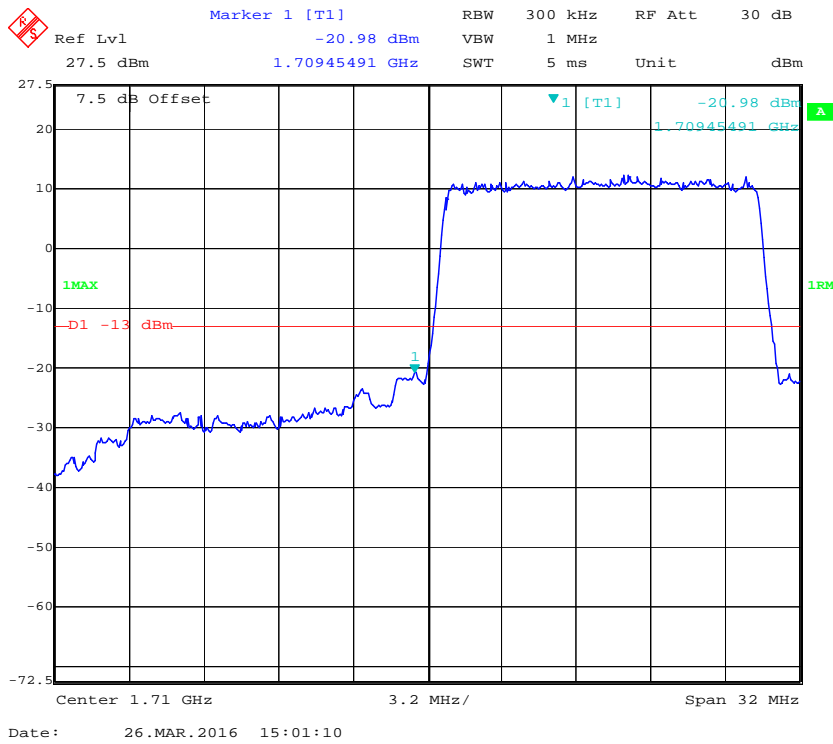
QPSK (15.0 MHz, FULL RB) - Left Band Edge



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



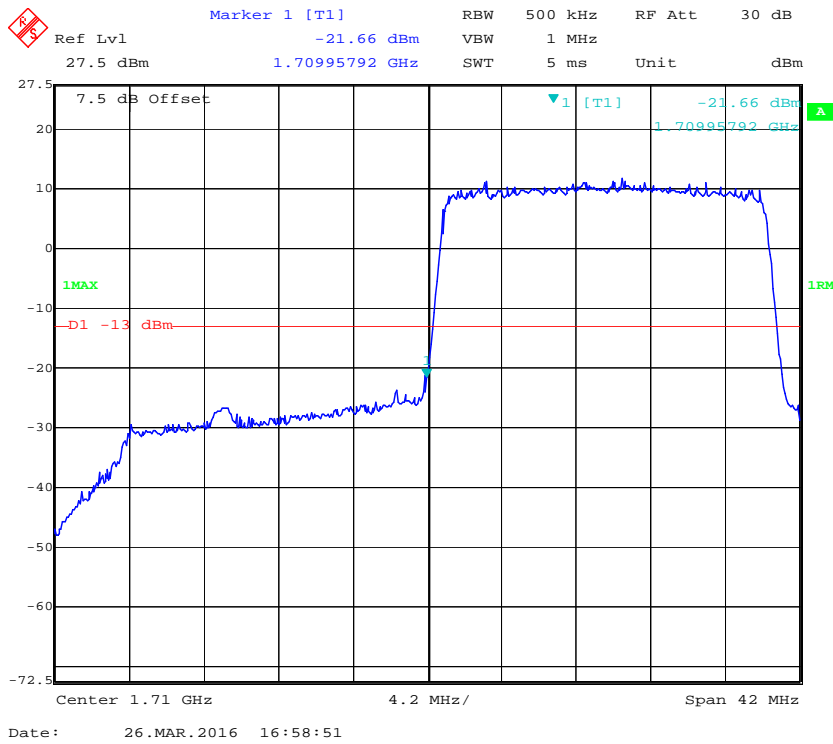
16-QAM (15.0 MHz, FULL RB) - Left Band Edge



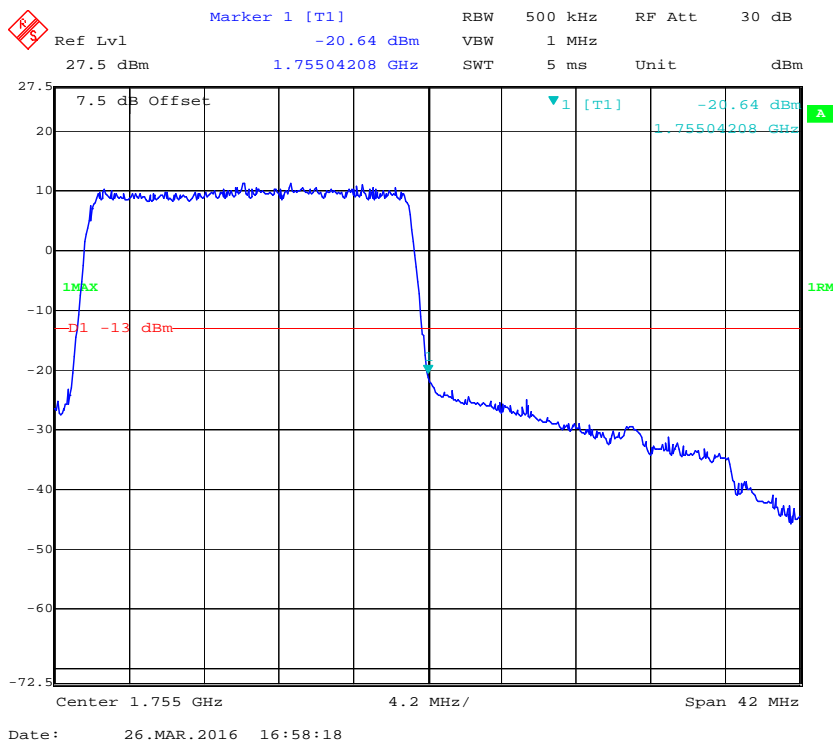
16-QAM (15.0 MHz, FULL RB) - Right Band Edge



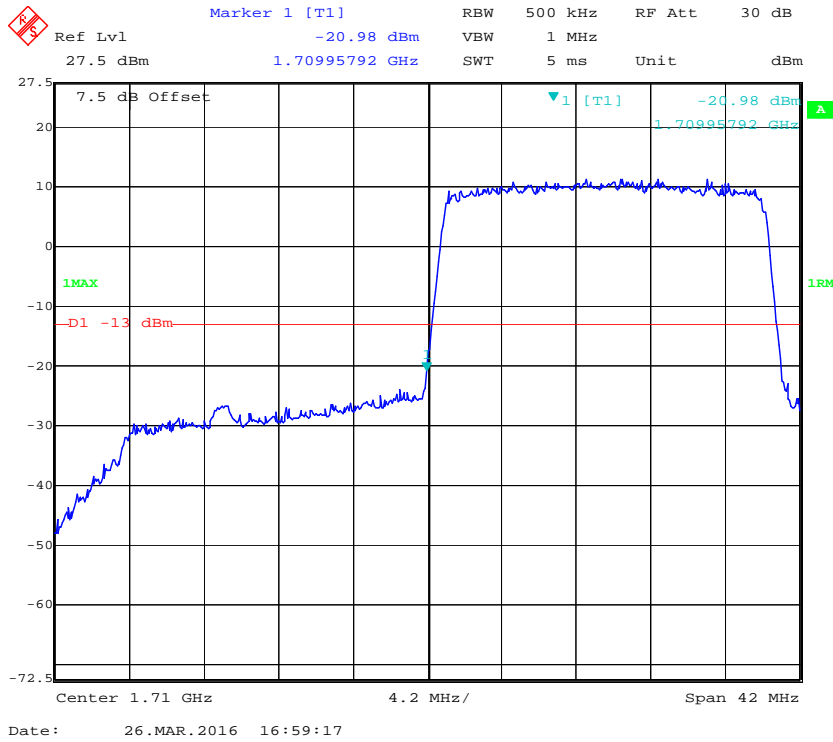
QPSK (20.0 MHz, FULL RB) - Left Band Edge



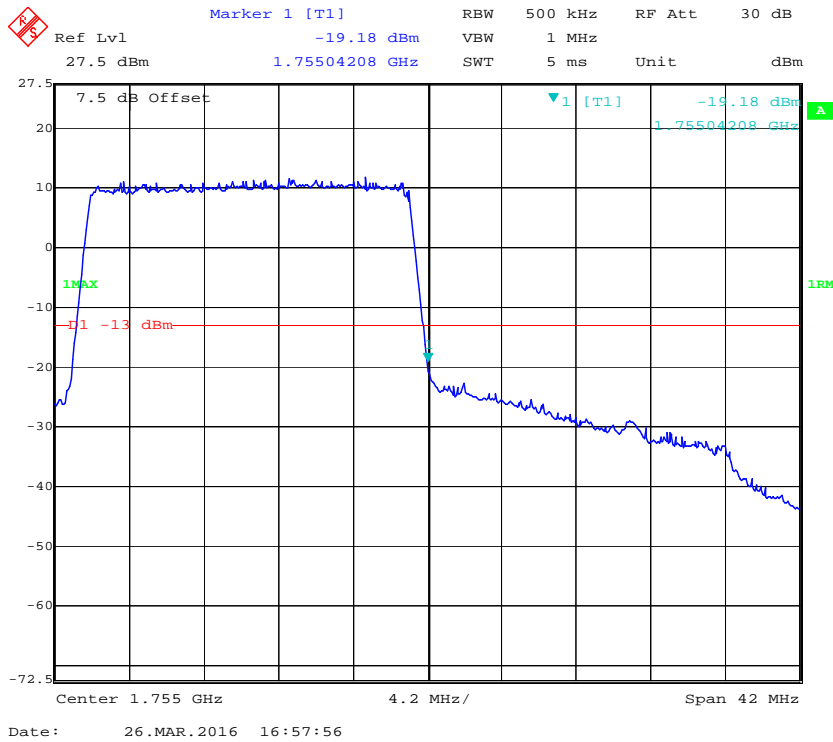
QPSK (20.0 MHz, FULL RB) - Right Band Edge



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

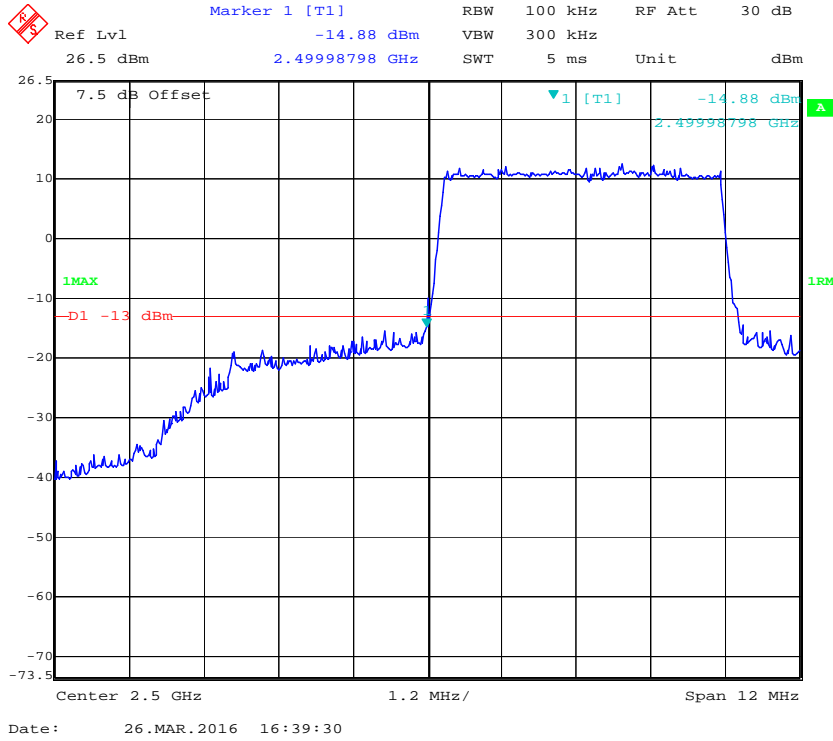


16-QAM (20.0 MHz, FULL RB) - Right Band Edge

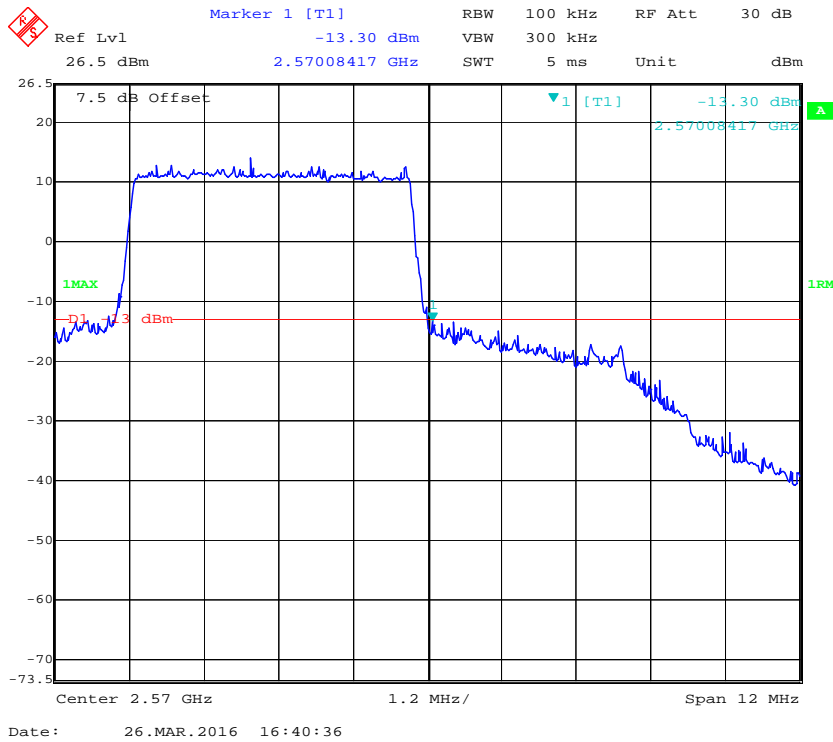


Band 7:

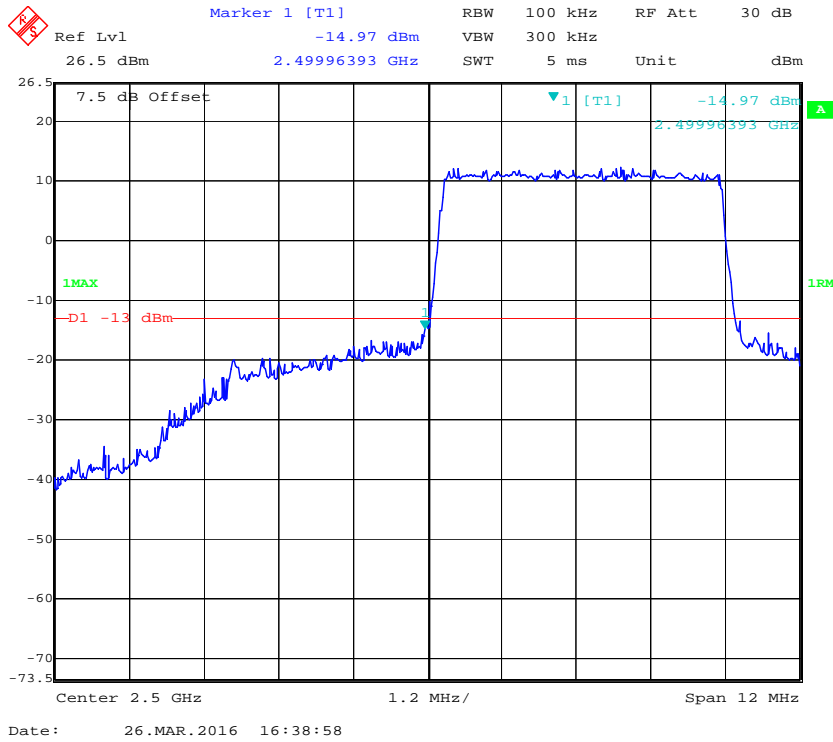
QPSK (5.0 MHz, FULL RB) - Left Band Edge



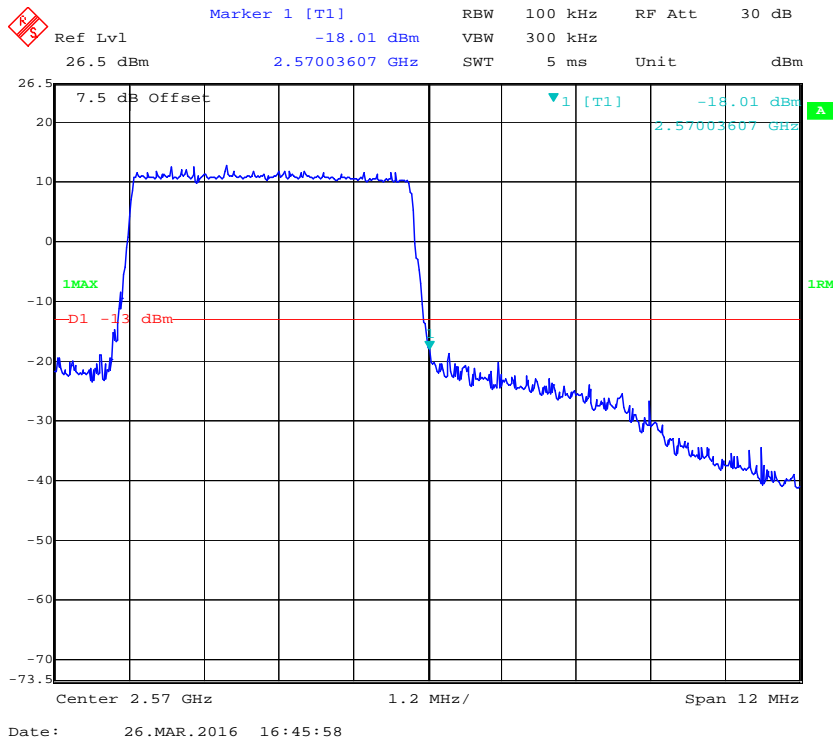
QPSK (5.0 MHz, FULL RB) - Right Band Edge



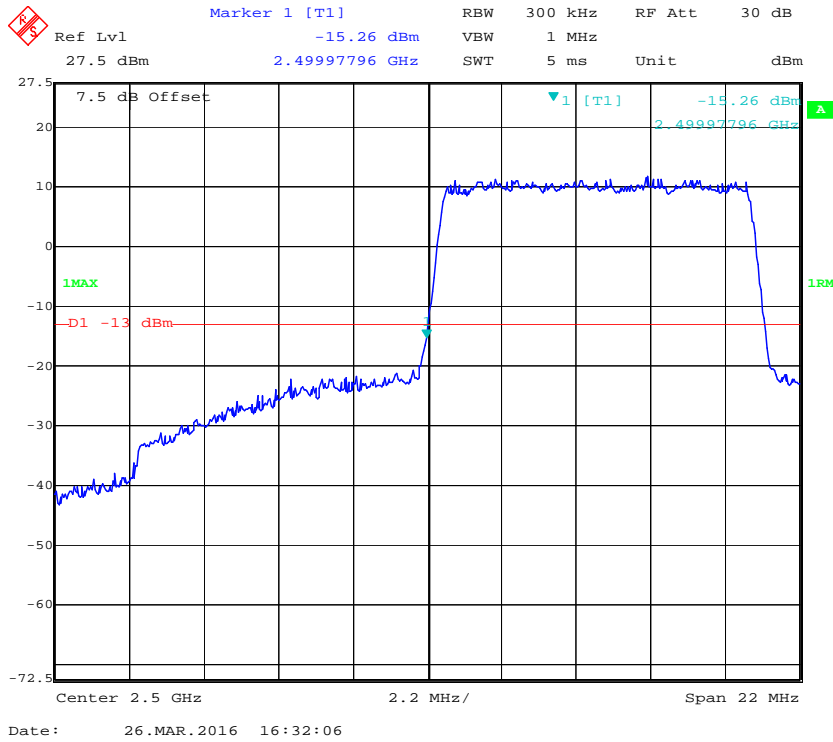
16-QAM (5.0 MHz, FULL RB) - Left Band Edge



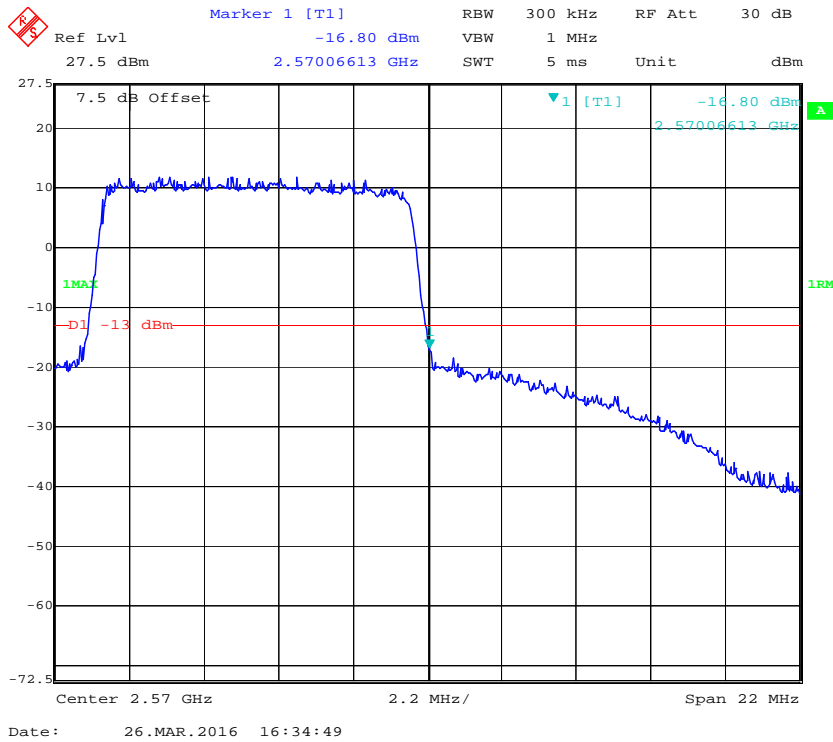
16-QAM (5.0 MHz, FULL RB) - Right Band Edge



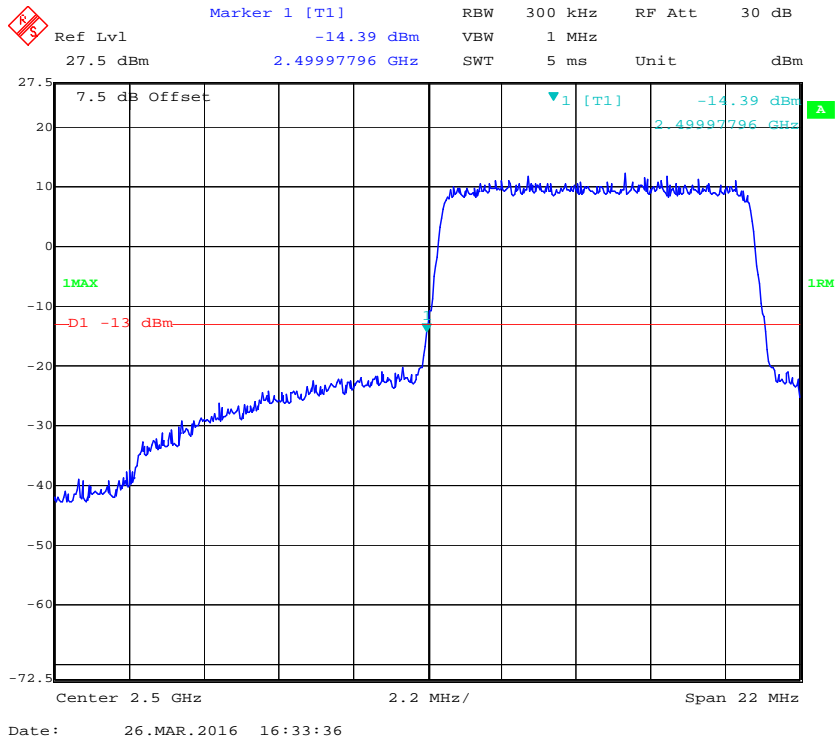
QPSK (10.0 MHz, FULL RB) - Left Band Edge



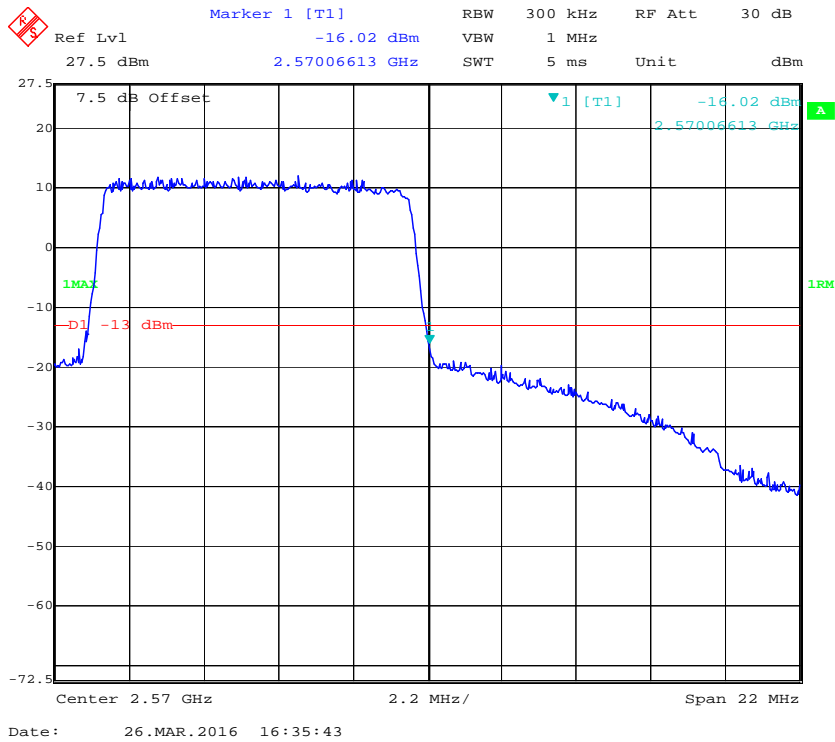
QPSK (10.0 MHz, FULL RB) - Right Band Edge



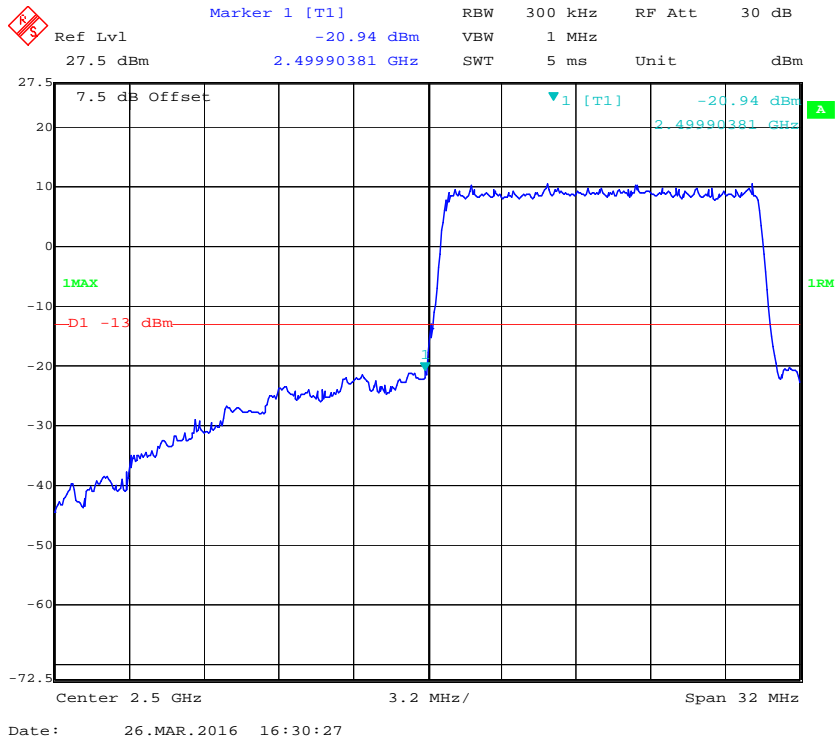
16-QAM (10.0 MHz, FULL RB) - Left Band Edge



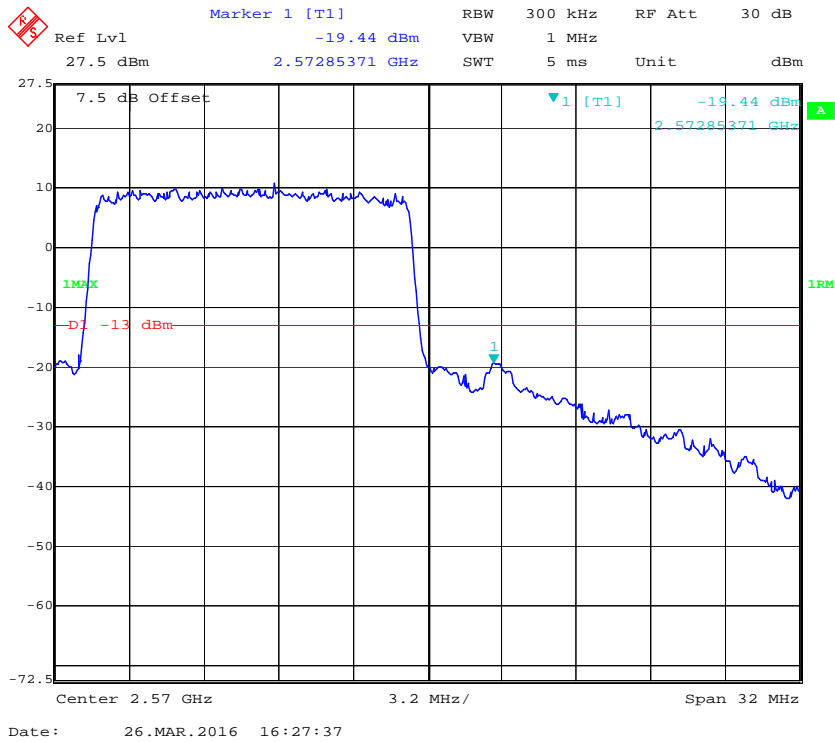
16-QAM (10.0 MHz, FULL RB) - Right Band Edge



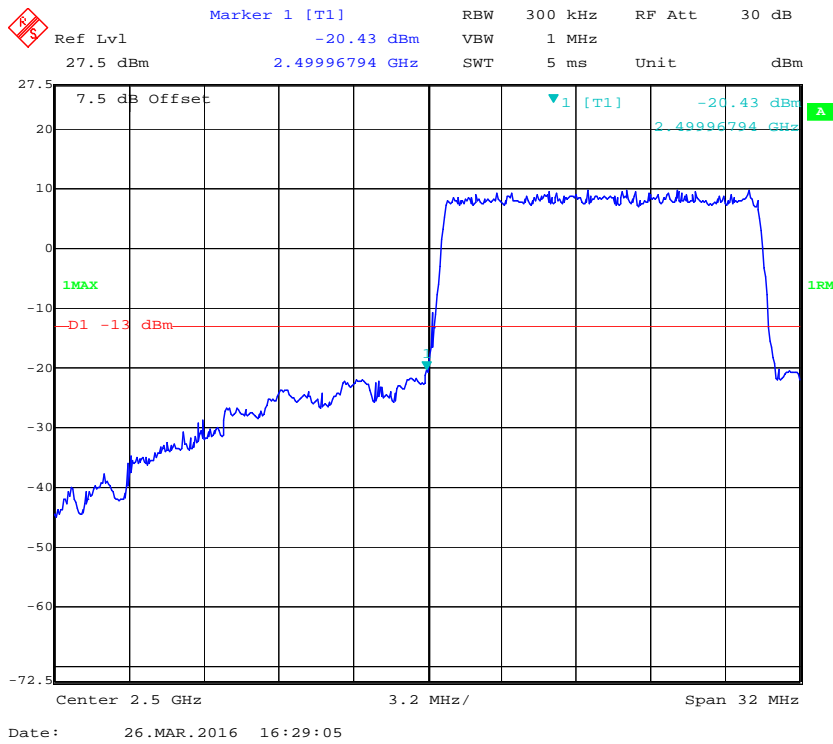
QPSK (15 MHz, FULL RB) - Left Band Edge



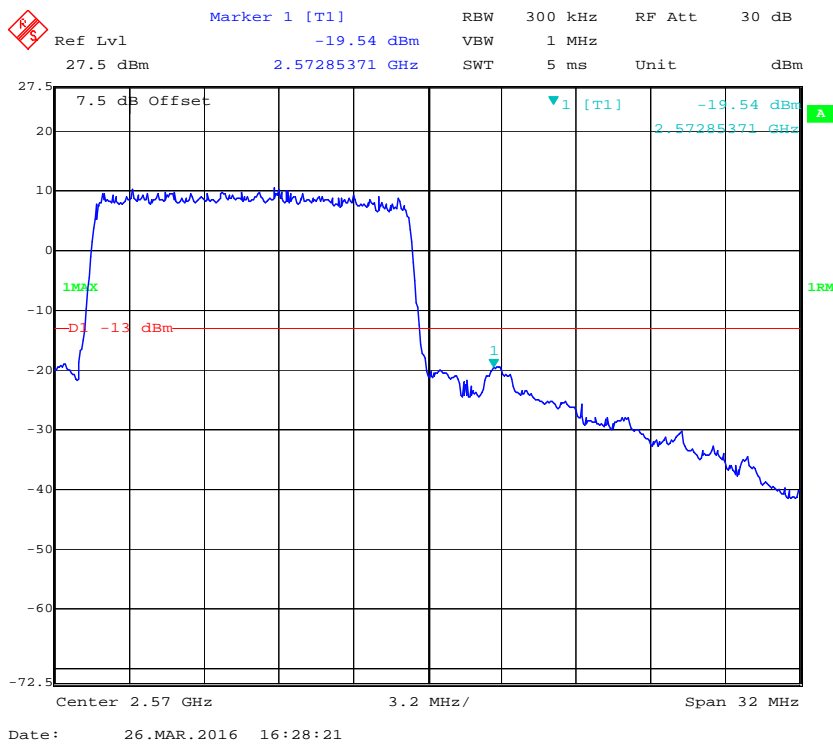
QPSK (15 MHz, FULL RB) - Right Band Edge



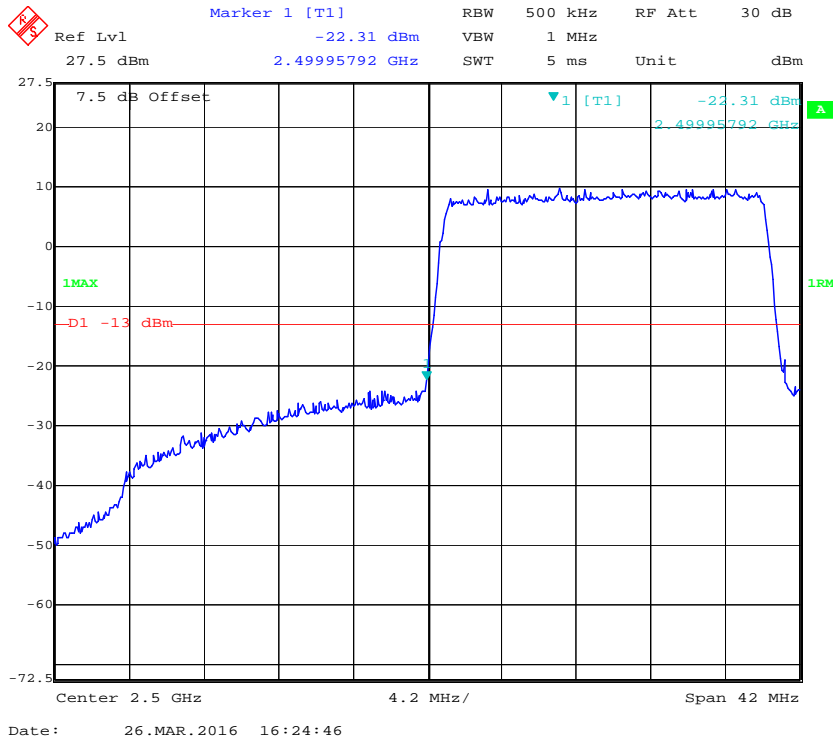
16-QAM (15 MHz, FULL RB) - Left Band Edge



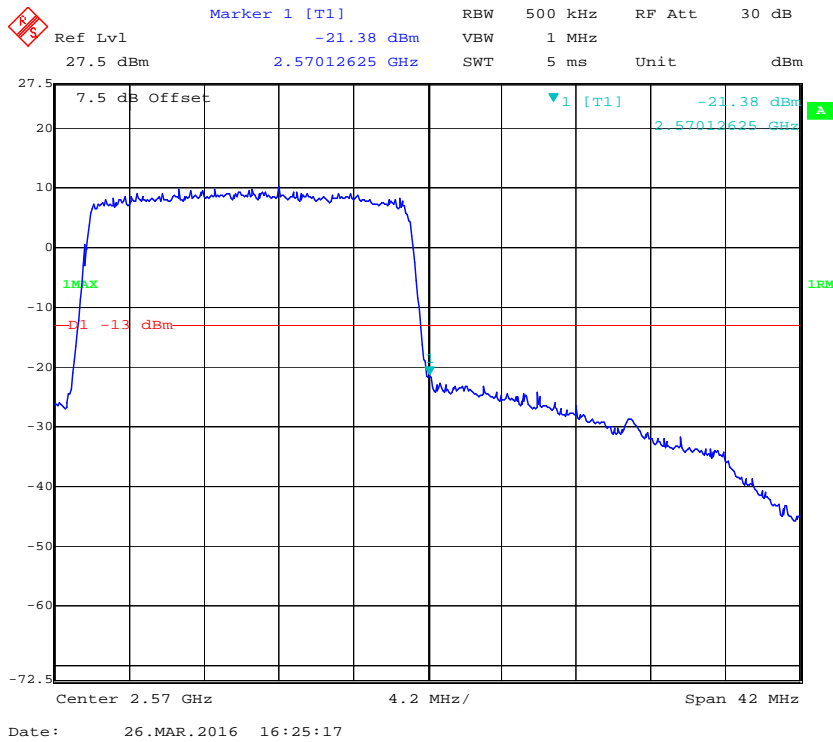
16-QAM (15 MHz, FULL RB) - Right Band Edge



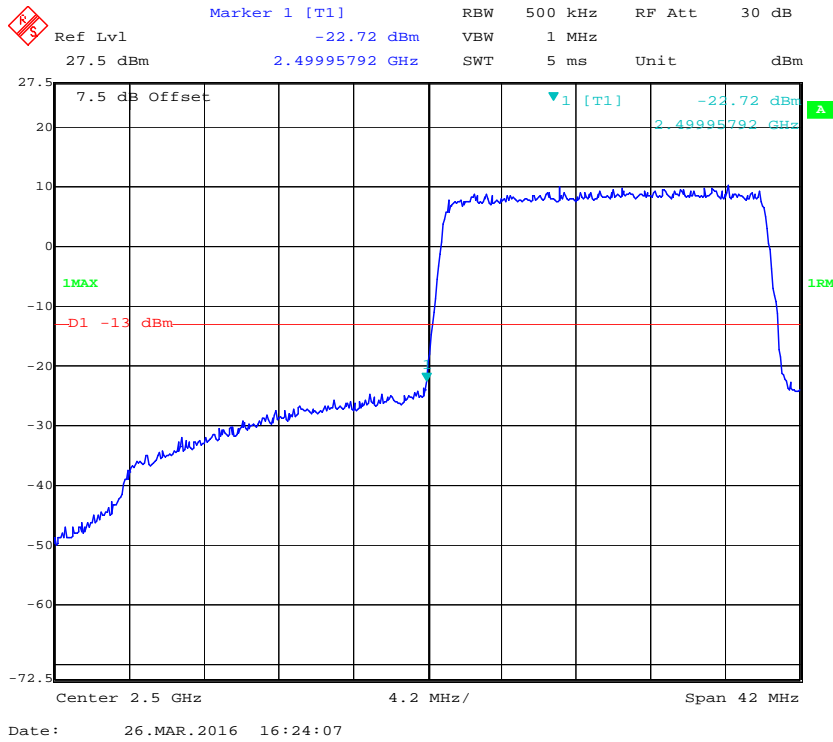
QPSK (20 MHz, FULL RB) - Left Band Edge



QPSK (20 MHz, FULL RB) - Right Band Edge



16-QAM (20 MHz, FULL RB) - Left Band Edge



16-QAM (20 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

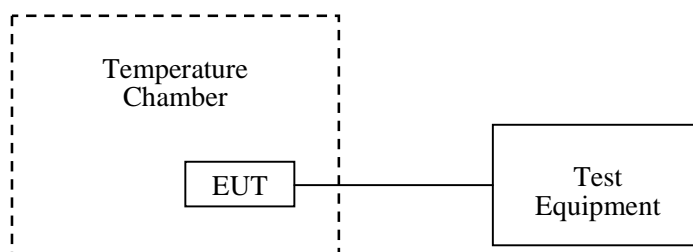
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
ESPEC	Temperature & Humidity Chamber	EL-10KA	09107726	2015-11-01	2016-11-01
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	106891	2015-11-23	2016-11-23
R&S	Wideband Radio Communication tester	CMW500	1201.002K50-146520-wh	2015-11-23	2016-11-23
Ducommun technologies	RF Cable	RG-214	4	2015-06-15	2016-06-15
WEINSCHTEL	6dB Attenuator	1012	30187	2015-06-18	2016-06-18

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

Test Data**Environmental Conditions**

Temperature:	22 °C
Relative Humidity:	50 %
ATM Pressure:	101.0kPa

The testing was performed by Simon Wang on 2016-03-30.

EUT operation mode: Transmitting

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

Cellular Band (Part 22H)

GSM Mode

Middle Channel, $f_0 = 836.6$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-20	3.8	27	0.032	2.5
-10		22	0.026	2.5
0		20	0.024	2.5
10		23	0.027	2.5
20		21	0.025	2.5
30		28	0.033	2.5
40		27	0.032	2.5
50		25	0.030	2.5
25	V min.= 3.5	24	0.029	2.5
25	V max.= 4.35	26	0.031	2.5

EDGE Mode

Middle Channel, $f_0 = 836.6$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-20	3.8	26	0.0311	2.5
-10		27	0.0323	2.5
0		23	0.0275	2.5
10		24	0.0287	2.5
20		28	0.0335	2.5
30		29	0.0347	2.5
40		28	0.0335	2.5
50		21	0.0251	2.5
25	V min.= 3.5	22	0.0263	2.5
25	V max.= 4.35	29	0.0347	2.5

WCDMA Mode

Middle Channel, $f_0 = 836.6$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Limit (ppm)
-20	3.8	-4	-0.0048	2.5
-10		-3	-0.0036	2.5
0		-2	-0.0024	2.5
10		-1	-0.0012	2.5
20		3	0.0036	2.5
30		-2	-0.0024	2.5
40		2	0.0024	2.5
50		1	0.0012	2.5
25	V min.= 3.5	3	0.0036	2.5
25	V max.= 4.35	2	0.0024	2.5

PCS Band (Part 24E)

GSM Mode

Middle Channel, $f_0 = 1880.0$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-20	3.8	18	0.0096	pass
-10		23	0.0122	pass
0		20	0.0106	pass
10		19	0.0101	pass
20		21	0.0112	pass
30		16	0.0085	pass
40		27	0.0144	pass
50		19	0.0101	pass
25	V min.= 3.5	20	0.0106	pass
25	V max.= 4.35	22	0.0117	pass

EDGE Mode

Middle Channel, $f_0 = 1880.0$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-20	3.8	14	0.0074	pass
-10		13	0.0069	pass
0		17	0.0090	pass
10		15	0.0080	pass
20		19	0.0101	pass
30		15	0.0080	pass
40		14	0.0074	pass
50		20	0.0106	pass
25	V min.= 3.5	22	0.0117	pass
25	V max.= 4.35	18	0.0096	pass

WCDMA Mode

Middle Channel, $f_0 = 1880.0$ MHz				
Temperature (°C)	Power Supplied (V _{DC})	Frequency Error (Hz)	Frequency Error (ppm)	Result
-20	3.8	0	0	pass
-10		2	0.0011	pass
0		3	0.0016	pass
10		1	0.0005	pass
20		2	0.0011	pass
30		-3	-0.0016	pass
40		-4	-0.0021	pass
50		-2	-0.0011	pass
25	V min.= 3.5	5	0.0027	pass
25	V max.= 4.35	2	0.0011	pass

QPSK:

Band 2:

Bandwidth	Voltage (V _{DC})	Temperature (°C)	QPSK (Hz)	QPSK (ppm)	Result
10.0 MHz, Middle Channel	3.7	-30	-15	-0.0080	Pass
		-20	-17	-0.0090	Pass
		-10	-19	-0.0101	Pass
		0	-14	-0.0074	Pass
		10	-16	-0.0085	Pass
		20	-12	-0.0064	Pass
		30	-17	-0.0090	Pass
		40	-18	-0.0096	Pass
		50	-20	-0.0106	Pass
	3.8	25	-17	-0.0090	Pass
	3.5	25	-24	-0.0128	Pass
	4.35	25	-19	-0.0101	Pass

Band 4:

Bandwidth	Voltage (V _{DC})	Temperature (°C)	QPSK (Hz)	QPSK (ppm)	Result
10.0 MHz, Middle Channel	3.7	-30	-20	-0.0115	Pass
		-20	-19	-0.0110	Pass
		-10	-17	-0.0098	Pass
		0	-23	-0.0133	Pass
		10	-19	-0.0110	Pass
		20	-15	-0.0087	Pass
		30	-14	-0.0081	Pass
		40	-16	-0.0092	Pass
		50	-18	-0.0104	Pass
	3.8	25	-21	-0.0121	Pass
	3.5	25	-19	-0.0110	Pass
	4.35	25	-23	-0.0133	Pass

Band 7:

Bandwidth	Voltage (V _{DC})	Temperature (°C)	QPSK (Hz)	QPSK (ppm)	Result
10.0 MHz, Middle Channel	3.7	-30	-18	-0.00710	Pass
		-20	-19	-0.00750	Pass
		-10	-20	-0.00789	Pass
		0	-24	-0.00947	Pass
		10	-21	-0.00828	Pass
		20	-19	-0.00750	Pass
		30	-18	-0.00710	Pass
		40	-17	-0.00671	Pass
		50	-18	-0.00710	Pass
	3.8	25	-17	-0.00671	Pass
	3.5	25	-20	-0.00789	Pass
	4.35	25	-19	-0.00750	Pass

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