for

47 CFR Part 15 Subpart C

Equipment : W11 GPRS with WLAN PC Card

Model No. : 56W11

FCC ID : JVP56W11

Filing Type : Certification

Applicant : **BENQ Corporation** No. 157, Shan-Ying Road, Gueishan Taoyuan 333, Taiwan, R.O.C.

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SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

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History of this test report

Original Report Issue Date: Feb. 13, 2004

No additional attachment.

Additional attachment were issued as following record:

Attachment No.	Issue Date	Description
	March 02, 2004	Highest frequency and 6 dB bandwidth

Certificate No. : F413003-01

CERTIFICATE OF COMPLIANCE

for

47 CFR Part 15 Subpart C

Equipment	: W11 GPRS with WLAN PC Card
Model No.	: 56W11
FCC ID	: JVP56W11
Filing Type	: Certification
Applicant	 BENQ Corporation No. 157, Shan-Ying Road, Gueishan Taoyuan 333, Taiwan, R.O.C.

I HEREBY CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4 - 2001** and the equipment under test was *passed* all test items required in FCC Part 15 subpart C, relative to the equipment under test. Testing was carried out on Feb. 12, 2004 at **SPORTON International Inc.** LAB.

Daniel Lee 7/6/2004

Daniel Lee Manager

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

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 FCC ID
 : JVP56W11

 Page No.
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 Issued Date
 : Feb.13, 2004

1. General Description of Equipment under Test

1.1. Applicant

BENQ Corporation No. 157, Shan-Ying Road, Gueishan Taoyuan 333, Taiwan, R.O.C.

1.2 Manufacturer

Same as 1.1

1.3 Basic Description of Equipment under Test

Equipment	: W11 GPRS with WLAN PC Card
Trade Name	: BenQ
Model No.	: 56W11
Power Supply Type	: From system
AC Power Cord	: AC 100~240V, Non-shielded, Wall-Mount
DC Power Cable	: DC 12V, Non-shielded, 1.8 meter, 3 pin

	Product Feature & Specification					
1.	Type of Modulation	DBPSK , DQPSK, CCK				
		USA/Canada: 11	V	European: 13	V	
2.	Number of Channels	Japan: 13,14	х	Other:		
3.	Frequency Band	2.400 ~ 2.4835GHz				
4.	Carrier Frequency of each channel	2412MHz+(n-1)*5MHz, n=1~13				
5.	Channel Spacing of each channel	5MHz				
6.	Maximum Output Power to Antenna	18.3dBm				
7.	Antenna Type / Class and Gain	PCB Antenna / 0dBi				
8.	Function Type	Transmitter Transceiver V			V	
9.	Power Rating (DC/AC , Voltage)	DC 5V+/-0.5V				
10.	Basic function of product	Wireless data communication				
11.	Temperature Range (Operating)	0°C ~ 55°C				
12.	Humidity	15% at 85%RH				

1.4 Feature of Equipment under Test

2 Test Configuration of Equipment under Test

2.1 Test Manner

- a. The EUT has been associated with peripherals pursuant to ANSI C63.4-2001 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.
- b. The complete test system included LOGITECH USB Mouse, EPSON Printer, ACEEX Modem, and EUT as local workstation and DELL Notebook, Gateway USB Keyboard as Remote workstation for EMI test.
- b. For WLAN emission The EUT can operate on eleven channels from 2412.0MHz to 2462.0MHz. (as listed in section <u>1.4</u>).
- c. The following test modes were pretested for conduction test:

 $\begin{array}{l} \mbox{Mode 1: Tx CH01 (2412MHz)} \\ \mbox{Mode 2: Tx CH06 (2437MHz)} \end{array}$

- Mode 3: Tx CH11 (2462MHz)
- d. The following test modes were pretested for radiation test:

Mode 1: Tx CH01_HF (2412MHz)

- Mode 2: Tx CH06_HF (2437MHz)
- Mode 3: Tx CH11_LF (2462MHz)
- Mode 4: Tx CH11_HF (2462MHz)
- e. Frequency range investigated: conduction 150 KHz to 30 MHz, radiation 30 MHz to 25000MHz.

2.2 Description of Test System

Support Unit 1. – Notebook (DELL)-I	ocal workstation and remote workstation
FCC ID	: E2K24CLNS
Model No.	: PP05L
Power Supply Type	: From system
Power Cord	: Shielded, 0.9m
Serial No.	: SP0037
Remark	: This support device was tested to comply with FCC standards and
	authorized under a declaration of conformity.
Support Unit 2. –(USB) Mouse (LOG	ITECH) –local workstation
FCC ID	: N/A
Model No.	: M-BE58
Serial No.	: SP0052
Serial No. Data Cable	: SP0052 : Shielded, 1.7m

Support Unit 3. - Printer (EPSON) -local workstation

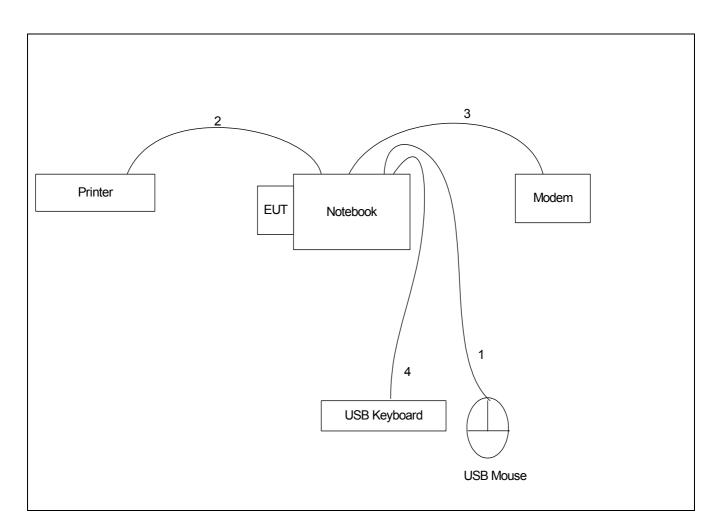
- FCC ID
- : N/A : STYLUS COLOR 680
- Model No. Serial No.
 - : SP0041
- Power Cord : Non-Shielded
- Data Cable Remark
- : Shielded, 1.35m
- : This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Unit 4. – Modem (ACEEX) –local workstation

: IFAXDM141
: DM141
: Linear
: Shielded, 1.15m
: SP0048
: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Unit 5. - USB keyboard (Gateway) -local workstation

FCC ID	: N/A
Model No.	: SK-9900V
Serial No.	: SP0049
Data Cable	: Shielded, 1.7m
Remark	: This support device was tested to comply with FCC standards and
	authorized under a declaration of conformity.



2.3 Connection Diagram of Test System

- 1. The I/O cable is connected from Notebook to the support unit 2
- 2. The I/O cable is connected from Notebook to the support unit 3
- 3. The I/O cable is connected from Notebook to the support unit 4
- 4. The I/O cable is connected from Notebook to the support unit 5

3 Operation of Equipment under Test

An executive program, EMCTEST.EXE on WIN2000 continuously generating a complete line of "H" pattern, was used as the test software.

The program was executed as follows:

- a. Turn on the power of all equipment.
- b. The PC reads the test program from the hard disk drive and runs it.
- c. The PC sends "H" messages to the monitor, and the monitor displays "H" patterns on the screen.
- d. The PC sends "H" messages to the printer, then the printer prints them on the paper.
- e. The PC sends "H" messages to the internal hard disk , and the hard disk reads and writes the message.
- f. Repeat the steps from c to e.

At the same time, the following program was executed:

"RF Hard ware Test" sends continuous Tx.

4 General Information of Test

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 : 886-3-318-0055	
Test Site No	:	CO01-HY, 03CH03-HY	

4.1 Test Voltage

110V/ 60Hz

4.2 Standard for Methods of Measurement

ANSI C63.4-2001

4.3 Test in Compliance with

47 CFR Part 15 Subpart C

4.4 Frequency Range Investigated

- a. Conduction: from 150 kHz to 30 MHz
- b. Radiation: from 30 MHz to 12750 MHz

4.5 Test Distance

The test distance of radiated emission from antenna to EUT is 3 M.

5 Report of Measurements and Examinations

5.1 List of Measurements and Examinations

FCC Rule	Description of Test	Result
15.207	Conducted Emission	Pass
15.247(a)(2)	6dB Bandwidth	Pass
15.247(b)	Maximum Peak Output Power	Pass
15.209	Radiated Emission	Pass
15.247(c)	100kHz Bandwidth of Frequency Band Edges	Pass
15.247(d)	Power Spectral Density	Pass
15.203	Antenna Requirement	Pass

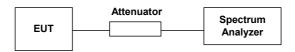
5.2 6dB Bandwidth

5.2.1 Measuring Instruments :

As described in chapter 7 of this test report.

5.2.2 Test Procedure :

- 1. The transmitter output was connected to the spectrum analyzer through an attenuator.
- 2. Set RBW of spectrum analyzer to 100KHz and VBW to 100KHz.
- 3. The 6 dB bandwidth is defined as the frequency range where the power is higher than the peak power minus 6dB.
- 5.2.3 Test Setup Layout :



5.2.4 Test Result :

- Mode 1~3 : WLAN Tx mode
- Temperature : 23 °C
- Relative Humidity : 51%

Channel	Frequency	6dB Emission bandwidth	Limits	Plot
	(MHz)	(MHz)	(MHz)	Ref. No.
01	2412	8.5	0.5	1
06	2437	8.5	0.5	2
11	2462	8.5	0.5	3

5.3 Power Spectral Density

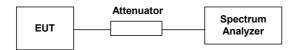
5.3.1 Measuring Instruments :

As described in chapter 7 of this test report.

5.3.2 Test Procedure :

- 1. The transmitter output was connected to spectrum analyzer through an attenuator.
- 2. The spectrum analyzer's resolution bandwidth was set at 3KHz RBW and 30KHz VBW as that of the fundamental frequency. Set the sweep time=span/3KHz.
- 3. The power spectral density was measured and recorded.
- 4. The sweep time is allowed to be longer than span/3KHz for a full response of the mixer in the spectrum analyzer.

5.3.3 Test Setup Layout :



5.3.4 Test Result :

- Mode 1~3: WLAN Tx mode
- Temperature : 23°C,
- Relative Humidity : 51%

Channel	Frequency	Power Spectral Density	Limits	Plot
	(MHz)	(dBm)	(dBm)	Ref. No.
01	2412	-13.53	8	4
06	2437	-13.61	8	5
11	2462	-13.52	8	6

5.4 Band Edges Measurement

5.4.1 Measuring Instruments :

As described in chapter 7 of this test report.

- 5.4.2 Test Procedure :
 - 1. The transmitter output was connected to the spectrum analyzer via a low lose cable.
 - Set both RBW and VBW of spectrum analyzer to 100KHz with suitable frequency span including 100 KHz bandwidth from band edge.
 - 3. The band edges was measured and recorded.

5.4.3 Test Result :

- Mode 1 and 3 : WLAN Tx mode
- Temperature : 23°C,
- Relative Humidity : 51%
- Test Result in lower band (Channel 1)
 PASS
- Test Result in higher band (Channel 11) : PASS
- 5.4.4 Note on Band edge Emission

The band edge emission plot on appendix B page B7 shows 53.29 dB delta between carrier maximum power and local maximum emission in the restricted band (2366.5 MHz).

The band edge emission plot on appendix B page B8 shows 54.26 dB delta between carrier maximum power and local maximum emission in the restricted band (2493.9 MHz).

Channel	Polarity	The emission of carrier power strength	The maximum field strength in restricted band	Limit	Margin	Result
		(dB μ V/m)	(dB μ V/m)	(dB μ V/m)	(dB)	
	V	110.07	56.78	74	-17.22	Peak
CH01	V	101.84	48.55	54	-5.45	Average
	Н	107.68	54.39	74	-19.61	Peak
	Н	99.9	46.61	54	-7.39	Average

Channel	Polarity	The emission of carrier power strength	The maximum field strength in restrict band	Limit	Margin	Result
		(dB μ V/m)	(dB μ V/m)	(dB	(dB)	
	V	106.12	51.86	74	-22.14	Peak
Ch11	V	98.37	44.11	54	-9.89	Average
Ch11	Н	105.66	51.4	74	-22.6	Peak
	Н	97.51	43.25	54	-10.75	Average

* The maximum field strength in restricted band is the emission of carrier power strength minus the delta between carrier maximum power and local maximum emission in the restricted band.

5.5 Peak Output Power

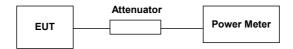
5.5.1 Measuring Instruments :

As described in chapter 7 of this test report.

5.5.2 Test Procedure :

The antenna port (RF output) of the EUT was connected to the input (RF input) of a power meter. The power is equal to the reading land on power meter plus cable loss at the EUT antenna terminal.

5.5.3 Test Setup Layout :



5.5.4 Test Result :

- Mode 1~3 : WLAN Tx mode
- Temperature : 23°C
- Relative Humidity : 51 %
- Antenna Gain: 0 dBi

Channel	Frequency	Measured Output Power	Measured Output Power	Limits
	(MHz)	(mWatt)	(dBm)	(Watt/dBm)
01	2412	67.60	18.30	1W/30 dBm
06	2437	60.25	17.80	1W/30 dBm
11	2462	57.80	17.62	1W/30 dBm

5.6 Test of Conducted Emission

Conducted emissions were measured from 150 KHz to 30 MHz with a bandwidth of 9 KHz and return leads of the EUT according to the methods defined in ANSI C63.4-2001 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

5.6.1 Major Measuring Instruments :

 Test Receiver 	(R&S ESCS 30)
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 KHz

5.6.2 Test Procedures :

- a. 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.
- b. Connect EUT to the power port of the line impedance stabilization network (LISN).
- c. All the support units are connect to the other LISN.
- d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- e. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
- f. Both sides of AC line were checked for maximum conducted interference.
- g. The frequency range from 150 KHz to 30 MHz was searched.
- h. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

5.6.3 Test Result of Conducted Emission :

Frequency Range of Test : from 150KHz to 30 MHz. 6dB Bandwidth : 9KHz

- Test Mode : Mode 1
- Temperature : 22.5°C
- Relative Humidity : 50 %

The test that passed at minimum margin was marked by the frame in the following table.

Condition EUT Power Model	: Tri Band : AC 110V : 56W11	: CNS/VCCI/CISPR-B 2003 2001/008 LINE : Tri Band GSM/WLAN (802-11B) PCMCIA Card : AC 110V/60Hz : 56 W11 : 802.11b Tx CH01 2412MHz										
Memo	:802.115	IXCHUI		Tinit	Deed	Draha	Cable					
	Freq	Level	Over Limit	Limit Line		Probe Factor		Remark				
<u>12</u>		<u></u>	<u></u>	<u></u> .	<u></u>	1 <u></u>						
	MHz	dBuV	dB	dBuV	dBuV	dB	dB					
1	0.162	45.24	-20.14	65.38	45.02	0.10	0.12	QP				
2	0.162	32.11	-23.27	55.38	31.89	0.10	0.12	Average				
3	0.164	44.95	-20.32	65.27	44.73	0.10	0.12	QP				
4	0.164	30.88	-24.39	55.27	30.66	0.10	0.12	Average				
5	0.213	26.96	-26.13	53.09	26.73	0.10	0.13	Average				
6	0.213	40.75	-22.34	63.09	40.52	0.10	0.13	QP				
7	0.282	33.13	-27.63	60.76	32.94	0.10	0.09	QP				
8	0.282	18.76	-32.00	50.76	18.57	0.10	0.09	Average				
9	0.334	23.27	-36.09	59.36	23.10	0.10	0.07	영양 이 집을 알려요. 영양 구요 같은				
10	0.334	9.82	-39.54	49.36	9.65	0.10	0.07	Average				
11	8.906	34.52	-25.48	60.00	34.20	0.19	0.13					
12	8.906	28.52	-21.48	50.00	28.20	0.19	0.13	Average				
Condition SUT	: AC 110V	CI/CISPR GSM/WL	-B 2003 20 AN (802-11									
Site Condition EUT Power Model Memo	: CNS/VC : Tri Band : AC 110V : 56W11 : 802.11b	CI/CISPR GSM/WL 7/60Hz Tx CH01	AN (802-1) 2412MHz Over	lB) PCMC Limit	IA Card Read	Probe	Cable	124 - 65				
Condition EUT Power Model	: CNS/VC : Tri Band : AC 110V : 56W11 : 802.11b	CI/CISPR GSM/WL 7/60Hz Tx CH01	AN (802-11) 2412MHz	IB) PCMC	IA Card Read	Probe Factor		Remark				
Condition EUT Power Model	: CNS/VC : Tri Band : AC 110V : 56W11 : 802.11b	CI/CISPR GSM/WL 7/60Hz Tx CH01	AN (802-1) 2412MHz Over	lB) PCMC Limit	IA Card Read			Remark				
Condition EUT Power Model	: CNS/VC : Tri Band : AC 110V : 56W11 : 802.11b Freq	CI/CISPR GSM/WL 760Hz Tx CH01 Level dBuV	AN(802-1) 2412MHz Over Limit	lB) PCMC Limit Line	IA Card Read Level	Factor	Loss					
Condition EUT Power Model Memo	:CNS/VC :TriBand :AC 110V :56W11 :802.11b Freq MHz	CI/CISPR GSM/WL 760Hz Tx CH01 Level dBuV 51.32	AN(802-1: 2412MHz Over Limit dB	Limit Linit Line dBuV	IA Card Read Level dBuV	Factor dB	Loss dB 0.11					
Condition EUT Power Model Memo 	CNS/VC Tri Band AC 110V 56W11 802.11b Freq MHz 0.150	CI/CISPR GSM/WL //60Hz Tx CH01 Level dBuV 51.32 35.12	AN(802-1: 2412MHz Over Limit dB -14.68	Limit Line dBuV 66.00	IA Card Read Level dBuV 51.11	Factor dB 0.10	Loss dB 0.11 0.11	 OP				
Condition EUT Power Model Memo 	:CNS/VC :Tri Band :AC 110V :56W11 :802.11b Freq MHz 0.150 0.150	CI/CISPR GSM/WL /60Hz Tx CH01 Level dBuV 51.32 35.12 33.58	AN(802-1) 2412MHz Over Limit dB -14.68 -20.88	IB) PCMC Limit Line dBuV 66.00 56.00	IA Card Read Level dBuV 51.11 34.91	Factor dB 0.10 0.10	Loss dB 0.11 0.11	OP Average Average				
Condition EUT Power Model Memo 	CNS/VC Tri Band AC 110V 56W11 802.11b Freq MHz 0.150 0.150 0.159	CI/CISPR GSM/WL //60Hz Tx CH01 Level dBuV 51.32 35.12 33.58 49.96	AN(802-1) 2412MHz Over Limit dB -14.68 -20.88 -21.94	 IB) PCMC Limit Line dBuV 66.00 56.00 55.52 	Read Level dBuV 51.11 34.91 33.36	Factor dB 0.10 0.10 0.10	Loss dB 0.11 0.11 0.12	OP Average Average QP				
Condition EUT Power Model Memo 	CNS/VC Tri Band AC 110V 56 W11 802.11b Freq MHz 0.150 0.150 0.159 0.159	CI/CISPR GSM/WL //60Hz Tx CH01 Level dBuV 51.32 35.12 33.58 49.96 41.75	AN (802-1) 2412MHz Over Limit _	Limit Line dBuV <u>66.00</u> 56.00 55.52 65.52	IA Card Read Level dBuV 51.11 34.91 33.36 49.74	Factor dB 0.10 0.10 0.10 0.10	Loss dB 0.11 0.12 0.12 0.13	OP Average Average QP				
Condition EUT Power Model Memo 	CNS/VC Tri Band AC 110V 56W11 802.11b Freq MHz 0.150 0.150 0.159 0.159 0.187	CI/CISPR GSM/WL //60Hz Tx CH01 Level dBuV 51.32 35.12 33.58 49.96 41.75 25.12	AN (802-1) 2412MHz Over Limit dB -14.68 -20.88 -21.94 -15.56 -22.42	Limit Line dBuV 66.00 56.00 55.52 65.52 64.17	IA Card Read Level dBuV 51.11 34.91 33.36 49.74 41.52	Factor dB 0.10 0.10 0.10 0.10 0.10 0.10	Loss dB 0.11 0.12 0.12 0.13	OP Average Average QP QP Average				
Condition EUT Power Model Memo 	CNS/VC Tri Band AC 110V 56W11 802.11b Freq MHz 0.150 0.150 0.159 0.159 0.187 0.187	CI/CISPR GSM/WL //60Hz Tx CH01 Level dBuV 51.32 35.12 33.58 49.96 41.75 25.12 41.03	AN (802-1) 2412MHz Over Limit dB -14.68 -20.88 -21.94 -15.56 -22.42 -29.05	Limit Line dBuV 66.00 56.00 55.52 65.52 64.17 54.17	Read Level dBuV 51.11 34.91 33.36 49.74 41.52 24.89	Factor dB 0.10 0.10 0.10 0.10 0.10 0.10 0.10	Loss dB 0.11 0.12 0.12 0.13 0.13 0.13 0.12	OP Average Average QP QP Average				
Condition EUT Power Model Memo 	CNS/VC Tri Band AC 110V 56W11 802.11b Freq MHz 0.150 0.150 0.159 0.159 0.187 0.187 0.223	CI/CISPR GSM/WL //60Hz Tx CH01 Level dBuV 51.32 35.12 33.58 49.96 41.75 25.12 41.03 27.94	AN (802-1) 2412MHz Over Limit dB -14.68 -20.88 -21.94 -15.56 -22.42 -29.05 -21.67	Limit Line dBuV <u>66.00</u> 56.00 55.52 65.52 64.17 54.17 62.70	IA Card Read Level dBuV 51.11 34.91 33.36 49.74 41.52 24.89 40.81	Factor dB 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.1	Loss dB 0.11 0.12 0.12 0.13 0.13 0.13 0.12 0.12	OP Average Average QP QP Average QP				
Condition EUT Power Model Memo 	CNS/VC Tri Band AC 110V 56W11 802.11b Freq MHz 0.150 0.150 0.159 0.159 0.187 0.187 0.223 0.223	CI/CISPR GSM/WL //60Hz Tx CH01 Level dBuV 51.32 33.58 49.96 41.75 25.12 41.03 27.94 13.86	AN (802-1) 2412MHz Over Limit dB -14.68 -20.88 -21.94 -15.56 -22.42 -29.05 -21.67 -24.76	Limit Line dBuV <u>66.00</u> 56.00 55.52 65.52 64.17 54.17 62.70 52.70	Read Level dBuV 51.11 34.91 33.36 49.74 41.52 24.89 40.81 27.72	Factor dB 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.1	Loss dB 0.11 0.12 0.12 0.13 0.13 0.13 0.12 0.12	OP Average QP QP Average QP Average Average				
Condition EUT Power Model Memo 	CNS/VC Tri Band AC 110V 56W11 802.11b Freq MHz 0.150 0.150 0.159 0.159 0.159 0.187 0.187 0.223 0.223 0.270	CI/CISPR GSM/WL //60Hz Tx CH01 Level dBuV 51.32 33.58 49.96 41.75 25.12 41.03 27.94 13.86 29.42	AN (802-1) 2412MHz Over Limit dB -14.68 -20.88 -21.94 -15.56 -22.42 -29.05 -21.67 -24.76 -37.26	Limit Line dBuV <u>66.00</u> 56.00 55.52 65.52 64.17 54.17 62.70 52.70 51.12	Read Level dBuV 51.11 33.36 49.74 41.52 24.89 40.81 27.72 13.66	Factor dB 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.1	Loss dB 0.11 0.12 0.12 0.12 0.13 0.13 0.13 0.12 0.12 0.10 0.10	OP Average QP QP Average QP Average Average				
Condition EUT Power Model Memo 2 3 4 5 6 7 8 9 10	CNS/VC Tri Band AC 110V 56W11 802.11b Freq MHz 0.150 0.150 0.159 0.159 0.159 0.187 0.223 0.223 0.270 0.270 8.581	CI/CISPR GSM/WL //60Hz Tx CH01 Level dBuV 51.32 33.58 49.96 41.75 25.12 41.03 27.94 13.86 29.42 28.64	AN (802-1) 2412MHz Over Limit dB -14.68 -20.88 -21.94 -15.56 -22.42 -29.05 -21.67 -24.76 -37.26 -31.70	Limit Line dBuV 66.00 55.52 64.17 54.17 62.70 52.70 51.12 61.12 50.00	Read Level dBuV 51.11 34.91 33.36 49.74 41.52 24.89 40.81 27.72 13.66 29.22	Factor dB 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.1	Loss dB 0.11 0.12 0.12 0.12 0.13 0.13 0.13 0.12 0.12 0.10 0.10	OP Average QP QP Average QP Average Average QP Average				

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Frequency Range of Test : from 150KHz to 30 MHz. 6dB Bandwidth : 9KHz

- Test Mode : Mode 2
- Temperature : 22.5°C
- Relative Humidity : 50 %

The test that passed at minimum margin was marked by the frame in the following table.

Site Condition EUT Power	: CO01-HY : CNS/VCCI/CISPR-B 2003 2001/008 LINE : Tri Band GSM/WLAN (802-11B) PCMCIA Card : AC 1107/00Hz : 55W11											
Model	: 56 W11 : 802.11b Tx CH06 2437MHz											
Memo	:802.110	IXCHUO		Tinit	Deed	Duche	Cable					
	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark				
						21						
	MHz	dBuV	dB	dBuV	dBuV	dB	dB					
1	0.152	48.25	-17.64	65.89	48.04	0.10	0.11	OP				
2	0.152	32.71	-23.18	55.89	32.50	0.10	0.11	Average				
3	0.202		-23.01	63.53	40.28	0.10	0.14					
4	0.202		-28.05	53.53	25.24	0.10		Average				
5	0.227		-20.15	62.56	42.19	0.10	0.12	8280 10				
6	0.227	30.88	-21.68	52.56	30.66	0.10		Average				
7	0.289		-28.56	60.55	31.80	0.10	0.09					
8	0.289		-30.03	50.55	20.33	0.10		Average				
9	0.367		-26.33	58.57	32.09	0.10	0.05	80. C. MARIA CONTRACTOR				
10	0.367		-22.22	48.57	26.20	0.10		Average				
11	8.640		-26.15	60.00	33.54	0.18	0.13	요구한 이번 위험 가지 않는 것 같아요.				
12	8.640		-21.58	50.00	28.11	0.18		Average				
EUT Power Model Memo	: AC 110V : 56W11	/60Hz	AN(802-1) 2437MHz Over Limit	Limit Line	Read	Probe Factor	Cable Loss	Remark				
1 <u>2)</u>	MHz	dBuV	dB	dBuV	dBuV	dB	dB	2 <u></u>				
1	0.151	50.23	-15.71	65.94	50.02	0.10	0.11	QP				
2	0.151	29.13	-26.81	55.94	28.92	0.10	0.11	Average				
3	0.151	44.97	-20.97	65.94	44.76	0.10	0.11	QP				
4	0.151	30.12	-25.82	55.94	29.91	0.10	0.11	Average				
5	0.172	42.31	-22.55	64.86	42.08	0.10	0.13	QP				
6	0.172	27.30	-27.56	54.86	27.07	0.10	0.13	Average				
7	0.200	41.85	-21.76	63.61	41.61	0.10	0.14	QP				
8	0.200	24.50	-29.11	53.61	24.26	0.10	0.14	Average				
9	0.264	24.15	-37.15	61.30	23.95	0.10	0.10	QP				
10	0.264	13.75	-37.55	51.30	13.55	0.10	0.10	Average				
11	0.370	33.87	-24.64	58.51	33.72	0.10	0.05	QP				
12	0.370	28.26	-20.25	48.51	28.11	0.10	0.05	Average				
Test Eng	gineer :	Jo,	ner Ts	ai	_ Jo	nes Tsa	i					

SPORTON International Inc. TEL : 886-2-2696-2468 FAX : 886-2-2696-2255 Frequency Range of Test : from 150KHz to 30 MHz. 6dB Bandwidth : 9KHz

- Test Mode : Mode 3
- Temperature : 22.5°C
- Relative Humidity : 50 %

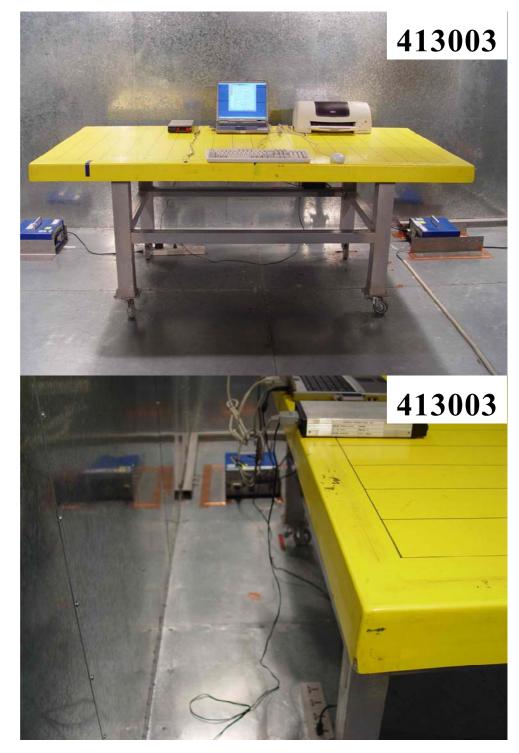
The test that passed at minimum margin was marked by the frame in the following table.

?ower Model	: Tri Band GSM/WLAN(802-11B) PCMCIA Card : AC 110V/60Hz : 56W11										
víemo	: 802.11b Tx CH11 2462MHz										
			Over	Limit	Read	Probe	Cable				
	Freq	Level	Limit	Line	Level	Factor	Loss	Remark			
<u>-2;</u>	MHz	dBuV	dB	dBuV	dBuV	dB	dB	-			
1	0.159	46.86	-18.66	65.52	46.64	0.10	0.12	QP			
2	0.159	35.04	-20.48	55.52	34.82	0.10	0.12	Average			
3	0.169		-21.96	65.01	42.83	0.10	0.12				
4	0.169		-26.75	55.01	28.04	0.10		Average			
5	0.194		-21.08	63.86	42.54	0.10	0.14	20,200 - 97			
6	0.194		-28.44	53.86	25.18	0.10		Average			
7	0.209		-21.77	63.24	41.24	0.10	0.14				
8	0.209		-24.99	53.24	28.02	0.10		Average			
9	0.209		-24.99	53.24 62.38	41.83	0.10	0.13	방향 귀엽에서 영어주에서			
				52.38	29.98	0.10		12.000			
10	0.232		-22.18					Average			
11 12	0.292 0.292		-28.44	60.47 50.47	31.84 23.34	0.10	0.09	Average			
ndition IT wer	: Tri Band : AC 110V	CI/CISPR GSM/WL	-B 2003 20 AN (802-11								
ondition UT ower lodel	: CNS/VC : Tri Band : AC 110V : 56W11 : 802.11b	CI/CISPR GSM/WL 7/60Hz Tx CH11	AN (802-1) 2462MHz Over	.B) PCMC Limit	IA Card Read	9835 TRATI	Cable				
ondition UT ower odel	: CNS/VC : Tri Band : AC 110V : 56W11	CI/CISPR GSM/WL 7/60Hz Tx CH11	AN (802-11) 2462MHz	.B) PCMC	IA Card Read	Probe Factor		Remark			
ondition JT wer odel	: CNS/VC : Tri Band : AC 110V : 56W11 : 802.11b	CI/CISPR GSM/WL 7/60Hz Tx CH11	AN (802-1) 2462MHz Over	.B) PCMC Limit	IA Card Read	9835 TRATI		Remark			
ondition UT over odel emo 	CNS/VC Tri Band AC 110V 56W11 802.11b Freq MHz 0.150	CI/CISPR GSM/WL 760Hz Tx CH11 Level dBuV 49.19	AN(802-11 2462MHz Over Limit dB -16.81	B) PCMC Limit Line dBuV 66.00	IA Card Read Level dBuV 48.98	Factor dB 0.10	Loss dB 0.11	 QP			
ondition JT over odel emo 	CNS/VC Tri Band 56W11 802.11b Freq MHz 0.150 0.150	CI/CISPR GSM/WL 760Hz Tx CH11 Level dBuV 49.19 32.71	AN(802-1) 2462MHz Over Limit dB -16.81 -23.29	 B) PCMC Limit Line dBuV 66.00 56.00 	IA Card Read Level dBuV 48.98 32.50	Factor dB 0.10 0.10	Loss dB 0.11 0.11	QP Average			
ondition JT over odel emo <u>1</u> 2 3	CNS/VC Tri Band 56W11 802.11b Freq MHz 0.150 0.150 0.180	CI/CISPR GSM/WL V60Hz Tx CH11 Level dBuV 49.19 32.71 42.26	AN (802-1) 2462MHz Over Limit dB -16.81 -23.29 -22.23	 B) PCMC Limit Line dBuV 66.00 56.00 64.49 	Read Level dBuV 48.98 32.50 42.03	Factor dB 0.10 0.10 0.10	Loss dB 0.11 0.11 0.13	QP Average QP			
ondition JT over odel emo 	CNS/VC Tri Band 56W11 802.11b Freq MHz 0.150 0.150 0.180 0.180	CI/CISPR GSM/WL V/60Hz Tx CH11 Level dBuV 49.19 32.71 42.26 25.92	AN (802-1) 2462MHz Over Limit dB -16.81 -23.29 -22.23 -28.57	 B) PCMC Limit Line dBuV 66.00 56.00 64.49 54.49 	IA Card Read Level dBuV 48.98 32.50 42.03 25.69	Factor dB 0.10 0.10 0.10 0.10	Loss dB 0.11 0.11 0.13 0.13	OP Average QP Average			
ondition JT odel emo <u>1</u> 2 3 4 5	CNS/VC Tri Band SGC 110V 56W11 802.11b Freq MHz 0.150 0.150 0.150 0.180 0.180 0.197	CI/CISPR GSM/WL V/60Hz Tx CH11 Level dBuV 49.19 32.71 42.26 25.92 41.30	AN (802-1) 2462MHz Over Limit dB -16.81 -23.29 -22.23 -28.57 -22.44	 B) PCMC Limit Line dBuV 66.00 56.00 64.49 54.49 63.74 	IA Card Read Level dBuV 48.98 32.50 42.03 25.69 41.06	Factor dB 0.10 0.10 0.10 0.10 0.10 0.10	Loss dB 0.11 0.11 0.13 0.13 0.14	OP Average QP Average QP			
ndition IT wer odel emo <u>1</u> 2 3 4	CNS/VC Tri Band 56W11 802.11b Freq MHz 0.150 0.150 0.180 0.180	CI/CISPR GSM/WL V/60Hz Tx CH11 Level dBuV 49.19 32.71 42.26 25.92 41.30	AN (802-1) 2462MHz Over Limit dB -16.81 -23.29 -22.23 -28.57	 B) PCMC Limit Line dBuV 66.00 56.00 64.49 54.49 	IA Card Read Level dBuV 48.98 32.50 42.03 25.69	Factor dB 0.10 0.10 0.10 0.10	Loss dB 0.11 0.11 0.13 0.13 0.14	OP Average QP Average			
IT wer odel emo <u>1</u> 2 3 4 5	CNS/VC Tri Band SGC 110V 56W11 802.11b Freq MHz 0.150 0.150 0.150 0.180 0.180 0.197	CI/CISPR GSM/WL V/60Hz Tx CH11 Level dBu¥ 49.19 32.71 42.26 25.92 41.30 25.61	AN (802-1) 2462MHz Over Limit dB -16.81 -23.29 -22.23 -28.57 -22.44	 B) PCMC Limit Line dBuV 66.00 56.00 64.49 54.49 63.74 	IA Card Read Level dBuV 48.98 32.50 42.03 25.69 41.06	Factor dB 0.10 0.10 0.10 0.10 0.10 0.10	Loss dB 0.11 0.11 0.13 0.13 0.14	OP Average QP Average QP Average			
ndition JT wer odel emo <u>1</u> 2 3 4 5 6	CNS/VC Tri Band SGC 110V 56W11 802.11b Freq MHz 0.150 0.150 0.150 0.180 0.180 0.197 0.197	CI/CISPR GSM/WL V/60Hz Tx CH11 Level dBu¥ 49.19 32.71 42.26 25.92 41.30 25.61 42.39	AN (802-1) 2462MHz Over Limit dB -16.81 -23.29 -22.23 -28.57 -22.44 -28.13	 B) PCMC Limit Line dBuV 66.00 56.00 64.49 54.49 63.74 53.74 	IA Card Read Level dBuV 48.98 32.50 42.03 25.69 41.06 25.37	Factor dB 0.10 0.10 0.10 0.10 0.10 0.10 0.10	Loss dB 0.11 0.13 0.13 0.14 0.14 0.12	OP Average QP Average QP Average			
ndition JT odel emo <u>1</u> 2 3 4 5 6 7	CNS/VC Tri Band SGC 110V 56W11 802.11b Freq MHz 0.150 0.150 0.150 0.180 0.180 0.197 0.197 0.223	CI/CISPR GSM/WL V/60Hz Tx CH11 Level dBu¥ 49.19 32.71 42.26 25.92 41.30 25.61 42.39 31.01	AN (802-1) 2462MHz Over Limit dB -16.81 -23.29 -22.23 -28.57 -22.44 -28.13 -20.32	 B) PCMC Limit Line dBuV 66.00 64.49 54.49 63.74 53.74 62.71 	IA Card Read Level dBuV 48.98 32.50 42.03 25.69 41.06 25.37 42.17	Factor dB 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.1	Loss dB 0.11 0.13 0.13 0.14 0.14 0.12	OP Average QP Average QP Average QP Average			
ondition JT odel emo <u>1</u> 2 3 4 5 6 7 8 9	CNS/VC Tri Band SGC 110V 56W11 802.11b Freq MHz 0.150 0.150 0.150 0.180 0.180 0.197 0.197 0.223 0.223	CI/CISPR GSM/WL V/60Hz Tx CH11 Level dBuV 49.19 32.71 42.26 25.92 41.30 25.61 42.39 31.01 28.72	AN (802-1) 2462MHz Over Limit dB -16.81 -23.29 -22.23 -28.57 -22.44 -28.13 -20.32 -21.70	 B) PCMC Limit Line dBuV 66.00 64.49 54.49 63.74 53.74 62.71 52.71 	IA Card Read Level dBuV 48.98 32.50 42.03 25.69 41.06 25.37 42.17 30.79	Factor dB 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.1	Loss dB 0.11 0.13 0.13 0.14 0.14 0.12 0.12 0.11	OP Average QP Average QP Average QP Average			
ondition UT Jower Iodel Iemo 2 3 4 5 6 7 8 9 10	CNS/VC Tri Band S6W11 802.11b Freq MHz 0.150 0.150 0.150 0.180 0.180 0.197 0.223 0.223 0.252	CI/CISPR GSM/WL V/60Hz Tx CH11 Level dBuV 49.19 32.71 42.26 25.92 41.30 25.61 42.39 31.01 28.72 17.36	AN (802-1) 2462MHz Over Limit dB -16.81 -23.29 -22.23 -28.57 -22.44 -28.13 -20.32 -21.70 -32.97 -34.33	 B) PCMC Limit Line dBuV 66.00 64.49 54.49 63.74 53.74 62.71 52.71 61.69 	IA Card Read Level dBuV 48.98 32.50 42.03 25.69 41.06 25.37 42.17 30.79 28.51	Factor dB 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.1	Loss dB 0.11 0.13 0.13 0.14 0.14 0.12 0.12 0.11	OP Average QP Average QP Average QP Average QP Average			
ondition UT Jover Iodel Iemo 2 3 4 5 6 7 8 9 10 11	CNS/VC Tri Band AC 110V 56W11 802.11b Freq MHz 0.150 0.150 0.150 0.180 0.180 0.197 0.223 0.223 0.252 0.252	CI/CISPR GSM/WL V/60Hz Tx CH11 Level dBuV 49.19 32.71 42.26 25.92 41.30 25.61 42.39 31.01 28.72 17.36 33.85	AN (802-1) 2462MHz Over Limit dB -16.81 -23.29 -22.23 -28.57 -22.44 -28.13 -20.32 -21.70 -32.97	B) PCMC Limit Line dBuV <u>66.00</u> 56.00 64.49 54.49 63.74 53.74 62.71 52.71 61.69 51.69	IA Card Read Level dBuV 48.98 32.50 42.03 25.69 41.06 25.37 42.17 30.79 28.51 17.15	Factor dB 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.1	Loss dB 0.11 0.13 0.13 0.14 0.14 0.12 0.12 0.12 0.11 0.11 0.05	OP Average QP Average QP Average QP Average QP Average			
2 3 4 5 6 7 8	CNS/VC Tri Band AC 110V 56W11 802.11b Freq MHz 0.150 0.150 0.150 0.180 0.180 0.197 0.223 0.223 0.223 0.252 0.252 0.369	CL/CISPR GSM/WL //60Hz Tx CH11 Level dBuV 49.19 32.71 42.26 25.92 41.30 25.61 42.39 31.01 28.72 17.36 33.85 28.22	AN (802-1) 2462MHz Over Limit dB -16.81 -23.29 -22.23 -28.57 -22.44 -28.13 -20.32 -21.70 -32.97 -34.33 -24.67	 B) PCMC Limit Line dBuV 66.00 64.49 54.49 63.74 53.74 62.71 52.71 61.69 51.69 58.52 48.52 	IA Card Read Level dBuV 48.98 32.50 42.03 25.69 41.06 25.37 42.17 30.79 28.51 17.15 33.70	Factor dB 0.10 0.10 0.10 0.10 0.10 0.10 0.10 0.1	Loss dB 0.11 0.13 0.13 0.14 0.14 0.12 0.12 0.12 0.11 0.11 0.05	OP Average QP Average QP Average QP Average QP Average QP			

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5.6.4 Photographs of Conducted Emission Test Configuration

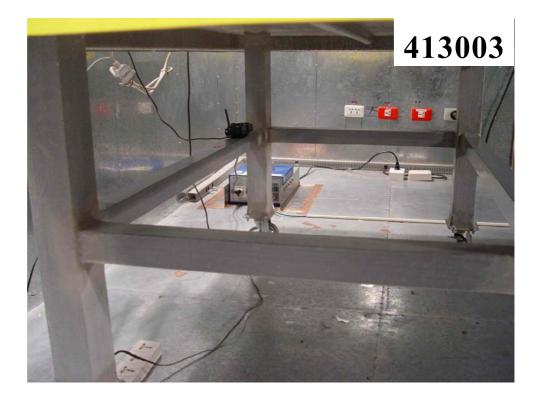
• The photographs show the configuration that generates the maximum emission.



FRONT VIEW

REAR VIEW

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SIDE VIEW

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5.7 Test of Radiated Emission

Radiated emissions from 30 MHz to 25 GHz were measured according to the methods defines in ANSI C63.4-2001. The EUT was placed, 0.8 meter above the ground plane, as shown in section 5.6.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions

5.7.1 Major Measuring Instruments

Amplifier	(MITEQ AFS44)
RF Gain	40 dB
Signal Input	100 MHz to 26.5 GHz
Amplifier	(HP8447D)
RF Gain	30 dB
Signal Input	100 MHz to 1.3 GHz

 Spectrum analyzer 	(R&S FSP40)
Attenuation	10 dB
Start Frequency	1 GHz
Stop Frequency	25 GHz
Resolution Bandwidth	1 MHz
Video Bandwidth	1 MHz
Signal Input	9 KHz to 40 GHz

 Spectrum analyzer 	(R&S FSP40)
Attenuation	10 dB
Start Frequency	30MHz
Stop Frequency	1 GHz
Resolution Bandwidth	120 KHz
Video Bandwidth	300KHz
Signal Input	9 KHz to 40 GHz

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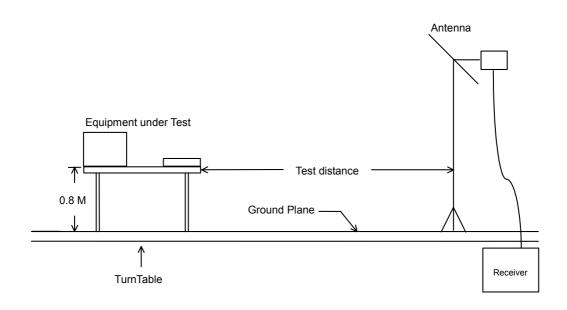
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5.7.2 Test Procedures

- 1. The EUT was placed on a rotatable table top 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 broadband antenna and its height is varied 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 or CISPR quasi-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. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

5.7.3 Typical Test Setup Layout of Radiated Emission



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- 5.7.4 Test Result of Radiated Emission
 - Test Mode: Mode 1
 - Test Distance : 3 M
 - Temperature : 23 °C
 - Relative Humidity :51 %
 - Emission level (dBuV/m) = 20 log Emission level (uV/m)
 - Corrected Reading : Probe Factor + Cable Loss + Read Level Preamp Factor = Level

The test that passed at minimum margin was marked by the frame in the following table.

Site Condit EUT Power Model	ion : FCC : Tri B : AC 1	and GSI 10V / 6	-B 3m F M/WLA	IORN-A N (802.1	G						
Memo	TX C	H01 24		1 47250-04574	2012240	ARE DOWN ON SO	000040548-00	2000000000		11000	570200787
	Freq	Level	Over Limit			Probe Factor		Preamp Factor	Remark	Ant Pos	Table Pos
3	MHz	dBuV/m	dB	dBuV/m		dB	dB	dB		CI	deg
1	2390.000	41.90	-12.10	54.00	53.12	28.20	1.72	41.14	Average	121	324
2	2390.000	53.04	-20.96	74.00	64.26	28.20	1.72	41.14	Peak	121	324
5	2483.500	41.14	-12.86	54.00	52.13	28.39	1.82	41.20	Àverage	128	337
6	2483.500	이 이렇게 아이지?) - TETRICOS	1 - 이구성구나 (구성구)	20. T. S. T. T.	28.39	1.82			128	337
Site Condit: EUT Power Model	ion FCC Tri B AC 1 56W	and GSI 10V / 60 11	M/WLA))Hz	IORN-A N (802.1	10.000.000000			L			
Vlemo	: TX C	H01 24:	0ver	Limit	Read	Probe	Coble	Preamp		Ant	Table
	Freq	Level		Line		Factor		Factor	Remark	Pos	Pos
8	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		CM	deg
1	2390.000	51.85	-22.15	74.00	63.07	28.20	1.72	41.14	Peak	124	346
2	2390.000	41.12	-12.88	54.00	52.34	28.20	1.72	41.14	Average	124	346
5	2483.500	42.12	-11.88	54.00	53.11	28.39	1.82	41.20	Average	124	346
6	2483.500		-20.84	74.00	64.15	28.39					

Site	: 03CH	103-HY										
Conditio	on : FCC	FCC CLASS-B 3m HORN-ANT-6741 VERTICAL										
EUT	: Tri B	Tri Band GSM/WLAN (802.11b) PCMCIA Card										
Power	: AC 1	10V/6	OHz									
Model	: 56W	11										
Memo	: TX C	CH01 24	12MHz									
			Over	Limit	Read	Probe	Cable	Preamp		Ant	Table	
	Freq	Level	Limit	Line	Level	Factor	Loss	Factor	Remark	Pos	Pos	
1	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB			deg	
1	4821.000	47.20	-26.80	74.00	54.03	33.06	2.47	42.36	Peak	142	348	

Site Conditio EUT Power	on : FCC : Tri B	0	-B 3m H M/WLAI			1 HORIZ ACIA Ca	1200	L						
Model	: 56W	11												
Memo	: TX C	TX CH01 2412MHz												
			Over	Limit	Read	Probe	Cable	Preamp		Ant	Table			
	Freq	Level	Limit	Line	Level	Factor	Loss	Factor	Remark	Pos	Pos			
1	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB			deg			
1 4	4821.000	44.66	-29.34	74.00	51.49	33.06	2.47	42.36	Peak	132	326			

➢ For 4.821GHz ~ 25GHz

Remark: Frequency from 4821MHz to 25GHz, the emission emitted by the EUT is too low to be measured

Frequency		Antenna	Cable	Reading	Lim	nits	Emission	Level	Margin	Detect
	Polarity	Factor	Loss							
(MHz)		(dB/m)	(dB)	(dBuV)	(dBuV/m))(uV/m)	(dBuV/m)	(uV/m)	(dB)	Mode
2414.000	V	28.25	1.74	80.08	-	-	110.07	318786.56	-	Peak
2414.000	V	28.25	1.74	71.85	-	-	101.84	123594.74	-	AV
2414.000	Н	28.25	1.74	77.69	-	-	107.68	242102.90	-	Peak
2414.000	Н	28.25	1.74	69.91	-	-	99.90	98855.31	-	AV
4821.000	V/H	33.06	2.47	11.67	74.00	5011.87	47.20	229.09	-26.80	AV/Peak
7236.000	V/H	-	-	-	-	-	-	-	-	AV/Peak
9648.000	V/H	-	-	-	-	-	-	-	-	AV/Peak
12060.000	V/H	-	-	-	-	-	-	-	-	AV/Peak
14472.000	V/H	-	-	-	-	-	-	-	-	AV/Peak
16884.000	V/H	-	-	-	-	-	-	-	-	AV/Peak
19296.000	V/H	-	-	-	-	-	-	-	-	AV/Peak
21708.000	V/H	-	-	-	-	-	-	-	-	AV/Peak
24120.000	V/H	-	-	-	-	-	-	-	-	AV/Peak

■ Field strength of fundamental and harmonics

Remark:

- 1. The emission emitted by the EUT is too low to be measured except the emission listed above,
- 2. Reading = Reading on SA-Preamp Factor

Test Engineer :

Jones Tsai

Jones Tsai

- Test Mode: Mode 2 (2437 MHz)
- Test Distance : 3 M
- Temperature : 23 °C
- Relative Humidity : 51 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Probe Factor + Cable Loss + Read Level Preamp Factor = Level

The test that passed at minimum margin was marked by the frame in the following table.

Site Condit EUT Power Model Memo	ion	FC Tri AC 561	C C Ban 11 W11	nd GSI 0V / 6(//WLA			I VERTI ICIA Ca					
				Level	Over	Limit Line	Read Level	Probe Factor		Preamp Factor	Remark	Ant Pos	Table Pos
-		МН	z d	BuV/m	dB	dBuV/m	 dBuV	dB	dB	dB			deg
1	239		0	40 90	-12 10	54.00	F2 12	28.20	1.72	41 14	Average	121	341
2	239	10.52				74.00	63.12		1.72		영상 승규는 것은 전화품이 없다.	121	341
5	248:	3.50	0	41.20	-12.80	54.00	52.19	28.39	1.82	41.20	Average	126	325
6	248:	8.50	0	52.43	-21.57	74.00	63.42	28.39	1.82	41.20	Peak		
Site Conc EUT Pow Mod Men	er el	: F : T : A : 5	CC ni B LC 1 6W	and G 110V / 11	S-B 3m SM/WL	AN (802.		41 HOR MCIA C		AL			
IVICII	10	1965	AC	/1100 2	OVe OVe	See - marine	t Rea	d Probe	e Cabl	e Pream	g	Ant	Table
		F	req	Leve	l Limi	t Lin.		1 Factor			r Remark	Pos	Pos
	3	j,	Mz	dBuV/	m c	B dBuV/:	m dBu	V di	3 d	LB c	B		deg
1	23	90.0	000	40.9	1 -13.0	9 54.0	0 52.1	3 28.20	0 1.7	2 41.1	4 Average	125	346
2	23	90.0	000	52.1	1 -21.8	89 74.0	0 63.3	3 28.20	0 1.7	2 41.1	4 Peak	125	326

5	2483 500	52 69 -	21 31	74 00	63 68	28 39	1 82	41.20 Peak	118	336
1000	145 C 40 C 40 Z C 40 C 10 C						100000	41.20 Average	118	336

Site Conditio EUT Power	n : FCC : Tri B		-B 3m H M/WLAI		T. C. T. C.	1 VERTI MCIA Ca					
Model	: 56W	11									
Memo	: TX C	H06 24	37MHz								
			Over	Limit	Read	Probe	Cable	Preamp		Ant	Table
	Freq	Level	Limit	Line	Level	Factor	Loss	Factor	Remark	Pos	Pos
52	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1 4	869.000	50.54	-23.46	74.00	57.29	33.16	2.52	42.43	Peak	140	329

0101010001	n : FCC : Tri B : AC 1 : 56W	03CH03-HY FCC CLASS-B 3m HORN-ANT-6741 HORIZONTAL Tri Band GSM/WLAN (802.11b) PCMCIA Card AC 110V / 60Hz 56W11 TX CH06 2437MHz													
Memo	: TX C	CH06 24	37MHz Over	Limit	Read	Probe	Cable	Preamp		Ant	Table				
	Freq	Level	Limit	Line		Factor		Factor	Remark	Pos	Pos				
53	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	8	cm	deg				
14	878.000	46.37	-27.63	74.00	53.12	33.18	2.51	42.44	Peak	137	343				

➢ For 4.878GHz ~ 25GHz

Remark: Frequency from 4878MHz to 25GHz, the emission emitted by the EUT is too low to be measured

	-ield stre	ngth of fund	damenta	l and harm	onics					
Frequency		Antenna	Cable	Reading	Lim	its	Emission	Level	Margin	Detect
	Polarity	Factor	Loss							
(MHz)		(dB/m)	(dB)	(dBuV)	(dBuV/m)	(uV/m)	(dBuV/m)	(uV/m)	(dB)	Mode
2436.000	V	28.29	1.76	79.28	-	-	109.33	292752.09	-	AV
2436.000	V	28.29	1.76	72.24	-	-	102.29	130166.73	-	Peak
2438.000	Н	28.30	1.76	76.07	-	-	106.13	202534.96	-	AV
2438.000	н	28.30	1.76	68.81	-	-	98.87	87801.11	-	Peak
4869.000	V/H	33.16	2.52	14.86	74.00	5011.87	50.54	336.51	-23.46	AV/Peak
7311.000	V/H	-	-	-	-	-	-	-	-	AV/Peak
9748.000	V/H	-	-	-	-	-	-	-	-	AV/Peak
12185.000	V/H	-	-	-	-	-	-	-	-	AV/Peak
14622.000	V/H	-	-	-	-	-	-	-	-	AV/Peak
17059.000	V/H	-	-	-	-	-	-	-	-	AV/Peak
19496.000	V/H	-	-	-	-	-	-	-	-	AV/Peak
21933.000	V/H	-	-	-	-	-	-	-	-	AV/Peak
24370.000	V/H	-	-	-	-	-	-	-	-	AV/Peak

Remark:

- The emission emitted by the EUT is too low to be measured except the emission listed above, Reading = Reading on SA-Preamp Factor 1.
- 2.

Test Engineer : Jones Tsai

Jones Tsai

- Test Mode: Mode 3 (2462 MHz)
- Test Distance : 3 M
- Temperature : 23 °C
- Relative Humidity : 51 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Probe Factor + Cable Loss + Read Level Preamp Factor = Level

The test that passed at minimum margin was marked by the frame in the following table.

Site Condition EUT Power	: FCC : Tri B		M/WLA	IC-9124- N (802.11	1997 - TELESS		70000				
	10000000	20012020	5112								
Model	: 56W	11									
Memo	: TX C	H11 246	62MHz								
			Over	Limit	Read	Probe	Cable	Preamp		Ant	Table
	Freq	Level	Limit	Line	Level	Factor	Loss	Factor	Remark	Pos	Pos
8	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	. <u> </u>	cm	deg
1	40.710	25.02	-14.98	40.00	40.41	11.41	1.22	28.02	QP	152	352
2 !	66.380	36.94	-3.06	40.00	54.18	9.17	1.56	27.97	Peak		

Site	: 03CH	103-HY									
Conditio	n :FCC	CLASS-	B 3m B	IC-9124	301 H	ORIZON	ITAL				
EUT	: Tri B	and GSN	A/WLA	N (802.1	1b) PCN	ACIA Ca	ard				
Power	: AC 1	10V/60)Hz	1997 - 1997 -							
Model	: 56W	11									
Memo	: TX C	CH11 246	52MHz								
			0ver	Limit	Read	Probe	Cable	Preamp		Ant	Table
	Freq	Level	Limit	Line	Level	Factor	Loss	Factor	Remark	Pos	Pos
3	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	. <u> </u>	cm	deg
1 1	66.380	35.74	-4.26	40.00	52.98	9.17	1.56	27.97	Peak	135	332
2	198.470	35.21	-8.29	43.50	45.39	14.76	2.76	27.70	Peak		

Site Condition EUT Power Model Memo	n : FCC : Tri B : AC 1 : 56W	: 03CH03-HY : FCC CLASS-B 3m LOG-9111-221 VERTICAL : Tri Band GSM/WLAN (802.11b) PCMCIA Card : AC 110V / 60Hz : 56W11 : 56W11 : TX CH11 2462MHz Over Limit Read Probe Cable Preamp Ant Table											
				이 같이 많이 많이 있다.				24303 (22) (20)		20335555	0.000.200		
	Freq	Level	Limit	Line	revel	Factor	LOSS	Factor	Kemark	Pos	Pos		
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	1 1	cm	deg		
1	452.000	37.88	-8.12	46.00	45.21	16.57	4.37	28.27	Peak	131	340		
2	732.800	34.32	-11.68	46.00	37.48	19.94	5.63	28.73	Peak				

Site	: 03CH	103-HY									
Condition	h : FCC	CLASS-	B 3m L	OG-9111	-221 H	ORIZON	TAL				
EUT	: Tri B	and GSN	/WLA	N (802.1)	1b) PCN	ICIA Ca	rd				
Power	: AC 1	10V/60	Hz								
Model	: 56W	11									
Memo	: TX C	CH11 246	2MHz								
			Over	Limit	Read	Probe	Cable	Preamp		Ant	Table
	Freq	Level	Limit	Line	Level	Factor	Loss	Factor	Remark	Pos	Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		Cm	deg
1	265.600	39.73	-6.27	46.00	51.34	12.50	3.33	27.44	Peak	141	341
2	363.200	38.69	-7.31	46.00	46.96	15.26	4.08	27.61	Peak		

Test Engineer : Jones Tsai

Jones Tsai

- Test Mode: Mode 4 (2402MHz)
- Test Distance : 3 M
- Temperature : 23 °C
- Relative Humidity : 51 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Probe Factor + Cable Loss + Read Level Preamp Factor = Level

The test that passed at minimum margin was marked by the frame in the following table.

Site Condit EUT Power Model Memo	ion : FCC : Tri B : AC 1 : 56W	and GSI 10V / 60	-B 3m H M/WLA))Hz	IORN-A N (802.1	5 KE KE KU		100 - 10 10 10 10 10 10 10 10 10 10 10 10 10				
	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor		Preamp Factor	Remark	Ant Pos	Table Pos
8	MHz	dBuV/m	dB	dBuV/m		dB	dB	dB		cm	deg
1	2390.000	1 929834	-22.00	- 1.1.1.T.T.T.T.T.T.T.T.T.	63.22	1.75.878.87.63	1.72	0000000		120	323
2	2390.000	37.01	-16.99	54.00	48.23	28.20	1.72	41.14	Average	120	323
5	2483.500	0 - 50200253	-19.75		65.24		1.82	41.20	2022220	100	323
6	2483.500	40.02	-13.98	54.00	51.01	28.39	1.82	41.20	Average	100	323
Site Condit EUT	tion : FCC : Tri E	0.00000000	-B 3m F M/WLA	IORN-A N (802.1	0.00000000000		20022/02/02	L			

Power : AC 110V / 60Hz

Model : 56W11

Memo : TX CH11 2462MHz

	Freq	Level	Over Limit			Probe Factor	23 방향(전) 것	Preamp Factor	Remark	Ant Pos	Table Pos
3	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2390.000	51.41	-22.59	74.00	62.63	28.20	1.72	41.14	Peak	118	342
2	2390.000	39.43	-14.57	54.00	50.65	28.20	1.72	41.14	Average	118	342
5	2483.500	40.91	-13.09	54.00	51.90	28.39	1.82	41.20	Average	121	323
6	2483.500	52.14	-21.86	74.00	63.13	28.39	1.82	41.20	Peak	121	323

Site	:03CH	103-HY									
Condition	: FCC	: FCC CLASS-B 3m HORN-ANT-6741 VERTICAL									
EUT	: Tri B	: Tri Band GSM/WLAN (802.11b) PCMCIA Card									
Power	: AC 1	10V/60	Hz								
Model	: 56W	11									
Memo	: TX C	H11 246	2MHz								
			Over	Limit	Read	Probe	Cable	Preamp		Ant	Table
	Freq	Level	Limit	Line	Level	Factor	Loss	Factor	Remark	Pos	Pos
<u>.</u>	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	8 - 8	cm	deg
1 ! 492	26.000	48.62	-5.38	54.00	55.39	33.27	2.47	42.51	Average	125	323

Site Conditio EUT Power Model	on : FCC : Tri B	and GSI 10V / 6	-B 3m H M/WLAI		5095 (ST2000	1 HORIZ MCIA Ca	1225	L			
Memo	TX C	H11 24	62MHz								
			Over	Limit	Read	Probe	Cable	Preamp		Ant	Table
	Freq	Level	Limit	Line	Level	Factor	Loss	Factor	Remark	Pos	Pos
87	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	· · · · · · · · ·	cm	deg
l	4926.000	47.48	-26.52	74.00	54.25	33.27	2.47	42.51	Peak	131	342

➢ For 4.926GHz ~ 25GHz

Remark: Frequency from 4926MHz to 25GHz, the emission emitted by the EUT is too low to be measured

Frequency		Antenna	Cable	Reading	Lim	its	Emission	Level	Margin	Detect
	Polarity	Factor	Loss							
(MHz)		(dB/m)	(dB)	(dBuV)	(dBuV/m)	(uV/m)	(dBuV/m)	(uV/m)	(dB)	Mode
2462.000	V	28.35	1.79	75.98	-	-	106.12	202301.92	-	Peak
2462.000	V	28.35	1.79	68.23	-	-	98.37	82889.59	-	AV
2462.000	Н	28.35	1.79	75.52	-	-	105.66	191866.87	-	Peak
2462.000	Н	28.35	1.79	67.37	-	-	97.51	75075.81	-	AV
4926.000	V/H	33.27	2.47	12.88	54.00	501.19	48.62	269.77	-5.38	AV/Peak
7236.000	V/H									AV/Peak
9648.000	V/H									AV/Peak
12060.000	V/H									AV/Peak
14472.000	V/H									AV/Peak
16884.000	V/H					-	-			AV/Peak
19296.000	V/H						-			AV/Peak
21708.000	V/H						-			AV/Peak
24120.000	V/H						-			AV/Peak

■ Field strength of fundamental and harmonics

Remark:

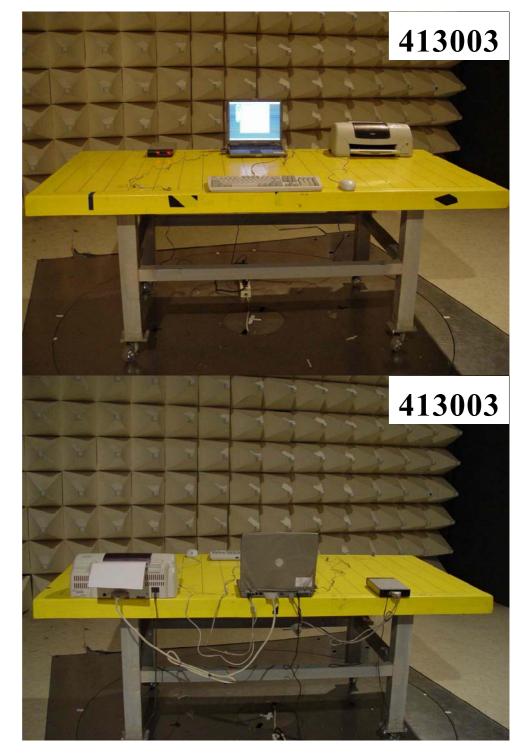
- The emission emitted by the EUT is too low to be measured except the emission listed above, 1.
- 2. Reading = Reading on SA-Preamp Factor

Test Engineer : Jones Tsai

Jones Tsai

5.7.5 Photographs of Radiated Emission Test Configuration

• The photographs show the configuration that generates the maximum emission.



FRONT VIEW

REAR VIEW

SPORTON International Inc. TEL : 886-2-2696-2468 FAX : 886-2-2696-2255
 FCC ID
 : JVP56W11

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 Issued Date
 : Feb.13, 2004

5.8 Antenna Requirements

The EUT use an embedded PCB antenna without connector. It is considered to meet antenna requirement of FCC.

5.8.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no other antenna except assembled by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), 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.

5.8.2 Antenna Connected Construction

The antenna used in this product is embedded PCB antenna without connector.

6 List of Measuring Equipments Used

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz~1GHz 3m	Jun. 21, 2003	Radiation (03CH03-HY)
Spectrum analyzer	R&S	FSP40	100004	9KHZ~40GHz	Aug. 23, 2003	Radiation (03CH03-HY)
Amplifier	HP	8447D	2944A09072	100KHz – 1.3GHz	Nov. 05, 2003	Radiation (03CH03-HY)
Biconical Antenna	SCHWARZBECK	VHBB 9124	301	30MHz –200MHz	Jul. 24, 2003	Radiation (03CH03-HY)
Log Antenna	SCHWARZBECK	VUSLP 9111	221	200MHz -1GHz	Jul. 24, 2003	Radiation (03CH03-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz~1GHz	Dec. 03, 2003	Radiation (03CH03-HY)
Amplifier	MITEQ	AFS44	879981	100MHz~26.5GHz	Jul. 23, 2003	Radiation (03CH03-HY)
Horn Antenna	COM-POWER	3115	6741	1GHz – 18GHz	Apr. 08, 2003	Radiation (03CH03-HY)
Turn Table	HD	DS 420	420/650/00	0 ~ 360 degree	N/A	Radiation (03CH03-HY)
Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)
Horn Antenna	Schwarzbeck	BBHA9170	154	15GHz~40GHz	Jun. 02, 2003	Radiation (03CH03-HY)
RF Cable-HIGH	Jye Bao	RG142	CB030-HIGH	1GHz~29.5GHz	Dec. 05, 2003	Radiation (03CH03-HY)

% Calibration Interval of instruments listed above is one year, except for Horn Antenna, BBHA9170.

% Calibration Interval of Horn Antenna, BBHA9170, is three years.

7 Uncertainty of Test Site

Uncertainty of Radiated Emission Measurement

Contribution	Probability	3m
Contribution	Distribution	5111
Antenna factor calibration	normal(k=2)	±1
cable loss calibration	normal(k=2)	±0.3
RCV/SPA specification	rectangular	±2
Antenna Directivity	rectangular	±3
Antenna Factor V.S. Height	rectangular	±2
Antenna Factor Interpolation for Frequency	rectangular	±0.25
site imperfection	rectangular	±2
Mismatch		
Receiver VSWR [1=0.09		
Antenna VSWR Γ2=0.67	Lisbanad	±0.54
Uncertainty=20log(1-Г1*Г2)	U-shaped	±0.54
combined standard uncertainty Ue(y)	normal	±2.7
Measuring uncertainty for a level of	normal	+E 4
confidence of 95% U=2Ue(y)	(k=2)	±5.4

$$\begin{split} U = & \sqrt{\{(1/2)^2 + (0.3/2)^2 + (2^2 + 0.5^2 + 2^2 + 0.25^2 + 2^2)/3 + (0.54)^2/2\}} = 2.2 & \text{for 10m test distance} \\ U = & \sqrt{\{(1/2)^2 + (0.3/2)^2 + (2^2 + 3^2 + 2^2 + 0.25^2 + 2^2)/3 + (0.54)^2/2\}} = 2.7 & \text{for 3m test distance} \end{split}$$

Uncertainty of Conducted Emission Measurement

Contribution	Probability Distribution	150KHz – 30MHz
Cable and I/P attenuator calibration	normal(k=2)	±0.3
RCV/SPA specification	rectangular	±2
LISN coupling specification	rectangular	±1.5
Transducer factor frequency interpolation	rectangular	±0.2
Mismatch		
Receiver VSWR Г1=0.09		
LISN VSWR F2=0.33	U-shaped	0.2
Uncertainty=20log(1-Γ1*Γ2)		
combined standard uncertainty Ue(y)	normal	±1.66
Measuring uncertainty for a level of confidence of 95% U=2Ue(y)	normal (k=2)	±3.32

 $U=\sqrt{\{(0.3/2)^2 + (2^2+1.5^2+0.2^2)/3 + (0.2)^2/2\}}=1.66$