

Advanced
Compliance Laboratory

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ELECTROMAGNETIC EMISSION COMPLIANCE REPORT

of

2.4GHZ COLOR TFT LCD AV WIRELESS MONITOR TRANSMITTER

MODEL: JY-228

FCC ID: R4GJY-228

May 6, 2004

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: JOYO ELECTRONICS COMPANY LIMITED
Report prepared by: Advanced Compliance Laboratory, Inc.
Report number: 0048-040503-01-TX



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

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1. GENERAL INFORMATION

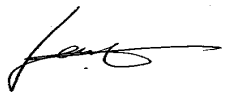
1.1 Verification of Compliance

EUT: 2.4GHZ COLOR TFT LCD AV WIRELESS MONITOR
 TRANSMITTER
 Model: JY-228
 Applicant: JOYO ELECTRONICS COMPANY LIMITED
 UNIT D, 13/F, WORLD TECH CENTRE, 95 HOW MING ST.
 KWUN TONG, KOWLOON, HONG KONG
 Test Type: FCC Part 15C CERTIFICATION
 Result: PASS
 Tested by: ADVANCED COMPLIANCE LAB
 Test Date: May 6, 2004
 Report Number: 0048-040503-01-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: May 6, 2004

1.2 Equipment Modifications

N/A

1.3 Product Information

System Configuration

ITEM	DESCRIPTION	FCC ID	CABLE
Product	TRANSMITTER(1)	R4GJY-228	
Housing	PLASTICS		
Power Supply	DC9V Adapter 120V/60Hz		
Operation Freq.	2411, 2433, 2453, 2473 MHz		
Device Type	Continuous Operation		
Receiver	FCC Part 15 DoC : JY-228(RX)		

(1) EUT submitted for grant.

1.4 Test Methodology

Radiated tests were performed according to the procedures in ANSI C63.4-2001 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	12/02/04	12/02/05
EMCO	3146	9008-2860	200-1000MHz Log-Periodic Antenna	09/02/04	09/02/05
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

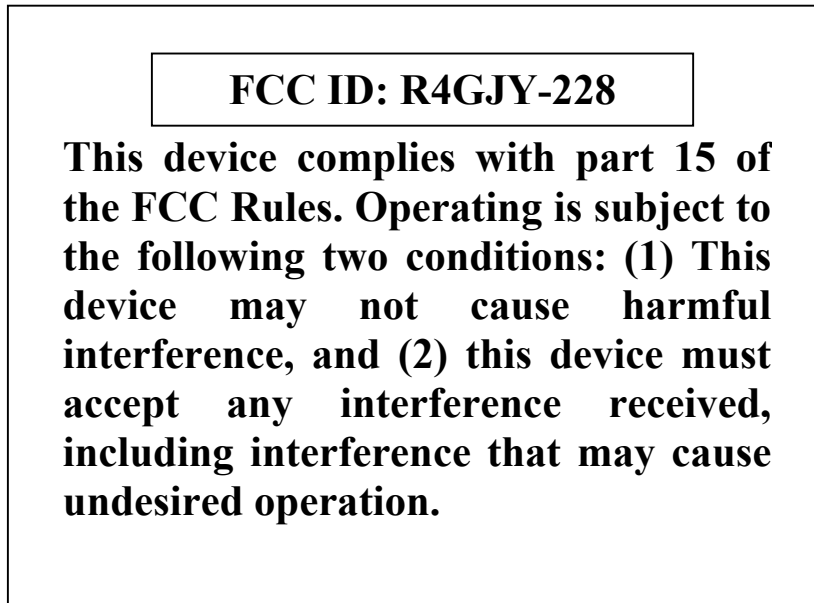


Figure 2.1 FCC ID Label

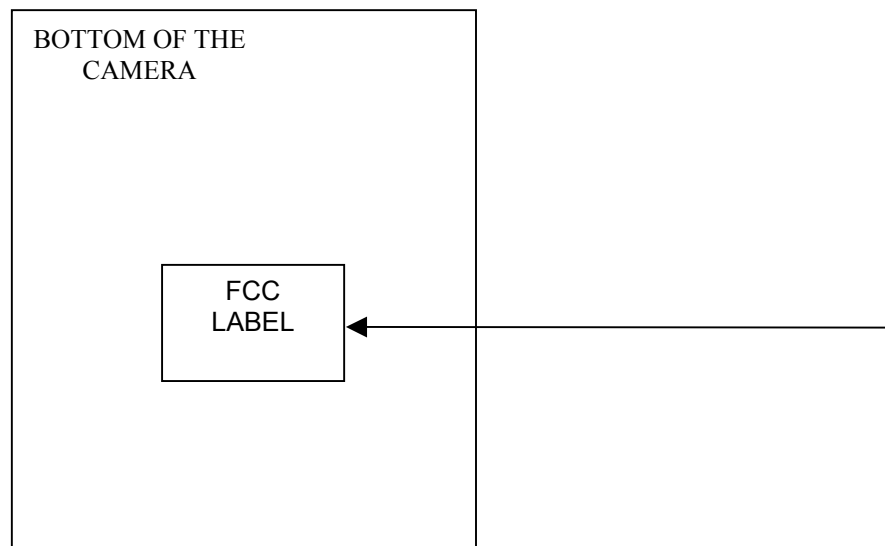


Figure 2.2 Location of the Label

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.

By pressing the power button in front of the unit, the unit is turned on and the indicator lights in red. Testing was performed as EUT was operated at all 4 channels. The frequencies were: 2411MHz, 2433MHz, 2453MHz, and 2473MHz.

3.2 Special Accessories

LCD monitor base and power adapters.

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-X Position



Figure 3.3 Radiated Front-Y Position



Figure 3.4 Radiated Rear



Figure 3.5 Conducted Front



Figure 3.6 Conducted Rear

4. SYSTEM BLOCK DIAGRAM

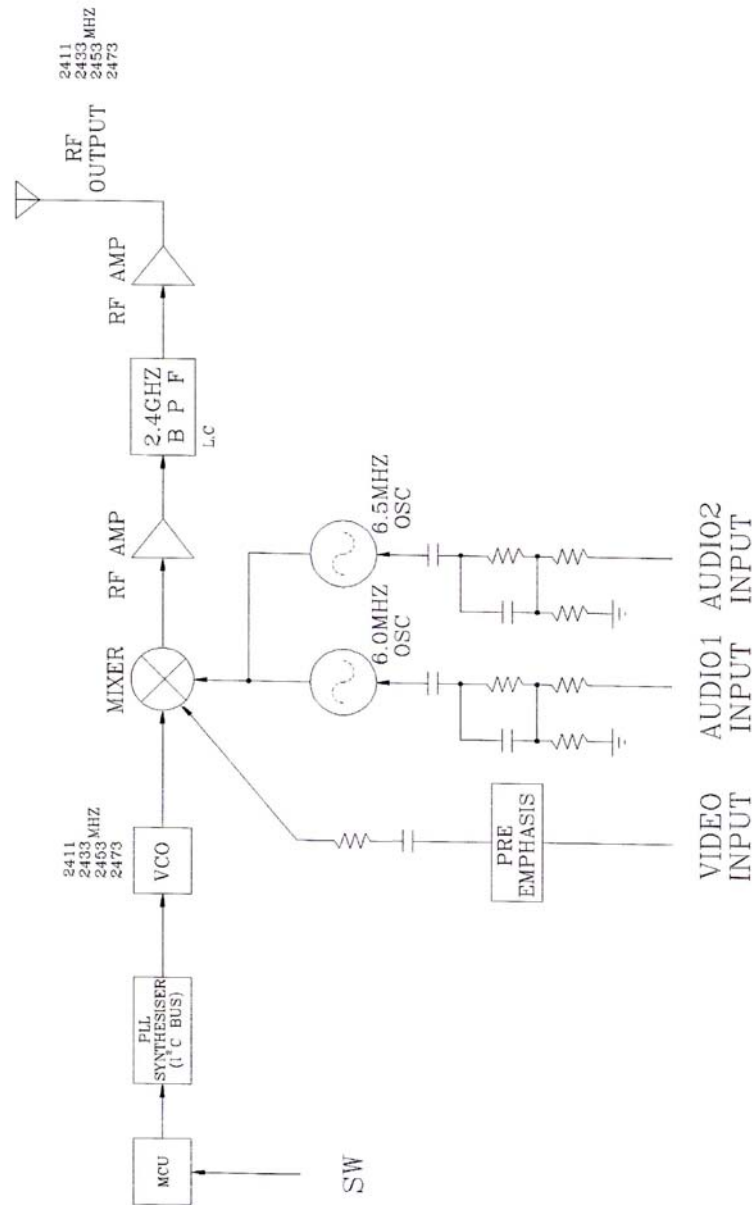


Figure 4.1 System BLOCK DIAGRAM

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)	0.1526	0.1596	0.1623	0.1649	26.76	28.89
Peak Reading (dBuV)	31.2	24.6	20.8	31.0	1.7	2.3

Test Personnel:

Tester Signature: 

Date: May 6, 2004

Typed/Printed Name: Edward Lee

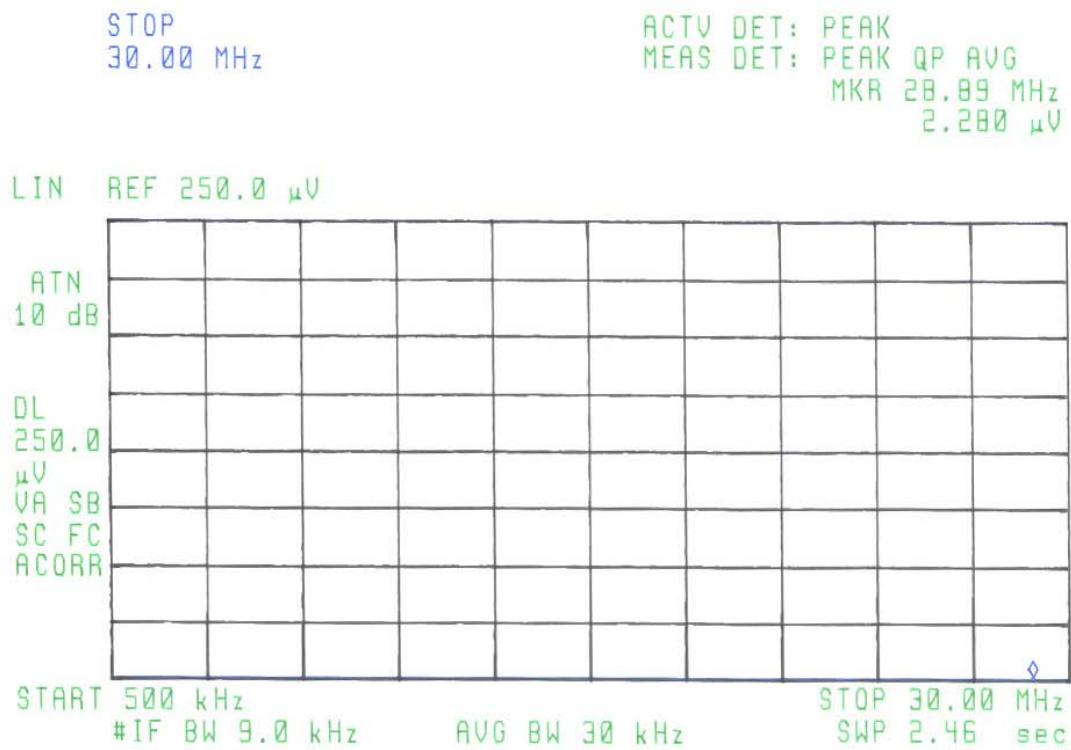
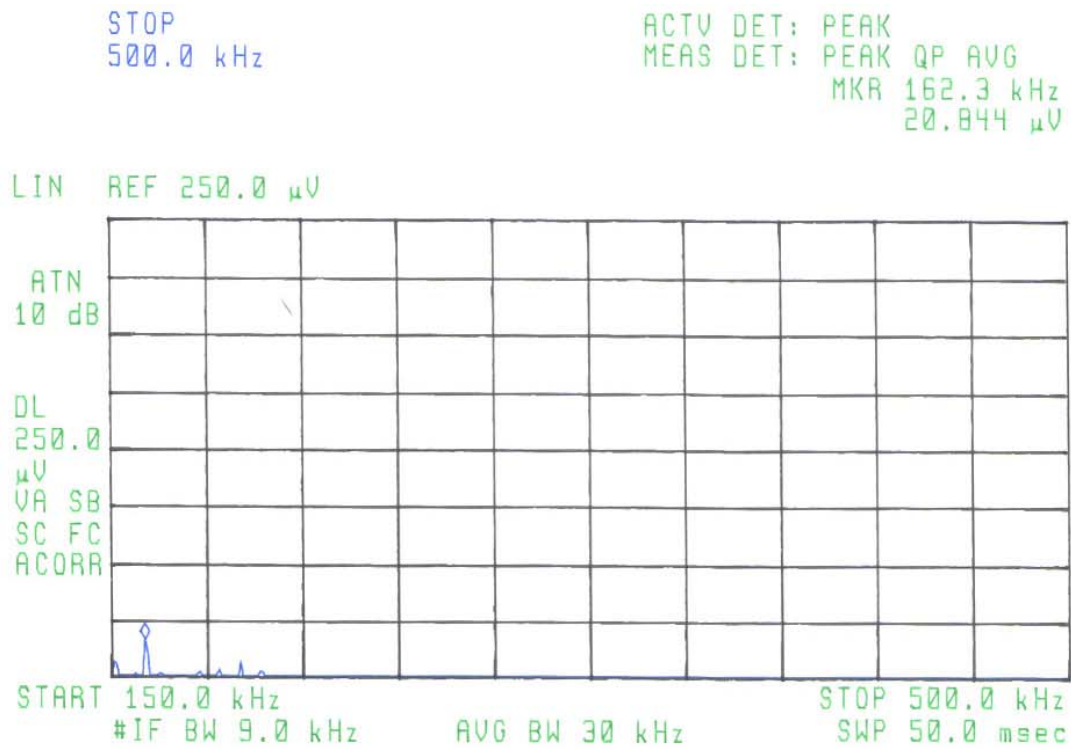


Figure 5.1 Line Conducted

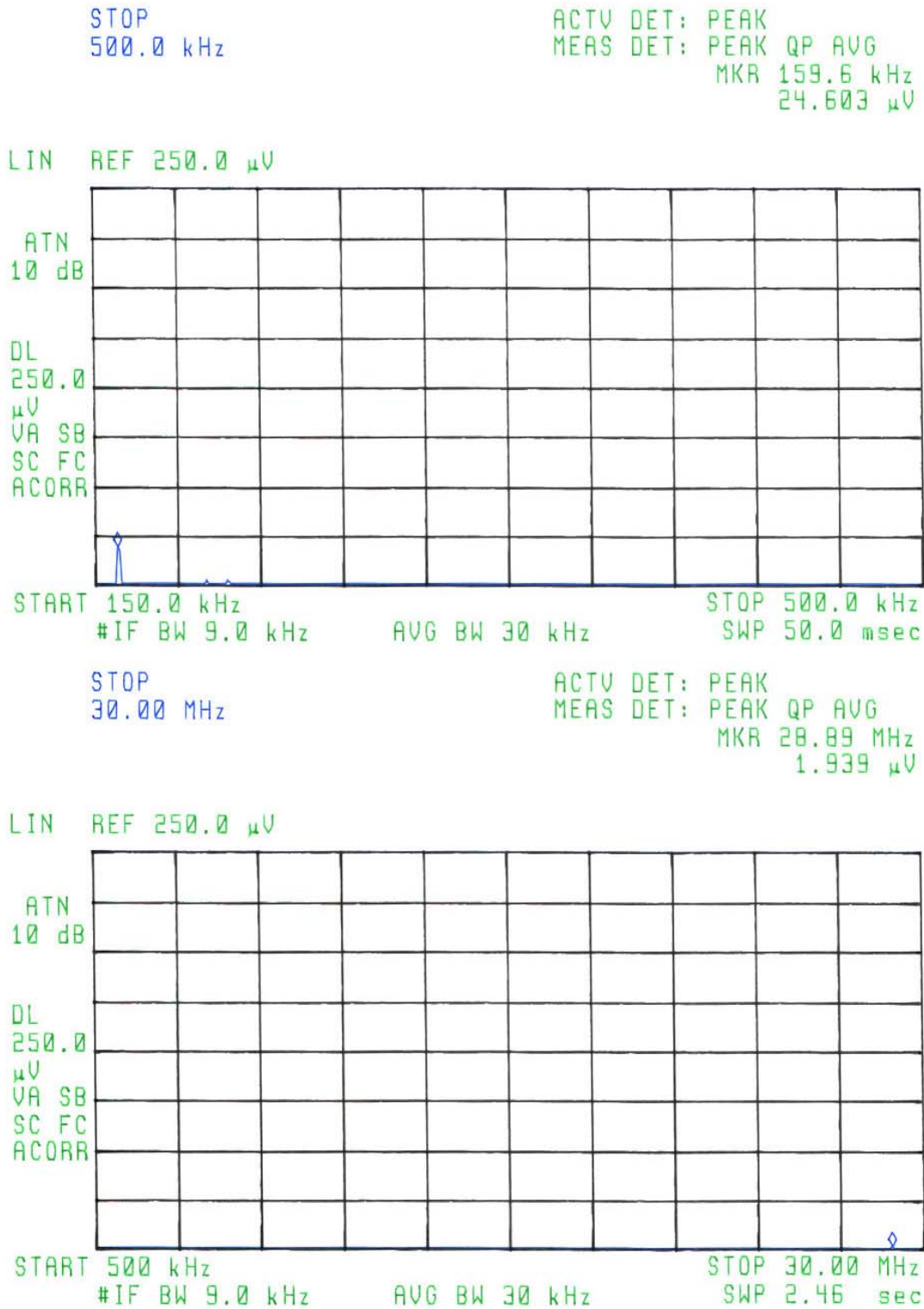


Figure 5.2 Neutral Conducted

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 25GHz, up to 10th harmonics, 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 frequencies 2411, 2433, 2453, 2473MHz respectively. The worst case of EUT operating frequency at 2473MHz (CH4), with max.-rated audio/video input level as modulation, was recorded for final data.

Test Personnel:

Tester Signature:



Typed/Printed Name: Edward Lee

Date: May 6, 2004

Radiated Test Data

Worst Case : operating frequency=2473MHz

Frequency (MHz)	Polarity [H, V] Position	Height (m)	Azimuth (Degree)	Peak ⁽²⁾ Reading (dB μ V/m)	Part 15C ⁽¹⁾ 3m Limit (dB μ V/m)	Difference from limit (dB)
2473	H-X	1.2	180	90.3	94	-3.7
4946	H-X	1.2	180	48.0	54	-6.0
2473	H-Y	1.2	180	89.2	94	-4.8
2473	V-X	1.3	180	84.0	94	-6.0
2473	V-Y	1.1	180	82.0	94	-12.0

(1) The limit for emissions within the 2400-2483.5MHz 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.