

FCC RF Test Report

APPLICANT : ZTE CORPORATION
EQUIPMENT : CDMA/LTE Tablet
BRAND NAME : ZTE
MODEL NAME : V68
FCC ID : Q78-V68
STANDARD : 47 CFR Part 2, 27
CLASSIFICATION : PCS Licensed Transmitter (PCB)
TX FREQUENCY RANGE : 777 MHz ~ 787 MHz (LTE – Band 13)
RX FREQUENCY RANGE : 746 MHz ~ 756 MHz (LTE – Band 13)
MAX. ERP POWER : 0.11 W (QPSK RB Size 1, RB Offset 0, BW 5MHz)
0.14 W (QPSK RB Size 1, RB Offset 0, BW 10MHz)
0.10 W (16QAM RB Size 1, RB Offset 24, BW 5MHz)
0.14 W (16QAM RB Size 1, RB Offset 0, BW 10MHz)
EMISSION DESIGNATOR : 4M51G7D (QPSK, BW 5MHz)
4M51D7W (16QAM, BW 5MHz)
8M98G7D (QPSK, BW 10MHz)
8M95D7W (16QAM, BW 10MHz)

The product was received on Sep. 08, 2011 and completely tested on Mar. 13, 2012. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI / TIA / EIA-603-C-2004 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.

Reviewed by:



Jones Tsai / Manager



SPORTON INTERNATIONAL (KUNSHA) INC.
No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG190807	Rev. 01	Initial issue of report	Mar. 13, 2012

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	§2.1046	Conducted Output Power	NA	PASS	
3.2	§27.50(b)(10)	Effective Radiated Power	< 3 Watts	PASS	-
3.3	§2.1049	Occupied Bandwidth	NA	PASS	-
3.4	§2.1049 §27.53(c)(2)	Band Edge and Emission Mask Measurement	$< 43 + 10\log_{10}(P[\text{Watts}])$ $< 65 + 10\log_{10}(P[\text{Watts}])$ in a 6.25 kHz bandwidth	PASS	-
3.5	§2.1051 §27.53(c)	Conducted Emission	$< 43 + 10\log_{10}(P[\text{Watts}])$	PASS	-
3.5	§2.1053 §27.53(f)	Undesirable Emissions in the 1559 ~ 1610 MHz band	< -40 dBm/MHz (wideband) < -50 dBm (narrowband)	PASS	-
3.6	§2.1053 §27.53(c)(2) §27.53(c)(4)	Undesirable Out of Band Emissions	$< 43 + 10\log_{10}(P[\text{Watts}])$	PASS	Under limit 43.35 dB at 5474 MHz
3.7	§2.1055 §27.54	Frequency Stability Temperature & Voltage	< 2.5 ppm	PASS	-

1 General Description

1.1 Applicant

ZTE CORPORATION

ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

1.2 Manufacturer

ZTE CORPORATION

ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	CDMA/LTE Tablet
Brand Name	ZTE
Model Name	V68
FCC ID	Q78-V68
Tx Frequency	777 MHz ~787 MHz
Rx Frequency	746 MHz ~ 756 MHz
Maximum Output Power to Antenna	23.28 dBm (5M) 23.30 dBm (10M)
Maximum ERP	0.11 W (20.27 dBm) (QPSK RB Size 1, RB Offset 0, BW 5MHz) 0.14 W (21.50 dBm) (QPSK RB Size 50, RB Offset 0, BW 10MHz) 0.10 W (19.90 dBm) (16QAM RB Size 1, RB Offset 24, BW 5MHz) 0.14 W (21.47 dBm) (16QAM RB Size 1, RB Offset 0, BW 10MHz)
Antenna Type	PIFA Antenna
HW Version	V2.1
SW Version	V68_V1.12
Type of Modulation	4M51G7D (QPSK, BW 5MHz) 4M51D7W (16QAM, BW 5MHz) 8M98G7D (QPSK, BW 10MHz) 8M95D7W (16QAM, BW 10MHz)
EUT Stage	Identical Prototype

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.		
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958		
Test Site No.	Sporton Site No.		FCC/IC Registration No.
	TH01-KS	03CH01-KS	149928/4086E-1

1.5 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR Part 2, 27
- ♦ ANSI / TIA / EIA-603-C-2004

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	LTE Station	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m
2.	DC Power Supply	GW	GPS-30300	N/A	N/A	Unshielded, 1.8 m

2 Test Configuration of Equipment Under Test

2.1 Test Mode

During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

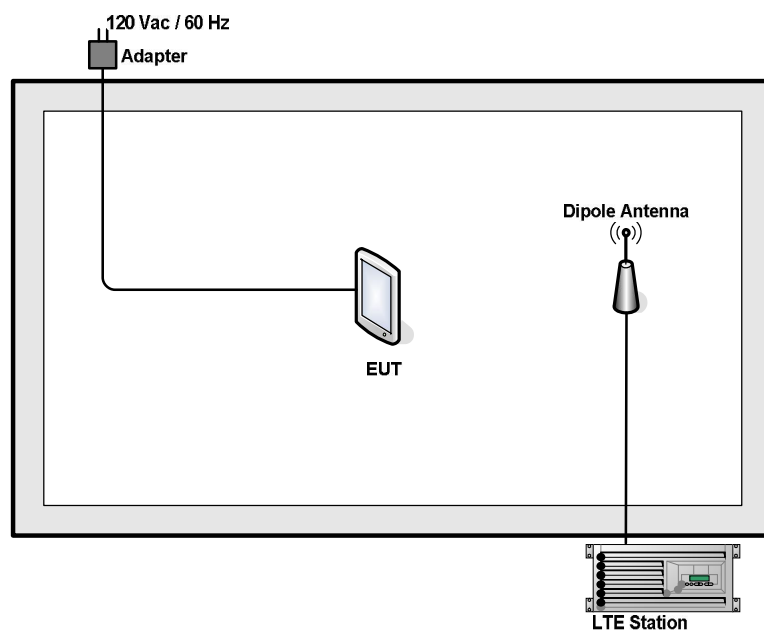
Frequency range investigated for radiated emission: 30MHz to 9000 MHz.

Test Modes			
Band		Radiated TCs	Conducted TCs
LTE Band 13	BW 5MHz	■ LTE (RB Size 1, RB Offset 24) Link	■ LTE (RB Size 1, RB Offset 0) Link ■ LTE (RB Size 1, RB Offset 24) Link ■ LTE (RB Size 12, RB Offset 6) Link ■ LTE (RB Size 25, RB Offset 0) Link
	BW 10MHz	■ LTE (RB Size 1, RB Offset 0) Link	■ LTE (RB Size 1, RB Offset 0)Link ■ LTE (RB Size 1, RB Offset 49)Link ■ LTE (RB Size 25, RB Offset 13)Link ■ LTE (RB Size 50, RB Offset 0)Link

Note:

1. For conducted test, both two Modulations (QPSK and 16QAM) are tested. For RSE, only the maximum RF output power level is chosen.
2. From conducted spurious emission measurement, the modulation related spurious emission out of the band is not identified. Since MPR is implemented, 1RB-16-QAM results in highest RF power, therefore it's chosen for RSE measurement.

2.2 Connection Diagram of Test System



3 Test Result

3.1 Conducted Output Power Measurement

3.1.1 Description of the Conducted Output Power Measurement

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals shall be reported.

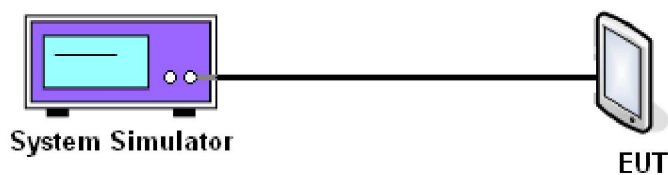
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The transmitter output port was connected to base station.
2. Set EUT at maximum power through base station.
3. Select lowest, middle, and highest channels for each band and different modulation.

3.1.4 Test Setup



3.1.5 Test Result of Conducted Output Power

LTE Band 13							
Modes	Channel	Frequency (MHz)	Modulation	RB Configuration		Conducted Power (dBm)	Conducted Power (Watts)
				RB Size	RB Offset		
5MHz	23205	779.5	QPSK	1	0	23.11	0.20
				1	24	23.17	0.21
				12	6	23.13	0.21
				25	0	23.08	0.20
			16-QAM	1	0	23.25	0.21
				1	24	23.25	0.21
				12	6	23.15	0.21
				25	0	23.21	0.21
	23230	782	QPSK	1	0	23.17	0.21
				1	24	23.1	0.20
				12	6	23.07	0.20
				25	0	23.16	0.21
			16-QAM	1	0	23.22	0.21
				1	24	23.27	0.21
				12	6	23.26	0.21
				25	0	23.26	0.21
	23255	784.5	QPSK	1	0	23.13	0.21
				1	24	23.07	0.20
				12	6	23.08	0.20
				25	0	23.03	0.20
			16-QAM	1	0	23.26	0.21
				1	24	23.28	0.21
				12	6	23.08	0.20
				25	0	23.14	0.21

LTE Band 13							
Modes	Channel	Frequency (MHz)	Modulation	RB Configuration		Conducted Power (dBm)	Conducted Power (Watts)
				RB Size	RB Offset		
10MHz	23230	782	QPSK	1	0	23.06	0.20
				1	49	23.02	0.20
				25	13	23.11	0.20
				50	0	23.15	0.21
			16-QAM	1	0	23.3	0.21
				1	49	23.25	0.21
				25	13	23.3	0.21
				50	0	23.06	0.20

3.2 Effective Radiated Power Measurement

3.2.1 Description of the ERP Measurement

Effective radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-C-2004. Mobile and portable (hand-held) stations operating in the 782 MHz band are limited to a peak ERP of 3 watt.

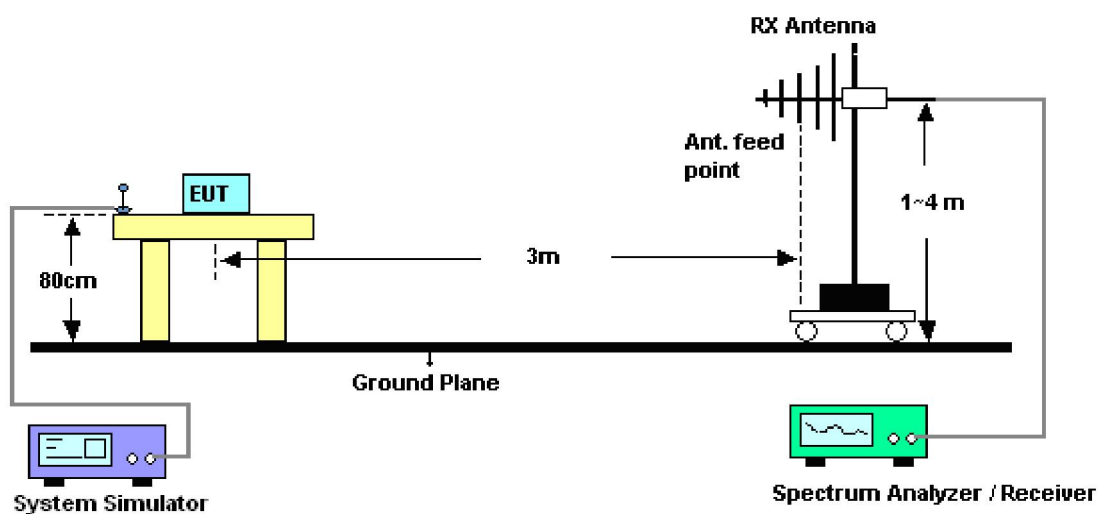
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The EUT was placed on an non-conductive rotating platform with 0.8 meter height in a semi-anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RBW=3M VBW=3*RBW RMS Detector and used Channel Power function with measurement bandwidth = 5M/10MHz.
2. During the measurement, the EUT was enforced in maximum power and linked with a base station. The highest emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
3. Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to TIA/EIA-603-C. The EUT was replaced by dipole antenna (substitution antenna) at same location, and then a known power from S.G. was applied into the dipole antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna. The correction factor (in dB) = S.G. - Tx Cable loss + Substitution antenna gain - Analyzer reading. Then the EUT's EIRP was calculated with the correction factor, $EIRP = LVL + \text{Correction factor}$.

3.2.4 Test Setup



3.2.5 Test Result of ERP

LTE Band 13 (QPSK RB Size 1, RB Offset 0, 5MHz)					
Radiated Power ERP					
Horizontal Polarization					
Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
23205	779.50	-9.36	27.91	18.55	0.07
23230	782.00	-9.97	28.51	18.54	0.07
23255	784.50	-8.56	28.83	20.27	0.11
Vertical Polarization					
Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
23205	779.50	-18.06	30.98	12.92	0.02
23230	782.00	-17.88	31.74	13.86	0.02
23255	784.50	-18.14	32.47	14.33	0.03

* ERP = LVL (dBm) + Correction Factor (dB)

LTE Band 13 (QPSK RB Size 50, RB Offset 0, 10MHz)					
Radiated Power ERP					
Horizontal Polarization					
Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
23230	782.00	-7.01	28.51	21.50	0.14
Vertical Polarization					
Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
23230	782.00	-16.96	31.74	14.78	0.03

* ERP = LVL (dBm) + Correction Factor (dB)

LTE Band 13 (16QAM RB Size 1, RB Offset 24, 5MHz) Radiated Power ERP					
Horizontal Polarization					
Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
23205	779.50	-8.25	27.91	19.66	0.09
23230	782.00	-8.61	28.51	19.90	0.10
23255	784.50	-10.46	28.83	18.37	0.07
Vertical Polarization					
Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
23205	779.50	-17.42	30.98	13.56	0.02
23230	782.00	-19.22	31.74	12.52	0.02
23255	784.50	-19.86	32.47	12.61	0.02

* ERP = LVL (dBm) + Correction Factor (dB)

LTE Band 13 (16QAM RB Size 1, RB Offset 0, 10MHz) Radiated Power ERP					
Horizontal Polarization					
Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
23230	782.00	-7.04	28.51	21.47	0.14
Vertical Polarization					
Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
23230	782.00	-15.40	31.74	16.34	0.04

* ERP = LVL (dBm) + Correction Factor (dB)

3.3 Occupied Bandwidth Measurement

3.3.1 Description of Occupied Bandwidth Measurement

The occupied bandwidth is the width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean transmitted power.

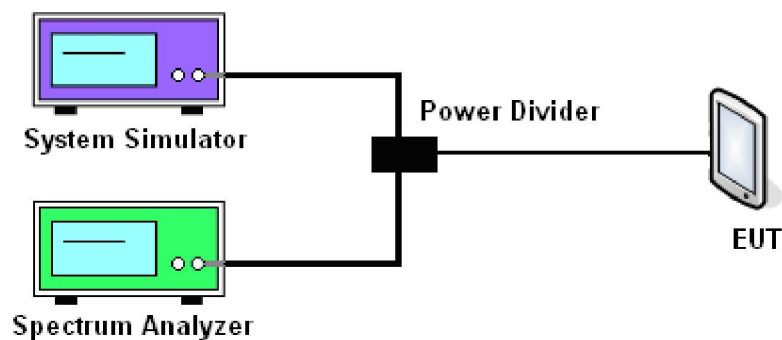
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

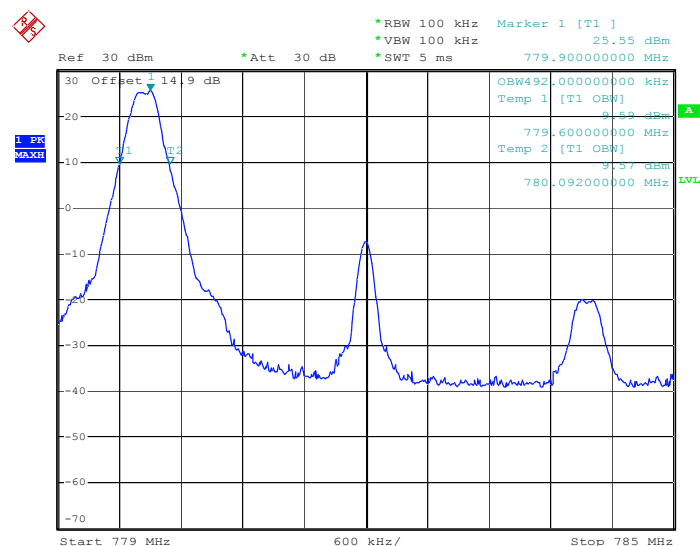
1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The 99% occupied bandwidth (BW) of the middle channel for the highest RF powers were measured.

3.3.4 Test Setup



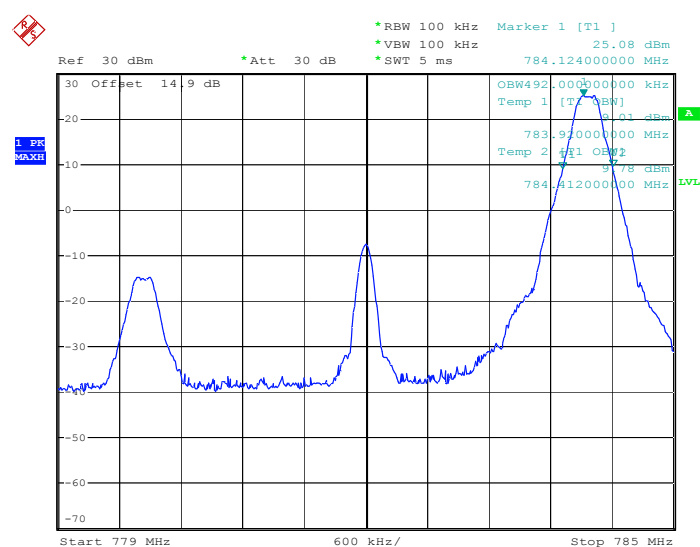
3.3.5 Test Result (Plots) of Occupied Bandwidth

Band :	LTE Band 13	Power Stage :	High
Test Mode :	RB Size 1 Offset 0	Modulation :	5MHz / QPSK

99% Occupied Bandwidth Plot on Channel 23230


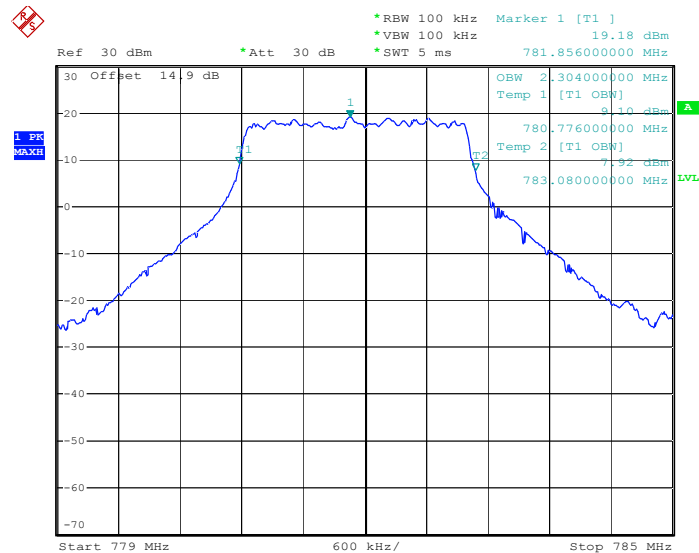
Date: 13.MAR.2012 10:48:08

Band :	LTE Band 13	Power Stage :	High
Test Mode :	RB Size 1 Offset 24	Modulation :	5MHz / QPSK

99% Occupied Bandwidth Plot on Channel 23230


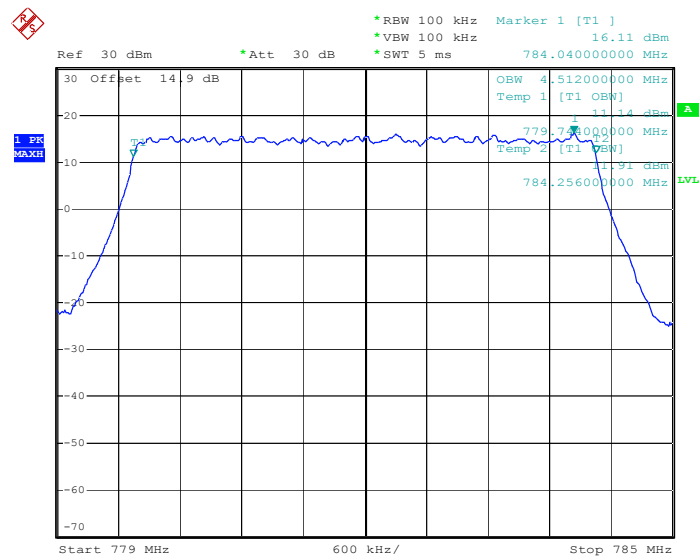
Date: 13.MAR.2012 10:49:17

Band :	LTE Band 13	Power Stage :	High
Test Mode :	RB Size 12 Offset 6	Modulation :	5MHz / QPSK

99% Occupied Bandwidth Plot on Channel 23230


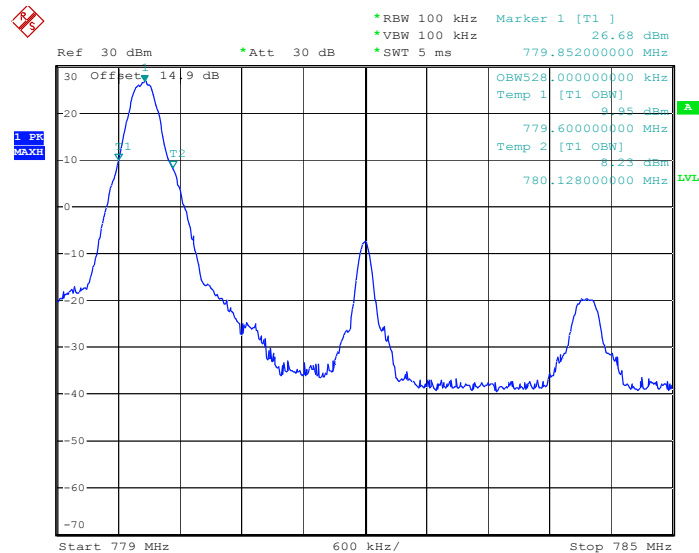
Date: 13.MAR.2012 10:50:28

Band :	LTE Band 13	Power Stage :	High
Test Mode :	RB Size 25 Offset 0	Modulation :	5MHz / QPSK

99% Occupied Bandwidth Plot on Channel 23230


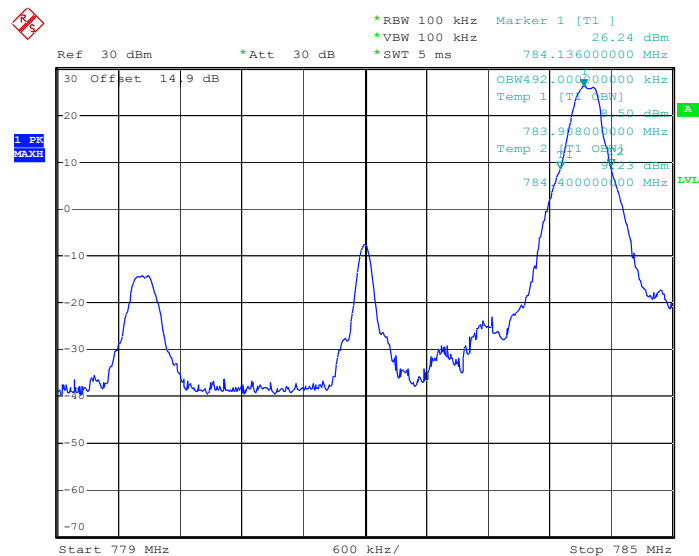
Date: 13.MAR.2012 10:46:15

Band :	LTE Band 13	Power Stage :	High
Test Mode :	RB Size 1 Offset 0	Modulation :	5MHz / 16QAM

99% Occupied Bandwidth Plot on Channel 23230


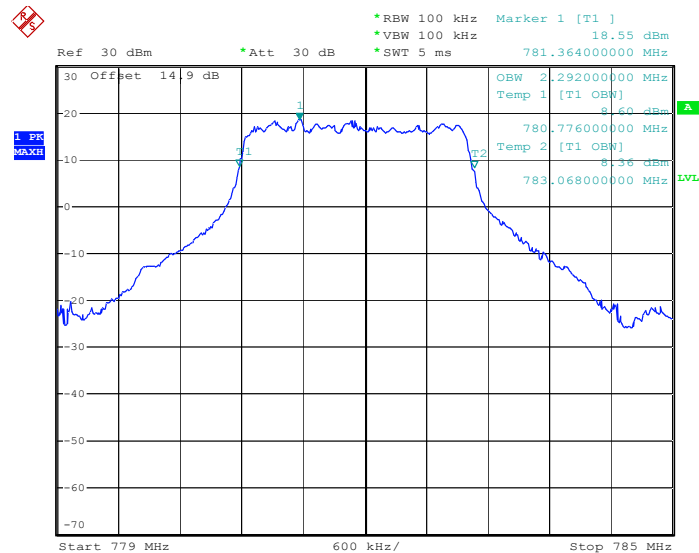
Date: 13.MAR.2012 10:41:26

Band :	LTE Band 13	Power Stage :	High
Test Mode :	RB Size 1 Offset 24	Modulation :	5MHz / 16QAM

99% Occupied Bandwidth Plot on Channel 23230


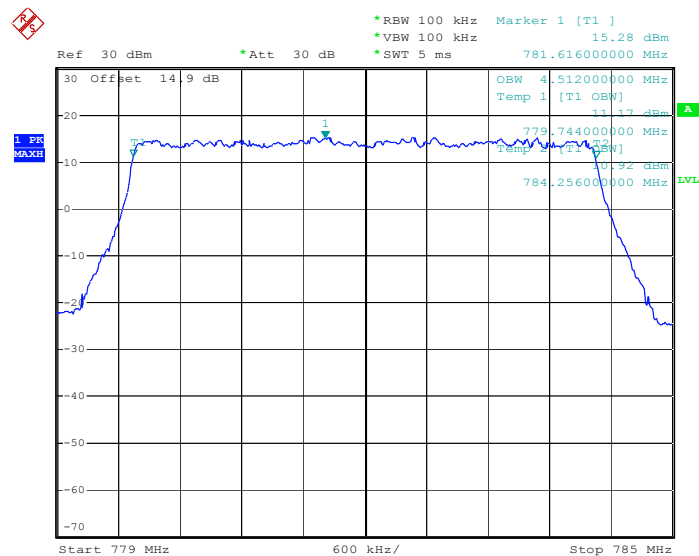
Date: 13.MAR.2012 10:42:35

Band :	LTE Band 13	Power Stage :	High
Test Mode :	RB Size 12 Offset 6	Modulation :	5MHz / 16QAM

99% Occupied Bandwidth Plot on Channel 23230


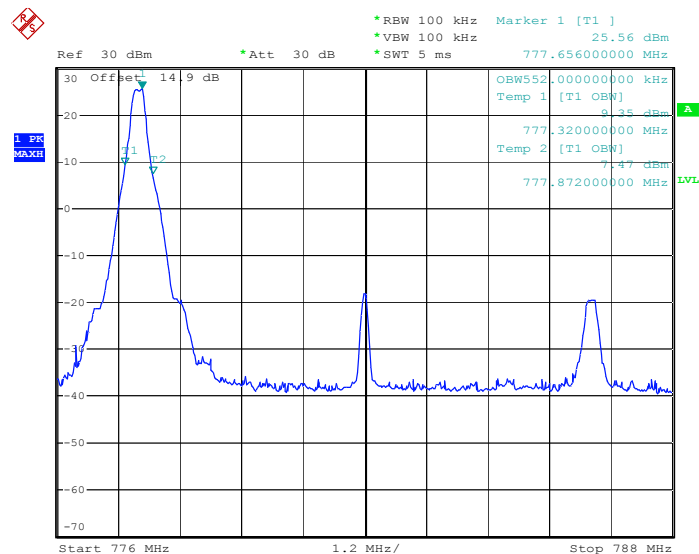
Date: 13.MAR.2012 10:43:25

Band :	LTE Band 13	Power Stage :	High
Test Mode :	RB Size 25 Offset 0	Modulation :	5MHz / 16QAM

99% Occupied Bandwidth Plot on Channel 23230


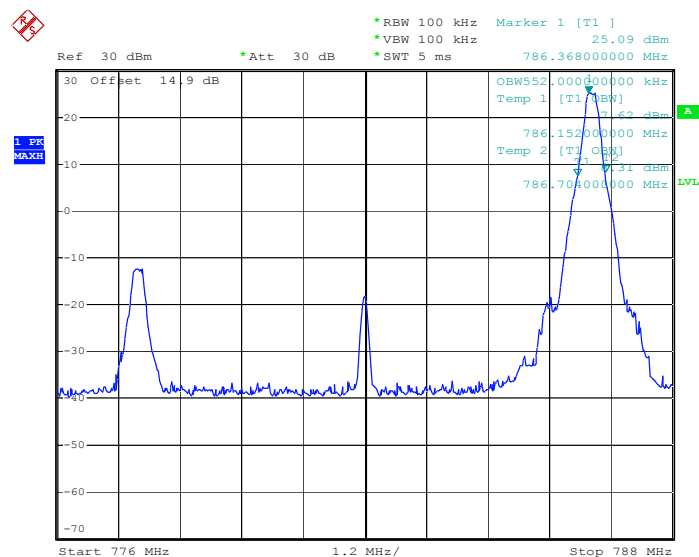
Date: 13.MAR.2012 10:44:21

Band :	LTE Band 13	Power Stage :	High
Test Mode :	RB Size 1 Offset 0	Modulation :	10MHz / QPSK

99% Occupied Bandwidth Plot on Channel 23230


Date: 21.FEB.2012 11:32:00

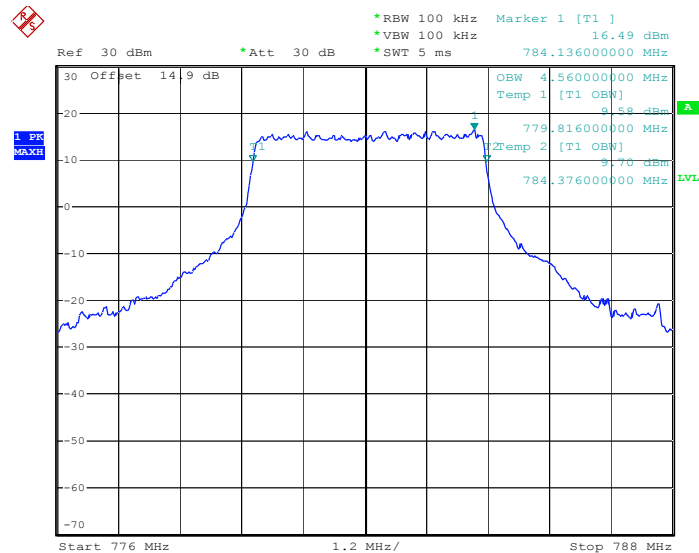
Band :	LTE Band 13	Power Stage :	High
Test Mode :	RB Size 1 Offset 49	Modulation :	10MHz / QPSK

99% Occupied Bandwidth Plot on Channel 23230


Date: 21.FEB.2012 11:32:51

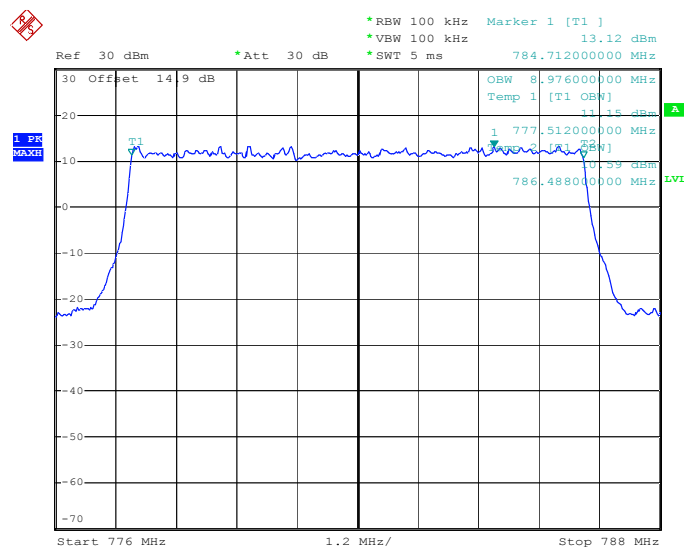


Band :	LTE Band 13	Power Stage :	High
Test Mode :	RB Size 25 Offset 13	Modulation :	10MHz / QPSK

99% Occupied Bandwidth Plot on Channel 23230

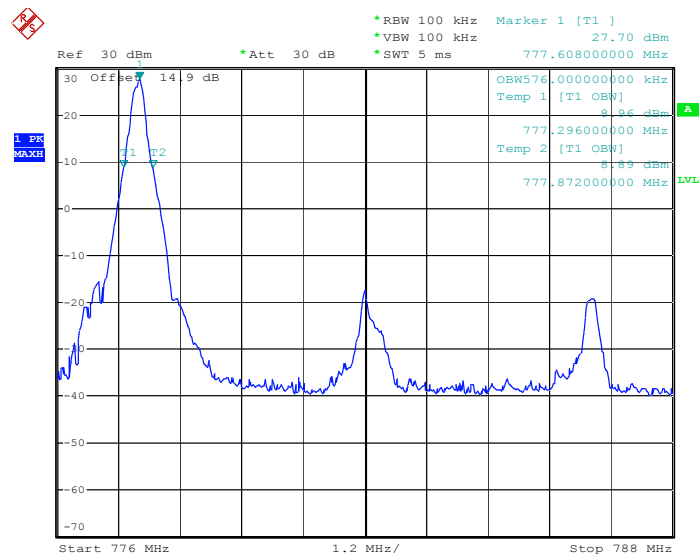
Date: 21.FEB.2012 11:34:31

Band :	LTE Band 13	Power Stage :	High
Test Mode :	RB Size 50 Offset 0	Modulation :	10MHz / QPSK

99% Occupied Bandwidth Plot on Channel 23230

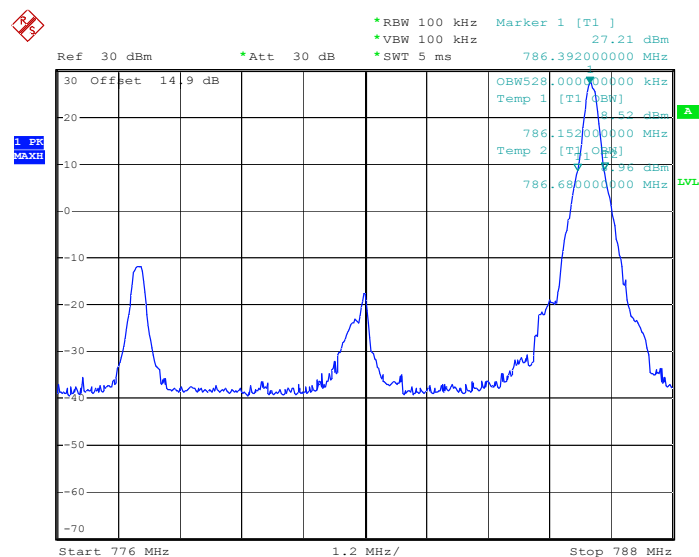
Date: 21.FEB.2012 11:29:57

Band :	LTE Band 13	Power Stage :	High
Test Mode :	RB Size 1 Offset 0	Modulation :	10MHz / 16QAM

99% Occupied Bandwidth Plot on Channel 23230


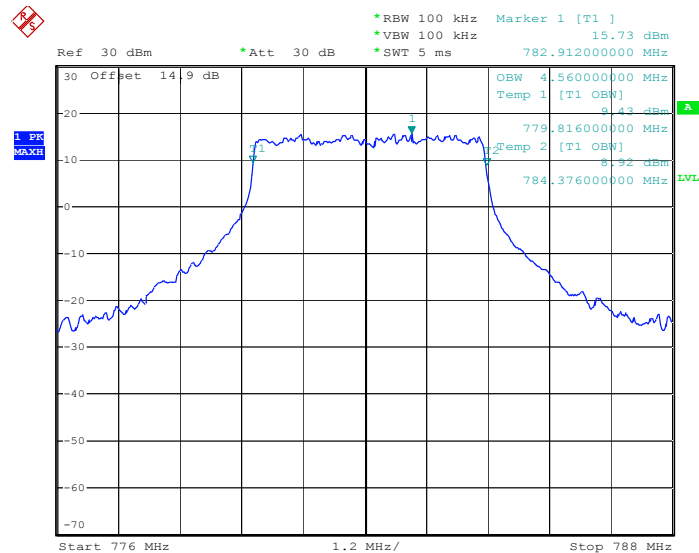
Date: 21.FEB.2012 11:36:09

Band :	LTE Band 13	Power Stage :	High
Test Mode :	RB Size 1 Offset 49	Modulation :	10MHz / 16QAM

99% Occupied Bandwidth Plot on Channel 23230


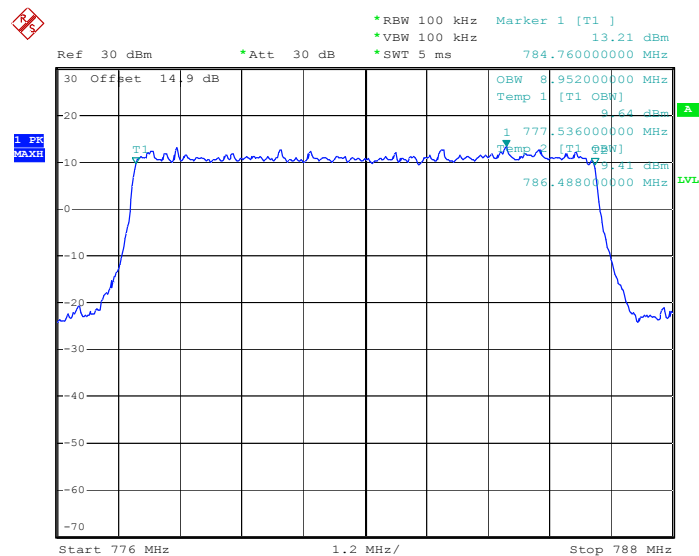
Date: 21.FEB.2012 11:37:23

Band :	LTE Band 13	Power Stage :	High
Test Mode :	RB Size 25 Offset 13	Modulation :	10MHz / 16QAM

99% Occupied Bandwidth Plot on Channel 23230


Date: 21.FEB.2012 11:40:27

Band :	LTE Band 13	Power Stage :	High
Test Mode :	RB Size 50 Offset 0	Modulation :	10MHz / 16QAM

99% Occupied Bandwidth Plot on Channel 23230


Date: 21.FEB.2012 11:42:41

3.4 Band Edge and Emission Mask Measurement

3.4.1 Limit

The emissions in the 763 – 775MHz and 793 – 805MHz band, the FCC limit is $65 + 10\log_{10}(P[\text{Watts}]) = -35\text{dBm}$ in a 6.25kHz bandwidth.

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

3.4.2 Measuring Instruments

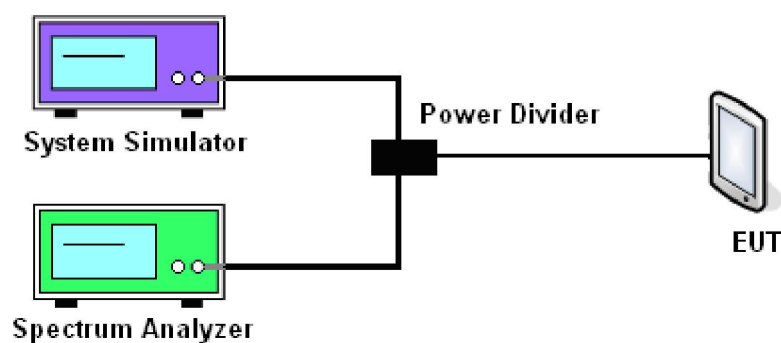
See list of measuring instruments of this test report.

3.4.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. For measurement of the emissions in the 763 – 775MHz and 793 – 805MHz band.
 - The band edges of low and high channels for the highest RF powers were measured.
Setting RBW = 10kHz
 - $\text{RealPwr(dBm)} = \text{PwrAbs (dBm)} - 10 \cdot \text{LOG}(10\text{k}/6.25\text{k})(\text{dB})$.
 $\text{Real } \Delta \text{Limit(dB)} = \Delta \text{Limit(dB)} - 10 \cdot \text{LOG}(10\text{k}/6.25\text{k})(\text{dB})$
 $10 \cdot \text{LOG}(10\text{k}/6.25\text{k}) \sim 2.04\text{dB}$
3. For measurement of any emission outside of the authorized operating frequency ranges, spectrum analyzer RBW is set to 100kHz.

3.4.4 Test Setup

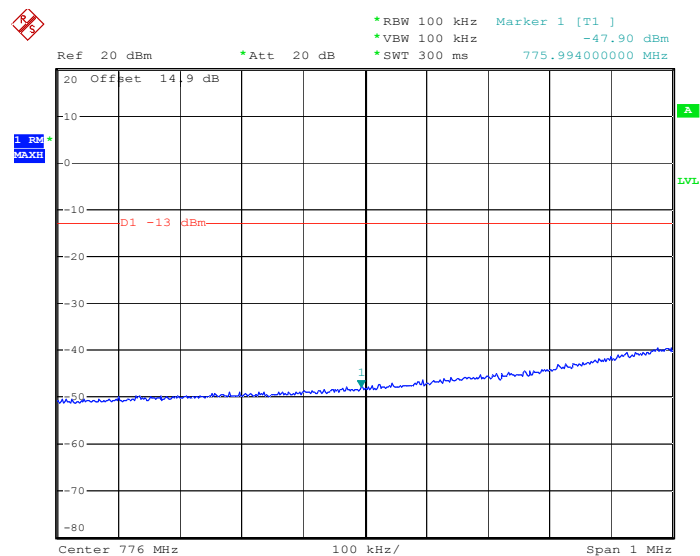
<Conducted Band Edge >



3.4.5 Test Result (Plots) of Conducted Band Edge

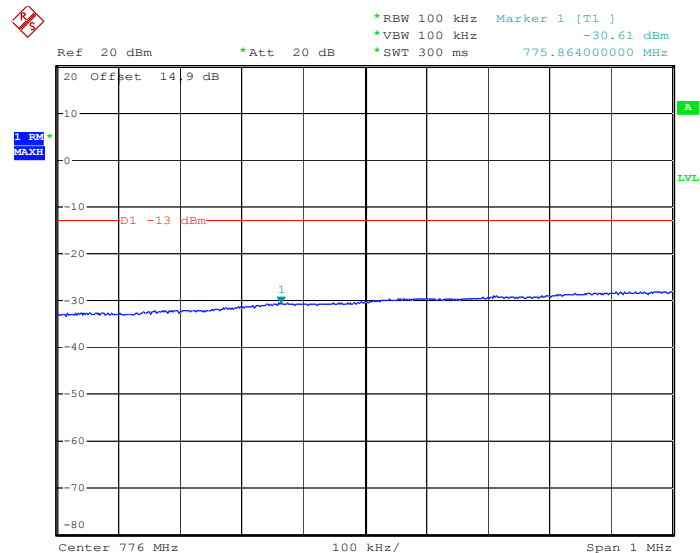
Band :	LTE Band 13	Power Stage :	High
Test Mode :	5MHz	Channel:	Low

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0

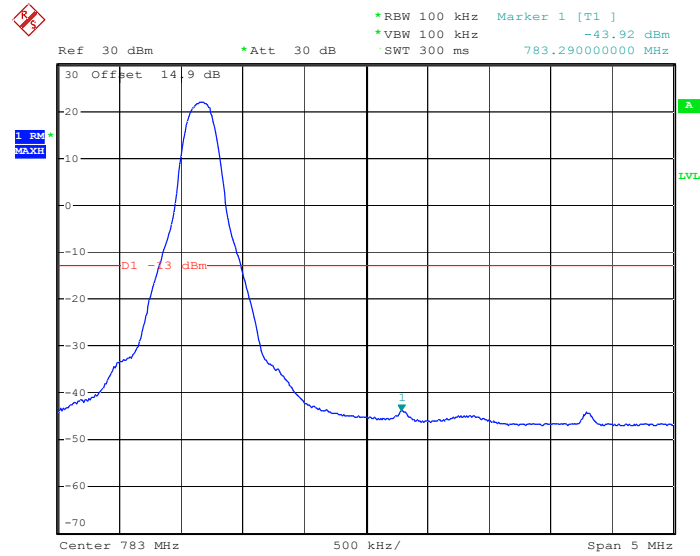


Date: 25.FEB.2012 12:55:27

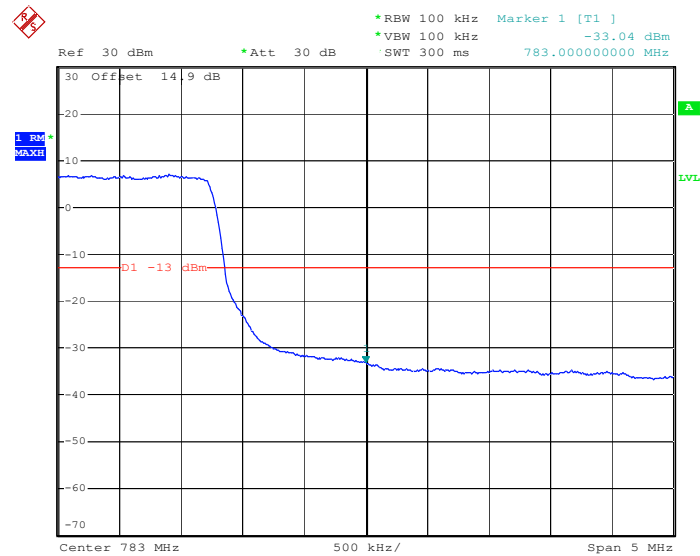
Lower Band Edge Plot for QPSK-RB Size 25, RB Offset 0



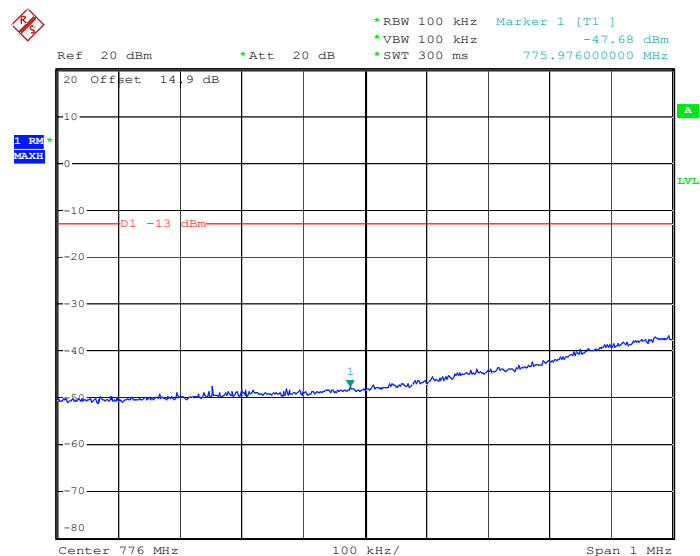
Date: 25.FEB.2012 12:54:48

Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 24


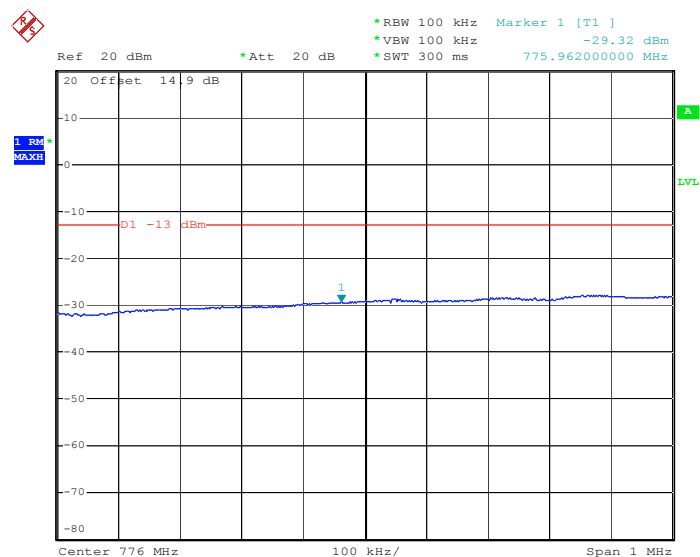
Date : 25.FEB.2012 13:12:35

Higher Band Edge Plot for QPSK-RB Size 25, RB Offset 0


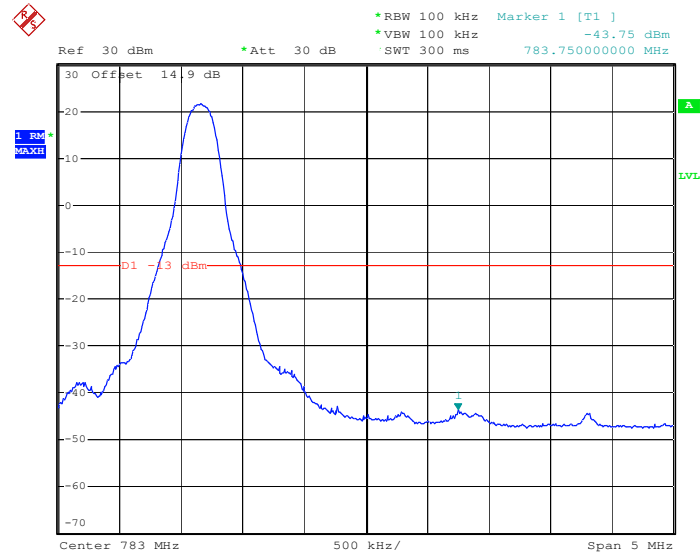
Date : 25.FEB.2012 13:13:39

Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0


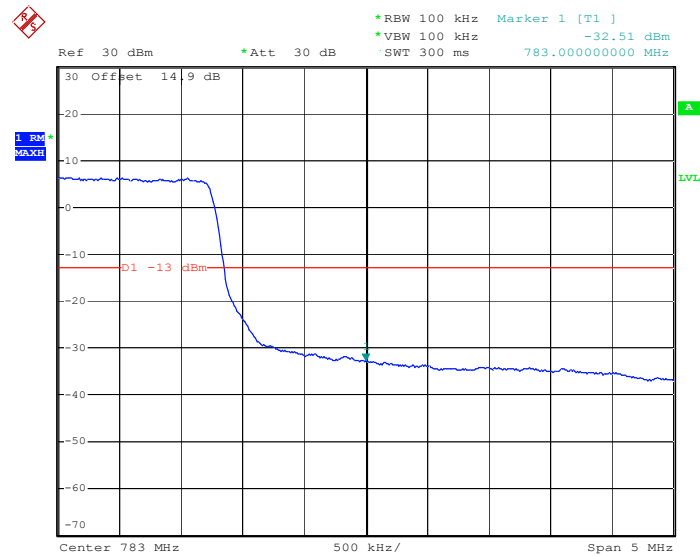
Date: 25.FEB.2012 12:56:24

Lower Band Edge Plot for 16QAM -RB Size 25, RB Offset 0


Date: 25.FEB.2012 12:57:02

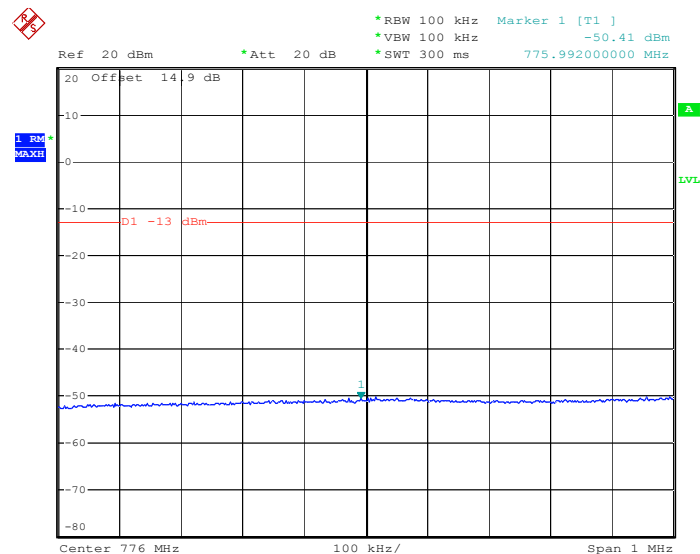
Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 24


Date: 25.FEB.2012 13:16:05

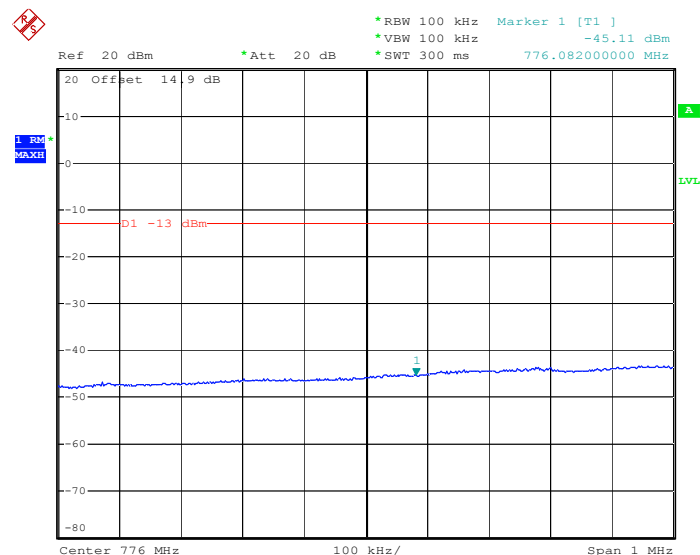
Higher Band Edge Plot for 16QAM -RB Size 25, RB Offset 0


Date: 25.FEB.2012 13:15:17

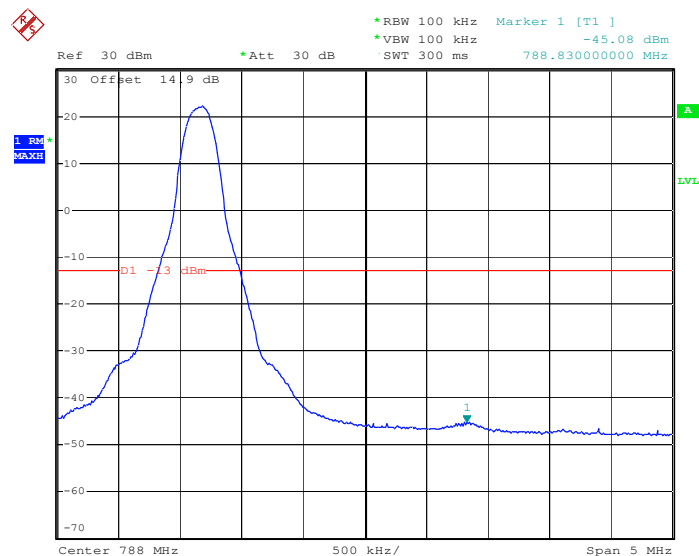
Band :	LTE Band 13	Power Stage :	High
Test Mode :	5MHz	Channel:	High

Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0


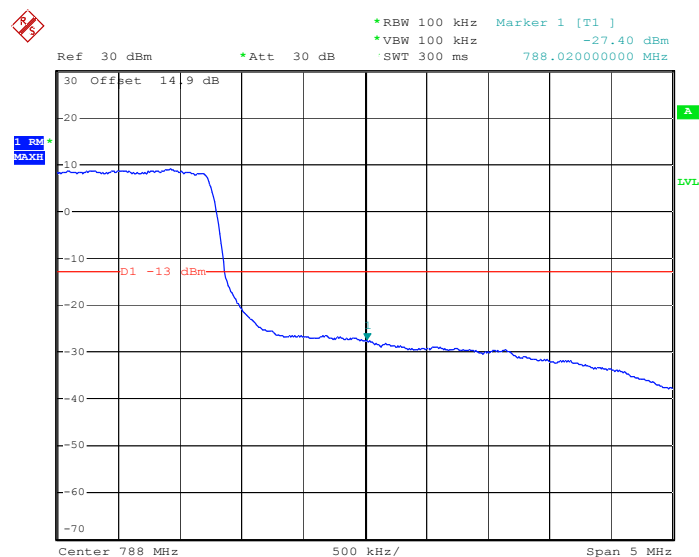
Date: 25.FEB.2012 11:42:45

Lower Band Edge Plot for QPSK-RB Size 25, RB Offset 0


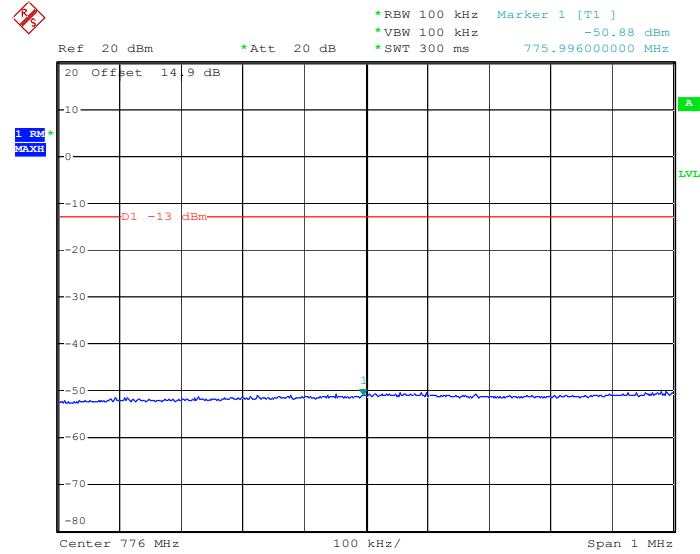
Date: 25.FEB.2012 11:44:00

Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 24


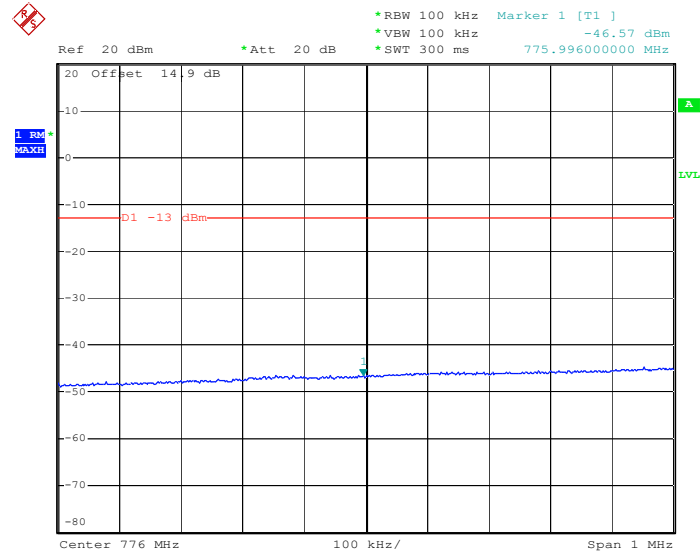
Date: 25.FEB.2012 11:57:11

Higher Band Edge Plot for QPSK-RB Size 25, RB Offset 0


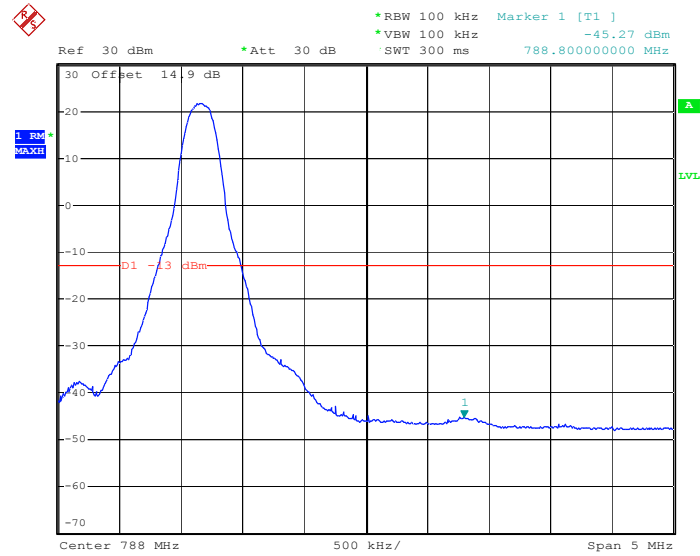
Date: 25.FEB.2012 11:55:01

Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0


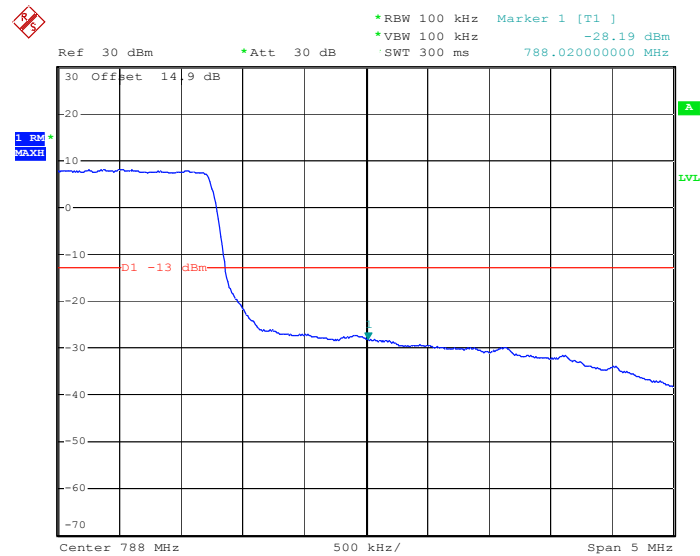
Date: 25.FEB.2012 11:47:10

Lower Band Edge Plot for 16QAM -RB Size 25, RB Offset 0


Date: 25.FEB.2012 11:45:09

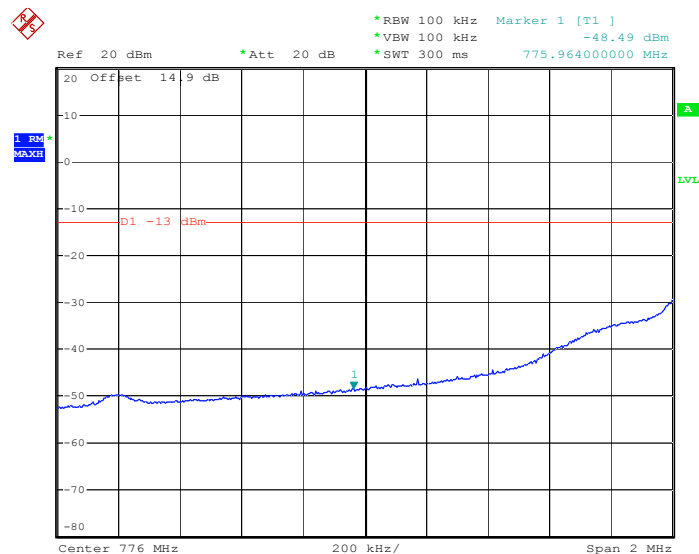
Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 24


Date: 25.FEB.2012 11:50:18

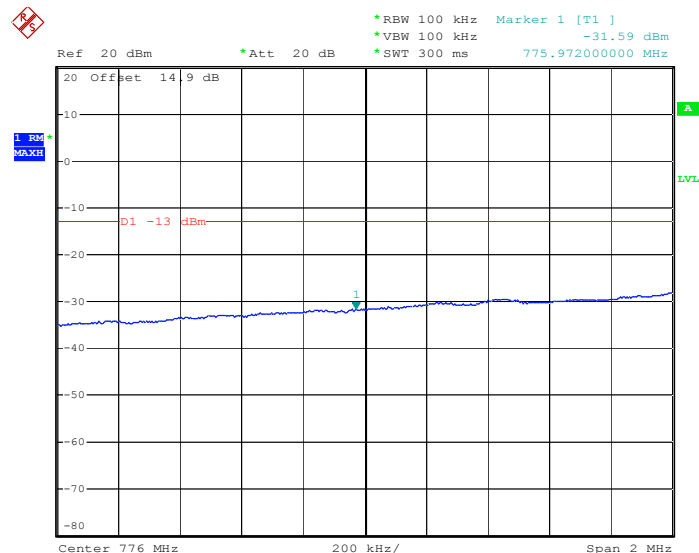
Higher Band Edge Plot for 16QAM -RB Size 25, RB Offset 0


Date: 25.FEB.2012 11:53:24

Band :	LTE Band 13	Power Stage :	High
Test Mode :	10MHz	Channel:	Middle

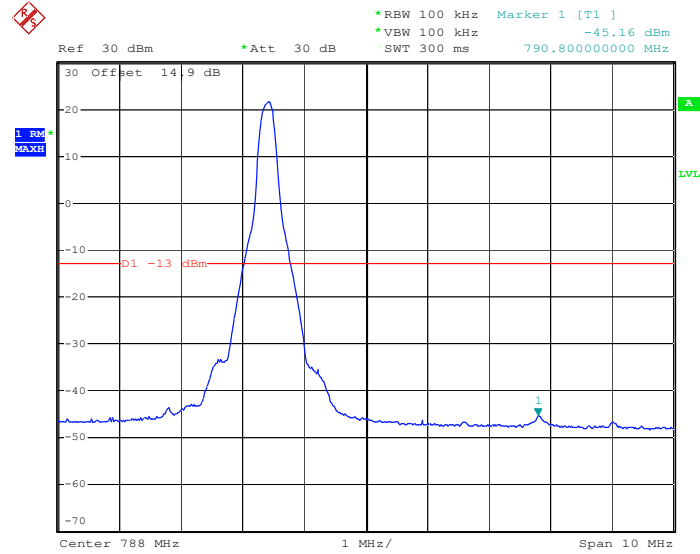
Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0


Date: 25.FEB.2012 14:36:10

Lower Band Edge Plot for QPSK-RB Size 50, RB Offset 0


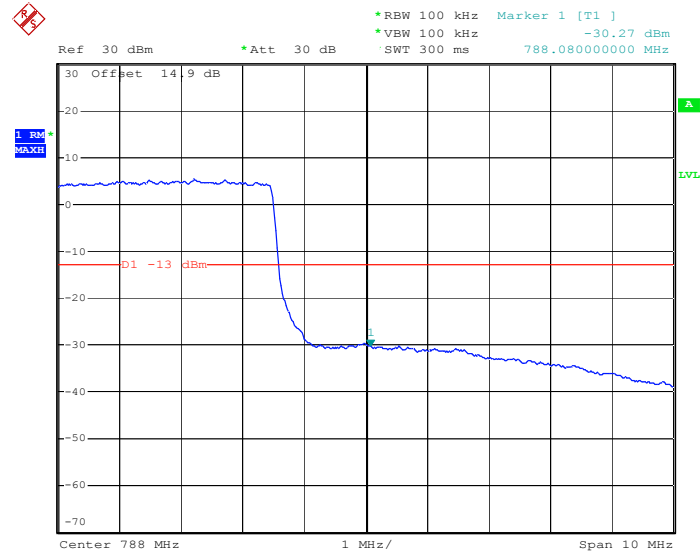
Date: 25.FEB.2012 14:38:03

Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 49

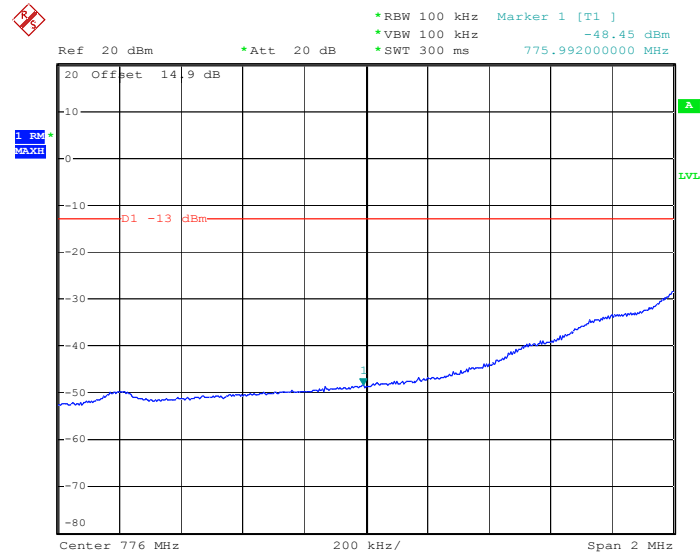


Date: 25.FEB.2012 14:40:43

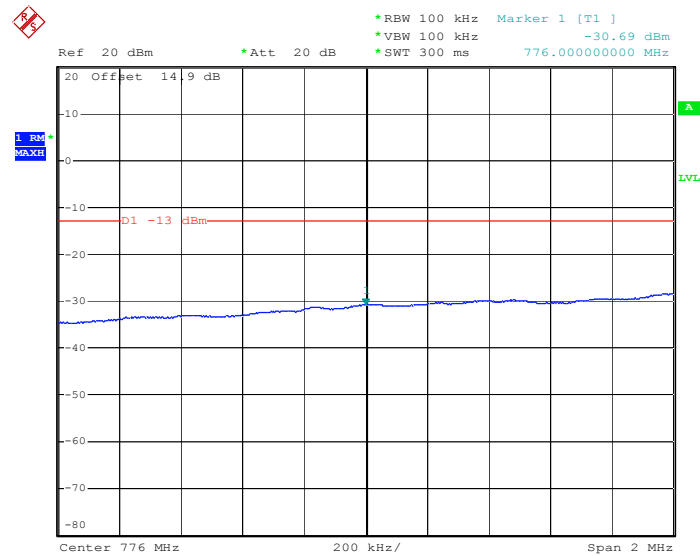
Higher Band Edge Plot for QPSK-RB Size 50, RB Offset 0



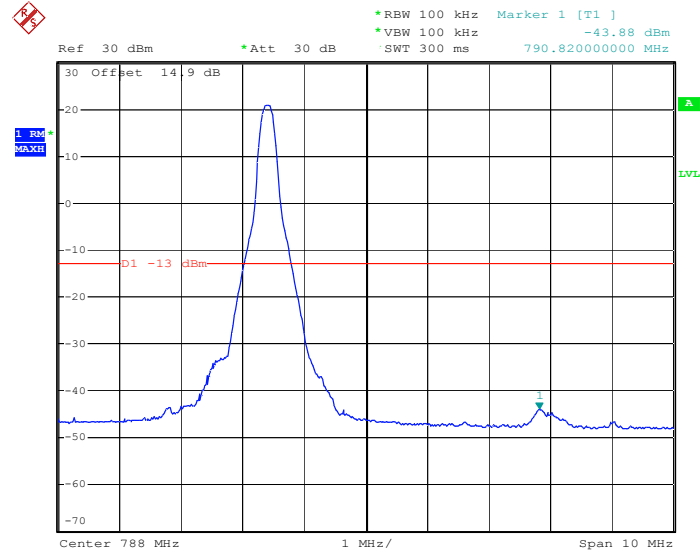
Date: 25.FEB.2012 14:39:26

Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0


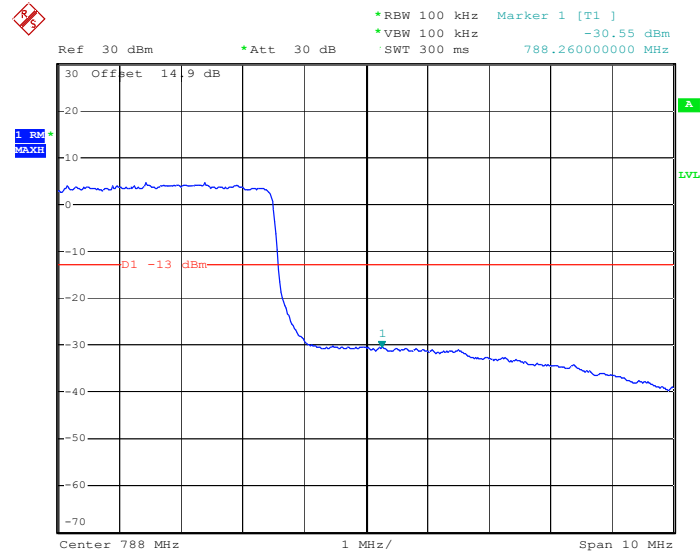
Date: 25.FEB.2012 14:30:12

Lower Band Edge Plot for 16QAM -RB Size 50, RB Offset 0


Date: 25.FEB.2012 14:26:01

Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 49


Date: 25.FEB.2012 14:42:05

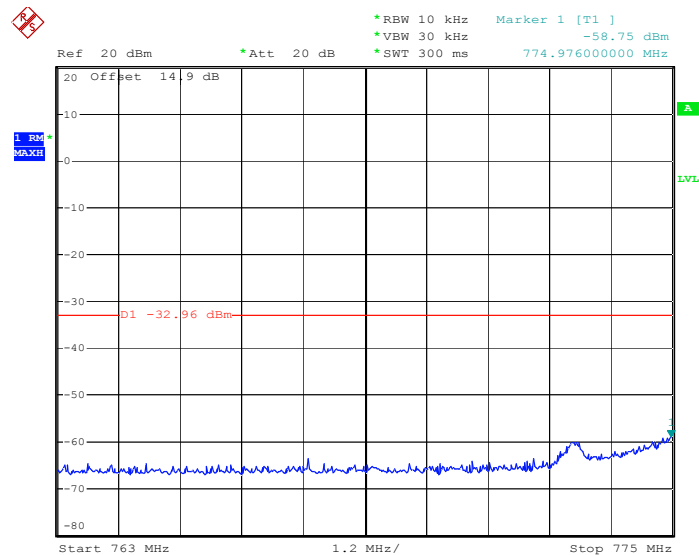
Higher Band Edge Plot for 16QAM -RB Size 50, RB Offset 0


Date: 25.FEB.2012 14:43:41

3.4.6 Test Result (Plots) of Conducted Emission Mask

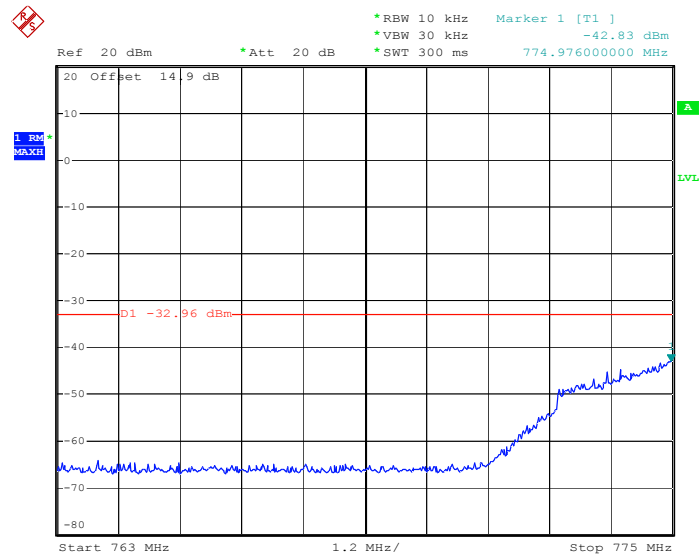
Band :	LTE Band 13	Power Stage :	High
Test Mode :	5MHz	Channel:	Low

Lower Emission Mask (763~775 MHz) Plot for QPSK-RB Size 1, RB Offset 0



Date: 25.FEB.2012 13:42:46

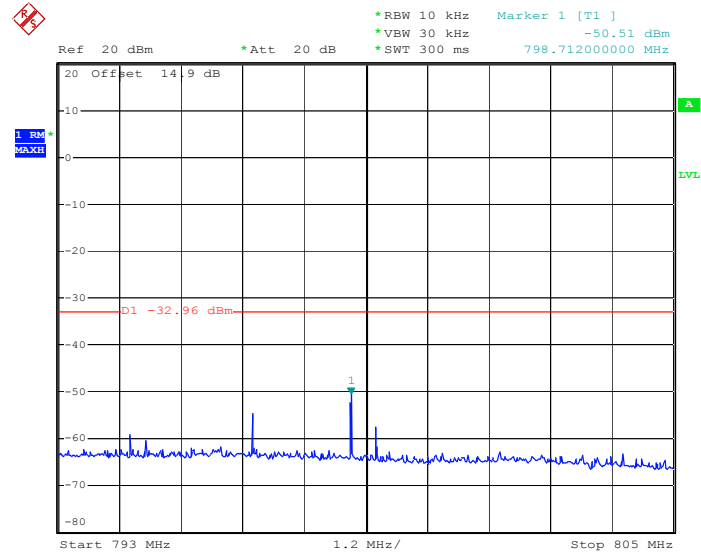
Lower Emission Mask (763~775 MHz) Plot for QPSK-RB Size 25, RB Offset 0



Date: 25.FEB.2012 13:41:54

Higher Emission Mask (793~805 MHz) for QPSK-RB Size 1, RB

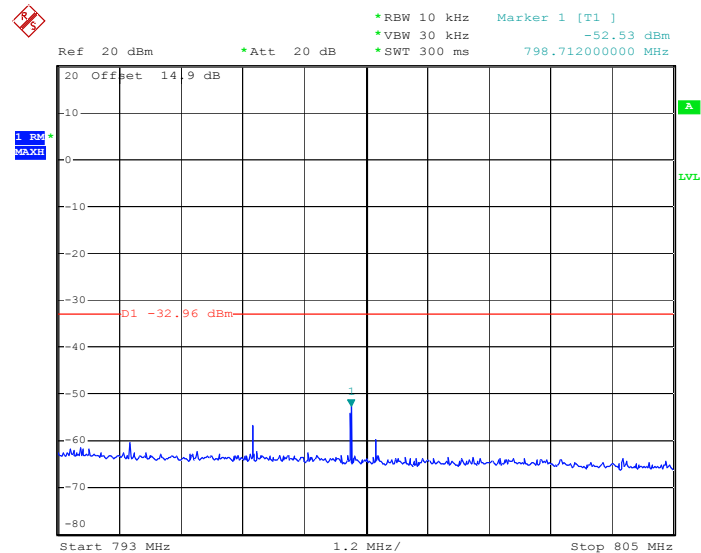
Offset 24



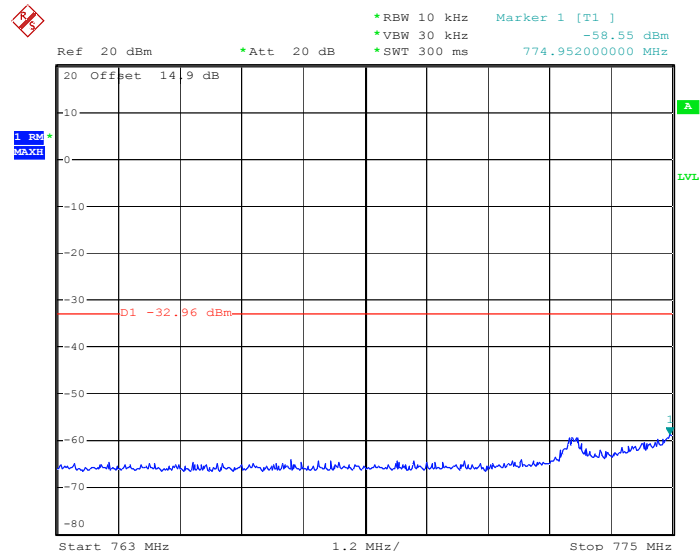
Date: 25.FEB.2012 13:47:17

Higher Emission Mask (793~805 MHz) for QPSK-RB Size 25,

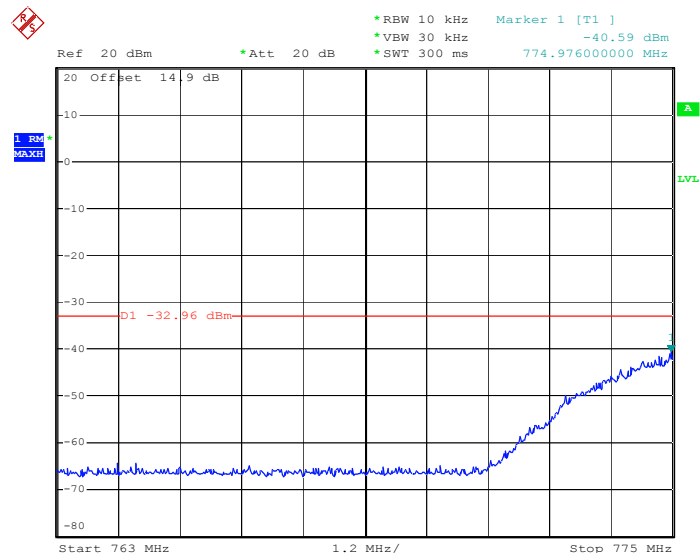
RB Offset 0



Date: 25.FEB.2012 13:50:13

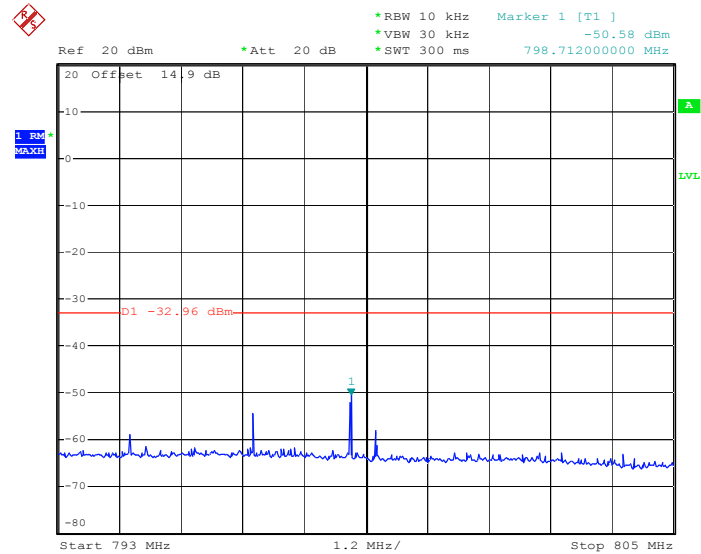
Lower Emission Mask (763~775 MHz) Plot for 16QAM-RB Size
1, RB Offset 0


Date: 25.FEB.2012 13:40:13

Lower Emission Mask (763~775 MHz) Plot for 16QAM -RB Size
25, RB Offset 0


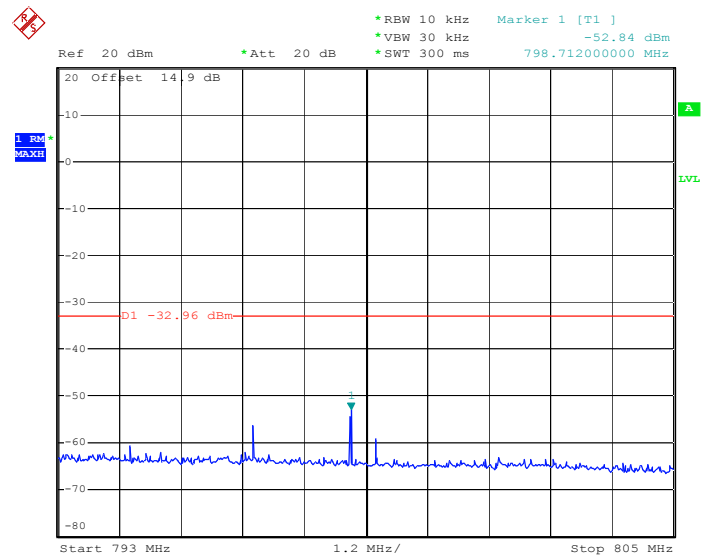
Date: 25.FEB.2012 13:40:56

Higher Emission Mask (793~805 MHz) for 16QAM-RB Size 1, RB Offset 24



Date: 25.FEB.2012 13:58:59

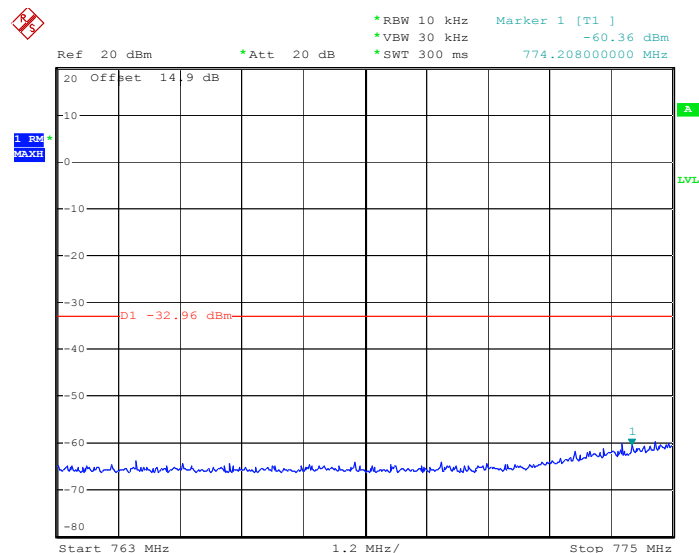
Higher Emission Mask (793~805 MHz) for 16QAM -RB Size 25, RB Offset 0



Date: 25.FEB.2012 13:52:30

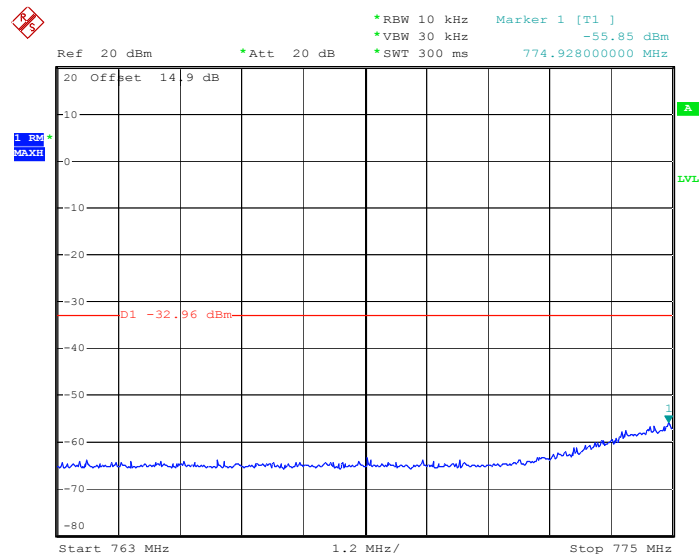
Band :	LTE Band 13	Power Stage :	High
Test Mode :	5MHz	Channel:	High

**Lower Emission Mask (763~775 MHz) Plot for QPSK-RB Size 1,
RB Offset 0**



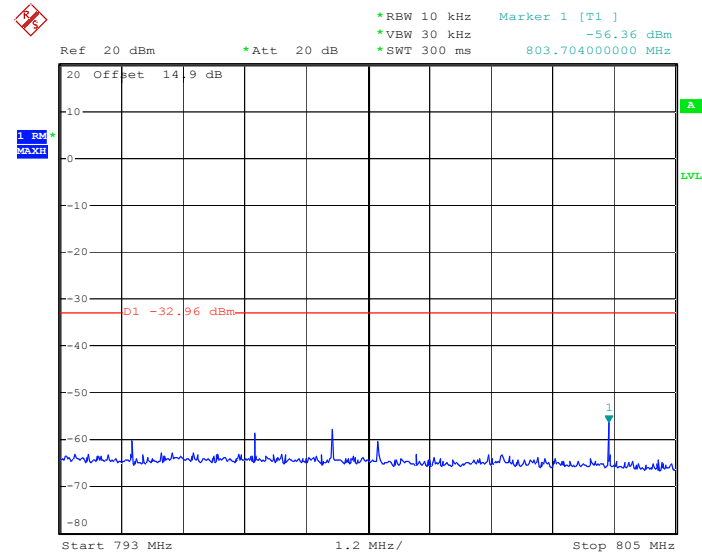
Date: 25.FEB.2012 12:07:02

**Lower Emission Mask (763~775 MHz) Plot for QPSK-RB Size
25, RB Offset 0**



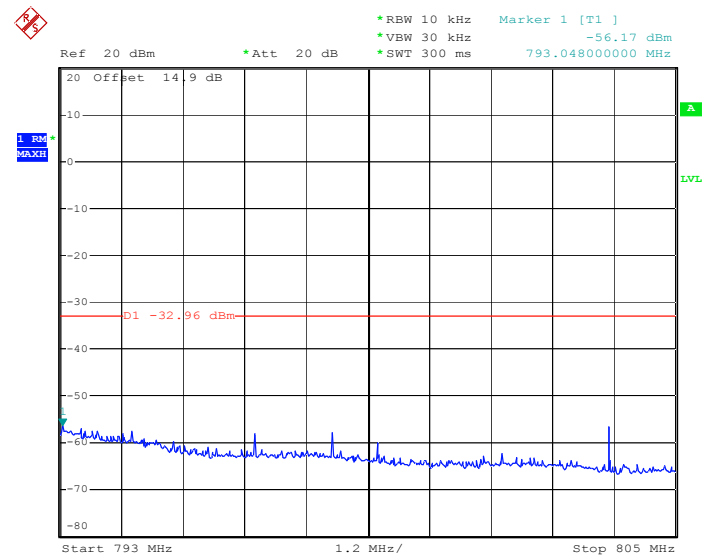
Date: 25.FEB.2012 12:38:57

Higher Emission Mask (793~805 MHz) for QPSK-RB Size 1, RB Offset 24

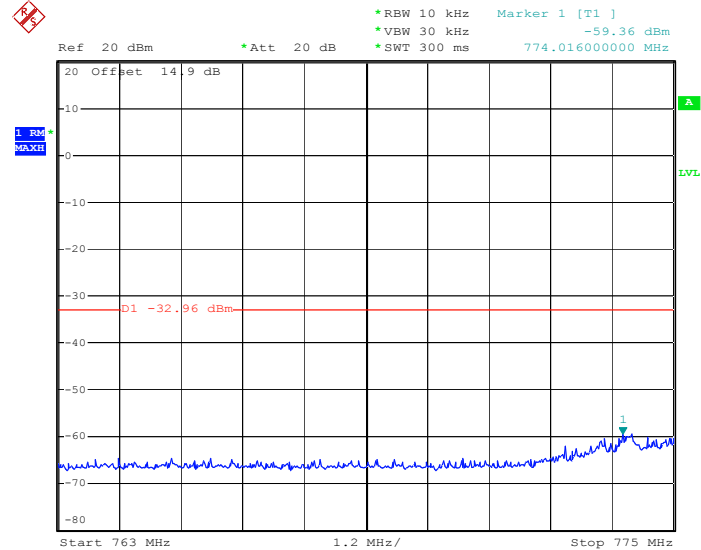


Date: 25.FEB.2012 12:47:46

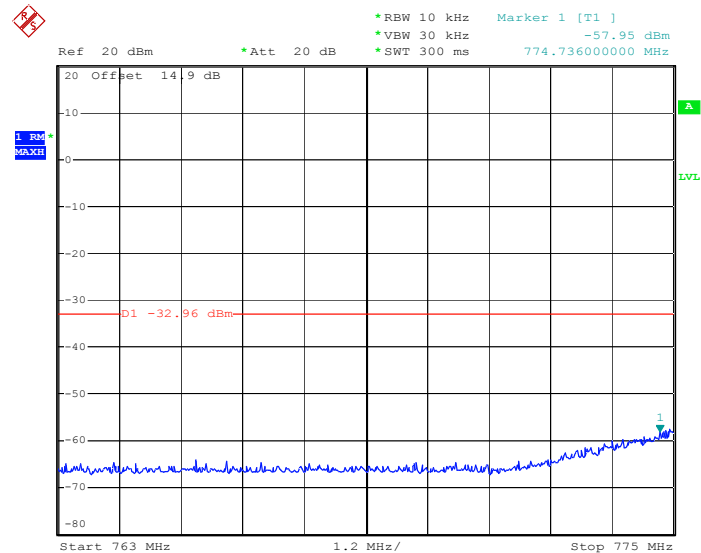
Higher Emission Mask (793~805 MHz) for QPSK-RB Size 25, RB Offset 0



Date: 25.FEB.2012 12:46:23

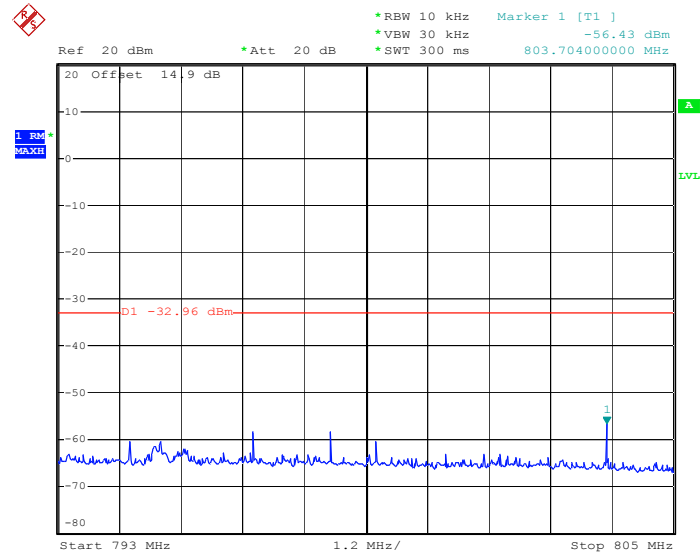
Lower Emission Mask (763~775 MHz) Plot for 16QAM-RB Size
1, RB Offset 0


Date: 25.FEB.2012 12:40:41

Lower Emission Mask (763~775 MHz) Plot for 16QAM -RB Size
25, RB Offset 0


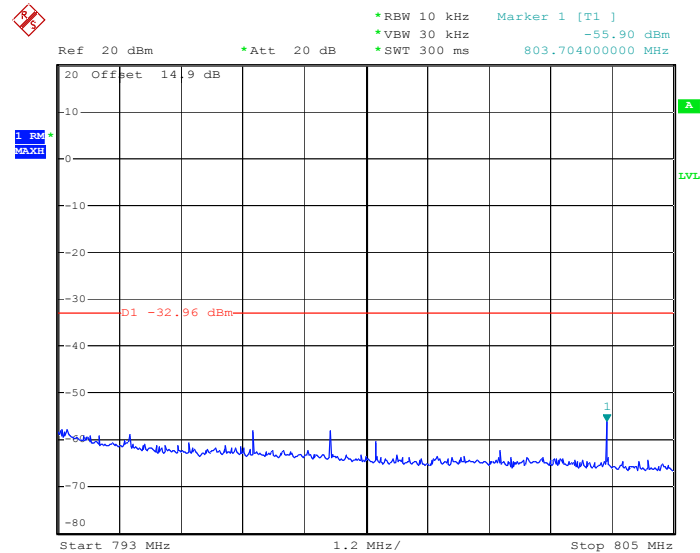
Date: 25.FEB.2012 12:39:54

Higher Emission Mask (793~805 MHz) for 16QAM-RB Size 1, RB Offset 24



Date: 25.FEB.2012 12:43:59

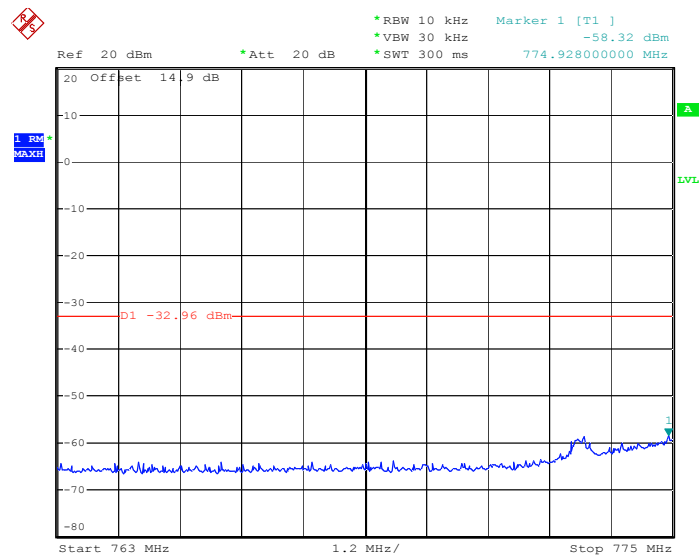
Higher Emission Mask (793~805 MHz) for 16QAM -RB Size 25, RB Offset 0



Date: 25.FEB.2012 12:45:13

Band :	LTE Band 13	Power Stage :	High
Test Mode :	10MHz		

**Lower Emission Mask (763~775 MHz) Plot for QPSK-RB Size 1,
RB Offset 0**

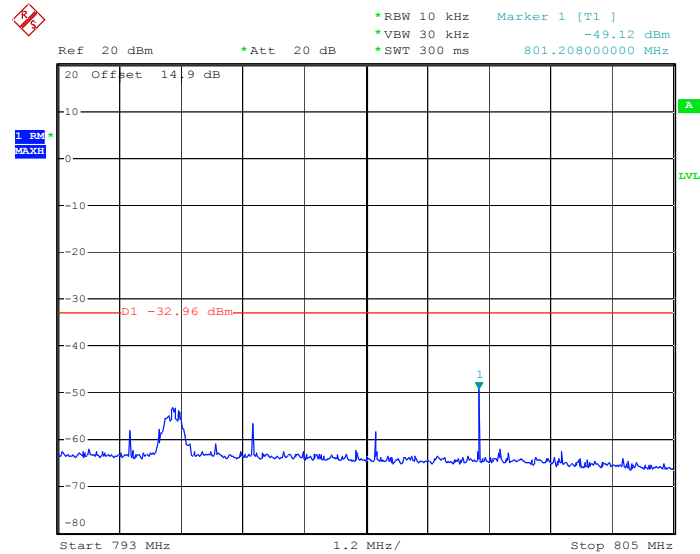


Date: 25.FEB.2012 14:16:48

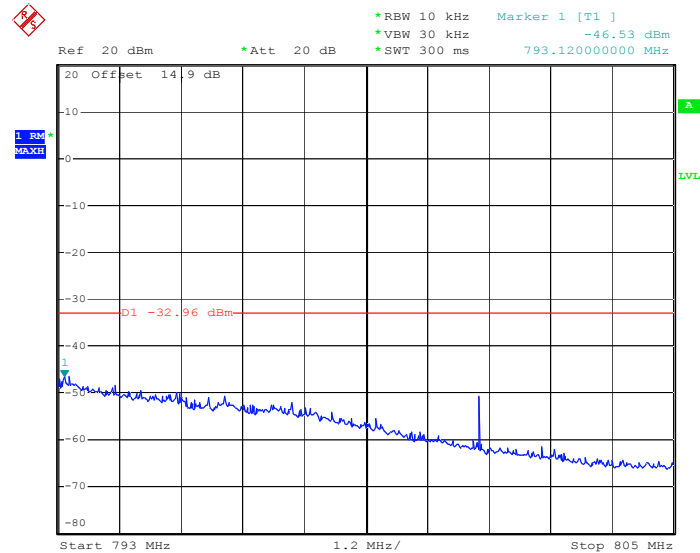
**Lower Emission Mask (763~775 MHz) Plot for QPSK-RB Size
50, RB Offset 0**



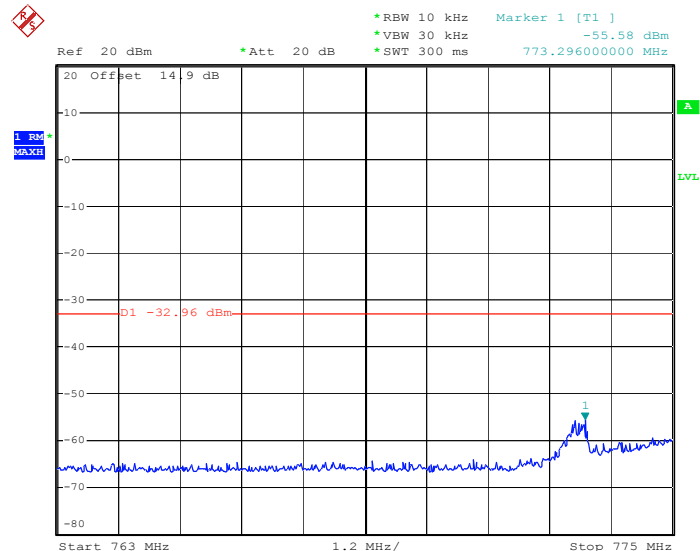
Date: 25.FEB.2012 14:14:03

Higher Emission Mask (793~805 MHz) for QPSK-RB Size 1, RB
Offset 49


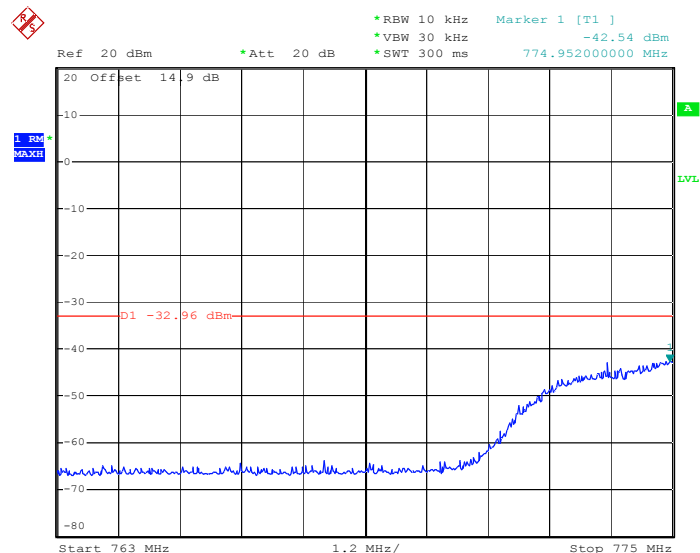
Date: 25.FEB.2012 14:10:28

Higher Emission Mask (793~805 MHz) for QPSK-RB Size 50,
RB Offset 0


Date: 25.FEB.2012 14:09:06

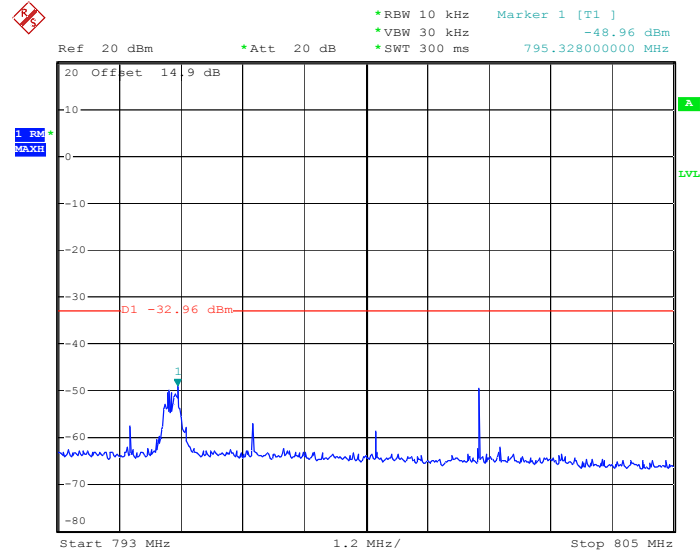
Lower Emission Mask (763~775 MHz) Plot for 16QAM-RB Size
1, RB Offset 0


Date: 25.FEB.2012 14:17:53

Lower Emission Mask (763~775 MHz) Plot for 16QAM -RB Size
50, RB Offset 0


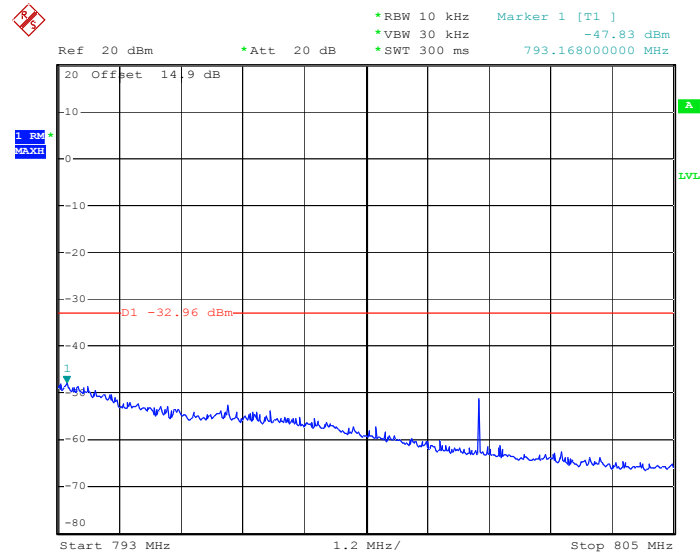
Date: 25.FEB.2012 14:18:45

Higher Emission Mask (793~805 MHz) for 16QAM-RB Size 1, RB Offset 49



Date: 25.FEB.2012 14:11:20

Higher Emission Mask (793~805 MHz) for 16QAM -RB Size 50, RB Offset 0



Date: 25.FEB.2012 14:12:26

3.5 Conducted Emission Measurement

3.5.1 Description of Conducted Emission Measurement

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

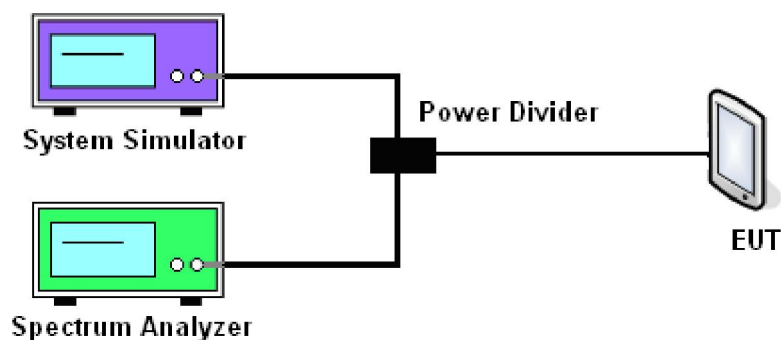
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

1. The EUT was connected to spectrum analyzer and base station via power divider.
2. The middle channel for the highest RF power within the transmitting frequency was measured.
3. The conducted spurious emission for the whole frequency range was taken.

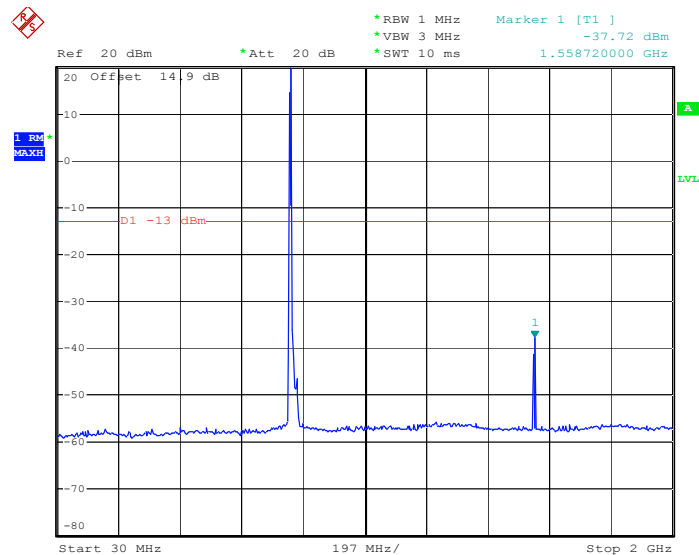
3.5.4 Test Setup



3.5.5 Test Result (Plots) of Conducted Emission

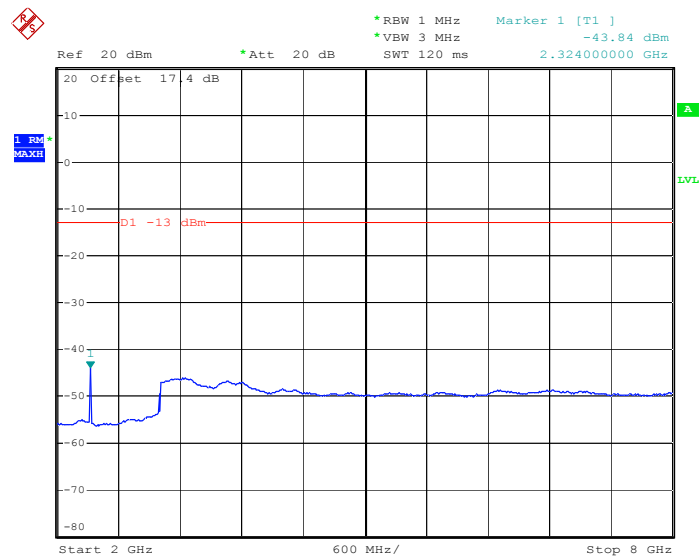
Band :	LTE Band 13	Channel :	CH23205
Test Mode :	5MHz	Power Stage :	High

Conducted Emission Plot (30M ~ 2GHz) for QPSK (RB Size 1, RB Offset 0)



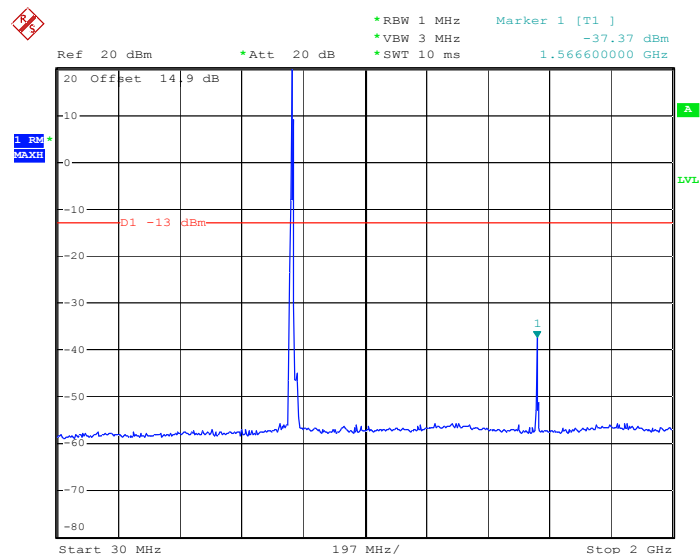
Date: 21.FEB.2012 14:11:54

Conducted Emission Plot (2GHz ~ 8GHz) for QPSK (RB Size 1, RB Offset 0)



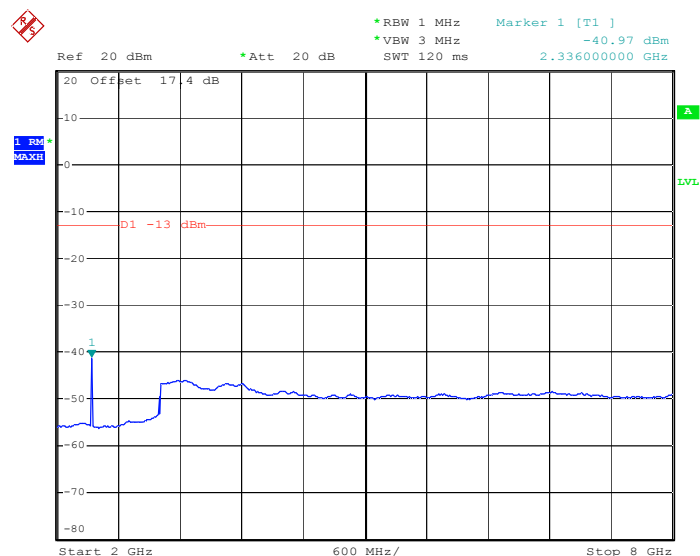
Date: 21.FEB.2012 14:18:39

Conducted Emission Plot (30M ~ 2GHz) for QPSK (RB Size 1, RB Offset 24)



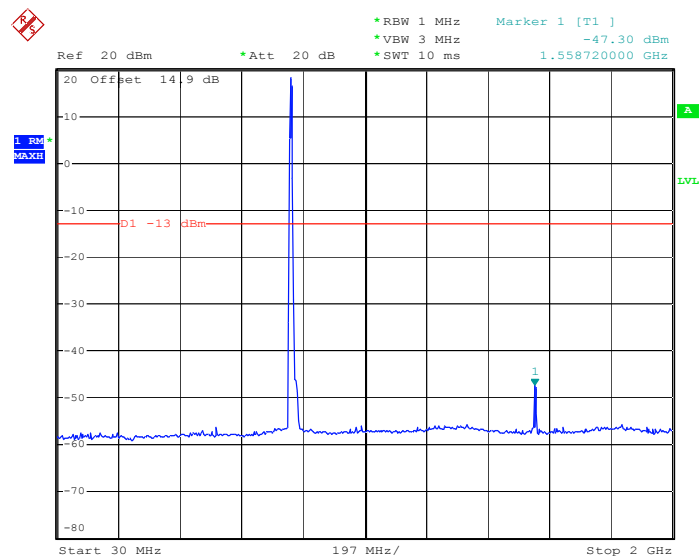
Date: 21.FEB.2012 14:13:27

Conducted Emission Plot (2GHz ~ 8GHz) for QPSK (RB Size 1, RB Offset 24)



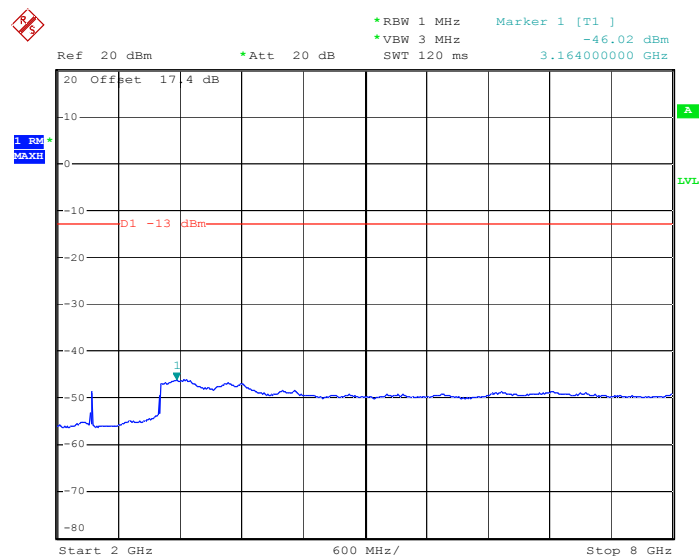
Date: 21.FEB.2012 14:23:07

Conducted Emission Plot (30M ~ 2GHz) for QPSK (RB Size 25, RB Offset 0)



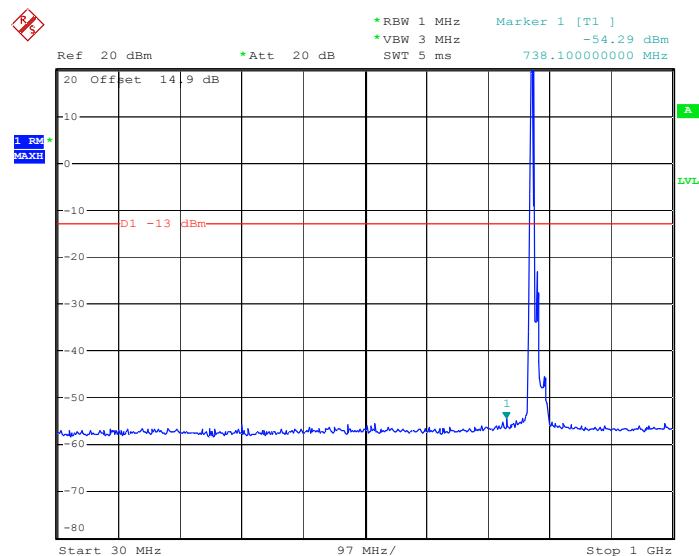
Date: 21.FEB.2012 14:14:46

Conducted Emission Plot (2GHz ~ 8GHz) for QPSK (RB Size 25, RB Offset 0)



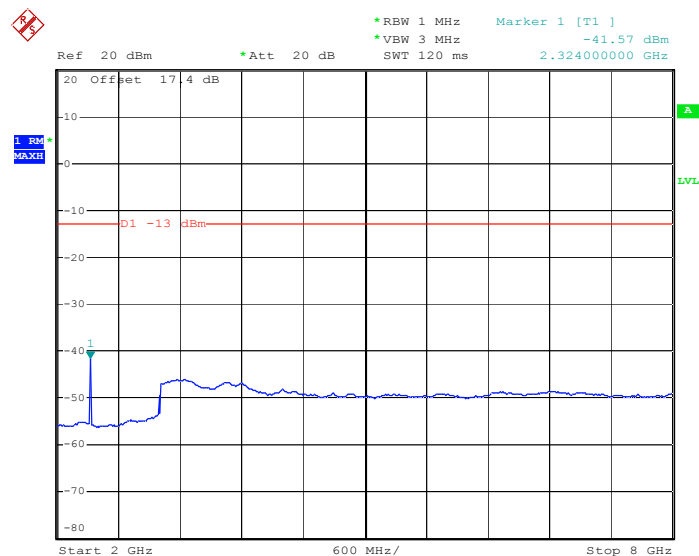
Date: 21.FEB.2012 14:17:37

Conducted Emission Plot (30M ~ 2GHz) for 16QAM (RB Size 1, RB Offset 0)



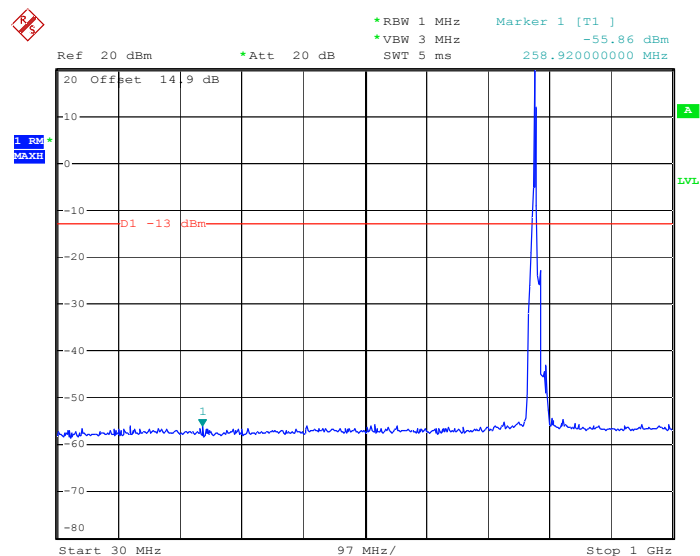
Date: 21.FEB.2012 14:35:44

Conducted Emission Plot (2GHz ~ 8GHz) for 16QAM (RB Size 1, RB Offset 0)



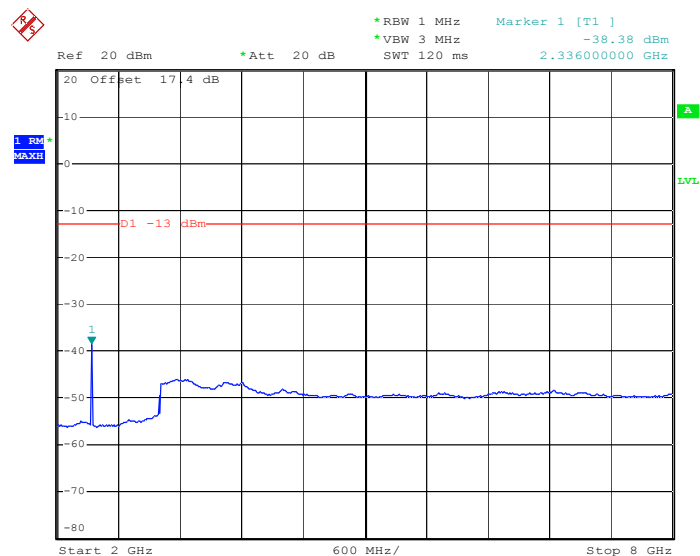
Date: 21.FEB.2012 14:26:00

Conducted Emission Plot (30M ~ 2GHz) for 16QAM (RB Size 1, RB Offset 24)



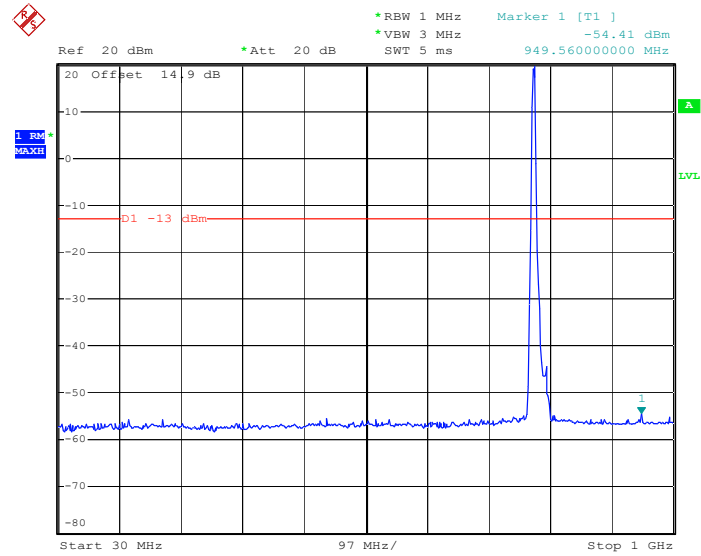
Date: 21.FEB.2012 14:37:26

Conducted Emission Plot (2GHz ~ 8GHz) for 16QAM (RB Size 1, RB Offset 24)



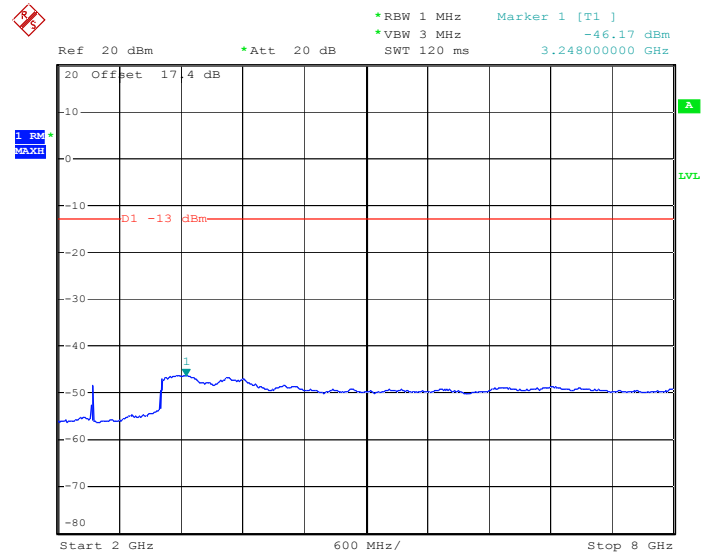
Date: 21.FEB.2012 14:28:31

Conducted Emission Plot (30M ~ 2GHz) for 16QAM (RB Size 25, RB Offset 0)



Date: 21.FEB.2012 14:34:02

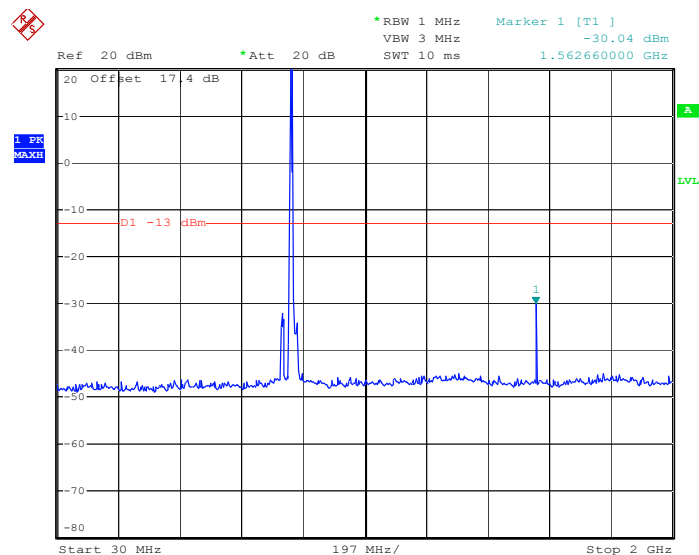
Conducted Emission Plot (2GHz ~ 8GHz) for 16QAM (RB Size 25, RB Offset 0)



Date: 21.FEB.2012 14:29:46

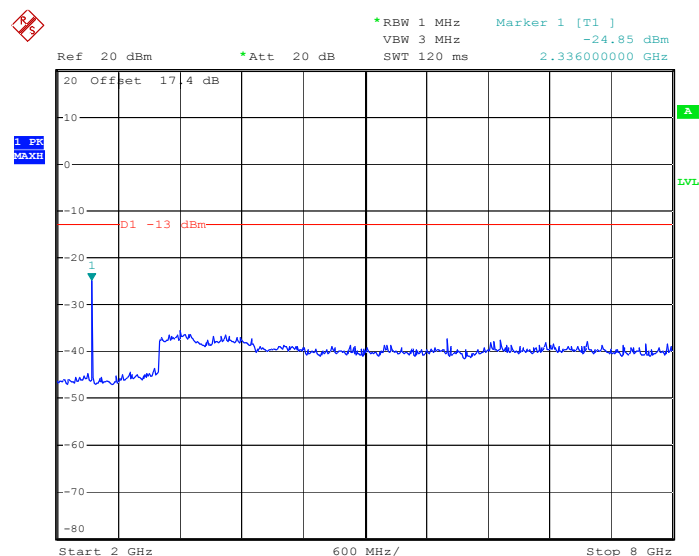
Band :	LTE Band 13	Channel :	CH23230
Test Mode :	5MHz	Power Stage :	High

**Conducted Emission Plot (30M ~ 2GHz) for
QPSK (RB Size 1, RB Offset 0)**



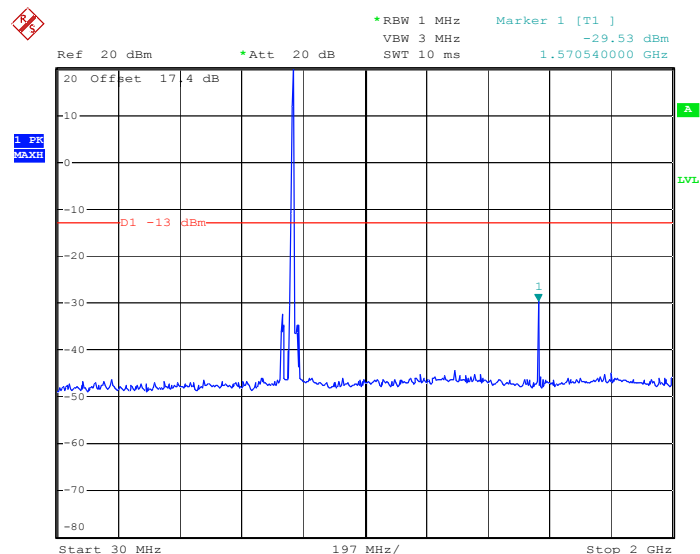
Date: 13.MAR.2012 10:23:11

**Conducted Emission Plot (2GHz ~ 8GHz) for
QPSK (RB Size 1, RB Offset 0)**



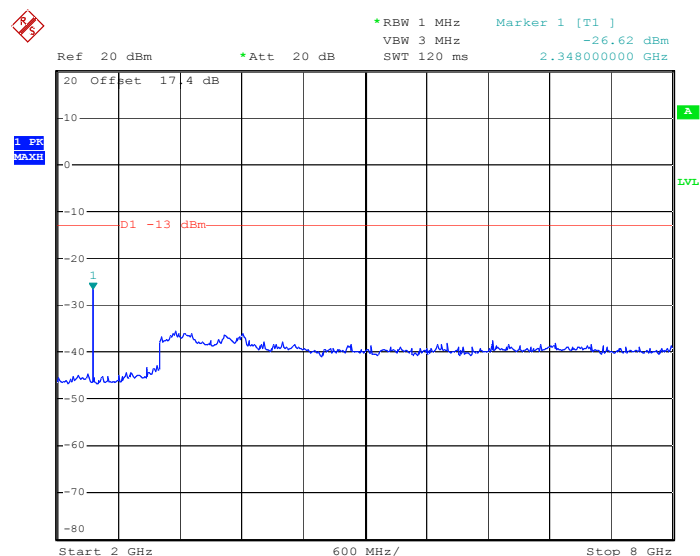
Date: 13.MAR.2012 10:19:20

Conducted Emission Plot (30M ~ 2GHz) for QPSK (RB Size 1, RB Offset 24)



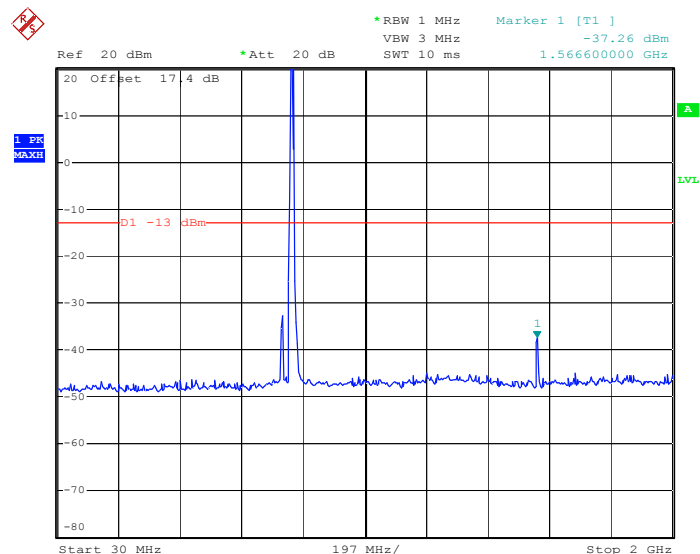
Date: 13.MAR.2012 10:24:18

Conducted Emission Plot (2GHz ~ 8GHz) for QPSK (RB Size 1, RB Offset 24)



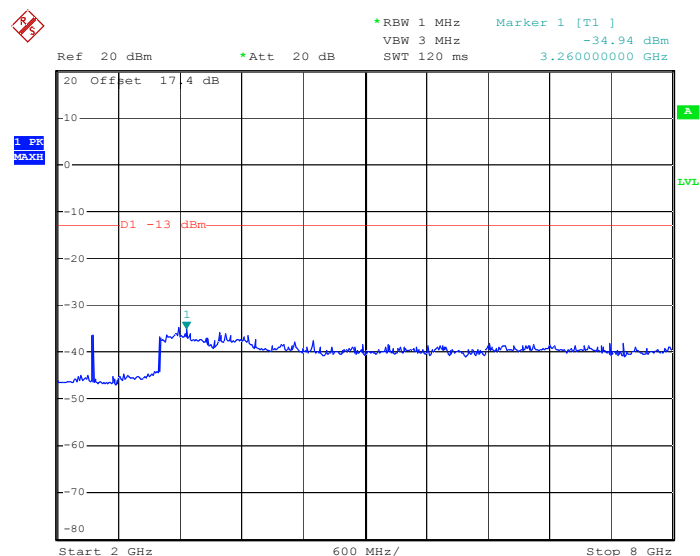
Date: 13.MAR.2012 10:18:49

Conducted Emission Plot (30M ~ 2GHz) for QPSK (RB Size 25, RB Offset 0)



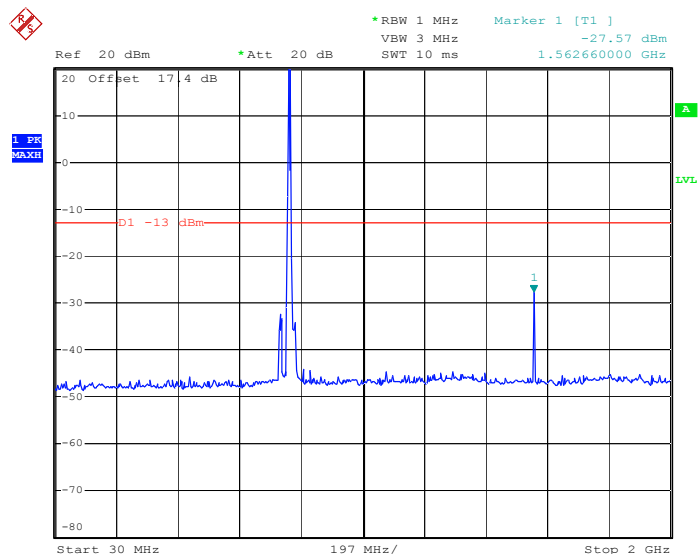
Date: 13.MAR.2012 10:21:52

Conducted Emission Plot (2GHz ~ 8GHz) for QPSK (RB Size 25, RB Offset 0)



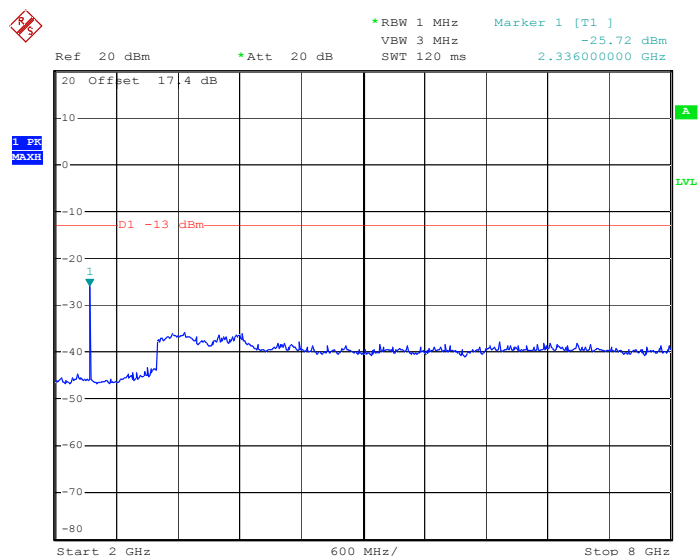
Date: 13.MAR.2012 10:20:06

Conducted Emission Plot (30M ~ 2GHz) for 16QAM (RB Size 1, RB Offset 0)



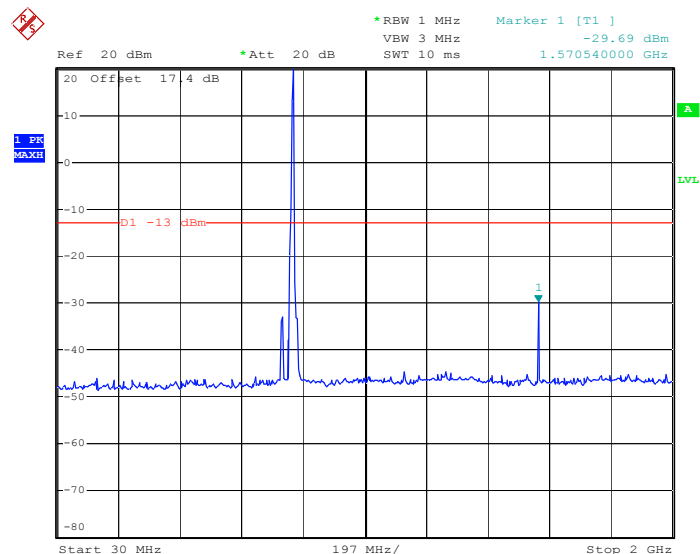
Date: 13.MAR.2012 10:27:51

Conducted Emission Plot (2GHz ~ 8GHz) for 16QAM (RB Size 1, RB Offset 0)



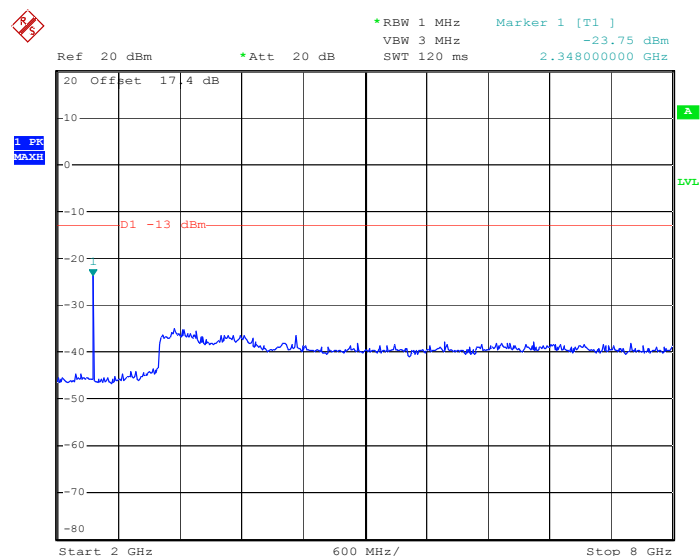
Date: 13.MAR.2012 10:34:23

Conducted Emission Plot (30M ~ 2GHz) for 16QAM (RB Size 1, RB Offset 24)



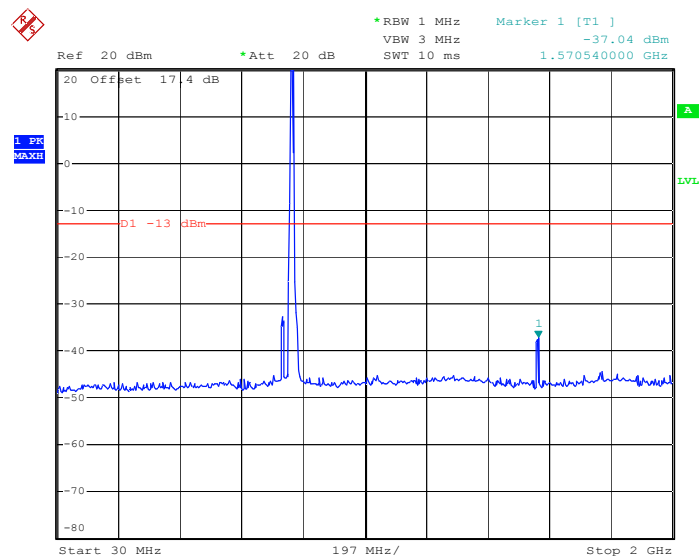
Date: 13.MAR.2012 10:26:08

Conducted Emission Plot (2GHz ~ 8GHz) for 16QAM (RB Size 1, RB Offset 24)



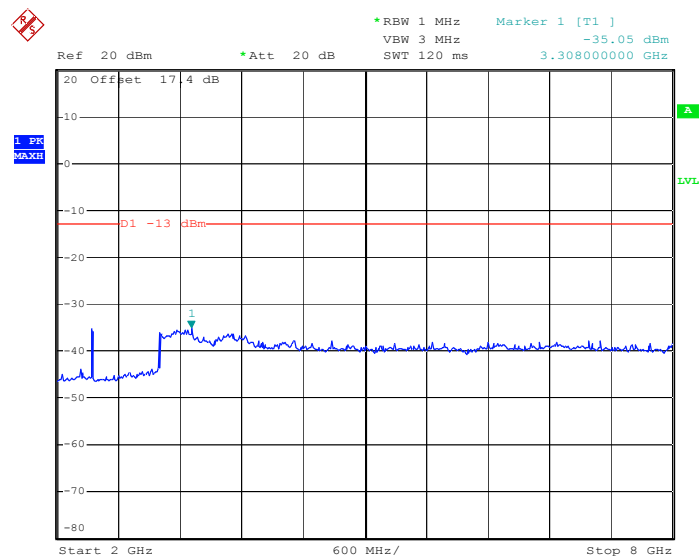
Date: 13.MAR.2012 10:33:19

Conducted Emission Plot (30M ~ 2GHz) for 16QAM (RB Size 25, RB Offset 0)



Date: 13.MAR.2012 10:29:32

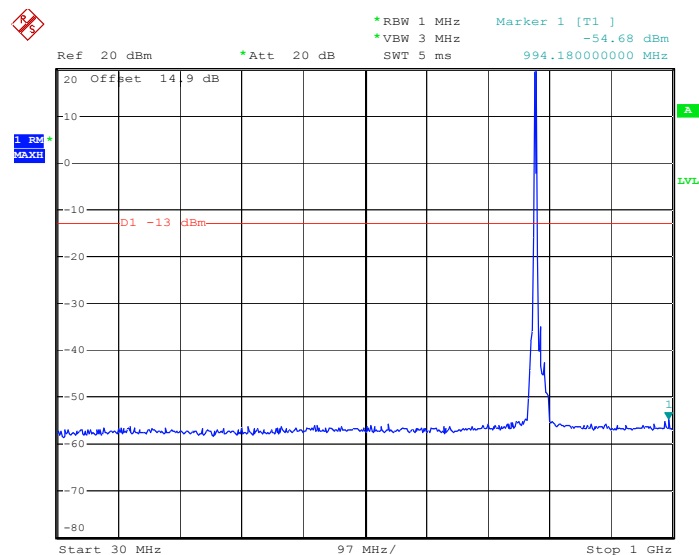
Conducted Emission Plot (2GHz ~ 8GHz) for 16QAM (RB Size 25, RB Offset 0)



Date: 13.MAR.2012 10:31:39

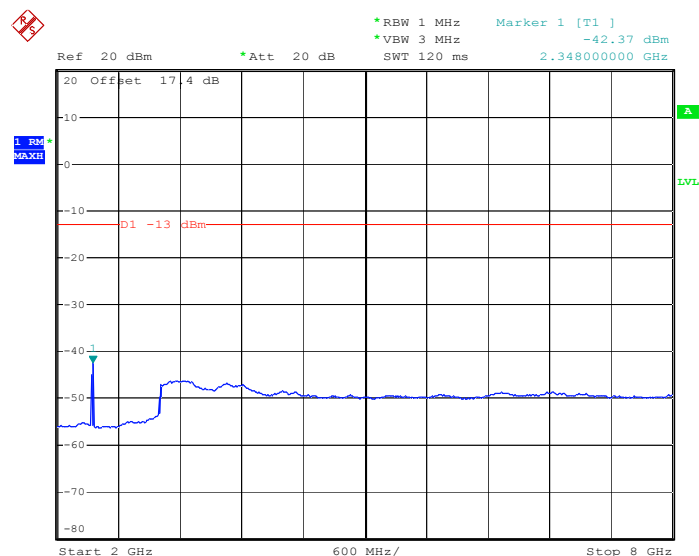
Band :	LTE Band 13	Channel :	CH23255
Test Mode :	5MHz	Power Stage :	High

**Conducted Emission Plot (30M ~ 2GHz) for
QPSK (RB Size 1, RB Offset 0)**



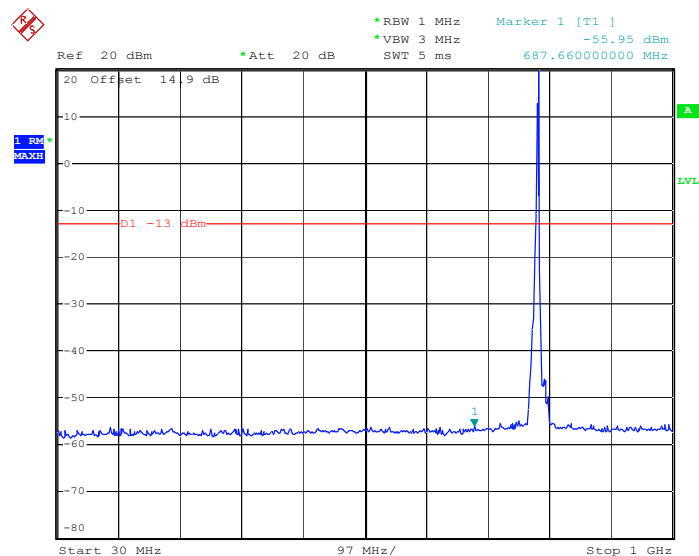
Date: 21.FEB.2012 14:43:34

**Conducted Emission Plot (2GHz ~ 8GHz) for
QPSK (RB Size 1, RB Offset 0)**



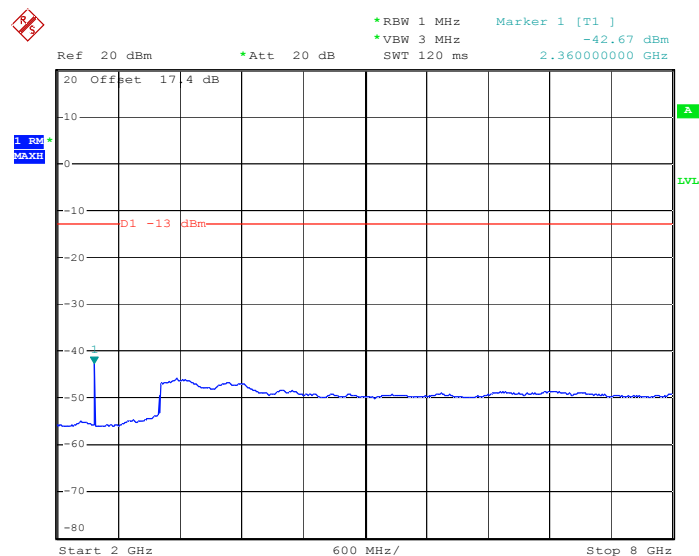
Date: 21.FEB.2012 14:50:45

Conducted Emission Plot (30M ~ 2GHz) for QPSK (RB Size 1, RB Offset 24)



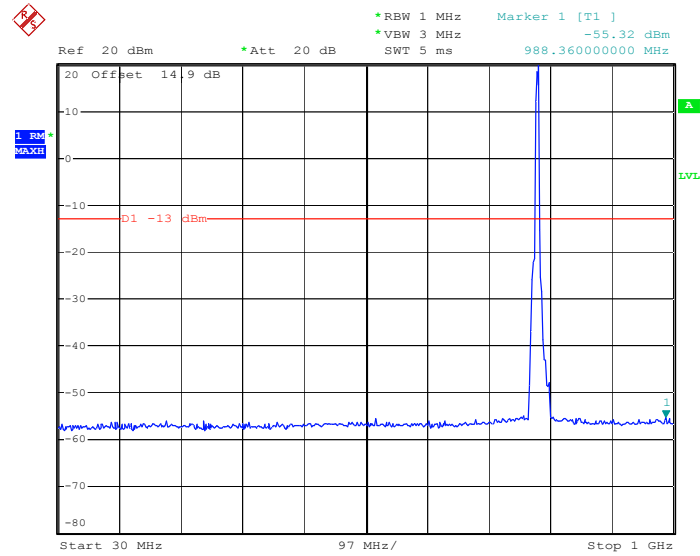
Date: 21.FEB.2012 14:41:35

Conducted Emission Plot (2GHz ~ 8GHz) for QPSK (RB Size 1, RB Offset 24)



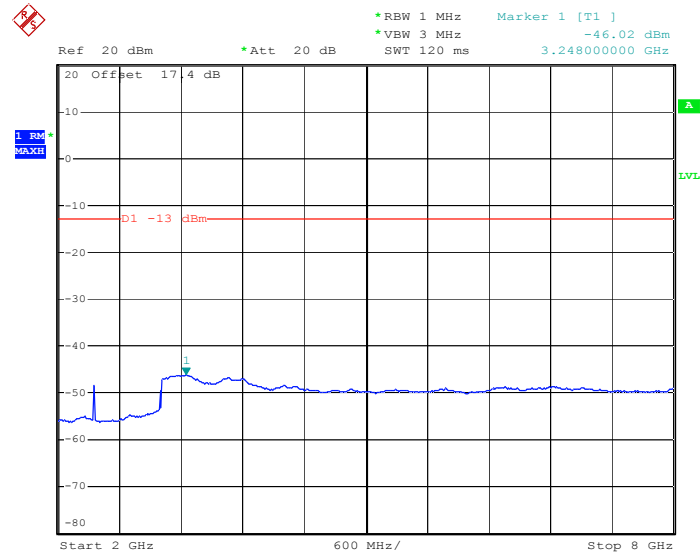
Date: 21.FEB.2012 14:54:01

Conducted Emission Plot (30M ~ 2GHz) for QPSK (RB Size 25, RB Offset 0)



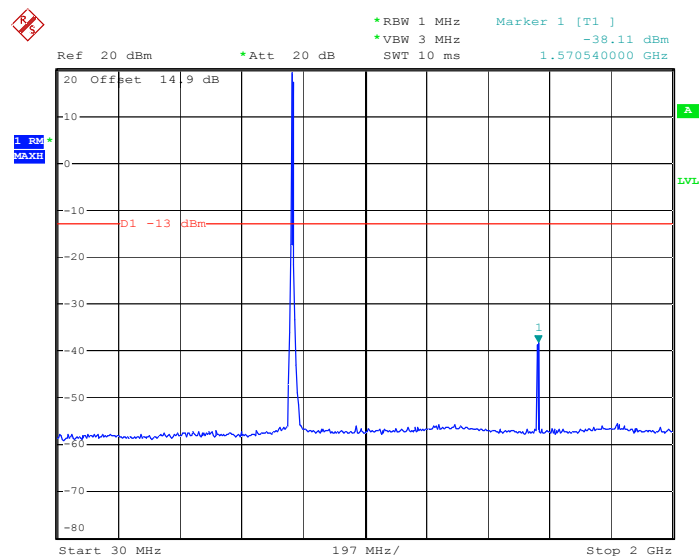
Date: 21.FEB.2012 14:48:29

Conducted Emission Plot (2GHz ~ 8GHz) for QPSK (RB Size 25, RB Offset 0)



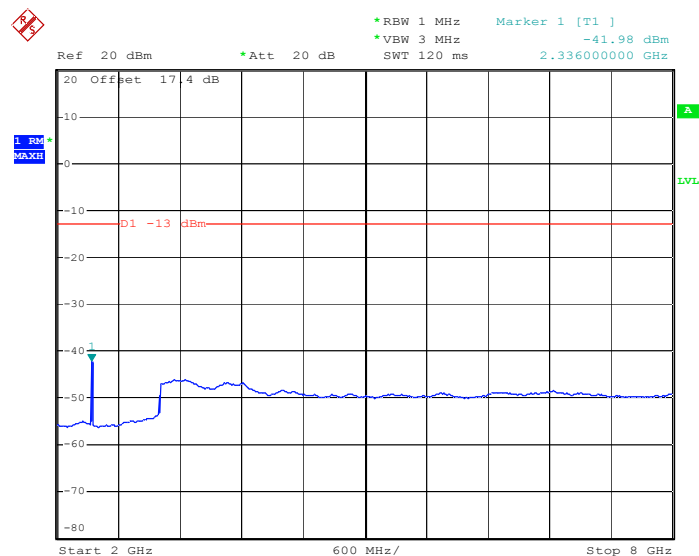
Date: 21.FEB.2012 14:50:12

Conducted Emission Plot (30M ~ 2GHz) for 16QAM (RB Size 1, RB Offset 0)



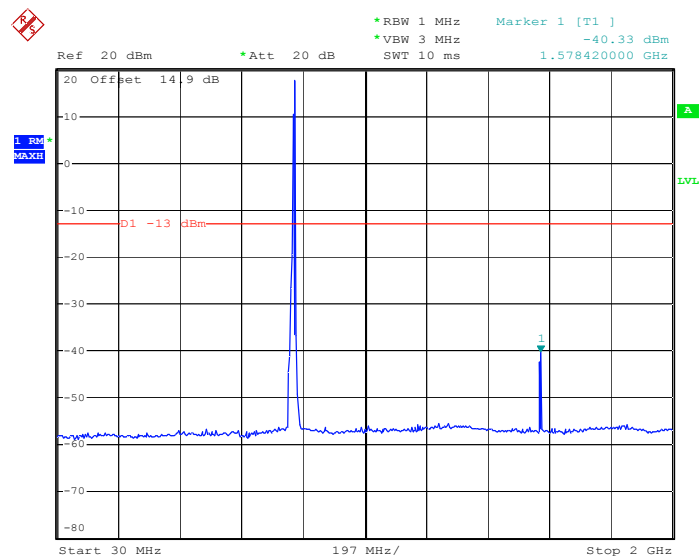
Date: 21.FEB.2012 15:00:32

Conducted Emission Plot (2GHz ~ 8GHz) for 16QAM (RB Size 1, RB Offset 0)



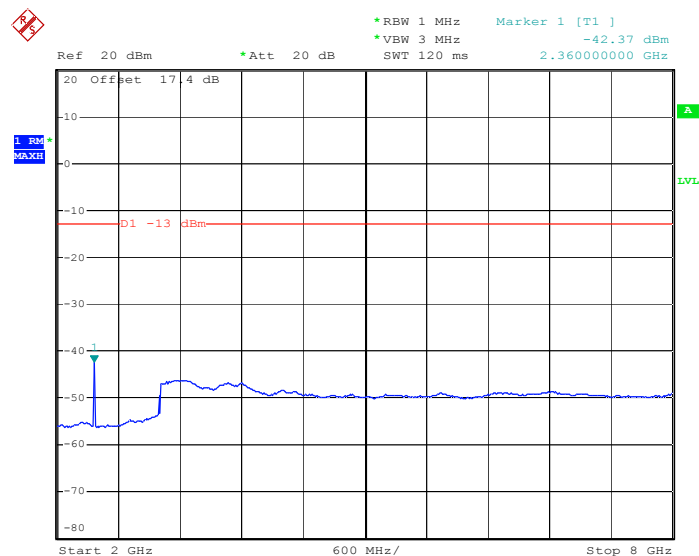
Date: 21.FEB.2012 14:56:22

Conducted Emission Plot (30M ~ 2GHz) for 16QAM (RB Size 1, RB Offset 24)



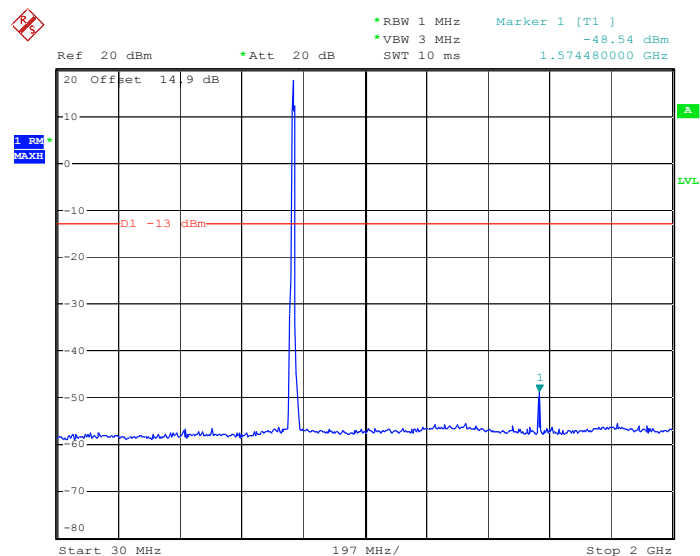
Date: 21.FEB.2012 15:03:34

Conducted Emission Plot (2GHz ~ 8GHz) for 16QAM (RB Size 1, RB Offset 24)



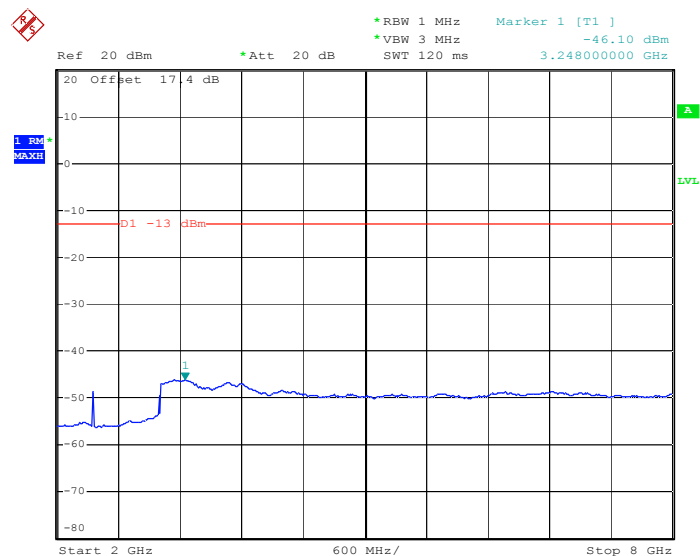
Date: 21.FEB.2012 14:54:53

Conducted Emission Plot (30M ~ 2GHz) for 16QAM (RB Size 25, RB Offset 0)



Date: 21.FEB.2012 14:59:08

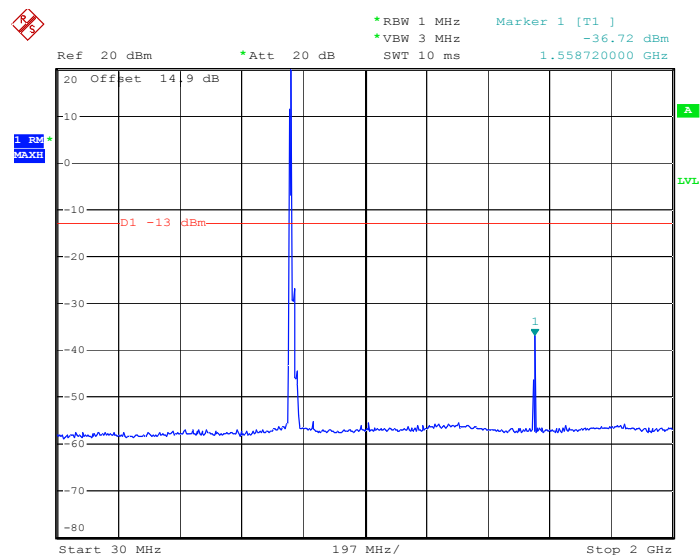
Conducted Emission Plot (2GHz ~ 8GHz) for 16QAM (RB Size 25, RB Offset 0)



Date: 21.FEB.2012 14:57:15

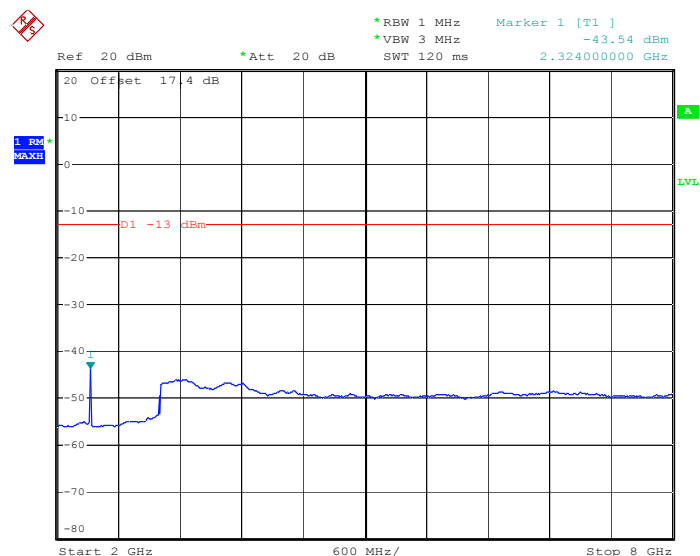
Band :	LTE Band 13	Channel :	CH23230
Test Mode :	10MHz	Power Stage :	High

**Conducted Emission Plot (30M ~ 2GHz) for
QPSK (RB Size 1, RB Offset 0)**



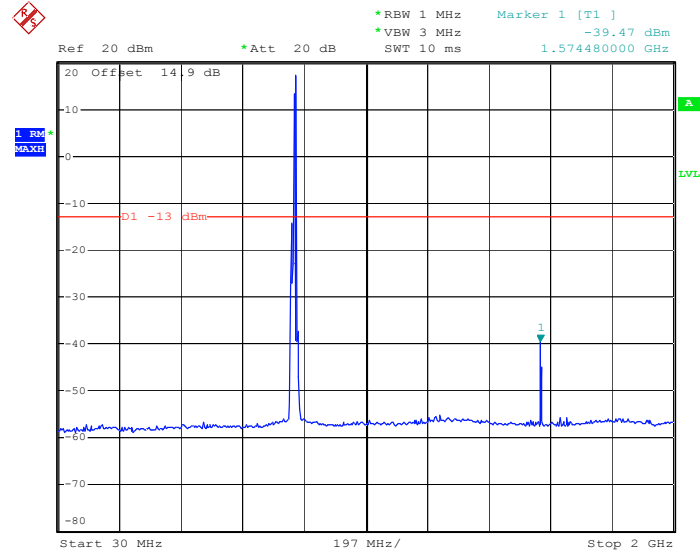
Date: 21.FEB.2012 11:04:22

**Conducted Emission Plot (2GHz ~ 8GHz) for
QPSK (RB Size 1, RB Offset 0)**



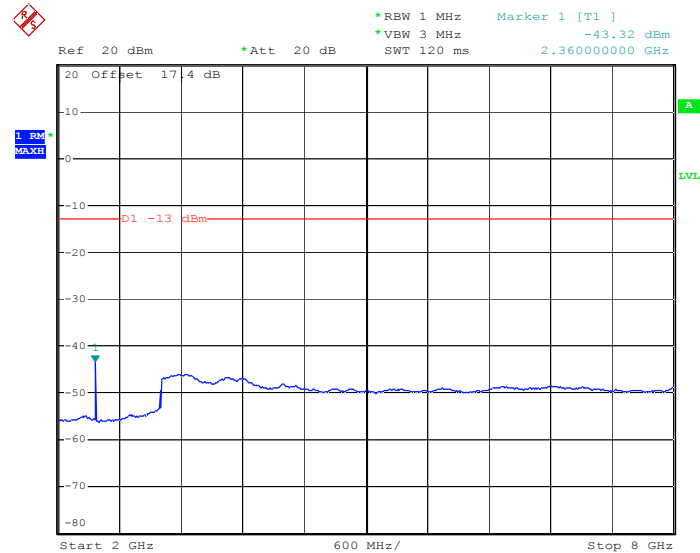
Date: 21.FEB.2012 11:17:28

Conducted Emission Plot (30M ~ 2GHz) for QPSK (RB Size 1, RB Offset 49)



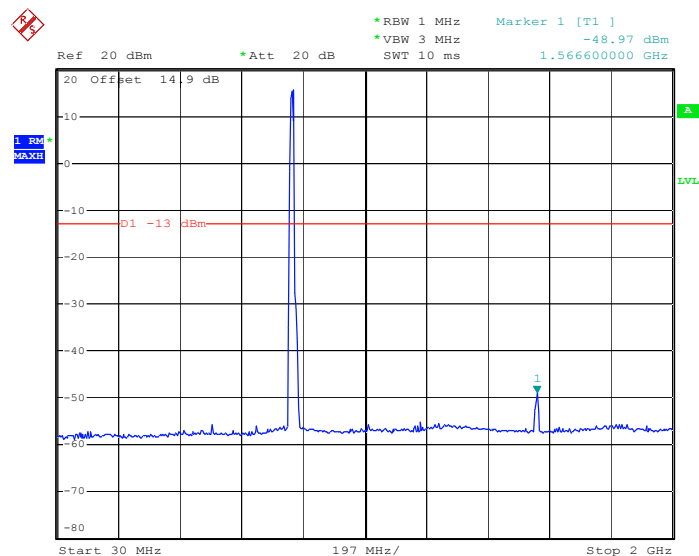
Date: 21.FEB.2012 11:06:48

Conducted Emission Plot (2GHz ~ 8GHz) for QPSK (RB Size 1, RB Offset 49)



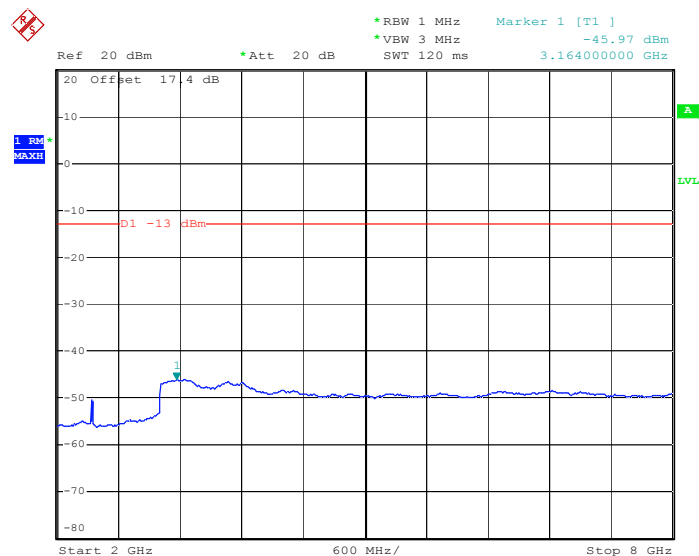
Date: 21.FEB.2012 11:20:41

Conducted Emission Plot (30M ~ 2GHz) for QPSK (RB Size 50, RB Offset 0)



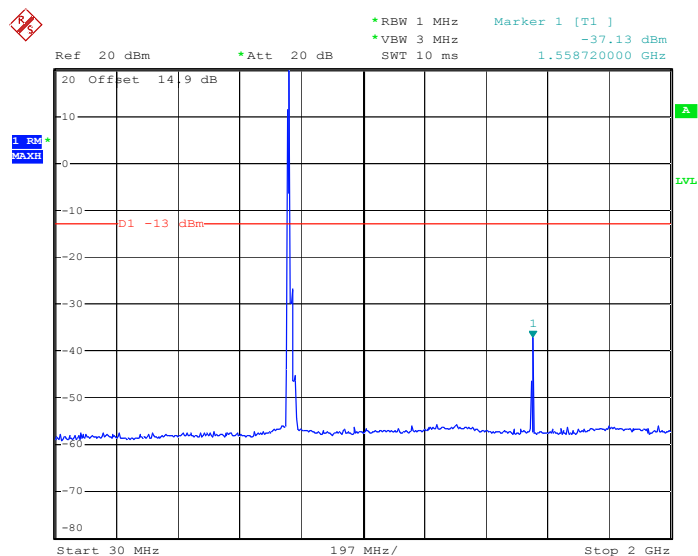
Date: 21.FEB.2012 11:09:40

Conducted Emission Plot (2GHz ~ 8GHz) for QPSK (RB Size 50, RB Offset 0)



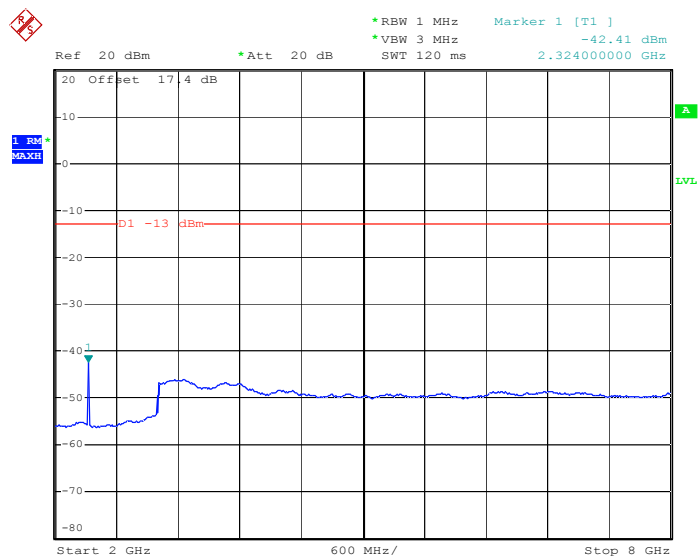
Date: 21.FEB.2012 11:23:12

Conducted Emission Plot (30M ~ 2GHz) for 16QAM (RB Size 1, RB Offset 0)



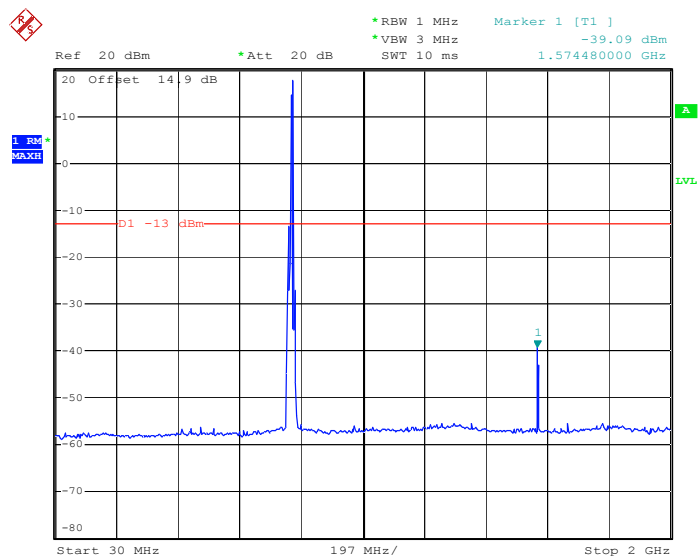
Date: 21.FEB.2012 11:15:02

Conducted Emission Plot (2GHz ~ 8GHz) for 16QAM (RB Size 1, RB Offset 0)



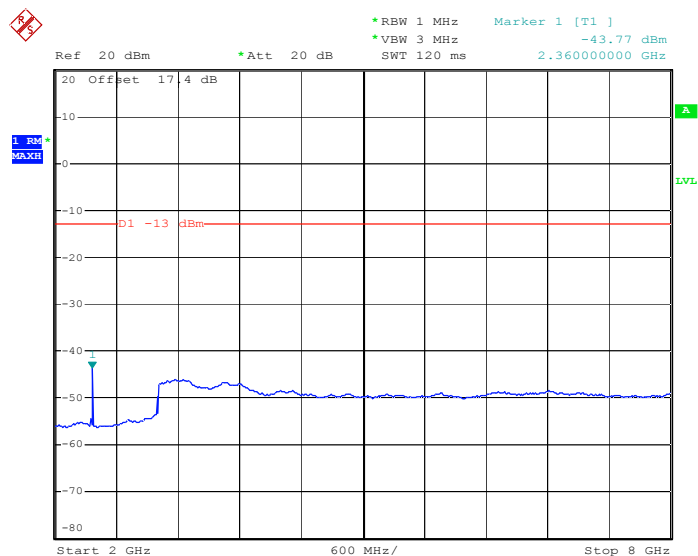
Date: 21.FEB.2012 10:59:22

Conducted Emission Plot (30M ~ 2GHz) for 16QAM (RB Size 1, RB Offset 49)



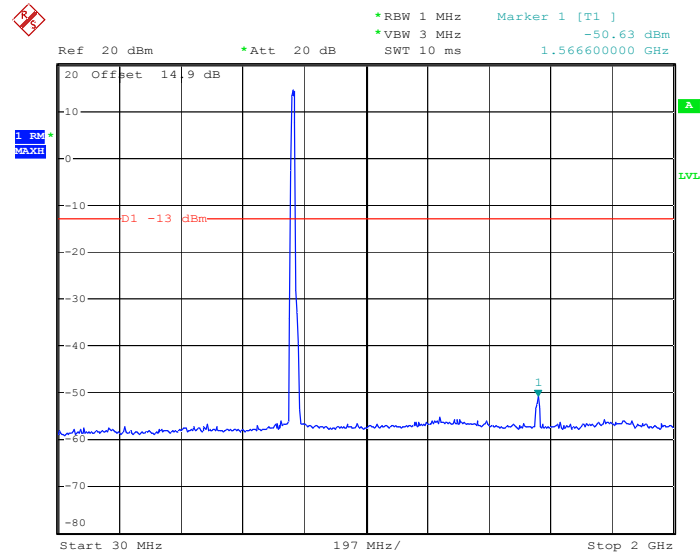
Date: 21.FEB.2012 11:14:11

Conducted Emission Plot (2GHz ~ 8GHz) for 16QAM (RB Size 1, RB Offset 49)



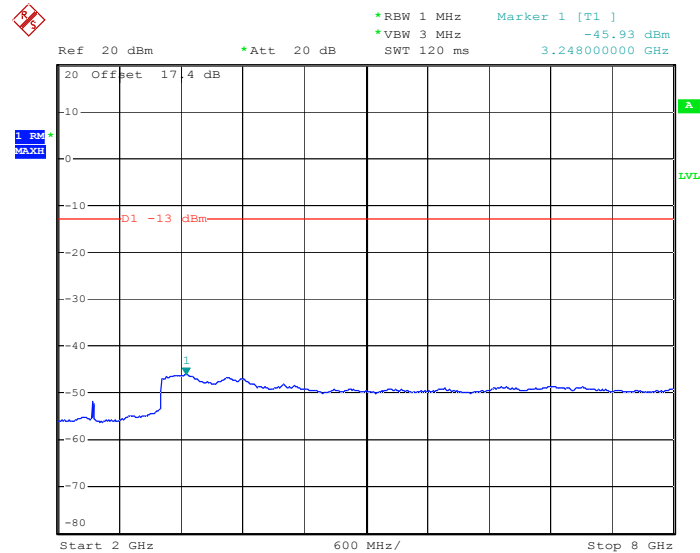
Date: 21.FEB.2012 10:59:55

Conducted Emission Plot (30M ~ 2GHz) for 16QAM (RB Size 50, RB Offset 0)



Date: 21.FEB.2012 11:10:52

Conducted Emission Plot (2GHz ~ 8GHz) for 16QAM (RB Size 50, RB Offset 0)



Date: 21.FEB.2012 10:58:49

3.6 Field Strength of Spurious Radiation Measurement

3.6.1 Description of Field Strength of Spurious Radiated Measurement

The radiated spurious emission was measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

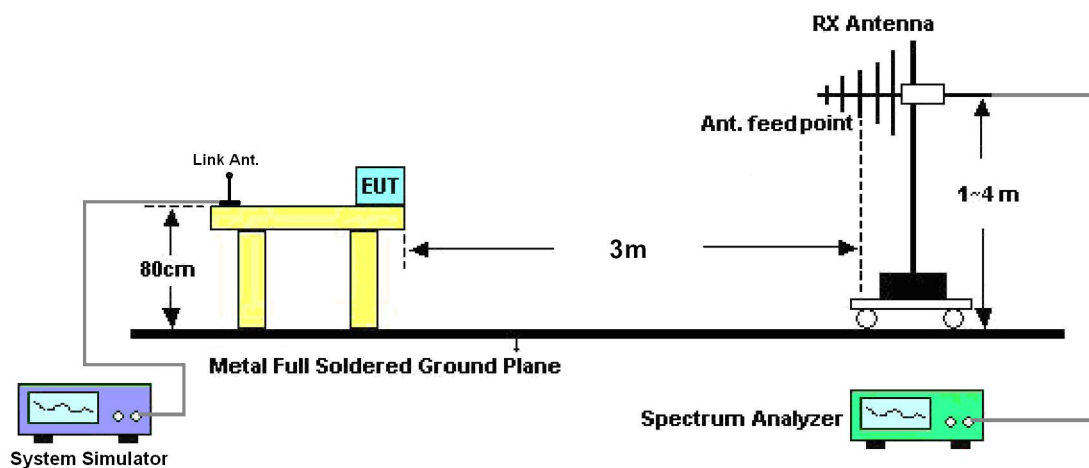
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

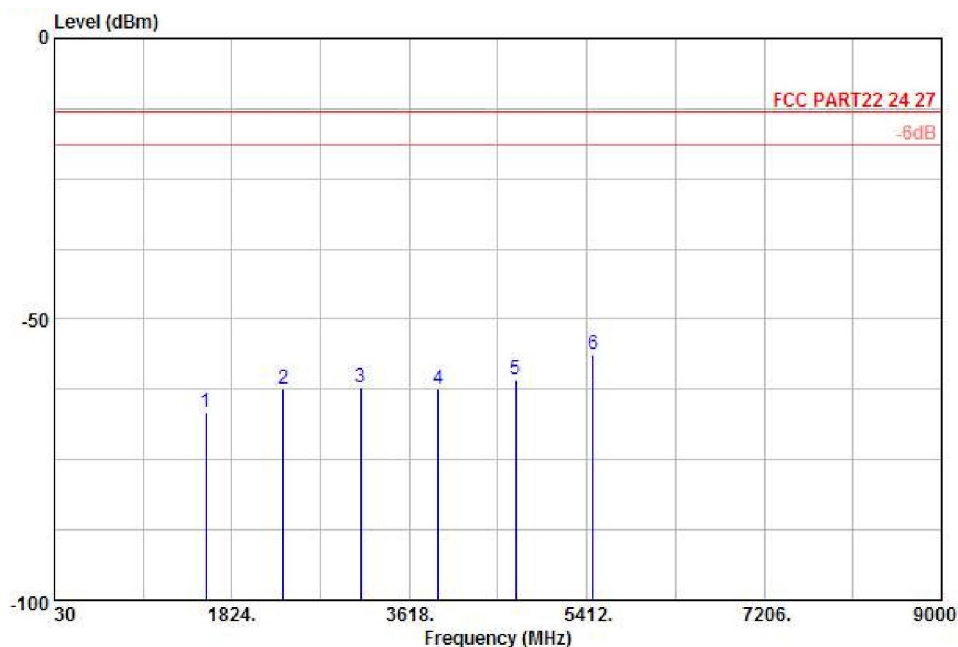
1. The EUT was placed on a rotatable wooden table with 0.8 meter about ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, Sweep = 500ms, Taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. Emission level (dBm) = output power + substitution Gain.

3.6.4 Test Setup



3.6.5 Test Result of Field Strength of Spurious Radiated

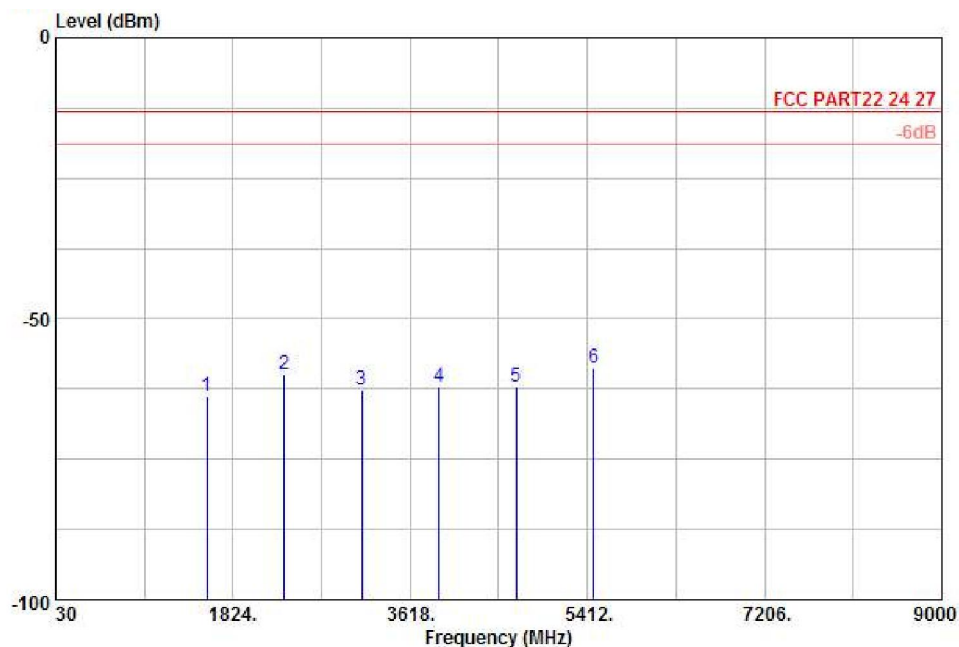
Band :	LTE Band 13	Temperature :	22~23°C
Test Mode :	5MHz 16QAM RB Size 1, RB Offset 24	Relative Humidity :	42~43%
Test Engineer :	Jack Li	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH01-KS
Condition: FCC PART22 24 27 HF EIRP FACTOR-09020 HORIZONTAL
Project : (FG) 190807

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1564	-66.59	-13	-53.59	-64.99	-71.55	0.72	5.68	H	Pass
2346	-62.45	-13	-49.45	-66.28	-67.38	1.01	5.94	H	Pass
3128	-62.04	-13	-49.04	-63.98	-68.40	1.2	7.56	H	Pass
3910	-62.51	-13	-49.51	-65.25	-70.38	1.28	9.15	H	Pass
4692	-60.63	-13	-47.63	-66.83	-68.99	1.59	9.95	H	Pass
5474	-56.35	-13	-43.35	-65.06	-65.42	1.71	10.78	H	Pass

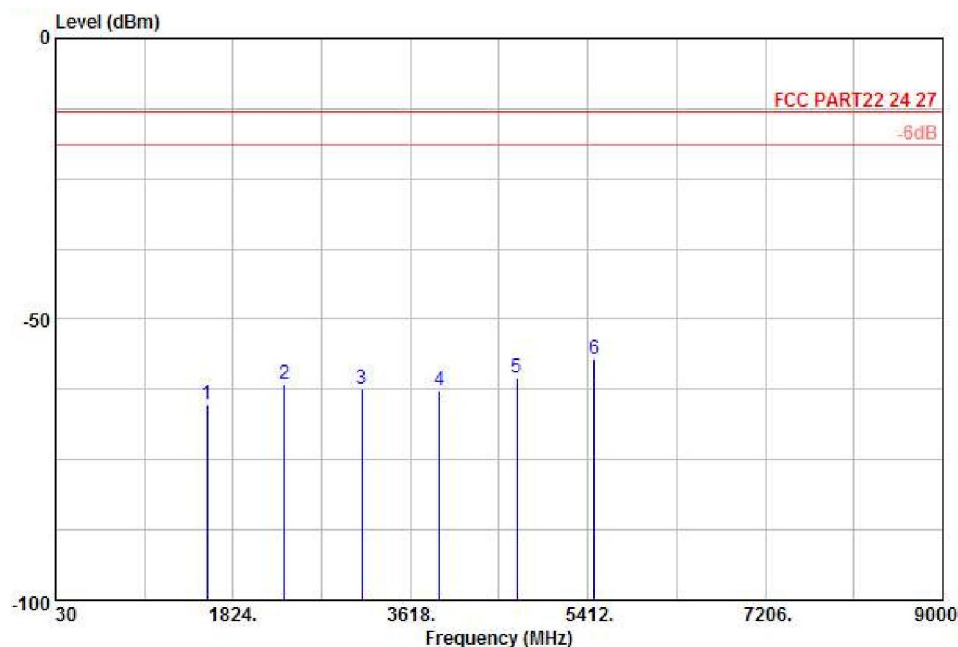
Band :	LTE Band 13	Temperature :	22~23°C
Test Mode :	5MHz 16QAM RB Size 1, RB Offset 24	Relative Humidity :	42~43%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH01-KS
 Condition: FCC PART22 24 27 HF EIRP FACTOR-09020 VERTICAL
 Project : (FG) 190807

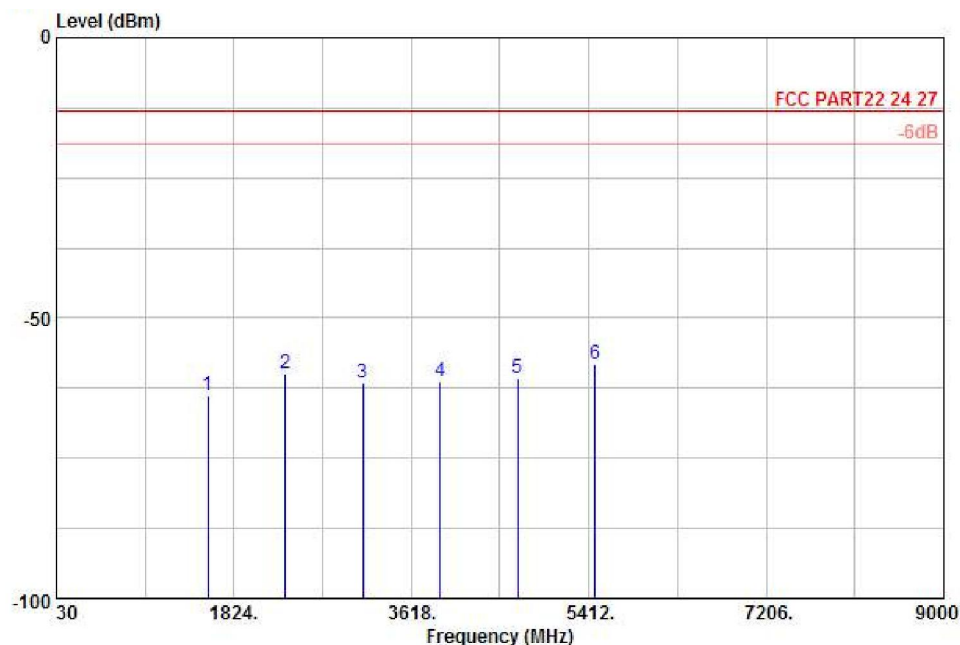
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1564	-63.86	-13	-50.86	-64.74	-68.82	0.72	5.68	V	Pass
2346	-59.91	-13	-46.91	-64.96	-64.84	1.01	5.94	V	Pass
3128	-62.80	-13	-49.80	-64.78	-69.16	1.2	7.56	V	Pass
3910	-62.16	-13	-49.16	-66	-70.03	1.28	9.15	V	Pass
4692	-62.18	-13	-49.18	-67.12	-70.54	1.59	9.95	V	Pass
5474	-58.81	-13	-45.81	-66.8	-67.88	1.71	10.78	V	Pass

Band :	LTE Band 13	Temperature :	21~22°C
Test Mode :	10MHz 16QAM RB Size 1, RB Offset 0	Relative Humidity :	41~42%
Test Engineer :	Cloud Peng	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1564	-65.17	-13	-52.17	-63.57	-70.13	0.72	5.68	H	Pass
2346	-61.62	-13	-48.62	-65.45	-66.55	1.01	5.94	H	Pass
3128	-62.51	-13	-49.51	-64.45	-68.87	1.2	7.56	H	Pass
3910	-62.74	-13	-49.74	-65.48	-70.61	1.28	9.15	H	Pass
4692	-60.39	-13	-47.39	-66.59	-68.75	1.59	9.95	H	Pass
5474	-56.98	-13	-43.98	-65.69	-66.05	1.71	10.78	H	Pass

Band :	LTE Band 13	Temperature :	22~23°C
Test Mode :	10MHz 16QAM RB Size 1, RB Offset 0	Relative Humidity :	42~43%
Test Engineer :	Jack Li	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH01-KS
Condition: FCC PART22 24 27 HF EIRP FACTOR-09020 VERTICAL
Project : (FG) 190807

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1564	-63.75	-13	-50.75	-64.63	-68.71	0.72	5.68	V	Pass
2346	-59.80	-13	-46.80	-64.85	-64.73	1.01	5.94	V	Pass
3128	-61.64	-13	-48.64	-63.62	-68.00	1.2	7.56	V	Pass
3910	-61.19	-13	-48.19	-65.03	-69.06	1.28	9.15	V	Pass
4692	-60.60	-13	-47.60	-65.54	-68.96	1.59	9.95	V	Pass
5474	-58.35	-13	-45.35	-66.34	-67.42	1.71	10.78	V	Pass

3.7 Frequency Stability Measurement

3.7.1 Description of Frequency Stability Measurement

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ ($\pm 2.5\text{ppm}$) of the center frequency.

3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

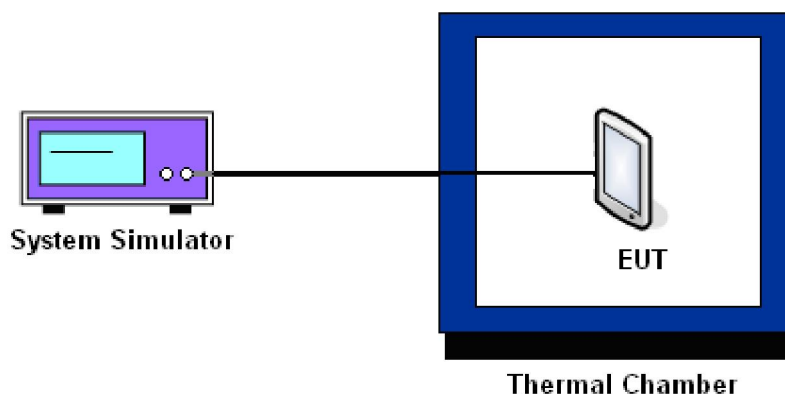
3.7.3 Test Procedures for Temperature Variation

1. The EUT was set up in the thermal chamber and connected with the base station.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized for three hours. Power was applied and the maximum change in frequency was recorded within one minute.
3. With power OFF, the temperature was raised in 10°C step up to 50°C . The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.
4. If the EUT can not be turned on at -30°C , the testing lowest temperature will be raised in 10°C step until the EUT can be turned on.

3.7.4 Test Procedures for Voltage Variation

1. The EUT was placed in a temperature chamber at $25\pm 5^{\circ}\text{C}$ and connected with the base station.
2. The power supply voltage to the EUT was varied from BEP to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

3.7.5 Test Setup



3.7.6 Test Result of Temperature Variation

Band :	LTE Band 13	Channel :	23205
Test Mode :	5MHz	Limit (ppm) :	2.5

Temperature (°C)	QPSK-RB Size 25, RB Offset 0		16QAM-RB Size 25, RB Offset 0		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	N/A	N/A	N/A	N/A	PASS
-20	N/A	N/A	N/A	N/A	
-10	-5.90	-0.008	-4.80	-0.006	
0	-2.50	-0.003	-6.40	-0.008	
10	-3.80	-0.005	-2.70	-0.003	
20	-0.20	0.000	-1.60	-0.002	
30	-1.00	-0.001	-4.10	-0.005	
40	-4.70	-0.006	-2.50	-0.003	
50	-5.80	-0.007	-6.30	-0.008	
55	-3.90	-0.005	-2.10	-0.003	

Note: The manufacturer declared that the EUT could work properly between temperatures -10°C~55°C.

Band :	LTE Band 13	Channel :	23230
Test Mode :	5MHz	Limit (ppm) :	2.5

Temperature (°C)	QPSK-RB Size 25, RB Offset 0		16QAM-RB Size 25, RB Offset 0		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	N/A	N/A	N/A	N/A	PASS
-20	N/A	N/A	N/A	N/A	
-10	-1.20	-0.002	0.30	0.000	
0	-1.50	-0.002	-3.50	-0.004	
10	-1.90	-0.002	0.60	0.001	
20	-2.80	-0.004	-0.30	0.000	
30	-3.80	-0.005	-3.20	-0.004	
40	1.20	0.002	-2.70	-0.003	
50	-3.10	-0.004	-2.40	-0.003	
55	-1.80	-0.002	-2.50	-0.003	

Note: The manufacturer declared that the EUT could work properly between temperatures -10°C~55°C.

Band :	LTE Band 13	Channel :	23255
Test Mode :	5MHz	Limit (ppm) :	2.5

Temperature (°C)	QPSK-RB Size 25, RB Offset 0		16QAM-RB Size 25, RB Offset 0		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	N/A	N/A	N/A	N/A	PASS
-20	N/A	N/A	N/A	N/A	
-10	-3.80	-0.005	-1.60	-0.002	
0	-1.50	-0.002	-4.20	-0.005	
10	-2.20	-0.003	-5.50	-0.007	
20	-1.80	-0.002	-4.90	-0.006	
30	-1.40	-0.002	-1.30	-0.002	
40	-2.60	-0.003	-3.60	-0.005	
50	-2.10	-0.003	-2.60	-0.003	
55	-1.50	-0.002	-4.60	-0.006	

Note: The manufacturer declared that the EUT could work properly between temperatures -10°C~55°C.

Band :	LTE Band 13	Channel :	23230
Test Mode :	10MHz	Limit (ppm) :	2.5

Temperature (°C)	QPSK-RB Size 50, RB Offset 0		16QAM-RB Size 50, RB Offset 0		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	N/A	N/A	N/A	N/A	PASS
-20	N/A	N/A	N/A	N/A	
-10	2.60	0.003	2.80	0.004	
0	-1.90	-0.002	1.00	0.001	
10	0.30	0.000	-4.30	-0.005	
20	0.80	0.001	0.10	0.000	
30	-0.90	-0.001	1.10	0.001	
40	-2.10	-0.003	-0.60	-0.001	
50	0.70	0.001	-0.20	0.000	
55	0.80	0.001	-1.40	-0.002	

Note: The manufacturer declared that the EUT could work properly between temperatures -10°C~55°C.

3.7.7 Test Result of Voltage Variation

Band	Band Width & Channel	Mode	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 13	5M (Low)	QPSK-RB Size 25, RB Offset 0	3.7	-0.70	-0.001	2.5	PASS
			BEP	2.10	0.003		
			4.2	0.80	0.001		
		16QAM-RB Size 25, RB Offset 0	3.7	-2.70	-0.003		
			BEP	2.10	0.003		
			4.2	0.20	0.000		
	5M (Middle)	QPSK-RB Size 25, RB Offset 0	3.7	1.10	0.001		
			BEP	-2.40	-0.003		
			4.2	-1.30	-0.002		
		16QAM-RB Size 25, RB Offset 0	3.7	1.80	0.002		
			BEP	-5.30	-0.007		
			4.2	-4.40	-0.006		
	5M (High)	QPSK-RB Size 25, RB Offset 0	3.7	-0.40	-0.001		
			BEP	1.80	0.002		
			4.2	-2.30	-0.003		
		16QAM-RB Size 25, RB Offset 0	3.7	1.90	0.002		
			BEP	-1.50	-0.002		
			4.2	-4.00	-0.005		
	10M (Middle)	QPSK-RB Size 50, RB Offset 0	3.7	-2.10	-0.003		
			BEP	-4.00	-0.005		
			4.2	-0.80	-0.001		
		16QAM-RB Size 50, RB Offset 0	3.7	-1.50	-0.002		
			BEP	-1.00	-0.001		
			4.2	-0.40	-0.001		

Remark:

1. Normal Voltage = 3.7V.
2. Battery End Point (BEP) = 3.5 V.

4 List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 30, 2011	Mar. 13, 2012	Dec. 29, 2012	Conducted (TH01-KS)
LTE Base Station	Anritsu	MT8820G	N/A	N/A	Dec. 28, 2011	Mar. 13, 2012	Dec. 27, 2012	Conducted (TH01-KS)
DC Power Supply	TOPWARD	GPS-3030D	E1884515	N/A	Aug. 23, 2011	Mar. 13, 2012	Aug. 22, 2012	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	N/A	Dec. 30, 2011	Mar. 13, 2012	Dec. 29, 2012	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 09, 2011	Feb. 26, 2012	Nov. 08, 2012	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 30, 2011	Feb. 26, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 08, 2011	Feb. 26, 2012	Dec. 07, 2012	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	860004/00	9GHz~30GHz	Jul. 28, 2011	Feb. 26, 2012	Jul. 27, 2012	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Jan. 06, 2012	Feb. 26, 2012	Jan. 05, 2013	Radiation (03CH01-KS)
Amplifier	Wireless	FPA-6592G	060004	30MHz~2GHz	Dec. 30, 2011	Feb. 26, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701023	1GHz~18GHz	Nov. 07, 2011	Feb. 26, 2012	Nov. 06, 2012	Radiation (03CH01-KS)
SHE-EHF Horn	Schwarzbeck	BBHA9170	BBHA170249	15GHz~40GHz	Oct. 11, 2011	Feb. 26, 2012	Oct. 10, 2012	Radiation (03CH01-KS)
LTE Base Station	Anritsu	MT8820C	6200930978	N/A	Dec. 28, 2011	Feb. 26, 2012	Dec. 27, 2012	-

5 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Contribution	Uncertainty of X_i		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.41	Normal (k=2)	0.21
Antenna Factor Calibration	0.83	Normal (k=2)	0.42
Cable Loss Calibration	0.25	Normal (k=2)	0.13
Pre-Amplifier Gain Calibration	0.27	Normal (k=2)	0.14
RCV/SPA Specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site Imperfection	1.43	Rectangular	0.83
Mismatch	+0.39 / -0.41	U-Shape	0.28
Combined Standard Uncertainty $U_c(y)$	1.27		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	2.54		

Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Contribution	Uncertainty of X_i		$u(X_i)$	C_i	$C_i * u(X_i)$
	dB	Probability Distribution			
Receiver Reading	± 0.10	Normal (k=2)	0.10	1	0.10
Antenna Factor Calibration	± 1.70	Normal (k=2)	0.85	1	0.85
Cable Loss Calibration	± 0.50	Normal (k=2)	0.25	1	0.25
Receiver Correction	± 2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	± 1.50	Rectangular	0.87	1	0.87
Site Imperfection	± 2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR $\Gamma_1 = 0.197$ Antenna VSWR $\Gamma_2 = 0.194$ Uncertainty = $20\text{Log}(1-\Gamma_1\Gamma_2)$	+0.34 / -0.35	U-Shape	0.244	1	0.244
Combined Standard Uncertainty $U_c(y)$	2.36				
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2U_c(y)$)	4.72				



Appendix A. Photographs of EUT

Please refer to Sporton report number EP190807 as below.