

CE EMC Test Report



(Declaration of Conformity)

For

Electromagnetic Interference

Of

Product: LED Lamp (Ceiling Lamp)

Trade Name: N/A

Model Number: MX82008-20A, MX1163-3, MX1167-6+3A,
MP82008-30A, MP8525-6B

Prepared for

JIANGMEN BAOTIAN LIGHTING CO., LTD.

Nange Industrial Zone, Hetang Town, Jiangmen City,
Guangdong Province, China

Prepared by

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TEST RESULT CERTIFICATION

Applicant's name : JIANGMEN BAOTIAN LIGHTING CO., LTD.
Address : Nange Industrial Zone, Hetang Town, Jiangmen City,
Guangdong Province, China

Manufacturer's Name : JIANGMEN BAOTIAN LIGHTING CO., LTD.
Address : Nange Industrial Zone, Hetang Town, Jiangmen City,
Guangdong Province, China

Product description

Product name : LED Lamp (Ceiling Lamp)
Model and/or type reference : MX82008-20A, MX1163-3, MX1167-6+3A, MP82008-30A,
MP8525-6B
EN 55015:2013
EN 61547:2009

Standards : EN 61000-3-2:2006+A1:2009+A2:2009
EN 61000-3-3:2013

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with the 2014/30/EU requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test

Date (s) of performance of tests : 26 Dec. 2014 ~07 Jan. 2015

Date of Issue..... : 07 Jan. 2015

Test Result..... : **Pass**

Testing Engineer : Brews Xu
(Brews Xu)

Technical Manager : Eileen Liu
(Eileen Liu)

Authorized Signatory : Bin
(Bill Yao)



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1. TEST SUMMARY

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
EN 55015:2013	Conducted Emission	-----	PASS	
	Radiated Emission	-----	PASS	
EN 61000-3-2:2006+A1:2009+A2:2009	Harmonic Current Emission	Class C	PASS	
EN 61000-3-3:2013	Voltage Fluctuations & Flicker	-----	N/A NOTE (1)	
EMC Immunity				
Section EN 61547:2009	Test Item	Performance Criteria	Judgment	Remark
EN 61000-4-2:2009	Electrostatic Discharge	B	PASS	
EN 61000-4-3:2006+A1:2009	RF electromagnetic field	A	PASS	
EN 61000-4-4:2012	Fast transients	B	PASS	
EN 61000-4-5:2006	Surges	C	PASS	
EN 61000-4-6:2014	Injected Current	A	PASS	
EN 61000-4-8:2010	Power Frequency Magnetic Field	A	PASS	
EN 61000-4-11:2004	Volt. Interruptions Volt. Dips	B / C NOTE (2)	PASS	

NOTE:

- (1) According to EN61000-3-3, no limits shall apply to lamps. And P_{st} and P_{it} evaluations are required only for lighting equipment which is likely to produce flicker; for example: disco lighting and automatically regulated equipment.
- (2) Voltage dip: 100% reduction – Performance Criteria **B**
Voltage dip: 30% reduction – Performance Criteria **C**
- (2) "N/A" denotes test is not applicable in this Test Report.
- (4) For client's request and manual description, the test will not be executed.

1.1 TEST FACILITY

NTEK Testing Technology Co., Ltd.

Add. : 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.

FCC Registration Number: 238937; IC Registration Number: 9270A-1

CNAS Registration Number: L5516

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U , (dB)	NOTE
NTEKC01	ANSI	9 kHz ~ 30MHz	3.6	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	U , (dB)	NOTE
NTEKA01	ANSI	30MHz ~ 1000MHz	4.8	
		1GHz ~6GHz	4.5	

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	LED Lamp (Ceiling Lamp)	
Model Name.	MX82008-20A	
Additional Model Number(s)	MX1163-3, MX1167-6+3A, MP82008-30A, MP8525-6B	
Model Difference	All models are identical except appearance, LED quantity and drive output parameter.	
Product Description	The EUT is a LED Lamp (Ceiling Lamp).	
	Operating frequency:	N/A
	Connecting I/O port:	N/A
	Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as a Lighting Device. More details of EUT technical specifications, please refer to the User's Manual.	
Power Source	AC Voltage	
Power Rating	AC 220-240V, 50/60Hz, 36.5W, 0.156A	

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Lighting

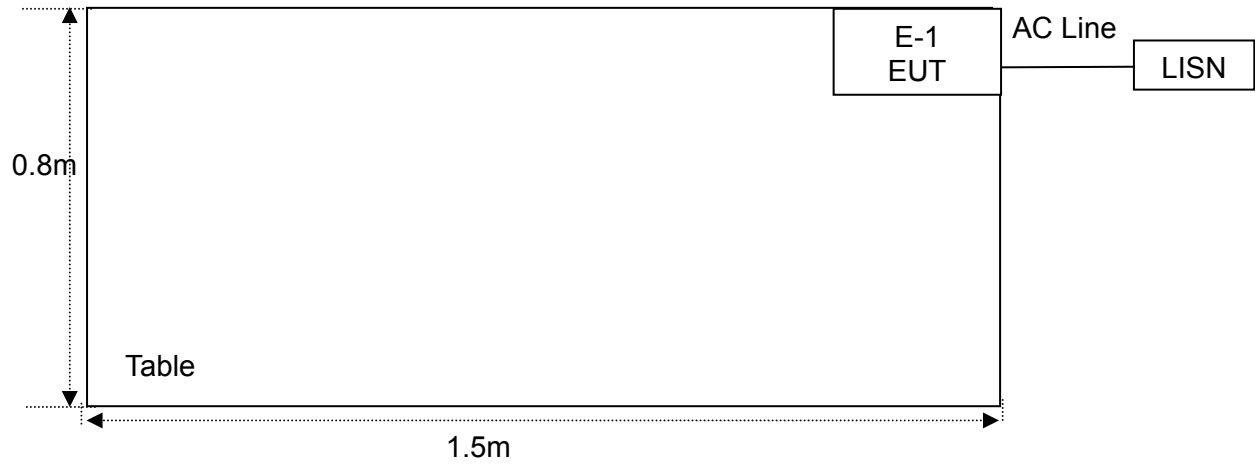
For Conducted Test	
Final Test Mode	Description
Mode 1	Lighting

For Radiated Test	
Final Test Mode	Description
Mode 1	Lighting

For EMS Test	
Final Test Mode	Description
Mode 1	Lighting

2.3 DESCRIPTION OF TEST SETUP

Mode CE: Lighting



2.4 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Brand	Model/Type No.	Series No.	Note
E-1	LED Lamp (Ceiling Lamp)	N/A	MX82008-20A	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” means “shielded” “with core”; “NO” means “unshielded” “without core”.

2.5 MEASUREMENT INSTRUMENTS LIST

2.5.1 CONDUCTED TEST SITE

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	LISN	R&S	ENV216	101313	Jul. 06, 2014	Jul. 06, 2015	1 year
2	50Ω Switch	ANRITSU CORP	MP59B	6200983704	Jun. 16, 2014	Jun. 15, 2015	1 year
3	Test Cable	N/A	C01	N/A	Jun. 16, 2014	Jun. 15, 2015	1 year
4	Test Cable	N/A	C03	N/A	Jun. 16, 2014	Jun. 15, 2015	1 year
5	EMI Test Receiver	R&S	ESCI	101160	Jun. 16, 2014	Jun. 15, 2015	1 year
6	Triple-Loop Antenna	EVERFINE	LIA-2	11020003	Jun. 18, 2014	Jun. 17, 2015	1 year

2.5.2 RADIATED TEST SITE

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Bilog Antenna	TESEQ	CBL6111D	31216	Jun. 16, 2014	Jun. 15, 2015	1 year
2	Test Cable	N/A	R-01	N/A	Jun. 16, 2014	Jun. 15, 2015	1 year
3	EMI Test Receiver	R&S	ESCI-7	101318	Jun. 16, 2014	Jun. 15, 2015	1 year
4	Antenna Mast	EM	SC100_1	N/A	N/A	N/A	N/A
5	Turn Table	EM	SC100	060531	N/A	N/A	N/A
6	50Ω Switch	Anritsu Corp	MP59B	6200983705	Jun. 16, 2014	Jun. 15, 2015	1 year

2.5.3 HARMONICS AND FLICKERS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Harmonic & Flicker	EM TEST	DPA500	0303-04	Jun. 18, 2014	Jun. 17, 2015	1 year
2	AC Power Source	EM TEST	ACS500	0203-01	Jun. 18, 2014	Jun. 17, 2015	1 year

2.5.4 ESD

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	ESD TEST GENERATOR	SCHAFFNER	NSG438	859	Jun. 16, 2014	Jun. 15, 2015	1 year

2.5.5 RS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Signal Generator	R&S	SMT 06	832080/007	Jul. 24, 2014	Jul. 23, 2015	1 year

2	Log-Bicon Antenna	Schwarzbeck	VULB9161	4022	Aug. 15, 2014	Aug. 14, 2015	1 year
3	Power Amplifier	AR	150W1000M1	320946	Sep. 21, 2014	Sep. 20, 2015	1 year
4	Microwave Horn Antenna	AR	AT4002A	321467	Jun. 11, 2014	Jun. 10, 2015	1 year
5	Power Amplifier	AR	25S1G4A	308598	Sep. 21, 2014	Sep. 20, 2015	1 year

2.5.6 SURGE, EFT/BURST, VOLTAGE INTERRUPTION/DIPS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Surge Generator	EVERFINE	EMS61000-5A	1101002	Jun. 16, 2014	Jun. 15, 2015	1 year
2	DIPS Generator	EVERFINE	EMS61000-11 K	1011002	Jun. 16, 2014	Jun. 15, 2015	1 year
3	EFT/B Generator	EVERFINE	EMS61000-4A-V2	1012005	Jun. 16, 2014	Jun. 15, 2015	1 year

2.5.7 INJECTION CURRENT

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Power Amplifier 80W 150kHz-230 MHz	TESEQ	2023A	CBA230M-080	Oct. 30, 2014	Oct. 29, 2015	1 year
2	Coupling and Decoupling Network	TESEQ	75A250AM1	CDN M016S	Oct. 30, 2014	Oct. 29, 2015	1 year
3	Attenuator	TESEQ	FCC-801-M2	ATN 6075	Oct. 30, 2014	Oct. 29, 2015	1 year
4	RF Cable	TESEQ	F-203I-23MM	RF Cable	Oct. 30, 2014	Oct. 29, 2015	1 year

2.5.8 MF

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Generator	EVERFINE	EMS61000-8K	1007001	Jun. 16, 2014	Jun. 15, 2015	1 year

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 9kHz-30MHz)

FREQUENCY (MHz)	Limits(dBμV)	
	Quasi-peak	Average
0.009-0.05	110	/
0.05-0.15	90 - 80 *	/
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

3.1.2 LOAD TERMINAL CONDUCTED EMISSION (Frequency Range 150kHz-30MHz)

FREQUENCY (MHz)	Limits(dBμV)	
	Quasi-peak	Average
0.15 -0.5	80	70
0.50 -30.0	74	64

Note:

- (1) The tighter limit applies at the band edges.
- (2) Based on our laboratory conditions, this test is not performed.

3.1.3 CONTROL TERMINAL CONDUCTED EMISSION (Frequency Range 150kHz-30MHz)

FREQUENCY (MHz)	Limits(dBμV)	
	Quasi-peak	Average
0.15 -0.5	84 - 74*	74 - 64*
0.50 -30.0	74	64

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.
- (3) Based on our laboratory conditions, this test is not performed.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.009 MHz
Stop Frequency	30 MHz

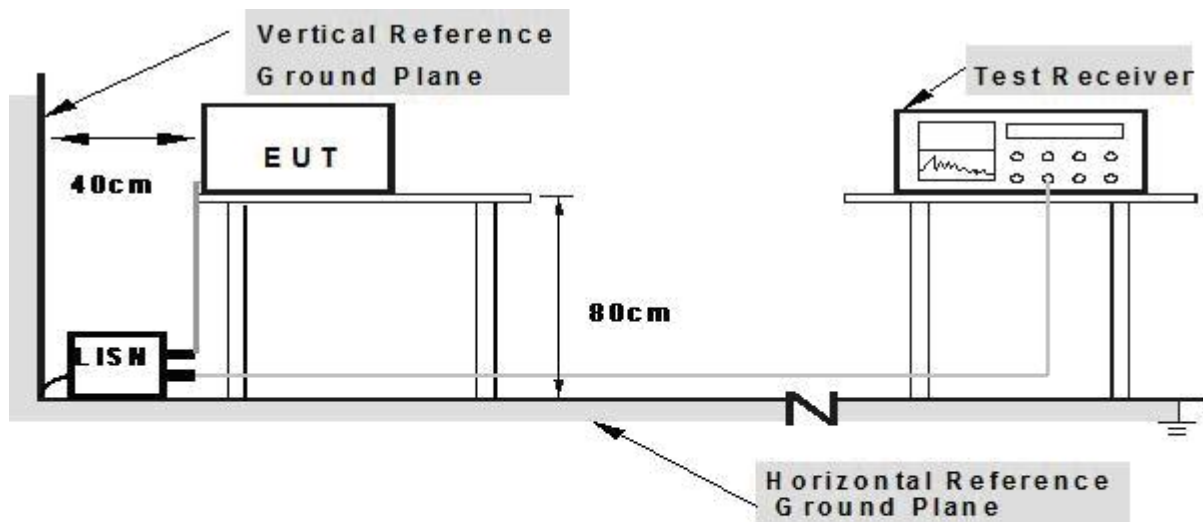
IF Bandwidth

200Hz and 9 kHz

3.1.4 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.5 TEST SETUP



Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

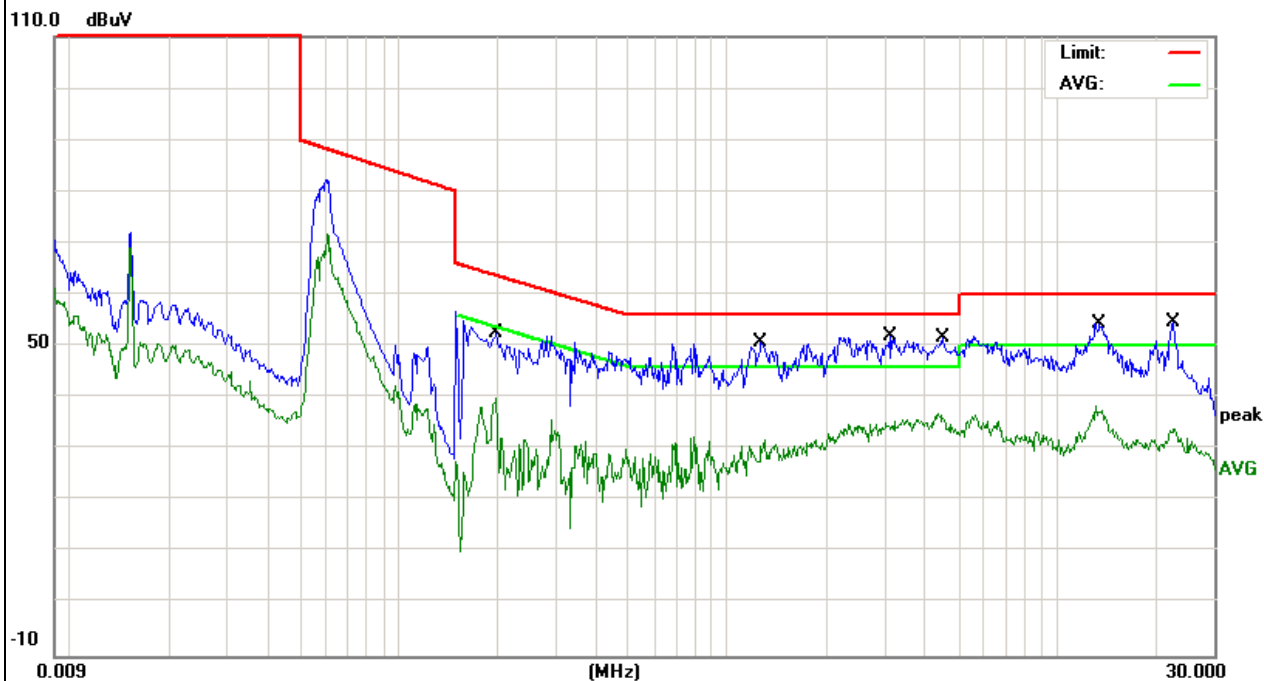
3.1.7 TEST RESULTS

EUT:	LED Lamp (Ceiling Lamp)	Model Name:	MX82008-20A
Temperature:	26°C	Relative Humidity:	54%
Pressure:	1010hPa	Test Date :	2015-01-05
Test Mode:	Lighting	Phase :	L
Test Voltage:	AC 230V/50Hz		

Freq. (MHz)	Reading (dBμV)	Factor (dB)	Measurement (dBμV)	Limit (dBμV)	Over (dB)	Detector
0.1980	42.96	9.47	52.43	63.69	-11.26	QP
0.1980	30.51	9.47	39.98	53.69	-13.71	AVG
1.2620	41.05	9.58	50.63	56.00	-5.37	QP
1.2620	22.41	9.58	31.99	46.00	-14.01	AVG
3.1099	42.23	9.60	51.83	56.00	-4.17	QP
3.1099	26.23	9.60	35.83	46.00	-10.17	AVG
4.5019	42.14	9.63	51.77	56.00	-4.23	QP
4.5019	27.38	9.63	37.01	46.00	-8.99	AVG
13.4860	44.51	9.73	54.24	60.00	-5.76	QP
13.4860	28.81	9.73	38.54	50.00	-11.46	AVG
22.6817	44.81	9.88	54.69	60.00	-5.31	QP
22.6817	24.02	9.88	33.90	50.00	-16.10	AVG

Remark:

Factor = Insertion Loss + Cable Loss.

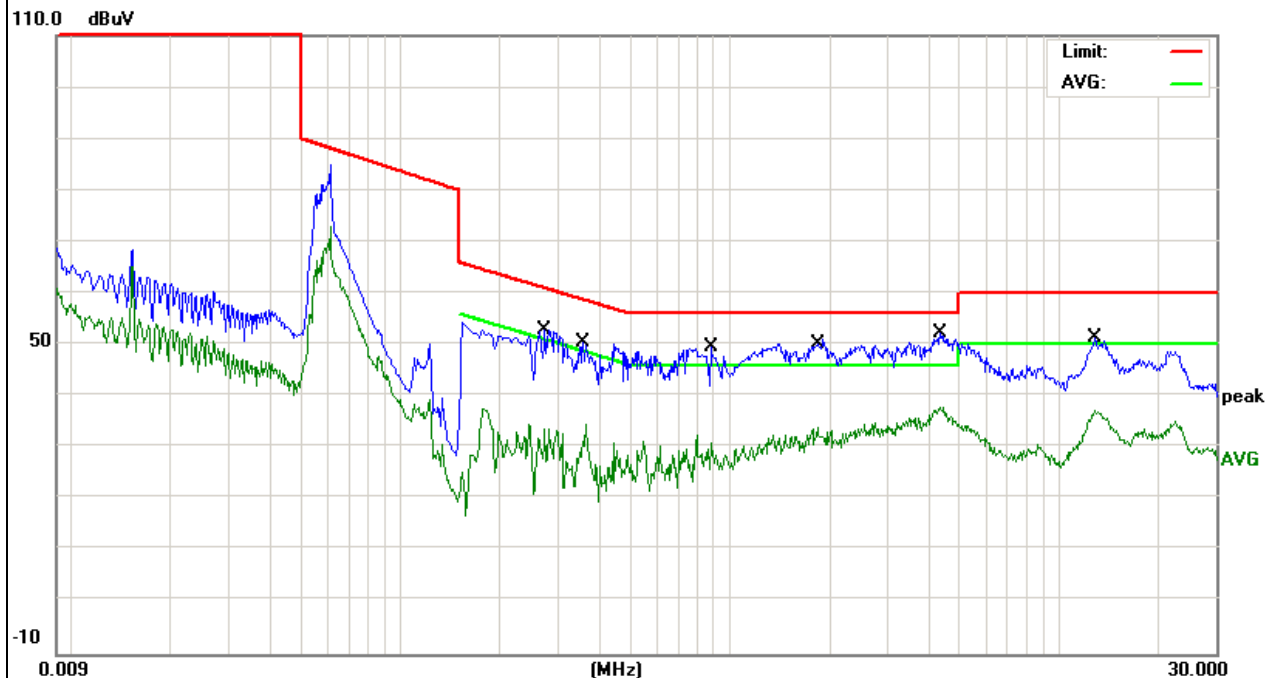


EUT:	LED Lamp (Ceiling Lamp)	Model Name:	MX82008-20A
Temperature:	26°C	Relative Humidity:	54%
Pressure:	1010hPa	Test Date :	2015-01-05
Test Mode:	Lighting	Phase :	N
Test Voltage:	AC 230V/50Hz		

Freq. (MHz)	Reading (dBμV)	Factor (dB)	Measurement (dBμV)	Limit (dBμV)	Over (dB)	Detector
0.2740	43.31	9.55	52.86	60.99	-8.13	QP
0.2740	25.11	9.55	34.66	50.99	-16.33	AVG
0.3578	41.21	9.34	50.55	58.78	-8.23	QP
0.3578	25.31	9.34	34.65	48.78	-14.13	AVG
0.8780	40.03	9.58	49.61	56.00	-6.39	QP
0.8780	22.86	9.58	32.44	46.00	-13.56	AVG
1.8500	41.37	9.57	50.94	56.00	-5.06	QP
1.8500	24.27	9.57	33.84	46.00	-12.16	AVG
4.3700	42.60	9.63	52.23	56.00	-3.77	QP
4.3700	28.35	9.63	37.98	46.00	-8.02	AVG
12.8658	41.57	9.72	51.29	60.00	-8.71	QP
12.8658	27.41	9.72	37.13	50.00	-12.87	AVG

Remark:

Factor = Insertion Loss + Cable Loss.



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT (Below 1000MHz)

FREQUENCY (MHz)	<input checked="" type="checkbox"/> 2m	<input type="checkbox"/> 3m	<input type="checkbox"/> 4m
	dB(μA)	dB(μA)	dB(μA)
9kHz~ 70kHz	88	81	75
70kHz ~ 150kHz	88 to 58	81 to 51	75 to 45
150kHz ~ 3MHz	58 to 22	51 to 15	45 to 9
3MHz ~ 30MHz	22	15 to 16	9 to 12

FREQUENCY (MHz)	<input type="checkbox"/> At 10m	<input checked="" type="checkbox"/> At 3m
	dBμV/m	dBμV/m
30 – 230	30	40
230 – 300	37	47

Notes:

(1) The limit for radiated test was performed according to as following:
CISPR 15.

(2) The tighter limit applies at the band edges.

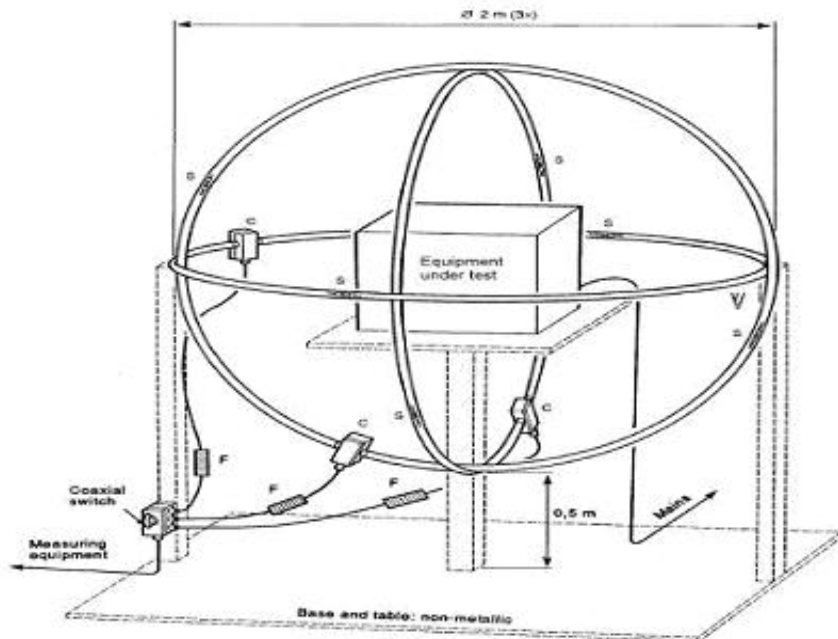
(3) Emission level (dBμV/m)=20log Emission level (uV/m).

3.2.2 TEST PROCEDURE

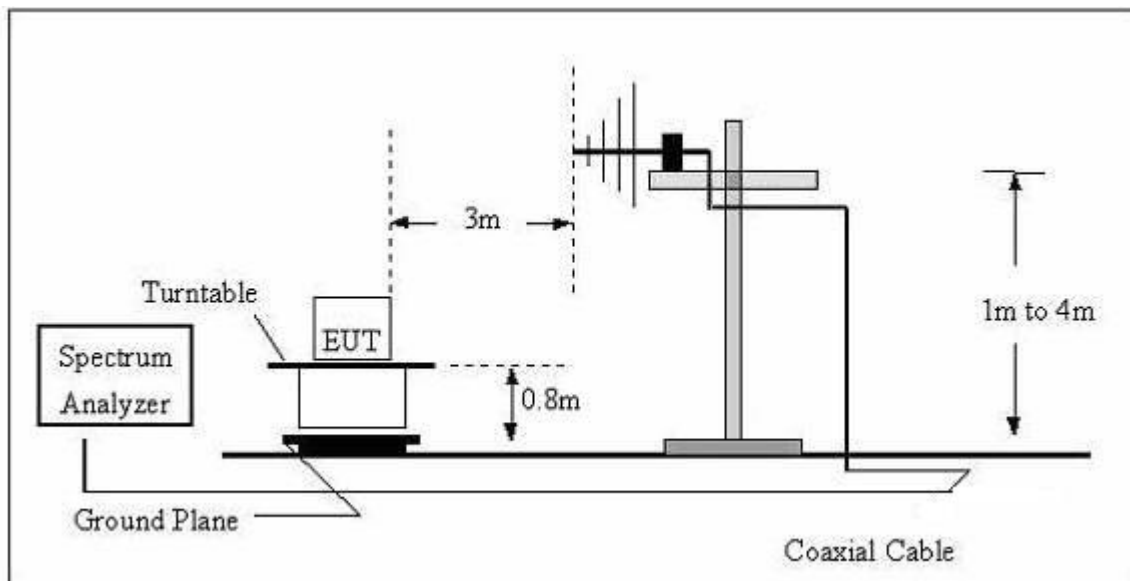
- The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured, above 1G Average detector mode will be instead.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP(AV) Limits and then no additional QP Mode measurement performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.2.3 TEST SETUP

(A) Radiated Emission Test Set-Up Frequency Below 30 MHz



(B) Radiated Emission Test Set-Up Frequency Above 30 MHz



3.2.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

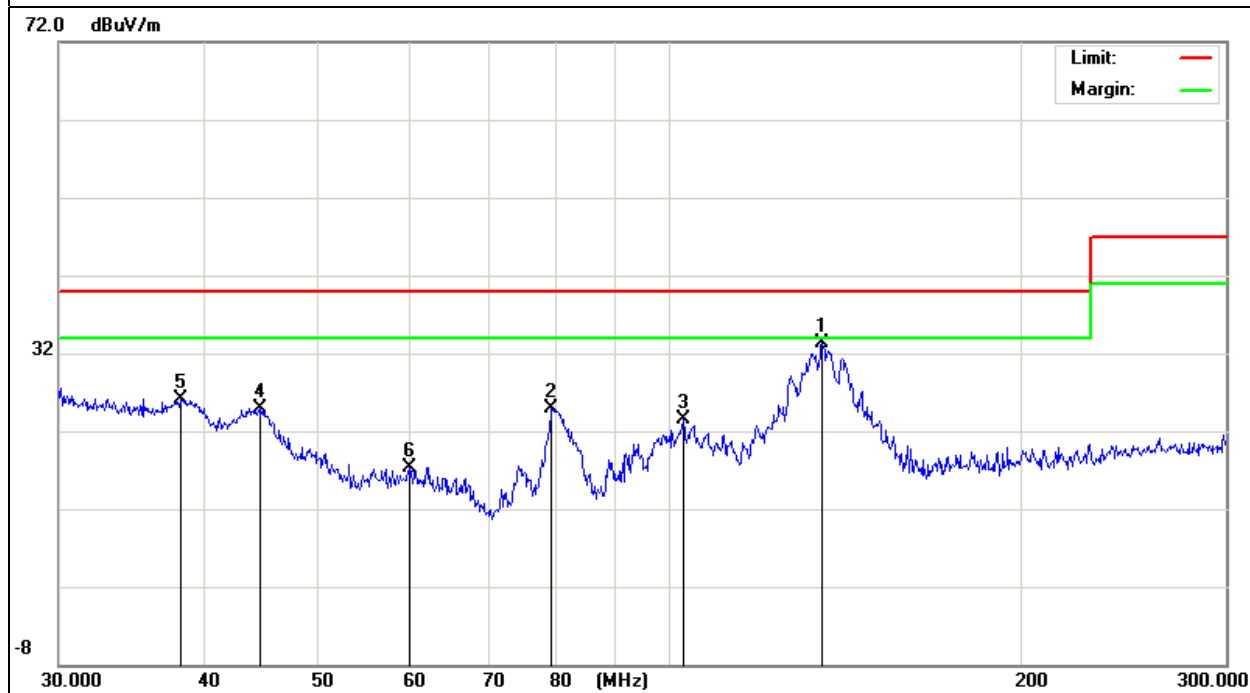
3.2.5 TEST RESULTS(30MHz-300MHz)

EUT:	LED Lamp (Ceiling Lamp)	Model Name:	MX82008-20A
Temperature:	24℃	Relative Humidity:	54%
Pressure:	1010hPa	Test Date :	2015-01-05
Test Mode:	Lighting	Polarization :	Horizontal
Test Voltage:	AC 230V/50Hz		

Freq. (MHz)	Reading (dBμV/m)	Factor (dB)	Measurement (dBμV/m)	Limit (dBμV/m)	Over (dB)	Detector
135.2450	21.62	11.64	33.26	40.00	-6.74	QP
79.2723	19.05	5.83	24.88	40.00	-15.12	QP
102.8302	14.18	9.25	23.43	40.00	-16.57	QP
44.5780	12.84	12.06	24.90	40.00	-15.10	QP
38.1171	11.41	14.72	26.13	40.00	-13.87	QP
59.9958	9.57	7.83	17.40	40.00	-22.60	QP

Remark:

Factor = Antenna Factor + Cable Loss.

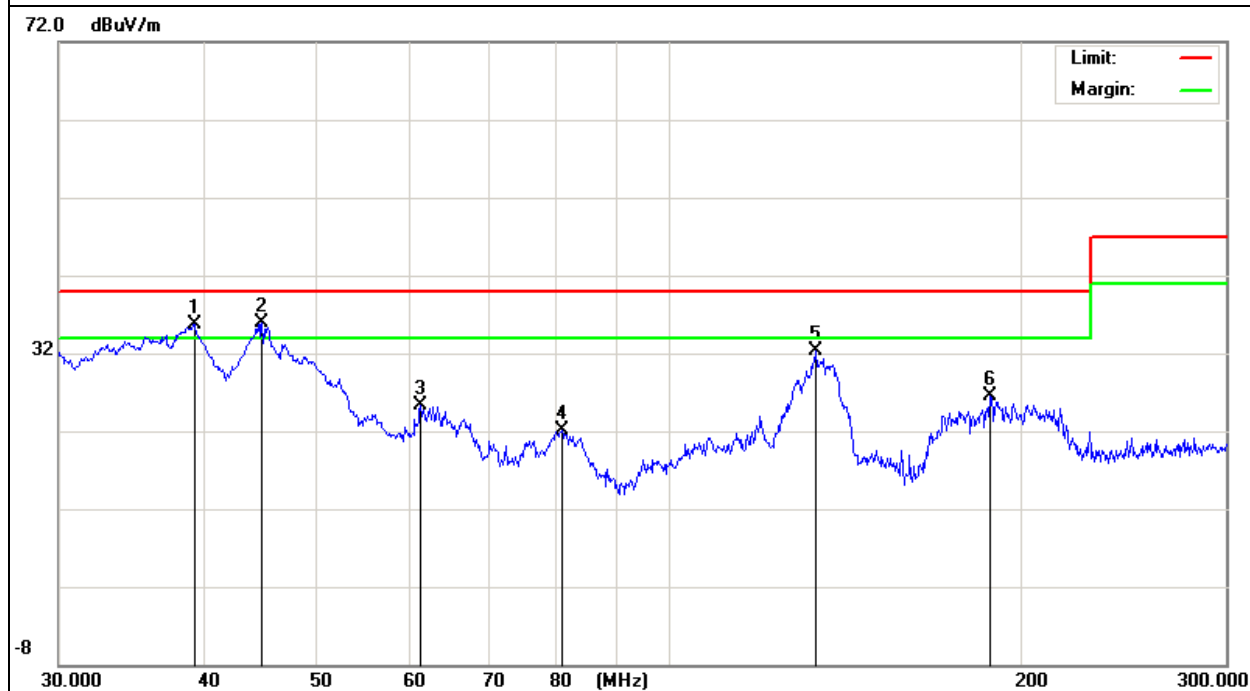


EUT:	LED Lamp (Ceiling Lamp)	Model Name:	MX82008-20A
Temperature:	24°C	Relative Humidity:	54%
Pressure:	1010hPa	Test Date :	2015-01-05
Test Mode:	Lighting	Polarization :	Vertical
Test Voltage:	AC 230V/50Hz		

Freq. (MHz)	Reading (dBμV/m)	Factor (dB)	Measurement (dBμV/m)	Limit (dBμV/m)	Over (dB)	Detector
39.1850	21.72	14.06	35.78	40.00	-4.22	QP
44.7837	23.91	12.00	35.91	40.00	-4.09	QP
61.2520	17.68	7.55	25.23	40.00	-14.77	QP
80.9321	15.99	6.04	22.03	40.00	-17.97	QP
133.6964	20.53	11.71	32.24	40.00	-7.76	QP
188.4173	15.73	10.69	26.42	40.00	-13.58	QP

Remark:

Factor = Antenna Factor + Cable Loss.



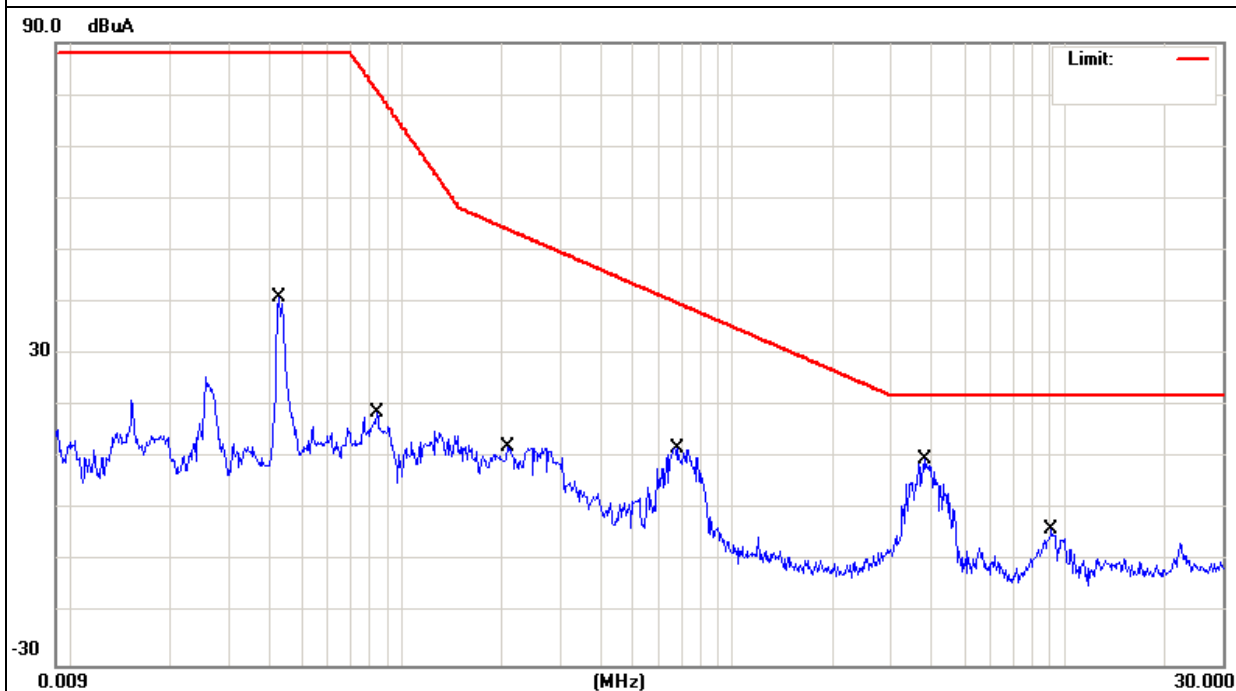
3.2.6 TEST RESULTS(0.009~30MHz)

EUT:	LED Lamp (Ceiling Lamp)	Model Name:	MX82008-20A
Temperature:	24℃	Relative Humidity:	54%
Pressure:	1010hPa	Test Date :	2015-01-05
Test Mode:	Lighting	Polarization :	X
Test Voltage:	AC 230V/50Hz		

Freq. (MHz)	Reading (dBμA)	Factor (dB)	Measurement (dBμA)	Limit (dBμA)	Over (dB)	Detector
0.0424	10.62	30.19	40.81	88.00	-47.19	QP
0.0840	-9.66	28.36	18.70	80.82	-62.12	QP
0.2076	-14.01	26.19	12.18	54.09	-41.91	QP
0.6820	-11.98	23.94	11.96	39.80	-27.84	QP
3.8060	-3.72	13.32	9.60	22.00	-12.40	QP
9.1300	-21.04	17.29	-3.75	22.00	-25.75	QP

Remark:

Factor = Antenna Factor + Cable Loss - Amplifier.

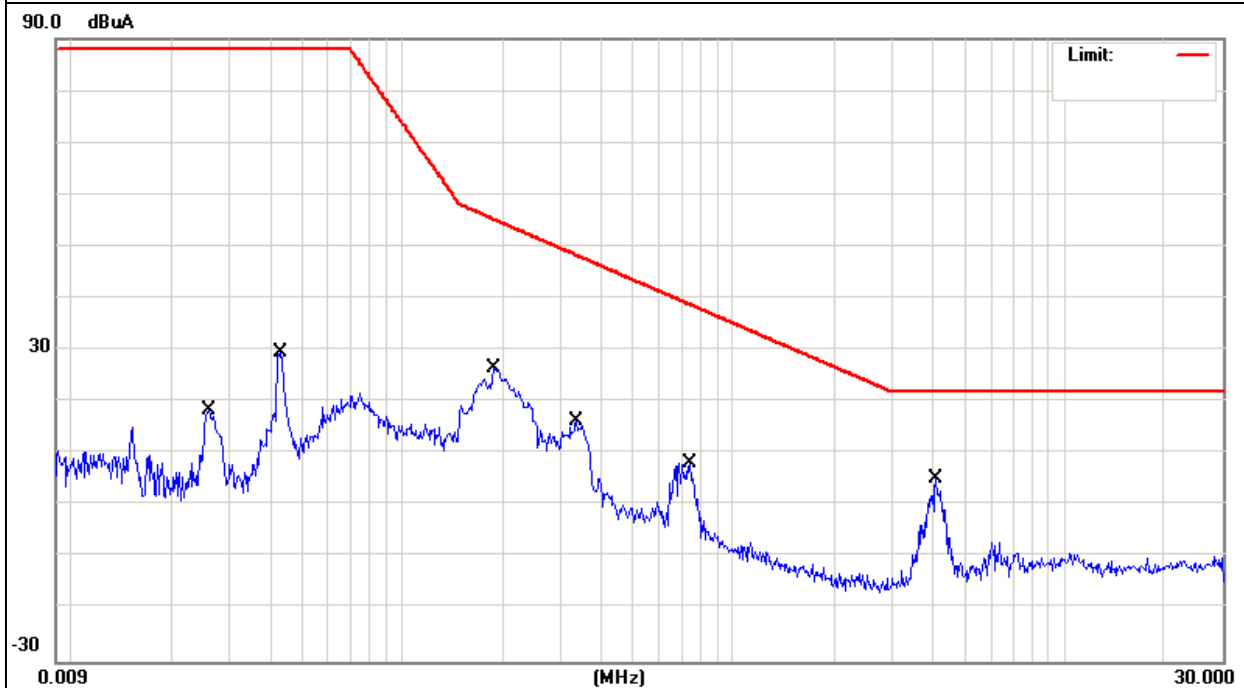


EUT:	LED Lamp (Ceiling Lamp)	Model Name:	MX82008-20A
Temperature:	24°C	Relative Humidity:	54%
Pressure:	1010hPa	Test Date :	2015-01-05
Test Mode:	Lighting	Polarization :	Y
Test Voltage:	AC 230V/50Hz		

Freq. (MHz)	Reading (dBμA)	Factor (dB)	Measurement (dBμA)	Limit (dBμA)	Over (dB)	Detector
0.1900	0.23	26.32	26.55	55.15	-28.60	QP
0.0432	-0.65	30.14	29.49	88.00	-58.51	QP
0.7378	-15.38	23.61	8.23	38.85	-30.62	QP
4.1100	-7.69	13.03	5.34	22.00	-16.66	QP
0.3379	-9.39	25.86	16.47	48.23	-31.76	QP
0.0262	-12.67	31.15	18.48	88.00	-69.52	QP

Remark:

Factor = Antenna Factor + Cable Loss - Amplifier.

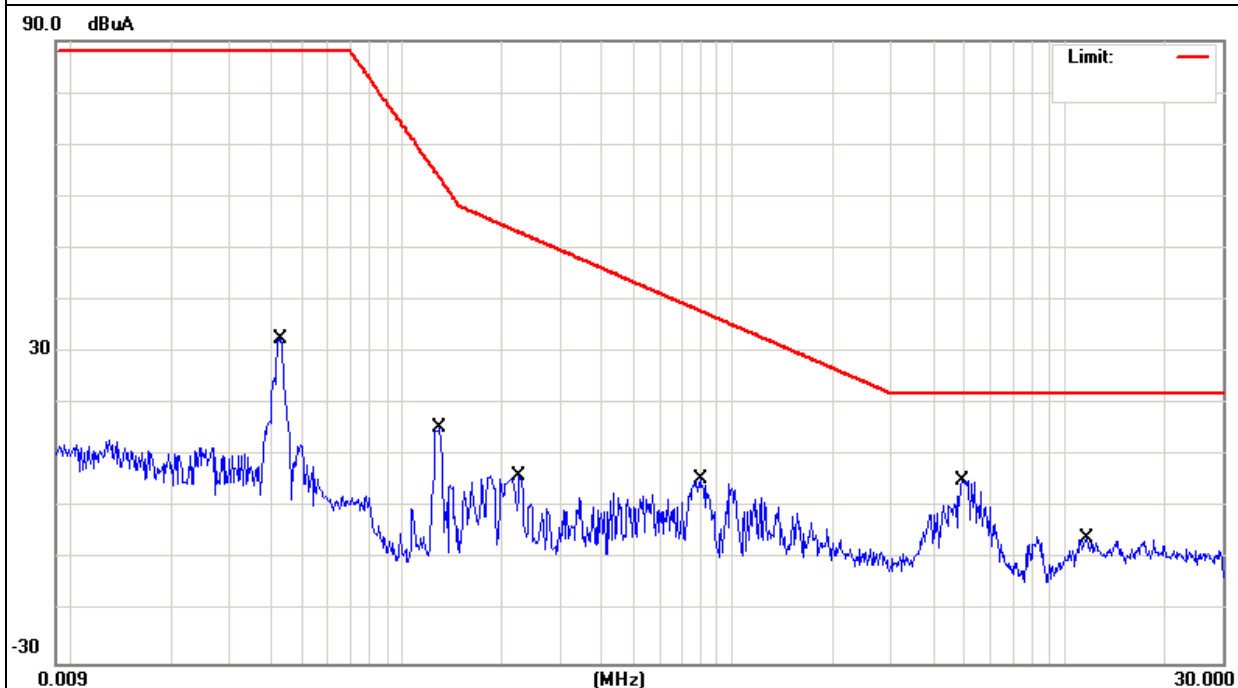


EUT:	LED Lamp (Ceiling Lamp)	Model Name:	MX82008-20A
Temperature:	24℃	Relative Humidity:	54%
Pressure:	1010hPa	Test Date :	2015-01-05
Test Mode:	Lighting	Polarization :	Z
Test Voltage:	AC 230V/50Hz		

Freq. (MHz)	Reading (dBμA)	Factor (dB)	Measurement (dBμA)	Limit (dBμA)	Over (dB)	Detector
0.0432	11.32	21.31	32.63	88.00	-55.37	QP
0.1297	-8.28	23.64	15.36	63.70	-48.34	QP
0.2260	-17.51	23.75	6.24	53.07	-46.83	QP
0.7940	-18.65	24.17	5.52	37.97	-32.45	QP
4.9340	-14.85	20.20	5.35	22.00	-16.65	QP
11.6379	-25.04	19.07	-5.97	22.00	-27.97	QP

Remark:

Factor = Antenna Factor + Cable Loss - Amplifier.



3.3 HARMONICS CURRENT

3.3.1 LIMITS OF HARMONICS CURRENT(CLASS C)

Harmonic Current Test Limit (Class C)

Harmonic order (n)	Maximum permissible harmonic current Expressed as a percentage of the input Current at the fundamental frequency (%)
2	2
3	30λ
5	10
7	7
9	5
$15 \leq n \leq 39$ (odd harmonics only)	3
Remark: λ is the circuit power factor	

Note: Reference standard of the two tables above: EN61000-3-2.

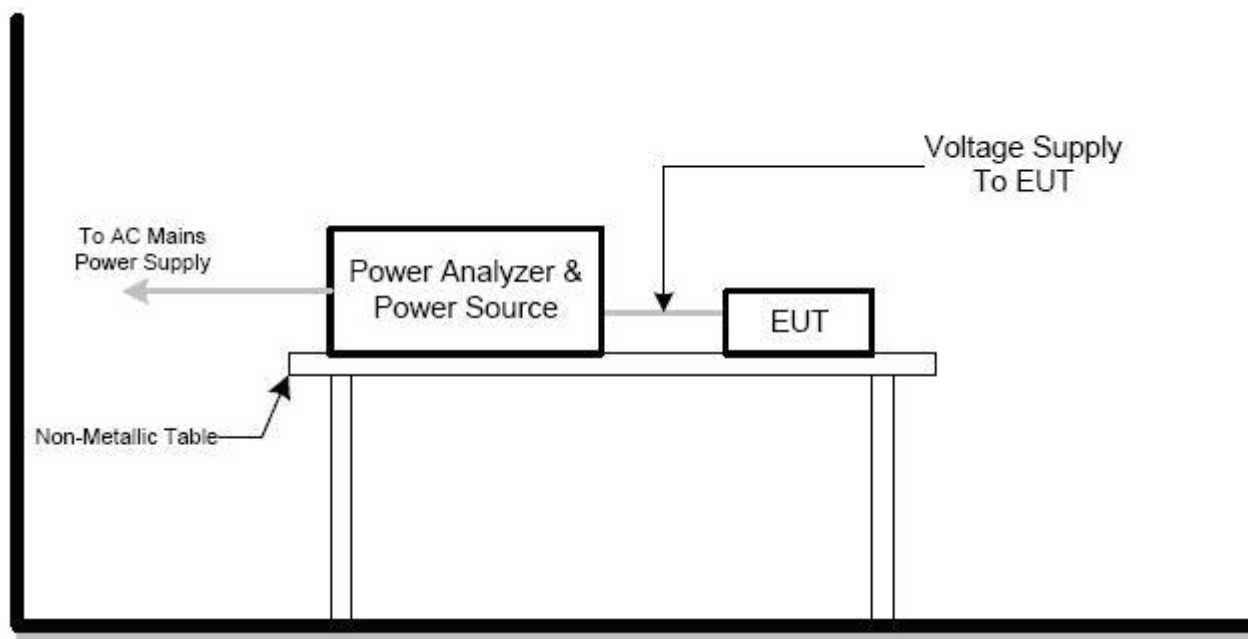
3.3.1.1 TEST PROCEDURE

- a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions.
- b. The classification of EUT is according to section 5 of EN 61000-3-2. The EUT is classified as follows:
 Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes.
 Class B: Portable tools. Portable tools.; Arc welding equipment which is not professional equipment.
 Class C: Lighting equipment.
 Class D: Equipment having a specified power less than or equal to 600W of the following types: Personal computers and personal computer monitors and television receivers.
- c. The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.

3.3.1.2 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

3.3.1.3 TEST SETUP



3.3.2 TEST RESULTS

EUT:	LED Lamp (Ceiling Lamp)	Model Name:	MX82008-20A
Temperature:	25°C	Relative Humidity:	45%
Pressure:	1010hPa	Test Date :	2015-01-05
Test Mode:	Lighting	Test duration:	150s
Test Voltage:	AC 230V/50Hz		

E. U. T. Result

Harmonic(s) > 150%:

Order (n): 2

Harmonic(s) with average > 100%:

Order (n): 2

All Partial Odd Harmonics below partial limits.

Harmonic(s) > 150%:

Order (n): None

Harmonic(s) with average > 150%:

Order (n): None

Power Source Result

First dataset out of limit:

DS (time): None

Harmonic(s) out of limit:

Order (n): None

Average harmonic current results

Hn	I _{eff} [A]	I _{eff} [%]	Limit [%]	Result
1	148.964E-3	99.719		
2	32.500E-3	21.756	2.00	FAIL
3	15.511E-3	10.384	28.02	PASS
4	11.212E-3	7.505		PASS
5	6.778E-3	4.537	10.00	PASS
6	3.225E-3	2.159		PASS
7	2.036E-3	1.363	7.00	PASS
8	2.497E-3	1.671		PASS
9	4.476E-3	2.996	5.00	PASS
10	1.513E-3	1.013		PASS
11	3.659E-3	2.449	3.00	PASS
12	761.672E-6	0.510		PASS
13	3.031E-3	2.029	3.00	PASS
14	1.726E-3	1.155		PASS
15	3.131E-3	2.096	3.00	PASS
16	1.208E-3	0.809		PASS
17	2.483E-3	1.662	3.00	PASS
18	1.811E-3	1.212		PASS
19	1.997E-3	1.337	3.00	PASS
20	1.229E-3	0.823		PASS
21	1.813E-3	1.214	4.50	PASS
22	1.210E-3	0.810		PASS
23	962.495E-6	0.644	4.50	PASS
24	991.799E-6	0.664		PASS
25	882.374E-6	0.591	4.50	PASS
26	1.192E-3	0.798		PASS
27	741.864E-6	0.497	4.50	PASS
28	1.053E-3	0.705		PASS
29	851.881E-6	0.570	4.50	PASS
30	1.295E-3	0.867		PASS
31	1.324E-3	0.887	4.50	PASS
32	1.021E-3	0.684		PASS
33	1.039E-3	0.695	4.50	PASS
34	1.145E-3	0.766		PASS
35	1.467E-3	0.982	4.50	PASS
36	829.401E-6	0.555		PASS
37	1.254E-3	0.839	4.50	PASS
38	825.851E-6	0.553		PASS
39	1.410E-3	0.944	4.50	PASS
40	918.769E-6	0.615		PASS

Maximum harmonic current results

Hn	I _{eff} [A]	I _{eff} [%]	Limit [%]	Result
1	149.384E-3	100.000		
2	32.906E-3	22.028	3.00	FAIL
3	16.114E-3	10.787	42.02	PASS
4	11.625E-3	7.782		PASS
5	7.136E-3	4.777	15.00	PASS
6	3.337E-3	2.234		PASS
7	2.150E-3	1.439	10.50	PASS
8	2.659E-3	1.780		PASS
9	4.815E-3	3.223	7.50	PASS
10	2.110E-3	1.412		PASS
11	3.772E-3	2.525	4.50	PASS
12	880.122E-6	0.589		PASS
13	3.211E-3	2.149	4.50	PASS
14	1.838E-3	1.231		PASS
15	3.444E-3	2.305	4.50	PASS
16	1.352E-3	0.905		PASS
17	2.652E-3	1.775	4.50	PASS
18	2.080E-3	1.392		PASS
19	2.146E-3	1.436	4.50	PASS
20	1.556E-3	1.042		PASS
21	1.961E-3	1.313	4.50	PASS
22	1.492E-3	0.999		PASS
23	1.162E-3	0.778	4.50	PASS
24	1.116E-3	0.747		PASS
25	1.000E-3	0.670	4.50	PASS
26	1.320E-3	0.884		PASS
27	822.338E-6	0.550	4.50	PASS
28	1.200E-3	0.803		PASS
29	965.160E-6	0.646	4.50	PASS
30	1.473E-3	0.986		PASS
31	1.510E-3	1.011	4.50	PASS
32	1.117E-3	0.748		PASS
33	1.243E-3	0.832	4.50	PASS
34	1.261E-3	0.844		PASS
35	1.629E-3	1.091	4.50	PASS
36	957.031E-6	0.641		PASS
37	1.413E-3	0.946	4.50	PASS
38	926.768E-6	0.620		PASS
39	1.553E-3	1.039	4.50	PASS
40	1.056E-3	0.707		PASS

Maximum harmonic voltage results

Hn	Ueff [V]	Ueff [%]	Limit [%]	Result
1	231.51	100.641		
2	68.30E-3	0.030	0.2	PASS
3	96.16E-3	0.042	0.9	PASS
4	20.24E-3	0.009	0.2	PASS
5	37.39E-3	0.016	0.4	PASS
6	11.88E-3	0.005	0.2	PASS
7	12.00E-3	0.005	0.3	PASS
8	20.00E-3	0.009	0.2	PASS
9	31.12E-3	0.014	0.2	PASS
10	15.33E-3	0.007	0.2	PASS
11	29.18E-3	0.013	0.1	PASS
12	16.92E-3	0.007	0.1	PASS
13	23.96E-3	0.010	0.1	PASS
14	16.65E-3	0.007	0.1	PASS
15	17.01E-3	0.007	0.1	PASS
16	12.79E-3	0.006	0.1	PASS
17	24.22E-3	0.011	0.1	PASS
18	11.88E-3	0.005	0.1	PASS
19	34.47E-3	0.015	0.1	PASS
20	17.48E-3	0.008	0.1	PASS
21	26.05E-3	0.011	0.1	PASS
22	13.25E-3	0.006	0.1	PASS
23	8.85E-3	0.004	0.1	PASS
24	17.23E-3	0.007	0.1	PASS
25	28.25E-3	0.012	0.1	PASS
26	12.69E-3	0.006	0.1	PASS
27	30.41E-3	0.013	0.1	PASS
28	11.57E-3	0.005	0.1	PASS
29	23.45E-3	0.010	0.1	PASS
30	17.77E-3	0.008	0.1	PASS
31	13.73E-3	0.006	0.1	PASS
32	17.64E-3	0.008	0.1	PASS
33	25.47E-3	0.011	0.1	PASS
34	9.97E-3	0.004	0.1	PASS
35	22.60E-3	0.010	0.1	PASS
36	16.48E-3	0.007	0.1	PASS
37	15.72E-3	0.007	0.1	PASS
38	16.16E-3	0.007	0.1	PASS
39	23.80E-3	0.010	0.1	PASS
40	11.43E-3	0.005	0.1	PASS

Harmonic current results - DS: 23

Hn	I _{eff} [A]	I _{eff} [%]	Limit [%]	Result
1	149.056E-3	99.781		
2	32.722E-3	21.905	2.00	FAIL
3	16.017E-3	10.722	28.02	PASS
4	11.463E-3	7.673		PASS
5	7.067E-3	4.731	10.00	PASS
6	2.972E-3	1.989		PASS
7	1.677E-3	1.123	7.00	PASS
8	2.586E-3	1.731		PASS
9	4.728E-3	3.165	5.00	PASS
10	1.984E-3	1.328		PASS
11	3.426E-3	2.293	3.00	PASS
12	823.387E-6	0.551		PASS
13	2.992E-3	2.003	3.00	PASS
14	1.569E-3	1.050		PASS
15	3.435E-3	2.300	3.00	PASS
16	1.107E-3	0.741		PASS
17	2.566E-3	1.718	3.00	PASS
18	2.027E-3	1.357		PASS
19	1.766E-3	1.182	3.00	PASS
20	1.532E-3	1.025		PASS
21	1.817E-3	1.216	3.00	PASS
22	1.142E-3	0.764		PASS
23	1.122E-3	0.751	3.00	PASS
24	841.658E-6	0.563		PASS
25	885.332E-6	0.593	3.00	PASS
26	1.145E-3	0.767		PASS
27	770.053E-6	0.515	3.00	PASS
28	1.033E-3	0.691		PASS
29	957.925E-6	0.641	3.00	PASS
30	1.421E-3	0.951		PASS
31	1.301E-3	0.871	3.00	PASS
32	896.064E-6	0.600		PASS
33	1.235E-3	0.827	3.00	PASS
34	1.050E-3	0.703		PASS
35	1.437E-3	0.962	3.00	PASS
36	875.069E-6	0.586		PASS
37	1.260E-3	0.843	3.00	PASS
38	895.970E-6	0.600		PASS
39	1.326E-3	0.887	3.00	PASS
40	1.011E-3	0.677		PASS

Caution: Results related to the 100% limit values

Harmonic voltage results - DS: 23

Hn	Ueff [V]	Ueff [%]	Limit [%]	Result
1	231.50	100.636		
2	45.37E-3	0.020	0.2	PASS
3	88.74E-3	0.039	0.9	PASS
4	13.98E-3	0.006	0.2	PASS
5	29.00E-3	0.013	0.4	PASS
6	2.86E-3	0.001	0.2	PASS
7	8.41E-3	0.004	0.3	PASS
8	6.26E-3	0.003	0.2	PASS
9	25.57E-3	0.011	0.2	PASS
10	4.88E-3	0.002	0.2	PASS
11	23.47E-3	0.010	0.1	PASS
12	12.14E-3	0.005	0.1	PASS
13	17.11E-3	0.007	0.1	PASS
14	10.79E-3	0.005	0.1	PASS
15	12.05E-3	0.005	0.1	PASS
16	8.92E-3	0.004	0.1	PASS
17	18.55E-3	0.008	0.1	PASS
18	3.03E-3	0.001	0.1	PASS
19	28.75E-3	0.012	0.1	PASS
20	2.24E-3	0.001	0.1	PASS
21	24.77E-3	0.011	0.1	PASS
22	1.84E-3	0.001	0.1	PASS
23	7.58E-3	0.003	0.1	PASS
24	8.64E-3	0.004	0.1	PASS
25	20.53E-3	0.009	0.1	PASS
26	7.24E-3	0.003	0.1	PASS
27	24.66E-3	0.011	0.1	PASS
28	5.88E-3	0.003	0.1	PASS
29	17.70E-3	0.008	0.1	PASS
30	8.20E-3	0.004	0.1	PASS
31	7.86E-3	0.003	0.1	PASS
32	9.23E-3	0.004	0.1	PASS
33	16.12E-3	0.007	0.1	PASS
34	1.26E-3	0.001	0.1	PASS
35	15.40E-3	0.007	0.1	PASS
36	8.11E-3	0.004	0.1	PASS
37	11.06E-3	0.005	0.1	PASS
38	11.26E-3	0.005	0.1	PASS
39	17.12E-3	0.007	0.1	PASS
40	5.22E-3	0.002	0.1	PASS

Power and THD results - DS: 23

True power P:	33.23W	Apparent power S:	35.7VA
Reactive power Q:	13.04var	Power factor:	0.931
THD (U):	0.001	THD (I):	0.268
Crest Factor (U):	1.414	Crest Factor (I):	1.459

3.4 VOLTAGE FLUCTUATION AND FLICKERS

3.4.1 LIMITS OF VOLTAGE FLUCTUATION AND FLICKERS

Test items	Limits(EN61000-3-3)	Descriptions
P_{st}	$\leq 1.0, T_p=10\text{min}$	short-term flicker indicator
P_{lt}	$\leq 0.65, T_p=2\text{h}$	long-term flicker indicator
d_c	$\leq 3.3\%$	relative steady-state voltage change
d_{max}	$\leq 4\%$ (or 6% <small>Note(1)</small> , 7% <small>Note(2)</small>)	maximum relative voltage change:
$d_{(t)}$	$\leq 3.3\%$, more than 500ms	relative voltage change characteristic

Note:

1. 6 % for equipment which is:
 - a. switched manually, or
 - b. switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.
2. 7 % for equipment which is
 - a. attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or
 - b. switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.

3.4.1.1 TEST PROCEDURE

a. Harmonic Current Test:

Test was performed according to the procedures specified in Sub-clause 6.2 of IEC/EN 61000-3-2 depend on which standard adopted for compliance measurement.

b. Fluctuation and Flickers Test:

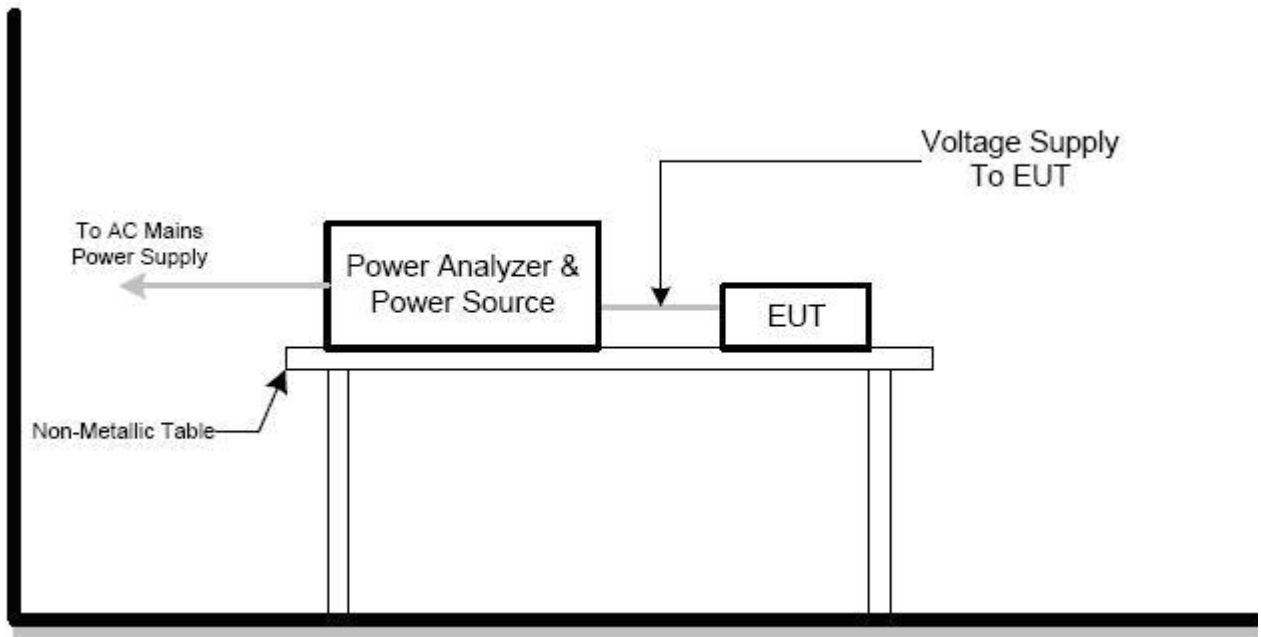
Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in Clause 6.0/4.0 of IEC/EN 61000-3-3 depend on which standard adopted for compliance measurement.

c. All types of harmonic current and/or voltage fluctuation in this report are assessed by direct measurement using flicker-meter.

3.4.1.2 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

3.4.1.3 TEST SETUP



3.4.2 TEST RESULTS

EUT:	LED Lamp (Ceiling Lamp)	Model Name:	MX82008-20A
Temperature:	25°C	Relative Humidity:	45%
Pressure:	1010hPa	Test Date :	N/A
Test Mode:	N/A		
Test Voltage:	N/A		

4. EMC IMMUNITY TEST

4.1 STANDARD COMPLIANCE/SEVERITY LEVEL/CRITERIA

Tests Standard No.	TEST SPECIFICATION Level	Test Mode Test Ports	Perform. Criteria
1. ESD IEC/EN 61000-4-2	8kV air discharge 4kV contact discharge	Direct Mode	B
	4kV HCP discharge 4kV VCP discharge	Indirect Mode	B
2. RS IEC/EN 61000-4-3	80 MHz to 1000 MHz 1000Hz, 80%, AM modulated	Enclosure	A
3. EFT/Burst IEC/EN 61000-4-4	5/50ns Tr/Th 5kHz Repetition Freq.	Power Supply Port	B
	5/50ns Tr/Th 5kHz Repetition Freq.	CTL/Signal Data Line Port	B
4. Surges IEC/EN 61000-4-5	1.2/50(8/20) Tr/Th us	L-N	C
	1.2/50(8/20) Tr/Th us	L-PE N-PE	C
5 Injected Current IEC/EN 61000-4-6	0.15 MHz to 80 MHz, 1000Hz 80% , AM Modulated 150Ω source impedance	CTL/Signal Port	A
	0.15 MHz to 80 MHz, 1000Hz 80% , AM Modulated 150Ω source impedance	AC Power Port	A
	0.15 MHz to 80 MHz, 1000Hz 80% , AM Modulated 150Ω source impedance	DC Power Port	A
6. Power Frequency Magnetic Field IEC/EN 61000-4-8	50 Hz,	Enclosure	A
7. Volt. Interruptions Volt. Dips IEC/EN 61000-4-11	Voltage dip 100%	AC Power Port	B
	Voltage dip 30%		C

4.2 GENERAL PERFORMANCE CRITERIA

According to **EN 61547** standard, the general performance criteria as following:

Criterion A	The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.
Criterion B	After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test.
Criterion C	Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

4.3 GENERAL PERFORMANCE CRITERIA TEST SETUP

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

4.4 ESD TESTING

4.4.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-2
Discharge Impedance:	330ohm / 150pF
Required Performance:	B
Discharge Voltage:	Air Discharge:2kV/4kV/8kV (Direct) Contact Discharge:2kV/4kV (Direct/Indirect)
Polarity:	Positive & Negative
Number of Discharge:	Air Discharge: min. 20 times at each test point Contact Discharge: min. 20 times at each test point
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

4.4.2 TEST PROCEDURE

The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

a. Vertical Coupling Plane (VCP):

The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the Discharge Electrode touching the coupling plane. The four faces of the EUT will be performed with electrostatic discharge.

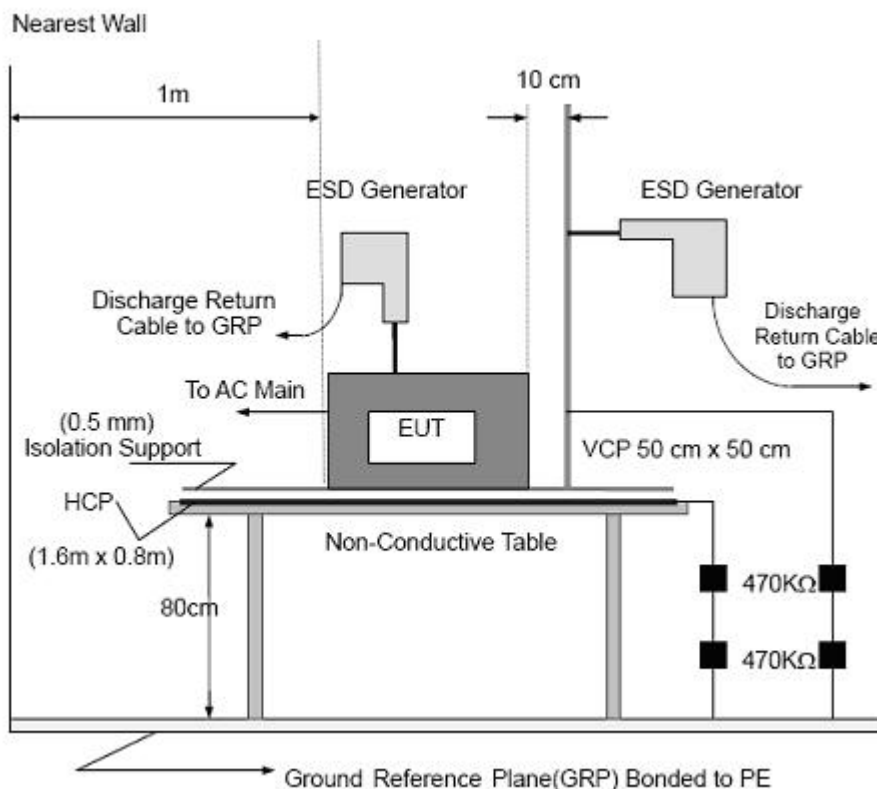
Horizontal Coupling Plane (HCP):

The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane. The four faces of the EUT will be performed with electrostatic discharge.

b. Air discharges at insulation surfaces of the EUT.

It was at least ten single discharges with positive and negative at the same selected point.

4.4.3 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meters high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940k total impedance. The equipment under test, was installed in a representative system as described in section 7 of IEC /EN 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of 1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

FLOOR-STANDING EQUIPMENT

The equipment under test was installed in a representative system as described in section 7 of IEC/EN 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of 0.1-meter thickness. The GRP consisted of a sheet of aluminum that is at least 0.25mm thick, and 2.5meters square connected to the protective grounding system and extended at least 0.5 meters from the EUT on all sides.

4.4.4 TEST RESULTS

EUT:	LED Lamp (Ceiling Lamp)	Model Name:	MX82008-20A
Temperature:	25°C	Relative Humidity:	45%
Pressure:	1010hPa	Test Date :	2015-01-05
Test Mode:	Lighting		
Test Voltage:	AC 230V/50Hz		

Mode	Contact Discharge (Indirect)							Criterion	Result
Test level (kV)	Test Point	2		4		6			
Test Location		+	-	+	-	+	-		
HCP	Front			P	P			B	Complies
	Rear			P	P				
	Left			P	P				
	Right			P	P				
VCP	Front			P	P				
	Rear			P	P				
	Left			P	P				
	Right			P	P				

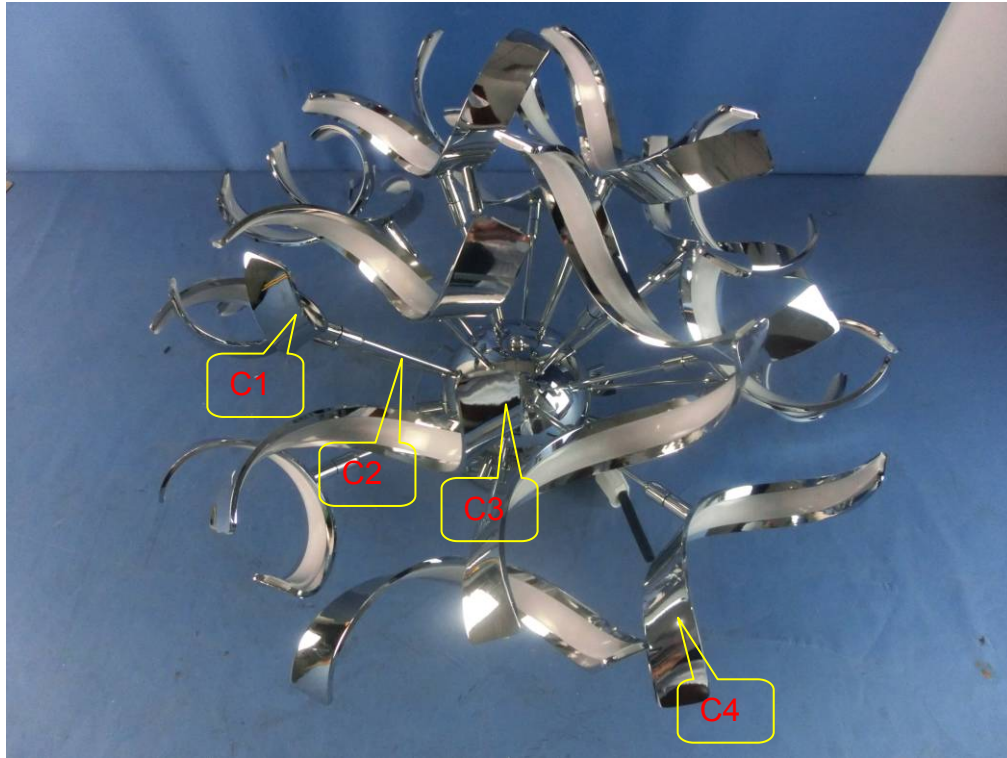
Mode	Air Discharge								Contact Discharge								Criterion	Result
Test level (kV)	2		4		8		15		2		4		6		8			
Test Location	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-		
C1											P	P					B	Complies
C2											P	P						
C3											P	P						
C4											P	P						

Note:

- 1) +/- denotes the Positive/Negative polarity of the output voltage.
- 2) Test location(s) in which discharge (Air and contact discharge) to be applied illustrated by photos shown in next page(s)
- 3) In the table: 'P' represents 'PASS'; 'F' represents 'FAIL'.
- 4) Criteria A: Normal performance within limits specified by the manufacturer, requestor or purchaser.

- 5) Criteria B: Temporary loss of function or degradation of performance which ceases after the disturbance ceases, and from which the EUT recovers its normal performance, without operator intervention.
- 6) Criteria C: Temporary loss of function or degradation of performance, the correction of which requires operator intervention.
- 7) Criteria D: Loss of function or degradation of performance which is not recoverable, owing to damage to hardware or software, or loss of data.

4.4.5 PHOTO(S) SHOWN THE LOCATION(S) OF ESD EVALUATED



4.5 RS TESTING

4.5.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-3
Required Performance	A
Frequency Range:	80 MHz - 1000 MHz
Field Strength:	3 V/m
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Polarity of Antenna:	Horizontal and Vertical
Test Distance:	3 m
Antenna Height:	1.5 m
Dwell Time:	3 seconds

4.5.2 TEST PROCEDURE

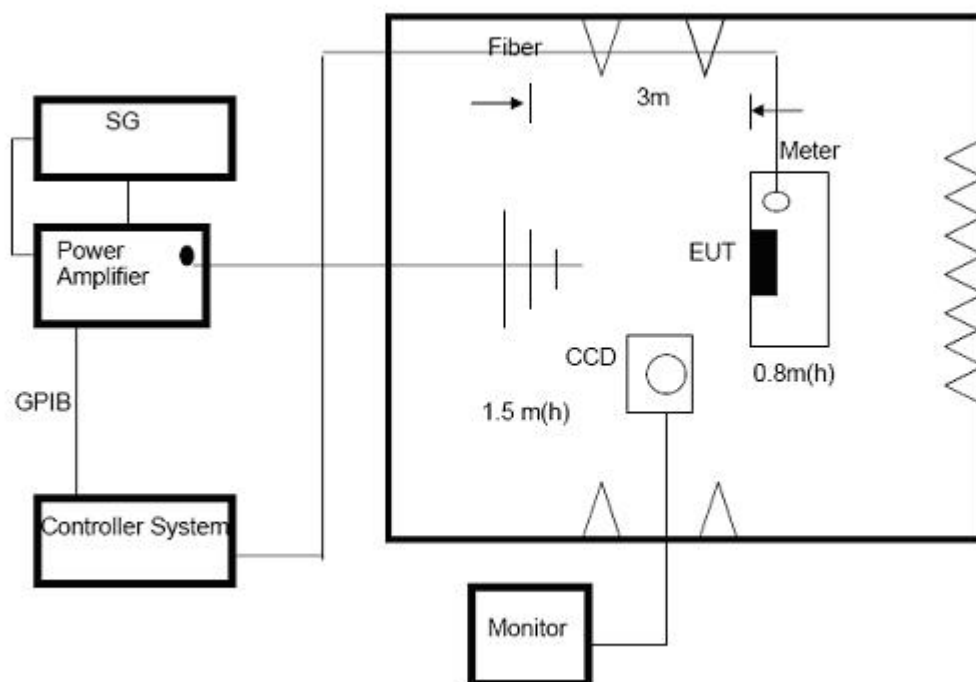
The EUT and support equipment, which are placed on a table that is 0.8 meter above ground and the testing was performed in a fully-anechoic chamber.

The testing distance from antenna to the EUT was 3 meters.

The other condition as following manner:

- The frequency range is swept from 80 MHz to 1000 MHz, & 1400MHz - 2700MHz with the signal 80%amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed 1.5x 10⁻³ decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- Sweep Frequency 900 MHz, with the Duty Cycle:1/8 and Modulation: Pulse 217 Hz(if applicable)
- The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

4.5.3 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

4.5.4 TEST RESULTS

EUT:	LED Lamp (Ceiling Lamp)	Model Name:	MX82008-20A
Temperature:	25°C	Relative Humidity:	60%
Pressure:	1010hPa	Test Date :	2015-01-05
Test Mode:	Lighting		
Test Voltage:	AC 230V/50Hz		

Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Azimuth	Perform. Criteria	Results	Judgment
80MHz - 1000MHz	H / V	3 V/m (r.m.s) AM Modulated 1000Hz, 80%	Front	A	P	Complies
			Rear			
			Left			
			Right			

Note:

- 1) N/A - denotes test is not applicable in this test report.
- 2) In the table: 'P' represents 'PASS'; 'F' represents 'FAIL'.
- 3) Criteria A: There was no change operated with initial operating during the test.
- 4) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- 5) Criteria C: The system shut down during the test.

4.6 EFT/BURST TESTING

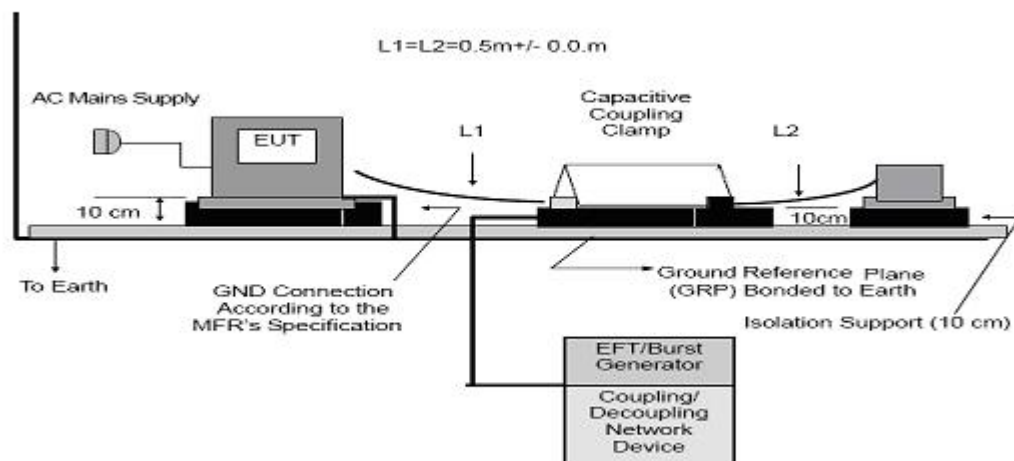
4.6.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-4
Required Performance:	B
Test Voltage:	Power Line:0.5 kV, 1 kV Signal/Control Line:0.5 kV
Polarity:	Positive & Negative
Impulse Frequency:	5 kHz
Impulse Wave shape :	5/50 ns
Burst Duration:	15 ms
Burst Period:	300 ms
Test Duration:	Not less than 1 min.

4.6.2 TEST PROCEDURE

The EUT and its simulators were placed on a ground reference plane and were insulated from it by a wood support 0.1m + 0.01m thick. The ground reference plane was 1m*1m metallic sheet with 0.65mm minimum thickness. The other condition as following manner:

- The length of power cord between the coupling device and the EUT should not exceed 1 meter.
- Both positive and negative polarity discharges were applied.
- The duration time of each test sequential was 1 minute



Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table (0.8m high) standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system. A minimum distance of 0.5m was provided between the EUT and the walls of the laboratory or any other metallic structure.

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-4 and its cables, were isolated from the Ground Reference Plane by an insulating support that is 0.1-meter thick. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system.

4.6.4 TEST RESULTS

EUT:	LED Lamp (Ceiling Lamp)	Model Name:	MX82008-20A
Temperature:	25°C	Relative Humidity:	60%
Pressure:	1010hPa	Test Date :	2015-01-05
Test Mode:	Lighting		
Test Voltage:	AC 230V/50Hz		

Coupling Line		Test level (kV)								Criterion	Result
		0.5		1		2		4			
		+	-	+	-	+	-	+	-		
AC line	L	P	P	P	P					B	Complies
	N	P	P	P	P						
	PE										
	L+N	P	P	P	P						
	L+PE										
	N+PE										
	L+N+PE										
DC Line											
Signal Line											

Note:

- 1) +/- denotes the Positive/Negative polarity of the output voltage.
- 2) N/A - denotes test is not applicable in this test report
- 3) In the table: 'P' represents 'PASS'; 'F' represents 'FAIL'.
- 4) Criteria A: There was no change operated with initial operating during the test.
- 5) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- 6) Criteria C: The system shut down during the test.

4.7 SURGE TESTING

4.7.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-5
Required Performance:	C
Wave-Shape:	Combination Wave 1.2/50 us Open Circuit Voltage 8 /20 us Short Circuit Current
Test Voltage:	Power Line:0.5 kV, 1 kV, 2 kV
Surge Input/Output:	L-N, L-PE, N-PE
Generator Source:	2 ohm between networks
Impedance:	12 ohm between network and ground
Polarity:	Positive/Negative
Phase Angle:	90°/270°
Pulse Repetition Rate:	1 time / min. (maximum)
Number of Tests:	5 positive and 5 negative at selected points

4.7.2 TEST PROCEDURE

a. For EUT power supply:

The surge is to be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks shall be 2meters in length (or shorter).

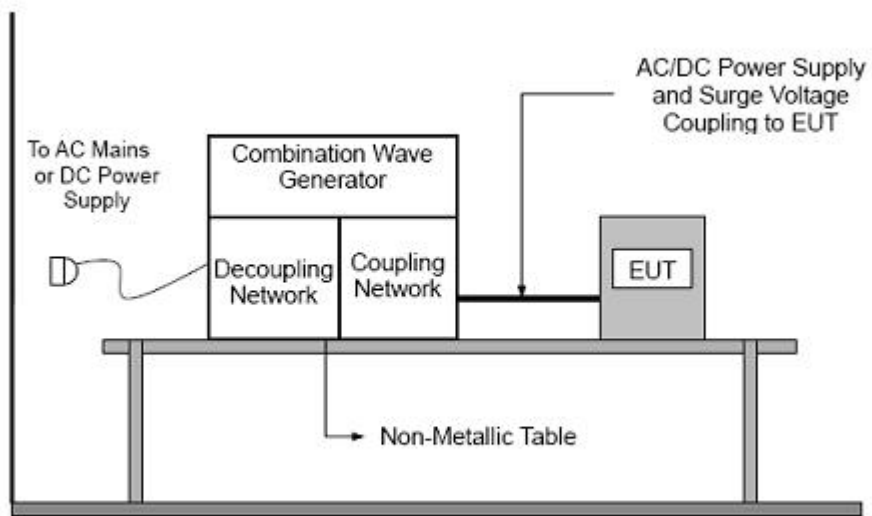
b. For test applied to unshielded unsymmetrically operated interconnection lines of EUT:

The surge is applied to the lines via the capacitive coupling. The coupling /decoupling networks shall not influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

c. For test applied to unshielded symmetrically operated interconnection /telecommunication lines of EUT:

d. The surge is applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestor cannot be specified. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

4.7.3 TEST SETUP



4.7.4 TEST RESULTS

EUT:	LED Lamp (Ceiling Lamp)	Model Name:	MX82008-20A
Temperature:	25°C	Relative Humidity:	60%
Pressure:	1010hPa	Test Date :	2015-01-05
Test Mode:	Lighting		
Test Voltage:	AC 230V/50Hz		

Coupling Line			Test level								Criterion	Result
			0.5 kV		1 kV		2 kV		4 kV			
			+	-	+	-	+	-	+	-		
AC line	L-N	0°									C	Complies
		90°	P		P							
		180°										
		270°		P		P						
	L-PE	0°										
		90°										
		180°										
		270°										
	N-PE	0°										
		90°										
		180°										
		270°										
DC Line												
Signal Line												

Note:

- 1) Polarity and Numbers of Impulses:5 Pst / Ngt at each tested mode
- 2) N/A - denotes test is not applicable in this Test Report
- 3) In the table: 'P' represents 'PASS'; 'F' represents 'FAIL'.
- 4) Criteria A: There was no change operated with initial operating during the test.
- 5) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- 6) Criteria C: The system shut down during the test.

4.8 INJECTION CURRENT TESTING

4.8.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-6
Required Performance:	A
Frequency Range:	0.15 MHz - 80 MHz
Field Strength:	3 Vr.m.s.
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Dwell Time:	3 seconds

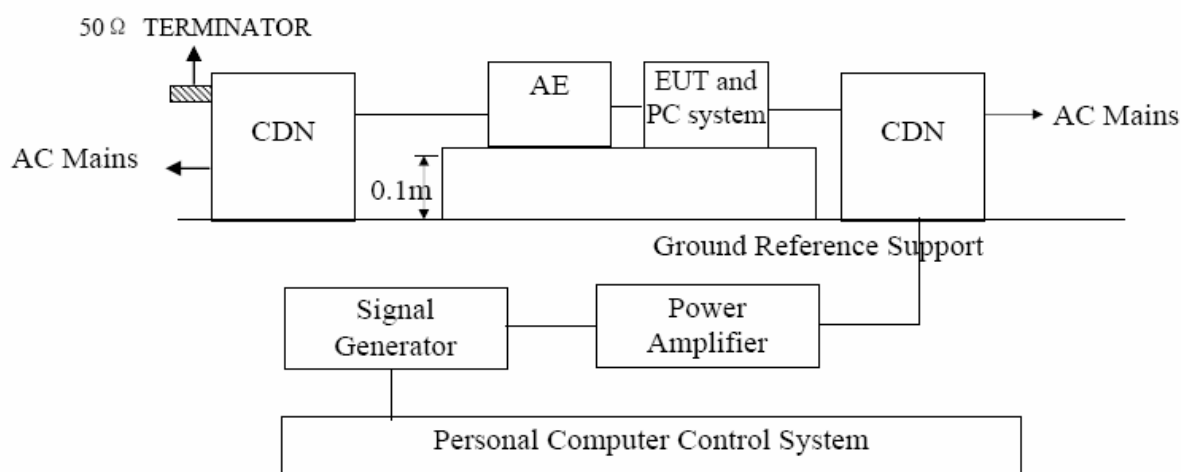
4.8.2 TEST PROCEDURE

The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50mm (where possible). The disturbance signal described below is injected to EUT through CDN.

The other condition as following manner:

- The frequency range is swept from 150 kHz to 80 MHz, with the signal 80% amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed 1.5×10^{-3} decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.

4.8.3 TEST SETUP



NOTE:

FLOOR-STANDING EQUIPMENT

The equipment to be tested is placed on an insulating support of 0.1 meters height above a ground reference plane. All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0.1 meters and 0.3 meters from the projected geometry of the EUT on the ground reference plane.

4.8.4 TEST RESULTS

EUT:	LED Lamp (Ceiling Lamp)	Model Name:	MX82008-20A
Temperature:	25°C	Relative Humidity:	60%
Pressure:	1010hPa	Test Date :	2015-01-05
Test Mode:	Lighting		
Test Voltage:	AC 230V/50Hz		

Test Ports (Mode)	Freq. Range MHz)	Field Strength	Perform. Criteria	Results	Judgment
Input/ Output AC. Power Port	0.15 ---80	3V(r.m.s) AM Modulated 1000Hz, 80%	A	P	Complies
Input/ Output DC. Power Port	0.15 --- 80		A	N/A	N/A
Signal Line	0.15 --- 80		A	N/A	N/A

Note:

- 1) N/A - denotes test is not applicable in this Test Report.
- 2) In the table: 'P' represents 'PASS'; 'F' represents 'FAIL'.
- 3) Criteria A: There was no change operated with initial operating during the test.
- 4) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- 5) Criteria C: The system shut down during the test.

4.9 POWER FREQUENCY MAGNETIC FIELD TESTING

4.9.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-8
Required Performance:	A
Frequency Range:	50Hz
Field Strength:	3 A/m
Observation Time:	1 minute
Inductance Coil:	Rectangular type, 1mx1m

4.9.2 TEST PROCEDURE

The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m min. and 0.65mm thick min.

The other condition as following manner:

- The equipment cabinets shall be connected to the safety earth directly on the GRP via the earth terminal of the EUT.
- The cables supplied or recommended by the equipment manufacturer shall be used. 1 meter of all cables used shall be exposed to the magnetic field.

The equipment shall be subjected to the test magnetic field by using induction coils of suitable dimensions. The test shall be repeated by moving and shifting the induction coils, in order to test the whole volume of the EUT for each orthogonal direction. The test shall be repeated with the coil shifted to different positions along the side of the EUT, in steps corresponding to 50 % of the shortest side of the coil. The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

4.9.4 TEST RESULTS

EUT:	LED Lamp (Ceiling Lamp)	Model Name:	MX82008-20A
Temperature:	25°C	Relative Humidity:	60%
Pressure:	1010hPa	Test Date :	2015-01-05
Test Mode:	Lighting		
Test Voltage:	AC 230V/50Hz		

Test Mode	Test Level	Antenna aspect	Duration (s)	Perform Criteria	Results	Judgment
Enclosure	3 A/m	X	60 s	A	P	Complies
Enclosure	3 A/m	Y	60 s	A	P	
Enclosure	3 A/m	Z	60 s	A	P	

Note:

- 1) N/A - denotes test is not applicable in this test report
- 2) In the table: 'P' represents 'PASS'; 'F' represents 'FAIL'.
- 3) Criteria A: There was no change operated with initial operating during the test.
- 4) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- 5) Criteria C: The system shut down during the test.

4.10 VOLTAGE INTERRUPTION/DIPS TESTING

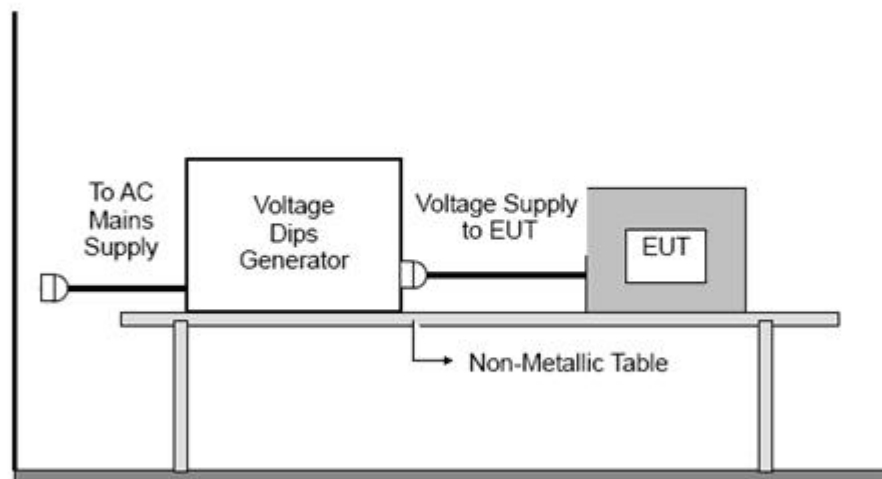
4.10.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-11
Required Performance:	B (For 100% Voltage Dips) C (For 30% Voltage Dips)
Test Duration Time:	Minimum three test events in sequence
Interval between Event:	Minimum ten seconds
Phase Angle:	0°/45°/90°/135°/180°/225°/270°/315°/360°
Test Cycle:	3 times

4.10.2 TEST PROCEDURE

The EUT shall be tested for each selected combination of test levels and duration with a sequence of three dips/interruptions with intervals of 10 s minimum (between each test event). Each representative mode of operation shall be tested. Abrupt changes in supply voltage shall occur at zero crossings of the voltage waveform.

4.10.3 TEST SETUP



4.10.4 TEST RESULTS

EUT:	LED Lamp (Ceiling Lamp)	Model Name:	MX82008-20A
Temperature:	25°C	Relative Humidity:	60%
Pressure:	1010hPa	Test Date :	2015-01-05
Test Mode:	Lighting		
Test Voltage:	AC 230V/50Hz		

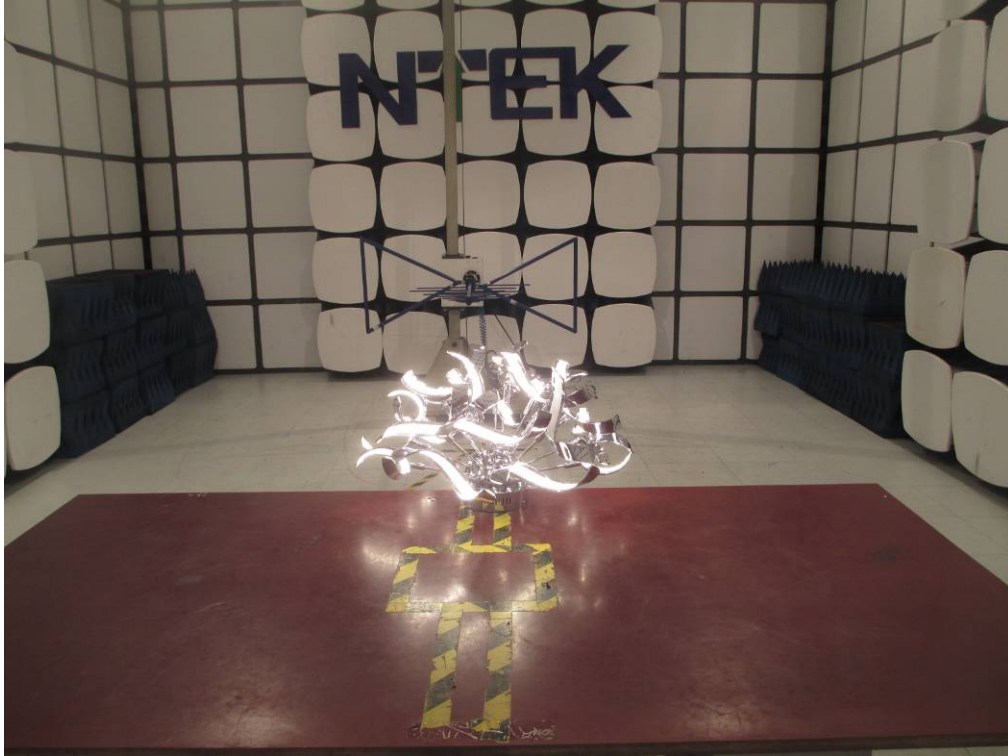
Interruption & Dips	Duration (T)	Perform Criteria	Results	Judgment
Voltage dip 100%	0.5	B	P	Complies
Voltage dip 30%	10	C	P	

Note:

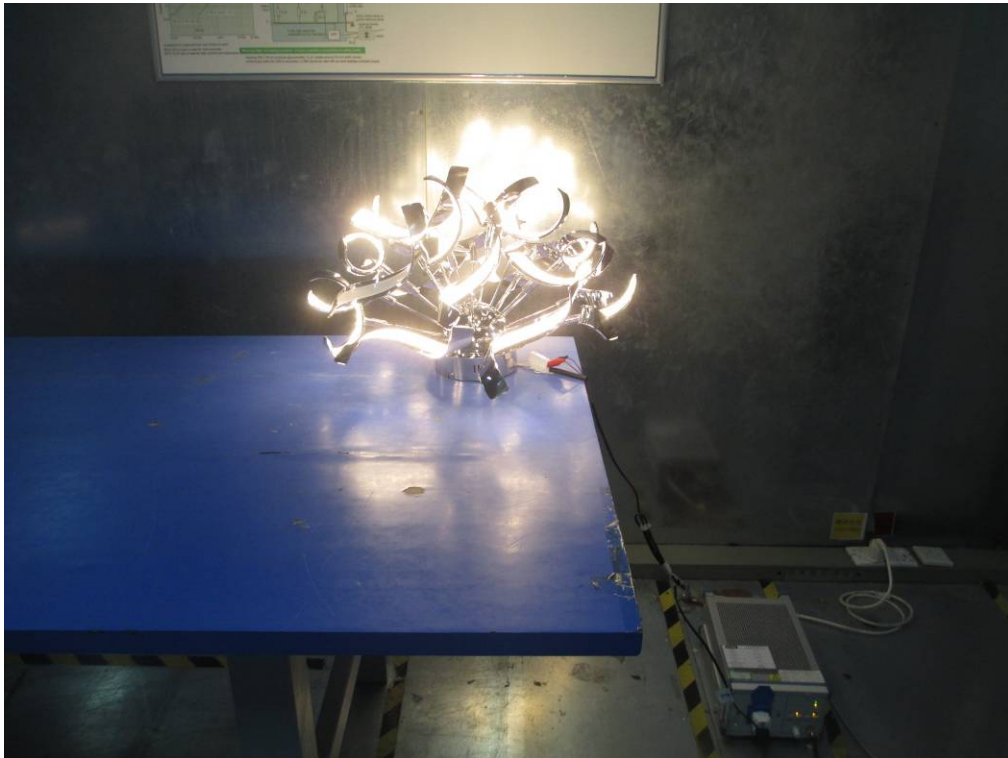
- 1). N/A - denotes test is not applicable in this test report.
- 2) In the table: 'P' represents 'PASS'; 'F' represents 'FAIL'.
- 3) Criteria A: There was no change operated with initial operating during the test.
- 4) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- 5) Criteria C: The system shut down during the test.

5. EUT TEST PHOTO

Radiated Measurement Photos



Conducted Measurement Photos



ATTACHMENT PHOTOGRAPHS OF EUT

Photo 1 (MX82008-20A)



Photo 2 (MX82008-20A)



Photo 3 (MX82008-20A)

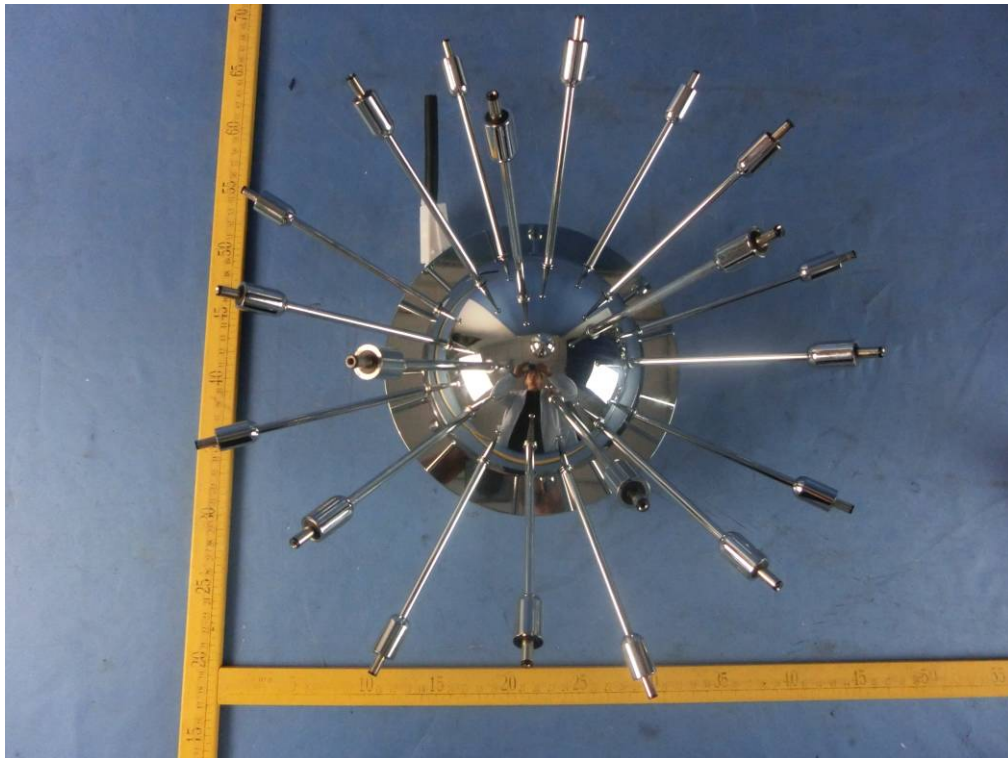


Photo 4 (MX82008-20A)

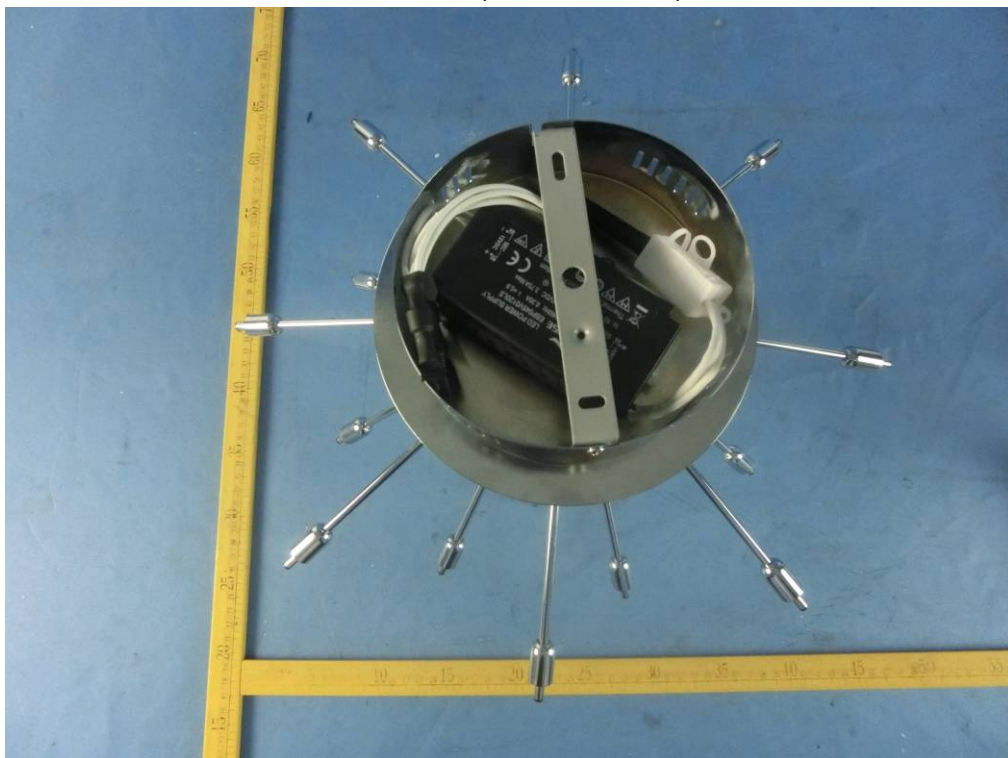


Photo 5 (MX82008-20A)



Photo 6 (MX82008-20A)



Photo 7 (MX82008-20A)



Photo 8

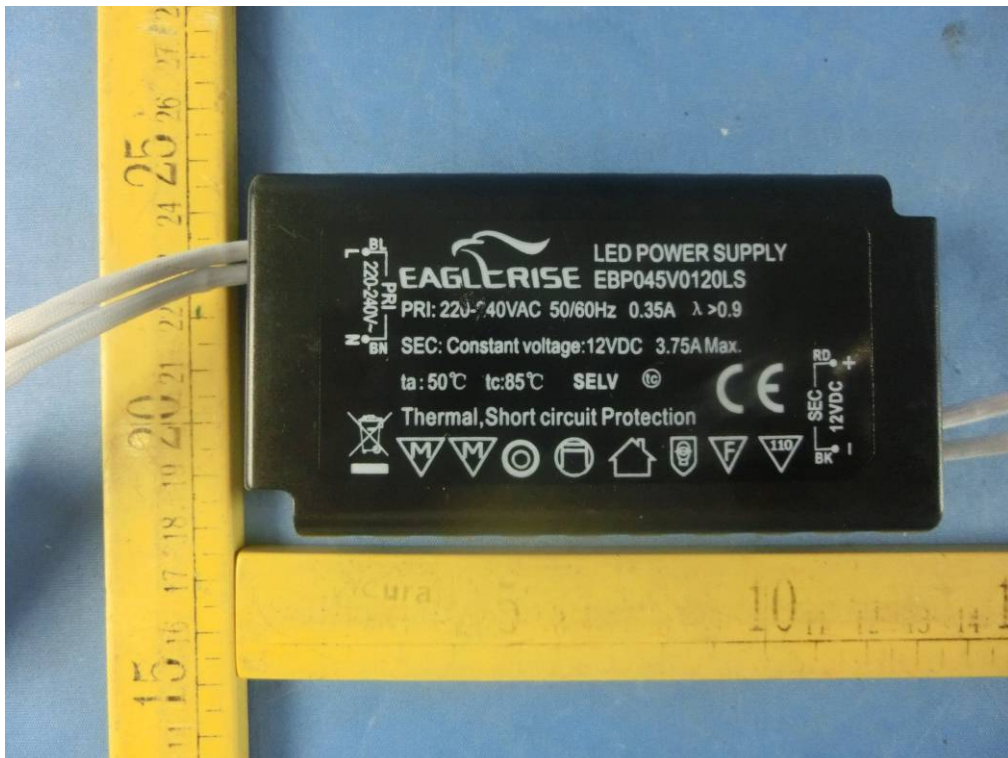


Photo 9



Photo 10

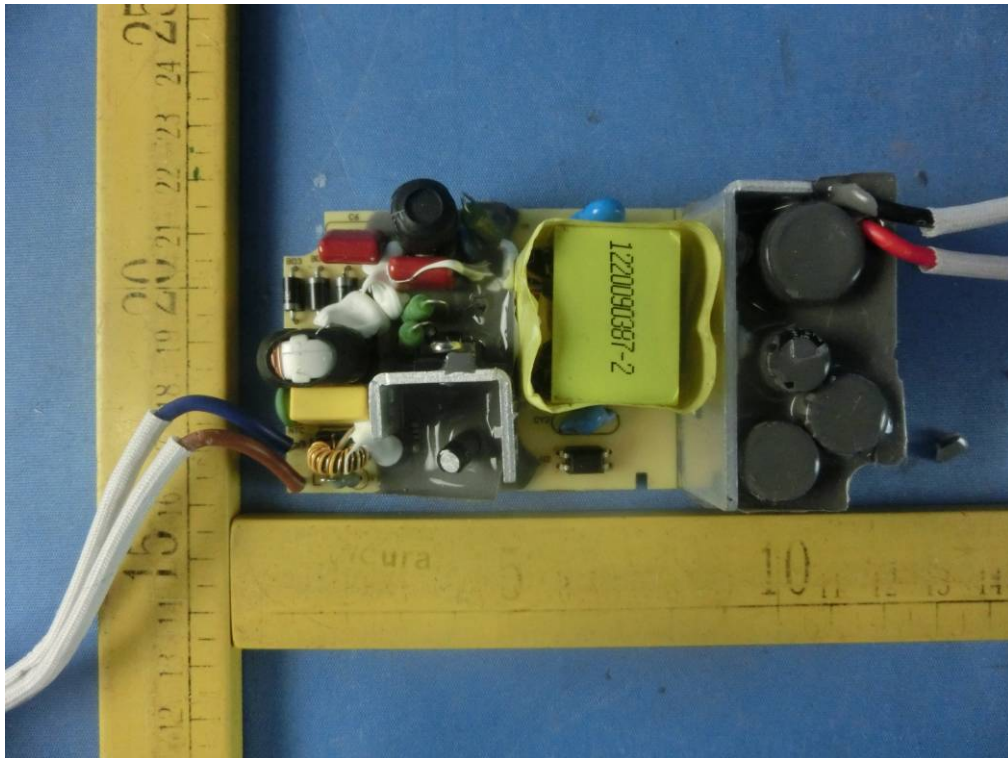


Photo 11

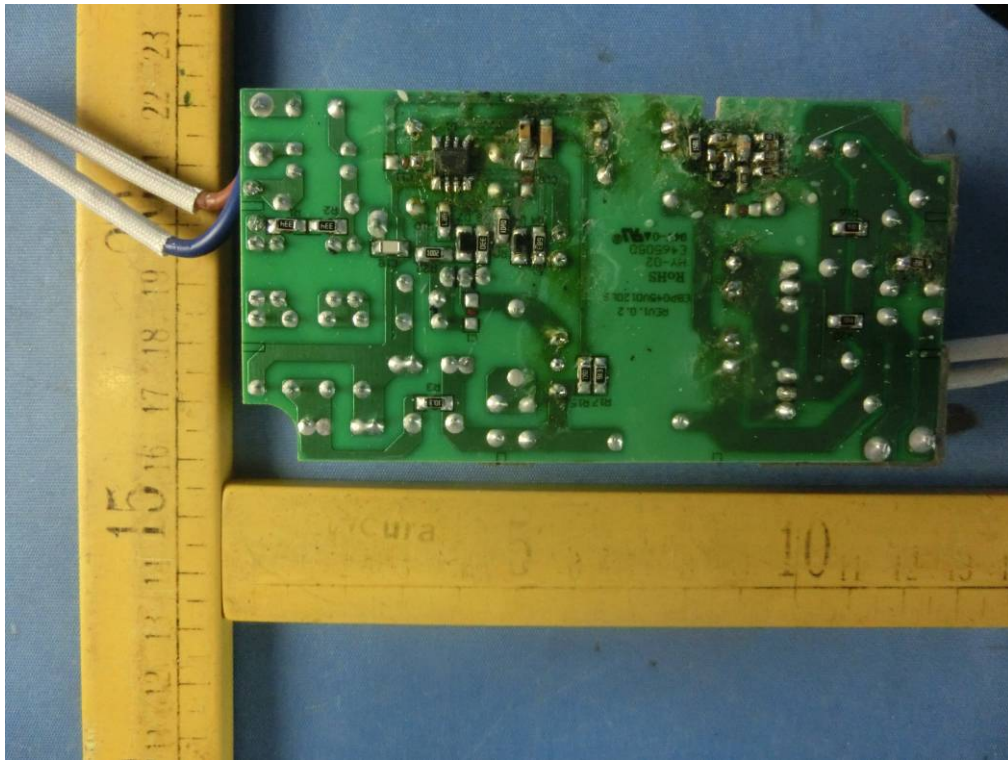


Photo 12 (MX1163-3)



Photo 13 (MX1163-3)

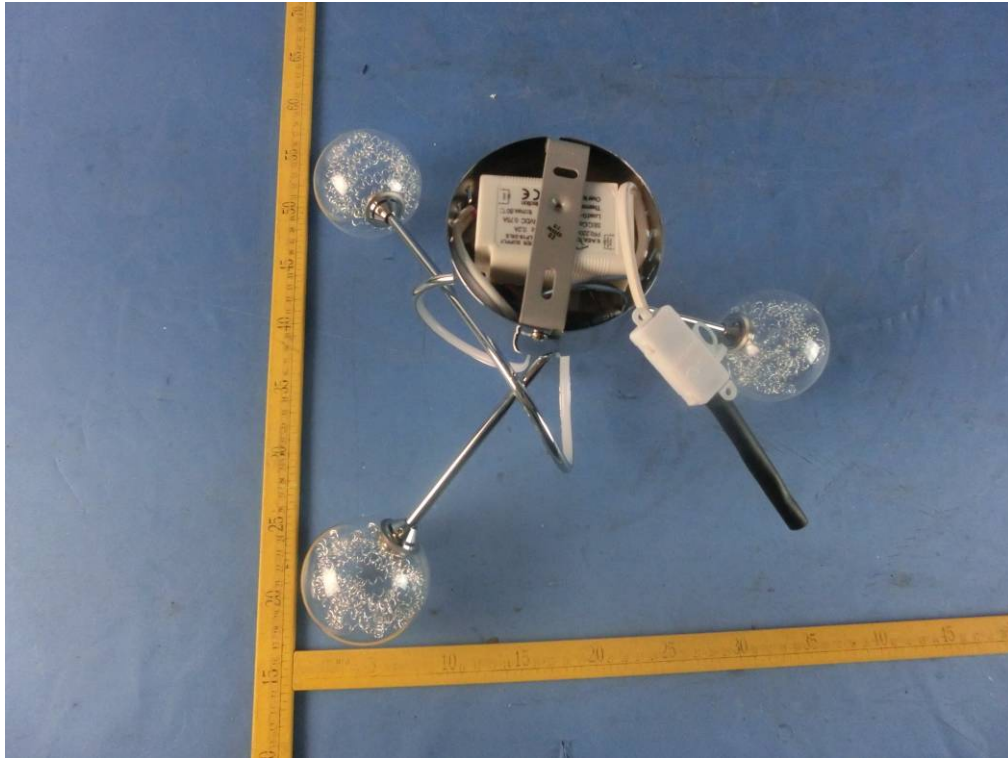


Photo 14 (MX1167-6+3A)



Photo 15 (MX1167-6+3A)

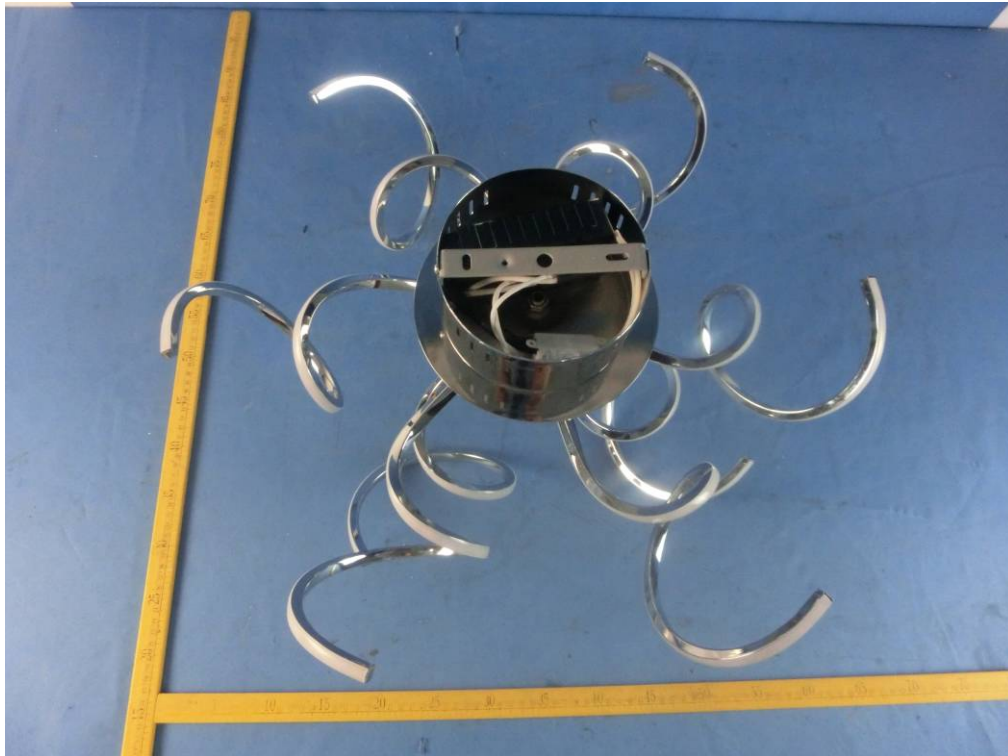


Photo 16 (MP82008-30A)



Photo 17 (MP82008-30A)



Photo 18 (MP8525-6B)

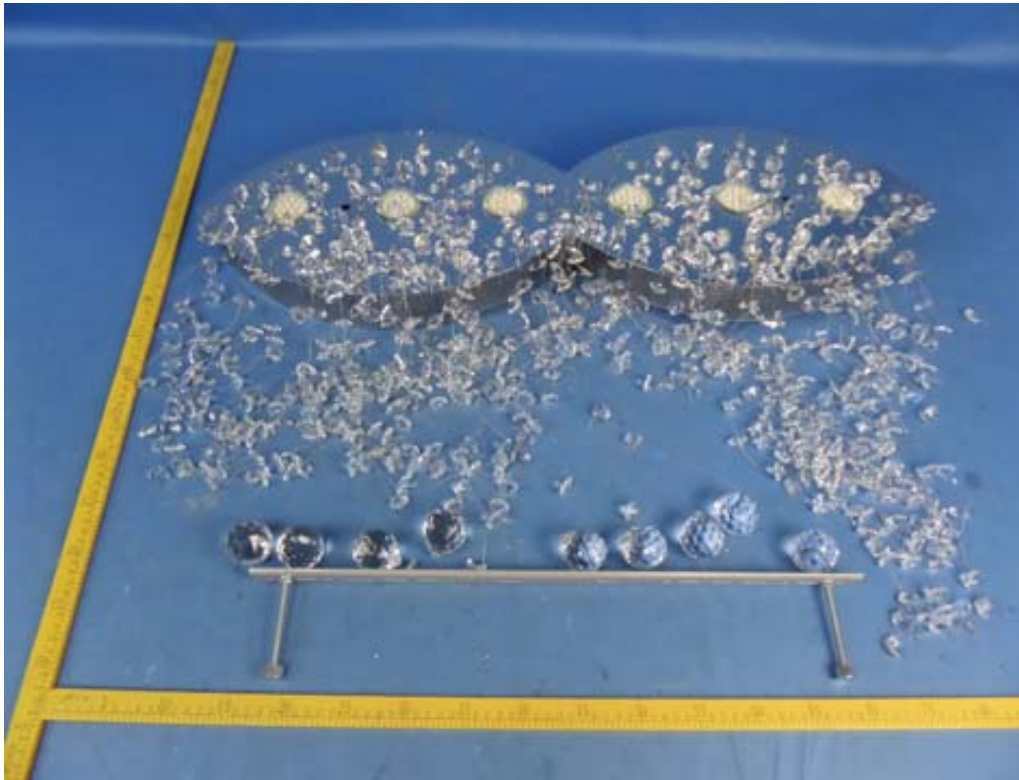


Photo 19 (MP8525-6B)

