APPLICATION FOR IC DECLARATION OF CONFORMITY
On Behalf of

MATRIX LIGHTING LTD.

LED spot light

Model No.:	50-45GUS	50-45EUS
Serial No.:	E1103090-01/02	E1103090-02/02

Prepared For :MATRIX LIGHTING LTD.
ROOM 223-231, 2ND FL, EAST WING TSIM SHA
TSUI CENTRE, 66 MODY RD, KOWLOON TST EAST,
HONG KONG

Prepared By : Audix Technology (Shanghai) Co., Ltd.
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Report No. : ACI-I11013
Date of Test : Mar 18 – 23, 2011
Date of Report : Mar 29, 2011

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TEST REPORT FOR DECLARATION OF CONFORMITY

Applicant : MATRIX LIGHTING LTD.

Manufacturer : Zhong Shan Ban Fu Micami Toys Factory

EUT Description : LED spot light

(A) Model Number :	50-45GUS	50-45EUS
(B) Serial Number :	E1103090-01/02	E1103090-02/02
(C) Power Supply :	AC 100-120V, 60Hz	
(D) Test Voltage :	AC 120V/60Hz	

Test Procedure Used:

ICES-003, Issue4 February 2004
Digital Apparatus

The device described above is tested by Audix Technology (Shanghai) Co., Ltd. to determine the characteristics of the device. All characteristics are compared to the IC standard ICES-003 limits.

The test results are contained in this test report and Audix Technology (Shanghai) Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. This report shows that this Class B which was tested on Mar 18 – 23, 2011 complies with the Canadian standard ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shanghai) Co., Ltd.

This report shall be retained on file by the manufacturer or importer for a period of at least five years from the date of completion of the test.

Date of Test : Mar 18 – 23, 2011 Date of Report : Mar 29, 2011

Producer : Kathy Wang
KATHY WANG / Assistant

Review : Dio Yang
DIO YANG / Deputy Assistant Manager

AUDIX® For and on behalf of
Audix Technology (Shanghai) Co., Ltd.

Signatory : Sammy Chen
Authorized Signature EMC SAMMY CHEN / Deputy Manager

1 SUMMARY OF STANDARDS AND RESULTS

1.1 Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

Description / Test Item	Test Standard	Results	Meets Limit
EMISSION			
Conducted Emission	ICES-003, Issue4 February 2004	Pass	Class B
Radiated Emission	ICES-003, Issue4 February 2004	Pass	Class B

2 GENERAL INFORMATION

2.1 Description of Equipment Under Test

Description : LED spot light

Type of EUT : ☑ Production ☐ Pre-product ☐ Pro-type

Model Number :	50-45GUS	50-45EUS
Serial Number :	E1103090-01/02	E1103090-02/02

Note : The above two models are different in lamp holder and LED driver, the LED and power are the same.
After pre-test, we selected 50-45EUS to be tested and recorded in the report for it cause the worse emission than 50-45GUS.

Rated Power : 4.5W

Applicant : MATRIX LIGHTING LTD.
ROOM 223-231, 2ND FL, EAST WING TSIM SHA
TSUI CENTRE, 66 MODY RD, KOWLOON TST EAST,
KOWLOON HONG KONG

Manufacturer : Zhong Shan Ban Fu Micami Toys Factory
Sha Guo Industrial Zone, Ban Fu County ZhongShan City
Guangdong Province, China

2.2 Description of Test Facility

Site Description : The site filed on November 29, 2004 is acceptable to Industry Canada, please reference the file number IC 5484.

November 29, 2009 Renewed

Name of Firm : Audix Technology (Shanghai) Co., Ltd.

Site Location : 3 F 34 Bldg 680 Guiping Rd,
Caohejing Hi-Tech Park,
Shanghai 200233, China

Accredited by NVLAP, Lab Code: 200371-0

2.3 Measurement Uncertainty

Conducted Emission Expanded Uncertainty : U = 3.38dB
Radiated Emission Expanded Uncertainty (30MHz - 200MHz):
U = 4.58dB (Horizontal)
U = 4.70dB (Vertical)
Radiated Emission Expanded Uncertainty (200MHz - 1GHz):
U = 4.84dB (Horizontal)
U = 4.70dB (Vertical)

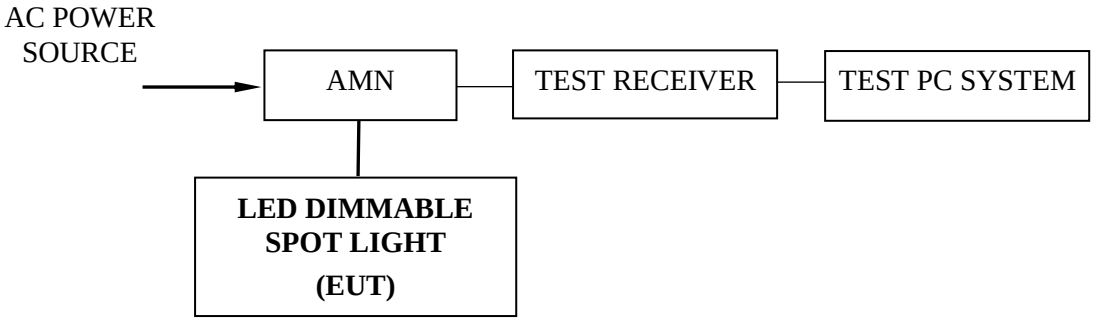
3 CONDUCTED EMISSION TEST

3.1 Test Equipment

The following test equipments are used during the conducted emission test in a shielded room:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESCI	100841	Oct 15, 2010	Oct 15, 2011
2.	Artificial Mains Network (AMN)	R&S	ESH2-Z5	843890/011	Apr 02, 2010	Apr 02, 2011
3.	50Ω Coaxial Switch	ANRITSU	MP59B	6200426389	Sep 19, 2010	Mar 19, 2011
4.	Software	Audix	E3	SET00200 9804M592	--	--

3.2 Block Diagram of Test Setup



—— : Signal Line
— : Power Line

3.3 Applicable Standard

ICES-003 (CLASS B)

3.4 Limits for Conducted Emission

Frequency Range (MHz)	Limits dB (μV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 ~ 56	56 ~ 46
0.5 ~ 5	56	46
5 ~ 30	60	50

NOTE 1 - RF Line Voltage dB (μV) = 20 lg RF Line Voltage (μV)

NOTE 2 - The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

NOTE 3 – If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is unnecessary.

3.5 EUT Configuration

The EUT (listed in Sec.2.1) was installed as shown on Sec.3.2 to meet ICES-003 (CLASS B) requirements and operating in a manner that tends to maximize its emission level in a normal application.

3.6 Operating Condition of EUT

3.6.1 Setup the EUT as shown in Sec. 3.2.

3.6.2 Turn on the power of EUT.

3.6.3 The EUT will be operated normally.

3.6.4 Set the EUT on the lighting test mode, and then test.

3.7 Test Procedures

The EUT was connected to the power mains through an Artificial Mains Network (AMN).

Both sides of AC line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables were changed or manipulated according to ICES-003 (CLASS B) during conducted test.

The IF bandwidth of Test Receiver ESCI was set at 9 kHz.

The frequency range from 150 kHz to 30 MHz for Lighting mode was checked.

The test mode (Lighting) was done on conducted test and the test results of the highest emissions are listed in Sec.3.8.

3.8 Test Results

< PASS >

The frequency and amplitude of the highest AC power line conducted emissions relative to the limit is reported. All emissions not reported below are too low against the prescribed limits.

NOTE 1 – All readings are "QP" means Quasi-Peak Values.
NOTE 2 – The worst emission is detected at 0.158 MHz with corrected signal level of 58.42 dB (μV) (limit is 65.59 dB (μV)), when the Neutral of the EUT is connected to AMN.

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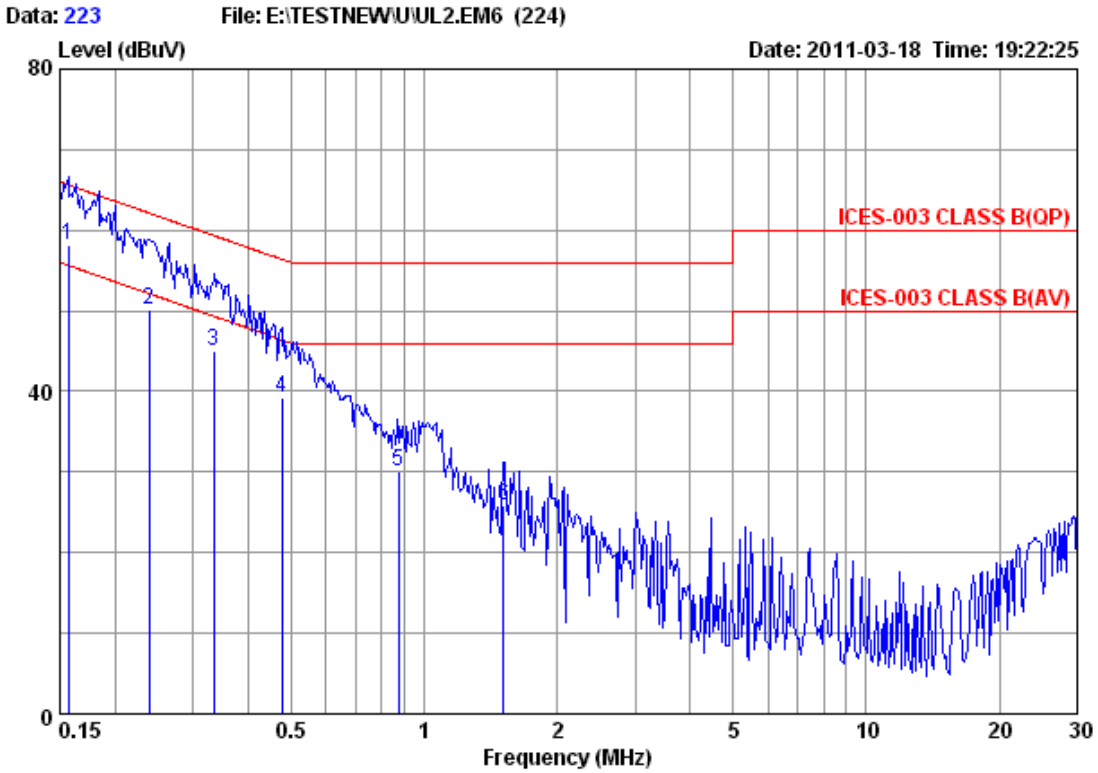
audixaci@audix.com



Site no : Audix(Shanghai) Shielded1 Data no :223
AMN : ESH2-Z5-10.04.02 AMN Phase :LINE
Limit : ICES-003 CLASS B(QP)
Env/Ins : 23'C 52%RH / ESCI Engineer :Wency
EUT : LED spot light
M/N : 50-45EUS
S/N : E1103090-02/02
Power Rating : 120V/60Hz
Test Mode : Lighting

	Freq (MHz)	AMN. Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.156	0.32	0.05	57.81	58.18	65.65	7.47	QP
2	0.239	0.30	0.11	49.70	50.11	62.13	12.02	QP
3	0.335	0.29	0.16	44.51	44.96	59.34	14.38	QP
4	0.477	0.29	0.22	38.80	39.31	56.39	17.08	QP
5	0.874	0.30	0.24	29.49	30.03	56.00	25.97	QP
6	1.510	0.32	0.25	25.20	25.77	56.00	30.23	QP

Remarks:1.Emission Level= AMN Factor + Cable Loss + Reading.
2.If the average limit is met when using a quasipeak detector the EUT shall be deemed to meet both limits and measurement with averavge detector is unnecessary.

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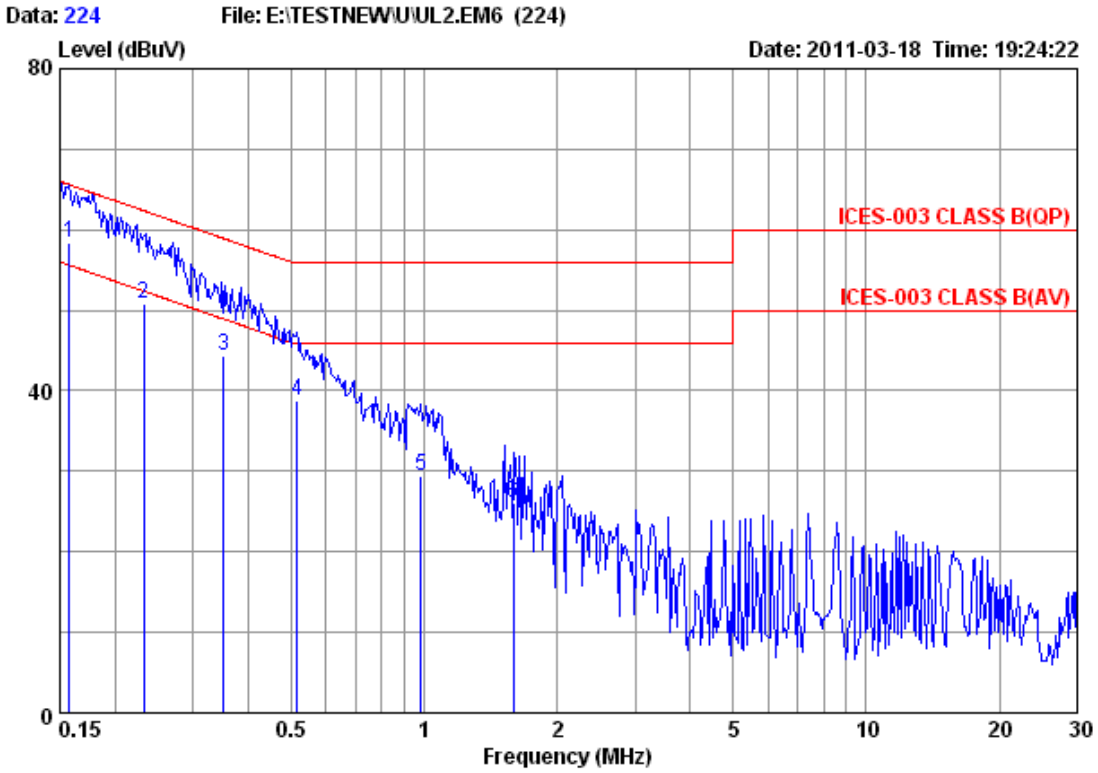


Site no : Audix(Shanghai) Shielded1 Data no :224
AMN : ESH2-Z5-10.04.02 AMN Phase :NEUTRAL
Limit : ICES-003 CLASS B(QP)
Env/Ins : 23'C 52%RH / ESCI Engineer :Wency
EUT : LED dimmable spot light
M/N : LED spot light
S/N : 50-45EUS
Power Rating : 120V/60Hz
Test Mode : Lighting

	Freq (MHz)	AMN. Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV)	Limits (dBuV)	Margin (dB)	Remark
1	0.158	0.26	0.06	58.10	58.42	65.59	7.17	QP
2	0.233	0.23	0.11	50.39	50.73	62.36	11.63	QP
3	0.351	0.24	0.17	43.91	44.32	58.94	14.62	QP
4	0.516	0.26	0.23	38.20	38.69	56.00	17.31	QP
5	0.984	0.27	0.24	28.90	29.41	56.00	26.59	QP
6	1.594	0.30	0.25	25.50	26.05	56.00	29.95	QP

Remarks:1.Emission Level= AMN Factor + Cable Loss + Reading.
2.If the average limit is met when using a quasipeak detector the EUT shall be deemed to meet both limits and measurement with averavge detector is unnecessary.

RADIATED EMISSION TEST

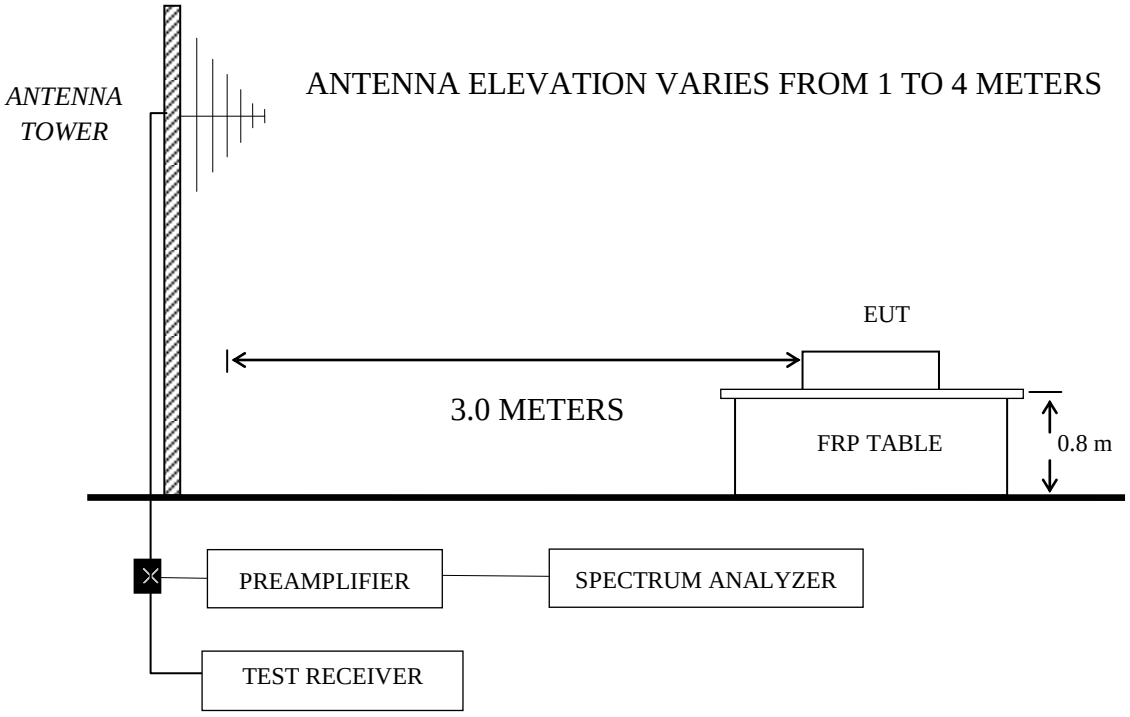
4.1 Test Equipment

The following test equipment are used during the radiated emission test in a semi-anechoic chamber:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Test Receiver	R&S	ESVS10	844594/001	Mar 07, 2011	Mar 07, 2012
2.	Preamplifier	Agilent	8447D	2944A10548	Mar 19, 2011	Sep 19, 2011
3.	Bi-log Antenna	TESEQ	CBL6112D	23192	Dec 01, 2011	Dec 01, 2012
4.	Spectrum	Agilent	E7405A	MY45106600	Mar 22, 2011	Mar 22, 2012
5.	Software	Audix	E3	SET00200 9912M295-2	--	--

4.2 Block Diagram of Test Setup

4.2.1 Test Setup



⊠ : 50 ohm Coaxial Switch

4.3 Applicable Standard

ICES-003 (CLASS B)

4.4 Radiated Emission Limit

Frequency (MHz)	Distance (m)	Field Strength Limits dB(μV/m)	Converted Field Strength Limits By 3 Meters Measuring Distance dB(μV/m)
30 ~ 230	10	30	40
230 ~ 1000	10	37	47

NOTE 1 - The tighter limit applies at the edge between two frequency bands.

NOTE 2 – Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

NOTE 3 – Audix Technology (Shanghai) Co., Ltd. Only has a 3 meters Semi-anechoic Chamber to do the radiated test, therefore, Audix Shanghai used 3 meters measuring distance and converted limits to judge the EUT compliance with or not.

4.5 Test Configuration

The configuration of the EUT is same as those used in conducted emission test. Please refer to Sec.3.5.

4.6 Operating Condition of EUT

Same as conducted emission test which is listed in Sec.3.6, except the test setup replaced by Sec.4.2.

4.7 Test Procedures

The EUT was placed upon a FRP turntable 0.8 m above the horizontal metal ground plane. The FRP turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on an antenna tower. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (Calibrated Bilog Antenna) or dipole antenna was used as receiving antenna. Both horizontal and vertical polarization of the antenna was set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to ICES-003 (CLASS B) requirements during radiated test.

The IF bandwidth setting on Test Receiver ESVS10 was 120 kHz.

The frequency range from 30 MHz to 1000 MHz was checked.

The test modes were done on radiated emission test and all the test results are listed in Sec. 4.8.

4.8 Test Results

<PASS>

The frequency and amplitude of the highest radiated emission relative the limit is reported. All the emissions not reported below are too low against the ICES limit.

NOTE 1 – All reading are Quasi-Peak values.

NOTE 2 – 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

NOTE 3 – The worst emission at horizontal polarization was detected at 434.490 MHz with corrected signal level of 32.01 dB (μV/m) (limit is 47.00 dB (μV/m)), when the antenna was 1.00m height and the FRP turntable was at 320°. The worst emission at vertical polarization was detected at 58.130 MHz with corrected signal level of 29.74 dB (μV/m) (limit is 40.00 dB (μV/m)), when the antenna was 1.00 m height and the FRP turntable was at 77°.

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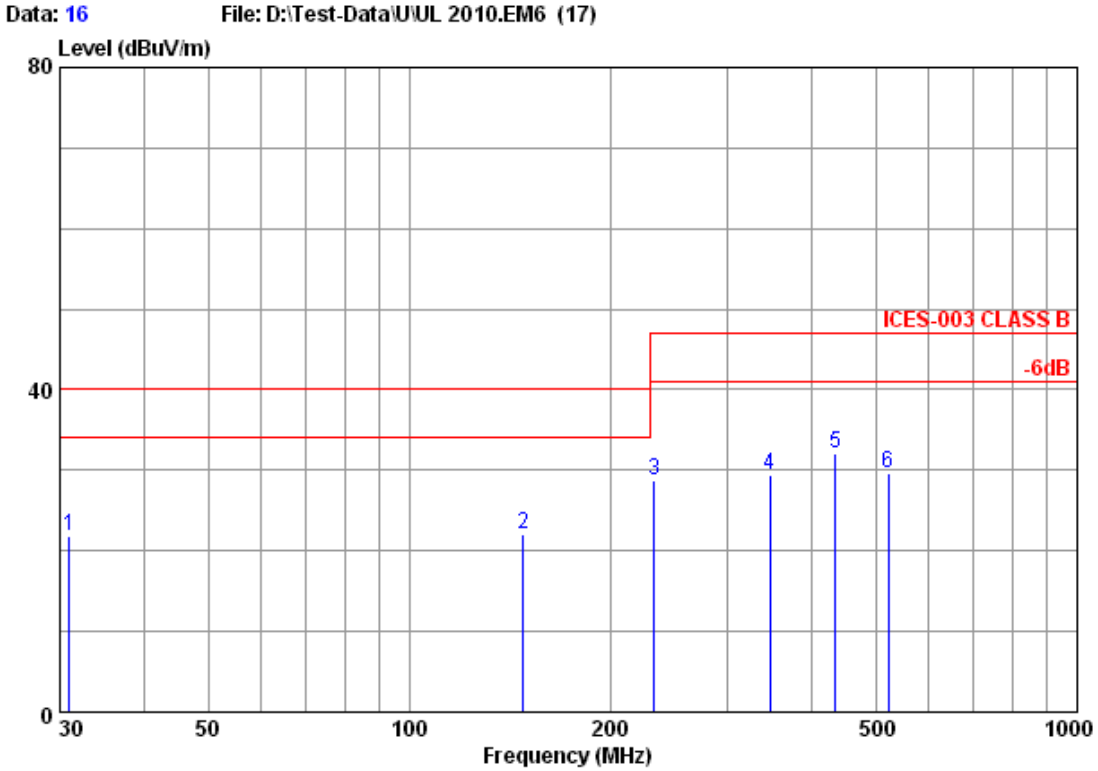

Site no :Audix ACI (3m Chamber)
Dis. / Ant. :3m /CBL 6112D-2010.12.01
Limit :ICES-003 CLASS B
Env. / Ins. :22'C 60%RH/ ESVS 10
EUT :LED spot light
M/N :50-45EUS
S/N :E1103090-02/02
Power Rating:120V/60Hz
Test Mode :Lighting

Data no. :16
Ant. pol. :HORIZONTAL
Engineer :Raven

	Freq. (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
1	30.970	17.78	0.81	3.17	21.76	40.00	18.24
2	148.340	10.44	2.22	9.38	22.04	40.00	17.96
3	232.730	11.19	2.55	15.02	28.76	47.00	18.24
4	347.190	15.04	2.88	11.51	29.43	47.00	17.57
5	434.490	16.74	3.08	12.19	32.01	47.00	14.99
6	521.790	17.73	3.31	8.58	29.62	47.00	17.38

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

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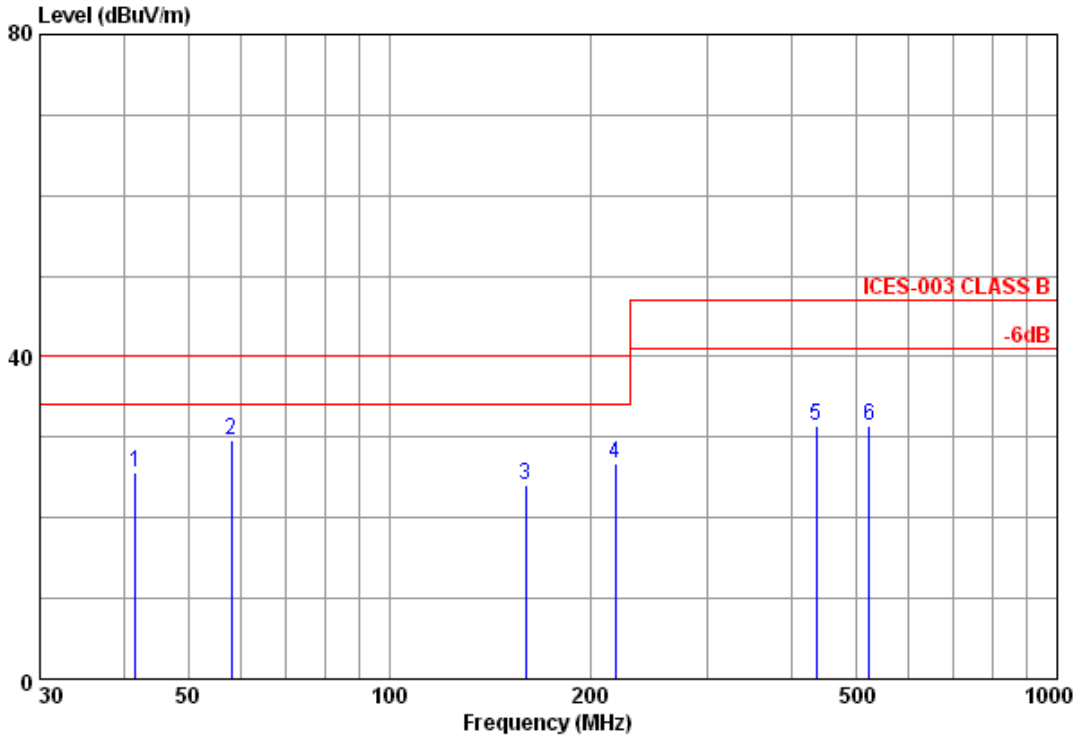
Data: 17 File: D:\Test-Data\U\UL 2010.EM6 (17)



Site no :Audix ACI (3m Chamber)
Dis. / Ant. :3m /CBL 6112D-2010.12.01 Data no. :17
Limit :ICES-003 CLASS B Ant. pol. :VERTICAL
Env. / Ins. :22'C 60%RH/ ESVS 10 Engineer :Raven
EUT :LED spot light
M/N :50-45EUS
S/N :E1103090-02/02
Power Rating:120V/60Hz
Test Mode :Lighting

	Freq. (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
1	41.640	11.78	0.88	12.91	25.57	40.00	14.43
2	58.130	9.02	1.14	19.58	29.74	40.00	10.26
3	159.980	10.25	2.27	11.51	24.03	40.00	15.97
4	218.180	10.52	2.50	13.81	26.83	40.00	13.17
5	436.430	16.79	3.09	11.53	31.41	47.00	15.59
6	523.730	17.74	3.31	10.40	31.45	47.00	15.55

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

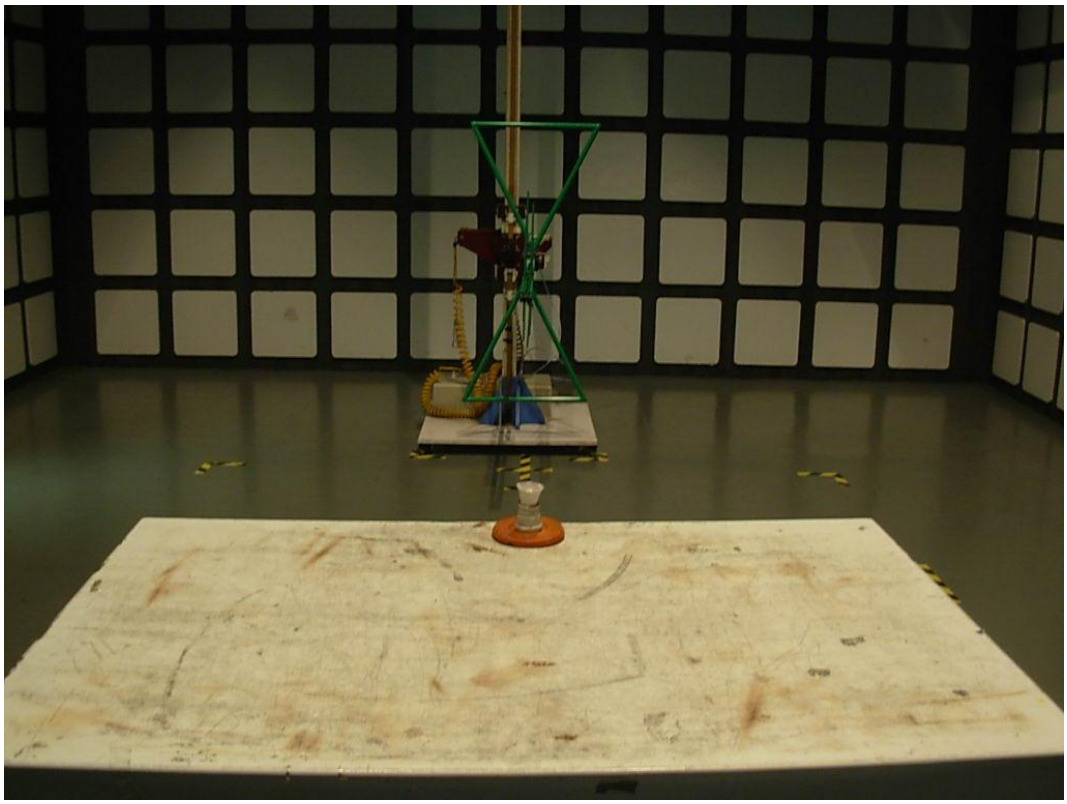
5 DEVIATION TO TEST SPECIFICATIONS

None.

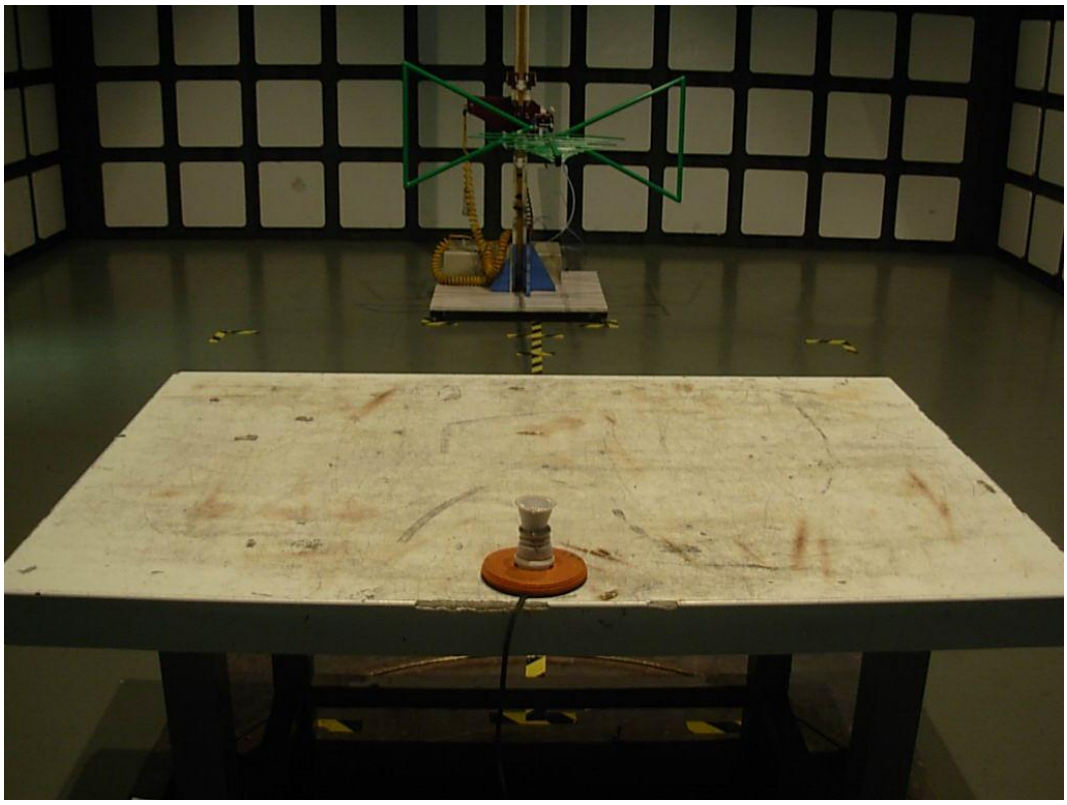
6 PHOTOGRAPH

6.1 Conducted Emission Test

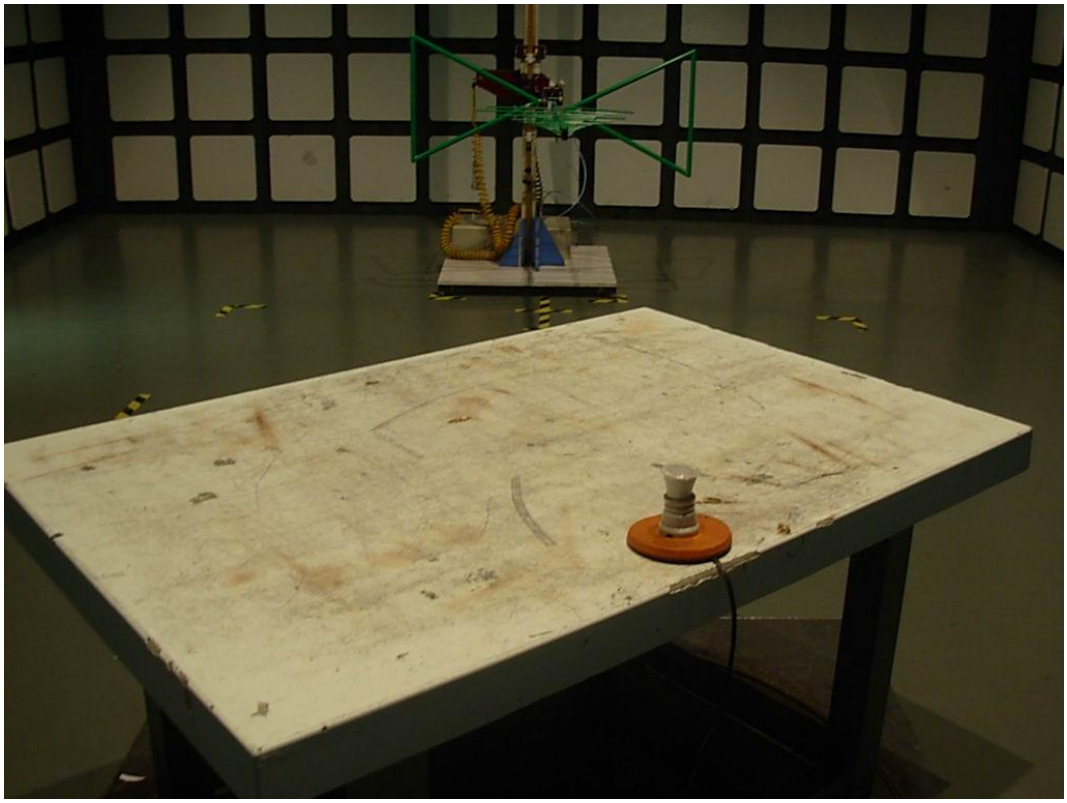
6.2 Radiated Emission Test



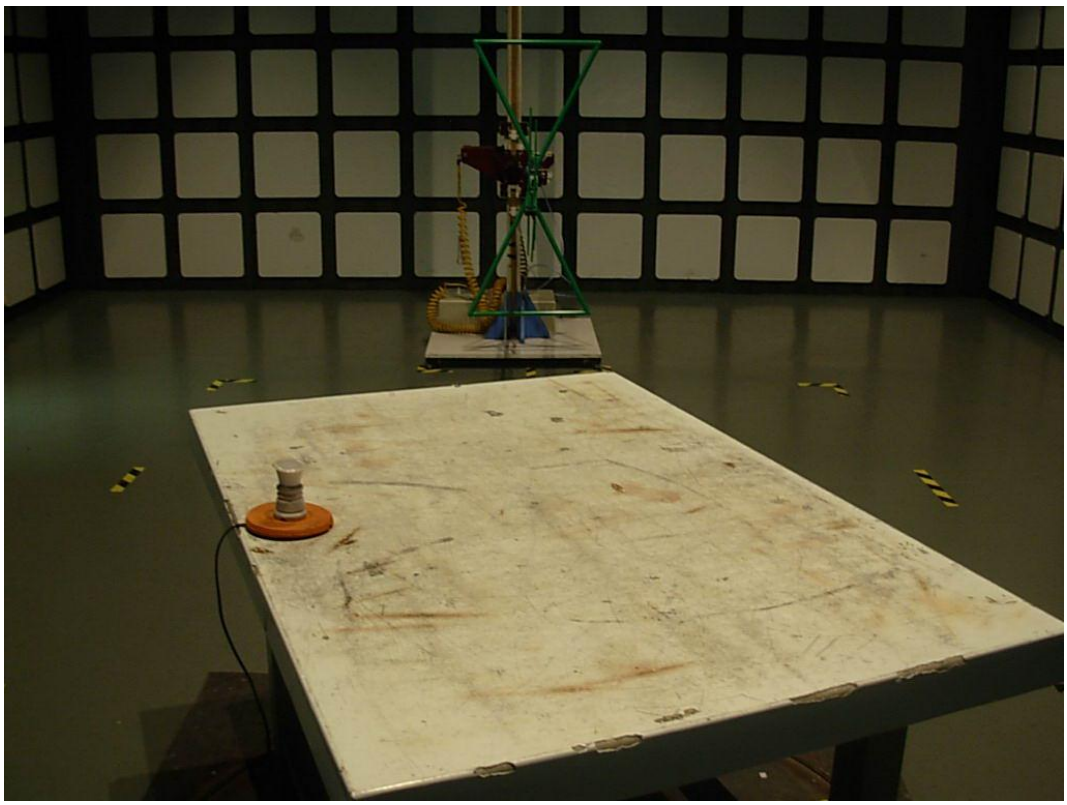
FRONT VIEW OF RADIATED EMISSION



BACK VIEW OF RADIATED EMISSION



SETUP WITH MAXIMUM DETECTED EMISSION AT HORIZONTAL POLARIZATION



SETUP WITH MAXIMUM DETECTED EMISSION AT VERTICAL POLARIZATION

APPENDIX

PHOTOGRAPHS OF EUT

FIGURE 1.
LED SPOT LIGHT (M/N: 50-45GUS)
GENERAL APPEARANCE

FIGURE 2.
LED SPOT LIGHT (M/N: 50-45GUS)
COVER REMOVED

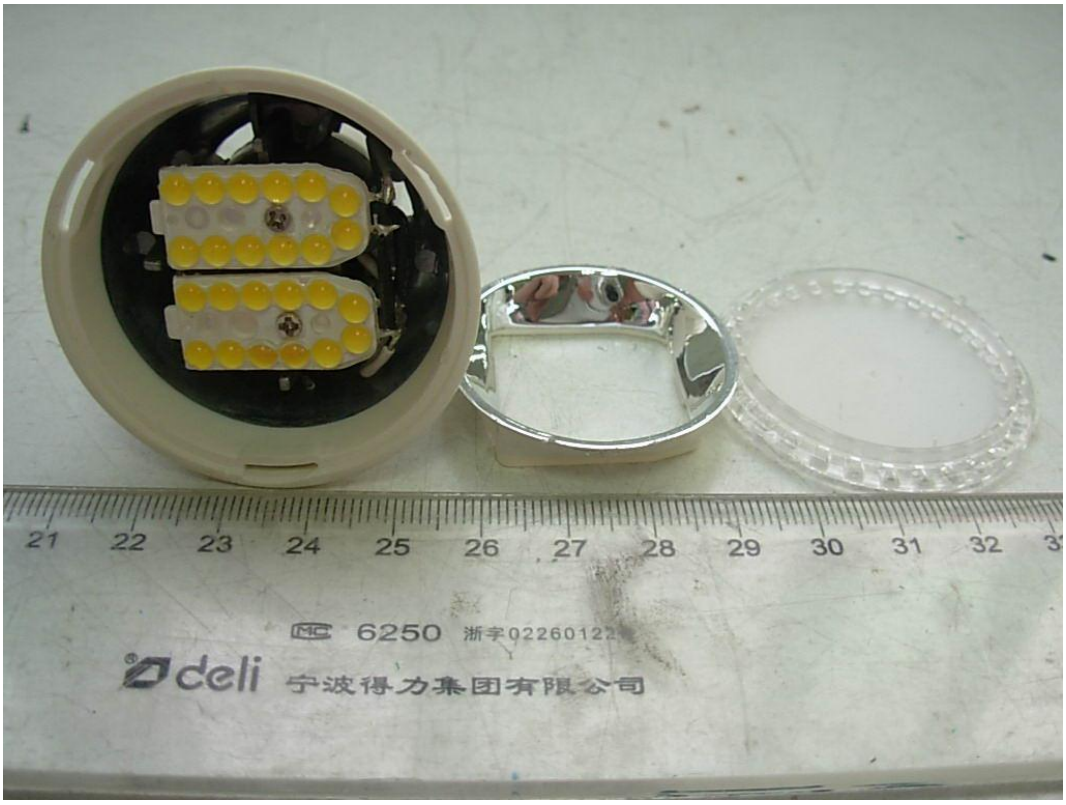


FIGURE 3.
LED SPOT LIGHT (M/N: 50-45GUS)
LED PCB

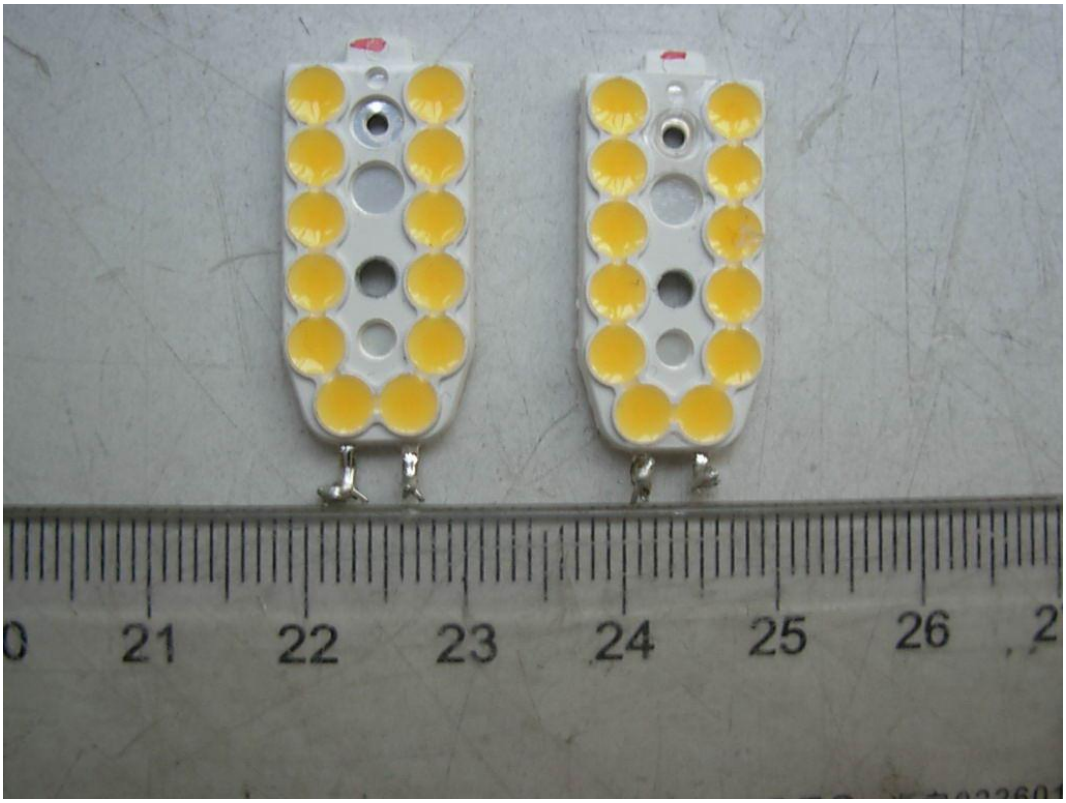


FIGURE 4.
LED SPOT LIGHT (M/N: 50-45GUS)
MAIN BOARD REMOVED

FIGURE 5.
LED SPOT LIGHT (M/N: 50-45GUS)
MAIN BOARD (COMPONENT VIEW)

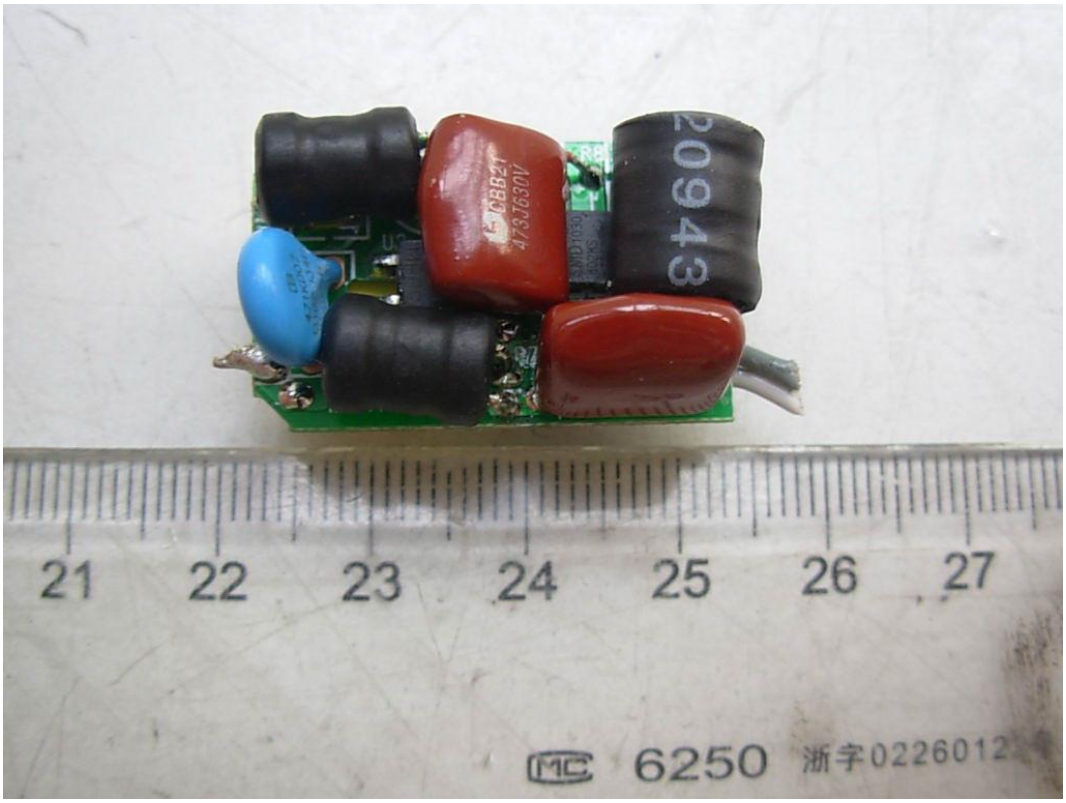


FIGURE 6.
LED SPOT LIGHT (M/N: 50-45GUS)
MAIN BOARD (SOLDERED VIEW)

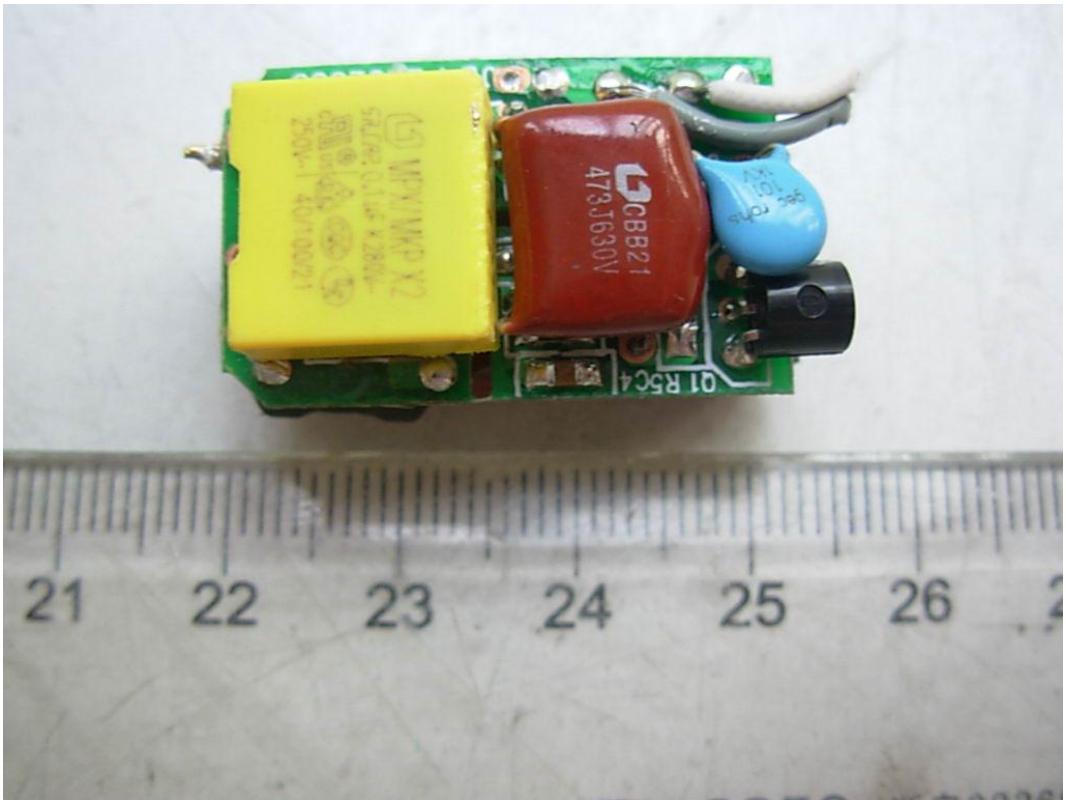


FIGURE 7.
LED SPOT LIGHT (M/N: 50-45EUS)
GENERAL APPEARANCE

FIGURE 8.
LED SPOT LIGHT (M/N: 50-45EUS)
COVER REMOVED

FIGURE 9.
LED SPOT LIGHT (M/N: 50-45EUS)
LED PCB

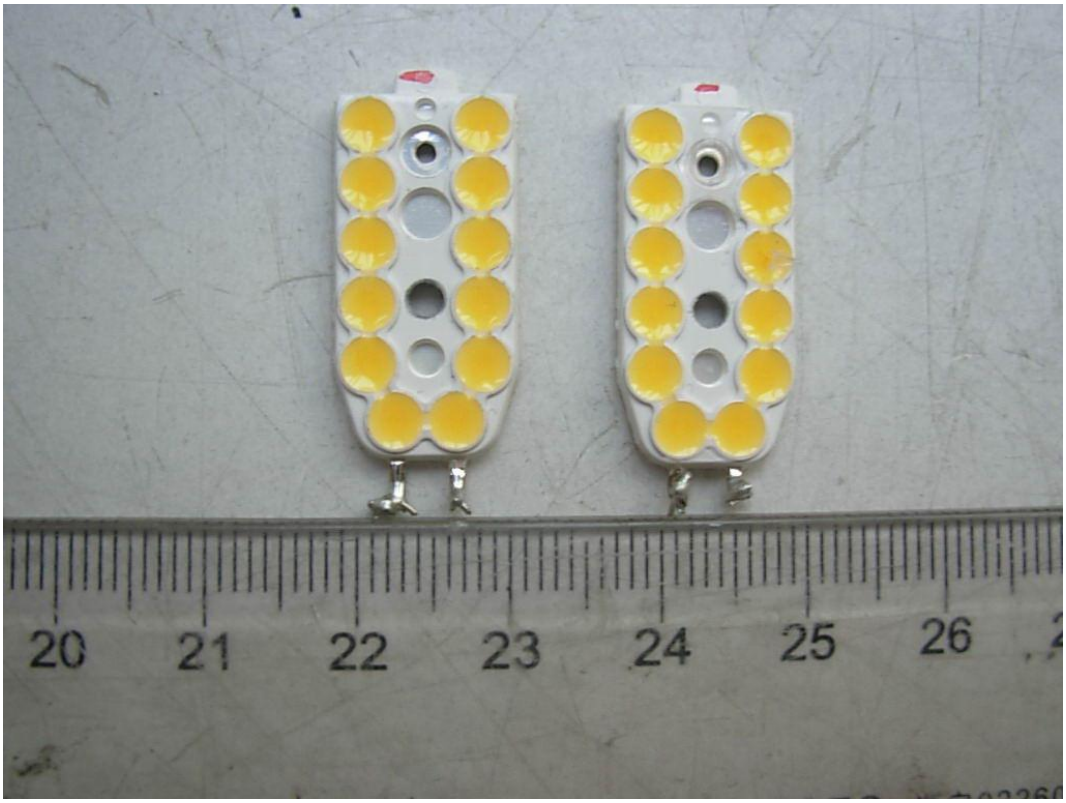


FIGURE 10.
LED SPOT LIGHT (M/N: 50-45EUS)
MAIN BOARD REMOVED

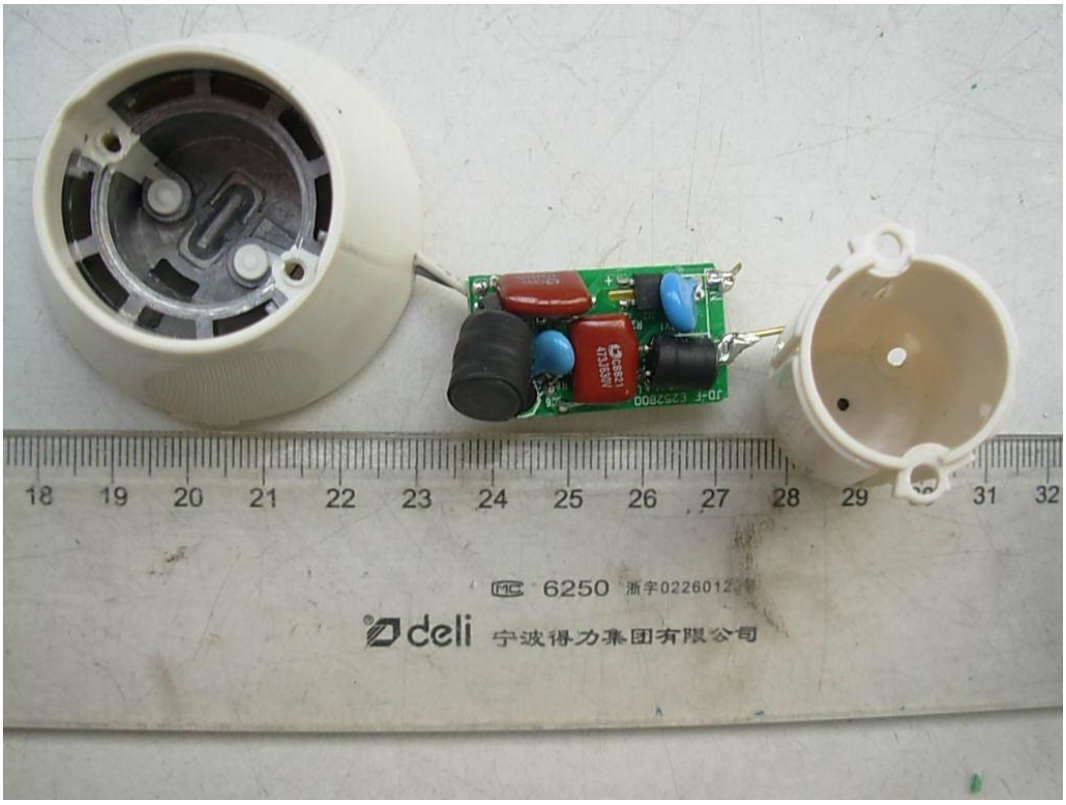


FIGURE 11.
LED SPOT LIGHT (M/N: 50-45EUS)
MAIN BOARD (COMPONENT VIEW)

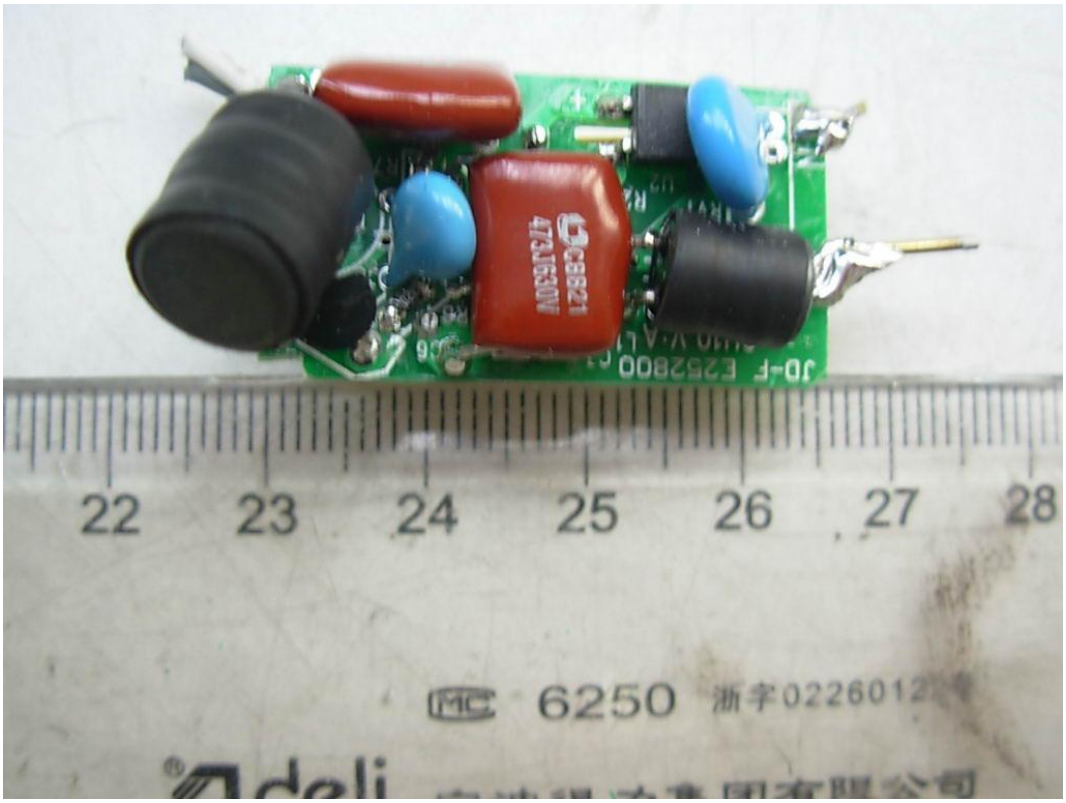


FIGURE 12.
LED SPOT LIGHT (M/N: 50-45EUS)
MAIN BOARD (SOLDERED VIEW)