

APPLICATION FOR CERTIFICATION
On Behalf of
Sonos, Inc
Zone Player (Red Rocks)
Model No. : ZP80
Contains TX module : FCC ID: SBVRM000

Prepared for : Sonos, Inc
223 E. De La Guerra St. Santa Barbara,
CA 93101, U.S.A.

Prepared by : Audix Corporation
Technical Division EMC Department
No. 53-11, Tin-Fu Tsun, Lin-Kou,
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TEST REPORT CERTIFICATION

Applicant : Sonos, Inc
Manufacturer : Inventec Electronics (M) Sdn Bhd.
EUT Description : Zone Player (Red Rocks)
Contains TX module : FCC ID: SBVRM000
(A) MODEL NO. : ZP80
(B) SERIAL NO. : N/A
(C) BRAND : SONOS
(D) POWER SUPPLY : ~100-240Vac, 50/60Hz
(E) TEST VOLTAGE : AC 120V/60Hz

Measurement Procedure Used:

FCC RULES AND REGULATIONS PART 15 SUBPART C, FEBRUARY 2006
AND ANSI C63.4/2003

(FCC CFR 47 Part 15C, §15.205, §15.209 and §15.247)

The device described above was tested by AUDIX CORPORATION to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15 subpart C limits.

The measurement results are contained in this test report and AUDIX CORPORATION is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC official limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of AUDIX CORPORATION.

Date of Test: Jun. 28, 2006

Prepared by: Tina Huang Jul. 08, 2006
(Tina Huang/Assistant)

Test Engineer: Henning Chang Jul. 08, 2006
(Henning Chang/Supervisor)

Approved & Authorized Signer: Leon Liu Jul. 8 2006
(Leon Liu/Senior Manager)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	:	Zone Player (Red Rocks) This device is a digital music system using a wired or wireless connection.
Model Number	:	ZP80
Contains TX module	:	FCC ID: SBVRM000
Brand Name	:	SONOS
Applicant	:	Sonos, Inc 223 E.De La Gureera St. Santa Barbara, CA 93101, U.S.A.
Manufacturer	:	Inventec Electronics (M) Sdn. Bhd. Plot 102, Bayan Lepas Industrial Estate, 11900 Bayan Lepas, Penang, Malaysia.
Wireless LAN Card	:	Cameo Communications Inc., M/N: WLG1304, IEEE 802.11g WLAN mini-PCI Adapter
Interfaces of EUT	:	• Digital Audio Out (RCA x 1) • Analog Audio Out (L/R, RCA x2) • Analog Audio In (L/R, RCA x2) • 10/100 Base-T Ethernet RJ45 x2 • AC In x1
AC Power Cord (2Pin)	:	Non-Shielded, Detachable, 2.0m
Date of Receipt of Sample	:	Jun. 28, 2006
Date of Test	:	Jun. 28, 2006

Remark:

The FCC reports to refer to the WiFi card as Sonos WiFi card FCC ID SBVRM000.

1.2. Tested Supporting System Details

1.2.1. PARTNER NOTEBOOK PC

Model Number	:	2378
Serial Number	:	N/A
FCC ID	:	By DoC
Manufacturer	:	IBM
Power Adapter	:	IBM, M/N 02K6808
		DC Cord: Non-Shielded, Undetachable, 1.0m
		AC Cord: Non-Shielded, Detachable, 1.8m
RJ45 LAN Cable *1EA	:	Non-Shielded, Detachable, 20m

1.2.2. PARTNER CONTROLLER

Model Number	:	CR100
Serial Number	:	N/A
FCC ID	:	By DoC
Manufacturer	:	Inventec Electronics (M) Sdn. Bhd.
I.T.E. Power Supply	:	UNIFIUE, M/N UIA324-06
		S/N 410-0215062, BSMI ID. D53003
		I/O: AC 100-240V, 50/60Hz, 0.6A
		O/P: DC 6V, 3.8A
		DC Cord: Shielded, Undetachable, 1.85m
		Bonded a ferrite core
AC Power Cord	:	Non-Shielded, Detachable, 2.0m

1.2.3. AUDIO INPUT/OUTPUT LOAD

Model Number	:	N/A
Serial Number	:	N/A
Manufacturer	:	Sonos
Audio Cable-In *1EA	:	Non-Shielded, Detachable, 1.8m
Audio Cable-Out *2EA	:	Non-Shielded, Detachable, 1.8m

1.2.4. ETHERNET TERMINATOR (100 OHM)

Model Number	:	N/A
Serial Number	:	N/A
Manufacturer	:	Sonos
RJ45 LAN Cable *1EA	:	Non-Shielded, Detachable, 1.8m

1.3. Description of Test Facility

Name of Firm : **Audix Corporation**
Technical Division EMC Department
 No. 53-11, Tin-Fu Tsun, Lin-Kou Hsiang,
 Taipei County 24443, Taiwan, R.O.C.

Test Location & Facility (AC) : **Semi-Anechoic Chamber**
 No. 53-11, Tin-Fu Tsun, Lin-Kou Hsiang,
 Taipei County 24443, Taiwan, R.O.C.

May 16, 2006 File on
 Federal Communication Commission
 Registration Number: 90993

NVLAP Lab. Code : 200077-0
 (NVLAP is a NATA accredited body under Mutual Recognition Agreement)

1.4. Measurement Uncertainty

Test Item	Frequency Range	Uncertainty (dB)
Radiation Test (Distance: 3m)	30MHz~300MHz	±2.91dB
	300MHz~1000MHz	±2.94dB
	Above 1GHz	± 5.02dB

Remark : Uncertainty = $k_{uc}(y)$

2. RADIATED EMISSION MEASUREMENT

2.1. Test Equipment

The following test equipment was used during the radiated emission measurement:

2.1.1. For Frequency 30MHz~1000MHz (at Semi-Anechoic Chamber)

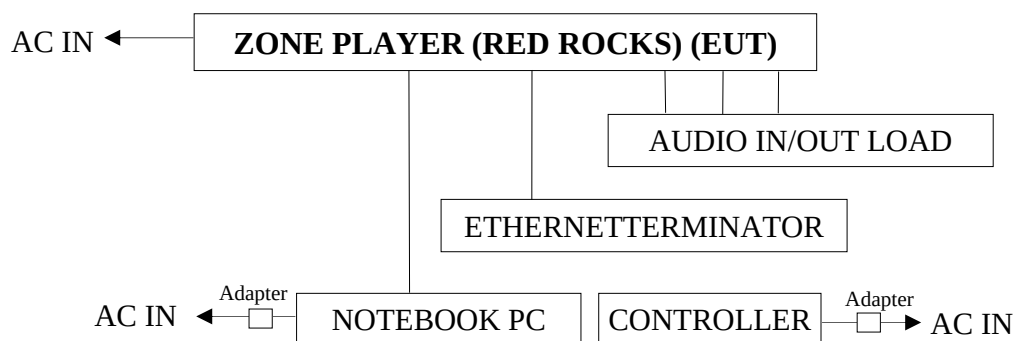
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	HP	8593EM	3826A00248	Sep. 26, 05'	Sep. 25, 06'
2.	Test Receiver	R & S	ESCS30	100265	Sep. 27, 05'	Sep. 25, 06'
3.	Pre-Amplifier	HP	8447D	2944A06305	Mar. 09, 06'	Mar. 08, 07'
4.	Biconical Antenna	CHASE	VBA6106A	1264	Nov. 11, 05'	Nov. 10, 06'
5.	Log Periodic Antenna	Schwarzbeck	UHALP91 08-A	0139	Nov. 19, 05'	Nov. 18, 06'

2.1.2. For Frequency Above 1GHz (at Semi-Anechoic Chamber)

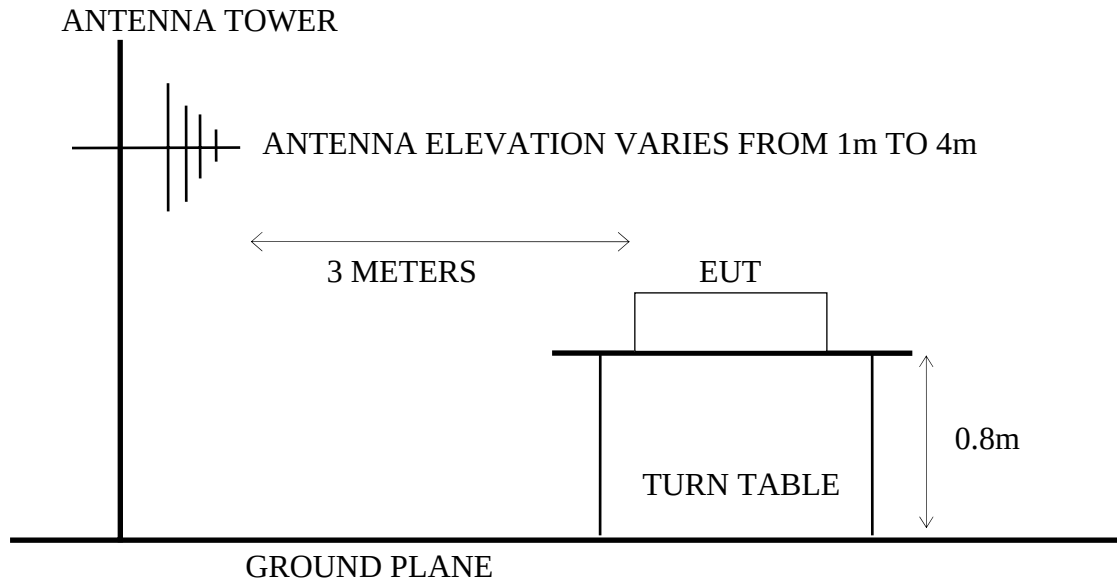
Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	HP	8593EM	3826A00248	Sep. 26, 05'	Sep. 25, 06'
2.	Pre-Amplifier	HP	8449B	3008A01284	Jul. 05, 05'	Jul. 04, 06'
3.	3.5G High Pass Filter	HP	84300- 80038	005	Jan. 11, 06'	Jan. 10, 07'
4.	Horn Antenna	EMCO	3115	9609-4927	Jul. 08, 05'	Jul. 07, 06'

2.2. Test Setup

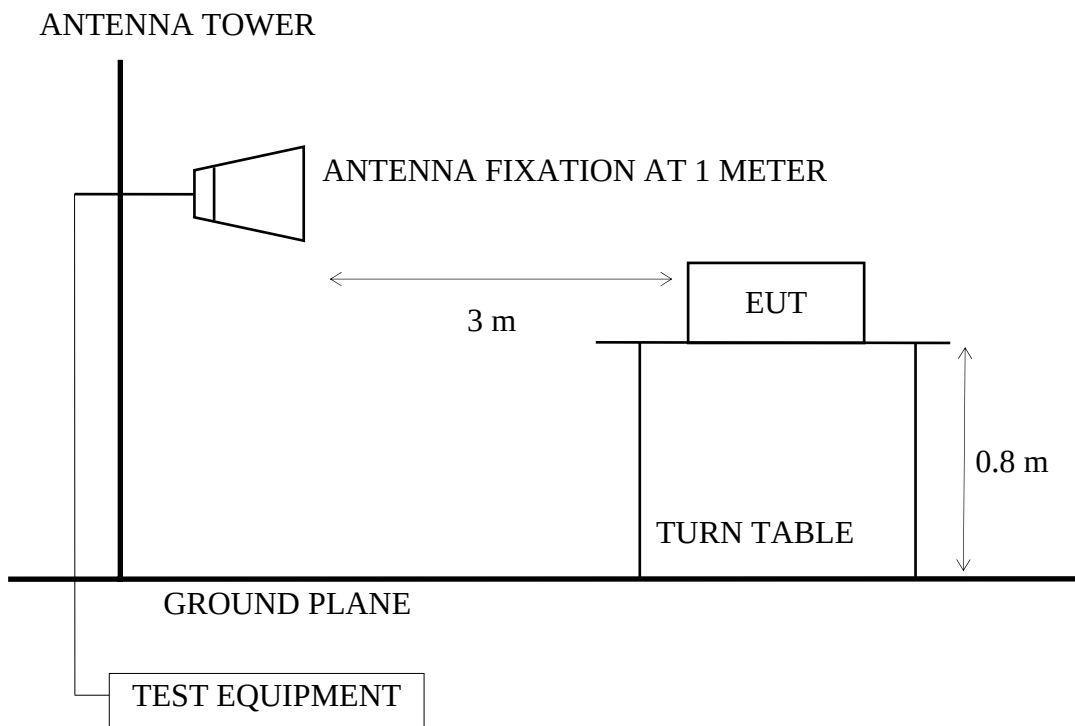
2.2.1. Block Diagram of connection between EUT and simulators



2.2.2. Semi-Anechoic Chamber (3m) Setup Diagram for 30-1000MHz



2.2.3. Semi-Anechoic Chamber (3m) Setup Diagram for above 1GHz



2.3. Radiated Emission Limits (§15.209)

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMITS	
		$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0
Above 1000	3	74.0 $\text{dB}\mu\text{V/m}$ (Peak) 54.0 $\text{dB}\mu\text{V/m}$ (Average)	

- Remark :
- (1) Emission level ($\text{dB}\mu\text{V/m}$) = $20 \log$ Emission level ($\mu\text{V/m}$)
 - (2) The tighter limit applies at the edge between two frequency bands.
 - (3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
 - (4) The limits in this table are based on CFR 47 Part 15.205(a)(b) and Part 15.209 (a).
 - (5) The over 1GHz limit, FCC limit is used based on CFR 47 Part 15.35 (b) and Part 15.205(b) & Part 15.209(e) and Part 15.207(c).

2.4. Operating Condition of EUT

- 2.4.1. Setup the EUT and simulator as shown on 2.2.
- 2.4.2. Turn on the power of all equipment.
- 2.4.3. Run the notebook PC (IBM ThinkPad) test software “dsp-write” to set EUT [Zone Player (Red Rocks)] transmitter channel through RJ45 Ethernet during the testing.

2.5. Test Procedure

The EUT and its simulators were placed on a turn table which was 0.8 meter above ground. The turn table rotated 360 degrees to determine the position of the maximum emission level. EUT was set 3 meters away from the receiving antenna which was mounted on a antenna tower. The antenna moved up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna such as calibrated biconical and log- periodical antenna or horn antenna were used as a receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to FCC ANSI C63.4-2003 regulation.

The bandwidth of the R&S Test Receiver ESCS30 was set at 120kHz. (For 30MHz to 1000MHz)

The resolution bandwidth and video bandwidth of spectrum analyzer is 1MHz for peak detection (PK) at frequency above 1GHz.

The resolution bandwidth of spectrum analyzer is 1MHz and the video bandwidth is 10Hz for average detection (AV) at frequency above 1GHz.

The frequency range from 30MHz to 25GHz (Up to 10th harmonics from fundamental frequency) was checked.

2.6. Radiated Emission Measurement Results

PASSED. All the emissions not reported below are too low against the official limits.

EUT : Zone Player (Red Rocks)

M/N : ZP80

Test Date : Jun. 28, 2006 Temperature : 25°C Humidity : 62%

For Frequency Range 30MHz~1000MHz:

The EUT with following test modes were performed during this section testing and all the test results are listed in section 2.6.1.

No.	Test Mode	Test Frequency	Reference Test Data No.	
			Horizontal	Vertical
1.	Transmitting	2412MHz (CH1)	# 9	# 10
2.		2437MHz (CH6)	# 10	# 9
3.		2462MHz (CH11)	# 9	# 10
4.	Receiving	---	# 10	# 9

* Above all final readings were measured with Quasi-Peak detector.

For Frequency above 1GHz:

The EUT with following test modes were performed during this section testing and all the test results are listed in section 2.6.2.

No.	Test Mode	Test Frequency
1.	Transmitting	2412MHz (CH1)
2.		2437MHz (CH6)
3.		2462MHz (CH11)
4.	Receiving	---

* Above all final readings were measured with Peak detector and Average detector.

For Restricted Bands:

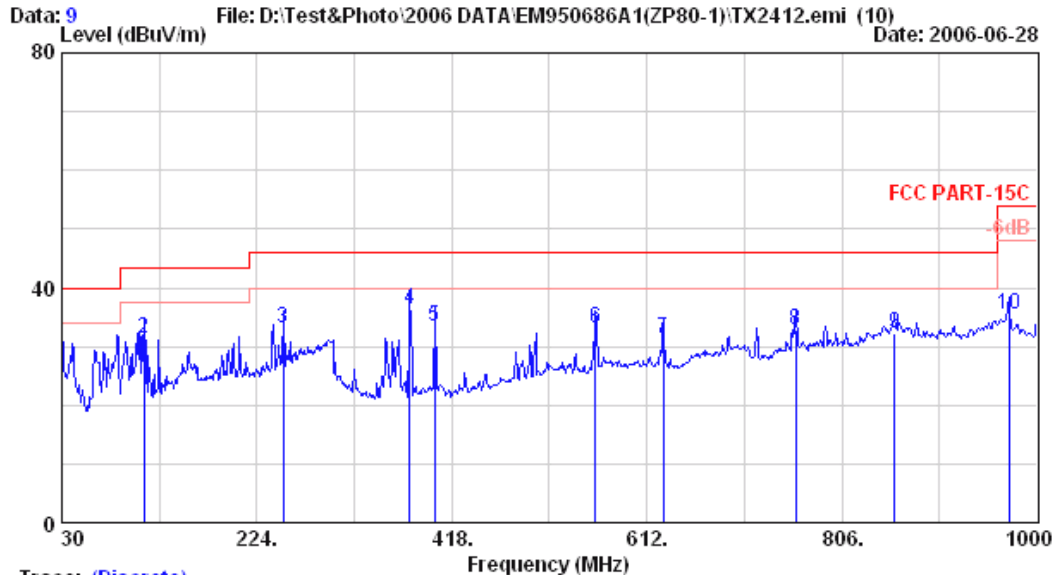
The EUT was tested in restricted bands and all the test results are listed in section 2.6.3. (The restricted bands defined in part 15.205(a))

No.	Test Mode	Reference Test Data No.				
		Frequency Range	Horizontal		Vertical	
1.	Transmitting	2412MHz (CH1)	Peak	# 1	Peak	# 2
			Average	# 4	Average	# 3
2.		2462MHz (CH11)	Peak	# 8	Peak	# 7
			Average	# 5	Average	# 6

2.6.1. 30MHz~ 1000MHz Frequency Range Measurement Result



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Email:ttemc@ttemc.com.tw



Trace: (Discrete)

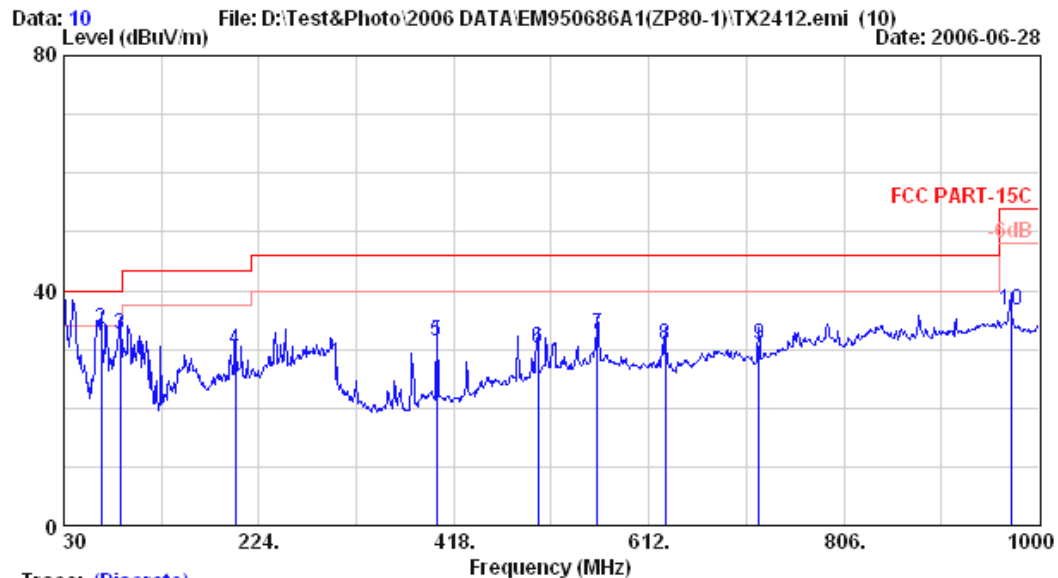
Site no. : A/C Chamber Data no. : 9
Dis. / Ant. : 3m VBA6106A/UHALP9108-A Ant. pol. : HORIZONTAL
Limit : FCC PART-15C
Env. / Ins. : 8593EM 25°C/62% Engineer : Alvin_Yang
EUT : Zone Player (Red Rocks) M/N: ZP80
Power Rating : 120Vac/60Hz
Test Mode : TX 2412MHz

	Freq.	Ant.	Cable		Emission			
	(MHz)	Factor	Loss	Reading	Level	Limits	Margin	Remark
		(dB/m)	(dB)	(dBμV)	(dBμV/m)	(dBμV/m)	(dB)	
1	30.000	24.86	1.10	2.50	28.46	40.00	11.54	
2	111.480	18.28	2.20	10.96	31.44	43.50	12.06	
3	250.190	23.83	3.50	5.80	33.13	46.00	12.87	
4	376.290	17.15	4.60	14.54	36.29	46.00	9.71	
5	400.540	17.66	4.80	11.08	33.54	46.00	12.46	
6	560.590	20.03	6.70	6.34	33.07	46.00	12.93	
7	628.490	21.06	6.37	4.01	31.45	46.00	14.55	
8	760.410	23.66	6.75	2.52	32.93	46.00	13.07	
9	858.380	25.98	7.20	-0.81	32.36	46.00	13.64	
10	971.870	26.79	7.70	0.92	35.41	54.00	18.59	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



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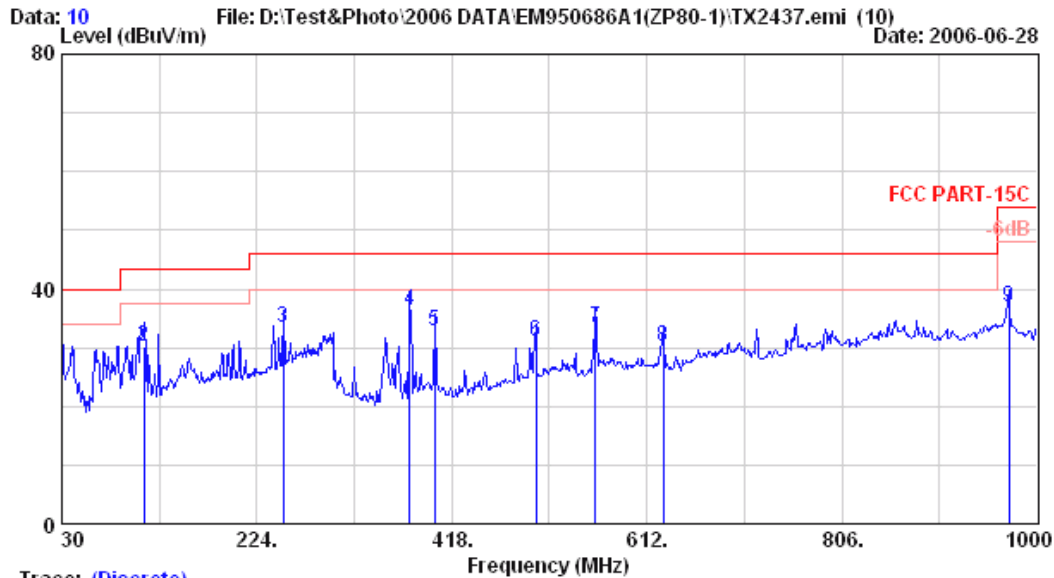
Site no. : A/C Chamber Data no. : 10
Dis. / Ant. : 3m VBA6106A/UHALP9108-A Ant. pol. : VERTICAL
Limit : FCC PART-15C
Env. / Ins. : 8593EM 25°C/62% Engineer : Alvin_Yang
EUT : Zone Player (Red Rocks) M/N: ZP80
Power Rating : 120Vac/60Hz
Test Mode : TX 2412MHz

	Freq.	Ant.	Cable		Emission			
	(MHz)	Factor	Loss	Reading	Level	Limits	Margin	Remark
		(dB/m)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)	
1	30.000	23.60	1.10	10.69	35.39	40.00	4.61	
2	66.860	12.52	1.70	19.26	33.47	40.00	6.53	
3	86.260	15.13	1.90	15.55	32.58	40.00	7.42	
4	200.720	22.94	3.00	4.07	30.01	43.50	13.49	
5	400.540	17.58	4.80	9.09	31.47	46.00	14.53	
6	501.420	19.91	6.52	3.86	30.29	46.00	15.71	
7	560.590	22.08	6.70	3.75	32.53	46.00	13.47	
8	628.490	21.11	6.37	3.18	30.67	46.00	15.33	
9	721.610	22.11	6.50	2.09	30.70	46.00	15.30	
10	971.870	26.81	7.70	2.00	36.51	54.00	17.49	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
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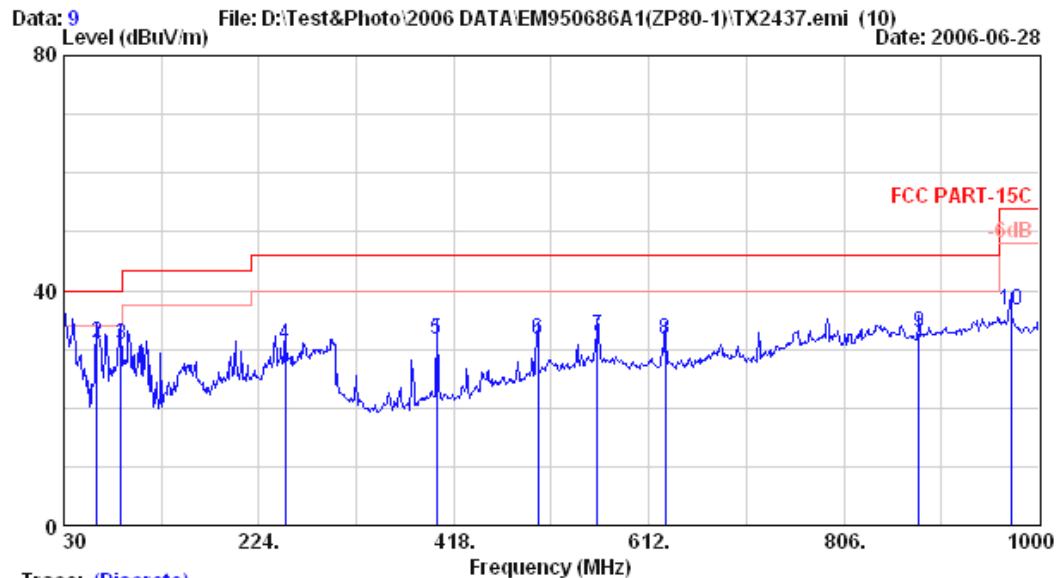
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Dis. / Ant. : 3m VBA6106A/UHALP9108-A Ant. pol. : HORIZONTAL
Limit : FCC PART-15C
Env. / Ins. : 8593EM 25°C/62% Engineer : Alvin_Yang
EUT : Zone Player (Red Rocks) M/N: ZP80
Power Rating : 120Vac/60Hz
Test Mode : TX 2437MHz

		Ant.	Cable		Emission			
Freq.	Factor	Loss	Reading	Level	Limits	Margin	Remark	
(MHz)	(dB/m)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)		
1	30.000	24.86	1.10	1.83	27.79	40.00	12.21	
2	111.480	18.28	2.20	9.84	30.32	43.50	13.18	
3	250.190	23.83	3.50	5.97	33.30	46.00	12.70	
4	376.290	17.15	4.60	14.47	36.22	46.00	9.78	
5	400.540	17.66	4.80	10.42	32.88	46.00	13.12	
6	501.420	18.95	6.52	5.65	31.13	46.00	14.87	
7	560.590	20.03	6.70	6.76	33.49	46.00	12.51	
8	628.490	21.06	6.37	2.84	30.28	46.00	15.72	
9	971.870	26.79	7.70	2.51	37.00	54.00	17.00	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



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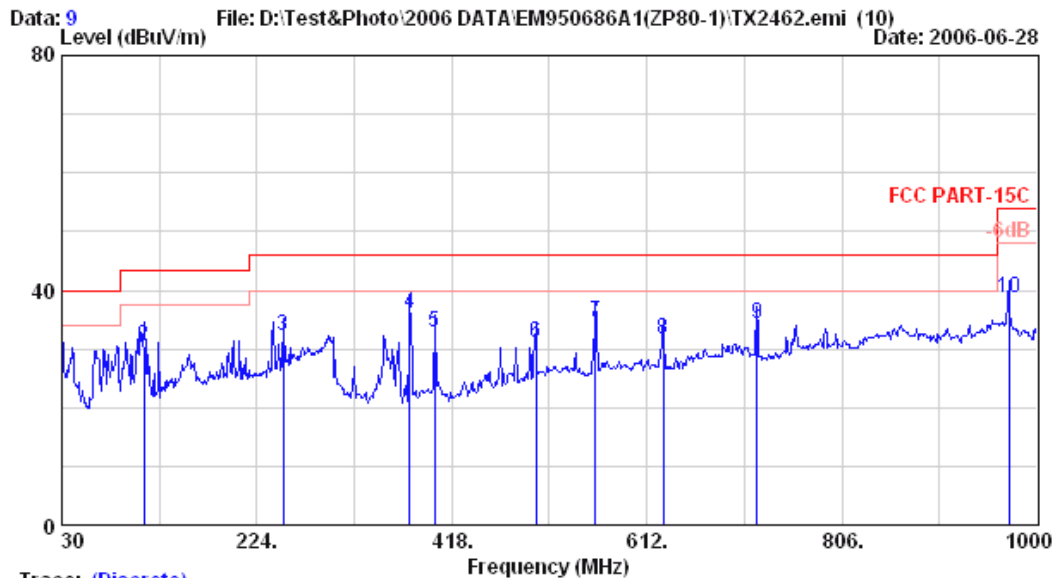
Site no. : A/C Chamber Data no. : 9
Dis. / Ant. : 3m VBA6106A/UHALP9108-A Ant. pol. : VERTICAL
Limit : FCC PART-15C
Env. / Ins. : 8593EM 25°C/62% Engineer : Alvin_Yang
EUT : Zone Player (Red Rocks) M/N: ZP80
Power Rating : 120Vac/60Hz
Test Mode : TX 2437MHz

		Ant.	Cable		Emission			
Freq.		Factor	Loss	Reading	Level	Limits	Margin	Remark
(MHz)		(dB/m)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)	
1	30.000	23.60	1.10	9.04	33.74	40.00	6.26	
2	62.980	13.19	1.63	16.32	31.15	40.00	8.85	
3	87.230	15.32	2.00	13.59	30.92	40.00	9.08	
4	250.190	25.02	3.50	2.37	30.89	46.00	15.11	
5	400.540	17.58	4.80	9.39	31.77	46.00	14.23	
6	501.420	19.91	6.52	5.08	31.51	46.00	14.49	
7	560.590	22.08	6.70	3.31	32.09	46.00	13.91	
8	628.490	21.11	6.37	4.03	31.52	46.00	14.48	
9	880.690	25.34	7.30	0.25	32.89	46.00	13.11	
10	971.870	26.81	7.70	2.05	36.56	54.00	17.44	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



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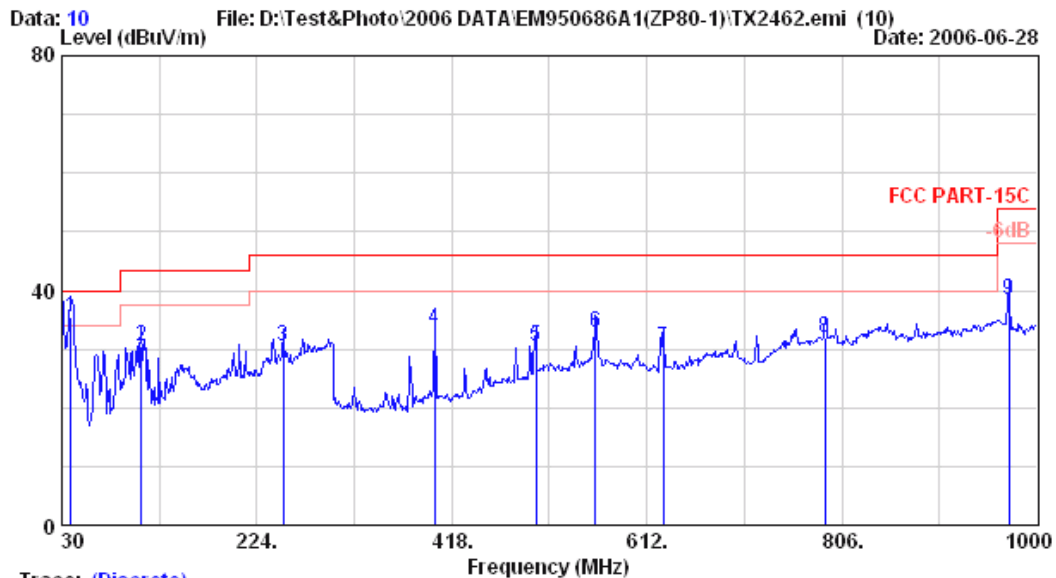
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Limit : FCC PART-15C
Env. / Ins. : 8593EM 25°C/62% Engineer : Alvin_Yang
EUT : Zone Player (Red Rocks) M/N:ZP80
Power Rating : 120Vac/60Hz
Test Mode : TX 2462MHz

		Ant.	Cable		Emission			
Freq.	Factor	Loss	Reading	Level	Limits	Margin	Remark	
(MHz)	(dB/m)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)		
1	30.000	24.86	1.10	2.55	28.51	40.00	11.49	
2	111.480	18.28	2.20	10.10	30.58	43.50	12.92	
3	250.190	23.83	3.50	4.90	32.23	46.00	13.77	
4	376.290	17.15	4.60	14.24	35.99	46.00	10.01	
5	400.540	17.66	4.80	10.40	32.86	46.00	13.14	
6	501.420	18.95	6.52	5.72	31.20	46.00	14.80	
7	560.590	20.03	6.70	7.97	34.70	46.00	11.30	
8	628.490	21.06	6.37	4.29	31.73	46.00	14.27	
9	721.610	22.21	6.50	5.61	34.32	46.00	11.68	
10	971.870	26.79	7.70	4.15	38.64	54.00	15.36	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



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Trace: (Discrete)

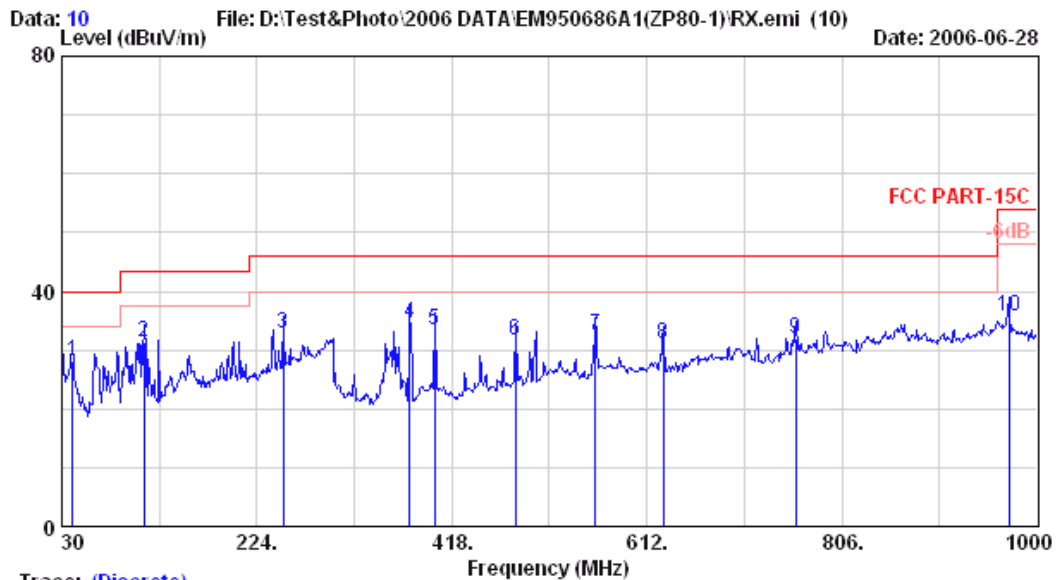
Site no. : A/C Chamber Data no. : 10
Dis. / Ant. : 3m VBA6106A/UHALP9108-A Ant. pol. : VERTICAL
Limit : FCC PART-15C
Env. / Ins. : 8593EM 25°C/62% Engineer : Alvin_Yang
EUT : Zone Player (Red Rocks) M/N: ZP80
Power Rating : 120Vac/60Hz
Test Mode : TX 2462MHz

		Ant.	Cable		Emission			
Freq.	Factor	Loss	Reading	Level	Limits	Margin	Remark	
(MHz)	(dB/m)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)		
1	38.730	21.07	1.20	13.24	35.51	40.00	4.49	
2	109.540	17.95	2.20	10.40	30.55	43.50	12.95	
3	250.190	25.02	3.50	1.95	30.47	46.00	15.53	
4	400.540	17.58	4.80	10.93	33.31	46.00	12.69	
5	501.420	19.91	6.52	4.17	30.60	46.00	15.40	
6	560.590	22.08	6.70	3.95	32.73	46.00	13.27	
7	628.490	21.11	6.37	2.84	30.33	46.00	15.67	
8	789.510	25.46	6.90	-0.29	32.07	46.00	13.93	
9	971.870	26.81	7.70	3.97	38.48	54.00	15.52	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



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Trace: (Discrete)

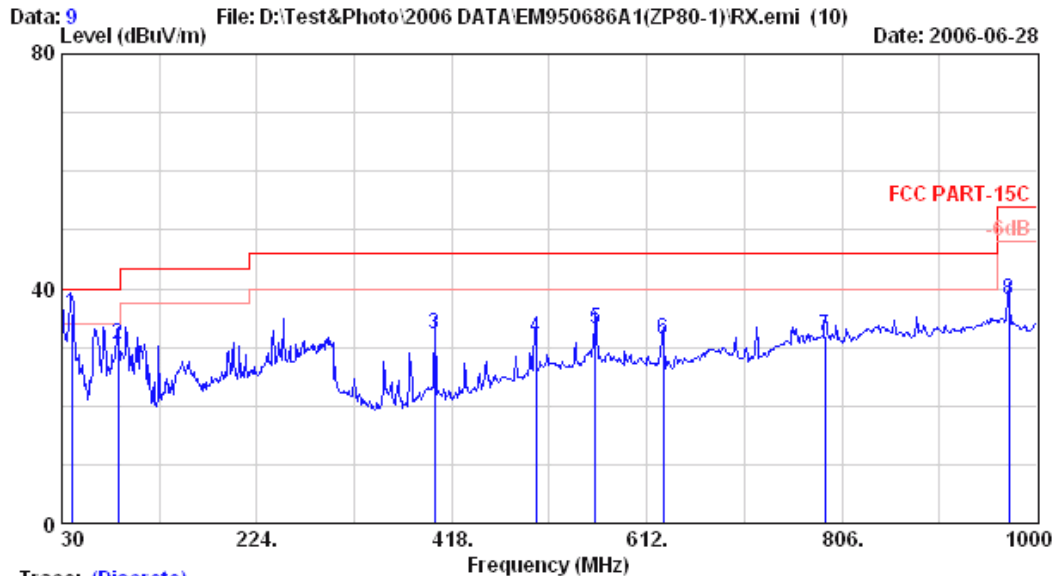
Site no. : A/C Chamber Data no. : 10
Dis. / Ant. : 3m VBA6106A/UHALP9108-A Ant. pol. : HORIZONTAL
Limit : FCC PART-15C
Env. / Ins. : 8593EM 25°C/62% Engineer : Alvin_Yang
EUT : Zone Player (Red Rocks) M/N:ZP80
Power Rating : 120Vac/60Hz
Test Mode : RX

		Ant. Cable		Emission				
Freq.	Factor	Loss	Reading	Level	Limits	Margin	Remark	
(MHz)	(dB/m)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)		
1	40.670	20.36	1.30	6.34	28.00	40.00	12.00	
2	111.480	18.28	2.20	10.77	31.25	43.50	12.25	
3	250.190	23.83	3.50	5.55	32.88	46.00	13.12	
4	376.290	17.15	4.60	12.81	34.56	46.00	11.44	
5	400.540	17.66	4.80	10.96	33.42	46.00	12.58	
6	481.050	18.74	6.10	6.67	31.50	46.00	14.50	
7	560.590	20.03	6.70	5.75	32.48	46.00	13.52	
8	628.490	21.06	6.37	3.60	31.04	46.00	14.96	
9	760.410	23.66	6.75	1.57	31.98	46.00	14.02	
10	971.870	26.79	7.70	1.37	35.86	54.00	18.14	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.



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Site no. : A/C Chamber Data no. : 9
Dis. / Ant. : 3m VBA6106A/UHALP9108-A Ant. pol. : VERTICAL
Limit : FCC PART-15C
Env. / Ins. : 8593EM 25°C/62% Engineer : Alvin_Yang
EUT : Zone Player (Red Rocks) M/N: ZP80
Power Rating : 120Vac/60Hz
Test Mode : RX

	Freq.	Ant.	Cable		Emission			
	(MHz)	Factor	Loss	Reading	Level	Limits	Margin	Remark
		(dB/m)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(dB)	
1	39.700	20.74	1.20	13.86	35.80	40.00	4.20	
2	86.260	15.13	1.90	13.46	30.49	40.00	9.51	
3	400.540	17.58	4.80	9.84	32.22	46.00	13.78	
4	501.420	19.91	6.52	5.29	31.72	46.00	14.28	
5	560.590	22.08	6.70	4.34	33.12	46.00	12.88	
6	628.490	21.11	6.37	4.00	31.49	46.00	14.51	
7	789.510	25.46	6.90	-0.50	31.86	46.00	14.14	
8	971.870	26.81	7.70	3.59	38.10	54.00	15.90	

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. The emission levels that are 20dB below the official limit are not reported.

2.6.2. Above 1GHz Frequency Range Measurement Results

Date of Test : Jun. 28, 2006 Temperature : 25°C

EUT : Zone Player (Red Rocks) Humidity : 62%

Test Mode : Transmitting Mode, Frequency: 2412MHz (CH1)

	Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dBμV	Meter Reading Horizontal dBμV/m	Emission Level Horizontal dBμV/m	Limits dB	Margin
Peak	1233.520	25.30	4.64	9.13	39.07	74.00	34.93
	1759.360	26.72	7.12	8.33	42.17	74.00	31.83
Average	1233.520	25.30	4.64	1.13	31.07	54.00	22.93
	1759.360	26.72	7.12	0.33	34.17	54.00	19.83
	Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dBμV	Meter Reading Vertical dBμV/m	Emission Level Vertical dBμV/m	Limits dB	Margin
Peak	1040.320	25.22	4.26	11.42	40.90	74.00	33.10
	1608.160	25.98	6.21	10.20	42.39	74.00	31.61
Average	1040.320	25.22	4.26	2.42	31.90	54.00	22.10
	1608.160	25.98	6.21	2.20	34.39	54.00	19.61

Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
 2. Measurement was up to 25GHz, but the emissions level were too low against the official limit and not report.

Date of Test : Jun. 28, 2006 Temperature : 25°C

EUT : Zone Player (Red Rocks) Humidity : 62%

Test Mode : Transmitting Mode, Frequency: 2437MHz (CH6)

	Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dBμV	Meter Reading Horizontal dBμV/m	Emission Level Horizontal dBμV/m	Limits dB	Margin
Peak	1641.760	26.17	6.41	9.18	41.76	74.00	32.24
	1809.760	26.96	6.85	7.85	41.66	74.00	32.34
Average	1641.760	26.17	6.41	1.18	33.76	54.00	20.24
	1809.760	26.96	6.85	-0.15	33.66	54.00	20.34
	Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dBμV	Meter Reading Vertical dBμV/m	Emission Level Vertical dBμV/m	Limits dB	Margin
Peak	1199.920	25.29	4.59	10.60	40.48	74.00	33.52
	1624.960	26.07	6.32	11.05	43.44	74.00	30.56
Average	1199.920	25.29	4.59	3.60	33.48	54.00	20.52
	1624.960	26.07	6.32	2.05	34.44	54.00	19.56

Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
 2. Measurement was up to 25GHz, but the emissions level were too low against the official limit and not report.

Date of Test : Jun. 28, 2006 Temperature : 25°C

EUT : Zone Player (Red Rocks) Humidity : 62%

Test Mode : Transmitting Mode, Frequency: 2462MHz (CH11)

	Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB μ V	Meter Reading Horizontal dB μ V/m	Emission Level Horizontal dB μ V/m	Limits dB	Margin
Peak	1712.320	26.50	6.92	8.58	42.00	74.00	32.00
	1818.160	27.01	6.80	7.69	41.50	74.00	32.50
Average	1712.320	26.50	6.92	0.58	34.00	54.00	20.00
	1818.160	27.01	6.80	-0.31	33.50	54.00	20.50

	Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB μ V	Meter Reading Vertical dB μ V/m	Emission Level Vertical dB μ V/m	Limits dB	Margin
Peak	1641.760	26.17	6.41	12.17	44.75	74.00	29.25
	1729.120	26.58	7.04	11.69	45.31	74.00	28.69
Average	1641.760	26.17	6.41	4.17	36.75	54.00	17.25
	1729.120	26.58	7.04	3.69	37.31	54.00	16.69

Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
2. Measurement was up to 25GHz, but the emissions level were too low against the official limit and not report.

Date of Test : Jun. 28, 2006 Temperature : 25°C

EUT : Zone Player (Red Rocks) Humidity : 62%

Test Mode : Receiving Mode

	Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dBμV	Meter Reading Horizontal dBμV/m	Emission Level Horizontal dBμV/m	Limits dB	Margin
Peak	1431.760	25.38	5.24	8.11	38.73	74.00	35.27
	2271.760	28.37	6.19	6.17	40.73	74.00	33.27
Average	1431.760	25.38	5.24	0.11	30.73	54.00	23.27
	2271.760	28.37	6.19	-1.83	32.73	54.00	21.27

	Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dBμV	Meter Reading Vertical dBμV/m	Emission Level Vertical dBμV/m	Limits dB	Margin
Peak	1040.320	25.22	4.26	9.41	38.89	74.00	35.11
	1641.760	26.17	6.41	7.81	40.39	74.00	33.61
Average	1040.320	25.22	4.26	1.41	30.89	54.00	23.11
	1641.760	26.17	6.41	-0.19	32.39	54.00	21.61

Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
 2. Measurement was up to 25GHz, but the emissions level were too low against the official limit and not report.

2.6.3. Restricted Bands Measurement Results

Date of Test : Jun. 28, 2006 Temperature : 25°C

EUT : Zone Player (Red Rocks) Humidity : 62%

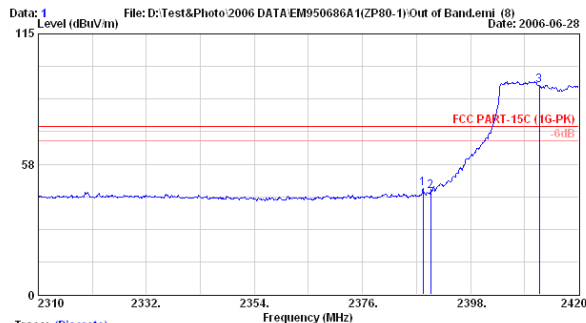
Test Mode : Transmitting Mode, Frequency: 2412MHz (CH1)

	Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB μ V	Meter Reading Horizontal dB μ V/m	Emission Level Horizontal dB μ V/m	Limits dB	Margin
Peak *	2388.320	28.59	6.34	12.02	46.95	74.00	27.05
Average *	2320.010	28.46	6.25	-1.55	33.16	54.00	20.84

- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
 2. Low frequency section (spurious in the restricted band 2310-2390MHz).
 3. “*” The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.



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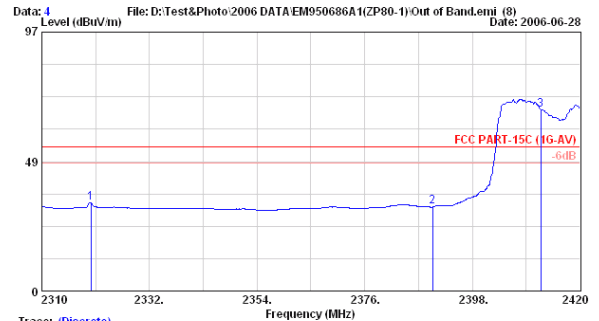
Trace: (Discrete)
 Site no. : A/C Chamber Data no. : 1
 Dis. / Ant. : 3m 3115 Ant. pol. : HORIZONTAL
 Limit : FCC PART-15C (1G-PK)
 Env. / Ins. : 8593EM 25°C/62% Engineer : Alvin_Yang
 EUT : Zone Player (Red Rocks) M/N: ZP80
 Power Rating : 120Vac/60Hz
 Test Mode : TX 2412MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2388.320	28.59	6.34	12.02	46.95	74.00	27.05	Peak
2	2390.000	28.59	6.34	10.69	45.63	74.00	28.37	Peak
3	2412.000	28.64	6.36	57.33	92.34	74.00	-18.34	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



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Trace: (Discrete)
 Site no. : A/C Chamber Data no. : 4
 Dis. / Ant. : 3m 3115 Ant. pol. : HORIZONTAL
 Limit : FCC PART-15C (1G-AV)
 Env. / Ins. : 8593EM 25°C/62% Engineer : Alvin_Yang
 EUT : Zone Player (Red Rocks) M/N: ZP80
 Power Rating : 120Vac/60Hz
 Test Mode : TX 2412MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2320.010	28.46	6.25	-1.55	33.17	54.00	20.83	Average
2	2390.000	28.59	6.34	-3.46	31.47	54.00	22.53	Average
3	2412.000	28.64	6.36	32.95	67.96	54.00	-13.96	Average

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

Date of Test : Jun. 28, 2006 Temperature : 25°C

EUT : Zone Player (Red Rocks) Humidity : 62%

Test Mode : Transmitting Mode, Frequency: 2412MHz (CH1)

	Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dBμV	Meter Reading Vertical dBμV/m	Emission Level Vertical dBμV/m	Limits dB	Margin
Peak *	2389.750	28.59	6.34	14.47	49.40	74.00	24.60
Average *	2320.120	28.46	6.25	1.09	35.80	54.00	18.20

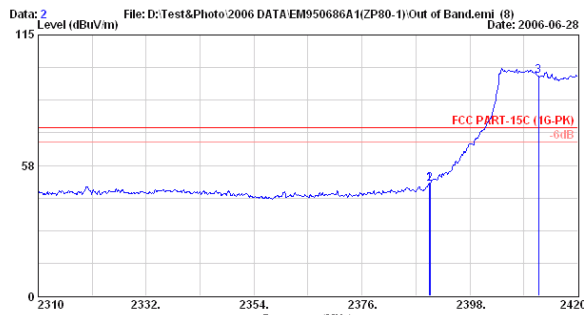
- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
 2. Low frequency section (spurious in the restricted band 2310-2390MHz).
 3. ‘*’ The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.



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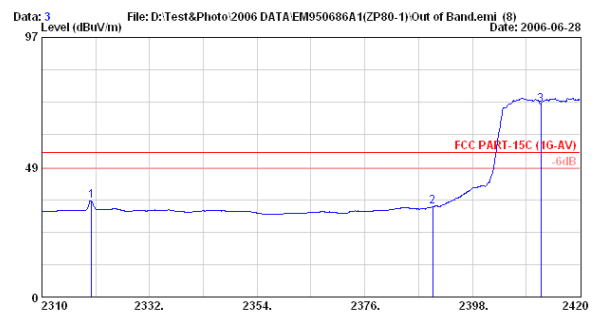
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Trace: (Discrete)
 Site no. : A/C Chamber Data no. : 2
 Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL
 Limit : FCC PART-15C (1G-PK)
 Env. / Ins. : 8593EM 25°C/62% Engineer : Alvin_Yang
 EUT : Zone Player (Red Rocks) M/N:ZP80
 Power Rating : 120Vac/60Hz
 Test Mode : TX 2412MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	2389.750	28.59	6.34	14.47	49.41	74.00	24.59	Peak
2	2390.000	28.59	6.34	14.37	49.31	74.00	24.69	Peak
3	2412.000	28.64	6.36	61.68	96.69	74.00	-22.69	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



Trace: (Discrete)
 Site no. : A/C Chamber Data no. : 3
 Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL
 Limit : FCC PART-15C (1G-AV)
 Env. / Ins. : 8593EM 25°C/62% Engineer : Alvin_Yang
 EUT : Zone Player (Red Rocks) M/N:ZP8C
 Power Rating : 120Vac/60Hz
 Test Mode : TX 2412MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dBμV)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Remark
1	2320.120	28.46	6.25	1.09	35.80	54.00	18.20	Average
2	2390.000	28.59	6.34	-1.29	33.65	54.00	20.35	Average
3	2412.000	28.64	6.36	36.92	71.93	54.00	-17.93	Average

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

Date of Test : Jun. 28, 2006 Temperature : 25°C

EUT : Zone Player (Red Rocks) Humidity : 62%

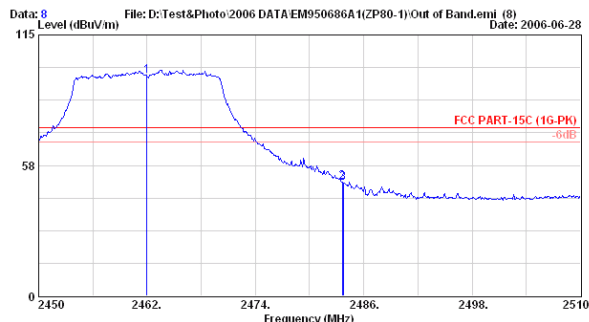
Test Mode : Transmitting Mode, Frequency: 2462MHz (CH11)

	Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB μ V	Meter Reading Horizontal dB μ V/m	Emission Level Horizontal dB μ V/m	Limits dB	Margin
Peak *	2483.600	28.77	6.45	14.72	49.94	74.00	24.06
Average *	2483.600	28.77	6.45	-4.38	30.84	54.00	23.16

- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
 2. Low frequency section (spurious in the restricted band 2483.5-2500MHz).
 3. ‘*’ The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.



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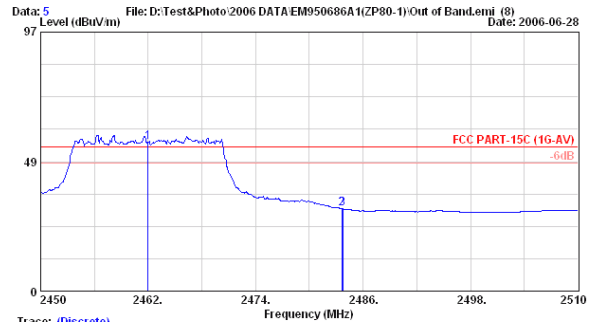
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 Dis. / Ant. : 3m 3115 Ant. pol. : HORIZONTAL
 Limit : FCC PART-15C (1G-PK)
 Env. / Ins. : 8593EM 25°C/62% Engineer : Alvin_Yang
 EUT : Zone Player (Red Rocks) M/N: ZP80
 Power Rating : 120Vac/60Hz
 Test Mode : TX 2462MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2462.000	28.74	6.42	61.83	96.98	74.00	-22.98	Peak
2	2483.600	28.77	6.45	14.72	49.95	74.00	24.05	Peak
3	2483.720	28.77	6.45	14.66	49.88	74.00	24.12	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



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Site no. : A/C Chamber Data no. : 5
 Dis. / Ant. : 3m 3115 Ant. pol. : HORIZONTAL
 Limit : FCC PART-15C (1G-AV)
 Env. / Ins. : 8593EM 25°C/62% Engineer : Alvin_Yang
 EUT : Zone Player (Red Rocks) M/N: ZP80
 Power Rating : 120Vac/60Hz
 Test Mode : TX 2462MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2462.000	28.74	6.42	20.72	55.88	54.00	-1.88	Average
2	2483.600	28.77	6.45	-4.38	30.85	54.00	23.15	Average
3	2483.720	28.77	6.45	-4.44	30.78	54.00	23.22	Average

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

Date of Test : Jun. 28, 2006 Temperature : 25°C

EUT : Zone Player (Red Rocks) Humidity : 62%

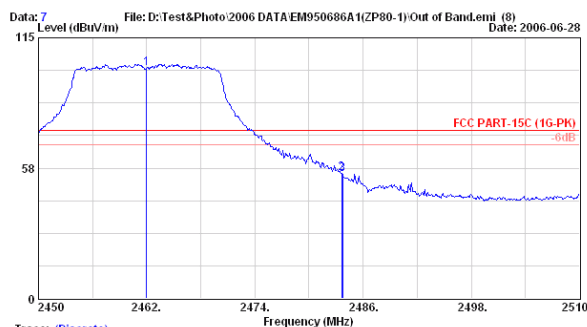
Test Mode : Transmitting Mode, Frequency: 2462MHz (CH11)

	Emission Frequency MHz	Antenna Factor dB/m	Cable Loss dB μ V	Meter Reading Vertical dB μ V/m	Emission Level Vertical dB μ V/m	Limits dB	Margin
Peak *	2483.600	28.77	6.45	19.87	55.09	74.00	18.91
Average *	2483.600	28.77	6.45	-2.99	32.23	54.00	21.77

- Remark : 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
 2. Low frequency section (spurious in the restricted band 2483.5-2500MHz).
 3. '*' The field strength of emission appearing within Part 15.205(a) shall not exceed the limits shown in section 15.209.



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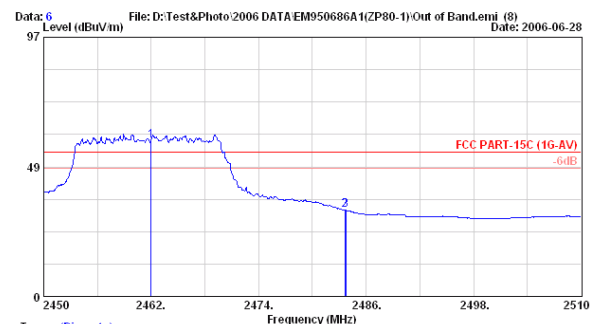
Site no. : A/C Chamber Data no. : 7
 Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL
 Limit : FCC PART-15C (1G-PK)
 Env. / Ins. : 8593EM 25°C/62% Engineer : Alvin_Yang
 EUT : Zone Player (Red Rocks) M/N: ZP80
 Power Rating : 120Vac/60Hz
 Test Mode : TX 2462MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2462.000	28.74	6.42	66.33	101.48	74.00	-27.48	Peak
2	2483.600	28.77	6.45	19.87	55.10	74.00	18.90	Peak
3	2483.720	28.77	6.45	19.72	54.94	74.00	19.06	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.



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Site no. : A/C Chamber Data no. : 6
 Dis. / Ant. : 3m 3115 Ant. pol. : VERTICAL
 Limit : FCC PART-15C (1G-AV)
 Env. / Ins. : 8593EM 25°C/62% Engineer : Alvin_Yang
 EUT : Zone Player (Red Rocks) M/N: ZP80
 Power Rating : 120Vac/60Hz
 Test Mode : TX 2462MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Reading (dB μ V)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Remark
1	2462.000	28.74	6.42	23.04	58.19	54.00	-4.19	Average X
2	2483.600	28.77	6.45	-2.99	32.23	54.00	21.77	Average
3	2483.720	28.77	6.45	-3.01	32.21	54.00	21.79	Average

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
 2. The emission levels that are 20dB below the official limit are not reported.

3. DEVIATION TO TEST SPECIFICATIONS

【NONE】

4. PHOTOGRAPHS

4.1. Photos of Radiated Measurement at Semi-Anechoic Chamber

4.1.1. Frequency Range 30MHz~1GHz

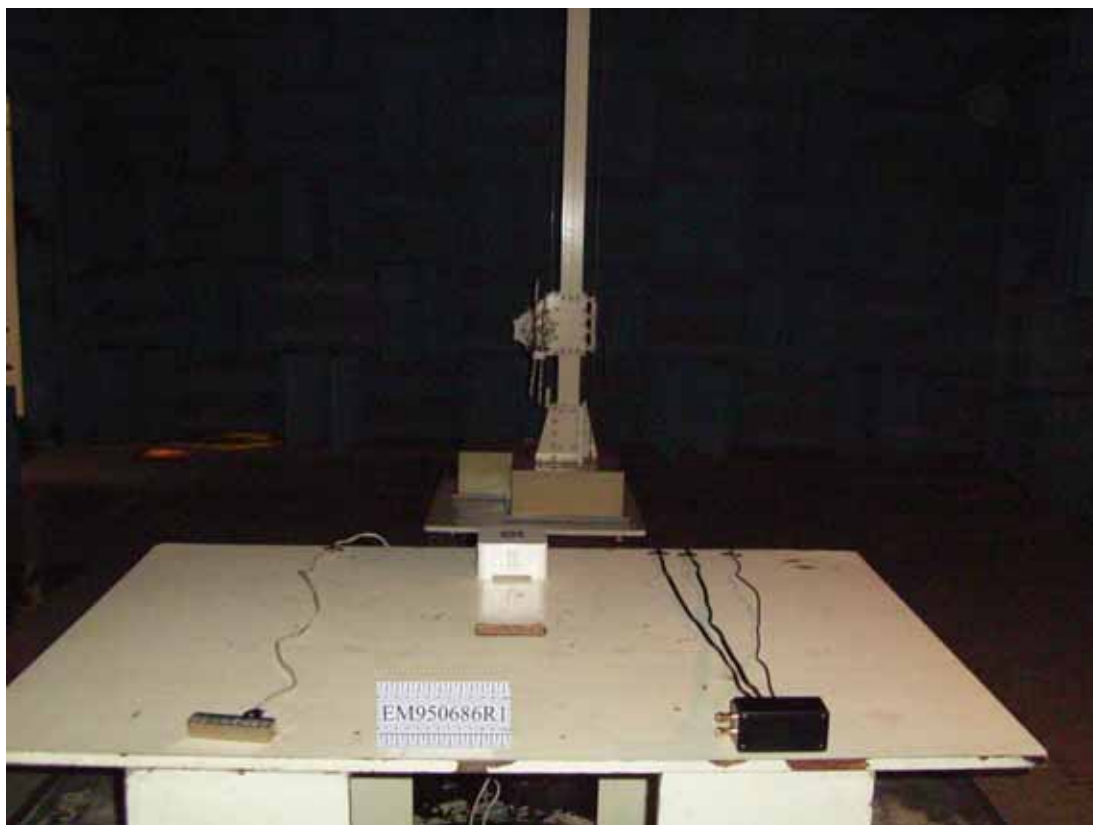


FRONT VIEW OF RADIATED MEASUREMENT



BACK VIEW OF RADIATED MEASUREMENT

4.1.2. Frequency Range: Above 1GHz



FRONT VIEW OF RADIATED MEASUREMENT



BACK VIEW OF RADIATED MEASUREMENT

PARTNER NOTEBOOK PC & CONTROLLER



VIEW OF RADIATED MEASUREMENT