

FCC ID PER PART 15.239 EMI MEASUREMENT AND TEST REPORT

For

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FCC ID: PVDMP-1688

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This Report Concerns: ☒ Original Report	Equipment Type: 88.6-89.2 MP3/Mobile Stereo Auto-Transplayer
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Test Date: August 15, 2001	
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1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

The *Shenzhen JWL Electronic Co., Ltd.*'s product, model *MP-1688* or the "EUT" as referred to in this report is a 88.6-89.2MHz MP3/Mobile Stereo Auto-transplayer which measures approximately 6" L x 2.5" W x 1.25" H.

1.2 Objective

This Type approval report is prepared on behalf of *Shenzhen JWL Electronic Co., Ltd.* in accordance with Part 2, Subpart J, and Part 15, Subparts A and B of the Federal Communication Commissions rules.

The objective of the manufacturer is to demonstrate compliance with FCC rules, Part 15, sec 239 for conducted and radiated margin.

1.3 Related Submittal(s)/Grant(s)

No Related Submittals

1.4 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4 –1992, 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. All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

1.5 Test Facility

The Open Area Test site used by Bay Area Compliance Laboratory Corporation to collect radiated and conducted emission measurement data is located in the back parking lot of the building at 230 Commercial Street, Suite 2, Sunnyvale, California, USA.

Test site at Bay Area Compliance Laboratory Corporation has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-1992.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratory Corporation is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (NVLAP). The scope of the accreditation covers the FCC Method - 47 CFR Part 15 - Digital Devices, IEC/CISPR 22: 1998, and AS/NZS 3548: Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment test methods under NVLAP Lab Code 200167-0.

1.6 Test Equipment List

Manufacturer	Description	Model	Serial Number	Cal. Due Data
HP	Spectrum Analyzer	8564E	08303	12/6/01
HP	Spectrum Analyzer	8593B	2919A00242	12/20/01
HP	Amplifier	8349B	2644A02662	12/20/01
HP	Quasi-Peak Adapter	85650A	917059	12/6/01
HP	Amplifier	8447E	1937A01046	12/6/01
A.H. System	Horn Antenna	SAS0200/571	261	12/27/01
Com-Power	Log Periodic Antenna	AL-100	16005	11/2/01
Com-Power	Biconical Antenna	AB-100	14012	11/2/01
Solar Electronics	LISN	8012-50-R-24-BNC	968447	12/28/01
Com-Power	LISN	LI-200	12208	12/20/01
Com-Power	LISN	LI-200	12005	12/20/01
BACL	Data Entry Software	DES1	0001	12/20/01

1.7 Equipment Under Test (EUT)

Manufacturer	Description	Model	Serial Number	FCC ID
Shenzhen JWL Electronic Co., Ltd.	88.6-89.2MHz MP3/Mobile Stereo Auto-Transplayer	MP-1688	None	PVDMP-1688

1.8 Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
BK Precision	DC Power Supply	1740	None	DOC

1.9 External I/O Cables List and Details

Manufacturer	Description	From	To
	Shielded Audio Cable	1.0	MP3 Out Port/EUT
	Shielded Power Cable	0.5	DC In/EUT
			Terminator
			DC Power Supply

2 - SYSTEM TEST CONFIGURATION

2.1 Justification

The EUT was configured for testing in a typical fashion (as normally used in a typical application).

The final qualification test was performed with the EUT operating at normal mode for the purpose of measurement.

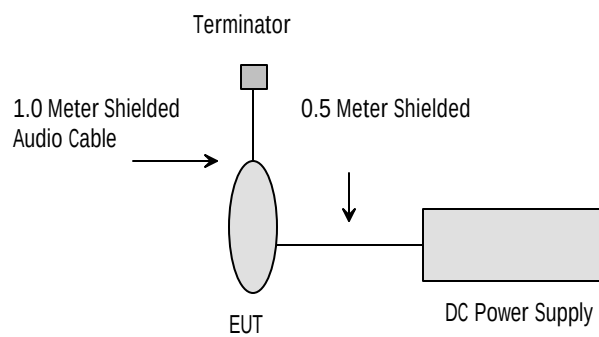
2.2 Block Diagram

Appendix A contains a copy of the EUT's block diagram as reference.

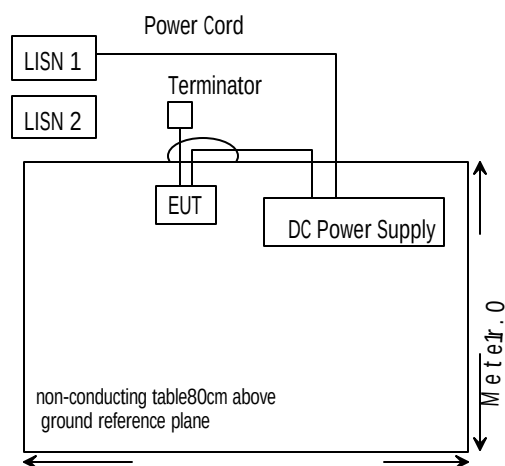
2.3 Equipment Modifications

No modification(s) was made to ensure the EUT comply with applicable limits and requirements.

2.4 Configuration of Test System



2.5 Test Setup Block Diagram



3 - CONDUCTED EMISSIONS TEST DATA

Not applicable because of battery operation.

4 - RADIATED EMISSION DATA

4.1 EUT Setup

The radiated emission tests were performed in the open area 3-meter test site, using the setup accordance with the ANSI C63.4 - 1992. The specification used was the FCC Class B limits.

The spacing between the peripherals was 10 cm.

External I/O cables are draped over edge of test table or bundled when necessary.

4.2 Spectrum Analyzer Setup

According to FCC Rules, 47 CFR 15.33, the EUT was tested to 1000 MHz.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

Start Frequency	30 MHz
Stop Frequency	1000 MHz
Sweep Speed.....	Auto
IF Bandwidth.....	100 kHz
Video Bandwidth.....	1 MHz
Quasi-Peak Adapter Bandwidth.....	120 kHz
Quasi-Peak Adapter Mode	Normal
Resolution Bandwidth.....	1MHz

4.3 Test Procedure

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combination.

All data was recorded in the peak detection mode. Quasi-peak readings performed only when an emission was found to be marginal (within -4 dBμV of specified limitation), and are distinguished with a "QP" in the data table.

The EUT was operating at normal to represent worst case results during final qualification test. Therefore, this configuration was used for final test data recorded in the table(s) listed under section 4.7 of this report.

4.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dBμV means the emission is 7dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Limit}$$

4.5 Summary of Test Results

According to the final data in section 4.6, the EUT complied with the FCC 15.239 (b) standards, and had the worst margin of:

-1.9 dBmV at 88.60 MHz in the **Vertical** polarization, Low Channel, 30 to 1000MHz, 3 meters.

-1.1 dBmV at 89.20 MHz in the **Vertical** polarization, High Channel, 30 to 1000MHz, 3 meters.

4.6 Radiated Emissions Test Result Data

4.6.1 Final Test Data, Low Channel, 30 to 1000 MHz, 3 meters.

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15.239	
Frequency MHz	Ampl. dBμV/m	Angle Degree	Height Meter	Polar H/ V	Antenna dBμV/m	Cable dB	Amp. dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
88.60	55.1	90	1.0	V	9.7	2.2	20.9	46.1	48	-1.9
88.60	54.2	45	2.2	H	9.7	2.2	20.9	45.2	48	-2.8
181.27	42.6	180	1.0	V	13.6	3.7	21.7	38.2	43.5	-5.3
75.63	39.5	225	1.0	V	9.5	2.1	21.0	30.1	40	-9.9
220.60	41.9	270	2.0	H	10.1	4.0	21.9	34.1	46	-11.9
334.12	33.0	135	1.8	H	15.4	5.7	22.6	31.5	46	-14.5
143.03	33.2	90	1.0	H	13.2	3.1	21.2	28.3	43.5	-15.2
265.86	36.4	45	1.0	H	11.7	4.9	22.2	30.8	46	-15.2
72.02	33.3	225	1.8	V	9.6	1.9	21.3	23.5	40	-16.5

4.6.2 Final Test Data, High Channel, 30 to 1000 MHz, 3 meters.

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15.239	
Frequency MHz	Ampl. dBμV/m	Angle Degree	Height Meter	Polar H/ V	Antenna dBμV/m	Cable dB	Amp. dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
89.20	55.9	135	1.0	V	9.7	2.2	20.9	46.9	48	-1.1
89.20	53.2	180	2.0	H	9.7	2.2	20.9	44.2	48	-3.8
485.99	40.2	180	2.0	H	17.9	7.3	23.7	41.7	46	-4.3
485.99	37.6	180	2.0	V	17.9	7.3	23.7	39.1	46	-6.9
66.79	41.8	315	1.8	V	9.7	1.9	21.6	31.8	40	-8.2
440.69	36.6	315	2.0	H	16.2	6.8	22.9	36.7	46	-9.3
58.10	34.7	0	1.8	V	10.3	1.7	21.8	24.9	40	-15.1
334.14	31.3	225	1.0	H	15.4	5.7	22.6	29.8	46	-16.2
68.12	33.5	270	1.0	V	9.7	1.9	21.6	23.5	40	-16.5
223.78	34.6	180	1.8	H	10.1	4.0	21.9	26.8	46	-19.2
266.98	30.4	90	1.5	H	11.7	4.9	22.2	24.8	46	-21.2

5 – Emission from the Intentional Radiator

5.1 Applicable Requirements

Per FCC 15.239 (a), emission from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency. The 200 kHz band shall lie wholly within the frequency range of 88-108 MHz.

5.2 Test Results

Result: Pass.

Please refer the attached plots for more details.

