



FCC RF Test Report

APPLICANT : ASUSTek COMPUTER INC.
EQUIPMENT : ASUS Transformer Pad
MODEL NAME : ASUS
MARKETING NAME : ASUS Transformer Pad
FCC ID : MSQTF300TL
STANDARD : 47 CFR Part 2, 27
CLASSIFICATION : PCS Licensed Transmitter (PCB)
TX FREQUENCY RANGE : 1710 MHz ~ 1755 MHz (LTE – Band 4)
: 704 MHz ~ 716 MHz (LTE – Band 17)
RX FREQUENCY RANGE : 2110 MHz ~ 2155 MHz (LTE – Band 4)
: 734 MHz ~ 746 MHz (LTE – Band 17)
MAX. ERP/EIRP POWER : 0.2410 W (LTE Band 4 QPSK, BW 5MHz)
: 0.2032 W (LTE Band 4 16 QAM, BW 5MHz)
: 0.1746 W (LTE Band 4 QPSK, BW 10MHz)
: 0.1493 W (LTE Band 4 16 QAM, BW 10MHz)
: 0.1683 W (LTE Band 17 QPSK, BW 5MHz)
: 0.1510 W (LTE Band 17 16 QAM, BW 5MHz)
: 0.1742 W (LTE Band 17 QPSK, BW 10MHz)
: 0.1614 W (LTE Band 17 16 QAM, BW 10MHz)
Emission Designator : 4M52G7D (QPSK, BW 5MHz)
: 4M52D7W (16QAM, BW 5MHz)
: 9M20G7D (QPSK, BW 10MHz)
: 9M12D7W (16QAM, BW 10MHz)



The product was received on Jan. 18, 2012 and completely tested on Mar. 28, 2011. 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.

SPORTON INTERNATIONAL INC.

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FCC ID : MSQTF300TL

Page Number : 2 of 71

Report Issued Date : Apr. 20, 2012

Report Version : Rev. 01



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APPENDIX B. SETUP PHOTOGRAPHS



SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	§2.1046	Conducted Output Power	NA	PASS	
3.2	§27.50(c)(10) §27.50(d)(4)	Effective Radiated Power and Effective Isotropic Radiated Power Measurement	< 3 Watts (ERP) < 1 Watt (EIRP)	PASS	-
3.3	§2.1049	Occupied Bandwidth	NA	PASS	-
3.4	§2.1049 §27.53(h)(g)	Emission Mask Measurement	< 43+10log ₁₀ (P[Watts])	PASS	-
3.5	§2.1051 §27.53(h)(g)	Conducted Emission	< 43+10log ₁₀ (P[Watts])	PASS	-
3.6	§2.1053 §27.53(h)(g)	Undesirable Out of Band Emissions	< 43+10log ₁₀ (P[Watts])	PASS	Under limit 13.75 dB at 13860.000 MHz -
3.7	§2.1055 §27.54	Frequency Stability Temperature & Voltage	< 2.5 ppm	PASS	



1 General Description

1.1 Applicant

ASUSTek COMPUTER INC.
No. 15, Li-Te Rd., Peitou, Taipei, Taiwan

1.2 Manufacturer

WISTRON INFOCOMM (KUNSHAN) CO., LTD.
FIRST AVE. KUNSHAN INTEGR TED FREE TRADE ZONE. KUNSHAN. JIANGSU

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	ASUS Transformer Pad
Model Name	ASUS
FCC ID	MSQTF300TL
Tx Frequency	LTE Band 4 : 1710 MHz ~ 1755 MHz LTE Band 17 : 704 MHz ~ 716 MHz
Rx Frequency	LTE Band 4 : 2110 MHz ~ 2155 MHz LTE Band 17 : 734 MHz ~ 746 MHz
Maximum Output Power to Antenna	LTE Band 4 : 23.23 dBm LTE Band 17 : 23.55 dBm
Maximum ERP/EIRP	0.2410 W (23.82 dBm) (LTE Band 4 QPSK, BW 5MHz) 0.2032 W (23.08 dBm) (LTE Band 4 16QAM, BW 5MHz) 0.1746 W (22.42 dBm) (LTE Band 4 QPSK, BW 10MHz) 0.1493 W (21.74 dBm) (LTE Band 4 16QAM, BW 10MHz) 0.1683 W (22.26 dBm) (LTE Band 17 QPSK, BW 5MHz) 0.1510 W (21.79 dBm) (LTE Band 17 16QAM, BW 5MHz) 0.1742 W (22.41 dBm) (LTE Band 17 QPSK, BW 10MHz) 0.1614 W (22.08 dBm) (LTE Band 17 16QAM, BW 10MHz)
Antenna Type	PIFA Antenna
Type of Modulation	4M52G7D (QPSK, BW 5MHz) 4M52D7W (16QAM, BW 5MHz) 9M20G7D (QPSK, BW 10MHz) 9M12D7W (16QAM, BW 10MHz)
EUT Stage	Production Unit

Remark: For other wireless features of this EUT, the test report will be issued separately.

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

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 (DoC), 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.	iPod Earphone	Apple	N/A	FCC DoC	Unshielded, 1.2 m	N/A

2 Test Configuration of Equipment Under Test

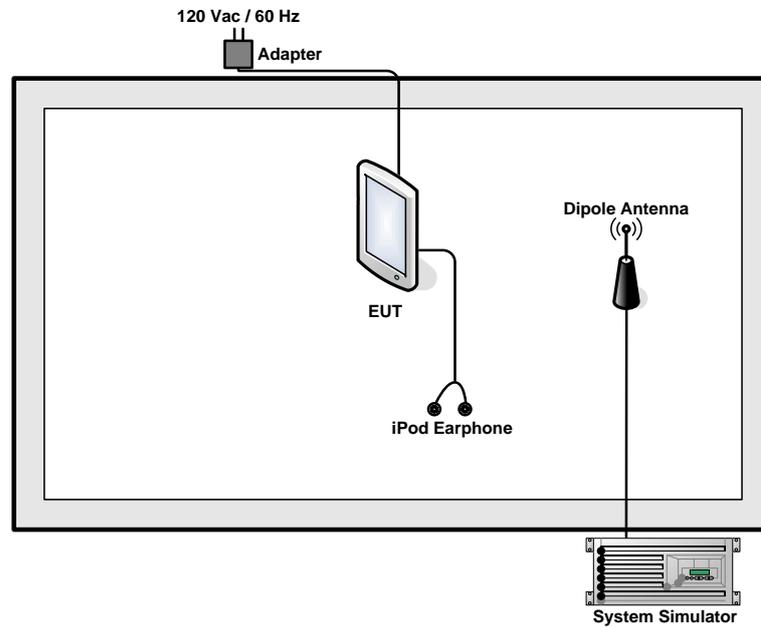
2.1 Test Mode

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
LTE Band 4	BW 5MHz	<ul style="list-style-type: none"> ■ LTE (RB Size 1, RB Offset 0) Link + TC 	<ul style="list-style-type: none"> ■ LTE (RB Size 1, RB Offset 0) Link ■ LTE (RB Size 1, RB Offset 24) Link ■ LTE (RB Size 12, RB Offset 6) Link ■ LTE (RB Size 25, RB Offset 0) Link
	BW 10MHz	<ul style="list-style-type: none"> ■ LTE (RB Size 1, RB Offset 0) Link + TC 	<ul style="list-style-type: none"> ■ LTE (RB Size 1, RB Offset 0)Link ■ LTE (RB Size 1, RB Offset 49)Link ■ LTE (RB Size 25, RB Offset 13)Link ■ LTE (RB Size 50, RB Offset 0)Link
LTE Band 17	BW 5MHz	<ul style="list-style-type: none"> ■ LTE (RB Size 1, RB Offset 0) Link + TC 	<ul style="list-style-type: none"> ■ LTE (RB Size 1, RB Offset 0) Link ■ LTE (RB Size 1, RB Offset 24) Link ■ LTE (RB Size 12, RB Offset 6) Link ■ LTE (RB Size 25, RB Offset 0) Link
	BW 10MHz	<ul style="list-style-type: none"> ■ LTE (RB Size 1, RB Offset 0) Link + TC 	<ul style="list-style-type: none"> ■ LTE (RB Size 1, RB Offset 0)Link ■ LTE (RB Size 1, RB Offset 49)Link ■ LTE (RB Size 25, RB Offset 13)Link ■ LTE (RB Size 50, RB Offset 0)Link
<p>Remark: TC stands for Test Configuration, and consists of Adapter and Earphone.</p>			

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.

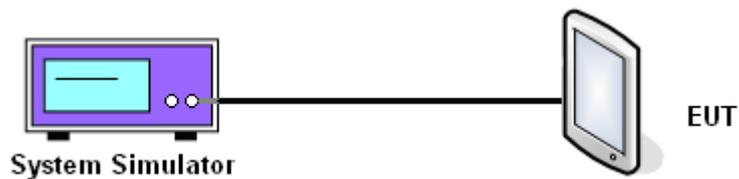
3.1.2 Measuring Instruments

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	23.16	0.2070	6.04
			20175	1732.5	23.17	0.2075	6.04
			20375	1752.5	23.15	0.2065	6.04
		16QAM	19975	1712.5	22.32	0.1706	6.72
			20175	1732.5	22.40	0.1738	6.72
			20375	1752.5	22.40	0.1738	6.72
	10MHz	QPSK	20000	1715.0	23.20	0.2089	5.68
			20175	1732.5	23.23	0.2104	5.68
			20350	1750.0	23.19	0.2084	5.68
		16QAM	20000	1715.0	22.18	0.1652	6.56
			20175	1732.5	22.30	0.1698	6.56
			20350	1750.0	22.40	0.1738	6.56

Operation Band	Band Width	Modulation	Channel	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (Watts)	PAPR (dB)
LTE Band 17	5MHz	QPSK	23755	706.5	23.50	0.2239	6.08
			23790	710.0	23.45	0.2213	6.08
			23825	713.5	23.46	0.2218	6.08
		16QAM	23755	706.5	22.96	0.1977	6.68
			23790	710.0	22.96	0.1977	6.68
			23825	713.5	22.92	0.1959	6.68
	10MHz	QPSK	23780	709.0	23.55	0.2265	5.92
			23790	710.0	23.50	0.2239	5.92
			23800	711.0	23.51	0.2244	5.92
		16QAM	23780	709.0	23.09	0.2037	6.68
			23790	710.0	22.96	0.1977	6.68
			23800	711.0	22.96	0.1977	6.68



3.2 Effective Radiated Power and Effective Isotropic Radiated Power Measurement

3.2.1 Description of the ERP/EIRP Measurement

ERP/EIRP is measured by substitution method according to ANSI / TIA / EIA-603-C-2004. The ERP of mobile transmitters must not exceed 3 Watts and the EIRP of mobile transmitters are limited to 1 Watts.

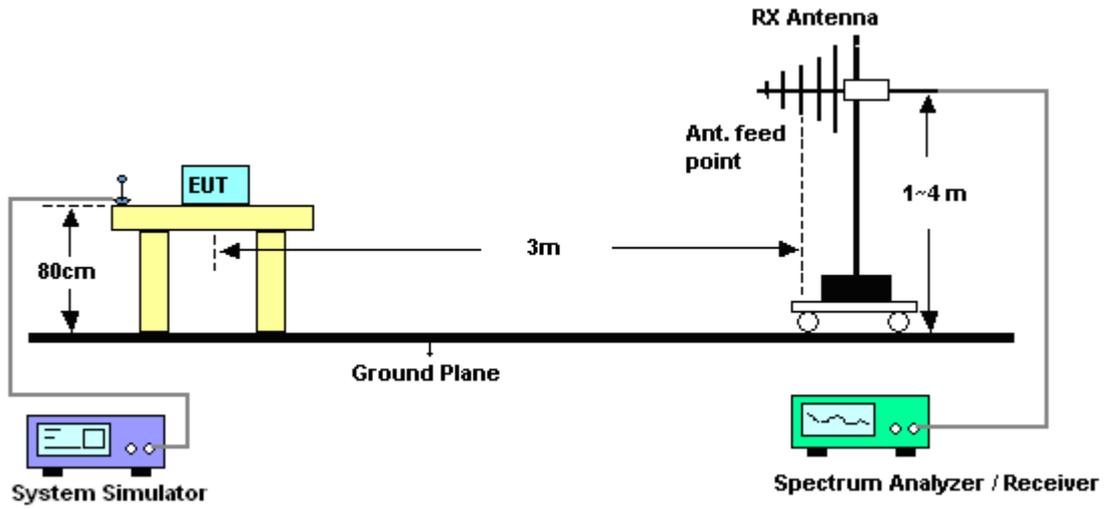
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The EUT was placed on a non-conductive rotating platform with 0.8 meter height in a semi-anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RBW= 300kHz, VBW= 1MHz, RMS detector, and used Channel Power function with measurement bandwidth = 5MHz/10MHz.
2. During the measurement, the EUT was enforced in maximum power and linked with a base station. The highest emission was recorded from analyzer power level (LVL) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
3. Effective Radiated Power (ERP)/ 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 ERP/EIRP was calculated with the correction factor, $ERP/EIRP = LVL + \text{Correction factor}$.

3.2.4 Test Setup



3.2.5 Test Result of ERP/EIRP

LTE Band 4 Radiated Power EIRP for BW 5MHz (QPSK, 1RB Size, RB Offset 0)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1712.5	-18.38	41.42	23.04	0.2014
1732.5	-17.98	41.80	23.82	0.2410
1752.5	-18.35	41.52	23.17	0.2075
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1712.5	-27.26	40.67	13.41	0.0219
1732.5	-26.68	42.06	15.38	0.0345
1752.5	-25.45	41.40	15.95	0.0394

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

LTE Band 4 Radiated Power EIRP for BW 5MHz (16QAM, 1RB Size, RB Offset 0)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1712.5	-20.00	41.42	21.42	0.1387
1732.5	-18.72	41.80	23.08	0.2032
1752.5	-19.06	41.52	22.46	0.1762
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1712.5	-27.99	40.67	12.68	0.0185
1732.5	-27.57	42.06	14.49	0.0281
1752.5	-25.90	41.40	15.50	0.0355

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



LTE Band 4 Radiated Power EIRP for BW 10MHz (QPSK, 1RB Size, RB Offset 0)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1715.0	-19.45	41.42	21.97	0.1574
1732.5	-19.76	41.80	22.04	0.1600
1750.0	-19.10	41.52	22.42	0.1746
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1715.0	-26.88	40.67	13.79	0.0239
1732.5	-26.20	42.06	15.86	0.0385
1750.0	-25.73	41.40	15.67	0.0369

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

LTE Band 4 Radiated Power EIRP for BW 10MHz (16QAM, 1RB Size, RB Offset 0)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1715.0	-20.14	41.42	21.28	0.1343
1732.5	-20.41	41.80	21.39	0.1377
1750.0	-19.78	41.52	21.74	0.1493
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	EIRP (dBm)	EIRP (W)
1715.0	-27.51	40.67	13.16	0.0207
1732.5	-26.85	42.06	15.21	0.0332
1750.0	-26.42	41.40	14.98	0.0315

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



LTE Band 17 Radiated Power ERP for BW 5MHz (QPSK, 1RB Size, RB Offset 0)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
706.5	-6.25	29.13	20.73	0.1183
710	-7.06	29.24	20.03	0.1007
713.5	-7.33	29.23	19.75	0.0944
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
706.5	-6.79	31.2	22.26	0.1683
710	-7.76	30.89	20.98	0.1253
713.5	-8.08	30.91	20.68	0.1169

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

LTE Band 17 Radiated Power ERP for BW 5MHz (16QAM, 1RB Size, RB Offset 0)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
706.5	-8.59	29.13	18.39	0.0690
710	-8.25	29.24	18.84	0.0766
713.5	-9.48	29.23	17.60	0.0575
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
706.5	-7.26	31.2	21.79	0.1510
710	-8.07	30.89	20.67	0.1167
713.5	-9.04	30.91	19.72	0.0938

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



LTE Band 17 Radiated Power ERP for BW 10MHz (QPSK, 1RB Size, RB Offset 49)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
709	-6.23	29.13	20.75	0.1189
710	-6.37	29.24	20.72	0.1180
711	-6.63	29.23	20.45	0.1109
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
709	-6.64	31.2	22.41	0.1742
710	-7.02	30.89	21.72	0.1486
711	-7.29	30.91	21.47	0.1403

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

LTE Band 17 Radiated Power ERP for BW 10MHz (16QAM, 1RB Size, RB Offset 49)				
Horizontal Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
709	-8.59	29.13	18.39	0.0690
710	-8.96	29.24	18.13	0.0650
711	-9.03	29.23	18.05	0.0638
Vertical Polarization				
Frequency (MHz)	LVL (dBm)	Correction Factor (dB)	ERP (dBm)	ERP (W)
709	-6.97	31.2	22.08	0.1614
710	-7.72	30.89	21.02	0.1265
711	-7.90	30.91	20.86	0.1219

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

3.3 Occupied Bandwidth

3.3.1 Description of Occupied Bandwidth Measurement

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

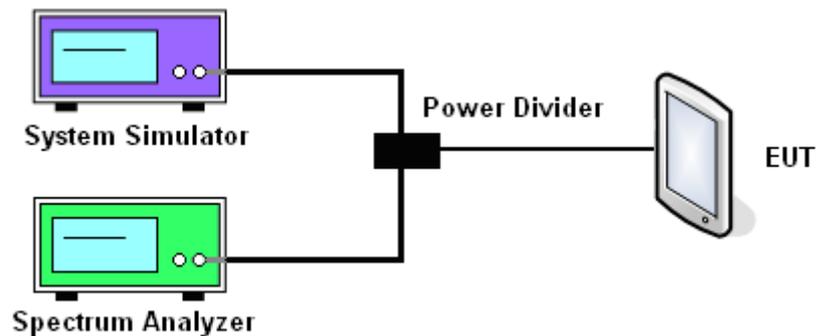
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

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

3.3.4 Test Setup

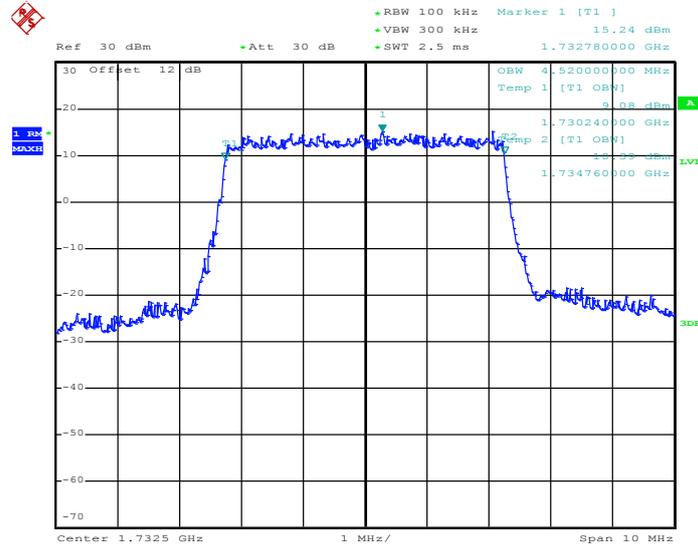




3.3.5 Test Result (Plots) of Occupied Bandwidth

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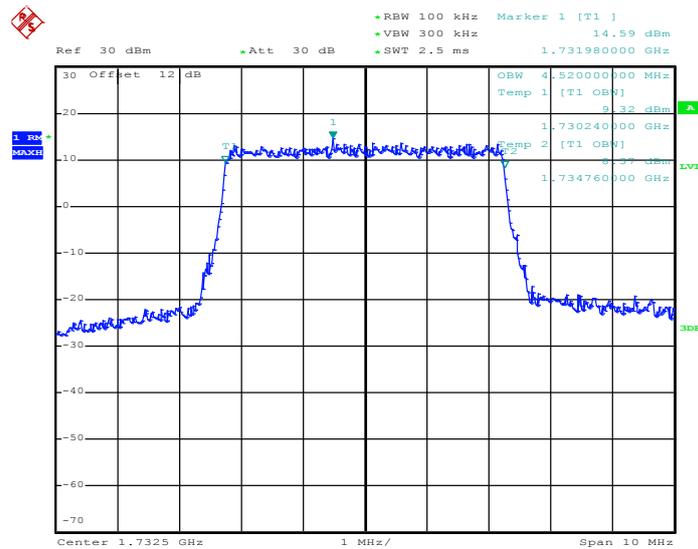
99% Occupied Bandwidth Plot on Channel 20175



Date: 24.FEB.2012 11:06:20

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

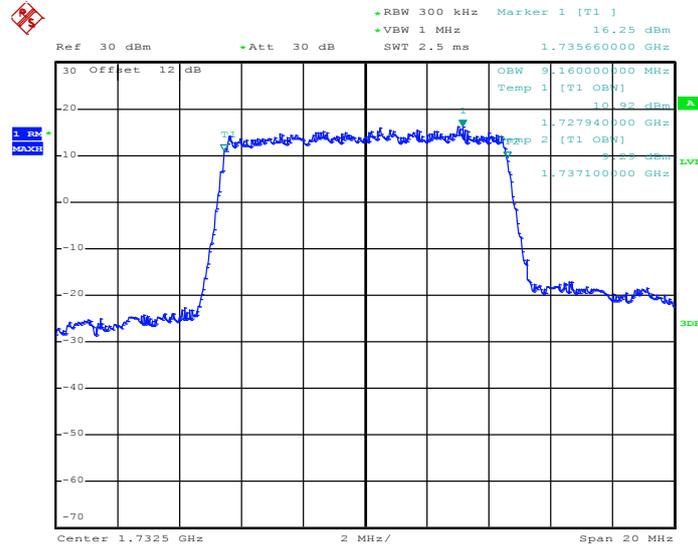


Date: 24.FEB.2012 11:06:46



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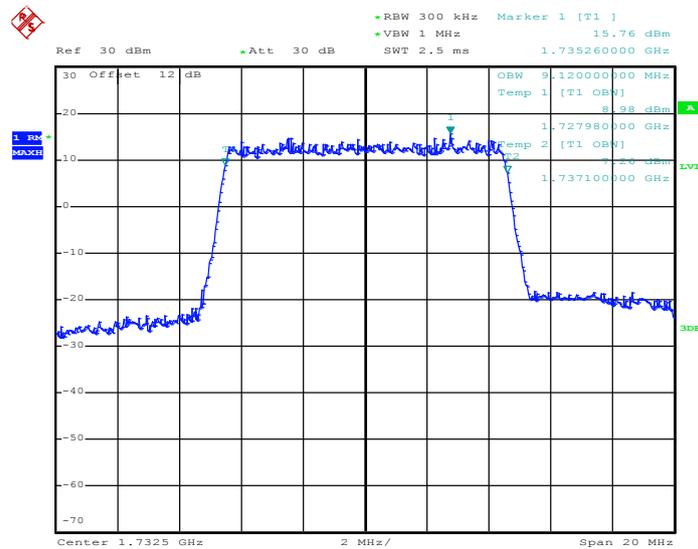
99% Occupied Bandwidth Plot on Channel 20175



Date: 24.FEB.2012 11:30:18

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

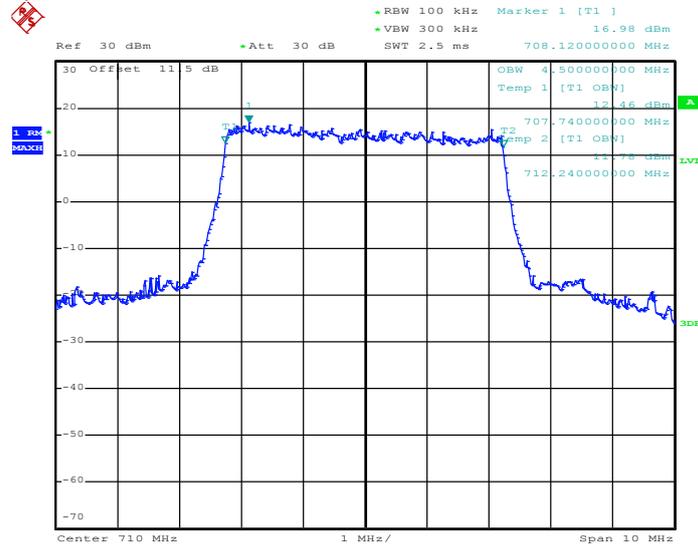


Date: 24.FEB.2012 11:30:42



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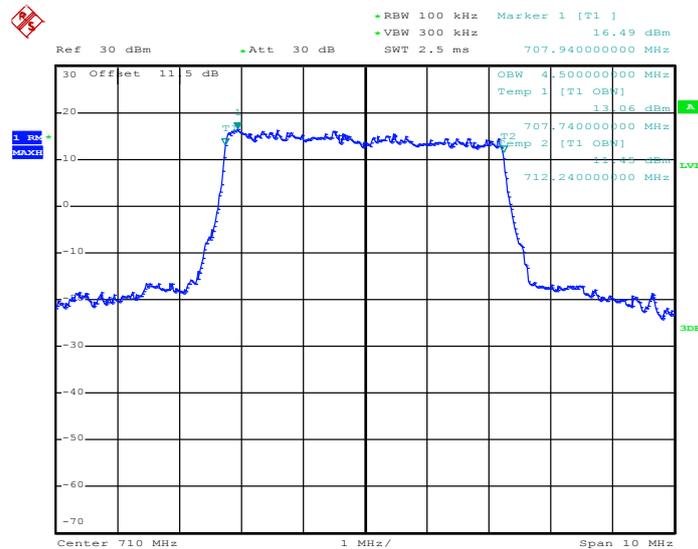
99% Occupied Bandwidth Plot on Channel 23790



Date: 24.FEB.2012 15:01:49

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

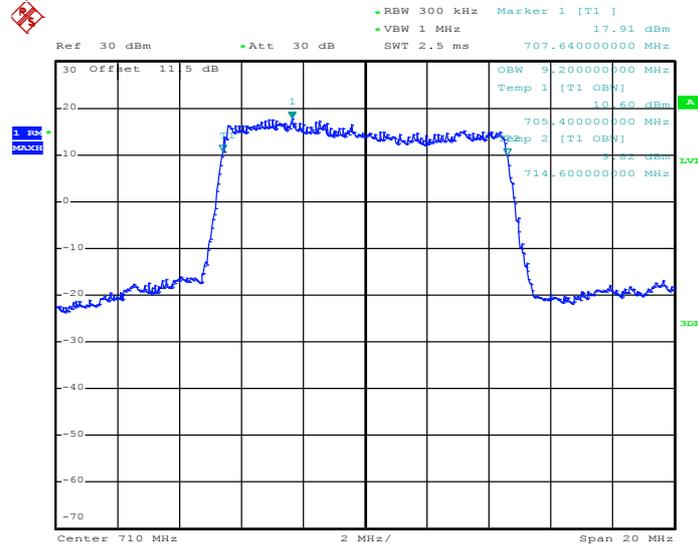


Date: 24.FEB.2012 15:17:50



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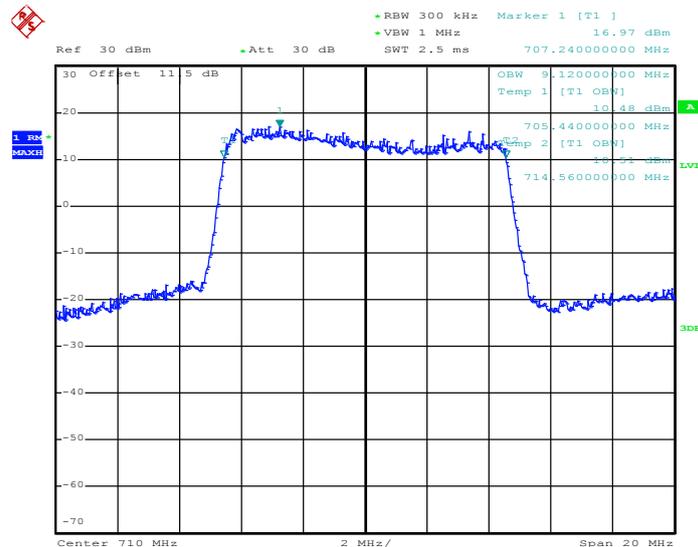
99% Occupied Bandwidth Plot on Channel 23790



Date: 24.FEB.2012 13:52:25

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



Date: 24.FEB.2012 13:53:07

3.4 Emission Mask Measurement

3.4.1 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 and 2110 – 2155 MHz bands, the FCC limit is $43 + 10\log_{10}(P[\text{Watts}])$ dB = -13 dBm in a 1 MHz bandwidth.

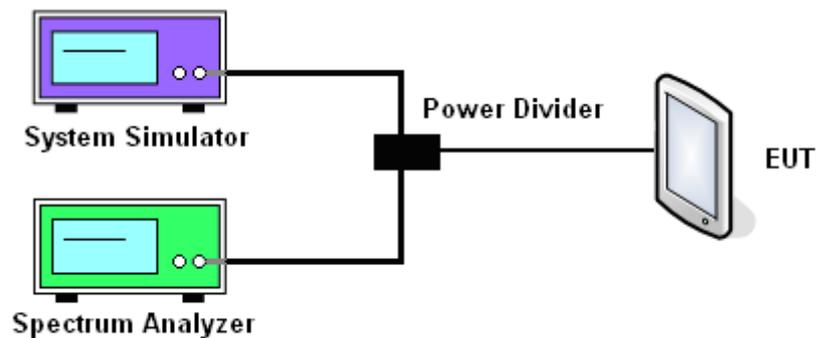
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The band edges of low and high channels for the highest RF powers were measured. Setting RBW as specify.

3.4.4 Test Setup

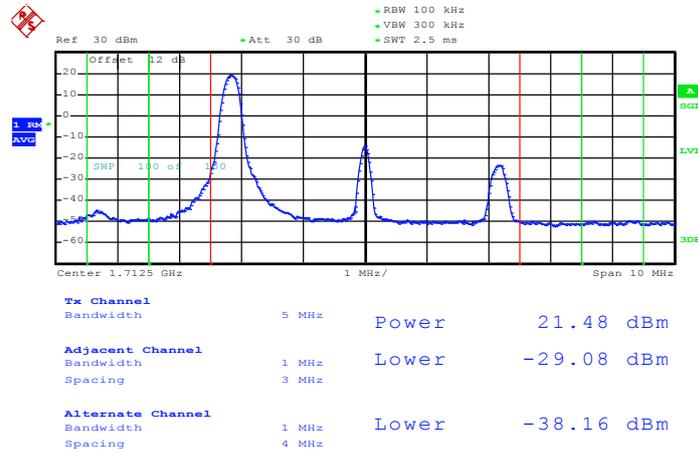




3.4.5 Test Result (Plots) of Conducted Band Edge

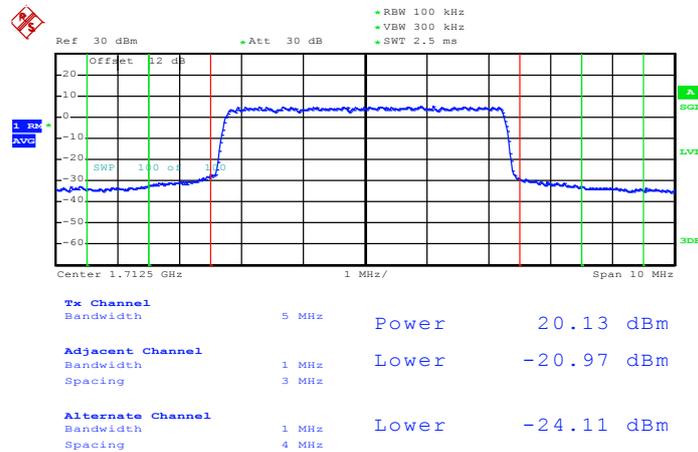
Band :	LTE Band 4	Band Width	5MHz
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Date: 24.FEB.2012 11:19:42

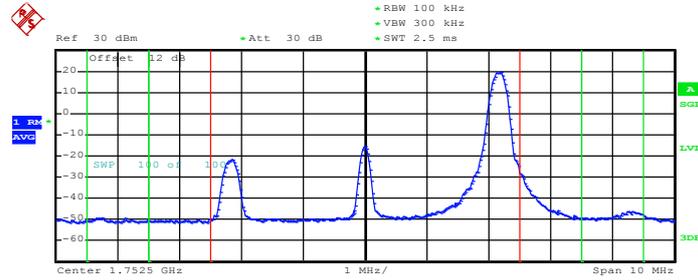
Lower Band Edge Plot for QPSK-RB Size 25, RB Offset 0



Date: 24.FEB.2012 11:21:39



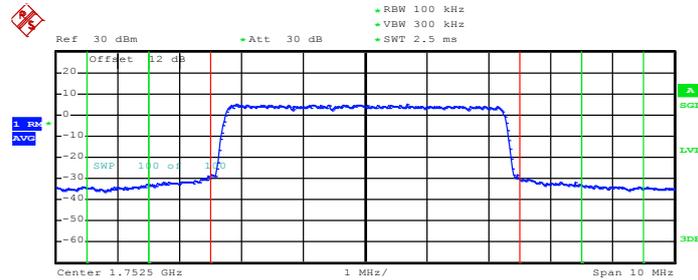
Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 24



Tx Channel	Bandwidth	5 MHz	Power	21.64 dBm
Adjacent Channel	Bandwidth	1 MHz	Upper	-28.11 dBm
	Spacing	3 MHz		
Alternate Channel	Bandwidth	1 MHz	Upper	-38.51 dBm
	Spacing	4 MHz		

Date: 24.FEB.2012 11:23:58

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



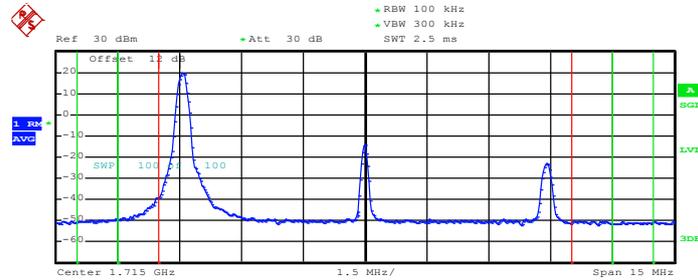
Tx Channel	Bandwidth	5 MHz	Power	20.11 dBm
Adjacent Channel	Bandwidth	1 MHz	Upper	-22.38 dBm
	Spacing	3 MHz		
Alternate Channel	Bandwidth	1 MHz	Upper	-24.48 dBm
	Spacing	4 MHz		

Date: 24.FEB.2012 11:22:44



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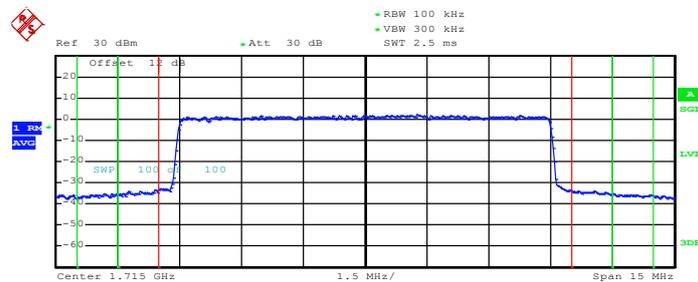
Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Tx Channel	Bandwidth	10 MHz	Power	21.78 dBm
Adjacent Channel	Bandwidth	1 MHz	Lower	-35.32 dBm
	Spacing	5.5 MHz		
Alternate Channel	Bandwidth	1 MHz	Lower	-40.42 dBm
	Spacing	6.5 MHz		

Date: 24.FEB.2012 11:42:31

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

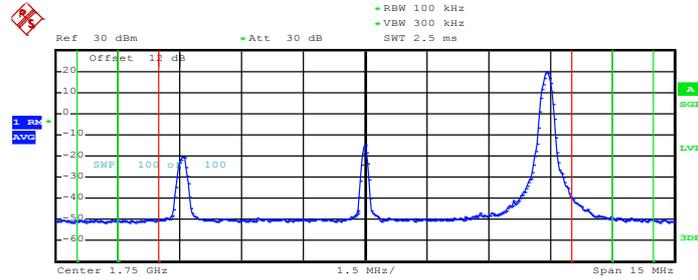


Tx Channel	Bandwidth	10 MHz	Power	20.08 dBm
Adjacent Channel	Bandwidth	1 MHz	Lower	-25.17 dBm
	Spacing	5.5 MHz		
Alternate Channel	Bandwidth	1 MHz	Lower	-26.46 dBm
	Spacing	6.5 MHz		

Date: 24.FEB.2012 11:42:53



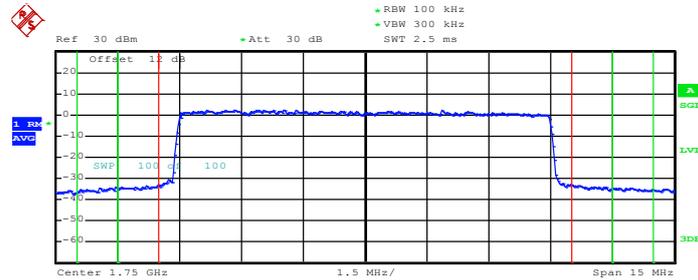
Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 49



Tx Channel	Bandwidth	10 MHz	Power	21.56 dBm
Adjacent Channel	Bandwidth	1 MHz	Upper	-35.58 dBm
	Spacing	5.5 MHz		
Alternate Channel	Bandwidth	1 MHz	Upper	-40.40 dBm
	Spacing	6.5 MHz		

Date: 24.FEB.2012 11:40:22

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



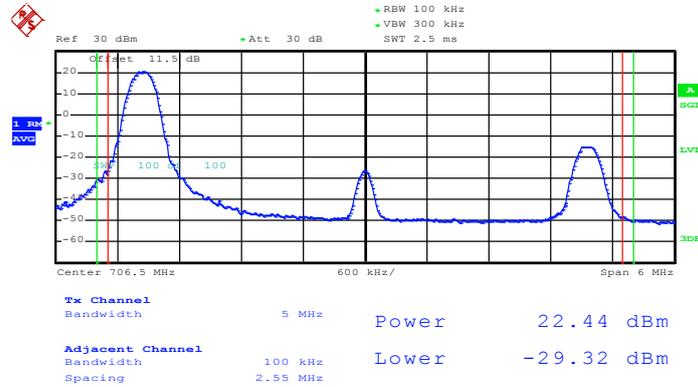
Tx Channel	Bandwidth	10 MHz	Power	20.22 dBm
Adjacent Channel	Bandwidth	1 MHz	Upper	-24.49 dBm
	Spacing	5.5 MHz		
Alternate Channel	Bandwidth	1 MHz	Upper	-25.46 dBm
	Spacing	6.5 MHz		

Date: 24.FEB.2012 11:39:58



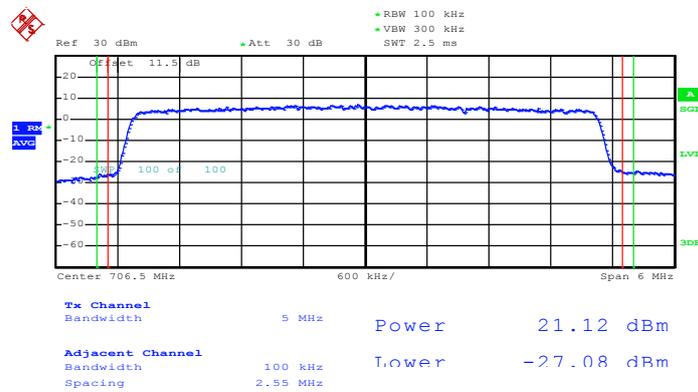
Band :	LTE Band 17	Band Width	5MHz
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Date: 24.FEB.2012 15:27:10

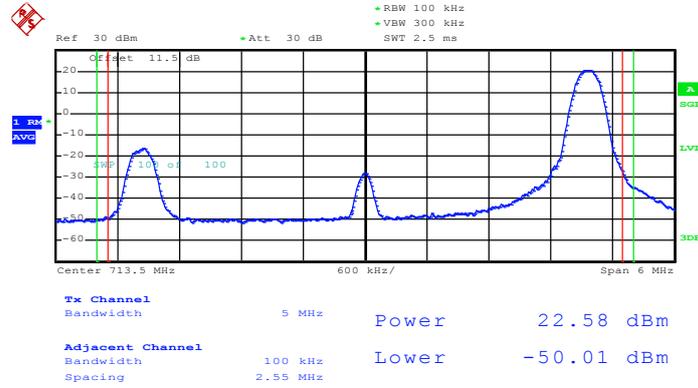
Lower Band Edge Plot for QPSK-RB Size 25, RB Offset 0



Date: 24.FEB.2012 15:25:25



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



Date: 24.FEB.2012 15:28:39

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

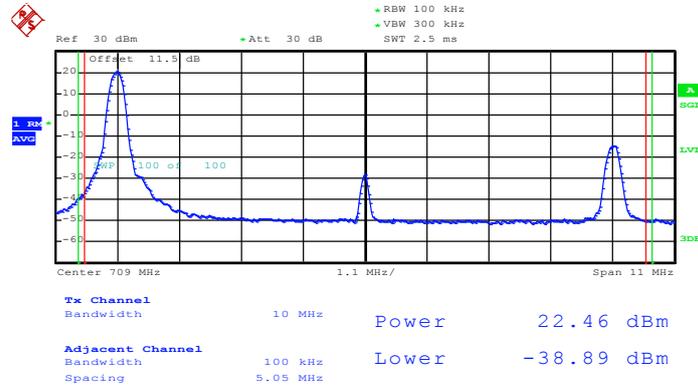


Date: 24.FEB.2012 16:01:37



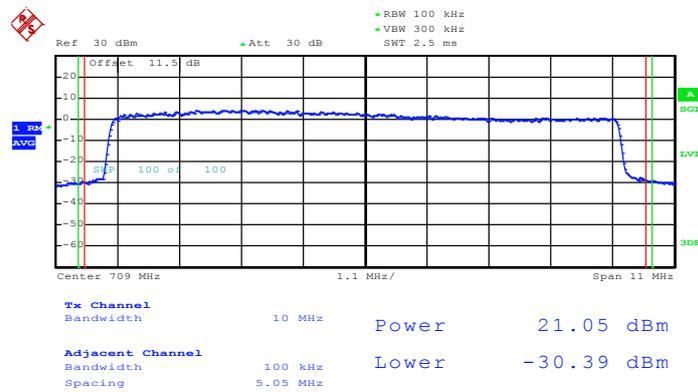
Band :	LTE Band 17	Band Width	10MHz
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Lower Band Edge Plot for QPSK-RB Size 1, RB Offset 0



Date: 24.FEB.2012 13:45:01

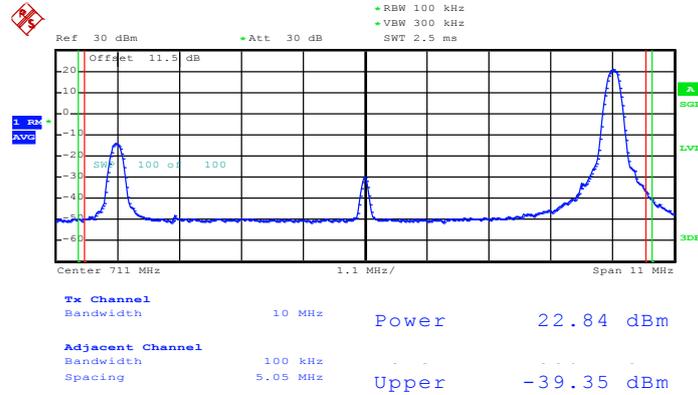
Lower Band Edge Plot for QPSK-RB Size 50, RB Offset 0



Date: 24.FEB.2012 13:43:55

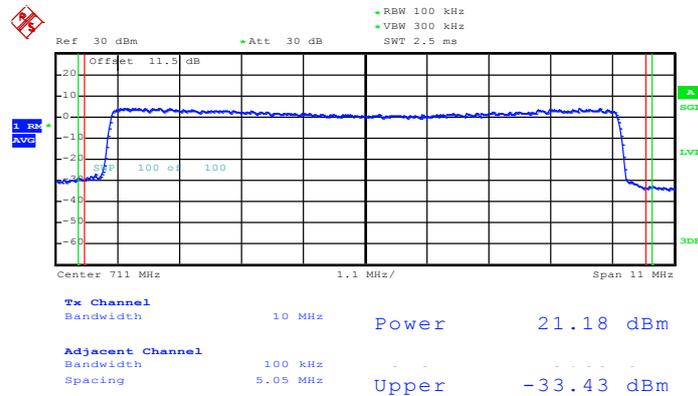


Higher Band Edge Plot for QPSK-RB Size 1, RB Offset 49



Date: 24.FEB.2012 13:46:45

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



Date: 24.FEB.2012 13:48:09

3.5 Conducted Emission Measurement

3.5.1 Description of Conducted Emission Measurement

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

It is measured by means of a calibrated spectrum analyzer and scanned from 9 kHz up to a frequency including its 10th harmonic.

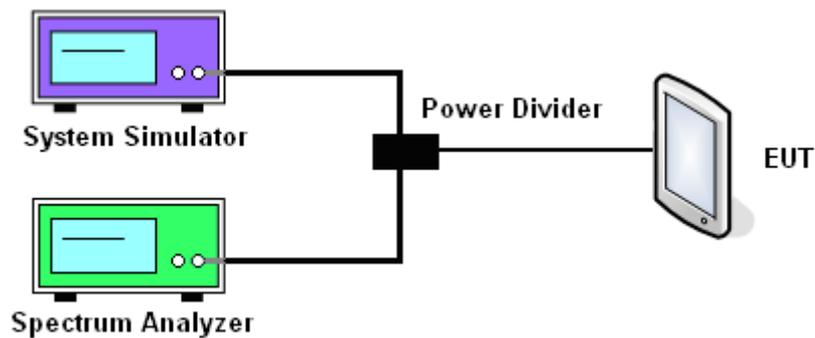
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

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

3.5.4 Test Setup

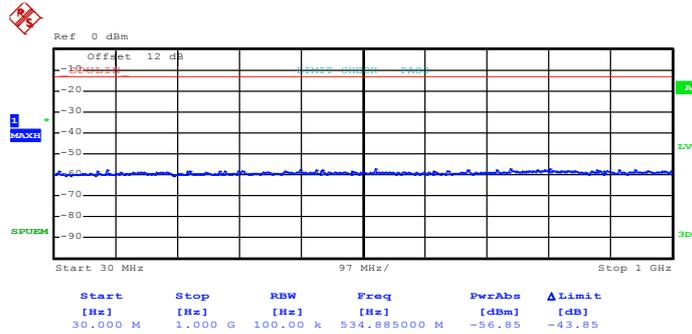




3.5.5 Test Result (Plots) of Conducted Emission

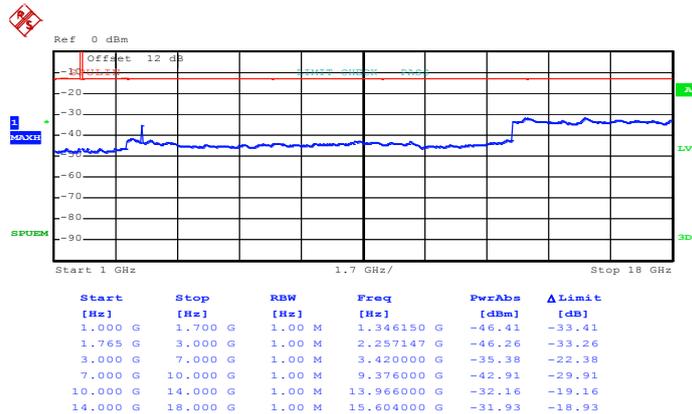
Band :	LTE Band 4	Channel :	CH19975
Band Width	5MHz		

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



Date: 16.MAR.2012 22:09:42

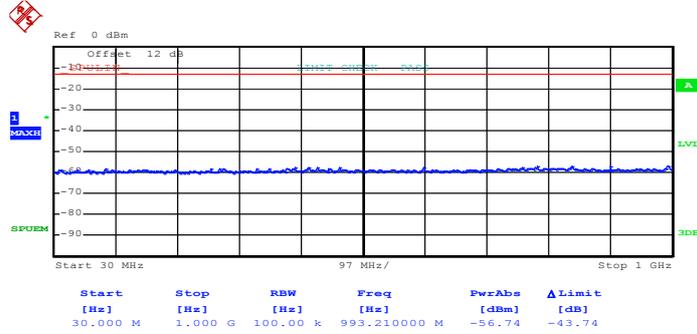
Conducted Emission Plot (1GHz ~ 18GHz) for QPSK (RB Size 1, RB Offset 0)



Date: 16.MAR.2012 21:58:14

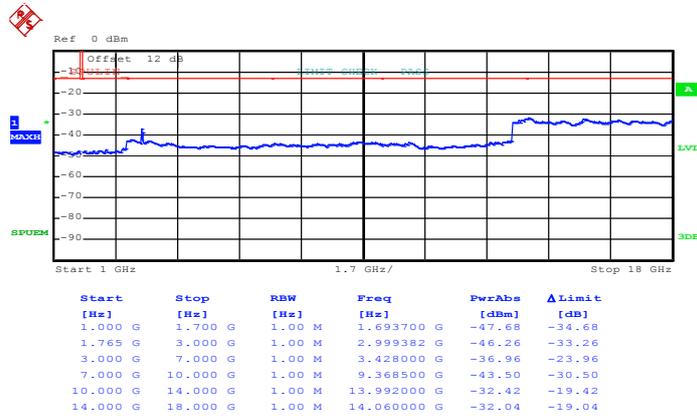


Conducted Emission Plot (30MHz ~ 1GHz) for 16-QAM (RB Size 1, RB Offset 24)



Date: 16.MAR.2012 22:10:18

Conducted Emission Plot (1GHz ~ 18GHz) for 16-QAM (RB Size 1, RB Offset 24)

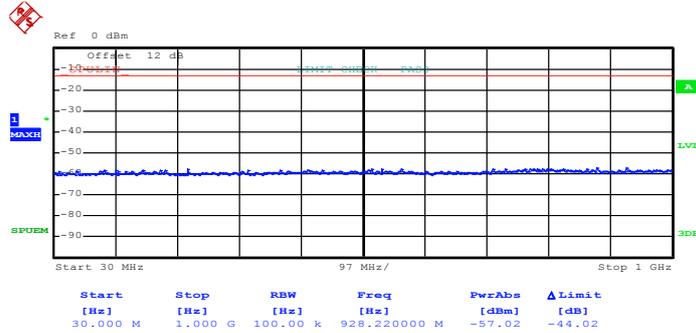


Date: 16.MAR.2012 21:58:58



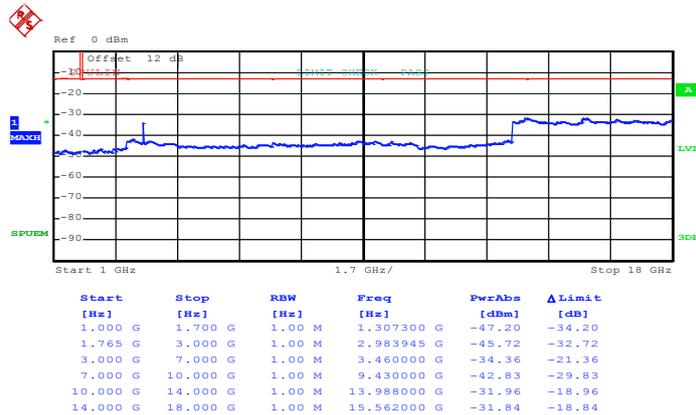
Band :	LTE Band 4	Channel :	CH20175
Band Width	5MHz		

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



Date: 16.MAR.2012 22:08:29

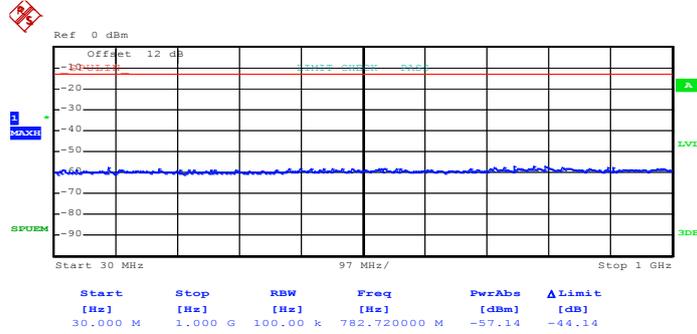
Conducted Emission Plot (1GHz ~ 18GHz) for QPSK (RB Size 1, RB Offset 0)



Date: 16.MAR.2012 22:01:22

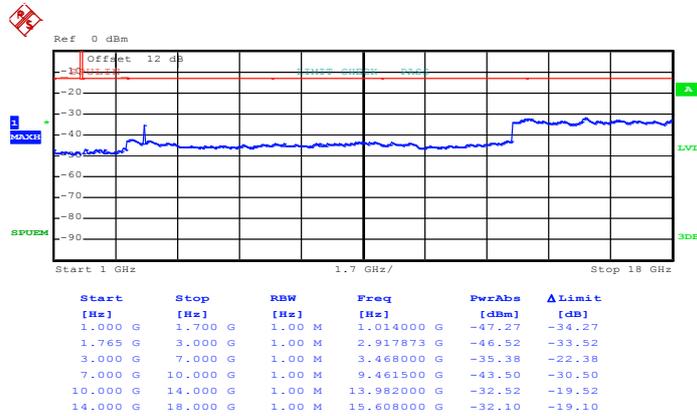


Conducted Emission Plot (30MHz ~ 1GHz) for 16-QAM (RB Size 1, RB Offset 24)



Date: 16.MAR.2012 22:09:00

Conducted Emission Plot (1GHz ~ 18GHz) for 16-QAM (RB Size 1, RB Offset 24)

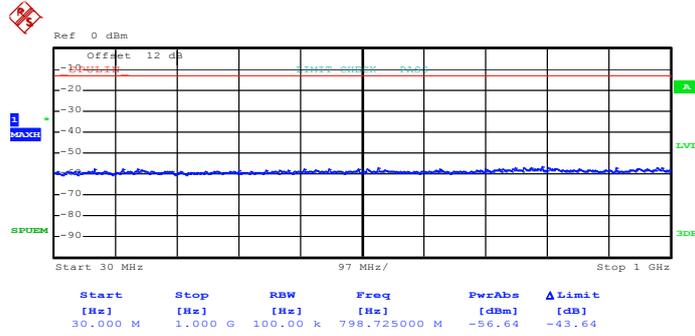


Date: 16.MAR.2012 22:02:30



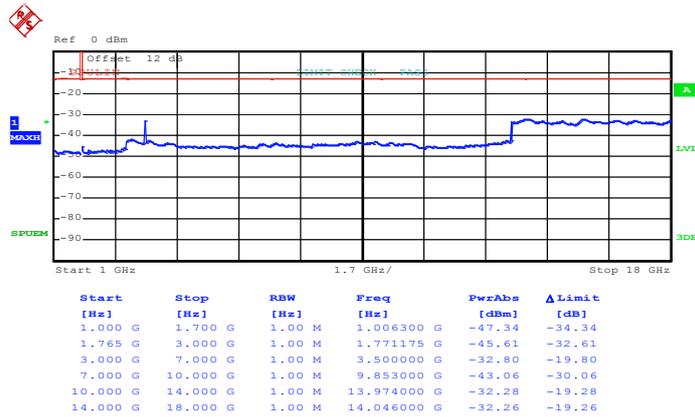
Band :	LTE Band 4	Channel :	CH20375
Band Width	5MHz		

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



Date: 16.MAR.2012 22:06:28

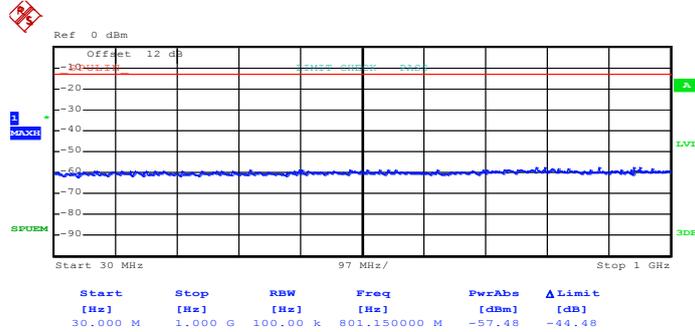
Conducted Emission Plot (1GHz ~ 18GHz) for QPSK (RB Size 1, RB Offset 0)



Date: 16.MAR.2012 22:04:17

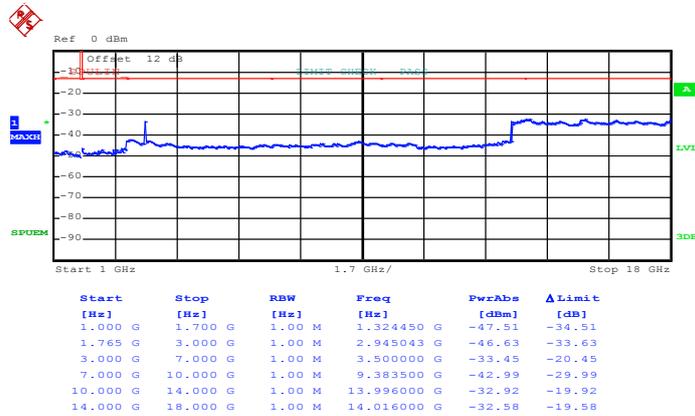


Conducted Emission Plot (30MHz ~ 1GHz) for 16-QAM (RB Size 1, RB Offset 0)



Date: 16.MAR.2012 22:07:36

Conducted Emission Plot (1GHz ~ 18GHz) for 16-QAM (RB Size 1, RB Offset 0)

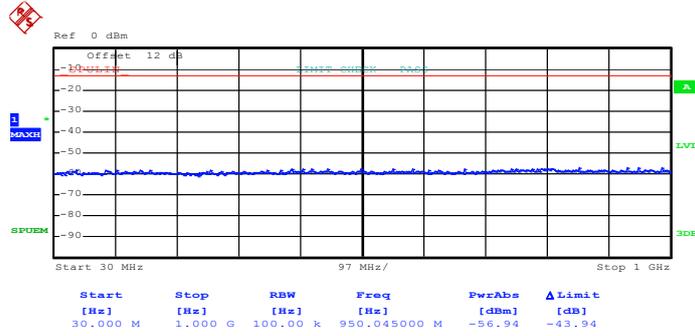


Date: 16.MAR.2012 22:04:52



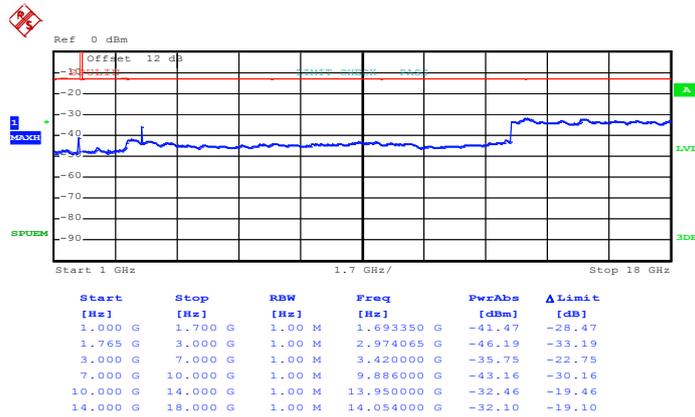
Band :	LTE Band 4	Channel :	CH20000
Band Width	10MHz		

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



Date: 16.MAR.2012 22:24:23

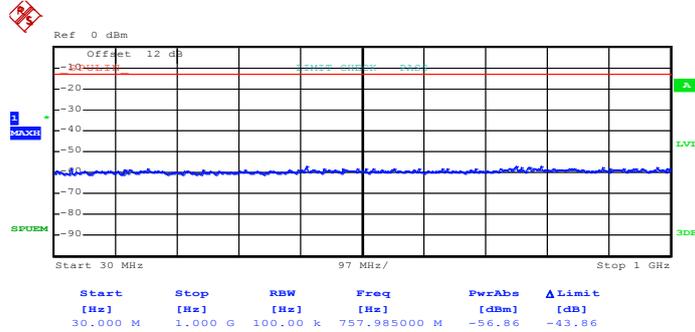
Conducted Emission Plot (1GHz ~ 18GHz) for QPSK (RB Size 1, RB Offset 0)



Date: 16.MAR.2012 22:31:17

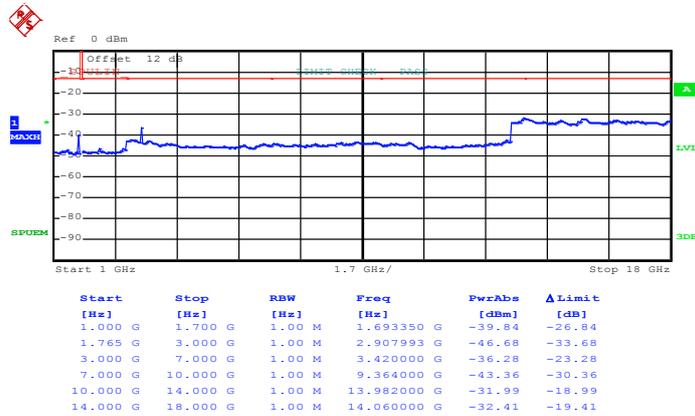


Conducted Emission Plot (30MHz ~ 1GHz) for 16-QAM (RB Size 1, RB Offset 0)



Date: 16.MAR.2012 22:24:42

Conducted Emission Plot (1GHz ~ 18GHz) for 16-QAM (RB Size 1, RB Offset 0)

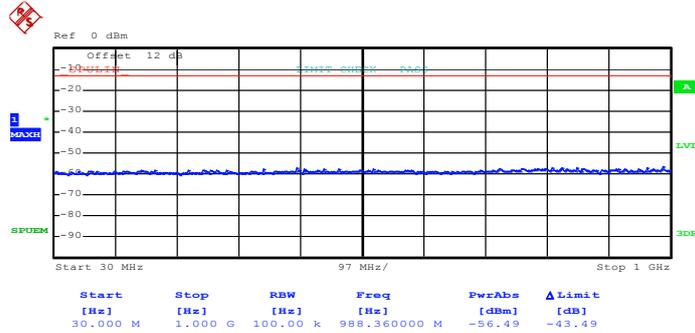


Date: 16.MAR.2012 22:32:25



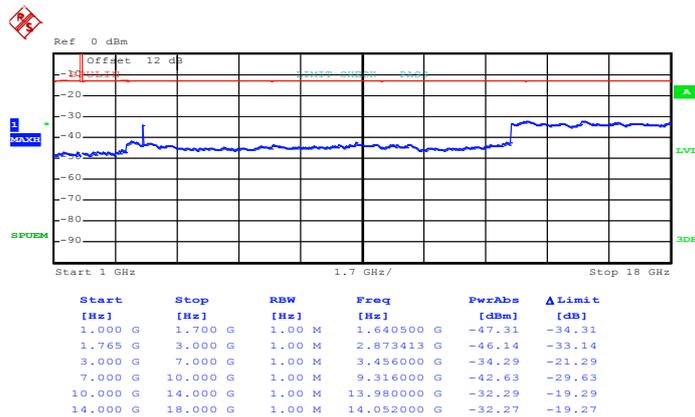
Band :	LTE Band 4	Channel :	CH20175
Band Width	10MHz		

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



Date: 16.MAR.2012 22:25:51

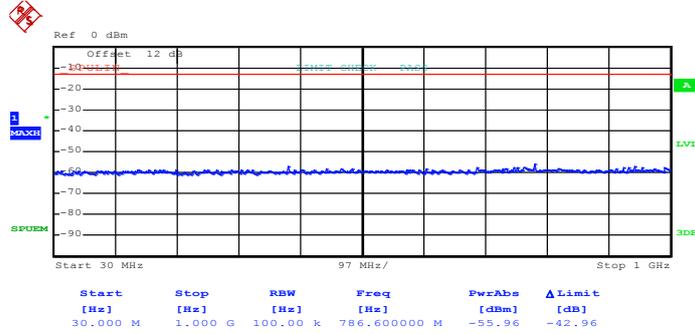
Conducted Emission Plot (1GHz ~ 18GHz) for QPSK (RB Size 1, RB Offset 0)



Date: 16.MAR.2012 22:33:51

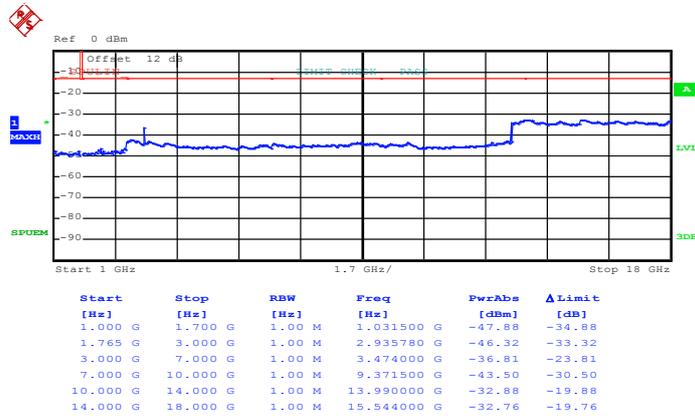


Conducted Emission Plot (30MHz ~ 1GHz) for 16-QAM (RB Size 1, RB Offset 49)



Date: 16.MAR.2012 22:26:10

Conducted Emission Plot (1GHz ~ 18GHz) for 16-QAM (RB Size 1, RB Offset 49)

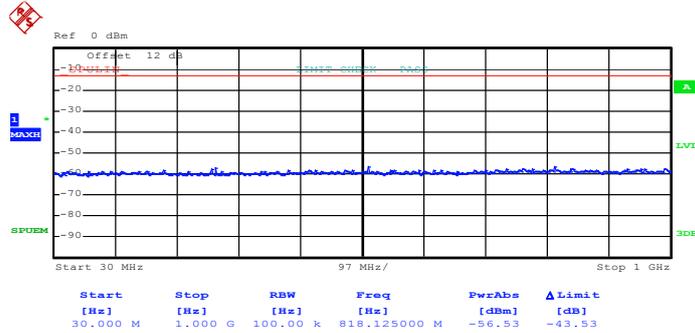


Date: 16.MAR.2012 22:35:10



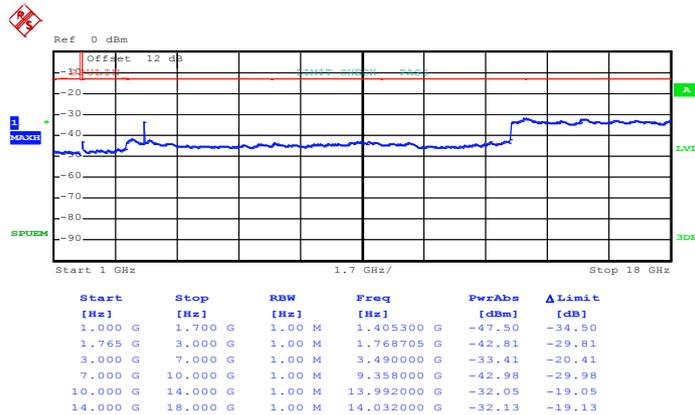
Band :	LTE Band 4	Channel :	CH20350
Band Width	10MHz		

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



Date: 16.MAR.2012 22:26:53

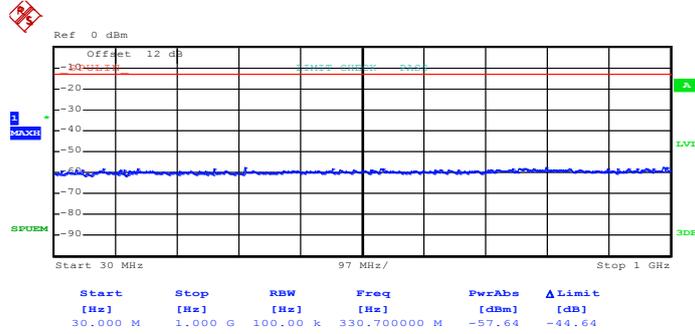
Conducted Emission Plot (1GHz ~ 18GHz) for QPSK (RB Size 1, RB Offset 0)



Date: 16.MAR.2012 22:36:45

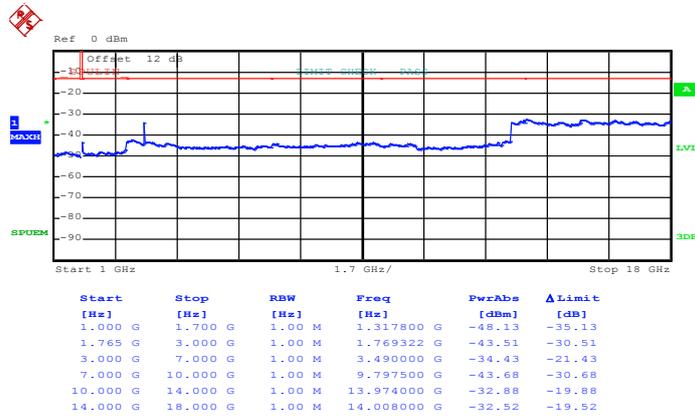


Conducted Emission Plot (30MHz ~ 1GHz) for 16-QAM (RB Size 1, RB Offset 0)



Date: 16.MAR.2012 22:27:07

Conducted Emission Plot (1GHz ~ 18GHz) for 16-QAM (RB Size 1, RB Offset 0)

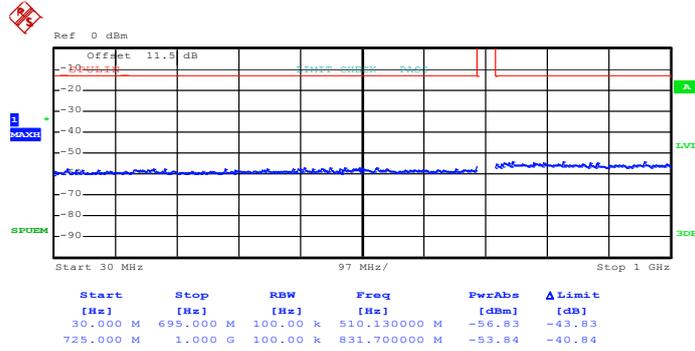


Date: 16.MAR.2012 22:37:16



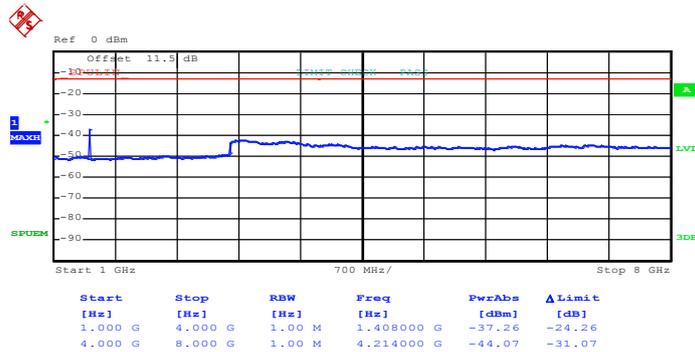
Band :	LTE Band 17	Channel :	CH23755
Band Width	5MHz		

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



Date: 16.MAR.2012 23:34:01

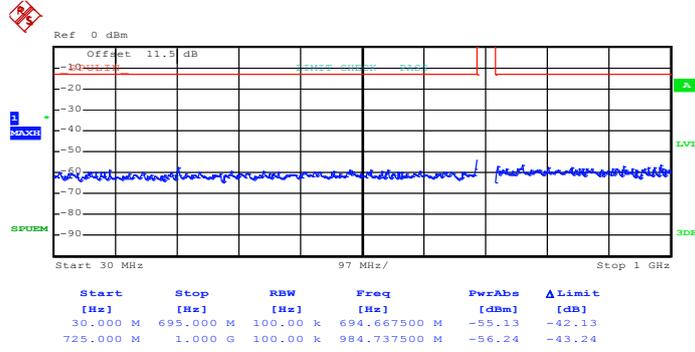
Conducted Emission Plot (1GHz ~ 8GHz) for QPSK (RB Size 1, RB Offset 0)



Date: 16.MAR.2012 23:42:35

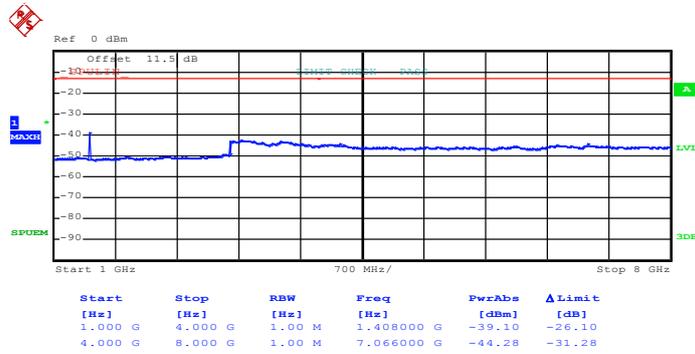


Conducted Emission Plot (30MHz ~ 1GHz) for 16-QAM (RB Size 25, RB Offset 0)



Date: 16.MAR.2012 23:35:07

Conducted Emission Plot (1GHz ~ 8GHz) for 16-QAM (RB Size 25, RB Offset 0)

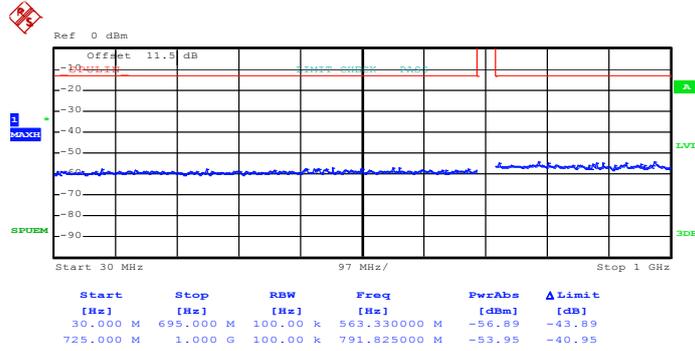


Date: 16.MAR.2012 23:43:03



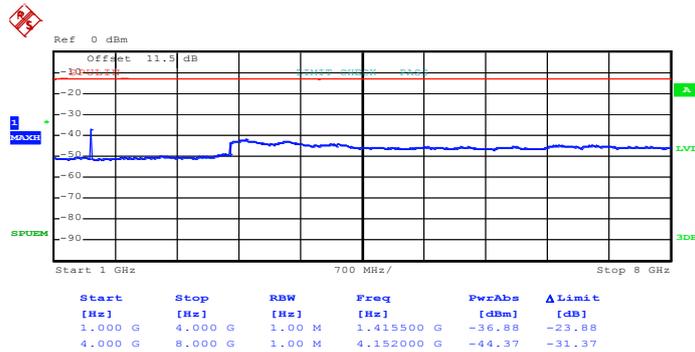
Band :	LTE Band 17	Channel :	CH23790
Band Width	5MHz		

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



Date: 16.MAR.2012 23:36:53

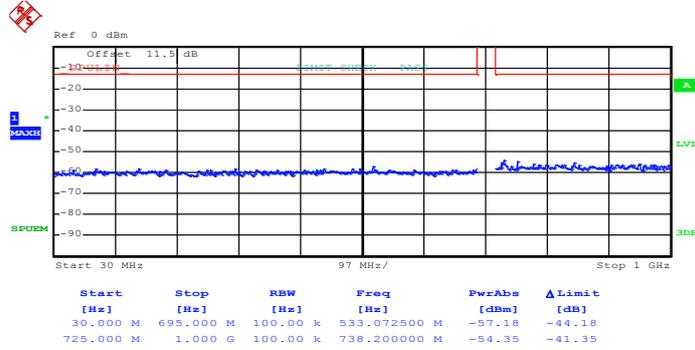
Conducted Emission Plot (1GHz ~ 8GHz) for QPSK (RB Size 1, RB Offset 0)



Date: 16.MAR.2012 23:44:48

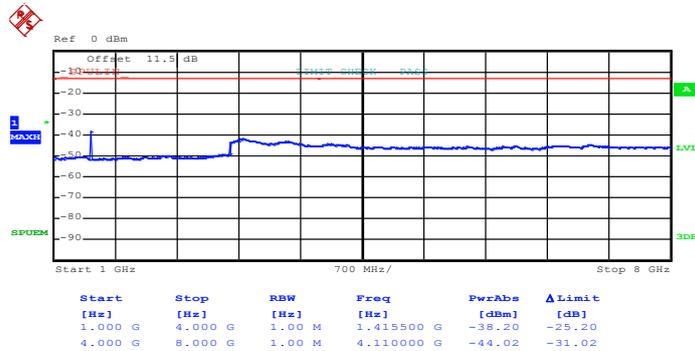


Conducted Emission Plot (30MHz ~ 1GHz) for 16-QAM (RB Size 1, RB Offset 0)



Date: 16.MAR.2012 23:37:19

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

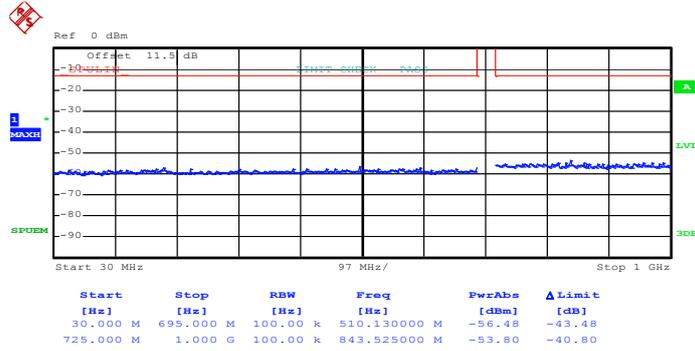


Date: 16.MAR.2012 23:45:22



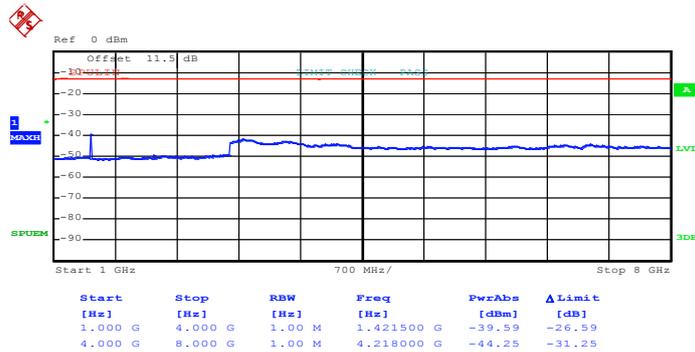
Band :	LTE Band 17	Channel :	CH23825
Band Width	5MHz		

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



Date: 16.MAR.2012 23:39:24

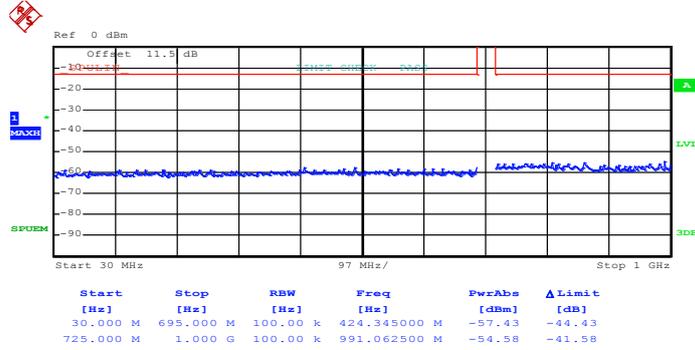
Conducted Emission Plot (1GHz ~ 8GHz) for QPSK (RB Size 1, RB Offset 0)



Date: 16.MAR.2012 23:46:54

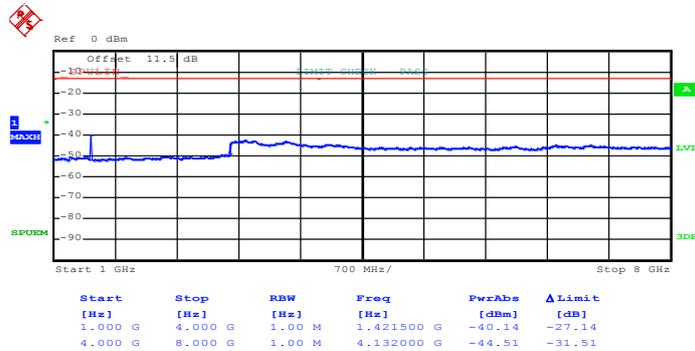


Conducted Emission Plot (30MHz ~ 1GHz) for 16-QAM (RB Size 25, RB Offset 49)



Date: 16.MAR.2012 23:40:09

Conducted Emission Plot (1GHz ~ 8GHz) for 16-QAM (RB Size 25, RB Offset 49)

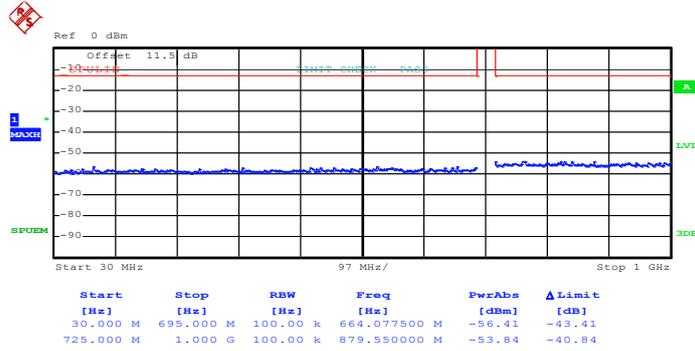


Date: 16.MAR.2012 23:47:34



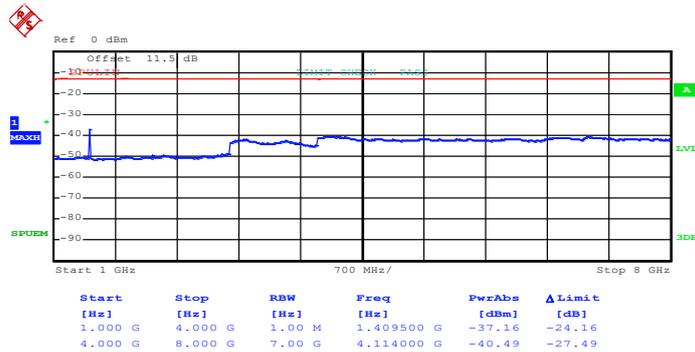
Band :	LTE Band 17	Channel :	CH23780
Band Width	10MHz		

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



Date: 16.MAR.2012 23:01:44

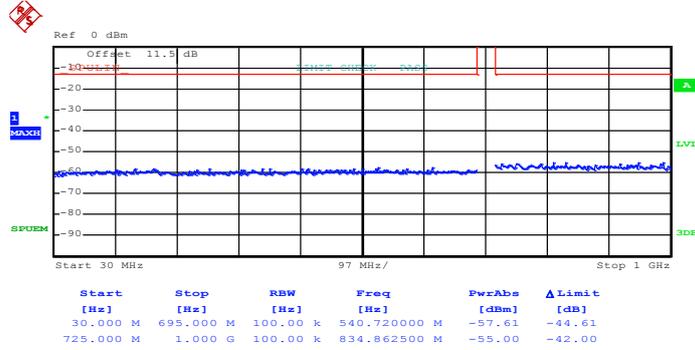
Conducted Emission Plot (1GHz ~ 8GHz) for QPSK (RB Size 1, RB Offset 0)



Date: 16.MAR.2012 22:46:50

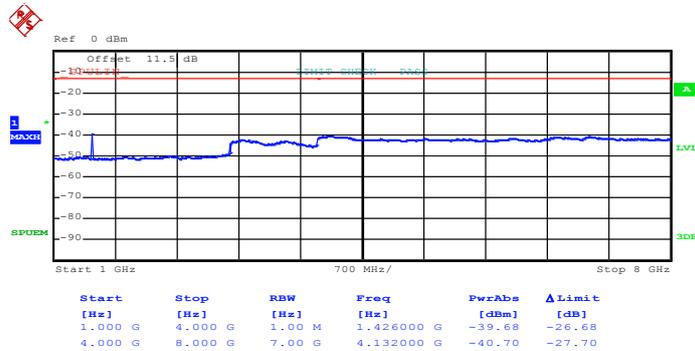


Conducted Emission Plot (30MHz ~ 1GHz) for 16-QAM (RB Size 1, RB Offset 49)



Date: 16.MAR.2012 23:02:13

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

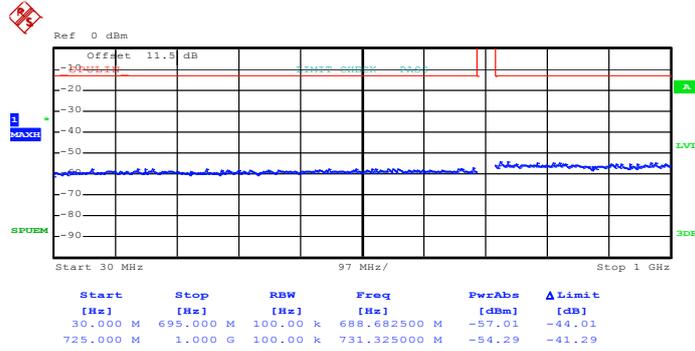


Date: 16.MAR.2012 22:47:51



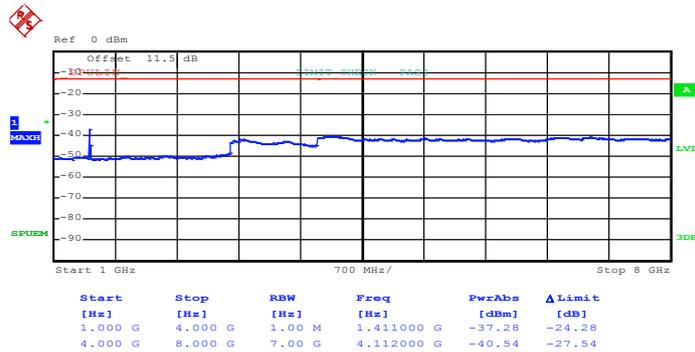
Band :	LTE Band 17	Channel :	CH23790
Band Width	10MHz		

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



Date: 16.MAR.2012 23:03:16

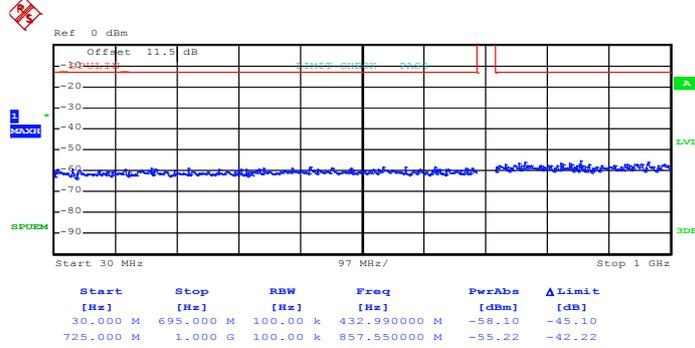
Conducted Emission Plot (1GHz ~ 8GHz) for QPSK (RB Size 1, RB Offset 0)



Date: 16.MAR.2012 22:49:07

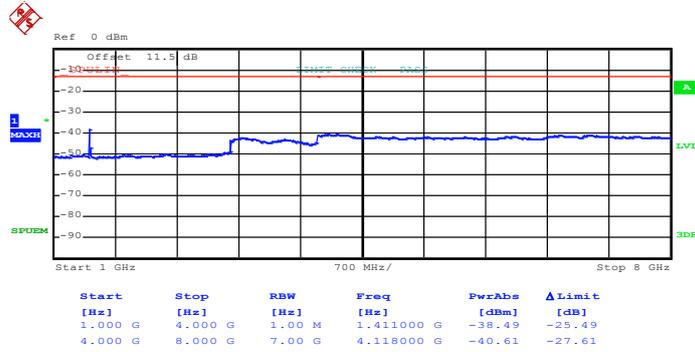


Conducted Emission Plot (30MHz ~ 1GHz) for 16-QAM (RB Size 1, RB Offset 49)



Date: 16.MAR.2012 23:03:46

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

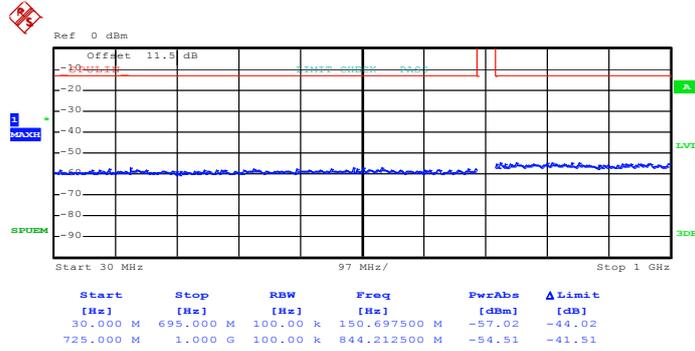


Date: 16.MAR.2012 22:49:37



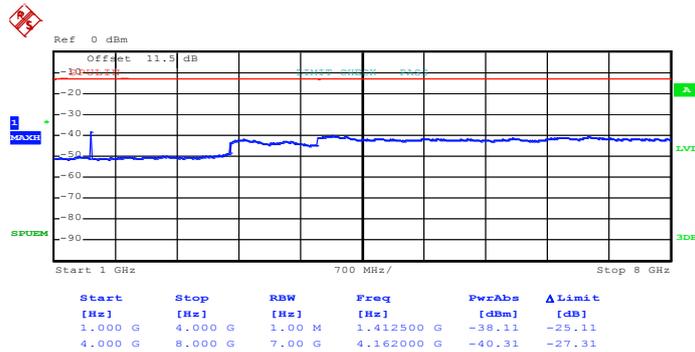
Band :	LTE Band 17	Channel :	CH23800
Band Width	10MHz		

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



Date: 16.MAR.2012 23:04:42

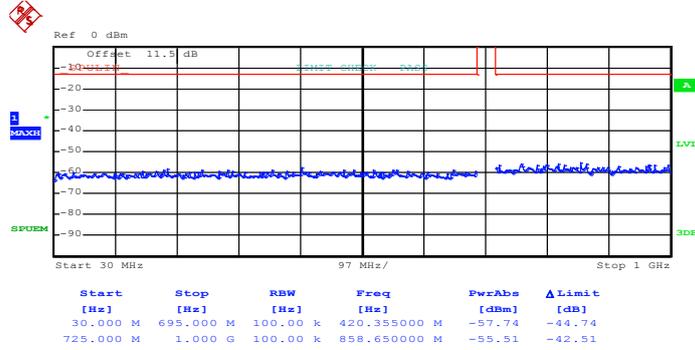
Conducted Emission Plot (1GHz ~ 8GHz) for QPSK (RB Size 1, RB Offset 0)



Date: 16.MAR.2012 22:52:05

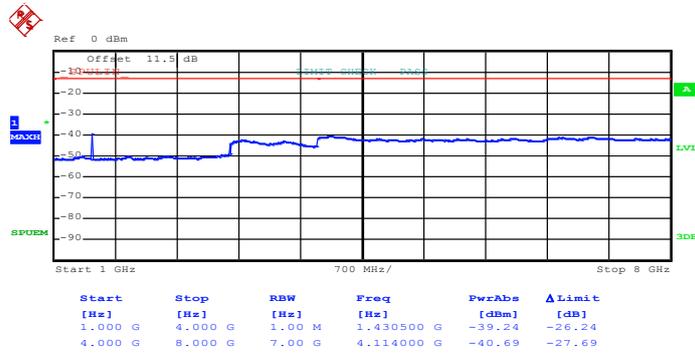


Conducted Emission Plot (30MHz ~ 1GHz) for 16-QAM (RB Size 1, RB Offset 49)



Date: 16.MAR.2012 23:05:02

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



Date: 16.MAR.2012 22:52:36

3.6 Field Strength of Spurious Radiation Measurement

3.6.1 Description of Field Strength of Spurious Radiated Measurement

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

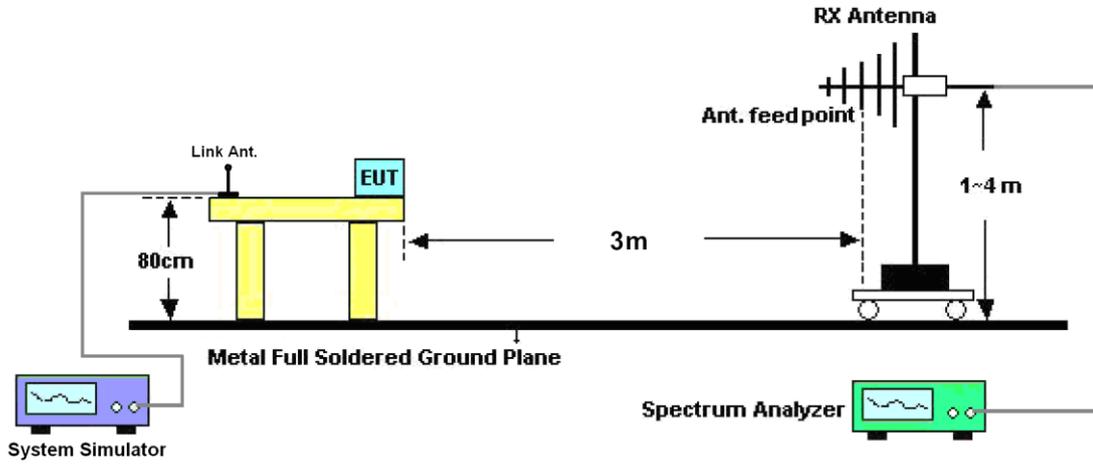
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

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

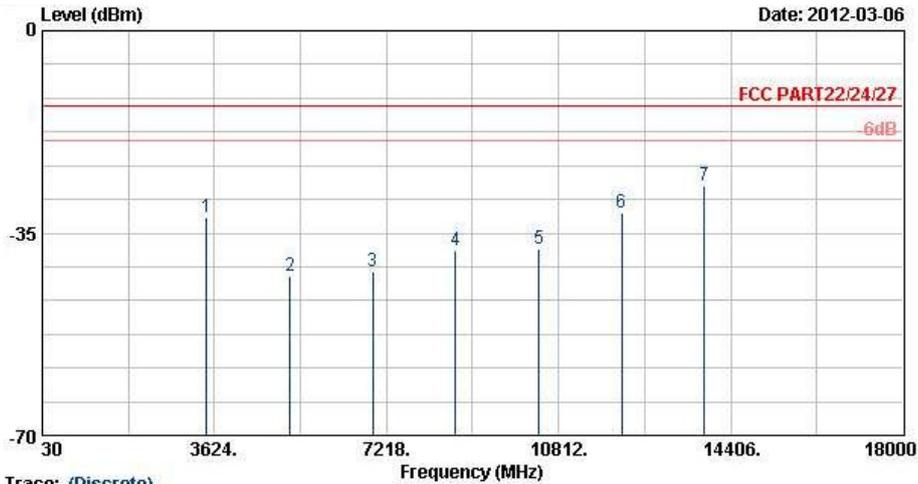
3.6.4 Test Setup





3.6.5 Test Result of Field Strength of Spurious Radiated

Band :	LTE Band 4	Temperature :	23~25°C
Test Mode :	5MHz QPSK RB Size 1	Relative Humidity :	49~51%
Test Engineer :	Eric Shih	Polarization :	Horizontal
Remark :	Spurious emissions were found more than 20dB below limit line.		

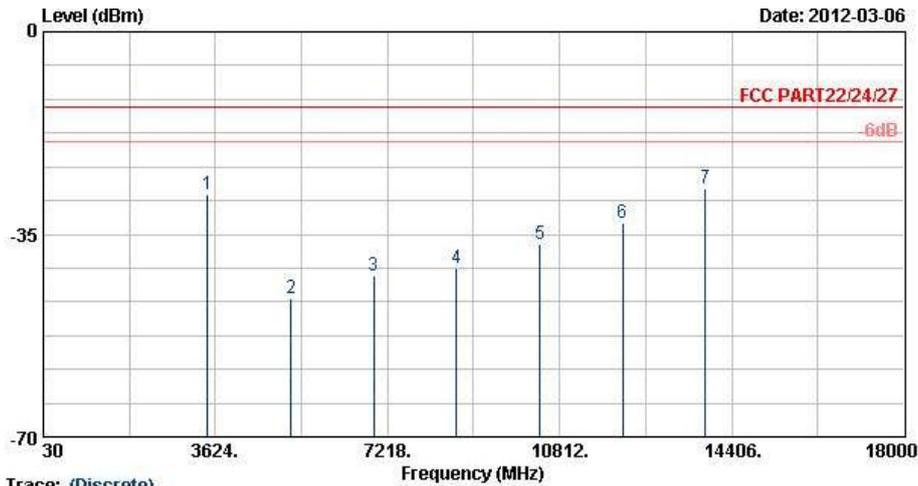


Trace: (Discrete)
 Site : D3CH06-HY
 Condition : FCC PART22/24/27 ETRP_I00524 HORIZONTAL
 Project : FG 211844

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
3465	-32.17	-13	-19.17	-47.93	-36	4.48	8.31	H	Pass
5197	-42.36	-13	-29.36	-63.34	-47	5.332	9.98	H	Pass
6930	-41.56	-13	-28.56	-66.47	-46.8	6.1	11.34	H	Pass
8662	-38.08	-13	-25.08	-64.31	-43	8.25	13.17	H	Pass
10395	-37.81	-13	-24.81	-66.97	-42.1	8.65	12.94	H	Pass
12128	-31.59	-13	-18.59	-62.94	-35.9	8.59	12.90	H	Pass
13860	-26.75	-13	-13.75	-61.83	-32.8	8.14	14.19	H	Pass



Band :	LTE Band 4	Temperature :	23~25°C
Test Mode :	5MHz QPSK RB Size 1	Relative Humidity :	49~51%
Test Engineer :	Eric Shih	Polarization :	Vertical
Remark :	Spurious emissions were found more than 20dB below limit line.		

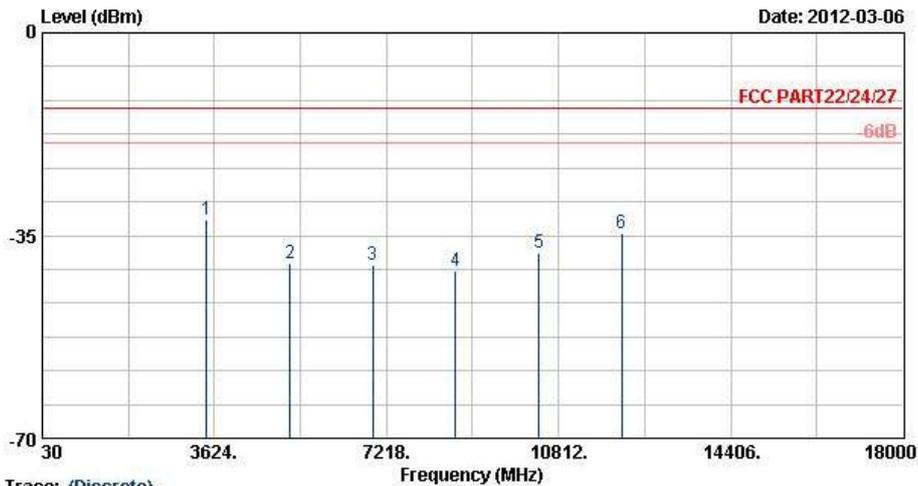


Trace: (Discrete)
 Site : D3CH06-HY
 Condition : FCC PART 22/24/27 ETRP_I00524 VERTICAL
 Project : FG 211844

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
3465	-28.17	-13	-15.17	-44.15	-32	4.48	8.31	V	Pass
5197	-46.06	-13	-33.06	-67.16	-50.7	5.332	9.98	V	Pass
6930	-42.16	-13	-29.16	-66.74	-47.4	6.1	11.34	V	Pass
8662	-40.98	-13	-27.98	-67.09	-45.9	8.25	13.17	V	Pass
10395	-36.81	-13	-23.81	-66.26	-41.1	8.65	12.94	V	Pass
12128	-33.09	-13	-20.09	-64.61	-37.4	8.59	12.90	V	Pass
13860	-27.05	-13	-14.05	-62.25	-33.1	8.14	14.19	V	Pass



Band :	LTE Band 4	Temperature :	23~25°C
Test Mode :	10MHz QPSK RB Size 1	Relative Humidity :	49~51%
Test Engineer :	Eric Shih	Polarization :	Horizontal
Remark :	Spurious emissions were found more than 20dB below limit line.		

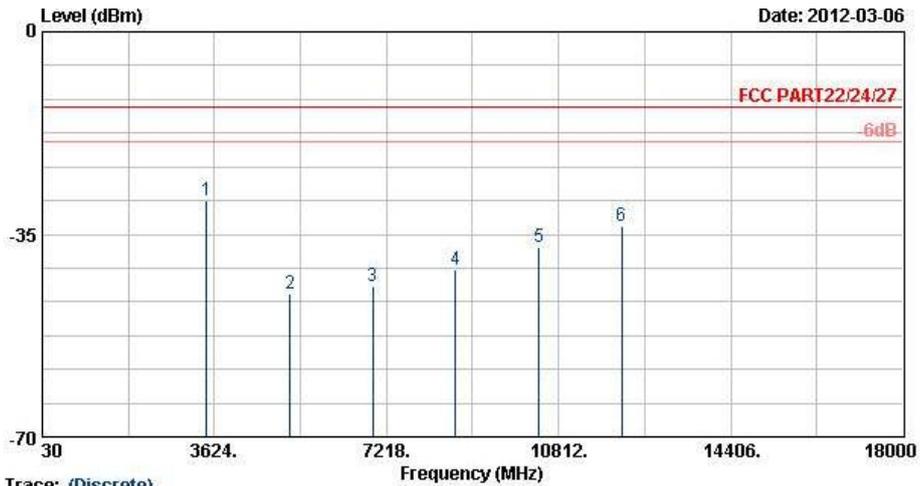


Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC PART22/24/27 ETRP_100524 HORIZONTAL
 Project : FG 211844

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
3465	-32.17	-13	-19.17	-48.15	-36	4.48	8.31	H	Pass
5197	-39.86	-13	-26.86	-60.73	-44.5	5.332	9.98	H	Pass
6930	-39.96	-13	-26.96	-64.71	-45.2	6.1	11.34	H	Pass
8662	-41.08	-13	-28.08	-67.45	-46	8.25	13.17	H	Pass
10395	-38.11	-13	-25.11	-67.25	-42.4	8.65	12.94	H	Pass
12128	-34.69	-13	-21.69	-66.28	-39	8.59	12.90	H	Pass



Band :	LTE Band 4	Temperature :	23~25°C
Test Mode :	10MHz QPSK RB Size 1	Relative Humidity :	49~51%
Test Engineer :	Eric Shih	Polarization :	Vertical
Remark :	Spurious emissions were found more than 20dB below limit line.		

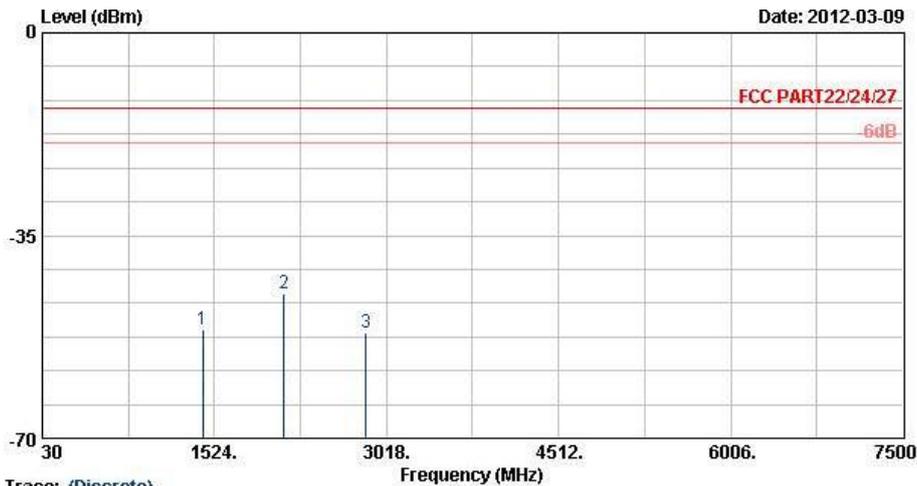


Trace: (Discrete)
 Site : D3CH06-HY
 Condition : FCC PART22/24/27 ETRP_I00524 VERTICAL
 Project : FG 211844

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
3465	-29.17	-13	-16.17	-45.31	-33	4.48	8.31	V	Pass
5197	-45.16	-13	-32.16	-66.18	-49.8	5.332	9.98	V	Pass
6930	-44.06	-13	-31.06	-68.63	-49.3	6.1	11.34	V	Pass
8662	-41.08	-13	-28.08	-67.92	-46	8.25	13.17	V	Pass
10395	-37.21	-13	-24.21	-66.37	-41.5	8.65	12.94	V	Pass
12128	-33.69	-13	-20.69	-65.07	-38	8.59	12.90	V	Pass



Band :	LTE Band 17	Temperature :	23~25°C
Test Mode :	5MHz QPSK RB Size 1	Relative Humidity :	49~51%
Test Engineer :	Eric Shih	Polarization :	Horizontal
Remark :	Spurious emissions were found more than 20dB below limit line.		

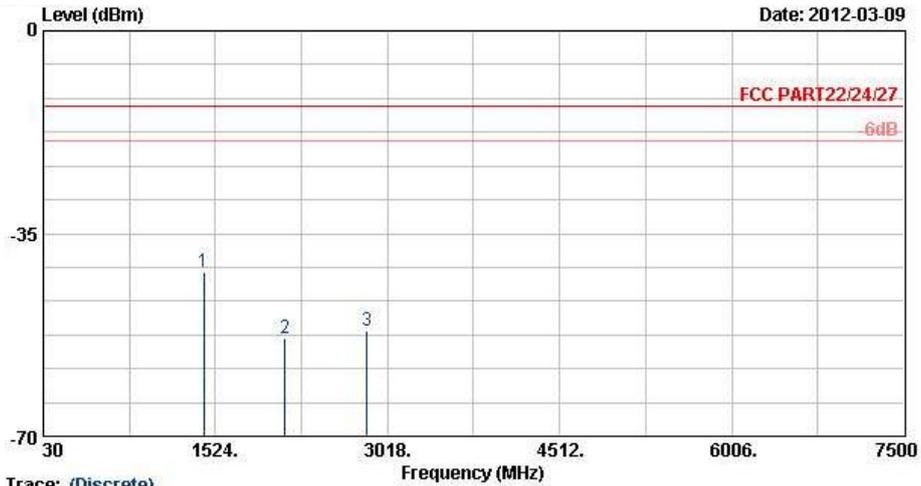


Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC PART22/24/27 ETRP_I00524 HORIZONTAL
 Project : FG 211844

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
1420	-51.21	-13	-38.21	-59.62	-53.5	0.72	5.16	H	Pass
2130	-45.09	-13	-32.09	-57.17	-46.8	0.93	4.79	H	Pass
2840	-51.70	-13	-38.70	-65.03	-55	1.13	6.58	H	Pass



Band :	LTE Band 17	Temperature :	23~25°C
Test Mode :	5MHz QPSK RB Size 1	Relative Humidity :	49~51%
Test Engineer :	Eric Shih	Polarization :	Vertical
Remark :	Spurious emissions were found more than 20dB below limit line.		

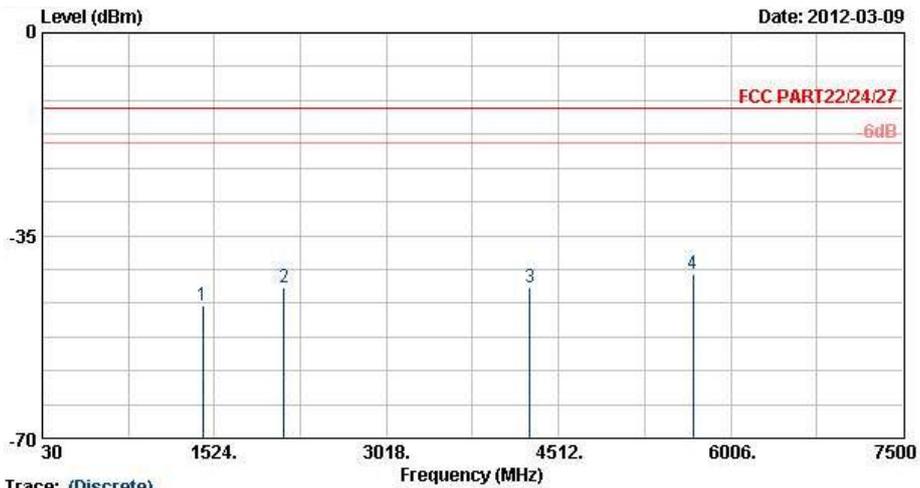


Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC PART22/24/27 ETRP_I00524 VERTICAL
 Project : PG 211844

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
1420	-41.71	-13	-28.71	-62.81	-44	0.72	5.16	V	Pass
2130	-53.09	-13	-40.09	-65.07	-54.8	0.93	4.79	V	Pass
2840	-51.70	-13	-38.70	-65.05	-55	1.13	6.58	V	Pass



Band :	LTE Band 17	Temperature :	23~25°C
Test Mode :	10MHz QPSK RB Size 1	Relative Humidity :	49~51%
Test Engineer :	Eric Shih	Polarization :	Horizontal
Remark :	Spurious emissions were found more than 20dB below limit line.		

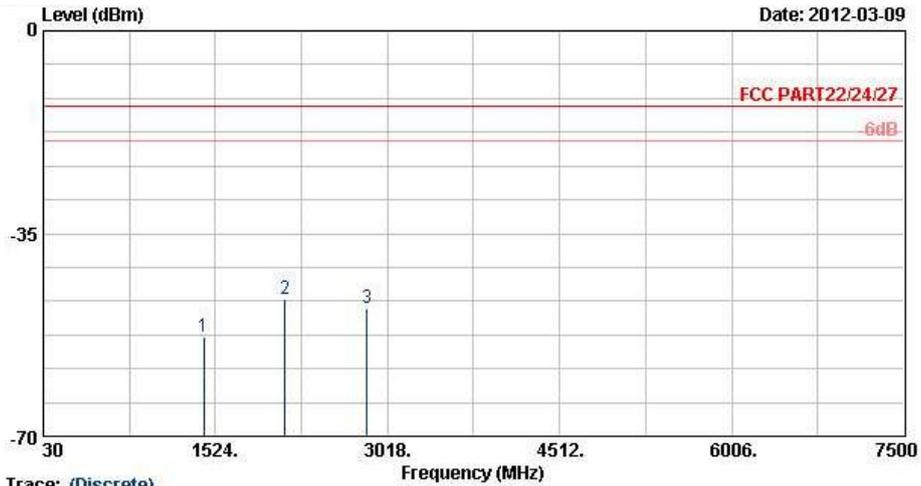


Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC PART22/24/27 ETRP_I00524 HORIZONTAL
 Project : FG 211844

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
1420	-47.01	-13	-34.01	-55	-49.3	0.72	5.16	H	Pass
2130	-43.99	-13	-30.99	-55.98	-45.7	0.93	4.79	H	Pass
4260	-44.08	-13	-31.08	-62.97	-49.2	1.42	8.69	H	Pass
5680	-41.63	-13	-28.63	-64.76	-48	1.78	10.30	H	Pass



Band :	LTE Band 17	Temperature :	23~25°C
Test Mode :	10MHz QPSK RB Size 1	Relative Humidity :	49~51%
Test Engineer :	Eric Shih	Polarization :	Vertical
Remark :	Spurious emissions were found more than 20dB below limit line.		



Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC PART22/24/27 ETRP_I00524 VERTICAL
 Project : PG 211844

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
1420	-52.71	-13	-39.71	-61.72	-55	0.72	5.16	V	Pass
2130	-46.29	-13	-33.29	-59.78	-48	0.93	4.79	V	Pass
2840	-47.80	-13	-34.80	-64.28	-51.1	1.13	6.58	V	Pass

3.7 Frequency Stability Measurement

3.7.1 Description of Frequency Stability Measurement

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

3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

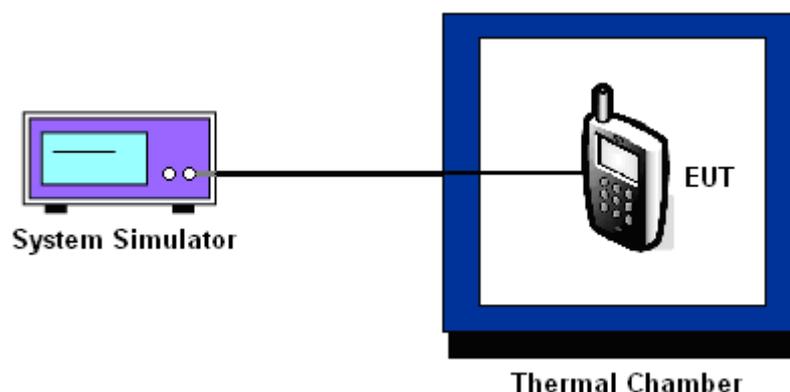
3.7.3 Test Procedures for Temperature Variation

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

3.7.4 Test Procedures for Voltage Variation

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

3.7.5 Test Setup



3.7.6 Test Result of Temperature Variation

Band :	LTE Band 4			Limit (ppm) :	2.5
Temperature (°C)	BW 5MHz		BW 10MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	N/A	N/A	N/A	N/A	PASS
-20	N/A	N/A	N/A	N/A	
-10	14.2	0.008	8.2	0.005	
0	10.7	0.006	6.7	0.004	
10	10.5	0.006	9.2	0.005	
20	12.0	0.007	10.2	0.006	
30	8.6	0.005	12.2	0.007	
40	10.4	0.006	9.0	0.005	
50	11.7	0.007	11.3	0.007	
55	12.0	0.007	12.9	0.007	

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

Band :	LTE Band 17			Limit (ppm) :	2.5
Temperature (°C)	BW 5MHz		BW 10MHz		Result
	Freq. Dev. (Hz)	Deviation (ppm)	Freq. Dev. (Hz)	Deviation (ppm)	
-30	N/A	N/A	N/A	N/A	PASS
-20	N/A	N/A	N/A	N/A	
-10	4.6	0.006	5.9	0.008	
0	3.7	0.005	3.9	0.005	
10	6.3	0.009	4.5	0.006	
20	5.0	0.007	5.7	0.008	
30	5.1	0.007	4.0	0.006	
40	5.0	0.007	4.4	0.006	
50	5.1	0.007	5.0	0.007	
55	6.2	0.009	5.2	0.007	

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



3.7.7 Test Result of Voltage Variation

Band & Channel	Mode	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 4	5M	8.3	12.1	0.007	2.5	PASS
		BEP	10.7	0.006		
		7.1	10.1	0.006		
	10M	8.3	10.0	0.006		
		BEP	10.3	0.006		
		7.1	11.4	0.007		
LTE Band 17	5M	8.3	5.1	0.007	2.5	PASS
		BEP	4.9	0.007		
		7.1	4.0	0.006		
	10M	8.3	4.6	0.006		
		BEP	4.1	0.006		
		7.1	3.7	0.005		

Remark:

- 1. Normal Voltage = 8.3V.
- 2. Battery End Point (BEP) = 7.5 V.



4 List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 13, 2011	Mar. 16, 2012~ Mar. 28, 2012	Jun. 12, 2012	Conducted (TH02-HY)
Power Sensor	Agilent	E9327A	US40441548	300MHz~40GHz	Feb. 21, 2012	Mar. 16, 2012~ Mar. 28, 2012	Feb. 20, 2013	Conducted (TH02-HY)
Thermal Chamber	Ten Billion	TTH-D35P	TBN-930701	N/A	Jul. 27, 2011	Mar. 16, 2012~ Mar. 28, 2012	Jul. 26, 2012	Conducted (TH02-HY)
Spectrum Analyzer	Agilent	E4408B	MY44211030	9KHz ~ 26.5GHz	Nov. 23, 2011	Mar. 05, 2012~ Mar. 15, 2012	Nov. 22, 2012	Radiation (03CH06-HY)
Spectrum Analyzer	R&S	FSP40	100057	9KHz ~ 40GHz	Oct. 27, 2011	Mar. 05, 2012~ Mar. 15, 2012	Oct. 26, 2012	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/003	20MHz ~ 1000MHz	May 10, 2011	Mar. 05, 2012~ Mar. 15, 2012	May 09, 2012	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz ~ 2GHz	Oct. 22, 2011	Mar. 05, 2012~ Mar. 15, 2012	Oct. 21, 2012	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz ~ 18GHz	Aug. 01, 2011	Mar. 05, 2012~ Mar. 15, 2012	Jul. 31, 2012	Radiation (03CH06-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA917025 1	15GHz ~ 40GHz	Oct. 21, 2011	Mar. 05, 2012~ Mar. 15, 2012	Oct. 20, 2012	Radiation (03CH06-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1GHz ~ 26.5GHz	Apr. 14, 2011	Mar. 05, 2012~ Mar. 15, 2012	Apr. 13, 2012	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9KHz ~ 1GHz	Apr. 14, 2011	Mar. 05, 2012~ Mar. 15, 2012	Apr. 13, 2012	Radiation (03CH06-HY)
Pre Amplifier	EMCI	EMC051845	SN980048	1GHz ~ 18GHz	Jul. 18, 2011	Mar. 05, 2012~ Mar. 15, 2012	Jul. 17, 2012	Radiation (03CH06-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 29, 2010	Mar. 05, 2012~ Mar. 15, 2012	Jul. 28, 2012	Radiation (03CH06-HY)
LTE Base Station	Anritsu	MT8820C	6201074414	N/A	Jan. 05, 2012	Mar. 05, 2012~ Mar. 15, 2012	Jan. 04, 2013	Radiation (03CH06-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 $Uc(y)$	1.27		
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	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 $Uc(y)$	2.36				
Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.72				



Appendix A. Photographs of EUT

Please refer to Sporton report number EP211844 as below.