

FCC RF Test Report

APPLICANT : ZTE CORPORATION
EQUIPMENT : CDMA/LTE 7 inch Tablet
BRAND NAME : ZTE
MODEL NAME : V66
FCC ID : Q78-V66
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 : 0.28 W (QPSK RB Size 1, RB Offset 0, BW 5MHz)
0.29 W (QPSK RB Size 1, RB Offset 24, BW 5MHz)
0.23 W (QPSK RB Size 1, RB Offset 0, BW 10MHz)
0.22 W (QPSK RB Size 1, RB Offset 49, BW 10MHz)
0.26 W (16QAM RB Size 1, RB Offset 0, BW 5MHz)
0.24 W (16QAM RB Size 1, RB Offset 24, BW 5MHz)
0.20 W (16QAM RB Size 1, RB Offset 0, BW 10MHz)
0.18 W (16QAM RB Size 1, RB Offset 49, BW 10MHz)
EMISSION DESIGNATOR : 4M92G7D (QPSK, BW 5MHz)
4M80D7W (16QAM, BW 5MHz)
8M93G7D (QPSK, BW 10MHz)
8M88D7W (16QAM, BW 10MHz)

The product was received on Sep. 01, 2011 and completely tested on Nov. 07, 2011. 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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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+10log ₁₀ (P[Watts]) < 65+10log ₁₀ (P[Watts]) in a 6.25 kHz bandwidth	PASS	-
3.5	§2.1051 §27.53(c)	Conducted Emission	< 43+10log ₁₀ (P[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+10log ₁₀ (P[Watts])	PASS	Under limit 41.70 dB at 2334 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 7 inch Tablet
Brand Name	ZTE
Model Name	V66
FCC ID	Q78-V66
Tx Frequency	777 MHz ~787 MHz
Rx Frequency	746 MHz ~ 756 MHz
Maximum Output Power to Antenna	23.20 dBm (5M) 23.30 dBm (10M)
Maximum ERP	0.28 W (24.53 dBm) (QPSK RB Size 1, RB Offset 0, BW 5MHz) 0.29 W (24.59 dBm) (QPSK RB Size 1, RB Offset 24, BW 5MHz) 0.23 W (23.66 dBm) (QPSK RB Size 1, RB Offset 0, BW 10MHz) 0.22 W (23.44 dBm) (QPSK RB Size 1, RB Offset 49, BW 10MHz) 0.26 W (24.22 dBm) (16QAM RB Size 1, RB Offset 0, BW 5MHz) 0.24 W (23.81 dBm) (16QAM RB Size 1, RB Offset 24, BW 5MHz) 0.20 W (23.09 dBm) (16QAM RB Size 1, RB Offset 0, BW 10MHz) 0.18 W (22.51 dBm) (16QAM RB Size 1, RB Offset 49, BW 10MHz)
Antenna Type	PIFA Antenna
HW Version	110601
SW Version	NA
Type of Modulation	4M92G7D (QPSK, BW 5MHz) 4M80D7W (16QAM, BW 5MHz) 8M93G7D (QPSK, BW 10MHz) 8M88D7W (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

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

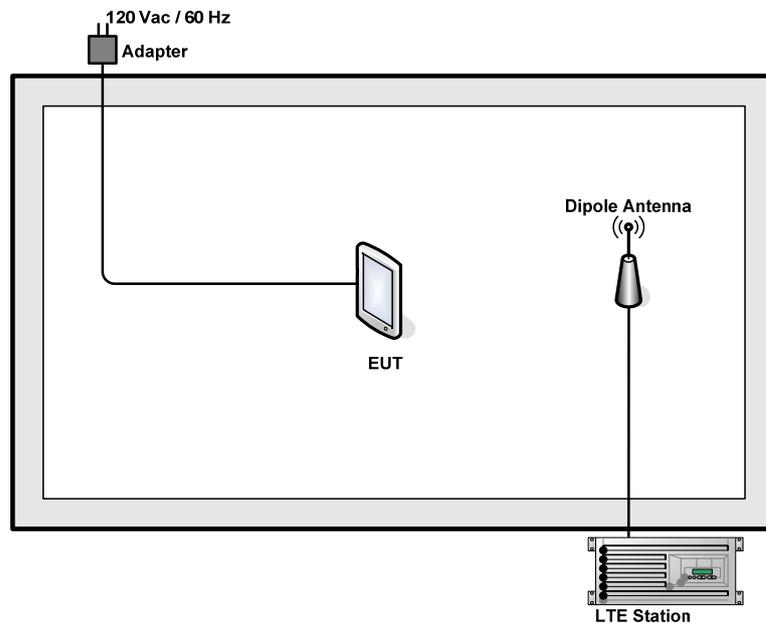
During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range, and EUT is rotated on three test planes to find out the worst emission.

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

Test Modes			
Band		Radiated TCs	Conducted TCs
LTE Band 13	BW 5MHz	<ul style="list-style-type: none"> ■ LTE (RB Size 1, RB Offset 0) Link 	<ul style="list-style-type: none"> ■ 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	<ul style="list-style-type: none"> ■ LTE (RB Size 1, RB Offset 0) Link 	<ul style="list-style-type: none"> ■ 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: Above test modes all test for two Modulation (QPSK and 16QAM)

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.

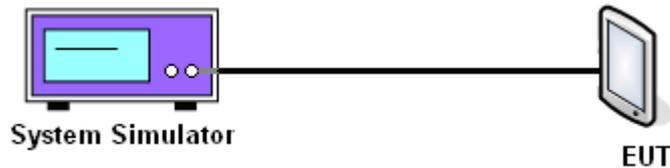
3.1.2 Measuring Instruments

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	23.15	0.207
				1	24	22.83	0.192
				12	6	22.67	0.185
				25	0	22.61	0.182
			16-QAM	1	0	22.80	0.191
				1	24	22.51	0.178
				12	6	22.64	0.184
				25	0	22.95	0.197
	23230	782	QPSK	1	0	23.07	0.201
				1	24	22.83	0.192
				12	6	22.56	0.180
				25	0	22.61	0.182
			16-QAM	1	0	23.06	0.202
				1	24	22.92	0.196
				12	6	22.54	0.179
				25	0	22.81	0.191
	23255	784.5	QPSK	1	0	22.79	0.190
				1	24	23.20	0.201
				12	6	22.61	0.182
				25	0	22.63	0.183
			16-QAM	1	0	22.88	0.194
				1	24	23.15	0.207
				12	6	22.64	0.184
				25	0	22.94	0.197



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	23.30	0.214
				1	49	23.08	0.203
				25	13	22.53	0.179
				50	0	22.41	0.174
			16-QAM	1	0	23.05	0.202
				1	49	22.70	0.186
				25	13	22.71	0.187
				50	0	22.26	0.168

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.

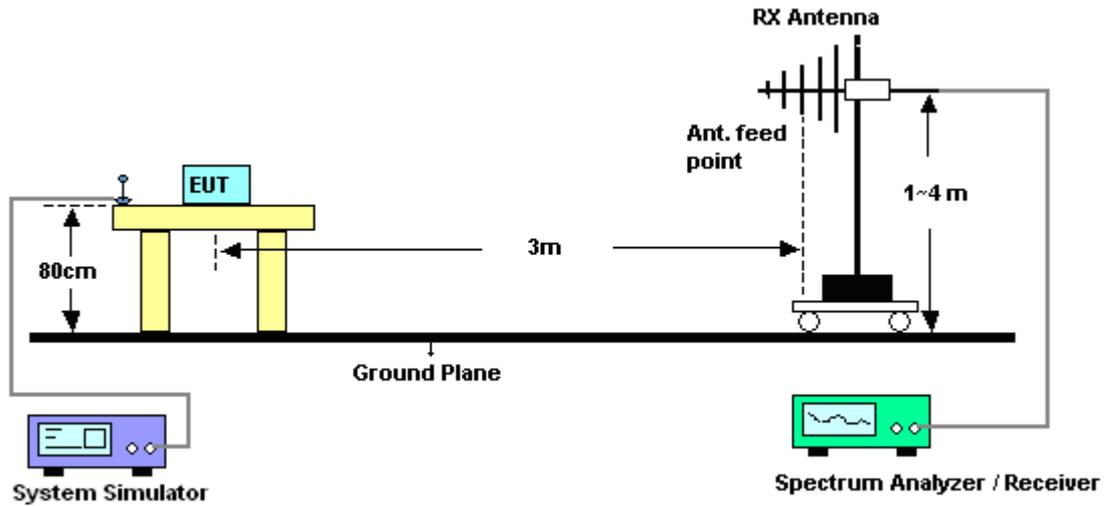
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The EUT was placed on a 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	-4.82	27.91	23.09	0.20
23230	782.00	-3.98	28.51	24.53	0.28
23255	784.50	-5.34	28.83	23.49	0.22
Vertical Polarization					
Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
23205	779.50	-15.28	30.98	15.70	0.04
23230	782.00	-14.92	31.74	16.82	0.05
23255	784.50	-15.05	32.47	17.42	0.06

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

LTE Band 13 (QPSK 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	-5.04	27.91	22.87	0.19
23230	782.00	-5.07	28.51	23.44	0.22
23255	784.50	-4.24	28.83	24.59	0.29
Vertical Polarization					
Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
23205	779.50	-14.33	30.98	16.65	0.05
23230	782.00	-14.54	31.74	17.20	0.05
23255	784.50	-15.59	32.47	16.88	0.05

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



LTE Band 13 (QPSK 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	782.0	-4.85	28.51	23.66	0.23
Vertical Polarization					
Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
23230	782.0	-15.45	31.74	16.29	0.04

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

LTE Band 13 (QPSK RB Size 1, RB Offset 49, 10MHz) Radiated Power ERP					
Horizontal Polarization					
Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
23230	782.0	-5.07	28.51	23.44	0.22
Vertical Polarization					
Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
23230	782.0	-16.00	31.74	15.74	0.04

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



LTE Band 13 (16QAM 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	-5.21	27.91	22.70	0.19
23230	782.00	-4.29	28.51	24.22	0.26
23255	784.50	-5.11	28.83	23.72	0.24
Vertical Polarization					
Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
23205	779.50	-17.86	30.98	13.12	0.02
23230	782.00	-14.72	31.74	17.02	0.05
23255	784.50	-15.51	32.47	16.96	0.05

* 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	-4.77	27.91	23.14	0.21
23230	782.00	-4.70	28.51	23.81	0.24
23255	784.50	-5.76	28.83	23.07	0.20
Vertical Polarization					
Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
23205	779.50	-15.60	30.98	15.38	0.03
23230	782.00	-16.16	31.74	15.58	0.04
23255	784.50	-14.92	32.47	17.55	0.06

* 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	782.0	-5.42	28.51	23.09	0.20
Vertical Polarization					
Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
23230	782.0	-16.22	31.74	15.52	0.04

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

LTE Band 13 (16QAM RB Size 1, RB Offset 49, 10MHz) Radiated Power ERP					
Horizontal Polarization					
Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
23230	782.0	-6.00	28.51	22.51	0.18
Vertical Polarization					
Channel	Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
23230	782.0	-16.48	31.74	15.26	0.03

* 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.

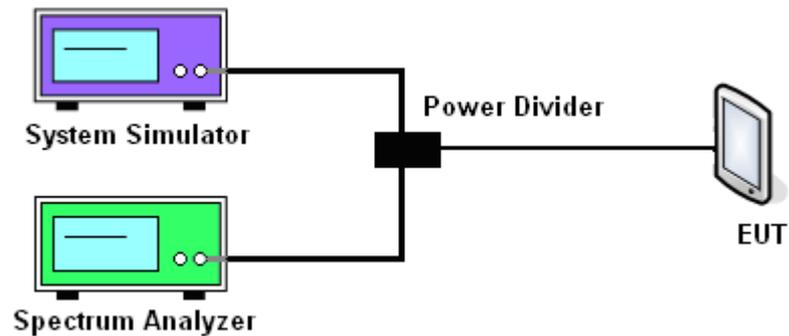
3.3.2 Measuring Instruments

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.

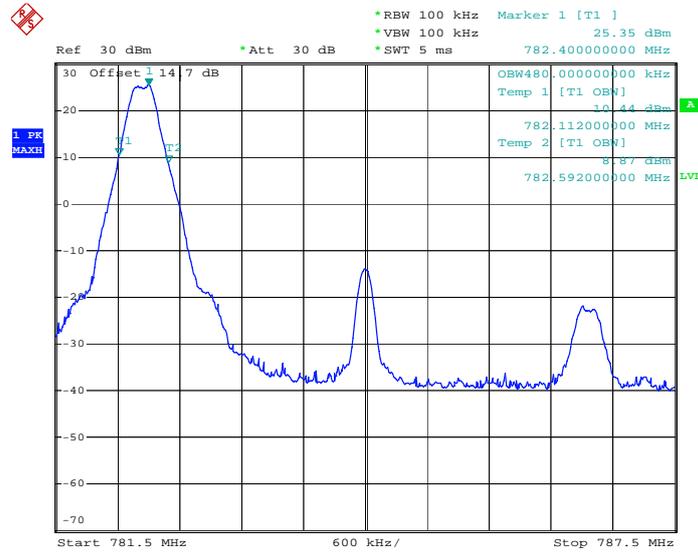
3.3.4 Test Setup



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

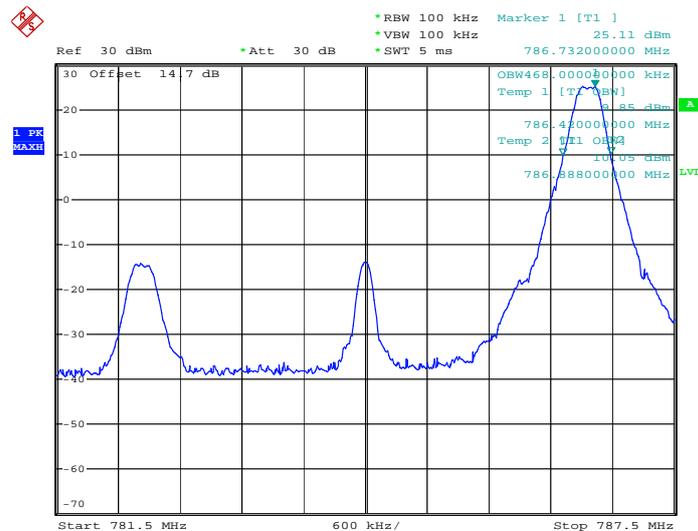
99% Occupied Bandwidth Plot on Channel 23205



Date: 2.NOV.2011 17:49:48

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

99% Occupied Bandwidth Plot on Channel 23205

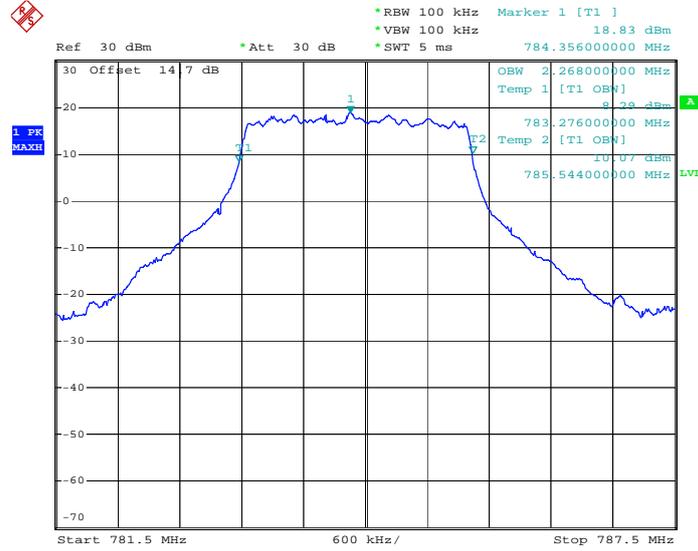


Date: 2.NOV.2011 17:48:45



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

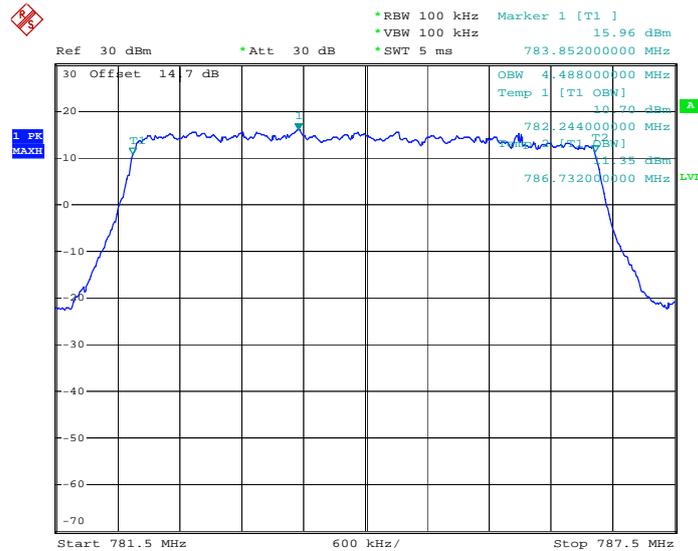
99% Occupied Bandwidth Plot on Channel 23205



Date: 2.NOV.2011 17:51:59

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

99% Occupied Bandwidth Plot on Channel 23205

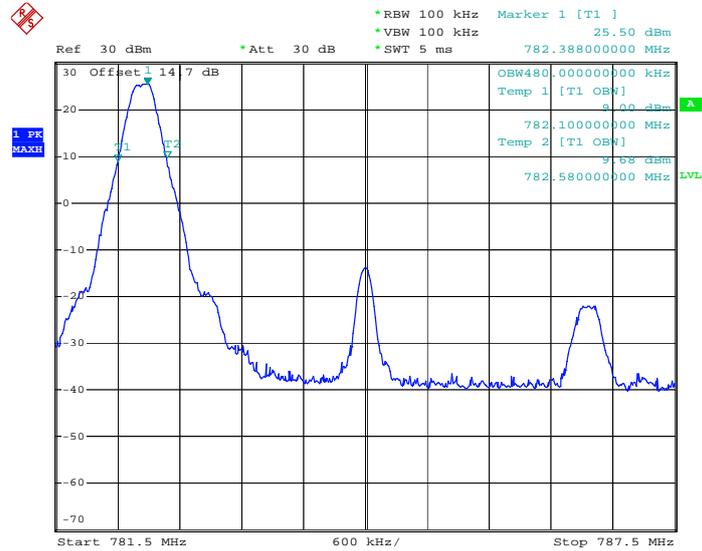


Date: 2.NOV.2011 17:50:45



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

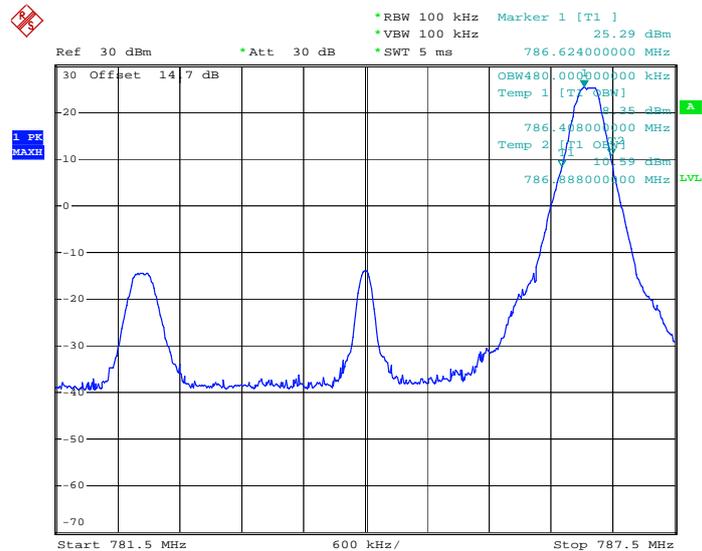
99% Occupied Bandwidth Plot on Channel 23205



Date: 2.NOV.2011 17:46:26

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

99% Occupied Bandwidth Plot on Channel 23205

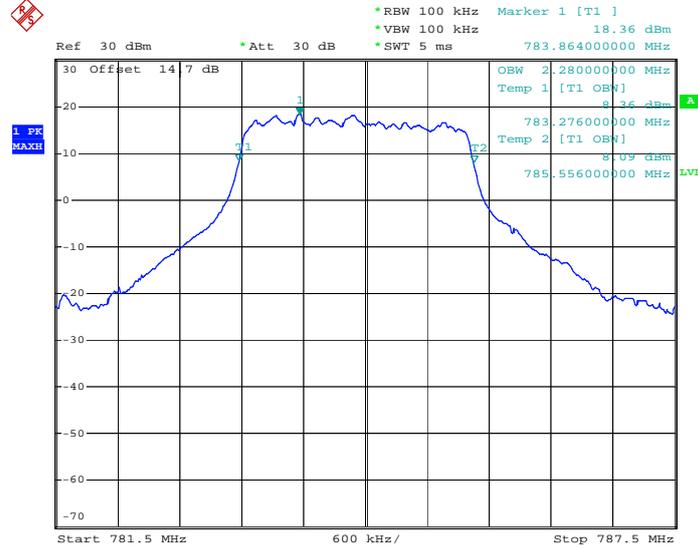


Date: 2.NOV.2011 17:47:33



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

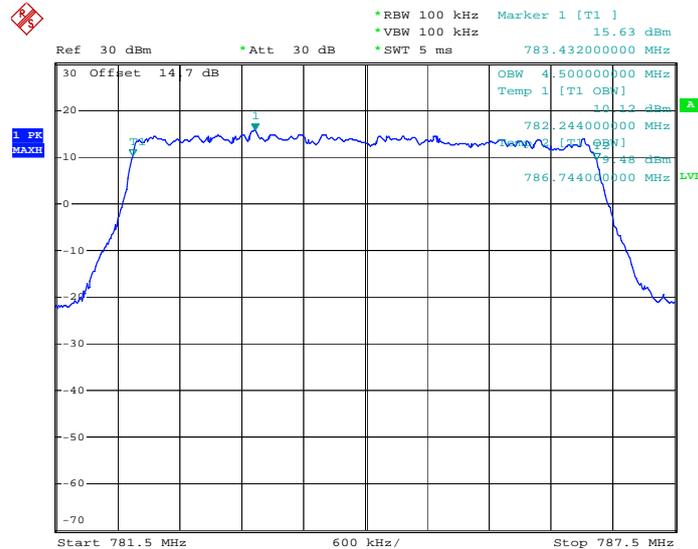
99% Occupied Bandwidth Plot on Channel 23205



Date: 2.NOV.2011 17:43:52

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

99% Occupied Bandwidth Plot on Channel 23205

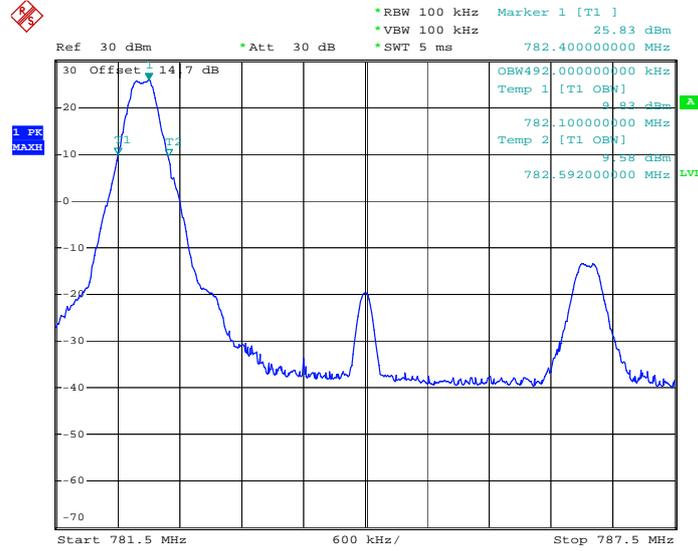


Date: 2.NOV.2011 17:45:07



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

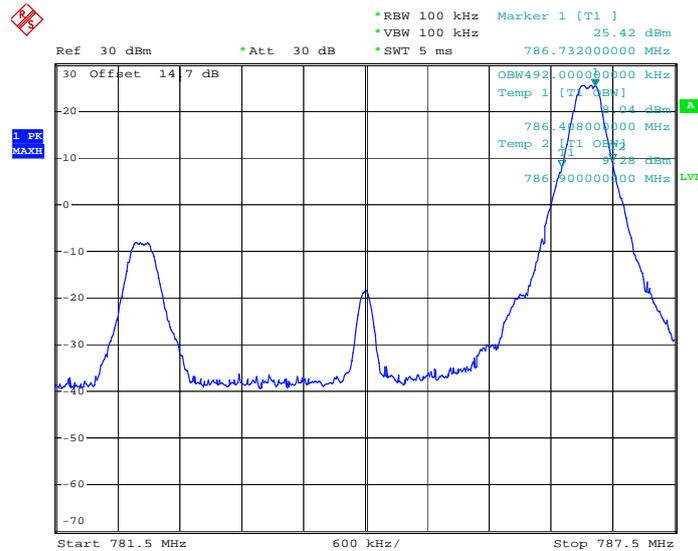
99% Occupied Bandwidth Plot on Channel 23255



Date: 31.OCT.2011 18:54:42

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

99% Occupied Bandwidth Plot on Channel 23255

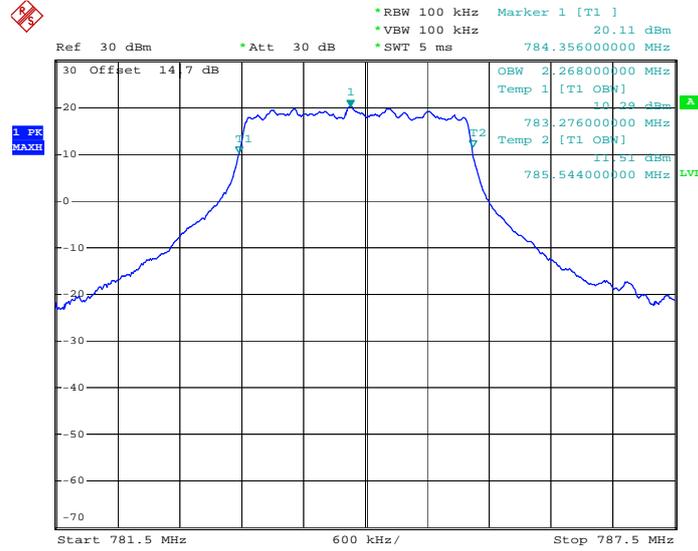


Date: 31.OCT.2011 18:57:08



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

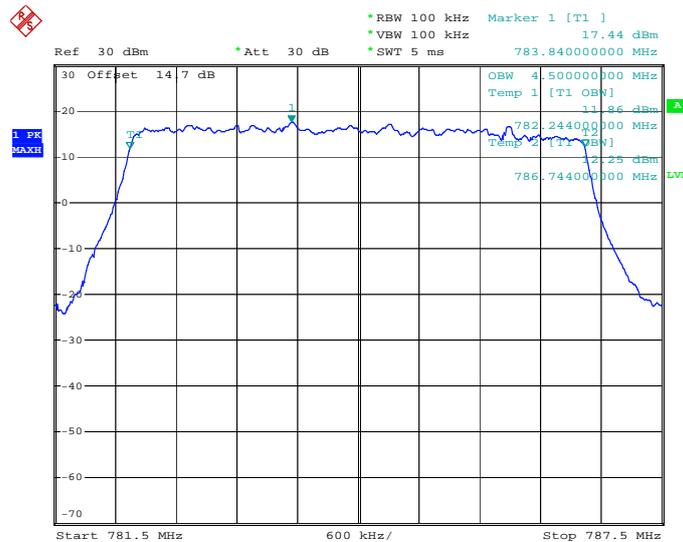
99% Occupied Bandwidth Plot on Channel 23255



Date: 31.OCT.2011 18:53:22

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

99% Occupied Bandwidth Plot on Channel 23255

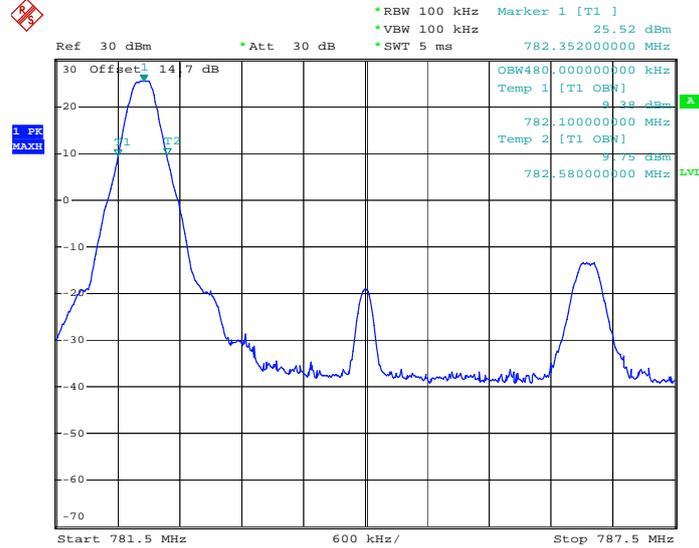


Date: 31.OCT.2011 18:56:02



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

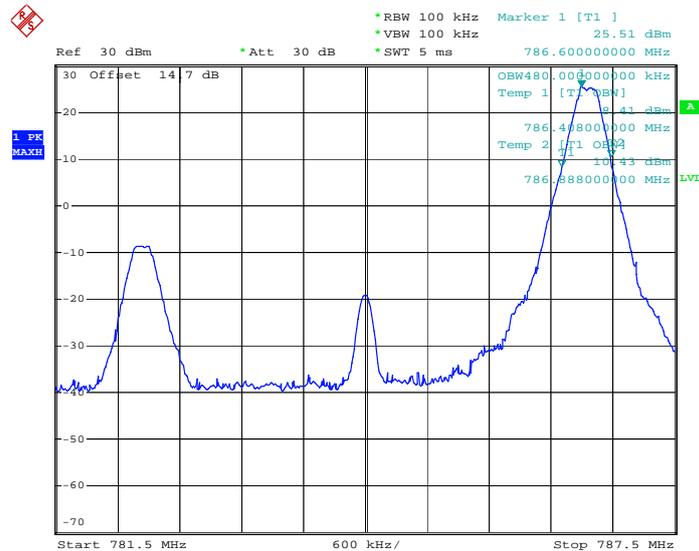
99% Occupied Bandwidth Plot on Channel 23255



Date: 31.OCT.2011 18:48:00

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

99% Occupied Bandwidth Plot on Channel 23255

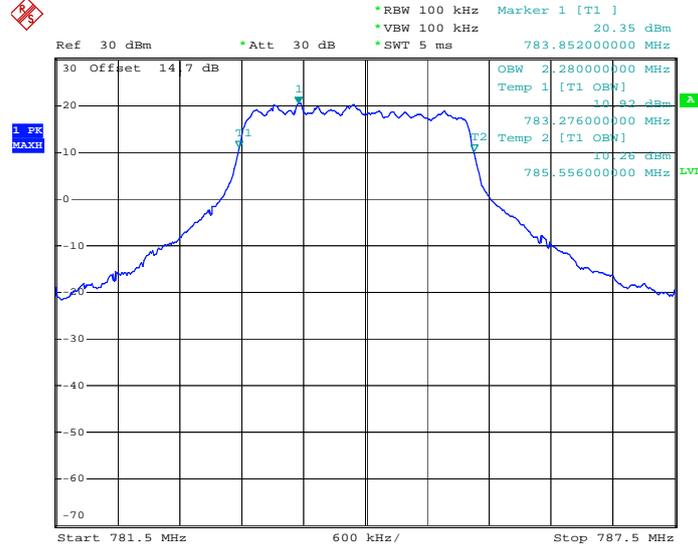


Date: 31.OCT.2011 18:49:12



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

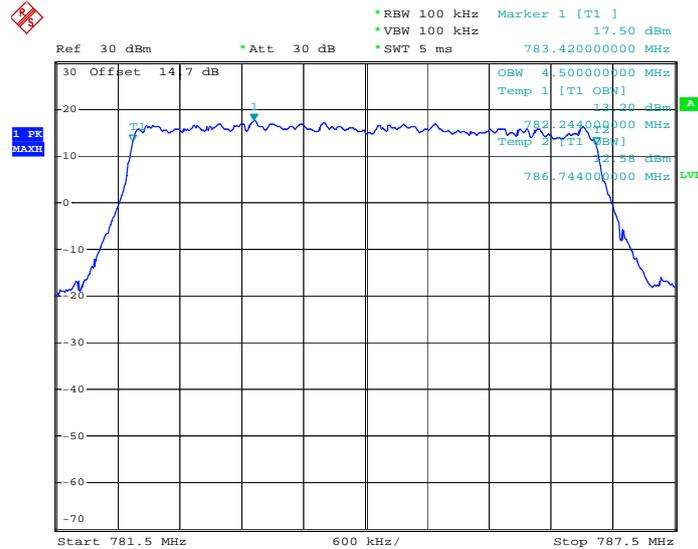
99% Occupied Bandwidth Plot on Channel 23255



Date: 31.OCT.2011 18:51:49

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

99% Occupied Bandwidth Plot on Channel 23255

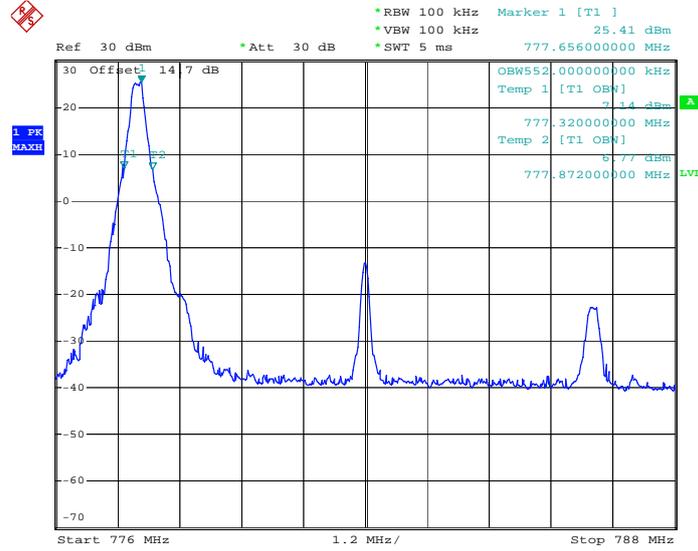


Date: 31.OCT.2011 18:50:47



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

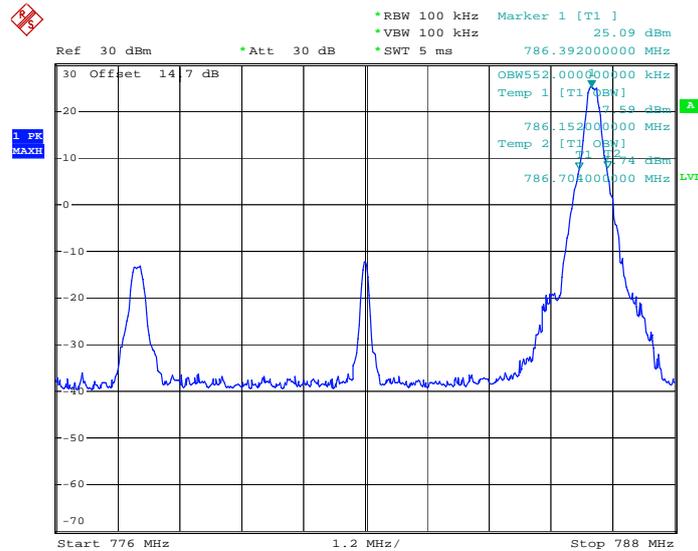
99% Occupied Bandwidth Plot on Channel 23230



Date: 11.OCT.2011 17:26:08

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

99% Occupied Bandwidth Plot on Channel 23230

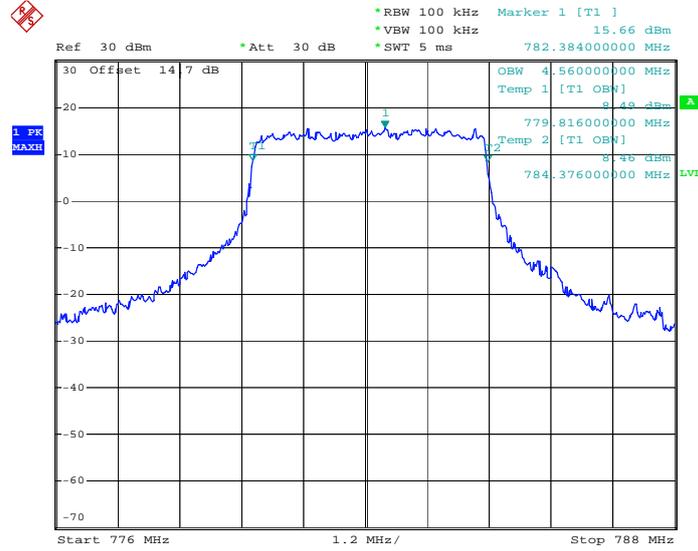


Date: 11.OCT.2011 17:26:46



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

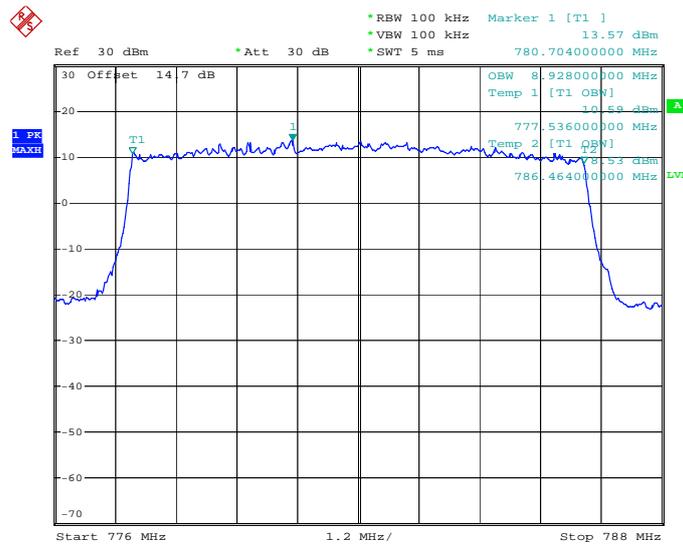
99% Occupied Bandwidth Plot on Channel 23230



Date: 11.OCT.2011 17:25:37

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

99% Occupied Bandwidth Plot on Channel 23230

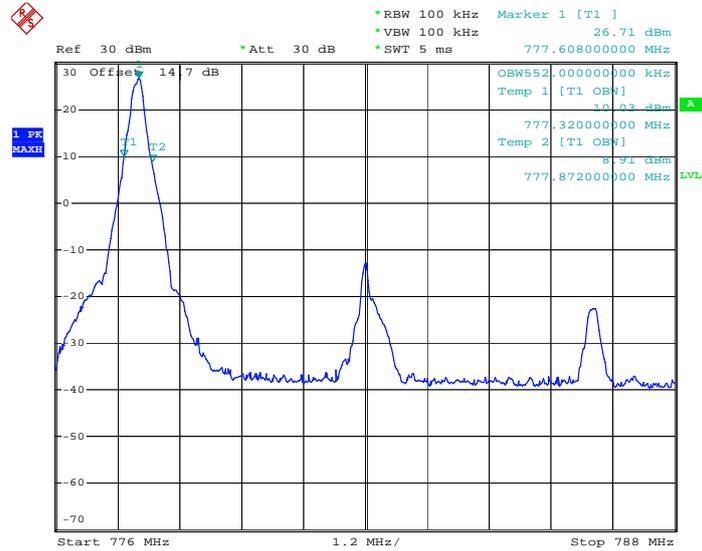


Date: 11.OCT.2011 17:25:02



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

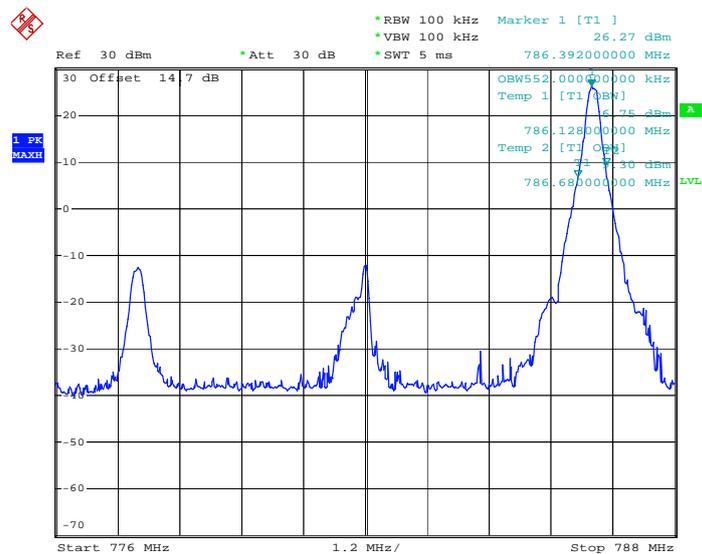
99% Occupied Bandwidth Plot on Channel 23230



Date: 11.OCT.2011 17:21:04

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

99% Occupied Bandwidth Plot on Channel 23230

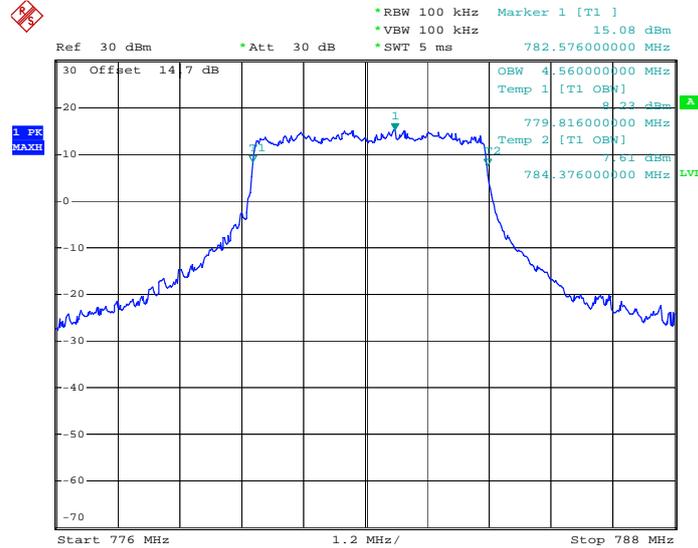


Date: 11.OCT.2011 17:22:01



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

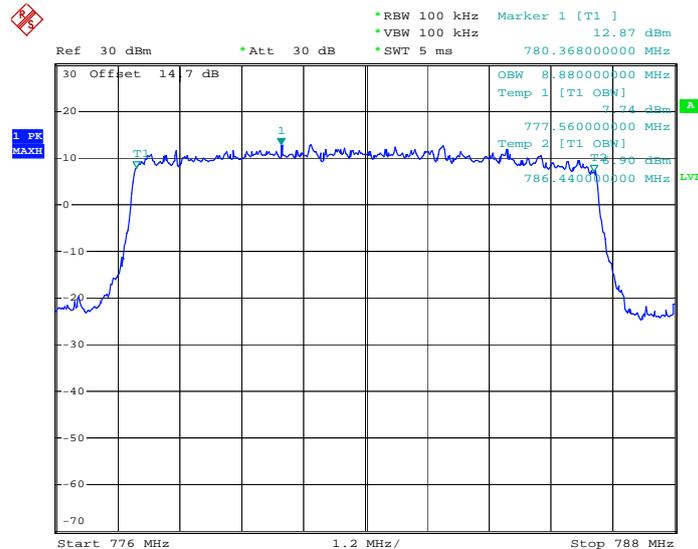
99% Occupied Bandwidth Plot on Channel 23230



Date: 11.OCT.2011 17:23:08

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: 11.OCT.2011 17:23:40

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.

3.4.2 Measuring Instruments

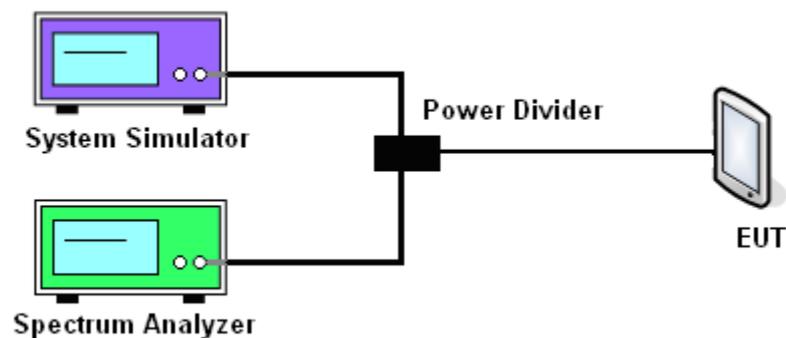
See list of measuring instruments of this test report.

3.4.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The band edges of low and high channels for the highest RF powers were measured. Setting RBW = 10kHz
3. $\text{RealPwr}(\text{dBm}) = \text{PwrAbs}(\text{dBm}) - 10 \cdot \text{LOG}(10\text{k}/6.25\text{k})(\text{dB})$.
 $\text{Real } \Delta \text{Limit}(\text{dB}) = \Delta \text{Limit}(\text{dB}) - 10 \cdot \text{LOG}(10\text{k}/6.25\text{k})(\text{dB})$
 $10 \cdot \text{LOG}(10\text{k}/6.25\text{k}) \sim 2.04\text{dB}$

3.4.4 Test Setup

<Conducted Band Edge >

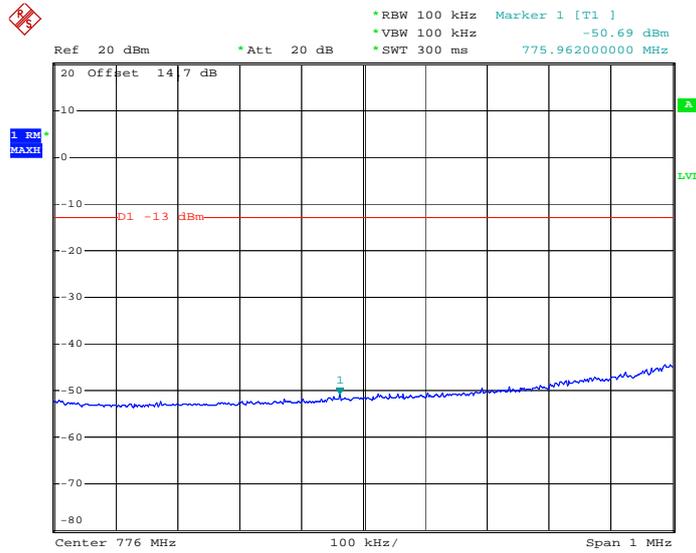




3.4.5 Test Result (Plots) of Conducted Band Edge

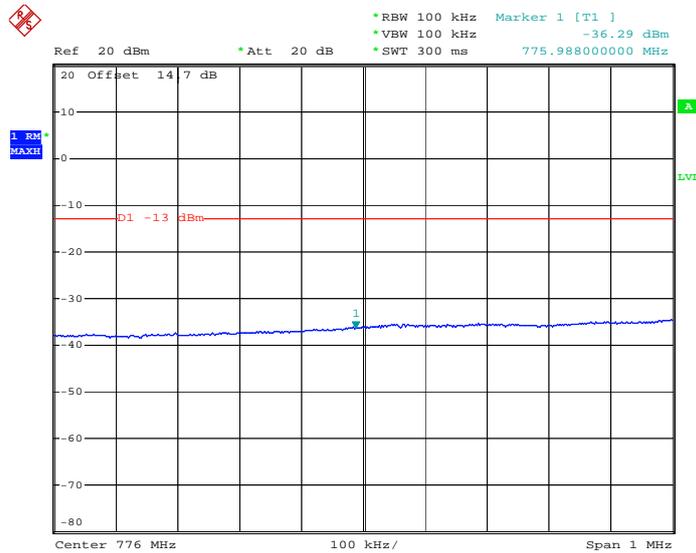
Band :	LTE Band 13	Power Stage :	High
Test Mode :	5MHz	Channel:	Low

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



Date: 2.NOV.2011 19:13:16

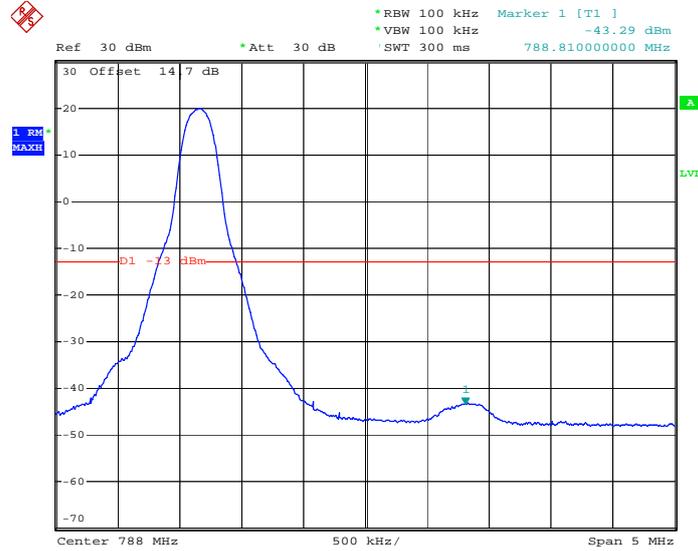
Lower Band Edge Plot for QPSK-RB Size 25, RB Offset 0



Date: 2.NOV.2011 19:14:33

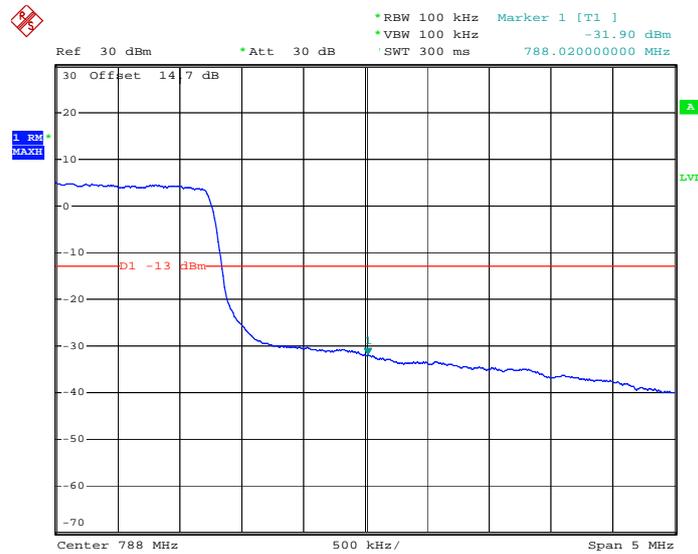


Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 24



Date: 2.NOV.2011 17:16:53

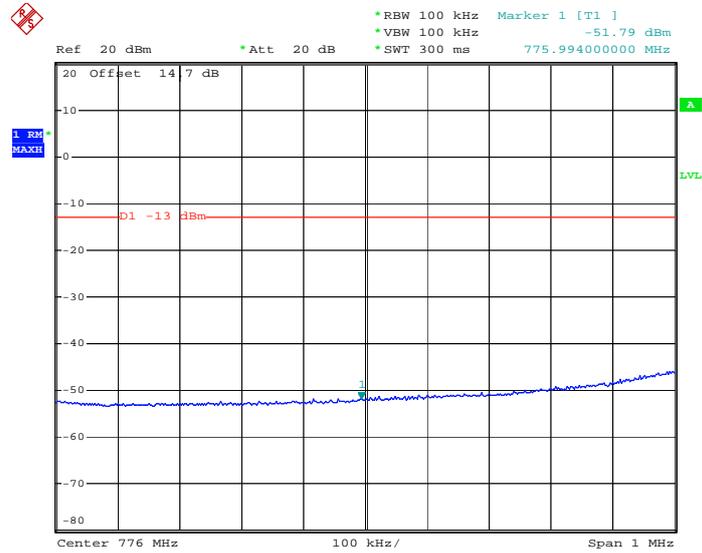
Higher Band Edge Plot for QPSK-RB Size 25, RB Offset 0



Date: 2.NOV.2011 17:18:07

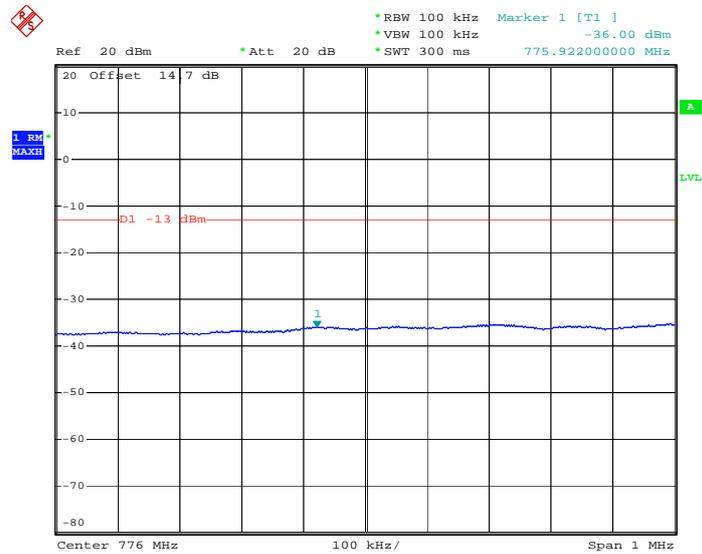


Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



Date: 2.NOV.2011 19:11:47

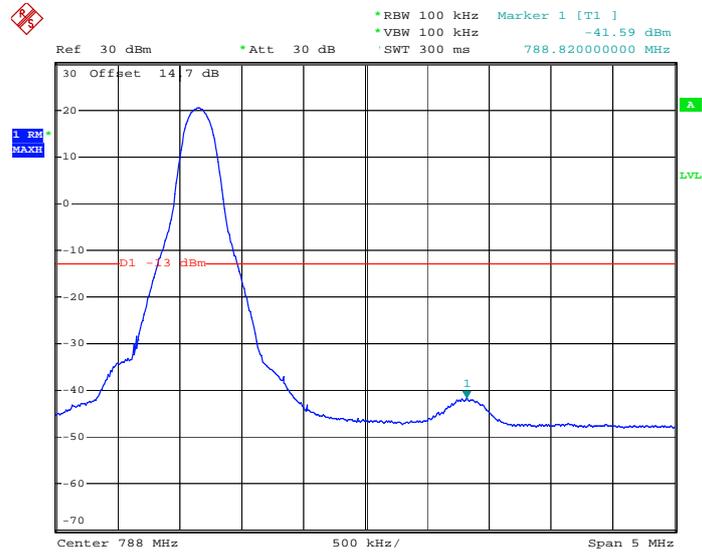
Lower Band Edge Plot for 16QAM -RB Size 25, RB Offset 0



Date: 2.NOV.2011 19:16:22

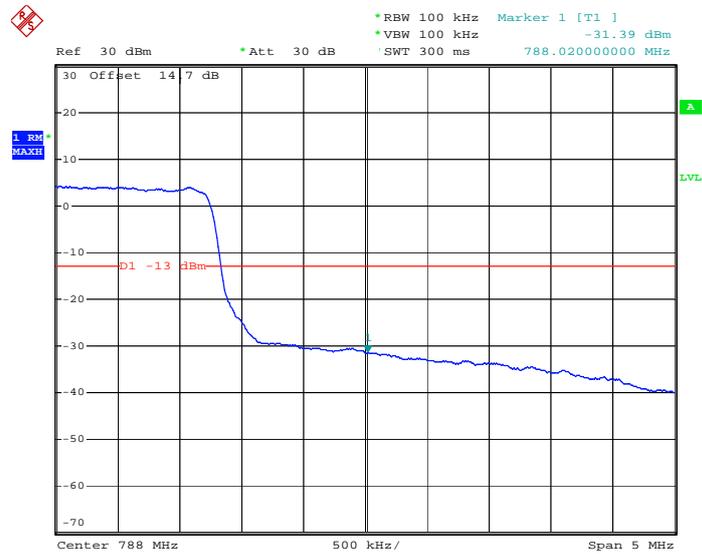


Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 24



Date: 2.NOV.2011 17:21:40

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

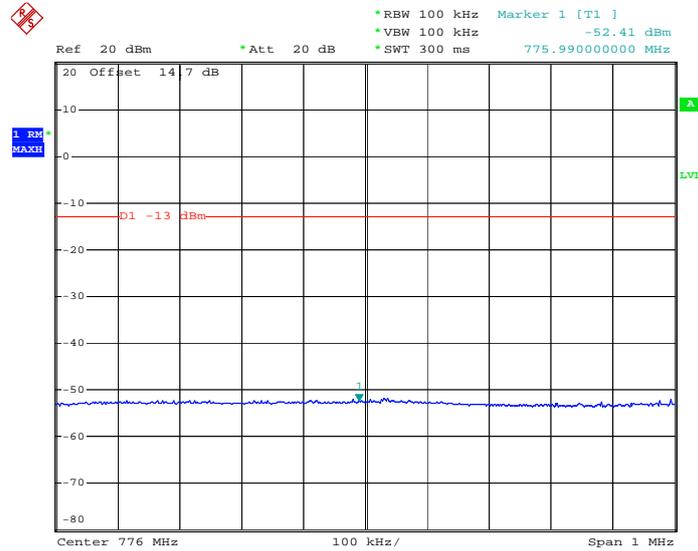


Date: 2.NOV.2011 17:20:19



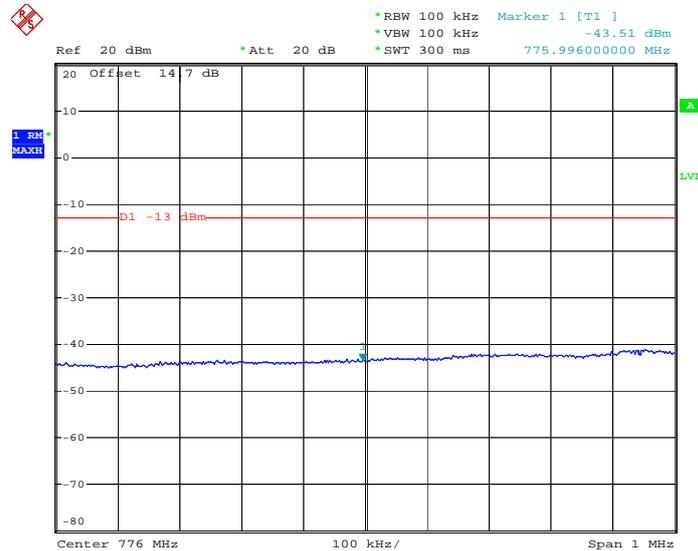
Band :	LTE Band 13	Power Stage :	High
Test Mode :	5MHz	Channel:	High

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



Date: 1.NOV.2011 15:30:17

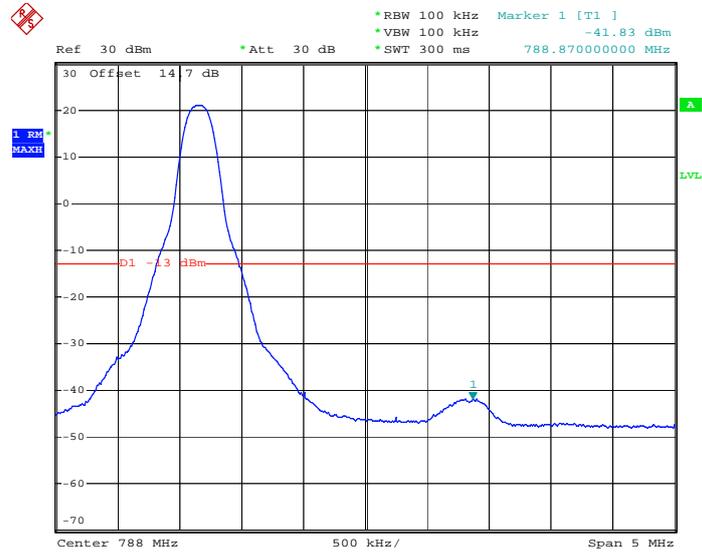
Lower Band Edge Plot for QPSK-RB Size 25, RB Offset 0



Date: 1.NOV.2011 15:30:54

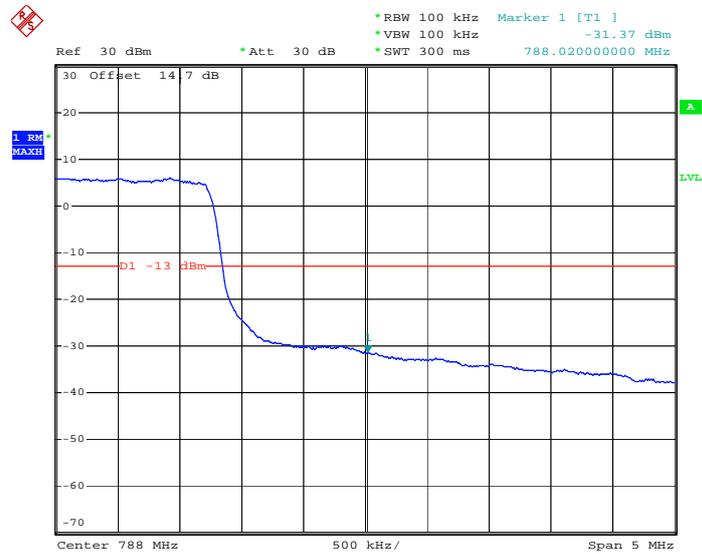


Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 24



Date: 1.NOV.2011 15:21:51

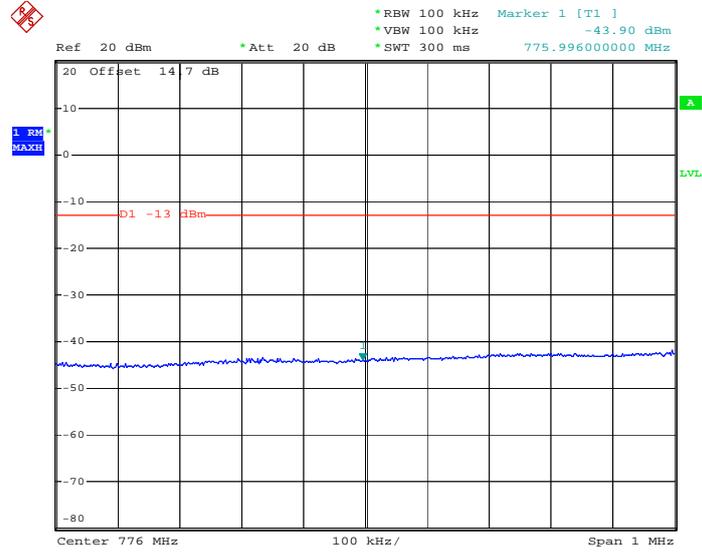
Higher Band Edge Plot for QPSK-RB Size 25, RB Offset 0



Date: 1.NOV.2011 15:20:58

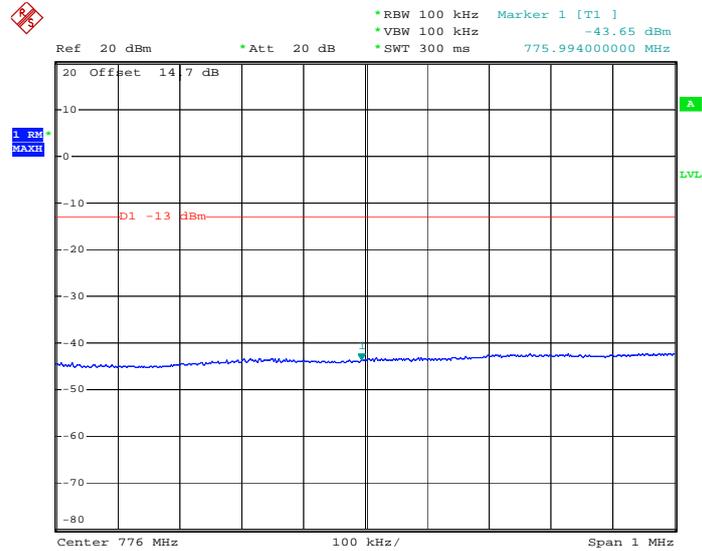


Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



Date: 1.NOV.2011 15:32:02

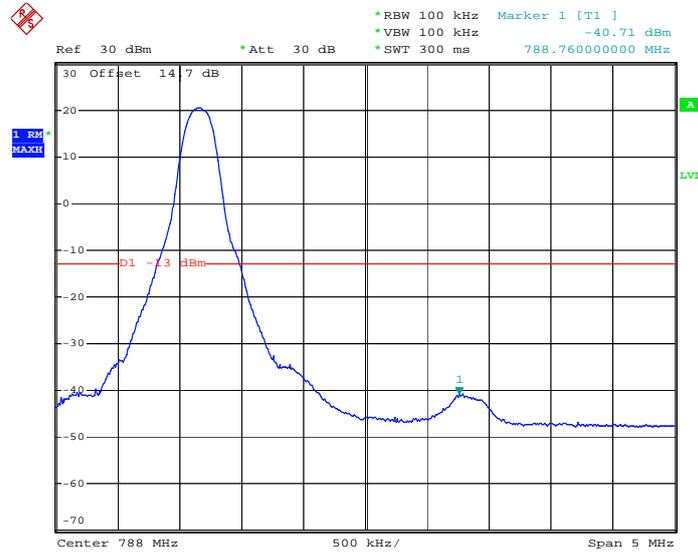
Lower Band Edge Plot for 16QAM -RB Size 25, RB Offset 0



Date: 1.NOV.2011 15:31:37

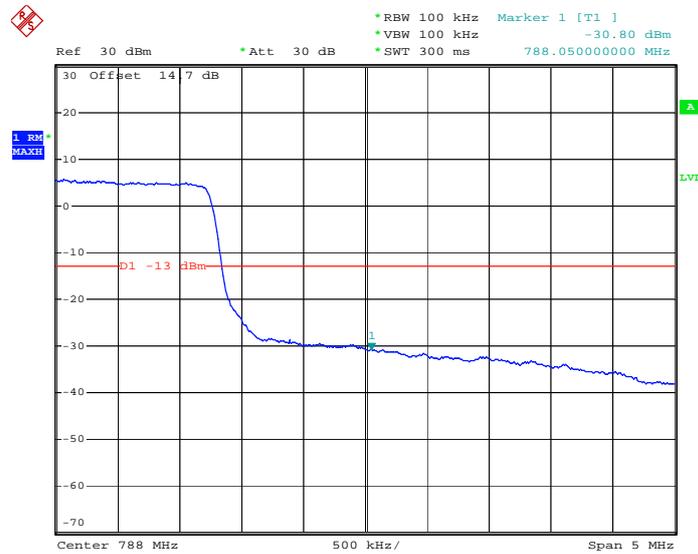


Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 24



Date: 1.NOV.2011 15:18:47

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

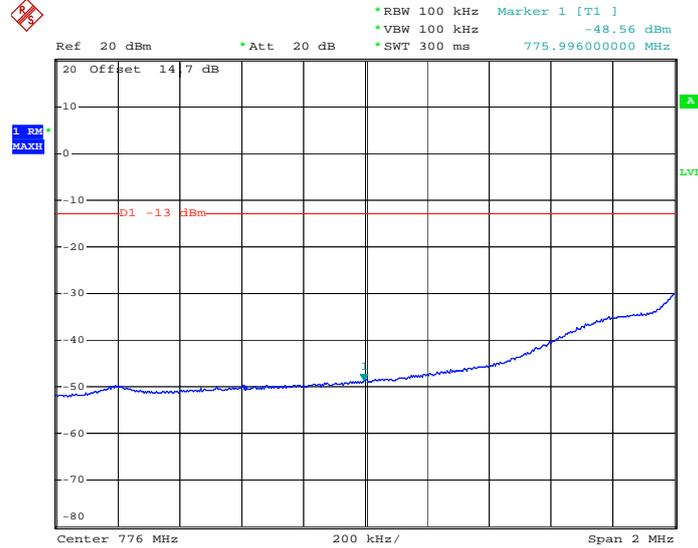


Date: 1.NOV.2011 15:19:47



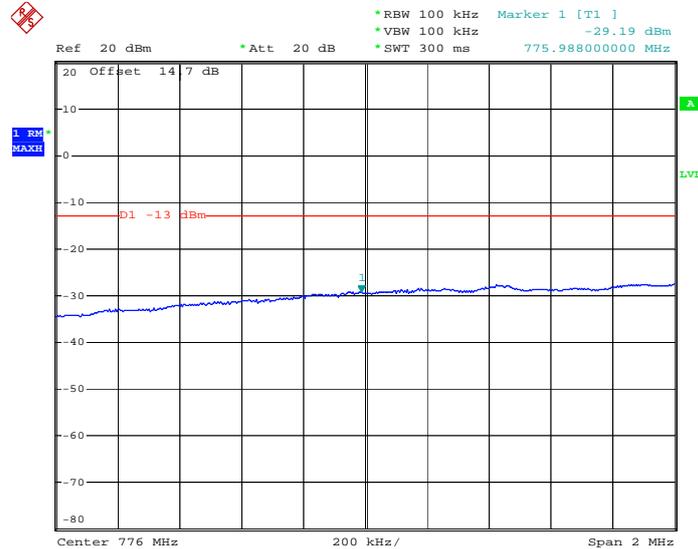
Band :	LTE Band 13	Power Stage :	High
Test Mode :	10MHz	Channel:	Middle

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



Date: 11.OCT.2011 16:16:20

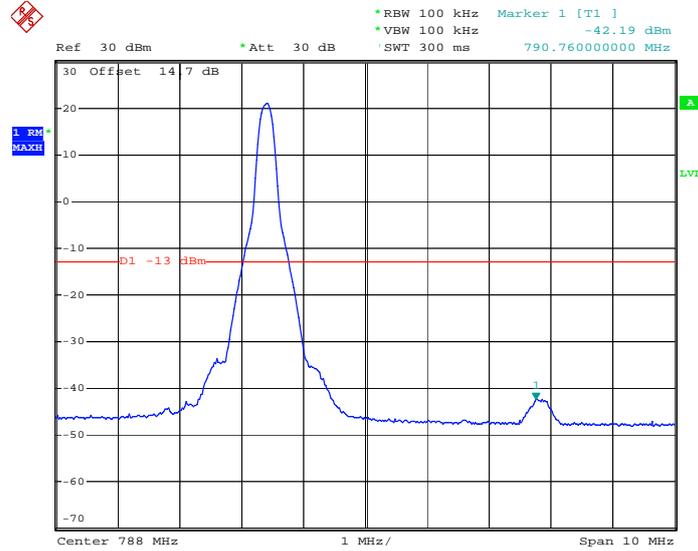
Lower Band Edge Plot for QPSK-RB Size 50, RB Offset 0



Date: 11.OCT.2011 16:20:42

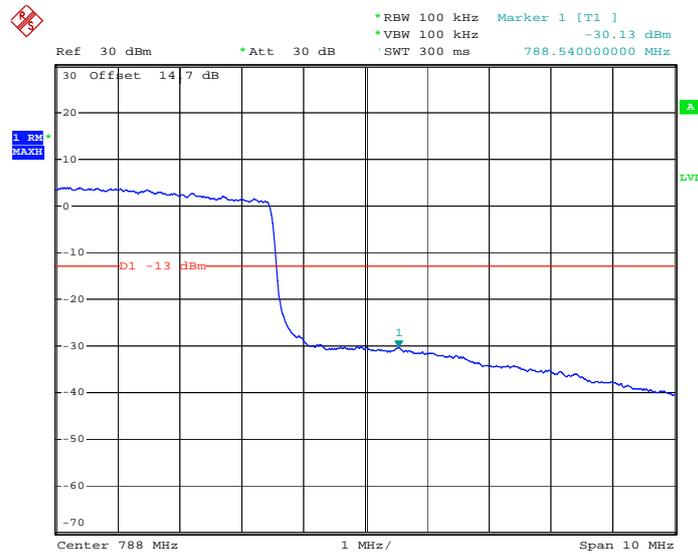


Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 49



Date: 11.OCT.2011 16:27:44

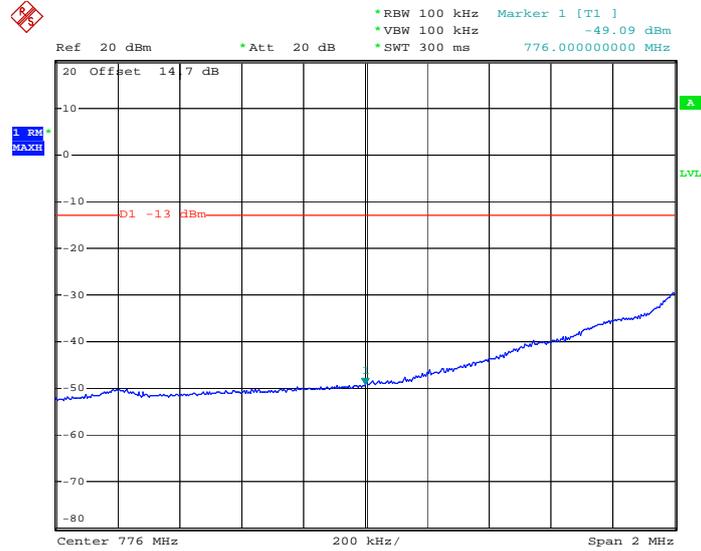
Higher Band Edge Plot for QPSK-RB Size 50, RB Offset 0



Date: 11.OCT.2011 16:29:12

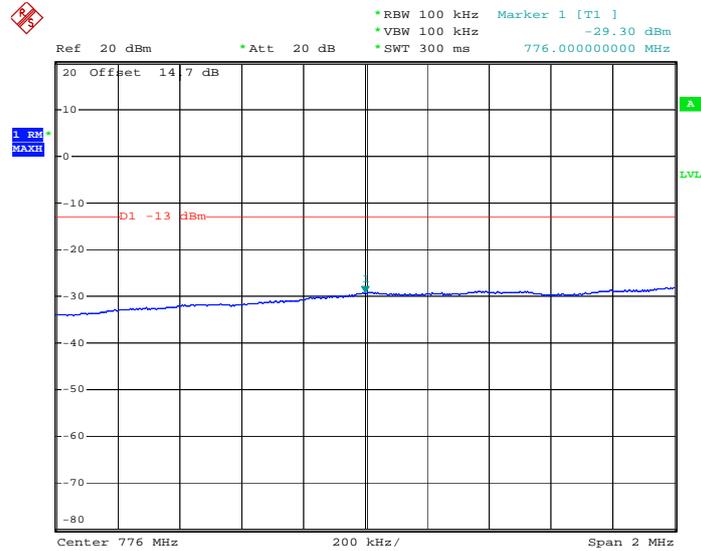


Lower Band Edge Plot for 16QAM-RB Size 1, RB Offset 0



Date: 11.OCT.2011 16:18:12

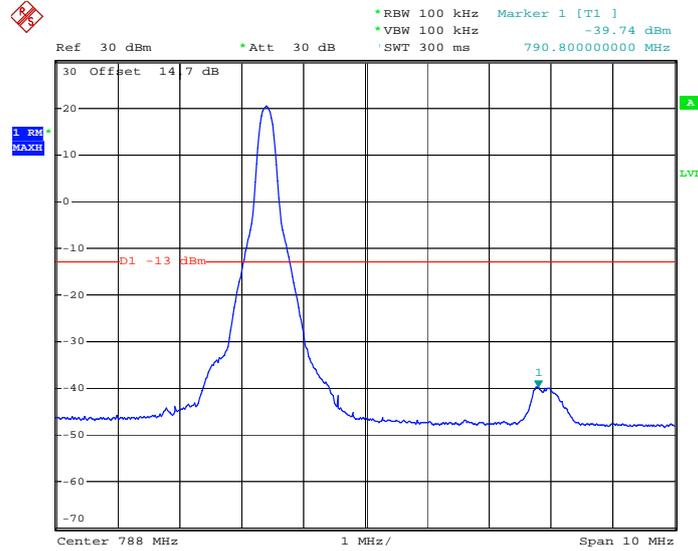
Lower Band Edge Plot for 16QAM -RB Size 50, RB Offset 0



Date: 11.OCT.2011 16:19:44

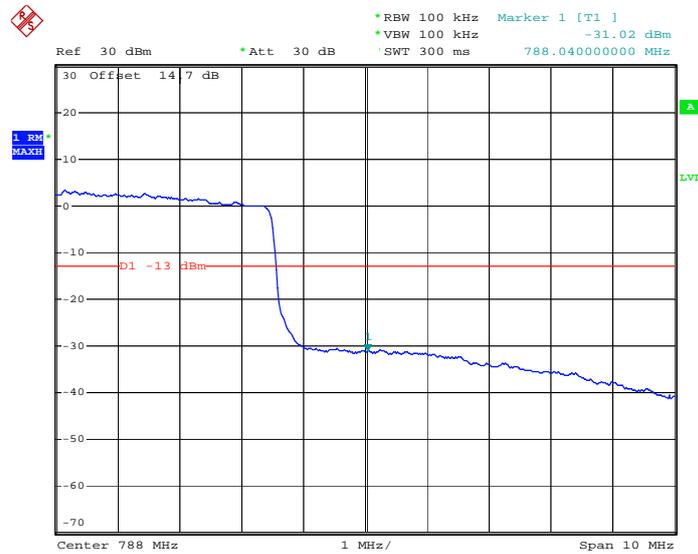


Higher Band Edge Plot for 16QAM-RB Size 1, RB Offset 49



Date: 11.OCT.2011 16:26:10

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

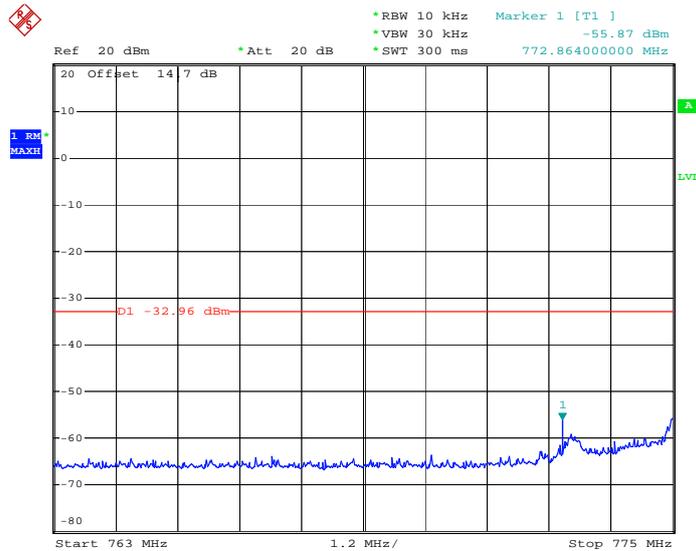


Date: 11.OCT.2011 16:30:14

3.4.6 Test Result (Plots) of Conducted Emission Mask

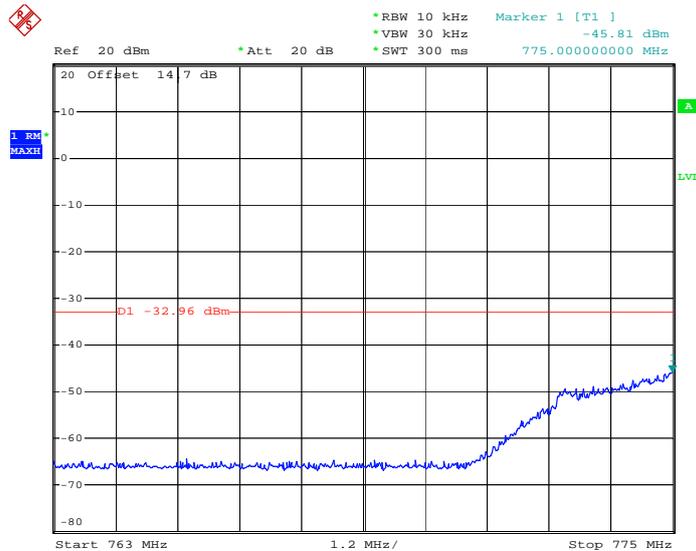
Band :	LTE Band 13	Power Stage :	High
Test Mode :	5MHz	Channel:	Low

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



Date: 2.NOV.2011 16:28:59

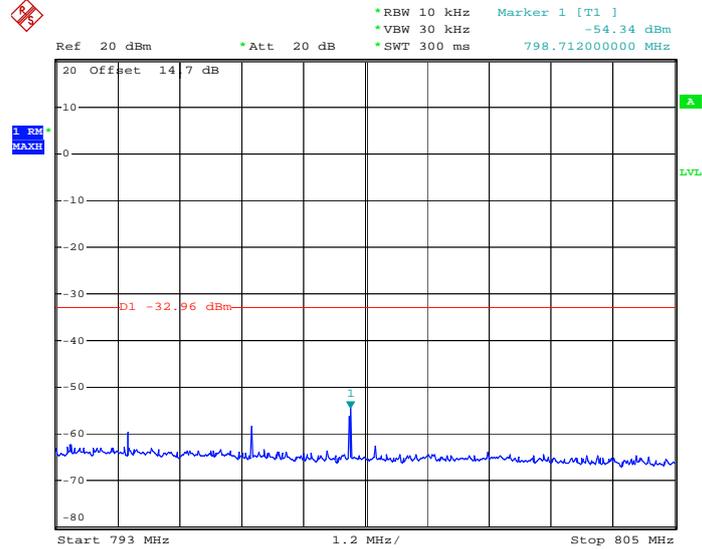
Lower Emission Mask (763~775 MHz) Plot for QPSK-RB Size 25, RB Offset 0



Date: 2.NOV.2011 16:27:10

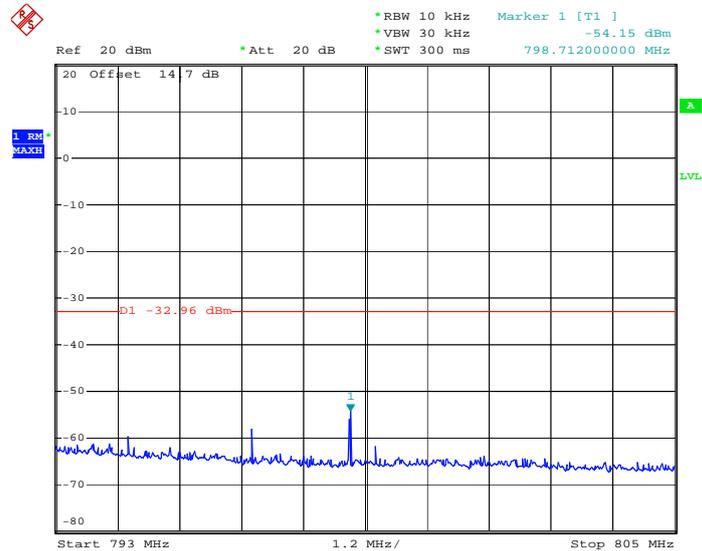


Higher Emission Mask (793~805 MHz) for QPSK-RB Size 1, RB Offset 24



Date: 4.NOV.2011 12:53:17

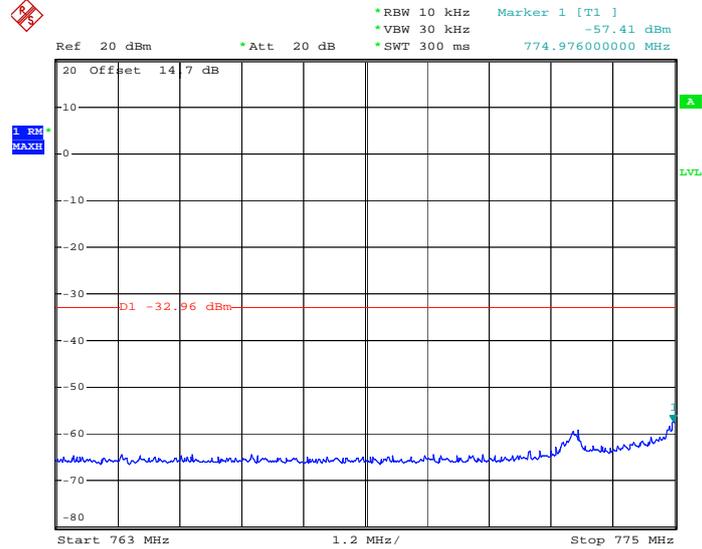
Higher Emission Mask (793~805 MHz) for QPSK-RB Size 25, RB Offset 0



Date: 4.NOV.2011 12:54:12

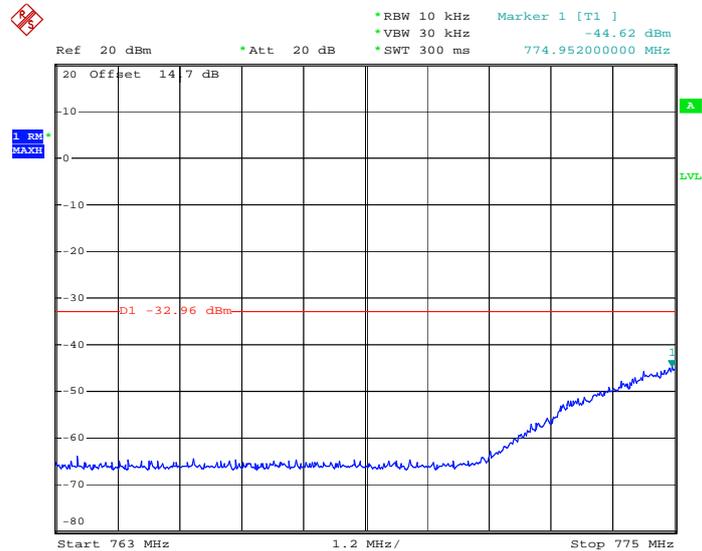


Lower Emission Mask (763~775 MHz) Plot for 16QAM-RB Size
1, RB Offset 0



Date: 2.NOV.2011 16:23:43

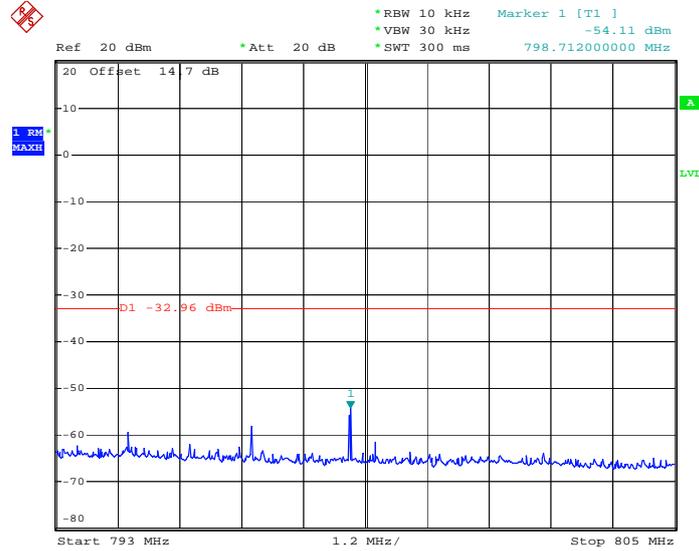
Lower Emission Mask (763~775 MHz) Plot for 16QAM -RB Size
25, RB Offset 0



Date: 2.NOV.2011 16:25:24

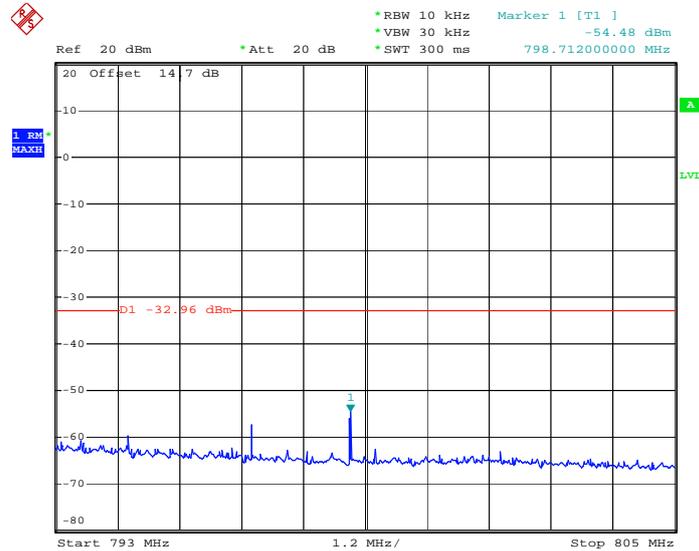


Higher Emission Mask (793~805 MHz) for 16QAM-RB Size 1,
RB Offset 24



Date: 4.NOV.2011 12:55:42

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

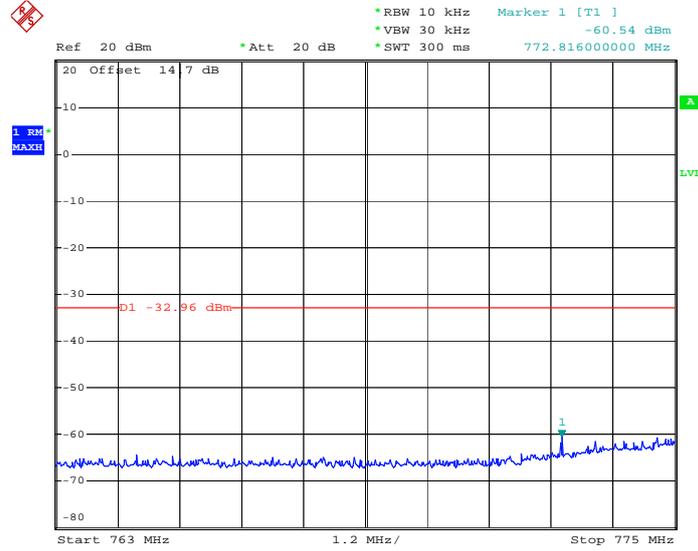


Date: 4.NOV.2011 12:55:13



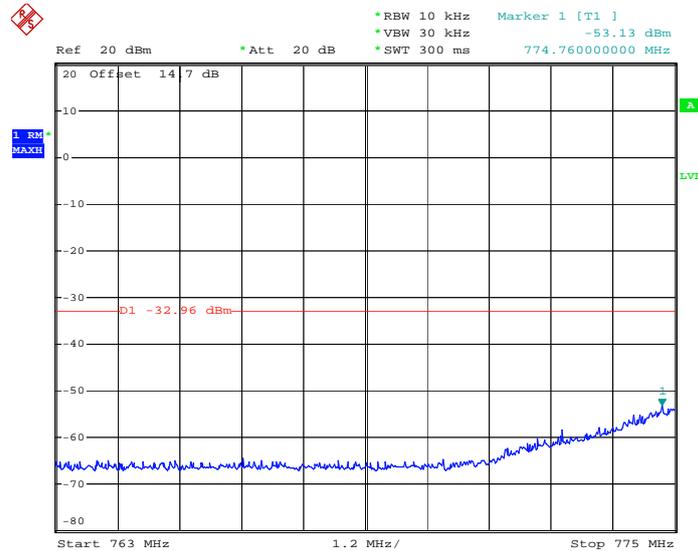
Band :	LTE Band 13	Power Stage :	High
Test Mode :	5MHz	Channel:	High

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



Date: 4.NOV.2011 12:50:56

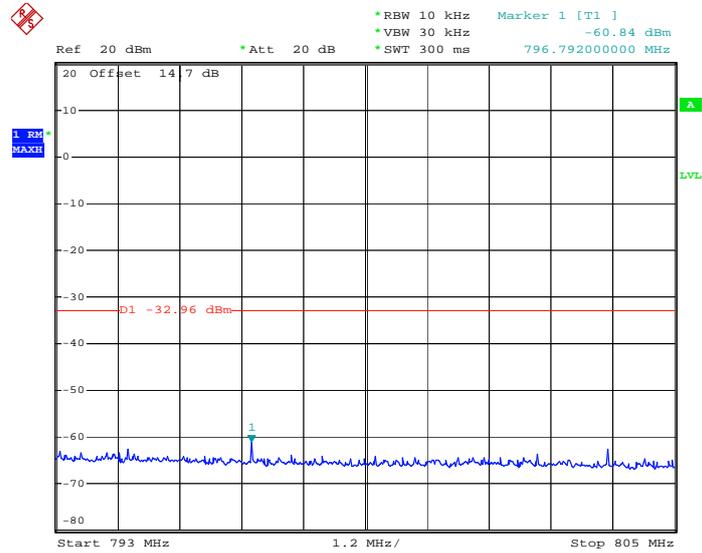
Lower Emission Mask (763~775 MHz) Plot for QPSK-RB Size
25, RB Offset 0



Date: 4.NOV.2011 12:50:13

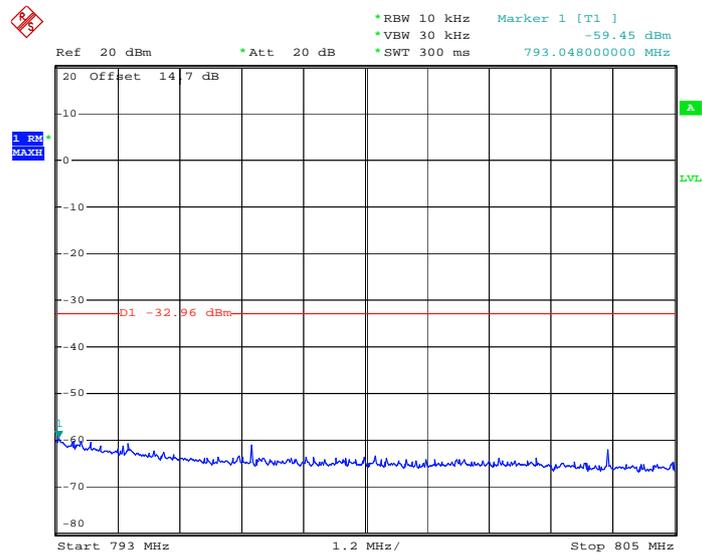


Higher Emission Mask (793~805 MHz) for QPSK-RB Size 1, RB Offset 24



Date: 2.NOV.2011 16:11:57

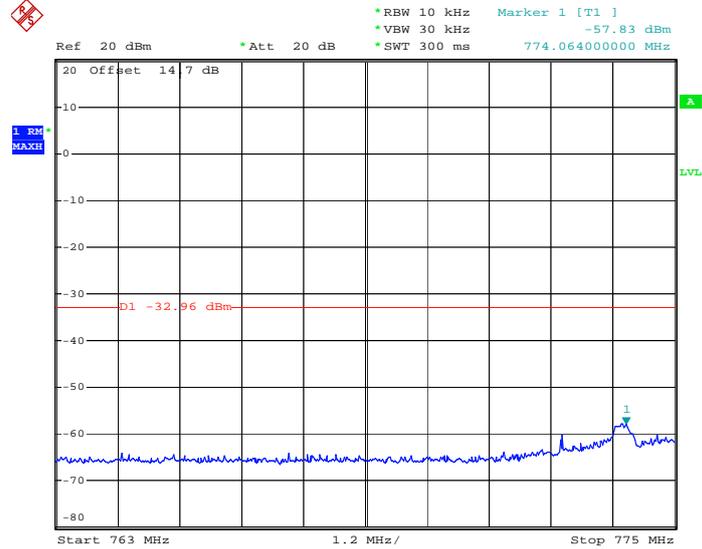
Higher Emission Mask (793~805 MHz) for QPSK-RB Size 25, RB Offset 0



Date: 2.NOV.2011 16:10:16

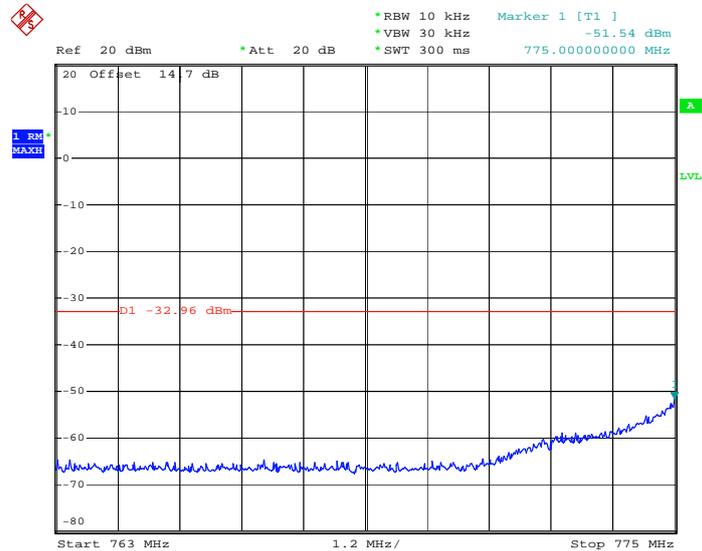


Lower Emission Mask (763~775 MHz) Plot for 16QAM-RB Size
1, RB Offset 0



Date: 4.NOV.2011 12:48:36

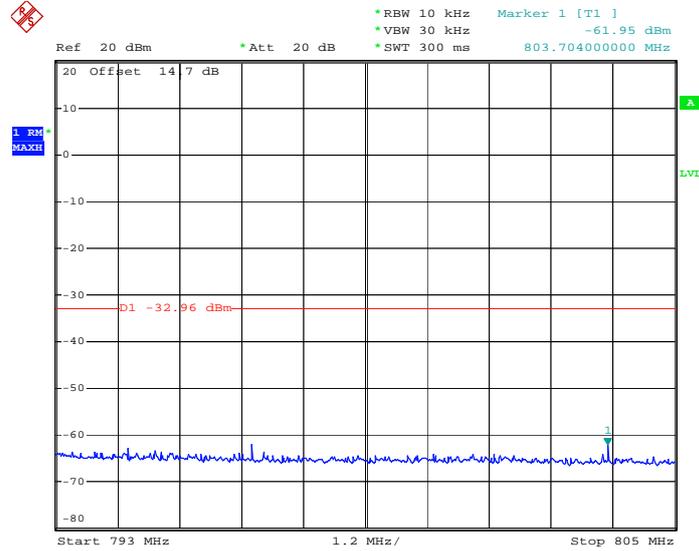
Lower Emission Mask (763~775 MHz) Plot for 16QAM -RB Size
25, RB Offset 0



Date: 4.NOV.2011 12:49:20

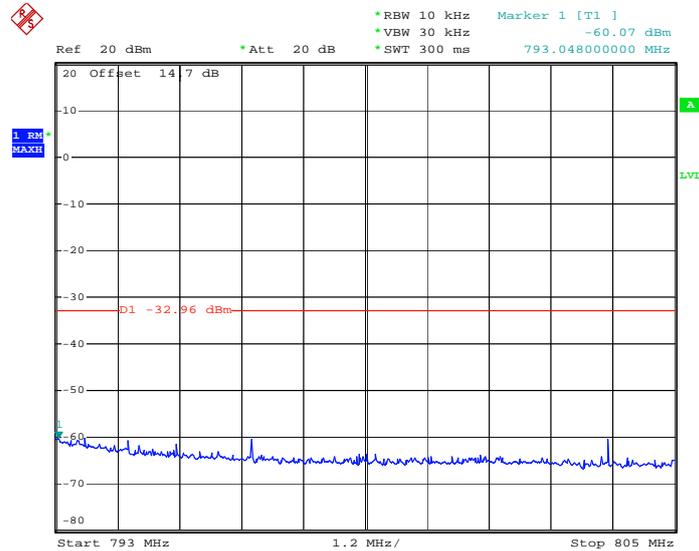


Higher Emission Mask (793~805 MHz) for 16QAM-RB Size 1,
RB Offset 24



Date: 2.NOV.2011 16:06:03

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

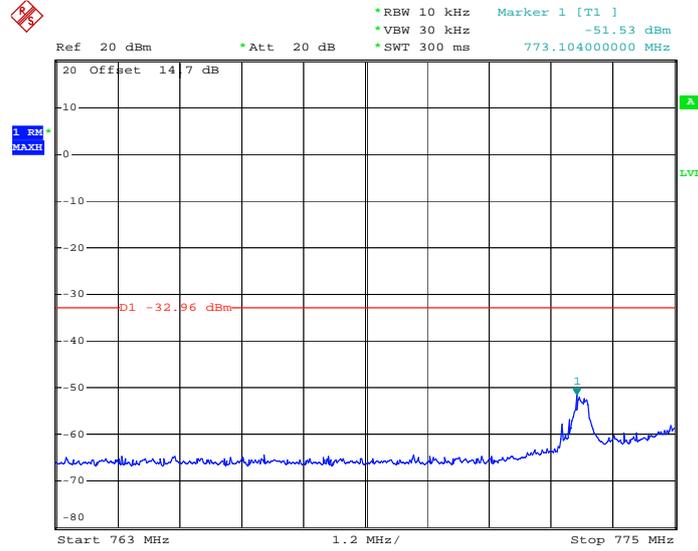


Date: 2.NOV.2011 16:08:24



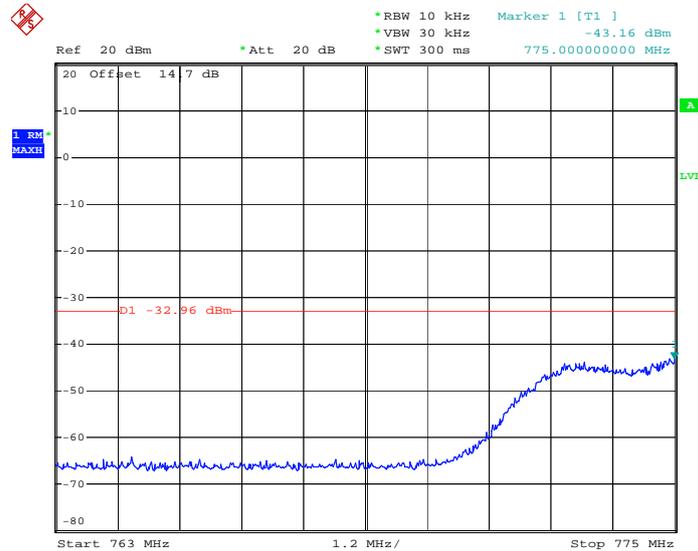
Band :	LTE Band 13	Power Stage :	High
Test Mode :	10MHz		

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



Date: 12.OCT.2011 09:15:38

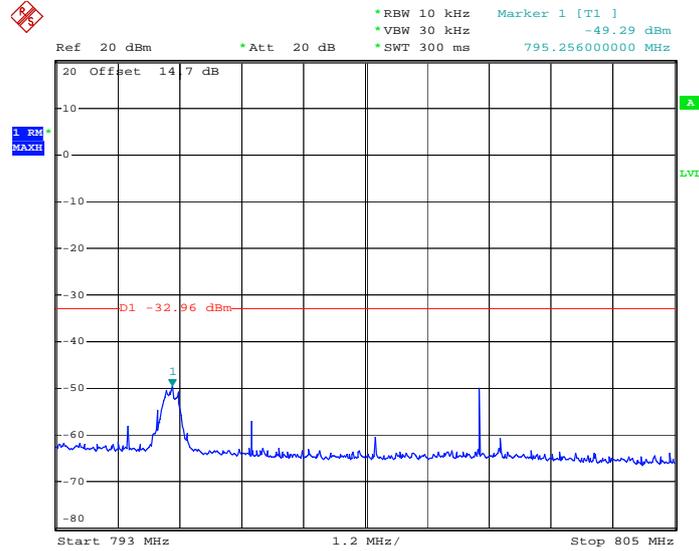
Lower Emission Mask (763~775 MHz) Plot for QPSK-RB Size
50, RB Offset 0



Date: 12.OCT.2011 09:13:28

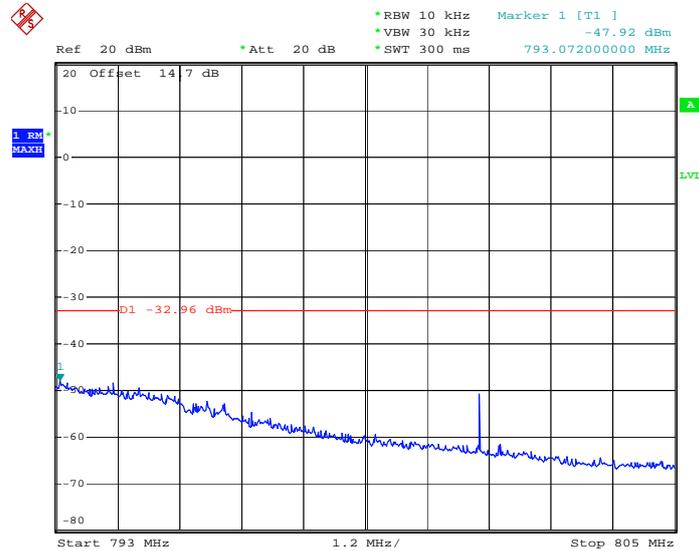


Higher Emission Mask (793~805 MHz) for QPSK-RB Size 1, RB Offset 49



Date: 12.OCT.2011 09:21:50

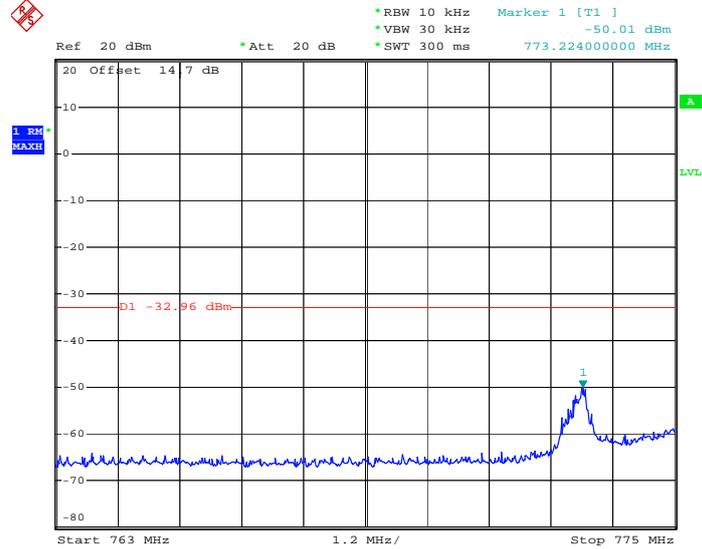
Higher Emission Mask (793~805 MHz) for QPSK-RB Size 50, RB Offset 0



Date: 12.OCT.2011 09:23:13

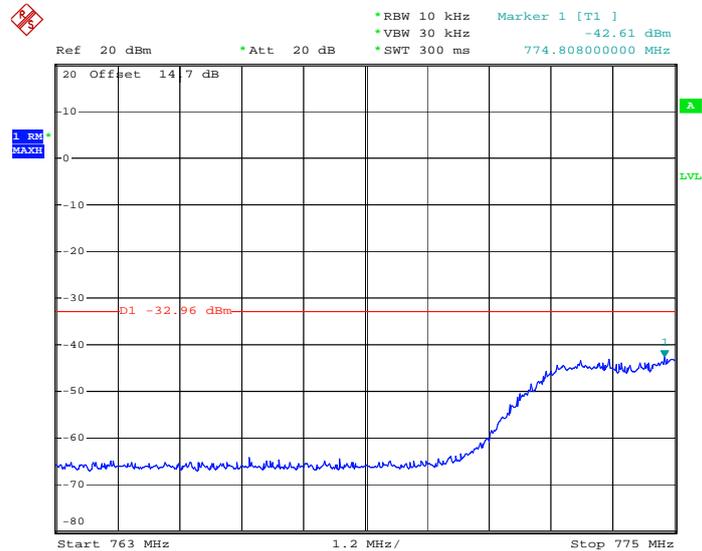


Lower Emission Mask (763~775 MHz) Plot for 16QAM-RB Size
1, RB Offset 0



Date: 12.OCT.2011 09:11:08

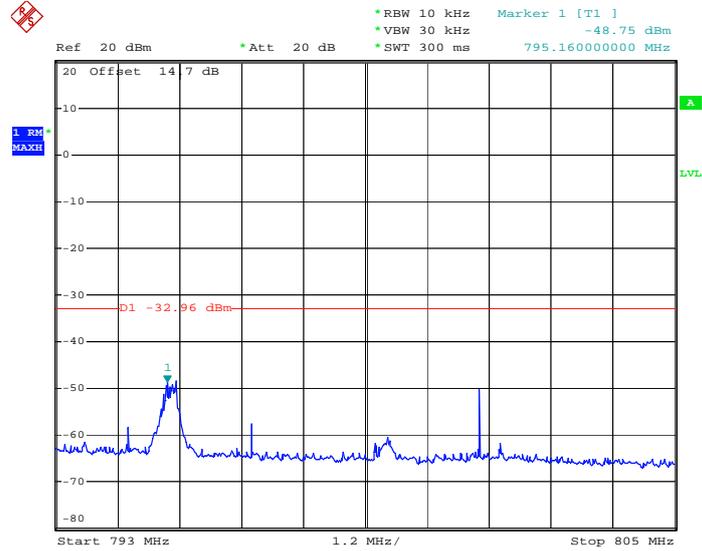
Lower Emission Mask (763~775 MHz) Plot for 16QAM -RB Size
50, RB Offset 0



Date: 12.OCT.2011 09:12:28

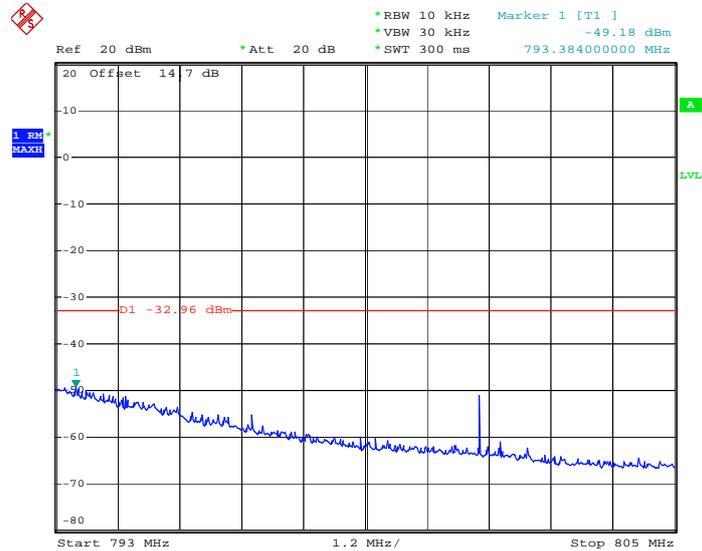


Higher Emission Mask (793~805 MHz) for 16QAM-RB Size 1,
RB Offset 49



Date: 12.OCT.2011 09:25:36

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



Date: 12.OCT.2011 09:24:25

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.

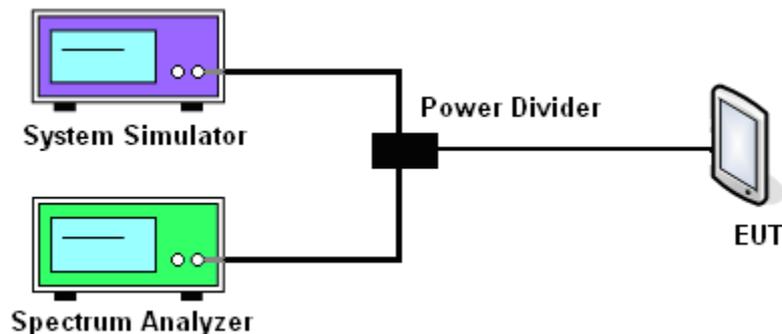
3.5.2 Measuring Instruments

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.

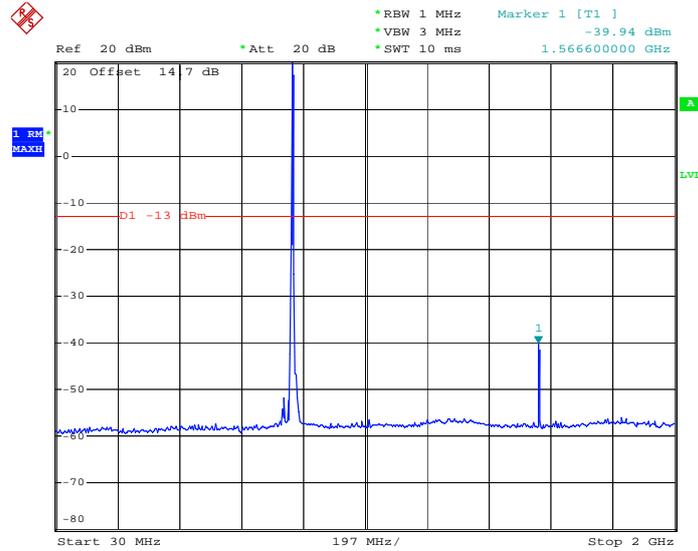
3.5.4 Test Setup



3.5.5 Test Result (Plots) of Conducted Emission

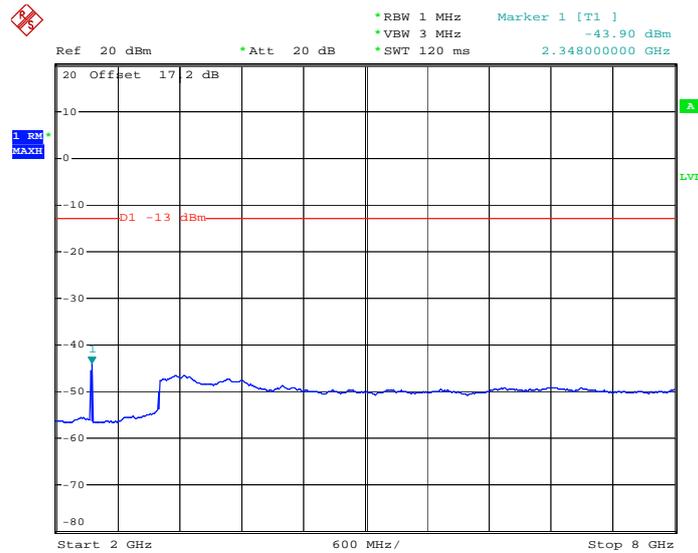
Band :	LTE Band 13	Channel :	CH23205
Test Mode :	5MHz	Power Stage :	High

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



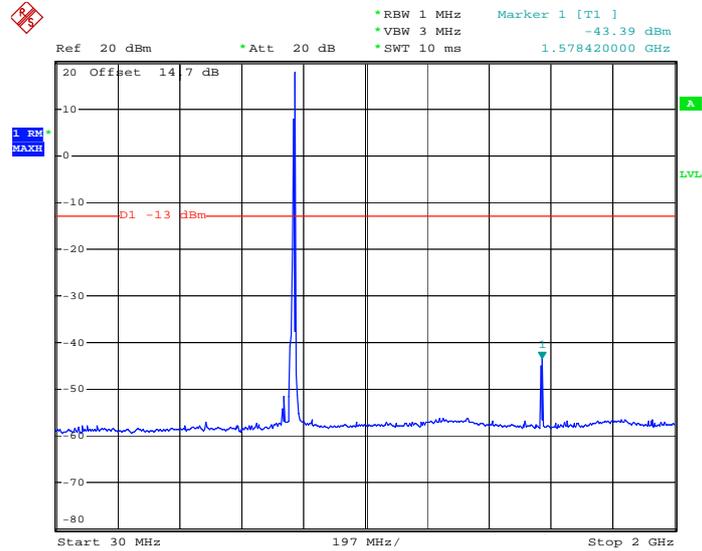
Date: 2.NOV.2011 17:33:59

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



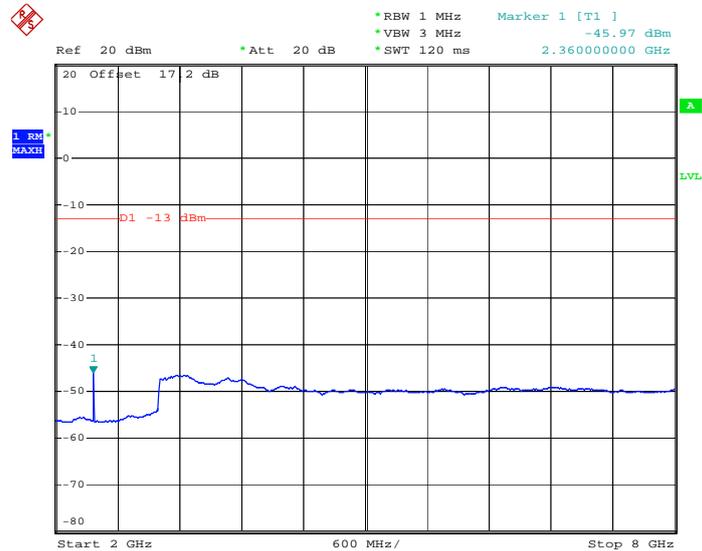
Date: 2.NOV.2011 17:29:51

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



Date: 2.NOV.2011 17:32:41

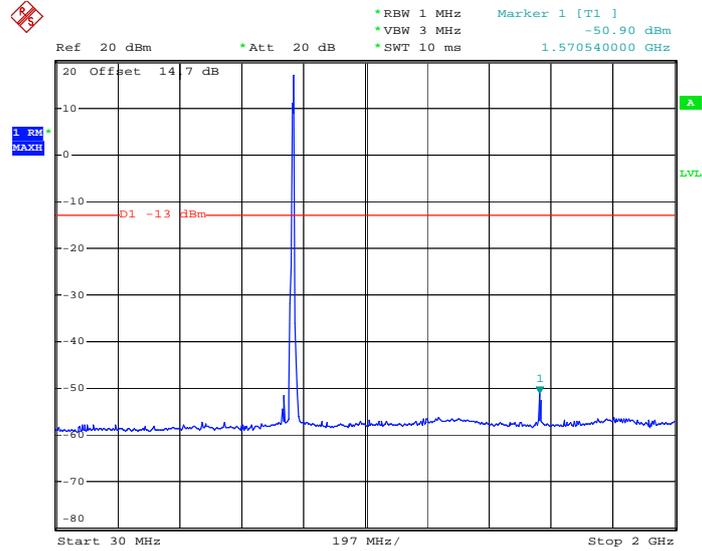
Conducted Emission Plot (2GHz ~ 8GHz) for QPSK (RB Size 1, RB Offset 24)



Date: 2.NOV.2011 17:31:00

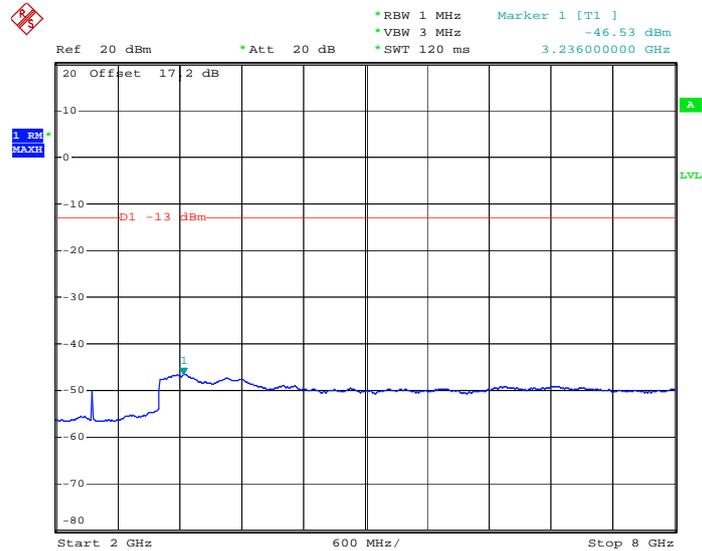


Conducted Emission Plot (30M ~ 2GHz) for QPSK (RB Size 25, RB Offset 0)



Date: 2.NOV.2011 17:35:20

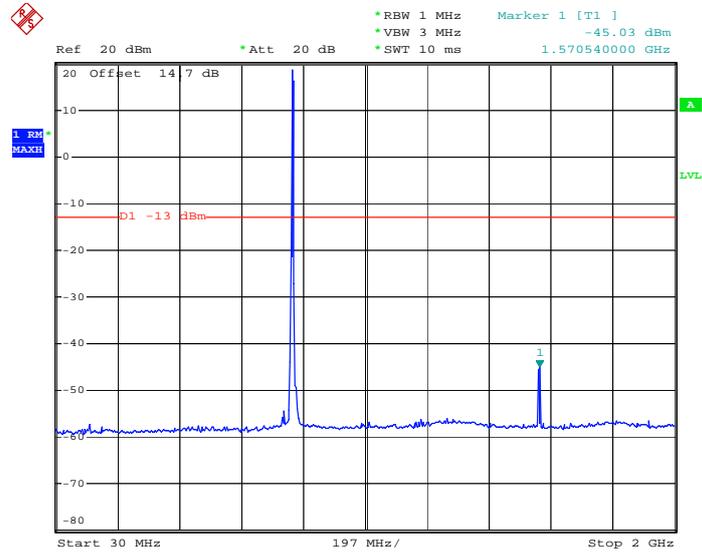
Conducted Emission Plot (2GHz ~ 8GHz) for QPSK (RB Size 25, RB Offset 0)



Date: 2.NOV.2011 17:29:04

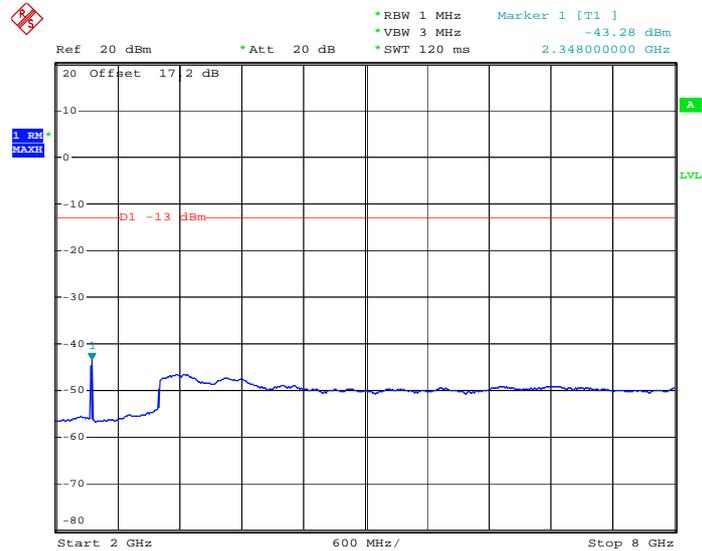


**Conducted Emission Plot (30M ~ 2GHz) for
16QAM (RB Size 1, RB Offset 0)**



Date: 2.NOV.2011 17:37:35

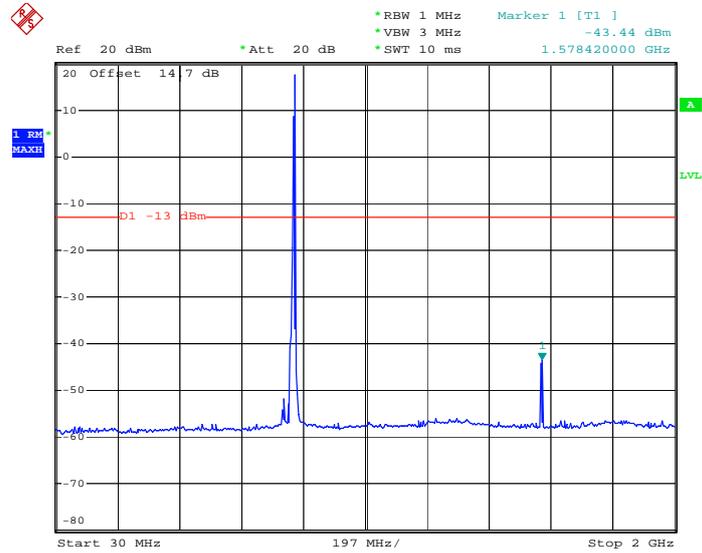
**Conducted Emission Plot (2GHz ~ 8GHz) for
16QAM (RB Size 1, RB Offset 0)**



Date: 2.NOV.2011 17:26:10

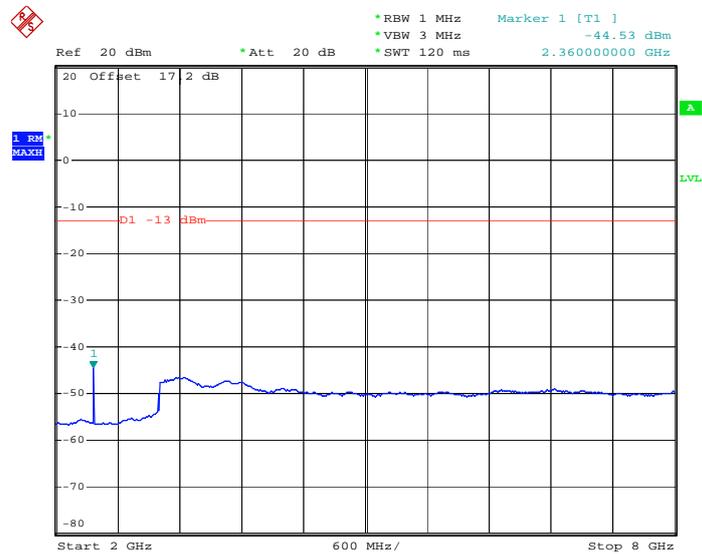


Conducted Emission Plot (30M ~ 2GHz) for 16QAM (RB Size 1, RB Offset 24)



Date: 2.NOV.2011 17:39:19

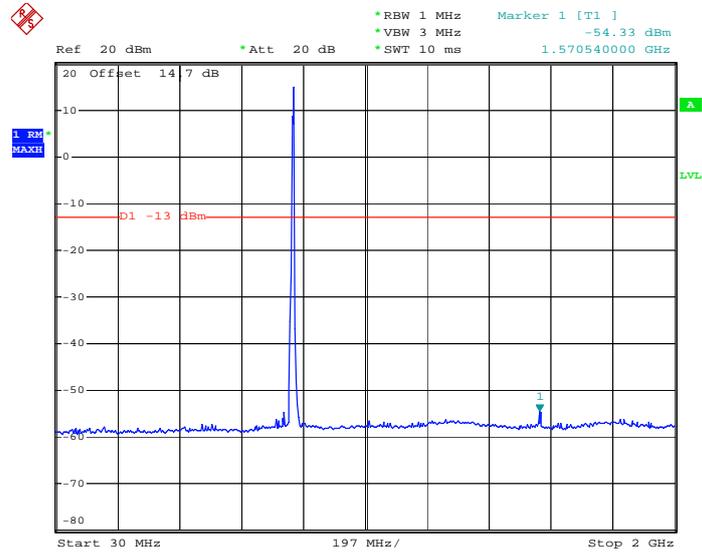
Conducted Emission Plot (2GHz ~ 8GHz) for 16QAM (RB Size 1, RB Offset 24)



Date: 2.NOV.2011 17:26:59

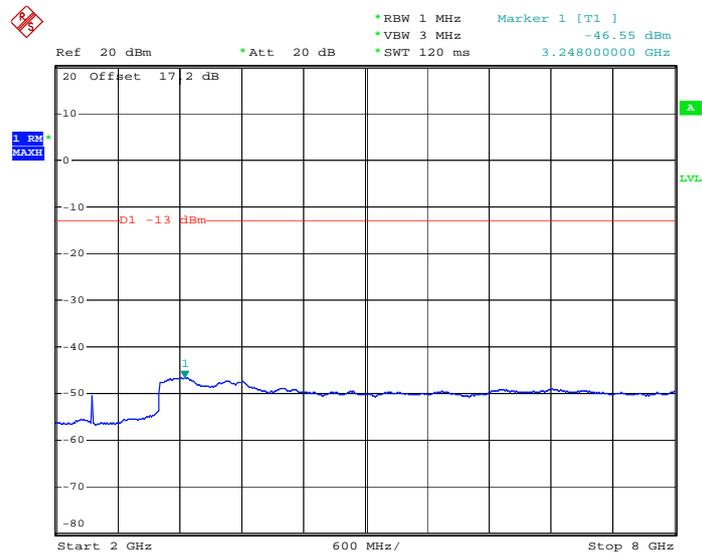


Conducted Emission Plot (30M ~ 2GHz) for
16QAM (RB Size 25, RB Offset 0)



Date: 2.NOV.2011 17:36:25

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

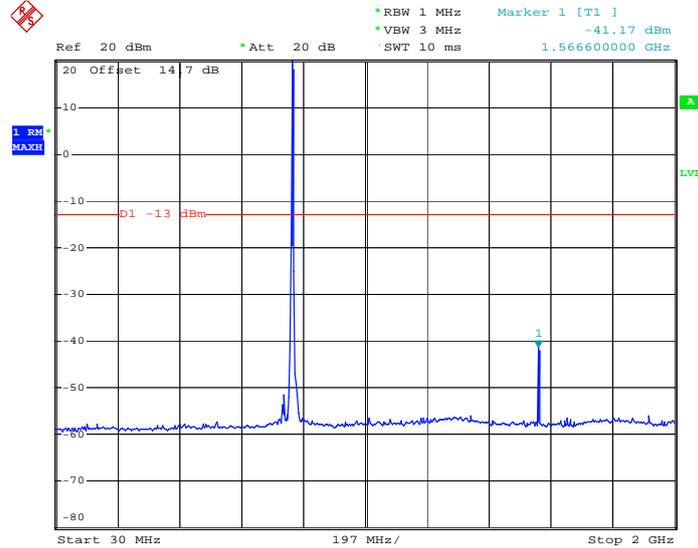


Date: 2.NOV.2011 17:28:14



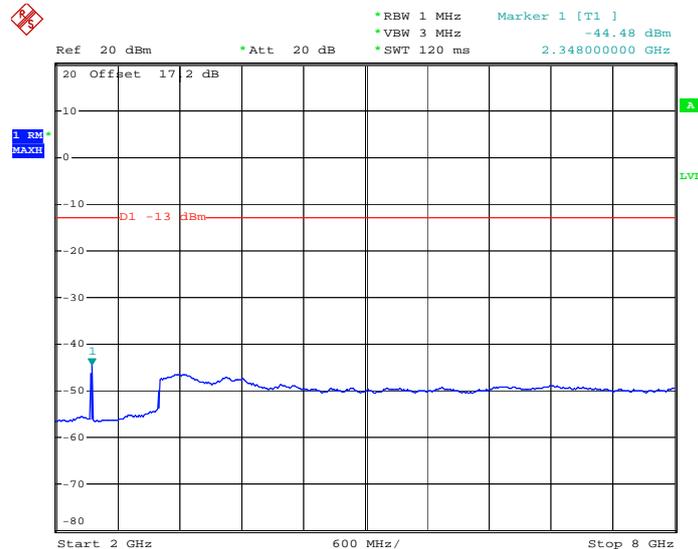
Band :	LTE Band 13	Channel :	CH23255
Test Mode :	5MHz	Power Stage :	High

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



Date: 1.NOV.2011 14:53:54

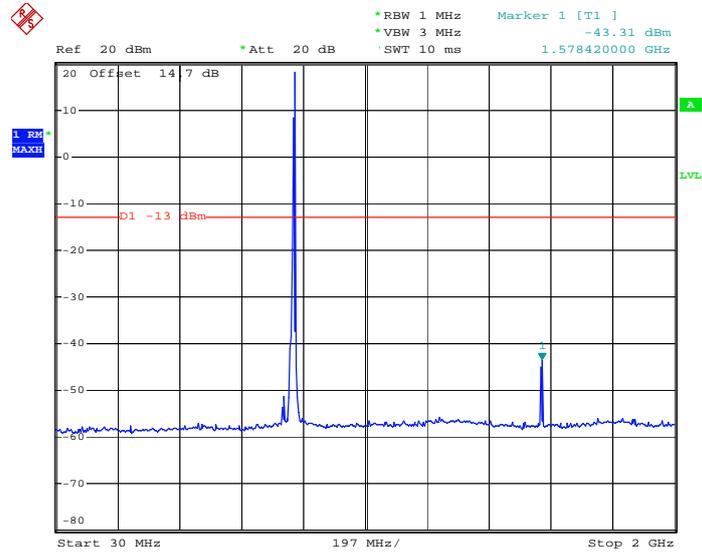
Conducted Emission Plot (2GHz ~ 8GHz) for QPSK (RB Size 1, RB Offset 0)



Date: 1.NOV.2011 14:57:49

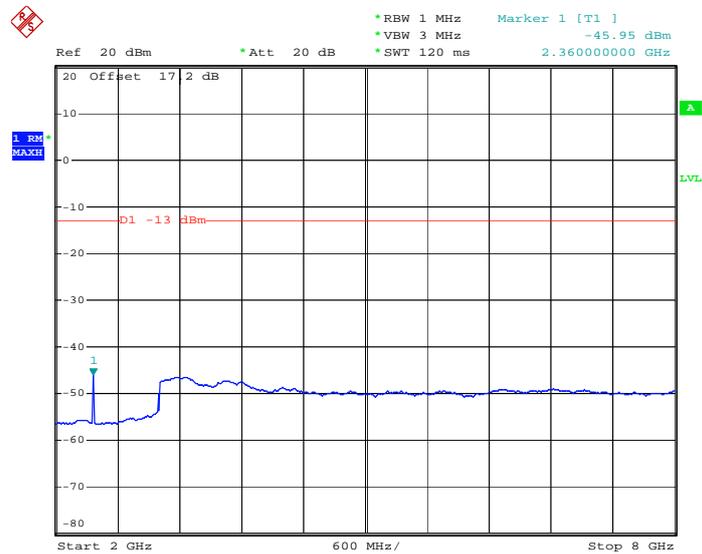


Conducted Emission Plot (30M ~ 2GHz) for QPSK (RB Size 1, RB Offset 24)



Date: 1.NOV.2011 14:53:16

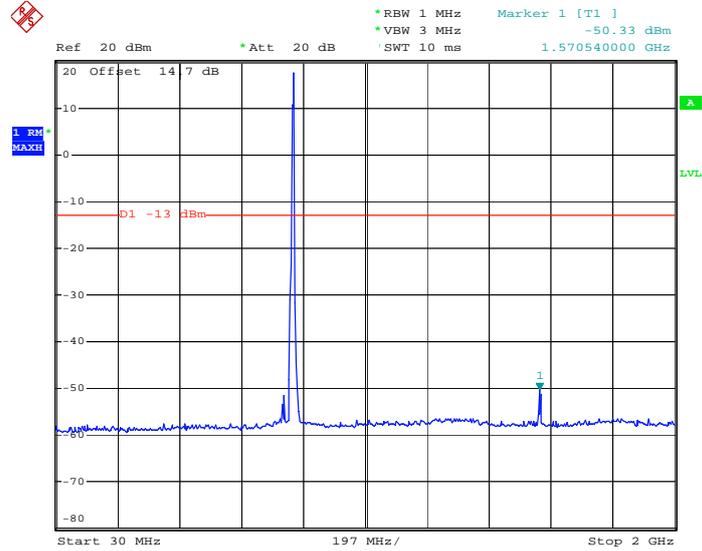
Conducted Emission Plot (2GHz ~ 8GHz) for QPSK (RB Size 1, RB Offset 24)



Date: 1.NOV.2011 14:58:19

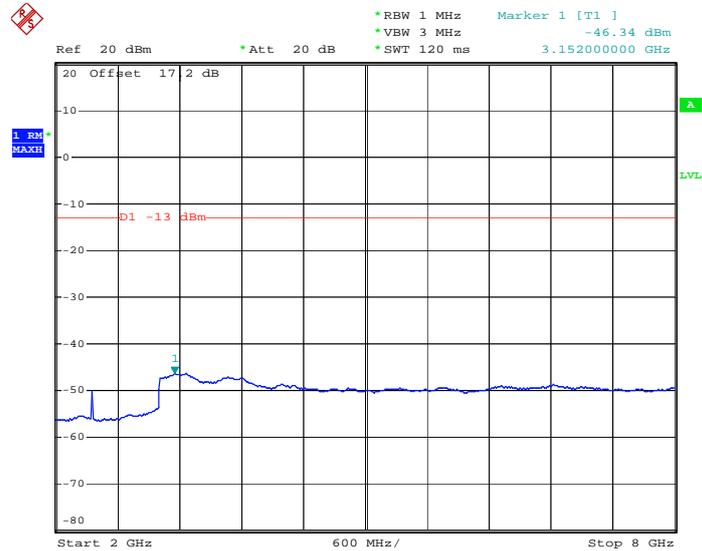


Conducted Emission Plot (30M ~ 2GHz) for QPSK (RB Size 25, RB Offset 0)



Date: 1.NOV.2011 14:54:32

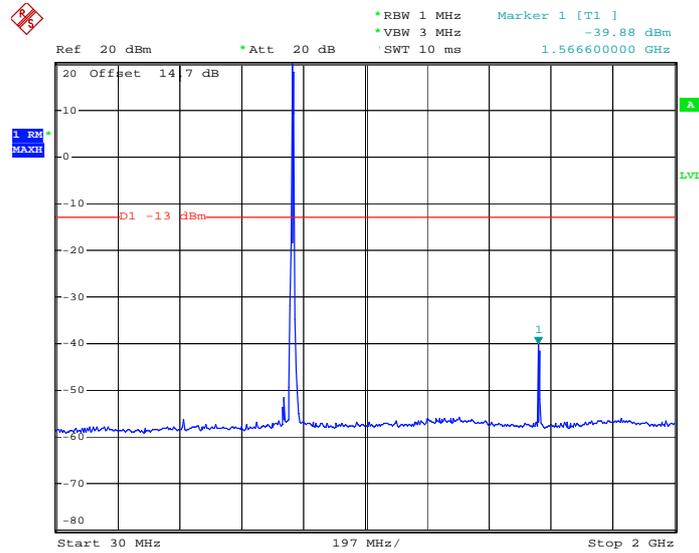
Conducted Emission Plot (2GHz ~ 8GHz) for QPSK (RB Size 25, RB Offset 0)



Date: 1.NOV.2011 14:57:16

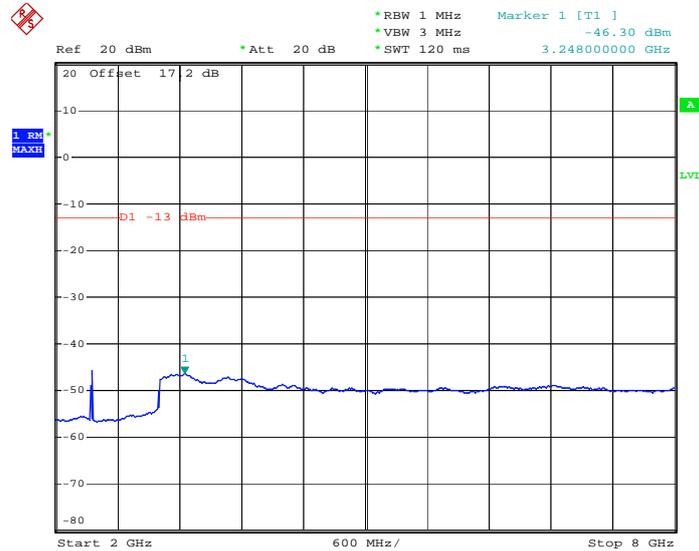


Conducted Emission Plot (30M ~ 2GHz) for
16QAM (RB Size 1, RB Offset 0)



Date: 1.NOV.2011 14:48:11

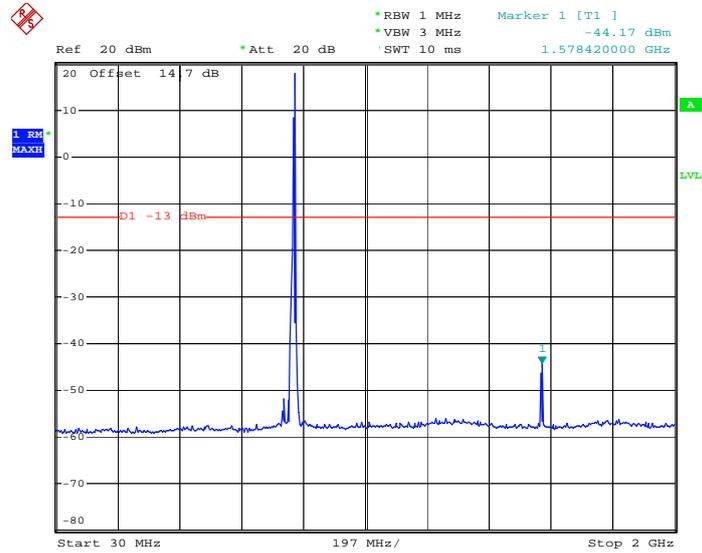
Conducted Emission Plot (2GHz ~ 8GHz) for
16QAM (RB Size 1, RB Offset 0)



Date: 1.NOV.2011 14:59:54

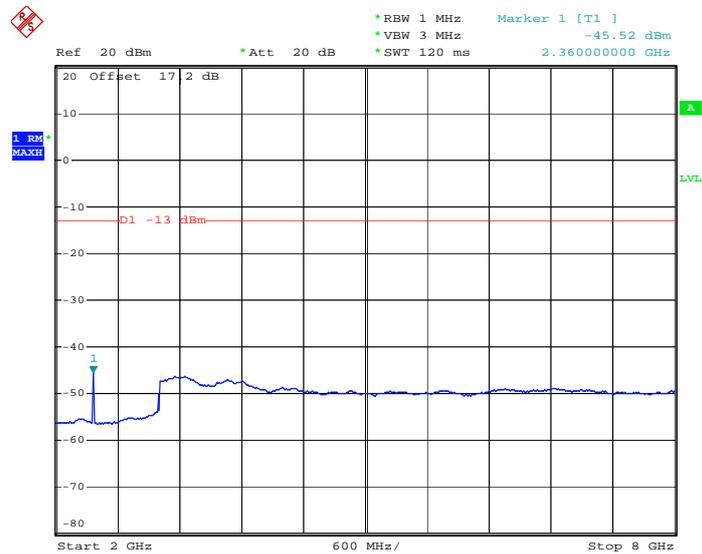


Conducted Emission Plot (30M ~ 2GHz) for
16QAM (RB Size 1, RB Offset 24)



Date: 1.NOV.2011 14:51:18

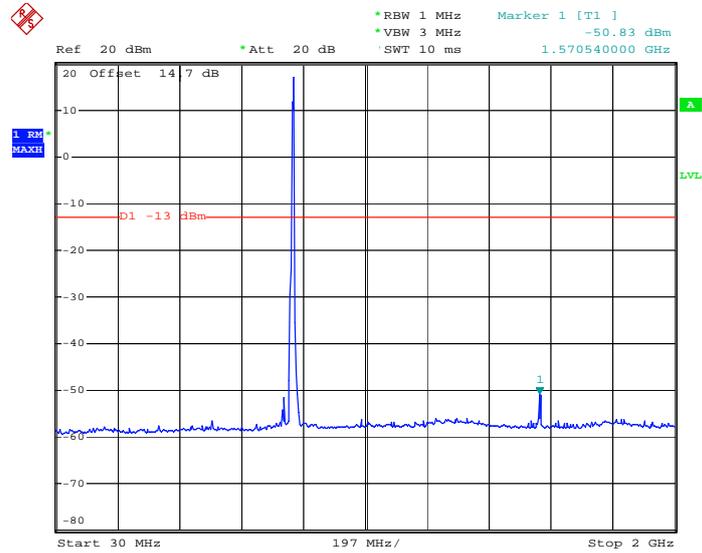
Conducted Emission Plot (2GHz ~ 8GHz) for
16QAM (RB Size 1, RB Offset 24)



Date: 1.NOV.2011 14:59:26

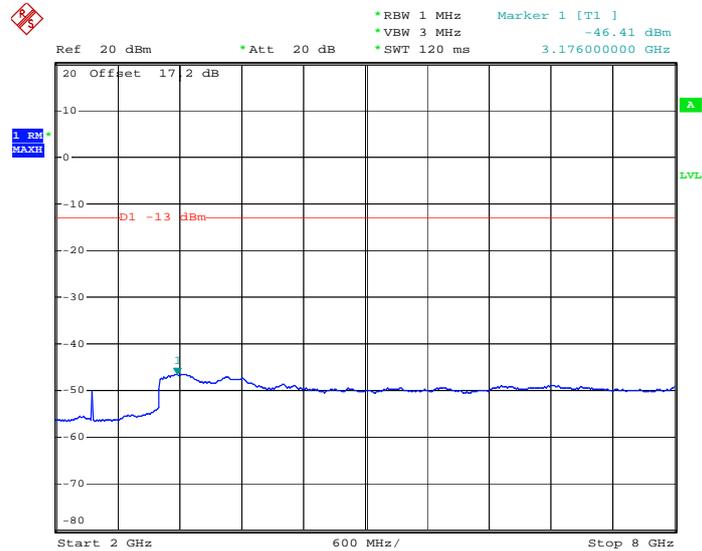


Conducted Emission Plot (30M ~ 2GHz) for
16QAM (RB Size 25, RB Offset 0)



Date: 1.NOV.2011 14:49:12

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

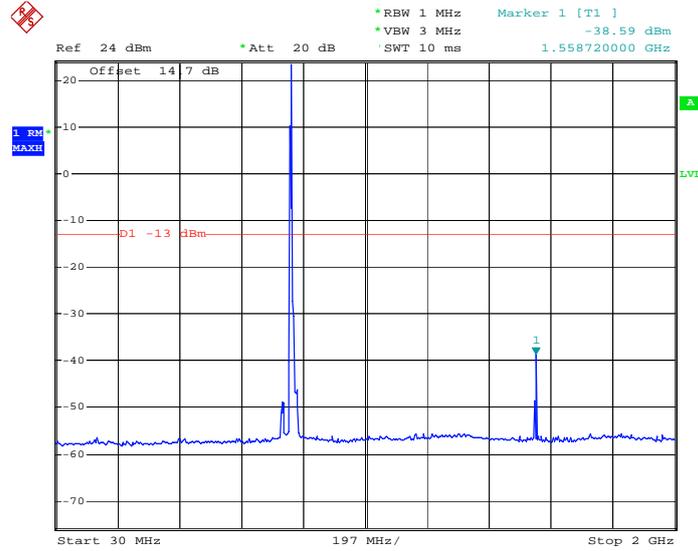


Date: 1.NOV.2011 15:00:24



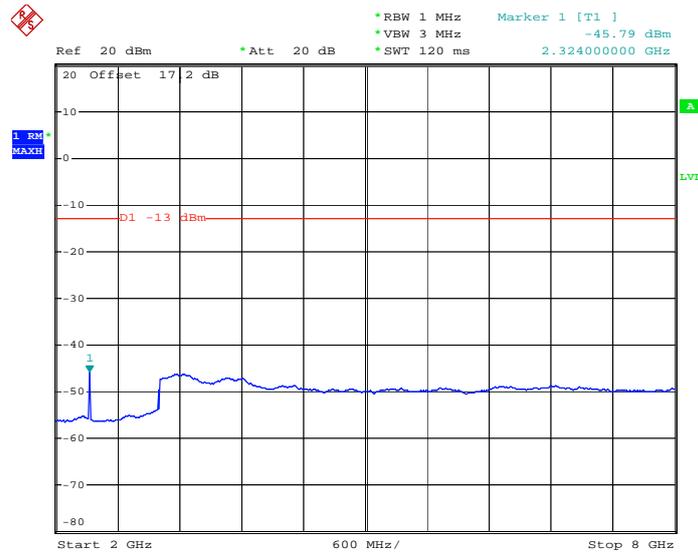
Band :	LTE Band 13	Channel :	CH23230
Test Mode :	10MHz	Power Stage :	High

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



Date: 11.OCT.2011 16:49:18

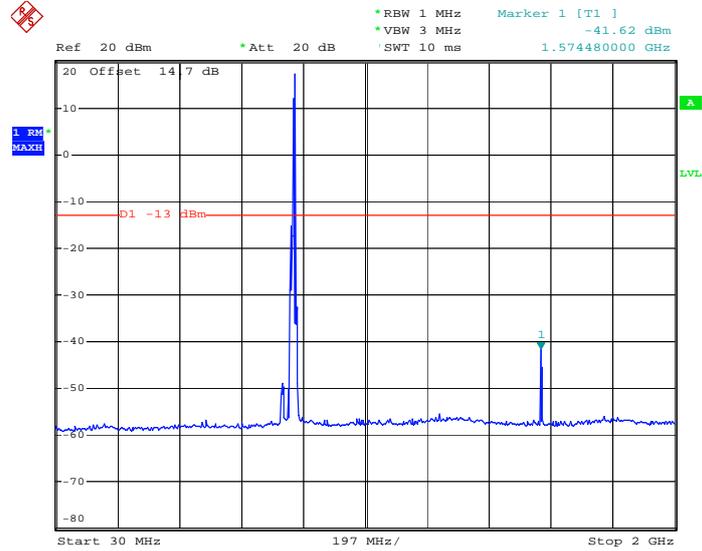
Conducted Emission Plot (2GHz ~ 8GHz) for QPSK (RB Size 1, RB Offset 0)



Date: 11.OCT.2011 17:11:00

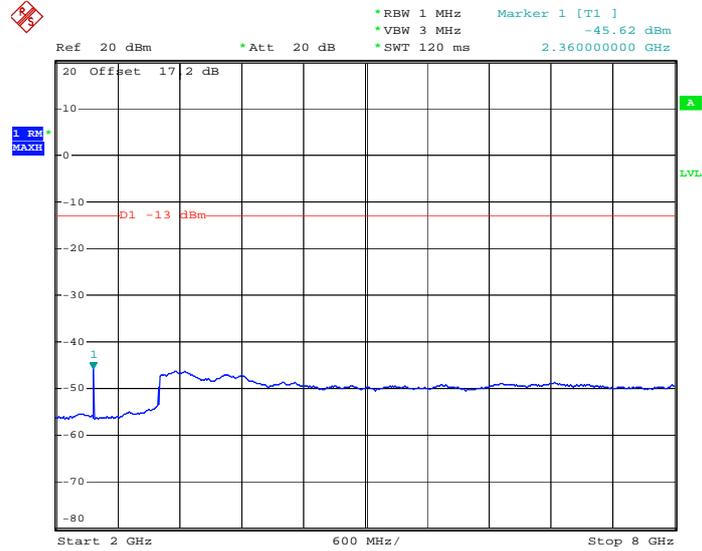


Conducted Emission Plot (30M ~ 2GHz) for QPSK (RB Size 1, RB Offset 49)



Date: 11.OCT.2011 16:44:57

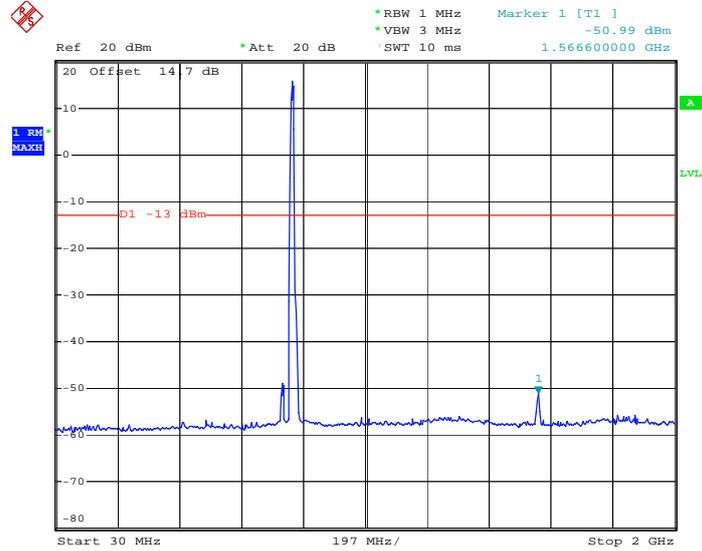
Conducted Emission Plot (2GHz ~ 8GHz) for QPSK (RB Size 1, RB Offset 49)



Date: 11.OCT.2011 17:12:55

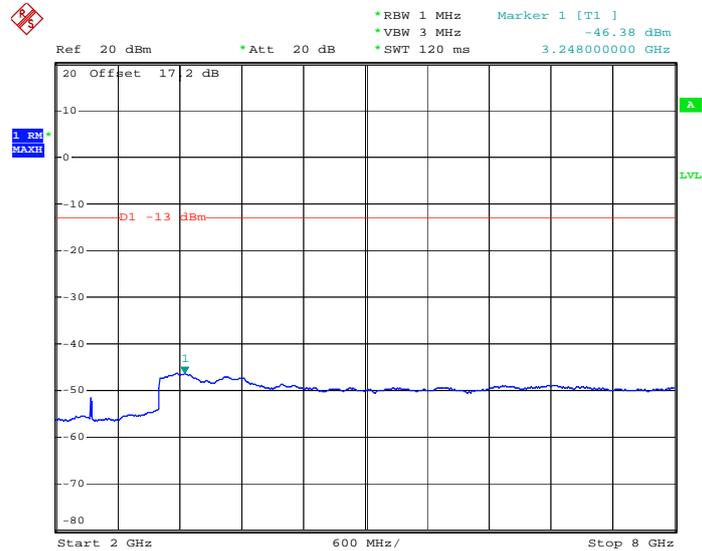


Conducted Emission Plot (30M ~ 2GHz) for QPSK (RB Size 50, RB Offset 0)



Date: 11.OCT.2011 16:50:31

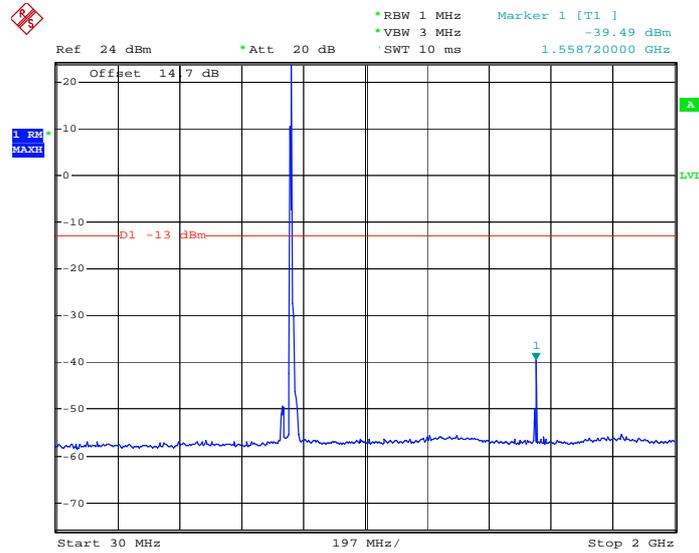
Conducted Emission Plot (2GHz ~ 8GHz) for QPSK (RB Size 50, RB Offset 0)



Date: 11.OCT.2011 17:09:42

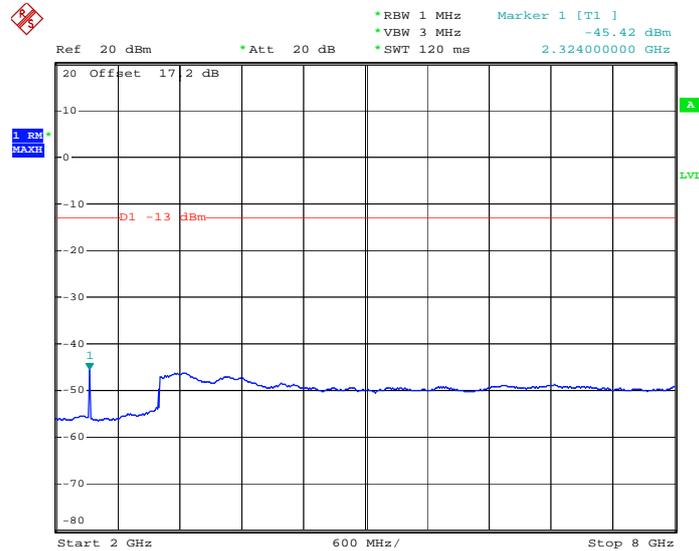


Conducted Emission Plot (30M ~ 2GHz) for 16QAM (RB Size 1, RB Offset 0)



Date: 11.OCT.2011 16:51:42

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



Date: 11.OCT.2011 17:07:52

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.

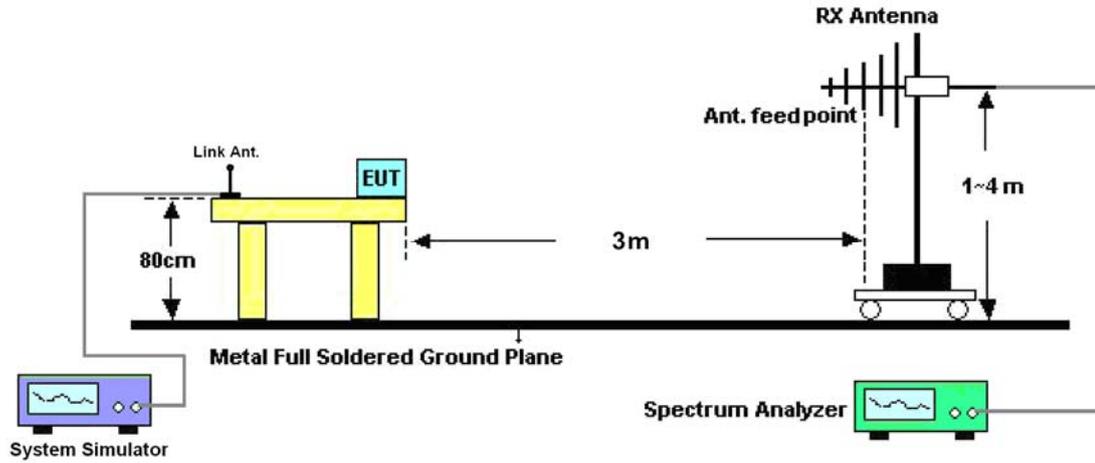
3.6.2 Measuring Instruments

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.

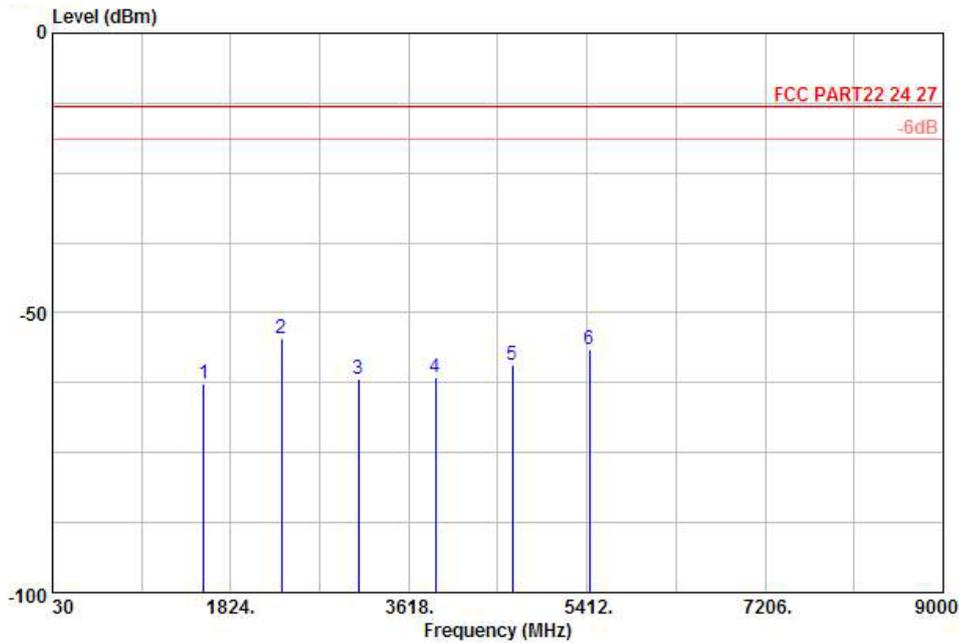
3.6.4 Test Setup





3.6.5 Test Result of Field Strength of Spurious Radiated

Band :	LTE Band 13	Temperature :	21~22°C
Test Mode :	5MHz QPSK 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.		

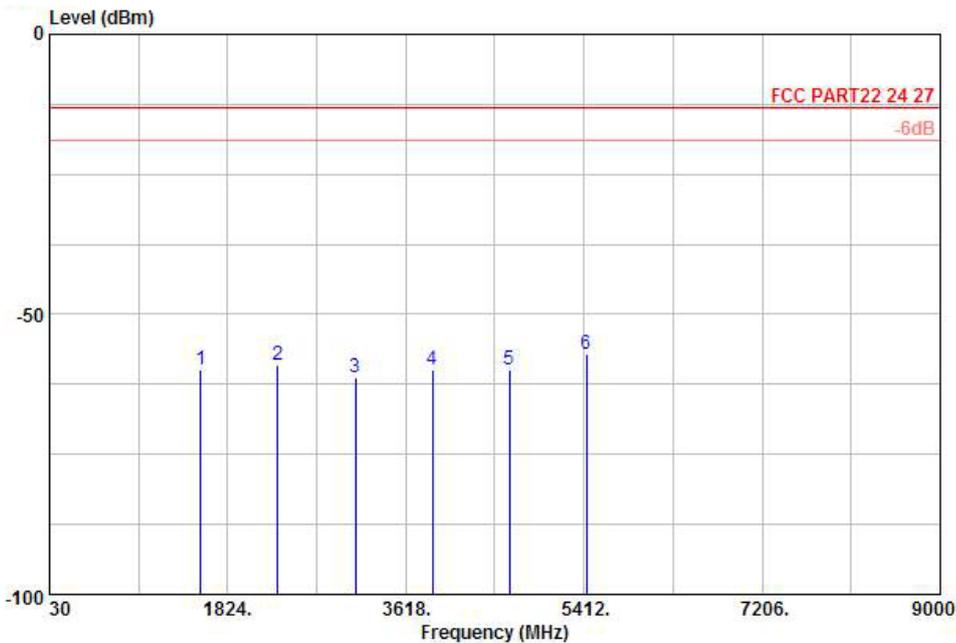


Site : 03CH01-KS
 Condition: FCC PART22 24 27 HF EIRP FACTOR-09020 HORIZONTAL
 Project : (FG) 190101

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
1554	-62.69	-13	-49.69	-61.09	-67.65	0.72	5.68	H	Pass
2334	-54.70	-13	-41.70	-58.53	-59.63	1.01	5.94	H	Pass
3108	-61.75	-13	-48.75	-63.69	-68.11	1.2	7.56	H	Pass
3885	-61.53	-13	-48.53	-64.27	-69.40	1.28	9.15	H	Pass
4662	-59.21	-13	-46.21	-65.41	-67.57	1.59	9.95	H	Pass
5439	-56.59	-13	-43.59	-65.3	-65.66	1.71	10.78	H	Pass



Band :	LTE Band 13	Temperature :	21~22°C
Test Mode :	5MHz QPSK RB Size 1, RB Offset 0	Relative Humidity :	41~42%
Test Engineer :	Cloud Peng	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

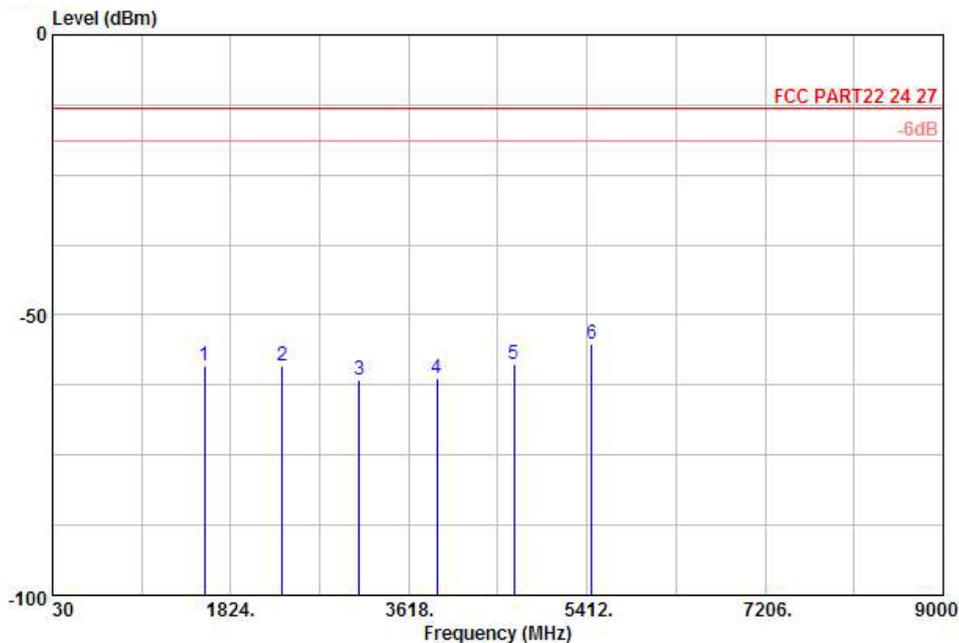


Site : 03CH01-KS
 Condition: FCC PART22 24 27 HF EIRP FACTOR-09020 VERTICAL
 Project : (FG) 190101

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
1554	-59.87	-13	-46.87	-60.82	-64.83	0.72	5.68	V	Pass
2331	-59.14	-13	-46.14	-64.19	-64.07	1.01	5.94	V	Pass
3108	-61.18	-13	-48.18	-63.16	-67.54	1.2	7.56	V	Pass
3885	-59.80	-13	-46.80	-63.64	-67.67	1.28	9.15	V	Pass
4662	-59.82	-13	-46.82	-64.76	-68.18	1.59	9.95	V	Pass
5439	-56.98	-13	-43.98	-64.97	-66.05	1.71	10.78	V	Pass



Band :	LTE Band 13	Temperature :	21~22°C
Test Mode :	10MHz QPSK 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.		

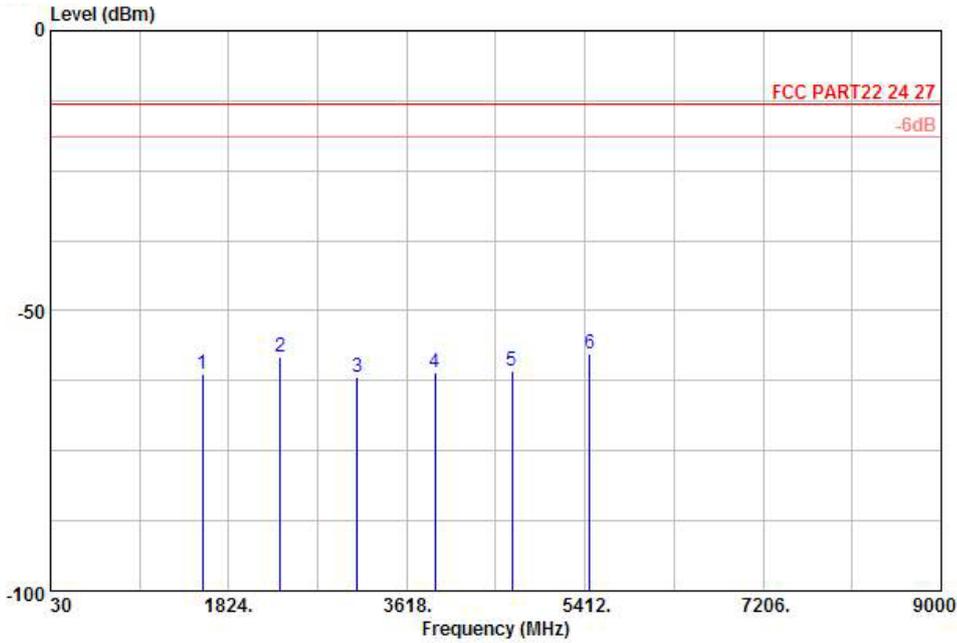


Site : 03CH01-KS
 Condition: FCC PART22 24 27 HF EIRP FACTOR-09020 HORIZONTAL
 Project : (FG) 190101

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
1560	-59.13	-13	-46.13	-57.84	-64.09	0.72	5.68	H	Pass
2340	-59.07	-13	-46.07	-62.9	-64.00	1.01	5.94	H	Pass
3120	-61.69	-13	-48.69	-63.63	-68.05	1.2	7.56	H	Pass
3900	-61.38	-13	-48.38	-64.12	-69.25	1.28	9.15	H	Pass
4680	-58.85	-13	-45.85	-65.05	-67.21	1.59	9.95	H	Pass
5460	-55.05	-13	-42.05	-63.76	-64.12	1.71	10.78	H	Pass



Band :	LTE Band 13	Temperature :	21~22°C
Test Mode :	10MHz QPSK RB Size 1, RB Offset 0	Relative Humidity :	41~42%
Test Engineer :	Cloud Peng	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) 190101

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
1560	-61.42	-13	-48.42	-62.3	-66.38	0.72	5.68	V	Pass
2340	-58.23	-13	-45.23	-63.28	-63.16	1.01	5.94	V	Pass
3120	-61.91	-13	-48.91	-63.89	-68.27	1.2	7.56	V	Pass
3900	-61.14	-13	-48.14	-64.98	-69.01	1.28	9.15	V	Pass
4680	-60.70	-13	-47.70	-65.64	-69.06	1.59	9.95	V	Pass
5460	-57.57	-13	-44.57	-65.56	-66.64	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.

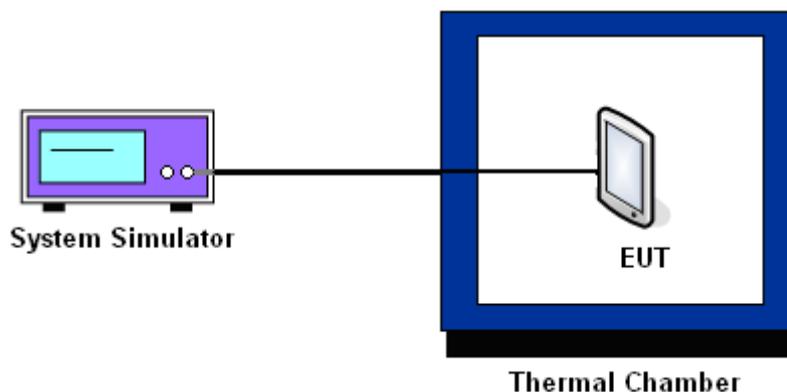
3.7.3 Test Procedures for Temperature Variation

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	7.70	0.010	2.70	0.003	
0	4.70	0.006	1.90	0.002	
10	4.30	0.005	3.10	0.004	
20	3.50	0.004	1.60	0.002	
30	0.10	0.000	3.30	0.004	
40	1.40	0.002	1.90	0.002	
50	-1.30	-0.002	1.20	0.002	
55	-3.60	-0.005	-3.70	-0.005	

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	5.70	0.007	4.90	0.006	
0	3.80	0.005	3.60	0.005	
10	1.20	0.002	0.90	0.001	
20	1.80	0.002	3.10	0.004	
30	-0.70	-0.001	1.10	0.001	
40	-1.80	-0.002	-0.30	0.000	
50	-1.40	-0.002	-2.90	-0.004	
55	1.10	0.001	1.20	0.002	

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	3.40	0.004	4.70	0.006	
0	1.30	0.002	8.00	0.010	
10	-1.40	-0.002	3.70	0.005	
20	2.90	0.004	5.10	0.007	
30	-1.80	-0.002	1.50	0.002	
40	2.80	0.004	-6.30	-0.008	
50	-1.50	-0.002	2.20	0.003	
55	-4.00	-0.005	1.70	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	2.20	0.003	2.5	PASS
			BEP	-0.80	-0.001		
			4.2	-2.40	-0.003		
		16QAM-RB Size 25, RB Offset 0	3.7	-1.90	-0.002		
			BEP	-1.40	-0.002		
			4.2	1.50	0.002		
	5M (High)	QPSK-RB Size 25, RB Offset 0	3.7	-2.90	-0.004		
			BEP	1.50	0.002		
			4.2	-1.70	-0.002		
		16QAM-RB Size 25, RB Offset 0	3.7	-1.50	-0.002		
			BEP	-4.10	-0.005		
			4.2	4.20	0.005		
	10M (Middle)	QPSK-RB Size 50, RB Offset 0	3.7	-2.40	-0.003		
			BEP	-1.60	-0.002		
			4.2	-5.20	-0.007		
		16QAM-RB Size 50, RB Offset 0	3.7	-4.50	-0.006		
			BEP	-3.50	-0.004		
			4.2	-2.80	-0.004		

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	Jan. 07, 2011	Oct. 11, 2011 ~Nov. 04, 2011	Jan. 06, 2012	Conducted (TH01-KS)
LTE Base Station	Anritsu	MT8820G	N/A	N/A	Dec. 28, 2010	Oct. 11, 2011 ~Nov. 04, 2011	Dec. 27, 2011	Conducted (TH01-KS)
DC Power Supply	TOPWARD	GPS-3030D	E1884515	N/A	Aug. 23, 2011	Oct. 11, 2011 ~Nov. 04, 2011	Aug. 22, 2012	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	N/A	Jan. 17, 2011	Oct. 11, 2011 ~Nov. 04, 2011	Jan. 16, 2012	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 16, 2010	Nov. 07, 2011	Nov. 15, 2011	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Jan. 07, 2011	Nov. 07, 2011	Jan. 06, 2012	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 07, 2010	Nov. 07, 2011	Dec. 06, 2011	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Jan. 07, 2011	Nov. 07, 2011	Jan. 06, 2012	Radiation (03CH01-KS)
Amplifier	Wireless	FPA-6592G	060004	30MHz~2GHz	Dec. 09, 2010	Nov. 07, 2011	Dec. 08, 2011	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701023	1GHz~18GHz	Nov. 07, 2010	Nov. 07, 2011	Nov. 08, 2011	Radiation (03CH01-KS)
SHE-EHF Horn	Schwarzbeck	BBHA9170	BBHA170249	15GHz~40GHz	Oct. 11, 2011	Nov. 07, 2011	Oct. 10, 2012	Radiation (03CH01-KS)
LTE Base Station	Anritsu	MT8820C	6200930978	N/A	Dec. 28, 2010	Nov. 07, 2011	Dec. 27, 2011	-

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 EP190101 as below.