

FCC RF Test Report

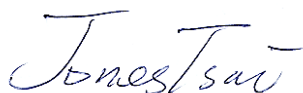
APPLICANT : Hewlett-Packard Company
EQUIPMENT : Tablet PC
BRAND NAME : hp
MODEL NAME : HSTNN-C78C
FCC ID : B94HNC78CSWTH
STANDARD : FCC 47 CFR Part 2, 22(H), 24(E), 27(L)
CLASSIFICATION : PCS Licensed Transmitter (PCB)

The product was received on Sep. 05, 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



SPORTON INTERNATIONAL INC.

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

SPORTON INTERNATIONAL INC.

TEL : 886-3-327-3456

FAX : 886-3-328-4978

FCC ID : B94HNC78CSWTH

Page Number : 1 of 36

Report Issued Date : Dec. 09, 2013

Report Version : Rev. 01

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 Modification of EUT	6
1.6 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator	7
1.7 Testing Site.....	7
1.8 Applied Standards	7
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST	8
2.1 Test Mode.....	8
2.2 Connection Diagram of Test System	10
2.3 Support Unit used in test configuration and system.....	10
3 TEST RESULT	11
3.1 Conducted Output Power Measurement and ERP/EIRP Measurement.....	11
3.2 Field Strength of Spurious Radiation Measurement	15
4 LIST OF MEASURING EQUIPMENTS.....	35
5 UNCERTAINTY OF EVALUATION	36



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FG392719A	Rev. 01	Initial issue of report	Dec. 09, 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 13.24 dB at 1672.000 MHz

1 General Description

1.1 Applicant

Hewlett-Packard Company

3000 Hanover Street, Palo Alto, California 94304, USA

1.2 Manufacturer

COMPAL ELECTRONICS, INC.

No. 581, Ruiguang Rd., Neihu District, Taipei City 11492, Taiwan (R.O.C.)

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	Tablet PC
Brand Name	hp
Model Name	HSTNN-C78C
FCC ID	B94HNC78CSWTH
Integrated WWAN Module	Brand Name: SIERRA WIRELESS Model Name: EM7355
EUT supports Radios application	CDMA/EV-DO/GSM/EGPRS/WCDMA/HSPA/LTE
EUT Stage	Identical Prototype

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. There have two batteries for EUT, The Battery 1 (model name: HSTNN-IB5O) and Battery 2 (model name: HSTNN-LB5O) are identical on power rating. The only differences are vendor and model name. All the tests were performed with Battery 1.

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 CDMA2000 BC0: 824.70 MHz ~ 848.31 MHz CDMA2000 BC1: 1851.25 MHz ~ 1908.75 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 CDMA2000 BC0: 869.70 MHz ~ 893.31 MHz CDMA2000 BC1: 1931.25 MHz ~ 1988.75 MHz
Maximum Output Power to Antenna	GSM850 : 32.29 dBm GSM1900 : 29.59 dBm WCDMA Band V : 23.51 dBm WCDMA Band IV : 23.80 dBm WCDMA Band II : 22.69 dBm CDMA2000 BC0 : 23.73 dBm CDMA2000 BC1 : 23.99 dBm
Antenna Type	Main Antenna :PIFA Antenna Aux. Antenna :Coupling Type Antenna
Antenna Gain	Cellular Band: -1.16 dBi PCS Band: 0.25 dBi AWS Band: 0.97 dBi
Type of Modulation	GPRS: GMSK EDGE: GMSK / 8PSK WCDMA: QPSK (Uplink) HSDPA: QPSK (Uplink) HSUPA: QPSK (Uplink) CDMA2000 : QPSK CDMA2000 1xEV-DO : QPSK/8PSK

1.5 Modification of EUT

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

1.6 Maximum ERP/EIRP Power, Frequency Tolerance, and Emission Designator

FCC Rule	System	Type of Modulation	Maximum ERP/EIRP (W)
Part 22	GSM850 GPRS class 8	GMSK	0.79
Part 22	GSM850 EDGE class 8	8PSK	0.23
Part 22	WCDMA Band V RMC 12.2Kbps	QPSK	0.10
Part 22	CDMA2000 BC0 1xEV-DO Rev. 0	QPSK	0.11
Part 24	GSM1900 GPRS class 8	GMSK	0.96
Part 24	GSM1900 EDGE class 8	8PSK	0.36
Part 24	WCDMA Band II RMC 12.2Kbps	QPSK	0.25
Part 24	CDMA2000 BC1 1xEV-DO Rev. 0	QPSK	0.27
Part 27	WCDMA Band IV RMC 12.2Kbps	QPSK	0.23

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 to find out the worst emission.

Frequency range investigated for radiated emission is as follows:

1. 30 MHz to 9000 MHz for GSM850, WCDMA Band V, and CDMA2000 BC0.
2. 30 MHz to 18000 MHz for WCDMA Band IV.
3. 30 MHz to 19000 MHz for GSM1900, WCDMA Band II, and CDMA2000 BC1.

Test Modes	
Band	Radiated TCs
GSM 850	■ GPRS class 8 Link ■ EDGE class 8 Link
GSM 1900	■ GPRS class 8 Link ■ EDGE class 8 Link
WCDMA Band V	■ RMC 12.2Kbps Link
WCDMA Band IV	■ RMC 12.2Kbps Link
WCDMA Band II	■ RMC 12.2Kbps Link
CDMA2000 BC0	■ 1xEV-DO Rev. 0 Link Mode
CDMA2000 BC1	■ 1xEV-DO Rev. 0 Link Mode

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, RMC 12.2Kbps mode for WCDMA band II, 1xEV-DO Rev. 0 mode for CDMA2000 BC0 on QPSK link, 1xEV-DO Rev. 0 for CDMA2000 BC1 on QPSK link, only these modes were used for all tests.

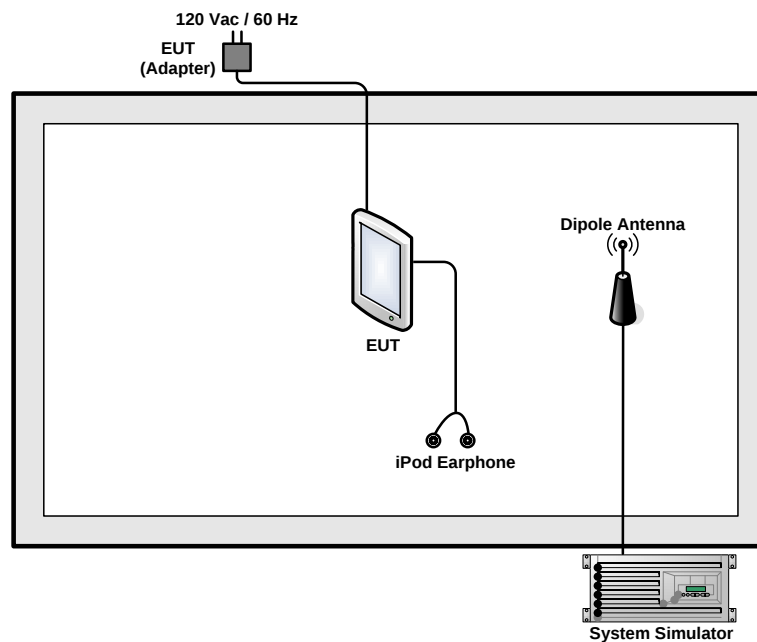
The conducted power tables are as follows:

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	32.29	32.27	32.22	29.59	29.45	29.38
GPRS class 10	32.21	32.16	32.08	29.50	29.38	29.29
EGPRS class 8	27.02	26.96	26.91	25.36	25.30	25.31
EGPRS class 10	26.82	26.76	26.71	25.30	25.24	25.22
EGPRS class 11	26.63	26.50	26.47	25.15	25.13	25.12
EGPRS class 12	26.66	26.59	26.55	25.10	25.08	25.03

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	23.45	23.51	23.16	23.64	23.65	23.80	22.52	22.69	22.49
HSDPA Subtest-1	23.26	23.33	23.44	23.46	23.51	23.66	22.38	22.46	22.67
HSDPA Subtest-2	23.24	23.31	23.36	23.34	23.42	23.63	22.38	22.49	22.60
HSDPA Subtest-3	22.74	22.83	22.96	22.84	22.95	23.21	21.86	21.97	22.23
HSDPA Subtest-4	22.72	22.82	22.91	22.82	22.93	23.19	21.88	21.81	21.83
HSUPA Subtest-1	23.11	23.10	23.15	22.81	23.01	23.07	22.23	22.36	22.38
HSUPA Subtest-2	21.73	21.88	21.95	21.60	21.80	21.90	20.36	20.38	20.39
HSUPA Subtest-3	22.12	22.10	22.16	21.70	21.84	21.93	21.17	21.24	21.79
HSUPA Subtest-4	21.80	21.92	22.00	21.63	21.70	21.95	20.38	20.40	20.43
HSUPA Subtest-5	23.25	23.32	23.33	23.39	23.45	23.60	22.20	22.23	22.29

Conducted Power (*Unit: dBm)						
Band	CDMA2000 BC0			CDMA2000 BC1		
Channel	1013	384	777	25	600	1175
Frequency	824.7	836.52	848.31	1851.25	1880	1908.75
1xRTT RC1+SO55	23.58	23.72	23.54	23.87	23.80	23.93
1xRTT RC3+SO55	23.55	23.71	23.50	23.93	23.79	23.92
1xEV-DO RTAP 153.6Kbps	23.61	23.73	23.60	23.99	23.80	23.90
1xEV-DO RETAP 4096Bits	23.50	23.72	23.52	23.85	23.76	23.84

2.2 Connection Diagram of Test System



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
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

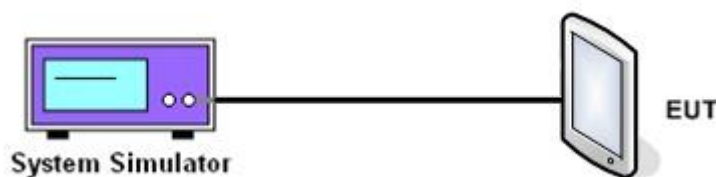
3.1.2 Measuring Instruments

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 GSM and 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 ($G_T - L_C = -1.16$ 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)	32.29	32.27	32.22	27.02	26.96	26.91	23.45	23.51	23.16
Conducted Power (Watts)	1.69	1.69	1.67	0.50	0.50	0.49	0.22	0.22	0.21
ERP(dBm)	28.98	28.96	28.91	23.71	23.65	23.60	20.14	20.20	19.85
ERP(Watts)	0.79	0.79	0.78	0.23	0.23	0.23	0.10	0.10	0.10

PCS Band ($G_T - L_C = 0.25$ 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)	29.59	29.45	29.38	25.36	25.30	25.31	23.64	23.65	23.80
Conducted Power (Watts)	0.91	0.88	0.87	0.34	0.34	0.34	0.23	0.23	0.24
EIRP(dBm)	29.84	29.70	29.63	25.61	25.55	25.56	23.89	23.90	24.05
EIRP(Watts)	0.96	0.93	0.92	0.36	0.36	0.36	0.24	0.25	0.25

AWS Band ($G_T - L_C = 0.97$ 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)	22.52	22.69	22.49
Conducted Power (Watts)	0.18	0.19	0.18
EIRP(dBm)	23.49	23.66	23.46
EIRP(Watts)	0.22	0.23	0.22

CDMA2000 BC0 ($G_T - L_C = -1.16$ dB)			
Test Mode	CDMA 2000 1xEV-DO Rev. 0		
Test Status	RTAP 153.6Kbps		
Channel	1013 (Low)	384 (Mid)	777 (High)
Frequency (MHz)	824.70	836.52	848.31
Conducted Power (dBm)	23.61	23.73	23.60
Conducted Power (Watts)	0.23	0.24	0.23
EIRP(dBm)	20.30	20.42	20.29
EIRP(Watts)	0.11	0.11	0.11

CDMA2000 BC1 ($G_T - L_C = 0.25$ dB)			
Test Mode	CDMA 2000 1xEV-DO Rev. 0		
Test Status	RTAP 153.6Kbps		
Channel	25 (Low)	600 (Mid)	1175 (High)
Frequency (MHz)	1851.25	1880.00	1908.75
Conducted Power (dBm)	23.99	23.80	23.90
Conducted Power (Watts)	0.25	0.24	0.25
EIRP(dBm)	24.24	24.05	24.15
EIRP(Watts)	0.27	0.25	0.26

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

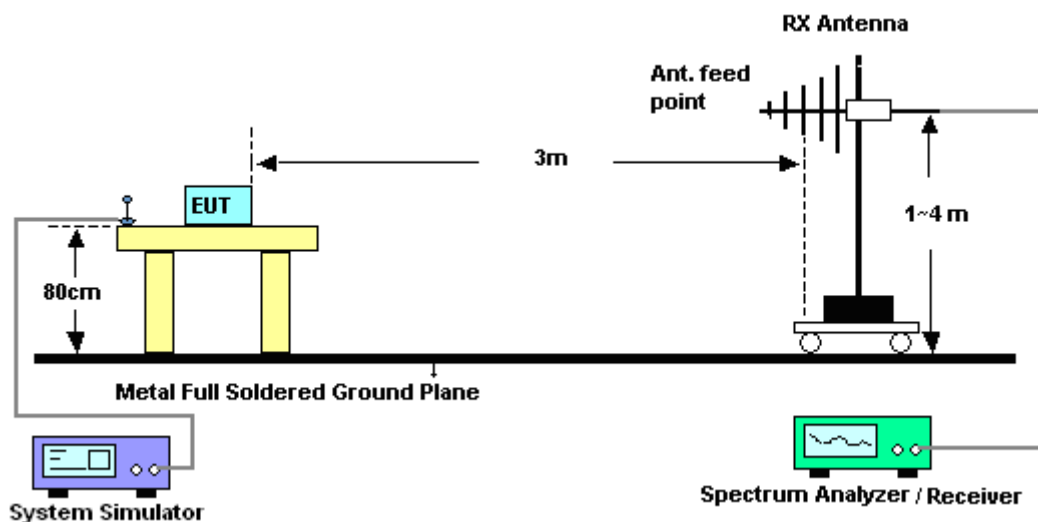
The measuring equipment is listed in the section 4 of this test report.

3.2.3 Test Procedures

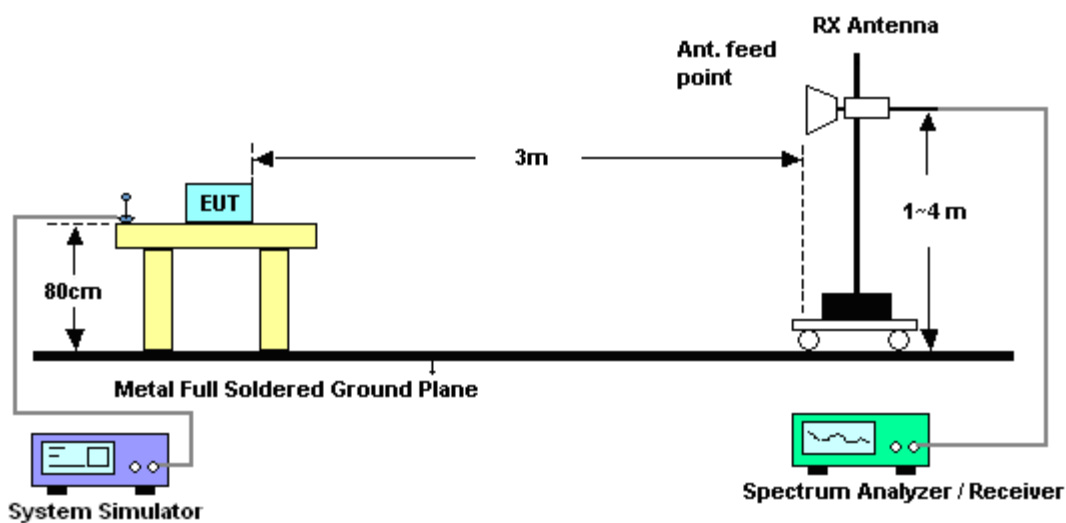
1. The EUT was placed on a rotatable wooden table with 0.8 meter above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving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

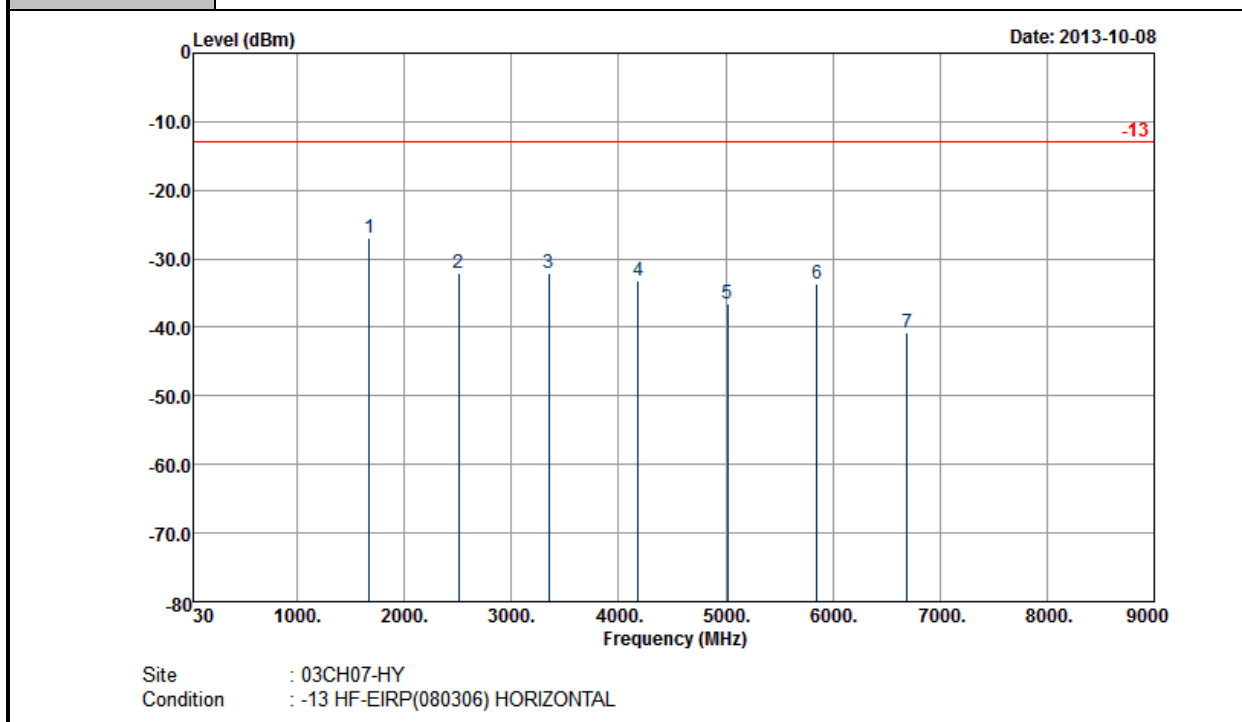


For radiated emissions above 1GHz



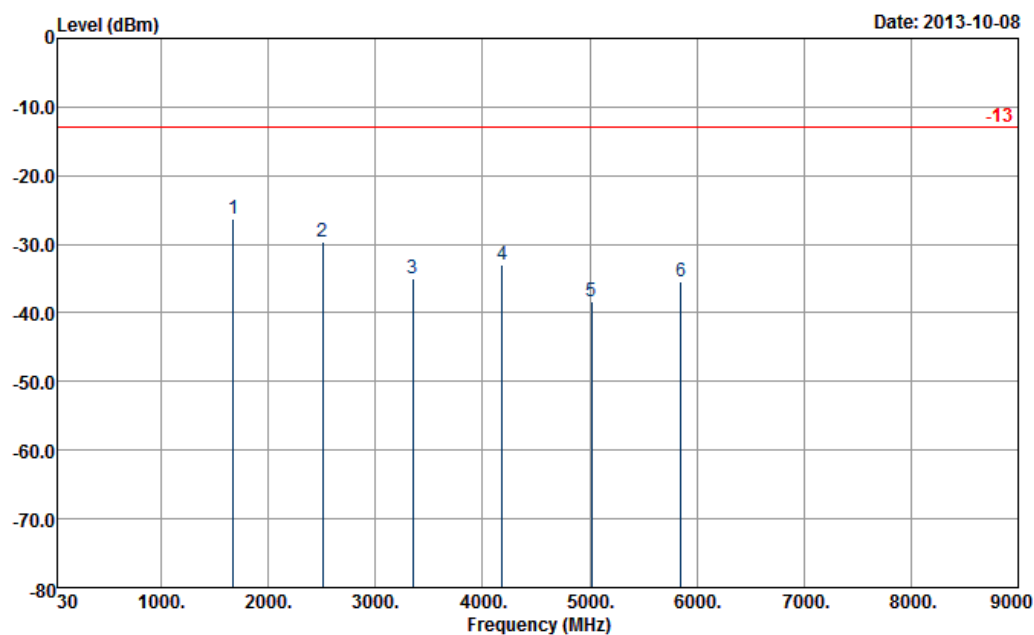
3.2.5 Test Result of Field Strength of Spurious Radiated

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



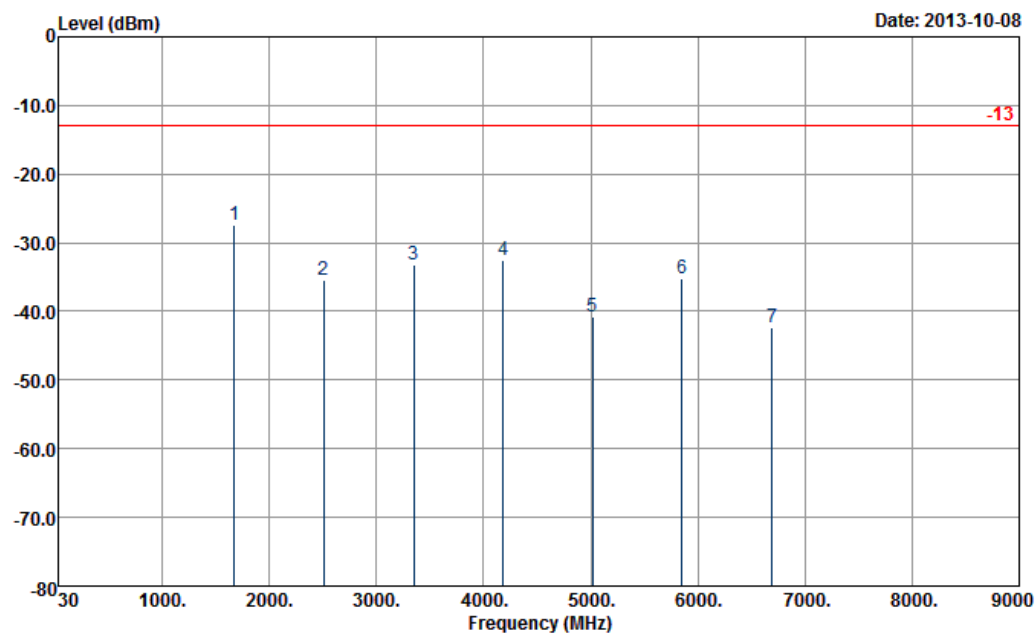
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-27.01	-13	-14.01	-36.01	-30.88	1.62	5.49	H	Pass
2509	-32.10	-13	-19.10	-45.32	-36.22	2.1	6.22	H	Pass
3346	-32.07	-13	-19.07	-46.15	-37.11	3.03	8.07	H	Pass
4180	-33.19	-13	-20.19	-49.45	-39.88	2.52	9.21	H	Pass
5015	-36.63	-13	-23.63	-54.61	-44.23	3.1	10.70	H	Pass
5855	-33.74	-13	-20.74	-55.54	-41.13	2.92	10.31	H	Pass
6690	-40.89	-13	-27.89	-65.98	-48.66	3.38	11.15	H	Pass

Band :	GSM850	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.		



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	-26.24	-13	-13.24	-37.18	-30.11	1.62	5.49	V	Pass
2509	-29.62	-13	-16.62	-43.52	-33.74	2.1	6.22	V	Pass
3346	-35.07	-13	-22.07	-50.74	-40.11	3.03	8.07	V	Pass
4180	-33.08	-13	-20.08	-50.09	-39.77	2.52	9.21	V	Pass
5015	-38.43	-13	-25.43	-56.61	-46.03	3.1	10.70	V	Pass
5855	-35.38	-13	-22.38	-56.76	-42.77	2.92	10.31	V	Pass

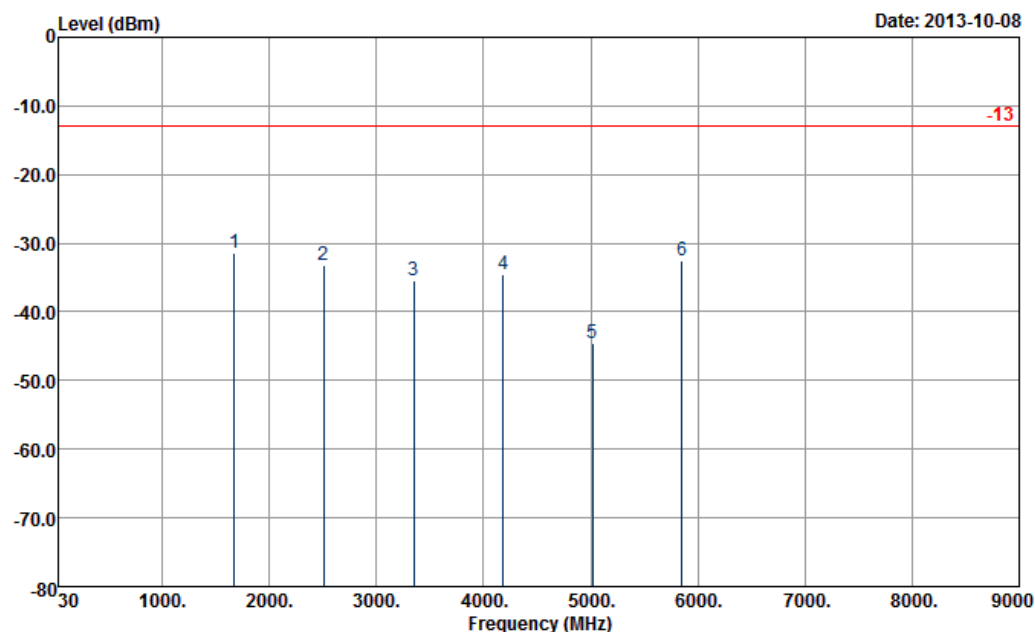
Band :	GSM850	Temperature :	21~24°C
Test Mode :	EDGE class 8 Link (8PSK)	Relative Humidity :	51~53%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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

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	-27.41	-13	-14.41	-36.86	-31.28	1.62	5.49	H	Pass
2509	-35.44	-13	-22.44	-48.69	-39.56	2.1	6.22	H	Pass
3346	-33.12	-13	-20.12	-47.19	-38.16	3.03	8.07	H	Pass
4180	-32.53	-13	-19.53	-49	-39.22	2.52	9.21	H	Pass
5015	-40.74	-13	-27.74	-58.75	-48.34	3.1	10.70	H	Pass
5855	-35.16	-13	-22.16	-56.82	-42.55	2.92	10.31	H	Pass
6690	-42.25	-13	-29.25	-67.25	-50.02	3.38	11.15	H	Pass

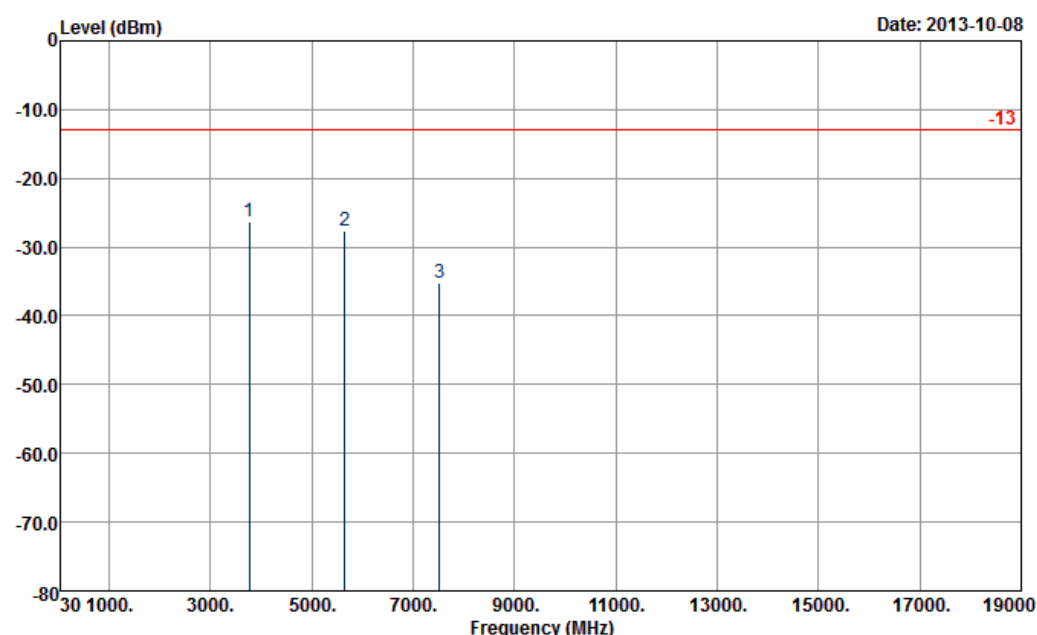
Band :	GSM850	Temperature :	21~24°C
Test Mode :	EDGE class 8 Link (8PSK)	Relative Humidity :	51~53%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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

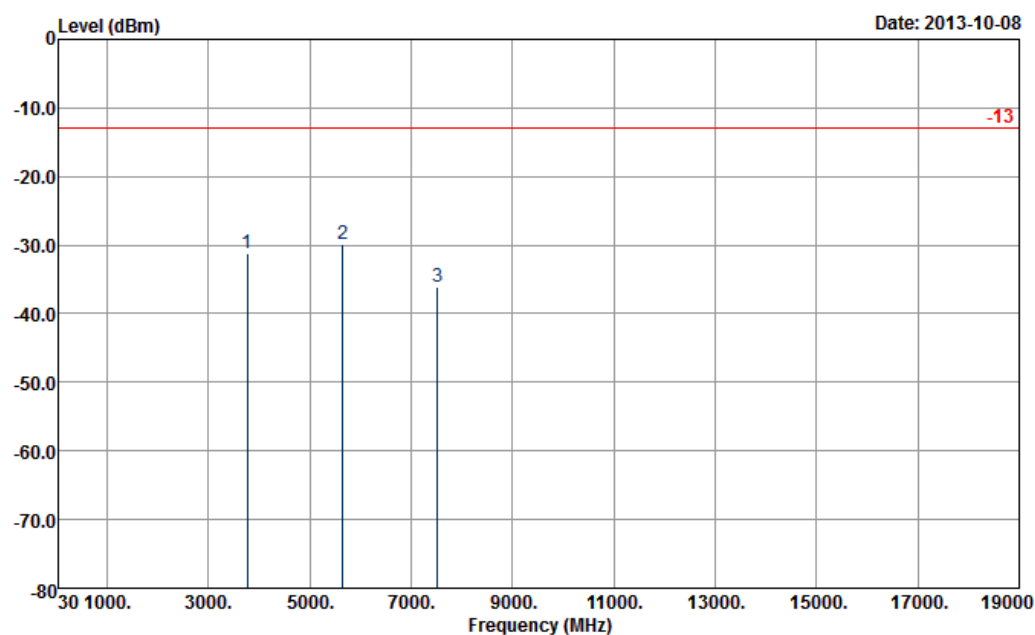
Frequency (MHz)	ERP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
1672	-31.48	-13	-18.48	-42.88	-35.35	1.62	5.49	V	Pass
2509	-33.29	-13	-20.29	-47.31	-37.41	2.1	6.22	V	Pass
3346	-35.52	-13	-22.52	-51.21	-40.56	3.03	8.07	V	Pass
4180	-34.59	-13	-21.59	-52.02	-41.28	2.52	9.21	V	Pass
5015	-44.51	-13	-31.51	-62.66	-52.11	3.1	10.70	V	Pass
5855	-32.61	-13	-19.61	-54.18	-40	2.92	10.31	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.		



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	-26.37	-13	-13.37	-41.66	-32.67	2.51	8.81	H	Pass
5640	-27.62	-13	-14.62	-48.56	-35.33	2.99	10.70	H	Pass
7520	-35.22	-13	-22.22	-62.6	-43.75	3.59	12.12	H	Pass

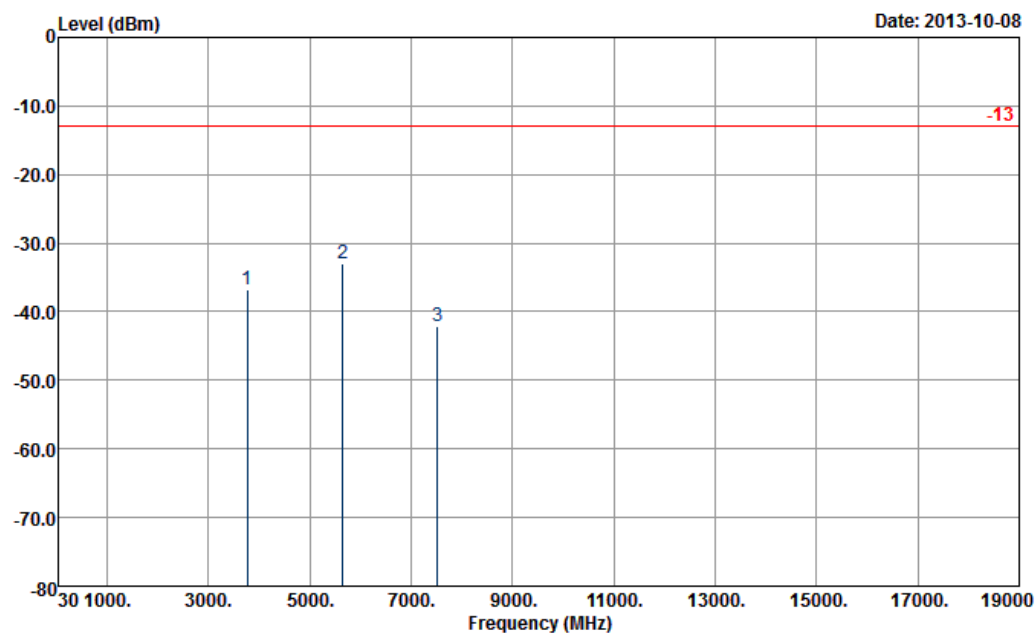
Band :	GSM1900	Temperature :	21~24°C
Test Mode :	GPRS class 8 Link (GMSK)	Relative Humidity :	51~53%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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

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	-31.12	-13	-18.12	-47.87	-37.42	2.51	8.81	V	Pass
5640	-29.97	-13	-16.97	-50.59	-37.68	2.99	10.70	V	Pass
7520	-36.10	-13	-23.10	-63.27	-44.63	3.59	12.12	V	Pass

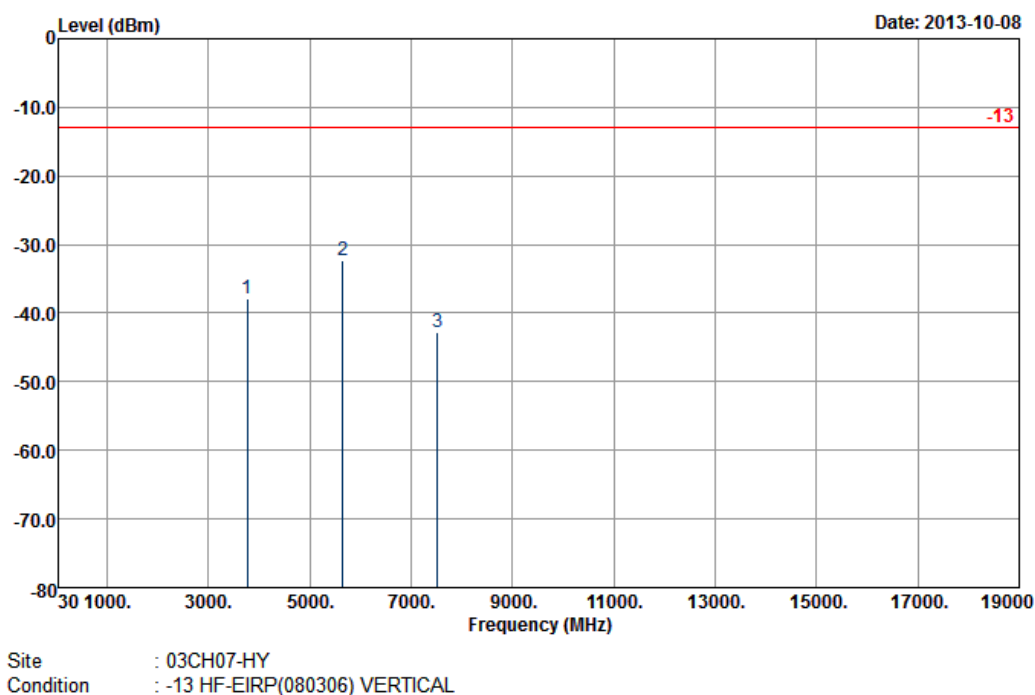
Band :	GSM1900	Temperature :	21~24°C
Test Mode :	EDGE class 8 Link (8PSK)	Relative Humidity :	51~53%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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

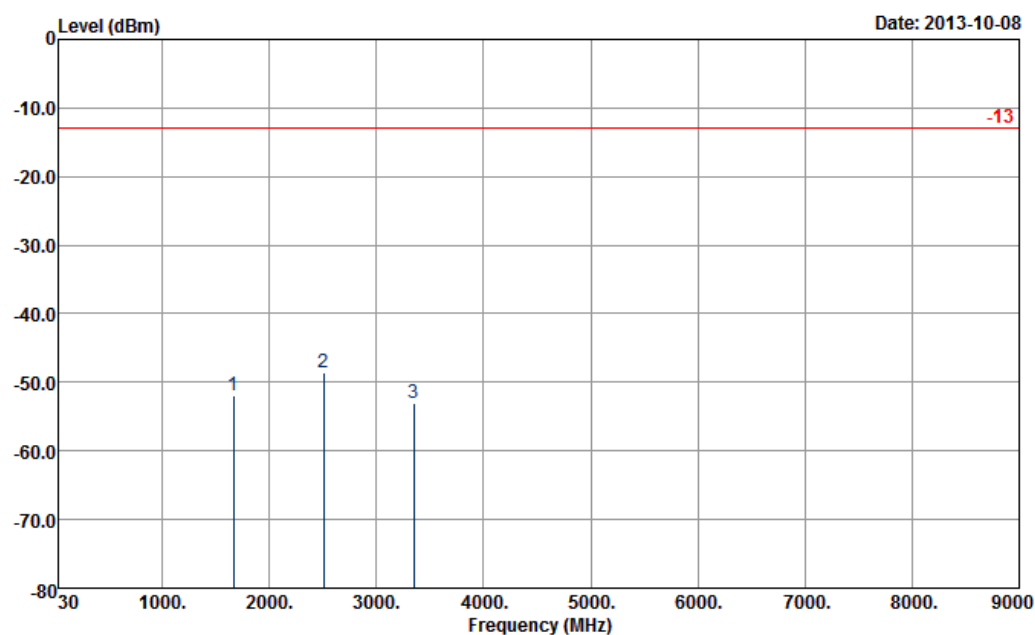
Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3760	-36.68	-13	-23.68	-52.05	-42.98	2.51	8.81	H	Pass
5640	-33.05	-13	-20.05	-53.98	-40.76	2.99	10.70	H	Pass
7520	-42.05	-13	-29.05	-69.54	-50.58	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	-37.82	-13	-24.82	-54.29	-44.12	2.51	8.81	V	Pass
5640	-32.32	-13	-19.32	-53.18	-40.03	2.99	10.70	V	Pass
7520	-42.71	-13	-29.71	-69.78	-51.24	3.59	12.12	V	Pass

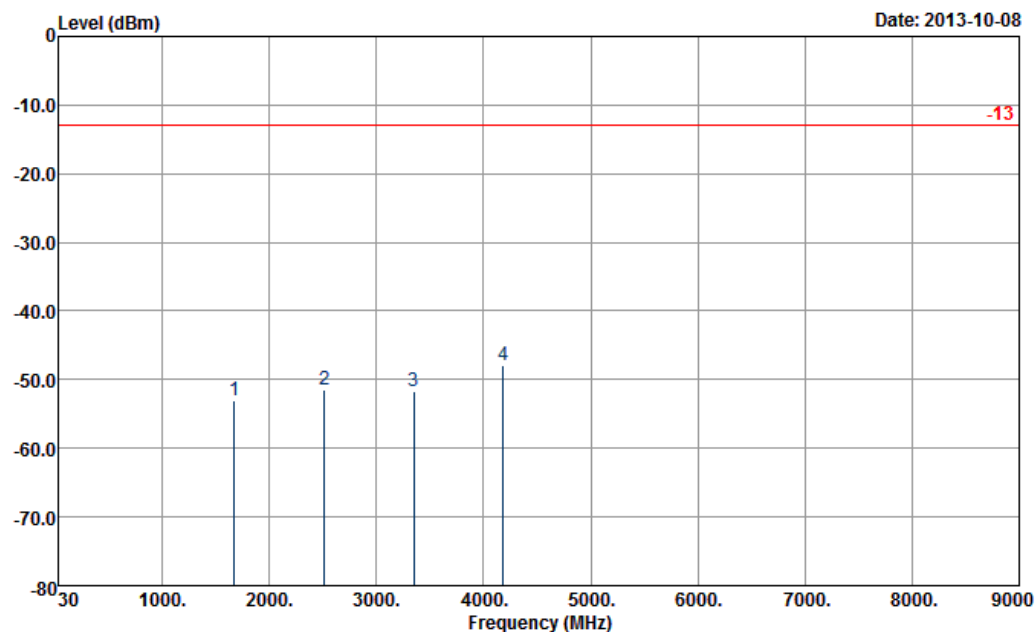
Band :	WCDMA Band V	Temperature :	21~24°C
Test Mode :	RMC 12.2Kbps Link (QPSK)	Relative Humidity :	51~53%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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

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
1669	-51.87	-13	-38.87	-60.89	-55.74	1.62	5.49	H	Pass
2506	-48.67	-13	-35.67	-61.95	-52.79	2.1	6.22	H	Pass
3346	-53.08	-13	-40.08	-67.38	-58.12	3.03	8.07	H	Pass

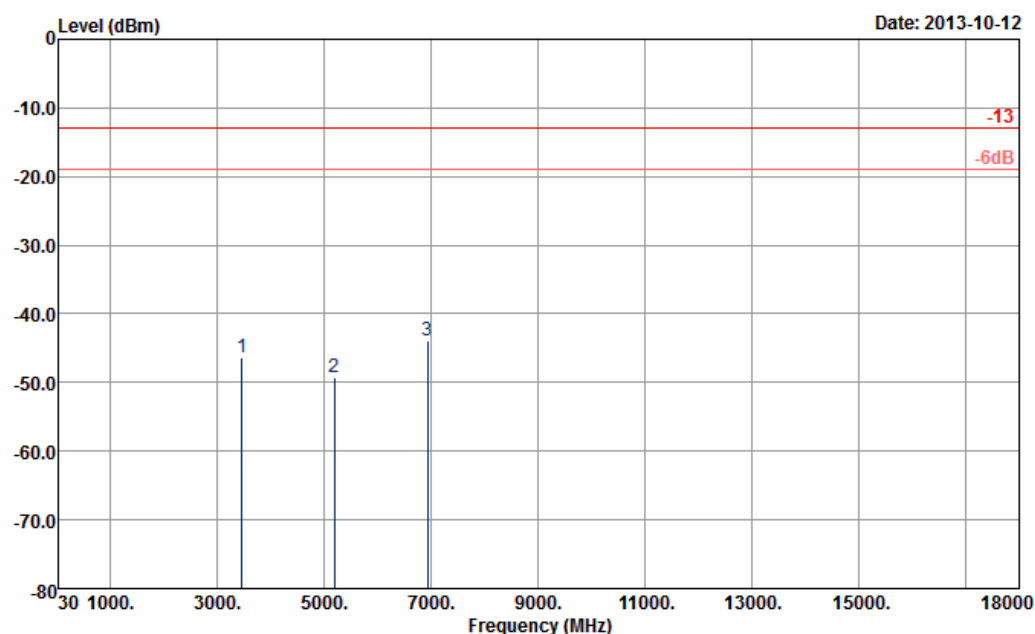
Band :	WCDMA Band V	Temperature :	21~24°C
Test Mode :	RMC 12.2Kbps Link (QPSK)	Relative Humidity :	51~53%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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

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
1675	-53.01	-13	-40.01	-64.2	-56.88	1.62	5.49	V	Pass
2512	-51.43	-13	-38.43	-64.68	-55.55	2.1	6.22	V	Pass
3346	-51.70	-13	-38.70	-67.35	-56.74	3.03	8.07	V	Pass
4180	-47.99	-13	-34.99	-65.29	-54.68	2.52	9.21	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.		

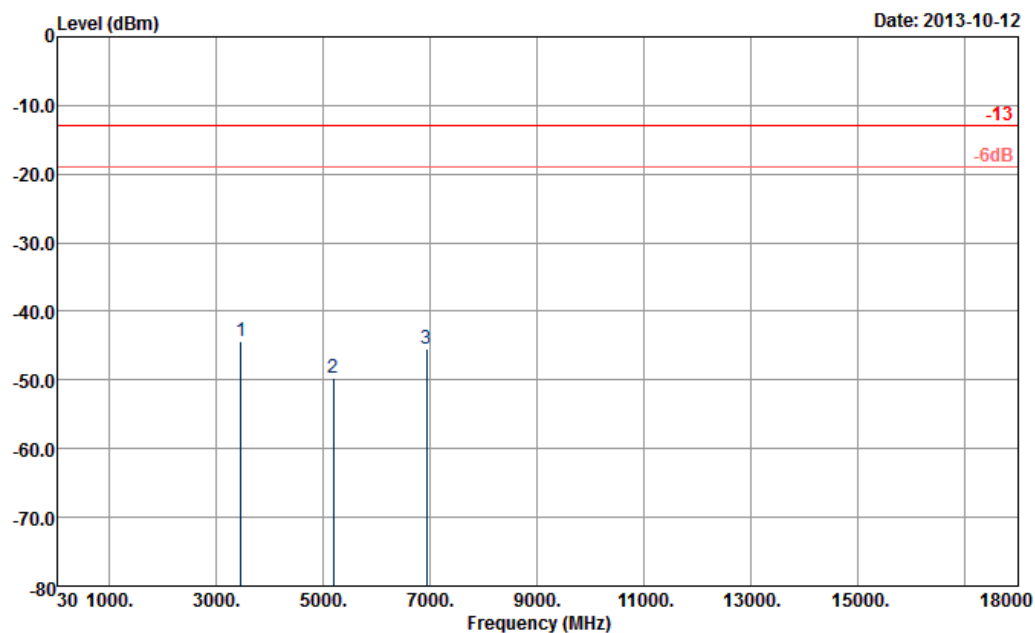


Site : 03CH07-HY
Condition : -13 HF-EIRP(080306) HORIZONTAL

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3465	-46.35	-13	-33.35	-60.47	-50.18	4.48	8.31	H	Pass
5197	-49.25	-13	-36.25	-69.09	-53.89	5.332	9.98	H	Pass
6930	-43.89	-13	-30.89	-70.88	-49.13	6.1	11.34	H	Pass



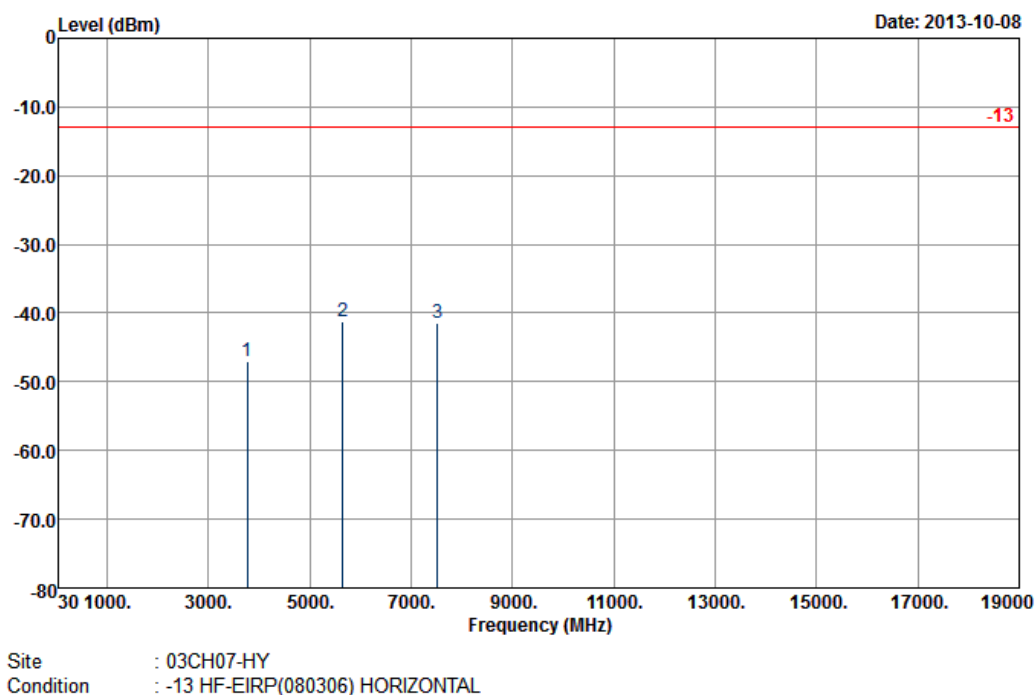
Band :	WCDMA Band IV	Temperature :	21~24°C
Test Mode :	RMC 12.2Kbps Link (QPSK)	Relative Humidity :	51~53%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Over Limit (dB)	SPA Reading (dBm)	S.G. Power (dBm)	TX Cable loss (dB)	TX Antenna Gain (dBi)	Polarization (H/V)	Result
3465	-44.44	-13	-31.44	-60.49	-48.27	4.48	8.31	V	Pass
5197	-49.70	-13	-36.70	-69.54	-54.34	5.332	9.98	V	Pass
6930	-45.50	-13	-32.50	-71.12	-50.74	6.1	11.34	V	Pass

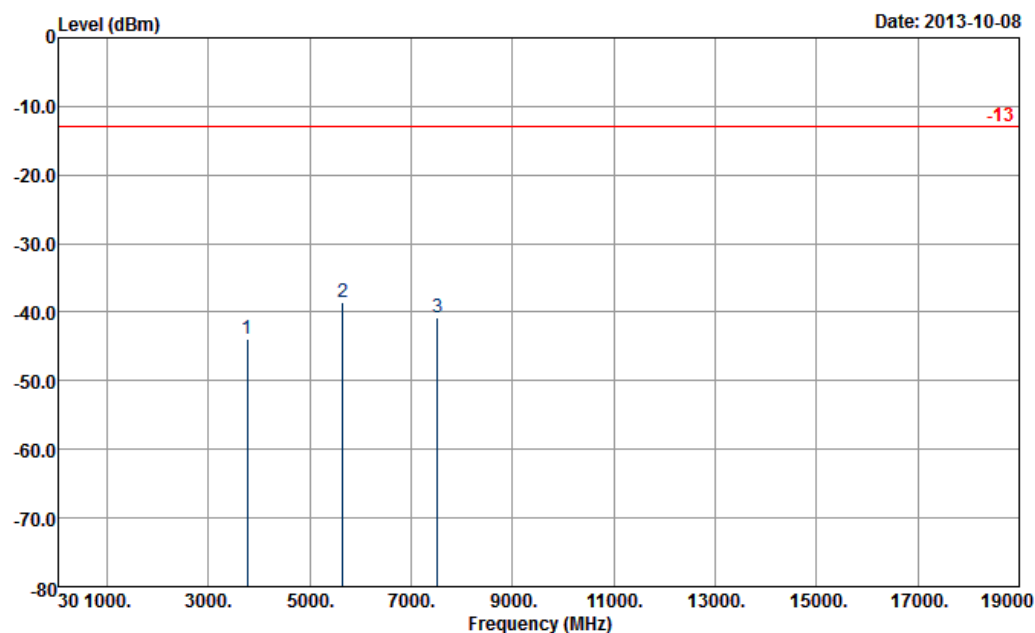
Band :	WCDMA Band II	Temperature :	21~24°C
Test Mode :	RMC 12.2Kbps Link (QPSK)	Relative Humidity :	51~53%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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
3756	-47.09	-13	-34.09	-62.42	-53.39	2.51	8.81	H	Pass
5644	-41.22	-13	-28.22	-62.02	-48.93	2.99	10.70	H	Pass
7520	-41.35	-13	-28.35	-68.61	-49.88	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.		

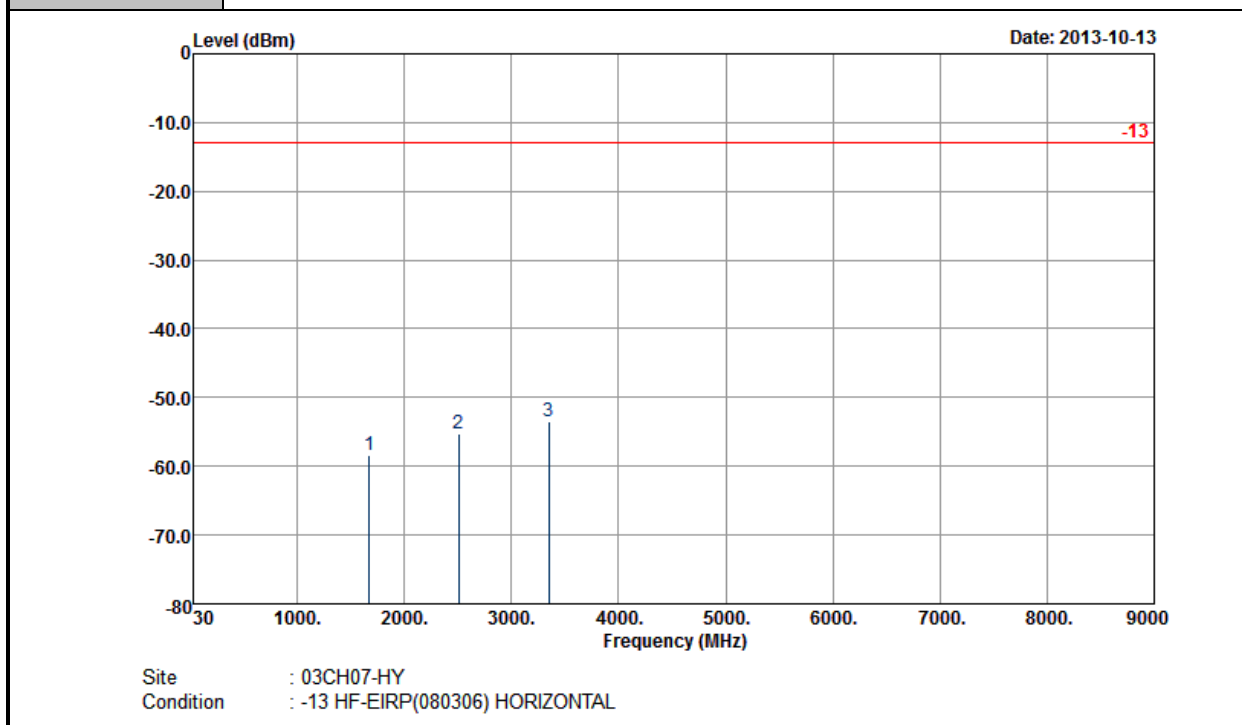


Site : 03CH07-HY
Condition : -13 HF-EIRP(080306) VERTICAL

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
3756	-43.81	-13	-30.81	-60.17	-50.11	2.51	8.81	V	Pass
5644	-38.64	-13	-25.64	-59.4	-46.35	2.99	10.70	V	Pass
7520	-40.68	-13	-27.68	-67.83	-49.21	3.59	12.12	V	Pass

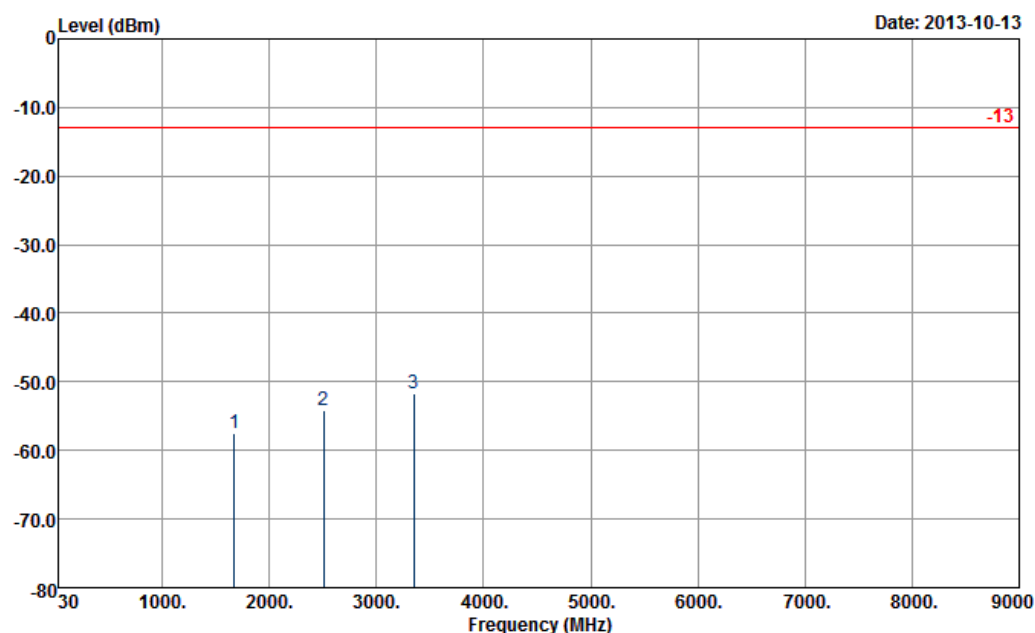


Band :	CDMA2000 BC0	Temperature :	21~24°C
Test Mode :	1xEV-DO Rev. 0 (QPSK)	Relative Humidity :	51~53%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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	-58.39	-13	-45.39	-67.61	-60.11	1.62	5.49	H	Pass
2510	-55.36	-13	-42.36	-68.87	-57.33	2.1	6.22	H	Pass
3346	-53.50	-13	-40.50	-67.82	-56.39	3.03	8.07	H	Pass

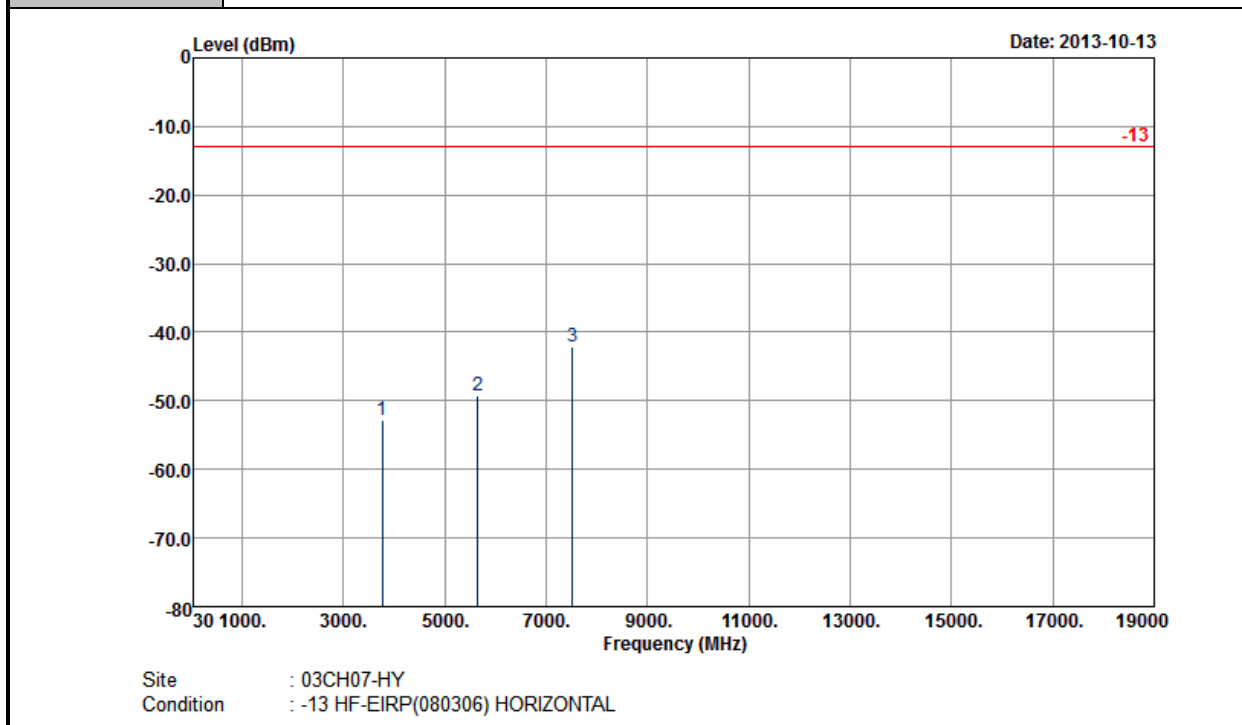
Band :	CDMA2000 BC0	Temperature :	21~24°C
Test Mode :	1xEV-DO Rev. 0 (QPSK)	Relative Humidity :	51~53%
Test Engineer :	Kyle Jhuang	Polarization :	Vertical
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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	-57.42	-13	-44.42	-68.52	-59.14	1.62	5.49	V	Pass
2510	-54.21	-13	-41.21	-68.21	-56.18	2.1	6.22	V	Pass
3346	-51.72	-13	-38.72	-67.33	-54.61	3.03	8.07	V	Pass

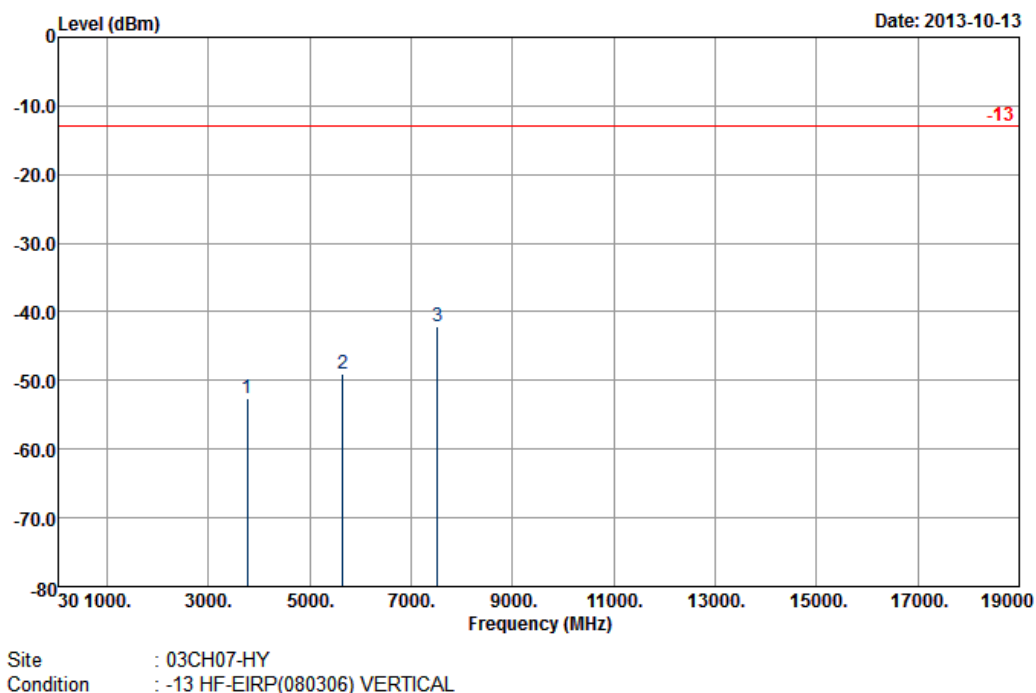


Band :	CDMA2000 BC1	Temperature :	21~24°C
Test Mode :	1xEV-DO Rev. 0 (QPSK)	Relative Humidity :	51~53%
Test Engineer :	Kyle Jhuang	Polarization :	Horizontal
Remark :	Spurious emissions within 30-1000MHz were found more than 20dB below limit line.		



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	-52.71	-13	-39.71	-68.18	-59.01	2.51	8.81	H	Pass
5640	-49.17	-13	-36.17	-70.08	-56.88	2.99	10.70	H	Pass
7520	-42.13	-13	-29.13	-69.47	-50.66	3.59	12.12	H	Pass

Band :	CDMA2000 BC1	Temperature :	21~24°C
Test Mode :	1xEV-DO Rev. 0 (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.		



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	-52.58	-13	-39.58	-68.93	-58.88	2.51	8.81	V	Pass
5640	-49.07	-13	-36.07	-69.88	-56.78	2.99	10.70	V	Pass
7520	-42.16	-13	-29.16	-69.22	-50.69	3.59	12.12	V	Pass

4 List of Measuring Equipments

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	Sep. 05, 2013	Oct. 20, 2013	Conducted (TH02-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP30	101067	9kHz~30GHz	Nov. 30, 2012	Oct. 08, 2013~ Oct. 13, 2013	Nov. 29, 2013	Radiation (03CH07-HY)
Bilog Antenna	Teseq GmbH	CBL6112D	35379	30MHz~2GHz	Mar. 28, 2013	Oct. 08, 2013~ Oct. 13, 2013	Mar. 27, 2014	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	75962	1GHz~18GHz	Aug. 22, 2013	Oct. 08, 2013~ Oct. 13, 2013	Aug. 21, 2014	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	30MHz~1GHz	Feb. 26, 2013	Oct. 08, 2013~ Oct. 13, 2013	Feb. 25, 2014	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~26.5GHz	Dec. 01, 2012	Oct. 08, 2013~ Oct. 13, 2013	Nov. 30, 2013	Radiation (03CH07-HY)
Turn Table	ChainTek	ChainTek 3000	N/A	0 ~ 360 degree	N/A	Oct. 08, 2013~ Oct. 13, 2013	N/A	Radiation (03CH07-HY)
Antenna Mast	ChainTek	ChainTek 3000	N/A	N/A	N/A	Oct. 08, 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
---	------

Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.72
---	------