FCC RF Test Report

APPLICANT	:	HTC Corporation
EQUIPMENT	:	Smartphone
MODEL NAME	:	PG05100
FCC ID	:	NM8PG05100
STANDARD	:	47 CFR Part 2, 27
CLASSIFICATION	:	PCS Licensed Transmitter Held to Ear (PCE)
TX FREQUENCY RANGE	:	777 MHz ~ 787 MHz (LTE Band 13)
RX FREQUENCY RANGE	:	746 MHz ~ 756 MHz (LTE Band 13)
MAX. ERP POWER	:	0.05 W (QPSK, BW 10MHz) 0.05 W (16QAM, BW 10MHz)
EMISSION DESIGNATOR	:	8M94G7D (QPSK, BW 10MHz) 8M92D7W (16QAM, BW 10MHz)

The product was received on Oct. 15, 2010 and completely tested on Nov. 22, 2010. 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:

Roy Wu

Roy Wu / Manager

Testing Laboratory
1190

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

TABLE OF CONTENTS

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG0O1550B	Rev. 01	Initial issue of report	Nov. 29, 2010

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	§2.1046	Conducted Output Power	NA	PASS	-
3.2	§27.50(b)(10)	Effective Radiated Power	< 3 Watts	PASS	-
3.3	§2.1049	Occupied Bandwidth	NA	PASS	-
3.4	§2.1051 §27.53(c)(2)	Band Edge and Emission Mask Measurement	< 43+10log$_{10}$(P[Watts]) < 65+10log$_{10}$(P[Watts]) in a 6.25 kHz bandwidth for emissions in the 763 ~ 805 MHz bands	PASS	-
3.5	§2.1051 §27.53(c)	Conducted Emission	< 43+10log$_{10}$(P[Watts])	PASS	-
3.5	§2.1053 §27.53(f)	Undesirable Emissions in the 1559 ~ 1610 MHz band	< -40 dBm/MHz (wideband) < -50 dBm (narrowband)	PASS	-
3.6	§27.50(d)(5)	Peak-Average Ratio	< 13 db	PASS	-
3.7	§2.1053 §27.53(c)(2) §27.53(c)(4)	Undesirable Out of Band Emissions	< 43+10log$_{10}$(P[Watts])	PASS	Under limit 28.78 dB at 2346.00 MHz
3.8	§2.1055 §27.54	Frequency Stability Temperature & Voltage	< 2.5 ppm	PASS	-

1 General Description

1.1 Applicant

HTC Corporation
No. 23, Xinghua Rd., Taoyuan City, Taiwan

1.2 Manufacturer

HTC Corporation
No. 23, Xinghua Rd., Taoyuan City, Taiwan

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	Smartphone
Model Name	PG05100
FCC ID	NM8PG05100
Tx Frequency	LTE Band 13 : 777 MHz ~ 787 MHz
Rx Frequency	LTE Band 13 : 746 MHz ~ 756 MHz
Band Width	10 MHz
Maximum Output Power to Antenna	23.00 dBm
Maximum ERP	0.05 W (16.59 dBm) (QPSK, BW 10MHz) 0.05 W (17.14 dBm) (16QAM, BW 10MHz)
Antenna Type	PIFA Antenna
Type of Modulation	QPSK/16QAM
Type of Emission	8M94G7D (QPSK, BW 10MHz) 8M92D7W (16QAM, BW 10MHz)
EUT Stage	Production Unit

Remark:

1. For other wireless features of this EUT, the test report will be issued separately.
2. This test report recorded only product characteristics and test results of PCS Licensed Transmitter Held to Ear (PCE).

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1st 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	03CH06-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	R&S	CMW500	N/A	N/A	Unshielded, 1.8 m
2.	Earphone	Merry	RC E160	N/A	N/A	N/A

2 Test Configuration of Equipment Under Test

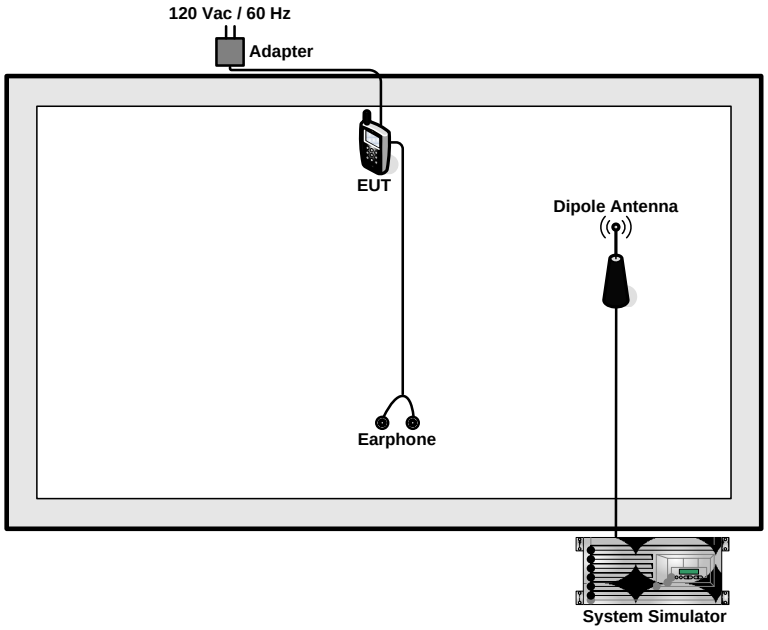
2.1 Test Mode

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, and EUT is rotated on three test planes to find out the worst emission.

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

Test Modes			
Band		**Radiated TCs**	**Conducted TCs**
LTE Band 13	**QPSK**	■ LTE (RB Size 1, RB Offset 49) Link + TC ■ LTE (RB Size 50, RB Offset 0) Link + TC	■ 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
	16QAM	■ LTE (RB Size 1, RB Offset 49) Link + TC ■ LTE (RB Size 50, RB Offset 0) Link + TC	■ 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
Remark: TC stands for Test Configuration, and consists of Battery3, USB Cable1, and Adapter 1.			

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.

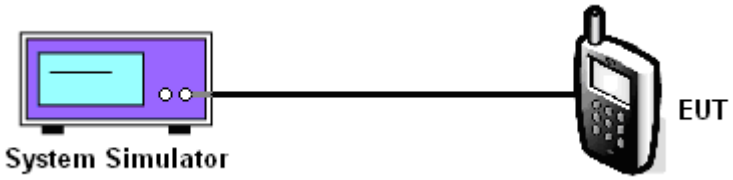
3.1.2 Measuring Instruments

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

Mode	Channel	Frequency (MHz)	Modulation	RB Configuration		Conducted Power (dBm)	Conducted Power (Watts)
				RB Size	RB Offset		
LTE Band 13	23230	782	QPSK	1	0	22.51	0.18
				1	49	22.92	0.20
				25	13	21.47	0.14
				50	0	21.42	0.14
			16QAM	1	0	22.49	0.18
				1	49	23.00	0.20
				25	13	21.46	0.14
				50	0	21.39	0.14

3.2 Effective Radiated Power Measurement

3.2.1 Description of the ERP Measurement

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

3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The EUT was placed on a turntable with 1.0 meter height in a fully anechoic chamber.
2. The EUT was set 1.2 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 radiated power.
4. The height of the receiving antenna is adjusted to look for the maximum EIRP.
5. Taking the record of maximum EIRP.
6. A dipole antenna was substituted in place of the EUT and was driven by a signal generator.
7. The conducted power at the terminal of the dipole antenna is measured.
8. Repeat step 3 to step 5 to get the maximum EIRP of the substitution antenna.
9. EIRP = Ps + Et – Es + Gs = Ps + Rt – Rs + Gs

   Ps (dBm)：Input power to substitution antenna.

   Gs (dBi or dBd)：Substitution antenna Gain.

   Et = Rt + AF

   Es = Rs + AF

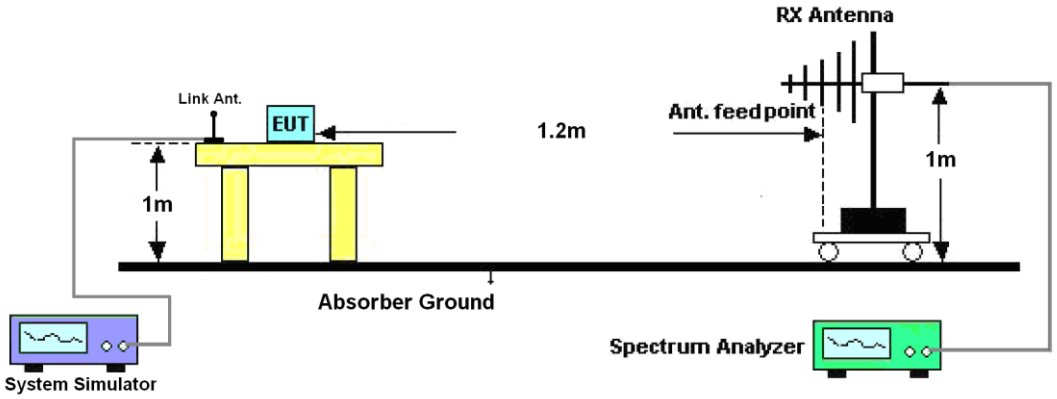
   AF (dB/m)：Receive antenna factor

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

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

   ERP = EIRP – 2.15

3.2.4 Test Setup



3.2.5 Test Result of ERP

LTE Band 13 Radiated Power ERP for QPSK							
Horizontal Polarization							
Channel	**Communication System**	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBd)**	**ERP (dBm)**	**ERP (W)**
23230	RB Size 1, RB Offset 0	-30.55	-48.12	0.00	-1.08	16.49	0.04
23230	RB Size 1, RB Offset 49	-31.11	-48.28	0.00	-0.93	16.24	0.04
23230	RB Size 25, RB Offset 13	-30.76	-48.28	0.00	-0.93	16.59	0.05
23230	RB Size 50, RB Offset 0	-32.31	-48.35	0.00	-0.76	15.28	0.03
Vertical Polarization							
Channel	**Communication System**	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBd)**	**ERP (dBm)**	**ERP (W)**
23230	RB Size 1, RB Offset 0	-39.23	-47.97	0.00	-1.08	7.66	0.01
23230	RB Size 1, RB Offset 49	-39.94	-47.97	0.00	-1.08	6.95	0.005
23230	RB Size 25, RB Offset 13	-41.34	-48.01	0.00	-0.93	5.74	0.004
23230	RB Size 50, RB Offset 0	-41.42	-48.05	0.00	-0.76	5.87	0.004

LTE Band 13 Radiated Power ERP for 16QAM							
Horizontal Polarization							
Channel	**Communication System**	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBd)**	**ERP (dBm)**	**ERP (W)**
23230	RB Size 1, RB Offset 0	-29.90	-48.12	0.00	-1.08	17.14	0.05
23230	RB Size 1, RB Offset 49	-31.22	-48.28	0.00	-0.93	16.13	0.04
23230	RB Size 25, RB Offset 13	-30.65	-48.28	0.00	-0.93	16.70	0.05
23230	RB Size 50, RB Offset 0	-32.00	-48.35	0.00	-0.76	15.59	0.04
Vertical Polarization							
Channel	**Communication System**	**Rt (dBm)**	**Rs (dBm)**	**Ps (dBm)**	**Gs (dBd)**	**ERP (dBm)**	**ERP (W)**
23230	RB Size 1, RB Offset 0	-39.09	-47.97	0.00	-1.08	7.80	0.01
23230	RB Size 1, RB Offset 49	-40.28	-47.97	0.00	-1.08	6.61	0.005
23230	RB Size 25, RB Offset 13	-41.24	-48.01	0.00	-0.93	5.84	0.004
23230	RB Size 50, RB Offset 0	-42.50	-48.05	0.00	-0.76	4.79	0.003

3.3 Occupied Bandwidth and Band Edge Measurement

3.3.1 Description of Occupied Bandwidth Measurement

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

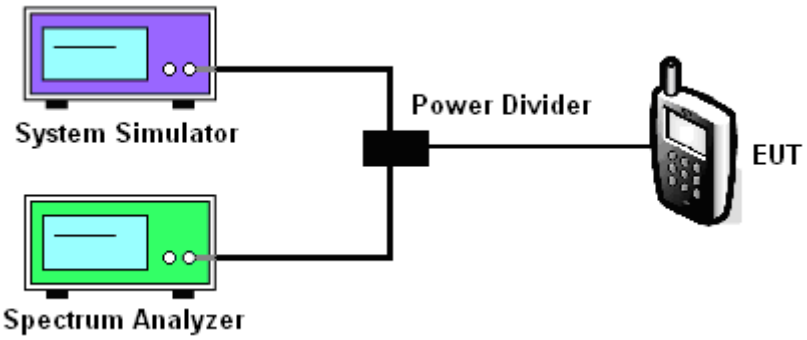
3.3.2 Measuring Instruments

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% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers were measured.

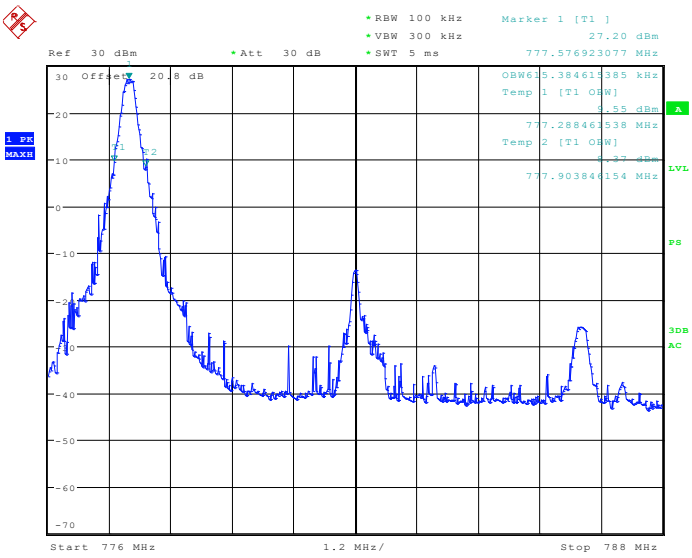
3.3.4 Test Setup



3.3.5 Test Result (Plots) of Occupied Bandwidth

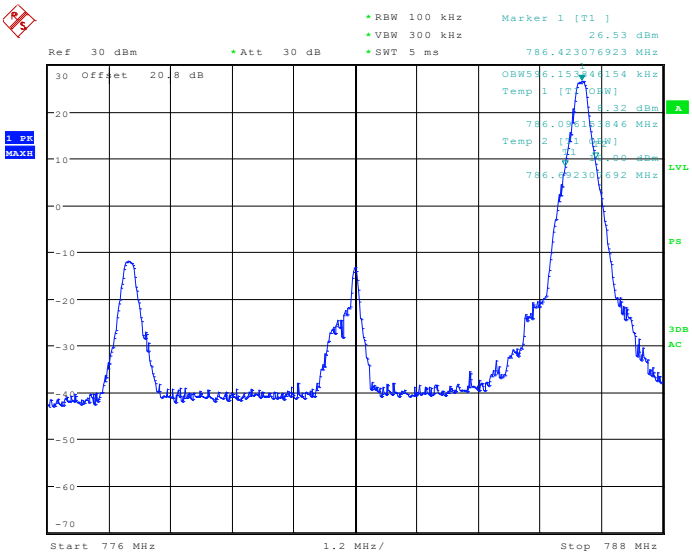
Band :	LTE Band 13	Power Stage :	High
Test Mode :	RB Size 1 RB Offset 0	Modulation :	QPSK

99% Occupied Bandwidth Plot on Channel 23230



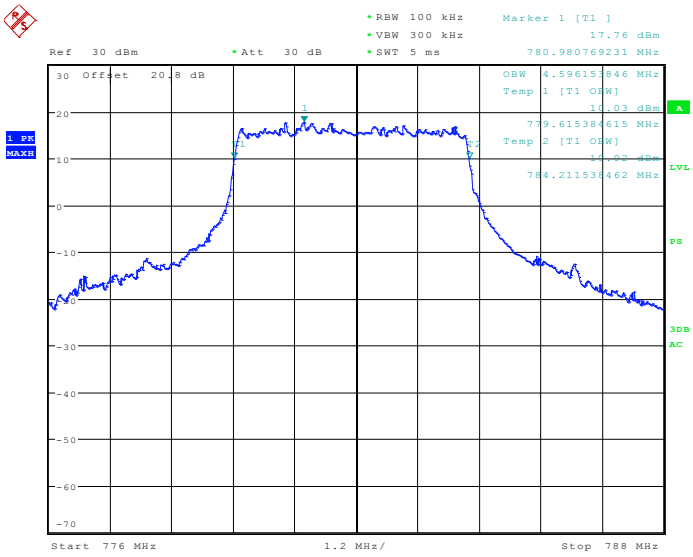
Band :	LTE Band 13	Power Stage :	High
Test Mode :	RB Size 1 RB Offset 49	Modulation :	QPSK

99% Occupied Bandwidth Plot on Channel 23230



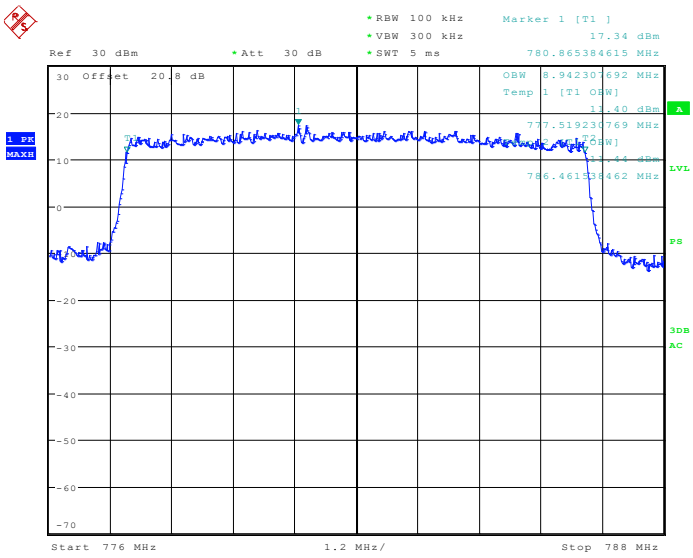
Band :	LTE Band 13	Power Stage :	High
Test Mode :	RB Size 25 RB Offset 13	Modulation :	QPSK

99% Occupied Bandwidth Plot on Channel 23230



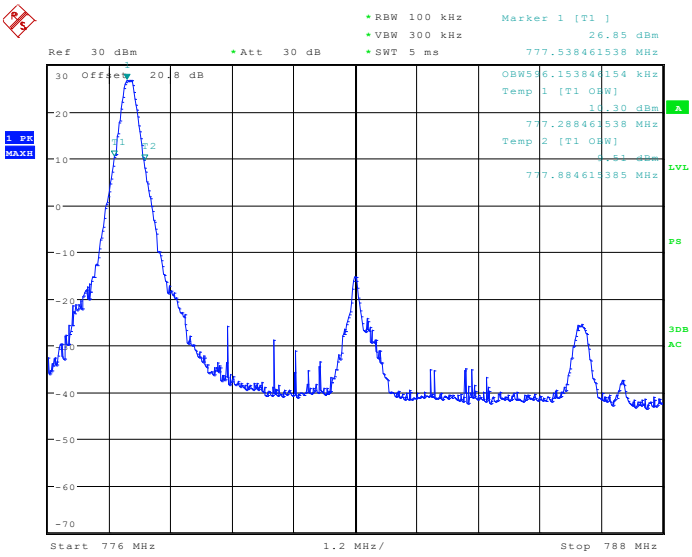
Band :	LTE Band 13	Power Stage :	High
Test Mode :	RB Size 50 RB Offset 0	Modulation :	QPSK

99% Occupied Bandwidth Plot on Channel 23230



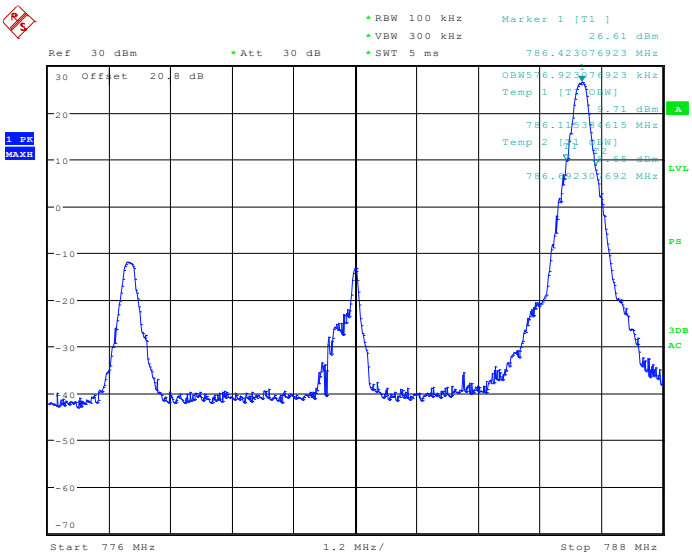
Band :	LTE Band 13	Power Stage :	High
Test Mode :	RB Size 1 RB Offset 0	Modulation :	16QAM

99% Occupied Bandwidth Plot on Channel 23230



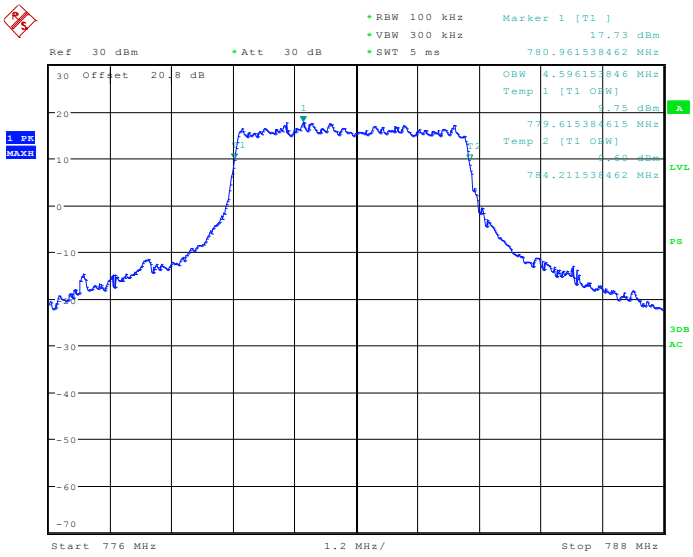
Band :	LTE Band 13	Power Stage :	High
Test Mode :	RB Size 1 RB Offset 49	Modulation :	16QAM

99% Occupied Bandwidth Plot on Channel 23230



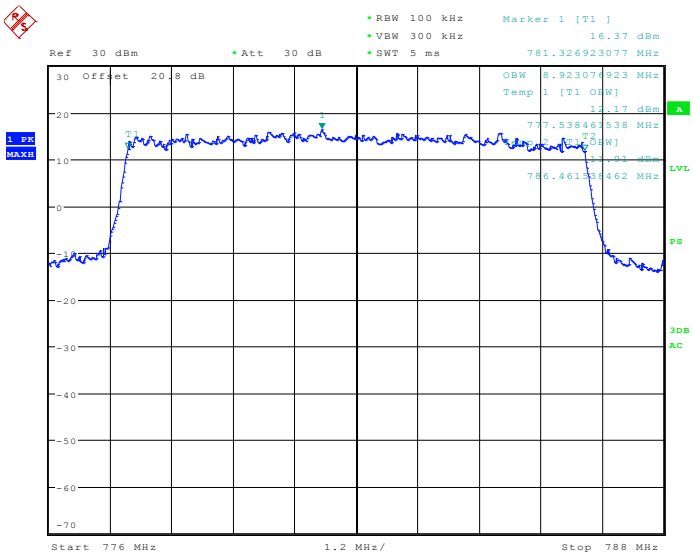
Band :	LTE Band 13	Power Stage :	High
Test Mode :	RB Size 25 RB Offset 13	Modulation :	16QAM

99% Occupied Bandwidth Plot on Channel 23230



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

99% Occupied Bandwidth Plot on Channel 23230



3.4 Band Edge and Emission Mask Measurement

3.4.1 Limit

The emissions in the 763 – 775MHz and 793 – 805MHz band, the FCC limit is 65 + 10log10(P[Watts]) = -35dBm in a 6.25kHz bandwidth.

3.4.2 Measuring Instruments

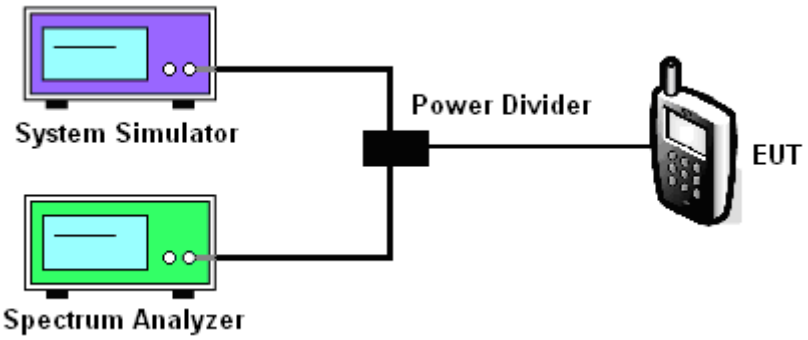
See list of measuring instruments of this test report.

3.4.3 Test Procedures

1. The EUT was connected to Spectrum Analyzer and Base Station via power divider.
2. The band edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100.

3.4.4 Test Setup

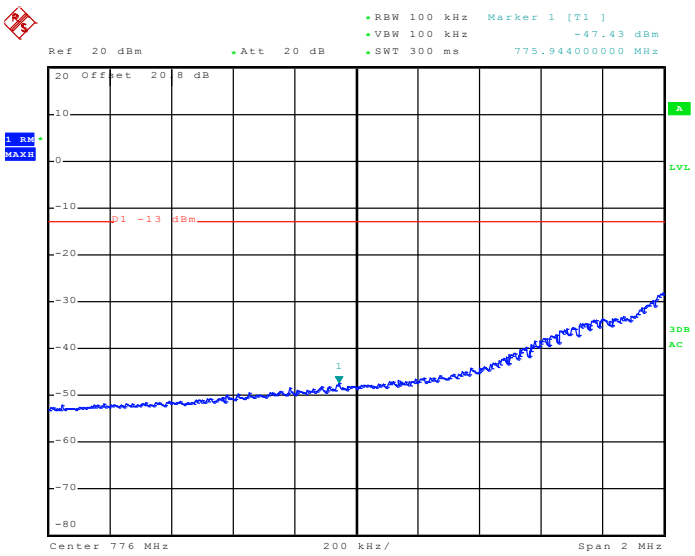
<Conducted Band Edge >



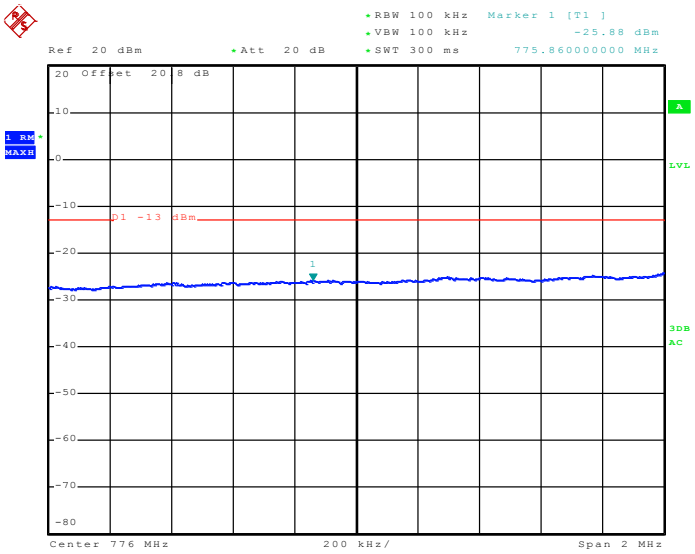
3.4.5 Test Result (Plots) of Conducted Band Edge

Band :	LTE Band 13	Power Stage :	High
		Modulation :	QPSK

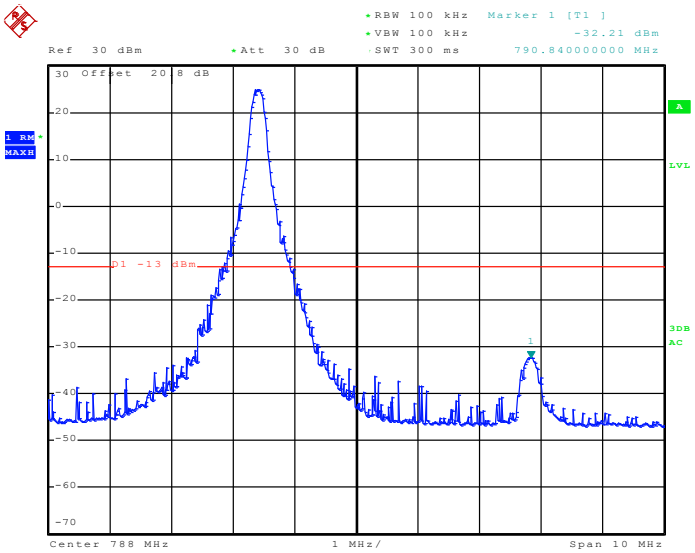
Lower Band Edge Plot for QPSK (RB Size 1, RB Offset 0)



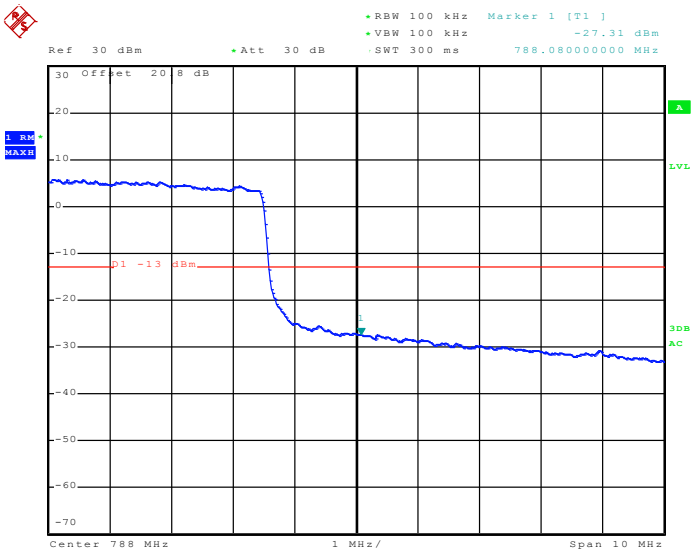
Lower Band Edge Plot for QPSK (RB Size 50, RB Offset 0)



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

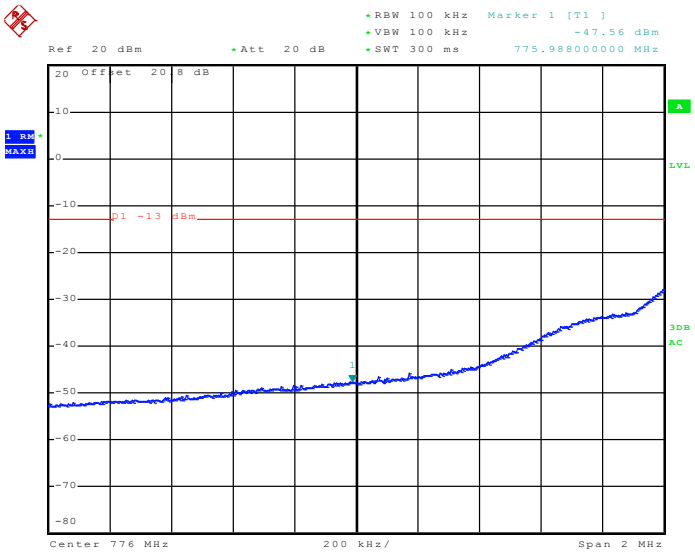


Higher Band Edge Plot for QPSK (RB Size 50, RB Offset 0)

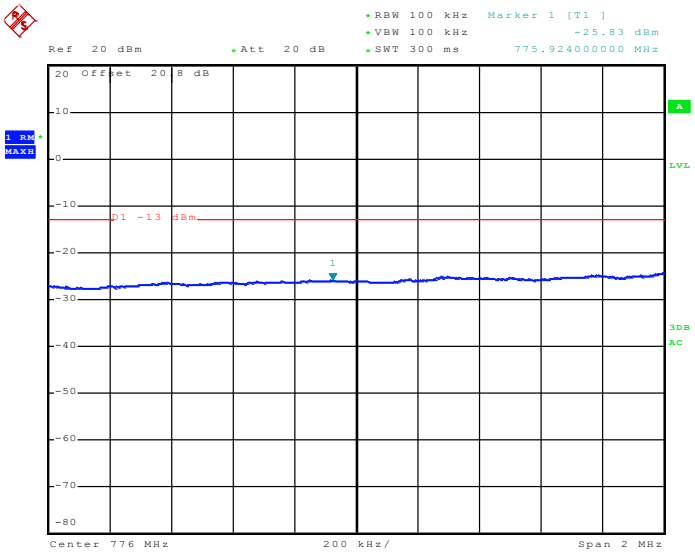


Band :	LTE Band 13	Power Stage :	High
		Modulation :	16QAM

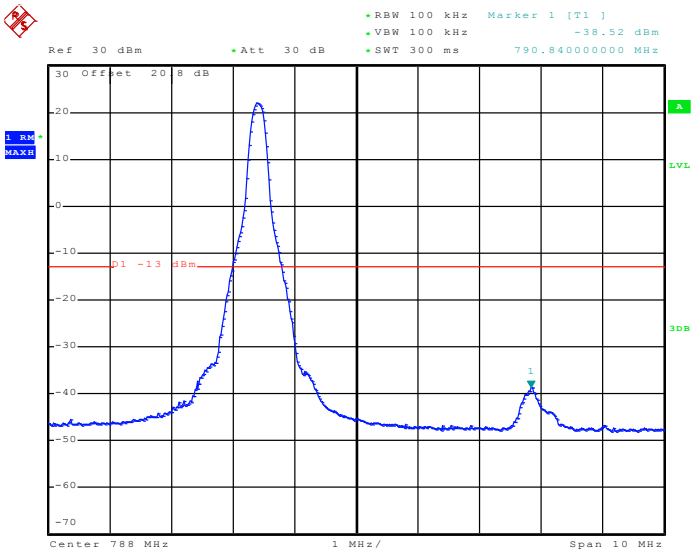
Lower Band Edge Plot for 16QAM (RB Size 1, RB Offset 0)



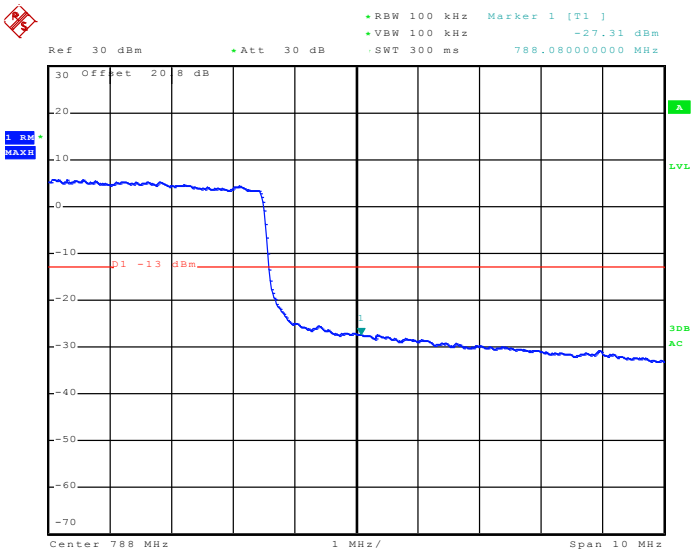
Lower Band Edge Plot for 16QAM (RB Size 50, RB Offset 0)



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



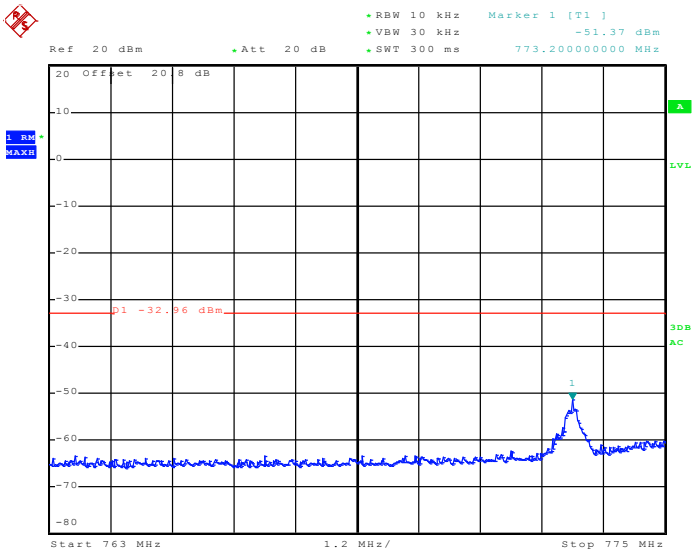
Higher Band Edge Plot for 16QAM (RB Size 50, RB Offset 0)



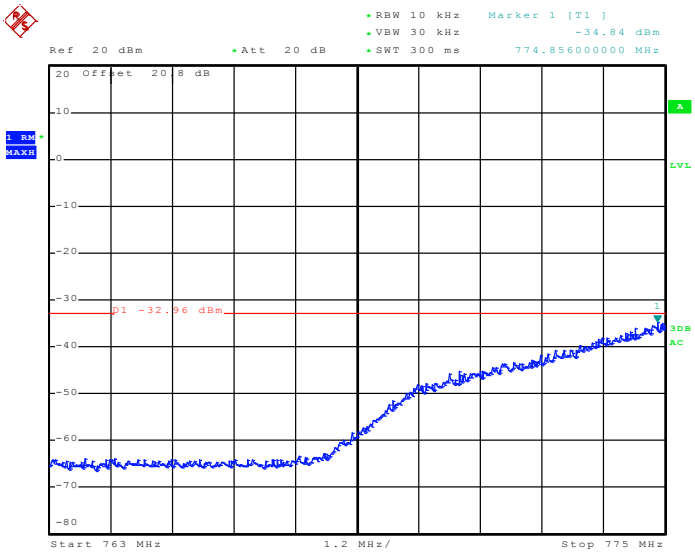
3.4.6 Test Result (Plots) of Conducted Emission Mask

Band :	LTE Band 13	Power Stage :	High
		Modulation :	QPSK

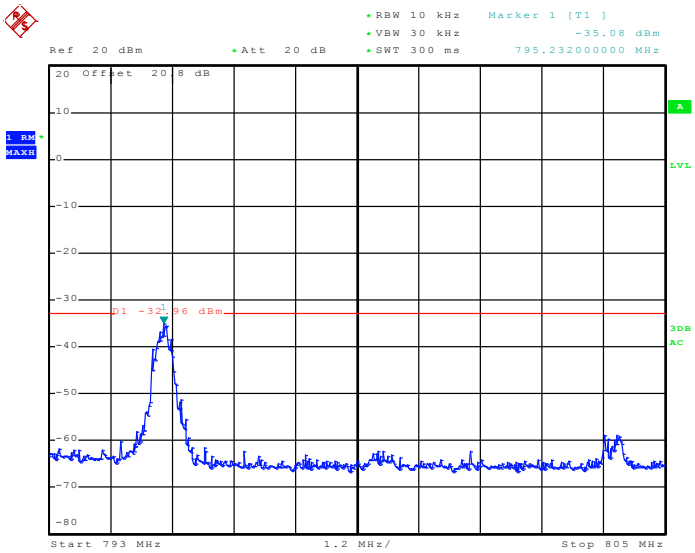
Lower Emission Mask (763~775 MHz) Plot for QPSK (RB Size 1, RB Offset 0)



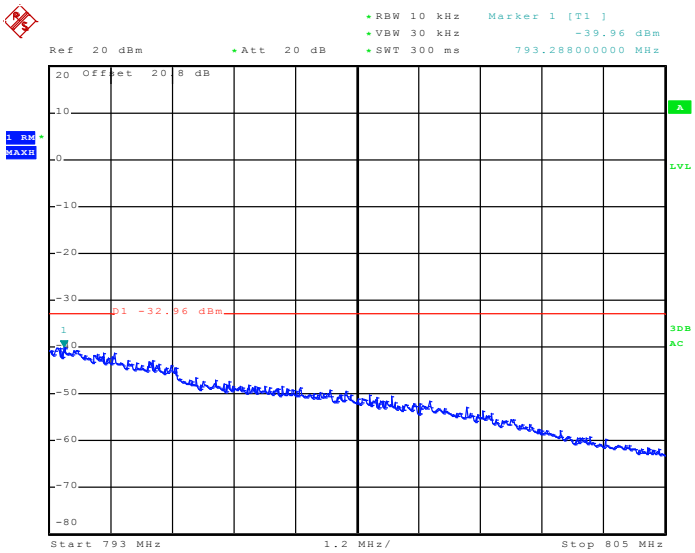
Lower Emission Mask (763~775 MHz) Plot for QPSK (RB Size 50, RB Offset 0)



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

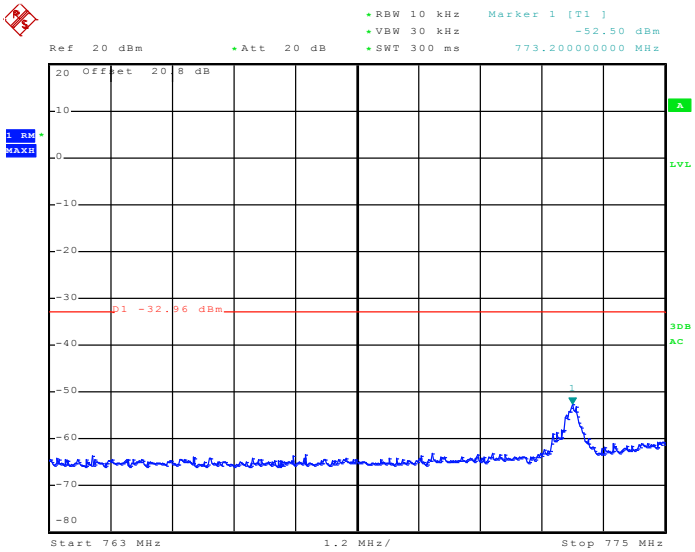


Higher Emission Mask (793~805 MHz) for QPSK (RB Size 50, RB Offset 0)

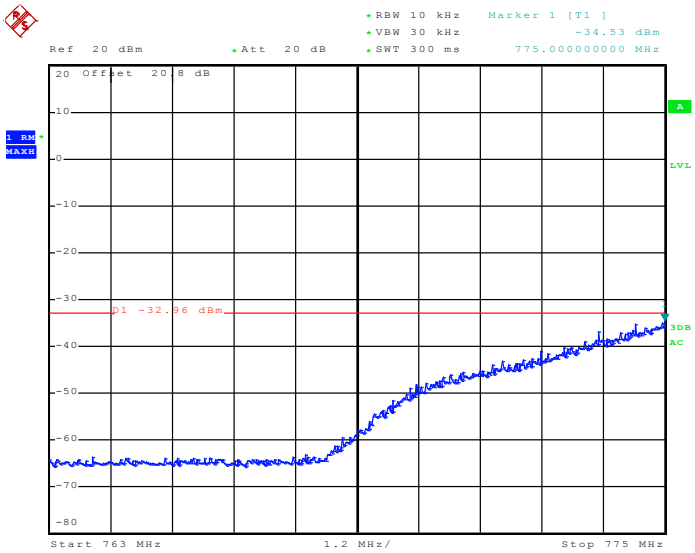


Band :	LTE Band 13	Power Stage :	High
		Modulation :	16QAM

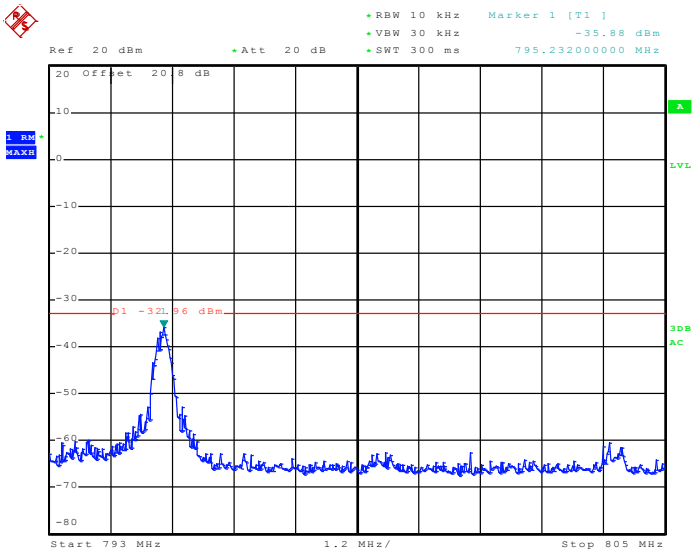
Lower Emission Mask (763~775 MHz) Plot for 16QAM (RB Size 1, RB Offset 0)



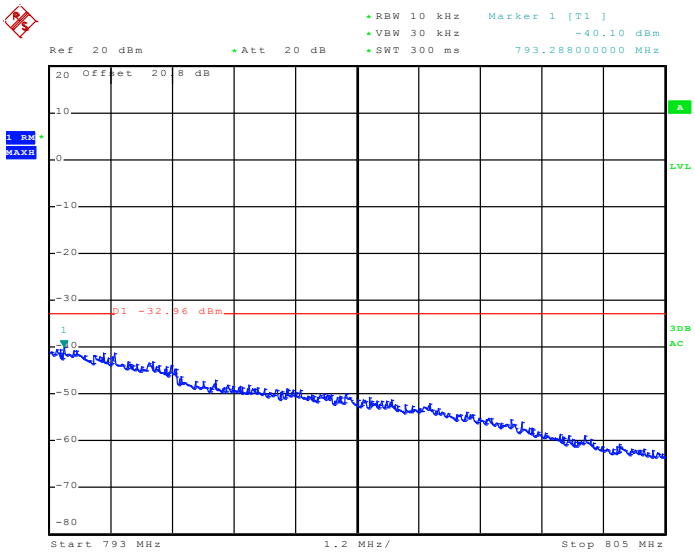
Lower Emission Mask (763~775 MHz) Plot for 16QAM (RB Size 50, RB Offset 0)



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



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



3.5 Conducted Emission Measurement

3.5.1 Description of Conducted Emission Measurement

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

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

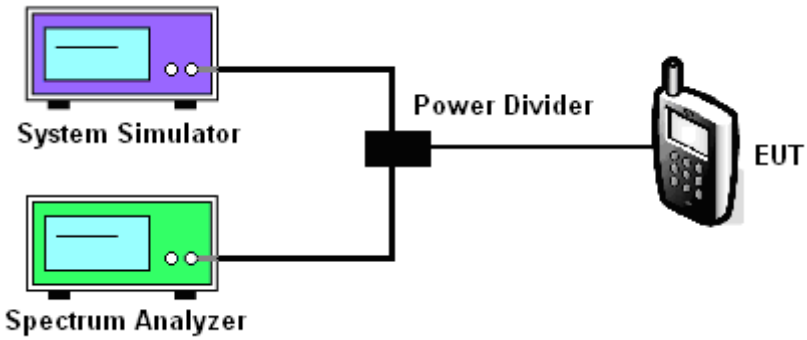
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

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

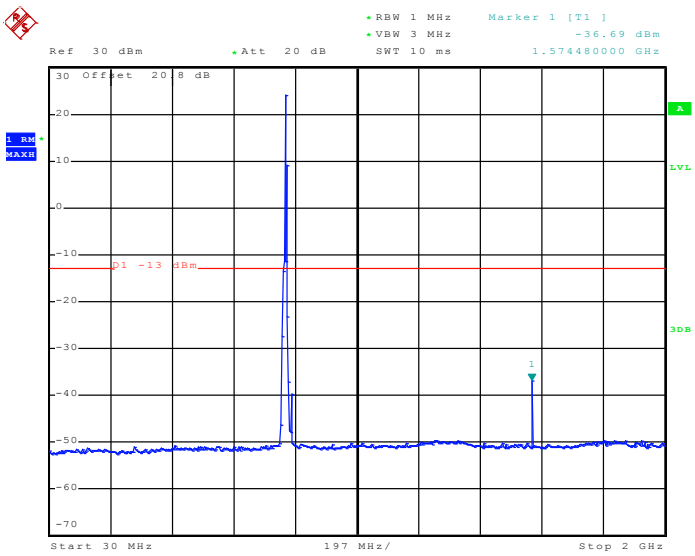
3.5.4 Test Setup



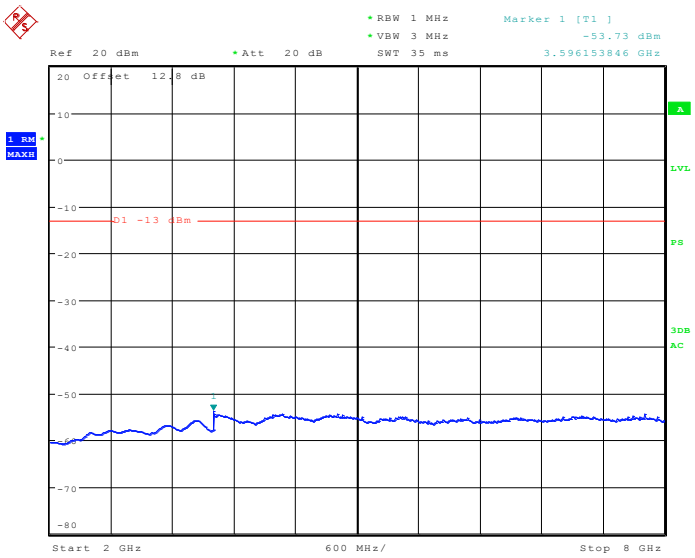
3.5.5 Test Result (Plots) of Conducted Emission

Band :	LTE Band 13	Channel :	CH23230
		Modulation :	QPSK

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

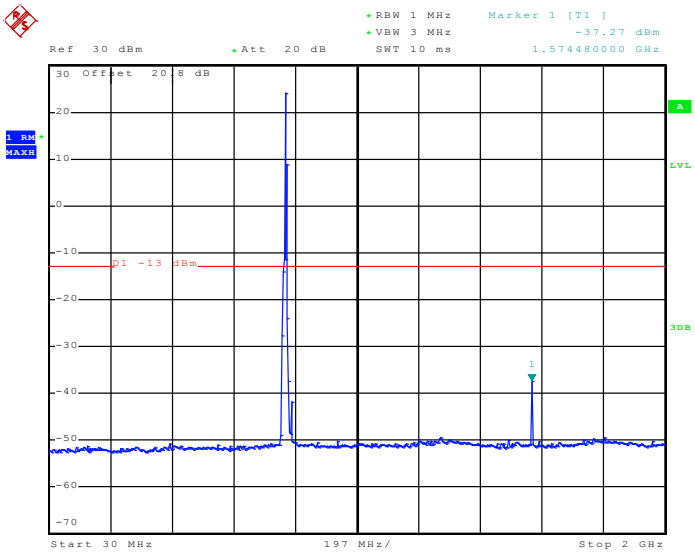


Conducted Emission Plot (2GHz ~ 8GHz) for QPSK (RB Size 1, RB Offset 49)

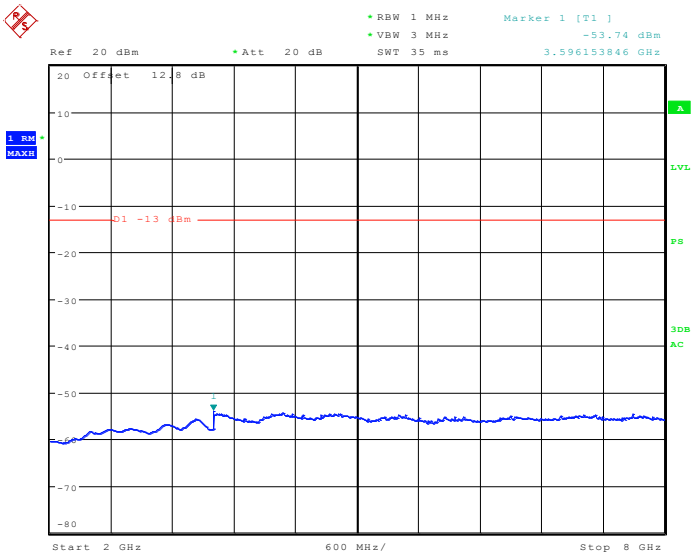


Band :	LTE Band 13	Channel :	CH23230
		Modulation :	16QAM

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



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



3.6 Peak-Average Ratio

3.6.1 Limit

The test result should be < 13 dB.

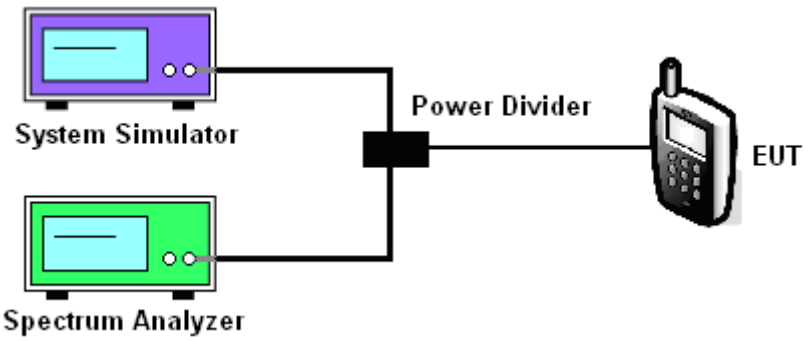
3.6.2 Measuring Instruments

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. Set the spectrum analyzer into CCDF mode with default RBW setting as 10 MHz to measure the ratio.

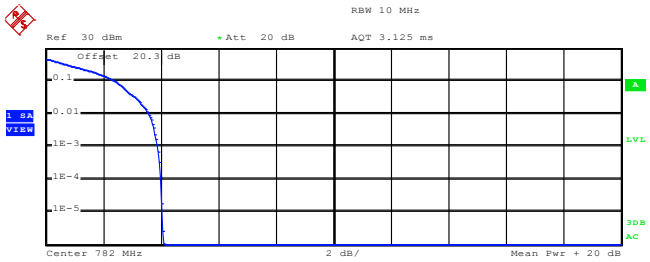
3.6.4 Test Setup



3.6.5 Test Result (Plots) of Peak-Average Ratio

Band :	LTE Band 13	Power Stage :	High
		Modulation :	QPSK

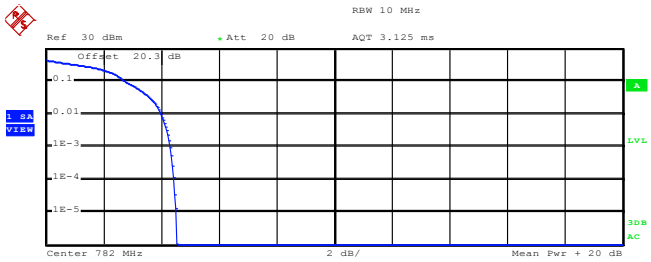
Peak-Average Ratio Plot for QPSK (RB Size 1, RB Offset 0)



Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	20.28 dBm
Peak	24.36 dBm
Crest	4.08 dB
10 %	2.44 dB
1 %	3.60 dB
.1 %	3.88 dB
.01 %	4.00 dB

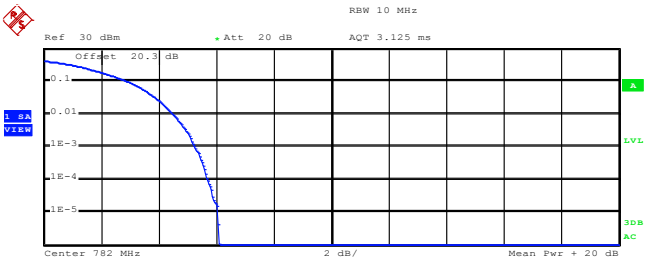
Peak-Average Ratio Plot for QPSK (RB Size 1, RB Offset 49)



Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	21.30 dBm
Peak	25.84 dBm
Crest	4.54 dB
10 %	2.80 dB
1 %	4.00 dB
.1 %	4.32 dB
.01 %	4.44 dB

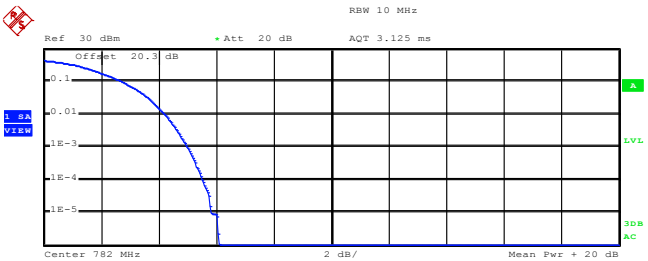
Peak-Average Ratio Plot for QPSK (RB Size 25, RB Offset 13)



Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	22.16 dBm
Peak	28.24 dBm
Crest	6.08 dB
10 %	2.96 dB
1 %	4.48 dB
.1 %	5.28 dB
.01 %	5.72 dB

Peak-Average Ratio Plot for QPSK (RB Size 50, RB Offset 0)

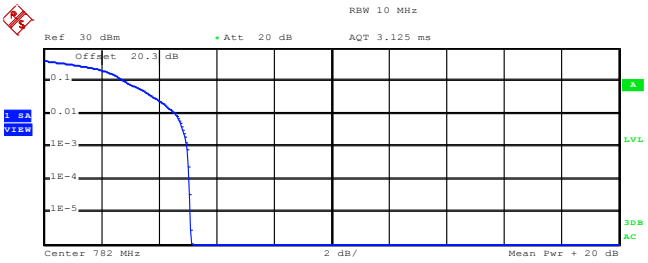


Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	23.08 dBm
Peak	29.16 dBm
Crest	6.08 dB
10 %	2.76 dB
1 %	4.20 dB
.1 %	5.00 dB
.01 %	5.52 dB

Band :	LTE Band 13	Power Stage :	High
		Modulation :	16QAM

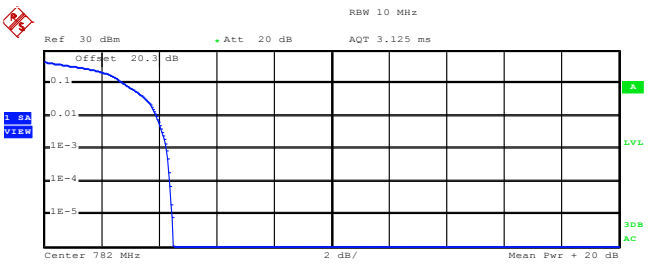
Peak-Average Ratio Plot for 16QAM (RB Size 1, RB Offset 0)



Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	19.25 dBm
Peak	24.36 dBm
Crest	5.11 dB
10 %	2.84 dB
1 %	4.60 dB
.1 %	5.00 dB
.01 %	5.08 dB

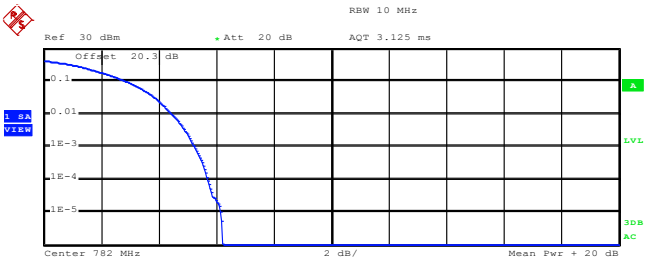
Peak-Average Ratio Plot for 16QAM (RB Size 1, RB Offset 49)



Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	21.34 dBm
Peak	25.84 dBm
Crest	4.50 dB
10 %	2.80 dB
1 %	3.92 dB
.1 %	4.28 dB
.01 %	4.40 dB

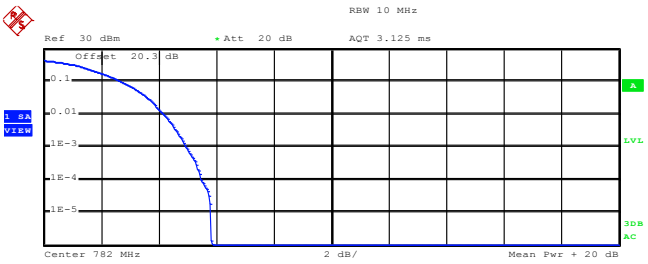
Peak-Average Ratio Plot for 16QAM (RB Size 25, RB Offset 13)



Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	22.23 dBm
Peak	28.45 dBm
Crest	6.23 dB
10 %	2.92 dB
1 %	4.48 dB
.1 %	5.24 dB
.01 %	5.72 dB

Peak-Average Ratio Plot for 16QAM (RB Size 50, RB Offset 0)



Complementary Cumulative Distribution Function (100000 samples)

	Trace 1
Mean	23.12 dBm
Peak	28.95 dBm
Crest	5.83 dB
10 %	2.76 dB
1 %	4.16 dB
.1 %	4.96 dB
.01 %	5.48 dB

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.

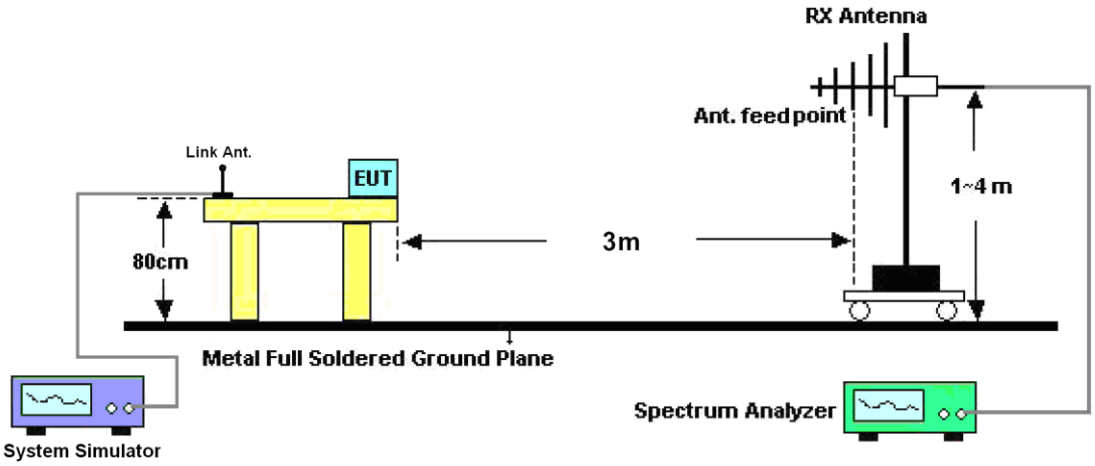
3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

3.7.3 Test Procedures

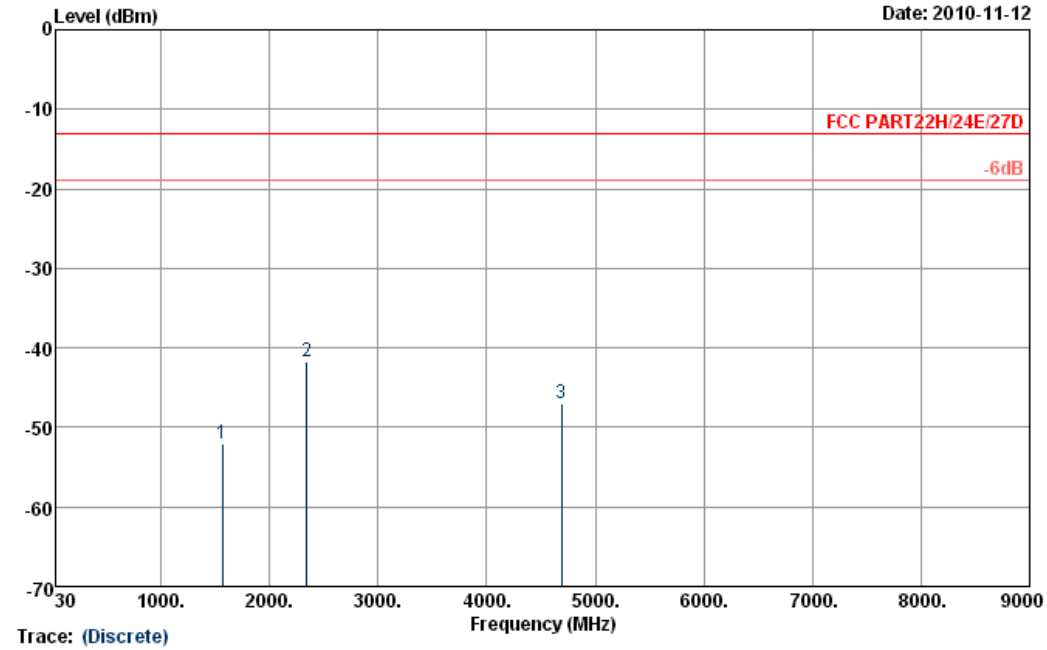
1. The EUT was placed on a rotatable wooden table with 0.8 meter about ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving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

3.7.4 Test Setup



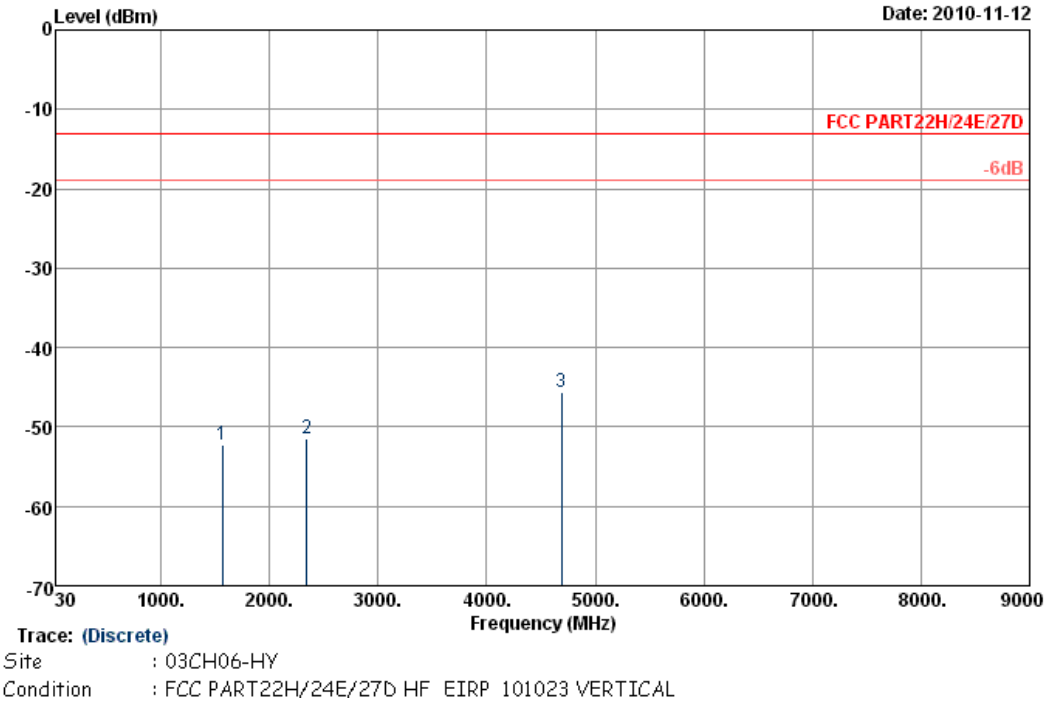
3.7.5 Test Result of Field Strength of Spurious Radiated

Band :	LTE Band 13	**Temperature :**	24~25°C
Test Mode :	QPSK (RB Size 1, RB Offset 49)	**Relative Humidity :**	46~47%
Test Engineer :	Lewis He	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



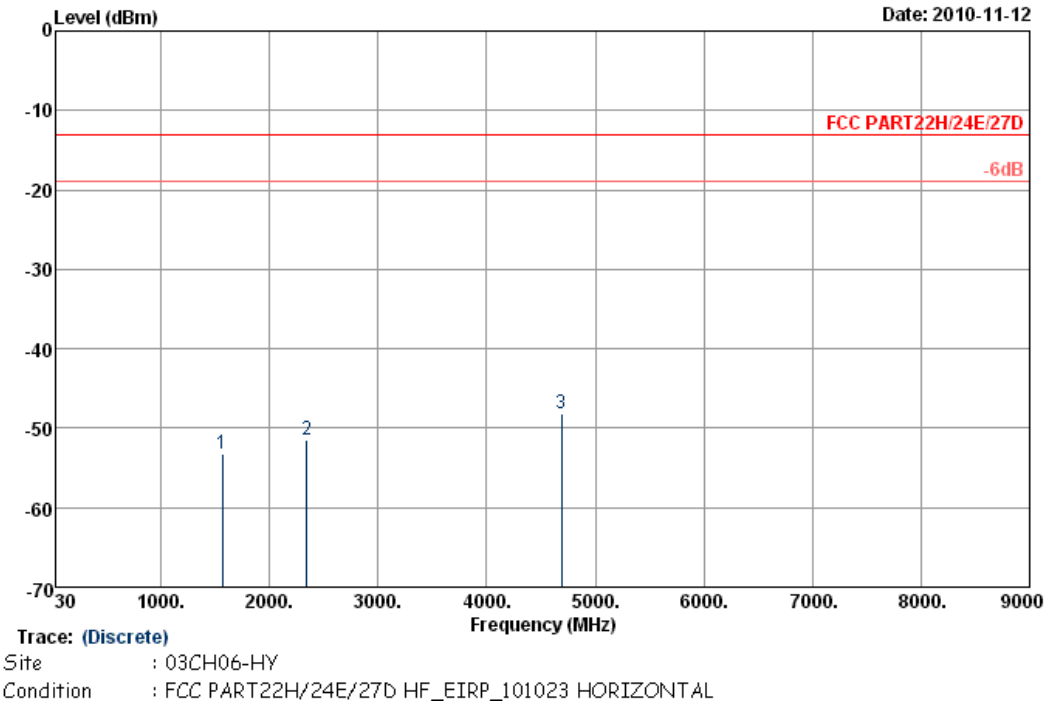
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1564.00	-52.01	-13.00	-39.01	-29.40	-54.82	0.72	5.68	H	Pass
2346.00	-41.78	-13.00	-28.78	-22.07	-44.56	1.01	5.94	H	Pass
4692.00	-47.08	-13.00	-34.08	-32.85	-53.29	1.59	9.95	H	Pass

Band :	LTE Band 13	**Temperature :**	24~25°C
Test Mode :	QPSK (RB Size 1, RB Offset 49)	**Relative Humidity :**	46~47%
Test Engineer :	Lewis He	**Polarization :**	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



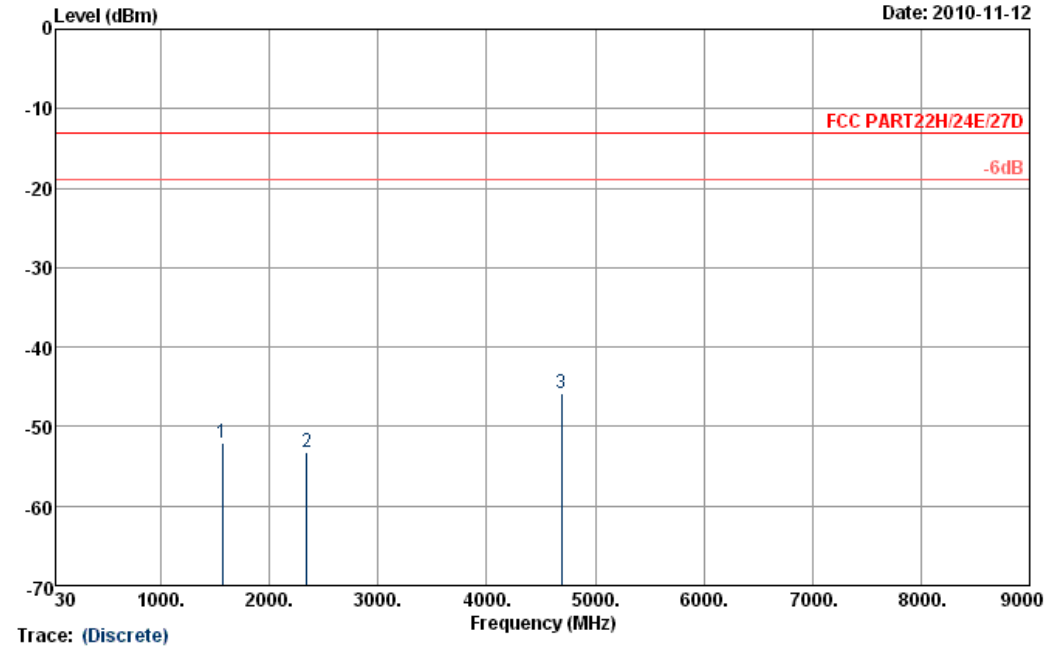
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1564.00	-52.21	-13.00	-39.21	-32.37	-55.02	0.72	5.68	V	Pass
2346.00	-51.55	-13.00	-38.55	-33.22	-54.33	1.01	5.94	V	Pass
4692.00	-45.72	-13.00	-32.72	-31.97	-51.93	1.59	9.95	V	Pass

Band :	LTE Band 13	**Temperature :**	24~25°C
Test Mode :	16QAM (RB Size 1, RB Offset 49)	**Relative Humidity :**	46~47%
Test Engineer :	Lewis He	**Polarization :**	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1564.00	-53.15	-13.00	-40.15	-31.37	-55.96	0.72	5.68	H	Pass
2346.00	-51.51	-13.00	-38.51	-32.12	-54.29	1.01	5.94	H	Pass
4692.00	-48.10	-13.00	-35.10	-33.86	-54.31	1.59	9.95	H	Pass

Band :	LTE Band 13	Temperature :	24~25°C
Test Mode :	16QAM (RB Size 1, RB Offset 49)	Relative Humidity :	46~47%
Test Engineer :	Lewis He	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1564.00	-52.05	-13.00	-39.05	-31.71	-54.86	0.72	5.68	V	Pass
2346.00	-53.14	-13.00	-40.14	-34.92	-55.92	1.01	5.94	V	Pass
4692.00	-45.81	-13.00	-32.81	-32.03	-52.02	1.59	9.95	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 ±0.00025% (±2.5ppm) of the center frequency.

3.8.2 Measuring Instruments

See list of measuring instruments of this test report.

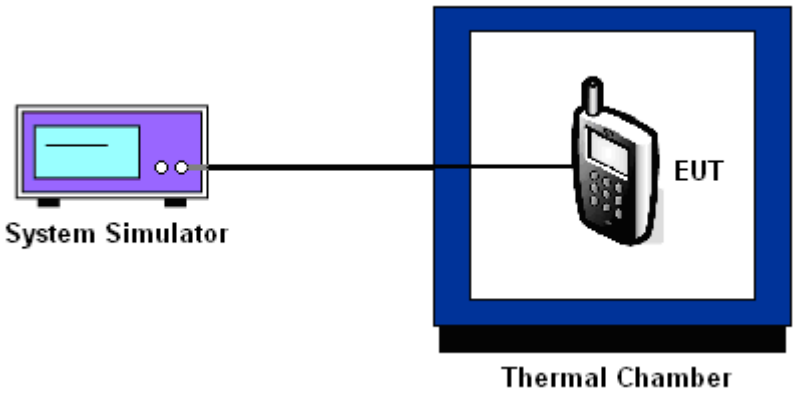
3.8.3 Test Procedures for Temperature Variation

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 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 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±5° 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.

3.8.5 Test Setup



3.8.6 Test Result of Temperature Variation

Band :	LTE Band 13	Channel :	23230
Limit (ppm) :	2.5	Modulation :	QPSK

Temperature (°C)	QPSK (RB Size 50, RB Offset 0)		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	N/A	N/A	PASS
-20	N/A	N/A	
-10	-2.69	0.00	
0	-4.22	0.00	
10	-0.82	0.00	
20	-4.50	-0.01	
30	-6.40	-0.01	
40	-10.00	-0.01	
50	13.00	0.02	

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

Band :	LTE Band 13	Channel :	23230
Limit (ppm) :	2.5	Modulation :	16QAM

Temperature (°C)	16QAM -RB Size 50, RB Offset 0		Result
	Freq. Dev. (Hz)	Deviation (ppm)	
-30	N/A	N/A	PASS
-20	N/A	N/A	
-10	-2.62	0.00	
0	-2.47	0.00	
10	-3.40	0.00	
20	-6.00	-0.01	
30	-7.00	-0.01	
40	-13.00	-0.02	
50	15.00	0.02	

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

3.8.7 Test Result of Voltage Variation

Band & Channel	Mode	Voltage (Volt)	Freq. Dev. (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 13 CH23230	QPSK (RB Size 50, RB Offset 0)	3.8	-2.30	0.00	2.5	PASS
		BEP	-6.70	-0.01		
		4.2	15.00	0.02		
	16QAM (RB Size 50, RB Offset 0)	3.8	-5.60	-0.01		
		BEP	5.30	0.01		
		4.2	6.30	0.01		

Remark:

1. Normal Voltage = 3.8 V.
2. Battery End Point (BEP) = 3.6 V.

4 List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
System Simulator	R&S	CMU200	117995	N/A	Mar. 19, 2009	Mar. 18, 2011	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP30	101329	9kHz~30GHz	Apr. 26, 2010	Apr. 25, 2011	Conducted (TH02-HY)
Thermal Chamber	Ten Billion	TTH-D35P	TBN-930701	N/A	Jul. 30,2010	Jul. 29, 2011	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP40	100057	9KHz-40GHz	Oct. 25, 2010	Oct. 24, 2011	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/003	20MHz-1000MHz	Apr. 28, 2010	Apr. 27, 2011	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz -2GHz	Oct. 31, 2010	Oct. 31, 2011	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz~18GHz	Aug. 02, 2010	Aug. 01, 2011	Radiation (03CH06-HY)
Double Ridge Horn Antenna	Training Research	AH-0801	95119	8GHz~18GHz	Oct. 20, 2010	Oct.19, 2011	Radiation (03CH06-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 18, 2010	Oct. 17, 2011	Radiation (03CH06-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1GHz- 26.5GHz	Apr. 15, 2010	Apr. 14, 2011	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9KHz~1GHz	Apr. 15, 2010	Apr. 14, 2011	Radiation (03CH06-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz~30 MHz	Jul. 29, 2010	Jul. 28, 2011	Radiation (03CH06-HY)
System Simulator	R&S	CMW500	102159	N/A	Sep. 09, 2010	Sep. 08, 2011	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 Γ1 = 0.197 Antenna VSWR Γ2 = 0.194 Uncertainty = 20Log(1-Γ1*Γ2)	+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**				