PEP Testing Laboratory
12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.
TEL: 886-2-26922097 FAX: 886-2-26956236

REPORT NO. :E920631

NVLAP LAB CODE: 200097-0

EMI TEST REPORT

according to

AS/NZS 4251.1:1999

EQUIPMENT : Door Entry Alarm System

MODEL NO. : DES-700

APPLICANT : YUAN HSUN ELECTRIC CO., LTD.

NO. 57, CHUNG HE RD., ZUO-YING DIST., KAOHSIUNG CITY 813, TAIWAN, R. O. C.

TEST ENGINEER : DENNY HUANG

CHECKED BY : JASON KUNG

ISSUED DATE : JULY 23, 2004

PEP TESTING LABORATORY

12-3Fl., No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
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1. General

1.1 General Information

Applicant : YUAN HSUN ELECTRIC CO., LTD.

NO. 57, CHUNG HE RD., ZUO-YING DIST., KAOHSIUNG CITY 813, TAIWAN, R. O. C.

Manufacturer : YUAN HSUN ELECTRIC CO., LTD.

NO. 57, CHUNG HE RD., ZUO-YING DIST., KAOHSIUNG CITY 813, TAIWAN, R. O. C.

TEST PROCEDURE : ANSI C63.4 (1992)

TEST FOR COMPLIANCE WITH : AS/NZS 4251.1:1999

1. 2 Place of Measurement

PEP TESTING LABORATORY

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Measurement Uncertainty :

The uncertainty of the testing result is given as below. The method of uncertainty Calculation is provided in PEP Testing Lab document No. QP-T-28-A & QP-T-27-A

Frequency (MHz)	0.15 ～ 30	30 ～ 1000
Expanded Uncertainty μ_c	1.4 (dB)	2.8 (dB)

※ 95% Confidence Level; K=2

2. Product Information

a. EUT Name: Door Entry Alarm System

b. Model No.： DES-700

c. CPU Type： N/A

d. CPU Frequency： N/A

e. Crystal/Oscillator(s) ： 4 MHz

f. Chassis Used： ABS

g. Port/Connector(s) ： Input Port * 1, Output Port * 1

h. Power Rating： **Adapter -----**
Manufacturer：ENG
Model No.：T35-9-200C-3
Input：AC 230V 23A 50Hz
Output：DC 9V 200mA

i. Condition of the EUT : ☐ Prototype Sample ☑ Engineering Sample
☐ Production Sample

j. Test Item Receipt Date : JULY 21, 2004

3. EUT Description and Test Conclusion

The equipment under test (EUT) is Door Entry Alarm System model DES-700. The EUT that consists of speaker, photoelectric beam sensor and reflector is used for the application at locations such as garage door, overhead door, entrance of supermarket, restaurant, etc. The light source of EUT is IR LED and the maximum sensing range between the photoelectric beam sensor and reflector is 7 meters. AC-DC power adaptor supplies EUT DC 9V from AC main power. For more detail specification about EUT, please refer to the user's manual.

Test method: According to the major function designed, the EUT was set by the following steps for test.

(A) Arrange the placement of EUT photoelectric beam sensor and reflector shown as setup photos.
(B) Plug EUT photoelectric beam sensor to speaker input.
(C) Plug EUT speaker output by data cable.

The test was respectively carried out on EUT alarm function and chime function and the worst-case test result of each test mode was recorded and provided in this report.

Conducted emission test:
The system was setup with the EMI diagnostic software running. The power line conducted EMI tests were run on the line and neutral conductors of the power cord and the results were recorded. The effect of varying the position of the interface cables has been investigated to find the worst-case configuration that produces maximum emission.
At the frequencies where the peak values of the emission exceeded the quasi-peak limit, the emissions were also measured with the quasi-peak detectors. The average detector also measured the emission either (A) quasi-peak values were under quasi-peak limit but exceeded average limit, or (B) peak values were under quasi-peak limit but exceeded average limit.

Radiated emission test:
The maximum readings were found by varying the height of antenna and then rotating the turntable. Both polarization of antenna, horizontal and vertical, are measured. The effect of varying the position of the interface cables has been investigated to find the configuration that produces maximum emission.
The highest emissions were also analyzed in details by operating the spectrum analyzer in fixed tuned quasi-peak mode to determine the precise amplitude of the emissions.

4. Modification(s):

N/A

5. Test Software Used

N/A

6. Support Equipment Used

N/A

7. Description of Conducted Emissions Test

7.1 Conducted Emissions

A 1m x1.5m wooden table 80 cm high is placed 40cm away from the vertical wall. Two AMN are bonded to the grounding plane. The EUT is powered from the designated AMN and the support equipment is powered from another designated AMN. Powers to the AMN are filtered by a high-current high insertion loss power line filters. All electrical cables are shielded by braided tinned copper zipper tubing with inner diameter of 1/2". All interconnecting cables more than 1 meter were shortened by non-inductive bundling (serpentine fashion) to a 1-meter length.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the AMN was connected to the spectrum analyzer to determine the frequency producing the maximum EME from the EUT.

The spectrum was scanned from 150kHz to 30 MHz with1.5 sec sweep time. The frequency producing the maximum level was re-examined using Quasi-Peak adapter. The detector function was set to CISPR quasi-peak mode. The bandwidth of the receiver was set to 10kHz. The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each EME emission. Each emission was maximized by: switching power lines; varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and/or support equipment, and powering the monitor from the floor mounted outlet box and the computer aux AC outlet, if applicable; whichever determined the worst-case emission.

7.2 Conducted Emissions Limits

Frequency	Maximum RF Line Voltage dB(uV)	
	Class B	
MHz	QUASI-PEAK	AVERAGE
0.15 - 0.50	66-56	56-46
0.50 - 5.0	56	46
5.0 - 30	60	50

Remarks : In the above table, the tighter limit applies at the band edges.

8. Description of Radiated Emissions Test

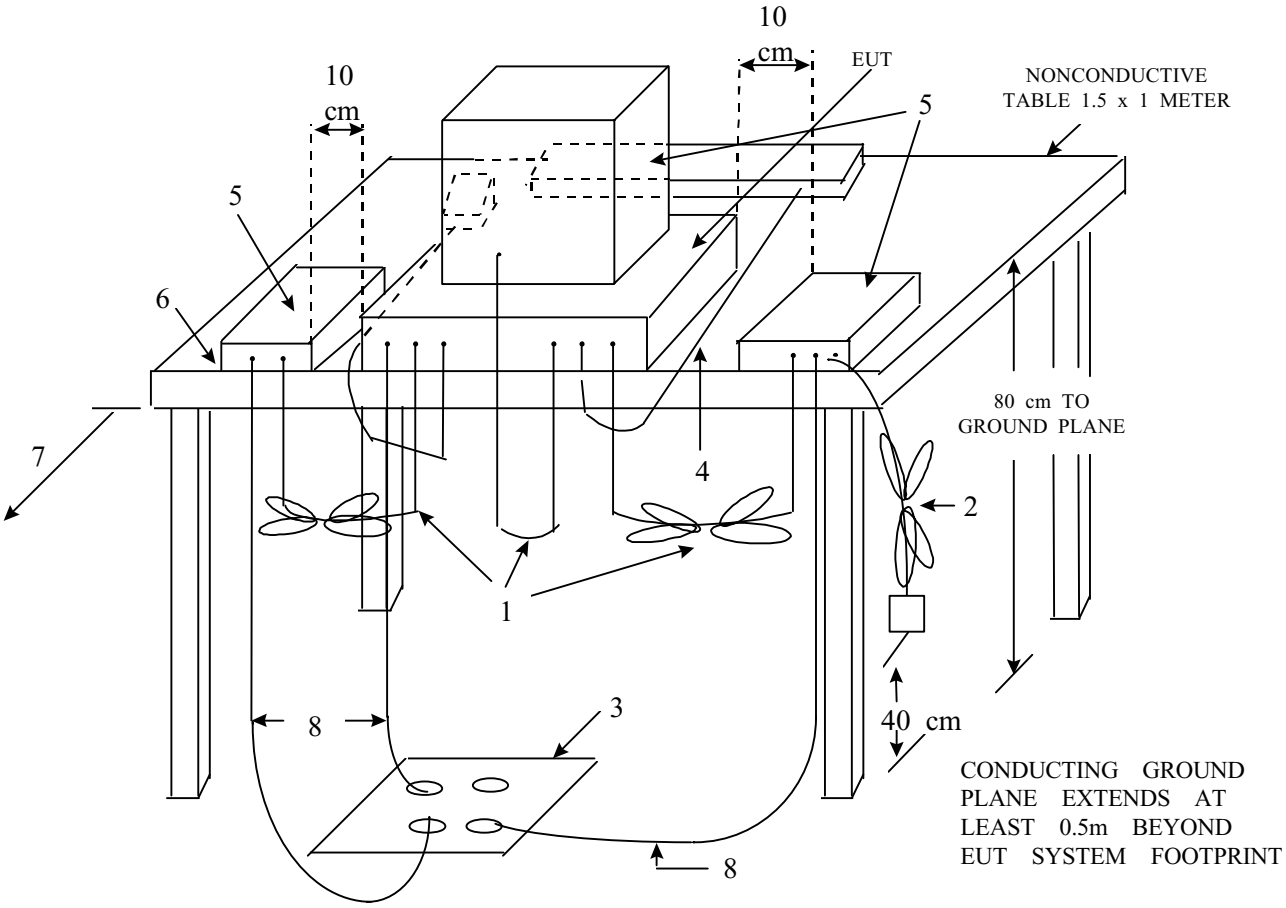
8.1 Radiated Emissions

Preliminary measurements were made indoors chamber at 3 meter using broadband antennas, broadband amplifier, and spectrum analyzer to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30 to 1000 MHz using logbicon antenna. Above 1GHz, linearly polarized double ridge horn antenna were used.

Final measurements were made outdoors at 10-meter test range using biconical, dipole antenna or horn antenna. The test equipment was placed on a wooden bench situated on a 1.5x1 meter area adjacent to the measurement area. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined and investigated using Quasi-Peak Adapter. The detector function was set to CISPR quasi-peak mode and the bandwidth of the receiver was set to 120kHz.

The half-wave dipole antenna was tuned to the frequency found during preliminary radiated measurements. The EUT, support equipment and interconnecting cables were re-configured to the set-up producing the maximum emission for the frequency and were placed on top of a 0.8-meter high non-metallic 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each EME emission. The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by: varying mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and/or support equipment, and powering the monitor from the floor mounted outlet box and the computer aux AC outlet, if applicable; and changing the polarity of the antenna, whichever determined the worst-case emission. Photographs of the worst-case emission can be seen in radiated emission test photo.

8.2 Test Configuration



LEGEND

1. Interconnecting cables which hang closer than 40 cm to the ground plane shall be folded back and forth forming a bundle 30 to 40 cm long. hanging approximately in the middle between ground plane and table .
2. I/O cables which are connected to a peripheral hall be bundled in center. The end of the cable may be terminated if required using correct terminating impedance. The total length shall not exceed 1 m.
3. If LISN are kept in the test setup for radiated emissions, it is preferred that they be installed under the ground if requires receptacle flush with the ground plane.
4. Cables of hand-operated devices, such as keyboards, mouses, etc., have to be placed as close as possible to the controller.
5. Non-EUT components of EUT system being tested.
6. The rear of all components of the system under test shall be located flush with the rear of the table.
7. No vertical conducting wall used.
8. Power cords drape to the floor and are routed over to receptacle.

8.3 Radiated Emission Limits

Limits for radiated disturbance of Class B ITE at
a measuring distance of 10 m

Frequency MHz	Field Strength dB(μ V/m)
30 to 230	30
230 to 1 000	37

NOTES
1 The lower limit shall apply at the transition frequency.
2 Additional provisions may be required for cases where interference occurs.

9. Conducted Emissions Test Setup Photo

< FRONT VIEW >

10. Conducted Emissions Test Data

Model No. **: DES-700**
Frequency range **: 150KHz to 30MHz**
Detector **: Peak Value**
Temperature **: 29 ℃**
Humidity **: 55 %**
MEMO **: ALARM MODE**

Test Data : **#** **1109** < LINE >
**1111** < NEUTRAL >

Note 1. Level = Read Level + Cable Loss + Probe (LISN)
2. Over Limit = Level – Limit = Margin

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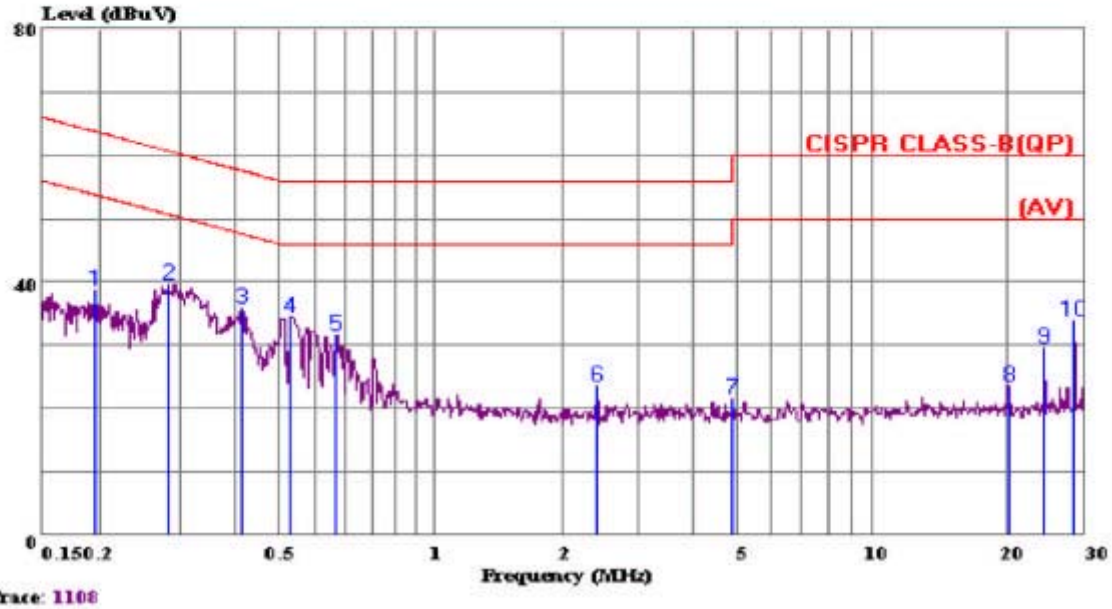
Data#: 1109 File#: EN55022-B(QP).EMI Date: 2004-07-22 Time: 12:02:28



Trace: 1108
Site : Shih-Chi : Conduction No.1(Gene)
Condition: CISPR CLASS-B(QP) LISN.L(16A) LINE
eut : E920631
power : AC 240V 50Hz
memo : Peak Value
memo : Final Test
memo : Alarm Mode

Page: 1

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.195	38.70	-25.10	63.80	38.40	0.20	0.10	
2	0.283	39.53	-21.19	60.72	39.20	0.20	0.13	
3	0.415	35.70	-21.85	57.55	35.40	0.20	0.10	
4	0.529	34.37	-21.63	56.00	34.00	0.20	0.17	
5	0.665	31.50	-24.50	56.00	31.20	0.20	0.10	
6	2.513	23.60	-32.40	56.00	23.20	0.20	0.20	
7	5.005	21.52	-38.48	60.00	21.00	0.22	0.30	
8	20.377	23.42	-36.58	60.00	22.40	0.62	0.40	
9	24.400	29.58	-30.42	60.00	28.40	0.78	0.40	
10	28.452	33.90	-26.10	60.00	32.60	0.80	0.50	

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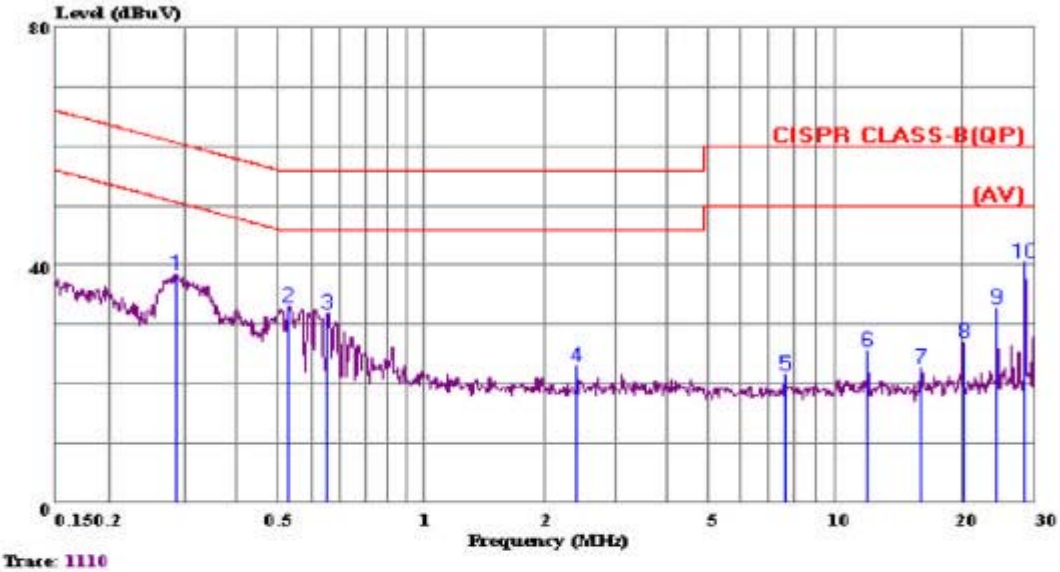
Data#: 1111 File#: EN55022-B(QP).EMI Date: 2004-07-22 Time: 12:02:53



Trace: 1110
Site : Shih-Chi : Conduction No.1(Gene)
Condition: CISPR CLASS-B(QP) LISN.N(16A) NEUTRAL
eut : E920631
power : AC 240V 50Hz
memo : Peak Value
memo : Final Test
memo : Alarm Mode

Page: 1

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.289	38.52	-22.02	60.54	38.20	0.20	0.12	
2	0.529	32.97	-23.03	56.00	32.60	0.20	0.17	
3	0.654	31.70	-24.30	56.00	31.40	0.20	0.10	
4	2.513	22.80	-33.20	56.00	22.40	0.20	0.20	
5	7.769	21.37	-38.63	60.00	20.80	0.27	0.30	
6	12.124	25.39	-34.61	60.00	24.60	0.39	0.40	
7	16.140	22.71	-37.29	60.00	21.79	0.52	0.40	
8	20.377	26.82	-33.18	60.00	25.80	0.62	0.40	
9	24.400	32.78	-27.22	60.00	31.60	0.78	0.40	
10	28.452	40.30	-19.70	60.00	39.00	0.80	0.50	

Model No.	**: DES-700**
Frequency range	**: 150KHz to 30MHz**
Detector	**: Peak Value**
Temperature	**: 29 ℃**
Humidity	**: 55 %**
MEMO	**: CHIME MODE**

Test Data : # **1101** < LINE >
1099 < NEUTRAL >

Note 1. Level = Read Level + Cable Loss + Probe (LISN)
2. Over Limit = Level – Limit = Margin

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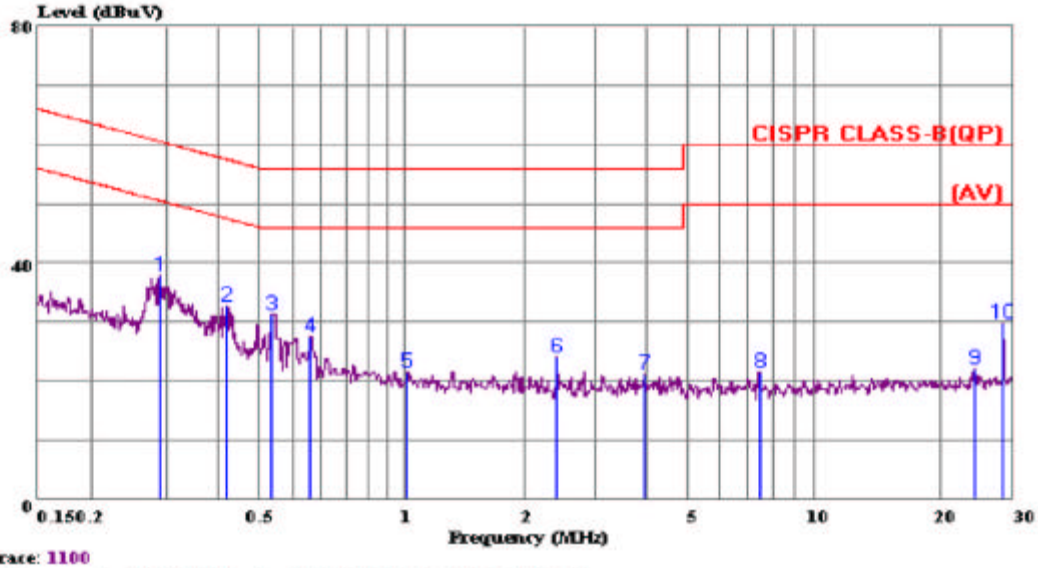
Data#: 1101 File#: EN55022-B(QP).EMI Date: 2004-07-22 Time: 11:55:49



Trace: 1100

Site : Shih-Chi : Conduction No.1(Gene)
Condition: CISPR CLASS-B(QP) LISN.L(16A) LINE
eut : E920631
power : AC 240V 50Hz
memo : Peak Value
memo : Final Test
memo : Chime Mode

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.291	37.71	-22.79	60.50	37.39	0.20	0.12	
2	0.417	32.70	-24.81	57.51	32.40	0.20	0.10	
3	0.535	31.16	-24.84	56.00	30.79	0.20	0.17	
4	0.661	27.50	-28.50	56.00	27.20	0.20	0.10	
5	1.117	21.40	-34.60	56.00	21.00	0.20	0.20	
6	2.513	24.20	-31.80	56.00	23.80	0.20	0.20	
7	4.027	21.10	-34.90	56.00	20.60	0.20	0.30	
8	7.566	21.37	-38.63	60.00	20.80	0.27	0.30	
9	24.400	22.18	-37.82	60.00	21.00	0.78	0.40	
10	28.452	29.70	-30.30	60.00	28.40	0.80	0.50	

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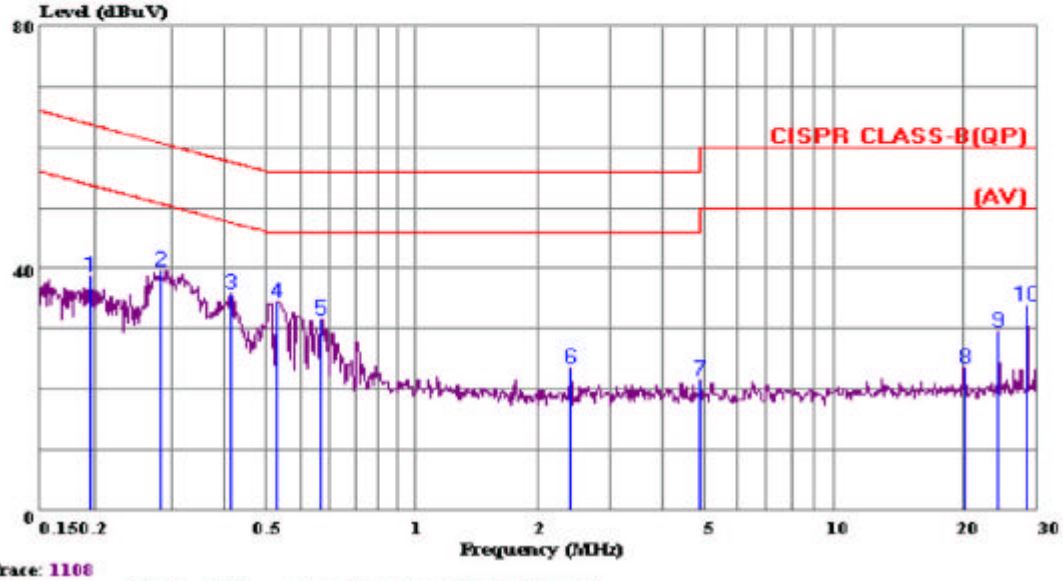
Data#: 1109 File#: EN55022-B(QP).EMI Date: 2004-07-22 Time: 12:02:28



Trace: 1108

Site : Shih-Chi : Conduction No.1(Gene)
Condition: CISPR CLASS-B(QP) LISN.L(16A) LINE
eut : E920631
power : AC 240V 50Hz
memo : Peak Value
memo : Final Test
memo : Alarm Mode

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.195	38.70	-25.10	63.80	38.40	0.20	0.10	
2	0.283	39.53	-21.19	60.72	39.20	0.20	0.13	
3	0.415	35.70	-21.85	57.55	35.40	0.20	0.10	
4	0.529	34.37	-21.63	56.00	34.00	0.20	0.17	
5	0.665	31.50	-24.50	56.00	31.20	0.20	0.10	
6	2.513	23.60	-32.40	56.00	23.20	0.20	0.20	
7	5.005	21.52	-38.48	60.00	21.00	0.22	0.30	
8	20.377	23.42	-36.58	60.00	22.40	0.62	0.40	
9	24.400	29.58	-30.42	60.00	28.40	0.78	0.40	
10	28.452	33.90	-26.10	60.00	32.60	0.80	0.50	

11. Radiated Emissions Test Setup Photos

< FRONT VIEW >

< REAR VIEW >

12. Radiated Emissions Test Data

Model No. : DES-700
Frequency range : 30MHz to 1GHz Detector : Quasi-Peak Value
Frequency range : above 1GHz Detector : Quasi-Peak/Average Value
Temperature : 29° C Humidity : 55 %
MEMO : ALARM MODE

Antenna polarization : HORIZONTAL ; Test distance : 10m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Azimuth (°angle)	Antenna High(m)
57.749	27.91	- 2.09	30.00	37.48	10.27	0.66	20.50	60.0	4.0
208.983	20.14	- 9.86	30.00	27.36	11.40	1.68	20.30	100.0	4.0
624.073	24.31	-12.69	37.00	21.23	19.50	3.48	19.90	125.0	3.5
750.202	30.71	- 6.29	37.00	24.99	21.12	4.10	19.50	173.0	3.5
826.355	26.00	-11.00	37.00	19.10	22.02	4.37	19.49	209.0	3.5
924.651	24.61	-12.39	37.00	16.14	23.06	4.51	19.10	240.0	3.5

Note :

1. Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line

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Model No. : DES-700
Frequency range : 30MHz to 1GHz Detector : Quasi-Peak Value
Frequency range : above 1GHz Detector : Quasi-Peak/Average Value
Temperature : 29° C Humidity : 55 %
MEMO : ALARM MODE

Antenna polarization : VERTICAL ; Test distance : 10m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Azimuth (°angle)	Antenna High(m)
35.924	28.82	- 1.18	30.00	37.94	11.04	0.44	20.60	90.0	1.0
40.434	28.28	- 1.72	30.00	36.93	11.35	0.59	20.59	140.0	1.0
44.476	25.57	- 4.43	30.00	34.51	11.06	0.51	20.51	180.0	1.0
72.781	24.78	- 5.22	30.00	36.95	7.41	0.86	20.44	225.0	1.0
123.695	24.09	- 5.91	30.00	31.08	12.41	1.08	20.48	270.0	1.0
826.419	27.54	- 9.46	37.00	20.64	22.02	4.37	19.49	290.0	1.5

Note :

1. Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line

Model No. : DES-700
Frequency range : 30MHz to 1GHz Detector : Quasi-Peak Value
Frequency range : above 1GHz Detector : Quasi-Peak/Average Value
Temperature : 29° C Humidity : 55 %
MEMO : CHIME MODE

Antenna polarization : HORIZONTAL ; Test distance : 10m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Azimuth (°angle)	Antenna High(m)
57.749	26.91	- 3.09	30.00	36.48	10.27	0.66	20.50	114.0	4.0
208.983	23.14	- 6.86	30.00	30.36	11.40	1.68	20.30	150.0	4.0
624.073	26.31	-10.69	37.00	23.23	19.50	3.48	19.90	172.0	3.5
750.202	30.71	- 6.29	37.00	24.99	21.12	4.10	19.50	214.0	3.5
826.355	27.00	-10.00	37.00	20.10	22.02	4.37	19.49	270.0	3.5
924.651	20.61	-16.39	37.00	12.14	23.06	4.51	19.10	309.0	3.5

Note :

1. Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line

Model No. : DES-700
Frequency range : 30MHz to 1GHz Detector : Quasi-Peak Value
Frequency range : above 1GHz Detector : Quasi-Peak/Average Value
Temperature : 29° C Humidity : 55 %
MEMO : CHIME MODE

Antenna polarization : VERTICAL ; Test distance : 10m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Azimuth (°angle)	Antenna High(m)
35.924	27.82	- 2.18	30.00	36.94	11.04	0.44	20.60	70.0	1.0
40.434	27.28	- 2.72	30.00	35.93	11.35	0.59	20.59	160.0	1.0
44.476	26.57	- 3.43	30.00	35.51	11.06	0.51	20.51	240.0	1.0
72.781	25.78	- 4.22	30.00	37.95	7.41	0.86	20.44	290.0	1.0
123.695	20.09	- 9.91	30.00	27.08	12.41	1.08	20.48	322.0	1.5
826.419	25.54	-11.46	37.00	18.64	22.02	4.37	19.49	350.0	1.5

Note :

1. Level = Read Level + Antenna Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line

13. List of Test Equipment

Test Mode	Instrument	Model No.	Serial No.	Next Cal. Date	Cal. Interval
Conduction (No.1)	R & S Receiver	ESHS10	830223/008	May 22, 2005	1Year
	Rolf Heine LISN	NNB-4/63TL	98008	May 01, 2005	1Year
	R & S LISN	ESH3-Z5	844982/039	Aug. 06, 2004	1Year
	Spectrum Analyzer	R3261A	91720076	June 08, 2005	1Year
	RF Cable	Rg400	N/A	May 12, 2005	1Year
	Schaffner ISN	T411	N/A	June 29, 2005	1Year
Radiation (OP No.1)	R & S Receiver	ESVS30	863342/012	May 22, 2005	1Year
	Schaffner Pre-amplifier	CPA9232	1028	May 20, 2005	1Year
	COM-Power Horn Ant.	AH-118 (1GHz~18GHz)	10095	May 21, 2005	2Year
	Schwarzbeck Precision Dipole Ant	VHAP (30MHz~1GHz)	970 + 971 953 + 954	June 26, 2006	3Year
	R &S Signal Generator	SMY01	841104/037	Apr. 29, 2005	2Year
	RF Cable	No. 1	N/A	May 11, 2005	1Year
	EMCO Antenna	3142B (26MHz~2GHz)	9904-1370	Aug. 24, 2004	1Year

14. Labeling Requirements

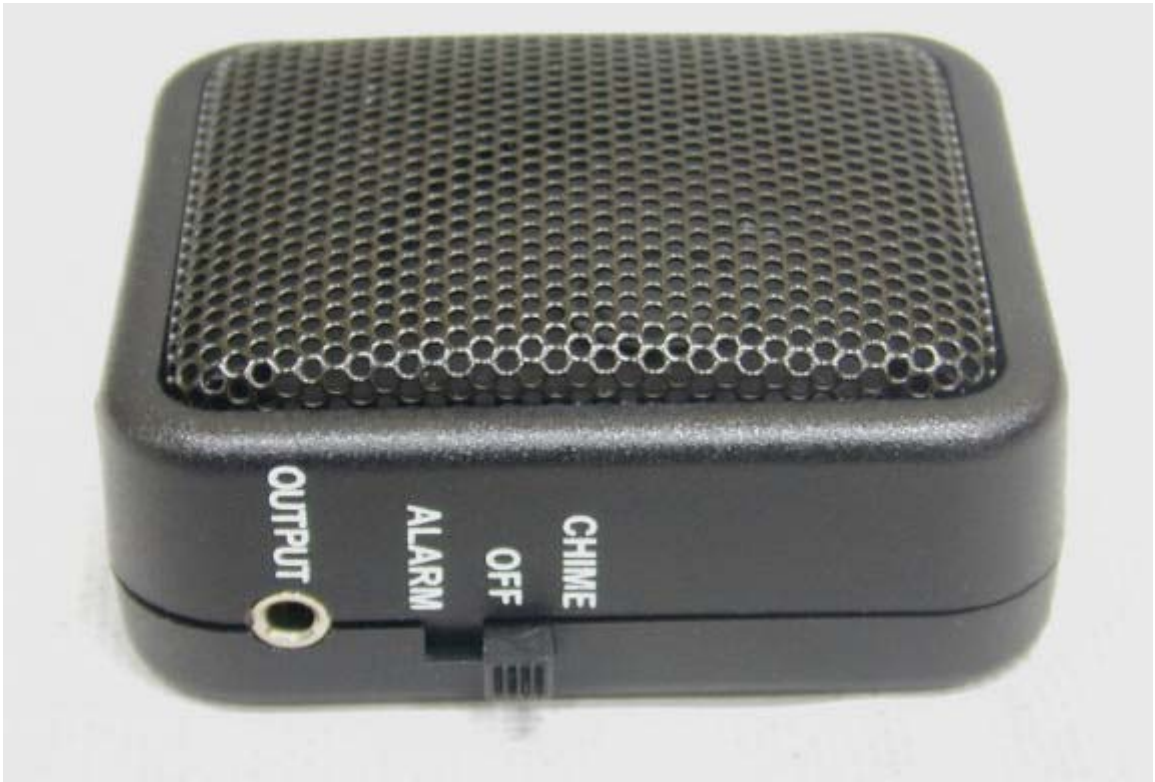
The mark should adhere to specific guidelines for appearance and location, as follows:

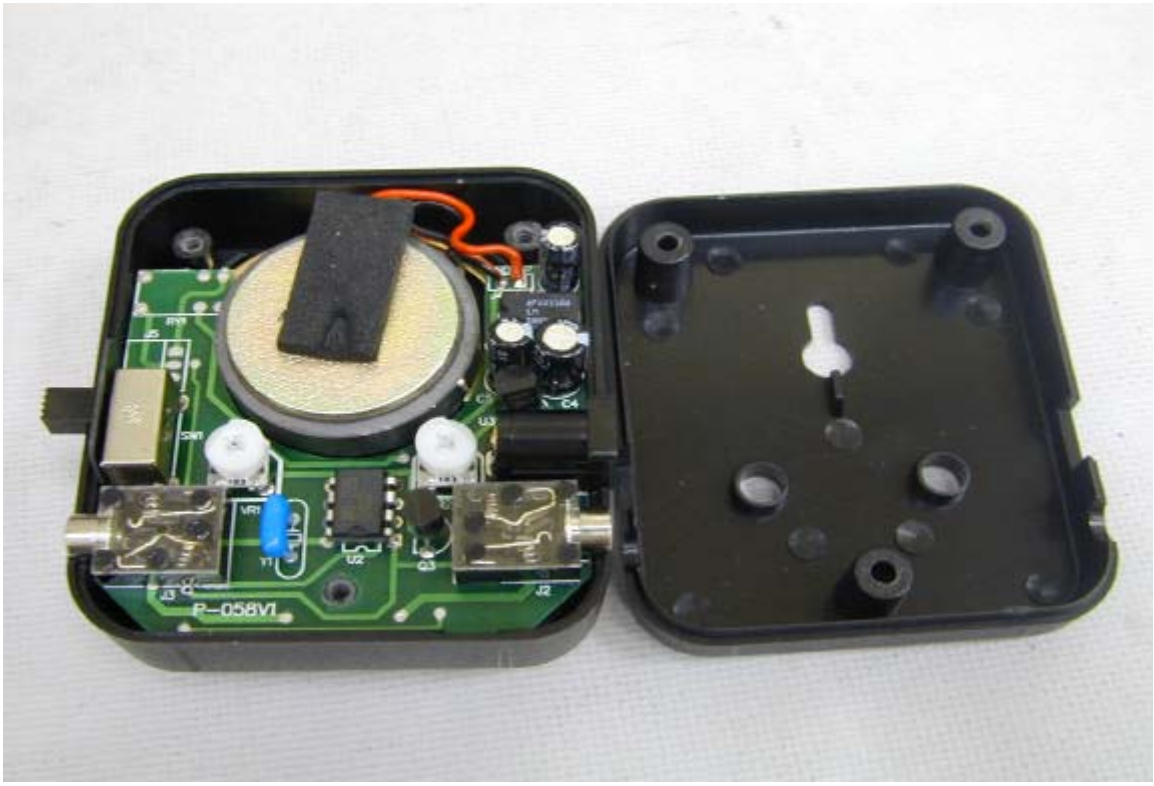
1. The mark must be placed on an external surface of the product, near the model ID; or
2. If the above is impractical, the mark should appear on the labeling, packaging, or warranty;
3. The mark must be applied by durable means such as printing, painting, or molding;
4. The mark's color should ensure its visibility and contrast; and
5. The domestic manufacturer, or its agent or importer, must be identified.

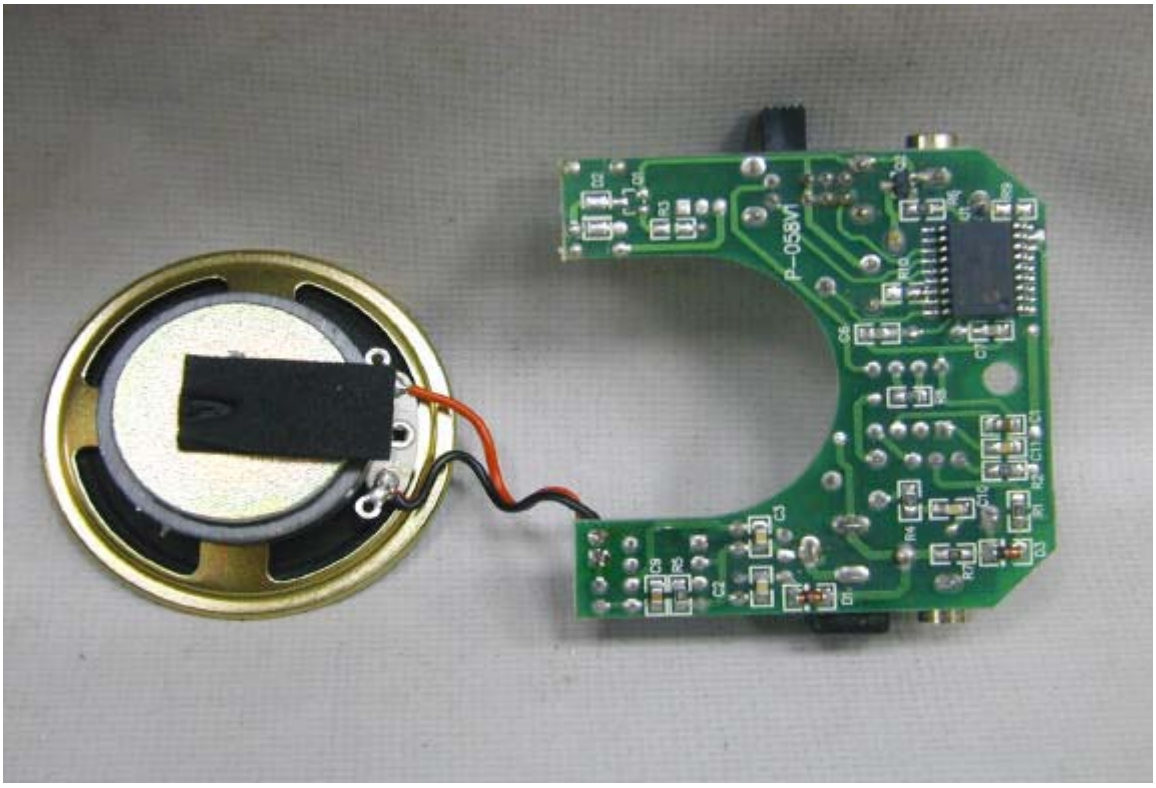
15. EUT Photographs

MODEL NO. : DES-700


DC6V
INPUT


OUTPUT
ALARM
OFF
CHIME


P-058V1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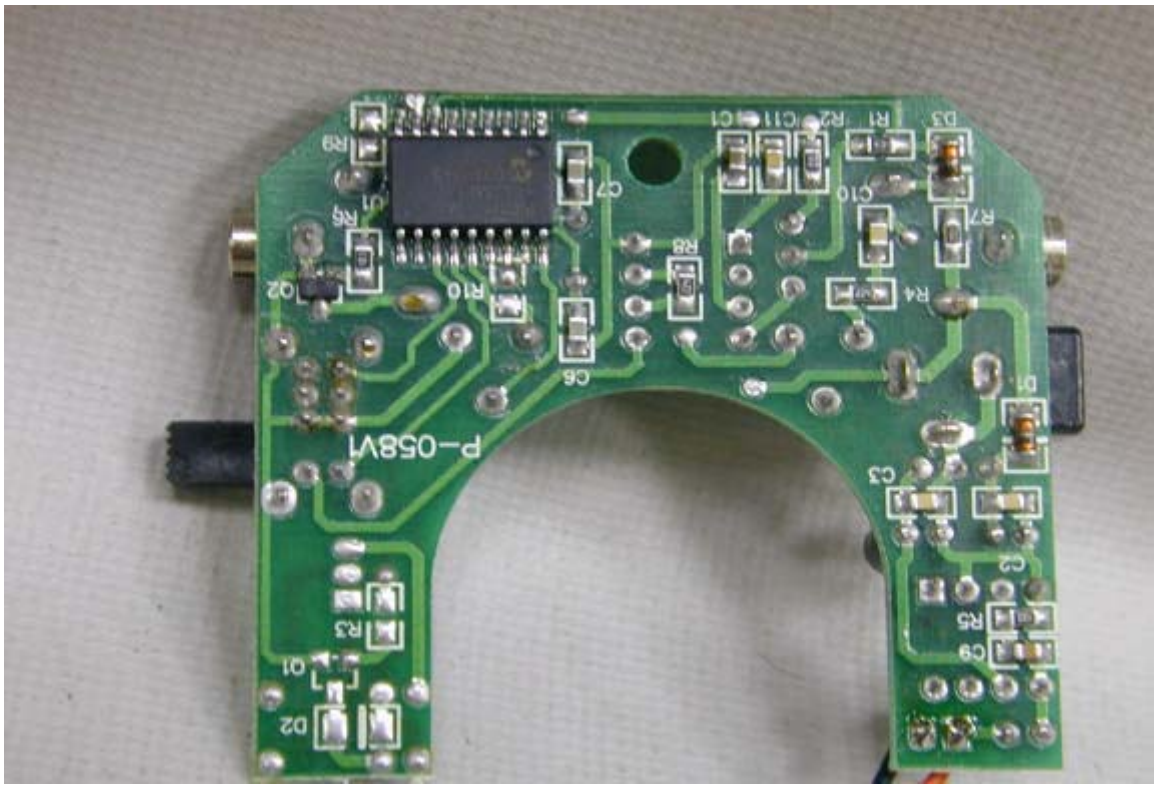
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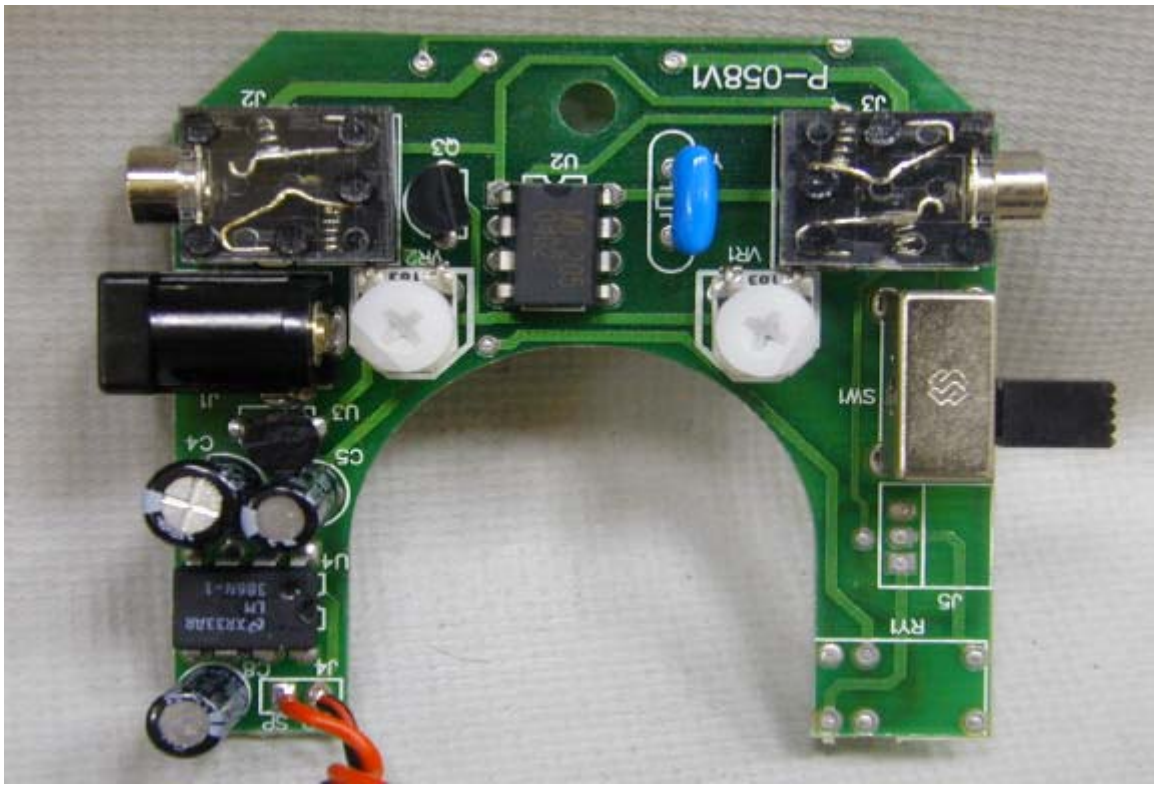
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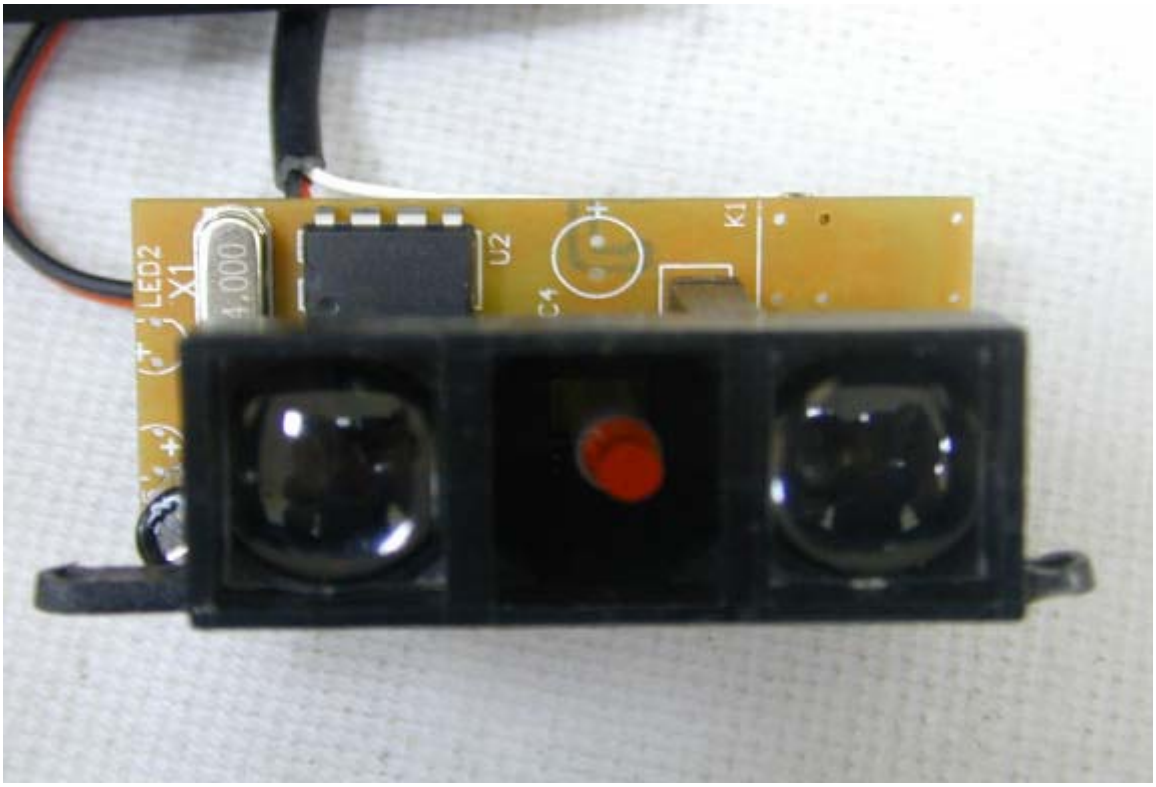
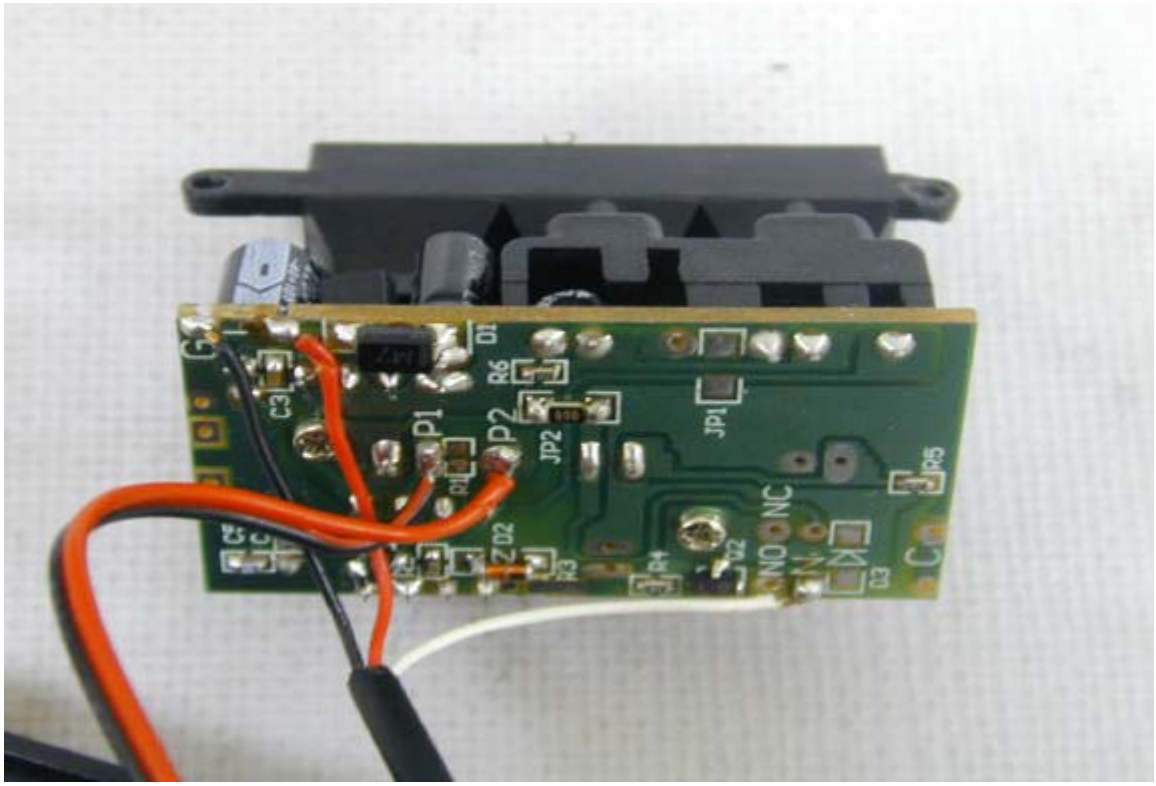
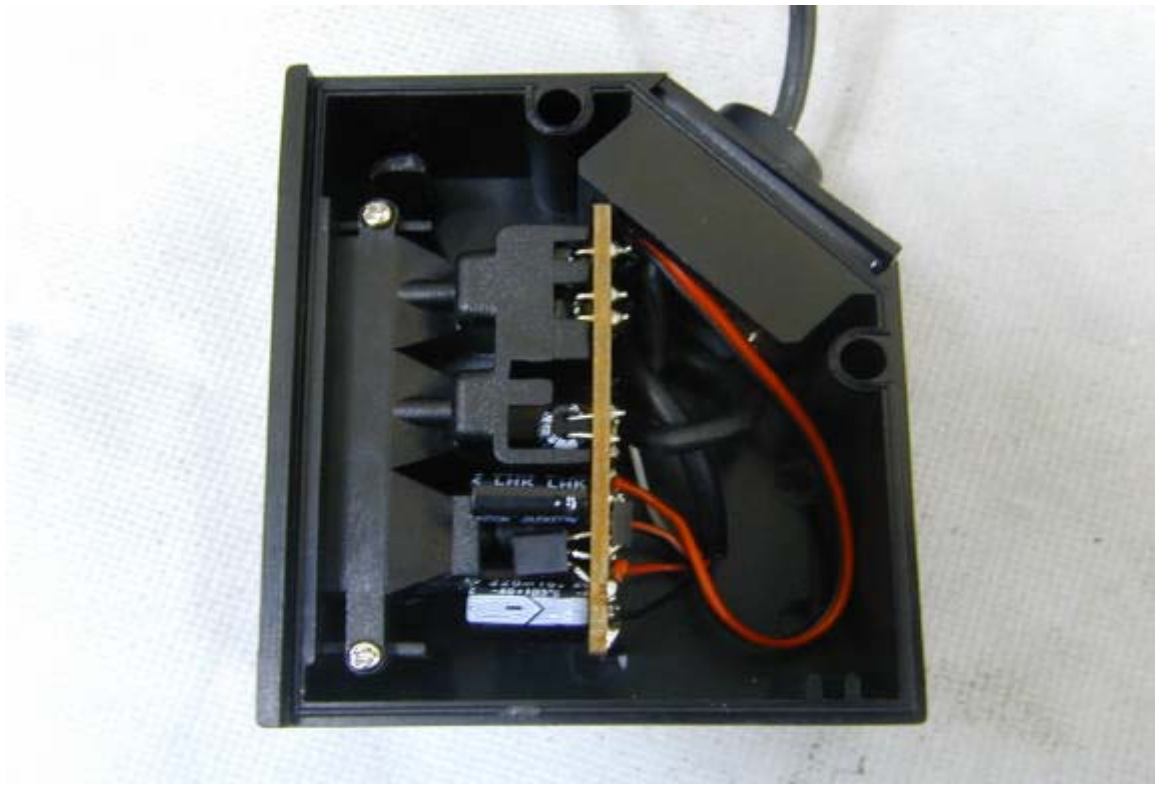

LED2
X1
U2
C1
K1


D1
R6
C3
P1
P2
JP2
JP1
NC
NO
D2
D3
R4
R5




JR1 P-057 v3
COM
COM
GND
VDD
J1

CERTIFICATE OF COMPLIANCE

APPLICANT : YUAN HSUN ELECTRIC CO., LTD.

ADDRESS : NO. 57, CHUNG HE RD., ZUO-YING DIST., KAOHSIUNG CITY 813, TAIWAN, R. O. C.

PRODUCT NAME : Door Entry Alarm System

MODEL NO. : DES-700

REPORT NO. : E920631

THIS IS TO CERTIFY, ON THE BASIS OF THE TESTS UNDERTAKEN, THE SUBMITTED SAMPLES OF THE ABOVE ITEM IS CONSIDERED TO COMPLY WITH :

AS/NZS 4251.1:1999

SIGNED FOR AND ON BEHALF OF
PEP TESTING LABORATORY

NVLAP LAB CODE: 200097-0

Peter Kao
President, NVLAP Signatory

Date : JULY 23, 2004