FCC PART 22H, PART 24E

FCC PART 27

MEASUREMENT AND TEST REPORT

For

Hangzhou iReadyGo Intelligence Technology Co., Ltd.

RM 1503, Tianheng Builing, No.1509 Binsheng RD, Xixing Street, Binjiang District, Hangzhou, China

FCC ID: 2AFXQ-W3D

Report Type:	**Product Type:**
Original Report	Smart phone

Test Engineer:	Dean Liu
Report Number:	RDG150828003-00E
Report Date:	2015-10-09
Reviewed By:	Sula Huang RF Leader
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *Hangzhou iReadyGo Intelligence Technology Co., Ltd.*'s product, model number: *W3D (FCC ID: 2AFXQ-W3D)* (the "EUT") in this report was a *Smart phone,* which was measured approximately: 18.35 cm (L) x 7.65cm (W) x 1.25 cm (H), rated input voltage: DC3.8V rechargeable Li-ion battery or DC5V charging from adapter.

All measurement and test data in this report was gathered from production sample serial number:030011538000124 (Assigned by applicant). The EUT was received on 2015-08-31

Objective

This report is prepared on behalf of *Hangzhou iReadyGo Intelligence Technology Co., Ltd.* in accordance with: Part 2-Subpart J, Part 22-Subpart H, and Part 24-Subpart E of the Federal Communications Commission's rules.
Part 2, Part 27 of the Federal Communication Commissions rules.

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

Related Submittal(s)/Grant(s)

FCC Part 15B JBP submissions with FCC ID: 2AFXQ-W3D
FCC Part 15C DSS submissions with FCC ID: 2AFXQ-W3D
FCC Part 15C DTS submissions with FCC ID: 2AFXQ-W3D
FCC Part 15E NII submissions with FCC ID: 2AFXQ-W3D.

Test Methodology

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

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

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

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

Test Facility

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

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) has been fully described in reports submitted to the Federal Communications 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 February 06, 2015.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 273710. 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-2010.

The test items were performed with the EUT operating at testing mode.

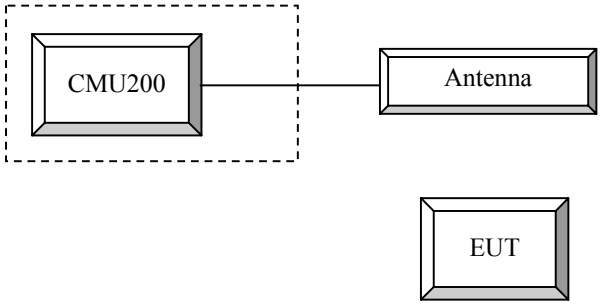
Equipment Modifications

No modification was made to the EUT.

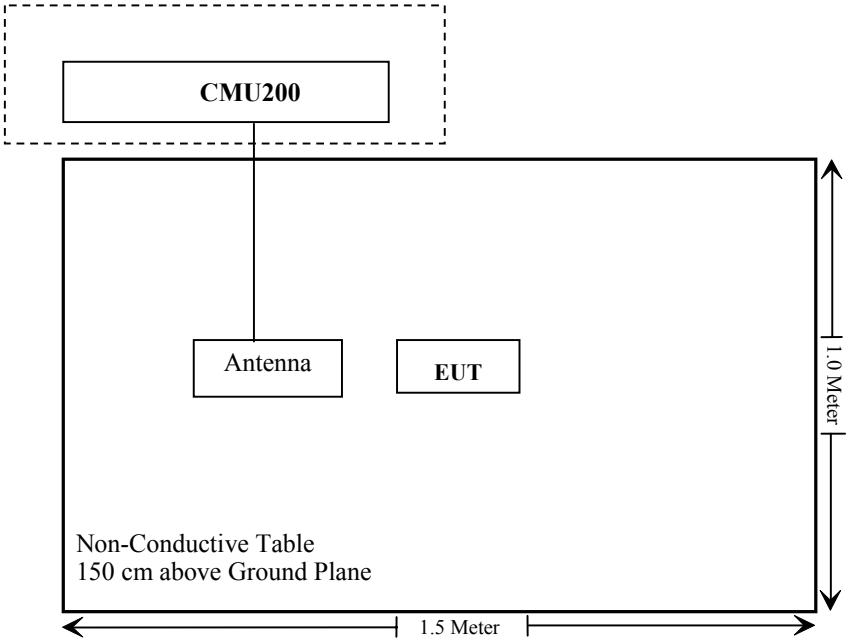
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
R&S	Universal Radio Communication Tester	CMU200	109038
R&S	Wideband Radio Communication Tester	CMW500	106891

Configuration of Test Setup



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

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

FCC §1.1310 & §2.1093- RF EXPOSURE

Applicable Standard

FCC§1.1310 and §2.1093.

Test Result

Compliance, please refer to the SAR report: RDG150828003-20A, RDG150828003-20B.

FCC §2.1047 - MODULATION CHARACTERISTIC

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

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

Applicable Standard

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

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

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

According to FCC §2.1046 and §27.50 (c), (10) Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

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

According to FCC §2.1046 and §27.50 (h), (2) Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

Test Procedure

Test Procedure

GSM/GPRS/EGPRS

Function: Menu select > GSM Mobile Station > GSM 850/1900
Press Connection control to choose the different menus
Press RESET > choose all the reset all settings
Connection Press Signal Off to turn off the signal and change settings
Network Support > GSM + GPRS or GSM + EGSM
Main Service > Packet Data
Service selection > Test Mode A – Auto Slot Config. off
MS Signal Press Slot Config Bottom on the right twice to select and change the number of time slots and power setting
> Slot configuration > Uplink/Gamma
> 33 dBm for GPRS 850
> 30 dBm for GPRS 1900
> 27 dBm for EGPRS 850
> 26 dBm for EGPRS 1900
BS Signal Enter the same channel number for TCH channel (test channel) and BCCH channel
Frequency Offset > + 0 Hz
Mode > BCCH and TCH
BCCH Level > -85 dBm (May need to adjust if link is not stable)
BCCH Channel > choose desire test channel [Enter the same channel number for TCH channel (test channel) and BCCH channel]

Channel Type > Off

P0 > 4 dB
Slot Config > Unchanged (if already set under MS signal)
TCH > choose desired test channel
Hopping > Off
Main Timeslot > 3
Network Coding Scheme > CS4 (GPRS) and MCS5 (EGPRS)

Bit Stream > 2E9-1 PSR Bit Stream
AF/RF Enter appropriate offsets for Ext. Att. Output and Ext. Att. Input
Connection Press Signal on to turn on the signal and change settings

WCDMA-Release 99

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

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

WCDMA HSDPA

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

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subset	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	Power Control Algorithm	Algorithm2			
	βc	2/15	12/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	βd (SF)	64			
	βc/ βd	2/15	12/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	MPR(dB)	0	0	0.5	0.5
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	Ahs=βhs/ βc	30/15			

WCDMA HSUPA

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

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

HSPA+

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

Sub-test	β_c (Note3)	β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{ed} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	β_{ed}1: 30/15 β_{ed}2: 30/15	β_{ed}3: 24/15 β_{ed}4: 24/15	3.5	2.5	14	105	105

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c.
Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).
Note 3: DPDCH is not configured, therefore the β_c is set to 1 and β_d = 0 by default.
Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value.
Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signalled to use the extrapolation algorithm.

DC-HSDPA

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

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

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK

Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.
Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.

LTE:

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

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

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

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

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

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

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

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

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

Radiated method:

ANSI/TIA 603-D section 2.2.17

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2015-05-09	2016-05-09
Sunol Sciences	Antenna	JB3	A060611-3	2014-11-06	2017-11-05
HP	Amplifier	8447E	2434A02181	2015-09-01	2016-09-01
R&S	Spectrum Analyzer	FSEM	DE31388	2015-05-09	2016-05-09
ETS LINDGREN	Horn Antenna	3115	000 527 35	2015-09-06	2018-09-06
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2015-02-19	2016-02-19
Giga	Signal Generator	1026	320408	2015-05-09	2016-05-09
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
TDK RF	Horn Antenna	HRN-0118	130 084	2012-09-06	2015-09-06

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

Test Data

Environmental Conditions

Temperature:	26.6 °C
Relative Humidity:	51~55%
ATM Pressure:	100.7kPa

The testing was performed by Dean Liu on 2015-09-29.

Conducted Power

Cellular Band (Part 22H) & PCS Band (Part 24E)

Band	Channel No.	Peak Output Power (dBm)								
		GSM	GPRS 1 TX Slot	GPRS 2 TX Slot	GPRS 3 TX Slot	GPRS 4 TX Slot	EDGE 1 TX Slot	EDGE 2 TX Slot	EDGE 3 TX Slot	EDGE 4 TX Slot
Cellular	128	32.49	32.37	31.90	30.13	28.94	26.66	24.62	22.73	21.81
	190	32.43	32.33	31.73	30.11	29.08	26.64	24.82	22.75	21.55
	251	32.22	32.15	31.72	30.00	28.92	26.58	24.90	22.56	21.60
PCS	512	28.16	28.09	27.21	25.51	24.31	25.23	23.60	21.52	20.67
	661	28.07	28.01	27.33	25.53	24.43	25.24	23.85	22.03	20.54
	810	28.15	28.07	27.45	25.56	24.53	25.09	23.67	21.79	20.79

WCDMA Band Ⅱ (PART 24E)

Mode	3GPP Sub Test	Average Output Power (dBm)					
		Low Channel (Ave. Power)	Low Channel (PAR)	Middle Channel (Ave. Power)	Middle Channel (PAR)	High Channel (Ave. Power)	High Channel (PAR)
Rel 99	1	22.32	3.00	22.66	3.20	22.82	3.04
HSDPA	1	21.65	3.13	21.88	3.49	22.01	3.22
	2	21.50	3.27	22.02	3.33	21.99	3.23
	3	21.60	2.99	21.96	3.34	22.03	3.08
	4	21.56	3.23	21.98	3.43	22.11	3.19
HSUPA	1	21.57	3.22	21.95	3.40	22.02	3.17
	2	21.59	3.16	21.89	3.33	22.15	3.23
	3	21.62	3.24	21.83	3.38	22.03	3.08
	4	21.55	3.19	21.92	3.29	22.06	3.28
	5	21.53	3.32	21.92	3.35	22.15	3.14
DC-HSDPA	1	21.05	2.97	21.43	3.36	21.45	3.19
	2	21.02	3.30	21.33	3.26	21.55	3.27
	3	20.98	3.30	21.47	3.25	21.49	3.26
	4	21.07	3.16	21.45	3.52	21.50	3.16
HSPA+	1	21.01	3.09	21.44	3.32	21.59	3.21

WCDMA Band V (PART 22H)

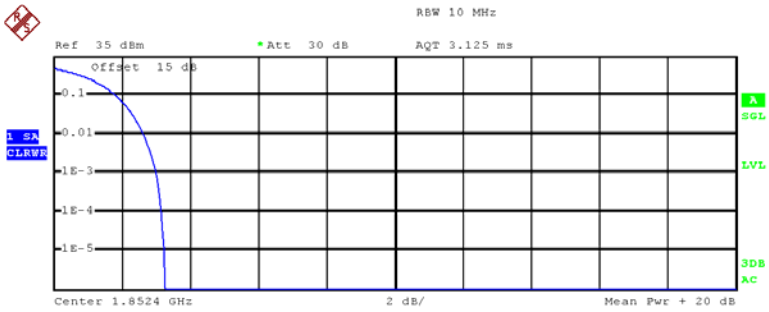
Mode	3GPP Sub Test	Average Output Power (dBm)					
		Low Channel (Ave. Power)	Low Channel (PAR)	Middle Channel (Ave. Power)	Middle Channel (PAR)	High Channel (Ave. Power)	High Channel (PAR)
Rel 99	1	22.59	2.72	22.05	3.16	22.46	2.92
HSDPA	1	21.72	2.88	21.06	3.17	21.59	3.02
	2	21.88	2.87	21.17	3.32	21.71	3.05
	3	21.54	2.88	20.92	3.29	21.70	2.96
	4	21.81	2.94	20.83	3.40	21.65	3.13
DC-HSDPA	1	21.57	2.7	21.00	3.2	21.47	2.94
	2	21.76	2.90	20.86	3.18	21.56	3.13
	3	21.58	2.90	20.87	3.30	21.74	3.18
	4	21.60	2.97	20.88	3.34	21.49	3.06
	5	21.62	2.72	21.18	3.38	21.67	3.14
HSUPA	1	21.11	2.88	20.58	3.3	21.03	2.99
	2	21.10	2.72	20.57	3.19	21.08	3.00
	3	21.07	2.85	20.66	3.29	21.17	3.07
	4	21.14	2.80	20.64	3.22	21.07	3.02
HSPA+	1	21.04	2.93	20.61	3.26	21.17	3.18

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

Peak-to-average ratio (PAR)

WCDMA Band Ⅱ(PART 24E)

Low Channel



Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	23.70 dBm
Peak	26.97 dBm
Crest	3.27 dB
10 %	1.84 dB
1 %	2.64 dB
.1 %	3.00 dB
.01 %	3.16 dB

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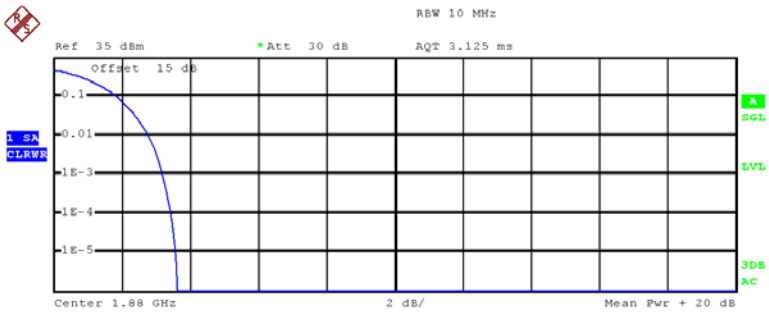
Middle Channel



Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	23.19 dBm
Peak	26.83 dBm
Crest	3.64 dB
10 %	1.88 dB
1 %	2.80 dB
.1 %	3.20 dB
.01 %	3.44 dB

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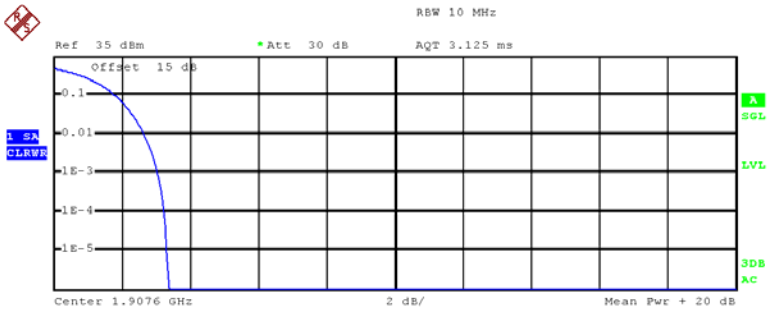
High Channel



Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	21.97 dBm
Peak	25.34 dBm
Crest	3.38 dB
10 %	1.84 dB
1 %	2.68 dB
.1 %	3.04 dB
.01 %	3.24 dB

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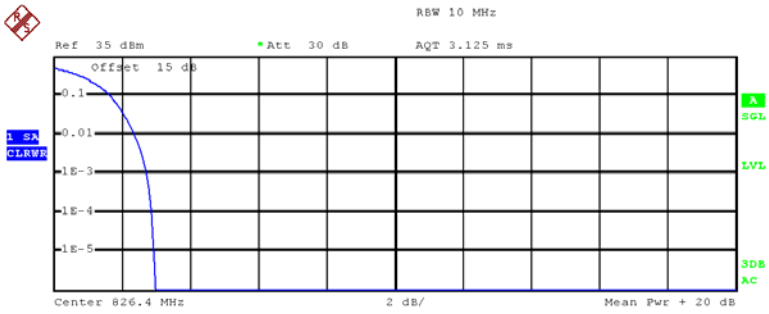
WCDMA Band V (PART 22H)

Low Channel

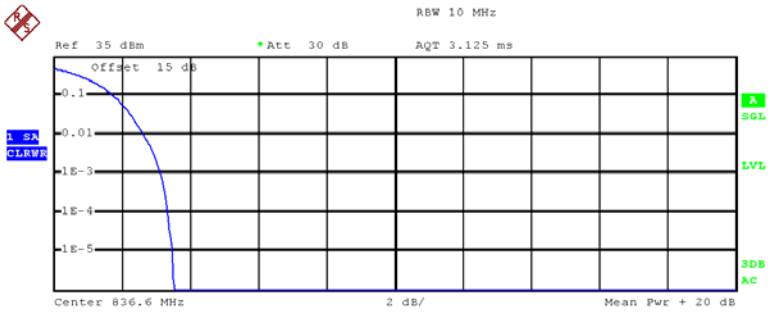


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	23.15 dBm
Peak	26.12 dBm
Crest	2.97 dB
10 %	1.68 dB
1 %	2.36 dB
.1 %	2.72 dB
.01 %	2.88 dB

Date: 5.SEP.2015 16:14:45

Middle Channel

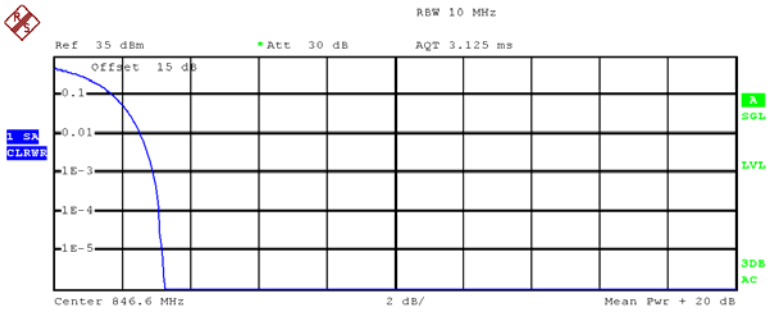


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	22.74 dBm
Peak	26.26 dBm
Crest	3.52 dB
10 %	1.76 dB
1 %	2.64 dB
.1 %	3.16 dB
.01 %	3.36 dB

Date: 5.SEP.2015 16:14:32

High Channel



Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	23.86 dBm
Peak	27.11 dBm
Crest	3.25 dB
10 %	1.76 dB
1 %	2.56 dB
.1 %	2.92 dB
.01 %	3.08 dB

Date: 5.SEP.2015 16:14:02

LTE Band 7

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	22.35	22.59	22.14
		1#3	22.35	22.56	22.13
		1#5	22.27	22.53	21.97
		3#0	21.67	21.88	21.48
		3#1	21.76	21.96	21.51
		3#3	21.65	21.88	21.38
		6#0	21.28	21.57	21.04
	16-QAM	1#0	21.14	21.49	20.88
		1#3	21.15	21.34	20.91
		1#5	21.15	21.42	20.93
		3#0	20.72	20.97	20.40
		3#1	20.66	20.83	20.43
		3#3	20.74	20.94	20.51
		6#0	20.36	20.56	20.10
10M	QPSK	1#0	22.39	22.58	22.17
		1#7	22.51	22.67	22.19
		1#14	22.36	22.58	22.09
		8#0	21.63	21.84	21.30
		8#4	21.67	21.89	21.49
		8#7	21.62	21.88	21.37
		15#0	21.34	21.56	21.14
	16-QAM	1#0	21.67	21.95	21.56
		1#7	21.70	22.01	21.42
		1#14	21.71	21.87	21.45
		8#0	20.88	21.04	20.53
		8#4	20.88	21.09	20.61
		8#7	20.93	21.15	20.74
		15#0	20.36	20.60	20.14

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15M	QPSK	1#0	22.46	22.67	22.28
		1#37	22.44	22.62	22.28
		1#74	22.35	22.60	22.08
		36#0	21.48	21.77	21.29
		36#17	21.45	21.74	21.22
		36#35	21.53	21.85	21.35
		75#0	21.26	21.57	21.01
	16-QAM	1#0	21.70	21.97	21.47
		1#37	21.70	21.94	21.52
		1#74	21.64	21.85	21.44
		36#0	21.04	21.20	20.84
		36#17	21.11	21.33	20.85
		36#35	20.97	21.17	20.67
		75#0	20.45	20.70	20.22
20M	QPSK	1#0	22.39	22.60	22.09
		1#49	22.44	22.61	22.23
		1#99	22.33	22.57	22.01
		50#0	21.26	21.49	20.96
		50#24	21.35	21.55	21.12
		50#49	21.31	21.53	21.09
		100#0	21.51	21.67	21.28
	16-QAM	1#0	21.55	21.74	21.32
		1#49	21.61	21.87	21.48
		1#99	21.54	21.72	21.34
		50#0	20.71	21.00	20.53
		50#24	20.87	21.11	20.60
		50#49	20.90	21.14	20.67
		100#0	20.40	20.66	20.14

LTE Band 17

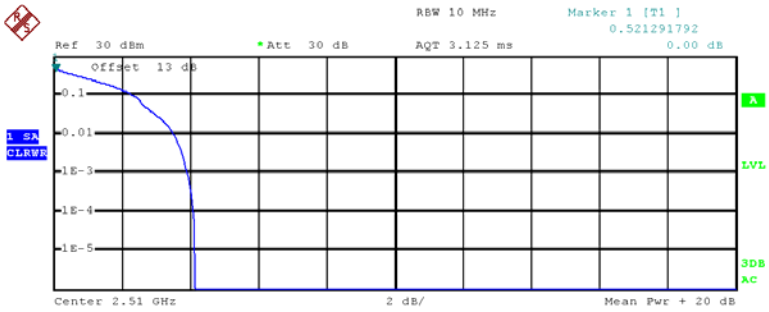
Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
5M	QPSK	1#0	22.21	22.46	22.10
		1#12	22.33	22.53	22.23
		1#24	22.37	22.59	22.23
		12#0	21.75	21.95	21.70
		12#6	21.68	21.94	21.53
		12#11	21.67	21.88	21.58
		25#0	21.16	21.37	21.02
	16-QAM	1#0	21.32	21.57	21.19
		1#12	21.18	21.46	21.18
		1#24	21.21	21.45	21.22
		12#0	20.50	20.78	20.54
		12#6	20.71	20.92	20.57
		12#11	20.51	20.76	20.47
		25#0	20.37	20.61	20.27
10M	QPSK	1#0	22.35	22.60	22.33
		1#24	22.23	22.50	22.23
		1#49	22.40	22.59	22.34
		25#0	21.54	21.79	21.49
		25#12	21.66	21.87	21.52
		25#24	21.61	21.89	21.61
		50#0	21.26	21.44	21.17
	16-QAM	1#0	21.61	21.81	21.50
		1#24	21.49	21.75	21.45
		1#49	21.52	21.71	21.36
		25#0	21.13	21.35	20.97
		25#12	21.11	21.33	21.00
		25#24	21.03	21.28	20.96
		50#0	20.47	20.68	20.29

Peak-to-average ratio (PAR)

LTE Band	Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit (dB)
Band 7	QPSK	1 RB	20M	3.92	4.00	3.80	13
		Full RB		6.20	6.32	6.20	13
	16-QAM	1 RB		4.96	4.96	4.68	13
		Full RB		6.88	7.12	6.96	13
Band 17	QPSK	1 RB	10M	5.44	5.36	5.32	13
		Full RB		5.84	5.76	5.76	13
	16-QAM	1 RB		6.52	6.08	6.12	13
		Full RB		6.80	6.60	6.60	13

LTE Band 7

QPSK-1RB, 20M Low Channel

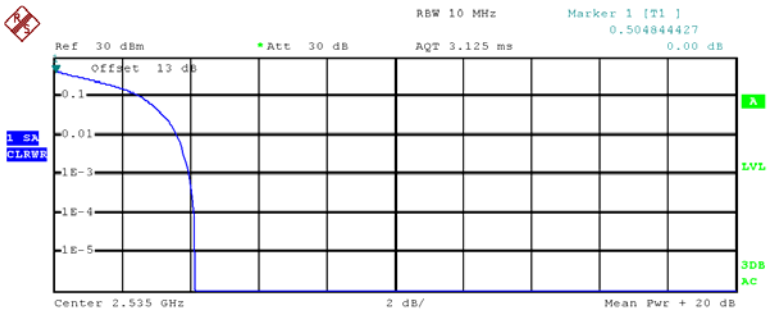


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	22.26 dBm
Peak	26.41 dBm
Crest	4.15 dB
10 %	2.36 dB
1 %	3.52 dB
.1 %	3.92 dB
.01 %	4.12 dB

Date: 29.SEP.2015 09:59:38

QPSK-1RB, 20M Middle Channel

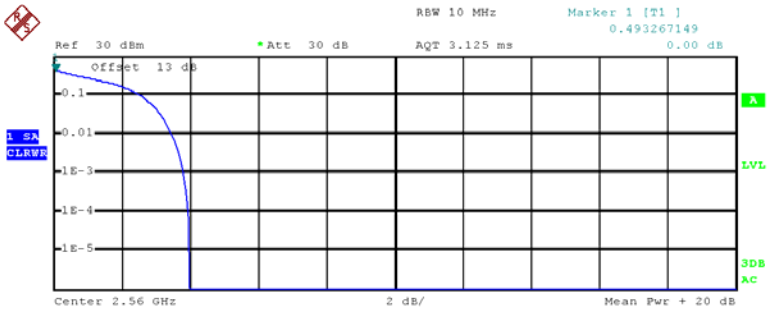


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	22.05 dBm
Peak	26.20 dBm
Crest	4.15 dB
10 %	2.60 dB
1 %	3.64 dB
.1 %	4.00 dB
.01 %	4.12 dB

Date: 29.SEP.2015 09:58:50

QPSK-1RB, 20M High Channel

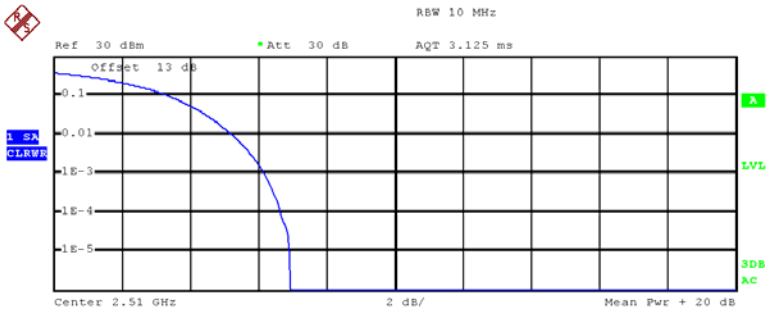


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	22.08 dBm
Peak	26.06 dBm
Crest	3.98 dB
10 %	2.60 dB
1 %	3.48 dB
.1 %	3.80 dB
.01 %	3.96 dB

Date: 29.SEP.2015 10:00:29

QPSK- Full RB, 20M Low Channel

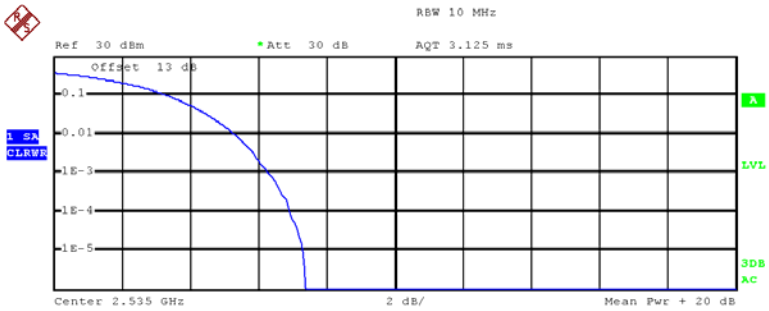


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	21.10 dBm
Peak	28.03 dBm
Crest	6.93 dB
10 %	3.44 dB
1 %	5.28 dB
.1 %	6.20 dB
.01 %	6.68 dB

Date: 29.SEP.2015 09:53:44

QPSK- Full RB, 20M Middle Channel

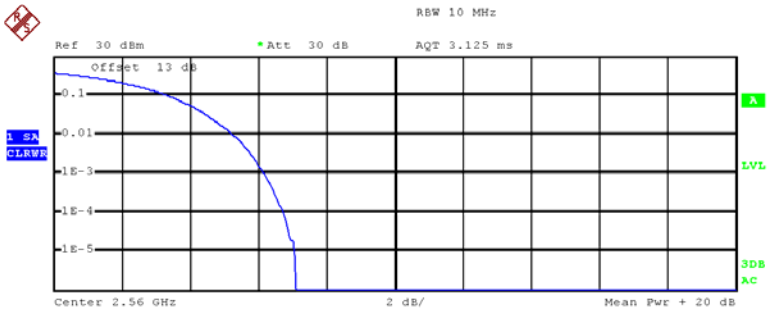


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	20.66 dBm
Peak	28.03 dBm
Crest	7.38 dB
10 %	3.40 dB
1 %	5.32 dB
.1 %	6.32 dB
.01 %	6.92 dB

Date: 29.SEP.2015 09:53:14

QPSK- Full RB, 20M High Channel

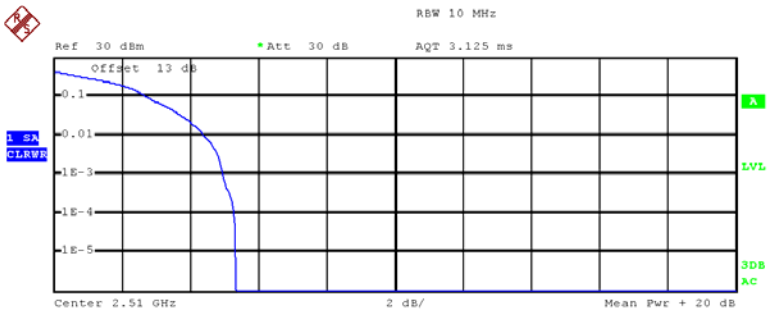


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	20.80 dBm
Peak	27.89 dBm
Crest	7.10 dB
10 %	3.44 dB
1 %	5.28 dB
.1 %	6.20 dB
.01 %	6.76 dB

Date: 29.SEP.2015 09:51:04

16QAM- 1RB, 20M Low Channel

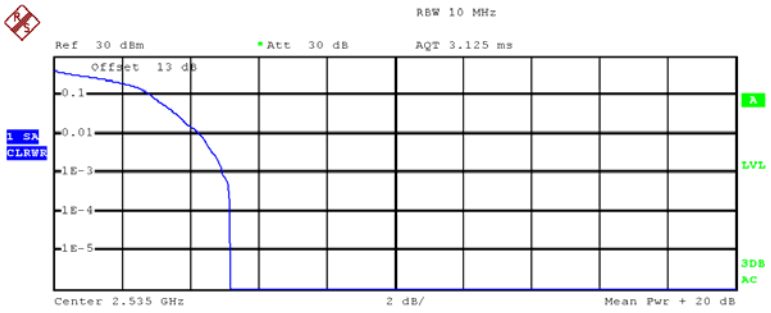


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	21.28 dBm
Peak	26.62 dBm
Crest	5.34 dB
10 %	2.76 dB
1 %	4.44 dB
.1 %	4.96 dB
.01 %	5.28 dB

Date: 29.SEP.2015 10:02:56

16QAM- 1RB, 20M Middle Channel

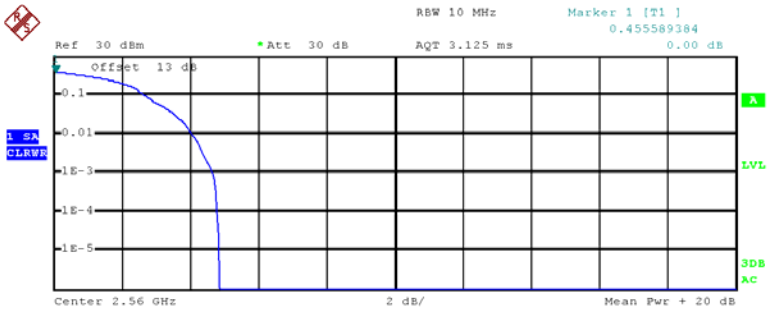


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	21.09 dBm
Peak	26.27 dBm
Crest	5.18 dB
10 %	2.88 dB
1 %	4.32 dB
.1 %	4.96 dB
.01 %	5.20 dB

Date: 29.SEP.2015 10:02:25

16QAM- 1RB, 20M High Channel

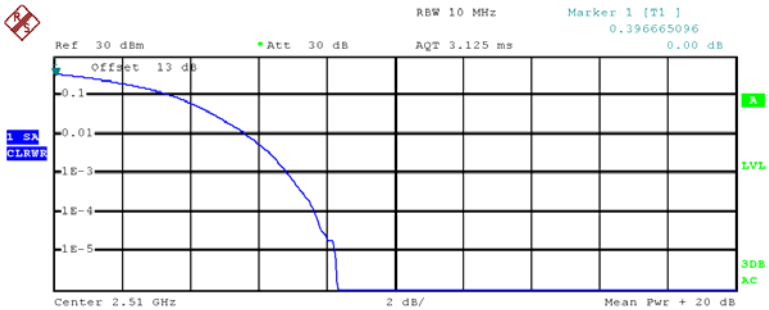


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	21.35 dBm
Peak	26.20 dBm
Crest	4.85 dB
10 %	2.72 dB
1 %	4.08 dB
.1 %	4.68 dB
.01 %	4.80 dB

Date: 29.SEP.2015 10:01:30

16QAM- Full RB, 20M Low Channel

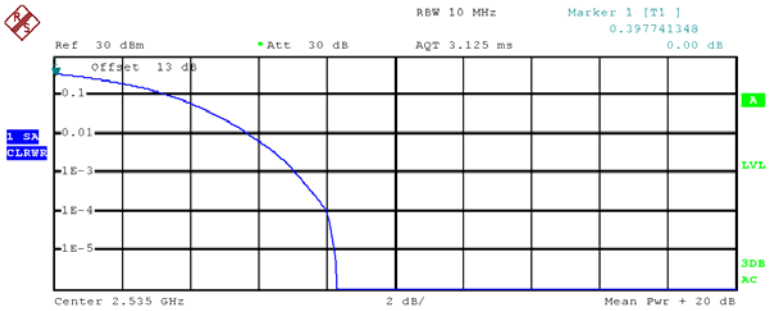


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	19.01 dBm
Peak	27.33 dBm
Crest	8.32 dB
10 %	3.56 dB
1 %	5.68 dB
.1 %	6.88 dB
.01 %	7.68 dB

Date: 29.SEP.2015 10:13:49

16QAM- Full RB, 20M Middle Channel

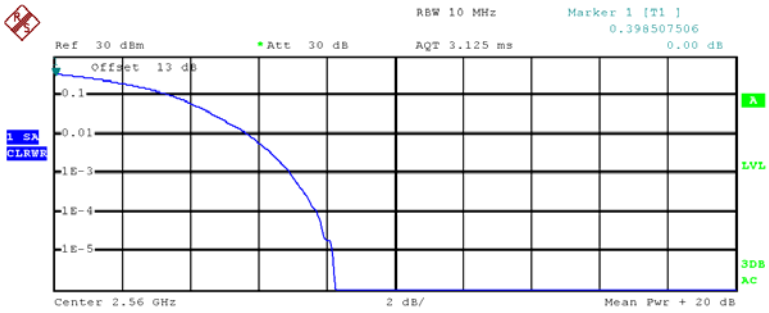


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	18.67 dBm
Peak	26.98 dBm
Crest	8.31 dB
10 %	3.48 dB
1 %	5.76 dB
.1 %	7.12 dB
.01 %	8.04 dB

Date: 29.SEP.2015 10:15:20

16QAM- Full RB, 20M High Channel



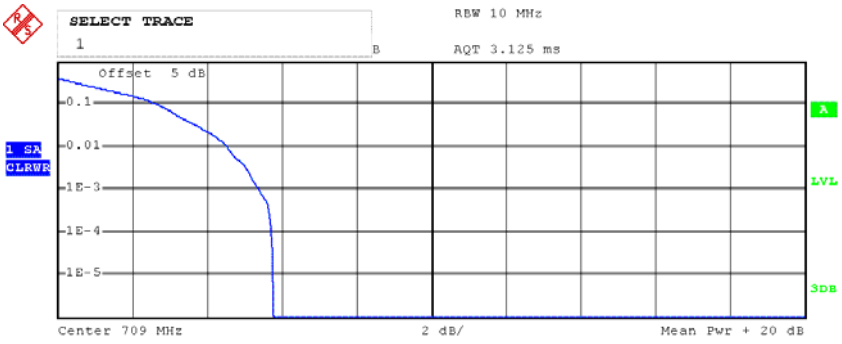
Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	19.79 dBm
Peak	28.03 dBm
Crest	8.24 dB
10 %	3.56 dB
1 %	5.76 dB
.1 %	6.96 dB
.01 %	7.76 dB

Date: 29.SEP.2015 10:17:23

LTE Band 17

QPSK-1RB, 10M Low Channel

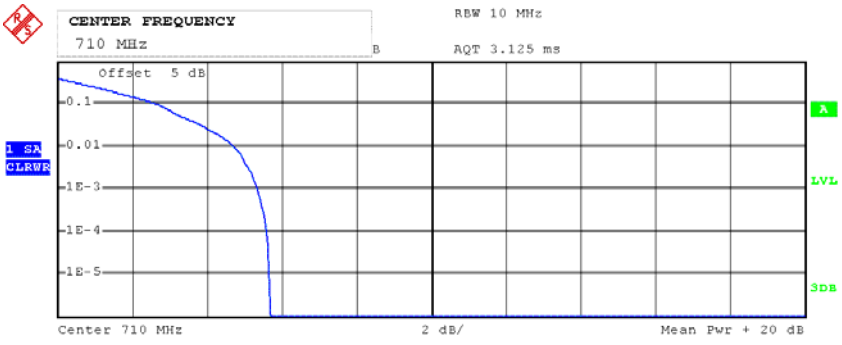


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	22.90 dBm
Peak	28.66 dBm
Crest	5.76 dB
10% @	2.76 dB
1% @	4.56 dB
.1% @	5.44 dB

Date: 3.SEP.2015 09:46:58

QPSK-1RB, 10M Middle Channel

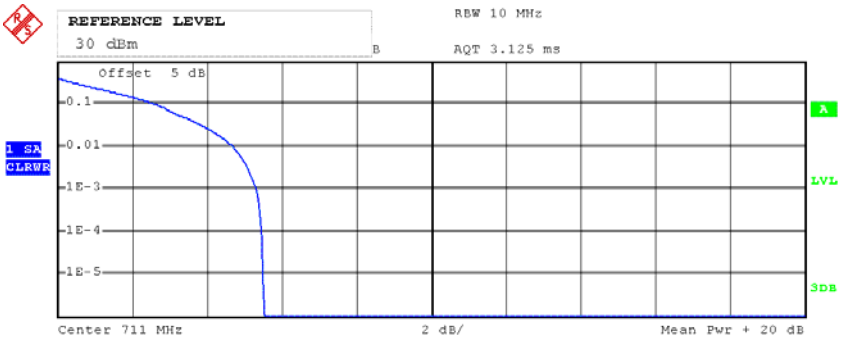


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	22.70 dBm
Peak	28.38 dBm
Crest	5.68 dB
10% @	2.72 dB
1% @	4.76 dB
.1% @	5.36 dB

Date: 3.SEP.2015 09:50:07

QPSK-1RB, 10M High Channel

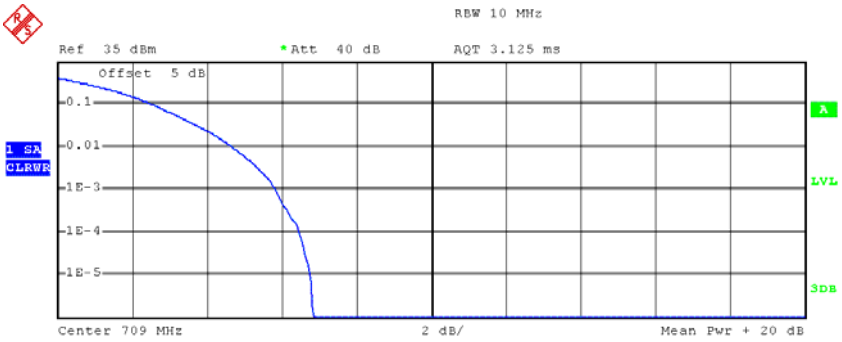


Complementary Cumulative Distribution Function (100000 samples)

Trace 1	
Mean	22.66 dBm
Peak	28.18 dBm
Crest	5.51 dB
10% @	2.72 dB
1% @	4.72 dB
.1% @	5.32 dB

Date: 3.SEP.2015 10:01:35

QPSK- Full RB, 10M Low Channel

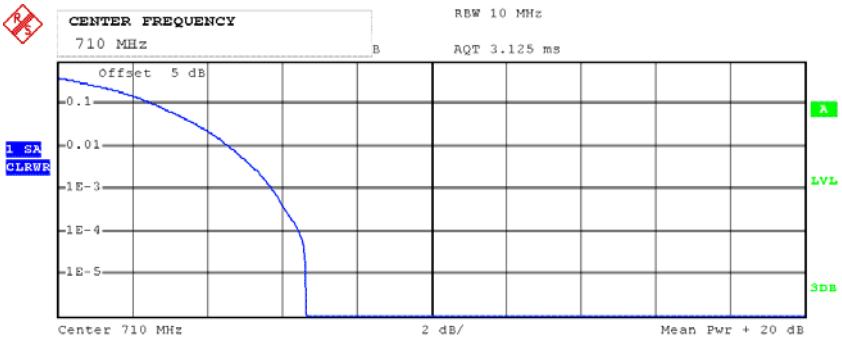


Complementary Cumulative Distribution Function (100000 samples)

Trace 1	
Mean	21.54 dBm
Peak	28.38 dBm
Crest	6.84 dB
10% @	2.60 dB
1% @	4.72 dB
.1% @	5.84 dB

Date: 3.SEP.2015 09:43:04

QPSK- Full RB, 10M Middle Channel

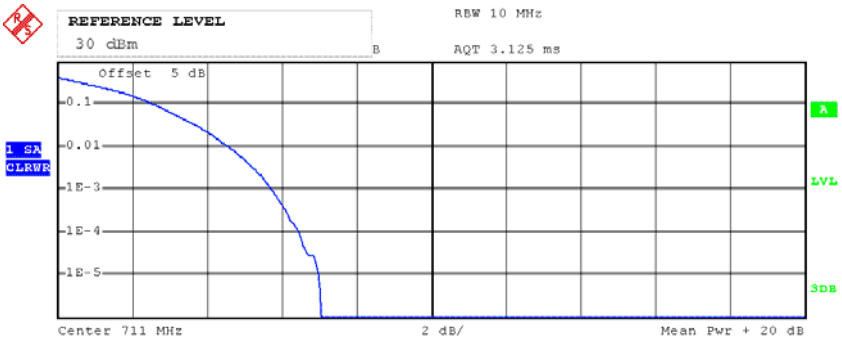


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	21.44 dBm
Peak	28.10 dBm
Crest	6.66 dB
10% @	2.64 dB
1% @	4.64 dB
.1% @	5.76 dB

Date: 3.SEP.2015 09:51:16

QPSK- Full RB, 10M High Channel

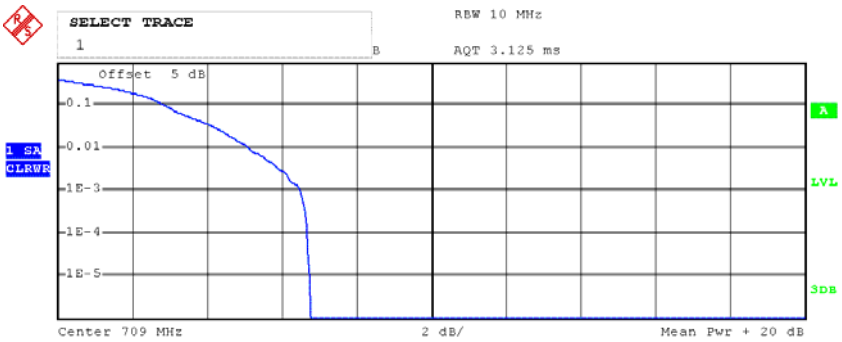


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	21.33 dBm
Peak	28.39 dBm
Crest	7.06 dB
10% @	2.64 dB
1% @	4.60 dB
.1% @	5.76 dB

Date: 3.SEP.2015 10:02:51

16QAM- 1RB, 10M Low Channel

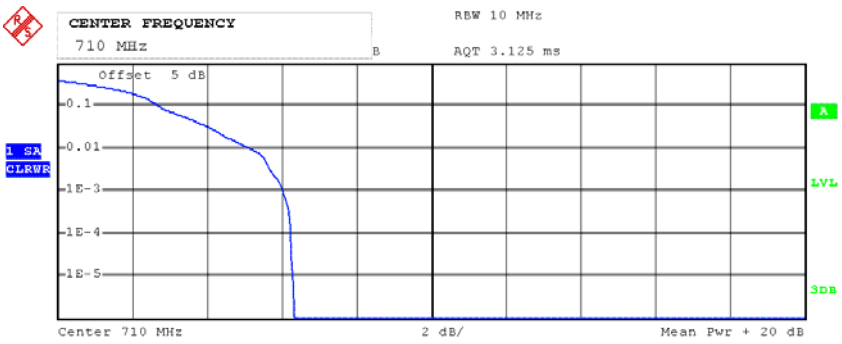


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	21.96 dBm
Peak	28.73 dBm
Crest	6.77 dB
10% @	2.92 dB
1% @	5.12 dB
.1% @	6.52 dB

Date: 3.SEP.2015 09:46:02

16QAM- 1RB, 10M Middle Channel

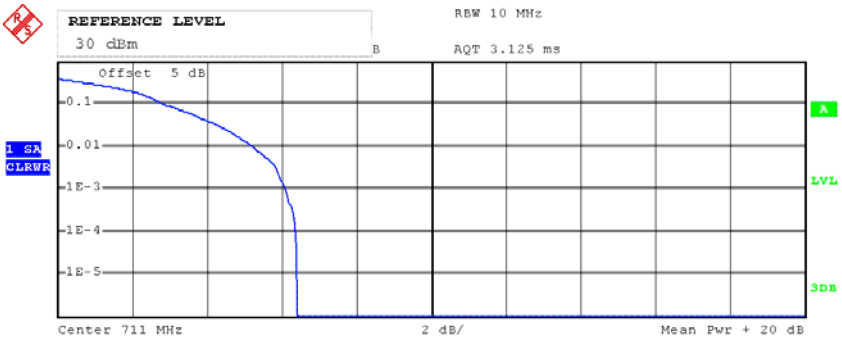


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	21.98 dBm
Peak	28.31 dBm
Crest	6.33 dB
10% @	2.76 dB
1% @	5.24 dB
.1% @	6.08 dB

Date: 3.SEP.2015 09:50:24

16QAM- 1RB, 10M High Channel

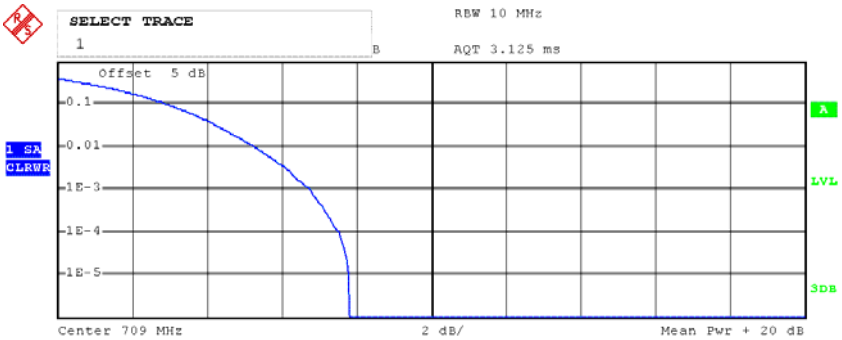


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	21.91 dBm
Peak	28.32 dBm
Crest	6.41 dB
10% @	2.96 dB
1% @	5.24 dB
.1% @	6.12 dB

Date: 3.SEP.2015 10:01:51

16QAM- Full RB, 10M Low Channel

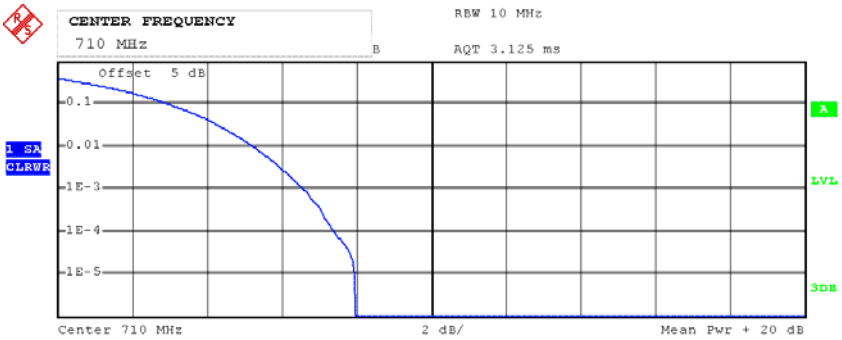


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	20.55 dBm
Peak	28.38 dBm
Crest	7.83 dB
10% @	3.04 dB
1% @	5.32 dB
.1% @	6.80 dB

Date: 3.SEP.2015 09:44:16

16QAM- Full RB, 10M Middle Channel

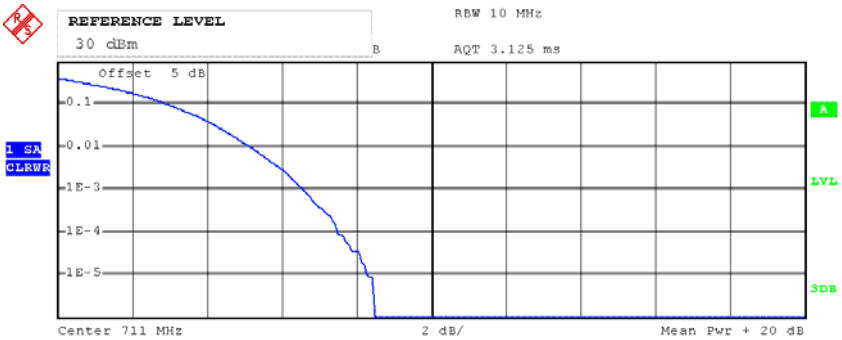


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	20.46 dBm
Peak	28.45 dBm
Crest	7.99 dB
10% @	3.08 dB
1% @	5.28 dB
.1% @	6.60 dB

Date: 3.SEP.2015 09:51:05

16QAM- Full RB, 10M High Channel



Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	20.32 dBm
Peak	28.81 dBm
Crest	8.49 dB
10% @	3.04 dB
1% @	5.20 dB
.1% @	6.60 dB

Date: 3.SEP.2015 10:02:44

ERP & EIRP

PART 22H

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
GSM 850 Middle Channel								
836.600	H	98.65	23.7	0.0	1.0	22.7	38.50	15.8
836.600	V	103.36	31.6	0.0	1.0	30.6	38.50	7.9
EGPRS 850 Middle Channel								
836.600	H	91.64	16.7	0.0	1.0	15.7	38.50	22.8
836.600	V	97.85	26.1	0.0	1.0	25.1	38.50	13.4
WCDMA Band V Middle Channel								
836.600	H	89.80	14.9	0.0	1.0	13.9	38.50	24.6
836.600	V	94.83	23	0.0	1.0	22.0	38.50	16.5

PART 24E

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
PCS 1900 Middle Channel								
1880.000	H	84.62	13	11.7	1.4	23.3	33.0	9.7
1880.000	V	91.02	19.6	11.7	1.4	29.9	33.0	3.1
EGPRS 1900 Middle Channel								
1880.000	H	83.15	11.6	11.7	1.4	21.9	33.0	11.1
1880.000	V	88.36	16.9	11.7	1.4	27.2	33.0	5.8
WCDMA Band II Middle Channel								
1880.000	H	78.09	6.5	11.7	1.4	16.8	33.0	16.2
1880.000	V	83.34	11.9	11.7	1.4	22.2	33.0	10.8

PART 27

LTE Band 7

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK 5M BW Middle Channel								
2535.000	H	79.16	8	13.1	2.5	18.6	33.00	14.4
2535.000	V	78.20	8.5	13.1	2.5	19.1	33.00	13.9
QPSK 10M BW Middle Channel								
2535.000	H	78.51	7.3	13.1	2.5	17.9	33.00	15.1
2535.000	V	77.65	7.9	13.1	2.5	18.5	33.00	14.5
QPSK 15M BW Middle Channel								
2535.000	H	78.89	7.7	13.1	2.5	18.3	33.00	14.7
2535.000	V	77.91	8.2	13.1	2.5	18.8	33.00	14.2
QPSK 20M BW Middle Channel								
2535.000	H	78.23	7	13.1	2.5	17.6	33.00	15.4
2535.000	V	77.28	7.5	13.1	2.5	18.1	33.00	14.9
16-QAM 5M BW Middle Channel								
2535.000	H	79.85	8.6	13.1	2.5	19.2	33.00	13.8
2535.000	V	79.27	9.5	13.1	2.5	20.1	33.00	12.9
16-QAM 10M BW Middle Channel								
2535.000	H	79.31	8.1	13.1	2.5	18.7	33.00	14.3
2535.000	V	78.28	8.5	13.1	2.5	19.1	33.00	13.9
16-QAM 15M BW Middle Channel								
2535.000	H	78.82	7.6	13.1	2.5	18.2	33.00	14.8
2535.000	V	77.75	8	13.1	2.5	18.6	33.00	14.4
16-QAM 20M BW Middle Channel								
2535.000	H	78.31	7.1	13.1	2.5	17.7	33.00	15.3
2535.000	V	77.42	7.7	13.1	2.5	18.3	33.00	14.7

LTE Band 17

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK 5M BW Middle Channel								
710.000	H	87.29	10.5	0.0	0.9	9.6	34.77	25.2
710.000	V	94.14	19.8	0.0	0.9	18.9	34.77	15.9
QPSK 10M BW Middle Channel								
710.000	H	86.96	10.1	0.0	0.9	9.2	34.77	25.6
710.000	V	93.56	19.2	0.0	0.9	18.3	34.77	16.5
16-QAM 5M BW Middle Channel								
710.000	H	86.69	9.9	0.0	0.9	9.0	34.77	25.8
710.000	V	93.76	19.4	0.0	0.9	18.5	34.77	16.3
16-QAM 10M BW Middle Channel								
710.000	H	86.48	9.7	0.0	0.9	8.8	34.77	26.0
710.000	V	93.69	19.3	0.0	0.9	18.4	34.77	16.4

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

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

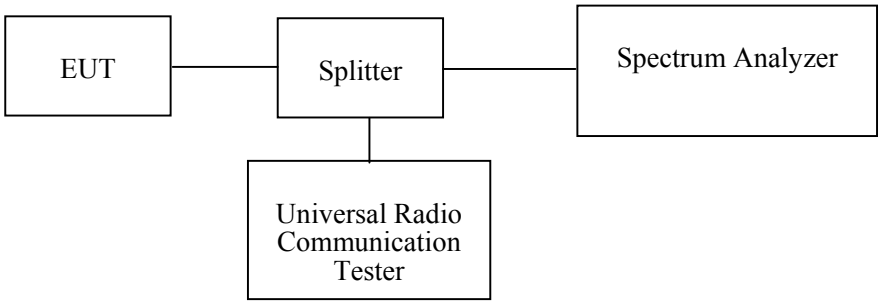
Applicable Standard

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

Test Procedure

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

The 26 dB & 99% bandwidth was recorded.



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2015-05-09	2016-05-09
R&S	Universal Radio Communication Tester	CMU200	109038	2015-05-09	2016-05-09
R&S	Wideband Radio Communication Tester	CMW500	106891	2014-11-23	2015-11-23

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

Test Data

Environmental Conditions

Temperature:	26.1~27.2 °C
Relative Humidity:	51~56%
ATM Pressure:	99.9~100.3 kPa

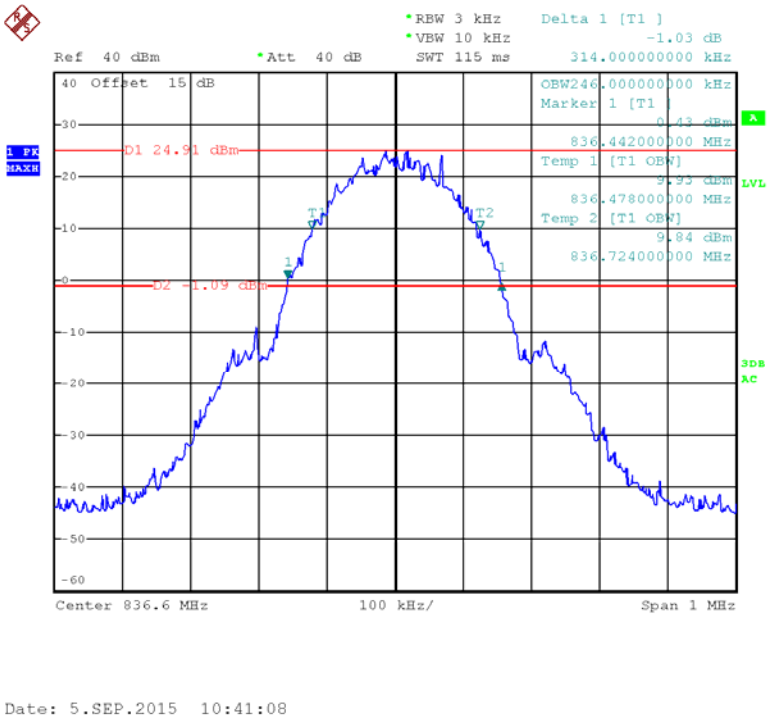
The testing was performed by Dean Liu from 2015-08-30 to 2015-09-10.

Test Mode: Transmitting

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

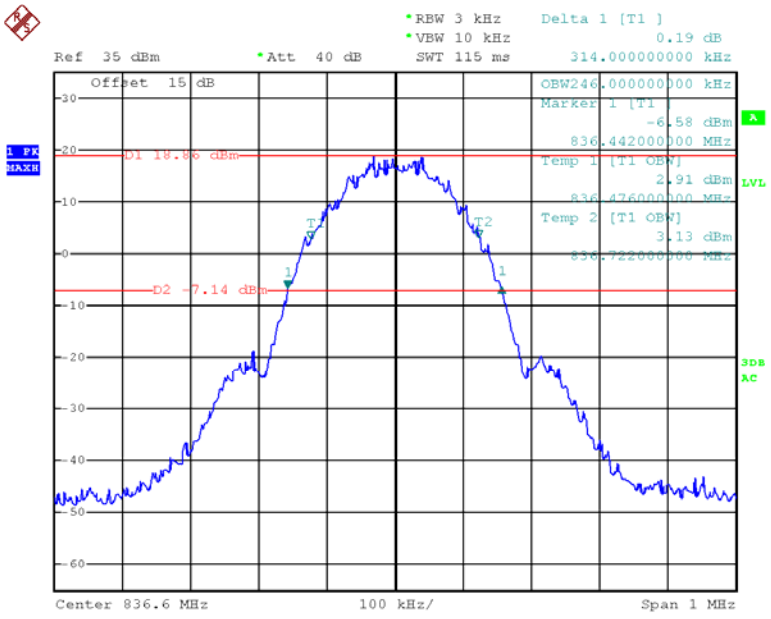
Band	Channel No.	Mode	99% Occupied Bandwidth (kHz)	26 dB Occupied Bandwidth (kHz)
Cellular	190	GSM	246	314
		EDGE	246	314
PCS	661	PCS	248	314
		EDGE	248	316
WCDMA Band Ⅱ	9400	Rel 99	4180	4700
	9400	HSDPA	4180	4700
	9400	HSUPA	4180	4700
WCDMA Band V	4183	Rel 99	4220	4880
	4183	HSDPA	4220	4880
	4183	HSUPA	4220	4900

GMSK 850 Cellular Band



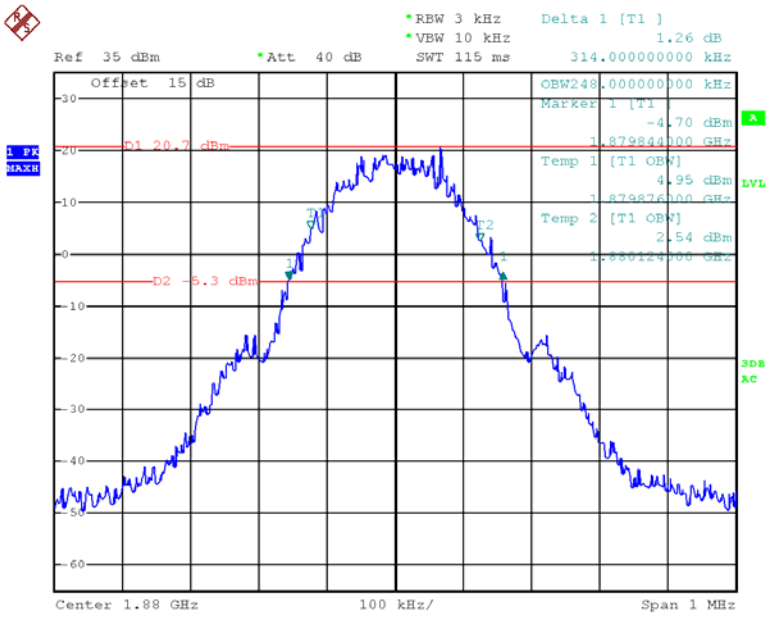
Date: 5.SEP.2015 10:41:08

EDGE 850 Cellular Band



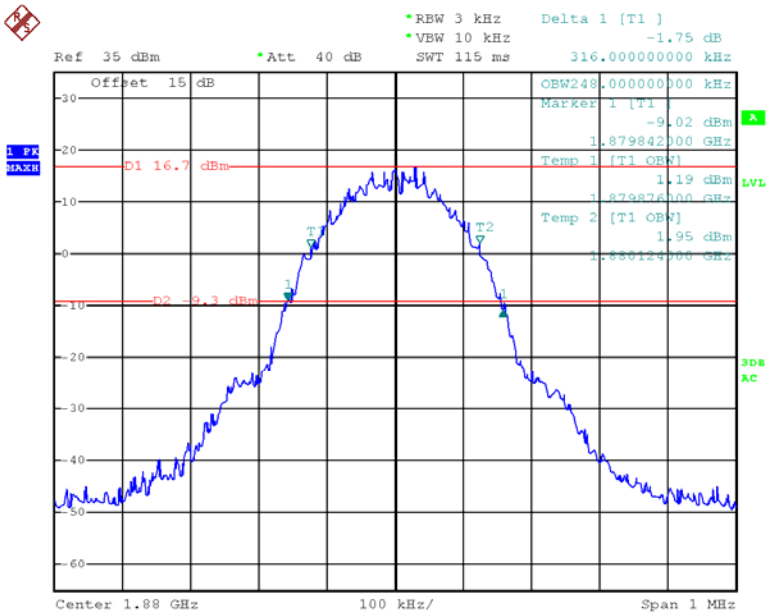
Date: 5.SEP.2015 11:04:47

GMSK PCS Band



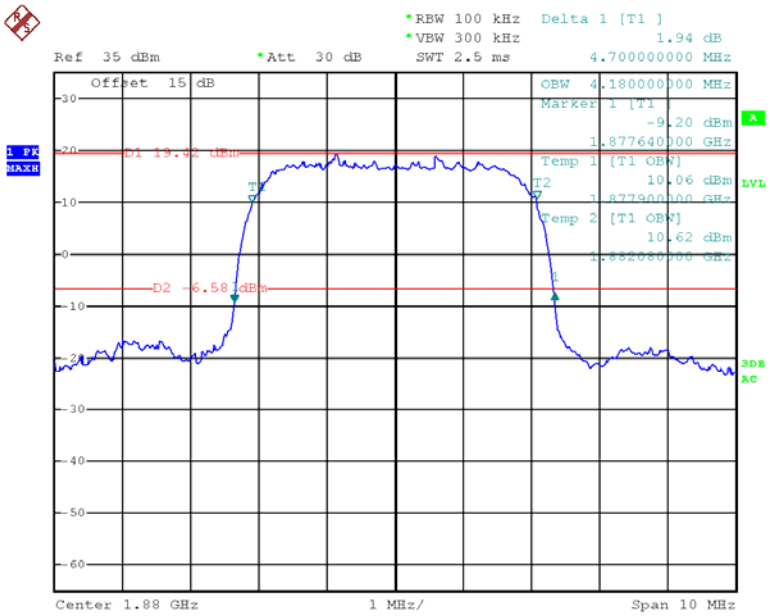
Date: 5.SEP.2015 11:42:27

EDGE PCS Band



Date: 5.SEP.2015 13:26:44

REL99 Band II



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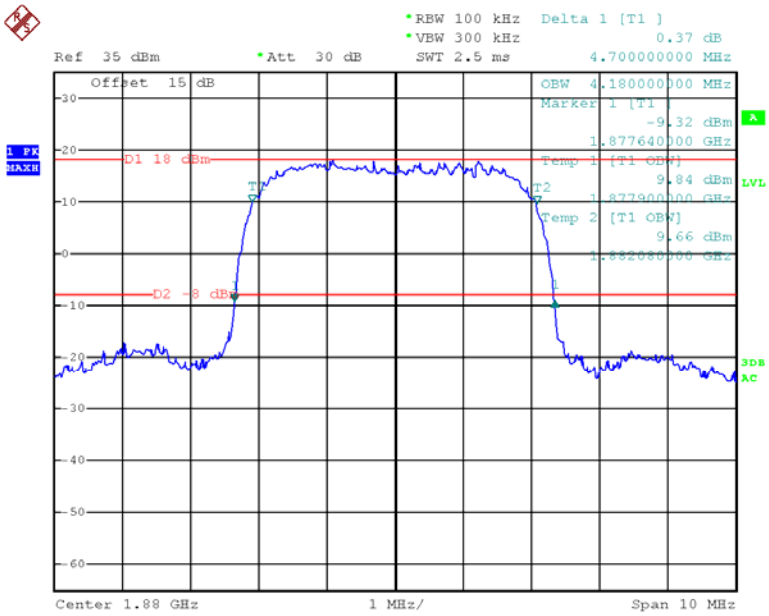
HSDPA Band II



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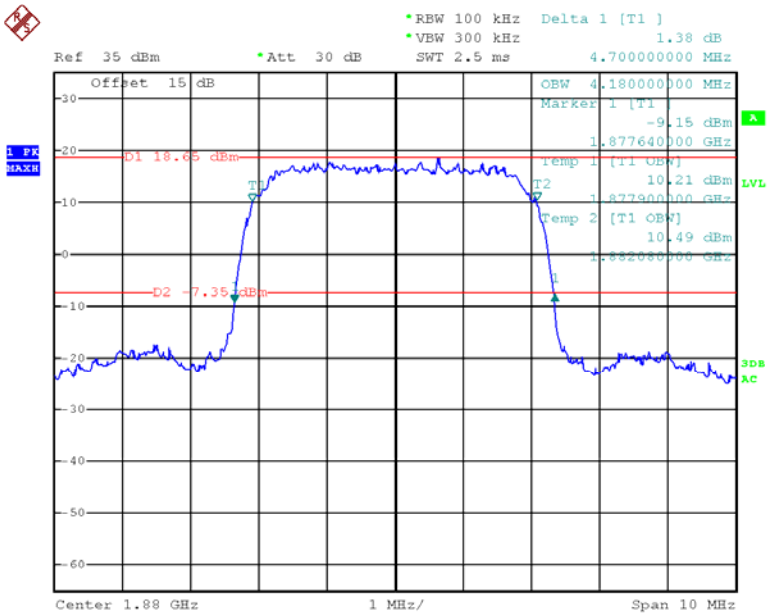
HSUPA Band II



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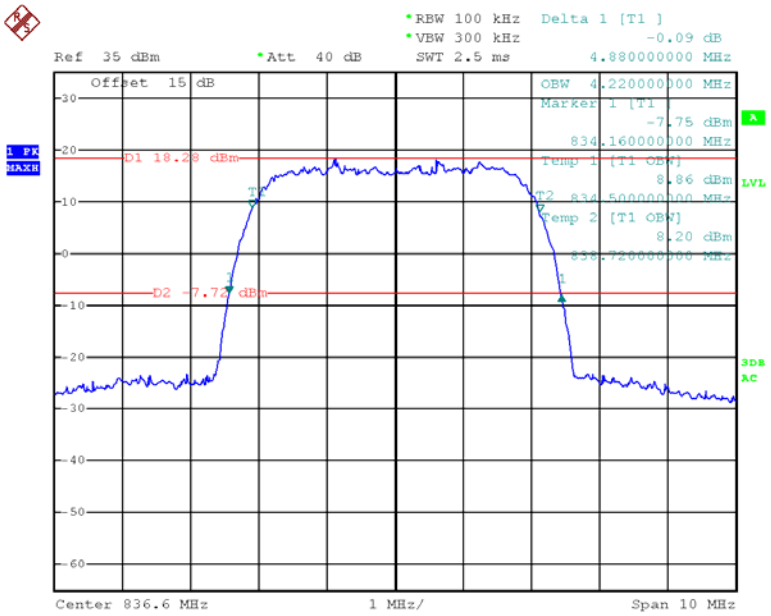
REL99 Band V



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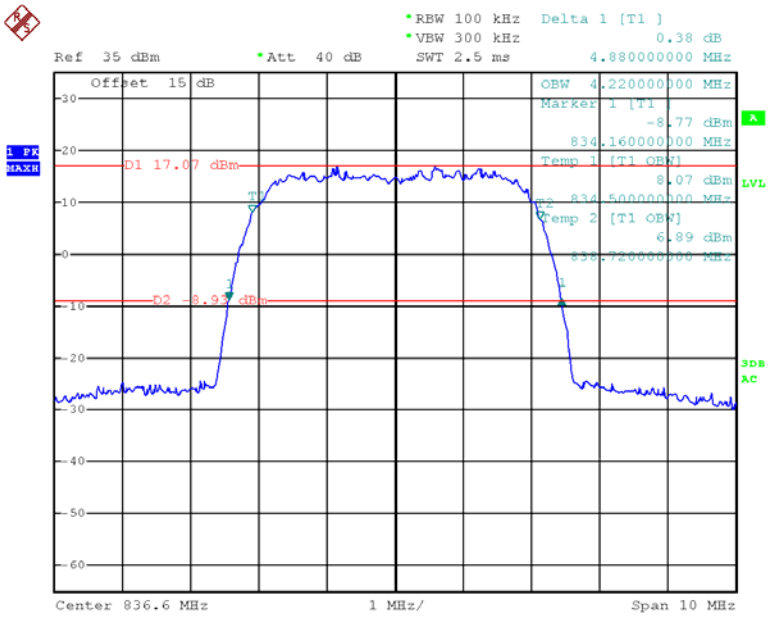
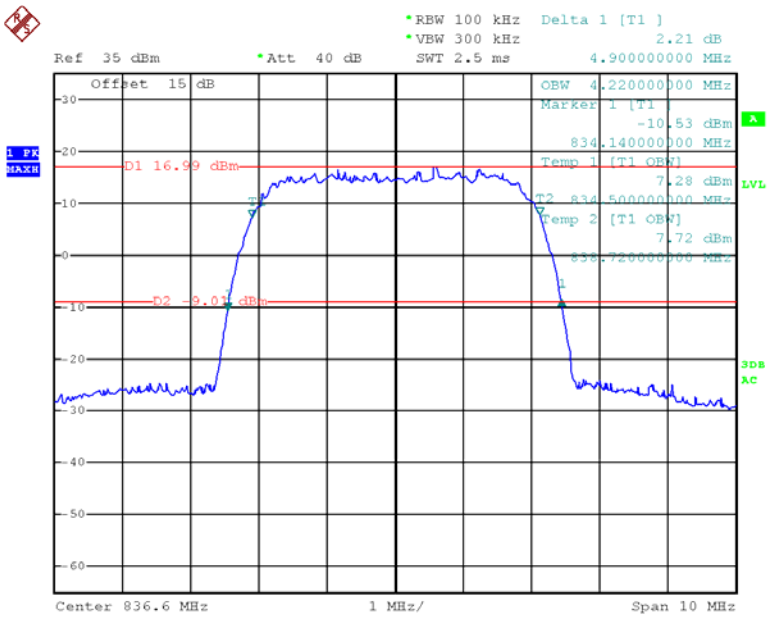
HSDPA Band V



Date: 5.SEP.2015 13:47:29

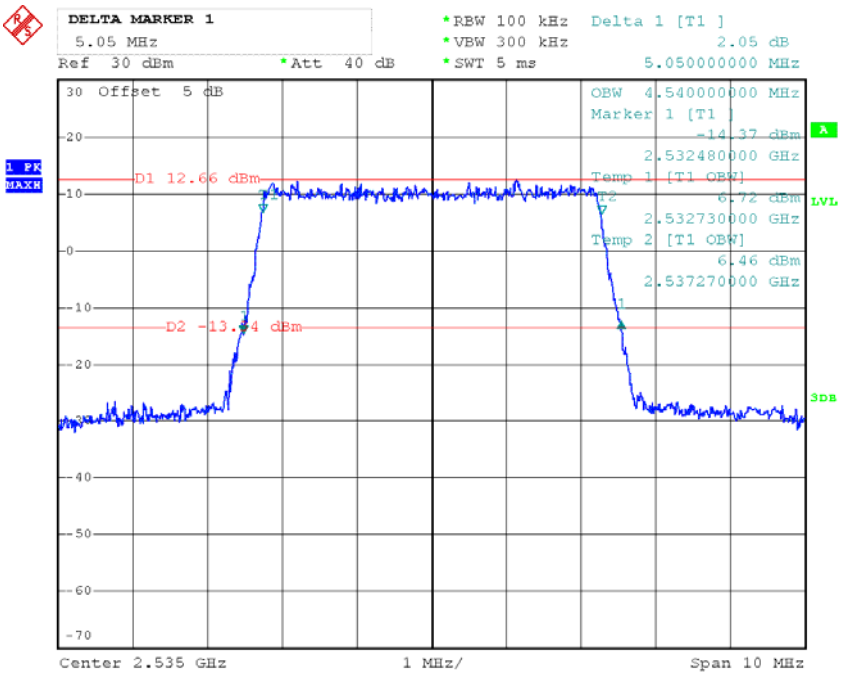
HSUPA Band V



Date: 5.SEP.2015 13:48:44

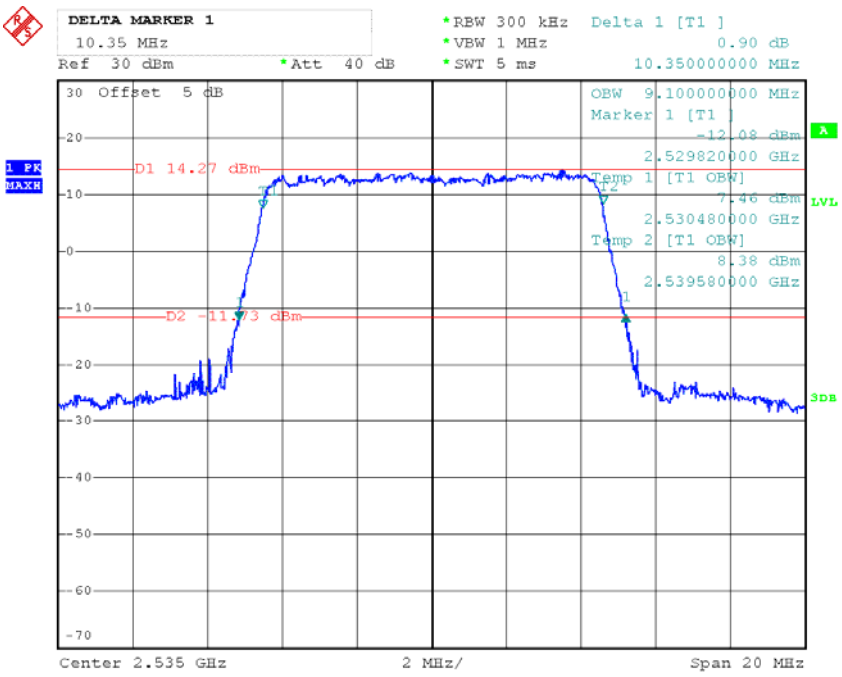
LTE Band	Test Modulation	Test Bandwidth	Test Channel	99% Occupied Bandwidth	26 dB Bandwidth
				MHz	MHz
Band 7	QPSK	5M	Middle	4.54	5.05
		10M		9.10	10.35
		15M		13.53	15.06
		20M		18.00	19.52
	16-QAM	5M	Middle	4.52	5.07
		10M		9.10	10.20
		15M		13.56	15.06
		20M		18.08	19.76
Band 17	QPSK	5M	Middle	4.569	5.11
		10M		9.138	10.38
	16-QAM	5M	Middle	4.529	5.11
		10M		9.138	10.261

QPSK, Band 7-5M



Date: 30.AUG.2015 17:15:32

QPSK, Band 7-10M



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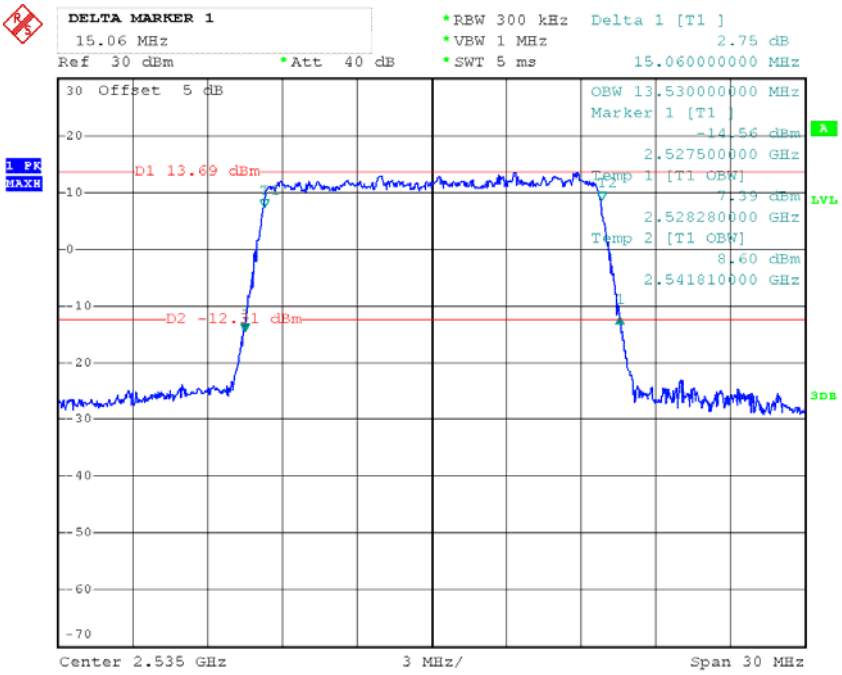
QPSK, Band 7-15M



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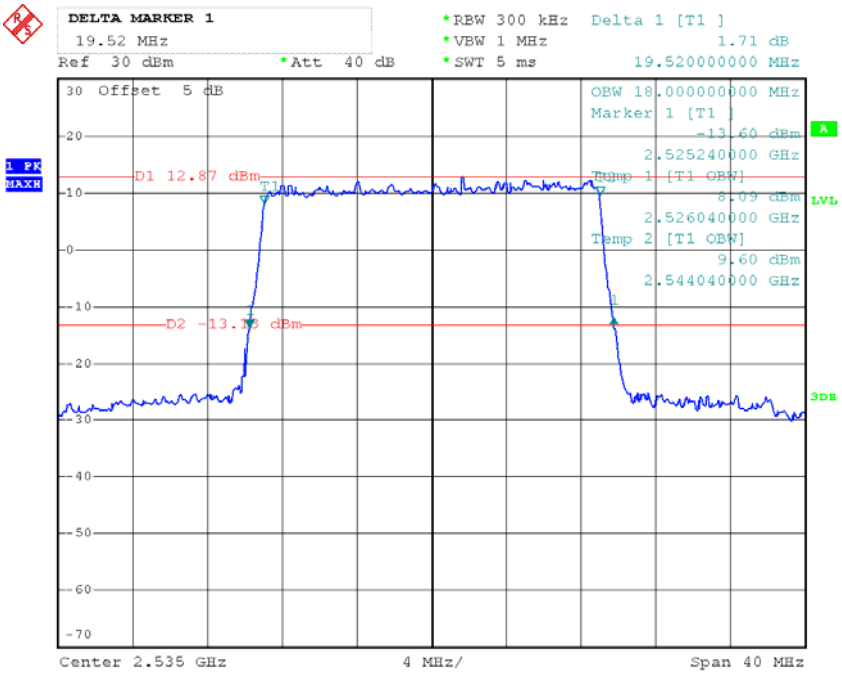
QPSK, Band 7-20M



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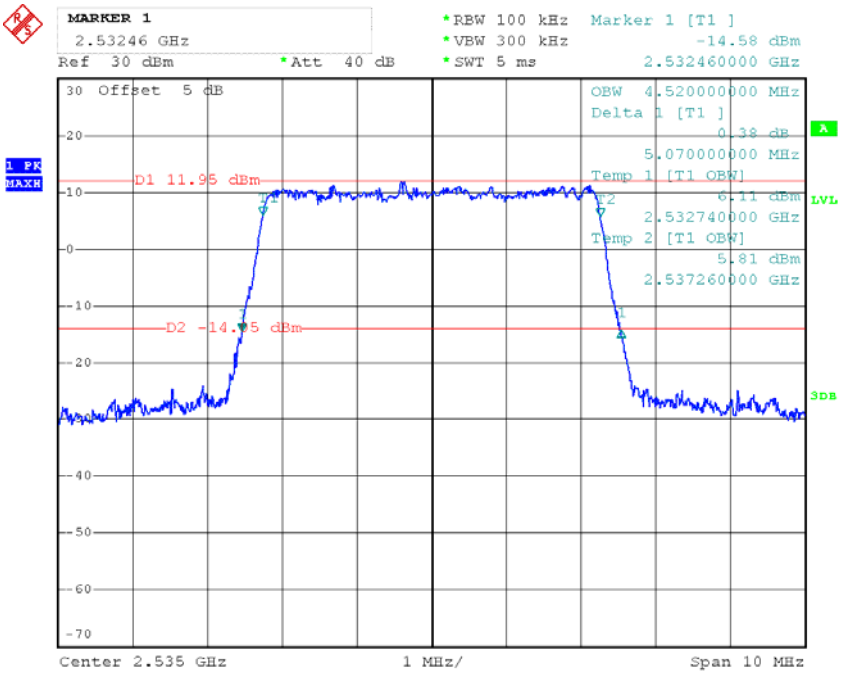
16-QAM, Band 7-5M



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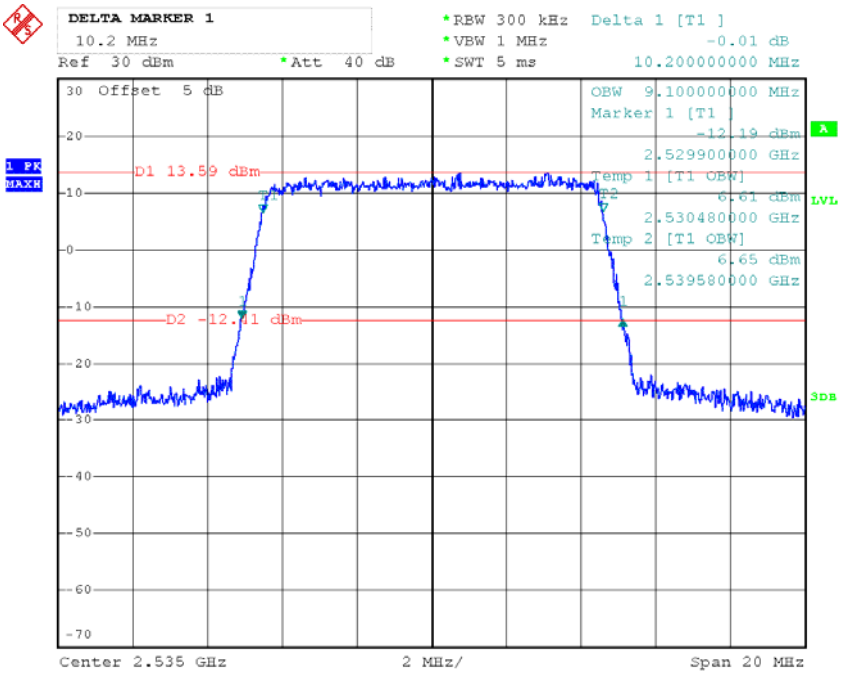
16-QAM, Band 7-10M



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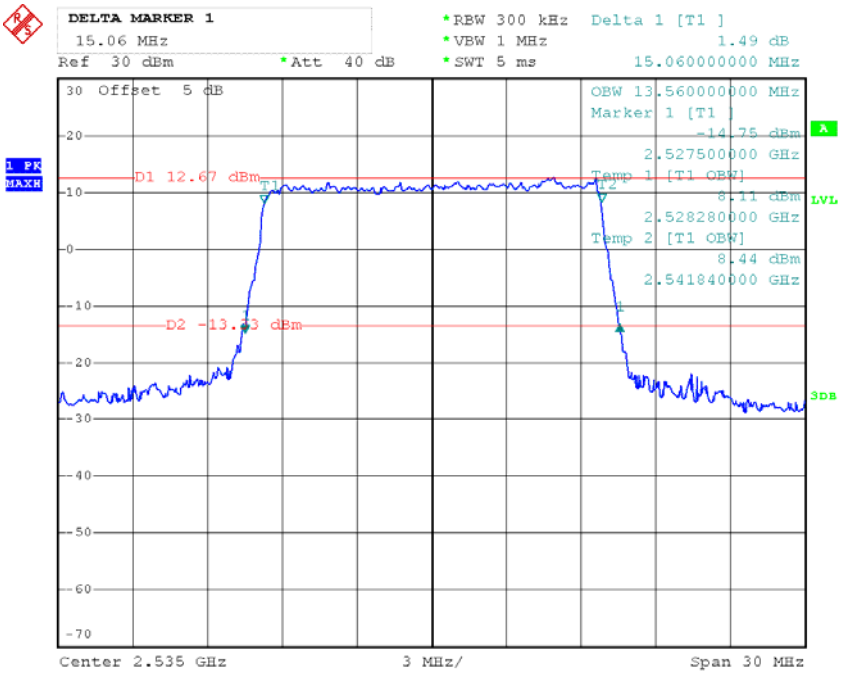
16-QAM, Band 7-15M



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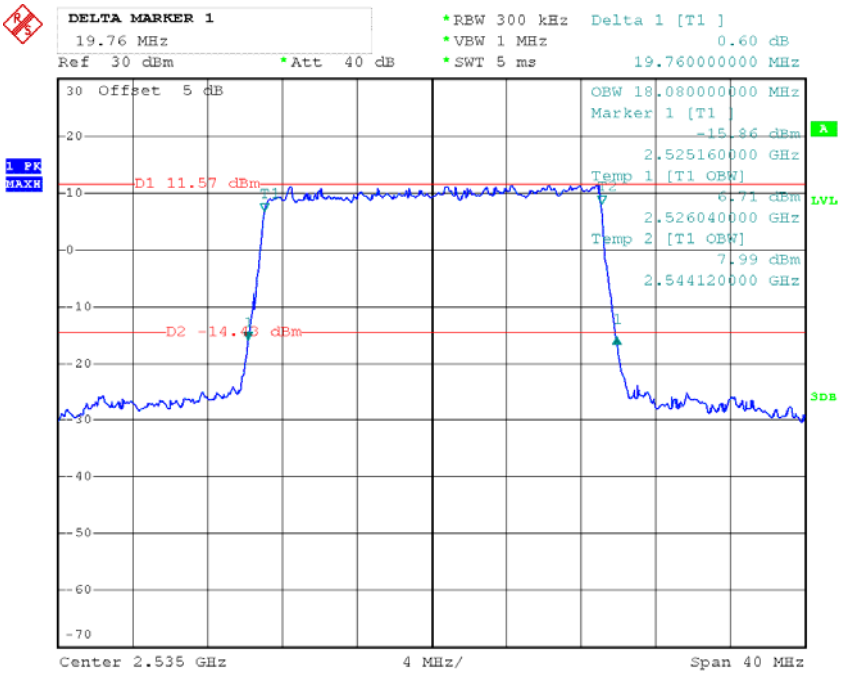
16-QAM, Band 7-20M



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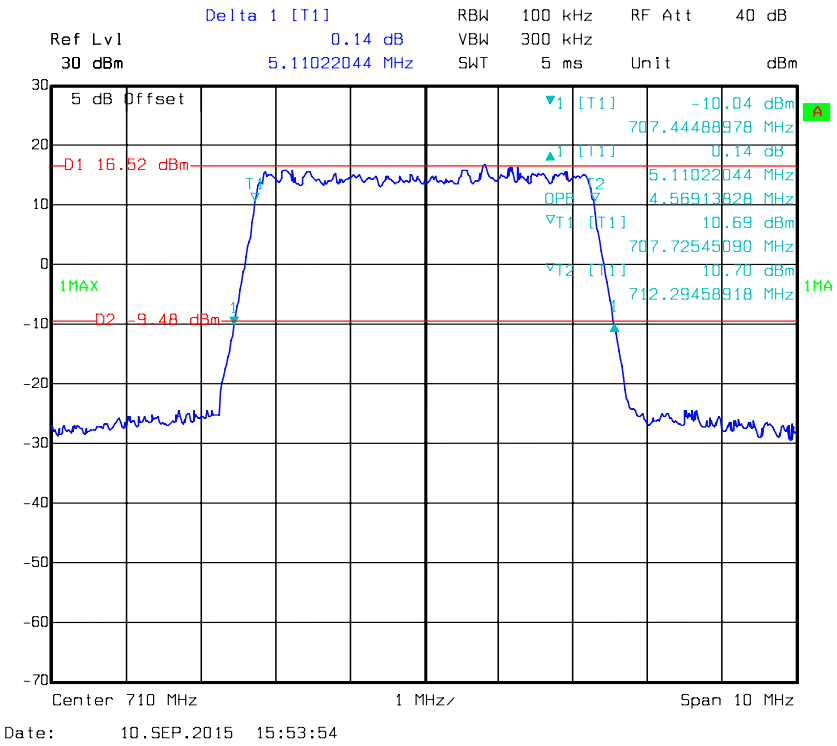
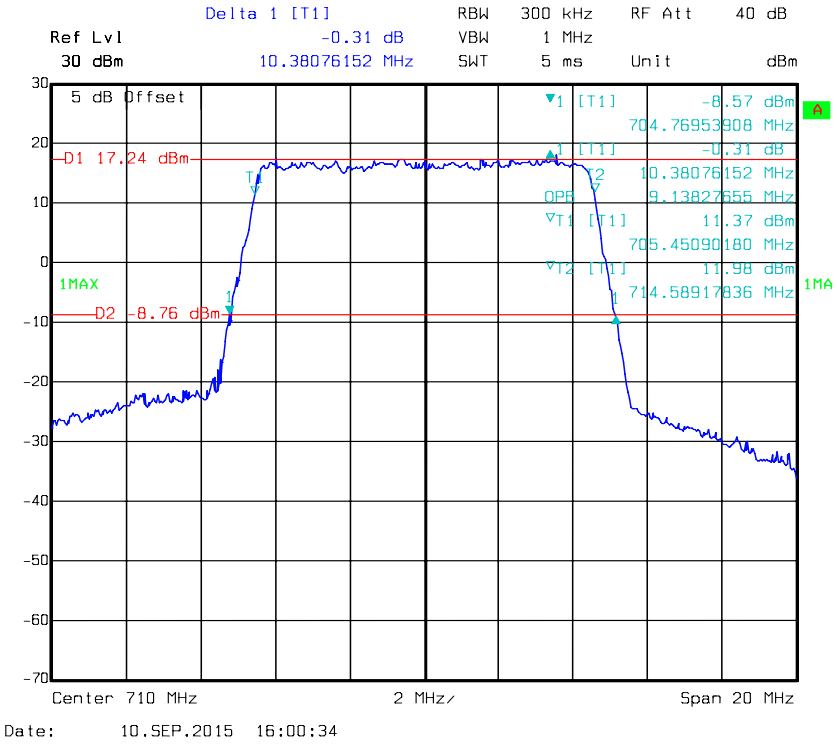
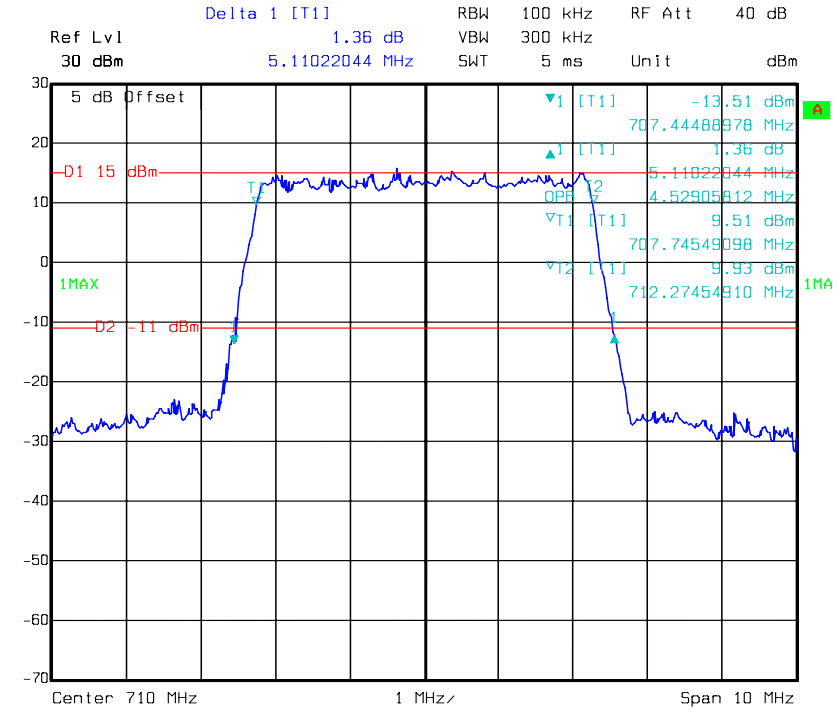
QPSK, Band 17-5M



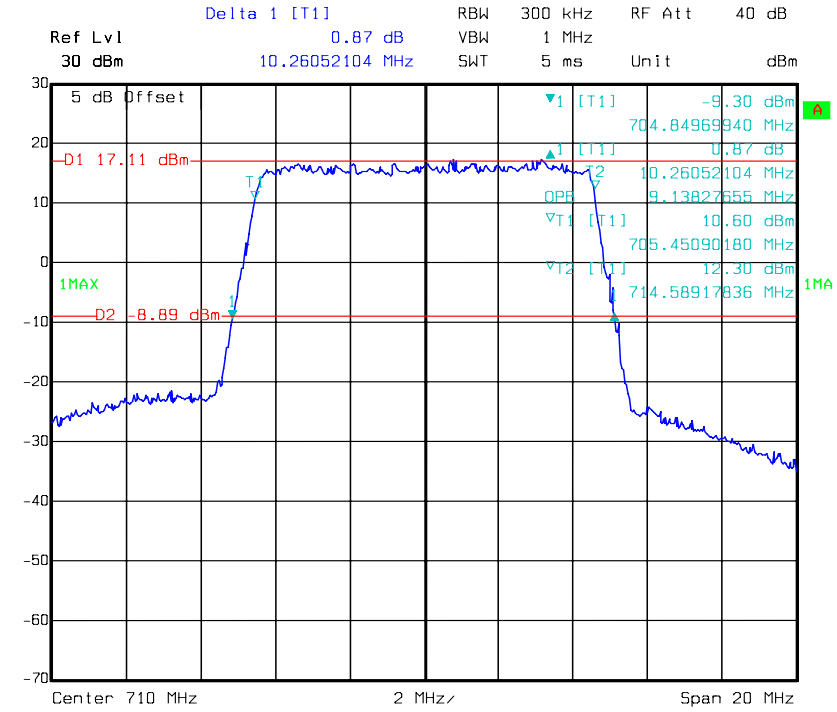
QPSK, Band 17-10M



16-QAM, Band 17-5M



16-QAM, Band 17-10M



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

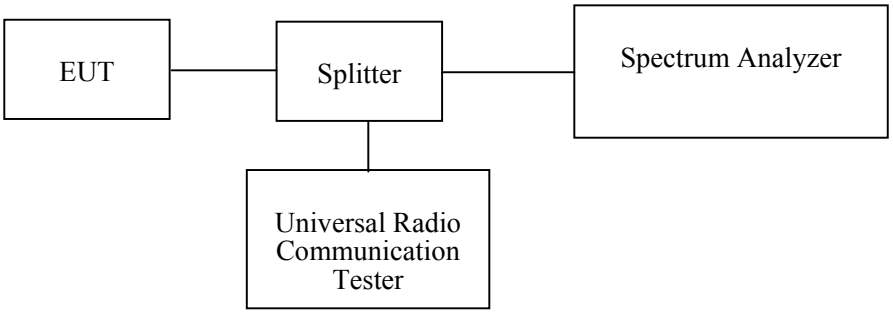
Applicable Standard

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

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

Test Procedure

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



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2015-05-09	2016-05-09
R&S	Universal Radio Communication Tester	CMU200	109038	2015-05-09	2016-05-09
R&S	Wideband Radio Communication Tester	CMW500	106891	2014-11-23	2015-11-23

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

Test Data

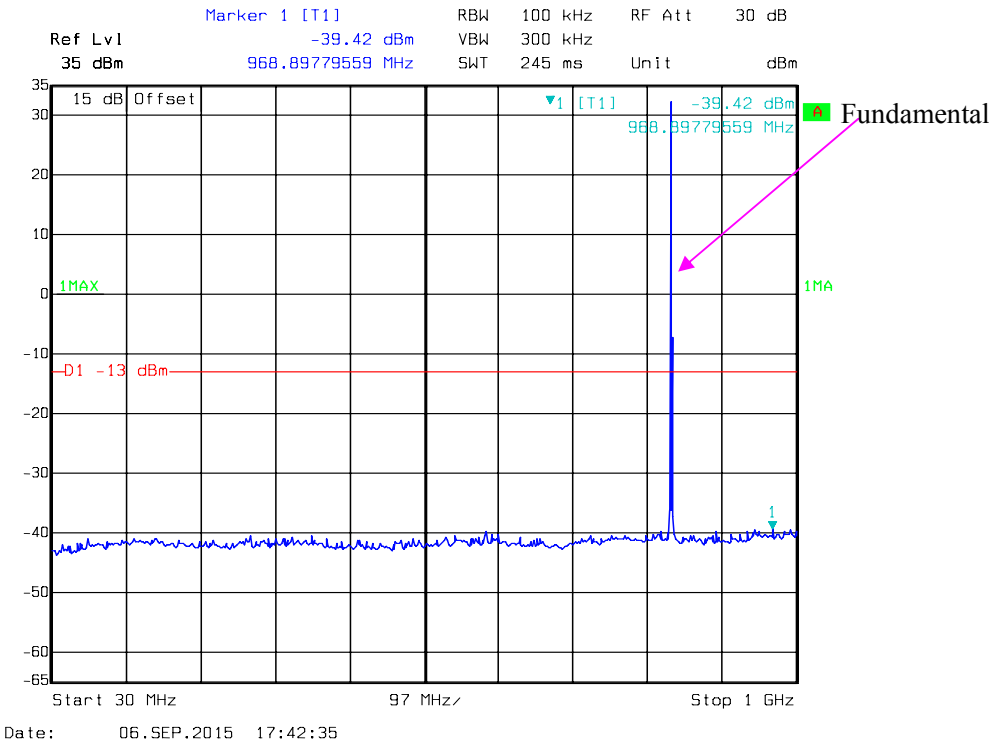
Environmental Conditions

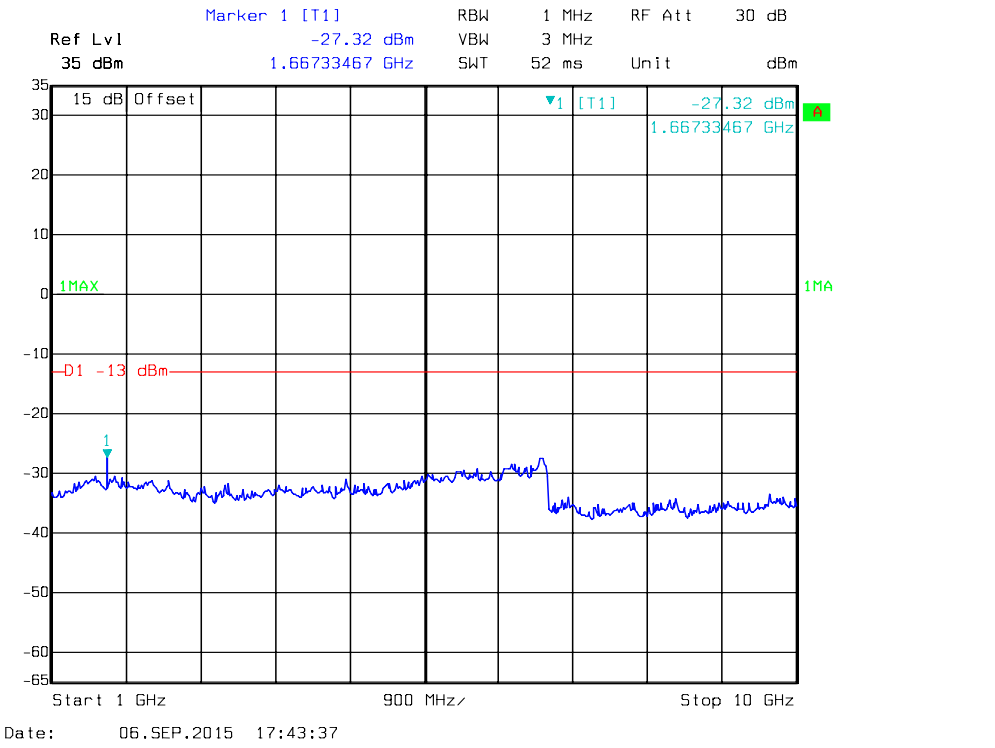
Temperature:	26.1~26.6 °C
Relative Humidity:	51~55 %
ATM Pressure:	100~100.3 kPa

The testing was performed by Dean Liu from 2015-09-06 to 2015-09-13.

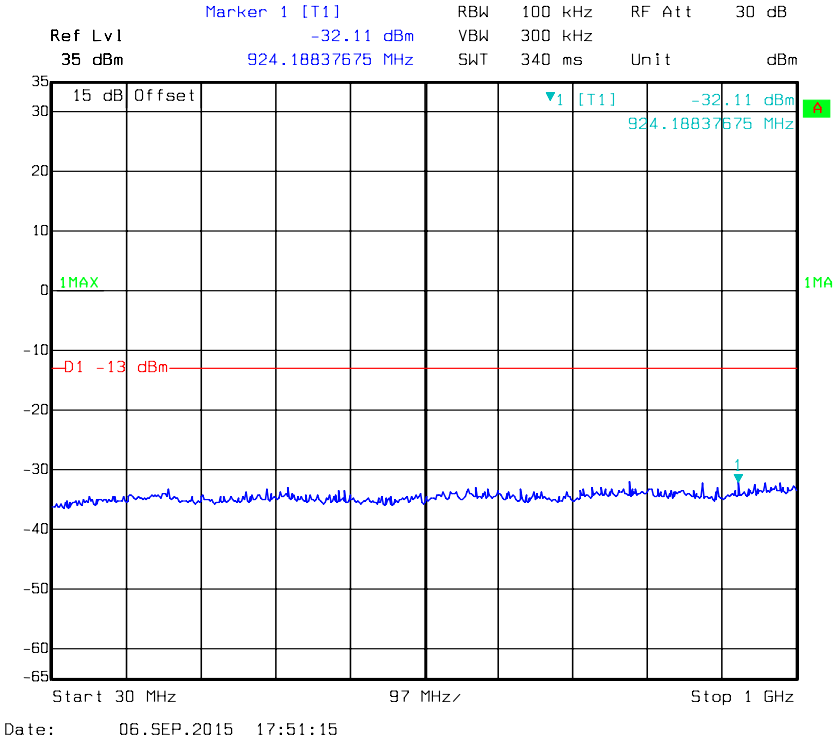
Please refer to the following plots.

GSM850_Middle Channel

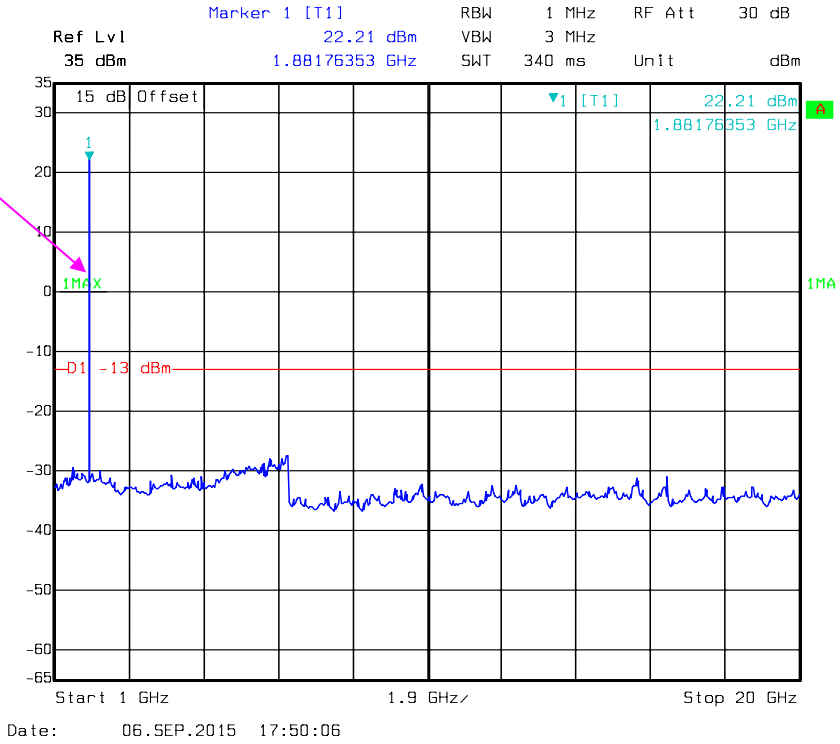




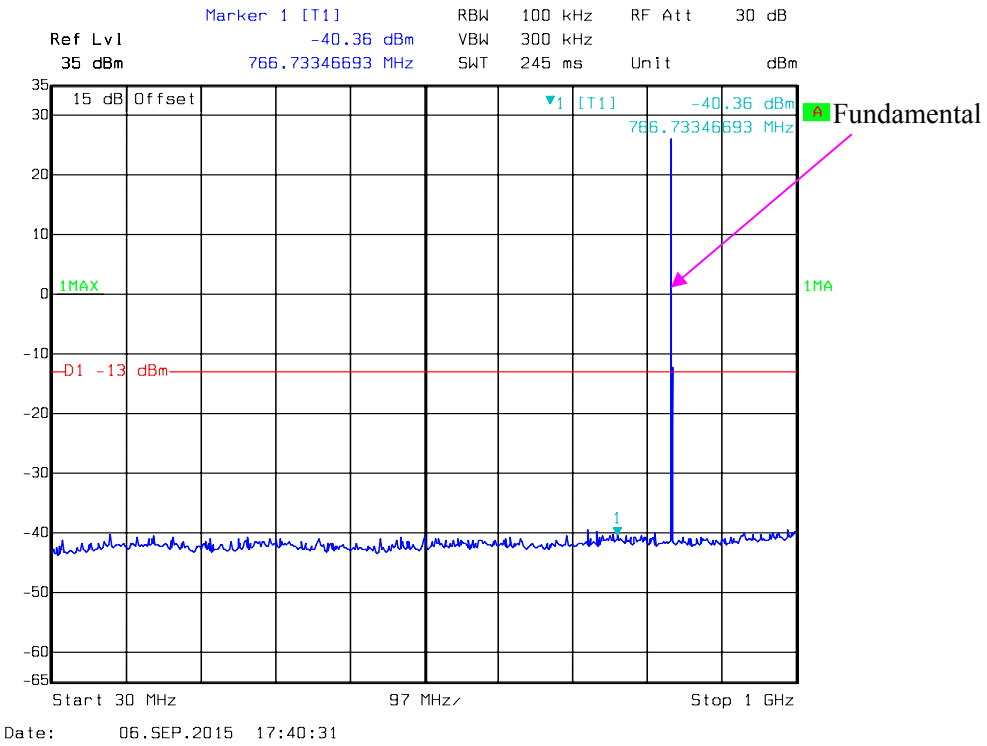
PCS 1900_ Middle Channel



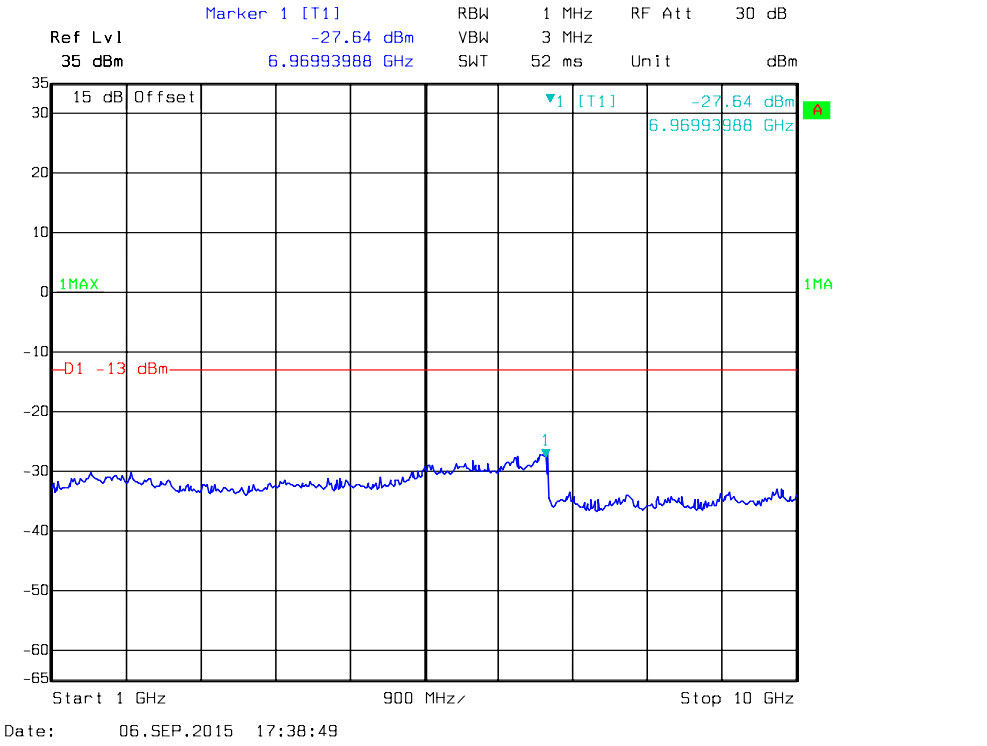
Fundamental



EDGE850_Middle Channel

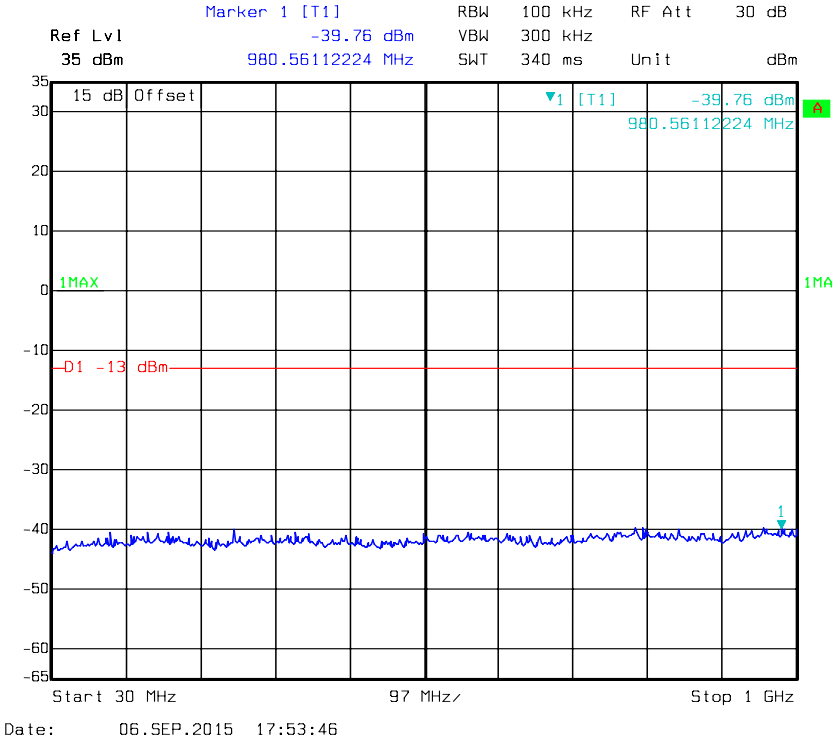


Date: 06.SEP.2015 17:40:31

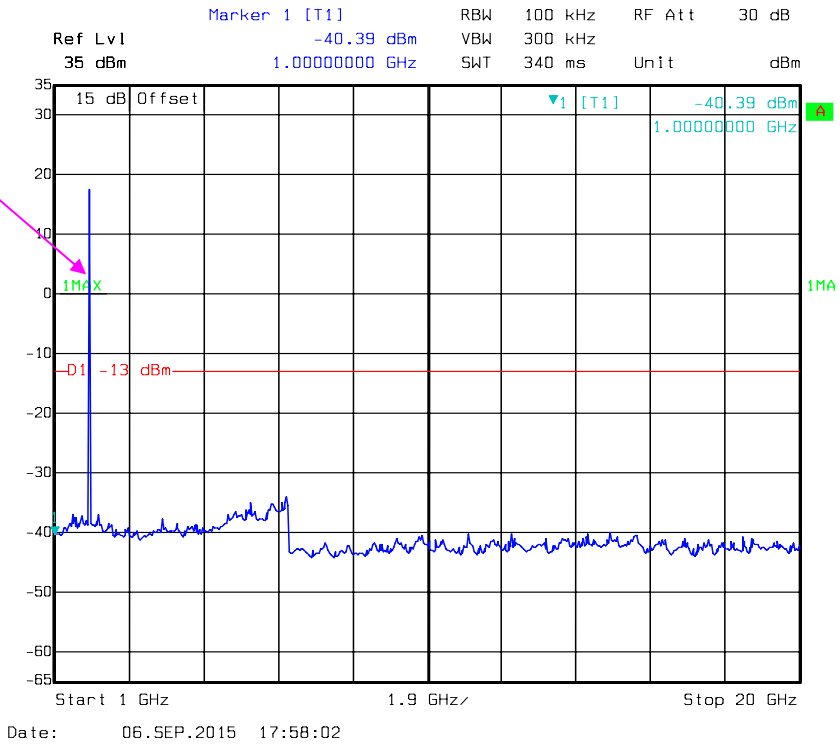


Date: 06.SEP.2015 17:38:49

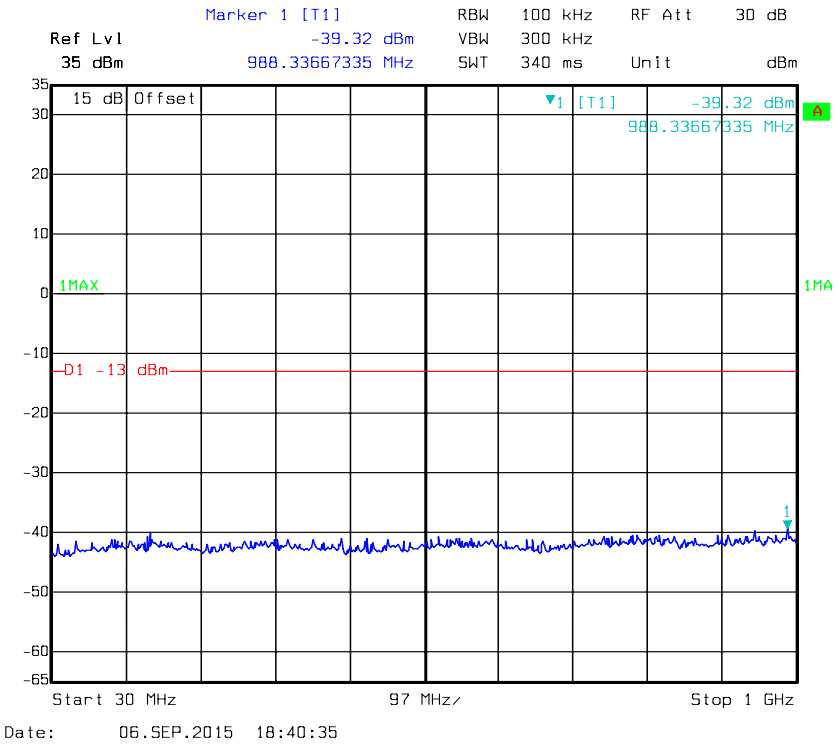
EDGE1900_ Middle Channel



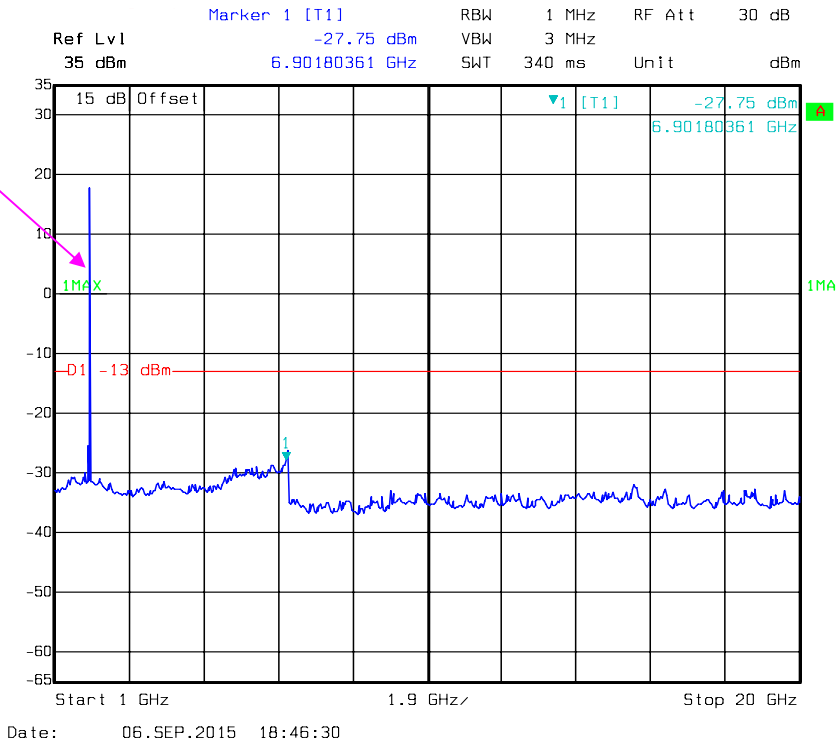
Fundamental



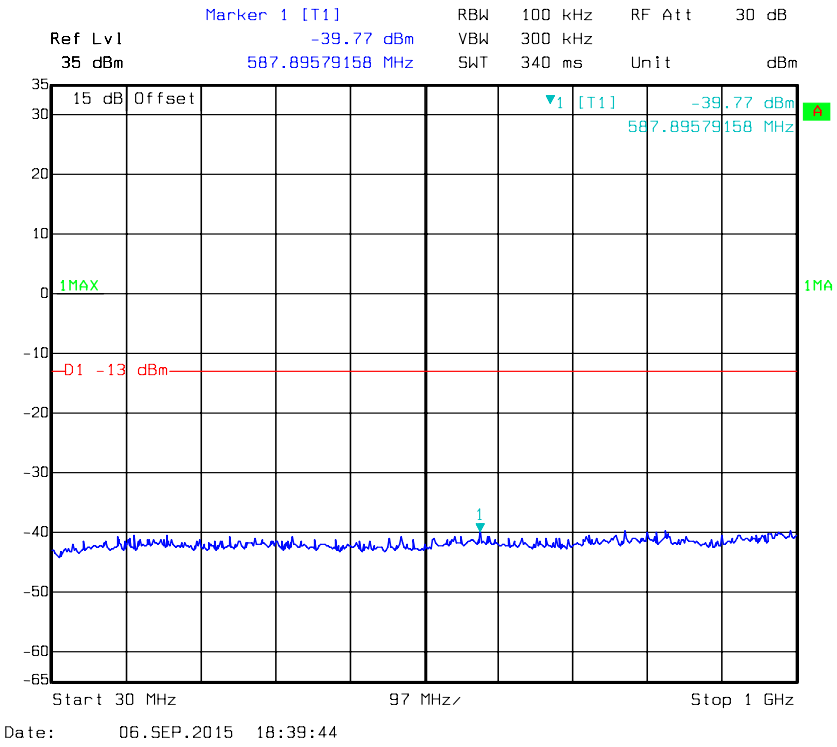
REL99 Band II_ Middle Channel



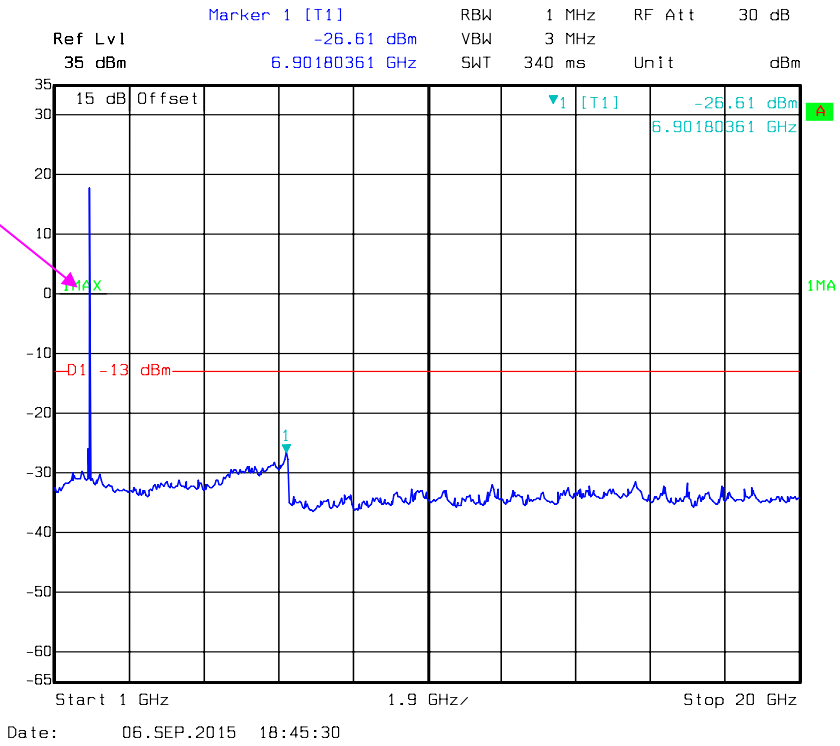
Fundamental



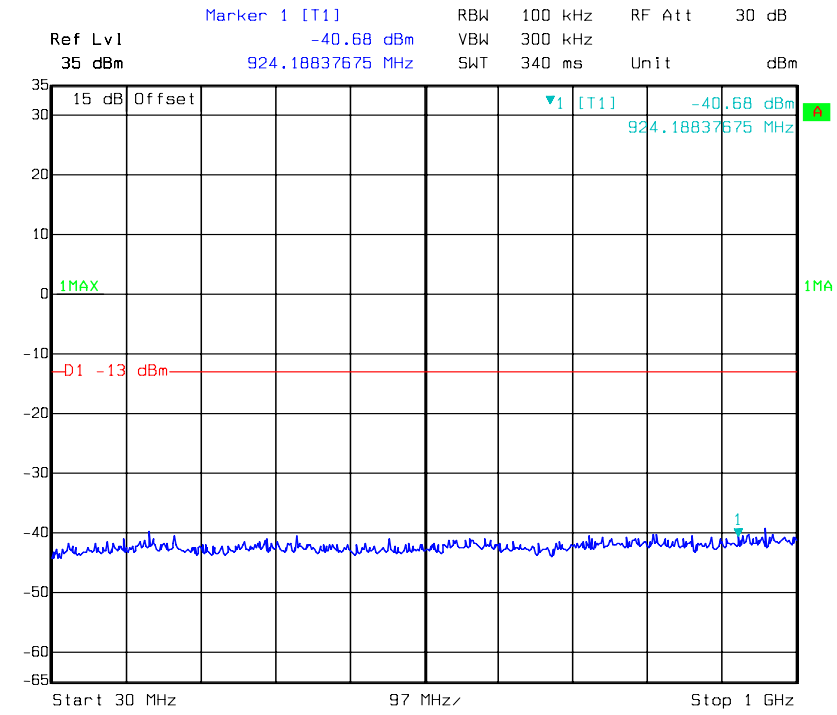
HSDPA Band II _Middle Channel

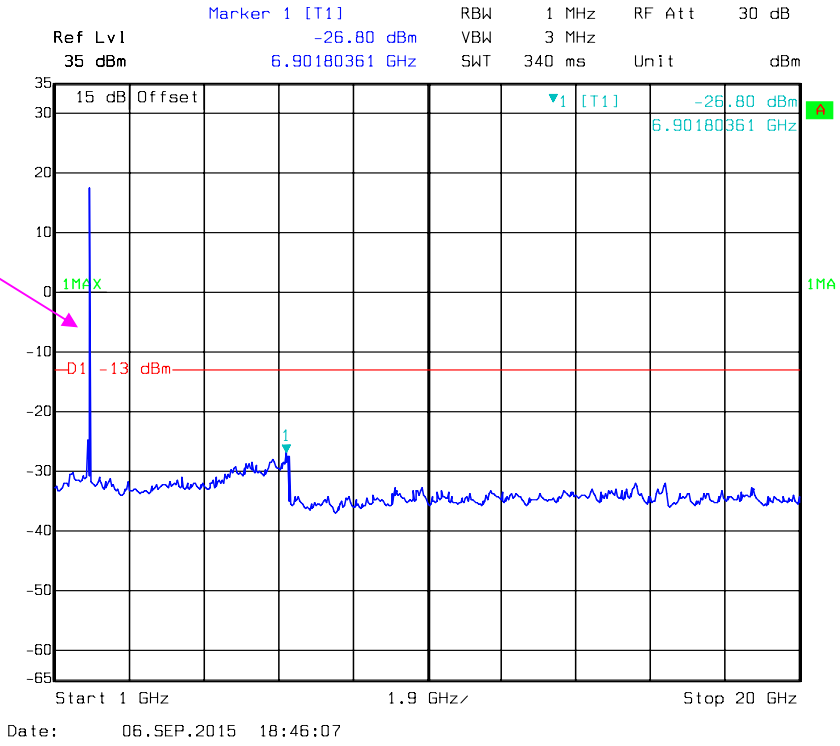


Fundamental



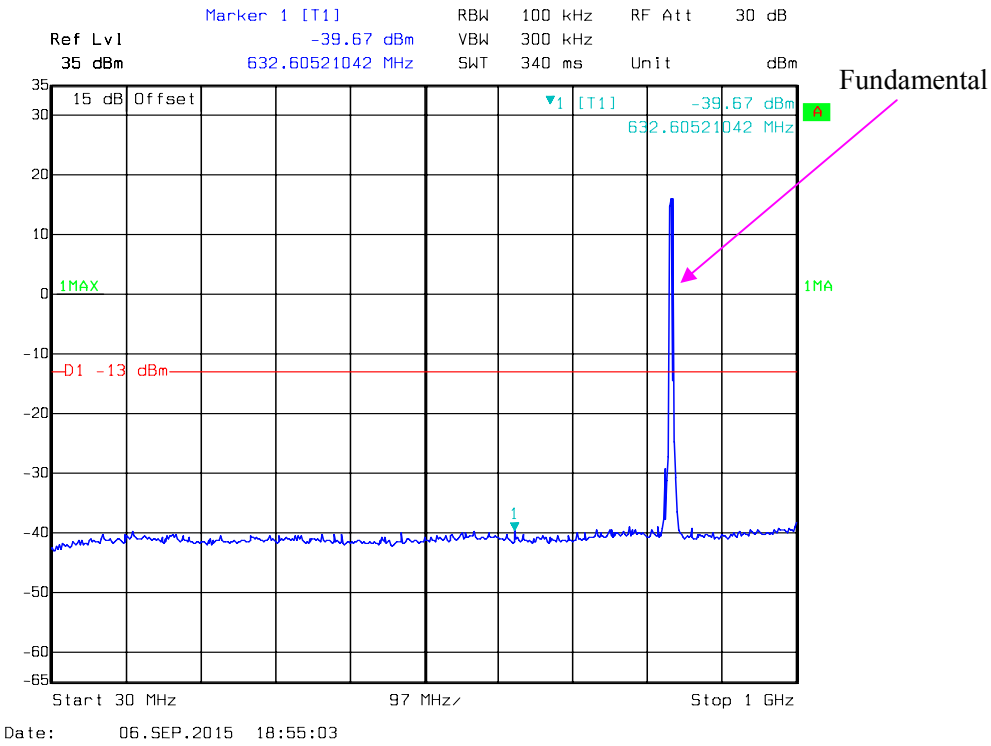
HSUPA Band II _ Middle Channel

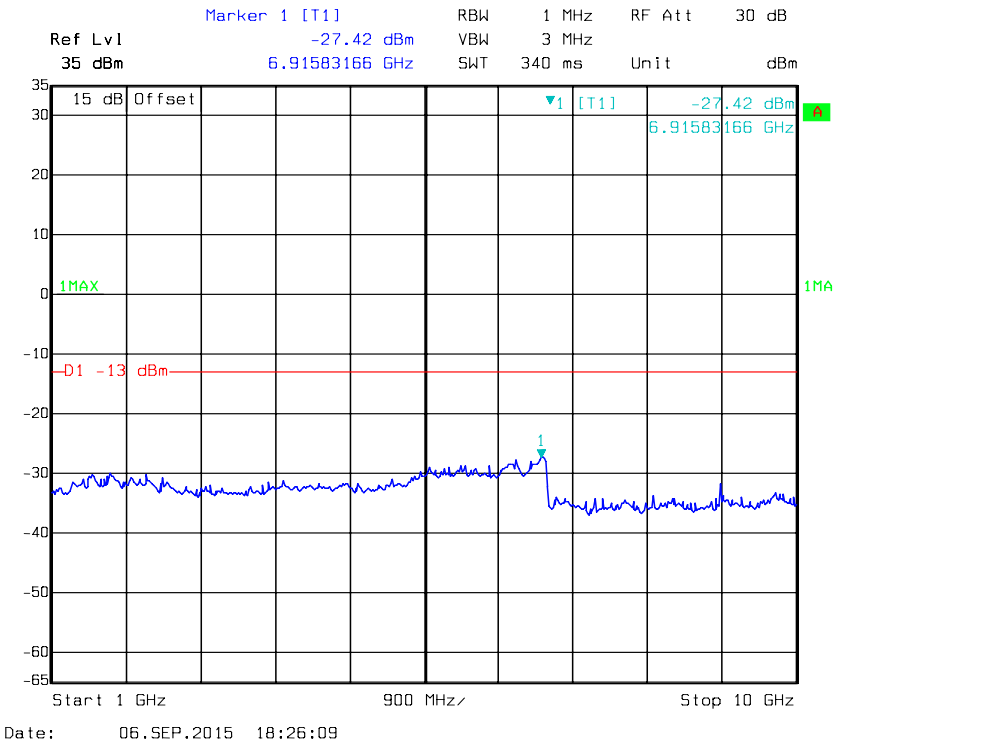




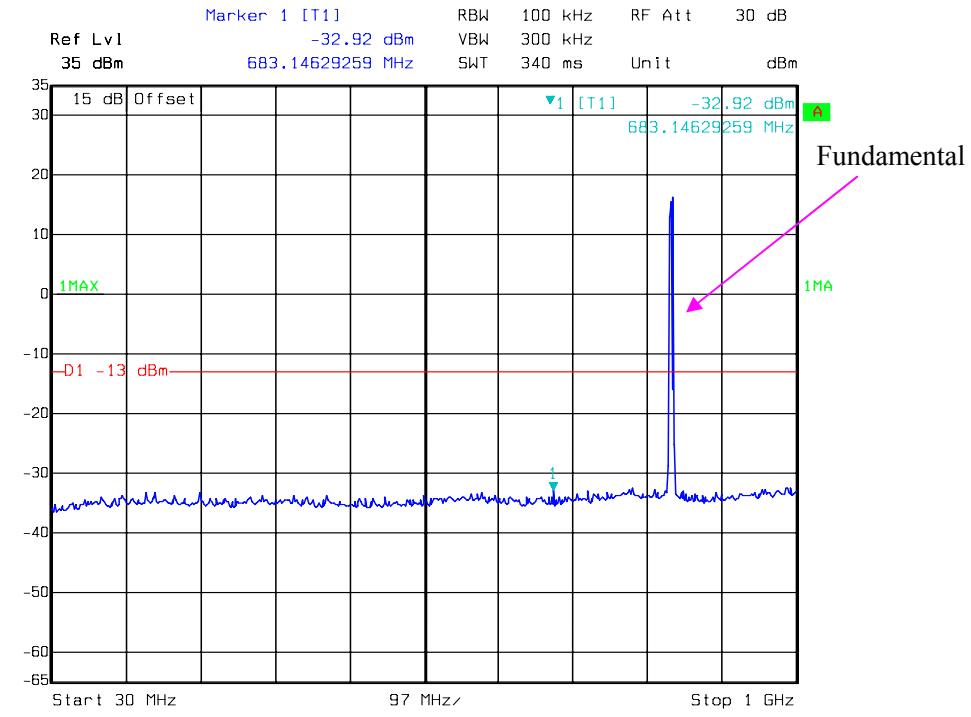
Fundamental

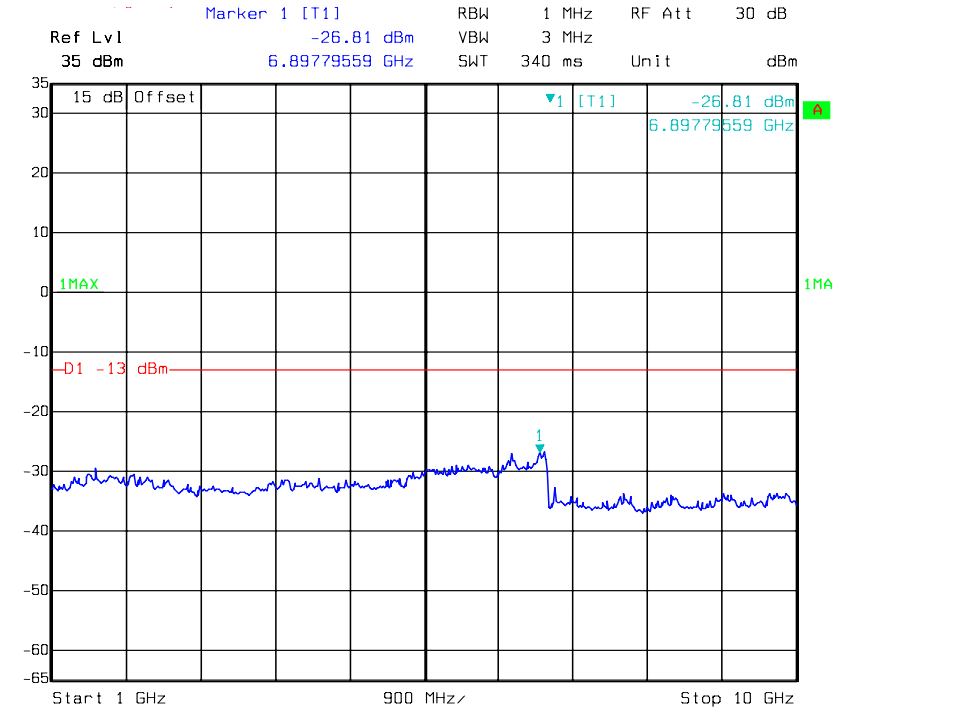
REL99 Band V_ Middle Channel



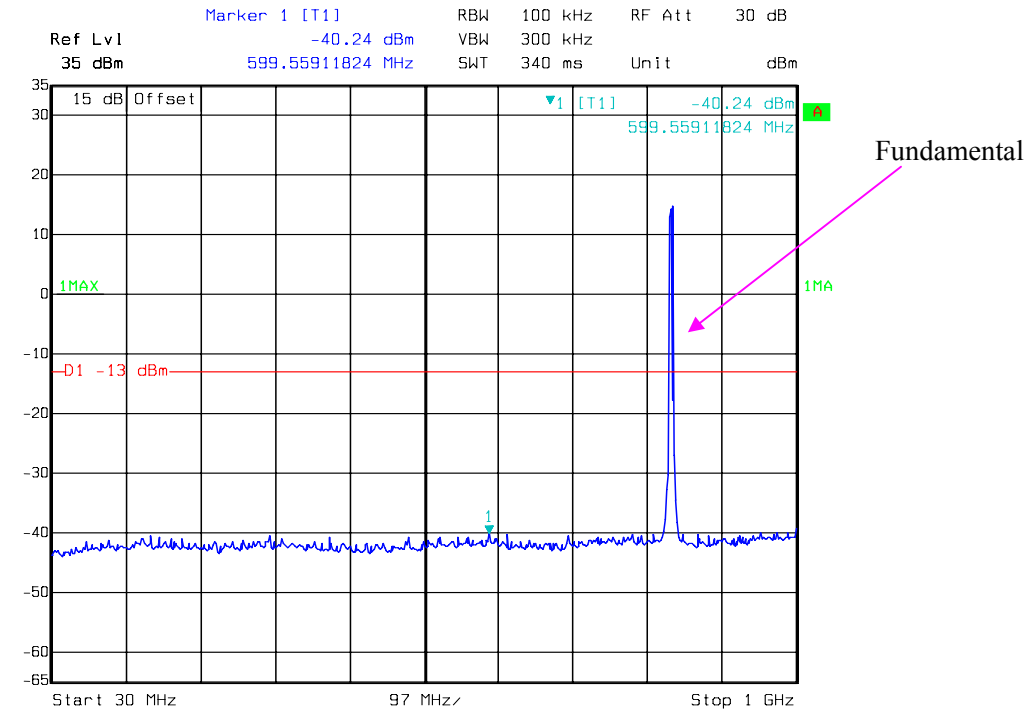


HSDPA Band V_ Middle Channel

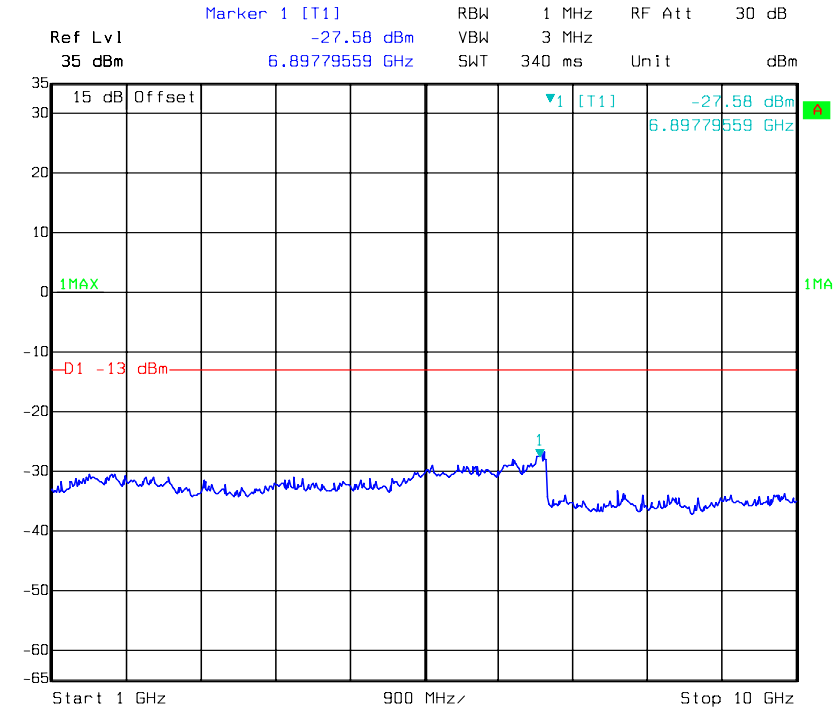




HSUPA Band V_ Middle Channel



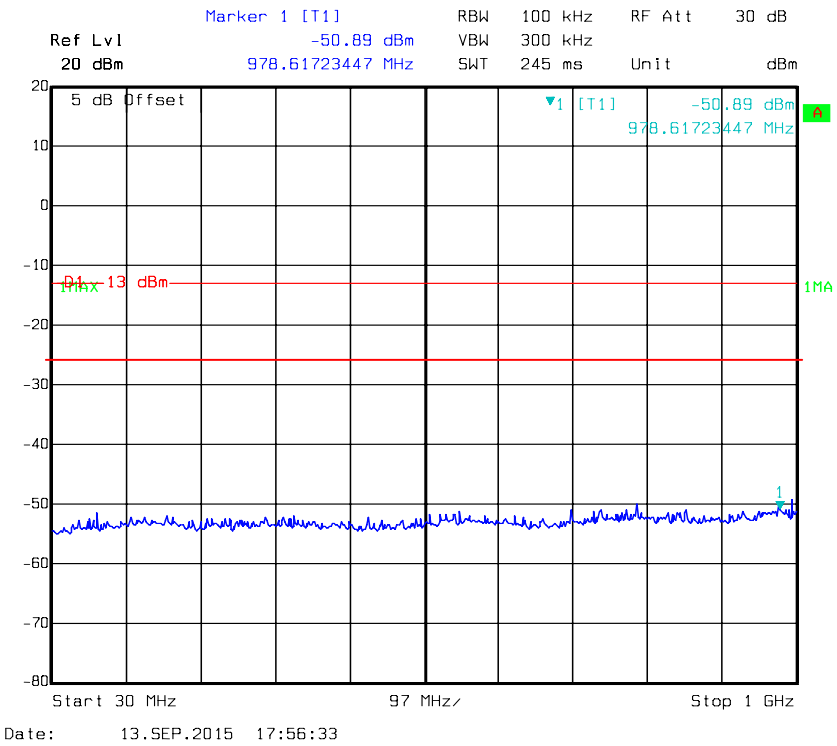
Date: 06.SEP.2015 18:49:31

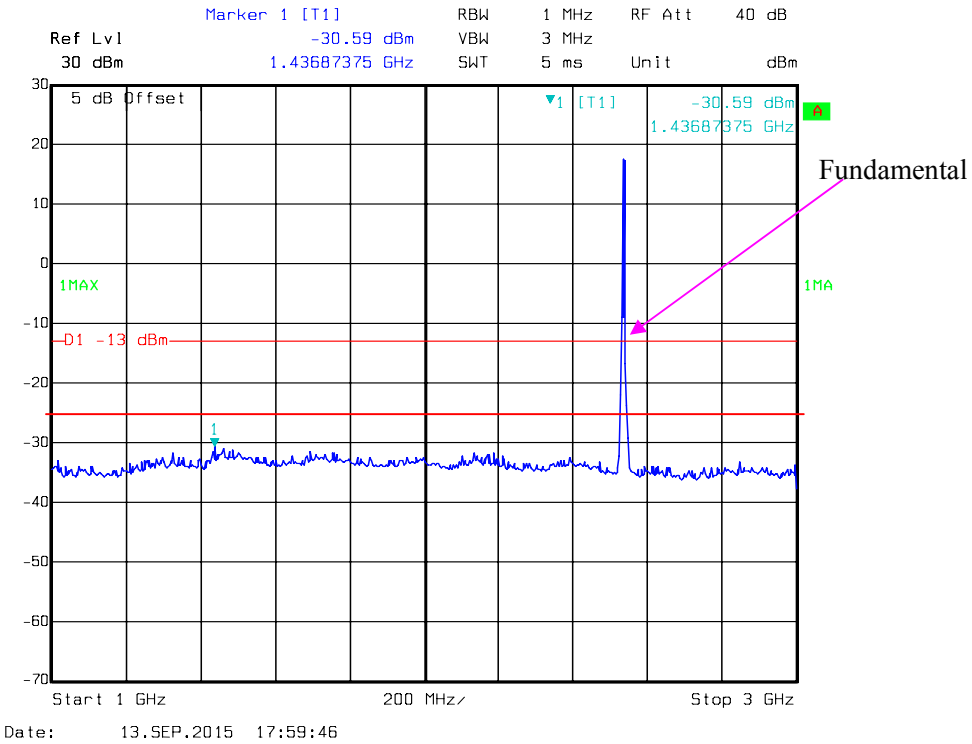


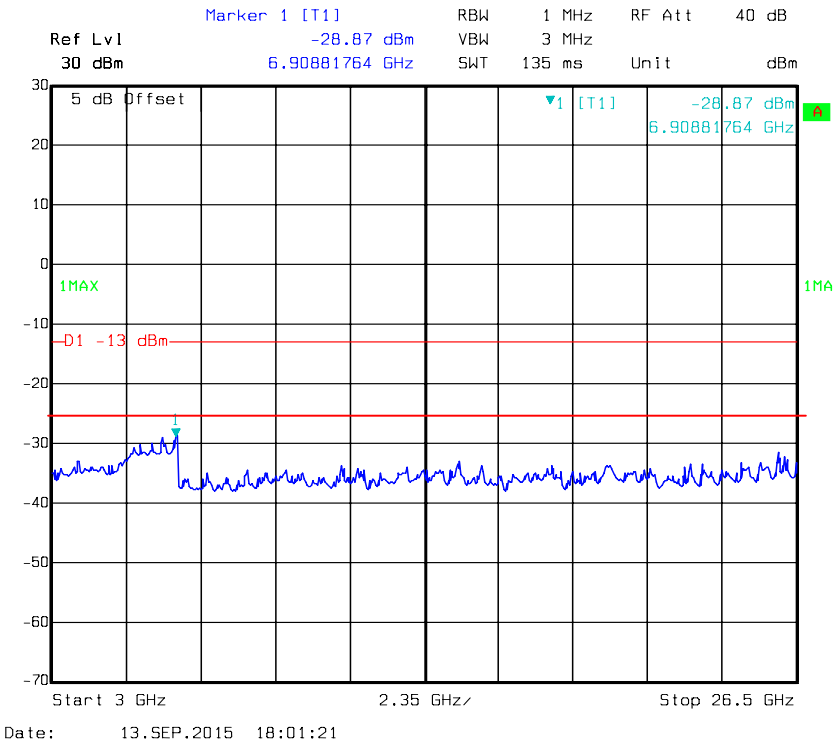
Date: 06.SEP.2015 18:25:45

LTE Band:

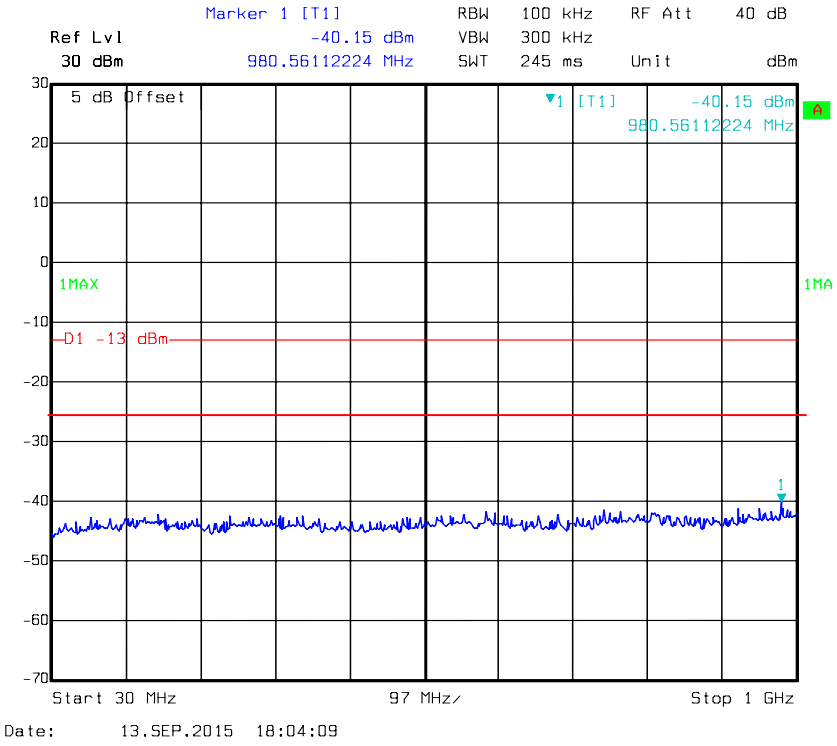
QPSK, Band 7-5M _ Middle Channel

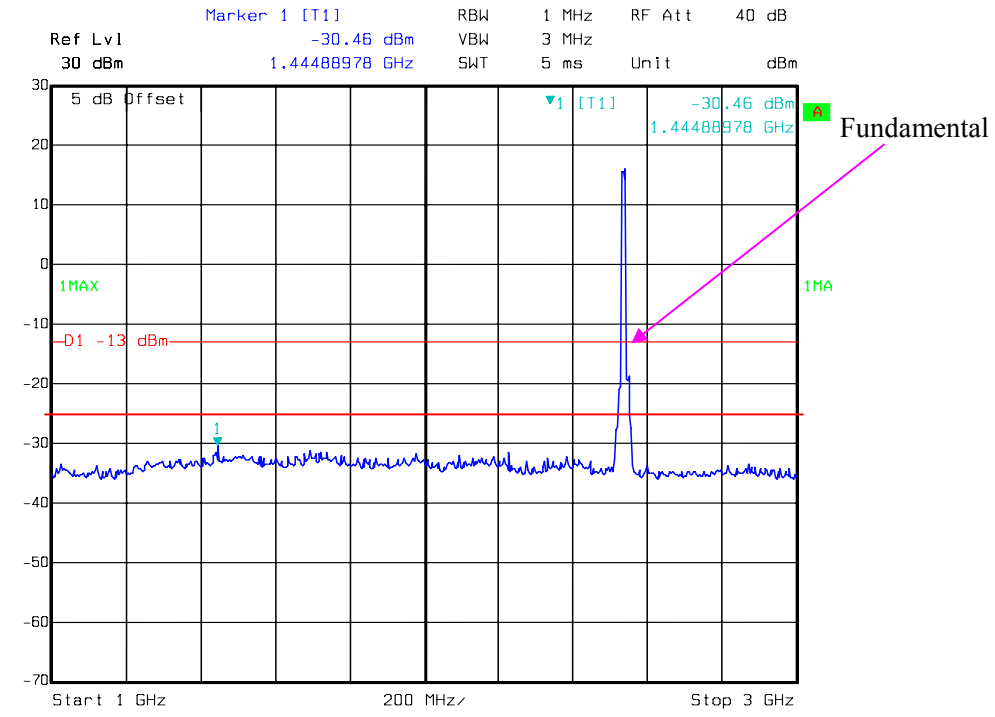


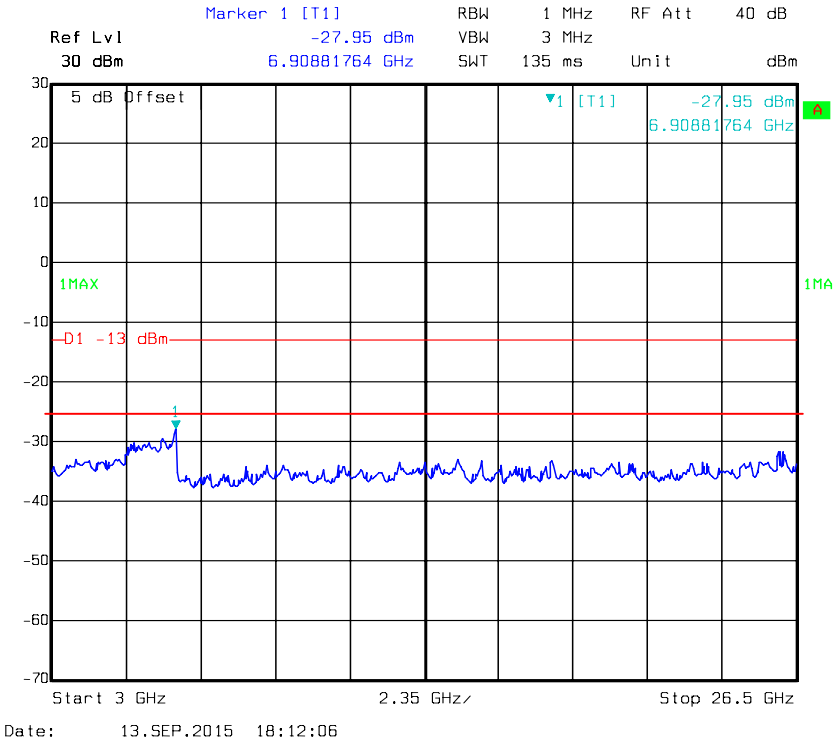




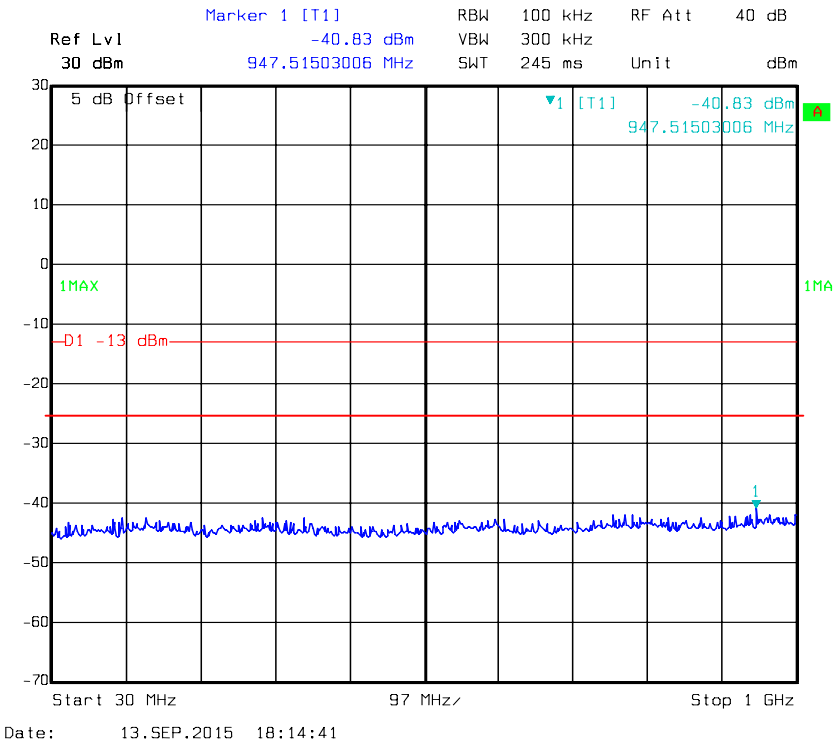
QPSK, Band 7-10M _ Middle Channel

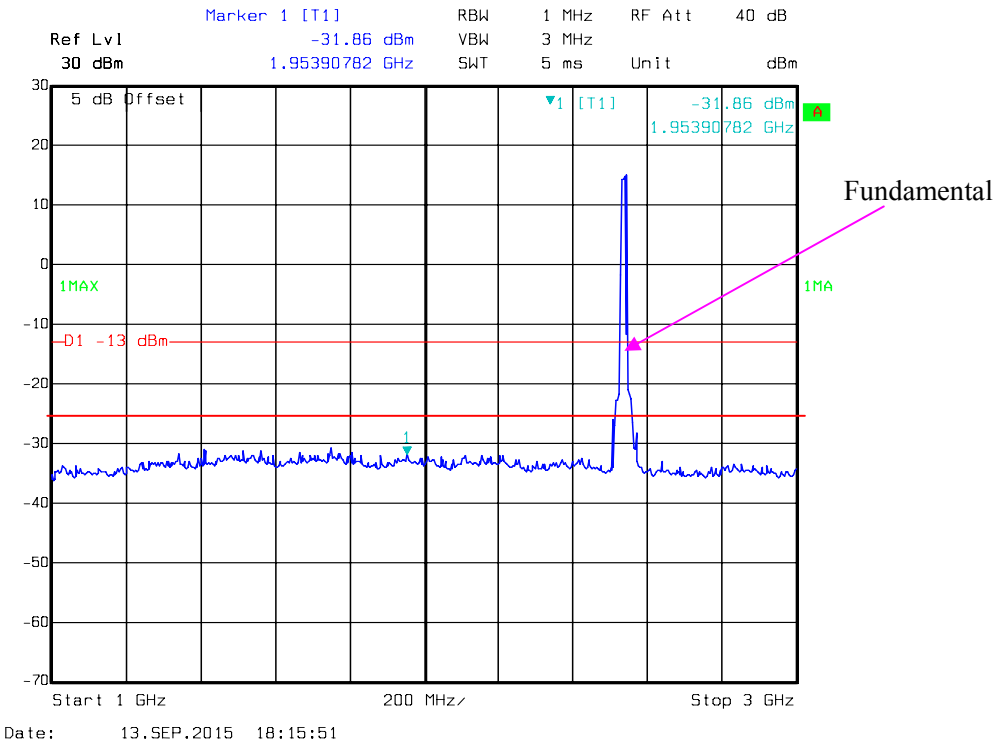


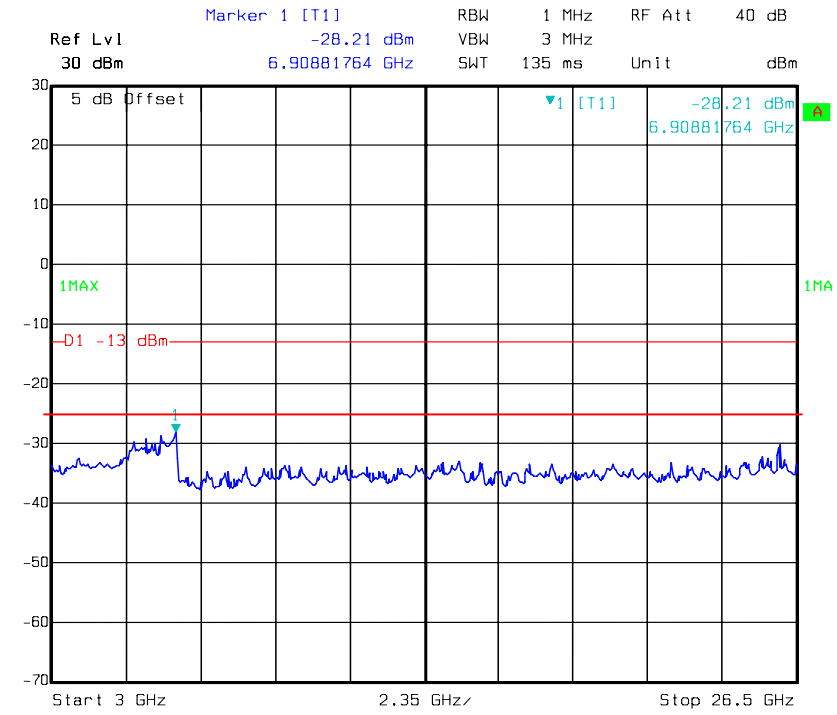

Marker 1 [T1]
RBW 1 MHz
RF Att 40 dB
Ref Lvl
-30.46 dBm
VBW 3 MHz
30 dBm
1.44488978 GHz
SWT 5 ms
Unit dBm
5 dB Offset
1 [T1]
-30.46 dBm
1.44488978 GHz
Fundamental
1MAX
1MA
D1 -13 dBm
Start 1 GHz
200 MHz/
Stop 3 GHz
Date: 13.SEP.2015 18:10:55


Marker 1 [T1]
RBW 1 MHz
RF Att 40 dB
Ref Lvl
-27.95 dBm
VBW 3 MHz
30 dBm
6.90881764 GHz
SWT 135 ms
Unit dBm
5 dB Offset
1 [T1]
-27.95 dBm
6.90881764 GHz
1MAX
1MA
D1 -13 dBm
Start 3 GHz
2.35 GHz/
Stop 26.5 GHz
Date: 13.SEP.2015 18:12:06

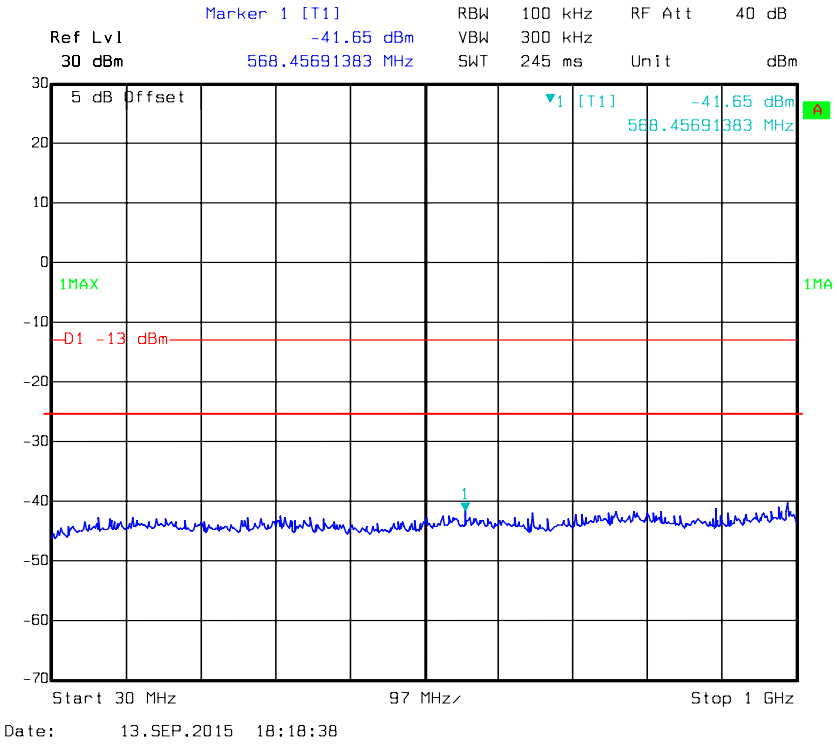
QPSK, Band 7-15M _ Middle Channel

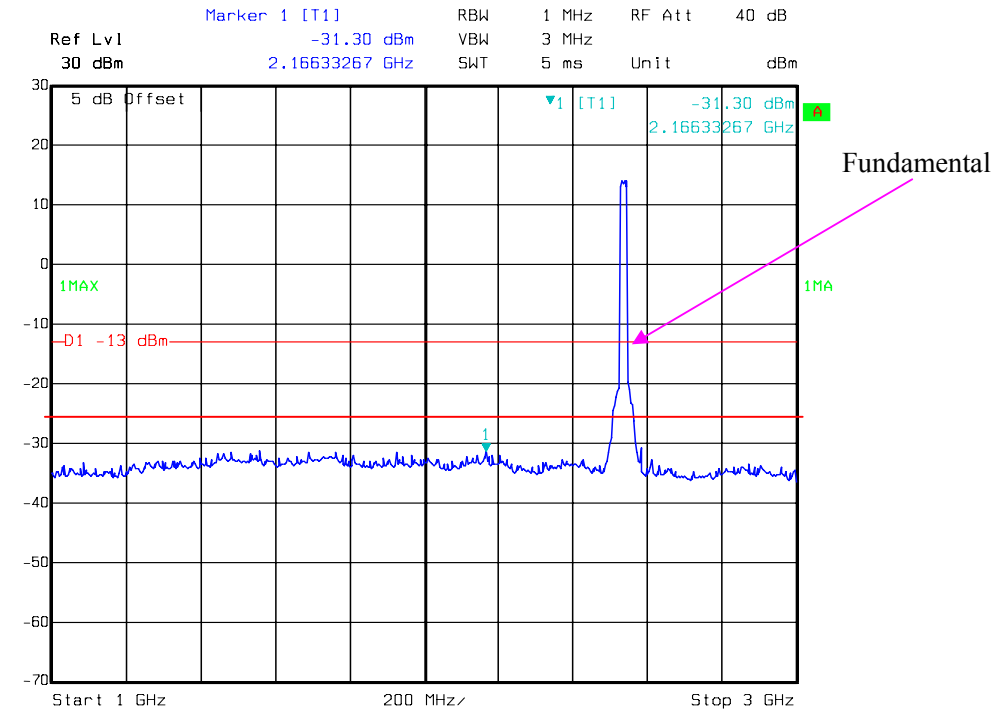


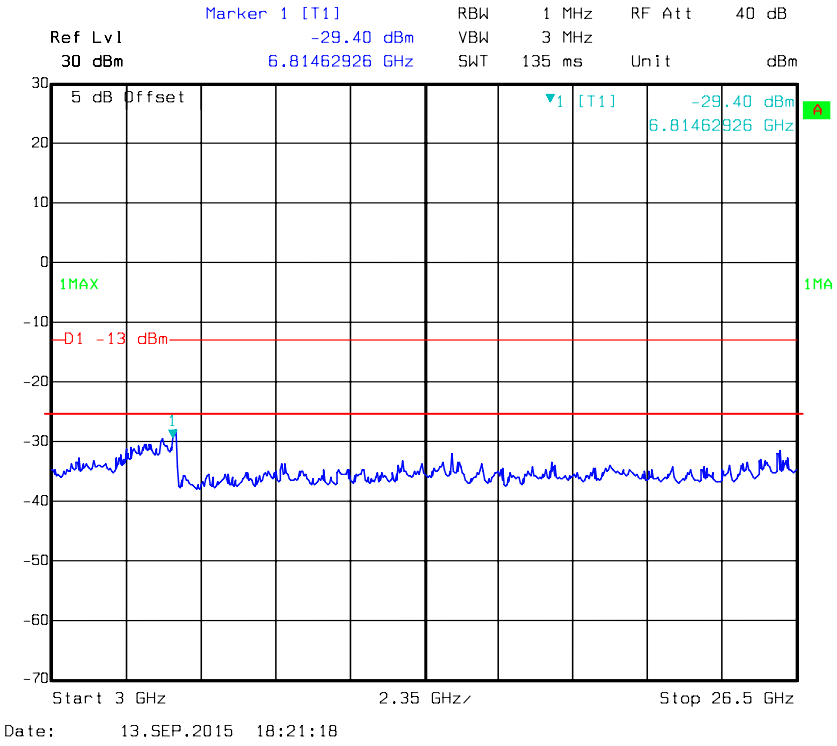




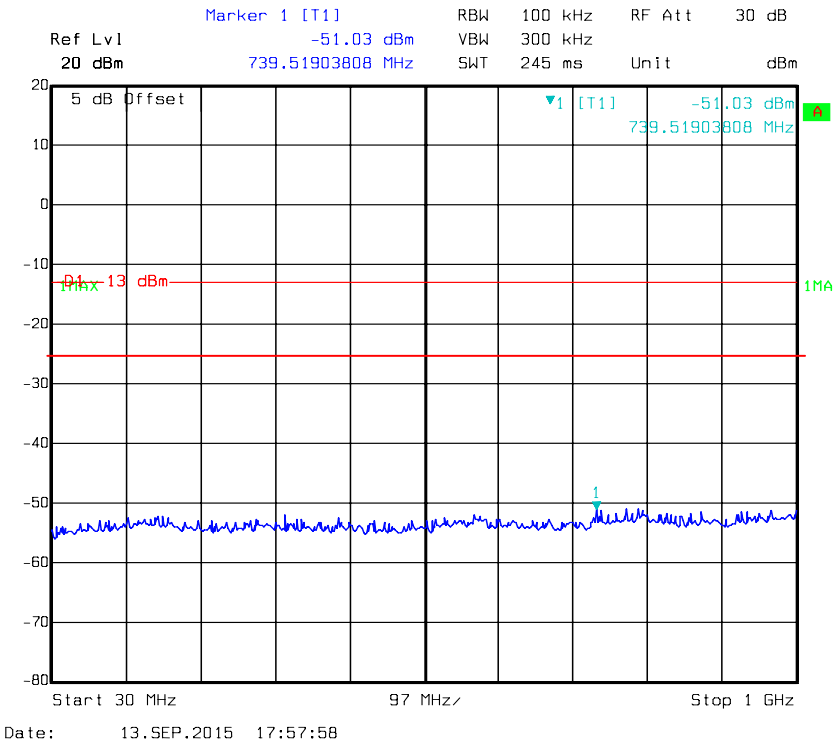
QPSK, Band 7-20M _ Middle Channel

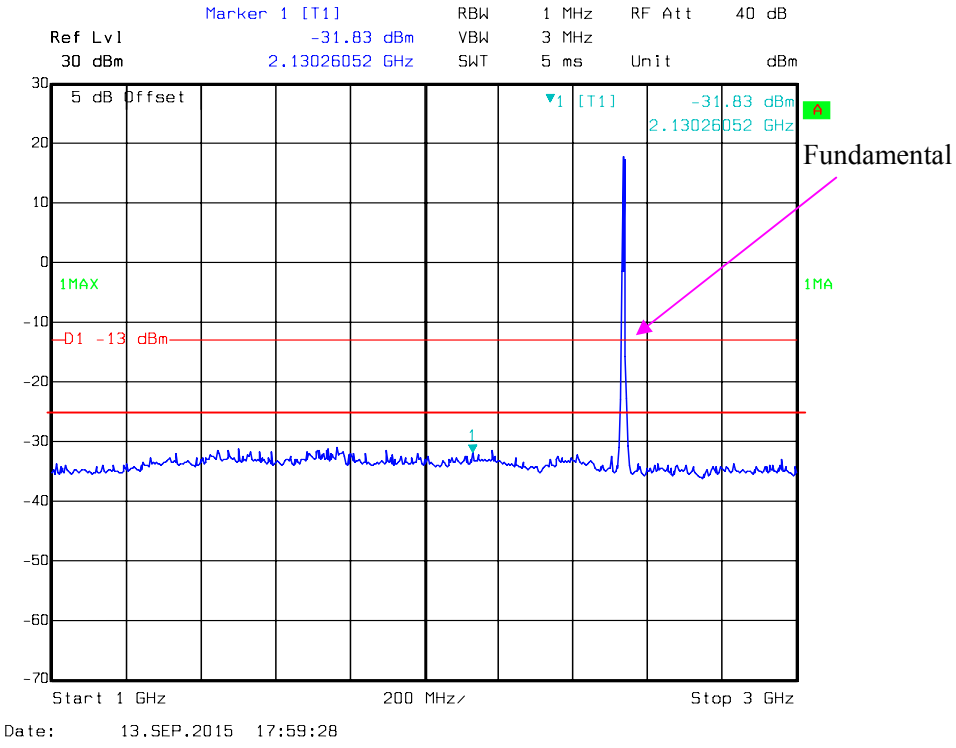


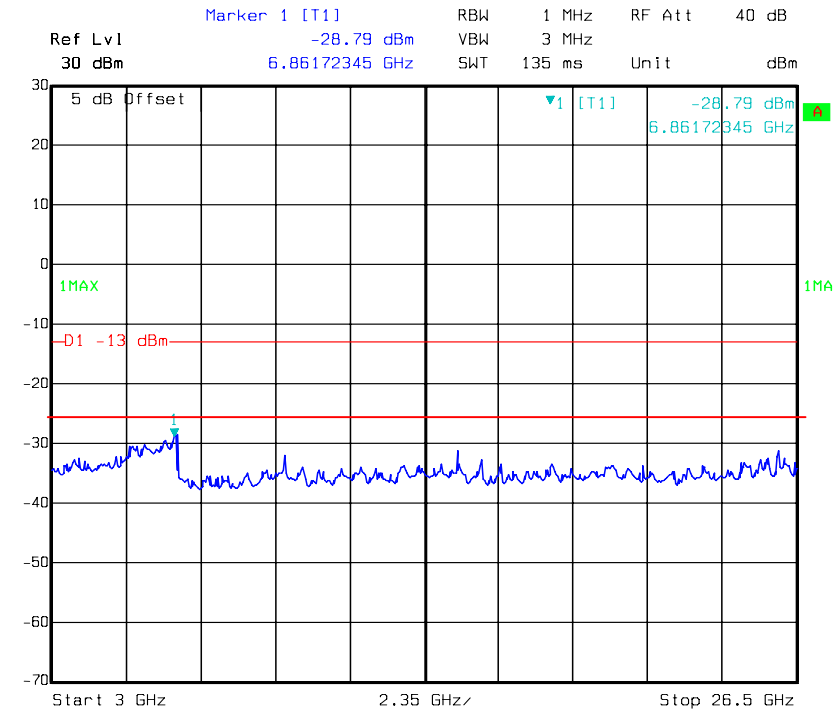

Marker 1 [T1]
RBW 1 MHz
RF Att 40 dB
Ref Lvl
-31.30 dBm
VBW 3 MHz
30 dBm
2.16633267 GHz
SWT 5 ms
Unit dBm
5 dB Offset
1 [T1]
-31.30 dBm
2.16633267 GHz
Fundamental
1MAX
1MA
D1 -13 dBm
Start 1 GHz
200 MHz/
Stop 3 GHz
Date: 13.SEP.2015 18:19:57


Marker 1 [T1]
RBW 1 MHz
RF Att 40 dB
Ref Lvl
-29.40 dBm
VBW 3 MHz
30 dBm
6.81462926 GHz
SWT 135 ms
Unit dBm
5 dB Offset
1 [T1]
-29.40 dBm
6.81462926 GHz
1MAX
1MA
D1 -13 dBm
Start 3 GHz
2.35 GHz/
Stop 26.5 GHz
Date: 13.SEP.2015 18:21:18

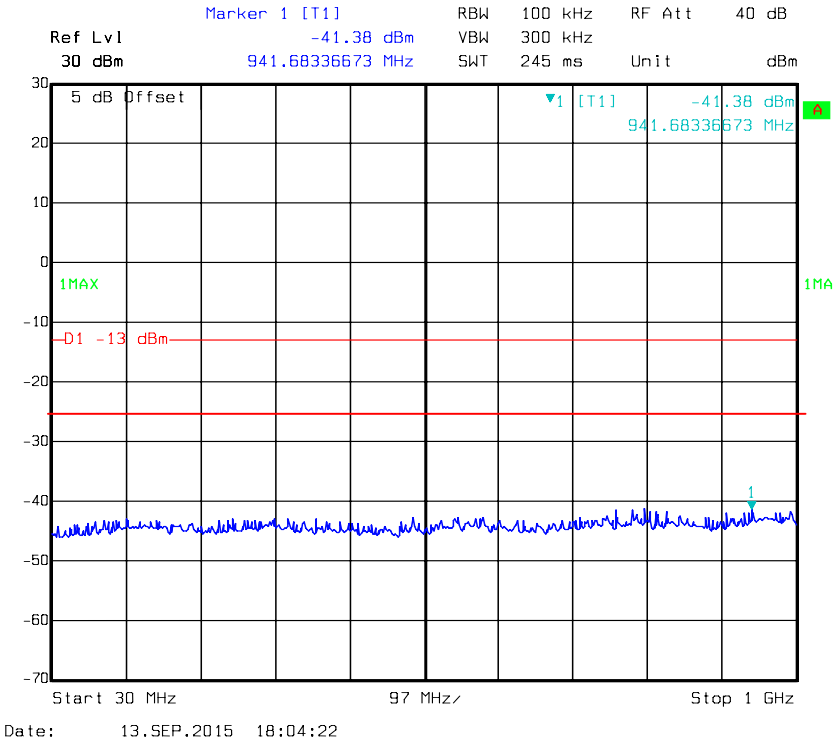
16-QAM, Band 7-5M _ Middle Channel

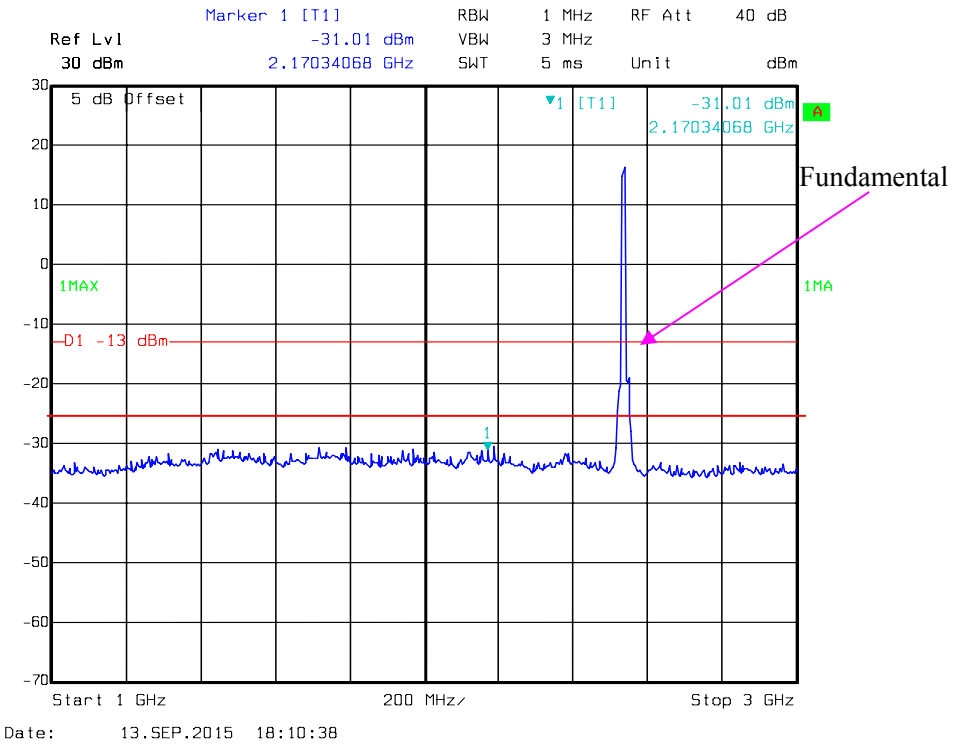


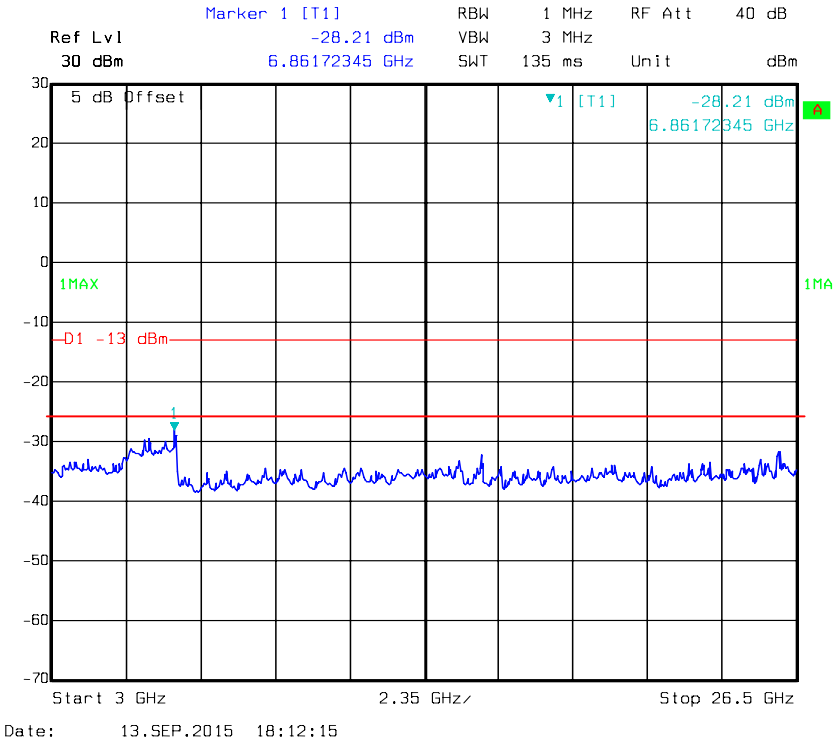




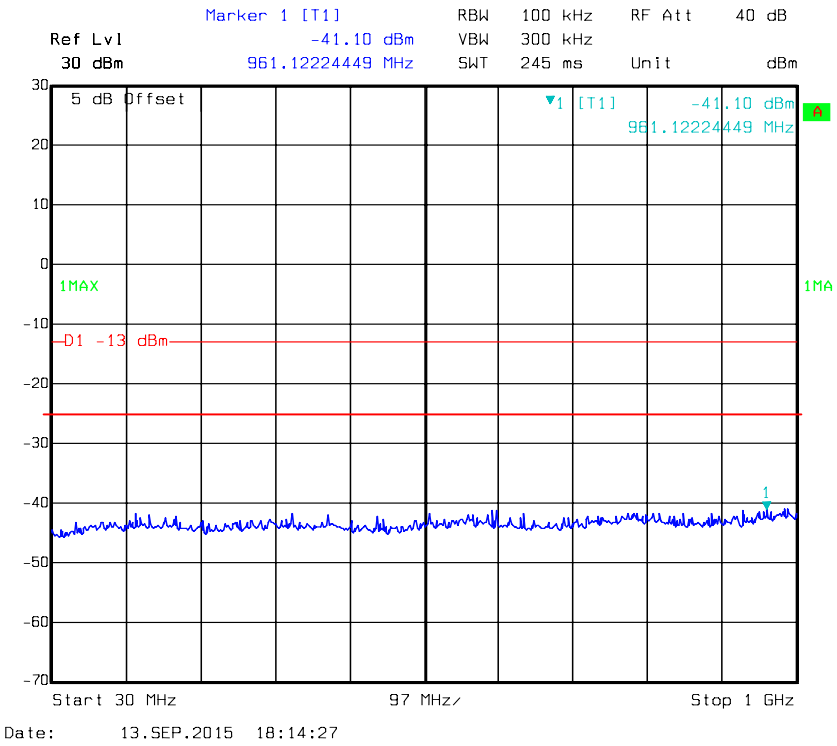
16-QAM, Band 7-10M _ Middle Channel

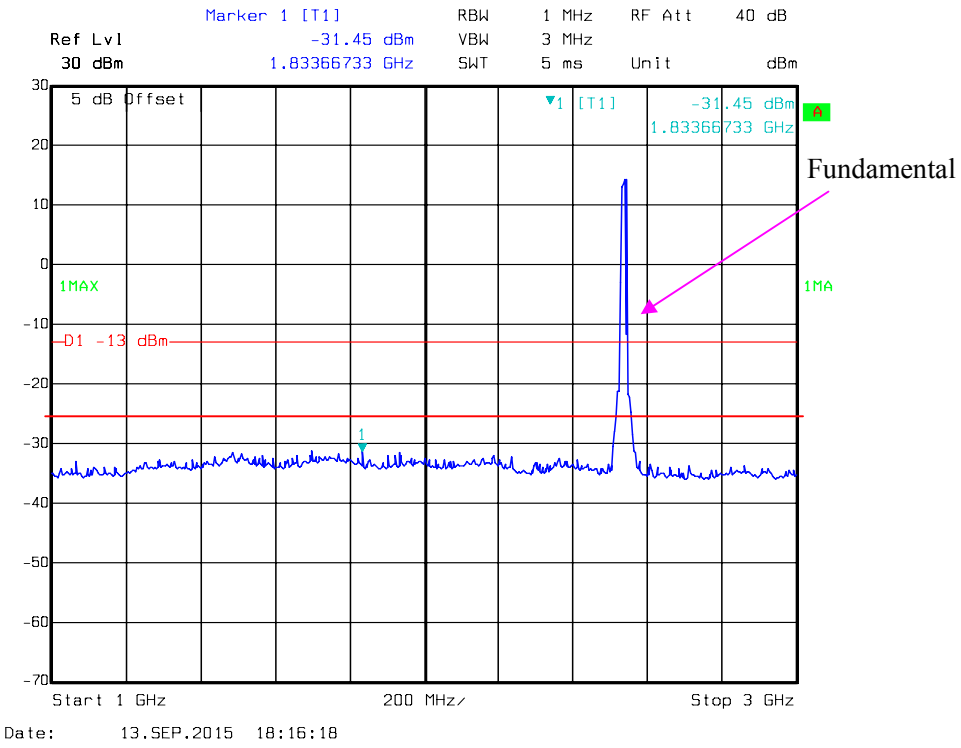


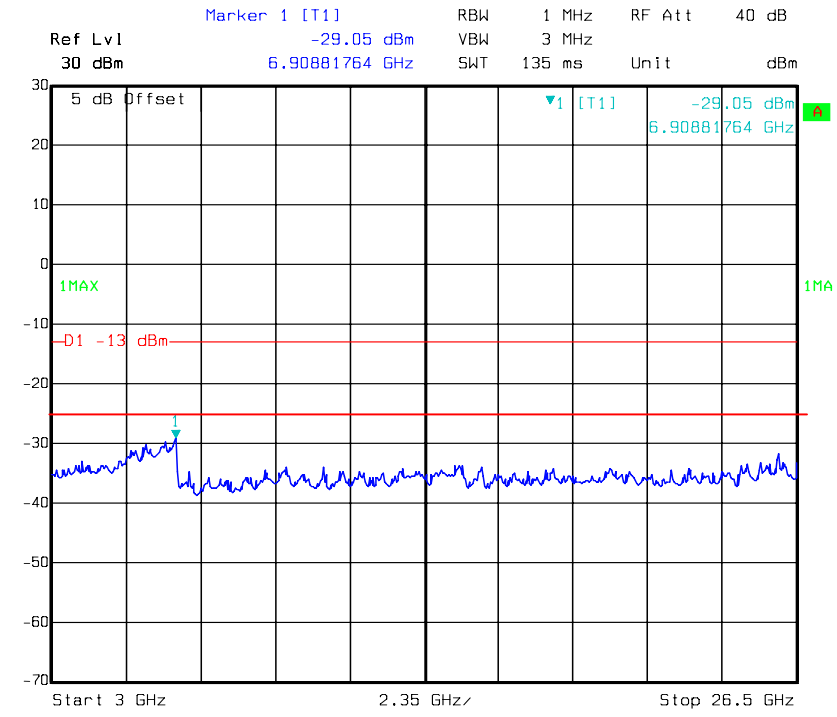

Marker 1 [T1]
RBW 1 MHz
RF Att 40 dB
Ref Lvl
-31.01 dBm
VBW 3 MHz
30 dBm
2.17034068 GHz
SWT 5 ms
Unit dBm
5 dB Offset
1 [T1]
-31.01 dBm
2.17034068 GHz
Fundamental
1MAX
1MA
D1 -13 dBm
Start 1 GHz
200 MHz/
Stop 3 GHz
Date: 13.SEP.2015 18:10:38


Marker 1 [T1]
RBW 1 MHz
RF Att 40 dB
Ref Lvl
-28.21 dBm
VBW 3 MHz
30 dBm
6.86172345 GHz
SWT 135 ms
Unit dBm
5 dB Offset
1 [T1]
-28.21 dBm
6.86172345 GHz
1MAX
1MA
D1 -13 dBm
Start 3 GHz
2.35 GHz/
Stop 26.5 GHz
Date: 13.SEP.2015 18:12:15

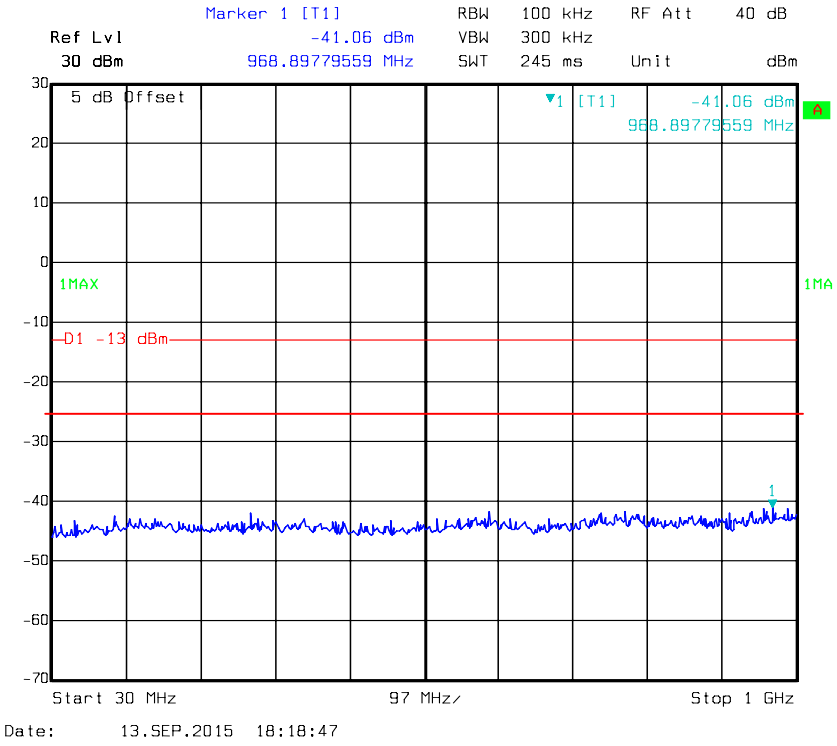
16-QAM, Band 7-15M _ Middle Channel

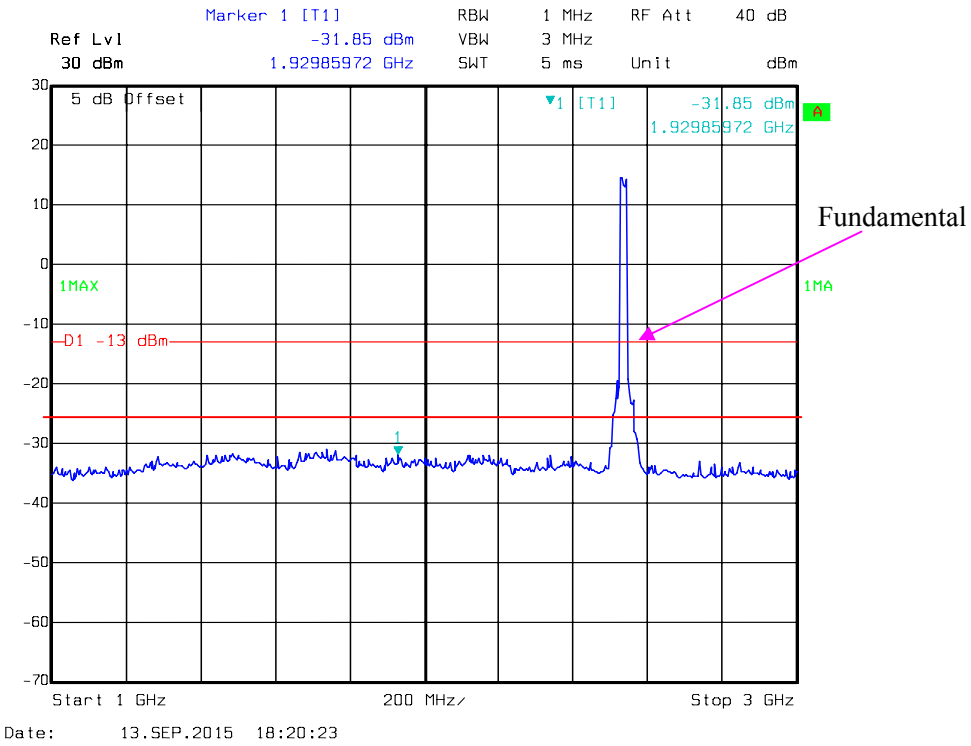


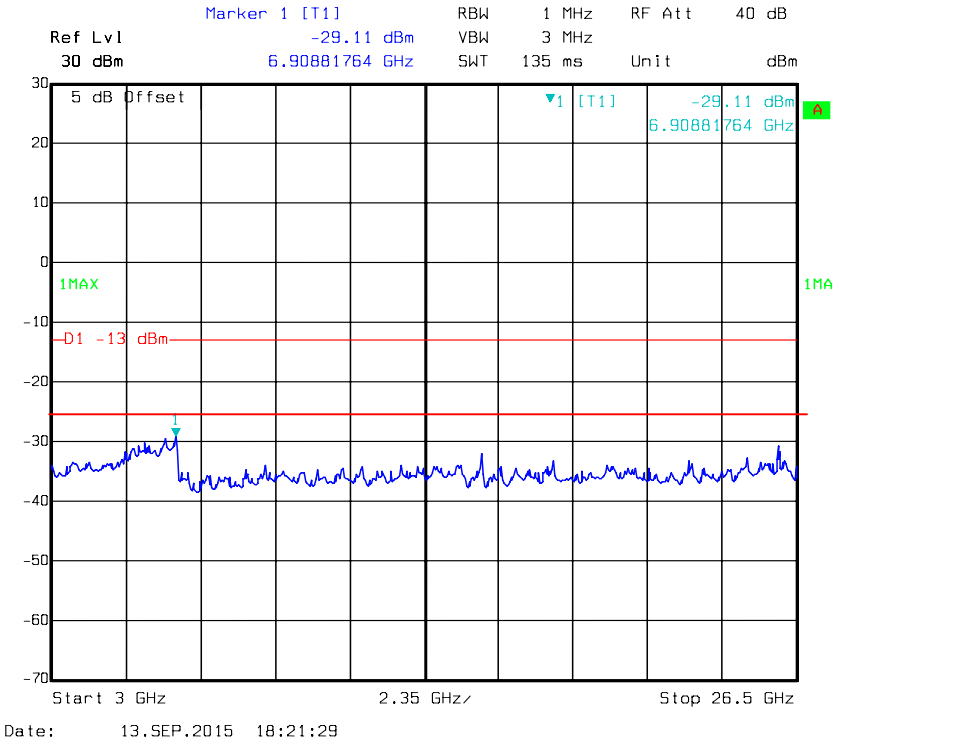




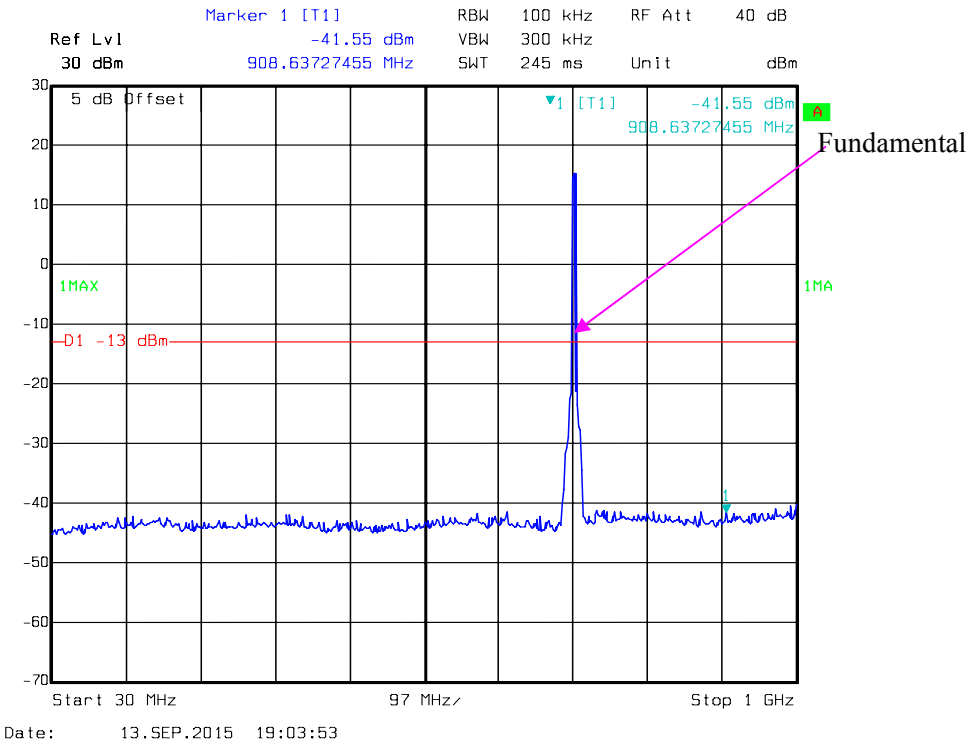
16-QAM, Band 7-20M _ Middle Channel

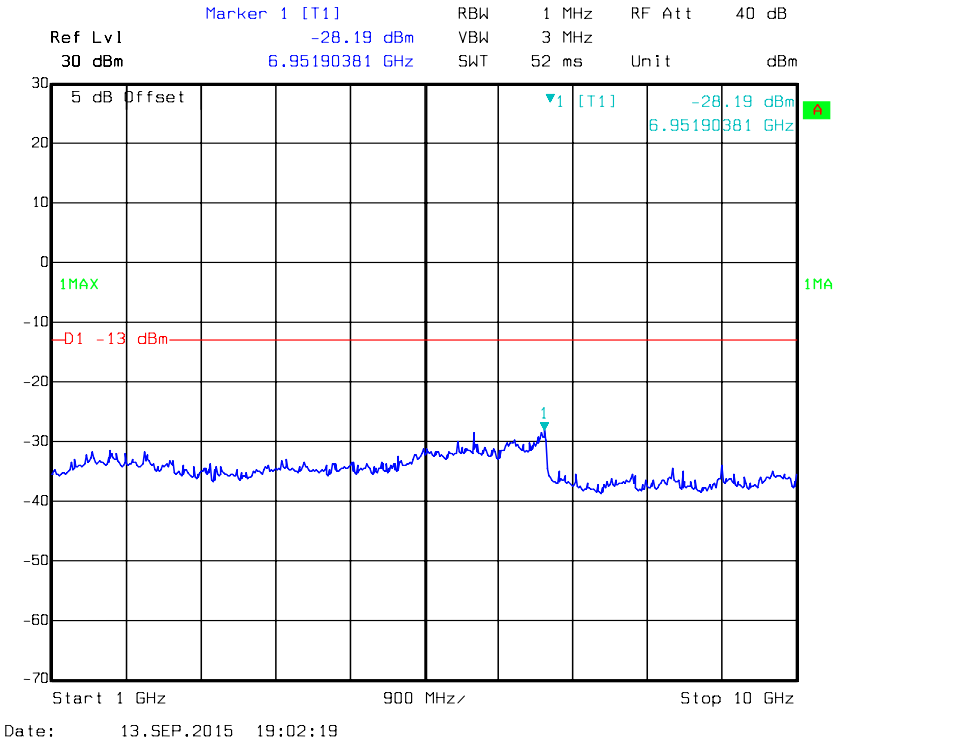



Marker 1 [T1]
RBW 1 MHz
RF Att 40 dB
Ref Lvl
-31.85 dBm
VBW 3 MHz
30 dBm
1.92985972 GHz
SWT 5 ms
Unit dBm
5 dB Offset
▼1 [T1]
-31.85 dBm
1.92985972 GHz
Fundamental
1MAX
1MA
D1 -13 dBm
Start 1 GHz
200 MHz/
Stop 3 GHz
Date: 13.SEP.2015 18:20:23

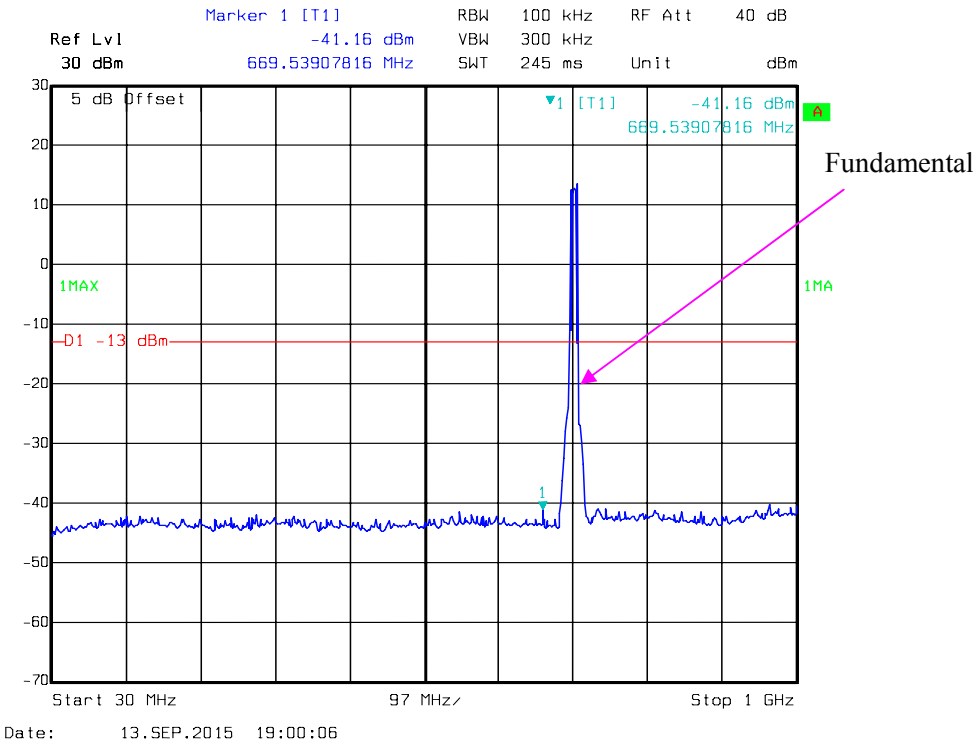

Marker 1 [T1]
RBW 1 MHz
RF Att 40 dB
Ref Lvl
-29.11 dBm
VBW 3 MHz
30 dBm
6.90881764 GHz
SWT 135 ms
Unit dBm
5 dB Offset
▼1 [T1]
-29.11 dBm
6.90881764 GHz
1MAX
1MA
D1 -13 dBm
Start 3 GHz
2.35 GHz/
Stop 26.5 GHz
Date: 13.SEP.2015 18:21:29

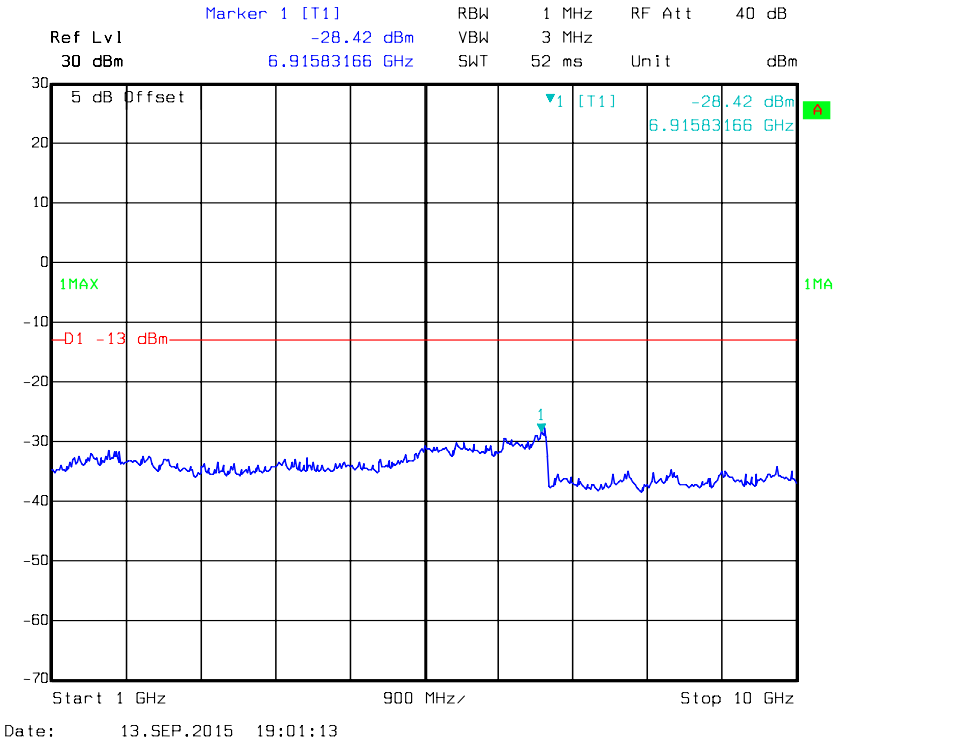
QPSK, Band 17-5M _ Middle Channel



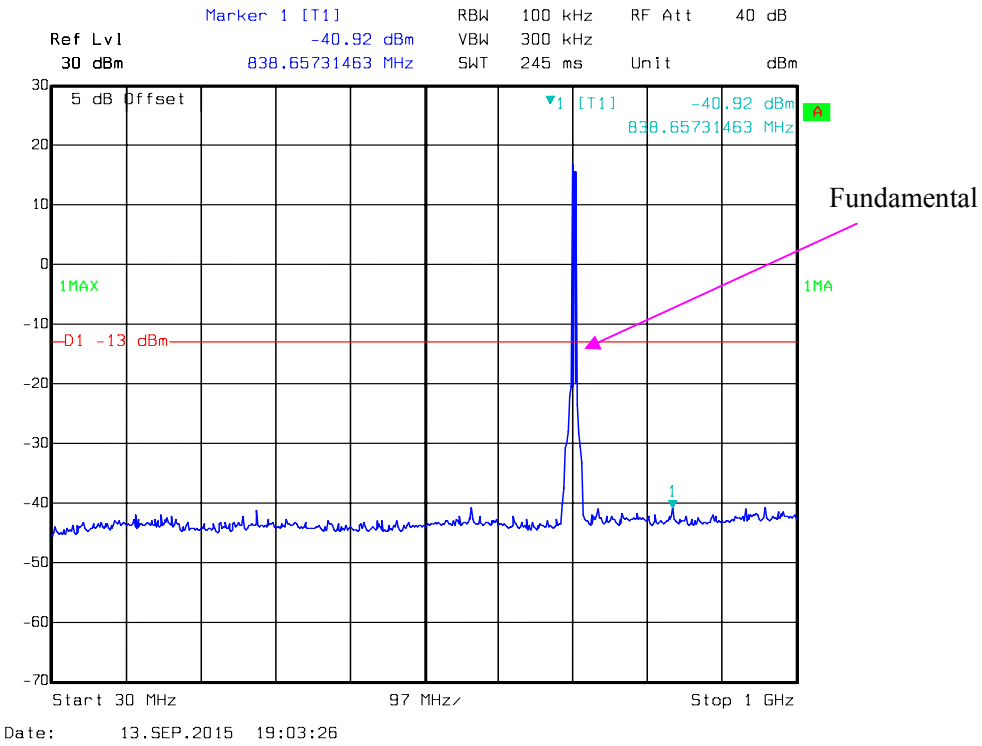


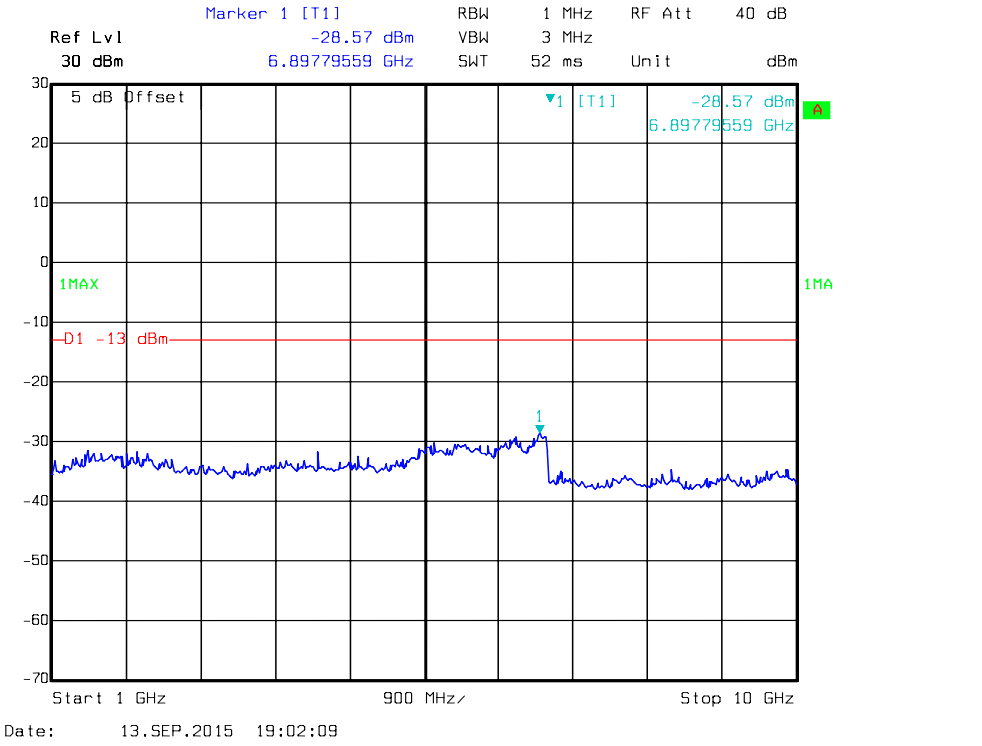
QPSK, Band 17-10M _ Middle Channel



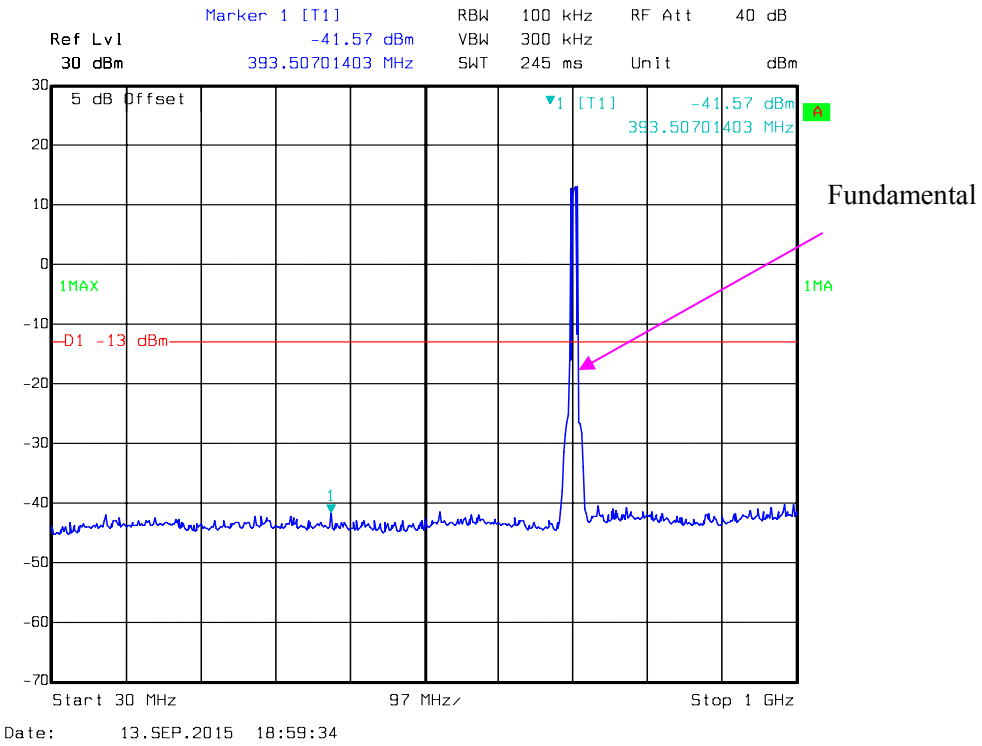


16-QAM, Band 17-5M _ Middle Channel

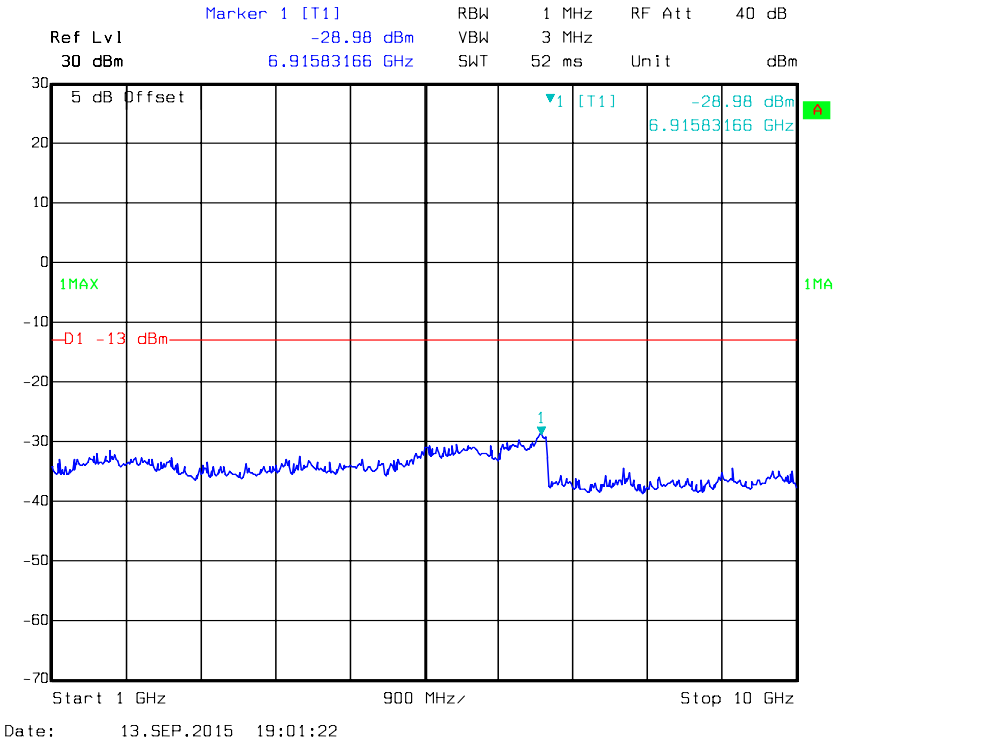




16-QAM, Band 17-10M _ Middle Channel



Fundamental



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

Applicable Standard

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

Test Procedure

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

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

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

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

Spurious emissions in dB = 10 lg (TXpwr in Watts/0.001) – the absolute level

Spurious attenuation limit in dB = 43 + 10 Log_{10} (power out in Watts)

Spurious attenuation limit in dB = 55 + 10 Log_{10} (power out in Watts) for band 7

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2015-05-09	2016-05-09
Sunol Sciences	Antenna	JB3	A060611-3	2014-07-28	2017-07-27
HP	Amplifier	8447E	2434A02181	2015-09-01	2016-09-01
R&S	Spectrum Analyzer	FSEM	DE31388	2015-05-09	2016-05-09
ETS LINDGREN	Horn Antenna	3115	000 527 35	2015-09-06	2018-09-06
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2015-02-19	2016-02-19
Giga	Signal Generator	1026	320408	2015-05-09	2016-05-09
EMCO	Adjustable Dipole Antenna	3121C	9109-753	N/A	N/A
TDK RF	Horn Antenna	HRN-0118	130 084	2015-09-06	2018-09-06

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

Test Data

Environmental Conditions

Temperature:	27.8 °C
Relative Humidity:	49 %
ATM Pressure:	100.2 kPa

The testing was performed by Dean Liu on 2015-09-10.

EUT Operation Mode: Transmitting

Cellular Band (PART 22H)

30 MHz-10 GHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
Frequency:836.6 MHz								
1673.200	H	49.45	-51.6	10.6	1.5	-42.5	-13.0	29.5
1673.200	V	48.51	-52.9	10.6	1.5	-43.8	-13.0	30.8
2509.800	H	64.94	-33.1	13.1	2.8	-22.8	-13.0	9.8
2509.800	V	61.67	-35.4	13.1	2.8	-25.1	-13.0	12.1
400.200	H	41.80	-53.6	0.0	0.6	-54.2	-13.0	41.2
666.300	V	38.21	-49.5	0.0	0.9	-50.4	-13.0	37.4

WCDMA Band V

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
Frequency:836.6 MHz								
1673.200	H	48.63	-52.4	10.6	1.5	-43.3	-13.0	30.3
1673.200	V	45.84	-55.5	10.6	1.5	-46.4	-13.0	33.4
400.200	H	35.30	-60.1	0.0	0.6	-60.7	-13.0	47.7
666.300	V	34.80	-52.9	0.0	0.9	-53.8	-13.0	40.8

PCS Band (PART 24E)

30 MHz-20 GHz:

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
Frequency:1880 MHz								
3760.000	H	36.54	-57.8	13.8	2.9	-46.9	-13.0	33.9
3760.000	V	34.86	-58.2	13.8	2.9	-47.3	-13.0	34.3
400.200	H	37.32	-58	0.0	0.6	-58.6	-13.0	45.6
666.300	V	36.35	-51.3	0.0	0.9	-52.2	-13.0	39.2

WCDMA Band II

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
Frequency:1880 MHz								
3760.000	H	34.92	-59.4	13.8	2.9	-48.5	-13.0	35.5
3760.000	V	33.81	-59.3	13.8	2.9	-48.4	-13.0	35.4
400.200	H	35.10	-60.3	0.0	0.6	-60.9	-13.0	47.9
666.300	V	34.10	-53.6	0.0	0.9	-54.5	-13.0	41.5

Note:

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

PART 27

LTE Band 7

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK, Frequency: 2535 MHz								
5070.000	H	35.12	-56.2	13.9	2.4	-44.7	-25.0	19.7
5070.000	V	33.96	-58.2	13.9	2.4	-46.7	-25.0	21.7
7605.000	H	36.58	-50.9	13.2	3.1	-40.8	-25.0	15.8
7605.000	V	35.44	-52.1	13.2	3.1	-42.0	-25.0	17.0
400.200	H	35.25	-60.1	0.0	0.6	-60.7	-25.0	35.7
666.300	V	33.01	-54.7	0.0	0.9	-55.6	-25.0	30.6
16- QAM, Frequency: 2535 MHz								
5070.000	H	34.75	-56.6	13.9	2.4	-45.1	-25.0	20.1
5070.000	V	33.65	-58.5	13.9	2.4	-47.0	-25.0	22.0
7605.000	H	35.63	-51.9	13.2	3.1	-41.8	-25.0	16.8
7605.000	V	34.55	-52.9	13.2	3.1	-42.8	-25.0	17.8
400.200	H	34.47	-60.9	0.0	0.6	-61.5	-25.0	36.5
666.300	V	33.36	-54.3	0.0	0.9	-55.2	-25.0	30.2

LTE Band 17

Frequency (MHz)	Polar (H/V)	Receiver Reading (dBμV)	Substituted Method			Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			S.G. Level (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)			
QPSK, Frequency:710 MHz								
1420.000	H	40.03	-60.8	9.1	1.3	-53.0	-13.0	40.0
1420.000	V	36.57	-64.1	9.1	1.3	-56.3	-13.0	43.3
2130.000	H	52.69	-43.2	11.2	1.4	-33.4	-13.0	20.4
2130.000	V	39.14	-55.6	11.2	1.4	-45.8	-13.0	32.8
400.200	H	35.69	-59.7	0.0	0.6	-60.3	-13.0	47.3
666.300	V	34.50	-53.2	0.0	0.9	-54.1	-13.0	41.1
16- QAM, Frequency: 710 MHz								
1420.000	H	39.53	-61.3	9.1	1.3	-53.5	-13.0	40.5
1420.000	V	36.04	-64.6	9.1	1.3	-56.8	-13.0	43.8
2130.000	H	51.95	-44	11.2	1.4	-34.2	-13.0	21.2
2130.000	V	48.49	-46.3	11.2	1.4	-36.5	-13.0	23.5
400.200	H	34.25	-61.1	0.0	0.6	-61.7	-13.0	48.7
666.300	V	34.21	-53.5	0.0	0.9	-54.4	-13.0	41.4

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

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

Applicable Standard

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

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

According to §27.53 (g), For operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

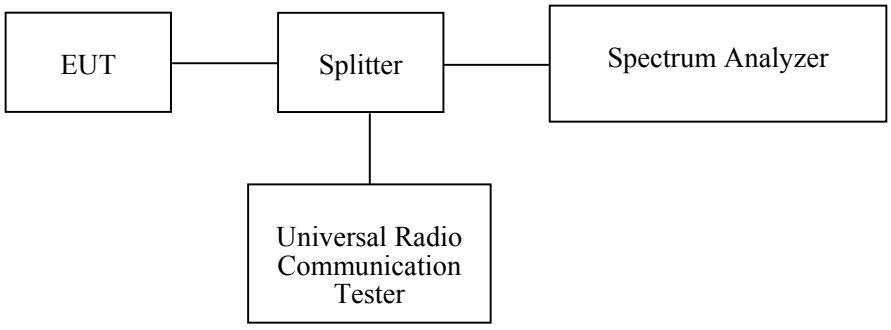
According to §27.53 (h), AWS emission limits—(1) General protection levels. Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB.

According to §27.53 (m), (4) For mobile digital stations, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Test Procedure

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

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



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	Spectrum Analyzer	FSP 38	100478	2015-05-09	2016-05-09
R&S	Universal Radio Communication Tester	CMU200	109038	2015-05-09	2016-05-09
R&S	Wideband Radio Communication Tester	CMW500	106891	2014-11-23	2015-11-23

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

Test Data

Environmental Conditions

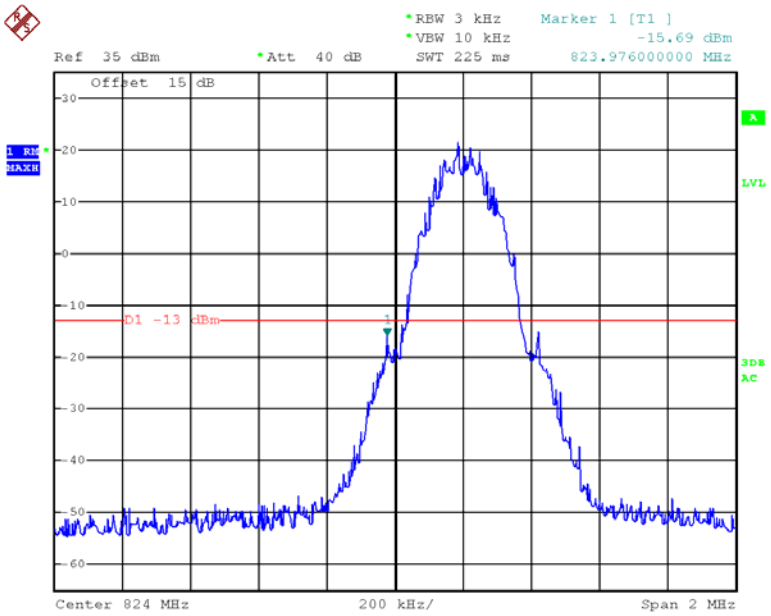
Temperature:	26.1~26.3 °C
Relative Humidity:	51~55 %
ATM Pressure:	100~100.3 kPa

The testing was performed by Dean Liu from 2015-09-05 to 2015-09-14.

Test Mode: Transmitting

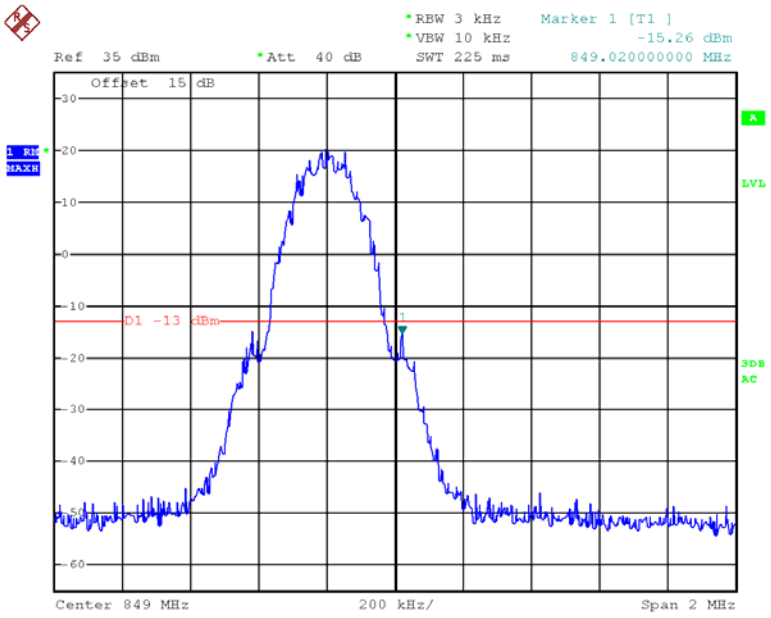
Test Result: Compliance. Please refer to the following plots.

GSM 850, Left Band Edge



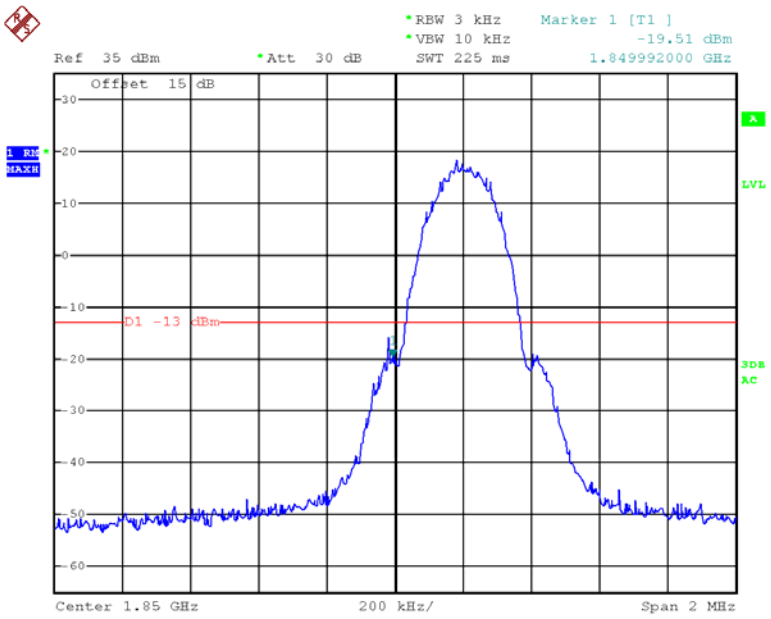
Date: 5.SEP.2015 10:48:29

GSM 850, Right Band Edge



Date: 5.SEP.2015 10:47:31

GSM 1900, Left Band Edge



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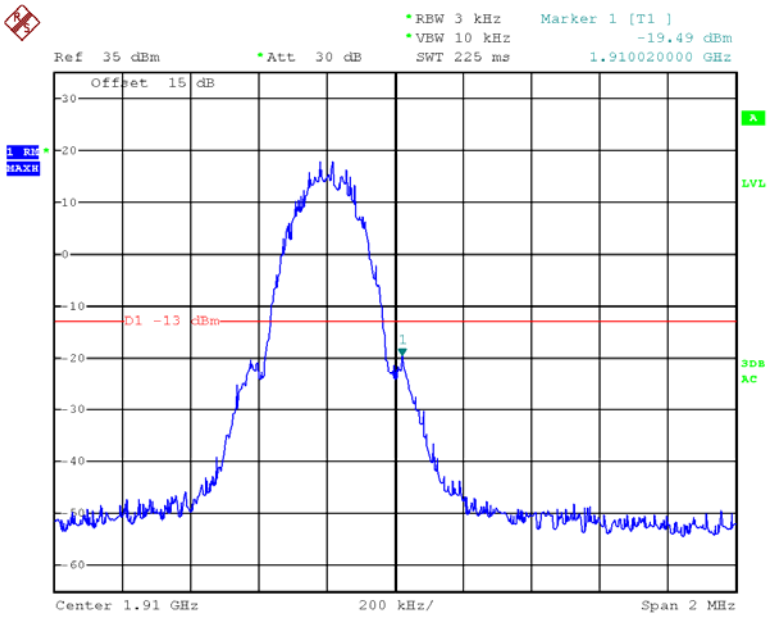
GSM 1900, Right Band Edge



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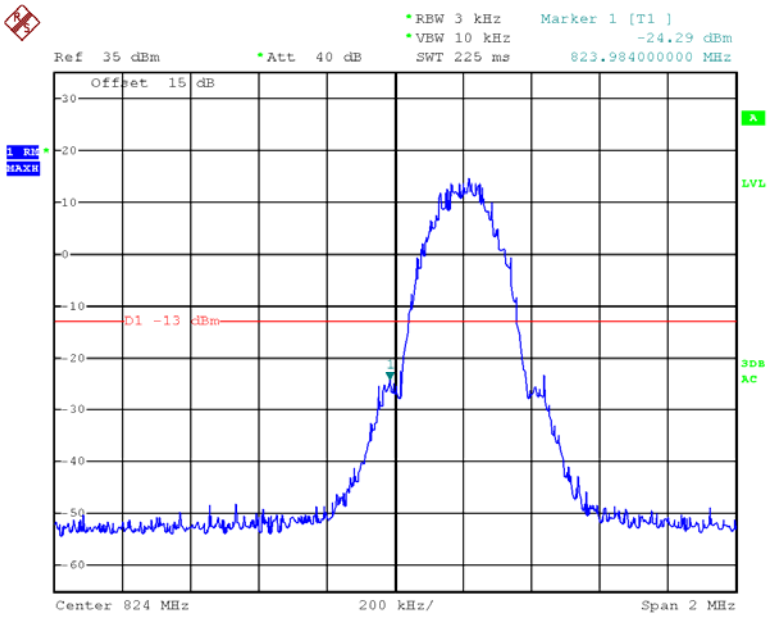
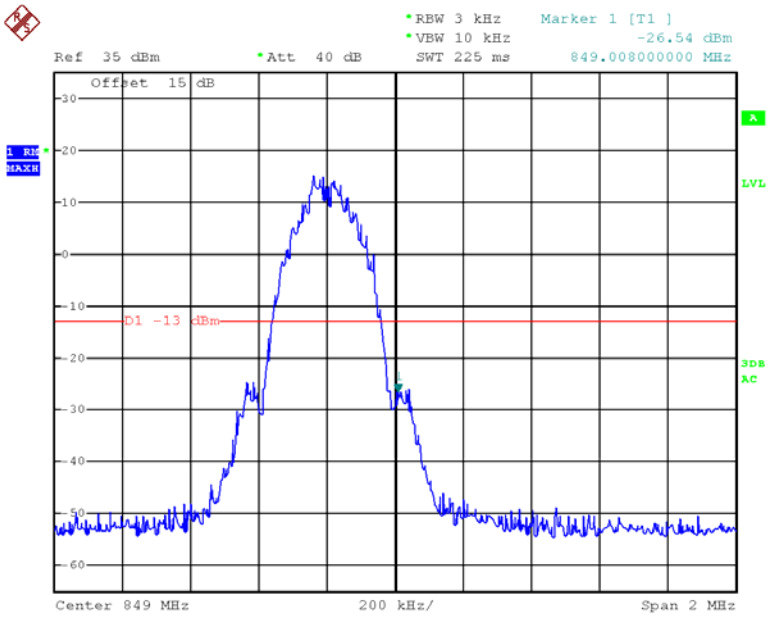
EDGE 850, Left Band Edge



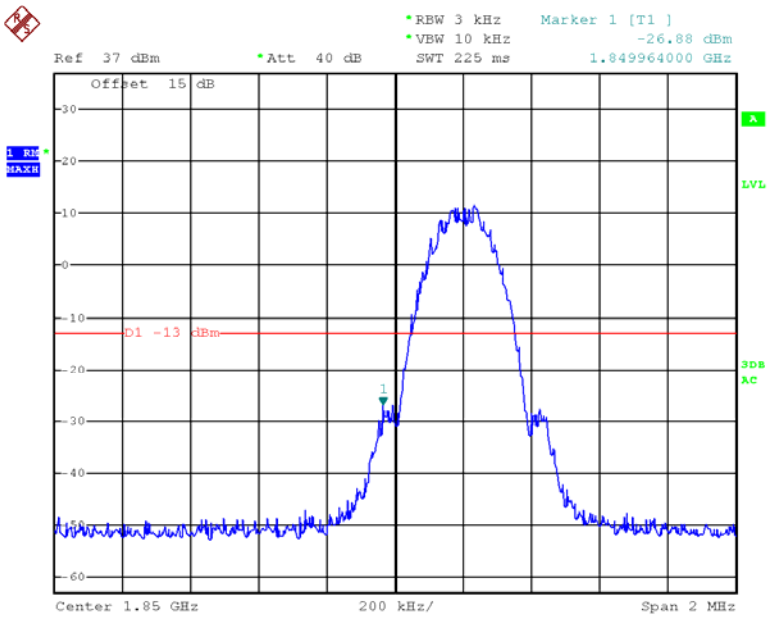
Date: 5.SEP.2015 10:58:30

EDGE 850, Right Band Edge



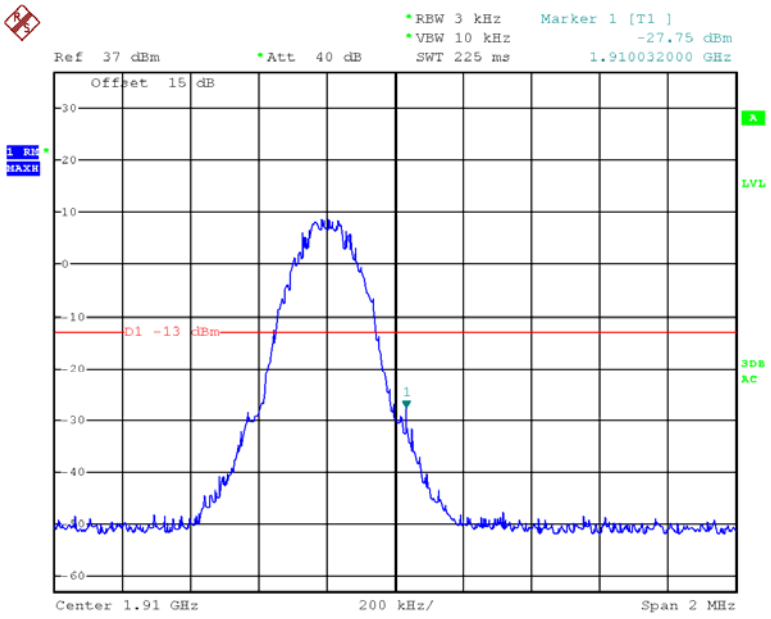
Date: 5.SEP.2015 10:59:40

EDGE 1900, Left Band Edge



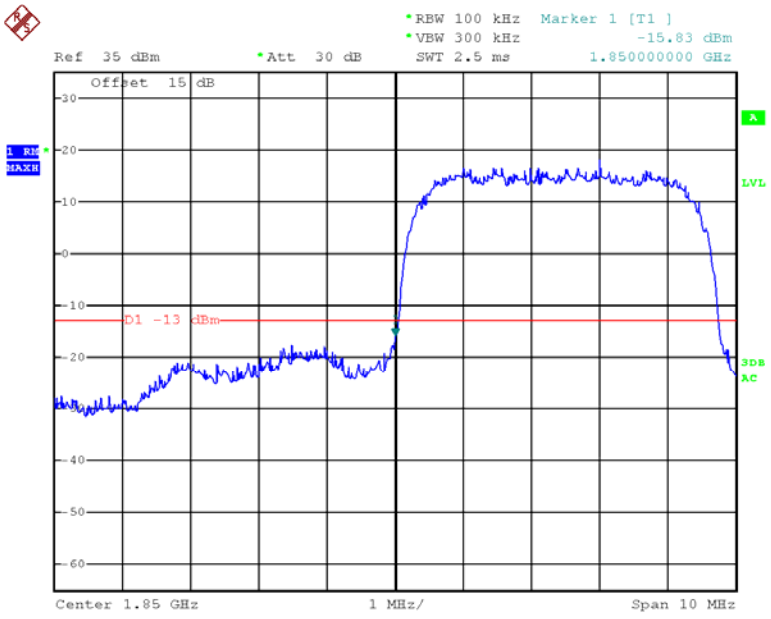
Date: 5.SEP.2015 13:15:28

EDGE 1900, Right Band Edge



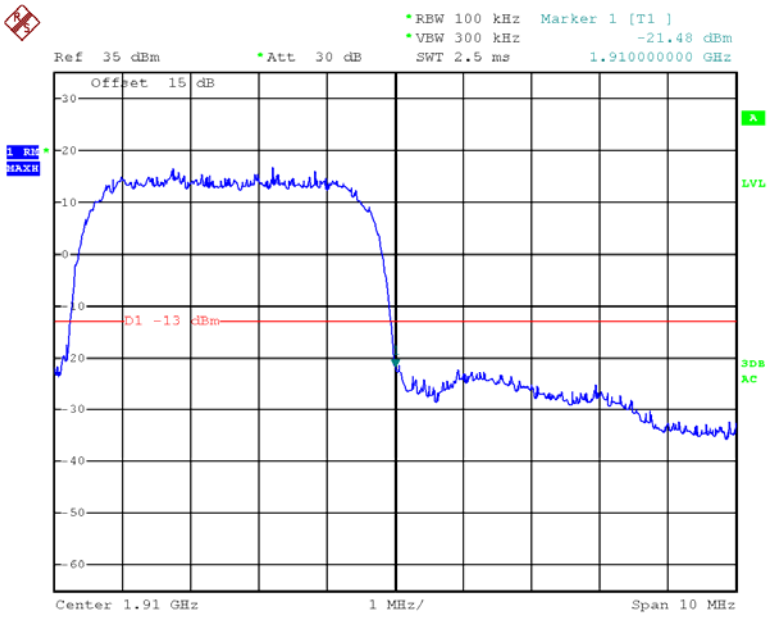
Date: 5.SEP.2015 13:14:36

REL99 Band II, Left Band Edge



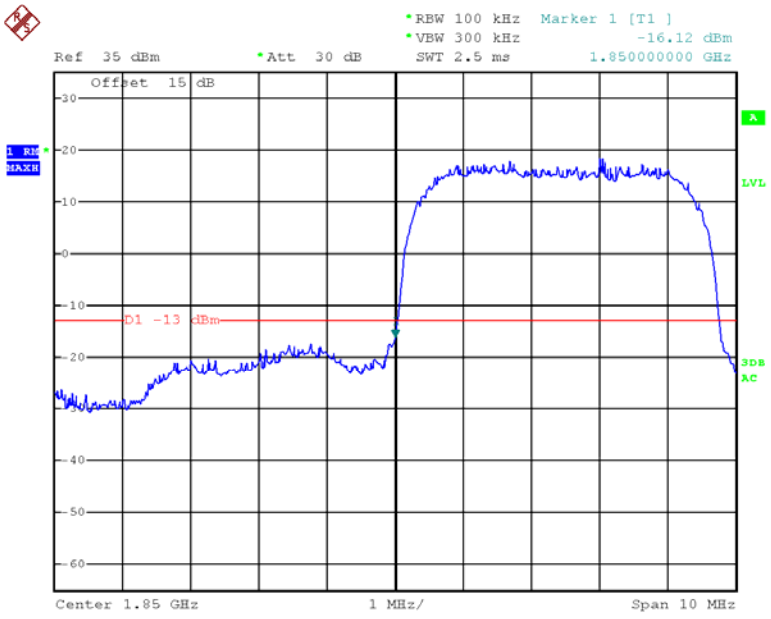
Date: 5.SEP.2015 15:46:05

REL99 Band II, Right Band Edge



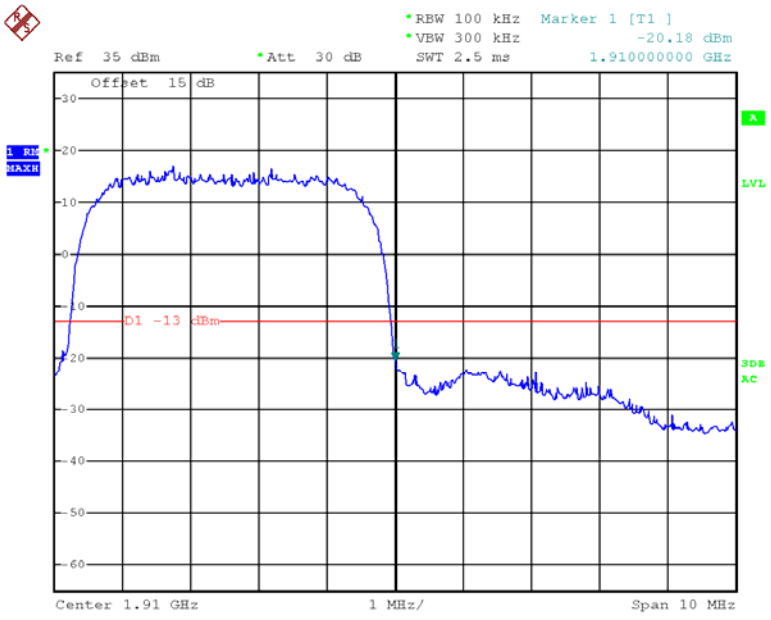
Date: 5.SEP.2015 15:44:24

HSDPA Band II, Left Band Edge



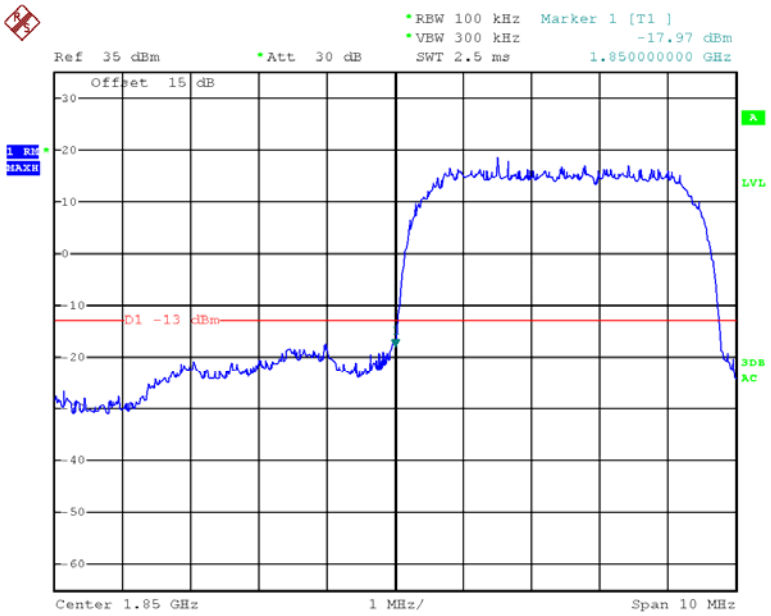
Date: 5.SEP.2015 15:45:02

HSDPA Band II, Right Band Edge



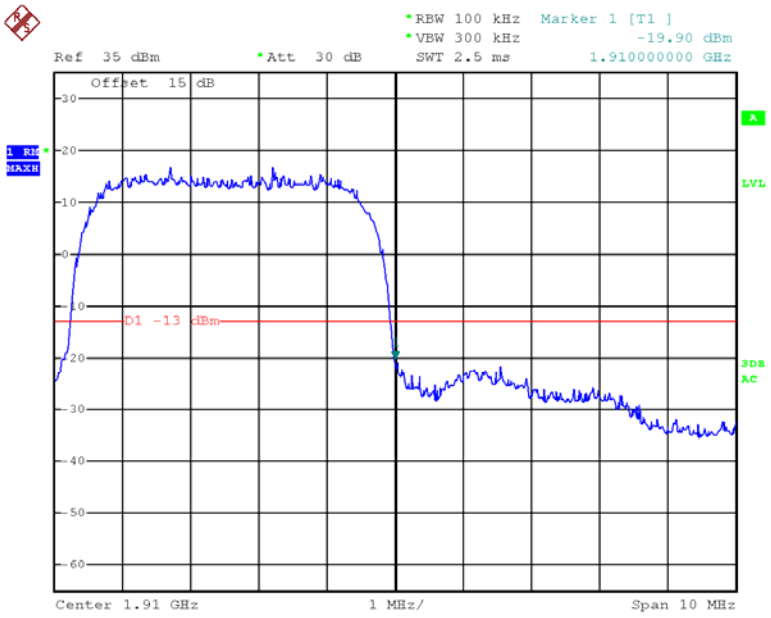
Date: 5.SEP.2015 15:43:51

HSUPA Band II, Left Band Edge



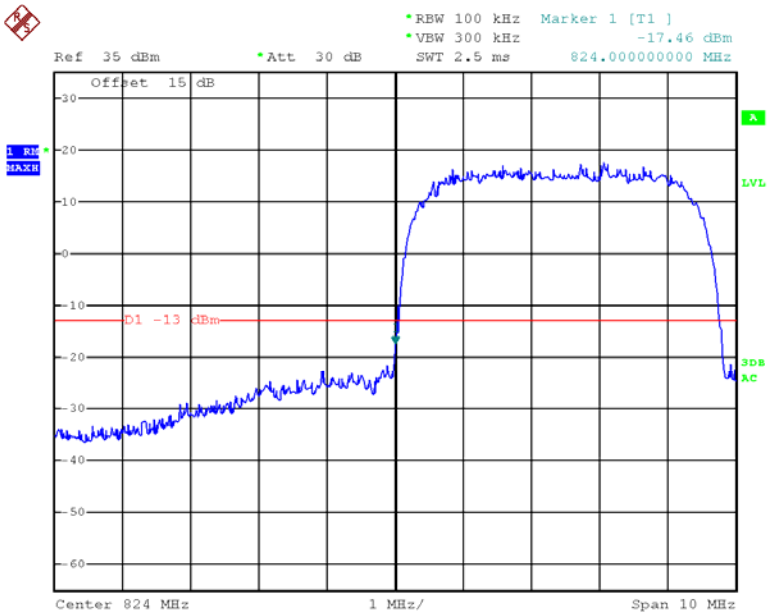
Date: 5.SEP.2015 15:45:13

HSUPA Band II, Right Band Edge



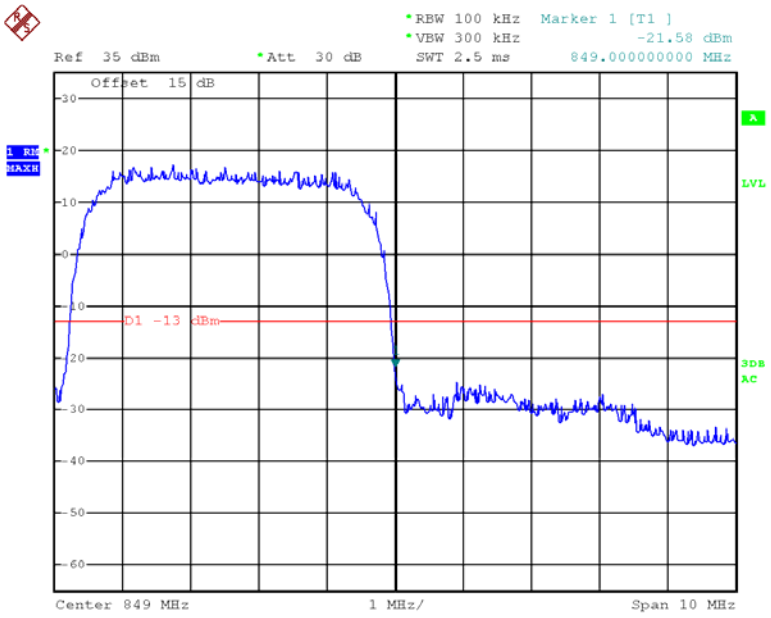
Date: 5.SEP.2015 15:44:08

REL99 Band V, Left Band Edge



Date: 5.SEP.2015 15:25:15

REL99 Band V Right Band Edge



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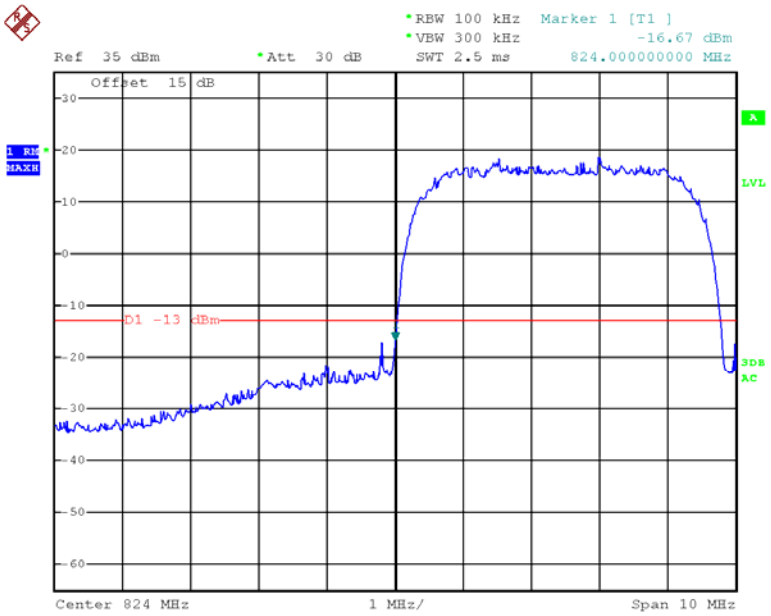
HSDPA Band V, Left Band Edge



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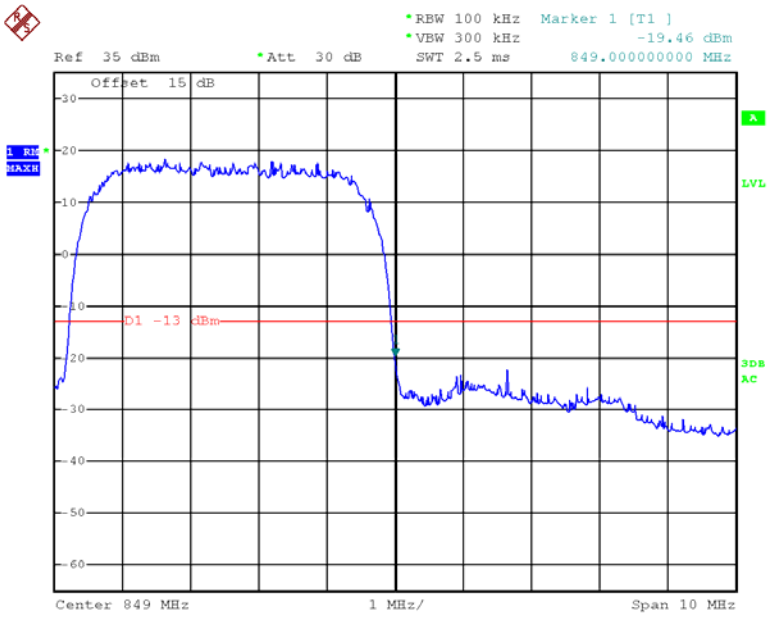
HSDPA Band V, Right Band Edge



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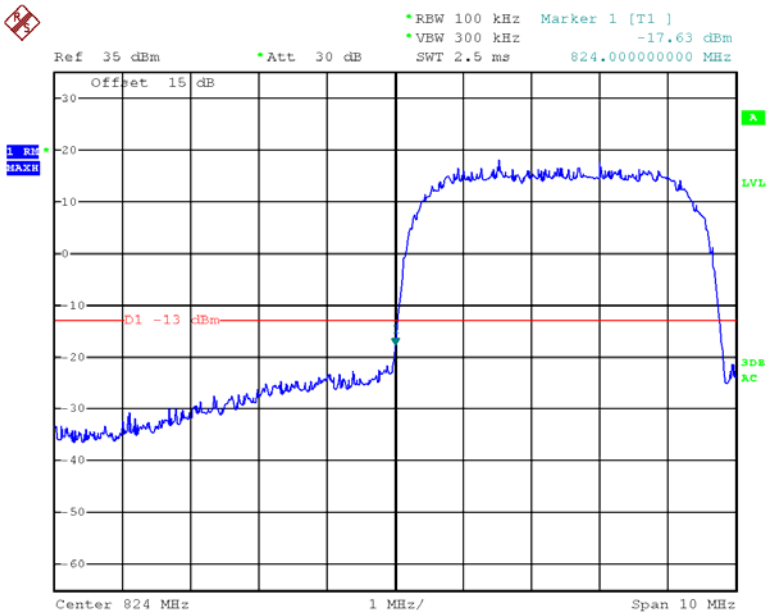
HSUPA Band V, Left Band Edge



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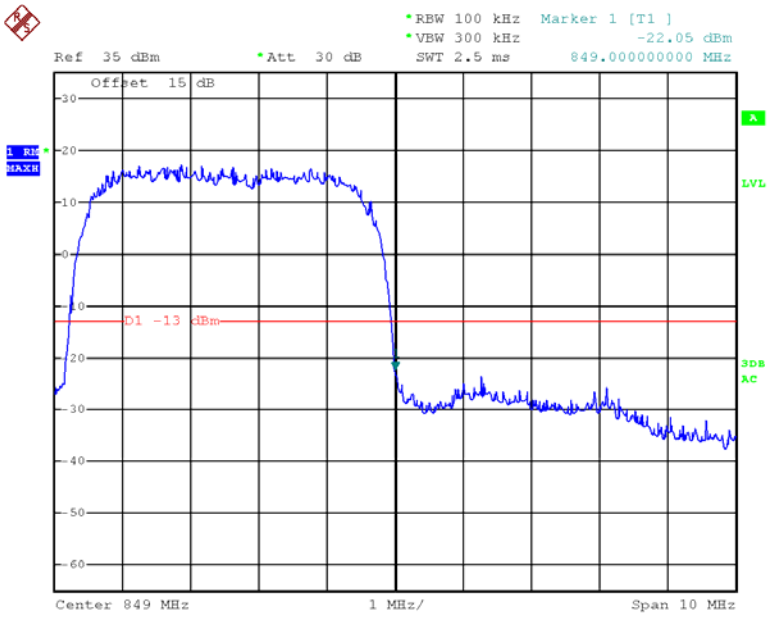

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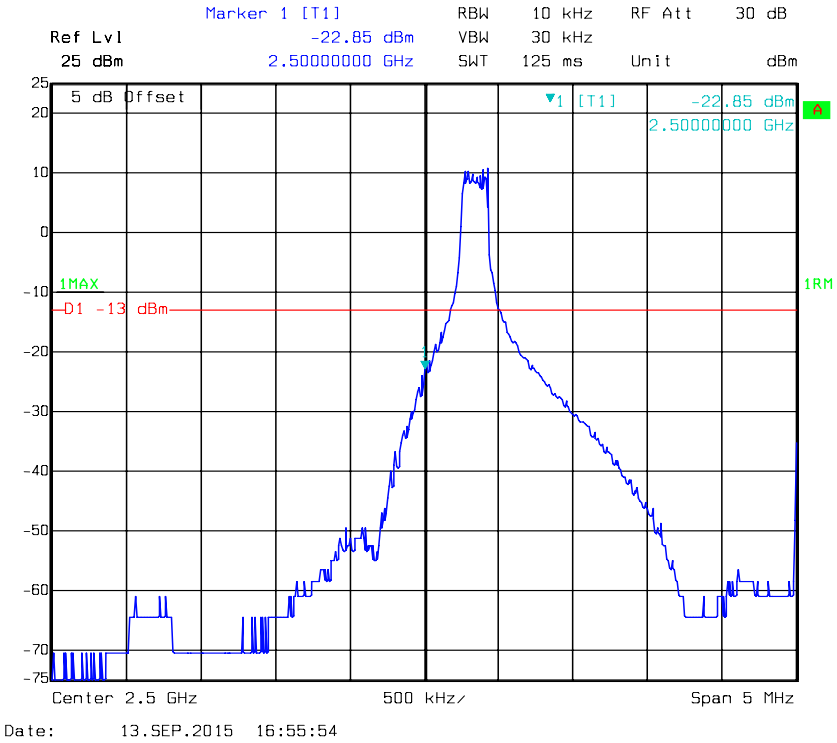
LTE Band 7

QPSK-5M 1RB, Left Band Edge



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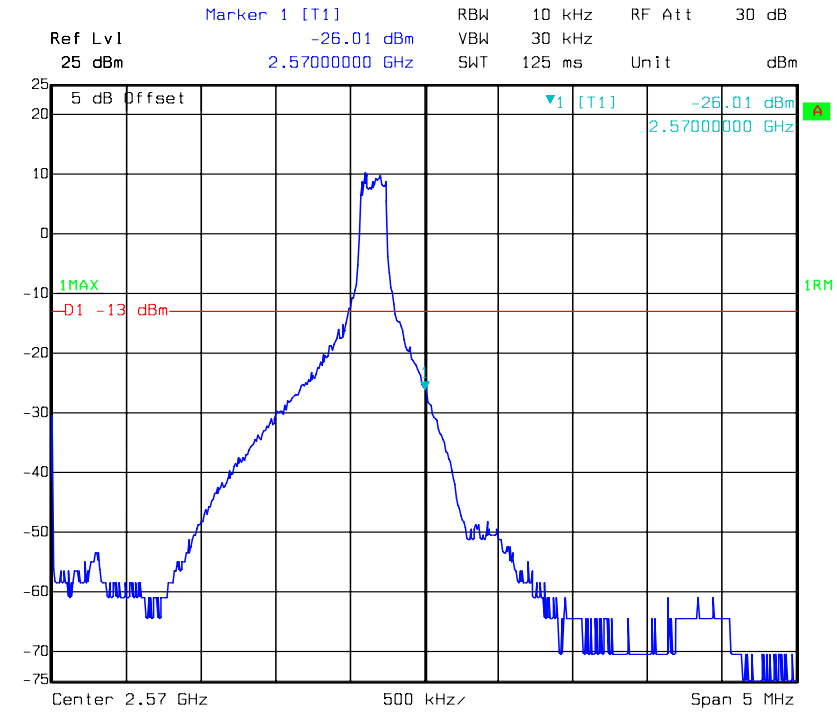
QPSK-5M 1RB, Right Band Edge



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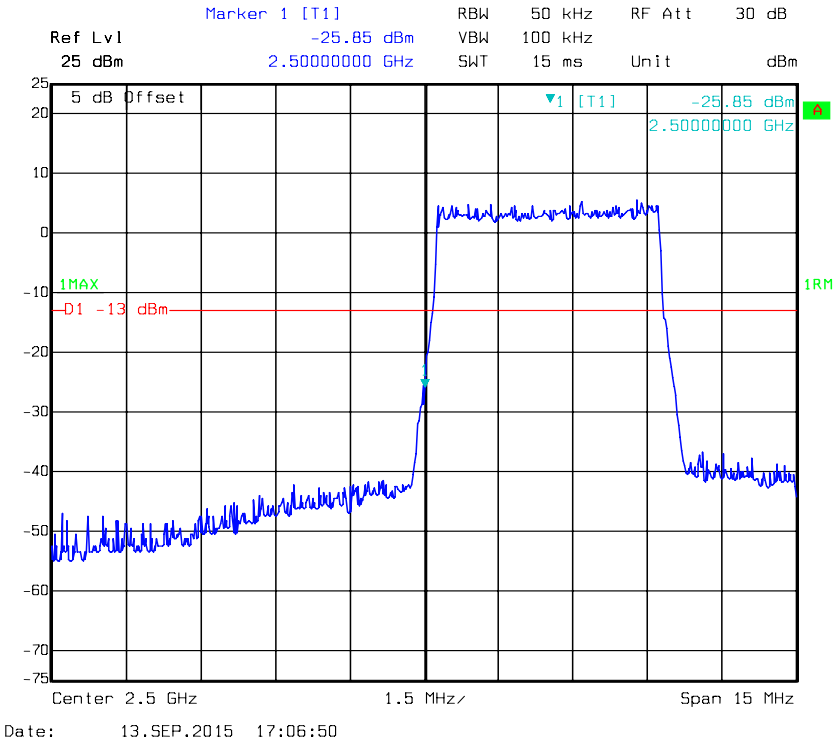
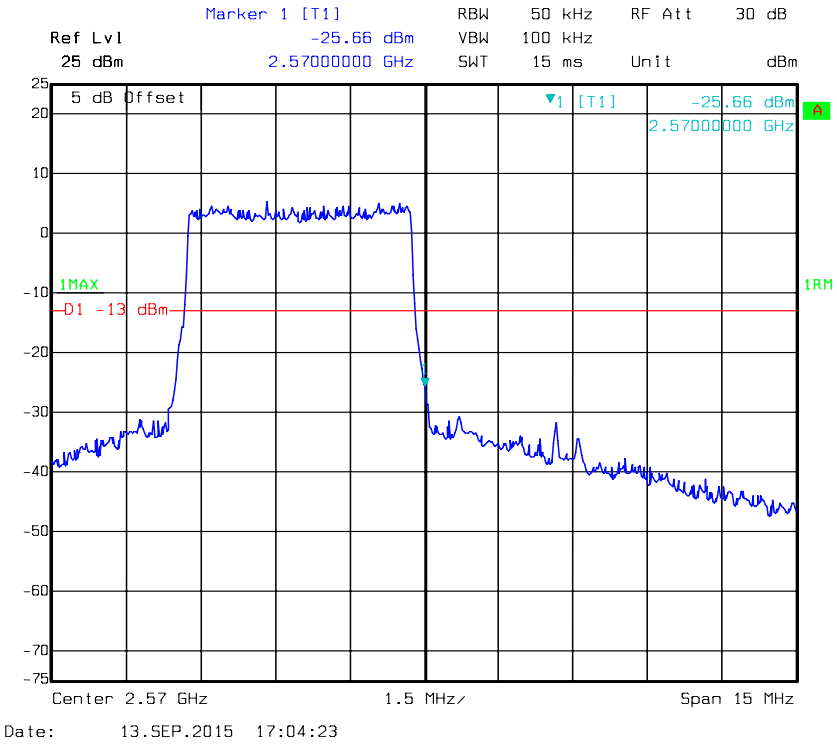
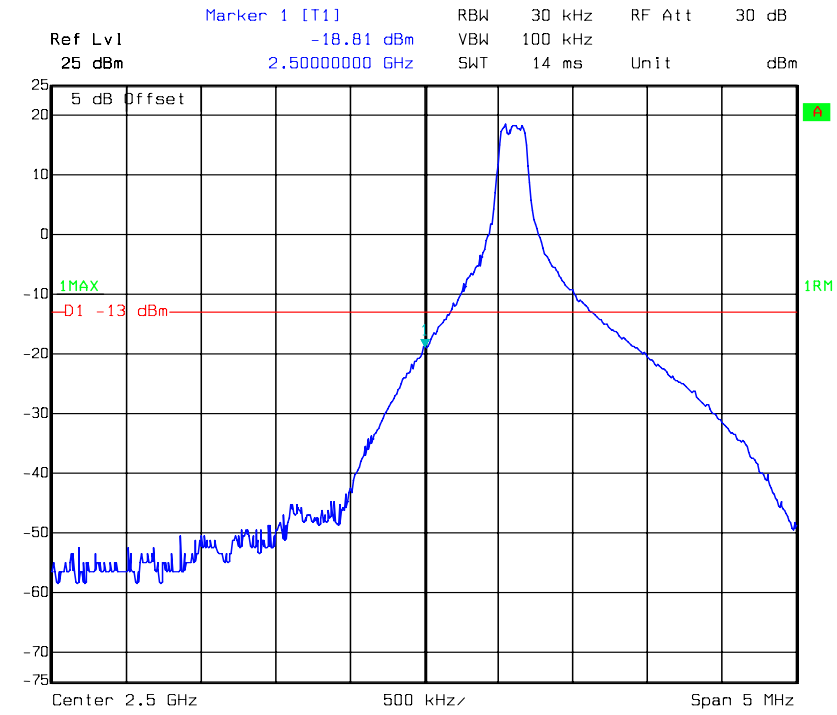
QPSK-5M Full RB, Left Band Edge



QPSK-5M Full RB, Right Band Edge



QPSK-10M 1RB, Left Band Edge



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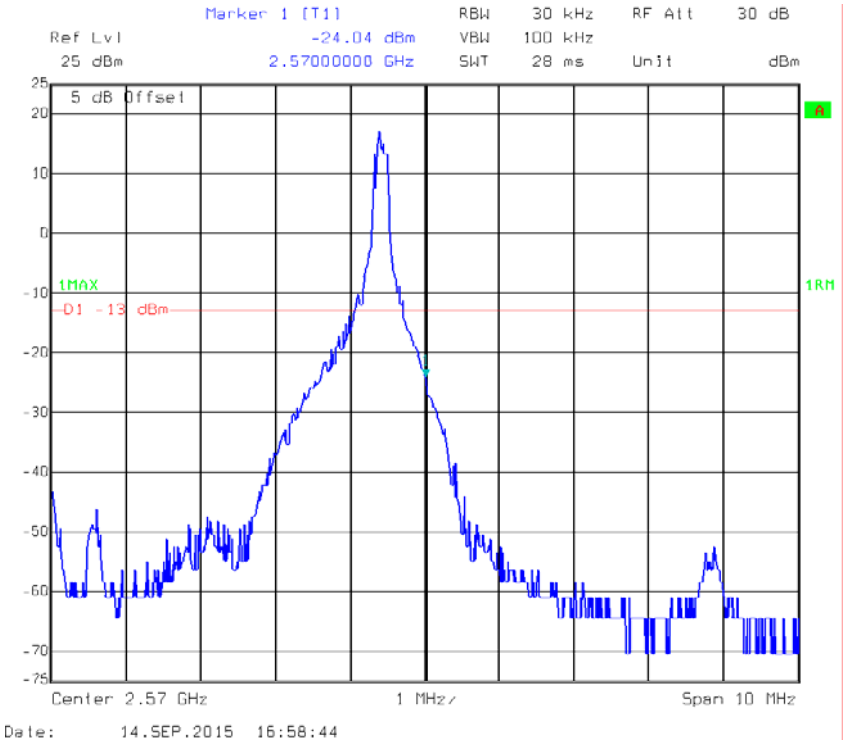
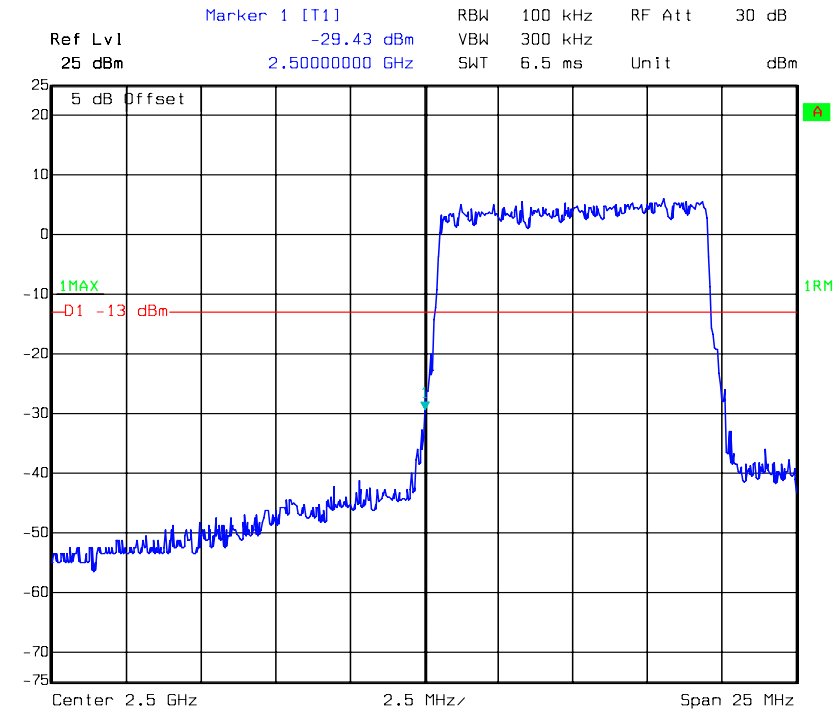
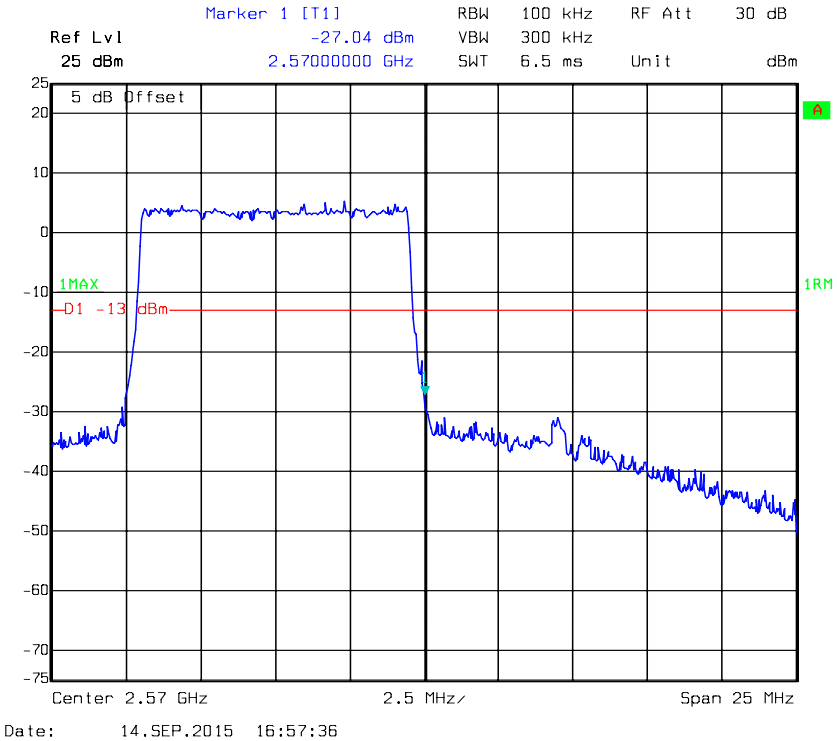


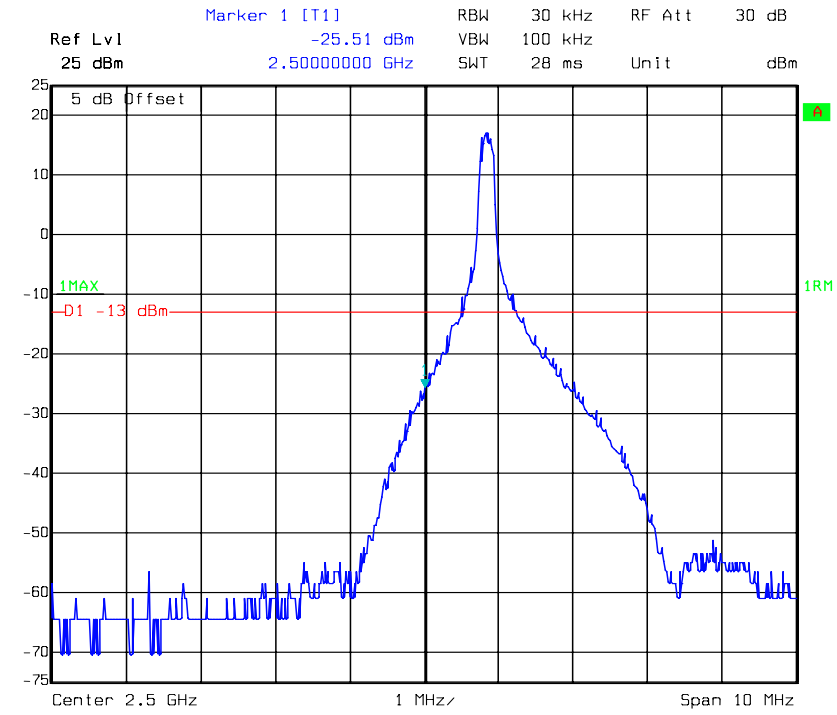
QPSK-10M Full RB, Left Band Edge



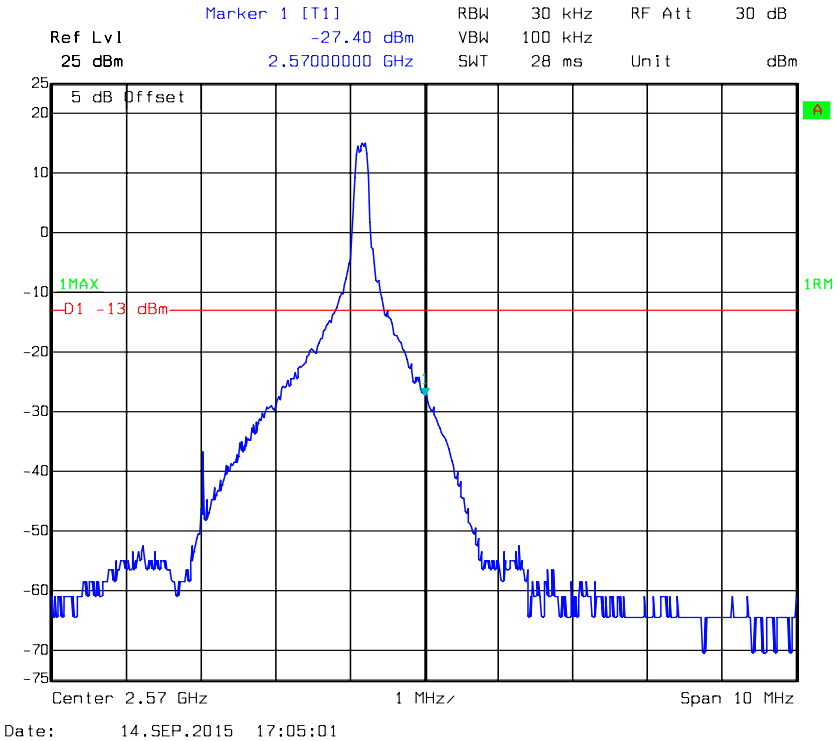
QPSK-10M Full RB, Right Band Edge



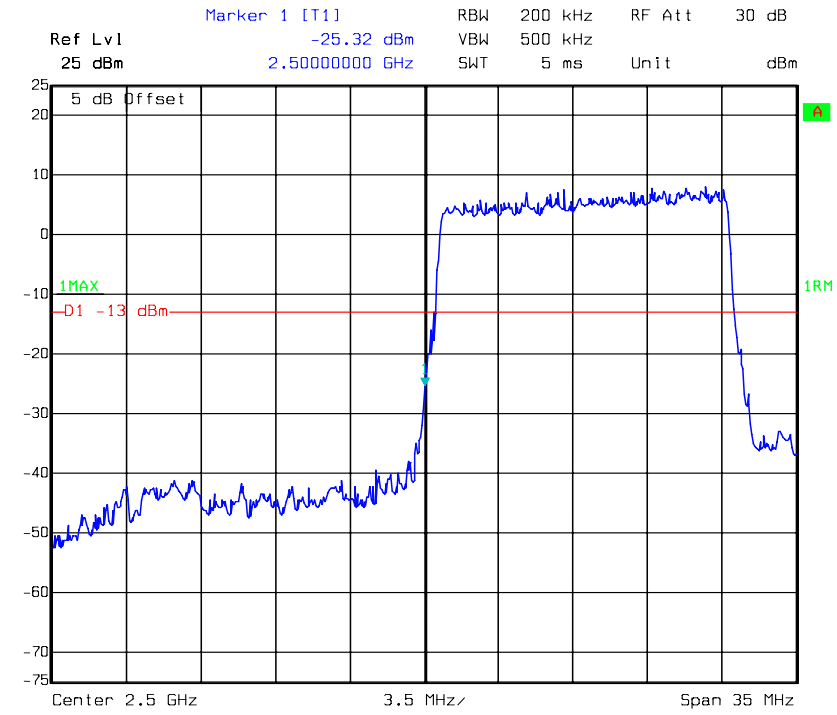
QPSK-15M 1RB, Left Band Edge



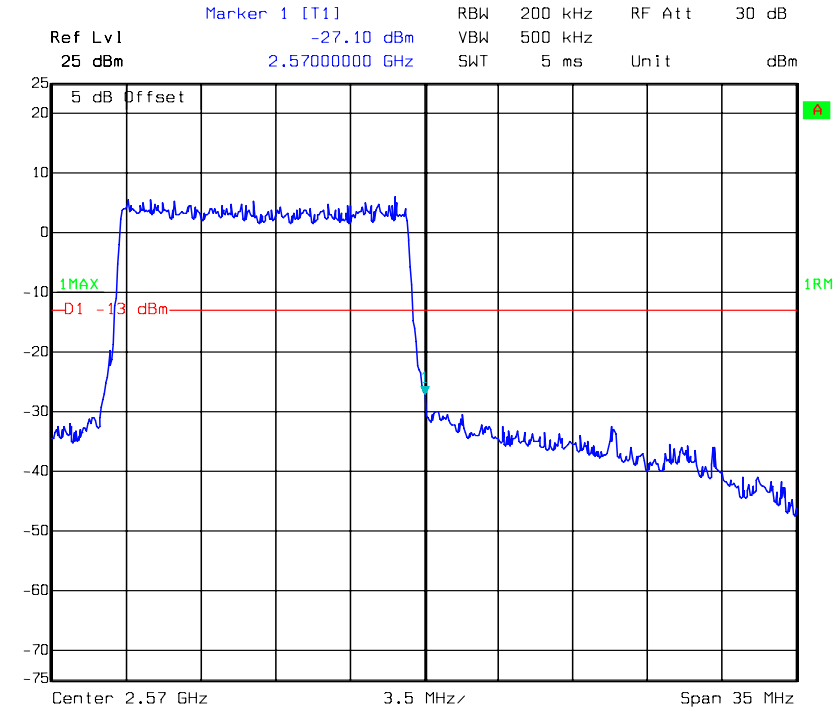
QPSK-15M 1RB, Right Band Edge



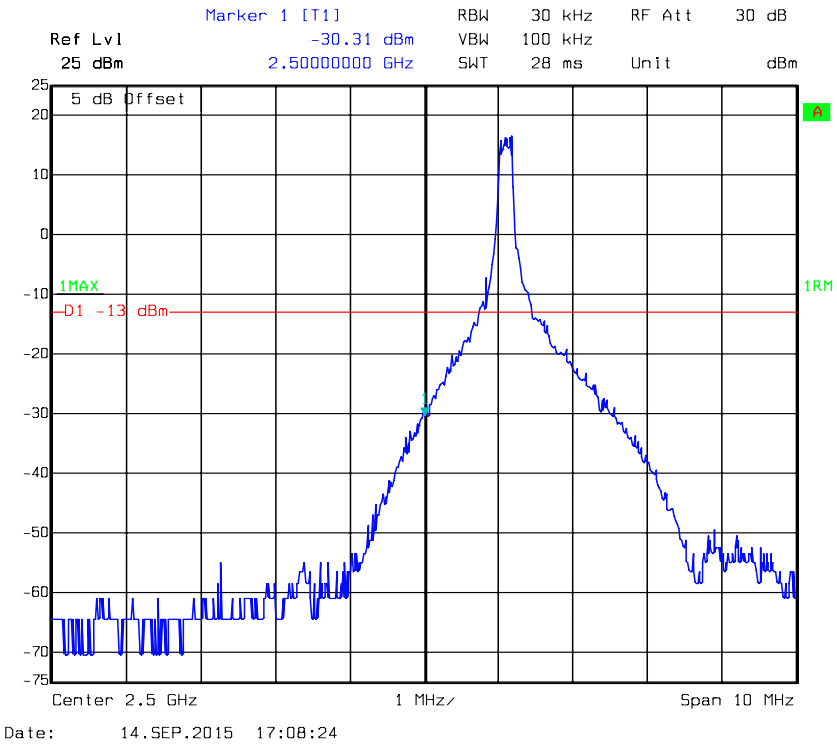
QPSK-15M Full RB, Left Band Edge



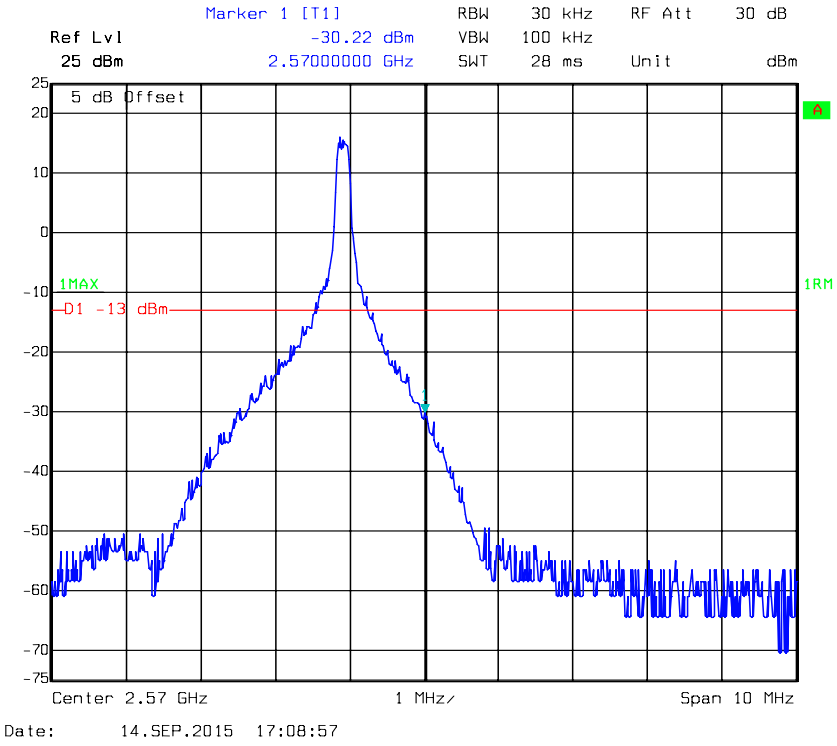
QPSK-15M Full RB, Right Band Edge



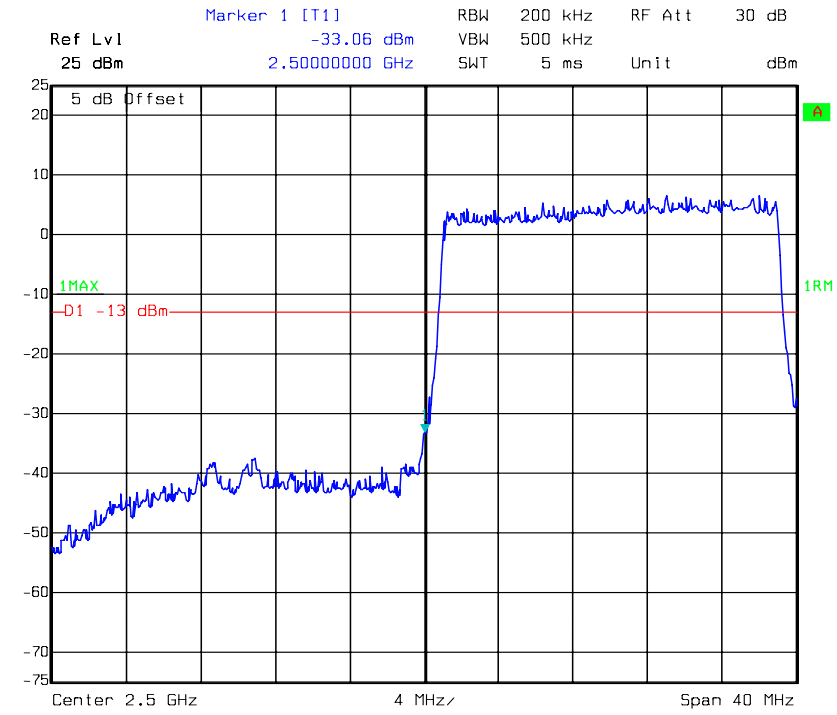
QPSK-20M 1RB, Left Band Edge



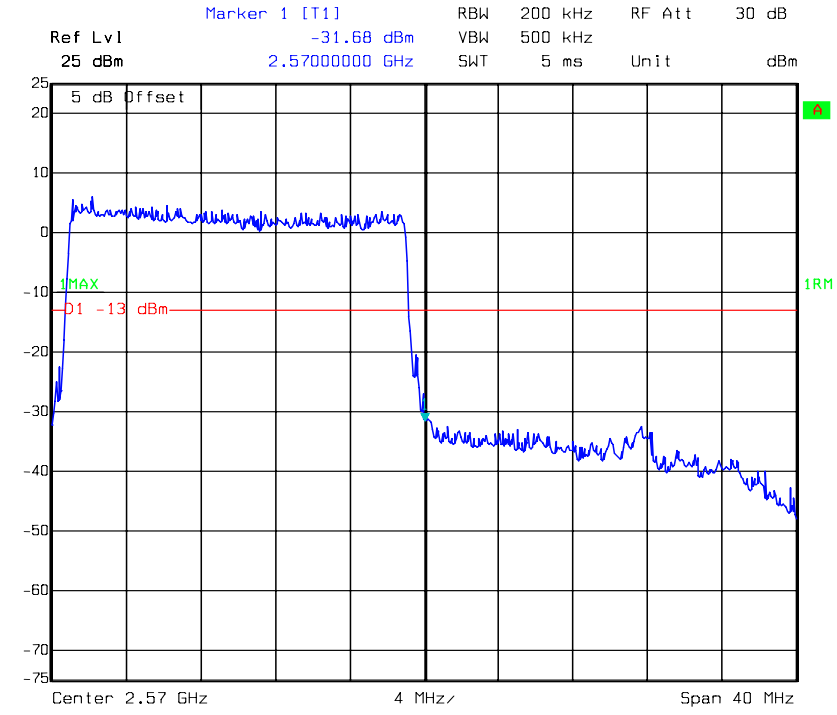
QPSK-20M 1RB, Right Band Edge



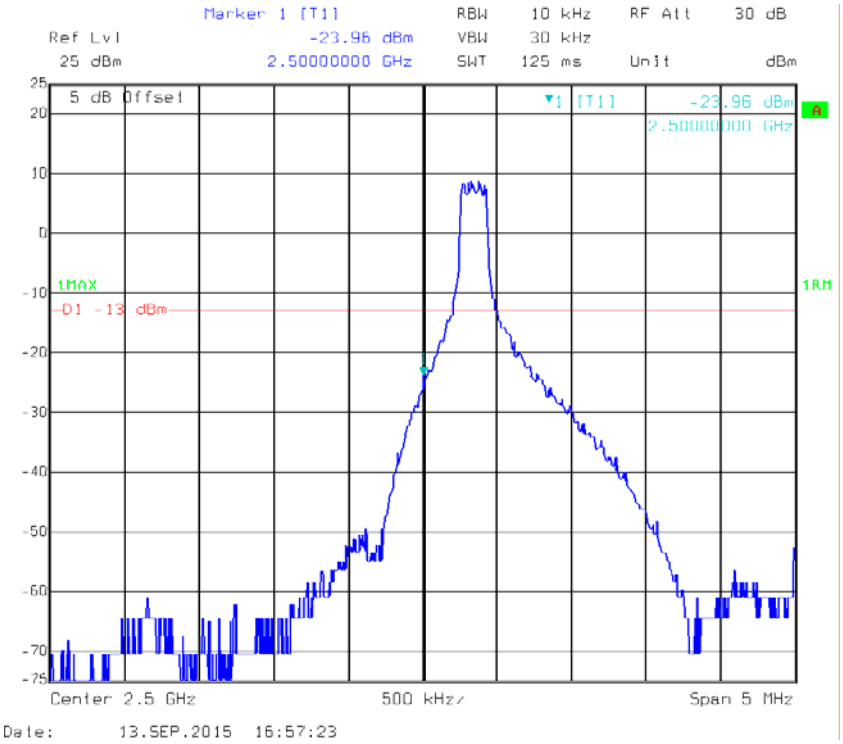
QPSK-20M Full RB, Left Band Edge



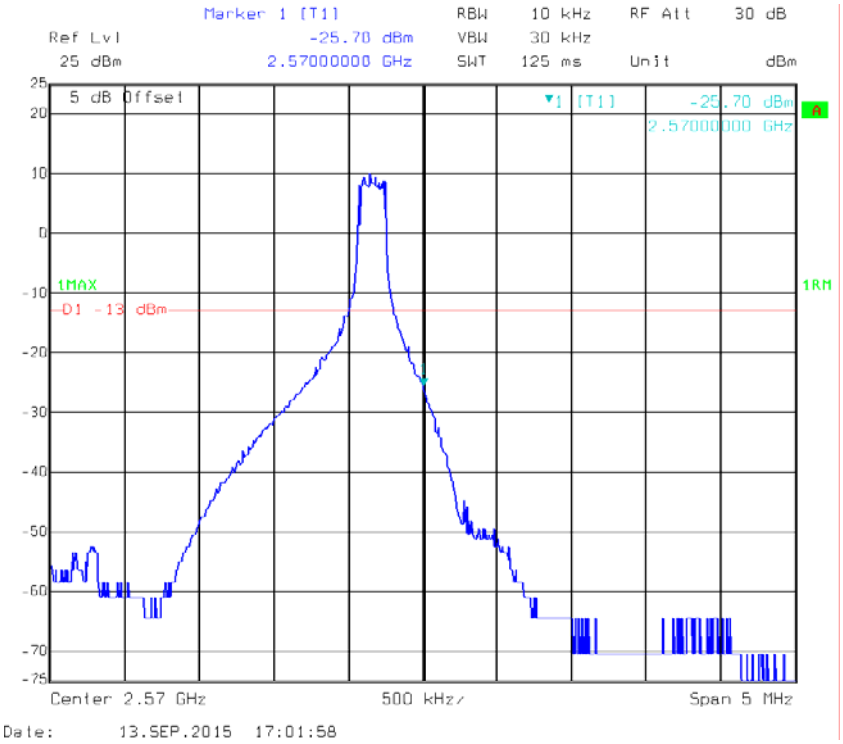
QPSK-20M Full RB, Right Band Edge



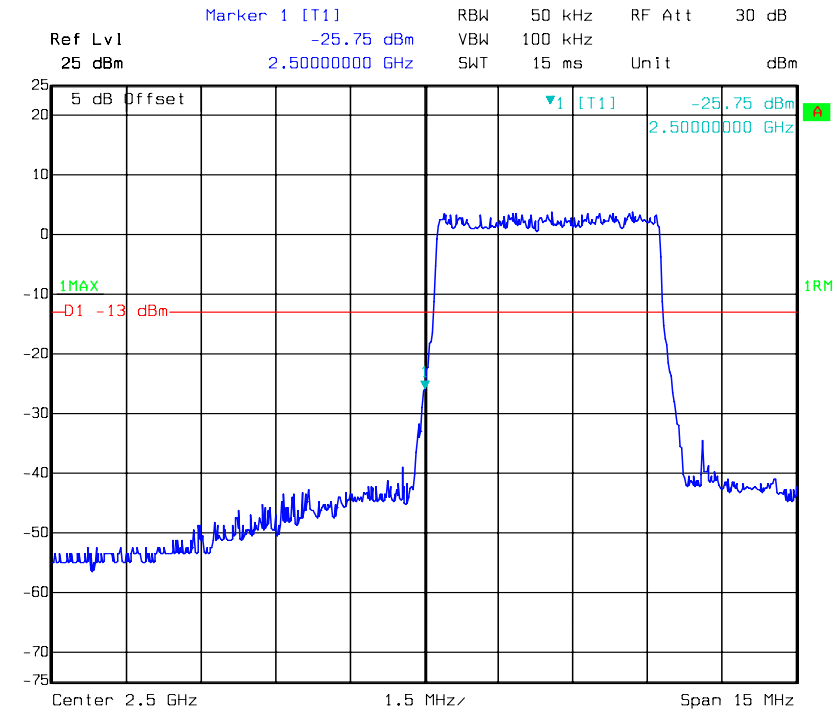
16QAM -5M 1RB, Left Band Edge



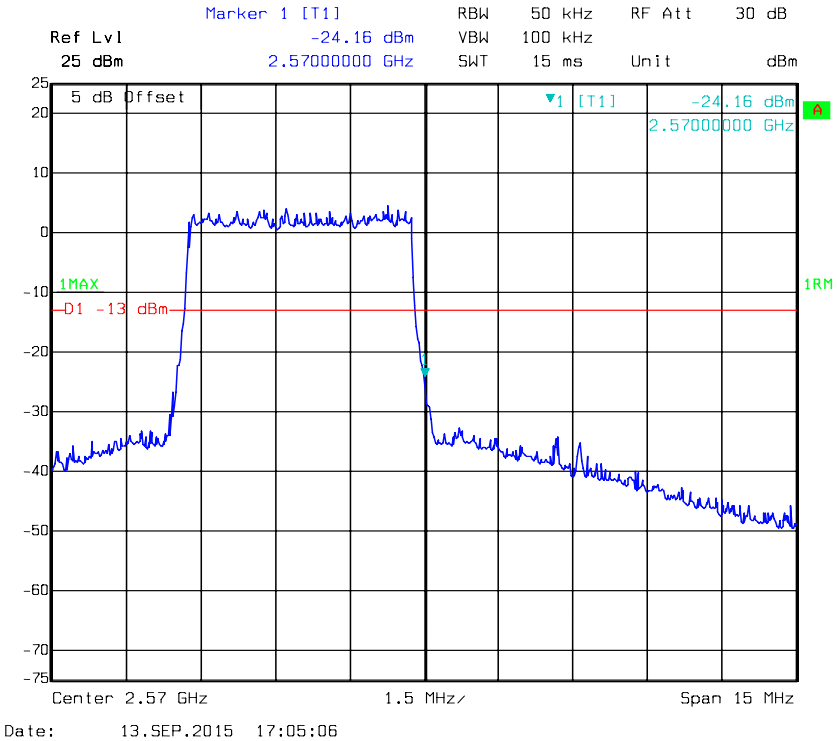
16QAM -5M 1RB, Right Band Edge



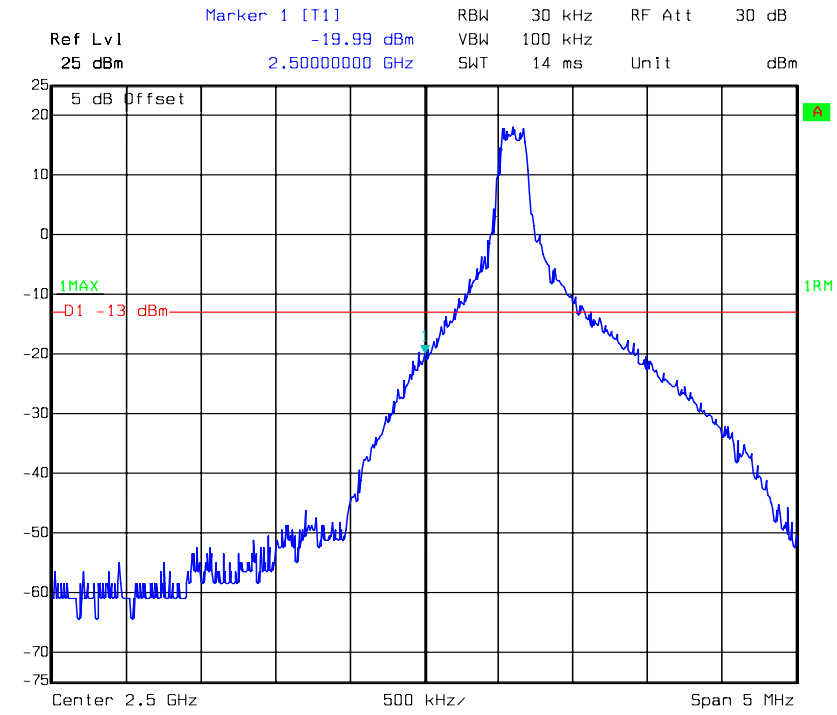
16QAM -5M Full RB, Left Band Edge



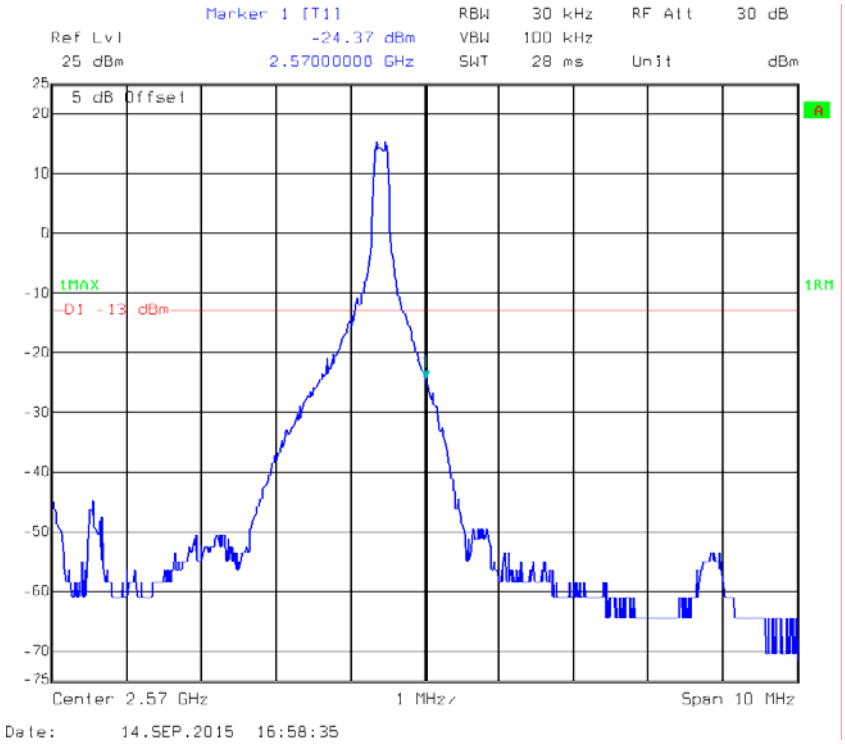
16QAM -5M Full RB, Right Band Edge



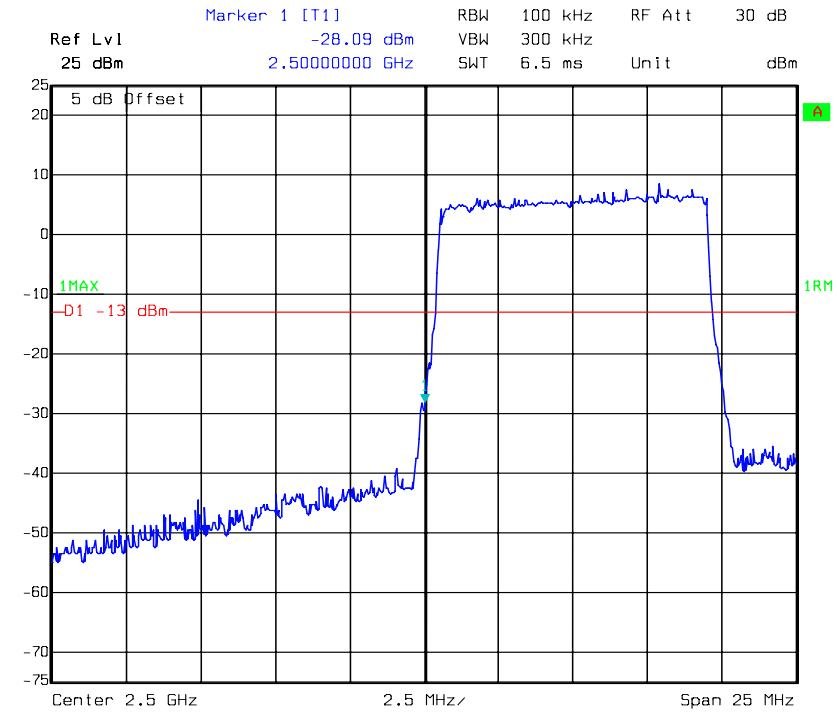
16QAM -10M 1RB, Left Band Edge



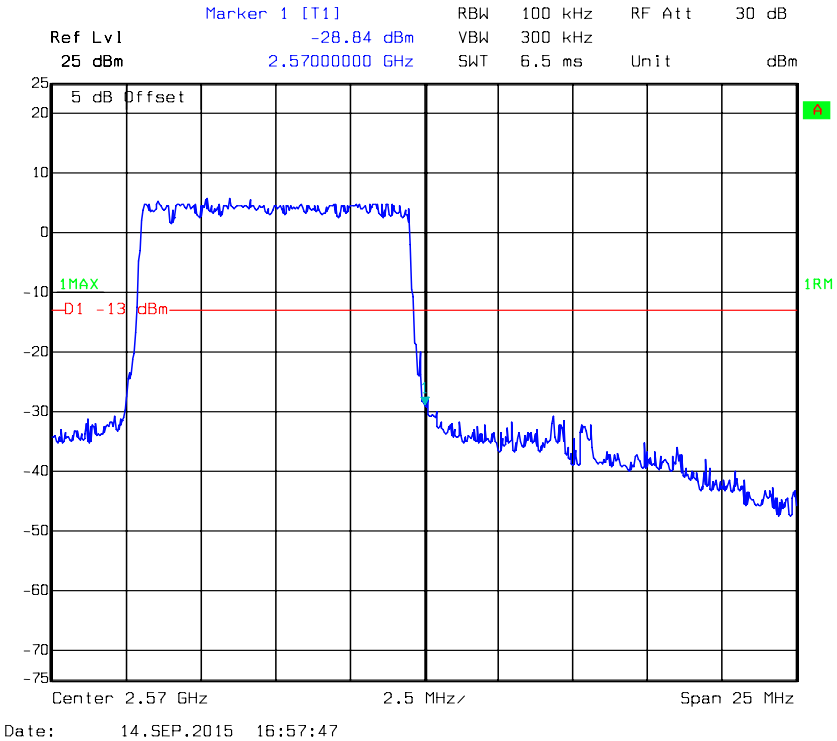
16QAM -10M 1RB, Right Band Edge



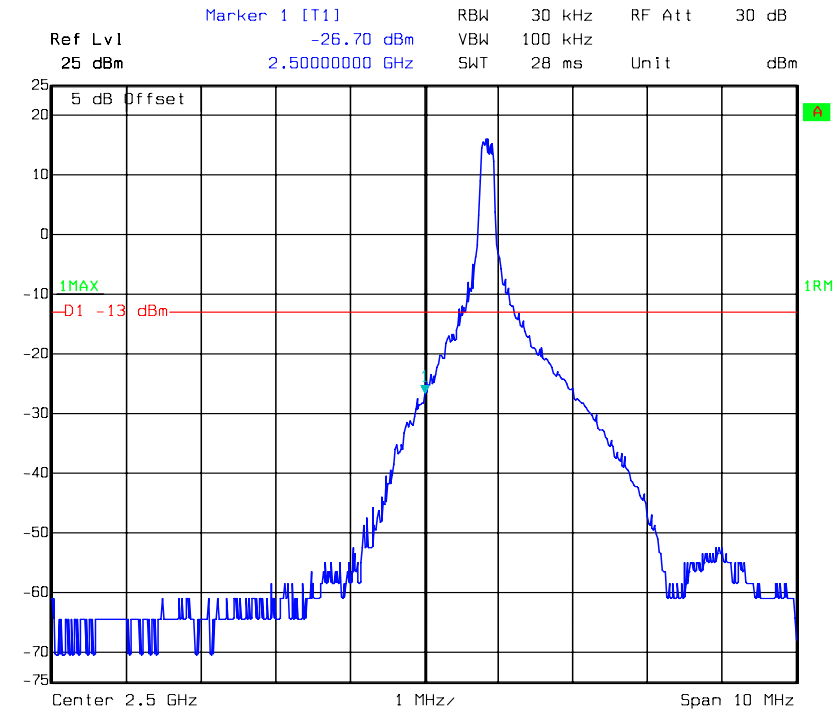
16QAM -10M Full RB, Left Band Edge



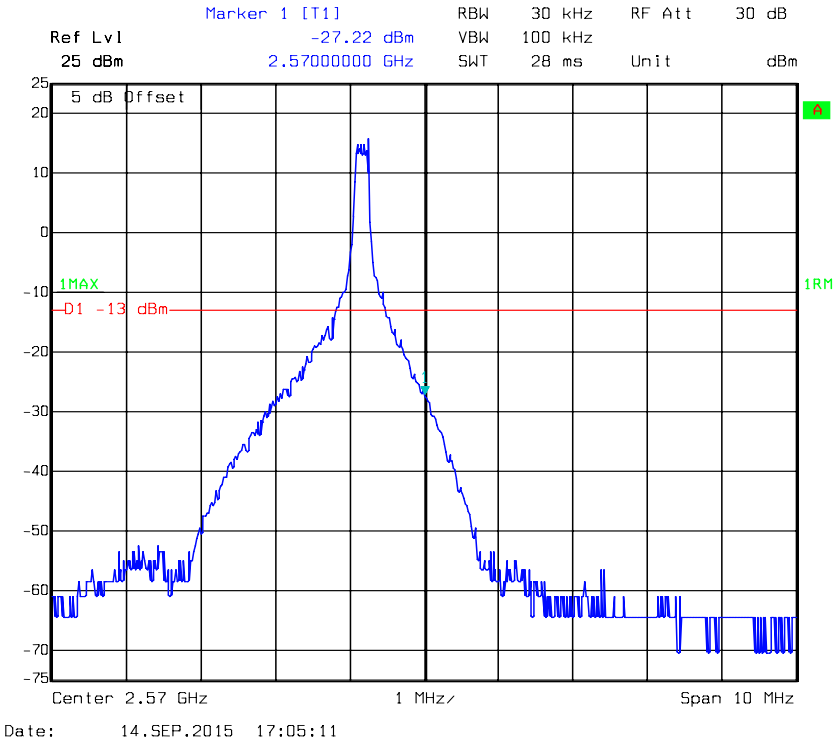
16QAM -10M Full RB, Right Band Edge



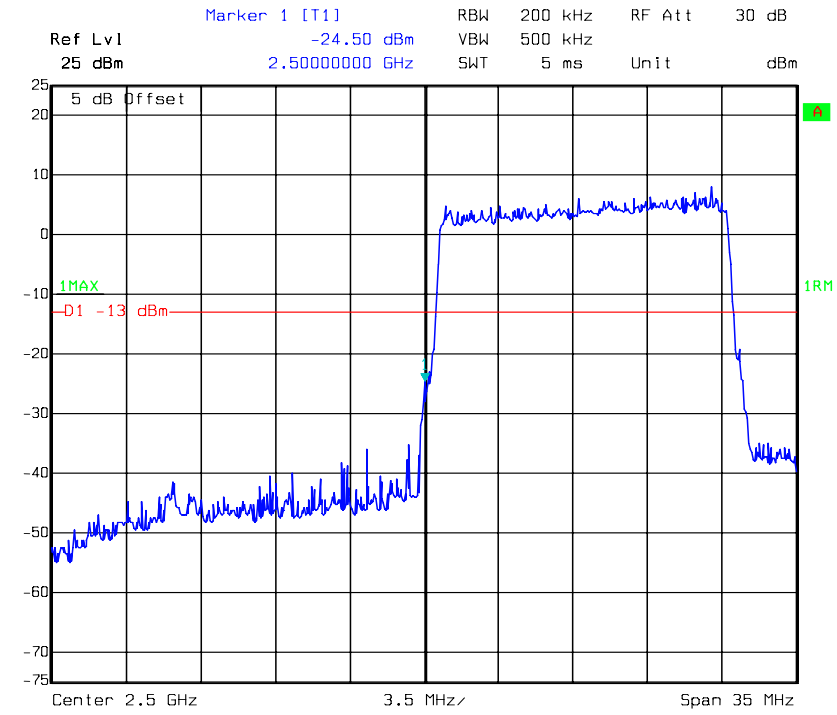
16QAM -15M 1RB, Left Band Edge



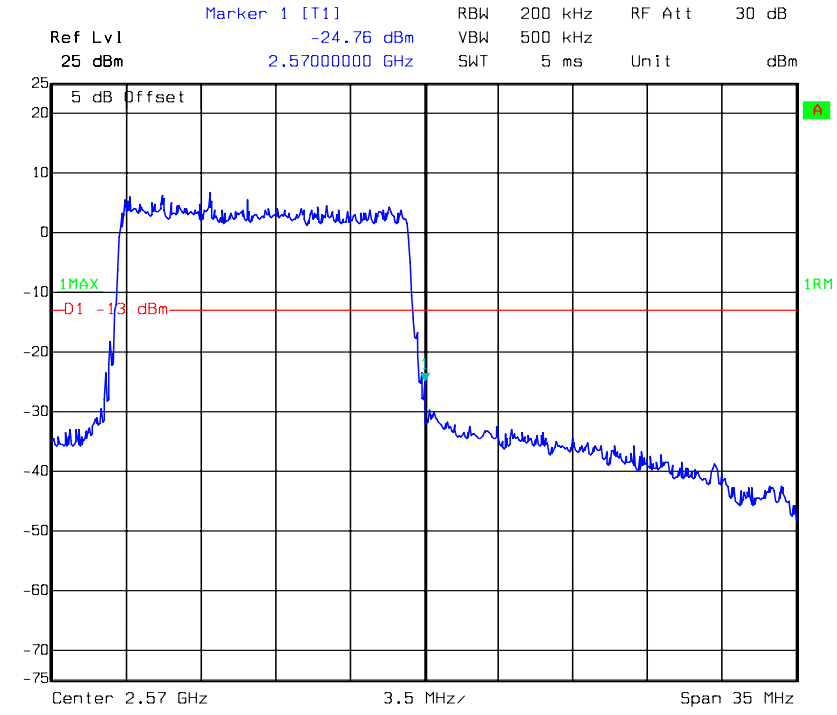
16QAM -15M 1RB, Right Band Edge



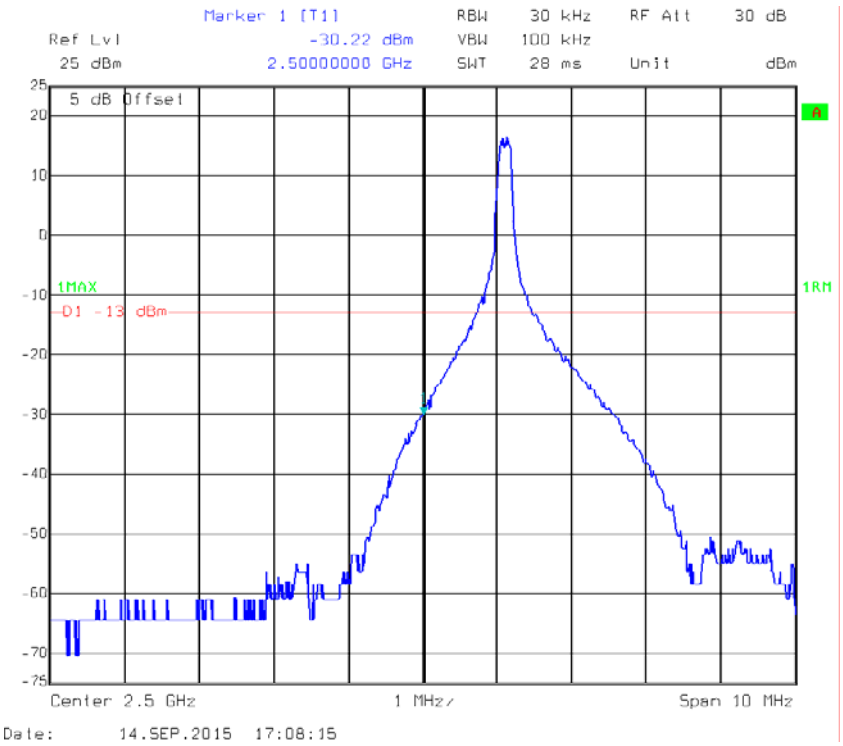
16QAM -15M Full RB, Left Band Edge



16QAM -15M Full RB, Right Band Edge

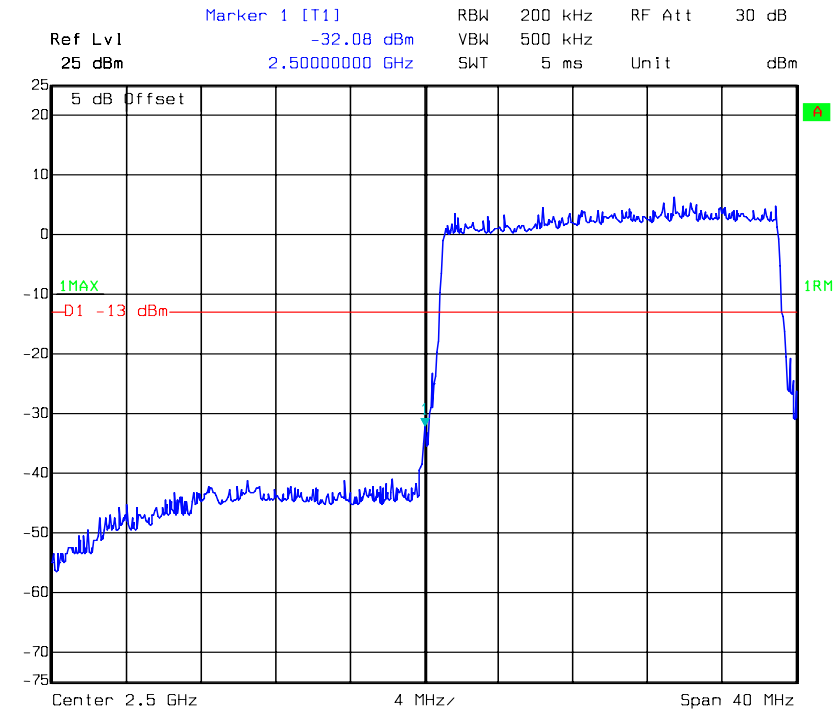


16QAM -20M 1RB, Left Band Edge

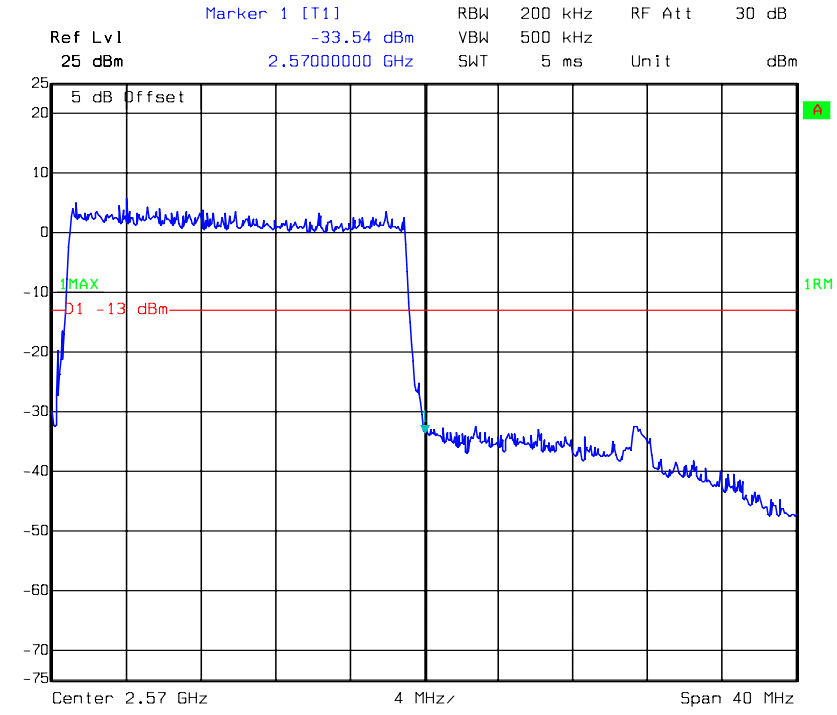


16QAM -20M 1RB, Right Band Edge

16QAM -20M Full RB, Left Band Edge

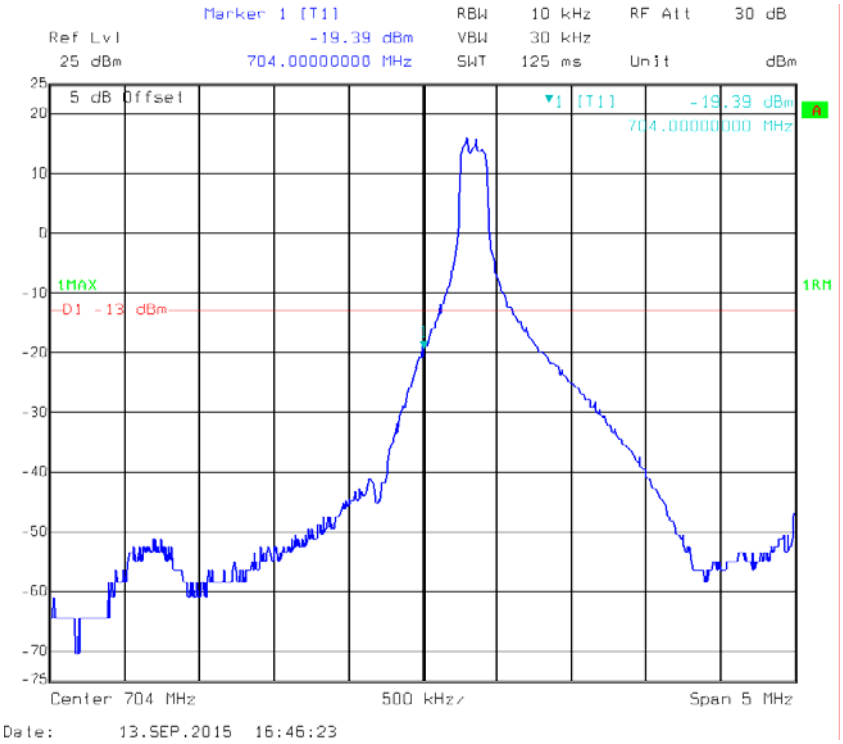


16QAM-20M Full RB, Right Band Edge

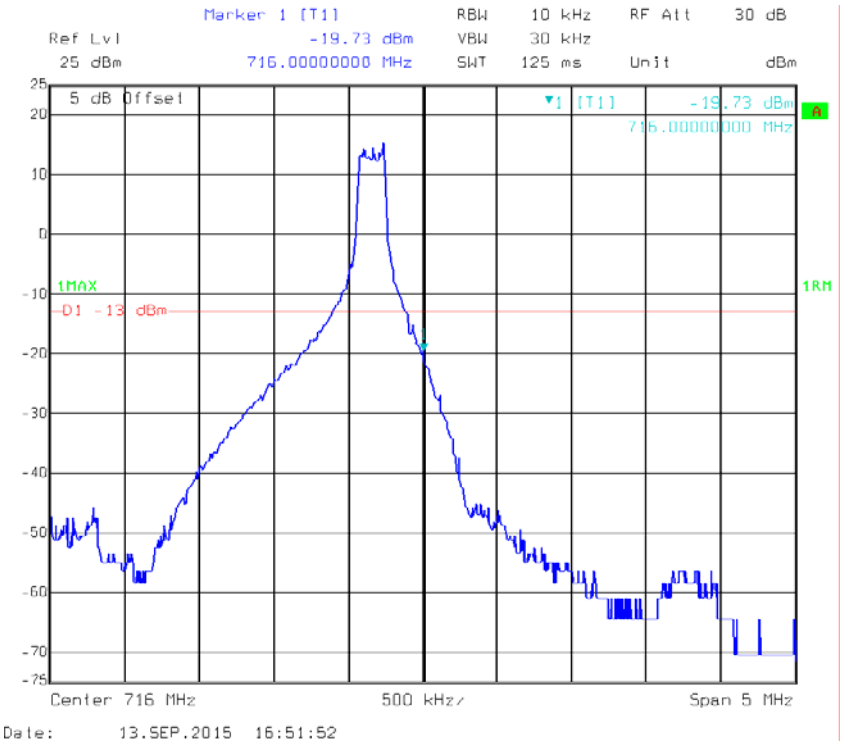


LTE Band 17

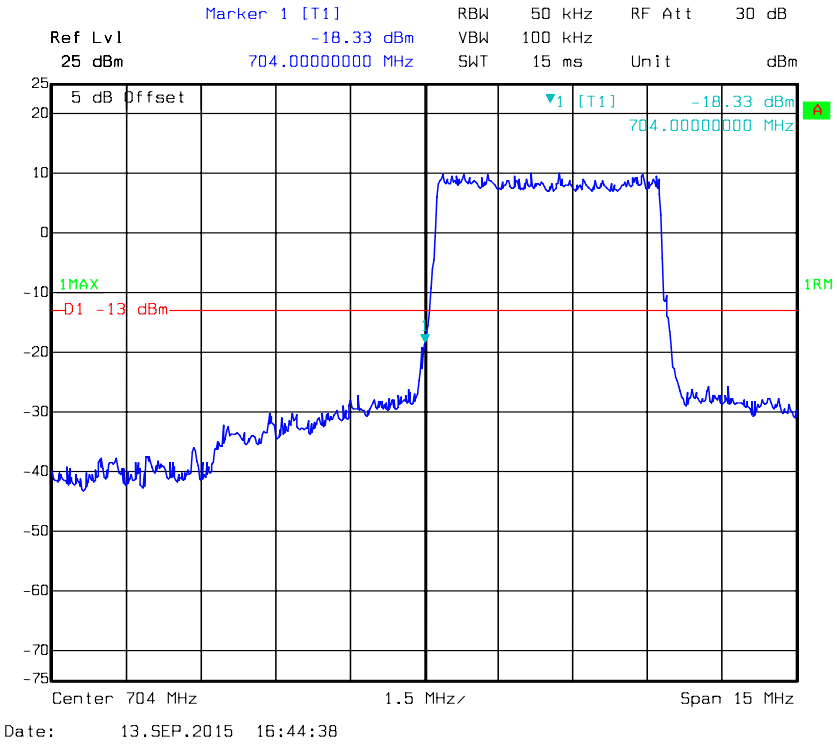
QPSK-5M 1RB, Left Band Edge



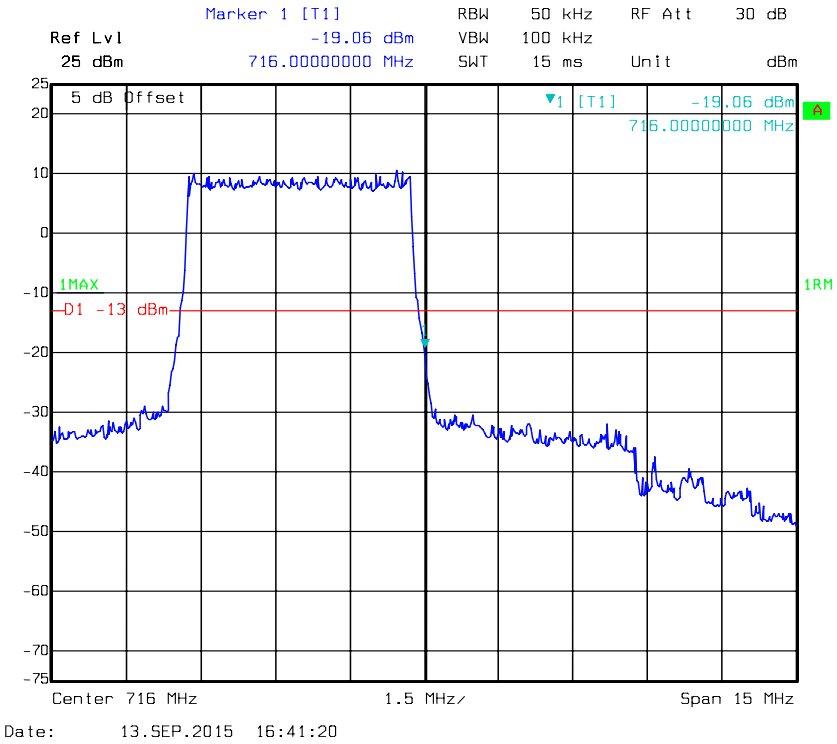
QPSK-5M 1RB, Right Band Edge



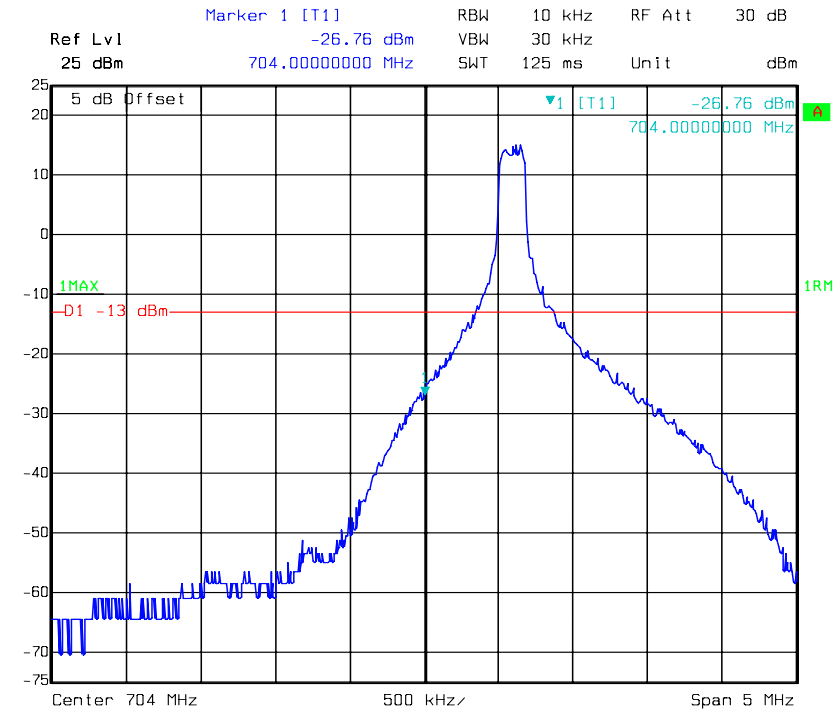
QPSK-5M Full RB, Left Band Edge



QPSK-5M Full RB, Right Band Edge

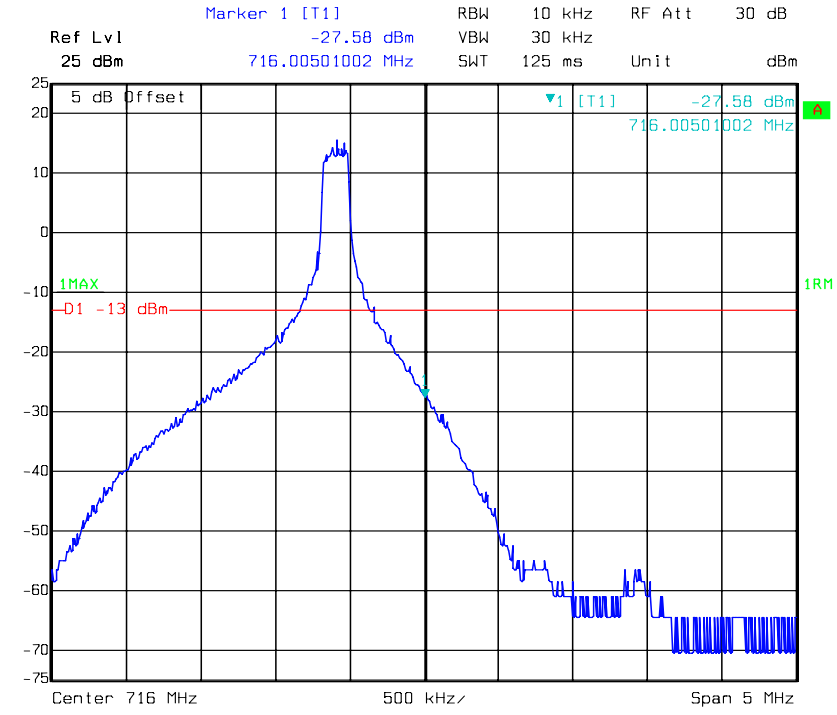


QPSK-10M 1RB, Left Band Edge



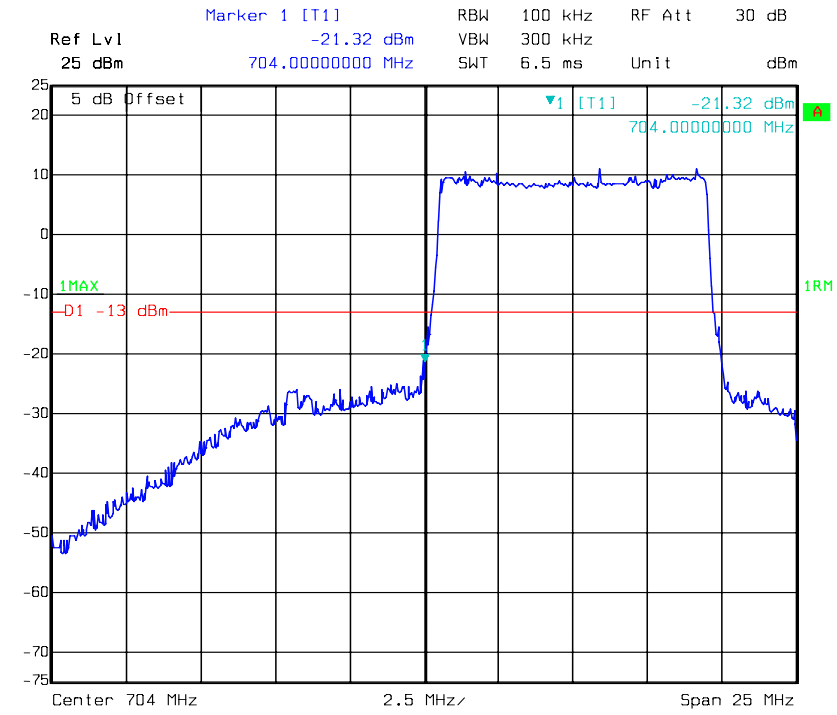
Date: 13.SEP.2015 16:31:14

QPSK-10M 1RB, Right Band Edge

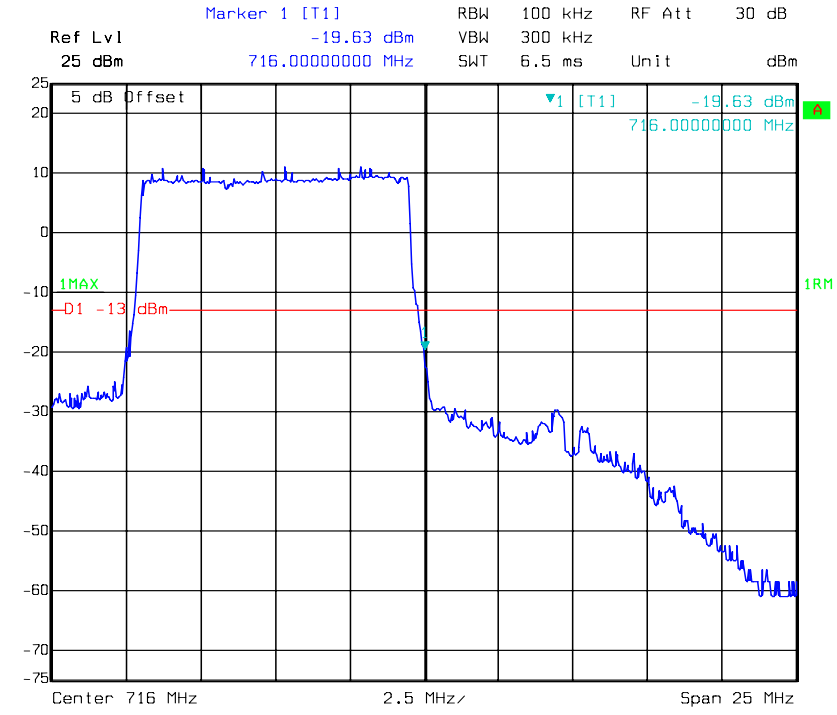


Date: 13.SEP.2015 16:10:09

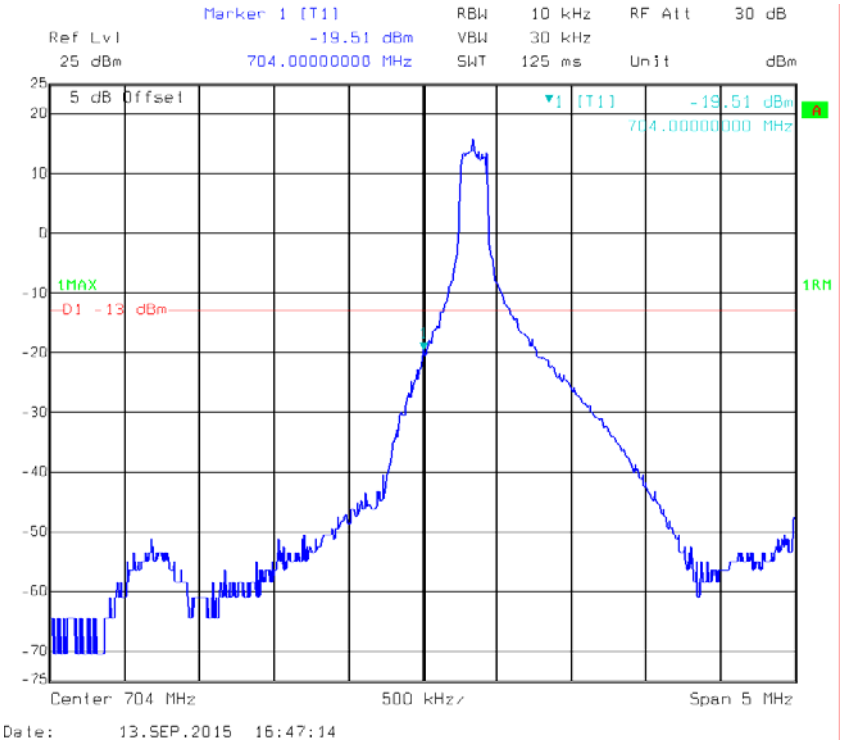
QPSK-10M Full RB, Left Band Edge



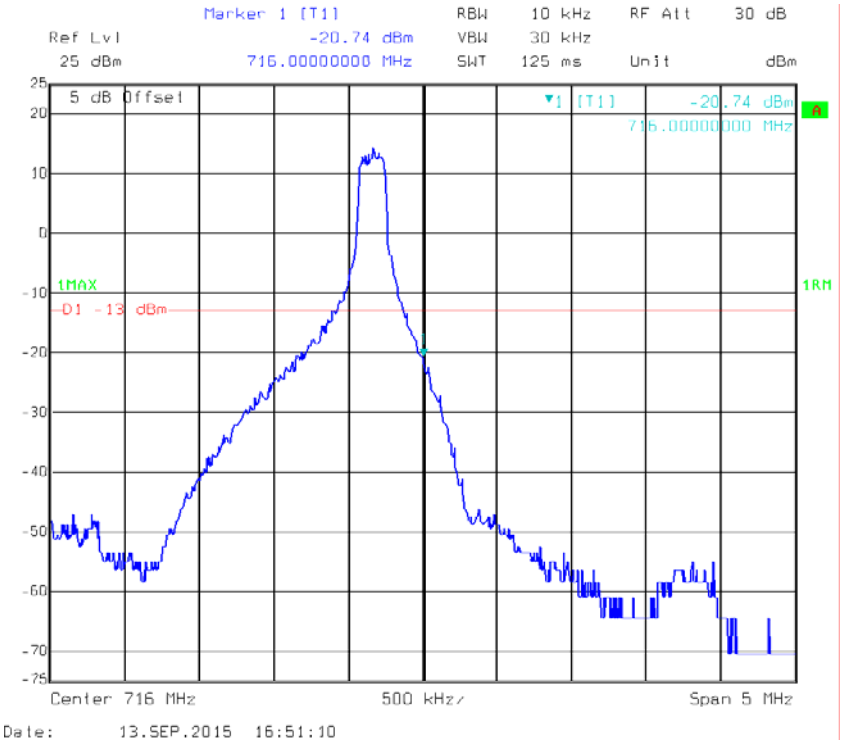
QPSK-10M Full RB, Right Band Edge



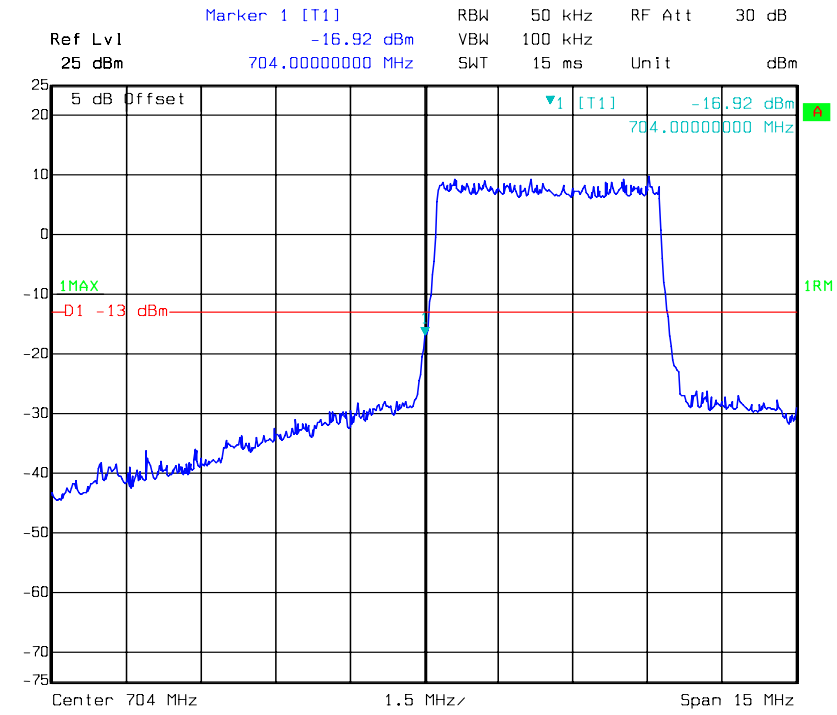
16QAM -5M 1RB, Left Band Edge



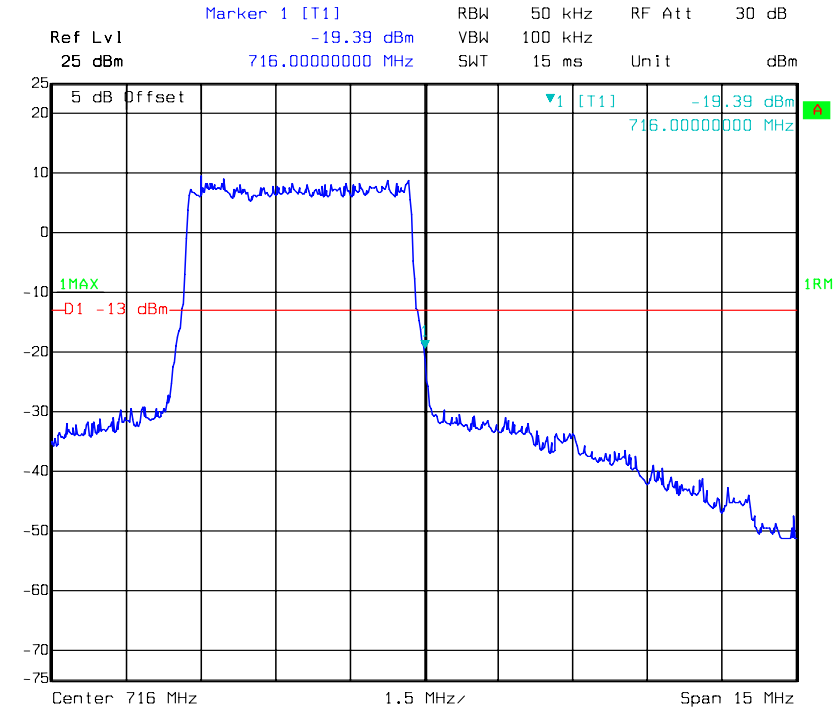
16QAM -5M 1RB, Right Band Edge



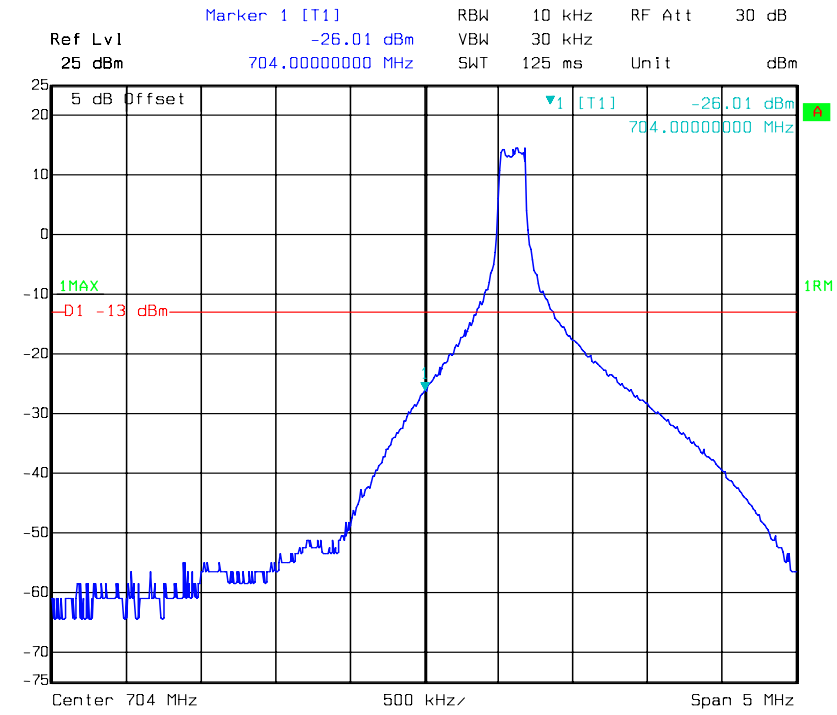
16QAM -5M Full RB, Left Band Edge



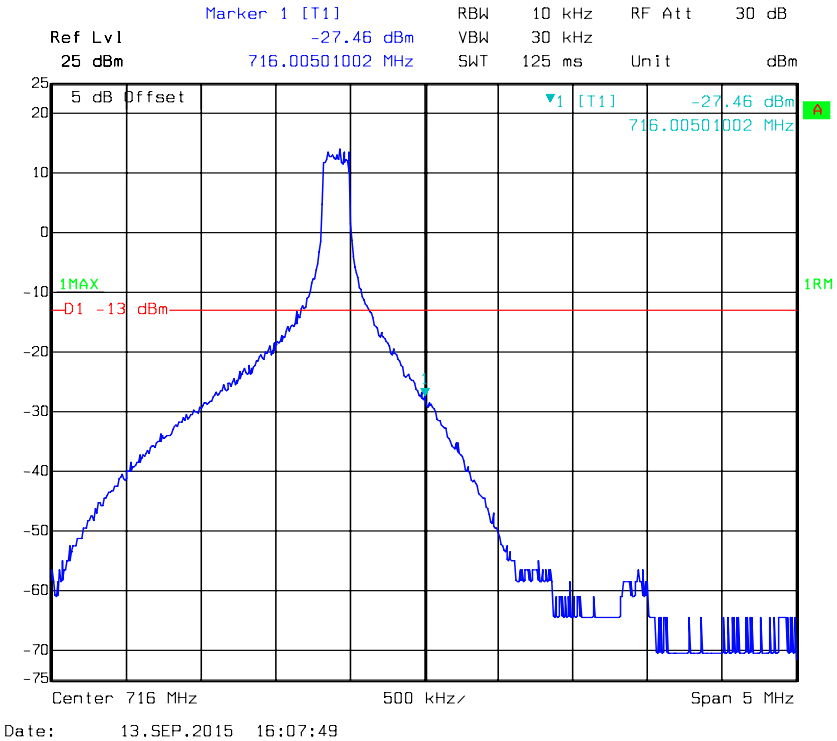
16QAM -5M Full RB, Right Band Edge



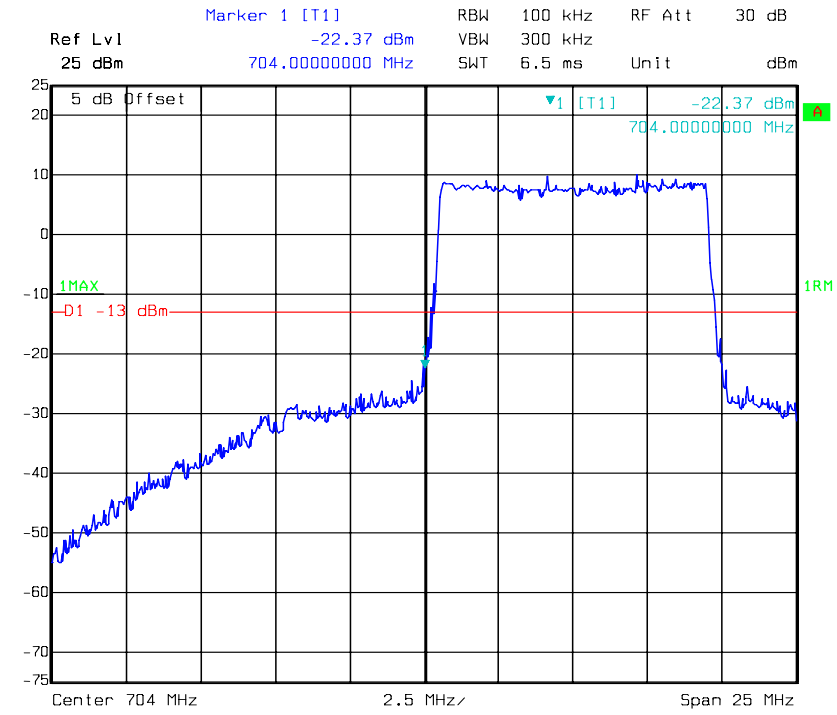
16QAM -10M 1RB, Left Band Edge



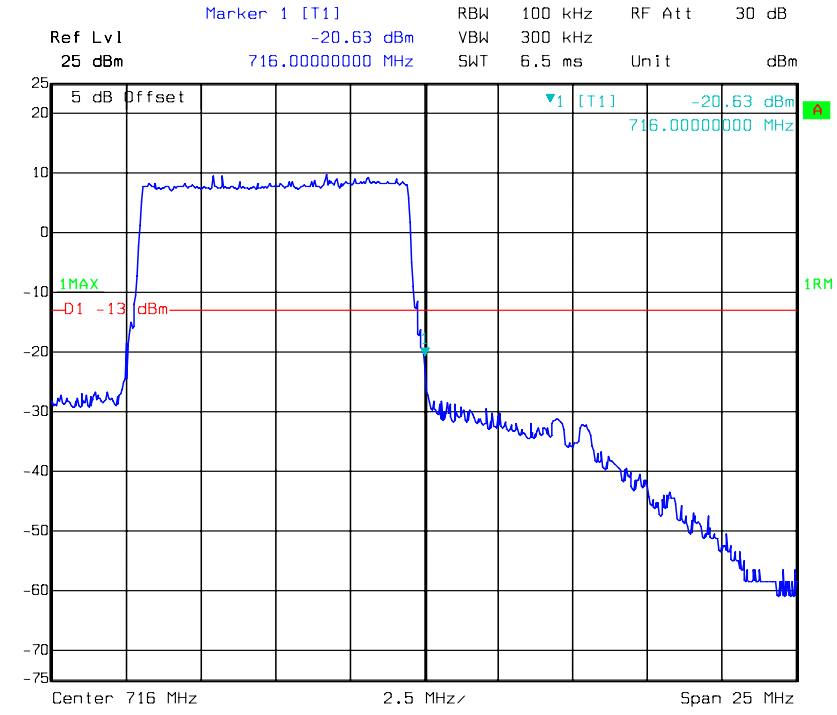
16QAM -10M 1RB, Right Band Edge



16QAM -10M Full RB, Left Band Edge



16QAM -10M Full RB, Right Band Edge



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

Applicable Standard

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

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

Frequency Tolerance for Transmitters in the Public Mobile Services

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

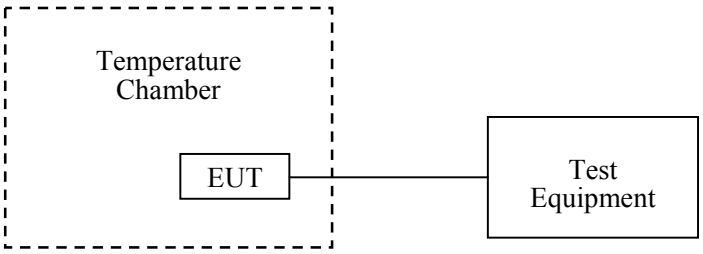
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

Test Procedure

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

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

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



Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Dongzhixu	High Temperature Test Chamber	DP1000	201105083-3	2015-08-01	2016-08-01
R&S	Universal Radio Communication Tester	CMU200	109 038	2015-05-09	2016-05-09
R&S	Wideband Radio Communication Tester	CMW500	106891	2014-11-23	2015-11-23

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

Test Data

Environmental Conditions

Temperature:	26.3 °C
Relative Humidity:	54%
ATM Pressure:	100 kPa

The testing was performed by Dean Liu on 2015-09-06.

Cellular Band (Part 22H)

GMSK, Middle Channel, f_c = 836.6 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Limit**
℃	**V_{DC}**	**Hz**	**ppm**	**ppm**
-30	3.8	-19	-0.023	2.5
-20	3.8	-15	-0.018	2.5
-10	3.8	-13	-0.016	2.5
0	3.8	-16	-0.019	2.5
10	3.8	-11	-0.013	2.5
20	3.8	-10	-0.012	2.5
30	3.8	-12	-0.014	2.5
40	3.8	-17	-0.020	2.5
50	3.8	-12	-0.014	2.5
25	3.6	-15	-0.018	2.5
25	4.3	-13	-0.016	2.5

EDGE, Middle Channel, f_c = 836.6 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
℃	V_{DC}	Hz	ppm	ppm
-30	3.8	-16	-0.019	2.5
-20	3.8	-18	-0.022	2.5
-10	3.8	-14	-0.017	2.5
0	3.8	-15	-0.018	2.5
10	3.8	-12	-0.014	2.5
20	3.8	-15	-0.018	2.5
30	3.8	-10	-0.012	2.5
40	3.8	-16	-0.019	2.5
50	3.8	-11	-0.013	2.5
25	3.6	-12	-0.014	2.5
25	4.3	-13	-0.016	2.5

WCDMA Band V: Re199

Middle Channel, f_c = 836.6 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
℃	V_{DC}	Hz	ppm	ppm
-30	3.8	-12	-0.014	2.5
-20	3.8	-15	-0.018	2.5
-10	3.8	-19	-0.023	2.5
0	3.8	-14	-0.017	2.5
10	3.8	-13	-0.016	2.5
20	3.8	-18	-0.022	2.5
30	3.8	-16	-0.019	2.5
40	3.8	-17	-0.020	2.5
50	3.8	-19	-0.023	2.5
25	3.6	-13	-0.016	2.5
25	4.3	-19	-0.023	2.5

WCDMA Band V: HSDPA

Middle Channel, f_c = 836.6 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Limit**
℃	**V_{DC}**	**Hz**	**ppm**	**ppm**
-30	3.8	-14	-0.017	2.5
-20	3.8	-17	-0.020	2.5
-10	3.8	-12	-0.014	2.5
0	3.8	-14	-0.017	2.5
10	3.8	-17	-0.020	2.5
20	3.8	-18	-0.022	2.5
30	3.8	-13	-0.016	2.5
40	3.8	-11	-0.013	2.5
50	3.8	-15	-0.018	2.5
25	3.6	-11	-0.013	2.5
25	4.3	-16	-0.019	2.5

WCDMA Band V: HSUPA

Middle Channel, f_c = 836.6 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Limit**
℃	**V_{DC}**	**Hz**	**ppm**	**ppm**
-30	3.8	-22	-0.026	2.5
-20	3.8	-13	-0.016	2.5
-10	3.8	-19	-0.023	2.5
0	3.8	-15	-0.018	2.5
10	3.8	-12	-0.014	2.5
20	3.8	-18	-0.022	2.5
30	3.8	-13	-0.016	2.5
40	3.8	-16	-0.019	2.5
50	3.8	-18	-0.022	2.5
25	3.6	-17	-0.020	2.5
25	4.3	-14	-0.017	2.5

PCS Band (Part 24E)

GMSK, Middle Channel, f_c = 1880.0 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
℃	V_{DC}	Hz	ppm	
-30	3.8	-19	-0.010	Compliance
-20	3.8	-12	-0.006	Compliance
-10	3.8	-14	-0.007	Compliance
0	3.8	-11	-0.006	Compliance
10	3.8	-21	-0.011	Compliance
20	3.8	-18	-0.010	Compliance
30	3.8	-17	-0.009	Compliance
40	3.8	-20	-0.011	Compliance
50	3.8	-14	-0.007	Compliance
25	3.6	-22	-0.012	Compliance
25	4.3	-16	-0.009	Compliance

EDGE, Middle Channel, f_c = 1880.0 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
℃	V_{DC}	Hz	ppm	
-30	3.8	-19	-0.010	Compliance
-20	3.8	-15	-0.008	Compliance
-10	3.8	-17	-0.009	Compliance
0	3.8	-22	-0.012	Compliance
10	3.8	-11	-0.006	Compliance
20	3.8	-12	-0.006	Compliance
30	3.8	-17	-0.009	Compliance
40	3.8	-13	-0.007	Compliance
50	3.8	-12	-0.006	Compliance
25	3.6	-11	-0.006	Compliance
25	4.3	-23	-0.012	Compliance

WCDMA Band II: Re199

Middle Channel, f_c = 1880.0 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
℃	V_{DC}	Hz	ppm	
-30	3.8	18	0.010	Compliance
-20	3.8	19	0.010	Compliance
-10	3.8	11	0.006	Compliance
0	3.8	15	0.008	Compliance
10	3.8	16	0.009	Compliance
20	3.8	21	0.011	Compliance
30	3.8	19	0.010	Compliance
40	3.8	10	0.005	Compliance
50	3.8	13	0.007	Compliance
25	3.6	23	0.012	Compliance
25	4.3	17	0.009	Compliance

WCDMA Band II: HSDPA

Middle Channel, f_c = 1880.0 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
℃	V_{DC}	Hz	ppm	
-30	3.8	-17	-0.009	Compliance
-20	3.8	-22	-0.012	Compliance
-10	3.8	-16	-0.009	Compliance
0	3.8	-18	-0.010	Compliance
10	3.8	-12	-0.006	Compliance
20	3.8	-15	-0.008	Compliance
30	3.8	-13	-0.007	Compliance
40	3.8	-20	-0.011	Compliance
50	3.8	-18	-0.010	Compliance
25	3.6	-22	-0.012	Compliance
25	4.3	-11	-0.006	Compliance

WCDMA Band II: HSUPA

Middle Channel, f_c = 1880.0 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
℃	V_{DC}	Hz	ppm	
-30	3.8	-17	-0.009	Compliance
-20	3.8	-12	-0.006	Compliance
-10	3.8	-16	-0.009	Compliance
0	3.8	-21	-0.011	Compliance
10	3.8	-18	-0.010	Compliance
20	3.8	-20	-0.011	Compliance
30	3.8	-16	-0.009	Compliance
40	3.8	-15	-0.008	Compliance
50	3.8	-11	-0.006	Compliance
25	3.6	-14	-0.007	Compliance
25	4.3	-19	-0.010	Compliance

PART 27:

LTE Band 7:

QPSK, Channel Bandwidth:10MHz Middle Channel, f_c = 2535 MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
℃	V_{DC}	Hz	ppm	
-30	3.8	-21.77	-0.009	Compliance
-20	3.8	-17.56	-0.007	Compliance
-10	3.8	-20.40	-0.008	Compliance
0	3.8	-15.43	-0.006	Compliance
10	3.8	-12.87	-0.005	Compliance
20	3.8	-14.56	-0.006	Compliance
30	3.8	-17.38	-0.007	Compliance
40	3.8	-12.62	-0.005	Compliance
50	3.8	-17.36	-0.007	Compliance
25	3.6	-14.00	-0.006	Compliance
25	4.3	-11.45	-0.005	Compliance

16QAM, Channel Bandwidth:10MHz Middle Channel, f_c = 2535 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Result**
℃	**V_{DC}**	**Hz**	**ppm**	
-30	3.8	-13.98	-0.006	Compliance
-20	3.8	-16.41	-0.006	Compliance
-10	3.8	-10.64	-0.004	Compliance
0	3.8	-11.22	-0.004	Compliance
10	3.8	-13.66	-0.005	Compliance
20	3.8	-12.81	-0.005	Compliance
30	3.8	-10.71	-0.004	Compliance
40	3.8	-15.50	-0.006	Compliance
50	3.8	-16.95	-0.007	Compliance
25	3.6	-17.47	-0.007	Compliance
25	4.3	-18.42	-0.007	Compliance

LTE Band 17:

QPSK, Channel Bandwidth:10MHz Middle Channel, f_c = 710 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Result**
℃	**V_{DC}**	**Hz**	**ppm**	
-30	3.8	-17.47	-0.025	Compliance
-20	3.8	-17.78	-0.025	Compliance
-10	3.8	-12.25	-0.017	Compliance
0	3.8	-19.86	-0.028	Compliance
10	3.8	-14.43	-0.020	Compliance
20	3.8	-12.67	-0.018	Compliance
30	3.8	-18.52	-0.026	Compliance
40	3.8	-15.75	-0.022	Compliance
50	3.8	-13.92	-0.020	Compliance
25	3.6	-14.58	-0.021	Compliance
25	4.3	-15.44	-0.022	Compliance

16QAM, Channel Bandwidth:10MHz Middle Channel, f_c = 710 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Result**
℃	**V_{DC}**	**Hz**	**ppm**	
-30	3.8	-16.65	-0.023	Compliance
-20	3.8	-11.57	-0.016	Compliance
-10	3.8	-16.15	-0.023	Compliance
0	3.8	-14.65	-0.021	Compliance
10	3.8	-18.44	-0.026	Compliance
20	3.8	-12.96	-0.018	Compliance
30	3.8	-18.68	-0.026	Compliance
40	3.8	-15.05	-0.021	Compliance
50	3.8	-16.93	-0.024	Compliance
25	3.6	-11.12	-0.016	Compliance
25	4.3	-14.43	-0.020	Compliance

Note: The fundamental emissions stay within the authorized bands of operation based on the frequency deviation measured is small.

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