FCC PART 27

FCC PART 22H, PART 24E

MEASUREMENT AND TEST REPORT

For

b mobile HK Limited

Flat 18; 14/F Block 1; Golden Industrial Building; 16-26 Kwai Tak Street; Kwai Chung; New Territories; Hong Kong, China

FCC ID: ZSW-30-013

Report Type:	**Product Type:**
Original Report	Mobile Phone

Test Engineer:	William Li
Report Number:	RSZ150716003-00D
Report Date:	2015-08-10
Reviewed By:	Jimmy Xiao RF Engineer
Prepared By:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

TABLE OF CONTENTS

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *b mobile HK Limited* 's product, model number:*AX1055 (FCC ID: ZSW-30-013)* or the "EUT" in this report was a *Mobile Phone*, which was measured approximately: 14.5 cm (L) × 7.2 cm (W) × 0.8 cm (H), rated with input voltage: DC 3.8 V rechargeable Li-ion battery or DC5.0 V from adapter.

Adapter Information
Input: AC 100-240V, 50/60Hz, 0.15A
Output: DC 5.0V, 1.0 A

Note: The serial models AX1045 and AX1055 share the same schematics, they are different in model names, the details was explained in the attached product similarity declaration letter provided and guaranteed by applicant. Model AX1055 was selected for testing.

**All measurement and test data in this report was gathered from production sample serial number: 1505751 (Assigned by Shenzhen BACL).The EUT supplied by the applicant was received on 2015-07-16.*

Objective

This type approval report is prepared on behalf of *b mobile HK Limited* in accordance with Part 2, Part 22-Subpart H, Part 24-Subpart E and Part 27 of the Federal Communication Commissions rules.

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

Related Submittal(s)/Grant(s)

FCC Part 15B JBP, Part 15.247 DSS&DTS submissions with FCC ID: ZSW-30-013.

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-1037, TIA/EIA 603-D & TIA/EIA 603-D, ANSI C63.4-2009.

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 5.91 dB for 30MHz-1GHz.and 4.92 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 C63.4-2003.

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.

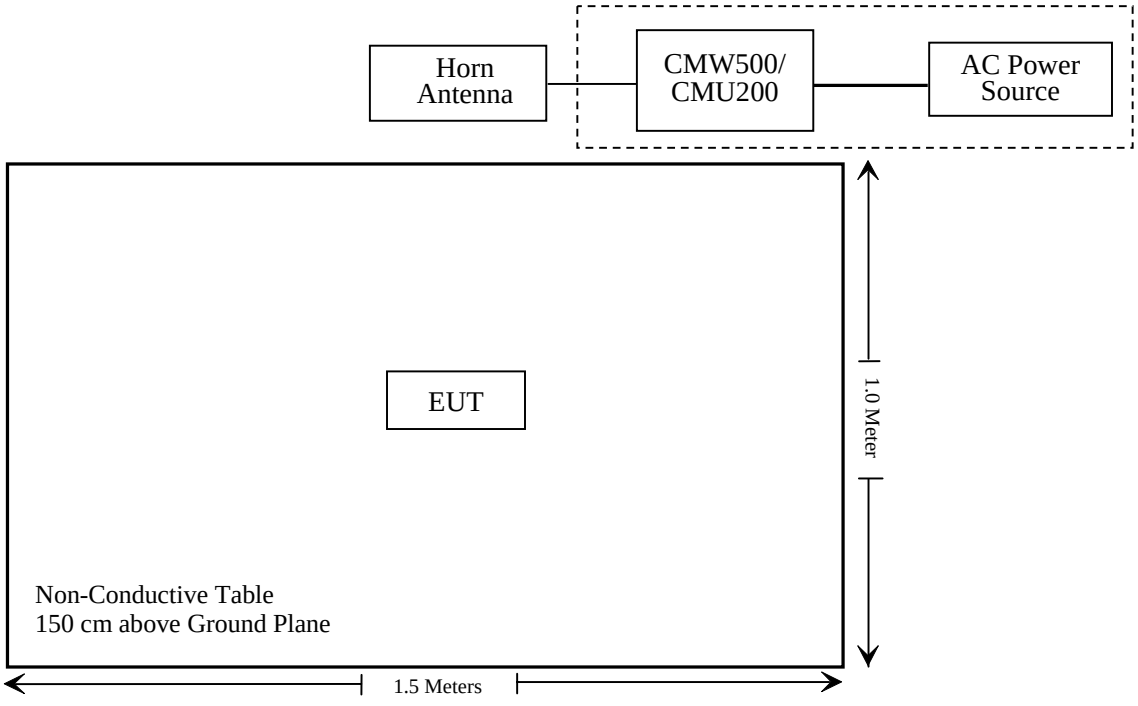
Equipment Modifications

No modifications were made to the EUT.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Rohde & Schwarz	Wideband Radio Communication Tester	CMW500	1201.0002K50
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, §27.52	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: RSZ150716003-20.

FCC §1.1307(b) & §27.52 & §2.1093 - RF EXPOSURE INFORMATION

Applicable Standard

FCC§1.1307, §2.1093 and §27.52.

Test Result

Compliance, please refer to the SAR report: RSZ150716003-20

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.

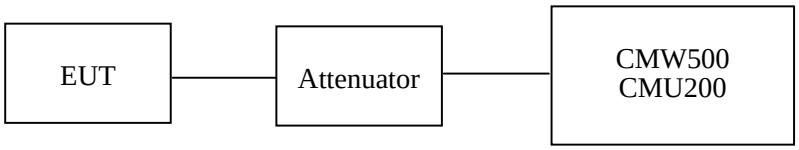
According to §27.50(c), the maximum EIRP must not exceed 3Watts (34.77dBm) for 704-716MHz.
According to §27.50(d), the maximum EIRP must not exceed 1Watts (30dBm) for 1710-1755MHz.
According to §27.50(h), the maximum EIRP must not exceed 2Watts (33dBm) for 2500-2570MHz.

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

Test Procedure

Conducted method:

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



Radiated 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	2014-11-03	2015-11-03
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2014-12-07	2017-12-06
HP	Synthesized Sweeper	8341B	2624A00116	2015-06-03	2016-06-03
COM POWER	Dipole Antenna	AD-100	041000	NCR	NCR
A.H. System	Horn Antenna	SAS-200/571	135	2013-02-11	2016-02-10
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2014-12-11	2015-12-11
Sunol Sciences	Horn Antenna	DRH-118	A052304	2014-12-01	2015-11-30
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	106891	2014-11-23	2015-11-23

*** 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:	22~25 ℃
Relative Humidity:	48~51 %
ATM Pressure:	101.0~101.5 kPa

The testing was performed by William Li from 2015-08-05 to 2015-08-12.

Conducted Power

Cellular Band (Part 22H)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	128	824.2	32.89	38.45
	190	836.6	32.86	38.45
	251	848.8	32.81	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	128	824.2	33.06	32.21	30.25	29.20	38.45
	190	836.6	33.05	32.19	30.29	29.23	38.45
	251	848.8	32.99	32.13	30.28	29.26	38.45

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	128	824.2	27.02	25.81	23.64	22.63	38.45
	190	836.6	26.97	25.73	23.57	22.55	38.45
	251	848.8	26.82	25.58	23.44	22.42	38.45

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band V)	Normal	RMC12.2k		21.88	21.93	21.84
		Rel 6 HSDPA	1	20.72	20.75	20.85
			2	20.63	20.70	20.81
			3	20.65	20.72	20.80
			4	20.68	20.67	20.74
		Rel 6 HSUPA	1	20.62	20.64	20.72
			2	20.71	20.72	20.84
			3	20.68	20.67	20.75
			4	20.65	20.65	20.78
			5	20.66	20.63	20.74

PCS Band (Part 24E)

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)	Limit (dBm)
GSM	512	1850.2	30.22	33
	661	1880.0	30.25	33
	810	1909.8	30.31	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
GPRS	512	1850.2	30.25	29.31	27.55	26.43	33
	661	1880.0	30.29	29.38	27.58	26.55	33
	810	1909.8	30.35	29.45	27.70	26.54	33

Mode	Channel	Frequency (MHz)	Average Output Power (dBm)				Limit (dBm)
			1 slot	2 slots	3 slots	4 slots	
EGPRS	512	1850.2	25.76	24.68	22.64	21.48	33
	661	1880.0	25.63	24.50	22.43	21.23	33
	810	1909.8	25.97	24.87	22.72	21.47	33

Mode	Test Condition	Test Mode	3GPP Sub Test	Average Output Power (dBm)		
				Low Frequency	Middle Frequency	High Frequency
WCDMA (Band II)	Normal	RMC12.2k		21.07	21.04	21.20
		Rel 6 HSDPA	1	20.68	20.62	20.59
			2	20.65	20.59	20.56
			3	20.63	20.52	20.54
			4	20.64	20.54	20.52
		Rel 6 HSUPA	1	20.60	20.50	20.48
			2	20.70	20.61	20.58
			3	20.66	20.60	20.56
			4	20.61	20.58	20.54
			5	20.58	20.56	20.49

Peak-to-average ratio (PAR)

Cellular Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	0.27	13
	Middle	0.30	13
	High	0.26	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	0.29	13
	Middle	0.32	13
	High	0.28	13

Mode	Channel	PAR (dB)	Limit (dB)
WCDMA (BPSK)	Low	2.63	13
	Middle	2.65	13
	High	2.76	13
HSDPA (16QAM)	Low	2.63	13
	Middle	2.72	13
	High	2.84	13
HSUPA (BPSK)	Low	2.65	13
	Middle	2.78	13
	High	2.76	13

PCS Band

Mode	Channel	PAR (dB)	Limit (dB)
GSM	Low	0.22	13
	Middle	0.25	13
	High	0.26	13

Mode	Channel	PAR (dB)	Limit (dB)
EGPRS	Low	0.31	13
	Middle	0.33	13
	High	0.29	13

Mode	Channel	PAR (dB)	Limit (dB)
WCDMA (BPSK)	Low	2.78	13
	Middle	2.86	13
	High	2.93	13
HSDPA (16QAM)	Low	2.74	13
	Middle	2.82	13
	High	2.95	13
HSUPA (BPSK)	Low	2.73	13
	Middle	2.67	13
	High	2.76	13

Radiated Power (Measured at Max. conducted power channel)

ERP & EIRP

GSM Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	S.G. Level (dBm)	Cable loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
ERP for Cellular Band (Part 22H), Middle Channel										
836.6	99.12	110	1.4	H	29.1	0.67	0	28.43	38.45	10.02
836.6	98.09	205	1.2	V	28.2	0.67	0	27.53	38.45	10.92
EIRP for PCS Band (Part 24E), Middle Channel										
1880	91.13	240	1.3	H	21.1	1.38	7.30	27.02	33	5.98
1880	91.03	65	1.2	V	21.0	1.38	7.30	26.62	33	6.38

EDGE Mode：

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	S.G. Level (dBm)	Cable loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
ERP for Cellular Band (Part 22H), Middle Channel										
836.6	94.12	110	1.4	H	24.1	0.67	0	23.43	38.45	15.02
836.6	94.02	205	1.2	V	24.0	0.67	0	23.33	38.45	15.12
EIRP for PCS Band (Part 24E), Middle Channel										
1880	85.13	240	1.3	H	16.1	1.38	7.30	22.02	33	10.98
1880	85.03	65	1.2	V	16.0	1.38	7.30	21.62	33	11.38

WCDMA Mode:

Frequency (MHz)	Receiver Reading (dBμV)	Turntable Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H/24E	
			Height (m)	Polar (H/V)	S.G. Level (dBm)	Cable loss (dB)	Antenna Gain (dB)		Limit (dBm)	Margin (dB)
EIRP for WCDMA Band V (Part 22H), Middle Channel										
836.6	90.90	110	1.3	H	20.9	0.67	0	20.23	38.45	18.22
836.6	91.91	115	1.2	V	21.9	0.67	0	21.23	38.45	17.22
EIRP for WCDMA Band II (Part 24E), Middle Channel										
1880	85.68	17	2.0	H	15.7	1.38	7.30	21.62	33	11.38
1880	84.72	93	2.1	V	14.7	1.38	7.30	20.62	33	12.38

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	22.15	22.23	22.23
		RB Size=1, RB Offset=2	22.23	22.24	22.24
		RB Size=1, RB Offset=5	22.23	22.35	22.14
		RB Size=3, RB Offset=0	22.04	22.07	22.15
		RB Size=3, RB Offset=1	22.19	22.11	22.09
		RB Size=3, RB Offset=2	22.04	22.12	22.15
		RB Size=6, RB Offset=0	21.79	21.84	21.91
	16QAM	RB Size=1, RB Offset=0	21.79	21.83	21.87
		RB Size=1, RB Offset=2	22.22	22.22	22.24
		RB Size=1, RB Offset=5	21.96	22.06	22.09
		RB Size=3, RB Offset=0	22.23	22.28	22.29
		RB Size=3, RB Offset=1	21.95	22.02	22.10
		RB Size=3, RB Offset=2	22.28	22.21	22.24
		RB Size=6, RB Offset=0	21.99	22.06	22.14
3.0	QPSK	RB Size=1, RB Offset=0	22.10	21.82	21.86
		RB Size=1, RB Offset=7	21.47	21.54	21.60
		RB Size=1, RB Offset=14	22.12	22.20	22.21
		RB Size=8, RB Offset=0	21.92	21.97	22.01
		RB Size=8, RB Offset=4	21.46	21.49	21.52
		RB Size=8, RB Offset=7	21.87	21.90	21.95
		RB Size=15, RB Offset=0	21.72	21.82	21.90
	16QAM	RB Size=1, RB Offset=0	21.80	21.89	21.98
		RB Size=1, RB Offset=7	22.46	21.83	21.85
		RB Size=1, RB Offset=14	21.83	21.85	21.91
		RB Size=8, RB Offset=0	21.86	21.92	21.93
		RB Size=8, RB Offset=4	22.14	22.17	22.21
		RB Size=8, RB Offset=7	21.96	22.04	22.13
		RB Size=15, RB Offset=0	21.81	21.83	21.90

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	22.18	22.27	22.37
		RB Size=1, RB Offset=12	22.17	22.24	22.30
		RB Size=1, RB Offset=24	21.85	21.86	21.91
		RB Size=12, RB Offset=0	21.76	21.83	21.88
		RB Size=12, RB Offset=6	21.80	21.84	21.84
		RB Size=12, RB Offset=11	21.69	21.77	21.78
		RB Size=25, RB Offset=0	21.81	21.90	21.93
	16QAM	RB Size=1, RB Offset=0	21.82	21.88	21.91
		RB Size=1, RB Offset=12	21.77	21.87	21.96
		RB Size=1, RB Offset=24	21.80	21.84	21.86
		RB Size=12, RB Offset=0	20.88	20.98	21.04
		RB Size=12, RB Offset=6	20.67	20.76	20.83
		RB Size=12, RB Offset=11	21.80	21.85	21.94
		RB Size=25, RB Offset=0	21.69	21.71	21.75
10.0	QPSK	RB Size=1, RB Offset=0	22.07	22.17	22.26
		RB Size=1, RB Offset=24	22.11	22.12	22.13
		RB Size=1, RB Offset=49	22.23	22.26	22.21
		RB Size=25, RB Offset=0	22.14	22.24	22.20
		RB Size=25, RB Offset=12	22.11	22.20	22.22
		RB Size=25, RB Offset=24	21.87	21.87	21.93
		RB Size=50, RB Offset=0	22.06	22.11	22.11
	16QAM	RB Size=1, RB Offset=0	22.21	22.31	22.37
		RB Size=1, RB Offset=24	22.17	22.24	22.25
		RB Size=1, RB Offset=49	21.93	21.96	22.05
		RB Size=25, RB Offset=0	21.74	21.80	21.82
		RB Size=25, RB Offset=12	21.81	21.84	21.92
		RB Size=25, RB Offset=24	21.78	21.87	21.88
		RB Size=50, RB Offset=0	21.84	21.93	22.02

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	22.05	21.85	21.92
		RB Size=1, RB Offset=37	21.75	21.79	21.87
		RB Size=1, RB Offset=74	21.79	21.86	21.91
		RB Size=36, RB Offset=0	22.09	22.17	22.21
		RB Size=36, RB Offset=18	21.93	21.93	22.01
		RB Size=36, RB Offset=37	21.78	21.82	21.84
		RB Size=75, RB Offset=0	22.14	22.23	22.26
	16QAM	RB Size=1, RB Offset=0	21.87	21.95	22.01
		RB Size=1, RB Offset=37	21.79	21.87	21.91
		RB Size=1, RB Offset=74	22.05	22.08	22.18
		RB Size=36, RB Offset=0	22.09	22.14	22.18
		RB Size=36, RB Offset=18	22.13	22.17	22.25
		RB Size=36, RB Offset=37	22.45	22.21	22.16
		RB Size=75, RB Offset=0	22.04	22.05	22.09
20.0	QPSK	RB Size=1, RB Offset=0	22.31	22.38	22.42
		RB Size=1, RB Offset=49	21.78	21.81	21.88
		RB Size=1, RB Offset=99	22.18	21.84	21.90
		RB Size=50, RB Offset=0	21.49	21.58	21.63
		RB Size=50, RB Offset=24	22.08	22.10	22.12
		RB Size=50, RB Offset=49	21.87	21.92	22.01
		RB Size=100, RB Offset=0	21.39	21.47	21.52
	16QAM	RB Size=1, RB Offset=0	21.80	21.89	21.96
		RB Size=1, RB Offset=49	21.70	21.80	21.88
		RB Size=1, RB Offset=99	21.79	21.84	21.89
		RB Size=50, RB Offset=0	21.95	22.17	21.82
		RB Size=50, RB Offset=24	21.77	21.82	21.84
		RB Size=50, RB Offset=49	21.79	21.89	21.95
		RB Size=100, RB Offset=0	20.91	20.96	21.01

EIRP:

QPSK:

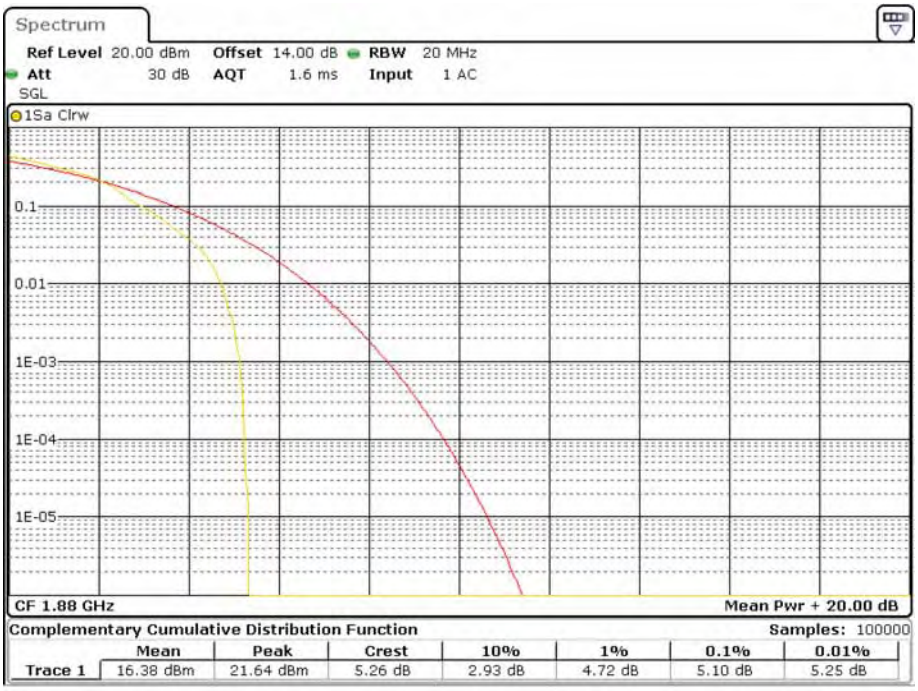
Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 24E
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)
Middle Channel									
1.4 MHz Bandwidth									
1880.00	86.43	76	1.3	H	15.4	1.38	7.30	21.32	33
1880.00	85.29	272	2.0	V	14.3	1.38	7.30	20.22	33
3 MHz Bandwidth									
1880.00	85.79	24	2.2	H	14.8	1.38	7.30	20.72	33
1880.00	84.93	179	1.2	V	13.9	1.38	7.30	19.82	33
5 MHz Bandwidth									
1880.00	85.83	69	1.1	H	14.8	1.38	7.30	20.72	33
1880.00	85.07	244	2.4	V	14.1	1.38	7.30	20.02	33
10 MHz Bandwidth									
1880.00	85.89	74	2.3	H	14.9	1.38	7.30	20.82	33
1880.00	85.22	279	1.1	V	14.2	1.38	7.30	20.12	33
15 MHz Bandwidth									
1880.00	85.96	39	1.4	H	15.0	1.38	7.30	20.92	33
1880.00	85.34	254	2.0	V	14.3	1.38	7.30	20.22	33
20 MHz Bandwidth									
1880.00	86.08	75	1.5	H	15.1	1.38	7.30	21.02	33
1880.00	85.49	277	2.6	V	14.5	1.38	7.30	20.42	33

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 24E
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)
Middle Channel									
1.4 MHz Bandwidth									
1880.00	86.58	88	2.3	H	15.6	1.38	7.30	21.52	33
1880.00	85.49	287	1.5	V	14.5	1.38	7.30	20.42	33
3 MHz Bandwidth									
1880.00	85.87	256	1.9	H	14.9	1.38	7.30	20.82	33
1880.00	85.03	136	1.1	V	14.0	1.38	7.30	19.92	33
5 MHz Bandwidth									
1880.00	85.91	168	1.7	H	14.9	1.38	7.30	20.82	33
1880.00	85.15	359	2.4	V	14.2	1.38	7.30	20.12	33
10 MHz Bandwidth									
1880.00	85.66	138	1.8	H	14.7	1.38	7.30	20.62	33
1880.00	85.31	319	1.6	V	14.3	1.38	7.30	20.22	33
15 MHz Bandwidth									
1880.00	86.02	71	1.4	H	15.0	1.38	7.30	20.92	33
1880.00	85.57	199	2.3	V	14.6	1.38	7.30	20.52	33
20 MHz Bandwidth									
1880.00	86.11	191	1.2	H	15.1	1.38	7.30	21.02	33
1880.00	85.61	130	1.1	V	14.6	1.38	7.30	20.52	33

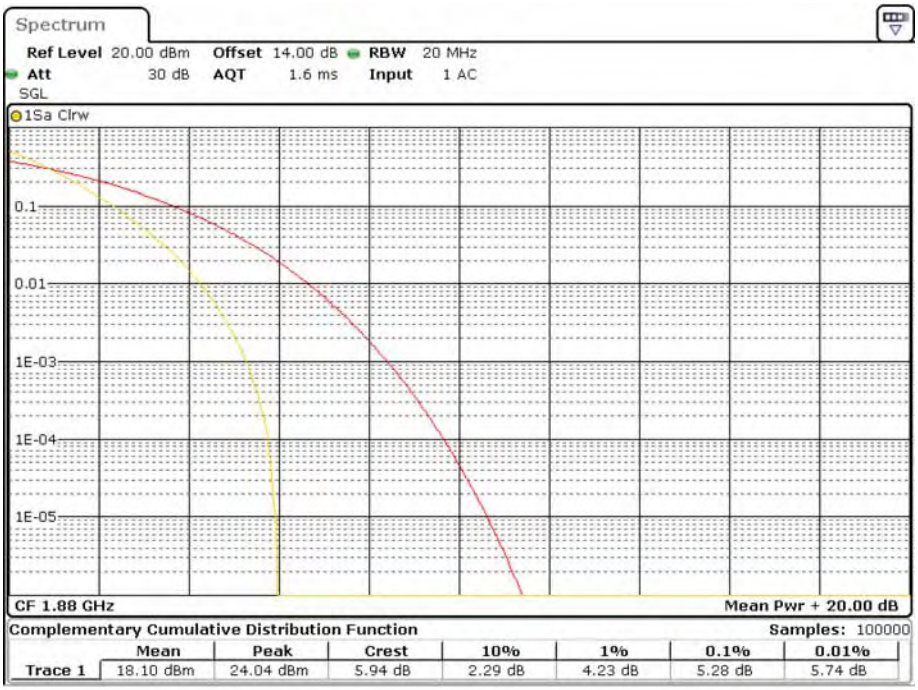
Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
16QAM (1RB Size)	5.26	≦ 13	Pass
16QAM (100RB Size)	5.94	≦ 13	Pass

20.0 MHz PAR – Middle Channel (16QAM, 1RB Size)



Date: 31.JUL.2015 11:30:19

20.0 MHz PAR – Middle Channel (16QAM, 100RB Size)



Date: 31.JUL.2015 11:23:59

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	21.32	21.40	21.40
		RB Size=1, RB Offset=2	21.40	21.41	21.41
		RB Size=1, RB Offset=5	21.40	21.52	21.31
		RB Size=3, RB Offset=0	21.21	21.24	21.32
		RB Size=3, RB Offset=1	21.36	21.28	21.26
		RB Size=3, RB Offset=2	21.21	21.29	21.32
		RB Size=6, RB Offset=0	20.96	21.01	21.08
	16QAM	RB Size=1, RB Offset=0	20.96	21.00	21.04
		RB Size=1, RB Offset=2	21.39	21.39	21.41
		RB Size=1, RB Offset=5	21.13	21.23	21.26
		RB Size=3, RB Offset=0	21.40	21.45	21.46
		RB Size=3, RB Offset=1	21.12	21.19	21.27
		RB Size=3, RB Offset=2	21.45	21.38	21.41
		RB Size=6, RB Offset=0	21.16	21.23	21.31
3.0	QPSK	RB Size=1, RB Offset=0	21.27	20.99	21.03
		RB Size=1, RB Offset=7	20.64	20.71	20.77
		RB Size=1, RB Offset=14	21.29	21.37	21.38
		RB Size=8, RB Offset=0	21.09	21.14	21.18
		RB Size=8, RB Offset=4	20.63	20.66	20.69
		RB Size=8, RB Offset=7	21.04	21.07	21.12
		RB Size=15, RB Offset=0	20.89	20.99	21.07
	16QAM	RB Size=1, RB Offset=0	20.97	21.06	21.15
		RB Size=1, RB Offset=7	21.63	21.00	21.02
		RB Size=1, RB Offset=14	21.00	21.02	21.08
		RB Size=8, RB Offset=0	21.03	21.09	21.10
		RB Size=8, RB Offset=4	21.31	21.34	21.38
		RB Size=8, RB Offset=7	21.13	21.21	21.30
		RB Size=15, RB Offset=0	20.98	21.00	21.07

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	21.35	21.44	21.54
		RB Size=1, RB Offset=12	21.34	21.41	21.47
		RB Size=1, RB Offset=24	21.02	21.03	21.08
		RB Size=12, RB Offset=0	20.93	21.00	21.05
		RB Size=12, RB Offset=6	20.97	21.01	21.01
		RB Size=12, RB Offset=11	20.86	20.94	20.95
		RB Size=25, RB Offset=0	20.98	21.07	21.10
	16QAM	RB Size=1, RB Offset=0	20.99	21.05	21.08
		RB Size=1, RB Offset=12	20.94	21.04	21.13
		RB Size=1, RB Offset=24	20.97	21.01	21.03
		RB Size=12, RB Offset=0	20.05	20.15	20.21
		RB Size=12, RB Offset=6	19.84	19.93	20.00
		RB Size=12, RB Offset=11	20.97	21.02	21.11
		RB Size=25, RB Offset=0	20.86	20.88	20.92
10.0	QPSK	RB Size=1, RB Offset=0	21.24	21.34	21.43
		RB Size=1, RB Offset=24	21.28	21.29	21.30
		RB Size=1, RB Offset=49	21.40	21.43	21.38
		RB Size=25, RB Offset=0	21.31	21.41	21.37
		RB Size=25, RB Offset=12	21.28	21.37	21.39
		RB Size=25, RB Offset=24	21.04	21.04	21.10
		RB Size=50, RB Offset=0	21.23	21.28	21.28
	16QAM	RB Size=1, RB Offset=0	21.38	21.48	21.54
		RB Size=1, RB Offset=24	21.34	21.41	21.42
		RB Size=1, RB Offset=49	21.10	21.13	21.22
		RB Size=25, RB Offset=0	20.91	20.97	20.99
		RB Size=25, RB Offset=12	20.98	21.01	21.09
		RB Size=25, RB Offset=24	20.95	21.04	21.05
		RB Size=50, RB Offset=0	21.01	21.10	21.19

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	21.22	21.02	21.09
		RB Size=1, RB Offset=37	20.92	20.96	21.04
		RB Size=1, RB Offset=74	20.96	21.03	21.08
		RB Size=36, RB Offset=0	21.26	21.34	21.38
		RB Size=36, RB Offset=18	21.10	21.10	21.18
		RB Size=36, RB Offset=37	20.95	20.99	21.01
		RB Size=75, RB Offset=0	21.31	21.40	21.43
	16QAM	RB Size=1, RB Offset=0	21.04	21.12	21.18
		RB Size=1, RB Offset=37	20.96	21.04	21.08
		RB Size=1, RB Offset=74	21.22	21.25	21.35
		RB Size=36, RB Offset=0	21.26	21.31	21.35
		RB Size=36, RB Offset=18	21.30	21.34	21.42
		RB Size=36, RB Offset=37	21.62	21.38	21.33
		RB Size=75, RB Offset=0	21.21	21.22	21.26
20.0	QPSK	RB Size=1, RB Offset=0	21.48	21.55	21.59
		RB Size=1, RB Offset=49	20.95	20.98	21.05
		RB Size=1, RB Offset=99	21.35	21.01	21.07
		RB Size=50, RB Offset=0	20.66	20.75	20.80
		RB Size=50, RB Offset=24	21.25	21.27	21.29
		RB Size=50, RB Offset=49	21.04	21.09	21.18
		RB Size=100, RB Offset=0	20.56	20.64	20.69
	16QAM	RB Size=1, RB Offset=0	20.97	21.06	21.13
		RB Size=1, RB Offset=49	20.87	20.97	21.05
		RB Size=1, RB Offset=99	20.96	21.01	21.06
		RB Size=50, RB Offset=0	21.12	21.34	20.99
		RB Size=50, RB Offset=24	20.94	20.99	21.01
		RB Size=50, RB Offset=49	20.96	21.06	21.12
		RB Size=100, RB Offset=0	20.08	20.13	20.18

EIRP:

QPSK:

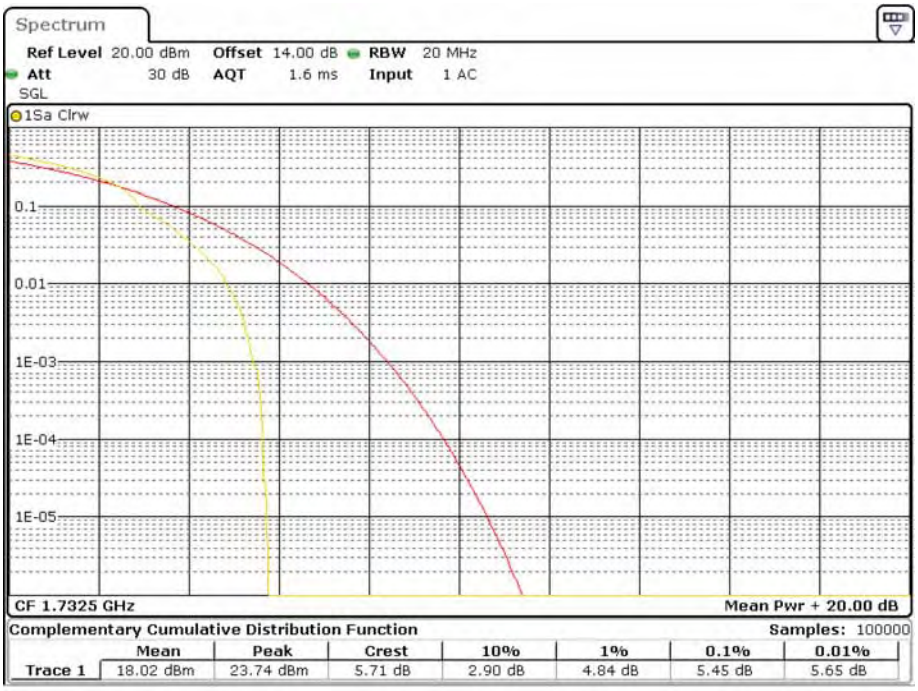
Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 27
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)
Middle Channel									
1.4 MHz Bandwidth									
1732.50	86.29	132	1.7	H	15.3	1.62	6.90	20.58	30
1732.50	86.03	127	1.6	V	15.0	1.62	6.90	20.28	30
3 MHz Bandwidth									
1732.50	86.41	152	1.6	H	15.4	1.62	6.90	20.68	30
1732.50	85.88	159	1.7	V	14.9	1.62	6.90	20.18	30
5 MHz Bandwidth									
1732.50	86.23	15	1.7	H	15.2	1.62	6.90	20.48	30
1732.50	85.91	114	1.6	V	14.9	1.62	6.90	20.18	30
10MHz Bandwidth									
1732.50	86.34	17	1.6	H	15.3	1.62	6.90	20.58	30
1732.50	85.79	132	1.7	V	14.8	1.62	6.90	20.08	30
15 MHz Bandwidth									
1732.50	86.41	122	1.7	H	15.4	1.62	6.90	20.68	30
1732.50	85.89	107	1.6	V	14.9	1.62	6.90	20.18	30
20 MHz Bandwidth									
1732.50	86.61	147	1.6	H	15.6	1.62	6.90	20.88	30
1732.50	85.82	167	1.6	V	14.8	1.62	6.90	20.08	30

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 27
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)
Middle Channel									
1.4 MHz Bandwidth									
1732.50	86.34	319	1.6	H	15.3	1.62	6.90	20.58	30
1732.50	86.11	314	2.4	V	15.1	1.62	6.90	20.38	30
3 MHz Bandwidth									
1732.50	86.32	347	2.4	H	15.3	1.62	6.90	20.58	30
1732.50	85.67	292	1.6	V	14.7	1.62	6.90	19.98	30
5 MHz Bandwidth									
1732.50	86.34	41	2.0	H	15.3	1.62	6.90	20.58	30
1732.50	85.88	141	1.0	V	14.9	1.62	6.90	20.18	30
10MHz Bandwidth									
1732.50	86.42	251	2.4	H	15.4	1.62	6.90	20.68	30
1732.50	85.83	127	2.3	V	14.8	1.62	6.90	20.08	30
15 MHz Bandwidth									
1732.50	86.55	270	1.5	H	15.6	1.62	6.90	20.88	30
1732.50	85.94	9	1.7	V	14.9	1.62	6.90	20.18	30
20 MHz Bandwidth									
1732.50	86.72	254	1.9	H	15.7	1.62	6.90	20.98	30
1732.50	85.98	265	1.1	V	15.0	1.62	6.90	20.28	30

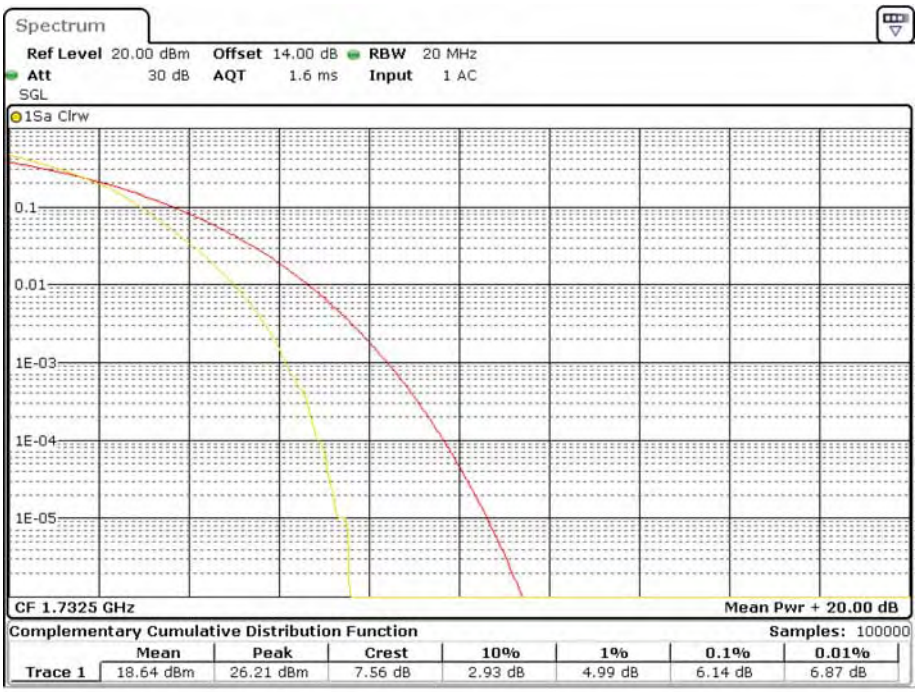
Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
16QAM (1RB Size)	5.71	≦ 13	Pass
16QAM (100RB Size)	7.56	≦ 13	Pass

20.0 MHz PAR – Middle Channel (16QAM, 1RB Size)



Date: 31.JUL.2015 11:29:31

20.0 MHz PAR –Middle Channel (16QAM, 100RB Size)



Date: 31.JUL.2015 11:28:50

LTE Band 5:

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	21.83	21.91	21.91
		RB Size=1, RB Offset=2	21.91	21.92	21.92
		RB Size=1, RB Offset=5	21.91	22.03	21.82
		RB Size=3, RB Offset=0	21.72	21.75	21.83
		RB Size=3, RB Offset=1	21.87	21.79	21.77
		RB Size=3, RB Offset=2	21.72	21.80	21.83
		RB Size=6, RB Offset=0	21.47	21.52	21.59
	16QAM	RB Size=1, RB Offset=0	21.47	21.51	21.55
		RB Size=1, RB Offset=2	21.90	21.90	21.92
		RB Size=1, RB Offset=5	21.64	21.74	21.77
		RB Size=3, RB Offset=0	21.91	21.96	21.97
		RB Size=3, RB Offset=1	21.63	21.70	21.78
		RB Size=3, RB Offset=2	21.96	21.89	21.92
		RB Size=6, RB Offset=0	21.67	21.74	21.82
3.0	QPSK	RB Size=1, RB Offset=0	21.78	21.50	21.54
		RB Size=1, RB Offset=7	21.15	21.22	21.28
		RB Size=1, RB Offset=14	21.80	21.88	21.89
		RB Size=8, RB Offset=0	21.60	21.65	21.69
		RB Size=8, RB Offset=4	21.14	21.17	21.20
		RB Size=8, RB Offset=7	21.55	21.58	21.63
		RB Size=15, RB Offset=0	21.40	21.50	21.58
	16QAM	RB Size=1, RB Offset=0	21.48	21.57	21.66
		RB Size=1, RB Offset=7	22.14	21.51	21.53
		RB Size=1, RB Offset=14	21.51	21.53	21.59
		RB Size=8, RB Offset=0	21.54	21.60	21.61
		RB Size=8, RB Offset=4	21.82	21.85	21.89
		RB Size=8, RB Offset=7	21.64	21.72	21.81
		RB Size=15, RB Offset=0	21.49	21.51	21.58

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	21.86	21.95	22.05
		RB Size=1, RB Offset=12	21.85	21.92	21.98
		RB Size=1, RB Offset=24	21.53	21.54	21.59
		RB Size=12, RB Offset=0	21.44	21.51	21.56
		RB Size=12, RB Offset=6	21.48	21.52	21.52
		RB Size=12, RB Offset=11	21.37	21.45	21.46
		RB Size=25, RB Offset=0	21.49	21.58	21.61
	16QAM	RB Size=1, RB Offset=0	21.50	21.56	21.59
		RB Size=1, RB Offset=12	21.45	21.55	21.64
		RB Size=1, RB Offset=24	21.48	21.52	21.54
		RB Size=12, RB Offset=0	20.56	20.66	20.72
		RB Size=12, RB Offset=6	20.35	20.44	20.51
		RB Size=12, RB Offset=11	21.48	21.53	21.62
		RB Size=25, RB Offset=0	21.37	21.39	21.43
10.0	QPSK	RB Size=1, RB Offset=0	21.75	21.85	21.94
		RB Size=1, RB Offset=24	21.79	21.80	21.81
		RB Size=1, RB Offset=49	21.91	21.94	21.89
		RB Size=25, RB Offset=0	21.82	21.92	21.88
		RB Size=25, RB Offset=12	21.79	21.88	21.90
		RB Size=25, RB Offset=24	21.55	21.55	21.61
		RB Size=50, RB Offset=0	21.74	21.79	21.79
	16QAM	RB Size=1, RB Offset=0	21.89	21.99	22.05
		RB Size=1, RB Offset=24	21.85	21.92	21.93
		RB Size=1, RB Offset=49	21.61	21.64	21.73
		RB Size=25, RB Offset=0	21.42	21.48	21.50
		RB Size=25, RB Offset=12	21.49	21.52	21.60
		RB Size=25, RB Offset=24	21.46	21.55	21.56
		RB Size=50, RB Offset=0	21.52	21.61	21.70

EIRP:

QPSK:

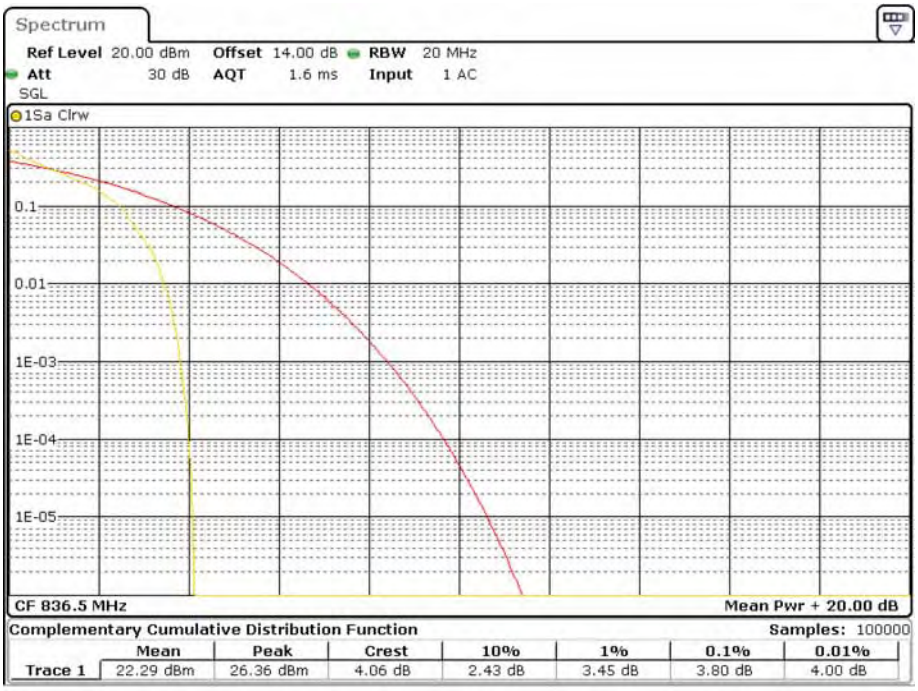
Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)
Middle Channel									
1.4 MHz Bandwidth									
836.50	91.53	120	1.4	H	20.5	0.67	0	19.83	38.45
836.50	91.02	18	1.2	V	20.0	0.67	0	19.33	38.45
3 MHz Bandwidth									
836.50	91.77	145	1.4	H	20.8	0.67	0	20.13	38.45
836.50	91.21	134	1.5	V	20.2	0.67	0	19.53	38.45
5 MHz Bandwidth									
836.50	91.62	138	1.3	H	20.6	0.67	0	19.93	38.45
836.50	91.34	142	1.2	V	20.3	0.67	0	19.63	38.45
10MHz Bandwidth									
836.50	91.54	142	1.1	H	20.5	0.67	0	19.83	38.45
836.50	91.28	135	1.6	V	20.3	0.67	0	19.63	38.45

16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 22H
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)
Middle Channel									
1.4 MHz Bandwidth									
836.50	91.38	143	1.6	H	20.4	0.67	0	19.73	38.45
836.50	90.82	217	2.3	V	19.8	0.67	0	19.13	38.45
3 MHz Bandwidth									
836.50	91.53	261	1.5	H	20.5	0.67	0	19.83	38.45
836.50	91.22	311	2.4	V	20.2	0.67	0	19.53	38.45
5 MHz Bandwidth									
836.50	91.38	342	1.9	H	20.4	0.67	0	19.73	38.45
836.50	90.59	54	1.3	V	19.6	0.67	0	18.93	38.45
10MHz Bandwidth									
836.50	91.41	2	1.5	H	20.4	0.67	0	19.73	38.45
836.50	90.77	34	1.1	V	19.8	0.67	0	19.13	38.45

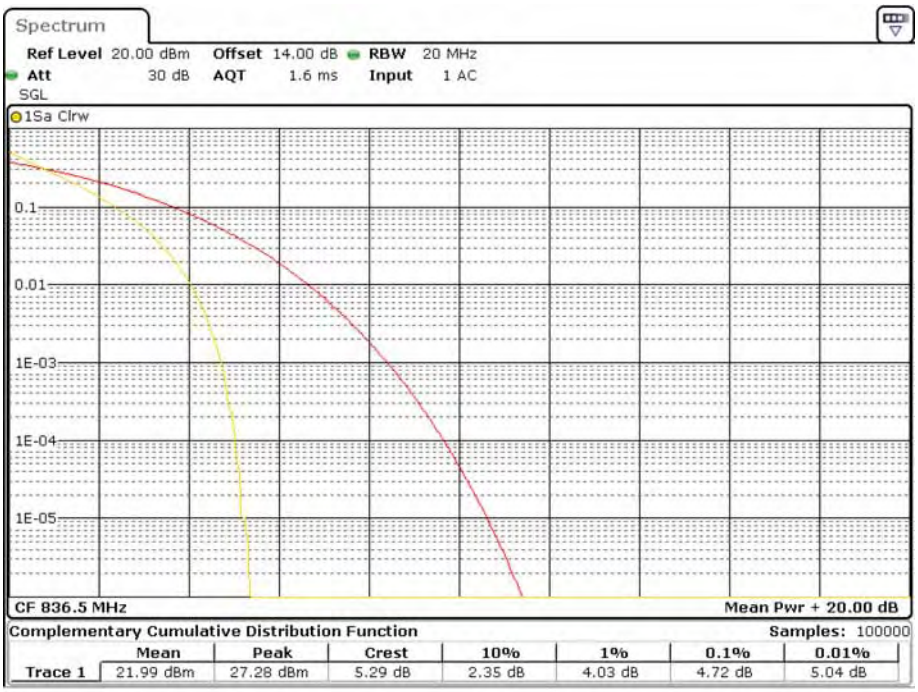
Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
16QAM (1RB Size)	4.06	≦ 13	Pass
16QAM (100RB Size)	5.29	≦ 13	Pass

10.0 MHz PAR – Middle Channel (16QAM, 1RB Size)



Date: 31.JUL.2015 11:35:21

10.0 MHz PAR –Middle Channel (16QAM, 50RB Size)



Date: 31.JUL.2015 11:33:21

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	21.29	21.36	21.41
		RB Size=1, RB Offset=12	21.37	21.45	21.47
		RB Size=1, RB Offset=24	21.76	21.78	21.80
		RB Size=12, RB Offset=0	21.67	21.69	21.75
		RB Size=12, RB Offset=6	21.78	21.84	21.85
		RB Size=12, RB Offset=11	21.78	21.86	21.93
		RB Size=25, RB Offset=0	21.72	21.72	21.74
	16QAM	RB Size=1, RB Offset=0	21.75	21.76	21.79
		RB Size=1, RB Offset=12	20.87	20.96	21.00
		RB Size=1, RB Offset=24	20.64	20.70	20.70
		RB Size=12, RB Offset=0	21.76	21.83	21.85
		RB Size=12, RB Offset=6	21.90	22.08	22.01
		RB Size=12, RB Offset=11	21.82	21.83	21.86
		RB Size=25, RB Offset=0	21.77	21.80	21.90
10.0	QPSK	RB Size=1, RB Offset=0	21.43	21.46	21.53
		RB Size=1, RB Offset=24	21.79	21.88	21.89
		RB Size=1, RB Offset=49	21.47	21.50	21.56
		RB Size=25, RB Offset=0	21.47	21.55	21.64
		RB Size=25, RB Offset=12	21.54	21.60	21.60
		RB Size=25, RB Offset=24	21.37	21.39	21.45
		RB Size=50, RB Offset=0	21.35	21.42	21.45
	16QAM	RB Size=1, RB Offset=0	21.82	21.82	21.82
		RB Size=1, RB Offset=24	21.72	21.78	21.81
		RB Size=1, RB Offset=49	21.85	21.87	21.93
		RB Size=25, RB Offset=0	21.77	21.83	21.85
		RB Size=25, RB Offset=12	21.76	21.84	21.87
		RB Size=25, RB Offset=24	21.79	21.86	21.96
		RB Size=50, RB Offset=0	20.89	20.98	21.01

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	22.00	22.03	22.05
		RB Size=1, RB Offset=37	21.87	21.85	21.90
		RB Size=1, RB Offset=74	21.93	21.78	21.95
		RB Size=36, RB Offset=0	21.80	21.89	21.85
		RB Size=36, RB Offset=18	21.86	21.95	22.02
		RB Size=36, RB Offset=37	21.84	21.94	21.95
		RB Size=75, RB Offset=0	22.06	22.05	21.91
	16QAM	RB Size=1, RB Offset=0	21.49	21.52	21.61
		RB Size=1, RB Offset=37	21.68	21.70	21.71
		RB Size=1, RB Offset=74	21.40	21.49	21.52
		RB Size=36, RB Offset=0	21.41	21.50	21.59
		RB Size=36, RB Offset=18	21.78	21.78	21.87
		RB Size=36, RB Offset=37	21.53	21.62	21.66
		RB Size=75, RB Offset=0	21.50	21.58	21.60
20.0	QPSK	RB Size=1, RB Offset=0	22.16	22.09	22.17
		RB Size=1, RB Offset=49	21.84	21.92	21.99
		RB Size=1, RB Offset=99	21.48	21.52	21.61
		RB Size=50, RB Offset=0	21.46	21.49	21.56
		RB Size=50, RB Offset=24	21.51	21.52	21.58
		RB Size=50, RB Offset=49	21.34	21.42	21.49
		RB Size=100, RB Offset=0	21.36	21.39	21.46
	16QAM	RB Size=1, RB Offset=0	21.80	21.86	21.94
		RB Size=1, RB Offset=49	21.70	21.80	21.89
		RB Size=1, RB Offset=99	21.80	21.83	21.84
		RB Size=50, RB Offset=0	21.79	21.89	21.92
		RB Size=50, RB Offset=24	21.76	21.79	21.80
		RB Size=50, RB Offset=49	21.80	21.85	21.85
		RB Size=100, RB Offset=0	20.93	20.99	21.06

Radiated Power:

QPSK:

Frequency (MHz)	Receiver Reading (dBµV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 27
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)
Middle Channel									
5 MHz Bandwidth									
2535.00	85.06	23	2.2	H	14.1	1.65	8.60	21.05	33
2535.00	83.95	132	1.6	V	13.0	1.65	8.60	19.95	33
10 MHz Bandwidth									
2535.00	85.11	22	1.7	H	14.1	1.65	8.60	21.05	33
2535.00	84.22	243	2.3	V	13.2	1.65	8.60	20.15	33
15 MHz Bandwidth									
2535.00	85.23	28	2.6	H	14.2	1.65	8.60	21.15	33
2535.00	83.88	37	1.8	V	12.9	1.65	8.60	19.85	33
20 MHz Bandwidth									
2535.00	84.97	36	1.8	H	14.0	1.65	8.60	20.95	33
2535.00	84.18	222	2.4	V	13.2	1.65	8.60	20.15	33

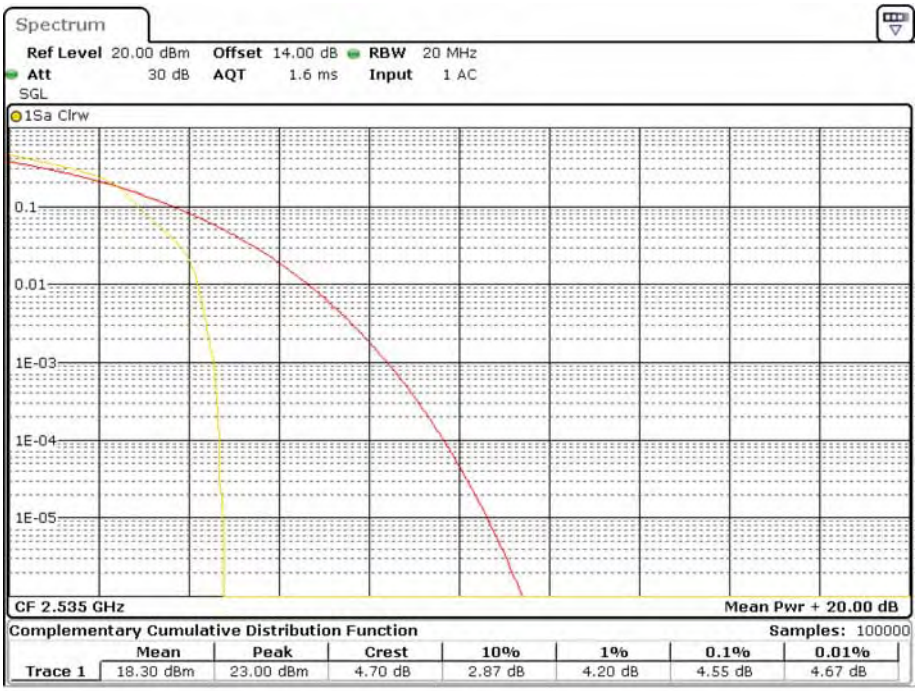
16QAM:

Frequency (MHz)	Receiver Reading (dBμV)	Turn table Angle Degree	Rx Antenna		Substituted			Absolute Level (dBm)	FCC Part 27
			Height (m)	Polar (H/V)	SG Level (dBm)	Cable Loss (dB)	Antenna Gain (dB)		Limit (dBm)
Middle Channel									
5 MHz Bandwidth									
2535.00	85.22	53	1.1	H	14.2	1.65	8.60	21.15	33
2535.00	84.31	64	1.8	V	13.3	1.65	8.60	20.25	33
10 MHz Bandwidth									
2535.00	85.02	196	2.1	H	14.0	1.65	8.60	20.95	33
2535.00	84.38	78	2.5	V	13.4	1.65	8.60	20.35	33
15 MHz Bandwidth									
2535.00	84.98	274	1.7	H	14.0	1.65	8.60	20.95	33
2535.00	84.01	270	2.3	V	13.0	1.65	8.60	19.95	33
20 MHz Bandwidth									
2535.00	85.18	167	1.5	H	14.2	1.65	8.60	21.15	33
2535.00	84.27	184	2.2	V	13.3	1.65	8.60	20.25	33

Note：
All above data were tested with no amplifier.
Absolute Level = SG Level - Cable loss + Antenna Gain
Margin = Limit- Absolute Level

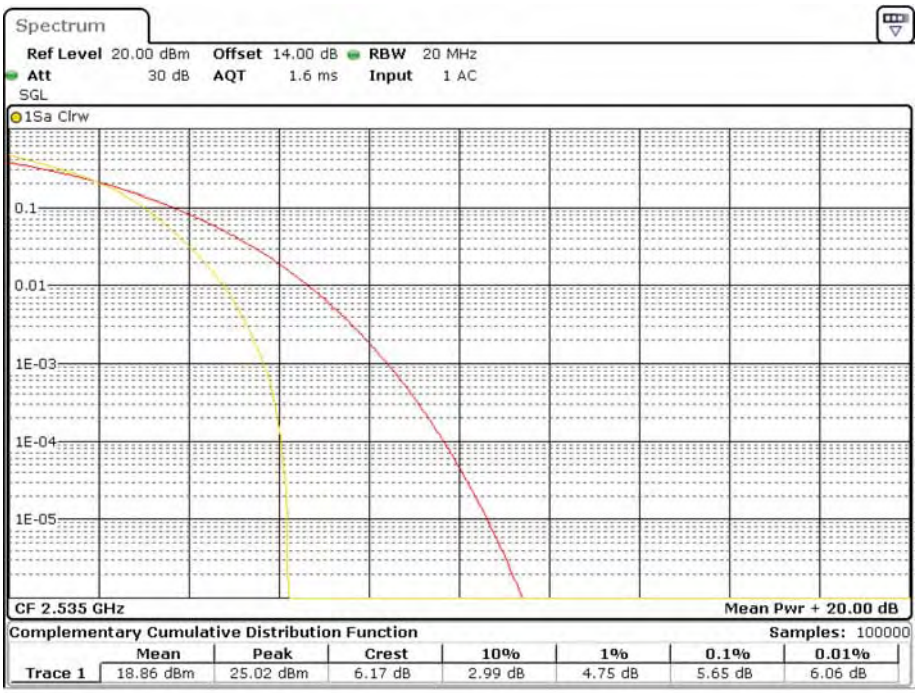
Modulation	Middle Channel (dB)	PAR Limit (dB)	Result
16QAM (1RB Size)	4.70	≦ 13	Pass
16QAM (100RB Size)	6.17	≦ 13	Pass

20.0 MHz PAR – Low Channel (16QAM, 1RB Size)



Date: 31.JUL.2015 11:43:52

20.0 MHz PAR – Middle Channel (16QAM, 100RB Size)



Date: 31.JUL.2015 11:44:17

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

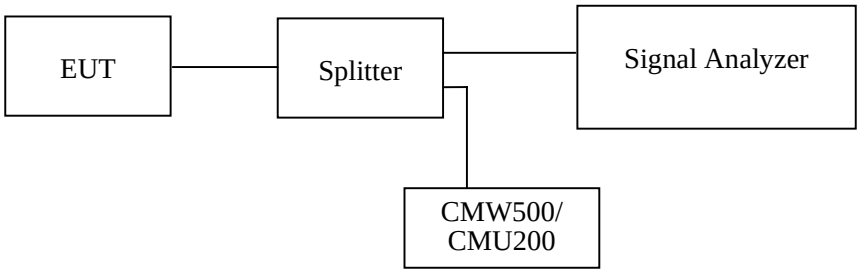
Applicable Standards

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	2014-12-11	2015-12-11
Rohde & Schwarz	EMI Test Receiver	ESR	1316.3003K03-101746-zn	2015-06-13	2016-06-13
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	106891	2014-11-23	2015-11-23

*** 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:	21~26 ℃
Relative Humidity:	48~54 %
ATM Pressure:	100.0~101.0 kPa

The testing was performed by William Li from 2015-07-20 to 2015-08-12.

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	246.49	318.64
EGPRS(8PSK)	836.6	244.49	314.63

Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
WCDMA (BPSK)	836.6	4.228	4.910
HSUPA (BPSK)	836.6	4.188	4.890
HSDPA (16QAM)	836.6	4.208	4.870

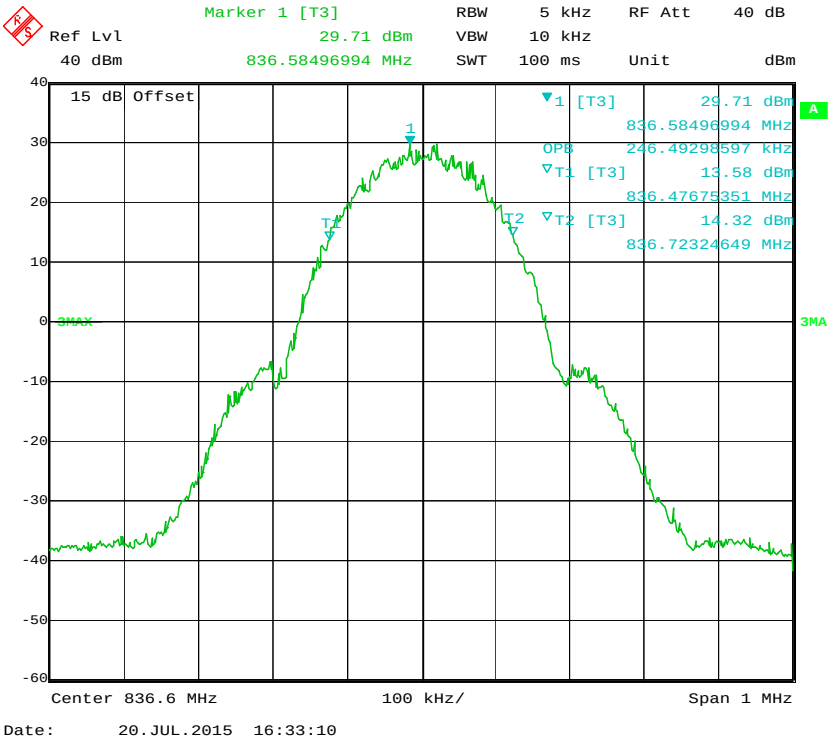
PCS Band (Part 24E)

Mode	Frequency (MHz)	99% Occupied Bandwidth (kHz)	26 dB Emission Bandwidth (kHz)
GSM(GMSK)	1880.0	246.49	318.64
EGPRS(8PSK)	1880.0	246.49	314.63

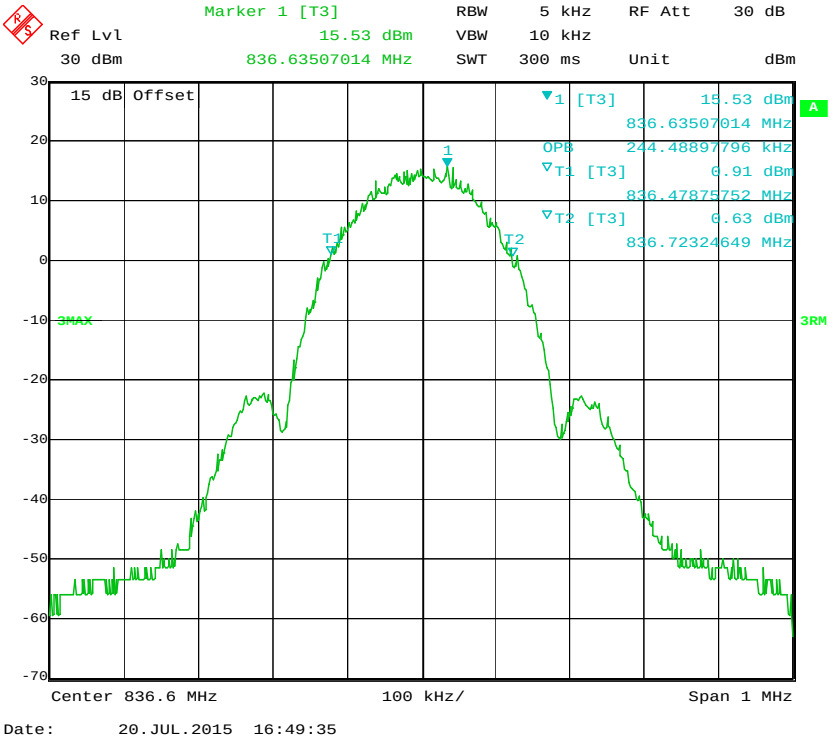
Mode	Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
WCDMA (BPSK)	1880.0	4.228	4.890
HSUPA (BPSK)	1880.0	4.208	4.890
HSDPA (16QAM)	1880.0	4.208	4.890

Cellular Band (Part 22H)

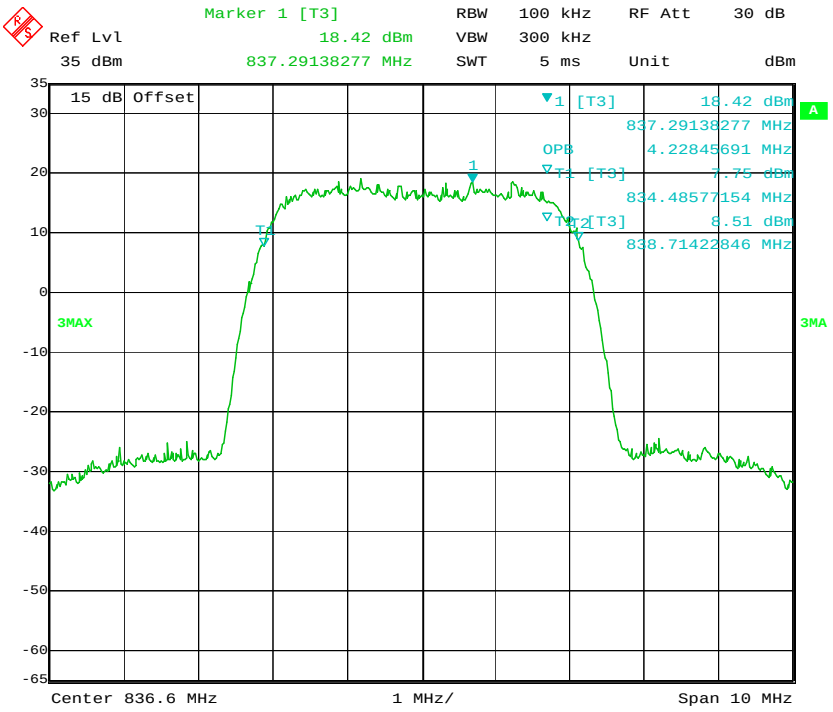
99% Occupied Bandwidth for GSM (GMSK) Mode



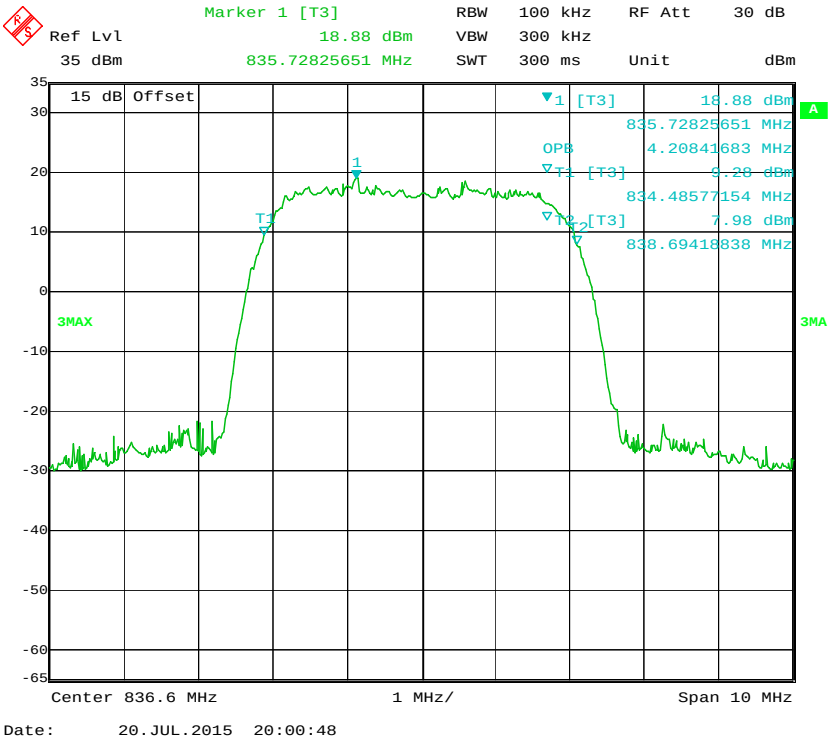
99% Occupied Bandwidth for EDGE Mode



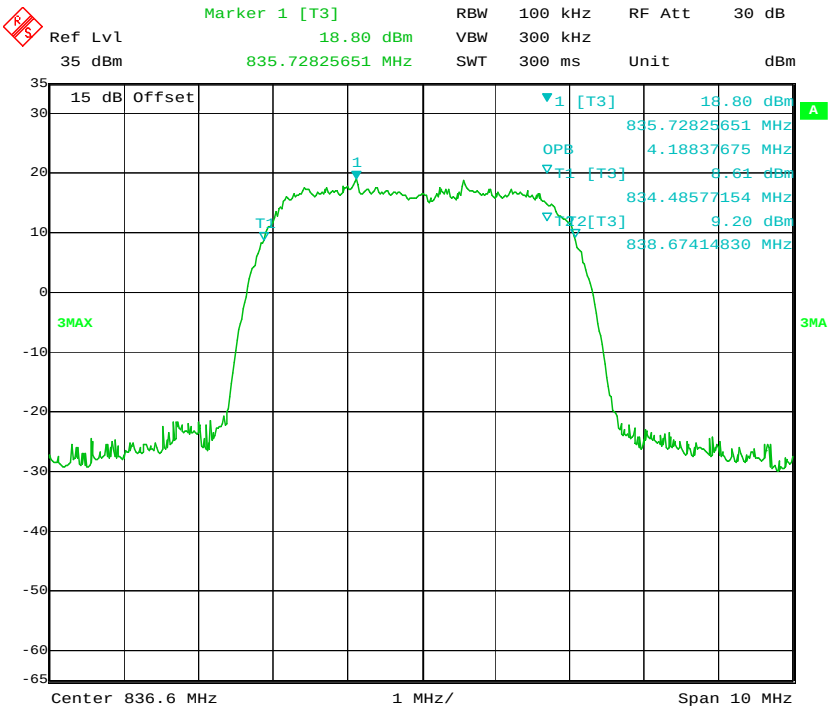
99% Occupied Bandwidth for WCDMA (BPSK) Mode



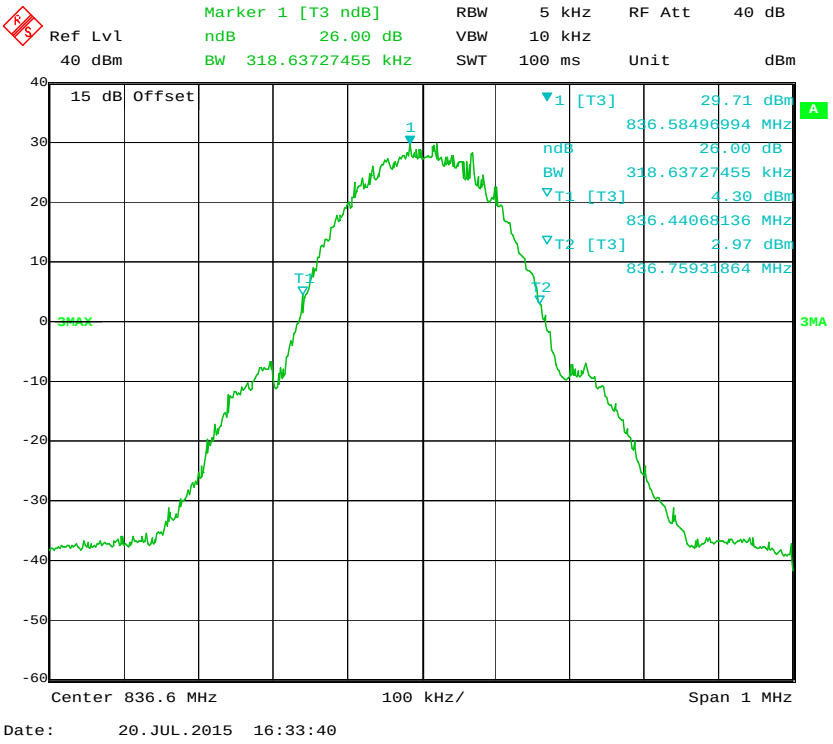
99% Occupied Bandwidth for HSUPA (BPSK) Mode



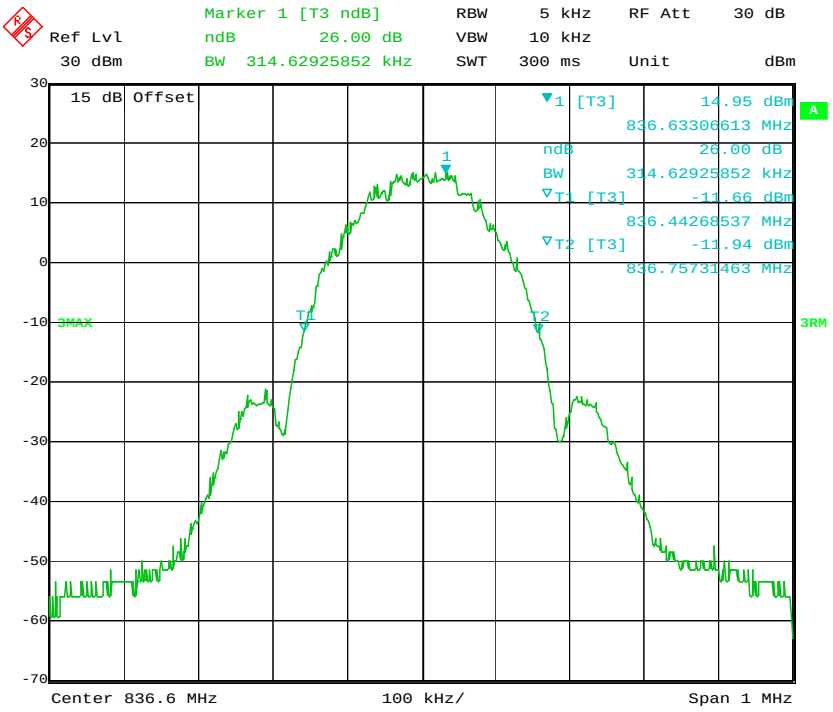
99% Occupied Bandwidth for HSDPA (16QAM) Mode



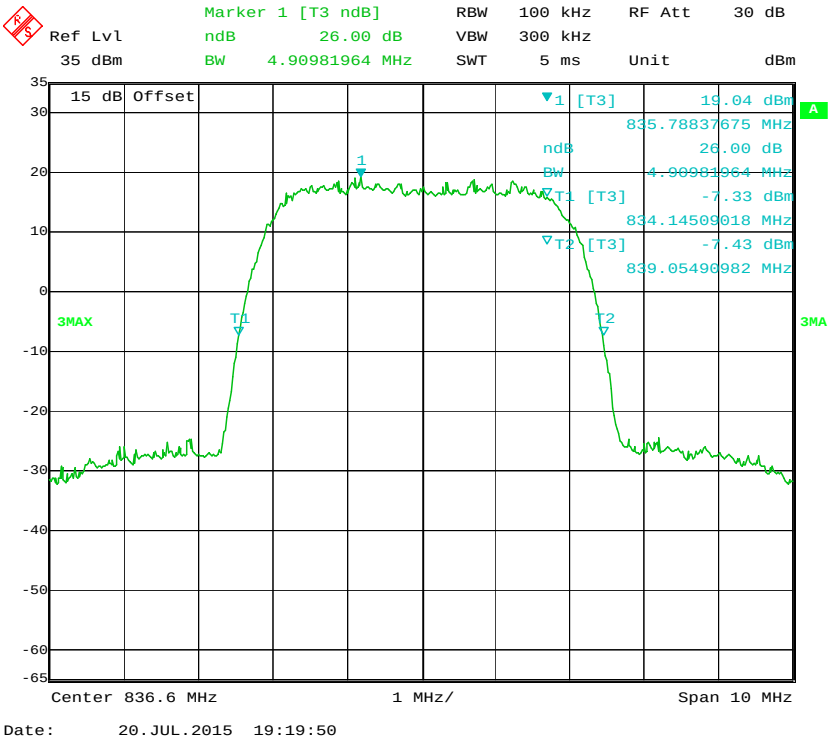
26 dB Emissions Bandwidth for GSM (GMSK) Mode



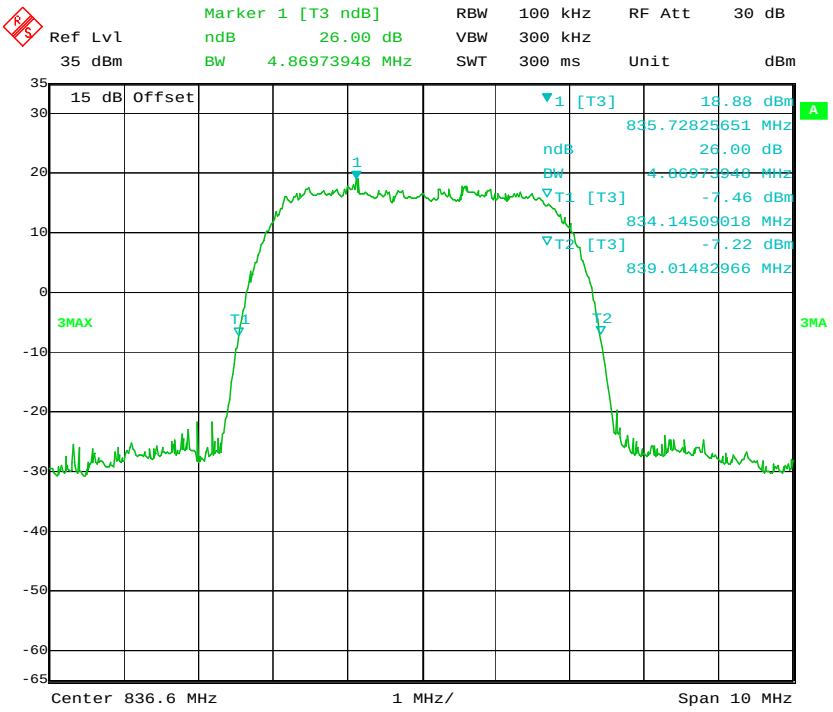
26 dB Emissions Bandwidth for EDGE Mode



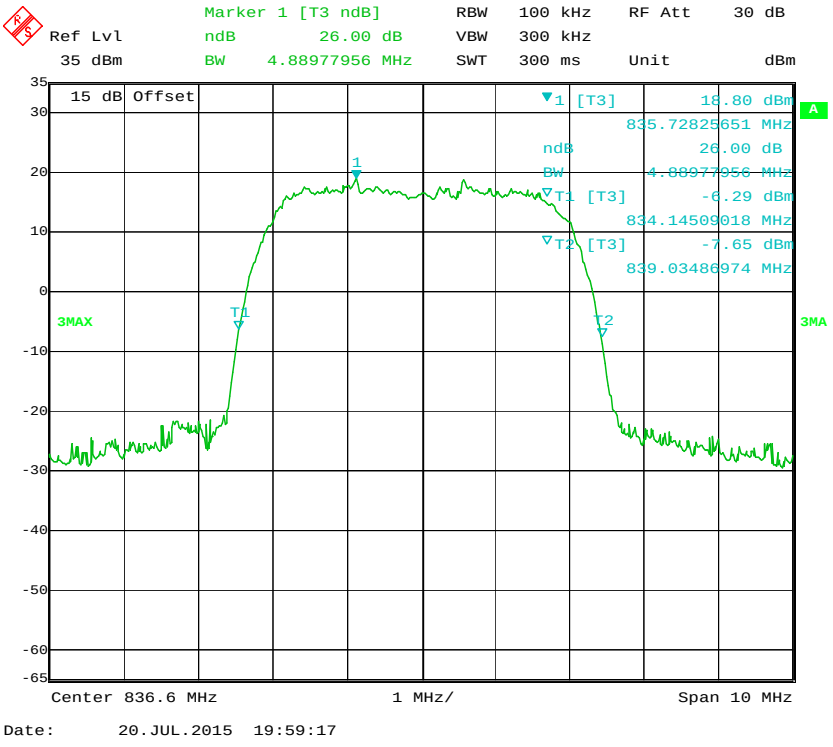
26 dB Emissions Bandwidth for WCDMA (BPSK) Mode



26 dB Emissions Bandwidth for HSUPA (BPSK) Mode

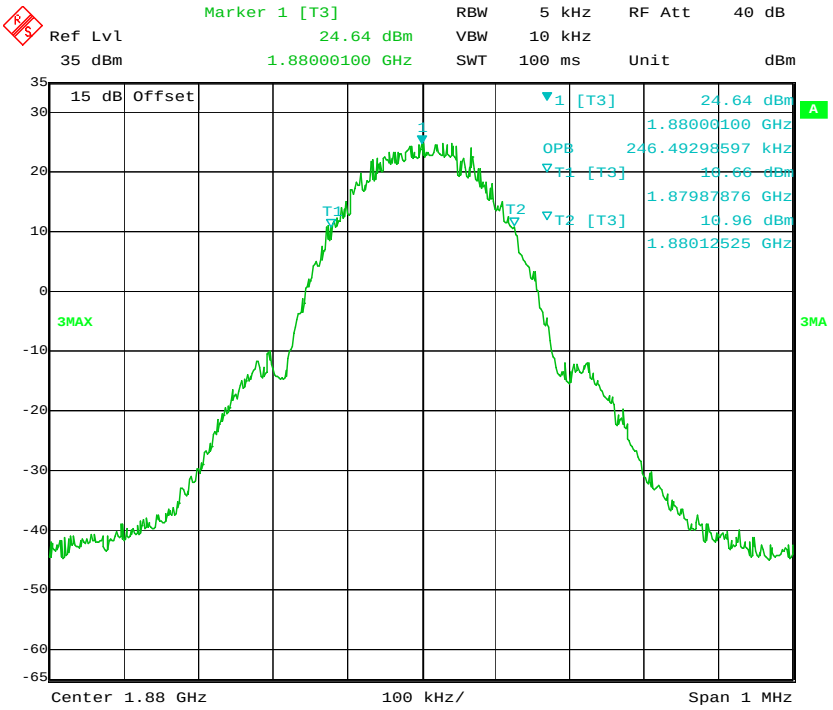


26 dB Emissions Bandwidth for HSDPA (16QAM) Mode

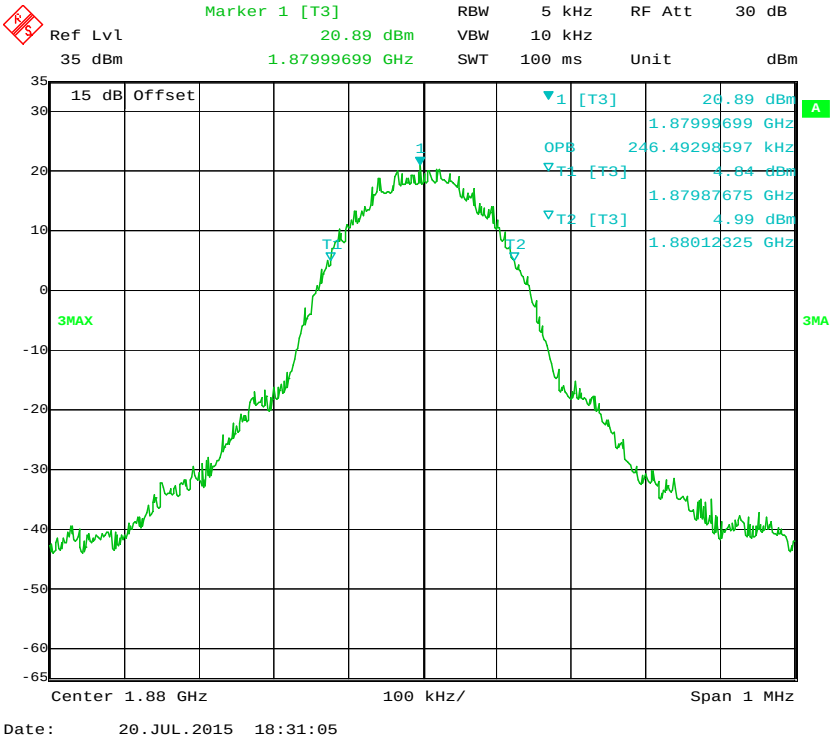


PCS Band (Part 24E)

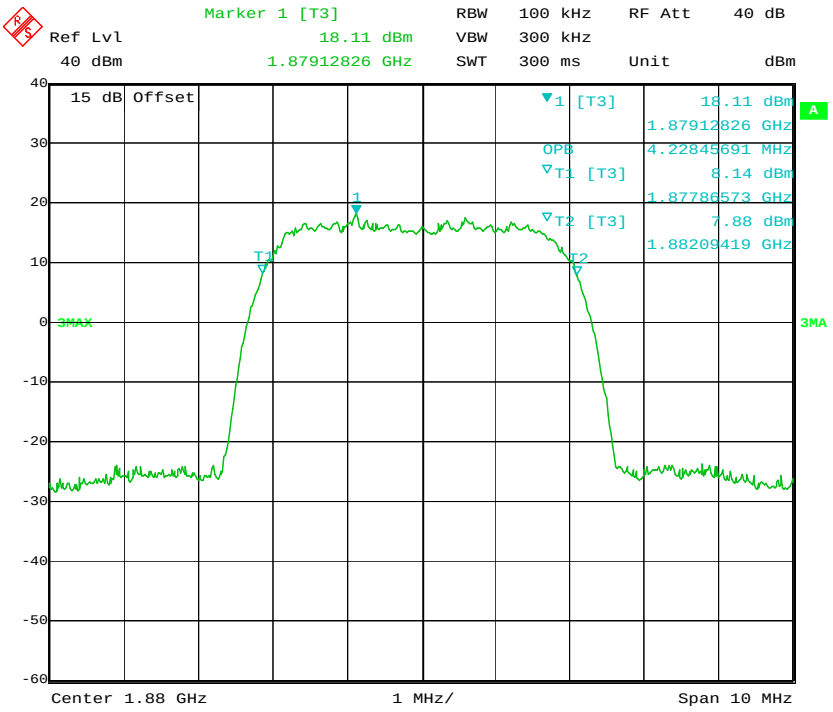
99% Occupied Bandwidth for GSM (GMSK) Mode



99% Occupied Bandwidth for EGPRS Mode

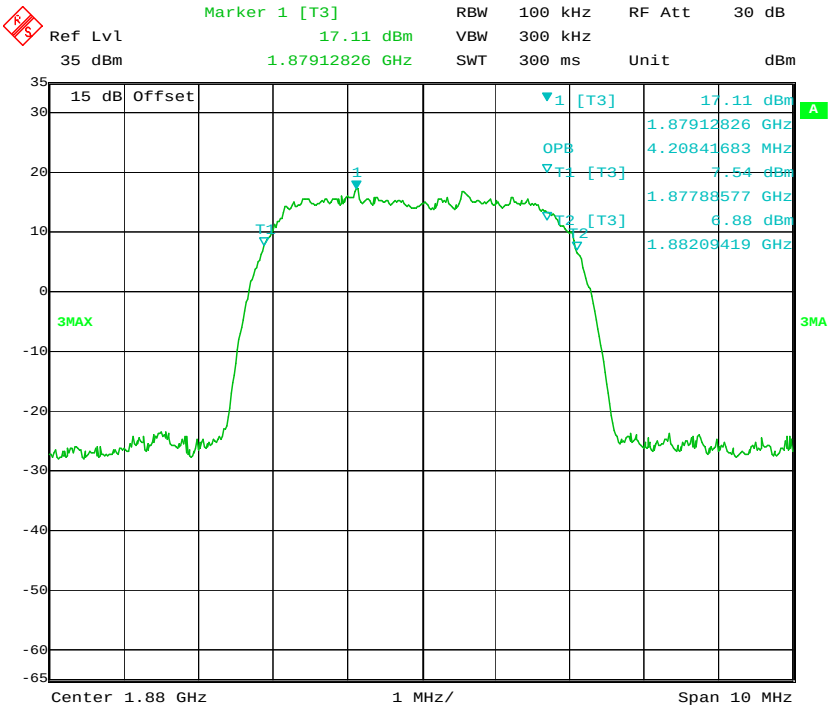


99% Occupied Bandwidth for WCDMA (BPSK) Mode



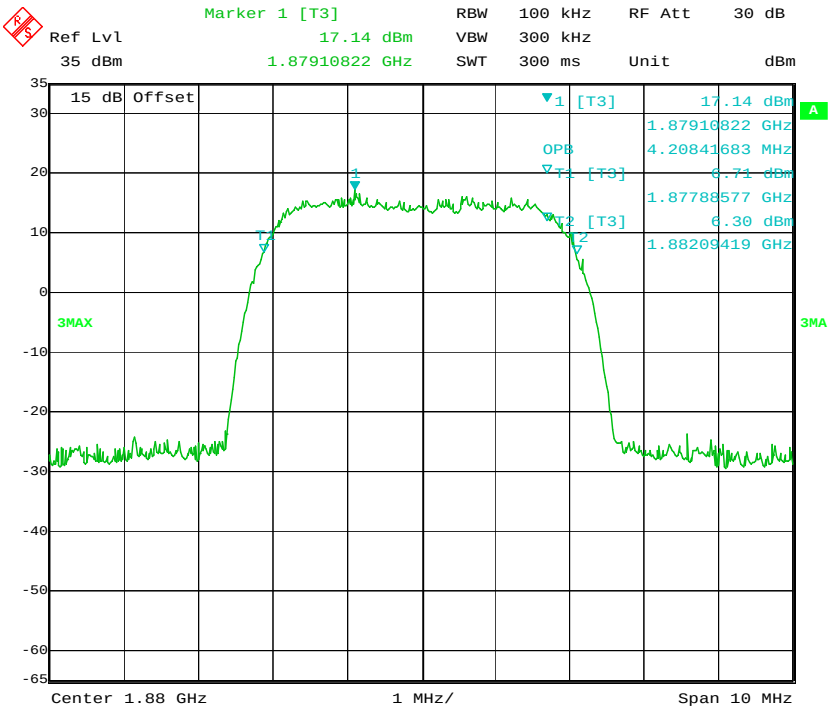
Date: 20.JUL.2015 19:44:34

99% Occupied Bandwidth for HSUPA (BPSK) Mode

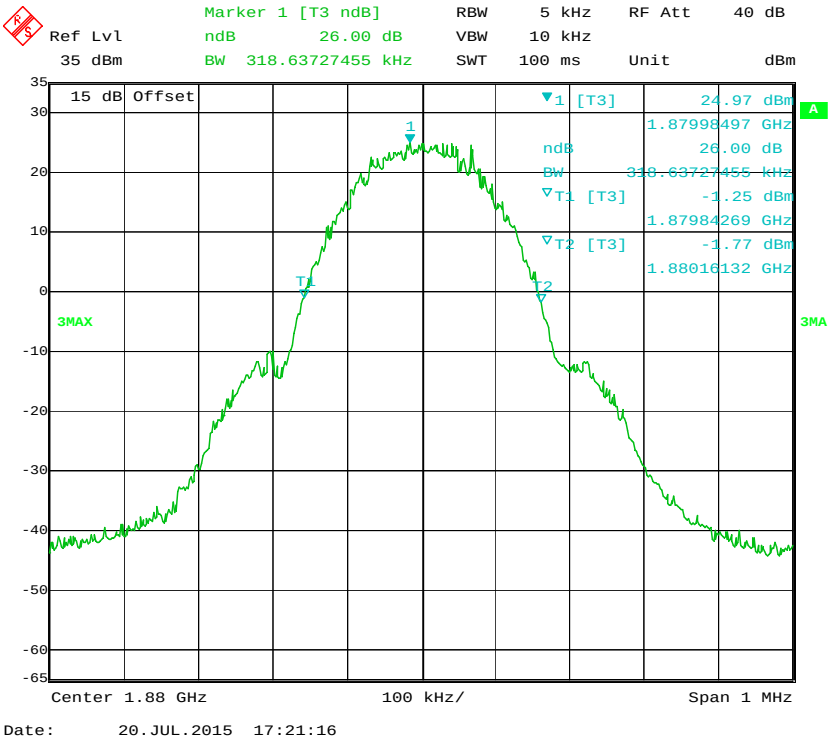


Date: 20.JUL.2015 19:51:30

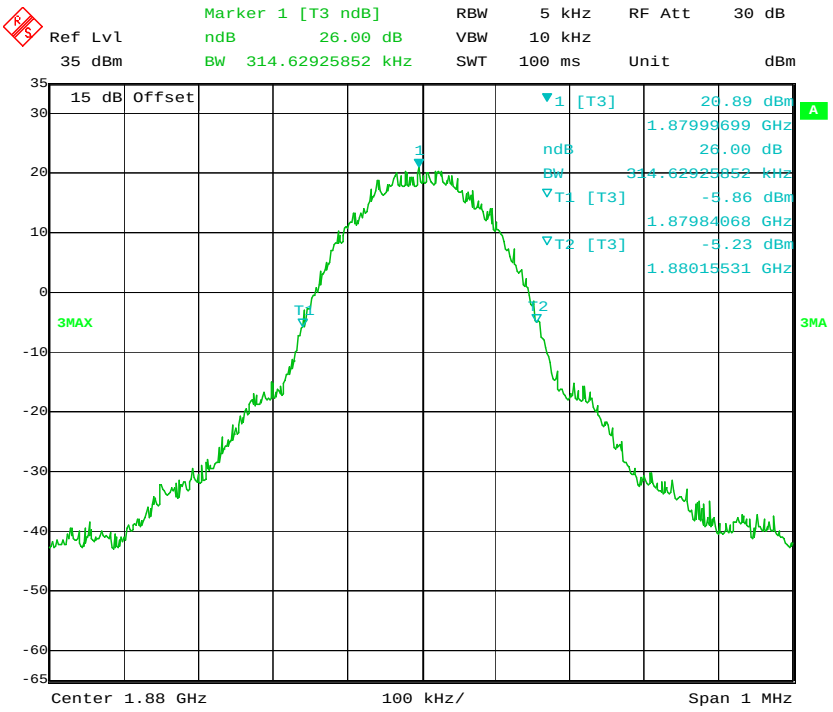
99% Occupied Bandwidth for HSDPA (16QAM) Mode



26 dB Emissions Bandwidth for GSM (GMSK) Mode

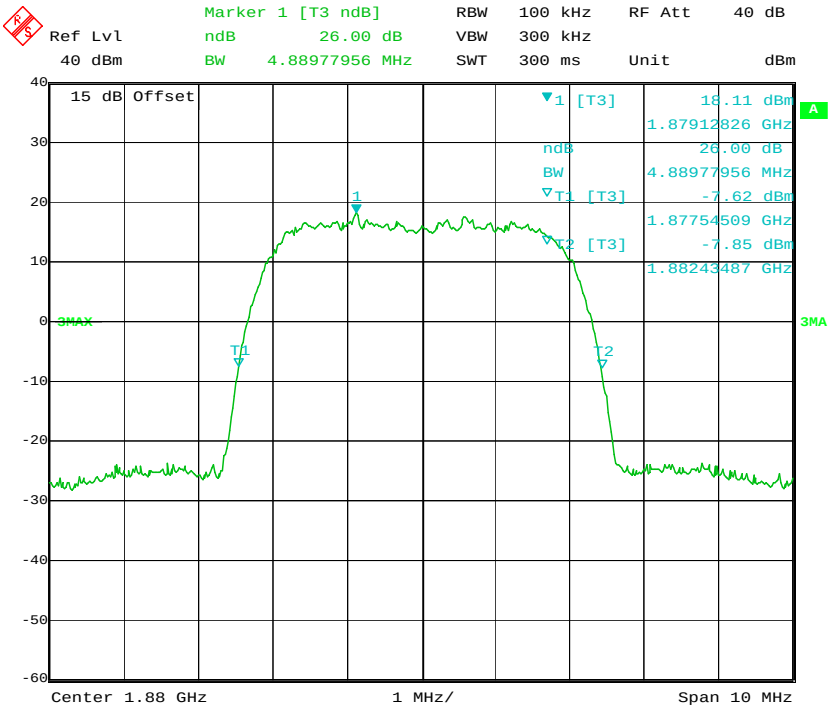


26 dB Emissions Bandwidth for EGPRS Mode



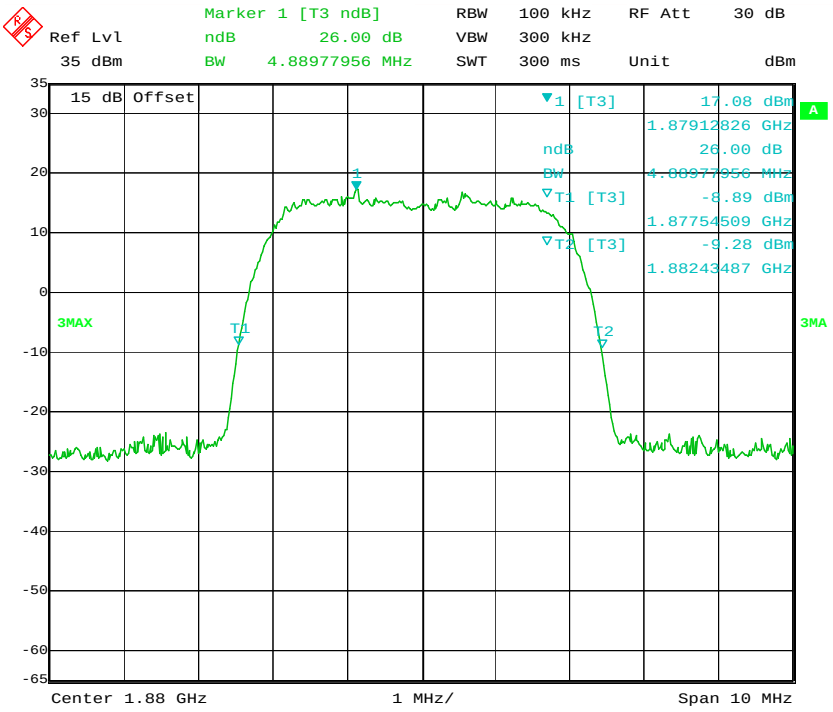
Date: 20.JUL.2015 18:31:34

26 dB Emissions Bandwidth for WCDMA (BPSK) Mode



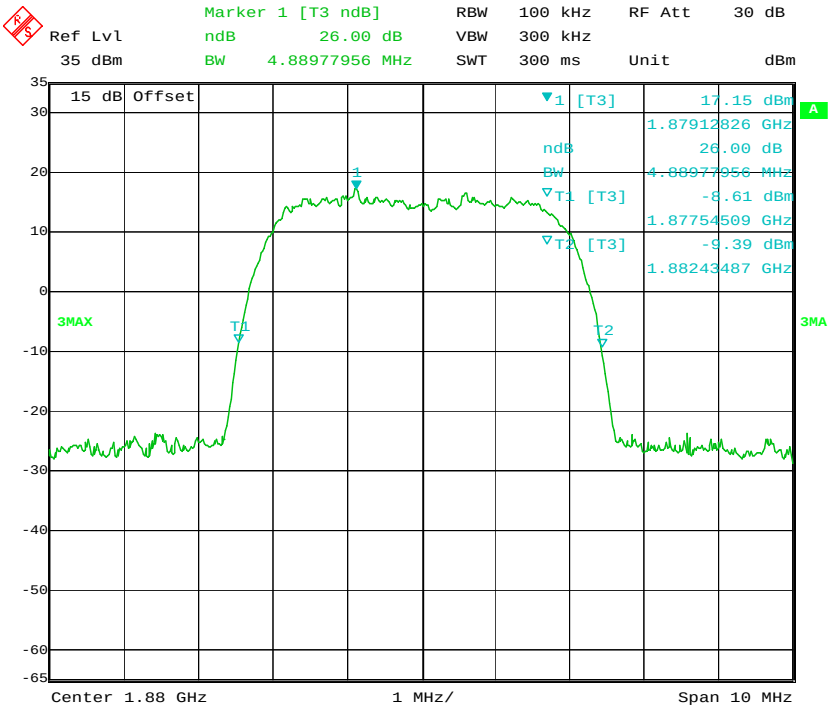
Date: 20.JUL.2015 19:44:50

26 dB Emissions Bandwidth for HSUPA (BPSK) Mode



Date: 20.JUL.2015 19:51:02

26 dB Emissions Bandwidth for HSDPA (16QAM) Mode

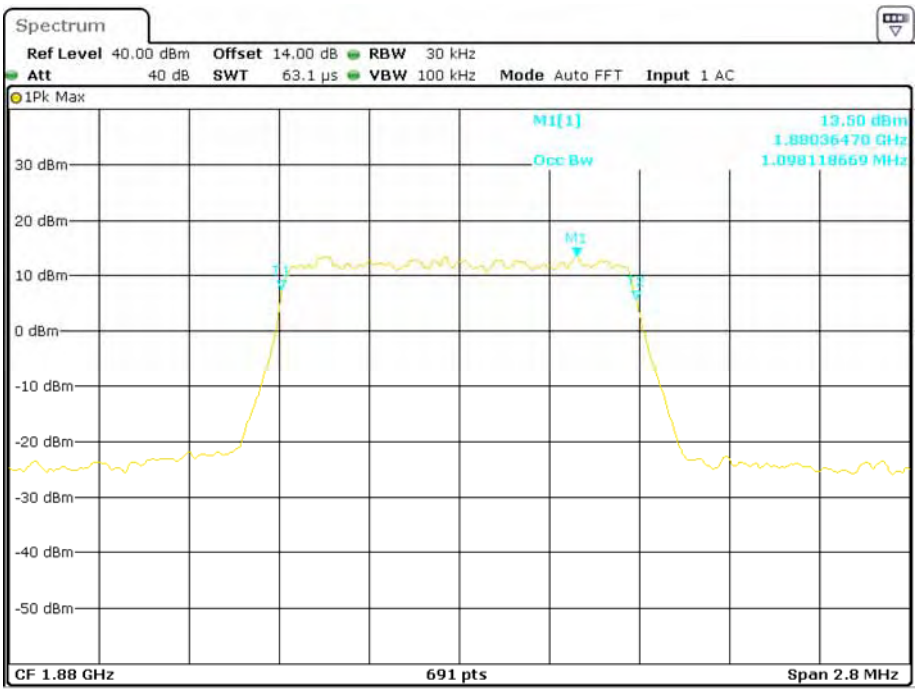


Date: 20.JUL.2015 19:52:33

LTE Band 2: (Middle Channel)

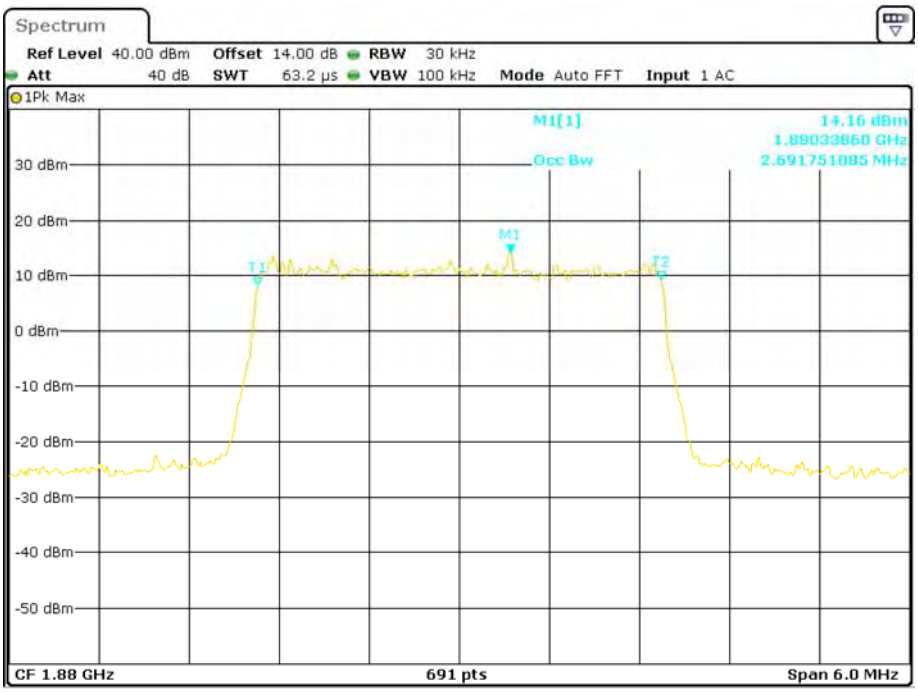
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4 MHz	QPSK	1.098	1.272
	16QAM	1.102	1.289
3.0 MHz	QPSK	2.692	2.918
	16QAM	2.683	2.944
5.0 MHz	QPSK	4.544	5.094
	16QAM	4.530	5.051
10.0 MHz	QPSK	8.944	9.812
	16QAM	8.944	9.667
15.0 MHz	QPSK	13.546	14.978
	16QAM	13.546	14.805
20.0 MHz	QPSK	17.945	19.334
	16QAM	18.003	19.334

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



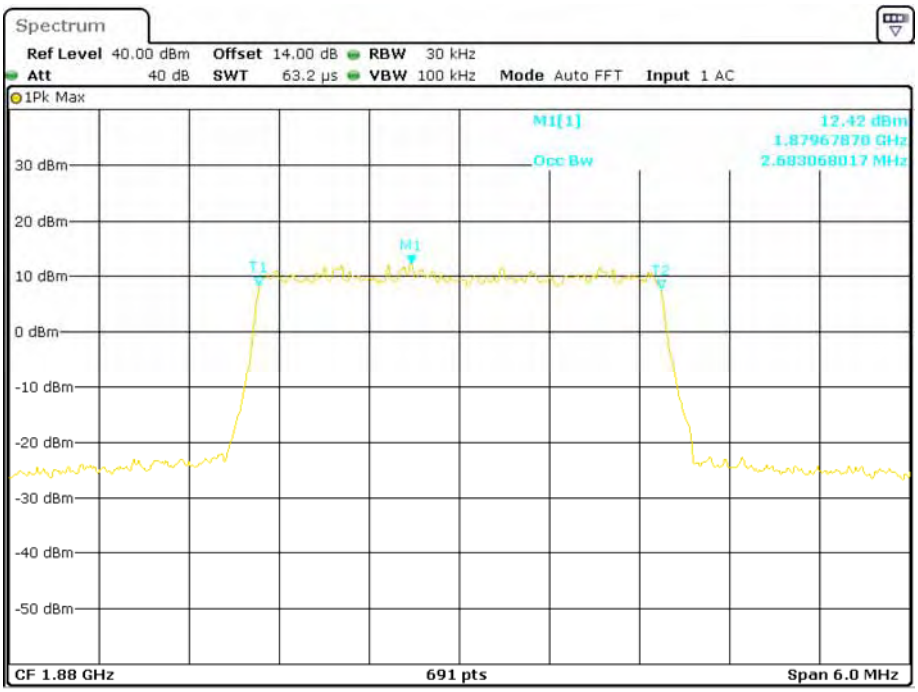
16-QAM (1.4 MHz) - 99% Occupied Bandwidth, Middle channel

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



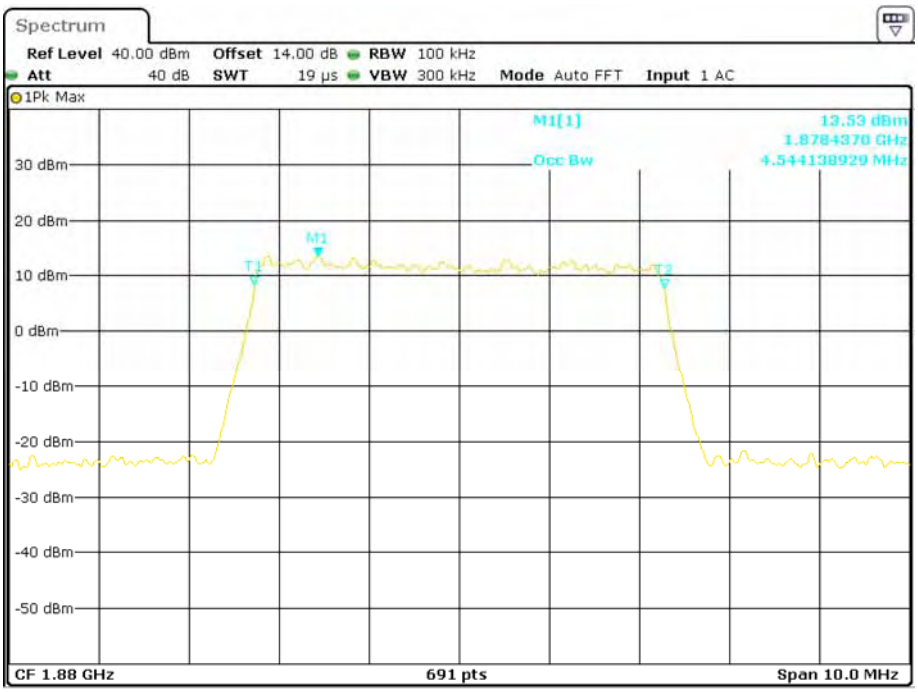
Date: 12.AUG.2015 10:08:03

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

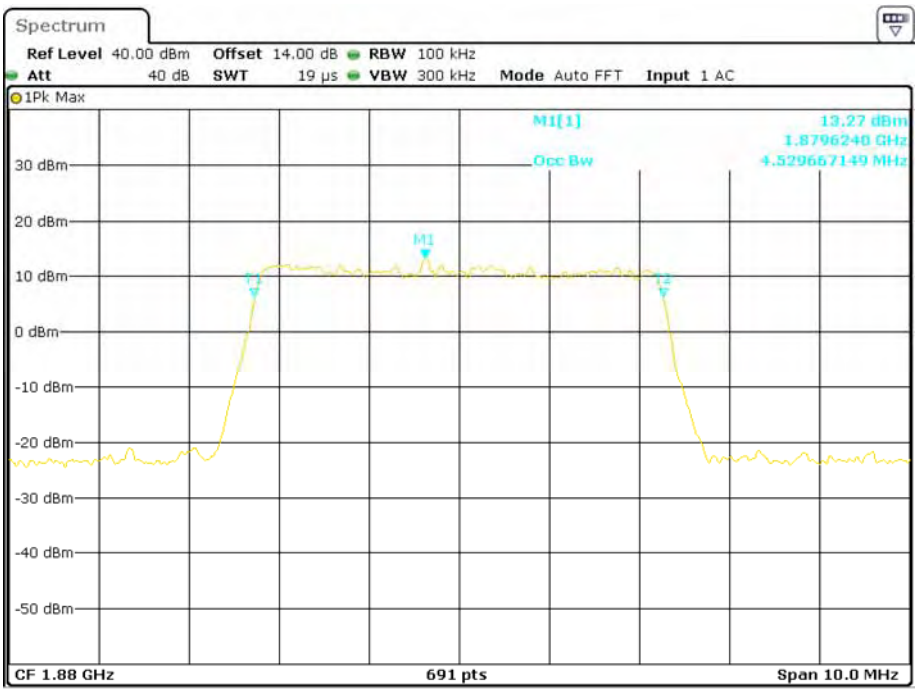


Date: 12.AUG.2015 10:09:05

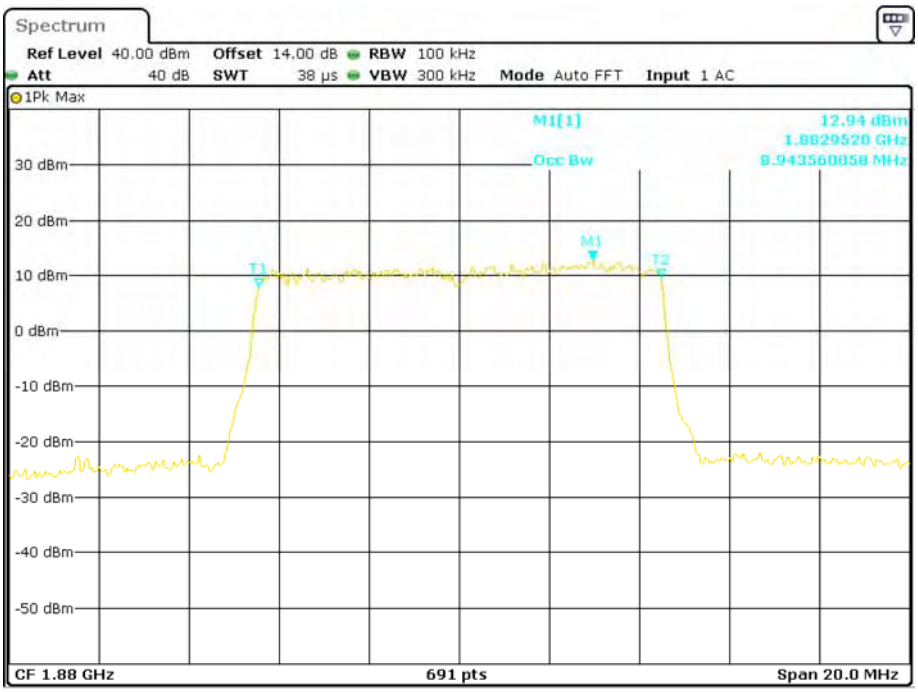
QPSK (5.0 MHz) - 99% Occupied Bandwidth, Middle channel



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

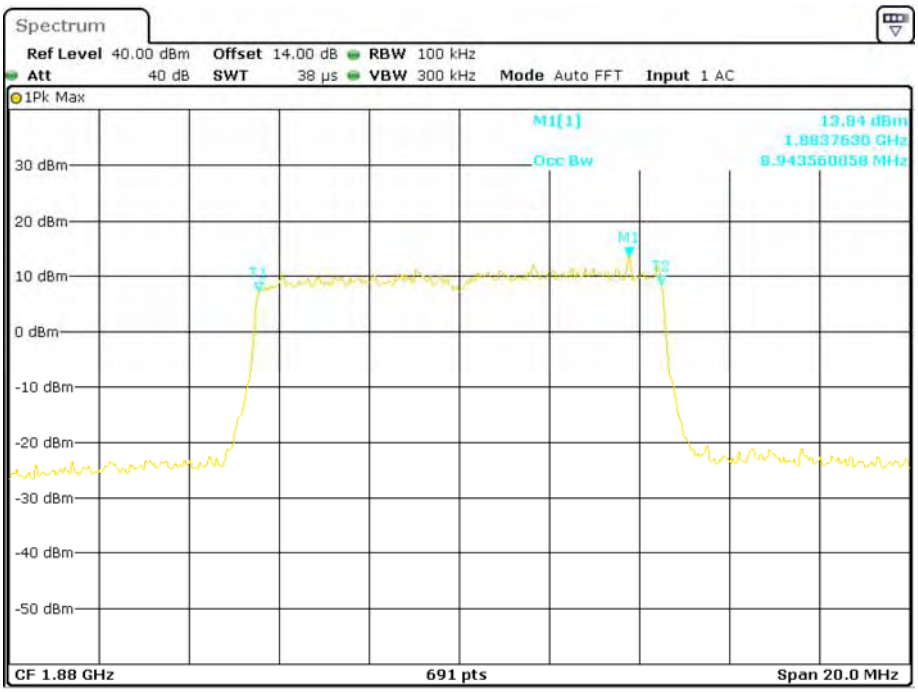


QPSK (10.0 MHz) - 99% Occupied Bandwidth, Middle channel



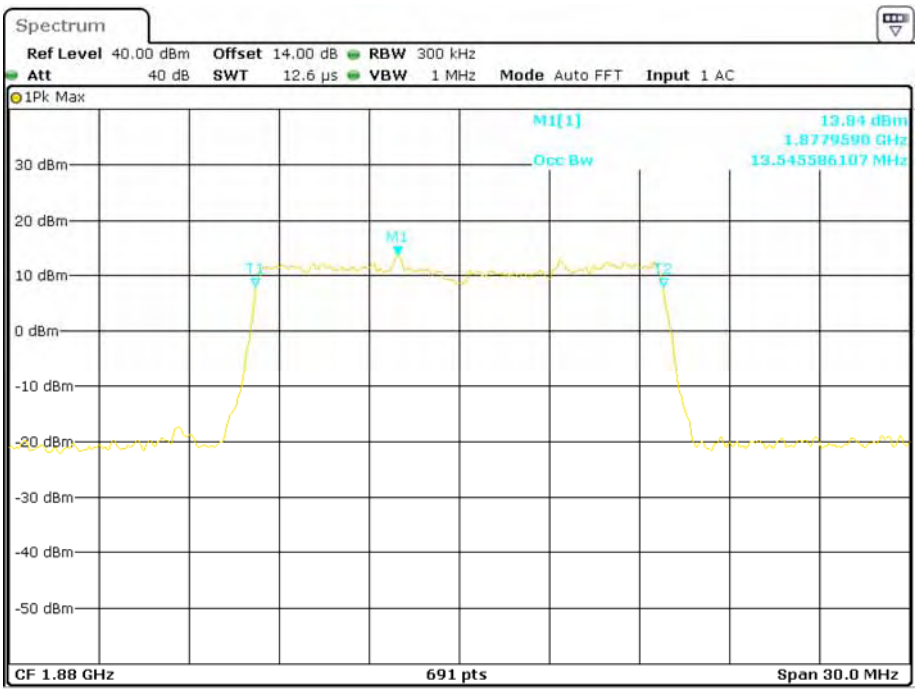
Date: 12.AUG.2015 10:13:06

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

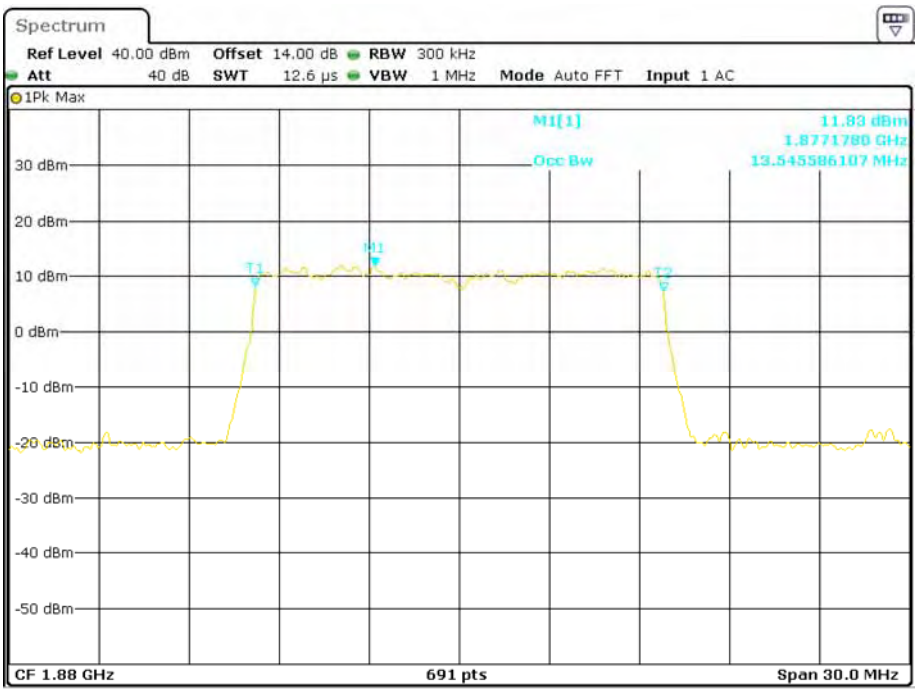


Date: 12.AUG.2015 10:13:37

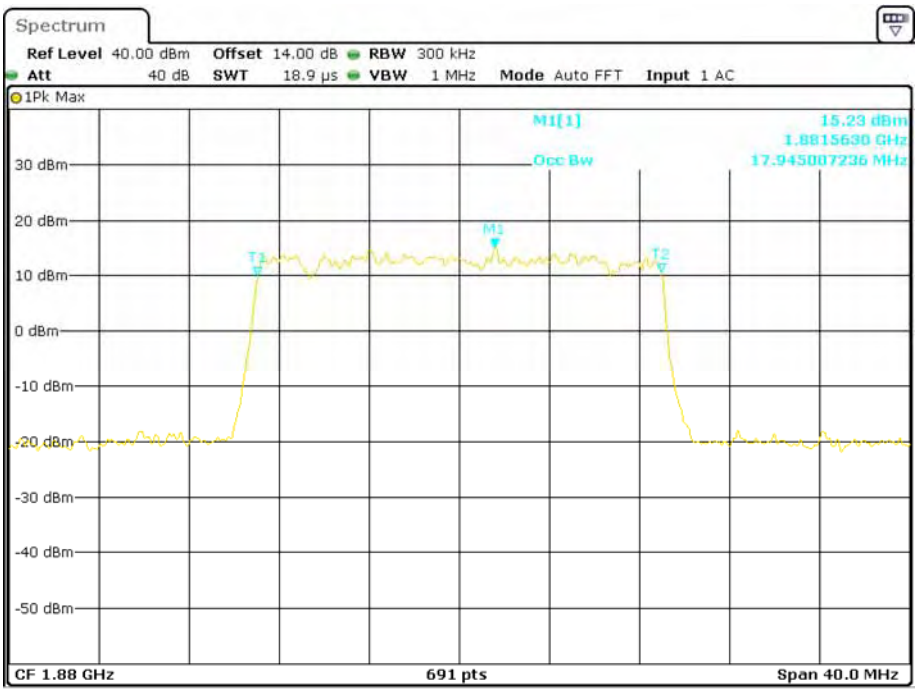
QPSK (15.0 MHz) - 99% Occupied Bandwidth, Middle channel



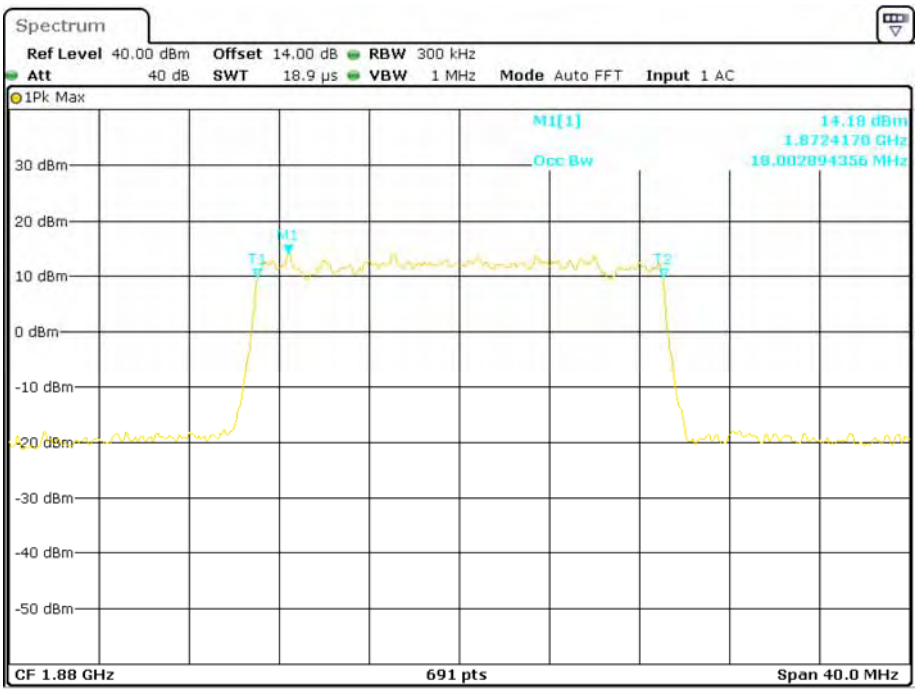
16-QAM (15.0 MHz) - 99% Occupied Bandwidth, Middle channel



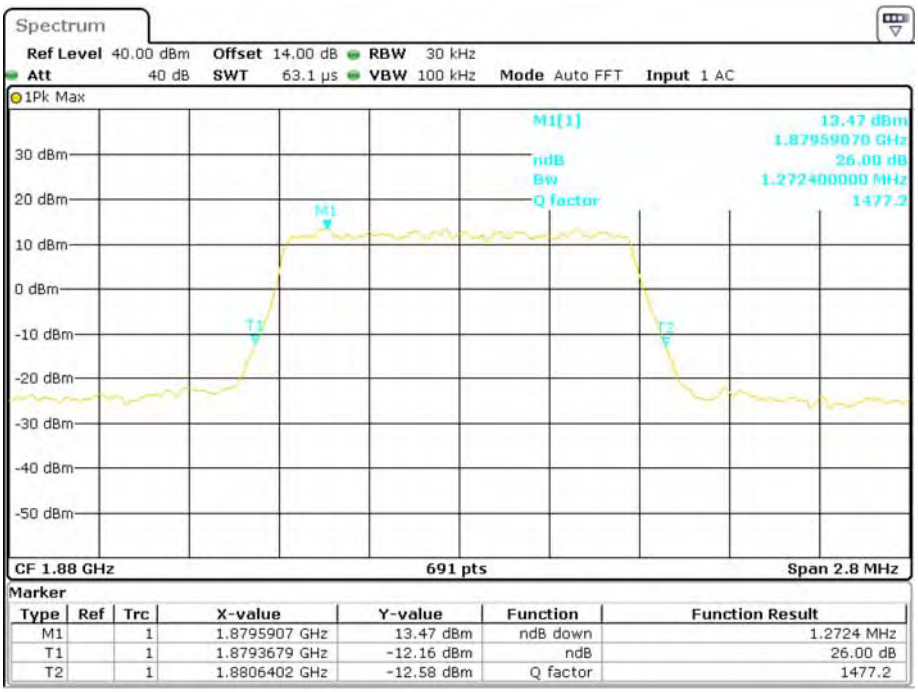
QPSK (20.0 MHz) - 99% Occupied Bandwidth, Middle channel



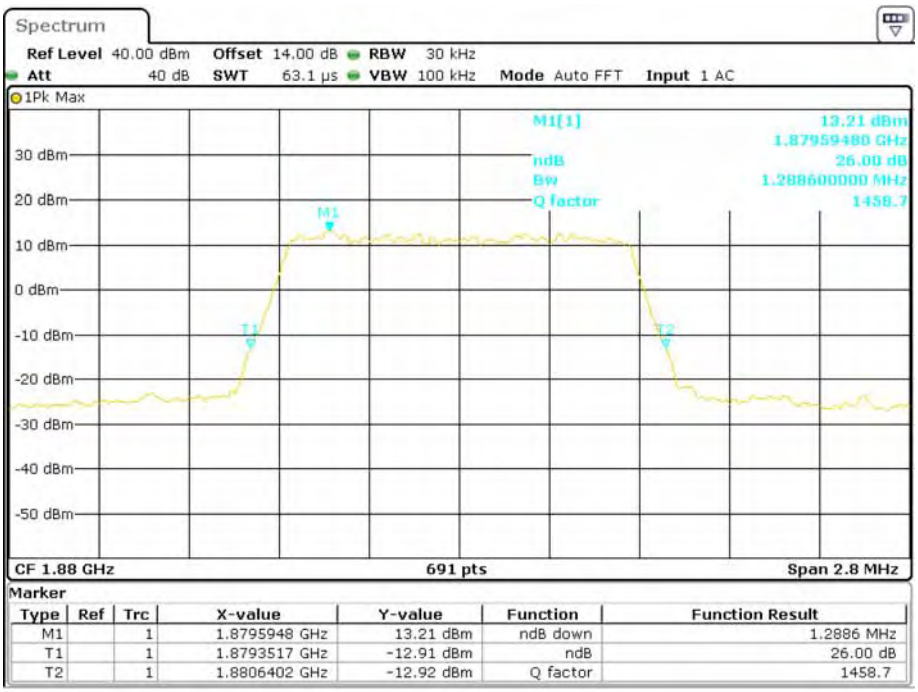
16-QAM (20.0 MHz) - 99% Occupied Bandwidth, Middle channel



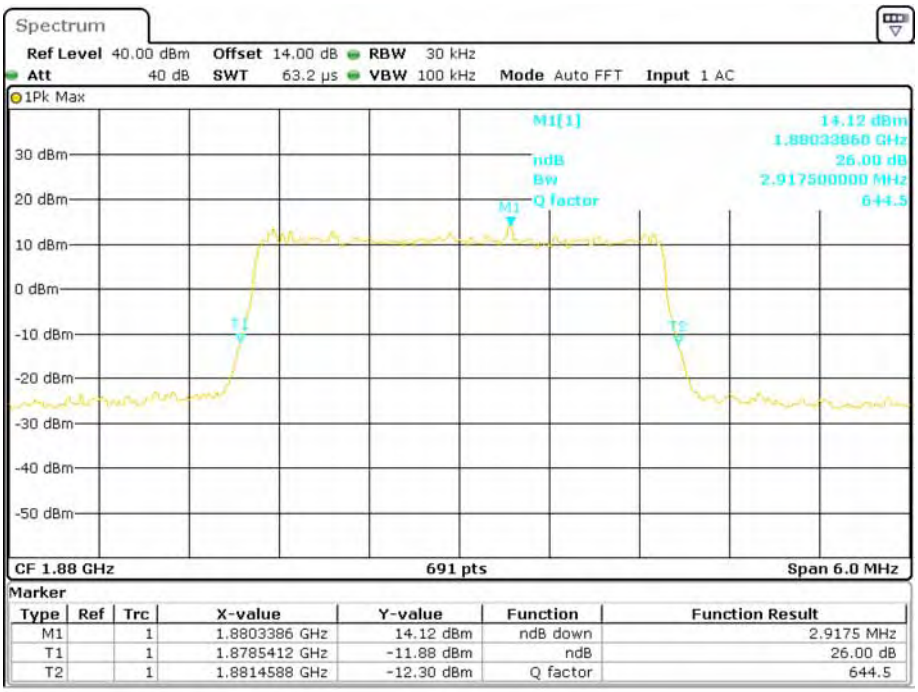
QPSK (1.4 MHz) - 26 dB Bandwidth, Middle channel



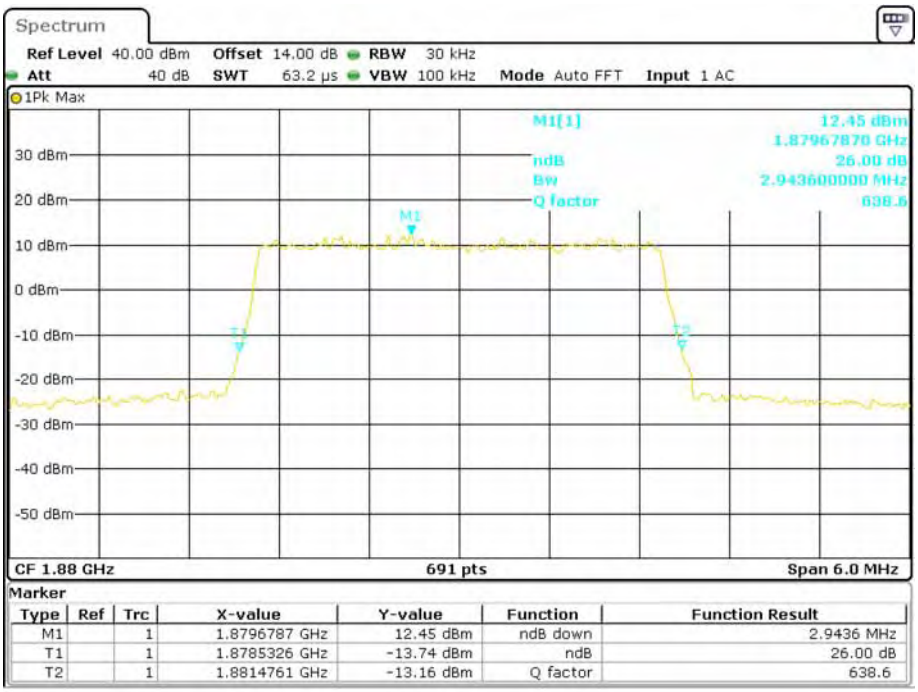
16-QAM (1.4 MHz) - 26 dB Bandwidth, Middle channel



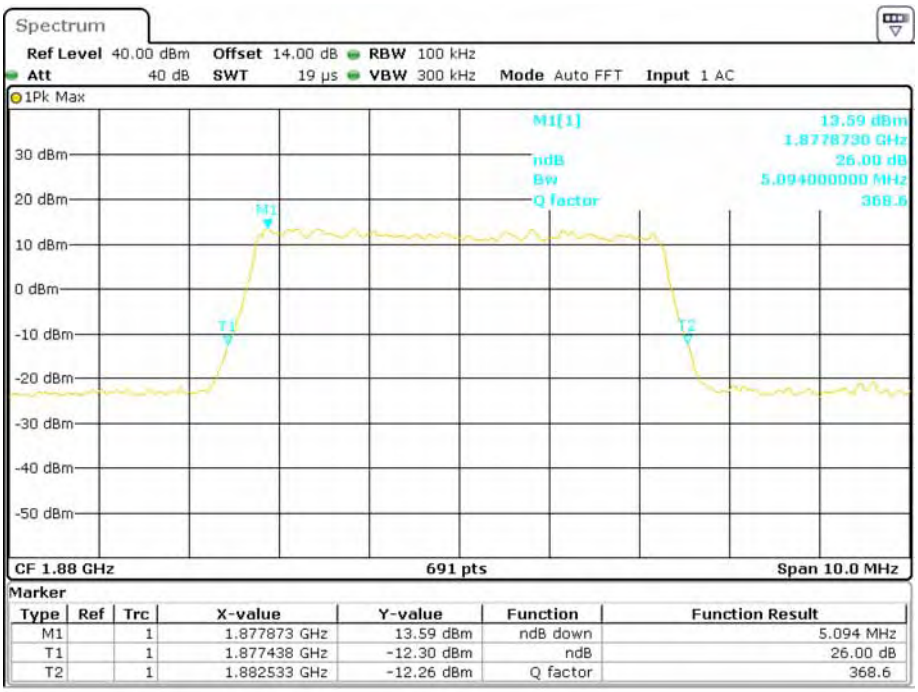
QPSK (3.0 MHz) - 26 dB Bandwidth, Middle channel



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



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

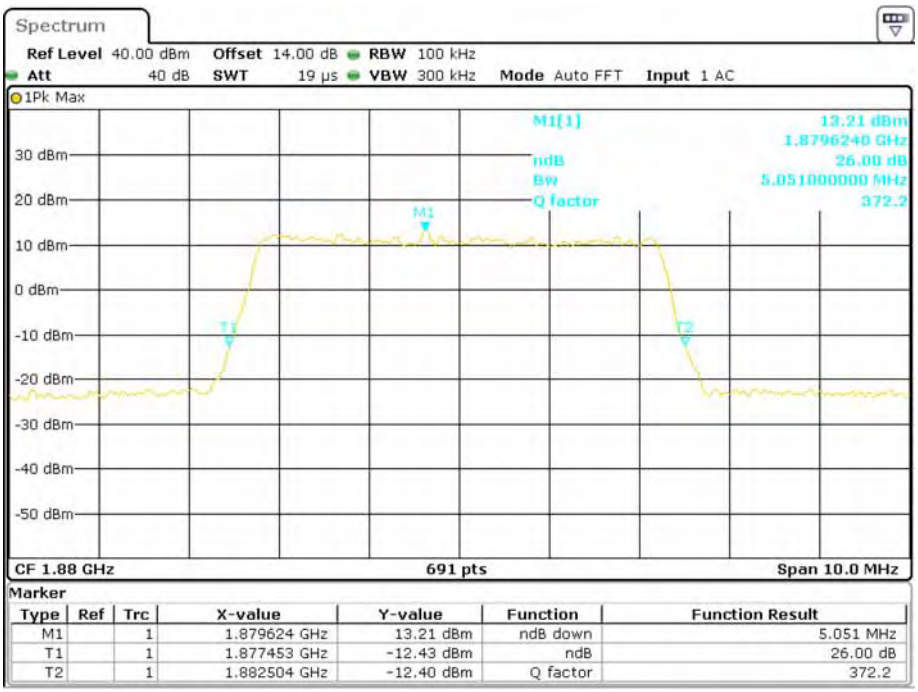


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.877873 GHz	13.59 dBm	ndB down	5.094 MHz
T1		1	1.877438 GHz	-12.30 dBm	ndB	26.00 dB
T2		1	1.882533 GHz	-12.26 dBm	Q factor	368.6

Date: 31.JUL.2015 13:57:29

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

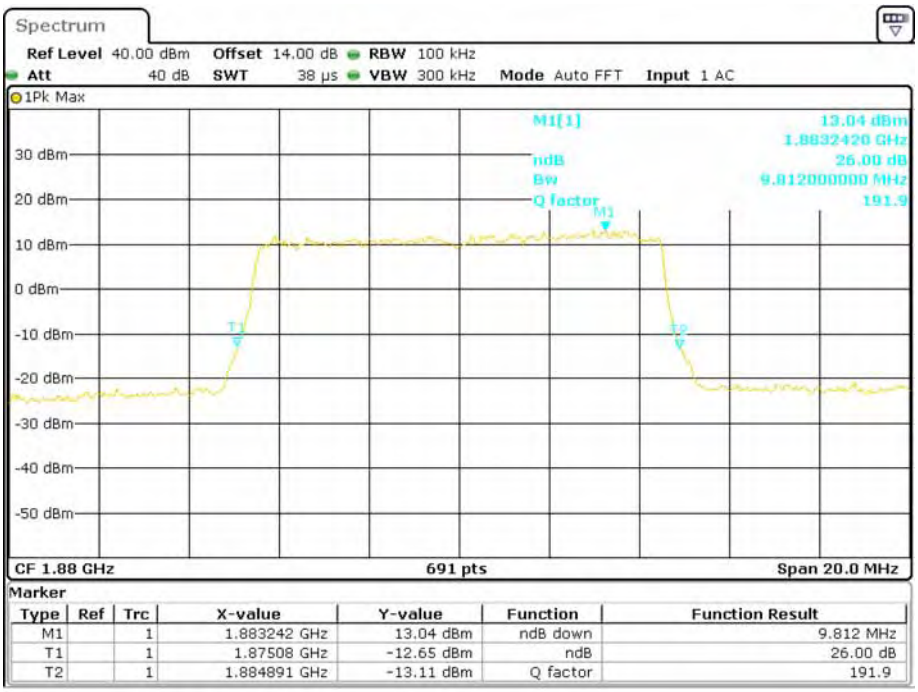


Marker

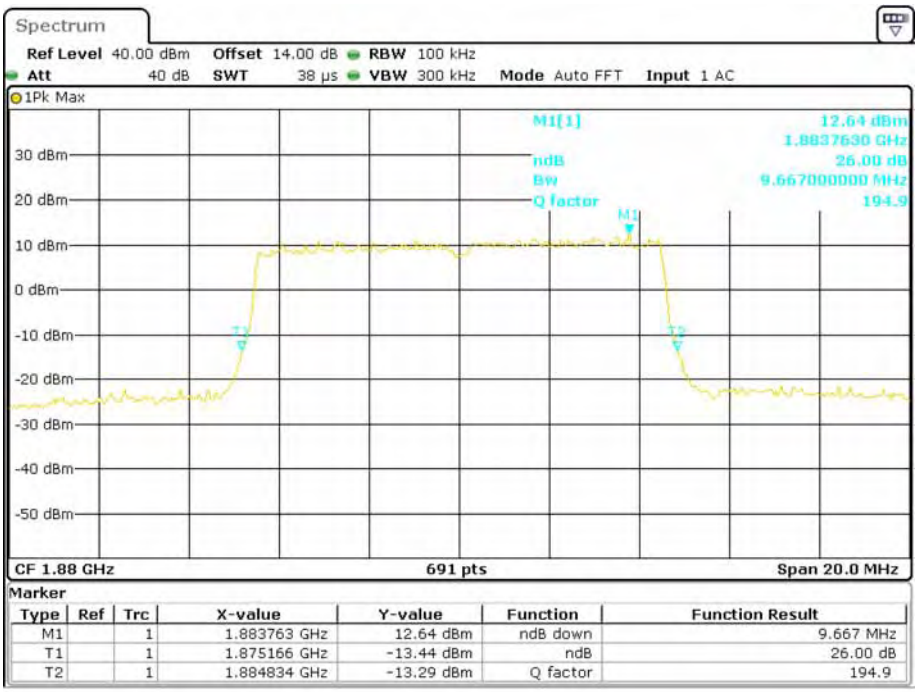
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.879624 GHz	13.21 dBm	ndB down	5.051 MHz
T1		1	1.877453 GHz	-12.43 dBm	ndB	26.00 dB
T2		1	1.882504 GHz	-12.40 dBm	Q factor	372.2

Date: 31.JUL.2015 13:58:03

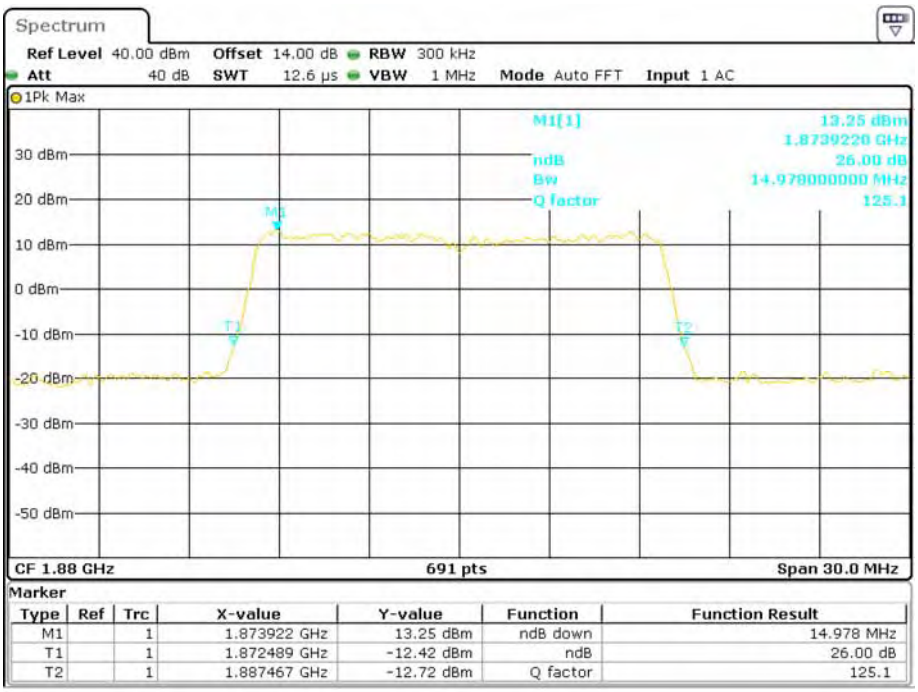
QPSK (10.0 MHz) - 26 dB Bandwidth, Middle channel



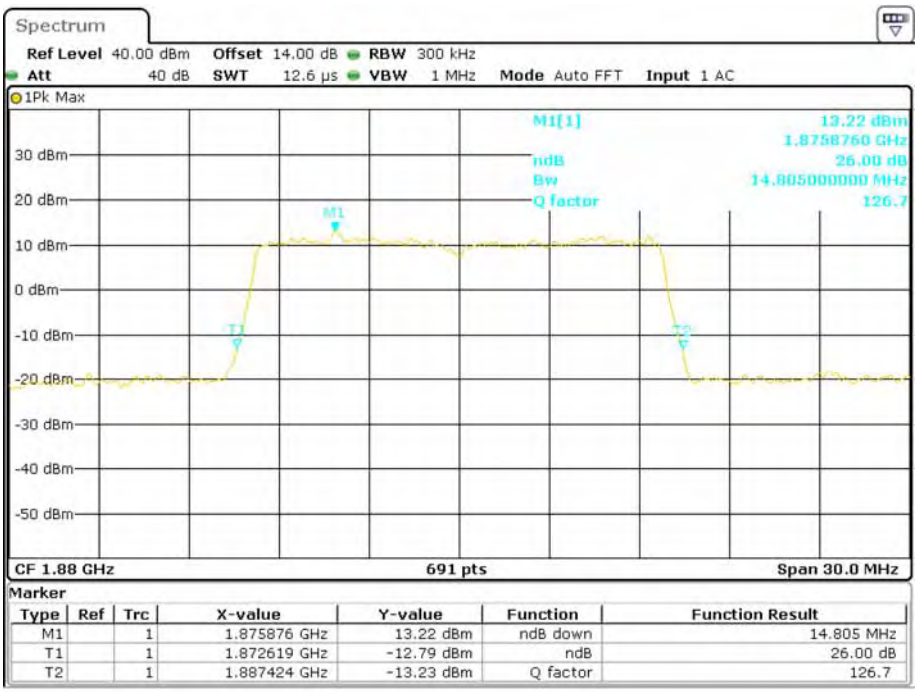
16-QAM (10.0 MHz) - 26 dB Bandwidth, Middle channel



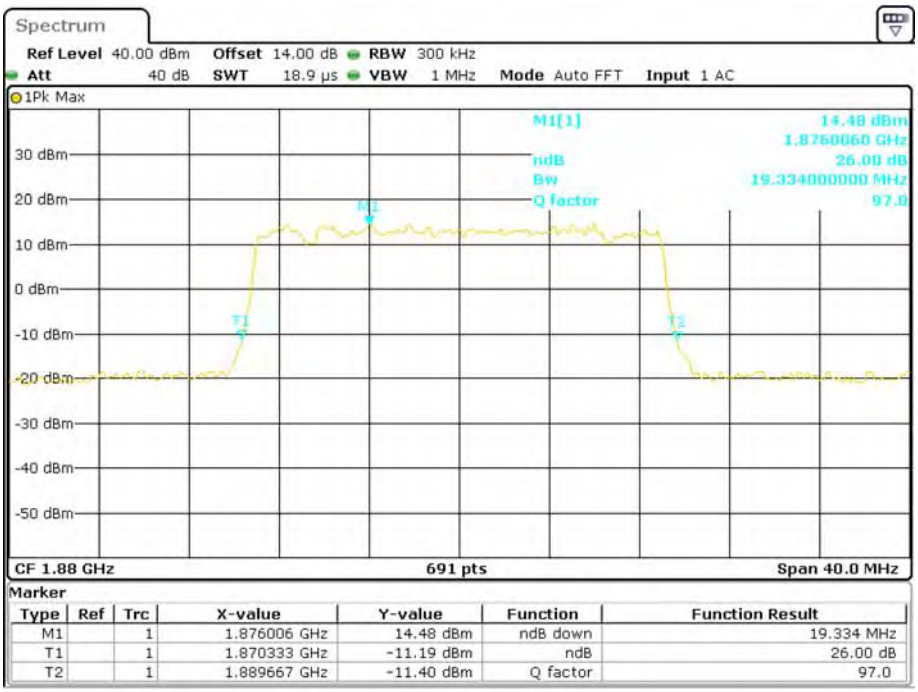
QPSK (15.0 MHz) - 26 dB Bandwidth, Middle channel



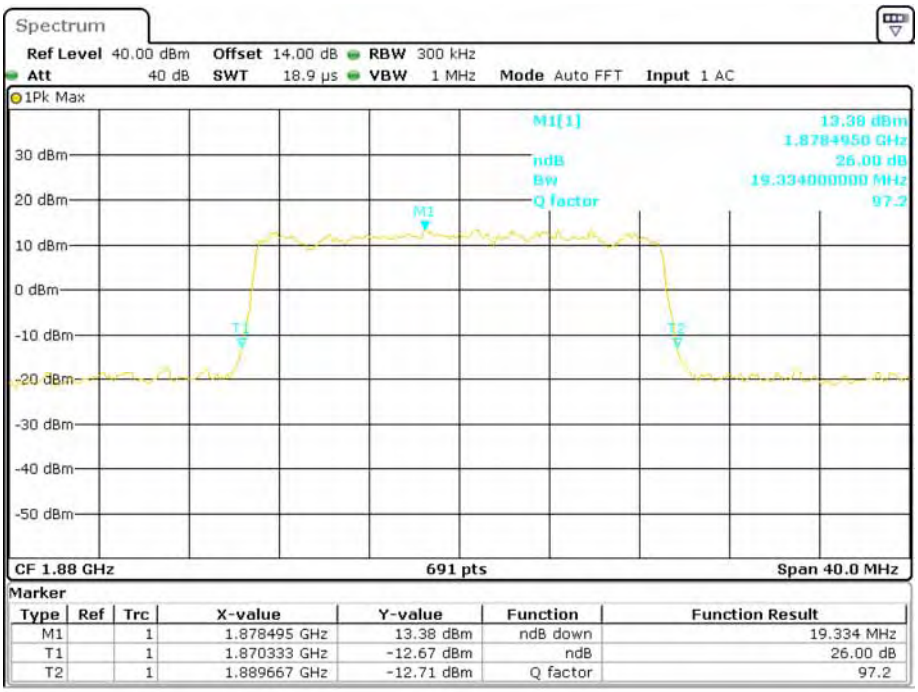
16-QAM (15.0 MHz) - 26 dB Bandwidth, Middle channel



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



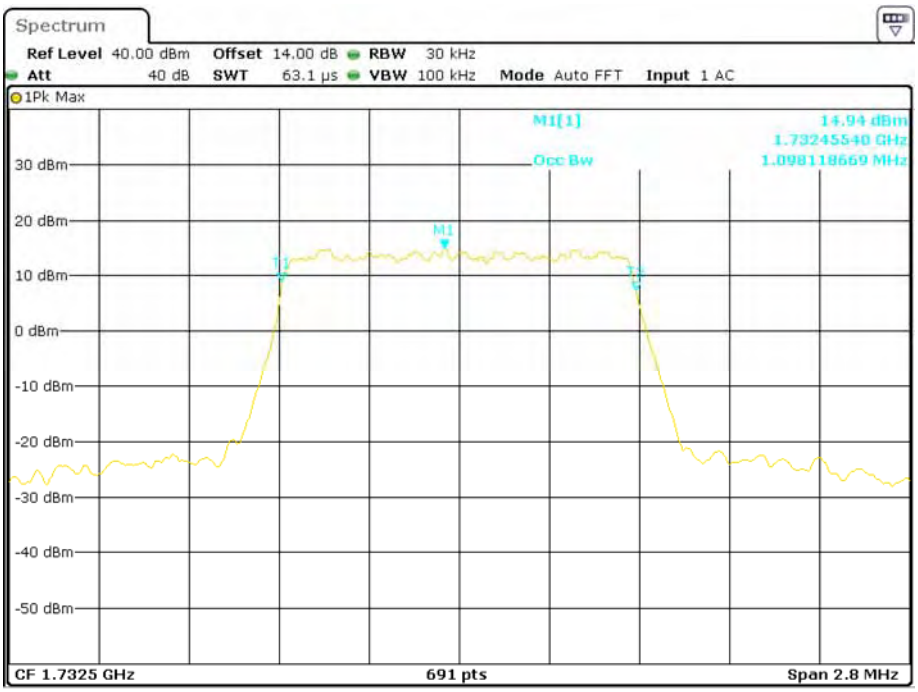
16-QAM (20.0 MHz) - 26 dB Bandwidth, Middle channel



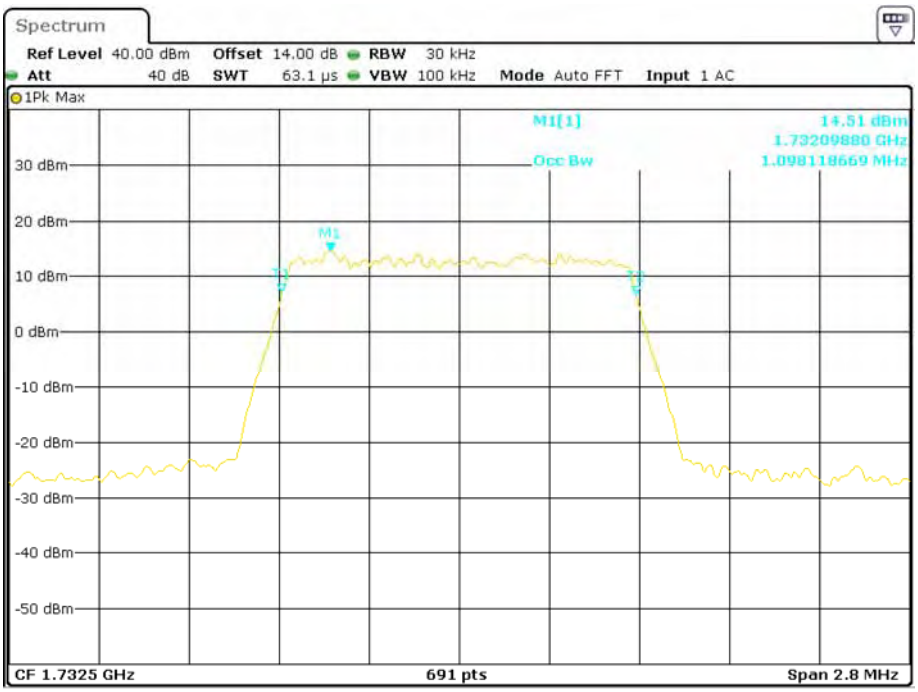
LTE Band 4: (Middle Channel)

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4 MHz	QPSK	1.098	1.268
	16QAM	1.098	1.285
3.0 MHz	QPSK	2.692	2.918
	16QAM	2.683	2.935
5.0 MHz	QPSK	4.544	5.094
	16QAM	4.515	5.065
10.0 MHz	QPSK	8.973	9.812
	16QAM	8.944	9.696
15.0 MHz	QPSK	13.502	14.805
	16QAM	13.546	14.935
20.0 MHz	QPSK	17.945	19.508
	16QAM	18.003	19.624

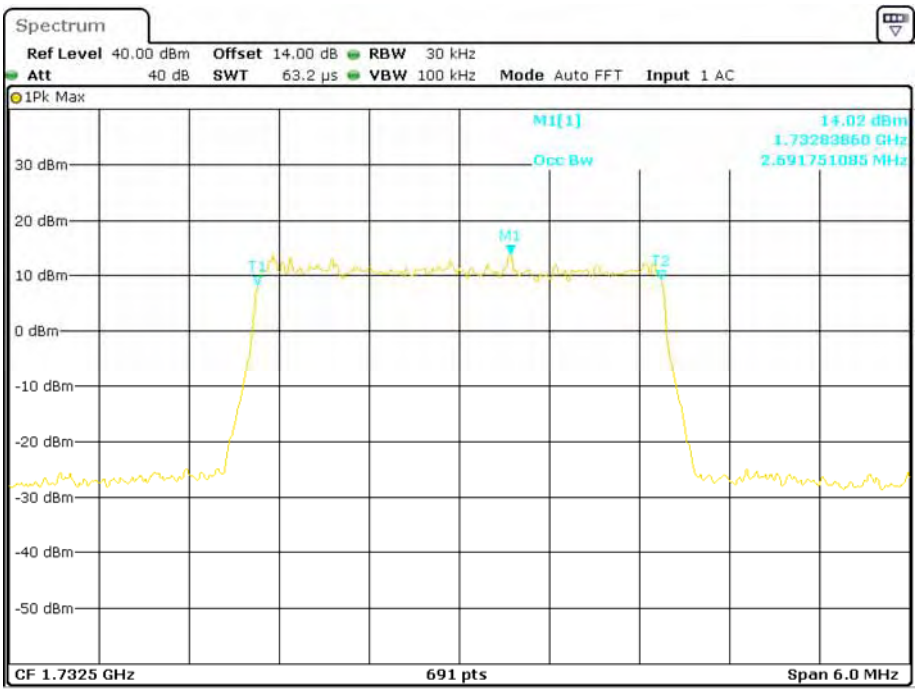
QPSK (1.4 MHz) - 99% Occupied Bandwidth, Middle channel



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

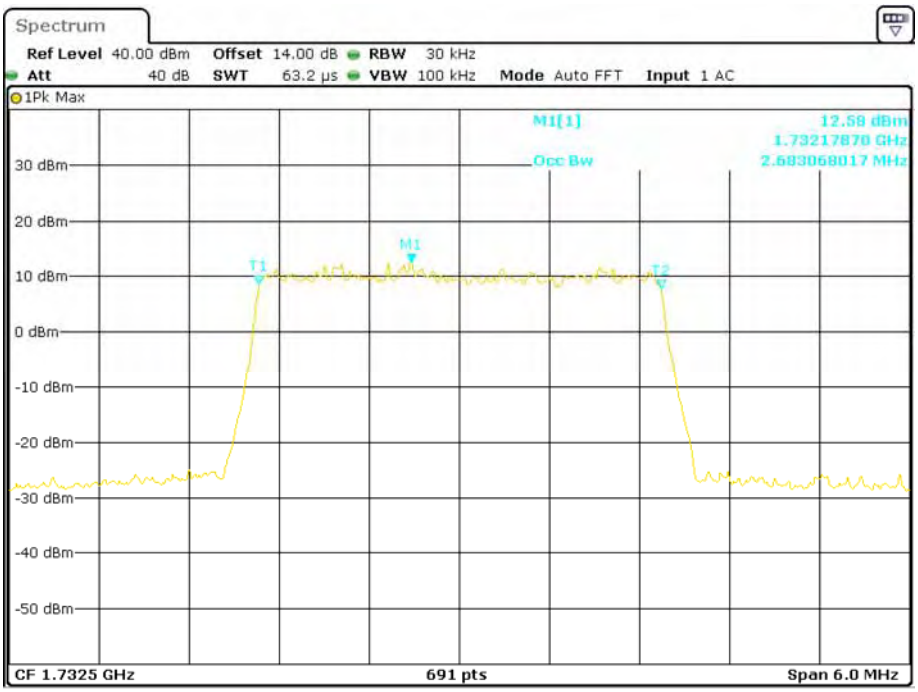


QPSK (3.0 MHz) - 99% Occupied Bandwidth, Middle channel



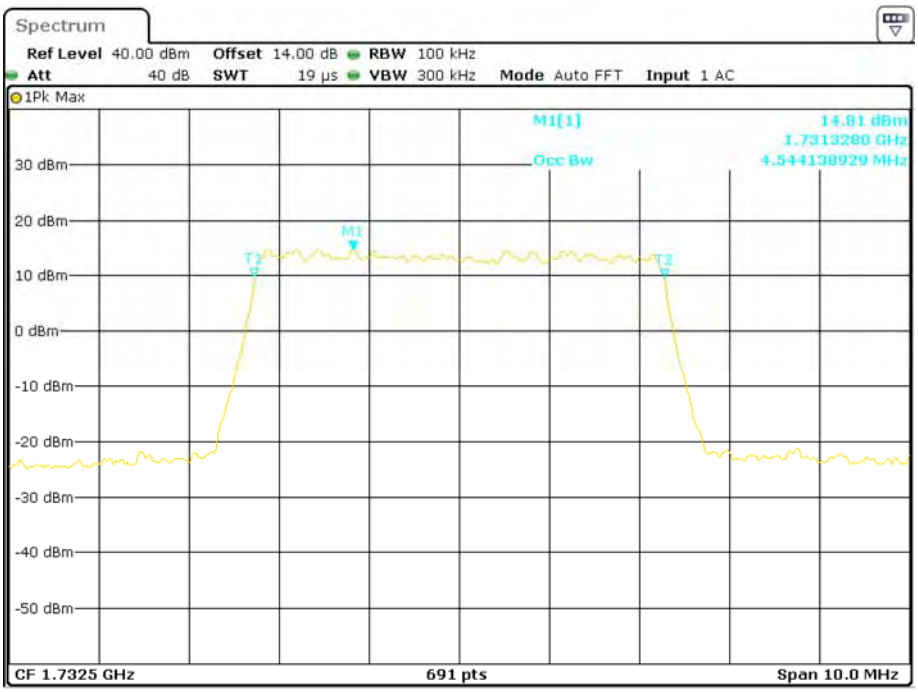
Date: 12.AUG.2015 10:35:47

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



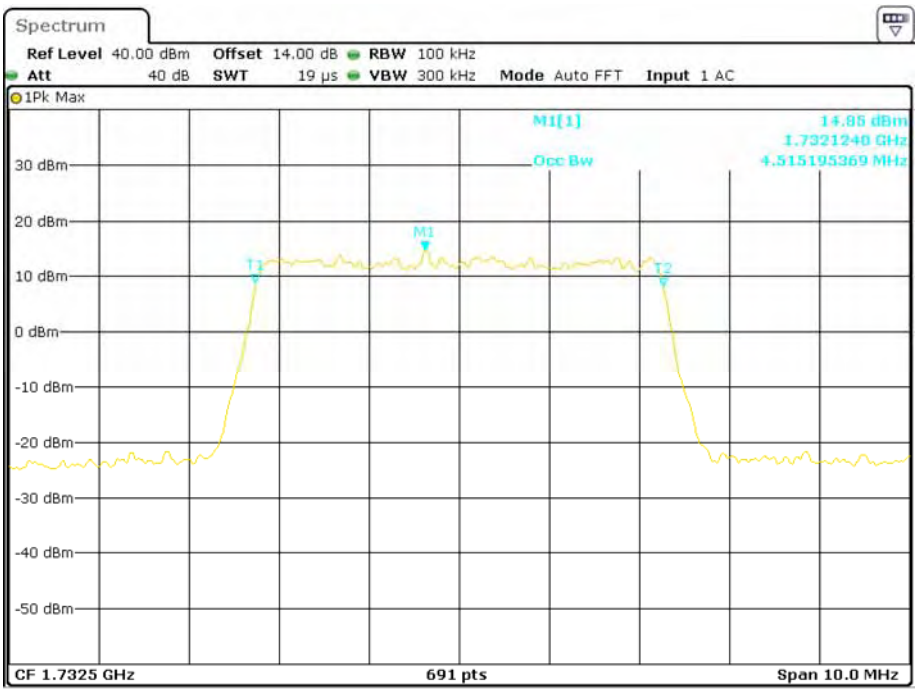
Date: 12.AUG.2015 10:34:31

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



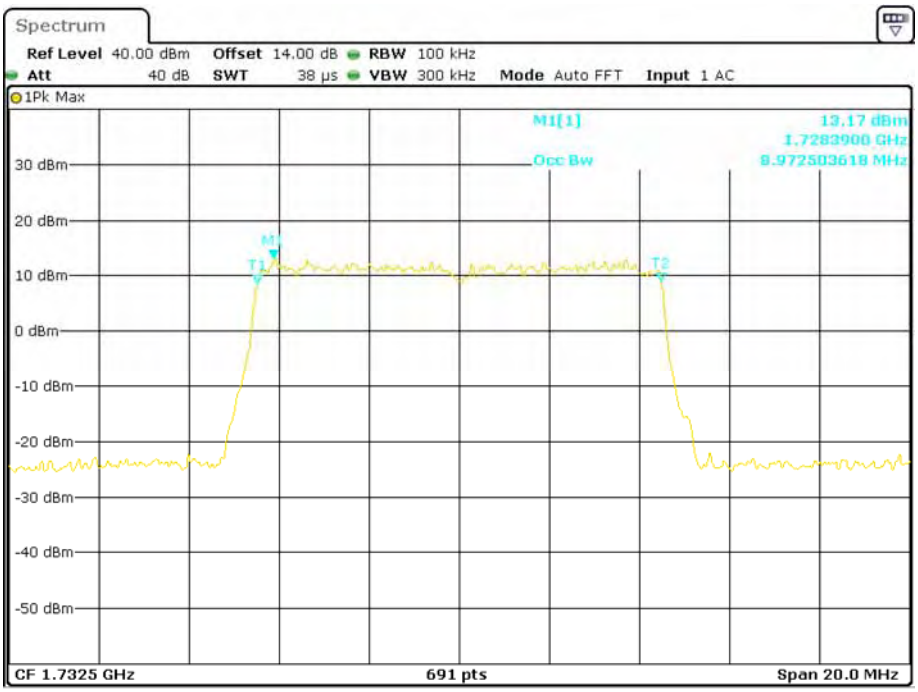
Date: 31.JUL.2015 13:42:21

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



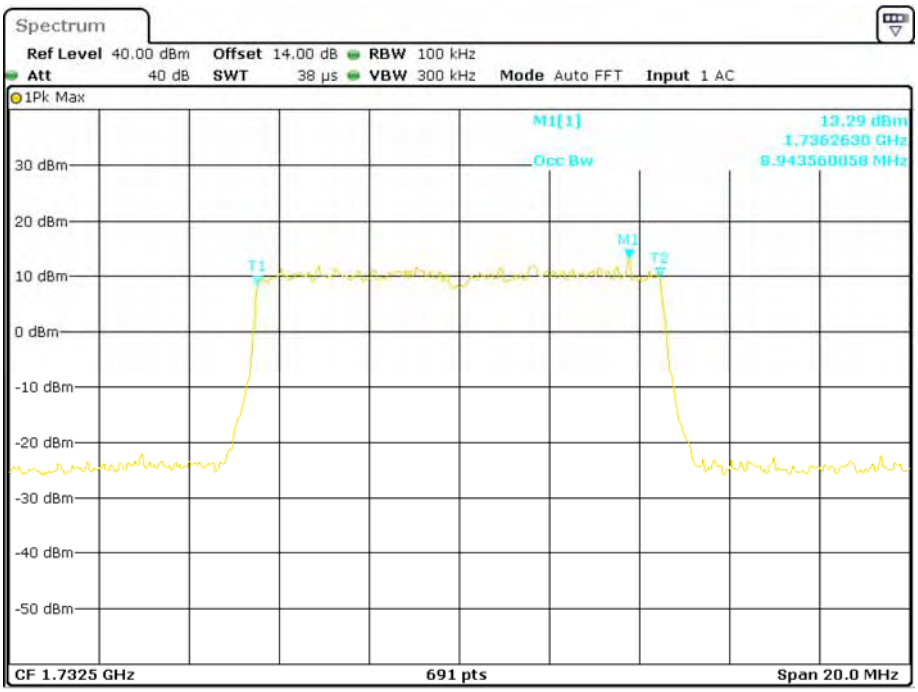
Date: 31.JUL.2015 13:43:03

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



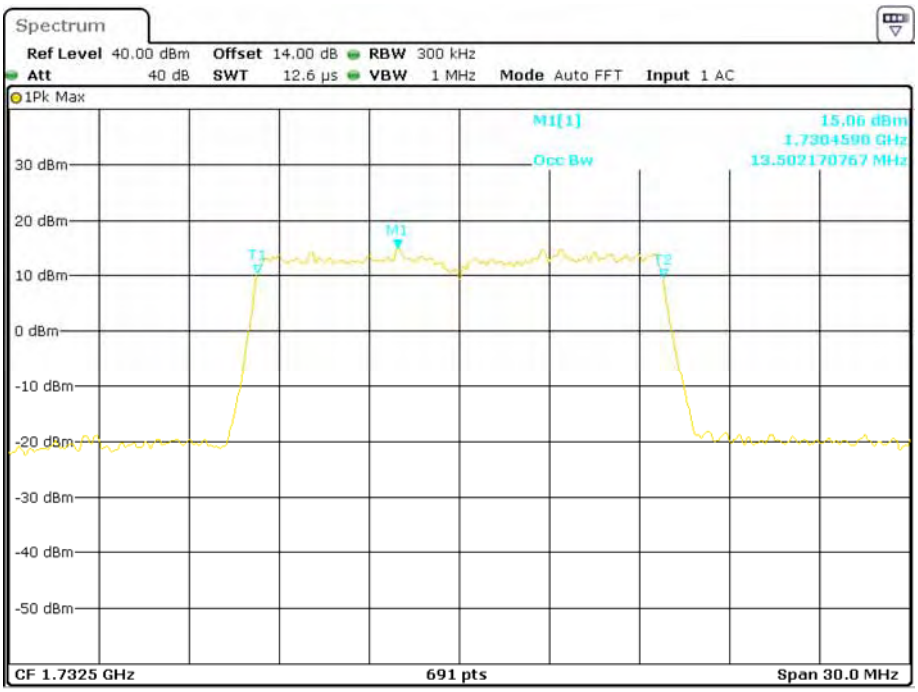
Date: 12.AUG.2015 10:30:45

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



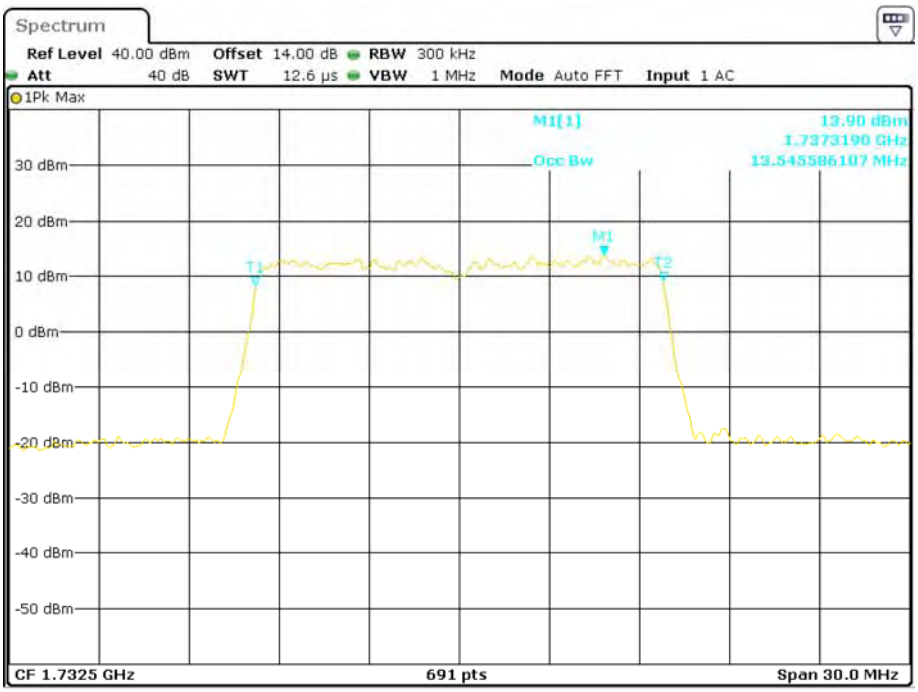
Date: 12.AUG.2015 10:29:52

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



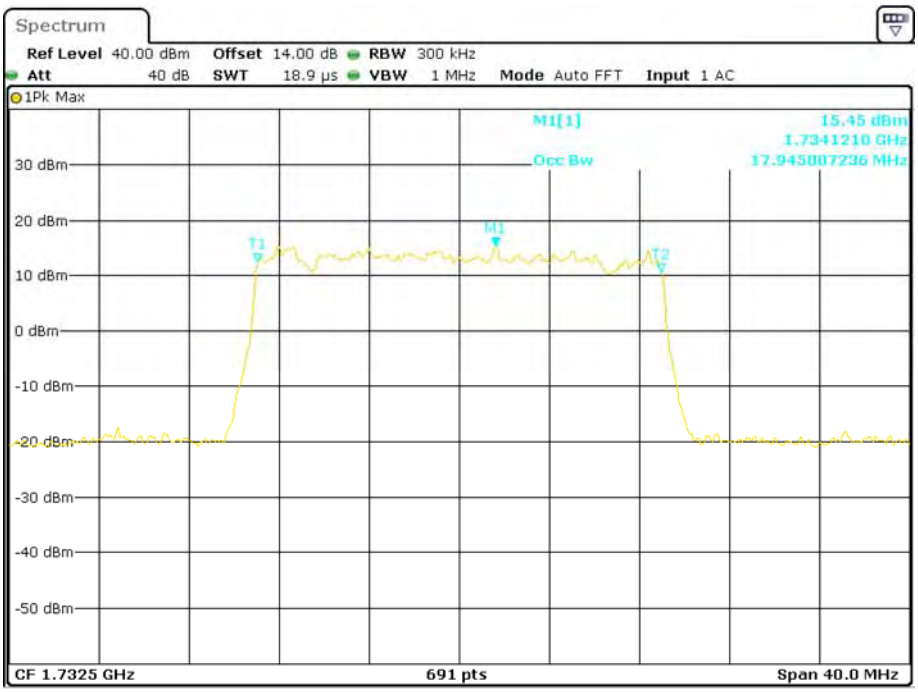
Date: 31.JUL.2015 13:36:34

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



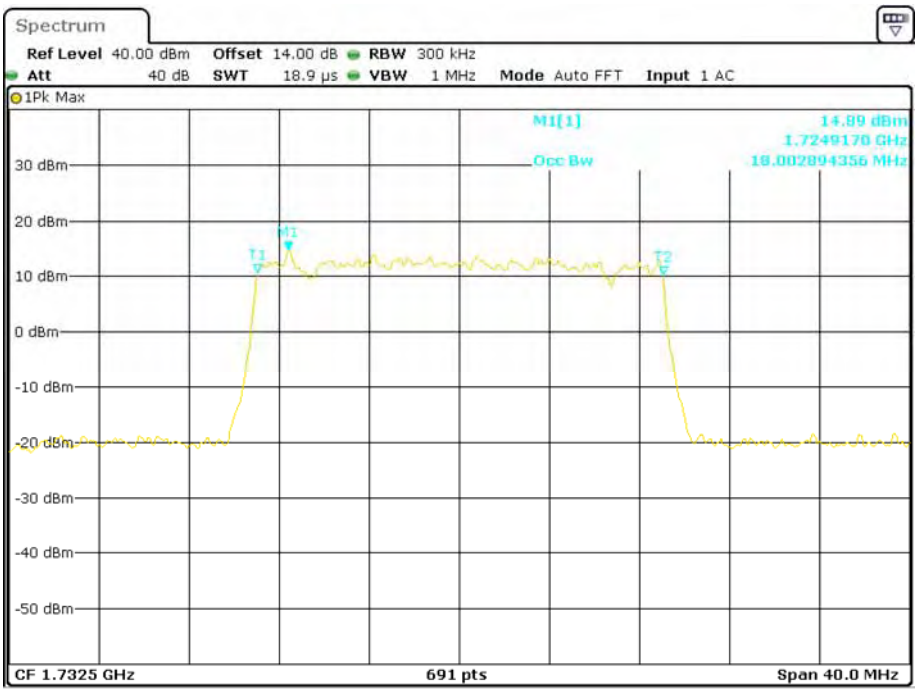
Date: 31.JUL.2015 13:35:54

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



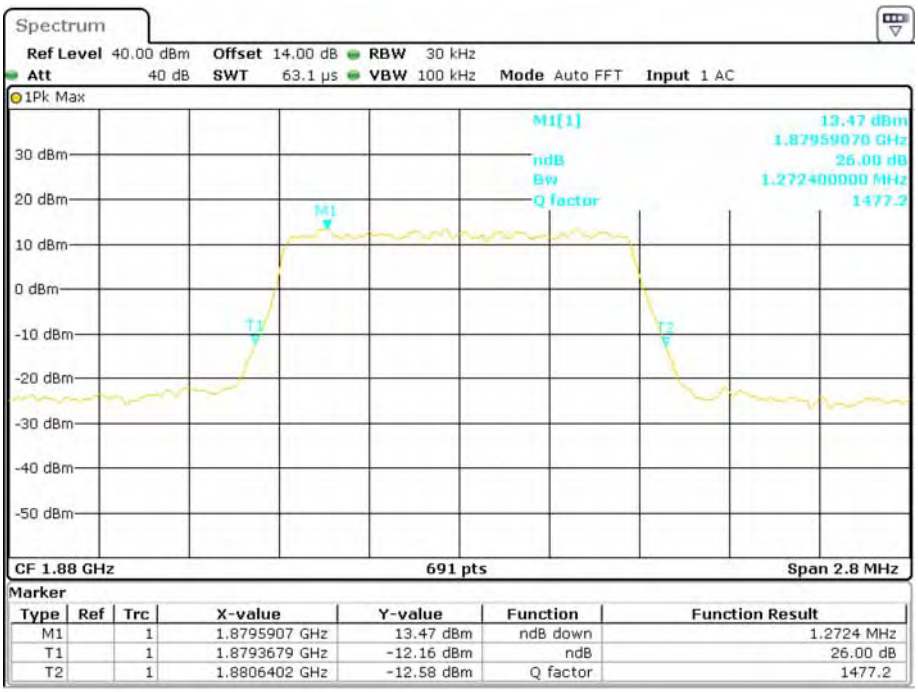
Date: 12.AUG.2015 10:23:04

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

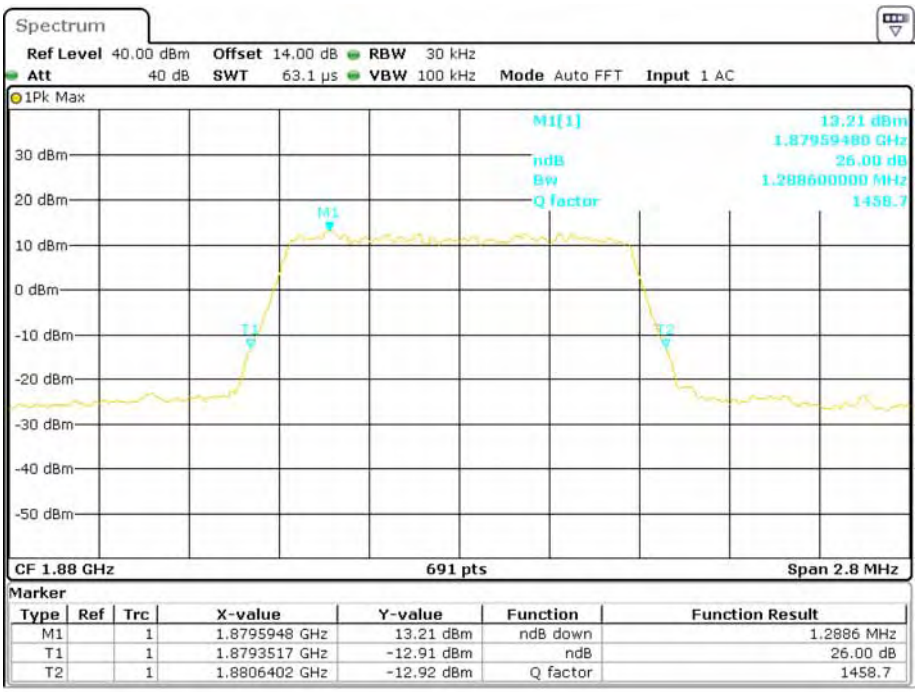


Date: 12.AUG.2015 10:21:33

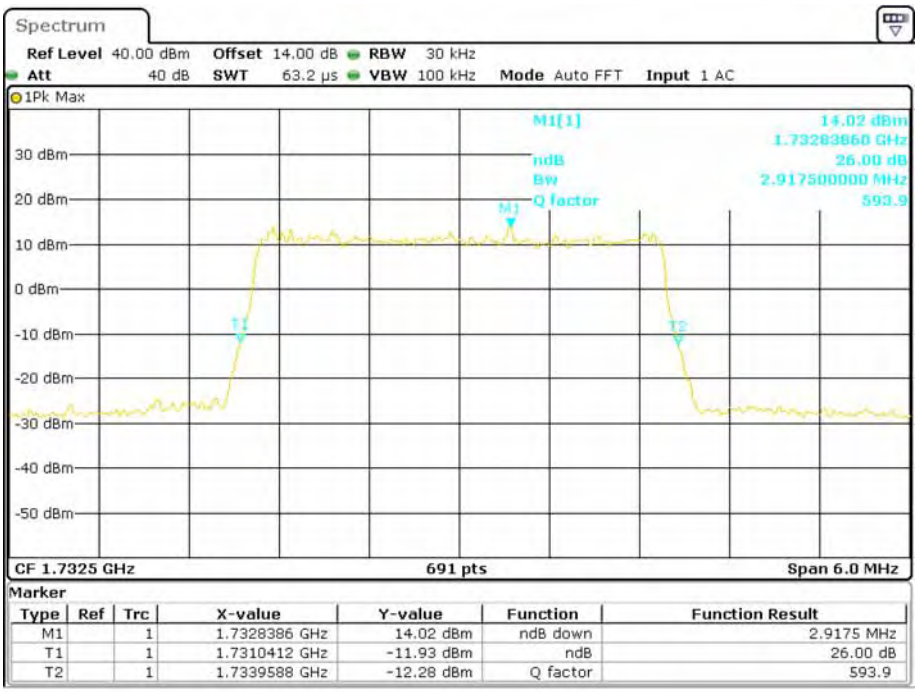
QPSK (1.4 MHz) - 26 dB Bandwidth, Middle channel



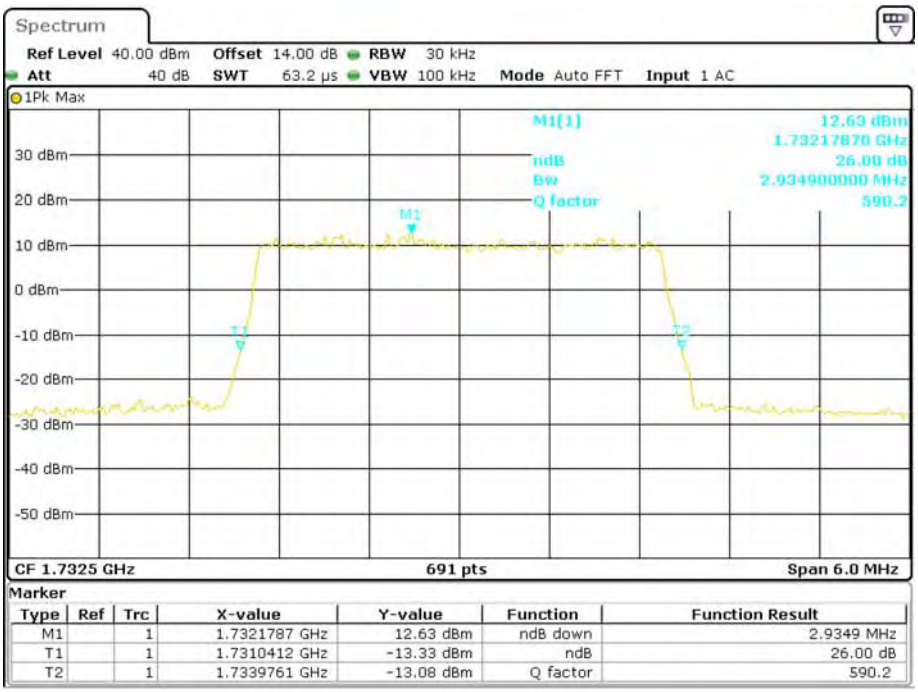
16-QAM (1.4 MHz) - 26 dB Bandwidth, Middle channel



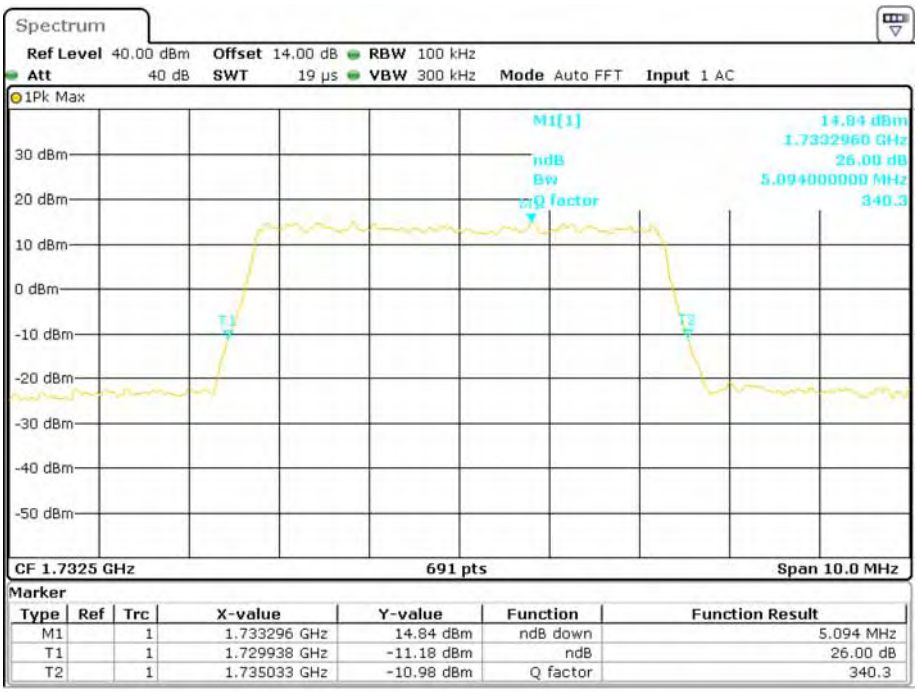
QPSK (3.0 MHz) - 26 dB Bandwidth, Middle channel



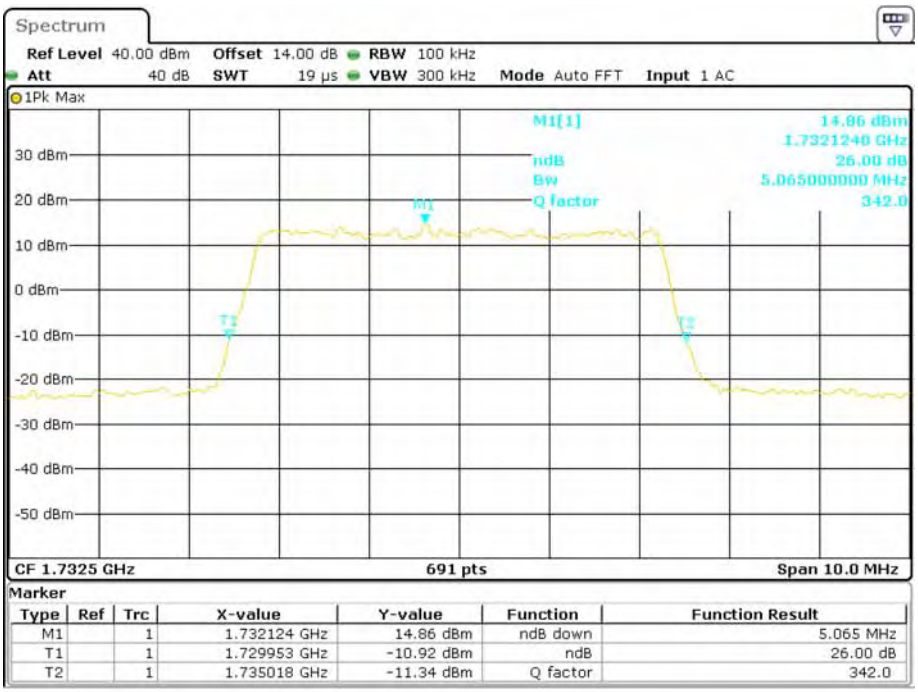
16-QAM (3.0 MHz) - 26 dB Bandwidth, Middle channel



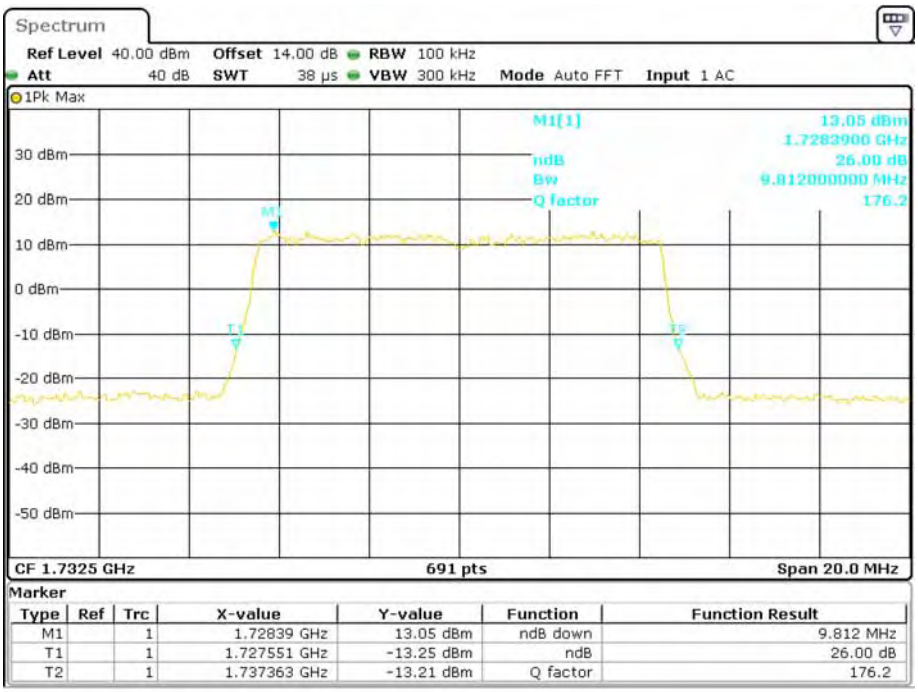
QPSK (5.0 MHz) - 26 dB Bandwidth, Middle channel



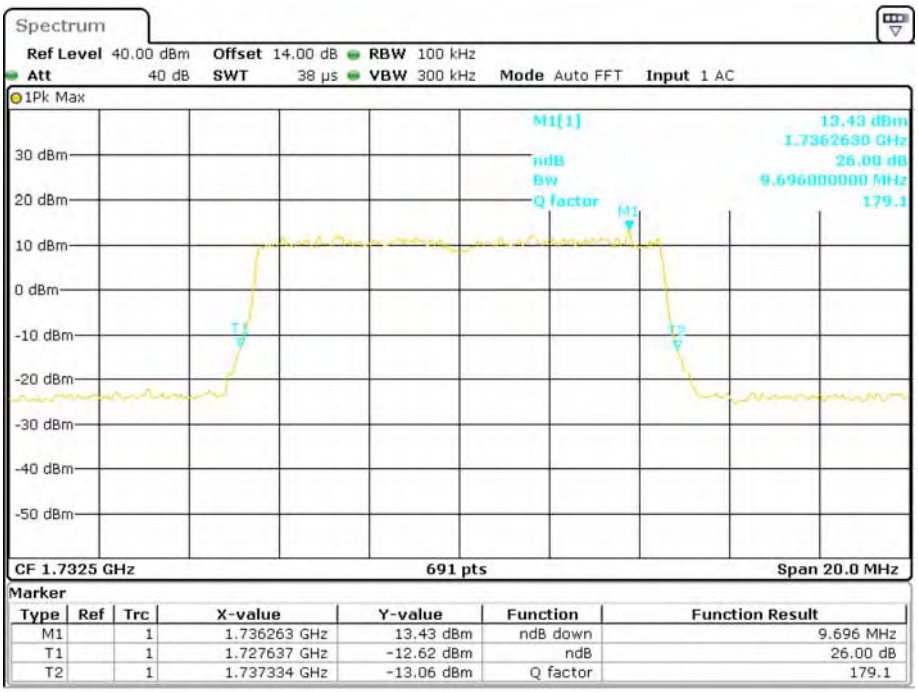
16-QAM (5.0 MHz) - 26 dB Bandwidth, Middle channel



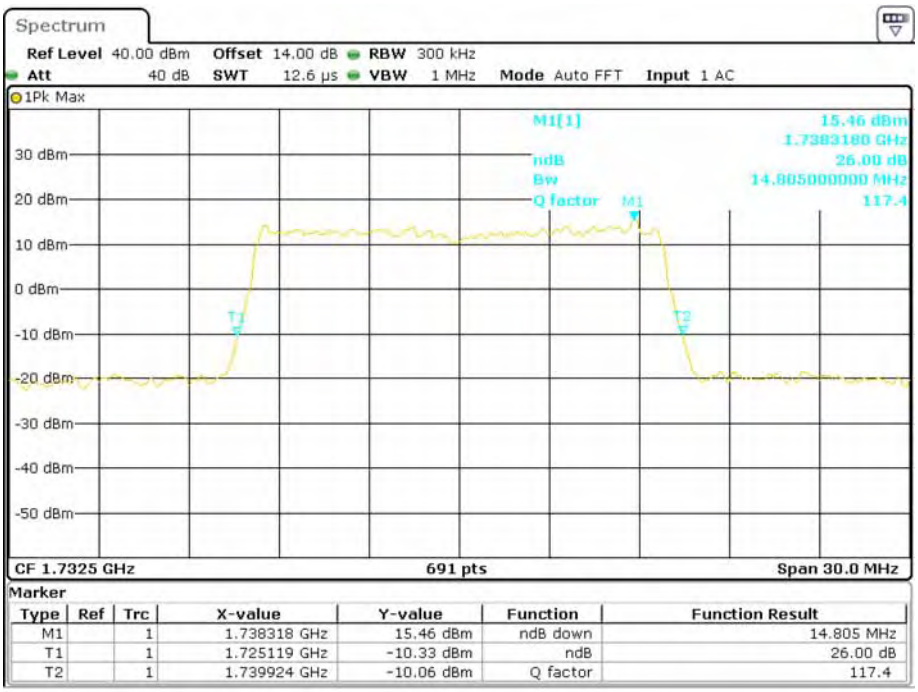
QPSK (10.0 MHz) - 26 dB Bandwidth, Middle channel



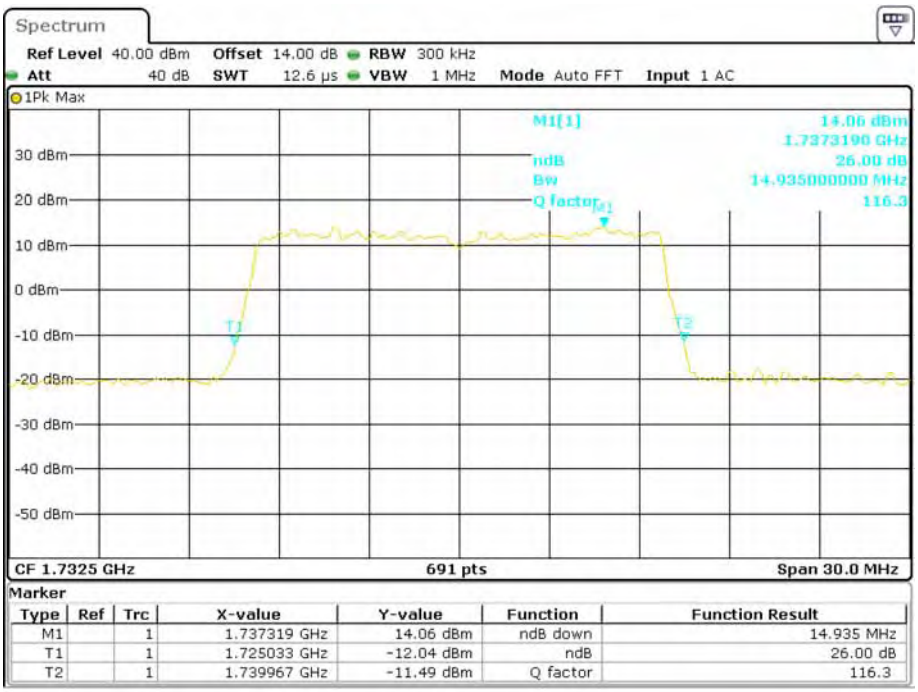
16-QAM (10.0 MHz) - 26 dB Bandwidth, Middle channel



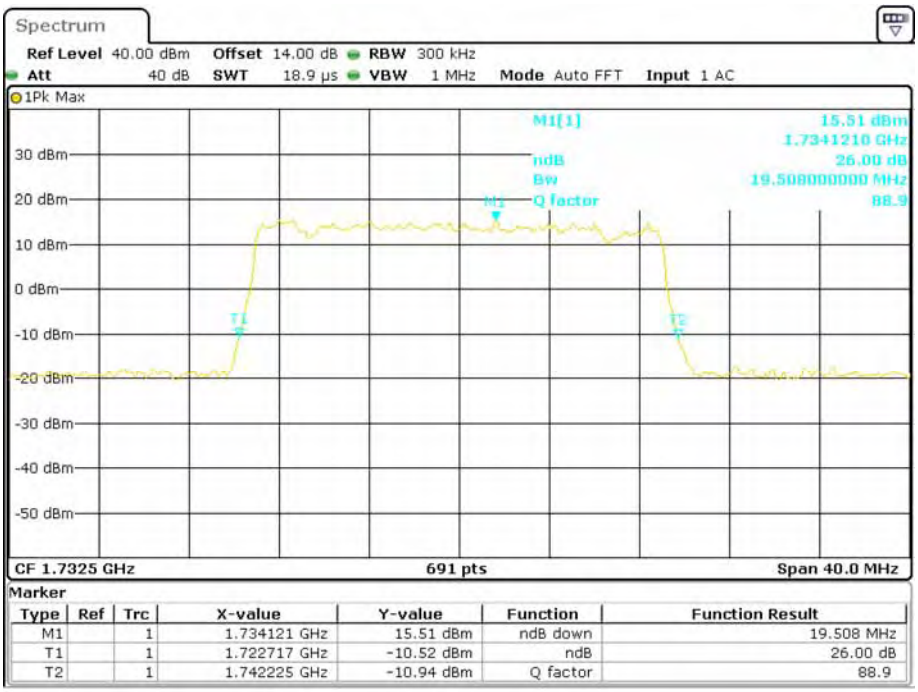
QPSK (15.0 MHz) - 26 dB Bandwidth, Middle channel



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



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

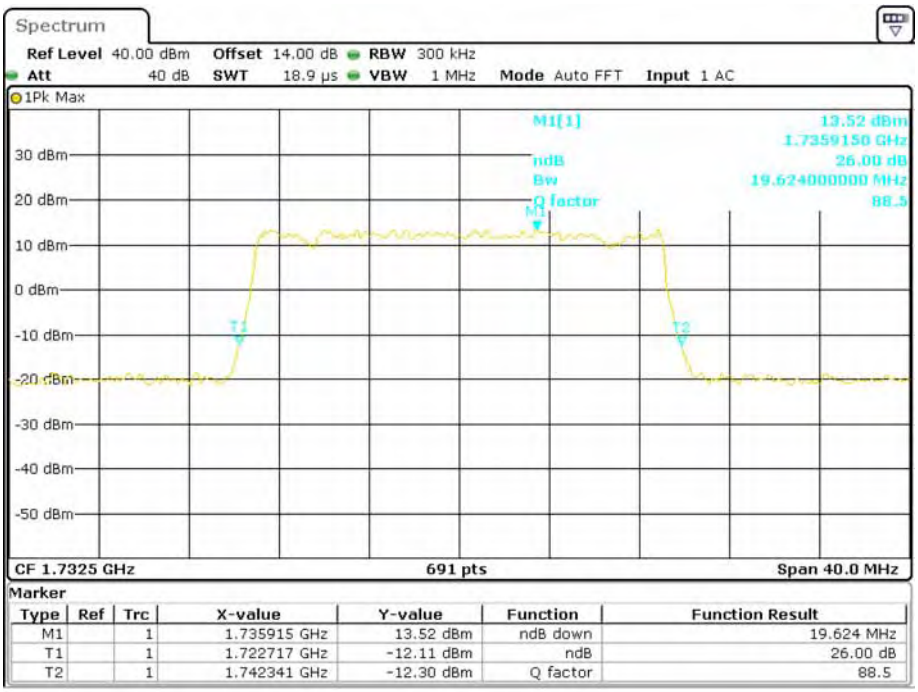


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.734121 GHz	15.51 dBm	ndB down	19.508 MHz
T1		1	1.722717 GHz	-10.52 dBm	ndB	26.00 dB
T2		1	1.742225 GHz	-10.94 dBm	Q factor	88.9

Date: 12.AUG.2015 10:26:46

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



Marker

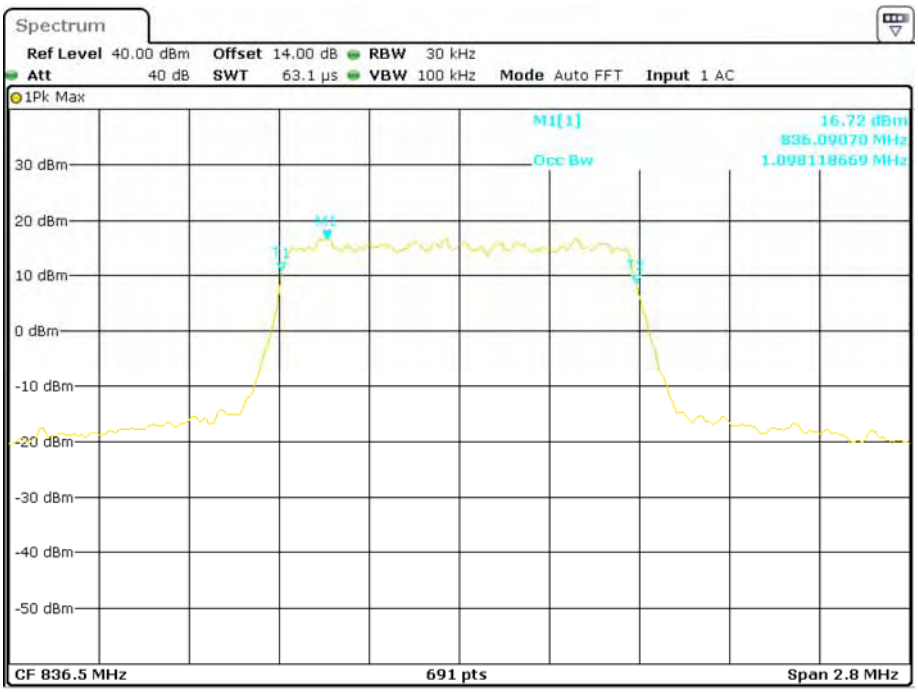
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	1.735915 GHz	13.52 dBm	ndB down	19.624 MHz
T1		1	1.722717 GHz	-12.11 dBm	ndB	26.00 dB
T2		1	1.742341 GHz	-12.30 dBm	Q factor	88.5

Date: 12.AUG.2015 10:20:32

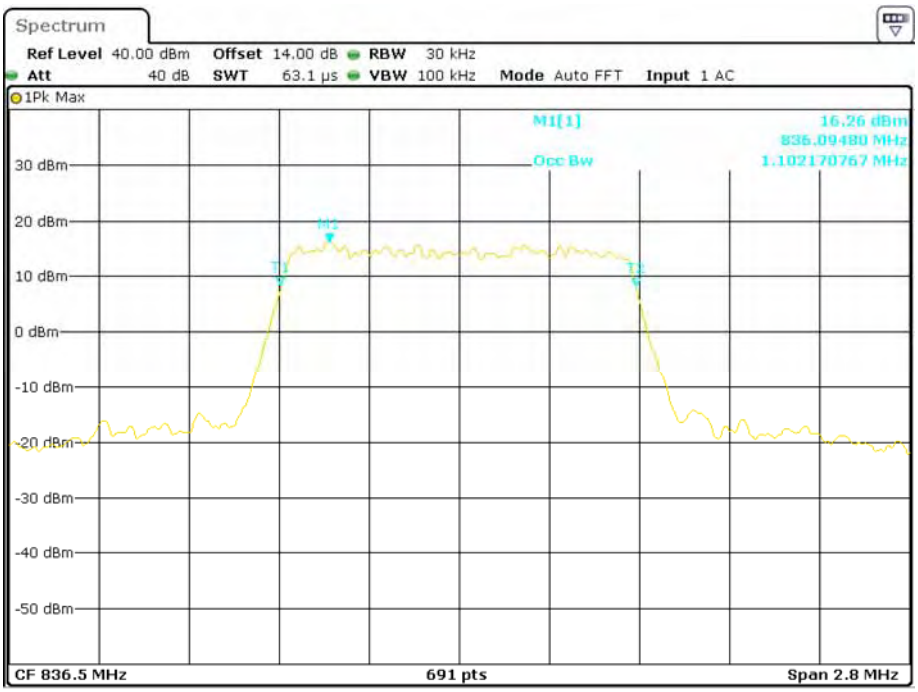
Band 5: (Middle Channel)

Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
1.4 MHz	QPSK	1.098	1.281
	16QAM	1.102	1.289
3.0 MHz	QPSK	2.692	2.926
	16QAM	2.692	2.952
5.0 MHz	QPSK	4.544	5.094
	16QAM	4.530	5.094
10.0 MHz	QPSK	9.001	9.812
	16QAM	8.973	9.812

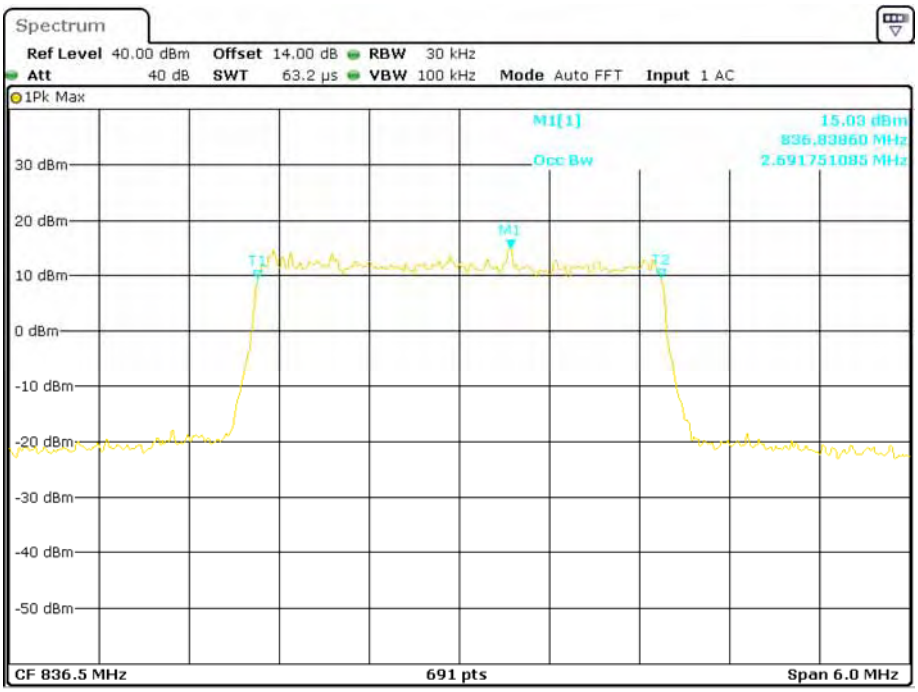
QPSK (1.4 MHz) - 99% Occupied Bandwidth, Middle channel



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

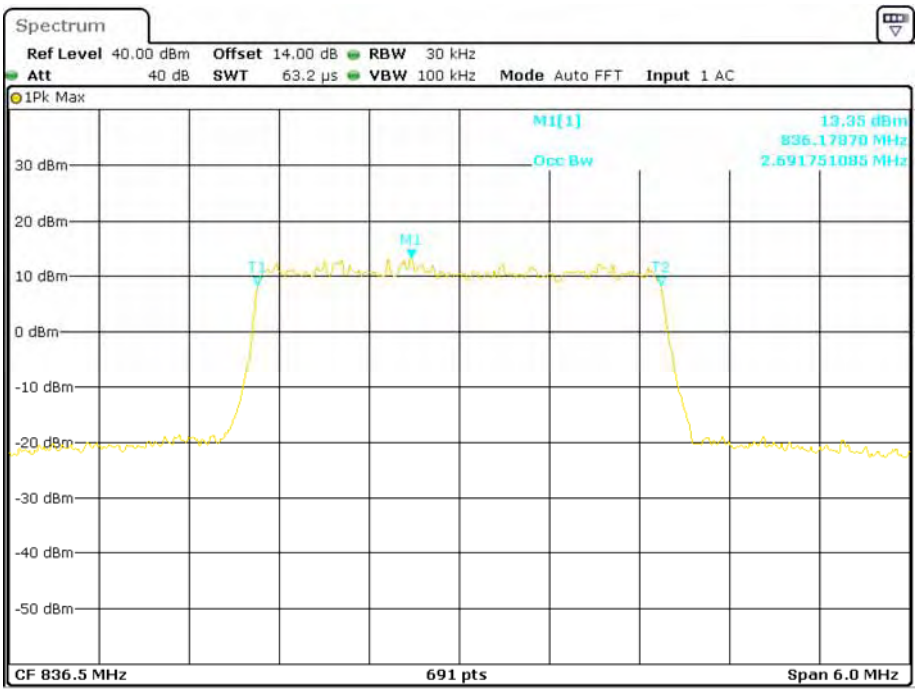


QPSK (3.0 MHz) - 99% Occupied Bandwidth, Middle channel



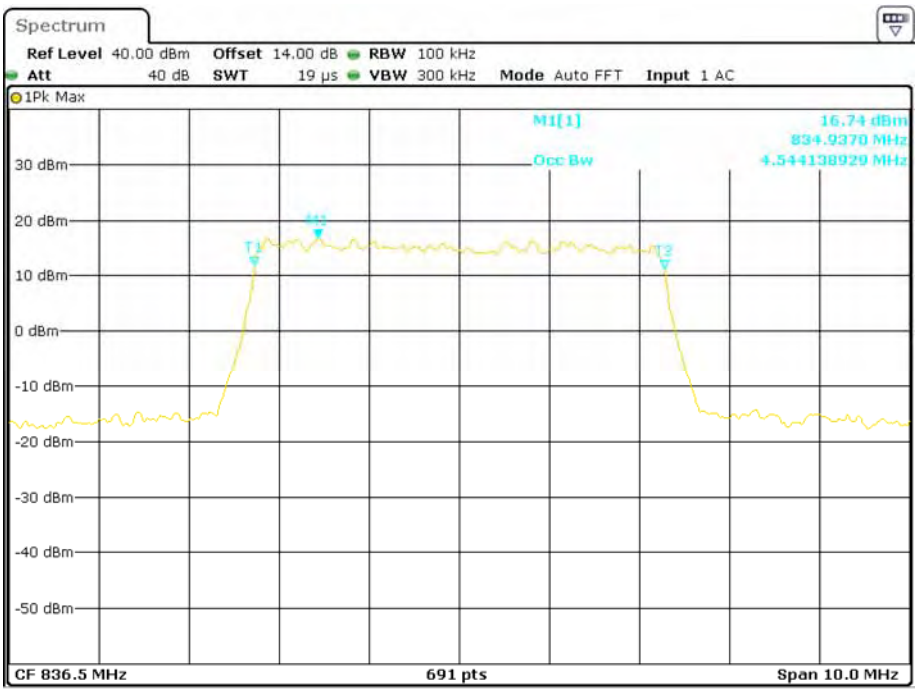
Date: 12.AUG.2015 10:39:43

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



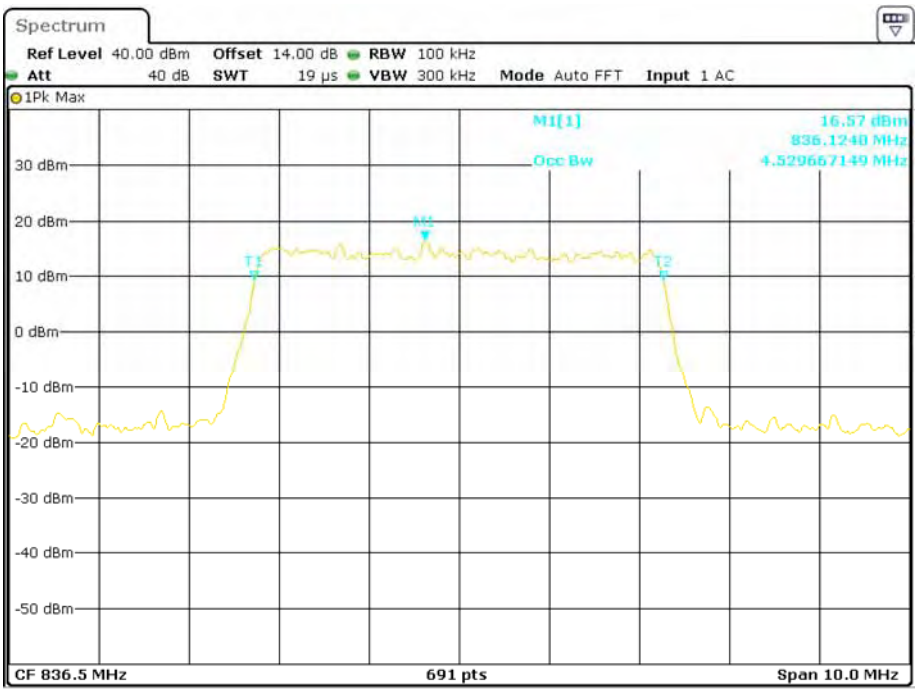
Date: 12.AUG.2015 10:41:02

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



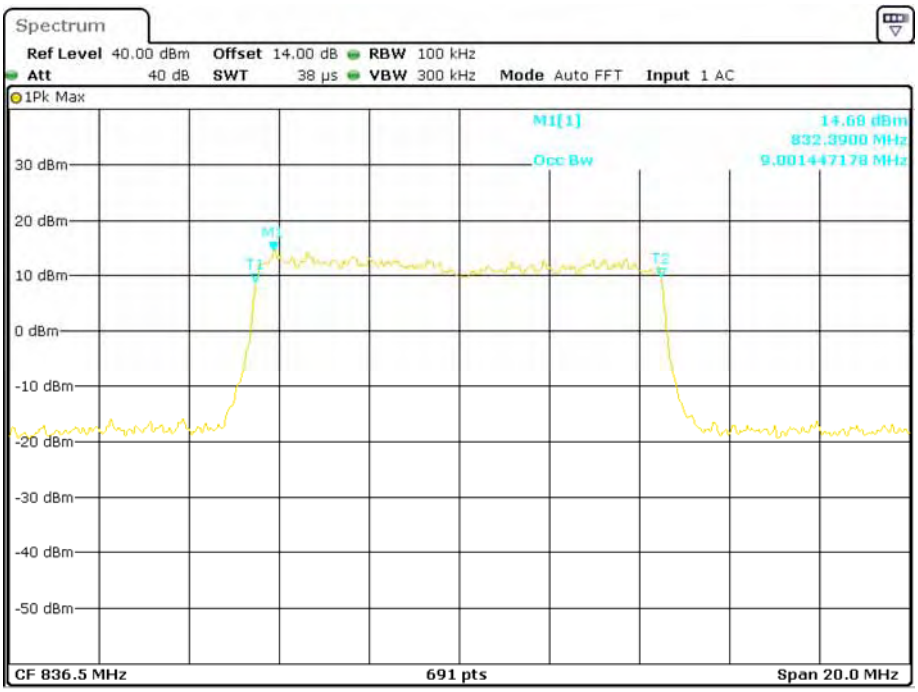
Date: 31.JUL.2015 13:15:45

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



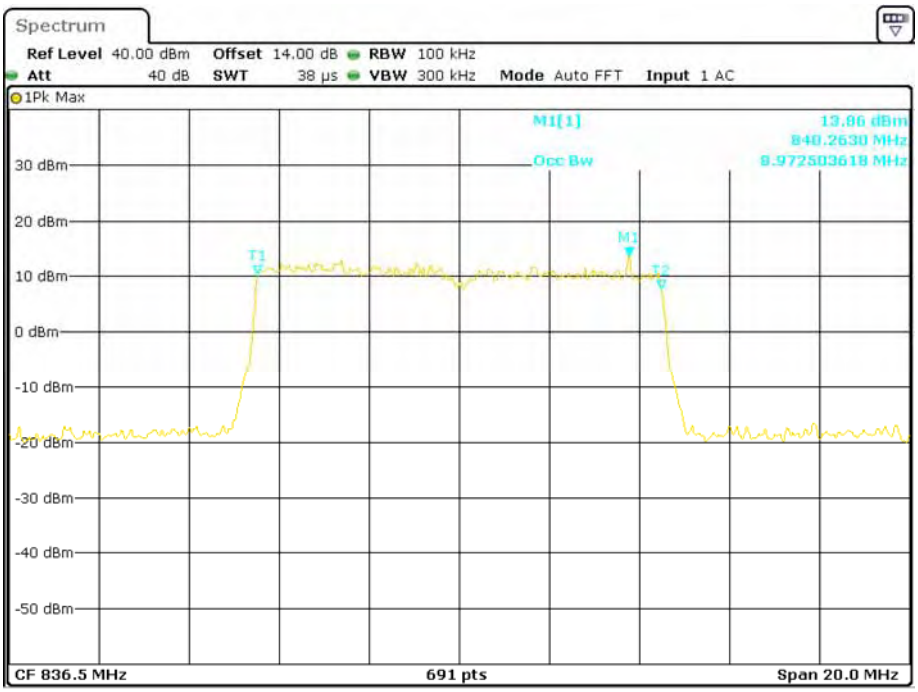
Date: 31.JUL.2015 13:14:48

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



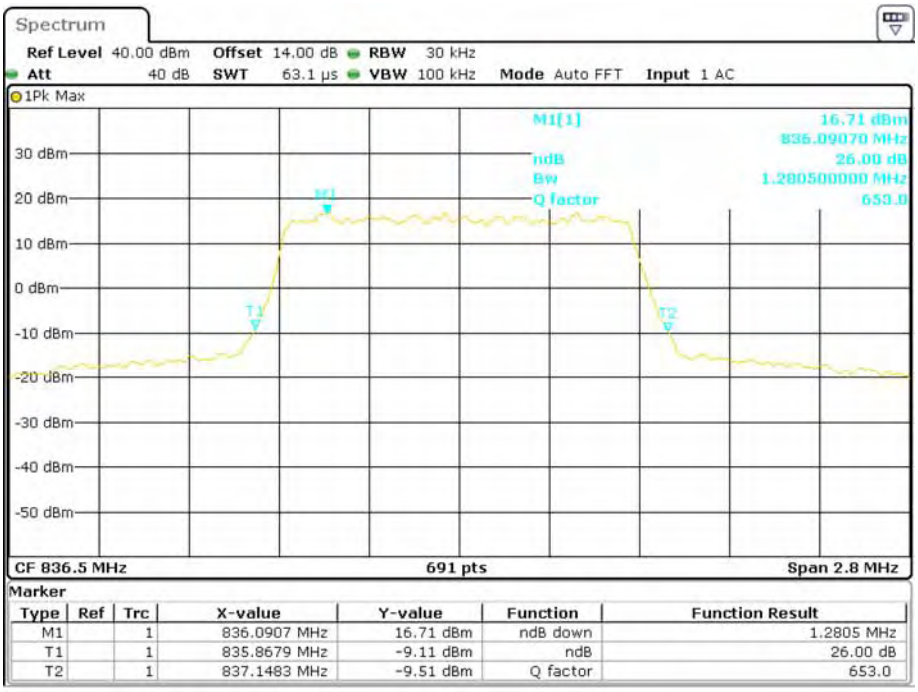
Date: 12.AUG.2015 10:47:06

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



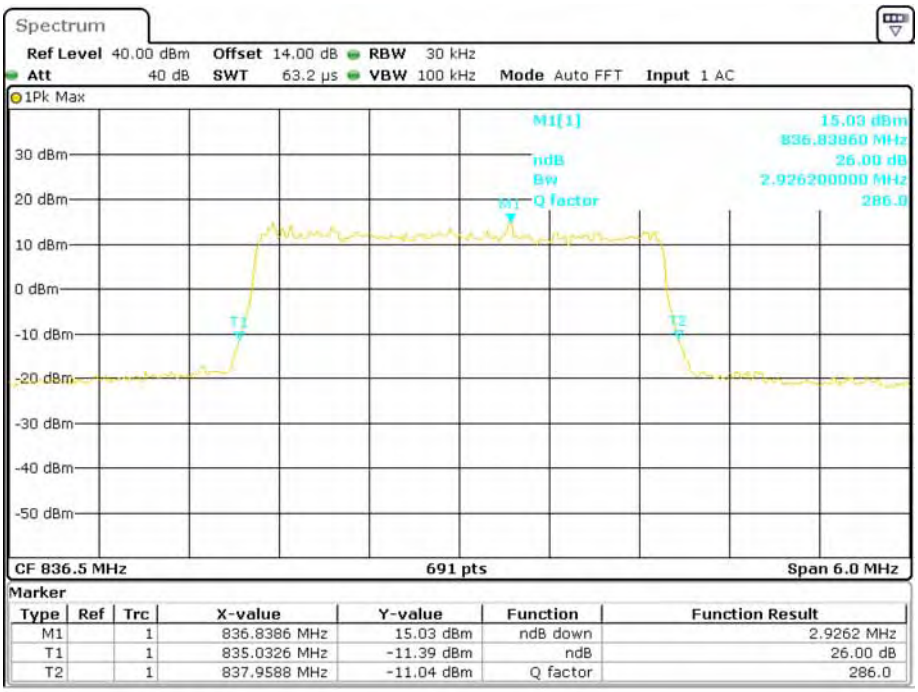
Date: 12.AUG.2015 10:46:25

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

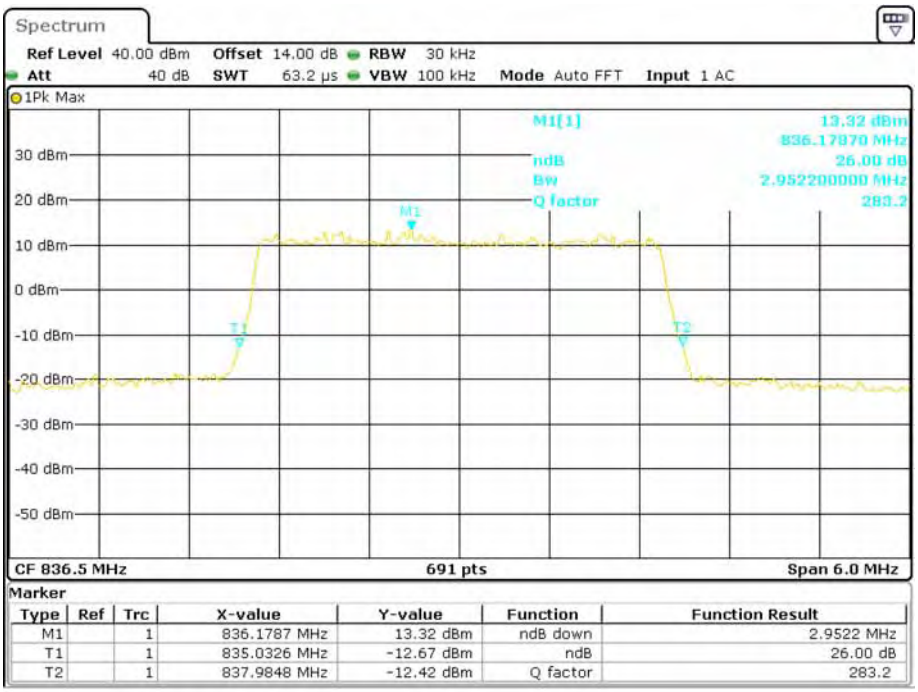


16-QAM (1.4 MHz) - 26 dB Bandwidth, Middle channel

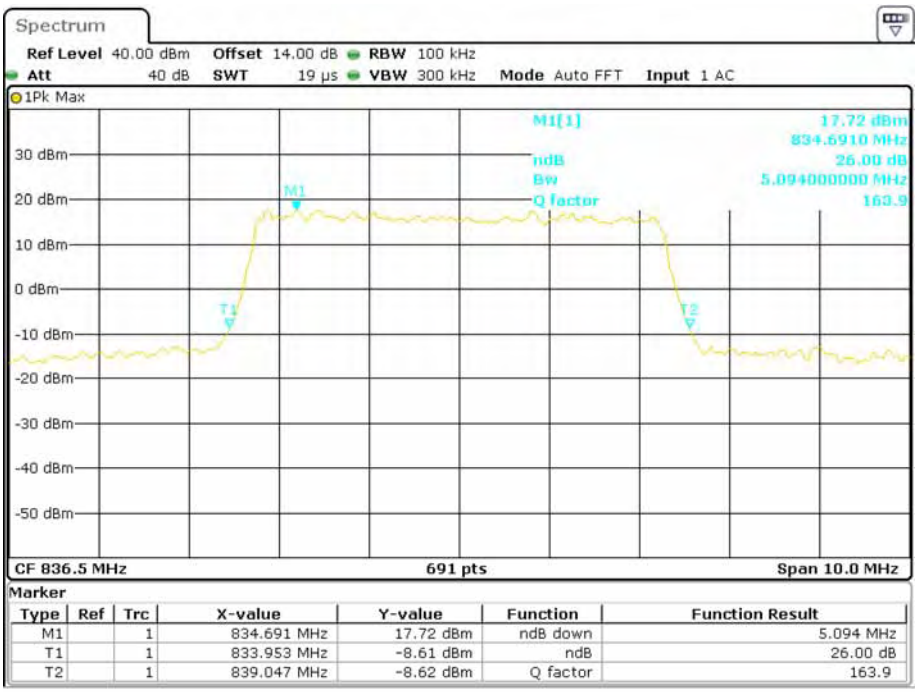
QPSK (3.0 MHz) - 26 dB Bandwidth, Middle channel



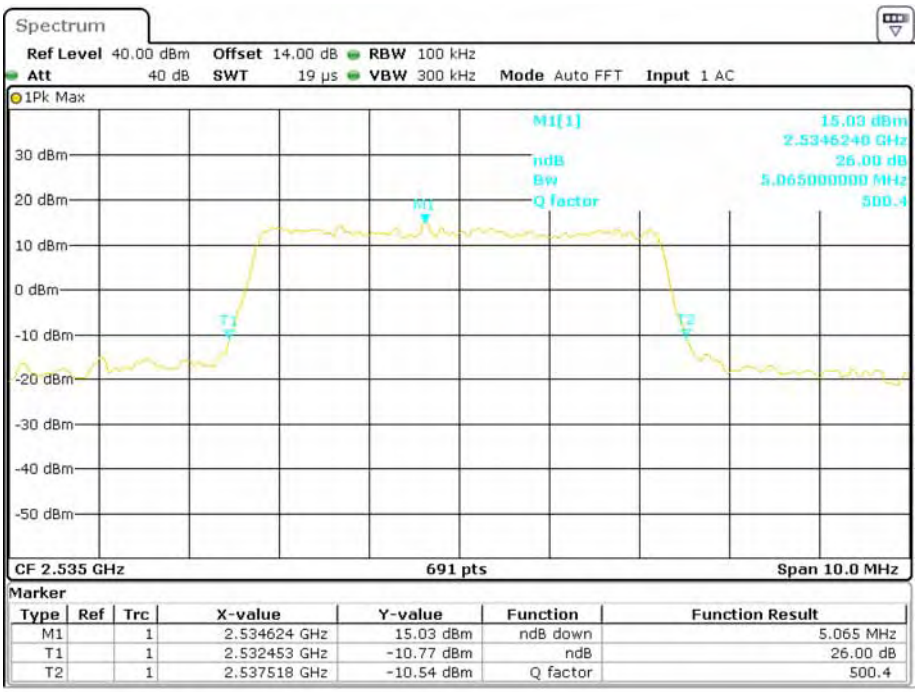
16-QAM (3.0 MHz) - 26 dB Bandwidth, Middle channel



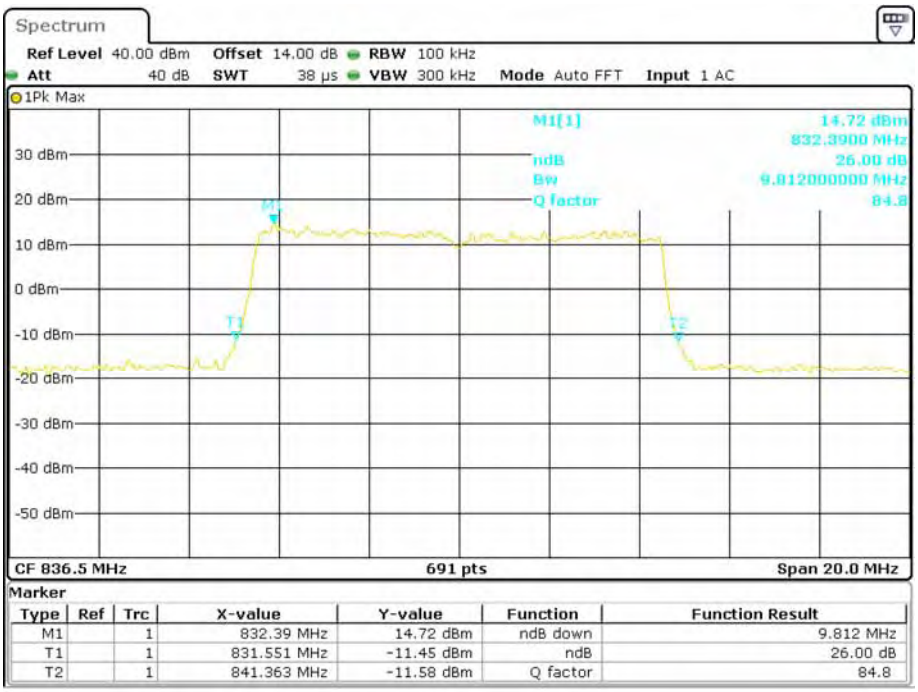
QPSK (5.0 MHz) - 26 dB Bandwidth, Middle channel



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

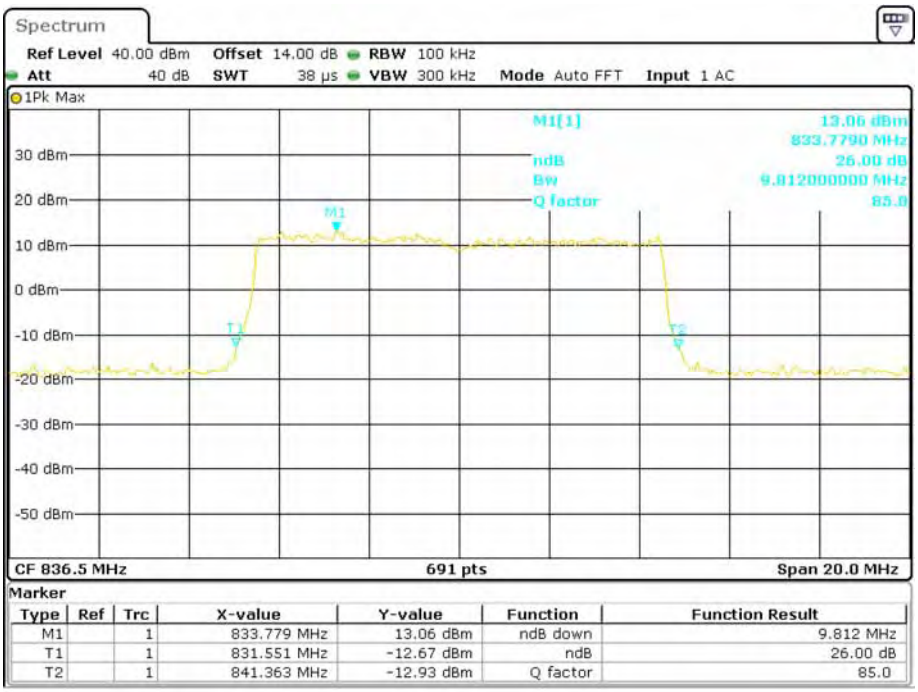


QPSK (10.0 MHz) - 26 dB Bandwidth, Middle channel



Date: 12.AUG.2015 10:44:08

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

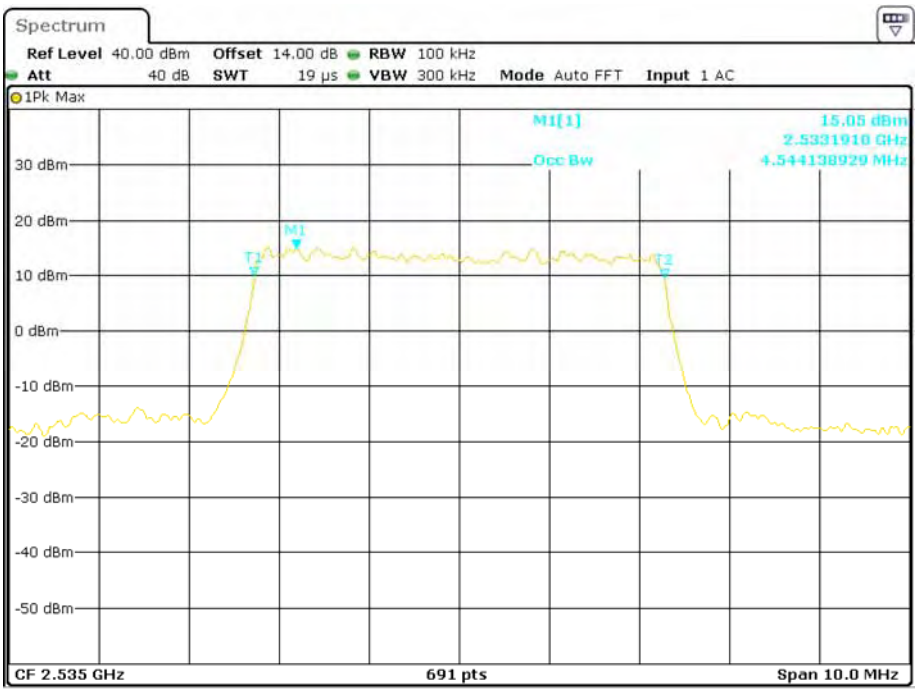


Date: 12.AUG.2015 10:45:40

LTE Band 7: (Middle Channel)

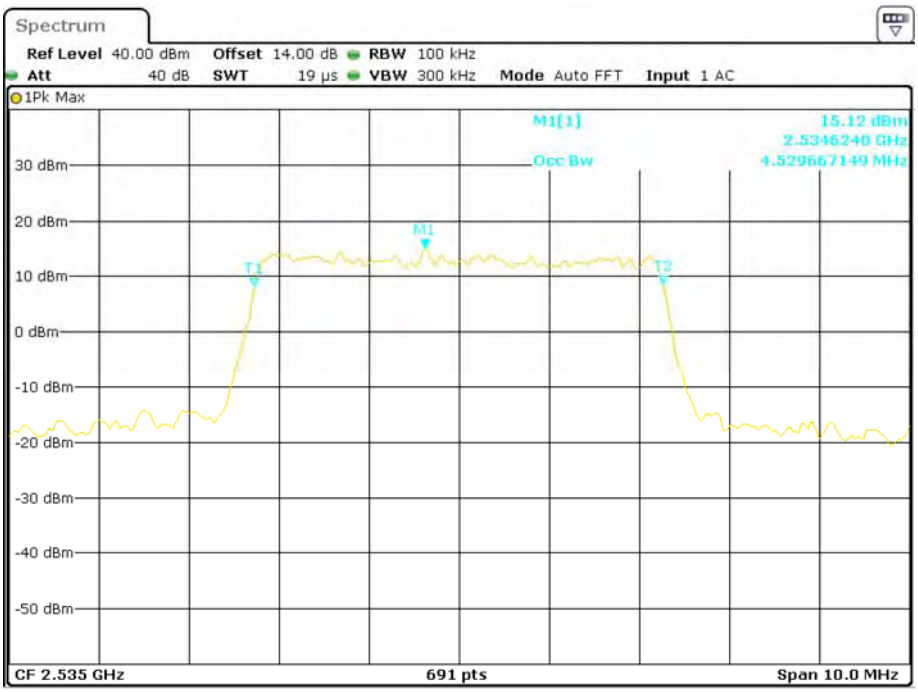
Bandwidth (MHz)	Modulation	99% Occupied Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)
5.0 MHz	QPSK	4.544	5.123
	16QAM	4.530	5.065
10.0 MHz	QPSK	8.973	9.928
	16QAM	8.973	9.667
15.0 MHz	QPSK	13.546	15.022
	16QAM	13.502	15.022
20.0 MHz	QPSK	18.061	19.624
	16QAM	18.119	19.797

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



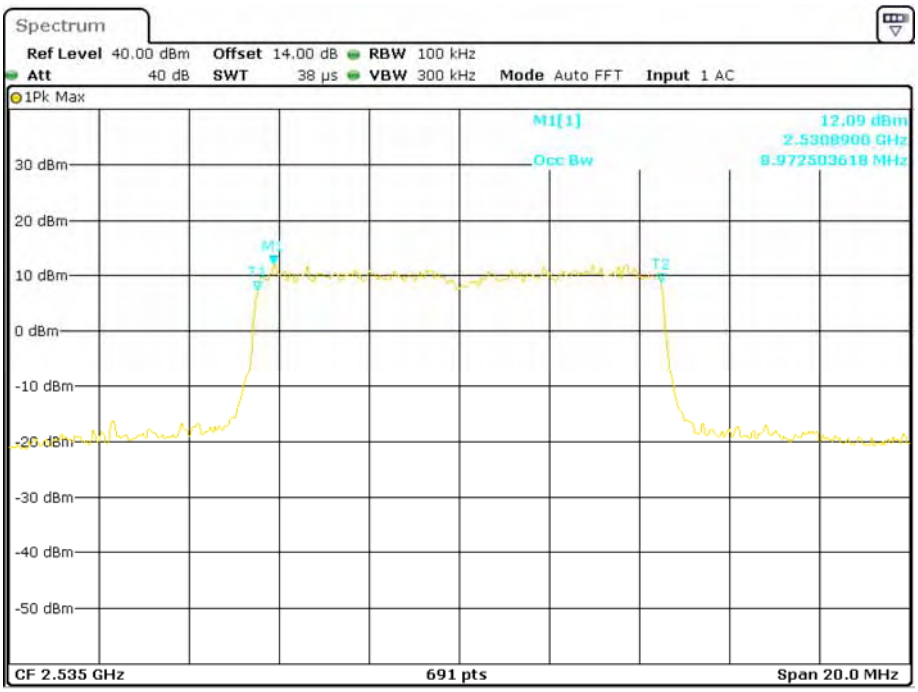
Date: 31.JUL.2015 12:05:45

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



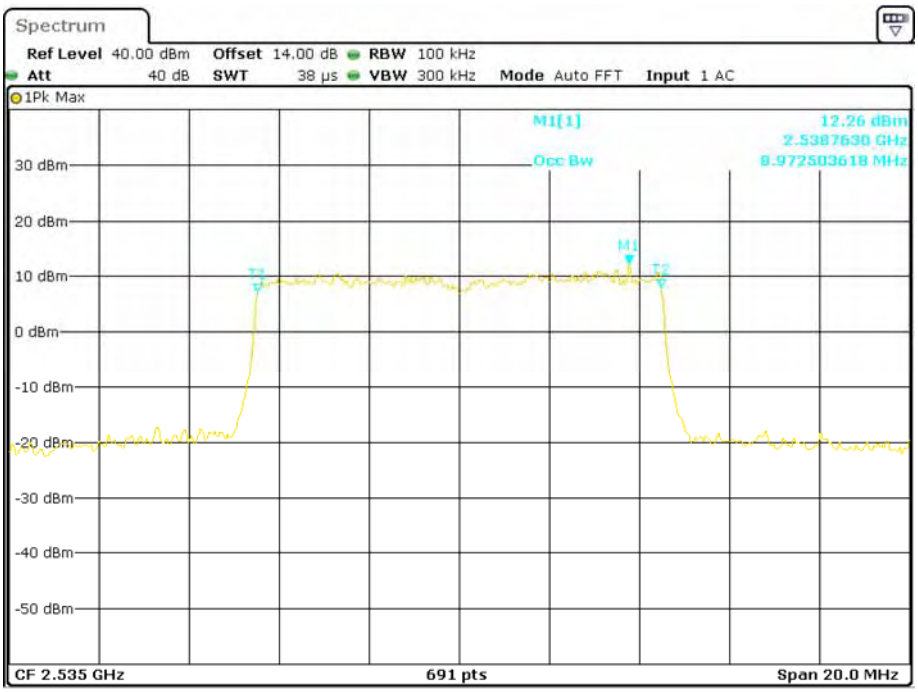
Date: 31.JUL.2015 12:04:35

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



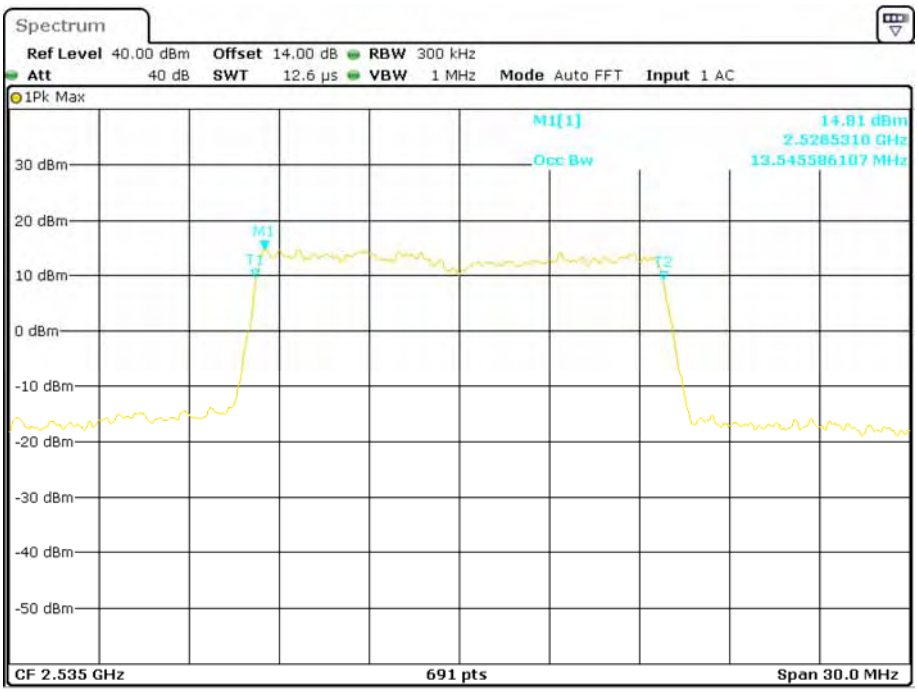
Date: 12.AUG.2015 10:55:27

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



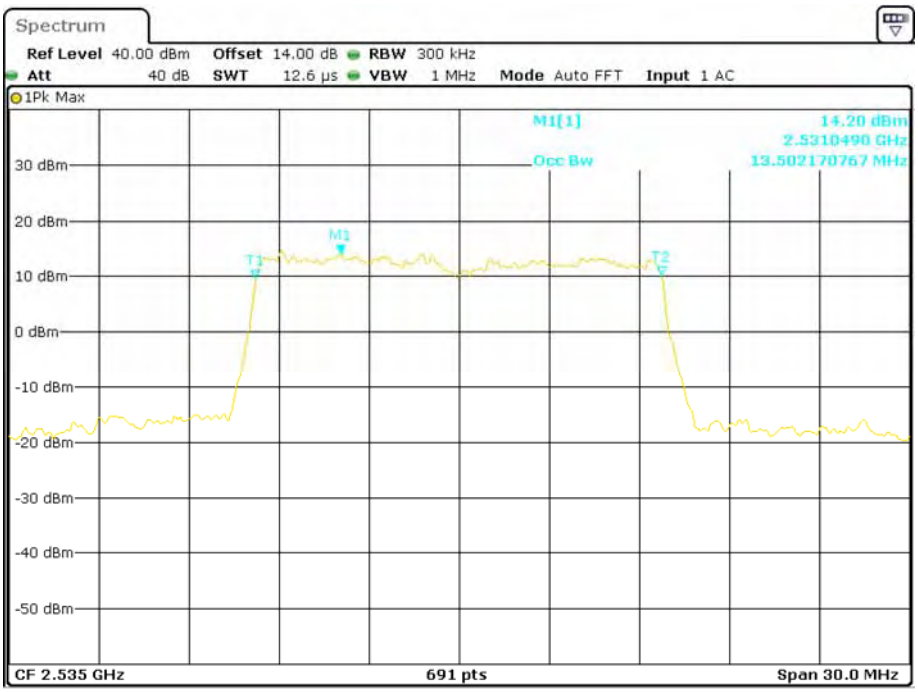
Date: 12.AUG.2015 10:56:14

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



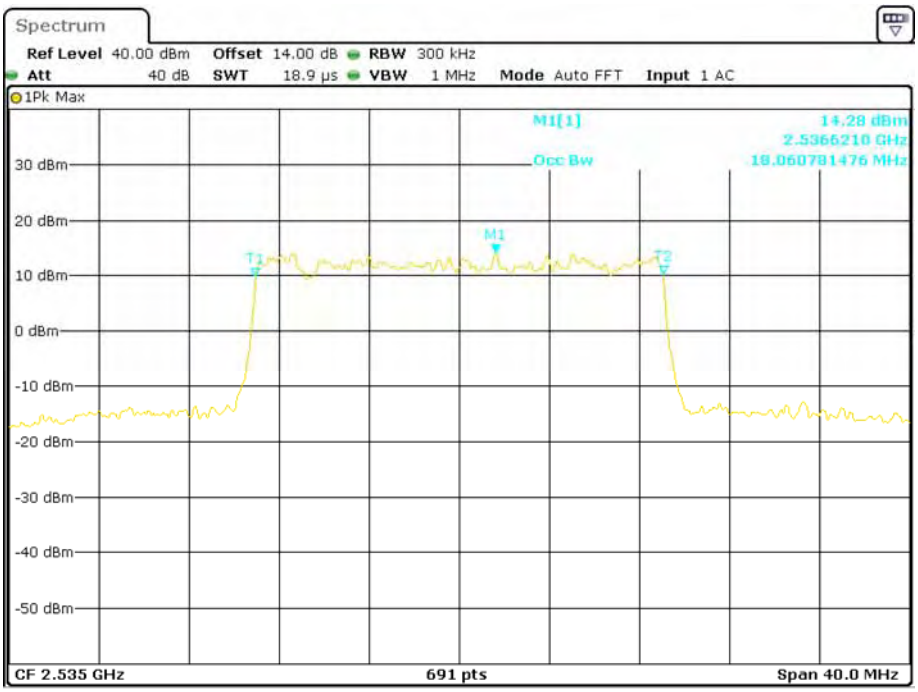
Date: 31.JUL.2015 11:57:05

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



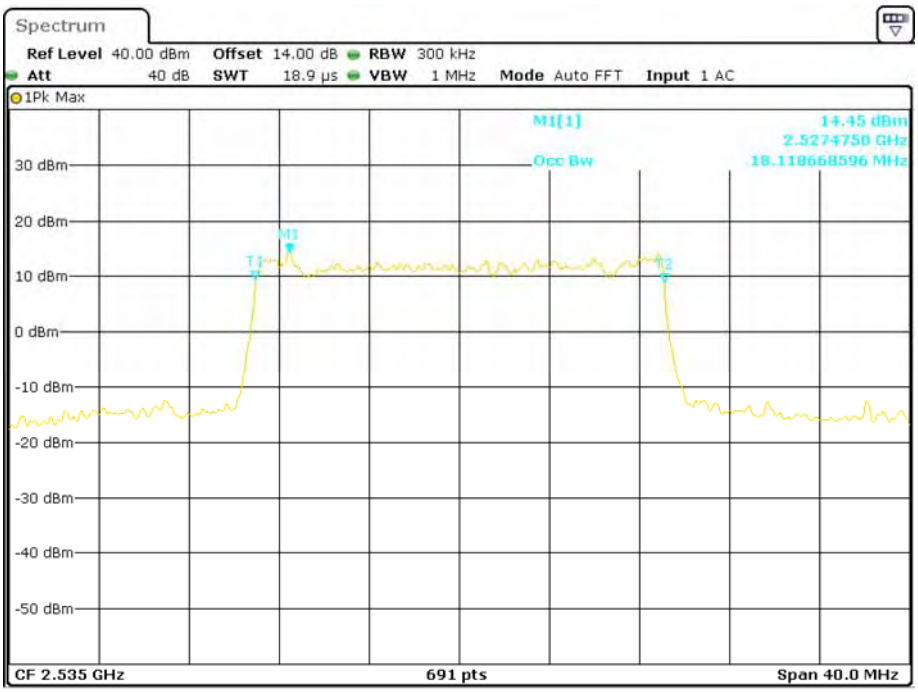
Date: 31.JUL.2015 11:56:16

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



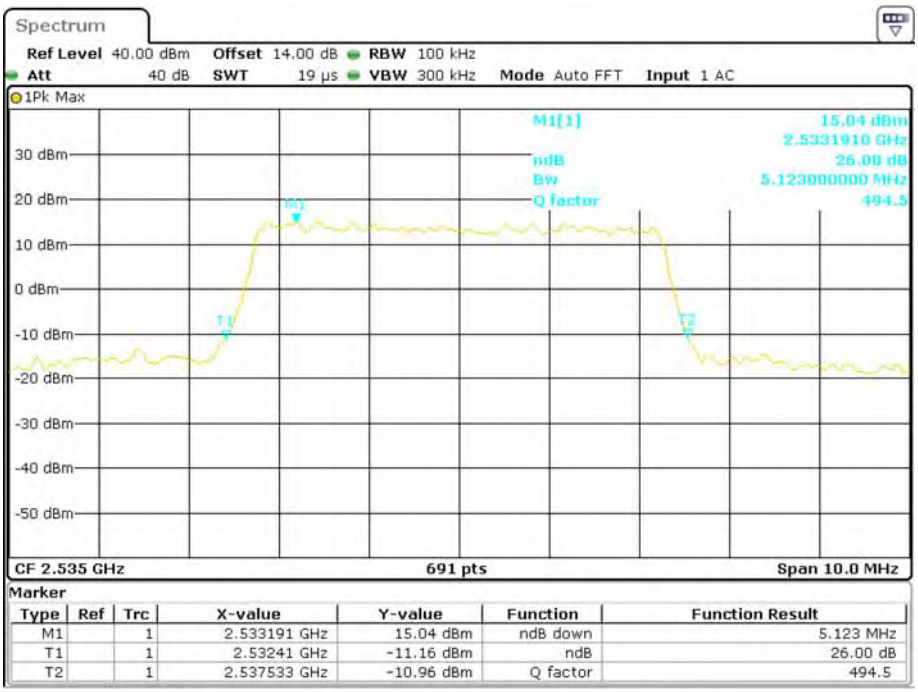
Date: 12.AUG.2015 11:06:03

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

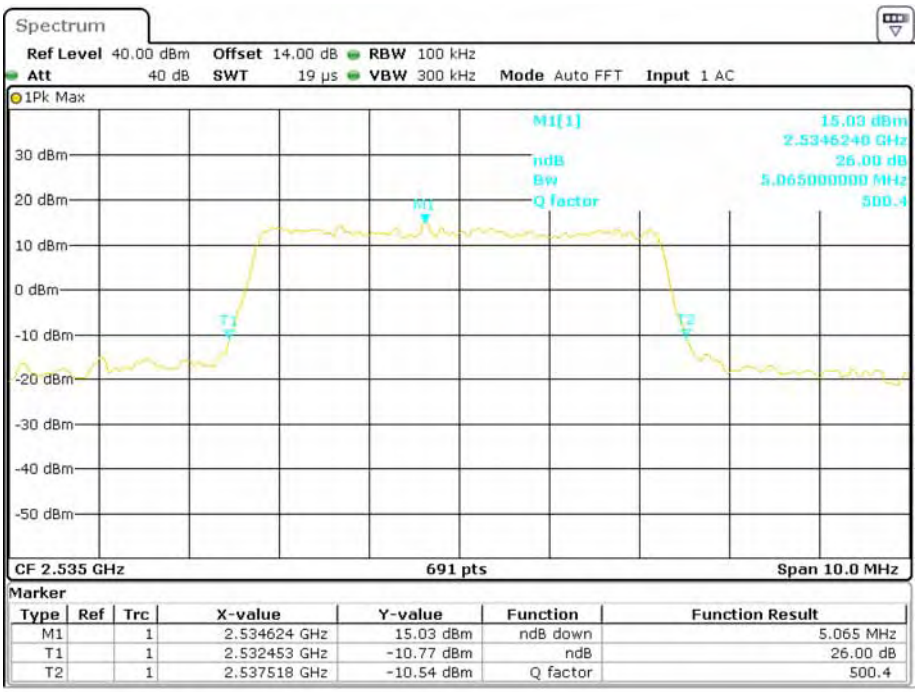


Date: 12.AUG.2015 11:05:16

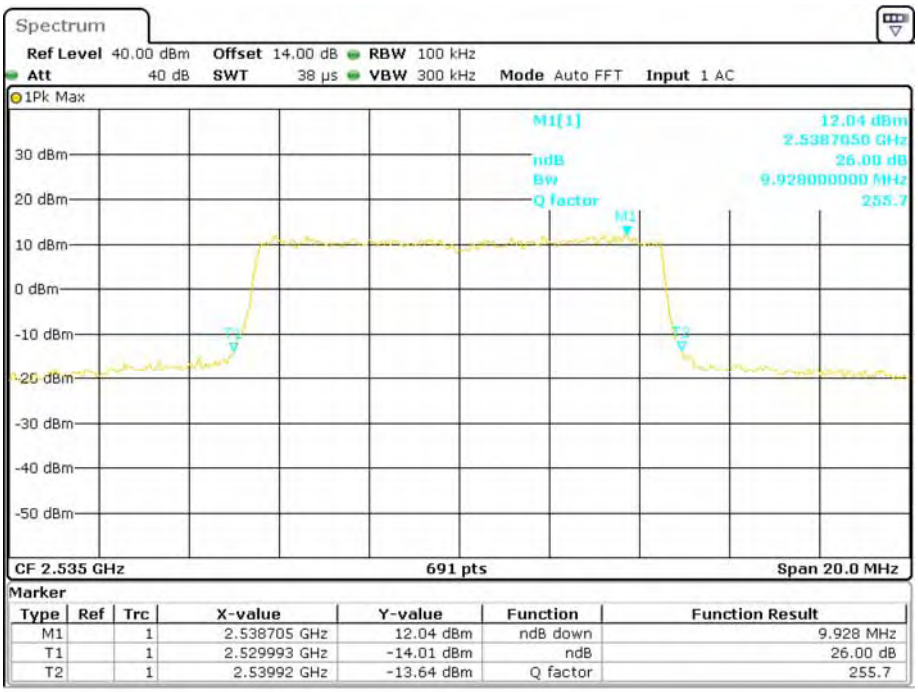
QPSK (5.0 MHz) - 26 dB Bandwidth, Middle channel



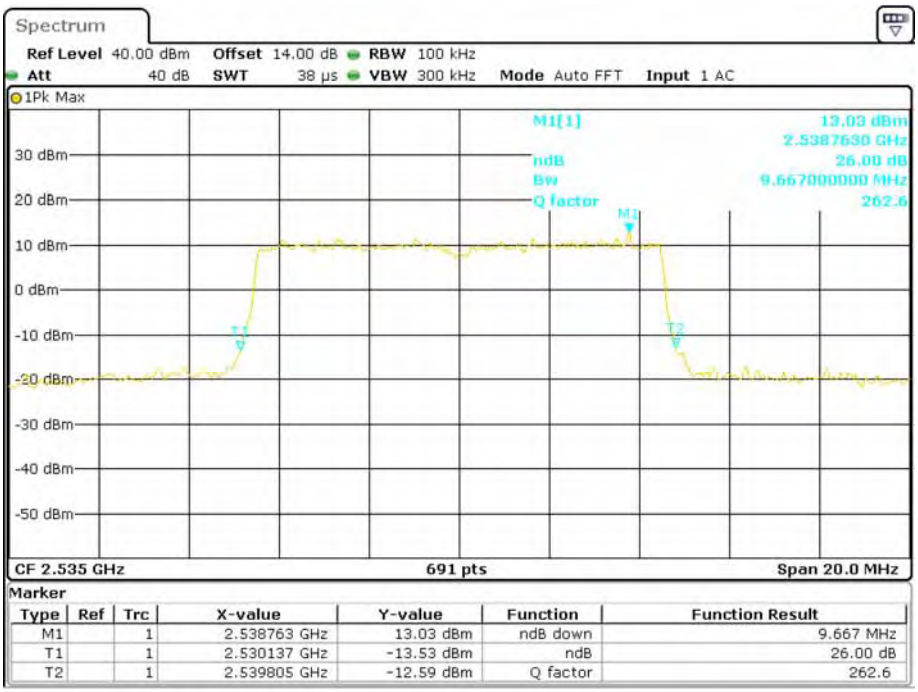
16-QAM (5.0 MHz) - 26 dB Bandwidth, Middle channel



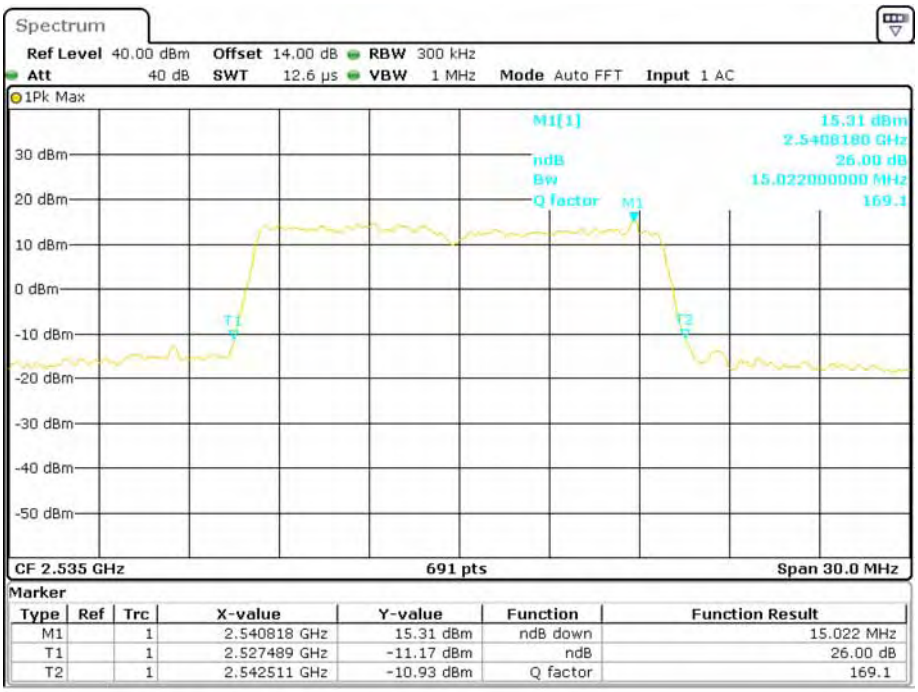
QPSK (10.0 MHz) - 26 dB Bandwidth, Middle channel



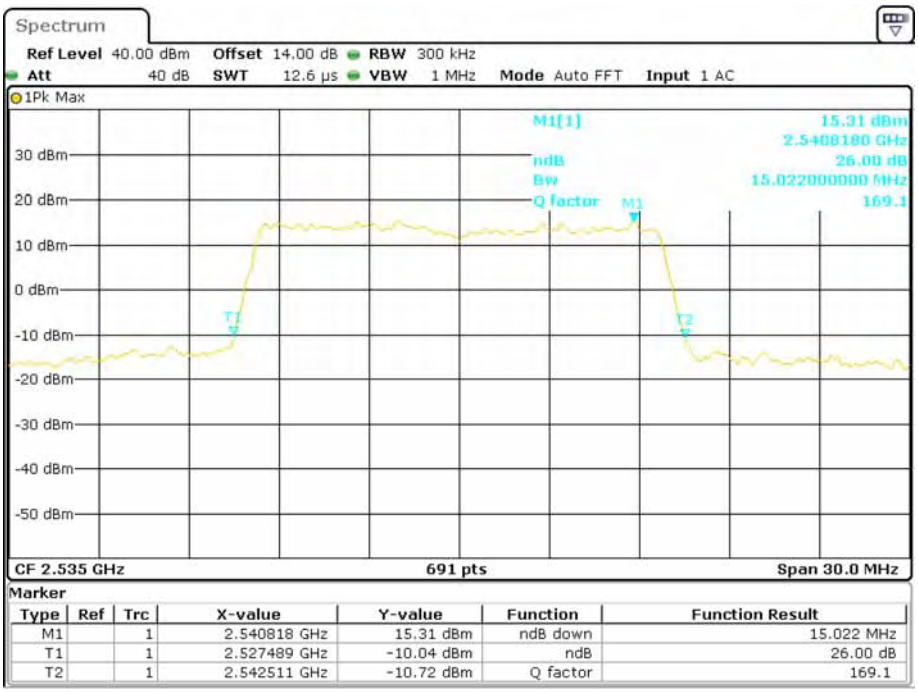
16-QAM (10.0 MHz) - 26 dB Bandwidth, Middle channel



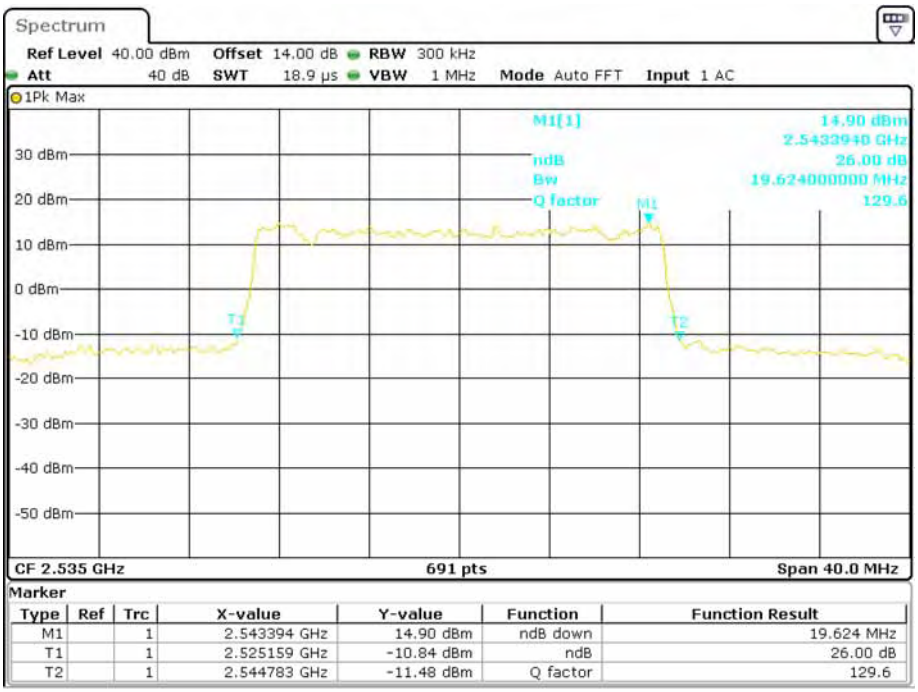
QPSK (15.0 MHz) - 26 dB Bandwidth, Middle channel



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

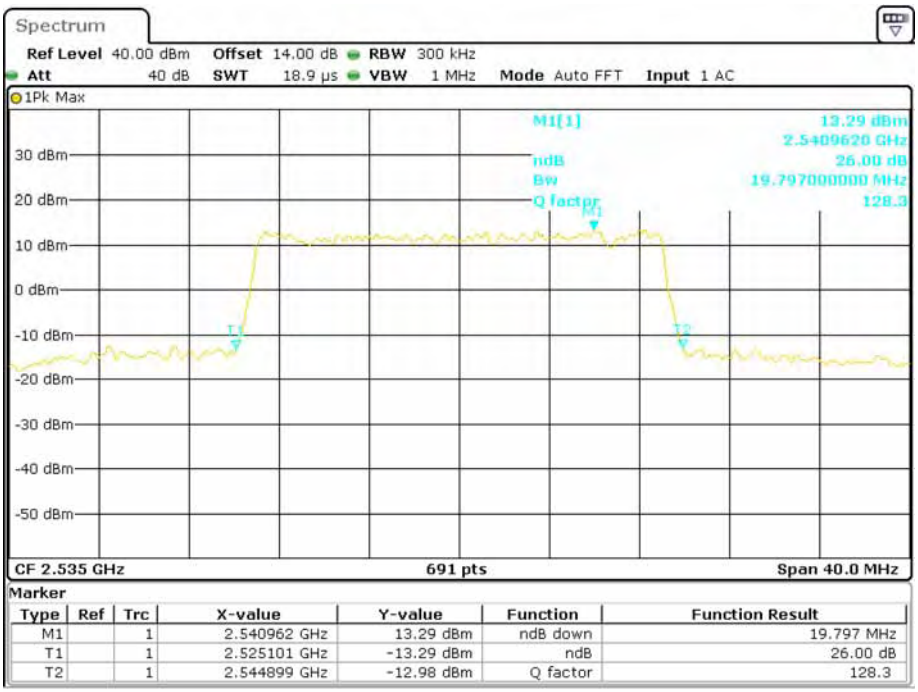


QPSK (20.0 MHz) - 26 dB Bandwidth, Middle channel



Date: 12.AUG.2015 11:03:03

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



Date: 12.AUG.2015 11:04:09

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

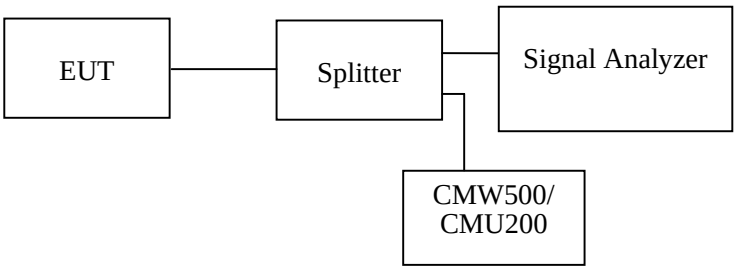
Applicable Standards

FCC §2.10511, §22.917(a) and §24.238(a) and §27.53.

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

Test Procedure

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



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2014-12-11	2015-12-11
Rohde & Schwarz	Universal Radio Communication Tester	CMU200	106891	2014-11-23	2015-11-23

*** 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

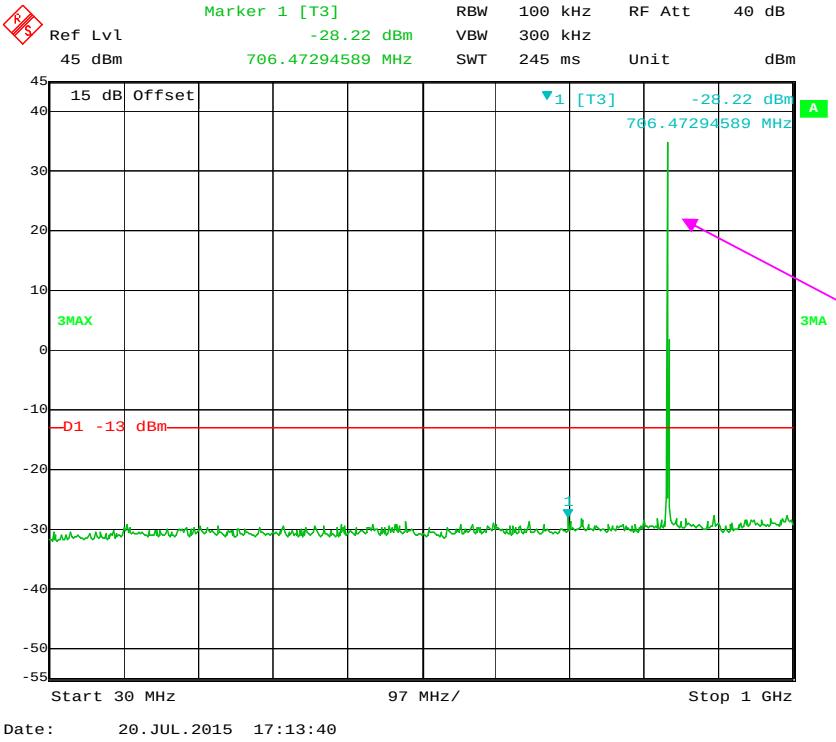
Temperature:	20~26 ℃
Relative Humidity:	51~55 %
ATM Pressure:	100.0~100.5 kPa

The testing was performed by William Li from 2015-07-20 to 2015-07-31.

Please refer to the following plots.

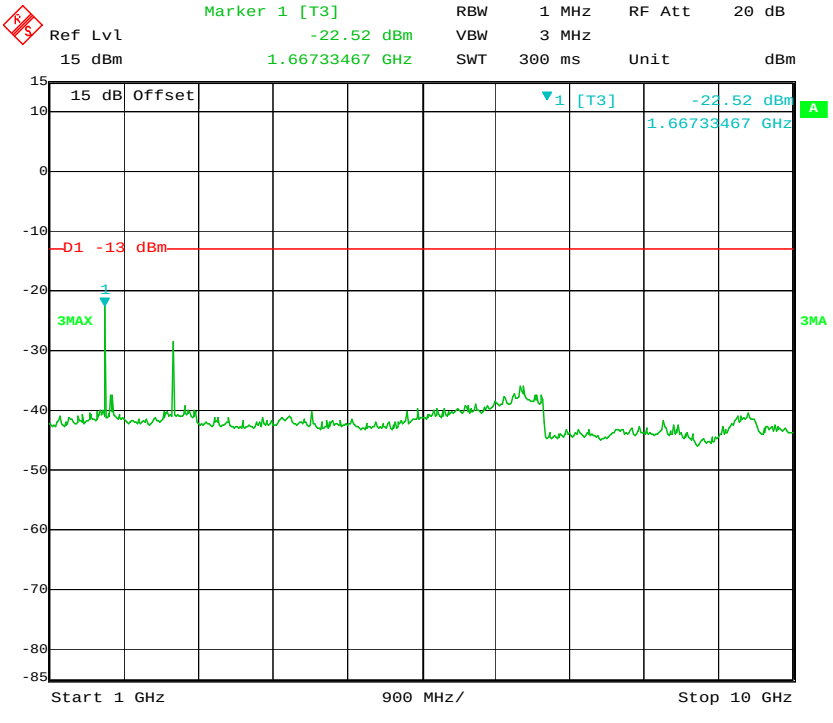
Cellular Band (Part 22H)

30 MHz – 1 GHz (GSM Mode)

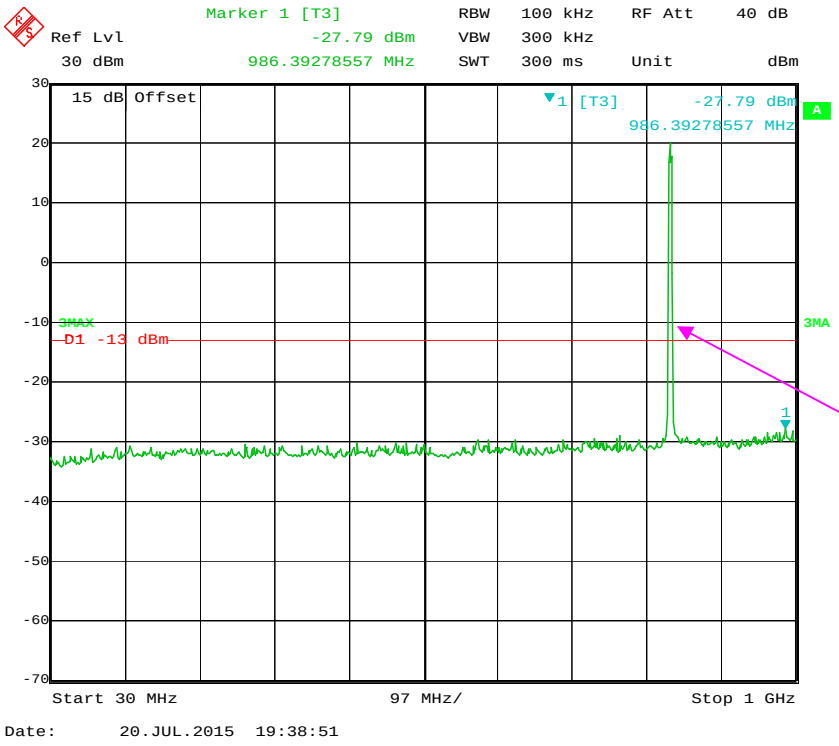


Fundamental test with notch filter

1 GHz – 10 GHz (GSM Mode)

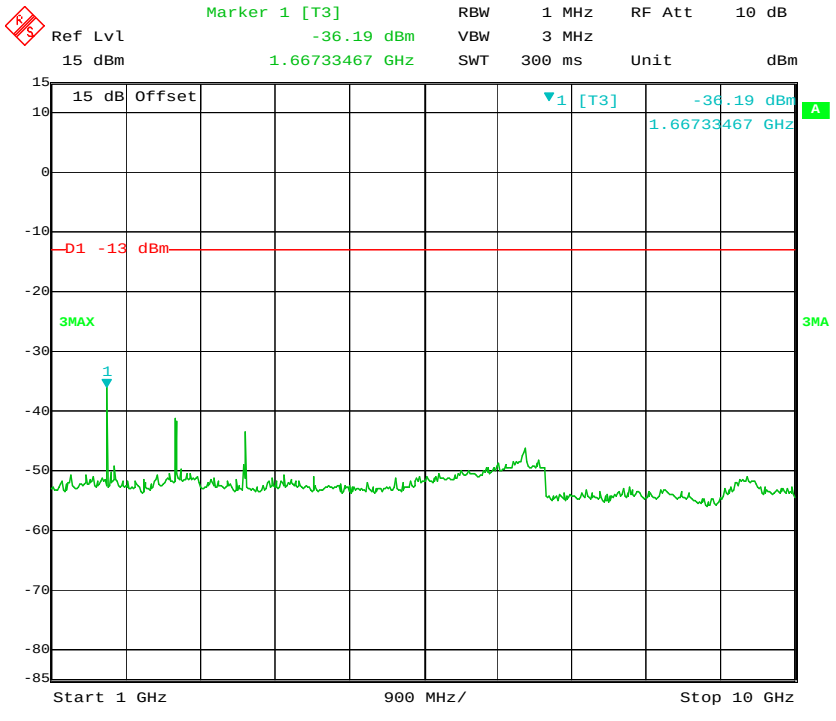


30 MHz – 1 GHz (WCDMA Mode)



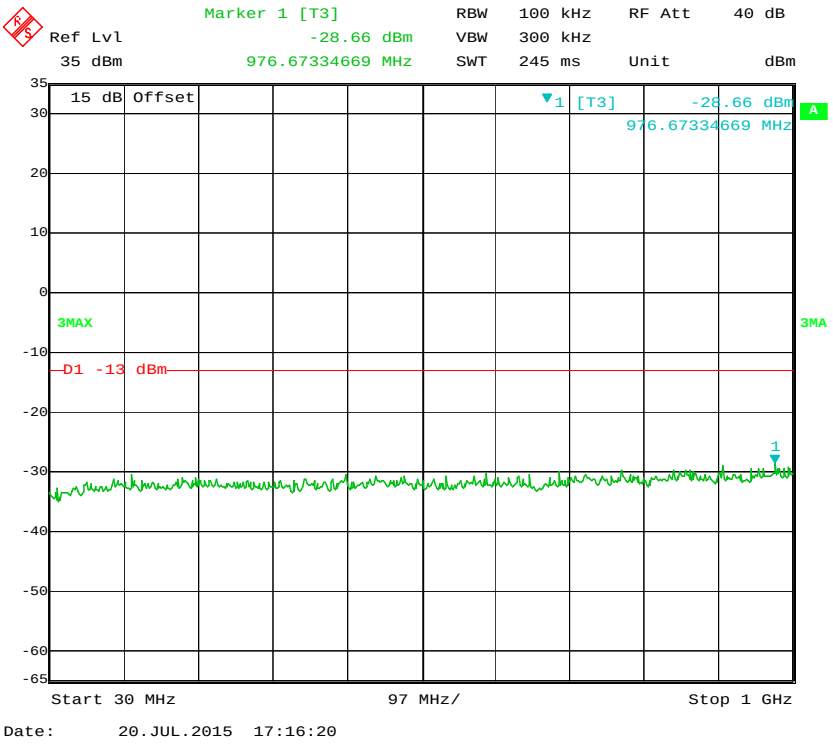
Fundamental test with notch filter

1 GHz – 10 GHz (WCDMA Mode)



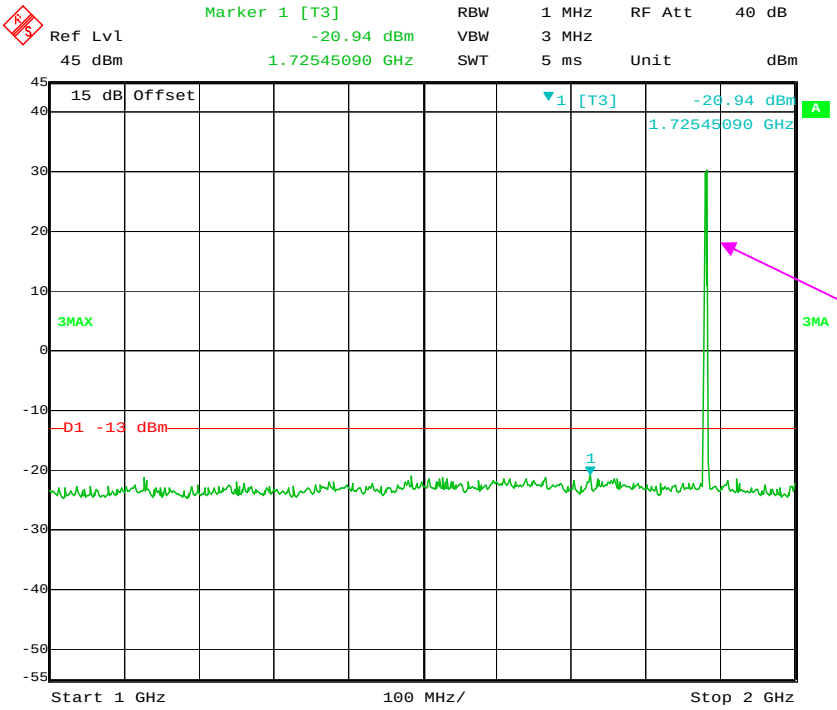
PCS Band (Part 24E)

30 MHz – 1 GHz (GSM Mode)



Date: 20.JUL.2015 17:16:20

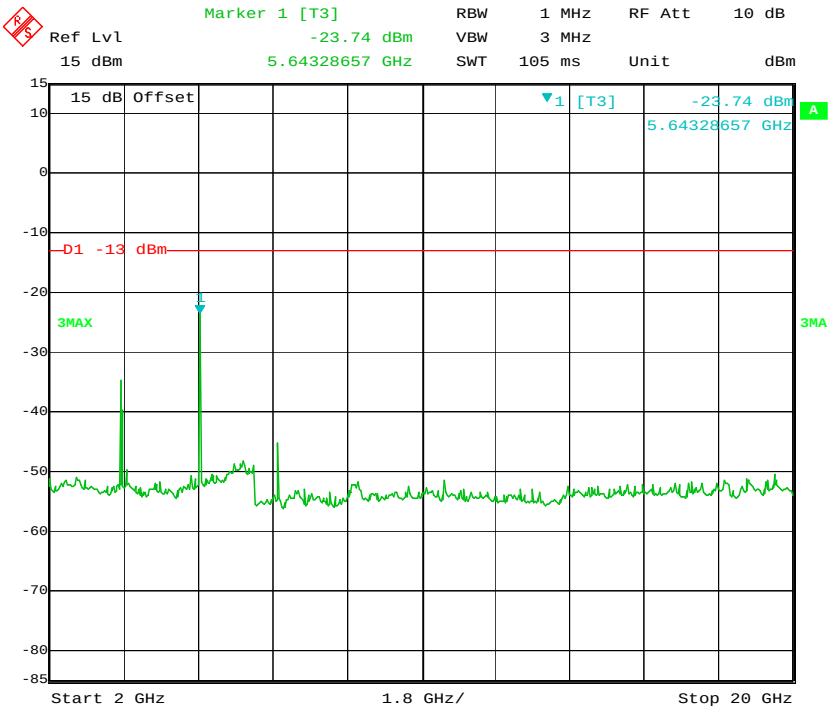
1 GHz – 2 GHz (GSM Mode)



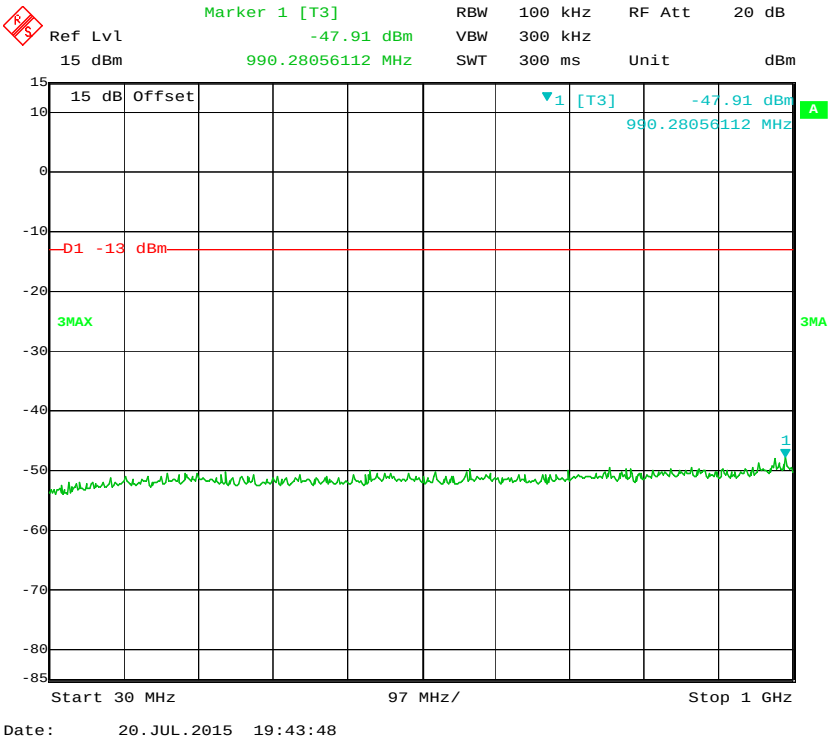
Date: 20.JUL.2015 17:17:27

Fundamental test with notch filter

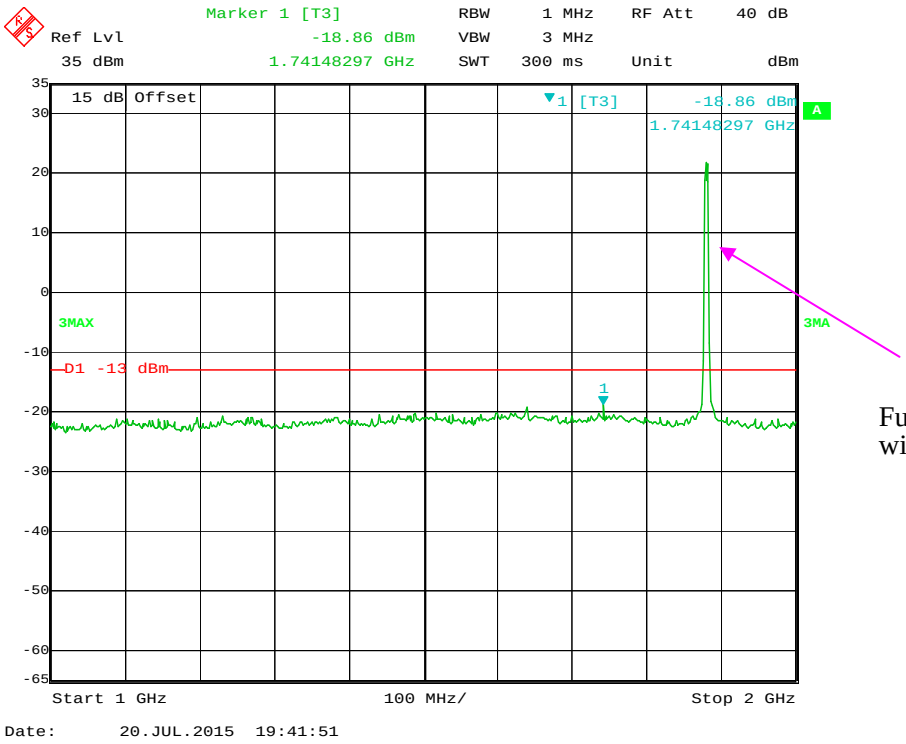
2 GHz – 20 GHz (GSM Mode)



30 MHz – 1 GHz (WCDMA Mode)

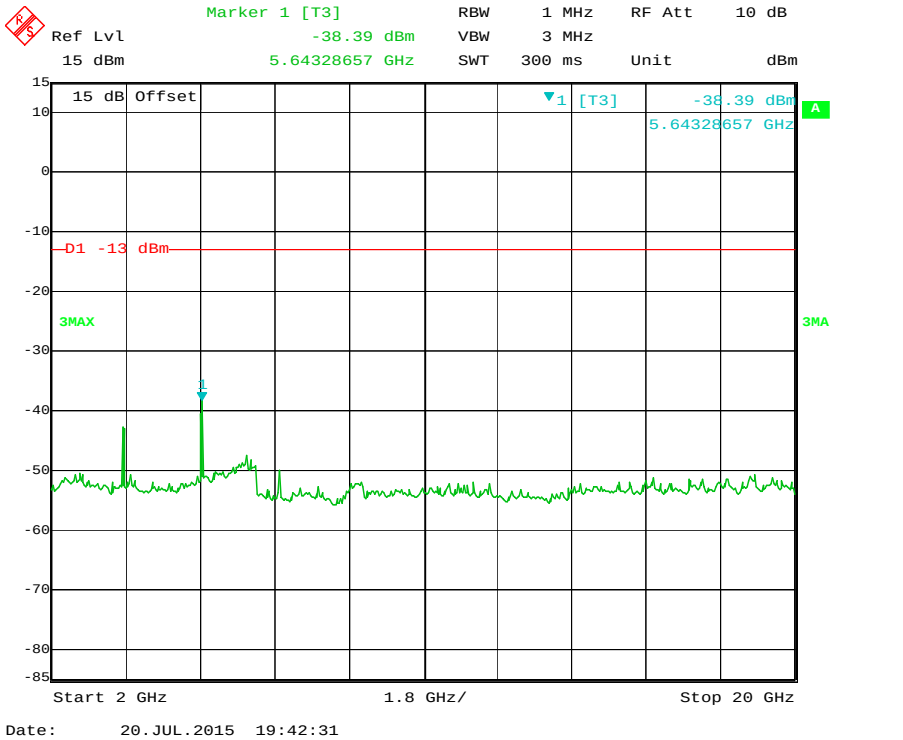


1 GHz – 2 GHz (WCDMA Mode)



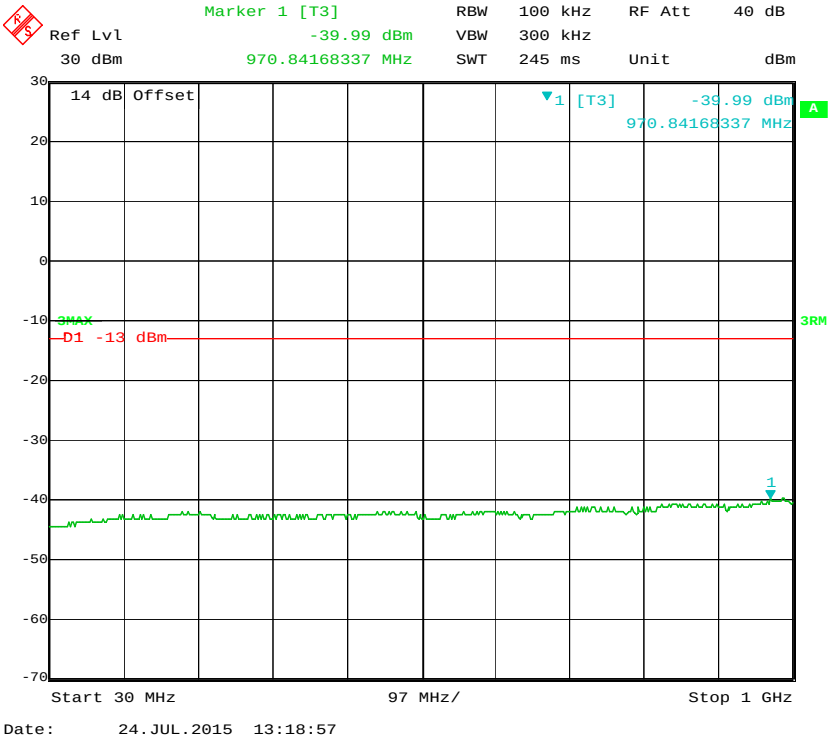
Fundamental test with notch filter

2 GHz – 20 GHz (WCDMA Mode)

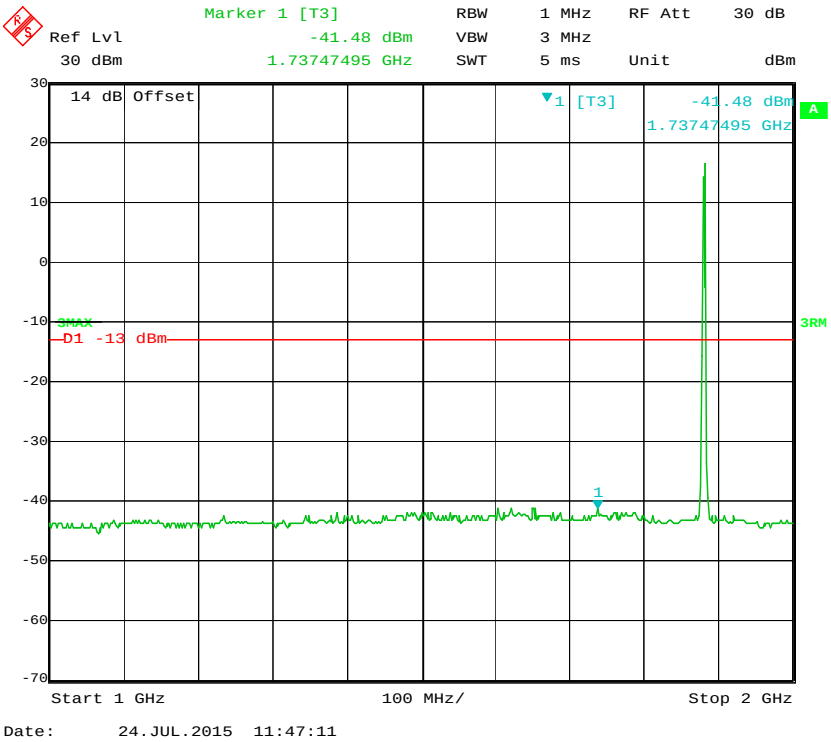


LTE Band 2:

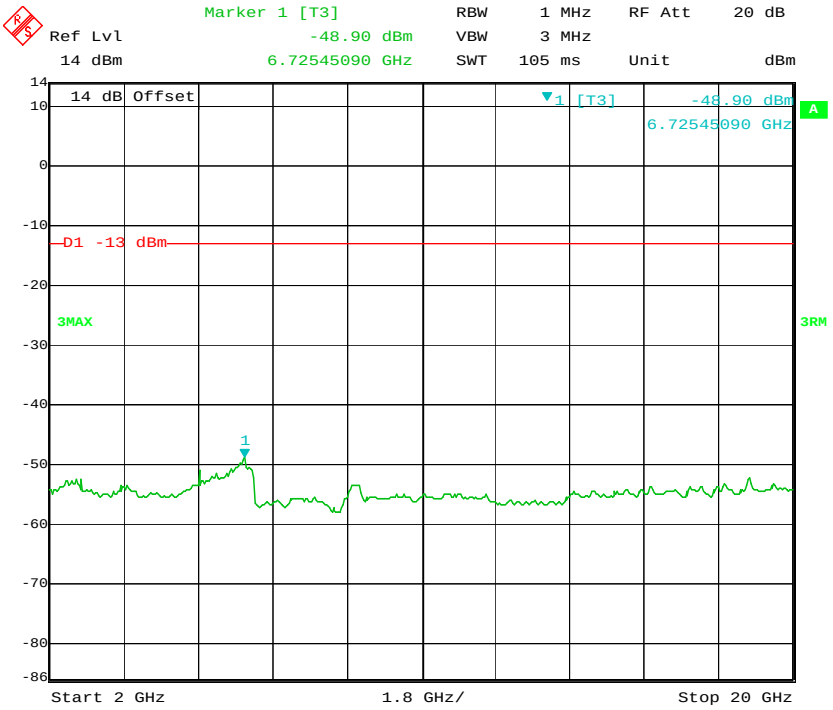
30 MHz - 1 GHz (1.4 MHz, Middle Channel)



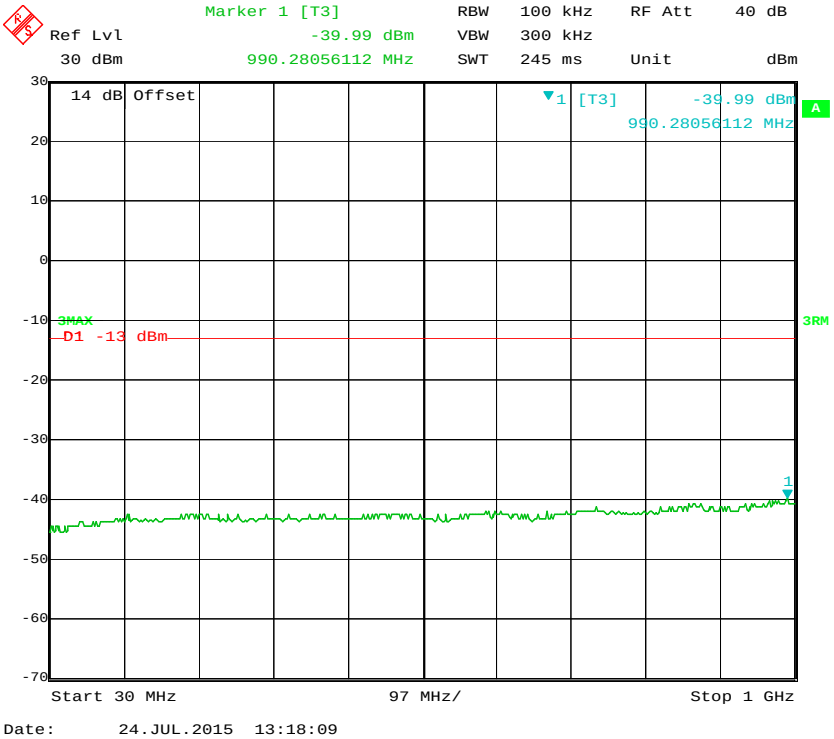
1 GHz – 2 GHz (1.4 MHz, Middle Channel)



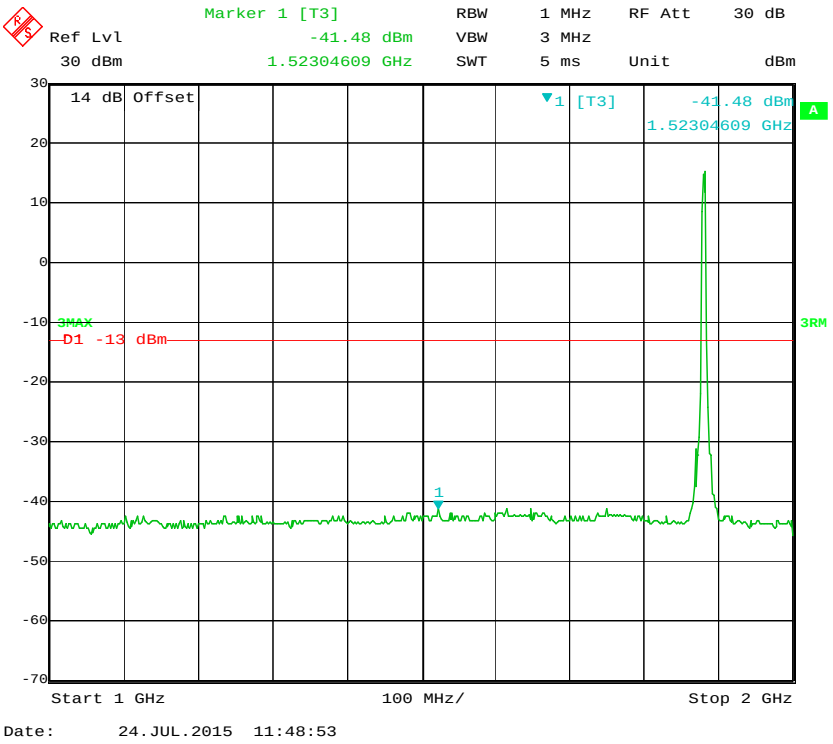
2 GHz – 20 GHz (1.4 MHz, Middle Channel)



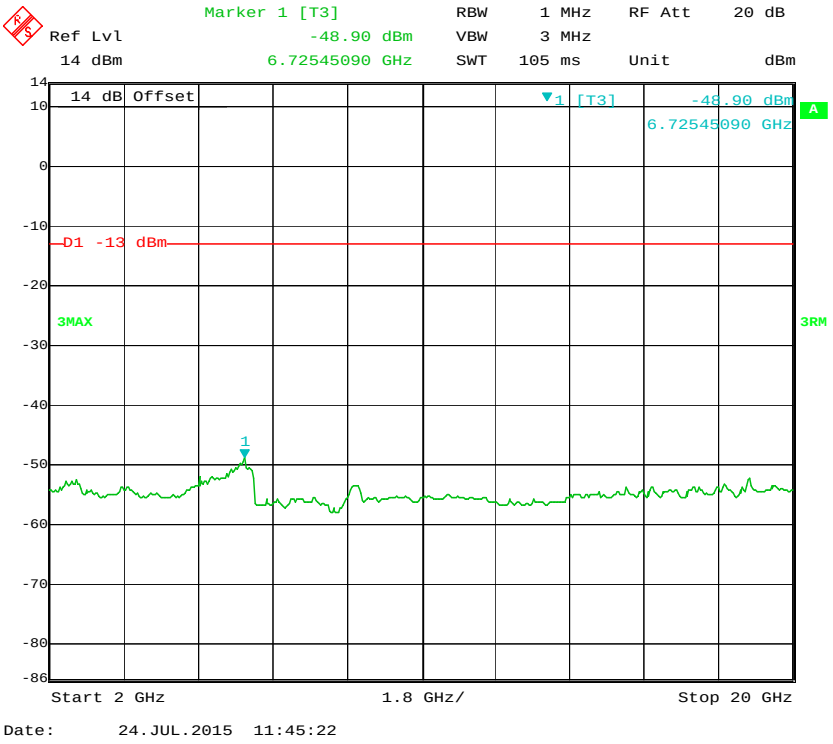
30 MHz - 1 GHz (3.0 MHz, Middle Channel)



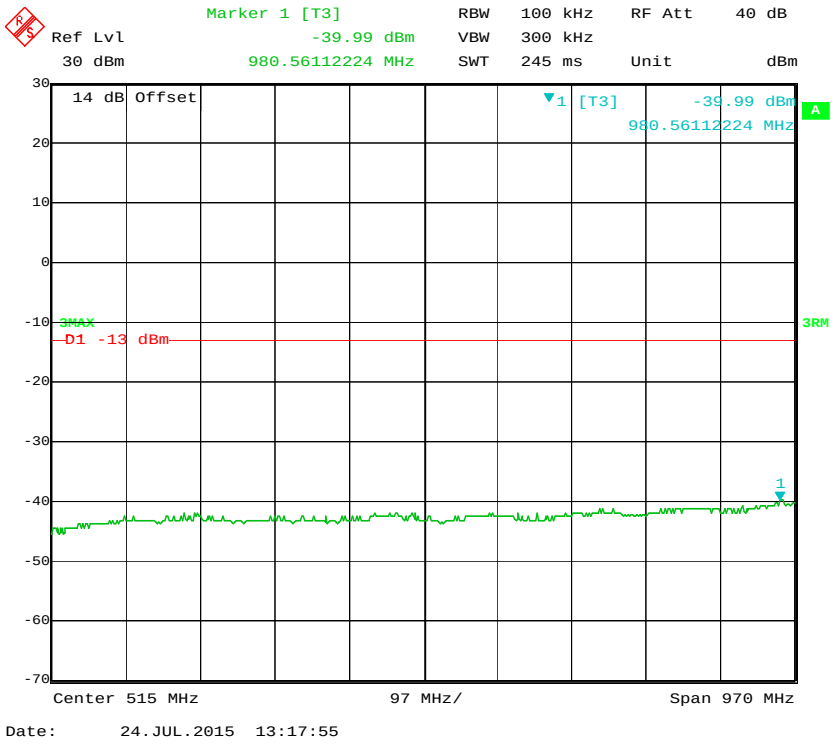
1 GHz – 2 GHz (3.0 MHz, Middle Channel)



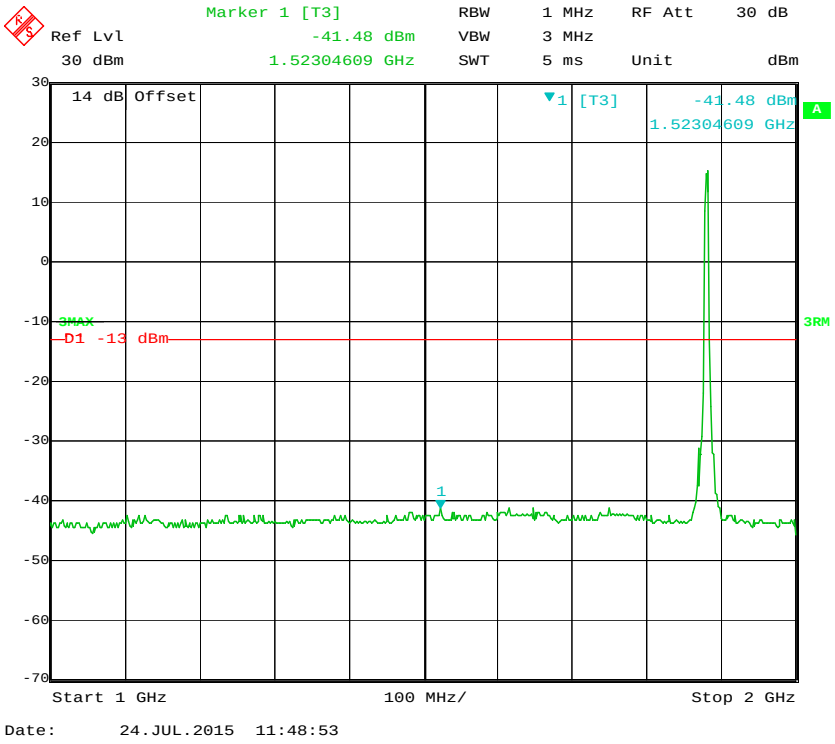
2 GHz – 20 GHz (3.0 MHz, Middle Channel)



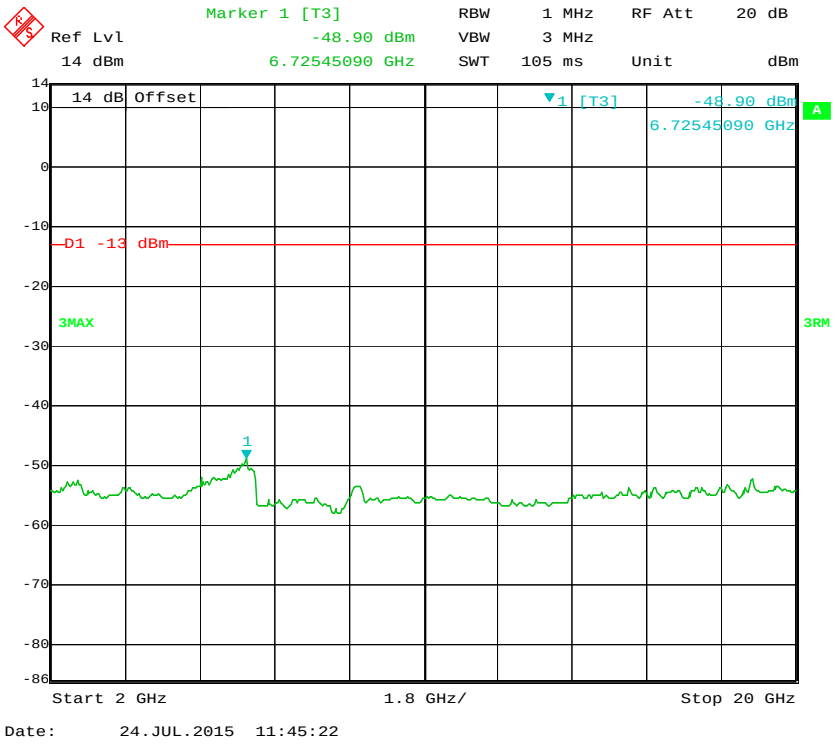
30 MHz - 1 GHz (5.0 MHz, Middle Channel)



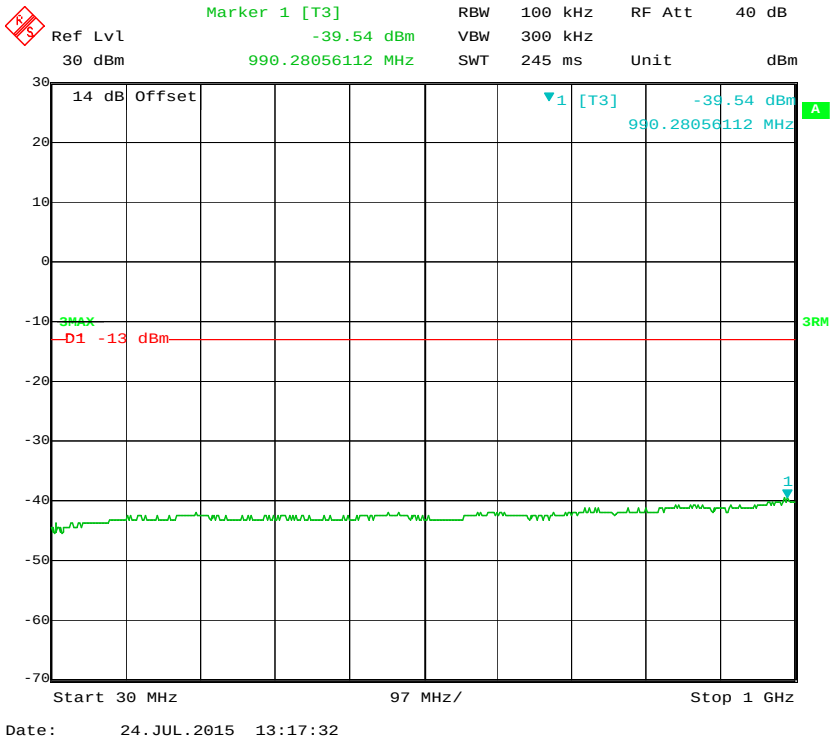
1 GHz – 2 GHz (5.0 MHz, Middle Channel)



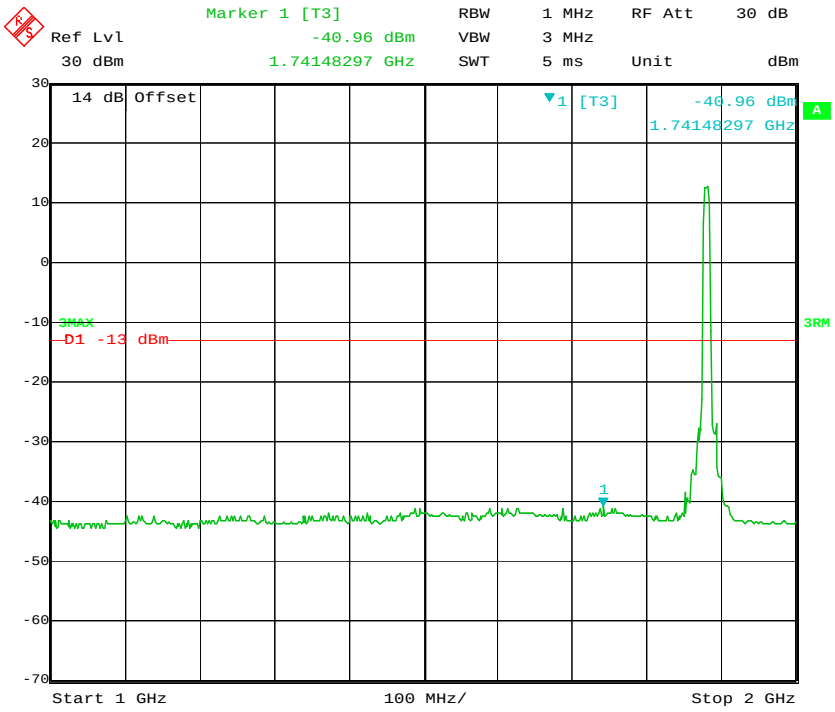
2 GHz – 20 GHz (5.0 MHz, Middle Channel)



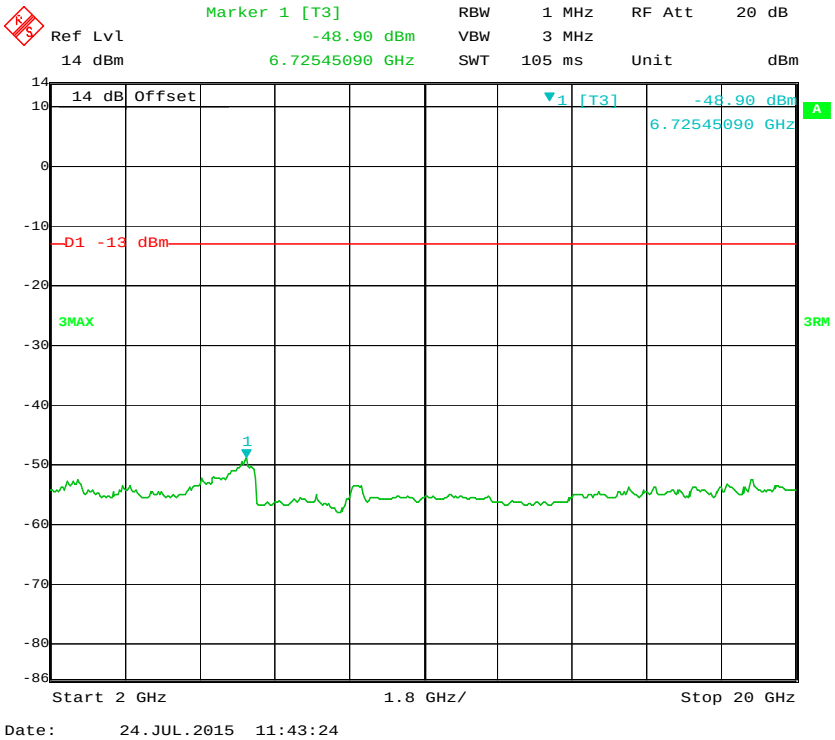
30 MHz - 1 GHz (10.0 MHz, Middle Channel)



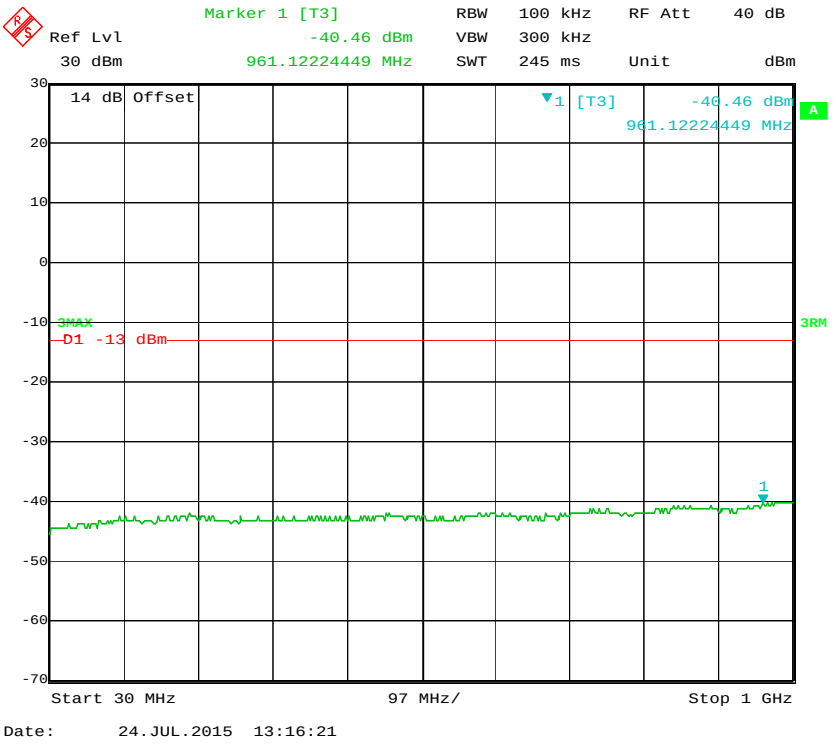
1 GHz – 2 GHz (10.0 MHz, Middle Channel)



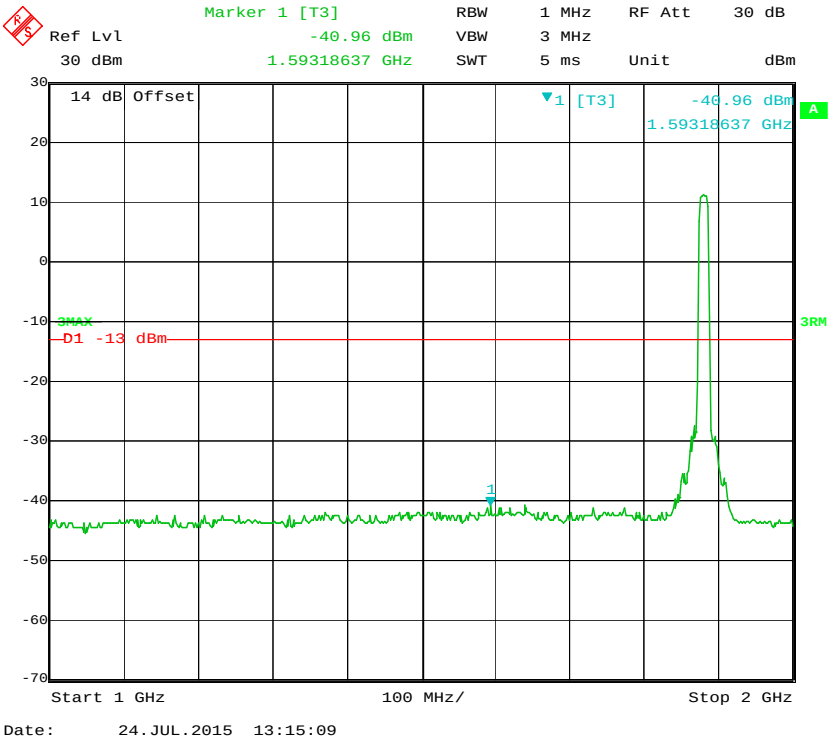
2 GHz – 20 GHz (10.0 MHz, Middle Channel)



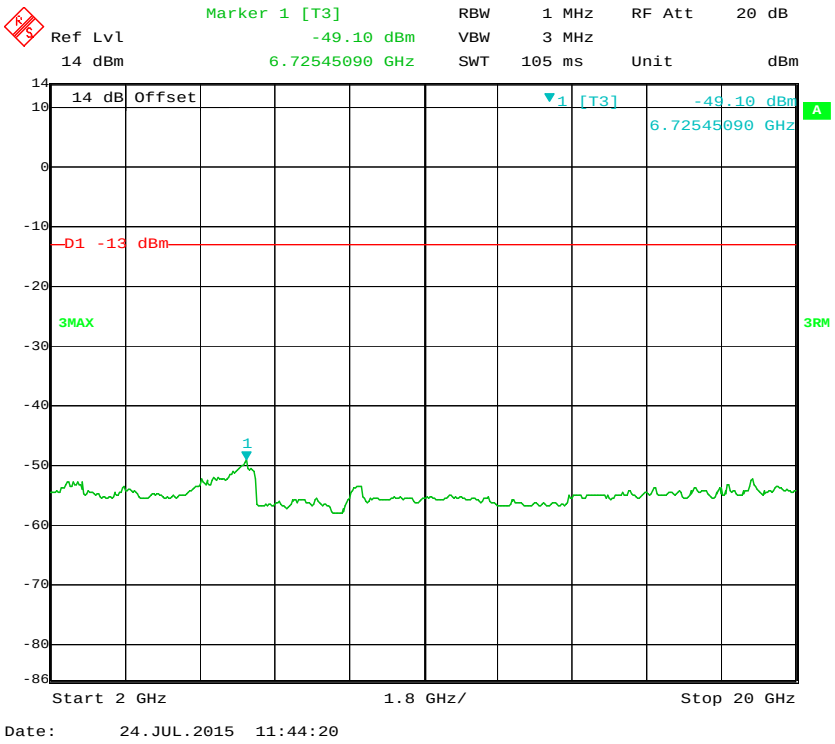
30 MHz - 1 GHz (15.0 MHz, Middle Channel)



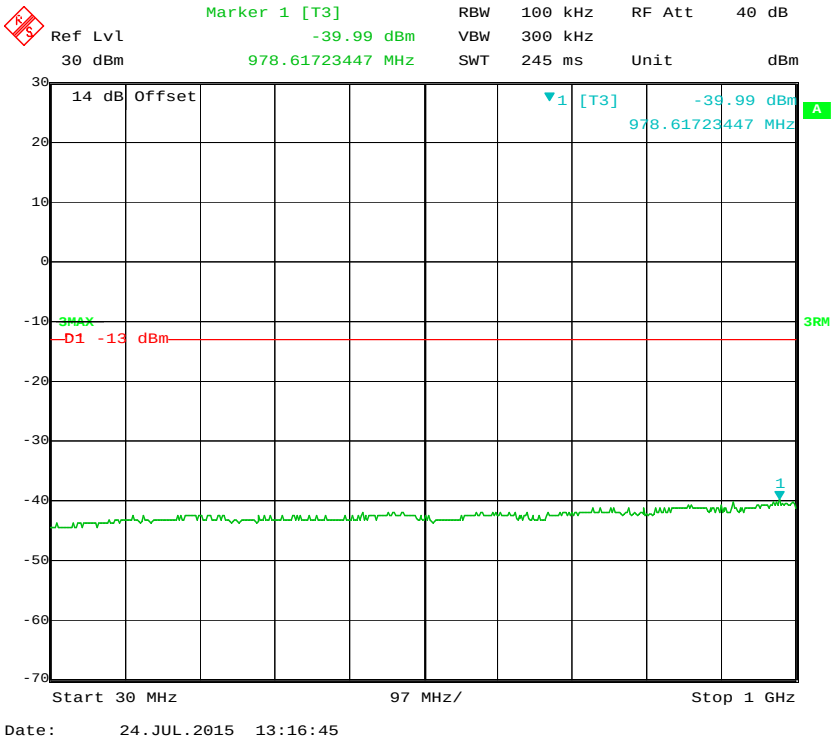
1 GHz –2 GHz (15.0 MHz, Middle Channel)



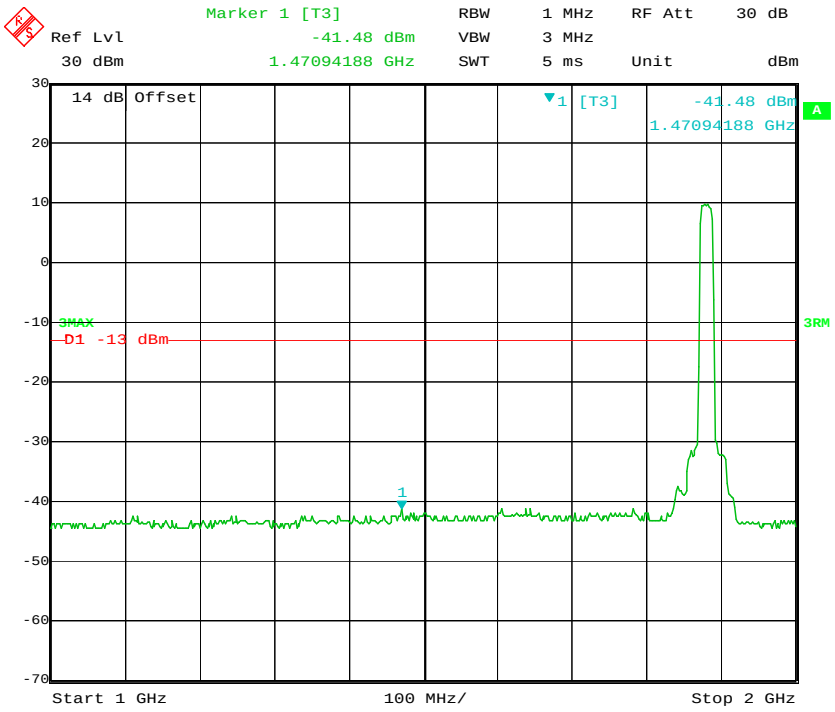
2 GHz –20 GHz (15.0 MHz, Middle Channel)



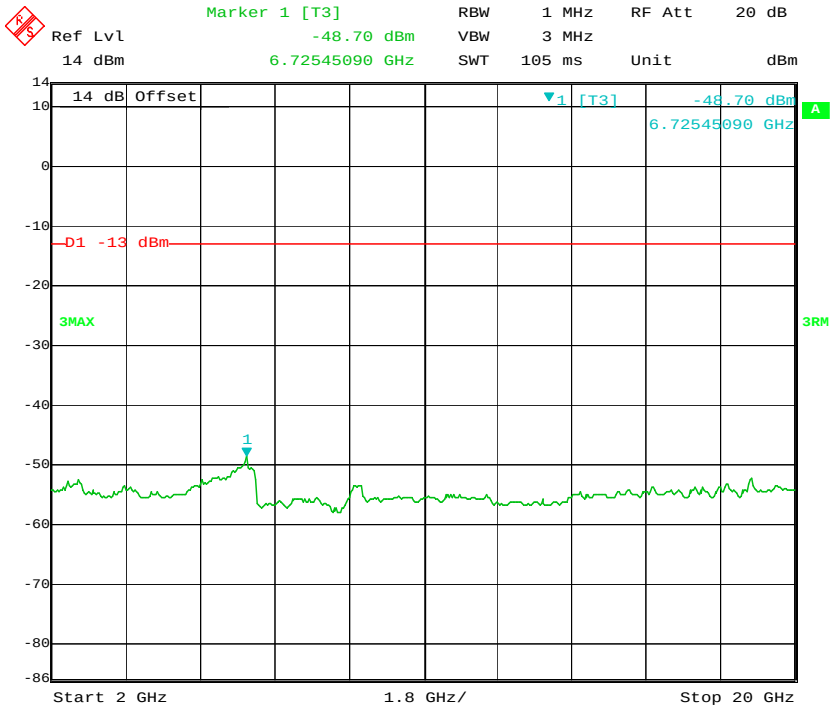
30 MHz - 1 GHz (20.0 MHz, Middle Channel)



1 GHz –2 GHz (20.0 MHz, Middle Channel)

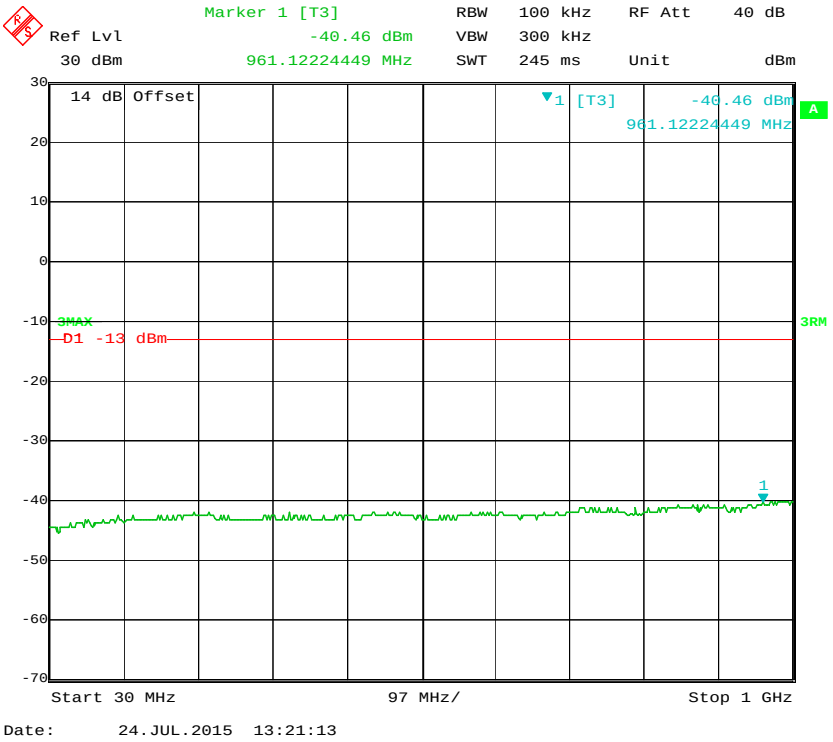


2 GHz –20 GHz (20.0 MHz, Middle Channel)



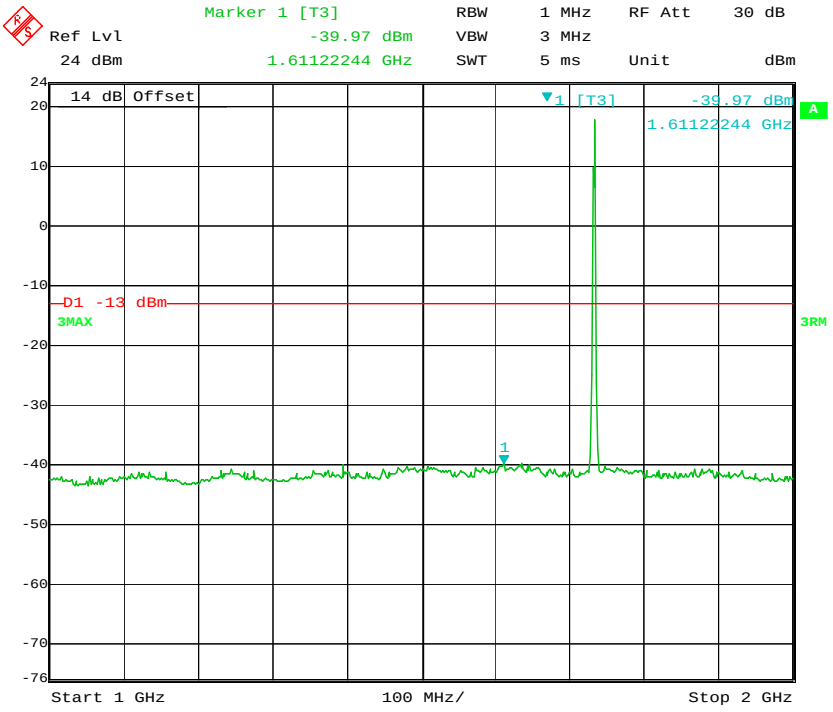
LTE Band 4:

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



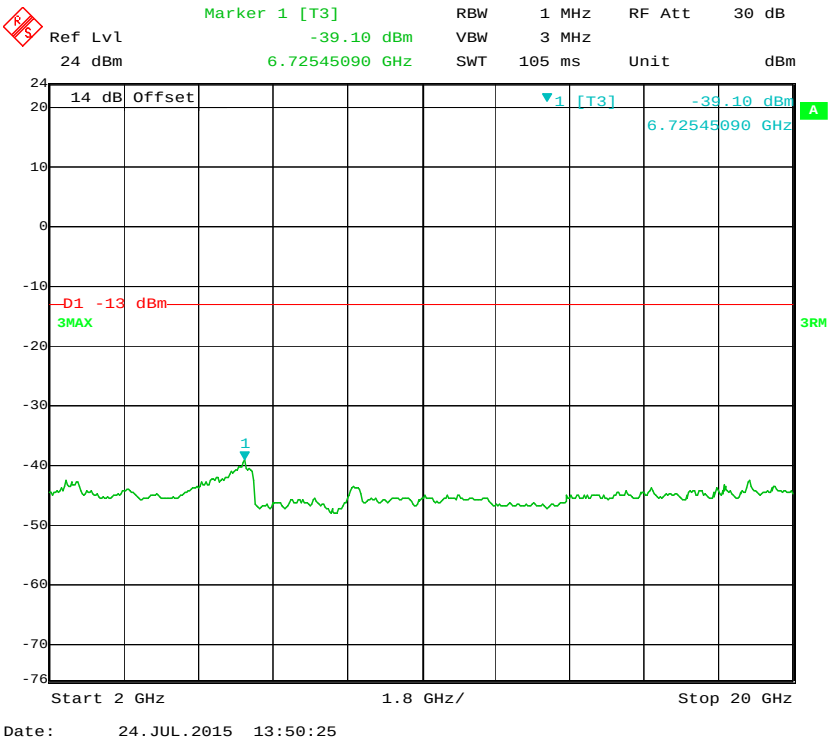
Date: 24.JUL.2015 13:21:13

1 GHz – 2 GHz (1.4 MHz, Middle Channel)

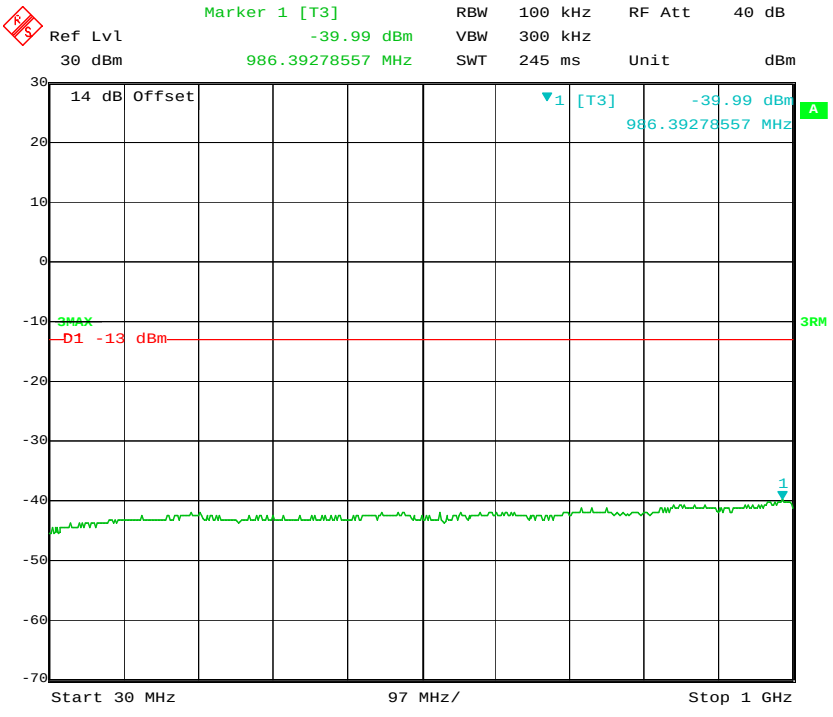


Date: 24.JUL.2015 13:51:23

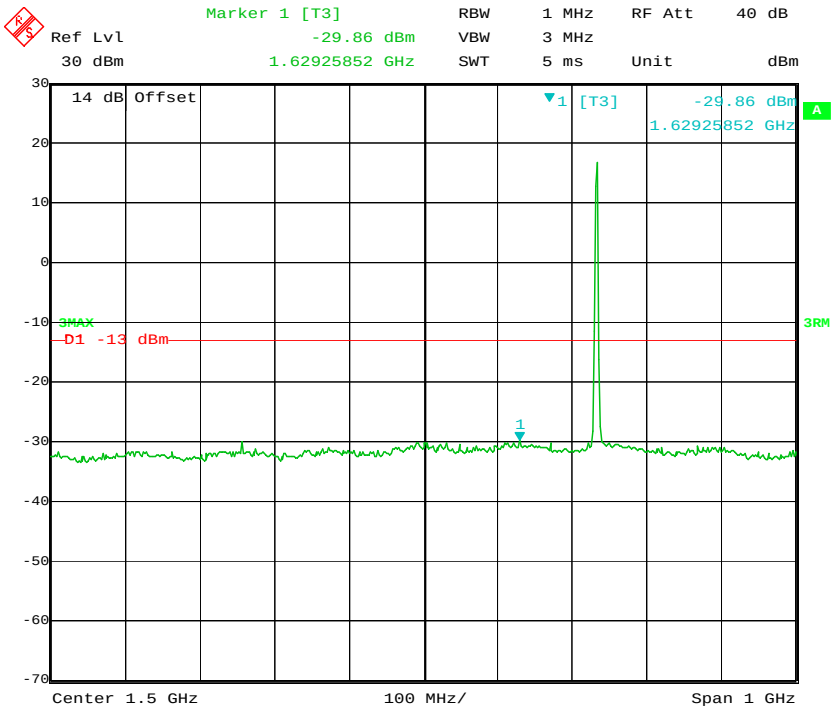
2 GHz – 20 GHz (1.4 MHz, Middle Channel)



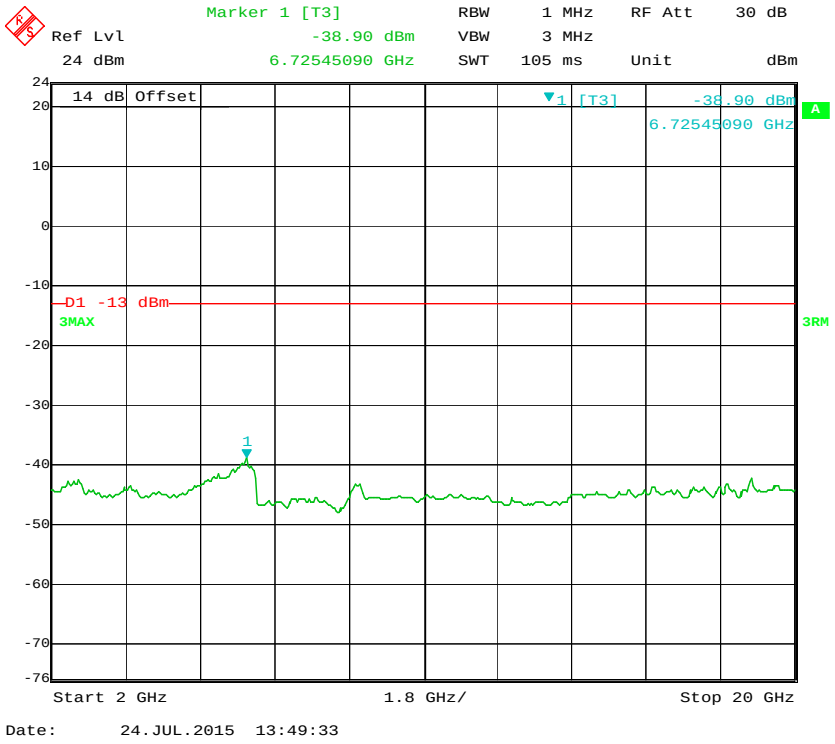
30 MHz - 1 GHz (3.0 MHz, Middle Channel)



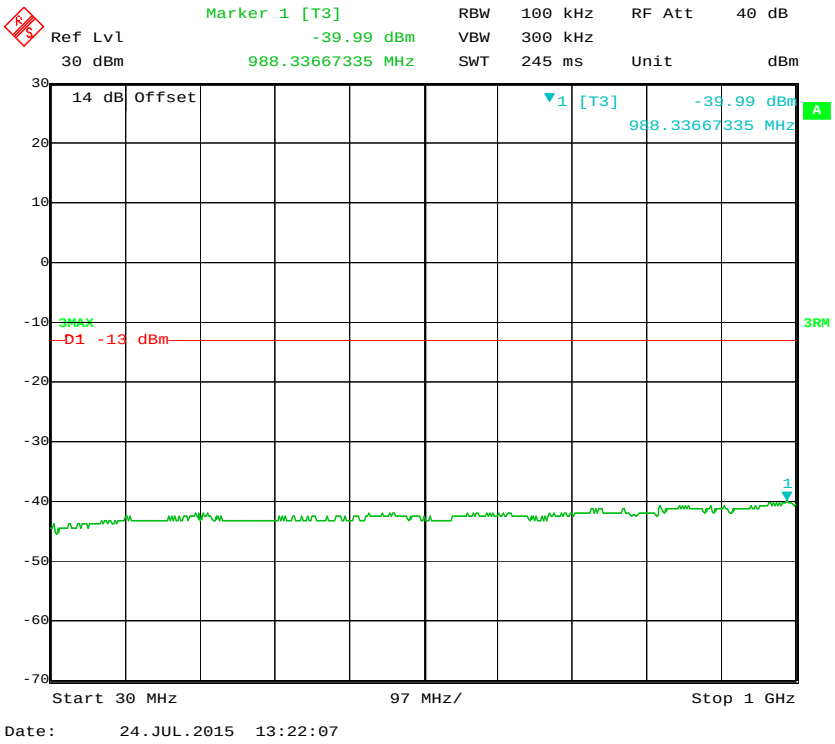
1 GHz – 2 GHz (3.0 MHz, Middle Channel)



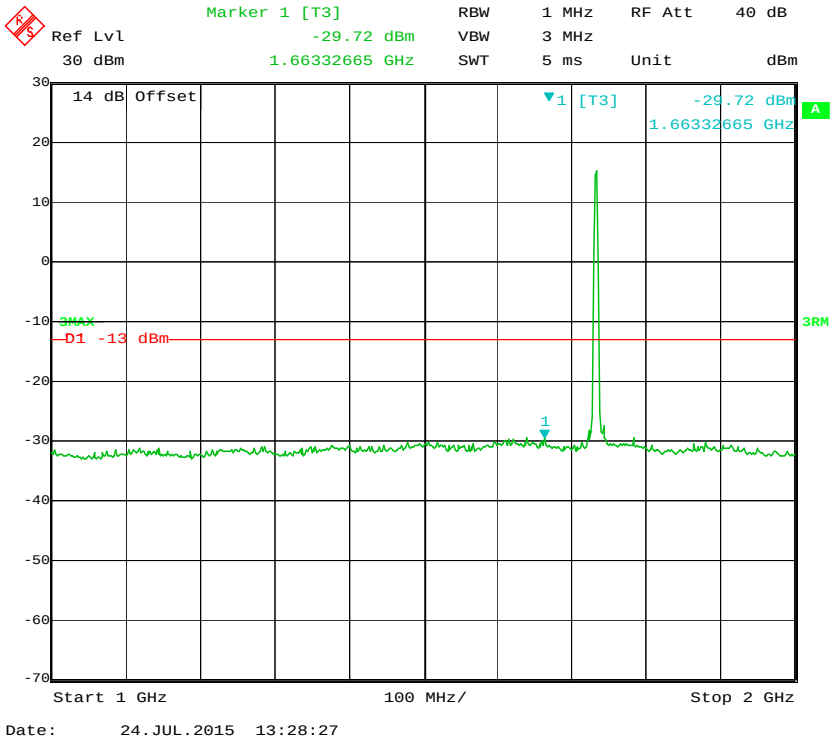
2 GHz – 20 GHz (3.0 MHz, Middle Channel)



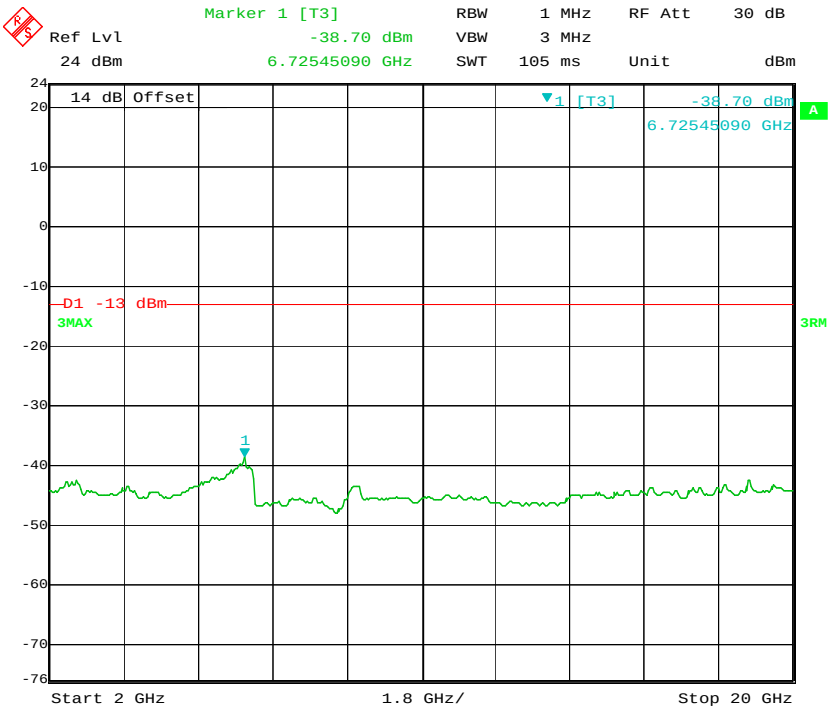
30 MHz - 1 GHz (5.0 MHz, Middle Channel)



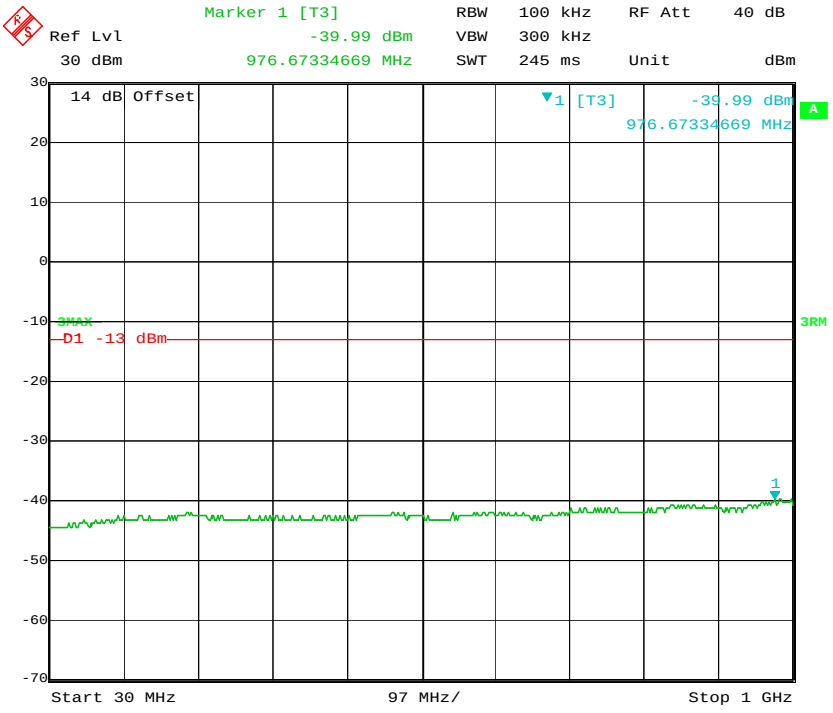
1 GHz – 2 GHz (5.0 MHz, Middle Channel)



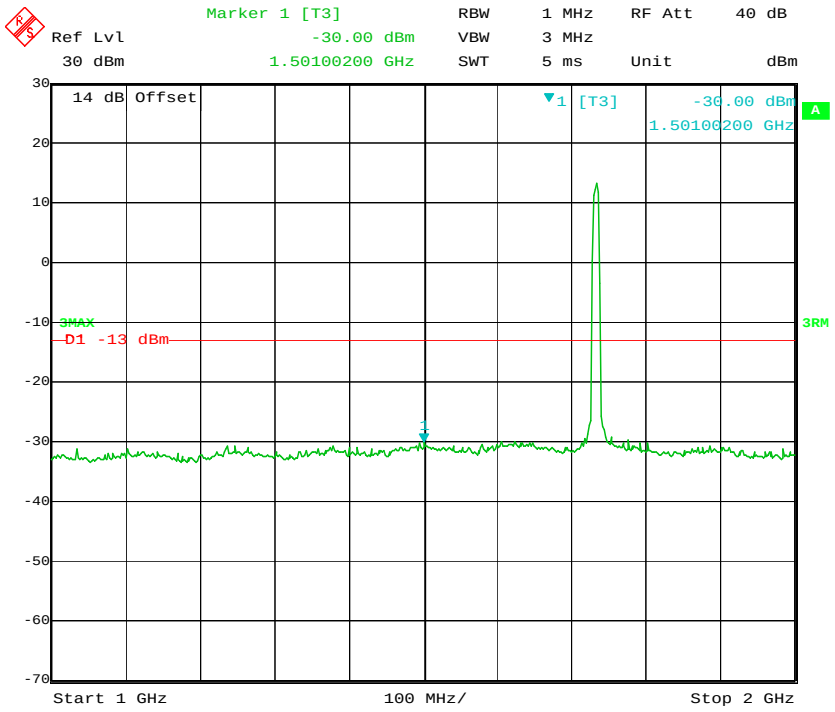
2 GHz – 20 GHz (5.0 MHz, Middle Channel)



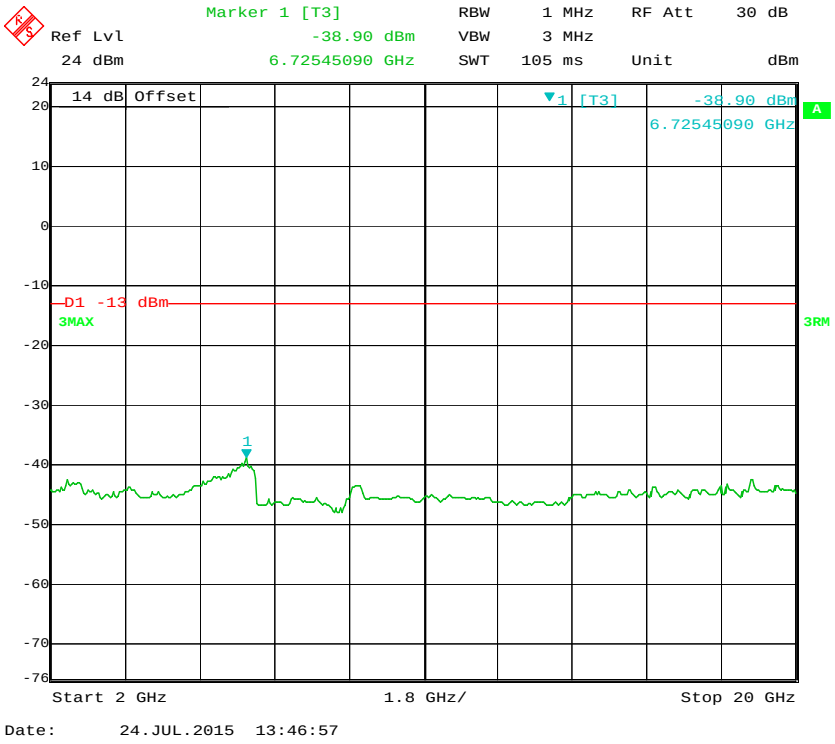
30 MHz - 1 GHz (10.0 MHz, Middle Channel)



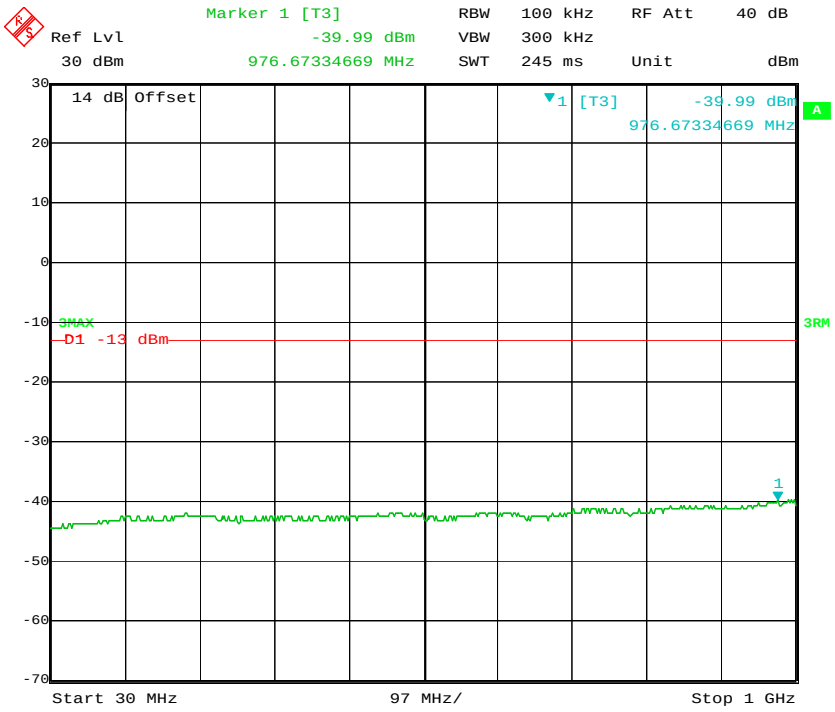
1 GHz – 2 GHz (10.0 MHz, Middle Channel)



2 GHz – 20 GHz (10.0 MHz, Middle Channel)

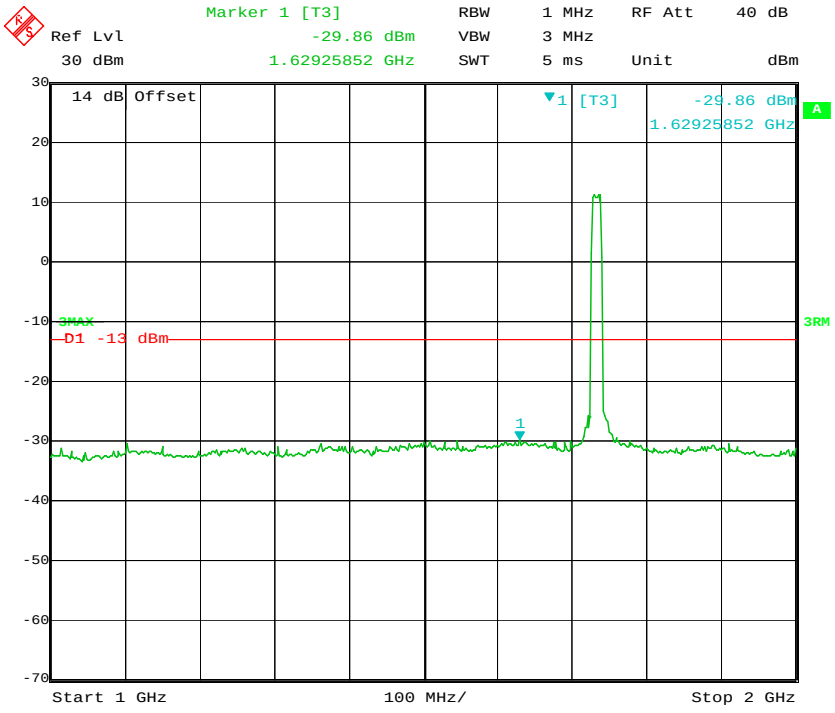


30 MHz - 1 GHz (15.0 MHz, Middle Channel)



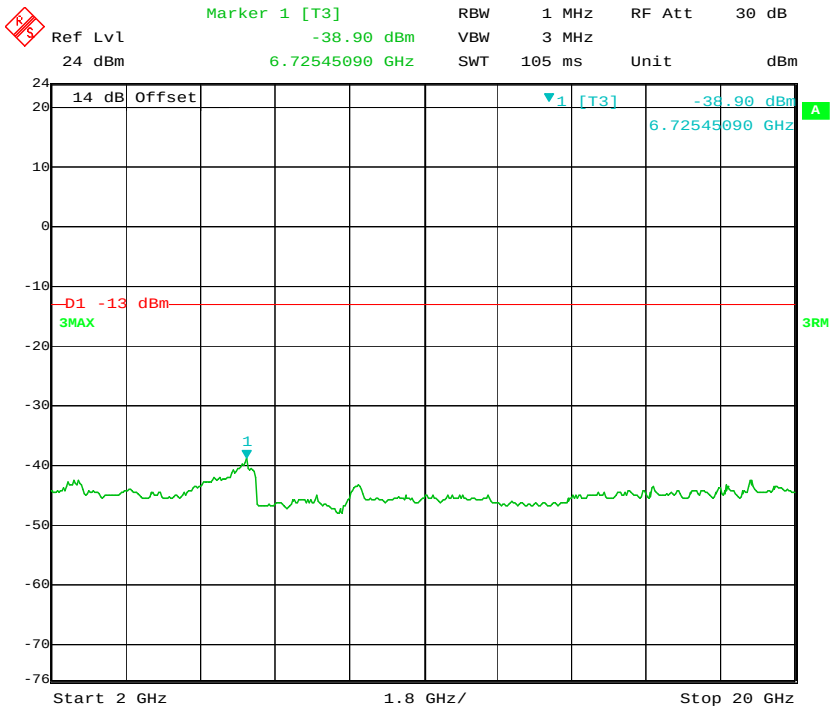
Date: 24.JUL.2015 13:24:02

1 GHz –2 GHz (15.0 MHz, Middle Channel)

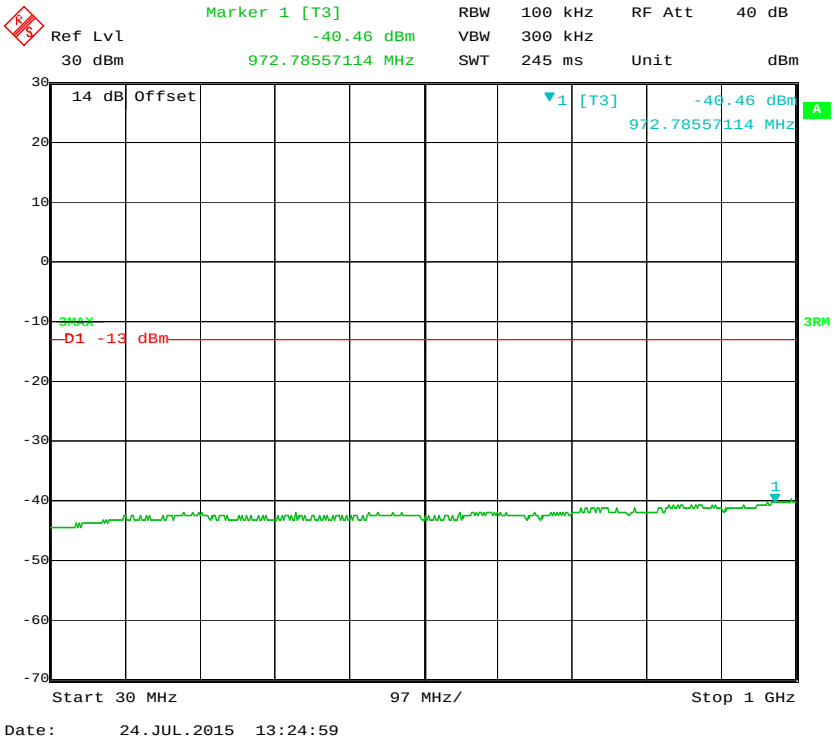


Date: 24.JUL.2015 13:37:57

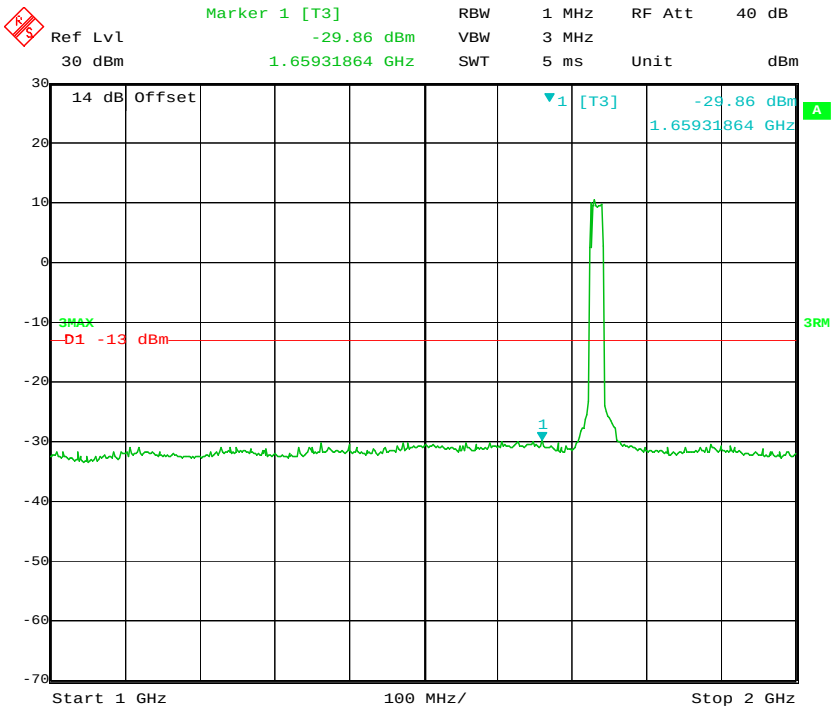
2 GHz –20 GHz (15.0 MHz, Middle Channel)



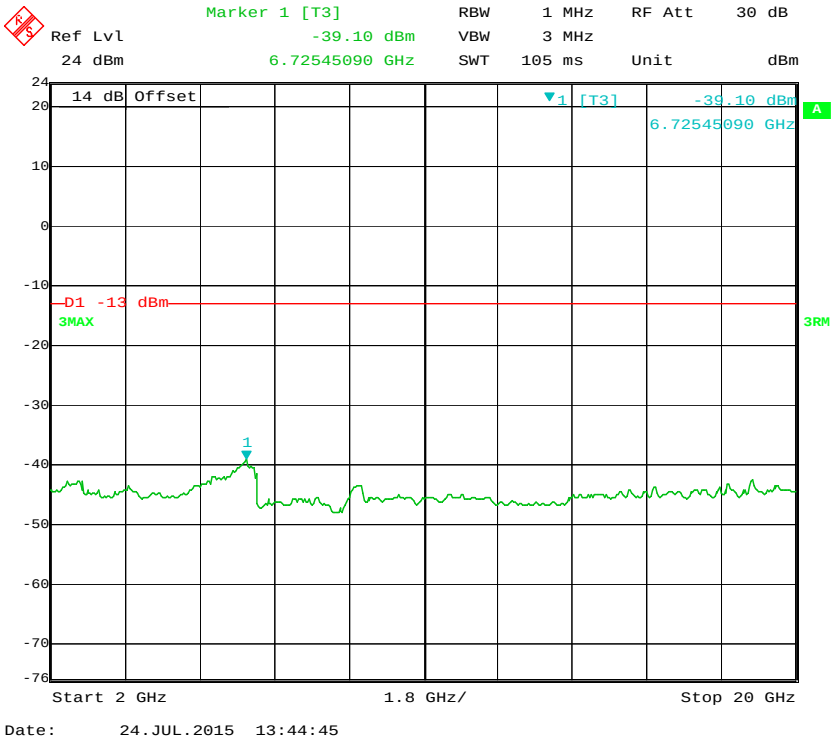
30 MHz - 1 GHz (20.0 MHz, Middle Channel)



1 GHz –2 GHz (20.0 MHz, Middle Channel)

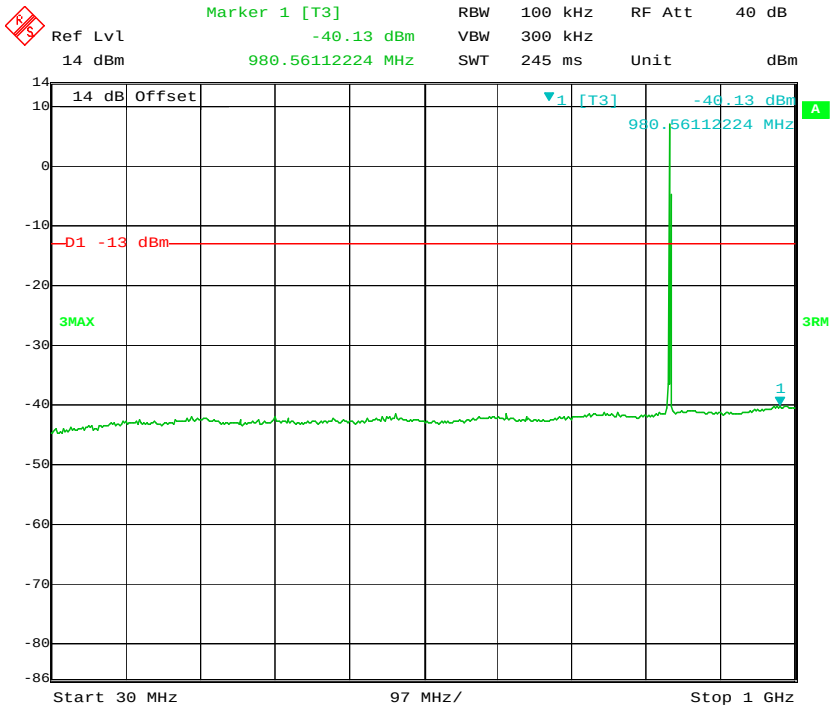


2 GHz –20 GHz (20.0 MHz, Middle Channel)



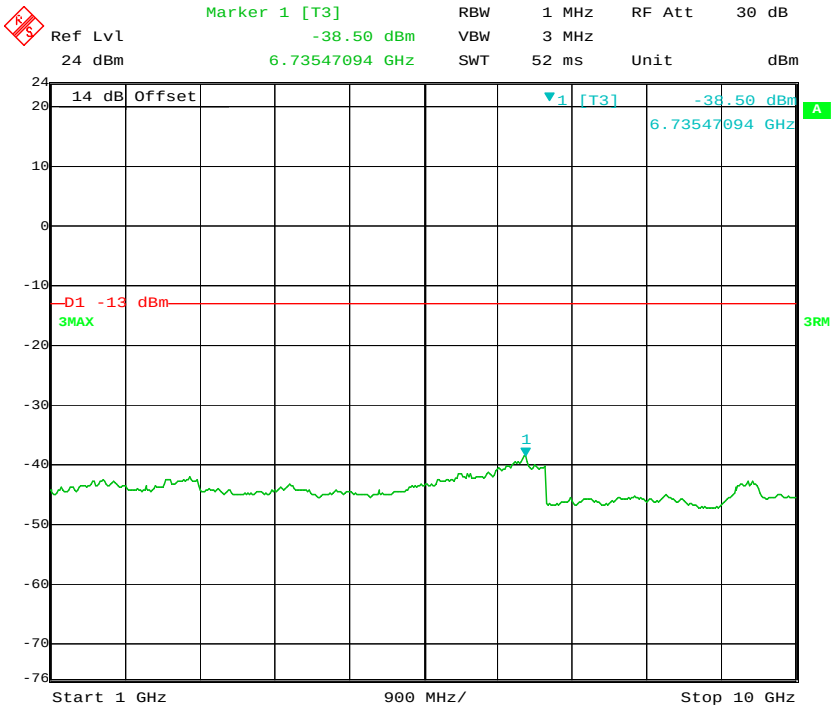
LTE Band 5:

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



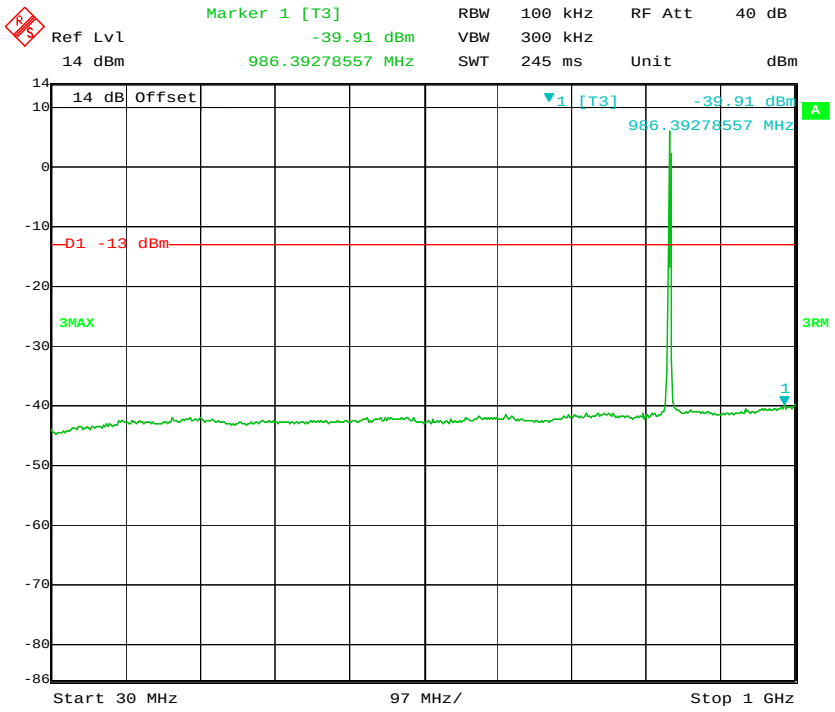
Date: 24.JUL.2015 14:02:54

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

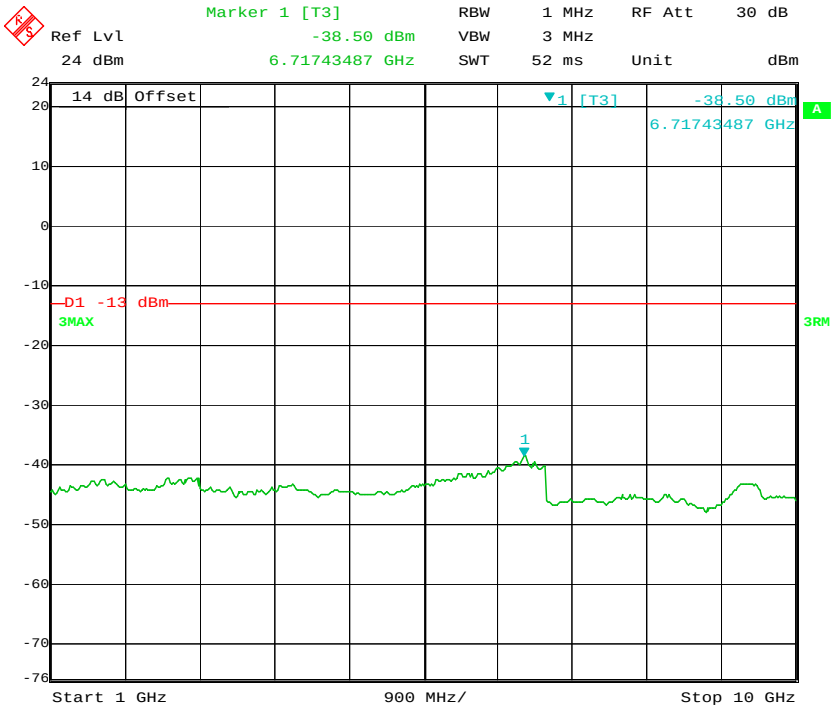


Date: 24.JUL.2015 13:54:02

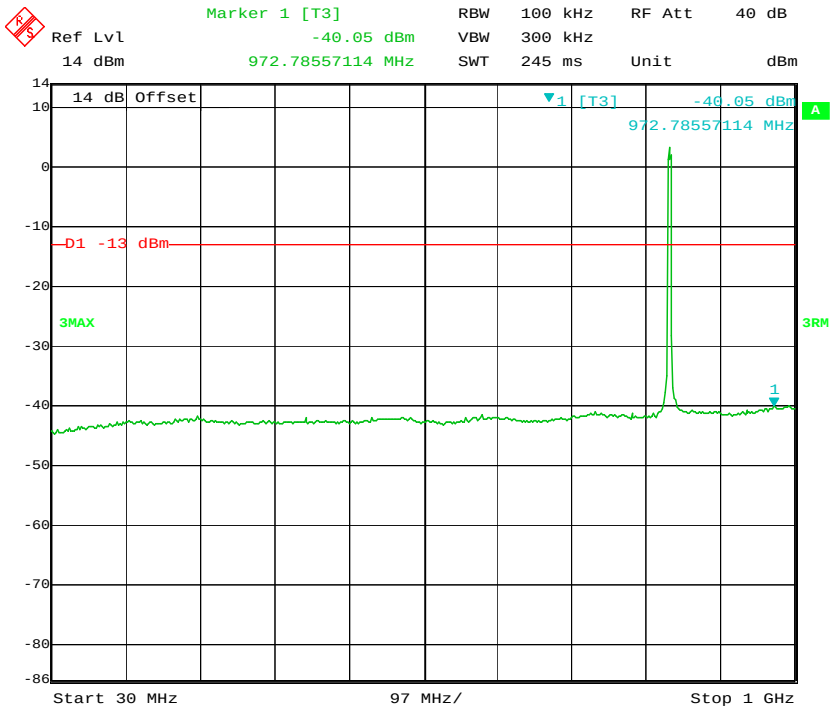
30 MHz - 1 GHz (3.0 MHz, Middle Channel)



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

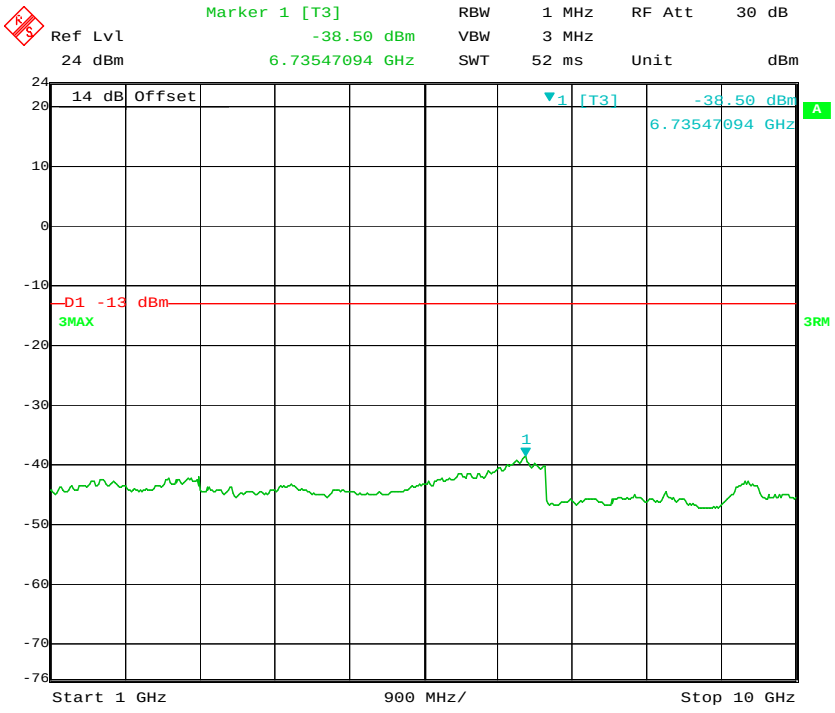


30 MHz - 1 GHz (5.0 MHz, Middle Channel)



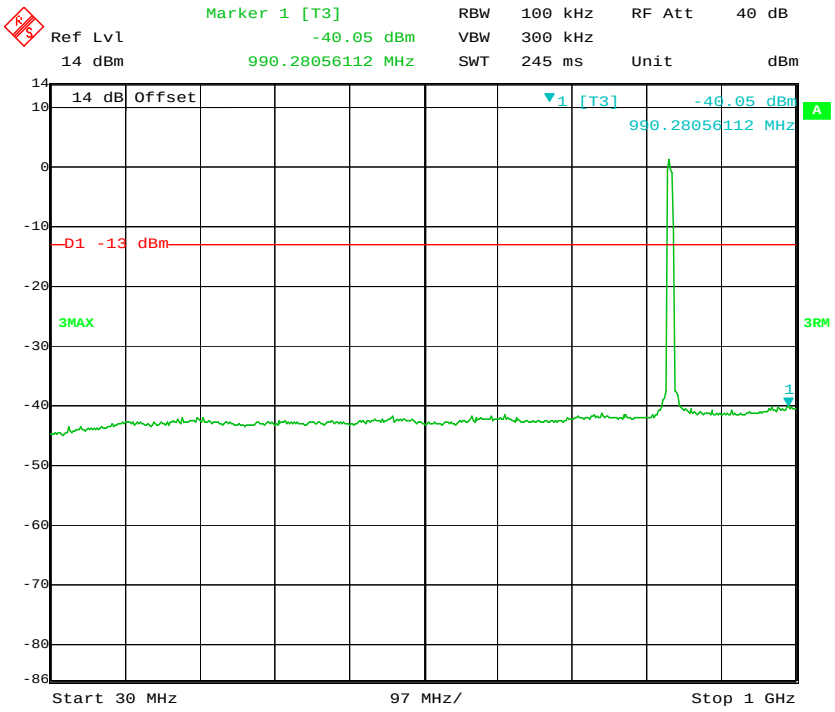
Date: 24.JUL.2015 14:00:31

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



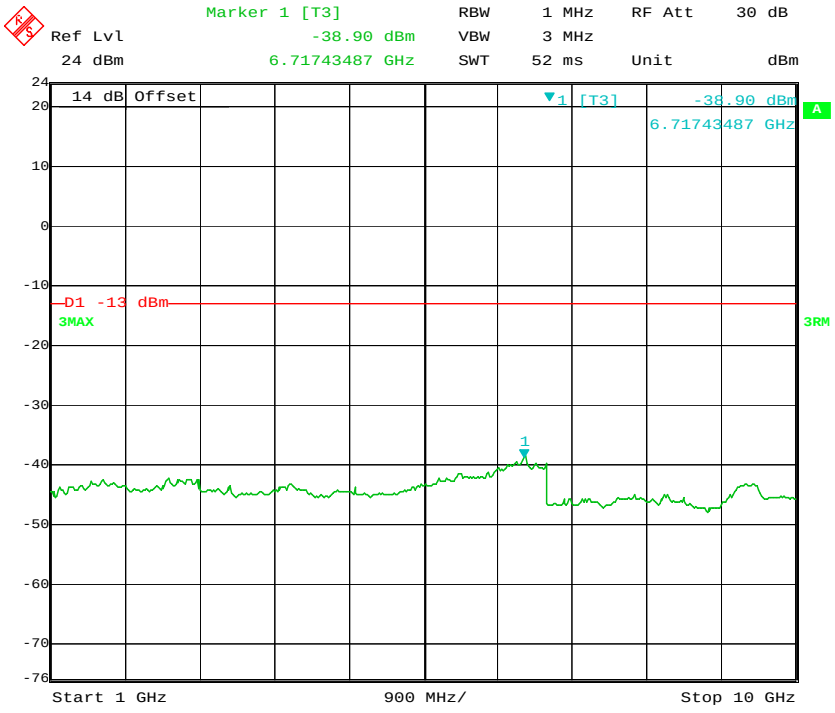
Date: 24.JUL.2015 13:56:06

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



Date: 24.JUL.2015 13:59:00

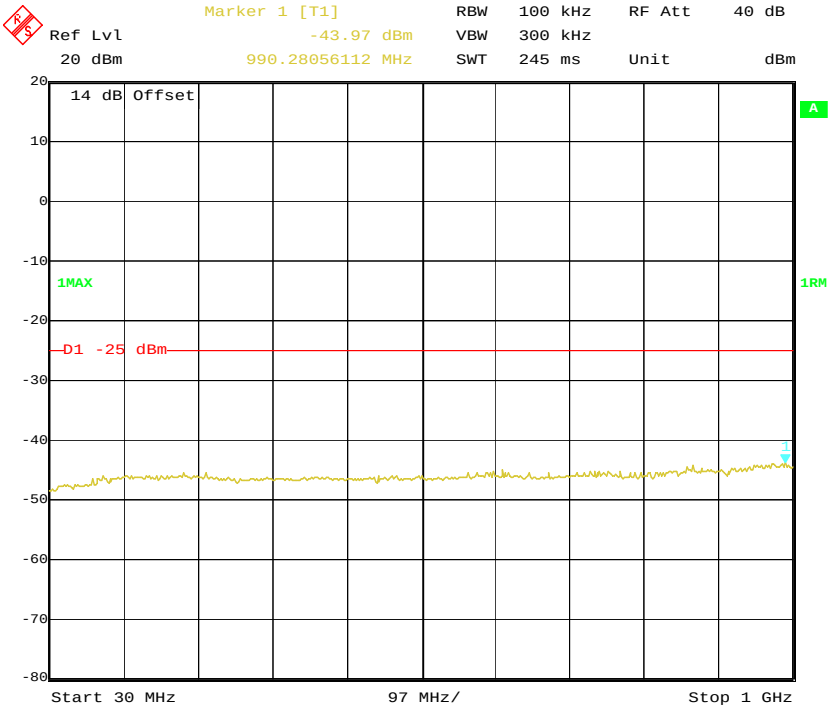
1 GHz – 10 GHz (10.0 MHz, Middle Channel)



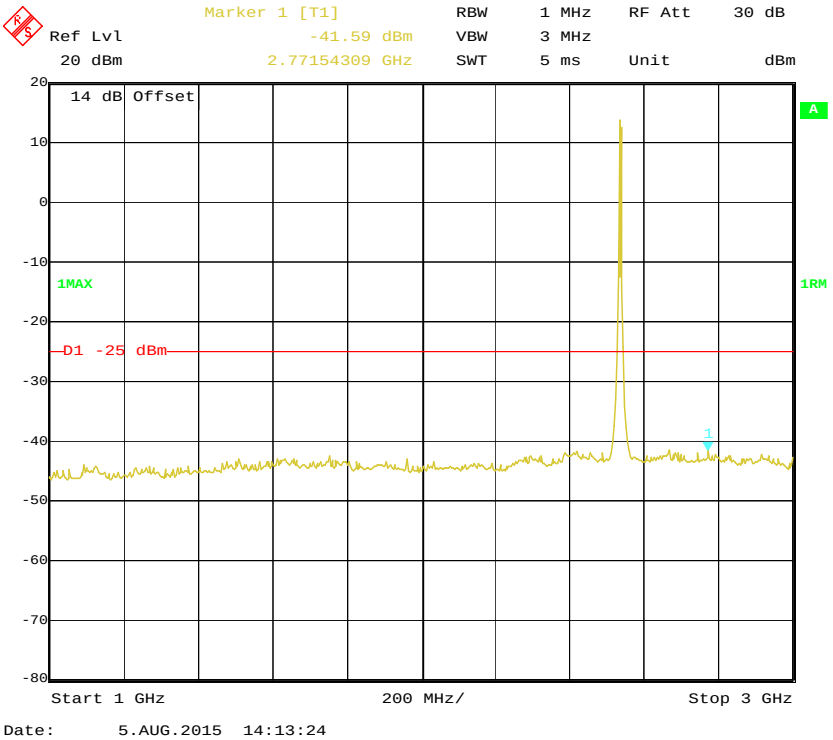
Date: 24.JUL.2015 13:56:33

LTE Band 7:

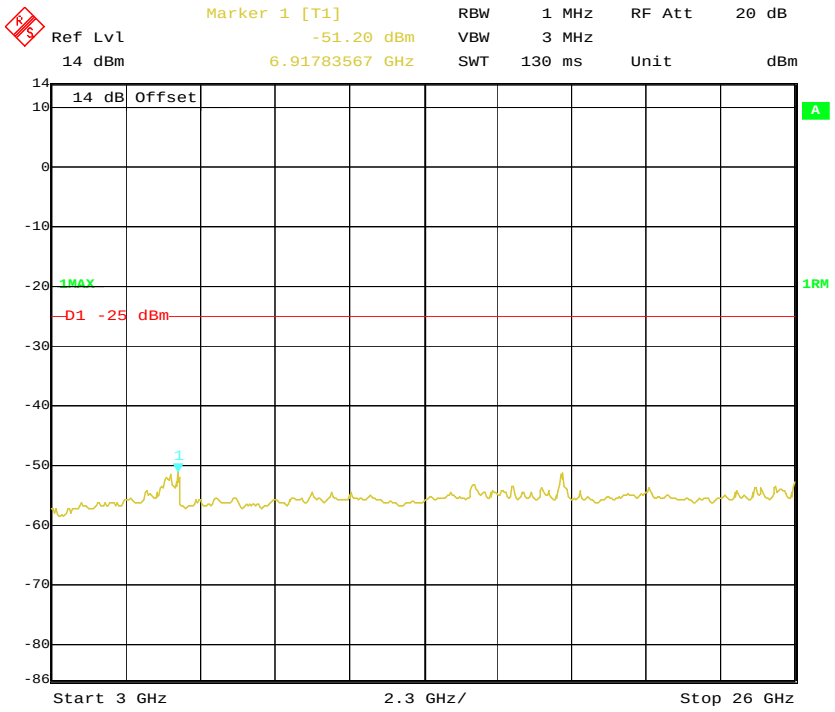
30 MHz - 1 GHz (5.0 MHz, Middle Channel)



1 GHz – 3 GHz (5.0 MHz, Middle Channel)

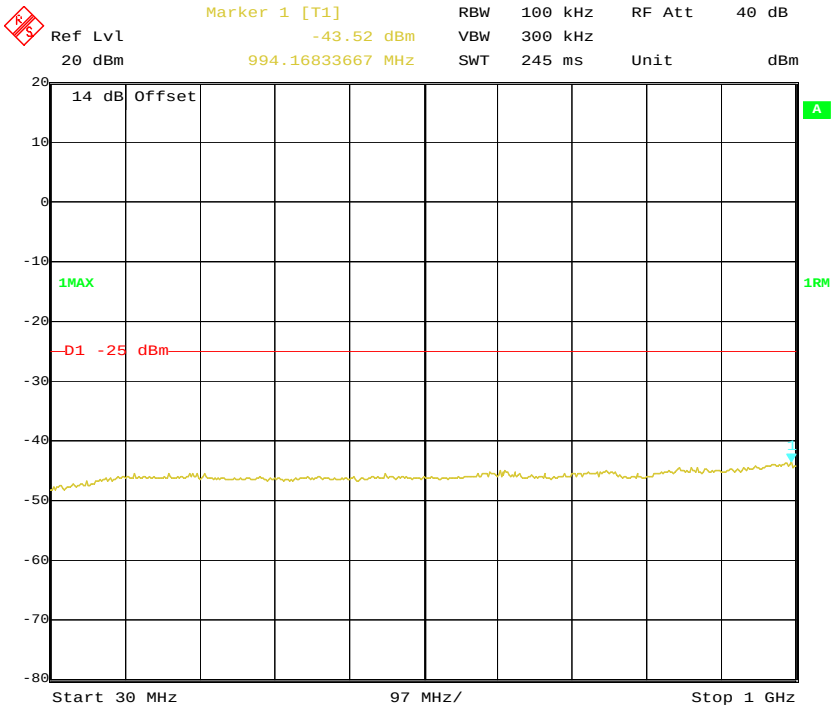


3 GHz – 26 GHz (5.0 MHz, Middle Channel)



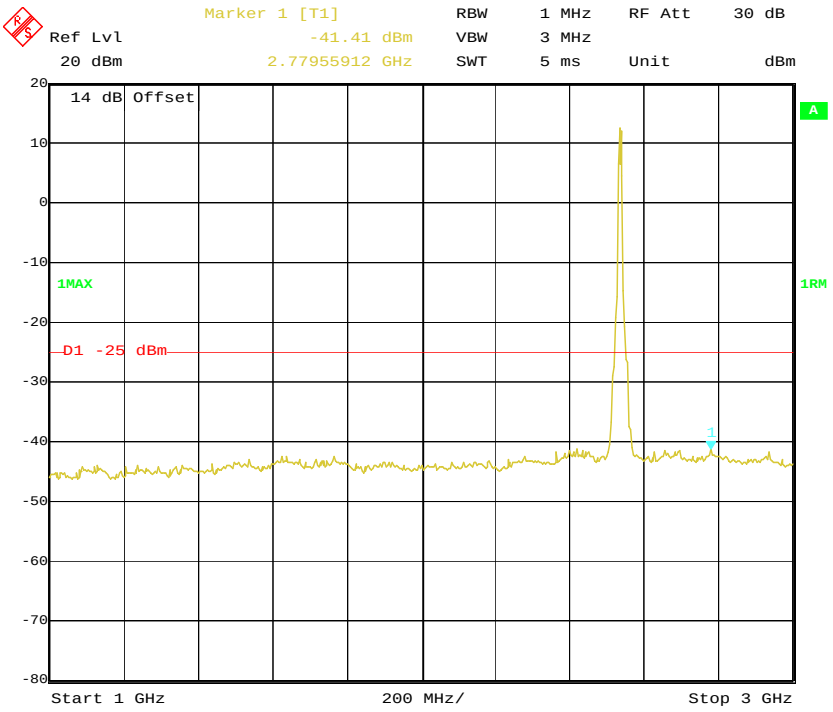
Date: 5.AUG.2015 14:14:15

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



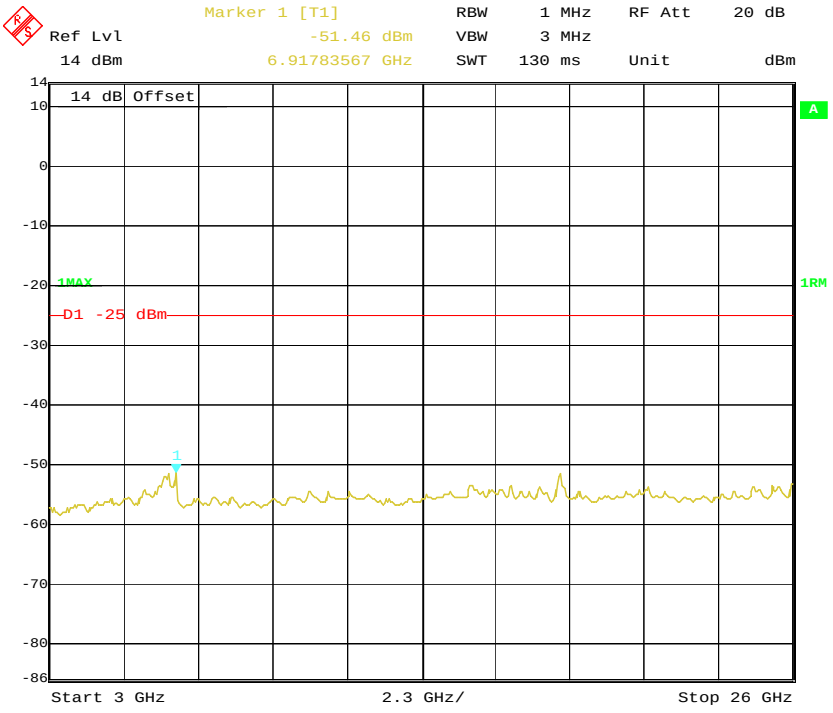
Date: 5.AUG.2015 14:01:23

1 GHz – 3 GHz (10.0 MHz, Middle Channel)



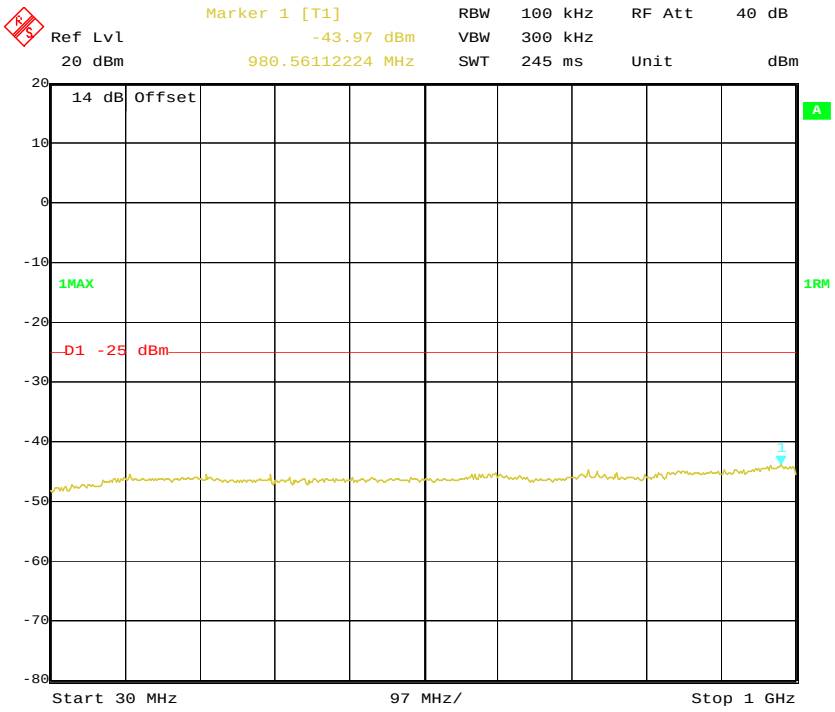
Date: 5.AUG.2015 14:13:05

3 GHz – 26 GHz (10.0 MHz, Middle Channel)

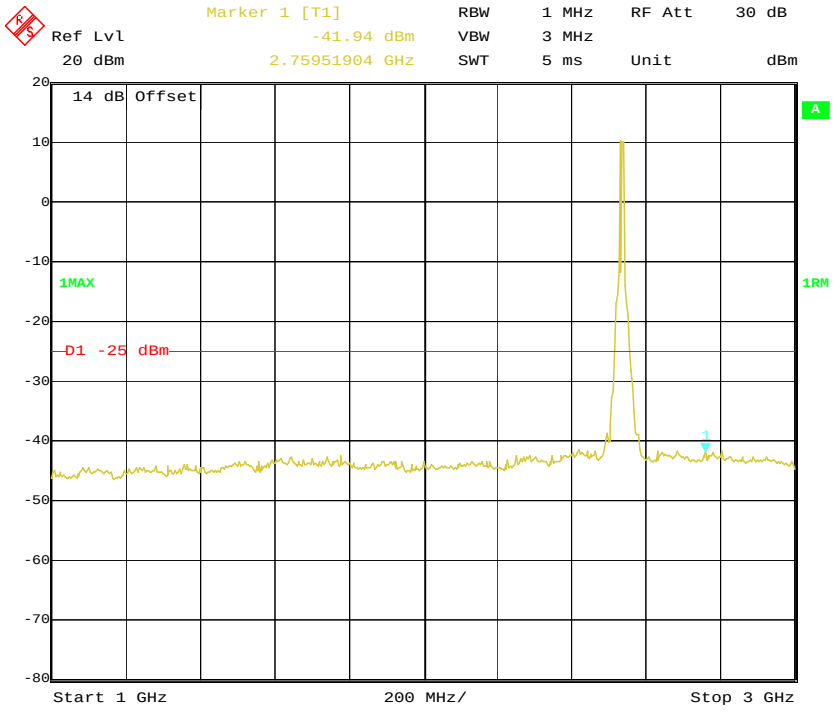


Date: 5.AUG.2015 14:14:38

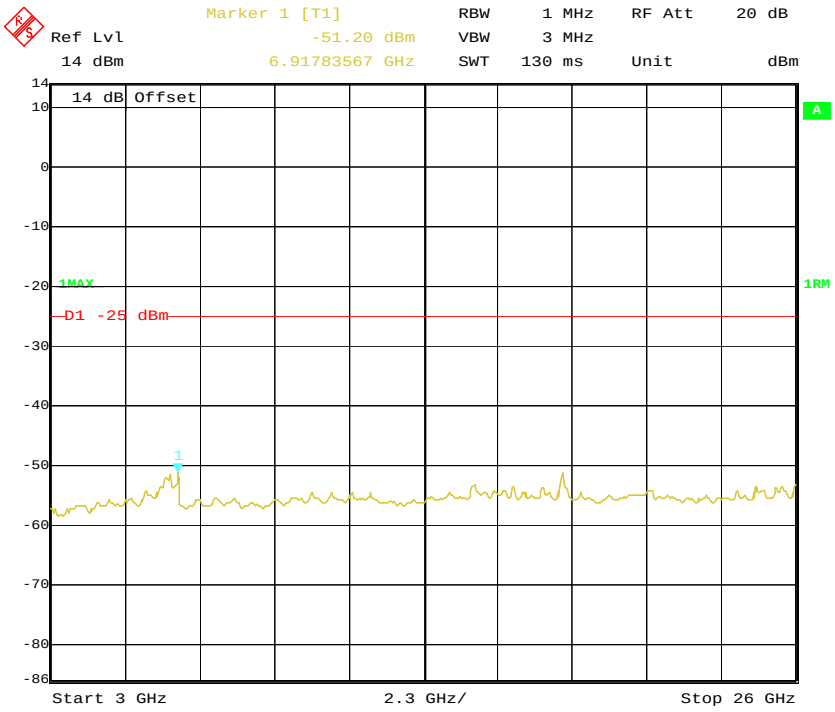
30 MHz - 1 GHz (15.0 MHz, Middle Channel)



1 GHz – 3 GHz (15.0 MHz, Middle Channel)

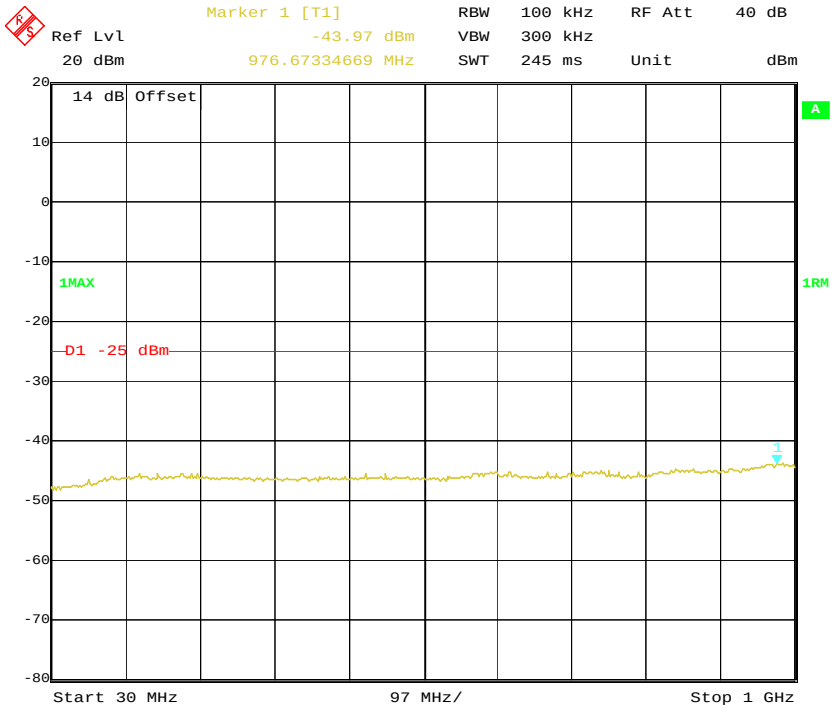


3 GHz –26 GHz (15.0 MHz, Middle Channel)



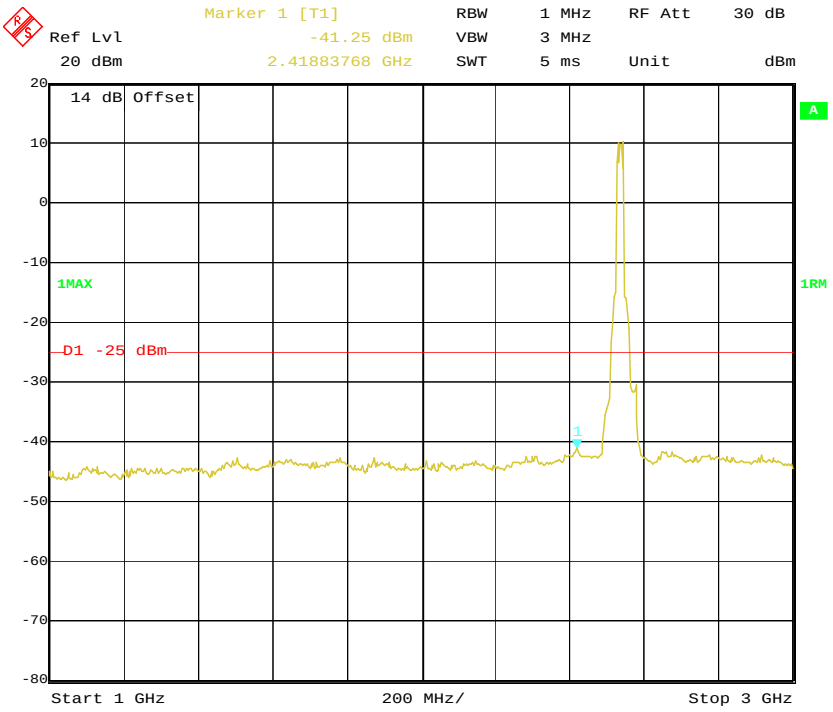
Date: 5.AUG.2015 14:14:59

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



Date: 5.AUG.2015 14:07:31

1 GHz – 3 GHz (20.0 MHz, Middle Channel)



3 GHz –26 GHz (20.0 MHz, Middle Channel)