

Certificate of Test

March 2017

KAGA ELECTRONICS (USA) INC

Product Name : AC Adapter
Model Number : 1)KTPSxx-yyyyyDT-2P- VI (for Desktop Equipment)
2)KTPSxx-yyyyyzz-VI (for Direct Plug-In Equipment)
(xx can be 18 or 24 for output watt; yyyy can be 05040, 06035, 06040, 07030, 07530, 09025, 12020, 15016 (When xx=24W) and 05030,06025, 06030, 07025, 07525, 09022, 10019, 11016, 12016, 15013, 16012, 18011, 24008.(When xx = 18W). zz can be WA/EU/UK/AU/CN/KR/MP ;WA is US plug, EU is EU plug, UK is UK plug, AU is AU plug. MP is for Snap-fit plug with AU, UK, CN, EU, KR or US plug)
Test Report Number : 1702052E-01
Date of Test : November 29, 2016 - December 08, 2016

This product was tested according to the standards as below at the laboratory of Global EMC Standard Tech. Corp..

Standards:

EN55032: 2012+AC: 2013 / CISPR 32:2012 (EQV), Class B
EN 55024: 2010+A1: 2015 / CISPR 24:2010 + A1:2015, IEC 61000-4 Series
EN 61000-3-2: 2014 &EN 61000-3-3: 2013

[http : //www.gestek.com.tw](http://www.gestek.com.tw)



Sharon Chang, President

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Issue Date: March 17, 2017



Declaration of Conformity

We, Manufacturer/Importer
(full address)

declare that the product
(description of the apparatus, system, installation to which it refers)

EUT: AC Adapter

**Model Number: 1)KTPSxx-yyyyyDT-2P- VI (for Desktop Equipment)
2)KTPSxx-yyyyyz-VI (for Direct Plug-In Equipment)**

(xx can be 18 or 24 for output watt; yyyy can be 05040, 06035, 06040, 07030, 07530, 09025, 12020, 15016 (When xx=24W) and 05030,06025, 06030, 07025, 07525, 09022, 10019, 11016, 12016, 15013, 16012, 18011, 24008.(When xx = 18W). zz can be WA/EU/UK/AU/CN/KR/MP ;WA is US plug, EU is EU plug, UK is UK plug, AU is AU plug. MP is for Snap-fit plug with AU, UK, CN, EU, KR or US plug)

is in conformity with

(reference to the specification under which conformity is declared)
in accordance with 2014/30/EU-EMC Directive

- | | | | |
|--|--|---|---|
| <input type="checkbox"/> EN 55011 | Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) high frequency equipment | <input checked="" type="checkbox"/> EN 61000-3-2 | Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase |
| <input type="checkbox"/> EN 55013 | Limits and methods of measurement Information Technology of radio disturbance characteristics of broadcast receivers and associated equipment | <input checked="" type="checkbox"/> EN 61000-3-3 | Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection |
| <input checked="" type="checkbox"/> EN 55032 | Electromagnetic compatibility of multimedia equipment Emission Requirements | <input checked="" type="checkbox"/> EN 55024 | Information Technology equipment-Immunity characteristics-Limits and methods of measurement |
| <input type="checkbox"/> EN 55014-1 | Limits and methods of measurement of radio disturbance characteristics of household electrical appliances, portable tools and similar electrical apparatus | <input type="checkbox"/> EN 61000-6-1 | Generic standards-Immunity for residential, commercial and light-industrial environments |
| <input type="checkbox"/> EN 61000-6-3 | Generic standards-Emission standard for residential, commercial and light-industrial environments | <input type="checkbox"/> EN 61000-6-2 | Generic standards-Immunity for industrial environments |
| <input type="checkbox"/> EN 61000-6-4 | Generic standards-Emission standard for industrial environments | <input type="checkbox"/> EN 55014-2 | Immunity requirements for household appliances tools and similar apparatus |
| <input type="checkbox"/> EN 55015 | Limits and methods of measurement of radio disturbance characteristics of fluorescent lamps and luminaires | <input type="checkbox"/> EN 50091- 2 | EMC requirements for uninterruptible power systems (UPS) |
| <input type="checkbox"/> DIN VDE 0855 part 10 | Cabled distribution systems; Equipment for receiving and/or distribution from sound and television signals | <input type="checkbox"/> EN 55020 | Immunity from radio interference of broadcast receivers and associated equipment |
| <input type="checkbox"/> part 12 | | <input type="checkbox"/> EN 61204-3 | Low voltage power supplies, d.c. output - Part 3: Electromagnetic compatibility. (EMC) |

CE marking



The manufacturer also declares the conformity of above mentioned product with the actual required safety standards in accordance with LVD 2014/35/EU

- | | | | |
|--|---|--|---|
| <input type="checkbox"/> EN 60065 | Safety requirements for mains operated electronic and related apparatus for household and similar general use | <input type="checkbox"/> EN 60950 | Safety for information technology equipment including electrical business equipment |
| <input type="checkbox"/> EN 60335 | Safety of household and similar electrical appliances | <input type="checkbox"/> EN 50091-1 | General and Safety requirements for uninterruptible power systems (UPS) |

Manufacturer/Importer

Signature: _____

(Stamp)

Date:

Name: _____

EMC Test Report
For:
KAGA ELECTRONICS (USA) INC

EUT: AC Adapter

Model Number: 1)KTPSxx-yyyyyDT-2P- VI (for Desktop Equipment)

2)KTPSxx-yyyyyzz-VI (for Direct Plug-In Equipment)

(xx can be 18 or 24 for output watt; yyyy can be 05040, 06035, 06040, 07030, 07530, 09025, 12020, 15016 (When xx=24W) and 05030,06025, 06030, 07025, 07525, 09022, 10019, 11016,

12016, 15013, 16012, 18011, 24008.(When xx = 18W). zz can be

WA/EU/UK/AU/CN/KR/MP ;WA is US plug, EU is EU plug, UK is UK plug, AU is AU plug.

MP is for Snap-fit plug with AU, UK, CN, EU, KR or US plug)

Prepared for:

KAGA ELECTRONICS (USA) INC

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Test results given in this report only relate to the specimen(s) tested, measured.

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The client should not use it to claim product endorsement by TAF or any government agencies.

All data in this report are traceable to national standard or international standard.

TABLE OF CONTENTS

Description	Page
1. CERTIFICATION	3
2. SUMMARY OF TEST RESULTS	4
2.1 UNCERTAINTY DESCRIPTION	5
3. GENERAL INFORMATION	6
3.1 PRODUCT DESCRIPTION	6
3.2 TEST MODES & EUT COMPONENTS DESCRIPTION	7
3.3 CONFIGURATION OF THE SYSTEM UNDER TEST	9
3.4 BLOCK DIAGRAM OF CONNECTIONS BETWEEN EUT AND SIMULATORS	9
3.5 LAB AMBIENT	10
3.6 TEST FACILITY ACCREDITATION	10
4. CONDUCTED EMISSION MEASUREMENT	11
4.1 TEST EQUIPMENTS	11
4.2 TEST METHOD	11
4.3 BLOCK DIAGRAM OF TEST SETUP	11
4.4 CONDUCTED EMISSION LIMITS	12
4.5 TEST CONFIGURATION ON MEASUREMENT	12
4.6 CONDUCTED EMISSION MEASURED PROCEDURE AND DATA	12
4.7 OPERATING CONDITIONS OF THE EUT	12
4.8 CONDUCTED EMISSION MEASUREMENT RESULTS	13
5. RADIATED EMISSION MEASUREMENT	17
5.1 TEST EQUIPMENT	17
5.2 TEST METHOD	17
5.3 OPEN AREA TEST SITE & SEMI-ANECHOIC CHAMBER SETUP DIAGRAM	17
5.4 RADIATED EMISSION LIMITS	18
5.5 TEST CONFIGURATION	18
5.6 OPERATING CONDITIONS OF THE EUT	18
5.7 RADIATED EMISSION DATA	19
5.8 RADIATED EMISSIONS MEASUREMENT RESULTS	20
6. HARMONIC CURRENT EMISSIONS, VOLTAGE FLUCTUATIONS AND FLICKER MEASUREMENT	24
6.1 TEST EQUIPMENT	24
6.2 TEST METHOD	24
6.3 BLOCK DIAGRAM OF TEST SETUP	24
6.4 LIMITS OF FLICKER MEASUREMENT	25
6.5 OPERATING CONDITIONS OF THE EUT	25
6.6 TEST PROCEDURE	25
6.7 TEST RESULT	25
7. ESD IMMUNITY TEST	28
7.1 TEST EQUIPMENT	28
7.2 TEST METHOD	28
7.3 BLOCK DIAGRAM OF TEST SETUP	28
7.4 SEVERITY LEVELS	29
7.5 OPERATING CONDITIONS OF THE EUT	29
7.6 TEST PROCEDURE	29
7.7 TEST RESULT	30
8. RF FIELD STRENGTH SUSCEPTIBILITY TEST	32
8.1 TEST EQUIPMENT	32
8.2 TEST METHOD	32
8.3 BLOCK DIAGRAM OF TEST SETUP	32
8.4 SEVERITY LEVELS	33
8.5 OPERATING CONDITIONS OF THE EUT	33
8.6 TEST PROCEDURE	33
8.7 TEST RESULT	34
9. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST	35
9.1 TEST EQUIPMENT	35
9.2 TEST METHOD	35
9.3 BLOCK DIAGRAM OF TEST SETUP	35
9.4 SEVERITY LEVELS	36
9.5 OPERATING CONDITIONS OF THE EUT	36
9.6 TEST RESULT	37
10. SURGE IMMUNITY TEST	38
10.1 TEST EQUIPMENT	38
10.2 TEST METHOD	38
10.3 BLOCK DIAGRAM OF TEST SETUP	38
10.4 SEVERITY LEVELS	38
10.5 OPERATING CONDITIONS OF THE EUT	39
10.6 TEST PROCEDURE	39
10.7 TEST RESULT	40
11. CONDUCTED DISTURBANCE SUSCEPTIBILITY TEST	42
11.1 TEST EQUIPMENT	42
11.2 TEST METHOD	42
11.3 BLOCK DIAGRAM OF TEST SETUP	42
11.4 SEVERITY LEVELS	42
11.5 OPERATING CONDITIONS OF THE EUT	43
11.6 TEST PROCEDURE	43
11.7 TEST RESULT	44
12. MAGNETIC FIELD IMMUNITY MEASUREMENT	45
12.1 TEST EQUIPMENT	45
12.2 TEST METHOD	45
12.3 BLOCK DIAGRAM OF TEST SETUP	45
12.4 SEVERITY LEVELS	46
12.5 EUT OPERATION CONDITION	46
12.6 TEST PROCEDURE	46
12.7 TEST RESULT	47
13. VOLTAGE DIPS AND SHORT INTERRUPTIONS TEST	48
13.1 TEST EQUIPMENT	48
13.2 TEST METHOD	48
13.3 BLOCK DIAGRAM OF TEST SETUP	48
13.4 SEVERITY LEVELS	48
13.5 OPERATING CONDITIONS OF THE EUT	49
13.6 TEST PROCEDURE	49
13.7 TEST RESULT	50
14. PHOTOGRAPHS FOR TEST	54
14.1 TEST PHOTOGRAPHS FOR CONDUCTION	54
14.2 TEST PHOTOGRAPHS FOR RADIATED	55
14.3 TEST PHOTOGRAPHS FOR HARMONIC/FLICKER	56
14.4 TEST PHOTOGRAPHS FOR ESD	57
14.5 TEST PHOTOGRAPHS FOR ESD TEST POINTS	58
14.6 TEST PHOTOGRAPHS FOR RS	59
14.7 TEST PHOTOGRAPHS FOR EFT	60
14.8 TEST PHOTOGRAPHS FOR SURGE	61
14.9 TEST PHOTOGRAPHS FOR CS	62
14.10 TEST PHOTOGRAPHS FOR MAGNETIC	63
14.11 TEST PHOTOGRAPHS FOR DIPS	64
15. PHOTOGRAPHS FOR PRODUCT	65
16. EMI/EMS REDUCTION METHOD DURING COMPLIANCE TESTING	79

1. CERTIFICATION

Applicant : KAGA ELECTRONICS (USA) INC
EUT Description : AC Adapter
Model Number : 1)KTPSxx-yyyyyDT-2P- VI (for Desktop Equipment)
2)KTPSxx-yyyyyzz-VI (for Direct Plug-In Equipment)
(xx can be 18 or 24 for output watt; yyyyy can be 05040, 06035, 06040, 07030, 07530, 09025, 12020, 15016 (When xx=24W) and 05030,06025, 06030, 07025, 07525, 09022, 10019, 11016, 12016, 15013, 16012, 18011, 24008.(When xx = 18W). zz can be WA/EU/UK/AU/CN/KR/MP ;WA is US plug, EU is EU plug, UK is UK plug, AU is AU plug. MP is for Snap-fit plug with AU, UK, CN, EU, KR or US plug)
Serial Number : N/A
Brand Name : KAGA

STANDARDS OF TEST METHOD:

EN 55032: 2012+AC: 2013 / CISPR 32:2012 (EQV) AND
EN 61000-3-2:2014 & EN 61000-3-3: 2013
EN 55024: 2010+A1: 2015 / CISPR 24:2010 + A1:2015 AND EN 61000-4 SERIES REGULATIONS

GENERAL REMARKS:

The tests were performed according to the technical requirement of EUT.

- Electro-magnetic Radiated Emission Interference Measurement (EN 55032)
- Electro-magnetic Conducted Emission Interference Measurement (EN 55032)
- Harmonic Current Emissions (EN 61000-3-2)
- Voltage Fluctuation and Flicker Measurement (EN 61000-3-3)
- ESD Immunity Test ((IEC 61000-4-2)
- RF Field strength Susceptibility Test (IEC 61000-4-3)
- Electrical Fast Transient/Burst Immunity Test (IEC 61000-4-4)
- Surge Immunity Test (IEC 61000-4-5)
- Conducted disturbance Susceptibility Test (IEC 61000-4-6)
- Power Frequency Magnetic Field Immunity Test (IEC 61000-4-8)
- Voltage Dips/Short Interruptions Test (IEC 61000-4-11)

Sample Received Data : November 25, 2016
Date of Test : November 29, 2016 - December 08, 2016
Issue Date : March 17, 2017

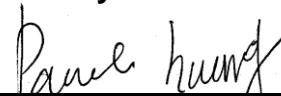
In order to ensure the quality and accuracy of this document, the contents have been thoroughly reviewed by the following qualified personnel from Global EMC Standard Tech. Corp..

Documented By:



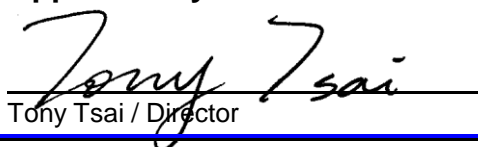
Mandy Chen / Report Author

Tested By:



Pual Huang / Eng. Dept. Engineer

Approved By:


Tony Tsai / Director

2. SUMMARY OF TEST RESULTS

STANDARD	TEST ITEM	TEST RESULT	REMARKS
EN55032: 2012+AC: 2013 Class B	Conducted emission (Mode 47)	PASS	The worst emission frequency is <u>0.1990MHz</u> And minimum passing margin is <u>-4.29dB</u> The measurement uncertainty is <u>3.88 dB</u> .
	Radiated emission (Mode 47)	PASS	The worst emission frequency is <u>34.6635 MHz</u> at <u>Vertical</u> . And minimum passing margin is <u>-5.51 dB</u> . Height of antenna is <u>100cm</u> . Angle of turntable is <u>326°</u> . The measurement uncertainty is <u>4.30 dB</u> .
EN 61000-3-2:2014	Harmonic Current Emissions	PASS	Note: EUT power level is below 75 Watts and therefore has no defined limits The measurement uncertainty is 9.23 mA
EN 61000-3-3: 2013	Voltage Fluctuation and Flicker Measurement	PASS	The Value of Pst shall not be greater than 1.0 The measurement uncertainty is <u>0.02 %</u>
EN 55024: 2010+A1: 2015 IEC 61000-4-2:2008	Electrostatic Discharge(ESD)	PASS	Contact discharge up to <u>±4kV</u> . Air discharge up to <u>±8kV</u> .
EN 55024: 2010+A1: 2015 IEC 61000-4-3:2006+A1:2 007+A2:2010	RF field strength Susceptibility	PASS	80-1000MHz (1kHz sinewave with 80% Amplitude Modulation: 3V/m)
EN 55024: 2010+A1: 2015 IEC 61000-4-4:2012	Electrical Fast Transients/Burst	PASS	±0.5kV, ±1.0kV (AC Input)
EN 55024: 2010+A1: 2015 IEC 61000-4-5: 2014	Surge	PASS	±0.5kV, ±1kV, ±2kV ((AC Input)
EN 55024: 2010+A1: 2015 IEC 61000-4-6:2013	Conducted Disturbance Susceptibility	PASS	0.15-80MHz (1kHz sinewave with 80% Amplitude Modulation: 3V)
EN 55024: 2010+A1: 2015 IEC 61000-4-8:2009	Magnetic Field Measurement	PASS	1A/m at 50Hz
EN 55024: 2010+A1: 2015 IEC 61000-4-11: 2004	Voltage short Interruptions	PASS	>95% reduction, 5s at 50/60Hz
	Voltage Dips		>95% reduction, 10 ms at 50Hz >95% reduction, 8.33 ms at 60Hz 30% reduction, 500 ms at 50/60Hz

2.1 UNCERTAINTY DESCRIPTION

According to CISPR 16-4-2,

The measure level is compliance with the limit if

$$L_m < L_{lim} \quad \text{and} \quad L_m + U(L_m) < L_{lim} + U_{cispr} = L_{eff}$$

Where,

U_{cispr} = Uncertainty value specified in Table 1 of CISPR 16-4-2

Measurement		U_{cispr}
Conducted disturbance (mains port)	(150 kHz – 30 MHz)	3.6 dB
Radiated disturbance (OATS or ATS)	(30 MHz – 1000 MHz)	5.2 dB

L_m = Measure value

L_{lim} = Emission limit level

$U(L_m)$ = Uncertainty value of test laboratory

L_{eff} = Effective emission limit level

The above stated condition will be taking as a criterion for pass/fail determination.

3. GENERAL INFORMATION

3.1 PRODUCT DESCRIPTION

- Product Name** : AC Adapter
- Model Number** : 1)KTPSxx-yyyyyDT-2P- VI (for Desktop Equipment)
2)KTPSxx-yyyyyzz-VI (for Direct Plug-In Equipment)
(xx can be 18 or 24 for output watt; yyyy can be 05040, 06035, 06040, 07030, 07530, 09025, 12020, 15016 (When xx=24W) and 05030,06025, 06030, 07025, 07525, 09022, 10019, 11016, 12016, 15013, 16012, 18011, 24008.(When xx = 18W). zz can be WA/EU/UK/AU/CN/KR/MP ;WA is US plug, EU is EU plug, UK is UK plug, AU is AU plug. MP is for Snap-fit plug with AU, UK, CN, EU, KR or US plug)
- Serial Number** : N/A
- Applicant** : KAGA ELECTRONICS (USA) INC
- Address** : 780 Montague Expy, Suite 403, San Jose, CA 95131 USA
- Manufacturer** : Boayang Electronics Co., Ltd.
- Address** : Di Feng Gong Yu Qu 2 Hao Xiasha Liuwu Village, Shipai Town Dong Guan City P. R. China
- Power Supply** : KTPS18-yyyyyDT-2P- VI and KTPS18-yyyyyzz-VI Input :100-240Vac, 50-60Hz, 0.48A
KTPS24-yyyyyDT-2P- VI and KTPS24-yyyyyzz-VI Input :100-240Vac, 50-60Hz, 0.58A

3.2 TEST MODES & EUT COMPONENTS DESCRIPTION

EUT: AC Adapter, M/N: 1)KTPSxx-yyyyyDT-2P- VI (for Desktop Equipment)			
2)KTPSxx-yyyyyzz-VI (for Direct Plug-In Equipment)			
(xx can be 18 or 24 for output watt; yyyyy can be 05040, 06035, 06040, 07030, 07530, 09025, 12020, 15016 (When xx=24W) and 05030,06025, 06030, 07025, 07525, 09022, 10019, 11016, 12016, 15013, 16012, 18011, 24008.(When xx = 18W). zz can be WA/EU/UK/AU/CN/KR/MP ;WA is US plug, EU is EU plug, UK is UK plug, AU is AU plug. MP is for Snap-fit plug with AU, UK, CN, EU, KR or US plug)			
Test Mode	Mode 1- Full Load (Pre-Scan Mode)	Mode 2- Full Load (Pre-Scan Mode)	Mode 3- Full Load (Pre-Scan Mode)
Test Model Number	KTPS24-05040DT-2P-VI	KTPS24-06035DT-2P-VI	KTPS24-06040DT-2P-VI
Test Mode	Mode 4- Full Load (Pre-Scan Mode)	Mode 5- Full Load (Pre-Scan Mode)	Mode 6- Full Load (Pre-Scan Mode)
Test Model Number	KTPS24-07030DT-2P-VI	KTPS24-07530DT-2P-VI	KTPS24-09025DT-2P-VI
Test Mode	Mode 7- Full Load (Pre-Scan Mode)	Mode 8- Full Load (Pre-Scan Mode)	Mode 9- Full Load (Worst Case)
Test Model Number	KTPS24-12020DT-2P-VI	KTPS24-15016DT-2P-VI	KTPS24-24010DT-2P-VI
Test Mode	Mode 10- Full Load (Pre-Scan Mode)	Mode 11- Full Load (Pre-Scan Mode)	Mode 12- Full Load (Pre-Scan Mode)
Test Model Number	KTPS24-48005DT-2P-VI	KTPS18-05030DT-2P-VI	KTPS18-06025DT-2P-VI
Test Mode	Mode 13- Full Load (Pre-Scan Mode)	Mode 14- Full Load (Pre-Scan Mode)	Mode 15- Full Load (Pre-Scan Mode)
Test Model Number	KTPS18-06030DT-2P-VI	KTPS18-07025DT-2P-VI	KTPS18-07525DT-2P-VI
Test Mode	Mode 17- Full Load (Pre-Scan Mode)		Mode 18- Full Load (Pre-Scan Mode)
Test Model Number	KTPS18-09022DT-2P-VI		KTPS18-10019DT-2P-VI
Test Mode	Mode 19- Full Load (Pre-Scan Mode)	Mode 20- Full Load (Pre-Scan Mode)	Mode 21- Full Load (Pre-Scan Mode)
Test Model Number	KTPS18-11016DT-2P-VI	KTPS18-12016DT-2P-VI	KTPS18-15013DT-2P-VI
Test Mode	Mode 22- Full Load (Pre-Scan Mode)	Mode 23- Full Load (Pre-Scan Mode)	Mode 24- Full Load (Worst Case)
Test Model Number	KTPS18-16012DT-2P-VI	KTPS18-18011DT-2P-VI	KTPS18-24008DT-2P-VI
Test Mode	Mode 25- Full Load (Pre-Scan Mode)	Mode 26- Full Load (Pre-Scan Mode)	Mode 27- Full Load (Pre-Scan Mode)
Test Model Number	KTPS24-05040WA-VI	KTPS24-06035WA-VI	KTPS24-06040WA-VI
Test Mode	Mode 28- Full Load (Pre-Scan Mode)	Mode 29- Full Load (Pre-Scan Mode)	Mode 30- Full Load (Pre-Scan Mode)
Test Model Number	KTPS24-07030WA-VI	KTPS24-07530WA-VI	KTPS24-09025WA-VI
Test Mode	Mode 31- Full Load (Pre-Scan Mode)	Mode 32- Full Load (Pre-Scan Mode)	Mode 33- Full Load (Worst Case)
Test Model Number	KTPS24-12020WA-VI	KTPS24-15016WA-VI	KTPS24-24010WA-VI
Test Mode	Mode 34- Full Load (Pre-Scan Mode)	Mode 35- Full Load (Pre-Scan Mode)	Mode 36- Full Load (Worst Case)
Test Model Number	KTPS24-48005WA-VI	KTPS18-05030WA-VI	KTPS18-06025WA-VI
Test Mode	Mode 37- Full Load (Pre-Scan Mode)	Mode 38- Full Load (Pre-Scan Mode)	Mode 39- Full Load (Pre-Scan Mode)
Test Model Number	KTPS18-06030WA-VI	KTPS18-07025WA-VI	KTPS18-07525WA-VI
Test Mode	Mode 40- Full Load (Pre-Scan Mode)	Mode 41- Full Load (Pre-Scan Mode)	Mode 42- Full Load (Pre-Scan Mode)
Test Model Number	KTPS18-09022WA-VI	KTPS18-10019WA-VI	KTPS18-11016WA-VI
Test Mode	Mode 43- Full Load (Pre-Scan Mode)	Mode 44- Full Load (Pre-Scan Mode)	Mode 45- Full Load (Pre-Scan Mode)
Test Model Number	KTPS18-12016WA-VI	KTPS18-15013WA-VI	KTPS18-16012WA-VI
Test Mode	Mode 46- Full Load (Pre-Scan Mode)		Mode 47- Full Load (Worst Case)
Test Model Number	KTPS18-18011WA-VI		KTPS18-24008WA-VI

Note:

1. According to pre-scan data, we determine the data (Mode 33, 47) shown in this test report, which reflects the worst-case data for each operation mode.
2. The EUT has serial model numbers for the requirement of marketing.

The difference of model numbers are shown as below:

Model No	Input Rated	Output Rated	Transformer	PCB		
KTPS24-05040DT-2P-VI KTPS24-05040WA-VI	100-240Vac, 50-60Hz, 0.58A	5Vdc, 4.0A, 20W	T1	SR		
KTPS24-06035DT-2P-VI KTPS24-06035WA-VI		5.9Vdc, 3.5A, 20.65W		SR		
KTPS24-06040DT-2P-VI KTPS24-06040WA-VI		5.9Vdc, 4.0A, 23.6W		SR		
KTPS24-07030DT-2P-VI KTPS24-07030WA-VI		7.0Vdc, 3.0A, 21W	T2	SR		
KTPS24-07530DT-2P-VI KTPS24-07530WA-VI				7.5Vdc, 3.0A, 22.5W	SR	
KTPS24-09025DT-2P-VI KTPS24-09025WA-VI		100-240Vac, 50-60Hz, 0.48A	9.0Vdc, 2.5A, 22.50W	T8	SBD	
KTPS24-12020DT-2P-VI KTPS24-12020WA-VI			12Vdc, 2.0A, 24W	T3	SBD	
KTPS24-15016DT-2P-VI KTPS24-15016WA-VI			15Vdc, 1.6A, 24W	T4	SBD	
KTPS24-24010DT-2P-VI KTPS24-24010WA-VI			24Vdc, 1.0A, 24W	T5	SBD	
KTPS24-48005DT-2P-VI KTPS24-48005WA-VI			48Vdc, 0.5A, 24W	T6	SBD	
KTPS18-05030DT-2P-VI KTPS18-05030WA-VI			100-240Vac, 50-60Hz, 0.48A	5Vdc, 3.0A, 15W	T7	SBD
KTPS18-06025DT-2P-VI KTPS18-06025WA-VI				5.9Vdc, 2.5A, 14.75W		SBD
KTPS18-06030DT-2P-VI KTPS18-06030WA-VI	5.9Vdc, 3.0A, 17.7W			SBD		
KTPS18-07025DT-2P-VI KTPS18-07025WA-VI	7.0Vdc, 2.5A, 17.5W	T8		SBD		
KTPS18-07525DT-2P-VI KTPS18-07525WA-VI	7.5Vdc, 2.5A, 18.75W			SBD		
KTPS18-09022DT-2P-VI KTPS18-09022WA-VI	9.0Vdc, 2.2A, 19.8W			SBD		
KTPS18-10019DT-2P-VI KTPS18-10019WA-VI	10Vdc, 1.9A, 19W	T3		SBD		
KTPS18-11016DT-2P-VI KTPS18-11016WA-VI				11Vdc, 1.6A, 17.60W	SBD	
KTPS18-12016DT-2P-VI KTPS18-12016WA-VI				12Vdc, 1.6A, 19.2W	SBD	

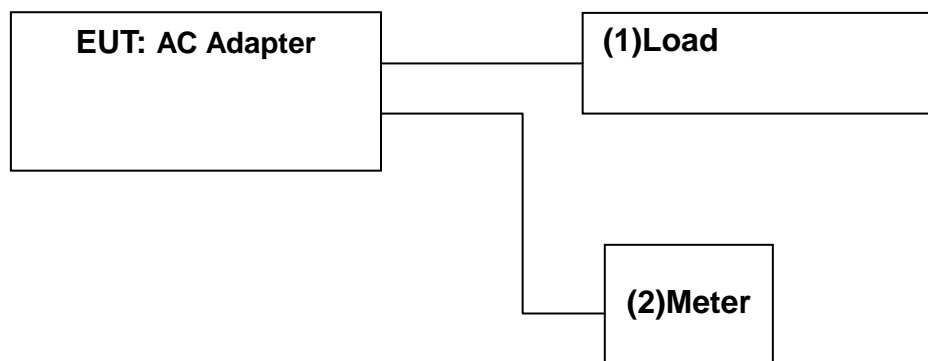
Model No	Input Rated	Output Rated	Transformer	PCB
KTPS18-15013DT-2P-VI KTPS18-15013WA-VI	100-240Vac, 50-60Hz, 0.48A	15Vdc, 1.3A, 19.5W	T4	SBD
KTPS18-16012DT-2P-VI KTPS18-16012WA-VI	100-240Vac, 50-60Hz, 0.48A	16Vdc, 1.2A, 19.2W		SBD
KTPS18-18011DT-2P-VI KTPS18-18011WA-VI	100-240Vac, 50-60Hz, 0.48A	18Vdc, 1.1A, 19.8W		SBD
KTPS18-24008DT-2P-VI KTPS18-24008WA-VI	100-240Vac, 50-60Hz, 0.48A	24Vdc, 0.8A, 19.2W	T5	SBD

3.3 CONFIGURATION OF THE SYSTEM UNDER TEST

Item	Device	No.	Configuration
1	Load	-----	Full Load: 24Ω for mode 33 Full Load: 30Ω for mode 47
2	Meter	-----	0-5A

Note: All the peripherals above were selected specifically after confirming that there is no impact on test results.

3.4 BLOCK DIAGRAM OF CONNECTIONS BETWEEN EUT AND SIMULATORS



3.5 LAB AMBIENT

Items	Range Requirement
Temperature (°C)	10-40
Humidity (%RH)	10-90
Barometric pressure (mbar)	860-1060

3.6 TEST FACILITY ACCREDITATION

Global EMC Standard Tech. Corp. is accredited in respect of laboratory and the accreditation criteria is ISO/IEC 17025: 2005.

Site Description : Registration on VCCI effective through July 13, 2018.
VCCI Member No.708

Recognized by the Council of Taiwan Accreditation Foundation
As an accredited laboratory and registration No.:1082.
Registration on TAF effective through September 18, 2018.

Aug. 10, 1995 /Aug. 25, 1998 File on FCC Engineering Laboratory
Federal Communications Commission
Designation Number: TW1031, TW1032

Name of firm : Global EMC Standard Tech. Corp.

Site location : No.3, Baodoucuokeng, Linkou Dist., New Taipei City 244, Taiwan (R.O.C.)



4. CONDUCTED EMISSION MEASUREMENT

4.1 TEST EQUIPMENTS

Item	Instrument	Manufacturer	Model	S/N or Version	Next Cal. Date
1	TEST RECEIVER	RS	ESCS30	100393	2016.04.16
2	L.I.S.N.(EUT)	RS	ENV216	100108	2016.05.11
3	CABLE	GTK	N/A	GTK-E-A154-01	2016.01.09
4	Software	FARAD	EZ-EMC	2A1.1(USB)	N/A

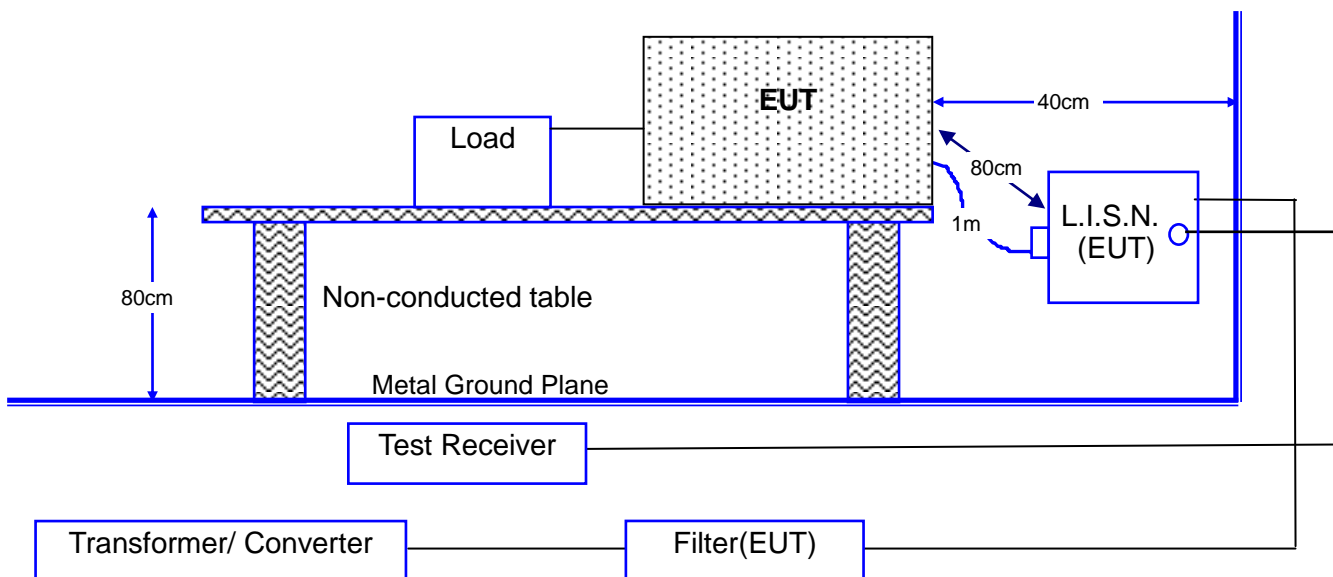
- Note: 1. All equipments are calibrated and will be valid only for a period of 1 year.
 2. The test was performed at GTK Shielded Room B5.

4.2 TEST METHOD

According to EN55032: 2012+AC: 2013

4.3 BLOCK DIAGRAM OF TEST SETUP

4.3.1 TEST SETUP FOR EMISSION MEASUREMENT AT MAINS TERMINAL



- Note: This is a representative setup diagram for Table-top EUT.
 For Floor-standing EUT, the table will be removed with all others setup condition remain the same.

4.4 CONDUCTED EMISSION LIMITS

4.4.1 Requirements for conducted emissions from the AC mains power ports

Applicable to 1. AC mains power ports (3.1.1)				
Table clause	Frequency range MHz	Coupling device (see Table A.8)	Detector type / bandwidth	Class B limits dB(mV)
A10.1	0,15 to 0,5	AMN	Quasi Peak / 9 kHz	66 to 56
	0,5 to 5			56
	5 to 30			60
A10.2	0,15 to 0,5	AMN	Average / 9 kHz	56 to 46
	0,5 to 5			46
	5 to 30			50

Apply A10.1 and A10.2 across the entire frequency range.

4.5 TEST CONFIGURATION ON MEASUREMENT

The equipments that are listed in section 4.1 are installed on Conducted Power Line Test in order to meet the requirement of the Commission and operating in a manner, which tends to maximize its emission characteristics in a normal application.

The device under test, installed in a representative system as described in section 4.3, was placed on a non-conductive table whose total height equal to 80cm. Powered from one L.I.S.N. which signal output to receiver, and the other peripherals was powered from another L.I.S.N. which signal output was terminated by 50Ω.

4.6 CONDUCTED EMISSION MEASURED PROCEDURE AND DATA

4.6.1 CONDUCTED EMISSION (MAINS TERMINAL)

The measurement range of conducted emission, which is from 0.15 MHz to 30 MHz, was scan for peak emission curve of all the test modes. The worst mode is then measured using an average and/or quasi peak detector and record at least the disturbance levels and the frequencies of the six highest disturbances. The final measurement value is equal to the receiver reading plus the correction factor. If AMN insertion loss is more than 0.5dB, automatically the receiver will add the correction factor to the reading level.

4.7 OPERATING CONDITIONS OF THE EUT

The exercise program used during conducted emission measurement was designed to exercise the EUT in a manner similar to a typical use. The exercise sequence is listed as below:

1. Setup the EUT and simulators as shown on 3.4
2. Turn on the power of all equipments.
3. Start test.

4.8 CONDUCTED EMISSION MEASUREMENT RESULTS

Date of Test	July 07, 2015	Temperature	26 °C
EUT	AC Adapter	Humidity	59 %
Test Mode	Mode 33	Display Pattern	N/A
Test Power Supply	AC 230V/50Hz		

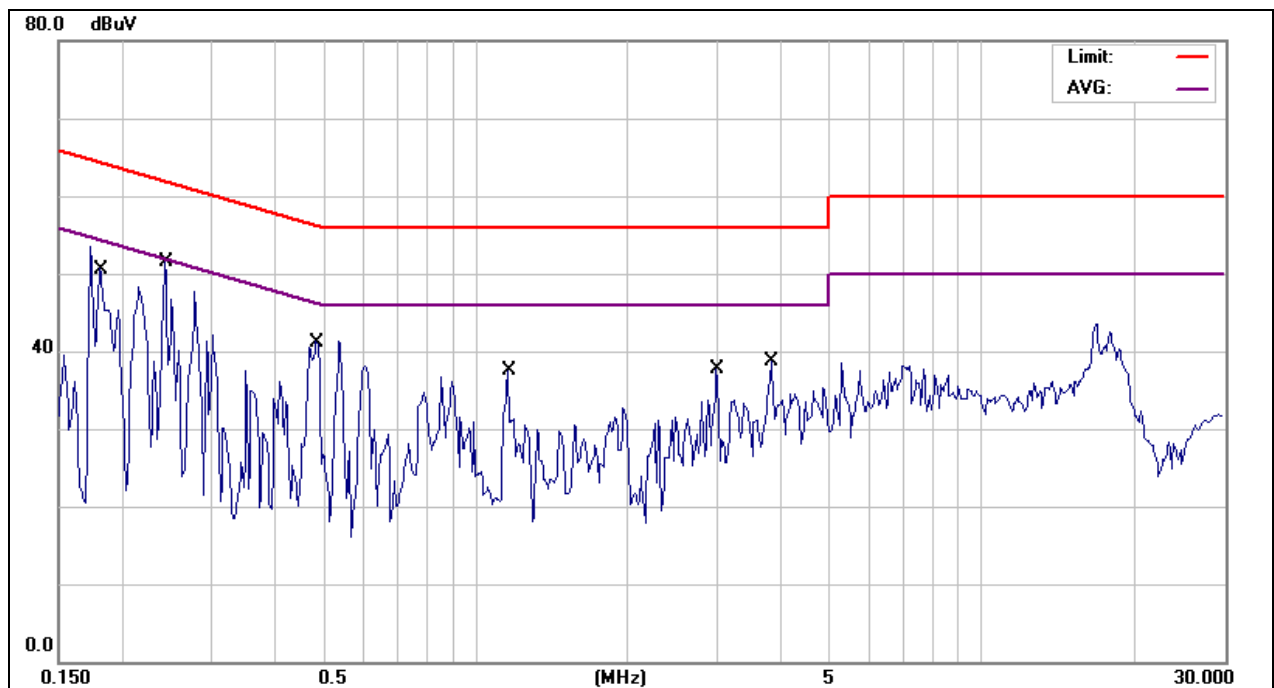
Line

No.	Frequency MHz	Reading Level dBµV	Factor dB	Measurement dBµV	Limit dBµV	Over Limit dB	Detector
1	★0.1823	48.95	9.67	58.62	64.38	-5.76	QP
2	0.1823	36.94	9.67	46.61	54.38	-7.77	AVG
3	0.2435	41.33	9.67	51.00	61.98	-10.98	QP
4	0.2435	31.62	9.67	41.29	51.98	-10.69	AVG
5	0.4859	31.55	9.65	41.20	56.24	-15.04	QP
6	0.4859	25.36	9.65	35.01	46.24	-11.23	AVG
7	1.1656	27.82	9.70	37.52	56.00	-18.48	QP
8	1.1656	24.29	9.70	33.99	46.00	-12.01	AVG
9	3.0055	27.84	9.82	37.66	56.00	-18.34	QP
10	3.0055	22.95	9.82	32.77	46.00	-13.23	AVG
11	3.8531	28.84	9.80	38.64	56.00	-17.36	QP
12	3.8531	23.63	9.80	33.43	46.00	-12.57	AVG

Remarks :

1. All readings are Quasi-peak and Average values.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = L.I.S.N. insertion loss + cable loss
5. “ ★ ” means that this data is the worse case measurement level.
6. The measurement uncertainty is 3.88 dB.

Line



- Remark:
1. The Limit (The red line of the graph indicates the quasi-peak measurements).
 2. The AVG (The purple line of the graph indicates the average measurements).
 3. The scan curve indicates peak detector measurement.

Date of Test	July 07, 2015	Temperature	26 °C
EUT	AC Adapter	Humidity	59 %
Test Mode	Mode 33	Display Pattern	N/A
Test Power Supply	AC 230V/50Hz		

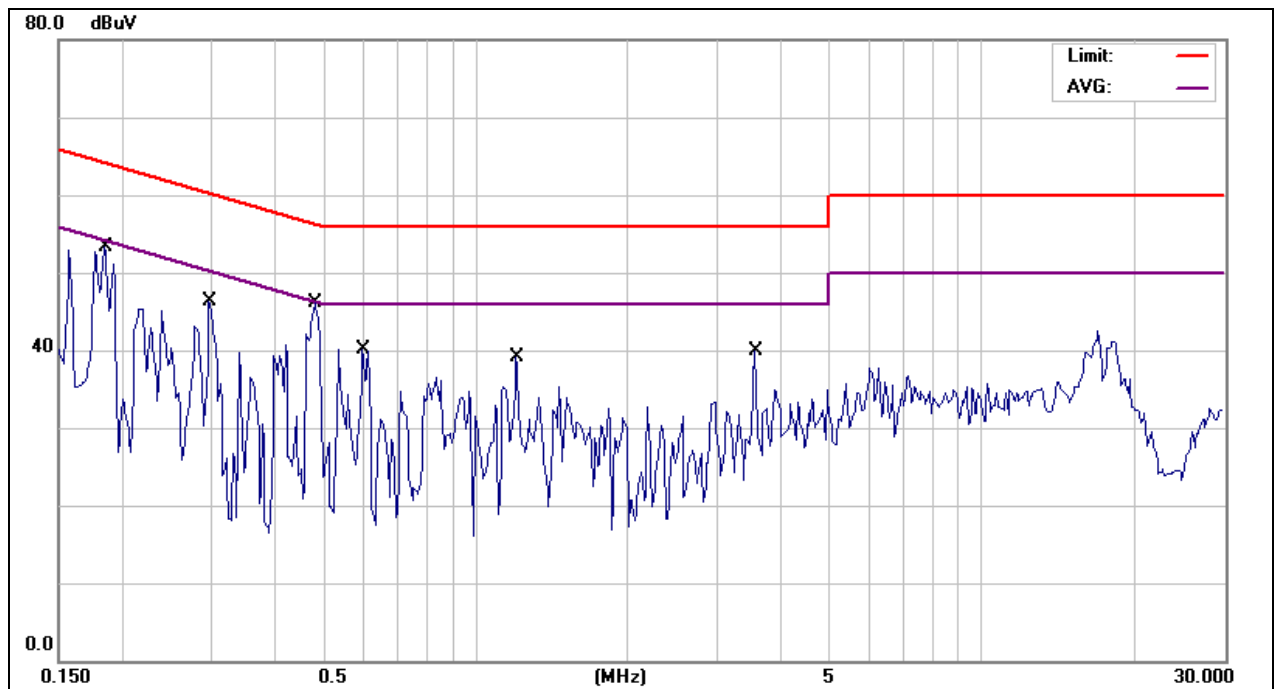
Neutral

No.	Frequency MHz	Reading Level dB μ V	Factor dB	Measurement dB μ V	Limit dB μ V	Over Limit dB	Detector
1	0.1859	46.13	9.69	55.82	64.22	-8.40	QP
2	0.1859	35.79	9.69	45.48	54.22	-8.74	AVG
3	0.2984	36.57	9.69	46.26	60.29	-14.03	QP
4	★0.2984	32.63	9.69	42.32	50.29	-7.97	AVG
5	0.4822	35.44	9.68	45.12	56.30	-11.18	QP
6	0.4822	27.98	9.68	37.66	46.30	-8.64	AVG
7	0.5992	30.32	9.69	40.01	56.00	-15.99	QP
8	0.5992	25.62	9.69	35.31	46.00	-10.69	AVG
9	1.2086	29.35	9.73	39.08	56.00	-16.92	QP
10	1.2086	24.29	9.73	34.02	46.00	-11.98	AVG
11	3.5680	30.02	9.83	39.85	56.00	-16.15	QP
12	3.5680	24.19	9.83	34.02	46.00	-11.98	AVG

Remarks :

1. All readings are Quasi-peak and Average values.
2. Measurement = Reading + Factor (Could have ± 0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = L.I.S.N. insertion loss + cable loss
5. " ★ " means that this data is the worse case measurement level.
6. The measurement uncertainty is 3.88 dB.

Neutral



- Remark:
1. The Limit (The red line of the graph indicates the quasi-peak measurements).
 2. The AVG (The purple line of the graph indicates the average measurements).
 3. The scan curve indicates peak detector measurement.

Date of Test	July 15, 2015	Temperature	26 °C
EUT	AC Adapter	Humidity	59 %
Test Mode	Mode 47	Display Pattern	N/A
Test Power Supply	AC 230V/50Hz		

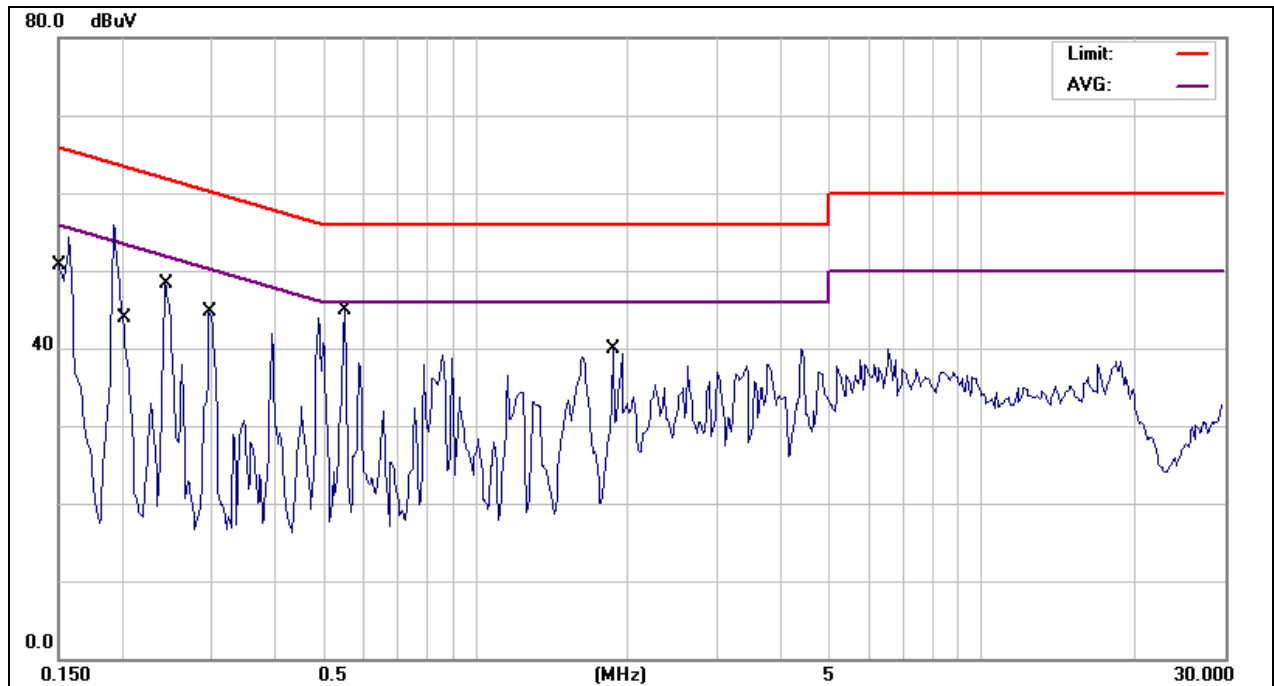
Line

No.	Frequency MHz	Reading Level dB μ V	Factor dB	Measurement dB μ V	Limit dB μ V	Over Limit dB	Detector
1	0.1500	50.63	9.67	60.30	66.00	-5.70	QP
2	★0.1500	41.75	9.67	51.42	56.00	-4.58	AVG
3	0.2029	45.84	9.67	55.51	63.49	-7.98	QP
4	0.2029	37.08	9.67	46.75	53.49	-6.74	AVG
5	0.2437	38.67	9.67	48.34	61.97	-13.63	QP
6	0.2437	32.86	9.67	42.53	51.97	-9.44	AVG
7	0.2984	35.03	9.66	44.69	60.29	-15.60	QP
8	0.2984	30.82	9.66	40.48	50.29	-9.81	AVG
9	0.5503	34.03	9.66	43.69	56.00	-12.31	QP
10	0.5503	28.10	9.66	37.76	46.00	-8.24	AVG
11	1.8766	30.24	9.73	39.97	56.00	-16.03	QP
12	1.8766	26.30	9.73	36.03	46.00	-9.97	AVG

Remarks :

1. All readings are Quasi-peak and Average values.
2. Measurement = Reading + Factor (Could have ± 0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = L.I.S.N. insertion loss + cable loss
5. " ★ " means that this data is the worse case measurement level.
6. The measurement uncertainty is 3.88 dB.

Line



- Remark:
1. The Limit (The red line of the graph indicates the quasi-peak measurements).
 2. The AVG (The purple line of the graph indicates the average measurements).
 3. The scan curve indicates peak detector measurement.

Date of Test	July 15, 2015	Temperature	26 °C
EUT	AC Adapter	Humidity	59 %
Test Mode	Mode 47	Display Pattern	N/A
Test Power Supply	AC 230V/50Hz		

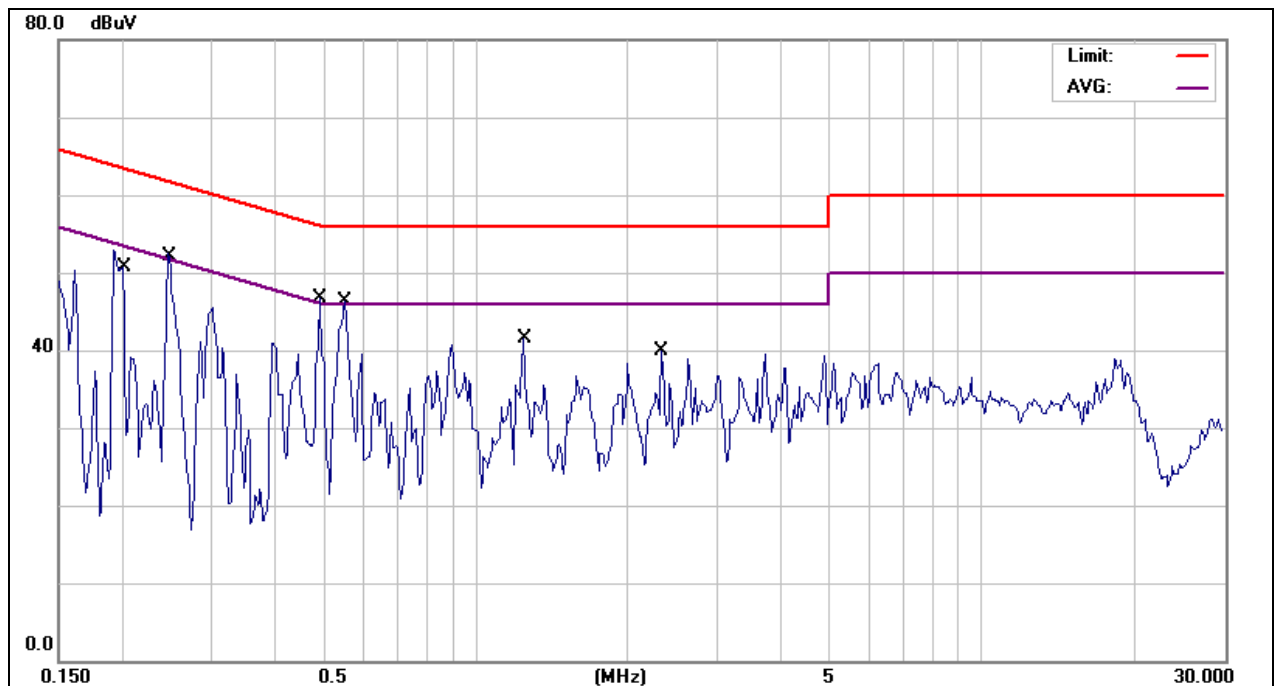
Neutral

No.	Frequency MHz	Reading Level dBµV	Factor dB	Measurement dBµV	Limit dBµV	Over Limit dB	Detector
1	0.1990	45.72	9.69	55.41	63.65	-8.24	QP
2	★0.1990	39.67	9.69	49.36	53.65	-4.29	AVG
3	0.2499	41.31	9.69	51.00	61.76	-10.76	QP
4	0.2499	35.17	9.69	44.86	51.76	-6.90	AVG
5	0.4938	36.96	9.68	46.64	56.10	-9.46	QP
6	0.4938	31.30	9.68	40.98	46.10	-5.12	AVG
7	0.5523	36.71	9.68	46.39	56.00	-9.61	QP
8	0.5523	30.74	9.68	40.42	46.00	-5.58	AVG
9	1.2477	31.81	9.73	41.54	56.00	-14.46	QP
10	1.2477	24.80	9.73	34.53	46.00	-11.47	AVG
11	2.3336	30.14	9.78	39.92	56.00	-16.08	QP
12	2.3336	25.63	9.78	35.41	46.00	-10.59	AVG

Remarks :

1. All readings are Quasi-peak and Average values.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = L.I.S.N. insertion loss + cable loss
5. " ★ " means that this data is the worse case measurement level.
6. The measurement uncertainty is 3.88 dB.

Neutral



- Remark:
1. The Limit (The red line of the graph indicates the quasi-peak measurements).
 2. The AVG (The purple line of the graph indicates the average measurements).
 3. The scan curve indicates peak detector measurement.

5. RADIATED EMISSION MEASUREMENT

5.1 TEST EQUIPMENT

The following test equipments are used during the radiated emission tests:

Item	Instrument	Manufacturer	Model	S/N or Version	Next Cal. Date
1	Test Receiver	RS	ESCS30	100393	2017.04.12
2	Spectrum Analyzer	RS	FSU26	200882	2017.08.15
3	Pre-Amplifier	EMV-Technik	PA303	GTK-E-A339-01	2017.04.09
4	Pre-Amplifier	HP	8449B	3008A01263	2017.04.06
5	Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-251	2017.05.24
6	HORN ANTENNA	SCHWARZBECK	BBHA 9120	473	2017.03.20
7	CABLE	INSULATED WIRE INC.	SPS-2801-394 0-NPS	03262012	2017.04.10
8	CABLE	SUHNER	SUCOFLEX 104PEA	27054/4PEA	2017.03.14
9	Software	FARAD	EZ-EMC	2A1.1(USB)	N/A

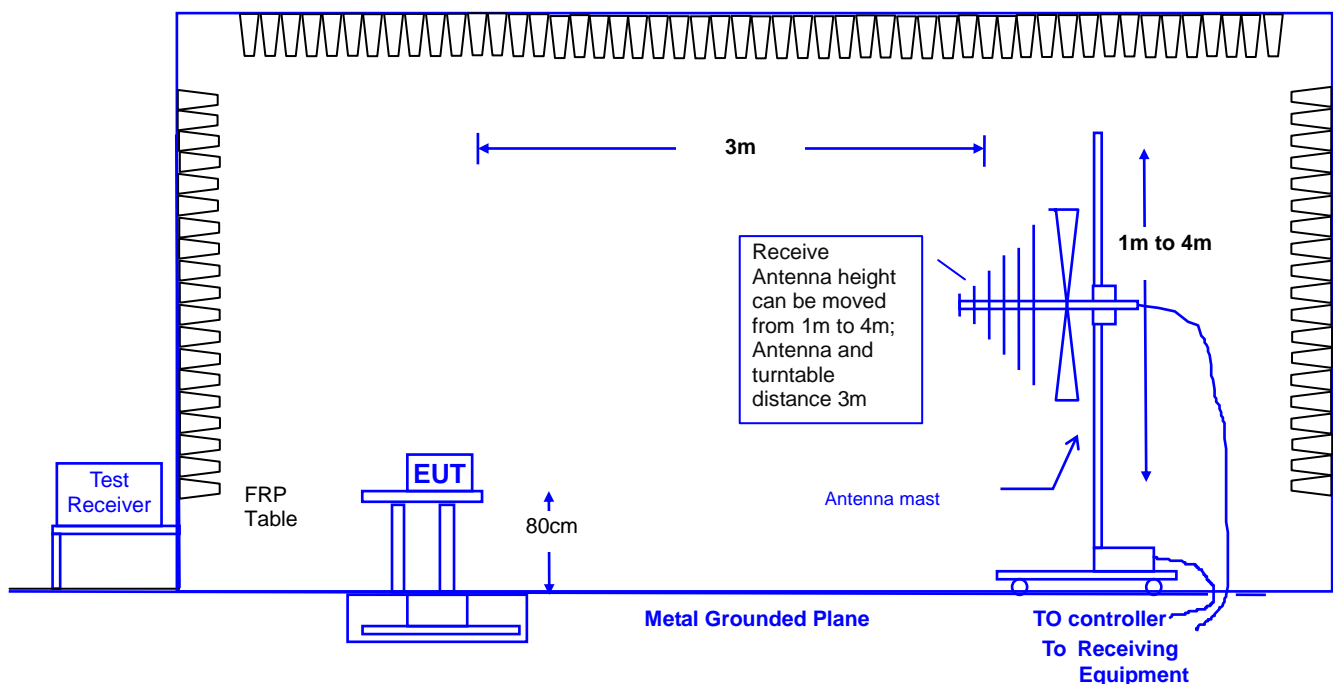
Note: 1. All equipments are calibrated and will be valid only for a period of 1 year.

2. The test was performed at GTK Chamber A6.

5.2 TEST METHOD

According to EN55032: 2012+AC: 2013

5.3 OPEN AREA TEST SITE & SEMI-ANECHOIC CHAMBER SETUP DIAGRAM



Note: This is a representative setup diagram for Table-top EUT.

For Floor-standing EUT, the table will be removed with all the other setup conditions remain the same.

5.4 RADIATED EMISSION LIMITS

5.4.1 Requirements for radiated emissions at frequencies up to 1 GHz

Table clause	Frequency range MHz	Measurement			Class B limits dB(mV/m)
		Facility (see Table A.1)	Distance m	Detector type /bandwidth	
A4.1	30 to 230	OATS/SAC	10	Quasi Peak / 120 kHz	30
	230 to 1 000				37
A4.2	30 to 230	OATS/SAC	3	Quasi Peak / 120 kHz	40
	230 to 1 000				47
A4.3	30 to 230	FAR	10	Quasi Peak / 120 kHz	32 to 25
	230 to 1 000				32
A4.4	30 to 230	FAR	3	Quasi Peak / 120 kHz	42 to 35
	230 to 1 000				42

Apply only table clause A4.1 or A4.2 or A4.3 or A4.4 across the entire frequency range. These requirements are not applicable to the local oscillator and harmonics frequencies of equipment covered by Table A.6.

5.5 TEST CONFIGURATION

The equipments which are listed at 5.1 are installed at the Radiated Emission Test site to meet the Commission requirements and operated in a manner, which tends to maximize its emission characteristics in a normal application.

The EUT, installed in a representative system as described in section 5.3, was placed on a non-conductive table whose total height equaled 80 cm. This table can be rotated 360 degrees.

5.5.1 30 MHz to 1 GHz

The measurement antenna was mounted to a non-conductive mast capable of moving the antenna vertically. Antenna height was varied from 1 m to 4 m and the system under test was rotated from 0 degree through 360 degrees relative to the antenna position and polarization (Horizontal and Vertical). Also the I/O cable positions were investigated to find the maximum emission condition.

5.6 OPERATING CONDITIONS OF THE EUT

Same as conducted emission measurement, which is listed in 4.7

5.7 RADIATED EMISSION DATA

According EN55032: 2012+AC: 2013 Section 8, the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table:

Highest frequency of the internal sources of the EUT (MHz)	Upper frequency of measurement rang (MHz)
<108	1000
108-500	2000
500-1000	5000
Above 1000	5 th harmonic of the highest frequency or 6 GHz, whichever is less

Remark: The highest tested frequency is generated by the 150 kHz.
At least, the upper frequency of measurement range is 1GHz.

5.7.1 30 MHz to 1 GHz

The measurement range of radiated emission, which is from 30 MHz to 1 GHz, was investigated. All readings are quasi-peak values with a resolution bandwidth of 120 kHz. The initial step in collecting radiated emission data is a spectrum analyzer peak scans of the measurement range for all the test modes and then use test receiver for final measurement and record at least the disturbance levels and the frequencies of the six highest disturbances. Then the worst modes were reported the following data pages.

5.8 RADIATED EMISSIONS MEASUREMENT RESULTS

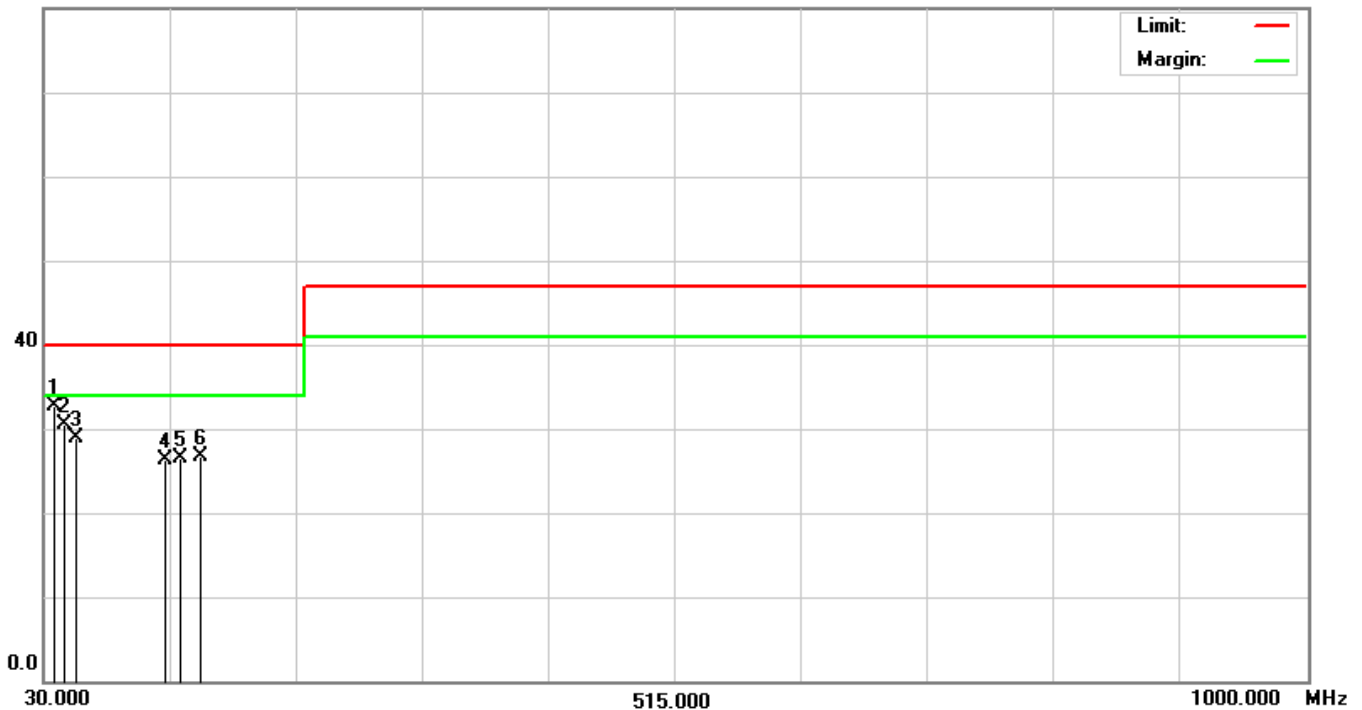
Date of Test	December 08, 2016	Temperature	26.8 deg/C
EUT	AC Adapter	Humidity	57 %RH
Working Cond.	Mode 33	Display Pattern	N/A
Antenna distance	10m at Horizontal	Test Frequency Range	30-1000MHz
Test Power Supply	AC 230V/50Hz		

No.	Frequency MHz	Reading Level dBµV	Factor dB	Measurement dBµV/m	Limit dBµV/m	Over Limit dB	Detector
1	★37.7724	42.51	-9.90	32.61	40.00	-7.39	QP
2	45.5449	39.65	-9.14	30.51	40.00	-9.49	QP
3	54.8718	38.59	-9.71	28.88	40.00	-11.12	QP
4	123.2692	37.36	-11.12	26.24	40.00	-13.76	QP
5	135.7051	36.38	-9.83	26.55	40.00	-13.45	QP
6	151.2500	35.80	-9.14	26.66	40.00	-13.34	QP

Remarks:

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = antenna factor + cable loss – amplifier gain.
5. “ ★ ” means that this data is the worse case measurement level.
6. The antenna height could have ±1cm tolerance and the turn table degree could have ±1° tolerance.
7. The measurement uncertainty is 4.30 dB.

80.0 dBµV/m



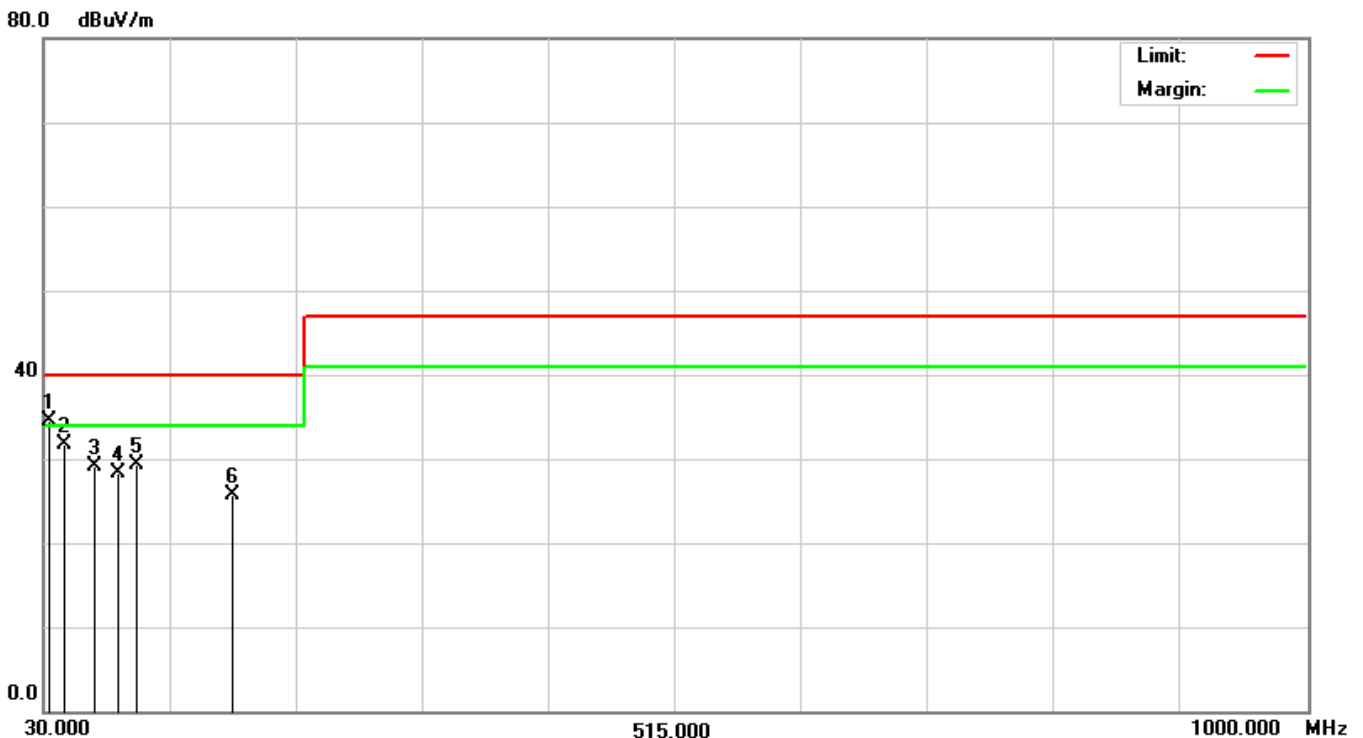
- Remark:
1. The Limit (The red line of the graph indicates the quasi -peak measurements).
 2. The Margin (The green line of the graph indicates the 6dB margin).

Date of Test	December 08, 2016	Temperature	26.8 deg/C
EUT	AC Adapter	Humidity	57 %RH
Working Cond.	Mode 33	Display Pattern	N/A
Antenna distance	10m at Vertical	Test Frequency Range	30-1000MHz
Test Power Supply	AC 230V/50Hz		

No.	Frequency MHz	Reading Level dB μ V	Factor dB	Measurement dB μ V/m	Limit dB μ V/m	Over Limit dB	Detector
1	★34.6635	44.88	-10.39	34.49	40.00	-5.51	QP
2	45.5449	40.85	-9.14	31.71	40.00	-8.29	QP
3	68.8622	40.88	-11.73	29.15	40.00	-10.85	QP
4	87.5160	43.53	-15.24	28.29	40.00	-11.71	QP
5	101.5064	43.08	-13.83	29.25	40.00	-10.75	QP
6	176.1218	35.75	-10.01	25.74	40.00	-14.26	QP

Remarks:

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement = Reading + Factor (Could have ± 0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = antenna factor + cable loss – amplifier gain.
5. “ ★ ” means that this data is the worse case measurement level.
6. The antenna height could have ± 1 cm tolerance and the turn table degree could have $\pm 1^\circ$ tolerance.
7. The measurement uncertainty is 4.30 dB.



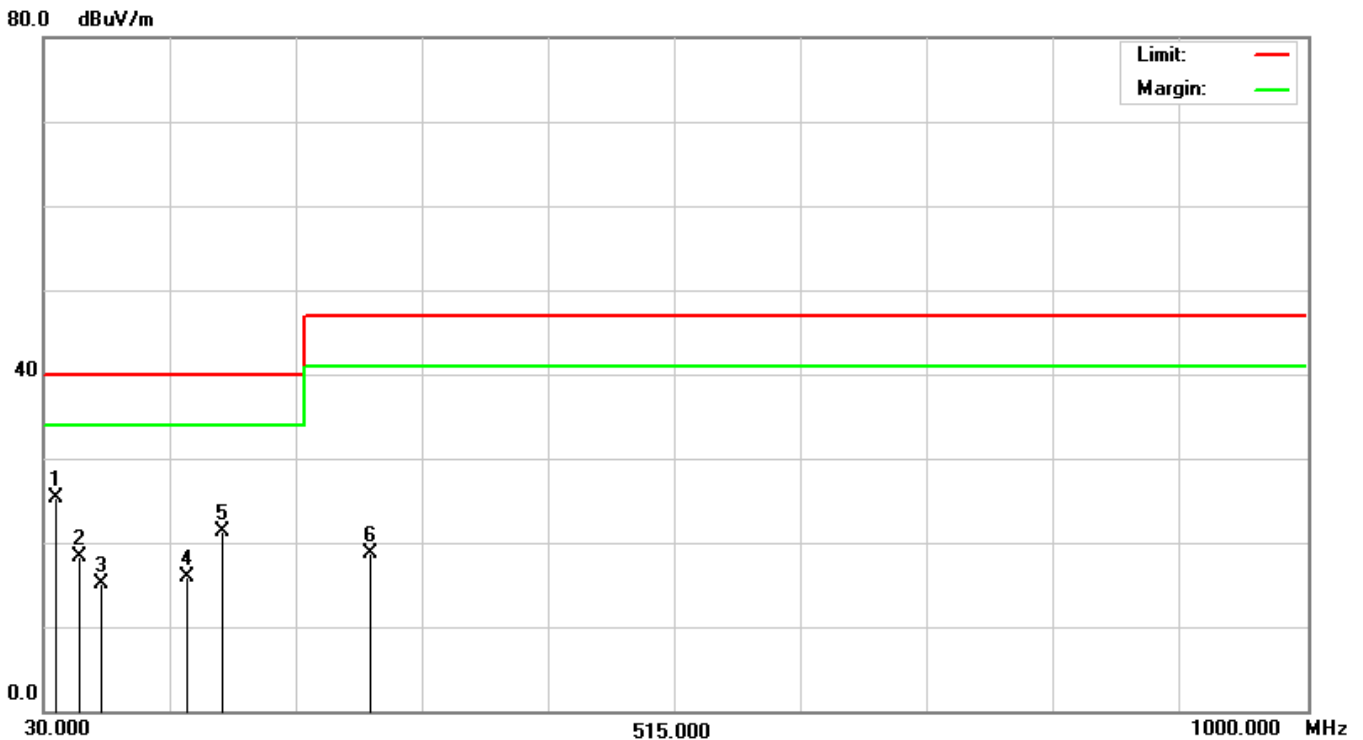
- Remark:
1. The Limit (The red line of the graph indicates the quasi -peak measurements).
 2. The Margin (The green line of the graph indicates the 6dB margin).

Date of Test	November 29, 2016	Temperature	26.8 deg/C
EUT	AC Adapter	Humidity	57 %RH
Working Cond.	Mode 47	Display Pattern	N/A
Antenna distance	10m at Horizontal	Test Frequency Range	30-1000MHz
Test Power Supply	AC 230V/50Hz		

No.	Frequency MHz	Reading Level dB μ V	Factor dB	Measurement dB μ V/m	Limit dB μ V/m	Over Limit dB	Detector
1	★38.7724	35.09	-9.73	25.36	40.00	-14.64	QP
2	57.9808	28.46	-10.06	18.40	40.00	-21.60	QP
3	75.0801	27.98	-12.81	15.17	40.00	-24.83	QP
4	140.3686	25.44	-9.44	16.00	40.00	-24.00	QP
5	168.3494	30.47	-9.19	21.28	40.00	-18.72	QP
6	281.8269	27.33	-8.53	18.80	47.00	-28.20	QP

Remarks:

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement = Reading + Factor (Could have ± 0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = antenna factor + cable loss – amplifier gain.
5. “ ★ ” means that this data is the worse case measurement level.
6. The antenna height could have ± 1 cm tolerance and the turn table degree could have $\pm 1^\circ$ tolerance.
7. The measurement uncertainty is 4.30 dB.



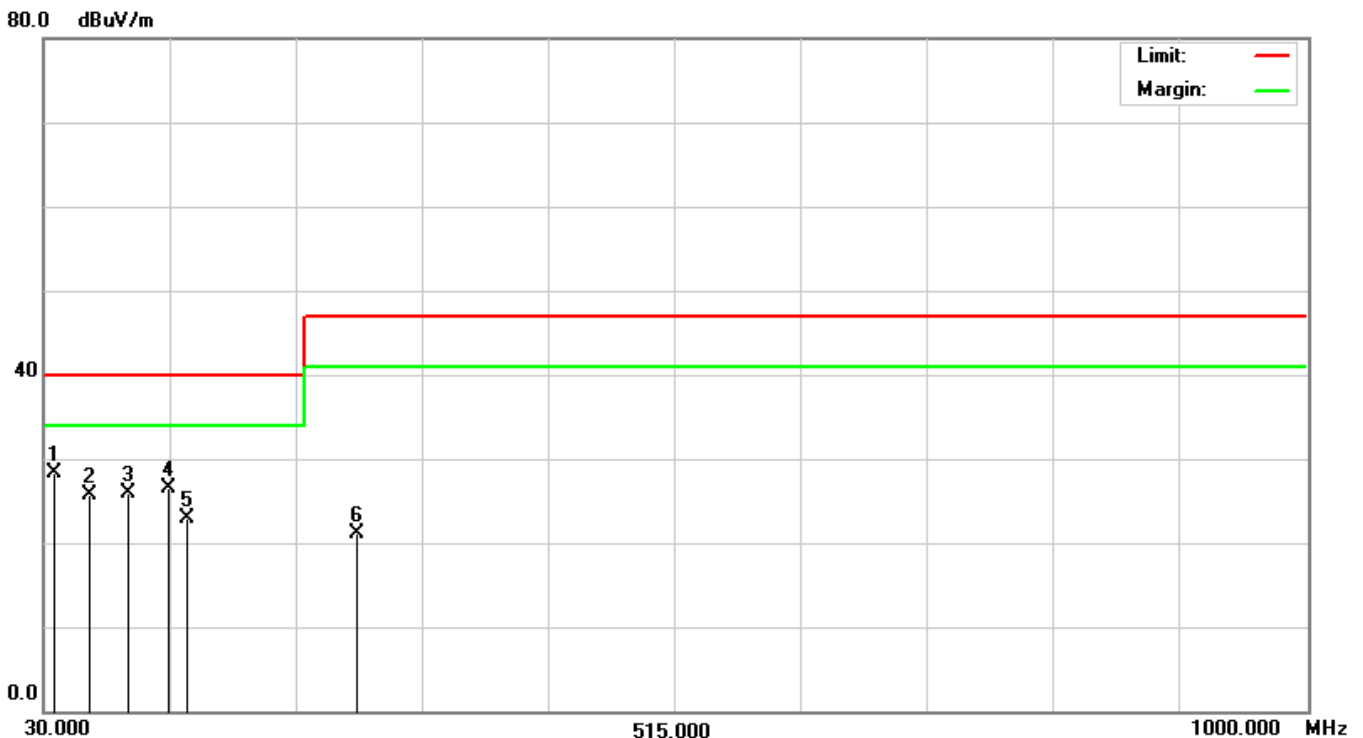
- Remark:
1. The Limit (The red line of the graph indicates the quasi -peak measurements).
 2. The Margin (The green line of the graph indicates the 6dB margin).

Date of Test	November 29, 2016	Temperature	26.8 deg/C
EUT	AC Adapter	Humidity	57 %RH
Working Cond.	Mode 47	Display Pattern	N/A
Antenna distance	10m at Vertical	Test Frequency Range	30-1000MHz
Test Power Supply	AC 230V/50Hz		

No.	Frequency MHz	Reading Level dBμV	Factor dB	Measurement dBμV/m	Limit dBμV/m	Over Limit dB	Detector
1	★37.7724	38.12	-9.90	28.22	40.00	-11.78	QP
2	65.7532	37.03	-11.23	25.80	40.00	-14.20	QP
3	95.2885	40.82	-14.87	25.95	40.00	-14.05	QP
4	126.3782	37.35	-10.75	26.60	40.00	-13.40	QP
5	140.3686	32.39	-9.44	22.95	40.00	-17.05	QP
6	270.9455	30.07	-9.00	21.07	47.00	-25.93	QP

Remarks:

1. All Readings below 1GHz are Quasi-Peak.
2. Measurement = Reading + Factor (Could have ±0.01 tolerance due to computer automatically round off calculation).
3. Over Limit (Margin Value)=Measurement level-Limit value.
4. Factor = antenna factor + cable loss – amplifier gain.
5. “ ★ ” means that this data is the worse case measurement level.
6. The antenna height could have ±1cm tolerance and the turn table degree could have ±1° tolerance.
7. The measurement uncertainty is 4.30 dB.



- Remark:
1. The Limit (The red line of the graph indicates the quasi -peak measurements).
 2. The Margin (The green line of the graph indicates the 6dB margin).

6. HARMONIC CURRENT EMISSIONS, VOLTAGE FLUCTUATIONS AND FLICKER MEASUREMENT

6.1 TEST EQUIPMENT

Item	Instrument	Manufacturer	Model	S/N or Version	Next Cal. Date
1	Signal Conditioning Unit	SCHAFFNER	CCN1000-1	72282	2016.04.16
2	AC Power Source	PACIFIC	345AMX/UPC32	270	N/A
3	Software	SCHAFFNER	SCHAFFNER	3.2.0.31	N/A

Note: 1. All equipments are calibrated and will be valid only for a period of 1 year.

2. The test was performed at GTK Shielded Room B7.

6.2 TEST METHOD

According to EN 61000-3-2:2014

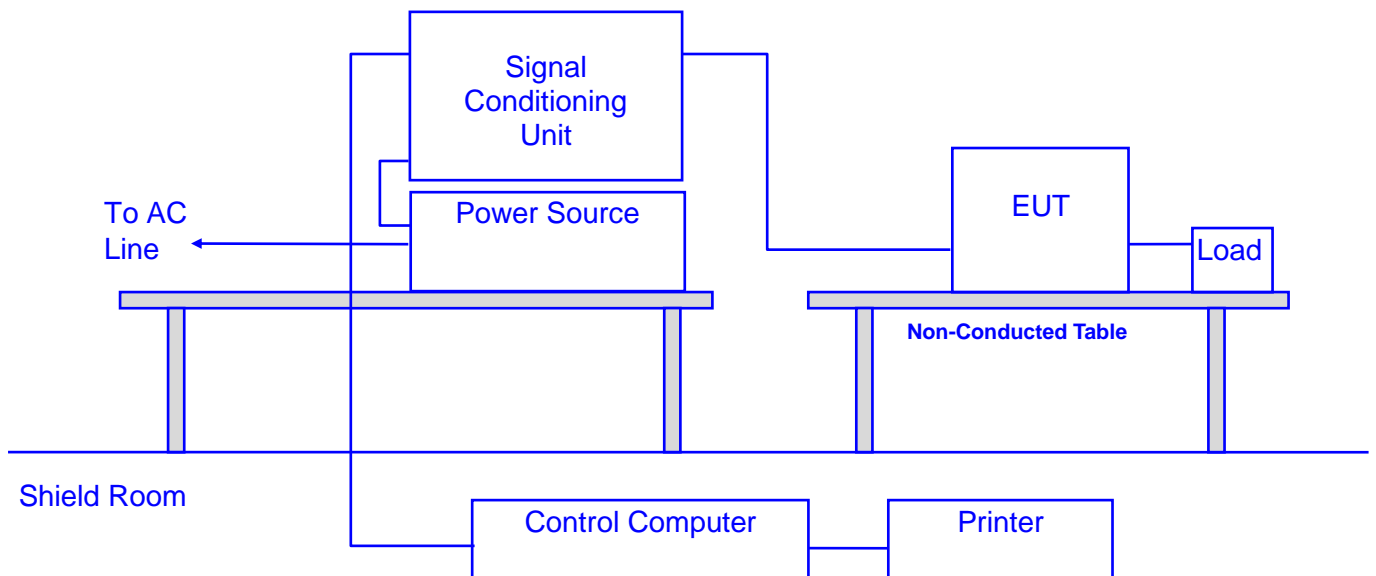
(Note: EUT power level is below 75 Watts and therefore has no defined limits)

EN 61000-3-3: 2013

6.3 BLOCK DIAGRAM OF TEST SETUP

Note: This is a representative setup diagram for Table-top EUT.

For Floor-standing EUT, the table will be removed with all others setup condition remain the same.



6.4 LIMITS OF FLICKER MEASUREMENT

Flicker:

Limits	
P_{st}	1.0
P_{lt}	0.65
$d(t)$	3.3%
Time(ms)>dt	500ms
d_c	3.3%
d_{max}	4%

6.5 OPERATING CONDITIONS OF THE EUT

1. Setup the EUT and Test Equipment as shown on 6.3.
2. Power on the EUT. Acting performance checking program to allow EUT executing its usual operation mode during test.

6.6 TEST PROCEDURE

6.6.1 Flicker:

The test voltage supplied the EUT shall be maintained within $230V \pm 2\%$.

The frequency shall be $50Hz \pm 0.5\%$.

The observation period T_p :

-for P_{st} $T_p=10min$.

-for P_{lt} $T_p=2h$.

6.7 TEST RESULT

1. The measurement of the flicker, which test at the extremes of EUT's supply range was investigated, and the test result are reported the following data pages. The measurement limits were met, and the EUT passed the test.
2. The Flicker measurement uncertainty is 0.02 %.

Flicker Test Summary per EN/IEC61000-3-3 (Run time)

Comply: EN 61000-3-3: 2013 - IEC 61000-4-15 Ed.2

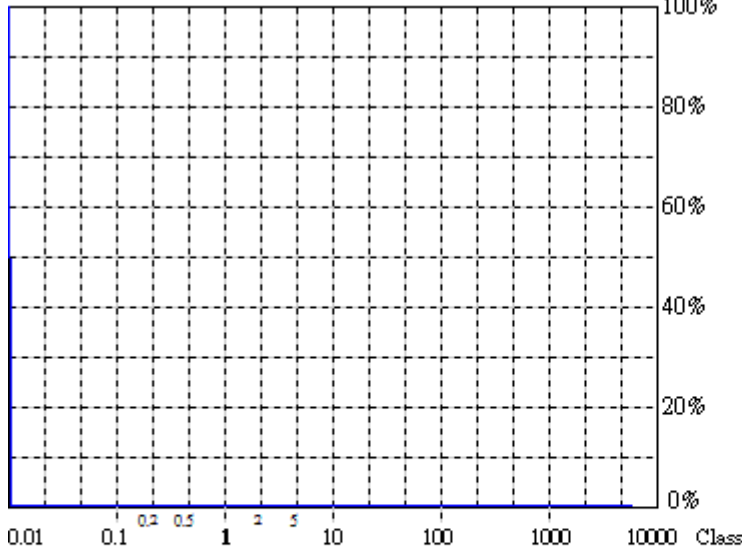
Operator Eric

Unit

Serial Number

Remarks Mode 33

Flickermeter 1000-4-15 for 230V/50Hz



Actual Flicker (Fli): 0.00
Short-term Flicker (Pst): 0.07
 Limit (Pst): 1.00
Long-term Flicker (Plt): 0.07
 Limit (Plt): 0.65
Maximum Relative Volt. Change (dmax): 0.00%
 Limit (dmax): 4.00%
Relative Steady-state Voltage Change (dc): 0.02%
 Limit (dc): 3.00%
Maximum Interval exceeding 3.30% (dt): 0.00ms
 Limit (dt>Lim): 500ms

Flicker Emission - IEC 61000-3-3 , EN 61000-3-3

2015/8/19 PM 05:09:4

Urms = 229.9 V P = 27.00 W
 Irms = 0.269 A pf = 0.437

Range: 50 A
 V-nom: 230 V
 TestTime: 10 min (100%)

Test completed, Result: PASSED

ATS024-W240

HAR-1000 EMC-Printer

Urms = 229.9V Freq = 49.987 Range: 50 A
 Irms = 0.269A Ipk = 1.294A cf = 4.818
 P = 27.00W S = 61.74VA pf = 0.437

Test - Time : 1 x 10min = 10min (100 %)

LIN (Line Impedance Network) : L: 0.24ohm +j0.15ohm N: 0.16ohm +j0.10ohm

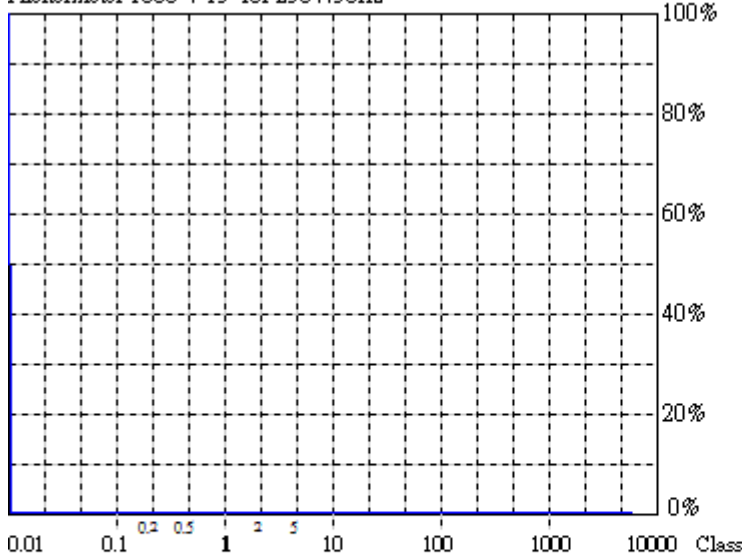
Limits : Plt : 0.65 Pst : 1.00
 dmax : 4.00 % dc : 3.00 %
 dtLim: 3.30 % dt>Lim: 500ms

Test completed, Result: PASSED

Flicker Test Summary per EN/IEC61000-3-3 (Run time)

Comply: EN 61000-3-3: 2013 - IEC 61000-4-15 Ed.2
 Operator Eric
 Unit
 Serial Number
 Remarks Mode 47

Flickermeter 1000-4-15 for 230V/50Hz



Actual Flicker (Fli): 0.00
Short-term Flicker (Pst): 0.07
 Limit (Pst): 1.00
Long-term Flicker (Plt): 0.07
 Limit (Plt): 0.65
Maximum Relative Volt. Change (dmax): 0.00%
 Limit (dmax): 4.00%
Relative Steady-state Voltage Change (dc): 0.01%
 Limit (dc): 3.00%
Maximum Interval exceeding 3.30% (dt): 0.00ms
 Limit (dt>Lim): 500ms

Flicker Emission - IEC 61000-3-3 , EN 61000-3-3

2015/8/19 PM 05:21:4

Urms = 229.9 V P = 21.40 W
 Irms = 0.228 A pf = 0.409

Range: 2 A
 V-nom: 230 V
 TestTime: 10 min (100%)

Test completed, Result: PASSED

ATS024-W240

HAR-1000 EMC-Printer

Urms = 229.9V Freq = 50.000 Range: 2 A
 Irms = 0.228A Ipk = 1.053A cf = 4.627
 P = 21.40W S = 52.31VA pf = 0.409

Test - Time : 1 x 10min = 10min (100 %)

LIN (Line Impedance Network) : L: 0.24ohm +j0.15ohm N: 0.16ohm +j0.10ohm

Limits : Plt : 0.65 Pst : 1.00
 dmax : 4.00 % dc : 3.00 %
 dtLim: 3.30 % dt>Lim: 500ms

Test completed, Result: PASSED

7. ESD IMMUNITY TEST

7.1 TEST EQUIPMENT

Item	Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
1	Electrostatic Discharge Simulator	NoiseKen	ESS-B3011	ESS1367086	2016.06.05

Note: 1. All equipments are calibrated and will be valid only for a period of 1 year.

2. The test was performed at GTK Shielded Room B4.

7.2 TEST METHOD

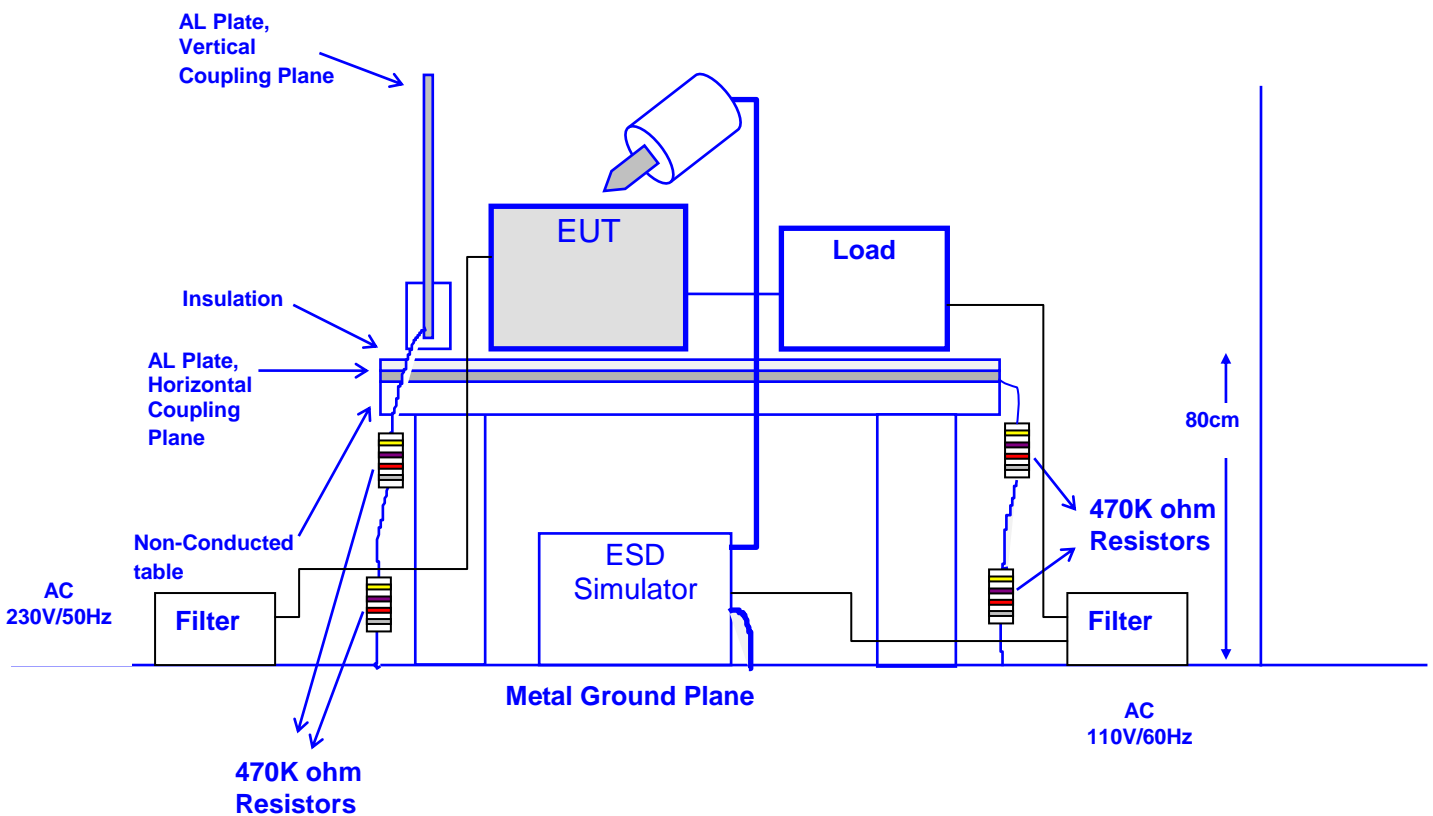
According to EN 55024: 2010+A1: 2015

IEC 61000-4-2:2008

7.3 BLOCK DIAGRAM OF TEST SETUP

Note: This is a representative setup diagram for Table-top EUT.

For Floor-standing EUT, the table will be removed with all others setup condition remain the same.



7.4 SEVERITY LEVELS

Required Performance Criteria : B
Level : $\pm 8\text{kV}$ and lower levels (Air Discharge)
 $\pm 4\text{kV}$ and lower levels (Contact Discharge)

7.5 OPERATING CONDITIONS OF THE EUT

1. Setup the EUT and Test Equipment as shown on 7.3.
2. Power on the EUT. Acting performance checking program to allow EUT executing its usual operation mode during test.

7.6 TEST PROCEDURE

Air Discharge: discharge at slots and apertures and insulating surfaces:

This test was performed on non-conductive surfaces in accordance with EN 61000-4-2:2009.

The selected test point shall be subjected to at least 10 positive & 10 negative discharges with >1 second interval.

Contact Discharge: discharge to the conductive surfaces and coupling planes:

The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points.

Each one test point shall be subjected to at least 25 positive & 25 negative discharges with >1 second interval.

Horizontal Coupling Plane (HCP) under the EUT & Vertical Coupling Plane (VCP) beside the 4 sides of the EUT, with the sharp discharge electrode touching the coupling plane.

HCP discharge:

ESD was applied to the earth reference plane on each accessible side of the EUT.

VCP discharge:

Vertical Coupling Plane was positioned at a distance of 0.1m from the EUT.

7.7 TEST RESULT

Date of Test	August 20, 2015	Temperature	26 °C
Test Mode	Mode 33	Humidity	40 %
Test Power Supply	AC 230V/50Hz	Atmospheric Pressure	998 hPa (mbar)

Item	Each Point of Discharge	Voltage	Required Criteria	Complied to Criteria (A, B, C)	Result
Air Direct Discharge	10	<input checked="" type="checkbox"/> +2kV <input checked="" type="checkbox"/> +4kV <input checked="" type="checkbox"/> +8kV	B	A	PASS
	10	<input checked="" type="checkbox"/> -2kV <input checked="" type="checkbox"/> -4kV <input checked="" type="checkbox"/> -8kV	B	A	PASS
Contact Direct Discharge	25	<input checked="" type="checkbox"/> -2kV <input checked="" type="checkbox"/> -4kV	B	A	PASS
Indirect Discharge (HCP)	25	<input checked="" type="checkbox"/> +2kV <input checked="" type="checkbox"/> +4kV	B	A	PASS
	25	<input checked="" type="checkbox"/> -2kV <input checked="" type="checkbox"/> -4kV	B	A	PASS
Indirect Discharge (VCP) (Front)	25	<input checked="" type="checkbox"/> +2kV <input checked="" type="checkbox"/> +4kV	B	A	PASS
	25	<input checked="" type="checkbox"/> -2kV <input checked="" type="checkbox"/> -4kV	B	A	PASS
Indirect Discharge (VCP) (Left)	25	<input checked="" type="checkbox"/> +2kV <input checked="" type="checkbox"/> +4kV	B	A	PASS
	25	<input checked="" type="checkbox"/> -2kV <input checked="" type="checkbox"/> -4kV	B	A	PASS
Indirect Discharge (VCP) (Back)	25	<input checked="" type="checkbox"/> +2kV <input checked="" type="checkbox"/> +4kV	B	A	PASS
	25	<input checked="" type="checkbox"/> -2kV <input checked="" type="checkbox"/> -4kV	B	A	PASS
Indirect Discharge (VCP) (Right)	25	<input checked="" type="checkbox"/> +2kV <input checked="" type="checkbox"/> +4kV	B	A	PASS
	25	<input checked="" type="checkbox"/> -2kV <input checked="" type="checkbox"/> -4kV	B	A	PASS

- Meet criteria A: Operate as intended during and after the test
 - Meet criteria B: Operate as intended after the test
 - Meet criteria C: Loss/Error of function
 - Additional Information
 - There was no observable degradation in performance.
 - No false alarms or other malfunctions were observed during or after the test.
- The acceptance criteria were met, and the EUT passed the test.
- ★The Green tag means the air discharge point . (see the report page 58)

Date of Test	August 20, 2015	Temperature	26 °C
Test Mode	Mode 47	Humidity	40 %
Test Power Supply	AC 230V/50Hz	Atmospheric Pressure	998 hPa (mbar)

Item	Each Point of Discharge	Voltage	Required Criteria	Complied to Criteria (A, B, C)	Result
Air Direct Discharge	10	<input checked="" type="checkbox"/> +2kV <input checked="" type="checkbox"/> +4kV <input checked="" type="checkbox"/> +8kV	B	A	PASS
	10	<input checked="" type="checkbox"/> -2kV <input checked="" type="checkbox"/> -4kV <input checked="" type="checkbox"/> -8kV	B	A	PASS
Contact Direct Discharge	25	<input checked="" type="checkbox"/> -2kV <input checked="" type="checkbox"/> -4kV	B	A	PASS
Indirect Discharge (HCP)	25	<input checked="" type="checkbox"/> +2kV <input checked="" type="checkbox"/> +4kV	B	A	PASS
	25	<input checked="" type="checkbox"/> -2kV <input checked="" type="checkbox"/> -4kV	B	A	PASS
Indirect Discharge (VCP) (Front)	25	<input checked="" type="checkbox"/> +2kV <input checked="" type="checkbox"/> +4kV	B	A	PASS
	25	<input checked="" type="checkbox"/> -2kV <input checked="" type="checkbox"/> -4kV	B	A	PASS
Indirect Discharge (VCP) (Left)	25	<input checked="" type="checkbox"/> +2kV <input checked="" type="checkbox"/> +4kV	B	A	PASS
	25	<input checked="" type="checkbox"/> -2kV <input checked="" type="checkbox"/> -4kV	B	A	PASS
Indirect Discharge (VCP) (Back)	25	<input checked="" type="checkbox"/> +2kV <input checked="" type="checkbox"/> +4kV	B	A	PASS
	25	<input checked="" type="checkbox"/> -2kV <input checked="" type="checkbox"/> -4kV	B	A	PASS
Indirect Discharge (VCP) (Right)	25	<input checked="" type="checkbox"/> +2kV <input checked="" type="checkbox"/> +4kV	B	A	PASS
	25	<input checked="" type="checkbox"/> -2kV <input checked="" type="checkbox"/> -4kV	B	A	PASS

- Meet criteria A: Operate as intended during and after the test
 - Meet criteria B: Operate as intended after the test
 - Meet criteria C: Loss/Error of function
 - Additional Information
 - There was no observable degradation in performance.
 - No false alarms or other malfunctions were observed during or after the test.
- The acceptance criteria were met, and the EUT passed the test.
- ★The Green tag means the air discharge point . (see the report page 58)

8. RF FIELD STRENGTH SUSCEPTIBILITY TEST

8.1 TEST EQUIPMENT

Item	Instrument	Manufacturer	Model	S/N or Version	Next Cal. Date
1	SIGNAL GENERATOR	RS	SMT03	838077/019	2016.04.07
2	Power Amplifier	A & R	250W1000A	313023	N/A
3	Ultra Breitband Antenna	R & S	ULTRALOG HL562	100282	N/A
4	CHAMBER	GTK	N/A	B3	2016.01.01
5	Software	AR	SW1006	1.13	N/A

Note: 1. All equipments are calibrated and will be valid only for a period of 1 year.

2. The test was performed at GTK Chamber B3.

8.2 TEST METHOD

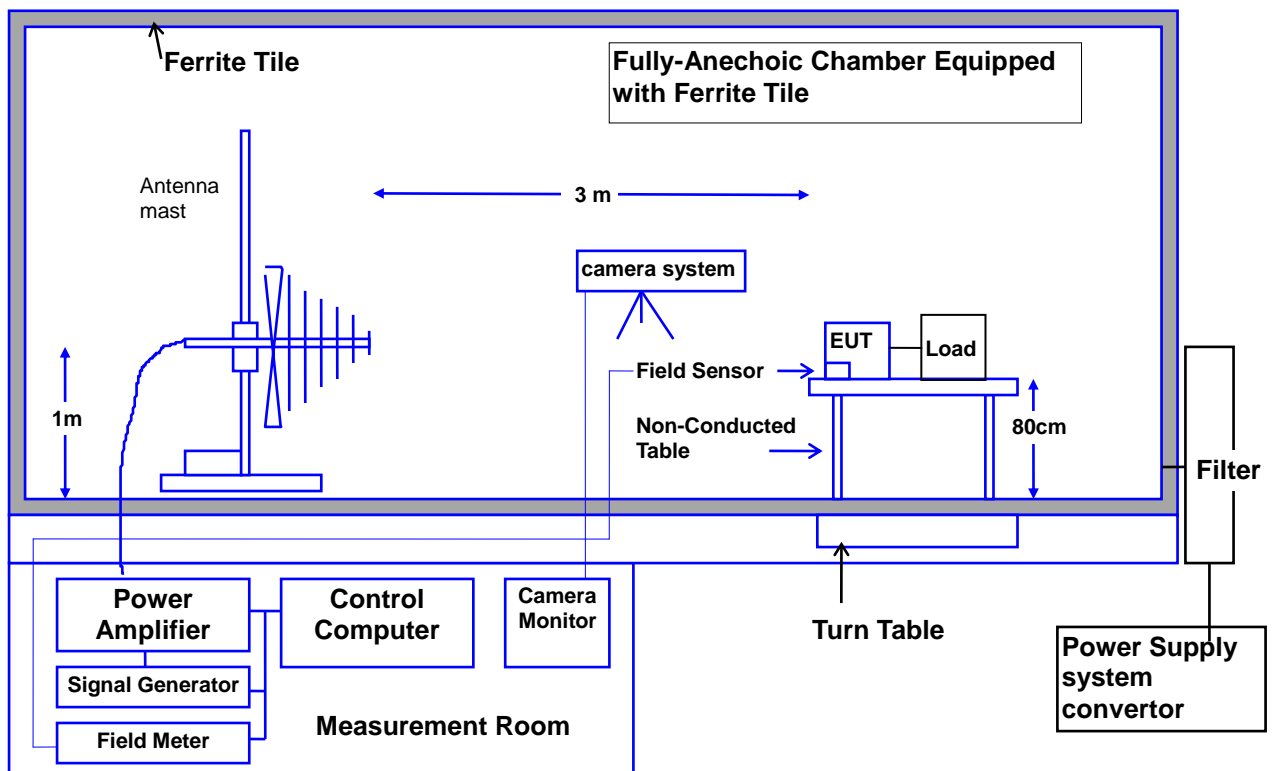
According to EN 55024: 2010+A1: 2015

IEC 61000-4-3:2006+A1:2007+A2:2010

8.3 BLOCK DIAGRAM OF TEST SETUP

Note: This is a representative setup diagram for Table-top EUT.

For Floor-standing EUT, the table will be removed with all others setup condition remain the same.



8.4 SEVERITY LEVELS

Required Performance Criteria : A
Level : 80~1000MHz(1kHz sinewave with 80% Amplitude
Modulation: 3V/m)

According to EN 55024: 2010+A1: 2015: 2010, an additional functional test for telecommunications terminal equipment shall be carried out at The following frequencies: 80, 120, 160, 230, 434, 460, 600, 863 and 900(+/- 1%)MHz.

8.5 OPERATING CONDITIONS OF THE EUT

1. Setup the EUT and Test Equipment as shown on 8.3.
2. Power on the EUT. Acting performance checking program to allow EUT executing its usual operation mode during test.

8.6 TEST PROCEDURE

The EUT and load were placed on a table, which was 0.8 meters high. The field sensor was also placed on the same table to monitor field strength from transmitting antenna. EUT was set 3 meters away from the transmitting antenna. The transmitting antenna was fixed at 1 meter above ground. Both horizontal and vertical polarizations of the antenna were used during testing. In order to judge the EUT performance, a CCD camera was used to monitor the EUT screen.

All the scanning conditions are as follows:

Condition of Test	Remarks
Field Strength	3V/m
Radiated Signal	80MHz-1000MHz (1kHz sinewave with 80% Amplitude modulation)
Dwell Time	3 Seconds
Frequency step size	1 % of the present frequency

8.7 TEST RESULT

Date of Test	August 20, 2015	Temperature	26 °C
Test Mode	Mode 33	Humidity	57 %
Test Power Supply	AC 230V/50Hz		

Freq. Range (MHz)	Position (Angle)	Polarity (H or V)	Field Strength (V/m)	Performance Criteria Complied to	Results
<input type="checkbox"/> 27-80 MHz	0	H / V	3	A	PASS
<input checked="" type="checkbox"/> 80-1000 MHz	90	H / V	3	A	PASS
<input type="checkbox"/> 900 ± 5 MHz	180	H / V	3	A	PASS
	270	H / V	3	A	PASS

- Meet criteria A: Operate as intended during and after the test
- Meet criteria B: Operate as intended after the test
- Meet criteria C: Loss/Error of function
- Additional Information
 - There was no observable degradation in performance.
 - No false alarms or other malfunctions were observed during or after the test. The acceptance criteria were met, and the EUT passed the test.

Date of Test	August 20, 2015	Temperature	26 °C
Test Mode	Mode 47	Humidity	57 %
Test Power Supply	AC 230V/50Hz		

Freq. Range (MHz)	Position (Angle)	Polarity (H or V)	Field Strength (V/m)	Performance Criteria Complied to	Results
<input type="checkbox"/> 27-80 MHz	0	H / V	3	A	PASS
<input checked="" type="checkbox"/> 80-1000 MHz	90	H / V	3	A	PASS
<input type="checkbox"/> 900 ± 5 MHz	180	H / V	3	A	PASS
	270	H / V	3	A	PASS

- Meet criteria A: Operate as intended during and after the test
- Meet criteria B: Operate as intended after the test
- Meet criteria C: Loss/Error of function
- Additional Information
 - There was no observable degradation in performance.
 - No false alarms or other malfunctions were observed during or after the test. The acceptance criteria were met, and the EUT passed the test.

9. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

9.1 TEST EQUIPMENT

Item	Instrument	Manufacturer	Model	S/N or Version	Next Cal. Date
1	Ultra Compact Simulator	EM TEST	UCS 500N5.1	P1310114655	2016.06.03
2	Software	EM TEST	ISMIEC	5.3.0	N/A

Note: 1. All equipments are calibrated and will be valid only for a period of 1 year.

2. The test was performed at GTK Shielded Room B6.

9.2 TEST METHOD

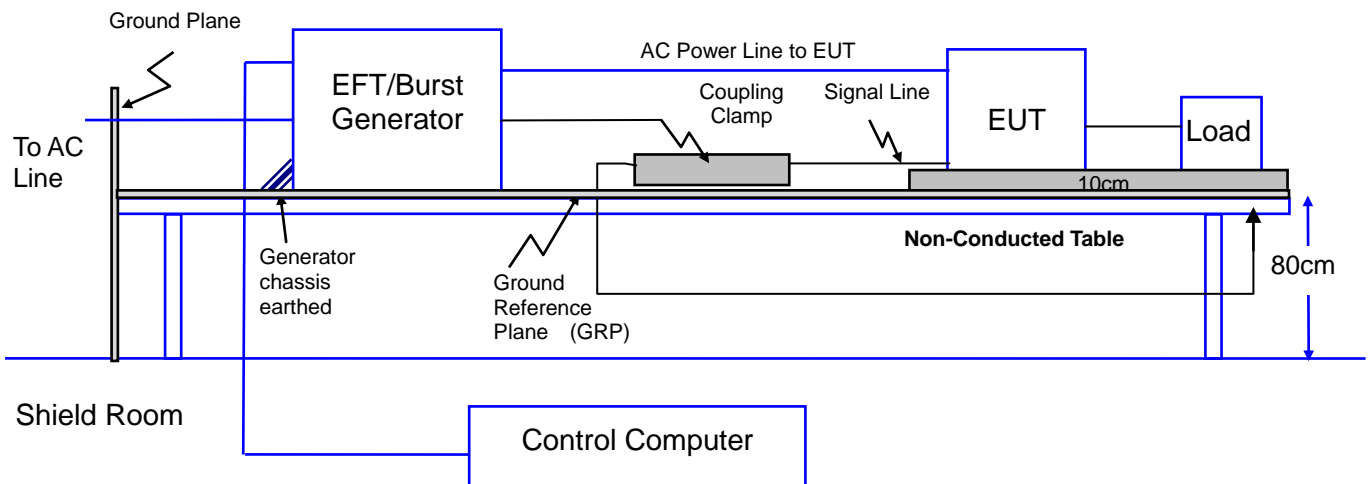
According to EN 55024: 2010+A1: 2015

IEC 61000-4-4:2012

9.3 BLOCK DIAGRAM OF TEST SETUP

Note: This is a representative setup diagram for Table-top EUT.

For Floor-standing EUT, the table will be removed with all others setup condition remain the same.



9.4 SEVERITY LEVELS

Required Performance Criteria : B
Level : $\pm 0.5\text{kV}$, $\pm 1.0\text{kV}$ for Power Lines

9.5 OPERATING CONDITIONS OF THE EUT

1. Setup the EUT and Test Equipment as shown on 9.3.
2. Power on the EUT. Acting performance checking program to allow EUT executing its usual operation mode during test.

The EUT and its load were placed on a table which was 0.8 meters above a metal ground plane measuring 2m by 2m and 0.65mm thick min, and projecting beyond the EUT by at least 0.1m on all sides. More than 0.5 meters separated the EUT from the walls of the shielded room.

Prior to the start of the test, a functional test was performed on the EUT to ensure proper operation. The EUT was also monitored during the test for any degradation of performance.

For AC Power lines test:

The EUT is connected to the power mains through a coupling/decoupling network that directly injected the transient energy. Bursts of pulse trains were injected onto the power line, in both positive and negative polarities. The test level was 0.5kV & 1.0kV. The Line, Neutral, and protective earth conductors were impressed with burst noise for one minute.

9.6 TEST RESULT

Date of Test	August 20, 2015	Temperature	26 °C
Test Mode	Mode 33	Humidity	57 %
Test Power Supply	AC 230V/50Hz		

Inject Place: Power Supply Line							
Inject Line	Polarity	Voltage kV	Inject time (minute)	Inject Method	Required Criteria	Complied to Criteria	Result
L+N+PE	+	<input checked="" type="checkbox"/> 0.5	1	DIRECT	B	A	PASS
		<input checked="" type="checkbox"/> 1.0	1	DIRECT	B	A	PASS
L+N+PE	-	<input checked="" type="checkbox"/> 0.5	1	DIRECT	B	A	PASS
		<input checked="" type="checkbox"/> 1.0	1	DIRECT	B	A	PASS

- Meet criteria A: Operate as intended during and after the test
- Meet criteria B: Operate as intended after the test
- Meet criteria C: Loss/Error of function
- Additional Information
 - There was no observable degradation in performance.
 - No false alarms or other malfunctions were observed during or after the test. The acceptance criteria were met, and the EUT passed the test.

Date of Test	August 20, 2015	Temperature	26 °C
Test Mode	Mode 47	Humidity	57 %
Test Power Supply	AC 230V/50Hz		

Inject Place: Power Supply Line							
Inject Line	Polarity	Voltage kV	Inject time (minute)	Inject Method	Required Criteria	Complied to Criteria	Result
L+N+PE	+	<input checked="" type="checkbox"/> 0.5	1	DIRECT	B	A	PASS
		<input checked="" type="checkbox"/> 1.0	1	DIRECT	B	A	PASS
L+N+PE	-	<input checked="" type="checkbox"/> 0.5	1	DIRECT	B	A	PASS
		<input checked="" type="checkbox"/> 1.0	1	DIRECT	B	A	PASS

- Meet criteria A: Operate as intended during and after the test
- Meet criteria B: Operate as intended after the test
- Meet criteria C: Loss/Error of function
- Additional Information
 - There was no observable degradation in performance.
 - No false alarms or other malfunctions were observed during or after the test. The acceptance criteria were met, and the EUT passed the test.

10. SURGE IMMUNITY TEST

10.1 TEST EQUIPMENT

Item	Instrument	Manufacturer	Model	S/N or Version	Next Cal. Date
1	Ultra Compact Simulator	EM TEST	UCS 500N5.1	P1310114655	2016.06.03
2	Software	EM TEST	ISMIEC	5.3.0	N/A

Note: 1. All equipments are calibrated and will be valid only for a period of 1 year.

2. The test was performed at GTK Shielded Room B6.

10.2 TEST METHOD

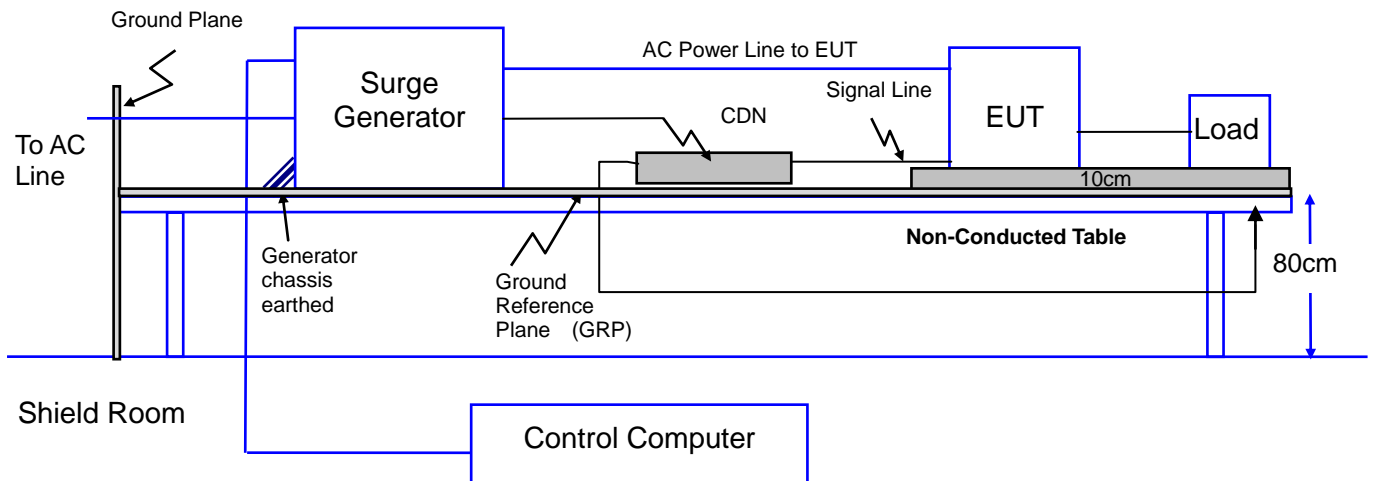
According to EN 55024: 2010+A1: 2015

IEC 61000-4-5: 2014

10.3 BLOCK DIAGRAM OF TEST SETUP

Note: This is a representative setup diagram for Table-top EUT.

For Floor-standing EUT, the table will be removed with all others setup condition remain the same.



10.4 SEVERITY LEVELS

Open Circuit Output Test Voltage +/- 10%	
Level	On power supply lines
1	0.5kV
2	1kV
3	2kV
4	4kV
X	Special

10.5 OPERATING CONDITIONS OF THE EUT

1. Setup the EUT and Test Equipment as shown on 10.3.
2. Power on the EUT. Acting performance checking program to allow EUT executing its usual operation mode during test.

10.6 TEST PROCEDURE

A "combination wave" as specified in IEC 61000-4-5: 2014 was applied to the EUT. The amplitude was gradually increased using control software. Surges were initiated line synced. One surge per polarity and voltage level was applied in common and differential mode to the EUT at 0, 90, 180, 270, and 0 degree phase angles. The surges were applied at a rate of 1 surge per minute. The EUT was monitored for any degradation of performance. The AC test was conducted for differential mode at 0.5kV & 1.0kV and common mode at 0.5kV & 1.0kV & 2.0kV. All tests were run in both the positive and negative polarity for differential and common modes.

10.7 TEST RESULT

Date of Test	August 20, 2015	Temperature	26 °C
Test Mode	Mode 33	Humidity	57 %
Test Power Supply	AC 230V/50Hz		

AC Power line test								
Inject Line	Voltage kV	Repetition Rate (minute)	Phase Angle	Surge applied Method	Number of pulse	Required Criteria	Complied to Criteria	Result
L-N (Differential mode)	☒+0.5 ☒+1.0	1	0°	CDN	5	B	A	PASS
		1	90°	CDN	5	B	A	PASS
		1	180°	CDN	5	B	A	PASS
		1	270°	CDN	5	B	A	PASS
	☒-0.5 ☒-1.0	1	0°	CDN	5	B	A	PASS
		1	90°	CDN	5	B	A	PASS
		1	180°	CDN	5	B	A	PASS
		1	270°	CDN	5	B	A	PASS
L-PE (Common mode)	☒+0.5 ☒+1.0 ☒+2.0	1	0°	CDN	5	B	A	PASS
		1	90°	CDN	5	B	A	PASS
		1	180°	CDN	5	B	A	PASS
		1	270°	CDN	5	B	A	PASS
	☒-0.5 ☒-1.0 ☒-2.0	1	0°	CDN	5	B	A	PASS
		1	90°	CDN	5	B	A	PASS
		1	180°	CDN	5	B	A	PASS
		1	270°	CDN	5	B	A	PASS
N-PE (Common mode)	☒+0.5 ☒+1.0 ☒+2.0	1	0°	CDN	5	B	A	PASS
		1	90°	CDN	5	B	A	PASS
		1	180°	CDN	5	B	A	PASS
		1	270°	CDN	5	B	A	PASS
	☒-0.5 ☒-1.0 ☒-2.0	1	0°	CDN	5	B	A	PASS
		1	90°	CDN	5	B	A	PASS
		1	180°	CDN	5	B	A	PASS
		1	270°	CDN	5	B	A	PASS

- Meet criteria A: Operate as intended during and after the test
- Meet criteria B: Operate as intended after the test
- Meet criteria C: Loss/Error of function
- Additional Information
 - There was no observable degradation in performance.
 - No false alarms or other malfunctions were observed during or after the test. The acceptance criteria were met, and the EUT passed the test.

Date of Test	August 20, 2015	Temperature	26 °C
Test Mode	Mode 47	Humidity	57 %
Test Power Supply	AC 230V/50Hz		

AC Power line test								
Inject Line	Voltage kV	Repetition Rate (minute)	Phase Angle	Surge applied Method	Number of pulse	Required Criteria	Complied to Criteria	Result
L-N (Differential mode)	☒+0.5 ☒+1.0	1	0°	CDN	5	B	A	PASS
		1	90°	CDN	5	B	A	PASS
		1	180°	CDN	5	B	A	PASS
		1	270°	CDN	5	B	A	PASS
	☒-0.5 ☒-1.0	1	0°	CDN	5	B	A	PASS
		1	90°	CDN	5	B	A	PASS
		1	180°	CDN	5	B	A	PASS
		1	270°	CDN	5	B	A	PASS
L-PE (Common mode)	☒+0.5 ☒+1.0 ☒+2.0	1	0°	CDN	5	B	A	PASS
		1	90°	CDN	5	B	A	PASS
		1	180°	CDN	5	B	A	PASS
		1	270°	CDN	5	B	A	PASS
	☒-0.5 ☒-1.0 ☒-2.0	1	0°	CDN	5	B	A	PASS
		1	90°	CDN	5	B	A	PASS
		1	180°	CDN	5	B	A	PASS
		1	270°	CDN	5	B	A	PASS
N-PE (Common mode)	☒+0.5 ☒+1.0 ☒+2.0	1	0°	CDN	5	B	A	PASS
		1	90°	CDN	5	B	A	PASS
		1	180°	CDN	5	B	A	PASS
		1	270°	CDN	5	B	A	PASS
	☒-0.5 ☒-1.0 ☒-2.0	1	0°	CDN	5	B	A	PASS
		1	90°	CDN	5	B	A	PASS
		1	180°	CDN	5	B	A	PASS
		1	270°	CDN	5	B	A	PASS

- Meet criteria A: Operate as intended during and after the test
- Meet criteria B: Operate as intended after the test
- Meet criteria C: Loss/Error of function
- Additional Information
 - There was no observable degradation in performance.
 - No false alarms or other malfunctions were observed during or after the test. The acceptance criteria were met, and the EUT passed the test.

11. CONDUCTED DISTURBANCE SUSCEPTIBILITY TEST

11.1 TEST EQUIPMENT

Item	Instrument	Manufacturer	Model	S/N or Version	Next Cal. Date
1	Continuous Wave Simulator	EM TEST	CWS 500 A	1099-01	2016.03.05
2	Dual Directional Couplor	AR	DC-2600	20193	N/A
3	VOLTMETER	BOONTON	9200C	361501AA	2015.11.04
4	Injection Clamp	Liithi	EM101	35260	2016.04.13
5	ATTENUATOR	BNOS	AT50-6-250	521926	N/A
6	CDN(EUT)	LUTHI	CDN L-801 M2/M3	2627	2016.06.04
7	CDN (AE)	Knorr Bremse	M3	12184	N/A
8	SHIELDING ROOM	GTK	N/A	B6	2016.06.04
9	Software	EM TEST	ICD	2.20	N/A

Note: 1. All equipments are calibrated and will be valid only for a period of 1 year.

2. The test was performed at GTK Shielded Room B6.

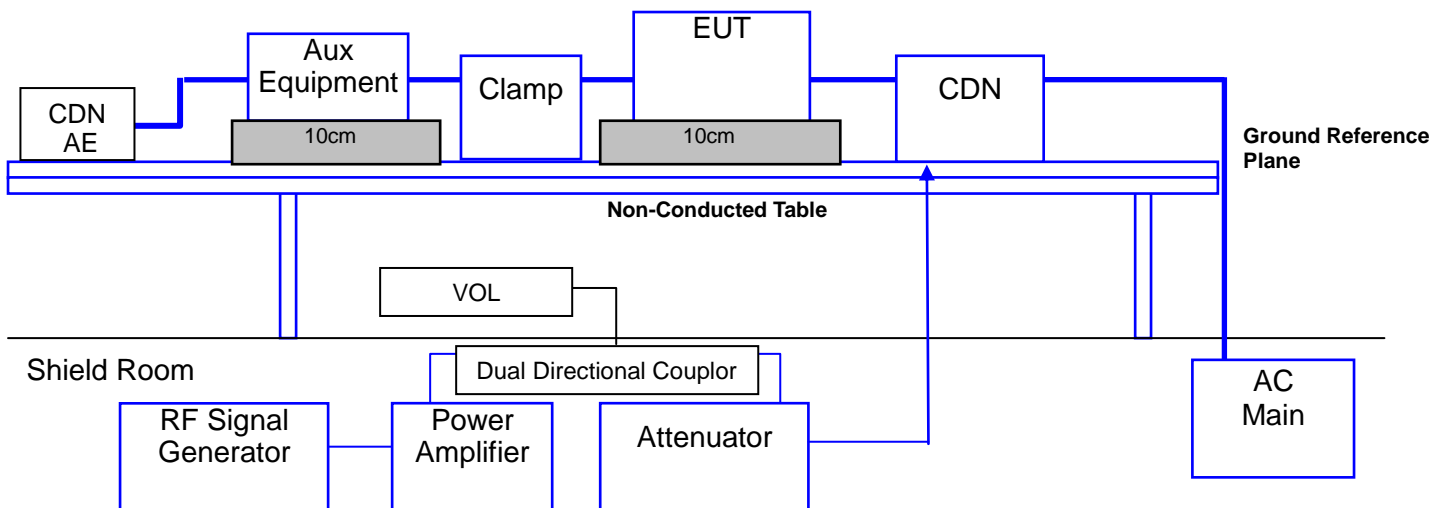
11.2 TEST METHOD

According to EN 55024: 2010+A1: 2015
 IEC 61000-4-6:2013

11.3 BLOCK DIAGRAM OF TEST SETUP

Note: This is a representative setup diagram for Table-top EUT.

For Floor-standing EUT, the table will be removed with all others setup condition remain the same.



11.4 SEVERITY LEVELS

Test specification

Required Performance Criteria : A

Level : 1kHz sine wave with 80% Amplitude Modulation: 3V

Frequency range : 0.15-80MHz

According to EN 55024: 2010+A1: 2015:2010, an additional functional test for telecommunications terminal equipment shall be carried out at the following frequencies: 0.2, 1., 7.1, 13.56, 21.0, 27.12 and 40.68MHz. (+/- 1%)

11.5 OPERATING CONDITIONS OF THE EUT

1. Setup the EUT and Test Equipment as shown on 11.3.
2. Power on the EUT. Acting performance checking program to allow EUT executing its usual operation mode during test.

11.6 TEST PROCEDURE

The EUT and load were placed on a table, which was 0.1 meters high from a Ground reference plane. Prior to the start of the test, a functional test was performed on the EUT to ensure proper operation. The EUT was also monitored during the test for any degradation of performance. Also, prior to the start of the test, clamp injection (RF current probe) calibration measurements were performed as described in IEC 61000-4-6:2013.

For AC Power line test & For Signal Lines and Control Lines test:

The disturbance signal is through a coupling and decoupling networks (CDN) or EM-clamp device couples to the signal and control lines of the EUT.

After completion of the test, a functional test was performed on the EUT to ensure proper operation.

All the scanning conditions are as follows:

Condition of Test	Remarks
Field Strength	3V
Radiated Signal	0.15-80MHz (1kHz sinewave with 80% Amplitude modulation)
Dwell Time	3 Seconds
Frequency step size	1% of the present frequency

11.7 TEST RESULT

Date of Test	August 20, 2015	Temperature	25 °C
Test Mode	Mode 33	Humidity	59 %
Test Power Supply	AC 230V/50Hz		

Frequency Range (MHz)	Inject Line	Field Strength	Inject Method	Required Criteria	Performance Criteria Complied To	Result
0.15~80	AC Line	3V	CDN	A	A	PASS

- Meet criteria A: Operate as intended during and after the test
- Meet criteria B: Operate as intended after the test
- Meet criteria C: Loss/Error of function
- Additional Information
 - There was no observable degradation in performance.
 - No false alarms or other malfunctions were observed during or after the test. The acceptance criteria were met, and the EUT passed the test.

Date of Test	August 20, 2015	Temperature	25 °C
Test Mode	Mode 47	Humidity	59 %
Test Power Supply	AC 230V/50Hz		

Frequency Range (MHz)	Inject Line	Field Strength	Inject Method	Required Criteria	Performance Criteria Complied To	Result
0.15~80	AC Line	3V	CDN	A	A	PASS

- Meet criteria A: Operate as intended during and after the test
- Meet criteria B: Operate as intended after the test
- Meet criteria C: Loss/Error of function
- Additional Information
 - There was no observable degradation in performance.
 - No false alarms or other malfunctions were observed during or after the test. The acceptance criteria were met, and the EUT passed the test.

12. MAGNETIC FIELD IMMUNITY MEASUREMENT

12.1 TEST EQUIPMENT

Item	Instrument	Manufacturer	Model	S/N or Version	Next Cal. Date
1	ULTRA COMPACT GENERATOR	EM TEST	UCS 500-M	0500-15	2016.04.15
2	MAGNETIC FIELD ANTENNA	EM TEST	MS100	D3730	2016.06.04
3	Software	EM TEST	ISMIEC	5.3.0	N/A

Note: 1. All equipments are calibrated and will be valid only for a period of 1 year.

2. The test was performed at GTK Shielded Room B6.

12.2 TEST METHOD

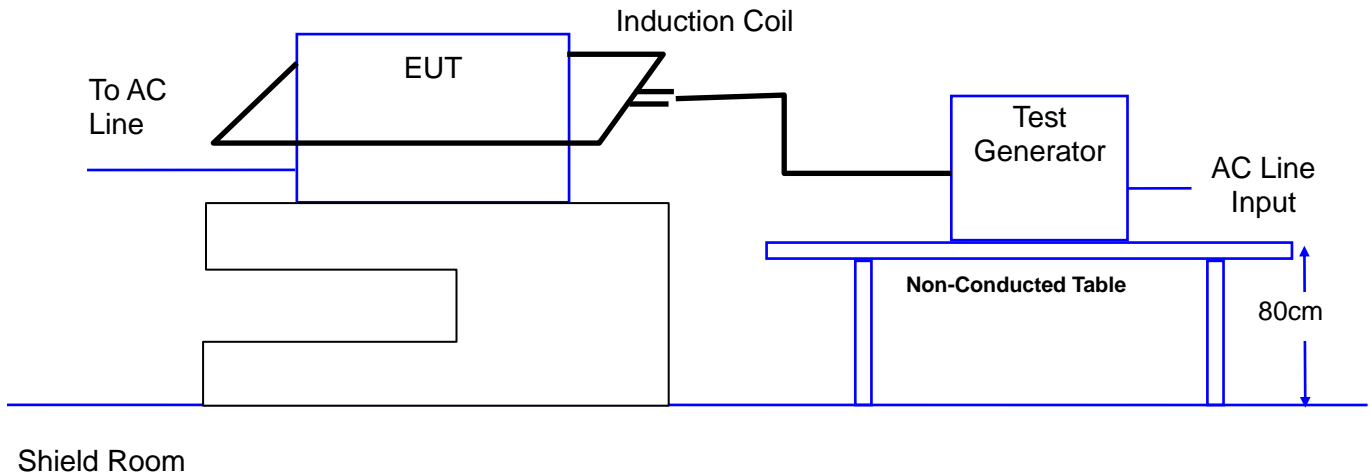
According to EN 55024: 2010+A1: 2015

IEC 61000-4-8:2009

12.3 BLOCK DIAGRAM OF TEST SETUP

Note: This is a representative setup diagram for Table-top EUT.

For Floor-standing EUT, the table will be removed with all others setup condition remain the same.



12.4 SEVERITY LEVELS

Test level for continuous field		Test levels for short duration: 1to3s	
Level	Magnetic Field Strength A/m	Level	Magnetic Field Strength A/m
1	1	1	n.a.
2	3	2	n.a.
3	10	3	n.a.
4	30	4	300
5	100	5	1000
X	Special	X	Special
"X" is an open level.		"X" is an open level. n.a.= not application	
Test level	Required Performance Criteria	Test Duration	
1	A	Continued Field	

12.5 EUT OPERATION CONDITION

1. Setup the EUT and Test Equipment as shown on 12.3.
2. Power on. Active performance checking program to allow EUT execute its usual operation mode during test.

12.6 TEST PROCEDURE

The EUT and its load are placed on a table which is 0.8 meter above a metal ground plane measured at least 1m*1m min. The test magnetic Field shall be applied by the immersion method to the EUT, previously set-up as specified in 12.3. And 90 shall rotate the induction coil° in order to expose the EUT to the test field with different orientation.

12.7 TEST RESULT

Date of Test	August 20, 2015	Temperature	26 °C
Test Mode	Mode 33	Humidity	60 %
Test Power Supply	AC 230V/50Hz		

Induction Coil Orientation	Testing Duration	Magnetic Field Strength A/m	Performance Criteria Complied To	Test Result
X	60 sec.	1 A/m, 50Hz	A	PASS
Y	60 sec.	1 A/m, 50Hz	A	PASS
Z	60 sec.	1 A/m, 50Hz	A	PASS

- Meet criteria A: Operate as intended during and after the test
 - Meet criteria B: Operate as intended after the test
 - Meet criteria C: Loss/Error of function
 - Additional Information
 - There was no observable degradation in performance.
 - No false alarms or other malfunctions were observed during or after the test.
- The acceptance criteria were met, and the EUT passed the test.

Date of Test	August 20, 2015	Temperature	26 °C
Test Mode	Mode 47	Humidity	60 %
Test Power Supply	AC 230V/50Hz		

Induction Coil Orientation	Testing Duration	Magnetic Field Strength A/m	Performance Criteria Complied To	Test Result
X	60 sec.	1 A/m, 50Hz	A	PASS
Y	60 sec.	1 A/m, 50Hz	A	PASS
Z	60 sec.	1 A/m, 50Hz	A	PASS

- Meet criteria A: Operate as intended during and after the test
 - Meet criteria B: Operate as intended after the test
 - Meet criteria C: Loss/Error of function
 - Additional Information
 - There was no observable degradation in performance.
 - No false alarms or other malfunctions were observed during or after the test.
- The acceptance criteria were met, and the EUT passed the test.

13. VOLTAGE DIPS AND SHORT INTERRUPTIONS TEST

13.1 TEST EQUIPMENT

Item	Instrument	Manufacturer	Model	S/N or Version	Next Cal. Date
1	Ultra Compact Simulator	EM TEST	UCS 500N5.1	P1310114655	2016.06.03

Note: 1. All equipments are calibrated and will be valid only for a period of 1 year.

2. The test was performed at GTK Shielded Room B6.

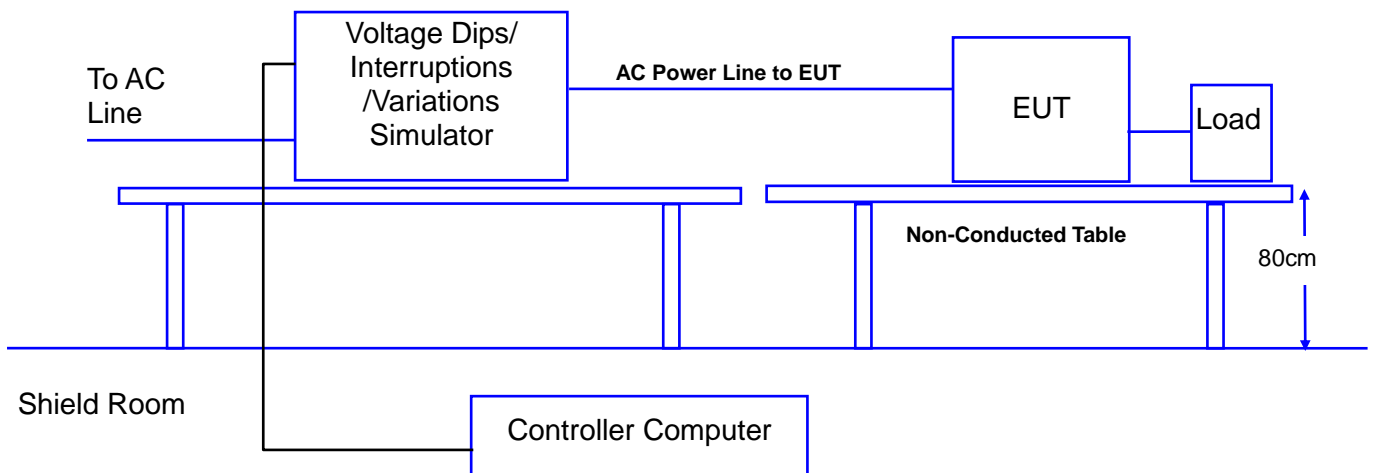
13.2 TEST METHOD

According to EN 55024: 2010+A1: 2015
 IEC 61000-4-11: 2004

13.3 BLOCK DIAGRAM OF TEST SETUP

Note: This is a representative setup diagram for Table-top EUT.

For Floor-standing EUT, the table will be removed with all others setup condition remain the same.



13.4 SEVERITY LEVELS

For 50Hz

Voltage Dips and Interruption Reduction(%)	Test Duration	Required Performance Criteria
>95	10 ms	B
30	500 ms	C
>95	5s	C

For 60Hz

Voltage Dips and Interruption Reduction(%)	Test Duration	Required Performance Criteria
>95	8.33 ms	B
30	500 ms	C
>95	5s	C

13.5 OPERATING CONDITIONS OF THE EUT

1. Setup the EUT and Test Equipment as shown on 13.3.
2. Power on the EUT. Acting performance checking program to allow EUT executing its usual operation mode during test.

13.6 TEST PROCEDURE

The EUT and its load were placed on a table which was 0.8 meters height.

For AC Power line test (For 50Hz):

The EUT was connected to the power mains through a coupling device that directly couples to the Voltage Dips and Interruption Generator.

Voltage dips of >95% for 10ms and 30% for 500ms were applied to the EUT three times with 10 sec intervals between dips. A power interruption of >95% for 5000ms (5 sec) was applied to the EUT three times with 60-second intervals between interruptions.

For AC Power line test (For 60Hz):

The EUT was connected to the power mains through a coupling device that directly couples to the Voltage Dips and Interruption Generator.

Voltage dips of >95% for 8.33ms and 30% for 500ms were applied to the EUT three times with 10 sec intervals between dips. A power interruption of >95% for 5000ms (5 sec) was applied to the EUT three times with 60-second intervals between interruptions.

13.7 TEST RESULT

Date of Test	August 20, 2015	Temperature	26 °C
Test Mode	Mode 33	Humidity	52 %
Test Power Supply	AC 100V/50Hz		

Item	Phase Angle	Reduction (%)	Test Duration (ms)	Required Criteria	Complied to Criteria	Result
Voltage Short Interruptions	<input checked="" type="checkbox"/> 0	>95	5000	C	B	PASS
	<input checked="" type="checkbox"/> 0	>95	10	B	A	PASS
Voltage Dips	<input checked="" type="checkbox"/> 0	30	500	C	A	PASS

- Meet criteria A: Operate as intended during and after the test
- Meet criteria B: Operate as intended after the test
- Meet criteria C: Loss of function, provided the function is self-recoverable, or can be restored by the operation of the controls
- Additional Information
 - There was no observable degradation in performance.
 - No false alarms or other malfunctions were observed during or after the test. The acceptance criteria were met, and the EUT passed the test.

Date of Test	August 20, 2015	Temperature	26 °C
Test Mode	Mode 33	Humidity	52 %
Test Power Supply	AC 100V/60Hz		

Item	Phase Angle	Reduction (%)	Test Duration (ms)	Required Criteria	Complied to Criteria	Result
Voltage Short Interruptions	<input checked="" type="checkbox"/> 0	>95	5000	C	B	PASS
	<input checked="" type="checkbox"/> 0	>95	8.33	B	A	PASS
Voltage Dips	<input checked="" type="checkbox"/> 0	30	500	C	A	PASS

- Meet criteria A: Operate as intended during and after the test
- Meet criteria B: Operate as intended after the test
- Meet criteria C: Loss of function, provided the function is self-recoverable, or can be restored by the operation of the controls
- Additional Information
 - There was no observable degradation in performance.
 - No false alarms or other malfunctions were observed during or after the test. The acceptance criteria were met, and the EUT passed the test.

Date of Test	August 20, 2015	Temperature	26 °C
Test Mode	Mode 33	Humidity	52 %
Test Power Supply	AC 240V/50Hz		

Item	Phase Angle	Reduction (%)	Test Duration (ms)	Required Criteria	Complied to Criteria	Result
Voltage Short Interruptions	<input checked="" type="checkbox"/> 0	>95	5000	C	B	PASS
Voltage Dips	<input checked="" type="checkbox"/> 0	>95	10	B	A	PASS
	<input checked="" type="checkbox"/> 0	30	500	C	A	PASS

- Meet criteria A: Operate as intended during and after the test
- Meet criteria B: Operate as intended after the test
- Meet criteria C: Loss of function, provided the function is self-recoverable, or can be restored by the operation of the controls
- Additional Information
 - There was no observable degradation in performance.
 - No false alarms or other malfunctions were observed during or after the test. The acceptance criteria were met, and the EUT passed the test.

Date of Test	August 20, 2015	Temperature	26 °C
Test Mode	Mode 33	Humidity	52 %
Test Power Supply	AC 240V/60Hz		

Item	Phase Angle	Reduction (%)	Test Duration (ms)	Required Criteria	Complied to Criteria	Result
Voltage Short Interruptions	<input checked="" type="checkbox"/> 0	>95	5000	C	B	PASS
Voltage Dips	<input checked="" type="checkbox"/> 0	>95	8.33	B	A	PASS
	<input checked="" type="checkbox"/> 0	30	500	C	A	PASS

- Meet criteria A: Operate as intended during and after the test
- Meet criteria B: Operate as intended after the test
- Meet criteria C: Loss of function, provided the function is self-recoverable, or can be restored by the operation of the controls
- Additional Information
 - There was no observable degradation in performance.
 - No false alarms or other malfunctions were observed during or after the test. The acceptance criteria were met, and the EUT passed the test.

Date of Test	August 20, 2015	Temperature	26 °C
Test Mode	Mode 47	Humidity	52 %
Test Power Supply	AC 100V/50Hz		

Item	Phase Angle	Reduction (%)	Test Duration (ms)	Required Criteria	Complied to Criteria	Result
Voltage Short Interruptions	<input checked="" type="checkbox"/> 0	>95	5000	C	B	PASS
Voltage Dips	<input checked="" type="checkbox"/> 0	>95	10	B	A	PASS
	<input checked="" type="checkbox"/> 0	30	500	C	A	PASS

- Meet criteria A: Operate as intended during and after the test
- Meet criteria B: Operate as intended after the test
- Meet criteria C: Loss of function, provided the function is self-recoverable, or can be restored by the operation of the controls
- Additional Information
 - There was no observable degradation in performance.
 - No false alarms or other malfunctions were observed during or after the test. The acceptance criteria were met, and the EUT passed the test.

Date of Test	August 20, 2015	Temperature	26 °C
Test Mode	Mode 47	Humidity	52 %
Test Power Supply	AC 100V/60Hz		

Item	Phase Angle	Reduction (%)	Test Duration (ms)	Required Criteria	Complied to Criteria	Result
Voltage Short Interruptions	<input checked="" type="checkbox"/> 0	>95	5000	C	B	PASS
Voltage Dips	<input checked="" type="checkbox"/> 0	>95	8.33	B	A	PASS
	<input checked="" type="checkbox"/> 0	30	500	C	A	PASS

- Meet criteria A: Operate as intended during and after the test
- Meet criteria B: Operate as intended after the test
- Meet criteria C: Loss of function, provided the function is self-recoverable, or can be restored by the operation of the controls
- Additional Information
 - There was no observable degradation in performance.
 - No false alarms or other malfunctions were observed during or after the test. The acceptance criteria were met, and the EUT passed the test.

Date of Test	August 20, 2015	Temperature	26 °C
Test Mode	Mode 47	Humidity	52 %
Test Power Supply	AC 240V/50Hz		

Item	Phase Angle	Reduction (%)	Test Duration (ms)	Required Criteria	Complied to Criteria	Result
Voltage Short Interruptions	<input checked="" type="checkbox"/> 0	>95	5000	C	B	PASS
Voltage Dips	<input checked="" type="checkbox"/> 0	>95	10	B	A	PASS
	<input checked="" type="checkbox"/> 0	30	500	C	A	PASS

- Meet criteria A: Operate as intended during and after the test
- Meet criteria B: Operate as intended after the test
- Meet criteria C: Loss of function, provided the function is self-recoverable, or can be restored by the operation of the controls
- Additional Information
 - There was no observable degradation in performance.
 - No false alarms or other malfunctions were observed during or after the test. The acceptance criteria were met, and the EUT passed the test.

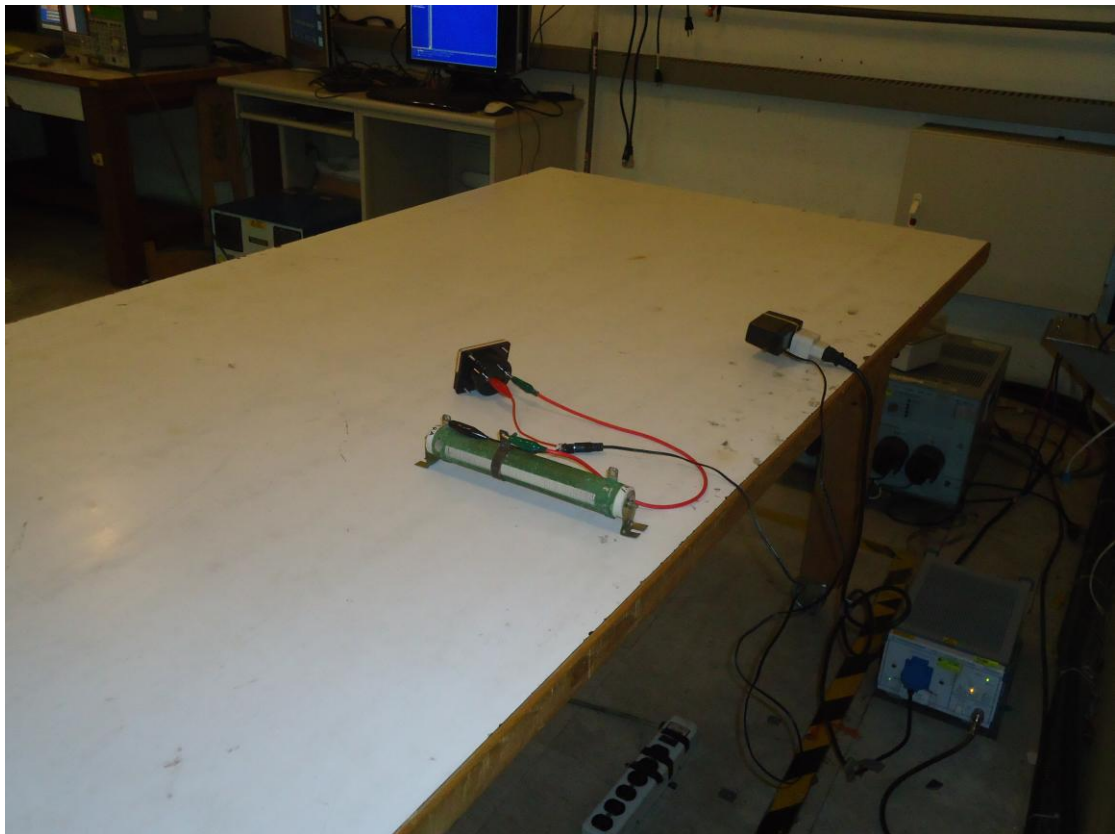
Date of Test	August 20, 2015	Temperature	26 °C
Test Mode	Mode 47	Humidity	52 %
Test Power Supply	AC 240V/60Hz		

Item	Phase Angle	Reduction (%)	Test Duration (ms)	Required Criteria	Complied to Criteria	Result
Voltage Short Interruptions	<input checked="" type="checkbox"/> 0	>95	5000	C	B	PASS
Voltage Dips	<input checked="" type="checkbox"/> 0	>95	8.33	B	A	PASS
	<input checked="" type="checkbox"/> 0	30	500	C	A	PASS

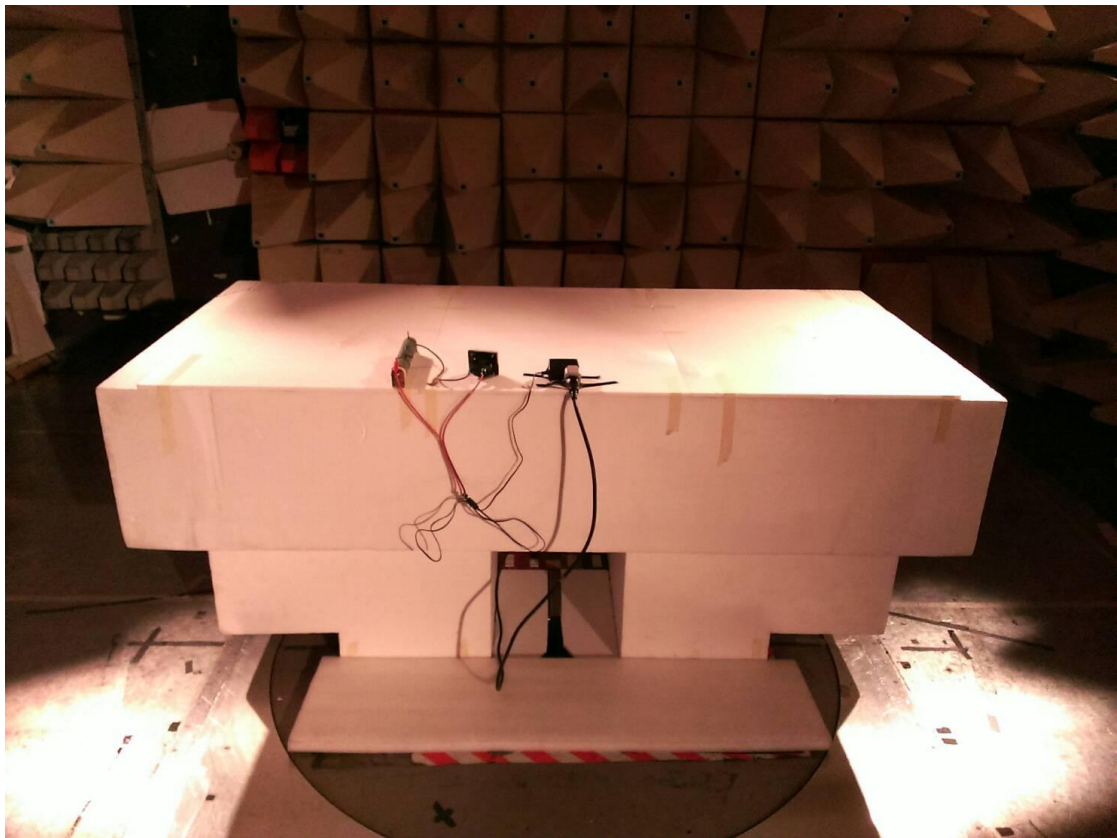
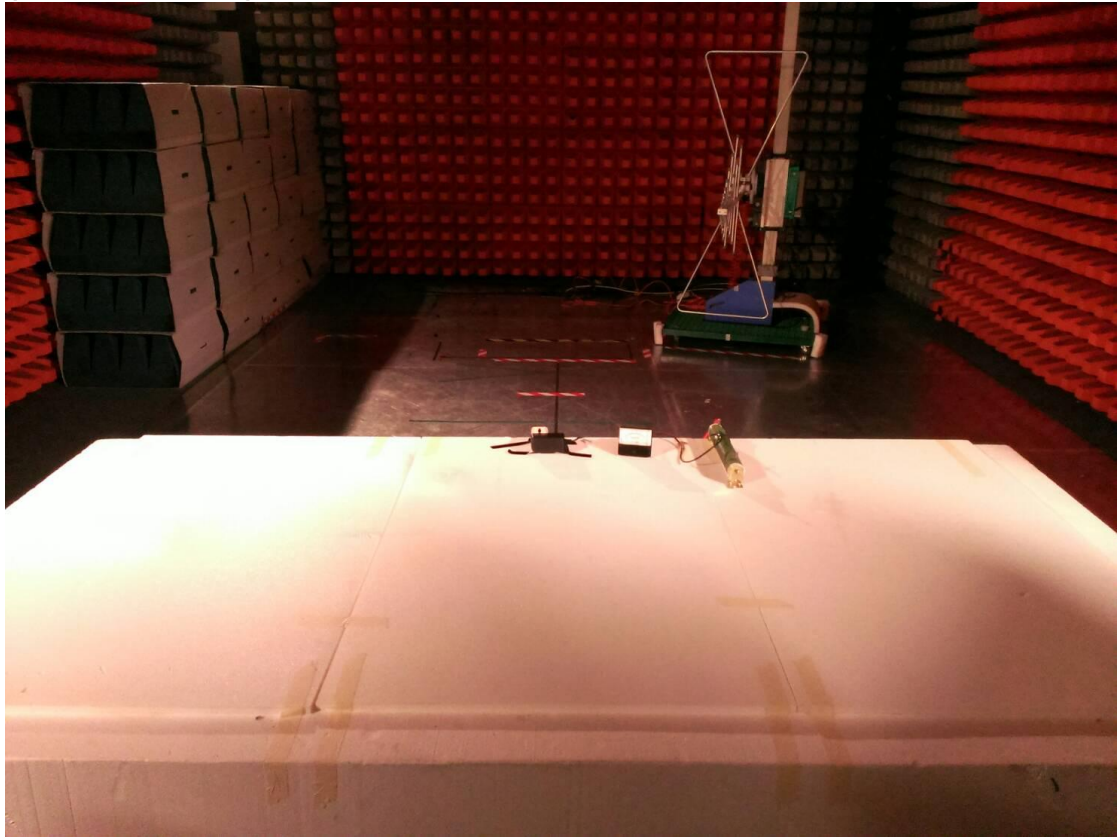
- Meet criteria A: Operate as intended during and after the test
- Meet criteria B: Operate as intended after the test
- Meet criteria C: Loss of function, provided the function is self-recoverable, or can be restored by the operation of the controls
- Additional Information
 - There was no observable degradation in performance.
 - No false alarms or other malfunctions were observed during or after the test. The acceptance criteria were met, and the EUT passed the test.

14. PHOTOGRAPHS FOR TEST

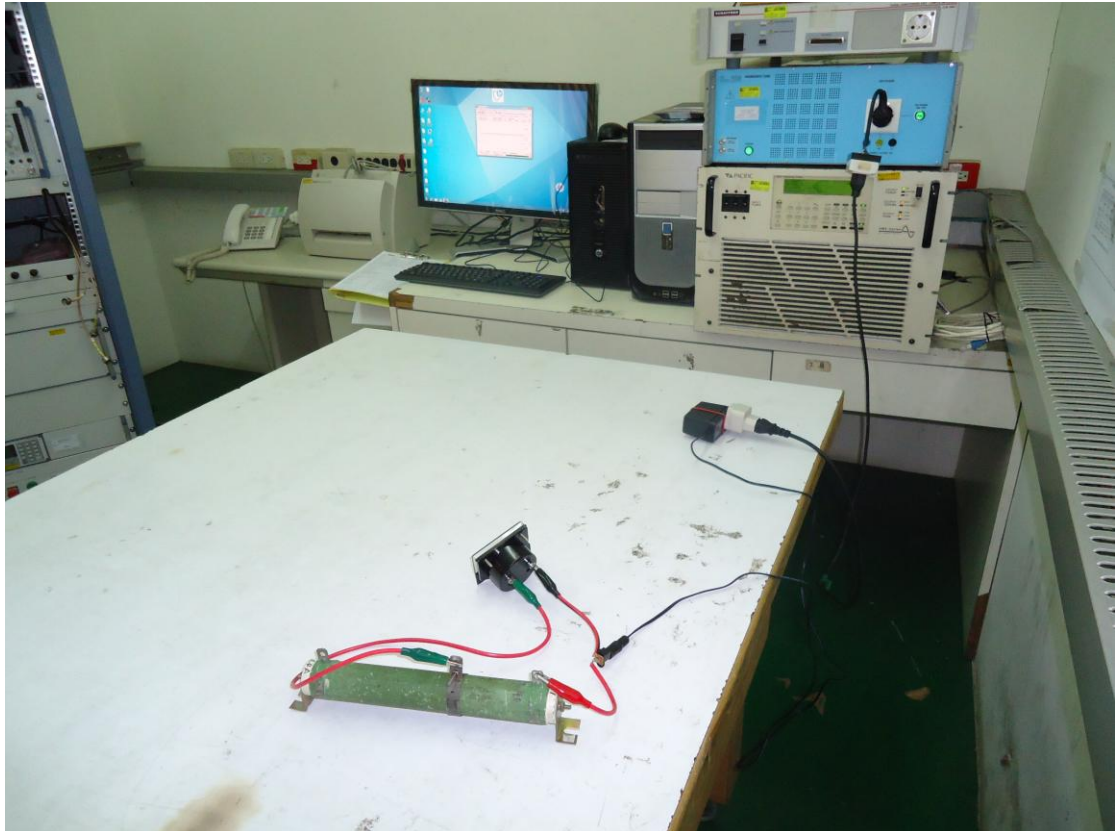
14.1 TEST PHOTOGRAPHS FOR CONDUCTION



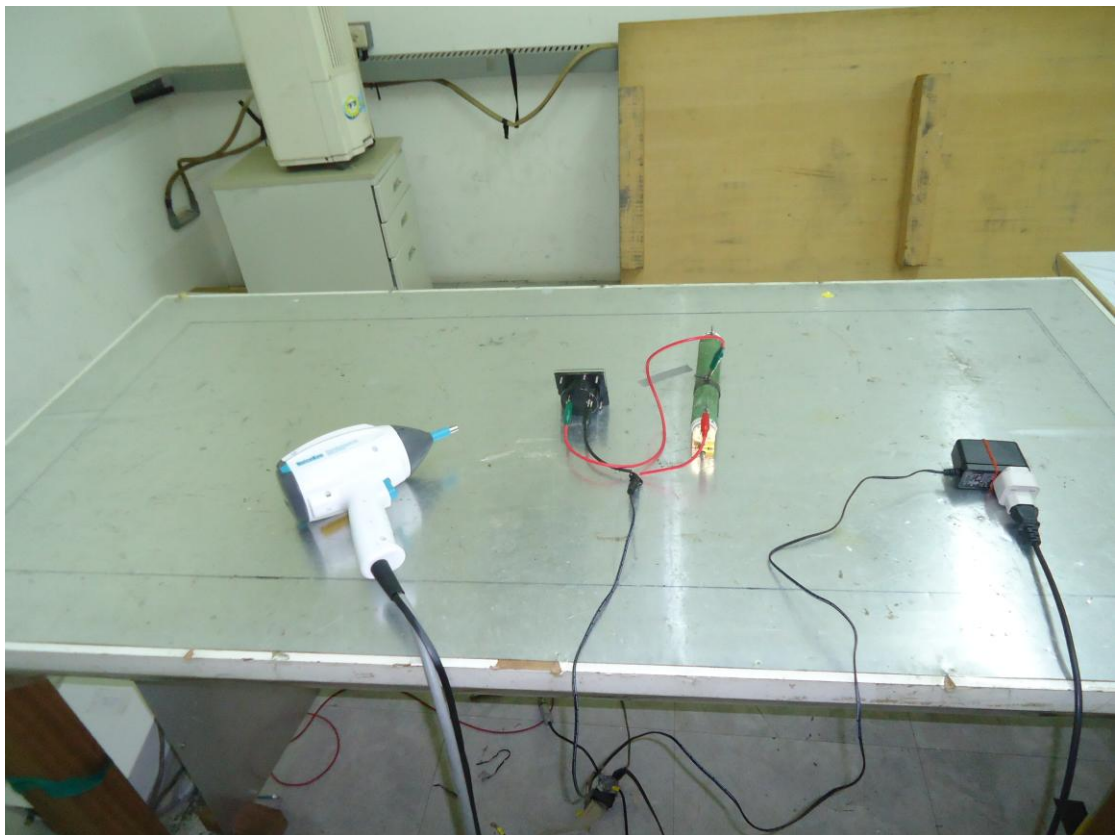
14.2 TEST PHOTOGRAPHS FOR RADIATED (30 MHz to 1 GHz)



14.3 TEST PHOTOGRAPHS FOR HARMONIC/FLICKER



14.4 TEST PHOTOGRAPHS FOR ESD



14.5 TEST PHOTOGRAPHS FOR ESD TEST POINTS



14.6 TEST PHOTOGRAPHS FOR RS



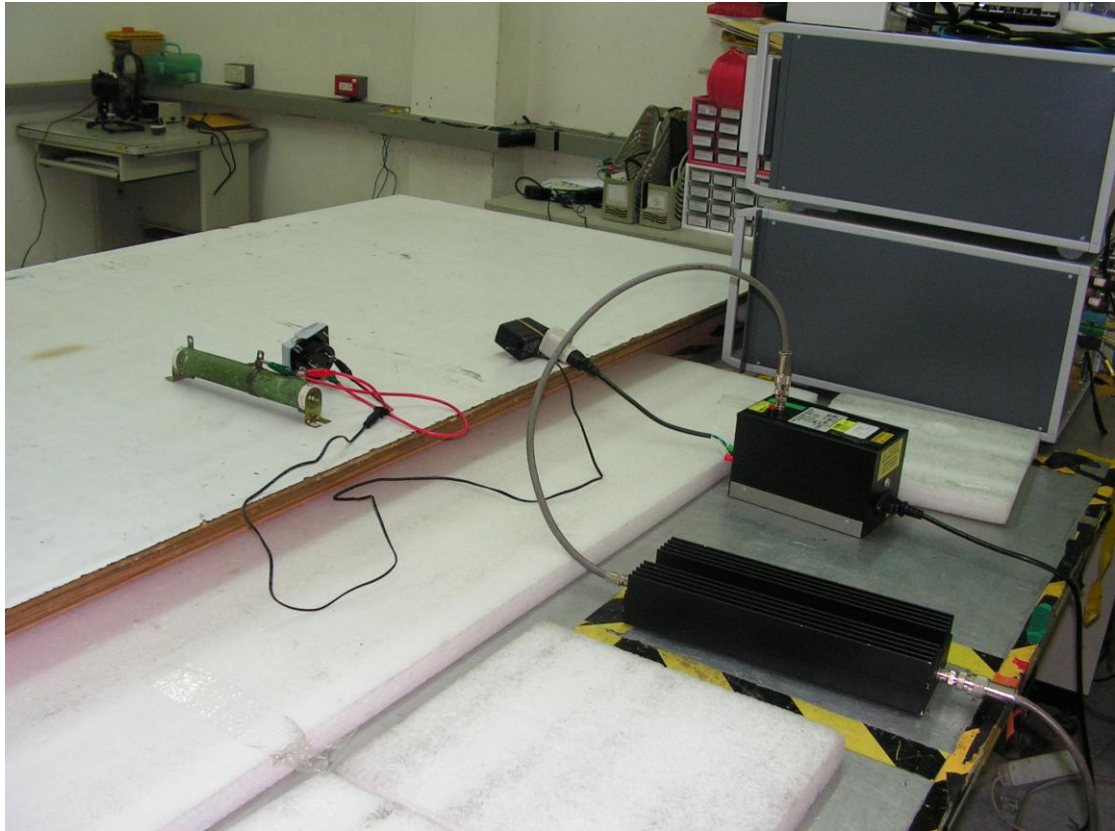
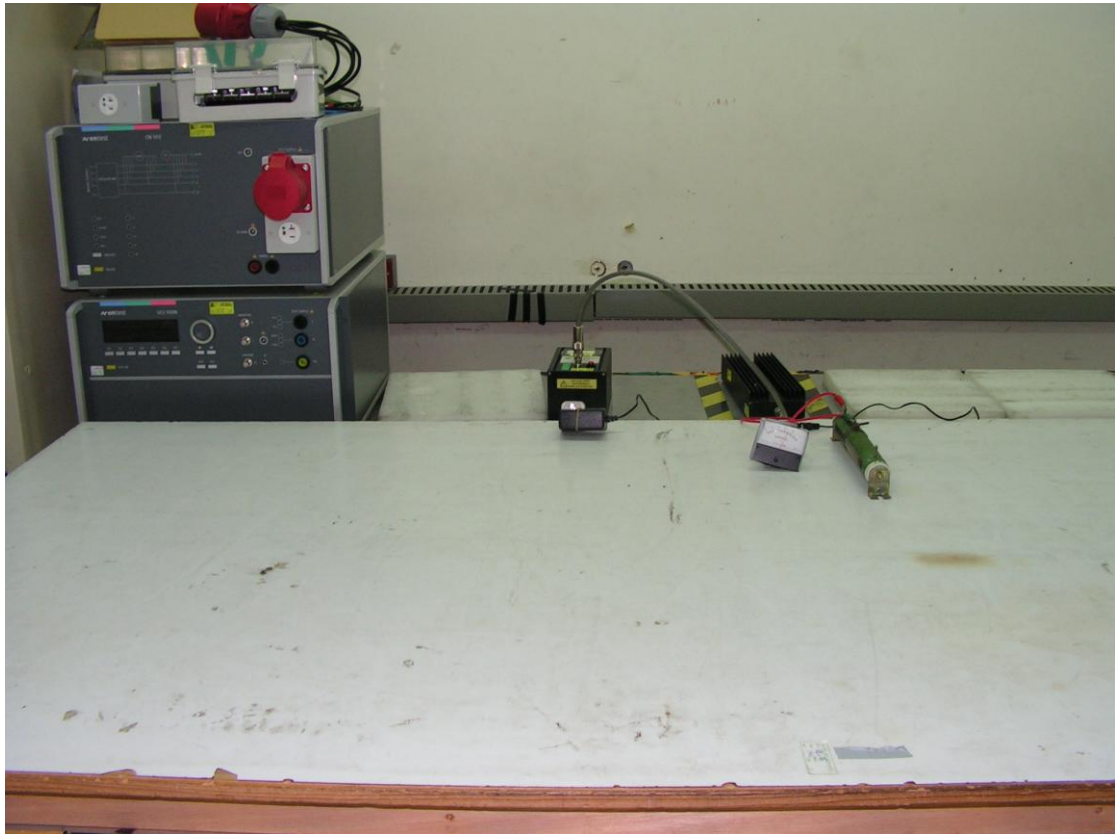
14.7 TEST PHOTOGRAPHS FOR EFT



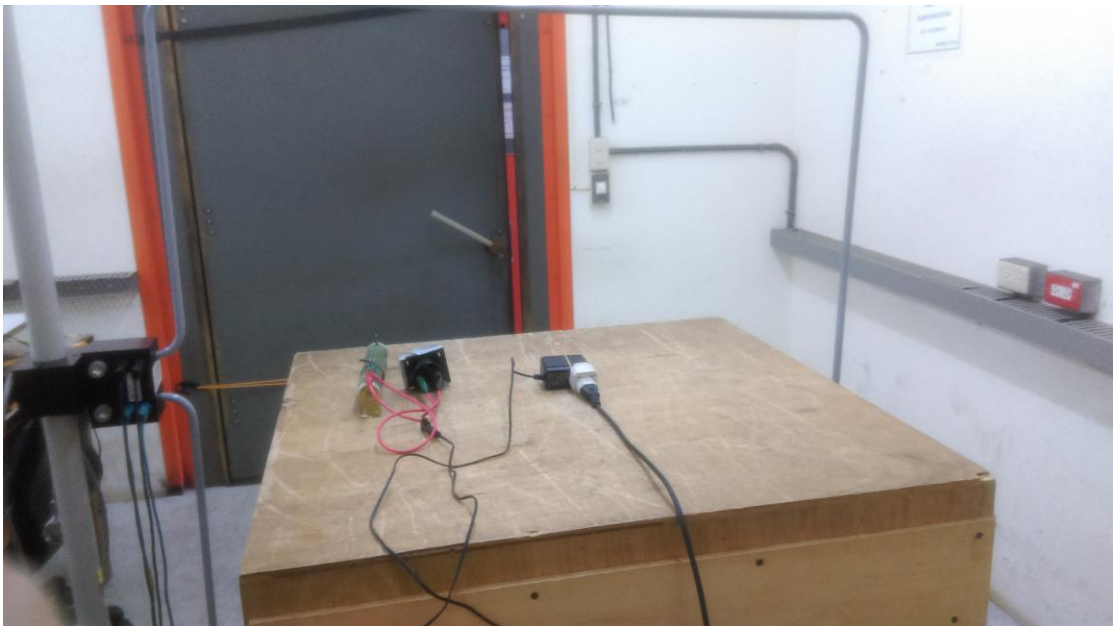
14.8 TEST PHOTOGRAPHS FOR SURGE



14.9 TEST PHOTOGRAPHS FOR CS



14.10 TEST PHOTOGRAPHS FOR MAGNETIC

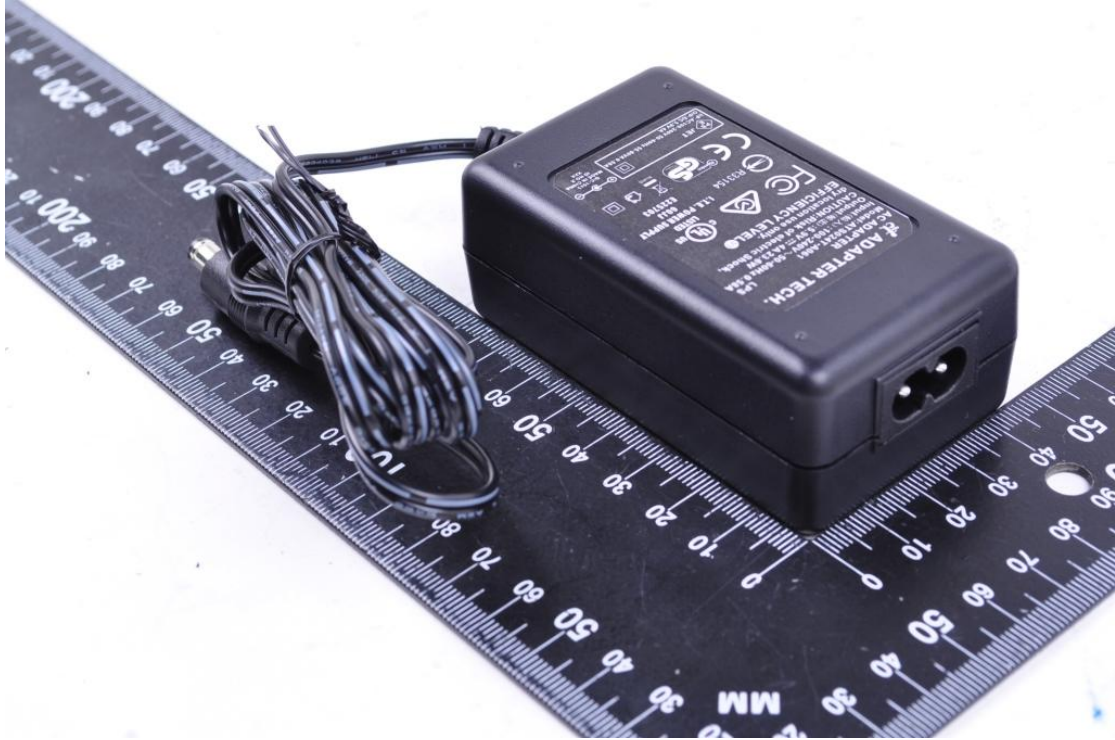


14.11 TEST PHOTOGRAPHS FOR DIPS

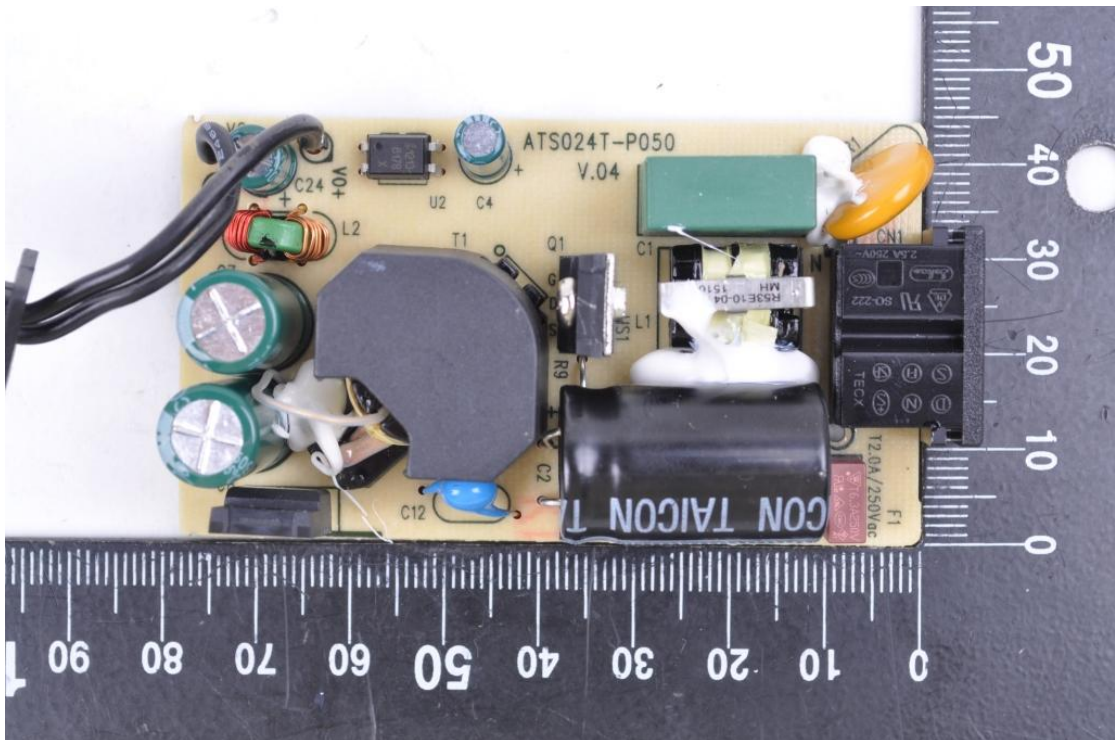
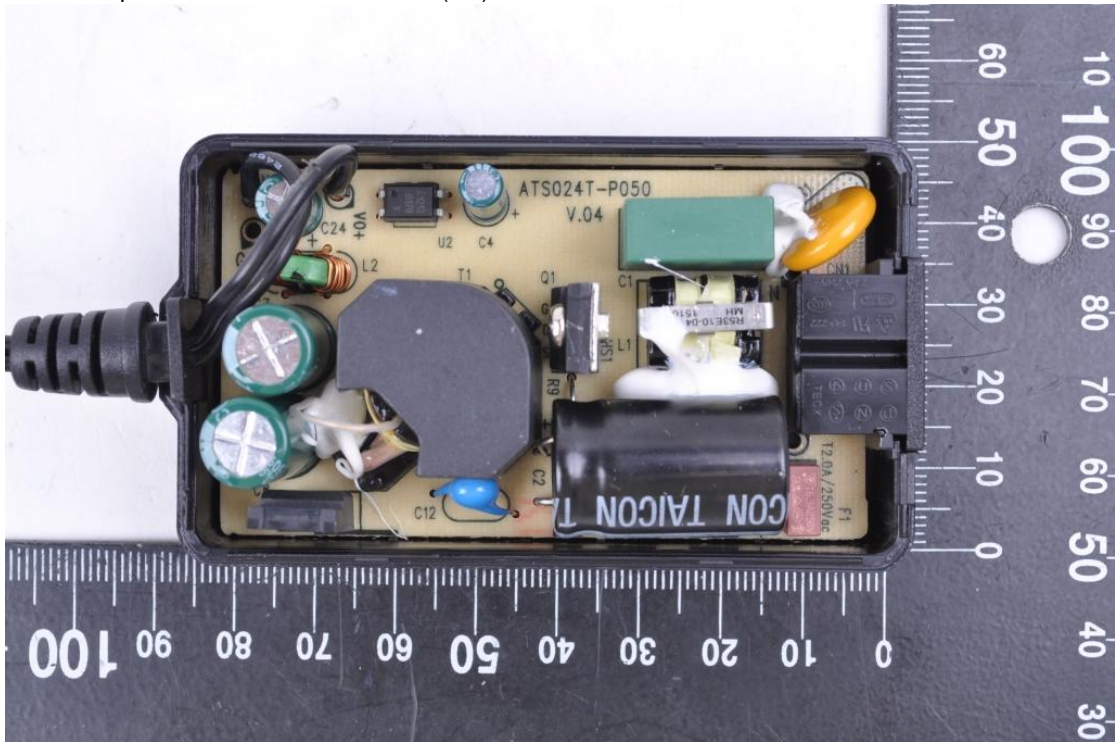


15. PHOTOGRAPHS FOR PRODUCT

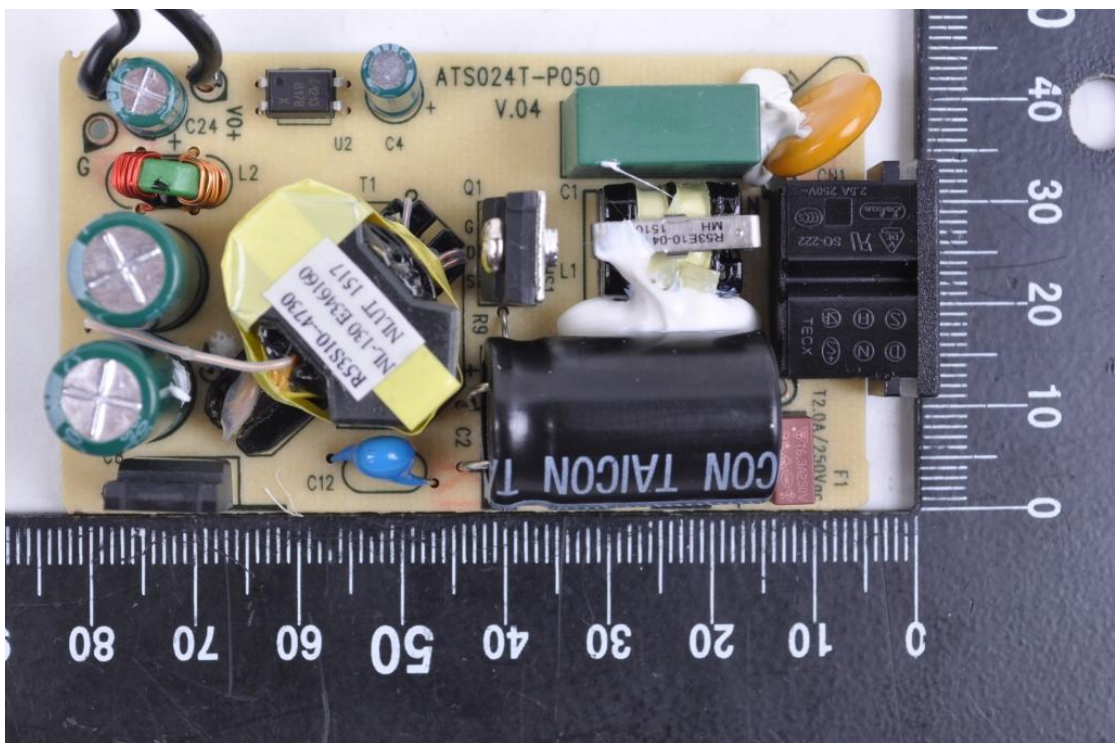
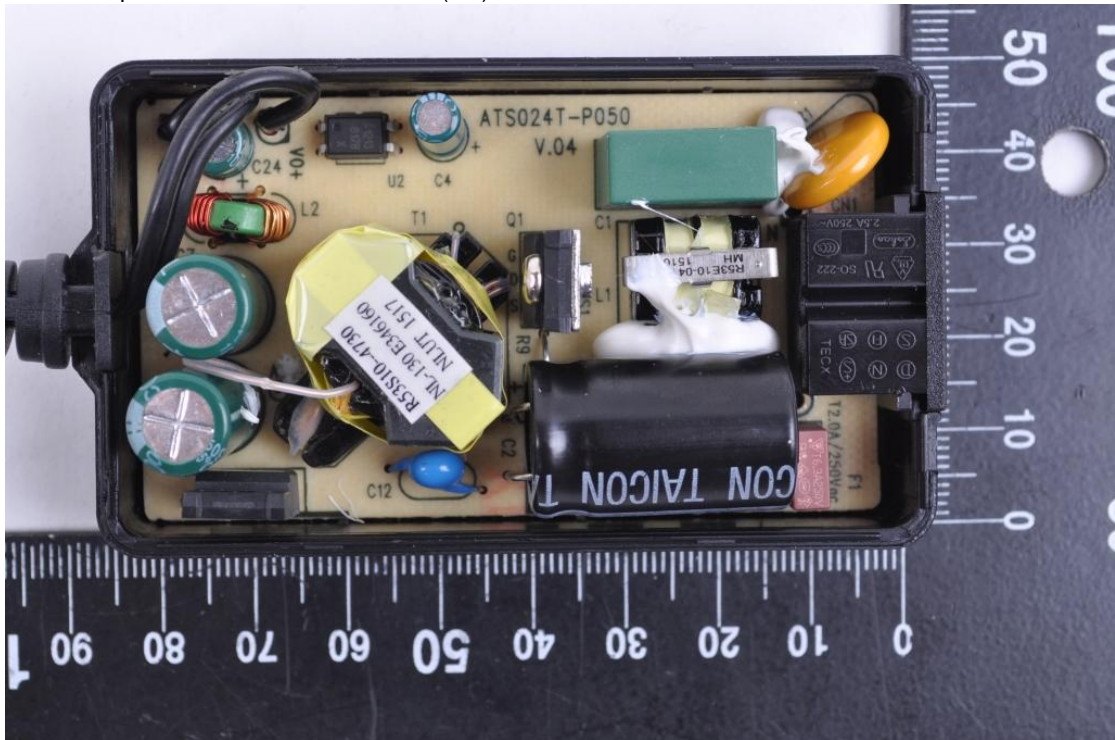
1. Front View of AC Adapter. (Desk Top type)
2. Back View of AC Adapter. (Desk Top type)



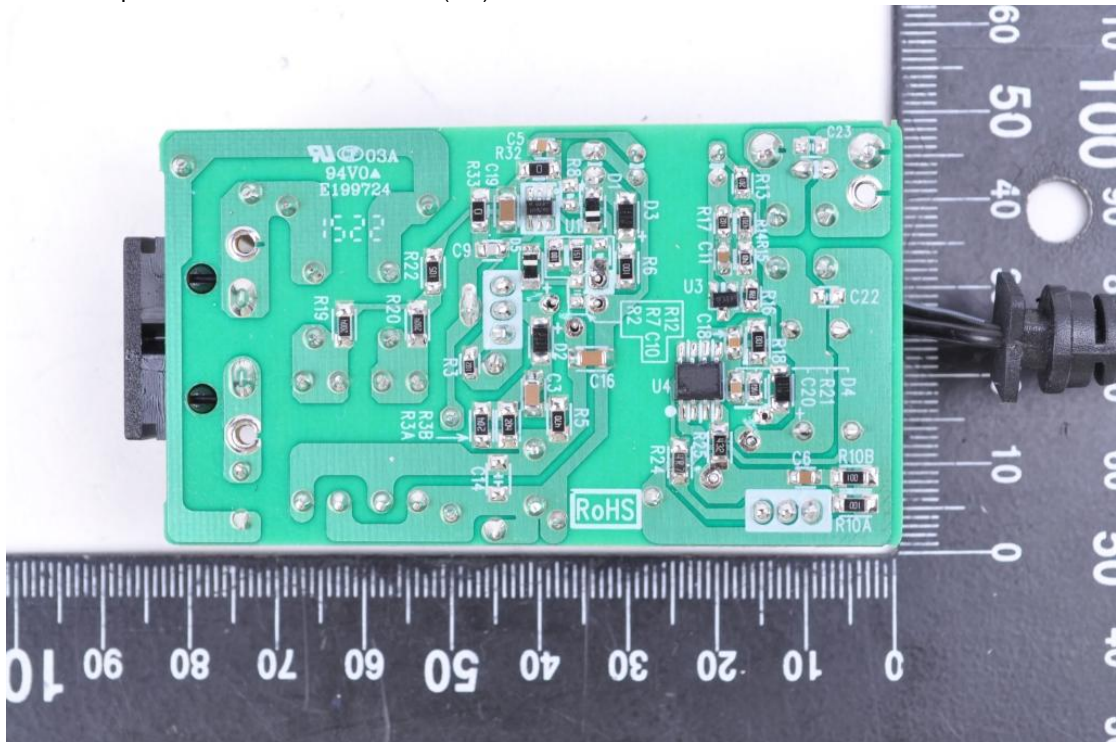
- 3. Component Side of Mother Board. (SR)
- 4. Component Side of Mother Board. (SR)



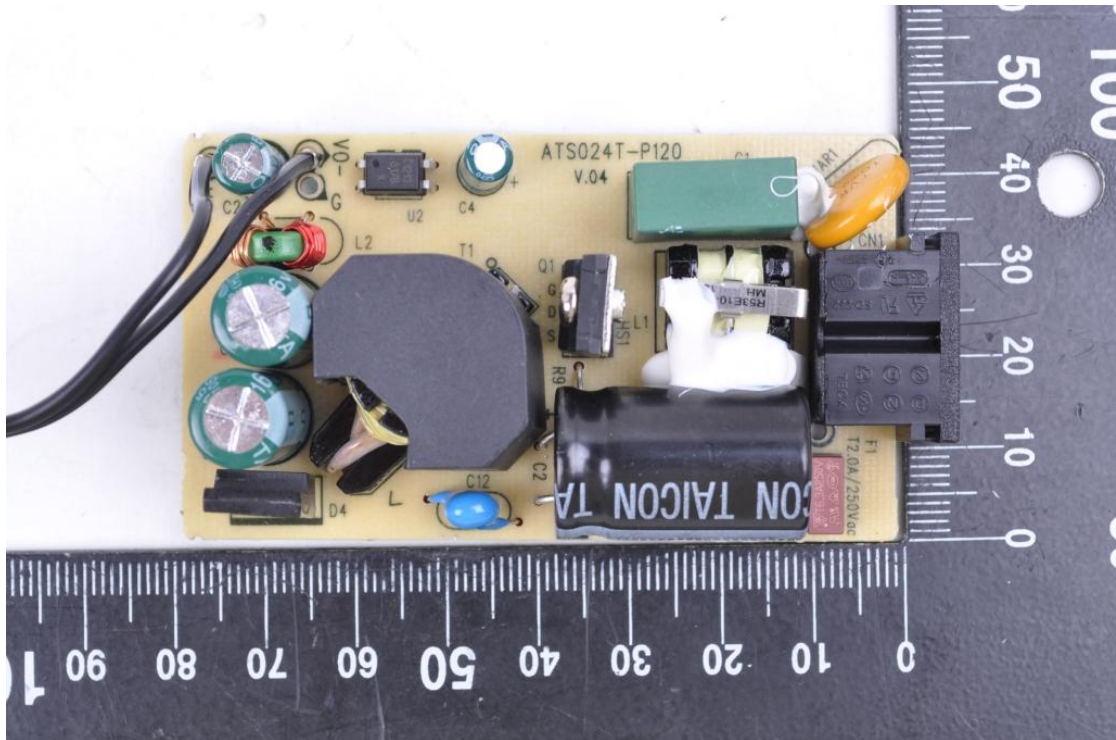
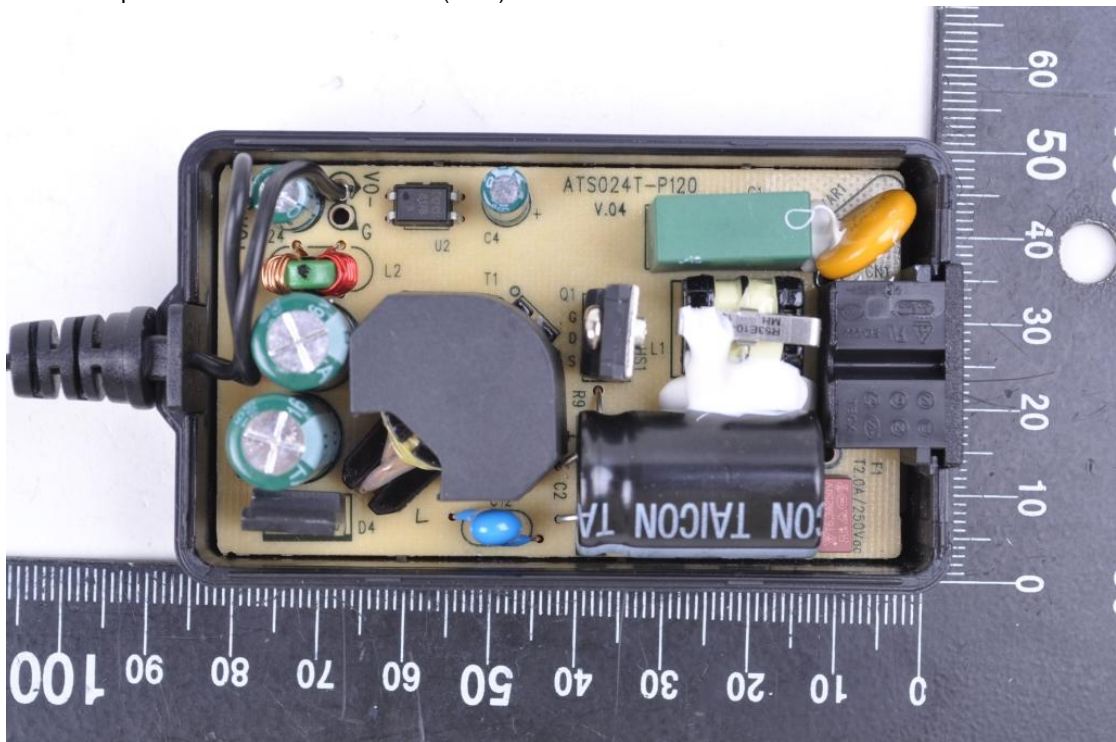
- 5. Component Side of Mother Board. (SR)
- 6. Component Side of Mother Board. (SR)



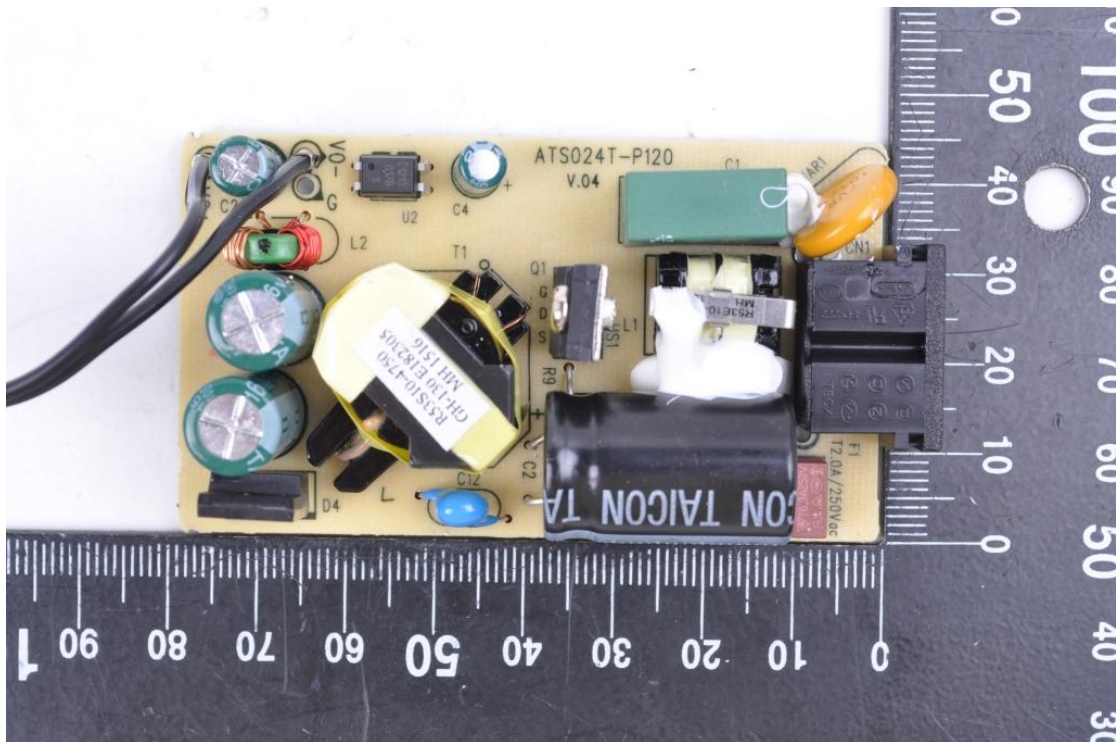
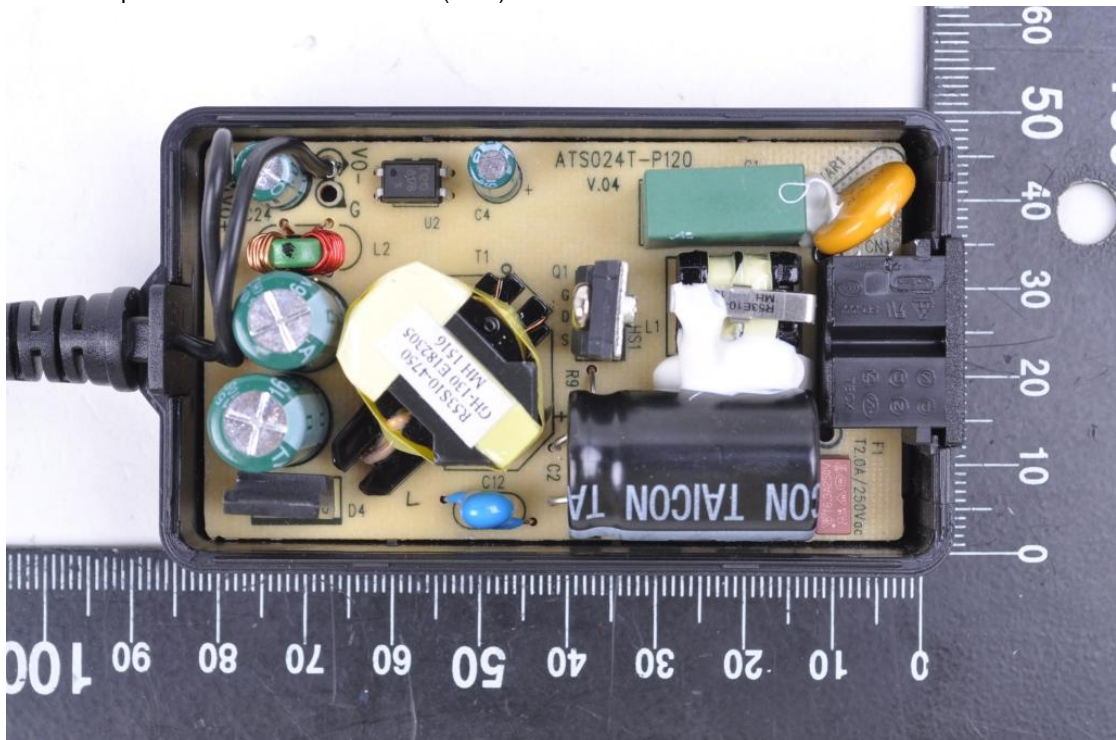
7. Component Side of Mother Board. (SR)



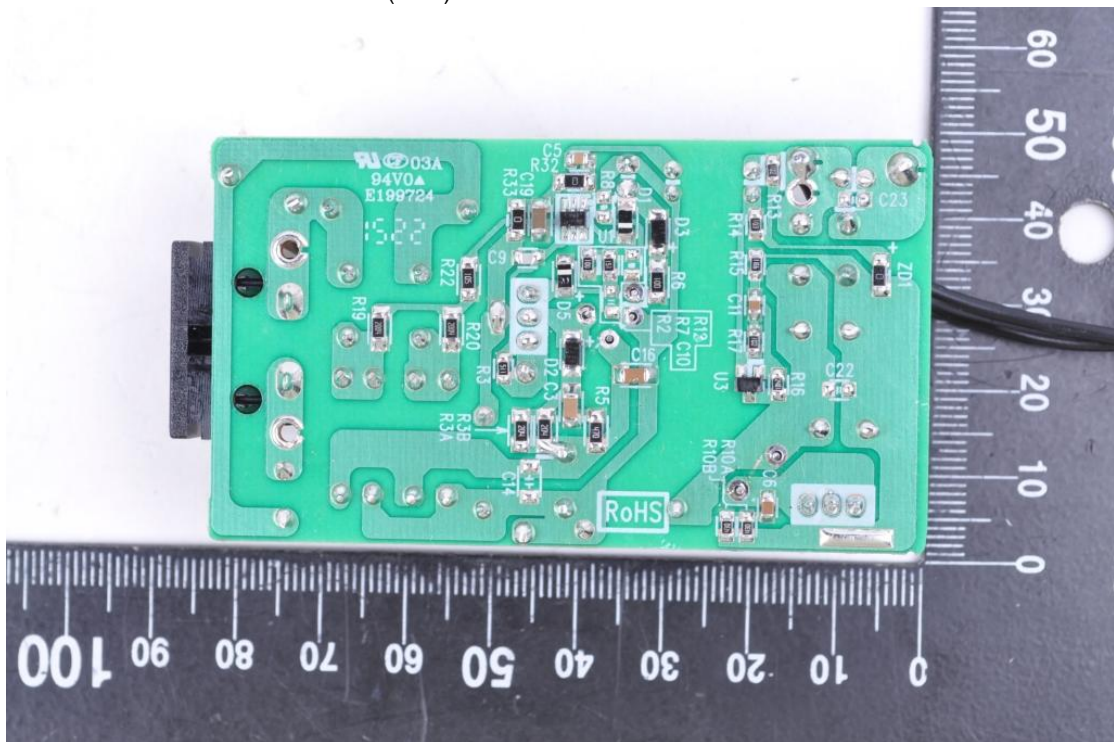
- 8. Component Side of Mother Board. (SBD)
- 9. Component Side of Mother Board. (SBD)



- 10. Component Side of Mother Board. (SBD)
- 11. Component Side of Mother Board. (SBD)



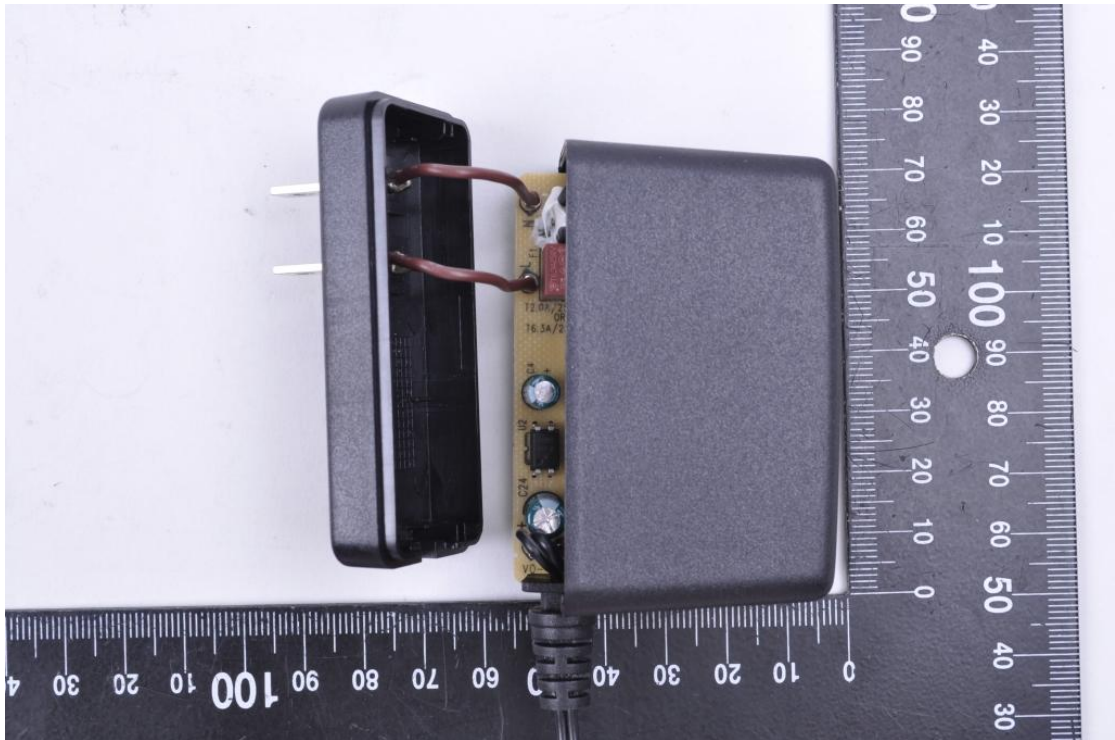
12. Solder Side of Mother Board. (SBD)



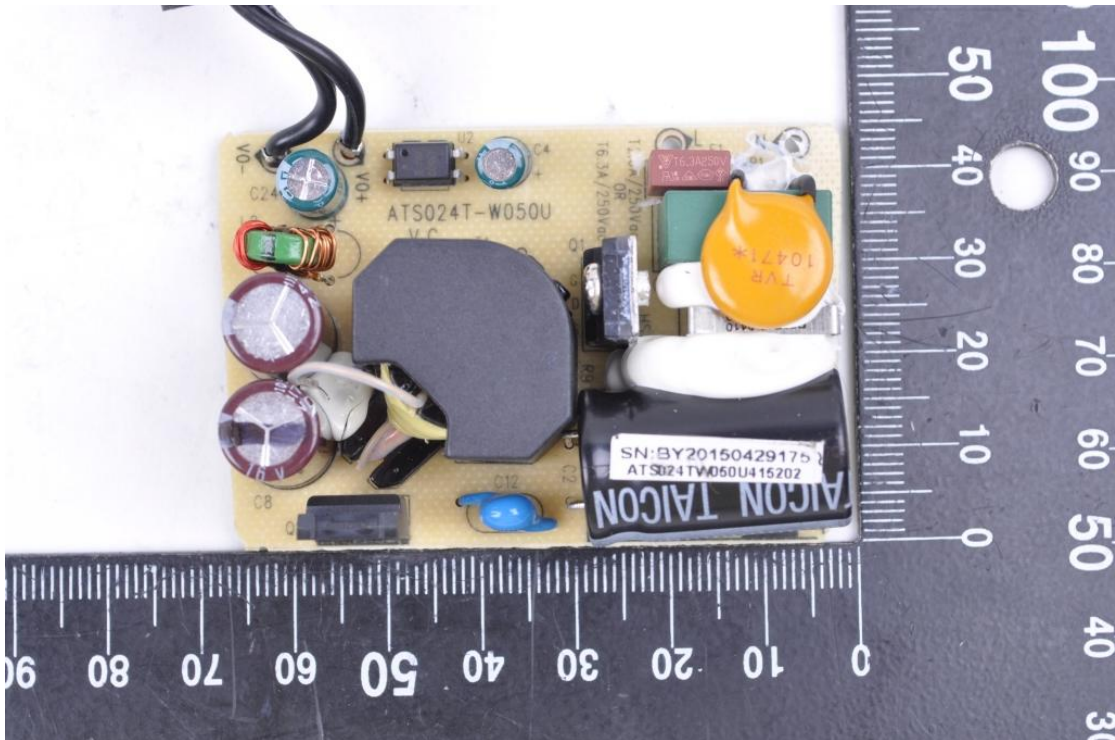
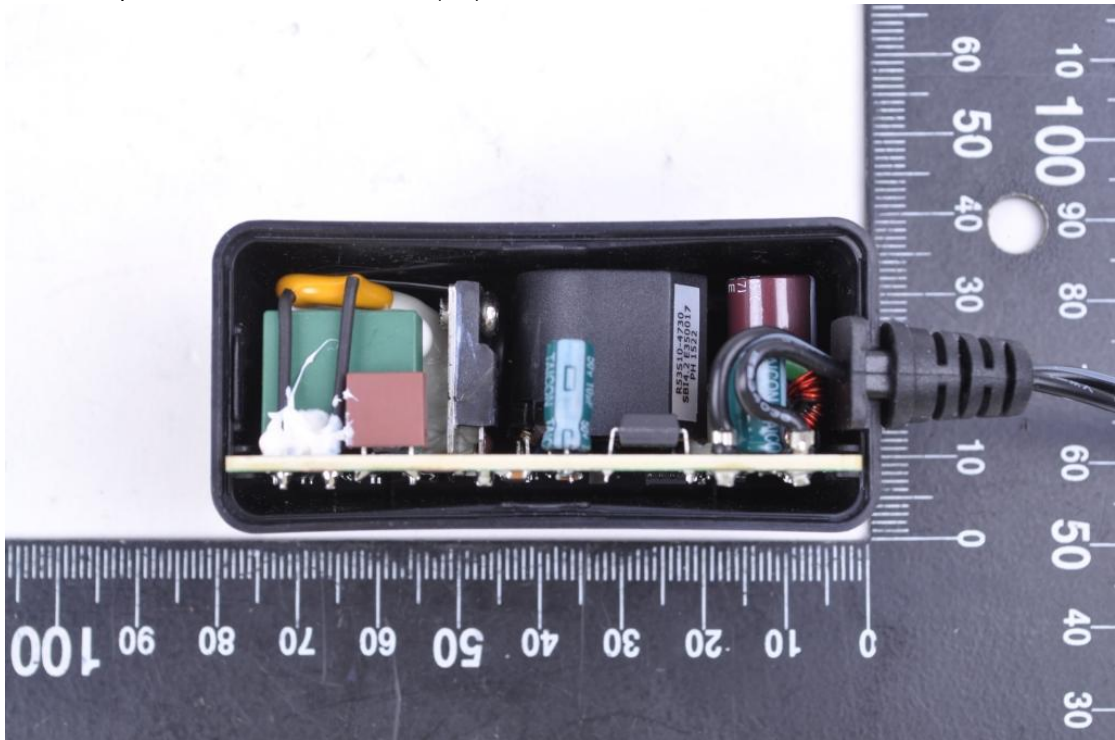
13. Front View of AC Adapter. (Direct Plug In type)
14. Back View of AC Adapter. (Direct Plug In type)



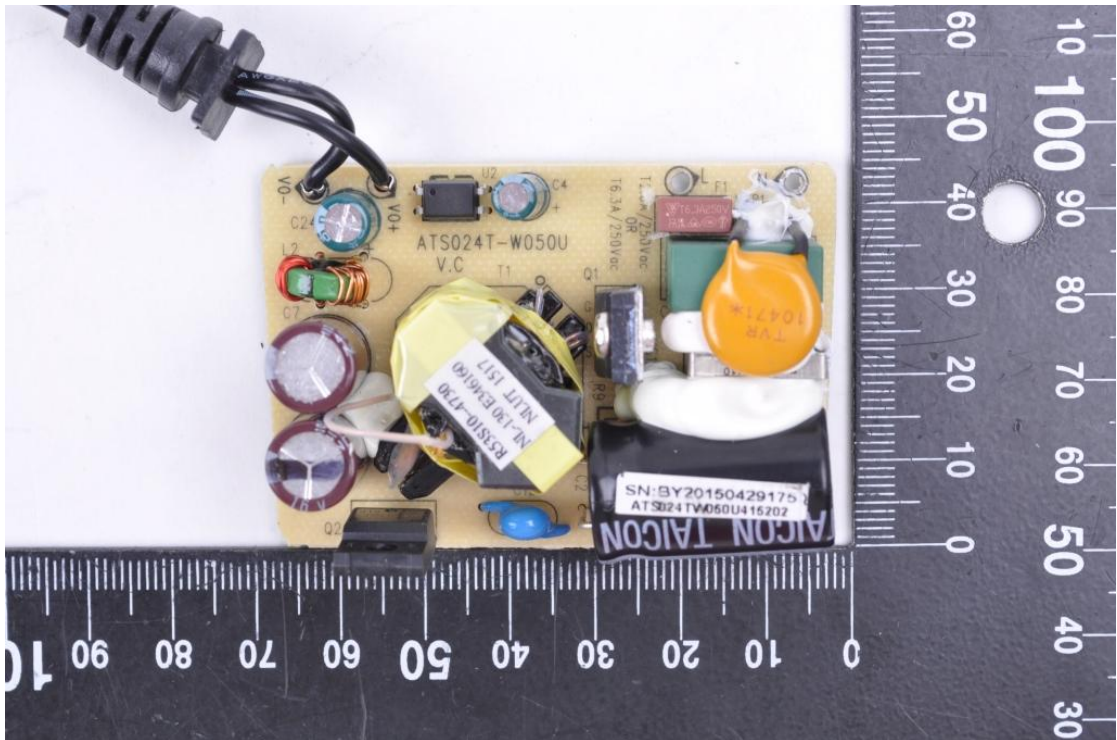
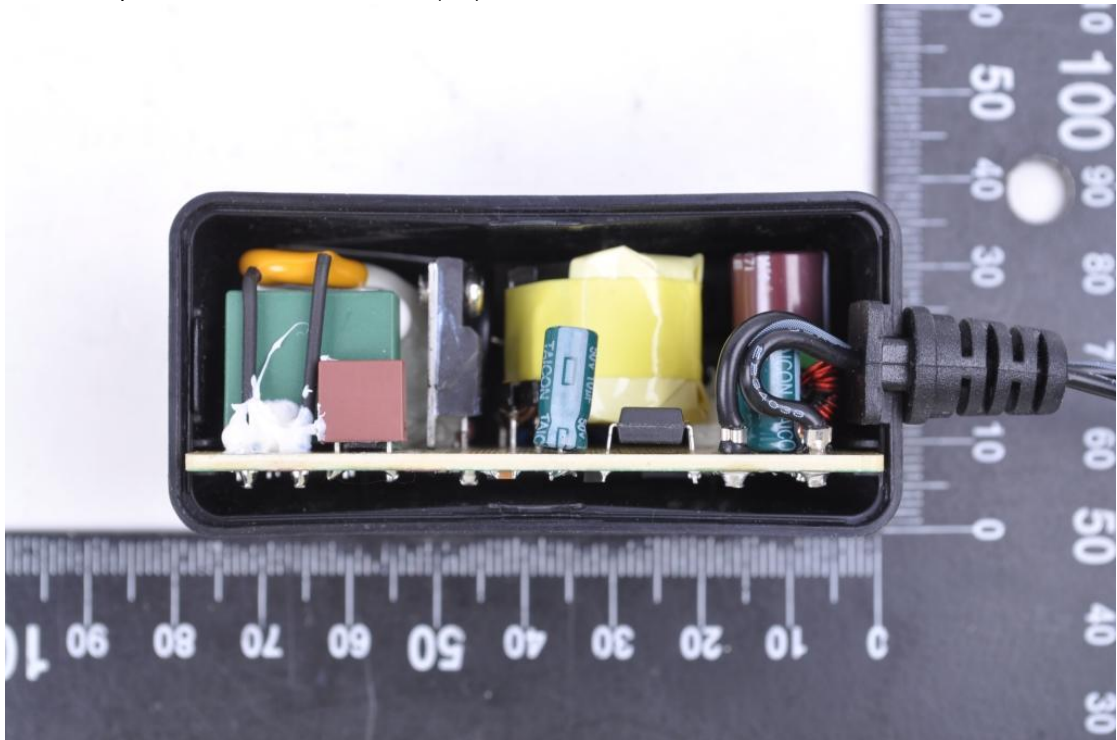
- 15. Inner.
- 16. Inner.



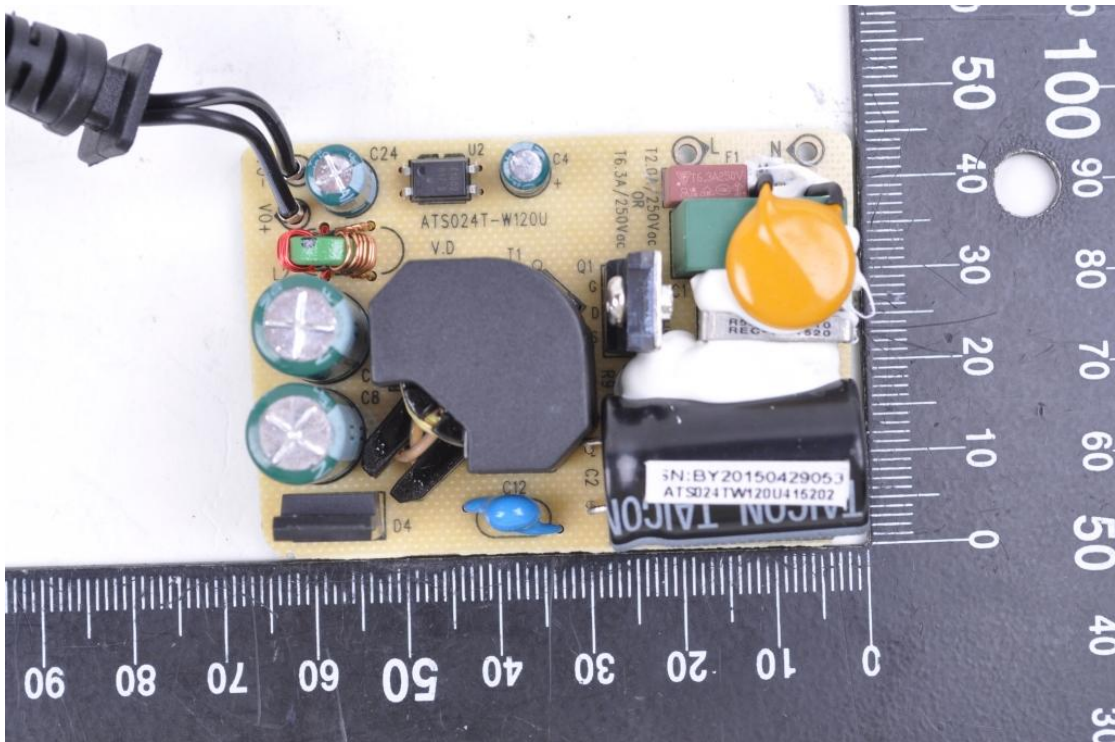
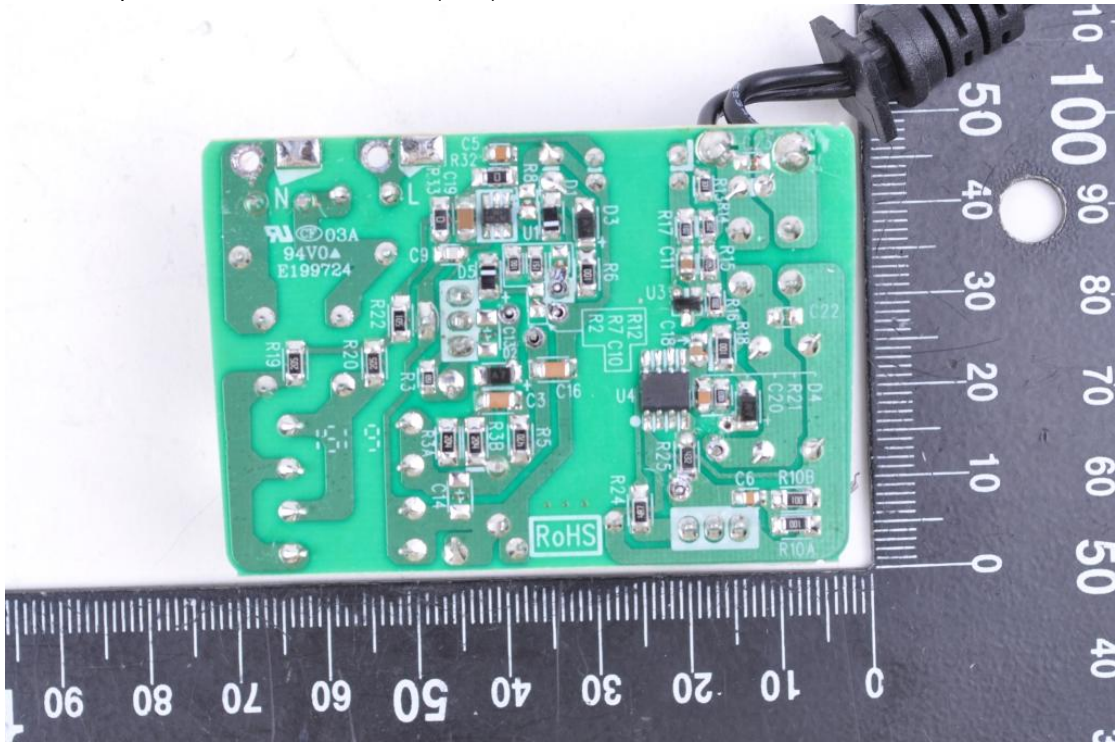
- 17. Inner.
- 18. Component Side of Mother Board.(SR)



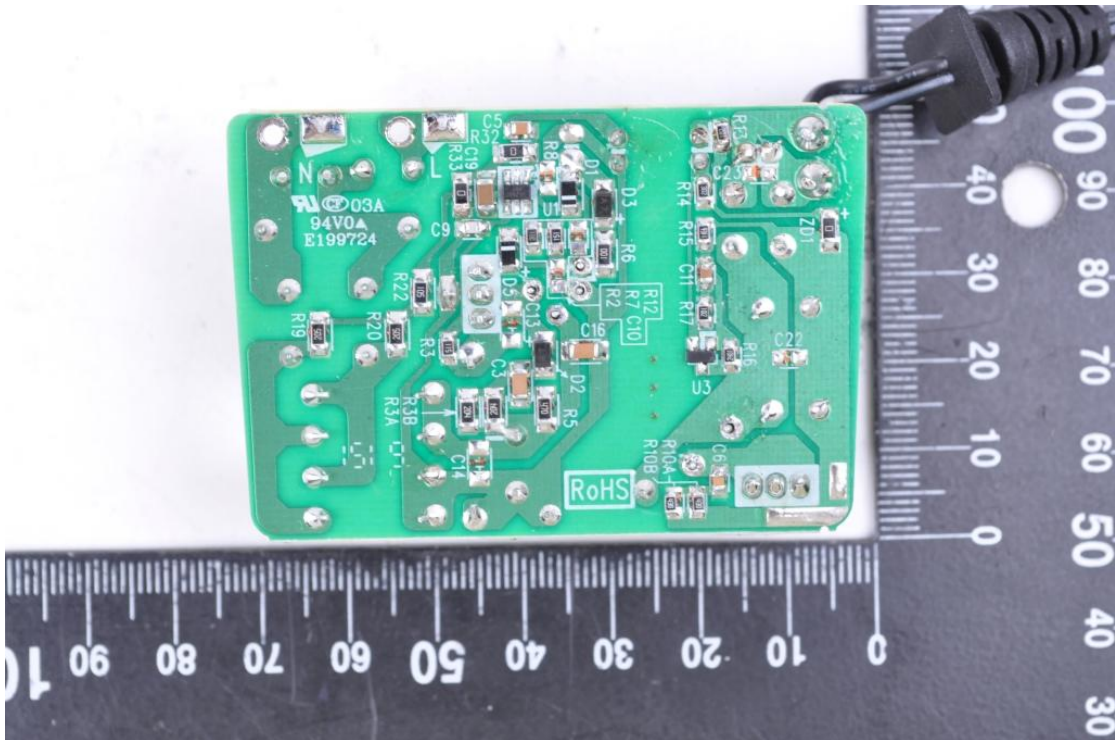
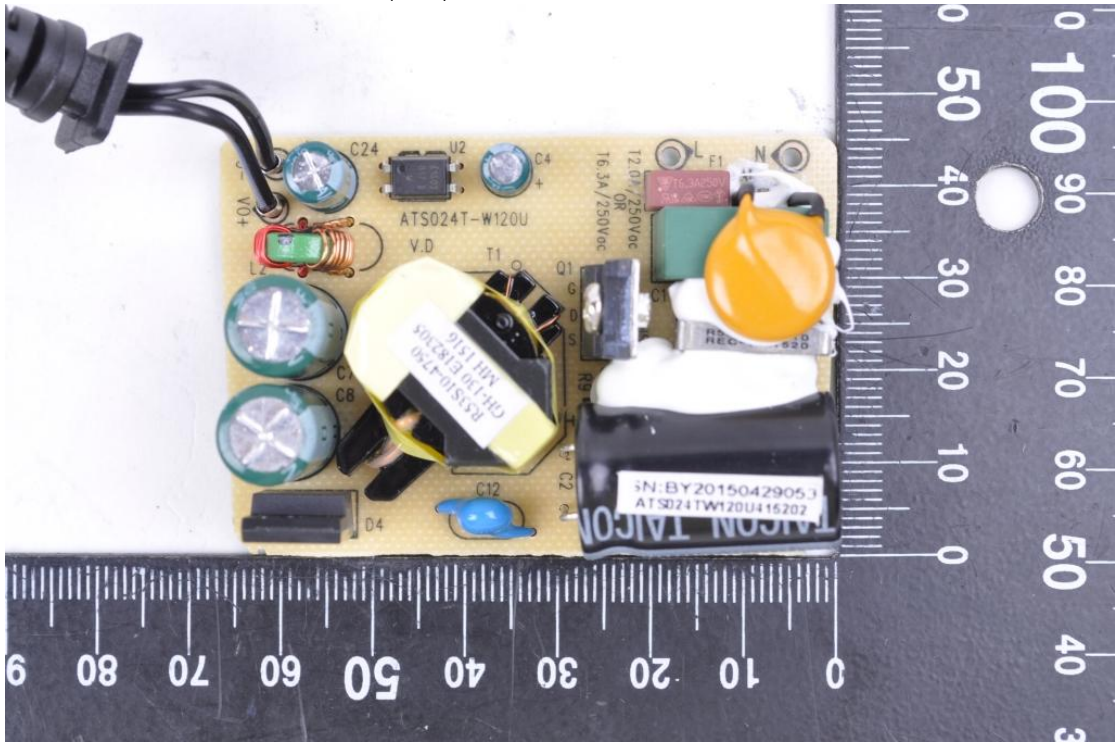
- 19. Inner.
- 20. Component Side of Mother Board.(SR)



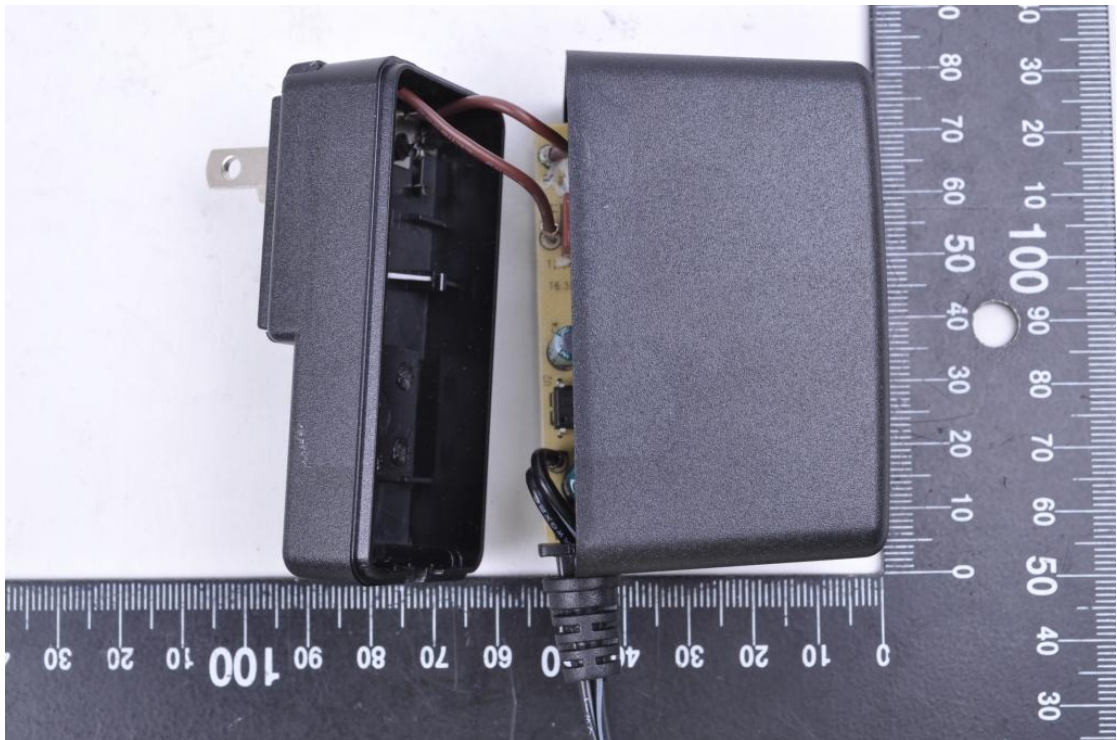
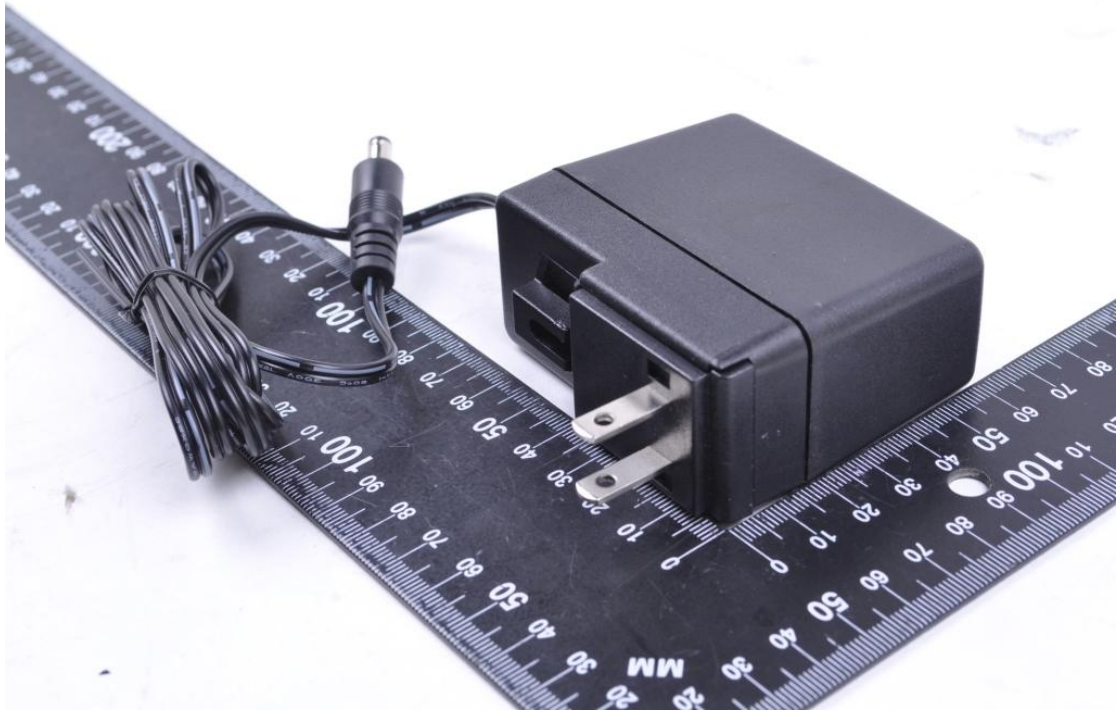
- 21. Solder Side of Mother Board. (SR)
- 22. Component Side of Mother Board.(SBD)



- 23. Component Side of Mother Board.(SBD)
- 24. Solder Side of Mother Board. (SBD)



- 25. Front View of AC Adapter. (US plug)
- 26. Back View of AC Adapter. (US plug)



16. EMI/EMS REDUCTION METHOD DURING COMPLIANCE TESTING

No modification was made during testing.