

FCC Test Report

APPLICANT : Hewlett Packard Company
EQUIPMENT : HP iPAQ KB1
BRAND NAME : HP
MODEL NAME : HSTNH-P21C
FCC ID : B94HHP21C
STANDARD : FCC Part 15 Subpart C §15.247
CLASSIFICATION : Digital Spread Spectrum (DSS)

The product sample received on Jun. 13, 2009 and completely tested on Jun. 29, 2009. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.4-2003 and shown compliance with the applicable technical standards.

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

Reviewed by:



Roy Wu / Manager



SPORTON INTERNATIONAL INC.

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



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SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(b)(1)	A8.4(2)	Number of Channels	≥ 15 Chs	Pass	
3.2	15.247(a)(1)	A8.1(a)	20dB Bandwidth	NA	Pass	-
3.3	15.247(a)(1)	A8.1(b)	Channel Separation	≥ 2/3 of 20 dB BW	Pass	-
3.4	15.247(a)(1)	A8.1(d)	Dwell Time of Each Channel	≤ 0.4 sec in 31.6sec period	Pass	-
3.5	15.247(a)(1)	A8.1(b)	Peak Output Power	≤ 1 W	Pass	-
3.6	15.247(d)	A8.5	Frequency Band Edges	≤ 20 dBc	Pass	-
3.7	15.247(d)	A8.5	Spurious Emission	< 20 dBc	Pass	-
3.8	15.207	Gen 7.2.2	AC Conducted Emission	15.207(a)	Pass	Under limit 5.4 dB at 0.63 MHz
3.9	15.247(d)	A8.5	Transmitter Radiated Emission	15.209(a) & 15.247(d)	Pass	Under limit 3.12 dB at 33.78 MHz
3.10	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-



1 General Description

1.1 Applicant

Hewlett Packard Company
3000 Hanover Street, Palo Alto, CA 94304

1.2 Manufacturer

Pegatron Corporation
5F., No. 76, Ligong St., Beitou Dist., Taipei City 112, Taiwan (R.O.C.)

1.3 Feature of Equipment under Test

Product Feature & Specification	
Equipment	HP iPAQ KB1
Brand Name	HP
Model Name	HSTNH-P21C
FCC ID	B94HHP21C
Tx/Rx Frequency Range	2400 MHz ~ 2483.5 MHz
Number of Channels	79
Carrier Frequency of Each Channel	2402+n*1 MHz; n=0~78
Channel Spacing	1 MHz
Maximum Output Power to Antenna	Bluetooth (1Mbps) : -1.62 dBm (0.69 mW) Bluetooth EDR (2Mbps) : -1.74dBm (0.67 mW) Bluetooth EDR (3Mbps) : -1.95dBm (0.64 mW)
Antenna Type	PIFA Antenna with gain 1 dBi
Antenna Connector Type	N/A
HW Version	EVT2
SW Version	Obsidian_0.21.58.03
Type of Modulation	Bluetooth (1Mbps) : GFSK Bluetooth EDR (2Mbps) : π /4-DQPSK Bluetooth EDR (3Mbps) : 8-DPSK
EUT Stage	Identical Prototype

Remark:

1. For other wireless features of this EUT, test report will be issued separately.
2. This test report recorded only product characteristics and test results of Digital Spread Spectrum (DSS).

List of Accessory:

Specification of Accessory		
AC Adapter 1	Manufacturer	Flextronics
	Brand Name	HP
	Part Number	538745-001
	Power Rating	I/P:100-240Vac, 50-60Hz, 200mA; O/P: 5Vdc, 1A
AC Adapter 2	Manufacturer	Phihong
	Brand Name	HP
	Model Name	PSAA05A-050 (for US) PSAA05N-050 (for Argentina)
	Power Rating	I/P:100-240Vac, 50-60Hz, 200mA; O/P: 5Vdc, 1A
	AC Power Cord Type	1.8 meter shielded cable without ferrite core
Battery 1	Brand Name	HP
	Model Name	HSTNH-T21C-H
	Power Rating	3.7Vdc, 11.3Wh
	Type	Li-ion
Battery 2	Brand Name	HP
	Model Name	HSTNH-T21C-S
	Power Rating	3.7Vdc, 5.7Wh
	Type	Li-ion
Earphone	Brand Name	foster
	Model Name	492854
	Signal Line Type	1.3 meter non-shielded cable without ferrite core
USB Cable	Brand Name	Foxconn
	Model Name	486113-001
	Signal Line Type	1.2 meter shielded cable without ferrite core
LCD Panel	Brand Name	Samsung Mobile Display
	Model Name	AMS250CU01

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. For accessories equipped with this EUT, please refer to the appendix of the external photo.
3. PSAA05A-050 and PSAA05N-050 have the same circuit design. The difference between these models is plug, only PSAA05A-050 (for US) was used for the test.

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1 st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-3273456 / FAX: +886-3-3284978		
Test Site No.	Sporton Site No.		FCC/IC Registration No.
	CO05-HY	03CH06-HY	TW1022/4086B-1

1.5 Applied Standards

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

- ♦ FCC Part 15 Subpart C §15.247
- ♦ FCC Public Notice DA 00-705
- ♦ ANSI C63.4-2003
- ♦ IC RSS-210 Issue 7

Remark:

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B (DoC), recorded in a separate test report.

1.6 Ancillary Equipment List

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	R&S	CMU 200	N/A	N/A	Unshielded, 1.8 m
2.	GPS Station	T&E	GS-50	N/A	N/A	Unshielded, 1.8 m
3.	BT Base Station	Anritsu	8852B	N/A	N/A	Unshielded, 1.8 m
4.	WLAN AP	SMC	SMC-100	HEDWG400 5ACC	N/A	Unshielded, 1.8 m
5.	Bluetooth Earphone	Nokia	BH-100	PYA1YH	N/A	N/A
6.	Notebook	DELL	Vostro 1510	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
7.	i-Pod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
8.	LCD Monitor	Lenovo	6135-AB1	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m

2 Test Configuration of Equipment under Test

2.1 RF Output Power

Preliminary tests were performed in different data rate and recorded the RF output power in the following table:

Channel	Frequency	Bluetooth RF Output Power		
		Data Rate / Modulation		
		GFSK	π /4-DQPSK	8-DPSK
		1Mbps	2Mbps	3Mbps
Ch00	2402MHz	-1.62 dBm	-1.74 dBm	-1.95 dBm
Ch39	2441MHz	-1.79 dBm	-1.80 dBm	-2.08 dBm
Ch78	2480MHz	-1.97 dBm	-1.97 dBm	-2.60 dBm

Remark:

1. The data rate 1Mbps was set for all the test items due to the highest RF output power.
2. The EUT is programmed to transmit signals continuously for all testing.

2.2 Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction (150 kHz to 30 MHz), radiation (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

Pre-scanned tests were conducted to determine the final configuration from all possible combinations.

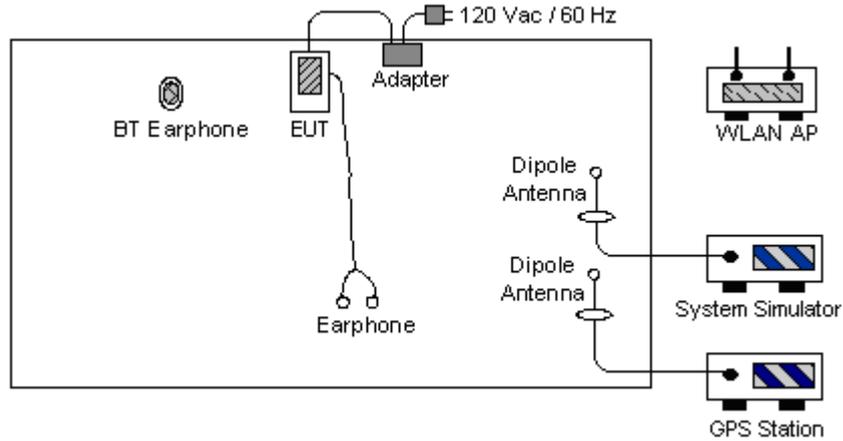
The following tables are showing the test modes as the worst cases and recorded in this report.

Test Cases			
Test Item	Data Rate / Modulation		
	Bluetooth 1Mbps GFSK	Bluetooth EDR 2Mbps π /4-DQPSK	Bluetooth EDR 3Mbps 8-DPSK
Conducted TCs	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz	Mode 4: CH00_2402 MHz Mode 5: CH39_2441 MHz Mode 6: CH78_2480 MHz	Mode 7: CH00_2402 MHz Mode 8: CH39_2441 MHz Mode 9: CH78_2480 MHz
Radiated TCs	Mode 1: CH00_2402 MHz Mode 2: CH39_2441 MHz Mode 3: CH78_2480 MHz	N/A	N/A
AC Conducted Emission	Mode 1: GSM850 Idle + BT Link + WLAN Link + GPS Rx + Battery 1 + Earphone + Adapter 1 Mode 2: GSM850 Idle + BT Link + WLAN Link + GPS Rx + Battery 2 + Earphone + Adapter 2 Mode 3: WCDMA Band V Idle + BT Link + WLAN Link + GPS Rx + Earphone + USB Link + Battery 2		
Remark: <ol style="list-style-type: none"> 1. The worst case of conducted TCs is Bluetooth 1Mbps, only the test data of these modes was reported. 2. The worst cases of radiated emission were Bluetooth 1Mbps Tx modes (with adapter 2, battery 2, and earphone); only the test data of these modes were reported. 3. The worst case of conducted emission is mode 3; only the test data of this mode was reported. 			

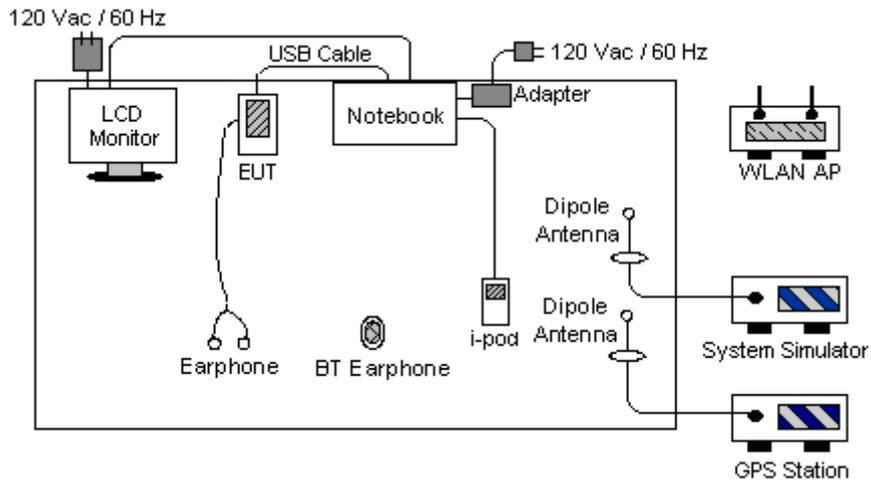
2.3 Connection Diagram of Test System

<Conducted Emission>

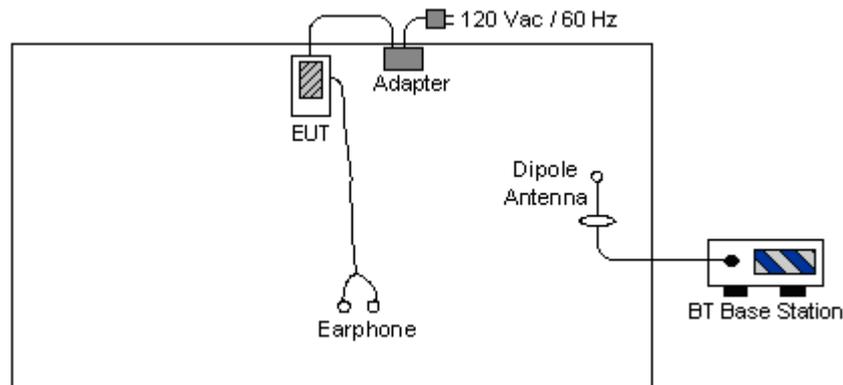
EUT with Adapter Mode



EUT with USB Link Mode



<Radiated Emission>





2.4 RF Utility

For Bluetooth function, the RF utility, "EnterDUTMode" was installed in EUT which was programmed in order to make the EUT into the engineering modes to contact with BT base station for transmitting and receiving signals continuously.

3 Test Result

3.1 Number of Channel Measurement

3.1.1 Limits of Number of Hopping Frequency

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

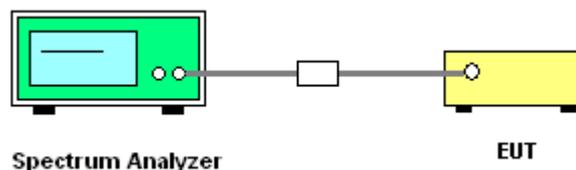
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedure

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The modulation types of EUT are irrelevant to number of hopping channels deviation.
4. The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:
Span = the frequency band of operation; RBW \geq 1% of the span; VBW \geq RBW; Sweep = auto;
Detector function = peak; Trace = max hold.
5. The number of hopping frequency used is defined as the device has the numbers of total channel.

3.1.4 Test Setup

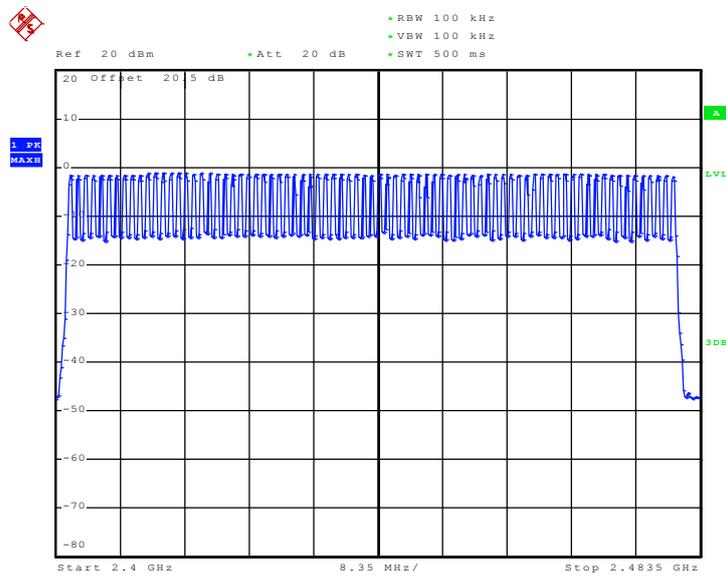




3.1.5 Test Result of Number of Hopping Frequency

Test Mode :	Mode 1~3	Temperature :	23~24°C
Test Engineer :	Eric Hum	Relative Humidity :	44~45%
Number of Hopping Channels (Channel)		Limits (Channel)	Pass/Fail
79		> 15	Pass

Number of Hopping Channel Plot on Channel 00 - 78



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3.2 20dB Bandwidth Measurement

3.2.1 Limit of 20dB Bandwidth

N/A

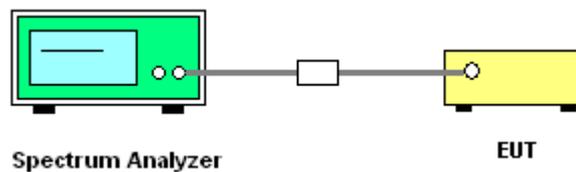
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The EUT should be transmitting at its maximum data rate as the worst cases.
4. Use the following spectrum analyzer settings:
Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel;
RBW \geq 1% of the 20 dB bandwidth; VBW \geq RBW; Sweep = auto; Detector function = peak;
Trace = max hold.
5. The marker-delta reading at this point is the 20 dB bandwidth of the emission.

3.2.4 Test Setup



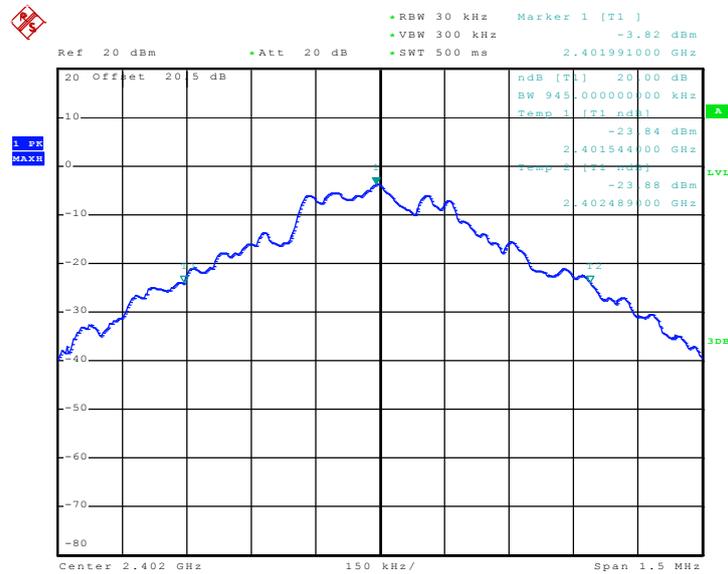


3.2.5 Test Result of 20dB Bandwidth

Test Mode :	Mode 1, 2, 3	Temperature :	23~24°C
Test Engineer :	Eric Hum	Relative Humidity :	44~45%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	0.945
39	2441	0.942
78	2480	0.939

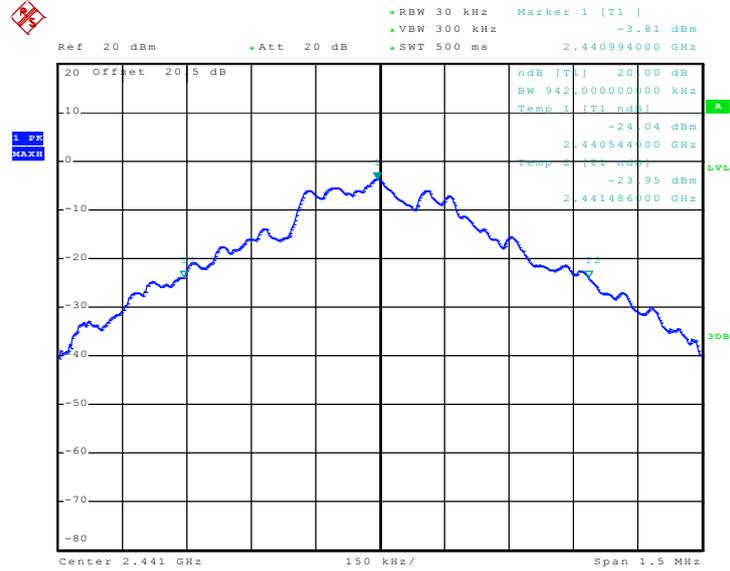
20 dB Bandwidth Plot on Channel 00



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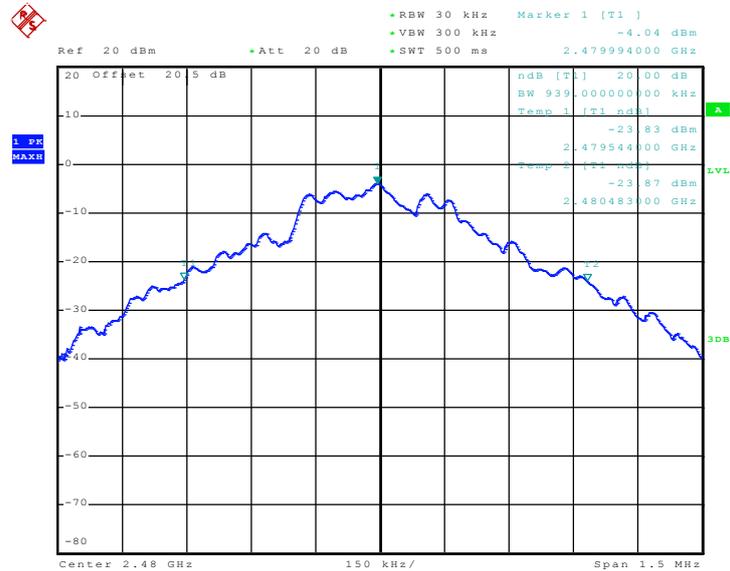


20 dB Bandwidth Plot on Channel 39



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20 dB Bandwidth Plot on Channel 78



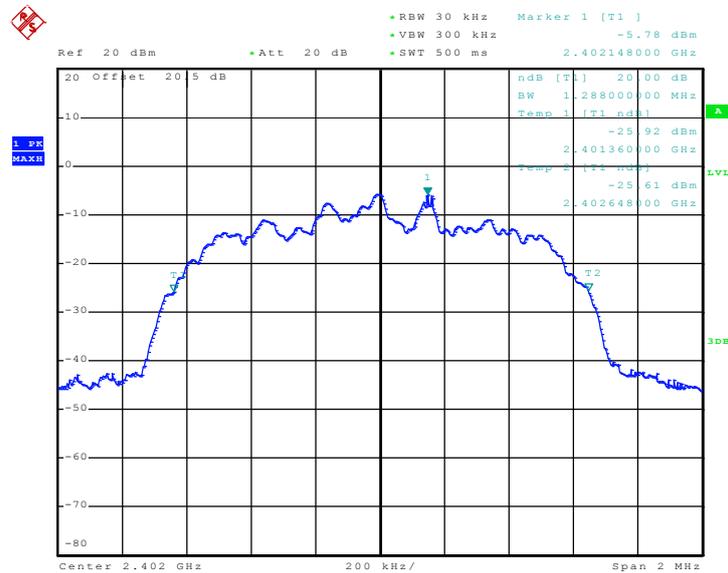
Date: 19.JUN.2009 19:34:42



Test Mode :	Mode 4, 5, 6	Temperature :	23~24°C
Test Engineer :	Eric Hum	Relative Humidity :	44~45%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.288
39	2441	1.288
78	2480	1.288

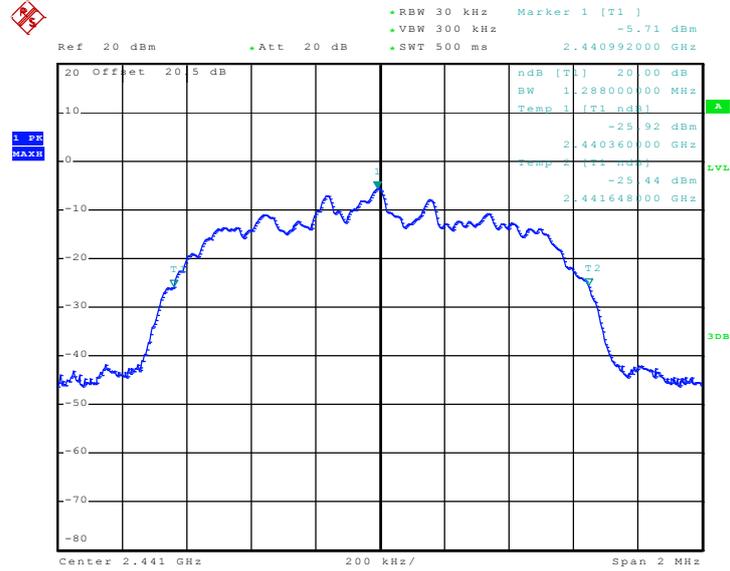
20 dB Bandwidth Plot on Channel 00



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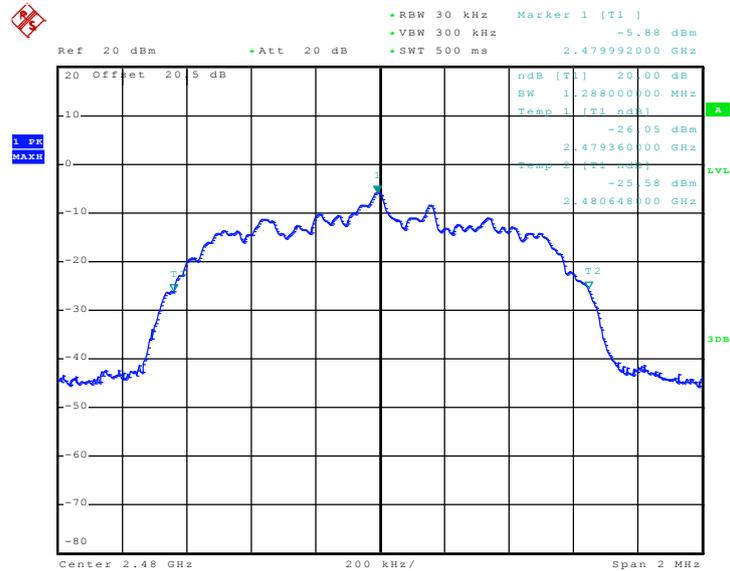


20 dB Bandwidth Plot on Channel 39



Date: 19.JUN.2009 19:35:58

20 dB Bandwidth Plot on Channel 78



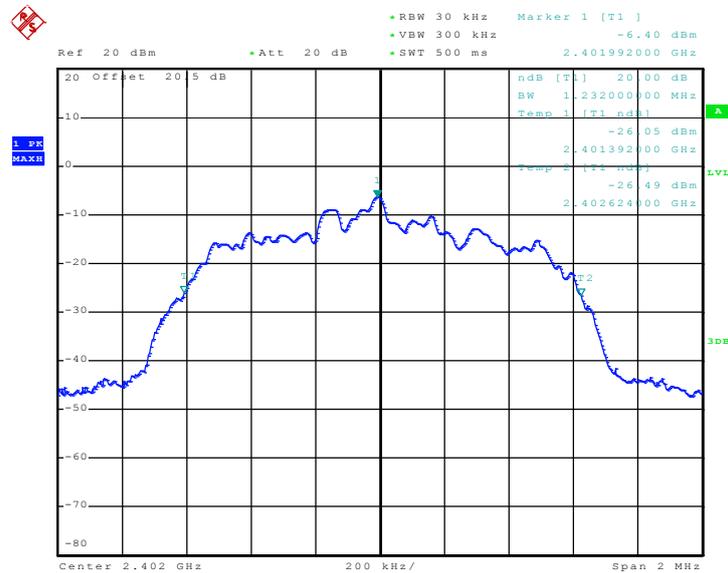
Date: 19.JUN.2009 19:36:21



Test Mode :	Mode 7, 8, 9	Temperature :	23~24°C
Test Engineer :	Eric Hum	Relative Humidity :	44~45%

Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2402	1.232
39	2441	1.236
78	2480	1.236

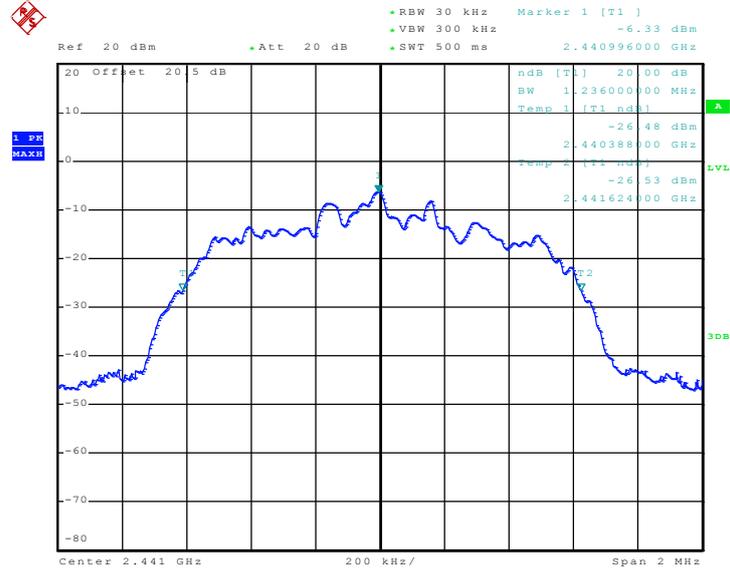
20 dB Bandwidth Plot on Channel 00



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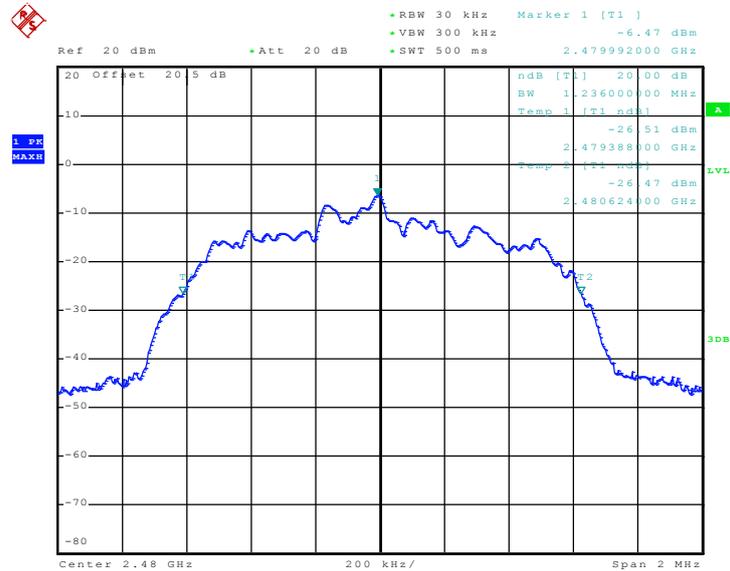


20 dB Bandwidth Plot on Channel 39



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20 dB Bandwidth Plot on Channel 78



Date: 19.JUN.2009 19:37:29

3.3 Hopping Channel Separation Measurement

3.3.1 Limit of Hopping Channel Separation

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

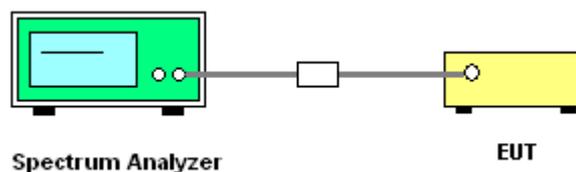
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. Please refer FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The EUT should be transmitting at its maximum data rate as the worst cases.
4. Use the following spectrum analyzer settings:
Span = wide enough to capture the peaks of two adjacent channels; RBW \geq 1% of the span;
VBW \geq RBW; Sweep = auto; Detector function = peak; Trace = max hold.
5. Use the marker-delta function to determine the separation between the peaks of the adjacent channels.

3.3.4 Test Setup



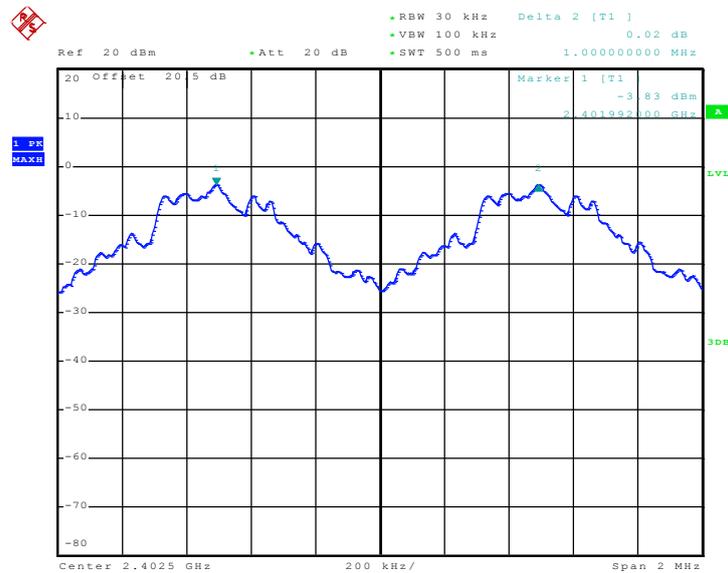


3.3.5 Test Result of Hopping Channel Separation

Test Mode :	Mode 1, 2, 3	Temperature :	23~24°C
Test Engineer :	Eric Hum	Relative Humidity :	44~45%

Channel	Frequency (MHz)	Frequency Separation (MHz)	(2/3 of 20dB BW) Limits (MHz)	Pass/Fail
00	2402	1.000	0.630	Pass
39	2441	1.000	0.628	Pass
78	2480	1.000	0.626	Pass

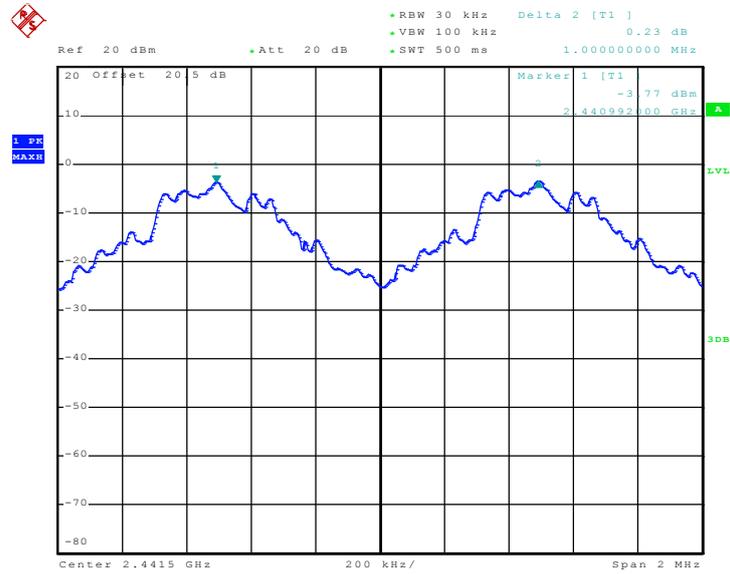
Channel Separation Plot on Channel 00 - 01



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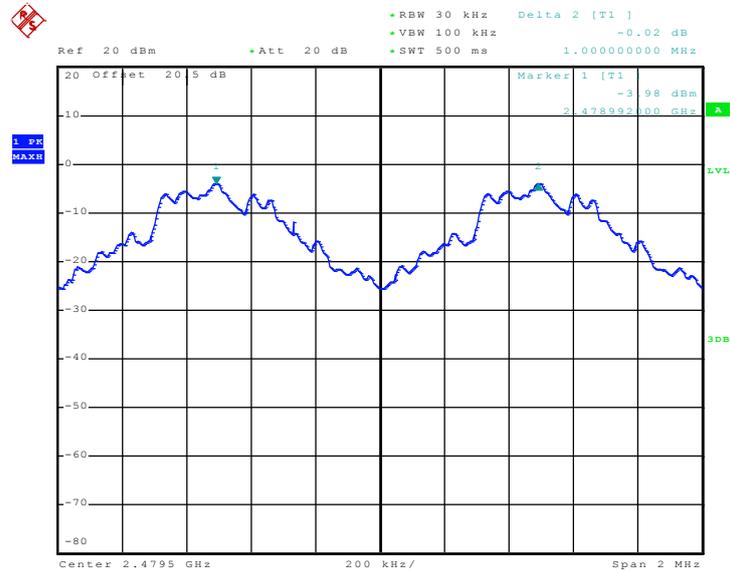


Channel Separation Plot on Channel 39 - 40



Date: 19.JUN.2009 19:43:25

Channel Separation Plot on Channel 77 - 78



Date: 19.JUN.2009 19:43:44

3.4 Dwell Time Measurement

3.4.1 Limit of Dwell Time

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

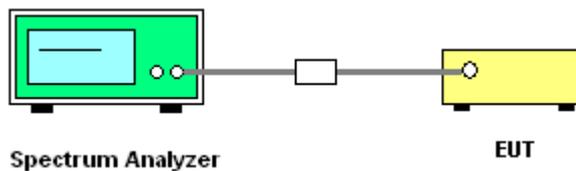
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedures

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. The EUT should be transmitting at its maximum data rate as the worst cases.
4. The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:
Span = zero span, centered on a hopping channel; RBW = 1 MHz; VBW ≥ RBW; Sweep = as necessary to capture the entire dwell time per hopping channel; Detector function = peak; Trace = max hold.
5. Use the marker-delta function to calculate the dwell time.

3.4.4 Test Setup



3.4.5 Test Result of Dwell Time

Test Mode :	Mode 2	Temperature :	23~24°C
Test Engineer :	Eric Hum	Relative Humidity :	44~45%

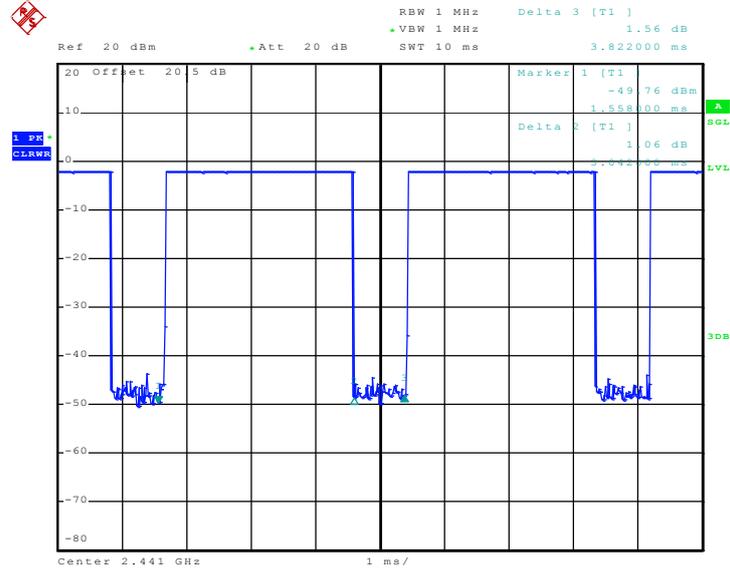
Package Mode	Average Hopping Channel	Package Transfer Time (usec)	Dwell Time (sec)	Limits (sec)	Pass/Fail
DH5	3.80	3042.00	0.365	0.4	Pass

Remark:

1. Dwell Time=79(channels) x 0.4(s) x average hopping channel x package transfer time
2. 79 channels come from the Hopping Channel number.
3. Average Hopping Channel = hops/sweep time
4. t: Package Transfer Time(us)

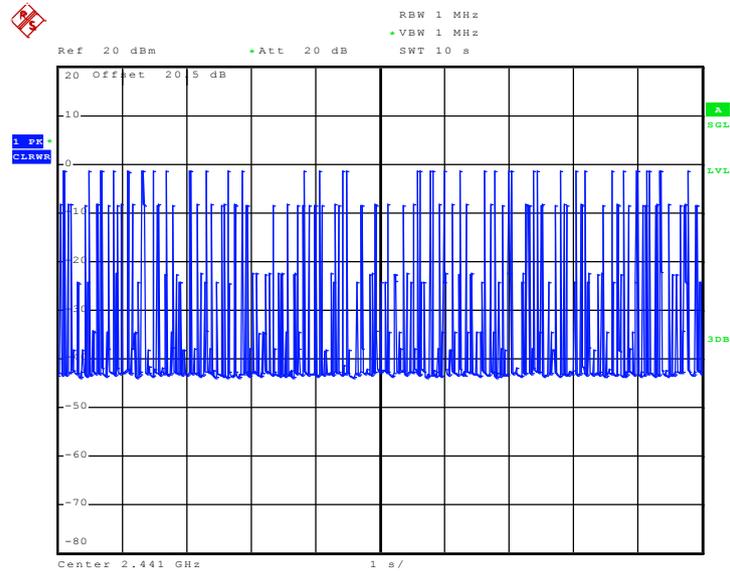


DH5 Dwell Time (One Pulse) Plot on Channel 39



Date: 18.JUN.2009 19:50:24

DH5 Dwell Time (Count Pulses) Plot on Channel 39



Date: 19.JUN.2009 19:59:29

3.5 Peak Output Power Measurement

3.5.1 Limit of Peak Output Power

Frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels: 1W (30 dBm).

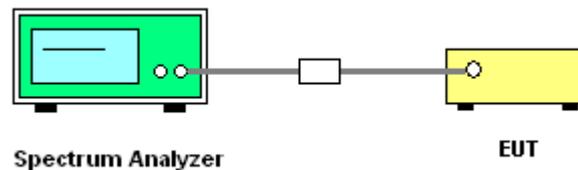
3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

3.5.3 Test Procedures

1. The testing follows FCC Public Notice DA 00-705 Measurement Guidelines.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.

3.5.4 Test Setup



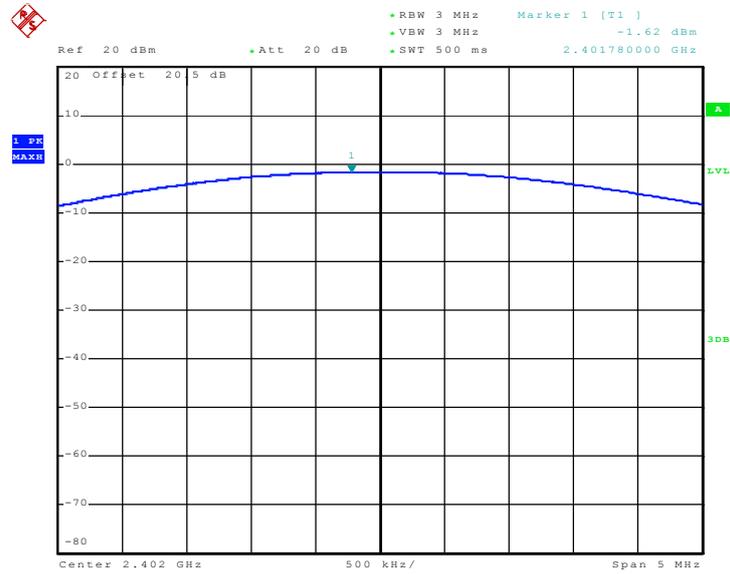
3.5.5 Test Result of Peak Output Power

Test Mode :	Mode 1, 2, 3	Temperature :	23~24°C
Test Engineer :	Eric Hum	Relative Humidity :	44~45%

Channel	Frequency (MHz)	RF Power (dBm)		
		GFSK	Max. Limits (dBm)	Pass/Fail
		1 Mbps		
00	2402	-1.62	30	Pass
39	2441	-1.79	30	Pass
78	2480	-1.97	30	Pass

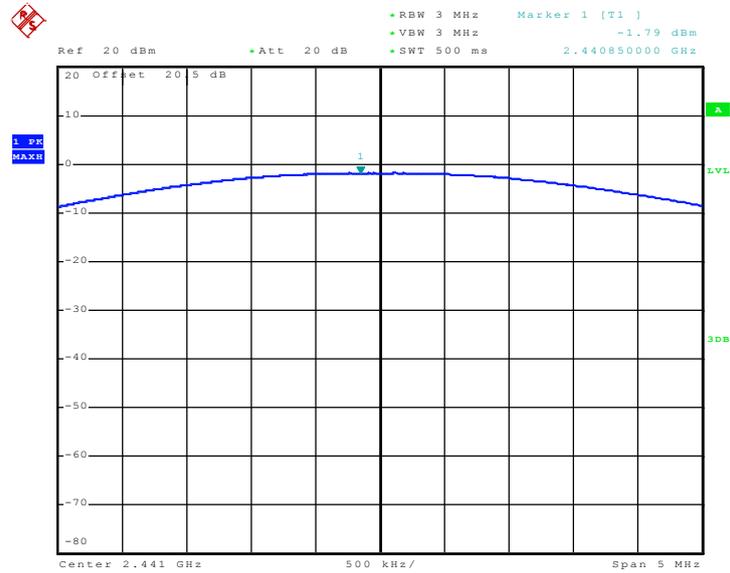


Peak Output Power Plot on Channel 00



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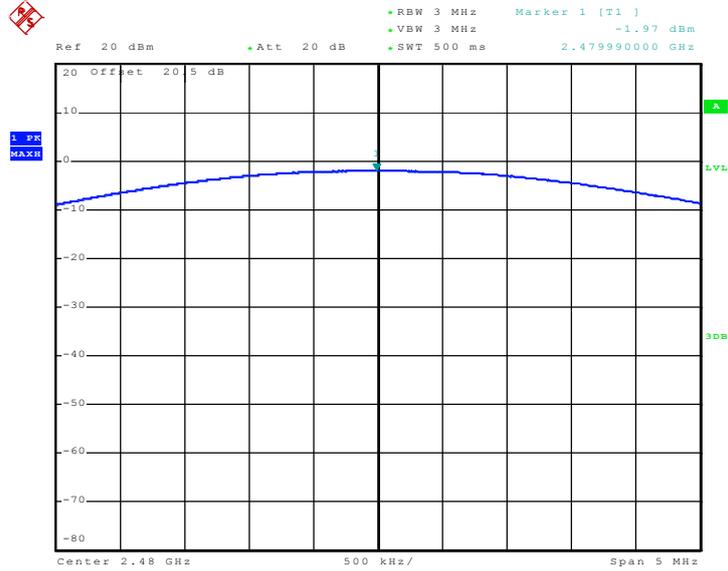
Peak Output Power Plot on Channel 39



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Peak Output Power Plot on Channel 78



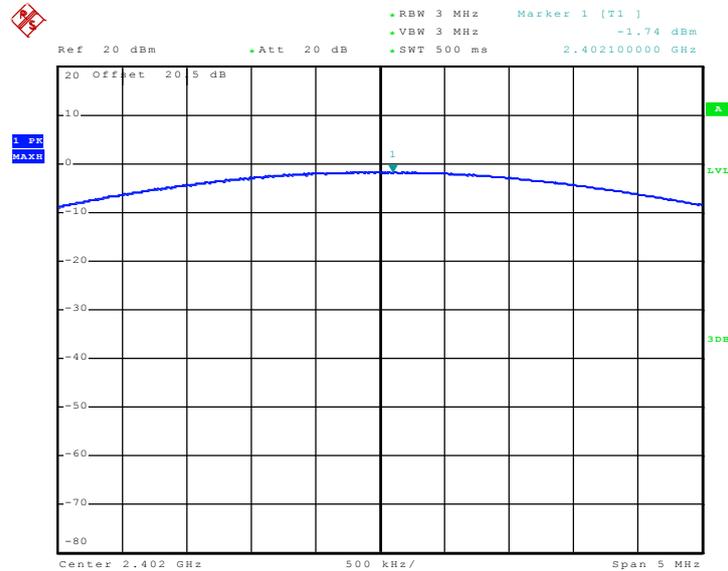
Date: 18.JUN.2009 19:42:35



Test Mode :	Mode 4, 5, 6	Temperature :	23~24°C
Test Engineer :	Eric Hum	Relative Humidity :	44~45%

Channel	Frequency (MHz)	RF Power (dBm)		
		π /4-DQPSK	Max. Limits (dBm)	Pass/Fail
		2 Mbps		
00	2402	-1.74	30	Pass
39	2441	-1.80	30	Pass
78	2480	-1.97	30	Pass

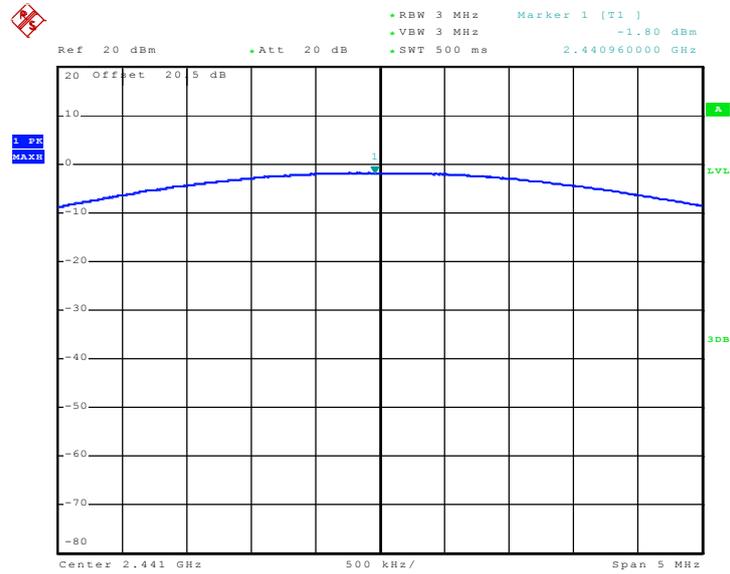
Peak Output Power Plot on Channel 00



Date: 18.JUN.2009 19:37:36

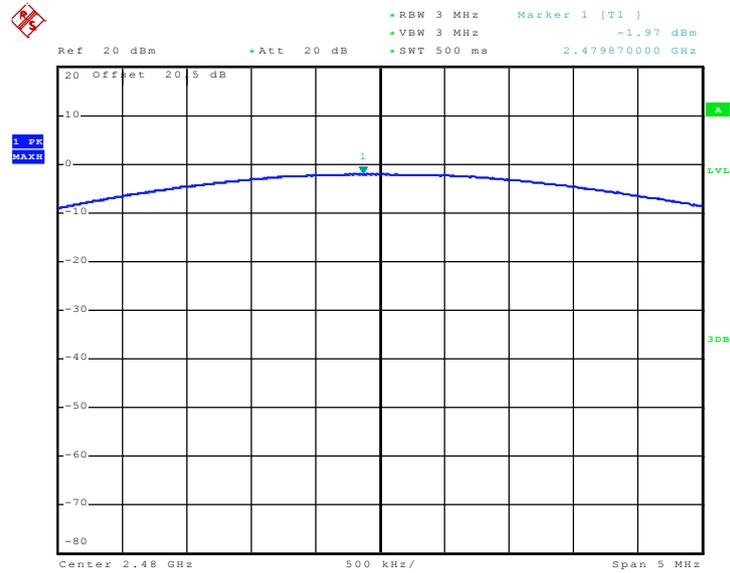


Peak Output Power Plot on Channel 39



Date: 18.JUN.2009 19:41:22

Peak Output Power Plot on Channel 78



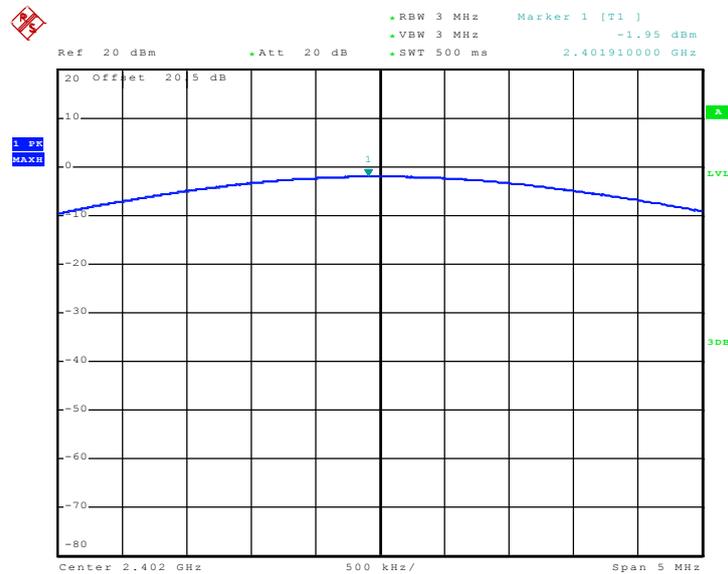
Date: 18.JUN.2009 19:43:41



Test Mode :	Mode 7, 8, 9	Temperature :	23~24°C
Test Engineer :	Eric Hum	Relative Humidity :	44~45%

Channel	Frequency (MHz)	RF Power (dBm)		
		8-DPSK	Max. Limits (dBm)	Pass/Fail
		3 Mbps		
00	2402	-1.95	30	Pass
39	2441	-2.08	30	Pass
78	2480	-2.60	30	Pass

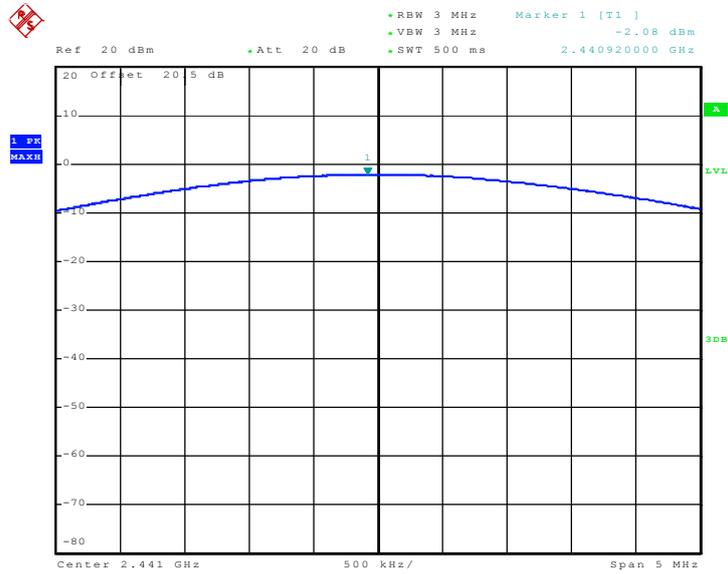
Peak Output Power Plot on Channel 00



Date: 18.JUN.2009 19:37:47

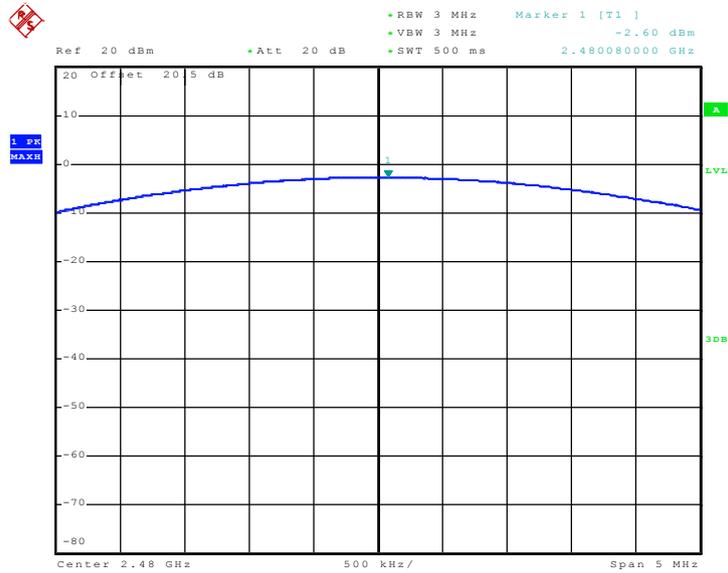


Peak Output Power Plot on Channel 39



Date: 18.JUN.2009 19:41:08

Peak Output Power Plot on Channel 78



Date: 18.JUN.2009 19:43:57

3.6 Band Edges Measurement

3.6.1 Limit of Band Edges

In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.

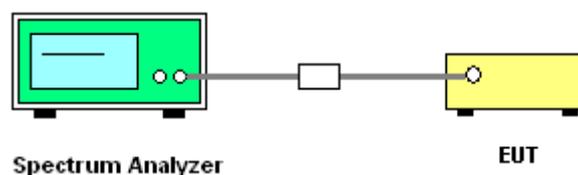
3.6.2 Measuring Instruments

See list of measuring instruments of this test report.

3.6.3 Test Procedures

1. The testing follows the guidelines in ANSI C63.4-2003 and FCC Public Notice DA 00-705 Measurement Guidelines.
2. RF antenna conducted test: Set RBW = 100 kHz, Video bandwidth (VBW) > RBW, scan up through 10th harmonic. Band edge emissions must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. Note: If the device complies with the use of power option 2 the attenuation under this paragraph shall be 30 dB instead of 20 dB.
3. Radiated emission test: Applies to band edge emissions that fall in the restricted bands listed in FCC Section 15.205. The maximum permitted average field strength is listed in FCC Section 15.209. A pre-amp is necessary for this measurement. For measurements above 1 GHz, set RBW = 1MHz, VBW = 10 Hz, Sweep: Auto. If the emission is pulsed, modify the unit for continuous operation; use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation. See FCC Section 15.35(b) and (c).

3.6.4 Test Setup





3.6.5 Test Result of Radiated Band Edges

Test Mode :	Mode 1	Temperature :	24~27°C
Test Channel :	00	Relative Humidity :	47~52%
		Test Engineer :	Mac Lin

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2344.58	44.58	-29.42	74.00	45.08	31.91	3.86	36.27	103	326	Peak
2344.58	30.89	-23.11	54.00	31.39	31.91	3.86	36.27	103	326	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2311.33	44.17	-29.83	74.00	44.74	31.87	3.82	36.26	149	316	Peak
2311.33	30.93	-23.07	54.00	31.50	31.87	3.82	36.26	149	316	Average

Test Mode :	Mode 3	Temperature :	24~27°C
Test Channel :	78	Relative Humidity :	47~52%
		Test Engineer :	Mac Lin

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.50	56.16	-17.84	74.00	56.33	32.08	4.05	36.30	100	318	Peak
2483.50	47.28	-6.72	54.00	47.45	32.08	4.05	36.30	100	318	Average

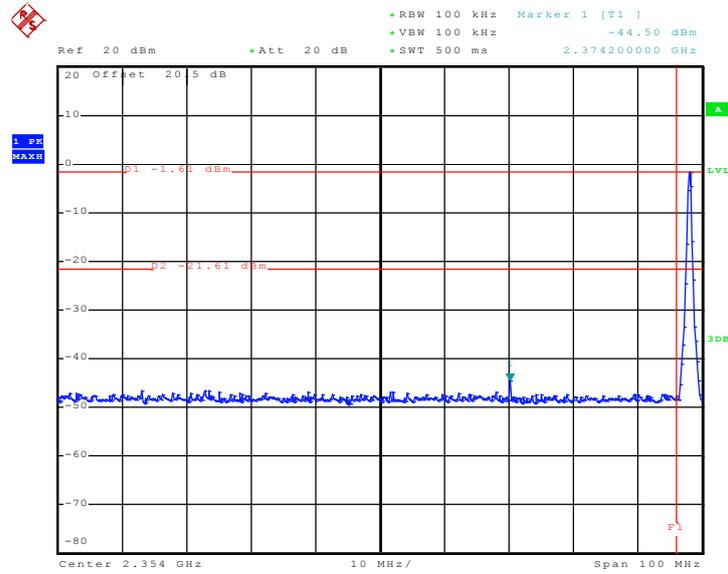
ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.50	55.99	-18.01	74.00	56.16	32.08	4.05	36.30	147	306	Peak
2483.50	46.06	-7.94	54.00	46.23	32.08	4.05	36.30	147	306	Average



3.6.6 Test Result of Conducted Band Edges

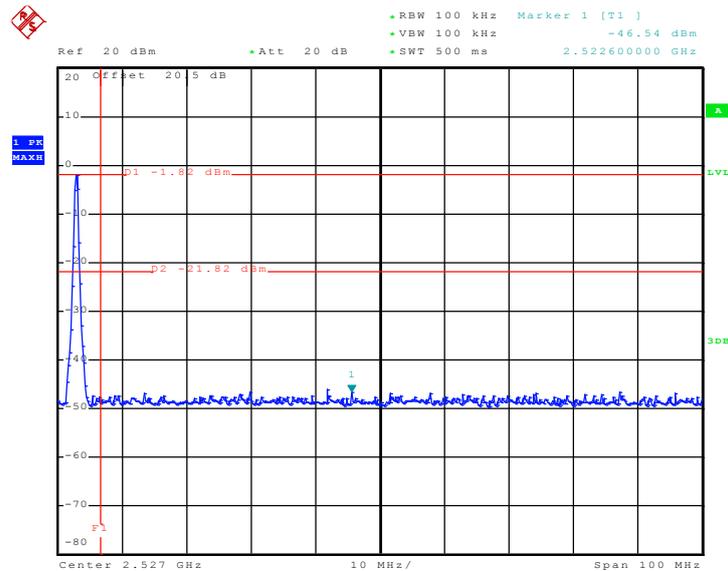
Test Mode :	Mode 1 and 3	Temperature :	23~24°C
Test Channel :	00 and 78	Relative Humidity :	44~45%
		Test Engineer :	Eric Hum

Low Band Edge Plot on Channel 00



Date: 19.JUN.2009 19:38:51

High Band Edge Plot on Channel 78



Date: 19.JUN.2009 19:40:56

3.7 Spurious Emission Measurement

3.7.1 Limit of Spurious Emission Measurement

All harmonics/spurs must be at least 20 dB down from the highest emission level within the authorized band.

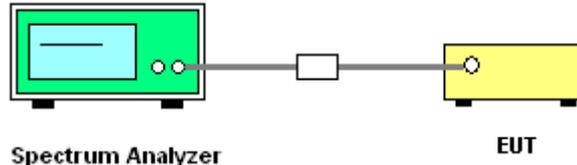
3.7.2 Measuring Instruments

See list of measuring instruments of this test report.

3.7.3 Test Procedure

1. The transmitter output was connected to the spectrum analyzer via a low lose cable.
2. Set RBW = 100 kHz, Video bandwidth (VBW) \geq RBW, scan up through 10th harmonic. All harmonics/spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.

3.7.4 Test Setup

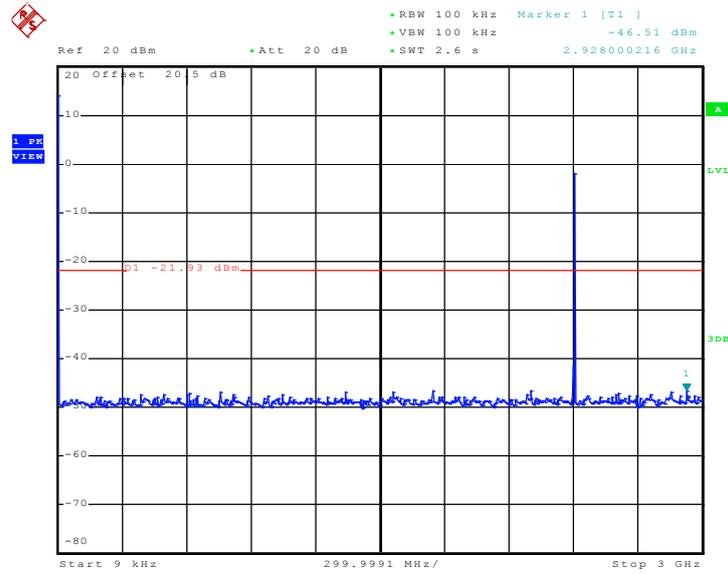




3.7.5 Test Result

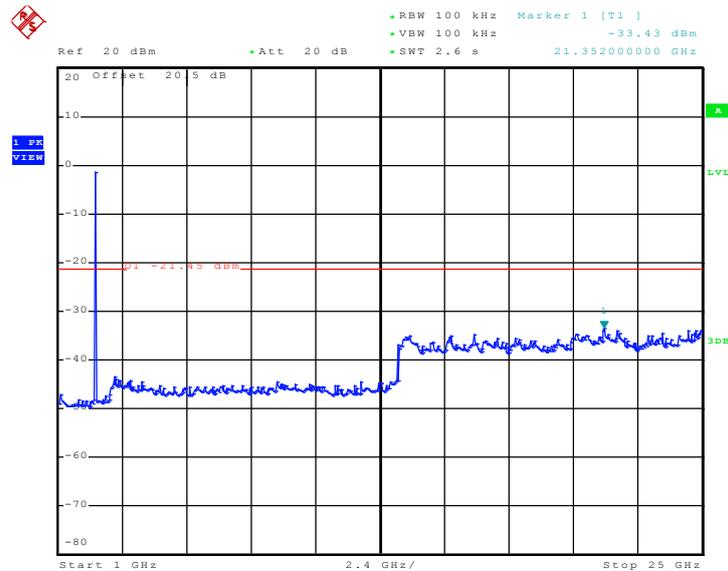
Test Mode :	Mode 1	Temperature :	23~24°C
Test Channel :	00	Relative Humidity :	44~45%
		Test Engineer :	Eric Hum

Conducted Spurious Emission Plot between 9k-3G



Date: 19.JUN.2009 20:46:50

Conducted Spurious Emission Plot between 1G-25G

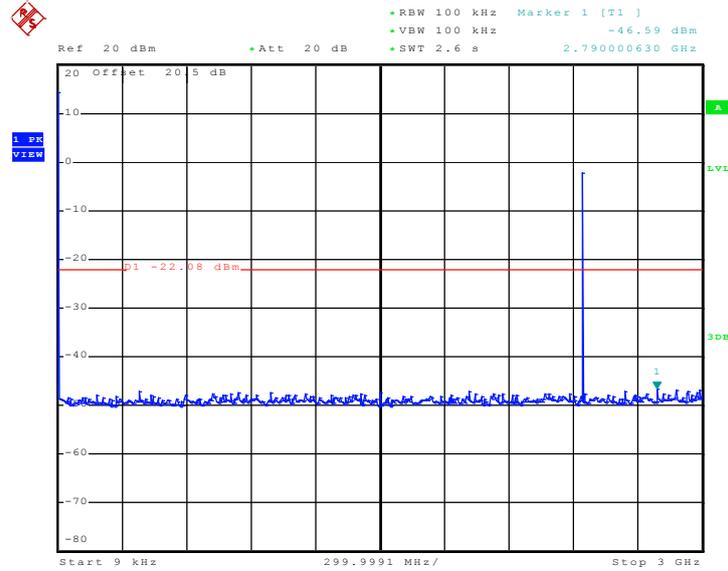


Date: 19.JUN.2009 20:47:12



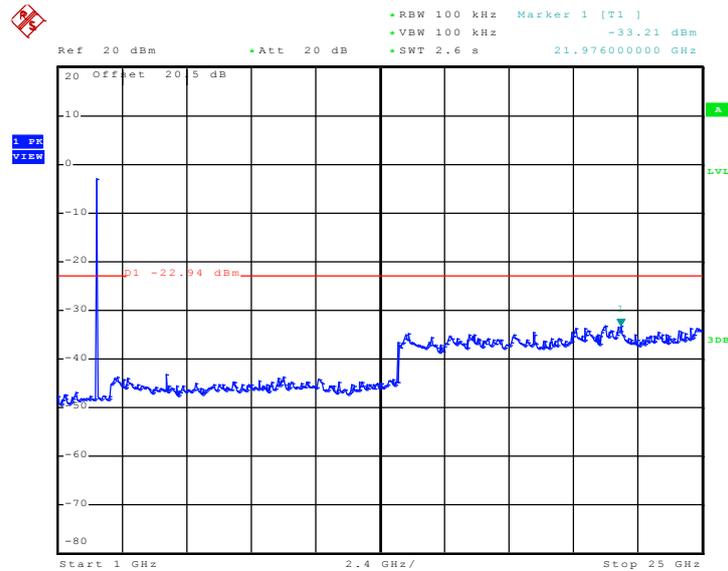
Test Mode :	Mode 2	Temperature :	23~24°C
Test Channel :	39	Relative Humidity :	44~45%
		Test Engineer :	Eric Hum

Conducted Spurious Emission Plot between 9k-3G



Date: 19.JUN.2009 20:47:38

Conducted Spurious Emission Plot between 1G-25G

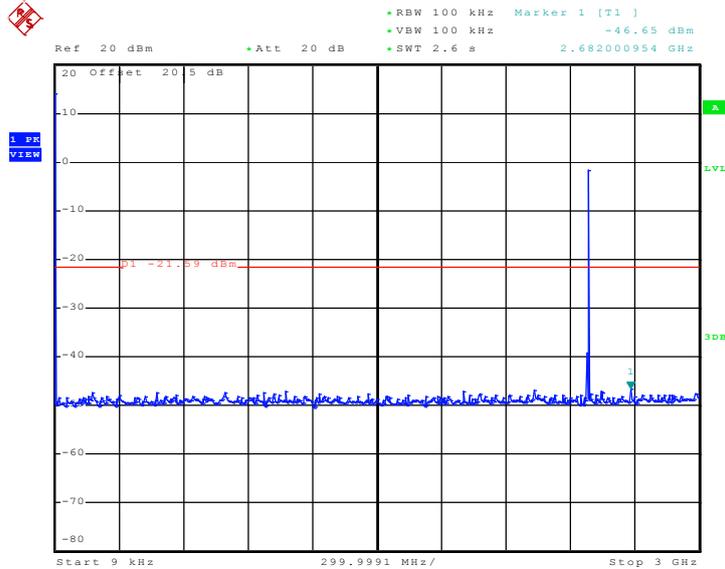


Date: 19.JUN.2009 20:48:11



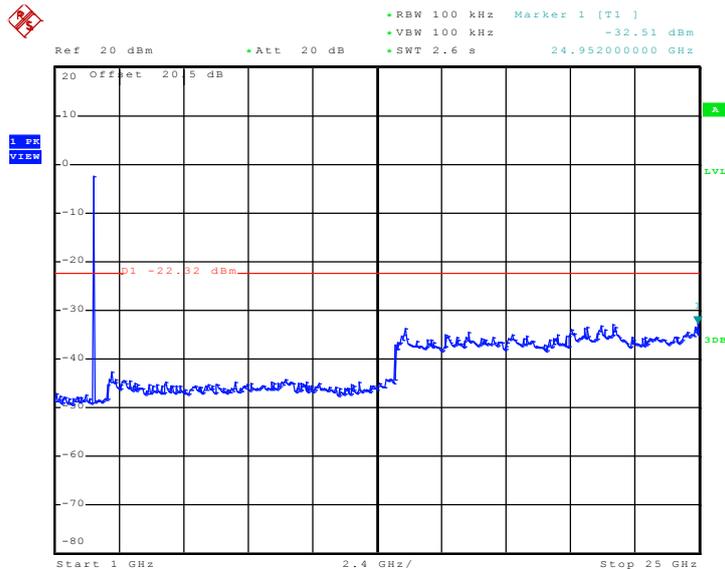
Test Mode :	Mode 3	Temperature :	23~24°C
Test Channel :	78	Relative Humidity :	44~45%
		Test Engineer :	Eric Hum

Conducted Spurious Emission Plot between 9k-3G



Date: 19.JUN.2009 20:48:37

Conducted Spurious Emission Plot between 1G-25G



Date: 19.JUN.2009 20:49:03

3.8 AC Conducted Emission Measurement

3.8.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

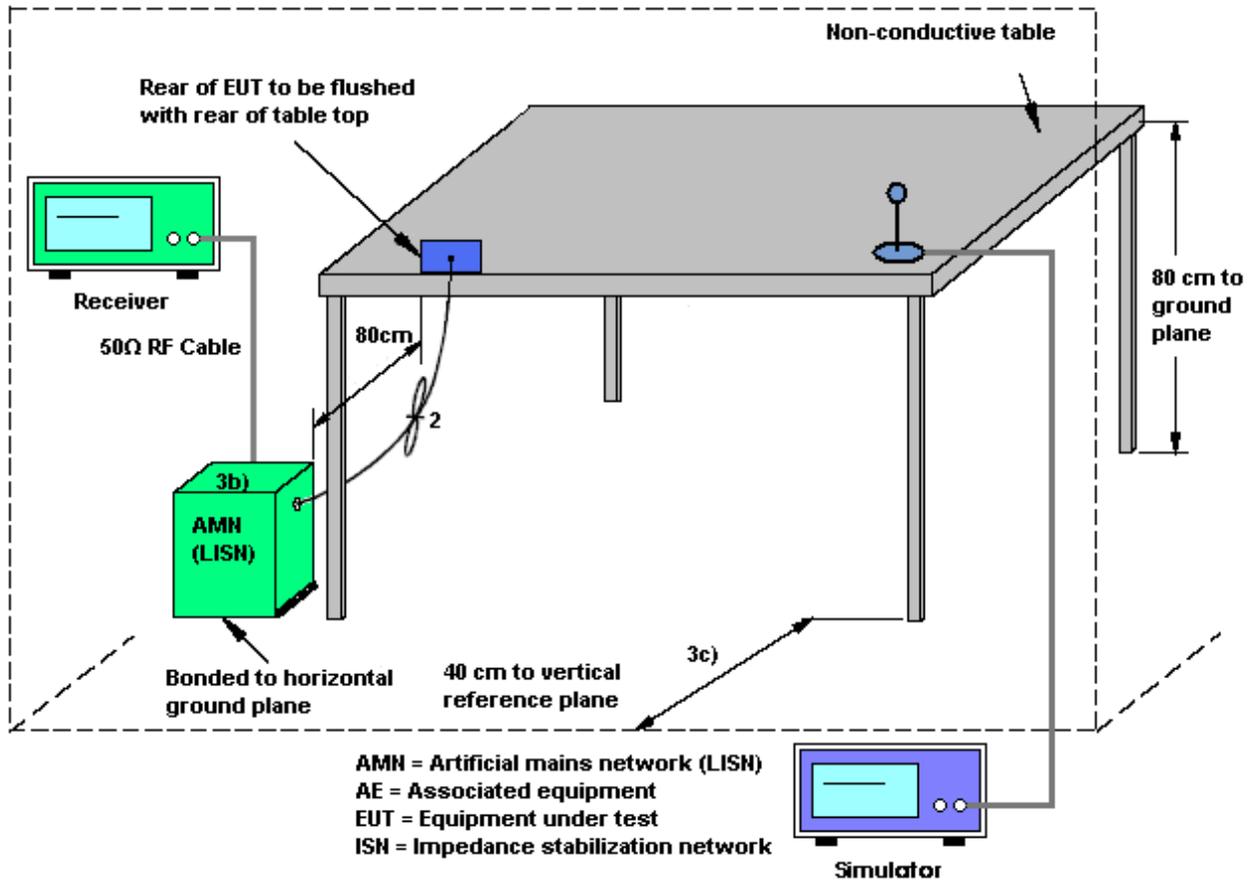
3.8.2 Measuring Instruments

See list of measuring instruments of this test report.

3.8.3 Test Procedures

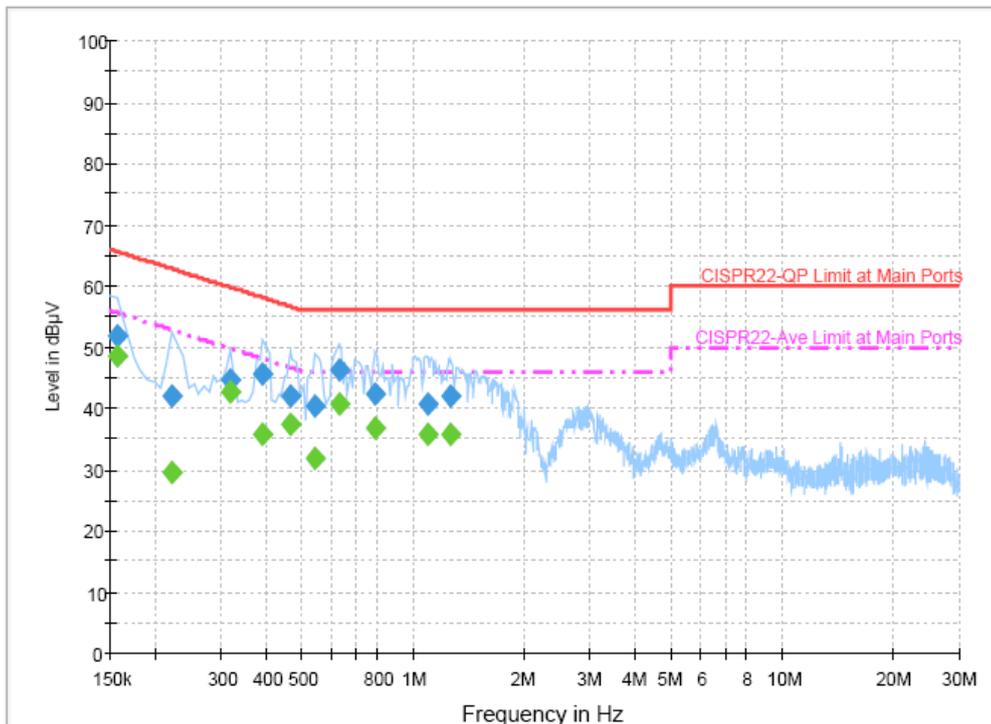
1. Please follow the guidelines in ANSI C63.4-2003.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connecting to the other LISN.
5. The LISN provides 50 ohm coupling impedance for the measuring instrument.
6. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
7. Both sides of AC line were checked for maximum conducted interference.
8. The frequency range from 150 kHz to 30 MHz was searched.
9. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

3.8.4 Test Setup



3.8.5 Test Result of AC Conducted Emission

Test Mode :	Mode 3	Temperature :	23~24°C
Test Engineer :	Cona Huang	Relative Humidity :	44~45%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WCDMA Band V Idle + BT Link + WLAN Link + GPS Rx + Earphone + USB Link + Battery 2		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result 1

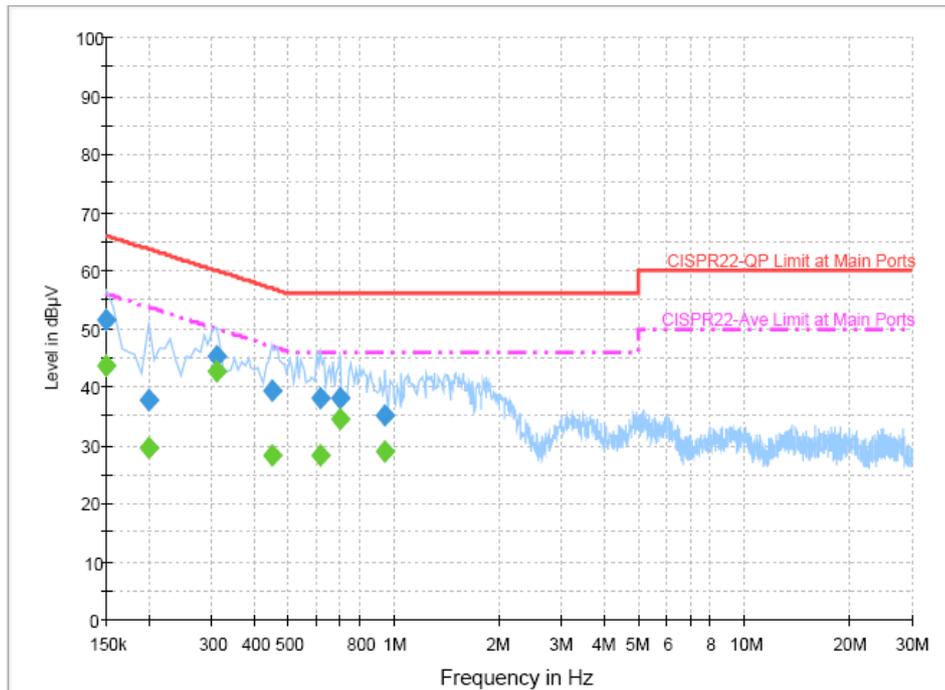
Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	51.9	Off	L1	19.5	13.7	65.6
0.222000	41.9	Off	L1	19.5	20.8	62.7
0.318000	44.7	Off	L1	19.4	15.1	59.8
0.390000	45.4	Off	L1	19.5	12.7	58.1
0.462000	41.9	Off	L1	19.4	14.8	56.7
0.542000	40.2	Off	L1	19.5	15.8	56.0
0.630000	46.1	Off	L1	19.4	9.9	56.0
0.790000	42.4	Off	L1	19.5	13.6	56.0
1.094000	40.8	Off	L1	19.5	15.2	56.0
1.262000	41.8	Off	L1	19.5	14.2	56.0



Final Result 2

Frequency (MHz)	Average (dBμV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.158000	48.4	Off	L1	19.5	7.2	55.6
0.222000	29.4	Off	L1	19.5	23.3	52.7
0.318000	42.6	Off	L1	19.4	7.2	49.8
0.390000	35.8	Off	L1	19.5	12.3	48.1
0.462000	37.4	Off	L1	19.4	9.3	46.7
0.542000	31.7	Off	L1	19.5	14.3	46.0
0.630000	40.6	Off	L1	19.4	5.4	46.0
0.790000	36.6	Off	L1	19.5	9.4	46.0
1.094000	35.9	Off	L1	19.5	10.1	46.0
1.262000	35.8	Off	L1	19.5	10.2	46.0

Test Mode :	Mode 3	Temperature :	23~24°C
Test Engineer :	Cona Huang	Relative Humidity :	44~45%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WCDMA Band V Idle + BT Link + WLAN Link + GPS Rx + Earphone + USB Link + Battery 2		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	51.5	Off	N	19.5	14.5	66.0
0.198000	37.9	Off	N	19.5	25.8	63.7
0.310000	45.2	Off	N	19.4	14.8	60.0
0.446000	39.3	Off	N	19.4	17.6	56.9
0.614000	37.9	Off	N	19.5	18.1	56.0
0.702000	38.2	Off	N	19.5	17.8	56.0
0.942000	35.1	Off	N	19.5	20.9	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	43.5	Off	N	19.5	12.5	56.0
0.198000	29.4	Off	N	19.5	24.3	53.7
0.310000	42.7	Off	N	19.4	7.3	50.0
0.446000	28.3	Off	N	19.4	18.6	46.9
0.614000	28.3	Off	N	19.5	17.7	46.0
0.702000	34.3	Off	N	19.5	11.7	46.0
0.942000	28.8	Off	N	19.5	17.2	46.0

3.9 Radiated Emission Measurement

3.9.1 Limit of Radiated Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.9.2 Measuring Instruments

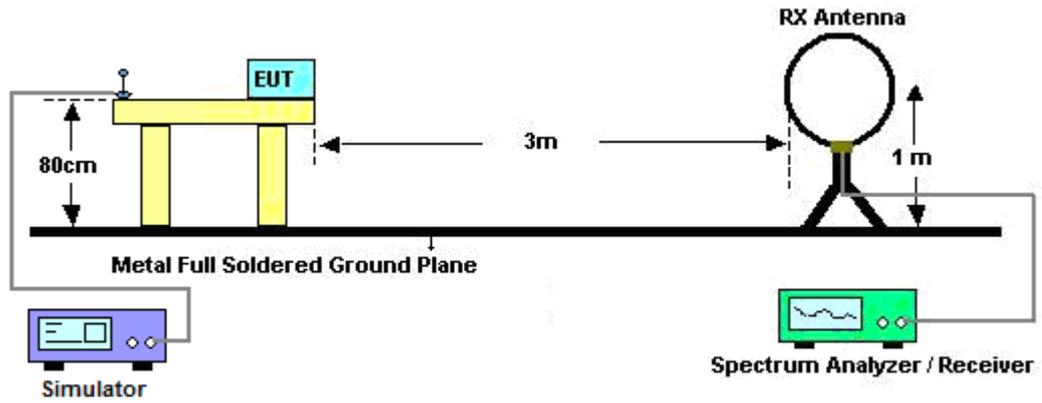
See list of measuring instruments of this test report.

3.9.3 Test Procedures

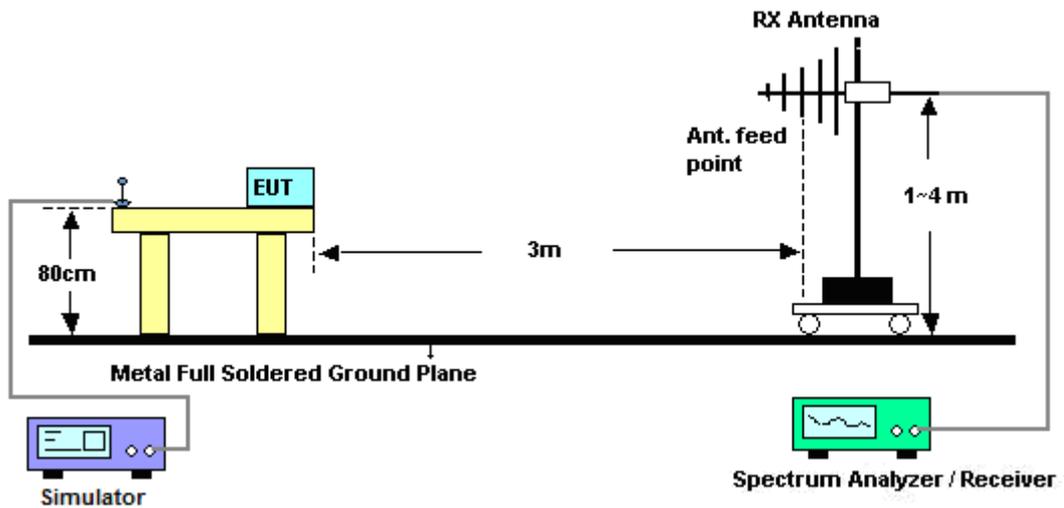
1. The testing follows the guidelines in FCC Public Notice DA 00-705 Measurement Guidelines.
2. Use the following spectrum analyzer settings:
Span = wide enough to fully capture the emission being measured; RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz; VBW \geq RBW; Sweep = auto; Detector function = peak; Trace = max hold.
3. Follow the guidelines in ANSI C63.4-2003 with respect to maximizing the emission by rotating the EUT, measuring the emission for three EUT orthogonal planes, and adjusting the measurement antenna height and polarization. A pre-amp and a high pass filter are used for this test in order to get the good signal level.

3.9.4 Test Setup

For radiated emissions below 30MHz



For radiated emissions above 30MHz





3.9.5 Test Results of Radiated Emissions (9kHz ~ 30MHz)

Test Engineer :	Mac Lin	Temperature :	24~27°C	
		Relative Humidity :	47~52%	
Frequency (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note:

The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

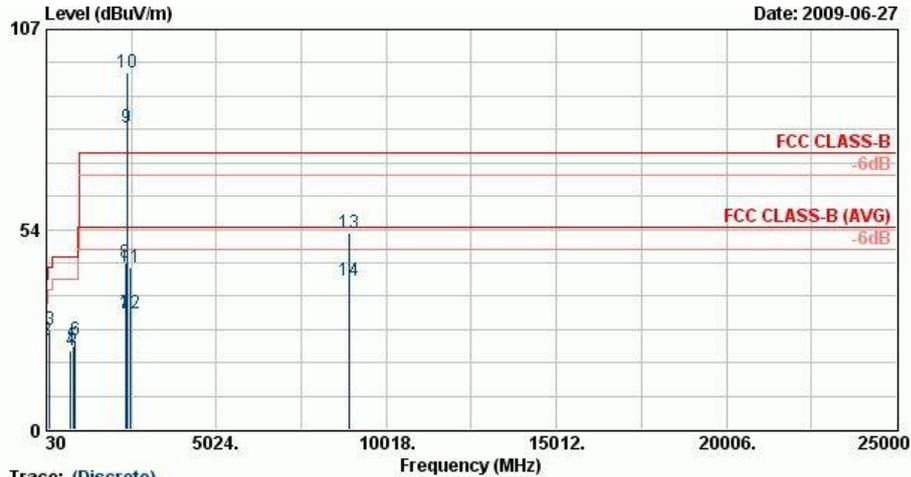
Distance extrapolation factor = $40 \log(\text{specific distance} / \text{test distance})$ (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.



3.9.6 Test Result of Radiated Emission (30MHz ~ 10th Harmonic)

Test Mode :	Mode 1	Temperature :	24~27°C
Test Channel :	00	Relative Humidity :	47~52%
Test Engineer :	Mac Lin	Polarization :	Horizontal
Remark :	#9 and #10 are fundamental signals which can be ignored.		

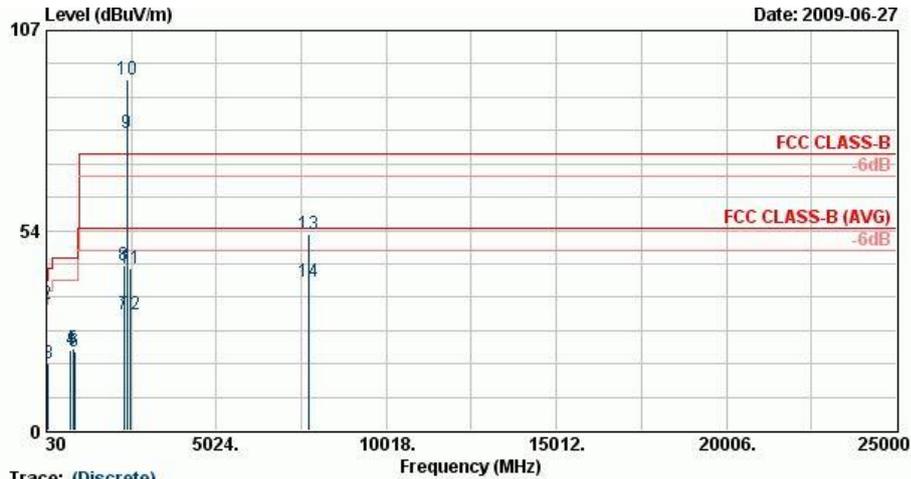


Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
 Project : FR 961307
 Memo : Mode 1

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 !	32.16	35.38	-4.62	40.00	48.04	18.70	0.30	31.67	100	118	Peak
2	42.69	23.85	-16.15	40.00	43.10	12.16	0.30	31.71	---	---	Peak
3	120.99	26.83	-16.67	43.50	45.39	12.66	0.50	31.73	---	---	Peak
4	749.40	21.16	-24.84	46.00	31.82	20.30	1.10	32.06	---	---	Peak
5	808.90	22.19	-23.81	46.00	32.30	20.91	1.20	32.22	---	---	Peak
6	869.80	23.96	-22.04	46.00	33.24	21.52	1.30	32.11	---	---	Peak
7	2344.58	30.89	-23.11	54.00	31.39	31.91	3.86	36.27	103	326	Average
8	2344.58	44.58	-29.42	74.00	45.08	31.91	3.86	36.27	103	326	Peak
9 @	2402.00	80.72			81.10	31.98	3.92	36.28	103	326	Average
10 X	2402.00	95.35			95.72	32.00	3.92	36.28	103	326	Peak
11	2484.00	43.45	-30.55	74.00	43.61	32.08	4.05	36.30	103	326	Peak
12	2484.00	31.00	-23.00	54.00	31.17	32.08	4.05	36.30	103	326	Average
13	8922.00	52.63	-21.37	74.00	45.67	36.12	7.71	36.87	100	111	Peak
14	8922.00	39.84	-14.16	54.00	32.88	36.12	7.71	36.87	100	111	Average



Test Mode :	Mode 1	Temperature :	24~27°C
Test Channel :	00	Relative Humidity :	47~52%
Test Engineer :	Mac Lin	Polarization :	Vertical
Remark :	#9 and #10 are fundamental signals which can be ignored.		



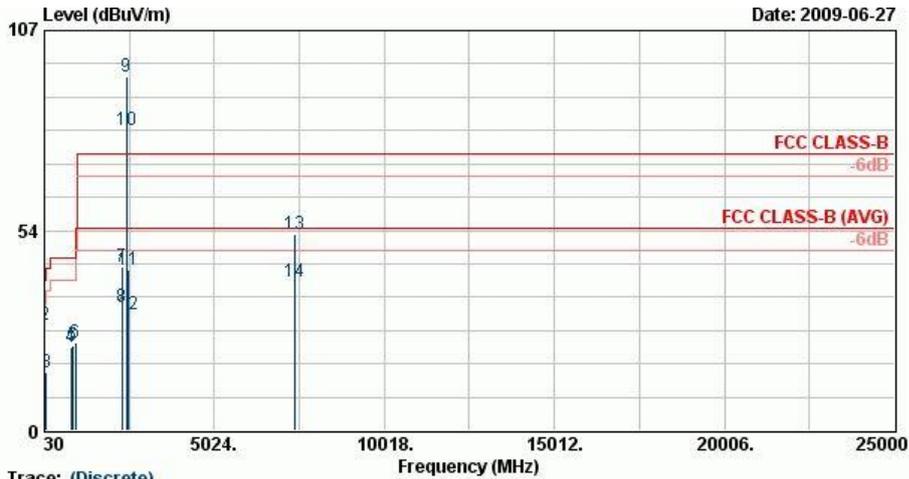
Site :
Condition :
Project :
Memo :

Trace: (Discrete)
03CH06-HV
FCC CLASS-B 3m SHF-EHF HORN VERTICAL
FR 961307
Mode 1

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	Remark
1 !	34.59	36.67	-3.33	40.00	51.30	16.90	0.30	31.83	400	29	QP
2	40.53	33.78	-6.22	40.00	51.86	13.32	0.30	31.70	---	---	Peak
3	79.14	18.08	-21.92	40.00	42.18	7.42	0.48	31.99	---	---	Peak
4	752.90	21.54	-24.46	46.00	32.18	20.33	1.10	32.07	---	---	Peak
5	813.80	21.78	-24.22	46.00	31.85	20.96	1.20	32.24	---	---	Peak
6	854.20	20.90	-25.10	46.00	30.60	21.43	1.20	32.33	---	---	Peak
7	2311.33	30.93	-23.07	54.00	31.50	31.87	3.82	36.26	149	316	Average
8	2311.33	44.17	-29.83	74.00	44.74	31.87	3.82	36.26	149	316	Peak
9 @	2402.00	79.69			80.07	31.98	3.92	36.28	149	316	Average
10 X	2402.00	94.00			94.36	32.00	3.92	36.28	149	316	Peak
11	2484.00	43.51	-30.49	74.00	43.68	32.08	4.05	36.30	149	316	Peak
12	2484.00	31.05	-22.95	54.00	31.22	32.08	4.05	36.30	149	316	Average
13	7746.00	52.43	-21.57	74.00	46.09	35.60	7.39	36.65	100	303	Peak
14	7746.00	39.85	-14.15	54.00	33.51	35.60	7.39	36.65	100	303	Average



Test Mode :	Mode 2	Temperature :	24~27°C
Test Channel :	39	Relative Humidity :	47~52%
Test Engineer :	Mac Lin	Polarization :	Horizontal
Remark :	#9 and #10 are fundamental signals which can be ignored.		



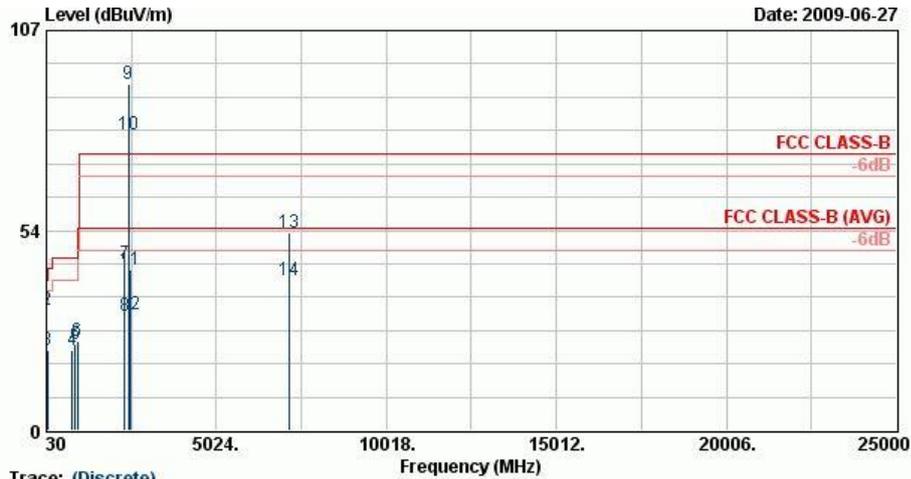
Site :
Condition :
Project :
Memo :

Trace: (Discrete)
03CH06-HY
FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
FR 961307
Mode 2

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 !	31.89	34.88	-5.12	40.00	47.55	18.70	0.30	31.67	100	221	Peak
2	41.34	28.41	-11.59	40.00	47.07	12.74	0.30	31.70	---	---	Peak
3	78.33	15.68	-24.32	40.00	39.83	7.34	0.47	31.96	---	---	Peak
4	806.80	22.30	-23.70	46.00	32.42	20.88	1.20	32.21	---	---	Peak
5	850.90	22.49	-23.51	46.00	32.27	21.41	1.20	32.39	---	---	Peak
6	952.40	23.40	-22.60	46.00	31.46	22.11	1.23	31.39	---	---	Peak
7	2310.00	43.68	-30.32	74.00	44.25	31.87	3.82	36.26	100	310	Peak
8	2310.00	33.04	-20.96	54.00	33.61	31.87	3.82	36.26	100	310	Average
9 X	2441.00	94.82			95.09	32.04	3.99	36.29	100	310	Peak
10 @	2441.00	80.31			80.58	32.04	3.99	36.29	100	310	Average
11	2492.00	43.09	-30.91	74.00	43.24	32.10	4.05	36.30	100	310	Peak
12	2492.00	31.09	-22.91	54.00	31.24	32.10	4.05	36.30	100	310	Average
13	7401.00	52.69	-21.31	74.00	46.48	35.53	7.24	36.56	100	53	Peak
14	7401.00	39.82	-14.18	54.00	33.61	35.53	7.24	36.56	100	53	Average



Test Mode :	Mode 2	Temperature :	24~27°C
Test Channel :	39	Relative Humidity :	47~52%
Test Engineer :	Mac Lin	Polarization :	Vertical
Remark :	#9 and #10 are fundamental signals which can be ignored.		



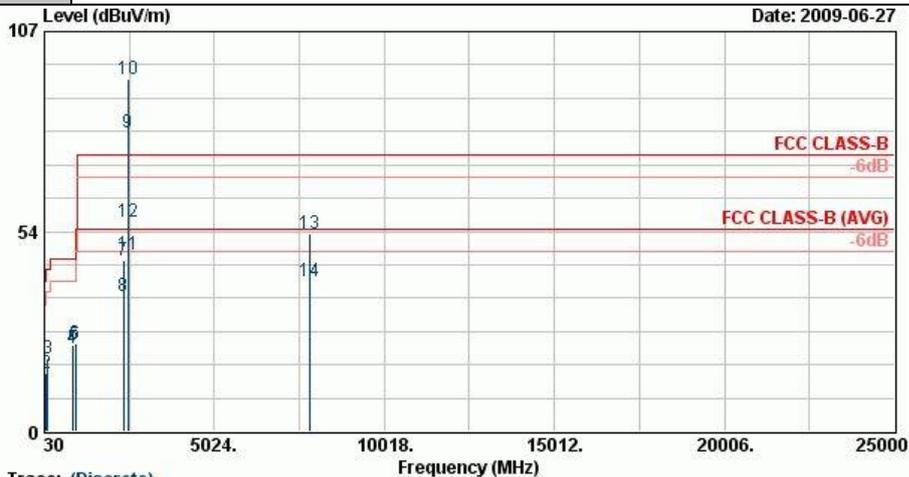
Site :
Condition :
Project :
Memo :

Trace: (Discrete)
03CH06-HV
FCC CLASS-B 3m SHF-EHF HORN VERTICAL
FR 961307
Mode 2

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 !	33.78	36.88	-3.12	40.00	50.86	17.50	0.30	31.78	400	35	QP
2	40.53	32.24	-7.76	40.00	50.31	13.32	0.30	31.70	---	---	Peak
3	53.49	21.50	-18.50	40.00	44.78	8.31	0.36	31.94	---	---	Peak
4	789.30	21.59	-24.41	46.00	31.85	20.69	1.20	32.15	---	---	Peak
5	871.90	23.07	-22.93	46.00	32.31	21.53	1.30	32.08	---	---	Peak
6	953.80	23.78	-22.22	46.00	31.81	22.11	1.24	31.38	---	---	Peak
7	2332.00	44.41	-29.59	74.00	44.93	31.89	3.86	36.27	100	39	Peak
8	2332.00	30.63	-23.37	54.00	31.15	31.89	3.86	36.27	100	39	Average
9 X	2441.00	92.77			93.04	32.04	3.99	36.29	100	39	Peak
10 @	2441.00	79.23			79.50	32.04	3.99	36.29	100	39	Average
11	2500.00	43.10	-30.90	74.00	43.25	32.10	4.05	36.30	100	39	Peak
12	2500.00	31.10	-22.90	54.00	31.25	32.10	4.05	36.30	100	39	Average
13	7176.00	52.81	-21.19	74.00	46.50	35.63	7.15	36.47	100	132	Peak
14	7176.00	40.24	-13.76	54.00	33.93	35.63	7.15	36.47	100	132	Average



Test Mode :	Mode 3	Temperature :	24~27°C
Test Channel :	78	Relative Humidity :	47~52%
Test Engineer :	Mac Lin	Polarization :	Horizontal
Remark :	#9 and #10 are fundamental signals which can be ignored.		

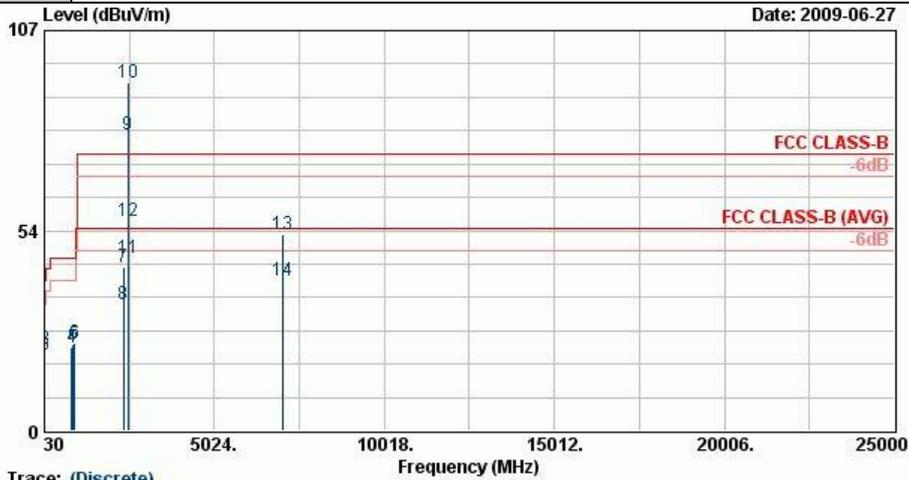


Trace: (Discrete)
 Site : 03CH06-HY
 Condition : FCC CLASS-B 3m SHF-EHF HORN HORIZONTAL
 Project : FR 961307
 Memo : Mode 3

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 !	33.78	35.00	-5.00	40.00	48.98	17.50	0.30	31.78	100	252	Peak
2	75.63	15.64	-24.36	40.00	39.98	7.09	0.42	31.85	---	---	Peak
3	123.69	19.57	-23.93	43.50	38.24	12.54	0.50	31.71	---	---	Peak
4	859.30	22.27	-23.73	46.00	31.88	21.46	1.20	32.26	---	---	Peak
5	885.90	23.23	-22.77	46.00	32.20	21.61	1.30	31.88	---	---	Peak
6	941.90	23.57	-22.43	46.00	31.80	22.04	1.20	31.47	---	---	Peak
7	2350.00	45.57	-28.43	74.00	46.08	31.91	3.86	36.27	100	318	Peak
8	2350.00	36.04	-17.96	54.00	36.54	31.91	3.86	36.27	100	318	Average
9 @	2480.00	80.08			80.25	32.08	4.05	36.30	100	318	Average
10 X	2480.00	94.12			94.29	32.08	4.05	36.30	100	318	Peak
11	2483.50	47.28	-6.72	54.00	47.45	32.08	4.05	36.30	100	318	Average
12	2483.50	56.16	-17.84	74.00	56.33	32.08	4.05	36.30	100	318	Peak
13	7842.00	52.72	-21.28	74.00	46.32	35.63	7.44	36.67	100	46	Peak
14	7842.00	40.00	-14.01	54.00	33.59	35.63	7.44	36.67	100	46	Average



Test Mode :	Mode 3	Temperature :	24~27°C
Test Channel :	78	Relative Humidity :	47~52%
Test Engineer :	Mac Lin	Polarization :	Vertical
Remark :	#9 and #10 are fundamental signals which can be ignored.		



Site :
Condition :
Project :
Memo :

Trace: (Discrete)
: 03CH06-HY
: FCC CLASS-B 3m SHF-EHF HORN VERTICAL
: FR 961307
: Mode 3

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1 !	31.89	36.58	-3.42	40.00	49.25	18.70	0.30	31.67	400	64	QP
2	40.26	21.88	-18.12	40.00	39.96	13.32	0.30	31.70	---	---	Peak
3	51.33	20.26	-19.74	40.00	43.16	8.77	0.32	31.99	---	---	Peak
4	829.90	22.19	-23.81	46.00	32.14	21.16	1.20	32.31	---	---	Peak
5	880.30	23.03	-22.97	46.00	32.10	21.58	1.30	31.95	---	---	Peak
6	920.90	23.28	-22.72	46.00	31.78	21.86	1.20	31.57	---	---	Peak
7	2350.00	43.62	-30.38	74.00	44.12	31.91	3.86	36.27	147	306	Peak
8	2350.00	33.72	-20.28	54.00	34.22	31.91	3.86	36.27	147	306	Average
9 @	2480.00	79.19			79.36	32.08	4.05	36.30	147	306	Average
10 X	2480.00	92.89			93.06	32.08	4.05	36.30	147	306	Peak
11	2483.50	46.06	-7.94	54.00	46.23	32.08	4.05	36.30	147	306	Average
12	2483.50	55.99	-18.01	74.00	56.16	32.08	4.05	36.30	147	306	Peak
13	7017.00	52.69	-21.31	74.00	46.31	35.69	7.10	36.41	100	284	Peak
14	7017.00	40.22	-13.78	54.00	33.84	35.69	7.10	36.41	100	284	Average



3.10 Antenna Requirements

3.10.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi.

The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

3.10.2 Antenna Connected Construction

The antennas type used in this product is PIFA Antenna without connector and it is considered to meet antenna requirement.

3.10.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100055	9kHz~40GHz	Jun. 23, 2009	Jun. 22, 2010	Conducted (TH02-HY)
Power Meter	Agilent	E4416A	GB412923 44	N/A	Feb. 19, 2009	Feb. 18, 2010	Conducted (TH02-HY)
Power Sensor	Agilent	E9327A	US404415 48	N/A	Feb. 19, 2009	Feb. 18, 2010	Conducted (TH02-HY)
EMI Receiver	R&S	ESCS 30	100356	9kHz~2.75GHz	Aug. 01, 2008	Jul. 31, 2009	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100081	9kHz~30MHz	Nov. 26, 2008	Nov. 25, 2009	Conduction (CO05-HY)
Two-LISN	R&S	ENV216	11-100080	9kHz~30MHz	Nov. 26, 2008	Nov. 25, 2009	Conduction (CO05-HY)
AC Power Source	APC	APC-1000W	N/A	N/A	N/A	N/A	Conduction (CO05-HY)
System Simulator	R&S	CMU200	105934	N/A	Nov. 11, 2008	Nov. 10, 2010	Conduction (CO05-HY)
GPS Base Station	T&E	GS-50	N/A	N/A	N/A	N/A	Conduction (CO05-HY)
Spectrum Analyzer	Agilent	E4408B	MY442110 30	9kHz~26.5GHz	Oct. 24, 2008	Oct. 23, 2009	Radiation (03CH06-HY)
Spectrum Analyzer	R&S	FSP40	100057	9kHz~40GHz	Oct. 16, 2008	Oct. 15, 2009	Radiation (03CH06-HY)
EMI Test Receiver	R&S	ESVS10	834468/00 3	20MHz~1000M Hz	Apr. 28, 2009	Apr. 27, 2010	Radiation (03CH06-HY)
Bilog Antenna	SCHAFFNER	CBL6112B	2885	30MHz~2GHz	Nov. 12, 2008	Nov. 11, 2009	Radiation (03CH06-HY)
Double Ridge Horn Antenna	EMCO	3117	00066583	1G~18GHz	Aug. 18, 2008	Aug. 17, 2009	Radiation (03CH06-HY)
Double Ridge Horn Antenna	Training Research	AF-0801	95119	8G~18G	Oct. 28, 2008	Oct. 27, 2009	Radiation (03CH06-HY)
SHF-EHF Horn	SCHWARZBE CK	BBHA 9170	BBHA9170 251	15G~40GHz	Oct. 16, 2008	Oct. 15, 2009	Radiation (03CH06-HY)
Pre Amplifier	Agilent	8449B	3008A019 17	1G~26.5GHz	Nov. 11, 2008	Nov. 10, 2009	Radiation (03CH06-HY)
Pre Amplifier	Agilent	310N	186713	9kHz~1GHz	Apr. 20, 2009	Apr. 19, 2010	Radiation (03CH06-HY)
Loop Antenna	R&S	HFH2-Z2	860004/00 1	9 kHz~30 MHz	May 22, 2008	May 21, 2010	Radiation (03CH06-HY)
BT Base Station	Anritsu	MT8852B	6K000057 22	N/A	Oct. 23, 2007	Oct. 22, 2009	Radiation (03CH06-HY)

5 Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.10	Normal(k=2)	0.05
Cable loss	0.10	Normal(k=2)	0.05
AMN insertion loss	2.50	Rectangular	0.63
Receiver Spec	1.50	Rectangular	0.43
Site imperfection	1.39	Rectangular	0.80
Mismatch	+0.34/-0.35	U-shape	0.24
Combined standard uncertainty Uc(y)	1.13		
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)	2.26		

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

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.41	Normal(k=2)	0.21
Antenna factor calibration	0.83	Normal(k=2)	0.42
Cable loss calibration	0.25	Normal(k=2)	0.13
Pre Amplifier Gain calibration	0.27	Normal(k=2)	0.14
RCV/SPA specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site imperfection	1.43	Rectangular	0.83
Mismatch	+0.39/-0.41	U-shaped	0.28
Combined standard uncertainty Uc(y)	1.27		
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)	2.54		

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

Contribution	Uncertainty of x_i		$u(x_i)$	C_i	$C_i * u(x_i)$
	dB	Probability Distribution			
Receiver reading	±0.10	Normal(k=1)	0.10	1	0.10
Antenna factor calibration	±1.70	Normal(k=2)	0.85	1	0.85
Cable loss calibration	±0.50	Normal(k=2)	0.25	1	0.25
Receiver Correction	±2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	±1.50	Rectangular	0.87	1	0.87
Site imperfection	±2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR $\Gamma_1 = 0.197$ Antenna VSWR $\Gamma_2 = 0.194$ Uncertainty = $20 \log(1 - \Gamma_1 * \Gamma_2)$	+0.34/-0.35	U-shaped	0.244	1	0.244
Combined standard uncertainty $U_c(y)$	2.36				
Measuring uncertainty for a level of confidence of 95% $U = 2U_c(y)$	4.72				

6 Certification of TAF Accreditation



Certificate No. : L1190-090417

財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

This is to certify that

Sporton International Inc.

EMC & Wireless Communications Laboratory

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

is accredited in respect of laboratory

Accreditation Criteria : ISO/IEC 17025:2005
Accreditation Number : 1190
Originally Accredited : December 15, 2003
Effective Period : January 10, 2007 to January 09, 2010
Accredited Scope : Testing Field, see described in the Appendix
Specific Accreditation Program : Accreditation Program for Designated Testing Laboratory for Commodities Inspection
Accreditation Program for Telecommunication Equipment Testing Laboratory
Accreditation Program for BSMI Mutual Recognition Arrangement with Foreign Authorities



Jay-San Chen
President, Taiwan Accreditation Foundation
Date : April 17, 2009

P1, total 20 pages

The Appendix forms an integral part of this Certificate, which shall be invalid when use without the Appendix



Appendix A. Photographs of EUT

Please refer to Sporton report number EP961307 as below.