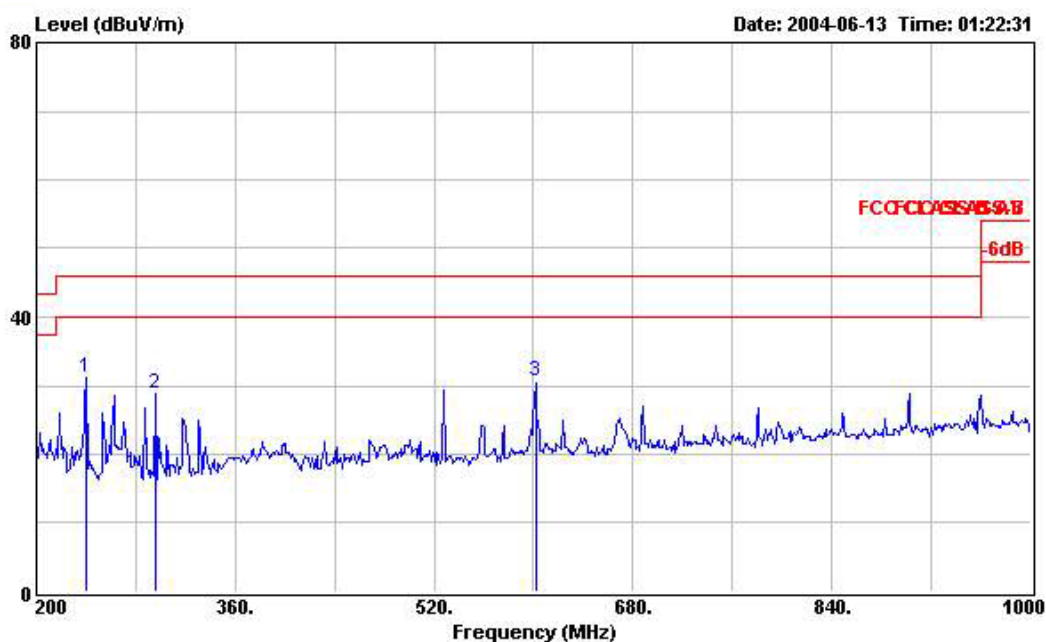


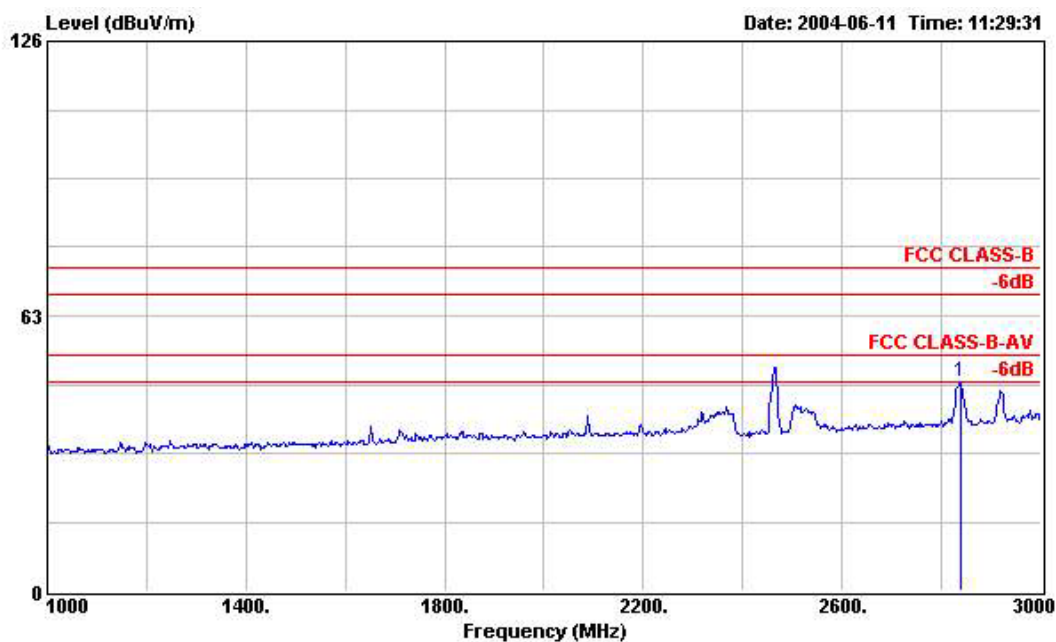
FCC TEST REPORT

Report No. :F452063



Site : 03CH03-HY
 Condition : FCC CLASS-B 3m LOG-9111-221 VERTICAL
 EUT : WLAN
 Power : AC 110V / 60Hz
 Model : EW-7128G
 Memo : 11g TX CH11 2462MHz
 Dipole

	Freq	Level	Over	Limit	Read	Probe	Cable	Preamp		Ant	Table
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Remark	Pos	Pos
			dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	240.000	31.26	-14.74	46.00	43.15	12.85	2.80	27.54	Peak	---	---
2	295.200	28.75	-17.25	46.00	39.94	13.06	3.07	27.32	Peak	---	---
3	601.600	30.52	-15.48	46.00	35.94	18.99	4.39	28.80	Peak	---	---

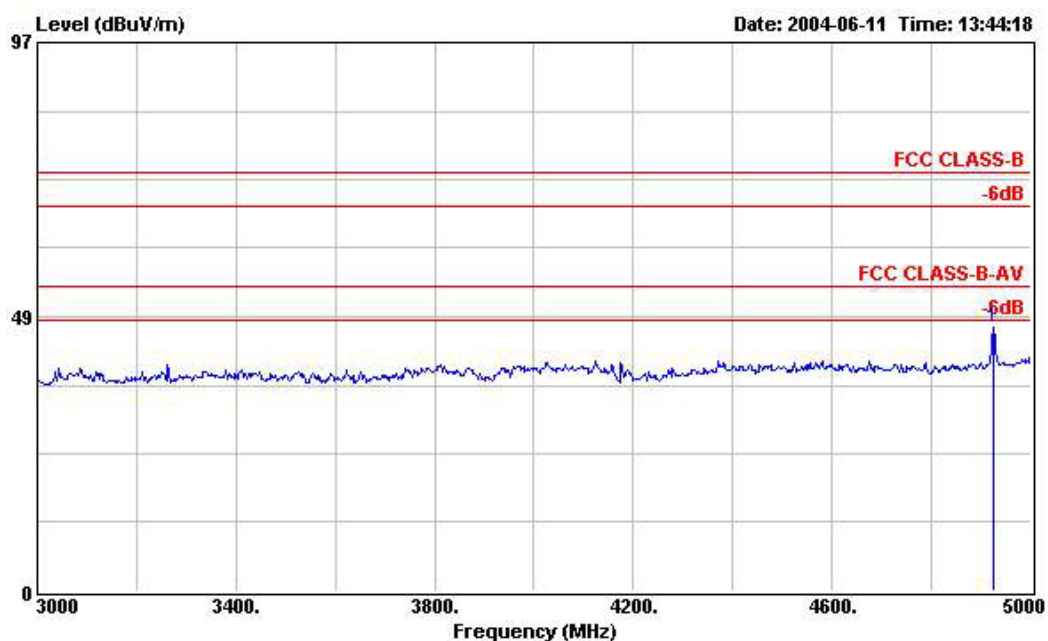


Site : 03CH03-HY
 Condition : FCC CLASS-B 3m HORN-ANT-6821 HORIZONTAL
 EUT : WLAN
 Power : AC 110V / 60Hz
 Model : EW-7128G
 Memo : 11b TX CH11 2462MHz
 : Dipole

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2838.000	47.93	-26.07	74.00	57.55	29.63	1.95	41.20	Peak	---	---

FCC TEST REPORT

Report No. :F452063

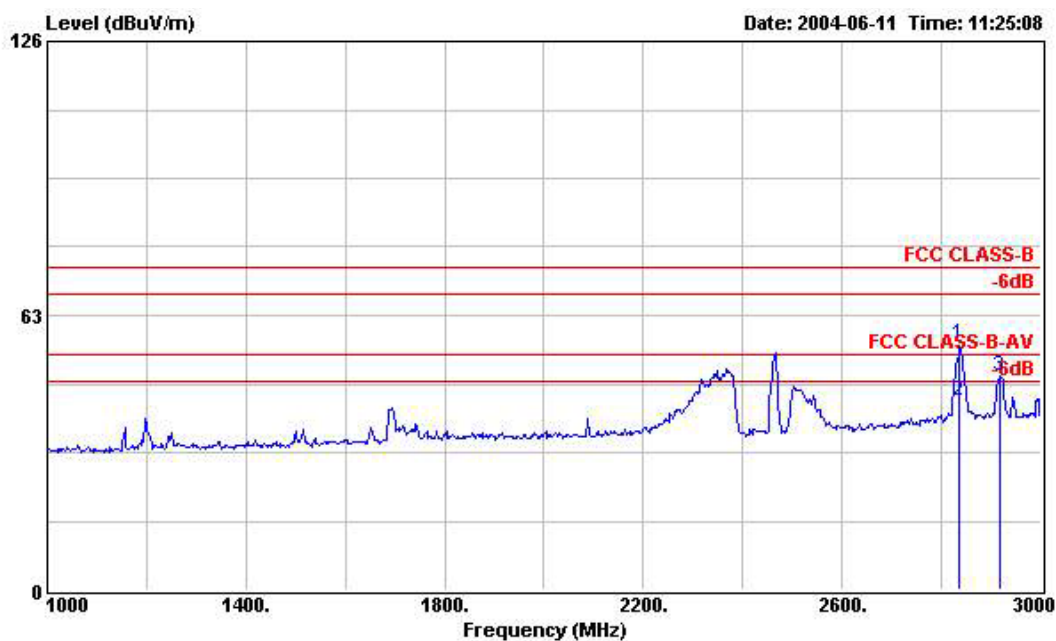


Site : 03CH03-HY
 Condition : FCC CLASS-B 3m HORN-ANT-6821 HORIZONTAL
 EUT : WLAN
 Power : AC 110V / 60Hz
 Model : EW-7128G
 Memo : 11b TX CH11 2462MHz
 Dipole

Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	Remark	Ant	Table
MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor		Pos	Pos
		dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	4924.000	46.60	-27.40	74.00	53.18	33.46	2.47	42.51	Peak	---

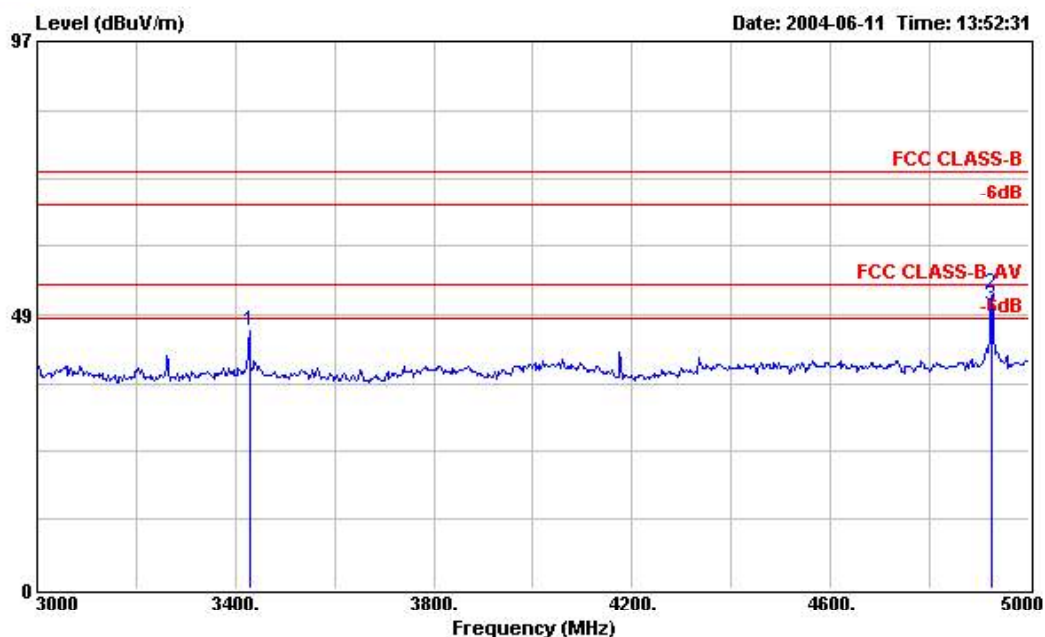
For 4.924GHz ~ 25GHz

Frequency from 4924MHz to 25000MHz, the emission emitted by the EUT is too low to be measured.



Site : 03CH03-HY
 Condition : FCC CLASS-B 3m HORN-ANT-6821 VERTICAL
 EUT : WLAN
 Power : AC 110V / 60Hz
 Model : EW-7128G
 Memo : 11b TX CH11 2462MHz
 Dipole

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2836.000	56.45	-17.55	74.00	66.07	29.63	1.95	41.20	Peak	---	---
2	2836.000	43.36	-10.64	54.00	52.98	29.63	1.95	41.20	Average	100	314
3	2916.000	49.09	-24.91	74.00	58.44	29.91	1.94	41.20	Peak	---	---

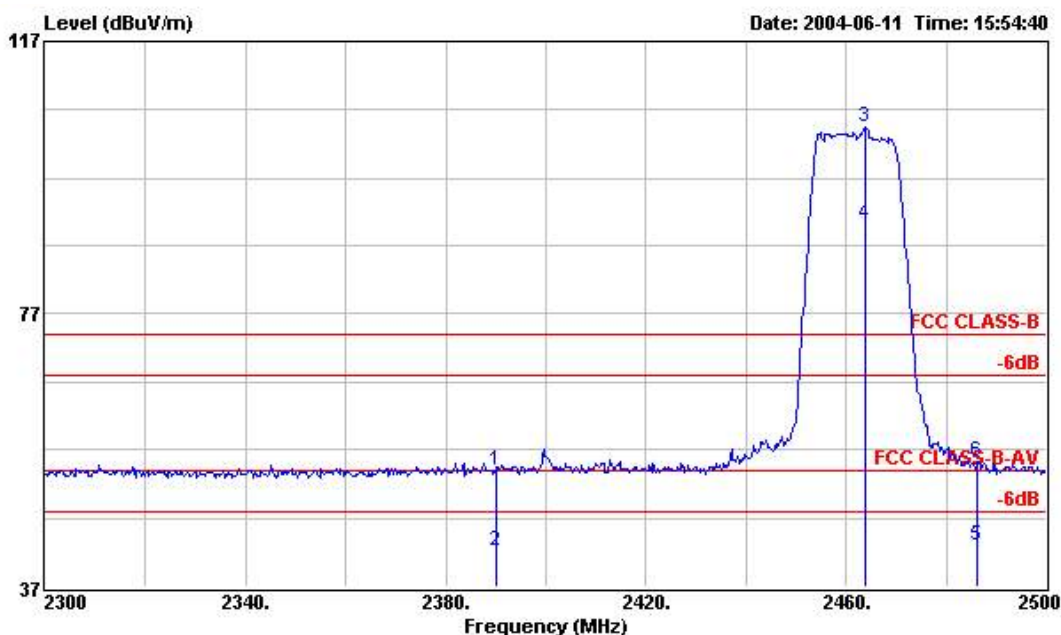


Site : 03CH03-HY
 Condition : FCC CLASS-B 3m HORN-ANT-6821 VERTICAL
 EUT : WLAN
 Power : AC 110V / 60Hz
 Model : EW-7128G
 Memo : 11b TX CH11 2462MHz
 Dipole

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	3428.000	45.53	-28.47	74.00	53.78	31.16	1.88	41.29	Peak	---	---
2	4924.000	52.29	-21.71	74.00	58.87	33.46	2.47	42.51	Peak	---	---
3 !	4924.000	49.94	-4.06	54.00	56.52	33.46	2.47	42.51	Average	100	310

For 4.924GHz ~ 25GHz

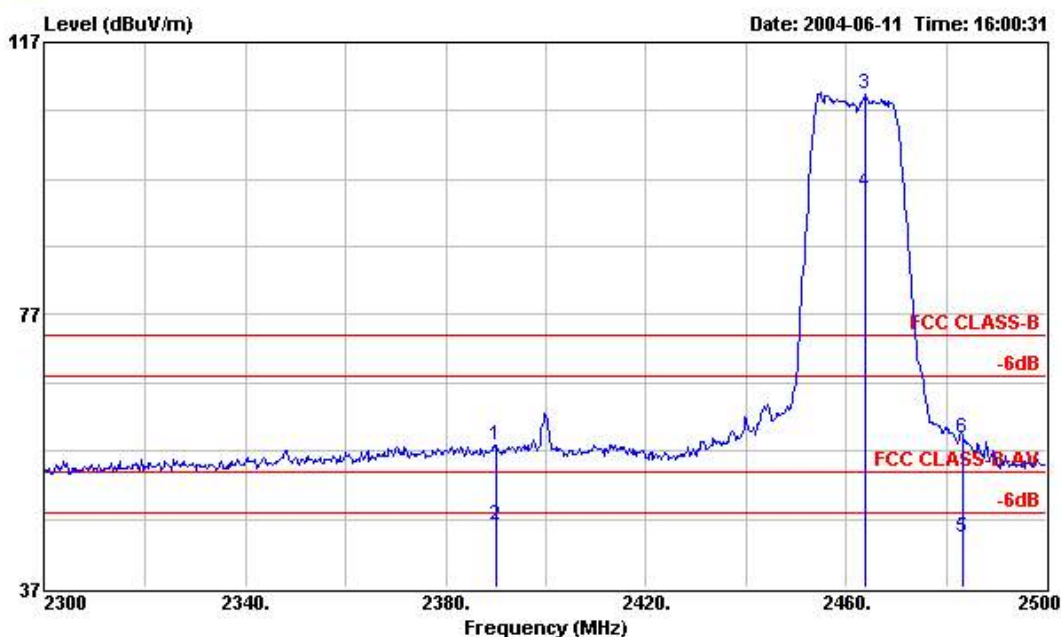
Frequency from 4924MHz to 25000MHz, the emission emitted by the EUT is too low to be measured.



Site : 03CH03-HY
 Condition : FCC CLASS-B 3m HORN-ANT-6821 HORIZONTAL
 EUT : WLAN
 Power : AC 110V / 60Hz
 Model : EW-7128G
 Memo : 11g TX CH11 2462MHz
 Dipole

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m		dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2390.000	53.98	-20.02	74.00	24.12	28.14	1.72	0.00	Peak	---	---
2	2390.000	42.30	-11.70	54.00	12.44	28.14	1.72	0.00	Average	100	332
3 X	2463.800	104.55			74.42	28.34	1.79	0.00	Peak	---	---
4 X	2463.800	90.19			60.06	28.34	1.79	0.00	Average	100	329
5	2486.200	42.93	-11.07	54.00	12.74	28.40	1.79	0.00	Average	100	323
6	2486.200	55.29	-18.71	74.00	25.10	28.40	1.79	0.00	Peak	---	---

Remark: The "X" represent a fundamental frequency.



Site : 03CH03-HY
 Condition : FCC CLASS-B 3m HORN-ANT-6821 VERTICAL
 EUT : WLAN
 Power : AC 110V / 60Hz
 Model : EW-7128G
 Memo : 11g TX CH11 2462MHz
 Dipole

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB		cm	deg
1	2390.000	57.95	-16.05	74.00	28.09	28.14	1.72	0.00	Peak	---	---
2	2390.000	46.11	-7.89	54.00	16.25	28.14	1.72	0.00	Average	110	353
3 X	2463.800	109.49			79.36	28.34	1.79	0.00	Peak	---	---
4 X	2463.800	95.24			65.11	28.34	1.79	0.00	Average	108	287
5	2483.500	44.22	-9.78	54.00	14.04	28.39	1.79	0.00	Average	100	285
6	2483.500	58.91	-15.09	74.00	28.73	28.39	1.79	0.00	Peak	---	---

Remark: The "X" represent a fundamental frequency.

■ Field strength of fundamental and harmonics

Frequency	Antenna	Cable	Reading	Preamp	Limits	Emission	Margin	Detect	
Polarity	Factor	Loss		Factor					
(MHz)	(dB/m)	(dB)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Mode	
2463.800	H	28.34	1.79	74.42	0.00	-	104.55	-	Peak
2463.800	H	28.34	1.79	60.06	0.00	-	90.19	-	Av
2463.800	V	28.34	1.79	79.36	0.00	-	109.49	-	Peak
2463.800	V	28.34	1.79	65.11	0.00	-	95.24	-	Av
4924.000	H	33.46	2.47	10.67	42.51	74.00	46.60	-27.40	Peak
3428.000	V	31.16	1.88	12.49	41.29	74.00	45.53	-28.47	AV
4924.000	V	33.46	2.47	16.36	42.51	74.00	52.29	-21.71	Peak
4924.000	V	33.46	2.47	14.01	42.51	54.00	49.94	-4.06	AV
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

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 : 

Jay

8. Antenna Requirements

The EUT use a 2dBi dipole antenna with reverse SMA connector. It is considered to meet antenna requirement of FCC.

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.

8.2. Antenna Connected Construction

The antenna used in this product is a dipole antenna with reverse SMA connector.

9. RF Exposure

FCC Rules and Regulations Part 1.1307,1.1310,2.1091,2.1093:

RF Exposure Compliance

9.1. Limit For Maximum Permissible Exposure (MPE)

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

F=frequency in MHz

*Plane-wave equivalent power density

9.2. MPE Calculations

$$\text{Power Density} = P_d \text{ (mW/cm}^2\text{)} = \text{EIRP} / 4 \pi d^2$$

$$\text{EIRP} = P \cdot G$$

P=Peak output power (mW)

G=Antenna numeric gain (numeric)

d=Separation distance (cm)

Because the EUT belongs to General Population/ Uncontrolled Exposure, the limit of power density is 1.0 mW/cm².

802.11b:

Channel NO.	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated RF Exposure at d=20cm (mW/cm ²)	Limit (mW/cm ²)
Channel 01	2.00	1.58	16.30	42.66	0.0135	1.00
Channel 06	2.00	1.58	16.40	43.65	0.0138	1.00
Channel 11	2.00	1.58	16.10	40.74	0.0129	1.00

802.11g:

Channel NO.	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated RF Exposure at d=20cm (mW/cm ²)	Limit (mW/cm ²)
Channel 01	2.00	1.58	17.10	51.29	0.0162	1.00
Channel 06	2.00	1.58	17.03	50.47	0.0159	1.00
Channel 11	2.00	1.58	16.82	48.08	0.0152	1.00

9.3. FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20cm during normal operation.

10. List of Measuring Equipments Used

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100174	9 KHz – 2.75 GHz	Feb. 16, 2004	Conduction (CO01-HY)
LISN	MessTec	NNB-2/16Z	2001/008	9 KHz – 30 MHz	May 03, 2004	Conduction (CO01-HY)
LISN (Support Unit)	MessTec	NNB-2/16Z	2001/009	9 KHz – 30 MHz	Apr. 19, 2004	Conduction (CO01-HY)
EMI Filter	LINDGREN	LRE-2060	1004	< 450 Hz	N/A	Conduction (CO01-HY)
EMI Filter	LINDGREN	N6006	201052	0 ~ 60 Hz	N/A	Conduction (CO01-HY)
RF Cable-CON	Suhner Switzerland	RG223/U	CB029	9KHz~30MHz	Dec. 24, 2003	Conduction (CO01-HY)
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	EMCO	3115	6821	1GHz – 18GHz	Sep. 12, 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.

11. Uncertainty Measurement

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 Receiver VSWR Γ_1 = LISN VSWR Γ_2 = Uncertainty= $20\log(1-\Gamma_1*\Gamma_2)$	+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		

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

$$U = \sqrt{\{(1/2)^2 + (0.3/2)^2 + (2^2 + 3^2 + 2^2 + 0.25^2 + 2^2)/3 + (0.54)^2/2\}} = 2.7 \text{ for 3m test distance}$$

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

Contribution	Uncertainty of x_i		$u(x_i)$
	dB	Probability Distribution	
Receiver reading	0.15	Normal(k=2)	0.08
Antenna factor calibration	1.12	Normal(k=2)	0.56
Cable loss calibration	0.12	Normal(k=2)	0.06
Pre Amplifier Gain calibration	0.13	Normal(k=2)	0.07
RCV/SPA specification	2.5	Rectangular	0.72
Antenna Factor Interpolation for Frequency	1	Rectangular	0.29
Site imperfection	2.1	Rectangular	1.21
Mismatch Receiver VSWR Γ_1 = 0.20 Antenna VSWR Γ_2 = 0.23 Uncertainty= $20\log(1-\Gamma_1*\Gamma_2)$	+0.39/-0.41	U-shaped	0.28
combined standard uncertainty Uc(y)	1.58		
Measuring uncertainty for a level of confidence of 95% U=2Uc(y)	3.16		

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 = $20\log(1 - \Gamma_1 * \Gamma_2 * \Gamma_3)$	+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				

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