

FCC RF Test Report

APPLICANT : Elk LLC
EQUIPMENT : Tablet PC
MODEL NAME : 3HT7G
FCC ID : ZHT-1013
STANDARD : 47 CFR Part 2, 27
CLASSIFICATION : PCS Licensed Transmitter (PCB)
TX FREQUENCY RANGE : 1712.5 MHz ~ 1752.5 MHz (LTE – Band 4)
706.5 MHz ~ 713.5 MHz (LTE – Band 17)
RX FREQUENCY RANGE : 2112.5 MHz ~ 2152.5 MHz (LTE – Band 4)
736.5 MHz ~ 743.5 MHz (LTE – Band 17)
MAX. ERP/EIRP POWER : 0.2427 W (LTE Band 4 QPSK, BW 5MHz)
0.2388 W (LTE Band 4 16QAM, BW 5MHz)
0.2213 W (LTE Band 4 QPSK, BW 10MHz)
0.2371 W (LTE Band 4 16QAM, BW 10MHz)
0.2685 W (LTE Band 4 QPSK, 15MHz)
0.2427 W (LTE Band 4 16QAM, 15MHz)
0.2825 W (LTE Band 4 QPSK, 20MHz)
0.2742 W (LTE Band 4 16QAM, 20MHz)
0.1778 W (LTE Band 17 QPSK, BW 5MHz)
0.1845 W (LTE Band 17 16QAM, BW 5MHz)
0.1954 W (LTE Band 17 QPSK, BW 10MHz)
0.1618 W (LTE Band 17 16QAM, BW 10MHz)

The product was completely tested on Aug. 21, 2012. We, SPORTON INTERNATIONAL 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 INC., the test report shall not be reproduced except in full.

Reviewed by:



Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

Report No. : FG240709B
Report Version : Rev. 02
Page Number : 1 of 106

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG240709B	Rev. 01	Initial issue of report	Aug. 24,2012
FG240709B	Rev. 02	Updated the EIRP/ERP description.	Sept. 10, 2012

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	§2.1046	Conducted Output Power	NA	PASS	
3.2	N/A	Peak-to-Average Ratio	< 13 dB	PASS	-
3.3	§27.50(c)(10) §27.50(d)(4)	Effective Radiated Power and Equivalent Isotropic Radiated Power	ERP < 3 Watts (Band 17) EIRP < 1 Watt (Band 4)	PASS	-
3.4	§2.1049	Occupied Bandwidth	NA	PASS	-
3.5	§2.1049 §27.53(g)(h)	Emission Mask Measurement	< 43+10log ₁₀ (P[Watts])	PASS	-
3.6	§2.1051 §27.53(g)(h)	Conducted Emission	< 43+10log ₁₀ (P[Watts])	PASS	-
3.7	§2.1053 §27.53(g)(h)	Undesirable Out of Band Emissions	< 43+10log ₁₀ (P[Watts])	PASS	Under limit 23.41 dB at 5242.000 MHz
3.8	§2.1055 §27.54	Frequency Stability Temperature & Voltage	< 2.5 ppm	PASS	-

1 General Description

1.1 Applicant

Elk LLC

Suite 100, 2730 Gateway Oaks Drive Sacramento, CA 95833

1.2 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Tablet PC
Model Name	3HT7G
FCC ID	ZHT-1013
Tx Frequency	LTE Band 4 : 1712.5MHz ~ 1752.5 MHz LTE Band 17 : 706.5 MHz ~ 713.5 MHz
Rx Frequency	LTE Band 4 : 2112.5 MHz ~ 2152.5 MHz LTE Band 17 : 736.5 MHz ~ 743.5 MHz
Bandwidth	5MHz / 10MHz / 15MHz / 20MHz (Band 4) 5MHz / 10MHz (Band 17)
Maximum Output Power to Antenna	LTE Band 4 : 24.43 dBm LTE Band 17 : 23.23 dBm
Antenna Type	Fixed Internal Antenna
EUT Stage	Production Unit

1.3 Emission Designator

FCC Rule	System	Type of Modulation	BW	Emission Designator	Maximum ERP/EIRP
Part 27	LTE Band 4	QPSK	5MHz	4M50G7D	0.2427 W
Part 27	LTE Band 4	16QAM	5MHz	4M50W7D	0.2388 W
Part 27	LTE Band 4	QPSK	10MHz	9M13G7D	0.2213 W
Part 27	LTE Band 4	16QAM	10MHz	9M10W7D	0.2371 W
Part 27	LTE Band 4	QPSK	15MHz	13M6G7D	0.2685 W
Part 27	LTE Band 4	16QAM	15MHz	13M6W7D	0.2427 W
Part 27	LTE Band 4	QPSK	20MHz	18M8G7D	0.2825 W
Part 27	LTE Band 4	16QAM	20MHz	18M9W7D	0.2742 W
Part 27	LTE Band 17	QPSK	5MHz	4M52G7D	0.1778 W
Part 27	LTE Band 17	16QAM	5MHz	4M50W7D	0.1845 W
Part 27	LTE Band 17	QPSK	10MHz	9M17G7D	0.1954 W
Part 27	LTE Band 17	16QAM	10MHz	9M13W7D	0.1618 W

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978		
Test Site No.	Sporton Site No.		FCC/IC Registration No.
	TH02-HY	03CH07-HY	TW1022/4086B-1

1.5 Applied Standards

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

- 47 CFR Part 2, 27
- ANSI / TIA / EIA-603-C-2004
- FCC KDB 971168 D01 Power Meas. License Digital Systems v01

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.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded, 1.8 m

2 Test Configuration of Equipment Under Test

2.1 Test Mode

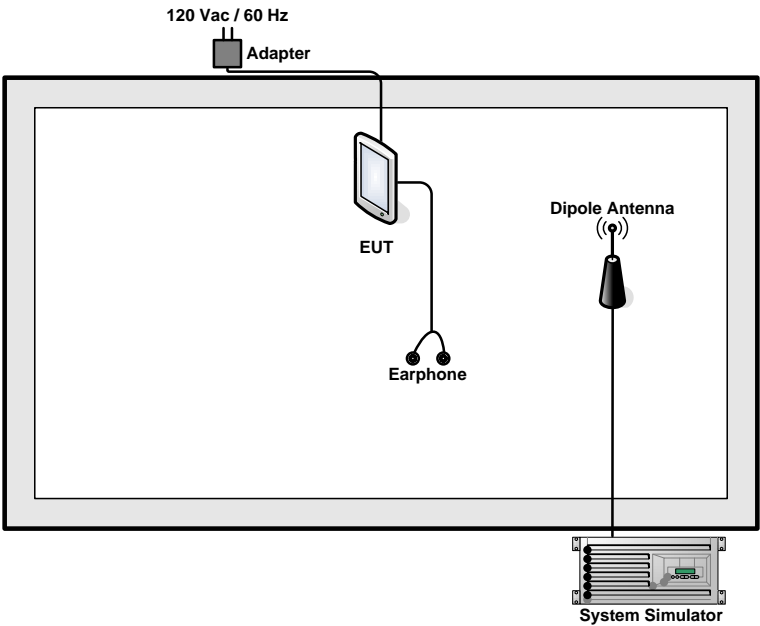
During all testing, EUT is in link mode with base station emulator at maximum power level. The spurious emission measurements were carried out in semi-anechoic chamber with 3-meter test range.

Frequency range investigated for radiated emission: 30MHz to 10th harmonic.

Test Modes			
Band		Radiated TCs	Conducted TCs
		Modulation : QPSK / 16QAM	Modulation : QPSK / 16QAM
LTE Band 4	BW 5MHz	■ LTE (RB Size 1, RB Offset 0) Link	■ LTE (RB Size 1, RB Offset 0) Link ■ LTE (RB Size 1, RB Offset 24) Link ■ LTE (RB Size 12, RB Offset 0) Link ■ LTE (RB Size 25, RB Offset 0) Link
	BW 10MHz	■ LTE (RB Size 1, RB Offset 0) Link	■ LTE (RB Size 1, RB Offset 0) Link ■ LTE (RB Size 1, RB Offset 49) Link ■ LTE (RB Size 25, RB Offset 0) Link ■ LTE (RB Size 50, RB Offset 0) Link
	BW 15MHz	■ LTE (RB Size 1, RB Offset 0) Link	■ LTE (RB Size 1, RB Offset 0) Link ■ LTE (RB Size 1, RB Offset 74) Link ■ LTE (RB Size 36, RB Offset 0) Link ■ LTE (RB Size 75, RB Offset 0) Link
	BW 20MHz	■ LTE (RB Size 1, RB Offset 0) Link	■ LTE (RB Size 1, RB Offset 0) Link ■ LTE (RB Size 1, RB Offset 99) Link ■ LTE (RB Size 50, RB Offset 0) Link ■ LTE (RB Size 100, RB Offset 0) Link
LTE Band 17	BW 5MHz	■ LTE (RB Size 1, RB Offset 0) Link	■ LTE (RB Size 1, RB Offset 0) Link ■ LTE (RB Size 1, RB Offset 24) Link ■ LTE (RB Size 12, RB Offset 0) Link ■ LTE (RB Size 25, RB Offset 0) Link
	BW 10MHz	■ LTE (RB Size 1, RB Offset 0) Link	■ LTE (RB Size 1, RB Offset 0) Link ■ LTE (RB Size 1, RB Offset 49) Link ■ LTE (RB Size 25, RB Offset 0) Link ■ LTE (RB Size 50, RB Offset 0) Link

Note: For radiated spurious emissions, the QPSK mode was chosen since RF power is higher than 16QAM modulation, and no modulation-related spurious emission is identified in conducted spurious emission to demonstrate compliance with the limit.

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.

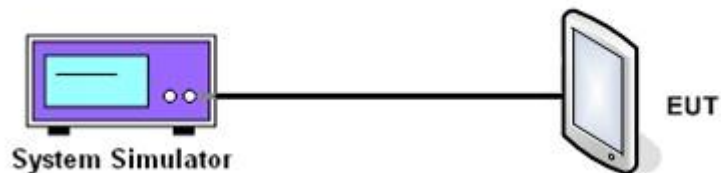
3.1.2 Measuring Instruments

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

Operation Band	Band Width	Modulation	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (Watts)	PAPR (dB)
LTE Band 4	5MHz	QPSK	19975	1712.5	24.36	0.2729	5.45
			20175	1732.5	23.96	0.2489	5.45
			20375	1752.5	23.90	0.2455	5.45
		16QAM	19975	1712.5	23.92	0.2466	6.15
			20175	1732.5	22.98	0.1986	6.15
			20375	1752.5	22.89	0.1945	6.15
	10MHz	QPSK	20000	1715.0	24.09	0.2564	5.61
			20175	1732.5	24.06	0.2547	5.61
			20350	1750.0	23.94	0.2477	5.61
		16QAM	20000	1715.0	23.86	0.2432	6.22
			20175	1732.5	23.01	0.2000	6.22
			20350	1750.0	22.82	0.1914	6.22
	15MHz	QPSK	20025	1717.5	24.19	0.2624	5.88
			20175	1732.5	24.16	0.2606	5.88
			20325	1747.5	24.06	0.2547	5.88
		16QAM	20025	1717.5	23.76	0.2377	6.84
			20175	1732.5	23.01	0.2000	6.84
			20325	1747.5	22.80	0.1905	6.84
	20MHz	QPSK	20050	1720.0	24.43	0.2773	6.60
			20175	1732.5	24.21	0.2636	6.60
			20300	1745.0	24.24	0.2655	6.60
		16QAM	20050	1720.0	23.76	0.2377	7.20
			20175	1732.5	23.04	0.2014	7.20
			20300	1745.0	22.98	0.1986	7.20

Operation Band	Band Width	Modulation	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (Watts)	PAPR (dB)
LTE Band 17	5MHz	QPSK	23755	706.5	22.80	0.1905	5.90
			23790	710.0	22.81	0.1910	5.90
			23825	713.5	22.80	0.1905	5.90
		16QAM	23755	706.5	22.03	0.1596	6.57
			23790	710.0	22.04	0.1600	6.57
			23825	713.5	21.65	0.1462	6.57
	10MHz	QPSK	23780	709.0	23.22	0.2099	6.03
			23790	710.0	23.23	0.2104	6.03
			23800	711.0	23.21	0.2094	6.03
		16QAM	23780	709.0	22.41	0.1742	6.76
			23790	710.0	22.22	0.1667	6.76
			23800	711.0	21.80	0.1514	6.76

Note: maximum average power for LTE.

3.2 Peak-to-Average Ratio

3.2.1 Description of the PAR Measurement

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. The following guidelines are offered for performing a CCDF measurement.

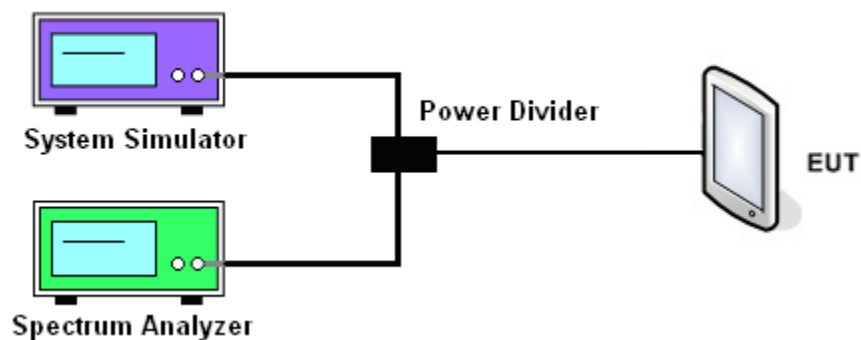
3.2.2 Measuring Instruments

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 CCDF (Complementary Cumulative Distribution Function) of the middle channel for the highest RF powers were measured.

3.2.4 Test Setup



3.2.5 Test Result of Peak-to-Average Ratio

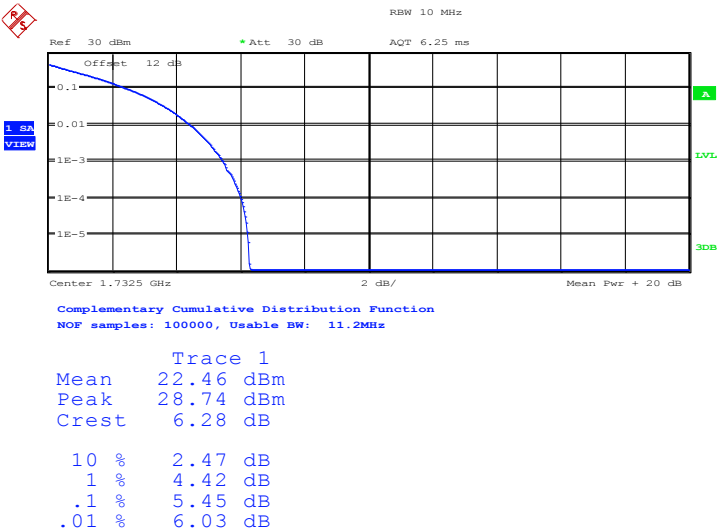
Modes	LTE Band 4			
BW / Mod.	5MHz / QPSK	5MHz / 16QAM	10MHz / QPSK	10MHz / 16QAM
Peak-to-Average Ratio (dB)	5.45	6.15	5.61	6.22

Modes	LTE Band 4			
BW / Mod.	15MHz / QPSK	15MHz / 16QAM	20MHz / QPSK	20MHz / 16QAM
Peak-to-Average Ratio (dB)	5.88	6.84	6.60	7.20

Modes	LTE Band 17			
BW / Mod.	5MHz / QPSK	5MHz / 16QAM	10MHz / QPSK	10MHz / 16QAM
Peak-to-Average Ratio (dB)	5.90	6.57	6.03	6.76

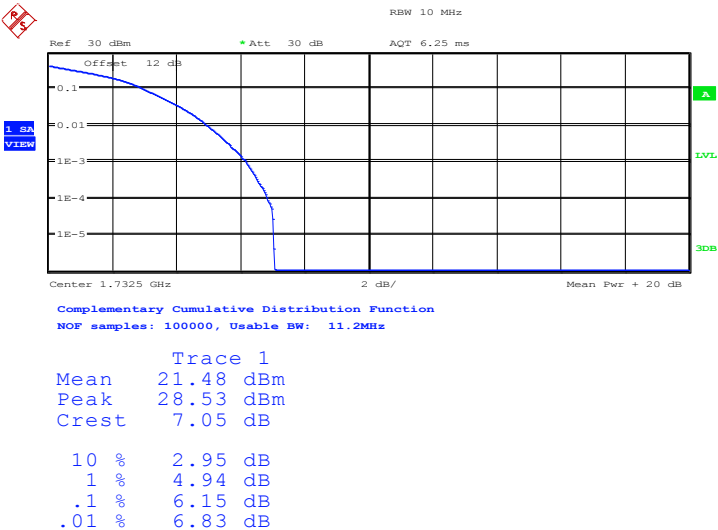
3.2.6 Peak to Average Power Ratio

Peak-to-Average Ratio on LTE Band 4 5MHz / QPSK



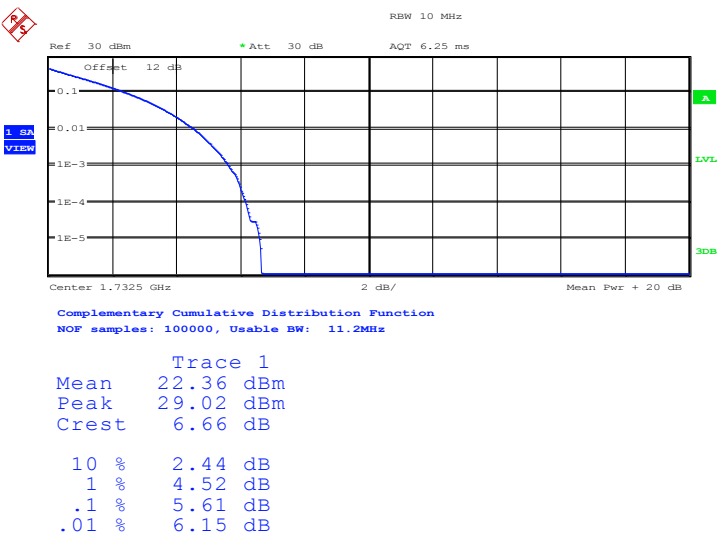
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Peak-to-Average Ratio on LTE Band 4 5MHz / 16QAM



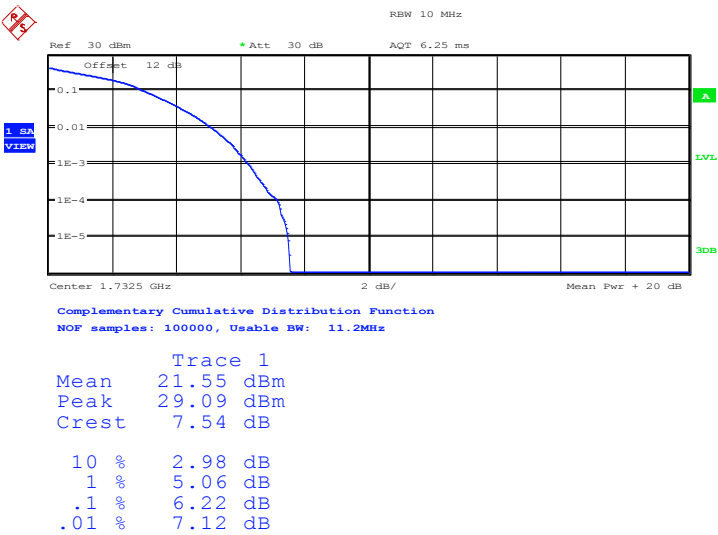
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Peak-to-Average Ratio on LTE Band 4 10MHz / QPSK



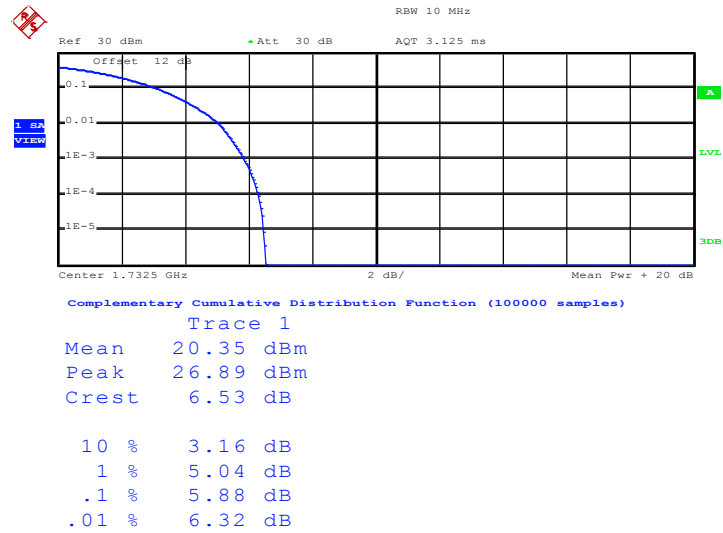
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Peak-to-Average Ratio on LTE Band 4 10MHz / 16QAM



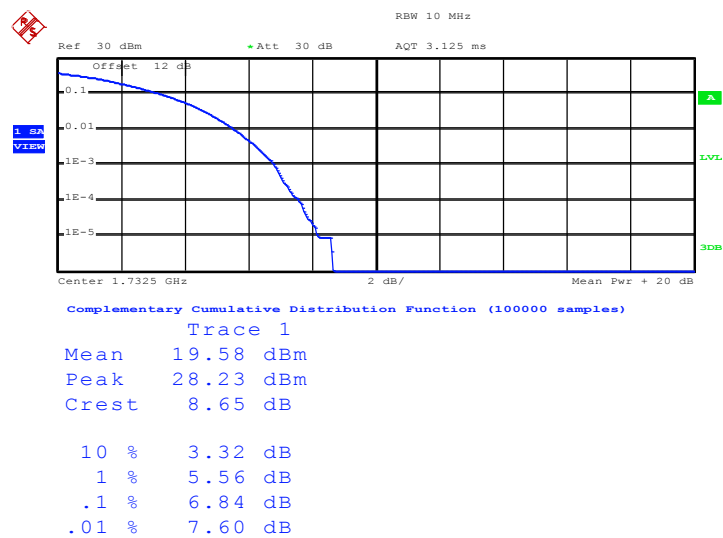
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Peak-to-Average Ratio on LTE Band 4 15MHz / QPSK



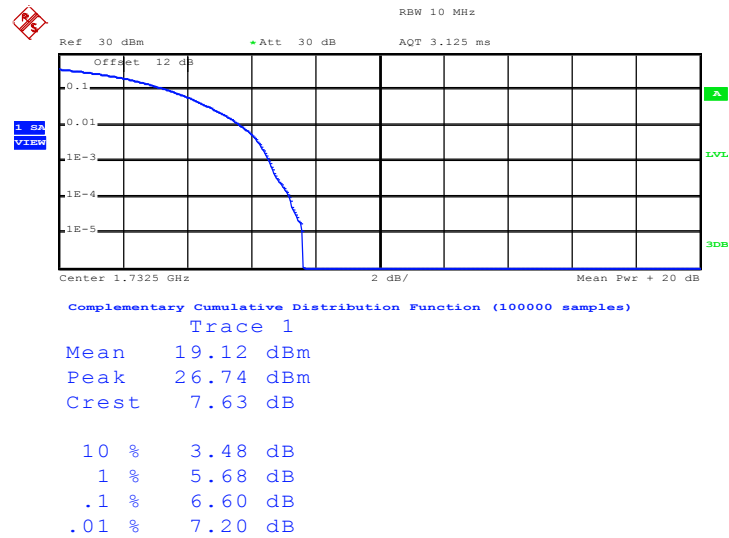
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Peak-to-Average Ratio on LTE Band 4 15MHz / 16QAM



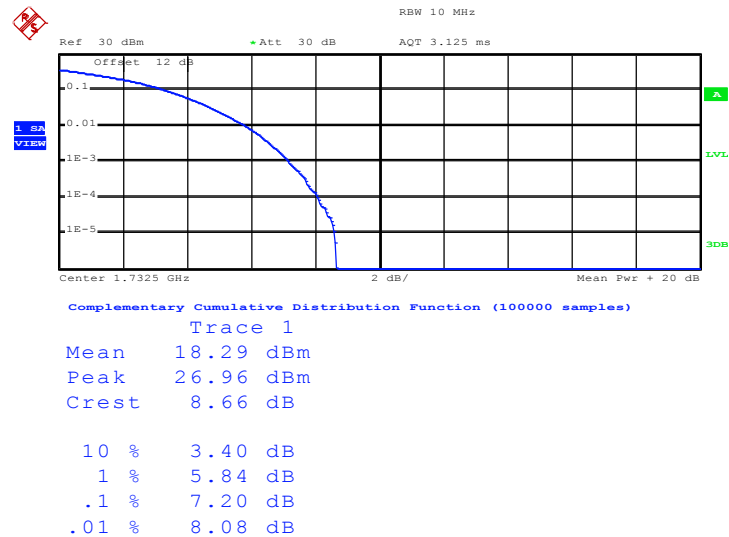
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Peak-to-Average Ratio on LTE Band 4 20MHz / QPSK



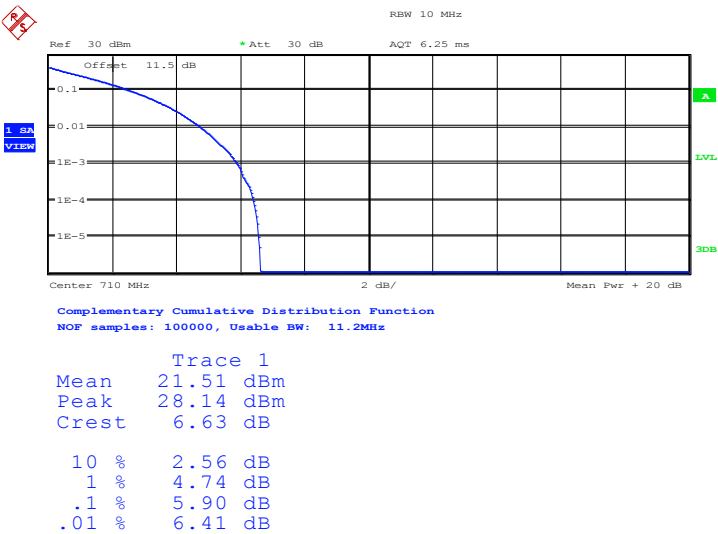
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Peak-to-Average Ratio on LTE Band 4 20MHz / 16QAM



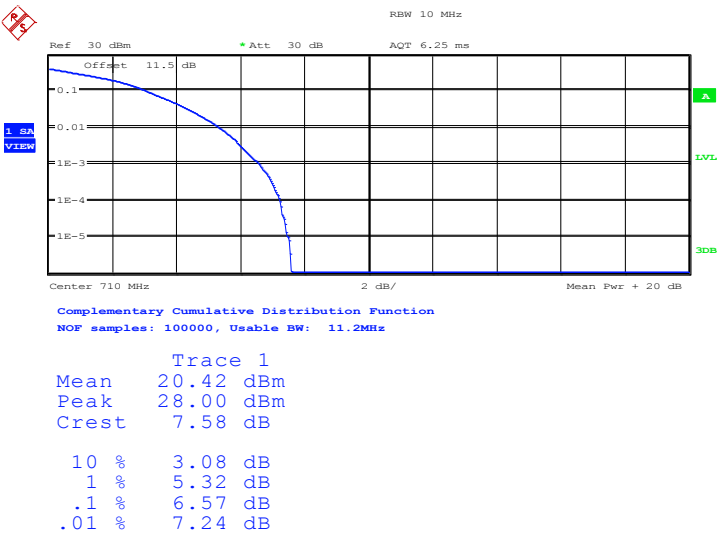
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Peak-to-Average Ratio on LTE Band 17 5MHz / QPSK



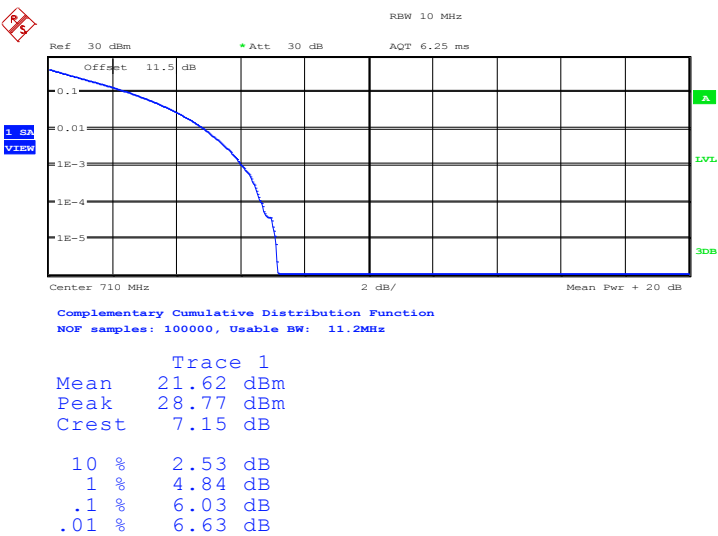
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Peak-to-Average Ratio on LTE Band 17 5MHz / 16QAM



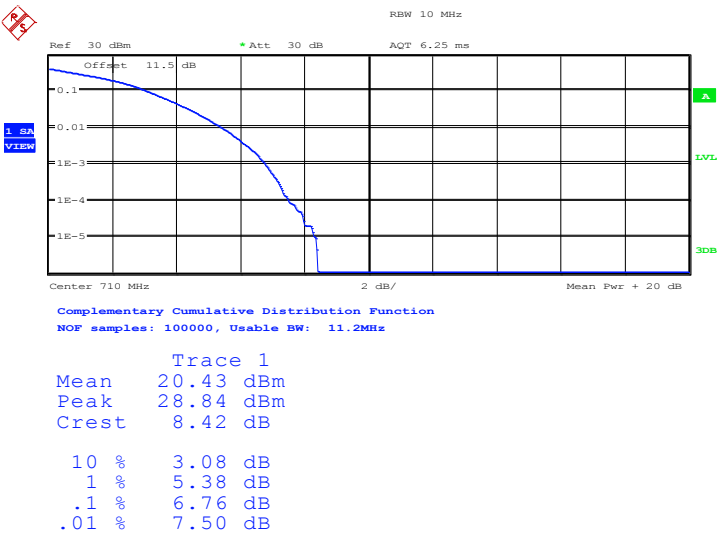
Date: 5.JUN.2012 02:36:47

Peak-to-Average Ratio on LTE Band 17 10MHz / QPSK



Date: 5.JUN.2012 02:35:07

Peak-to-Average Ratio on LTE Band 17 10MHz / 16QAM



Date: 5.JUN.2012 02:35:34

3.3 Effective Radiated Power and Equivalent Isotropic Radiated Power Measurement

3.3.1 Description of the ERP/EIRP Measurement

Effective radiated power output measurements by substitution method according to ANSI / TIA / EIA-603-C-2004, and the spectrum analyzer configuration follows KDB 971168 D01 Power Meas. License Digital Systems v01. Mobile and portable (hand-held) stations operating in the 704 MHz ~716 MHz band and 1710 MHz ~ 1755 MHz band are limited to a peak ERP of 3 watts with band 17 and EIRP of 1 watt with band 4.

3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The EUT was placed on a turntable with 1.0 meter height in a fully anechoic chamber.
2. The EUT was set at 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The spectrum analyzer is set with RBW= 300KHz, VBW= 1MHz for BW 5MHz and BW 10MHz, RBW= 1MHz, VBW= 3MHz for BW 15MHz and BW 20MHz, RMS detector, and used Channel Power function with measurement bandwidth = 5MHz/10MHz/15MHz/20MHz per section 4.0 of KDB 971168 D01.
4. The table was rotated 360 degrees to determine the position of the highest radiated power.
5. The height of the receiving antenna is adjusted to look for the maximum ERP/EIRP.
6. Taking the record of maximum ERP/EIRP.
7. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
8. The conducted power at the terminal of the dipole antenna is measured.
9. Repeat step 3 to step 5 to get the maximum ERP/EIRP of the substitution antenna.
10. $ERP/EIRP = P_s + E_t - E_s + G_s = P_s + R_t - R_s + G_s$

P_s (dBm) : Input power to substitution antenna.

G_s (dBi or dBd) : Substitution antenna Gain.

$E_t = R_t + AF$

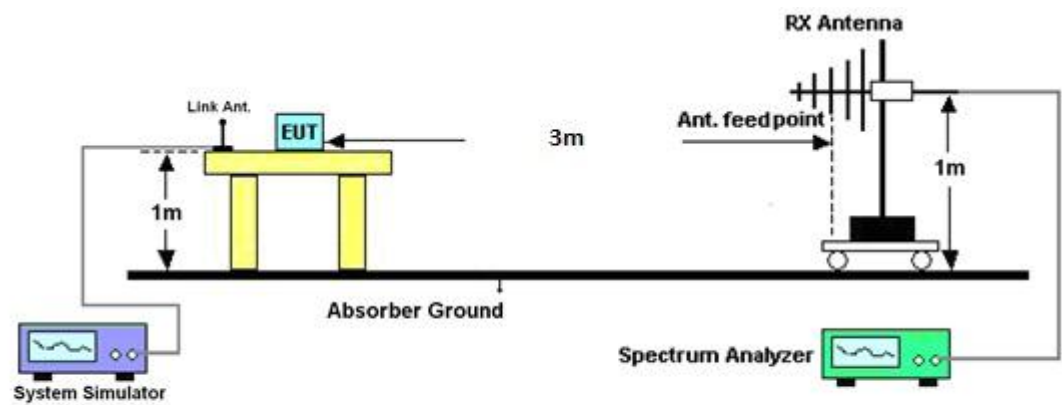
$E_s = R_s + AF$

AF (dB/m) : Receive antenna factor

R_t : The highest received signal in spectrum analyzer for EUT.

R_s : The highest received signal in spectrum analyzer for substitution antenna.

3.3.4 Test Setup



3.3.5 Test Result of ERP/EIRP

LTE Band 4 Radiated Power EIRP for BW 5MHz						
(QPSK, 1RB Size, RB Offset 0)						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
1712.50	-30.13	-51.88	0.00	1.96	23.71	0.2350
1732.50	-31.14	-52.99	0.00	2.00	23.85	0.2427
1752.50	-32.45	-54.28	0.00	1.98	23.81	0.2404
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
1712.50	-31.03	-52.13	0.00	1.96	23.06	0.2023
1732.50	-32.53	-53.17	0.00	2.00	22.64	0.1837
1752.50	-33.42	-54.13	0.00	1.98	22.69	0.1858

LTE Band 4 Radiated Power EIRP for BW 5MHz						
(16QAM, 1RB Size, RB Offset 0)						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
1712.50	-30.16	-51.88	0.00	1.96	23.68	0.2333
1732.50	-31.21	-52.99	0.00	2.00	23.78	0.2388
1752.50	-32.50	-54.28	0.00	1.98	23.76	0.2377
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
1712.50	-31.27	-52.13	0.00	1.96	22.82	0.1914
1732.50	-32.47	-53.17	0.00	2.00	22.70	0.1862
1752.50	-33.15	-54.13	0.00	1.98	22.96	0.1977

LTE Band 4 Radiated Power EIRP for BW 10MHz						
(QPSK, 1RB Size, RB Offset 0)						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
1715.00	-30.72	-51.88	0.00	1.96	23.12	0.2051
1732.50	-31.75	-52.99	0.00	2.00	23.24	0.2109
1750.00	-32.81	-54.28	0.00	1.98	23.45	0.2213
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
1715.00	-31.17	-52.13	0.00	1.96	22.92	0.1959
1732.50	-32.70	-53.17	0.00	2.00	22.47	0.1766
1750.00	-33.37	-54.13	0.00	1.98	22.74	0.1879

LTE Band 4 Radiated Power EIRP for BW 10MHz						
(16QAM, 1RB Size, RB Offset 0)						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
1715.00	-30.09	-51.88	0.00	1.96	23.75	0.2371
1732.50	-31.77	-52.99	0.00	2.00	23.22	0.2099
1750.00	-32.77	-54.28	0.00	1.98	23.49	0.2234
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
1715.00	-31.07	-52.13	0.00	1.96	23.02	0.2004
1732.50	-32.70	-53.17	0.00	2.00	22.47	0.1766
1750.00	-33.18	-54.13	0.00	1.98	22.93	0.1963

LTE Band 4 Radiated Power EIRP for BW 15MHz						
(QPSK, 1RB Size, RB Offset 0)						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
1717.50	-29.99	-51.88	0.00	1.96	23.85	0.2427
1732.50	-30.70	-52.99	0.00	2.00	24.29	0.2685
1747.50	-32.14	-54.28	0.00	1.98	24.12	0.2582
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
1717.50	-31.11	-52.13	0.00	1.96	22.98	0.1986
1732.50	-31.34	-53.17	0.00	2.00	23.83	0.2415
1747.50	-32.18	-54.13	0.00	1.98	23.93	0.2472

LTE Band 4 Radiated Power EIRP for BW 15MHz						
(16QAM, 1RB Size, RB Offset 0)						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
1717.50	-30.09	-51.88	0.00	1.96	23.75	0.2371
1732.50	-31.47	-52.99	0.00	2.00	23.52	0.2249
1747.50	-32.41	-54.28	0.00	1.98	23.85	0.2427
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
1717.50	-30.48	-52.13	0.00	1.96	23.61	0.2296
1732.50	-31.37	-53.17	0.00	2.00	23.80	0.2399
1747.50	-32.35	-54.13	0.00	1.98	23.76	0.2377

LTE Band 4 Radiated Power EIRP for BW 20MHz						
(QPSK, 1RB Size, RB Offset 0)						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
1720.00	-29.33	-51.88	0.00	1.96	24.51	0.2825
1732.50	-30.98	-52.99	0.00	2.00	24.01	0.2518
1745.00	-31.76	-54.28	0.00	1.98	24.50	0.2818
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
1720.00	-29.96	-52.13	0.00	1.96	24.13	0.2588
1732.50	-31.72	-53.17	0.00	2.00	23.45	0.2213
1745.00	-32.83	-54.13	0.00	1.98	23.28	0.2128

LTE Band 4 Radiated Power EIRP for BW 20MHz						
(16QAM, 1RB Size, RB Offset 0)						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
1720.00	-30.55	-51.88	0.00	1.96	23.29	0.2133
1732.50	-31.79	-52.99	0.00	2.00	23.20	0.2089
1745.00	-31.88	-54.28	0.00	1.98	24.38	0.2742
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	EIRP (dBm)	EIRP (W)
1720.00	-31.09	-52.13	0.00	1.96	23.00	0.1995
1732.50	-32.29	-53.17	0.00	2.00	22.88	0.1941
1745.00	-32.47	-54.13	0.00	1.98	23.64	0.2312

LTE Band 17 Radiated Power ERP for BW 5MHz						
(QPSK, 1RB Size, RB Offset 0)						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
706.50	-26.52	-48.12	0.00	-1.08	20.52	0.1127
710.00	-26.52	-48.28	0.00	-0.93	20.83	0.1211
713.50	-25.95	-48.35	0.00	-0.76	21.64	0.1459
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
706.50	-25.15	-47.97	0.00	-1.08	21.74	0.1493
710.00	-25.10	-48.01	0.00	-0.93	21.98	0.1578
713.50	-24.79	-48.05	0.00	-0.76	22.50	0.1778

LTE Band 17 Radiated Power ERP for BW 5MHz						
(16QAM, 1RB Size, RB Offset 0)						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
706.50	-26.70	-48.12	0.00	-1.08	20.34	0.1081
710.00	-26.40	-48.28	0.00	-0.93	20.95	0.1245
713.50	-25.86	-48.35	0.00	-0.76	21.73	0.1489
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
706.50	-25.22	-47.97	0.00	-1.08	21.67	0.1469
710.00	-25.37	-48.01	0.00	-0.93	21.71	0.1483
713.50	-24.63	-48.05	0.00	-0.76	22.66	0.1845

LTE Band 17 Radiated Power ERP for BW 10MHz						
(QPSK, 1RB Size, RB Offset 0)						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
709.00	-26.00	-48.12	0.00	-1.08	21.04	0.1271
710.00	-26.15	-48.28	0.00	-0.93	21.20	0.1318
711.00	-25.95	-48.35	0.00	-0.76	21.64	0.1459
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
709.00	-24.50	-47.97	0.00	-1.08	22.39	0.1734
710.00	-24.57	-48.01	0.00	-0.93	22.51	0.1782
711.00	-24.38	-48.05	0.00	-0.76	22.91	0.1954

LTE Band 17 Radiated Power ERP for BW 10MHz						
(16QAM, 1RB Size, RB Offset 0)						
Horizontal Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
709.00	-26.84	-48.12	0.00	-1.08	20.20	0.1047
710.00	-26.76	-48.28	0.00	-0.93	20.59	0.1146
711.00	-26.94	-48.35	0.00	-0.76	20.65	0.1161
Vertical Polarization						
Frequency (MHz)	Rt (dBm)	Rs (dBm)	Ps (dBm)	Gs (dBd)	ERP (dBm)	ERP (W)
709.00	-24.87	-47.97	0.00	-1.08	22.02	0.1592
710.00	-25.33	-48.01	0.00	-0.93	21.75	0.1496
711.00	-25.20	-48.05	0.00	-0.76	22.09	0.1618

3.4 Occupied Bandwidth

3.4.1 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.

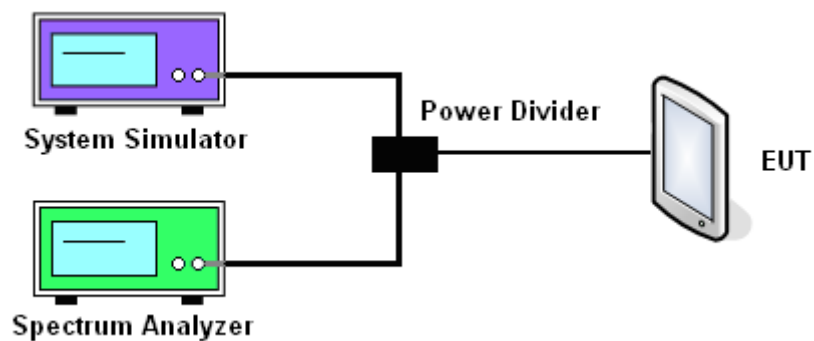
3.4.2 Measuring Instruments

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 99% occupied bandwidth (BW) of the middle channel for the highest RF powers with full RB sizes were measured.

3.4.4 Test Setup



3.4.5 Test Result of Occupied Bandwidth

Modes	LTE Band 4			
BW / Modulation	5MHz / QPSK	5MHz / 16QAM	10MHz / QPSK	10MHz / 16QAM
99% OBW (MHz)	4.50	4.50	9.13	9.10

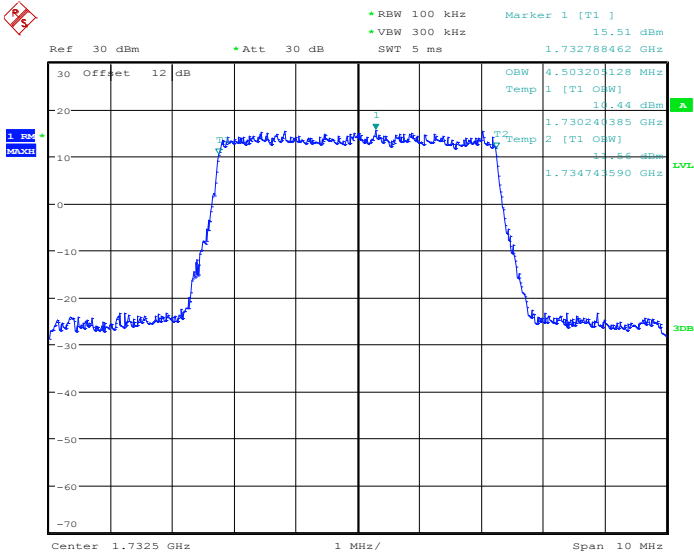
Modes	LTE Band 4			
BW / Modulation	15MHz / QPSK	15MHz / 16QAM	20MHz / QPSK	20MHz / 16QAM
99% OBW (MHz)	13.56	13.56	18.80	18.88

Modes	LTE Band 17			
BW / Modulation	5MHz / QPSK	5MHz / 16QAM	10MHz / QPSK	10MHz / 16QAM
99% OBW (MHz)	4.52	4.50	9.17	9.13

3.4.6 Test Result (Plots) of Occupied Bandwidth

Band :	LTE Band 4	BW / Mod. :	5MHz / QPSK
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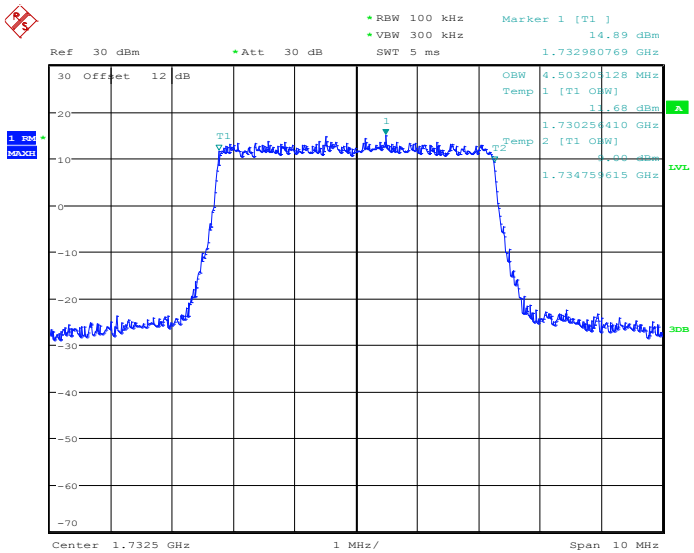
99% Occupied Bandwidth Plot on Channel 20175



Date: 5.JUN.2012 01:31:12

Band :	LTE Band 4	BW / Mod. :	5MHz / 16QAM
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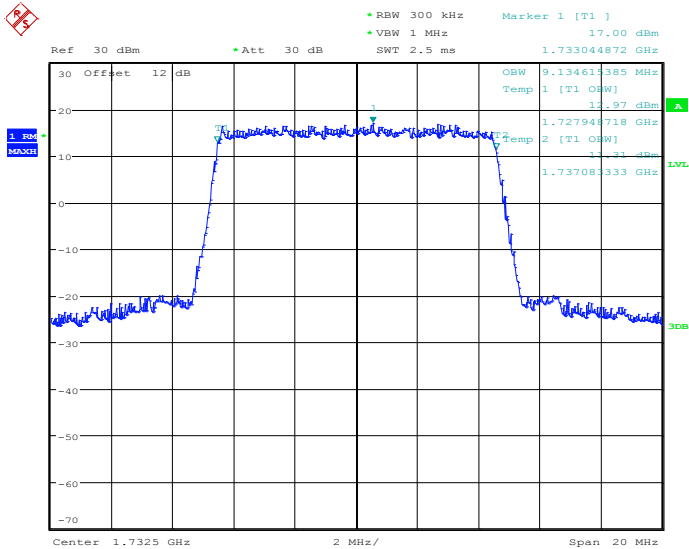
99% Occupied Bandwidth Plot on Channel 20175



Date: 5.JUN.2012 01:31:29

Band :	LTE Band 4	BW / Mod. :	10MHz / QPSK
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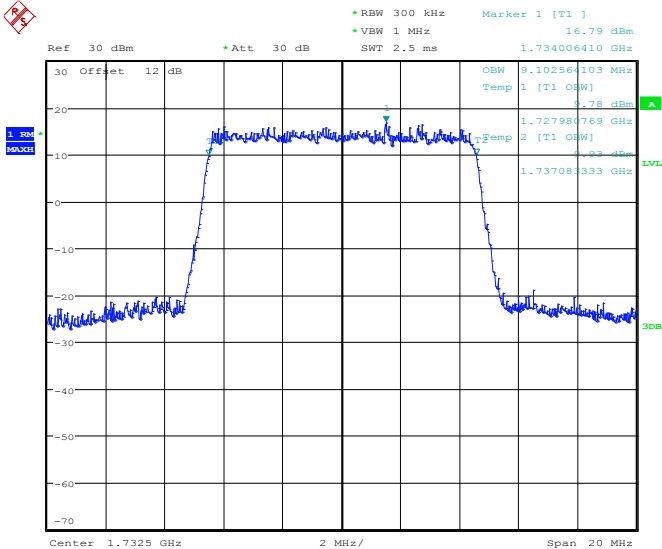
99% Occupied Bandwidth Plot on Channel 20175



Date: 5.JUN.2012 01:25:42

Band :	LTE Band 4	BW / Mod. :	10MHz / 16QAM
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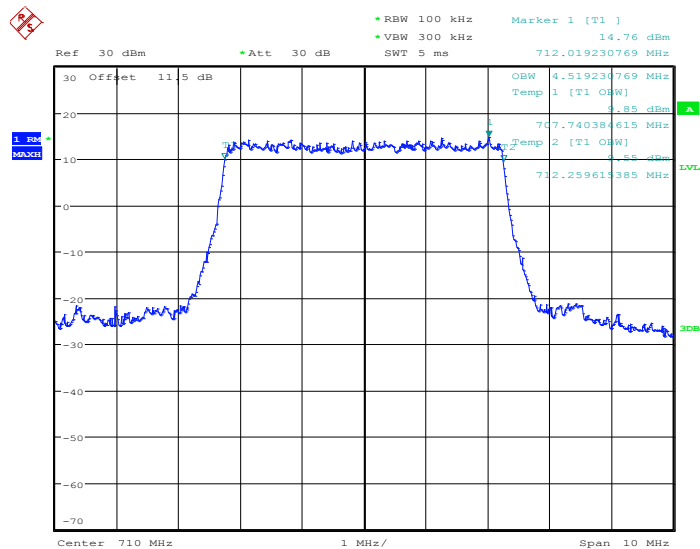
99% Occupied Bandwidth Plot on Channel 20175



Date: 5.JUN.2012 01:26:06

Band :	LTE Band 17	BW / Mod. :	5MHz / QPSK
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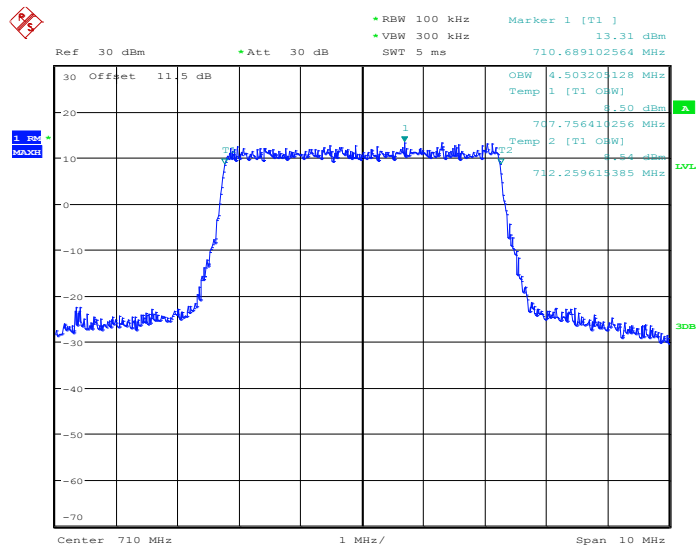
99% Occupied Bandwidth Plot on Channel 23790



Date: 5.JUN.2012 02:38:46

Band :	LTE Band 17	BW / Mod. :	5MHz / 16QAM
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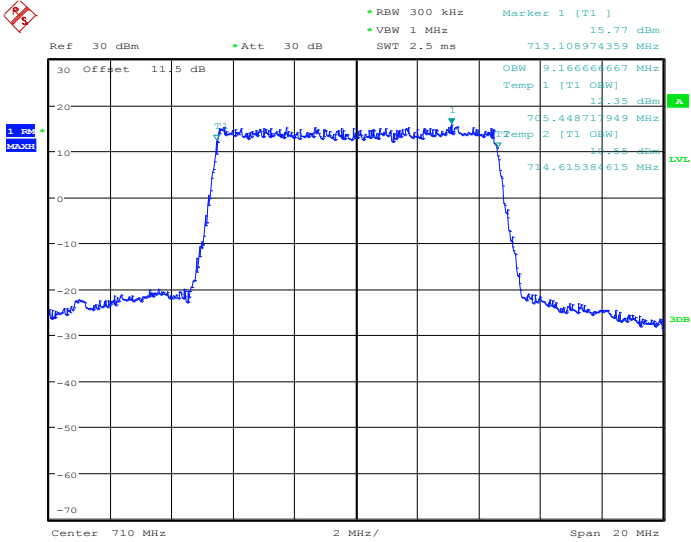
99% Occupied Bandwidth Plot on Channel 23790



Date: 5.JUN.2012 02:39:02

Band :	LTE Band 17	BW / Mod. :	10MHz / QPSK
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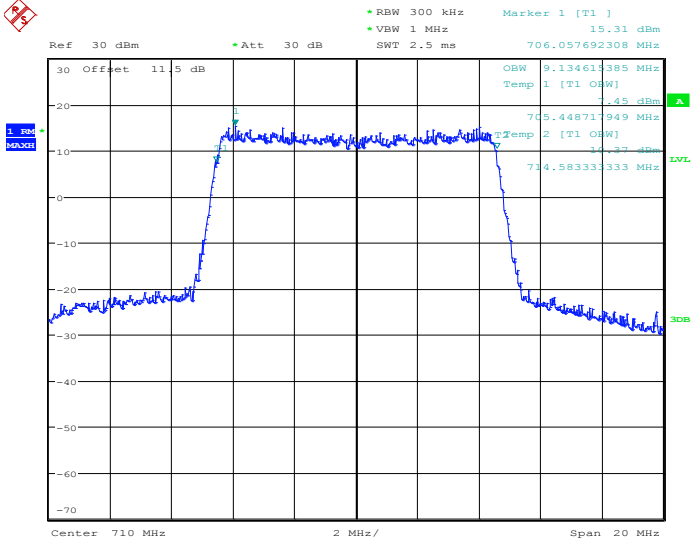
99% Occupied Bandwidth Plot on Channel 23790



Date: 5.JUN.2012 02:42:12

Band :	LTE Band 17	BW / Mod. :	10MHz / 16QAM
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99% Occupied Bandwidth Plot on Channel 23790



Date: 5.JUN.2012 02:42:57

3.5 Band Edge Measurement

3.5.1 Limit

The emissions be operated in the 698 -746 MHz band, the FCC limit is $43 + 10\log_{10}(P[\text{Watts}])$ dB = -13 dBm in a 100 KHz bandwidth.

For operations in the 1710 – 1755 MHz bands , the FCC limit is $43 + 10\log_{10}(P[\text{Watts}])$ dB = -13 dBm in a 1 MHz bandwidth.

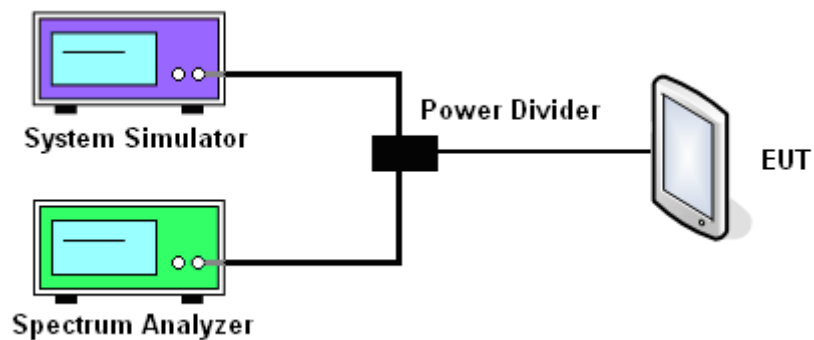
3.5.2 Measuring Instruments

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 band edges of low and high channels for the highest RF powers were measured. Setting measuring BW = 100KHz(Band 17) / 1MHz(Band 4).

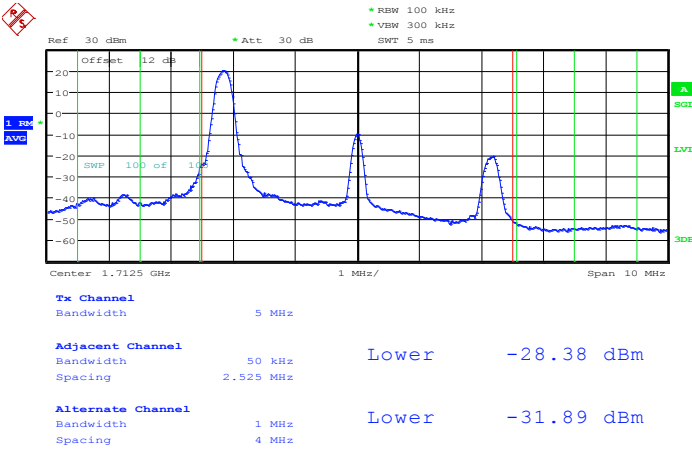
3.5.4 Test Setup



3.5.5 Test Result (Plots) of Conducted Band Edge

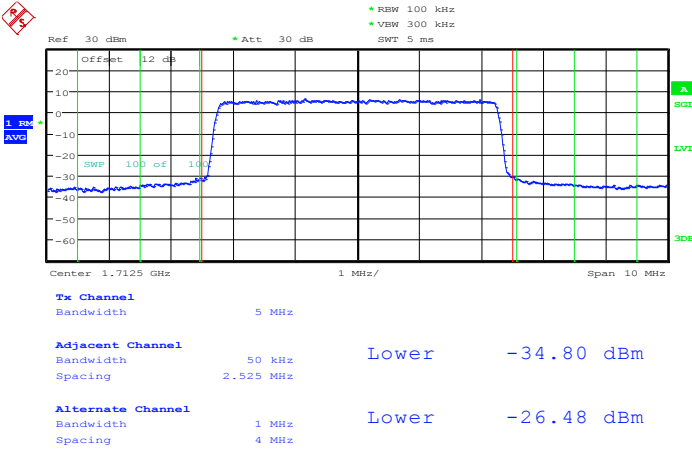
Band :	LTE Band 4	Band Width	5MHz
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



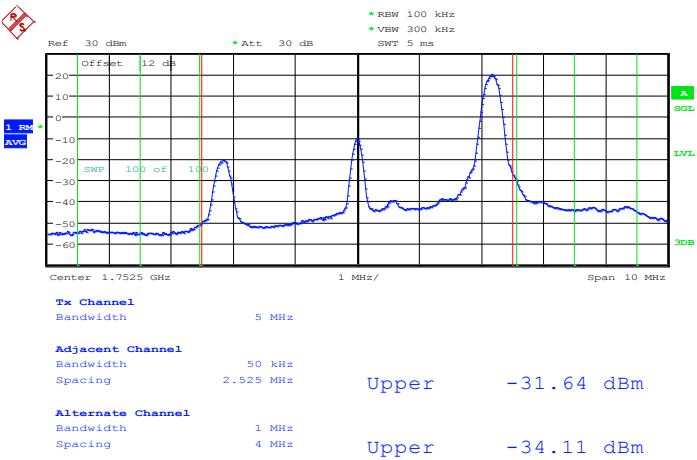
Date: 7.JUN.2012 20:03:08

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



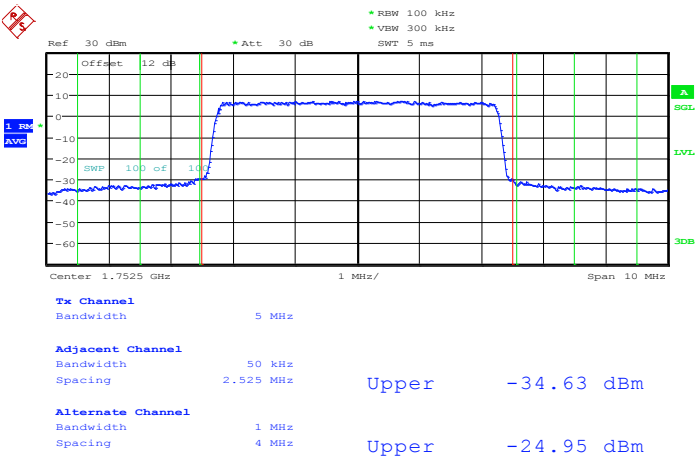
Date: 7.JUN.2012 20:01:50

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



Date: 7.JUN.2012 20:05:00

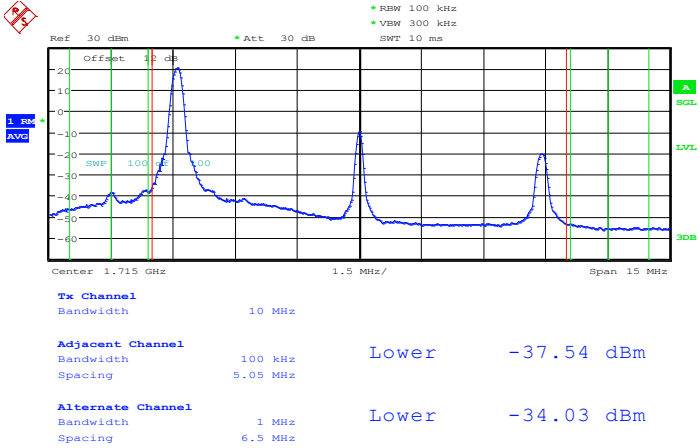
Higher Band Edge Plot for QPSK-RB Size 25, RB Offset 0



Date: 7.JUN.2012 20:04:23

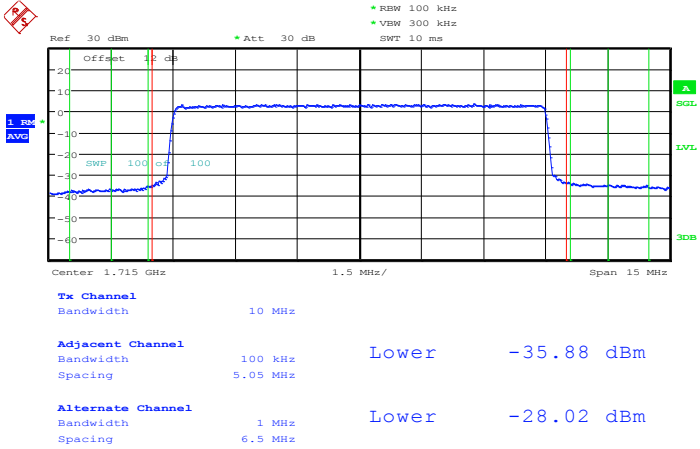
Band :	LTE Band 4	Band Width	10MHz
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



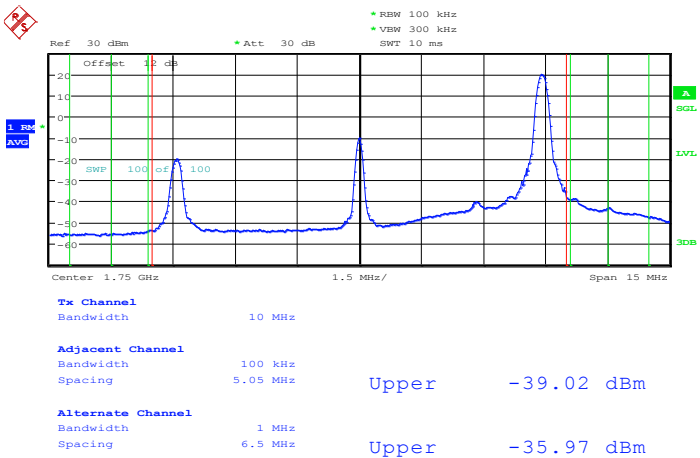
Date: 7.JUN.2012 20:22:25

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



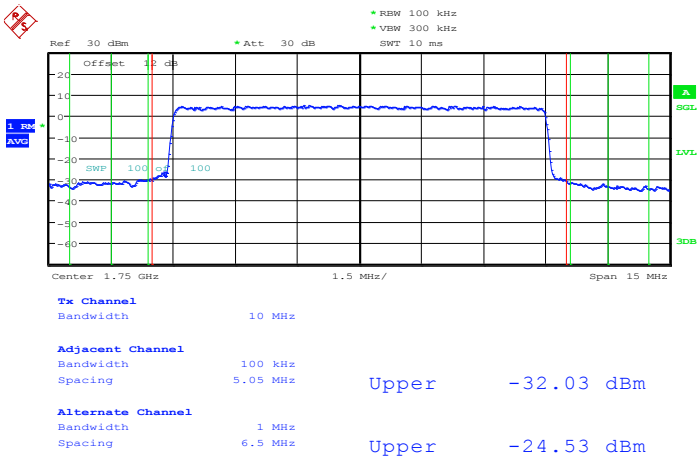
Date: 7.JUN.2012 20:20:59

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



Date: 7.JUN.2012 20:26:20

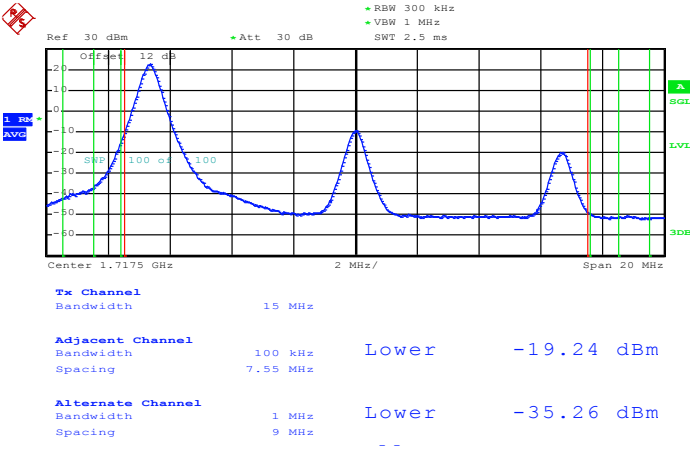
Higher Band Edge Plot for QPSK-RB Size 50, RB Offset 0



Date: 7.JUN.2012 20:23:53

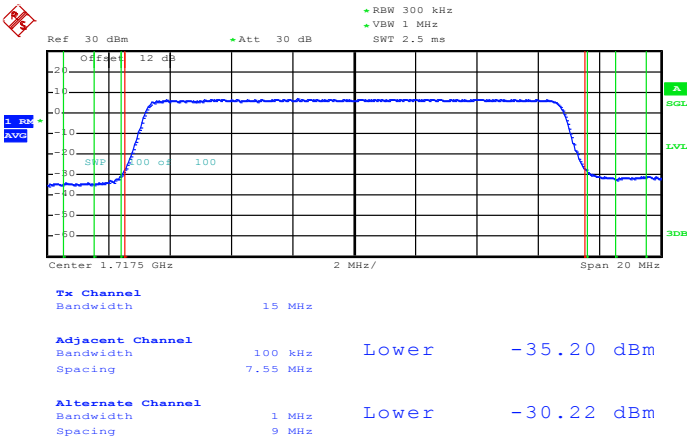
Band :	LTE Band 4	Band Width	15MHz
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



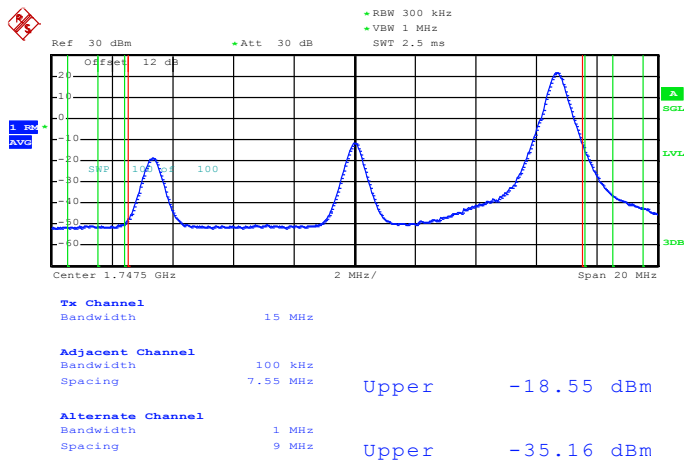
Date: 13.JUN.2012 22:58:36

Lower Band Edge Plot for QPSK-RB Size 75, RB Offset 0



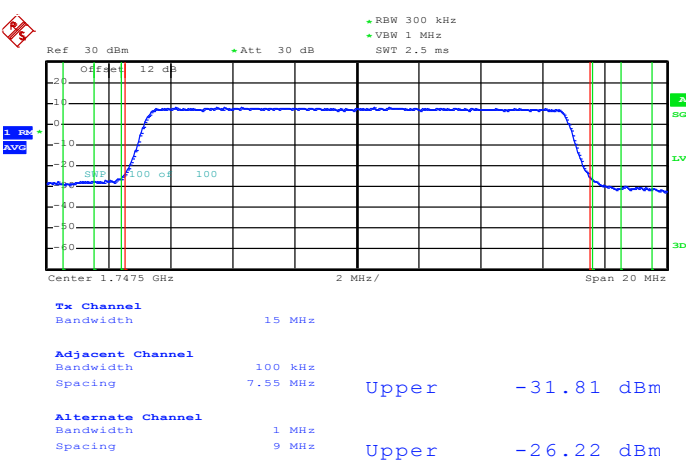
Date: 13.JUN.2012 22:56:55

Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 74



Date: 13.JUN.2012 22:56:11

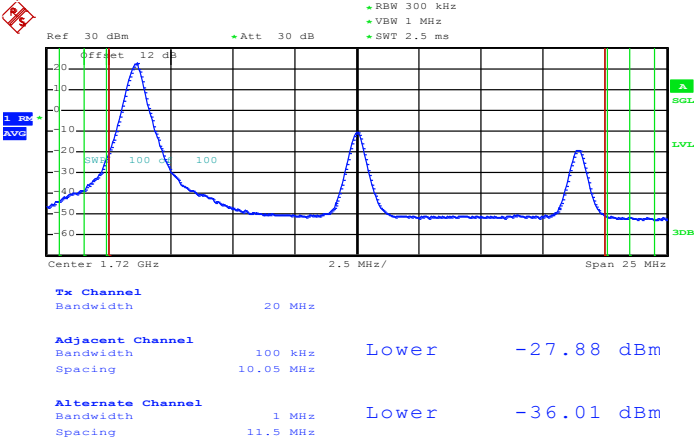
Higher Band Edge Plot for QPSK-RB Size 75, RB Offset 0



Date: 13.JUN.2012 22:53:30

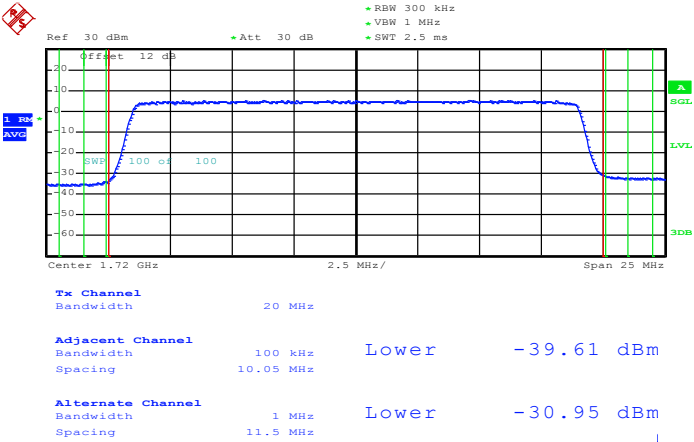
Band :	LTE Band 4	Band Width	20MHz
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



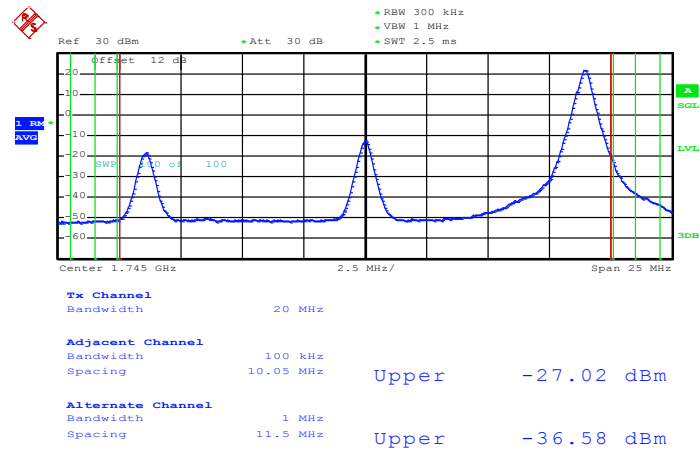
Date: 12.JUN.2012 22:06:07

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



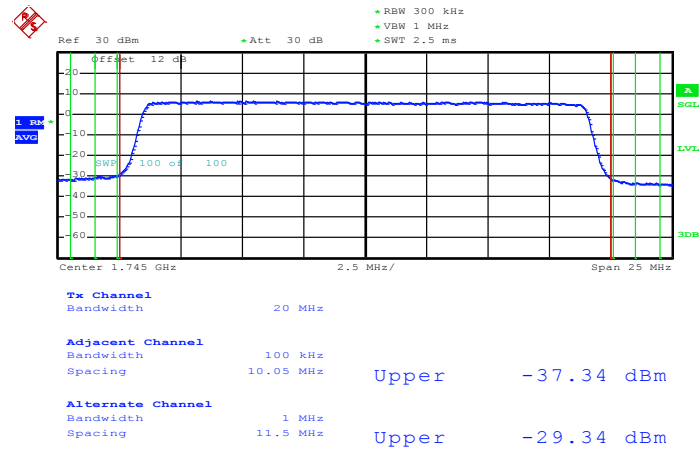
Date: 12.JUN.2012 22:05:04

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



Date: 12.JUN.2012 22:10:50

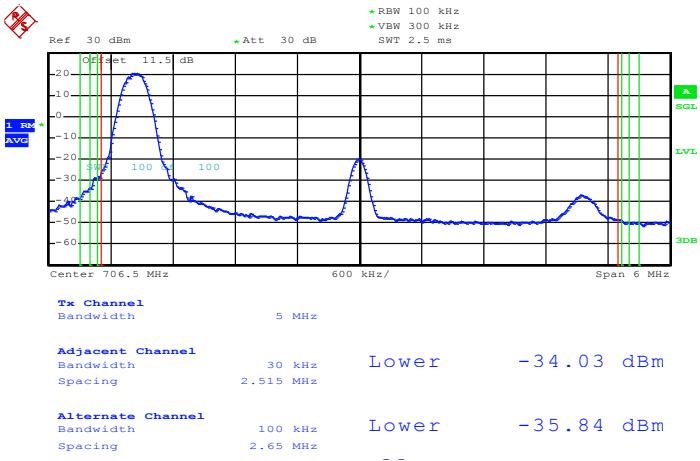
Higher Band Edge Plot for QPSK-RB Size 100, RB Offset 0



Date: 12.JUN.2012 22:07:23

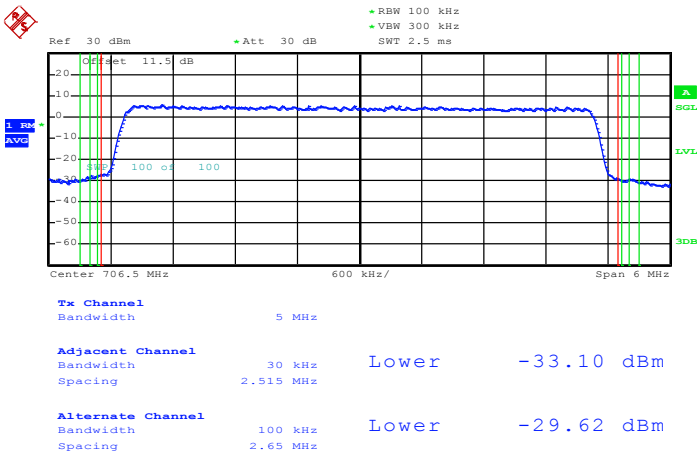
Band :	LTE Band 17	Band Width	5MHz
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



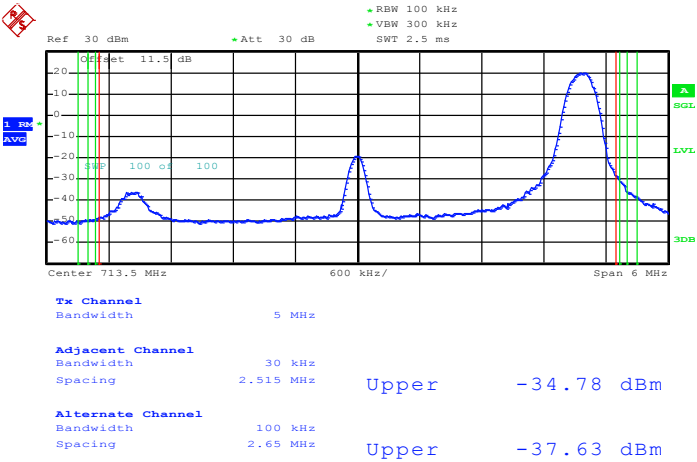
Date: 11.JUN.2012 20:13:25

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



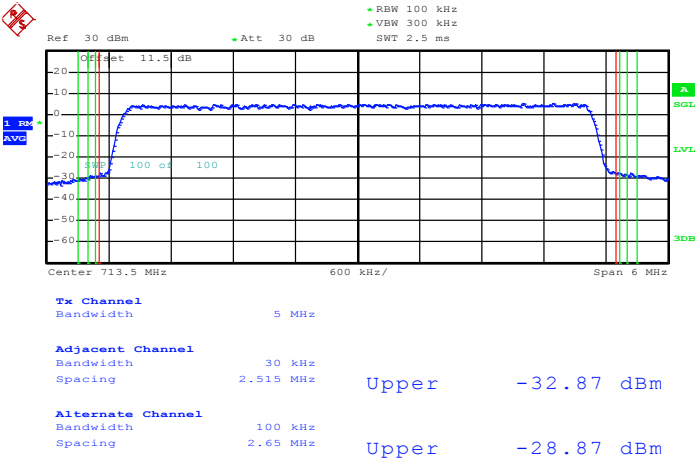
Date: 11.JUN.2012 20:12:27

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



Date: 11.JUN.2012 20:16:57

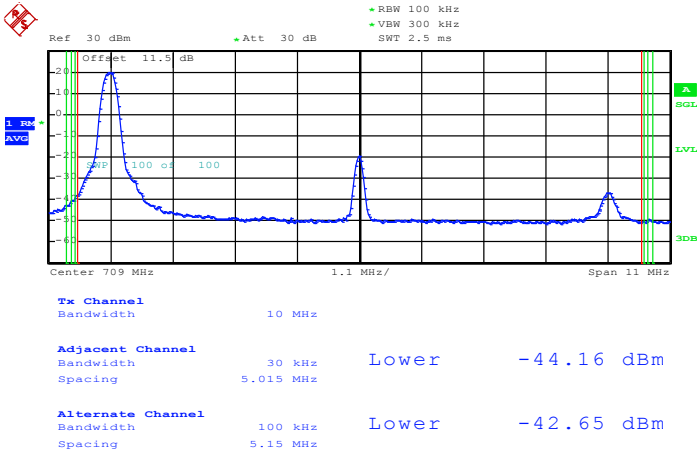
Higher Band Edge Plot for QPSK-RB Size 25, RB Offset 0



Date: 11.JUN.2012 20:15:04

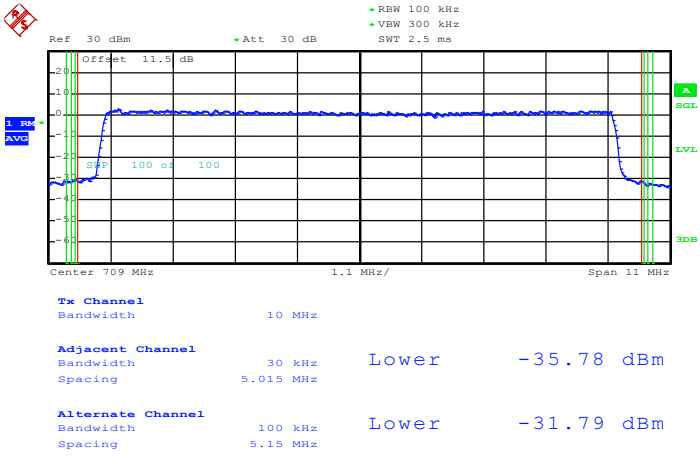
Band :	LTE Band 17	Band Width	10MHz
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



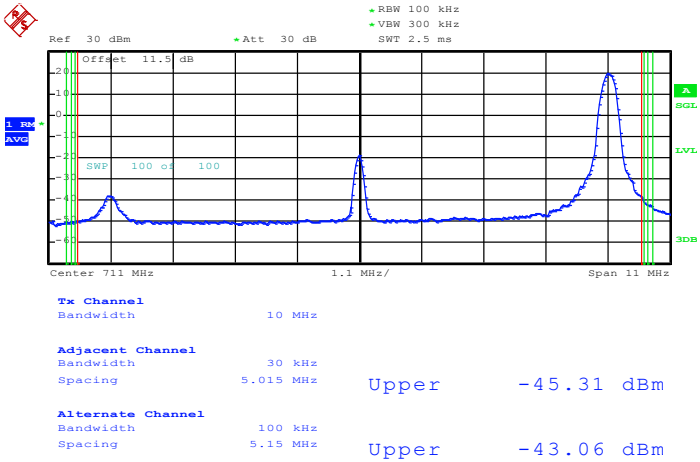
Date: 11.JUN.2012 19:52:16

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



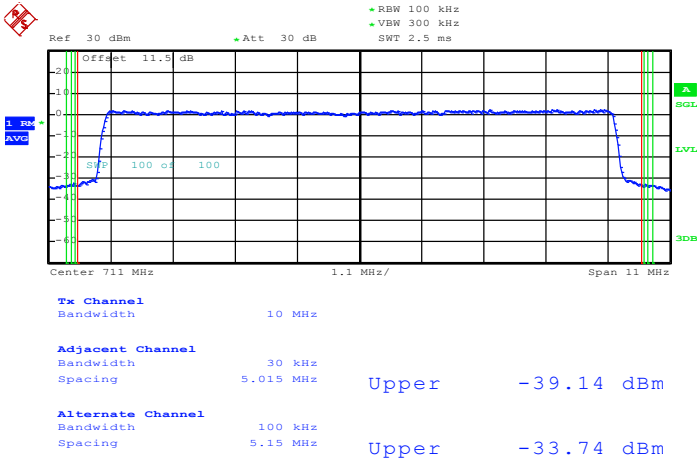
Date: 11.JUN.2012 19:50:28

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



Date: 11.JUN.2012 19:54:06

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



Date: 11.JUN.2012 19:55:03

3.6 Conducted Emission Measurement

3.6.1 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 9 KHz up to a frequency including its 10th harmonic.

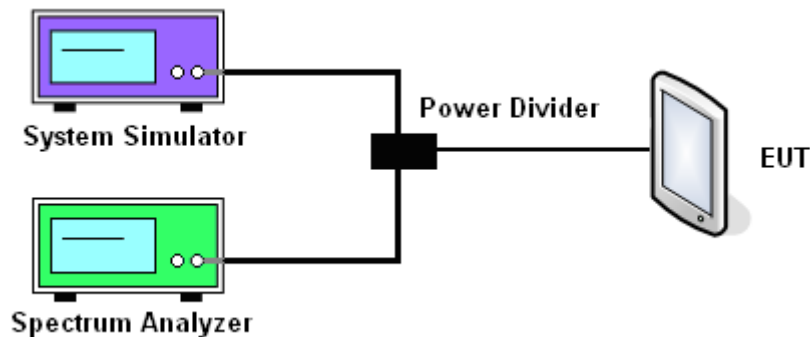
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

1. The EUT was 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.

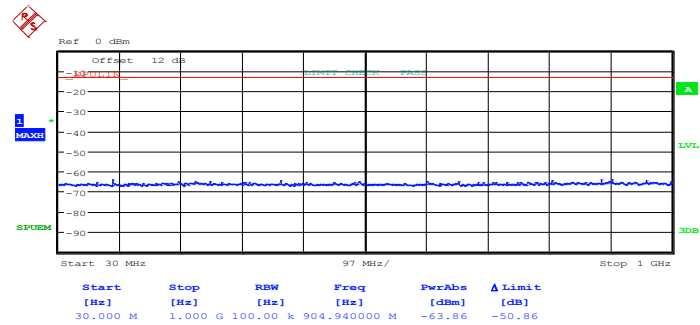
3.6.4 Test Setup



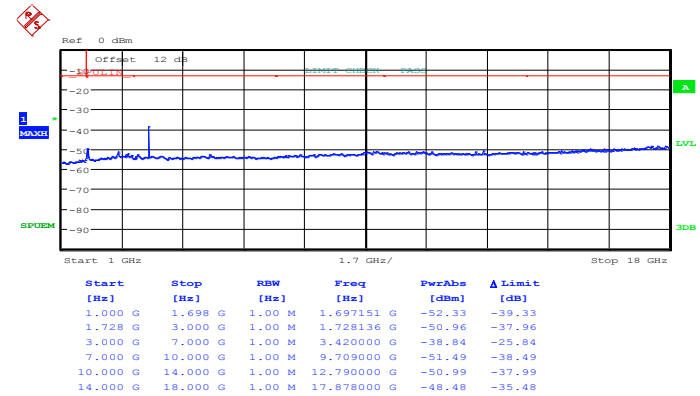
3.6.5 Test Result (Plots) of Conducted Emission

Band :	LTE Band 4	Channel :	CH19975 (Low)
Band Width	5MHz		

QPSK (RB Size 1, RB Offset 0)

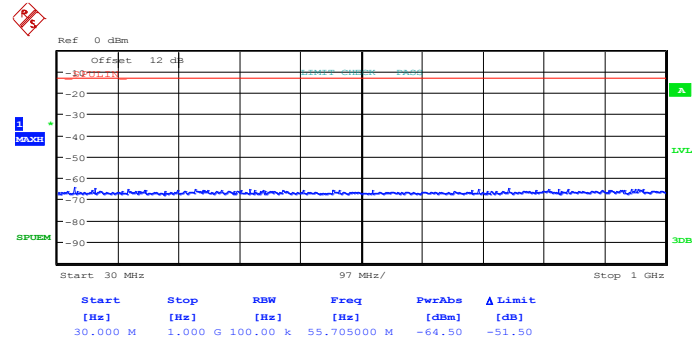


Date: 5.JUN.2012 02:01:46

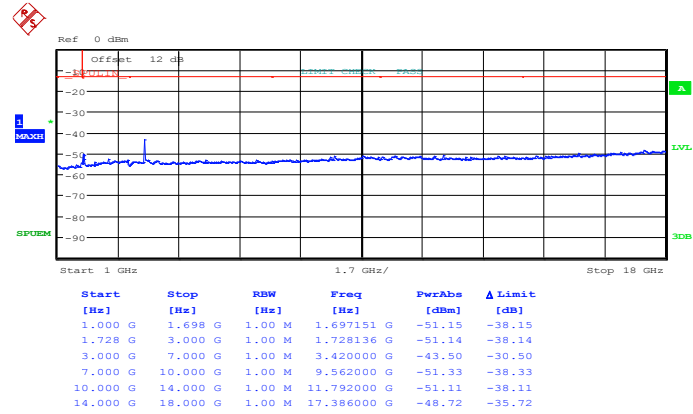


Date: 5.JUN.2012 02:05:24

16QAM (RB Size 1, RB Offset 0)



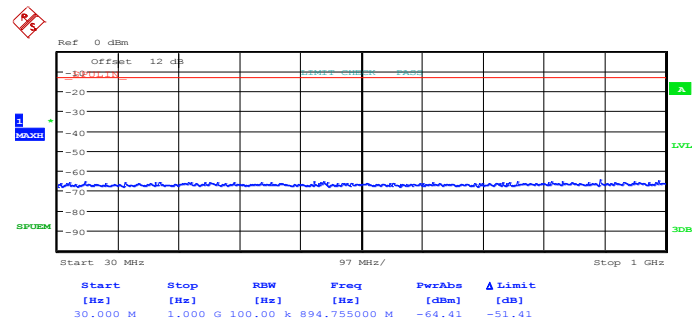
Date: 5.JUN.2012 02:02:04



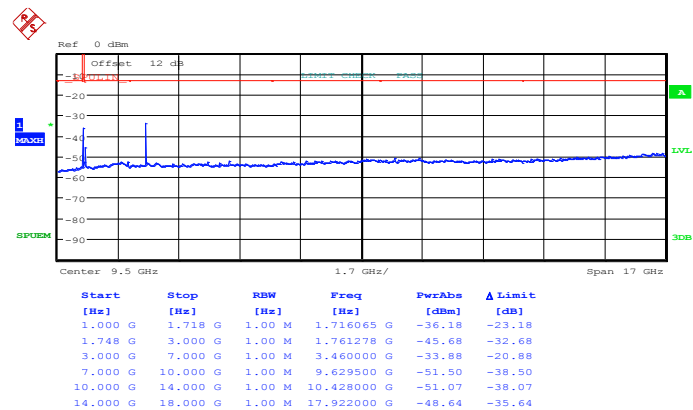
Date: 5.JUN.2012 02:05:53

Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width	5MHz		

QPSK (RB Size 1, RB Offset 0)

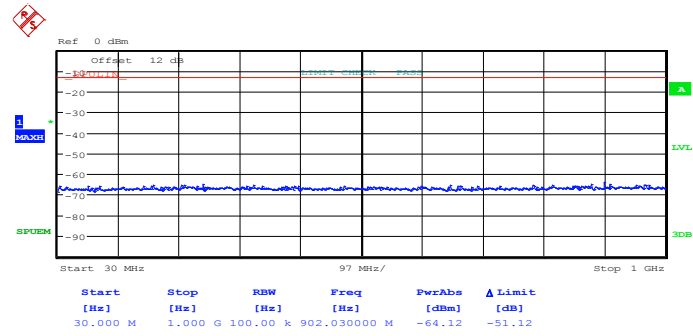


Date: 5.JUN.2012 02:02:40

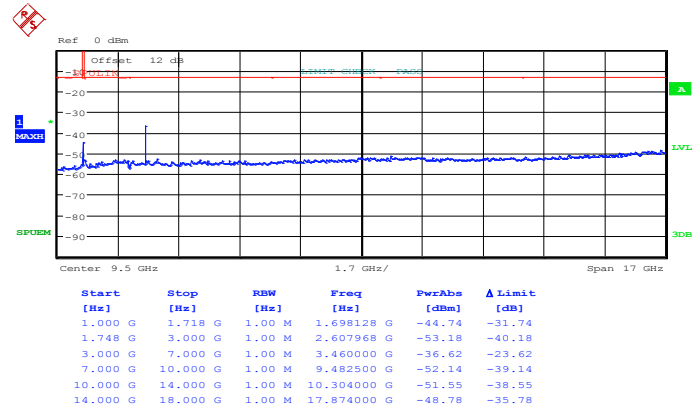


Date: 5.JUN.2012 02:08:06

16QAM (RB Size 1, RB Offset 0)



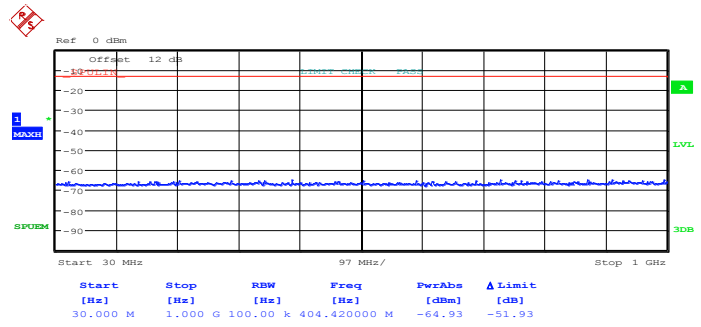
Date: 5.JUN.2012 02:02:55



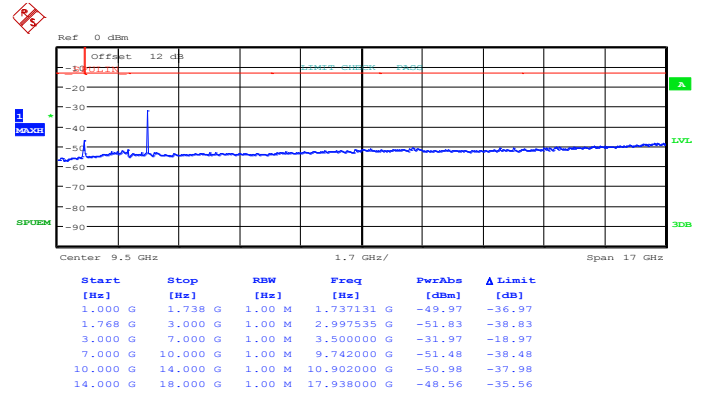
Date: 5.JUN.2012 02:08:25

Band :	LTE Band 4	Channel :	CH20375 (High)
Band Width	5MHz		

QPSK (RB Size 1, RB Offset 0)

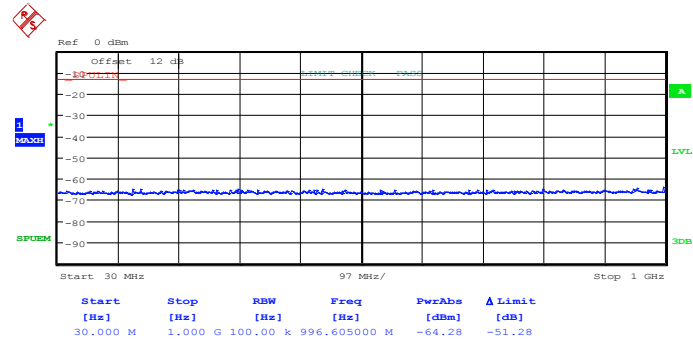


Date: 5.JUN.2012 02:03:30

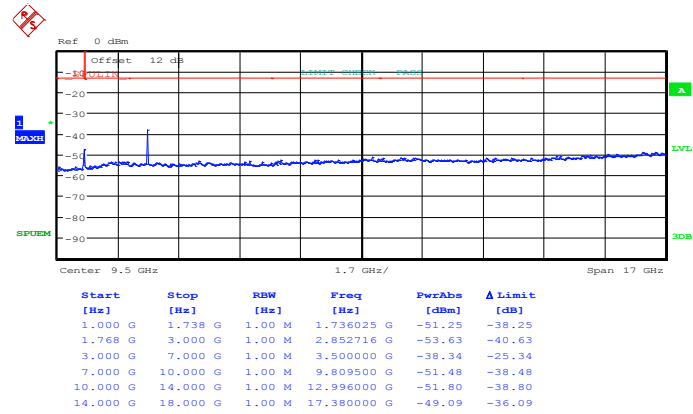


Date: 5.JUN.2012 02:11:04

16QAM (RB Size 1, RB Offset 0)



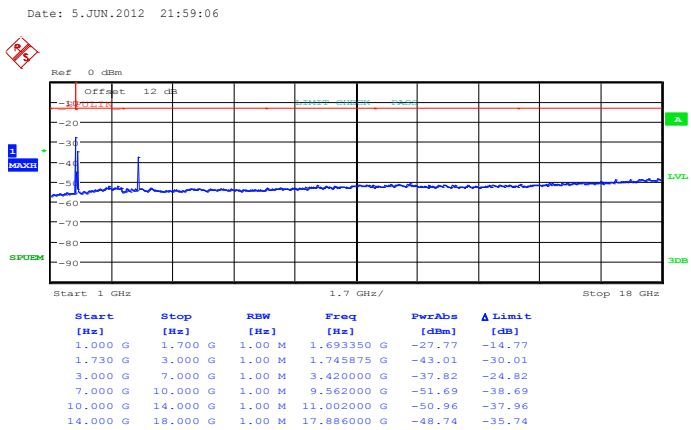
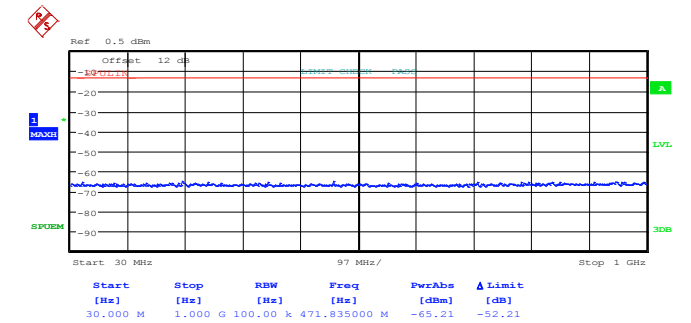
Date: 5.JUN.2012 02:04:06



Date: 5.JUN.2012 02:11:26

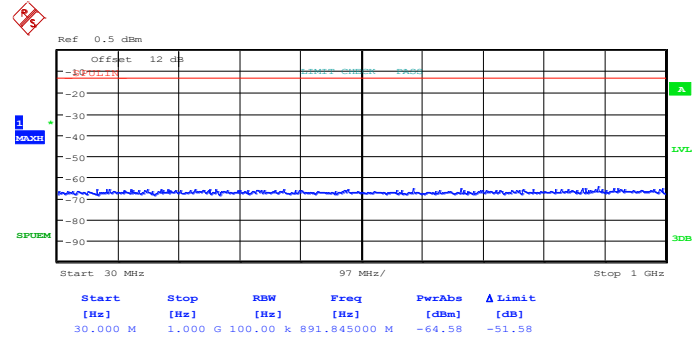
Band :	LTE Band 4	Channel :	CH20000 (Low)
Band Width	10MHz		

QPSK (RB Size 1, RB Offset 0)

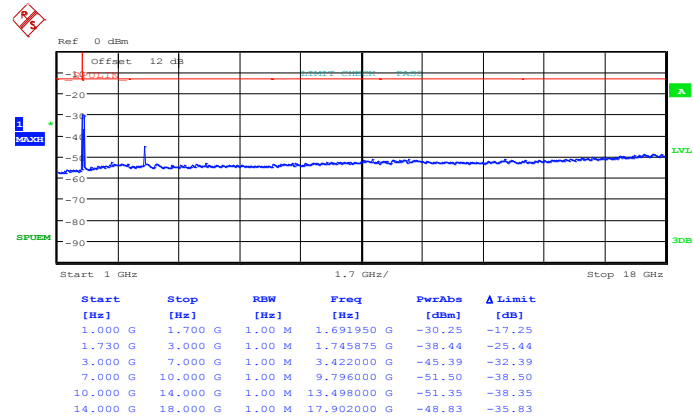


Date: 5.JUN.2012 22:03:51

16QAM (RB Size 1, RB Offset 0)



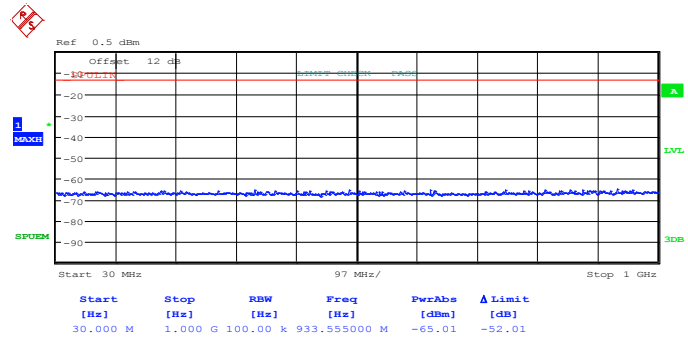
Date: 5.JUN.2012 21:59:20



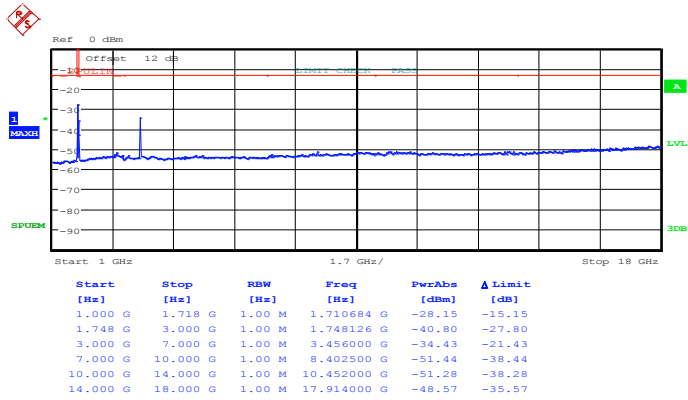
Date: 5.JUN.2012 22:04:46

Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width	10MHz		

QPSK (RB Size 1, RB Offset 0)

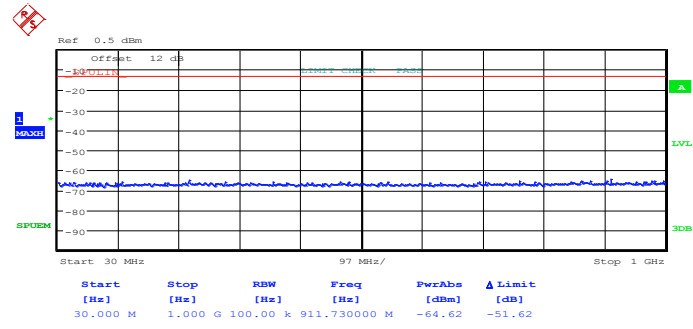


Date: 5.JUN.2012 21:59:39

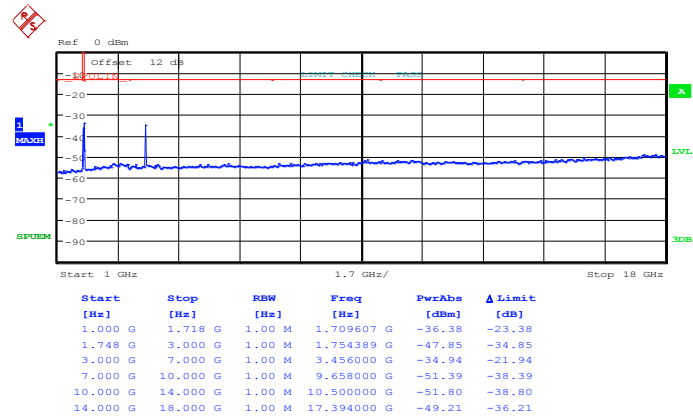


Date: 5.JUN.2012 22:05:56

16QAM (RB Size 1, RB Offset 0)



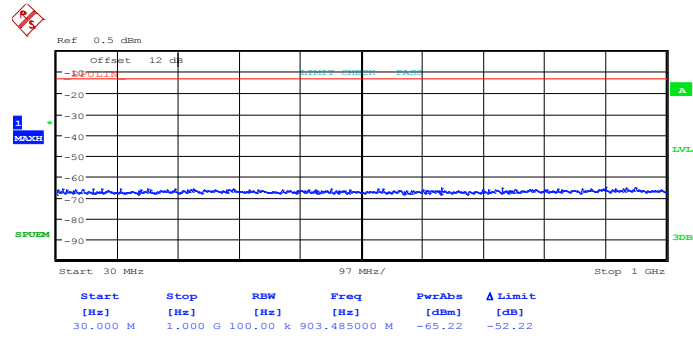
Date: 5.JUN.2012 22:00:05



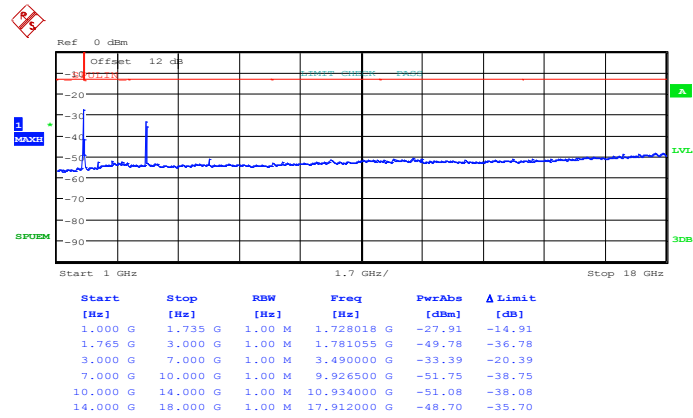
Date: 5.JUN.2012 22:07:29

Band :	LTE Band 4	Channel :	CH20350 (High)
Band Width	10MHz		

QPSK (RB Size 1, RB Offset 0)

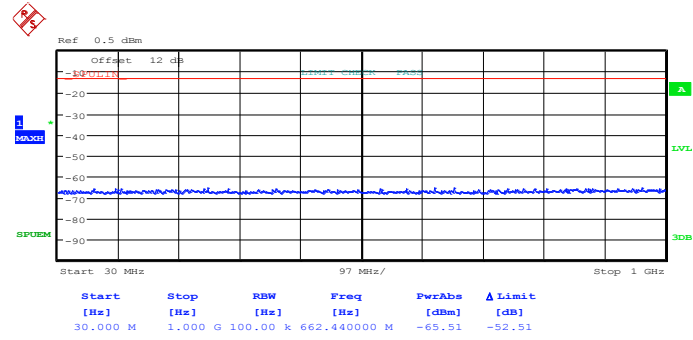


Date: 5.JUN.2012 22:01:58

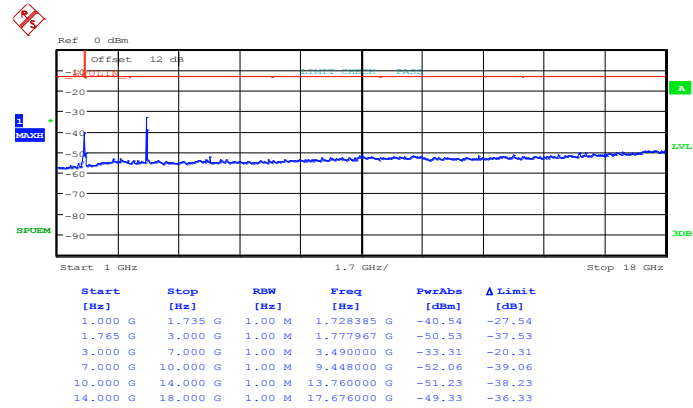


Date: 5.JUN.2012 22:08:27

16QAM (RB Size 1, RB Offset 0)



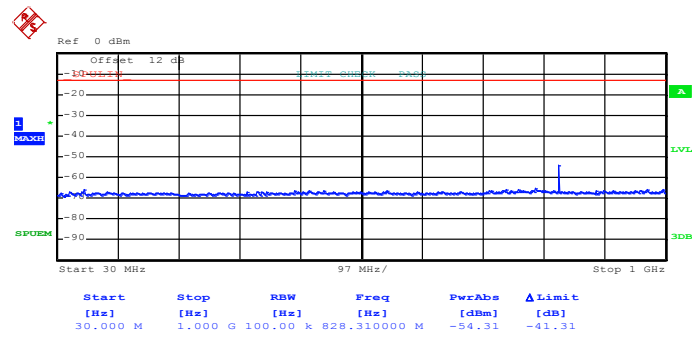
Date: 5.JUN.2012 22:00:21



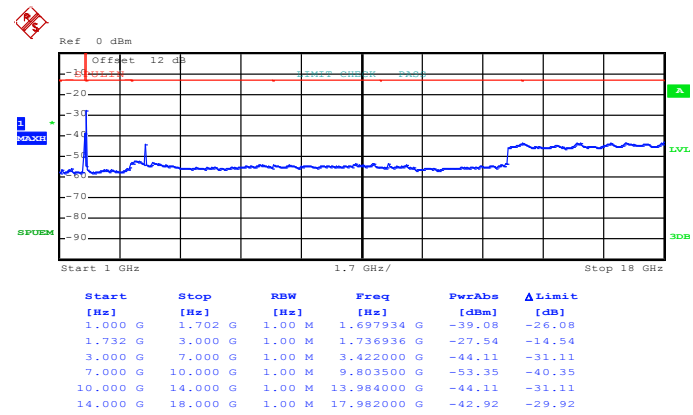
Date: 5.JUN.2012 22:09:01

Band :	LTE Band 4	Channel :	CH20025 (Low)
Band Width	15MHz		

QPSK (RB Size 1, RB Offset 0)

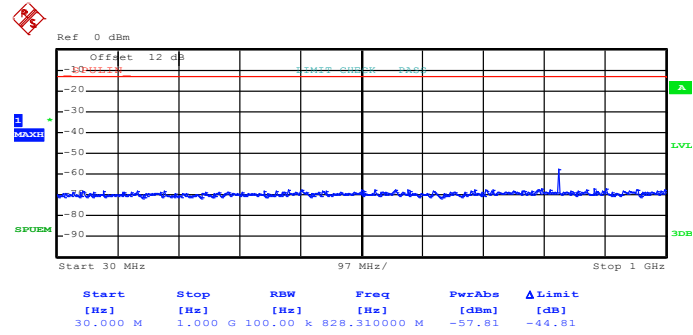


Date: 13.JUN.2012 22:44:34

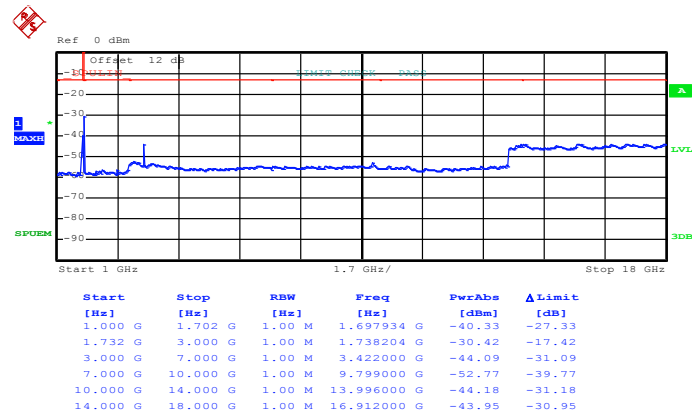


Date: 13.JUN.2012 22:42:50

16QAM (RB Size 1, RB Offset 0)



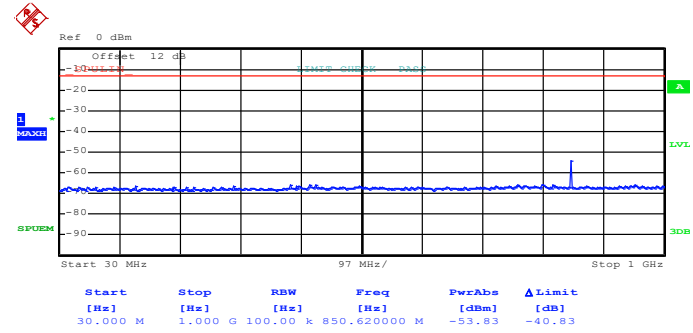
Date: 13.JUN.2012 22:44:51



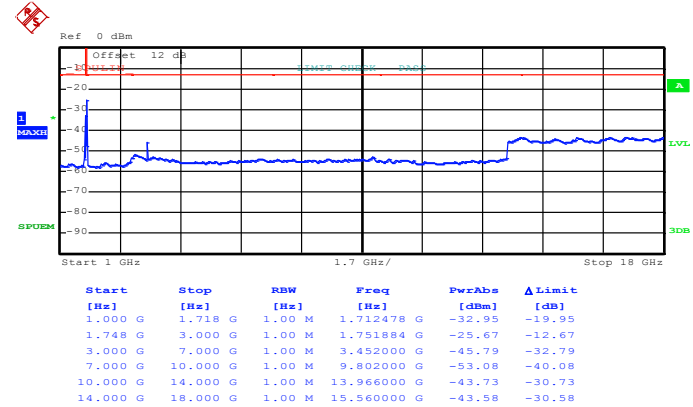
Date: 13.JUN.2012 22:43:10

Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width	15MHz		

QPSK (RB Size 1, RB Offset 0)

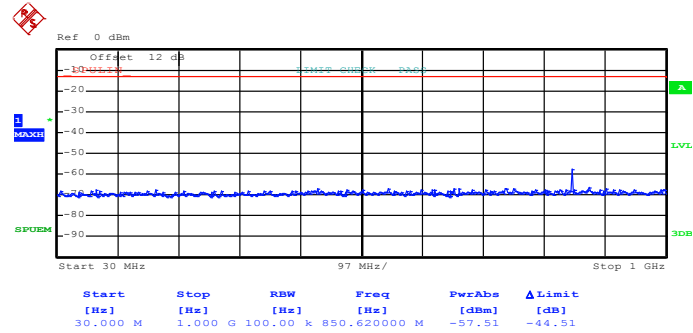


Date: 13.JUN.2012 22:46:05

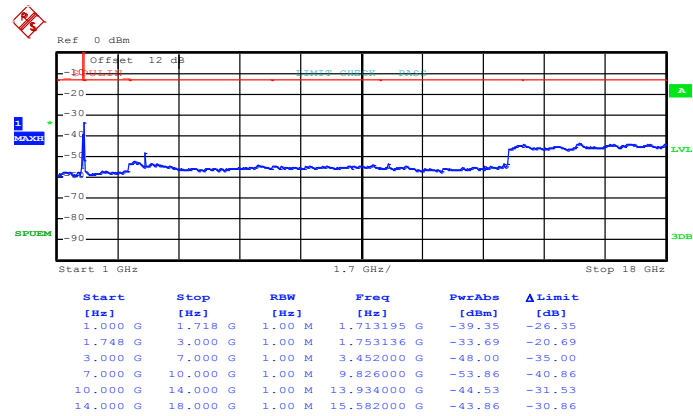


Date: 13.JUN.2012 22:41:22

16QAM (RB Size 1, RB Offset 0)



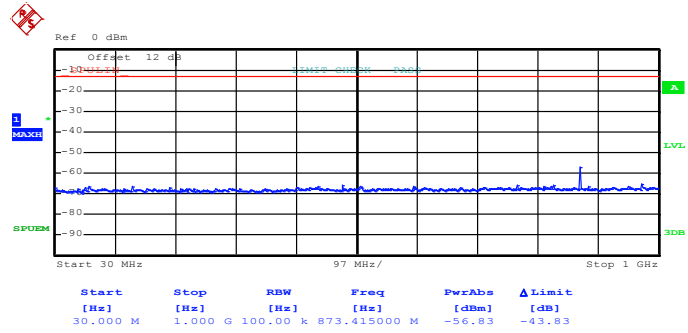
Date: 13.JUN.2012 22:46:24



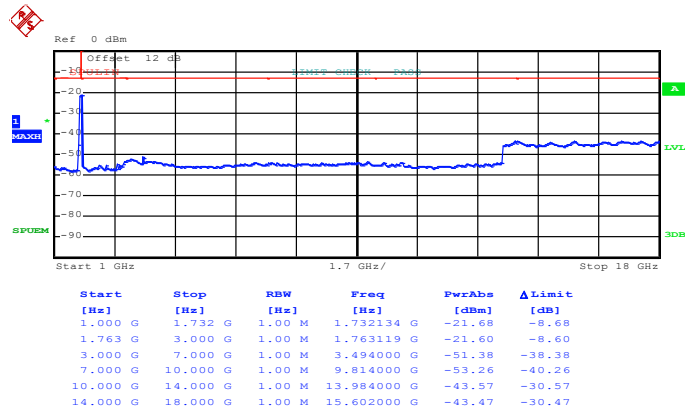
Date: 13.JUN.2012 22:41:42

Band :	LTE Band 4	Channel :	CH20325 (High)
Band Width	15MHz		

QPSK (RB Size 1, RB Offset 0)

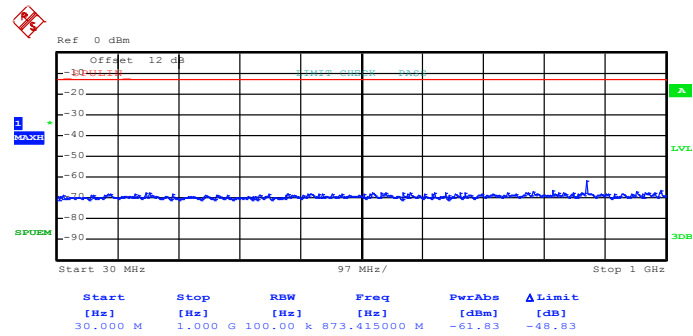


Date: 13.JUN.2012 22:47:03

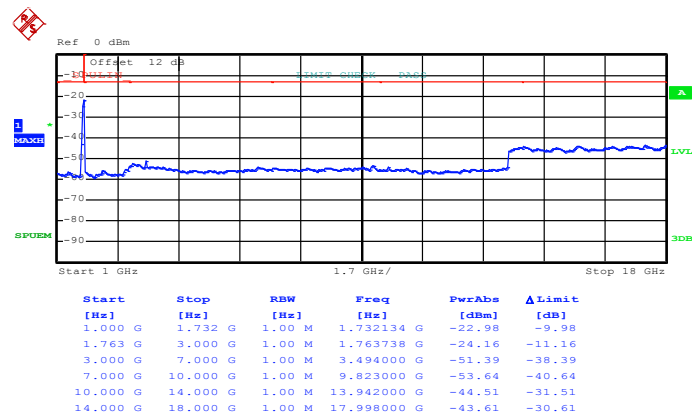


Date: 13.JUN.2012 22:38:31

16QAM (RB Size 1, RB Offset 0)



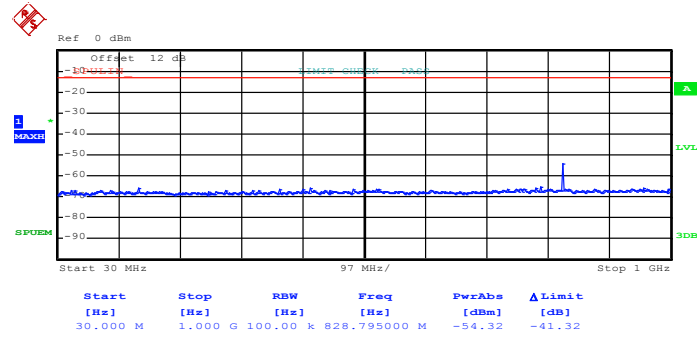
Date: 13.JUN.2012 22:47:18



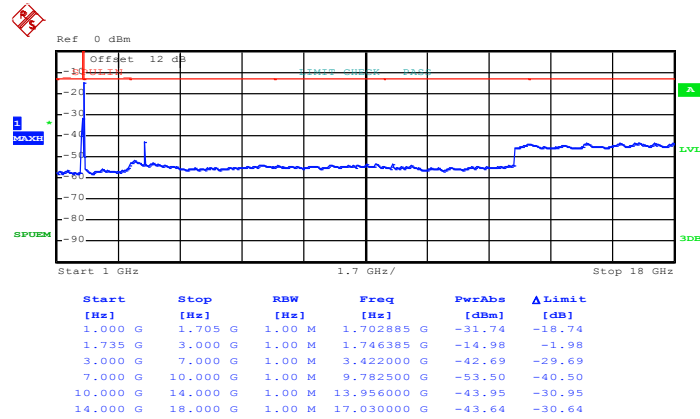
Date: 13.JUN.2012 22:38:55

Band :	LTE Band 4	Channel :	CH20050 (Low)
Band Width	20MHz		

QPSK (RB Size 1, RB Offset 0)

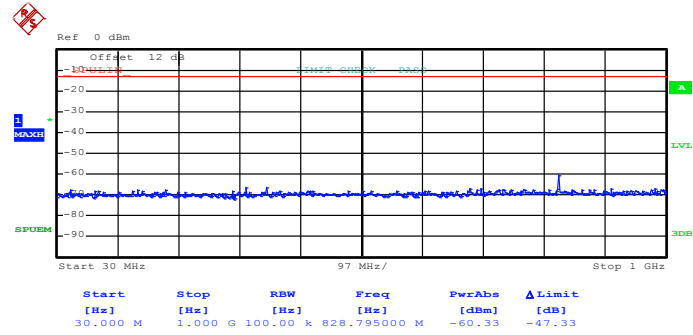


Date: 13.JUN.2012 22:30:37

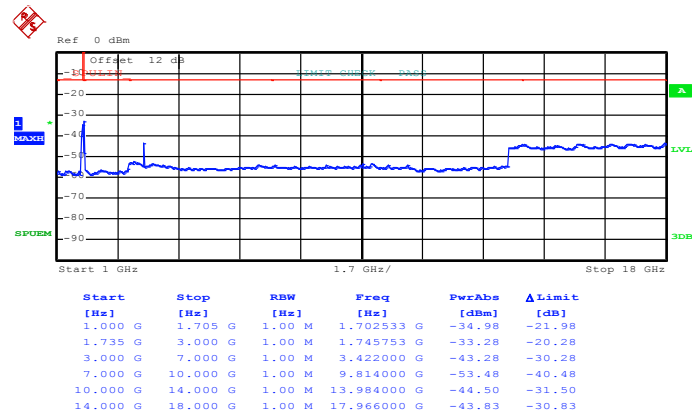


Date: 13.JUN.2012 22:33:43

16QAM (RB Size 1, RB Offset 0)



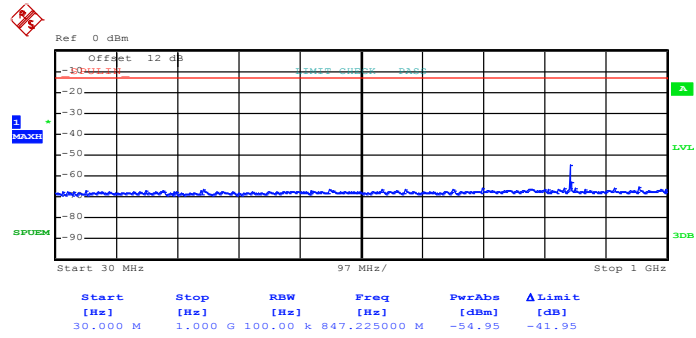
Date: 13.JUN.2012 22:31:01



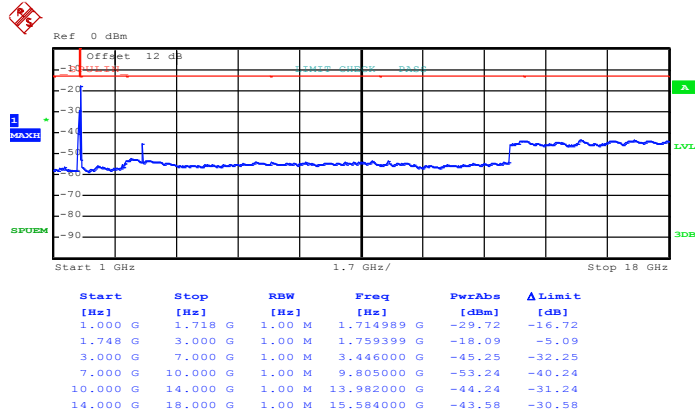
Date: 13.JUN.2012 22:34:11

Band :	LTE Band 4	Channel :	CH20175 (Middle)
Band Width	20MHz		

QPSK (RB Size 1, RB Offset 0)

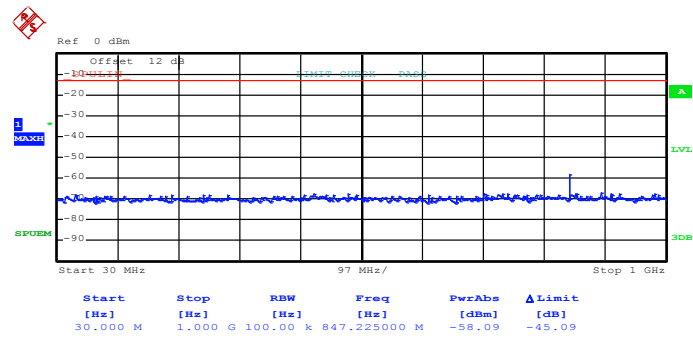


Date: 13.JUN.2012 22:31:38

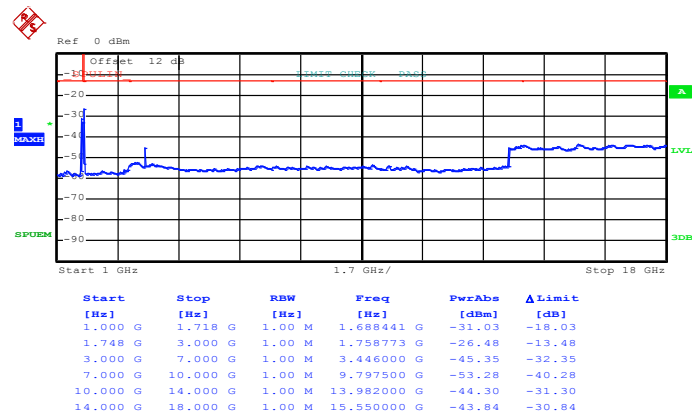


Date: 13.JUN.2012 22:35:11

16QAM (RB Size 1, RB Offset 0)



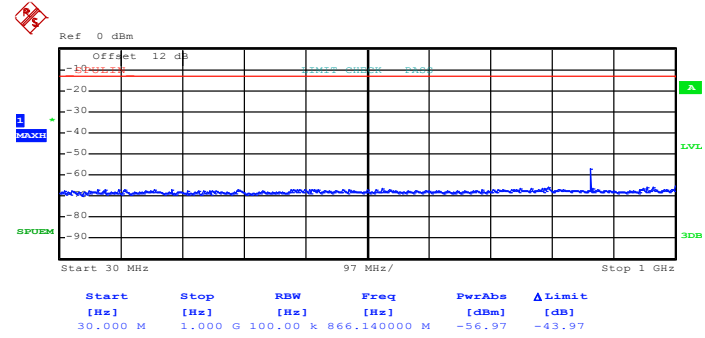
Date: 13.JUN.2012 22:31:53



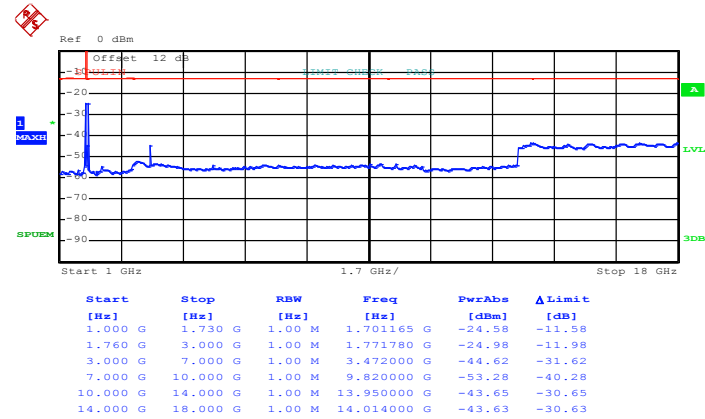
Date: 13.JUN.2012 22:35:51

Band :	LTE Band 4	Channel :	CH20300 (High)
Band Width	20MHz		

QPSK (RB Size 1, RB Offset 0)

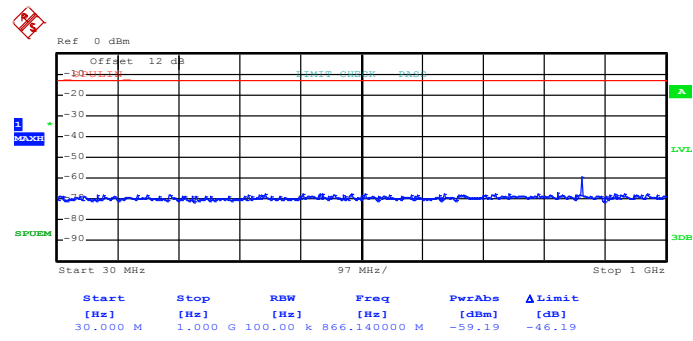


Date: 13.JUN.2012 22:32:28

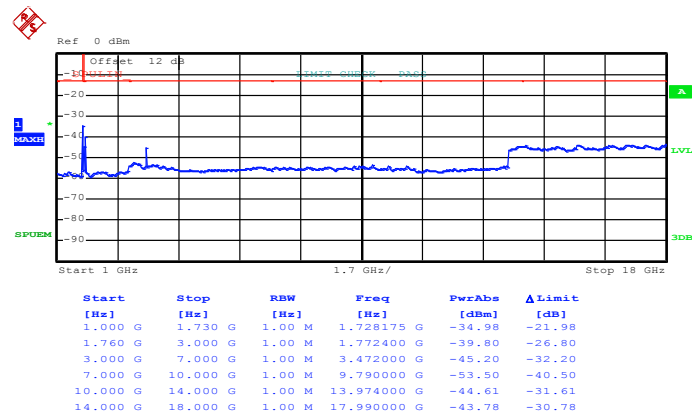


Date: 13.JUN.2012 22:36:53

16QAM (RB Size 1, RB Offset 0)



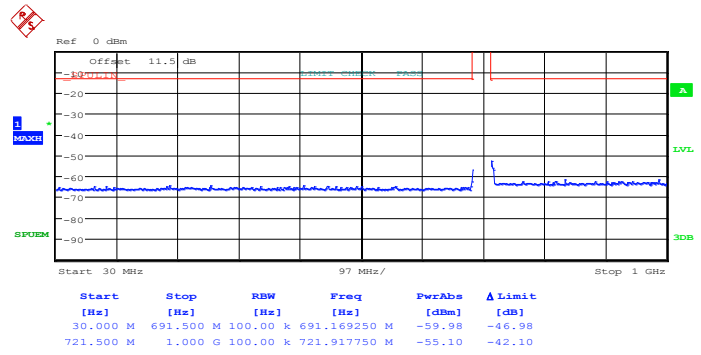
Date: 13.JUN.2012 22:32:47



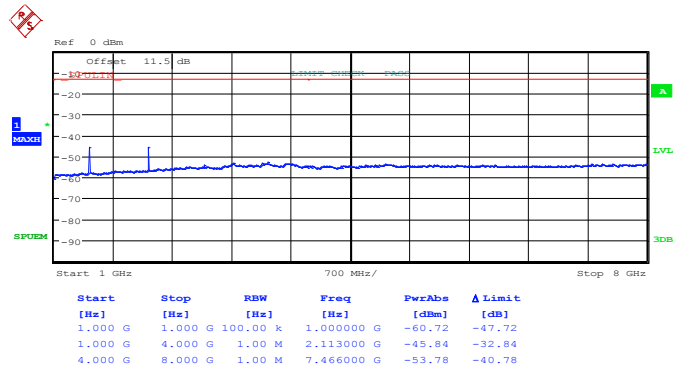
Date: 13.JUN.2012 22:37:20

Band :	LTE Band 17	Channel :	CH23755 (Low)
Band Width	5MHz		

QPSK (RB Size 1, RB Offset 0)

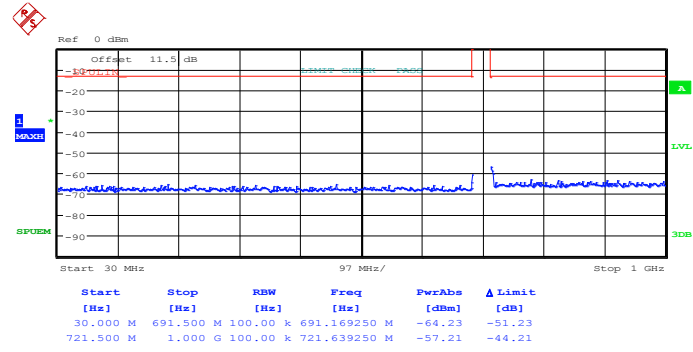


Date: 5.JUN.2012 21:16:17

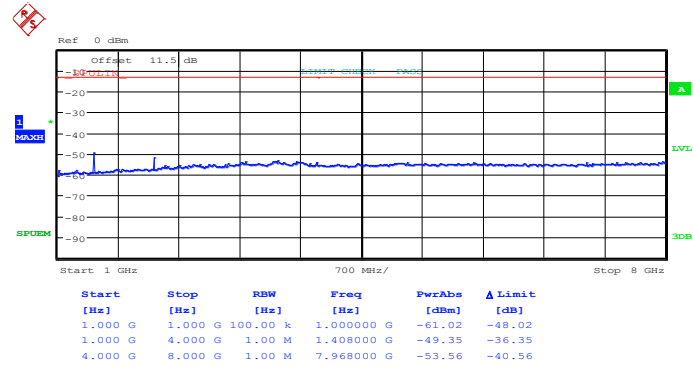


Date: 5.JUN.2012 21:29:21

16QAM (RB Size 1, RB Offset 0)



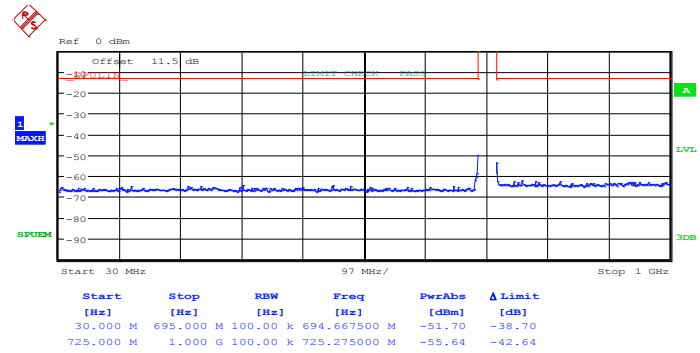
Date: 5.JUN.2012 21:16:57



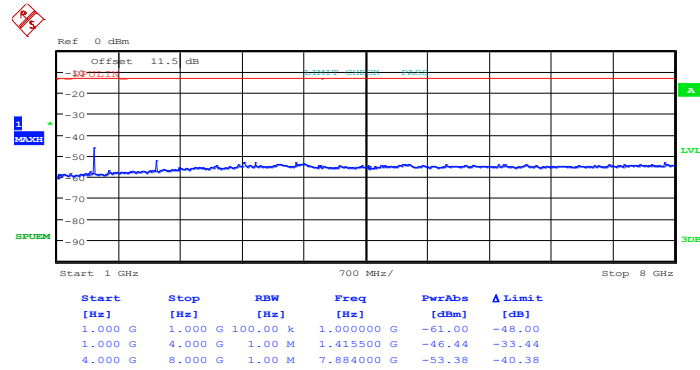
Date: 5.JUN.2012 21:30:36

Band :	LTE Band 17	Channel :	CH23790 (Middle)
Band Width	5MHz		

QPSK (RB Size 1, RB Offset 0)

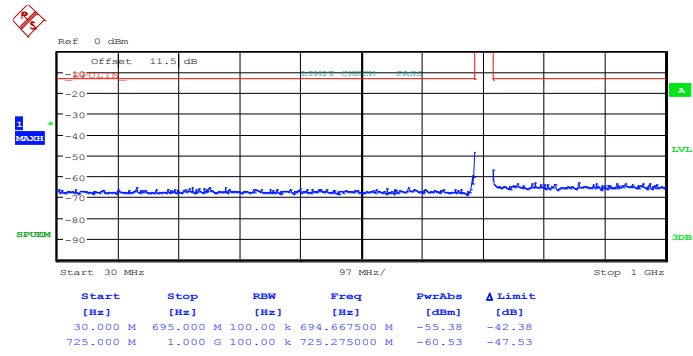


Date: 5.JUN.2012 21:18:17

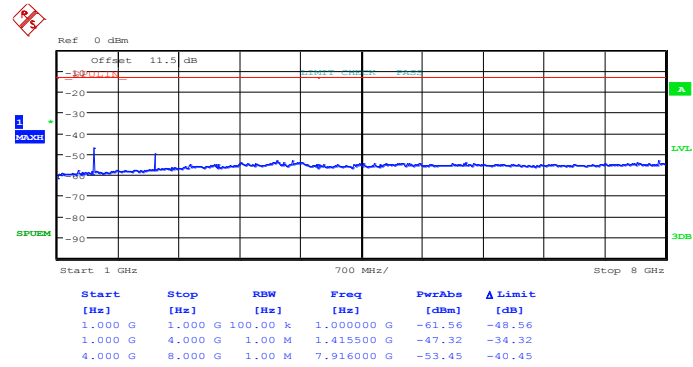


Date: 5.JUN.2012 21:26:31

16QAM (RB Size 1, RB Offset 0)



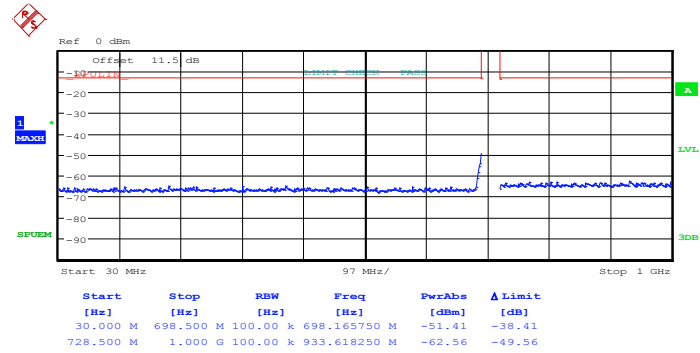
Date: 5.JUN.2012 21:18:44



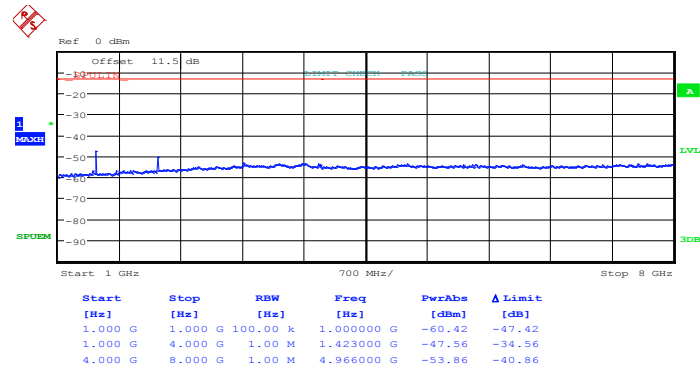
Date: 5.JUN.2012 21:26:57

Band :	LTE Band 17	Channel :	CH23825 (High)
Band Width	5MHz		

QPSK (RB Size 1, RB Offset 0)

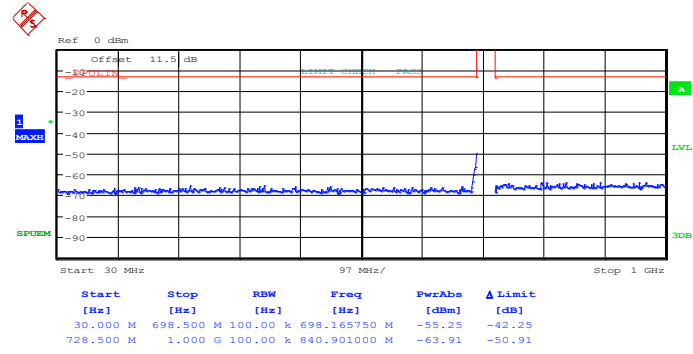


Date: 5.JUN.2012 21:20:18

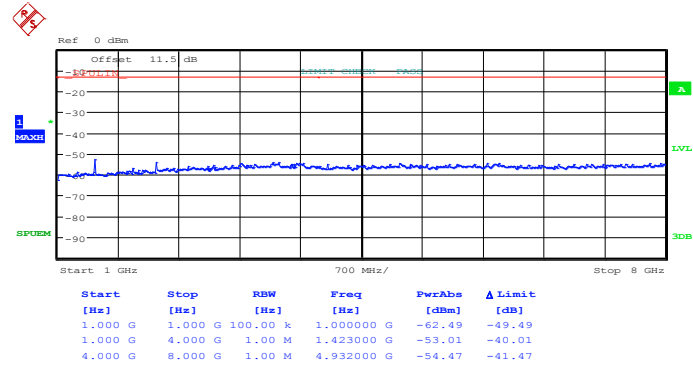


Date: 5.JUN.2012 21:21:57

16QAM (RB Size 1, RB Offset 0)



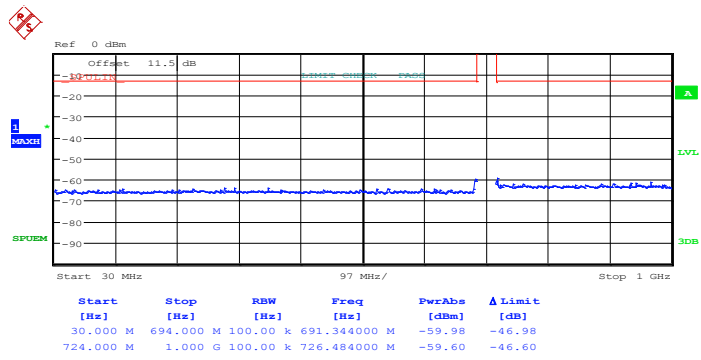
Date: 5.JUN.2012 21:20:38



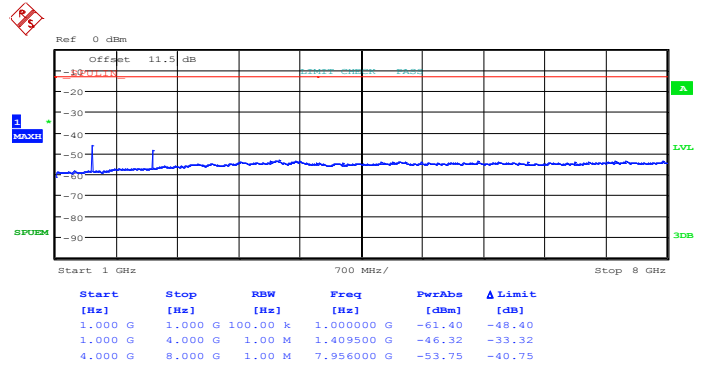
Date: 5.JUN.2012 21:22:23

Band :	LTE Band 17	Channel :	CH23780 (Low)
Band Width	10MHz		

QPSK (RB Size 1, RB Offset 0)

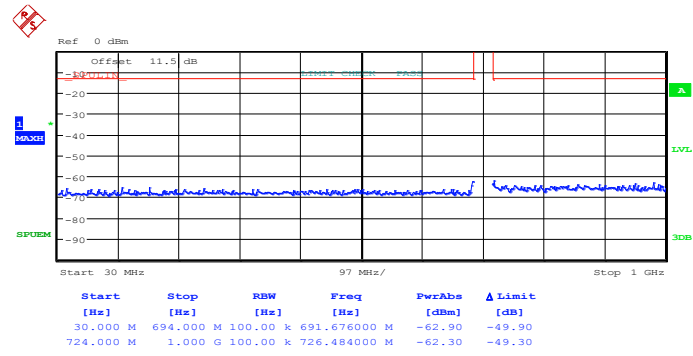


Date: 5.JUN.2012 21:44:01

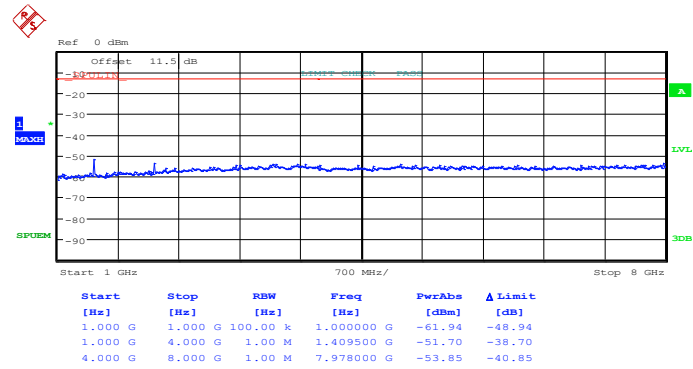


Date: 5.JUN.2012 21:37:22

16QAM (RB Size 1, RB Offset 0)



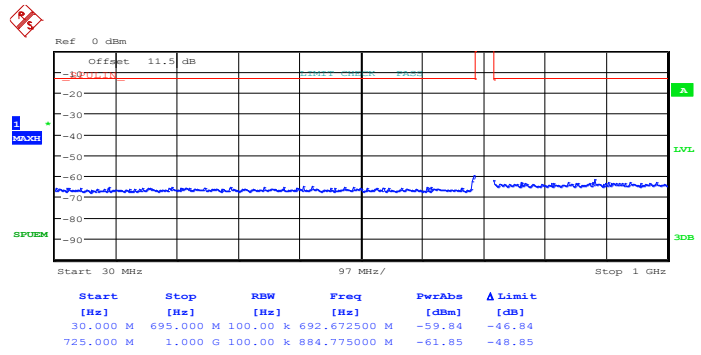
Date: 5.JUN.2012 21:44:23



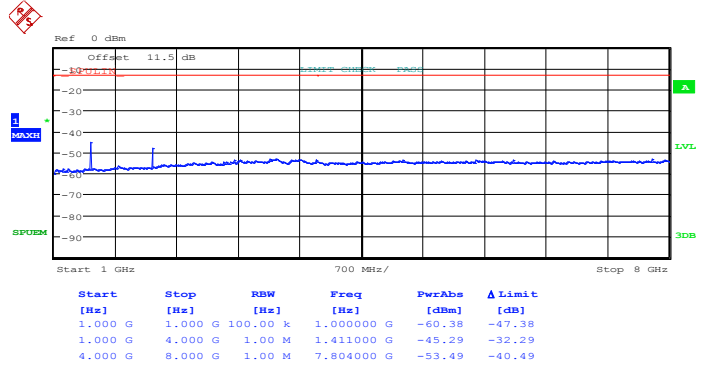
Date: 5.JUN.2012 21:37:42

Band :	LTE Band 17	Channel :	CH23790 (Middle)
Band Width	10MHz		

QPSK (RB Size 1, RB Offset 0)

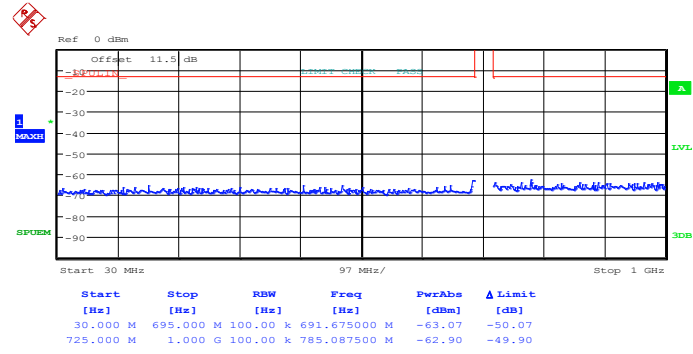


Date: 5.JUN.2012 21:46:15

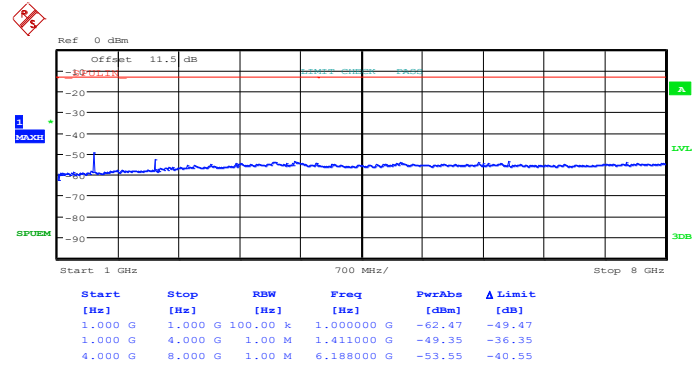


Date: 5.JUN.2012 21:36:11

16QAM (RB Size 1, RB Offset 0)



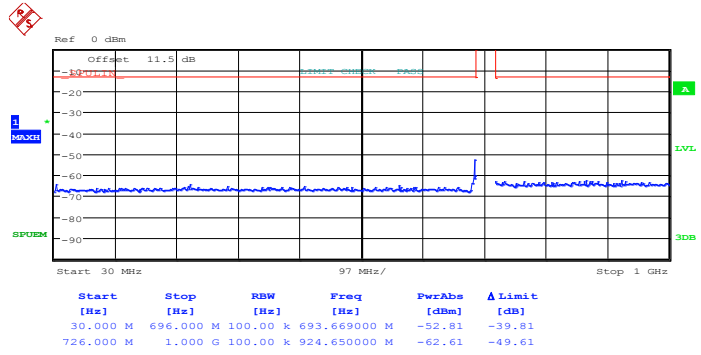
Date: 5.JUN.2012 21:46:43



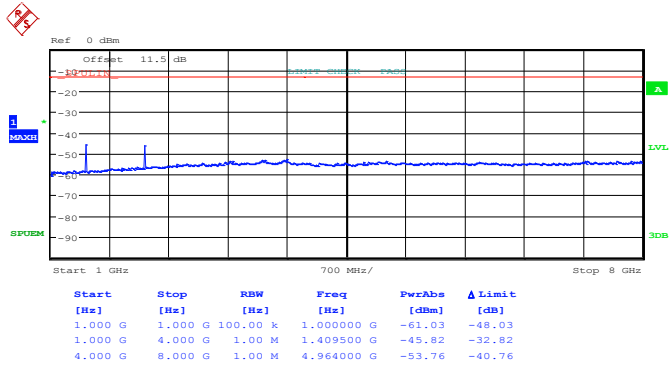
Date: 5.JUN.2012 21:36:40

Band :	LTE Band 17	Channel :	CH23800 (High)
Band Width	10MHz		

QPSK (RB Size 1, RB Offset 0)

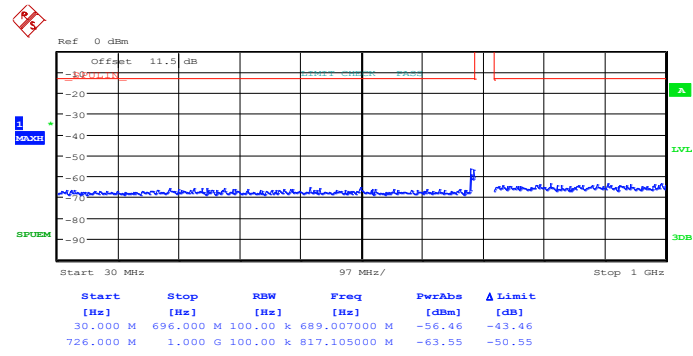


Date: 5.JUN.2012 21:47:28

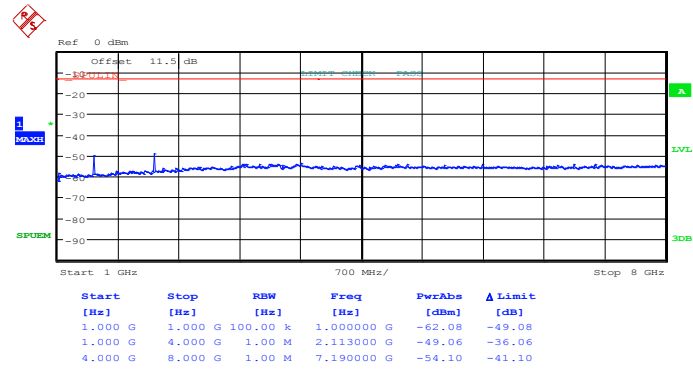


Date: 5.JUN.2012 21:38:43

16QAM (RB Size 1, RB Offset 0)



Date: 5.JUN.2012 21:48:07



Date: 5.JUN.2012 21:39:03

3.7 Field Strength of Spurious Radiation Measurement

3.7.1 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.

3.7.2 Measuring Instruments

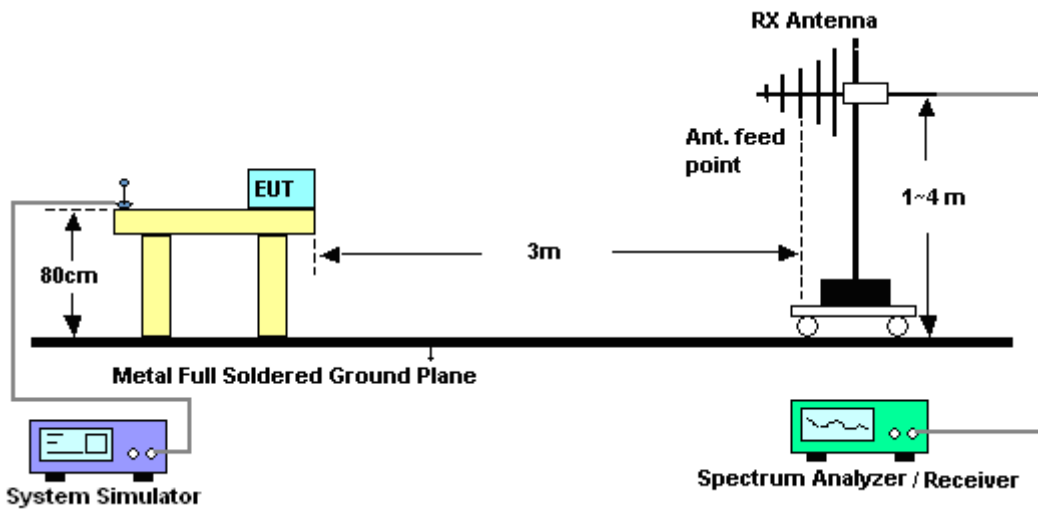
See list of measuring instruments of this test report.

3.7.3 Test Procedures

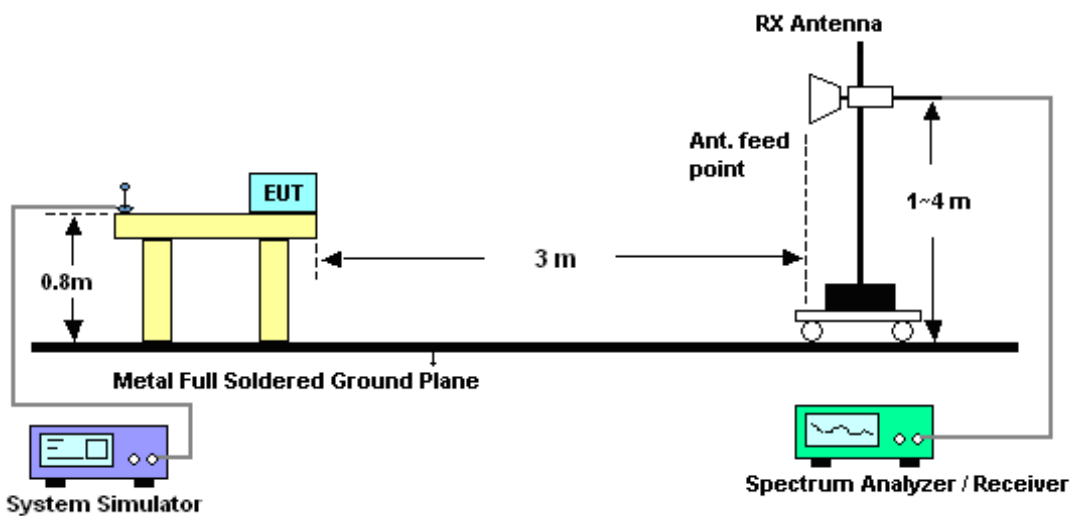
1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving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

3.7.4 Test Setup

For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz

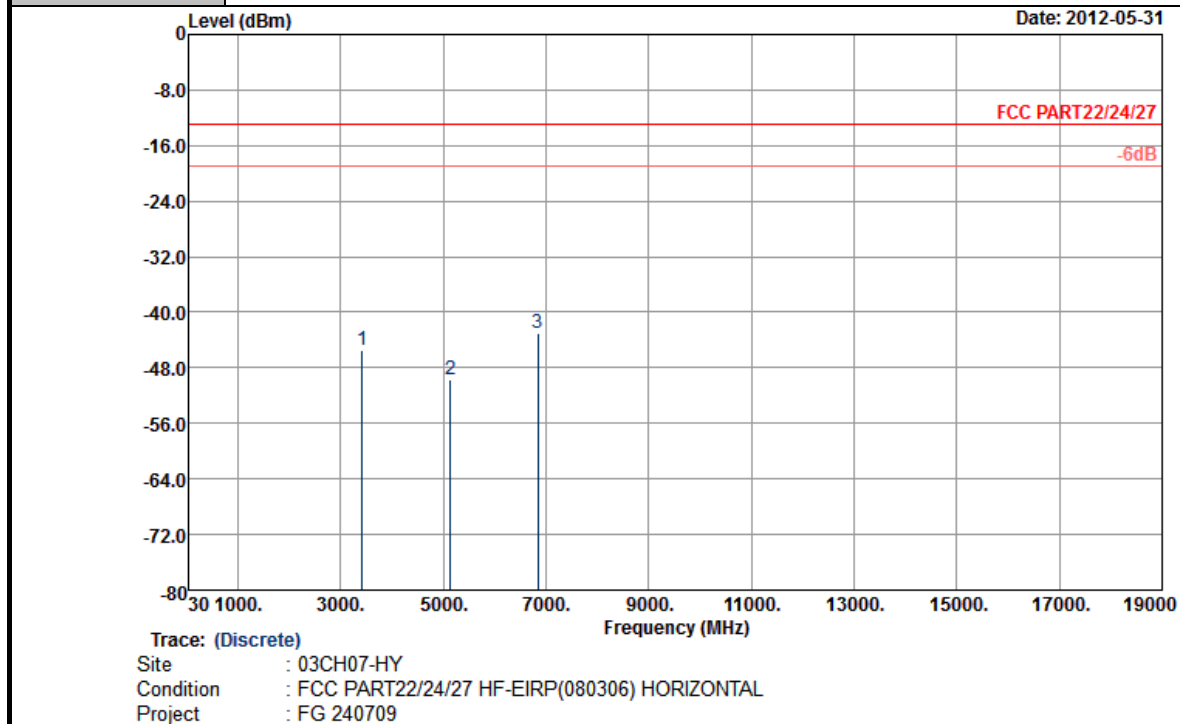


3.7.5 Test Results of Radiated Emissions (9 KHz ~ 30 MHz)

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.

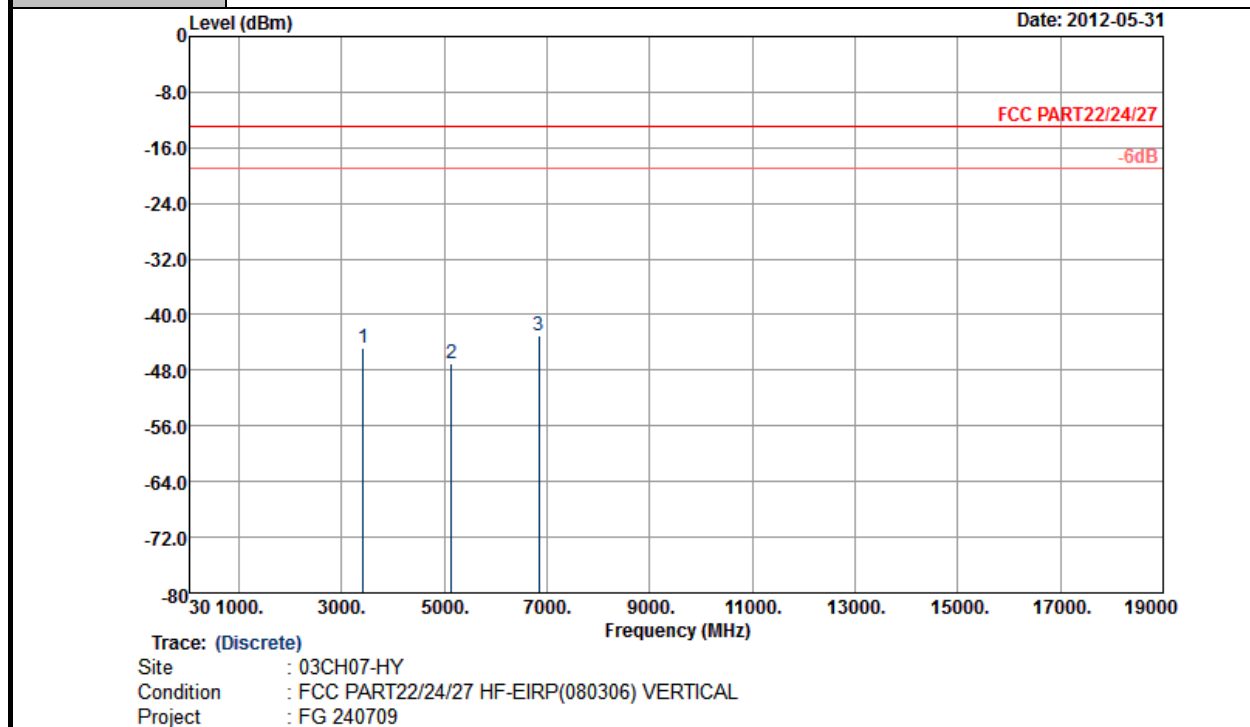
3.7.6 Test Result of Field Strength of Spurious Radiated

Band :	LTE Band 4	Temperature :	24~26°C
Test Mode :	5MHZ QPSK RB Size 1	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



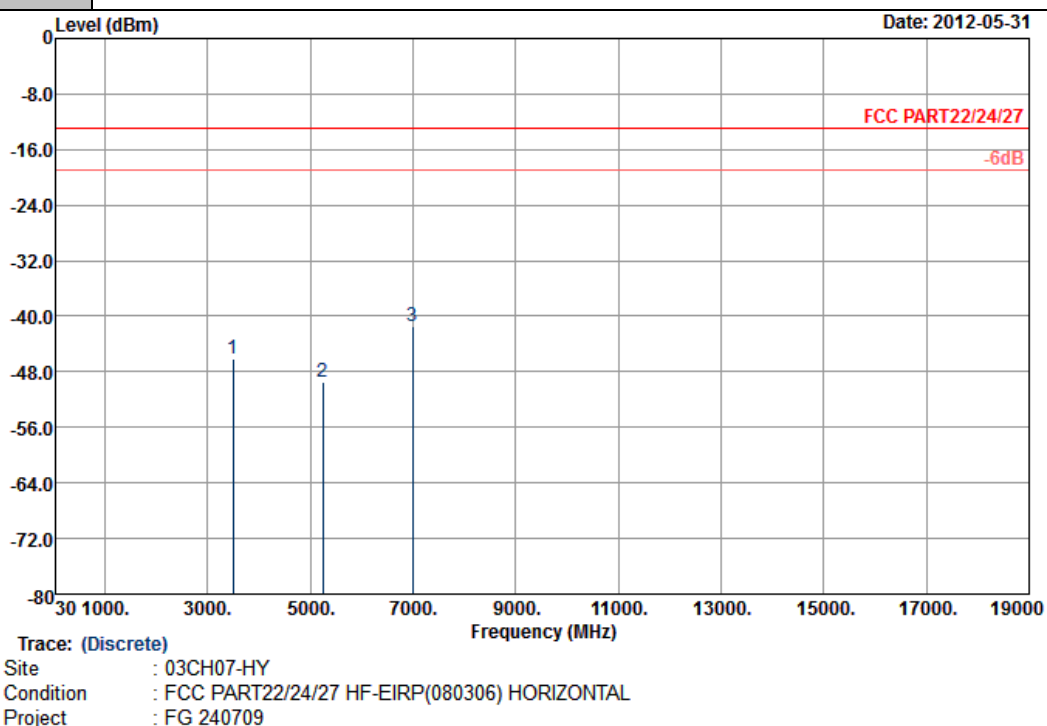
Frequency (MHz)	LEVEL (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3420	-43.41	-13	-30.41	-60.06	-47.24	4.48	8.31	H	Pass
5132	-47.61	-13	-34.61	-67.93	-52.25	5.332	9.98	H	Pass
6844	-40.94	-13	-27.94	-69.02	-46.18	6.1	11.34	H	Pass

Band :	LTE Band 4	Temperature :	24~26°C
Test Mode :	5MHZ QPSK RB Size 1	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



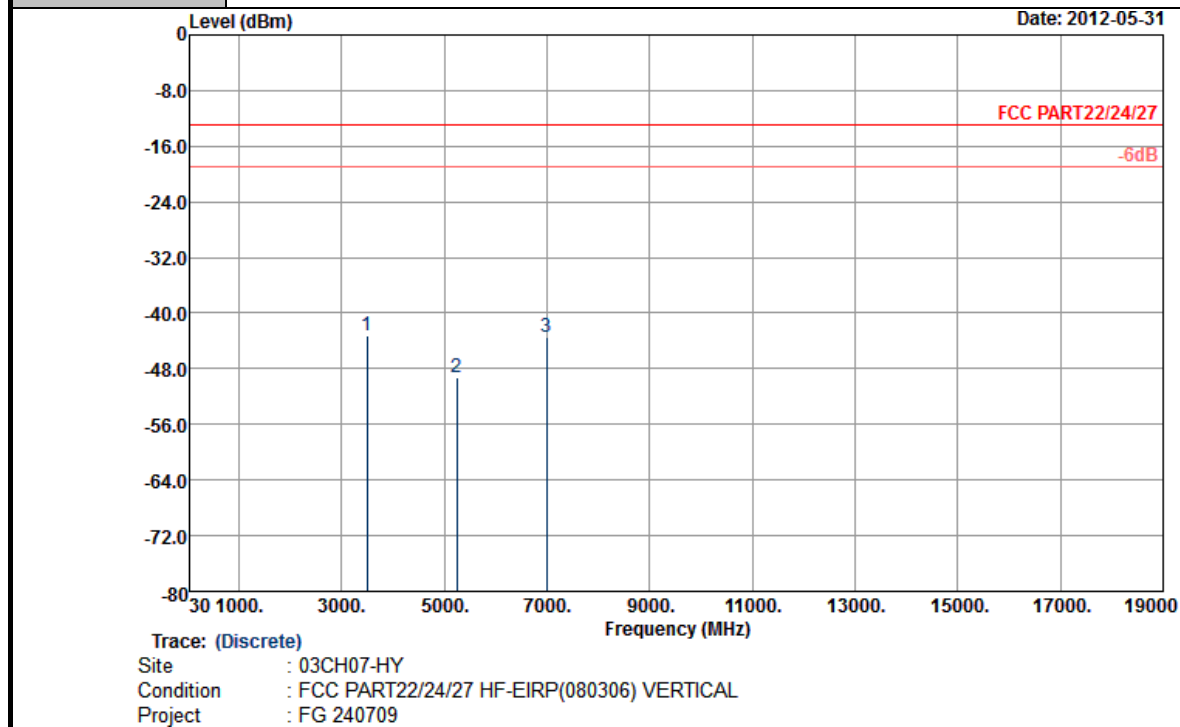
Frequency (MHz)	LEVEL (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3420	-42.72	-13	-29.72	-60.12	-46.55	4.48	8.31	V	Pass
5132	-44.90	-13	-31.90	-65.64	-49.54	5.332	9.98	V	Pass
6844	-40.87	-13	-27.87	-68.19	-46.11	6.1	11.34	V	Pass

Band :	LTE Band 4	Temperature :	24~26°C
Test Mode :	10MHZ QPSK RB Size 1	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



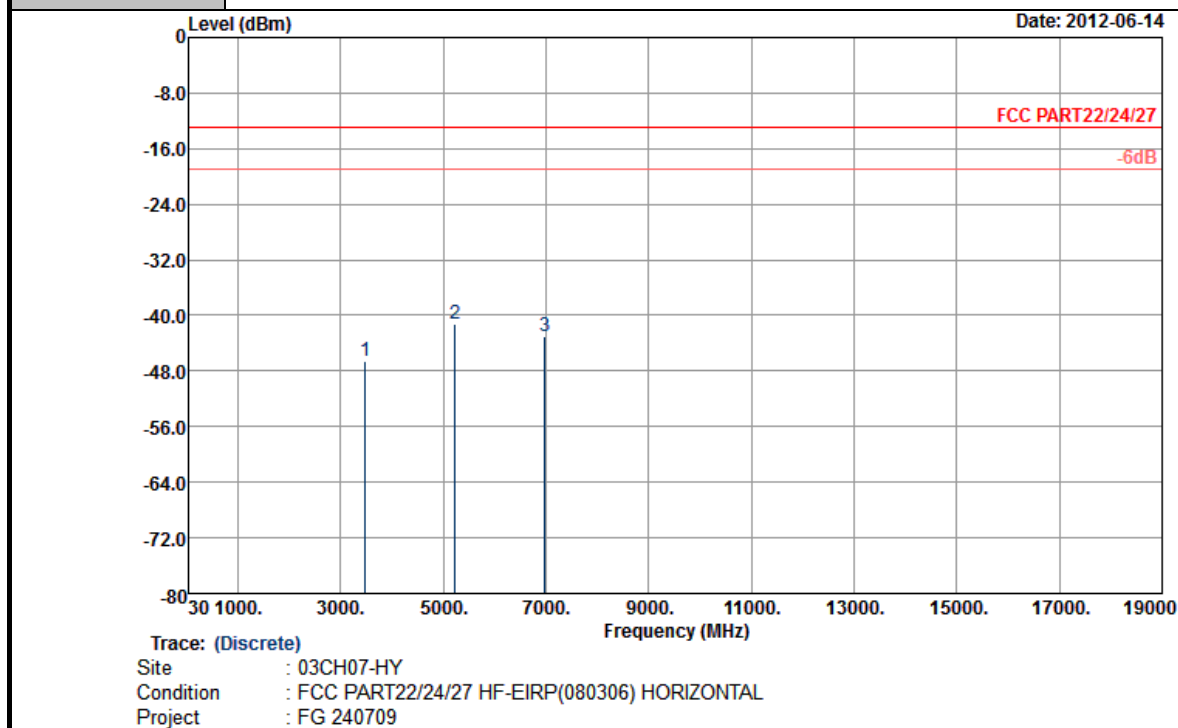
Frequency (MHz)	LEVEL (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3492	-46.05	-13	-33.05	-60.75	-50.24	4.2	8.39	H	Pass
5240	-49.57	-13	-36.57	-68.65	-54.45	5.17	10.05	H	Pass
6992	-41.37	-13	-28.37	-68.1	-46.57	6.2	11.40	H	Pass

Band :	LTE Band 4	Temperature :	24~26°C
Test Mode :	10MHZ QPSK RB Size 1	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



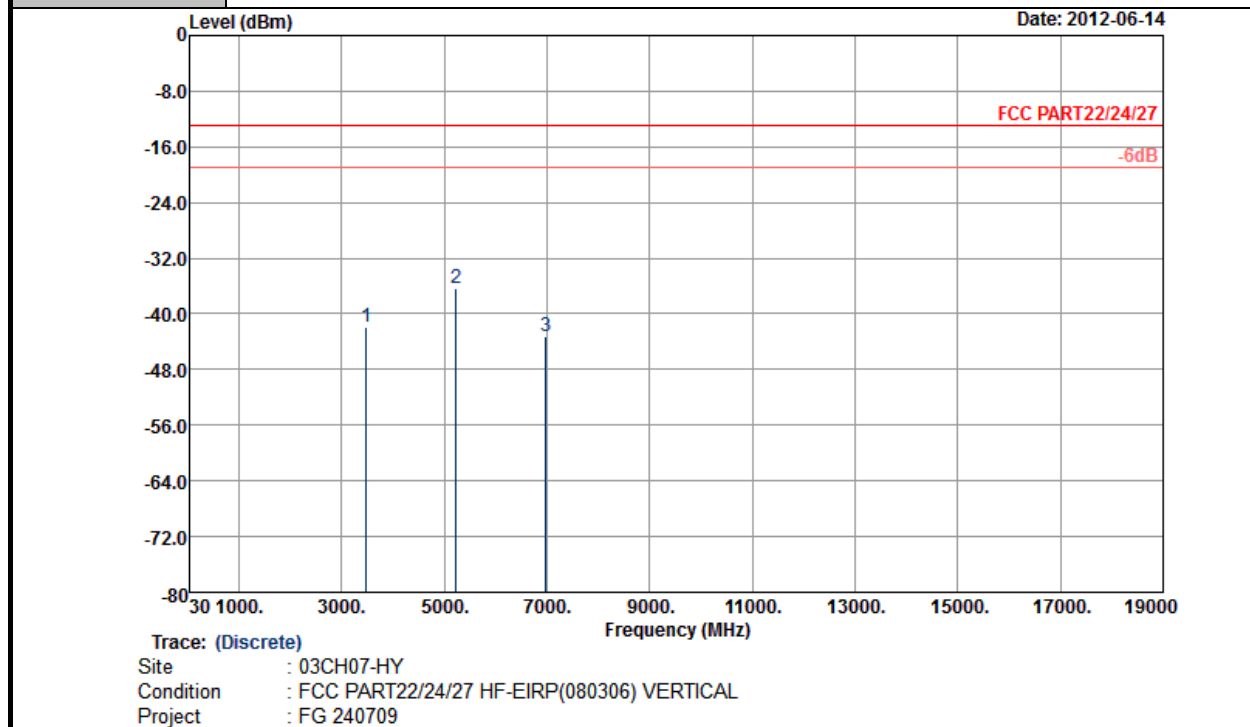
Frequency (MHz)	LEVEL (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3492	-43.32	-13	-30.32	-59.1	-47.51	4.2	8.39	V	Pass
5240	-49.34	-13	-36.34	-68.61	-54.22	5.17	10.05	V	Pass
6992	-43.52	-13	-30.52	-69.28	-48.72	6.2	11.40	V	Pass

Band :	LTE Band 4	Temperature :	24~26°C
Test Mode :	15MHZ QPSK RB Size 1	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



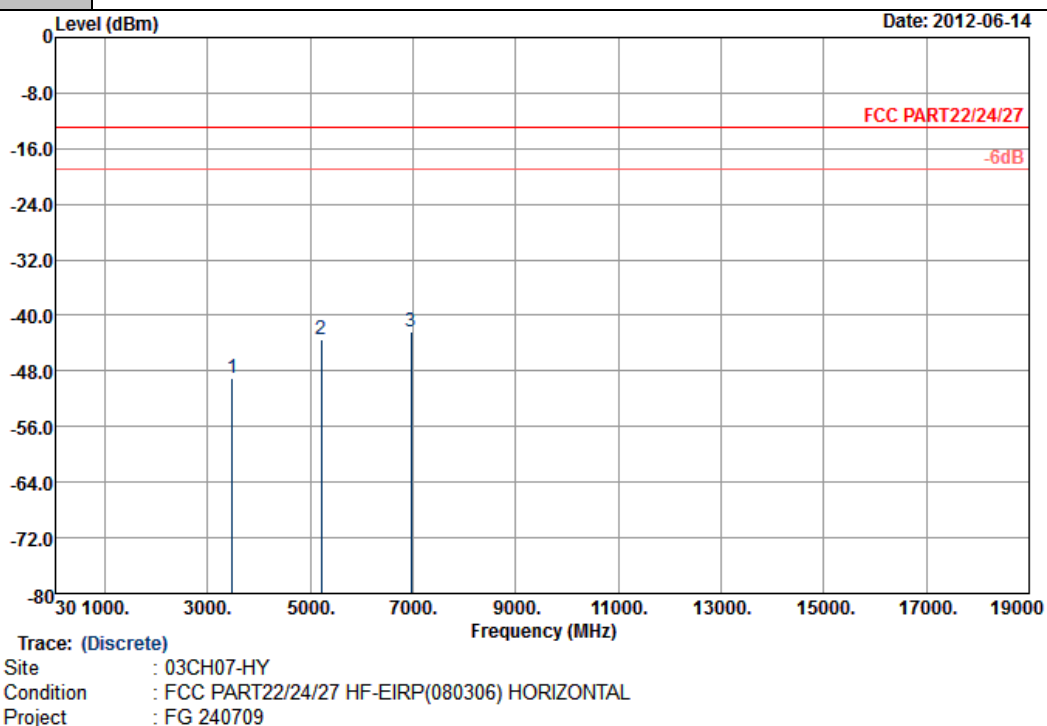
Frequency (MHz)	LEVEL (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3480	-46.65	-13	-33.65	-61.02	-50.79	4.24	8.38	H	Pass
5224	-41.14	-13	-28.14	-60.48	-46.01	5.18	10.05	H	Pass
6972	-43.08	-13	-30.08	-69.19	-48.27	6.19	11.38	H	Pass

Band :	LTE Band 4	Temperature :	24~26°C
Test Mode :	15MHZ QPSK RB Size 1	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



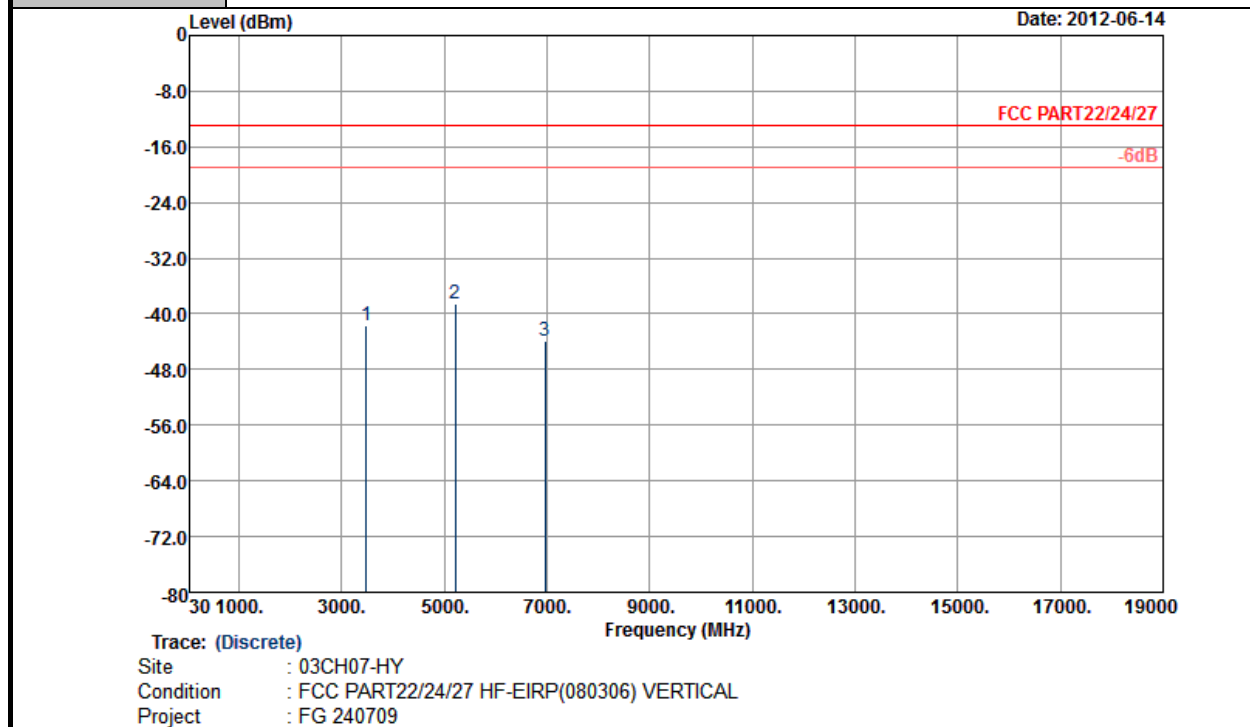
Frequency (MHz)	LEVEL (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3480	-41.94	-13	-28.94	-57.64	-46.08	4.24	8.38	V	Pass
5224	-36.41	-13	-23.41	-55.59	-41.28	5.18	10.05	V	Pass
6972	-43.34	-13	-30.34	-68.92	-48.53	6.19	11.38	V	Pass

Band :	LTE Band 4	Temperature :	24~26°C
Test Mode :	20MHZ QPSK RB Size 1	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



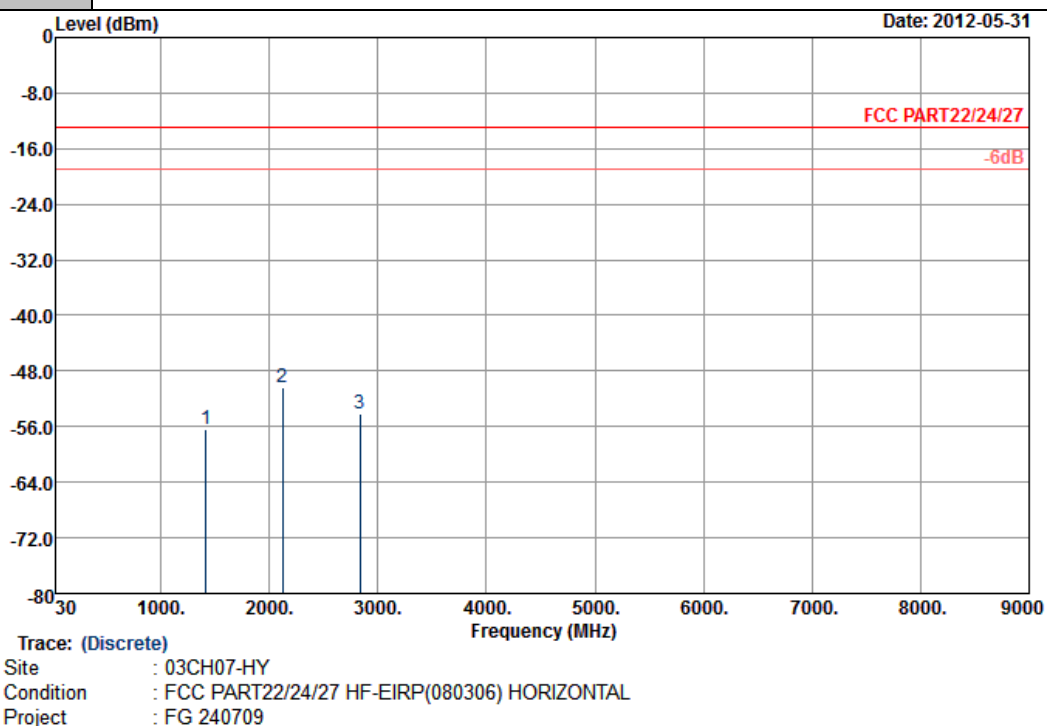
Frequency (MHz)	LEVEL (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3472	-48.93	-13	-35.93	-63.39	-53.02	4.28	8.37	H	Pass
5208	-43.41	-13	-30.41	-62.52	-48.22	5.22	10.03	H	Pass
6952	-42.39	-13	-29.39	-68.98	-47.52	6.23	11.36	H	Pass

Band :	LTE Band 4	Temperature :	24~26°C
Test Mode :	20MHZ QPSK RB Size 1	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



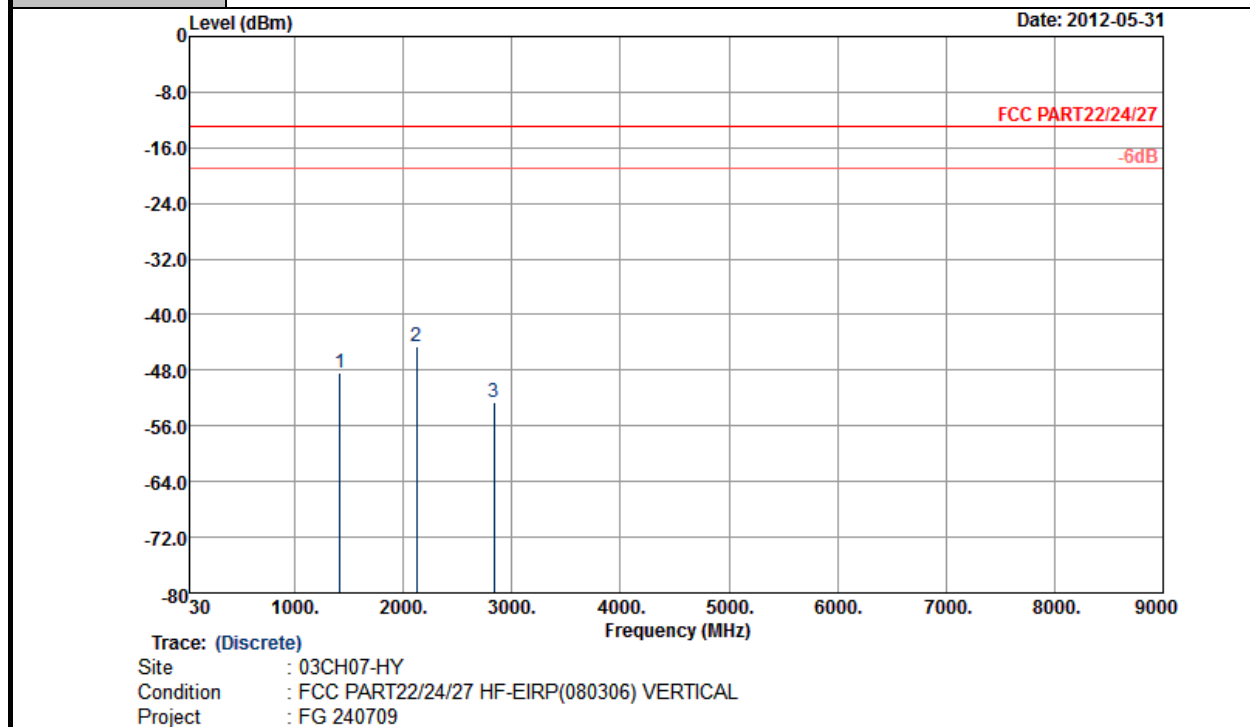
Frequency (MHz)	LEVEL (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3472	-41.68	-13	-28.68	-57.29	-45.77	4.28	8.37	V	Pass
5208	-38.48	-13	-25.48	-57.81	-43.29	5.22	10.03	V	Pass
6952	-43.88	-13	-30.88	-69.09	-49.01	6.23	11.36	V	Pass

Band :	LTE Band 17	Temperature :	24~26°C
Test Mode :	5MHZ QPSK RB Size 1	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



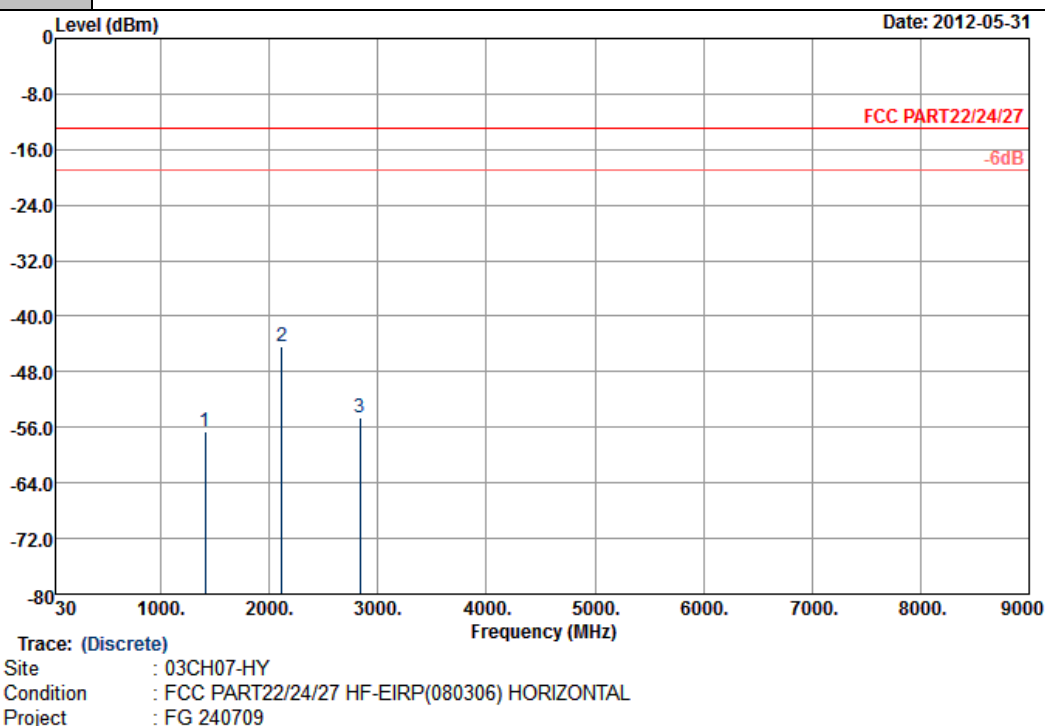
Frequency (MHz)	LEVEL (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1414	-54.12	-13	-41.12	-64.63	-58.2	1.53	5.61	H	Pass
2122	-48.25	-13	-35.25	-61.89	-52.42	1.85	6.02	H	Pass
2836	-51.95	-13	-38.95	-67.66	-56.71	2.24	7.00	H	Pass

Band :	LTE Band 17	Temperature :	24~26°C
Test Mode :	5MHZ QPSK RB Size 1	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



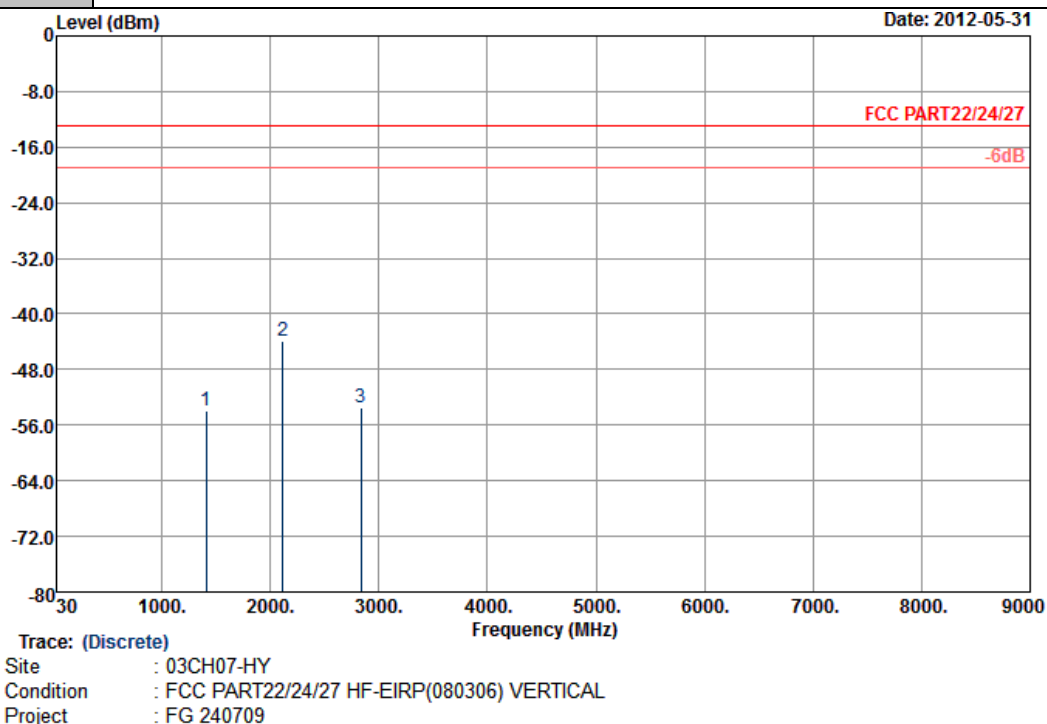
Frequency (MHz)	LEVEL (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1414	-46.16	-13	-33.16	-59.15	-50.24	1.53	5.61	V	Pass
2122	-42.40	-13	-29.40	-57.76	-46.57	1.85	6.02	V	Pass
2836	-50.47	-13	-37.47	-67.76	-55.23	2.24	7.00	V	Pass

Band :	LTE Band 17	Temperature :	24~26°C
Test Mode :	10MHZ QPSK RB Size 1	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



Frequency (MHz)	LEVEL (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
1411	-54.48	-13	-41.48	-65.78	-58.56	1.53	5.61	H	Pass
2116	-42.28	-13	-29.28	-56.1	-46.45	1.85	6.02	H	Pass
2836	-52.50	-13	-39.50	-68.59	-57.26	2.24	7.00	H	Pass

Band :	LTE Band 17	Temperature :	24~26°C
Test Mode :	10MHZ QPSK RB Size 1	Relative Humidity :	50~52%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-10th harmonic were found more than 20dB below limit line.		



Frequency (MHz)	LEVEL (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
1411	-51.67	-13	-38.67	-65.9	-55.75	1.53	5.61	V	Pass
2116	-41.61	-13	-28.61	-56.92	-45.78	1.85	6.02	V	Pass
2836	-51.36	-13	-38.36	-68.36	-56.12	2.24	7.00	V	Pass

3.8 Frequency Stability Measurement

3.8.1 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.

3.8.2 Measuring Instruments

See list of measuring instruments of this test report.

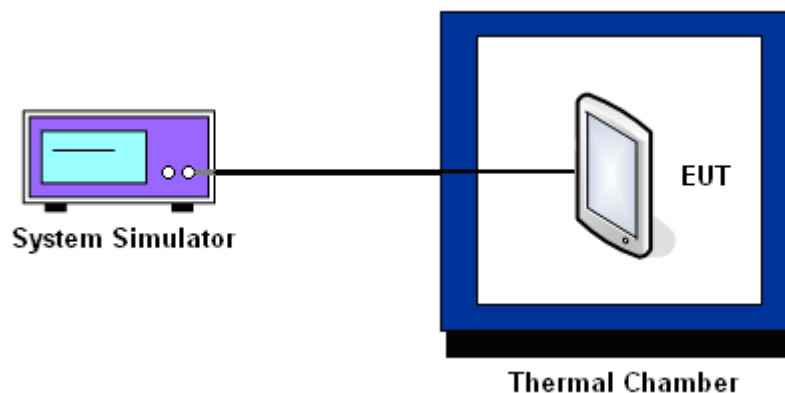
3.8.3 Test Procedures for Temperature Variation

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 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.

3.8.4 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 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.

3.8.5 Test Setup



3.8.6 Test Result of Temperature Variation

Band :	LTE Band 4			Limit (ppm) :	2.5
Temperature (°C)	BW 5MHz		BW 10MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-8.1	-0.011	-9.1	-0.013	PASS
-20	8.6	0.012	10.2	0.014	
-10	-9.7	-0.014	8.4	0.012	
0	10.1	0.014	11.2	0.016	
10	8.3	0.012	10.1	0.014	
20	11.1	0.016	8.7	0.012	
30	13.6	0.019	10.8	0.015	
35	11.1	0.016	7.0	0.010	
40	10.1	0.014	12.2	0.017	
50	8.2	0.012	8.7	0.012	

Band :	LTE Band 4			Limit (ppm) :	2.5
Temperature (°C)	BW 15MHz		BW 20MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	-7.5	-0.011	-11.1	-0.016	PASS
-20	12.1	0.017	-10.2	-0.014	
-10	9.1	0.013	-9.8	-0.014	
0	-6.2	-0.009	7.8	0.011	
10	7.0	0.010	7.2	0.010	
20	9.0	0.013	7.6	0.011	
30	9.2	0.013	7.7	0.011	
35	9.7	0.014	9.6	0.014	
40	10.3	0.015	8.7	0.012	
50	12.1	0.017	11.7	0.016	

Band :	LTE Band 17	Limit (ppm) :	2.5
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Temperature (°C)	BW 5MHz		BW 10MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	5.6	0.008	6.4	0.009	PASS
-20	5.1	0.007	6.3	0.009	
-10	4.7	0.007	6.4	0.009	
0	4.9	0.007	-4.0	-0.006	
10	4.2	0.006	5.6	0.008	
20	4.6	0.006	5.1	0.007	
30	4.0	0.006	5.0	0.007	
35	4.2	0.006	5.7	0.008	
40	5.1	0.007	5.0	0.007	
50	5.4	0.008	4.8	0.007	

3.8.7 Test Result of Voltage Variation

Band	Bandwidth	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 4	5M	3.4	8.1	0.011	2.5	PASS
		Normal	9.7	0.014		
		4.2	8.7	0.012		
	10M	3.4	9.4	0.013		
		Normal	11.6	0.016		
		4.2	10.2	0.014		
	15M	3.4	7.7	0.011	2.5	PASS
		Normal	8.4	0.012		
		4.2	11.4	0.016		
	20M	3.4	10.4	0.015		
		Normal	8.7	0.012		
		4.2	9.9	0.014		
LTE Band 17	5M	3.4	4.4	0.006	2.5	PASS
		Normal	5.0	0.007		
		4.2	4.6	0.006		
	10M	3.4	5.8	0.008		
		Normal	5.6	0.008		
		4.2	5.2	0.007		

Remark:

1. Normal Voltage = 3.7V.
2. The manufacturer declared that the EUT could work properly between voltage 3.4V ~ 4.2V.

4 List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
System Simulator	R&S	CMU200	117995	N/A	Jul. 28, 2011	Jun. 05, 2012 ~ Aug. 21, 2012	Jul. 27, 2012	Conducted (TH02-HY)
System Simulator	R&S	CMU200	117995	N/A	Jul. 30, 2012	Jun. 05, 2012 ~ Aug. 21, 2012	Jul. 29, 2013	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 13, 2011	Jun. 05, 2012 ~ Aug. 21, 2012	Jun. 12, 2012	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 06, 2012	Jun. 05, 2012 ~ Aug. 21, 2012	Jun. 05, 2013	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 06, 2012	Jun. 12, 2012 ~ Aug. 21, 2012	Jun. 05, 2013	Conducted (TH02-HY)
Thermal Chamber	Ten Billion	TTH-D35P	TBN-930701	N/A	Jul. 27, 2011	Jun. 05, 2012 ~ Aug. 21, 2012	Jul. 26, 2012	Conducted (TH02-HY)
Thermal Chamber	Ten Billion	TTH-D3SP	TBN-930701	N/A	Jul. 23, 2012	Jun. 05, 2012 ~ Aug. 21, 2012	Jul. 22, 2013	Conducted (TH02-HY)
LTE Base Station	Anritsu	MT8820C	6201074414	N/A	Jan. 05, 2012	Jun. 05, 2012 ~ Aug. 21, 2012	Jan. 04, 2013	Conducted (TH02-HY)
Bilog Antenna	SCHAFFNER	CBL6111C	2726	30MHz ~ 1GHz	Oct. 22, 2011	May 31, 2012 ~ Jun. 14, 2012	Oct. 21, 2012	Radiation (03CH07-HY)
Spectrum Analyzer	R&S	FSP30	101067	9KHz ~ 30GHz	Dec. 06, 2011	May 31, 2012 ~ Jun. 14, 2012	Dec. 05, 2012	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 10, 2011	May 31, 2012 ~ Jun. 14, 2012	Aug. 09, 2012	Radiation (03CH07-HY)
Pre Amplifier	Agilent	8449B	3008A02362	1GHz ~ 26.5GHz	Dec. 05, 2011	May 31, 2012 ~ Jun. 14, 2012	Dec. 04, 2012	Radiation (03CH07-HY)
Pre Amplifier	COM-POWER	PA-103A	161241	10-1000MHz.32dB. GAIN	Feb. 27, 2012	May 31, 2012 ~ Jun. 14, 2012	Feb. 26, 2013	Radiation (03CH07-HY)
EMI TEST RECEIVER	R&S	ESCI 7	100724	9kHz ~ 7GHz	Aug. 22, 2011	May 31, 2012 ~ Jun. 14, 2012	Aug. 21, 2012	Radiation (03CH07-HY)
Pre Amplifier	MITEQ	AMF-7D-00 101800-30-1	159088	1GHz ~ 18GHz	Mar. 10, 2012	May 31, 2012 ~ Jun. 14, 2012	Mar. 09, 2013	Radiation (03CH07-HY)
LTE Base Station	Anritsu	MT8820C	6201074414	N/A	Jan. 05, 2012	May 31, 2012 ~ Jun. 14, 2012	Jan. 04, 2013	Radiation (03CH07-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 29, 2010	May 31, 2012 ~ Jun. 14, 2012	Jul. 28, 2012	Radiation (03CH07-HY)

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				