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Report No.: SHEM161000658301
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1 Cover Page

TEST REPORT

Application No.:	SHEM1610006583LM
Applicant:	Ningbo Mingwei Electric Appliance Co., Ltd
Product Name:	LED Cosmetic Mirror
Model No.(EUT):	MWLM316
Add Model No.:	MWLM318, MWLM318-01, MWLM319
Standards:	EN 55015:2013+A1:2015, EN 61547:2009
Date of Receipt:	January 09, 2015
Date of Test:	January 12, 2015 to January 16, 2015
Date of Issue:	October 18, 2016
Test Result:	Pass*

* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EC Declaration of Conformity and compliance with all relevant EU Directives.



Parlam Zhan
E&E Section Manager
SGS-CSTC (Shanghai) Co., Ltd.

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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2 Test Summary

ELECTROMAGNETIC INTERFERENCE (EMI)			
Test	Test Requirement	Test Method	Result
Radiated Electromagnetic Disturbance 9 KHz to 30 MHz	EN 55015:2013+A1:2015	EN 55015:2013+A1:2015	PASS
Radiated Emission, 30 MHz to 300 MHz	EN 55015:2013+A1:2015	EN 55015:2013+A1:2015	PASS
Electromagnetic Susceptibility(EMS)			
Test	Test Requirement	Test Method	Result
Electrostatic Discharge (ESD)	EN 61547:2009	EN 61000-4-2:2009	PASS
Radio-frequency electromagnetic fields, 80 MHz to 1 GHz	EN 61547:2009	EN 61000-4-3:2006+ A1:2008+A2:2010	PASS
Power frequency magnetic fields	EN 61547:2009	EN 61000-4-8:2010	N/A**
Remark:			
Note:** The Power-frequency magnetic field test will not apply to the equipment containing no components susceptible to magnetic fields, such as Hall elements or magnetic field sensors, according to EN 61547.			
EUT IN THIS WHOLE REPORT EUT MEANS EQUIPMENT UNDER TEST.			
Note1: There are 4 models mentioned in this report, and they are the similar in electrical and electronic characters. Only the model MWLM316 was tested since their differences are Model Number and Appearance			
Note2: The report is copied from SHEM150100007201 to update standard and directive.			

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4 General Information

4.1 Client Information

Applicant: Ningbo Mingwei Electric Appliance Co., Ltd
 Address of Applicant: 18, qiou road, industrial zone, simen town, yuyao ningbo, 315470 zhejiang china
 Manufacturer: Ningbo Mingwei Electric Appliance Co., Ltd
 Address of Manufacturer: 18, qiou road, industrial zone, simen town, yuyao ningbo, 315470 zhejiang china
 Factory: Ningbo Mingwei Electric Appliance Co., Ltd
 Address of Factory: 18, qiou road, industrial zone, simen town, yuyao ningbo, 315470 zhejiang china

4.2 Details of E.U.T.

Power Supply: 3*1.5V "AAA" battery Size DC 4.5V
 Test voltage: DC 4.5V
 Cable Type: N/A

4.3 E.U.T Operation Mode

Functions/Modes: Lighting mode
 Lighting mode: Keep EUT lighting.

4.4 E.U.T Operation Environment

Temperature Range: 20-25°C
 Humidity Range: 30-60% RH
 Atmospheric Pressure Range: 100-102kPa

4.5 Description of Support Units

The EUT has been tested independently.

4.6 Deviation from Standards

All Immunity tests to EN 61547 were performed in accordance with EN 61000-4-x and not IEC 61000-4-x. (x=2,3).

4.7 Abnormalities from Standard Conditions

None.

4.8 Modification/Retest Record

None.

4.9 Monitoring of EUT for All Immunity Test

Audio: None

Visual: Working status of the EUT

4.10 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab

588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666

Fax: +86 21 6191 5678

No tests were sub-contracted.

4.11 Test Facility

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A-1.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3868 and C-4336 respectively.

4.12 Measurement Uncertainty

According to CISPR 16-4-2.

Test Item	Frequency Range	Measurement Uncertainty	U _{cispr}
Conducted Emission at mains port using AMN	9kHz-150kHz	3.2dB	3.8dB
Conducted Emission at mains port using AMN	150kHz-30MHz	2.6dB	3.4dB
Conducted Emission at mains port using VP	9kHz-30MHz	3.9dB	2.9dB
Conducted Emission at telecommunication port using AAN	150kHz-30MHz	4.5dB	5.0dB
Radiated Emission	30MHz-1000MHz	4.3dB	6.3dB
Radiated Emission	1GHz-18GHz	4.5dB	5.2dB(1GHz-6GHz)
			5.5dB(6GHz-18GHz)
Disturbance Power	30MHz-300MHz	2.6dB	4.5dB
Remark: AMN – Artificial Mains Network VP – Voltage Probe ANN – Asymmetric Artificial Network			

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

5 Equipment list

Radiated Electromagnetic Disturbance

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
1	3-dimensional large loop	SCHWARZBE CK	HXYZ917 0	HXYZ917 0-136	2014-02-13	2015-02-12
2	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2014-02-13	2015-02-12

Radiated Emission

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2014-02-13	2015-02-12
2	CONTROLLER	INNCO	CO200	474	/	/
3	Broadband UHF-VHF ANTENNA	SCHWARZBE CK	VULB916 8	9168-313	2014-02-13	2015-02-12
4	Double ridged broadband horn ANTENNA	SCHWARZBE CK	BBHA912 0D	9120D-67 9	2014-02-13	2015-02-12
5	Amplifier	SCHWARZBE CK	SCU-F011 8-G40-BZ 4-CSS(F)	10001	2014-02-13	2015-02-12
6	Low noise amplifier	TESEQ	LNA6900	71033	2014-02-13	2015-02-12

Electrostatic Discharge Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
1	Electrostatic Discharge Simulator	TESEQ	NSG 437	468	2014-08-28	2015-08-27

Radiated Immunity

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
1	Single Generator	Rohde & Schwarz	SMJ100A	101394	2014-02-13	2015-02-12
2	Calibrated Stacked Lagarithmic-Periodic Test-Antenna	SCHWARIBFC K	STLP 9128D	9128 D 055	/	/
3	Stacked DoubleLog-Per. Antenna	SCHWARIBFC K	STLP 9149	9149-187	/	/
4	Power Amplifiers	MILMEGA	80RF1000-250	1053058	2014-08-10	2015-08-09
5	Power Amplifiers	MILMEGA	AS0840-55-55	1053059	2014-08-10	2015-08-09
6	Power Meter	Rohde & Schwarz	NRP	101641	2014-02-13	2015-02-12
7	Electromagnetic Field Probe	ETS-Lindgren	HI-6113	000114591	2014-09-10	2015-09-09
8	Power sensor	Rohde & Schwarz	NRP-Z91	100647	2014-02-13	2015-02-12
9	Power sensor	Rohde & Schwarz	NRP-Z22	101096	2014-08-10	2015-08-09

General Equipment

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
1	Digital pressure meter	YONGZHI	DYM3-01	101012	2013-03-11	2015-03-09
2	Temperature & humidity recorder	ShangHai weather meter work	ZJ 1-2B	0804081	2014-08-19	2015-08-18
3	Temperature & humidity recorder	ShangHai weather meter work	ZJ 1-2B	0802150	2014-08-19	2015-08-18
4	Digital Multimeter	FLUKE	17B	19720439	2015-01-19	2016-01-18
5	Digital illuminance meter	TES electrical electronic Corp.	TES-1330A	120702468	2014-09-05	2015-09-04

6 Emission Test Results

6.1 Radiated Electromagnetic Disturbance Test: 9 kHz -30 MHz

Detector: Peak for pre-scan
 Quasi-Peak for final test
 200 Hz resolution bandwidth between 9 kHz & 150 kHz
 9 kHz resolution bandwidth between 150 kHz & 30 MHz

Limit:

Frequency range MHz	Limits for loop diameter limits 2m dB (μA) ^a
0.009 to 0.070	88
0.070 to 0.150	88 to 58 ^b
0.150 to 3.0	58 to 22 ^b
3.0 to 30.0	22

^a At the transition frequency, the lower limit applies.

^b Decreasing linearly with the logarithm of the frequency. For electrodeless lamps and luminaires, the limit in the frequency range of 2.2 MHz to 3.0 MHz is 58 dB(μA) for 2 m loop diameter.

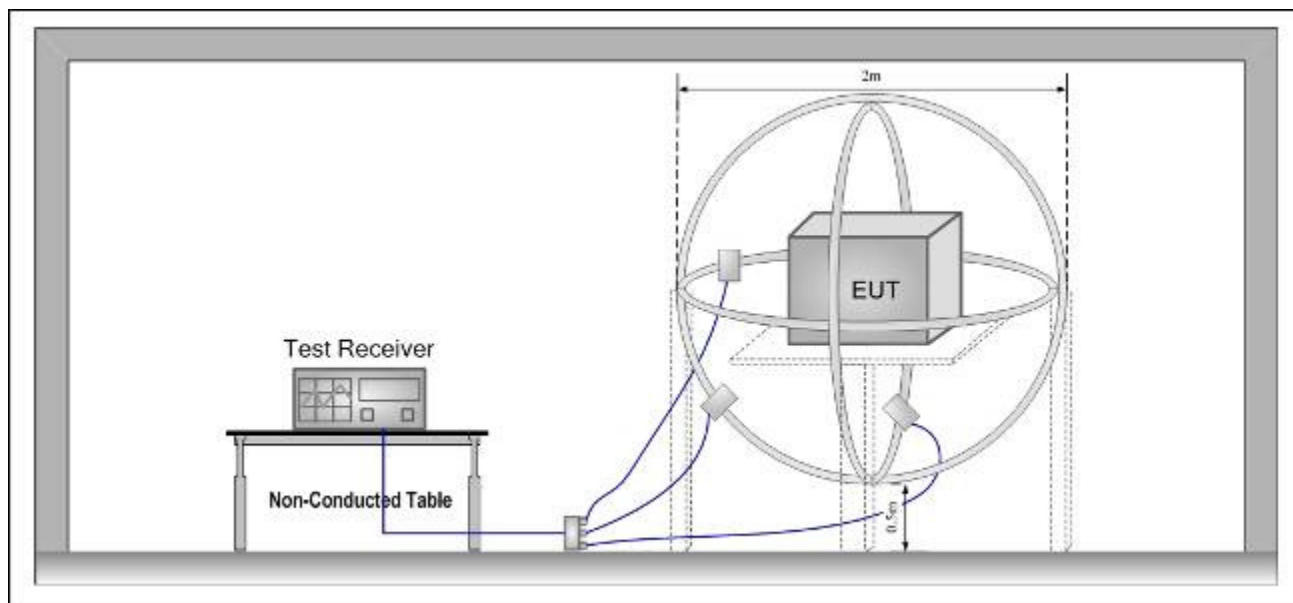
6.1.1 E.U.T. Operation

Test mode: Lighting mode

Pre-scan was performed with peak detected on all ports, Quasi-peak measurements were performed at the frequencies at which maximum peak emission level were detected.

Please see the attached Quasi-peak test results.

6.1.2 Test Setup and Procedure



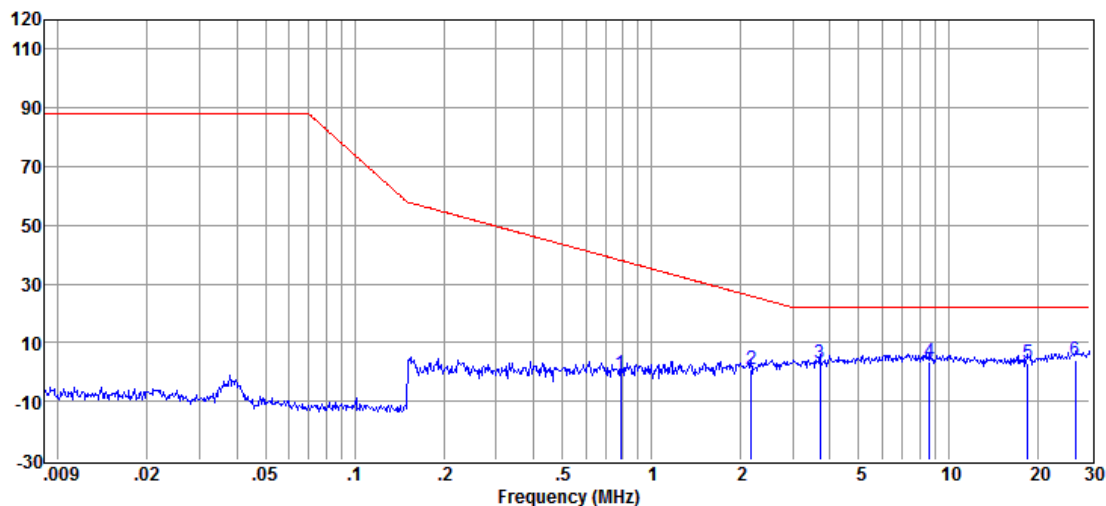
1. The magnetic component was measured by means of a loop antenna. The lighting equipment was placed in the centre of the antenna. The position of the mains lead was optimized for maximum current induction.
2. The induced current in the loop antenna was measured by means of a current probe (1 V/A) and the CISPR measuring receiver. During the measurements the EUT remains in a fixed position. By means of a coaxial switch, The currents in the three large loop antennas, originating from the three mutually orthogonal magnetic field components, were measured in sequence. Each value was fulfill the requirements given.
3. There were no special instructions for the supply wiring.
4. The distance between the outer perimeter of the LAS(Loop Antenna System) and nearby objects, such as floor and walls, was at least 0.5 m.
5. To avoid unwanted capacitive coupling between the EUT and the LAS, the maximum dimensions of the EUT allowed a distance of at least 0.20 m between the EUT and the standardized 2 m large loop antennas of the LAS.

6.1.3 Measurement Data

An initial pre-scan was performed in the 2 m loop antenna using the spectrum analyser in peak detection mode. The EUT was measured for X(A), Y(B), Z(C) polarities. (EN 55015 Table 3a column 2).

X:

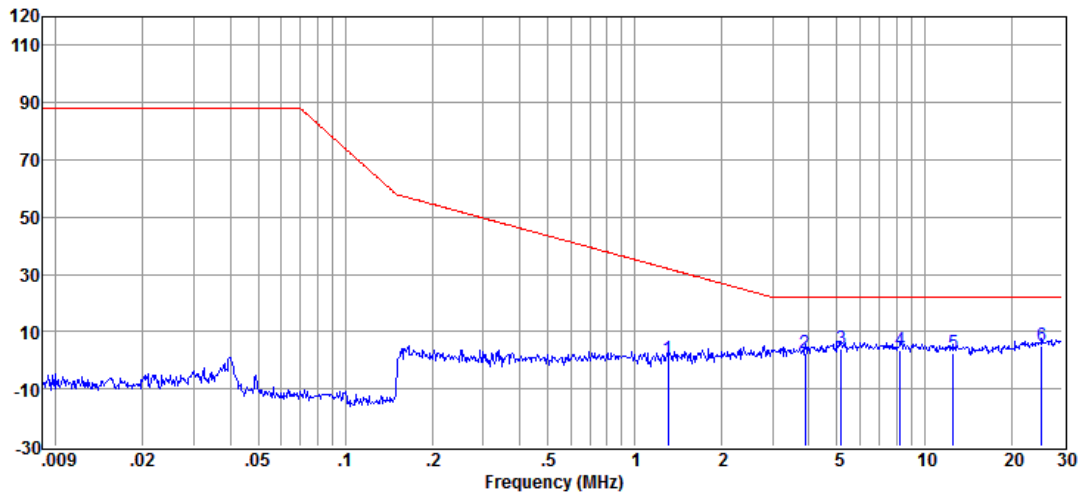
Level (dBuA)



Item	Freq.	Read Level	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBμV)	(dB)	(dBuA)	(dBuA)	(dB)	
1	0.786	-0.77	0.30	-0.47	38.10	-38.57	QP
2	2.166	0.60	0.31	0.91	25.91	-25.00	QP
3	3.700	2.60	0.37	2.97	22.00	-19.03	QP
4	8.672	3.17	0.50	3.67	22.00	-18.33	QP
5	18.590	2.58	0.57	3.15	22.00	-18.85	QP
6	26.779	3.08	0.80	3.88	22.00	-18.12	QP

Y:

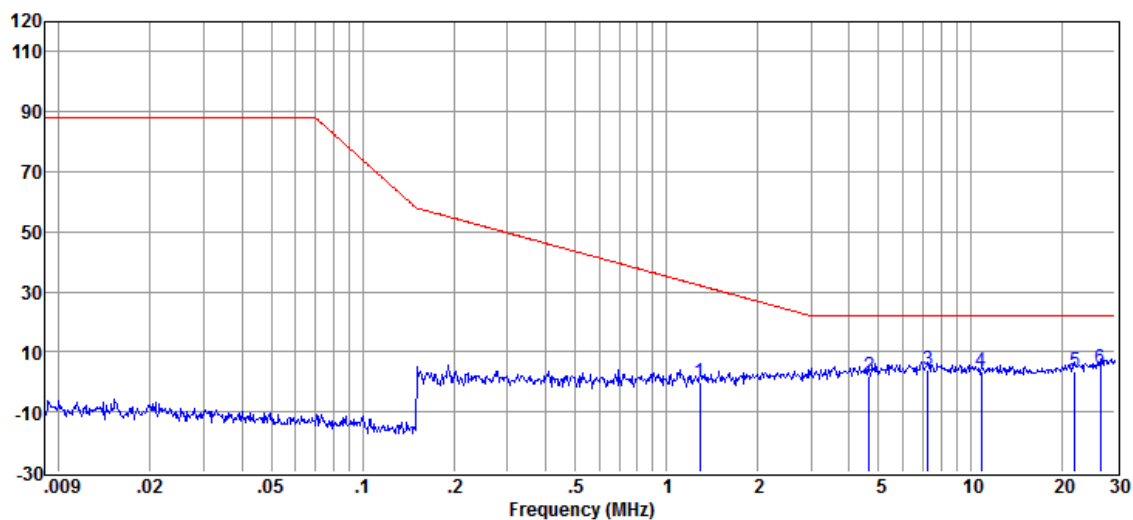
Level (dBuA)



Item	Freq.	Read Level	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dB μ V)	(dB)	(dBuA)	(dBuA)	(dB)	
1	1.299	0.12	0.30	0.42	32.05	-31.63	QP
2	3.885	2.00	0.37	2.37	22.00	-19.63	QP
3	5.160	3.37	0.41	3.78	22.00	-18.22	QP
4	8.260	2.99	0.50	3.49	22.00	-18.51	QP
5	12.594	1.83	0.50	2.33	22.00	-19.67	QP
6	25.507	4.04	0.80	4.84	22.00	-17.16	QP

Z:

Level (dBuA)



Item	Freq.	Read Level	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBμV)	(dB)	(dBuA)	(dBuA)	(dB)	
1	1.289	-0.64	0.30	-0.34	32.15	-32.49	QP
2	4.644	1.58	0.39	1.97	22.00	-20.03	QP
3	7.255	3.29	0.50	3.79	22.00	-18.21	QP
4	10.883	2.78	0.50	3.28	22.00	-18.72	QP
5	22.042	3.04	0.69	3.73	22.00	-18.27	QP
6	26.779	3.71	0.80	4.51	22.00	-17.49	QP

Level = Read Level + Cable Loss

6.2 Radiated Emissions, 30 MHz to 300 MHz

Detector: Peak for pre-scan (120 kHz resolution bandwidth)
 Quasi-Peak for final test (120 kHz resolution bandwidth)

Limit:

For 3m

Frequency range MHz	Quasi-peak limits dB (μV/m)
30 to 230	40
230 to 300	47
At transitional frequencies the lower limit applies.	

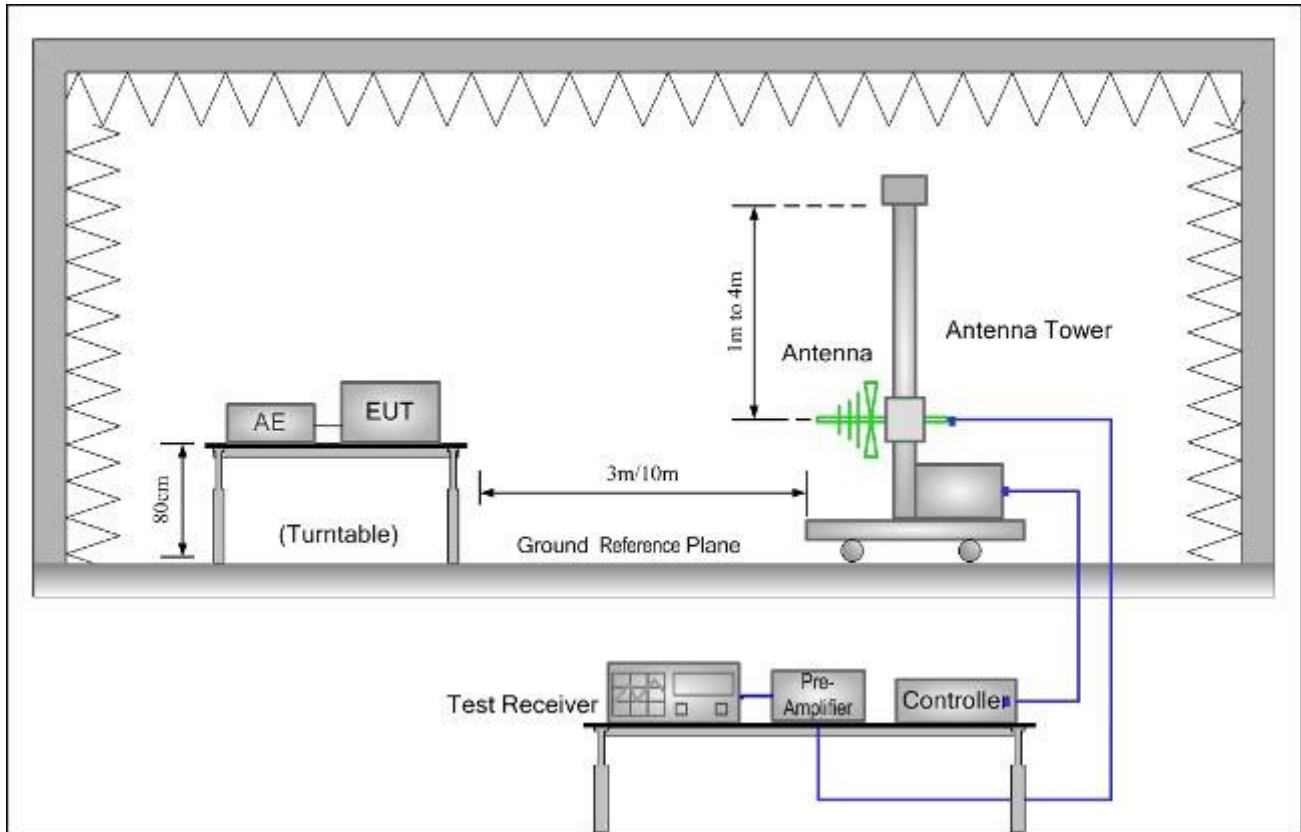
6.2.1 E.U.T. Operation

Test mode: Lighting mode

Pre-scan was performed with peak detected on all ports, Quasi-peak measurements was performed at the frequencies at which maximum peak emission level were detected.

Please see the attached Quasi-peak test results.

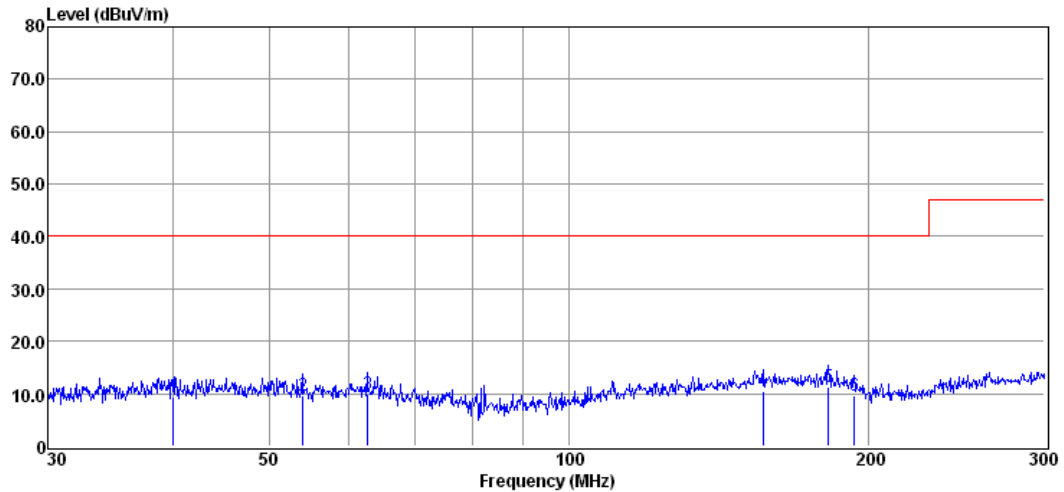
6.2.2 Test Setup and Procedure



1. The radiated emissions test was conducted in a semi-anechoic chamber.
2. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
3. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emission spectrum signature data plots of the EUT.
4. The frequencies of maximum emission were determined in the final radiated emissions measurement, The physical arrangement of the test system and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.

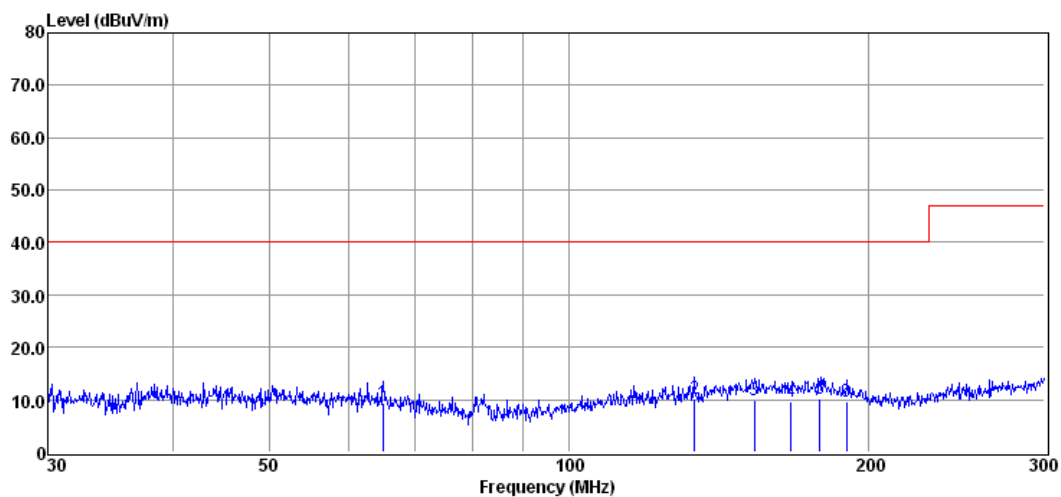
6.2.3 Measurement Data

Vertical:



Item	Freq.	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
1	40.075	18.33	13.10	23.70	0.27	9.26	40.00	-30.74	QP
2	54.027	19.56	12.21	23.69	0.47	9.63	40.00	-30.37	QP
3	62.731	20.27	11.75	23.68	0.54	10.00	40.00	-30.00	QP
4	156.562	19.68	12.30	23.63	1.21	10.57	40.00	-29.43	QP
5	182.203	21.10	11.94	23.63	1.35	11.26	40.00	-28.74	QP
6	193.421	19.87	10.70	23.62	1.37	9.57	40.00	-30.43	QP

Horizontal:



Item	Freq.	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector
(Mark)	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
1	64.980	20.07	11.50	23.68	0.56	9.48	40.00	-30.52	QP
2	133.530	20.57	11.33	23.64	1.10	10.29	40.00	-29.71	QP
3	153.516	19.21	12.30	23.64	1.20	9.97	40.00	-30.03	QP
4	167.069	18.85	12.23	23.63	1.26	9.56	40.00	-30.44	QP
5	178.522	19.92	12.11	23.63	1.33	10.18	40.00	-29.82	QP
6	189.891	19.47	11.45	23.62	1.37	9.68	40.00	-30.32	QP

$$\text{Level} = \text{Read Level} + \text{Antenna Factor} + \text{Cable Loss} - \text{Preamp Factor}$$

7 Immunity Test Results

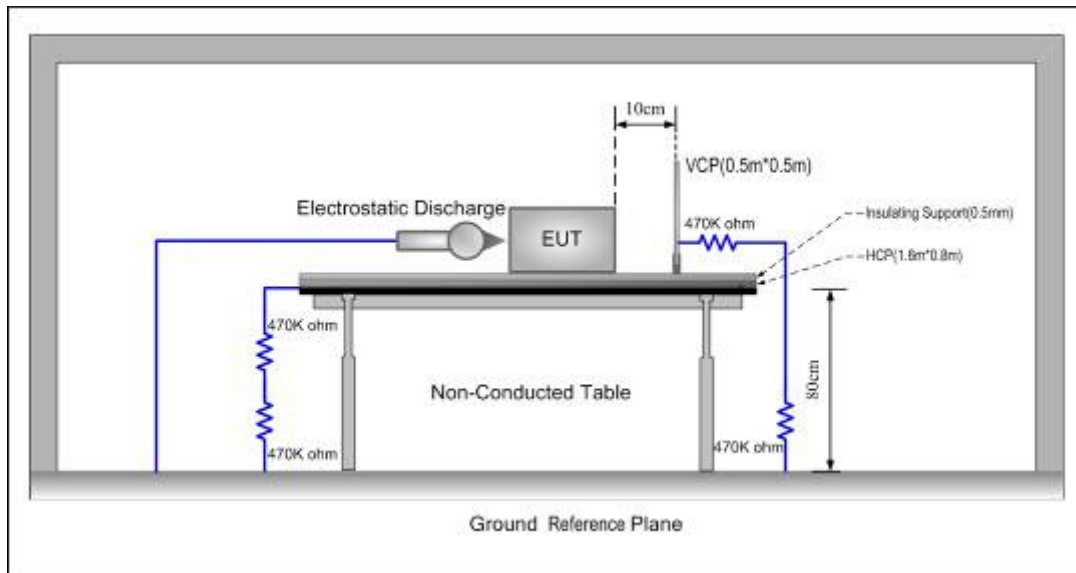
7.1 Performance Criteria Description in Clause 4.2 of EN 61547

Criterion A:
During the test, no change of the luminous intensity shall be observed and the regulating control, if any, shall operate during the test as intended.
Criterion B:
During the test, the luminous intensity may change to any value. After the test, the luminous intensity shall be restored to its initial value within 1 min. Regulating controls need not function during the test, but after the test, the mode of the control shall be the same as before the test provided that during the test no mode changing commands were given.
Criterion C:
<p>During and after the test, any change of the luminous intensity is allowed and the lamp(s) may be extinguished. After the test, within 30 min, all functions shall return to normal if necessary by temporary interruption of the mains supply and/or operating the regulating control.</p> <p>Additional requirement for lighting equipment incorporating a starting device: After the test, the lighting equipment is switched off. After half an hour it is switched on again. The lighting equipment shall start and operate as intended.</p>

7.2 ESD

Discharge Voltage:	Air Discharge:	8 kV
	Contact Discharge:	4 kV
	HCP:	4 kV
	VCP:	4 kV
Polarity:	Positive & Negative	
Number of Discharge:	Minimum 10 times at each test point	
Discharge Mode:	Single Discharge	
Discharge Period:	1 second minimum	

7.2.1 Test Setup and Procedure



1. Contact discharge was applied only to conductive surfaces of the EUT. Air discharge was applied only to non-conducted surfaces of the EUT.
2. The EUT was put on a 0.8m high wooden table for table-top equipment or 0.1m high for floor standing equipment standing on the ground reference plane (GRP).
3. A horizontal coupling plane(HCP) 1.6m by 0.8m in size was placed on the table, and the EUT with its cables were isolated from the HCP by an insulating support thick than 0.5mm. The VCP 0.5m by 0.5m in size while HCP were constructed from the same material type and thickness as that of the GRP, and connected to the GRP via a 470kΩ resistor at each end. The distance between EUT and any of the other metallic surface excepted the GRP, HCP and VCP was greater than 1m.
4. During the contact discharges, the tip of the discharge electrode was touch the EUT before the discharge switch is operated. During the air discharges, the round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT.
5. After each discharge, the ESD generator was removed from the EUT, the generator is then retriggered for a new single discharge. For ungrounded product, a discharge cable with two resistances were used after each discharge to remove remnant electrostatic voltage. 10 times of each polarity single discharge were applied to HCP and VCP.

7.2.2 Test Results

Direct Application Test Results

- Observations: Test Point:
1. All insulated enclosure & seams.
 2. All accessible metal parts of the enclosure.

Direct Application		Test Results			
Discharge Level (kV)	Polarity (+/-)	Test Point	Test Mode	Contact Discharge	Air Discharge
8	+/-	1	Lighting mode	N/A	A
4	+/-	2		A	N/A

Indirect Application Test Results

- Observations: Test Point:
1. All sides.

Indirect Application		Test Results			
Discharge Level (kV)	Polarity (+/-)	Test Point	Test Mode	Horizontal Coupling	Vertical Coupling
4	+/-	1	Lighting mode	A	A

Results:

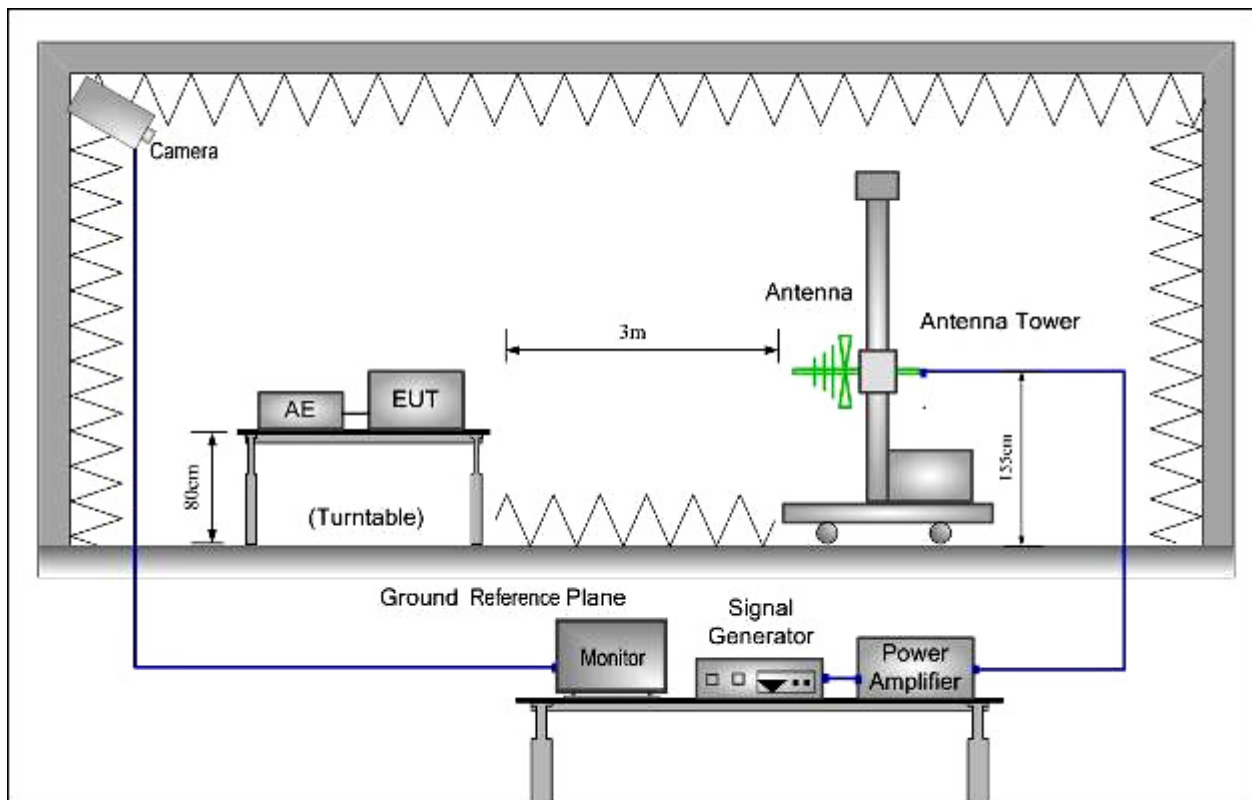
A: During test, no degradation in the performance of the EUT was observed; After test, no degradation in the performance of the EUT was observed.

N/A: Not applicable (floor mounted EUT or not requested by Standard).

7.3 Radio-frequency electromagnetic fields

Frequency Range:	80 MHz to 1 GHz
Antenna Polarization:	Horizontal & Vertical
Test level:	3 V/m on enclosure
Modulation:	80%, 1 kHz Amplitude Modulation

7.3.1 Test Setup and Procedure



1. For table-top equipment, the EUT was placed in the chamber on a non-conductive table 0.8m high. For arrangement of floor-standing equipment, the EUT was mounted on a non-conductive support 0.1m above the supporting plane. For human body-mounted equipment, the EUT may be tested in the same manner as table top items.
2. If possible, a minimum of 1 m of cable is exposed to the electromagnetic field. Excess length of cables interconnecting units of the EUT shall be bundled low-inductively in the approximate center of the cable to form a bundle 30 cm to 40 cm in length.
3. The EUT was initially placed with one face coincident with the calibration plane. The EUT face being illuminated was contained within the UFA (Uniform Field Area).
4. The frequency ranges to be considered were swept with the signal modulated and pausing to adjust the RF signal level or to switch oscillators and antennas as necessary. Here the frequency range was swept incrementally, the step size was not exceed 1% of the preceding frequency value.

5. The dwell time of the amplitude modulated carrier at each frequency was not be less than the time necessary for the EUT to be exercised and to respond, and was not less than 0.5 s.
6. The test normally was performed with the generating antenna facing each side of the EUT.
7. The polarization of the field generated by each antenna necessitates testing each selected side twice, once with the antenna positioned vertically and again with the antenna positioned horizontally.
8. The EUT was performed in a configuration to actual installation conditions, a video camera and/or a audio monitor were used to monitor the performance of the EUT.

7.3.2 Test Results

Frequency	Level	Modulation	Dwell Time	Test Mode	Antenna Polarization	EUT Face	Result / Observations
80MHz-1GHz	3 V/m	1 kHz, 80% Amp. Mod, 1 % increment	3s	Lighting mode	V	Front	A
					H		A
					V	Rear	A
					H		A
					V	Left	A
					H		A
					V	Right	A
					H		A
					V	Top	N/A
					H		N/A
					V	Bottom	N/A
					H		N/A

Remarks:

Front: the front of the EUT faces to transmitting antenna (refer to Radiated Immunity test setup photo)

A: During test, no degradation in the performance of the EUT was observed; After test, no degradation in the performance of the EUT was observed.

N/A: Not applicable.

The EUT does meet the Radiated Immunity requirements of Standard.

8 Photographs (Test Setup For the EUT)

8.1 Radiated Electromagnetic Disturbance Test Setup



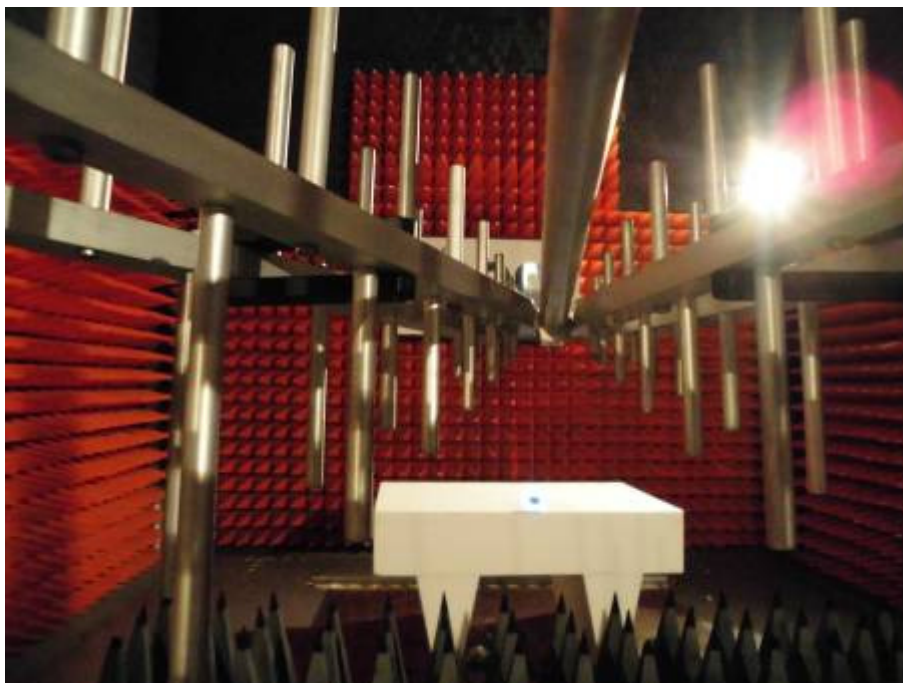
8.2 Radiated Emission Test Setup



8.3 ESD Test Setup



8.4 Radio-frequency electromagnetic fields Test Setup



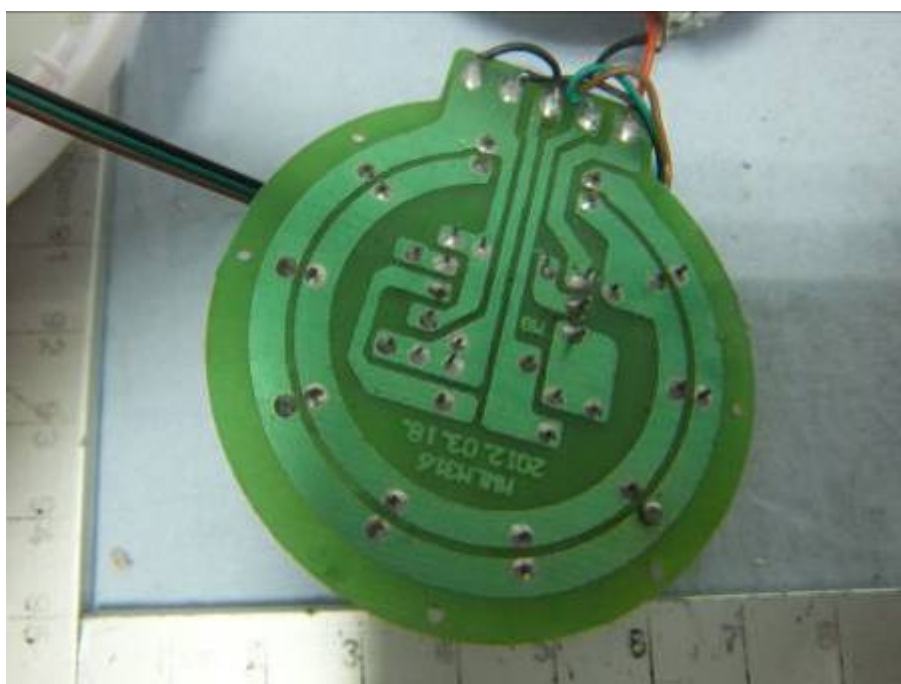
9 EUT Constructional Details

9.1 Exterior of EUT



9.2 Interior of EUT





9.3 Photo of Add model

Model: MWLM318



Model: MWLM318-01



Model: MWLM319



--End of the Report--