FCC PART 22H, PART 24E

FCC PART 27

MEASUREMENT AND TEST REPORT

For

Acegame S.A

Gorriti 4539 - C.A.B.A., Buenos Aires, Argentina

FCC ID: 2ADTU-ZENAIR

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

Test Engineer:	Allen Qiao
Report Number:	RDG160217001-00C
Report Date:	2016-02-25
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 *Acegame S.A*'s product, model number: *Zen Air (FCC ID: 2ADTU-ZENAIR)* (the "EUT") in this report was a *Mobile Phone,* which was measured approximately: 14.6cm (L) x 7.2 cm (W) x 0.8 cm (H), rated input voltage: DC 3.8V rechargeable Li-ion battery or DC5V charging from adapter.

All measurement and test data in this report was gathered from production sample serial number: 160217001 (Assigned by BACL, Dongguan). The EUT was received on 2016-02-17.

Objective

This report is prepared on behalf of *Acegame S.A* 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: 2ADTU-ZENAIR
FCC Part 15C DSS submissions with FCC ID: 2ADTU-ZENAIR
FCC Part 15C DTS submissions with FCC ID: 2ADTU-ZENAIR

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.

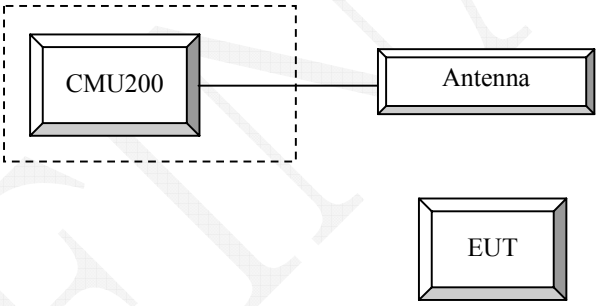
Equipment Modifications

No modification was made to the EUT.

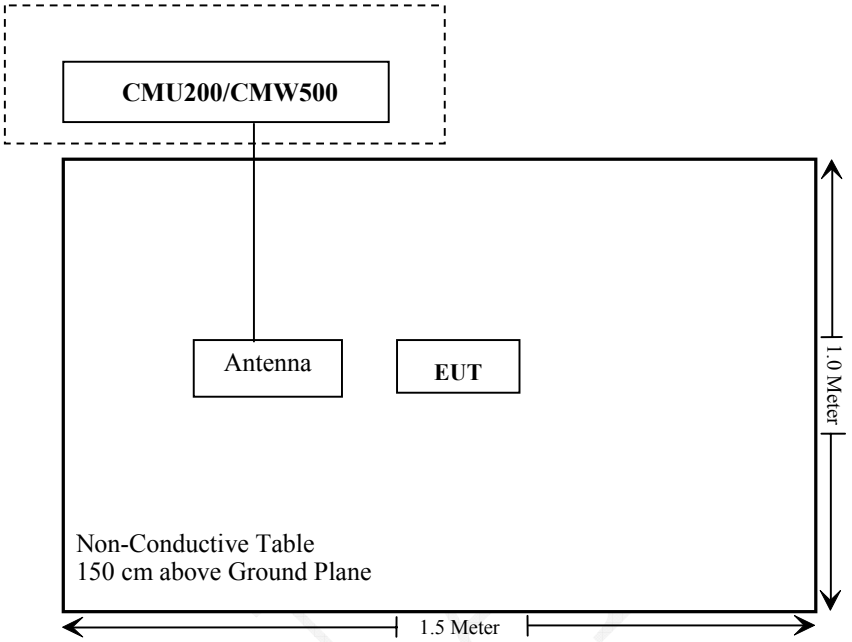
Support Equipment List and Details

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

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	Spurious Radiation Emissions	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

Compliant, please refer to the SAR report: RDG160217001-20.

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 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 §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.

Test Procedure

GSM/GPRS

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
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 stabe)
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)
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	2016-02-19	2017-02-19
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
N/A	Coaxial Cable	14m	N/A	2015-05-06	2016-05-06
N/A	Coaxial Cable	8m	N/A	2015-05-06	2016-05-06
N/A	Coaxial Cable	0.1m	N/A	2015-05-06	2016-05-06
E-Microwave	DC Blocking	EMDCB-00036	0E01201047	2015-05-06	2016-05-06
E-Microwave	Attenuator(10dB)	EMCA10-5RN	OE01203239	2015-05-08	2016-05-08
Pasternack	RF Coaxial Cable	RF-01	N/A	2015-05-06	2016-05-06
Pasternack	RF Coaxial Cable	RF-02	N/A	2015-05-06	2016-05-06
N/A	Two-way Spliter	ODP-1-6-2S	OE0120142	2015-05-06	2016-05-06

*** 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:	24.6 ~ 26.3°C
Relative Humidity:	26.3 ~ 44 %
ATM Pressure:	101.4 ~ 101.7kPa

The testing was performed by Allen Qiao from 2016-02-22 to 2016-02-23.

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
Cellular	128	33.20	33.26	32.09	29.72	28.95
	190	33.30	33.30	32.10	29.56	28.77
	251	33.40	33.39	32.15	29.55	28.70
PCS	512	29.80	29.66	28.48	26.09	25.26
	661	29.60	29.61	28.53	26.30	25.44
	810	29.60	29.58	28.62	26.48	25.65

WCDMA Band Ⅱ

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 (QPSK)	1	22.63	2.24	22.57	2.40	22.74	2.36
HSDPA (QPSK)	1	21.59	2.29	21.52	2.48	21.65	2.31
	2	21.68	2.22	21.49	2.38	21.59	2.41
	3	21.54	2.18	21.43	2.42	21.60	2.30
	4	21.64	2.25	21.52	2.46	21.65	2.43
HSUPA (QPSK)	1	21.56	2.16	21.49	2.41	21.6	2.29
	2	21.58	2.27	21.56	2.4	21.55	2.27
	3	21.65	2.19	21.40	2.41	21.62	2.30
	4	21.47	2.15	21.59	2.38	21.65	2.37
	5	21.51	2.15	21.43	2.36	21.61	2.35
DC-HSDPA (QPSK)	1	21.43	2.31	21.33	2.41	21.60	2.44
	2	21.59	2.23	21.47	2.31	21.67	2.42
	3	21.47	2.21	21.36	2.37	21.55	2.39
	4	21.48	2.33	21.48	2.34	21.64	2.36
HSPA+ (16QAM)	1	21.39	2.29	21.46	2.48	21.59	2.31

WCDMA Band Ⅴ

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 (QPSK)	1	22.89	2.56	22.68	2.76	22.96	2.88
HSDPA (QPSK)	1	21.89	2.55	21.66	2.82	21.94	2.8
	2	21.91	2.47	21.60	2.68	21.89	2.92
	3	21.83	2.59	21.63	2.69	21.92	2.95
	4	21.99	2.63	21.64	2.76	21.97	2.81
HSUPA (QPSK)	1	21.86	2.63	21.66	2.77	21.92	2.88
	2	21.92	2.56	21.74	2.77	21.98	2.95
	3	21.95	2.48	21.60	2.68	22.02	2.92
	4	21.90	2.64	21.67	2.74	21.88	2.87
DC-HSDPA (QPSK)	1	21.91	2.60	21.63	2.68	21.84	2.88
	2	21.92	2.6	21.65	2.75	21.94	2.82
	3	21.95	2.50	21.65	2.72	21.85	2.94
	4	22.01	2.61	21.57	2.73	21.78	2.80
	5	21.81	2.65	21.66	2.69	21.76	2.88
HSPA+ (16QAM)	1	21.75	2.63	21.63	2.74	21.71	2.84

LTE Band IV (PART 27)

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4MHz	QPSK	1#0	22.46	22.37	22.51
		1#3	22.53	22.42	22.56
		1#5	22.47	22.39	22.53
		3#0	22.57	22.46	22.59
		3#1	22.55	22.44	22.57
		3#3	22.58	22.46	22.60
		6#0	21.42	21.35	21.48
	16QAM	1#0	21.46	21.31	21.57
		1#3	21.54	21.35	21.62
		1#5	21.48	21.33	21.57
		3#0	21.54	21.38	21.36
		3#1	21.46	21.27	21.29
		3#3	21.51	21.41	21.36
		6#0	20.39	20.35	20.51

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
3 MHz	QPSK	1#0	22.45	22.29	22.50
		1#7	22.46	22.30	22.51
		1#14	22.43	22.31	22.53
		8#0	22.42	22.41	22.54
		8#4	22.44	22.28	22.51
		8#7	22.40	22.33	22.49
		15#0	21.47	21.35	21.54
	16QAM	1#0	21.39	21.31	21.56
		1#7	21.49	21.29	21.57
		1#14	21.33	21.32	21.58
		8#0	21.26	21.40	21.63
		8#4	21.36	21.38	21.52
		8#7	21.38	21.32	21.60
		15#0	20.48	20.42	20.52
5 MHz	QPSK	1#0	22.46	22.49	22.67
		1#12	22.42	22.41	22.63
		1#24	22.58	22.50	22.67
		12#0	22.54	22.46	22.64
		12#6	22.58	22.55	22.73
		12#11	22.64	22.52	22.66
		25#0	21.48	21.40	21.54
	16QAM	1#0	21.59	21.68	21.61
		1#12	21.51	21.62	21.59
		1#24	21.49	21.67	21.56
		12#0	21.58	21.71	21.48
		12#6	21.49	21.59	21.51
		12#11	21.52	21.76	21.65
		25#0	20.50	20.41	20.70
10 MHz	QPSK	1#0	22.50	22.41	22.40
		1#24	22.42	22.45	22.50
		1#49	22.47	22.51	22.43
		25#0	21.59	21.39	21.59
		25#12	21.54	21.38	21.57
		25#24	21.51	21.33	21.54
		50#0	21.48	21.53	21.44
	16QAM	1#0	21.44	21.62	21.51
		1#24	21.50	21.56	21.51
		1#49	21.53	21.54	21.48
		25#0	21.50	21.57	21.46
		25#12	21.38	21.55	21.47
		25#24	21.32	21.52	21.43
		50#0	20.55	20.75	20.62

Channel Bandwidth	Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
15 MHz	QPSK	1#0	22.38	22.42	22.53
		1#37	22.35	22.49	22.45
		1#74	22.39	22.41	22.55
		36#0	21.73	21.41	21.47
		36#17	21.68	21.42	21.43
		36#35	21.73	21.32	21.48
		75#0	21.52	21.55	21.49
	16QAM	1#0	21.71	21.91	21.75
		1#37	21.63	21.89	21.66
		1#74	21.77	21.99	21.80
		36#0	21.63	21.46	21.52
		36#17	21.73	21.54	21.60
		36#35	21.72	21.42	21.53
		75#0	20.51	20.83	20.86
20 MHz	QPSK	1#0	22.41	22.52	22.37
		1#49	22.32	22.59	22.29
		1#99	22.51	22.44	22.41
		50#0	21.52	21.61	21.42
		50#24	22.34	21.62	21.40
		50#49	22.38	21.56	21.33
		100#0	21.50	21.45	21.44
	16QAM	1#0	21.76	21.67	21.86
		1#49	21.77	21.71	21.77
		1#99	21.71	21.70	21.82
		50#0	21.84	21.58	21.83
		50#24	21.70	21.71	21.90
		50#49	21.67	21.68	21.84
		100#0	20.69	20.49	20.56

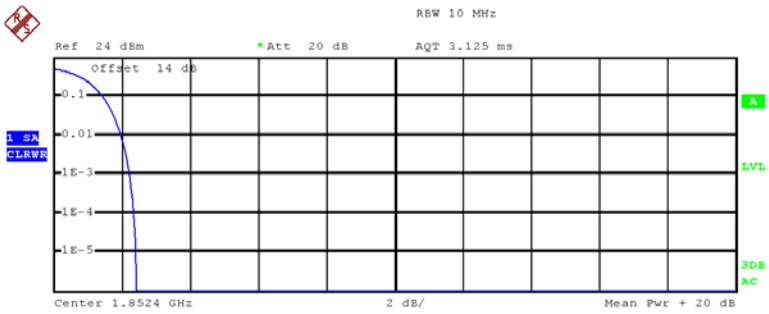
Test Modulation		Channel Bandwidth	Low Channel PAR (dB)	Middle Channel PAR (dB)	High Channel PAR (dB)	Limit (dB)
QPSK	1 RB	20 MHz	5.20	5.12	5.32	13
	100 RB		6.32	7.04	7.12	13
16QAM	1 RB	20 MHz	5.40	4.84	5.36	13
	100 RB		7.08	6.24	6.24	13

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

Peak-to-average ratio (PAR)

WCDMA Band Ⅱ

Low Channel

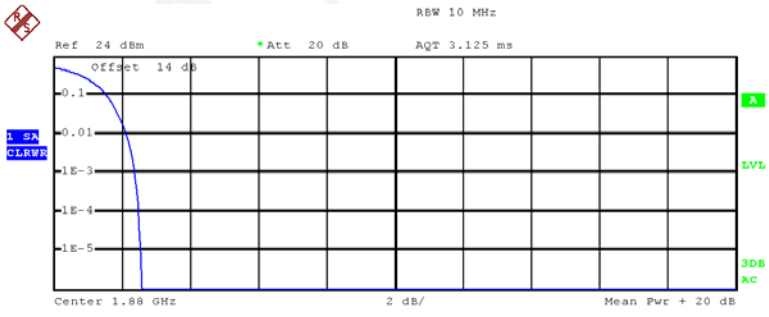


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	17.93 dBm
Peak	20.34 dBm
Crest	2.41 dB
10 %	1.44 dB
1 %	2.00 dB
.1 %	2.24 dB
.01 %	2.36 dB

Date: 23.FEB.2016 15:58:11

Middle Channel

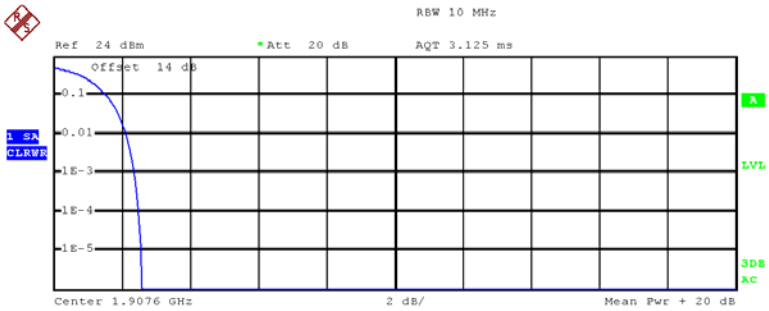


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	17.47 dBm
Peak	20.06 dBm
Crest	2.59 dB
10 %	1.56 dB
1 %	2.16 dB
.1 %	2.40 dB
.01 %	2.52 dB

Date: 23.FEB.2016 15:57:26

High Channel



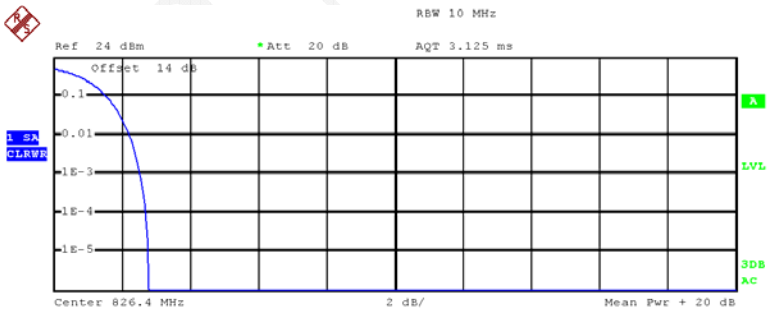
Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	19.58 dBm
Peak	22.18 dBm
Crest	2.59 dB
10 %	1.56 dB
1 %	2.12 dB
.1 %	2.36 dB
.01 %	2.48 dB

Date: 23.FEB.2016 15:56:25

WCDMA Band Ⅴ

Low Channel

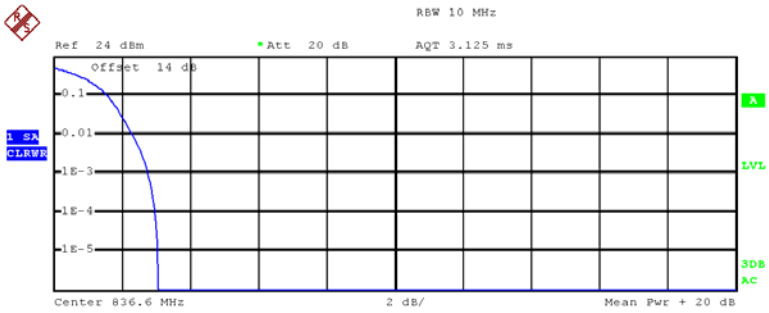


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	20.59 dBm
Peak	23.37 dBm
Crest	2.79 dB
10 %	1.56 dB
1 %	2.24 dB
.1 %	2.56 dB
.01 %	2.72 dB

Date: 23.FEB.2016 16:01:24

Middle Channel

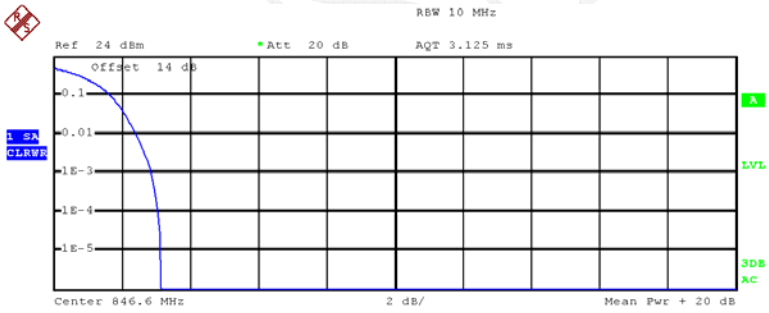


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	20.39 dBm
Peak	23.45 dBm
Crest	3.06 dB
10 %	1.60 dB
1 %	2.32 dB
.1 %	2.76 dB
.01 %	3.00 dB

Date: 23.FEB.2016 16:01:40

High Channel



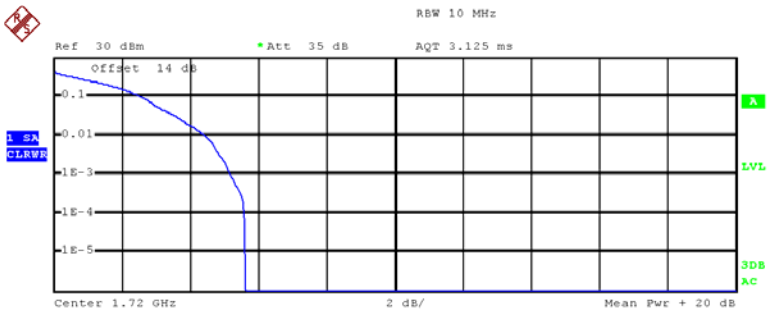
Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	20.78 dBm
Peak	23.94 dBm
Crest	3.15 dB
10 %	1.68 dB
1 %	2.44 dB
.1 %	2.88 dB
.01 %	3.08 dB

Date: 23.FEB.2016 16:02:16

LTE Band IV (PART 27)

QPSK_20MHz_1RB_Low Channel

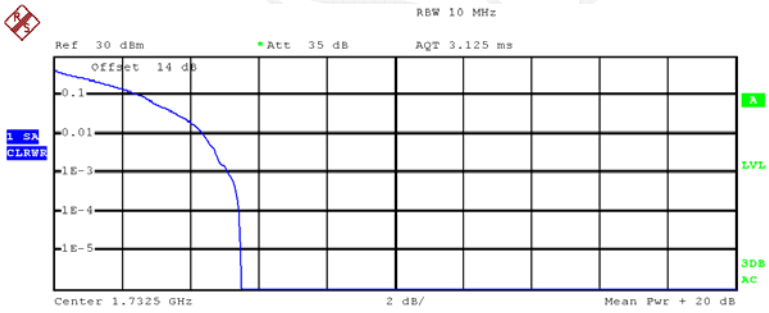


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	22.84 dBm
Peak	28.46 dBm
Crest	5.61 dB
10 %	2.64 dB
1 %	4.48 dB
.1 %	5.20 dB
.01 %	5.60 dB

Date: 22.FEB.2016 14:11:09

QPSK_20MHz_1RB Middle Channel

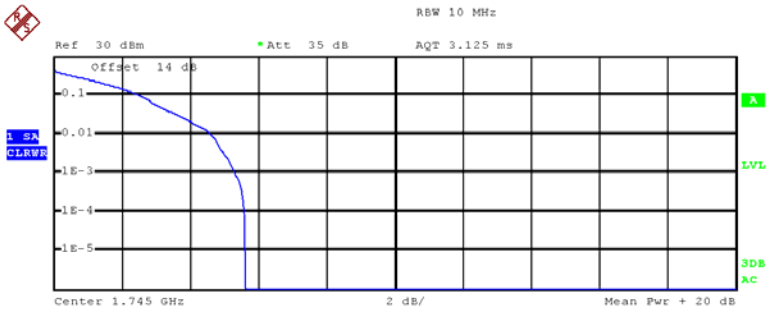


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	22.42 dBm
Peak	27.89 dBm
Crest	5.48 dB
10 %	2.60 dB
1 %	4.40 dB
.1 %	5.12 dB
.01 %	5.44 dB

Date: 22.FEB.2016 14:12:35

QPSK_20MHz_1RB High Channel

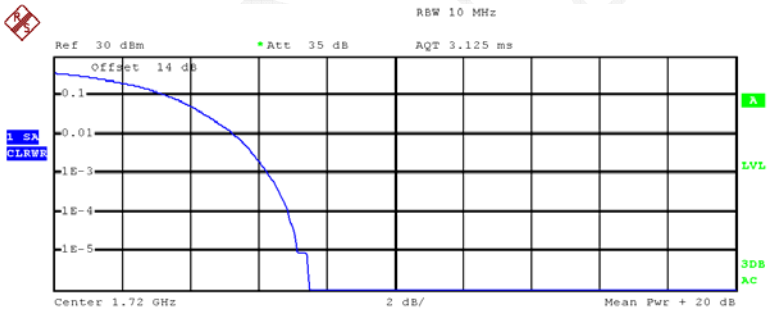


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	22.48 dBm
Peak	28.10 dBm
Crest	5.63 dB
10 %	2.60 dB
1 %	4.64 dB
.1 %	5.32 dB
.01 %	5.60 dB

Date: 22.FEB.2016 14:13:26

QPSK_20MHz_FULL RB Low Channel

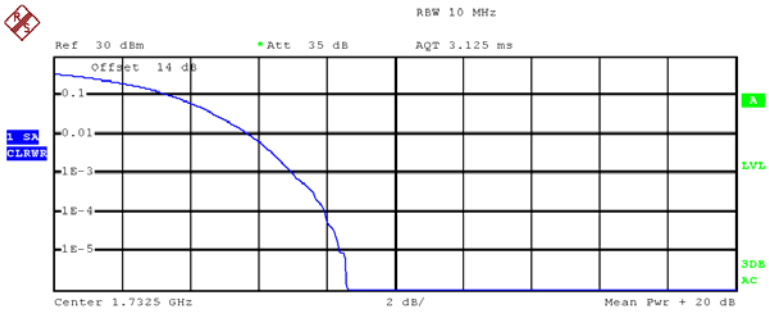


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	20.55 dBm
Peak	28.03 dBm
Crest	7.49 dB
10 %	3.40 dB
1 %	5.32 dB
.1 %	6.32 dB
.01 %	6.88 dB

Date: 22.FEB.2016 14:17:53

QPSK_20MHz_FULL RB Middle Channel

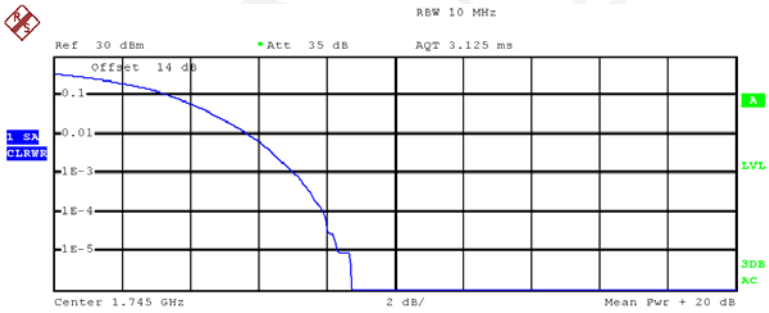


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	19.37 dBm
Peak	27.96 dBm
Crest	8.59 dB
10 %	3.52 dB
1 %	5.76 dB
.1 %	7.04 dB
.01 %	7.96 dB

Date: 22.FEB.2016 14:16:58

QPSK 20MHz_FULL RB High Channel

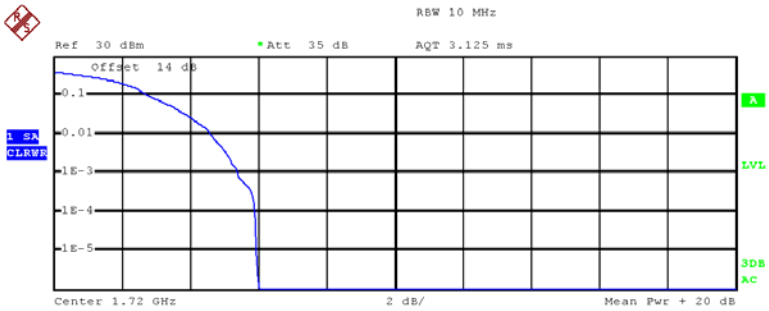


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	19.22 dBm
Peak	27.96 dBm
Crest	8.74 dB
10 %	3.48 dB
1 %	5.76 dB
.1 %	7.12 dB
.01 %	7.92 dB

Date: 22.FEB.2016 14:14:35

16QAM_20MHz_1RB_Low Channel

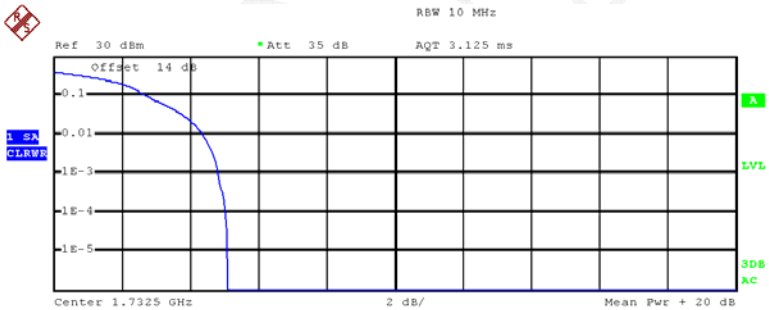


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	23.02 dBm
Peak	29.02 dBm
Crest	6.00 dB
10 %	2.84 dB
1 %	4.64 dB
.1 %	5.40 dB
.01 %	5.92 dB

Date: 22.FEB.2016 14:11:26

16QAM 20MHz_1RB Middle Channel

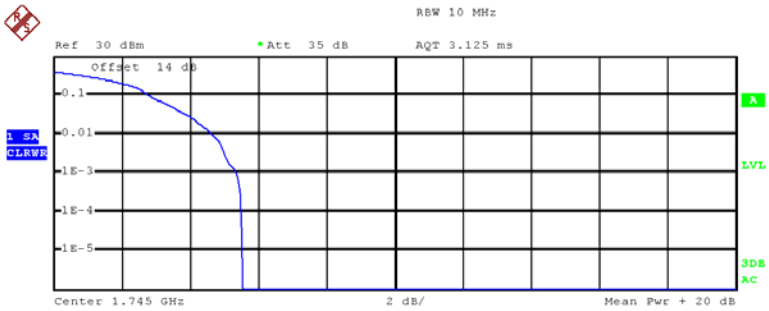


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	22.73 dBm
Peak	27.82 dBm
Crest	5.09 dB
10 %	2.76 dB
1 %	4.40 dB
.1 %	4.84 dB
.01 %	5.04 dB

Date: 22.FEB.2016 14:12:54

16QAM 20MHz_1RB High Channel

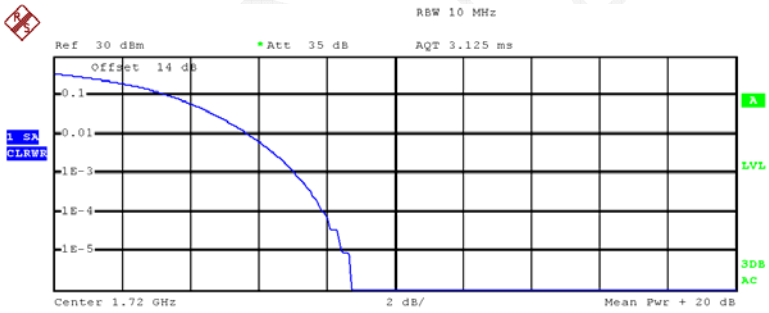


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	22.59 dBm
Peak	28.10 dBm
Crest	5.52 dB
10 %	2.84 dB
1 %	4.68 dB
.1 %	5.36 dB
.01 %	5.52 dB

Date: 22.FEB.2016 14:13:34

16QAM 20MHz_FULL RB Low Channel

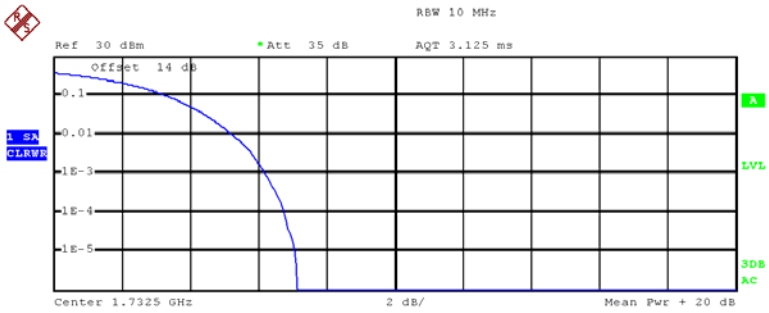


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	19.60 dBm
Peak	28.32 dBm
Crest	8.72 dB
10 %	3.48 dB
1 %	5.76 dB
.1 %	7.08 dB
.01 %	7.96 dB

Date: 22.FEB.2016 14:18:04

16QAM 20MHz_FULL RB Middle Channel

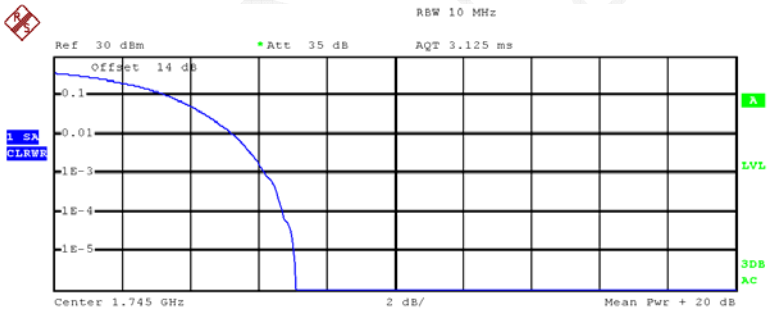


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	19.34 dBm
Peak	26.48 dBm
Crest	7.14 dB
10 %	3.40 dB
1 %	5.24 dB
.1 %	6.24 dB
.01 %	6.76 dB

Date: 22.FEB.2016 14:15:28

16QAM 20MHz_FULL RB High Channel



Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	19.16 dBm
Peak	26.27 dBm
Crest	7.11 dB
10 %	3.40 dB
1 %	5.32 dB
.1 %	6.24 dB
.01 %	6.72 dB

Date: 22.FEB.2016 14:14:22

ERP & EIRP

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	105.39	30.5	0.0	1.0	29.5	38.50	9.0
836.600	V	104.77	33	0.0	1.0	32.0	38.50	6.5
WCDMA Band V Middle Channel								
836.600	H	96.16	21.2	0.0	1.0	20.2	38.5	18.3
836.600	V	95.24	23.4	0.0	1.0	22.4	38.5	16.1

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	91.61	20	11.7	1.4	30.3	33.0	2.7
1880.000	V	88.87	17.4	11.7	1.4	27.7	33.0	5.3
WCDMA Band II Middle Channel								
1880.000	H	84.29	12.7	11.7	1.4	23.0	33.0	10.0
1880.000	V	81.98	10.5	11.7	1.4	20.8	33.0	12.2

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)			
LTE Band IV								
QPSK 1.4 MHz Middle Channel								
1732.500	H	86.95	13.9	10.9	1.4	23.4	30.00	6.6
1732.500	V	82.41	9.1	10.9	1.4	18.6	30.00	11.4
QPSK 3 MHz Middle Channel								
1732.500	H	85.78	12.8	10.9	1.4	22.3	30.00	7.7
1732.500	V	81.04	7.7	10.9	1.4	17.2	30.00	12.8
QPSK 5 MHz Middle Channel								
1732.500	H	84.57	11.6	10.9	1.4	21.1	30.00	8.9
1732.500	V	79.83	6.5	10.9	1.4	16.0	30.00	14.0
QPSK 10 MHz Middle Channel								
1732.500	H	83.35	10.3	10.9	1.4	19.8	30.00	10.2
1732.500	V	78.69	5.4	10.9	1.4	14.9	30.00	15.1
QPSK 15 MHz Middle Channel								
1732.500	H	82.01	9	10.9	1.4	18.5	30.00	11.5
1732.500	V	77.37	4	10.9	1.4	13.5	30.00	16.5
QPSK 20 MHz Middle Channel								
1732.500	H	80.89	7.9	10.9	1.4	17.4	30.00	12.6
1732.500	V	76.66	3.3	10.9	1.4	12.8	30.00	17.2
16QAM 1.4 MHz Middle Channel								
1732.500	H	86.72	13.7	10.9	1.4	23.2	30.00	6.8
1732.500	V	81.09	7.8	10.9	1.4	17.3	30.00	12.7
16QAM 3 MHz Middle Channel								
1732.500	H	85.66	12.7	10.9	1.4	22.2	30.00	7.8
1732.500	V	80.84	7.5	10.9	1.4	17.0	30.00	13.0
16QAM 5 MHz Middle Channel								
1732.500	H	84.51	11.5	10.9	1.4	21.0	30.00	9.0
1732.500	V	79.77	6.4	10.9	1.4	15.9	30.00	14.1
16QAM 10 MHz Middle Channel								
1732.500	H	83.34	10.3	10.9	1.4	19.8	30.00	10.2
1732.500	V	78.58	5.3	10.9	1.4	14.8	30.00	15.2
16QAM 15 MHz Middle Channel								
1732.500	H	82.19	9.2	10.9	1.4	18.7	30.00	11.3
1732.500	V	77.76	4.4	10.9	1.4	13.9	30.00	16.1
16QAM 20 MHz Middle Channel								
1732.500	H	81.36	8.4	10.9	1.4	17.9	30.00	12.1
1732.500	V	77.05	3.7	10.9	1.4	13.2	30.00	16.8

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

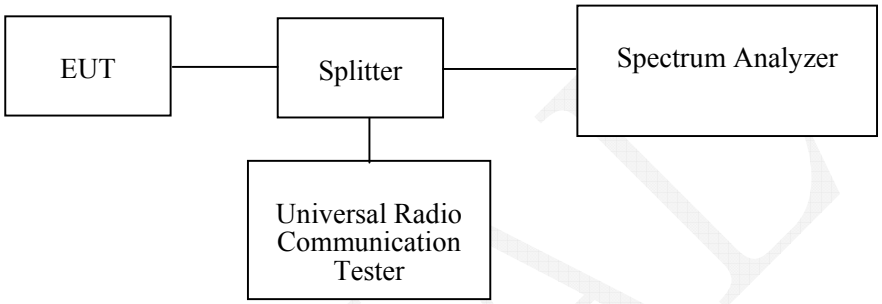
Applicable Standard

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	Spectrum Analyzer	FSEM	831259/019	2015-05-09	2016-05-09
R&S	Universal Radio Communication Tester	CMU200	109 038	2015-05-09	2016-05-09
R&S	Wideband Radio Communication Tester	CMW500	106891	2015-11-23	2016-11-23
N/A	Coaxial Cable	0.1m	N/A	2015-05-06	2016-05-06
E-Microwave	DC Blocking	EMDCB-00036	0E01201047	2015-05-06	2016-05-06
E-Microwave	Attenuator(10dB)	EMCA10-5RN	OE01203239	2015-05-08	2016-05-08
Pasternack	RF Coaxial Cable	RF-01	N/A	2015-05-06	2016-05-06
Pasternack	RF Coaxial Cable	RF-02	N/A	2015-05-06	2016-05-06
N/A	Two-way Spliter	ODP-1-6-2S	OE0120142	2015-05-06	2016-05-06

*** 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:	24.6 ~ 26.3 °C
Relative Humidity:	26.3 ~ 44 %
ATM Pressure:	101.4 ~ 101.7 kPa

The testing was performed by Allen Qiao from 2016-02-22 to 2016-02-23.

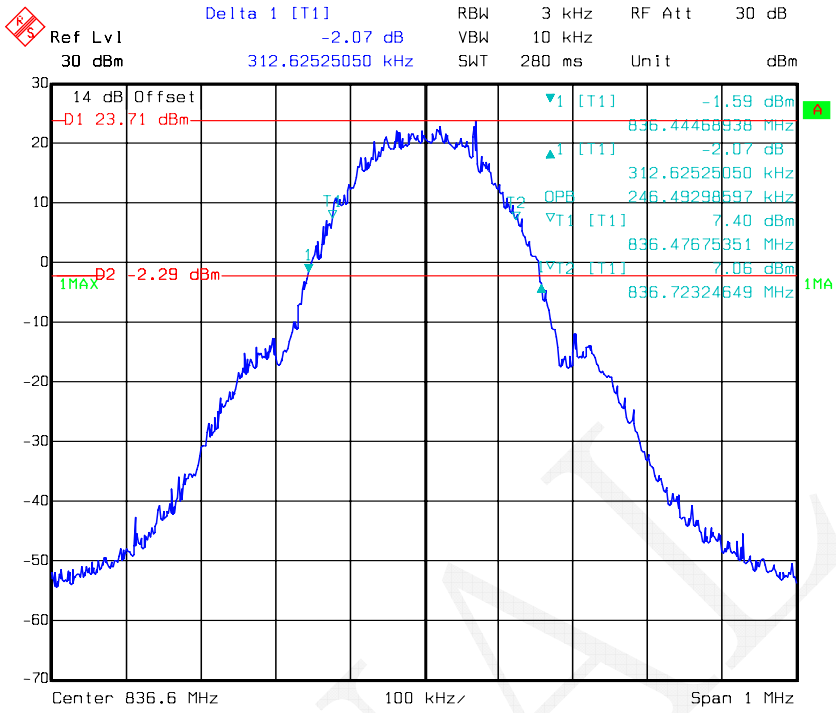
Test Mode: Transmitting

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

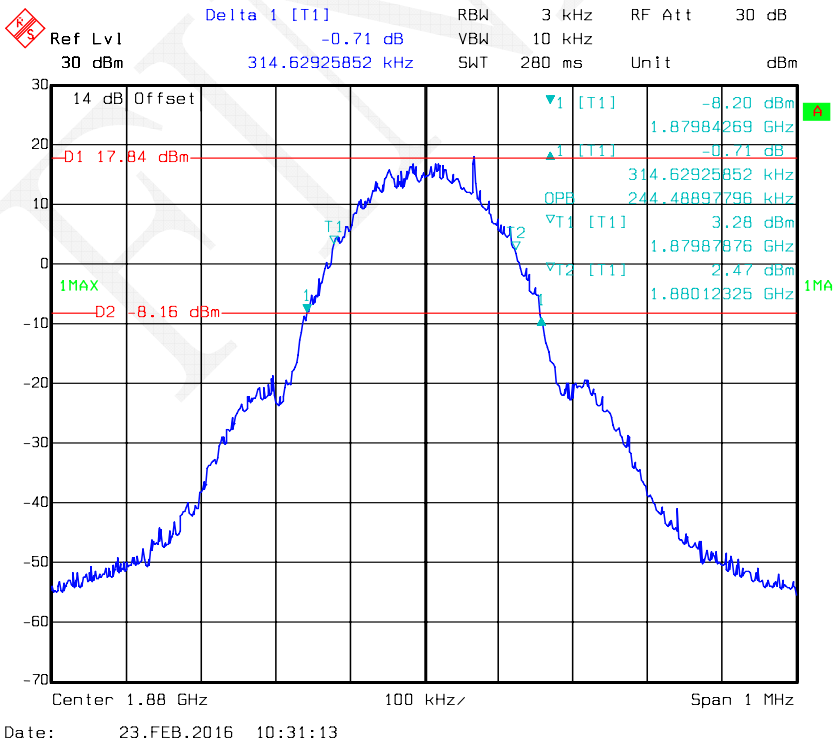
Band	Channel No.	Mode	99% Occupied Bandwidth (kHz)	26 dB Occupied Bandwidth (kHz)
Cellular	190	GSM	246.49	312.63
PCS	661	PCS	244.49	314.63
WCDMA Band Ⅱ	9400	Rel 99	4228.46	4949.90
	9400	HSDPA	4228.46	4929.86
	9400	HSUPA	4228.46	4909.82
WCDMA Band V	4183	Rel 99	4228.46	4929.86
	4183	HSDPA	4228.46	4929.86
	4183	HSUPA	4228.46	4909.81

Band	Test Modulation	Test Bandwidth (MHz)	Test Channel	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
LTE Band IV	QPSK	1.4	M	1.106	1.293
		3		2.765	3.111
		5		4.549	5.055
		10		9.138	10.336
		15		13.587	15.09
		20		18.116	20.07
	16QAM	1.4	M	1.094	1.274
		3		2.765	3.123
		5		4.529	5.115
		10		9.098	10.256
		15		13.587	14.970
		20		18.196	20.150

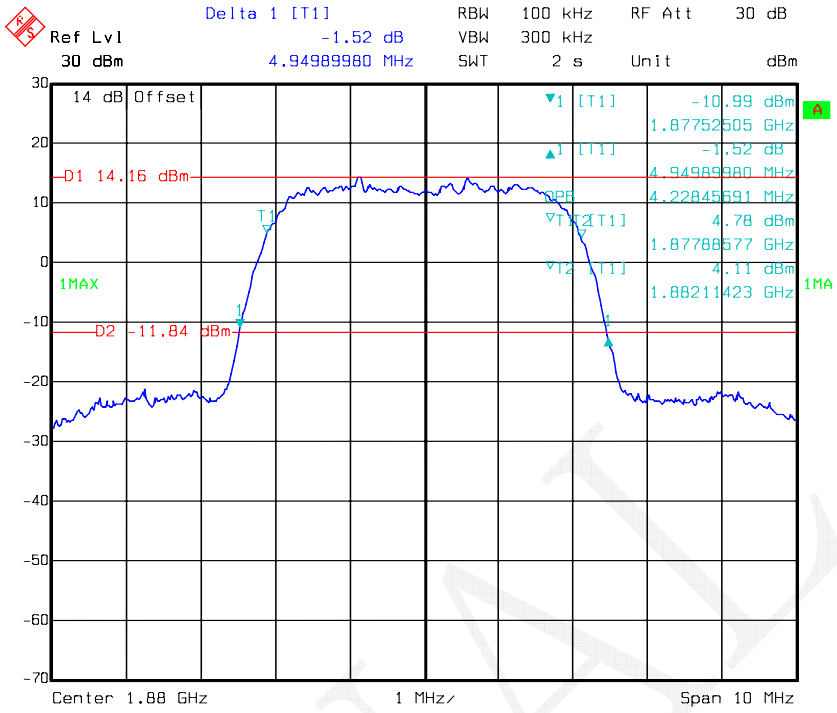
GMSK 850 Cellular Band



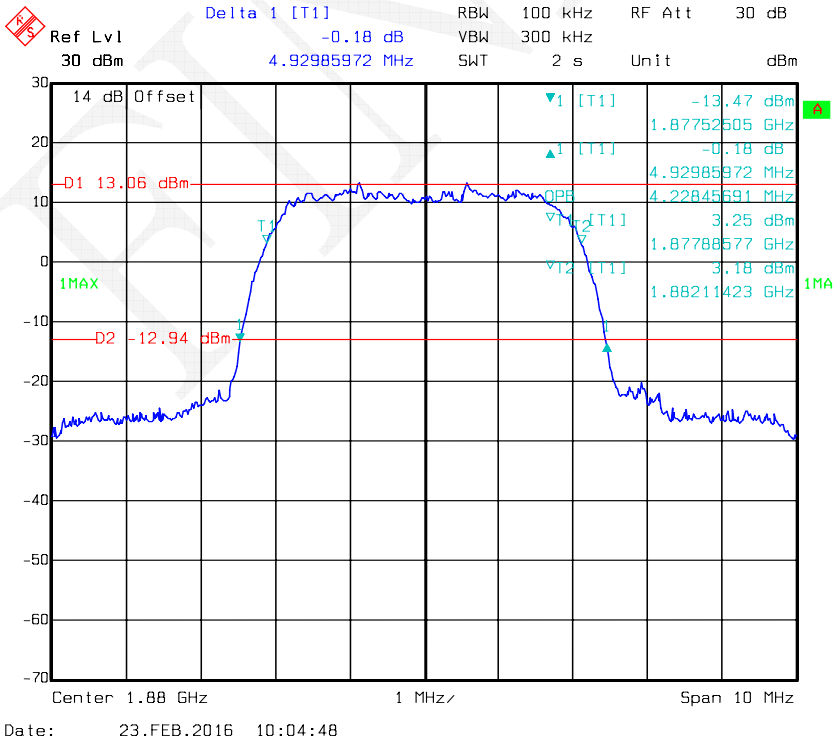
GMSK PCS Band



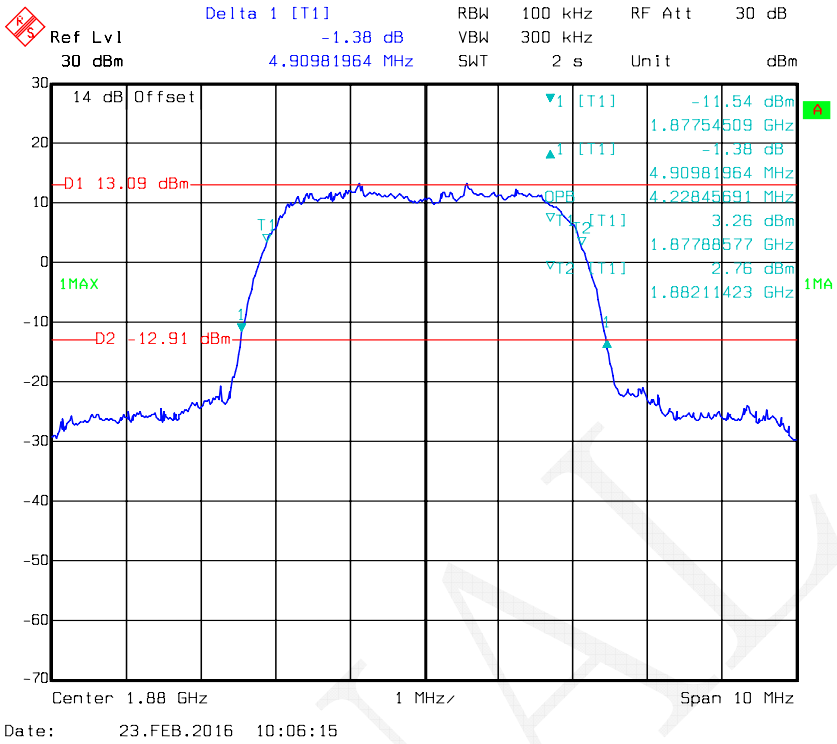
REL99 Band II



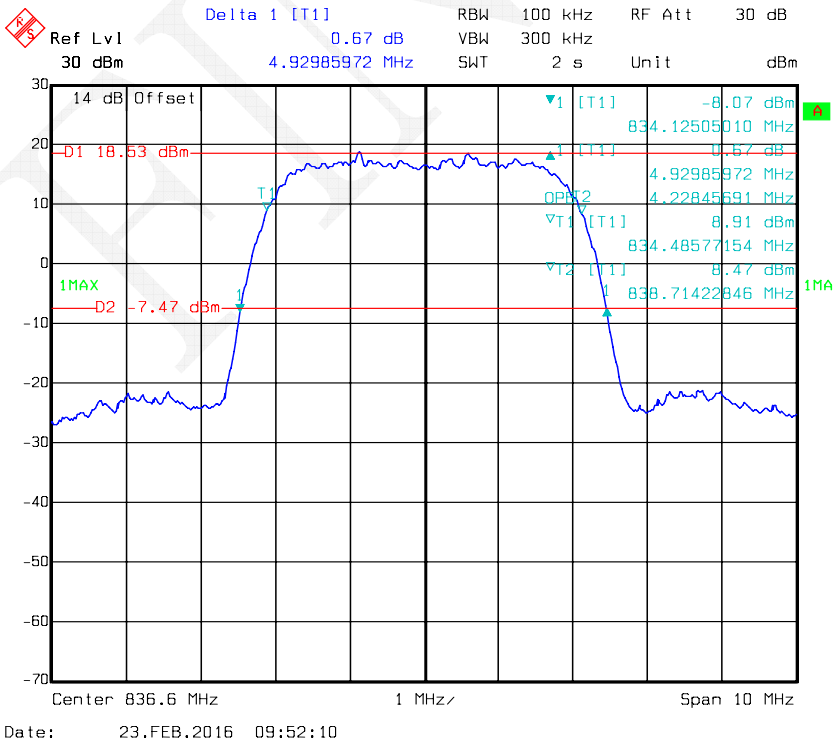
HSDPA Band II



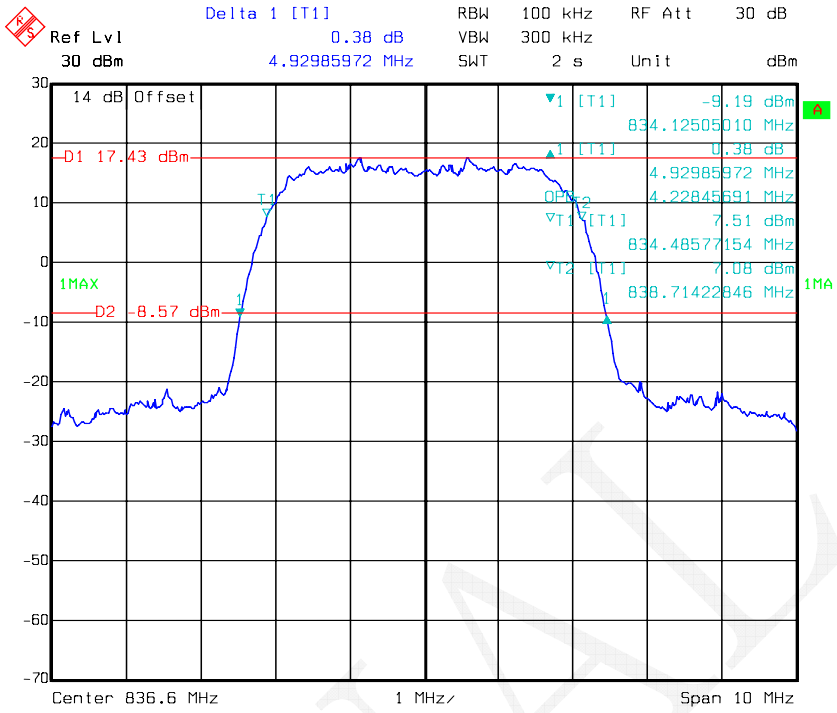
HSUPA Band II



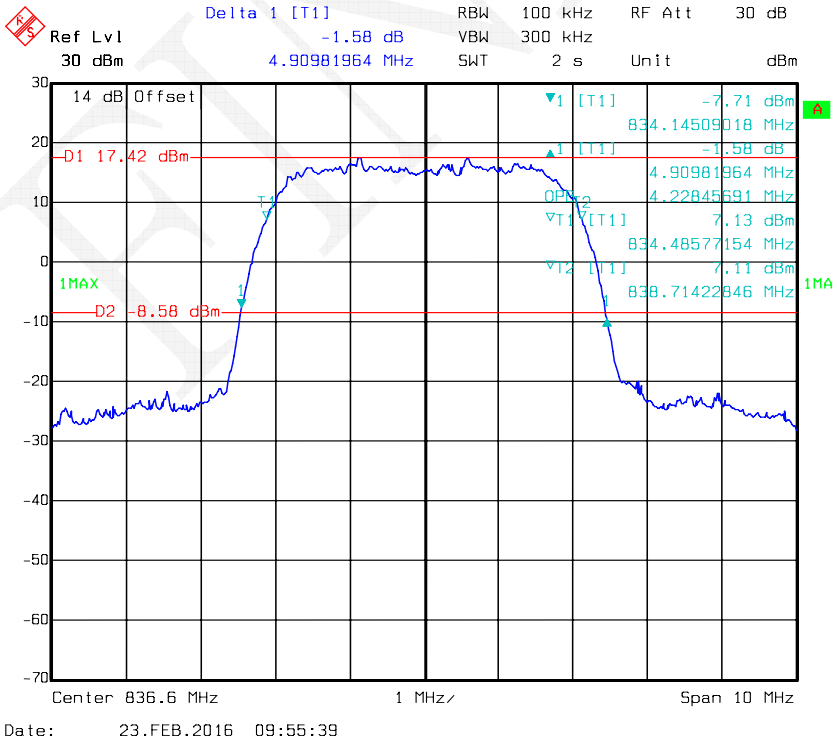
REL99 Band V



HSDPA Band V

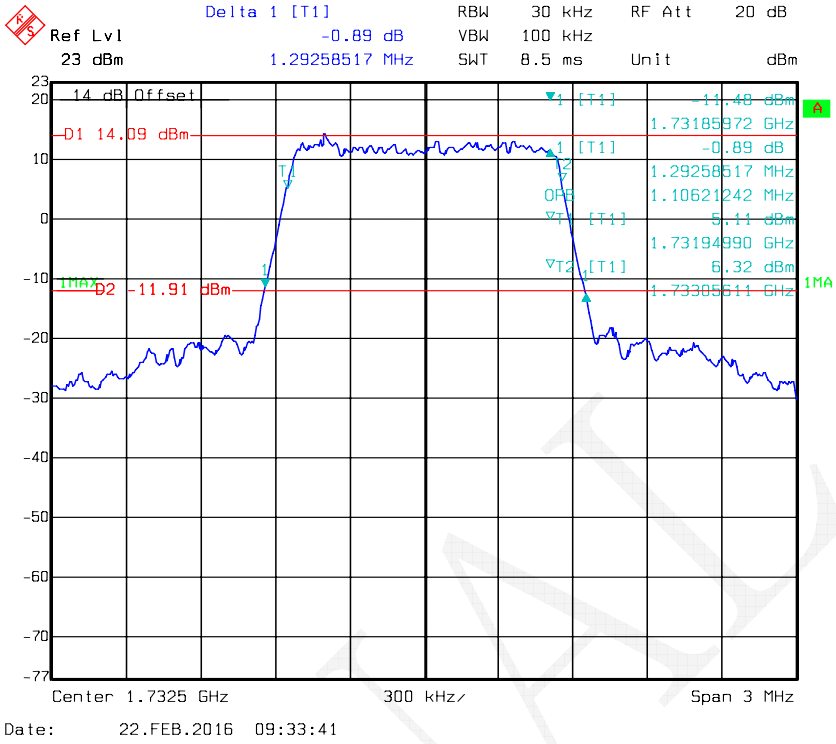


HSUPA Band V

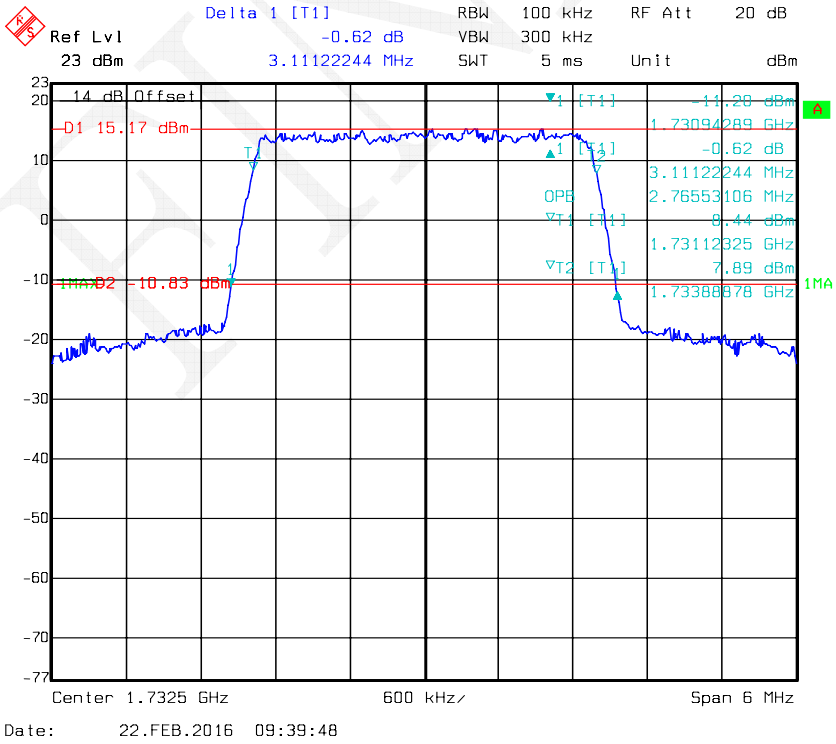


LTE Band IV

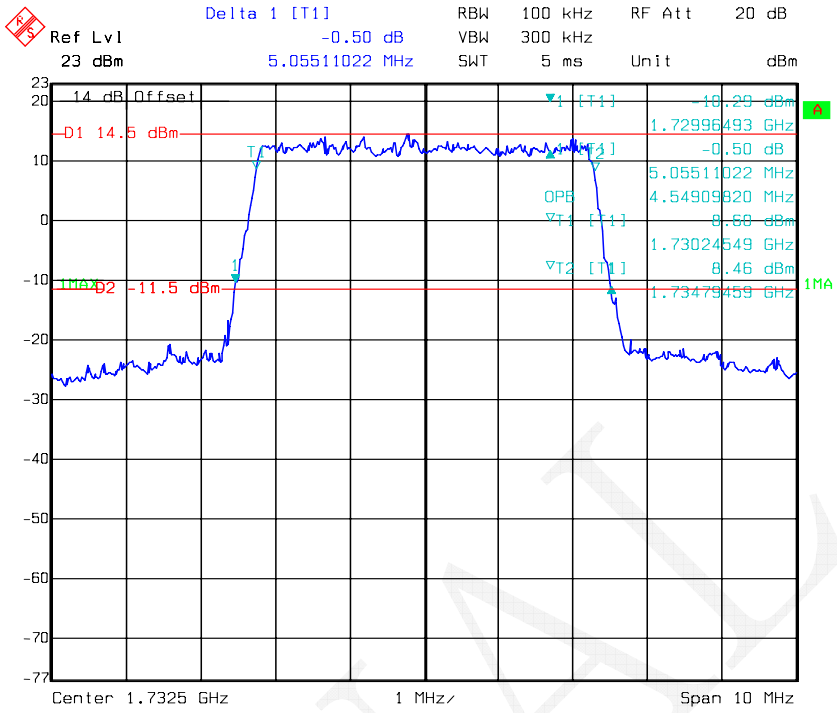
QPSK_1.4 MHz



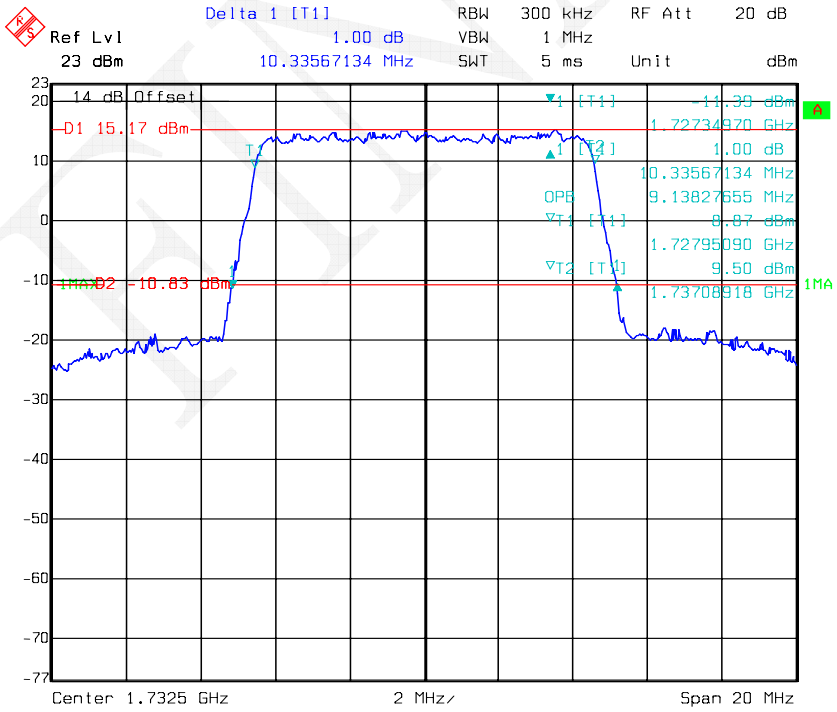
QPSK_3 MHz



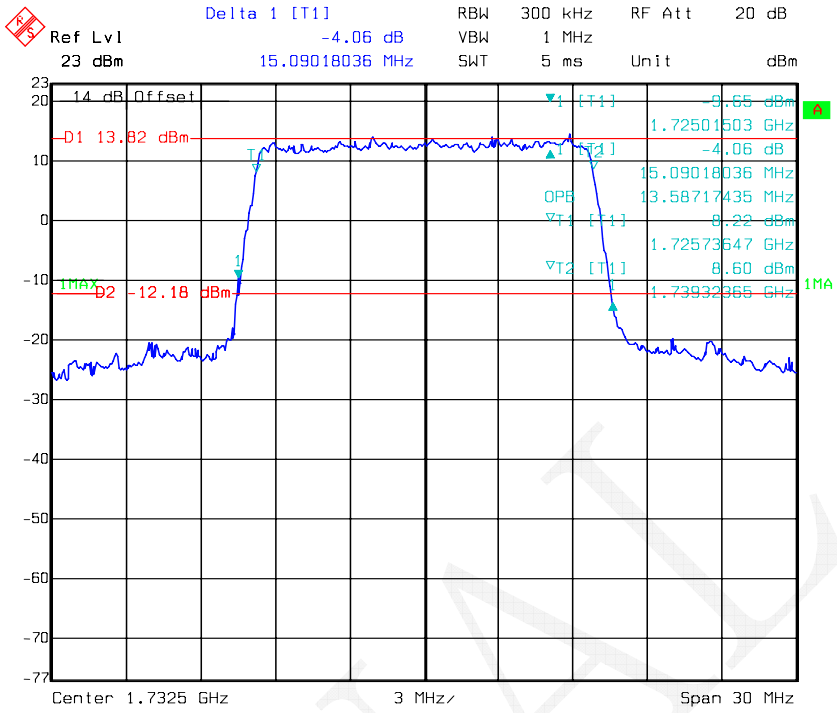
QPSK_5 MHz



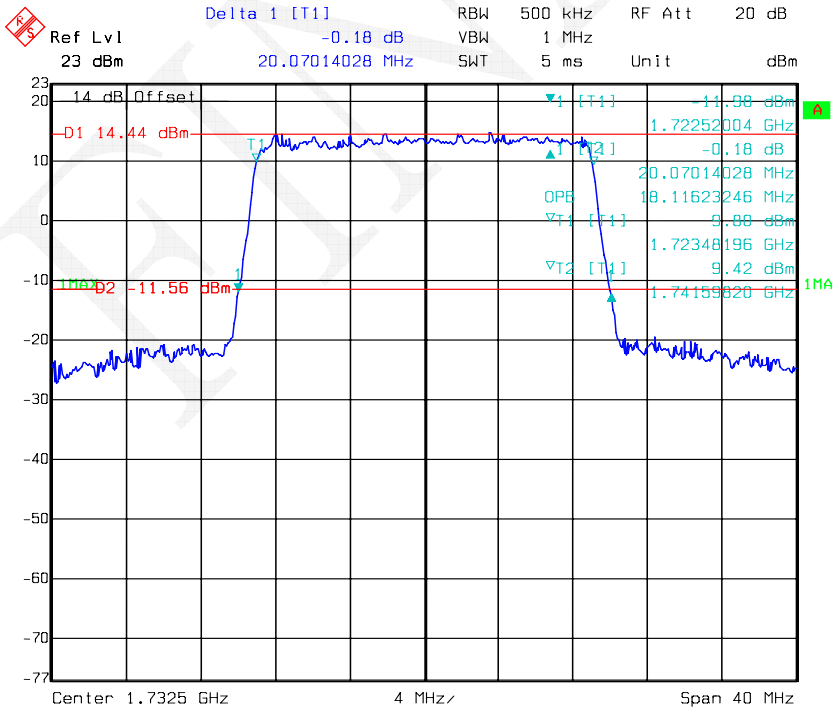
QPSK_10 MHz



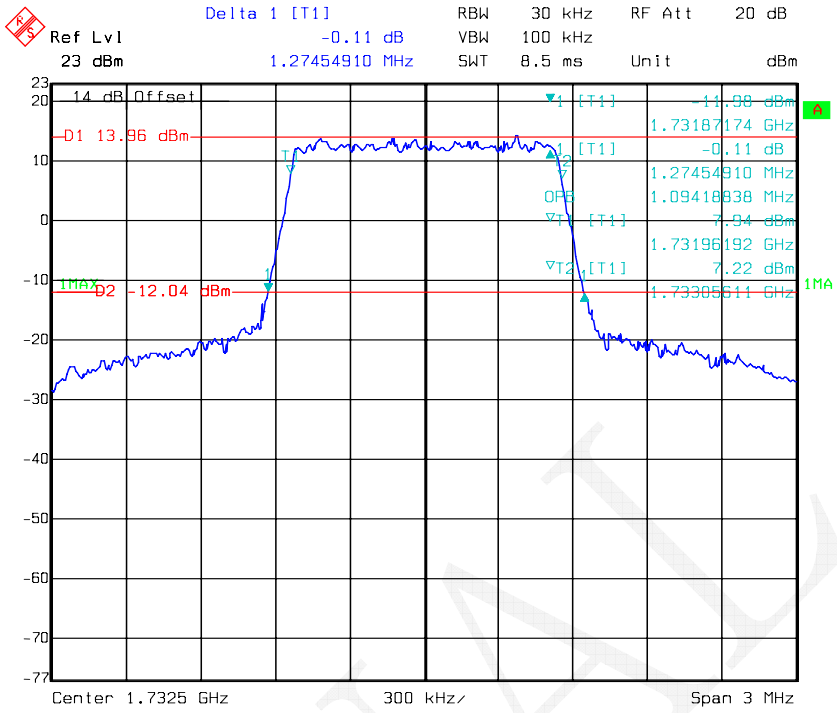
QPSK_15 MHz



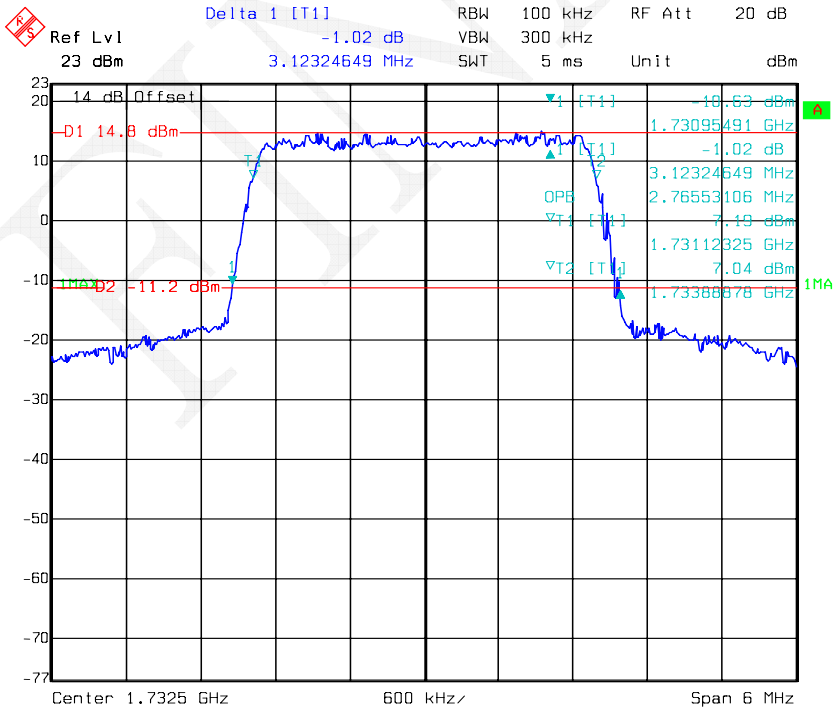
QPSK_20 MHz



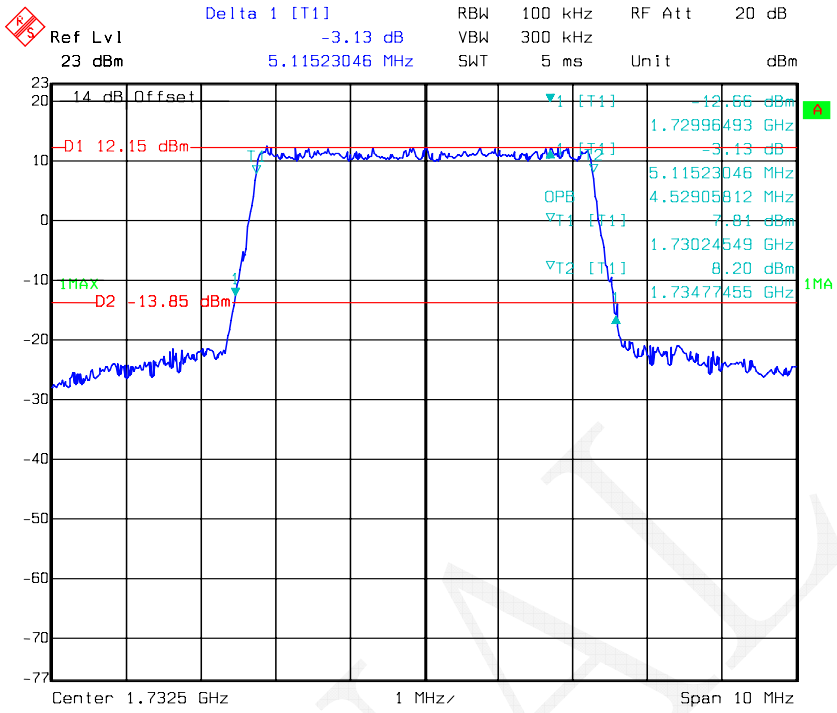
16QAM_1.4 MHz



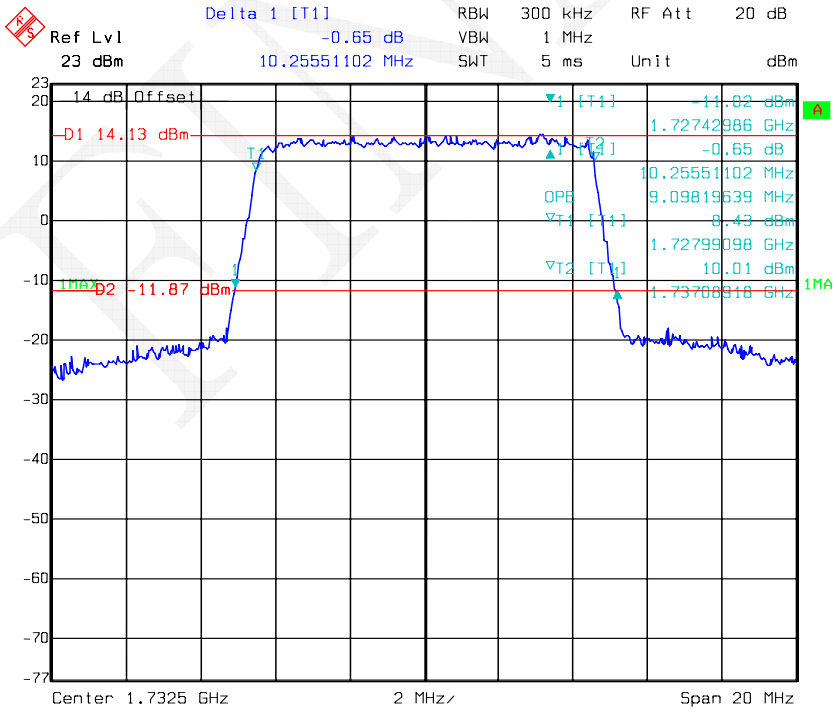
16QAM_3 MHz



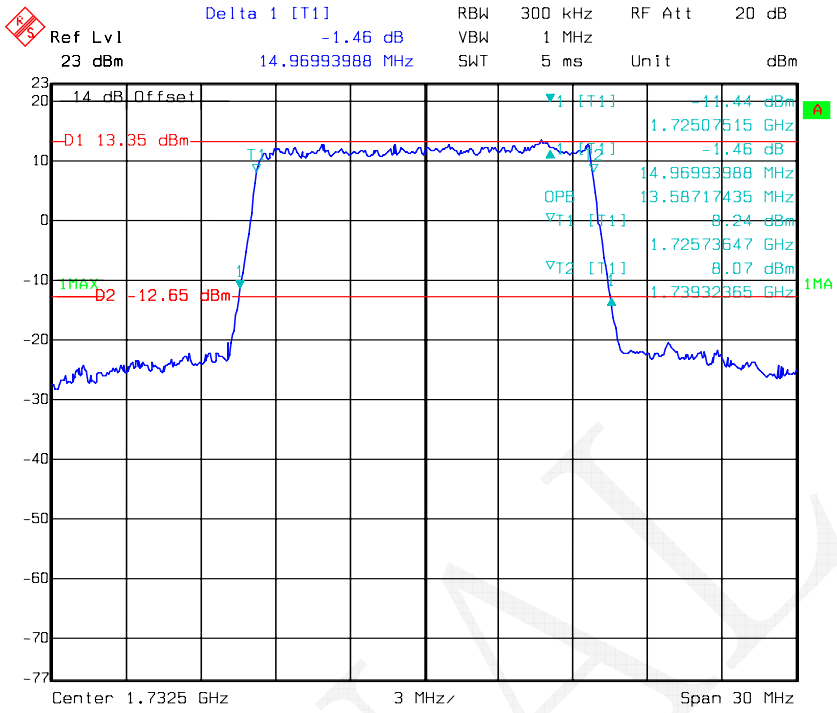
16QAM_5 MHz



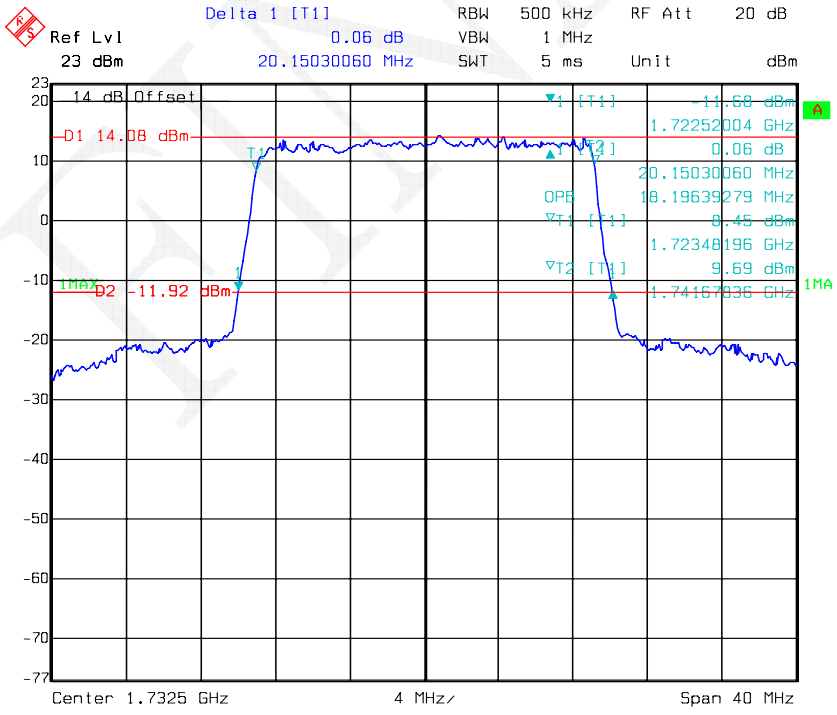
16QAM_10 MHz



16QAM_15 MHz



16QAM_20 MHz



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

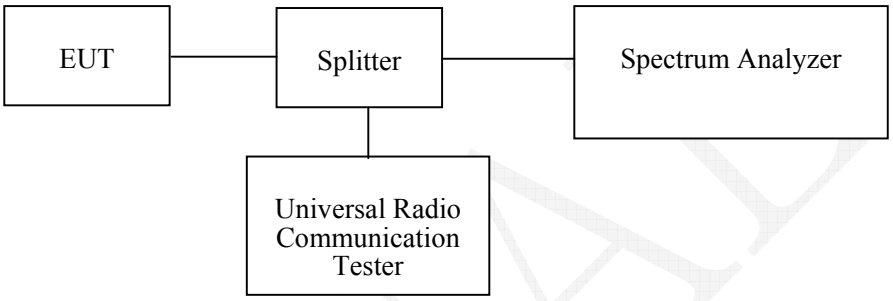
Applicable Standard

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	Spectrum Analyzer	FSEM	831259/019	2015-05-09	2016-05-09
R&S	Universal Radio Communication Tester	CMU200	109 038	2015-05-09	2016-05-09
R&S	Wideband Radio Communication Tester	CMW500	106891	2015-11-23	2016-11-23
N/A	Coaxial Cable	0.1m	N/A	2015-05-06	2016-05-06
E-Microwave	DC Blocking	EMDCB-00036	0E01201047	2015-05-06	2016-05-06
E-Microwave	Attenuator(10dB)	EMCA10-5RN	OE01203239	2015-05-08	2016-05-08
Pasternack	RF Coaxial Cable	RF-01	N/A	2015-05-06	2016-05-06
Pasternack	RF Coaxial Cable	RF-02	N/A	2015-05-06	2016-05-06
N/A	Two-way Spliter	ODP-1-6-2S	OE0120142	2015-05-06	2016-05-06

*** 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

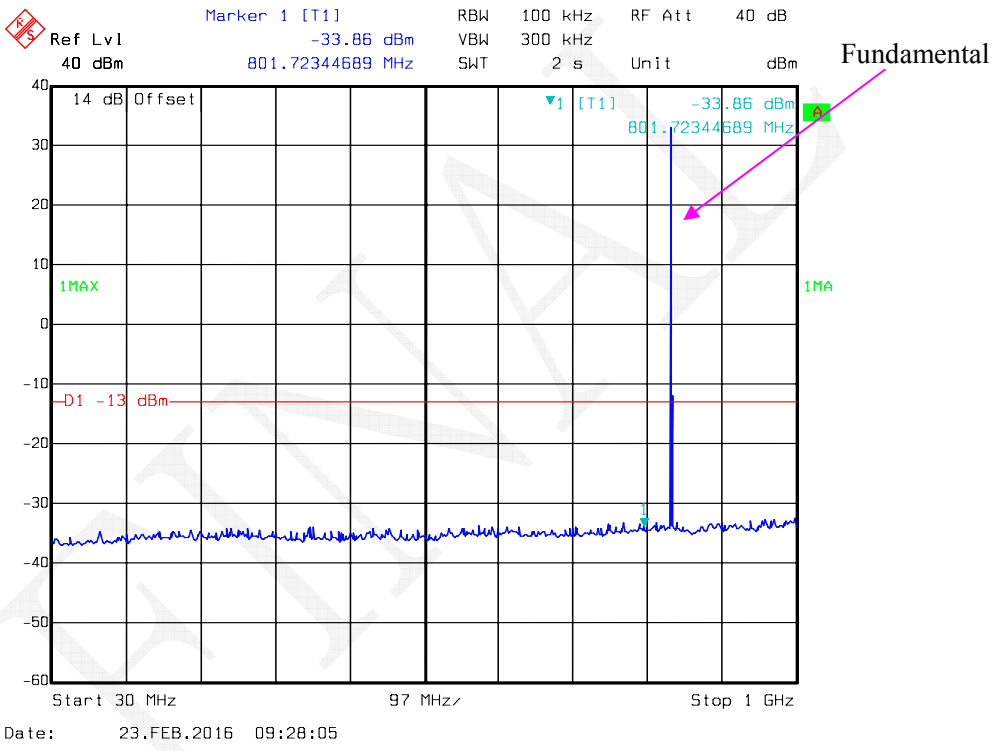
Environmental Conditions

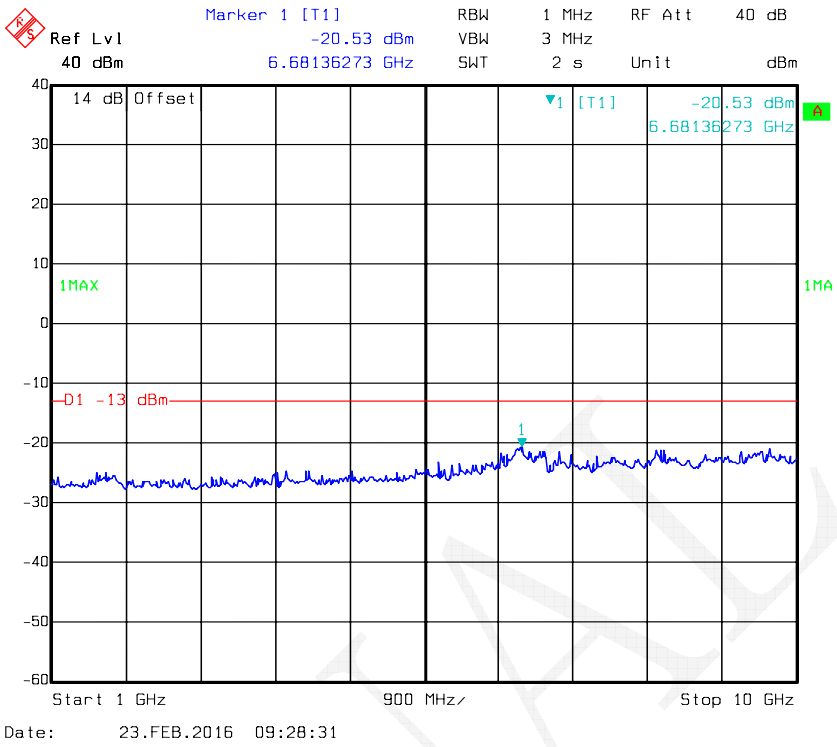
Temperature:	22.9 ~ 26.3 °C
Relative Humidity:	22.9 ~ 48 %
ATM Pressure:	101.4 ~ 101.9 kPa

The testing was performed by Allen Qiao from 2016-02-17 to 2016-02-23.

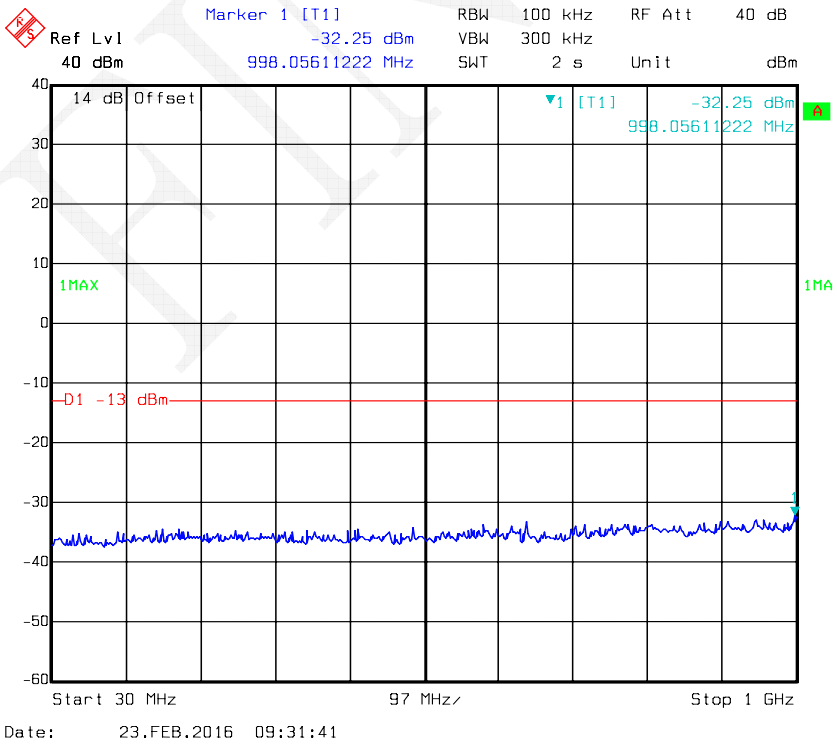
Please refer to the following plots.

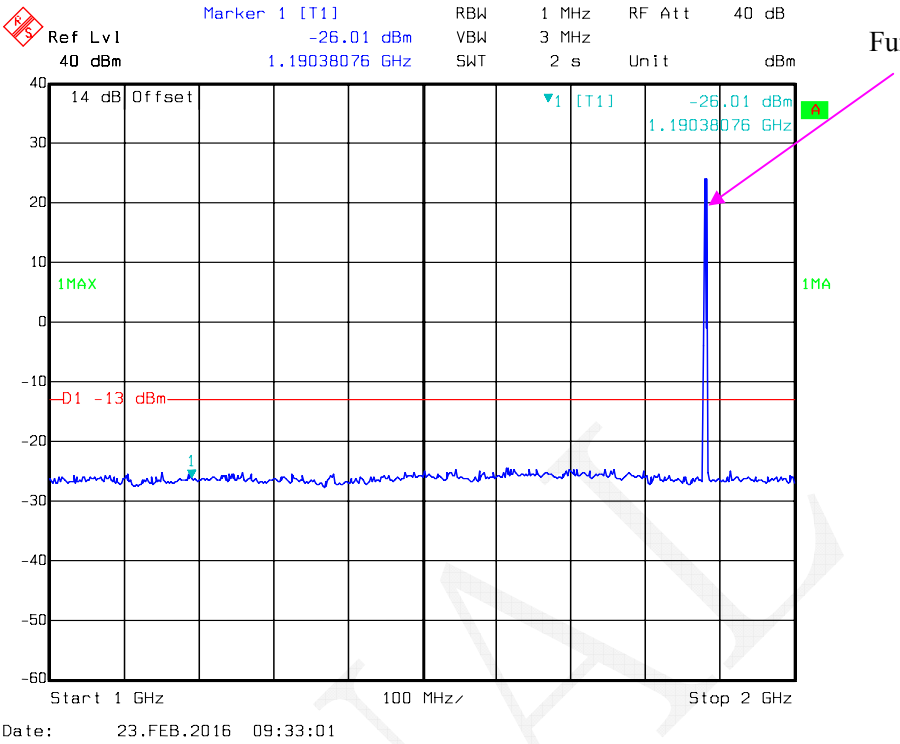
GSM850_Middle Channel

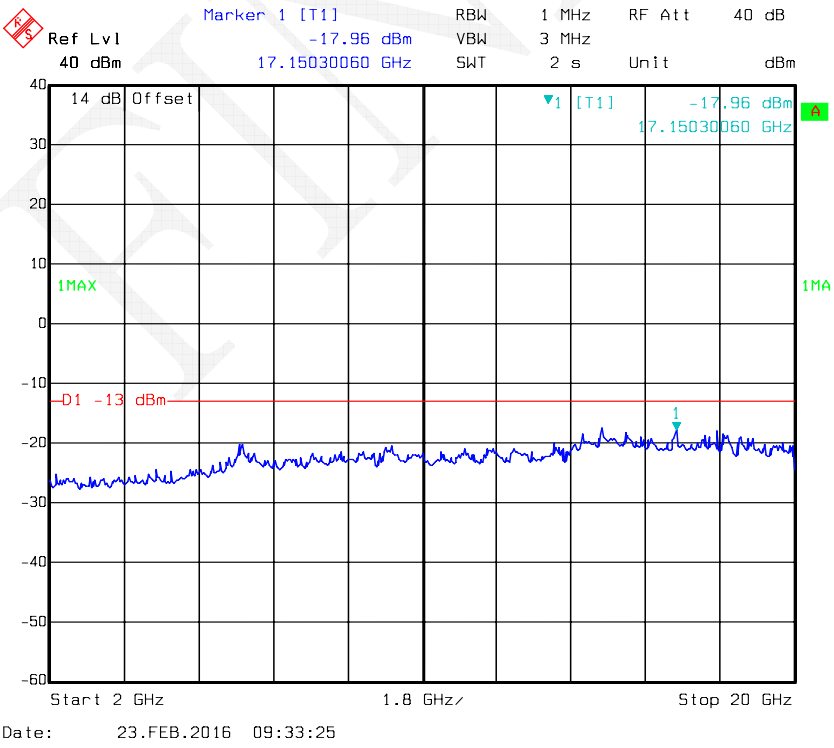




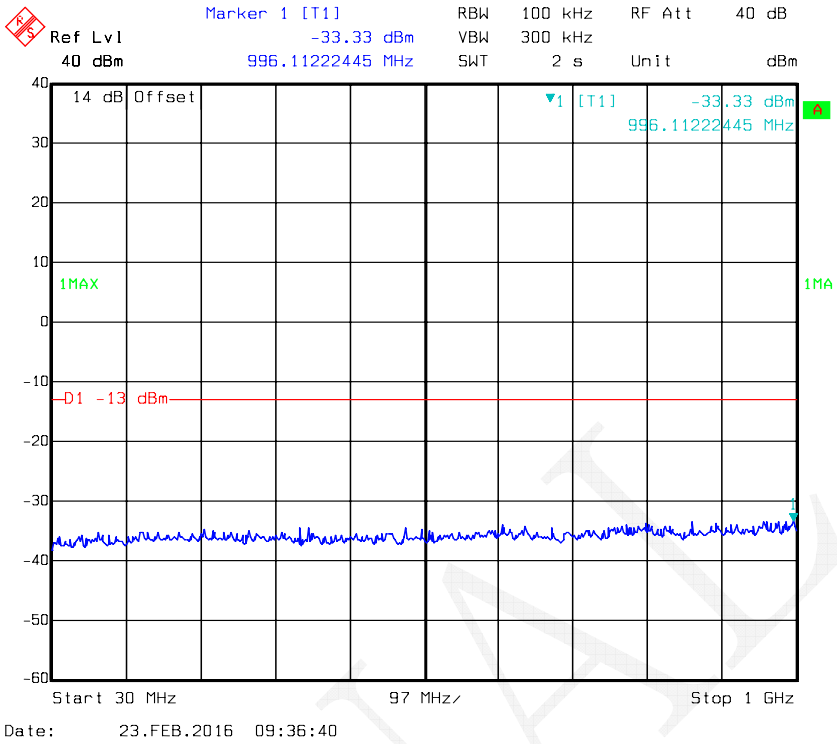
PCS 1900_ Middle Channel

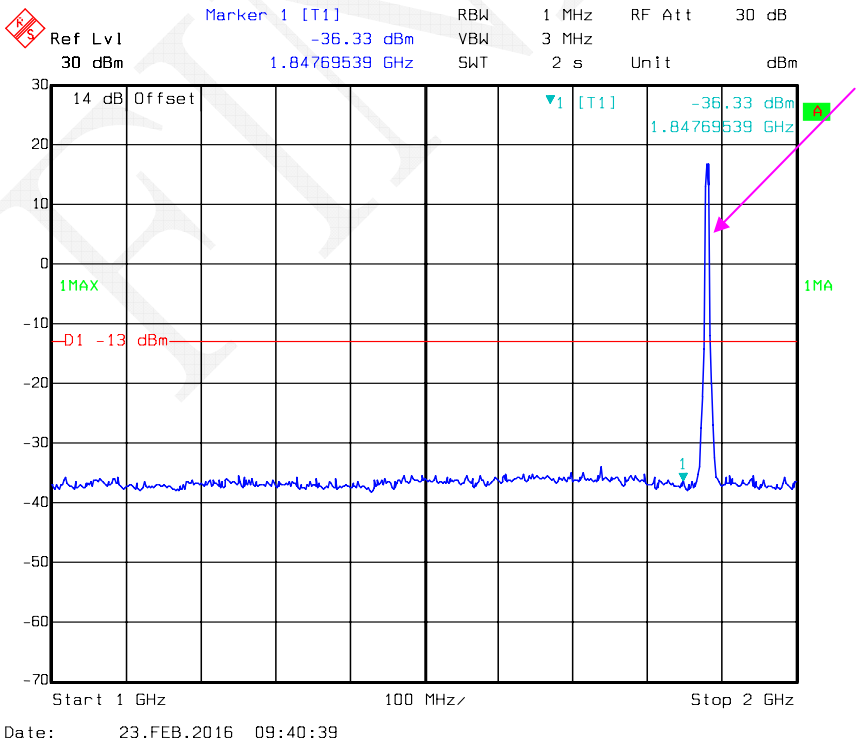



Marker 1 [T1]
-26.01 dBm
1.19038076 GHz
RBW 1 MHz
VBW 3 MHz
SWT 2 s
RF Att 40 dB
Unit dBm
Ref Lvl
40 dBm
14 dB Offset
1MAX
1MA
D1 -13 dBm
Start 1 GHz
100 MHz/
Stop 2 GHz
Date: 23.FEB.2016 09:33:01
Fundamental

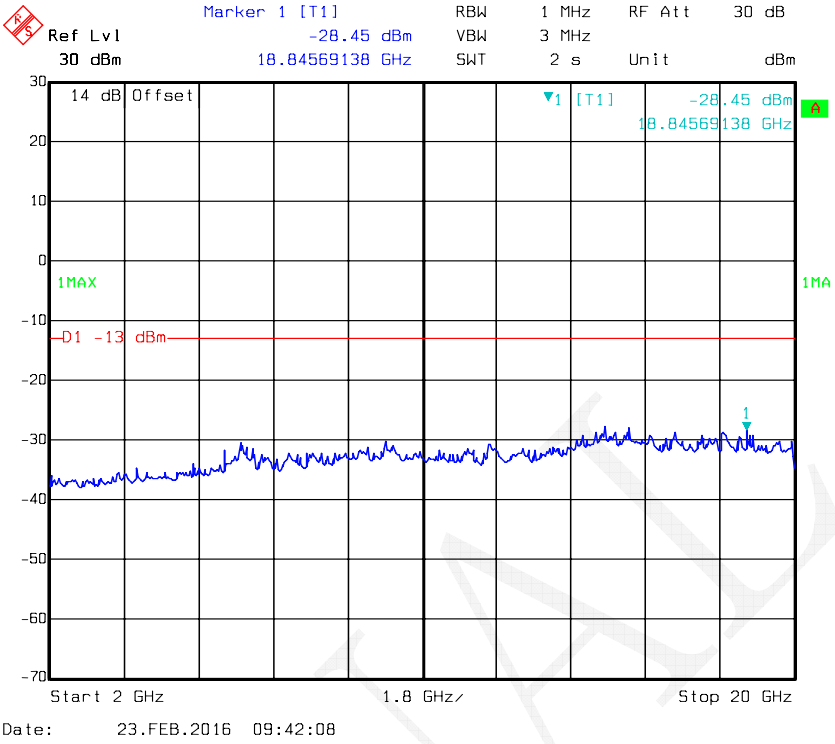

Marker 1 [T1]
-17.96 dBm
17.15030060 GHz
RBW 1 MHz
VBW 3 MHz
SWT 2 s
RF Att 40 dB
Unit dBm
Ref Lvl
40 dBm
14 dB Offset
1MAX
1MA
D1 -13 dBm
Start 2 GHz
1.8 GHz/
Stop 20 GHz
Date: 23.FEB.2016 09:33:25

REL99 Band II_ Middle Channel

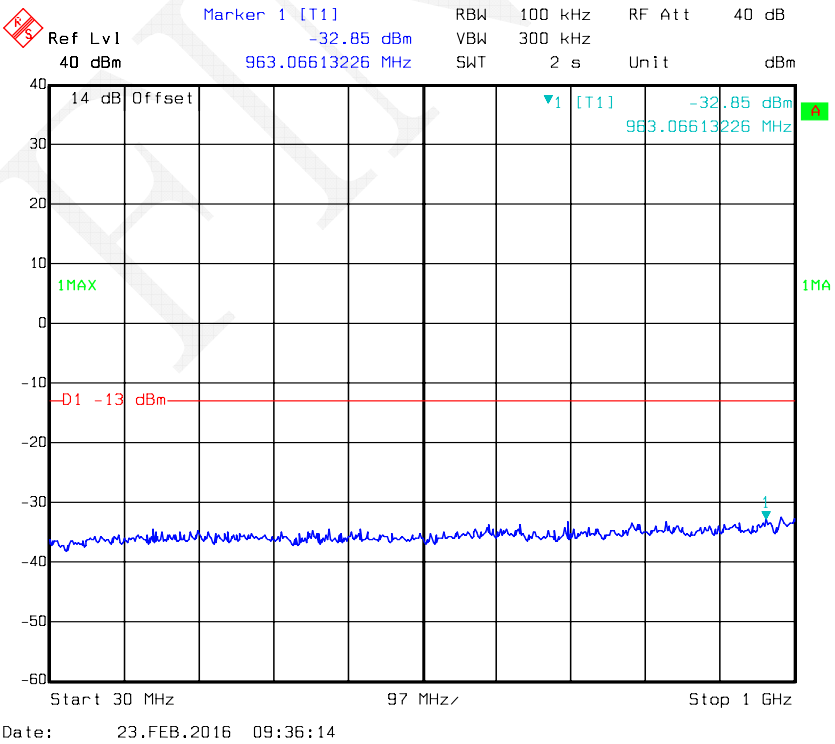


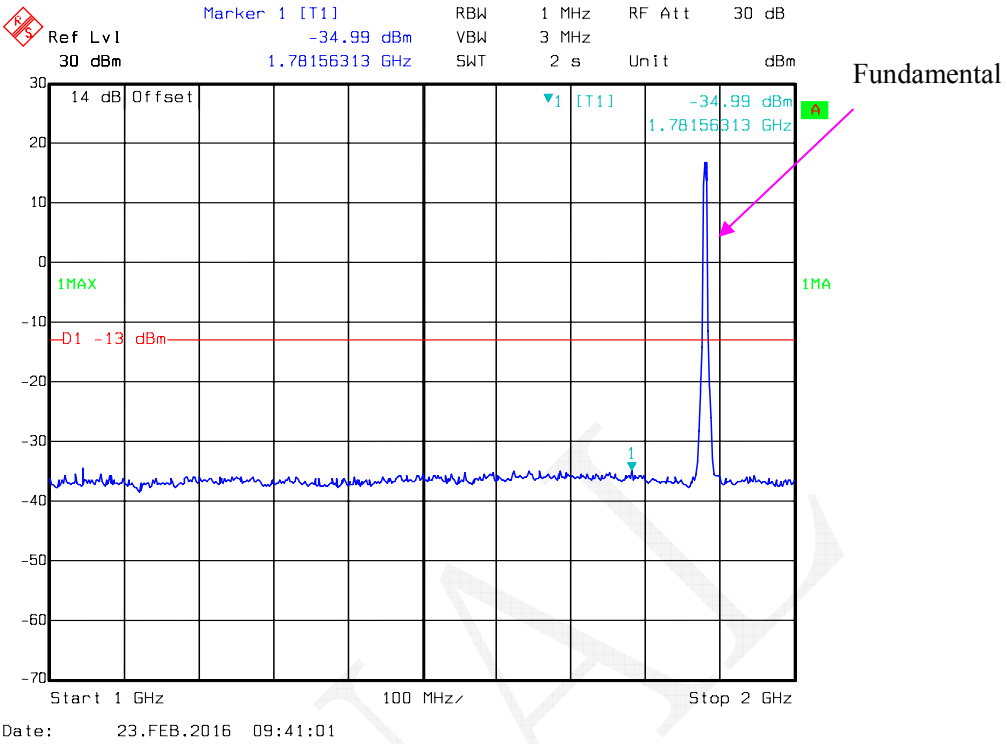


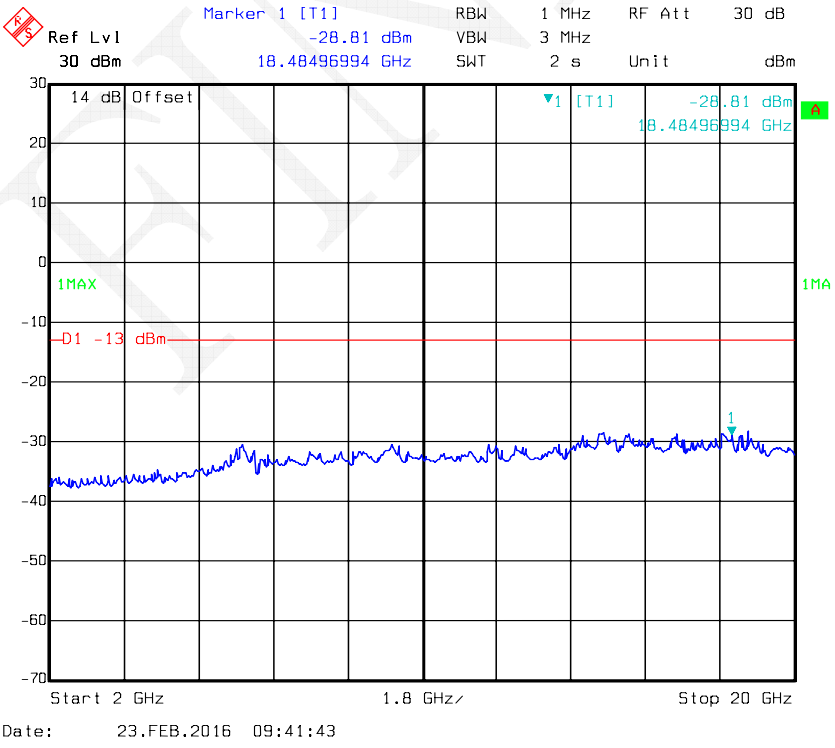
Fundamental



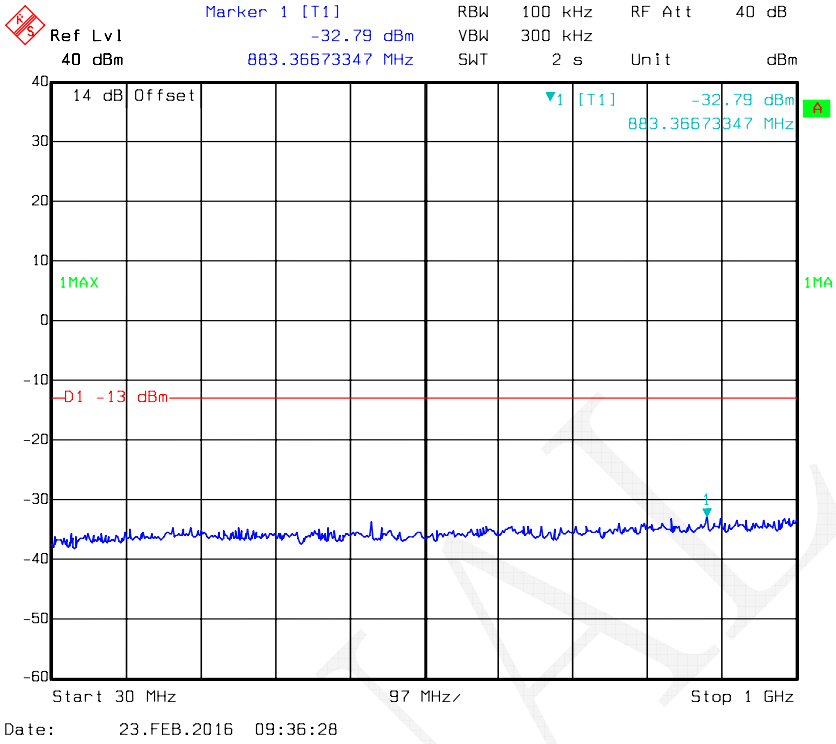
HSDPA Band II _Middle Channel

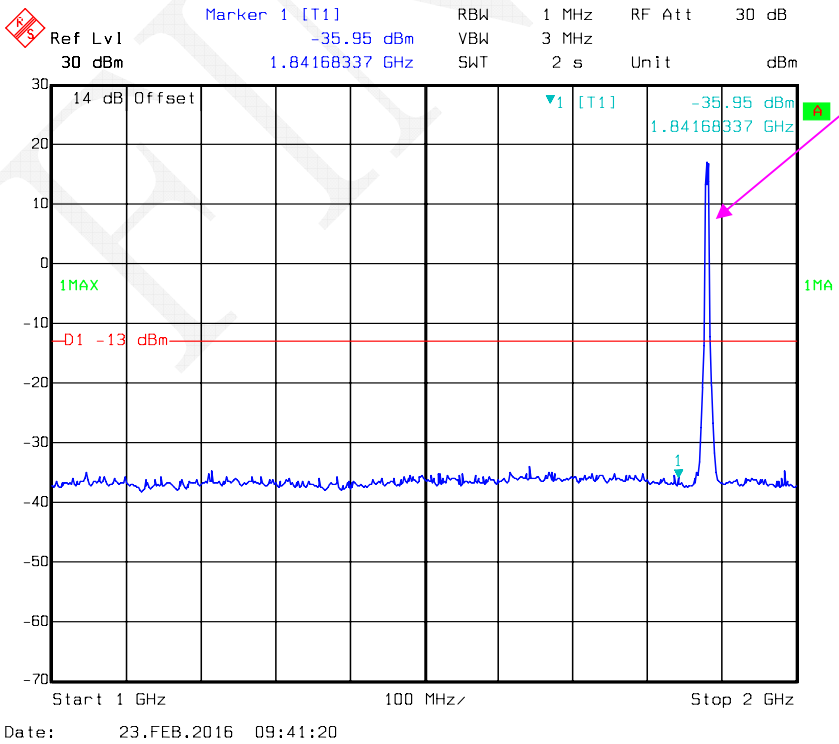



Marker 1 [T1]
-34.99 dBm
1.78156313 GHz
RBW 1 MHz
VBW 3 MHz
SWT 2 s
RF Att 30 dB
Unit dBm
Ref Lvl
30 dBm
14 dB Offset
[T1]
-34.99 dBm
1.78156313 GHz
1MAX
1MA
D1 -13 dBm
Start 1 GHz
100 MHz/
Stop 2 GHz
Date: 23.FEB.2016 09:41:01
Fundamental

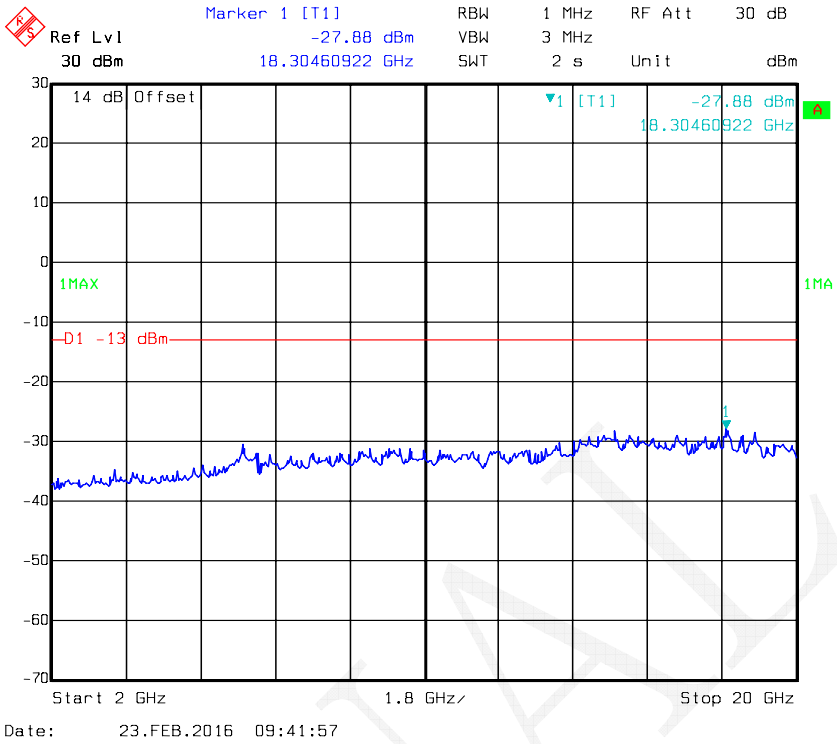

Marker 1 [T1]
-28.81 dBm
18.48496994 GHz
RBW 1 MHz
VBW 3 MHz
SWT 2 s
RF Att 30 dB
Unit dBm
Ref Lvl
30 dBm
14 dB Offset
[T1]
-28.81 dBm
18.48496994 GHz
1MAX
1MA
D1 -13 dBm
Start 2 GHz
1.8 GHz/
Stop 20 GHz
Date: 23.FEB.2016 09:41:43

HSUPA Band II _ Middle Channel

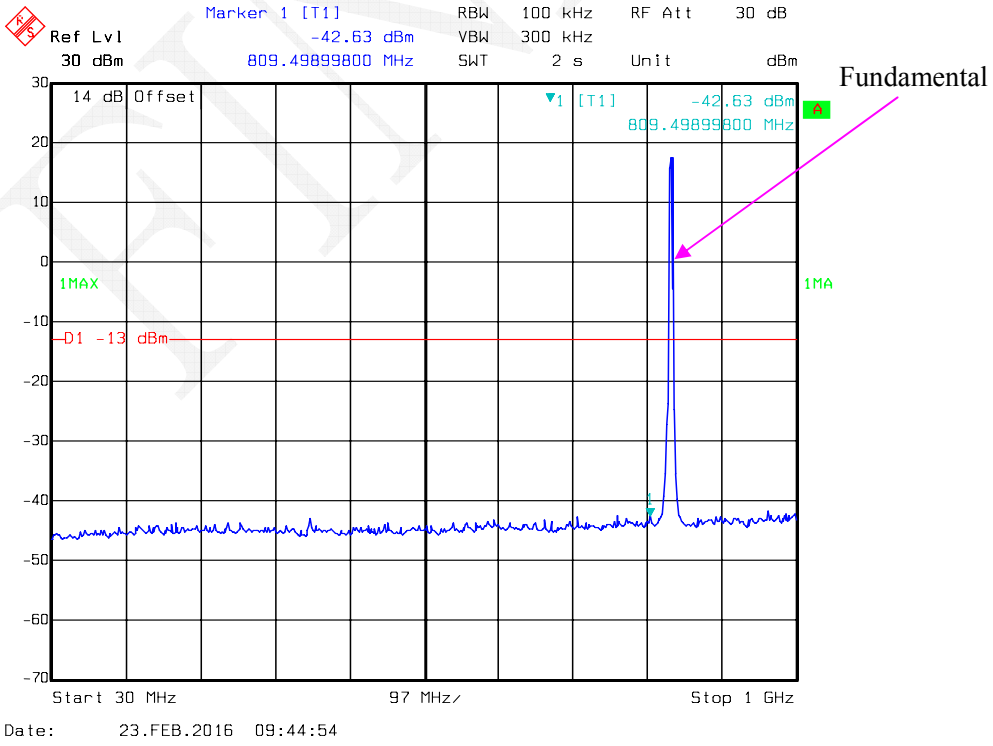


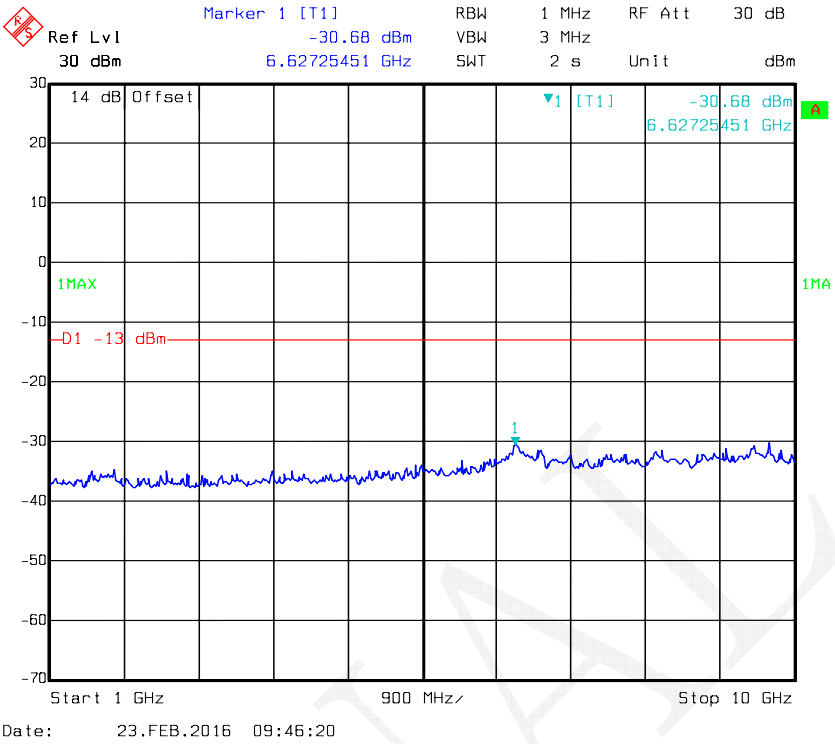


Fundamental

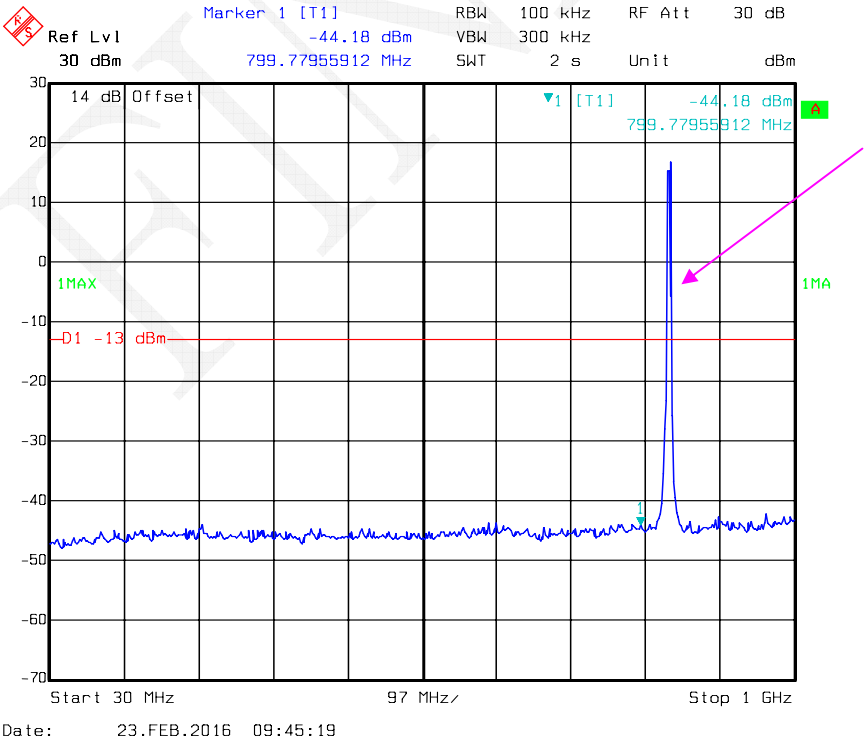


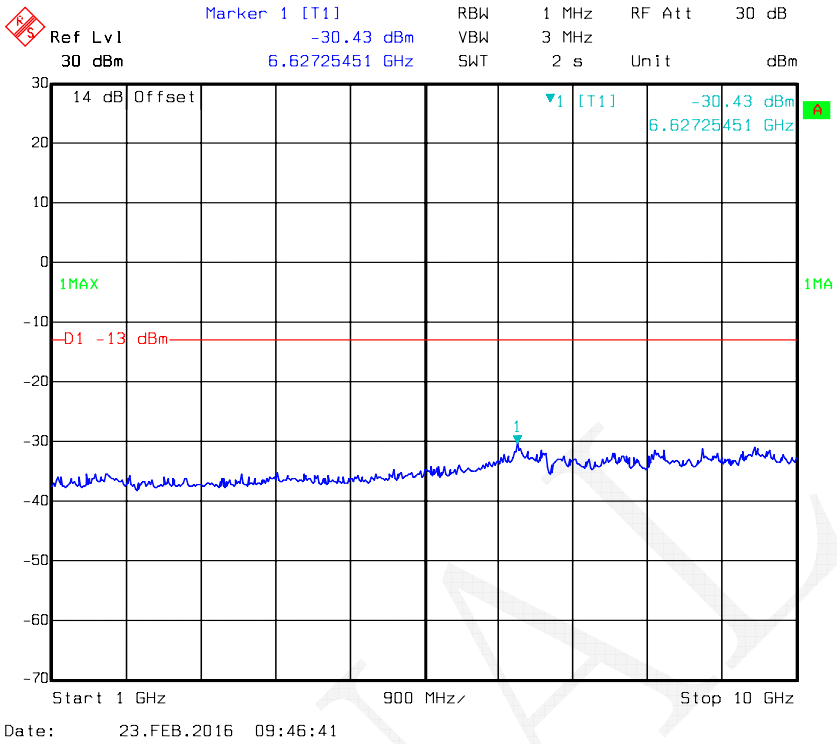
REL99 Band V_ Middle Channel



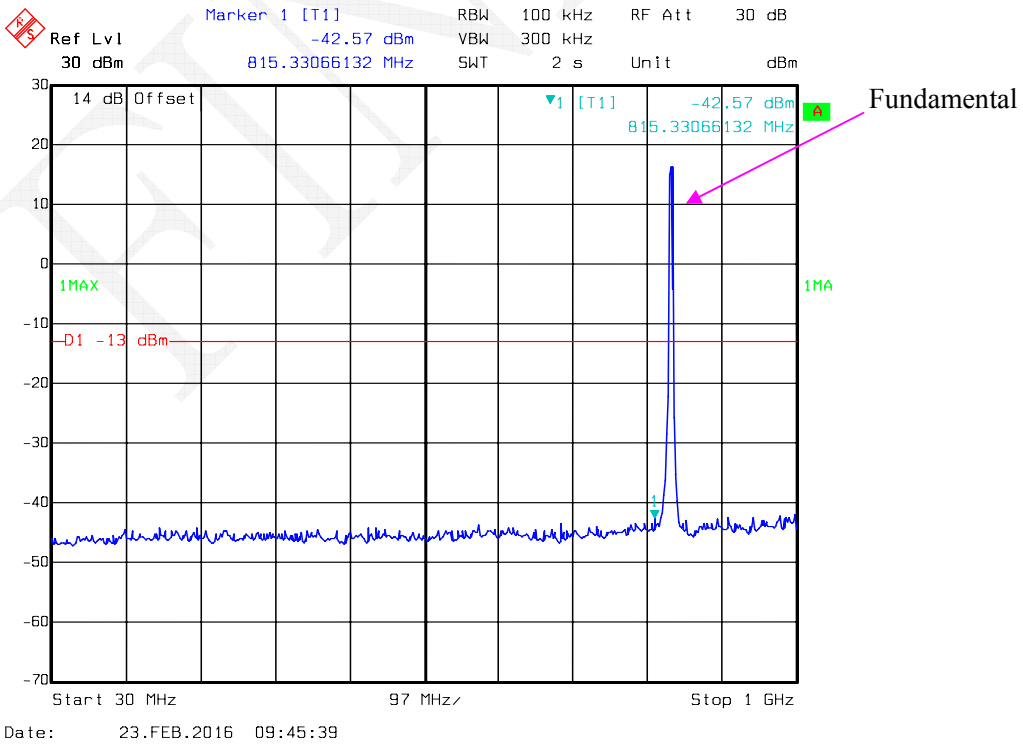


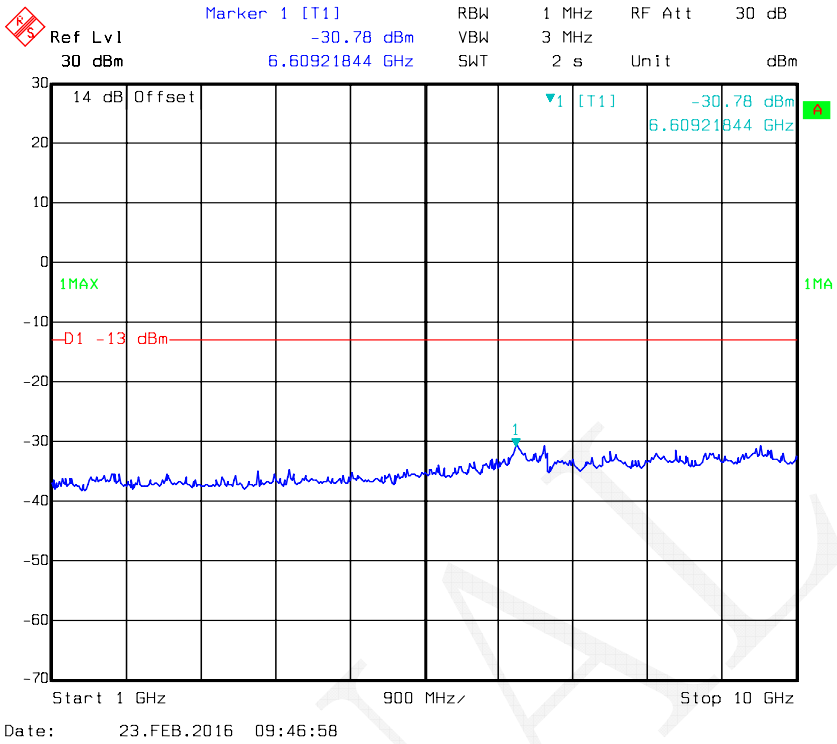
HSDPA Band V_ Middle Channel





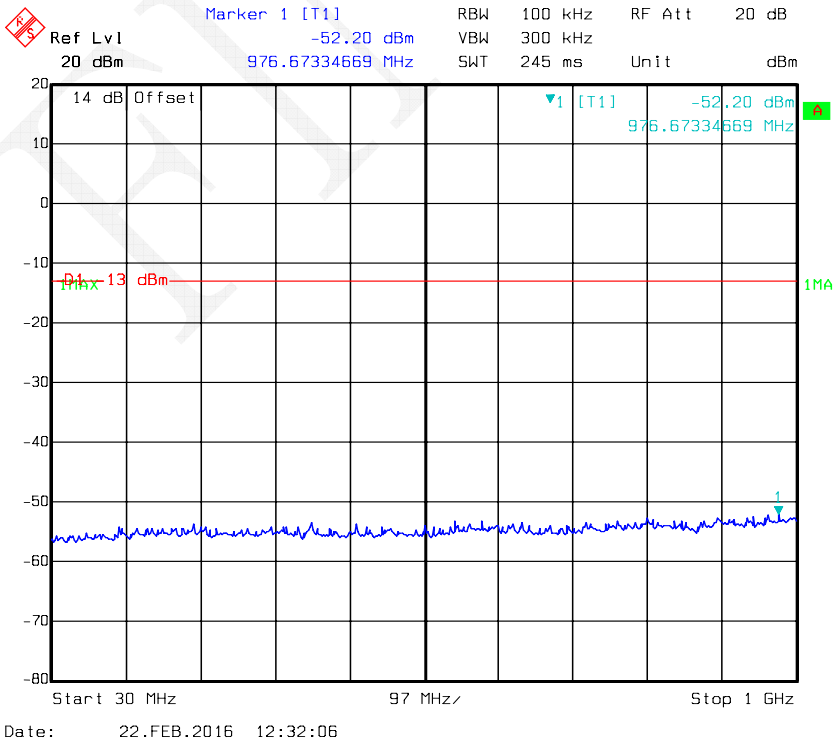
HSUPA Band V_ Middle Channel

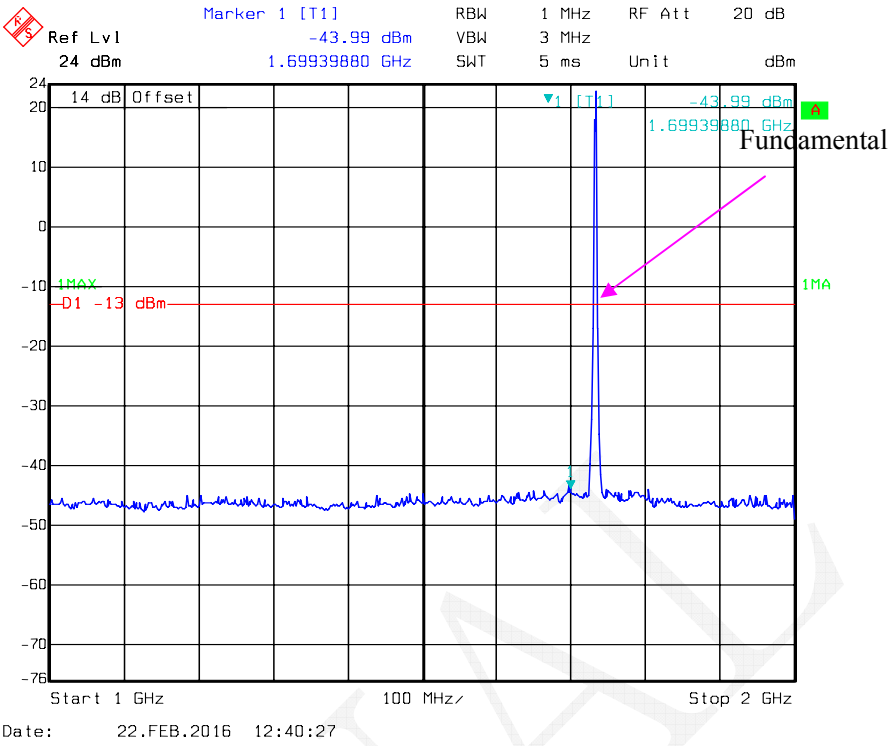


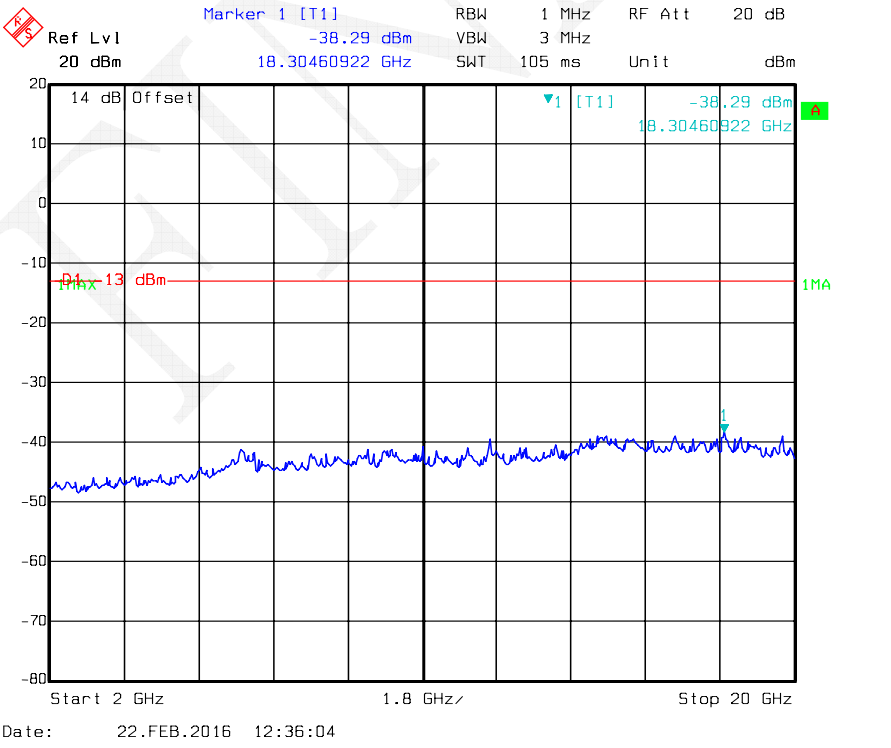


LTE Band IV (Middle Channel)

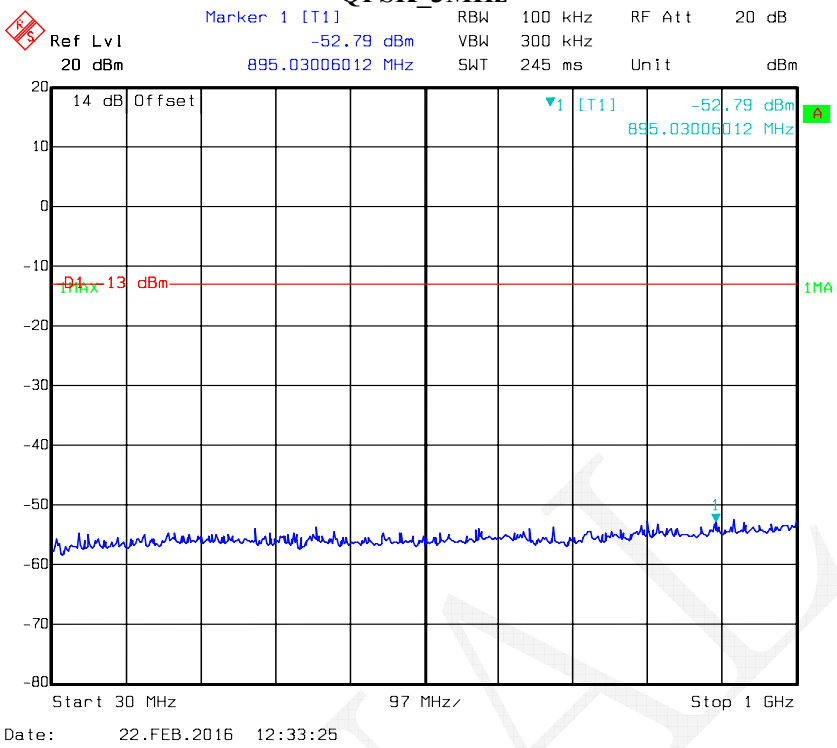
QPSK-1.4 MHz

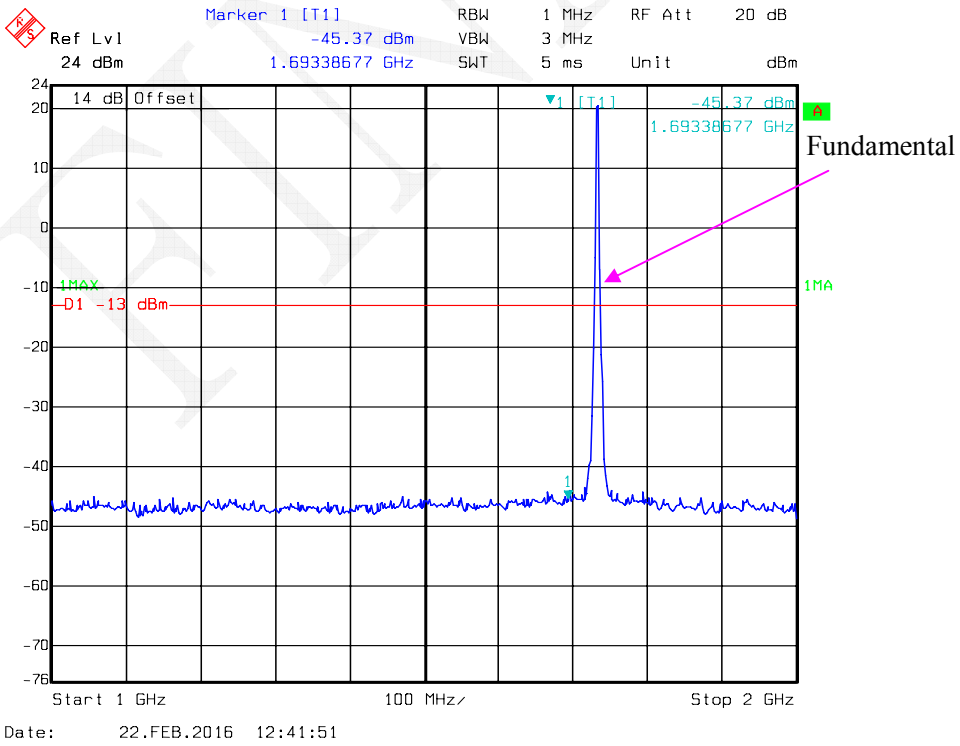


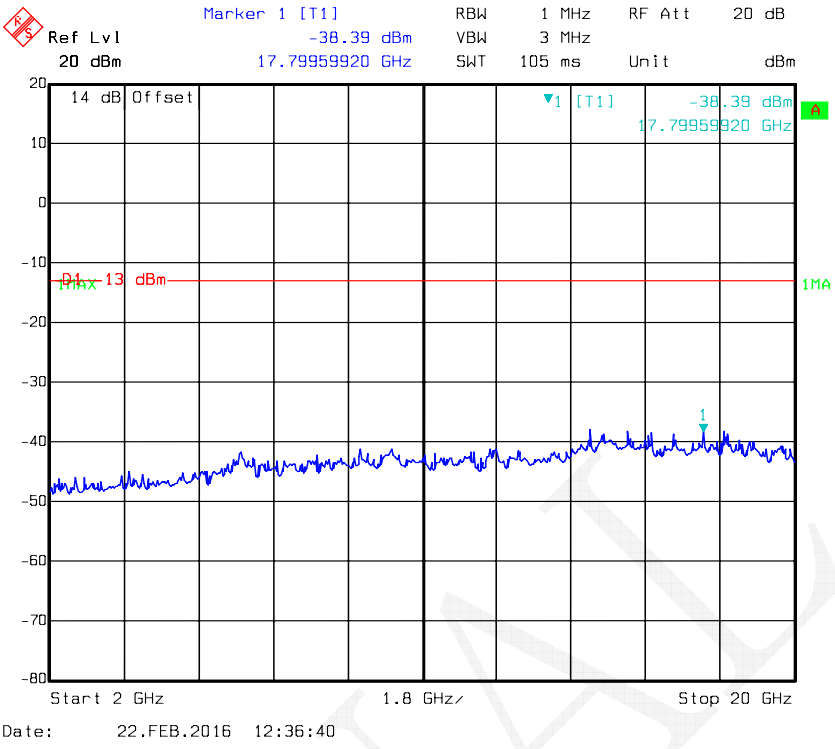

Marker 1 [T1]
-43.99 dBm
1.69939880 GHz
RBW 1 MHz
VBW 3 MHz
SWT 5 ms
RF Att 20 dB
Unit dBm
Ref Lvl
24 dBm
14 dB Offset
1MAX
D1 -13 dBm
1MA
Fundamental
Start 1 GHz
100 MHz/
Stop 2 GHz
Date: 22.FEB.2016 12:40:27


Marker 1 [T1]
-38.29 dBm
18.30460922 GHz
RBW 1 MHz
VBW 3 MHz
SWT 105 ms
RF Att 20 dB
Unit dBm
Ref Lvl
20 dBm
14 dB Offset
1MAX
D1 -13 dBm
1MA
Start 2 GHz
1.8 GHz/
Stop 20 GHz
Date: 22.FEB.2016 12:36:04

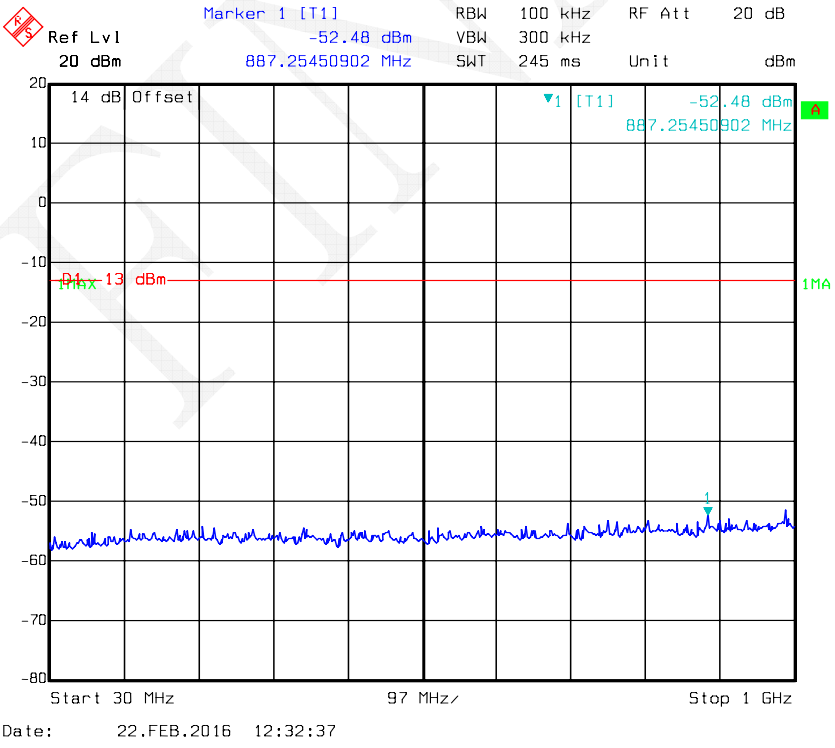
QPSK_3MHz

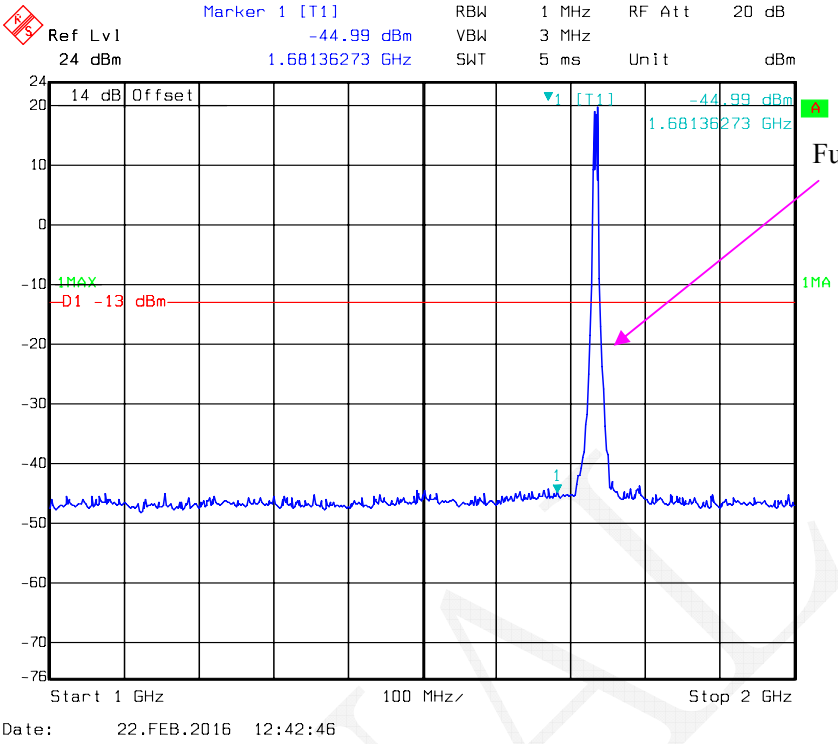

Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-52.79 dBm
VBW 300 kHz
20 dBm
895.03006012 MHz
SWT 245 ms
Unit dBm
14 dB Offset
1 [T1] -52.79 dBm
895.03006012 MHz
1MAX
D1 -13 dBm
1MA
Start 30 MHz
97 MHz/
Stop 1 GHz
Date: 22.FEB.2016 12:33:25


Marker 1 [T1]
RBW 1 MHz
RF Att 20 dB
Ref Lvl
-45.37 dBm
VBW 3 MHz
24 dBm
1.69338677 GHz
SWT 5 ms
Unit dBm
14 dB Offset
1 [T1] -45.37 dBm
1.69338677 GHz
Fundamental
1MAX
D1 -13 dBm
1MA
Start 1 GHz
100 MHz/
Stop 2 GHz
Date: 22.FEB.2016 12:41:51

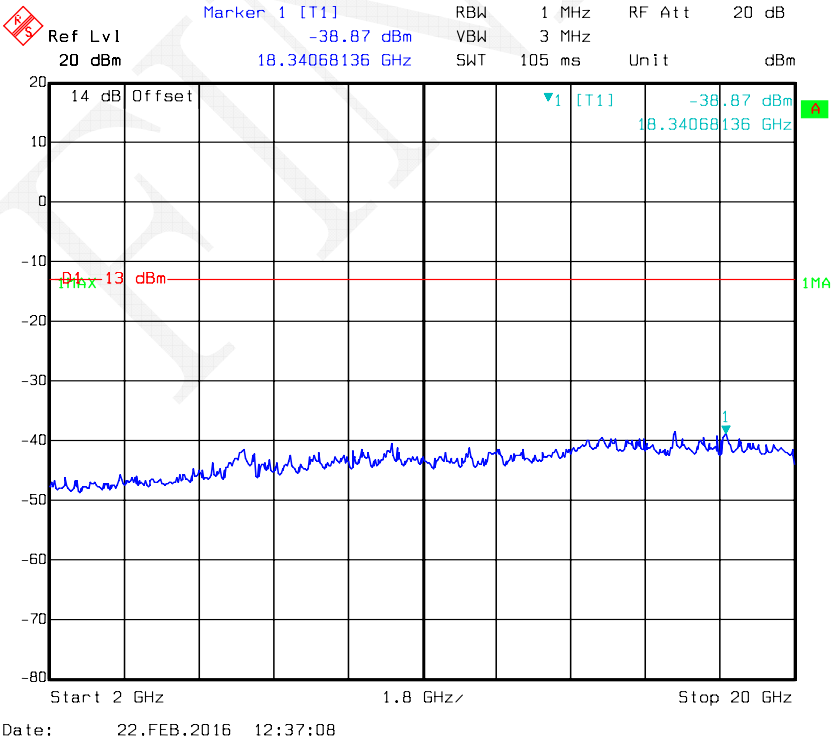

Marker 1 [T1]
Ref Lvl
20 dBm
-38.39 dBm
17.79959920 GHz
RBW 1 MHz
VBW 3 MHz
SWT 105 ms
RF Att 20 dB
Unit dBm
14 dB Offset
T1 [T1]
-38.39 dBm
17.79959920 GHz
D1 -13 dBm
1MA
Start 2 GHz
1.8 GHz/
Stop 20 GHz
Date: 22.FEB.2016 12:36:40

QPSK_5MHz

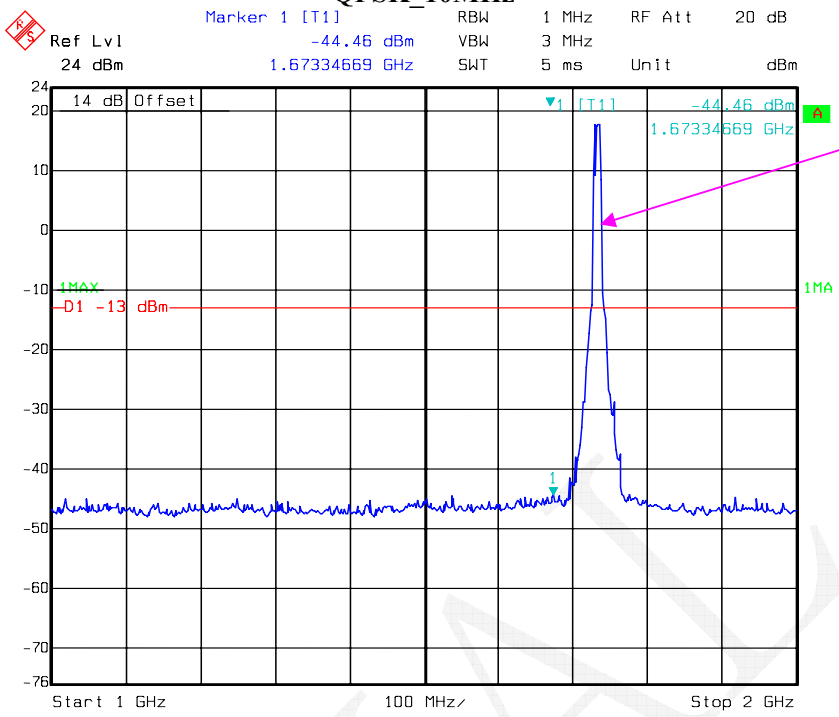

Marker 1 [T1]
Ref Lvl
20 dBm
-52.48 dBm
887.25450902 MHz
RBW 100 kHz
VBW 300 kHz
SWT 245 ms
RF Att 20 dB
Unit dBm
14 dB Offset
T1 [T1]
-52.48 dBm
887.25450902 MHz
D1 -13 dBm
1MA
Start 30 MHz
97 MHz/
Stop 1 GHz
Date: 22.FEB.2016 12:32:37



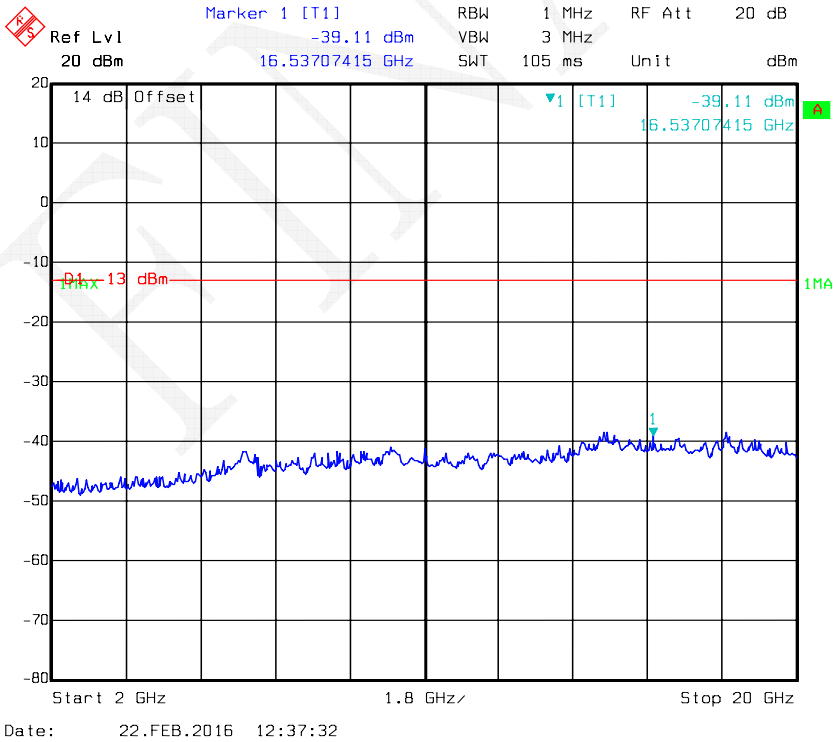
Fundamental



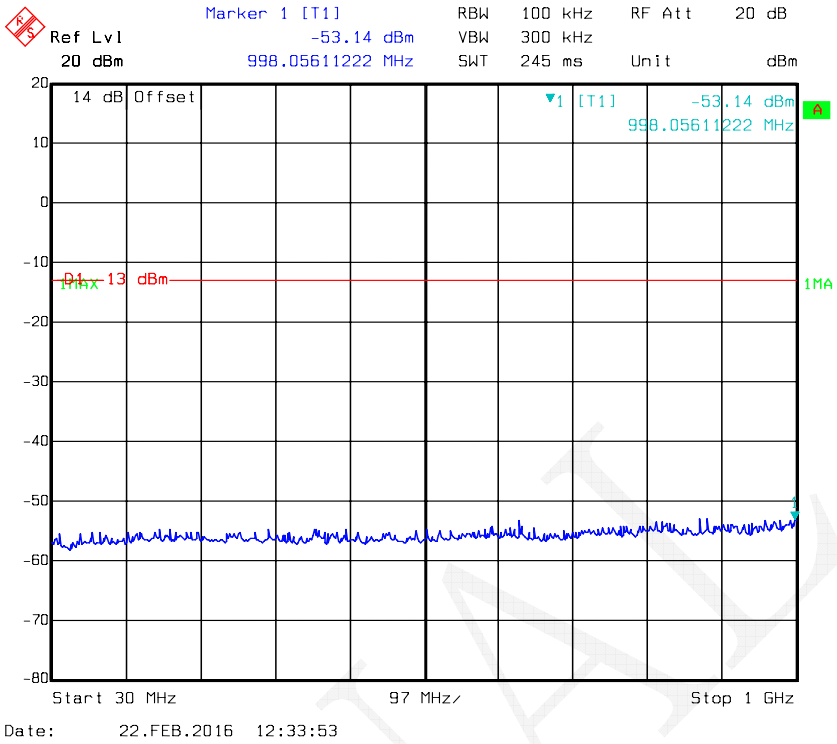
QPSK_10MHz

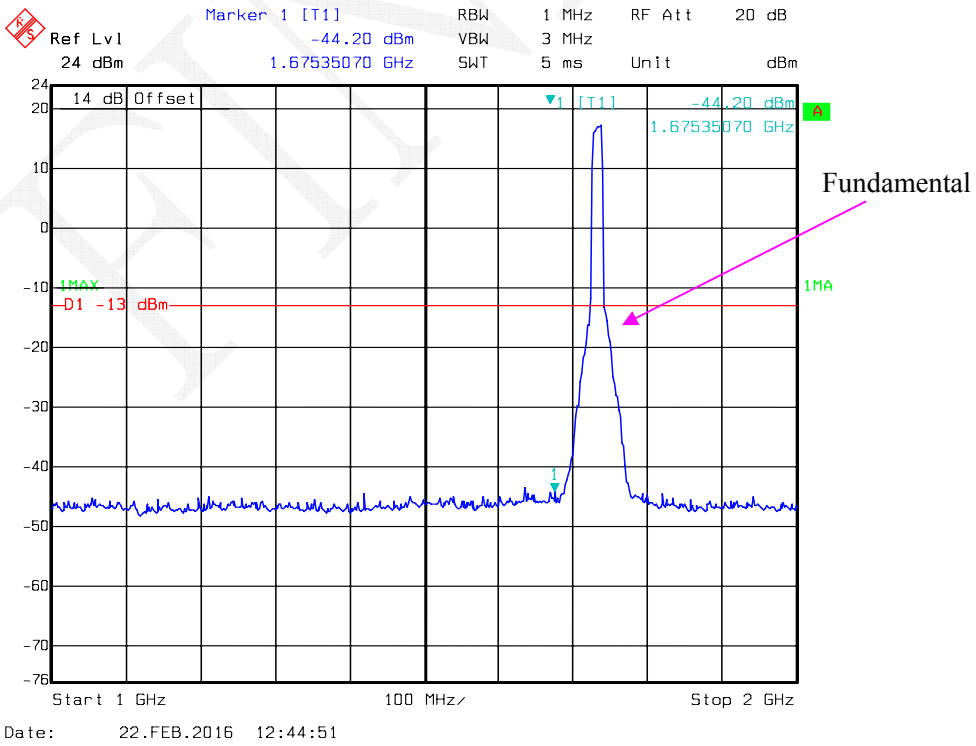


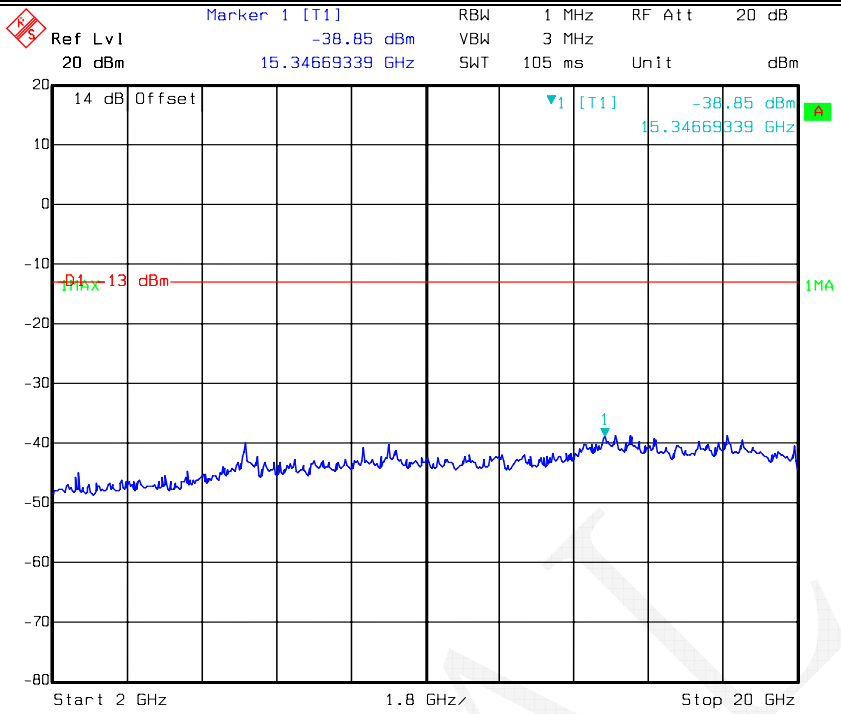
Fundamental



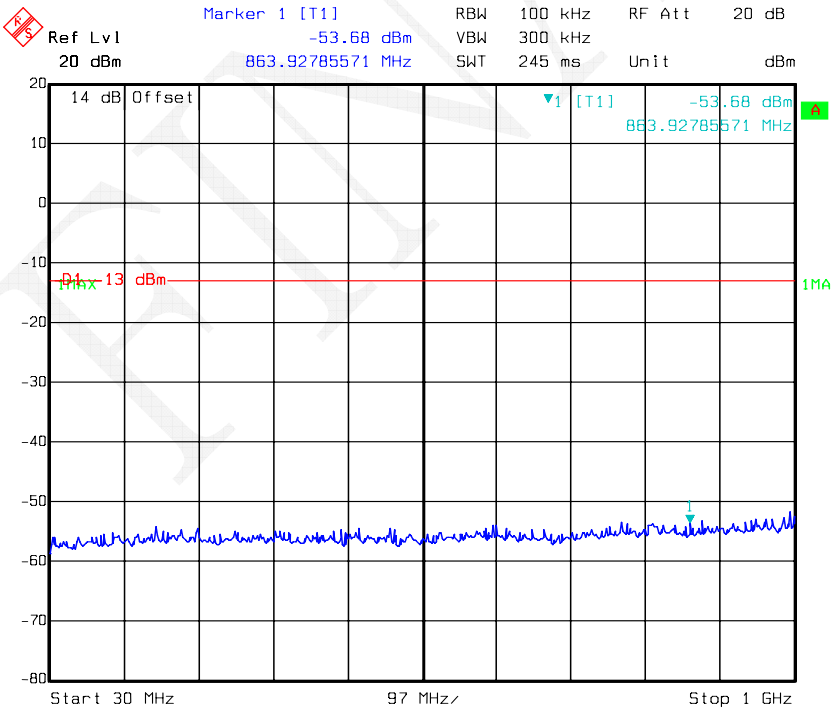
QPSK_15MHz

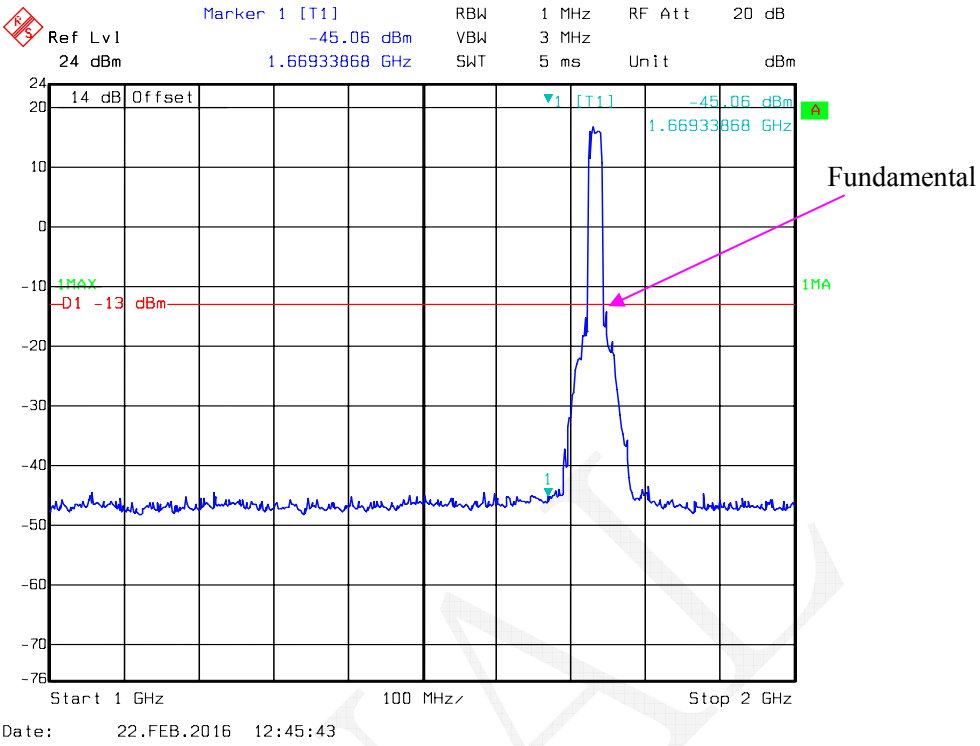

Marker 1 [T1]
-53.14 dBm
998.05611222 MHz
RBW 100 kHz
VBW 300 kHz
SWT 245 ms
RF Att 20 dB
Unit dBm
Ref Lvl
20 dBm
14 dB Offset
1 [T1] -53.14 dBm
998.05611222 MHz
1MAX
D1 -13 dBm
1MA
Start 30 MHz
97 MHz/
Stop 1 GHz
Date: 22.FEB.2016 12:33:53

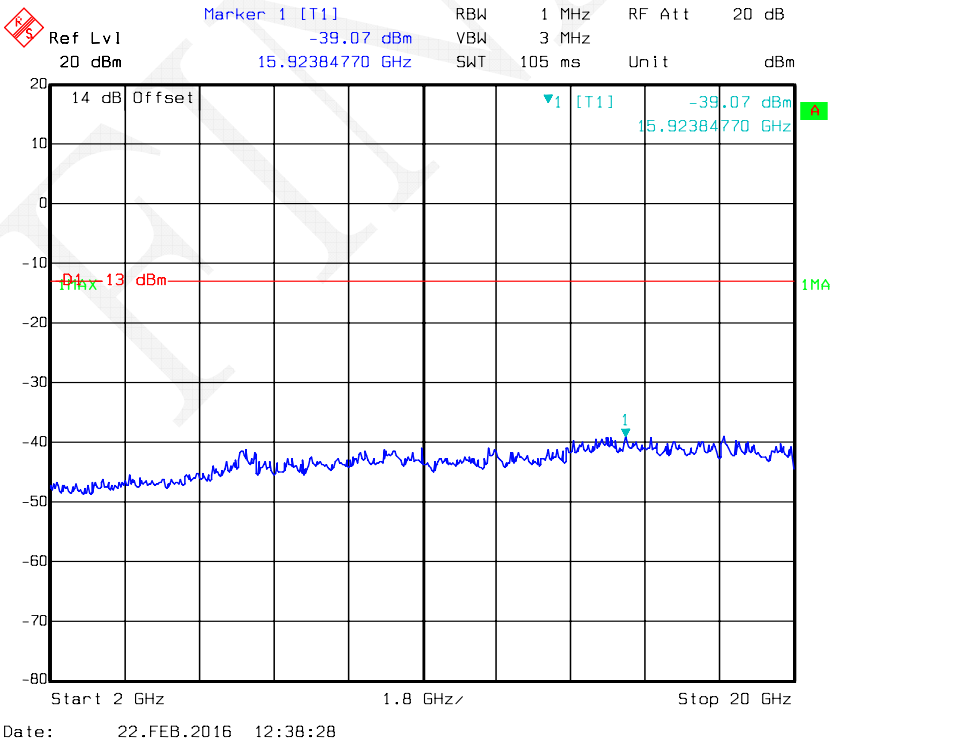

Marker 1 [T1]
-44.20 dBm
1.67535070 GHz
RBW 1 MHz
VBW 3 MHz
SWT 5 ms
RF Att 20 dB
Unit dBm
Ref Lvl
24 dBm
14 dB Offset
1 [T1] -44.20 dBm
1.67535070 GHz
1MAX
D1 -13 dBm
1MA
Fundamental
Start 1 GHz
100 MHz/
Stop 2 GHz
Date: 22.FEB.2016 12:44:51


Marker 1 [T1]
RBW 1 MHz
RF Att 20 dB
Ref Lvl
-38.85 dBm
VBW 3 MHz
20 dBm
15.34669339 GHz
SWT 105 ms
Unit dBm
14 dB Offset
▼1 [T1]
-38.85 dBm
15.34669339 GHz
D1 -13 dBm
1MA
Start 2 GHz
1.8 GHz/
Stop 20 GHz
Date: 22.FEB.2016 12:38:09

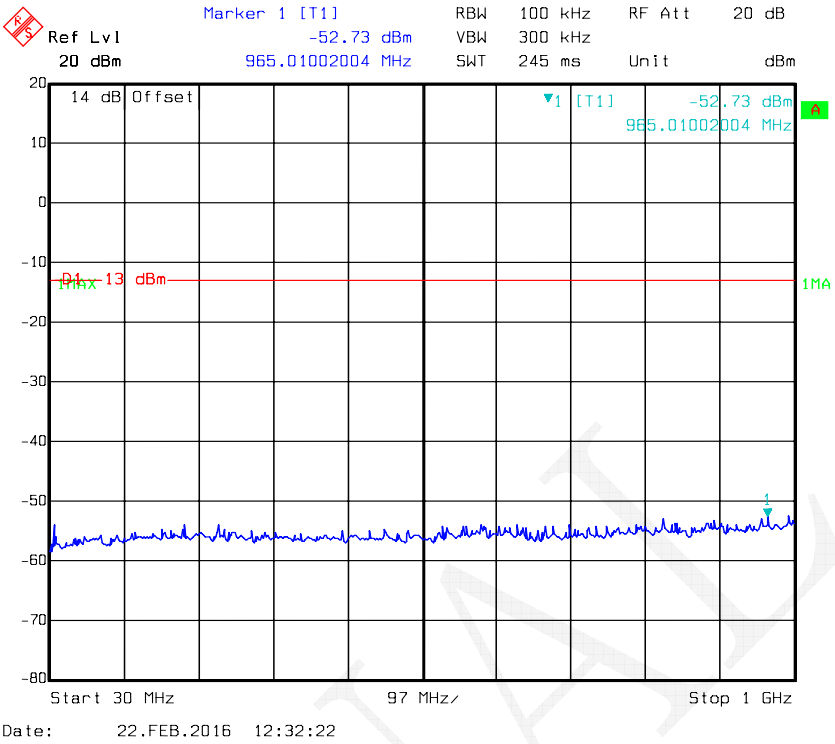
QPSK_20MHz

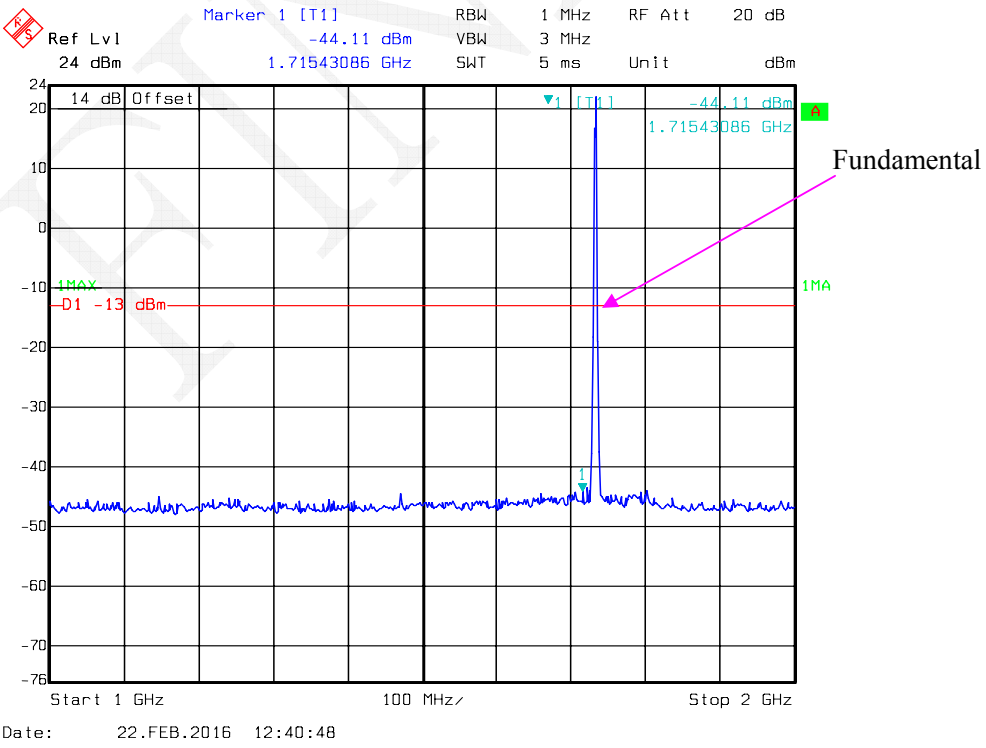

Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-53.68 dBm
VBW 300 kHz
20 dBm
863.92785571 MHz
SWT 245 ms
Unit dBm
14 dB Offset
▼1 [T1]
-53.68 dBm
863.92785571 MHz
D1 -13 dBm
1MA
Start 30 MHz
97 MHz/
Stop 1 GHz
Date: 22.FEB.2016 12:34:16

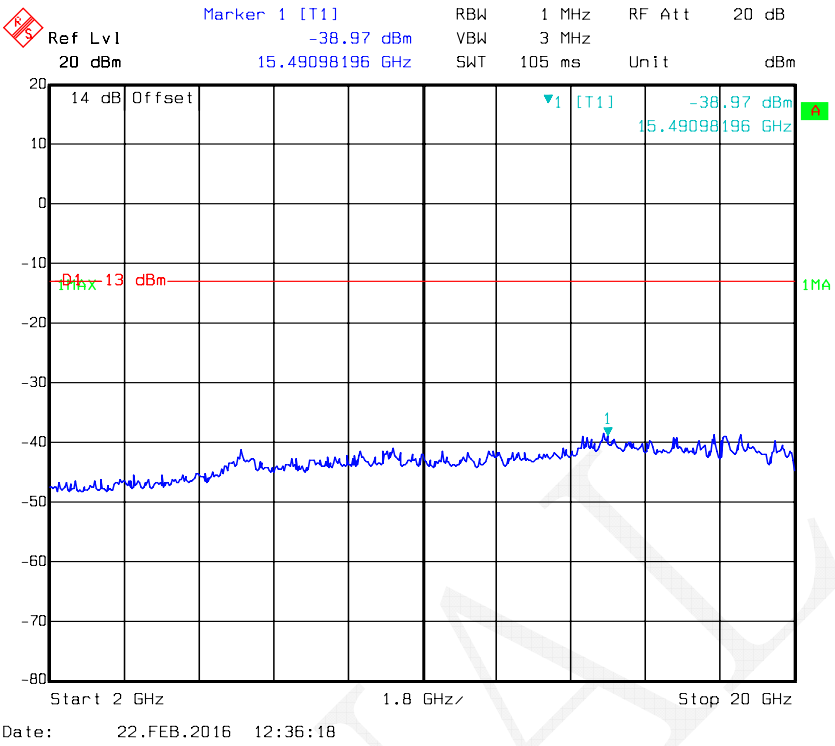

Marker 1 [T1]
Ref Lvl
24 dBm
-45.06 dBm
1.66933868 GHz
RBW 1 MHz
VBW 3 MHz
SWT 5 ms
RF Att 20 dB
Unit dBm
14 dB Offset
1MAX
D1 -13 dBm
1MA
Start 1 GHz
100 MHz/
Stop 2 GHz
Date: 22.FEB.2016 12:45:43
Fundamental


Marker 1 [T1]
Ref Lvl
20 dBm
-39.07 dBm
15.92384770 GHz
RBW 1 MHz
VBW 3 MHz
SWT 105 ms
RF Att 20 dB
Unit dBm
14 dB Offset
1MAX
D1 -13 dBm
1MA
Start 2 GHz
1.8 GHz/
Stop 20 GHz
Date: 22.FEB.2016 12:38:28

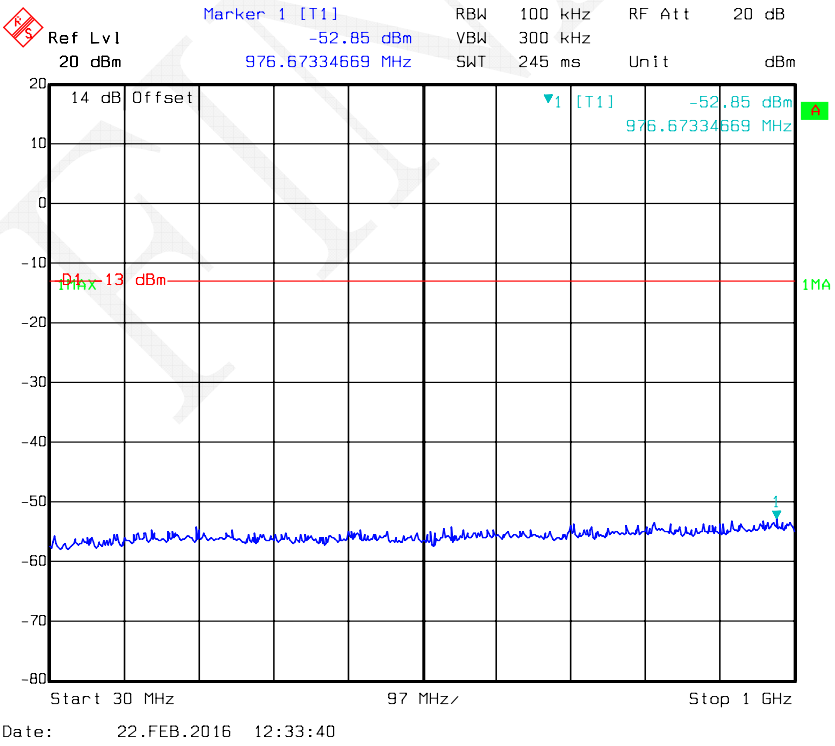
16QAM_1.4 MHz

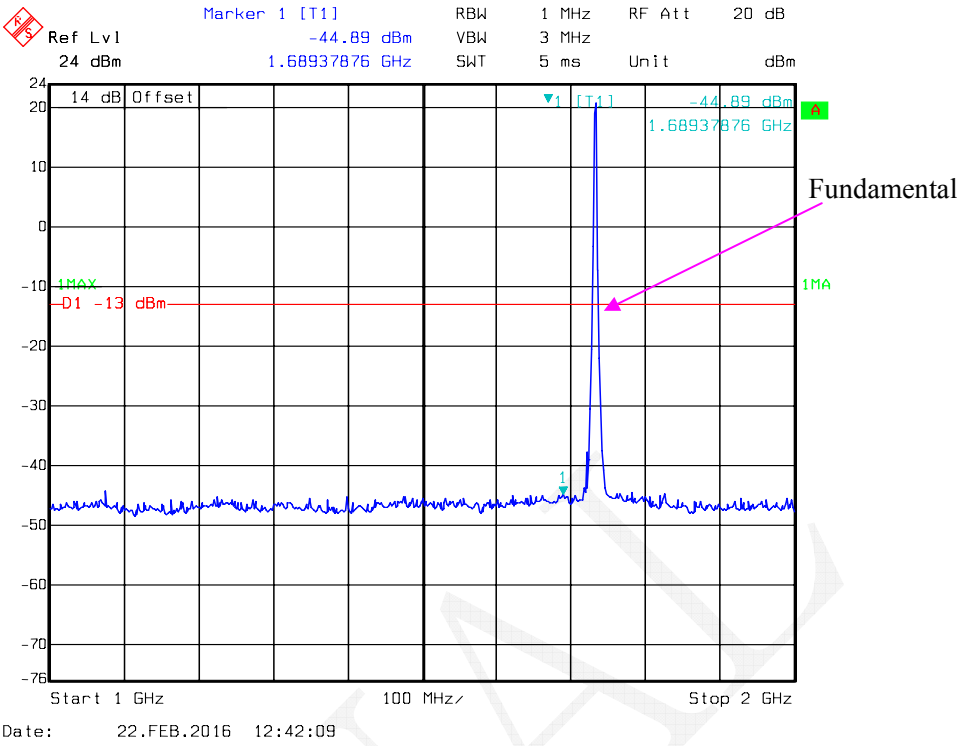

Marker 1 [T1]
-52.73 dBm
965.01002004 MHz
RBW 100 kHz
VBW 300 kHz
SWT 245 ms
RF Att 20 dB
Unit dBm
Ref Lvl
20 dBm
14 dB Offset
1 [T1] -52.73 dBm
965.01002004 MHz
D1 -13 dBm
1MAX
1MA
Start 30 MHz
97 MHz/
Stop 1 GHz
Date: 22.FEB.2016 12:32:22

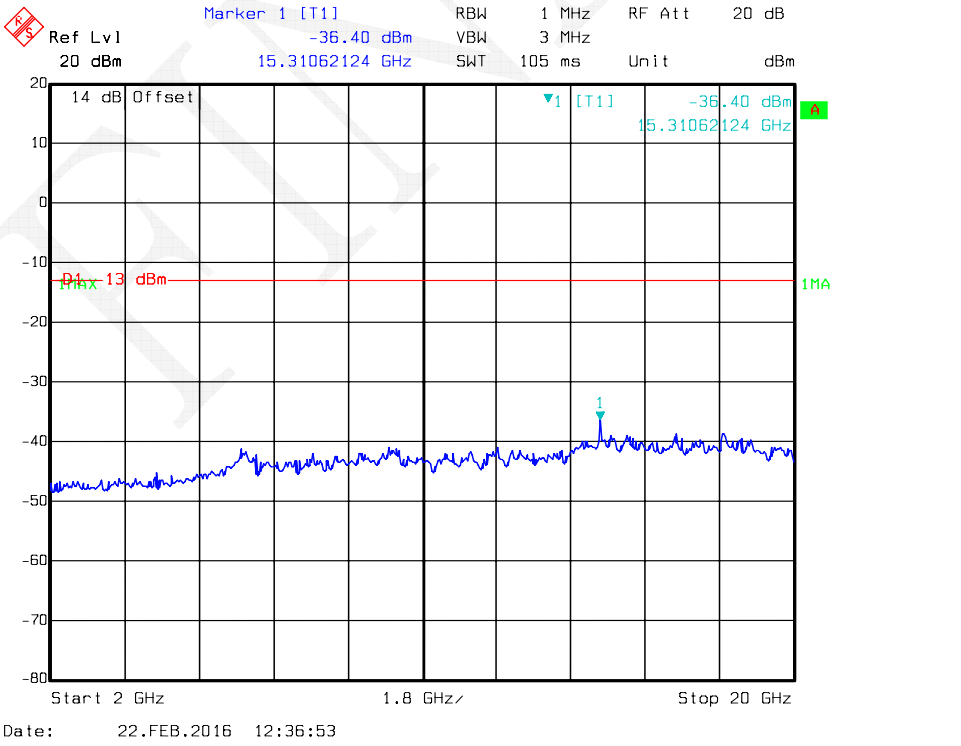

Marker 1 [T1]
-44.11 dBm
1.71543086 GHz
RBW 1 MHz
VBW 3 MHz
SWT 5 ms
RF Att 20 dB
Unit dBm
Ref Lvl
24 dBm
14 dB Offset
1 [T1] -44.11 dBm
1.71543086 GHz
D1 -13 dBm
1MAX
1MA
Fundamental
Start 1 GHz
100 MHz/
Stop 2 GHz
Date: 22.FEB.2016 12:40:48


Marker 1 [T1]
Ref Lvl
20 dBm
-38.97 dBm
15.49098196 GHz
RBW 1 MHz
VBW 3 MHz
SWT 105 ms
RF Att 20 dB
Unit dBm
14 dB Offset
1 [T1]
-38.97 dBm
15.49098196 GHz
D1 -13 dBm
1MA
Start 2 GHz
1.8 GHz/
Stop 20 GHz
Date: 22.FEB.2016 12:36:18

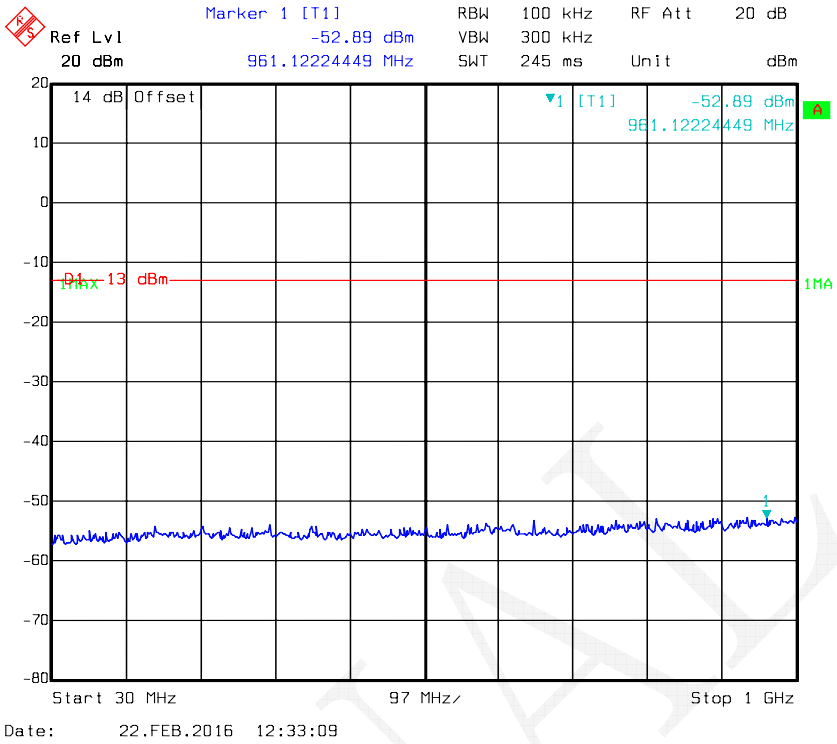
16QAM_3 MHz

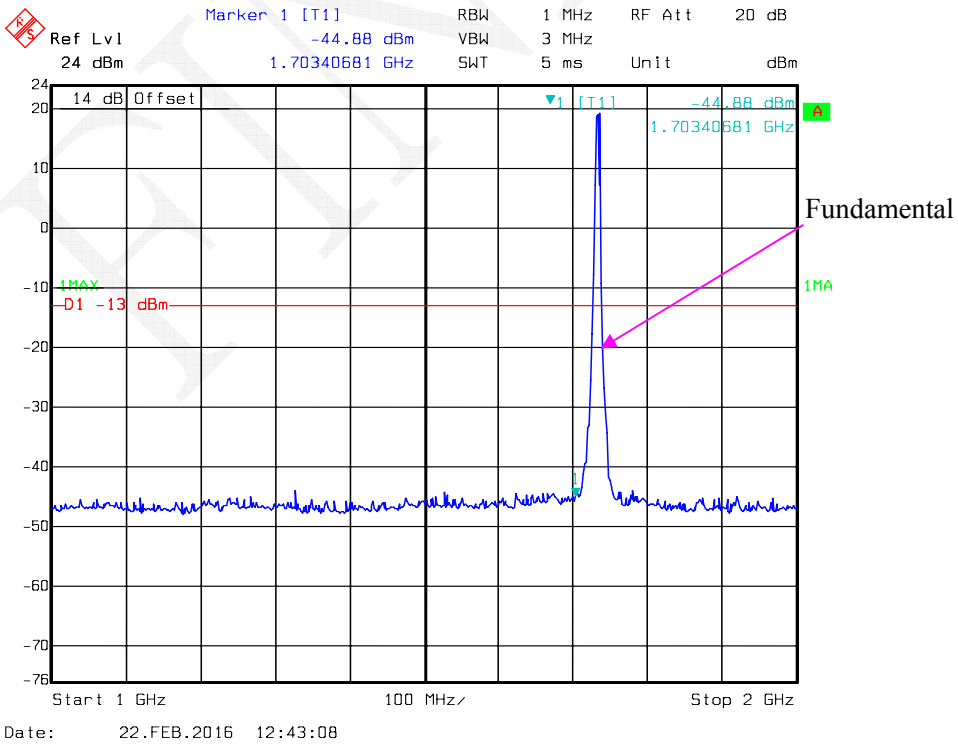

Marker 1 [T1]
Ref Lvl
20 dBm
-52.85 dBm
976.67334669 MHz
RBW 100 kHz
VBW 300 kHz
SWT 245 ms
RF Att 20 dB
Unit dBm
14 dB Offset
1 [T1]
-52.85 dBm
976.67334669 MHz
D1 -13 dBm
1MA
Start 30 MHz
97 MHz/
Stop 1 GHz
Date: 22.FEB.2016 12:33:40

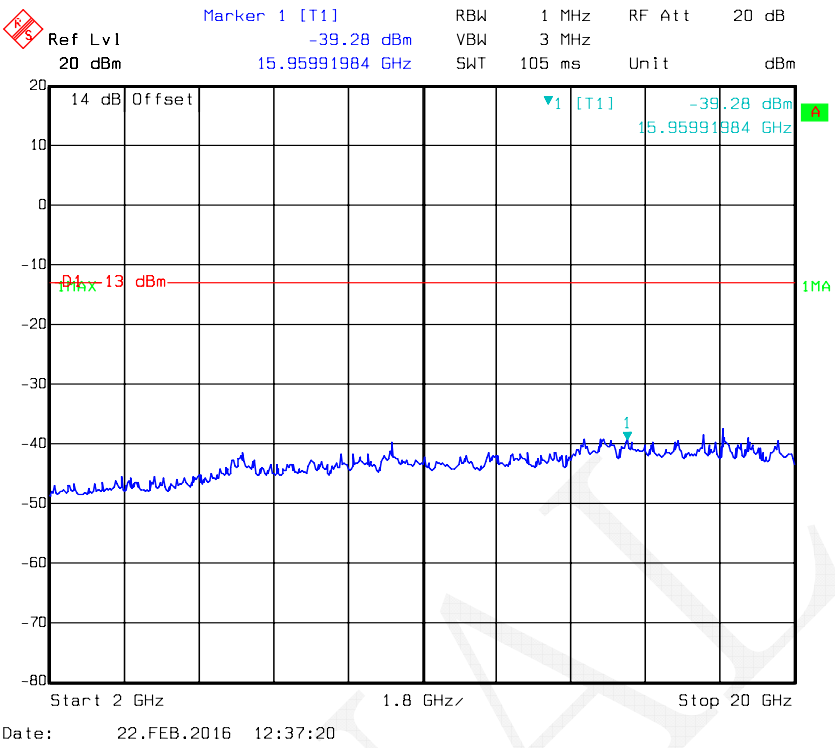

Marker 1 [T1]
-44.89 dBm
1.68937876 GHz
RBW 1 MHz
VBW 3 MHz
SWT 5 ms
RF Att 20 dB
Unit dBm
Ref Lvl
24 dBm
14 dB Offset
1MAX
D1 -13 dBm
1MA
Fundamental
Start 1 GHz
100 MHz/
Stop 2 GHz
Date: 22.FEB.2016 12:42:09


Marker 1 [T1]
-36.40 dBm
15.31062124 GHz
RBW 1 MHz
VBW 3 MHz
SWT 105 ms
RF Att 20 dB
Unit dBm
Ref Lvl
20 dBm
14 dB Offset
1MAX
D1 -13 dBm
1MA
Start 2 GHz
1.8 GHz/
Stop 20 GHz
Date: 22.FEB.2016 12:36:53

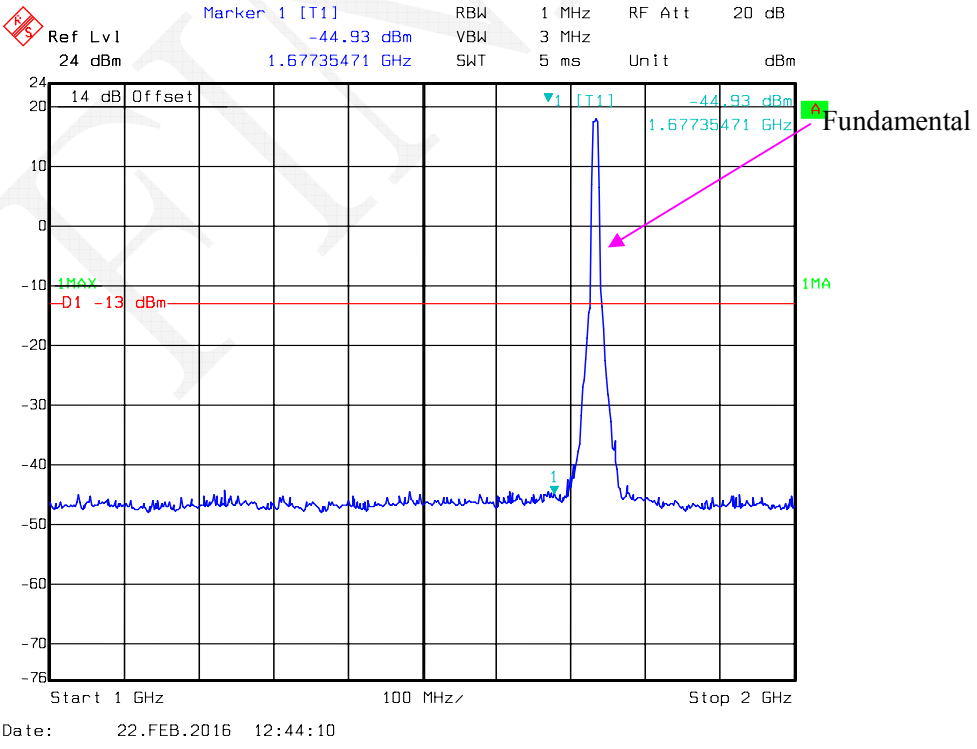
16QAM_5MHz

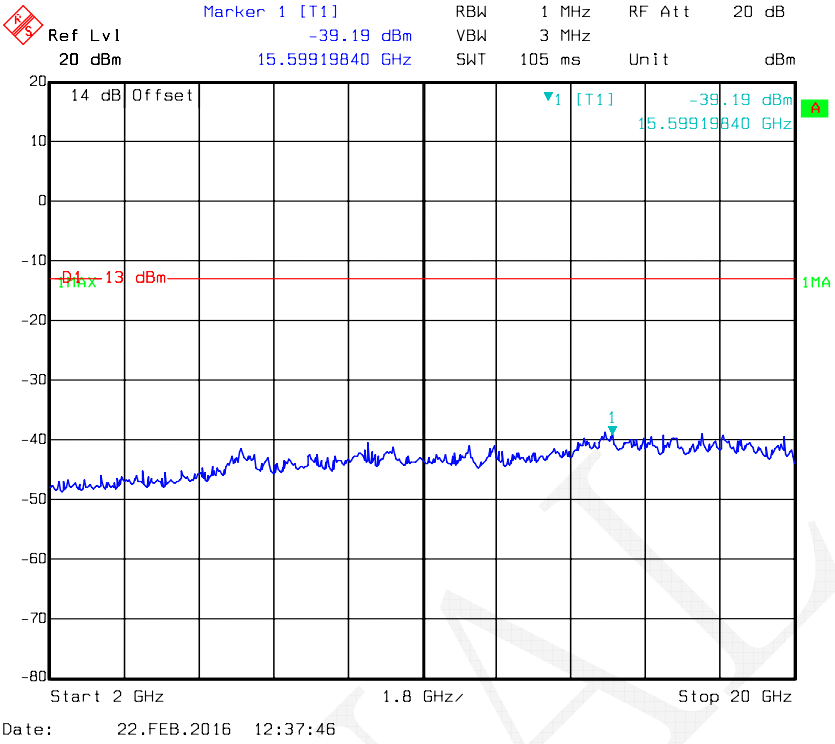

Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-52.89 dBm
VBW 300 kHz
20 dBm
961.12224449 MHz
SWT 245 ms
Unit dBm
14 dB Offset
[T1] -52.89 dBm
961.12224449 MHz
1MAX
D1 -13 dBm
1MA
Start 30 MHz
97 MHz/
Stop 1 GHz
Date: 22.FEB.2016 12:33:09


Marker 1 [T1]
RBW 1 MHz
RF Att 20 dB
Ref Lvl
-44.88 dBm
VBW 3 MHz
24 dBm
1.70340681 GHz
SWT 5 ms
Unit dBm
14 dB Offset
[T1] -44.88 dBm
1.70340681 GHz
Fundamental
1MAX
D1 -13 dBm
1MA
Start 1 GHz
100 MHz/
Stop 2 GHz
Date: 22.FEB.2016 12:43:08

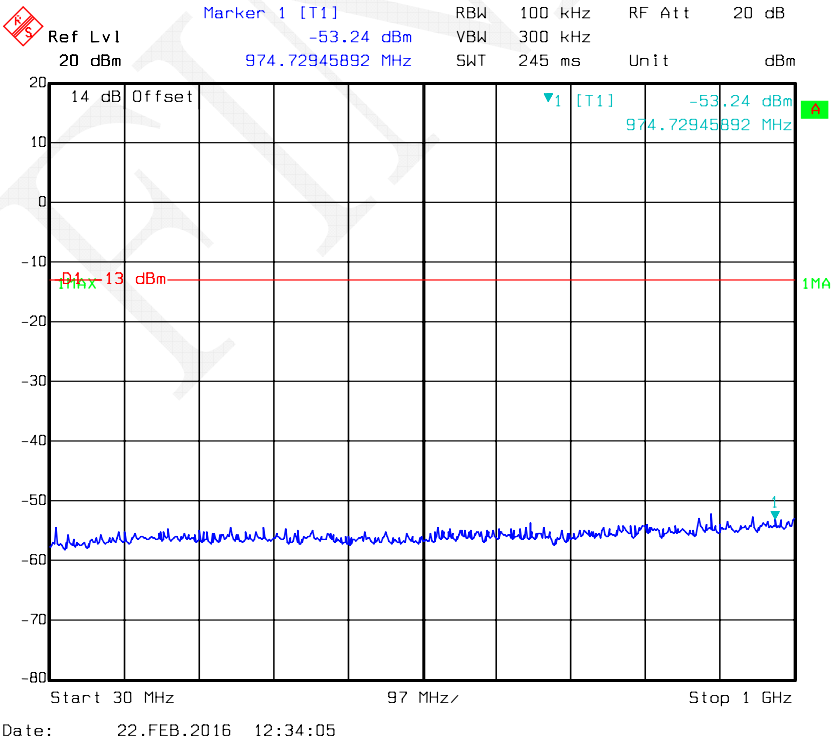

Marker 1 [T1]
Ref Lvl
20 dBm
-39.28 dBm
15.95991984 GHz
RBW 1 MHz
VBW 3 MHz
SWT 105 ms
RF Att 20 dB
Unit dBm
14 dB Offset
[T1] -39.28 dBm
15.95991984 GHz
D1 -13 dBm
1MAX
1MA
Start 2 GHz
1.8 GHz/
Stop 20 GHz
Date: 22.FEB.2016 12:37:20

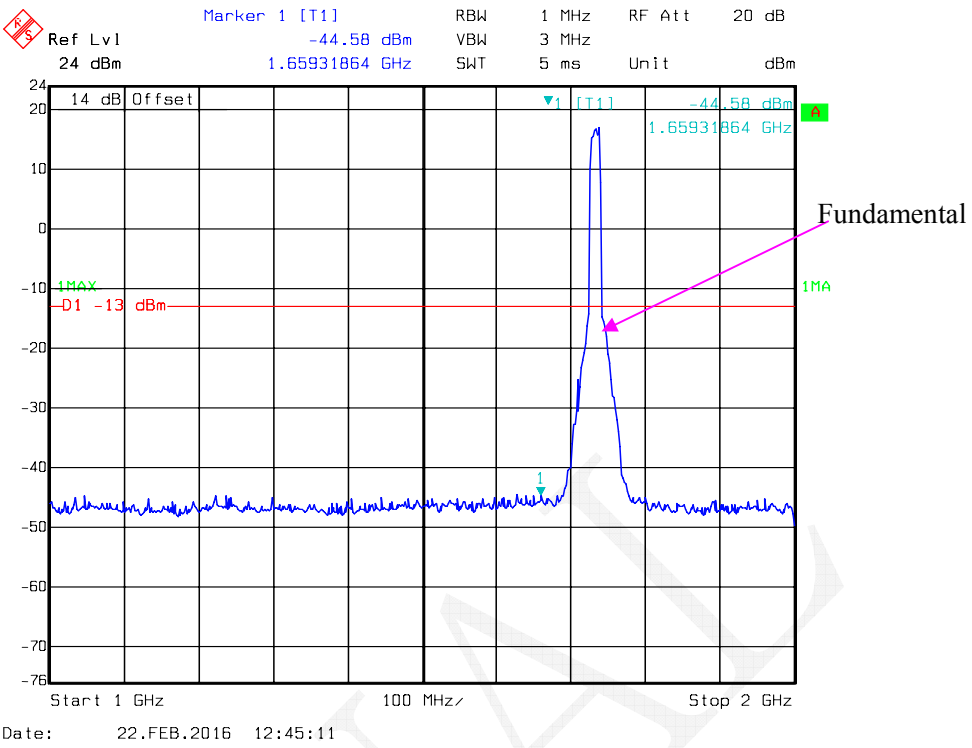
16QAM_10MHz

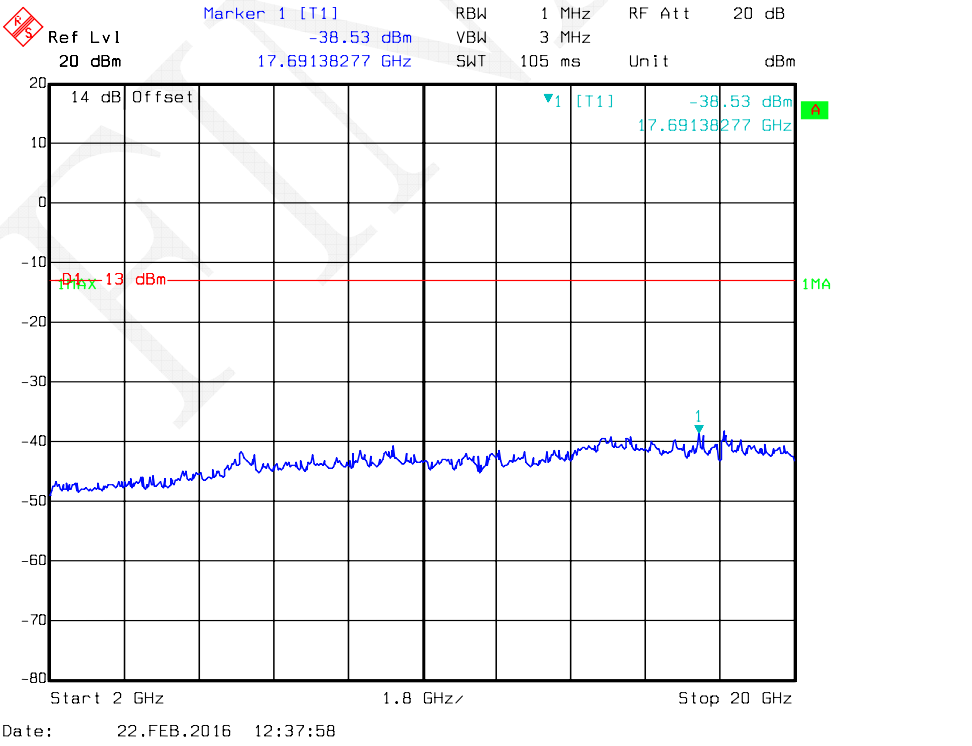

Marker 1 [T1]
Ref Lvl
24 dBm
-44.93 dBm
1.67735471 GHz
RBW 1 MHz
VBW 3 MHz
SWT 5 ms
RF Att 20 dB
Unit dBm
14 dB Offset
[T1] -44.93 dBm
1.67735471 GHz
Fundamental
1MAX
D1 -13 dBm
1MA
Start 1 GHz
100 MHz/
Stop 2 GHz
Date: 22.FEB.2016 12:44:10


Marker 1 [T1]
RBW 1 MHz
RF Att 20 dB
Ref Lvl
-39.19 dBm
VBW 3 MHz
20 dBm
15.59919840 GHz
SWT 105 ms
Unit dBm
14 dB Offset
[T1] -39.19 dBm
15.59919840 GHz
D1 -13 dBm
1MA
Start 2 GHz
1.8 GHz/
Stop 20 GHz
Date: 22.FEB.2016 12:37:46

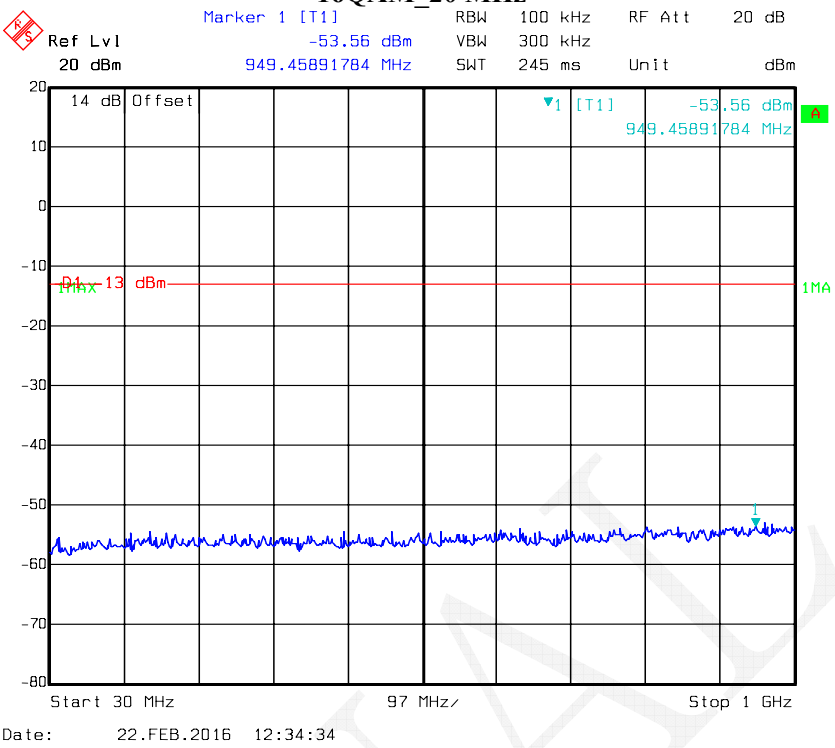
16QAM_15 MHz

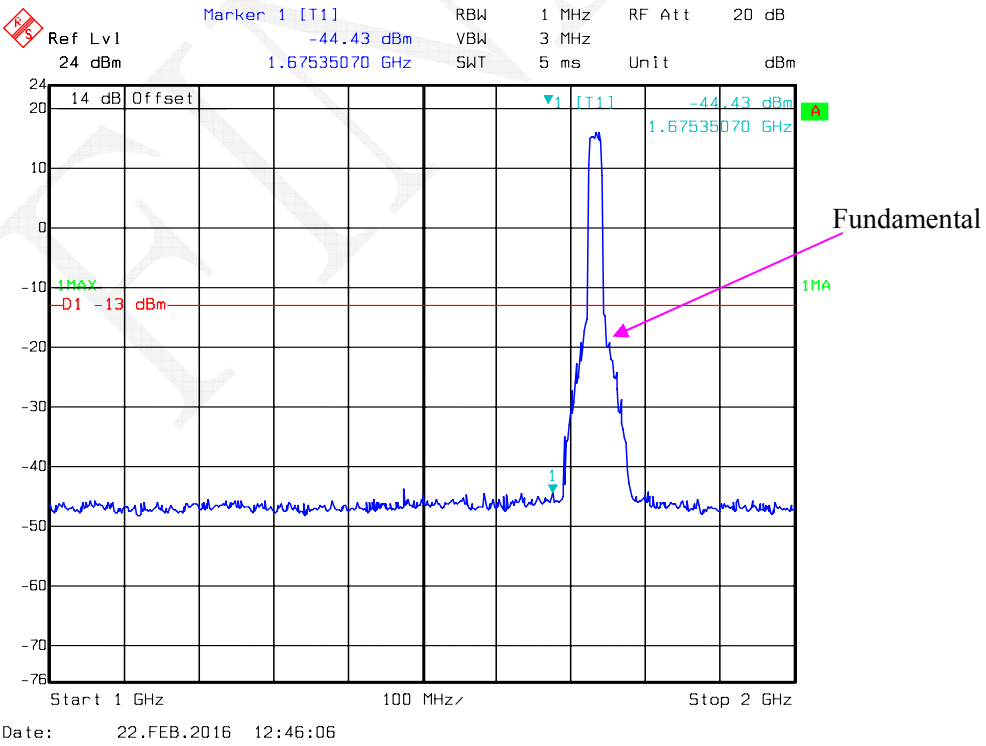

Marker 1 [T1]
RBW 100 kHz
RF Att 20 dB
Ref Lvl
-53.24 dBm
VBW 300 kHz
20 dBm
974.72945892 MHz
SWT 245 ms
Unit dBm
14 dB Offset
[T1] -53.24 dBm
974.72945892 MHz
D1 -13 dBm
1MA
Start 30 MHz
97 MHz/
Stop 1 GHz
Date: 22.FEB.2016 12:34:05

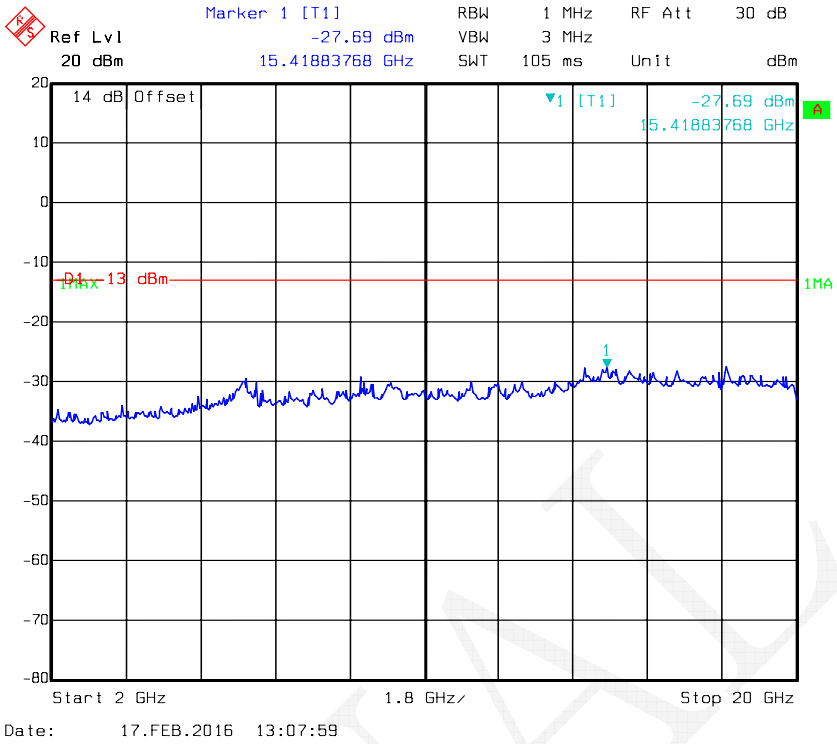

Marker 1 [T1]
-44.58 dBm
1.65931864 GHz
RBW 1 MHz
VBW 3 MHz
SWT 5 ms
RF Att 20 dB
Unit dBm
Ref Lvl
24 dBm
14 dB Offset
1MAX
D1 -13 dBm
1MA
Fundamental
Start 1 GHz
100 MHz/
Stop 2 GHz
Date: 22.FEB.2016 12:45:11


Marker 1 [T1]
-38.53 dBm
17.69138277 GHz
RBW 1 MHz
VBW 3 MHz
SWT 105 ms
RF Att 20 dB
Unit dBm
Ref Lvl
20 dBm
14 dB Offset
1MAX
D1 -13 dBm
1MA
Start 2 GHz
1.8 GHz/
Stop 20 GHz
Date: 22.FEB.2016 12:37:58

16QAM_20 MHz


Marker 1 [T1]
Ref Lvl
20 dBm
-53.56 dBm
949.45891784 MHz
RBW 100 kHz
VBW 300 kHz
SWT 245 ms
RF Att 20 dB
Unit dBm
14 dB Offset
1 [T1] -53.56 dBm
949.45891784 MHz
1MAX
D1 -13 dBm
1MA
Start 30 MHz
97 MHz/
Stop 1 GHz
Date: 22.FEB.2016 12:34:34


Marker 1 [T1]
Ref Lvl
24 dBm
-44.43 dBm
1.67535070 GHz
RBW 1 MHz
VBW 3 MHz
SWT 5 ms
RF Att 20 dB
Unit dBm
14 dB Offset
1 [T1] -44.43 dBm
1.67535070 GHz
1MAX
D1 -13 dBm
1MA
Fundamental
Start 1 GHz
100 MHz/
Stop 2 GHz
Date: 22.FEB.2016 12:46:06


Marker 1 [T1]
Ref Lvl
20 dBm
-27.69 dBm
15.41883768 GHz
RBW 1 MHz
VBW 3 MHz
SWT 105 ms
RF Att 30 dB
Unit dBm
14 dB Offset
[T1]
-27.69 dBm
15.41883768 GHz
D1 -13 dBm
1MAX
1MA
Start 2 GHz
1.8 GHz/
Stop 20 GHz
Date: 17.FEB.2016 13:07:59

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)

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
N/A	Coaxial Cable	14m	N/A	2015-05-06	2016-05-06
N/A	Coaxial Cable	8m	N/A	2015-05-06	2016-05-06
N/A	Coaxial Cable	2m	N/A	2015-05-06	2016-05-06
Mini Circuit	High Pass Filter	VHF-3100+	31251	2015-05-06	2016-05-06
Mini Circuit	High Pass Filte	VHF-1200+	N/A	2015-05-06	2016-05-06

*** 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:	24.6 °C
Relative Humidity:	44 %
ATM Pressure:	101.7 kPa

The testing was performed by Allen Qiao on 2016-02-23.

EUT Operation Mode: Transmitting

Cellular Band

30MHz-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:836.600 MHz								
1673.200	H	52.51	-48.6	10.6	1.5	-39.5	-13.0	26.5
1673.200	V	48.56	-52.8	10.6	1.5	-43.7	-13.0	30.7
2509.800	H	53.24	-44.8	13.1	2.8	-34.5	-13.0	21.5
2509.800	V	50.59	-46.5	13.1	2.8	-36.2	-13.0	23.2
197.810	H	33.81	-74	0.0	0.5	-74.5	-13.0	61.5
221.300	V	32.45	-73	0.0	0.5	-73.5	-13.0	60.5

For below 1GHz, all spurious emissions are 20dB below the limit or are on the system noise floor level.

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:836.600 MHz								
1673.200	H	38.59	-62.5	10.6	1.5	-53.4	-13.0	40.4
1673.200	V	36.71	-64.7	10.6	1.5	-55.6	-13.0	42.6
197.810	H	33.69	-74.1	0.0	0.5	-74.6	-13.0	61.6
221.300	V	32.39	-73.1	0.0	0.5	-73.6	-13.0	60.6

For below 1GHz, all spurious emissions are 20dB below the limit or are on the system noise floor level.

PCS Band

30MHz-20GHz:

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:1880.000 MHz								
3760.000	H	39.38	-54.9	13.8	2.9	-44.0	-13.0	31.0
3760.000	V	36.75	-56.3	13.8	2.9	-45.4	-13.0	32.4
197.810	H	33.79	-74	0.0	0.5	-74.5	-13.0	61.5
221.300	V	32.41	-73.1	0.0	0.5	-73.6	-13.0	60.6

For below 1GHz, all spurious emissions are 20dB below the limit or are on the system noise floor level.

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:1880.000 MHz								
3760.000	H	36.28	-58	13.8	2.9	-47.1	-13.0	34.1
3760.000	V	34.18	-58.9	13.8	2.9	-48.0	-13.0	35.0
197.810	H	33.74	-74	0.0	0.5	-74.5	-13.0	61.5
221.300	V	32.31	-73.2	0.0	0.5	-73.7	-13.0	60.7

For below 1GHz, all spurious emissions are 20dB below the limit or are on the system noise floor level.

LTE Band IV

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:1732.50 MHz (QPSK)_1.4MHz								
3465.000	H	38.94	-58	13.9	1.9	-46.0	-13.0	33.0
3465.000	V	37.74	-58.4	13.9	1.9	-46.4	-13.0	33.4
5197.500	H	50.02	-41	14.0	2.3	-29.3	-13.0	16.3
5197.500	V	45.33	-47.2	14.0	2.3	-35.5	-13.0	22.5
197.810	H	33.65	-74.1	0.0	0.5	-74.6	-13.0	61.6
221.300	V	32.32	-73.2	0.0	0.5	-73.7	-13.0	60.7
Frequency:1732.50 MHz (16QAM)_1.4MHz								
3465.000	H	38.62	-58.3	13.9	1.9	-46.3	-13.0	33.3
3465.000	V	37.45	-58.7	13.9	1.9	-46.7	-13.0	33.7
5197.500	H	50.49	-40.5	14.0	2.3	-28.8	-13.0	15.8
5197.500	V	45.87	-46.7	14.0	2.3	-35.0	-13.0	22.0
197.810	H	33.61	-74.2	0.0	0.5	-74.7	-13.0	61.7
221.300	V	32.29	-73.2	0.0	0.5	-73.7	-13.0	60.7

For below 1GHz, all spurious emissions are 20dB below the limit or are on the system noise floor level.
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.

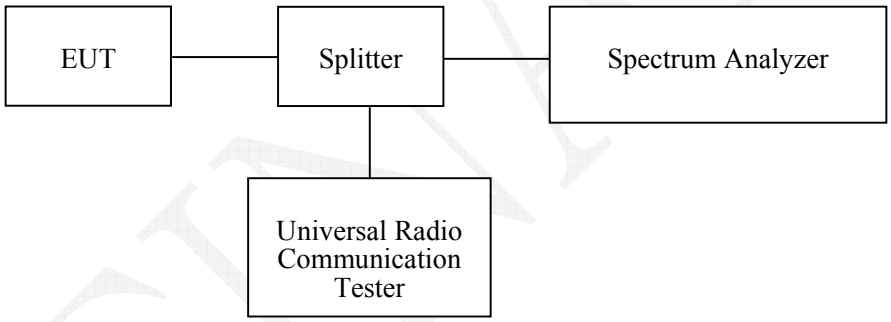
According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

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 log10 (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	Spectrum Analyzer	FSEM	831259/019	2015-05-09	2016-05-09
R&S	Universal Radio Communication Tester	CMU200	109 038	2015-05-09	2016-05-09
R&S	Wideband Radio Communication Tester	CMW500	106891	2015-11-23	2016-11-23
N/A	Coaxial Cable	0.1m	N/A	2015-05-06	2016-05-06
E-Microwave	DC Blocking	EMDCB-00036	0E01201047	2015-05-06	2016-05-06
E-Microwave	Attenuator(10dB)	EMCA10-5RN	OE01203239	2015-05-08	2016-05-08
Pasternack	RF Coaxial Cable	RF-01	N/A	2015-05-06	2016-05-06
Pasternack	RF Coaxial Cable	RF-02	N/A	2015-05-06	2016-05-06
N/A	Two-way Spliter	ODP-1-6-2S	OE0120142	2015-05-06	2016-05-06

*** 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

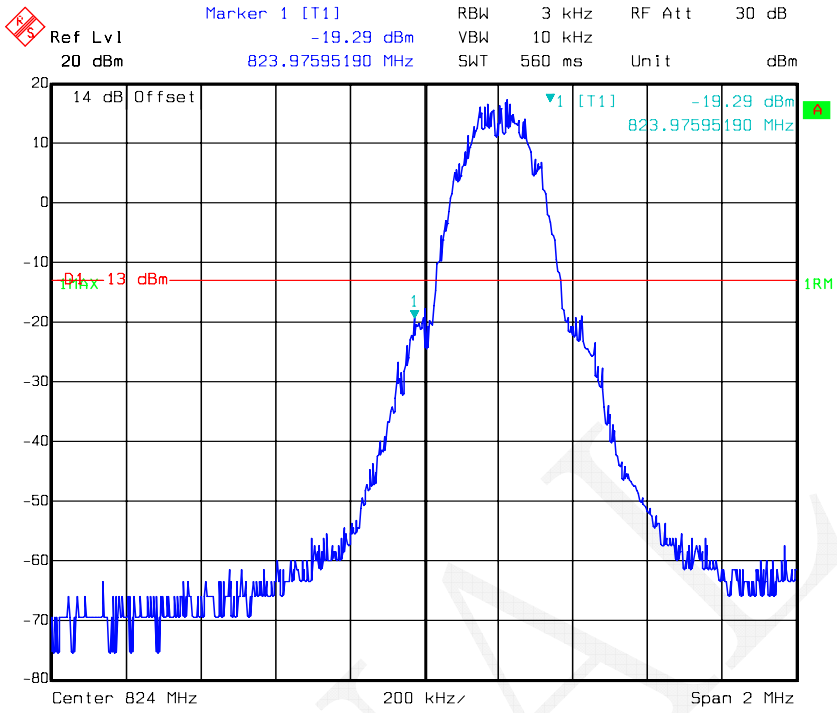
Temperature:	24.6 ~ 26.3°C
Relative Humidity:	26.3 ~ 44 %
ATM Pressure:	101.4 ~ 101.7 kPa

The testing was performed by Allen Qiao from 2016-02-22 to 2016-02-23.

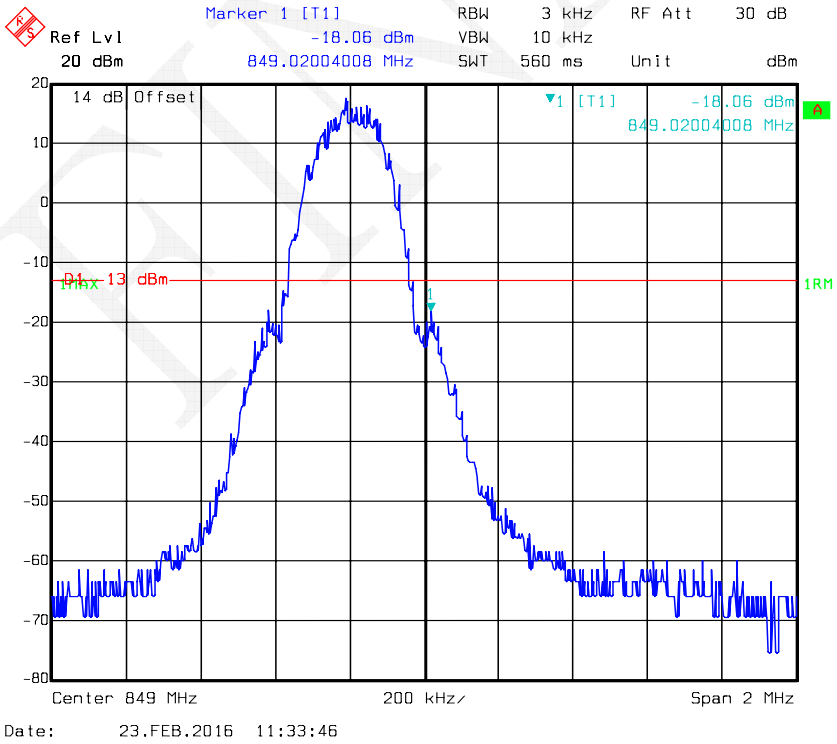
Test Mode: Transmitting

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

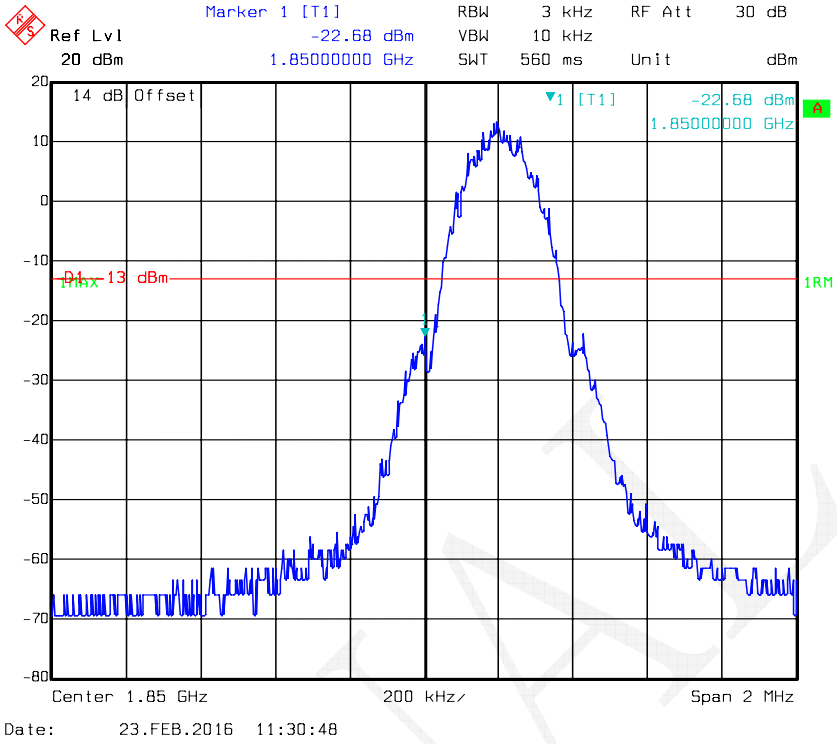
GSM 850, Left Band Edge



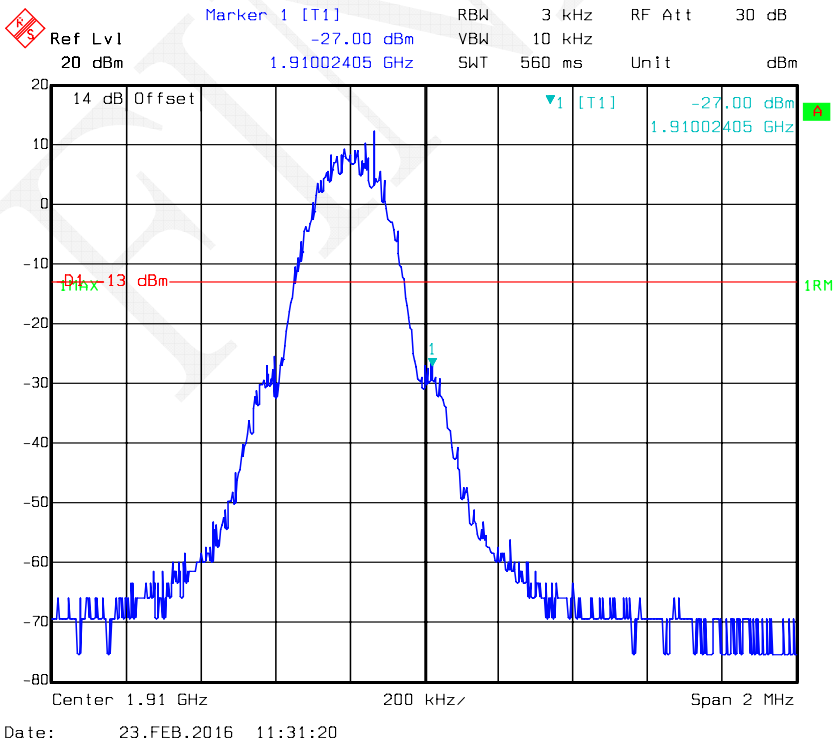
GSM 850, Right Band Edge



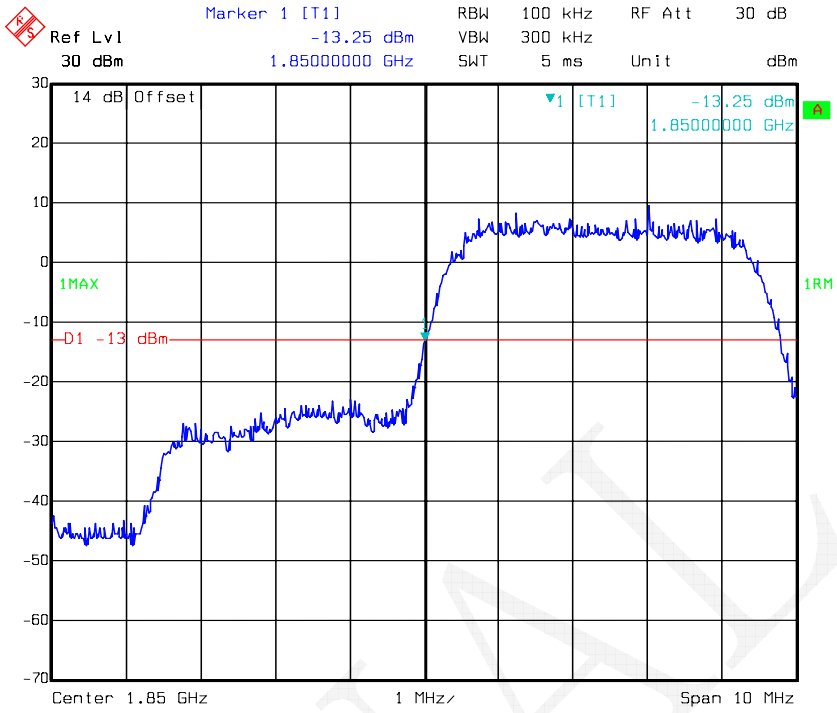
GSM 1900, Left Band Edge



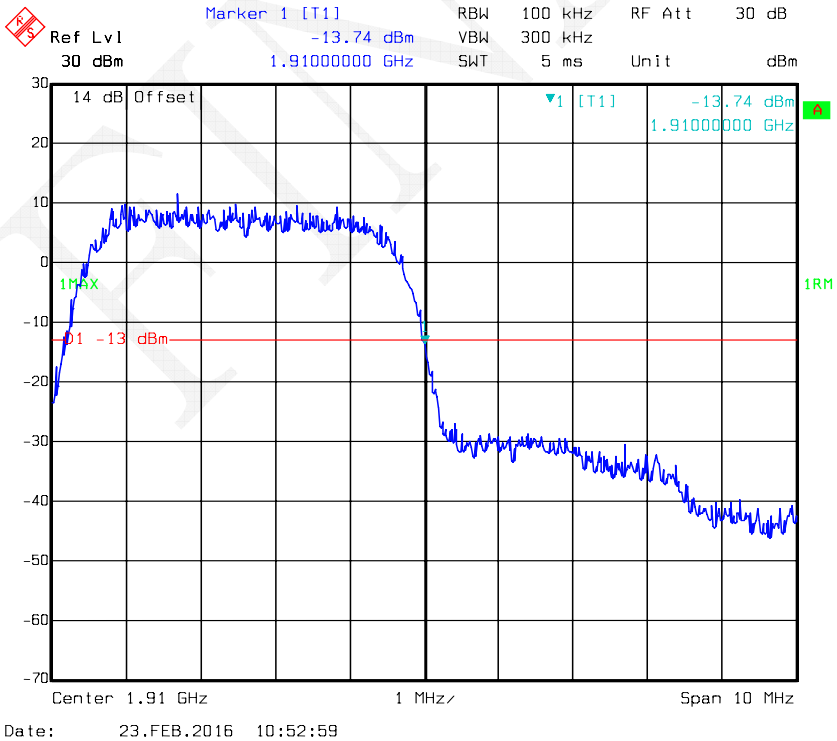
GSM 1900, Right Band Edge



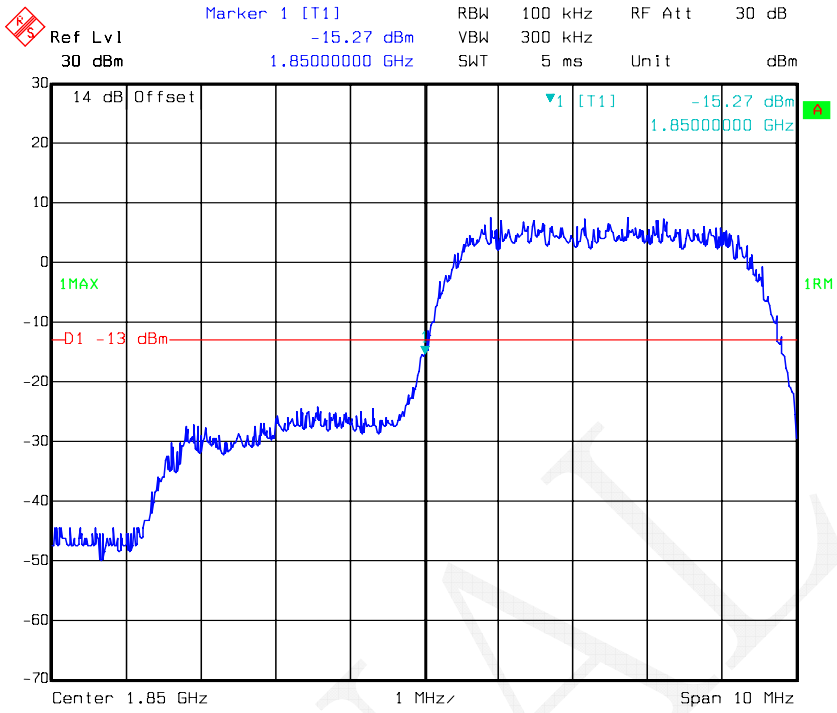
REL99 Band II, Left Band Edge



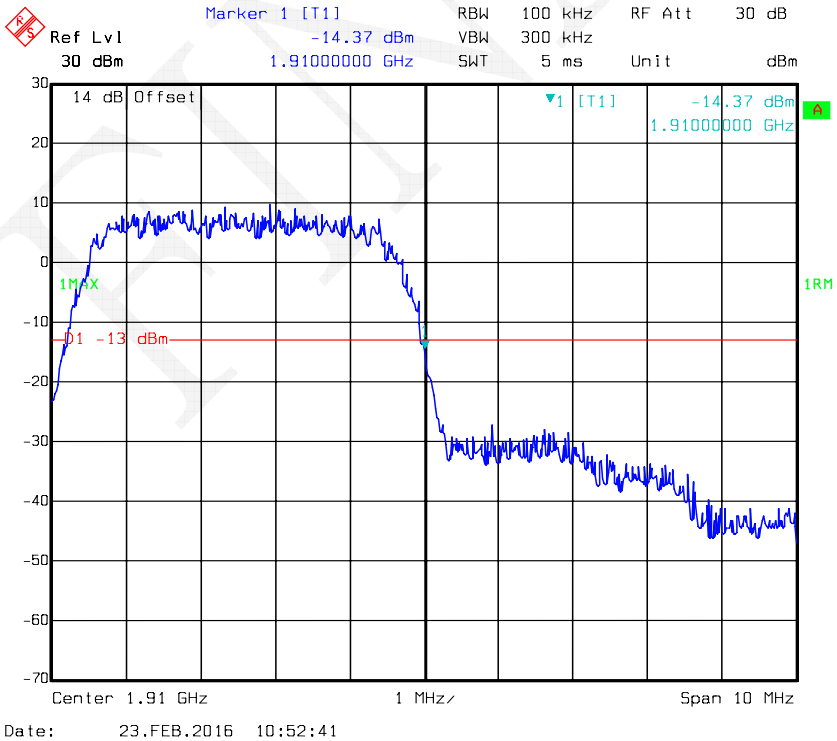
REL99 Band II, Right Band Edge



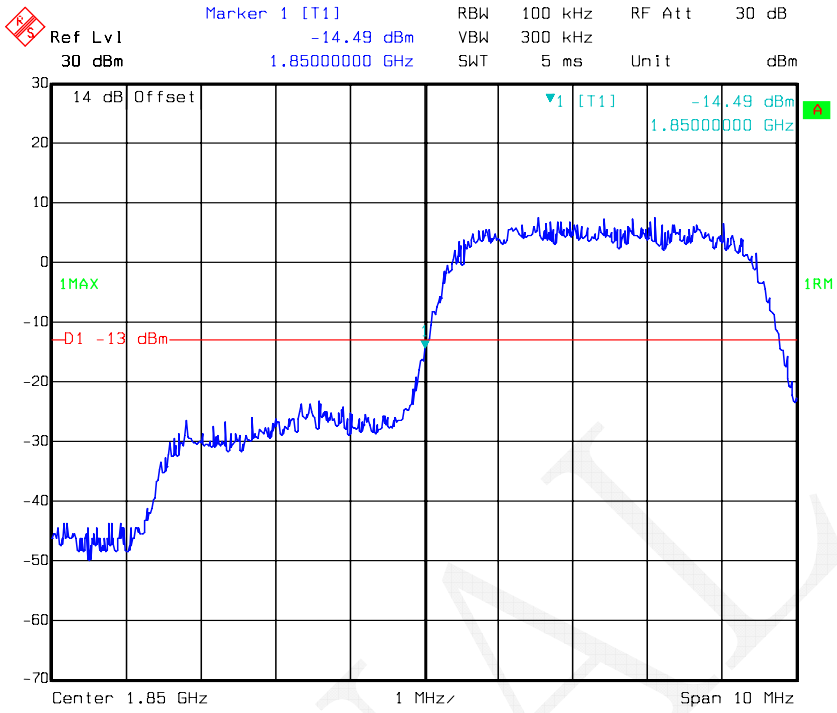
HSDPA Band II, Left Band Edge



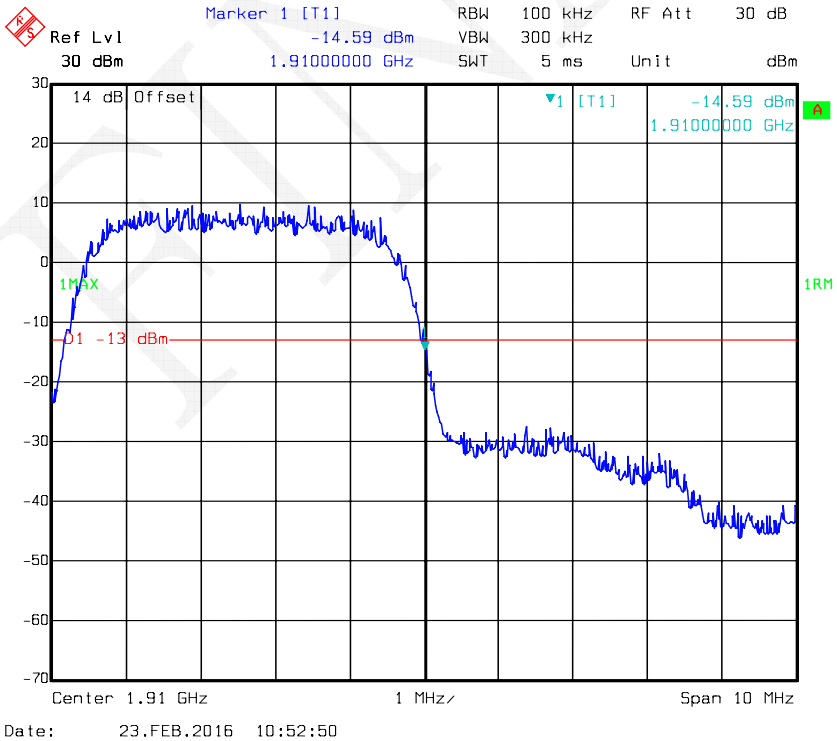
HSDPA Band II, Right Band Edge



HSUPA Band II, Left Band Edge

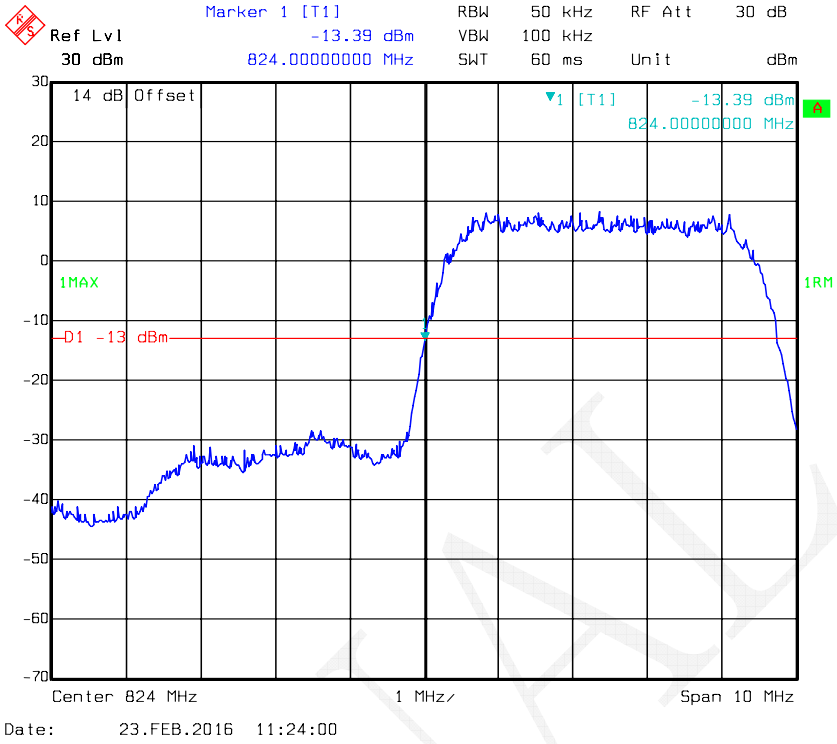


HSUPA Band II, Right Band Edge

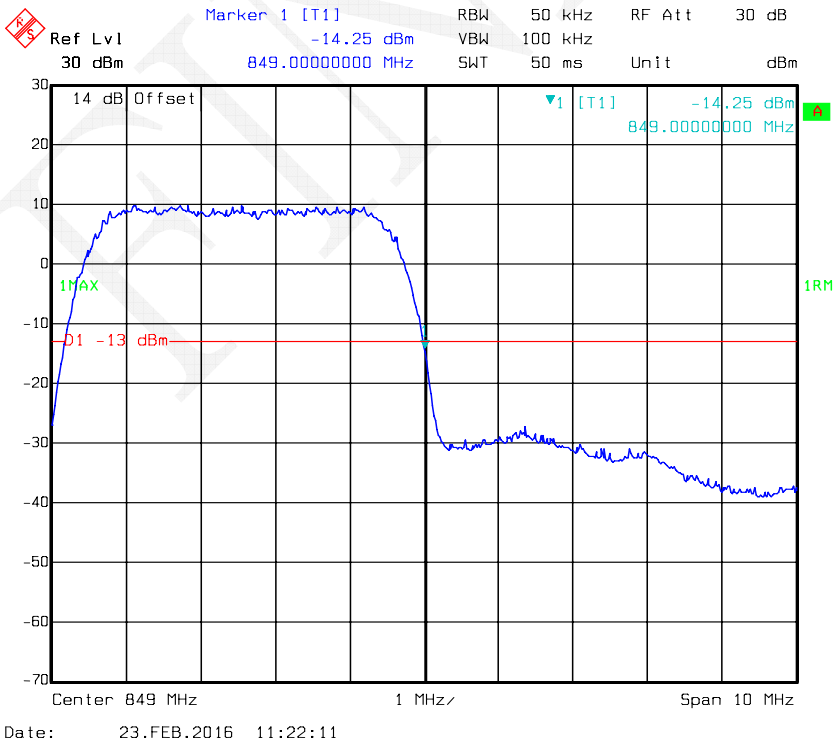


WCDMA Band V

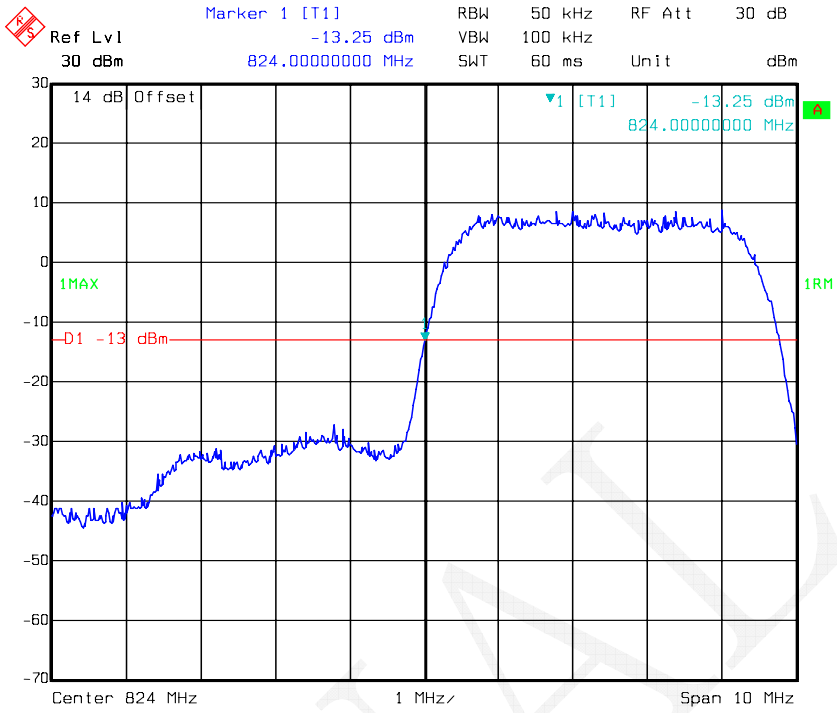
REL99 Band V, Left Band Edge



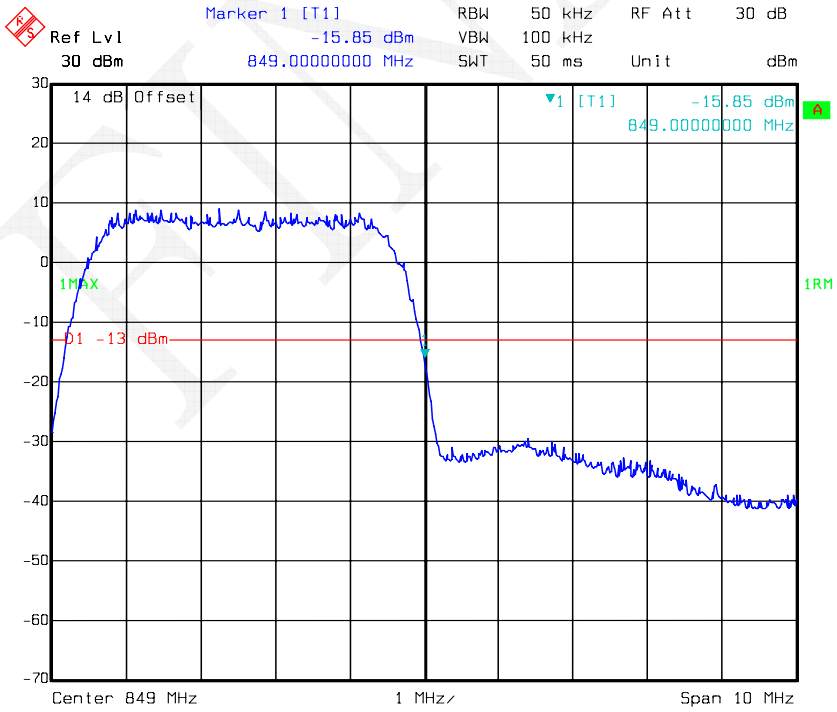
REL99 Band V Right Band Edge



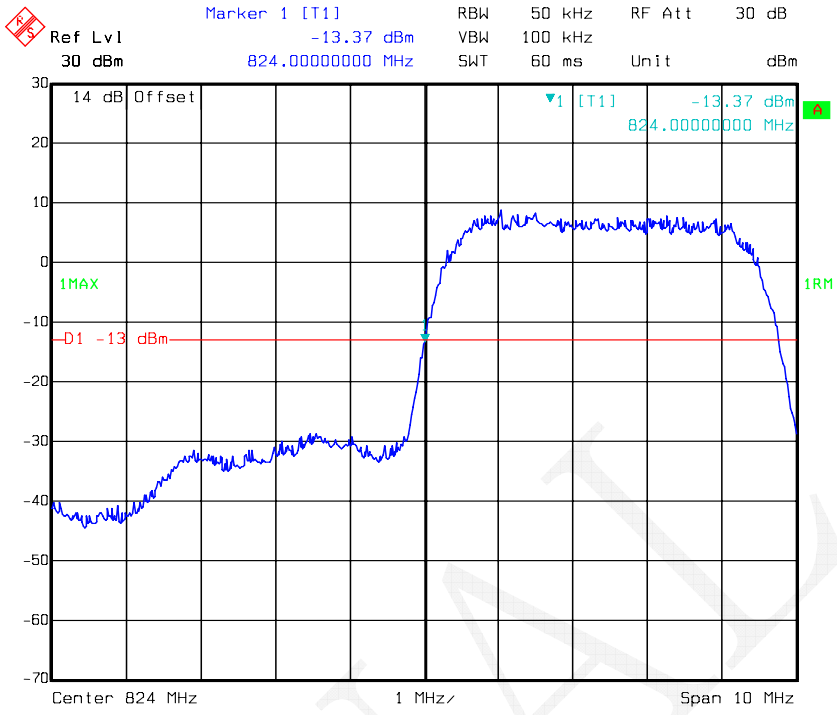
HSDPA Band V, Left Band Edge



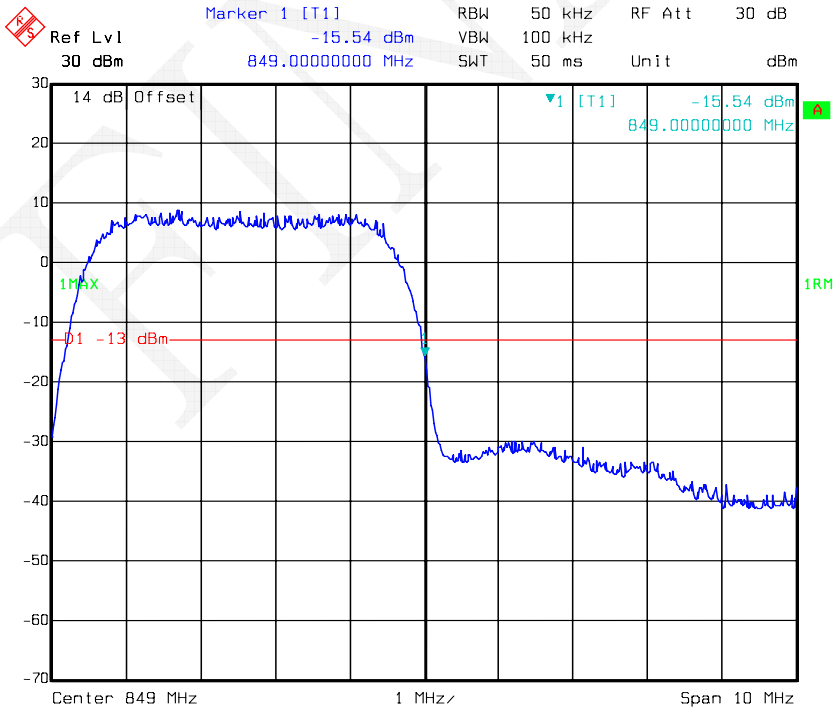
HSDPA Band V, Right Band Edge



HSUPA Band V, Left Band Edge

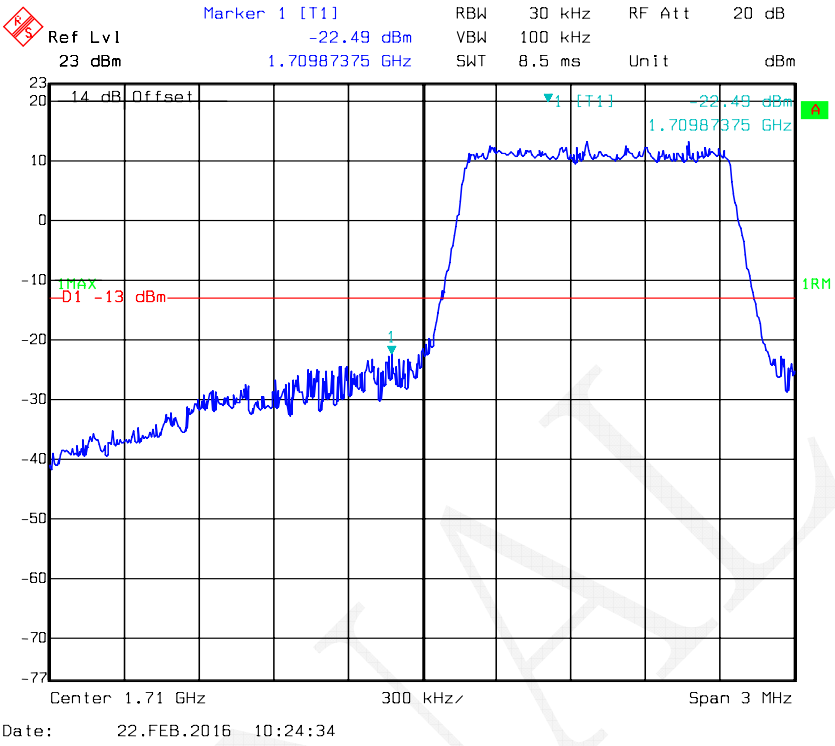


HSUPA Band V, Right Band Edge

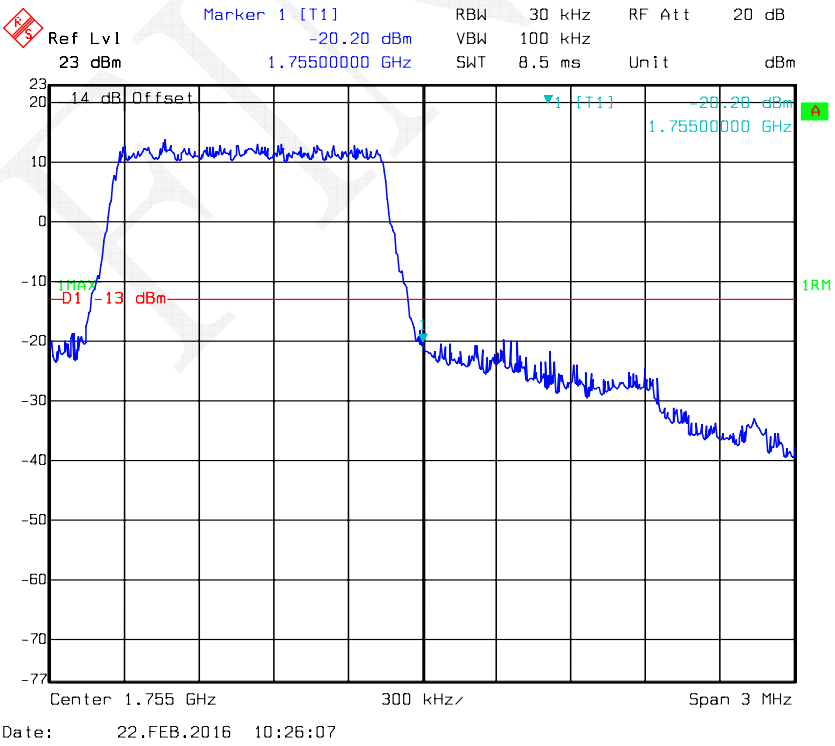


LTE Band IV

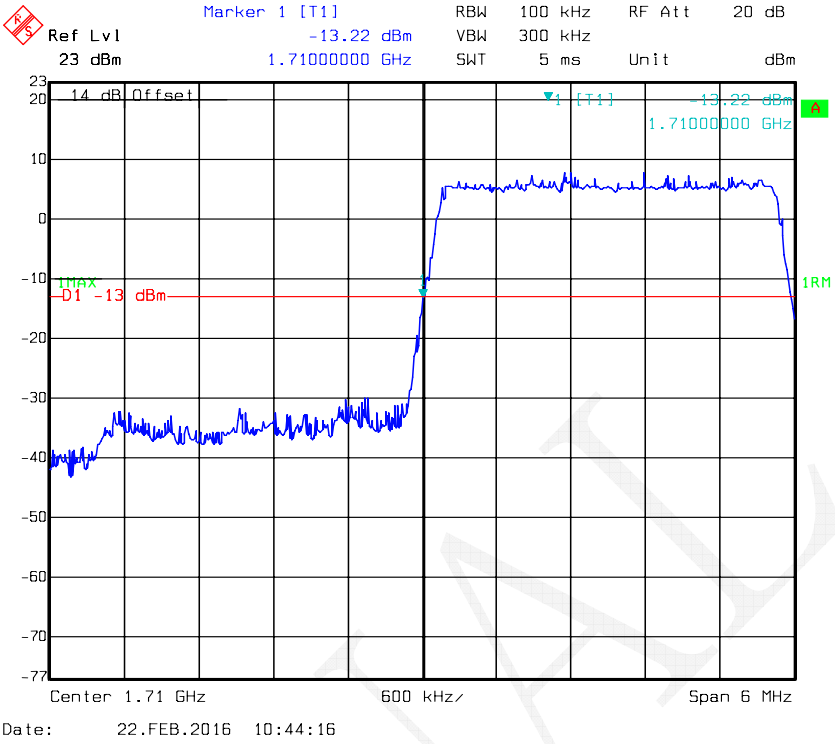
QPSK_1.4MHz_FULL RB_ Left



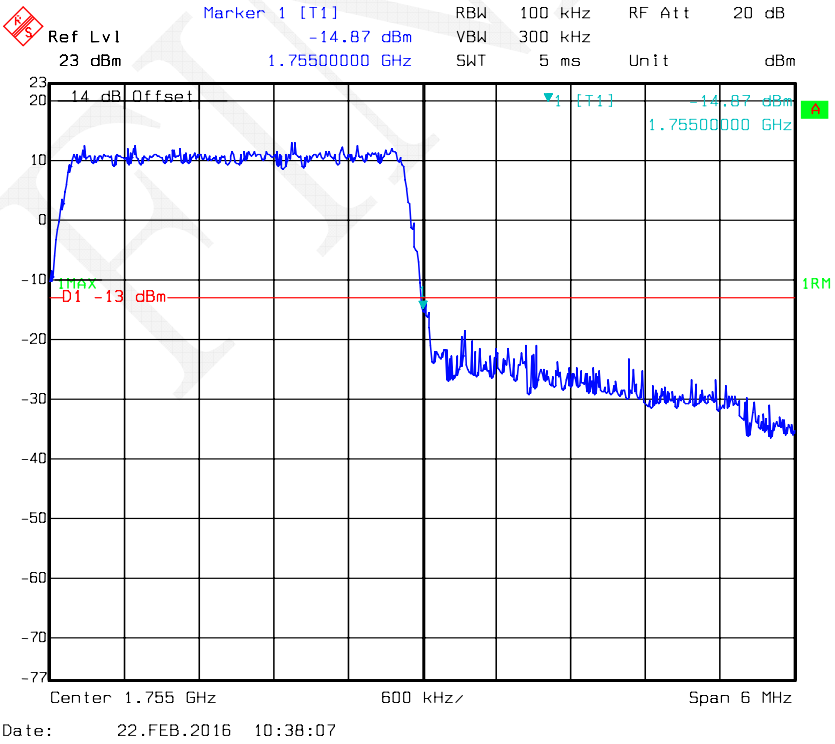
QPSK_1.4MHz_FULL RB_ Right



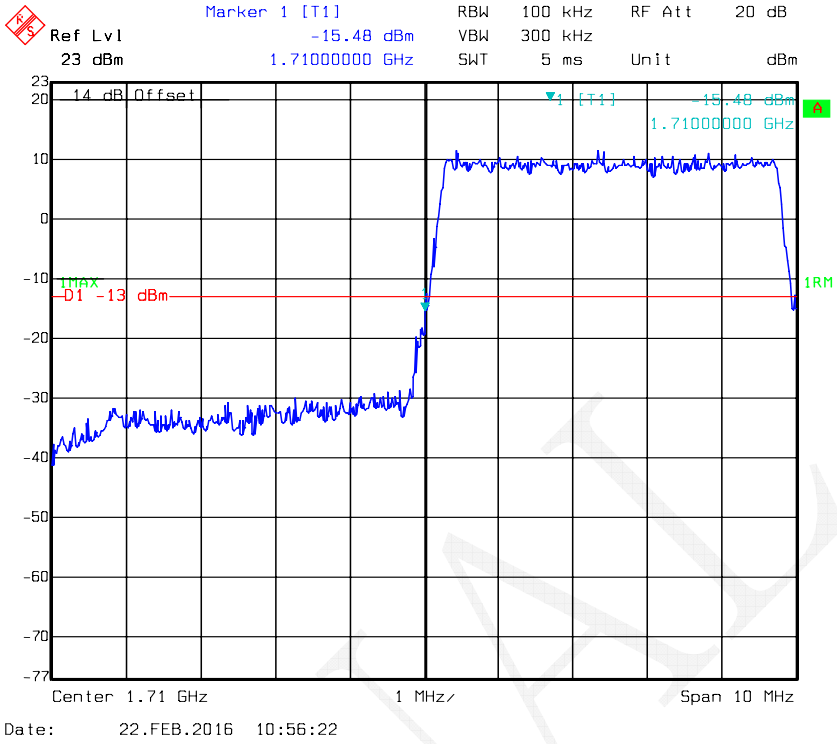
QPSK_3MHz_FULL RB_ Left



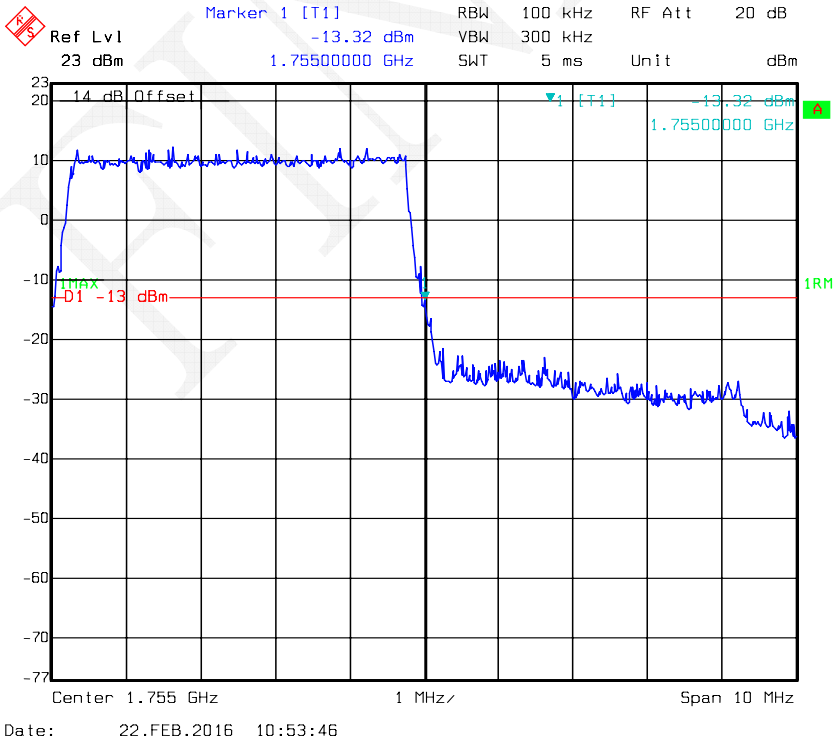
QPSK_3MHz_ FULL RB_ Right



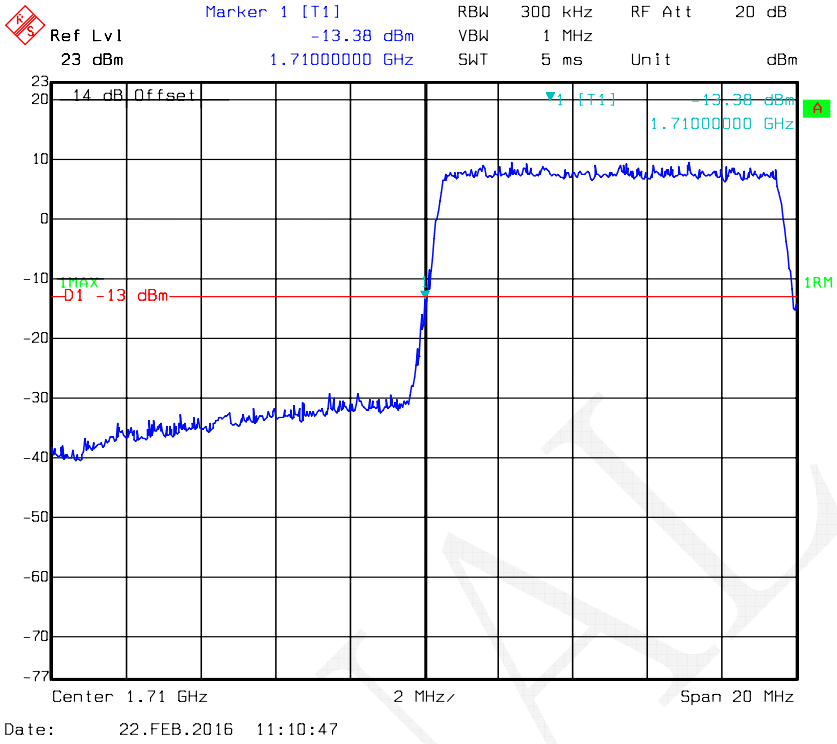
QPSK_5MHz_ FULL RB_ Left



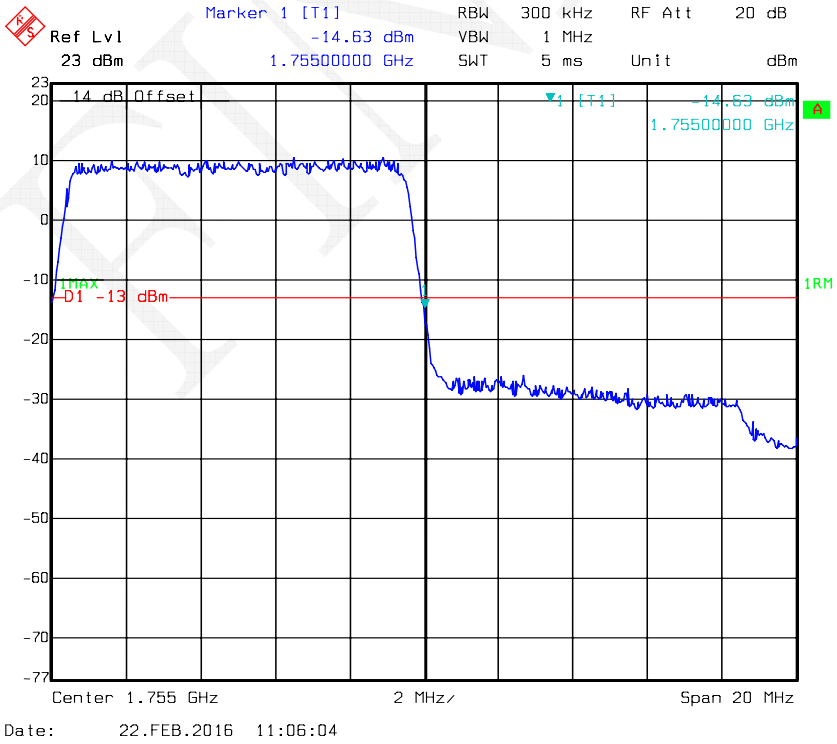
QPSK_5MHz_ FULL RB_ Right



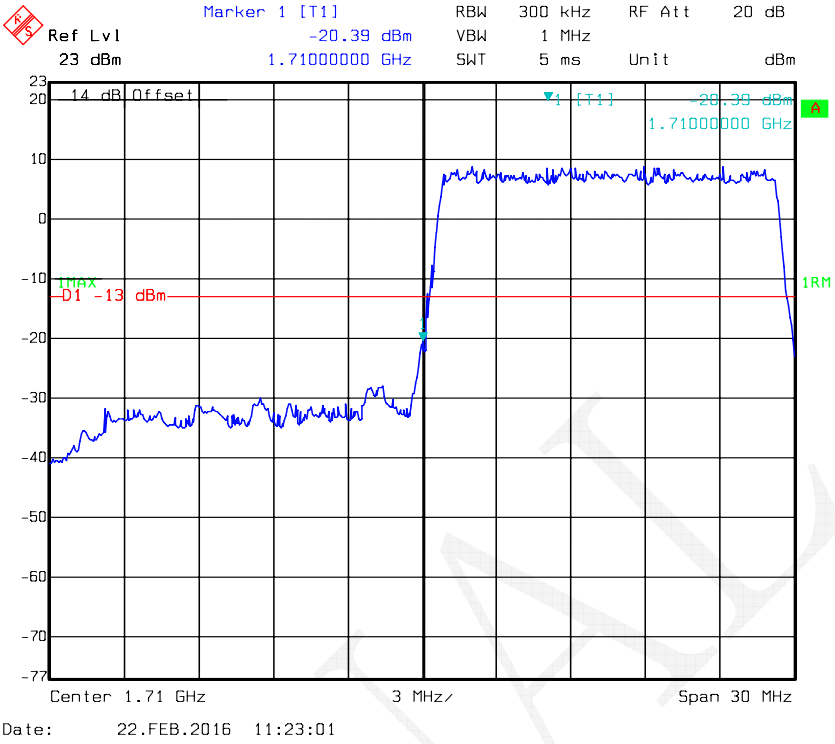
QPSK_10MHz_ FULL RB_ Left



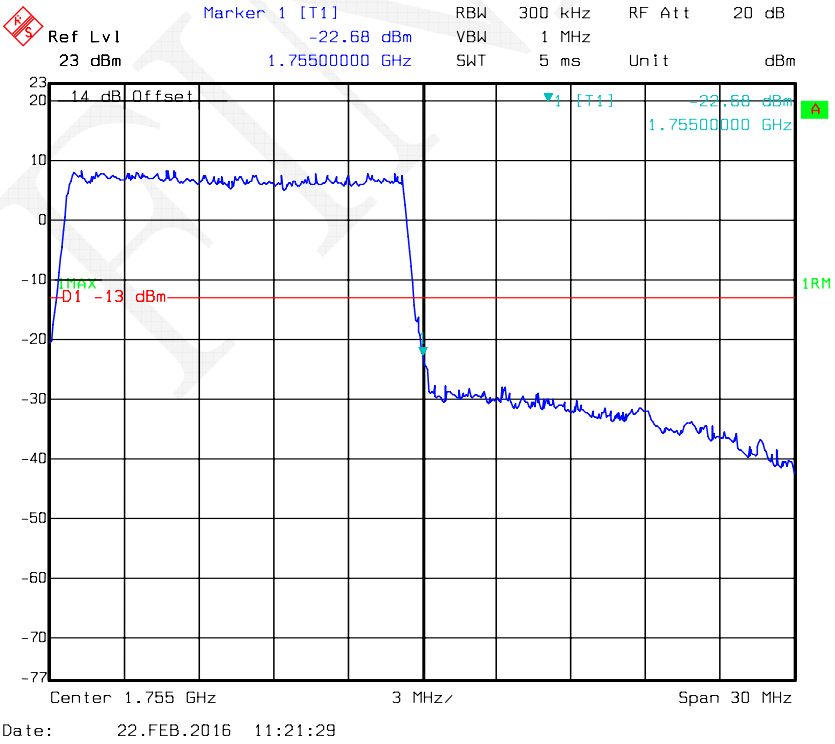
QPSK_10MHz_ FULL RB_ Right



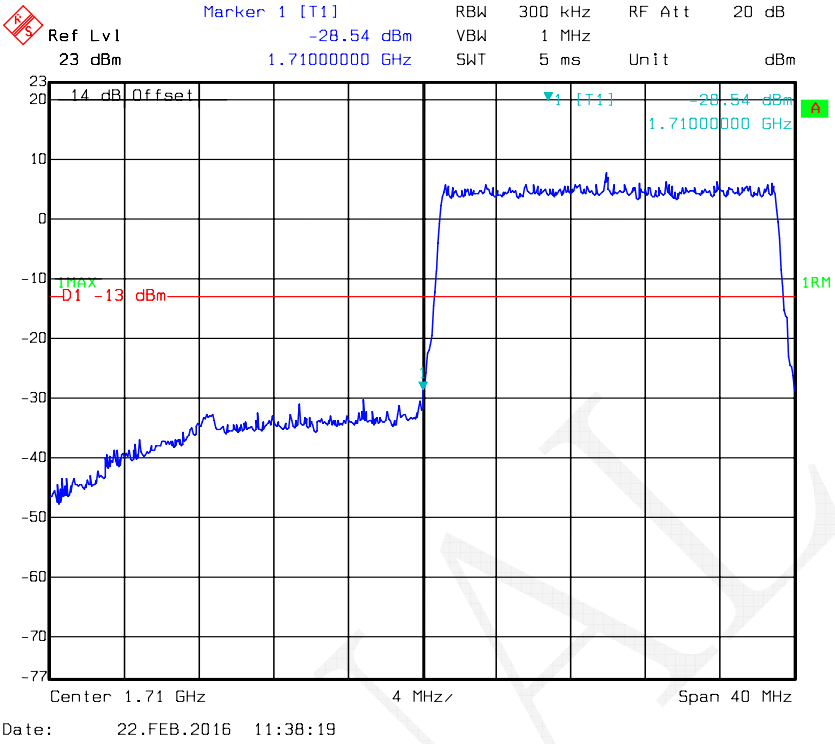
QPSK_15MHz_ FULL RB_ Left



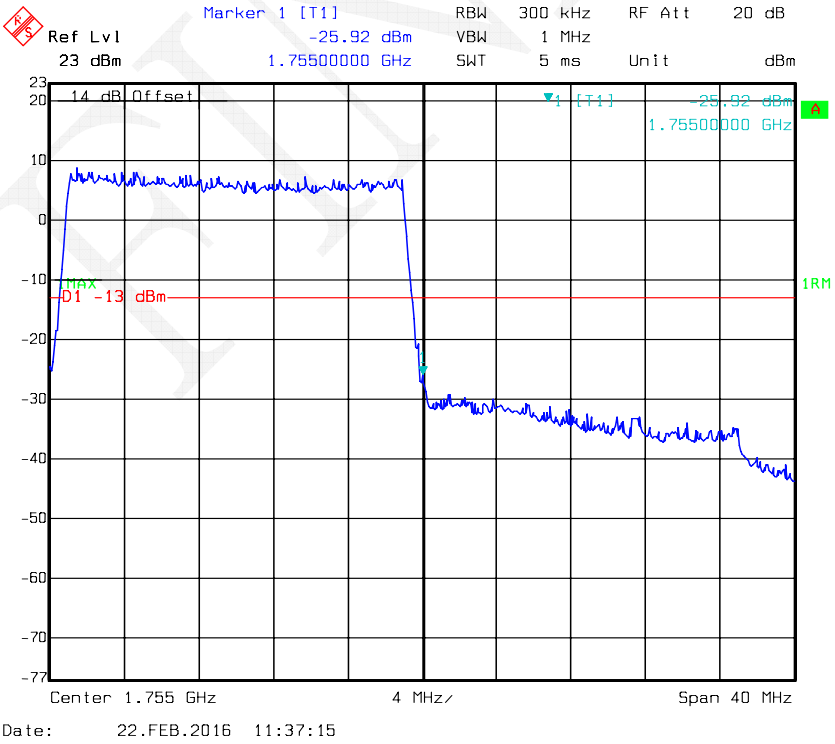
QPSK_15MHz_ FULL RB_ Right



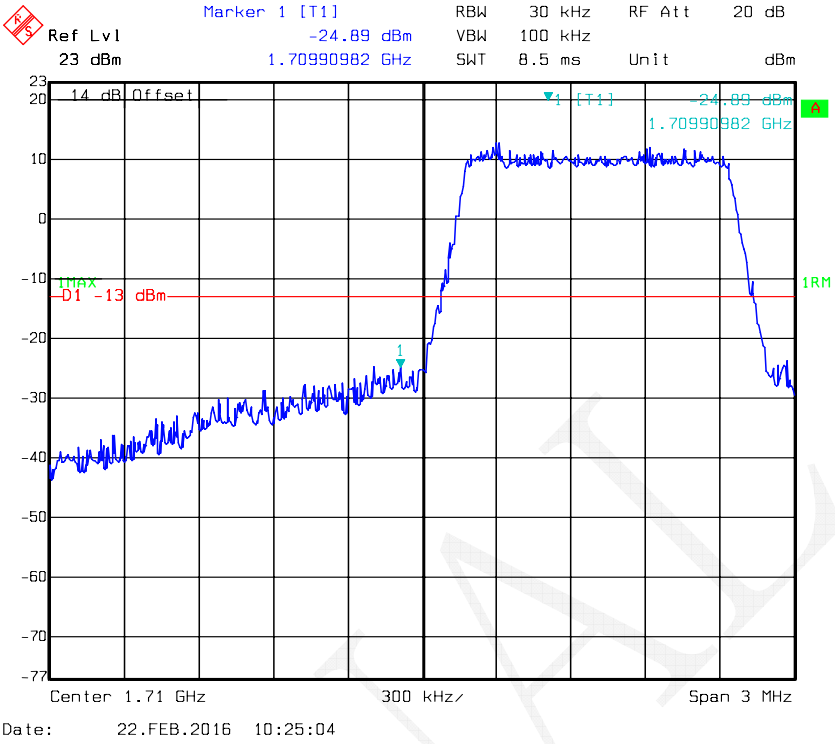
QPSK_20MHz_ FULL RB_ Left



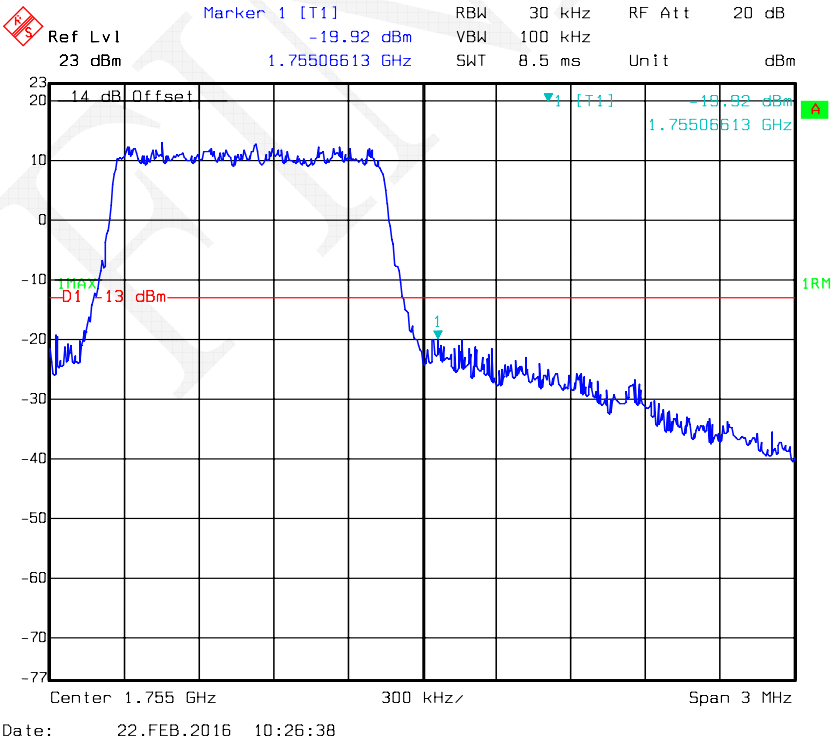
QPSK_20MHz_ FULL RB_ Right



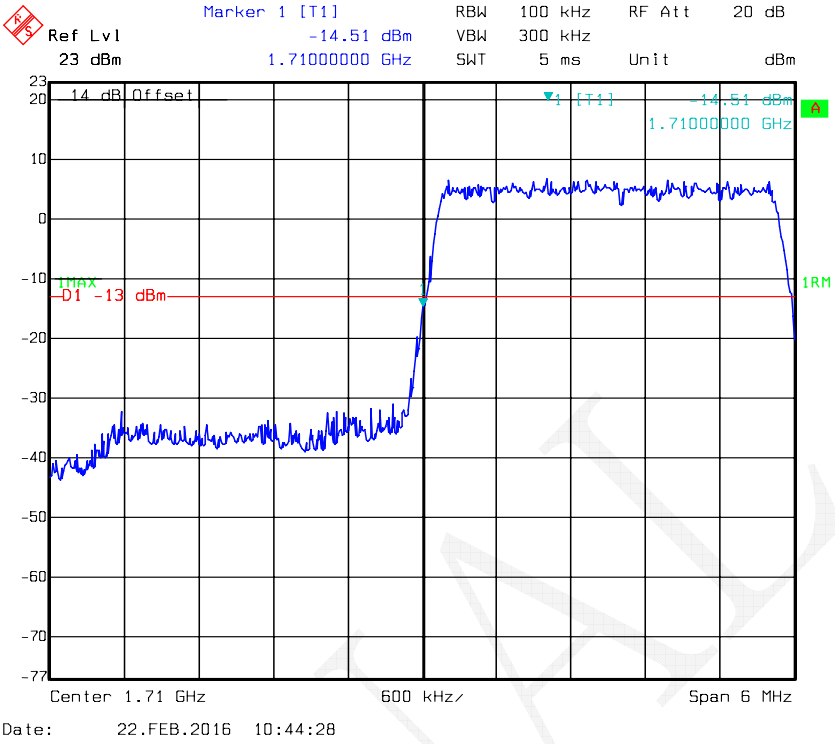
16QAM_1.4MHz_ FULL RB_ Left



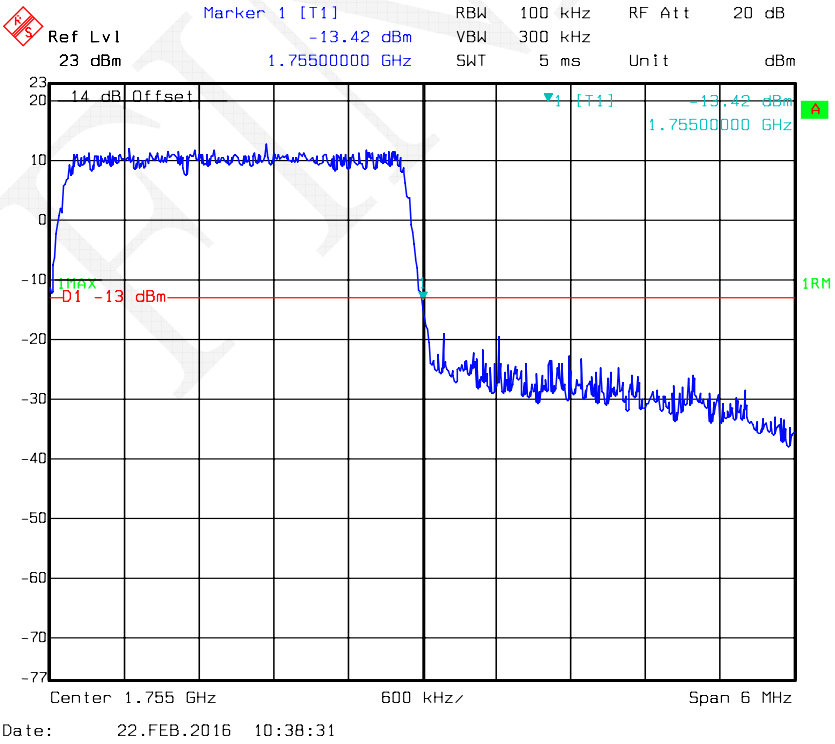
16QAM_1.4MHz_ FULL RB_ Right



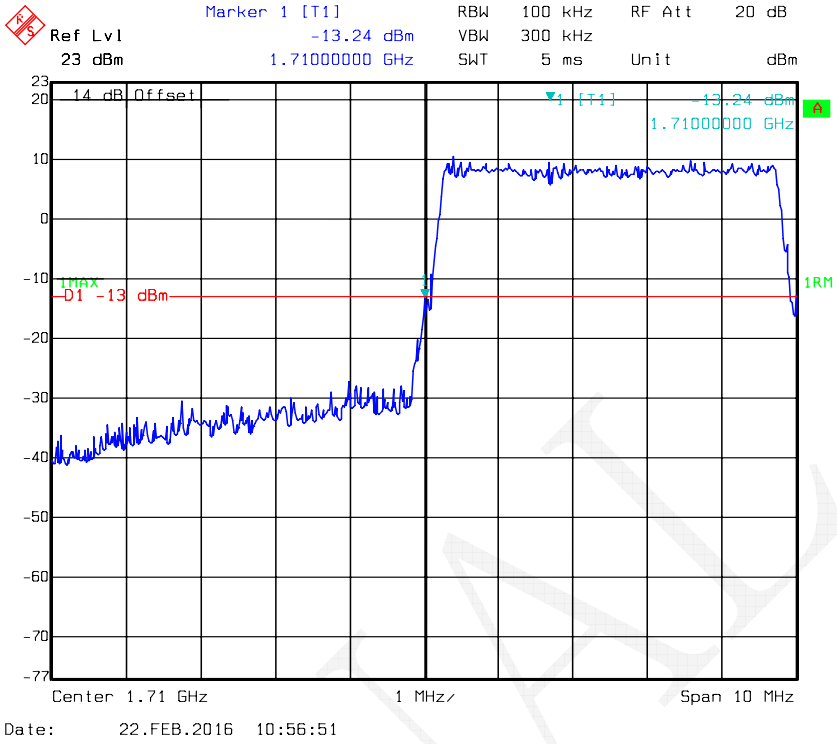
16QAM_3MHz_ FULL RB_ Left



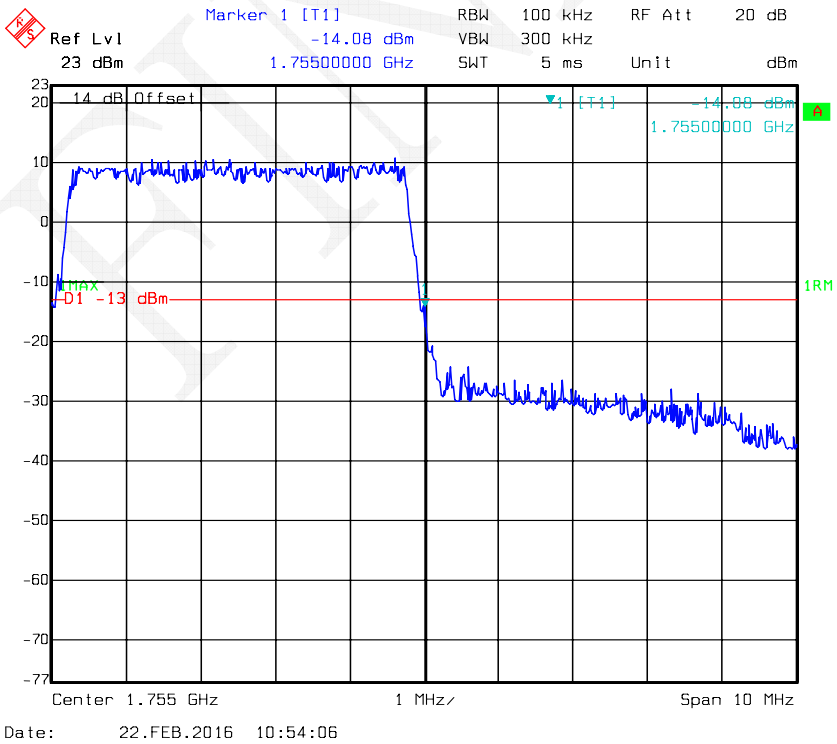
16QAM_3M_ FULL RB_ Right



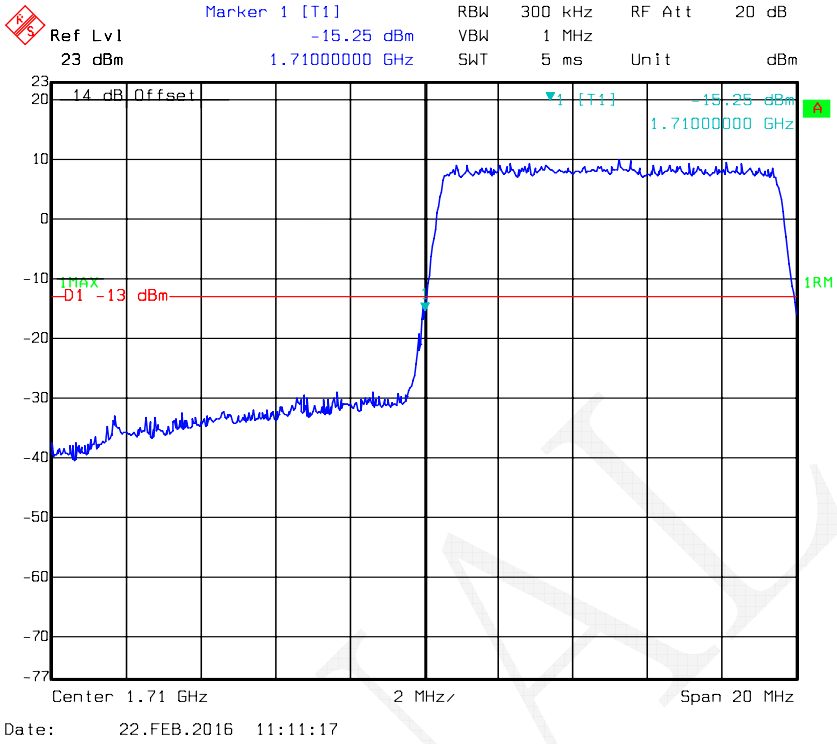
16QAM_5MHz_ FULL RB_ Left



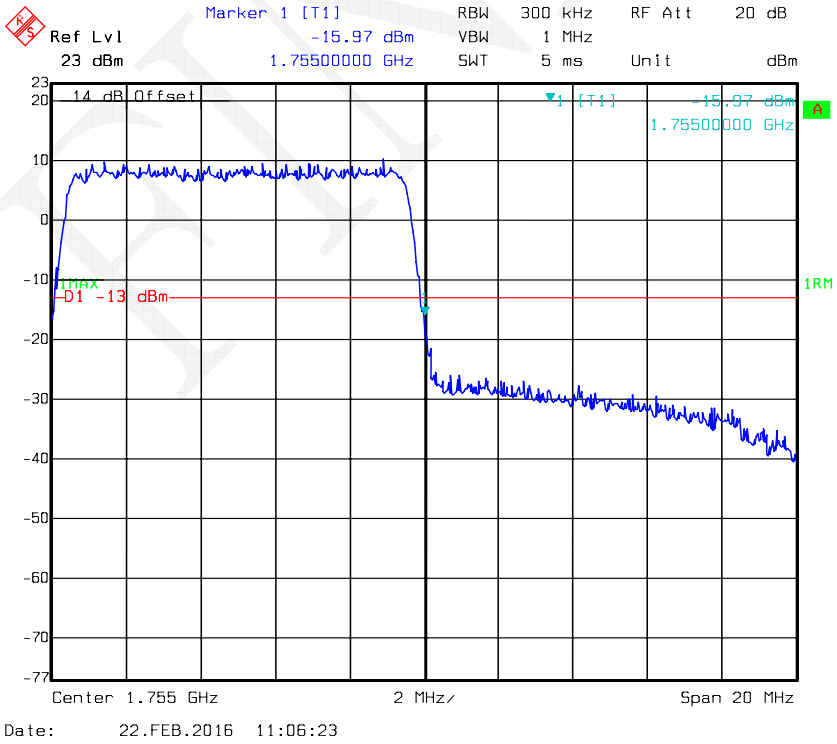
16QAM_5MHz_ FULL RB_ Right



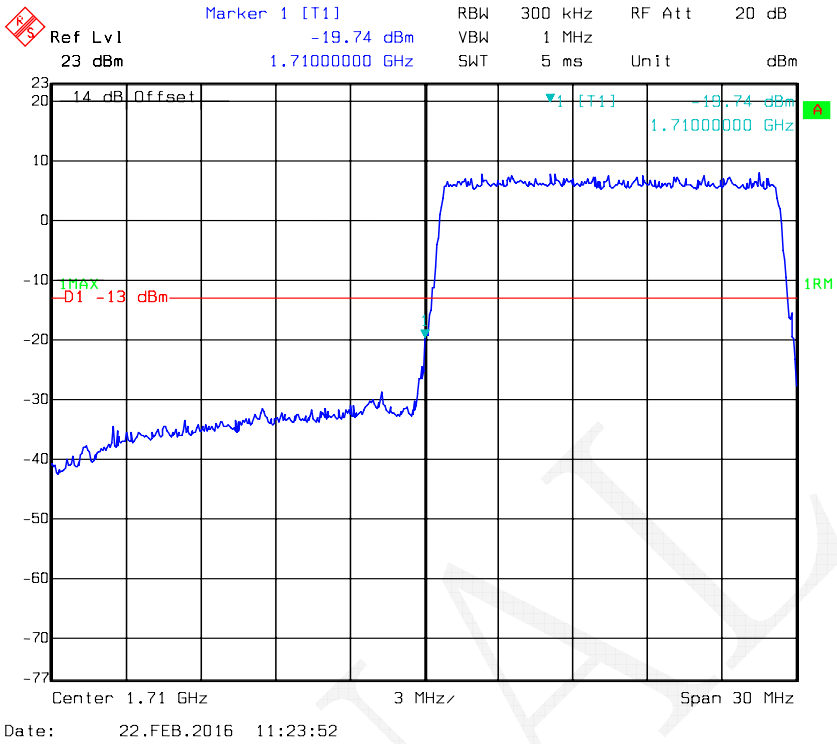
16QAM_10MHz_ FULL RB_ Left



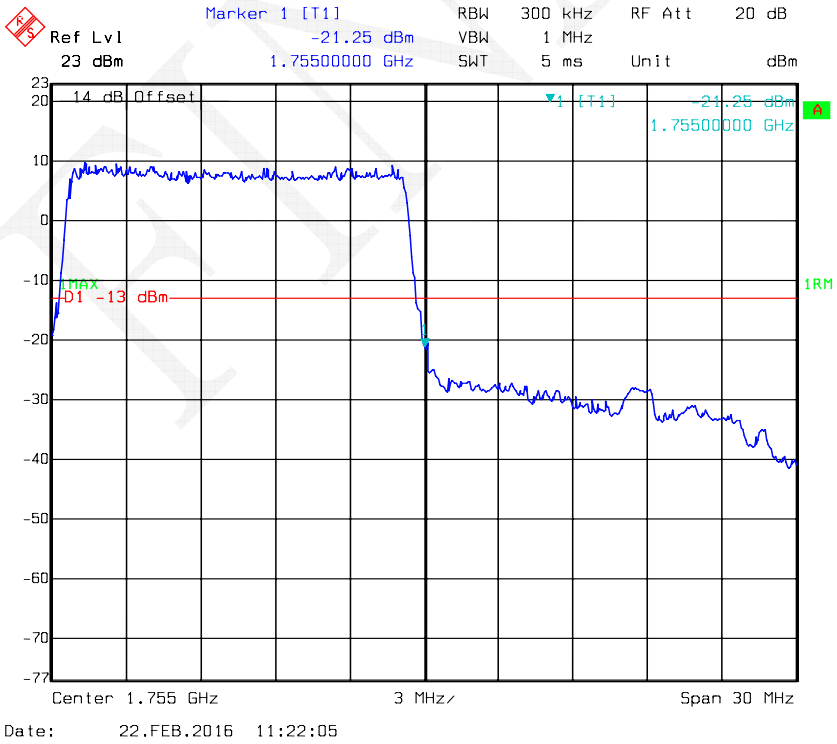
16QAM_10MHz_ FULL RB_ Right



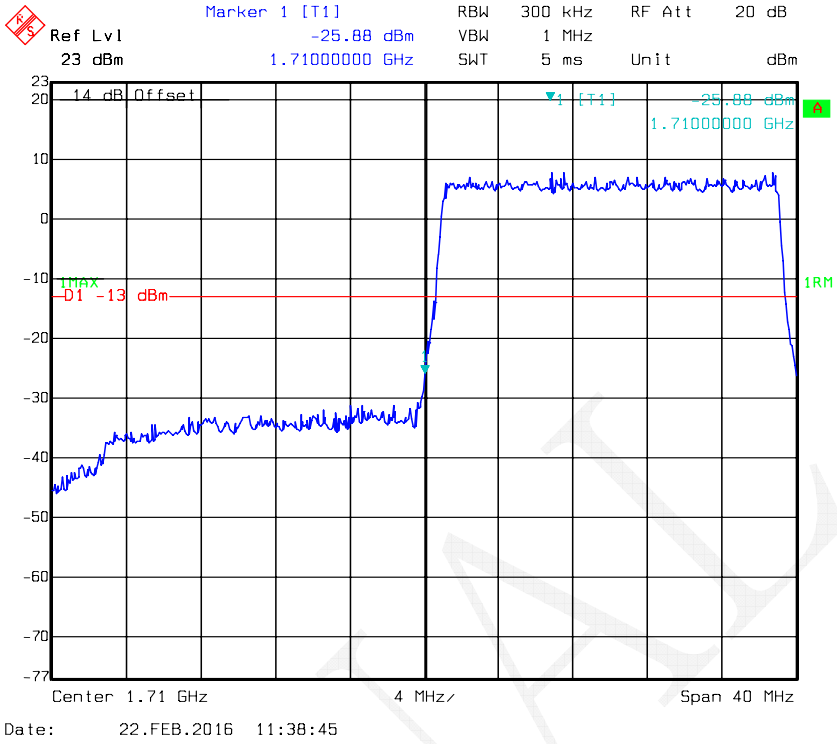
16QAM_15MHz_ FULL RB_ Left



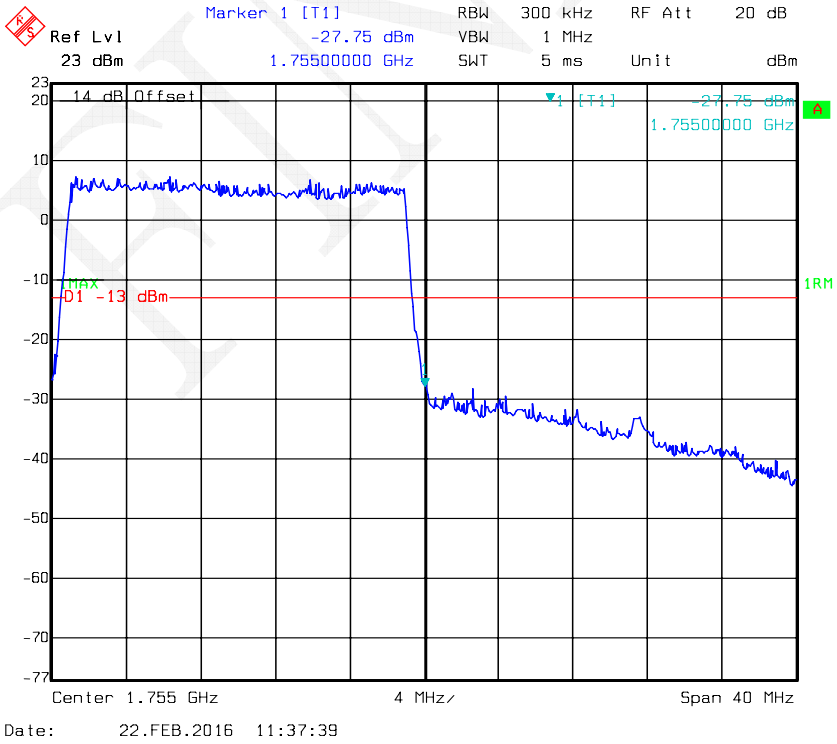
16QAM_15MHz_ FULL RB_ Right



16QAM_20MHz_ FULL RB_ Left



16QAM_20MHz_ FULL RB_ Right



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

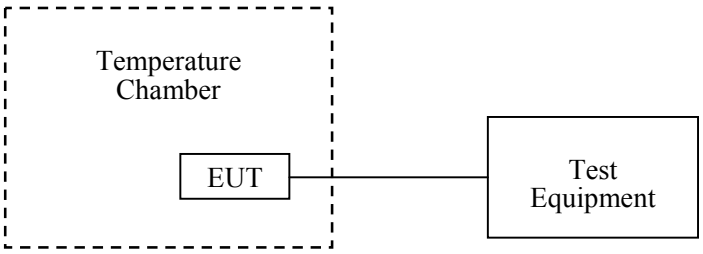
According to §24.235, the frequency stability shall be sufficient to ensure that the fundamental emissions stays within the authorized frequency block.

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	2015-11-23	2016-11-23
UNI-T	Multimeter	UT39A	M130199938	2015-04-10	2016-04-10
Pasternack	RF Coaxial Cable	RF-01	/	2015-05-06	2016-05-06

*** 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:	24.6 °C
Relative Humidity:	44 %
ATM Pressure:	101.7 kPa

The testing was performed by Allen Qiao on 2016-02-23.

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	-13	-0.016	2.5
-20	3.8	-17	-0.020	2.5
-10	3.8	-15	-0.018	2.5
0	3.8	-12	-0.014	2.5
10	3.8	-10	-0.012	2.5
20	3.8	-14	-0.017	2.5
30	3.8	-11	-0.013	2.5
40	3.8	-13	-0.016	2.5
50	3.8	-10	-0.012	2.5
25	3.6	-16	-0.019	2.5
25	4.3	-12	-0.014	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	-15	-0.018	2.5
-20	3.8	-17	-0.020	2.5
-10	3.8	-19	-0.023	2.5
0	3.8	-21	-0.025	2.5
10	3.8	-20	-0.024	2.5
20	3.8	-12	-0.014	2.5
30	3.8	-14	-0.017	2.5
40	3.8	-13	-0.016	2.5
50	3.8	-18	-0.022	2.5
25	3.6	-12	-0.014	2.5
25	4.3	-14	-0.017	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	12	0.014	2.5
-20	3.8	16	0.019	2.5
-10	3.8	15	0.018	2.5
0	3.8	20	0.024	2.5
10	3.8	14	0.017	2.5
20	3.8	19	0.023	2.5
30	3.8	21	0.025	2.5
40	3.8	15	0.018	2.5
50	3.8	16	0.019	2.5
25	3.6	11	0.013	2.5
25	4.3	18	0.022	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	15	0.018	2.5
-20	3.8	17	0.020	2.5
-10	3.8	12	0.014	2.5
0	3.8	11	0.013	2.5
10	3.8	10	0.012	2.5
20	3.8	12	0.014	2.5
30	3.8	14	0.017	2.5
40	3.8	13	0.016	2.5
50	3.8	16	0.019	2.5
25	3.6	13	0.016	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	18	0.010	Pass
-20	3.8	12	0.006	Pass
-10	3.8	16	0.009	Pass
0	3.8	17	0.009	Pass
10	3.8	20	0.011	Pass
20	3.8	14	0.007	Pass
30	3.8	12	0.006	Pass
40	3.8	21	0.011	Pass
50	3.8	23	0.012	Pass
25	3.6	19	0.010	Pass
25	4.3	14	0.007	Pass

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	15	0.008	Pass
-20	3.8	17	0.009	Pass
-10	3.8	12	0.006	Pass
0	3.8	10	0.005	Pass
10	3.8	12	0.006	Pass
20	3.8	18	0.010	Pass
30	3.8	14	0.007	Pass
40	3.8	13	0.007	Pass
50	3.8	17	0.009	Pass
25	3.6	15	0.008	Pass
25	4.3	19	0.010	Pass

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	15	0.008	Pass
-20	3.8	17	0.009	Pass
-10	3.8	14	0.007	Pass
0	3.8	12	0.006	Pass
10	3.8	11	0.006	Pass
20	3.8	16	0.009	Pass
30	3.8	13	0.007	Pass
40	3.8	19	0.010	Pass
50	3.8	13	0.007	Pass
25	3.6	20	0.011	Pass
25	4.3	12	0.006	Pass

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	18	0.010	Pass
-20	3.8	15	0.008	Pass
-10	3.8	14	0.007	Pass
0	3.8	16	0.009	Pass
10	3.8	13	0.007	Pass
20	3.8	12	0.006	Pass
30	3.8	19	0.010	Pass
40	3.8	11	0.006	Pass
50	3.8	14	0.007	Pass
25	3.6	17	0.009	Pass
25	4.3	13	0.007	Pass

LTE Band IV:

QPSK, Channel Bandwidth:10MHz Middle Channel, f_c = 1732.5 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Result**
℃	**V_{DC}**	**Hz**	**ppm**	
-30	3.8	3.15	0.0018	Pass
-20	3.8	4.16	0.0024	Pass
-10	3.8	5.21	0.0030	Pass
0	3.8	1.18	0.0007	Pass
10	3.8	2.21	0.0013	Pass
20	3.8	2.23	0.0013	Pass
30	3.8	3.19	0.0018	Pass
40	3.8	3.45	0.0020	Pass
50	3.8	2.51	0.0014	Pass
25	3.6	2.00	0.0012	Pass
25	4.3	1.68	0.0010	Pass

16QAM, Channel Bandwidth:10MHz Middle Channel, f_c = 1732.5 MHz				
Temperature	**Voltage**	**Frequency Error**	**Frequency Error**	**Result**
℃	**V_{DC}**	**Hz**	**ppm**	
-30	3.8	2.24	0.0013	Pass
-20	3.8	2.98	0.0017	Pass
-10	3.8	3.13	0.0018	Pass
0	3.8	3.29	0.0019	Pass
10	3.8	4.16	0.0024	Pass
20	3.8	5.17	0.0030	Pass
30	3.8	2.47	0.0014	Pass
40	3.8	2.59	0.0015	Pass
50	3.8	4.29	0.0025	Pass
25	3.6	4.00	0.0023	Pass
25	4.3	4.26	0.0025	Pass

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

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