

FCC RF Test Report

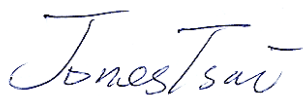
APPLICANT : Hewlett-Packard Company
EQUIPMENT : Notebook PC
BRAND NAME : HP
MODEL NAME : TPN-W110
FCC ID : B94TNW110HWWR
STANDARD : FCC 47 CFR Part 2, 22(H), 24(E), 27(L)
CLASSIFICATION : PCS Licensed Transmitter (PCB)

The product was received on Sep. 16, 2013 and testing was completed on Oct. 13, 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 to be compliant with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.



Reviewed by: Joseph Lin / Supervisor



Approved by: Jones Tsai / Manager



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FCC ID : B94TNW110HWWR

Page Number : 1 of 32

Report Issued Date : Oct. 31, 2013

Report Version : Rev. 01

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG391601	Rev. 01	Initial issue of report	Oct. 31, 2013

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	§2.1046	RSS-132 (5.4) RSS-133 (6.4) RSS-139 (6.4)	Conducted Output Power	Reporting Only	PASS	-
3.1	§22.913(a)(2)	RSS-132(5.4) 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	-
3.1	§27.50(d)(4)	RSS-139 (6.4) SRSP-513(5.1.2)	Equivalent Isotropic Radiated Power	< 1 Watts	PASS	-
3.2	§2.1053 §22.917(a) §24.238(a) §27.53(g)	RSS-132 (5.5) RSS-133 (6.5) RSS-139 (6.5)	Field Strength of Spurious Radiation	< 43+10log10(P[Watts])	PASS	Under limit 8.02 dB at 2509.000 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	TPN-W110
FCC ID	B94TNW110HWWR
Integrated the WWAN Module	Brand Name : Huawei Model Number : MU736
EUT supports Radios application	GSM/EGPRS/WCDMA/HSPA
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 IV : 1712.4 MHz ~ 1752.6 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 IV : 2112.4 MHz ~ 2152.6 MHz WCDMA Band II : 1932.4 MHz ~ 1987.6 MHz
Maximum Output Power to Antenna	GSM850 : 32.13 dBm GSM1900 : 29.34 dBm WCDMA Band V : 23.40 dBm WCDMA Band IV : 23.58 dBm WCDMA Band II : 23.41 dBm
Antenna Type	PIFA Antenna
Antenna Gain	Cellular Band: -1.96 dBi PCS Band: 0.55 dBi AWS Band: 0.29 dBi
Type of Modulation	GSM: GMSK GPRS: GMSK EDGE: GMSK / 8PSK WCDMA: QPSK (Uplink) HSDPA: QPSK (Uplink) HSUPA: QPSK (Uplink)

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Maximum ERP/EIRP Power

FCC Rule	System	Type of Modulation	Maximum ERP/EIRP (W)
Part 22	GSM850 GPRS class 8	GMSK	0.63
Part 22	GSM850 EDGE class 8	8PSK	0.17
Part 22	WCDMA Band V RMC 12.2Kbps	QPSK	0.09
Part 24	GSM1900 GPRS class 8	GMSK	0.98
Part 24	GSM1900 EDGE class 8	8PSK	0.42
Part 24	WCDMA Band II RMC 12.2Kbps	QPSK	0.25
Part 27	WCDMA Band IV RMC 12.2Kbps	QPSK	0.24

1.7 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	722060/4086B-1

1.8 Applied Standards

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

- 47 CFR Part 2, 22(H), 24(E), 27(L)
- ANSI / TIA / EIA-603-C-2004
- FCC KDB 971168 D01 Power Meas. License Digital Systems v02r01
- FCC KDB 412172 D01 Determining ERP and ERIP v01

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

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 18000 MHz for WCDMA Band IV.
3. 30 MHz to 19000 MHz for GSM1900 and WCDMA Band II.

Test Modes	
Band	Radiated TCs
GSM 850	■ GPRS class 8Link + Docking ■ EDGE class 8Link + Docking
GSM 1900	■ GPRS class 8Link ■ EDGE class 8Link
WCDMA Band V	■ RMC 12.2KbpsLink + Docking
WCDMA Band IV	■ RMC 12.2Kbps Link
WCDMA Band II	■ RMC 12.2KbpsLink

Note: 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, RMC 12.2Kbps mode for WCDMA band IV, and RMC 12.2Kbps mode for WCDMA band II, only these modes were used for all tests.

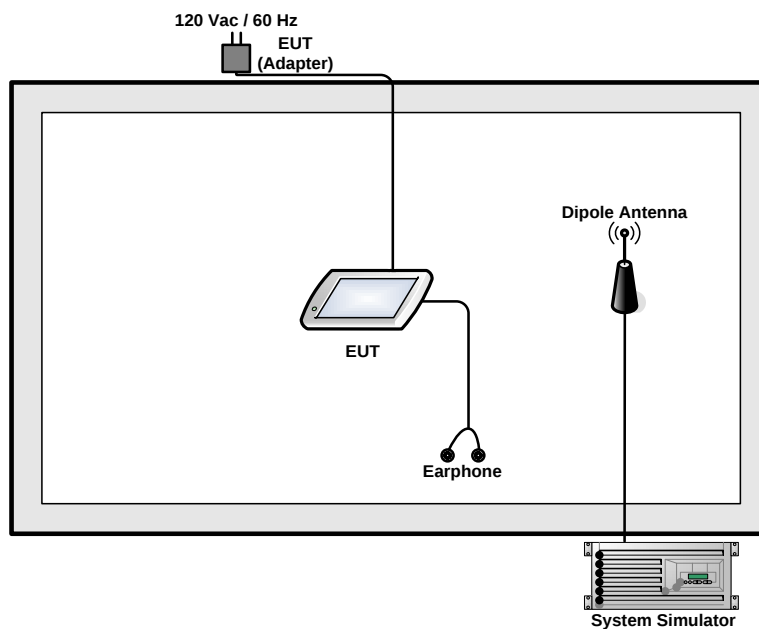
The conducted power tables are as follows:

Conducted Power (*Unit: dBm)						
Band	GSM850			GSM1900		
Channel	128	189	251	512	661	810
Frequency	824.2	836.4	848.8	1850.2	1880	1909.8
GPRS class 8	31.97	31.98	32.13	29.34	29.07	28.99
GPRS class 10	29.65	29.65	29.78	26.77	26.52	26.45
GPRS class 11	28.18	28.17	28.33	25.29	25.05	24.99
GPRS class 12	26.73	26.71	26.86	23.84	23.60	23.52
EGPRS class 8	26.24	26.23	26.38	25.64	25.37	25.28
EGPRS class 10	23.98	23.97	24.12	23.37	23.10	23.01
EGPRS class 11	22.52	22.50	22.64	21.87	21.60	21.52
EGPRS class 12	21.06	21.05	21.17	20.34	20.08	20.02

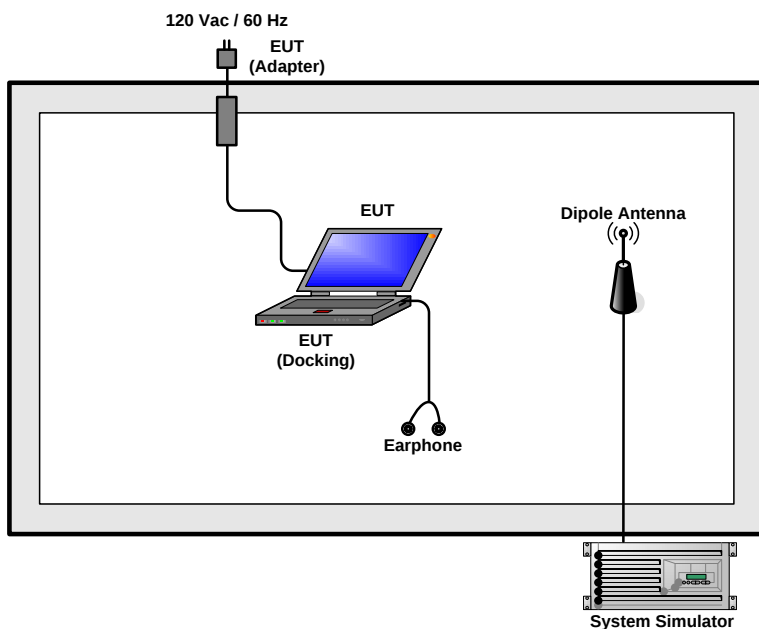
Conducted Power (*Unit: dBm)									
Band	WCDMA Band V			WCDMA Band II			WCDMA Band IV		
Channel	4132	4182	4233	9262	9400	9538	1312	1413	1513
Frequency	826.4	836.4	846.6	1852.4	1880	1907.6	1712.4	1732.6	1752.6
RMC 12.2K	23.40	23.00	22.95	23.41	23.12	23.09	23.58	23.50	23.12
HSDPA Subtest-1	22.90	22.74	22.65	22.84	22.85	22.51	23.14	22.80	22.77
HSDPA Subtest-2	22.07	21.77	21.64	21.86	21.96	21.64	22.12	21.86	21.77
HSDPA Subtest-3	21.83	21.46	21.40	21.66	21.75	21.35	21.91	21.61	21.56
HSDPA Subtest-4	21.55	21.27	21.14	21.37	21.45	21.14	21.71	21.39	21.32
HSUPA Subtest-1	22.49	22.15	22.06	21.92	21.97	21.58	22.13	21.87	21.82
HSUPA Subtest-2	20.07	19.73	19.67	19.82	19.88	19.47	20.12	19.79	19.77
HSUPA Subtest-3	20.84	20.49	20.38	20.57	20.68	20.37	20.89	20.63	20.53
HSUPA Subtest-4	20.34	20.04	19.94	20.05	20.16	19.85	20.34	20.04	20.01
HSUPA Subtest-5	21.97	21.87	21.51	21.78	21.82	21.46	22.01	21.86	21.82

2.2 Connection Diagram of Test System

<EUT with Adapter Mode>



<EUT with Adapter + Docking Mode>



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	CMU200	N/A	N/A	Unshielded, 1.8 m
2.	iPod Earphone	Apple	N/A	N/A	Unshielded, 1.0 m	N/A

3 Test Result

3.1 Conducted Output Power Measurement and ERP/EIRP Measurement

3.1.1 Description of the Conducted Output Power and ERP/EIRP 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.

The ERP of mobile transmitters must not exceed 7 Watts (Cellular Band) and the EIRP of mobile transmitters are limited to 2 Watts (PCS Band) and 1 Watts (AWS Band). According to KDB 412172 D01 Power Approach,

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

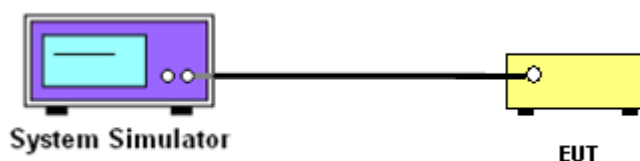
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 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.
4. Measure the maximum burst average power for GSM and maximum average power for WCDMA modes.
5. 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

Cellular Band ($G_T - L_C = -1.96\text{dB}$)									
Modes	GSM850 (GPRS class 8)			GSM850 (EDGE class 8)			WCDMA Band V (RMC 12.2Kbps)		
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)	31.97	31.98	32.13	26.24	26.23	26.38	23.4	23	22.95
Conducted Power (Watts)	1.57	1.58	1.63	0.42	0.42	0.43	0.22	0.20	0.20
ERP(dBm)	27.86	27.87	28.02	22.13	22.12	22.27	19.29	18.89	18.84
ERP(Watts)	0.61	0.61	0.63	0.16	0.16	0.17	0.09	0.08	0.08

PCS Band ($G_T - L_C = 0.55\text{dB}$)									
Modes	GSM1900 (GPRS class 8)			GSM1900 (EDGE class 8)			WCDMA Band II (RMC 12.2Kbps)		
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)	29.34	29.07	28.99	25.64	25.37	25.28	23.41	23.12	23.09
Conducted Power (Watts)	0.86	0.81	0.79	0.37	0.34	0.34	0.22	0.21	0.20
EIRP(dBm)	29.89	29.62	29.54	26.19	25.92	25.83	23.96	23.67	23.64
EIRP(Watts)	0.98	0.92	0.90	0.42	0.39	0.38	0.25	0.23	0.23

AWS Band ($G_T - L_C = 0.29\text{dB}$)			
Modes	WCDMA Band IV (RMC 12.2Kbps)		
Channel	1312(Low)	1413 (Mid)	1513 (High)
Frequency (MHz)	1712.4	1732.6	1752.6
Conducted Power (dBm)	23.58	23.50	23.12
Conducted Power (Watts)	0.23	0.22	0.21
EIRP(dBm)	23.87	23.79	23.41
EIRP(Watts)	0.24	0.24	0.21

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 Field Strength of Spurious Radiation Measurement

3.2.1 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.

3.2.2 Measuring Instruments

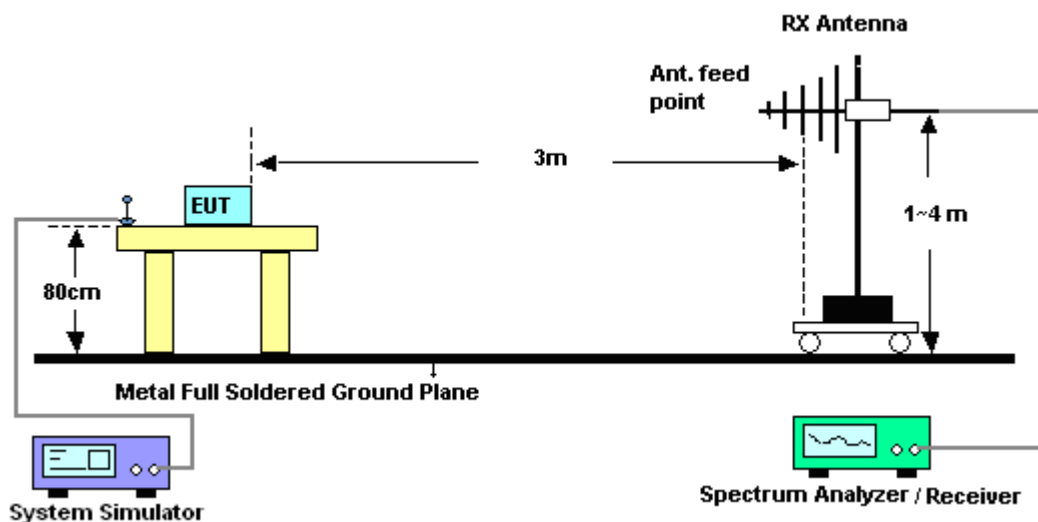
The measuring equipment is listed in the section 4 of this test report.

3.2.3 Test Procedures

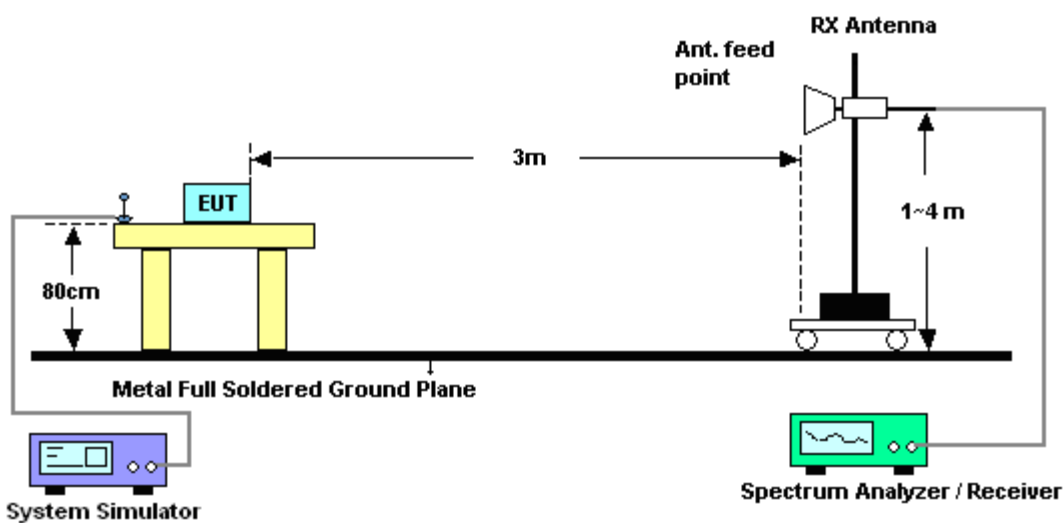
1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving 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. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
11. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)
$$= P(W) - [43 + 10\log(P)] \text{ (dB)}$$
$$= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$$
$$= -13\text{dBm}$$
12. $\text{EIRP (dBm)} = \text{S.G. Power} - \text{Tx Cable Loss} + \text{Tx Antenna Gain}$
13. $\text{ERP (dBm)} = \text{EIRP} - 2.15$

3.2.4 Test Setup

For radiated emissions from 30MHz to 1GHz

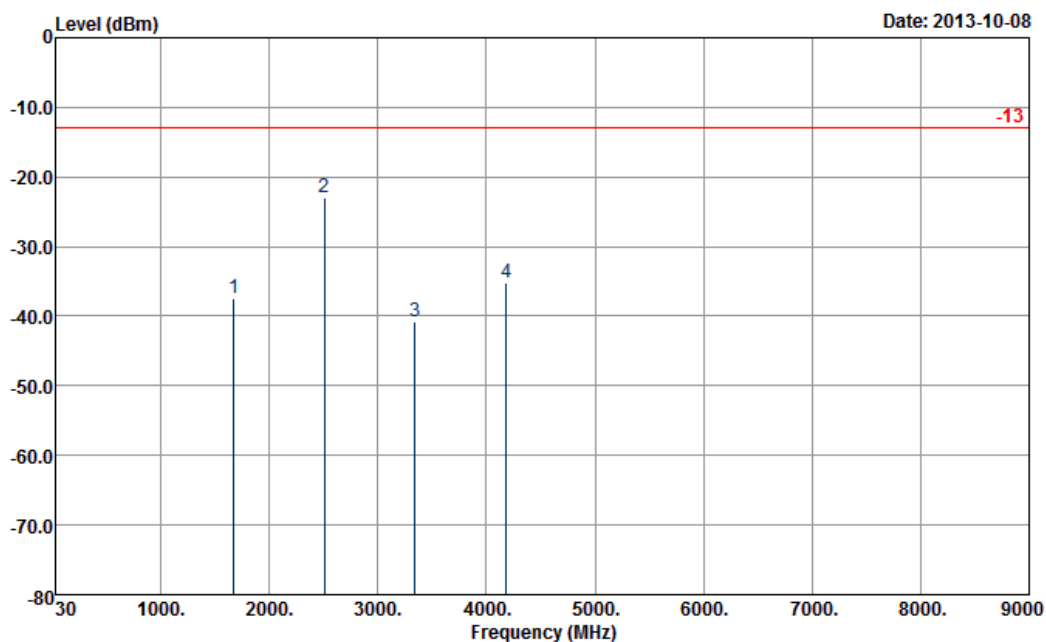


For radiated emissions above 1GHz



3.2.5 Test Result of Field Strength of Spurious Radiated

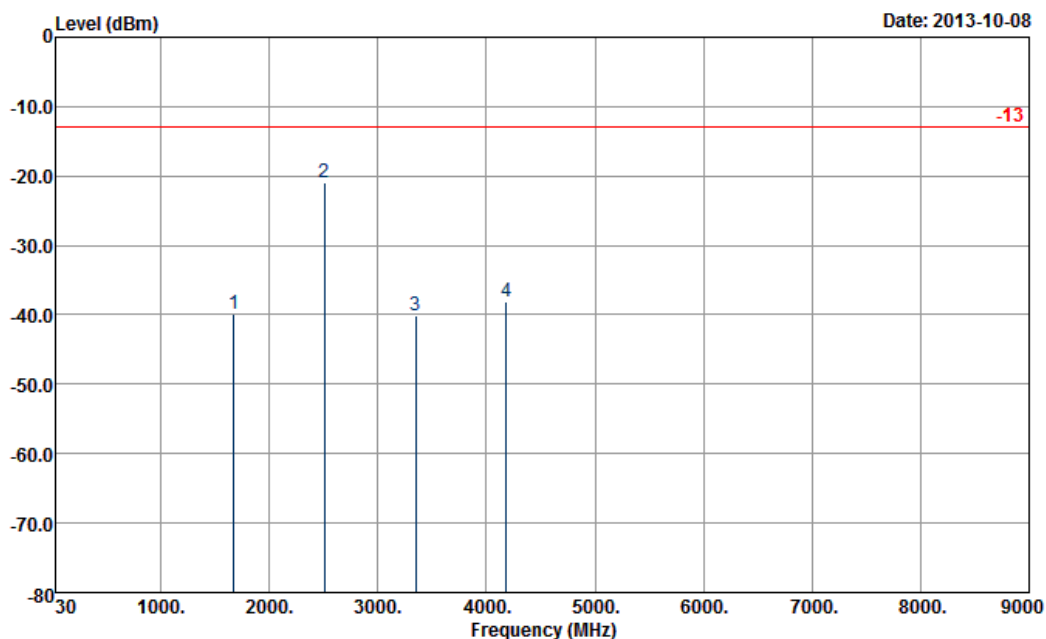
Band :	GSM850	Temperature :	21~24°C
Test Mode :	GPRS class 8 Link (GMSK) + Docking	Relative Humidity :	51~53%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH07-HY
 Condition : -13 HF-EIRP(080306) HORIZONTAL
 Project : FG 391601

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	-37.46	-13	-24.46	-46.59	-41.33	1.62	5.49	H	Pass
2509	-23.03	-13	-10.03	-36.74	-27.15	2.1	6.22	H	Pass
3345	-40.74	-13	-27.74	-54.95	-45.78	3.03	8.07	H	Pass
4180	-35.27	-13	-22.27	-51.57	-41.96	2.52	9.21	H	Pass

Band :	GSM850	Temperature :	21~24°C
Test Mode :	GPRS class 8 Link (GMSK) + Docking	Relative Humidity :	51~53%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

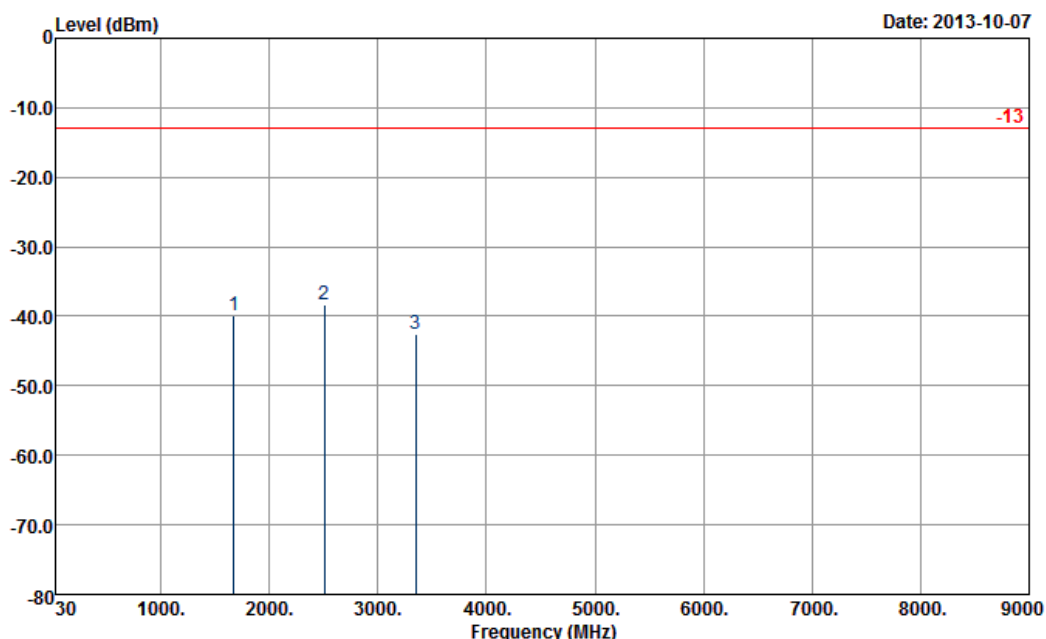


Site : 03CH07-HY
 Condition : -13 HF-EIRP(080306) VERTICAL
 Project : FG 391601

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	-39.81	-13	-26.81	-51	-43.68	1.62	5.49	V	Pass
2509	-21.02	-13	-8.02	-37.85	-25.14	2.1	6.22	V	Pass
3345	-40.08	-13	-27.08	-55.64	-45.12	3.03	8.07	V	Pass
4180	-38.07	-13	-25.07	-55.18	-44.76	2.52	9.21	V	Pass



Band :	GSM850	Temperature :	21~24°C
Test Mode :	EDGE class 8 Link (8PSK) + Docking	Relative Humidity :	51~53%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

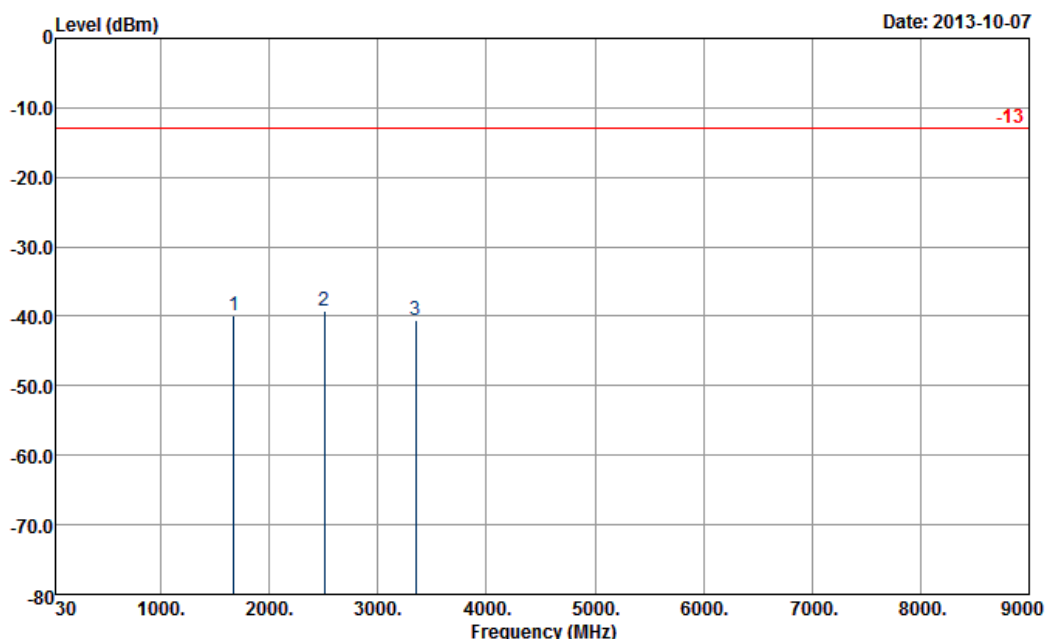


Site : 03CH07-HY
Condition : -13 HF-EIRP(080306) HORIZONTAL
Project : FG 391601

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	-39.89	-13	-26.89	-48.85	-43.76	1.62	5.49	H	Pass
2509	-38.42	-13	-25.42	-51.77	-42.54	2.1	6.22	H	Pass
3346	-42.64	-13	-29.64	-56.9	-47.68	3.03	8.07	H	Pass



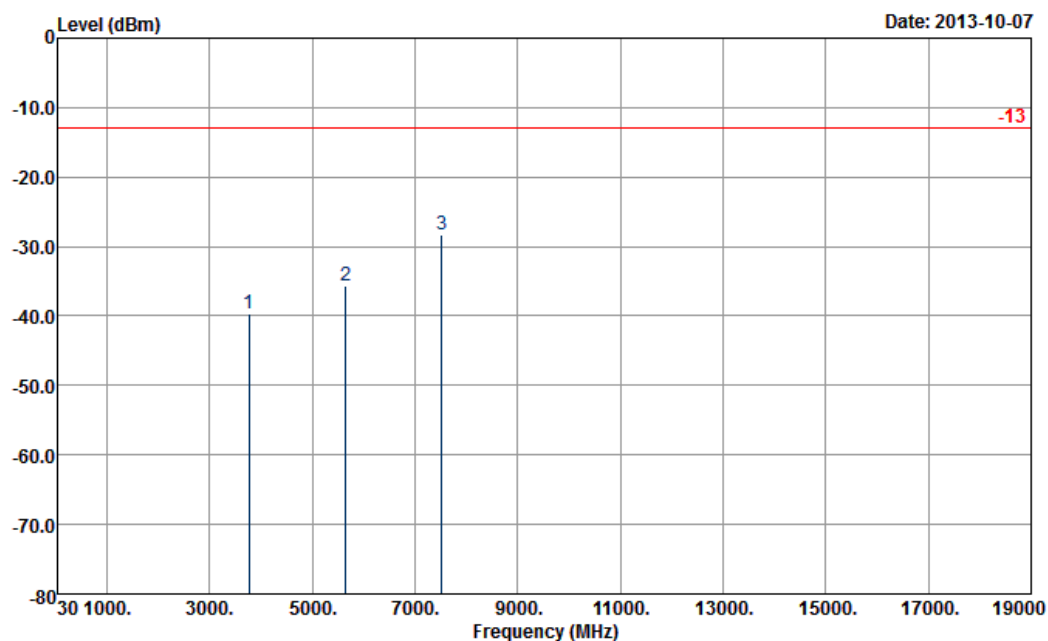
Band :	GSM850	Temperature :	21~24°C
Test Mode :	EDGE class 8 Link (8PSK) + Docking	Relative Humidity :	51~53%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH07-HY
Condition : -13 HF-EIRP(080306) VERTICAL
Project : FG 391601

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	-39.79	-13	-26.79	-51.05	-43.66	1.62	5.49	V	Pass
2509	-39.33	-13	-26.33	-53.42	-43.45	2.1	6.22	V	Pass
3346	-40.51	-13	-27.51	-56.58	-45.55	3.03	8.07	V	Pass

Band :	GSM1900	Temperature :	21~24°C
Test Mode :	GPRS class 8 Link (GMSK)	Relative Humidity :	51~53%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

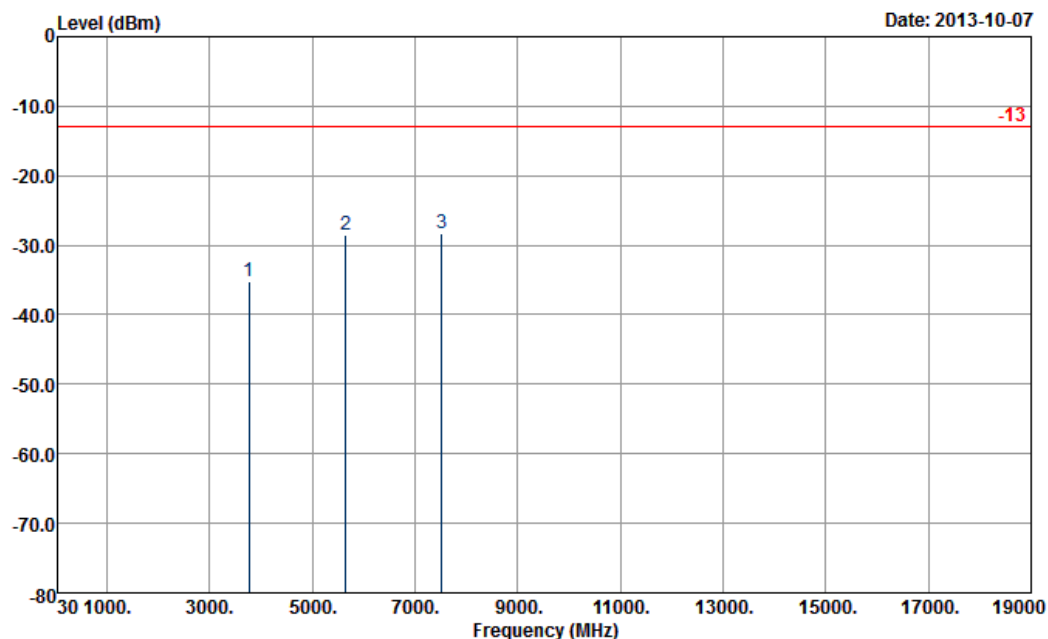


Site : 03CH07-HY
 Condition : -13 HF-EIRP(080306) HORIZONTAL
 Project : FG 391601

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	-39.57	-13	-26.57	-54.93	-45.87	2.51	8.81	H	Pass
5640	-35.70	-13	-22.70	-56.6	-43.41	2.99	10.70	H	Pass
7520	-28.28	-13	-15.28	-55.56	-36.81	3.59	12.12	H	Pass



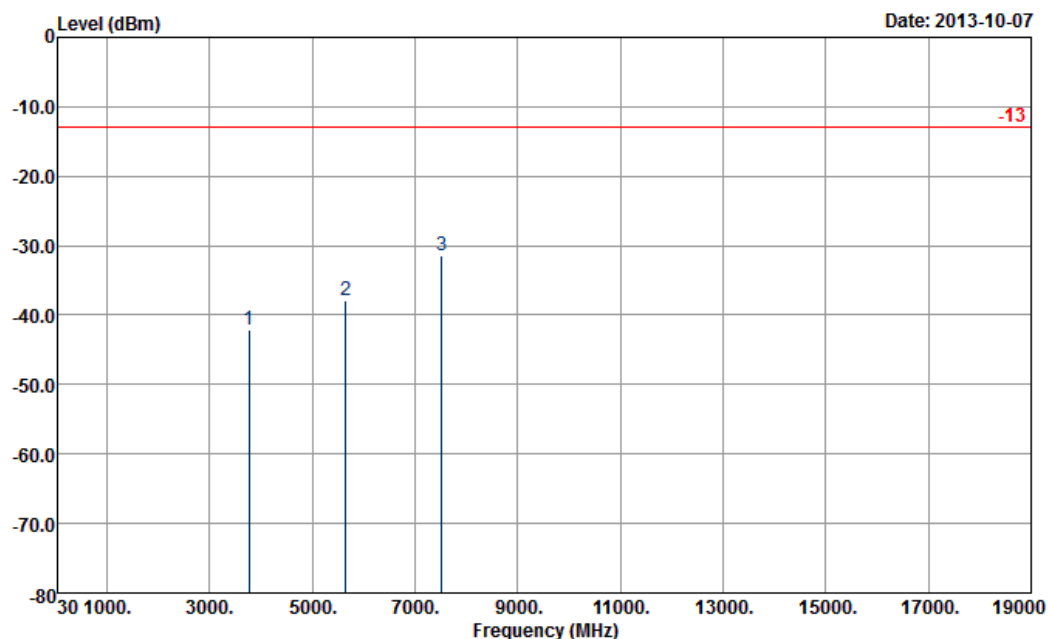
Band :	GSM1900	Temperature :	21~24°C
Test Mode :	GPRS class 8 Link (GMSK)	Relative Humidity :	51~53%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH07-HY
Condition : -13 HF-EIRP(080306) VERTICAL
Project : FG 391601

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	-35.22	-13	-22.22	-51.56	-41.52	2.51	8.81	V	Pass
5640	-28.62	-13	-15.62	-49.37	-36.33	2.99	10.70	V	Pass
7520	-28.26	-13	-15.26	-55.29	-36.79	3.59	12.12	V	Pass

Band :	GSM1900	Temperature :	21~24°C
Test Mode :	EDGE class 8 Link (8PSK)	Relative Humidity :	51~53%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

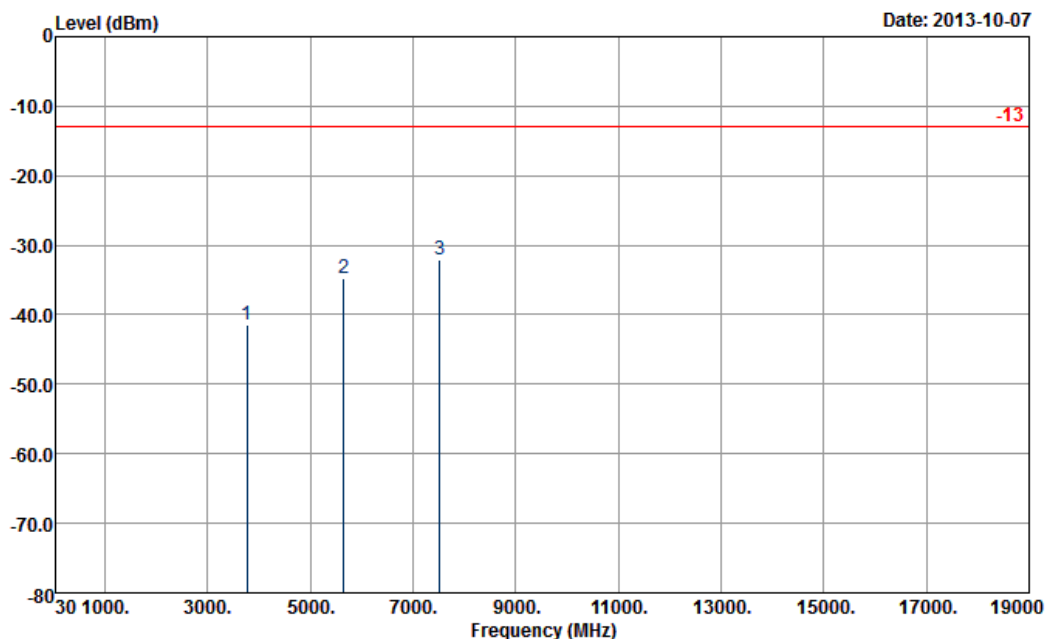


Site : 03CH07-HY
 Condition : -13 HF-EIRP(080306) HORIZONTAL
 Project : FG 391601

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	-42.12	-13	-29.12	-57.6	-48.42	2.51	8.81	H	Pass
5640	-37.92	-13	-24.92	-58.73	-45.63	2.99	10.70	H	Pass
7520	-31.49	-13	-18.49	-58.91	-40.02	3.59	12.12	H	Pass

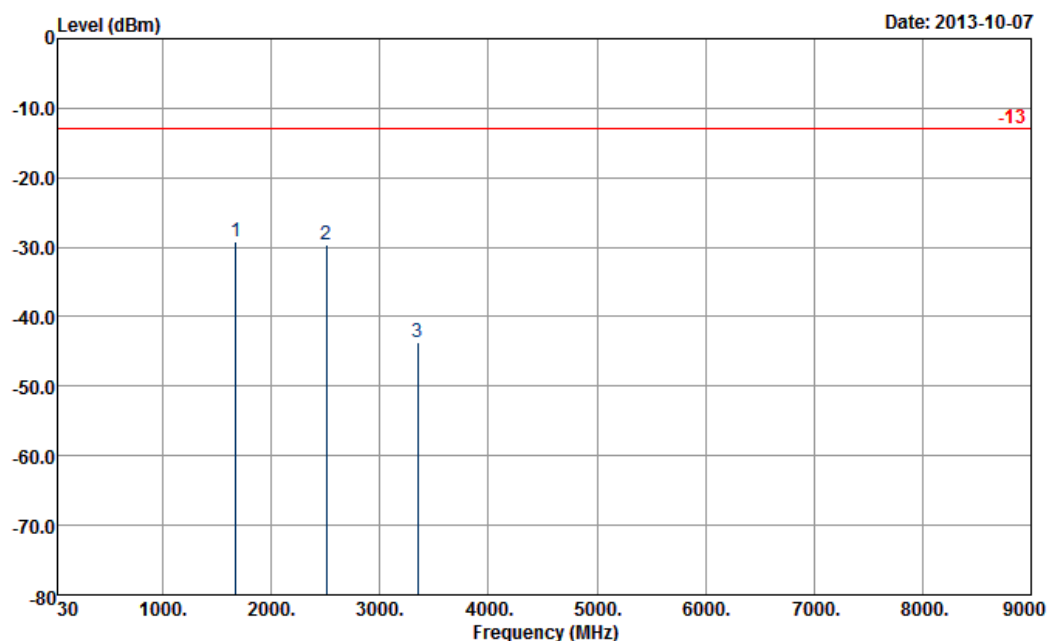


Band :	GSM1900	Temperature :	21~24°C
Test Mode :	EDGE class 8 Link (8PSK)	Relative Humidity :	51~53%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



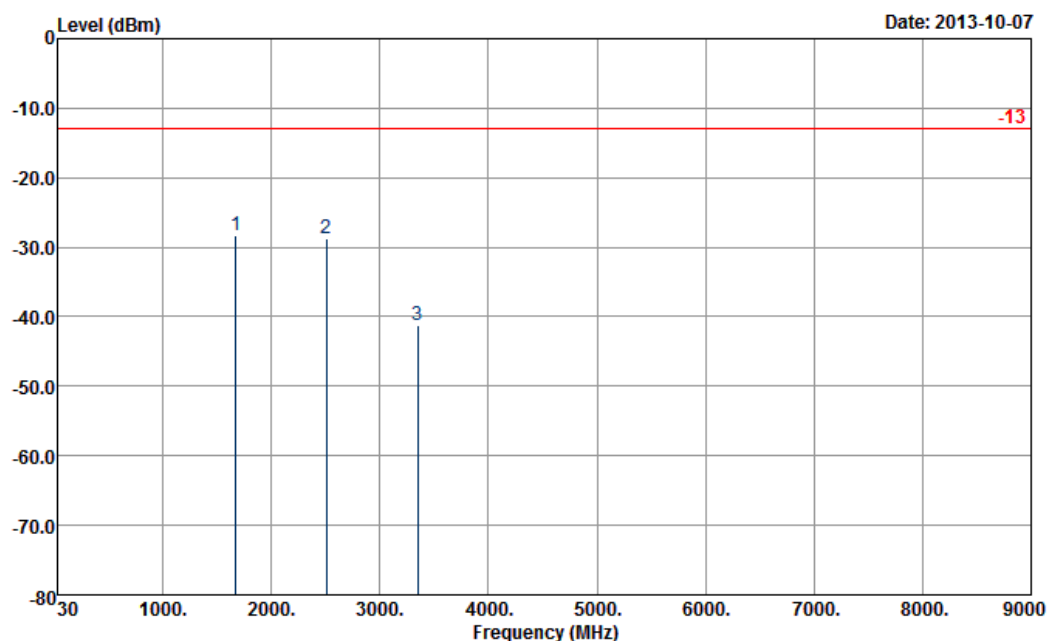
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-41.37	-13	-28.37	-57.72	-47.67	2.51	8.81	V	Pass
5640	-34.85	-13	-21.85	-55.59	-42.56	2.99	10.70	V	Pass
7520	-32.14	-13	-19.14	-59.24	-40.67	3.59	12.12	V	Pass

Band :	WCDMA Band V	Temperature :	21~24°C
Test Mode :	RMC 12.2Kbps Link (QPSK) + Docking	Relative Humidity :	51~53%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
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
1673	-29.25	-13	-16.25	-38.36	-33.12	1.62	5.49	H	Pass
2508	-29.73	-13	-16.73	-43.08	-33.85	2.1	6.22	H	Pass
3346	-43.62	-13	-30.62	-57.94	-48.66	3.03	8.07	H	Pass

Band :	WCDMA Band V	Temperature :	21~24°C
Test Mode :	RMC 12.2Kbps Link (QPSK) + Docking	Relative Humidity :	51~53%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

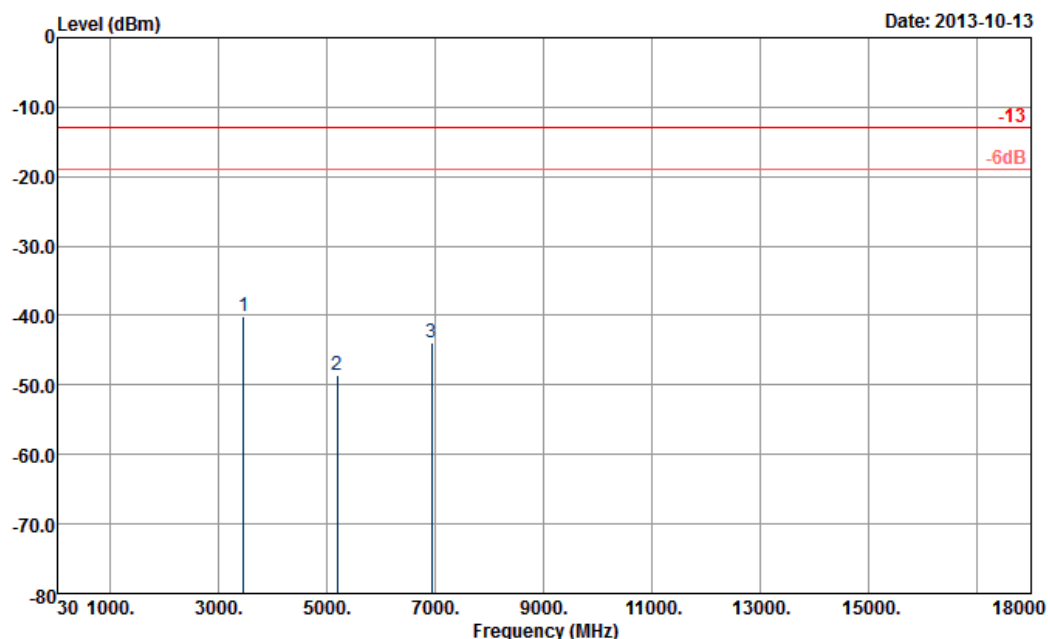


Site : 03CH07-HY
 Condition : -13 HF-EIRP(080306) VERTICAL
 Project : FG 391601

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
1673	-28.27	-13	-15.27	-39.41	-32.14	1.62	5.49	V	Pass
2508	-28.69	-13	-15.69	-42.46	-32.81	2.1	6.22	V	Pass
3346	-41.27	-13	-28.27	-56.72	-46.31	3.03	8.07	V	Pass



Band :	WCDMA Band IV	Temperature :	21~24°C
Test Mode :	RMC 12.2Kbps Link (QPSK)	Relative Humidity :	51~53%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

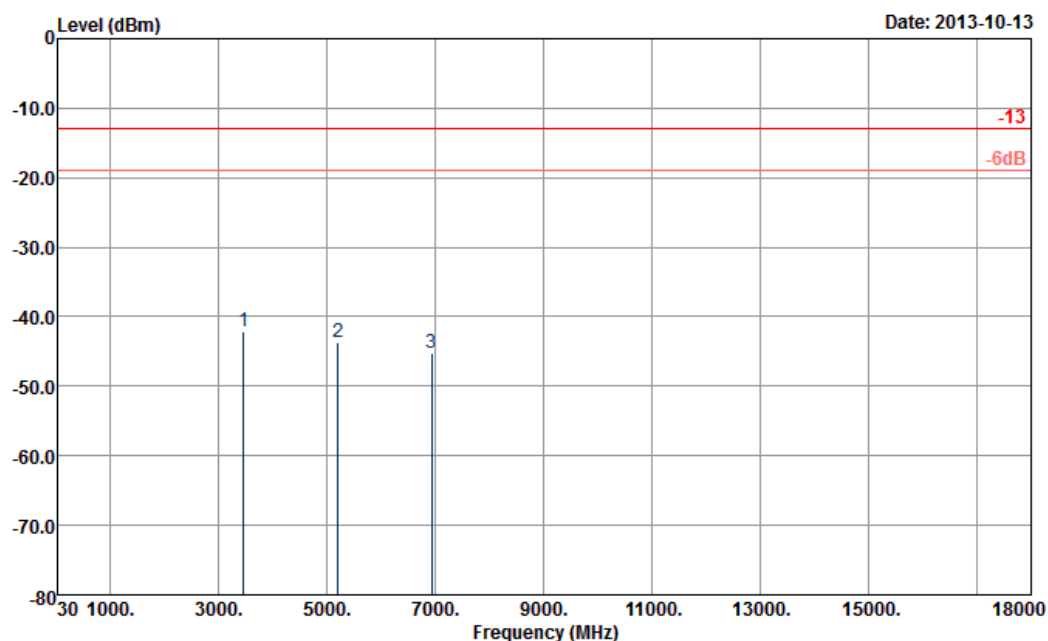


Site : 03CH07-HY
Condition : -13 HF-EIRP(080306) HORIZONTAL
Project : FG 391601

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
3468	-40.06	-13	-27.06	-54.49	-43.89	4.48	8.31	H	Pass
5200	-48.58	-13	-35.58	-67.47	-53.22	5.332	9.98	H	Pass
6936	-43.91	-13	-30.91	-70.27	-49.15	6.1	11.34	H	Pass



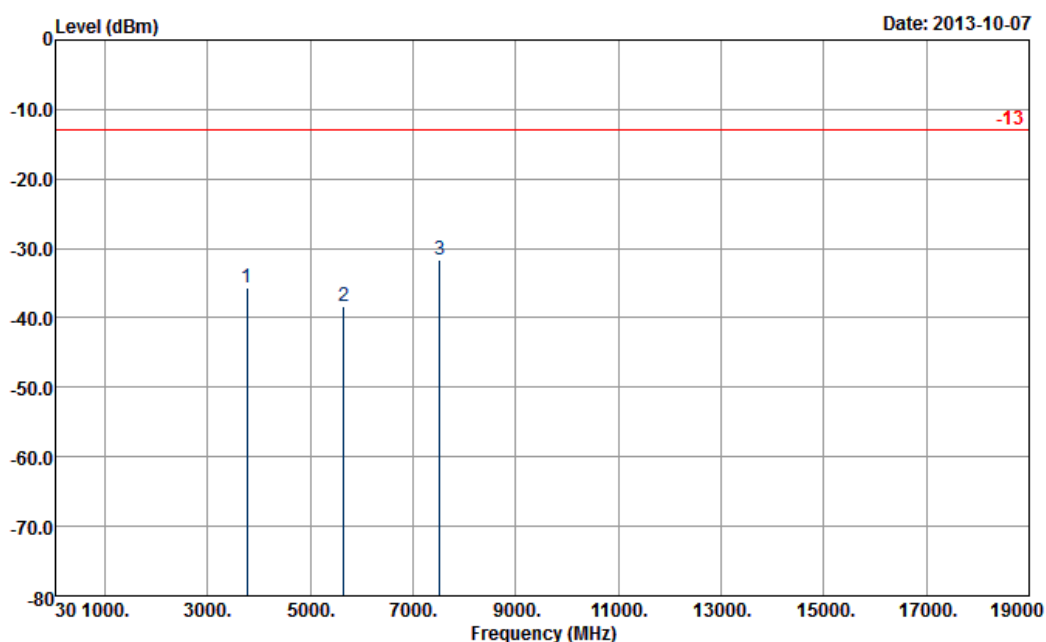
Band :	WCDMA Band IV	Temperature :	21~24°C
Test Mode :	RMC 12.2Kbps Link (QPSK)	Relative Humidity :	51~53%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH07-HY
Condition : -13 HF-EIRP(080306) VERTICAL
Project : FG 391601

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
3468	-42.19	-13	-29.19	-57.9	-46.02	4.48	8.31	V	Pass
5204	-43.65	-13	-30.65	-62.51	-48.29	5.332	9.98	V	Pass
6936	-45.17	-13	-32.17	-70.47	-50.41	6.1	11.34	V	Pass

Band :	WCDMA Band II	Temperature :	21~24°C
Test Mode :	RMC 12.2Kbps Link (QPSK)	Relative Humidity :	51~53%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		

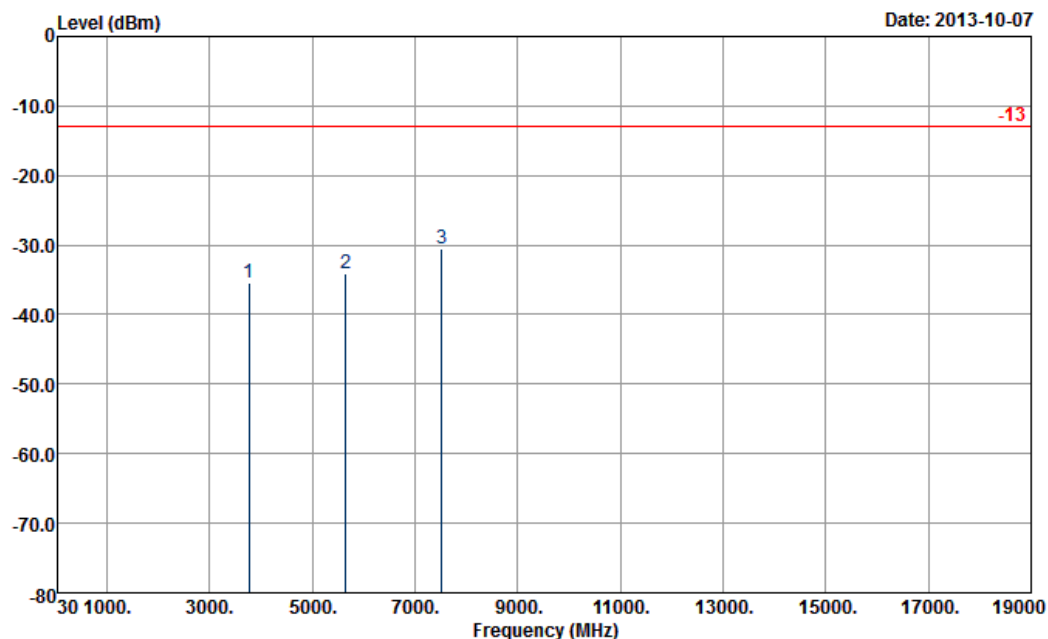


Site : 03CH07-HY
 Condition : -13 HF-EIRP(080306) HORIZONTAL
 Project : FG 391601

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	-35.71	-13	-22.71	-51.11	-42.01	2.51	8.81	H	Pass
5640	-38.27	-13	-25.27	-59.09	-45.98	2.99	10.70	H	Pass
7520	-31.59	-13	-18.59	-58.89	-40.12	3.59	12.12	H	Pass



Band :	WCDMA Band II	Temperature :	21~24°C
Test Mode :	RMC 12.2Kbps Link (QPSK)	Relative Humidity :	51~53%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



Site : 03CH07-HY
 Condition : -13 HF-EIRP(080306) VERTICAL
 Project : FG 391601

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	-35.36	-13	-22.36	-51.8	-41.66	2.51	8.81	V	Pass
5640	-34.13	-13	-21.13	-54.69	-41.84	2.99	10.70	V	Pass
7520	-30.49	-13	-17.49	-57.58	-39.02	3.59	12.12	V	Pass

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
System Simulator	Rohde & Schwarz	CMU200	117591	N/A	Oct. 21, 2011	Oct. 08, 2013	Oct. 20, 2013	Conducted (TH02-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101067	9KHz~30GHz	Nov. 30, 2012	Oct. 07, 2013 ~ Oct. 13, 2013	Nov. 29, 2013	Radiation (03CH07-HY)
Bilog Antenna	Teseq GmbH	CBL6112D	35379	30MHz~2GHz	Mar. 28, 2013	Oct. 07, 2013 ~ Oct. 08, 2013	Mar. 27, 2014	Radiation (03CH07-HY)
Bilog Antenna	Teseq GmbH	CBL6112D	35379	30MHz~2GHz	Oct. 10, 2013	Oct. 13, 2013	Oct. 09, 2014	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	75962	1GHz~18GHz	Aug. 22, 2013	Oct. 07, 2013 ~ Oct. 13, 2013	Aug. 21, 2014	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA917025 1	15GHz- 40GHz	Oct. 03, 2013	Oct. 07, 2013 ~ Oct. 13, 2013	Oct. 02, 2014	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	30MHz~1GHz	Feb. 26, 2013	Oct. 07, 2013 ~ Oct. 13, 2013	Feb. 25, 2014	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~26.5GHz	Dec. 01, 2012	Oct. 07, 2013 ~ Oct. 13, 2013	Nov. 30, 2013	Radiation (03CH07-HY)
Turn Table	ChainTek	ChainTek 3000	N/A	0 ~ 360 degree	N/A	Oct. 07, 2013 ~ Oct. 13, 2013	N/A	Radiation (03CH07-HY)
Antenna Mast	ChainTek	ChainTek 3000	N/A	N/A	N/A	Oct. 07, 2013 ~ Oct. 13, 2013	N/A	Radiation (03CH07-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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