FCC Test Report

APPLICANT	**:**	**Option NV**
EQUIPMENT	**:**	**USB Dongle**
BRAND NAME	**:**	**ICON 461**
MODEL NAME	**:**	**GI0461**
FCC ID	**:**	**NCMOGI0461**
STANDARD	**:**	**FCC 47 CFR FCC Part 15 Subpart B**
CLASSIFICATION	**:**	**Certification**

The product was received on Sep. 03, 2009 and completely tested on Oct. 02, 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 the 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

Testing Laboratory 1190

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

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FD990302	Rev. 01	Initial issue of report	Oct. 20, 2009
FD990302	Rev. 02	Update report for revising HW version	Oct. 29, 2009
FD990302	Rev. 03	Update report for revising Classification type	Nov. 02, 2009

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.107	7.2.2	AC Conducted Emission	< 15.107 limits < RSS-Gen table 2 limits	PASS	Under limit 6.8 dB at 0.622 MHz
3.2	15.109	7.2.3.2	Radiated Emission	< 15.109 limits or < RSS-Gen table 1 limits (Section 6)	PASS	Under limit 8.44 dB at 32.43 MHz

1. General Description

1.1 Applicant

Option NV
Gaston Geenslaan 14, 3001 Leuven, Belgium

1.2 Manufacturer

Option NV
Gaston Geenslaan 14, 3001 Leuven, Belgium

1.3 Feature of Equipment Under Test

Product Feature & Specification	
Equipment	USB Dongle
Brand Name	ICON 461
Model Name	GI0461
FCC ID	NCMOGI0461
Tx Frequency Range	GSM850 : 824 MHz ~ 849 MHz GSM1900 : 1850 MHz ~ 1910 MHz WCDMA Band V : 824 MHz ~ 849 MHz WCDMA Band II : 1850 MHz ~ 1910 MHz
Rx Frequency Range	GSM850 : 869 MHz ~ 894 MHz GSM1900 : 1930 MHz ~ 1990 MHz WCDMA Band V : 869 MHz ~ 894 MHz WCDMA Band II : 1930 MHz ~ 1990 MHz GPS : 1.57542 GHz
Antenna Type	Fixed Internal Antenna
HW Version	1.1
SW Version	2.10.0.0
Type of Modulation	GSM / GPRS : GMSK EDGE : 8PSK WCDMA : QPSK HSDPA : QPSK / 16QAM HSUPA : BPSK GPS : BPSK
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 Test Site

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978		
Test Site No.	Sporton Site No.		FCC/IC Registration No.
	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 47 CFR FCC Part 15 Subpart B
- ANSI C63.4-2003
- IC RSS-Gen Issue 2

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

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.	Notebook	DELL	Vostro 1510	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	LCD Monitor	Lenovo	6135-AB1	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
5.	i-pod	Apple	A1199	FCC DoC	Shielded, 1.0 m	N/A
6.	i-pod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A

2. Test Configuration of Equipment Under Test

2.1 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 (30MHz to the 5th 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.

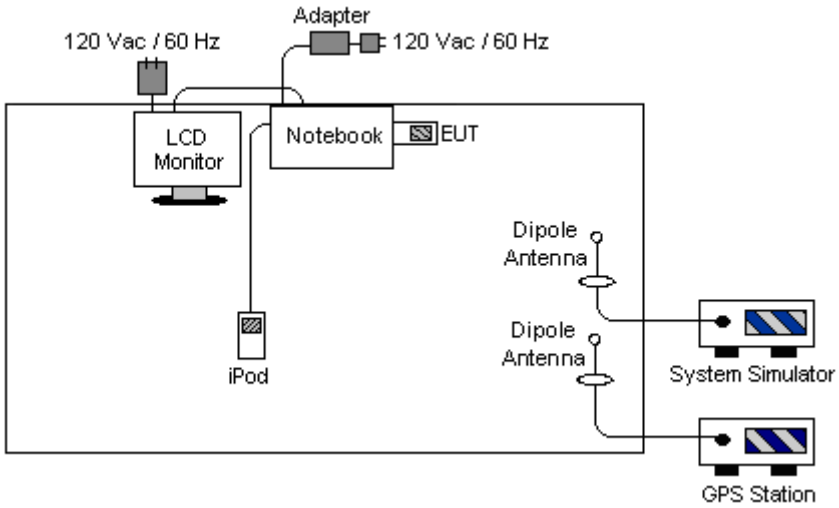
Item	EUT Configuration	Test Condition		
		EMI AC	EMI RE<1G	EMI RE≥1G
1.	Operating Mode (EUT with Notebook)	x	x	x

Abbreviations:

- EMI AC: AC conducted emissions
- EMI RE ≥ 1G: EUT radiated emissions ≥ 1GHz
- EMI RE < 1G: EUT radiated emissions < 1GHz

Test Items	EUT Configure Mode	Function Type
AC Conducted Emission	1	Mode 1: GSM850 Idle + USB Link + GPS Rx Mode 2: **WCDMA Band II Idle + USB Link + GPS Rx**
Radiated Emissions < 1GHz	1	Mode 1: GSM850 Idle + USB Link + GPS Rx Mode 2: **GSM1900 Idle + USB Link + GPS Rx** Mode 3: WCDMA Band V Idle + USB Link + GPS Rx Mode 4: WCDMA Band II Idle + USB Link + GPS Rx
Radiated Emissions ≥ 1GHz	1	Mode 1: GSM1900 Idle + USB Link + GPS Rx
Remark: **1.** The worst case of AC is mode 2; only the test data of this mode was reported. **2.** The worst case of RE < 1G is mode 2; only the test data of this mode was reported.		

2.2 Connection Diagram of Test System



2.3 Test Software

The EUT was in GSM or WCDMA idle mode during the testing. The EUT was synchronized to the BCCH, and is in continuous receiving mode by setting system simulator's paging reorganization.

At the same time, the following programs installed in the EUT were programmed during the test.

1. Execute the program, "Winthrax" under WINXP installed in notebook for active sync files transfer.
2. Execute "Mini GPS" to make the EUT receive signals from GPS base station continuously.

3. Test Result

3.1 Test of AC Conducted Emission Measurement

3.1.1 Limits 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.

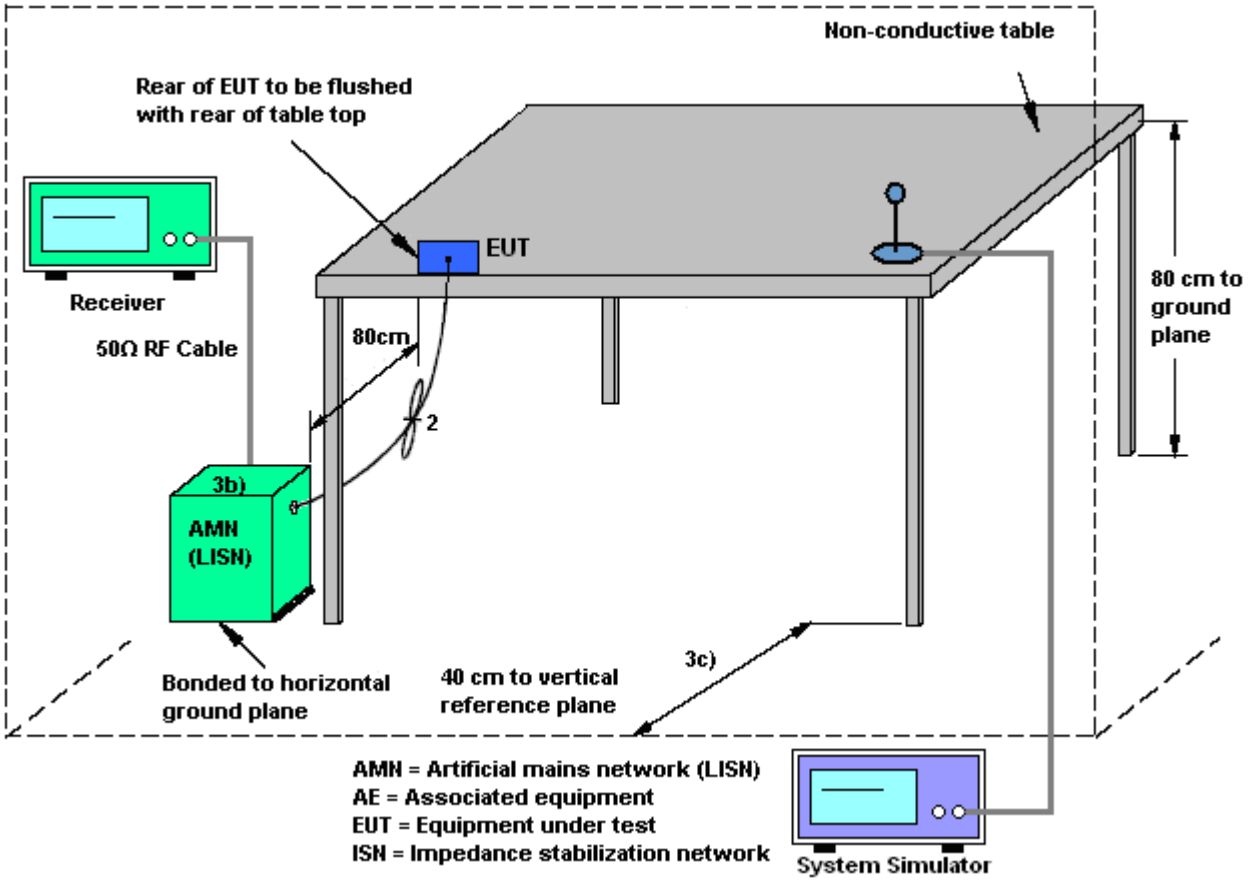
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedure

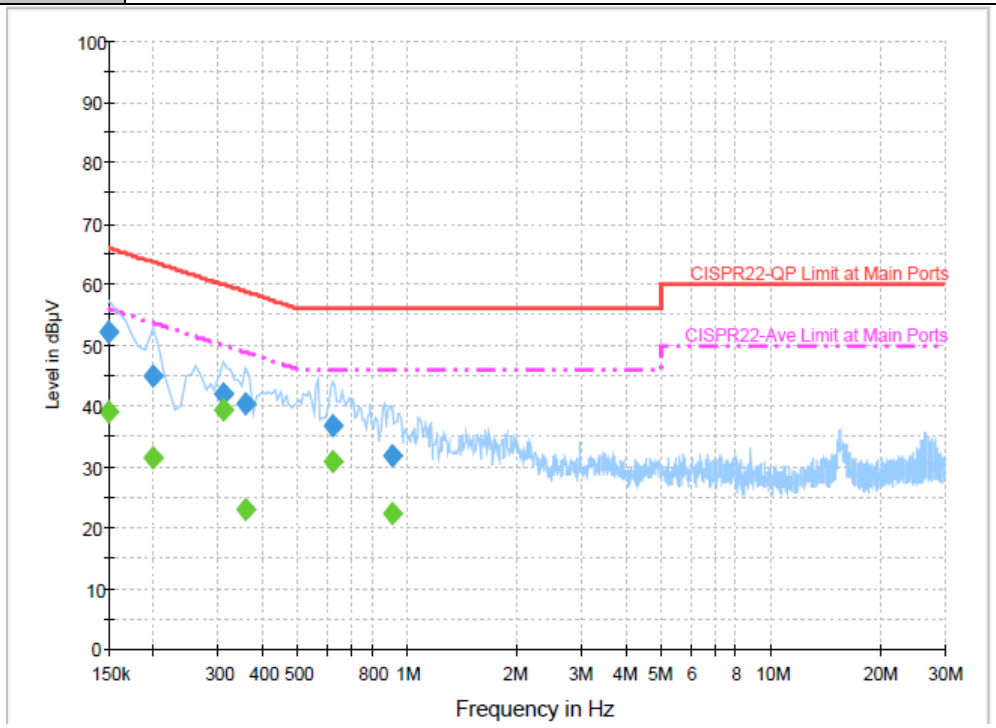
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.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

3.1.4 Test Setup



3.1.5 Test Result of AC Conducted Emission

Test Mode :	Mode 2	**Temperature :**	23~24℃
Test Engineer :	Cona Huang	**Relative Humidity :**	47~50%
Test Voltage :	120Vac / 60Hz	**Phase :**	Line
Function Type :	WCDMA Band II Idle + USB Link + GPS Rx		
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



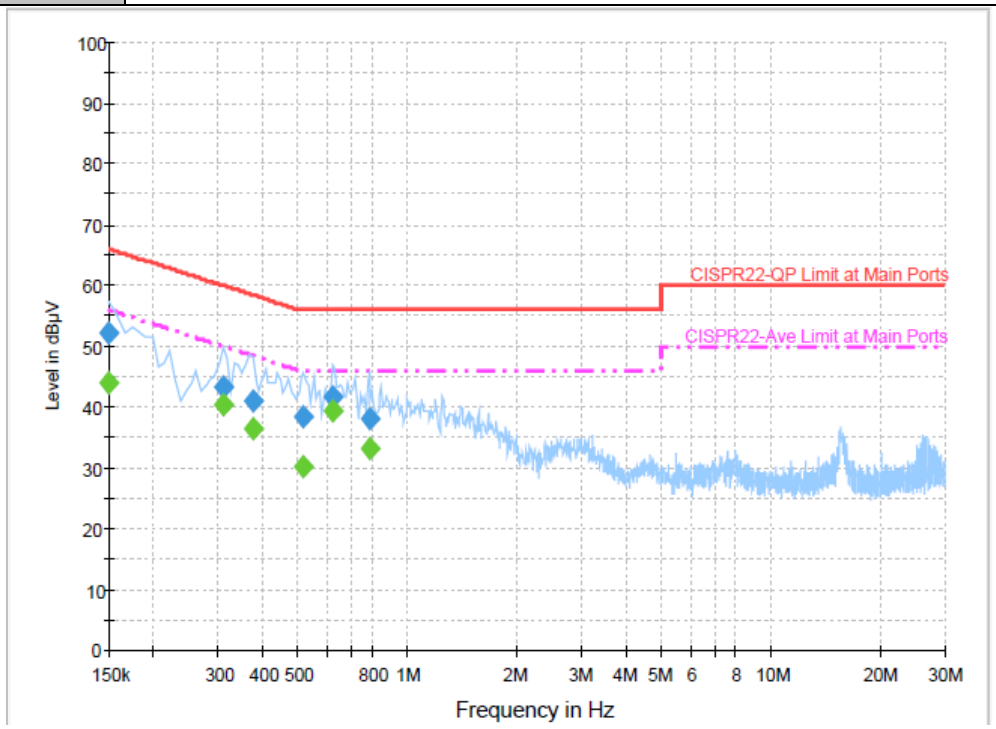
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	52.2	Off	L1	19.5	13.8	66.0
0.198000	44.9	Off	L1	19.5	18.8	63.7
0.310000	41.9	Off	L1	19.4	18.1	60.0
0.358000	40.4	Off	L1	19.4	18.4	58.8
0.622000	36.6	Off	L1	19.5	19.4	56.0
0.910000	31.7	Off	L1	19.4	24.3	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	39.1	Off	L1	19.5	16.9	56.0
0.198000	31.5	Off	L1	19.5	22.2	53.7
0.310000	39.3	Off	L1	19.4	10.7	50.0
0.358000	22.9	Off	L1	19.4	25.9	48.8
0.622000	30.9	Off	L1	19.5	15.1	46.0
0.910000	22.2	Off	L1	19.4	23.8	46.0

Test Mode :	Mode 2	**Temperature :**	23~24℃
Test Engineer :	Cona Huang	**Relative Humidity :**	47~50%
Test Voltage :	120Vac / 60Hz	**Phase :**	Neutral
Function Type :	WCDMA Band II Idle + USB Link + GPS Rx		
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	52.2	Off	N	19.5	13.8	66.0
0.310000	43.4	Off	N	19.5	16.6	60.0
0.374000	41.0	Off	N	19.4	17.4	58.4
0.518000	38.2	Off	N	19.5	17.8	56.0
0.622000	41.6	Off	N	19.5	14.4	56.0
0.782000	38.1	Off	N	19.5	17.9	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	43.9	Off	N	19.5	12.1	56.0
0.310000	40.2	Off	N	19.5	9.8	50.0
0.374000	36.5	Off	N	19.4	11.9	48.4
0.518000	30.1	Off	N	19.5	15.9	46.0
0.622000	39.2	Off	N	19.5	6.8	46.0
0.782000	33.1	Off	N	19.5	12.9	46.0

3.2 Test of Radiated Emission Measurement

3.2.1 Limit of Radiated Emission

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

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

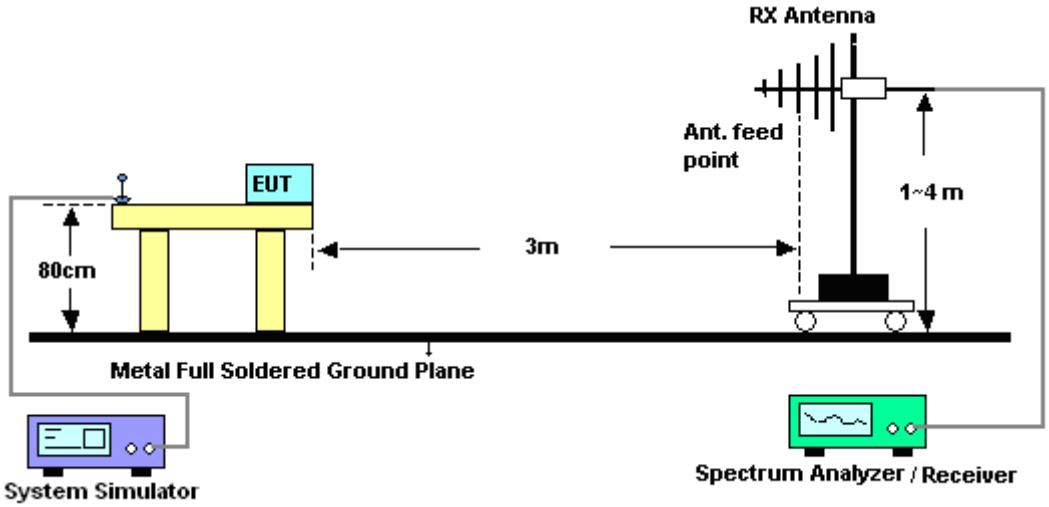
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

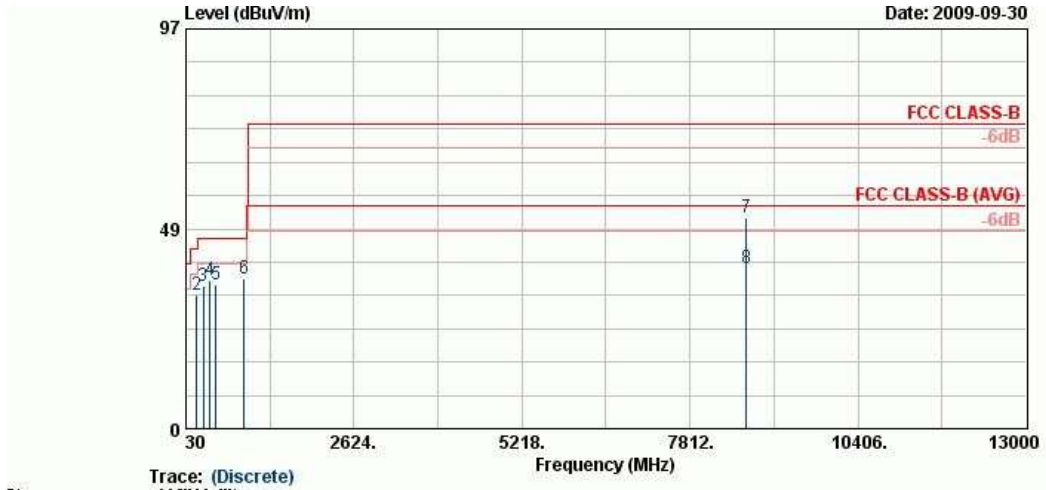
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a Bi-Log antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the quasi-peak method and reported
8. Emission level (dBuV/m) = 20 log Emission level (uV/m)
9. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

3.2.4 Test Setup of Radiated Emission



3.2.5 Test Result of Radiated Emission

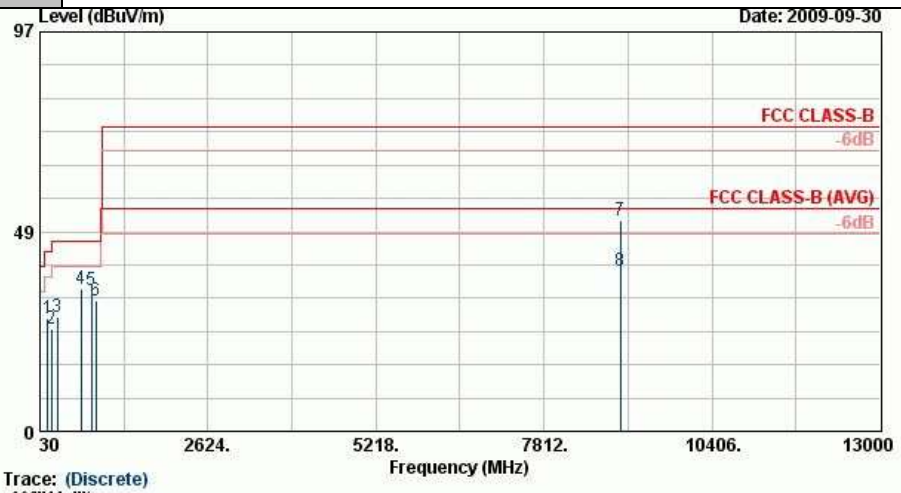
Test Mode :	Mode 2	Temperature :	22~23°C
Test Engineer :	Elvis Chen	Relative Humidity :	42~43%
Test Distance :	3m	Polarization :	Horizontal
Function Type :	GSM1900 Idle + USB Link + GPS Rx		



Site : 03CH06-HY
Condition : FCC CLASS-B 3m HF-ANT(8-18G)_081031 HORIZONTAL
Power : From System
Project : FD 990302
Mode : Mode 2

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	32.43	31.56	-8.44	40.00	44.30	18.10	0.88	31.72	100	167	Peak
2	199.83	32.31	-11.19	43.50	51.73	10.30	2.39	32.11	---	---	Peak
3	299.19	34.72	-11.28	46.00	49.96	13.90	3.01	32.15	---	---	Peak
4	397.30	36.19	-9.81	46.00	48.10	16.45	3.52	31.88	---	---	Peak
5	497.40	35.15	-10.85	46.00	45.40	17.86	3.96	32.07	---	---	Peak
6	927.90	36.29	-9.71	46.00	40.38	21.93	5.52	31.53	---	---	Peak
7	8678.00	51.16	-22.84	74.00	44.67	35.85	7.42	36.77	100	15	Peak
8	8678.00	38.98	-15.02	54.00	32.49	35.85	7.42	36.77	100	15	Average

Test Mode :	Mode 2	Temperature :	22~23°C
Test Engineer :	Elvis Chen	Relative Humidity :	42~43%
Test Distance :	3m	Polarization :	Vertical
Function Type :	GSM1900 Idle + USB Link + GPS Rx		



Site : 03CH06-HY
Condition : FCC CLASS-B 3m HF-ANT(6-18G)_081031 VERTICAL
Power : From System
Project : FD 990302
Mome : Mode 2

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	149.34	27.27	-16.23	43.50	45.70	11.25	2.00	31.68	---	---	Peak
2	206.04	25.01	-18.49	43.50	44.24	10.52	2.42	32.17	---	---	Peak
3	294.33	27.94	-18.06	46.00	43.28	13.80	2.98	32.11	---	---	Peak
4	665.40	34.53	-11.47	46.00	42.43	19.56	4.61	32.06	100	355	Peak
5	829.90	34.33	-11.67	46.00	40.25	21.16	5.23	32.31	---	---	Peak
6	897.80	31.87	-14.13	46.00	36.42	21.69	5.45	31.70	---	---	Peak
7	8988.00	51.27	-22.73	74.00	44.27	36.09	7.80	36.89	100	122	Peak
8	8988.00	39.01	-14.99	54.00	32.01	36.09	7.80	36.89	100	122	Average

4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Due Date	Remark
EMI Test Receive	R&S	ESCS 30	100356	9KHz – 2.75GHz	Aug. 05, 2009	Aug. 04, 2010	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)
Spectrum Analyzer	Agilent	E4408B	MY44211030	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	834468/003	20MHz-1000MHz	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	1GHz~18GHz	Aug. 20, 2009	Aug. 19, 2010	Radiation (03CH06-HY)
Double Ridge Horn Antenna	Training Research	AH-0801	95119	8GHz~18GHz	Oct. 28, 2008	Oct. 27, 2009	Radiation (03CH06-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	15GHz- 40GHz	Oct. 16, 2008	Oct. 15, 2009	Radiation (03CH06-HY)
Pre Amplifier	Agilent	8449B	3008A01917	1GHz- 26.5GHz	Nov. 11, 2008	Nov. 10, 2009	Radiation (03CH06-HY)
Amplifier	Agilent	310N	186713	9KHz~1GHz	Apr. 20, 2009	Apr. 19, 2010	Radiation (03CH06-HY)
Loop Antenna	R&S	HFH2-Z2	860004/001	9KHz~30MHz	May 22, 2008	May 21, 2010	Radiation (03CH06-HY)
System Simulator	R&S	CMU200	117591	N/A	Oct. 23, 2008	Oct. 22, 2010	-
GPS Station	T&E	GS-50	N/A	N/A	N/A	N/A	-

5. Uncertainty of Evaluation

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

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 Specification	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 (30 MHz ~ 1000 MHz)

Contribution	Uncertainty of X_i		$u(X_i)$
	dB	Probability Distribution	
Receiver Reading	0.41	Normal (k=2)	0.21
Antenna Factor Calibration	0.83	Normal (k=2)	0.42
Cable Loss Calibration	0.25	Normal (k=2)	0.13
Pre-Amplifier Gain Calibration	0.27	Normal (k=2)	0.14
RCV/SPA Specification	2.50	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1.00	Rectangular	0.29
Site Imperfection	1.43	Rectangular	0.83
Mismatch	+0.39 / -0.41	U-Shape	0.28
Combined Standard Uncertainty Uc(y)	**1.27**		
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.54**		

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

Contribution	Uncertainty of X_i		$u(X_i)$	C_i	$C_i * u(X_i)$
	dB	Probability Distribution			
Receiver Reading	±0.10	Normal (k=2)	0.10	1	0.10
Antenna Factor Calibration	±1.70	Normal (k=2)	0.85	1	0.85
Cable Loss Calibration	±0.50	Normal (k=2)	0.25	1	0.25
Receiver Correction	±2.00	Rectangular	1.15	1	1.15
Antenna Factor Directional	±1.50	Rectangular	0.87	1	0.87
Site Imperfection	±2.80	Triangular	1.14	1	1.14
Mismatch Receiver VSWR Γ1 = 0.197 Antenna VSWR Γ2 = 0.194 Uncertainty = 20Log(1-Γ1*Γ2)	+0.34 / -0.35	U-Shape	0.244	1	0.244
Combined Standard Uncertainty Uc(y)	**2.36**				
Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.72**				

Appendix A. Photographs of EUT

Please refer to Sporton report number EP990302 as below.