



FCC RF Test Report

APPLICANT : Hewlett-Packard Company
EQUIPMENT : Notebook PC
BRAND NAME : HP
MODEL NAME : HSTNN-W91C
FCC ID : B94HNW91CERTS
STANDARD : FCC 47 CFR Part 2, 22(H), 24(E)
CLASSIFICATION : PCS Licensed Transmitter (PCB)

The product was received on Nov. 21, 2012 and completely tested on Feb. 07, 2013. 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.



TABLE OF CONTENTS

REVISION HISTORY..... 3

SUMMARY OF TEST RESULT 4

1 GENERAL DESCRIPTION 5

 1.1 Applicant..... 5

 1.2 Manufacturer 5

 1.3 Feature of Equipment Under Test..... 5

 1.4 Product Specification of Equipment Under Test 6

 1.5 Maximum ERP/EIRP Power..... 6

 1.6 Testing Site..... 7

 1.7 Applied Standards 7

2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST 8

 2.1 Test Mode..... 8

 2.2 Connection Diagram of Test System 9

 2.3 Support Unit used in test configuration and system 9

3 TEST RESULT 10

 3.1 Conducted Output Power Measurement and Radiated Power Measurement..... 10

 3.2 Peak-to-Average Ratio 12

 3.3 Field Strength of Spurious Radiation Measurement 20

4 LIST OF MEASURING EQUIPMENT 35

5 UNCERTAINTY OF EVALUATION 36

APPENDIX A. PHOTOGRAPHS OF EUT

APPENDIX B. SETUP PHOTOGRAPHS



SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	§2.1046	RSS-132 (4.4) RSS-133 (4.1)	Conducted Output Power	N/A	PASS	-
3.1	§22.913(a)(2)	RSS-132 (4.4) SRSP-503 (5.1.3)	Effective Radiated Power	< 7 Watts	PASS	-
3.1	§24.232(c)	RSS-133 (6.4) SRSP-510 (5.1.2)	Equivalent Isotropic Radiated Power	< 2 Watts	PASS	-
3.2	§24.232(d)	RSS-133 (6.4)	Peak-to-Average Ratio	< 13 dB	PASS	-
3.3	§2.1053 §22.917(a) §24.238(a)	RSS-132 (4.5.1) RSS-133 (6.5.1)	Field Strength of Spurious Radiation	$< 43 + 10 \log_{10}(P[\text{Watts}])$	PASS	Under limit 14.47 dB at 15040.000 MHz



1 General Description

1.1 Applicant

Hewlett-Packard Company
3000 Hanover Street, Palo Alto, California 94304, USA

1.2 Manufacturer

Wistron Corporation
21F., No. 88, Sec.1, Xintai 5th Rd., Xizhi Dist., New Taipei City 22181, Taiwan (R.O.C)

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Notebook PC
Brand Name	HP
Model Name	HSTNN-W91C
FCC ID	B94HNW91CERTS
Integrated Module	Brand name : Ericsson Model name : F5321
EUT supports Radios application	GSM/EGPRS/WCDMA(Rel.99)/HSPA(Rel.6)/NFC
EUT Stage	Identical Prototype

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

1.4 Product Specification of Equipment Under Test

Product Specification subjective to this standard	
Tx Frequency	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz
Rx Frequency	GSM850: 869.2 MHz ~ 893.8 MHz GSM1900: 1930.2 MHz ~ 1989.8 MHz WCDMA Band V: 871.4 MHz ~ 891.6 MHz WCDMA Band II: 1932.4 MHz ~ 1987.6 MHz
Maximum Output Power to Antenna	GSM850 : 32.89 dBm GSM1900 : 29.78 dBm WCDMA Band V : 23.57 dBm WCDMA Band II : 23.56 dBm
Antenna Type	PIFA Antenna
Type of Modulation for Uplink	GPRS: GMSK EDGE: GMSK / 8PSK WCDMA: QPSK HSDPA: QPSK HSUPA: QPSK

1.5 Maximum ERP/EIRP Power

FCC Rule	System	Type of Modulation	Maximum ERP/EIRP (W)
Part 22	GSM850 GPRS Class 8	GMSK	0.752
Part 22	GSM850 EDGE Class 8	8PSK	0.193
Part 22	WCDMA Band V RMC 12.2Kbps	QPSK	0.088
Part 24	GSM1900 GPRS Class 8	GMSK	1.153
Part 24	GSM1900 EDGE Class 8	8PSK	0.552
Part 24	WCDMA Band II RMC 12.2Kbps	QPSK	0.275

1.6 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	03CH06-HY	722060/4086B-1

1.7 Applied Standards

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

- ♦ FCC 47 CFR Part 2, 22(H), 24(E)
- ♦ FCC KDB 412172 D01 Determining ERP and EIRP v01
- ♦ IC RSS-132 Issue 2
- ♦ IC RSS-133 Issue 5
- ♦ IC RSS-Gen Issue 3
- ♦ NOTICE 2012-DRS0126

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.
3. Per the section 2.2.3 of Notice of 2012-DRS0126, "Receivers Excluded from Industry Canada Requirements", only radio communication receivers operating in stand-alone mode within the band 30-960 MHz and scanner receivers are subject to Industry Canada requirements.

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 in Tablet PC configurations and one test plane in Laptop PC configuration to find out the worst emission.

Frequency range investigated for radiated emission is as follows:

1. 30 MHz to 9000 MHz for GSM850 and WCDMA Band V.
2. 30 MHz to 19000 MHz for GSM1900 and WCDMA Band II.

Test Modes		
Band	Radiated TCs	Conducted TCs
GSM 850	<ul style="list-style-type: none"> ■ GPRS Class 8 Link ■ EDGE Class 8 Link 	No required
GSM 1900	<ul style="list-style-type: none"> ■ GPRS Class 8 Link ■ EDGE Class 8 Link 	<ul style="list-style-type: none"> ■ GPRS Class 8 Link ■ EDGE Class 8 Link
WCDMA Band V	<ul style="list-style-type: none"> ■ RMC 12.2Kbps Link 	No required
WCDMA Band II	<ul style="list-style-type: none"> ■ RMC 12.2Kbps Link 	<ul style="list-style-type: none"> ■ RMC 12.2Kbps Link

Note:

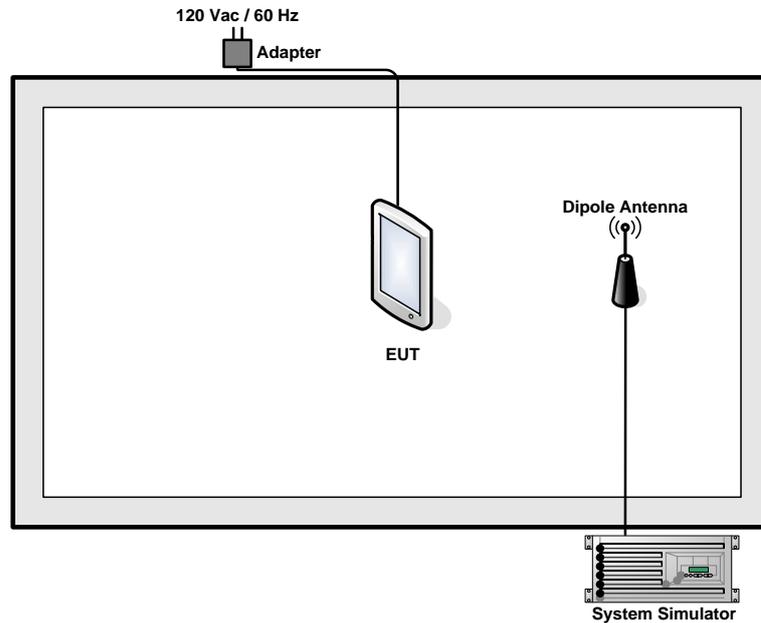
1. The maximum power levels are GPRS multi-slot class 8 mode for GMSK link, EDGE multi-slot class 8 mode for 8PSK link, RMC 12.2Kbps mode for WCDMA band V, and RMC 12.2Kbps mode for WCDMA band II, only these modes were used for all tests.
2. All test items were performed with Adapter 2.

The conducted power tables are as follows:

Conducted Power (*Unit: dBm)						
Band	GSM850			GSM1900		
Modulation	GMSK			GMSK		
Channel	128	189	251	512	661	810
Frequency	824.2	836.4	848.8	1850.2	1880.0	1909.8
GPRS Class 8	32.89	32.81	32.70	29.78	29.57	29.36
GPRS Class 10	32.82	32.75	32.66	29.76	29.54	29.34
Band	GSM850			GSM1900		
Modulation	8PSK			8PSK		
Channel	128	189	251	512	661	810
Frequency	824.2	836.4	848.8	1850.2	1880.0	1909.8
EGPRS Class 8	26.97	26.98	26.91	26.19	26.41	26.58
EGPRS Class 10	26.93	26.93	26.98	26.56	26.40	26.56

Conducted Power (*Unit: dBm)						
Band	WCDMA Band V			WCDMA Band II		
Modulation	QPSK			QPSK		
Channel	4132	4182	4233	9262	9400	9538
Frequency	826.4	836.4	846.6	1852.4	1880.0	1907.6
RMC 12.2K	23.38	23.50	23.57	23.54	23.56	23.45
HSDPA Subtest-1	23.15	23.28	23.34	22.16	22.23	22.21
HSDPA Subtest-2	23.07	23.19	23.27	22.14	22.23	22.24
HSDPA Subtest-3	22.60	22.76	22.81	21.60	21.74	21.71
HSDPA Subtest-4	22.58	22.73	22.80	21.59	21.71	21.65
HSUPA Subtest-1	23.04	23.23	23.31	22.13	22.25	22.31
HSUPA Subtest-2	20.61	21.21	21.29	20.32	20.11	20.28
HSUPA Subtest-3	22.02	22.14	22.28	21.13	21.25	21.35
HSUPA Subtest-4	21.01	21.16	21.28	20.16	20.22	20.32
HSUPA Subtest-5	23.02	23.19	23.27	22.20	22.21	22.24

2.2 Connection Diagram of Test System



Remark: The EUT is set in Tablet PC and Laptop PC configurations during test.

2.3 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model No.	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m

3 Test Result

3.1 Conducted Output Power Measurement and Radiated Power Measurement

3.1.1 Description of the Conducted Output Power Measurement, and Radiated Power Measurement, Effective Radiated Power (ERP) and Equivalent Isotropically Radiated Power (EIRP)

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. And, then the section 2.0 of FCC KDB 412172 Determining ERP and ERIP is used to determine the Radiated Power Measurement.

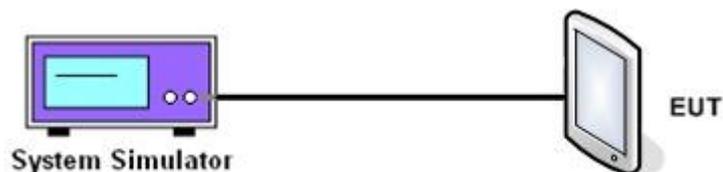
3.1.2 Measuring Instruments

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. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set EUT at maximum power through base station.
4. Select lowest, middle, and highest channels for each band and different modulation.
5. Measure the maximum burst average power for GSM and maximum average power for WCDMA mode.
6. The procedure section 2.0 of FCC KDB 412172 is used to determine the Radiated Power Measurement.

3.1.4 Test Setup



3.1.5 Test Result of Conducted Output Power Measurement and Radiated Power Measurement

Cellular Band ($G_T - L_C = -1.98$ dB)									
Modes	GSM850 (GPRS Class 8)			GSM850 (EDGE Class 8)			WCDMA Band V (RMC 12.2Kbps)		
Modulation	GMSK			8PSK			QPSK		
Channel	128 (Low)	189 (Mid)	251 (High)	128 (Low)	189 (Mid)	251 (High)	4132 (Low)	4182 (Mid)	4233 (High)
Frequency (MHz)	824.2	836.4	848.8	824.2	836.4	848.8	826.4	836.4	846.6
Conducted Power (dBm)	32.89	32.81	32.70	26.97	26.98	26.91	23.38	23.50	23.57
Conducted Power (Watts)	1.95	1.91	1.86	0.50	0.50	0.49	0.22	0.22	0.23
ERP(dBm)	28.76	28.68	28.57	22.84	22.85	22.78	19.25	19.37	19.44
ERP(Watts)	0.752	0.738	0.719	0.192	0.193	0.190	0.084	0.086	0.088

PCS Band ($G_T - L_C = 0.84$ dB)									
Modes	GSM1900 (GPRS Class 8)			GSM1900 (EDGE Class 8)			WCDMA Band II (RMC 12.2Kbps)		
Modulation	GMSK			8PSK			QPSK		
Channel	512 (Low)	661 (Mid)	810 (High)	512 (Low)	661 (Mid)	810 (High)	9262 (Low)	9400 (Mid)	9538 (High)
Frequency (MHz)	1850.2	1880	1909.8	1850.2	1880	1909.8	1852.4	1880	1907.6
Conducted Power (dBm)	29.78	29.57	29.36	26.19	26.41	26.58	23.54	23.56	23.45
Conducted Power (Watts)	0.95	0.91	0.86	0.42	0.04	0.45	0.23	0.23	0.22
EIRP(dBm)	30.62	30.41	30.2	27.03	27.25	27.42	24.38	24.4	24.29
EIRP(Watts)	1.153	1.099	1.047	0.505	0.531	0.552	0.274	0.275	0.269

Note: maximum burst average power for GSM, and maximum average power for WCDMA.

$EIRP = P_T + G_T - L_C$, $ERP = EIRP - 2.15$, where

P_T = transmitter output power in dBm

G_T = gain of the transmitting antenna in dBi

L_C = signal attenuation in the connecting cable between the transmitter and antenna in dB

3.2 Peak-to-Average Ratio

3.2.1 Description of the PAR Measurement

The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

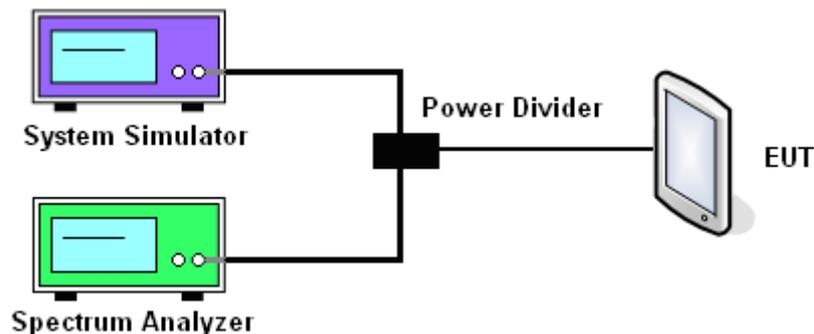
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. 1. The EUT was connected to Spectrum Analyzer and System Simulator via power divider.
2. For GSM/EGPRS operating modes:
 - a. Set EUT in maximum power output.
 - b. Set the RBW = 1MHz, VBW = 3MHz, Peak detector in spectrum analyzer for first trace.
 - c. Set the RBW = 1MHz, VBW = 3MHz, RMS detector in spectrum analyzer for second trace.
 - d. The wanted burst signal is triggered by spectrum analyzer, and measured respectively the peak level and Mean level without burst-off time, after system simulator synchronized with the spectrum analyzer.
3. For UMTS operating modes:
 - a. Set the CCDF (Complementary Cumulative Distribution Function) option in spectrum analyzer.
 - b. The highest RF powers were measured and recorded the maximum PAPR level associated with a probability of 0.1 %.
4. Record the deviation as Peak to Average Ratio.

3.2.4 Test Setup





3.2.5 Test Result of Peak-to-Average Ratio

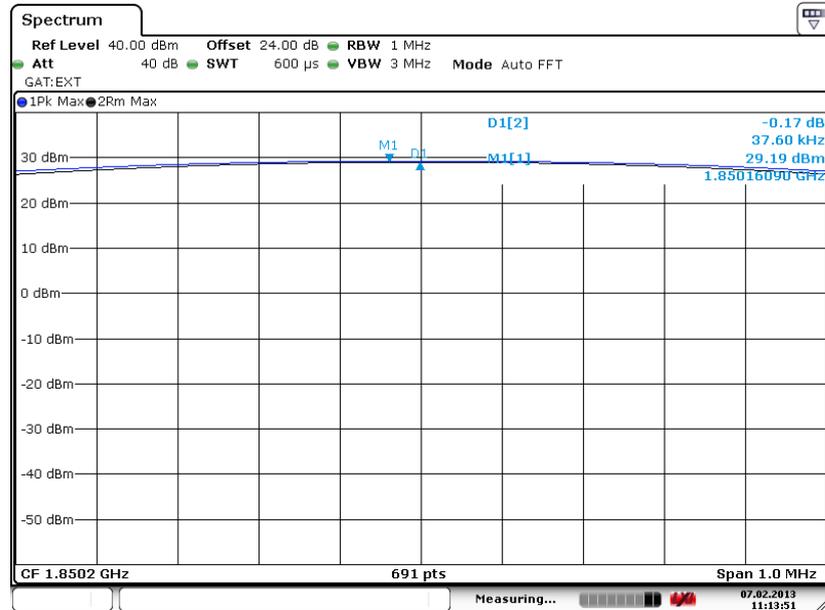
PCS Band									
Modes	GSM1900 (GPRS Class 8)			GSM1900 (EDGE Class 8)			WCDMA Band II (RMC 12.2Kbps)		
Modulation	GMSK			8PSK			QPSK		
Channel	512 (Low)	661 (Mid)	810 (High)	512 (Low)	661 (Mid)	810 (High)	9262 (Low)	9400 (Mid)	9538 (High)
Frequency (MHz)	1850.2	1880	1909.8	1850.2	1880	1909.8	1852.4	1880	1907.6
Peak-to-Average Ratio (dB)	0.17	0.16	0.18	2.52	2.57	2.57	2.20	2.52	2.32



3.2.6 Test Result (Plots) of Peak-to-Average Ratio

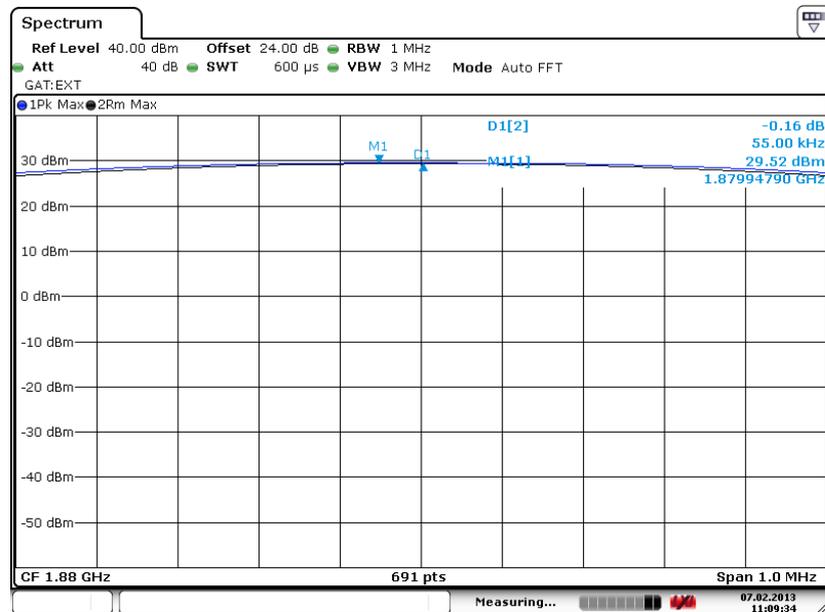
Band :	GSM 1900	Test Mode :	GPRS Class 8 Link (GMSK)
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Peak-to-Average Ratio on Channel 512 (1850.2 MHz)



Date: 7.FEB.2013 11:13:51

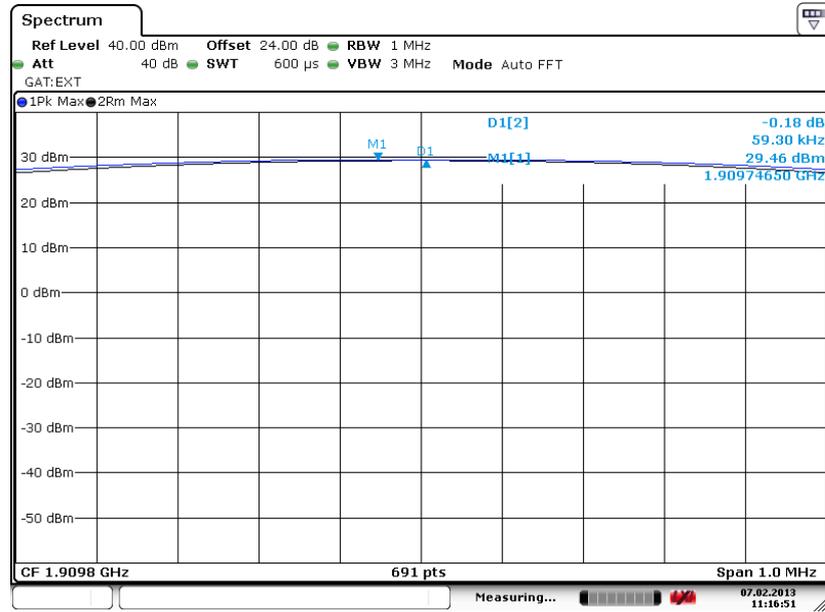
Peak-to-Average Ratio on Channel 661 (1880.0 MHz)



Date: 7.FEB.2013 11:09:35



Peak-to-Average Ratio on Channel 810 (1909.8 MHz)

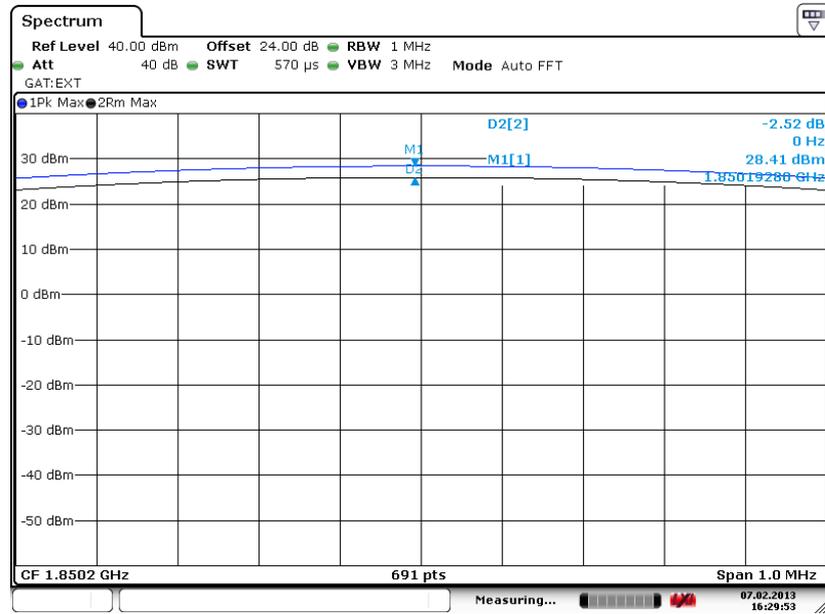


Date: 7.FEB.2013 11:16:51



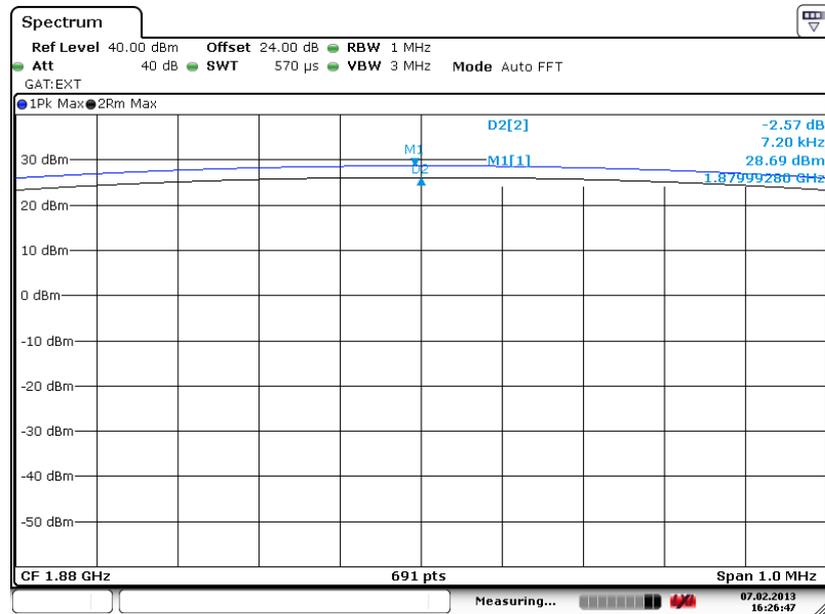
Band :	GSM 1900	Test Mode :	EDGE Class 8 Link (8PSK)
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Peak-to-Average Ratio on Channel 512 (1850.2 MHz)



Date: 7.FEB.2013 16:29:54

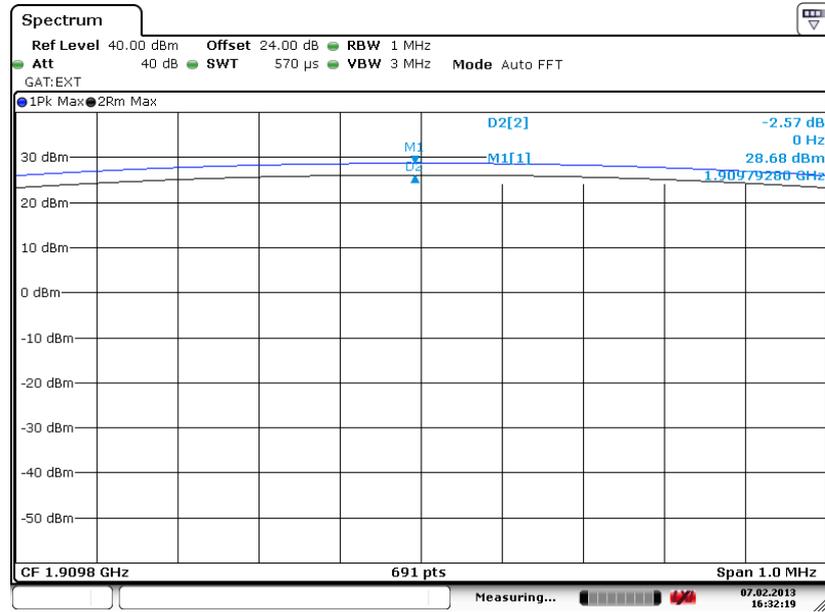
Peak-to-Average Ratio on Channel 661 (1880.0 MHz)



Date: 7.FEB.2013 16:26:47



Peak-to-Average Ratio on Channel 810 (1909.8 MHz)

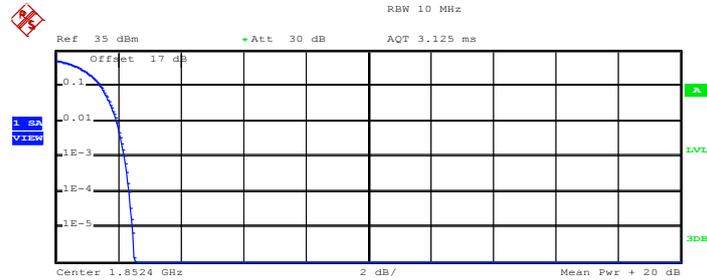


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Band :	WCDMA Band II	Test Mode :	RMC 12.2Kbps Link (QPSK)
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Peak-to-Average Ratio on Channel 9262 (1852.4 MHz)



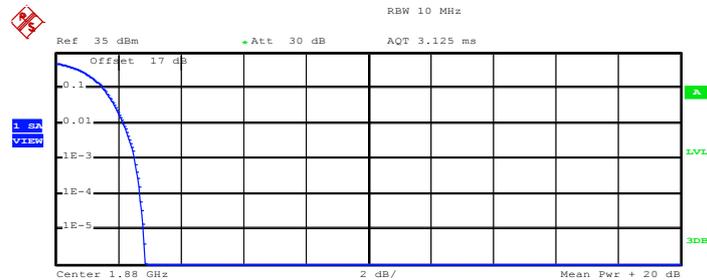
Complementary Cumulative Distribution Function (100000 samples)

Trace 1

Mean	22.57 dBm
Peak	25.09 dBm
Crest	2.53 dB
10 %	1.44 dB
1 %	1.96 dB
.1 %	2.20 dB
.01 %	2.36 dB

Date: 2.FEB.2013 06:17:11

Peak-to-Average Ratio on Channel 9400 (1880.0 MHz)



Complementary Cumulative Distribution Function (100000 samples)

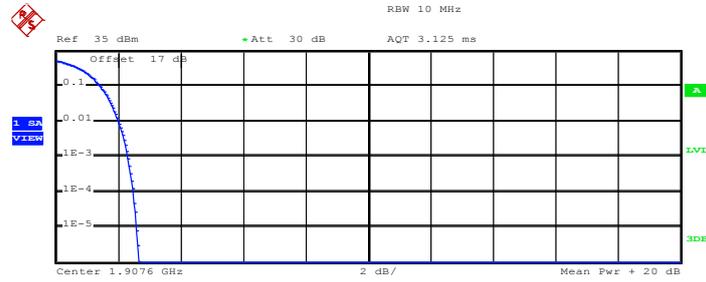
Trace 1

Mean	22.53 dBm
Peak	25.38 dBm
Crest	2.85 dB
10 %	1.52 dB
1 %	2.16 dB
.1 %	2.52 dB
.01 %	2.72 dB

Date: 2.FEB.2013 06:16:41



Peak-to-Average Ratio on Channel 9538 (1907.6 MHz)



Complementary Cumulative Distribution Function (100000 samples)

Trace 1	
Mean	22.23 dBm
Peak	24.88 dBm
Crest	2.66 dB
10 %	1.44 dB
1 %	2.04 dB
.1 %	2.32 dB
.01 %	2.48 dB

Date: 2.FEB.2013 06:16:15



3.3 Field Strength of Spurious Radiation Measurement

3.3.1 Description of Field Strength of Spurious Radiated Measurement

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.

3.3.2 Measuring Instruments

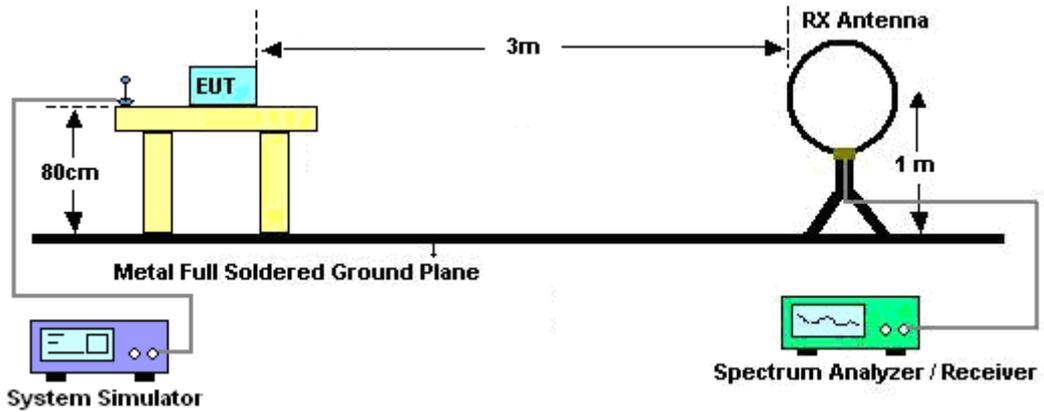
See list of measuring instruments of this test report.

3.3.3 Test Procedures

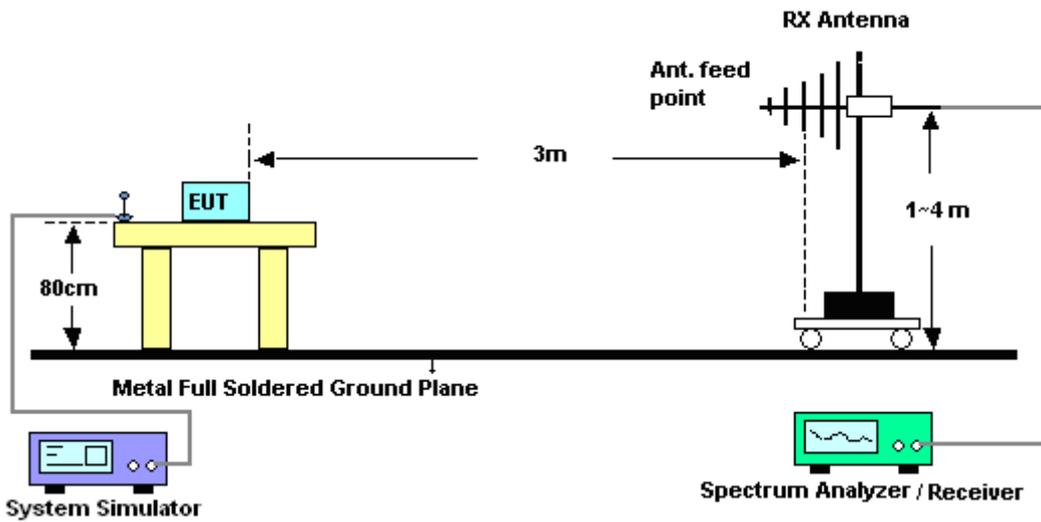
1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. $EIRP \text{ (dBm)} = S.G. \text{ Power} - Tx \text{ Cable Loss} + Tx \text{ Antenna Gain}$
11. $ERP \text{ (dBm)} = EIRP - 2.15$
12. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
13. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
 $= P(W) - [43 + 10\log(P)] \text{ (dB)}$
 $= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$
 $= -13\text{dBm}.$

3.3.4 Test Setup

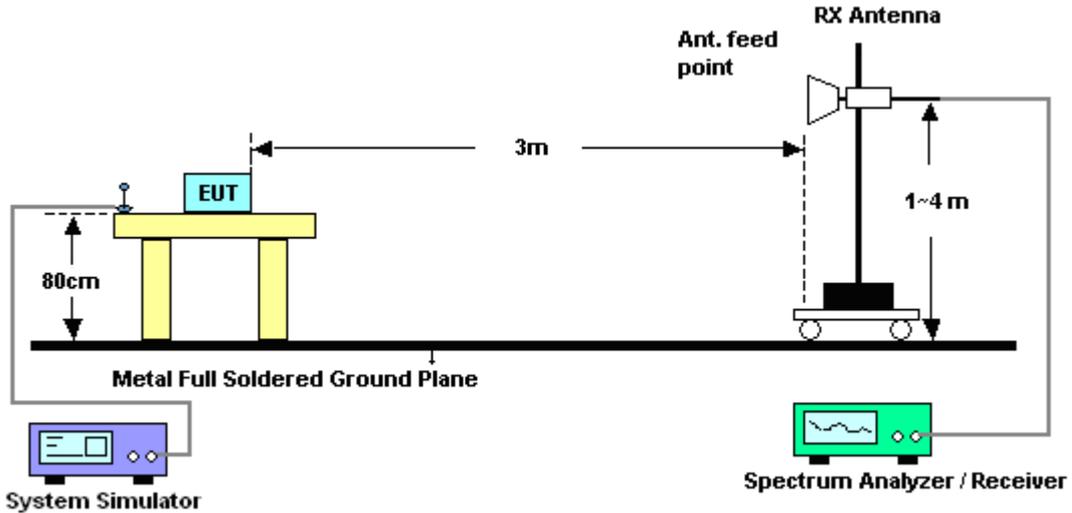
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



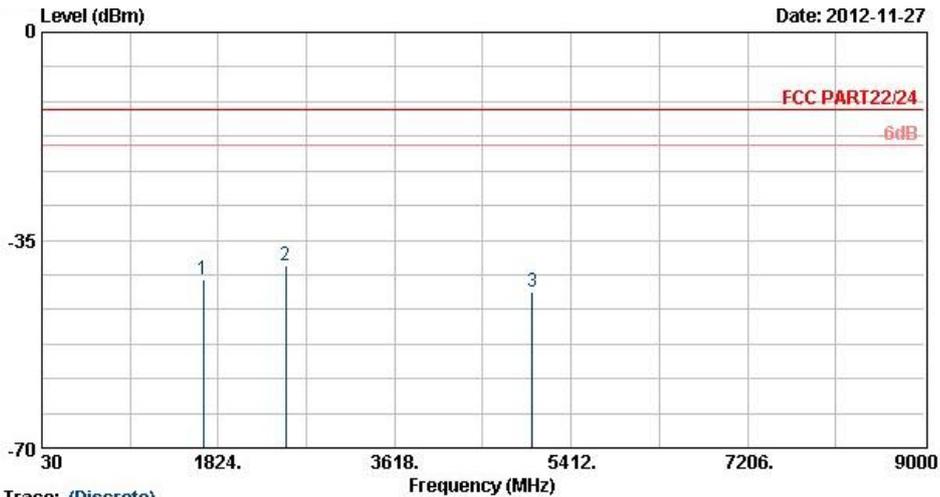
3.3.5 Test Results of Radiated Emissions (9 KHz ~ 30 MHz)

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



3.3.6 Test Result of Field Strength of Spurious Radiated

Band :	GSM850 (GMSK)	Temperature :	26~27°C
Test Mode :	GPRS Class 8 Link	Relative Humidity :	45~46%
Test Engineer :	Kai Wang and Hayden Wu	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

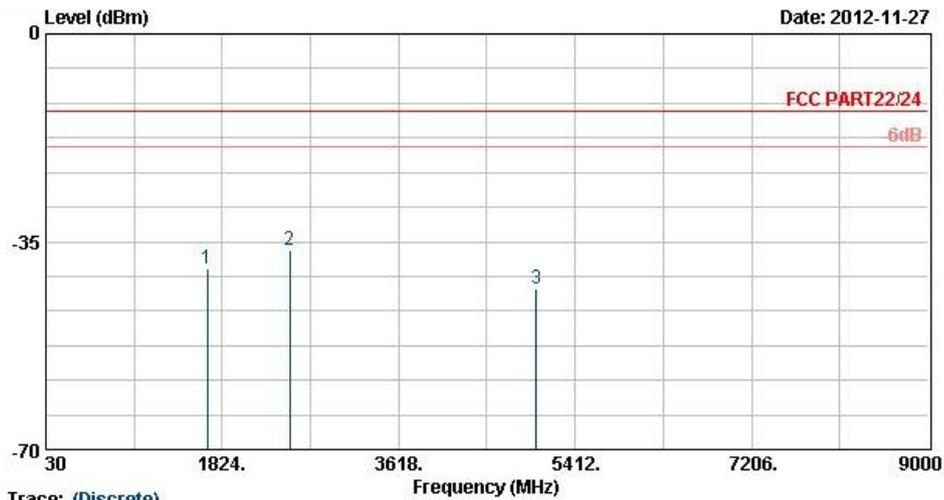


Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC PART22/24 ETRP_100524 HORIZONTAL

Frequency (MHz)	ERP (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
1672	-41.54	-13	-28.54	-52.71	-43	1.88	5.49	H	Pass
2509	-39.37	-13	-26.37	-52.44	-41	2.44	6.22	H	Pass
5018	-43.69	-13	-30.69	-65.18	-48.8	3.05	10.31	H	Pass



Band :	GSM850 (GMSK)	Temperature :	26~27°C
Test Mode :	GPRS Class 8 Link	Relative Humidity :	45~46%
Test Engineer :	Kai Wang and Hayden Wu	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

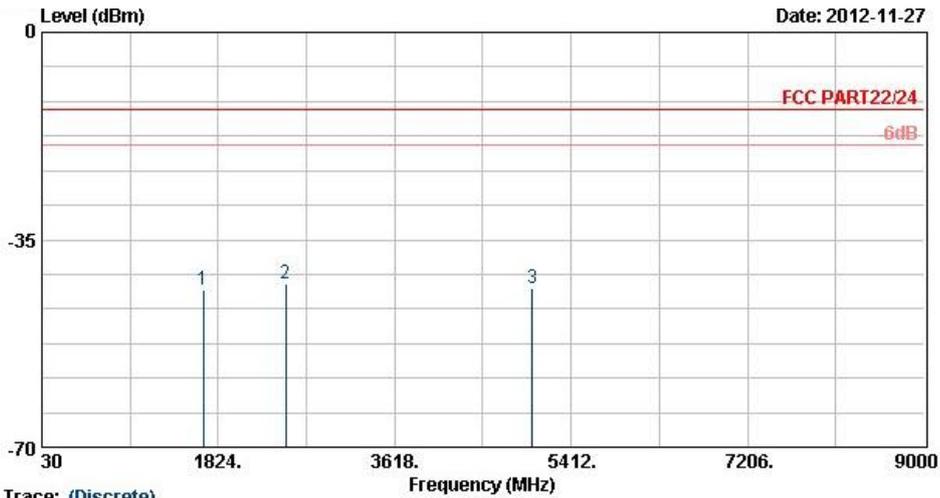


Trace: (Discrete)
 Site : D3CH06-HY
 Condition : FCC PART22/24 ETRP_100524 VERTICAL

Frequency (MHz)	ERP (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
1672	-39.54	-13	-26.54	-50.40	-41	1.88	5.49	V	Pass
2509	-36.37	-13	-23.37	-49.38	-38	2.44	6.22	V	Pass
5018	-42.89	-13	-29.89	-64.31	-48	3.05	10.31	V	Pass



Band :	GSM850 (8PSK)	Temperature :	26~27°C
Test Mode :	EDGE Class 8 Link	Relative Humidity :	45~46%
Test Engineer :	Kai Wang and Hayden Wu	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

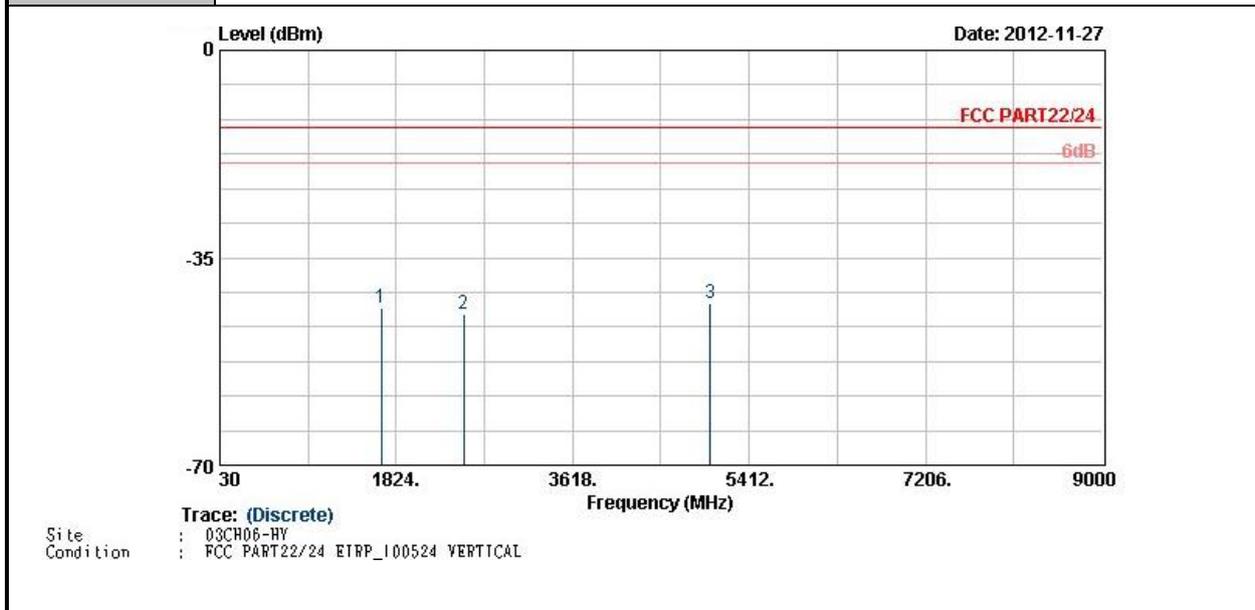


Trace: (Discrete)
 Site : D3CH06-HY
 Condition : FCC PART22/24 ETRP_100524 HORIZONTAL

Frequency (MHz)	ERP (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
1672	-43.54	-13	-30.54	-54.80	-45	1.88	5.49	H	Pass
2509	-42.37	-13	-29.37	-55.56	-44	2.44	6.22	H	Pass
5018	-43.19	-13	-30.19	-64.73	-48.3	3.05	10.31	H	Pass



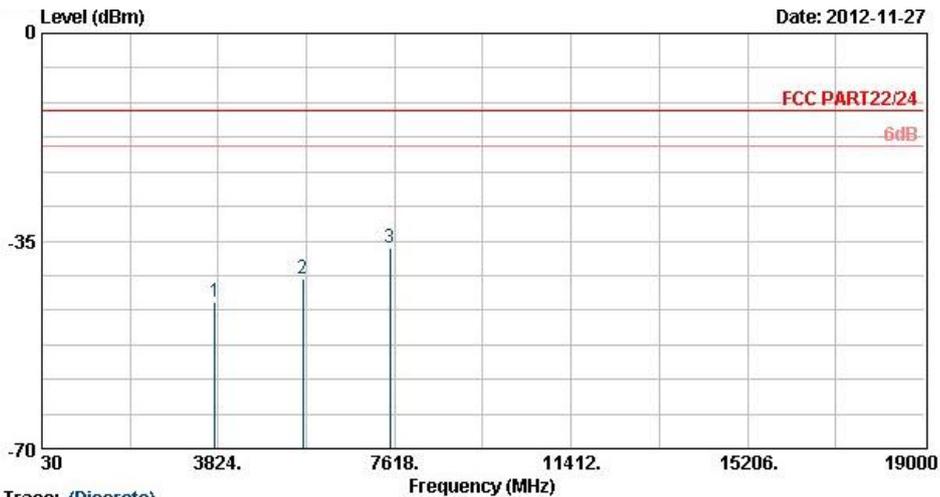
Band :	GSM850 (8PSK)	Temperature :	26~27°C
Test Mode :	EDGE Class 8 Link	Relative Humidity :	45~46%
Test Engineer :	Kai Wang and Hayden Wu	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Frequency (MHz)	ERP (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
1672	-43.34	-13	-30.34	-54.64	-44.8	1.88	5.49	V	Pass
2509	-44.37	-13	-31.37	-57.53	-46	2.44	6.22	V	Pass
5018	-42.59	-13	-29.59	-64.40	-47.7	3.05	10.31	V	Pass



Band :	GSM1900 (GMSK)	Temperature :	26~27°C
Test Mode :	GPRS Class 8 Link	Relative Humidity :	45~46%
Test Engineer :	Kai Wang and Hayden Wu	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

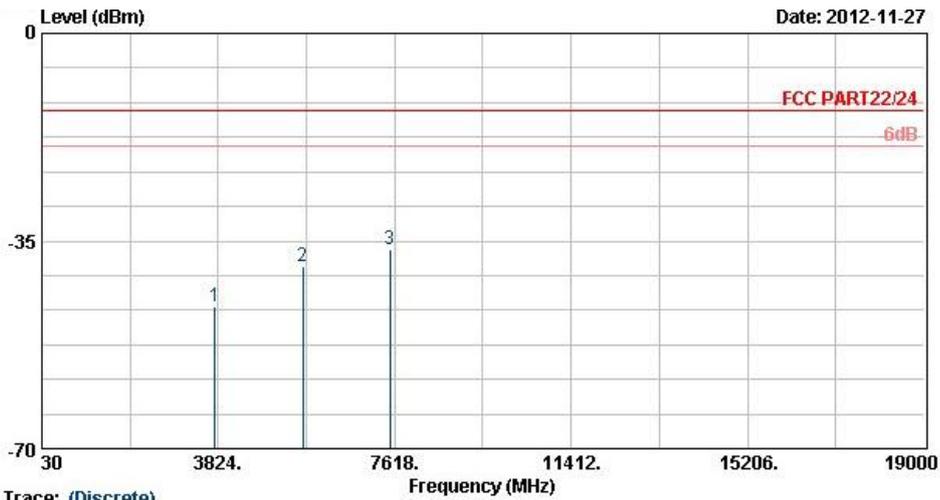


Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC PART22/24 ETRP_100524 HORIZONTAL

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
3760	-45.35	-13	-32.35	-63.37	-51.60	2.56	8.81	H	Pass
5636	-41.26	-13	-28.26	-65.06	-49.00	2.96	10.70	H	Pass
7520	-36.10	-13	-23.10	-63.68	-45	3.22	12.12	H	Pass



Band :	GSM1900 (GMSK)	Temperature :	26~27°C
Test Mode :	GPRS Class 8 Link	Relative Humidity :	45~46%
Test Engineer :	Kai Wang and Hayden Wu	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

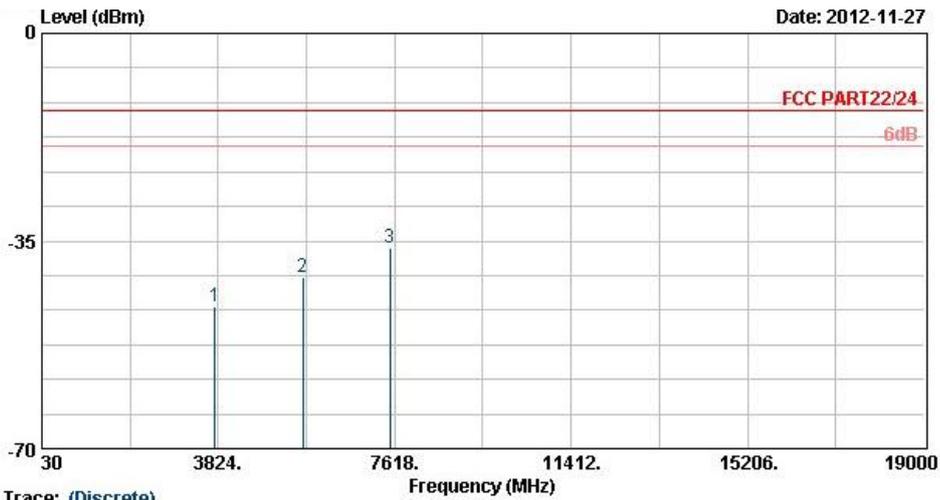


Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC PART22/24 ETRP_100524 VERTICAL

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
3760	-46.05	-13	-33.05	-64.00	-52.30	2.56	8.81	V	Pass
5636	-39.26	-13	-26.26	-62.99	-47.00	2.96	10.70	V	Pass
7520	-36.40	-13	-23.40	-63.94	-45.3	3.22	12.12	V	Pass



Band :	GSM1900 (8PSK)	Temperature :	26~27°C
Test Mode :	EDGE Class 8 Link	Relative Humidity :	45~46%
Test Engineer :	Kai Wang and Hayden Wu	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

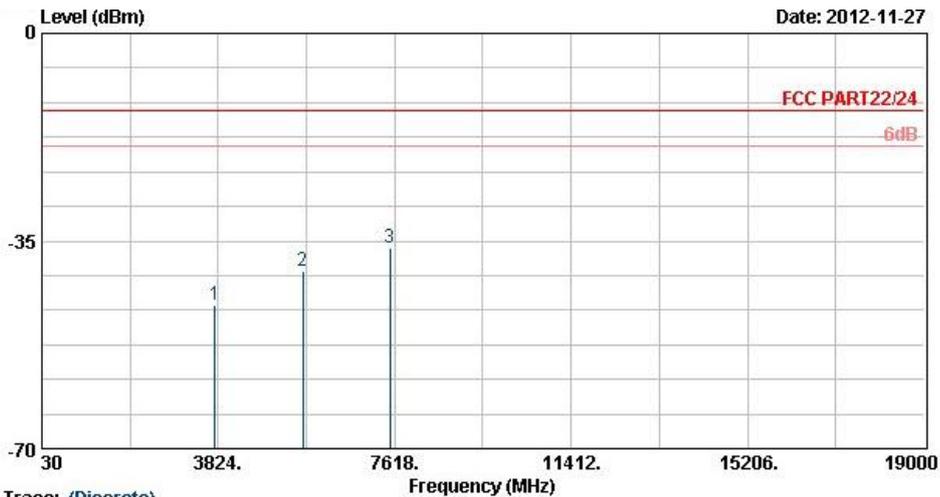


Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC PART22/24 ETRP_100524 HORIZONTAL

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
3760	-45.95	-13	-32.95	-63.94	-52.20	2.56	8.81	H	Pass
5636	-41.06	-13	-28.06	-64.16	-48.80	2.96	10.70	H	Pass
7520	-36.10	-13	-23.10	-63.83	-45	3.22	12.12	H	Pass



Band :	GSM1900 (8PSK)	Temperature :	26~27°C
Test Mode :	EDGE Class 8 Link	Relative Humidity :	45~46%
Test Engineer :	Kai Wang and Hayden Wu	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

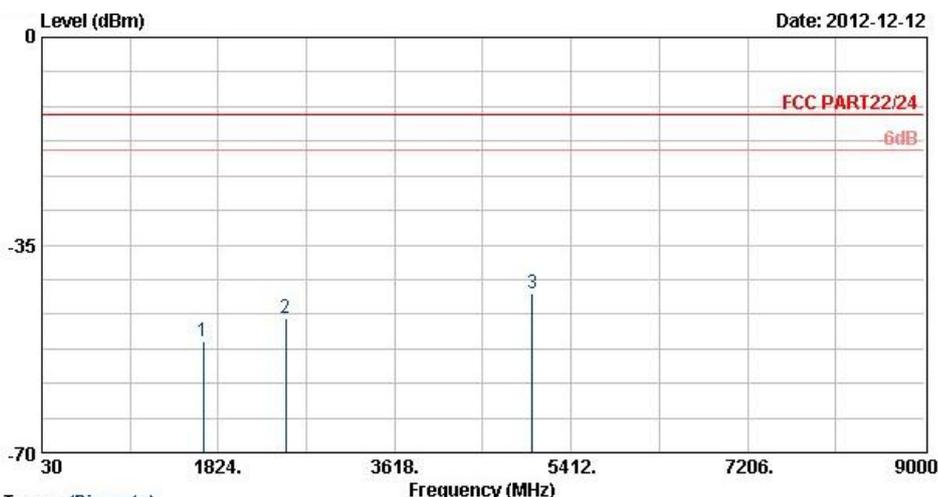


Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC PART22/24 ETRP_100524 VERTICAL

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
3760	-45.75	-13	-32.75	-63.73	-52.00	2.56	8.81	V	Pass
5636	-39.96	-13	-26.96	-63.21	-47.70	2.96	10.70	V	Pass
7520	-36.30	-13	-23.30	-63.63	-45.2	3.22	12.12	V	Pass



Band :	WCDMA Band V (QPSK)	Temperature :	26~27°C
Test Mode :	RMC 12.2Kbps Link	Relative Humidity :	45~46%
Test Engineer :	Kai Wang and Hayden Wu	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

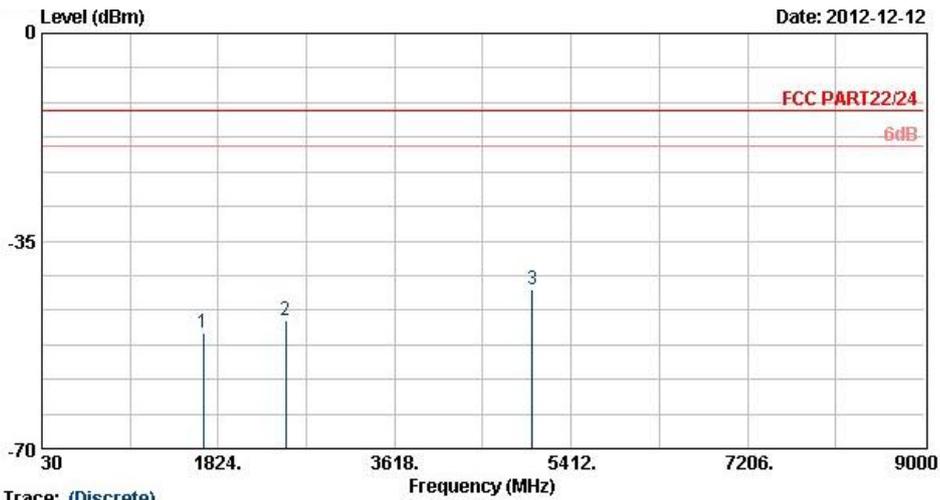


Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC PART22/24 ETRP_100524 HORIZONTAL

Frequency (MHz)	ERP (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
1672	-51.14	-13	-38.14	-62.02	-52.6	1.88	5.49	H	Pass
2509	-47.37	-13	-34.37	-60.12	-49	2.44	6.22	H	Pass
5018	-43.19	-13	-30.19	-64.79	-48.3	3.05	10.31	H	Pass



Band :	WCDMA Band V (QPSK)	Temperature :	26~27°C
Test Mode :	RMC 12.2Kbps Link	Relative Humidity :	45~46%
Test Engineer :	Kai Wang and Hayden Wu	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

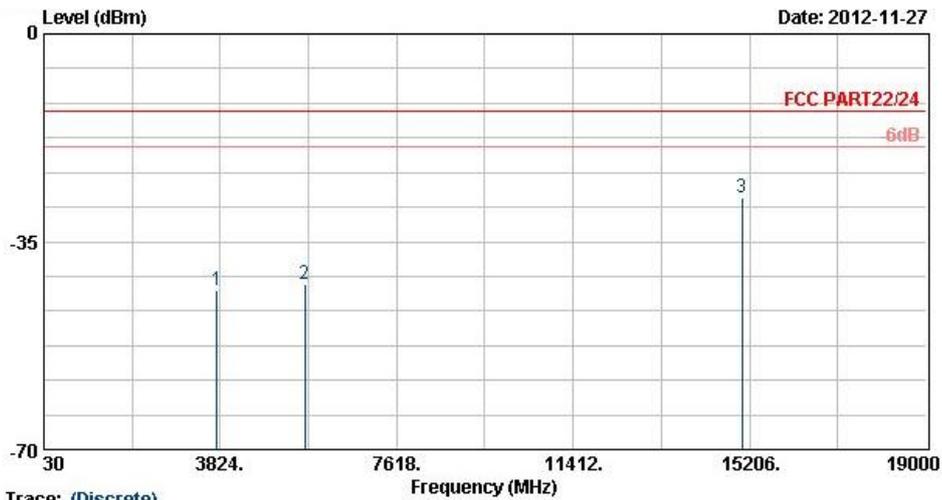


Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC PART22/24 ETRP_100524 VERTICAL

Frequency (MHz)	ERP (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
1672	-50.44	-13	-37.44	-61.36	-51.9	1.88	5.49	V	Pass
2509	-48.37	-13	-35.37	-61.38	-50	2.44	6.22	V	Pass
5018	-43.09	-13	-30.09	-64.42	-48.2	3.05	10.31	V	Pass



Band :	WCDMA Band II (QPSK)	Temperature :	26~27°C
Test Mode :	RMC 12.2Kbps Link	Relative Humidity :	45~46%
Test Engineer :	Kai Wang and Hayden Wu	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

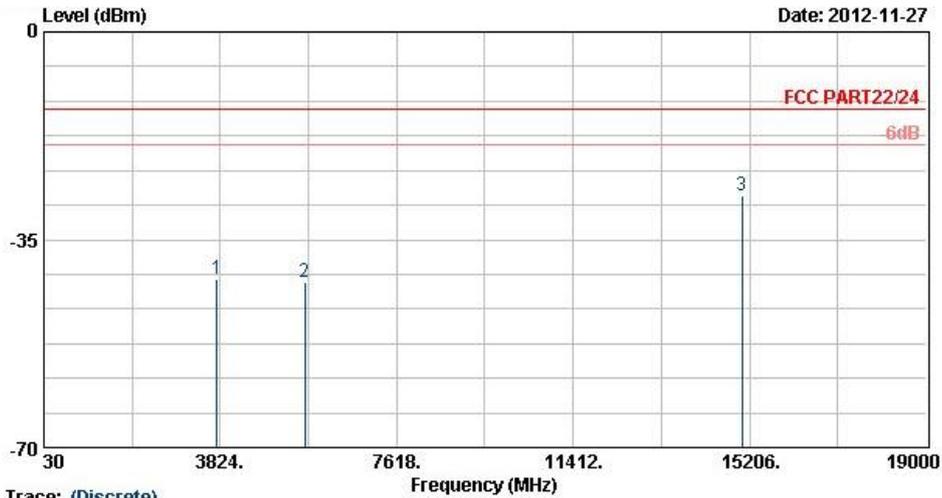


Trace: (Discrete)
 Site : D3CH06-HY
 Condition : FCC PART22/24 ETRP_100524 HORIZONTAL

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
3760	-43.25	-13	-30.25	-61.41	-49.50	2.56	8.81	H	Pass
5636	-42.26	-13	-29.26	-65.46	-50.00	2.96	10.70	H	Pass
15040	-27.47	-13	-14.47	-63.36	-36.6	4.59	13.72	H	Pass



Band :	WCDMA Band II (QPSK)	Temperature :	26~27°C
Test Mode :	RMC 12.2Kbps Link	Relative Humidity :	45~46%
Test Engineer :	Kai Wang and Hayden Wu	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Trace: (Discrete)
 Site : D3CH06-HY
 Condition : FCC PART22/24 EIRP_100524 VERTICAL

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
3760	-41.75	-13	-28.75	-59.73	-48.00	2.56	8.81	V	Pass
5636	-42.06	-13	-29.06	-65.36	-49.80	2.96	10.70	V	Pass
15040	-27.57	-13	-14.57	-63.46	-36.7	4.59	13.72	V	Pass



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
System Simulator	R&S	CMU200	117995	N/A	Jul. 30, 2012	Dec. 14, 2012~ Feb. 07, 2013	Jul. 29, 2013	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 06, 2012	Dec. 14, 2012~ Feb. 07, 2013	Jun. 05, 2013	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSV40	100979	9kHz~40GHz	Oct. 08, 2012	Dec. 14, 2012~ Feb. 07, 2013	Oct. 07, 2013	Conducted (TH02-HY)
Spectrum Analyzer	R&S	FSP30	101352	9KHz~30GHz	Nov. 07, 2012	Nov. 27, 2012 ~ Dec. 12, 2012	Nov. 06, 2013	Radiation (03CH06-HY)
Spectrum Analyzer	Agilent	E4408B	MY44211030	9KHz ~ 26.5GHz	Nov. 26, 2012	Nov. 27, 2012 ~ Dec. 12, 2012	Nov. 25, 2013	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/0003	20MHz ~ 1000MHz	May 04, 2012	Nov. 27, 2012 ~ Dec. 12, 2012	May 03, 2013	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz ~ 2GHz	Oct. 06, 2012	Nov. 27, 2012 ~ Dec. 12, 2012	Oct. 05, 2013	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1GHz ~ 18GHz	Aug. 01, 2012	Nov. 27, 2012 ~ Dec. 12, 2012	Jul. 31, 2013	Radiation (03CH06-HY)
Double Ridge Horn Antenna	COM-POWER	AH-118	071025	1GHz~18GHz	Aug. 09, 2012	Nov. 27, 2012 ~ Dec. 12, 2012	Aug. 08, 2013	Radiation (03CH06-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA917025 1	15GHz ~ 40GHz	Sep. 28, 2012	Nov. 27, 2012 ~ Dec. 12, 2012	Sep. 27, 2013	Radiation (03CH06-HY)
Preamplifier	Agilent	8449B	3008A01917	1GHz ~ 26.5GHz	Apr. 13, 2012	Nov. 27, 2012 ~ Dec. 12, 2012	Apr. 12, 2013	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9KHz ~ 1GHz	Apr. 11, 2012	Nov. 27, 2012 ~ Dec. 12, 2012	Apr. 10, 2013	Radiation (03CH06-HY)
Pre Amplifier	EMCI	EMC051845	SN980048	1GHz ~ 18GHz	Jul. 21, 2012	Nov. 27, 2012 ~ Dec. 12, 2012	Jul. 20, 2013	Radiation (03CH06-HY)
Pre Amplifier	MITEQ	AMF-7D-00 101800-30-1	159087	1GHz~18GHz	Feb. 27, 2012	Nov. 27, 2012 ~ Dec. 12, 2012	Feb. 26, 2013	Radiation (03CH06-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9KHz ~ 30MHz	Jul. 03, 2012	Nov. 27, 2012 ~ Dec. 12, 2012	Jul. 02, 2013	Radiation (03CH06-HY)
System Simulator	R&S	CMU200	117995	N/A	Jul. 28, 2011	Nov. 27, 2012 ~ Dec. 12, 2012	Jul. 27, 2013	Radiation (03CH06-HY)



5 Uncertainty of Evaluation

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

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

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

Please refer to Sporton report number EP2N2103-02 as below.