

FCC RF Test Report

APPLICANT : LG Electronics Inc.
EQUIPMENT : WCDMA & LTE Wireless Router with WLAN.
BRAND NAME : LG
MODEL NAME : CR820
MARKETING NAME : CR820
FCC ID : ZNFCR820
STANDARD : 47 CFR Part 2, 27(M)
CLASSIFICATION : PCS Licensed Transmitter (PCB)

The product was received on Mar. 04, 2013 and completely tested on Mar. 08, 2013. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and 47 CFR FCC Part 27 Subpart M 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 INC., the test report shall not be reproduced except in full.



Reviewed by: Joseph Lin / Supervisor



Approved by: Jones Tsai / Manager



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FCC ID : ZNFCR820

Page Number : 1 of 67

Report Issued Date : Apr. 03, 2013

Report Version : Rev. 01



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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FB330402B	Rev. 01	Initial issue of report	Apr. 03, 2013

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	§2.1033 §2.1046 §27.50	RSS-199 (4.4)	Maximum Output Power	Output Power < 2 Watts	PASS	-
3.1	§27.50	RSS-199 (4.4)	Equivalent Isotropic Radiated Power	< 33 dBW + 10 log(X/Y) dBW + 10 log(360/beamwidth) dBW	PASS	-
3.2	§2.1049 §27.53	RSS-199 (4.5)	Emissions Bandwidth	N/A	PASS	-
3.3	§2.1033 §2.1046 §27.50	RSS-199 (4.5)	Conducted Band Edge Emissions and Spurious Emissions	< 5.5MHz: -13 dBm ≥5.5MHz: -25 dBm	PASS	-
3.4	§2.1053 §27.53	RSS-199 (4.5)	Field Strength of Spurious Radiation	-25 dBm	PASS	Under limit 18.21 dB at 10144.000 MHz
3.5	§2.1055 §27.54	RSS-199 (4.3)	Frequency Stability for Temperature & Voltage	2.5 ppm	PASS	-

1 General Description

1.1 Applicant

LG Electronics Inc.

60-39, Kasan-dong, Kumchon-gu, Seoul 135-801, Korea

1.2 Manufacturer

LG Electronics Inc.

60-39, Kasan-dong, Kumchon-gu, Seoul 135-801, Korea

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	WCDMA & LTE Wireless Router with WLAN.
Brand Name	LG
Model Name	CR820
Marketing Name	CR820
FCC ID	ZNFCR820
EUT supports Radios application	WCDMA/HSPA/LTE/ WLAN 11bgn
HW Version	Rev.1.0
SW Version	V08a
EUT Stage	Production Unit

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx Frequency	2506.5 MHz ~ 2567.5 MHz
Rx Frequency	2626.5 MHz ~ 2687.5 MHz
Maximum Output Average Power to Antenna	22.48 dBm
Antenna Type	PIFA Antenna
Antenna Gain	0.07 dBi

1.5 Emission Designator and Maximum EIRP Power

FCC Rule	System	Type of Modulation	BW	Maximum EIRP (W)	Frequency Tolerance (% , Hz, ppm)	Emission Designator
Part 27	LTE Band 7	QPSK	5MHz	0.3381	0.005 ppm	4M50G7D
Part 27	LTE Band 7	16QAM	5MHz	0.2704	0.013 ppm	4M50D7W
Part 27	LTE Band 7	QPSK	10MHz	0.3802	0.004 ppm	9M10G7D
Part 27	LTE Band 7	16QAM	10MHz	0.2858	0.006 ppm	9M10D7W
Part 27	LTE Band 7	QPSK	20MHz	0.3221	0.008 ppm	18M7G7D
Part 27	LTE Band 7	16QAM	20MHz	0.2793	0.006 ppm	18M8D7W

1.6 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.
	TH02-HY	03CH07-HY	149928/4086E-1

1.7 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(M)
- ♦ ANSI C63.4-2003
- ♦ ANSI TIA-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.

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.

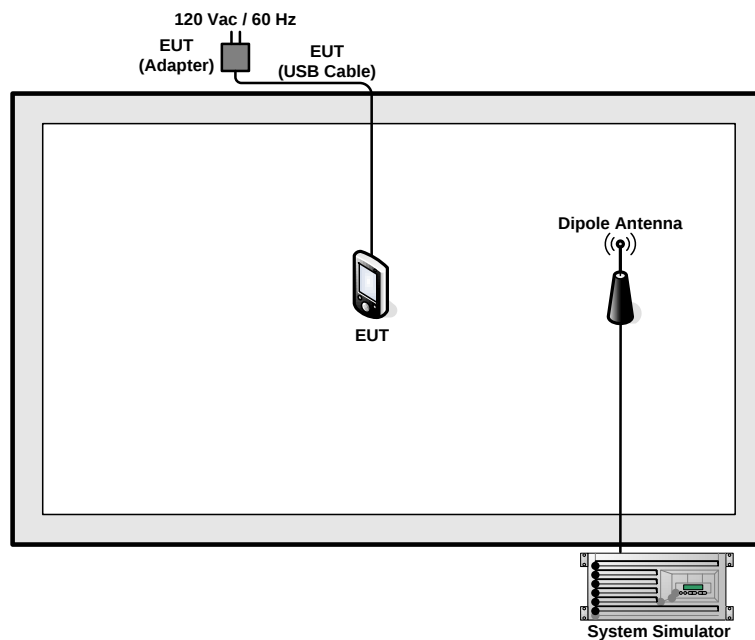
Frequency range investigated for radiated emission: 30MHz to 26000 MHz.

Test Modes			
Band		Radiated TCs	Conducted TCs
		Modulation : QPSK	Modulation : QPSK / 16QAM
LTE Band 7	BW 5MHz	■ LTE (RB Size 1, RB Offset 12) QPSK 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 24) QPSK Link	■ LTE (RB Size 1, RB Offset 0)Link ■ LTE (RB Size 1, RB Offset 49)Link ■ LTE (RB Size 25, RB Offset 12)Link ■ LTE (RB Size 50, RB Offset 0)Link
	BW 20MHz	■ LTE (RB Size 1, RB Offset 99) QPSK Link	■ LTE (RB Size 1, RB Offset 0) Link ■ LTE (RB Size 1, RB Offset 99) Link ■ LTE (RB Size 50, RB Offset 24) Link ■ LTE (RB Size 100, 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-QPSK results in highest RF power, therefore it's chosen for RSE measurement.

2.2 Connection Diagram of Test System



2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	LTE Base Station	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m

2.4 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

Example :

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 4.2 + 10 = 14.2 \text{ (dB)}\end{aligned}$$

3 Test Result

3.1 Maximum Output Power and Effective Isotropic Radiated Power Measurement

3.1.1 Limit

For mobile and other user stations, mobile stations are limited to 2.0 watts EIRP and all user stations are limited to 2.0 watts transmitter output power. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (p) by a factor of mobile digital stations, the attenuation factor shall be not less than $43 + 10 \log (p)$ dB at the channel edge and $55 + 10 \log (p)$ dB at 5.5 MHz from the channel edges.

3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

For Conducted Power Measurement:

1. The RF output of the transmitter was connected to base station simulator.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set EUT at maximum average power by base station simulator.
4. Measure lowest, middle, and highest channels for each bandwidth and different modulation.

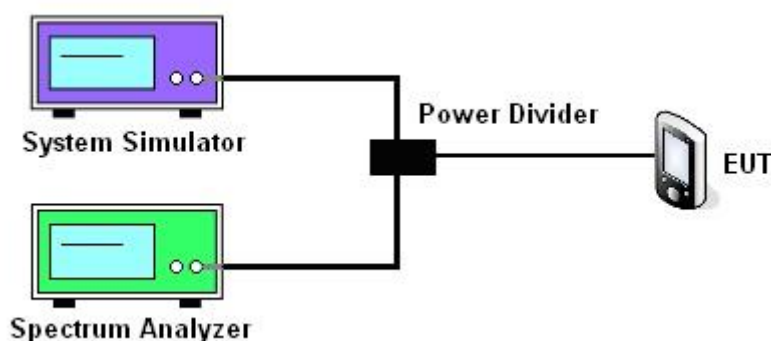
For Effective Isotropic Radiated Power Measurement:

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.
2. During the measurement, the EUT was enforced in maximum power. 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.

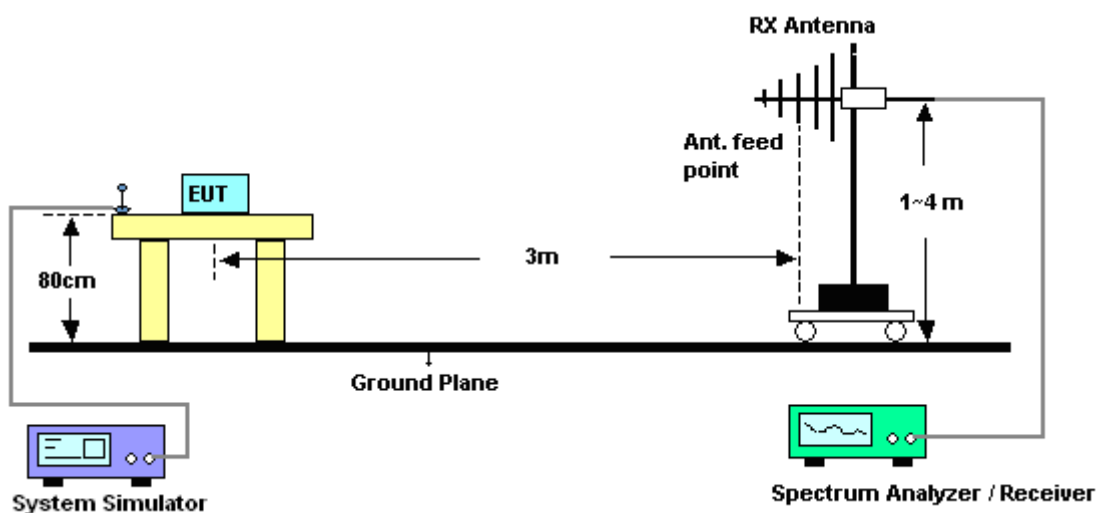
3. Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to TIA/EIA-603-C. The EUT was replaced by dipole antenna (substitution antenna) at same location, and then a known power from S.G. was applied into the dipole antenna through a Tx cable, and then recorded the maximum 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, $EIRP = LVL + \text{Correction factor}$.

3.1.4 Test Setup

<Conducted Power and Band Edge Measurement>



<Effective Isotropic Radiated Power Measurement>



3.1.5 Test Result of Conducted Output Power

Mode	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power (dBm)	Average Power (Watts)
					RB Size	RB Offset		
LTE Band 7	5MHz	20815	2506.5	QPSK	1	0	22.11	0.1626
					1	12	22.02	0.1592
					1	24	22.28	0.1690
					12	0	21.15	0.1303
					12	6	21.13	0.1297
					12	11	21.10	0.1288
					25	0	21.20	0.1318
				16-QAM	1	0	21.25	0.1334
					1	12	21.68	0.1472
					1	24	21.61	0.1449
					12	0	20.02	0.1005
					12	6	20.08	0.1019
					12	11	20.04	0.1009
					25	0	20.41	0.1099
		21095	2534.5	QPSK	1	0	22.26	0.1683
					1	12	22.41	0.1742
					1	24	22.31	0.1702
					12	0	21.38	0.1374
					12	6	21.40	0.1380
					12	11	21.39	0.1377
					25	0	21.34	0.1361
				16-QAM	1	0	21.01	0.1262
					1	12	21.36	0.1368
					1	24	21.29	0.1346
					12	0	20.25	0.1059
					12	6	20.16	0.1038
					12	11	20.43	0.1104
					25	0	20.70	0.1175
		21425	2567.5	QPSK	1	0	22.23	0.1671
					1	12	22.26	0.1683
					1	24	22.09	0.1618
					12	0	21.32	0.1355
					12	6	21.23	0.1327
					12	11	21.24	0.1330
					25	0	21.28	0.1343
				16-QAM	1	0	21.25	0.1334
					1	12	21.50	0.1413
					1	24	21.61	0.1449
					12	0	20.23	0.1054
					12	6	20.16	0.1038
					12	11	20.21	0.1050
					25	0	20.66	0.1164

Mode	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power (dBm)	Average Power (Watts)
					RB Size	RB Offset		
LTE Band 7	10MHz	20840	2509	QPSK	1	0	21.92	0.1556
					1	24	22.12	0.1629
					1	49	22.11	0.1626
					25	0	21.17	0.1309
					25	12	21.35	0.1365
					25	24	21.32	0.1355
					50	0	21.34	0.1361
				16-QAM	1	0	21.63	0.1455
					1	24	21.69	0.1476
					1	49	21.50	0.1413
					25	0	20.42	0.1102
					25	12	20.59	0.1146
					25	24	20.66	0.1164
					50	0	20.36	0.1086
		21070	2532	QPSK	1	0	22.18	0.1652
					1	24	22.31	0.1702
					1	49	22.21	0.1663
					25	0	21.40	0.1380
					25	12	21.42	0.1387
					25	24	21.43	0.1390
					50	0	21.41	0.1384
				16-QAM	1	0	21.35	0.1365
					1	24	21.70	0.1479
					1	49	21.21	0.1321
					25	0	20.66	0.1164
					25	12	20.64	0.1159
					25	24	20.67	0.1167
					50	0	20.30	0.1072
		21400	2565	QPSK	1	0	22.20	0.1660
					1	24	22.27	0.1687
					1	49	22.02	0.1592
					25	0	21.50	0.1413
					25	12	21.46	0.1400
					25	24	21.33	0.1358
					50	0	21.32	0.1355
				16-QAM	1	0	21.46	0.1400
					1	24	21.60	0.1445
					1	49	21.21	0.1321
					25	0	20.63	0.1156
					25	12	20.60	0.1148
					25	24	20.68	0.1169
					50	0	20.39	0.1094

Mode	Band Width	Channel	Frequency (MHz)	Modulation	RB Configuration		Average Power (dBm)	Average Power (Watts)
					RB Size	RB Offset		
LTE Band 7	20MHz	20890	2514	QPSK	1	0	22.01	0.1589
					1	49	22.34	0.1714
					1	99	22.20	0.1660
					50	0	21.31	0.1352
					50	24	21.35	0.1365
					50	49	21.23	0.1327
					100	0	21.34	0.1361
				16-QAM	1	0	21.06	0.1276
					1	49	21.48	0.1406
					1	99	21.65	0.1462
					50	0	20.34	0.1081
					50	24	20.45	0.1109
					50	49	20.49	0.1119
					100	0	20.47	0.1114
		21020	2527	QPSK	1	0	22.02	0.1592
					1	49	22.37	0.1726
					1	99	22.48	0.1770
					50	0	21.37	0.1371
					50	24	21.30	0.1349
					50	49	21.44	0.1393
					100	0	21.42	0.1387
				16-QAM	1	0	21.27	0.1340
					1	49	21.62	0.1452
					1	99	21.67	0.1469
					50	0	20.63	0.1156
					50	24	20.42	0.1102
					50	49	20.67	0.1167
					100	0	20.55	0.1135

Note: maximum average power for LTE.

3.1.6 Test Result of Effective Isotropic Radiated Power

LTE Band 7 Radiated Power EIRP for BW 5MHz (QPSK)						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
2506.50	-35.41	-55.42	0.00	3.51	23.52	0.2249
2534.50	-34.41	-55.69	0.00	3.54	24.82	0.3034
2567.50	-34.27	-55.72	0.00	3.58	25.03	0.3184
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
2506.50	-36.09	-56.19	0.00	3.51	23.61	0.2296
2534.50	-34.78	-56.53	0.00	3.54	25.29	0.3381
2567.50	-36.47	-56.85	0.00	3.58	23.96	0.2489

LTE Band 7 Radiated Power EIRP for BW 5MHz (16QAM)						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
2506.50	-36.09	-55.42	0.00	3.51	22.84	0.1923
2534.50	-34.97	-55.69	0.00	3.54	24.26	0.2667
2567.50	-35.49	-55.72	0.00	3.58	23.81	0.2404
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
2506.50	-36.90	-56.19	0.00	3.51	22.80	0.1905
2534.50	-35.75	-56.53	0.00	3.54	24.32	0.2704
2567.50	-37.37	-56.85	0.00	3.58	23.06	0.2023

LTE Band 7 Radiated Power EIRP for BW 10MHz (QPSK)						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
2509.00	-35.34	-55.53	0.00	3.51	23.70	0.2344
2532.00	-33.37	-55.63	0.00	3.54	25.80	0.3802
2565.00	-35.35	-55.70	0.00	3.58	23.93	0.2472
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
2509.00	-35.68	-56.16	0.00	3.51	23.99	0.2506
2532.00	-35.08	-56.46	0.00	3.54	24.92	0.3105
2565.00	-36.43	-56.79	0.00	3.58	23.93	0.2472

LTE Band 7 Radiated Power EIRP for BW 10MHz (16QAM)						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
2509.00	-36.39	-55.53	0.00	3.51	22.65	0.1841
2532.00	-34.67	-55.63	0.00	3.54	24.50	0.2818
2565.00	-35.90	-55.70	0.00	3.58	23.38	0.2178
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
2509.00	-36.97	-56.16	0.00	3.51	22.70	0.1862
2532.00	-35.44	-56.46	0.00	3.54	24.56	0.2858
2565.00	-37.31	-56.79	0.00	3.58	23.05	0.2018

LTE Band 7 Radiated Power EIRP for BW 20MHz (QPSK)						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
2514.00	-34.96	-55.62	0.00	3.52	24.18	0.2618
2527.00	-34.16	-55.68	0.00	3.53	25.06	0.3206
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
2514.00	-36.33	-56.18	0.00	3.52	23.37	0.2173
2527.00	-34.84	-56.39	0.00	3.53	25.08	0.3221

LTE Band 7 Radiated Power EIRP for BW 20MHz (16QAM)						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
2514.00	-34.94	-55.62	0.00	3.52	24.20	0.2630
2527.00	-34.87	-55.68	0.00	3.53	24.35	0.2723
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
2514.00	-35.58	-56.18	0.00	3.52	24.12	0.2582
2527.00	-35.46	-56.39	0.00	3.53	24.46	0.2793

3.2 Occupied Bandwidth and 26dB Bandwidth Measurement

3.2.1 Description of Occupied Bandwidth and 26dB 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.

The emission bandwidth is defined as the width of the signal between two points, located at the 2 sides of the carrier frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

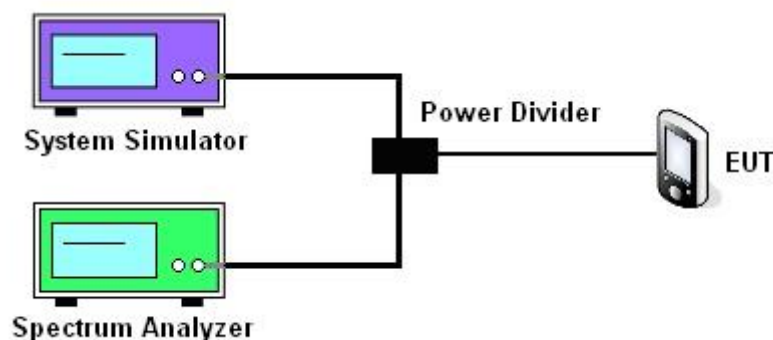
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The 99% occupied bandwidth and 26 dB bandwidth of the middle channel for the highest RF powers were measured.

3.2.4 Test Setup

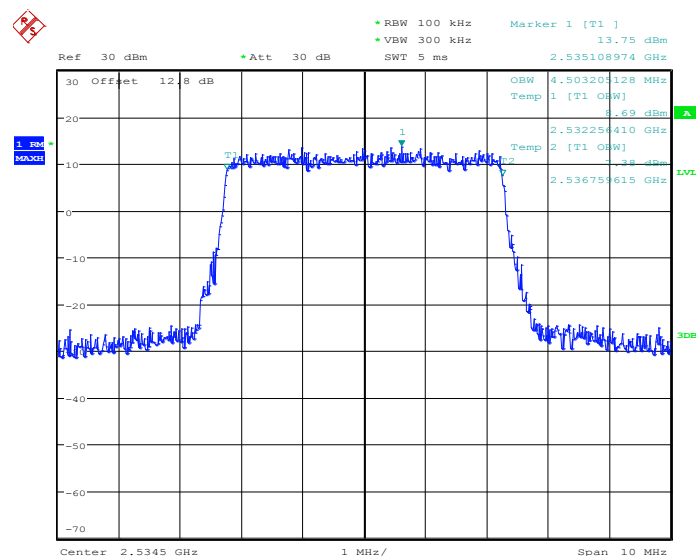


3.2.6 Test Result of 99% Occupied Bandwidth and 26dB Bandwidth

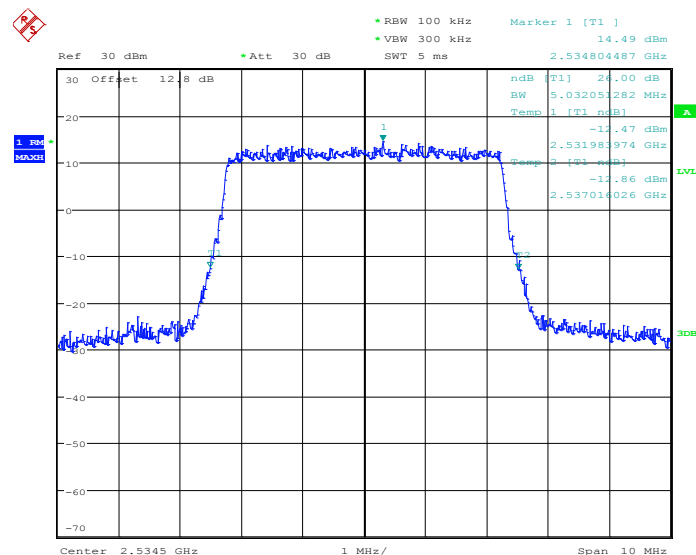
Modes	LTE Band 7					
BW / Modulation	5MHz / QPSK	5MHz / 16QAM	10MHz / QPSK	10MHz / 16QAM	20MHz / QPSK	20MHz / 16QAM
99% OBW (MHz)	4.50	4.50	9.10	9.10	18.72	18.78
26dB BW (MHz)	5.03	4.98	10.03	9.87	21.09	21.09

3.2.7 Test Result (Plots) of 99% Occupied Bandwidth and 26dB Bandwidth

Band :	LTE Band 7	BW / Mod. :	5MHz / QPSK
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99% Occupied Bandwidth Plot on Channel 21095


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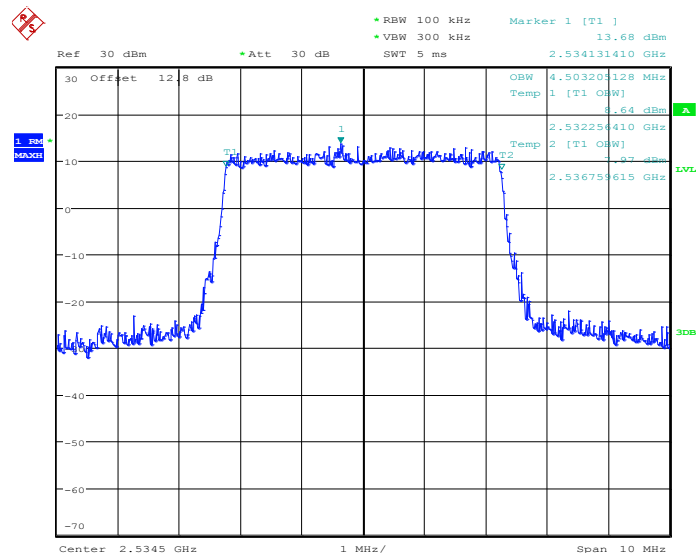
26dB Bandwidth Plot on Channel 21095


Date: 7.MAR.2013 20:38:50



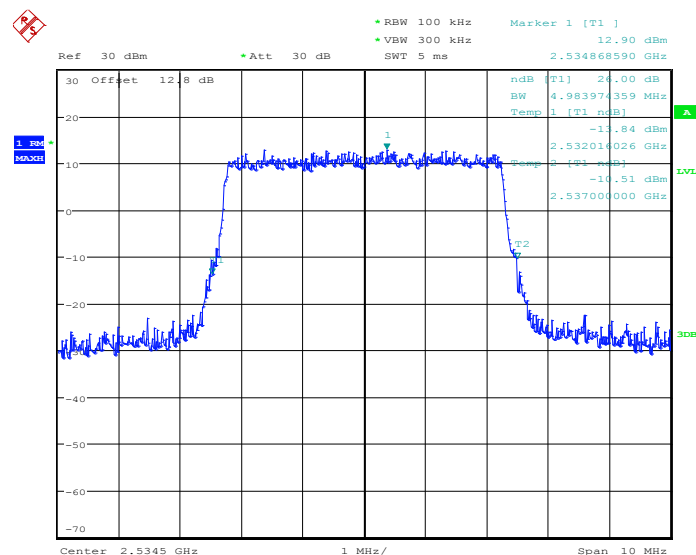
Band :	LTE Band 7	BW / Mod. :	5MHz / 16QAM
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99% Occupied Bandwidth Plot on Channel 21095



Date: 7.MAR.2013 20:01:56

26dB Bandwidth Plot on Channel 21095

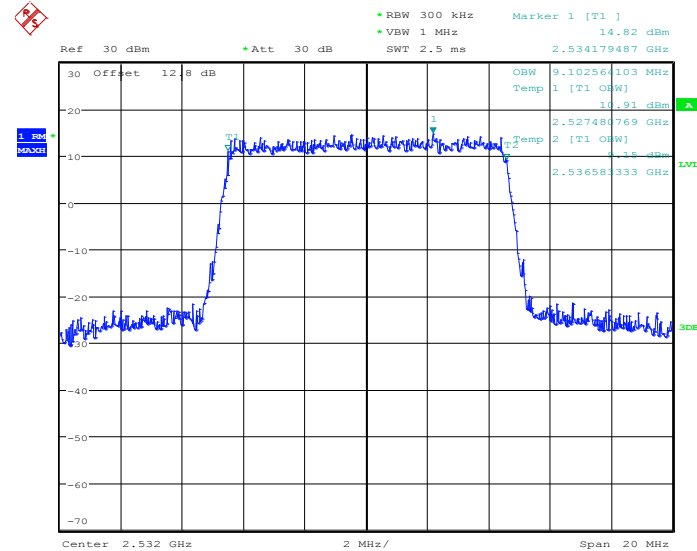


Date: 7.MAR.2013 20:39:00



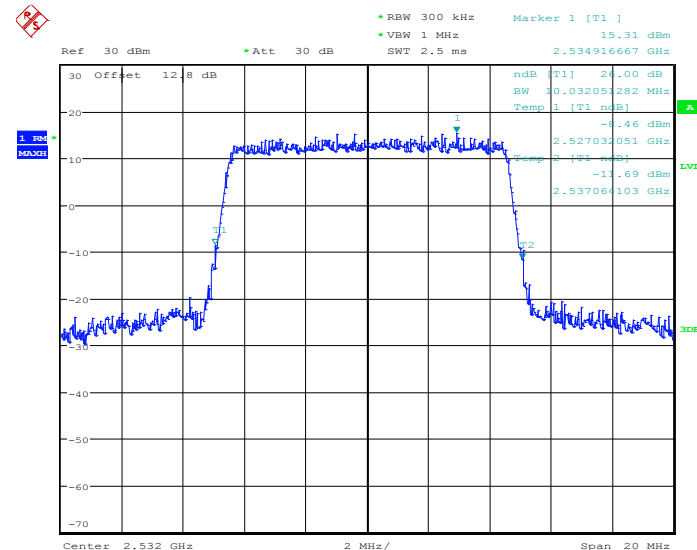
Band :	LTE Band 7	BW / Mod. :	10MHz / QPSK
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99% Occupied Bandwidth Plot on Channel 21070



Date: 7.MAR.2013 20:04:22

26dB Bandwidth Plot on Channel 21070



Date: 7.MAR.2013 20:37:39



99% Occupied Bandwidth Plot on Channel 21070

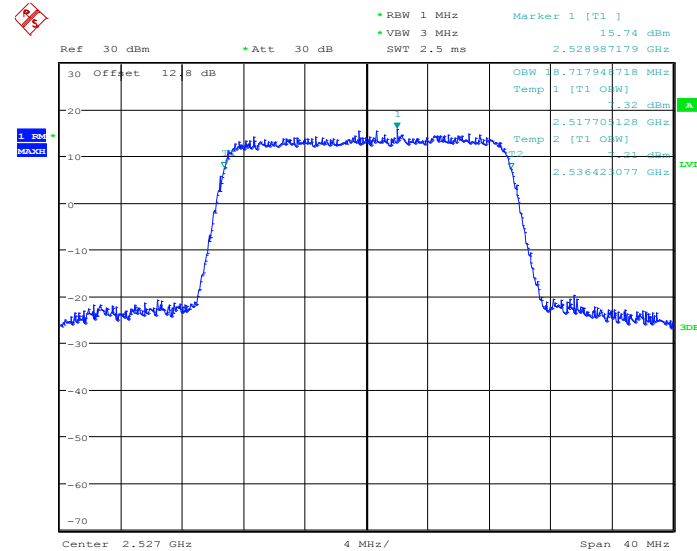


Date: 7.MAR.2013 20:37:53



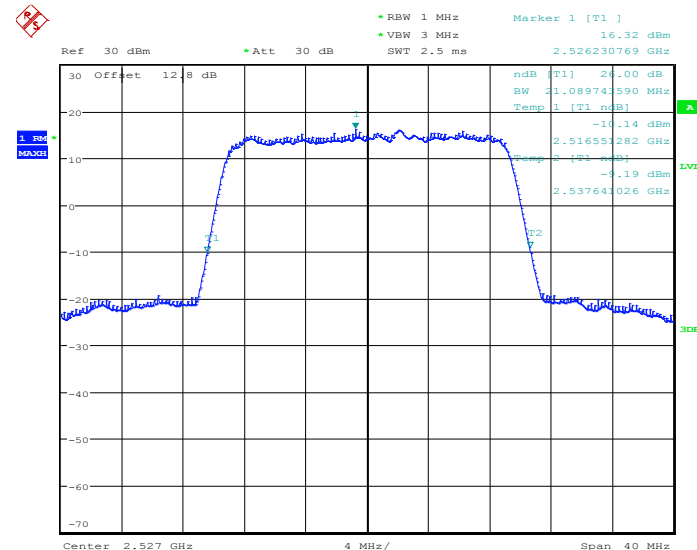
Band :	LTE Band 7	BW / Mod. :	20MHz / QPSK
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99% Occupied Bandwidth Plot on Channel 21020



Date: 7.MAR.2013 20:16:14

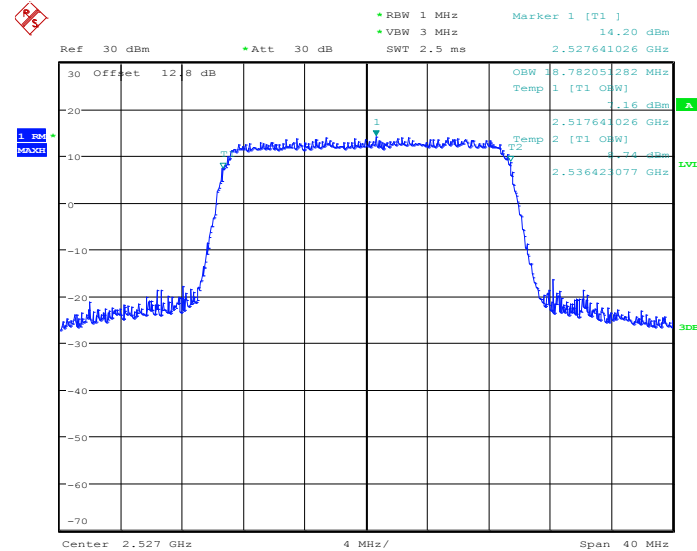
26dB Bandwidth Plot on Channel 21020



Date: 7.MAR.2013 20:36:07

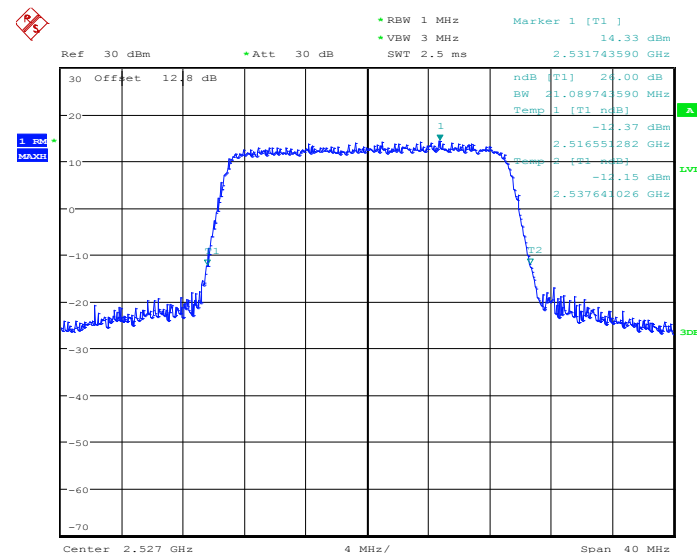
Band :	LTE Band 7	BW / Mod. :	20MHz / 16QAM
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99% Occupied Bandwidth Plot on Channel 21020



Date: 7.MAR.2013 20:14:43

26dB Bandwidth Plot on Channel 21020



Date: 7.MAR.2013 20:36:23

3.3 Conducted Band Edge and Spurious Emission Measurement

3.3.1 Description of Conducted Band Edge and Spurious 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 mobile digital stations, the attenuation factor shall be not less than $43 + 10 \log (P)$ dB at the channel edge and $55 + 10 \log (P)$ dB at 5.5 MHz from the channel edges. It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

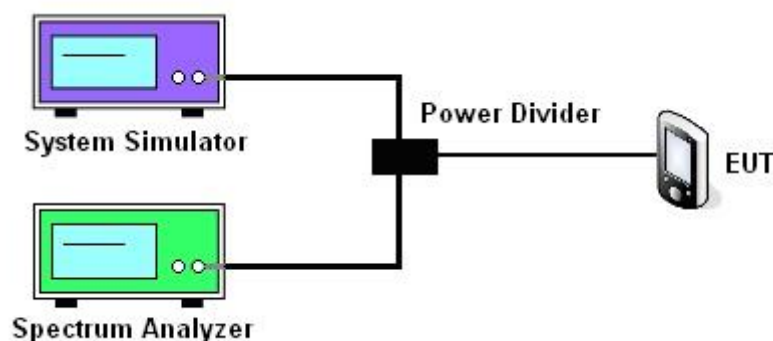
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The EUT was connected to spectrum analyzer and System Simulator via power divider.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. The conducted spurious emission for the whole frequency range was taken.

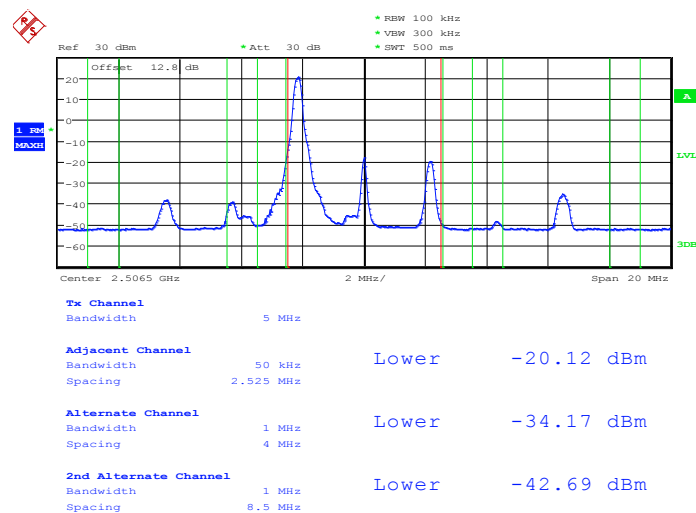
3.3.4 Test Setup



3.3.5 Test Plots of Conducted Band-Edge Emission

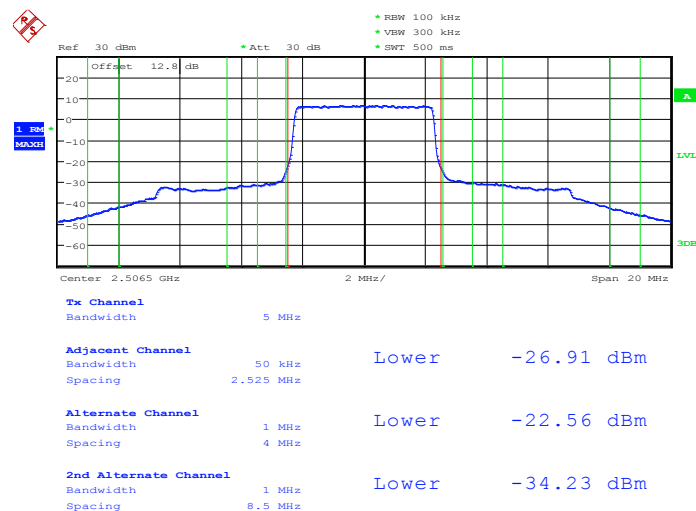
Band :	LTE Band 7	Band Width	5MHz / QPSK
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



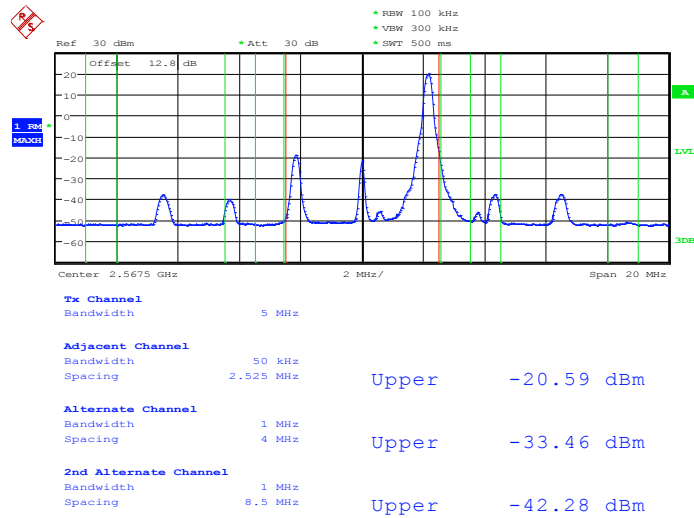
Date: 7.MAR.2013 21:48:18

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



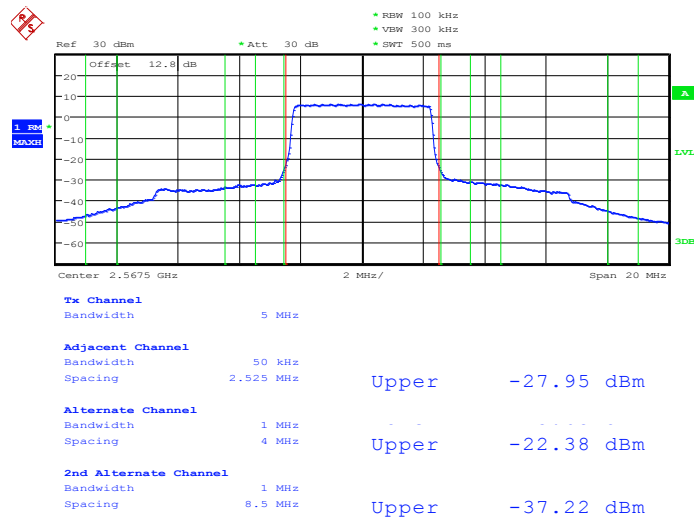
Date: 7.MAR.2013 21:47:31

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



Date: 7.MAR.2013 21:50:51

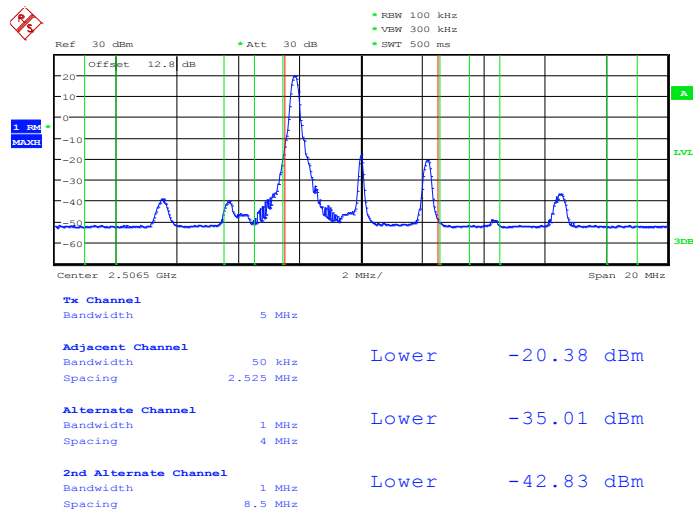
Higher Band Edge Plot for QPSK-RB Size 25, RB Offset 0



Date: 7.MAR.2013 21:49:10

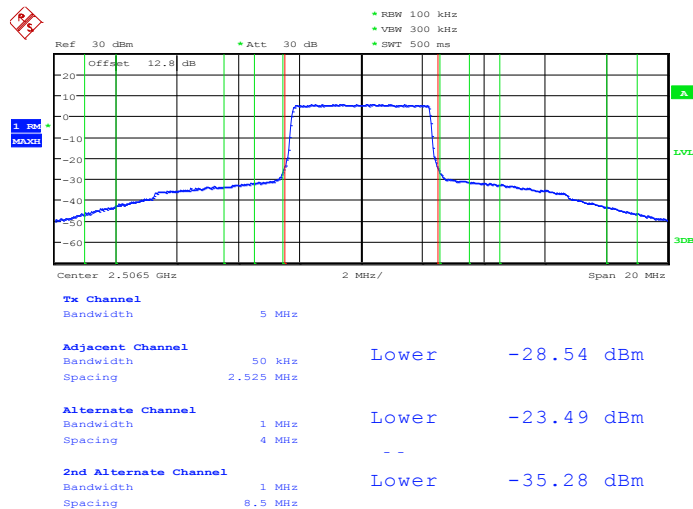
Band :	LTE Band 7	Band Width	5MHz / 16QAM
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Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0



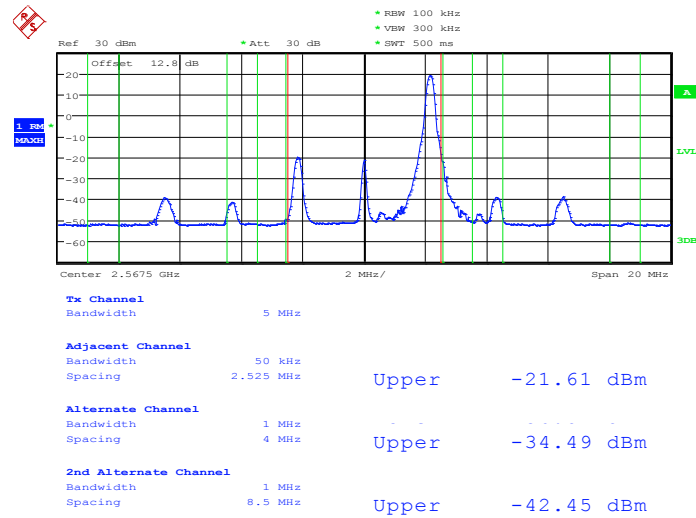
Date: 7.MAR.2013 21:48:31

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



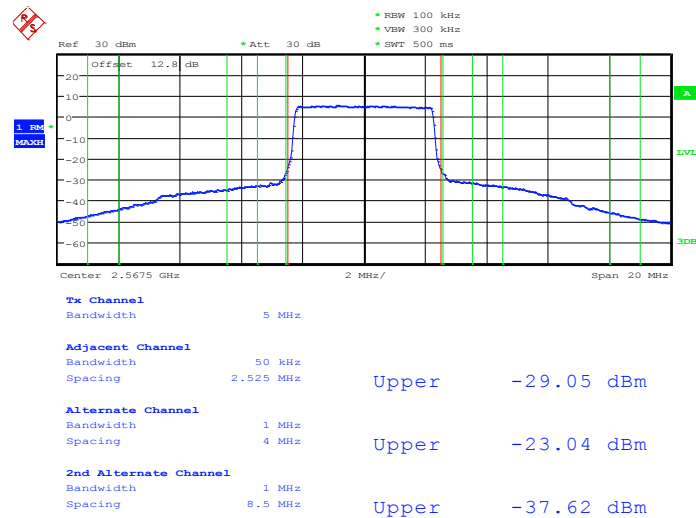
Date: 7.MAR.2013 21:47:46

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



Date: 7.MAR.2013 21:51:03

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

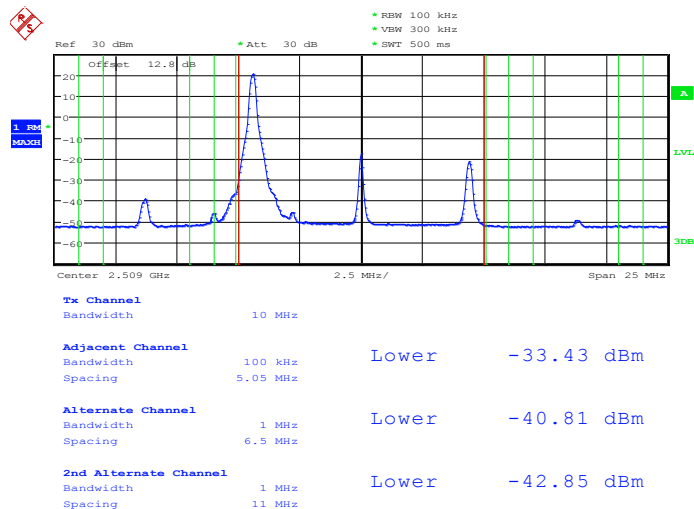


Date: 7.MAR.2013 21:50:31



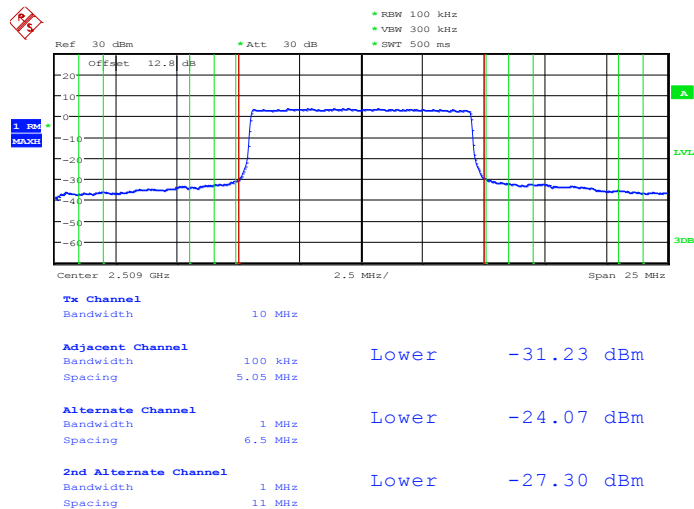
Band :	LTE Band 7	Band Width	10MHz / QPSK
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



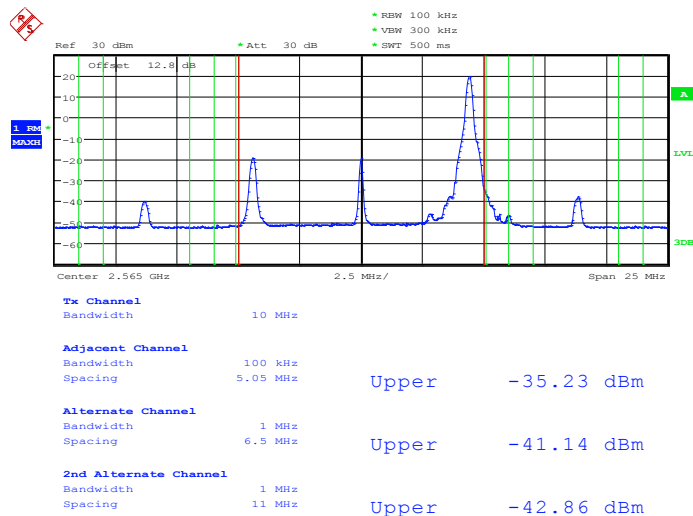
Date: 7.MAR.2013 21:37:09

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



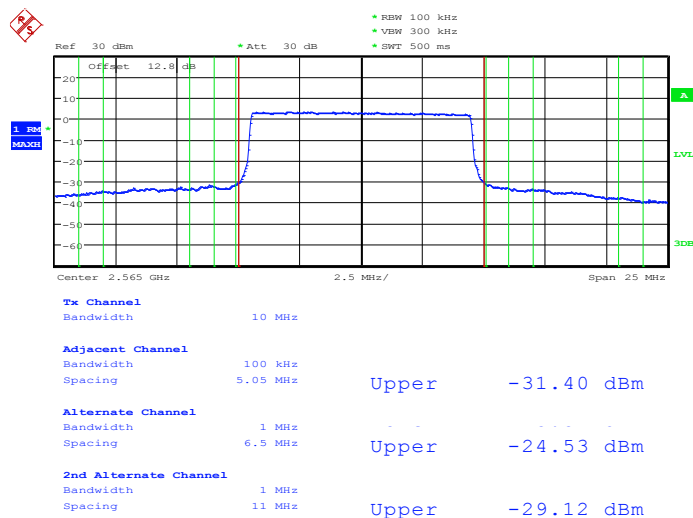
Date: 7.MAR.2013 21:36:32

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



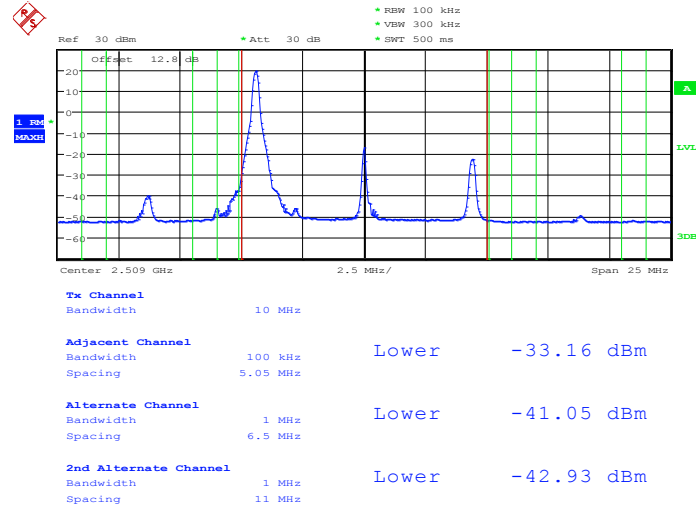
Date: 7.MAR.2013 21:40:03

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

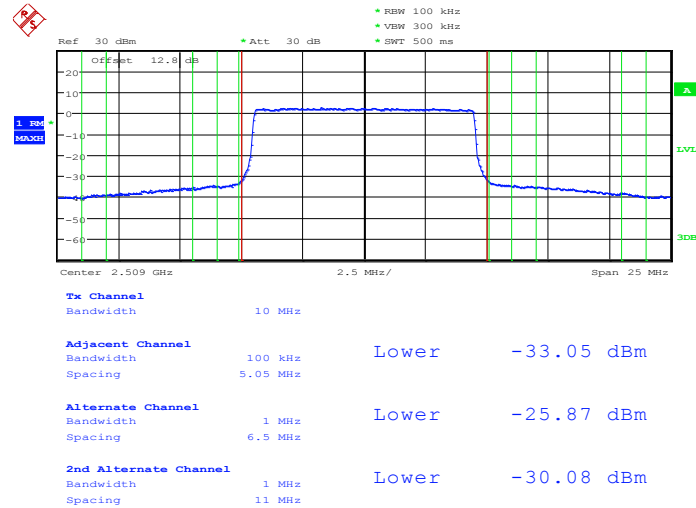


Date: 7.MAR.2013 21:38:28

Band :	LTE Band 7	Band Width	10MHz / 16QAM
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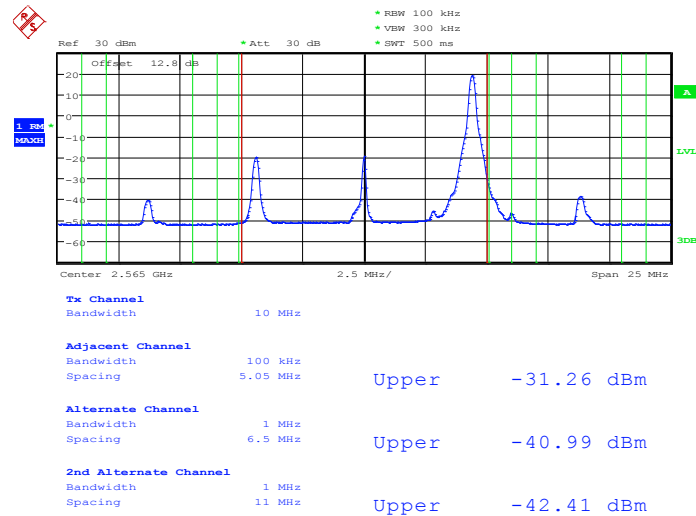
Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0


Date: 7.MAR.2013 21:37:25

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


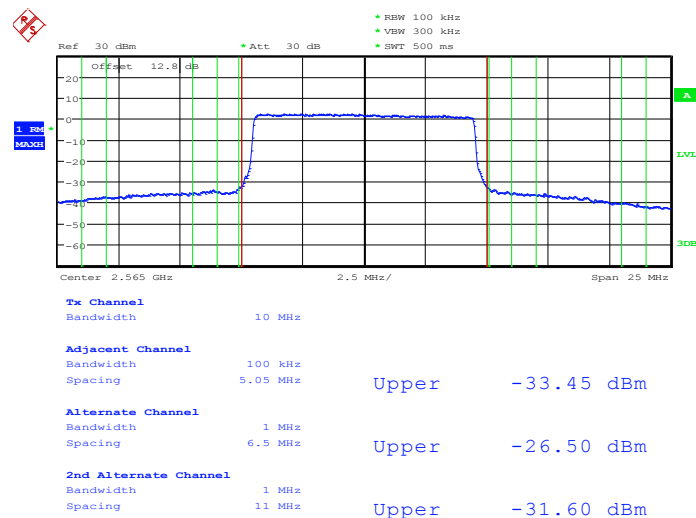
Date: 7.MAR.2013 21:36:47

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



Date: 7.MAR.2013 21:39:42

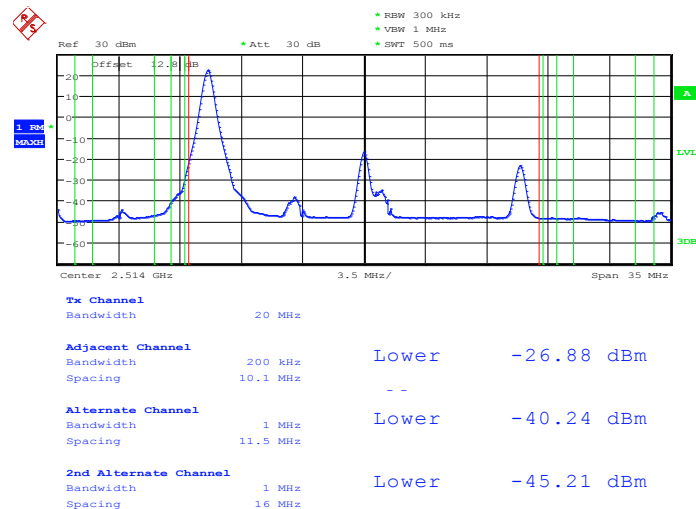
Higher Band Edge Plot for 16QAM -RB Size 50, RB Offset 0



Date: 7.MAR.2013 21:38:43

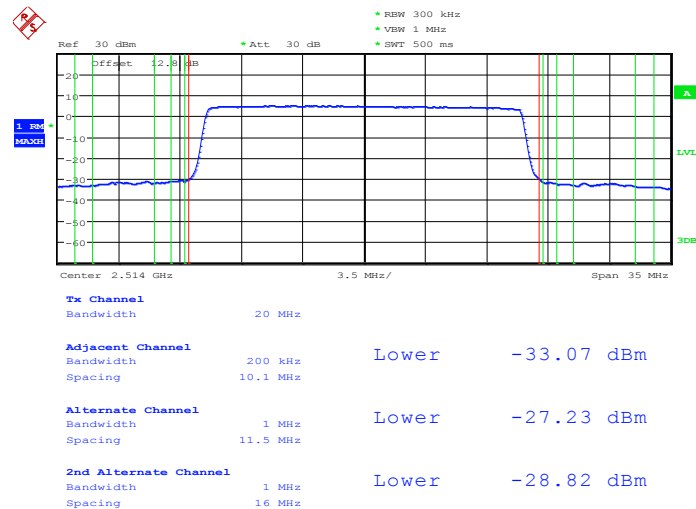
Band :	LTE Band 7	Band Width	20MHz / QPSK
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



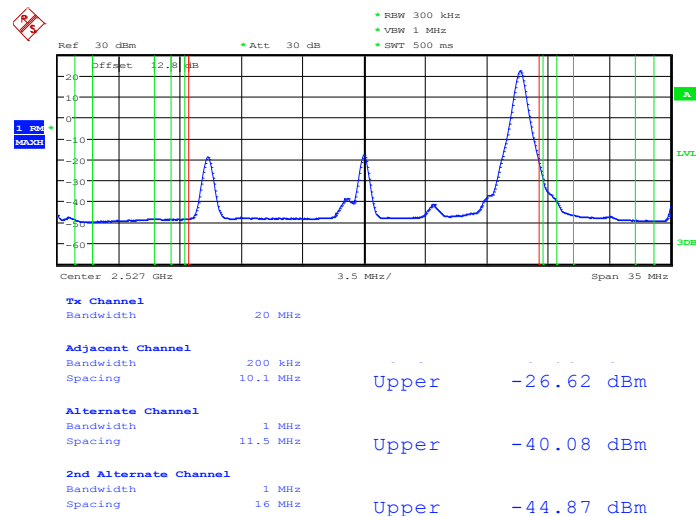
Date: 7.MAR.2013 21:27:09

Lower Band Edge Plot for QPSK-RB Size 100, RB Offset 0



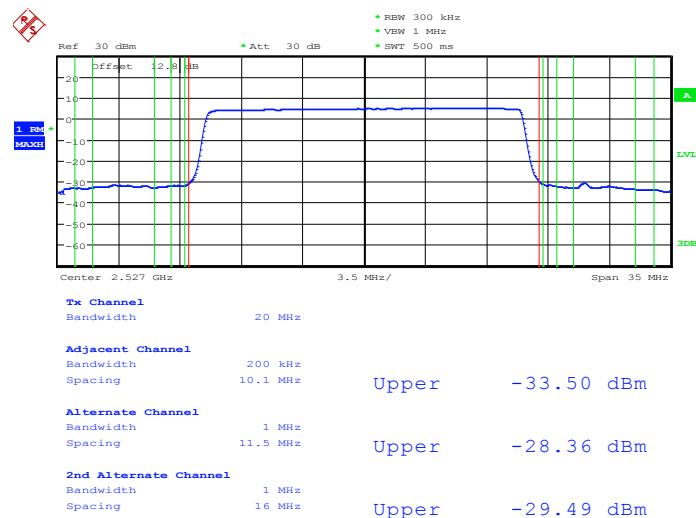
Date: 7.MAR.2013 21:25:43

Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 99



Date: 7.MAR.2013 21:24:24

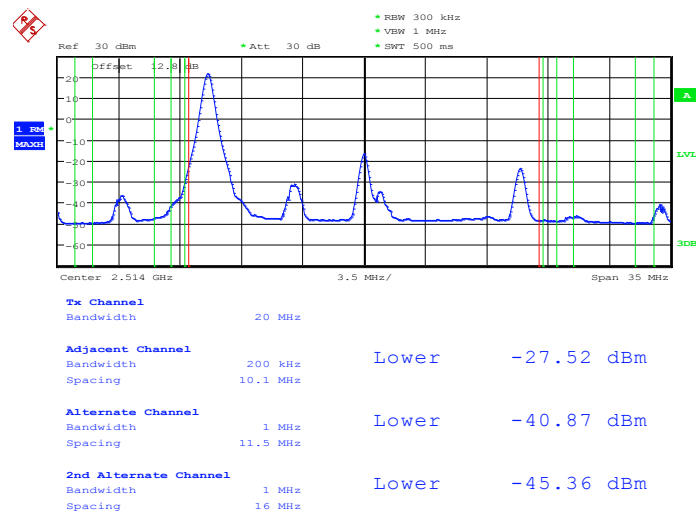
Higher Band Edge Plot for QPSK-RB Size 100, RB Offset 0



Date: 7.MAR.2013 21:23:36

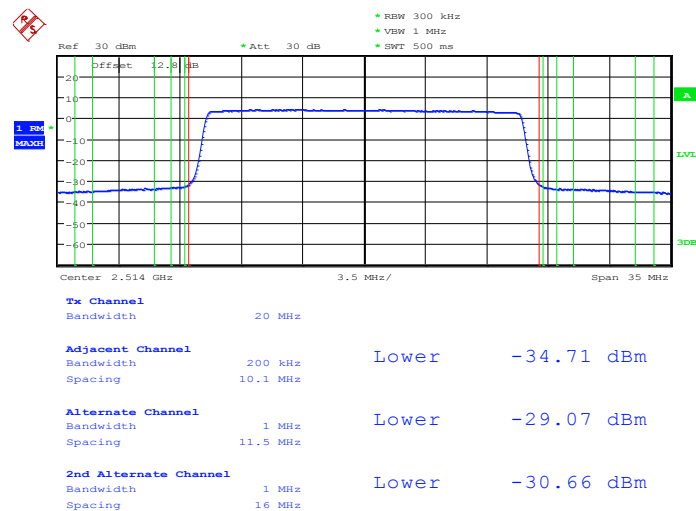
Band :	LTE Band 7	Band Width	20MHz / 16QAM
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Lower Band Edge Plot for 16QAM -RB Size 1, RB Offset 0



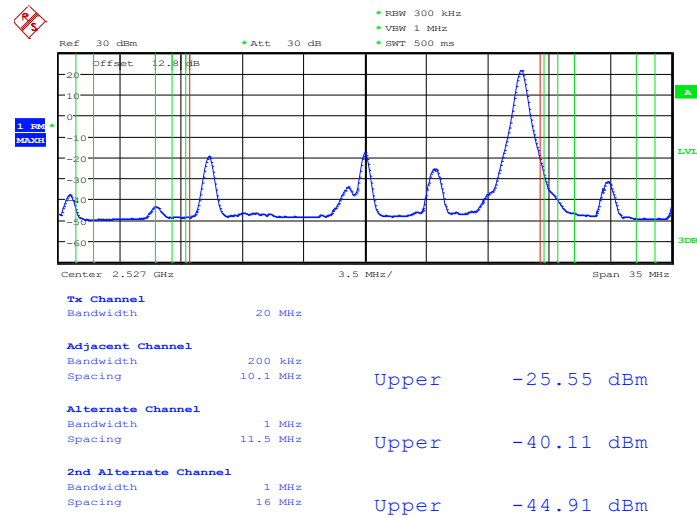
Date: 7.MAR.2013 21:27:29

Lower Band Edge Plot for 16QAM -RB Size 100, RB Offset 0



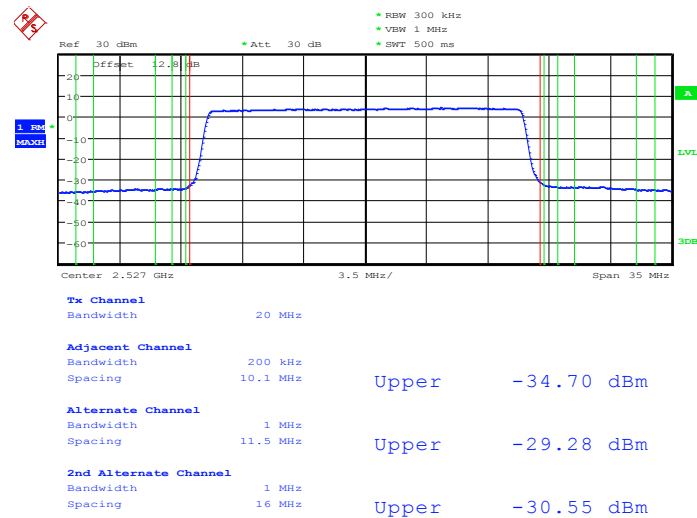
Date: 7.MAR.2013 21:26:00

Higher Band Edge Plot for 16QAM -RB Size 1, RB Offset 99



Date: 7.MAR.2013 21:25:08

Higher Band Edge Plot for 16QAM -RB Size 100, RB Offset 0

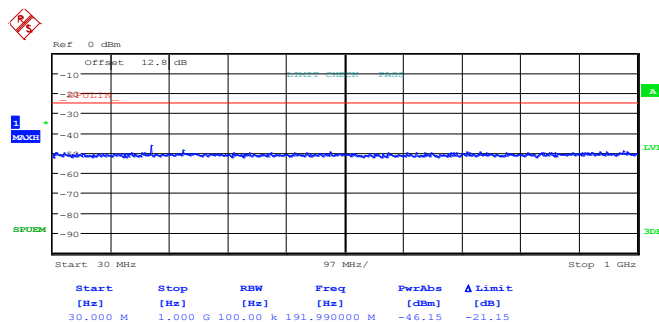


Date: 7.MAR.2013 21:23:48

3.3.6 Test Plots of Spurious Emission

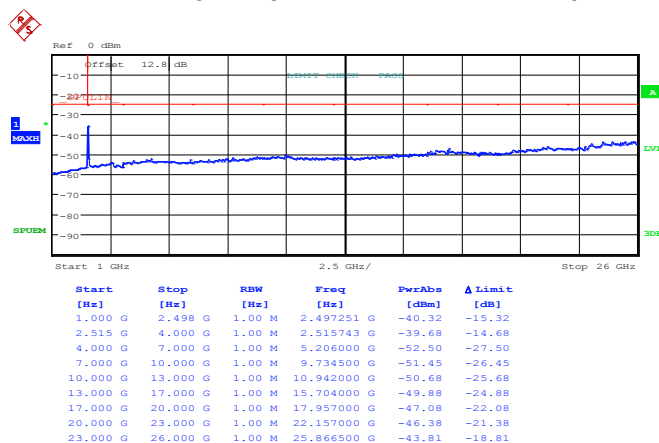
Band :	LTE Band 7	Bandwidth :	5MHz / QPSK
Frequency :	2506.5	Channel :	20815

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



Date: 7.MAR.2013 22:43:41

**Conducted Emission Plot (1GHz ~ 26GHz) for
QPSK (RB Size 1, RB Offset 24)**

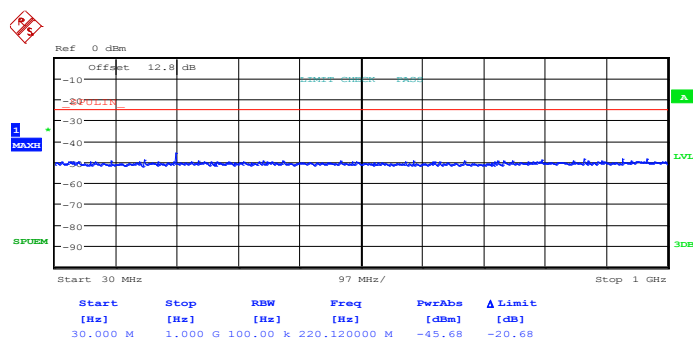


Date: 7.MAR.2013 22:35:33



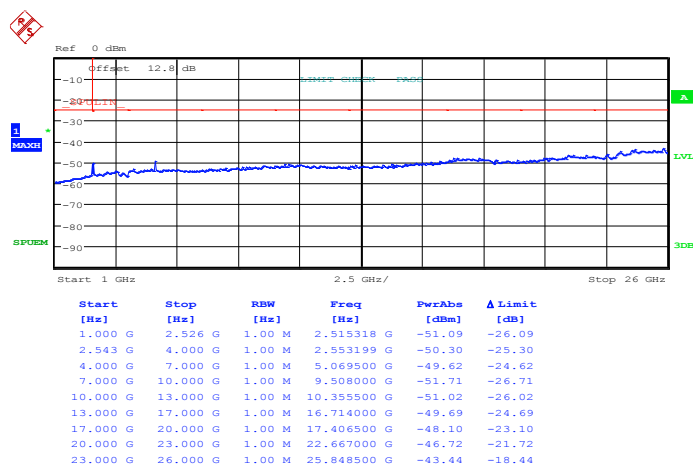
Band :	LTE Band 7	Bandwidth :	5MHz / QPSK
Frequency :	2534.5	Channel :	21095

Conducted Emission Plot (30MHz ~ 1GHz) for
QPSK (RB Size 1, RB Offset 12)



Date: 7.MAR.2013 22:42:59

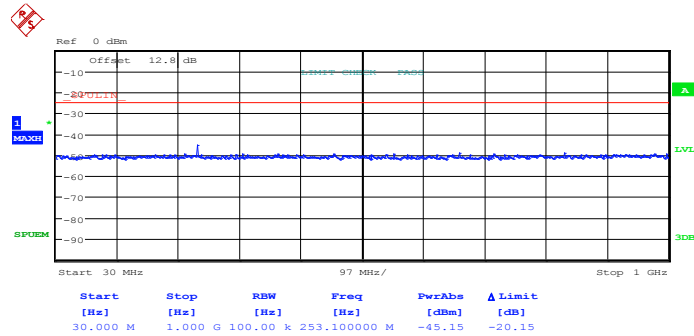
Conducted Emission Plot (1GHz ~ 26GHz) for
QPSK (RB Size 1, RB Offset 12)



Date: 7.MAR.2013 22:37:32

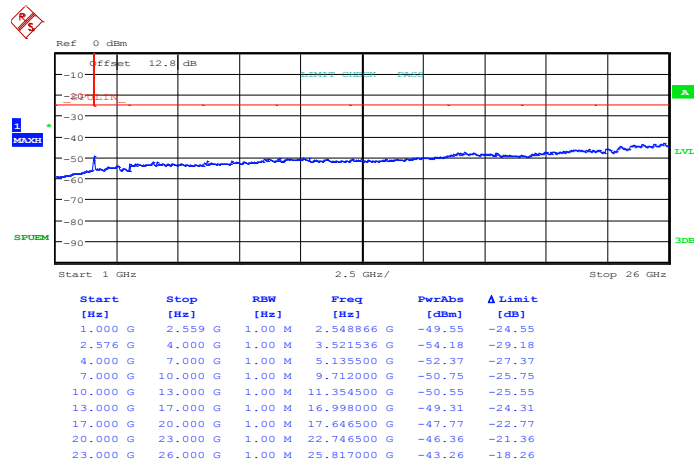
Band :	LTE Band 7	Bandwidth :	5MHz / QPSK
Frequency :	2567.5	Channel :	21425

**Conducted Emission Plot (30MHz ~ 1GHz) for
QPSK (RB Size 1, RB Offset 12)**



Date: 7.MAR.2013 22:42:38

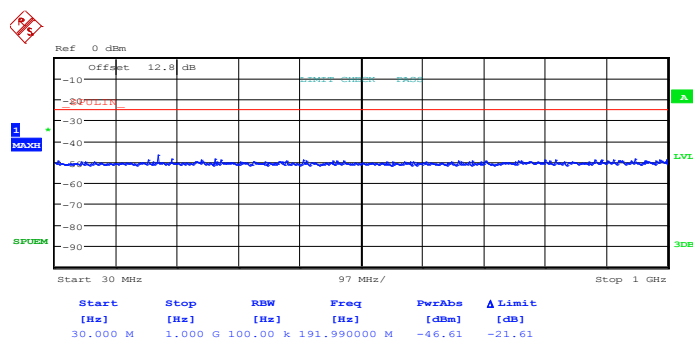
**Conducted Emission Plot (1GHz ~ 26GHz) for
QPSK (RB Size 1, RB Offset 12)**



Date: 7.MAR.2013 22:40:07

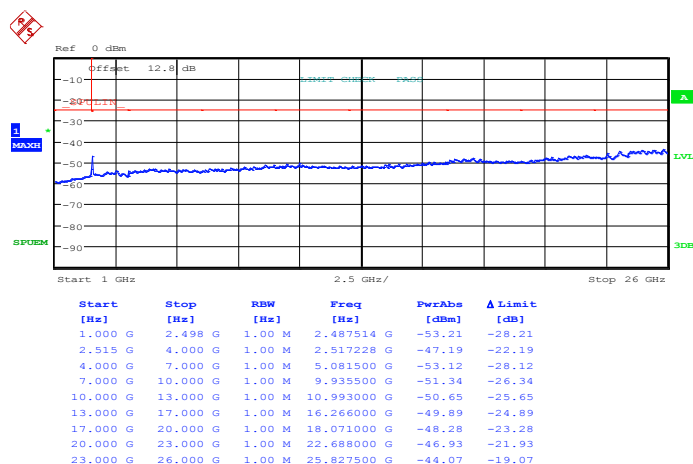
Band :	LTE Band 7	Bandwidth :	5MHz / 16QAM
Frequency :	2506.5	Channel :	20815

**Conducted Emission Plot (30MHz ~ 1GHz) for
16-QAM (RB Size 1, RB Offset 12)**



Date: 7.MAR.2013 22:43:30

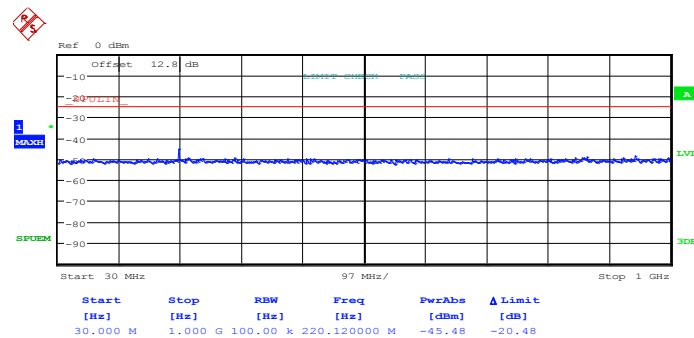
**Conducted Emission Plot (1GHz ~ 26GHz) for
16-QAM (RB Size 1, RB Offset 12)**



Date: 7.MAR.2013 22:36:05

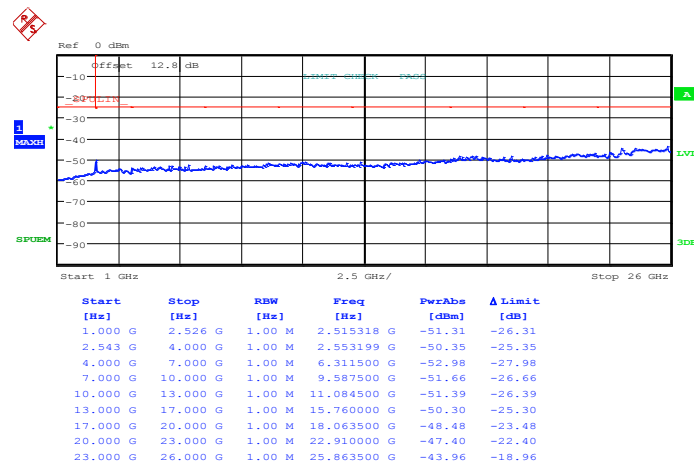
Band :	LTE Band 7	Bandwidth :	5MHz / 16QAM
Frequency :	2534.5	Channel :	21095

Conducted Emission Plot (30MHz ~ 1GHz) for 16-QAM (RB Size 1, RB Offset 12)



Date: 7.MAR.2013 22:43:07

Conducted Emission Plot (1GHz ~ 26GHz) for 16-QAM (RB Size 1, RB Offset 12)

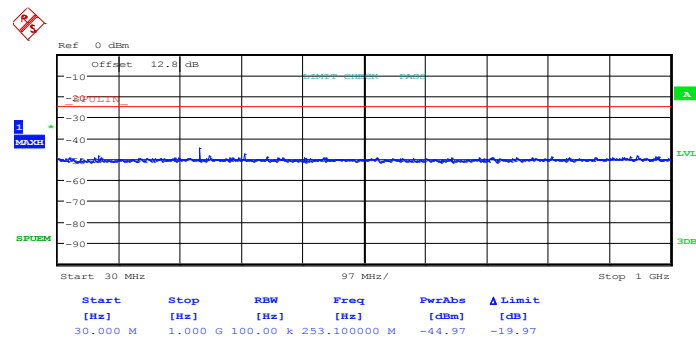


Date: 7.MAR.2013 22:37:46



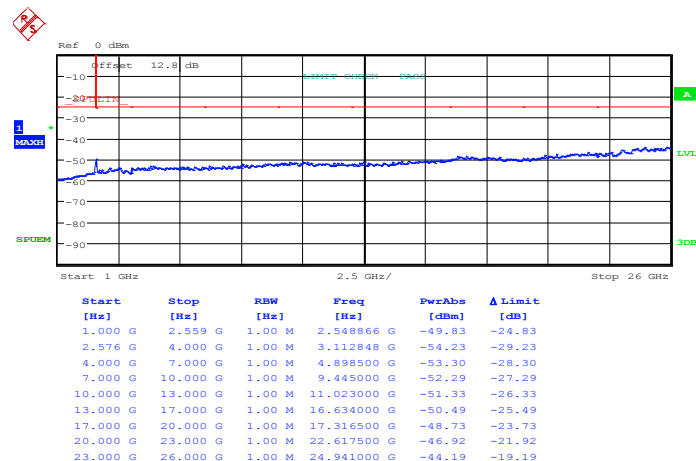
Band :	LTE Band 7	Bandwidth :	5MHz / 16QAM
Frequency :	2567.5	Channel :	21425

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



Date: 7.MAR.2013 22:42:28

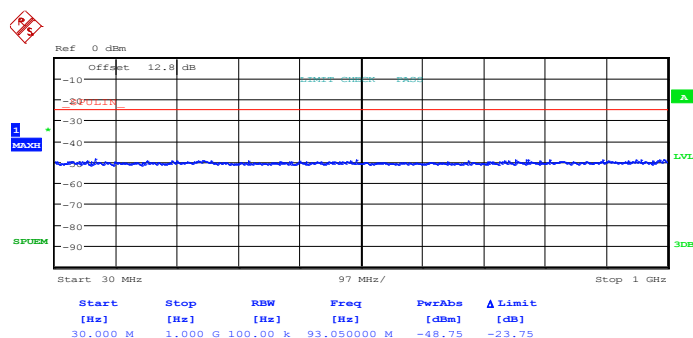
Conducted Emission Plot (1GHz ~ 26GHz) for
16-QAM (RB Size 1, RB Offset 24)



Date: 7.MAR.2013 22:40:32

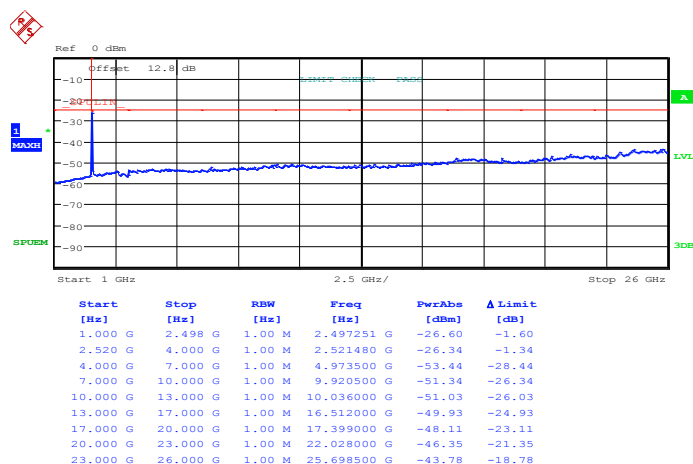
Band :	LTE Band 7	Bandwidth:	10MHz / QPSK
Frequency :	2509	Channel :	20840

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



Date: 7.MAR.2013 22:24:37

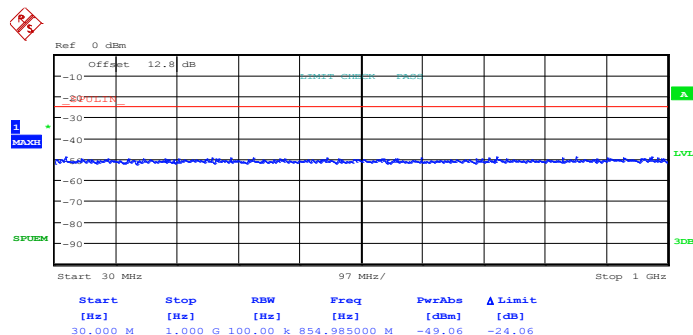
Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 24)



Date: 7.MAR.2013 22:27:22

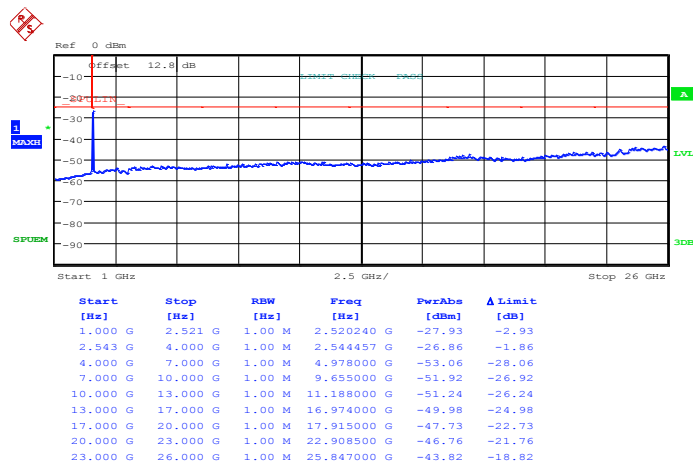
Band :	LTE Band 7	Bandwidth:	10MHz / QPSK
Frequency :	2532	Channel :	21070

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



Date: 7.MAR.2013 22:25:11

Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 24)

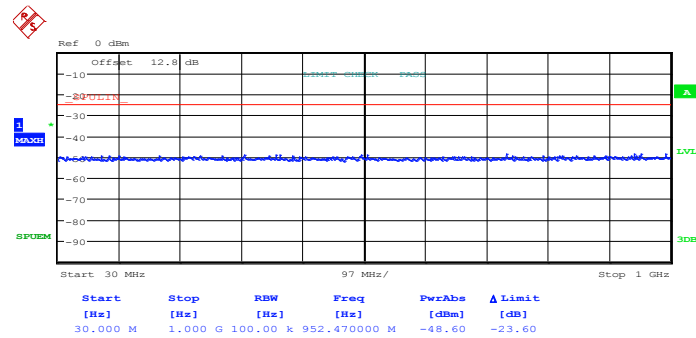


Date: 7.MAR.2013 22:28:38



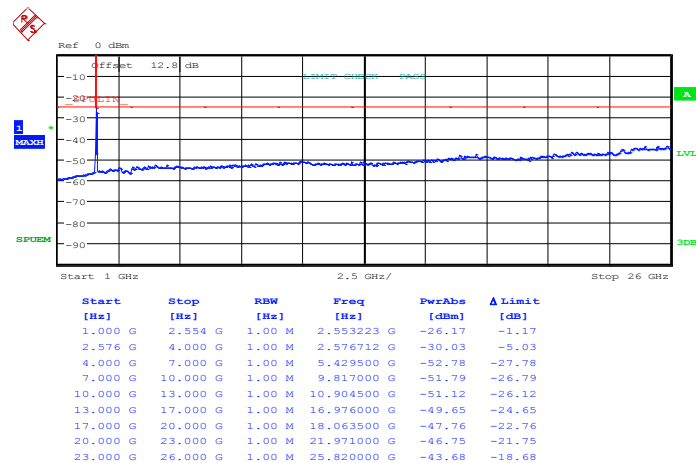
Band :	LTE Band 7	Bandwidth:	10MHz / QPSK
Frequency :	2565	Channel :	21400

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



Date: 7.MAR.2013 22:25:23

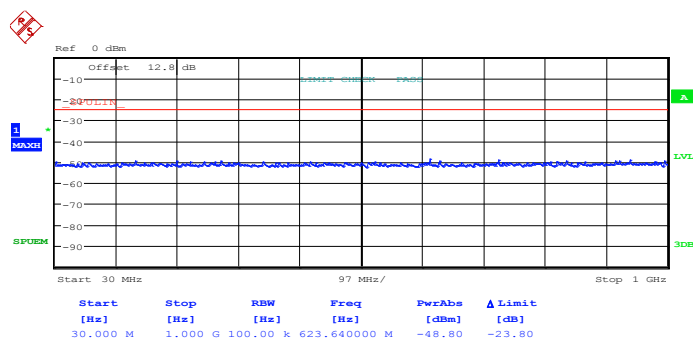
Conducted Emission Plot (1GHz ~ 26GHz) for
QPSK (RB Size 1, RB Offset 24)



Date: 7.MAR.2013 22:31:24

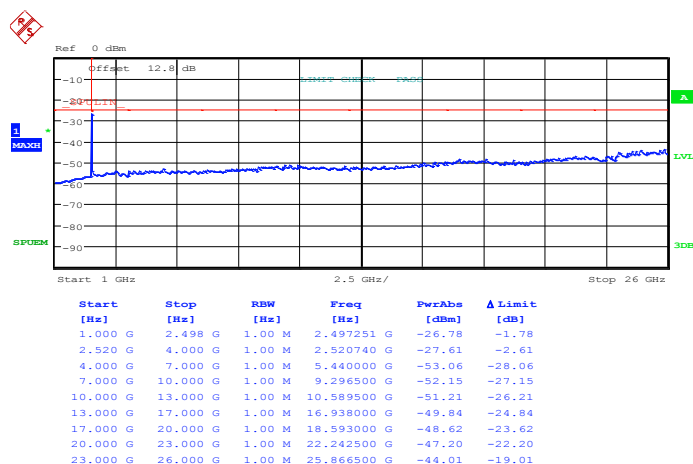
Band :	LTE Band 7	Bandwidth:	10MHz / 16QAM
Frequency :	2509	Channel :	20840

**Conducted Emission Plot (30MHz ~ 1GHz) for
16-QAM (RB Size 1, RB Offset 24)**



Date: 7.MAR.2013 22:24:44

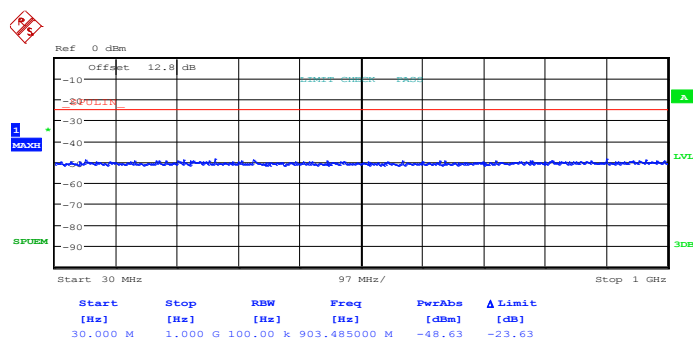
**Conducted Emission Plot (1GHz ~ 26GHz) for
16-QAM (RB Size 1, RB Offset 24)**



Date: 7.MAR.2013 22:27:38

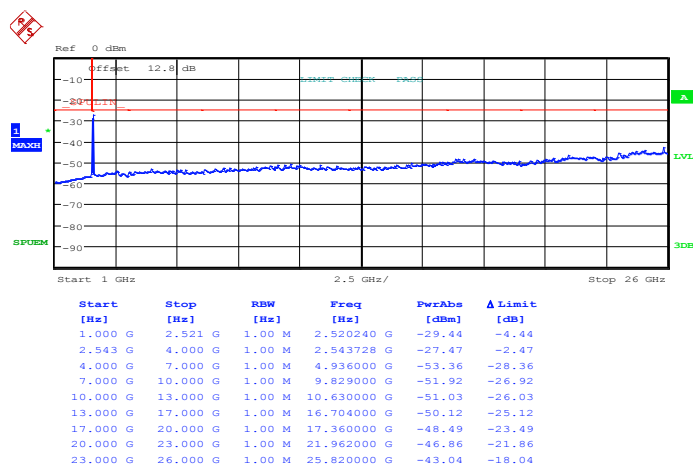
Band :	LTE Band 7	Bandwidth:	10MHz / 16QAM
Frequency :	2532	Channel :	21070

**Conducted Emission Plot (30MHz ~ 1GHz) for
16-QAM (RB Size 1, RB Offset 24)**



Date: 7.MAR.2013 22:25:02

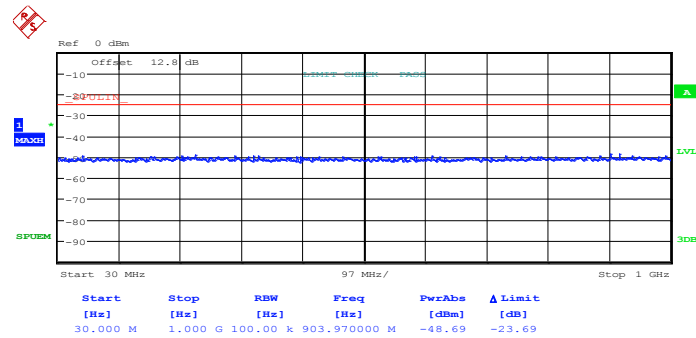
**Conducted Emission Plot (1GHz ~ 26GHz) for
16-QAM (RB Size 1, RB Offset 24)**



Date: 7.MAR.2013 22:28:50

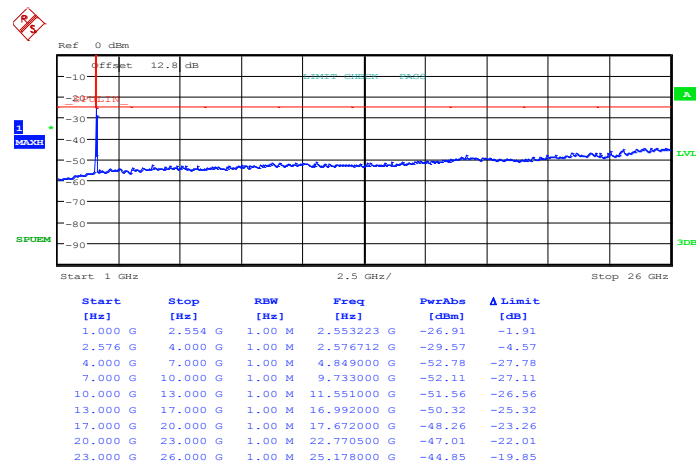
Band :	LTE Band 7	Bandwidth:	10MHz / 16QAM
Frequency :	2565	Channel :	21400

**Conducted Emission Plot (30MHz ~ 1GHz) for
16-QAM (RB Size 1, RB Offset 24)**



Date: 7.MAR.2013 22:25:31

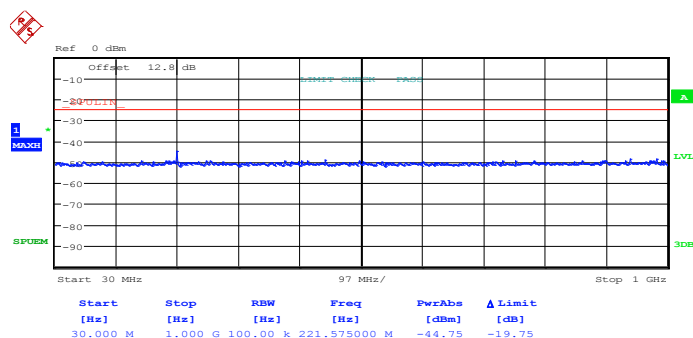
**Conducted Emission Plot (1GHz ~ 26GHz) for
16-QAM (RB Size 1, RB Offset 24)**



Date: 7.MAR.2013 22:31:37

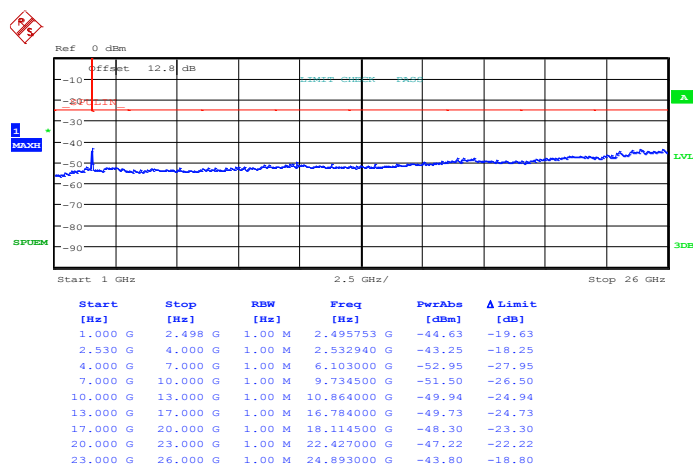
Band :	LTE Band 7	Bandwidth:	20MHz / QPSK
Frequency :	2514	Channel :	20890

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



Date: 7.MAR.2013 22:22:11

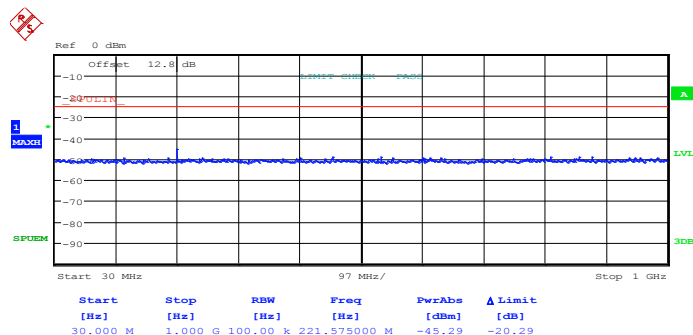
Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 49)



Date: 7.MAR.2013 22:17:03

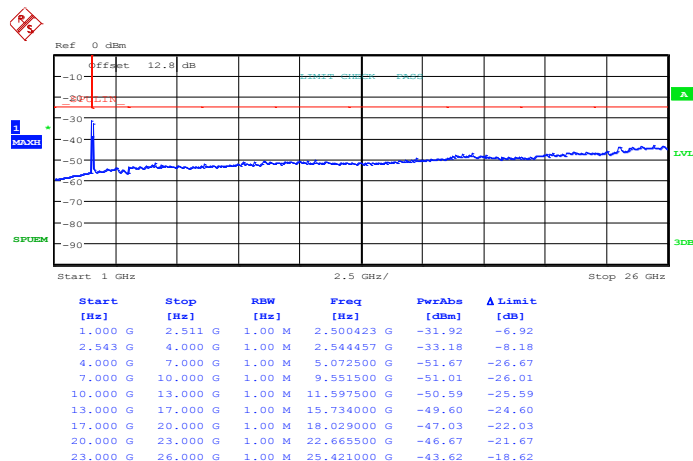
Band :	LTE Band 7	Bandwidth:	20MHz / QPSK
Frequency :	2527	Channel :	21020

Conducted Emission Plot (30MHz ~ 1GHz) for QPSK (RB Size 1, RB Offset 99)



Date: 7.MAR.2013 22:21:46

Conducted Emission Plot (1GHz ~ 26GHz) for QPSK (RB Size 1, RB Offset 99)

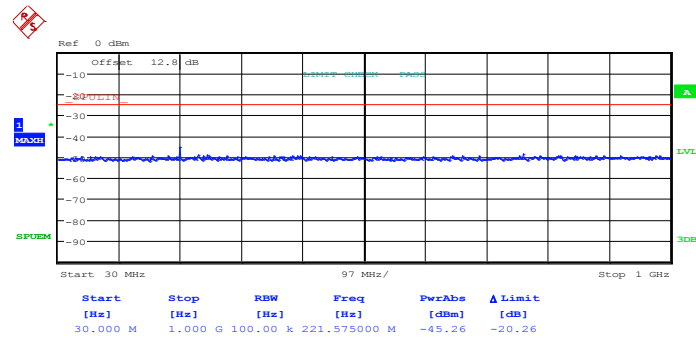


Date: 7.MAR.2013 22:20:43



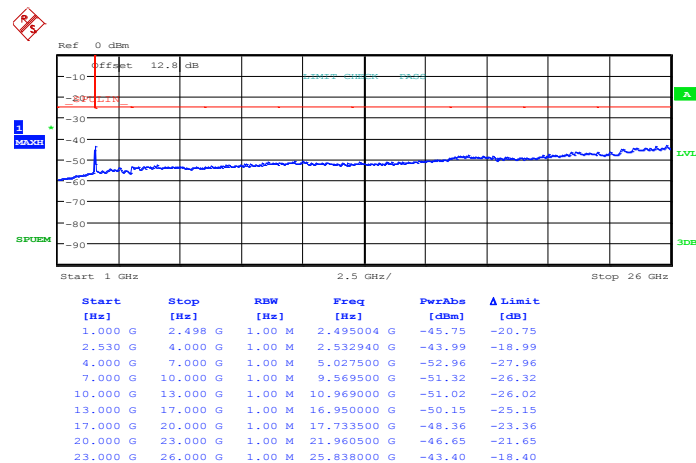
Band :	LTE Band 7	Bandwidth:	20MHz / 16QAM
Frequency :	2514	Channel :	20890

Conducted Emission Plot (30MHz ~ 1GHz) for
16-QAM (RB Size 1, RB Offset 99)



Date: 7.MAR.2013 22:21:59

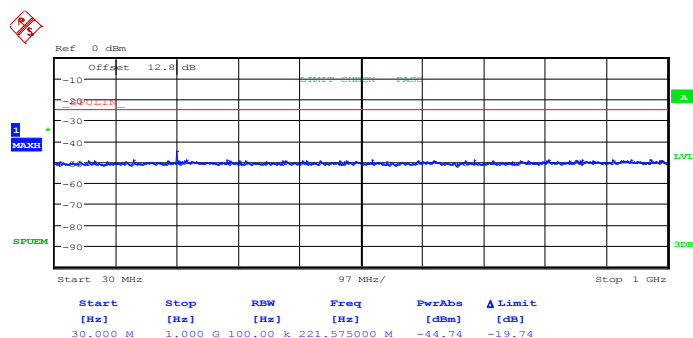
Conducted Emission Plot (1GHz ~ 26GHz) for
16-QAM (RB Size 1, RB Offset 99)



Date: 7.MAR.2013 22:16:07

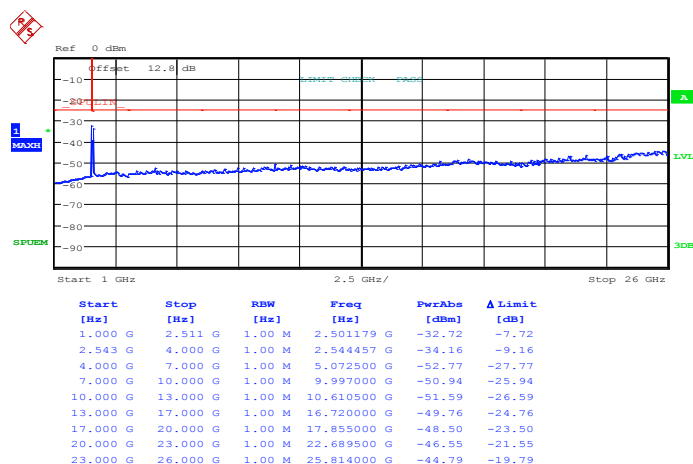
Band :	LTE Band 7	Bandwidth:	20MHz / 16QAM
Frequency :	2527	Channel :	21020

Conducted Emission Plot (30MHz ~ 1GHz) for 16-QAM (RB Size 1, RB Offset 99)



Date: 7.MAR.2013 22:21:36

Conducted Emission Plot (1GHz ~ 26GHz) for 16-QAM (RB Size 1, RB Offset 99)



Date: 7.MAR.2013 22:21:02

3.4 Radiated Emissions Measurement

3.4.1 Description of Radiated Emissions 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 mobile digital stations, the attenuation factor shall be not less than $55 + 10 \log (P)$ dB at 5.5 MHz from the channel edges. It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

3.4.2 Measuring Instruments

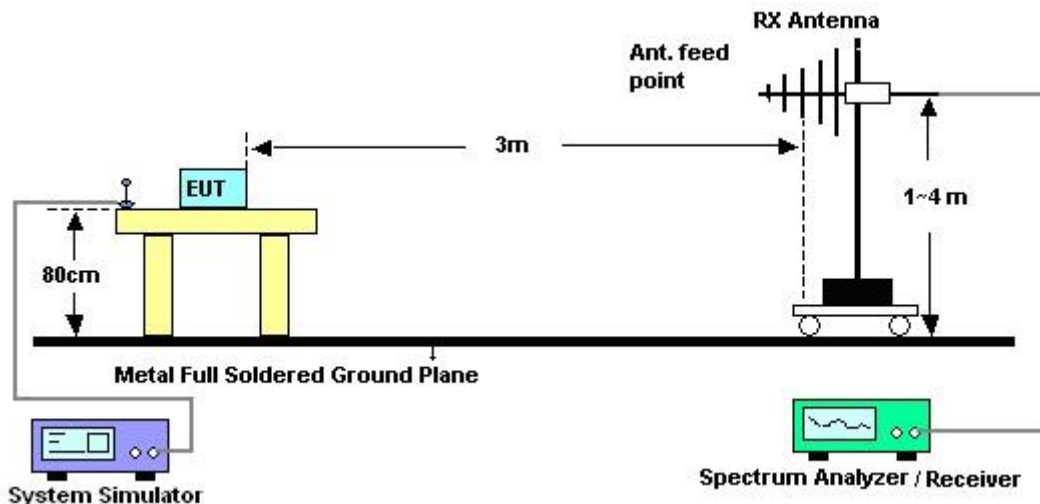
See list of measuring instruments of this test report.

3.4.3 Test Procedures

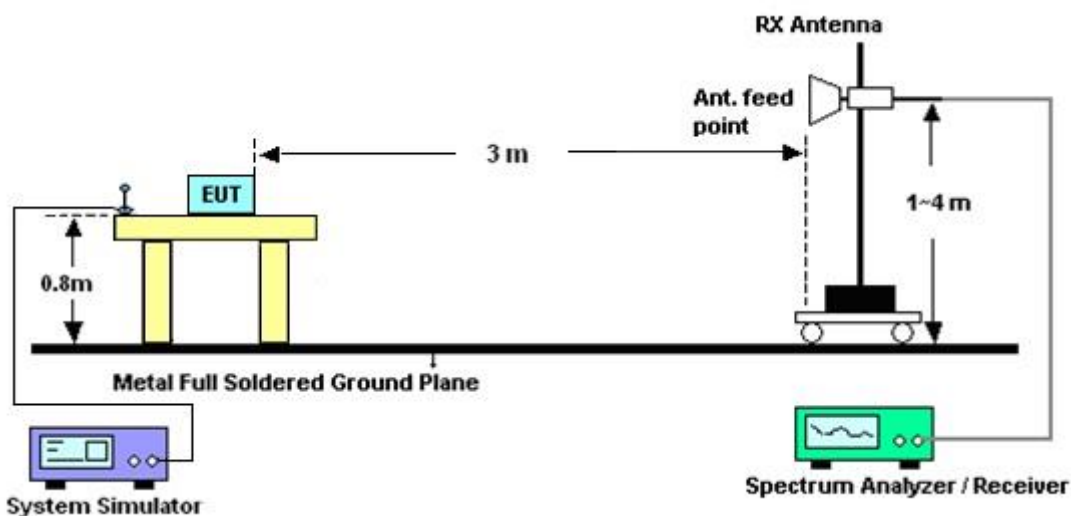
1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving 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 = 1MHz, 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.

3.4.4 Test Setup

For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz

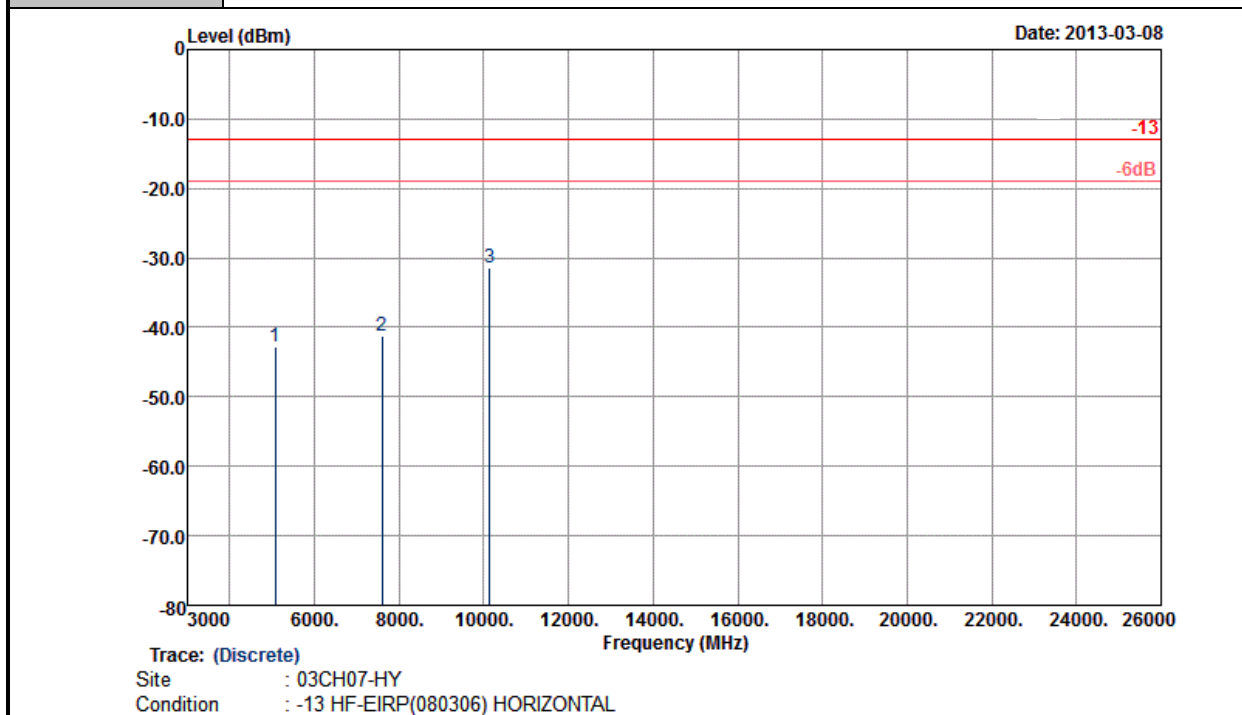


3.4.5 Test Results of Radiated Emissions (9 KHz ~ 30 MHz)

The low frequency, which started from 9 KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

3.4.6 Test Result of Radiated Emissions

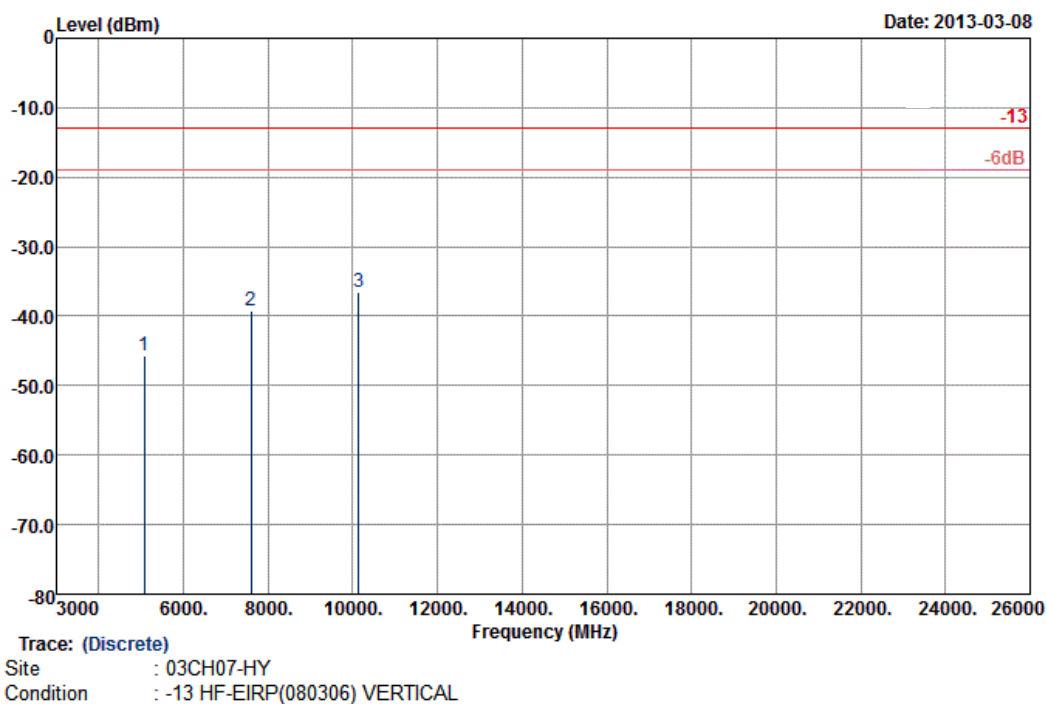
Band :	LTE Band 7	Temperature :	23~26°C
Test Mode :	5MHz, QPSK, RB Size 1, RB Offset 12	Relative Humidity :	41~42%
Test Engineer :	Gavin Wu	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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
5069	-42.70	-13	-29.70	-61.5	-46.24	6.91	10.45	H	Pass
7603.5	-41.28	-13	-28.28	-68.94	-44.25	9.35	12.32	H	Pass
10138	-31.40	-13	-18.40	-61.73	-35.77	8.63	13.00	H	Pass

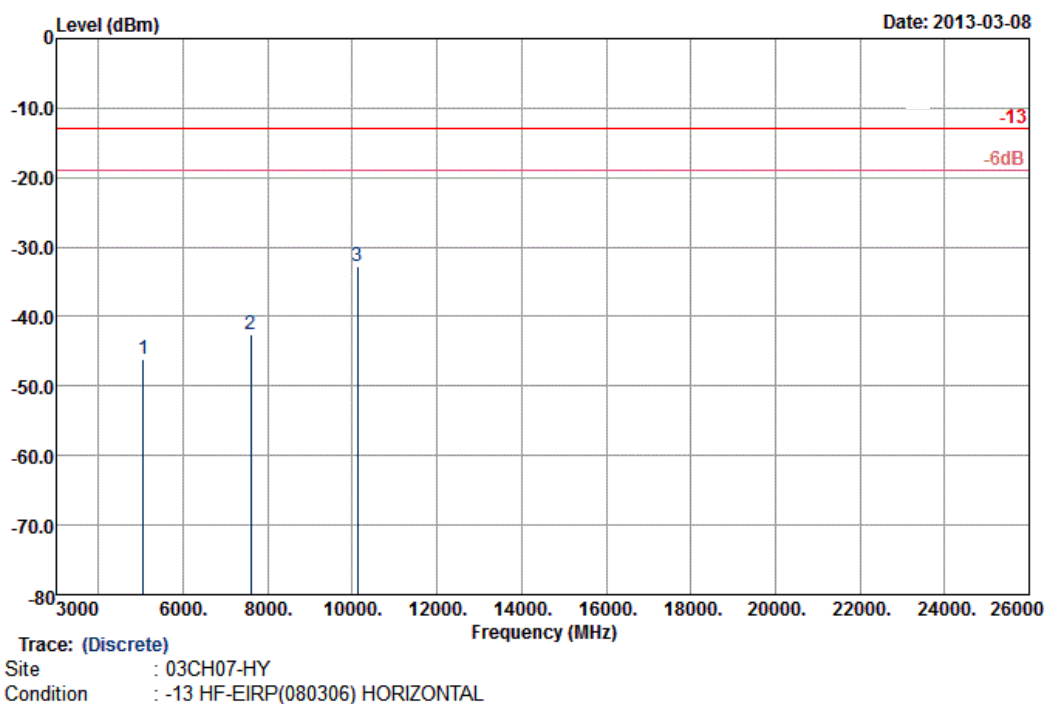


Band :	LTE Band 7	Temperature :	23~26°C
Test Mode :	5MHz, QPSK, RB Size 1, RB Offset 12	Relative Humidity :	41~42%
Test Engineer :	Gavin Wu	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



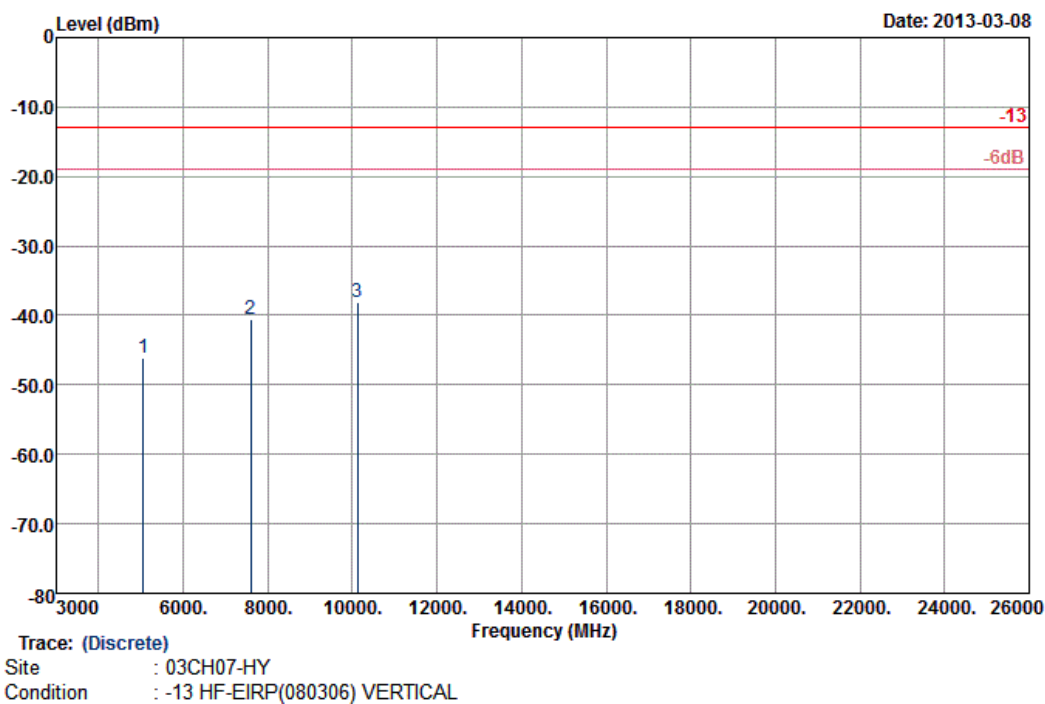
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5069	-45.72	-13	-32.72	-64.98	-49.26	6.91	10.45	V	Pass
7603.5	-39.27	-13	-26.27	-67.47	-42.24	9.35	12.32	V	Pass
10138	-36.51	-13	-23.51	-65.31	-40.88	8.63	13.00	V	Pass

Band :	LTE Band 7	Temperature :	23~26°C
Test Mode :	10MHz, QPSK, RB Size 1, RB Offset 24	Relative Humidity :	41~42%
Test Engineer :	Gavin Wu	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



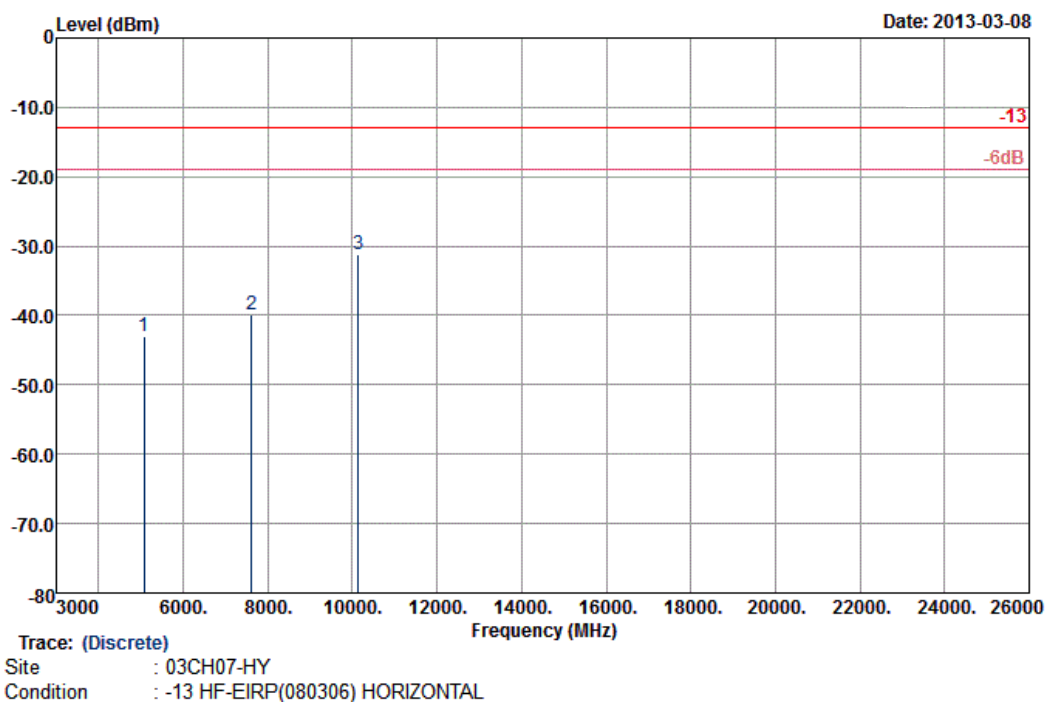
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5064	-46.11	-13	-33.11	-64.27	-49.65	6.91	10.45	H	Pass
7596	-42.60	-13	-29.60	-69.4	-45.57	9.35	12.32	H	Pass
10128	-32.77	-13	-19.77	-60.95	-37.14	8.63	13.00	H	Pass

Band :	LTE Band 7	Temperature :	23~26°C
Test Mode :	10MHz, QPSK, RB Size 1, RB Offset 24	Relative Humidity :	41~42%
Test Engineer :	Gavin Wu	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



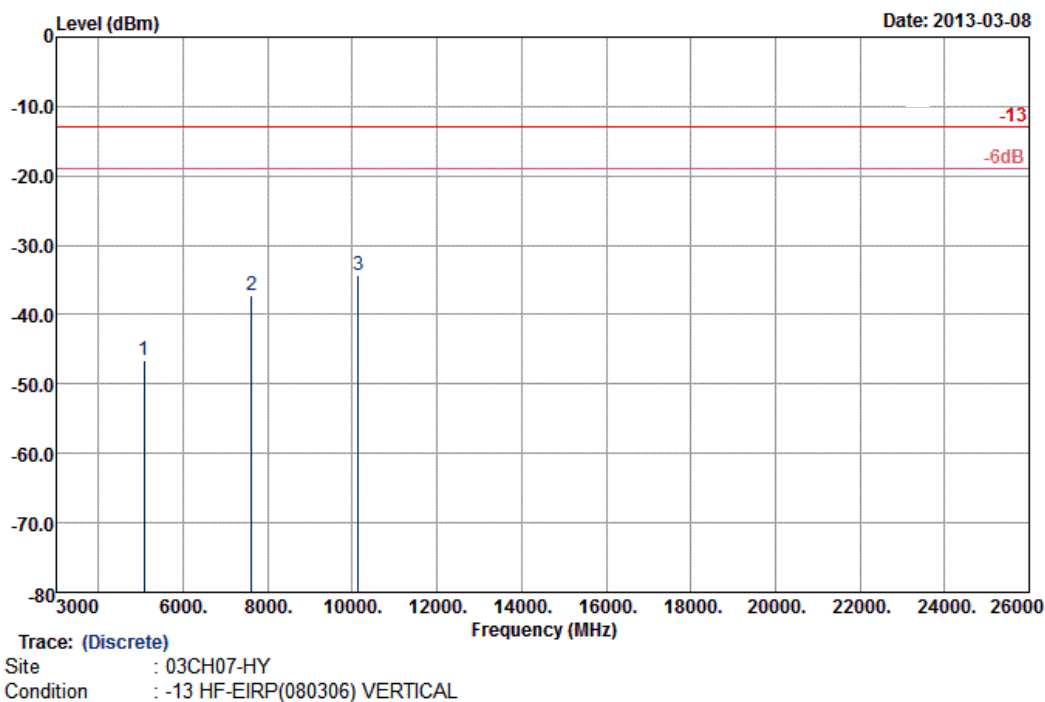
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
5064	-46.03	-13	-33.03	-65.73	-49.57	6.91	10.45	V	Pass
7596	-40.60	-13	-27.60	-67.49	-43.57	9.35	12.32	V	Pass
10128	-38.21	-13	-25.21	-66.65	-42.58	8.63	13.00	V	Pass

Band :	LTE Band 7	Temperature :	23~26°C
Test Mode :	20MHz, QPSK, RB Size 1, RB Offset 99	Relative Humidity :	41~42%
Test Engineer :	Gavin Wu	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
5072	-43.04	-13	-30.04	-62.89	-46.58	6.91	10.45	H	Pass
7608	-39.78	-13	-26.78	-67.65	-42.75	9.35	12.32	H	Pass
10144	-31.21	-13	-18.21	-61.74	-35.58	8.63	13.00	H	Pass

Band :	LTE Band 7	Temperature :	23~26°C
Test Mode :	20MHz, QPSK, RB Size 1, RB Offset 99	Relative Humidity :	41~42%
Test Engineer :	Gavin Wu	Polarization :	Vertical
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
5072	-46.60	-13	-33.60	-65.65	-50.14	6.91	10.45	V	Pass
7608	-37.28	-13	-24.28	-64.88	-40.25	9.35	12.32	V	Pass
10144	-34.22	-13	-21.22	-63.16	-38.59	8.63	13.00	V	Pass

3.5 Frequency Stability Measurement

3.5.1 Description of Frequency Stability Measurement

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized frequency band. For equipment authorization purposes, this is a reporting requirement only.

3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

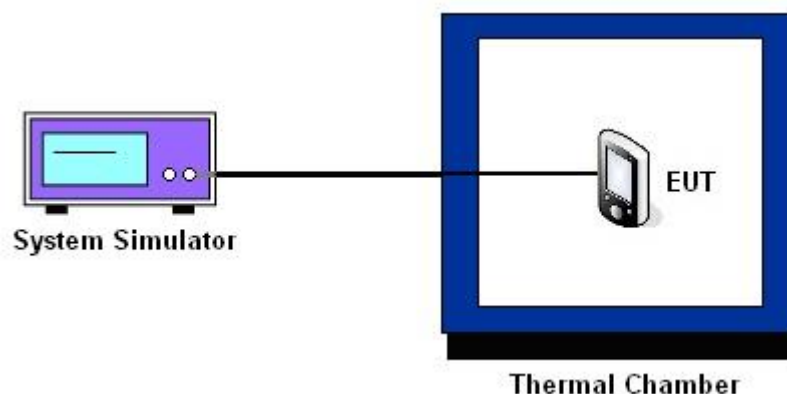
3.5.3 Test Procedures for Temperature Variation

1. The EUT was set up in the thermal chamber and connected with the system simulator.
2. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. 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 cannot be turned on at -30°C, the testing lowest temperature will be raised in 10°C step until the EUT can be turned on.

3.5.4 Test Procedures for Voltage Variation

1. The EUT was placed in a temperature chamber at 25±5 °C and connected with the system simulator.
2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

3.5.5 Test Setup



3.5.6 Test Result of Temperature Variation

Band :		LTE Band 7 (QPSK)			Limit (ppm) :		2.5
Temperature (°C)	5MHz		10MHz		20MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-10.7	-0.004	-7.1	-0.003	19.8	0.008	PASS
-20	9.1	0.004	-7.6	-0.003	11.9	0.005	
-10	11.4	0.004	5.7	0.002	-6.1	-0.002	
0	-8.5	-0.003	7.7	0.003	6.5	0.003	
10	7.6	0.003	8.1	0.003	8.7	0.003	
20	8.7	0.003	7.5	0.003	7.4	0.003	
30	6.6	0.003	7.5	0.003	9.0	0.004	
40	7.6	0.003	8.1	0.003	8.8	0.003	
50	8.2	0.003	5.6	0.002	8.1	0.003	
55	13.5	0.005	8.5	0.003	-6.4	-0.003	

Band :		LTE Band 7 (16QAM)			Limit (ppm) :		2.5
Temperature (°C)	5MHz		10MHz		20MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	11.2	0.004	-7.0	-0.003	12.3	0.005	PASS
-20	8.4	0.003	-6.5	-0.003	11.5	0.005	
-10	9.6	0.004	-6.9	-0.003	-8.6	-0.003	
0	-10.1	-0.004	7.1	0.003	10.3	0.004	
10	-7.6	-0.003	7.6	0.003	9.1	0.004	
20	-7.9	-0.003	7.2	0.003	7.2	0.003	
30	8.1	0.003	7.0	0.003	8.5	0.003	
40	5.9	0.002	-6.9	-0.003	9.2	0.004	
50	6.2	0.002	7.6	0.003	8.6	0.003	
55	31.7	0.013	10.4	0.004	8.5	0.003	

3.5.7 Test Result of Voltage Variation

Band	Band Width & Channel	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 7 (QPSK)	5MHz	4.35	-11.7	-0.005	2.5	PASS
		3.8	13.1	0.005		
		3.4	-12.1	-0.005		
	10MHz	4.35	-11.0	-0.004		
		3.8	-8.5	-0.003		
		3.4	-9.8	-0.004		
	20MHz	4.35	-8.7	-0.003		
		3.8	-7.5	-0.003		
		3.4	-14.2	-0.006		

Band	Band Width & Channel	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 7 (16QAM)	5MHz	4.35	-18.1	-0.007	2.5	PASS
		3.80	-8.4	-0.003		
		3.40	-16.9	-0.007		
	10MHz	4.35	-15.8	-0.006		
		3.80	-9.6	-0.004		
		3.40	-11.4	-0.005		
	20MHz	4.35	-12.6	-0.005		
		3.80	-10.2	-0.004		
		3.40	-15.8	-0.006		

Remark:

1. Normal Voltage = 3.8V.
2. The manufacturer declared that the EUT could work properly between voltage 3.4V ~ 4.35V.

3.5.8 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 06, 2012	Mar. 07, 2013	Jun. 05, 2013	Conducted (TH02-HY)
Thermal Chamber	Ten Billion	TTH-D3SP	TBN-930701	N/A	Jul. 23, 2012	Mar. 07, 2013	Jul. 22, 2013	Conducted (TH02-HY)
Bilog Antenna	Schaffner	CBL6111C	2726	30MHz ~ 1GHz	Oct. 06, 2012	Mar. 07, 2013 ~ Mar. 08, 2013	Oct. 05, 2013	Radiation (03CH07-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101067	9KHz ~ 30GHz	Nov. 30, 2012	Mar. 07, 2013 ~ Mar. 08, 2013	Nov. 29, 2013	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 22, 2012	Mar. 07, 2013 ~ Mar. 08, 2013	Aug. 21, 2013	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Dec. 01, 2012	Mar. 07, 2013 ~ Mar. 08, 2013	Nov. 30, 2013	Radiation (03CH07-HY)
Pre Amplifier	MITEQ	AMF-7D-00 101800-30-1 0P	159088	1GHz ~ 18GHz	Mar. 10, 2012	Mar. 07, 2013 ~ Mar. 08, 2013	Mar. 09, 2013	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10-1000MHz. 32dB.GAIN	Feb. 26, 2013	Mar. 07, 2013 ~ Mar. 08, 2013	Feb. 25, 2014	Radiation (03CH07-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Sep. 03, 2012	Mar. 07, 2013 ~ Mar. 08, 2013	Sep. 02, 2013	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBEC K	BBHA 9170	BBHA9170251	15GHz ~ 40GHz	Sep. 28, 2012	Mar. 07, 2013 ~ Mar. 08, 2013	Sep. 27, 2013	Radiation (03CH07-HY)
LTE Base Station	Anritsu	MT8820C	6201074414	N/A	Dec. 11, 2012	Mar. 07, 2013 ~ Mar. 08, 2013	Dec. 10, 2014	-

4 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.54
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Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.72
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Appendix A. Photographs of EUT

Please refer to Sporton report number EP330402 as below.