FCC Certification Test Report

FCC Certification Test Report for PRT Manufacturing Ltd. OMS-RFWC

August 20, 2003

Prepared for:

PRT Manufacturing Ltd.
Unit 1204, 12F, Fo Tan Industrial Centre
Fo Tan, Shatin, NT Hong Kong

Prepared By:

Washington Laboratories, Ltd.
7560 Lindbergh Drive
Gaithersburg, Maryland 20879

FCC Certification Test Program

FCC Certification Test Report
for the
PRT Manufacturing Ltd.
3D2 Wireless Controller
OMS-RFWC

August 20, 2003

WLL JOB# 7670

Prepared by: Brian J. Dettling
Documentation Specialist

Reviewed by: Gregory M. Snyder
Wireless/Telco Services Manager & Chief EMC Engineer

Abstract

This report has been prepared on behalf of PRT Manufacturing Ltd. to support the attached Application for Equipment Authorization. The test report and application are submitted for a Intentional Radiator under Part 15.249 of the FCC Rules and Regulations. This Federal Communication Commission (FCC) Certification Test Report documents the test configuration and test results for a PRT Manufacturing Ltd. 3D2 Wireless Controller.

Testing was performed on an Open Area Test Site (OATS) of Washington Laboratories, Ltd, 7560 Lindbergh Drive, Gaithersburg, MD 20879. Site description and site attenuation data have been placed on file with the FCC's Sampling and Measurements Branch at the FCC laboratory in Columbia, MD. Washington Laboratories, Ltd. has been accepted by the FCC and approved by NIST NVLAP (NVLAP Lab Code: 200066-0) as an independent FCC test laboratory.

The PRT Manufacturing Ltd. 3D2 Wireless Controller complies with the limits for a Intentional Radiator device under Part 15.249 of the FCC Rules and Regulations.

Table of Contents

List of Tables

List of Figures

1 Introduction

1.1 Compliance Statement

The PRT Manufacturing Ltd. 3D2 Wireless Controller complies with the limits for a Intentional Radiator device under Part 15.249 of the FCC Rules and Regulations.

This test report reflects the testing performed for the certification of the 3D2. Separate testing was performed for the digital and receiver portion under the DoC process.

1.2 Test Scope

Tests for radiated emissions were performed. All measurements were performed according to the 2001 version of ANSI C63.4. The measurement equipment conforms to ANSI C63.2 Specifications for Electromagnetic Noise and Field Strength Instrumentation.

1.3 Contract Information

Customer:	PRT Manufacturing Ltd. Unit 1204, 12F, Fo Tan Industrial Centre Fo Tan, Shatin, NT Hong Kong
Quotation Number:	60967

1.4 Test Dates

Testing was performed from July 16 to August 12, 2003.

1.5 Test and Support Personnel

Washington Laboratories, LTD	Chad Beattie, James Ritter

1.6 Abbreviations

A	Ampere
Ac	alternating current
AM	Amplitude Modulation
Amps	Amperes
b/s	bits per second
BW	Bandwidth
CE	Conducted Emission
cm	centimeter
CW	Continuous Wave
dB	decibel
dc	direct current
EMI	Electromagnetic Interference
EUT	Equipment Under Test
FM	Frequency Modulation
G	giga - prefix for 10^9 multiplier
Hz	Hertz
IF	Intermediate Frequency
k	kilo - prefix for 10^3 multiplier
M	Mega - prefix for 10^6 multiplier
m	Meter
μ	micro - prefix for 10^{-6} multiplier
NB	Narrowband
LISN	Line Impedance Stabilization Network
RE	Radiated Emissions
RF	Radio Frequency
rms	root-mean-square
SN	Serial Number
S/A	Spectrum Analyzer
V	Volt

2 Equipment Under Test

2.1 EUT Identification & Description

The PRT Manufacturing Ltd. 3D2 Wireless Controller is part of a wireless controller system for the Nintendo® Game Cube™ video game console. The 3D2 replaces the hard-wired controller, and transmits and receives commands to the PRT system interface 3D2 host (separate certification).

The RF controller pad is battery powered and has 4 selectable channels. Channels are selectable via slide switches on the controller.

Table 1. Device Summary

ITEM	DESCRIPTION
Manufacturer:	PRT Manufacturing Ltd.
FCC ID Number	OMS-RFWC
EUT Name:	Wireless Controller
Model:	3D2
FCC Rule Parts:	§15.249
Frequency Range:	4 Channels: CH1: 903MHz, CH2: 909.5MHz, CH3: 916.5MHz, CH4: 923.5MHz
Maximum Output Power:	<1mW
Modulation:	FSK
Occupied Bandwidth:	202.5 kHz
Keying:	Manual
Type of Information:	Control
Number of Channels:	4
Power Output Level	Fixed
Antenna Type	Integral
Interface Cables:	None
Power Source & Voltage:	3Vdc provided by two (2) 1.5v AA batteries

2.2 Test Configuration

The 3D2 was configured with a Nintendo® Game Cube™ and a companion game interface (3D2 Host). The video game device was connected to a television set and a sample game was set to run in normal mode.

2.3 Testing Algorithm

The 3D2 was operated continuously by transmitting play commands to the interface/game console.

The 3D2, Nintendo® Game Cube™ and television were powered on and a game was inserted into the Nintendo® Game Cube™. Once communication was established the 3D2 Controller continuously transmitted to the 3D2 Host connected to the Nintendo® Game Cube™ console. All controller pad buttons were pressed to determine the worst case

duty cycle operation. It was verified that there was no difference in duty cycle or bandwidth for pressing different buttons.

Worst case emission levels are provided in the test results data.

2.4 Test Location

All measurements herein were performed at Washington Laboratories, Ltd. test center in Gaithersburg, MD. Site description and site attenuation data have been placed on file with the FCC's Sampling and Measurements Branch at the FCC laboratory in Columbia, MD. Washington Laboratories, Ltd. has been accepted by the FCC and approved by NIST NVLAP (NVLAP Lab Code: 200066-0) as an independent FCC test laboratory.

2.5 Measurements

2.5.1 References

ANSI C63.2 Specifications for Electromagnetic Noise and Field Strength Instrumentation

ANSI C63.4 American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

Land Mobile FM or PM Communications Equipment Measurement and Performance Standards (ANSI/TIA/EIA-603-93)

2.6 Measurement Uncertainty

All results reported herein relate only to the equipment tested. For the purposes of the measurements performed by Washington Laboratories, the measurement uncertainty is ±2.3 dB. This has been calculated for a *worst-case situation* (radiated emissions measurements performed on an open area test site).

The following measurement uncertainty calculation is provided:

$$\text{Total Uncertainty} = (A^2 + B^2 + C^2)^{1/2}/(n-1)$$

where:

A = Antenna calibration uncertainty, in dB = 2 dB

B = Spectrum Analyzer uncertainty, in dB = 1 dB

C = Site uncertainty, in dB = 4 dB

n = number of factors in uncertainty calculation = 3

Thus, Total Uncertainty = $0.5\ (2^2 + 1^2 + 4^2)^{1/2} = \pm 2.3$ dB.

3 Test Equipment

Table 2 shows a list of the test equipment used for measurements along with the calibration information.

Table 2: Test Equipment List

Equipment	Serial Number	Calibration Due
Sunol JB1 Biconilog Antenna	A090501	10/03/03
Hewlett-Packard Spectrum Analyzer: HP 8568B (Site 1)	2928A04750	7/02/04
Hewlett-Packard Quasi-Peak Adapter: HP 85650A (Site 1)	3303A01786	7/08/04
Hewlett-Packard RF Preselector: HP 85685A (Site 1)	3146A01296	7/02/04
Hewlett-Packard Spectrum Analyzer: HP 8593A	3009A00739	6/25/04
Hewlett-Packard Spectrum Analyzer: HP8564E	3643A00657	5/22/04
Hewlett-Packard Pre-Amplifier: HP 8449B	3008A00729	2/11/04

4 Test Results

4.1 Duty Cycle Correction

Measurements may be adjusted where pulsed RF is utilized to find the average level associated with a quantity. This calculation is applied to limits for pulsed licensed and unlicensed devices.

On time = $N_1L_1 + N_2L_2 + \ldots + N_{N-1}L_{N-1} + N_NL_N$, where N_1 is number of type 1 pulses, L_1 is length of type 1 pulses, etc.

- For Licensed Transmitters basic formula can be stated as 20log[Duty Cycle]
- For Unlicensed Intentional Radiators under 47CFR Part 15, all duty cycle measurements compared to a 100 millisecond period
- i.e. duty cycle = on time/100 milliseconds or period, whichever is less
- Restating the basic formula:
    - Duty cycle = $(N_1L_1 + N_2L_2 + \ldots + N_{N-1}L_{N-1} + N_NL_N)/100$ or T, whichever is less

Where T is the period of the pulse train.

The following Figures show the plots of the modulated carrier. The spectrum analyzer was set to Zero Span and the video triggered to collect the pulse train of the modulation. Calculations of the duty cycle correction factor were obtained from time data provided by the plots.

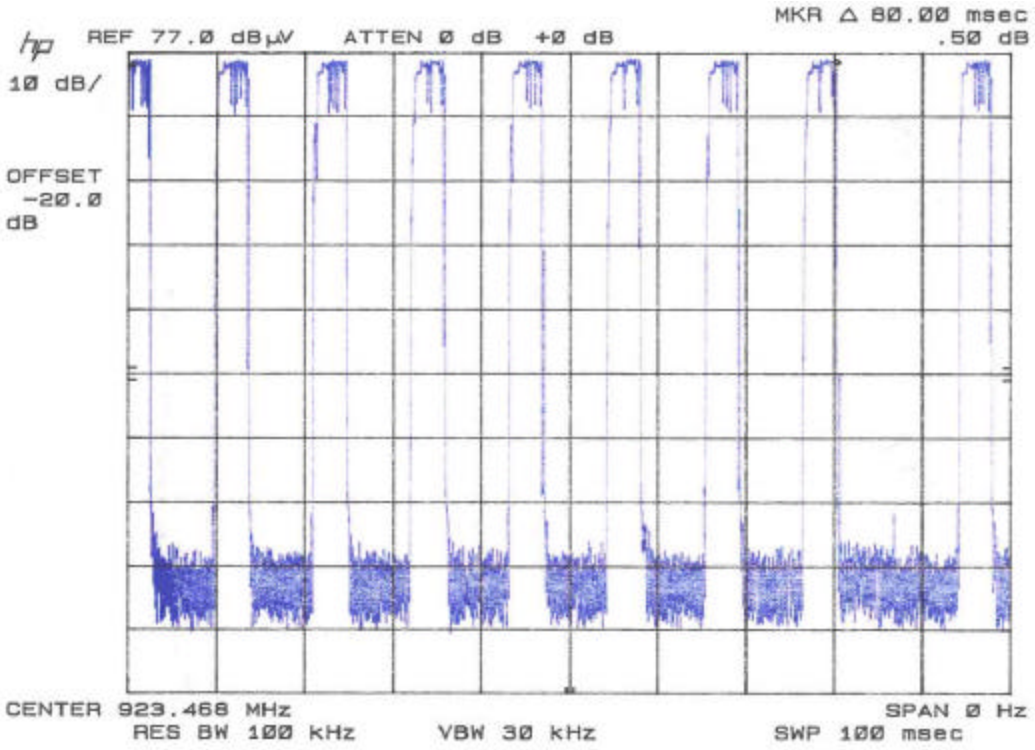

Figure 1. Duty Cycle Plot – Worst Case 100ms

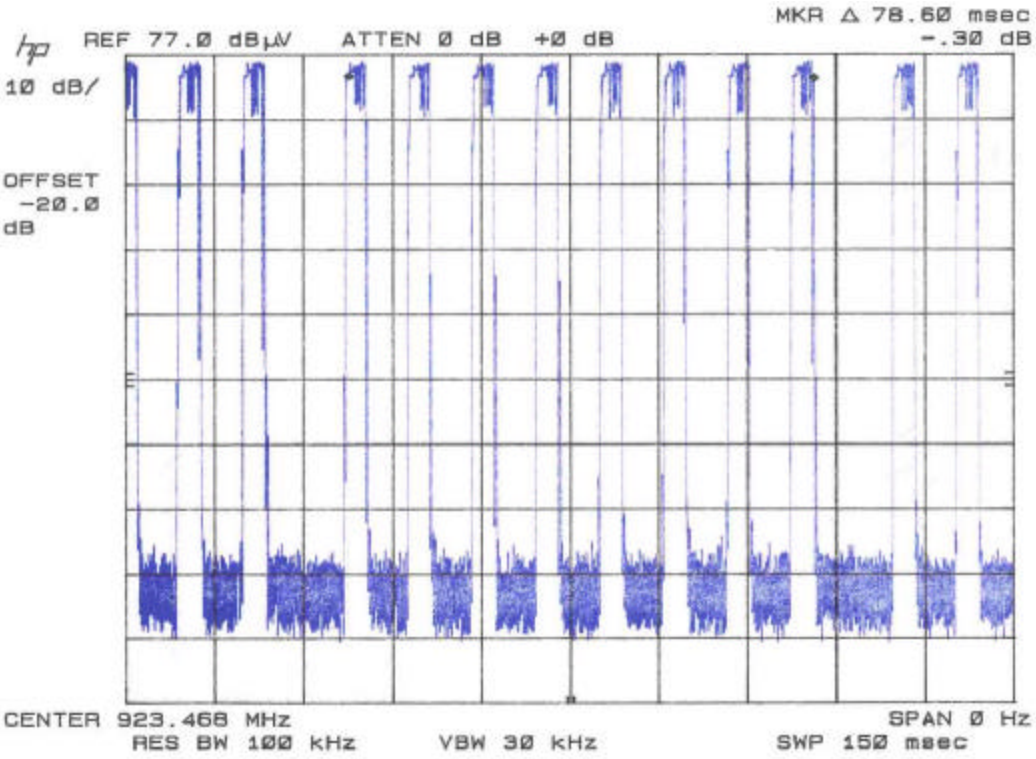

Figure 2. Duty Cycle Plot – Pulse Train

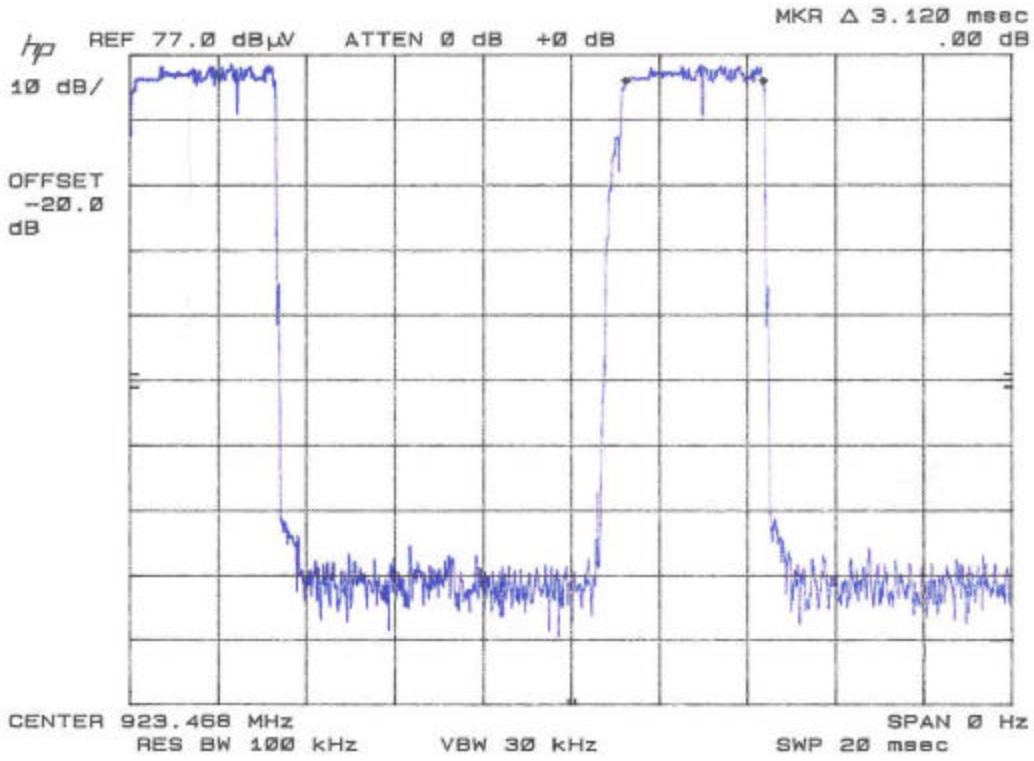

Figure 3. Duty Cycle Plot – Pulse Width

From the data in Figure 1 through Figure 3, the following calculations are made.

On Time Per 100ms (worst case):

9 x 3.12ms = 28.08ms

Duty cycle calculation:

28.08ms/100ms = 28.08% on time = -11dB duty cycle correction

4.2 Occupied Bandwidth: (FCC Part §2.1049)

Occupied bandwidth was performed by coupling the output of the EUT to the input of a spectrum analyzer.

At full modulation, the occupied bandwidth was measured for all 4 channels as shown in Figures 4 through 7:

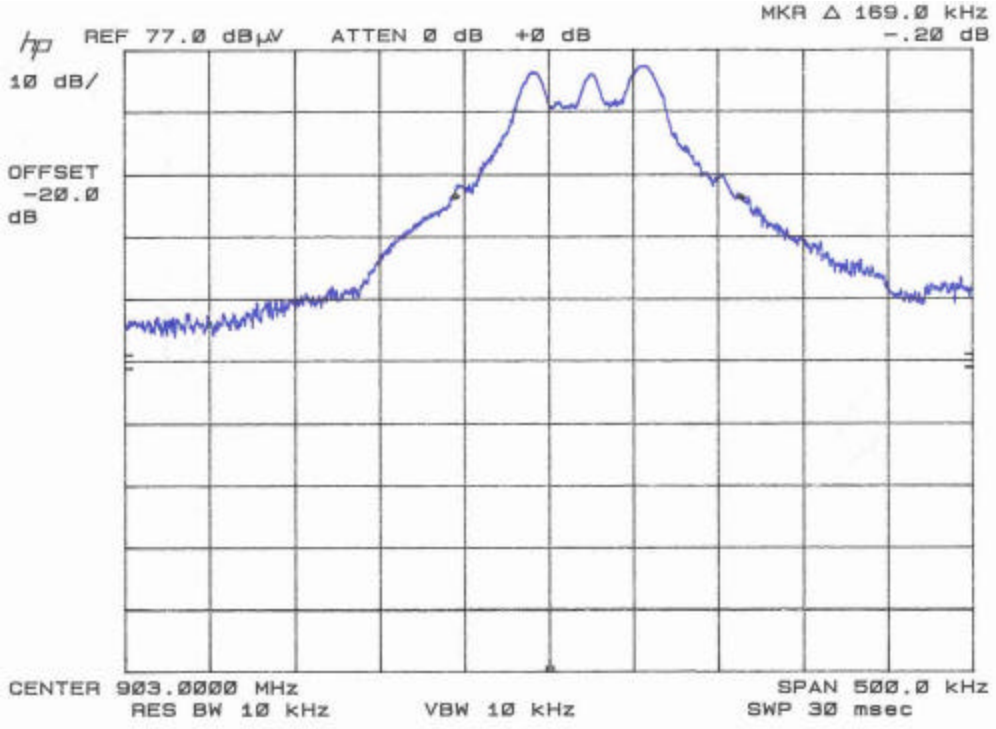

Figure 4. Occupied Bandwidth, Channel 1

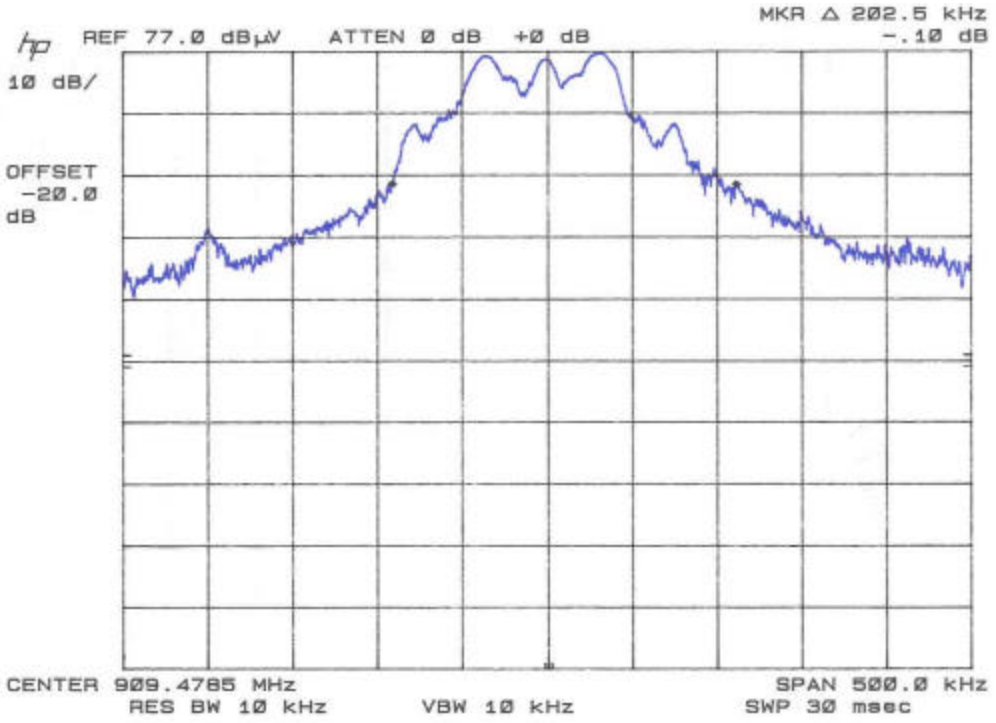

Figure 5. Occupied Bandwidth, Channel 2

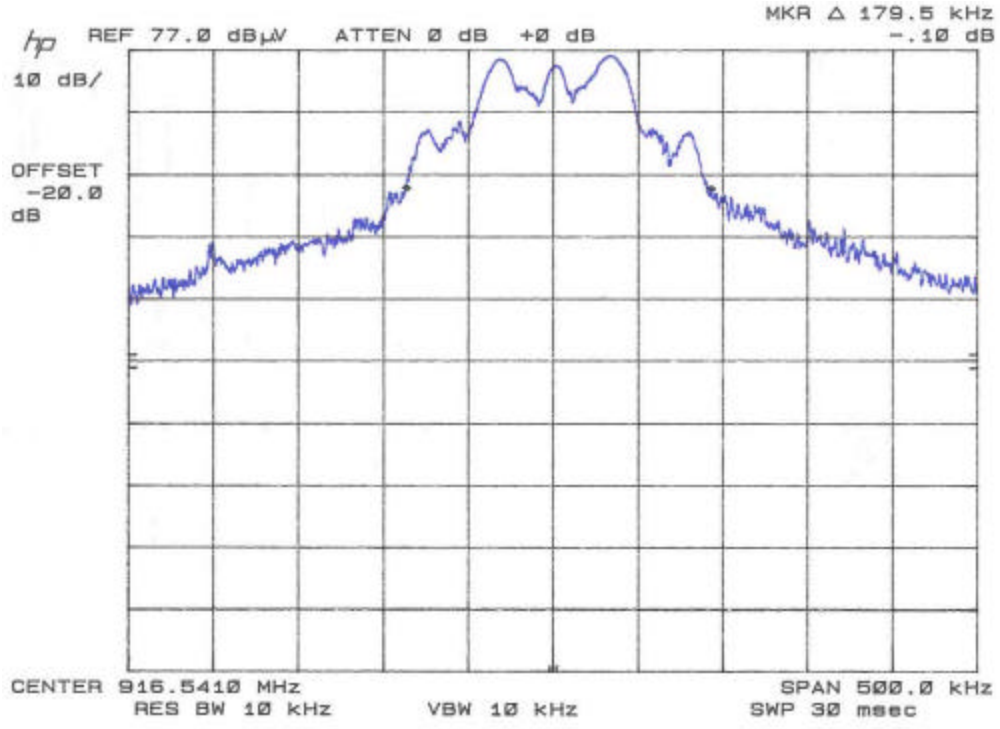

Figure 6. Occupied Bandwidth, Channel 3

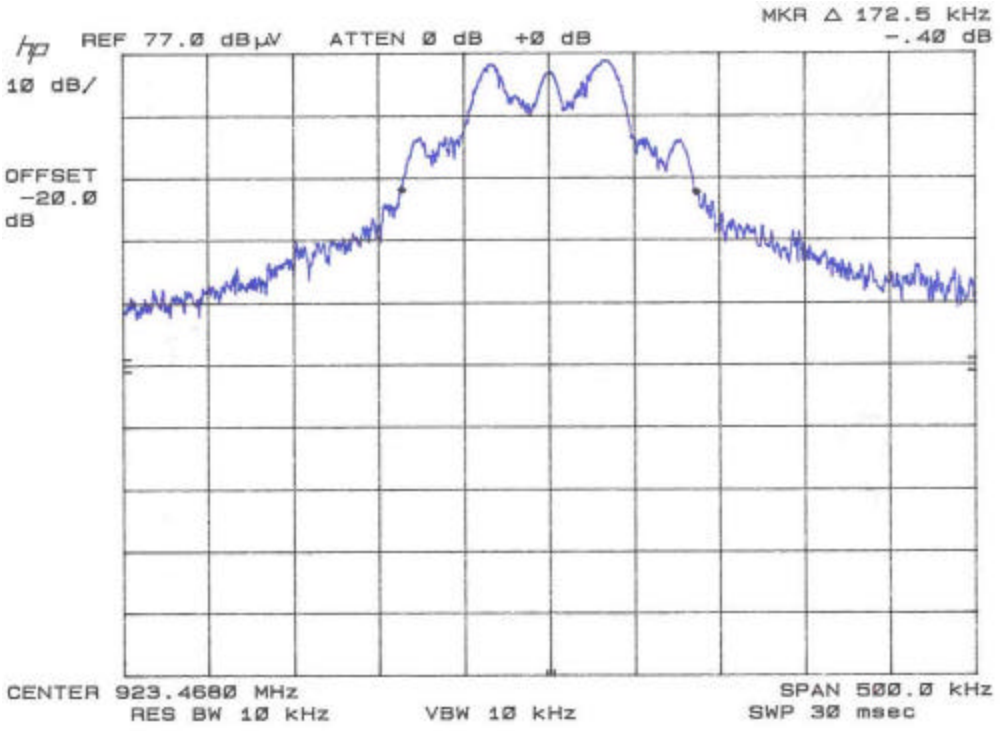

Figure 7. Occupied Bandwidth, Channel 4

Table 3 provides a summary of the Occupied Bandwidth Results.

Table 3. Occupied Bandwidth Results

Frequency	Bandwidth
Channel 1 903.5MHz	169kHz
Channel 2 909.5MHz	202.5kHz
Channel 3 916.5MHz	179.5kHz
Channel 4 923.5MHz	172.5kHz

4.3 Radiated Emissions: (FCC Part §2.1053)

The EUT must comply with the radiated emission limits of 15.249(a). The limits are as shown in the following table.

Table 4. Radiated Emissions Limits

Fundamental Frequency	**Field Strength of Fundamental (µV/m)**	**Field Strength of Harmonics (µV/m)**
902 – 928 MHz	50,000	500
2400 – 2483.5 MHz	50,000	500
5725 – 5875 MHz	50,000	500
24.00 – 24.25 MHz	250,000	2500

4.3.1 Test Procedure

The EUT was placed on motorized turntable for radiated testing on a 3-meter open field test site. The emissions from the EUT were measured continuously at every azimuth by rotating the turntable. Receiving antennas were mounted on an antenna mast to determine the height of maximum emissions. The height of the antenna was varied between 1 and 4 meters. The peripherals were placed on the table in accordance with ANSI C63.4-2001. Cables were varied in position to produce maximum emissions. Both the horizontal and vertical field components were measured.

The emissions were measured using the following resolution bandwidths:

Frequency Range	Resolution Bandwidth	Video Bandwidth
30MHz-1000 MHz	100kHz	>100kHz
>1000 MHz	1 MHz	1MHz (peak)

Emissions were measured to the 10th harmonic of the transmit frequency. The controller was tested in three orthogonal planes. Worst case emission levels are reported.

The following is a sample calculation used in the data tables for calculating the final field strength of spurious emissions and comparing these levels to the specified limits.

Sample Calculation:

Spectrum Analyzer Voltage (SA Level):	V dBµV
Antenna Factor (Ant Corr):	AFdB/m
Cable Loss Correction (Cable Corr):	CCdB
Duty Cycle Correction (Average)	DCCdB
Amplifier Gain:	GdB
Electric Field (Corr Level):	EdBµV/m = VdBµV + AFdB/m + CCdB + DCCdB - GdB

Table 5. Radiated Emissions Test Data

CLIENT:	Pacific Rim Technology	DATE:	8/11/03
TESTER:	James Ritter	JOB #:	7670
EUT Information:		**Test Requirements:**	
EUT:	3D2 Controller Pad	TEST STANDARD:	FCC Part 15.249
CONFIGURATION:	w/ Game cube and RCA TV	DISTANCE:	3m
S/N: 1.0			

Fundamental Measurements:

Freq. (MHz)	Polarity H/V	Azimuth Degree	Ant. Hght (m)	SA Level (QP) dBµV	Ant. Corr. dB/m	Cable Corr. dB	Corr. Level dBµV/m	Corr. Level µV/m	Limit µV/m	Margin dB	Notes
Ch. 1											
903.60	V	190.0	104.0	58.1	22.2	6.9	87.1	22740.5	50000.0	-6.8	X
903.60	H	180.0	1.0	57.4	22.2	6.9	86.4	20979.8	50000.0	-7.5	Z
Ch. 3											
916.54	H	245.0	1.6	59.8	22.7	6.8	89.2	28953.0	50000.0	-4.7	Y
916.54	V	270.0	1.1	57.7	22.7	6.8	87.1	22734.9	50000.0	-6.8	Z
Ch. 4											
923.57	V	180.0	1.3	58.6	22.8	6.8	88.3	25888.3	50000.0	-5.7	Z
923.57	H	170.0	2.0	57.7	22.8	6.8	87.4	23340.2	50000.0	-6.6	X

Bandedge Measurements:

Freq. (MHz)	Polarity H/V	Azimuth Degree	Ant. Hght (m)	SA Level (QP) dBµV	Ant. Corr. dB/m	Cable Corr. dB	Corr. Level dBµV/m	Corr. Level µV/m	Limit µV/m	Margin dB	Notes
(Ch. 1 @ 903.6MHz)											
902.00	H	180.0	1.4	6.9	22.1	7.0	36.0	63.1	200.0	-10.0	X
902.00	V	180.0	1.4	9.4	22.1	7.0	38.5	84.2	200.0	-7.5	Z
(Ch. 4 @ 923.5MHz)											
928.00	V	45.0	1.5	0.2	22.8	6.9	29.9	31.2	200.0	-16.1	Y
928.00	H	170.0	2.0	1.0	22.8	6.9	30.7	34.2	200.0	-15.3	Z

Average Measurements, Channel 1:

Freq (MHz)	Pol. H/V	Azimuth Degree	Ant. Hght (m)	SA Level (QP) dBµV	Duty Cycle Corr. dB	Ant. Corr. dB/m	Cable Corr. dB	Amp Gain dB	Corr. Level dBµV/m	Corr. Level µV/m	Limit µV/m	Margin dB	Notes
Ch. 1 – 903.6MHz													
1807.20	V	225.0	1.0	65.8	11.0	28.6	2.4	35.6	50.2	324.0	500.0	-3.8	X
1807.20	H	145.0	1.0	64.0	11.0	28.6	2.4	35.6	48.4	262.5	500.0	-5.6	Y
2710.80	H	225.0	1.0	57.8	11.0	30.3	3.2	35.6	44.7	171.1	500.0	-9.3	Y
2710.80	V	225.0	1.0	55.2	11.0	30.3	3.2	35.6	42.0	126.4	500.0	-11.9	X
3614.40	H	125.0	1.0	57.1	11.0	31.0	3.7	35.5	45.3	184.7	500.0	-8.7	Y
3614.40	V	220.0	1.0	54.3	11.0	31.0	3.7	35.5	42.5	133.8	500.0	-11.5	Z
4518.00	V	160.0	1.0	49.7	11.0	32.6	4.0	35.7	39.5	94.1	500.0	-14.5	Z
4518.00	H	180.0	1.0	49.5	11.0	32.6	4.0	35.7	39.3	92.2	500.0	-14.7	Y
5421.60	V	0.0	1.0	44.0	11.0	34.4	4.2	35.8	35.8	61.5	500.0	-18.2	AMB
5421.60	H	0.0	1.0	43.8	11.0	34.4	4.2	35.8	35.6	60.1	500.0	-18.4	AMB
6325.20	V	0.0	1.0	44.3	11.0	36.0	4.6	35.6	38.3	82.3	500.0	-15.7	AMB
6325.20	H	0.0	1.0	44.1	11.0	36.0	4.6	35.6	38.1	80.4	500.0	-15.9	AMB
7228.80	V	0.0	1.0	44.5	11.0	37.6	5.0	35.9	40.2	102.7	500.0	-13.7	AMB
7228.80	H	0.0	1.0	42.8	11.0	37.6	5.0	35.9	38.5	84.5	500.0	-15.4	AMB
8132.40	V	0.0	1.0	46.2	11.0	38.4	5.3	36.1	42.7	137.0	500.0	-11.2	AMB
8132.40	H	0.0	1.0	44.1	11.0	38.4	5.3	36.1	40.6	107.6	500.0	-13.3	AMB
9036.00	V	0.0	1.0	46.1	11.0	39.0	5.5	36.2	43.5	148.8	500.0	-10.5	AMB
9036.00	H	0.0	1.0	45.2	11.0	39.0	5.5	36.2	42.6	134.2	500.0	-11.4	AMB

Average Measurements, Channel 3:

Freq (MHz)	Pol. H/V	Azimuth Degree	Ant. Hght (m)	SA Level (QP) dBµV	Duty Cycle Corr. dB	Ant. Corr. dB/m	Cable Corr. dB	Amp Gain dB	Corr. Level dBµV/m	Corr. Level µV/m	Limit µV/m	Margin dB	Notes
Ch. 3 – 916.5MHz													
1834.00	V	245.0	1.0	65.5	11.0	28.7	2.4	35.6	50.0	316.5	500.0	-4.0	X
1834.00	H	190.0	1.0	60.7	11.0	28.7	2.4	35.6	45.2	182.1	500.0	-8.8	X
2751.00	V	180.0	1.0	59.2	11.0	30.4	3.2	35.7	46.1	201.1	500.0	-7.9	Y
2751.00	H	180.0	1.0	58.2	11.0	30.4	3.2	35.7	45.1	180.1	500.0	-8.9	Y
3668.00	H	180.0	1.0	55.0	11.0	31.0	3.7	35.5	43.3	146.0	500.0	-10.7	X
3668.00	V	190.0	1.0	54.1	11.0	31.0	3.7	35.5	42.4	131.7	500.0	-11.6	Z
4585.00	H	180.0	1.0	52.2	11.0	32.7	4.0	35.8	42.1	127.9	500.0	-11.8	Z
4585.00	V	200.0	1.0	50.8	11.0	32.7	4.0	35.8	40.8	109.2	500.0	-13.2	Y
5502.00	H	0.0	1.0	44.3	11.0	34.5	4.2	35.7	36.3	65.3	500.0	-17.7	AMB
5502.00	V	0.0	1.0	43.1	11.0	34.5	4.2	35.7	35.1	56.8	500.0	-18.9	AMB
6419.00	V	0.0	1.0	45.0	11.0	36.2	4.7	35.6	39.2	91.4	500.0	-14.8	AMB
6419.00	H	0.0	1.0	43.5	11.0	36.2	4.7	35.6	37.7	76.9	500.0	-16.3	AMB
7336.00	H	0.0	1.0	45.3	11.0	37.7	5.0	35.9	41.1	113.9	500.0	-12.8	AMB
7336.00	V	0.0	1.0	45.0	11.0	37.7	5.0	35.9	40.8	110.1	500.0	-13.1	AMB
8253.00	H	0.0	1.0	45.5	11.0	38.5	5.3	36.1	42.1	128.1	500.0	-11.8	AMB
8253.00	V	0.0	1.0	45.3	11.0	38.5	5.3	36.1	41.9	125.2	500.0	-12.0	AMB
9170.00	H	0.0	1.0	46.5	11.0	39.2	5.6	36.2	44.0	158.7	500.0	-10.0	AMB
9170.00	V	0.0	1.0	46.4	11.0	39.2	5.6	36.2	43.9	156.9	500.0	-10.1	AMB

Average Measurements, Channel 4:

Freq (MHz)	Pol. H/V	Azimuth Degree	Ant. Hght (m)	SA Level (QP) dBµV	Duty Cycle Corr. dB	Ant. Corr. dB/m	Cable Corr. dB	Amp Gain dB	Corr. Level dBµV/m	Corr. Level µV/m	Limit µV/m	Margin dB	Notes
Ch. 4 – 923.5MHz													
1848.00	V	245.0	1.0	66.2	11.0	28.7	2.4	35.6	50.7	344.6	500.0	-3.2	X
1848.00	H	170.0	1.0	60.5	11.0	28.7	2.4	35.6	45.1	179.4	500.0	-8.9	Y
2772.00	V	190.0	1.0	57.3	11.0	30.4	3.2	35.7	44.3	163.6	500.0	-9.7	Y
2772.00	H	170.0	1.0	55.5	11.0	30.4	3.2	35.7	42.4	132.6	500.0	-11.5	Y
3696.00	H	190.0	1.0	55.0	11.0	31.1	3.7	35.5	43.3	146.6	500.0	-10.7	X
3696.00	V	260.0	1.0	53.7	11.0	31.1	3.7	35.5	42.0	125.8	500.0	-12.0	X
4620.00	V	190.0	1.0	51.8	11.0	32.8	4.0	35.8	41.8	123.6	500.0	-12.1	Z
4620.00	H	0.0	1.0	45.8	11.0	32.8	4.0	35.8	35.8	61.7	500.0	-18.2	Y
5544.00	H	0.0	1.0	45.0	11.0	34.5	4.3	35.7	37.1	71.6	500.0	-16.9	AMB
5544.00	V	0.0	1.0	43.5	11.0	34.5	4.3	35.7	35.6	60.3	500.0	-18.4	AMB
6468.00	H	0.0	1.0	44.7	11.0	36.3	4.7	35.6	39.0	89.2	500.0	-15.0	AMB
6468.00	V	0.0	1.0	44.1	11.0	36.3	4.7	35.6	38.4	83.5	500.0	-15.5	AMB
7392.00	V	0.0	1.0	45.1	11.0	37.8	5.1	35.9	41.0	112.0	500.0	-13.0	AMB
7392.00	H	0.0	1.0	43.8	11.0	37.8	5.1	35.9	39.7	96.8	500.0	-14.3	AMB
8316.00	H	0.0	1.0	45.2	11.0	38.5	5.3	36.1	41.9	124.1	500.0	-12.1	AMB
8316.00	V	0.0	1.0	45.1	11.0	38.5	5.3	36.1	41.8	123.1	500.0	-12.2	AMB
9240.00	H	0.0	1.0	45.1	11.0	39.3	5.6	36.3	42.7	136.3	500.0	-11.3	AMB
9240.00	V	0.0	1.0	44.0	11.0	39.3	5.6	36.3	41.6	120.1	500.0	-12.4	AMB

Peak Measurements, Channel 1:

Freq. (MHz)	Pol. H/V	Azimuth Degree	Ant. Hght m	SA Level (Peak) dBµV	Ant. Corr. dB/m	Cable Corr. dB	Amp. Gain dB	Corr. Level dBµV/m	Corr. Level µV/m	Limit µV/m	Margin dB	Notes
Ch1 -903.6 MHz												
1807.20	V	225.0	1.0	65.8	28.6	2.4	35.6	61.2	1149.7	50000.0	-32.8	X
1807.20	H	145.0	1.0	64.0	28.6	2.4	35.6	59.4	931.3	50000.0	-34.6	Y
2710.80	H	225.0	1.0	57.8	30.3	3.2	35.6	55.7	607.1	50000.0	-38.3	Y
2710.80	V	225.0	1.0	55.2	30.3	3.2	35.6	53.0	448.5	50000.0	-40.9	X
3614.40	H	125.0	1.0	57.1	31.0	3.7	35.5	56.3	655.2	50000.0	-37.7	Y
3614.40	V	220.0	1.0	54.3	31.0	3.7	35.5	53.5	474.7	50000.0	-40.5	Z
4518.00	V	160.0	1.0	49.7	32.6	4.0	35.7	50.5	333.7	50000.0	-43.5	Z
4518.00	H	180.0	1.0	49.5	32.6	4.0	35.7	50.3	327.3	50000.0	-43.7	Y
5421.60	V	0.0	1.0	44.0	34.4	4.2	35.8	46.8	218.4	50000.0	-47.2	Amb
5421.60	H	0.0	1.0	43.8	34.4	4.2	35.8	46.6	213.4	50000.0	-47.4	Amb
6325.20	V	0.0	1.0	44.3	36.0	4.6	35.6	49.3	291.9	50000.0	-44.7	Amb
6325.20	H	0.0	1.0	44.1	36.0	4.6	35.6	49.1	285.2	50000.0	-44.9	Amb
7228.80	V	0.0	1.0	44.5	37.6	5.0	35.9	51.2	364.5	50000.0	-42.7	Amb
7228.80	H	0.0	1.0	42.8	37.6	5.0	35.9	49.5	299.7	50000.0	-44.4	Amb
8132.40	V	0.0	1.0	46.2	38.4	5.3	36.1	53.7	486.2	50000.0	-40.2	Amb
8132.40	H	0.0	1.0	44.1	38.4	5.3	36.1	51.6	381.8	50000.0	-42.3	Amb
9036.00	V	0.0	1.0	46.1	39.0	5.5	36.2	54.5	528.1	50000.0	-39.5	Amb
9036.00	H	0.0	1.0	45.2	39.0	5.5	36.2	53.6	476.1	50000.0	-40.4	Amb

Peak Measurements, Channel 3:

Freq. (MHz)	Pol. H/V	Azimuth Degree	Ant. Hght m	SA Level (Peak) dBµV	Ant. Corr. dB/m	Cable Corr. dB	Amp. Gain dB	Corr. Level dBµV/m	Corr. Level µV/m	Limit µV/m	Margin dB	Notes
Ch3 – 916.5MHz												
1834.00	V	245.0	1.0	65.5	28.7	2.4	35.6	61.0	1122.9	50000.0	-33.0	X
1834.00	H	190.0	1.0	60.7	28.7	2.4	35.6	56.2	646.2	50000.0	-37.8	X
2751.00	V	180.0	1.0	59.2	30.4	3.2	35.7	57.1	713.6	50000.0	-36.9	Y
2751.00	H	180.0	1.0	58.2	30.4	3.2	35.7	56.1	639.0	50000.0	-37.9	Y
3668.00	H	180.0	1.0	55.0	31.0	3.7	35.5	54.3	518.2	50000.0	-39.7	X
3668.00	V	190.0	1.0	54.1	31.0	3.7	35.5	53.4	467.2	50000.0	-40.6	Z
4585.00	H	180.0	1.0	52.2	32.7	4.0	35.8	53.1	453.8	50000.0	-40.8	Z
4585.00	V	200.0	1.0	50.8	32.7	4.0	35.8	51.8	387.6	50000.0	-42.2	Y
5502.00	H	0.0	1.0	44.3	34.5	4.2	35.7	47.3	231.5	50000.0	-46.7	Amb
5502.00	V	0.0	1.0	43.1	34.5	4.2	35.7	46.1	201.7	50000.0	-47.9	Amb
6419.00	V	0.0	1.0	45.0	36.2	4.7	35.6	50.2	324.4	50000.0	-43.8	Amb
6419.00	H	0.0	1.0	43.5	36.2	4.7	35.6	48.7	272.9	50000.0	-45.3	Amb
7336.00	H	0.0	1.0	45.3	37.7	5.0	35.9	52.1	404.2	50000.0	-41.8	Amb
7336.00	V	0.0	1.0	45.0	37.7	5.0	35.9	51.8	390.5	50000.0	-42.1	Amb
8253.00	H	0.0	1.0	45.5	38.5	5.3	36.1	53.1	454.4	50000.0	-40.8	Amb
8253.00	V	0.0	1.0	45.3	38.5	5.3	36.1	52.9	444.1	50000.0	-41.0	Amb
9170.00	H	0.0	1.0	46.5	39.2	5.6	36.2	55.0	563.0	50000.0	-39.0	Amb
9170.00	V	0.0	1.0	46.4	39.2	5.6	36.2	54.9	556.6	50000.0	-39.1	Amb

Peak Measurements, Channel 4:

Freq. (MHz)	Pol. H/V	Azimuth Degree	Ant. Hght m	SA Level (Peak) dBµV	Ant. Corr. dB/m	Cable Corr. dB	Amp. Gain dB	Corr. Level dBµV/m	Corr. Level µV/m	Limit µV/m	Margin dB	Notes
Ch4 – 923.5MHz												
1848.00	V	245.0	1.0	66.2	28.7	2.4	35.6	61.7	1222.8	50000.0	-32.2	X
1848.00	H	170.0	1.0	60.5	28.7	2.4	35.6	56.1	636.6	50000.0	-37.9	Y
2772.00	V	190.0	1.0	57.3	30.4	3.2	35.7	55.3	580.6	50000.0	-38.7	Y
2772.00	H	170.0	1.0	55.5	30.4	3.2	35.7	53.4	470.3	50000.0	-40.5	Y
3696.00	H	190.0	1.0	55.0	31.1	3.7	35.5	54.3	520.0	50000.0	-39.7	X
3696.00	V	260.0	1.0	53.7	31.1	3.7	35.5	53.0	446.2	50000.0	-41.0	X
4620.00	V	190.0	1.0	51.8	32.8	4.0	35.8	52.8	438.5	50000.0	-41.1	Z
4620.00	H	0.0	1.0	45.8	32.8	4.0	35.8	46.8	219.0	50000.0	-47.2	AMB
5544.00	H	0.0	1.0	45.0	34.5	4.3	35.7	48.1	254.1	50000.0	-45.9	AMB
5544.00	V	0.0	1.0	43.5	34.5	4.3	35.7	46.6	213.8	50000.0	-47.4	AMB
6468.00	H	0.0	1.0	44.7	36.3	4.7	35.6	50.0	316.4	50000.0	-44.0	AMB
6468.00	V	0.0	1.0	44.1	36.3	4.7	35.6	49.4	296.3	50000.0	-44.5	AMB
7392.00	V	0.0	1.0	45.1	37.8	5.1	35.9	52.0	397.4	50000.0	-42.0	AMB
7392.00	H	0.0	1.0	43.8	37.8	5.1	35.9	50.7	343.3	50000.0	-43.3	AMB
8316.00	H	0.0	1.0	45.2	38.5	5.3	36.1	52.9	440.4	50000.0	-41.1	AMB
8316.00	V	0.0	1.0	45.1	38.5	5.3	36.1	52.8	436.9	50000.0	-41.2	AMB
9240.00	H	0.0	1.0	45.1	39.3	5.6	36.3	53.7	483.7	50000.0	-40.3	AMB
9240.00	V	0.0	1.0	44.0	39.3	5.6	36.3	52.6	426.1	50000.0	-41.4	AMB