

FCC ID PER PART 15.231

EMI MEASUREMENT AND TEST REPORT

For

Chiulik Electronic Equipment Factory

Chrysanthemum Road, Xiaolan,
Zhongshan, Guangdong, China

FCC ID: P5YE-2108

January 28, 2002

This Report Concerns: <input checked="" type="checkbox"/> Original Report	Equipment Type: Wireless Door Chime
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1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

The *Chiulik Electronic Equipment Factory*'s *P5YE-2108* or the "EUT" as referred to in this report is a wireless door chime.

The EUT measures approximately 4.5" L x 2.1" W x 1.2" H.

** The test data was good for test sample only. It may have deviation for other product sample.*

1.2 Objective

This Type approval report is prepared on behalf of *Chiulik Electronic Equipment Factory* 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 231 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, 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 Date
HP	Spectrum Analyzer	8564E	08303	12/6/02
HP	Spectrum Analyzer	8593B	2919A00242	12/20/02
HP	Amplifier	8349B	2644A02662	12/20/02
HP	Quasi-Peak Adapter	85650A	917059	12/6/02
HP	Amplifier	8447E	1937A01046	12/6/02
A.H. System	Horn Antenna	SAS0200/571	261	12/27/02
Com-Power	Log Periodic Antenna	AL-100	16005	11/2/02
Com-Power	Biconical Antenna	AB-100	14012	11/2/02
Solar Electronics	LISN	8012-50-R-24-BNC	968447	12/28/02
Com-Power	LISN	LI-200	12208	12/20/02
Com-Power	LISN	LI-200	12005	12/20/02
BACL	Data Entry Software	DES1	0001	12/20/02

* **Statement of Traceability:** Bay Area Compliance Corp. certifies that all calibration has been performed using suitable standards traceable to NATIONAL INSTITUTE of STANDARDS and TECHNOLOGY (NIST).

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.

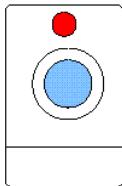
2.2 Block Diagram

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

2.3 Equipment Modifications

No modifications were made by BACL to ensure EUT to comply with the applicable limits and requirements.

2.4 Test Setup Block Diagram



Outdoor Unit

3 - SUMMARY OF TEST RESULTS

FCC Rules	REQUIREMENTS	SUMMARY	RESULT
CFR 15.203	<p>An intentional radiator shall be designed to ensure that no antenna other than that furnished by responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.</p>	<i>See Pictures</i>	Compliant
CFR15.205	Spurious Radiated Emissions. This test is required for any spurious emission or modulation product that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT	-1.0 dBm at 313.13 MHz	Compliant
CFR15.207 (a)	For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequency within the band 450 kHz to 30 MHz shall not exceed 250 microvolts.	<i>See Part 4</i>	N/A
CFR 15.231(a)(1)	A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.		Compliant
CFR 15.231(c)	20dB bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.	296kHz<0.25% of 313.13MHz	Compliant
CFR 15.231(e)	The devices operated shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmission shall be at least 30 times the duration of the transmission but in no case less than 10 seconds		Compliant

4 - AC LINE CONDUCTED EMISSIONS

4.1 Applicable Requirements

According to ANSI C63.4 and FCC §15.207(a), for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is connected back onto the AC power line on any frequency or frequencies within the band 450 kHz to 30 MHz shall not exceed 250 microvolts. Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals.

4.2 Test Procedure

The EUT shall be connected to the DC power supply which shall be connected to the AC line through the first LISN. Both hot and neutral leads shall be tested.

4.3 Test Equipment

HP 8566B Spectrum Analyzer
LISN

4.4 Test Results

Not applicable because of battery operation.

5 - RADIATED EMISSION DATA

5.1 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 EUT was placed on the center of the back edge on the test table.

The EUT used new battery.

5.2 Spectrum Analyzer Setup

According to FCC Rules, 47 CFR 15.33, the EUT was tested to 3131 MHz.

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

Start Frequency	30 MHz
Stop Frequency	3131 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

5.3 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 dB μ V of specification limit), 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.

5.4 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 -7dB μ V means the emission is 7dB μ V below the maximum limit for Class B. The equation for margin calculation is as follows:

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

5.5 Test Results

According to the final data in section 4.6, the EUT complied with the FCC 15.205, 15.231 (b) standards and these test results are deemed satisfactory evidence of compliance with ICES-003 of the Canadian Interference-Causing Equipment Regulations, and had the worst margin of:

-1.0 dB μ V at 313.13 MHz in the **Horizontal** polarization for Normal operating mode,
30 to 3131MHz, 3 meters

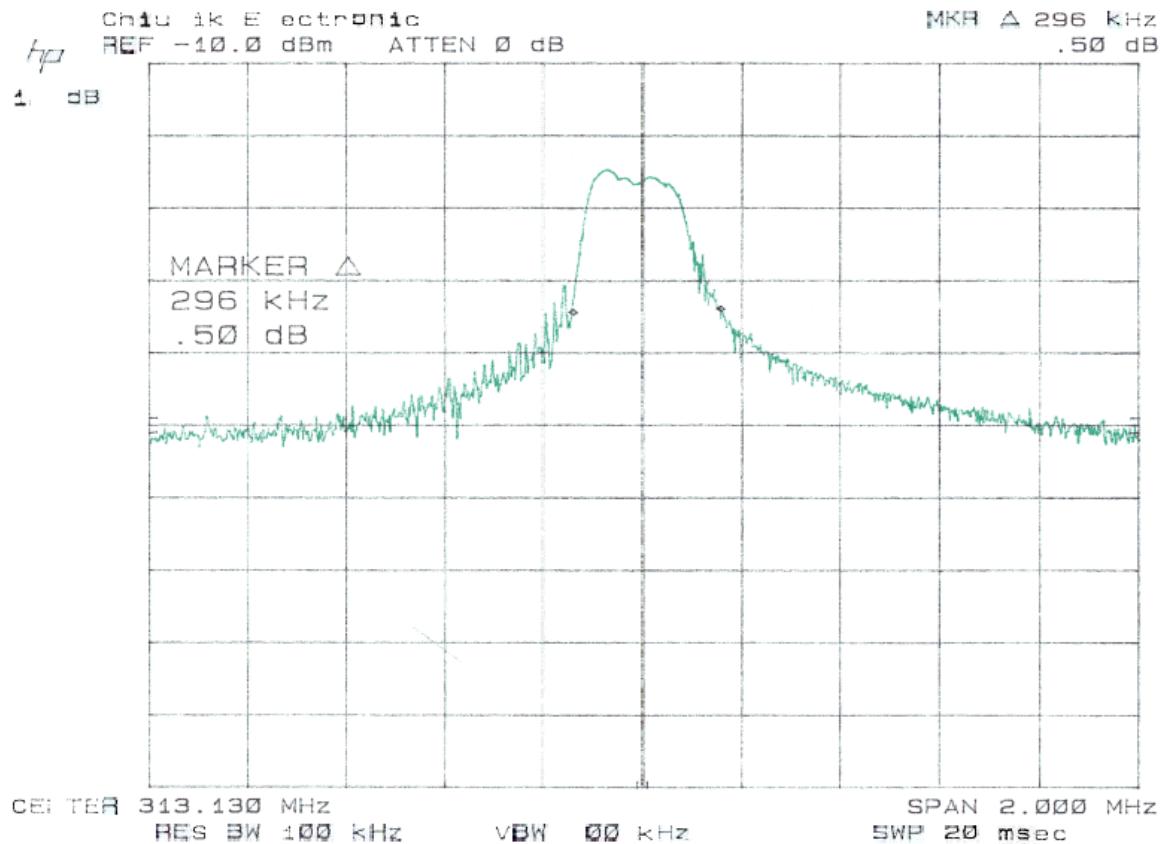
INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15.231	
Frequency MHz	Ampl. dB μ V/m		Angle Degree	Height Meter	Polar H/V	Antenna dB μ V/m	Cable dB		Corr. Ampl. dB μ V/m	Limit dB μ V/m
313.13	83.4	90	2.0	H	13.7	5.1	27.7	74.5	75.51	-1.0
626.25	56.7	120	1.5	H	19.4	7.3	29.0	54.4	55.5	-1.1
179.76	39.8	120	1.2	V	13.4	4.0	27.1	30.1	43.5	-13.4
267.68	42.9	300	1.2	V	12.0	4.6	27.2	32.3	46.0	-13.7
149.42	38.7	30	1.8	H	13.4	3.7	27.5	28.3	43.5	-15.2
75.66	37.6	90	2	H	9.5	2.8	27.5	22.4	40.0	-17.6
205.83	37.3	180	1.2	V	10.5	4.4	27.0	25.2	43.5	-18.3
88.11	36.8	45	1.5	V	9.7	2.9	27.5	21.9	43.5	-21.6
1564.2	27.0	180	1.8	H	26.5	2.6	28.3	27.8	54	-26.2

Note: There was no apparent emission after 1600MHz.

6 - 20DB BANDWIDTH

Requirement: Per 15.231(c), 20dB bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Result: $296 \text{ kHz} < 0.25\% \text{ of } 313.13\text{MHz}$
Complies with the requirement.



7 - DEACTIVATION

Per 15.231(a)(1), a manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

Test Result: Complies with the requirement.

