

FCC PART 22H, PART 24E
FCC PART 27
MEASUREMENT AND TEST REPORT
For
DOPPIO MOBILE INTERNATIONAL LIMITED

ROOM 1708,17/F HART AVENUE PLAZA,5-9 HART AVENUE TSIM SHA
TSUI,KOWLOON, Hong Kong

FCC ID: N2GSL512

Report Type: Original Report	Product Type: Doppio Diamante
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Report Number: RDG151221003-00C	
Report Date: 2015-12-30	
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Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan).

TABLE OF CONTENTS

GENERAL INFORMATION.....	4
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	4
OBJECTIVE	4
RELATED SUBMITTAL(S)/GRANT(S).....	4
TEST METHODOLOGY	4
TEST FACILITY	5
SYSTEM TEST CONFIGURATION.....	6
JUSTIFICATION	6
EQUIPMENT MODIFICATIONS	6
SUPPORT EQUIPMENT LIST AND DETAILS	6
CONFIGURATION OF TEST SETUP	6
BLOCK DIAGRAM OF TEST SETUP	7
SUMMARY OF TEST RESULTS	8
FCC §1.1310 & §2.1093- RF EXPOSURE	9
APPLICABLE STANDARD	9
TEST RESULT	9
FCC §2.1047 - MODULATION CHARACTERISTIC	10
FCC § 2.1046, § 22.913 (A) & § 24.232 (C) & § 27.50 - RF OUTPUT POWER.....	11
APPLICABLE STANDARD	11
TEST PROCEDURE	11
TEST EQUIPMENT LIST AND DETAILS.....	16
TEST DATA	16
FCC §2.1049, §22.917, §22.905 & §24.238 & §27.53- OCCUPIED BANDWIDTH.....	33
APPLICABLE STANDARD	33
TEST PROCEDURE	33
TEST EQUIPMENT LIST AND DETAILS.....	33
TEST DATA	33
FCC §2.1051, §22.917(A) & §24.238(A) & §27.53- SPURIOUS EMISSIONS AT ANTENNA TERMINALS...46	46
APPLICABLE STANDARD	46
TEST PROCEDURE	46
TEST EQUIPMENT LIST AND DETAILS.....	46
TEST DATA	46
FCC §2.1053, §22.917 & §24.238 & §27.53- SPURIOUS RADIATED EMISSIONS	75
APPLICABLE STANDARD	75
TEST PROCEDURE	75
TEST EQUIPMENT LIST AND DETAILS.....	75
TEST DATA	76
FCC §22.917(A) & §24.238(A) & §27.53(H) - BAND EDGES.....	79
APPLICABLE STANDARD	79
TEST PROCEDURE	79
TEST EQUIPMENT LIST AND DETAILS.....	79
TEST DATA	80

FCC §2.1055, §22.355 & §24.235 & §27.54 - FREQUENCY STABILITY.....115

 APPLICABLE STANDARD115

 TEST PROCEDURE115

 TEST EQUIPMENT LIST AND DETAILS.....116

 TEST DATA116

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *DOPPIO MOBILE INTERNATIONAL LIMITED*'s product, model number: *SL512* (FCC ID: *N2GSL512*) (the "EUT") in this report was a *Doppio Diamante*, which was measured approximately: 14.55 cm (L) x 7.35cm (W) x 1.05 cm (H), rated input voltage: DC3.7V rechargeable Li-ion battery or DC5.0V charging from adapter.

Adapter information:

Model: SL512

Input: AC100-240V, 50/60 Hz 0.2A

Output: DC 5V, 1000mA

All measurement and test data in this report was gathered from production sample serial number: 151221003 (Assigned byBACL, Dongguan). The EUT was received on 2015-12-21.

Objective

This report is prepared on behalf of *DOPPIO MOBILE INTERNATIONAL LIMITED*. 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: N2GSL512

FCC Part 15C DSS submissions with FCC ID: N2GSL512

FCC Part 15C DTS submissions with FCC ID: N2GSL512

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.

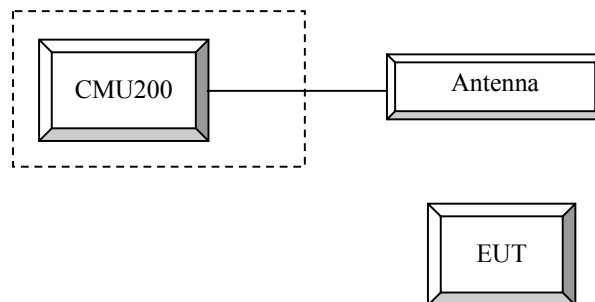
Equipment Modifications

No modification was made to the EUT.

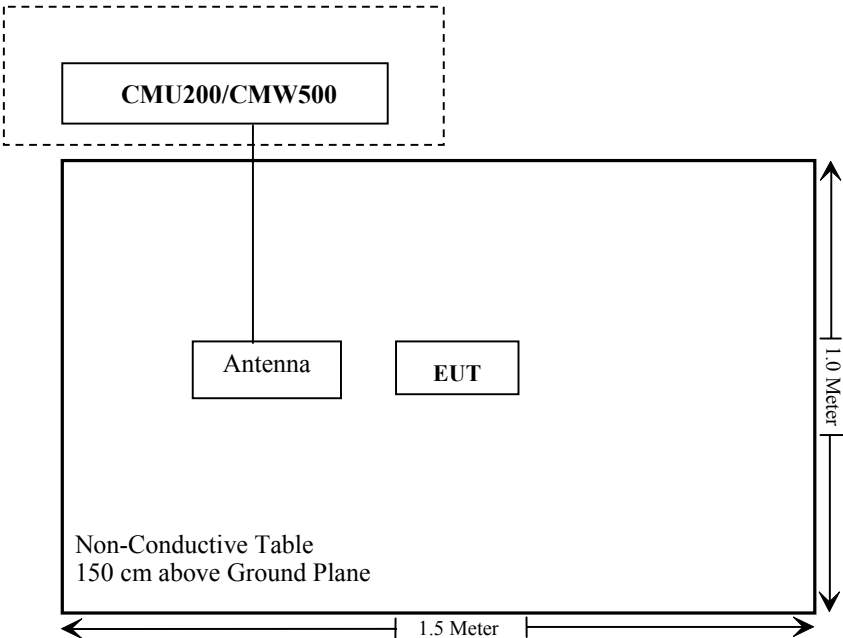
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
R&S	Universal Radio Communication Tester	CMU200	109038
R&S	Universal Radio Communication Tester	CMW500	T-03-EM342

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: RDG151221003-20.

FCC §2.1047 - MODULATION CHARACTERISTIC

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

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

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

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

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

According to 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.

Test Procedure**GSM/GPRS/EGPRS**

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

Press Connection control to choose the different menus

Press RESET > choose all the reset all settings

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

Network Support > GSM + GPRS or GSM + EGSM

Main Service > Packet Data

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

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

> Slot configuration > Uplink/Gamma

> 33 dBm for GPRS 850

> 30 dBm for GPRS 1900

> 27 dBm for EGPRS 850

> 26 dBm for EGPRS 1900

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

Frequency Offset > + 0 Hz

Mode > BCCH and TCH

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

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

Channel Type > Off

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

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

WCDMA-Release 99

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

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

WCDMA HSDPA

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

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subset	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set1			
	Power Control Algorithm	Algorithm2			
	β_c	2/15	12/15	15/15	15/15
	β_d	15/15	15/15	8/15	4/15
	β_d (SF)	64			
	β_c / β_d	2/15	12/15	15/8	15/4
	β_{hs}	4/15	24/15	30/15	30/15
	MPR(dB)	0	0	0.5	0.5
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	$A_{hs} = \beta_{hs} / \beta_c$	30/15			

WCDMA HSUPA

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

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

HSPA+

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

Sub-test	β_c (Note 3)	β_d	β_{HS} (Note 1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{ed} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	β_{ed1} : 30/15 β_{ed2} : 30/15	β_{ed3} : 24/15 β_{ed4} : 24/15	3.5	2.5	14	105	105
Note 1: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$. Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0). Note 3: DPDCH is not configured, therefore the β_c is set to 1 and $\beta_d = 0$ by default. Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value. Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signalled to use the extrapolation algorithm.											

DC-HSDPA

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

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

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table. Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

LTE:

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

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

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

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

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

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

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

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

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

Radiated method:

ANSI/TIA-603-D section 2.2.17

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2015-08-03	2016-08-02
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	831259/019	2015-07-28	2016-07-27
ETS LINDGREN	Horn Antenna	3115	9808-5557	2015-09-06	2018-09-06
Mini-Circuit	Amplifier	ZVA-213-S+	054201245	2015-02-19	2016-02-19
Giga	Signal Generator	1026	320408	2015-11-23	2016-11-22
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:	24.5°C
Relative Humidity:	50%
ATM Pressure:	101.2kPa

The testing was performed by Allen Qiao on 2015-12-26.

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	32.90	32.81	34.07	32.87	31.89	27.25	26.32	24.43	23.51
	190	32.88	32.80	32.21	32.86	31.87	27.31	26.38	24.48	23.58
	251	32.94	32.85	34.16	32.91	31.93	27.26	26.35	24.58	23.59
PCS	512	28.30	28.31	30.60	28.80	25.02	23.22	23.17	22.40	21.58
	661	28.50	28.51	30.21	28.87	25.21	23.60	23.53	22.72	21.83
	810	28.60	28.61	29.55	28.80	25.98	24.17	24.11	23.40	22.41

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	22.74	2.36	22.39	3.12	22.53	2.76
HSDPA	1	22.75	2.38	22.40	3.10	22.55	2.67
	2	22.53	2.34	22.24	3.15	22.35	2.74
	3	22.24	2.37	22.13	3.21	22.05	2.79
	4	22.01	2.31	22.01	3.11	22.01	2.81
HSUPA	1	21.72	2.39	21.32	3.08	21.38	2.74
	2	21.64	2.41	21.28	3.06	21.27	2.65
	3	21.61	2.37	21.23	3.14	21.24	2.71
	4	21.45	2.32	21.16	3.13	21.18	2.63
	5	21.31	2.38	21.10	3.21	21.12	2.80
DC-HSDPA	1	21.30	2.30	21.11	3.2	21.10	2.69
	2	21.25	2.36	21.08	3.12	21.09	2.71
	3	21.23	2.40	21.06	3.10	21.07	2.73
	4	21.15	2.36	21.03	3.06	21.05	2.83
HSPA+	1	21.11	2.37	21.01	3.11	21.03	2.65

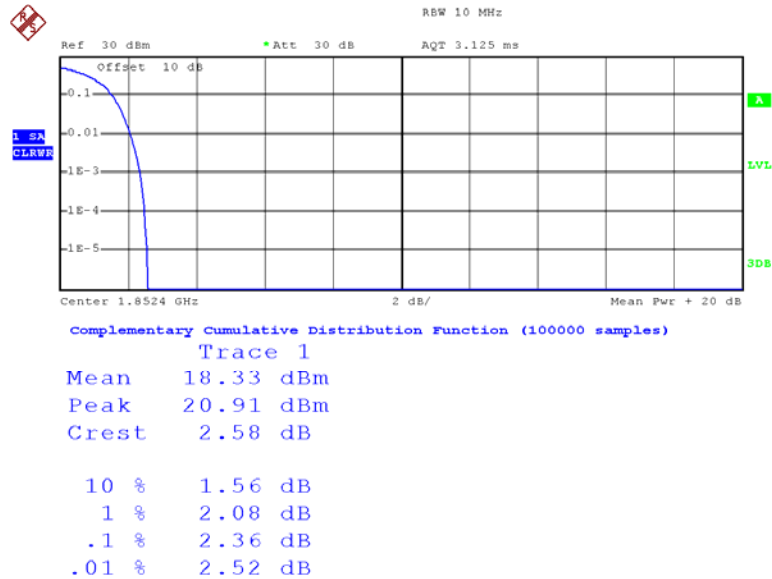
WCDMA Band V (PART 22H)

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	22.61	3.08	22.72	3.12	22.84	2.96
HSDPA	1	21.61	3.11	21.67	3.14	21.70	2.91
	2	21.57	3.05	21.65	3.08	21.67	3.02
	3	21.53	3.10	21.63	3.04	21.64	2.87
	4	21.51	3.14	21.61	3.16	21.62	2.84
HSUPA	1	21.58	3.21	21.62	3.1	21.69	2.96
	2	21.46	3.10	21.59	3.15	21.57	2.97
	3	21.38	3.12	21.40	3.07	21.46	3.04
	4	21.26	3.09	21.31	3.09	21.38	3.01
	5	21.14	3.07	21.25	3.21	21.30	2.94
DC-HSDPA	1	21.21	3.01	21.21	3.06	21.28	2.88
	2	21.16	3.15	21.14	3.11	21.24	2.95
	3	21.12	3.12	21.10	3.16	21.11	2.90
	4	21.07	3.05	21.08	3.24	21.09	2.97
HSPA+	1	21.02	3.07	21.05	3.15	21.07	2.96

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

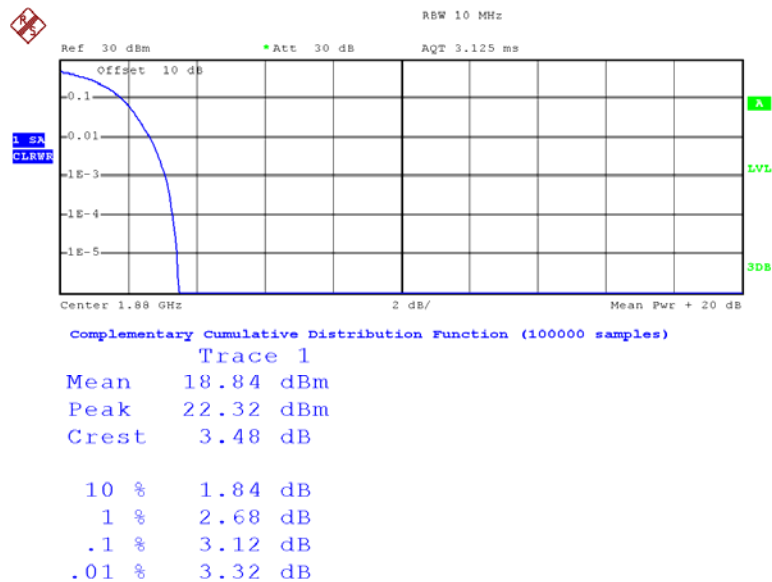
Peak-to-average ratio (PAR)
WCDMA Band II (PART 24E)

Low Channel

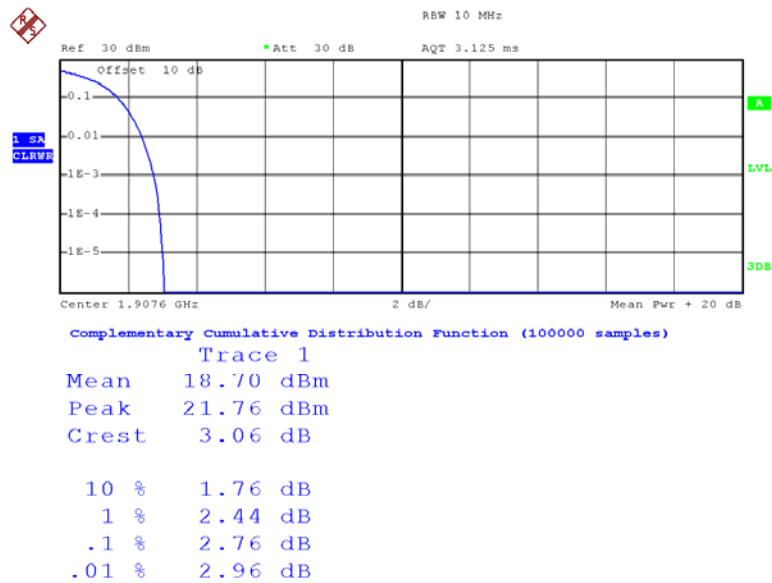


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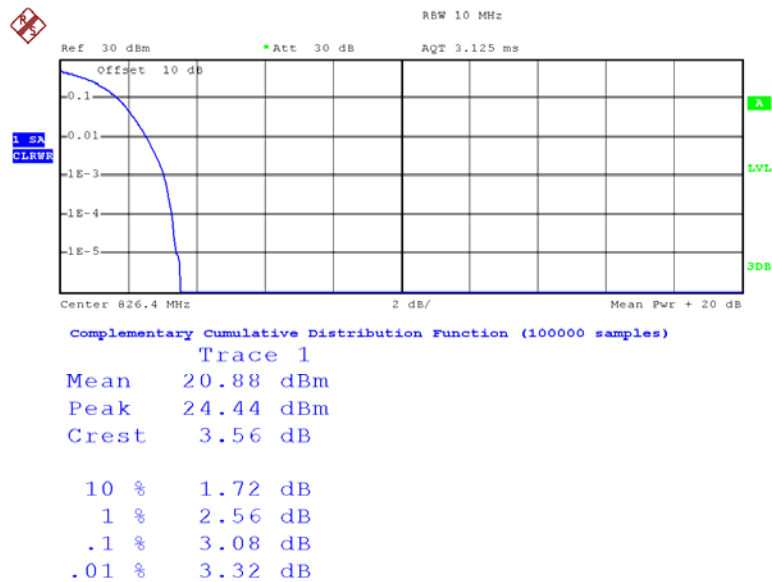
Middle Channel



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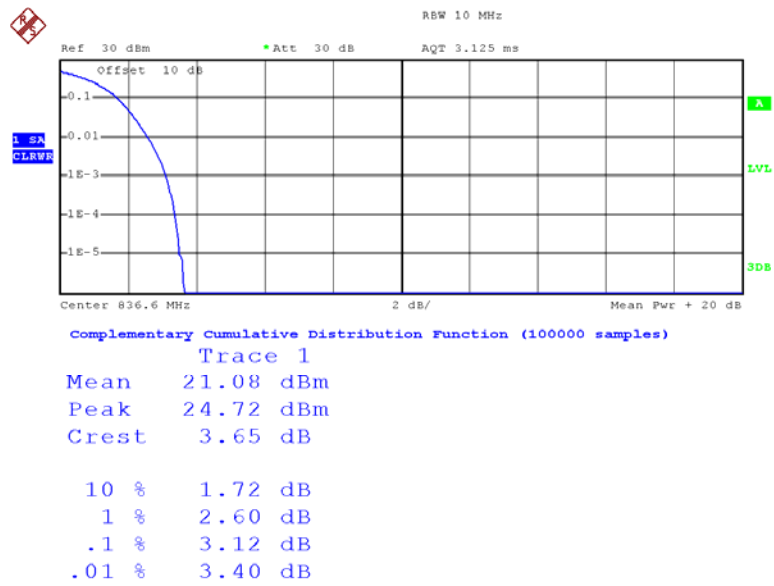
High Channel

Date: 26.DEC.2015 14:41:30

WCDMA Band V (PART 22H)**Low Channel**

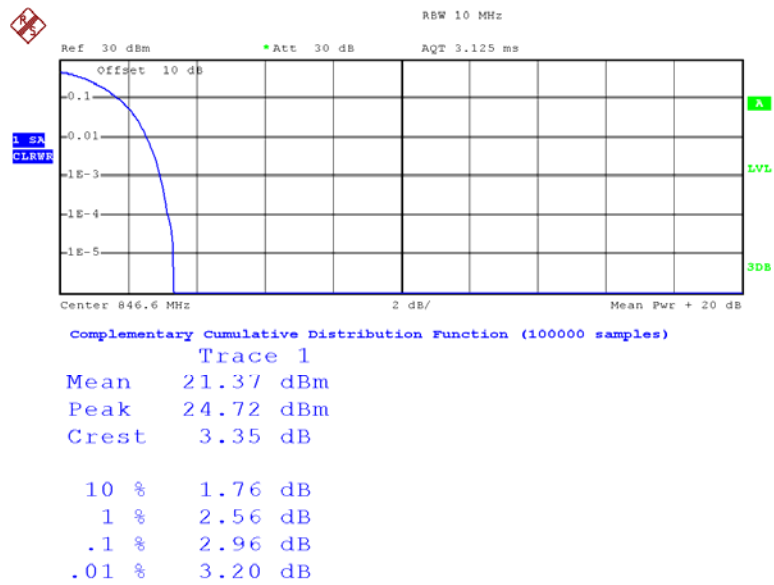
Date: 26.DEC.2015 16:40:14

Middle Channel



Date: 26.DEC.2015 16:39:30

High Channel



Date: 26.DEC.2015 16:40:31

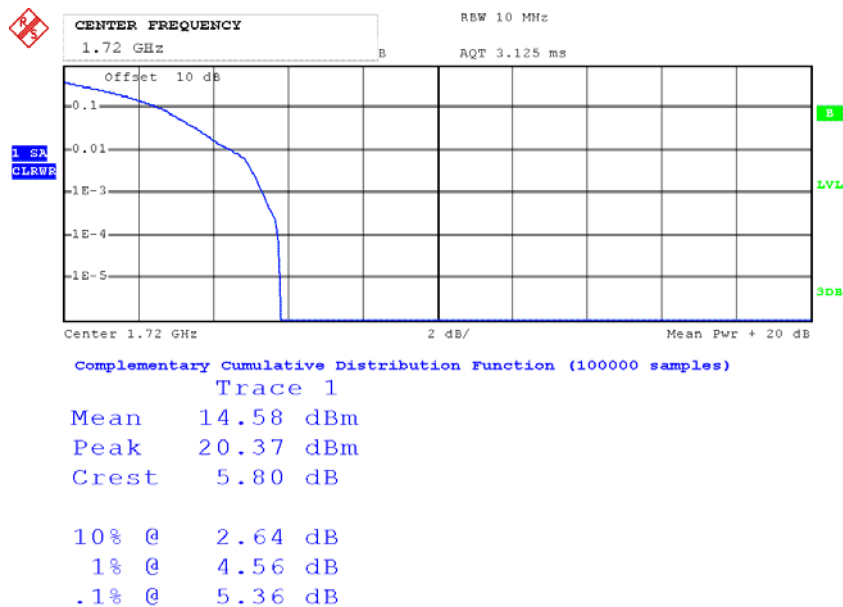
LTE Band IV

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4M	QPSK	1#0	21.95	22.21	22.29
		1#3	21.91	22.24	22.25
		1#5	21.93	22.23	22.23
		3#0	21.75	22.25	22.17
		3#1	21.73	22.21	22.10
		3#3	21.77	22.27	22.12
		6#0	21.54	22.28	22.06
	16-QAM	1#0	21.84	22.27	22.17
		1#3	21.80	22.24	22.15
		1#5	21.82	22.25	22.19
		3#0	21.76	22.23	22.21
		3#1	21.73	22.21	22.24
		3#3	21.75	22.20	22.22
		6#0	21.70	22.17	22.23
3M	QPSK	1#0	21.81	22.21	22.27
		1#7	21.83	22.20	22.23
		1#14	21.80	22.23	22.24
		8#0	21.73	22.15	22.15
		8#4	21.76	22.13	22.17
		8#7	21.72	22.11	22.13
		15#0	21.64	22.10	22.08
	16-QAM	1#0	21.73	22.18	22.15
		1#7	21.76	22.19	22.14
		1#14	21.75	22.16	22.17
		8#0	21.45	22.12	22.13
		8#4	21.43	22.10	22.15
		8#7	21.42	22.13	22.10
		15#0	21.25	22.03	22.05
5M	QPSK	1#0	21.75	22.16	22.18
		1#12	21.73	22.15	22.17
		1#24	21.77	22.12	22.18
		12#0	21.65	22.08	22.13
		12#6	21.67	22.07	22.15
		12#11	21.62	22.05	22.10
		25#0	21.53	22.10	22.13
	16-QAM	1#0	21.68	22.13	22.14
		1#12	21.64	22.15	22.16
		1#24	21.67	22.11	22.17
		12#0	21.53	22.04	22.05
		12#6	21.51	22.05	22.06
		12#11	21.53	22.03	22.08
		25#0	21.56	22.01	21.85

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
10M	QPSK	1#0	21.64	22.04	22.23
		1#24	21.56	22.06	22.21
		1#49	21.64	22.03	22.26
		25#0	21.43	21.84	22.15
		25#12	21.51	21.76	22.13
		25#24	21.49	21.91	22.14
		50#0	21.43	21.86	22.15
	16-QAM	1#0	21.51	21.97	21.86
		1#24	21.50	21.91	21.94
		1#49	21.49	21.94	21.91
		25#0	21.43	21.81	21.86
		25#12	21.46	21.88	21.75
		25#24	21.44	21.90	21.74
		50#0	21.38	21.83	21.72
15M	QPSK	1#0	21.52	21.86	22.13
		1#37	21.56	21.56	22.10
		1#74	21.50	21.65	22.14
		36#0	21.46	21.72	22.01
		36#17	21.41	21.34	22.04
		36#35	21.43	21.47	22.00
		75#0	21.34	21.64	21.80
	16-QAM	1#0	21.40	21.46	21.76
		1#37	21.46	21.49	21.81
		1#74	21.51	21.41	21.68
		36#0	21.53	21.35	21.71
		36#17	21.50	21.38	21.60
		36#35	21.40	21.40	21.66
		75#0	21.28	21.32	21.67
20M	QPSK	1#0	21.31	21.26	22.27
		1#49	21.33	21.31	22.21
		1#99	21.35	21.29	22.13
		50#0	21.24	21.51	21.53
		50#24	21.20	21.62	21.62
		50#49	21.21	21.61	21.71
		100#0	21.18	21.91	21.58
	16-QAM	1#0	21.75	21.55	22.41
		1#49	21.71	21.51	22.35
		1#99	21.76	21.64	22.21
		50#0	21.36	21.76	21.76
		50#24	21.34	21.86	21.81
		50#49	21.31	21.83	21.79
		100#0	21.23	21.95	21.57

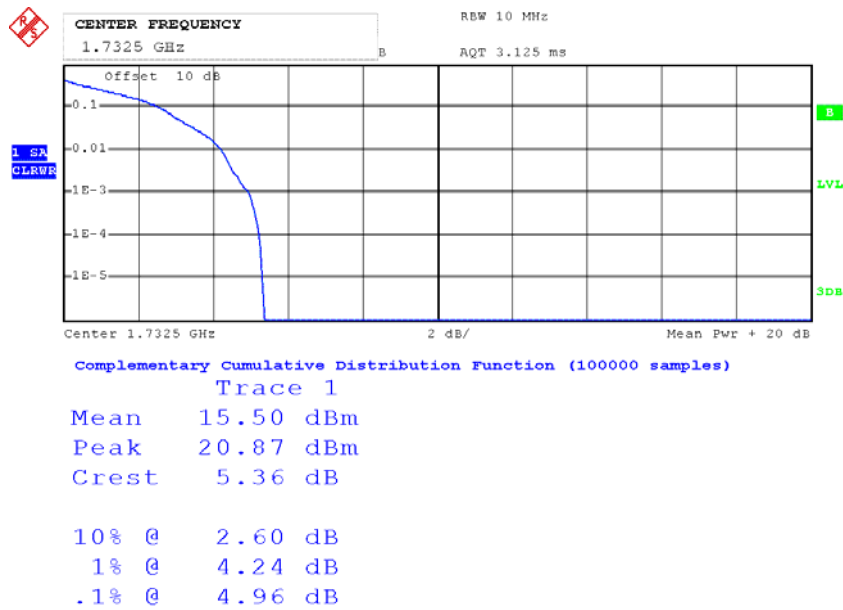
Peak-to-average ratio (PAR)

LTE Band	Test Modulation		Test Bandwidth	Low Channel (dB)	Middle Channel (dB)	High Channel (dB)	Limit (dB)
Band 4	QPSK	1 RB	20M	5.36	4.96	5.12	13
		Full RB		6.44	6.32	6.32	13
	16-QAM	1 RB	20M	6.48	5.00	5.48	13
		Full RB		7.28	7.04	7.20	13

LTE Band 4**QPSK- RB#1 Low Channel**

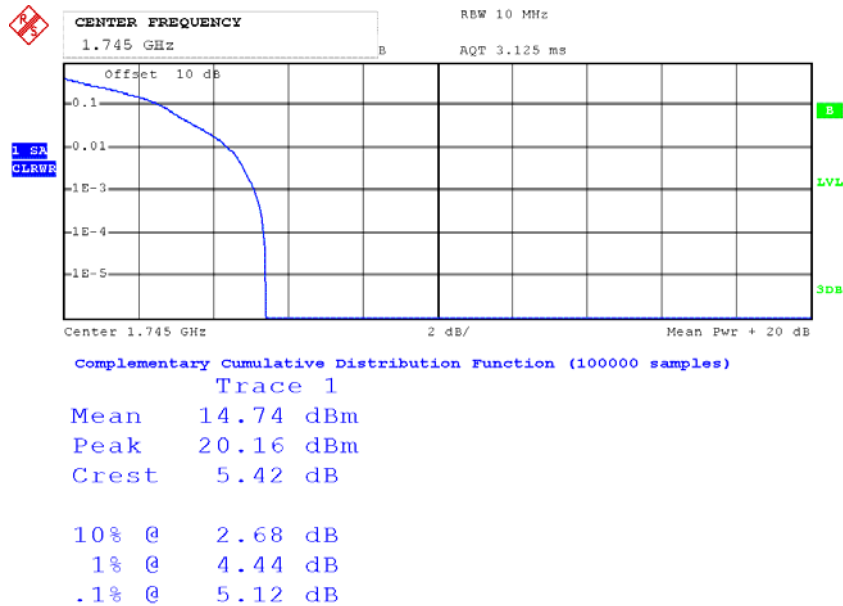
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QPSK- RB#1 Middle Channel



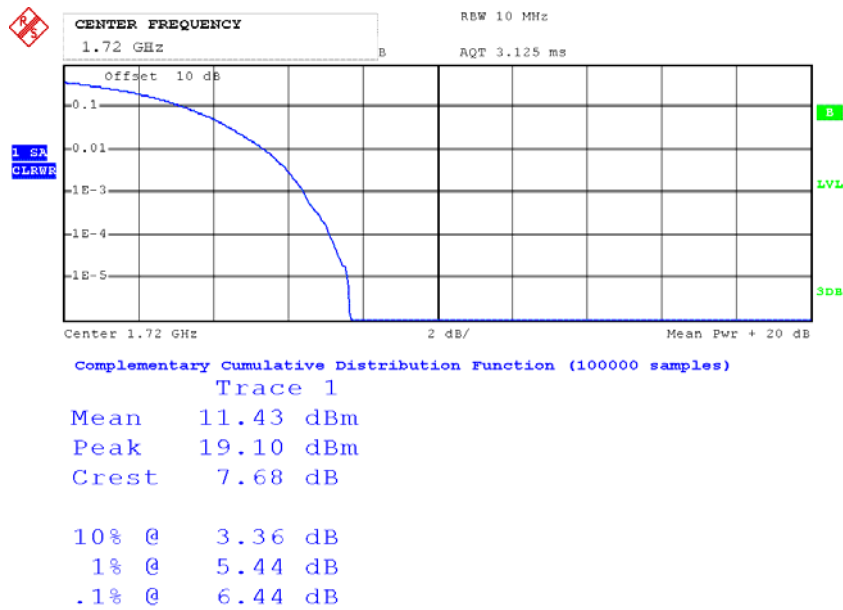
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QPSK- RB#1 High Channel



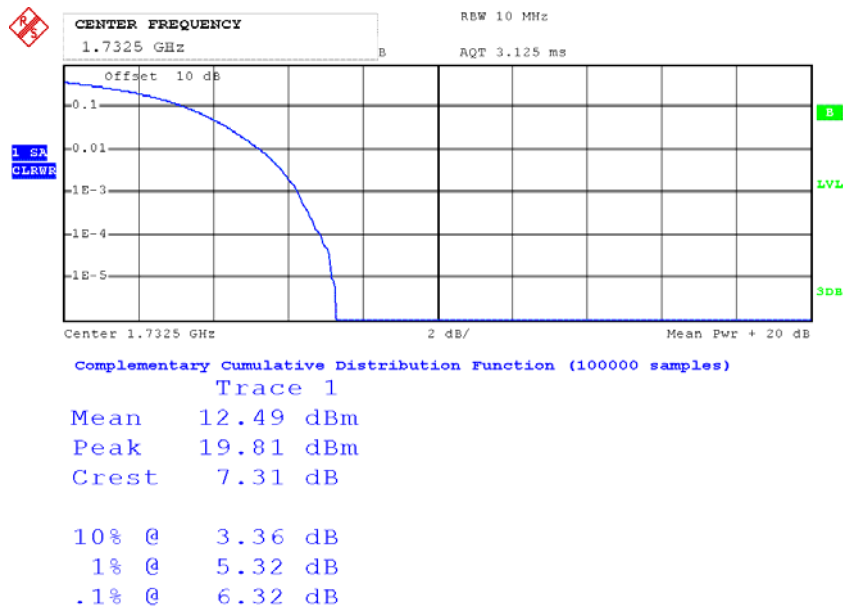
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QPSK- RB#100 Low Channel

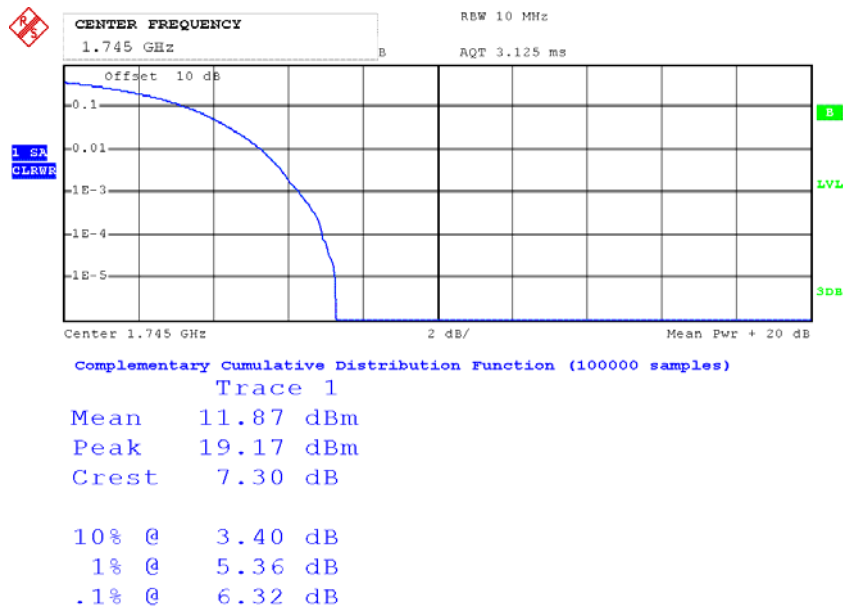


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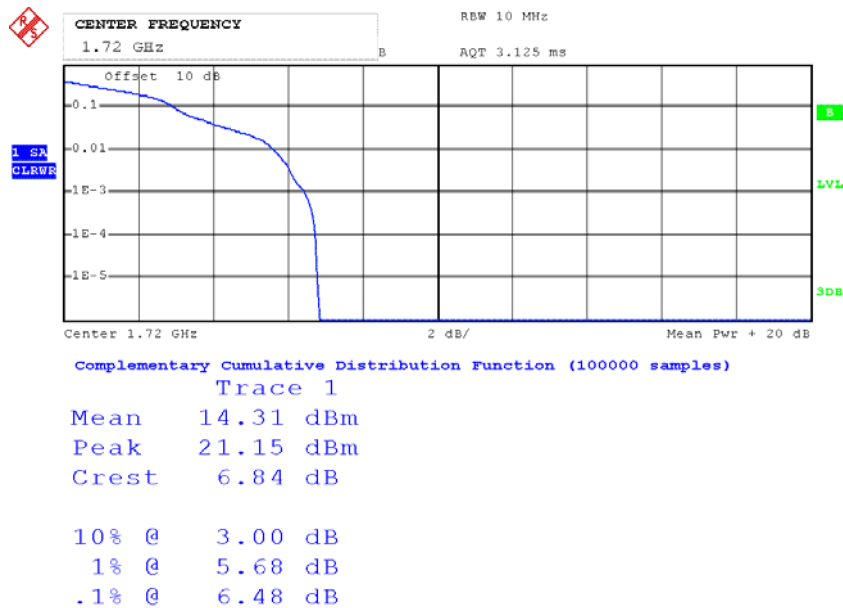
QPSK- RB#100 Middle Channel



Date: 26.DEC.2015 15:03:45

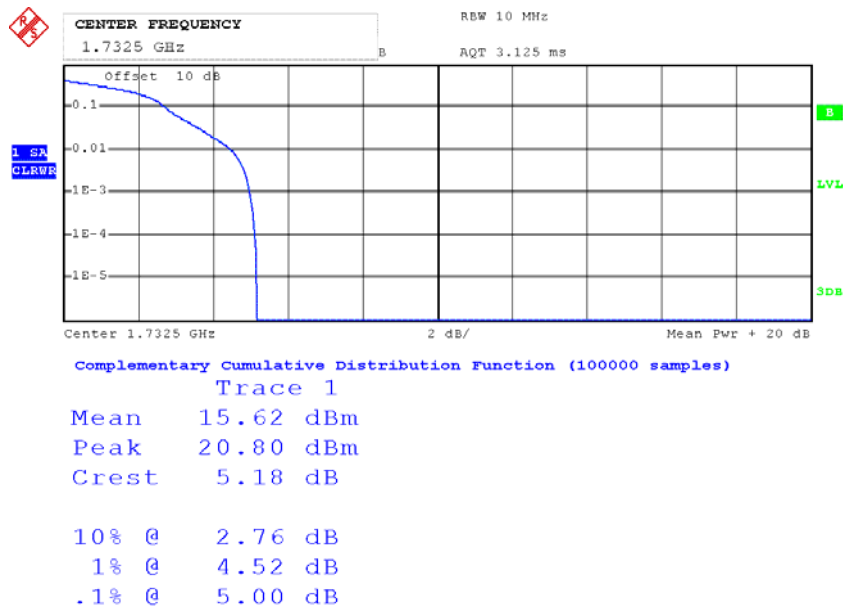
QPSK- RB#100 High Channel

Date: 26.DEC.2015 15:03:23

16QAM- RB#1 Low Channel

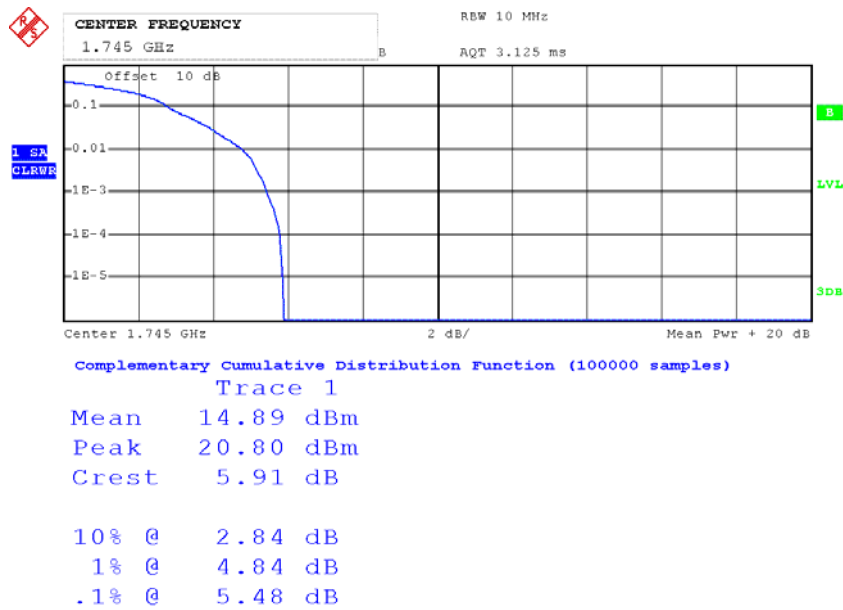
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16QAM- RB#1 Middle Channel

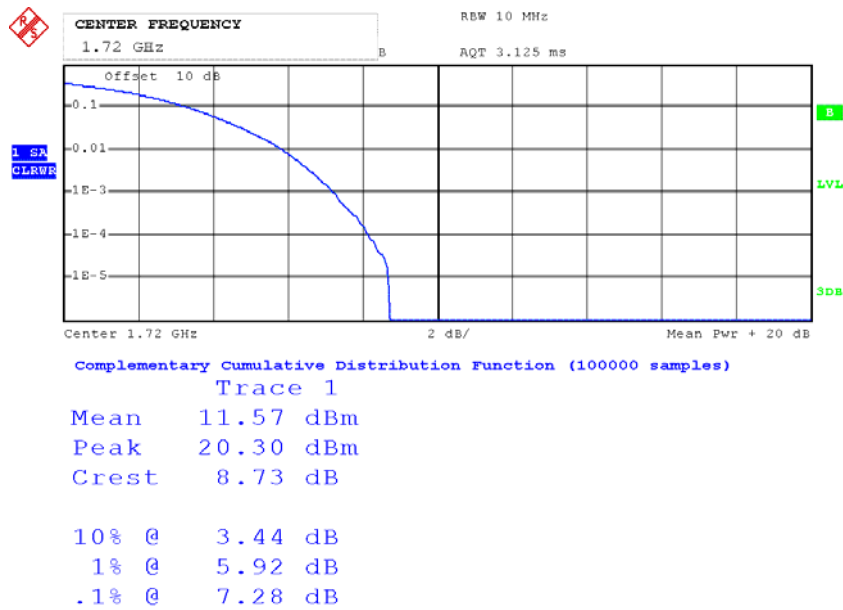


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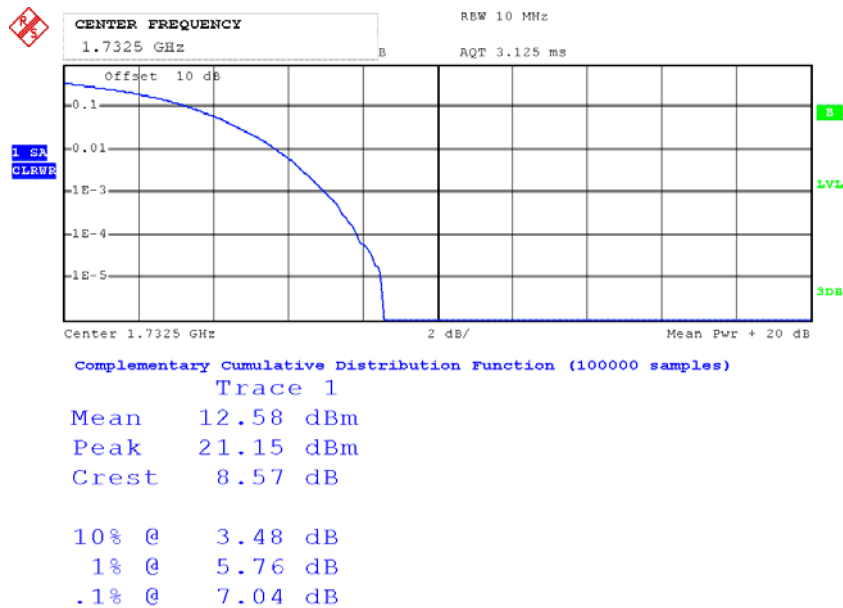
16QAM- RB#1 High Channel



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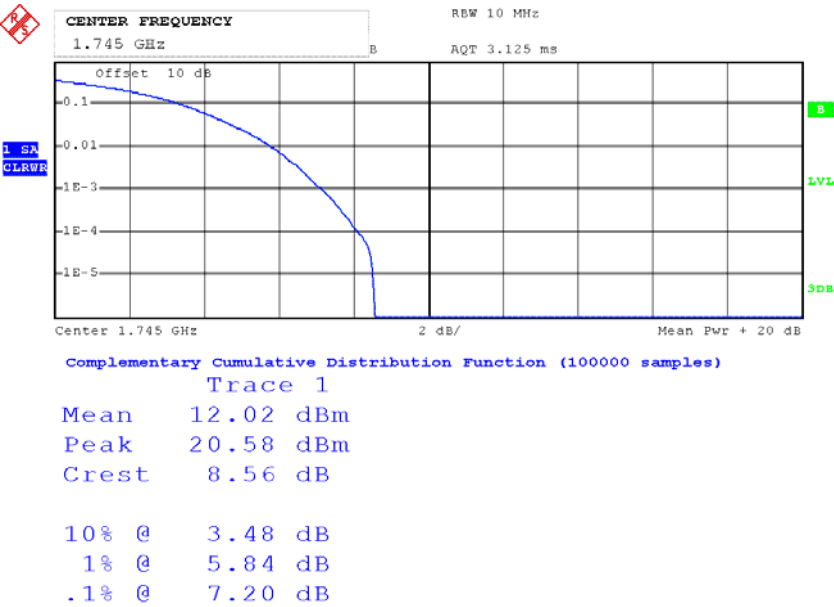
16QAM- RB#100 Low Channel

Date: 26.DEC.2015 15:01:02

16QAM- RB#100 Middle Channel

Date: 26.DEC.2015 15:01:51

16QAM- RB#100 High Channel



Date: 26.DEC.2015 15:02:18

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	94.87	19.9	0.0	1	18.9	38.50	19.6
836.600	V	104.09	32.3	0.0	1	31.3	38.50	7.2
EGPRS 850 Middle Channel								
836.600	H	94.08	19.2	0.0	1	18.2	38.50	20.3
836.600	V	100.18	28.4	0.0	1	27.4	38.50	11.1
WCDMA Band V Middle Channel								
836.600	H	85.16	10.2	0.0	1	9.2	38.50	29.3
836.600	V	94.11	22.3	0.0	1	21.3	38.50	17.2

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	90.24	18.6	11.7	1.4	28.9	33.0	4.1
1880.000	V	87.66	16.2	11.7	1.4	26.5	33.0	6.5
EGPRS 1900 Middle Channel								
1880.000	H	85.92	14.3	11.7	1.4	24.6	33.0	8.4
1880.000	V	83.36	11.9	11.7	1.4	22.2	33.0	10.8
WCDMA Band II Middle Channel								
1880.000	H	84.14	12.5	11.7	1.4	22.8	33.0	10.2
1880.000	V	81.07	9.6	11.7	1.4	19.9	33.0	13.1

LTE Band 4

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 1.4M BW Middle Channel								
1732.500	H	87.33	14.3	10.7	1.4	23.6	30.00	6.4
1732.500	V	86.13	12.8	10.7	1.4	22.1	30.00	7.9
QPSK 3M BW Middle Channel								
1732.500	H	85.48	12.5	10.7	1.4	21.8	30.00	8.2
1732.500	V	84.37	11	10.7	1.4	20.3	30.00	9.7
QPSK 5M BW Middle Channel								
1732.500	H	83.78	10.8	10.7	1.4	20.1	30.00	9.9
1732.500	V	82.34	9	10.7	1.4	18.3	30.00	11.7
QPSK 10M BW Middle Channel								
1732.500	H	82.52	9.5	10.7	1.4	18.8	30.00	11.2
1732.500	V	81.18	7.9	10.7	1.4	17.2	30.00	12.8
QPSK 15M BW Middle Channel								
1732.500	H	81.49	8.5	10.7	1.4	17.8	30.00	12.2
1732.500	V	79.73	6.4	10.7	1.4	15.7	30.00	14.3
QPSK 20M BW Middle Channel								
1732.500	H	80.80	7.8	10.7	1.4	17.1	30.00	12.9
1732.500	V	78.26	4.9	10.7	1.4	14.2	30.00	15.8
16-QAM 1.4M BW Middle Channel								
1732.500	H	87.89	14.9	10.7	1.4	24.2	30.00	5.8
1732.500	V	84.72	11.4	10.7	1.4	20.7	30.00	9.3
16-QAM 3M BW Middle Channel								
1732.500	H	86.45	13.4	10.7	1.4	22.7	30.00	7.3
1732.500	V	85.56	12.2	10.7	1.4	21.5	30.00	8.5
16-QAM 5M BW Middle Channel								
1732.500	H	85.10	12.1	10.7	1.4	21.4	30.00	8.6
1732.500	V	83.32	10	10.7	1.4	19.3	30.00	10.7
16-QAM 10M BW Middle Channel								
1732.500	H	83.75	10.7	10.7	1.4	20.0	30.00	10.0
1732.500	V	81.86	8.5	10.7	1.4	17.8	30.00	12.2
16-QAM 15M BW Middle Channel								
1732.500	H	82.13	9.1	10.7	1.4	18.4	30.00	11.6
1732.500	V	80.49	7.2	10.7	1.4	16.5	30.00	13.5
16-QAM 20M BW Middle Channel								
1732.500	H	81.08	8.1	10.7	1.4	17.4	30.00	12.6
1732.500	V	78.63	5.3	10.7	1.4	14.6	30.00	15.4

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

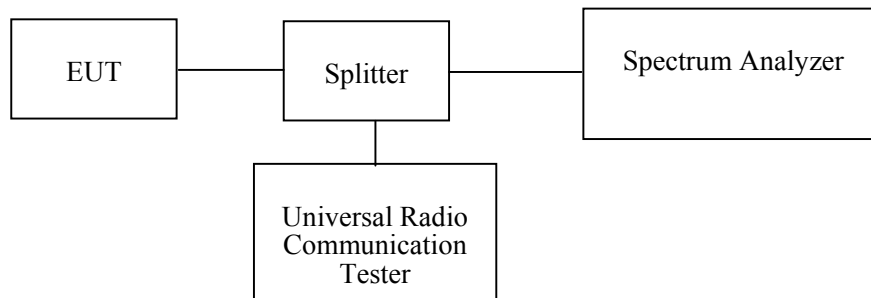
FCC §2.1049, §22.917, §22.905 & §24.238 & §27.53- OCCUPIED BANDWIDTH**Applicable Standard**

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	2015-11-23	2016-11-22
R&S	Universal Radio Communication Tester	CMU200	109038	2015-07-28	2016-07-27
R&S	Wideband Radio Communication Tester	CMW500	1201.002K50-146520-wh	2015-12-19	2016-12-19

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

Test Data**Environmental Conditions**

Temperature:	23.9~24.6 °C
Relative Humidity:	47~52%
ATM Pressure:	100.6~100.9 kPa

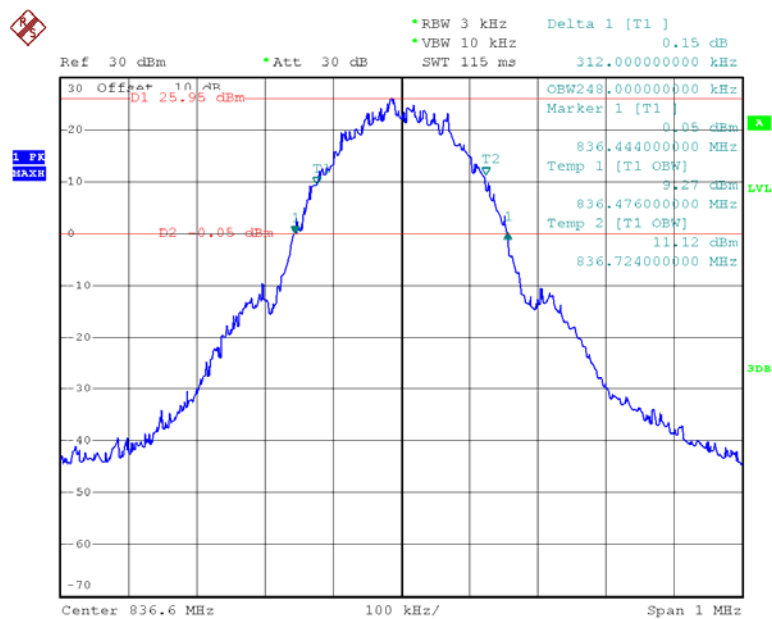
The testing was performed by Allen Qiao from 2015-12-23 to 2015-12-26.

Test Mode: Transmitting

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

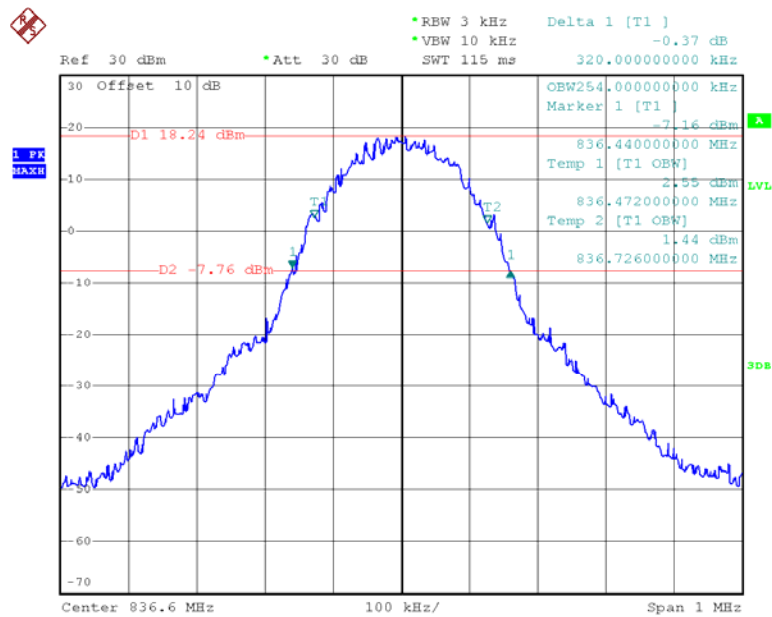
Band	Channel No.	Mode	99% Occupied Bandwidth (kHz)	26 dB Occupied Bandwidth (kHz)
Cellular	190	GSM	248	312
		EDGE	254	320
PCS	661	PCS	246	308
		EDGE	250	318
WCDMA Band II	9400	Rel 99	4220	4860
	9400	HSDPA	4240	4900
	9400	HSUPA	4240	4880
WCDMA Band V	4183	Rel 99	4220	4880
	4183	HSDPA	4220	4900
	4183	HSUPA	4220	4900

GMSK 850 Cellular Band



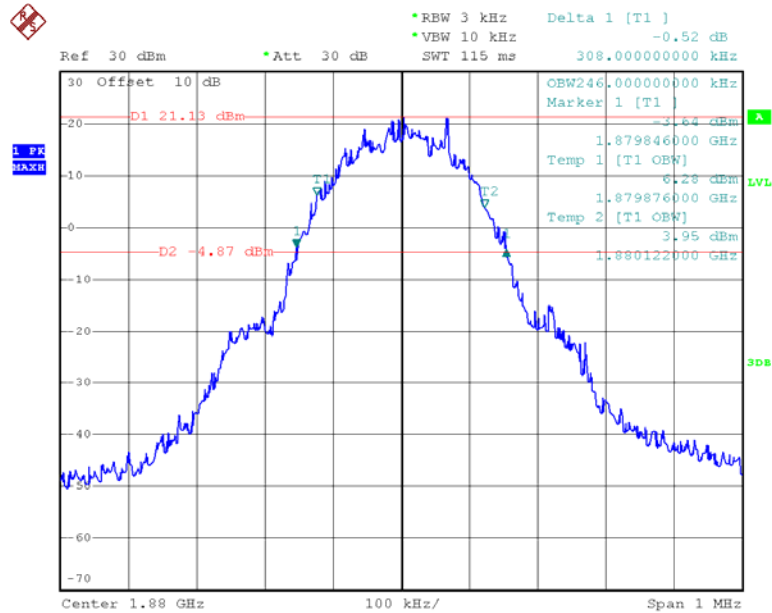
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EDGE 850 Cellular Band



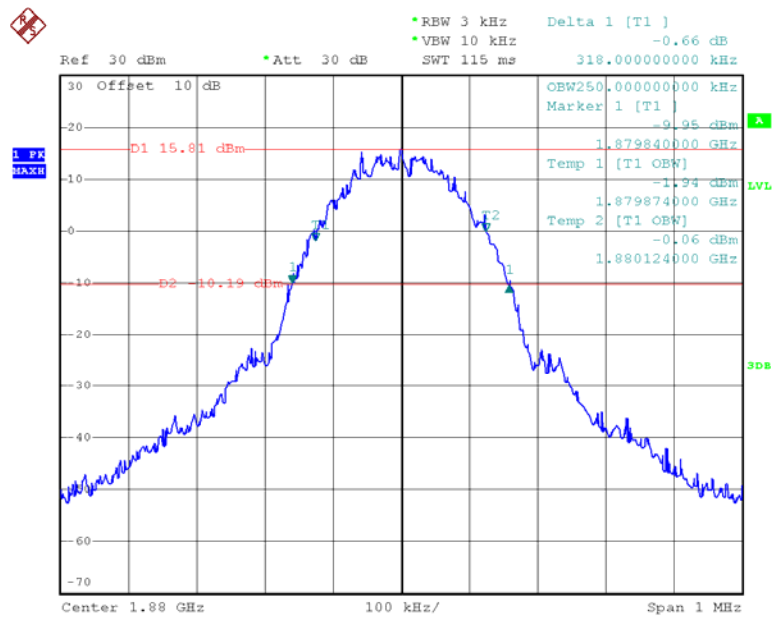
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GMSK PCS Band



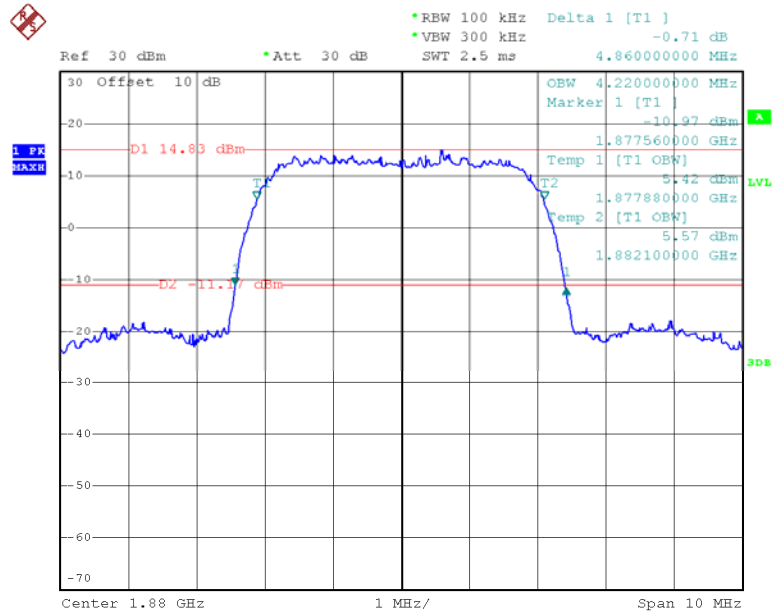
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EDGE PCS Band

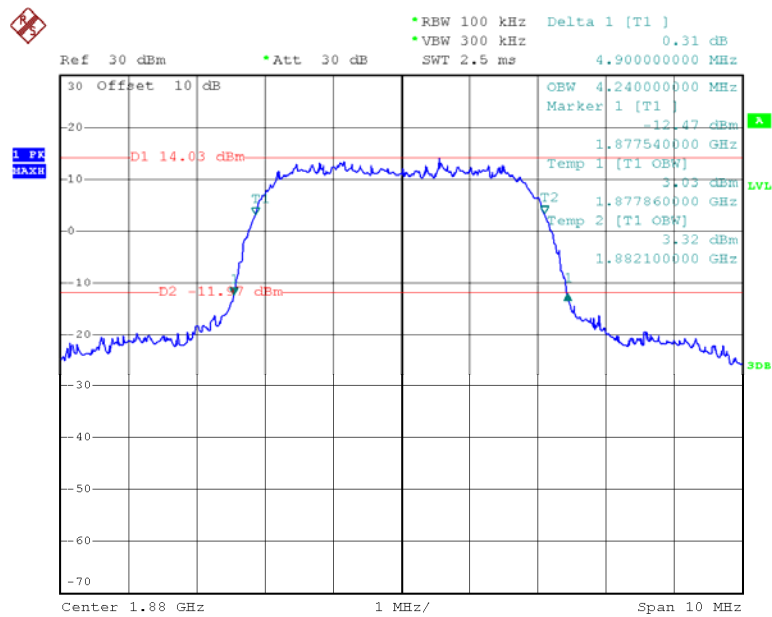


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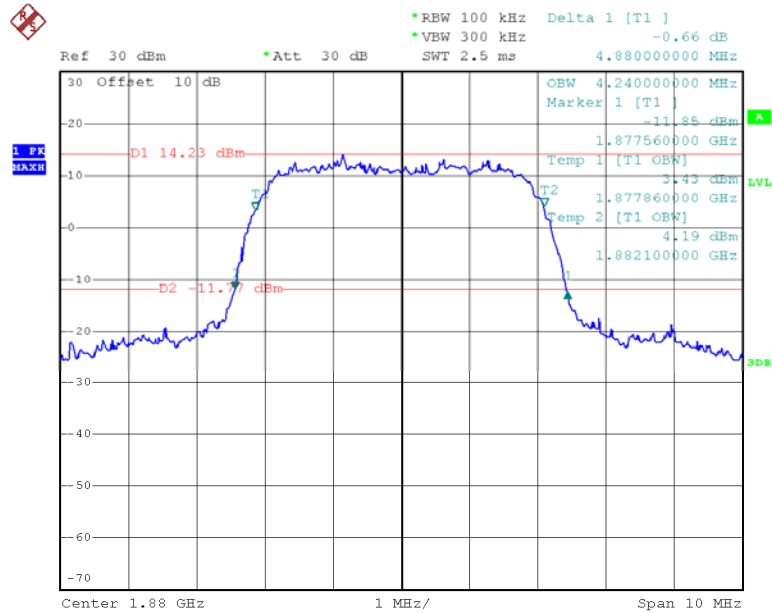
REL99 Band II



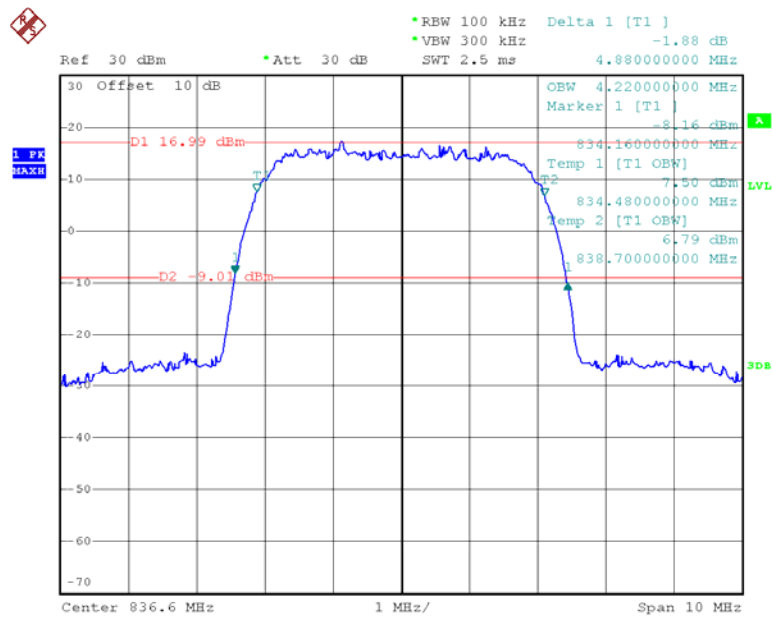
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HSDPA Band II

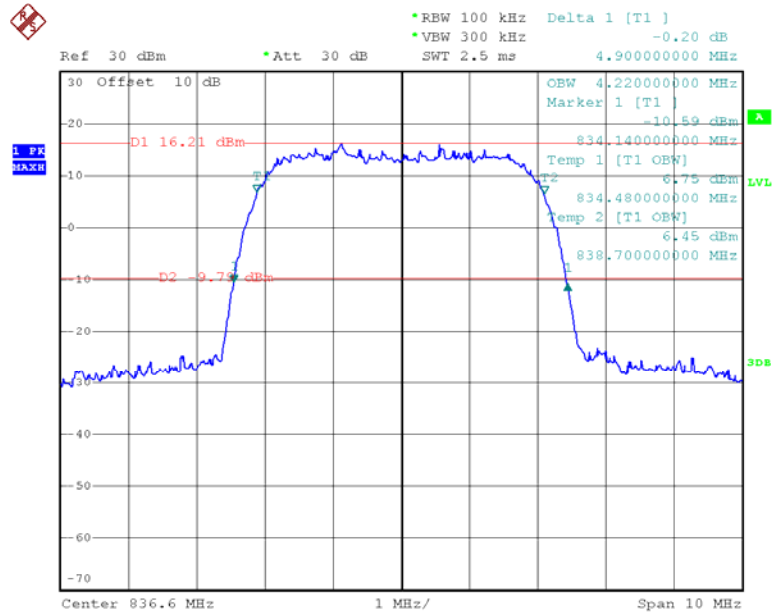
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HSUPA Band II

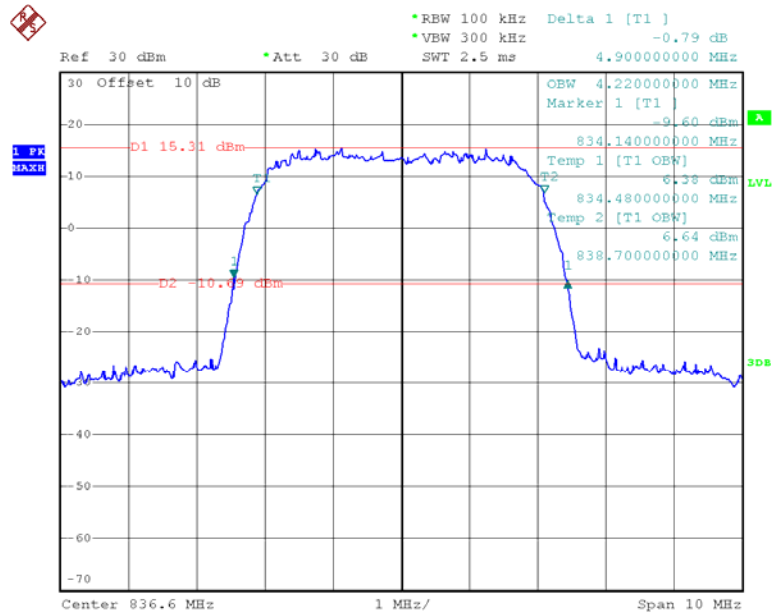
Date: 26.DEC.2015 14:48:10

REL99 Band V

Date: 26.DEC.2015 16:25:07

HSDPA Band V

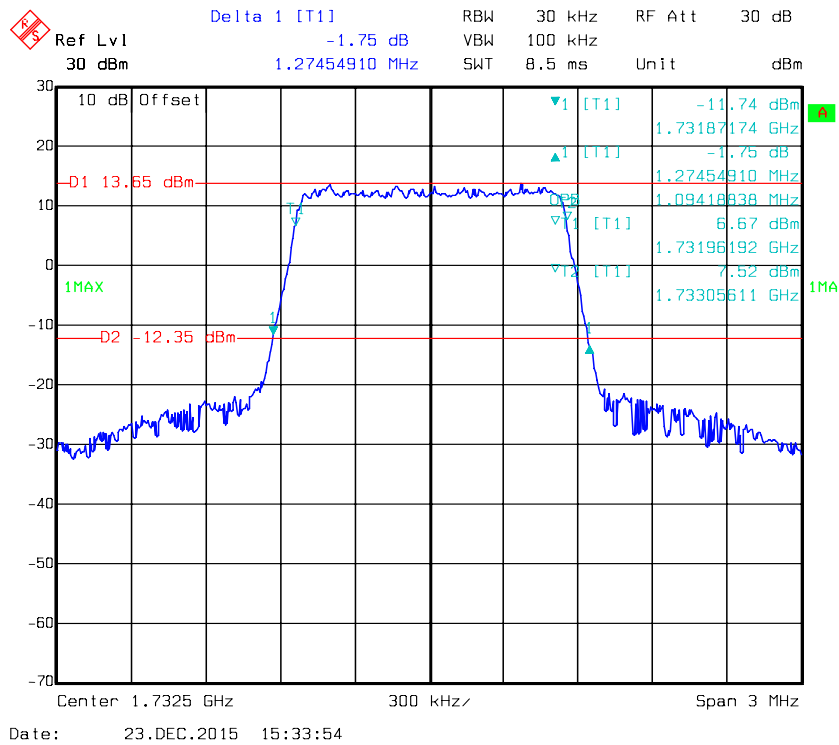
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HSUPA Band V

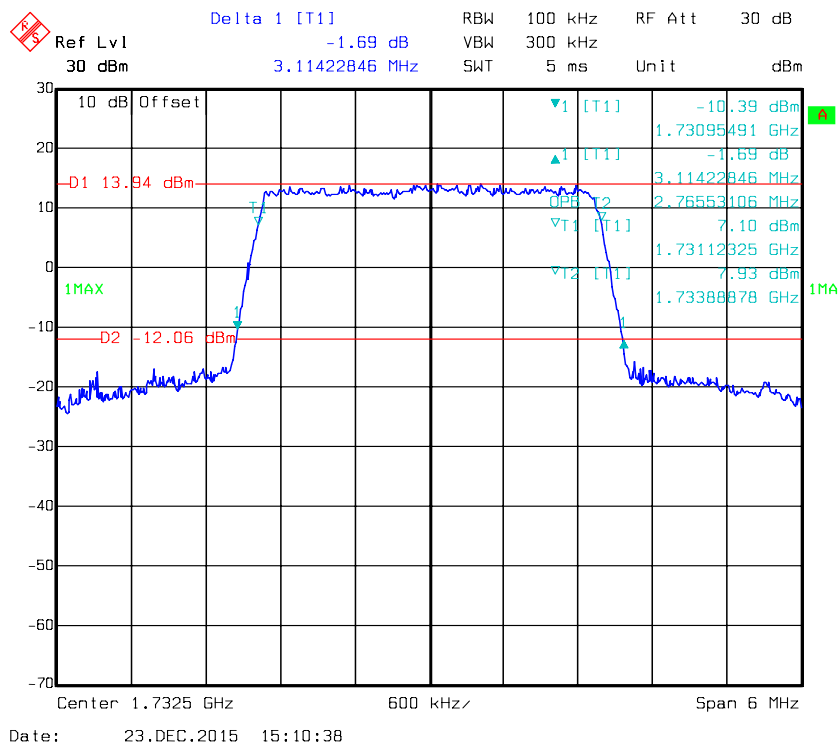
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LTE Band	Test Modulation	Test Bandwidth	Test Channel	99% Occupied Bandwidth	26 dB Bandwidth
				MHz	MHz
Band 4	QPSK	1.4M	Middle	1.094	1.275
		3M		2.766	3.114
		5M		4.549	5.090
		10M		9.098	10.301
		15M		13.527	15.090
		20M		18.116	19.880
	16-QAM	1.4M	Middle	1.112	1.281
		3M		2.778	3.138
		5M		4.569	5.130
		10M		9.098	10.261
		15M		13.587	15.090
		20M		18.196	19.960

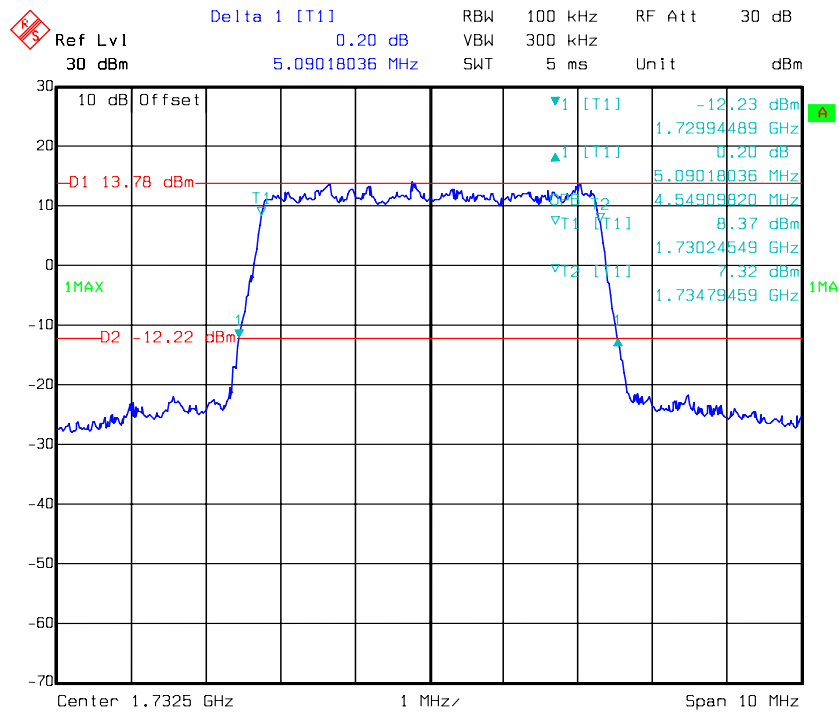
QPSK, Band 4-1.4M



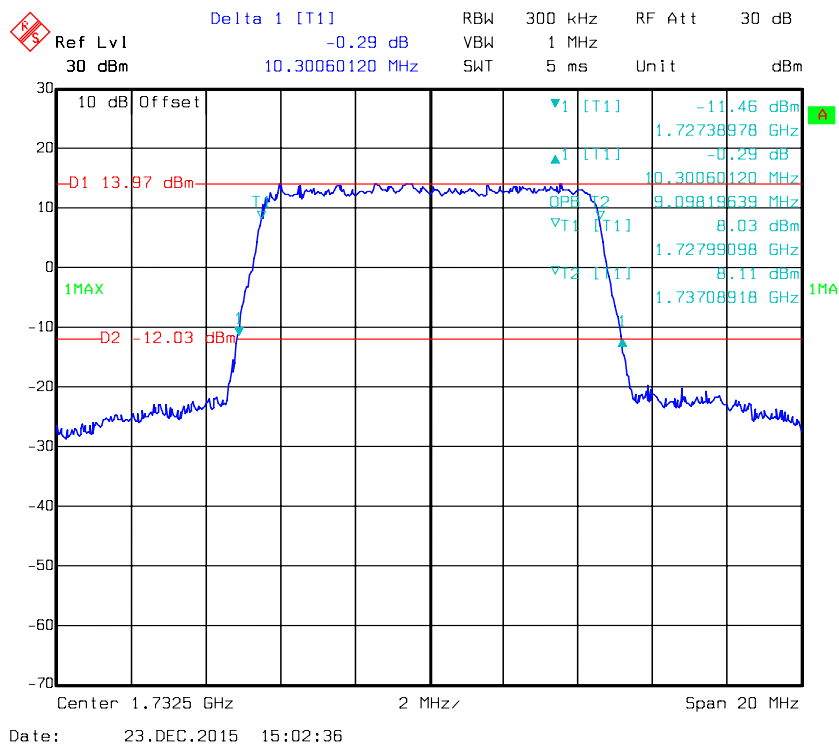
QPSK, Band 4-3M



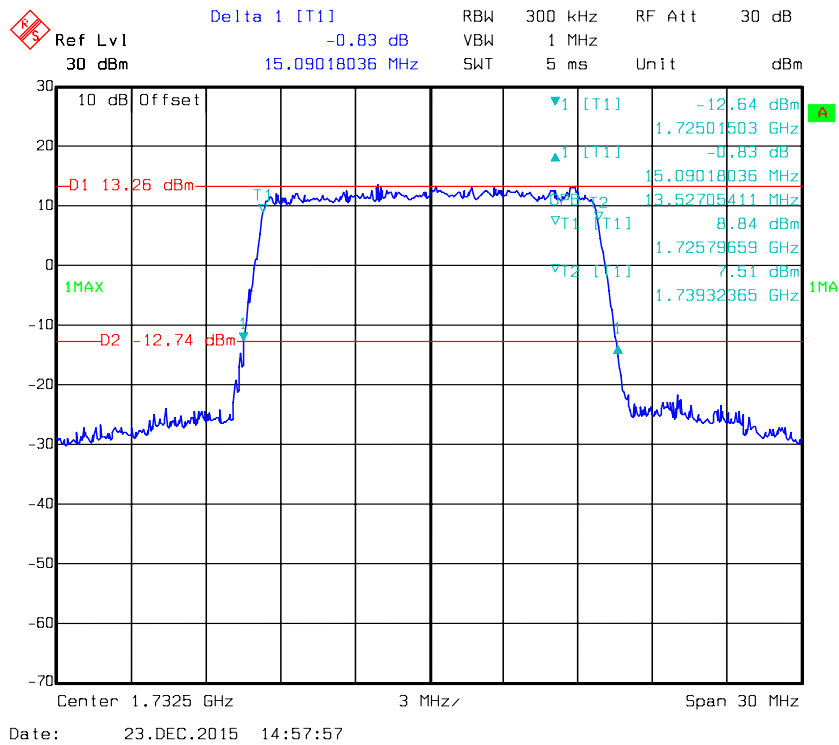
QPSK, Band 4-5M



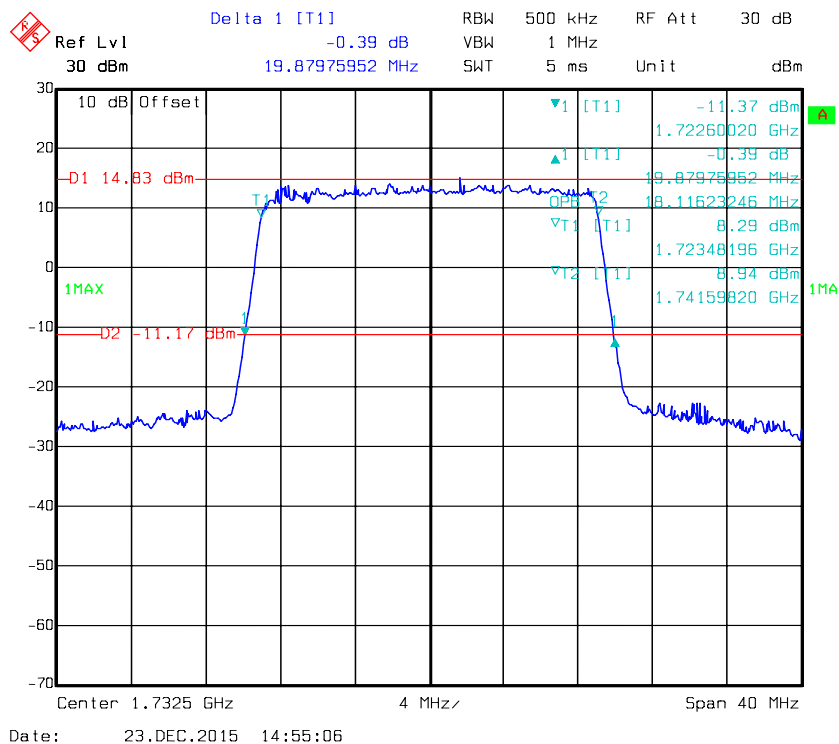
QPSK, Band 4-10M

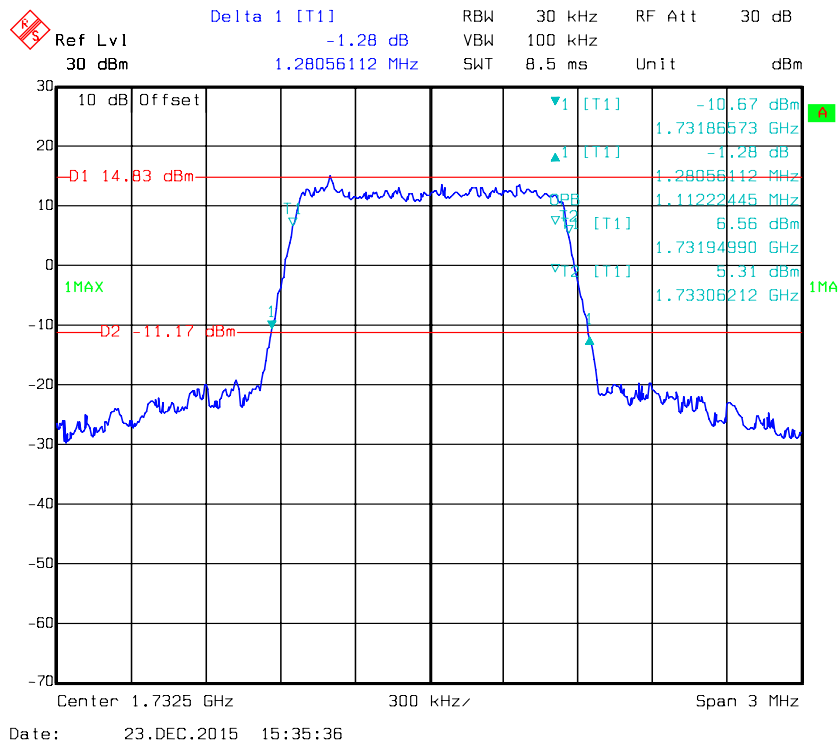
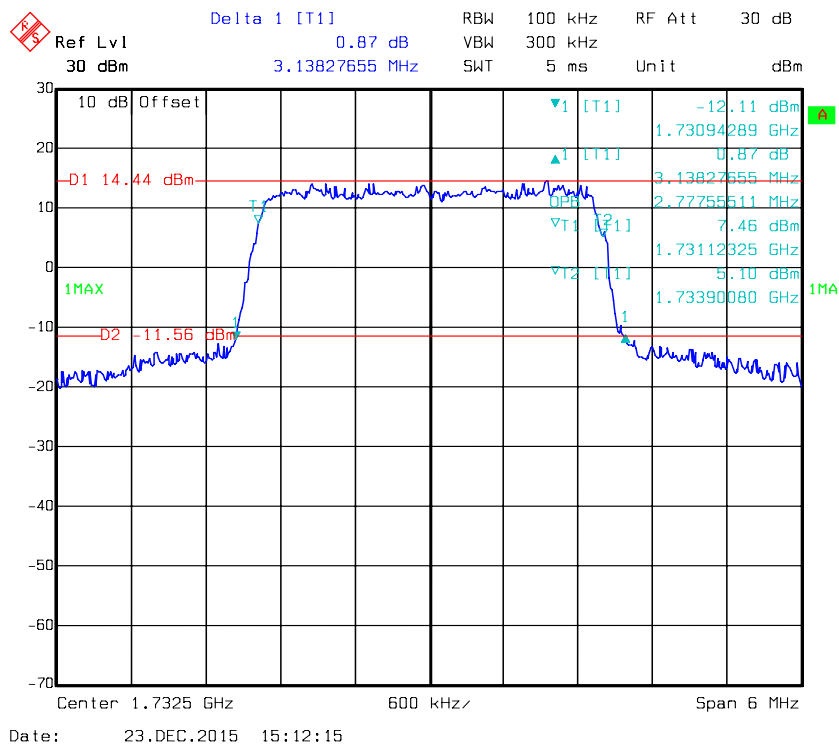


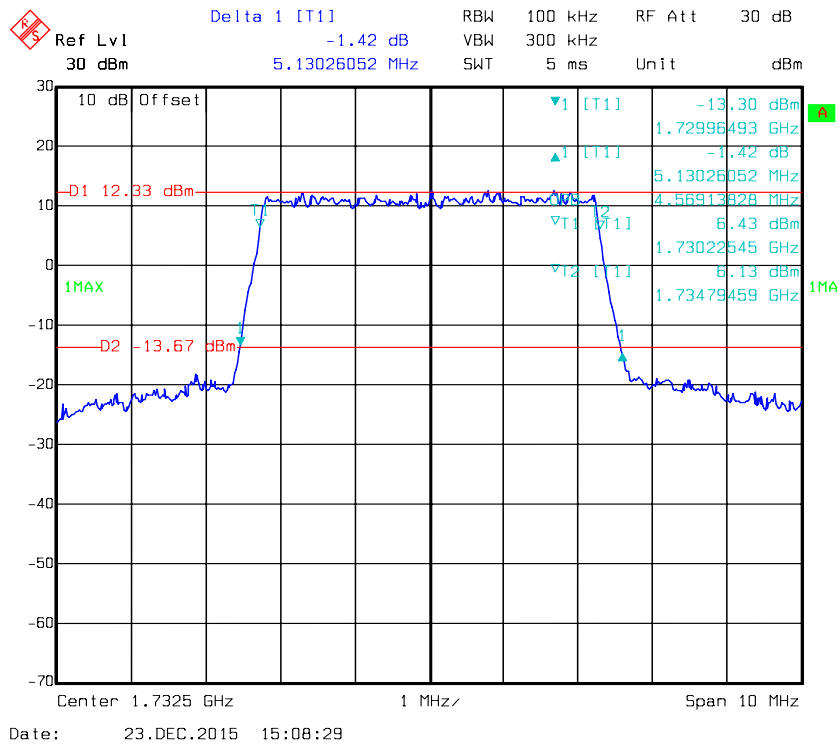
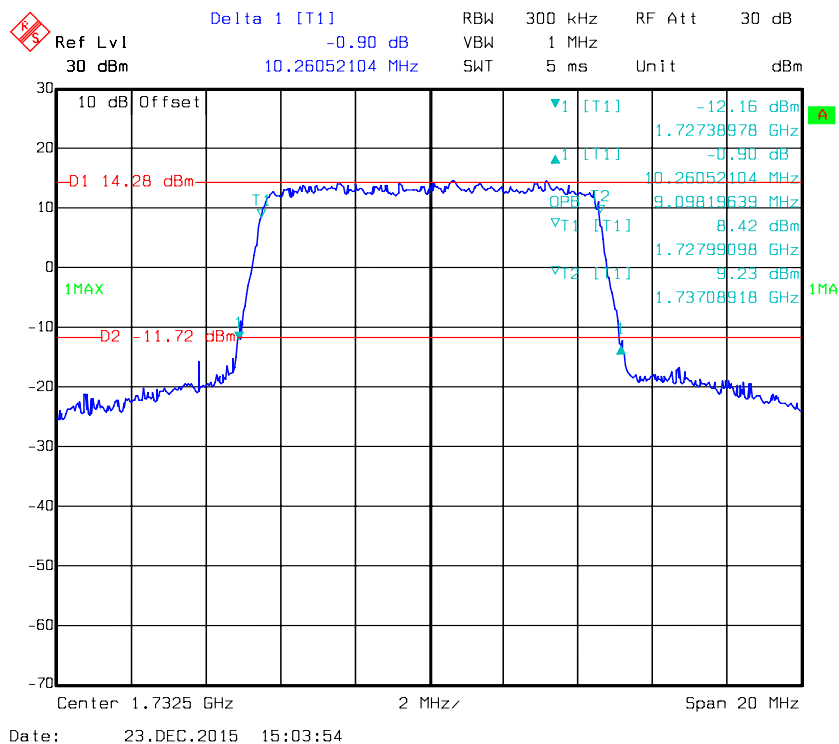
QPSK, Band 4-15M

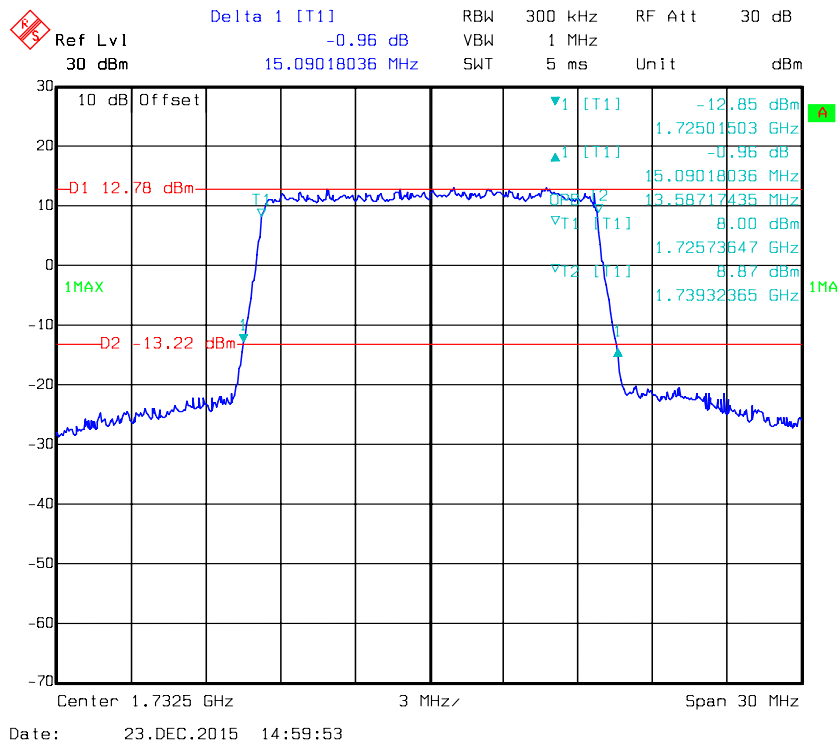
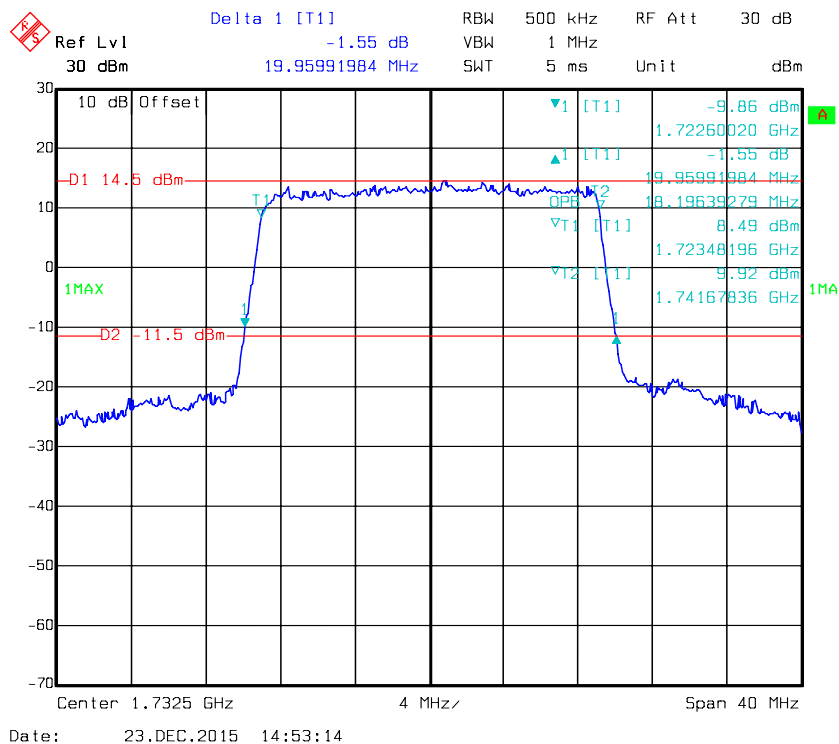


QPSK, Band 4-20M



16-QAM, Band 4-1.4M**16-QAM, Band 4-3M**

16-QAM, Band 4-5M**16-QAM, Band 4-10M**

16-QAM, Band 4-15M**16-QAM, Band 4-20M**

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

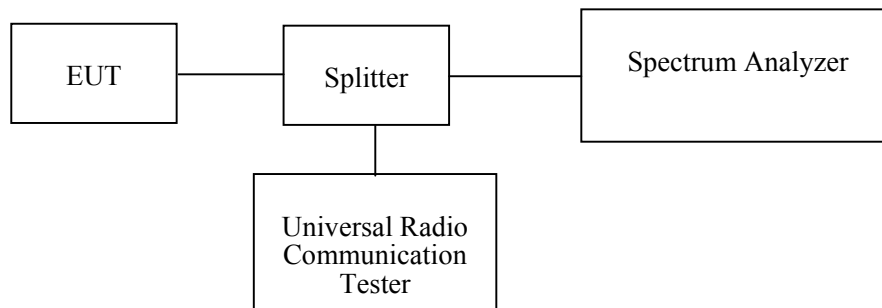
Applicable Standard

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	1201.002K50-146520-wh	2015-12-19	2016-12-19

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

Test Data

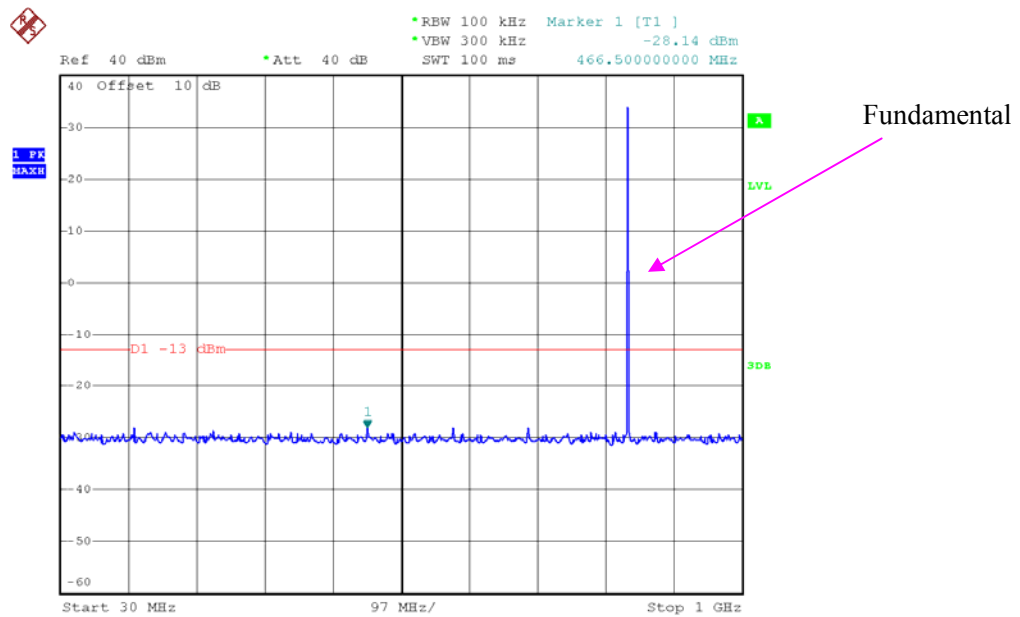
Environmental Conditions

Temperature:	23.9~24.6 °C
Relative Humidity:	47~52%
ATM Pressure:	100.6~100.9 kPa

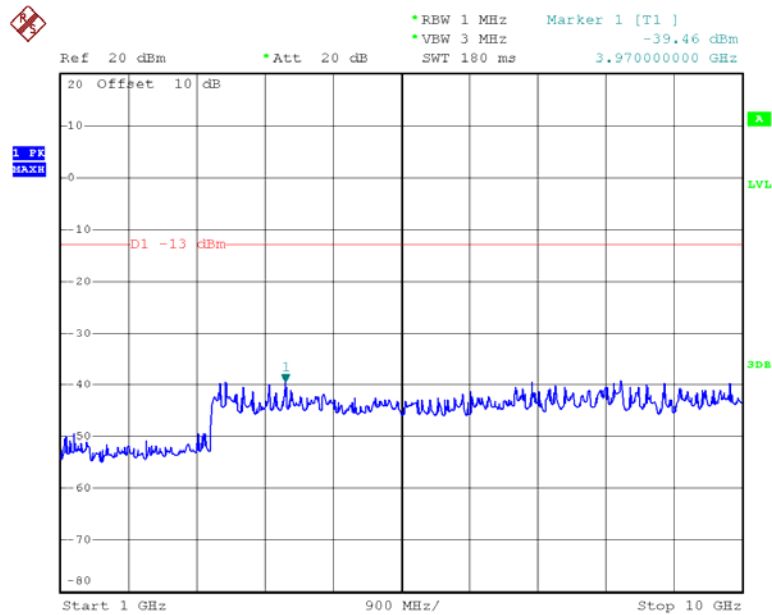
The testing was performed by Allen Qiao from 2015-12-23 to 2015-12-26.

Please refer to the following plots.

GSM850_Middle Channel

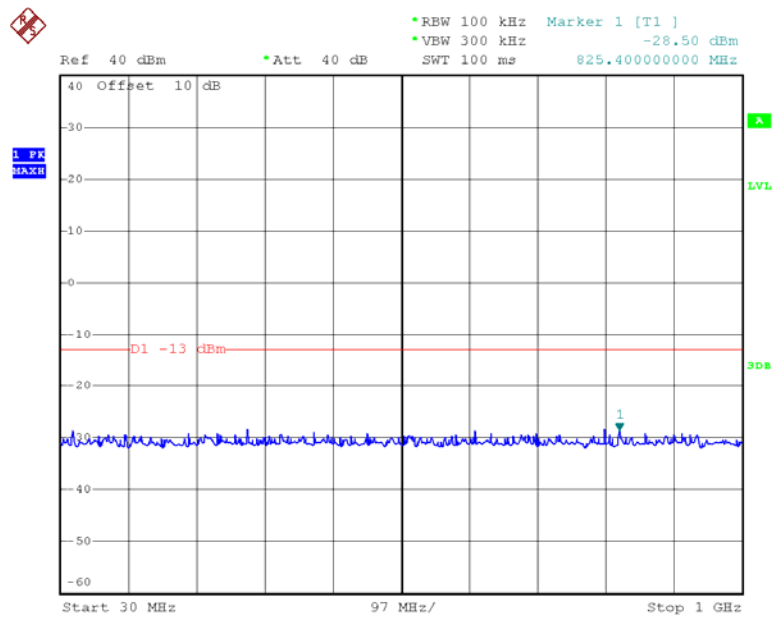


Date: 26.DEC.2015 12:57:54

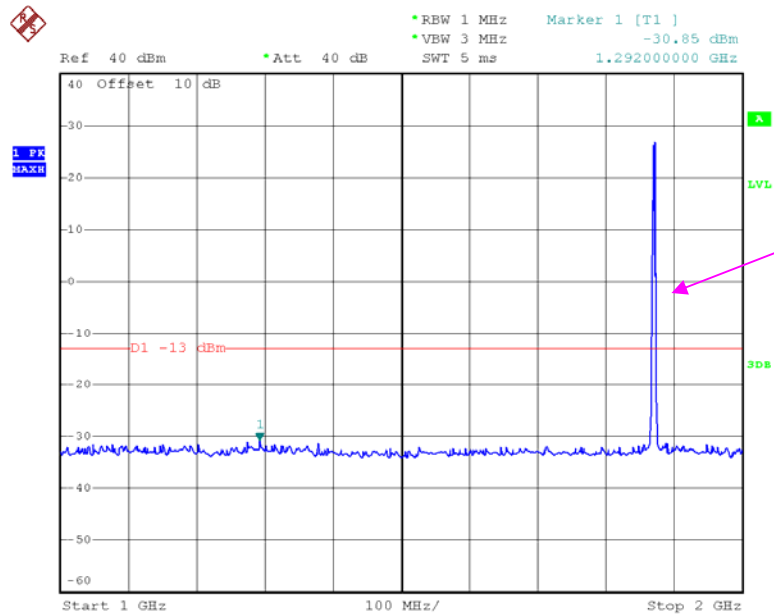


Date: 26.DEC.2015 13:02:32

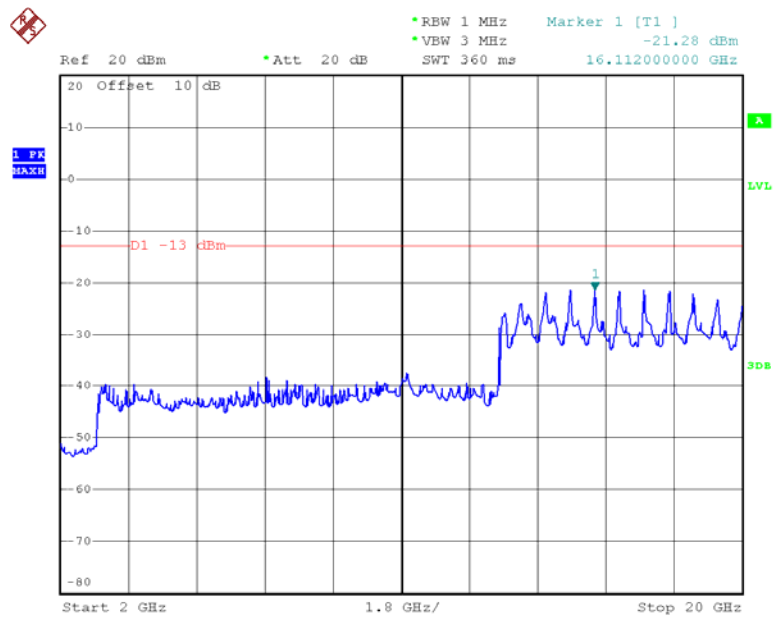
PCS 1900_ Middle Channel



Date: 26.DEC.2015 13:51:10

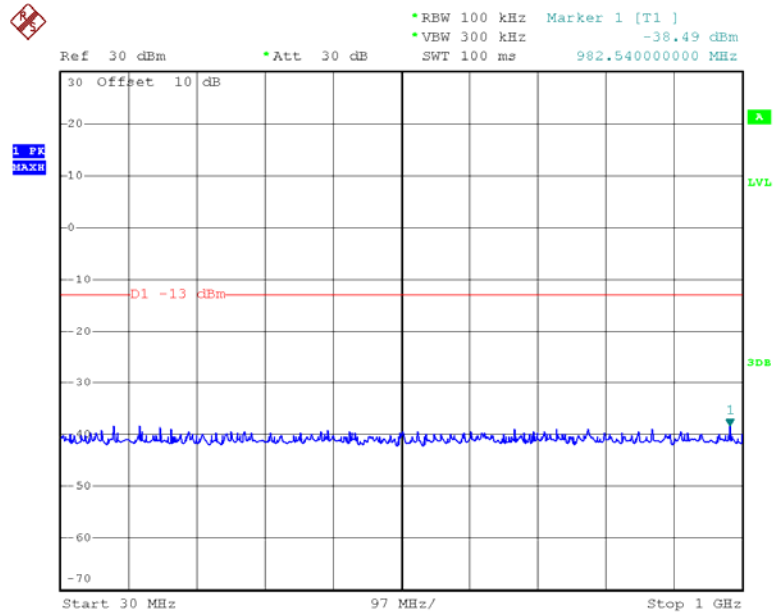


Date: 26.DEC.2015 13:53:30

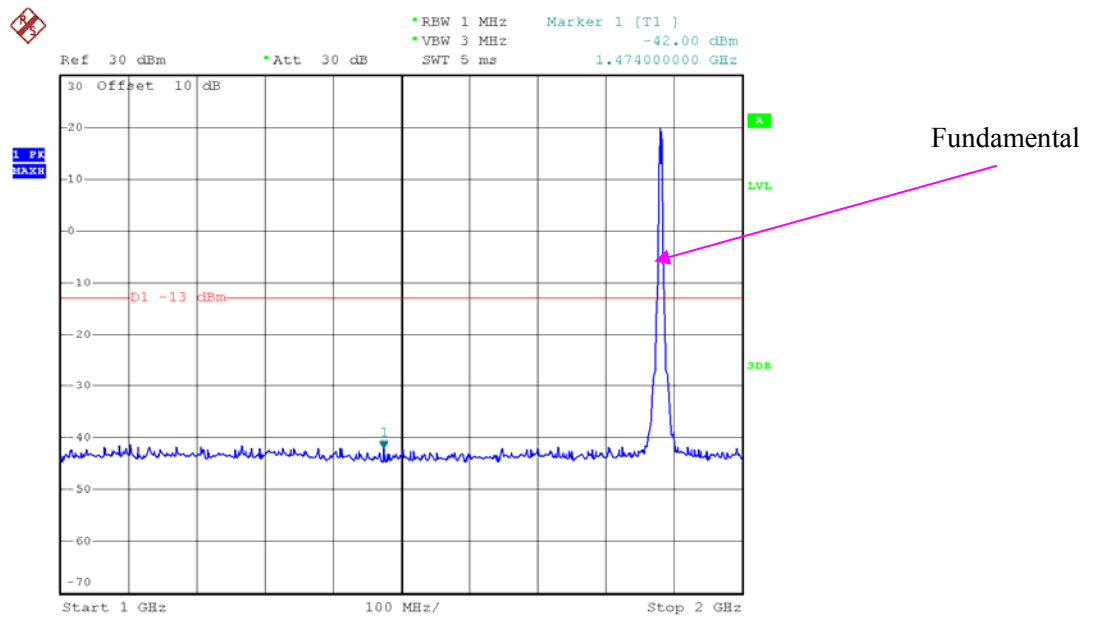


Date: 26.DEC.2015 13:54:32

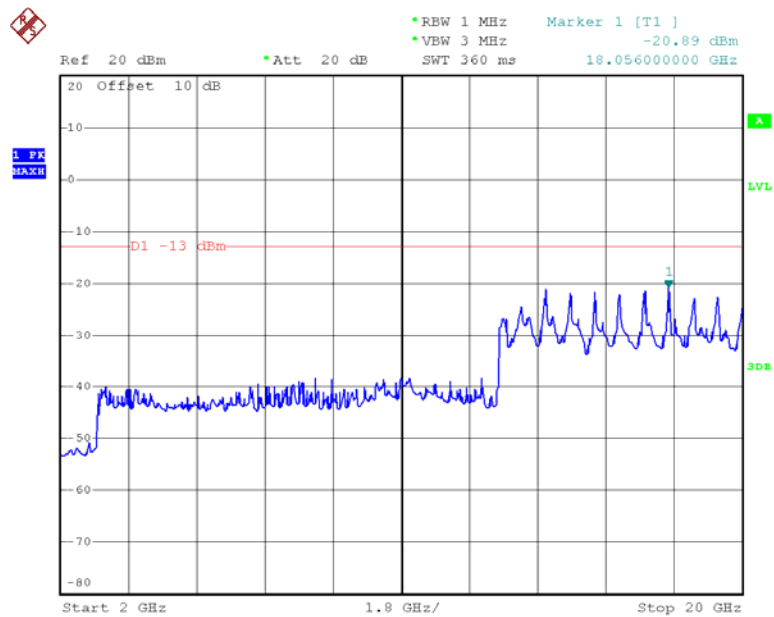
REL99 Band II_Middle Channel



Date: 26.DEC.2015 14:28:04

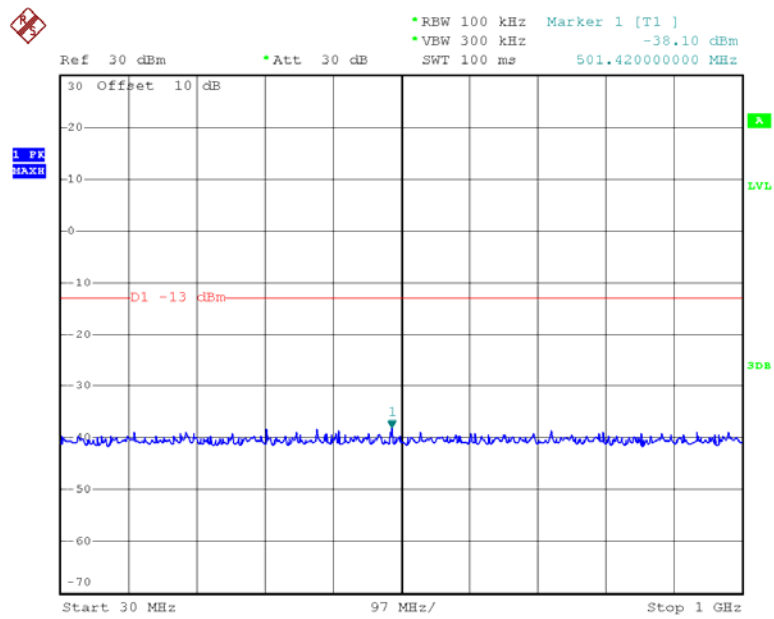


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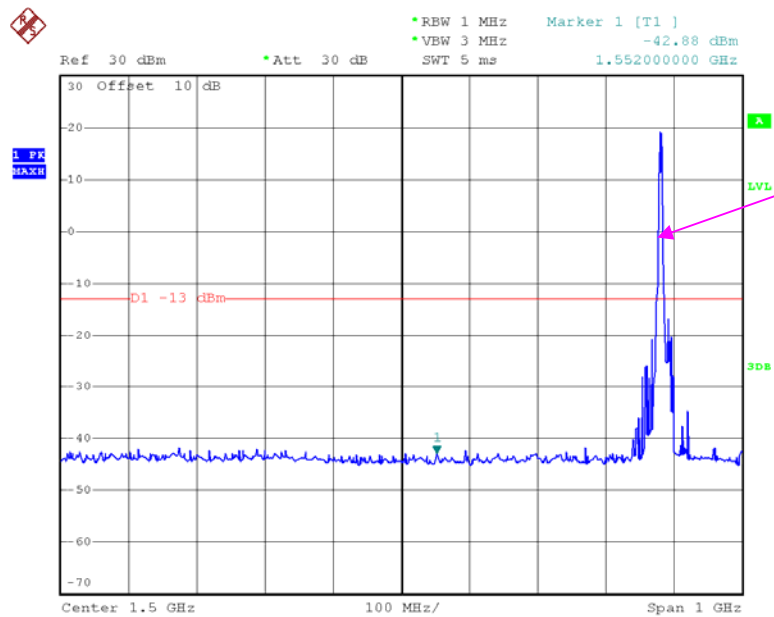


Date: 26.DEC.2015 14:30:06

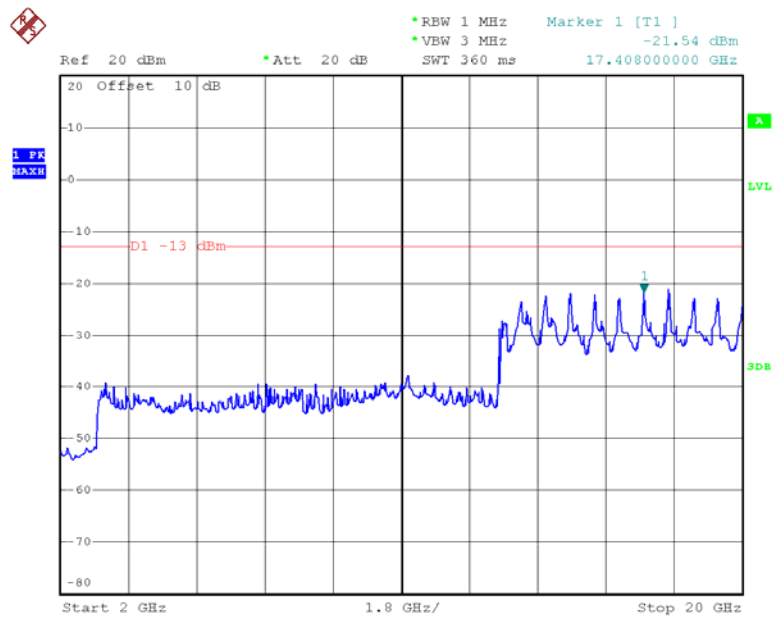
HSDPA Band II _Middle Channel



Date: 26.DEC.2015 16:17:21

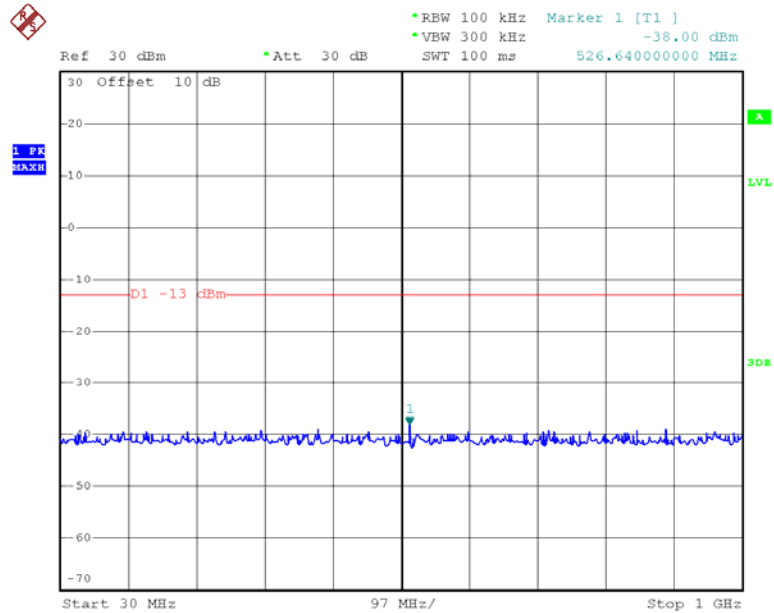


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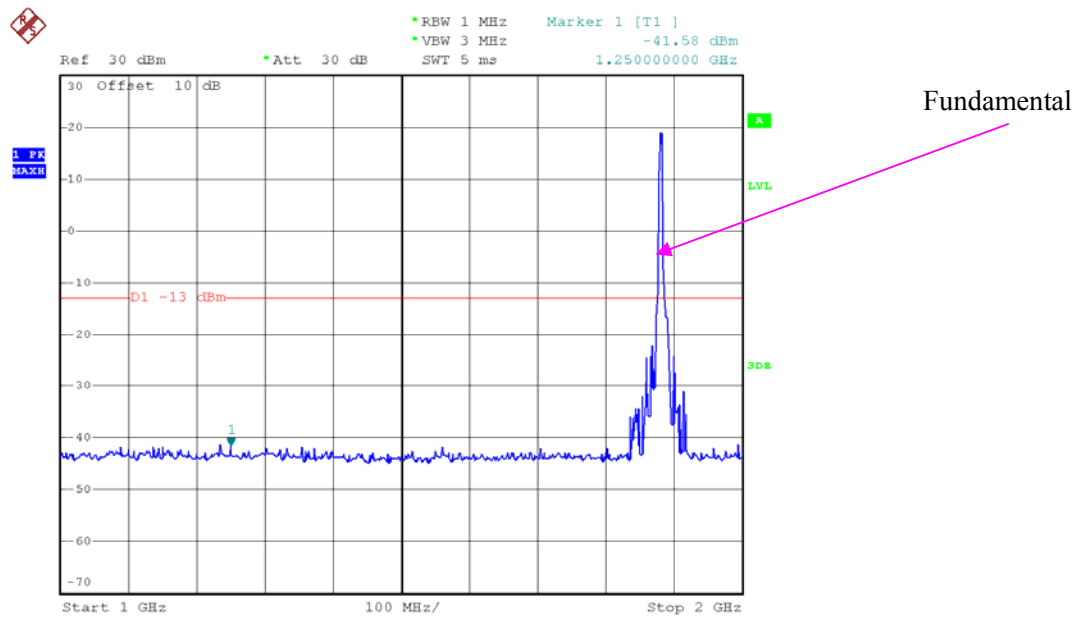


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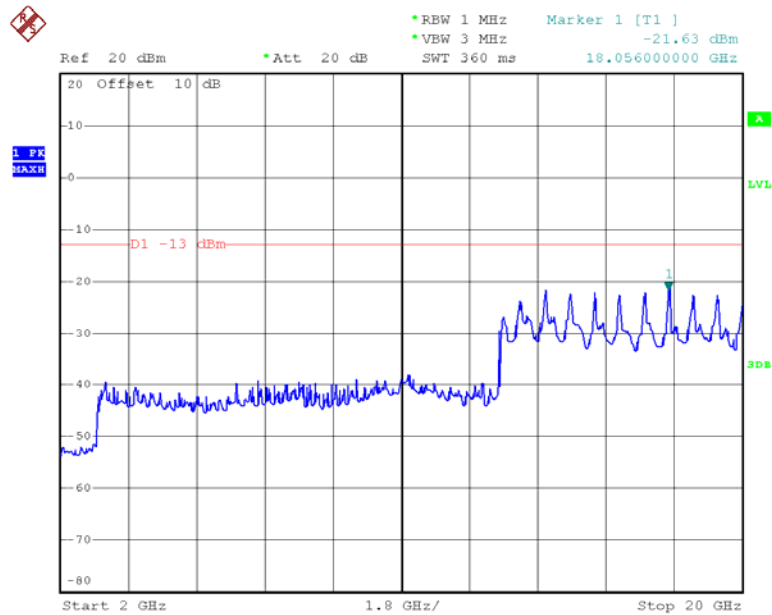
HSUPA Band II_Middle Channel



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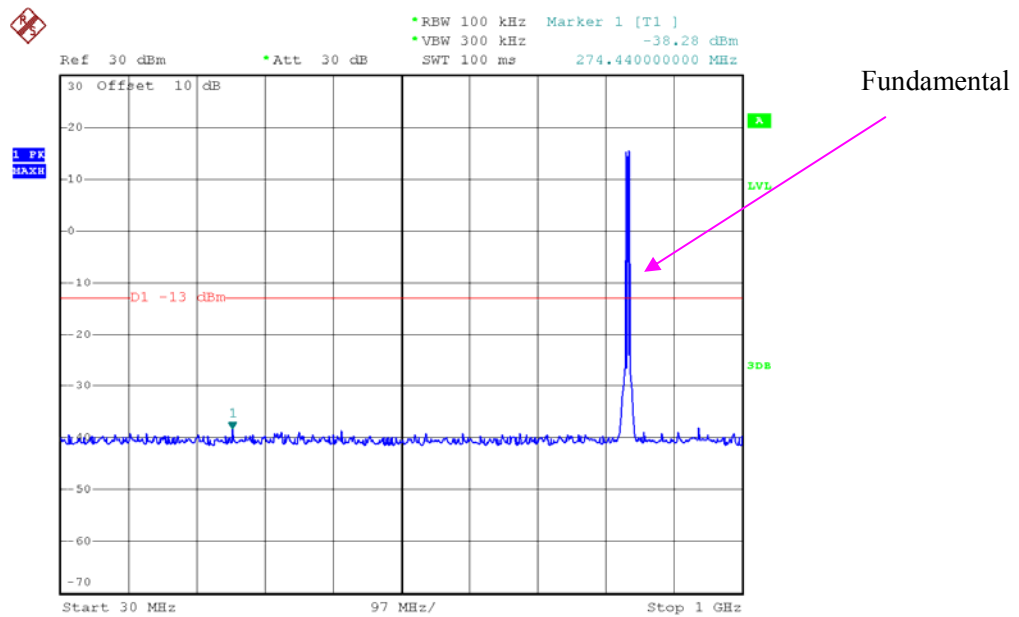


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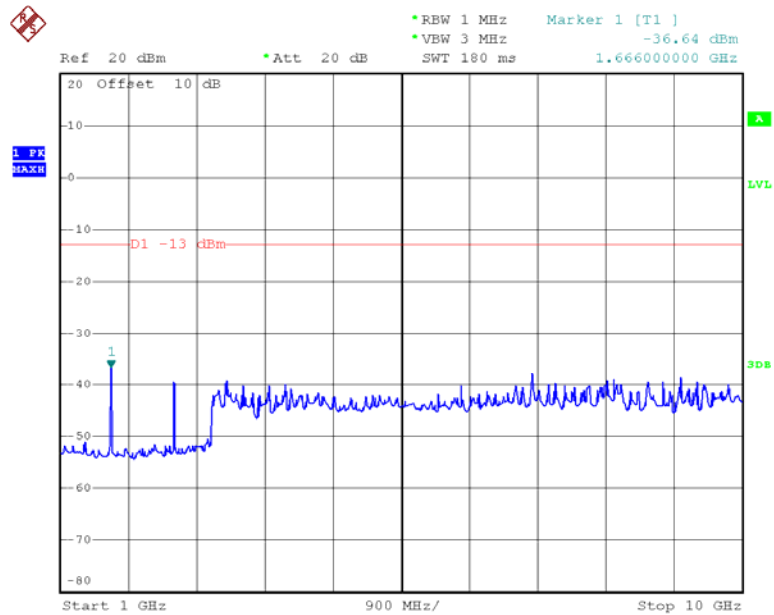


Date: 26.DEC.2015 16:03:59

REL99 Band V_ Middle Channel

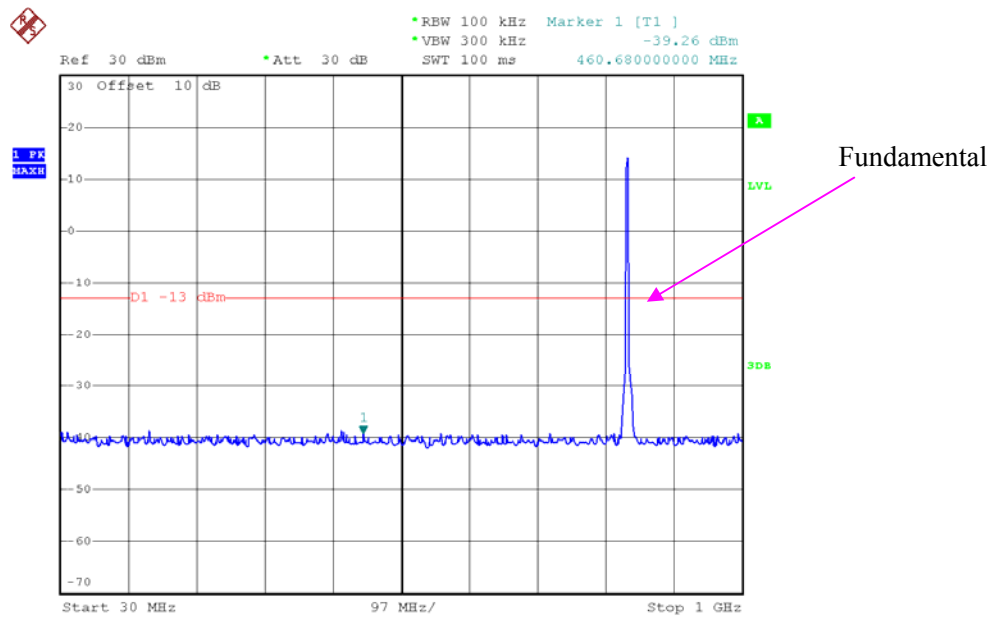


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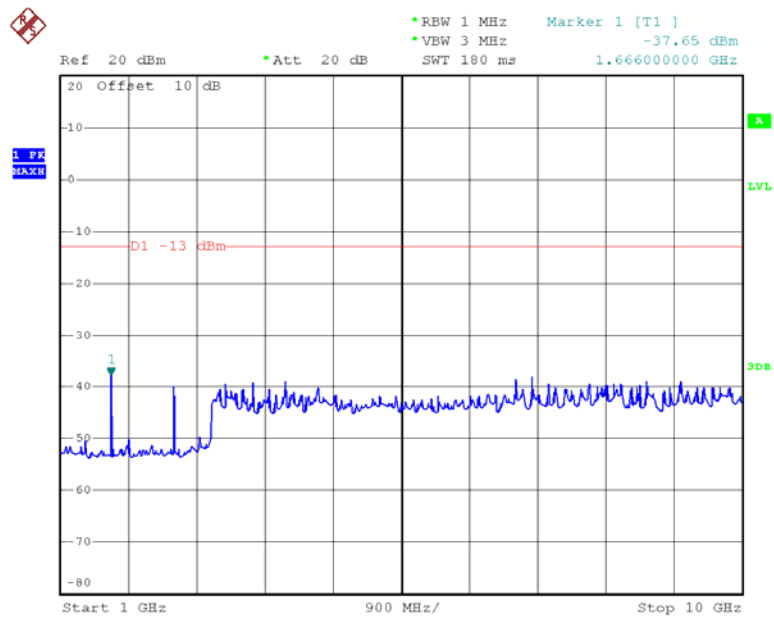


Date: 26.DEC.2015 16:38:01

HSDPA Band V_Middle Channel

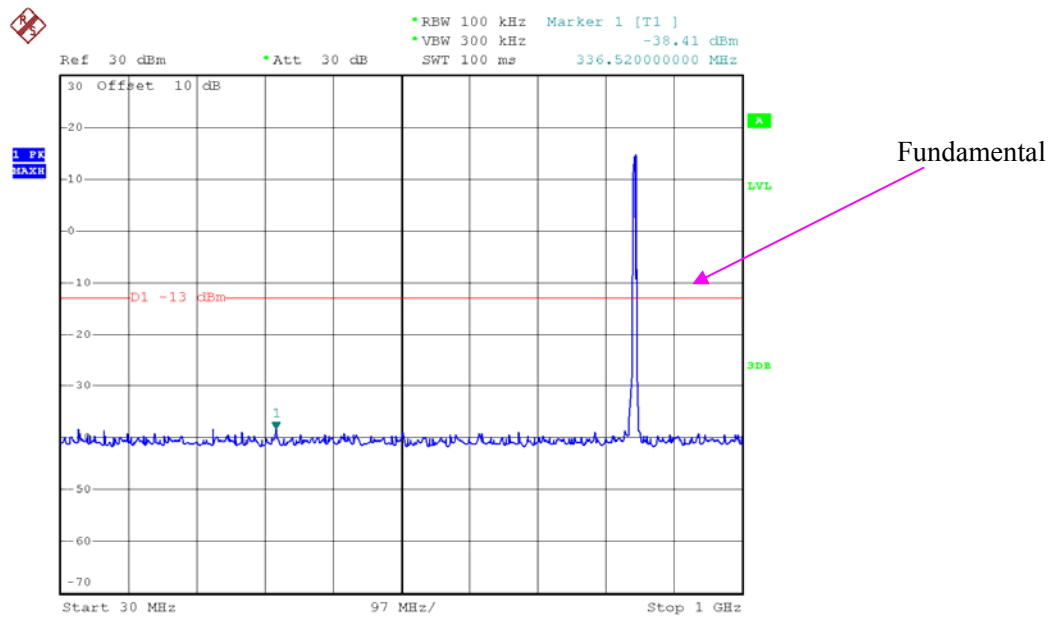


Date: 26.DEC.2015 16:54:44

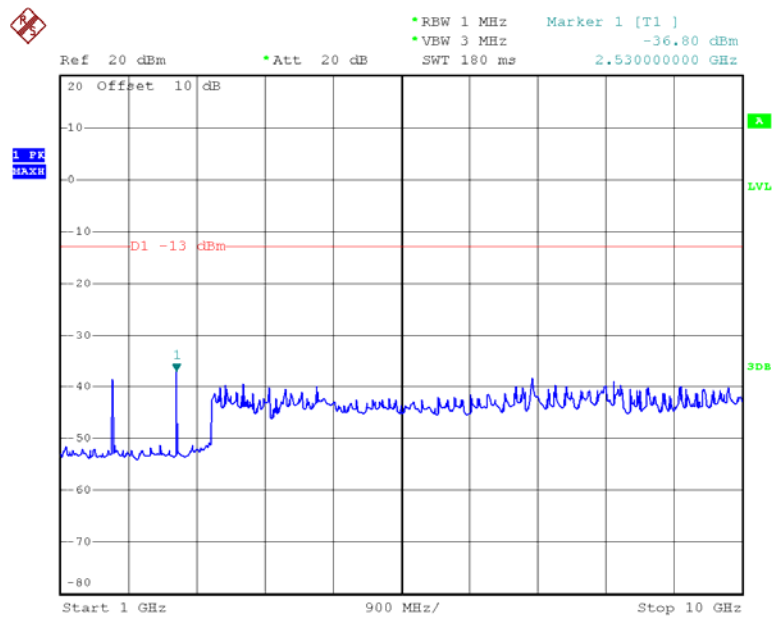


Date: 26.DEC.2015 16:55:46

HSUPA Band V_ Middle Channel



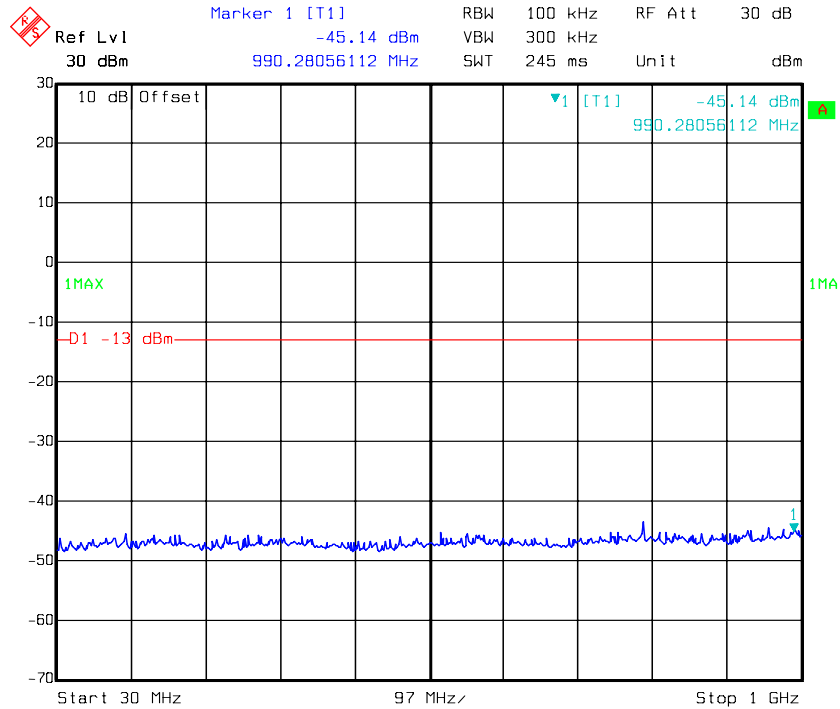
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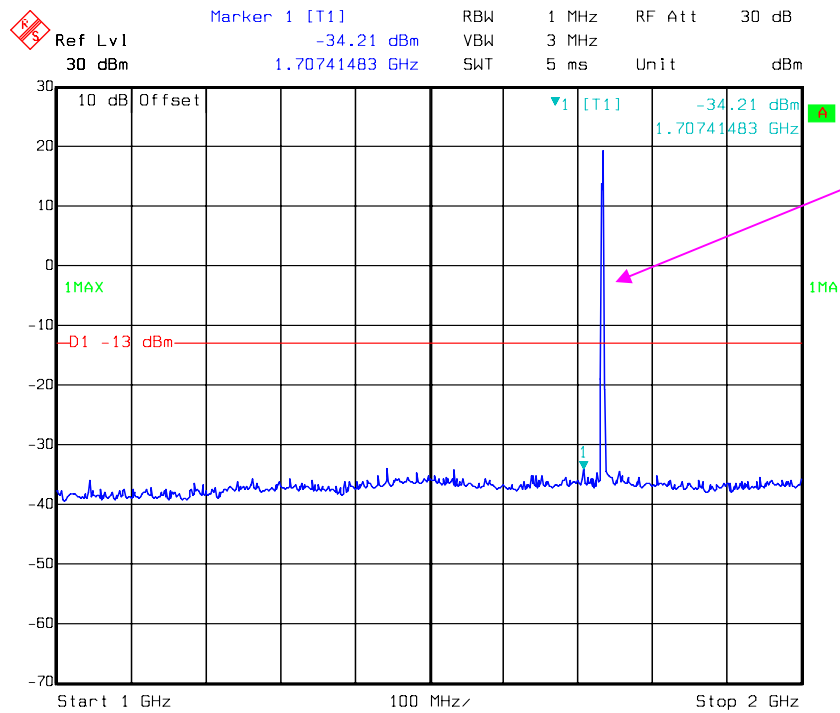
Date: 26.DEC.2015 17:04:09

LTE Band 4:

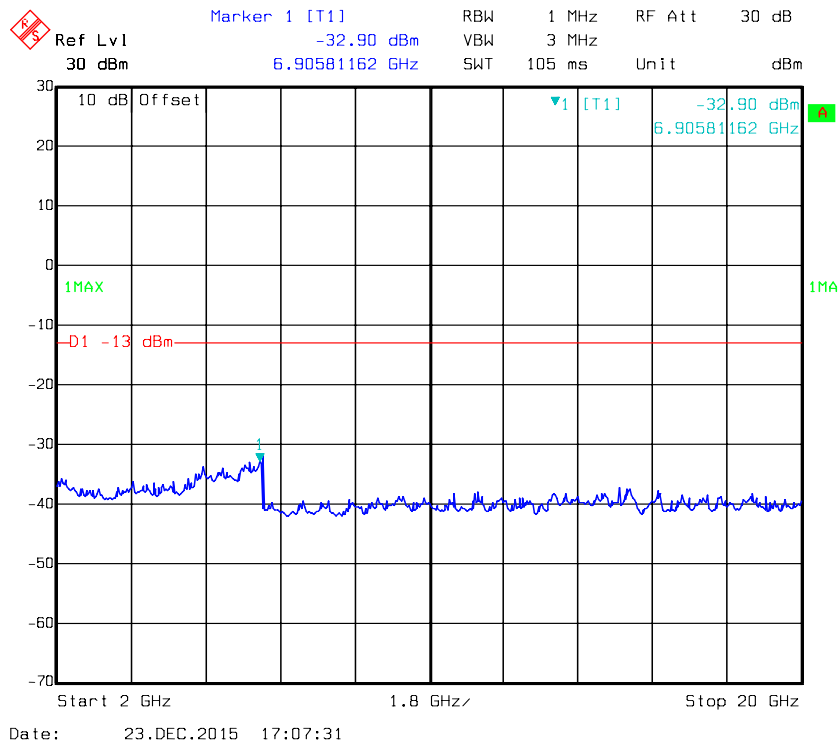
QPSK, Band 4-1.4M _ Middle Channel



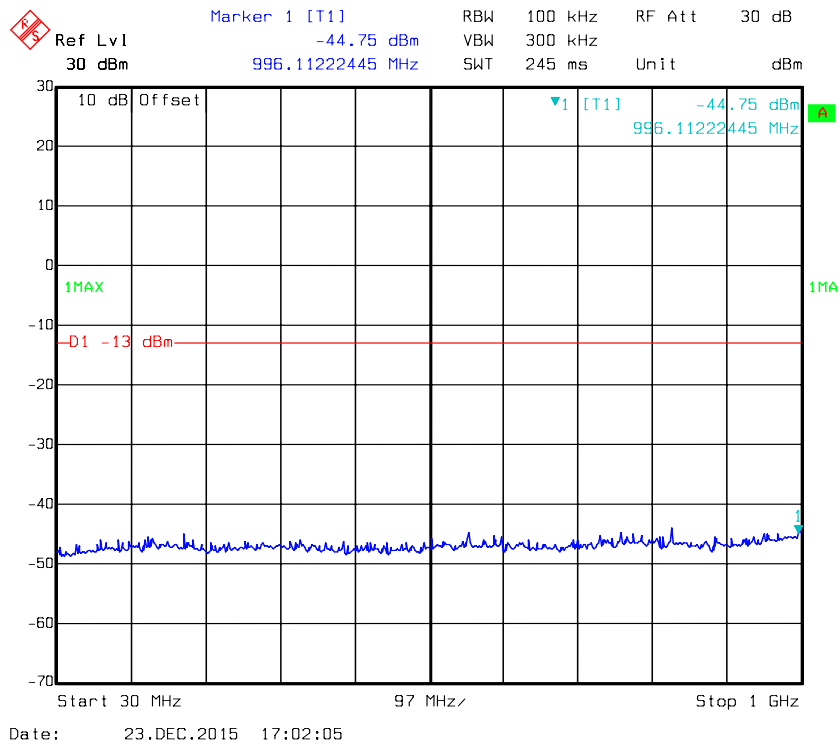
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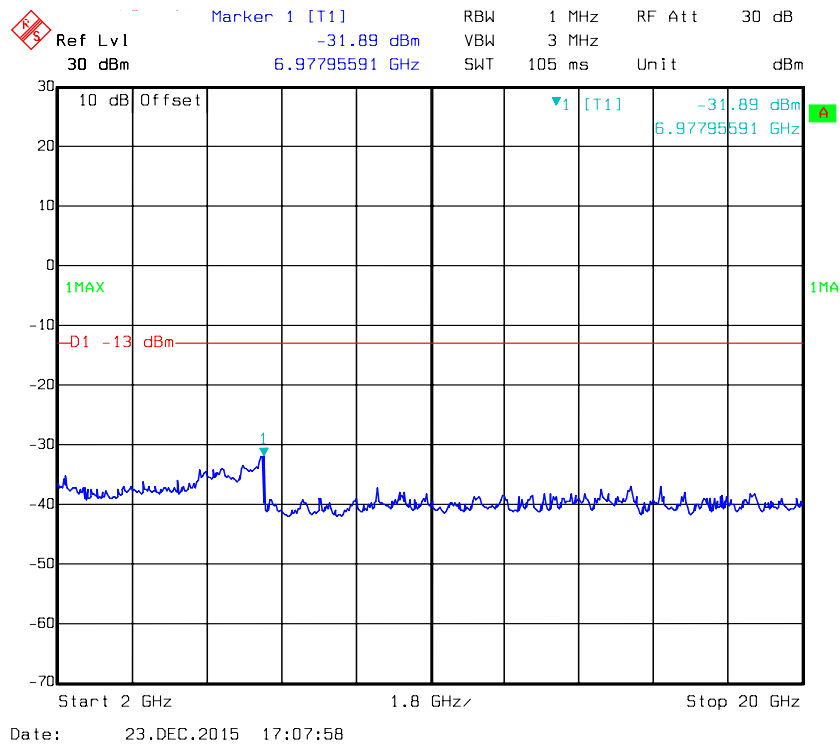
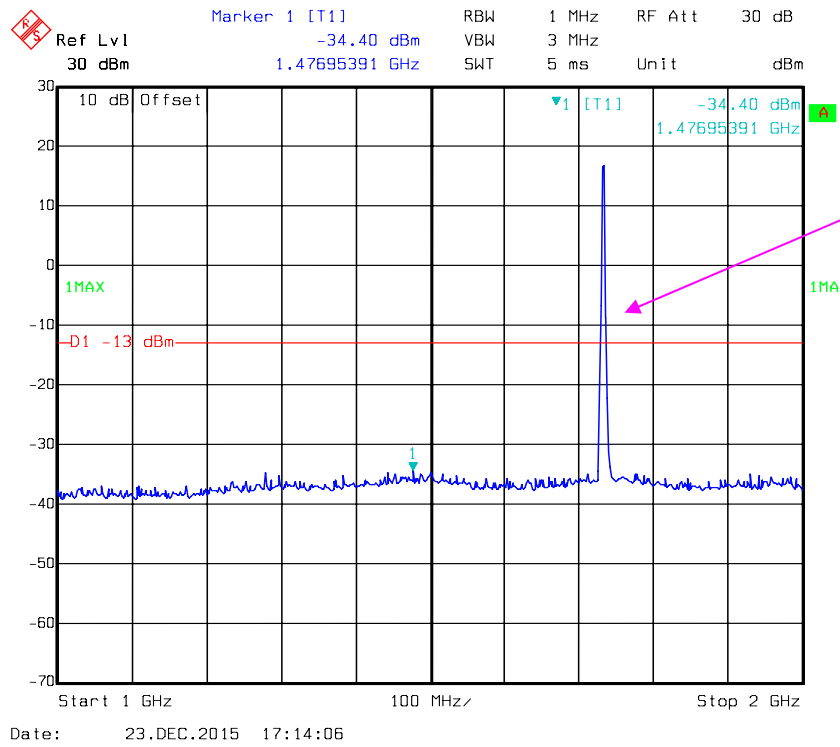


Date: 23.DEC.2015 17:12:16

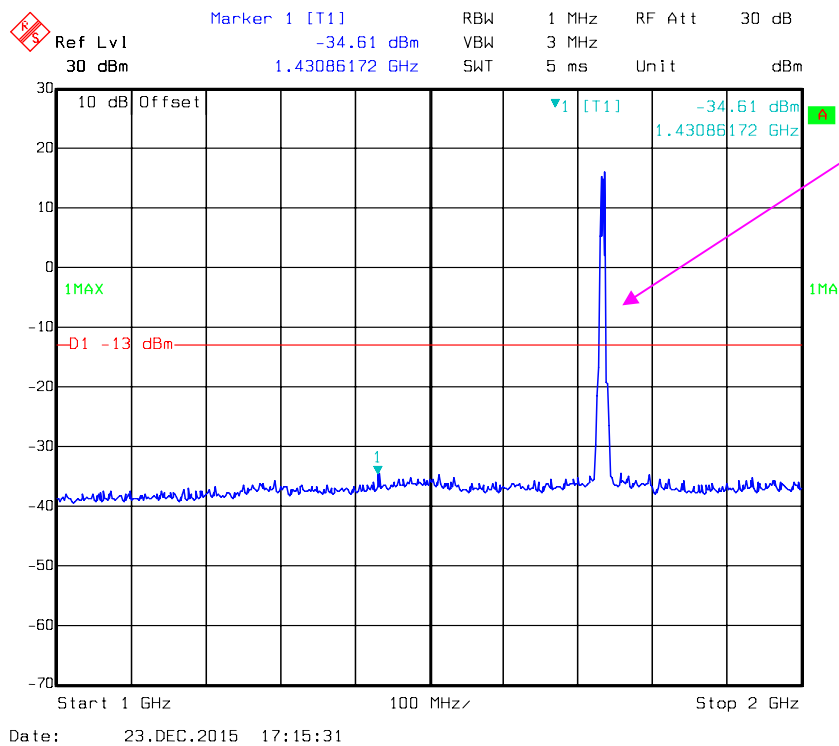
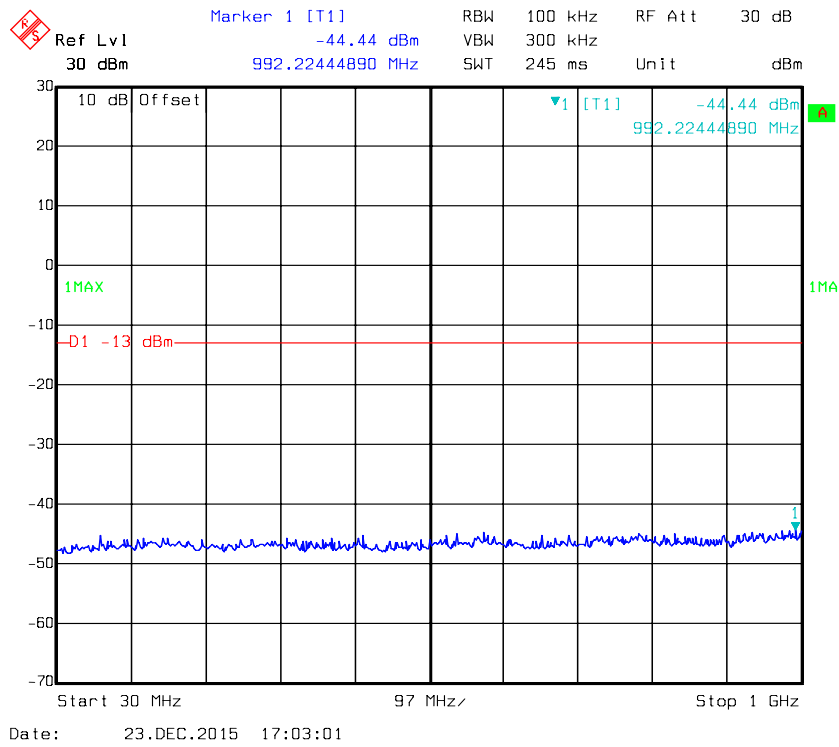


QPSK, Band 4-3M_Middle Channel

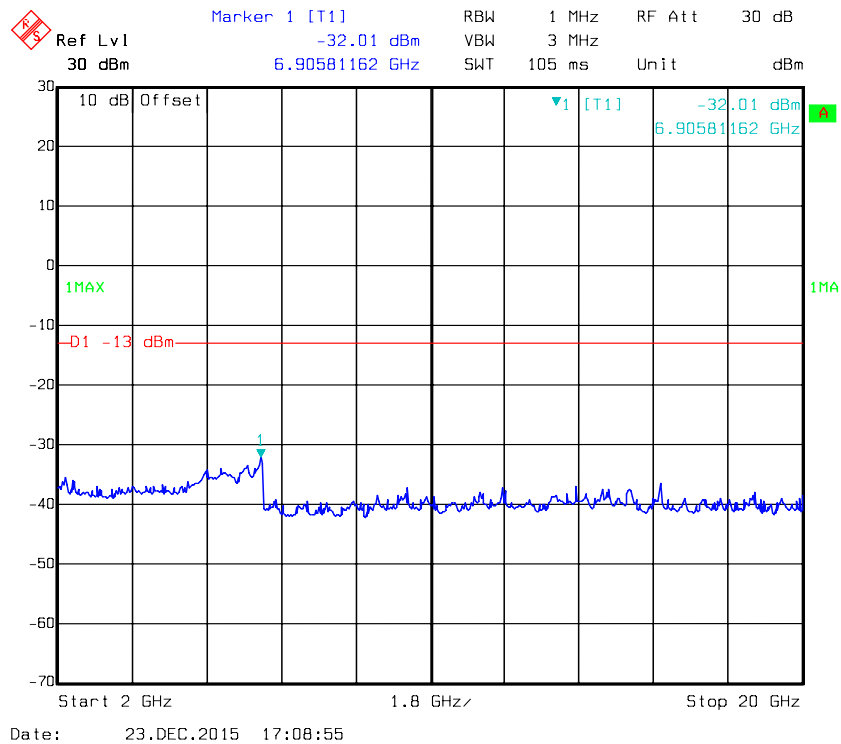
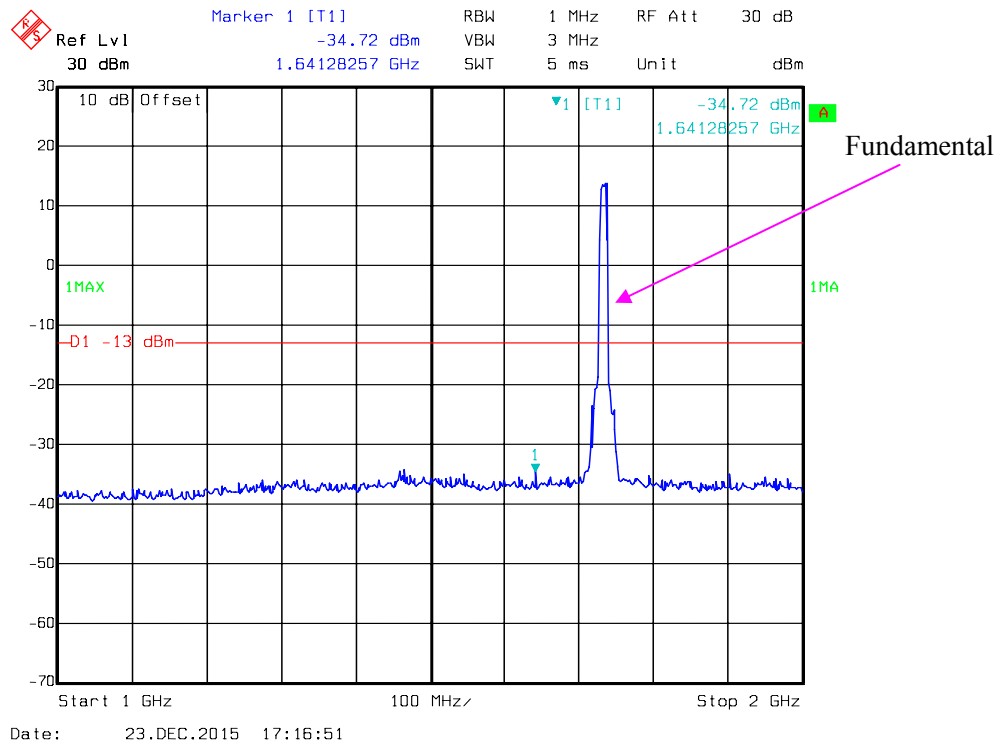




QPSK, Band 4-5M _ Middle Channel







Ref Lvl 30 dBm

Marker 1 [T1] -44.14 dBm

RBW 100 kHz

VBW 300 kHz

SWT 245 ms

RF Att 30 dB

Unit dBm

10 dB Offset

1MAX

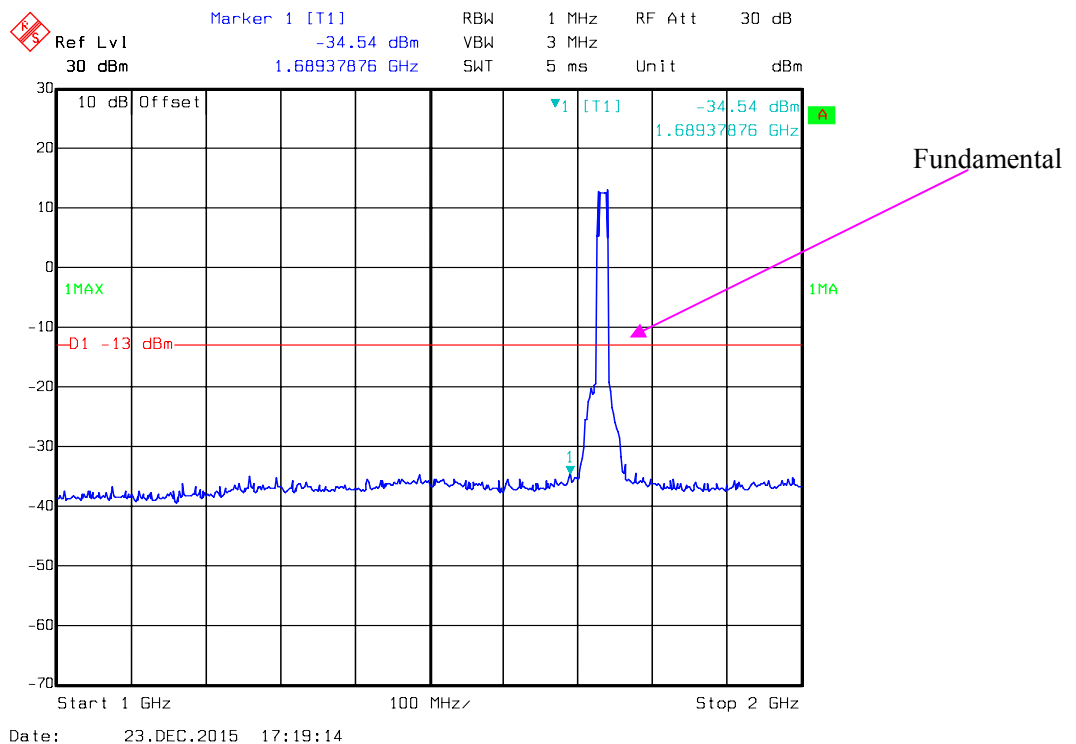
-D1 -13 dBm

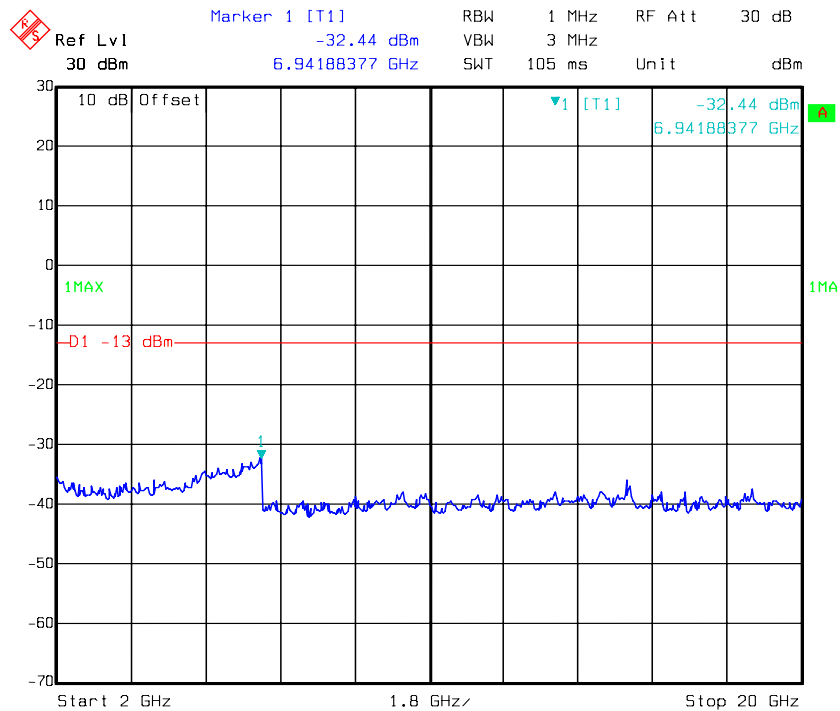
Start 30 MHz

97 MHz

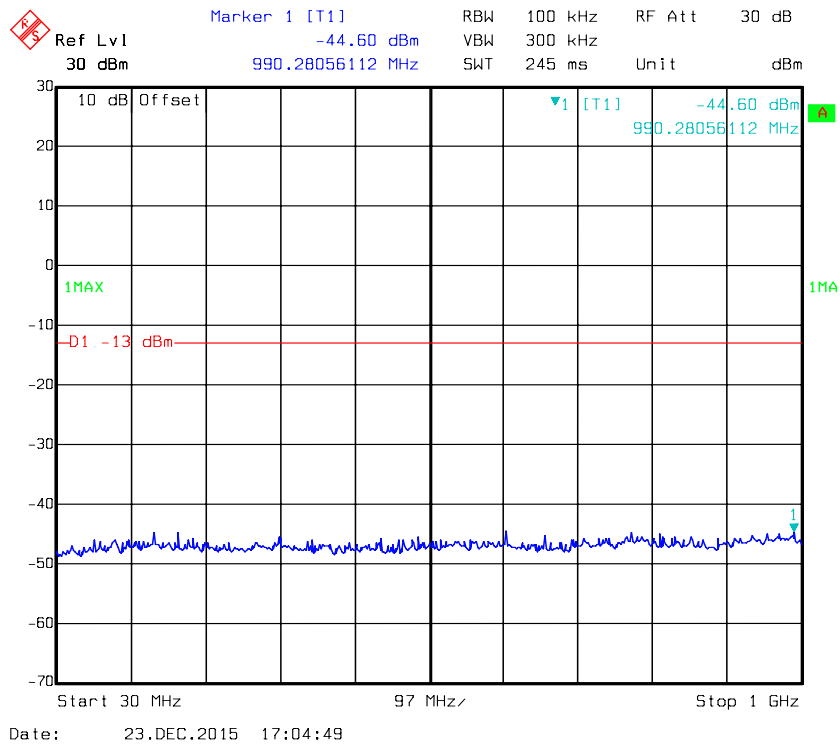
Stop 1 GHz

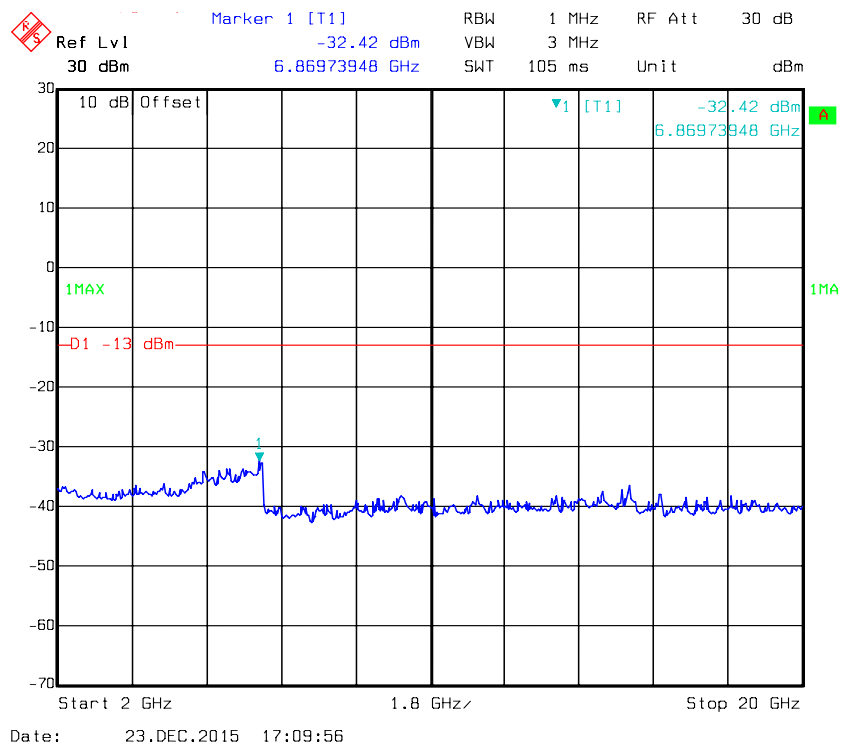
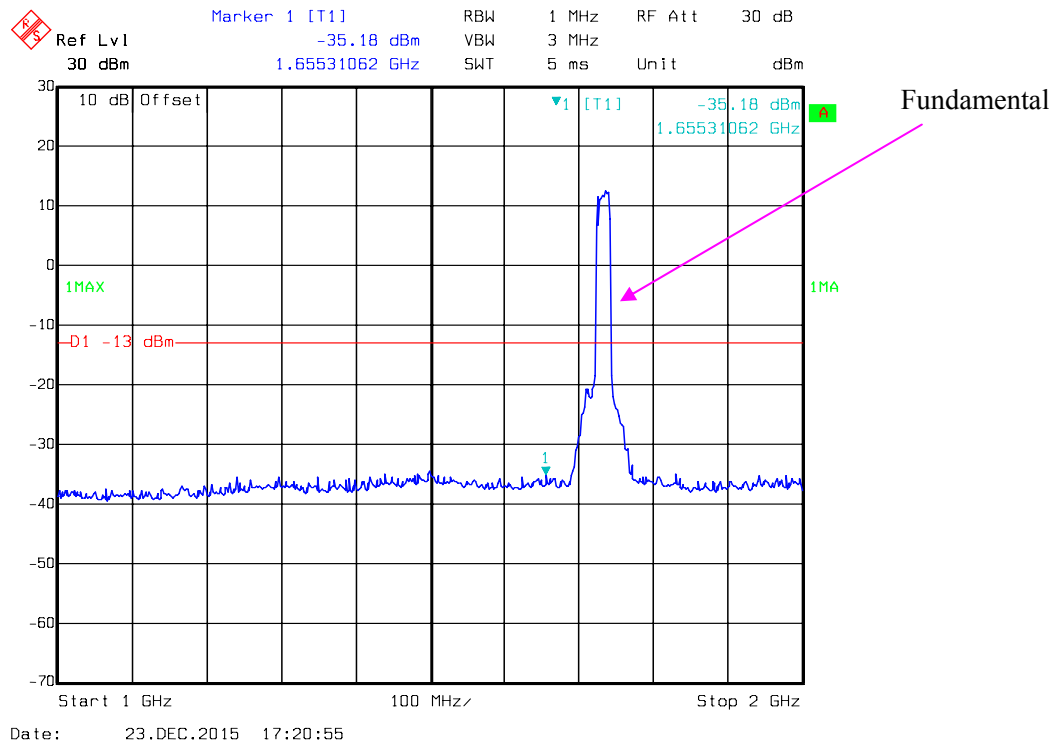
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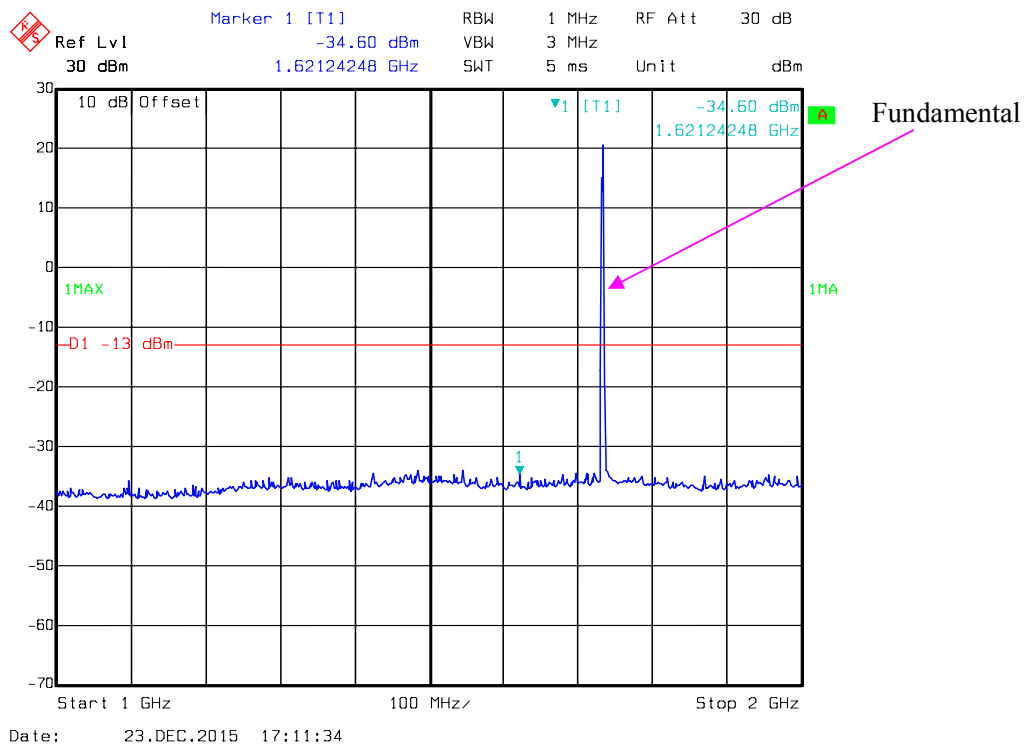
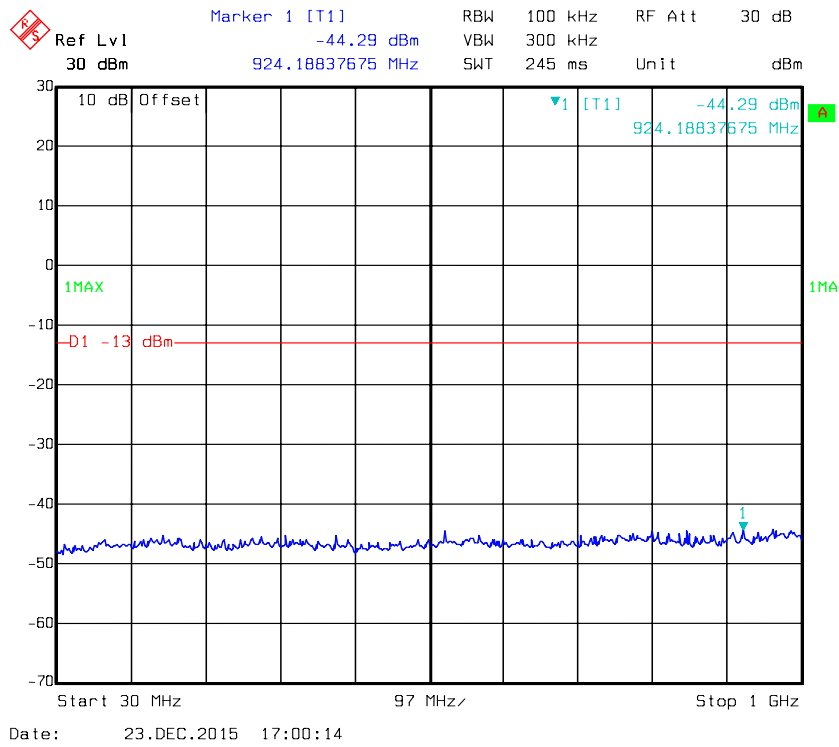


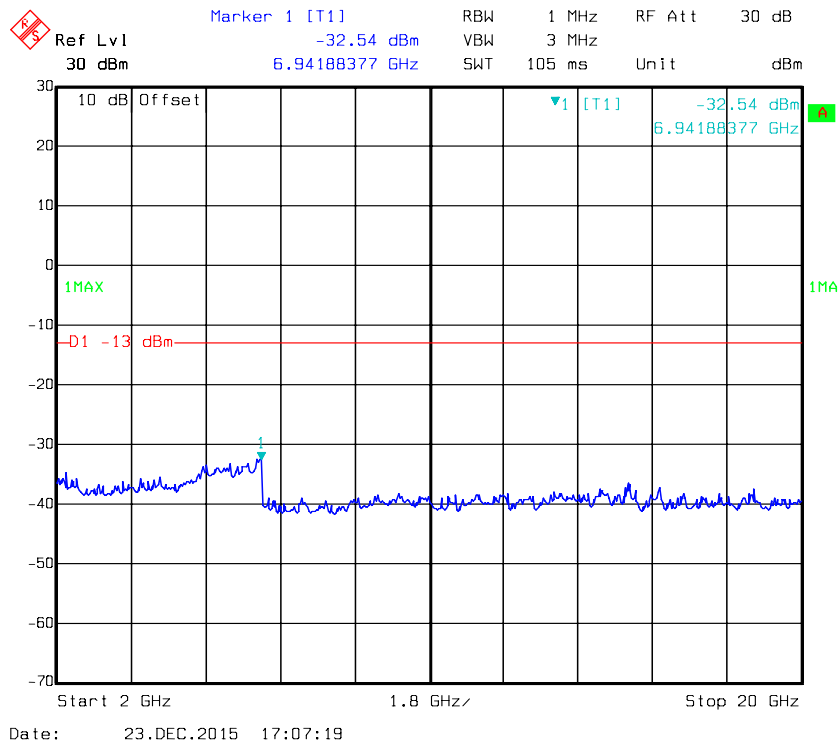
QPSK, Band 4-20M_Middle Channel



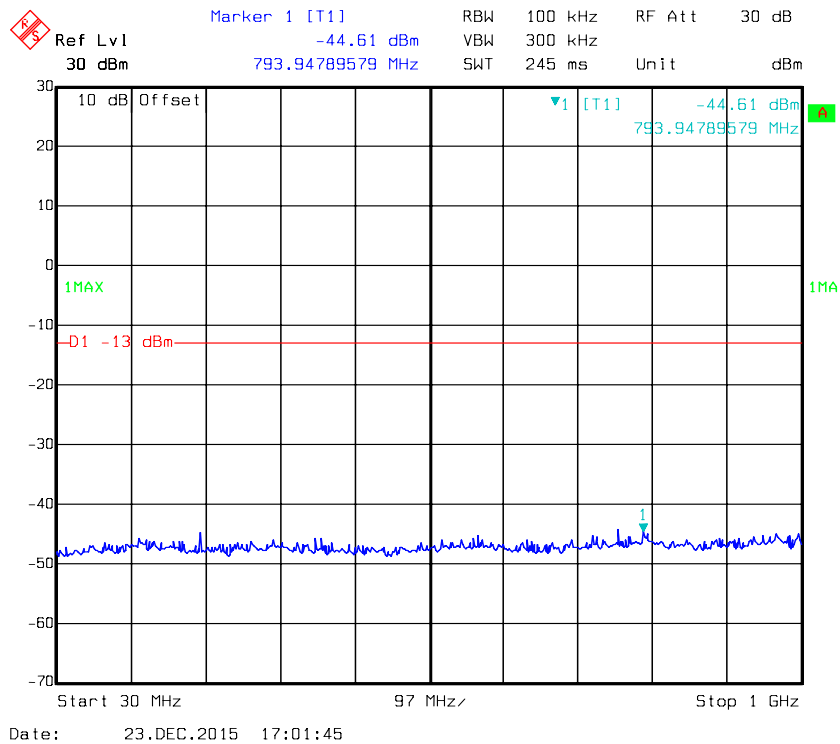


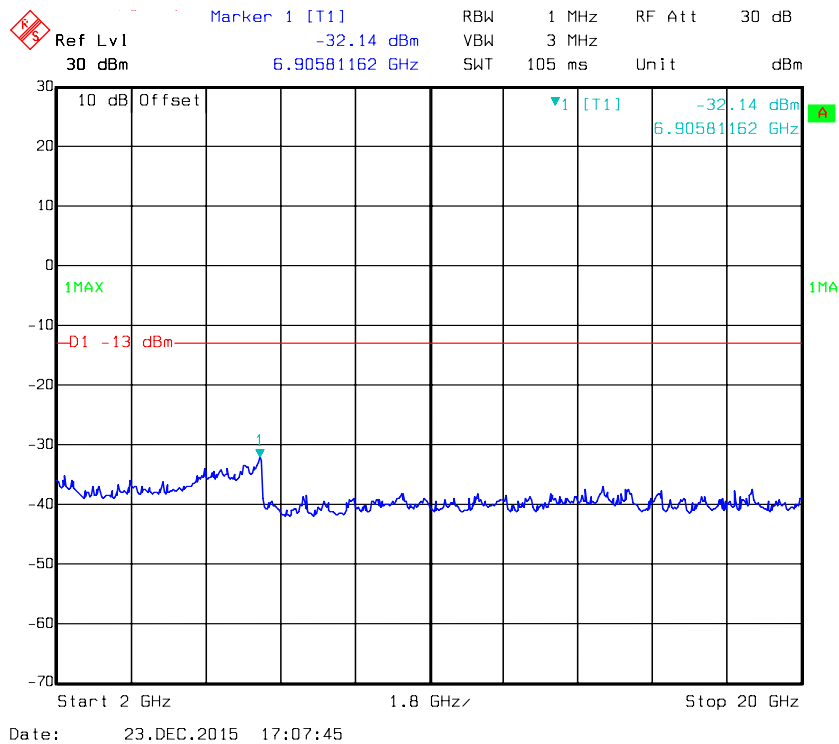
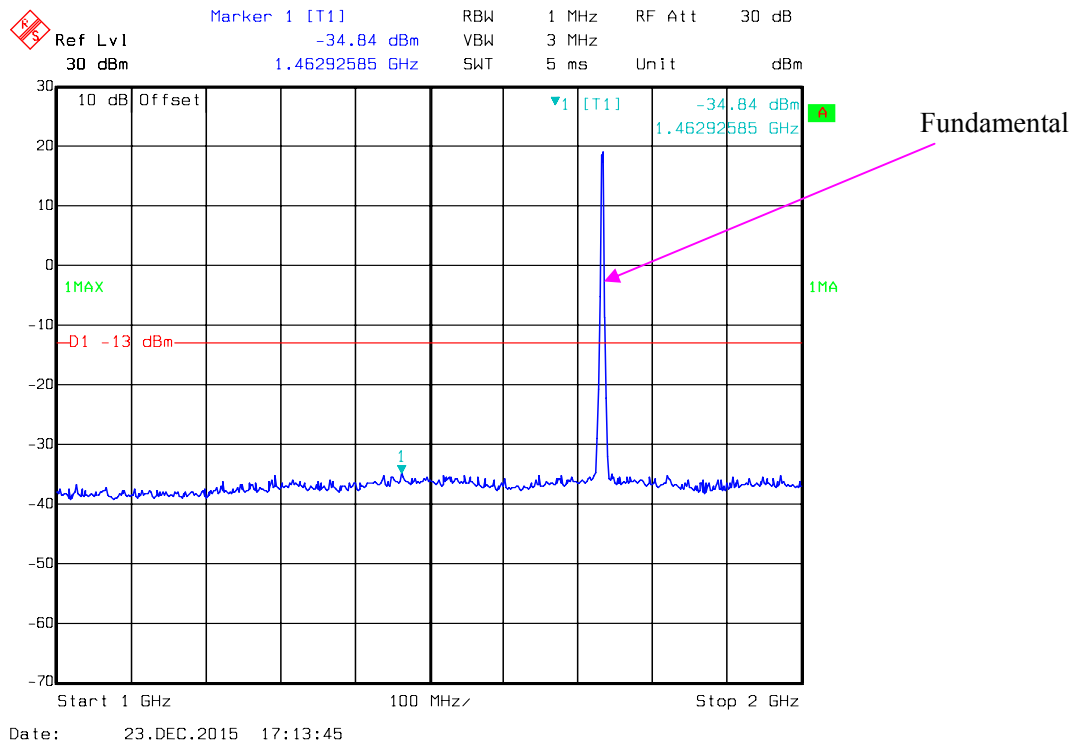
16-QAM, Band 4-1.4M _ Middle Channel



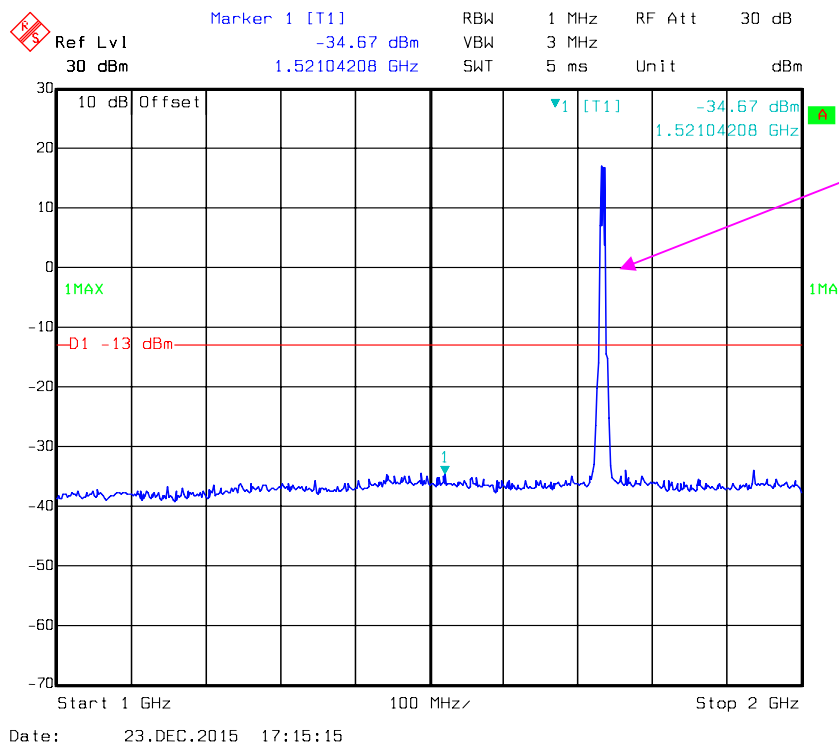
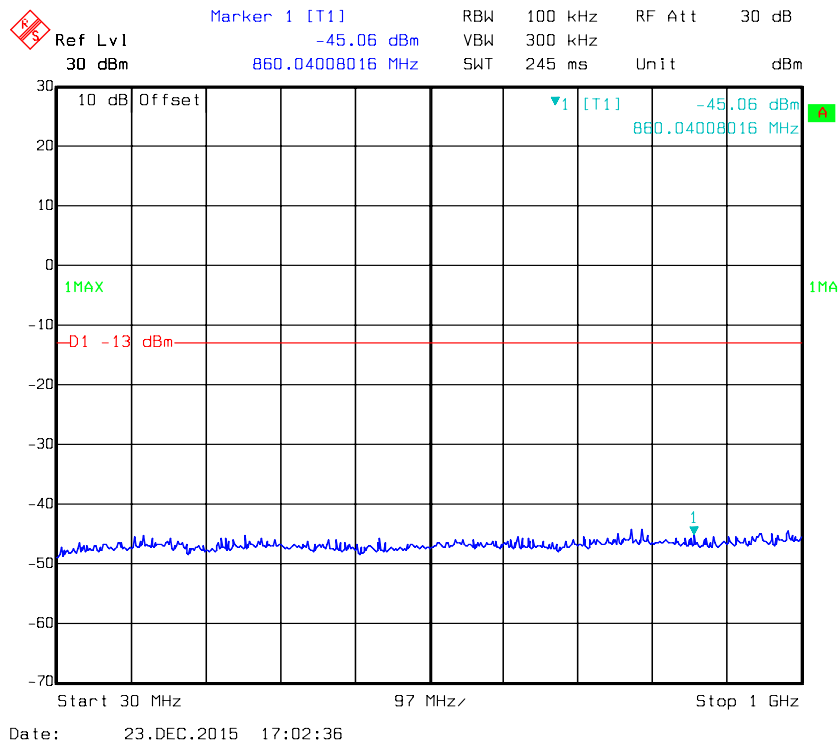


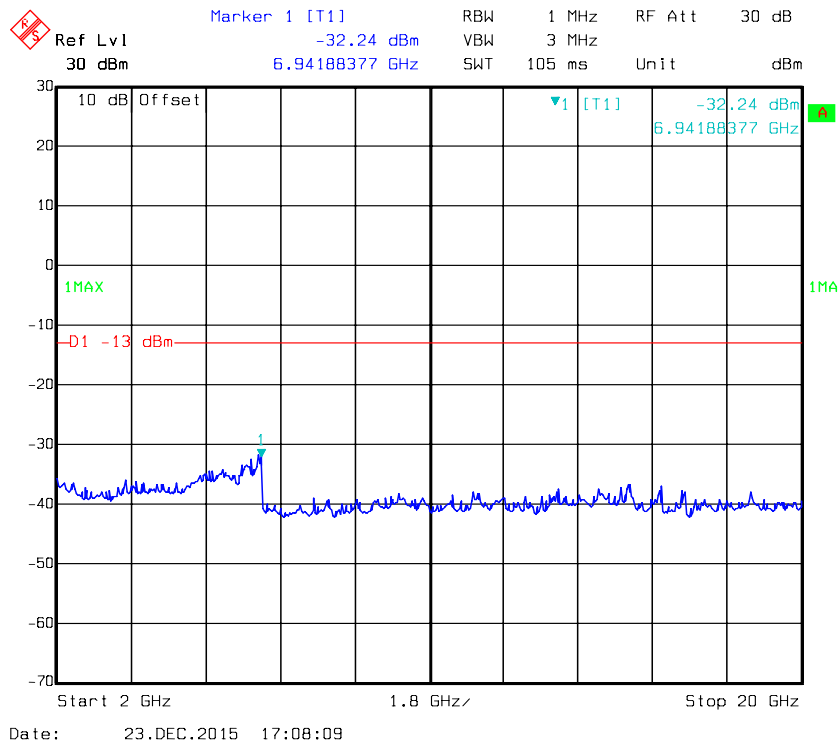
16-QAM, Band 4-3M_Middle Channel



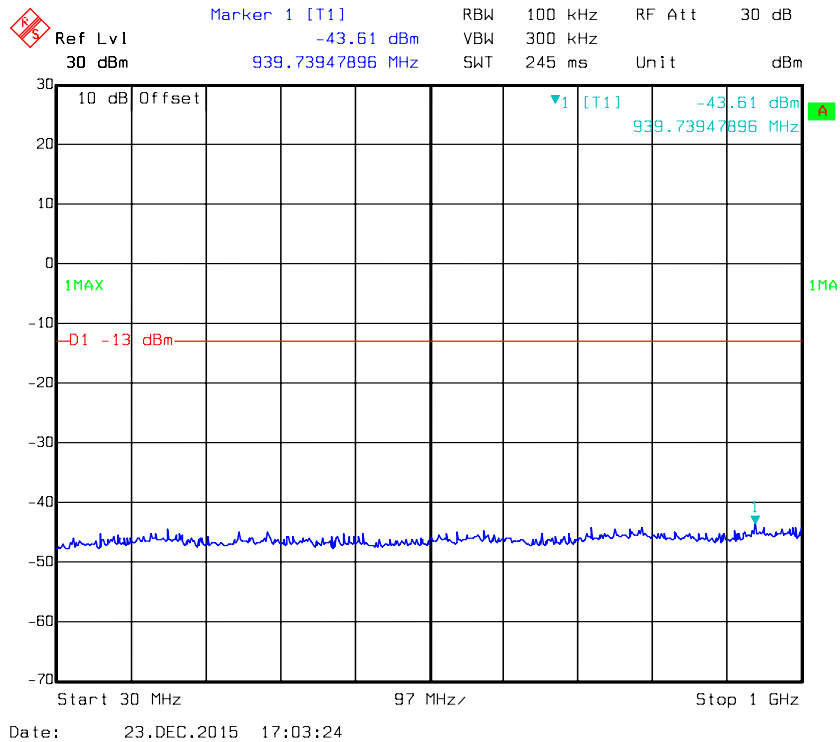


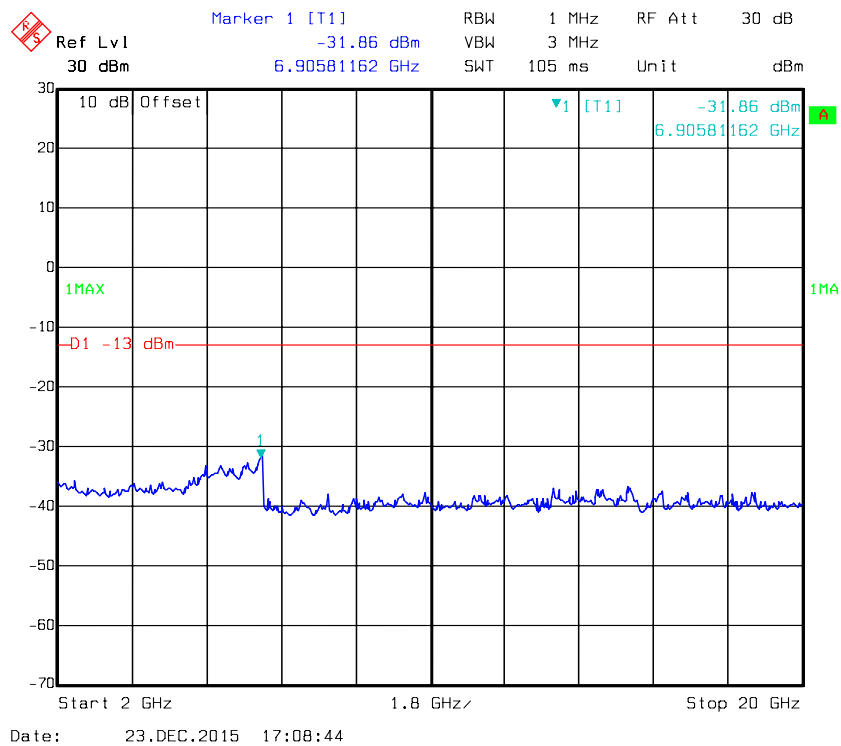
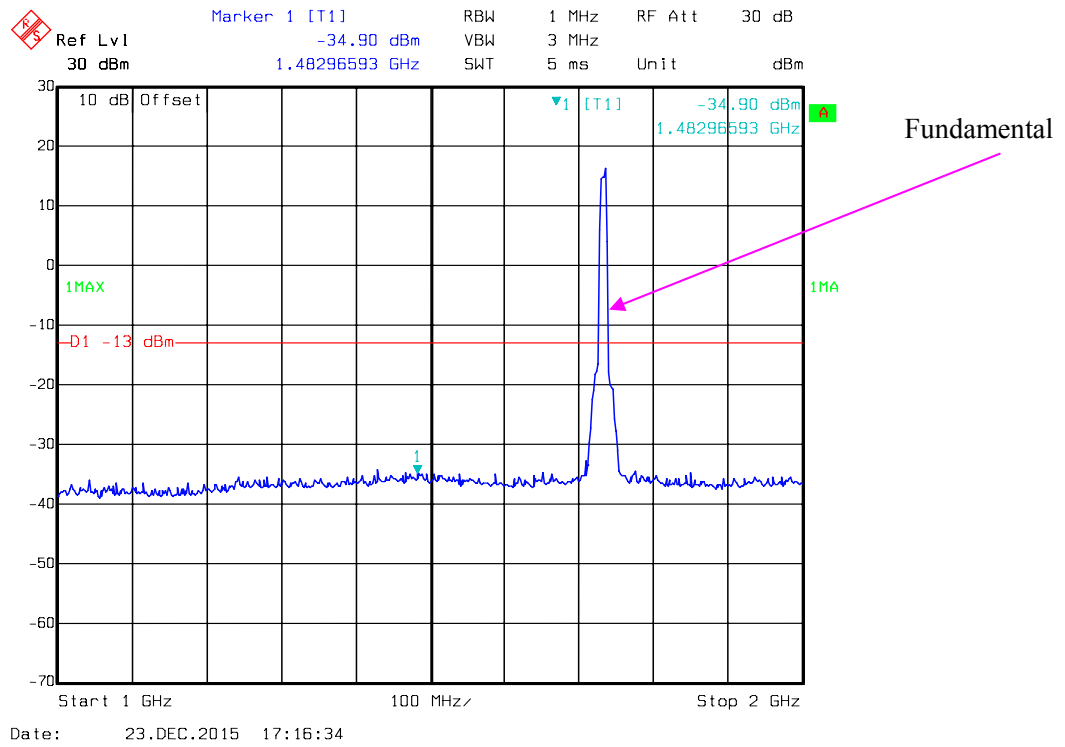
16-QAM, Band 4-5M _ Middle Channel



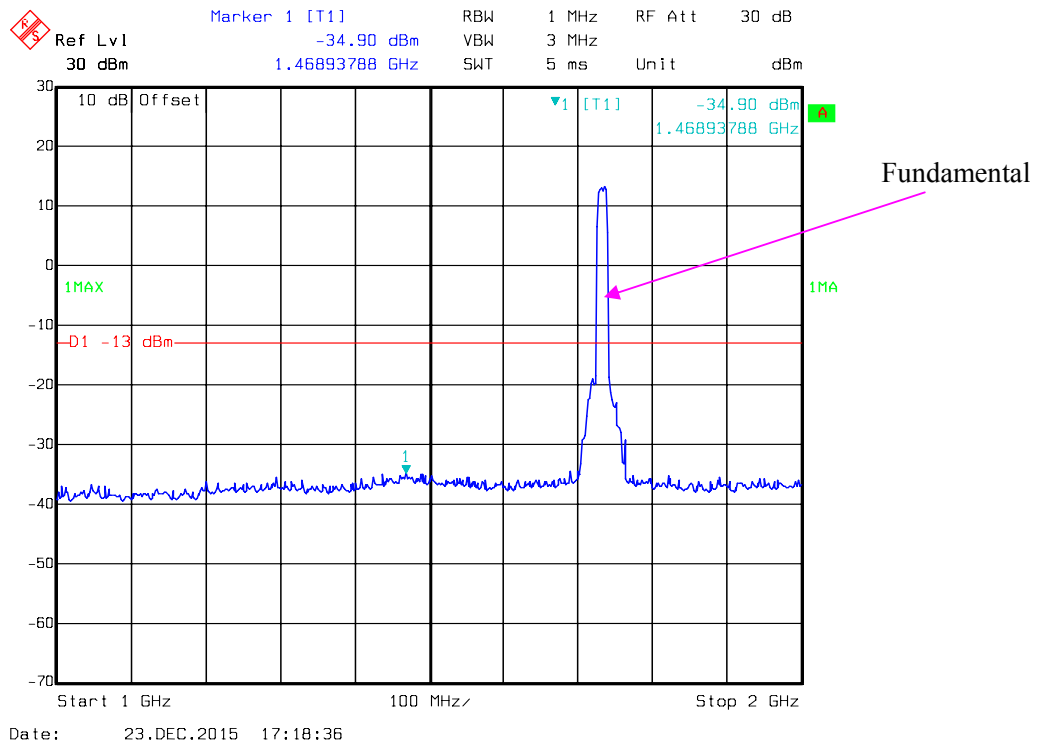
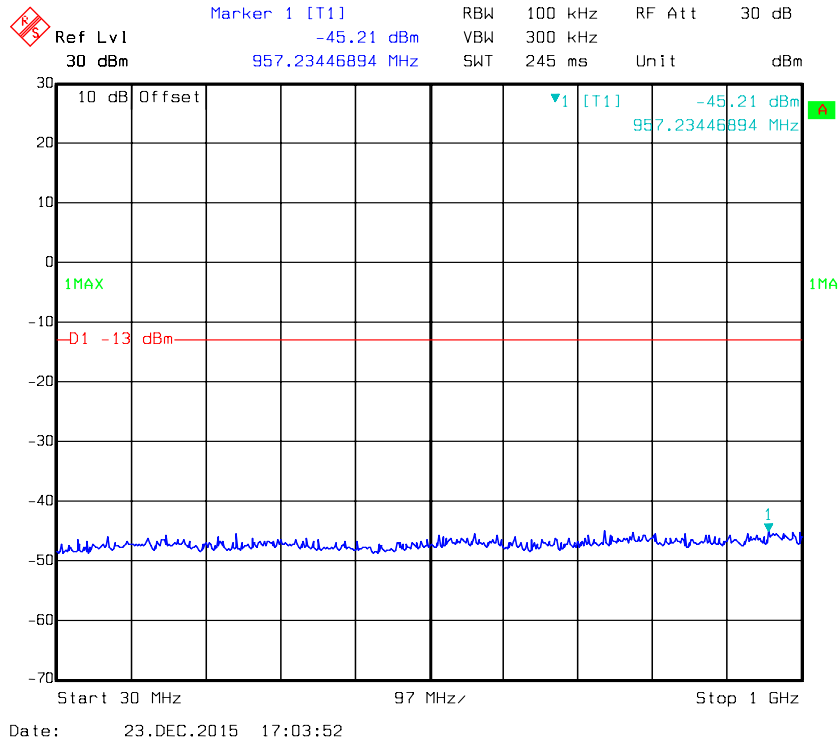


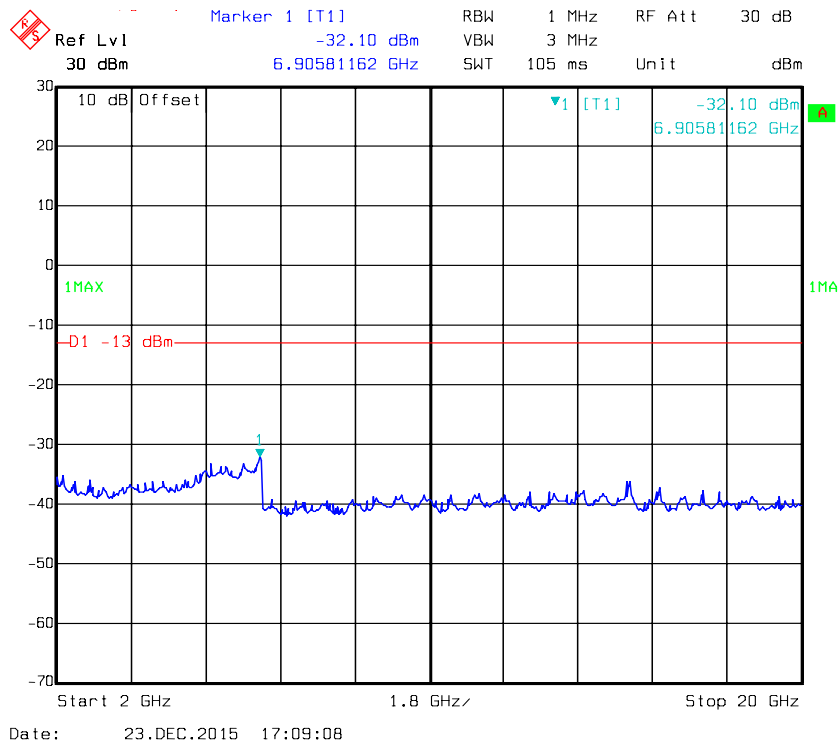
16-QAM, Band 4-10M_Middle Channel



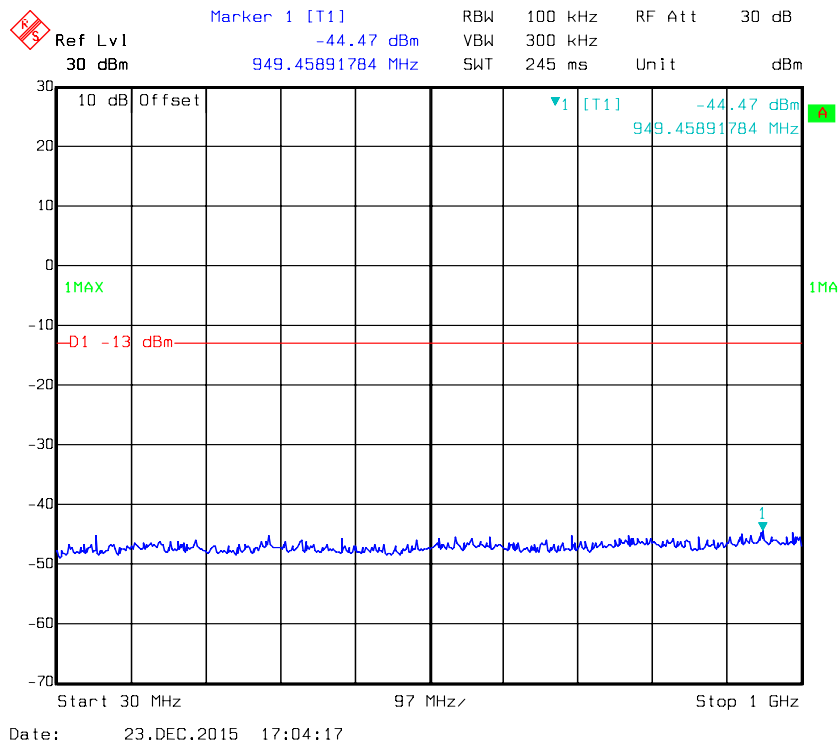


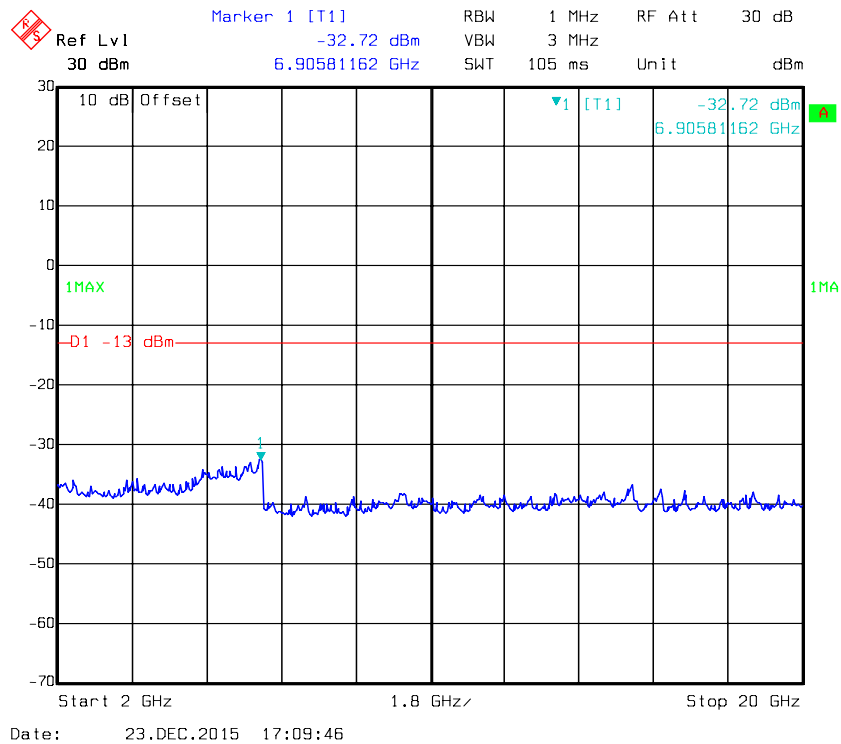
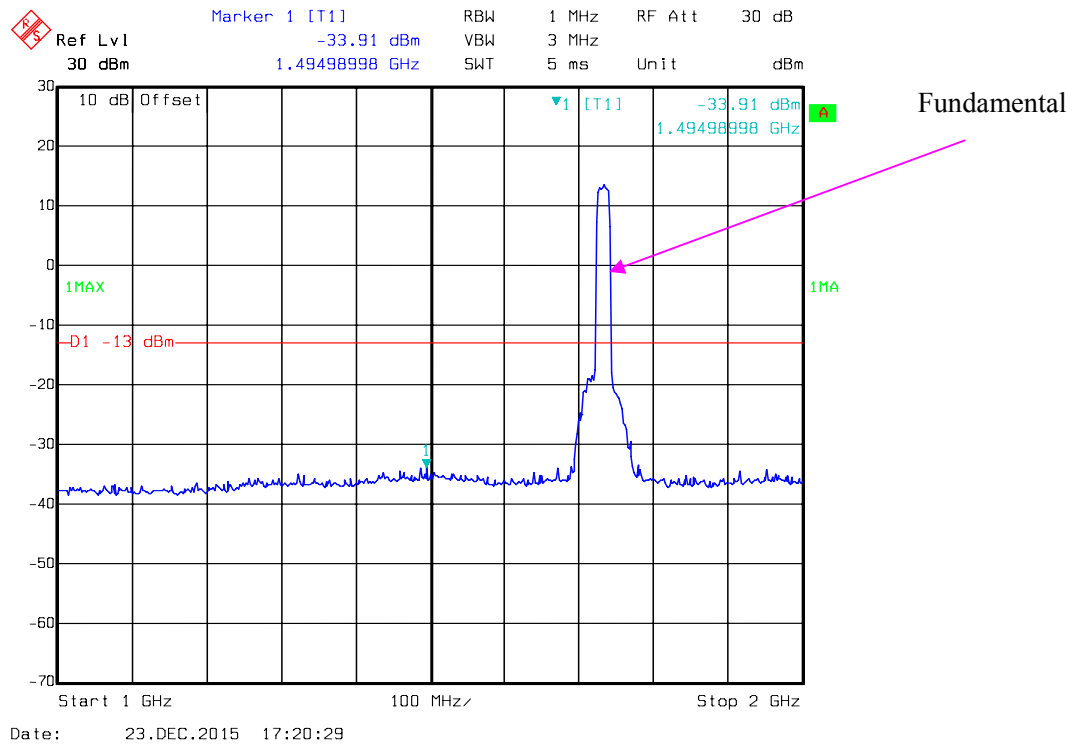
16-QAM, Band 4-15M _ Middle Channel





16-QAM, Band 4-20M_Middle Channel





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

Applicable Standard

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

Test Procedure

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

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

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

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

Spurious emissions in dB = $10 \lg(\text{TXpwr in Watts}/0.001)$ – the absolute level

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

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2015-08-03	2016-08-02
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	2015-11-23	2016-11-22
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:	23.5°C
Relative Humidity:	48 %
ATM Pressure:	101 kPa

The testing was performed by Allen Qiao on 2015-12-23.

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	42.08	-59	10.5	1.5	-50.0	-13.0	37.0
1673.200	V	44.96	-56.4	10.5	1.5	-47.4	-13.0	34.4
2509.800	H	40.98	-57	12.2	2.8	-47.6	-13.0	34.6
2509.800	V	38.66	-58.4	12.2	2.8	-49.0	-13.0	36.0
278.460	H	36.61	-71.1	0.0	0.5	-71.6	-13.0	58.6
243.510	V	36.46	-69.3	0.0	0.5	-69.8	-13.0	56.8

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	36.49	-64.6	10.5	1.5	-55.6	-13.0	42.6
1673.200	V	38.98	-62.4	10.5	1.5	-53.4	-13.0	40.4
278.460	H	36.64	-71.1	0.0	0.5	-71.6	-13.0	58.6
243.510	V	36.40	-69.3	0.0	0.5	-69.8	-13.0	56.8

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	41.82	-52.5	12.3	2.9	-43.1	-13.0	30.1
3760.000	V	40.52	-52.5	12.3	2.9	-43.1	-13.0	30.1
278.460	H	36.54	-71.2	0.0	0.5	-71.7	-13.0	58.7
243.510	V	36.23	-69.5	0.0	0.5	-70.0	-13.0	57.0

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	38.97	-55.3	12.3	2.9	-45.9	-13.0	32.9
3760.000	V	36.64	-56.4	12.3	2.9	-47.0	-13.0	34.0
278.460	H	35.46	-72.3	0.0	0.5	-72.8	-13.0	59.8
243.510	V	35.65	-70.1	0.0	0.5	-70.6	-13.0	57.6

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

LTE Band 4

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:1732.5 MHz								
3465.000	H	36.59	-60.3	12.2	1.9	-50.0	-13.0	37.0
3465.000	V	34.83	-61.3	12.2	1.9	-51.0	-13.0	38.0
5197.500	H	52.36	-38.6	12.9	2.3	-28.0	-13.0	15.0
5197.500	V	50.45	-42.1	12.9	2.3	-31.5	-13.0	18.5
286.400	H	37.63	-70	0.0	0.5	-70.5	-13.0	57.5
255.700	V	37.86	-67.8	0.0	0.5	-68.3	-13.0	55.3
16- QAM, Frequency:1732.5 MHz								
3465.000	H	36.18	-60.8	12.2	1.9	-50.5	-13.0	37.5
3465.000	V	34.41	-61.8	12.2	1.9	-51.5	-13.0	38.5
5197.500	H	52.84	-38.2	12.9	2.3	-27.6	-13.0	14.6
5197.500	V	50.88	-41.7	12.9	2.3	-31.1	-13.0	18.1
286.400	H	37.86	-69.8	0.0	0.5	-70.3	-13.0	57.3
255.700	V	37.69	-68	0.0	0.5	-68.5	-13.0	55.5

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

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

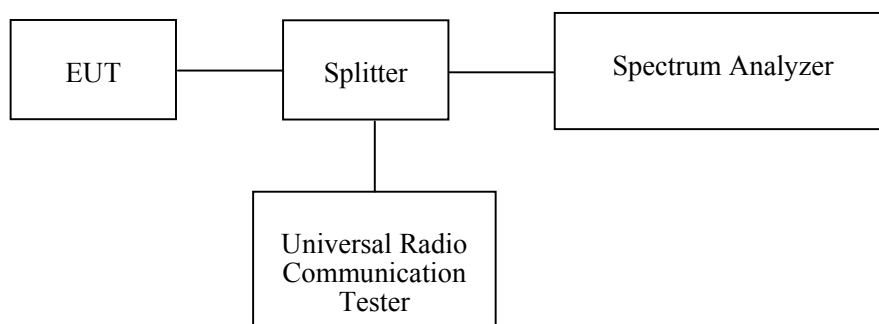
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

According to §27.53 (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 $43 + 10 \log_{10}(P)$ dB.

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	2015-12-19	2016-12-19

* **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**

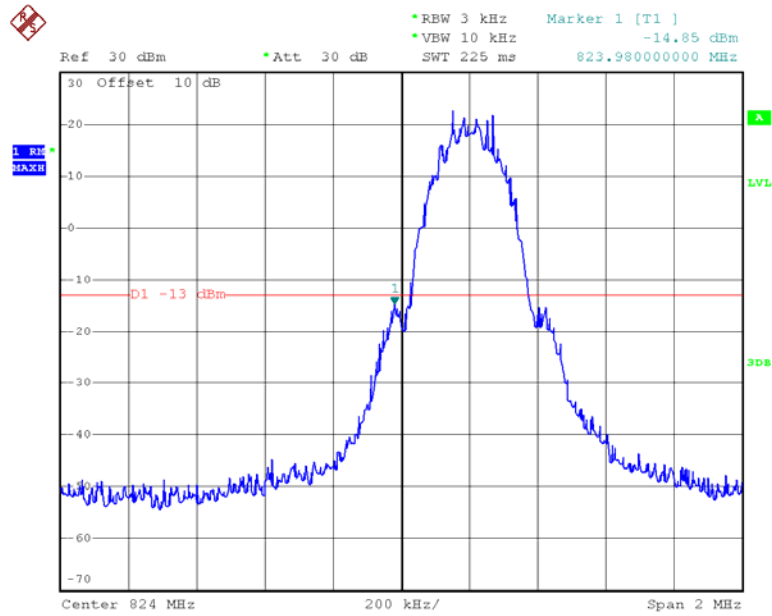
Temperature:	25.3 °C
Relative Humidity:	53 %
ATM Pressure:	100.9 kPa

The testing was performed by Allen Qiao on 2015-12-26.

Test Mode: Transmitting

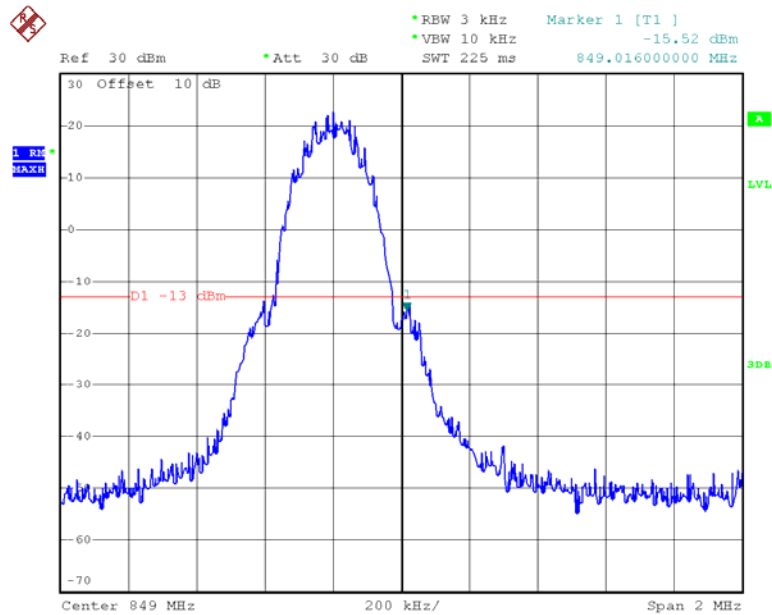
Test Result: Compliance. Please refer to the following plots.

GSM 850, Left Band Edge

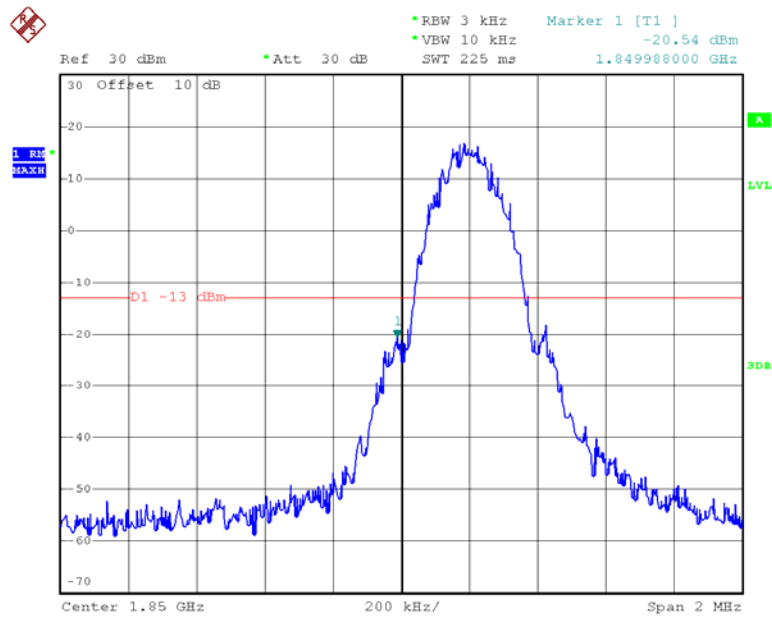


Date: 26.DEC.2015 17:13:02

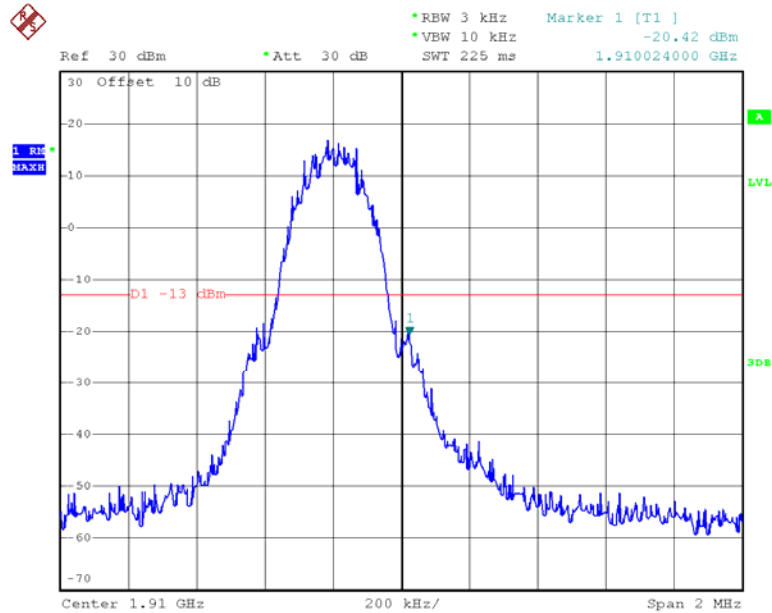
GSM 850, Right Band Edge



Date: 26.DEC.2015 17:13:46

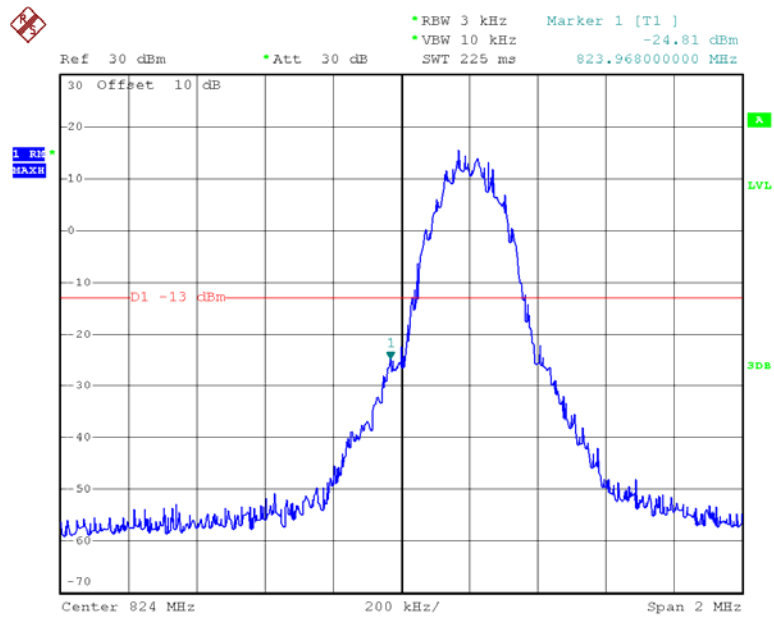
GSM 1900, Left Band Edge

Date: 26.DEC.2015 17:21:41

GSM 1900, Right Band Edge

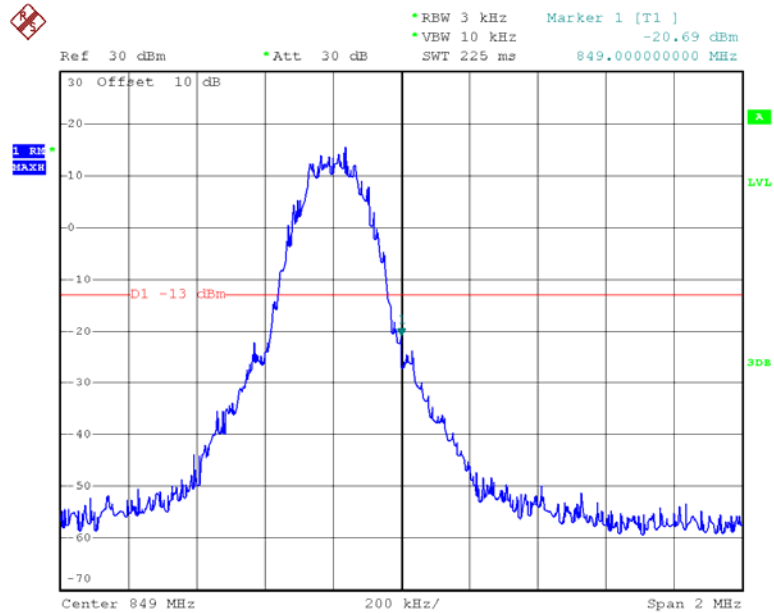
Date: 26.DEC.2015 17:20:47

EDGE 850, Left Band Edge



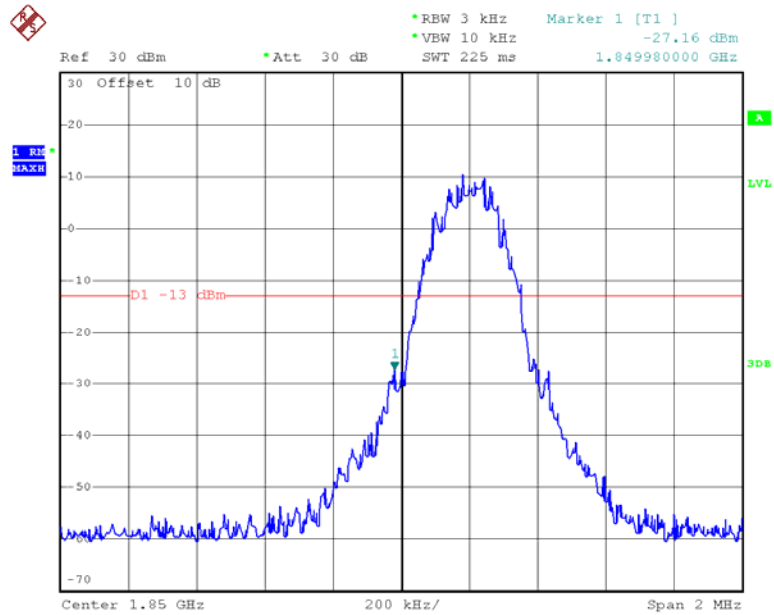
Date: 26.DEC.2015 17:16:56

EDGE 850, Right Band Edge



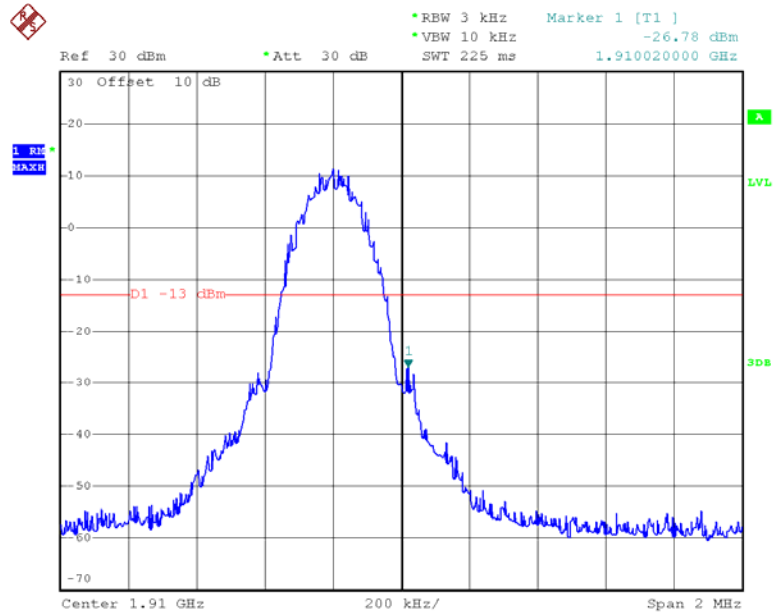
Date: 26.DEC.2015 17:17:39

EDGE 1900, Left Band Edge



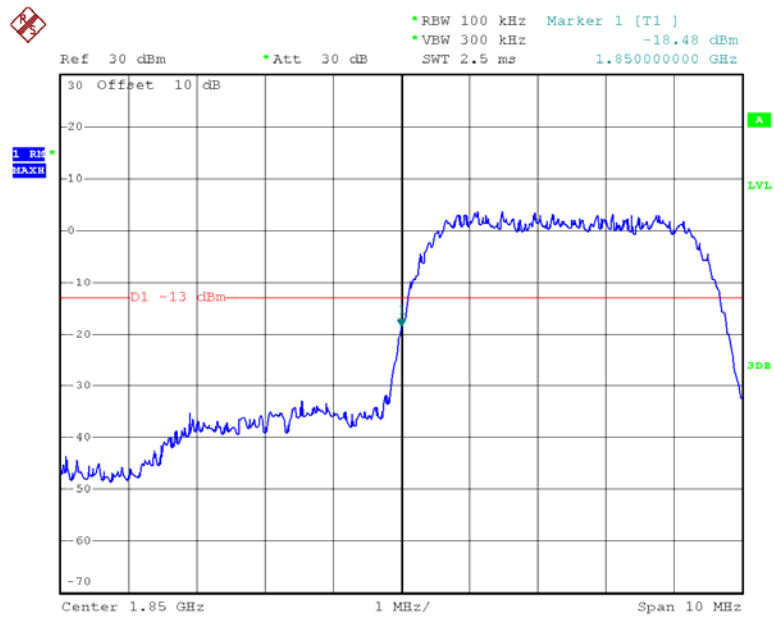
Date: 26.DEC.2015 14:08:17

EDGE 1900, Right Band Edge



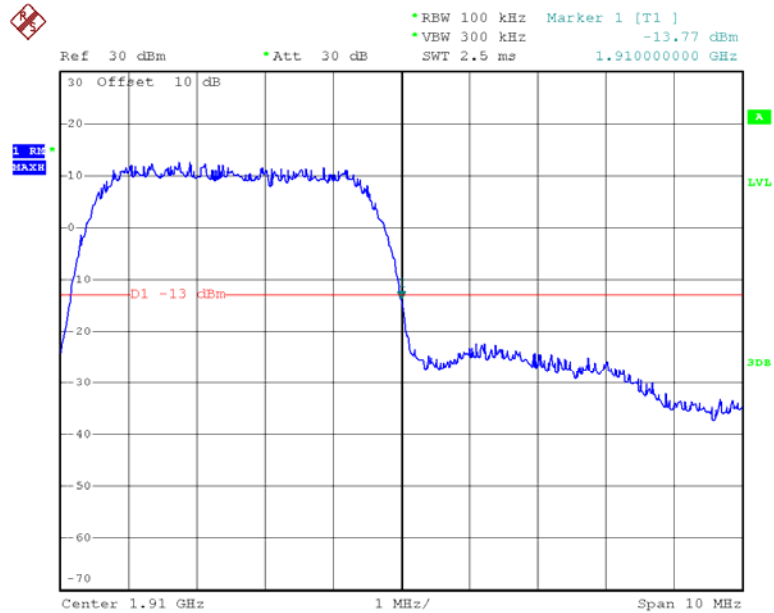
Date: 26.DEC.2015 14:07:25

REL99 Band II, Left Band Edge

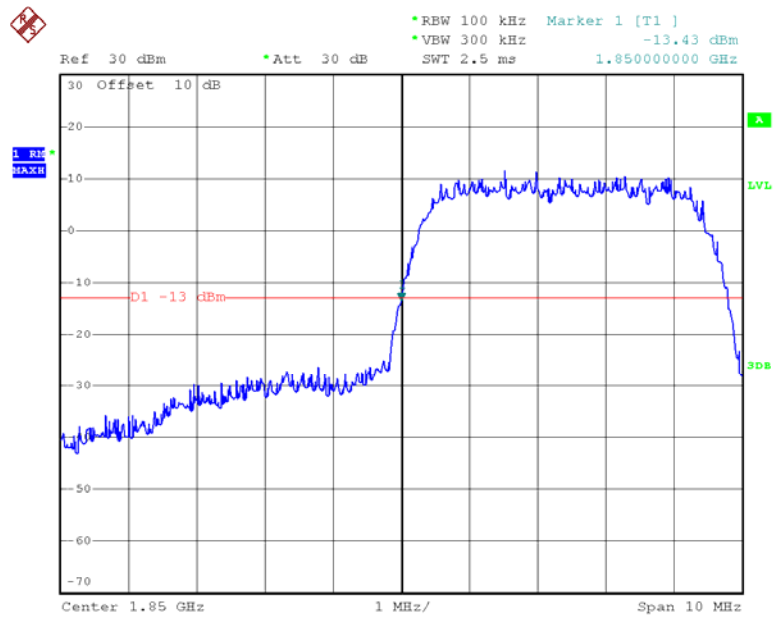


Date: 26.DEC.2015 14:24:11

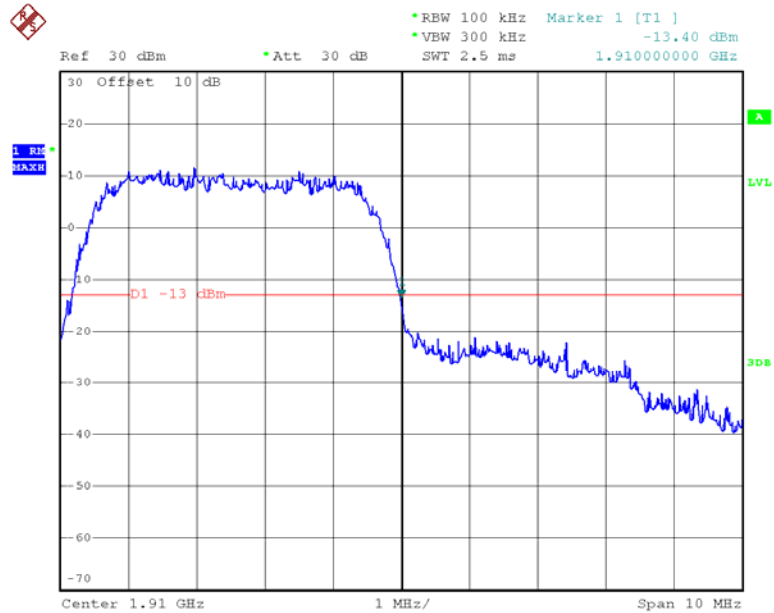
REL99 Band II, Right Band Edge



Date: 26.DEC.2015 14:22:37

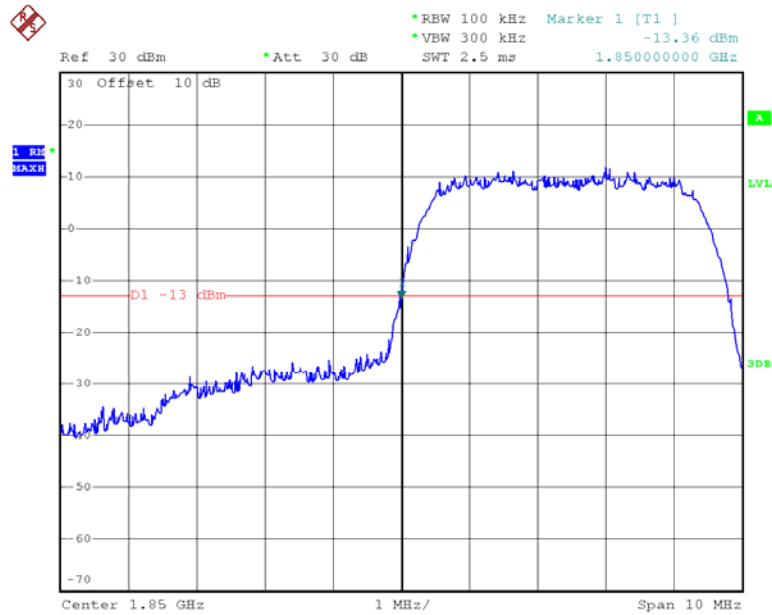
HSDPA Band II, Left Band Edge

Date: 26.DEC.2015 16:11:51

HSDPA Band II, Right Band Edge

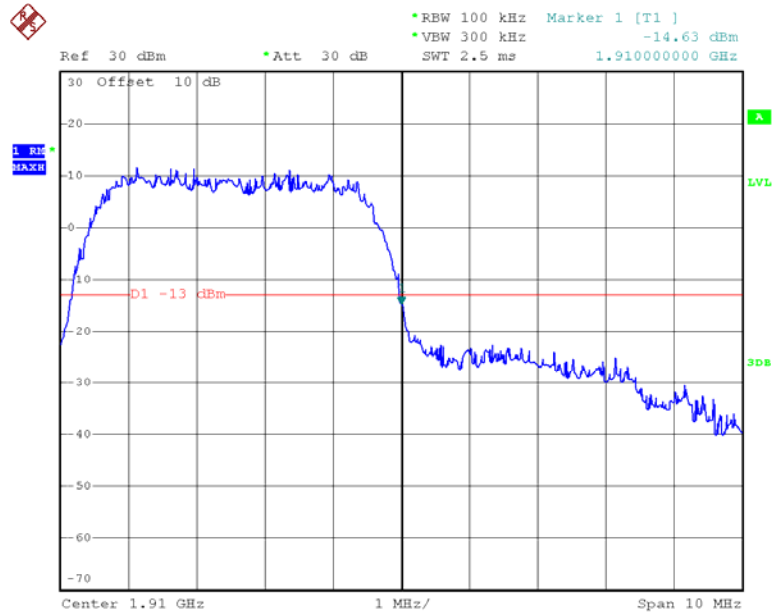
Date: 26.DEC.2015 16:12:40

HSUPA Band II, Left Band Edge



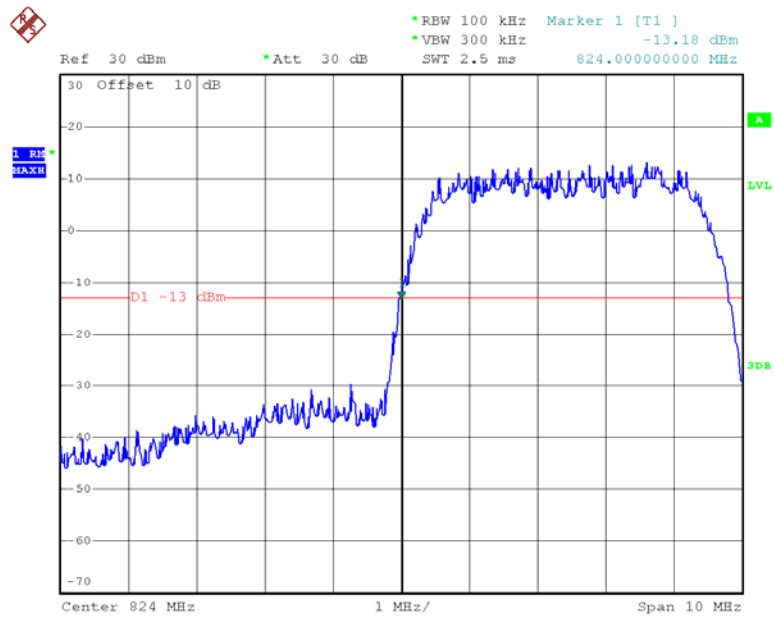
Date: 26.DEC.2015 14:51:43

HSUPA Band II, Right Band Edge



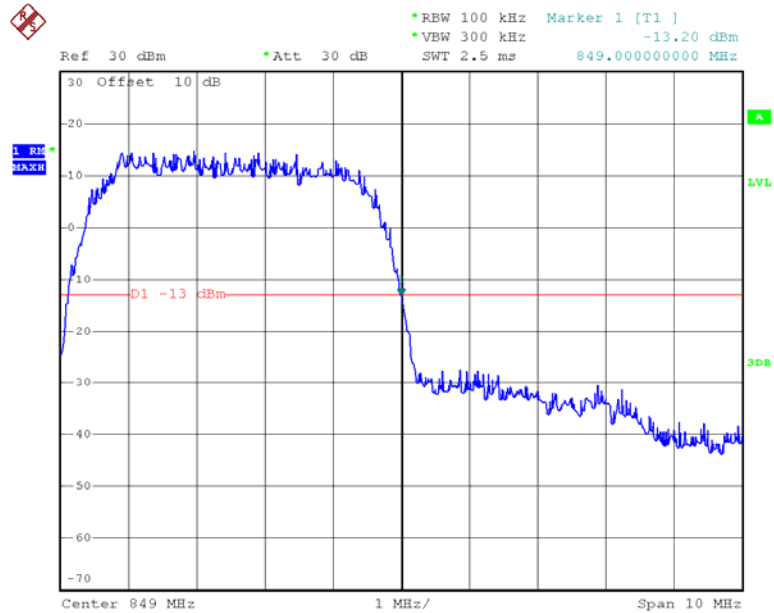
Date: 26.DEC.2015 14:51:01

REL99 Band V, Left Band Edge



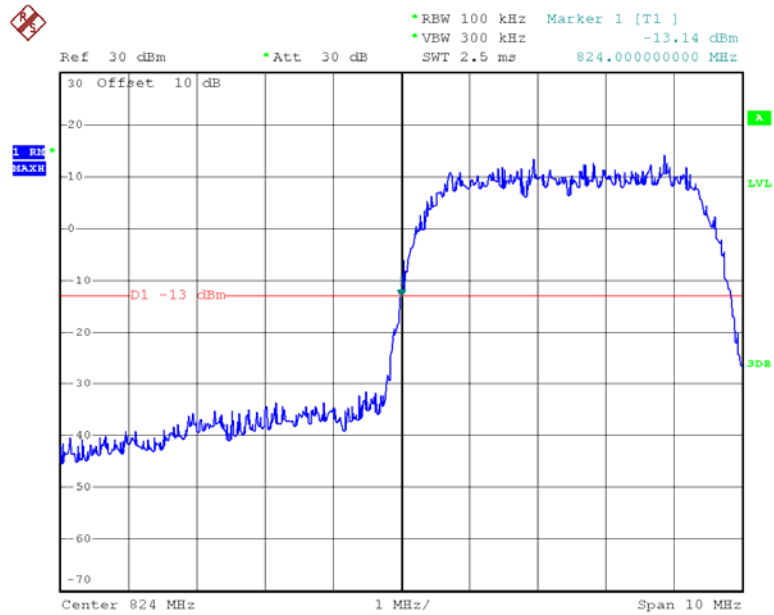
Date: 26.DEC.2015 16:31:43

REL99 Band V Right Band Edge



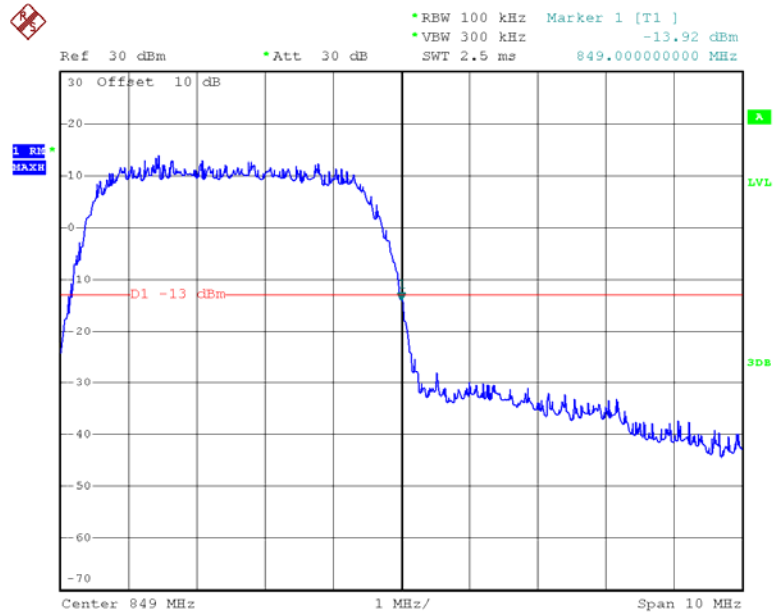
Date: 26.DEC.2015 16:35:01

HSDPA Band V, Left Band Edge



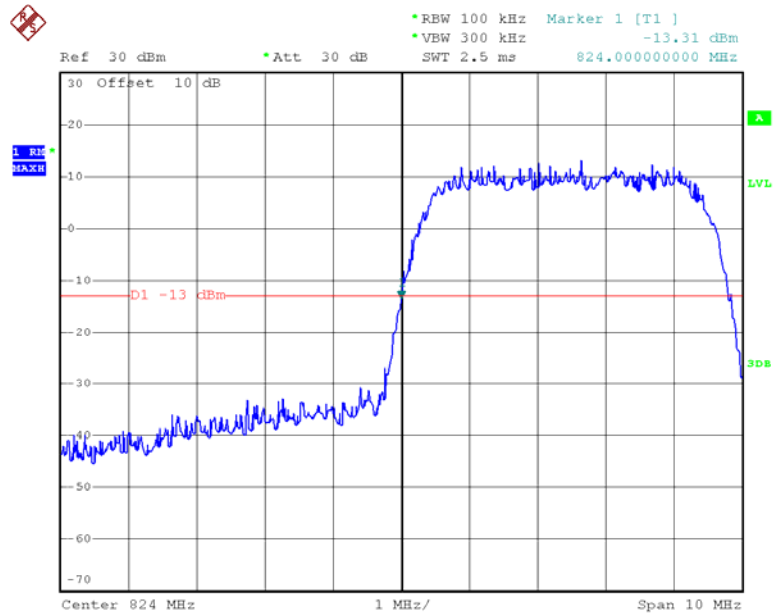
Date: 26.DEC.2015 16:50:58

HSDPA Band V, Right Band Edge



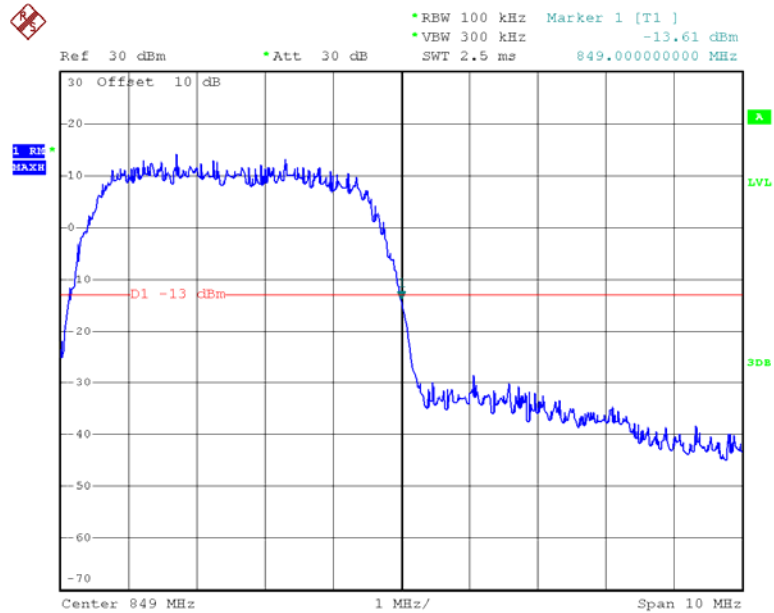
Date: 26.DEC.2015 16:52:50

HSUPA Band V, Left Band Edge



Date: 26.DEC.2015 17:00:17

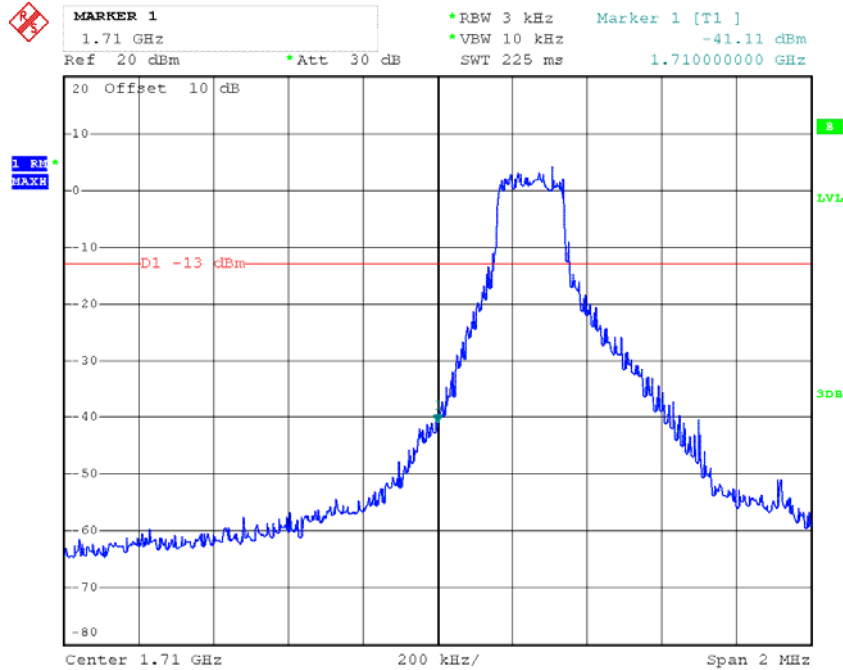
HSUPA Band V, Right Band Edge



Date: 26.DEC.2015 17:02:26

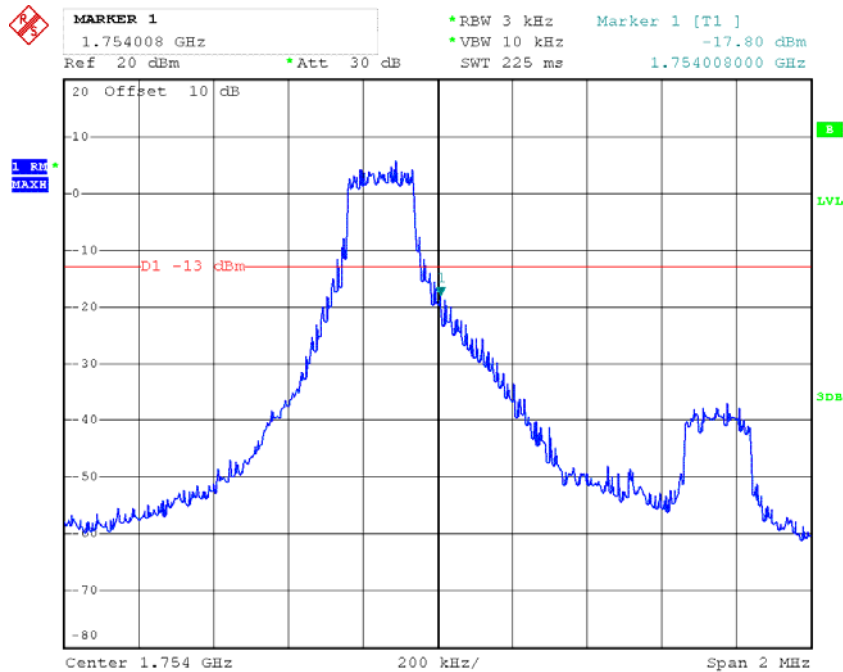
LTE Band 4:

QPSK-1.4M 1RB, Left Band Edge



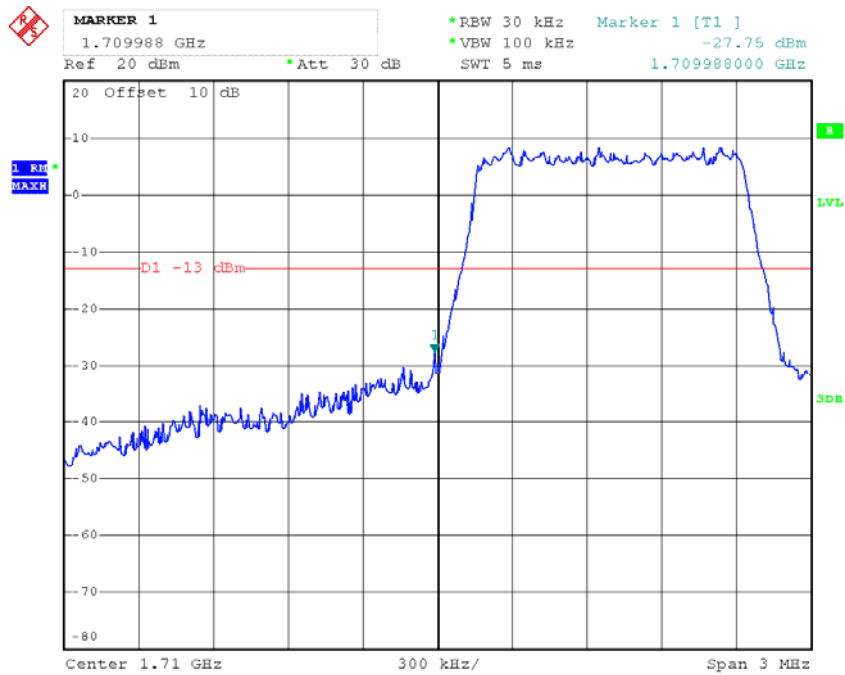
Date: 26.DEC.2015 15:24:28

QPSK-1.4M 1RB, Right Band Edge



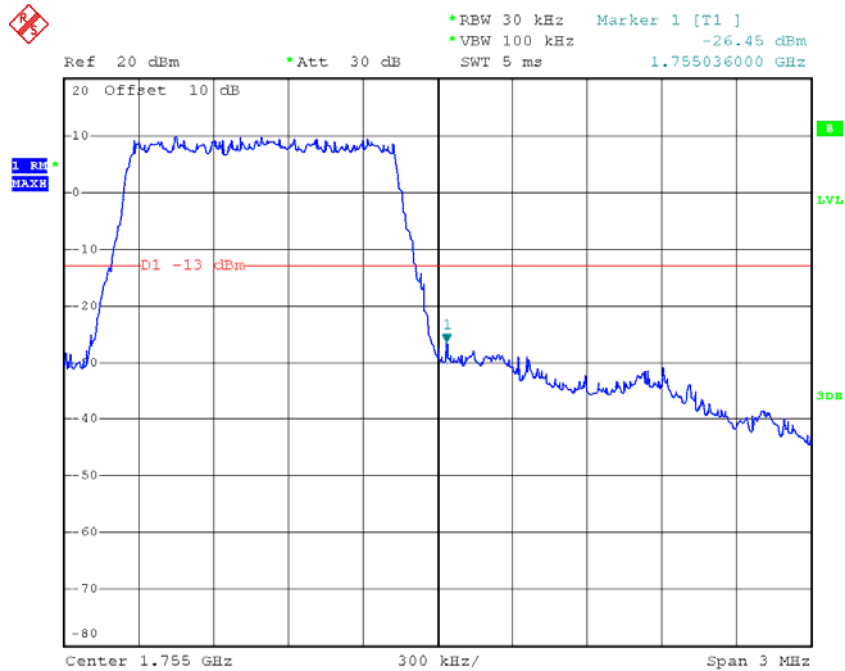
Date: 26.DEC.2015 15:30:53

QPSK-1.4M 6RB, Left Band Edge



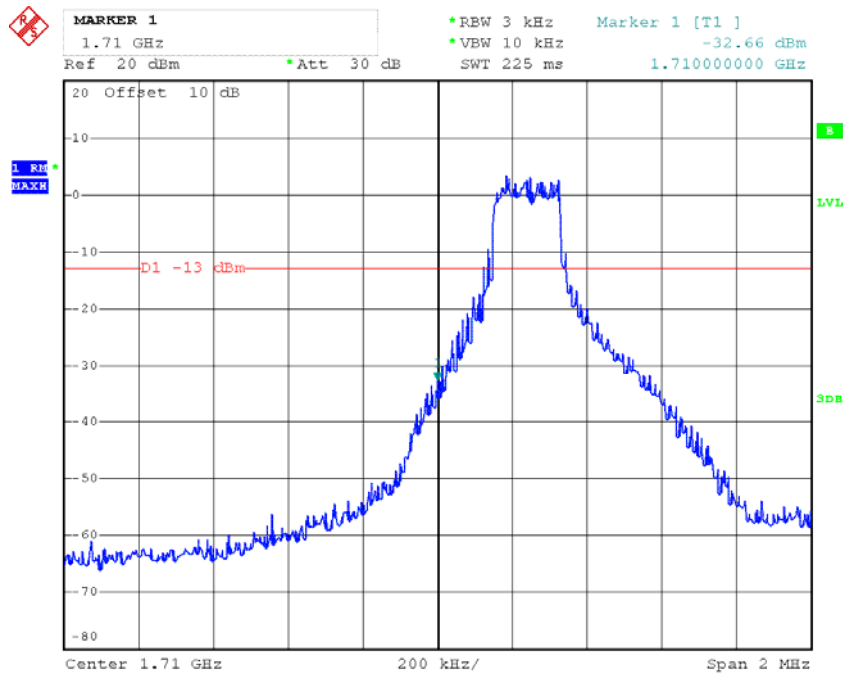
Date: 26.DEC.2015 15:38:17

QPSK-1.4M 6RB, Right Band Edge



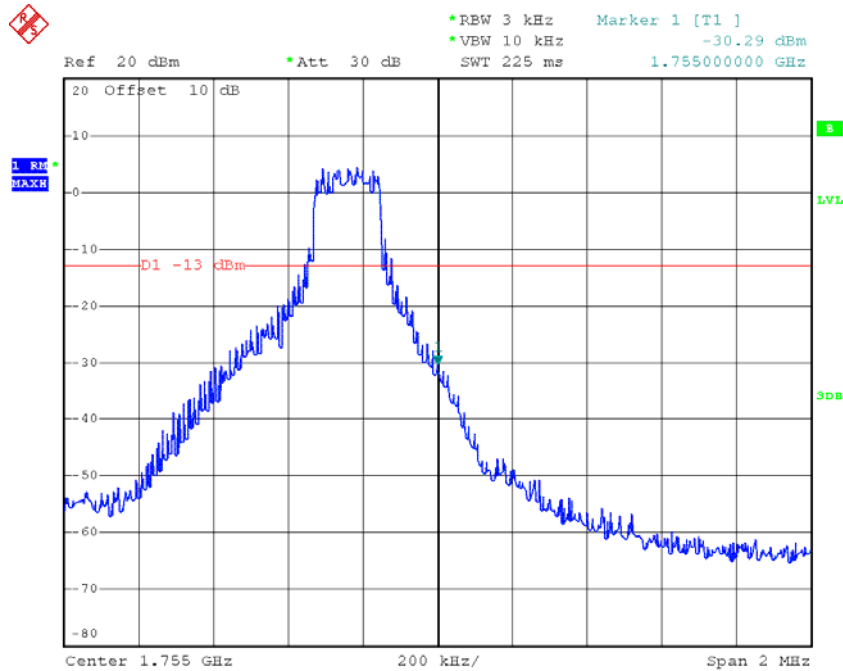
Date: 26.DEC.2015 15:39:34

QPSK-3M 1RB, Left Band Edge



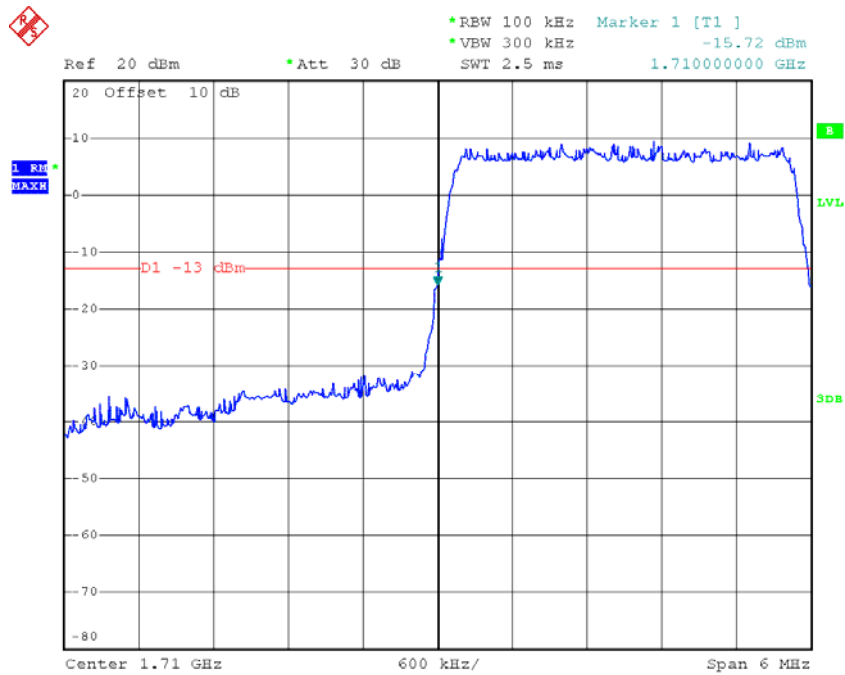
Date: 26.DEC.2015 15:48:36

QPSK-3M 1RB, Right Band Edge



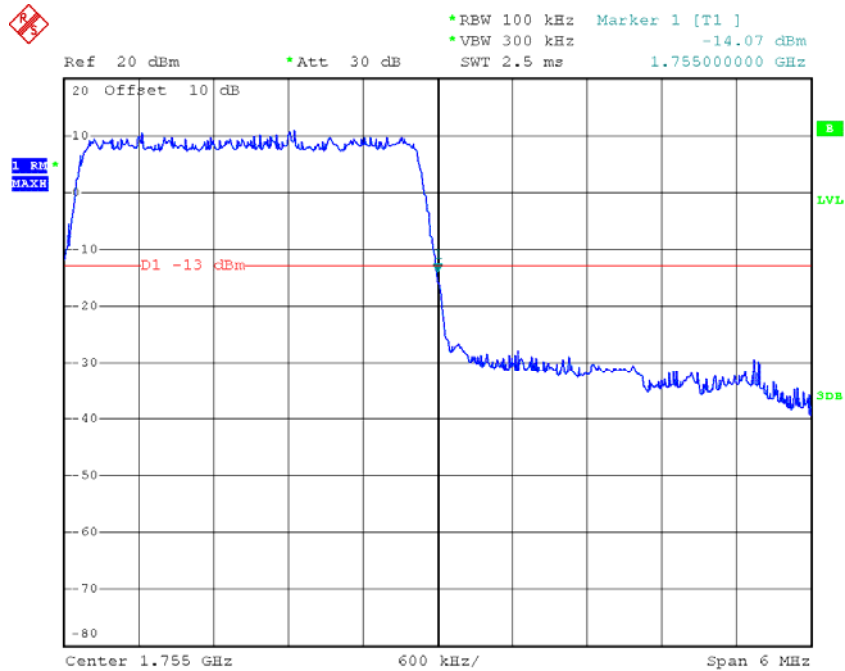
Date: 26.DEC.2015 15:49:54

QPSK-3M 15 RB, Left Band Edge



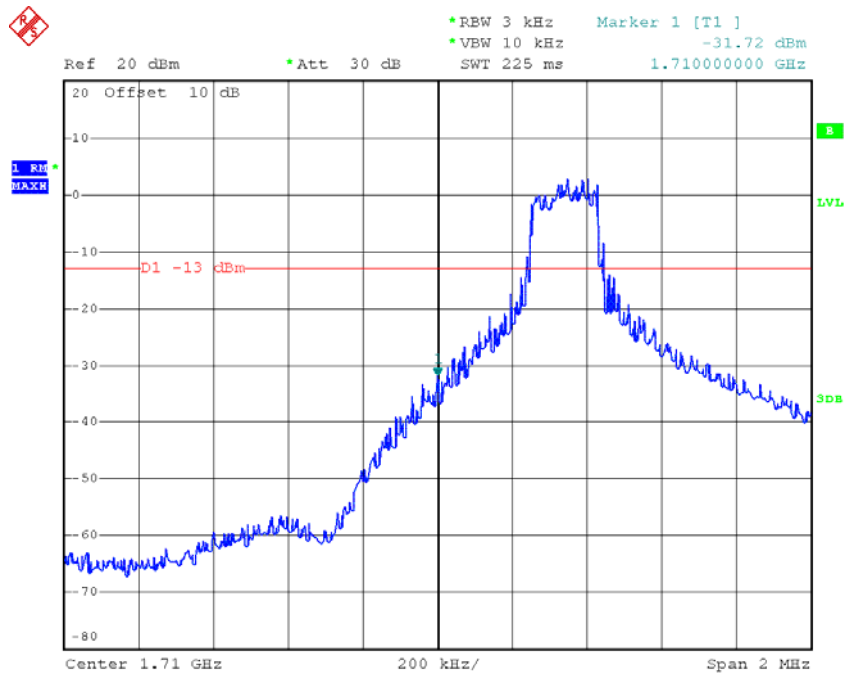
Date: 26.DEC.2015 15:53:21

QPSK-3M 15 RB, Right Band Edge



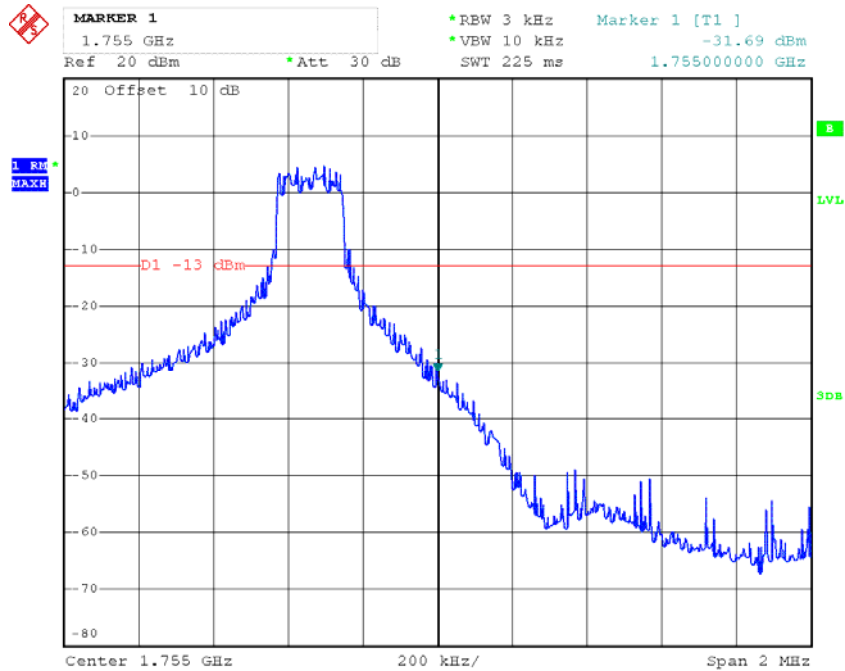
Date: 26.DEC.2015 15:54:47

QPSK-5M 1RB, Left Band Edge



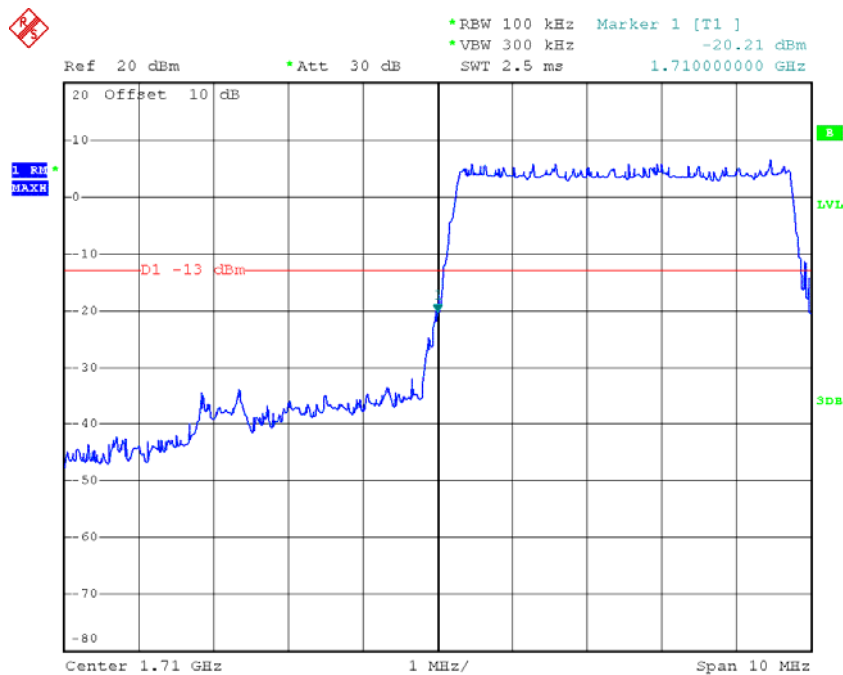
Date: 26.DEC.2015 15:58:11

QPSK-5M 1RB, Right Band Edge



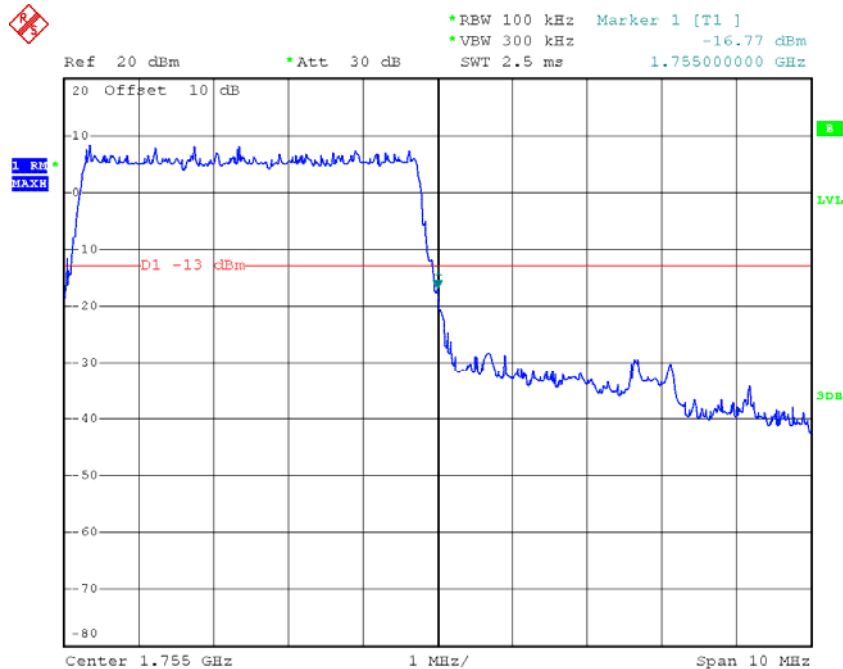
Date: 26.DEC.2015 15:59:58

QPSK-5M 25 RB, Left Band Edge



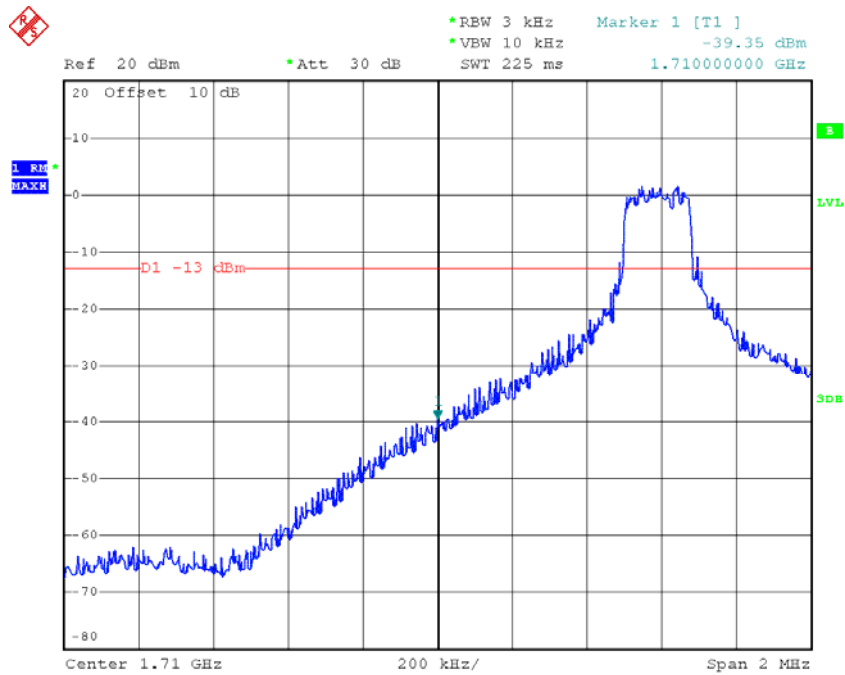
Date: 26.DEC.2015 16:01:47

QPSK-5M 25 RB, Right Band Edge



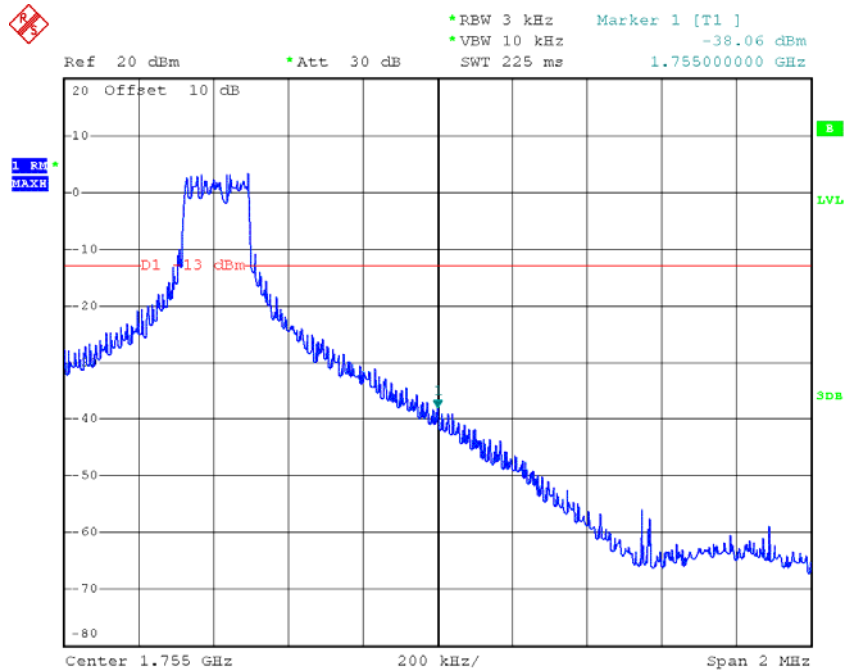
Date: 26.DEC.2015 16:02:39

QPSK-10M 1RB, Left Band Edge



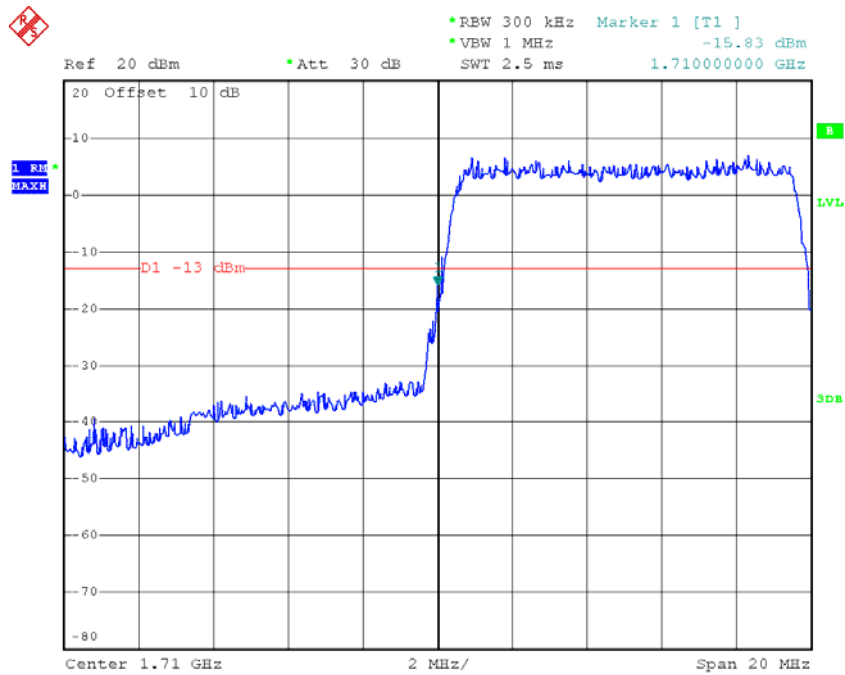
Date: 26.DEC.2015 16:08:36

QPSK-10M 1RB, Right Band Edge



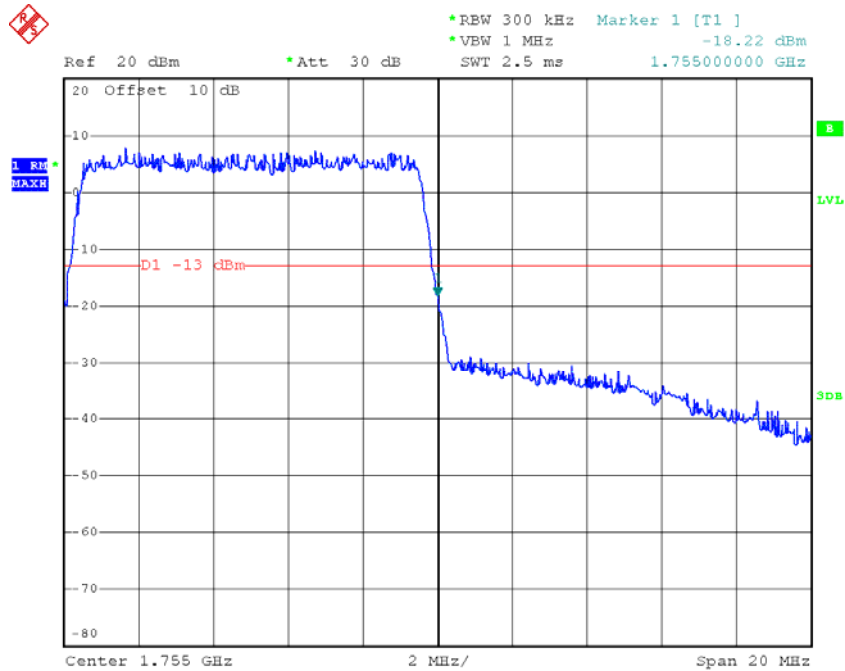
Date: 26.DEC.2015 16:09:59

QPSK-10M 50 RB, Left Band Edge



Date: 26.DEC.2015 16:11:26

QPSK-10M 50 RB, Right Band Edge



Date: 26.DEC.2015 16:12:17

MARKER 1
1.709982 GHz

Ref 20 dBm Att 30 dB RBW 3 kHz VBW 10 kHz SWT 340 ms

Marker 1 [T1]
-42.14 dBm
1.709982000 GHz

20 Offset 10 dB

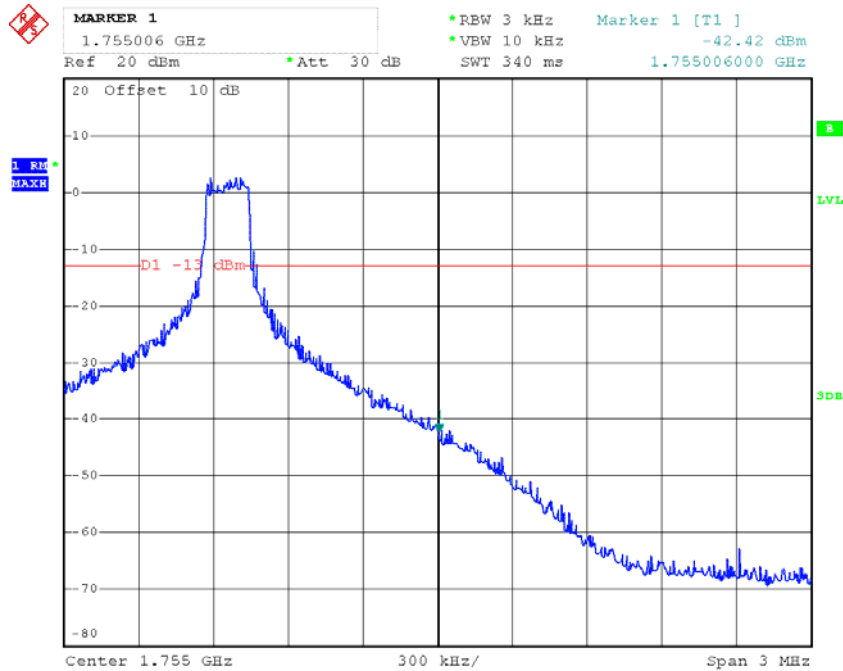
1 RM
MAX

D1 -13 dBm

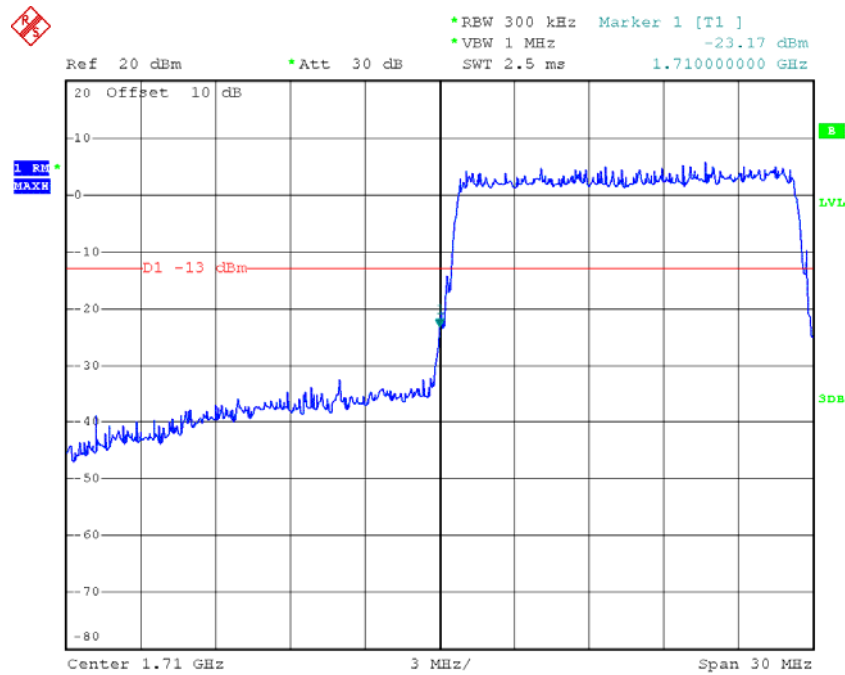
3 dB

Center 1.71 GHz 300 kHz/ Span 3 MHz

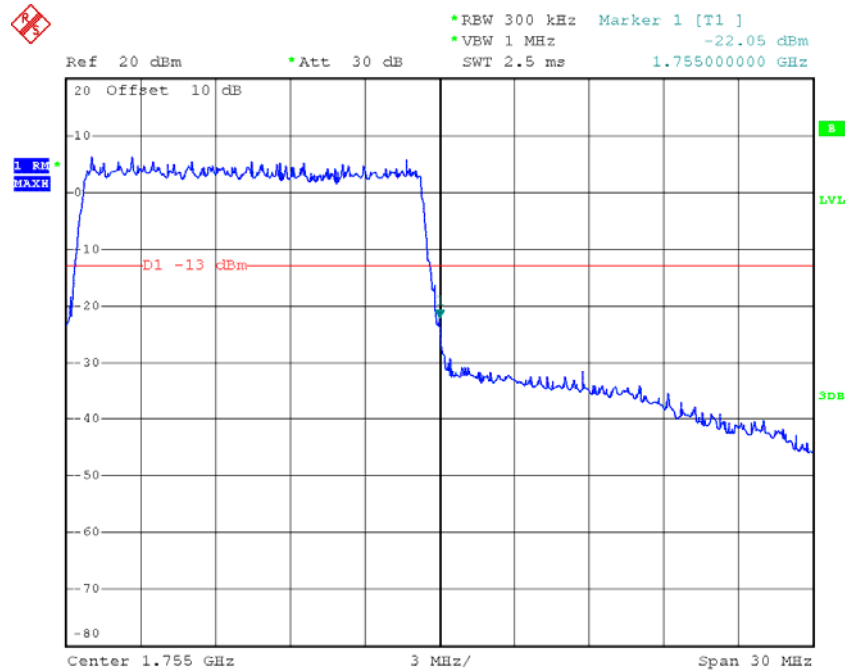
QPSK-15M 1RB, Right Band Edge



Page 99 of 122

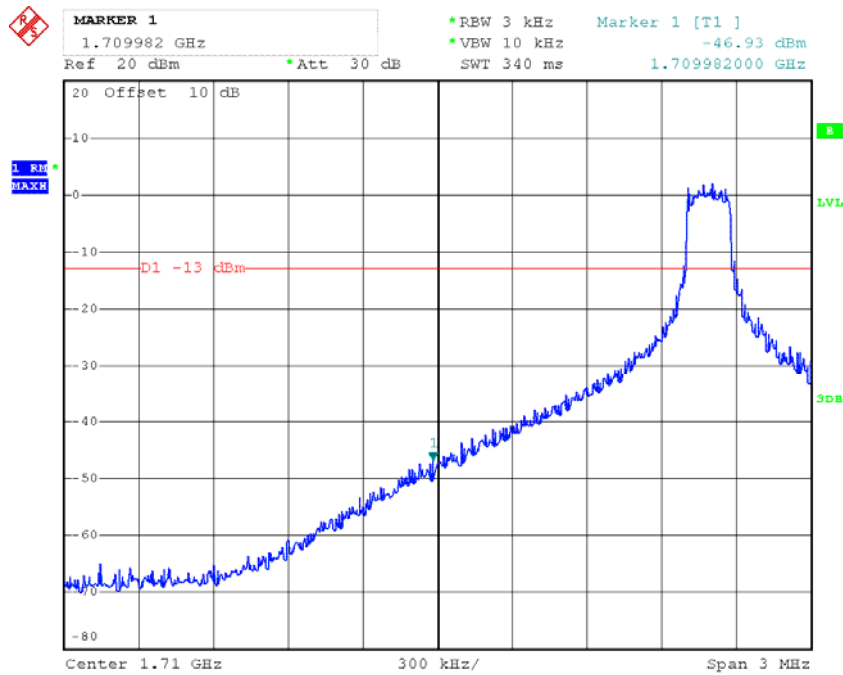
QPSK-15M 75 RB, Left Band Edge

Date: 26.DEC.2015 16:20:58

QPSK-15M 75 RB, Right Band Edge

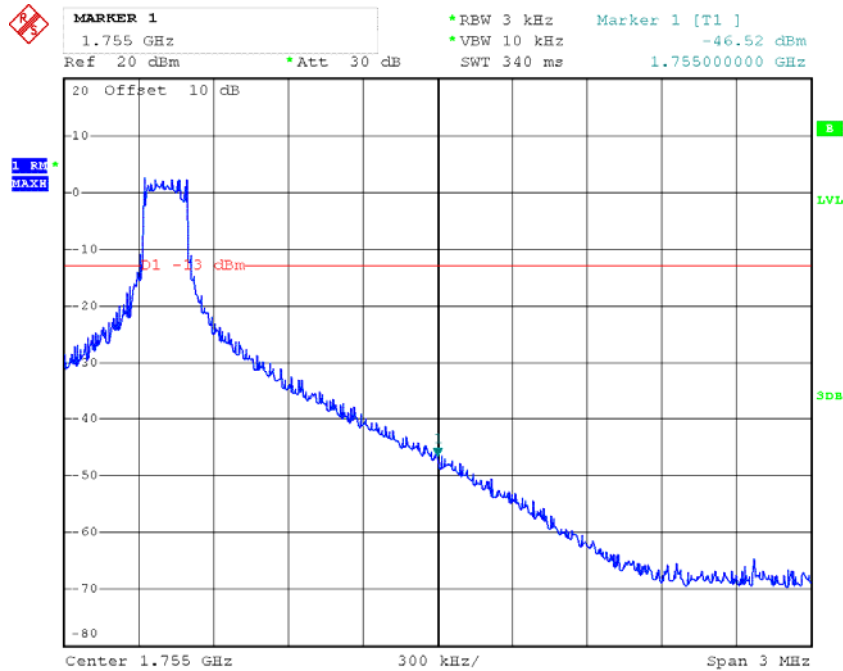
Date: 26.DEC.2015 16:20:12

QPSK-20M 1RB, Left Band Edge



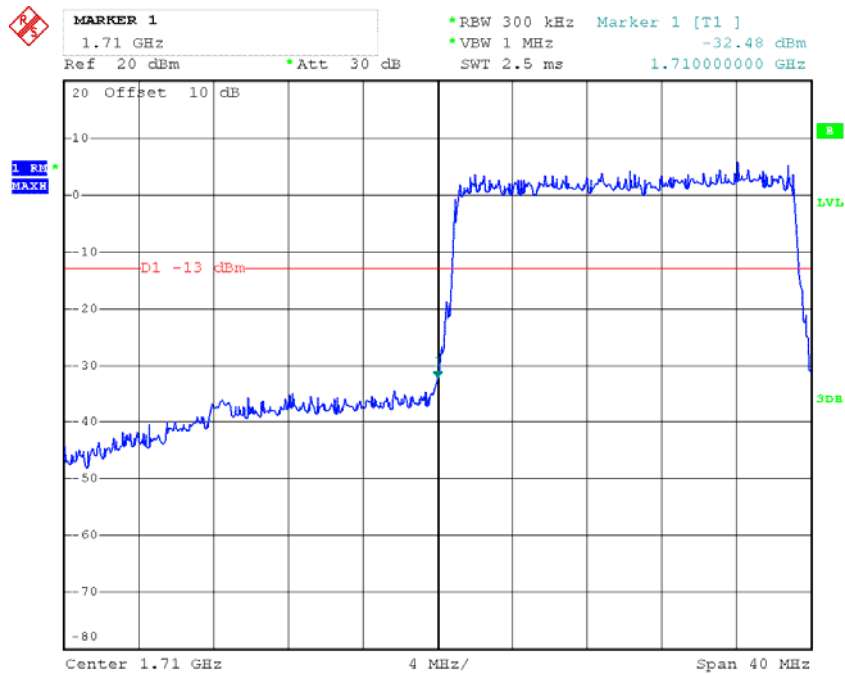
Date: 26.DEC.2015 16:26:03

QPSK-20M 1RB, Right Band Edge



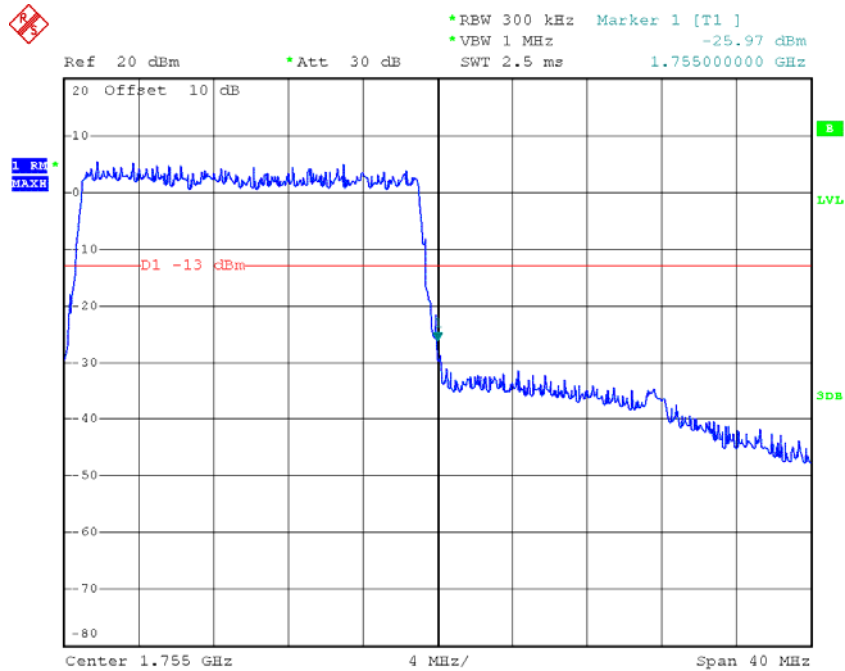
Date: 26.DEC.2015 16:27:24

QPSK-20M 100 RB, Left Band Edge



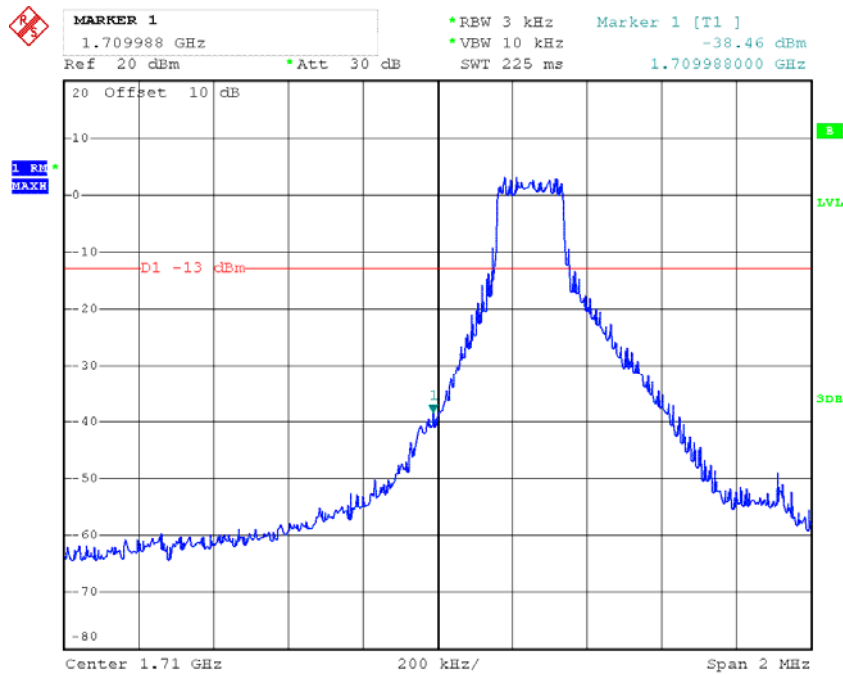
Date: 26.DEC.2015 16:29:54

QPSK-20M 100 RB, Right Band Edge



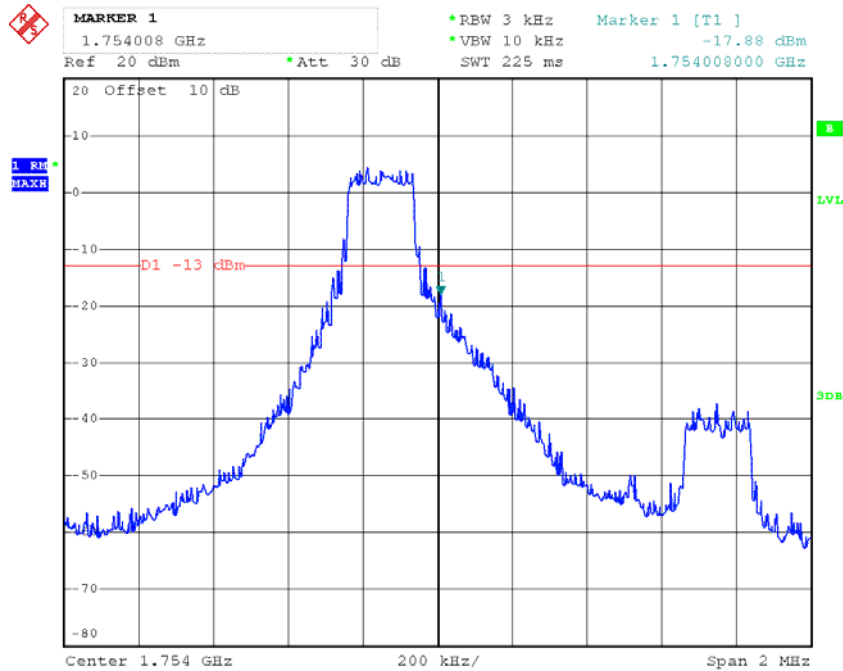
Date: 26.DEC.2015 16:29:01

16QAM -1.4M 1RB, Left Band Edge



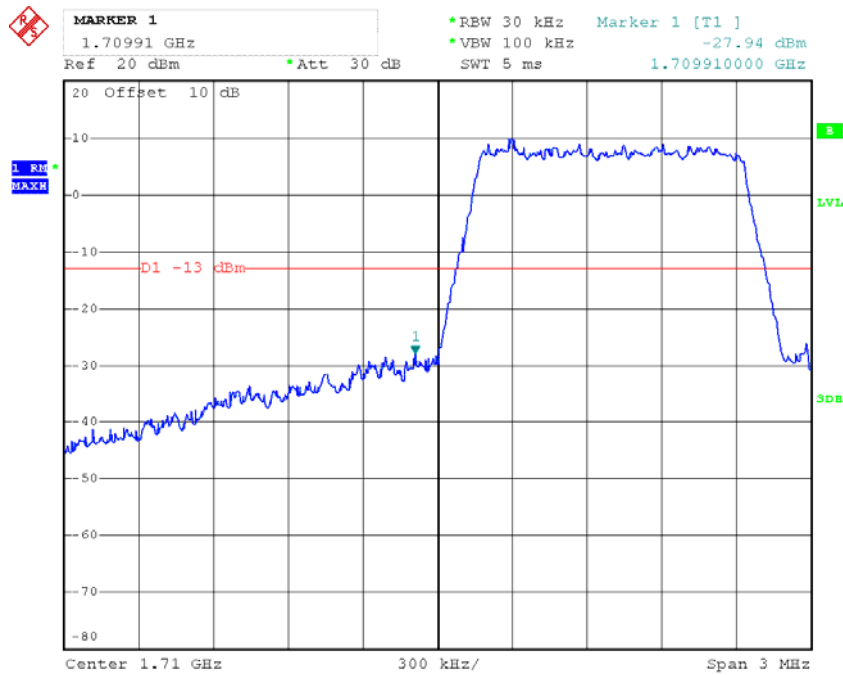
Date: 26.DEC.2015 15:23:12

16QAM -1.4M 1RB, Right Band Edge



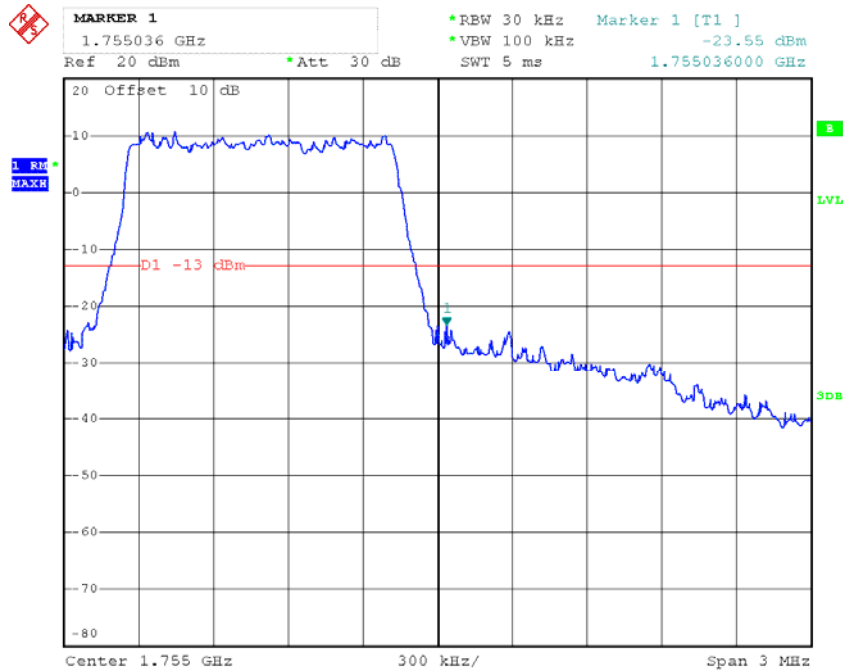
Date: 26.DEC.2015 15:31:13

16QAM -1.4M 6 RB, Left Band Edge



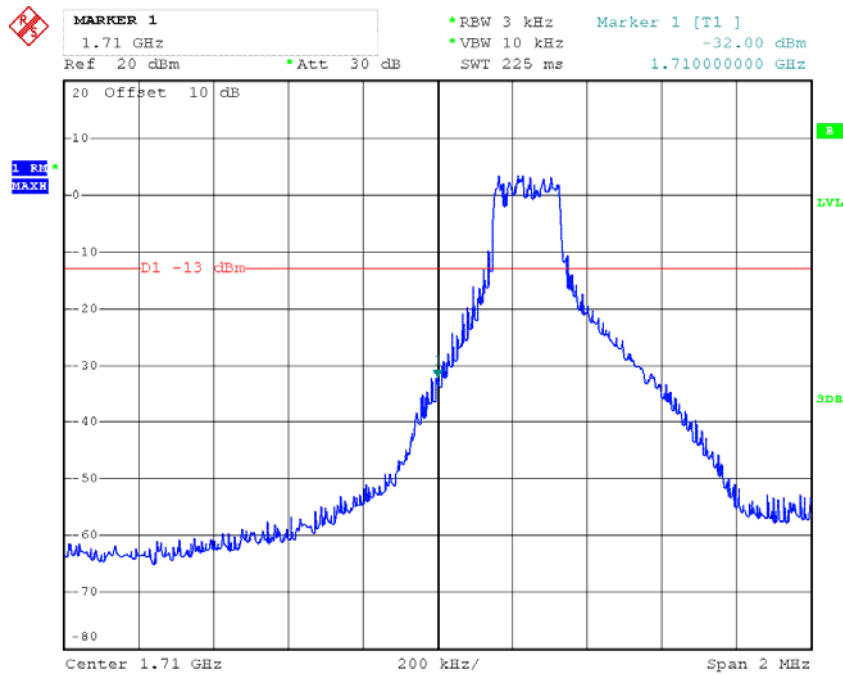
Date: 26.DEC.2015 15:38:00

16QAM -1.4M 6 RB, Right Band Edge



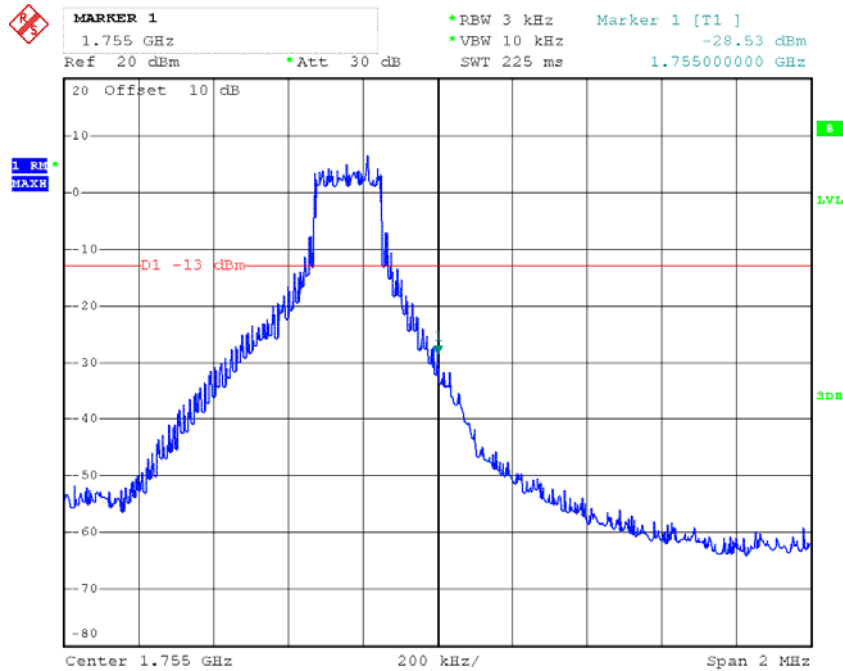
Date: 26.DEC.2015 15:39:19

16QAM -3M 1RB, Left Band Edge



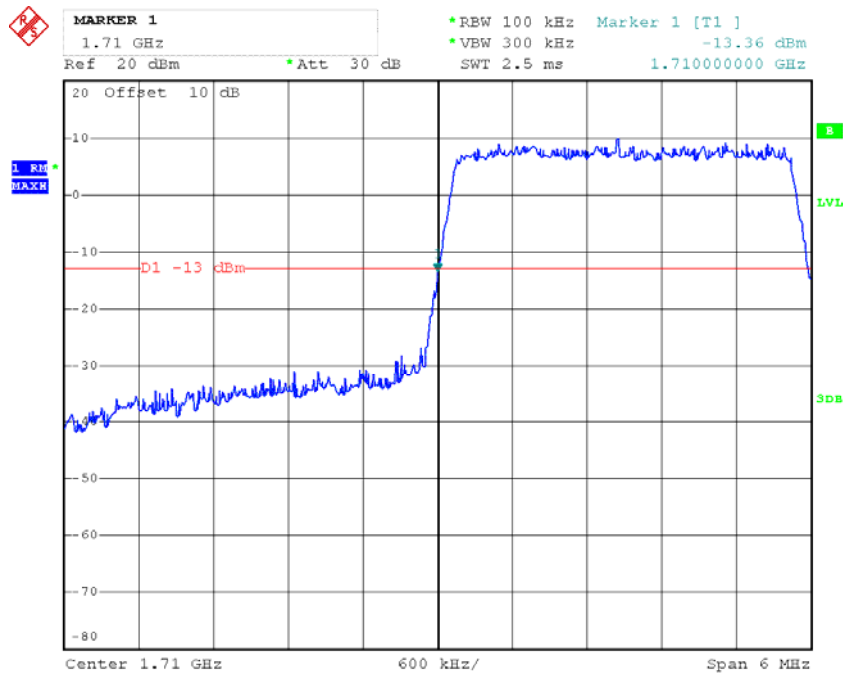
Date: 26.DEC.2015 15:48:13

16QAM -3M 1RB, Right Band Edge



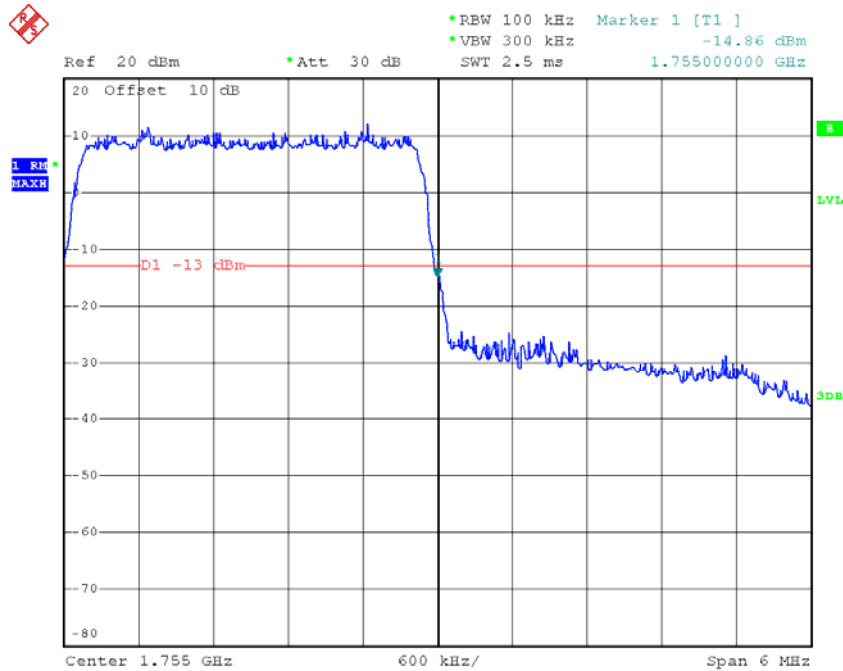
Date: 26.DEC.2015 15:49:37

16QAM -3M 15 RB, Left Band Edge



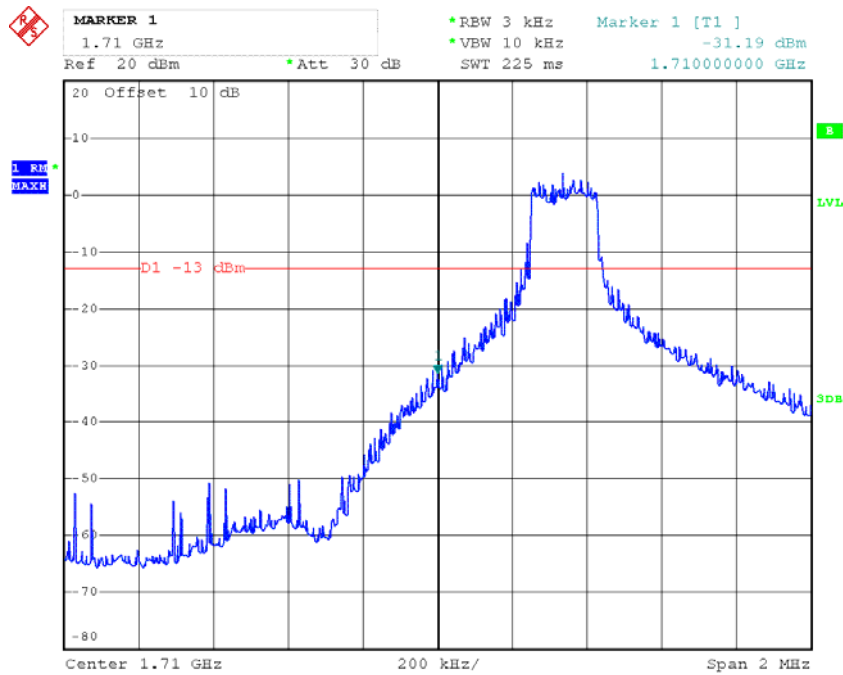
Date: 26.DEC.2015 15:53:04

16QAM -3M 15 RB, Right Band Edge



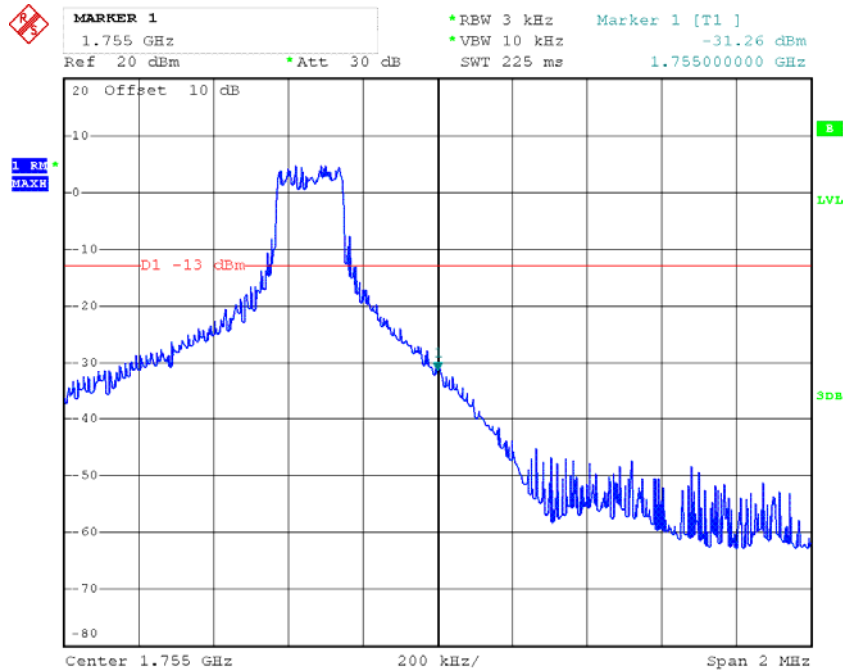
Date: 26.DEC.2015 15:54:29

16QAM -5M 1RB, Left Band Edge

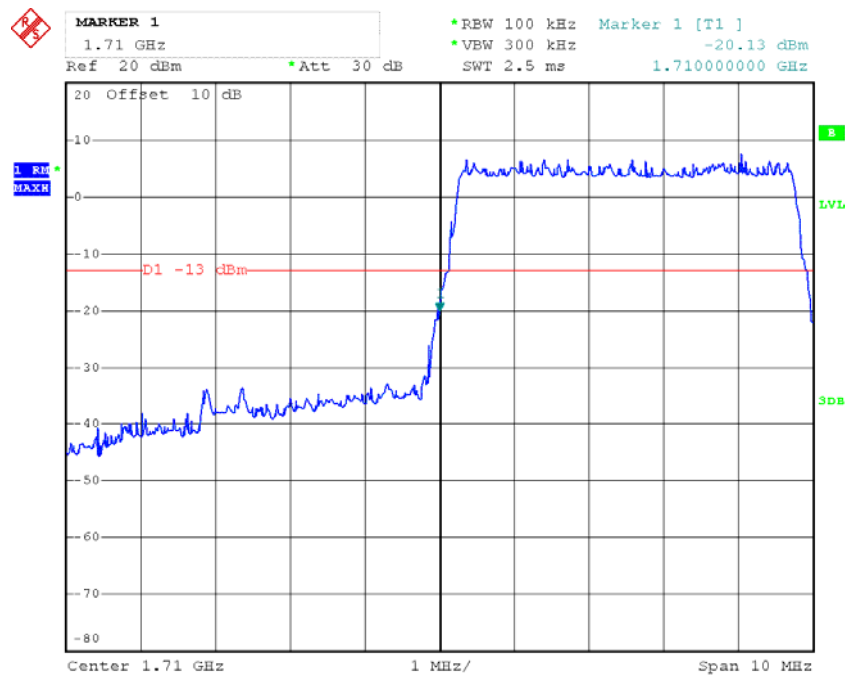


Date: 26.DEC.2015 15:57:57

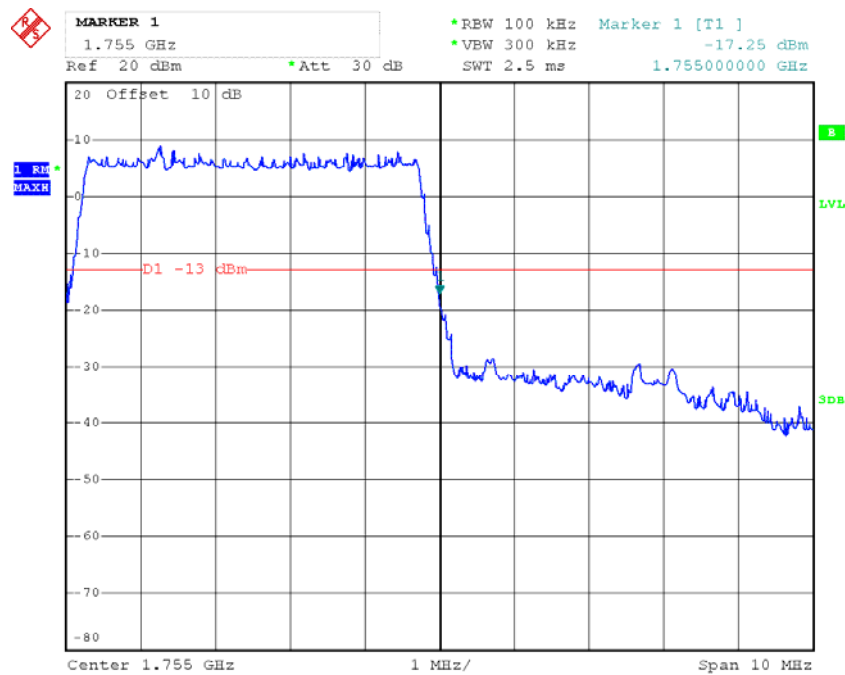
16QAM -5M 1RB, Right Band Edge



Date: 26.DEC.2015 15:59:38

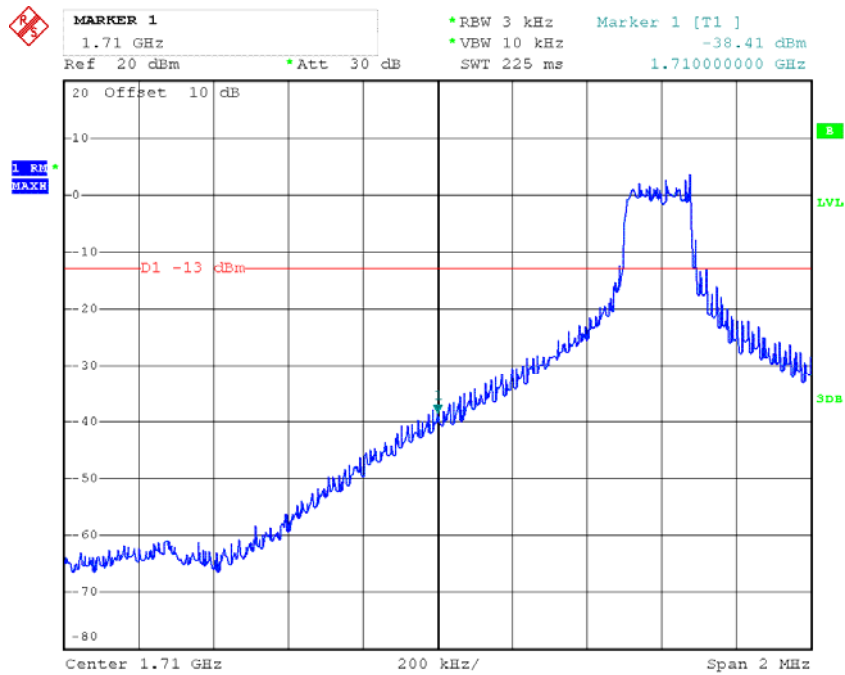
16QAM -5M 25 RB, Left Band Edge

Date: 26.DEC.2015 16:01:34

16QAM -5M 25 RB, Right Band Edge

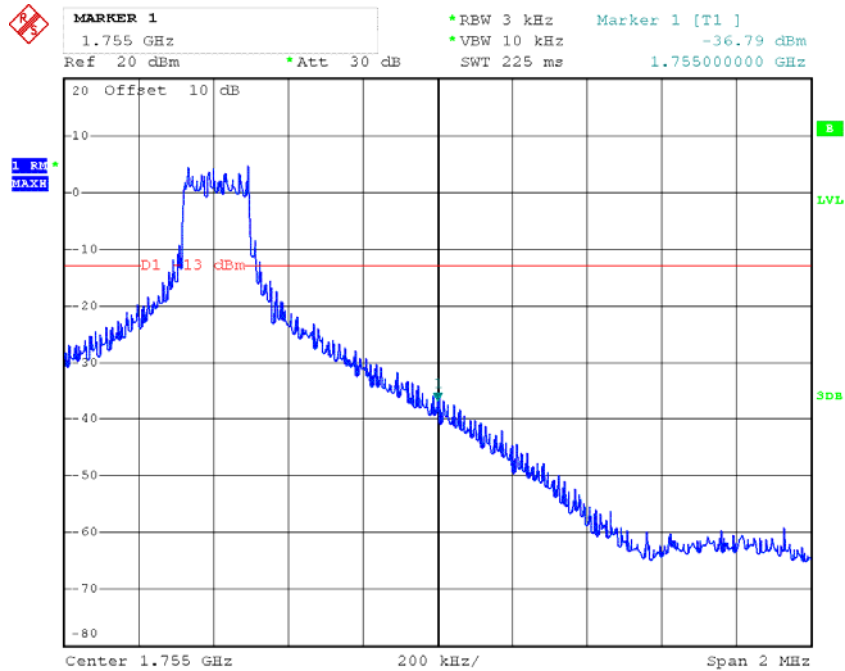
Date: 26.DEC.2015 16:02:26

16QAM -10M 1RB, Left Band Edge

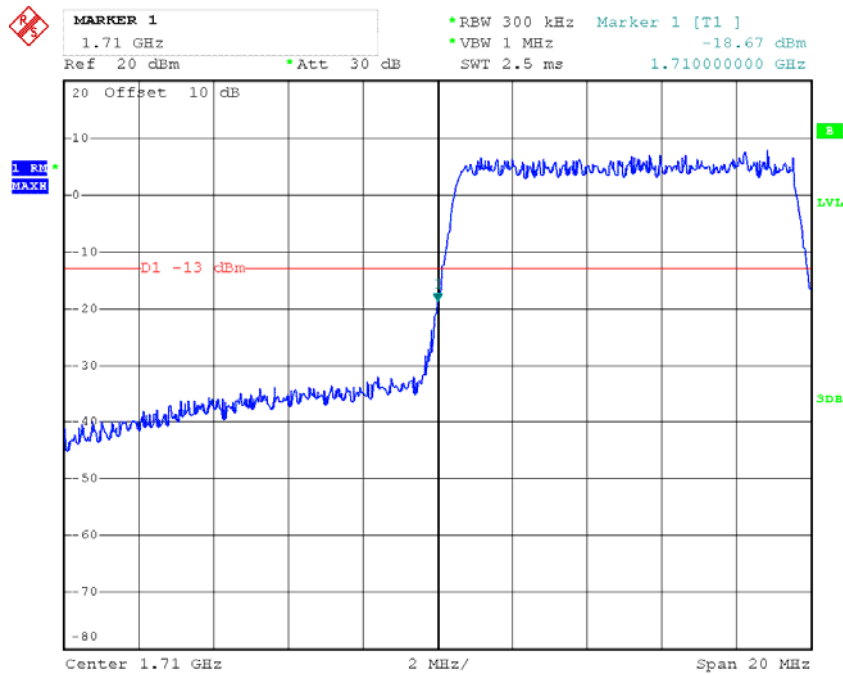


Date: 26.DEC.2015 16:08:20

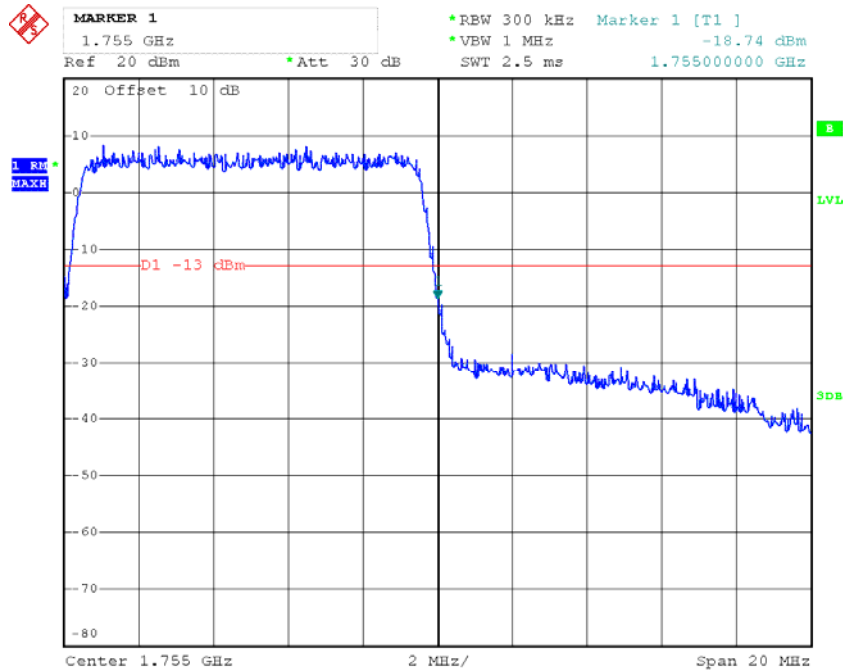
16QAM -10M 1RB, Right Band Edge



Date: 26.DEC.2015 16:09:34

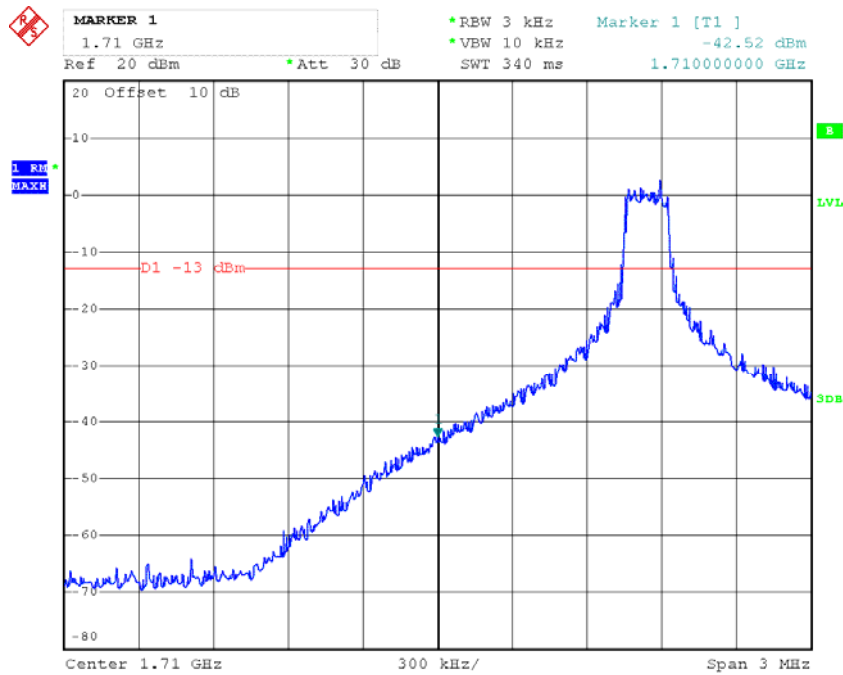
16QAM -10M 50 RB, Left Band Edge

Date: 26.DEC.2015 16:11:12

16QAM -10M 50 RB, Right Band Edge

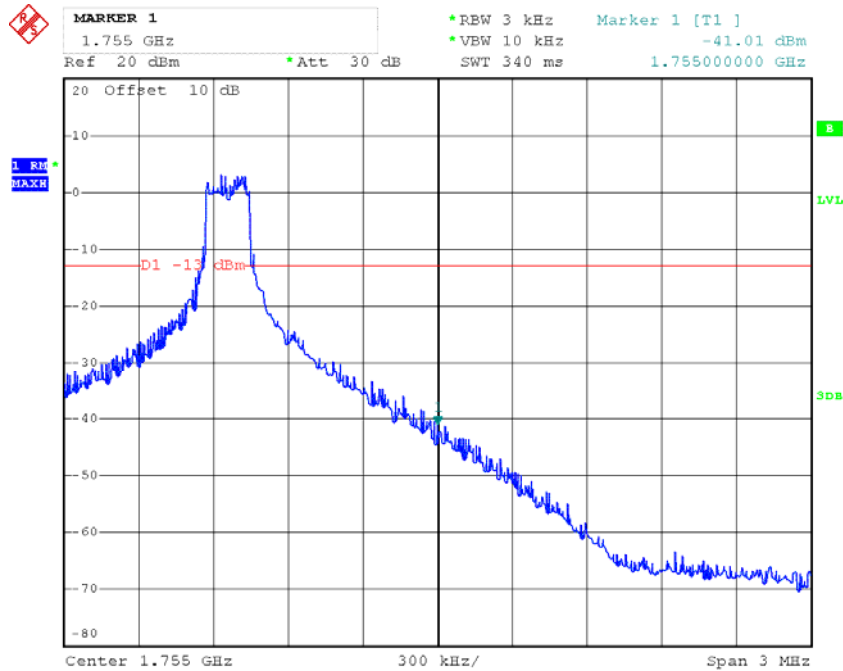
Date: 26.DEC.2015 16:12:04

16QAM -15M 1RB, Left Band Edge



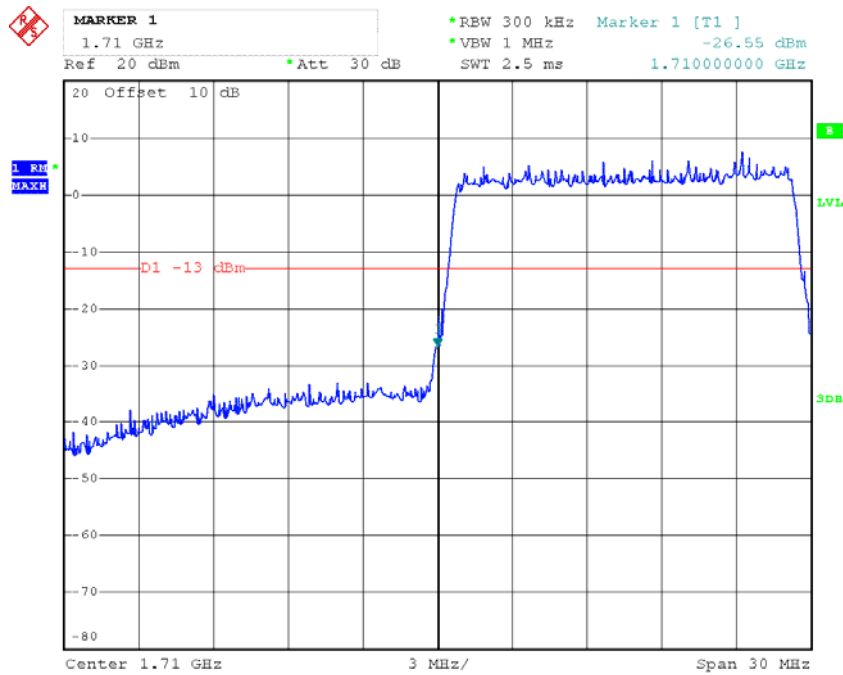
Date: 26.DEC.2015 16:17:07

16QAM -15M 1RB, Right Band Edge



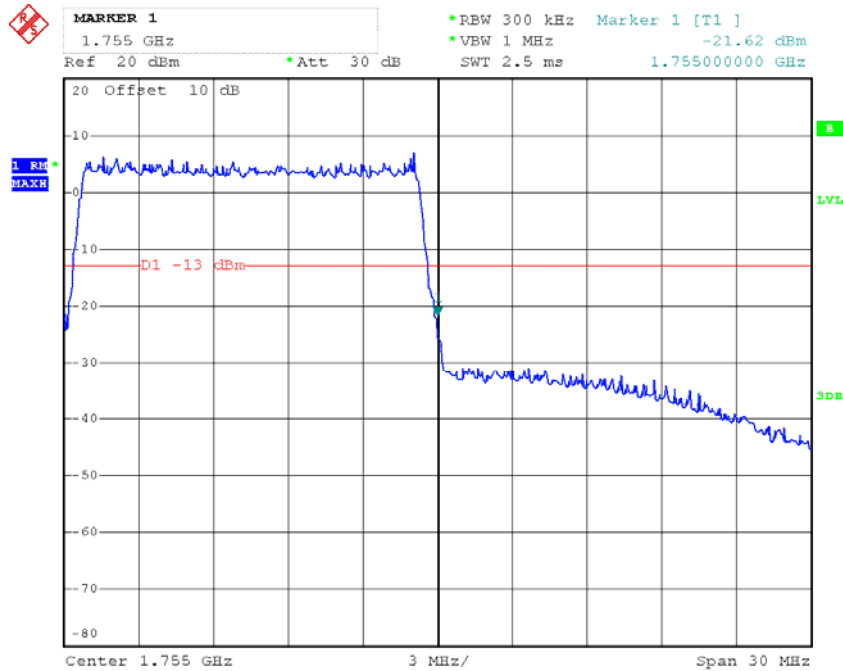
Date: 26.DEC.2015 16:18:10

16QAM -15M 75 RB, Left Band Edge



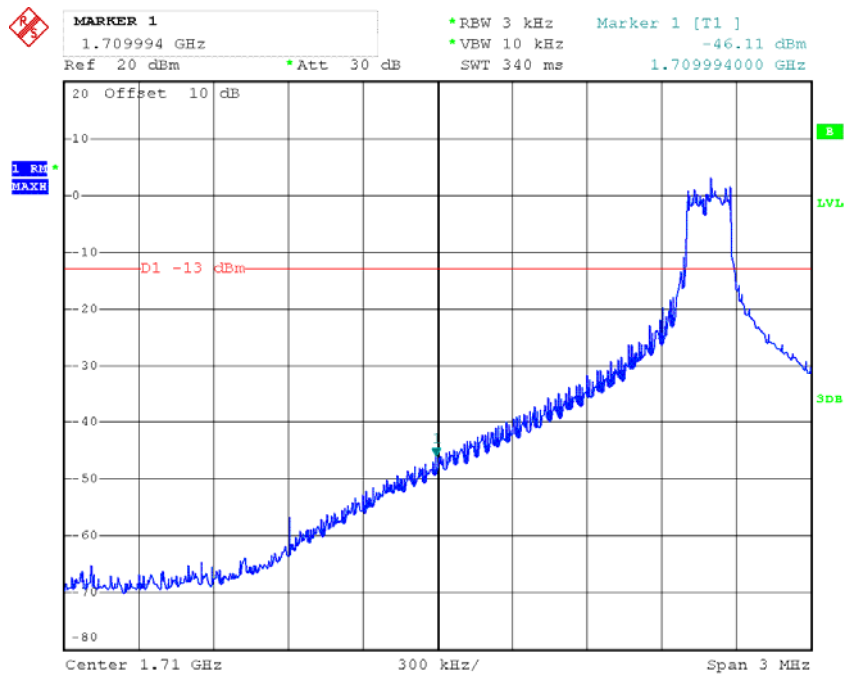
Date: 26.DEC.2015 16:20:46

16QAM -15M 75 RB, Right Band Edge



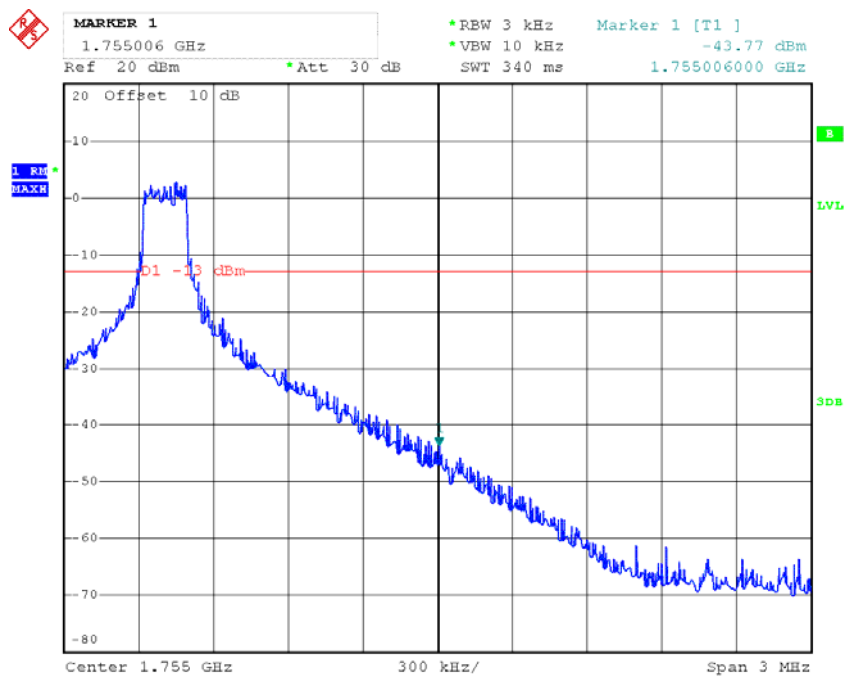
Date: 26.DEC.2015 16:19:57

16QAM -20M 1RB, Left Band Edge



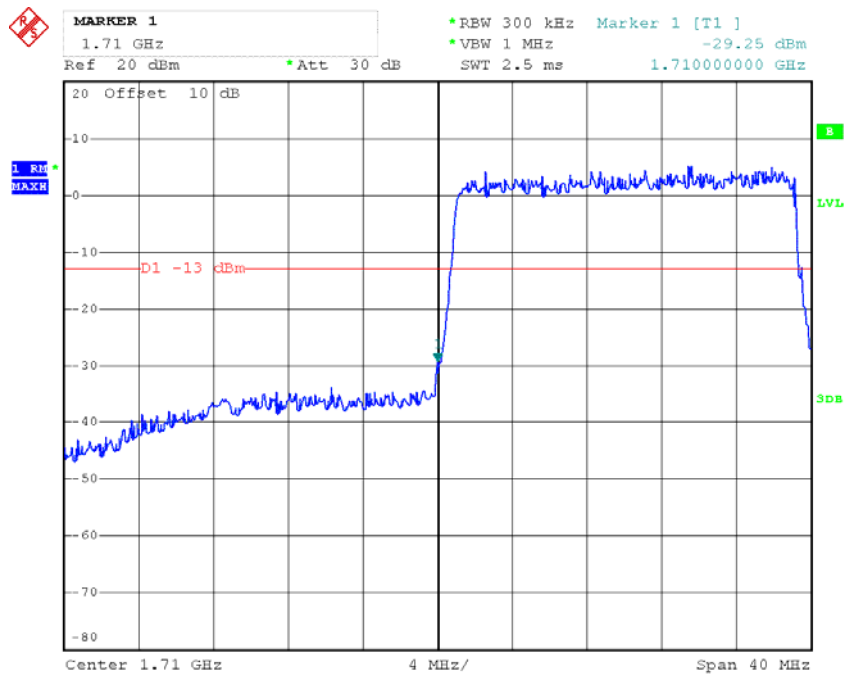
Date: 26.DEC.2015 16:25:30

16QAM -20M 1RB, Right Band Edge



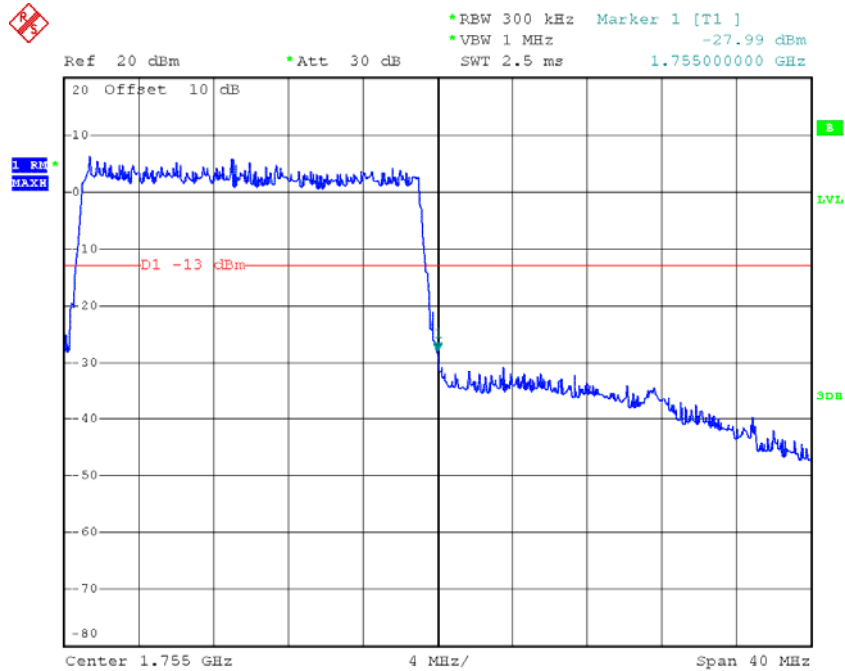
Date: 26.DEC.2015 16:27:02

16QAM -20M 100 RB, Left Band Edge



Date: 26.DEC.2015 16:29:41

16QAM-20M 100 RB, Right Band Edge



Date: 26.DEC.2015 16:28:44

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

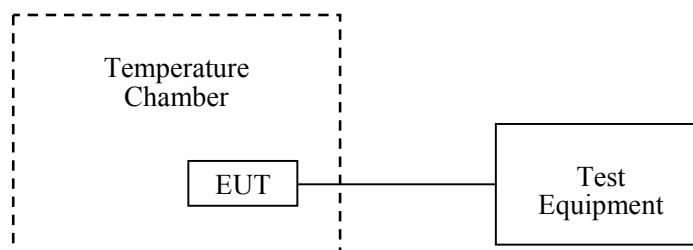
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

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	2015-09-10	2016-09-09
R&S	Universal Radio Communication Tester	CMU200	109 038	2015-05-09	2016-05-09
R&S	Wideband Radio Communication Tester	CMW500	106891	2015-12-19	2016-12-19

* **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:	25.3 °C
Relative Humidity:	53 %
ATM Pressure:	100.9 kPa

The testing was performed by Allen Qiao on 2015-12-26.

Cellular Band (Part 22H)

GMSK, Middle Channel, $f_c = 836.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	V _{DC}	Hz	ppm	ppm
-30	3.7	15	0.018	2.5
-20	3.7	11	0.013	2.5
-10	3.7	13	0.016	2.5
0	3.7	12	0.014	2.5
10	3.7	14	0.017	2.5
20	3.7	12	0.014	2.5
30	3.7	11	0.013	2.5
40	3.7	13	0.016	2.5
50	3.7	15	0.018	2.5
25	3.5	11	0.013	2.5
25	4.2	14	0.017	2.5

8PSK, Middle Channel, $f_c = 836.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	V _{DC}	Hz	ppm	ppm
-30	3.7	14	0.017	2.5
-20	3.7	16	0.019	2.5
-10	3.7	12	0.014	2.5
0	3.7	15	0.018	2.5
10	3.7	11	0.013	2.5
20	3.7	10	0.012	2.5
30	3.7	13	0.016	2.5
40	3.7	11	0.013	2.5
50	3.7	14	0.017	2.5
25	3.5	12	0.014	2.5
25	4.2	14	0.017	2.5

WCDMA Band V: Re199

Middle Channel, $f_c = 836.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	V _{DC}	Hz	ppm	ppm
-30	3.7	13	0.016	2.5
-20	3.7	14	0.017	2.5
-10	3.7	12	0.014	2.5
0	3.7	13	0.016	2.5
10	3.7	11	0.013	2.5
20	3.7	12	0.014	2.5
30	3.7	10	0.012	2.5
40	3.7	14	0.017	2.5
50	3.7	10	0.012	2.5
25	3.5	13	0.016	2.5
25	4.2	11	0.013	2.5

WCDMA Band V: HSDPA

Middle Channel, $f_c = 836.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	V _{DC}	Hz	ppm	ppm
-30	3.7	11	0.013	2.5
-20	3.7	13	0.016	2.5
-10	3.7	12	0.014	2.5
0	3.7	12	0.014	2.5
10	3.7	10	0.012	2.5
20	3.7	11	0.013	2.5
30	3.7	13	0.016	2.5
40	3.7	14	0.017	2.5
50	3.7	10	0.012	2.5
25	3.5	11	0.013	2.5
25	4.2	15	0.018	2.5

WCDMA Band V: HSUPA

Middle Channel, $f_c = 836.6$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Limit
°C	V _{DC}	Hz	ppm	ppm
-30	3.7	13	0.016	2.5
-20	3.7	11	0.013	2.5
-10	3.7	14	0.017	2.5
0	3.7	12	0.014	2.5
10	3.7	15	0.018	2.5
20	3.7	11	0.013	2.5
30	3.7	10	0.012	2.5
40	3.7	14	0.017	2.5
50	3.7	12	0.014	2.5
25	3.5	11	0.013	2.5
25	4.2	13	0.016	2.5

PCS Band (Part 24E)

GMSK, Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V_{DC}	Hz	ppm	
-30	3.7	14	0.007	Compliance
-20	3.7	11	0.006	Compliance
-10	3.7	16	0.009	Compliance
0	3.7	15	0.008	Compliance
10	3.7	12	0.006	Compliance
20	3.7	13	0.007	Compliance
30	3.7	16	0.009	Compliance
40	3.7	14	0.007	Compliance
50	3.7	17	0.009	Compliance
25	3.5	18	0.010	Compliance
25	4.2	15	0.008	Compliance

8PSK, Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V_{DC}	Hz	ppm	
-30	3.7	11	0.006	Compliance
-20	3.7	15	0.008	Compliance
-10	3.7	13	0.007	Compliance
0	3.7	11	0.006	Compliance
10	3.7	10	0.005	Compliance
20	3.7	16	0.009	Compliance
30	3.7	14	0.007	Compliance
40	3.7	17	0.009	Compliance
50	3.7	13	0.007	Compliance
25	3.5	15	0.008	Compliance
25	4.2	12	0.006	Compliance

WCDMA Band II: Re199

Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V _{DC}	Hz	ppm	
-30	3.7	14	0.007	Compliance
-20	3.7	12	0.006	Compliance
-10	3.7	16	0.009	Compliance
0	3.7	12	0.006	Compliance
10	3.7	15	0.008	Compliance
20	3.7	13	0.007	Compliance
30	3.7	11	0.006	Compliance
40	3.7	10	0.005	Compliance
50	3.7	12	0.006	Compliance
25	3.5	13	0.007	Compliance
25	4.2	10	0.005	Compliance

WCDMA Band II: HSDPA

Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V _{DC}	Hz	ppm	
-30	3.7	14	0.007	Compliance
-20	3.7	11	0.006	Compliance
-10	3.7	12	0.006	Compliance
0	3.7	10	0.005	Compliance
10	3.7	13	0.007	Compliance
20	3.7	12	0.006	Compliance
30	3.7	12	0.006	Compliance
40	3.7	11	0.006	Compliance
50	3.7	14	0.007	Compliance
25	3.5	12	0.006	Compliance
25	4.2	11	0.006	Compliance

WCDMA Band II: HSUPA

Middle Channel, $f_c = 1880.0$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V _{DC}	Hz	ppm	
-30	3.7	11	0.006	Compliance
-20	3.7	10	0.005	Compliance
-10	3.7	14	0.007	Compliance
0	3.7	12	0.006	Compliance
10	3.7	13	0.007	Compliance
20	3.7	13	0.007	Compliance
30	3.7	10	0.005	Compliance
40	3.7	12	0.006	Compliance
50	3.7	14	0.007	Compliance
25	3.5	12	0.006	Compliance
25	4.2	11	0.006	Compliance

LTE Band 4:

QPSK, Channel Bandwidth:10MHz Middle Channel, $f_c = 1732.5$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V _{DC}	Hz	ppm	
-30	3.7	-0.99	-0.0006	Compliance
-20	3.7	-1.15	-0.0007	Compliance
-10	3.7	-1.52	-0.0009	Compliance
0	3.7	-1.67	-0.0010	Compliance
10	3.7	-1.34	-0.0008	Compliance
20	3.7	-1.31	-0.0008	Compliance
30	3.7	-1.83	-0.0011	Compliance
40	3.7	-1.46	-0.0008	Compliance
50	3.7	-1.65	-0.0010	Compliance
25	3.5	-1.13	-0.0007	Compliance
25	4.2	-1.52	-0.0009	Compliance

16QAM, Channel Bandwidth:10MHz Middle Channel, $f_c = 1732.5$ MHz				
Temperature	Voltage	Frequency Error	Frequency Error	Result
°C	V _{DC}	Hz	ppm	
-30	3.7	-1.10	-0.0006	Compliance
-20	3.7	-1.86	-0.0011	Compliance
-10	3.7	-1.16	-0.0007	Compliance
0	3.7	-1.68	-0.0010	Compliance
10	3.7	-1.76	-0.0010	Compliance
20	3.7	-1.97	-0.0011	Compliance
30	3.7	-1.89	-0.0011	Compliance
40	3.7	-1.74	-0.0010	Compliance
50	3.7	-1.79	-0.0010	Compliance
25	3.5	-1.35	-0.0008	Compliance
25	4.2	-1.81	-0.0010	Compliance

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

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