



Report No.	G2115280
Specifications	FCC Part 15.231, Certification
Test Method	ANSI C63.4 1992
Applicant	GE Wiring Devices & Specialty Products, Inc. (d/b/a GE Home Electric Products, Inc.)
Applicant address	1975 Noble Road, Cleveland, OH 44112, United States
Items tested	RF Repeater
Model No.	R1G107 (Sample # G21280)
Results	<b>Compliance</b> (As detailed within this report)
Date	01/17/2003 (month / day / year) (Sample received) 01/17/2003 (month / day / year) (Test)
Prepared by	 Project Engineer
Authorized by	 General Manager (Frank Tsai)
Issue date	January 24, 2003 (month / day / year)
Modifications	None
Tested by	Training Research Co., Ltd.
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**NVLAP LAB CODE: 200174-0**  
**FCC ID: QOB- R1G107**

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## **Chapter 1 GENERAL**

### **1.1 Introduction**

The following measurement report is submitted on behalf of applicant in support of an International Periodic Radiator certification with Part 2 Subpart J and Part 15 Subpart A, Subpart B and C of the Commission's Rules and Regulations.

### **1.2 Description of EUT**

**Product Name** : RF Repeater  
**Model No.** : R1G107  
**FCC ID** : QOB-R1G107  
**Frequency Range** : 319.10MHz ~ 319.90MHz  
**Power Type** : Powered by AC Source

### **1.3 Test method**

**Tx mode:**

The fundamental frequency of transmitter emitted is due to a press on button of the EUT. **The emitting time of fundamental frequency is less than 5 seconds** pursuant to FCC Part 15.231(a). There are security codes for avoiding the possibility of duplicating codes in adjacent systems. The coding must be matching with the companion receiver.

While testing the EUT was adjusted at a position, which transmits the maximum emission.

**Rx mode:**

During testing, make sure the EUT operating at “receiving” mode. There is a near field probe placed approximately to the EUT to radiate an unmodulated continuous wave (CW) signal to EUT at its operating frequency in order to “cohere” from such a receiver. The signal level may need to be increased for this to occur pursuant to FCC ANSI C63.4 Section 12.1.1.1. The amplitude and frequency of the signal was varied to yield the maximum emission.

The test placement as the photographs showed is the worst case emission placed. (If the emission is close to the ambient, the resolution BW and view resolution will be reduced and the data will be recorded by detection of maximum hold peak mode.)

***Statement of transition provision for compliance with the rules.***

The EUT receives the signal that only sends from the remote controller. The EUT won't be influenced by the transition provision, it will be continuous comply with the regulations of the FCC Part 15.

***1.4 Description of Support Equipment***

<b>Field Probe</b>	<b>: HP Field Probe 30MHz ~ 1GHz</b>
Model No.	: HP11940A
Serial No.	: 2650A03038
Power type	: by signal generator
Data cable	: 1.8m long, non-shielded, no ferrite bead,
<b>Signal Generator</b>	<b>: HP 9KHz ~ 4000MHz</b>
Model No.	: 8648D
Serial No.	: 3613A00117
<b>Bulb</b>	<b>: 60Watt, 100Watt</b>

## ***1.5 Test Procedure***

All measurements contained in this report were performed according to the techniques described in measurement procedure of ANSI C63.4 1992 section 13

## ***1.6 Location of the Test Site***

The radiated emissions measurements required by the rules were performed on the **three-meter, Anechoic Chamber (Registration Number: 93906)** maintained by *Training Research Co., Ltd.* 1F, No. 255, Nan Yang Street, Hsi-chih, Taipei Hsien 221, Taiwan, R.O.C. Complete description and measurement data have been placed on file with the commission. The conducted power line emissions tests and other test items were performed in a anechoic chamber also located at Training Research Co., Ltd.

1F, No. 255, Nan Yang Street, Hsi-chih, Taipei Hsien 221, Taiwan, R.O.C. *Training Research Co., Ltd.* is listed by the FCC as a facility available to do measurement work for others on a contract basis.

## ***1.7 General Test Condition***

The conditions under which the EUT operates were varied to determine their effect on the equipment's emission characteristics. The final configuration of the test system and the mode of operation used during these tests were chosen as that which produced highest emission levels. However, only those conditions that the EUT was considered likely encounter in normal use were investigated.

***Chapter 2 Section 15.101(a): Equipment authorization of unintentional radiators***

The EUT equipped with a receiver of RF repeater. It was categorized to superregenerative receiver as received transmission signal. The authorization requires Certification and the items required such as Sect.15.107 (Conducted limits) and Sect.15.109 (Radiated emission limits) is same as Sect.15.207 and 15.231(b)(3) we'd performed respectively. We dropped this part, as the result will be repeated as the part we mentioned above.

## **Chapter 3 TRANSMITTER DUTY CYCLE MEASUREMENTS**

### **3.1 Test Condition and Setup**

The duty cycle measurements were performed in a shielded enclosure. The EUT was placed on a wooded table which is 0.8 meters height and a bi-log periodic antenna was used distance about 3 meters for receiving. While testing EUT was set to transmit continuously. Various key configurations were also investigated to find the maximum duty cycle.

The resolution bandwidth and video bandwidth of the spectrum analyzer was all set to 1MHz to encompass all significant spectral components during the test. The analyzer operated in linear scale and zero span mode after tuning to the transmitter carrier frequency. The spectrum analyzer measured pules width. The pulse width was determined by the difference between the two half voltage points on a pulse.

The duty cycle was determined by the following equation:

$$\text{Duty Cycle (\%)} = \frac{\text{Total on interval in a complete pulse train}}{\text{Length of a complete pulse train}} \times 100\%$$

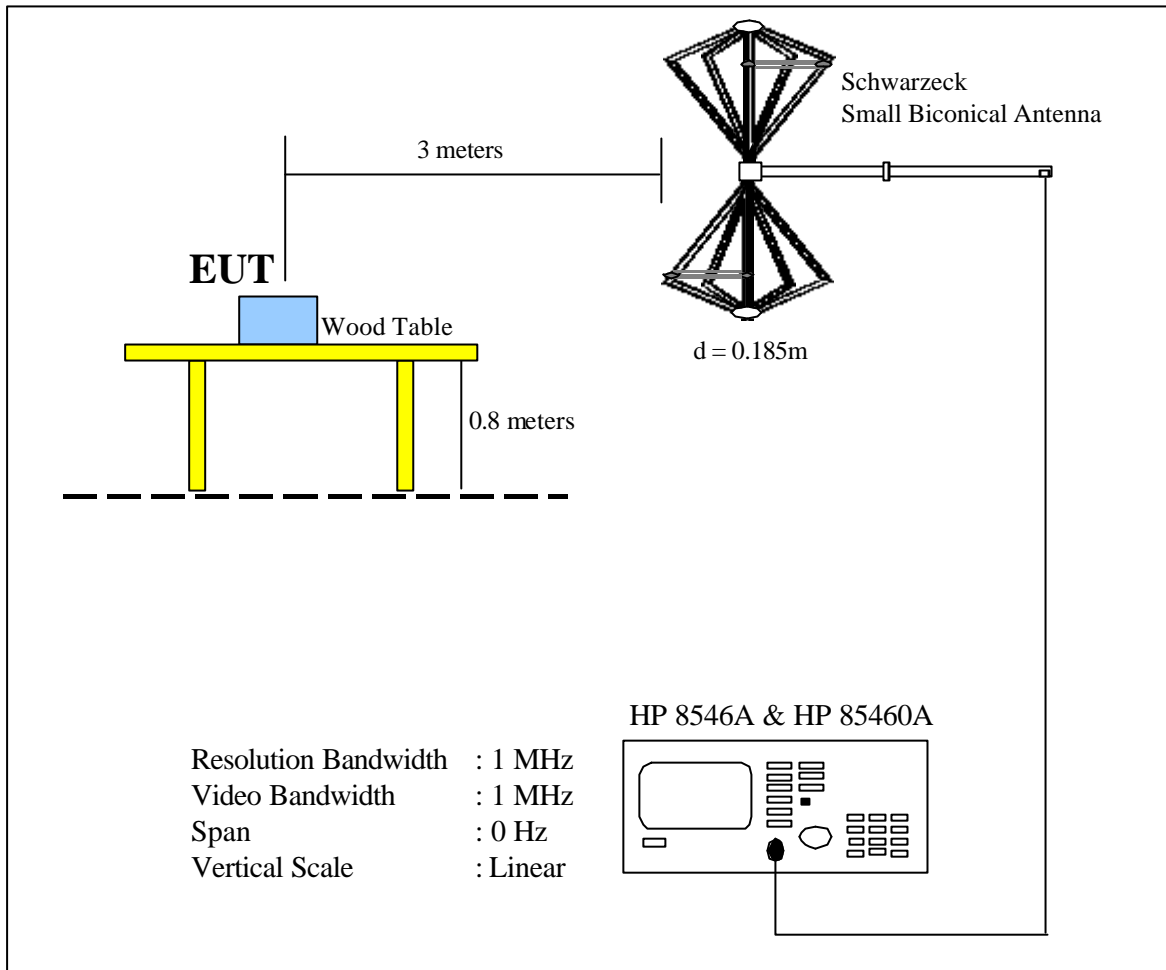
To calculate the actual field intensity, the duty cycle correction factor in decibel is needed for later use and be obtained from following conversion:

$$\text{Duty Cycle Correction Factor (dB)} = 20 \times \text{Log}_{10} \text{Duty Cycle}$$

### **3.2 List of Test Instruments**

Instrument Name	Model No.	Brand	Serial No.	Last time	Next time
EMI Receiver	8546A	H P	3520A00242	06/28/02	06/28/03
RF Filter Section	85460A	H P	3448A00217	06/28/02	06/28/03
Small Biconical	UBAA9114	Schwarzeck	127	05/07/02	05/07/03
	with BBVU9135				

### 3.3 Test Instruments Configuration



### 3.4 Test Result

Following is the test result, which produce maximum duty cycle:

Total on interval in a complete pulse train  
 = 21.75 mS

Length of a complete pulse train  
 = 28.25 mS

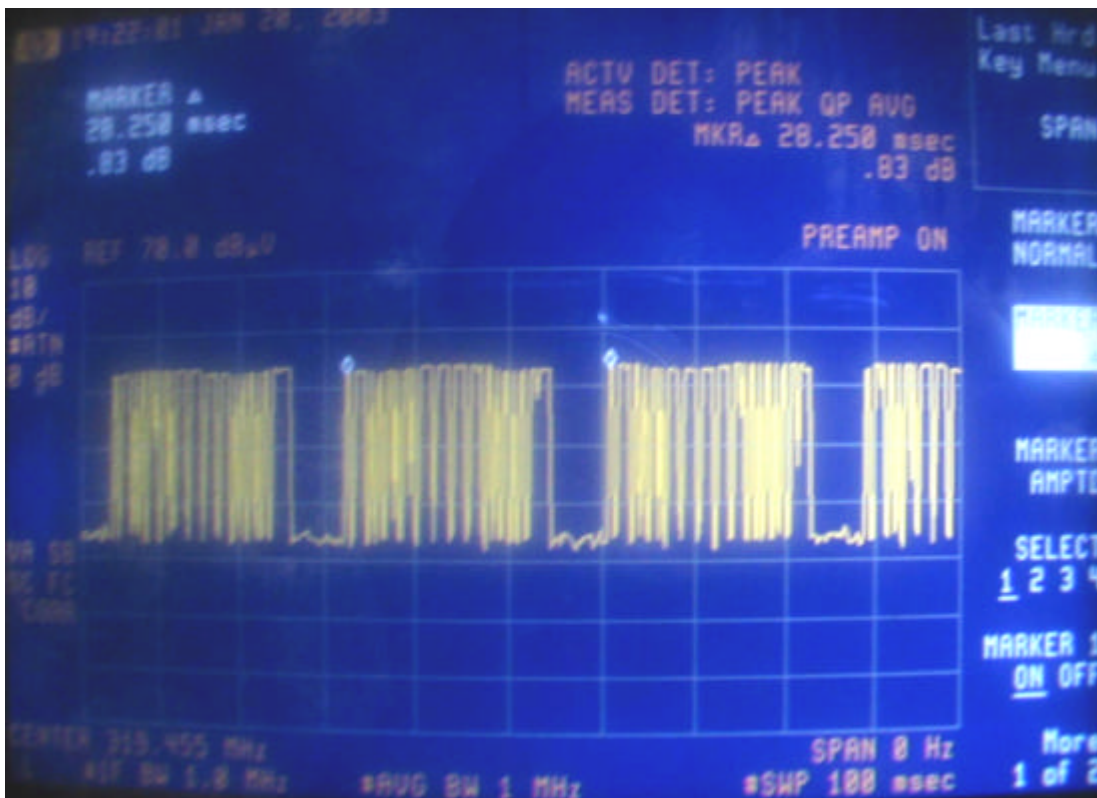
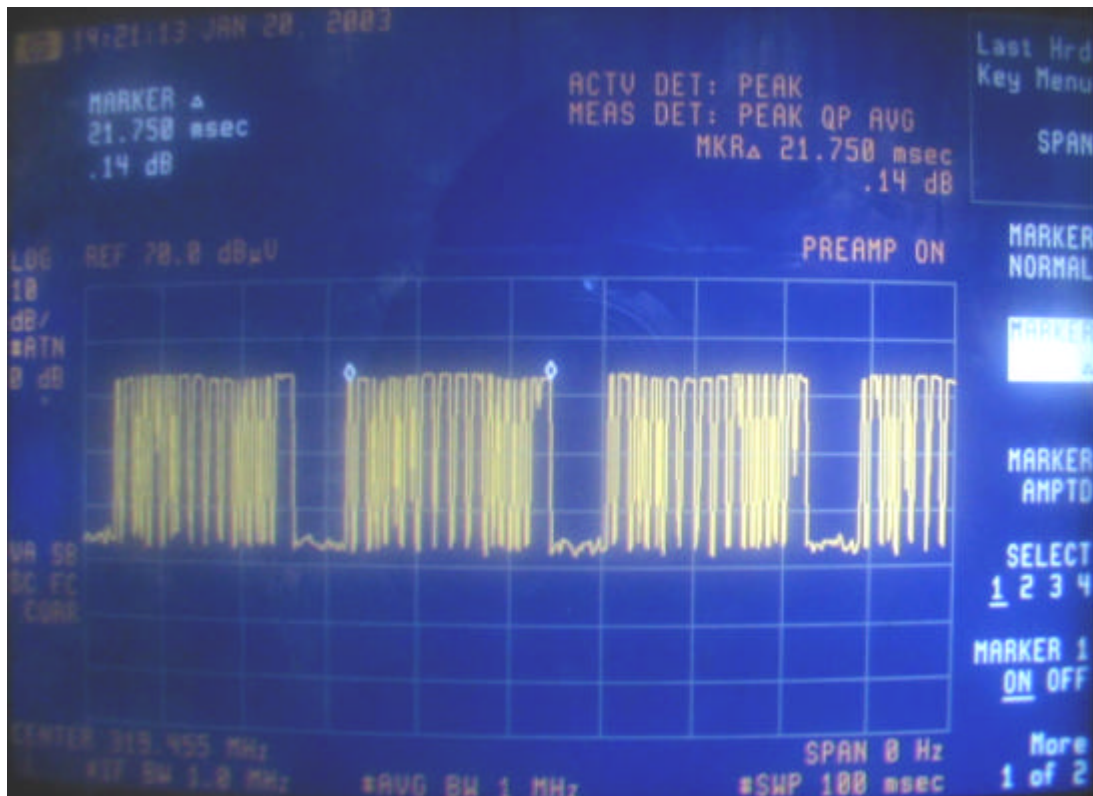
Duty Cycle (%) =  $21.75 \text{ ms} / 28.25 \text{ ms} * 100\% = 0.769912$

Duty Cycle Correction Factor (dB) =  $20 * \text{Log} (0.769912) = -2.271$

A plot is attached on the following page.



### Duty Cycle Test Picture



Report No.: G2115280 (Tx)

Training Research Co., Ltd., TEL: 886-2-26935155, Fax: 886-2-26934440

## ***Chapter 4 TRANSMITTER BANDWIDTH MEASUREMENTS, FCC PART 15.231(C)***

### ***4.1 Test Condition & Setup***

The test setup used to transmitter bandwidth measurement was the same with duty cycle test, except there is no need for digital oscilloscope in the bandwidth test. For detailed description, please reference to section 3.1, 3.2 and 3.3 on page 7 and 8 of this report.

The resolution bandwidth of the spectrum analyzer was set to 100KHz, which is greater 5 percent of the maximum permitted bandwidth that required by the ANSI C63.4 section13. Bandwidth is determined at the point 20dB down from the modulator carrier. The maximum permitted bandwidth specified by the rule was 0.25% of the center frequency of the EUT, e.g.  $319.50\text{MHz} * 0.25\% = 798.75\text{kHz}$ . The detector function was set to peak and hold mode to clearly observe the components.

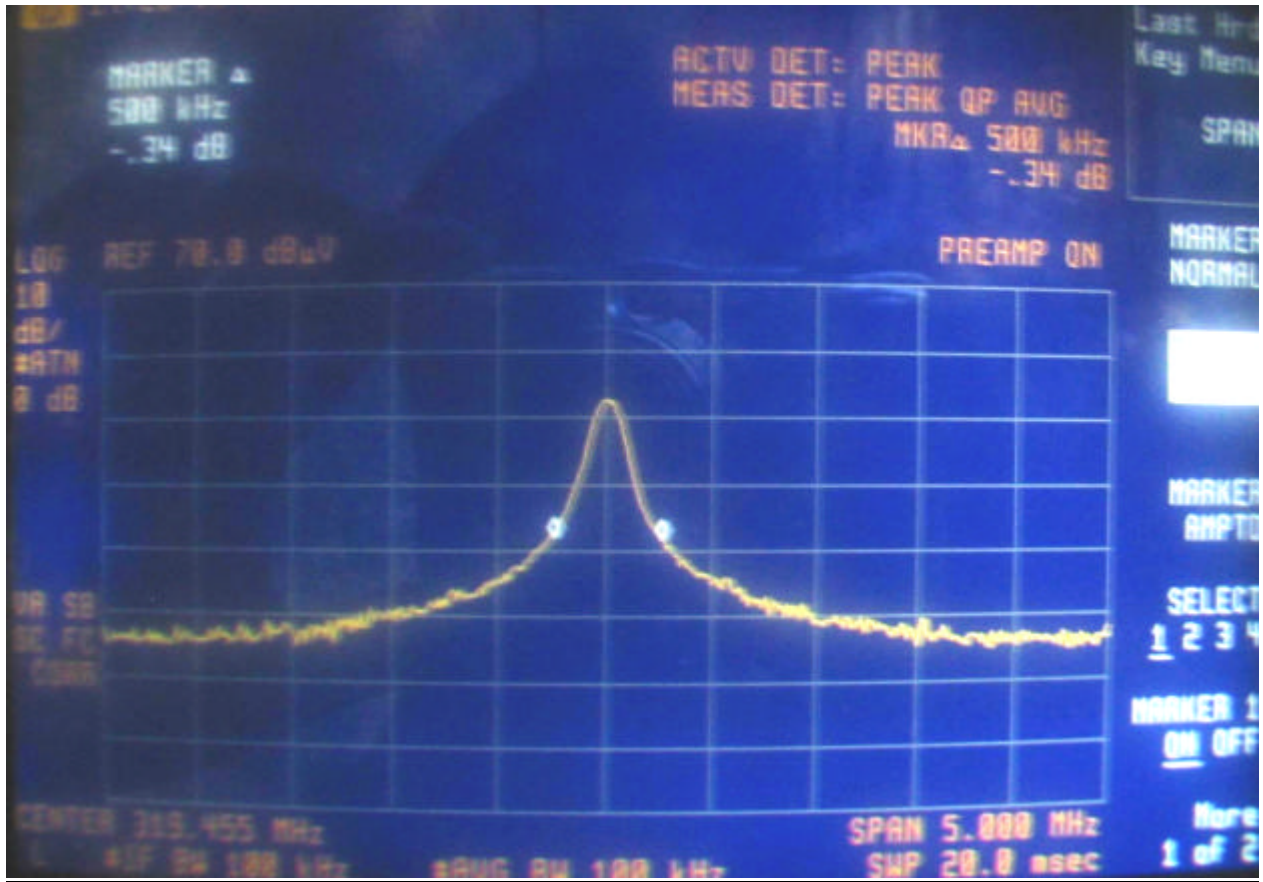
### ***4.2 Test Result***

Measured Transmitter Bandwidth: 500kHz

Permitted Maximum Bandwidth: 798.75kHz

A plot attached on the following page.

Plot of the Transmitter Bandwidth Measurement



## **Chapter 5 CONDUCTED EMISSIONS MEASUREMENTS**

### **5.1 Test condition and setup**

All the equipment is placed and setup according to ANSI C63.4--1992.

The EUT is assembled on a wooden table, which is 80 cm high and placed 40 cm from the back-wall, which is a vertical conducting plane. One LISN is for EUT, the other LISN is for support equipment. They are all placed on the conductive ground. The EUT's LISN connect a line switch box for selecting L1 or L2, then connect to a preamplifier and spectrum.

The spectrum scans from 150KHz to 30MHz. Conducted emission levels are detected at *maximum peak mode*. But if the maximum peak mode failed or over *average limit*, it will be measured by *average detection mode*.

While testing the worst-emission plot printed in the *peak detection mode*, and there are up to 6 highest emissions to be recorded. The plot is kept as the original data and not included in the test report.

### **5.2 List of test Instrument**

<u>Instrument Name</u>	<u>Model No.</u>	<u>Brand</u>	<u>Serial No.</u>	<u>Calibration Date</u>	
				<u>Last time</u>	<u>Next time</u>
EMI Receiver	8546A	H P	3520A00242	06/28/02	06/28/03
RF Filter Section	85460A	H P	3448A00217	06/28/02	06/28/03
LISN (EUT)	LISN-01	TRC	9912-03,04	06/04/02	06/04/03
LISN (Support E.)	LISN-01	TRC	9912-05	07/15/02	07/15/03
ISN	ISN T400	Schaffner	16596	10/16/02	10/16/03
Auto Switch Box (< 30MHz)	ASB-01	TRC	9904-01	11/20/02	11/20/03

The level of confidence of 95%, the uncertainty of measurement of conducted emission is  $\pm 2.02$  dB.

**5.3 Test Result**

**Test mode: Tx mode**

Testing room : Temperature : 25 ° C Humidity : 73 % RH

**Line 1**

Frequency (kHz)	READING AMPLITUDE			LIMIT		Margin (dB)
	Peak (dBmV)	Quasi-Peak (dBmV)	Average (dBmV)	Quasi-Peak (dBmV)	Average (dBmV)	
205.000	44.82	---	---	64.43	54.43	-9.61
222.000	43.85	---	---	63.94	53.94	-10.09
355.000	34.68	---	---	60.14	50.14	-15.46
405.000	38.75	---	---	58.17	48.17	-9.42
456.000	36.24	---	---	57.26	47.26	-11.02
504.000	33.77	---	---	56.00	46.00	-12.23
4014.000	23.73	---	---	56.00	46.00	-22.27
28110.000	25.91	---	---	60.00	50.00	-24.09

**Line 2**

Frequency (kHz)	READING AMPLITUDE			LIMIT		Margin (dB)
	Peak (dBmV)	Quasi-Peak (dBmV)	Average (dBmV)	Quasi-Peak (dBmV)	Average (dBmV)	
212.000	46.02	---	---	64.23	54.23	-8.21
352.000	35.77	---	---	60.23	50.23	-14.46
405.000	39.92	---	---	58.71	48.71	-8.79
456.000	36.19	---	---	57.26	47.26	-11.07
504.000	34.48	---	---	56.00	46.00	-11.52
558.000	28.64	---	---	56.00	46.00	-17.36
4014.000	30.99	---	---	56.00	46.00	-15.01
24200.000	24.02	---	---	60.00	50.00	-25.98

*\*The reading amplitudes are all under limit.*

**Test mode: Rx mode**

Testing room : Temperature : 25 ° C Humidity : 73 % RH

**Line 1**

Frequency (kHz)	READING AMPLITUDE			LIMIT		Margin (dB)
	Peak (dBmV)	Quasi-Pea k (dBmV)	Average (dBmV)	Quasi-Pea k (dBmV)	Average (dBmV)	
216.000	45.67	---	---	64.11	54.11	-8.44
359.000	35.17	---	---	60.03	50.03	-14.86
409.000	40.87	---	---	58.60	48.60	-7.73
509.000	34.36	---	---	56.00	46.00	-11.64
558.000	29.77	---	---	56.00	46.00	-16.23
1490.000	23.94	---	---	56.00	46.00	-22.06
1977.000	23.06	---	---	56.00	46.00	-22.94
4014.000	32.37	---	---	56.00	46.00	-13.63

**Line 2**

Frequency (kHz)	READING AMPLITUDE			LIMIT		Margin (dB)
	Peak (dBmV)	Quasi-Pea k (dBmV)	Average (dBmV)	Quasi-Pea k (dBmV)	Average (dBmV)	
203.000	45.05	---	---	64.49	54.49	-9.44
409.000	41.78	---	---	58.60	48.60	-6.82
509.000	35.80	---	---	56.00	46.00	-10.20
980.000	28.78	---	---	56.00	46.00	-17.22
1490.000	29.63	---	---	56.00	46.00	-16.37
1994.000	26.62	---	---	56.00	46.00	-19.38
2480.000	25.73	---	---	56.00	46.00	-20.27
4014.000	24.53	---	---	56.00	46.00	-21.47

*\*The reading amplitudes are all under limit.*

## **Chapter 6 RADIATED EMISSIONS MEASUREMENTS**

### **6.1 General Configuration**

Prior to final testing, the EUT was placed in a three-meter anechoic chamber and scanned at a close distance to determine its emission characteristics. The physical arrangement of the EUT was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude, directivity, and frequency. The exact system configuration that produced the highest emissions was noted so it could be reproduced later during the final tests. This was done to ensure that the final measurements would demonstrate the worst-case interference potential of the EUT.

### **6.2 Test Condition and Setup**

Final radiation measurements were made on a three-meter, anechoic chamber. The EUT was placed on a nonconductive turntable that is 0.8 meters height, top surface 1.0 x 1.5 meter. The spectrum was examined from 30MHz to 3.5GHz order to check the whole spectrum that could be generated from the EUT. During the test, EUT was set to transmit continuously and the switch was positioned to yield the maximum duty cycle that had measured before radiated emissions test. The test battery was a totally brand-new one.

A nonconductive material surrounded the EUT to supporting the EUT for standing on three orthogonal planes. At each condition, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarizations.

#### **Note: Setting the EUT to transmit continuously was just for the testing**

The field strength below 1GHz was measured by SCHWARZECK Small Biconical Antenna (model: UBAA9114 with BBVU9135) at 3 meter, and the EMCO Double Ridged Guide Antenna (model: 3115) was used in frequencies 1 ~ 3.5GHz at a distance of 3 meter.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. No post-detector video filters were used in the test. The spectrum analyzer's 6dB bandwidth was set to 3M and the spectrum was operated in the peak detection mode, for frequencies both below and up 1GHz. The peak levels were obtained by subtracting the duty cycle correction factor from the peak readings.

The following procedures were used to convert the emission levels measured in decibels referenced to 1 micro-volt (dBμV) into field intensity in micro-volts per meter (μV/m).

- (1) The actual field intensity in decibels referenced to 1 micro-volt per meter (dBμV/m) is determined by algebraically adding the measured reading in dBμV, the correction factor(dB), duty cycle correction factor (dB), and distance extrapolation factor (dB) at the appropriate frequency:

**30 MHz ~ 1GHz:**

Correction factor = Antenna factor + (Cable loss – Amplitude gain)

Peak Value = Reading Amplitude + Correction Factors

True Value = Peak Value + Duty Cycle

**Above 1GHz**

Correction Factors = Antenna Factor + (Cable Loss – Amplifier Gain)

Peak Value = Reading Amplitude + Correction Factors

True Value = Peak Value + Duty Cycle

- (2) The field intensity in micro-volts per meter can then be determined by the following equation:

$$FI(\mu V/ m) = 10^{FI (dB\mu V/ m) / 20}$$

The FCC specified emission limits were calculated according the EUT operating frequency and obtained by following linear interpolation equations:



**(a) For fundamental frequency:**

$$f_{EUT} : \text{EUT Operating Frequency Emission Limit } (\mu\text{V/m})$$

$$= [f_{EUT}(\text{MHz}) - 260(\text{MHz})] \times \frac{12500(\mu\text{V/m}) - 3750(\mu\text{V/m})}{470(\text{MHz}) - 260(\text{MHz})} + 3750(\mu\text{V/m})$$

**(b) For spurious frequencies:**

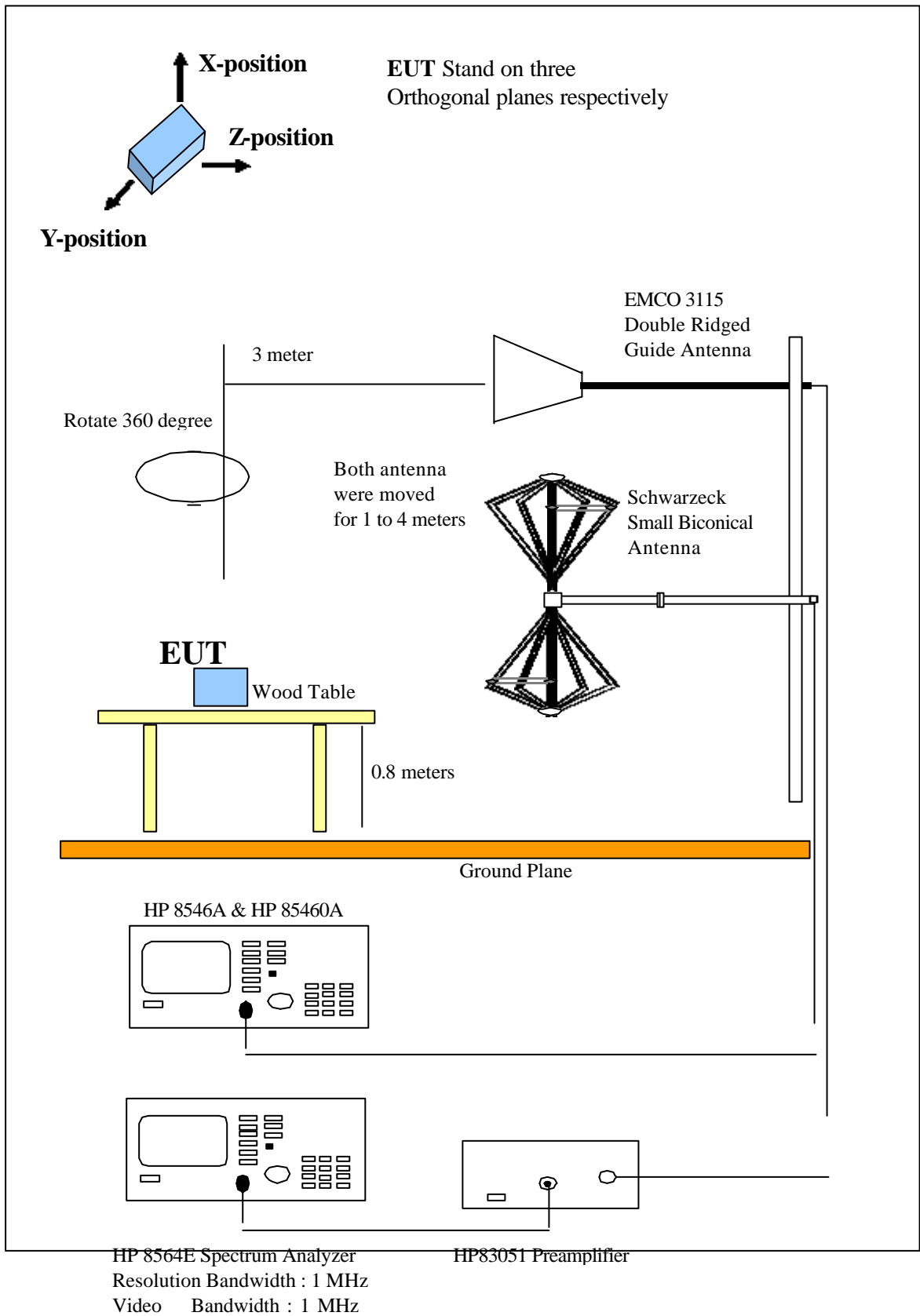
$$f_{EUT} : \text{EUT Operating Frequency Emission Limit } (\mu\text{V/m})$$

$$= [f_{EUT}(\text{MHz}) - 260(\text{MHz})] \times \frac{1250(\mu\text{V/m}) - 375(\mu\text{V/m})}{470(\text{MHz}) - 260(\text{MHz})} + 375(\mu\text{V/m})$$

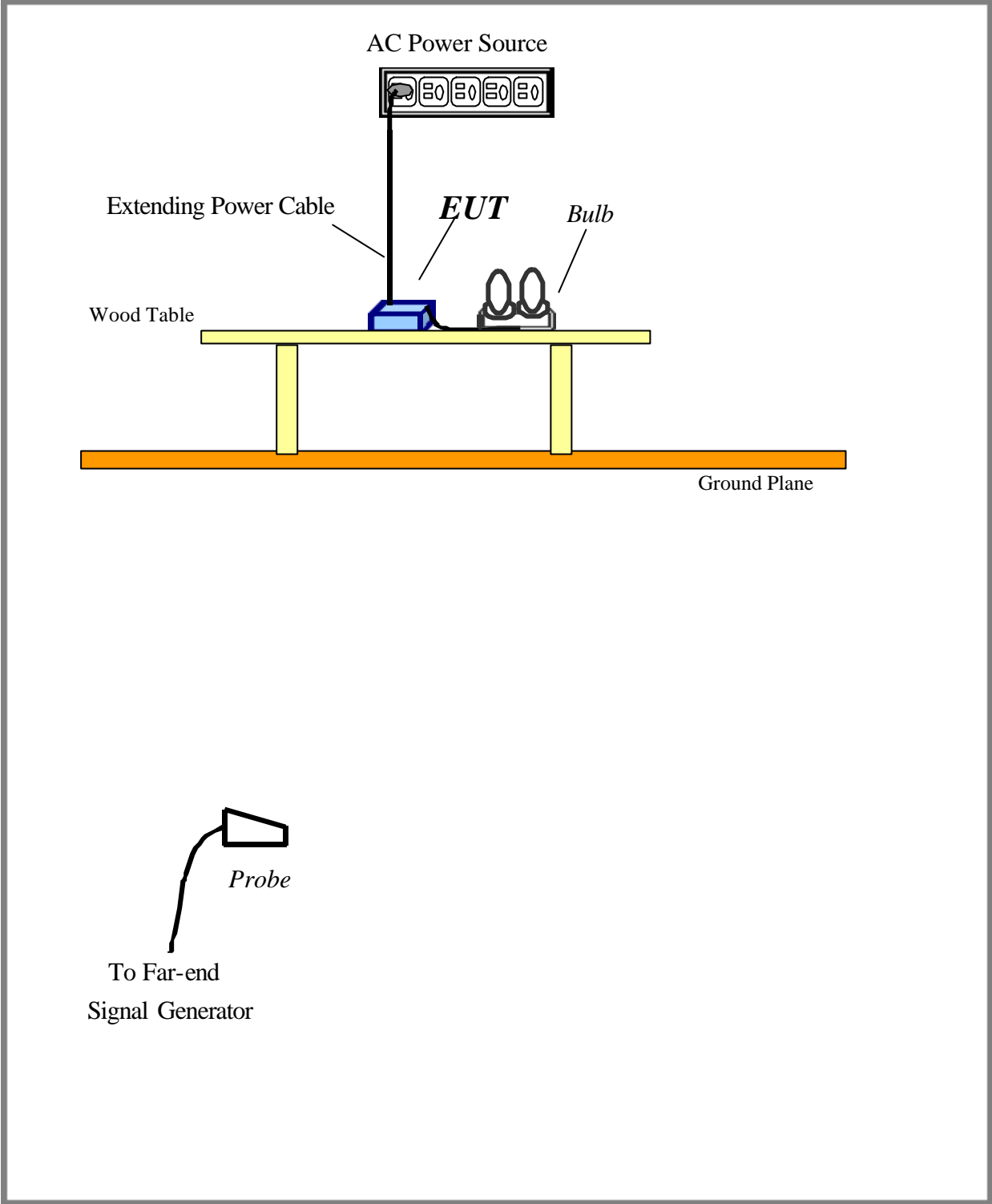
**6.3 List of Test Instruments**

Instrument Name	Model No.	Brand	Serial No.	Calibration Date	
				Last time	Next time
EMI Receiver	8546A	H P	3520A00242	06/28/02	06/28/03
RF Filter Section	85460A	H P	3448A00217	06/28/02	06/28/03
Small Biconical	UBAA9114 BBVU9135	Schwarzeck	127	05/07/02	05/07/03
Switch/Control Unit (> 30MHz)	3488A	HP	N/A	11/20/02	11/20/03
Auto Switch Box (> 30MHz)	ASB-01	TRC	9904-01	11/20/02	11/20/03
Spectrum Analyzer	8564E	HP	US36433002	08/01/02	08/01/03
Microwave Preamplifier	83051A	HP	3232A00347	08/01/02	08/01/03
Horn Antenna	3115	EMCO	9704 – 5178	08/01/02	08/01/03
Anechoic Chamber (cable calibrated together)				05/20/02	05/20/03

**6.4 Test Instruments Configuration (Tx mode)**



6.5 Test Instruments Configuration (Rx mode)



**6.6 Test Result of Radiated Emissions**

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarization, EUT orientation, etc. are recorded on the following.

**Test mode: Tx mode**

Test Conditions:      Testing Room: Temperature: 25 ° C      Humidity: 73 % RH

**Table 1 Radiated Emissions for 30MHz to 3.5GHz [Horizontal, X-axis]**

Radiated Emission				CF	Peak Value	Duty Cycle	True Value	FCC Class B ( 3 M )	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Angle	(dB)	(dBμV/m)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
319.50	64.77	1.00	109	2.52	67.29	-2.27	65.02	75.88	-10.86
639.89	20.37	1.00	142	15.08	35.45	-2.27	33.18	55.88	-22.70
1278.12	29.91	1.00	271	0.88	30.79	-2.27	28.52	55.88	-27.36

**Table 2 Radiated Emissions for 30MHz to 3.5GHz [Horizontal, Y-axis]**

Radiated Emission				CF	Peak Value	Duty Cycle	True Value	FCC Class B ( 3 M )	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Angle	(dB)	(dBμV/m)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
319.50	66.77	1.00	256	2.52	69.29	-2.27	67.02	75.88	-8.86
639.89	17.90	1.00	282	15.08	32.98	-2.27	30.71	55.88	-25.17

**Table 3 Radiated Emissions for 30MHz to 3.5GHz [Horizontal, Z-axis]**

Radiated Emission				CF	Peak Value	Duty Cycle	True Value	FCC Class B ( 3 M )	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Angle	(dB)	(dBμV/m)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
319.50	68.40	1.00	244	2.52	70.92	-2.27	68.65	75.88	-7.23
639.89	18.82	1.00	176	15.08	33.90	-2.27	31.63	55.88	-24.25

**Table 4 Radiated Emissions for 30MHz to 3.5GHz [Vertical, X-axis]**

Radiated Emission				CF	Peak Value	Duty Cycle	True Value	FCC Class B ( 3 M )	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Angle	(dB)	(dBμV/m)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
319.50	61.69	1.00	326	2.52	64.21	-2.27	61.94	75.88	-13.94
639.89	18.54	1.00	338	15.08	33.62	-2.27	31.35	55.88	-24.53

**Table 5 Radiated Emissions for 30MHz to 3.5GHz [Vertical, Y-axis]**

Radiated Emission				CF	Peak Value	Duty Cycle	True Value	FCC Class B ( 3 M )	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Angle	(dB)	(dBμV/m)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
319.50	58.79	1.00	315	2.52	61.31	-2.27	59.04	75.88	-16.84
639.89	22.63	1.00	289	15.08	37.71	-2.27	35.44	55.88	-20.44
1278.12	29.91	1.00	71	0.88	30.79	-2.27	28.52	55.88	-27.36

**Table 6 Radiated Emissions for 30MHz to 3.5GHz [Vertical, Z-axis]**

Radiated Emission				CF	Peak Value	Duty Cycle	True Value	FCC Class B ( 3 M )	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Angle	(dB)	(dBμV/m)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
319.50	55.38	1.00	265	2.52	57.90	-2.27	55.63	75.88	-20.25
639.89	21.17	1.00	14	15.08	36.25	-2.27	33.98	55.88	-21.90

Note:

1. Margin = Amplitude – limit, if margin is minus means under limit.
2. Correction factor = Antenna factor + ( Cable Loss – Amplitude gain)
3. Peak Value = Reading Amplitude + Correction Factors
4. True Value = Peak Value + Duty Cycle

**Test mode: Rx mode**

Test Conditions:      Testing Room: Temperature: 25 ° C      Humidity: 73 % RH

***Table 7 Radiated Emissions for 30MHz to 2GHz [Horizontal, X-axis]***

Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Class B Limit	Margin
MHz	dBµV	m	degree	dB/m	dBµV/m	dBµV/m	dB
319.50	40.53	1.00	265	2.52	43.05	46.00	-2.95
1278.33	30.41	1.00	28	0.88	31.29	53.96	-22.67

***Table 8 Radiated Emissions for 30MHz to 2GHz [Horizontal, Y-axis]***

Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Class B Limit	Margin
MHz	dBµV	m	degree	dB/m	dBµV/m	dBµV/m	dB
319.50	35.86	1.00	60	2.52	38.38	46.00	-7.62

***Table 9 Radiated Emissions for 30MHz to 2GHz [Horizontal, Z-axis]***

Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Class B Limit	Margin
MHz	dBµV	m	degree	dB/m	dBµV/m	dBµV/m	dB
319.50	41.07	1.00	352	2.52	43.59	46.00	-2.41

Note:

1. Margin = Amplitude – limit, *if margin is minus means under limit.*
2. Corrected Amplitude = Reading Amplitude + Correction Factors
3. Correction factor = Antenna factor + ( Cable Loss – Amplitude gain)

**Table 10 Radiated Emissions for 30MHz to 2GHz [Vertical, X-axis]**

Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Class B Limit	Margin
MHz	dBμV	m	degree	dB/m	dBμV/m	dBμV/m	dB
319.50	34.87	1.00	212	2.52	37.39	46.00	-8.61

**Table 11 Radiated Emissions for 30MHz to 2GHz [Vertical, Y-axis]**

Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Class B Limit	Margin
MHz	dBμV	m	degree	dB/m	dBμV/m	dBμV/m	dB
319.50	31.76	1.00	326	2.52	34.28	46.00	-11.72
1278.33	30.74	1.00	195	0.88	31.62	53.96	-22.34

**Table 12 Radiated Emissions for 30MHz to 2GHz [Vertical, Z-axis]**

Frequency	Reading Amplitude	Ant. Height	Table	Correction Factors	Corrected Amplitude	Class B Limit	Margin
MHz	dBμV	m	degree	dB/m	dBμV/m	dBμV/m	dB
319.50	30.26	1.00	116	2.52	32.78	46.00	-13.22

Note:

1. Margin = Amplitude – limit, *if margin is minus means under limit.*
2. Corrected Amplitude = Reading Amplitude + Correction Factors
3. Correction factor = Antenna factor + ( Cable Loss – Amplitude gain)