EMC TEST REPORT

For

Dimmer lamp module & Relay fluorescent light appliance module

Model Number: ZDP100 45602 ZRP100 45603
FCC ID: U2Z45602-3

Report Number **:** WT078000354

Test Laboratory	:	Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory Guangdong EMC Compliance Test Center
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TEST REPORT DECLARATION

Applicant	:	SHEENWAY ASIA LTD
Address	:	Room 1313, 13/F, Austin Tower, Tsim Sha Tsui, Kowloon.
Manufacturer	:	SHEENWAY ASIA LTD
Address	:	Room 1313, 13/F, Austin Tower, Tsim Sha Tsui, Kowloon.
EUT Description	:	Dimmer lamp module & Relay fluorescent light appliance module
Model Number		ZDP100 45602 ZRP100 45603
FCC ID Number		U2Z45602-3

Test Standards:

FCC Part 15 15.249 :2006

The EUT described above is tested by Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory to determine the maximum emissions from the EUT. Shenzhen Academy of Metrology and Quality Inspection EMC Laboratory is assumed full responsibility for the accuracy of the test results. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (2003) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.249.

The test report is valid for above tested sample only and shall not be reproduced in part without written approval of the laboratory.

Tested by:	(Dewelly Yang)	Date:	2007.04.02
Checked by:	(Louis Lin)	Date:	2007.04.02
Approved by:	(Peter Lin)	Date:	2007.04.02

1. TEST RESULTS SUMMARY

Table 1 Test Results Summary

Test Items	FCC Rules	Test Results
Conducted Disturbance	15.207	Pass
Radiated disturbance	15.249	Pass
Occupied Bandwidth	15.249	Pass
Band Edges	15.249	Pass
Antenna Requirement	15.203	Pass

2. GENERAL INFORMATION

2.1. Report information

2.1.1.This report is not a certificate of quality; it only applies to the sample of the specific product/equipment given at the time of its testing. The results are not used to indicate or imply that they are application to the similar items. In addition, such results must not be used to indicate or imply that SMQ approves recommends or endorses the manufacture, supplier or use of such product/equipment, or that SMQ in any way guarantees the later performance of the product/equipment.

2.1.2.The sample/s mentioned in this report is/are supplied by Applicant, SMQ therefore assumes no responsibility for the accuracy of information on the brand name, model number, origin of manufacture or any information supplied.

2.1.3.Additional copies of the report are available to the Applicant at an additional fee. No third part can obtain a copy of this report through SMQ, unless the applicant has authorized SMQ in writing to do so.

2.2. Laboratory Accreditation and Relationship to Customer

The testing report were performed by the Shenzhen Academy of Metrology and quality Inspection EMC Laboratory (Guangdong EMC compliance testing center), in their facilities located at Bldg. of Metrology & Quality Inspection, Longzhu Road, Nanshan District, Shenzhen, Guangdong, China. At the time of testing, Laboratory is accredited by the following organizations:
China National Accreditation Committee for Laboratories (**CNAL**) accredits the Laboratory for conformance to FCC standards, EMC international standards and EN standards. The Registration Number is L0579.

The Laboratory is listed in the United States of American Federal Communications Commission (**FCC**), and the registration number are **97379**(open area test site) and **274801**(semi anechoic chamber).
The Laboratory is listed in Voluntary Control Council for Interference by Information Technology Equipment (**VCCI**), and the registration number are **R-1974**(open area test site) , **R-1966**(semi anechoic chamber),**C-2117**(mains ports conducted interference measurement) and **T-180**(telecommunication ports conducted interference measurement).

The Laboratory is registered to perform emission tests with Industry Canada (**IC**), and the registration number is **IC4174**.

TUV Rhineland accredits the Laboratory for conformance to IEC and EN standards, the registration number is **E2024086Z02**.
Measurement Uncertainty

2.3. Measurement Uncertainty

Conducted Disturbance : 9kHz~30MHz 3.5dB

Radiated Disturbance: 30MHz~1000MHz 4.5dB
1GHz~18GHz 4.6dB

3. PRODUCT DESCRIPTION

3.1. EUT Description

Description	:	Dimmer lamp module & Relay fluorescent light appliance module
Manufacturer	:	SHEENWAY ASIA LTD
Model Number	:	ZDP100 45602 ZRP100 45603
Input Power	:	Input ： AC 120V, 60 Hz, Output：AC 300W(Incandescent)/1500W(resistive)--ZDP100 45602 Input：AC 120V, 60Hz, Output：AC 600W(Incand.)/1800W or 15A(resistive)--ZRP100 45603
Operate Frequency	:	908.42MHz
Modulation		FSK
Antenna Designation	:	integrated

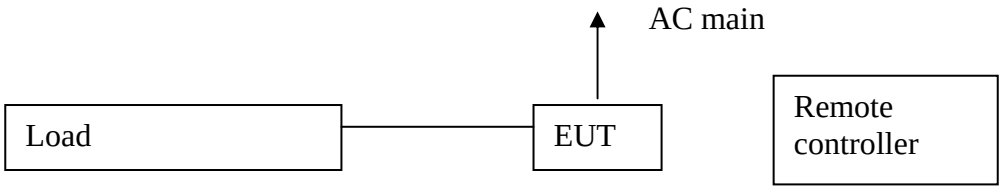
the model No. ZDP100 and the other model No.ZRP100 which are certified are identical in all aspects except for model name, one terminals of outlet, and one is dimmer lamp module, 300W(ZDP100) and other is relay fluorescent light & appliance module,600W(ZRP100).

ZDP100 and 45602, ZRP100 and 45603 are identical in schematic, structure and critical components except for model number, which vary with different customer,

3.2. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: U2Z45602-3 filing to comply with Section 15.249 of the FCC Part 15, Subpart C Rules.

3.3. Block Diagram of EUT Configuration



3.4. Operating Condition of EUT

Mode 1: 908.42MHz TX
Mode 2: 908.42MHz RX

3.5. Special Accessories

Not available for this EUT intended for grant.

3.6. Equipment Modifications

Not available for this EUT intended for grant.

3.7. Support Equipment List

Lamp
M/N：--- 600W/300W

3.8. Test Conditions

Date of test：Mar.1,2007
Date of EUT Receive：Mar.1-15,2007
Temperature: 21-23 ℃
Relative Humidity: 50-65%

4. TEST EQUIPMENT USED

4.1. Test Equipment Used to Measure Conducted Disturbance

Table 2 Conducted Disturbance Test Equipment

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
SB2603	EMI Test Receiver	Rohde & Schwarz	ESCS30	Jan.25, 2007	1 Year
SB3321	AMN	Rohde & Schwarz	ESH2-Z5	Jan.25, 2007	1 Year
SB2604	AMN	Rohde & Schwarz	ESH3-Z5	Jan.25, 2007	1 Year

4.2. Test Equipment Used to Measure Radiated Disturbance and bandwidth

Table 3 Radiated Disturbance Test Equipment

No.	Equipment	Manufacturer	Model No.	Last Cal.	Cal. Interval
SB3436	EMI Test Receiver	Rohde & Schwarz	ESI26	Jan.25, 2007	1 Year
SB3440	Bilog Antenna	Chase	CBL6112B	Jan.25, 2007	1 Year
SB3435	Horn Antenna	Rohde & Schwarz	HF906	Jan.25, 2007	1 Year
SB3435/01	Amplifier(1-18GHz)	Rohde & Schwarz	---	Jan.25, 2007	1 Year

5. CONDUCTED DISTURBANCE TEST

5.1. Test Standard and Limit

5.1.1.Test Standard

FCC Part 15:2006

5.1.2.Test Limit

Table 4 Conducted Disturbance Test Limit (Class B)

Frequency	Maximum RF Line Voltage (dBμV)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

- Decreasing linearly with logarithm of the frequency
- The lower limit shall apply at the transition frequency.

5.2. Test Procedure

The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI test receiver (R&S Test Receiver ESCS30) is used to test the emissions form both sides of AC line. According to the requirements in Section 7 and 13 of ANSI C63.4-2003.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode.The bandwidth of EMI test receiver is set at 9kHz.

5.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

5.4. Test Data

The test was performed with two model.The worst case is TX mode. the follow was shown the worst data.

Table 5 Conducted Disturbance Test Data

Model： 45602

Mode: 1

Line							
Frequency (MHz)	Correction Factor (dB)	Quasi-Peak			Average		
		Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)
0.150	10.0	51.9	61.9	66	22.8	32.8	56
0.274	10.0	38.5	48.5	61.0	30.9	40.9	51.0
0.675	10.0	40.3	50.3	56	33.9	43.9	46
0.831	10.0	40.1	50.1	56	34.7	44.7	46
0.946	10.0	39.3	49.3	56	33.4	43.4	46
3.440	10.2	36.9	47.1	56	31.0	41.2	46

REMARKS: 1. Emission level(dBuV)=Read Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB) =LISN Factor (dB) + Cable Factor (dB)+Limiter Factor(dB)
3. The other emission levels were very low against the limit.

Table 6 Conducted Disturbance Test Data

Model： 45602

Mode: 1

Neutral							
Frequency (MHz)	Correction Factor (dB)	Quasi-Peak			Average		
		Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)
0.150	10.0	51.9	61.9	66	24.6	34.6	56
0.274	10.0	41.1	51.1	61.0	35.3	45.3	51.0
0.681	10.0	41.2	51.2	56	35.1	45.1	46
0.828	10.0	40.7	50.7	56	35.2	45.2	46
0.970	10.0	40.5	50.5	56	34.7	44.7	46
3.641	10.2	36.9	47.1	56	31.1	41.3	46

REMARKS: 1. Emission level(dBuV)=Read Value(dBuV) + Correction Factor(dB)

2. Correction Factor(dB) =LISN Factor (dB) + Cable Factor (dB)+Limiter Factor(dB)

3. The other emission levels were very low against the limit.

Table 7 Conducted Disturbance Test Data

Model： 45603

Mode: 1

Line							
Frequency (MHz)	Correction Factor (dB)	Quasi-Peak			Average		
		Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)
0.450	10.0	42.6	52.6	56.8	34.6	44.6	46.8
0.540	10.0	42.9	52.9	56	33.9	43.9	46
0.630	10.0	42.3	52.3	56	22.5	42.5	46
1.627	10.1	41.5	51.5	56	29.1	39.2	46
2.535	10.1	42.3	52.4	56	29.4	39.5	46
4.525	10.2	40.7	50.9	56	28.5	38.7	46

REMARKS: 1. Emission level(dBuV)=Read Value(dBuV) + Correction Factor(dB)
2. Correction Factor(dB) =LISN Factor (dB) + Cable Factor (dB)+Limiter Factor(dB)
3. The other emission levels were very low against the limit.

Table 8 Conducted Disturbance Test Data

Model： 45603

Mode: 1

Neutral							
Frequency (MHz)	Correction Factor (dB)	Quasi-Peak			Average		
		Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)	Reading (dBμV)	Emission Level (dBμV)	Limits (dBμV)
0.454	10.0	44.4	54.4	56.8	34.8	44.8	46.8
0.539	10.0	43.7	53.7	56	34.3	44.3	46
0.632	10.0	42.1	52.1	56	33.1	43.1	46
1.451	10.1	42.8	52.8	56	31.7	41.8	46
2.450	10.1	42.3	52.4	56	30.3	40.4	46
3.276	10.2	40.6	50.8	56	28.2	38.4	46

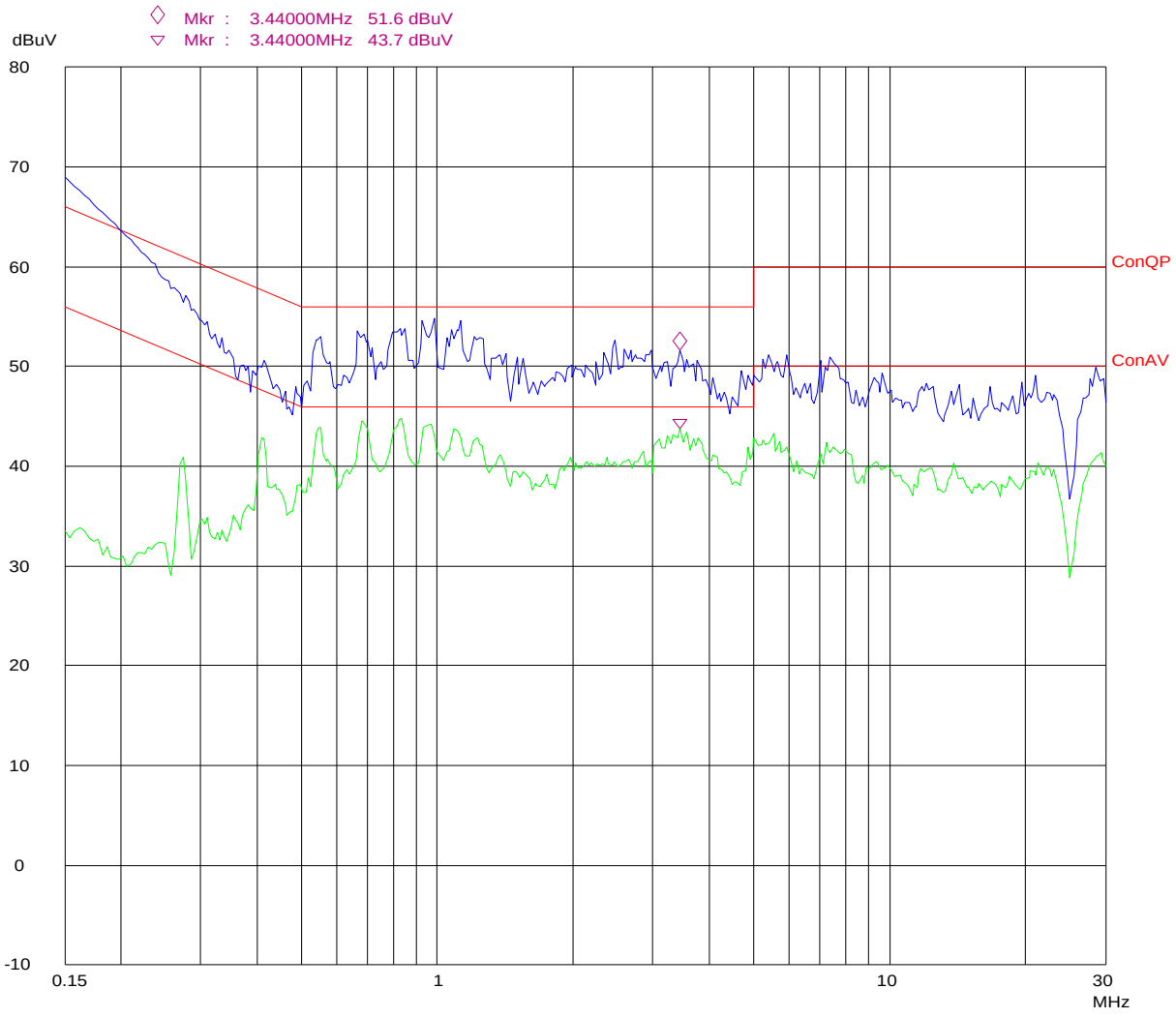
REMARKS: 1. Emission level(dBuV)=Read Value(dBuV) + Correction Factor(dB)

2. Correction Factor(dB) =LISN Factor (dB) + Cable Factor (dB)+Limiter Factor(dB)

3. The other emission levels were very low against the limit.

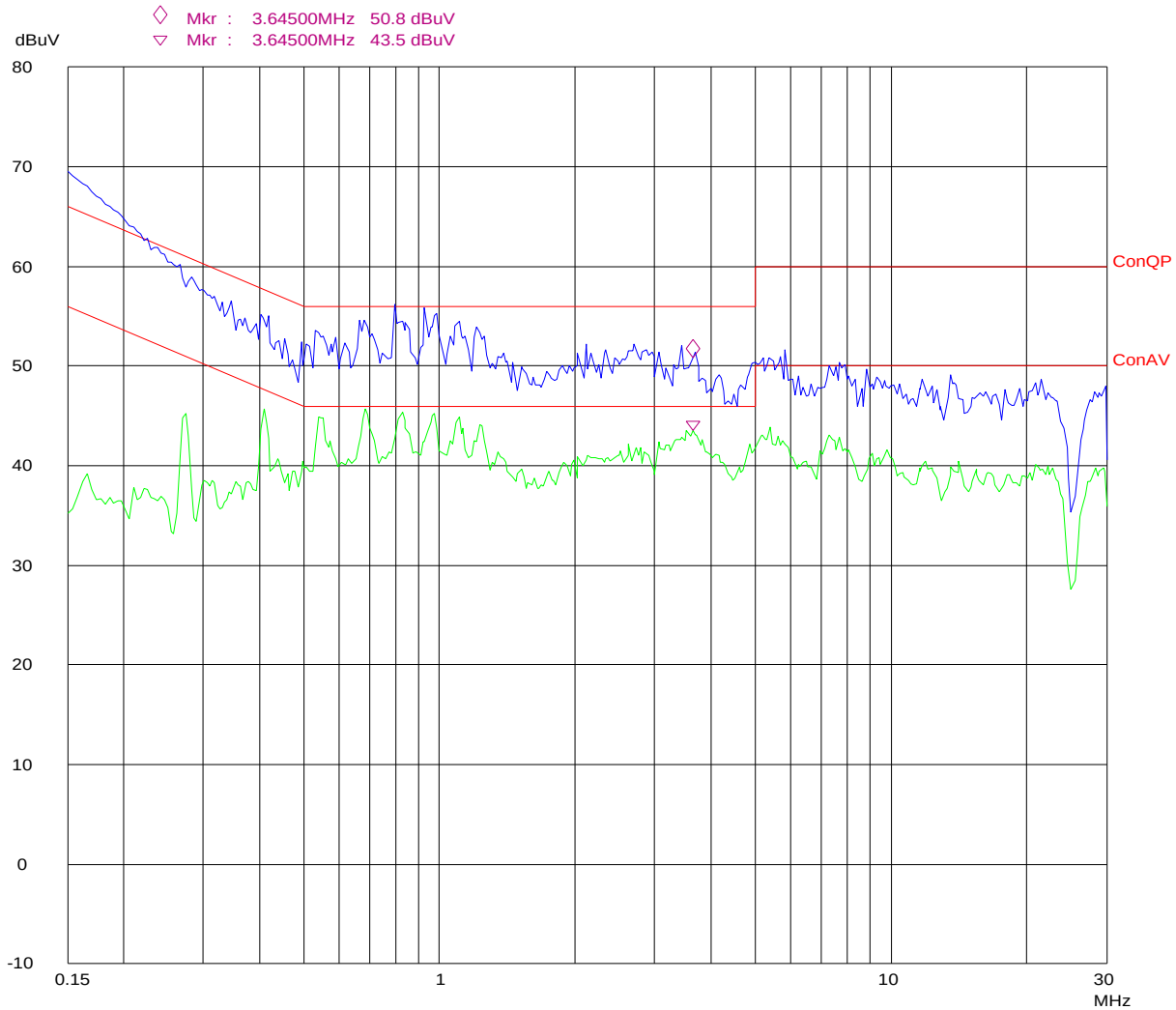
Conducted Disturbance

EUT: 45602
Op Cond: ON
Test Spec: L
Comment: AC 120V/60Hz



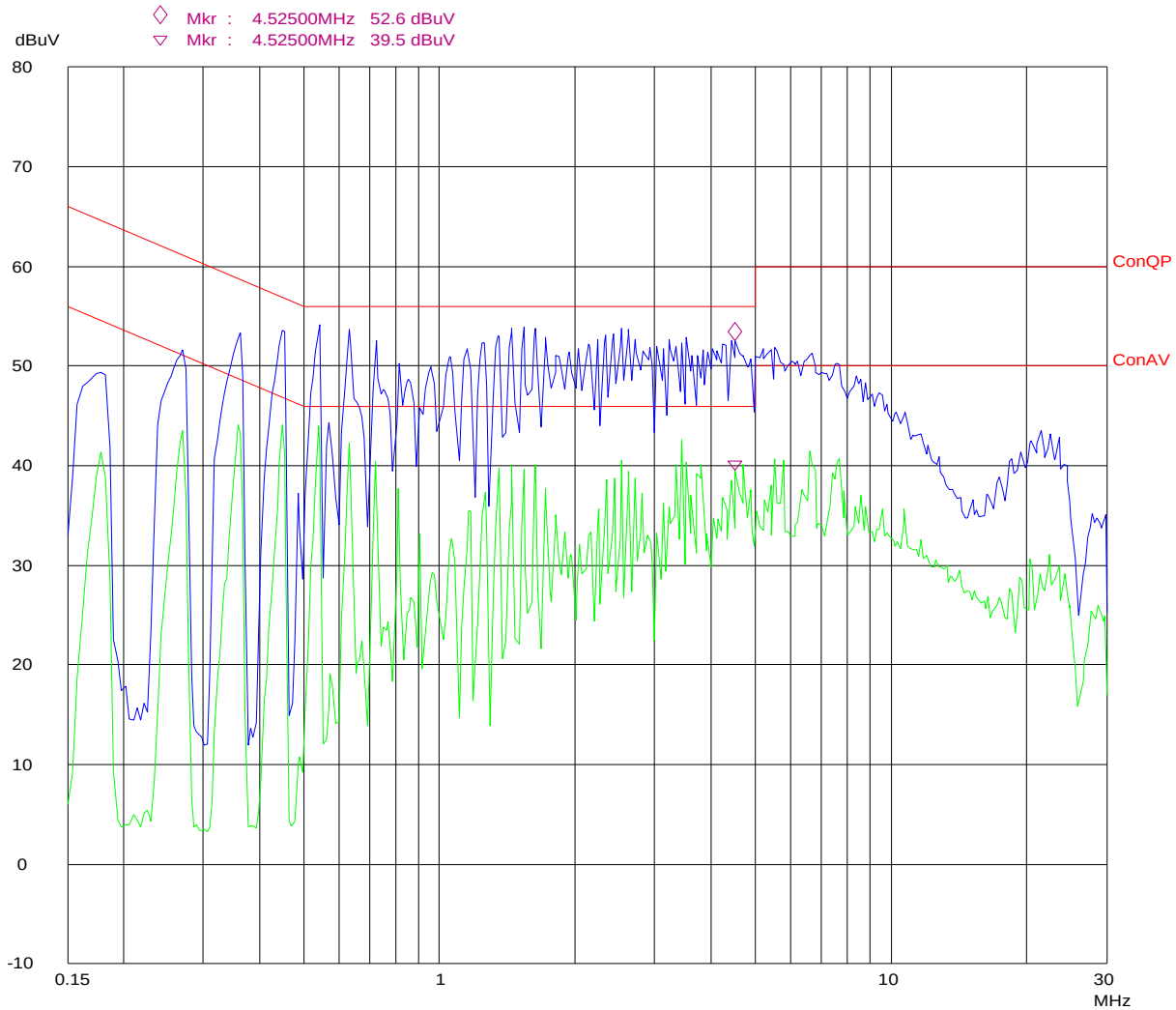
Conducted Disturbance

EUT: 45602
Op Cond: ON
Test Spec: N
Comment: AC 120V/60Hz



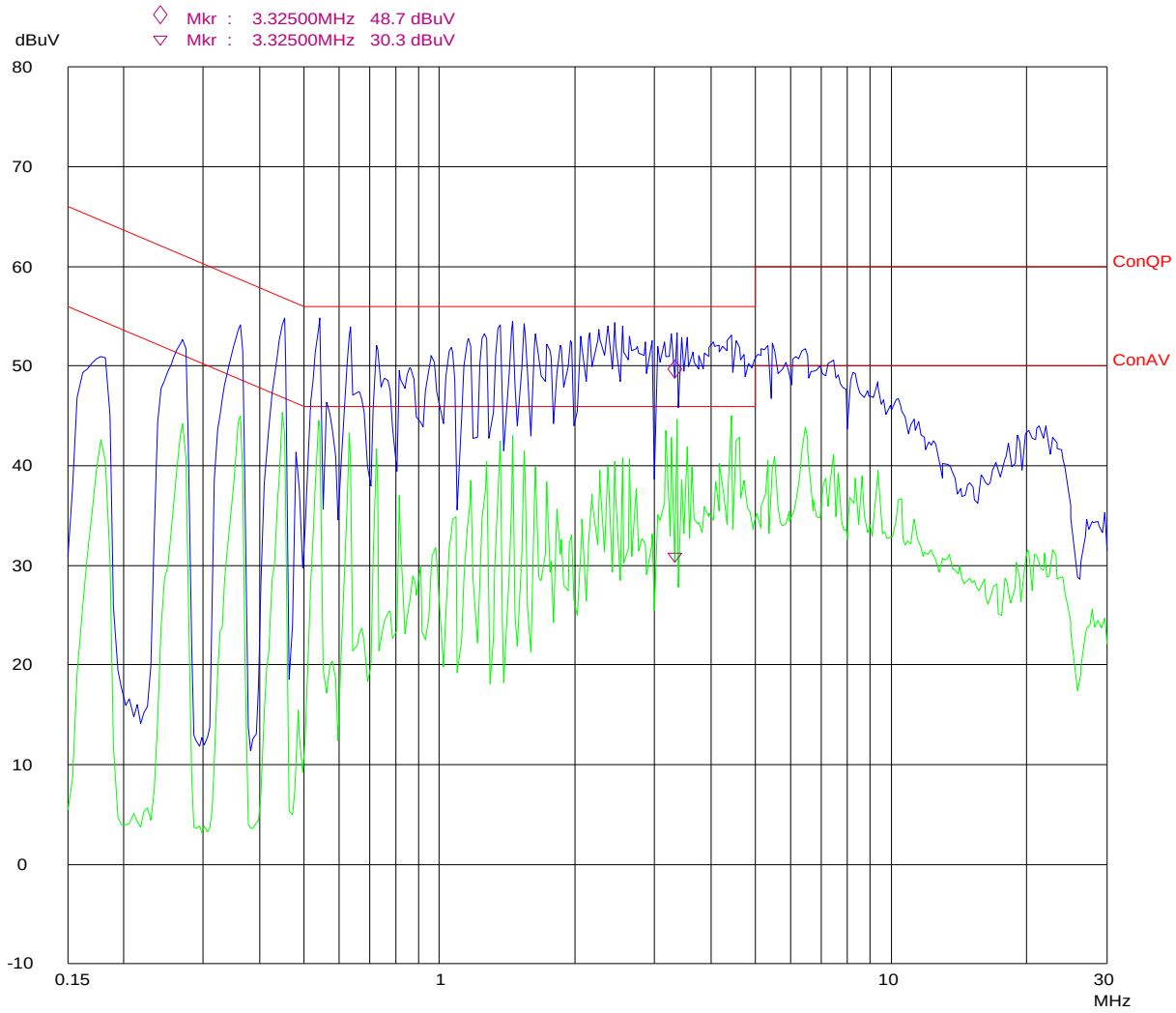
Conducted Disturbance

EUT: 45603
Op Cond: ON
Test Spec: L
Comment: AC 120V/60Hz



Conducted Disturbance

EUT: 45603
Op Cond: ON
Test Spec: N
Comment: AC 120V/60Hz



6. RADIATED DISTURBANCE TEST

6.1. Test Standard and Limit

6.1.1.Test Standard

FCC Part 15:2006

6.1.2.Test Limit

Table 9 Radiated Disturbance Test Limit (Class B)

FREQUENCY MHz	FIELD STRENGTHS LIMITS （μV/m)	FIELD STRENGTHS LIMITS dB (μV/m)
Fundamental	50000	94.0
Harmonics	500	54.0
30 ~ 88	100	40.0
88 ~ 216	150	43.5
216 ~ 960	200	46.0
960 ~	500	54.0

* The lower limit shall apply at the transition frequency.
* The test distance is 3m.

6.2. Test Procedure

The EUT is placed on a turntable, which is 0.8 meter above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level. Broadband antenna is used as a receiving antenna. Both horizontal and vertical polarization of the antenna is set on test. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 8 and13 of ANSI C63.4-2003.

The RBW of the EMI test receiver is :

30~1000MHz 120KHz
1000-18000MHz 1MHz

6.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

6.4. Test Data

Table 10 Radiated Disturbance Test Data

Model number: 45603
Test Mode:1

Frequency (MHz)	Polarization	Reading Value (dBμV)	Correction Factor (dB)	Antenna Factor (dB/m)	Emission Level dB(μV/m)	Limits dB(μV/m)	Note
908.386	V	42.6	5.1	20.7	68.4	94.0	Fundamental QP
908.386	H	41.1	5.1	20.7	66.9	94.0	Fundamental QP
1816.806	V	41.6	-32.3	27.2	36.5	74.0	Harmonics PK
1816.806	V	35.1	-32.3	27.2	30.0	54.0	Harmonics AV

Note: 1. Emission level(dBuV/m)=Reading Value(dBuV) + Correction Factor(dB/m)+ Antenna Factor (dB/m)
2. Correction Factor(dB/m) = Cable Factor (dB)+Amplifier Factor(dB)
3. The other emission levels were less than the limit 20dB

Table 11 Radiated Disturbance Test Data

Model number: 45603
Test Mode:2

Frequency (MHz)	Polarization	Reading (dB μ V)	Cable Loss R1 (dB)	Antenna Factor (dB/m)	Level dB (μ V/m)	Limits dB (μ V/m)	Note
---	---	---	---	----	---	---	---
---	---	---	---	----	---	---	---
---	---	---	---	----	---	---	---

Note: 1. Emission level(dBuV/m)=Reading Value(dBuV) + Correction Factor(dB/m)+ Antenna Factor (dB/m)
2. Correction Factor(dB/m) = Cable Factor (dB)+Amplifier Factor(dB)
3. The other emission levels were less than the limit 20dB

Table 12 Radiated Disturbance Test Data

Model number: 45602
Test Mode:1

Frequency (MHz)	Polarization	Reading Value (dB μ V)	Correction Factor (dB)	Antenna Factor (dB/m)	Emission Level dB (μ V/m)	Limits dB (μ V/m)	Note
908.390	V	38.4	5.1	20.7	64.2	94.0	Fundamental QP
908.395	H	35.9	5.1	20.7	61.7	94.0	Fundamental QP
1816.800	V	38.2	-32.3	27.2	33.1	74.0	Harmonics PK
1816.800	V	32.2	-32.3	27.2	27.1	54.0	Harmonics AV

Note: 1. Emission level(dBuV/m)=Reading Value(dBuV) + Correction Factor(dB/m)+ Antenna Factor (dB/m)
2. Correction Factor(dB/m) = Cable Factor (dB)+Amplifier Factor(dB)
3. The other emission levels were less than the limit 20dB

Table 13 Radiated Disturbance Test Data

Model number: 45602
Test Mode:2

Frequency (MHz)	Polarization	Reading (dB μ V)	Cable Loss R1 (dB)	Antenna Factor (dB/m)	Level dB (μ V/m)	Limits dB (μ V/m)	Note
---	---	---	---	----	---	---	---
---	---	---	---	----	---	---	---
---	---	---	---	----	---	---	---

Note: 1. Emission level(dBuV/m)=Reading Value(dBuV) + Correction Factor(dB/m)+ Antenna Factor (dB/m)
2. Correction Factor(dB/m) = Cable Factor (dB)+Amplifier Factor(dB)
3. The other emission levels were less than the limit 20dB

Table 14 **Restricted Band Radiated Emission Data**

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	
6.31175 - 6.31225	123 - 138	2200 - 2300	
8.291 - 8.294	149.9 - 150.05	2310 - 2390	
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	
12.29 - 12.293	167.72 - 173.2	3332 - 3339	
12.51975 - 12.52025	240 - 285	3345.8 - 3358	
12.57675 - 12.57725	322 - 335.4	3600 - 4400	
13.36 - 13.41			

All the emission of the above band were less than the limit 20dB.

7. OCCUPIED BANDWIDTH

7.1. Test Standard and Limit

7.1.1.Test Standard

FCC Part 15:2006

7.2. Test Procedure

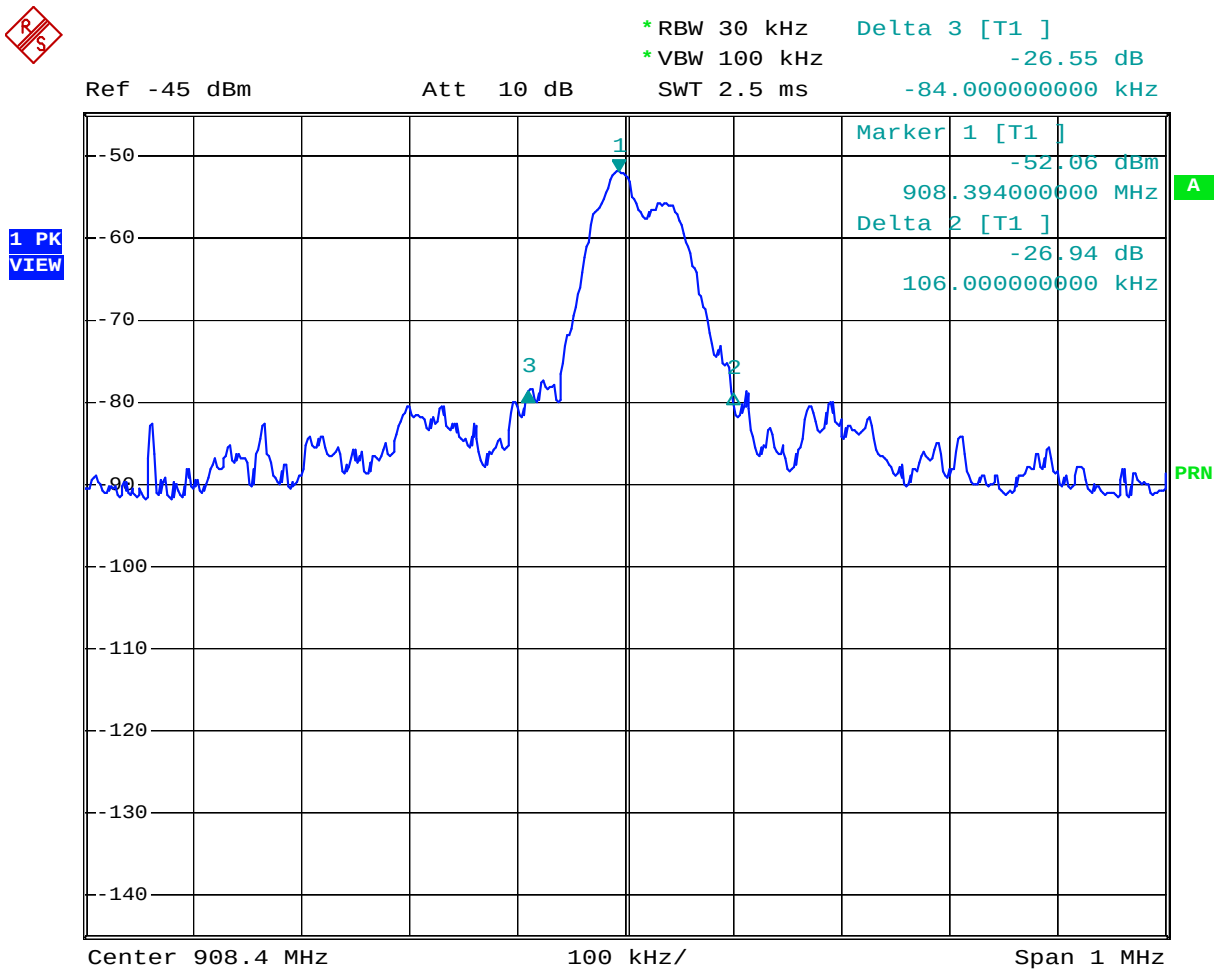
1.The EUT was placed on a turn table which is 0.8m above ground plane.
2.Set EUT as normal operation
3.Set EMI test receiver(ESIB26) Center Frequency = fundamental frequency, RBW=3kHz, VBW= 3kHz, Span=2MHz.
4. Set EMI test receiver(ESIB26) Max hold. Mark peak, -26dB.

7.3. Test Arrangement

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

7.4. Test Data

The test was performed with 45603 (the worst case).
26dB bandwidth =190.0 kHz



Comment: Conducted Disturbance
Date: 2.MAR.2007 11:56:20

8. BAND EDGE

8.1. Test Standard and Limit

8.1.1.Test Standard

FCC Part 15 15.249 :2006

8.2. Band Edge FCC 15.249(d) Limit

Emission radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation

8.3. Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instruments. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Measure the highest amplitude appearing on spectral display and set it as reference level. Plot the graph with marking the highest point and edge frequency.
4. Repeat above procedures until all measured frequencies were complete.

8.4. Test Arrangement

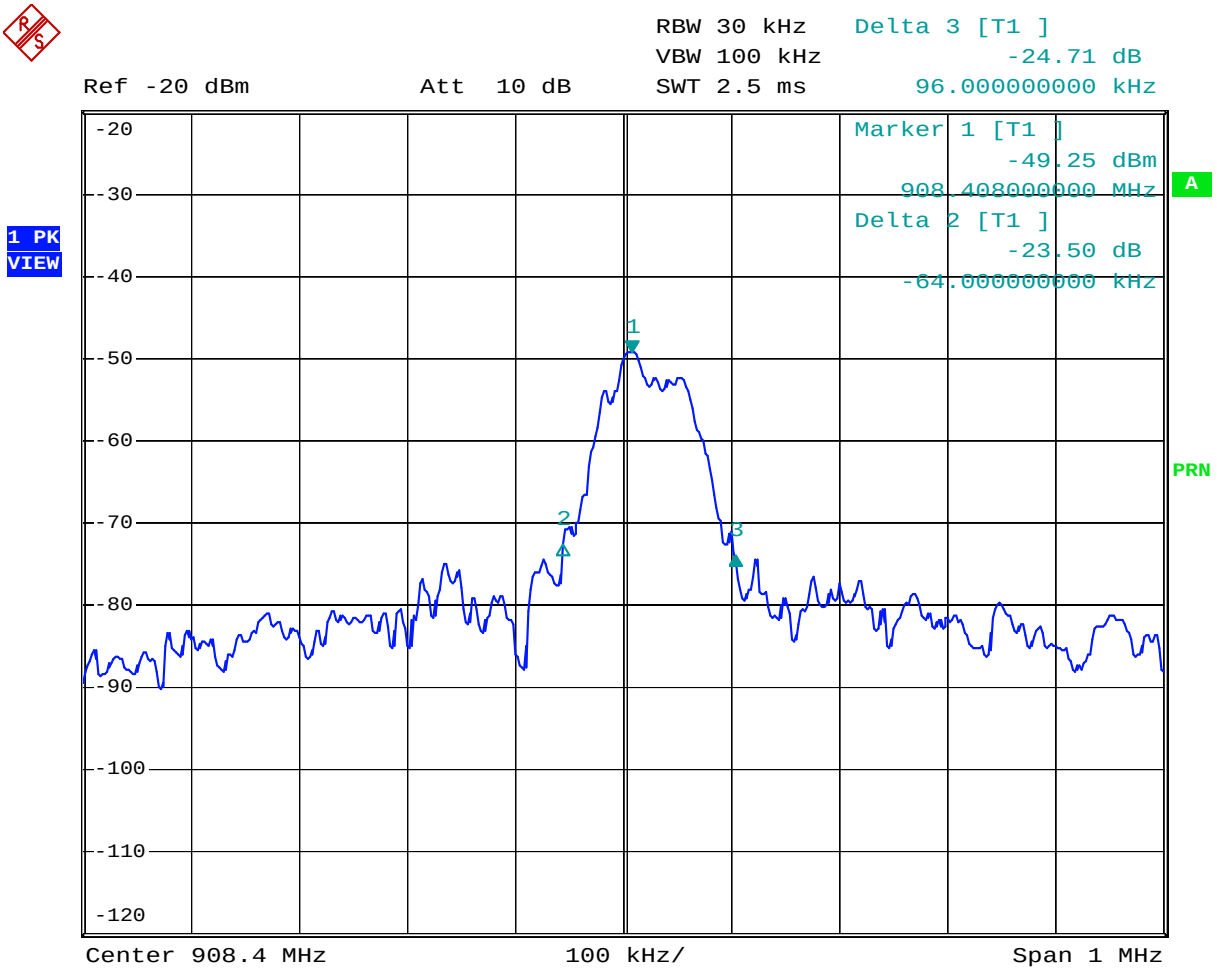
The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application. The detailed information refers to test picture.

8.5. Test Data

The test was performed with 45603 (the worst case).
All the emission outside 908.344 to 908.514 is lower than 46 dB (μ V/m).

NOTE 1: The band edge emission plot of on page 27 low frequency shows23.5dBc. The emission of carrier strength list in the test result of low frequency is 68.4dBuV/m (QP), so the maximum field strength in restrict band is 68.4-23.5=44.9dBuV/m which is under 46dBuV/m limit.

NOTE 2: The band edge emission plot of on page 27 high frequency shows 24.7dBc. The emission of carrier strength list in the test result of high frequency is 68.4dBuV/m (QP), so the maximum field strength in restrict band is 68.4-24.7=43.7dBuV/m which is under 46dBuV/m limit.



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Date: 20.MAR.2007 16:32:32

9. ANTENNA REQUIREMENT

According to Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.
The EUT has a built in antenna which is integrated on the PCB, this is permanently attached antenna and meets the requirements of this section.

APPENDIX I TEST PHOTO

Photo 1 Conducted Emission Test (45603)

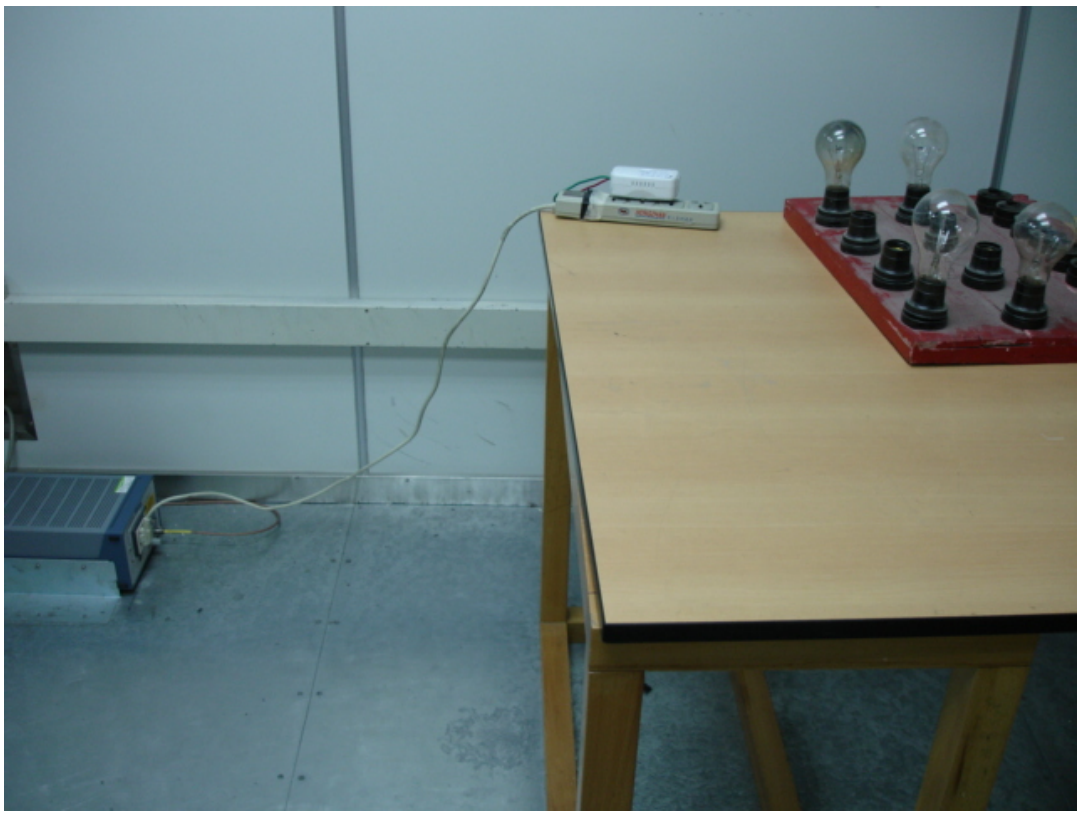


Photo 2 Conducted Emission Test (45603)

Photo 3 Radiated Emission Test (45603)

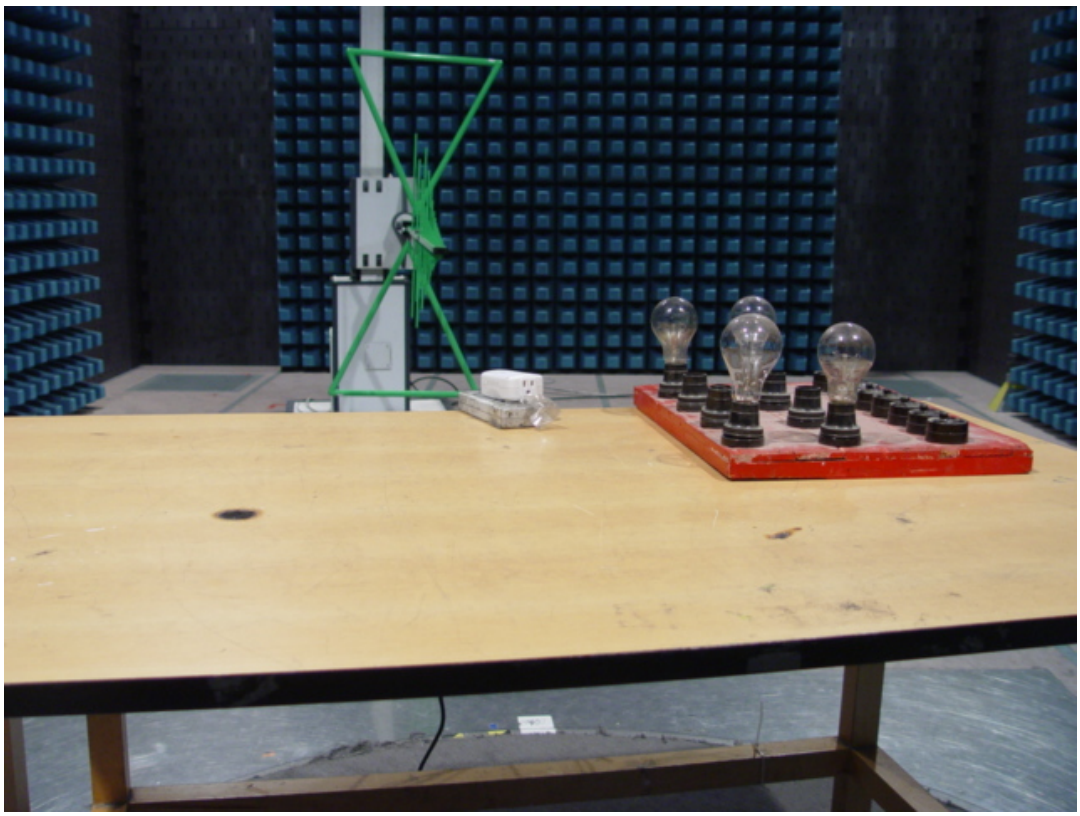


Photo 4 Radiated Emission Test (45603)

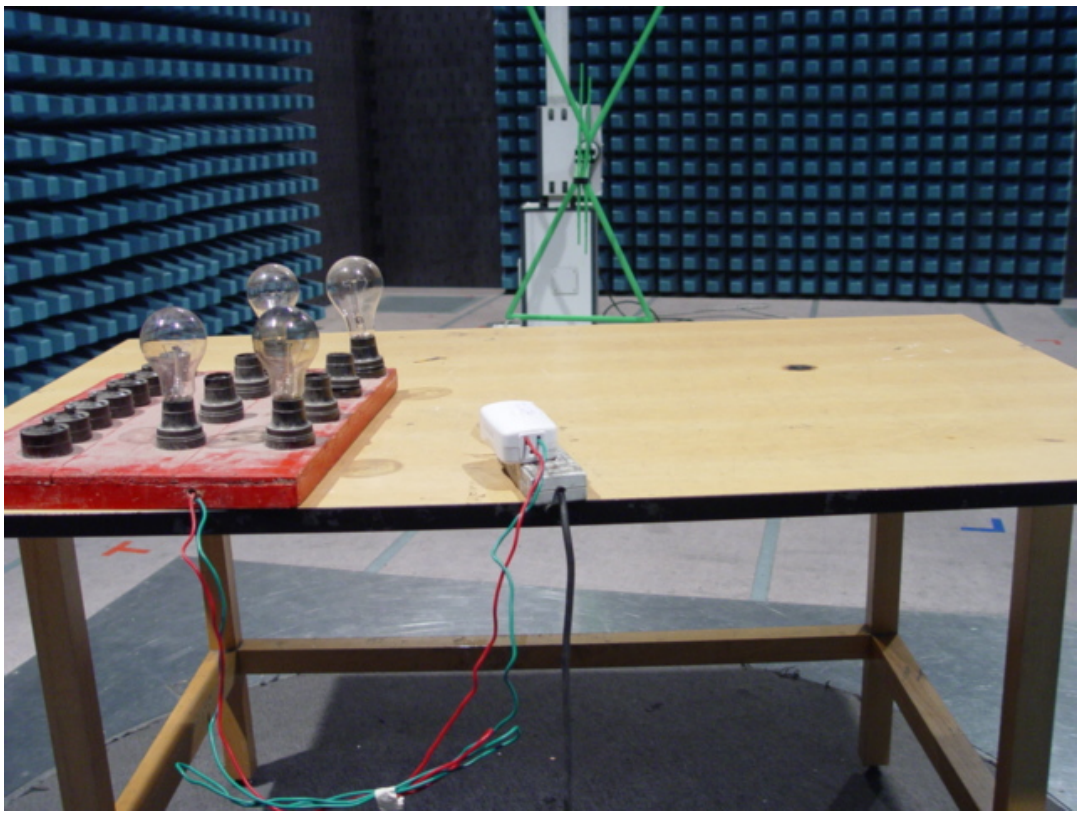


Photo 5 Radiated Emission Test (45603)

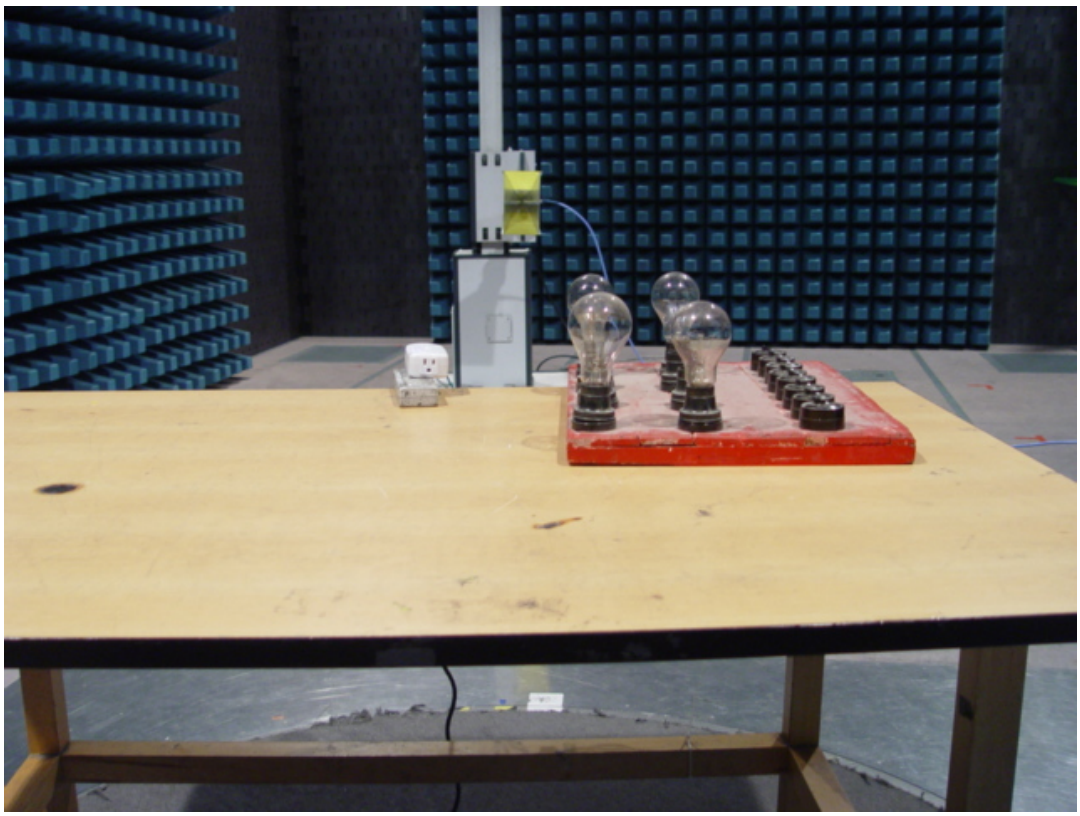
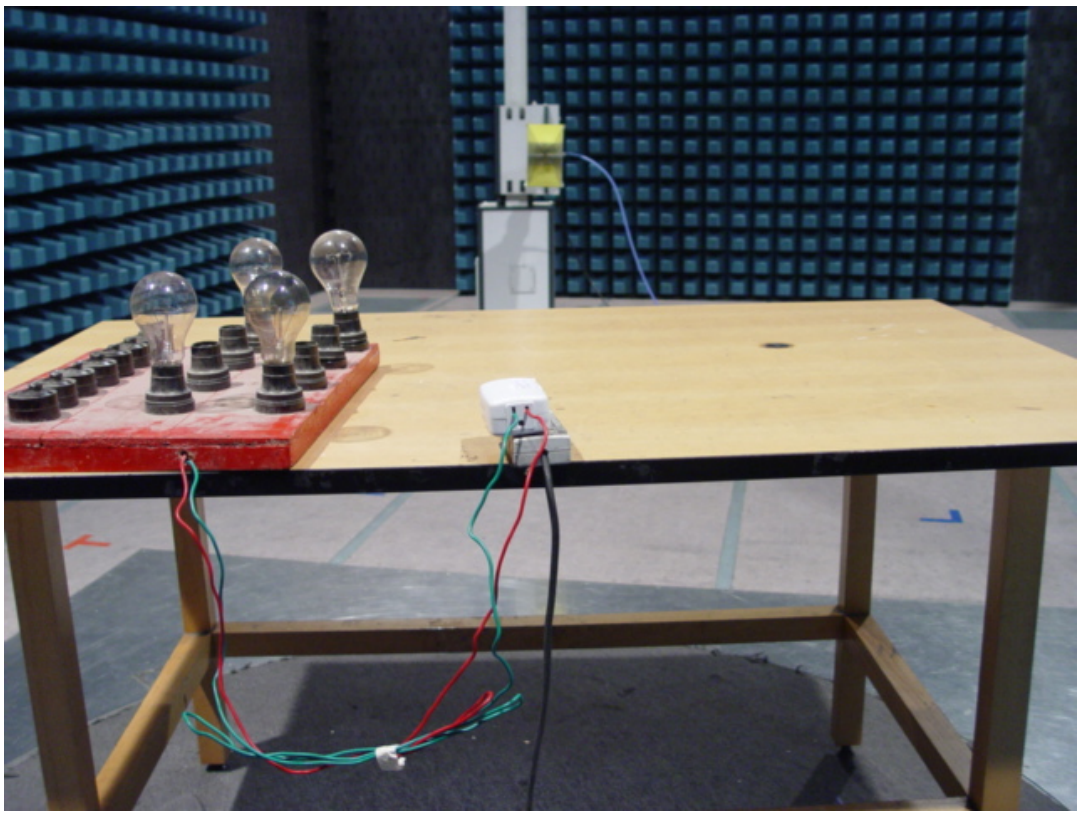


Photo 6 Radiated Emission Test (45603)



APPENDIX II EUT PHOTO

Photo 1 Appearance of EUT (45603)

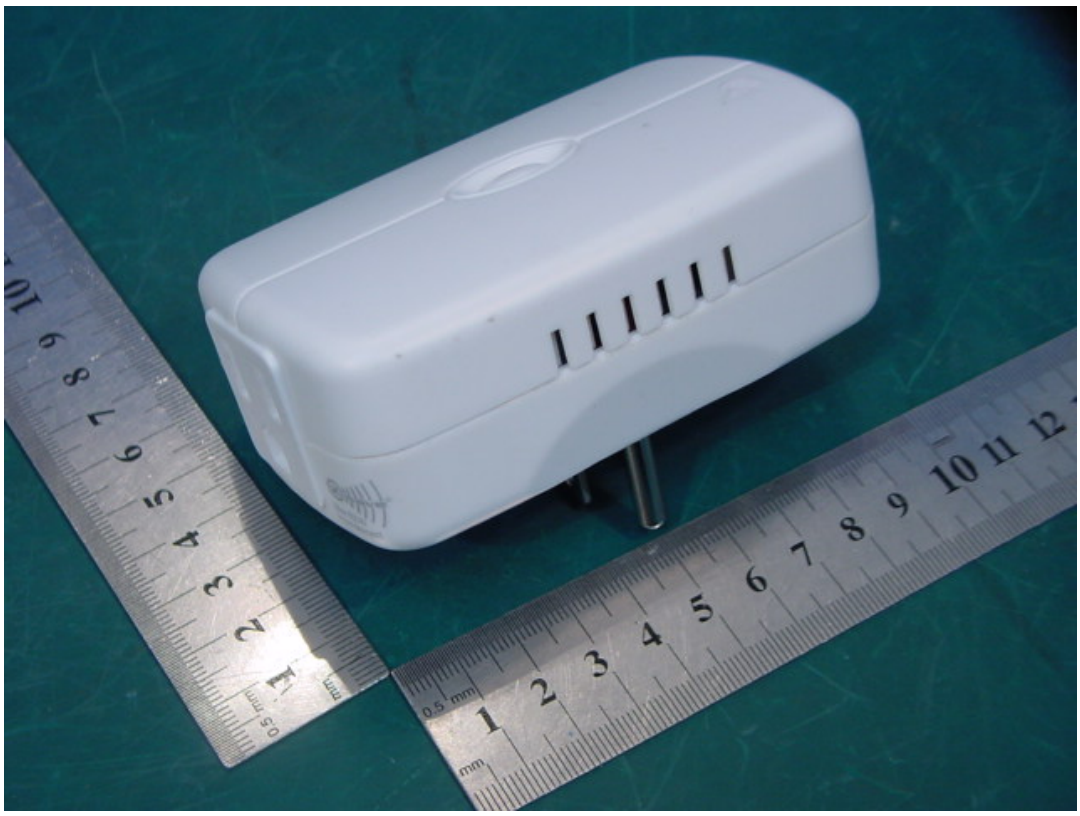


Photo 2 Appearance of EUT (45603)

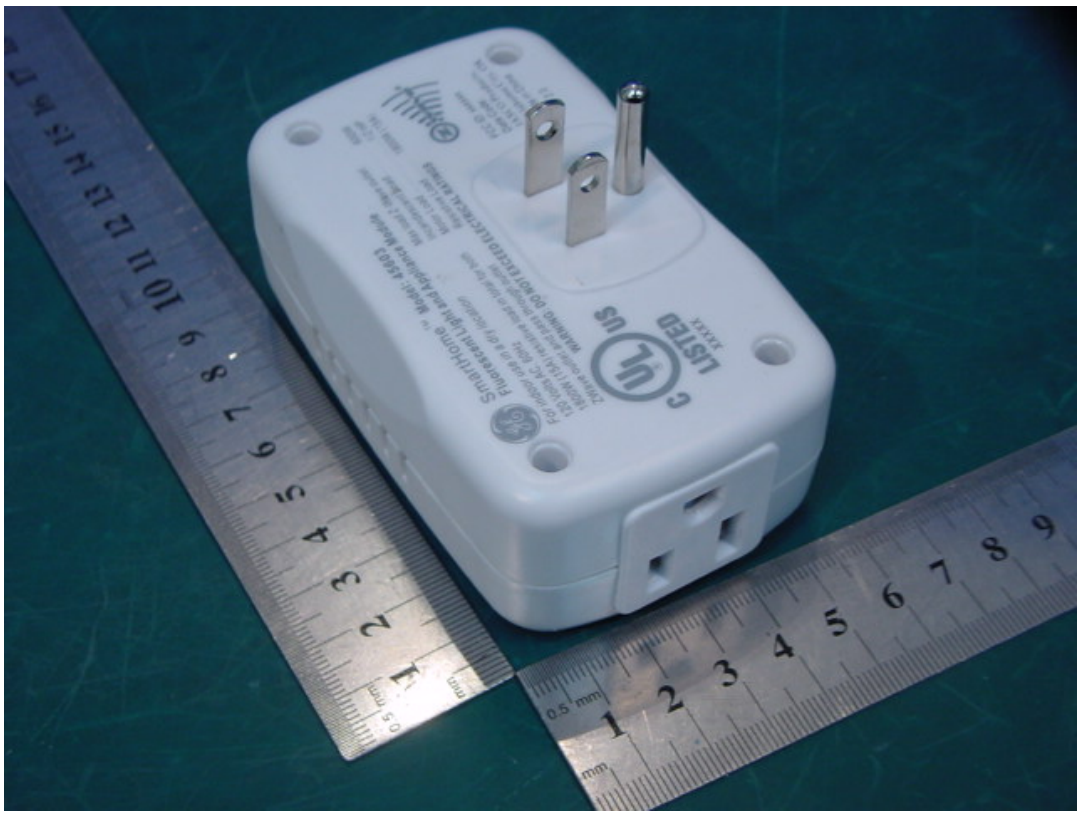


Photo 3 Inside of EUT (45603)

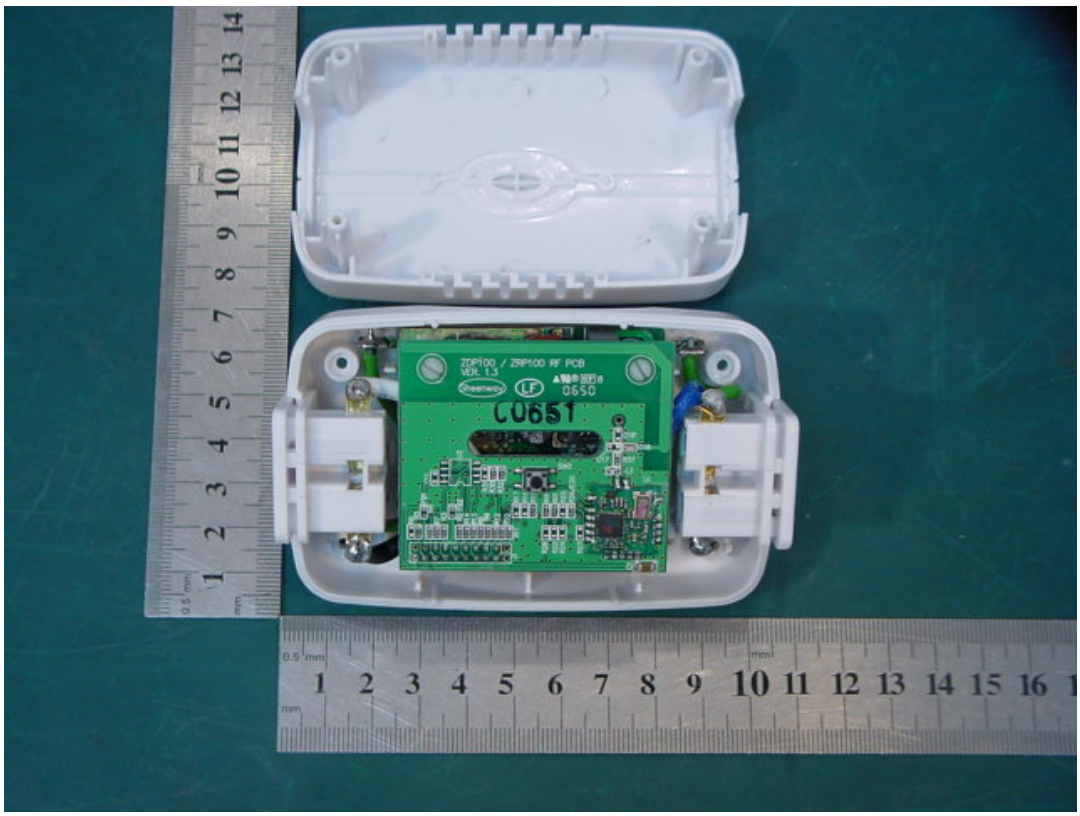


Photo 4 Inside of EUT (45603)

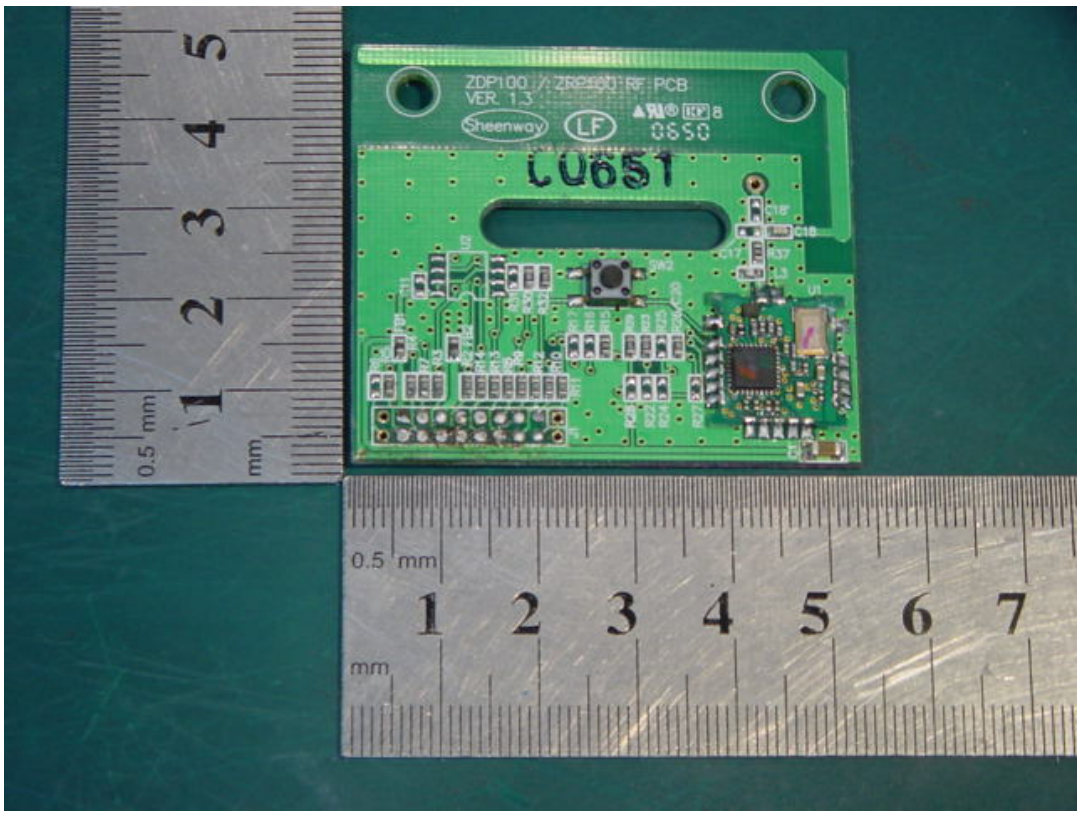


Photo 5 Inside of EUT **(**45603)

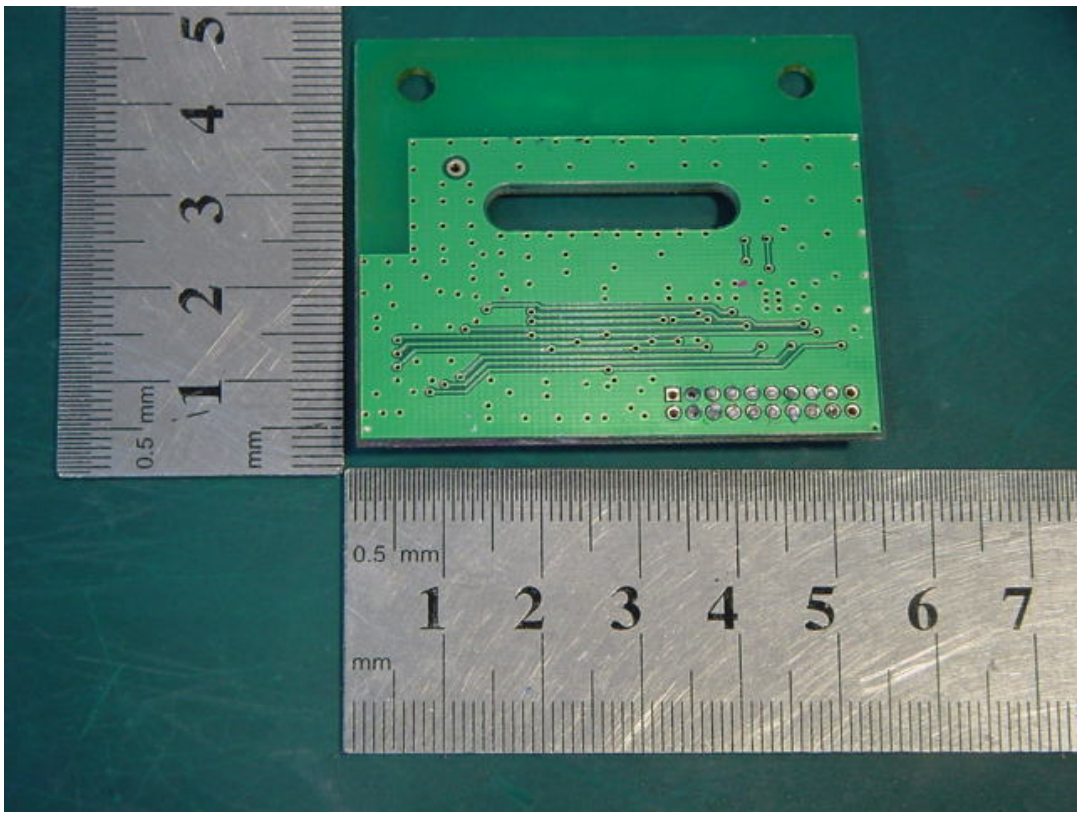


Photo 6 Inside of EUT **(**45603)

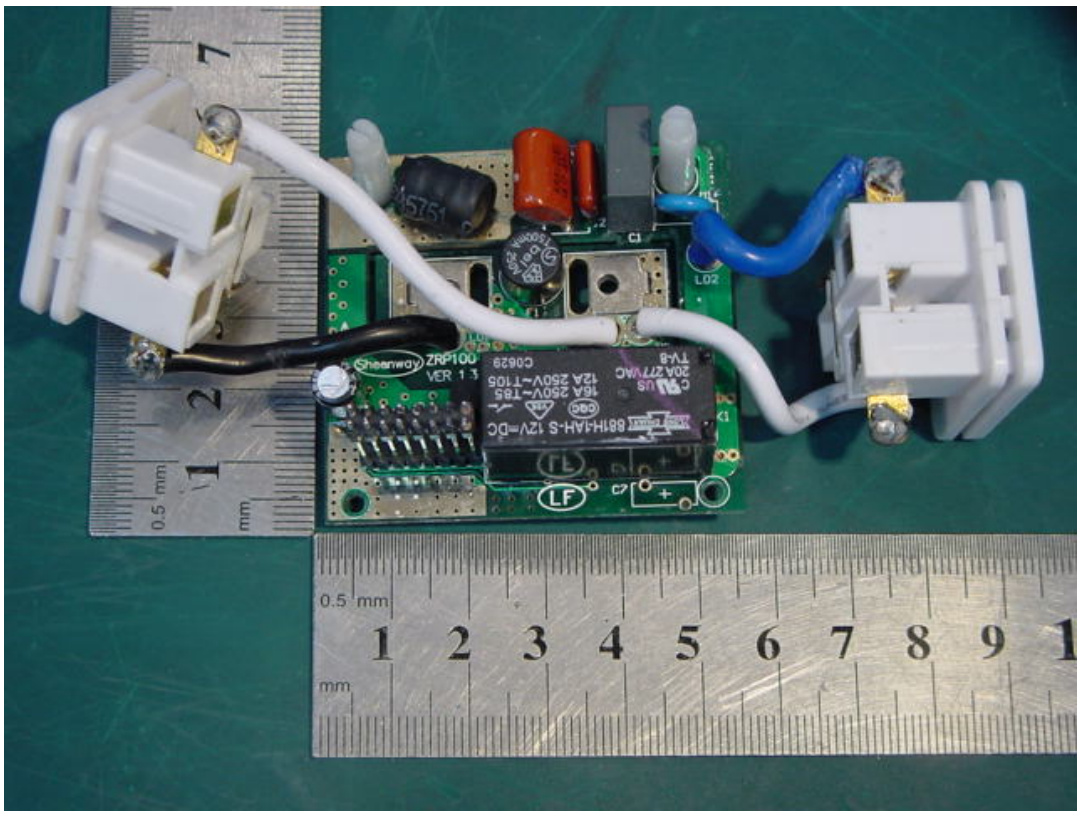


Photo 7 Inside of EUT (45603)

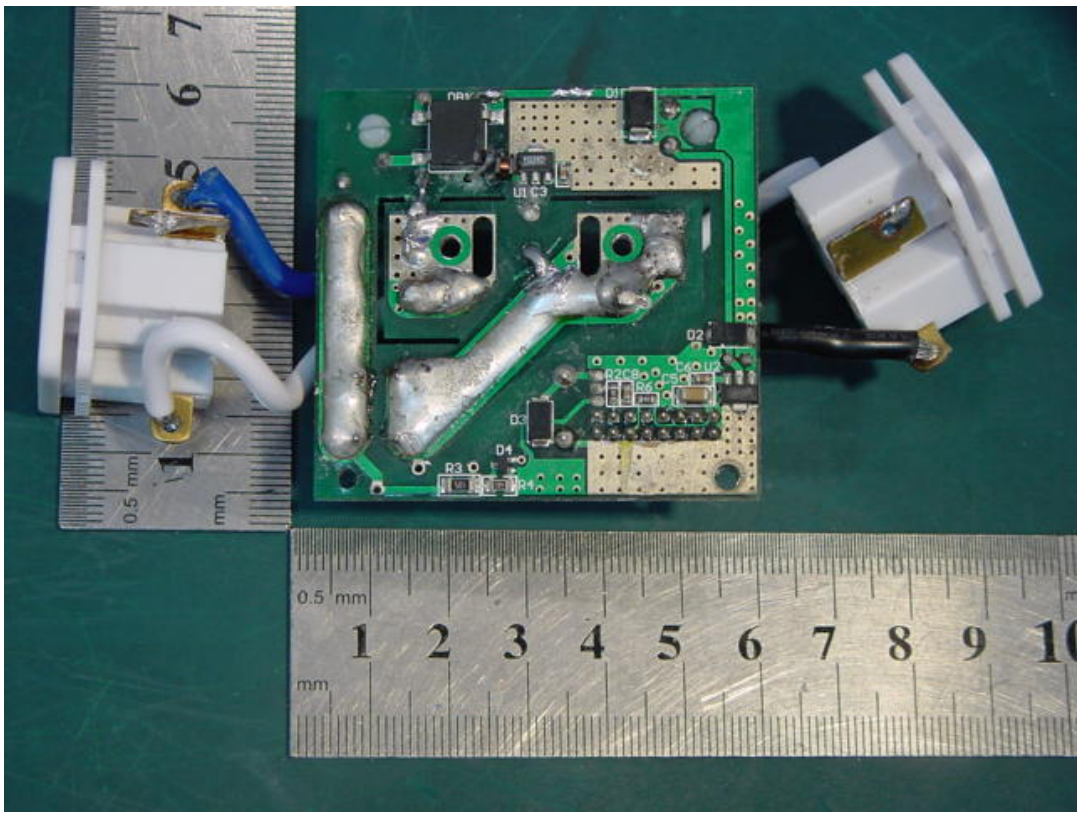


Photo 8 Appearance of EUT (45602)

Photo 9 Appearance of EUT (45602)

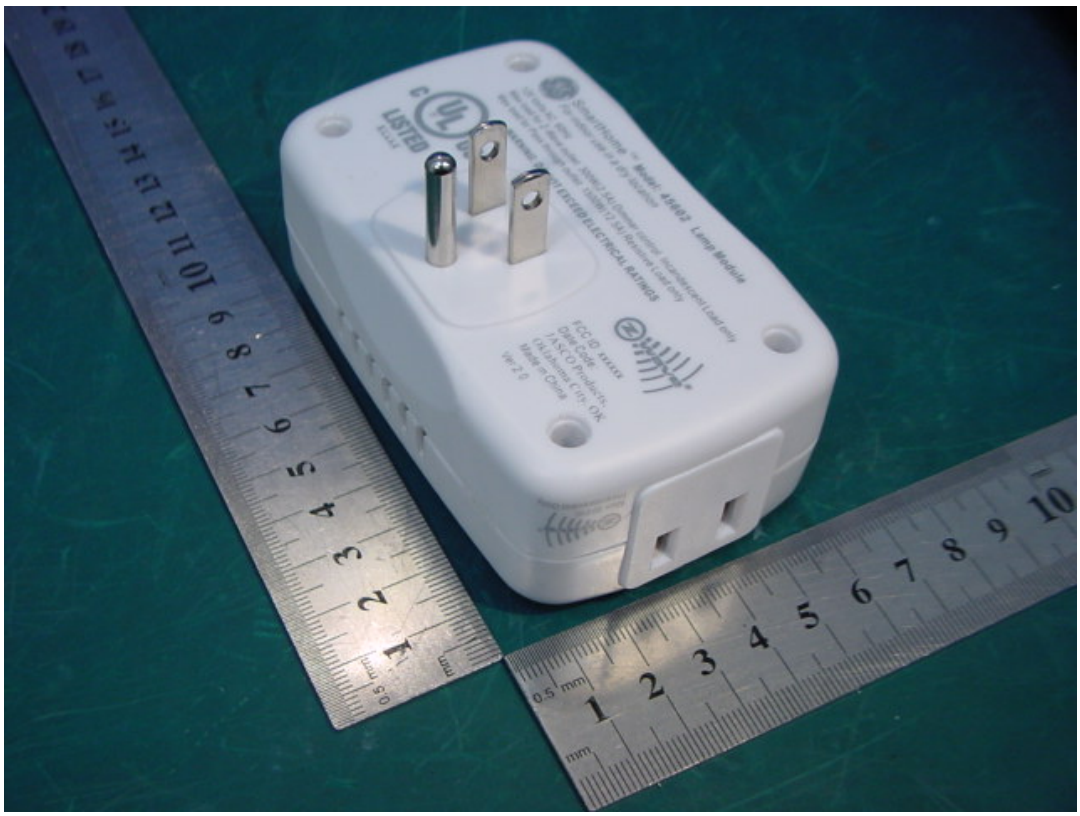


Photo 10 Inside of EUT (45602)

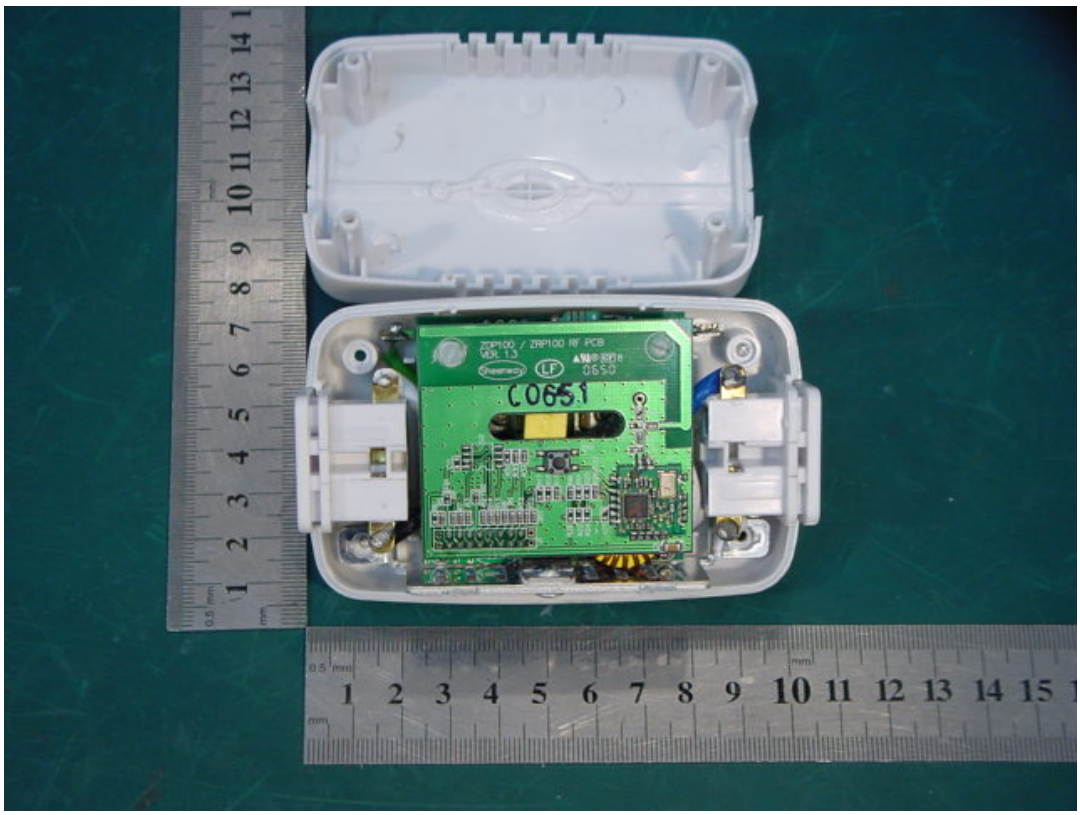
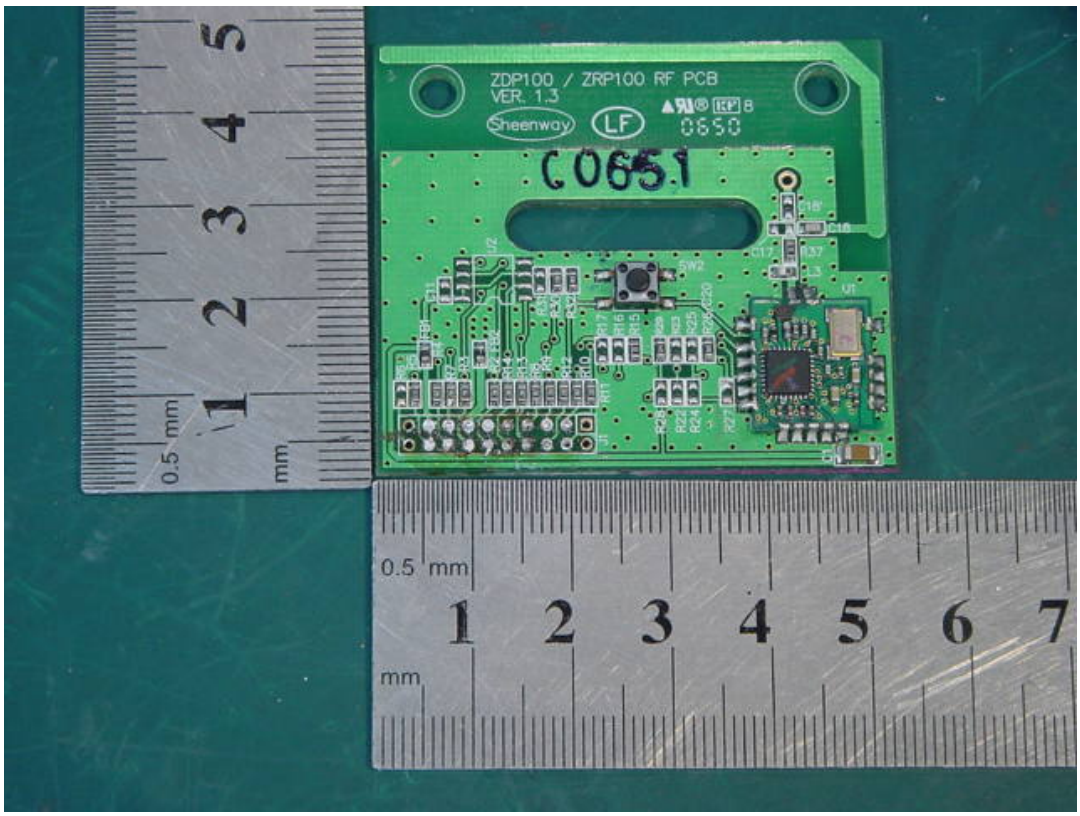


Photo 11 Inside of EUT **(**45602)



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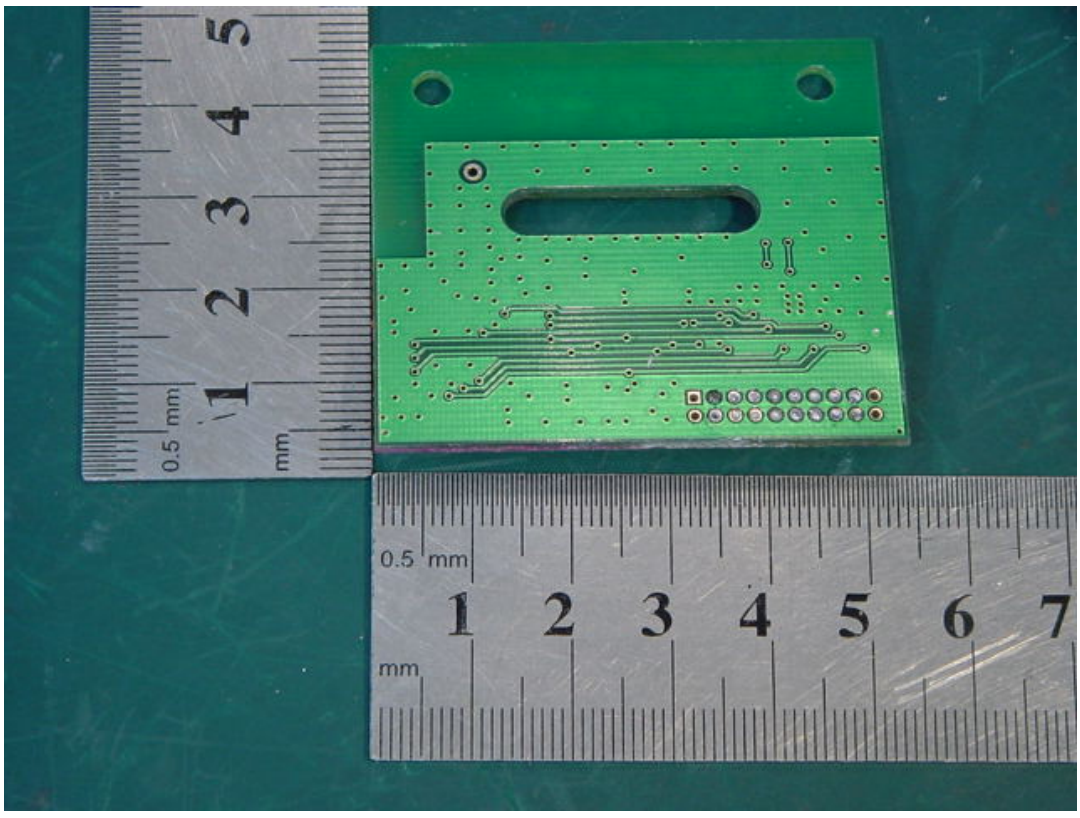

Photo 13 Inside of EUT **(**45602)

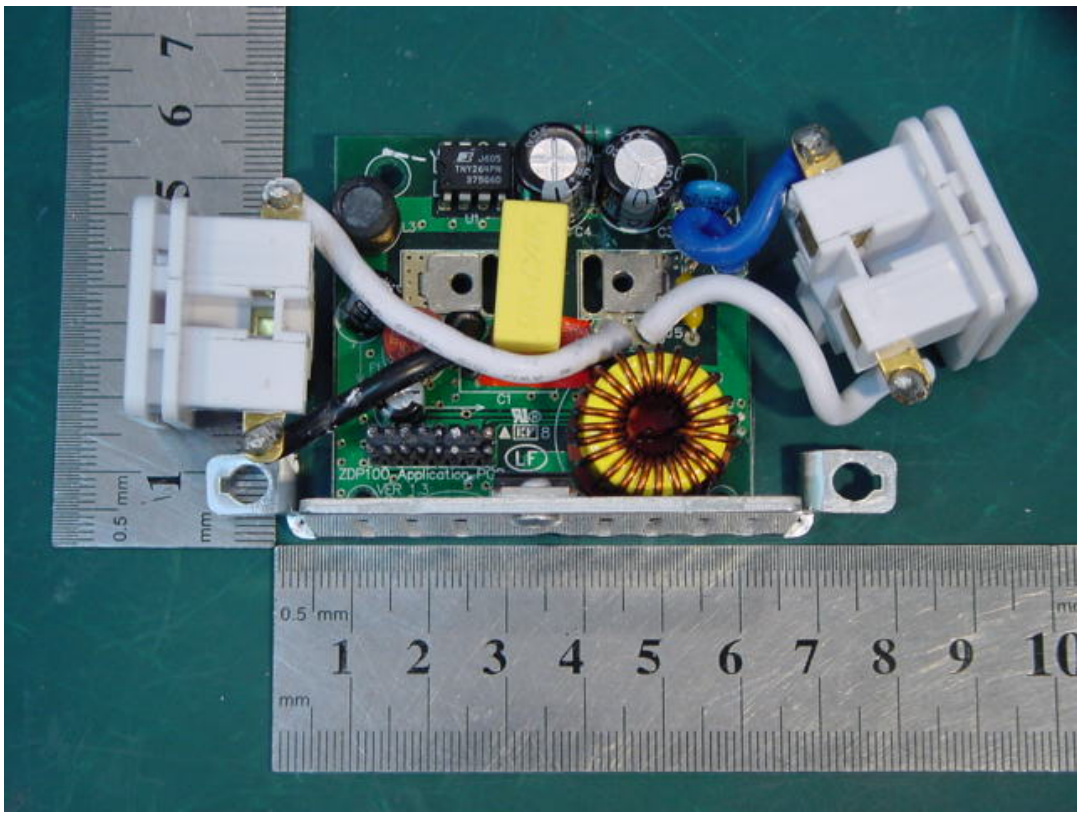

Photo 14 Inside of EUT **(**45602)