

Advanced
Compliance Laboratory

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ELECTROMAGNETIC EMISSION COMPLIANCE REPORT

of

RF CORDLESS HEADPHONE TRANSMITTER

MODEL: RP-WF930T

FCC ID: ACJRP-WF930T

December 16, 2003

This report concerns (check one): Original grant ☒ Class II change ☐
Equipment type: LOW POWER TRANSMITTER

Deferred grant requested per 47 CF 0.457(d)(1)(ii)? yes ☐ no ☒
If yes, defer until: (date)
Company agrees to notify the Commission by (date)
of the intended date of announcement of the product so that the grant can be
issued on that date.

Transition Rules Request per 15.37? yes ☐ no ☒
If no, assumed Part 15, Subpart B for unintentional radiators - the new 47 CFR
[10-1-90 Edition] provision.

Report prepared for: MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.
Report prepared by: Advanced Compliance Lab
Report number: 0048-031210-01-TX



The test result in this report IS supported and covered by the NVLAP accreditation

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1. GENERAL INFORMATION

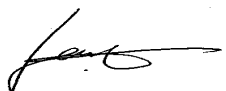
1.1 Verification of Compliance

EUT: RF CORDLESS HEADPHONE TRANSMITTER
 Model: RP-WF930T
 Applicant: MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.
 1-15 MATSUO-CHO, KADOMA CITY, OSAKA, JAPAN
 Test Type: FCC Part 15C CERTIFICATION
 Result: PASS
 Tested by: ADVANCED COMPLIANCE LAB
 Test Date: December 16, 2003
 Report Number: 0048-031210-01-TX

The above equipment was tested by Advanced Compliance Laboratory for compliance with the requirement set forth in the FCC rules and regulations Part 15, subpart C. This said equipment in the configuration described in the report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

The estimated uncertainty of the test result is given as following. The method of uncertainty calculation is provided in Advanced Compliance Lab. Doc. No. 0048-01-01.

	Prob. Dist.	Uncertainty(dB)	Uncertainty(dB)	Uncertainty(dB)
		30-1000MHz	1-6.5GHz	Conducted
Combined Std. Uncertainty u_c	norm.	± 2.36	± 2.99	± 1.83



Wei Li
 Lab Manager
 Advanced Compliance Lab

Date: December 16, 2003

1.2 Equipment Modifications

N/A

1.3 Product Information

System Configuration

ITEM	DESCRIPTION	FCC ID	CABLE
Product	TRANSMITTER	ACJRP-WF930T	
Housing	PLASTICS		
Power Supply	DC12V Adapter 120V/60Hz		
Operation Freq.	105 ~108 MHz		
Device Type	Continuous Operation		
FM Receiver	Sony SRF-19W		
Receiver	FCC Part 15 Certificate	ACJRP-WF930H	

(1) EUT submitted for grant.

1.4 Test Methodology

Radiated tests were performed according to the procedures in ANSI C63.4-1992 at an antenna to EUT distance of 3 meters.

1.5 Test Facility

The open area test site and conducted measurement facility used to collect the radiated and conducted data are located at Somerset, New Jersey. This site has been accepted by FCC to perform measurements under Part 15 or 18 in a letter dated May 19, 1997 (Refer to: 31040/PRV 1300F2). The NVLAP Lab code for accreditation of FCC EMC Test Method is: 200101-0.

1.6 Test Equipment

Manufacture	Model	Serial No.	Description	Last Cal dd/mm/y y	Cal Due dd/mm/y y
Hewlett-Packard	HP8546A	3625A00341	EMI Receiver	23/10/03	23/10/04
EMCO	3104C	9307-4396	20-300MHz Biconical Antenna	11/03/03	11/03/04
EMCO	3146	9008-2860	200-1000MHz Log-Periodic Antenna	11/02/03	11/02/04
Fischer Custom	LISN-2	900-4-0008	Line Impedance Stabilization Networks	03/07/03	03/07/04
Fischer Custom	LISN-2	900-4-0009	Line Impedance Stabilization Networks	03/07/03	03/07/04
EMCO	3115	4945	Double Ridge Guide Horn Antenna	15/09/03	15/09/04

All Test Equipment Used are Calibrated Traceable to NIST Standards.

1.7 Statement for the Document Use

This report shall not be reproduced except in full, without the written approval of the laboratory. And this report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

2. PRODUCT LABELING

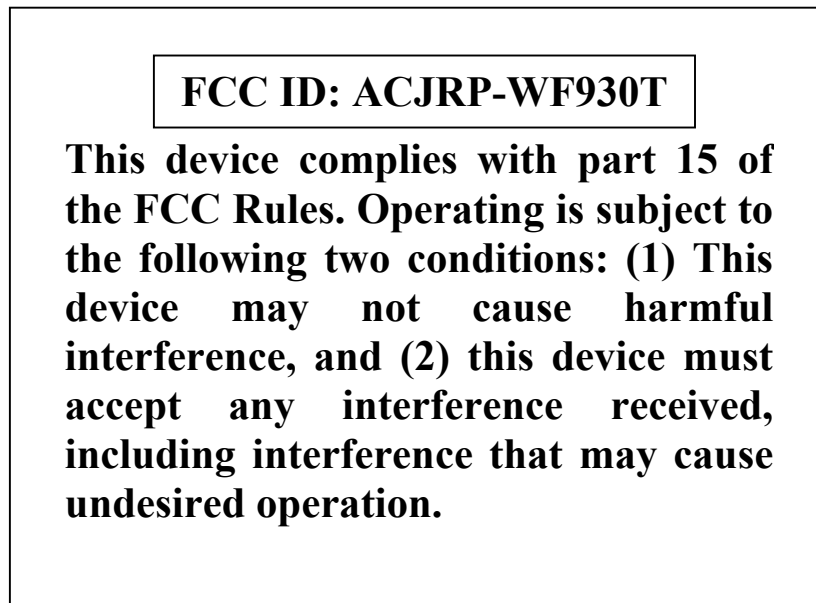


Figure 2.1 FCC ID Label

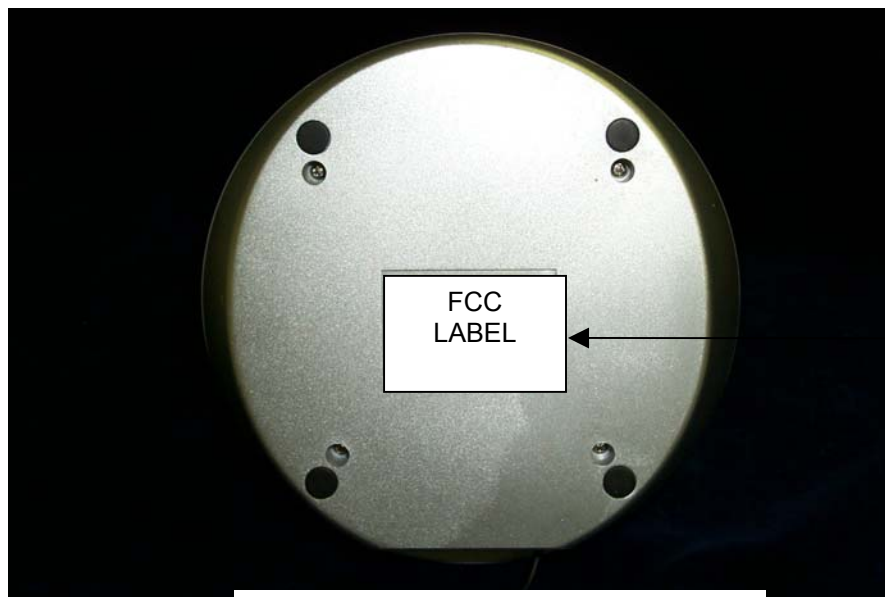


Figure 2.2 Location of the Label

3. SYSTEM TEST CONFIGURATION

3.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it). And its antenna was permanently attached to the EUT with maximum length, 3 inches.

When an audio signal is input, the transmitter's power is turned on automatically, and the indicator lights in red. Also, when no audio signal is input for about a minute, the indicator goes out automatically and the power turns off. (Automatic Power On/Off function)

Testing was performed as EUT was operated at frequency 905~908MHz continuously. The worst case of EUT operating frequency as 907.3MHz is recorded for final data on Pg. 19.

3.2 Special Accessories

N/A

3.3 Configuration of Tested System

Figure 3.1 and Figure 3.3 illustrate this system, which is tested standing along.

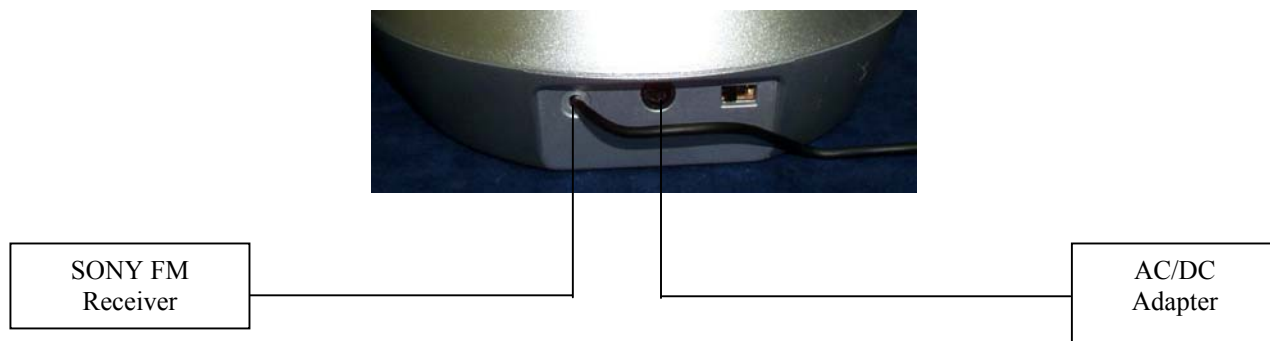


Figure 3.1 Cable Interlink Configuration



Figure 3.2 Radiated Front



Figure 3.3 Radiated Rear



Figure 3.4 Conducted Front



Figure 3.5 Conducted Rear

4. SYSTEM BLOCK DIAGRAM

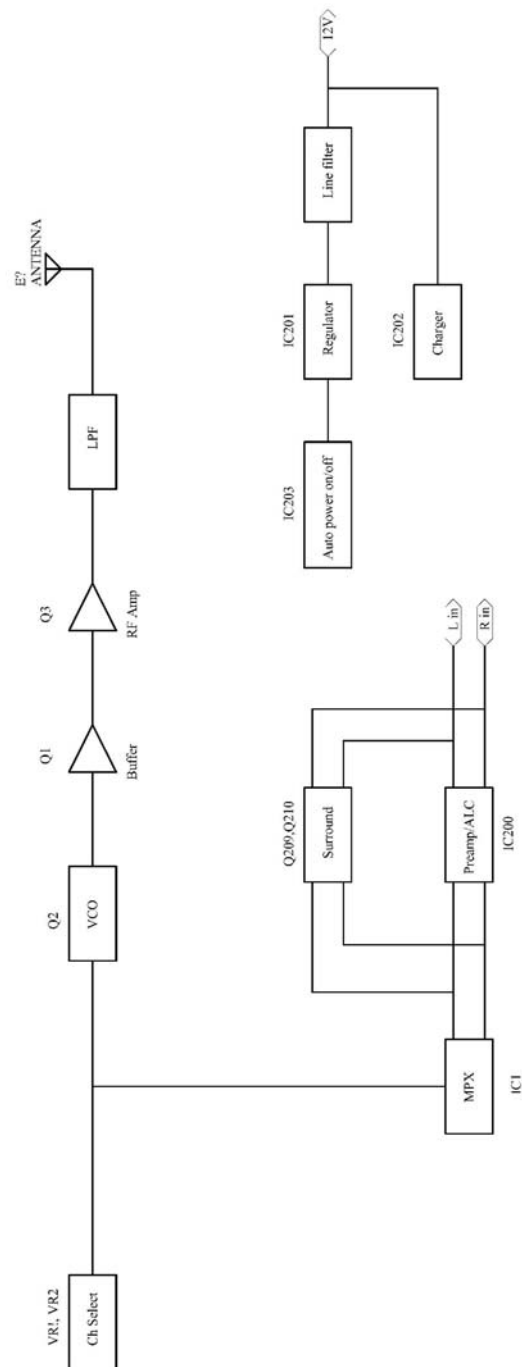


Figure 4.1 System BLOCK DIAGRAM

5. CONDUCTED EMISSION DATA

5.1 Test Methods and Conditions

The EUT was under normal operational mode during the conducted emission test. EMI Receiver was scanned from 150KHz to 30MHz with maximum hold mode for maximum emission. Recorded data was sent to the plotter to generate output in linear format. At the input of the spectrum analyzer, a HP transient limiter is inserted for protective purpose. This limiter has a 10 dB attenuation in the range of 150KHz to 30MHz. That factor was automatically compensated by the receiver, so the readings are the corrected readings. The reference of the plot is the CISPR 22 Class B limit in Figure 5.1 through Figure 5.2.

Conducted Emission Technical Requirements				
Frequency Range	Class A		Class B	
	Quasi-Peak dBuV	Average dBuV	Quasi-Peak DBuV	Average dBuV
150kHz-0.5MHz	79 (8912uV)	66 (1995uV)	66-56	56-46
0.5MHz-30MHz	73 (4467uV)	60 (1000uV)	---	---
0.5MHz- 5MHz	---	---	56	46
5MHz-30MHz	---	---	60	50

Emissions that have peak values close to the specification limit (if any) are also measured in the quasi-peak mode to determine compliance.

5.2 Test Data

Figure 5.1 through Figure 5.2 show the neutral and line conducted emissions for the standard operation mode.

Six Highest Data for AC Line Conducted Emissions						
Frequency (MHz)	12.10	12.21	12.38	12.47	12.82	12.93
Peak Reading (dBuV)	31.2	30.9	27.5	29.8	29.6	29.5

Test Personnel:

Tester Signature: 

Date: December 16, 2003

Typed/Printed Name: Edward Lee

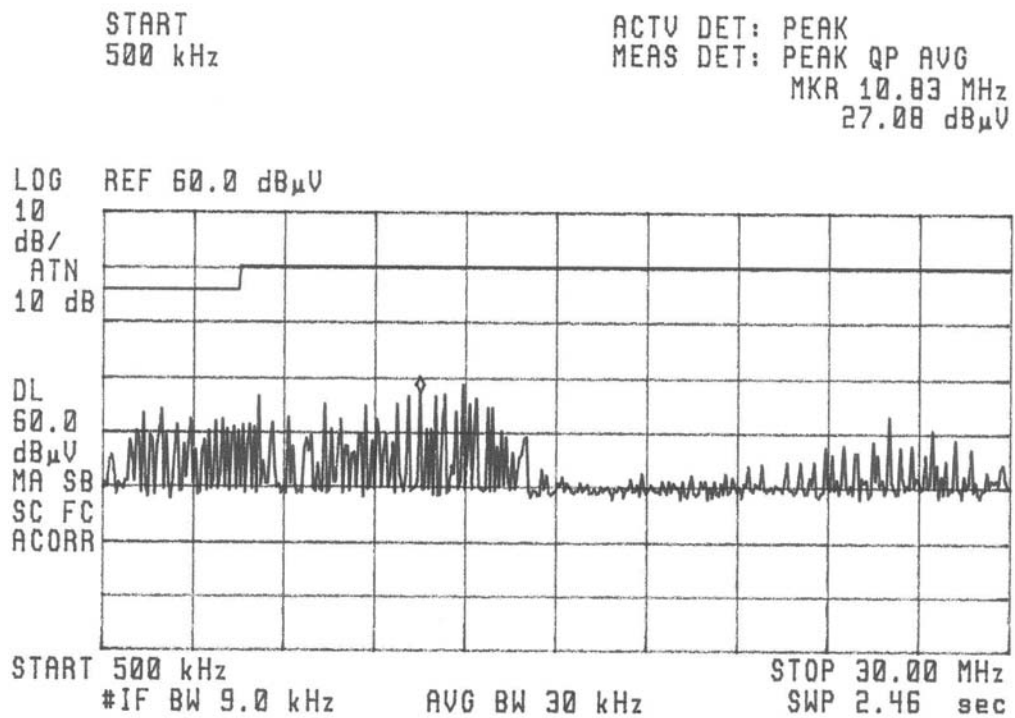
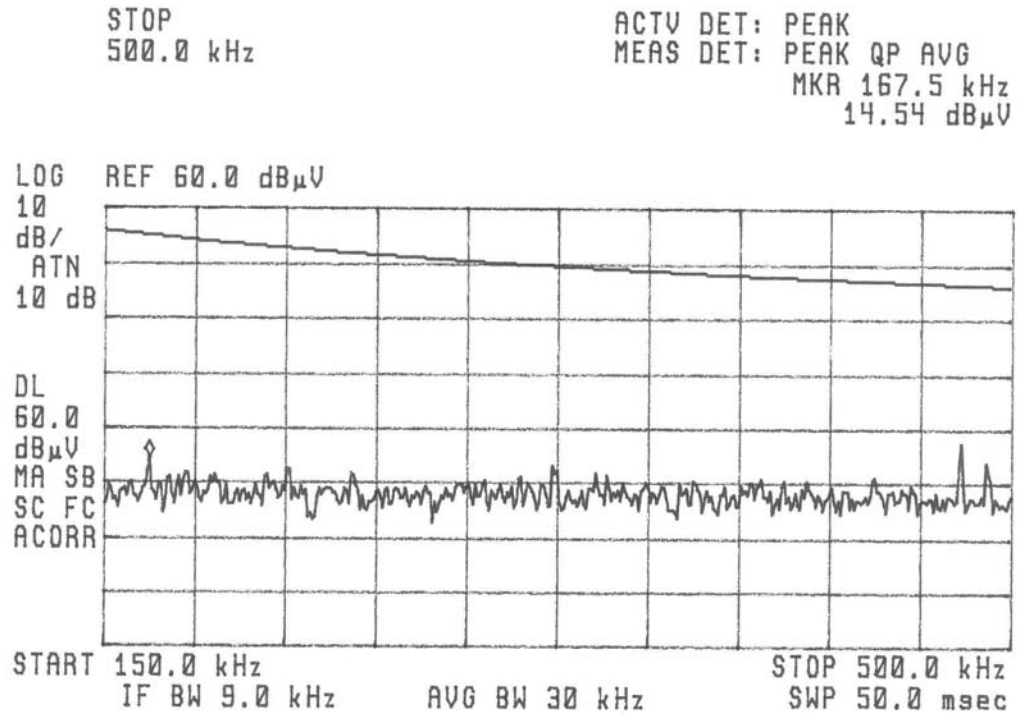


Figure 5.1 Line Conducted

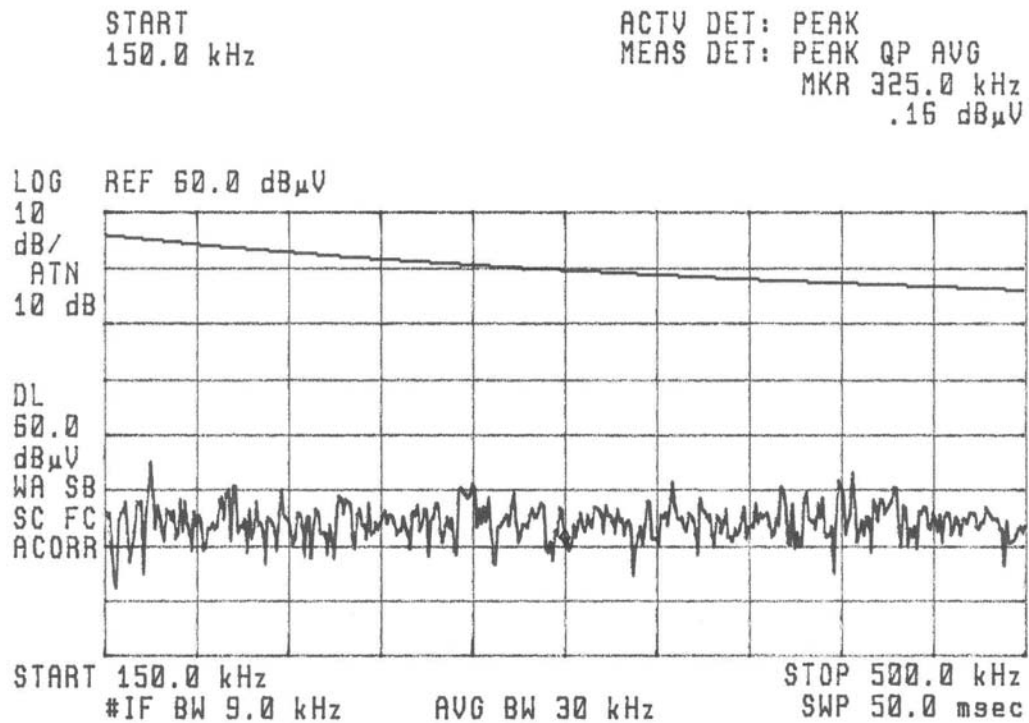
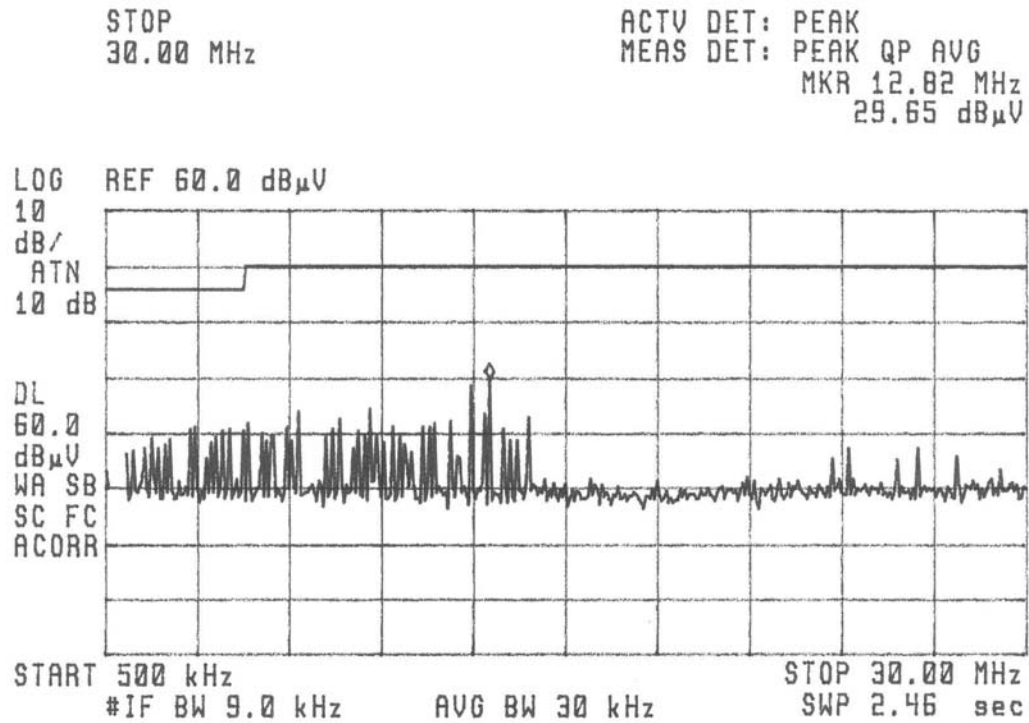


Figure 5.2 Neutral Conducted

6. RADIATED EMISSION DATA

6.1 Field Strength Calculation

The corrected field strength is automatically calculated by EMI Receiver using following:

$$FS = RA + AF + CF + AG$$

where FS: Corrected Field Strength in dB μ V/m

RA: Amplitude of EMI Receiver before correction in dB μ V

AF: Antenna Factor in dB/m

CF: Cable Attenuation Factor in dB

AG: Built-in Preamplifier Gain in dB (Stored in receiver as part of the calibration data)

6.2 Test Methods and Conditions

The initial step in collecting radiated data is a EMI Receiver scan of the measurement range below 30MHz using peak detector and 9KHz IF bandwidth / 30KHz video bandwidth. For the range 30MHz - 1GHz 120KHz, IF bandwidth / 30KHz video bandwidth are used. Both bandwidths are 1MHz for above 1GHz measurement. The highest radiated emissions below 10GHz are recorded.

6.3 Test Data

The following data lists the significant emission frequencies, polarity and position, peak reading of the EMI Receiver, the FCC limit, and the difference between the peak reading and the limit. Explanation of the correction and calculation are given in section 5.1.

Testing was performed as EUT was operated at frequency 905~908MHz continuously. The worst case of EUT operating frequency as 907.3MHz (CH2) is recorded for final data.

Test Personnel:

Tester Signature: 

Typed/Printed Name: Edward Lee

Date: December 16, 2003

Radiated Test Data

Worst Case : operating frequency=907.3MHz

Frequency (MHz)	Polarity [H, V] Position	Height (m)	Azimuth (Degree)	Peak ⁽²⁾ Reading (dBμV/m)	Part 15C ⁽¹⁾ 3m Limit (dBμV/m)	Difference from limit (dB)
907.3	H	1.2	200	80.2	94	-13.8
1814.6	H	1.2	200	47.4	54	-6.6
3629.2	H	1.3	200	47.1	54	-6.9
907.3	V	1.1	200	91.0	94	-3
1814.6	V	1.1	190	51.1	54	-2.9
2721.9	V	1.2	190	47.7	54	-6.3
3629.2	V	1.1	190	46.8	54	-7.2
4536.5	V	1.1	190	47.0	54	-7

(1) The limit for emissions within the **902-928MHz** band is **50,000uV/m(94dB)**. Sec. **15.249**. The limit for field harmonics is **500uV/m(54dB)**. The limit for other emissions is defined in Sec. 15.249.

(2) Because each peak reading is less than the FCC average limit, it is not necessary to show the calculated average reading based on the pulse train characteristics.

7. PHOTOS OF TESTED EUT

The following photos show the inside details of the EUT.