



Certificate of Compliance

Directive 2014/30/EU

Certificate No.: VTDC- 17052

Applicant:

Manufacturer:

Product: Travel adapter

Trademark: -

Model No.: YM-128

Standards: EMI:
EN 55032:2015

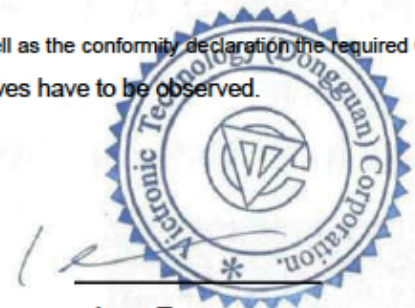
EMS:
EN 55024:2010 /A1:2015
IEC 61000-4-2:2008
IEC 61000-4-3:2006/A2:2010
IEC 61000-4-4:2012
IEC 61000-4-5:2014
IEC 61000-4-6:2013
IEC 61000-4-11:2004

Test Report No.: G1704028002

The observations and test results referenced from this Certificate of Compliance are relevant only to the sample tested. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. The applicant should hold the whole technical report at disposal of the competent all the right.



After preparation of the necessary technical documentation as well as the conformity declaration the required CE marking can be affixed on the product. Other relevant directives have to be observed.



Leo Tong

Certification Director

2017-05-04



Victronic Technology (Dongguan) Corporation
Website: www.victronic.com.tw



TEST REPORT

FOR

TRAVEL ADAPTER

Model : YM-128

Issued to

Issued by

Victronic Technology (Dongguan) Corporation



EMC Test Site	Office and Lab	No. 8 West 1st Street, Xingfa North Road, Liwu Wusha, Changan Town, Dongguan City, Guangdong, P.R.C. P.C.:523860
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Note: This test refers exclusively to the test presented test model and sample. This report shall not be reproduced except in full, without the written approval of VTDC Testing Laboratory. This document may be altered or revised by VTDC Testing Laboratory. Personnel only, and shall be noted in the revision section of the document.



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APPENDIX 1 PHOTOS OF TEST CONFIGURATION

APPENDIX 2 TEST DATA

PHOTOS OF EUT



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1. GENERAL INFORMATION

Applicant :
 Address :

 Manufacturer : Same as the applicant
 Address : Same as the applicant

 Factory : Same as the applicant
 Address : Same as the applicant

 EUT : Travel adapter
 Model Name : YM-128
 Model Differences : N/A

Measurement procedure used:

EMI :	EMS:
EN 55032: 2015	EN55024: 2010/A1:2015
	IEC 61000-4-2: 2008
	IEC 61000-4-3: 2006/A2:2010
	IEC 61000-4-4: 2012
	IEC 61000-4-5: 2014
	IEC 61000-4-6: 2013
	IEC 61000-4-11: 2004

Deviation from Applicable Standard

According to the applicant’s declaration this EUT is a class B product

The above equipment was tested by VTDC Testing Laboratory. for compliance with EMC requirements set forth in the EUROPEAN COUNCIL DIRECTIVE 2014/30/EU and the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance.

This test report shall not be reproducing in part without written approval of VTDC Testing Laboratory.

Tested By:		Reviewed by:	
2017/05/04	<u>Bangui Su</u>	2017/05/04	<u>Messi Lee</u>
Date	Bangui Su / Engineer	Date	Messi Lee / Manager



1.1 DESCRIPTION OF THE TESTED SAMPLES

EUT

EUT Type : Engineer Type
Condition when received : Good Damage :
EUT Name : Travel adapter
Model Number : YM-128
Receipt Date : 2017/04/20
EUT Power Rating : AC Power
Input:100-240Vac, 50/60Hz, 8A MAX
USB Output: 5VDC, 5A(Total)

DC Power Cord Type : 0.8 m Un-Shielded Shielded
I/O Port : USB x 4





1.2 SUMMARY OF TEST RESULT

Emission				
Test Standard	Test Item	Test Result		
EN55032 Class B	Conducted Emission	Pass		
EN55032 Class B	Radiated Emission	Pass		
EN61000-3-2	Harmonic	N/A		
EN61000-3-3	Flicker	N/A		
Immunity				
Test Standard	Test Item	Performance Criteria	Observed Result Class	Test Result
IEC61000-4-2	Electrostatic Discharge	B	A	Pass
IEC61000-4-3	Radiated Susceptibility	A	A	Pass
IEC61000-4-4	Electrical Fast Transient	B	A	Pass
IEC61000-4-5	Surge	B	A	Pass
IEC61000-4-6	Conducted Susceptibility	A	A	Pass
IEC61000-4-8	Magnetic Field	A	N/A	N/A
IEC61000-4-11	Voltage Dips and Interruption	Dips >95% B	A	Pass
		Dips 30% C	A	Pass
		Interruptions >95% C	C	Pass





1.3 TEST METHODOLOGY

EUT SYSTEM OPERATION

1. The EUT was configured according to EN55032.
2. Photos of test configuration please refer to appendix 1.
3. Perform the EMC testing procedures, and measure the maximum emission noise.

DECISION OF FINAL TEST MODE

1. The following test mode were scanned during the preliminary test:

Mode 1: Full load

Mode 2: Half load

Mode 3: No load

2. After the preliminary scan, the following test mode was found to produce the highest emission level.

Conduction: Mode 1

Radiation: Mode 1

Then, the EUT configuration and cable configuration of the above highest emission mode was chosen for all final test item.

3. EMS test mode is Mode 1.





1.4 DESCRIPTION OF THE SUPPORT EQUIPMENTS

Setup Diagram

See test photographs attached in appendix 1 for the actual connections between EUT and support equipment.

support Equipment

Peripherals Devices:

OUTSIDE SUPPORT EQUIPMENT							
No.	Equipment	Model	Serial No.	FCC ID/ BSMI ID	Trade name	Data Cable	Power Cord
1.	Cement resistance	N/A	N/A	N/A	N/A	N/A	N/A
2.	Tungsten	200W	N/A	N/A	N/A	N/A	1.5m
EUT							
No.	Equipment	Model	Serial No.	FCC ID/ BSMI ID	Trade name	Data Cable	Power Cord
1.	Travel adapter	YM-128	N/A	N/A	N/A	N/A	N/A

Note: All the above equipment /cable were placed in worse case position to maximize emission signals during emission test.

Grounding: Grounding was in accordance with the manufacturer's requirement and conditions for the intended use.

1.5 FEATURES OF EUT: PLEASE REFER TO USER MANUAL OR PRODUCT SPECIFICATION.



**2. INSTRUMENT AND CALIBRATION****2.1 MEASURING INSTRUMENT CALIBRATION**

The measuring equipment utilized to perform the tests documented in the report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

2.2 TEST AND MEASUREMENT EQUIPMENT

The following list contains measurement equipment used for testing. The equipment conforms to the requirement of CISPR 16-1, ANSI C63.2 and. Other required standards.

Calibration of all test and measurement, including any accessories that may effect such calibration, is checked frequently to ensure the accuracy. Adjustments are made and correction factors are applied in accordance with the instructions contained in the respective.

TABLELIST OF TEST AND MEASUREMENT EQUIPMENT

Conducted Emission Measurement						
	Instrument	Manufacturer	Model No.	Serial No.	Calibration Due Date	Note
■	SPECTRUM	Agilent	E4404B	MY45111243	2017-05-10	
■	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESPC	841758/013	2017-04-20	
■	LISN	CYBERTEK	EM5040A	E115040195	2017-05-10	For EUT
■	LISN	EMCO	3725/2M	9509-2105	2017-05-20	For Support Unit
■	COAXIAL CABLE	Huber +Suhner	RG223/U	9001-1589	2017-05-10	
■	GROUND PLANE	N/A	N/A	N/A	NCR	
■	GROUND PLANE	N/A	N/A	N/A	NCR	
□	Signal impedance stabilization network analyzer	FCC	FCC-TLISN-T4-02	20477	2017-05-27	





Radiated Emission Measurement						
	Instrument	Manufacturer	Model No.	Serial No.	Calibration Due Date	Note
■	SPECTRUM	R&S	FSV30	103411	2017-05-28	
■	Bilog Antenna	ETC	MCTD 2656	BL10S02005	2017-05-23	
■	COAXIAL CABLE	TIMES	VTDC CABLE	02/CBL 02	2017-05-10	
□	High frequency antenna	ETS	3117	00069380	2017-05-25	
■	Positioning Controller	Max-Full	MF7802	MF7802	N/A	
Power Harmonic Measurement and Voltage Fluctuations						
	Instrument	Manufacturer	Model No.	Serial No.	Calibration Due Date	Note
■	HARMONIC/ FLICKER TEST SYSTEM	EMC PARTNER	HARMONICS1000	080	2017-05-20	
EMS						
	Instrument	Manufacturer	Model No.	Serial No.	Calibration Due Date	Note
Electrostatic Discharge(IEC61000-4-2)						
■	ESD SIMULATOR	NOISEKEN	ESS-100L(A)	H367624	2017-05-10	
■	HCP (1.6M x 0.8M)	VTDC	WITH TWO 470k OHM CABLE	N/A	NCR	
■	VCP (0.5M x 0.5M)	VTDC	WITH TWO 470k OHM CABLE	N/A	NCR	
■	GROUND PLANE (3.4M x 2.4m)	VTDC	N/A	N/A	NCR	
Radiated Susceptibility Measurement (IEC61000-4-3)						
■	EPM Series Power Meter	Keysight	N1914A-CFG001	MY55316009	2017-12-30	



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■	Anechoic Chamber	TDK	8*4*4 (m)	CAC-3	2017-10-29	
■	EXG Analog Signal Generator	Keysight	N5171B	MY53051396	2017-12-29	
■	Power Amplifier	AR	250W1000BM1	344582	2017-12-30	
■	Power Sensor	Keysight	E9304A	MY55320006	2017-12-30	
■	V-Log Periodic Antenna	TDK	VLA-8001	130979	2017-01-09	
■	Measurement Software	TDK	TDK Radiated Immunity lab version:10.73	N/A	N/A	
Conducted Susceptibility Measurement (IEC61000-4-6)						
■	Coupled Decoupled Network	TESEQ	CDN M2/M3	41073	2017-02-26	
■	EXG Analog Signal Generator	Keysight	N5171B	MY53051423	2017-12-29	
■	Power Amplifier	AR	75A250W	034458	2017-12-29	
■	Measurement Software	TDK	TDK Conducted Immunity lab version:10.73	N/A	N/A	
IEC61000-4-4, IEC61000-4-5, IEC61000-4-8, IEC61000-4-11						
■	EFT GENERATOR	SCHAFFNER	BEST EMC	199935A020SC	2017-05-14	
□	COUPLING NETWORK	EMC-PARTNER	CNEFT1000	176	2017-05-14	
■	SURGER GENERATOR	SCHAFFNER	BEST EMC	199935A020SC	2017-05-14	
□	CDN	FRANKONIA	CDN M2+M3	A2210191	2017-04-14	
□	ATTENUATION	BIRD	DAM75W (6dB)	1143	2017-05-14	
□	EM LAMP	FRANKONIA	EMCL	132A1143/2012	2017-05-14	
□	MAGNETIC FIELD TESTER	EMC-PARTNER	MF-1000	MF1000-1-51	2017-05-14	
□	EMC Partner Capacitive Coupling Clamp	TESEQ	MFO 6502	106	2017-05-14	



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■	DIPS TESTER	EMC PARTNER	EXT-TRA3000D	EXT-TRA3000D-1510	2017-05-14	
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※ Calibration interval of instruments listed above is one year .

※ ■ : Instruments used in EUT test items

※ □ : Instruments not used in EUT test items

2.3 TEST PERFORMED

Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver which resolution bandwidth is set at 9 KHz.

Radiated emissions were investigated over the frequency range from 30MHz to 1000MHz using a receiver which resolution bandwidth is set at 120KHz. Radiated measurement was performed at distance that from an antenna to EUT is 3 meters.



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2.4 APPENDIX

Appendix A: Measurement Procedure for Main Power Port Conducted Emissions

The measurements are performed in a VTDC lab room; The EUT was placed on non-conductive 1.0m x 1.5m table, which is 0.8 meters above an earth-grounded.

Power to the EUT was provided through the LISN which has the Impedance (50ohm/50uH) vs. Frequency Characteristic in accordance with the standard. Powers to the LISNs were filtered to eliminate ambient signal interference and these filters were bonded to the ground plane. Peripheral equipment required to provide a functional system (support equipment) for EUT testing was powered from the second LISN through a ganged, metal power outlet box which is bonded to the ground plane at the LISN.

If the EUT is supplied with a flexible power cord, the power cord length in excess of the distance separating the EUT from the LISN shall be folded back and forth at the center of the lead so as to form a bundle not exceeding 40cm in length. If the EUT is provided with a permanently coiled power cord, bundling of the cord is not required. If the EUT is supplied without a power cord, the EUT shall be connected to the LISN by a power cord of the type specified by the manufacturer which shall not be longer than 1 meter. The excess power cord shall be bundled as described above. If a non-flexible power cord is provided with the EUT, it shall be cut to the length necessary to attach the EUT to the LISN and shall not be bundled.

The interconnecting cables were arranged and moved to get the maximum measurement. Both the line of power cord, hot and neutral, was measured.

The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.





Appendix B: Test Procedure for Radiated Emissions

Preliminary Measurements in the Anechoic Chamber

The radiated emissions are initially measured in the anechoic chamber at a measurement distance of 3 meters. Desktop EUT are placed on a wooden stand 0.8 meter in height. The measurement antenna is 3 meters from the EUT. The test setup in anechoic chamber is the same as open site. The turntable rotated 360°. The antenna height is 1m. The primary objective of the radiated measurements in the anechoic chamber is to identify the frequency spectrum in the absence of the electromagnetic environment existing on the open test site. The frequencies can then be pre-selected on the open test site to obtain the corresponding amplitude. The initial scan is made with the spectrum analyzer in automatic sweep mode. The spectrum peaks are then measured manually to determine the exact frequencies.

Measurements on the Open Site or Chamber

The radiated emissions test will then be repeated on the open site or chamber to measure the amplitudes accurately and without the multiple reflections existing in the shielded room. The EUT and support equipments are set up on the turntable. Desktop EUT are set up on a wooden stand 0.8 meter above the ground.

For the initial measurements, the receiving antenna is varied from 1-4 meter height and is changed in the vertical plane from vertical to horizontal polarization at each frequency. Both reading are recorded with the quasi-peak detector with 120 KHz bandwidth. For frequency between 30 MHz and 1000MHz, the reading is recorded with peak detector or quasi-peak detector.

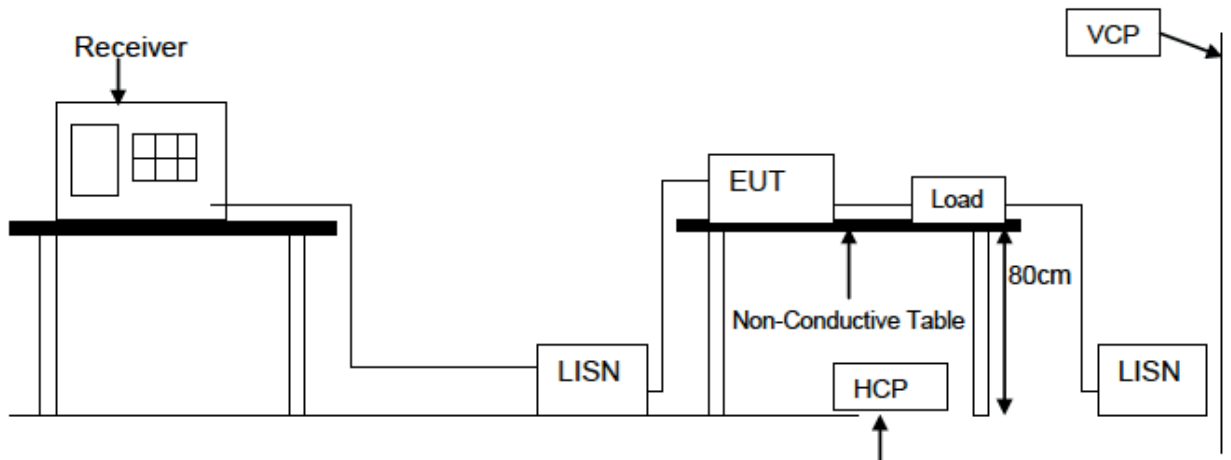
At the highest amplitudes observed, the EUT is rotated in the horizontal plane while changing the antenna polarization in the vertical plane to maximize the reading. The interconnecting cables were arranged and moved to get the maximum measurement. Once the maximum reading is obtained, the antenna elevation and polarization will be varied between specified limits to maximize the readings.





3. CONDUCTED EMISSION MEASUREMENT

3.1 TEST SET-UP



3.2 LIMIT

Frequency range (MHz)	CLASS A		CLASS B	
	QP dB(uV)	Average dB(uV)	QP dB(uV)	Average dB(uV)
0.15-0.5	79 dBuV	66 dBuV	66 - 56 dBuV	56 - 46 dBuV
0.5-5.0	73 dBuV	60 dBuV	56 dBuV	46 dBuV
5.0-30.0	73 dBuV	60 dBuV	60 dBuV	50 dBuV

Remark: In the above table, the tighter limit applies at the band edges.

3.3 TEST PROCEDURE

The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). It provides a 50 ohm / 50 μH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50 ohm / 50 μH coupling impedance with 50 ohm termination. (Please refer to the block diagram of the test setup and photograph.)

Both sides of AC line are checked for the maximum conducted emission interference. In order to find the maximum emissions, the relating positions of equipment and all of the interference cables must be changed according to EN 55032 regulation: The measurement procedure on conducted emission interference.

The resolution bandwidth of the field strength meter is set at 9 KHz.



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3.4 TEST SPECIFICATION

According to EN 55032

(Please refer to Page 4 for dated references which are related to the standard as mentioned above)

3.5 RESULT: PASSED

EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

Frequency Range:	150KHz--30MHz
Detector Function:	Quasi-Peak / Average Mode
Resolution Bandwidth:	9KHz

3.6 TEST DATA:

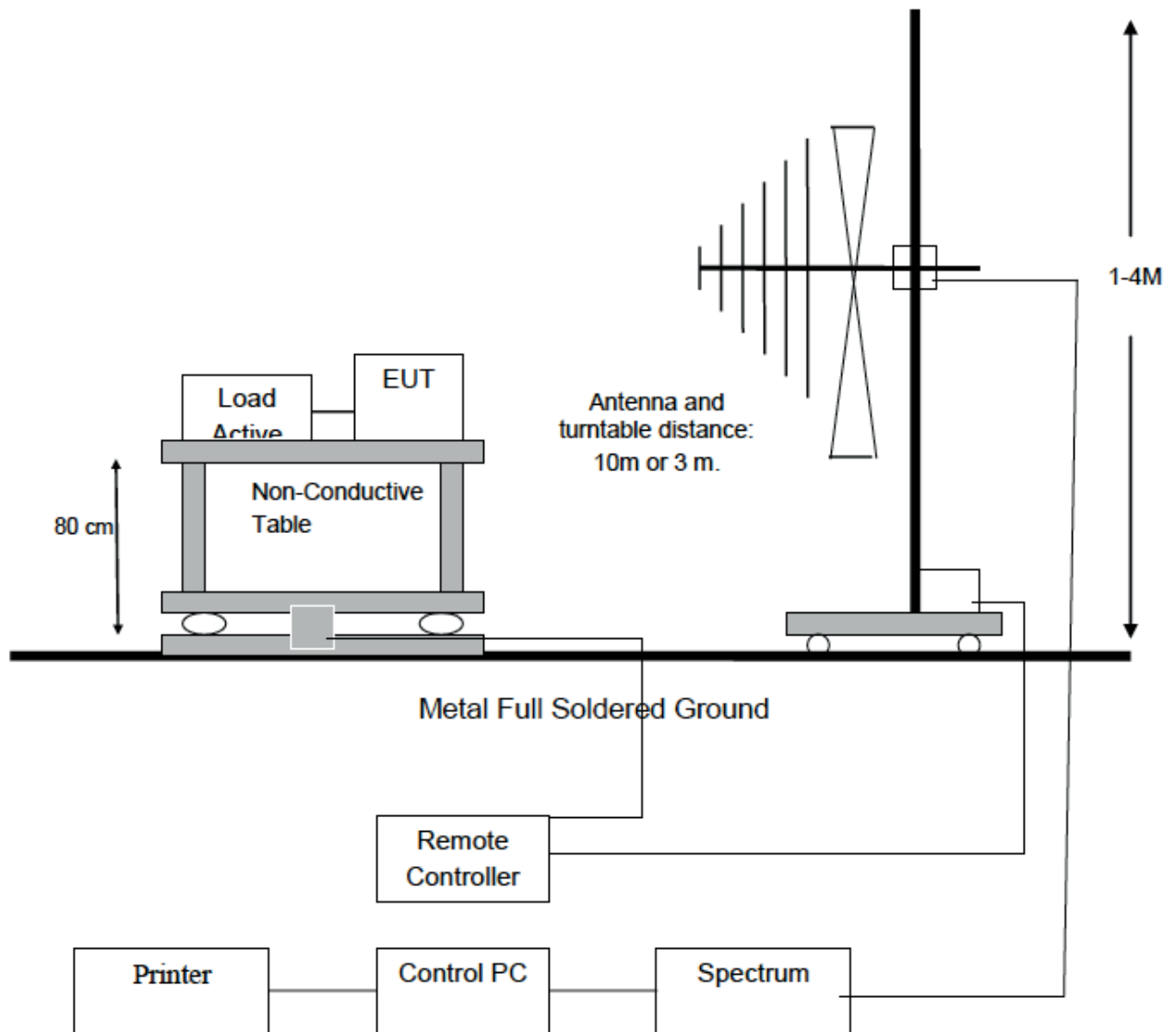
Please refer to appendix 2





4. RADIATED EMISSION MEASUREMENT

4.1 TEST SETUP



**4.2 LIMIT**

Frequency	Class A		Class B	
MHz	Distance (Meter)	Limit dB μ V/m	Distance (Meter)	Limit dB μ V/m
30 ~ 230	3	50	3	40
230 ~ 1000	3	57	3	47

For Class A

Frequency range GHz	Average limit dB(μ V/m)	Peak limit dB(μ V/m)
1 to 3	56	76
3 to 6	60	80
NOTE The lower limit applies at the transition frequency.		

For Class B

Frequency range GHz	Average limit dB(μ V/m)	Peak limit dB(μ V/m)
1 to 3	50	70
3 to 6	54	74
NOTE The lower limit applies at the transition frequency.		

Remark: In the above table, the tighter limit applies at the band edges.

4.3 TEST PROCEDURE

The EUT and its simulators are placed on turn table, non-conductive and wooden table, which is 0.8 meter above ground. The turn table rotates 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that distance from antenna to the EUT is 3 meters. For the frequency range is above 1 GHz, the EUT was positioned such that distance from antenna to the EUT is 3 meters.

The antenna is moved up and down between 1 meter to 4 meters to receive the maximum emission level.

Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission, all of the interference cables must be





manipulated according to EN 55032 regulation: the test procedure of the radiated emission measurement.

The bandwidth set on the field strength is 120 KHz when the frequency range is below 1GHz. The bandwidth set on the field strength is 1 MHz when the frequency range is above 1GHz.

4.4 TEST SPECIFICATION

According to EN 55032

(Please refer to Page 4 for dated references which are related to the standard as mentioned above)

4.5 RESULT: PASSED

4.6 TEST DATA:

Please refer to appendix 2



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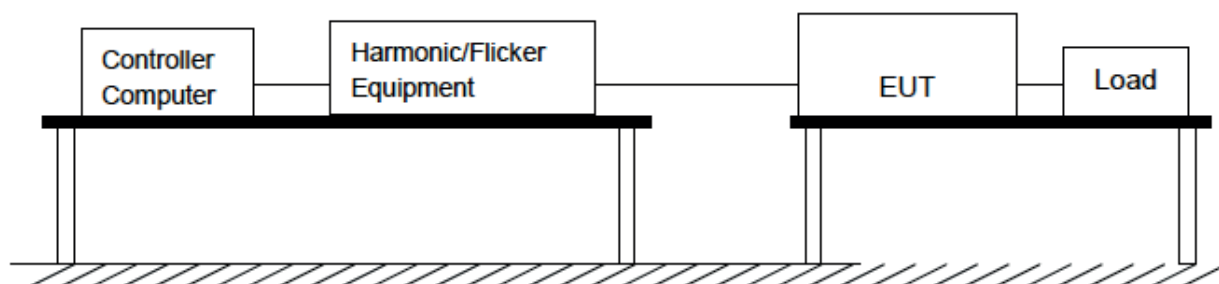
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5. POWER HARMONIC MEASUREMENT

5.1 TEST SETUP



5.2 LIMIT OF HARMONIC CURRENT

EN 61000-3-2/IEC 61000-3-2					
Equipment Category	Max. permissible harmonic current (in Amperes)	Equipment Category	Harmonic Order n	Max. permissible harmonic current (in A) (mA/w)	
Class A	Same as Limits Specified in 4-2.1, Table - I, but only odd harmonics required	Class D	3	2.30	3.4
			5	1.14	1.9
			7	0.77	1.0
			9	0.40	0.5
			11	0.33	0.35
			13 ≤ n ≤ 39	see Table I	3.85/n
only odd harmonics required					

5.3 TEST PROCEDURE

- The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions.
- The classification of EUT is according to section 5 of EN 61000-3-2. The EUT is classified as follows:

Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes.

Class B: Portable tools. Arc welding equipment which is not professional equipment.

Class C: Lighting equipment.

Class D: Equipment having a specified power less than or equal to 600 W of the following types: Personal computers and personal computer monitors and television receivers.





- c. The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen.

5.4 TEST SPECIFICATION

According to EN 61000-3-2

(Please refer to Page 4 for dated references which are related to the standard as mentioned above)

5.5 RESULT: N/A

5.6 TEST DATA: N/A



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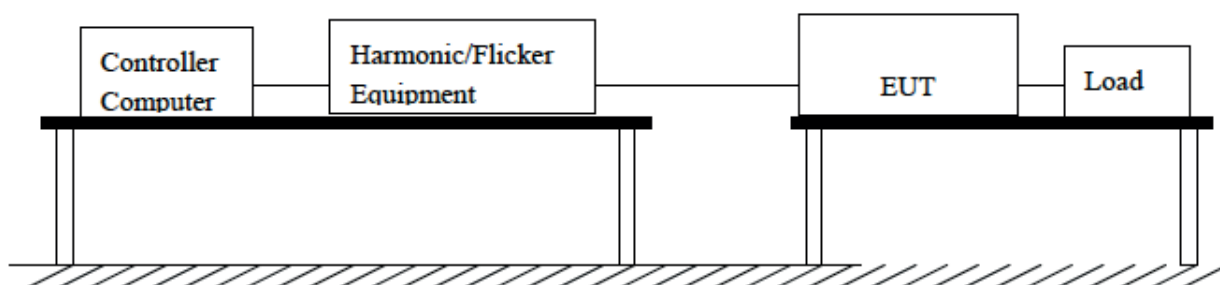
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6. VOLTAGE FLUCTUATIONS

6.1 TEST SETUP



6.2 LIMITS OF VOLTAGE FLUCTUATION AND FLICKSMEASUREMENT

Tests	Limits		Descriptions
	IEC555-3	IEC/EN 61000-3-3	
Pst	≤ 1.0, Tp= 10 min.	≤ 1.0, Tp= 10 min.	Short Term Flicker Indicator
Plt	N/A	≤ 0.65, Tp=2 hr.	Long Term Flicker Indicator
dc	≤ 3 %	≤ 3.3 %	Relative Steady-State V-Chang
dmax	≤ 4 %	≤ 4 %	Maximum Relative V-change
d (t)	N/A	≤ 3.3% for > 500 ms	Relative V-change characteristic

6.3 TEST PROCEDURE

- The EUT is supplied in series with reference impedance from a power source with the voltage and frequency as the nominal supply voltage and frequency of the EUT.
- Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in Clause 6.0/4.0 of IEC 61000-3-3 depend on which standard adopted for compliance measurement.
- All types of harmonic current and/or voltage fluctuation in this report are assessed by direct measurement using flicker-meter.

6.4 TEST SPECIFICATION

According to EN 61000-3-3

(Please refers to Page 4 for dated references which are related to the standard as mentioned above)

6.5 RESULT: N/A

6.6 TEST DATA: N/A



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7. ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)

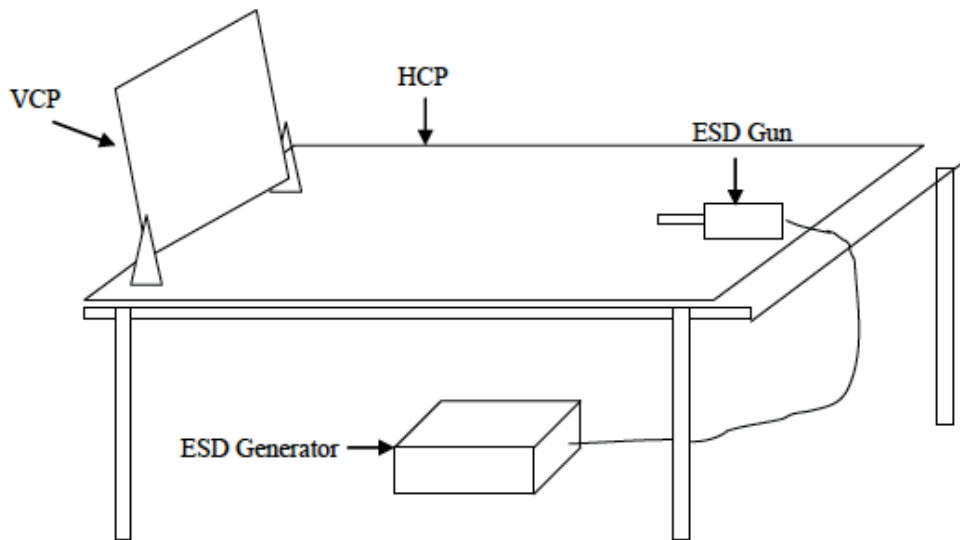
7.1 TEST SPECIFICATION

According To IEC 61000-4-2

According To EN 55024

(Please refer to Page 4 for dated references which are related to the standard as mentioned above)

7.2 TEST SETUP



7.3 TEST LEVEL

Item	Test Specification	Unit	Performance Criteria
Enclosure Room	±2, 4, 8 (Air Discharge)	KV (Charge Voltage)	B
Electrostatic Discharge	±2,4 (Contact Discharge)		
Time between test	<u>1</u>	sec	

Number of test: 10 Discharges / Test point / Polarity / Level

Particular requirements: at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points.

When the measurement was taken, The ESD discharger was performed in single discharge. For the single discharge time between successive single discharges will keep on one second. It was at least ten single discharges with positive and negative at the same selected pointed. The selected pointed, which was performed with electrostatic discharge, was marked on the red label on the EUT Indirect applicant of discharge to the EUT

Vertical Coupling Plane (VCP)



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The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the discharge electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge. It was at least ten singles discharges with positive and negative at the same selected point.

Horizontal Coupling Plane (HCP)

The coupling plane is placed under the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the discharge electrode touching the coupling.

The four faces of the EUT will be performed with electrostatic discharge. It was at least ten single discharges with positive and negative at the same selected pointed.

7.4TEST RESULT.

Model: YM-128

Temperature: 24°C , Humidity: 43 % RH

Test Item : Direct Discharge																
Contact Discharge								Air Discharge								
2KV		4KV		KV		KV		2KV		4KV		6KV		8KV		
+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	
/	/	/	/	/	/	/	/	A	A	A	A	A	A	A	A	
Test Item : Indirect Discharge																
Contact Discharge																
	2KV		4KV		KV		KV									
	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
1	A	A	A	A	A	A	/	/	/	/	/	/	/	/	/	/

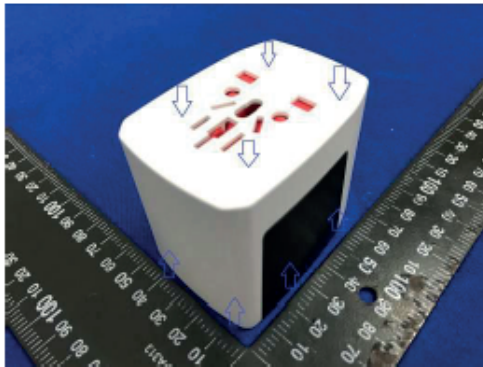
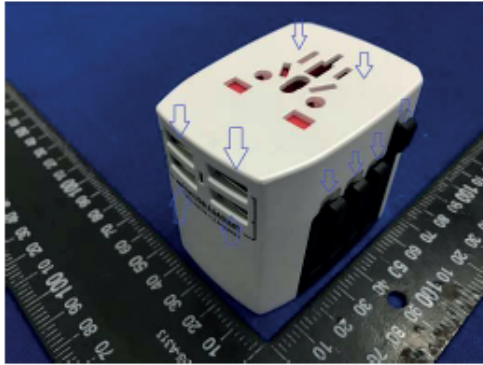
Performance Criteria:

- A) Normal performance within the specification;
 - B) Temporary degradation or less of function of performance which is self recoverable;
 - C) Temporary degradation or less of function or perform. Which requires. operate intervention or system reset;
 - D) Degradation or loss of function which is not recoverable due to damage of equipment (components) or software, or loss of data;
- "/" : no test.





Test Points please refer below photos.



Red Dot: Contact / Blue Dot: Air

Final Result: **PASSED**

Remark:



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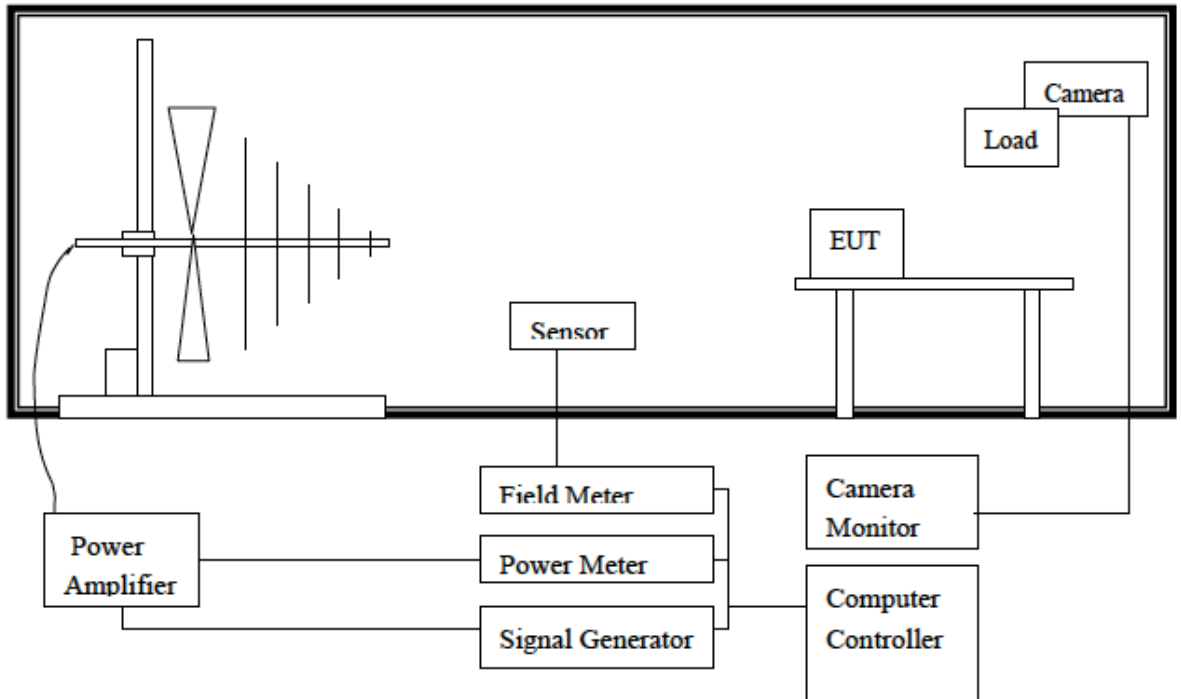
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8. RADIATED SUSCEPTIBILITY MEASUREMENT (RS)

8.1 TEST SETUP



8.2 TEST SPECIFICATION

According To IEC 61000-4-3

According To EN 55024

(Please refer to Page 4 for dated references which are related to the standard as mentioned above)

8.3 TEST LEVEL

Item	Test Specification	Unit	Performance Criteria
Radio –Frequency	80~1000	MHz	A
Electromagnetic Field	3	V/m (unmodulated, rms)	
Amplitude Modulated	80	%AM (1KHz)	



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8.4 TEST PROCEDURE

The EUT and load, which are placed on a wooden table whose height is 0.8 meter aboveground, are placed with one coincident with the calibration plane such that the distance from antenna to the EUT is 3 meters.

Both horizontal and vertical polarization of the antenna position and four sides of the EUT are set on measurement. In order to judge the EUT performance, a CCD camera is used to monitor the situation of EUT.

All the scanning conditions are as follows:

Condition of Test	
Basic Standard:	IEC 61000-4-3
Field Strength	3V/m
Radiated Signal	AM 80% modulated with 1KHz
Scanning Frequencies	80MHz ~ 1000MHz
Dwell Time	At least 3 seconds
Frequency step size	1%
The rate of swept of frequency	1.5 x 10 ⁻³ decades/s
Antenna Polarity	HORIZONTAL & VERTICAL
The four sides of EUT are tested	FRONT, REAR, RIGHT, LEFT

TEST RESULT

Model: YM-128

Temperature: 23°C , Humidity: 46 % RH

ANT SIDE	3V HORIZONTAL	3V VERTICAL	RESULT
FRONT	A	A	PASSED
REAR	A	A	PASSED
RIGHT	A	A	PASSED
LEFT	A	A	PASSED

Performance Criteria:

- A) Normal performance within the specification;
- B) Temporary degradation or less of function of performance which is self recoverable;
- C) Temporary degradation or less of function or perform. Which requires. operate intervention or system reset;
- D) Degradation or loss of function which is not recoverable due to damage of equipment (components) or software, or loss of data;

"P" : no test.

Final Result: **PASSED**

Remark:



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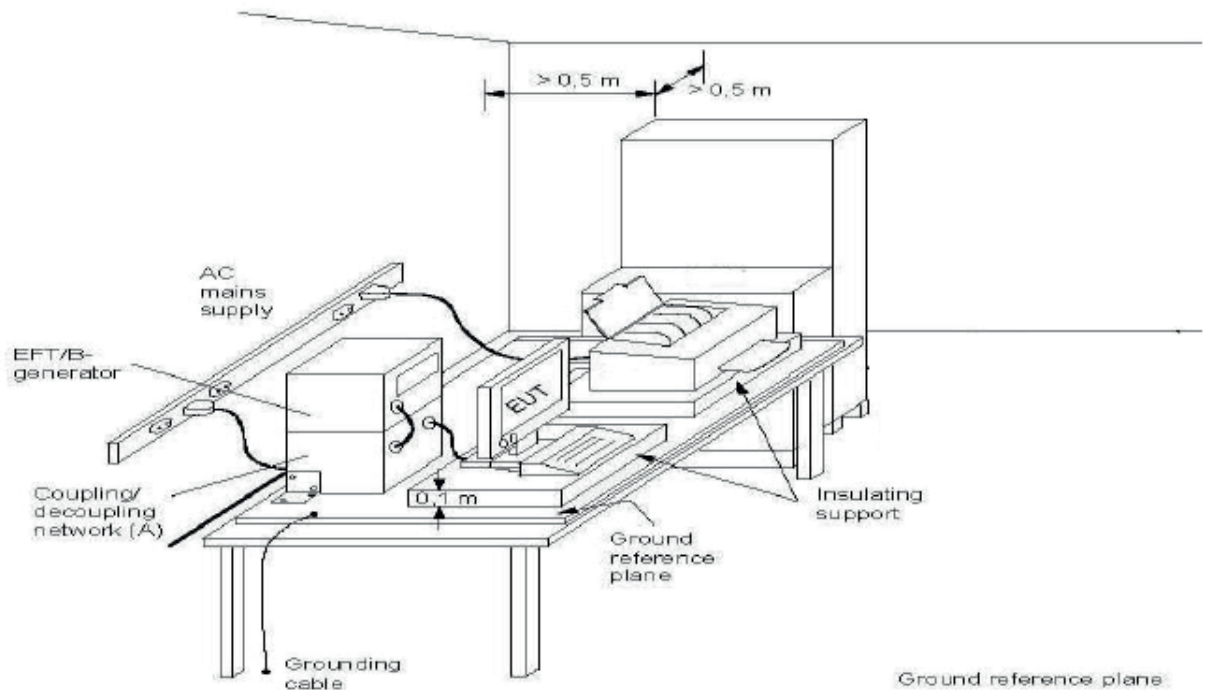
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9. ELECTRICAL FAST TRANSIENT/BURST (EFT)

9.1 TEST SETUP



9.2 TEST SPECIFICATION

According To IEC 61000-4-4

According To EN 55024

(Please refer to Page 4 for dated references which are related to the standard as mentioned above)

9.3 TEST PROCEDURE

The EUT and load are placed on a ground reference plane and insulated from it by an insulating support $0,1\text{ m} \pm 0,01\text{ m}$ thick. The minimum area of the ground reference plane is $1\text{ m} \times 1\text{ m}$. It also projected beyond the EUT by at least 0.1meter on all sides.

For Input and Output AC power or DC Input and DC Output Power Ports:

The EUT is connected with the power mains through a coupling device that directly couples the EFT interference signal.

Each of the line and nature conductors is impressed with burst noise for 1 minute.

For Protective Earth Port:

The EUT is connected to the power mains through a coupling device that directly couples the EFT interference signal. The protective earth line (PE) is impressed with burst noise for 1 minute.

The length of power cord between the coupling device and the EUT shall be $0.5\text{ m} \pm 0.05\text{ m}$.

For signal Lines and Control Lines Test:



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The EFT interference signal is through a coupling clamp device couples to the signal and control lines of the EUT with burst noise for 1 minute.

9.4 TEST LEVEL

Item	Test Specification	Unit	Performance Criteria
Test Voltage	±0.5, ±1	KV (Peak)	B
Pulse Rise time & Duration	5/50	Tr/Ts (ns)	
Pulse Repetition	5	Rep. Frequency (KHz)	

9.5 TEST RESULT

Model: YM-128

Temperature: 24°C , Humidity: 45 % RH

Test Point/ Mode / Result		0.5 KV		1 KV		2 KV	
		+	-	+	-	+	-
Power Line	L	/	/	A	A	/	/
	N	/	/	A	A	/	/
	G	/	/	/	/	/	/
Signal Line Clamp Test		/	/	/	/	/	/

Performance Criteria:

- A) Normal performance within the specification;
 - B) Temporary degradation or loss of function of performance which is self recoverable;
 - C) Temporary degradation or loss of function or perform. Which requires. operate intervention or system reset;
 - D) Degradation or loss of function which is not recoverable due to damage of equipment (components) or software, or loss of data;
- "/" : no test.

Final Result: **PASSED**

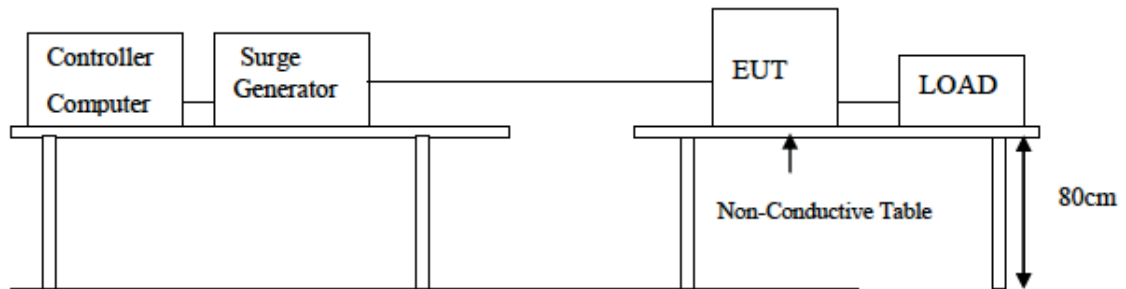
Remark:





10. SURGE

10.1 TEST SETUP



10.2 TEST SPECIFICATION

According To IEC 61000-4-5

According To EN 55024

(Please refer to Page 4 for dated references which are related to the standard as mentioned above)

10.3 TEST LEVEL

Item	Test Specification	Unit	Performance Criteria
DC Input and DC Output Power Ports			
Surge	1.2/50(8/20)	Tr/Ts (μs)	B
Line to Ground	±0.5	KV	
Line to Line	±0.5	KV	
AC Input and AC Output Power Ports			
Surge	1.2/50(8/20)	Tr/Ts (μs)	B
Line to Ground	±2	KV	
Line to Line	±1	KV	
Polarity	POSITIVE / NEGATIVE		
Phase shifting in a range between 0°/90°/180°/270°			

10.4 TEST PROCEDURE

The EUT and its load are placed on a table which is 0.8 meter height. The length of power cord between the coupling device and the EUT shall be 2 meters or less.

For Input and Output AC Power or DC Input and DC Output Power Ports:



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The EUT is connected to the power mains through a coupling device that directly couples the Surge interference signal.

The Surge noise shall be applied synchronized to the voltage phase at 0°, 90°, 180°, 270° and the peak value of the AC voltage wave. (5 Positive and 5 Negative)

Each of line-earth and line-line is impressed with a sequence of five surge voltages with interval of 1 minute.

10.5 TEST RESULT

Model: YM-128

Temperature: 24°C, Humidity: 46 % RH

Phase/Polarity/Mode/Result			0	90	180	270
1KV	Signal Lines	+	/	/	/	/
		-	/	/	/	/
1KV	Line	+	A	A	A	A
	Neutral	-	A	A	A	A
2KV	Line	+	/	/	/	/
	Neutral	-	/	/	/	/
2KV	Line	+	/	/	/	/
	Ground	-	/	/	/	/
	Neutral	+	/	/	/	/
	Ground	-	/	/	/	/

Performance Criteria:

- A) Normal performance within the specification;
- B) Temporary degradation or less of function of performance which is self recoverable;
- C) Temporary degradation or less of function or perform. Which requires. operate intervention or system reset;
- D) Degradation or loss of function which is not recoverable due to damage of equipment (components) or software, or loss of data;

"/" : no test.

Final Result: **PASSED**

Remark:



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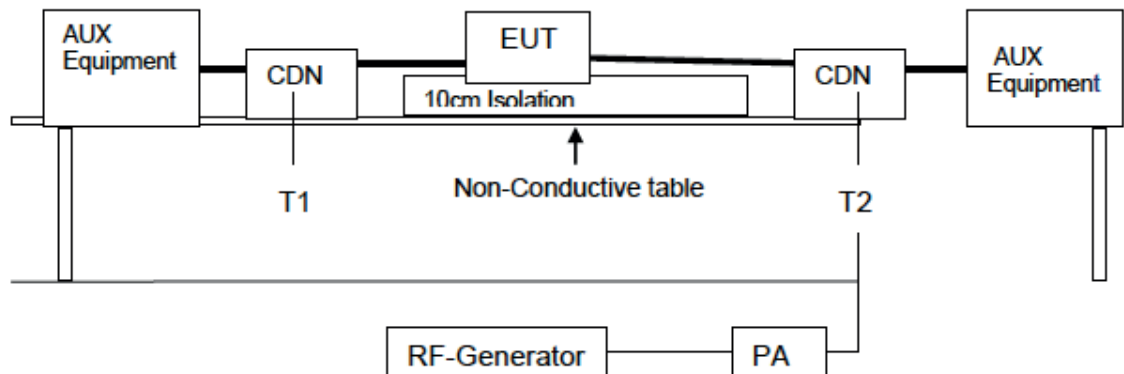
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11. IMMUNITY TEST TO CS CONDUCTED DISTURBANCE (CS)

11.1 TEST SETUP



11.2 TEST SPECIFICATION

According To IEC 61000-4-6

According To EN 55024

(Please refer to Page 4 for dated references which are related to the standard as mentioned above)

11.3 TEST LEVEL

Item	Test Specification	Unit	Performance Criteria
Ports for Signal Lines			
Radio-Frequency	0.15 ~ 80	MHz	A
Common Mode	3	V (rms, Unmodulated)	
Amplitude Modulated	80	%AM (1KHz)	
	150	Source Impedance	
Ac Input and AC Output and DC Input and DC output Ports and Functional Earth Ports			
Radio-Frequency	0.15 ~ 80	MHz	A
Common Mode	3	V (rms, Unmodulated)	
Amplitude Modulated	80	%AM (1KHz)	
	150	Source Impedance	



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11.4 TEST PROCEDURE

The EUT are placed on a table which is 0.8 meter height and a ground reference plane on the table, the EUT are placed upon table and use 10cm insulation between the EUT and ground reference plane.

For AC Input and AC Output Power or DC Input and DC Output Power Ports

The EUT is connected to the power mains through a coupling and decoupling networks for Power supply lines. It also directly couples the disturbance signal into EUT.

Use CDN-M2 for two wires or CDN-M3for three wires.

For Signal Lines and Control Lines Test:

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

All scanning frequencies conditions are as following:

Condition of Test	
Basic Standard	IEC 61000-4-6
Field Strength	3Vr.m.s
Radiated Signal	AM 80% modulated with 1KHz
Scanning Frequencies	0.15MHz ~ 80MHz
Dwell Time	At least 3 seconds
Frequency step size Δf	1%
The rate of swept of frequency	1.5×10^{-3} decades/s

11.5 TEST RESULT

Model: YM-128

Temperature: 24°C, Humidity: 48 % RH

Test Ports	Frequency(MHz) Range	EUT Condition	3V(rms) Field Strength	10V(rms) Field Strength
Input / Output a. c. power	0.15 ----- 80	NORMAL	A	/
Input / Output d. c.	0.15 ----- 80	NORMAL	/	/
Signal lines	0.15 ----- 80	NORMAL	/	/





Performance Criteria:

- A) Normal performance within the specification;
 - B) Temporary degradation or less of function of performance which is self recoverable;
 - C) Temporary degradation or less of function or perform. Which requires. operate intervention or system reset;
 - D) Degradation or loss of function which is not recoverable due to damage of equipment (components) or software, or loss of data;
- "P" : no test.

Final Result: **PASSED**

Remark:



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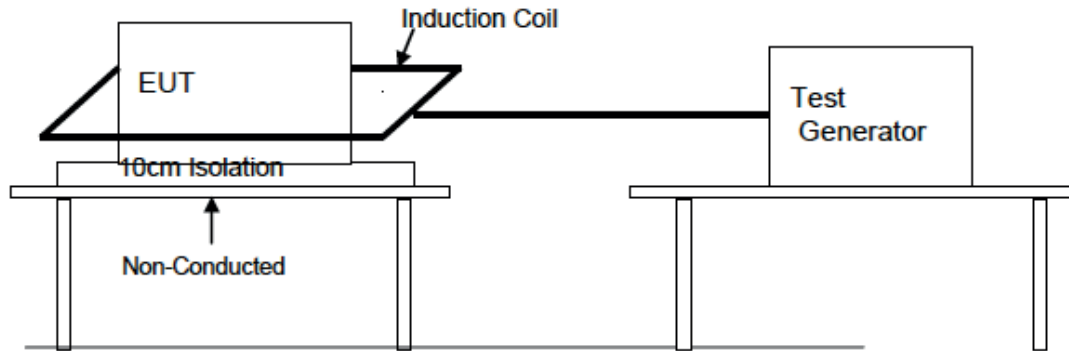
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12. POWER FREQUENCY MAGNETIC FIELD (MAGNETIC)

12.1 TEST SETUP



12.2 TEST SPECIFICATION

According To IEC 61000-4-8

According To EN 55024

(Please refer to Page 4 for dated references which are related to the standard as mentioned above)

12.3 TEST LEVEL

Item	Test Specification	Unit	Performance Criteria
Power-Frequency	50	Hz	A
Magnetic Field	1	A/m	

12.4 TEST PROCEDURE

The EUT and its load are placed on a table that is 0.8 meter above the metal ground plane dimension is at least 1 meter x 1 meter. The test magnetic field shall be placed at least than 3 meter distance from the induction coil.

The test magnetic field shall be applied by the immersion method to the EUT. The induction coil shall be rotated by 90° in order to expose the EUT to the test field with different orientation (X, Y, Z orientation).

12.5 TEST RESULT: N/A



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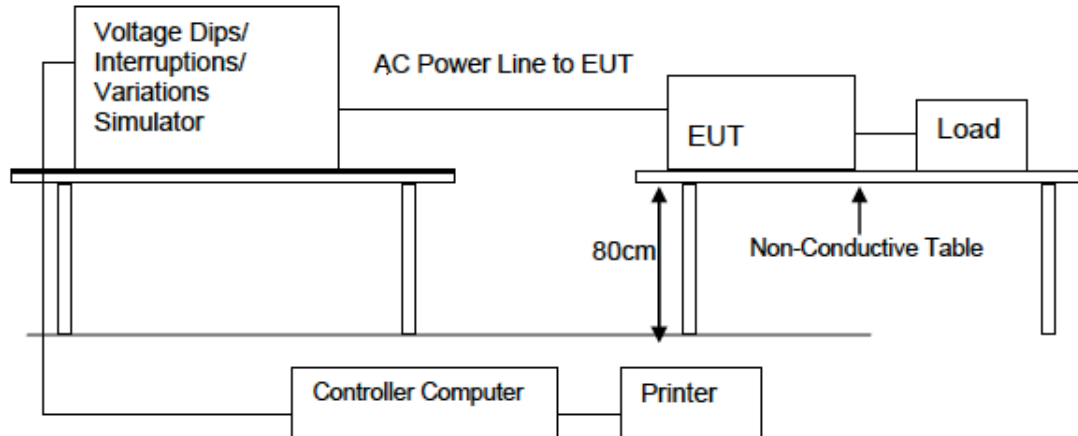
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13. VOLTAGE DIPS AND INTERRUPTION MEASUREMENT

13.1 TEST SETUP



13.2 TEST SPECIFICATION

According To IEC 61000-4-11

According To EN 55024

(Please refer to Page 4 for dated references which are related to the standard as mentioned above)

13.3 TEST LEVEL

Class ^a	Test level and durations for voltage dips				
Class 1	Case-by-case according to the equipment requirements				
Class 2	0 % during 1/2 cycle	0 % during 1 cycle	70 % during 25/30 ^c cycles		
Class 3	0 % during 1/2 cycle	0 % during 1 cycle	40 % during 10/12 ^c cycles	70 % during 25/30 ^c cycles	80 % during 250/300 ^c cycles
Class X ^b	X	X	X	X	X

a: Classes as per IEC 61000-2-4.

b: To be defined by product committee. For equipment connected directly or indirectly to the public network, the levels must not be less severe than Class 2.

c: "25/30 cycles" means "25 cycles for 50 Hz test" and "30 cycles for 60 Hz test".

Class ^a	Test level and durations for short interruptions (t _s) (50Hz / 60Hz)
Class 1	Case-by-case according to the equipment requirements
Class 2	0 % during 250/300 ^c cycles
Class 3	0 % during 250/300 ^c cycles



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Class X ^b	X
a: Classes as per IEC 61000-2-4. b: To be defined by product committee. For equipment connected directly or indirectly to the public network, the levels must not be less severe than Class 2. c: "250/300 cycles" means "250 cycles for 50 Hz test" and "300 cycles for 60 Hz test".	

13.4 TEST PROCEDURE

The EUT and its load are placed on a wooden table which is 0.8 meter above a metal ground plane which dimension is 1 meter x 1 meter, the thickness is 0.65mm. It projected beyond the EUT by at least 0.1 meter on all sides. The power cord shall be used the shortest power cord as specified by the manufacturer.

For Voltage Dips / Interruption Test:

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

The EUT shall be tested for 30% voltage dips of supplied voltage and duration time is 10ms, for 60% voltage dips of supplied voltage and duration time is 100ms with a sequence of three voltage dips with intervals of 10 seconds, and for 95% voltage interruption of supplied voltage and the duration time is 5000ms with a sequence of three voltage interruptions with intervals of 10 seconds.

Voltage phase shifting are shall occur at 0°, 45°, 90°, 135°, 180°, 225°, 270°, 315° of the voltage.





13.5 TEST RESULT

Model: YM-128

Temperature: 24°C , Humidity: 47 % RH

Test Status	Test Level % U _T	Reduction (%)	Duration	Performance Criteria
Voltage Dips	<5	>95	0.5 (periods)	A
	70	30	25 (periods)	A
Voltage interruptions	<5	>95	250(periods) 5000ms	C

Performance Criteria:

- A) Normal performance within the specification;
- B) Temporary degradation or less of function of performance which is self recoverable;
- C) Temporary degradation or less of function or perform. Which requires. operate intervention or system reset;
- D) Degradation or loss of function which is not recoverable due to damage of equipment (components) or software, or loss of data;

"/" : no test.

Final Result: PASSED

Remark:





14. PERFORMANCE CRITERIA

- A. The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.
- B. The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
- C. Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.





15. MEASUREMENT UNCERTAINTY

Measurement Item	Measurement Frequency	Polarization	Uncertainty
Conducted Emission	9 kHz ~ 30. MHz	LINE/NEUTRAL	2.12 dB
Radiated Emission	30 MHz ~ 1,000 MHz	Vertical / Horizontal	2.17 dB
	1,000 MHz ~ 6,000 MHz	Vertical / Horizontal	3.04 dB



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Appendix 1



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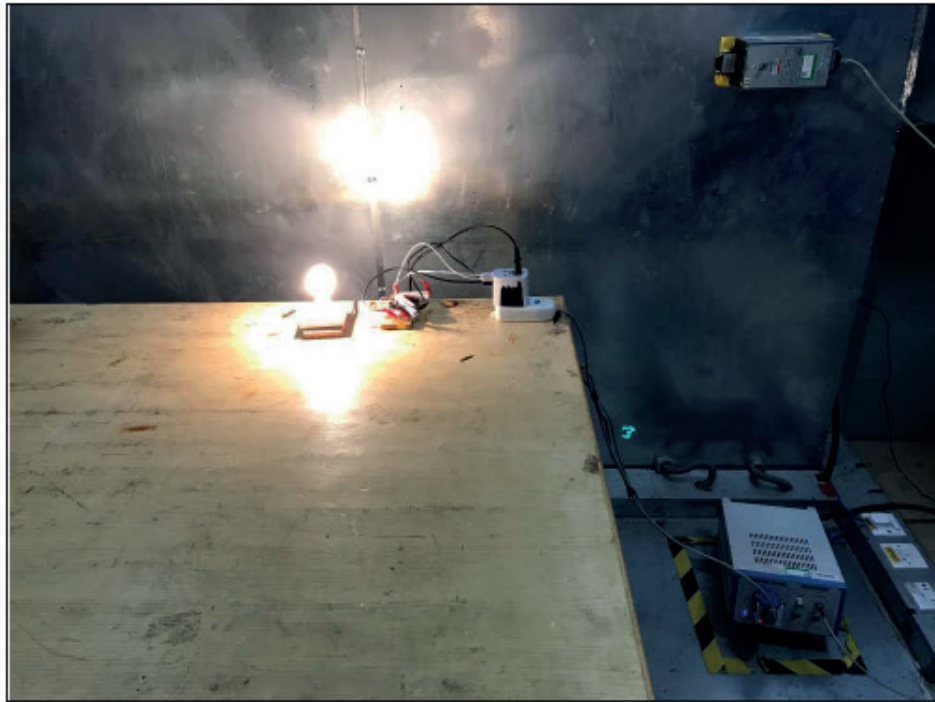


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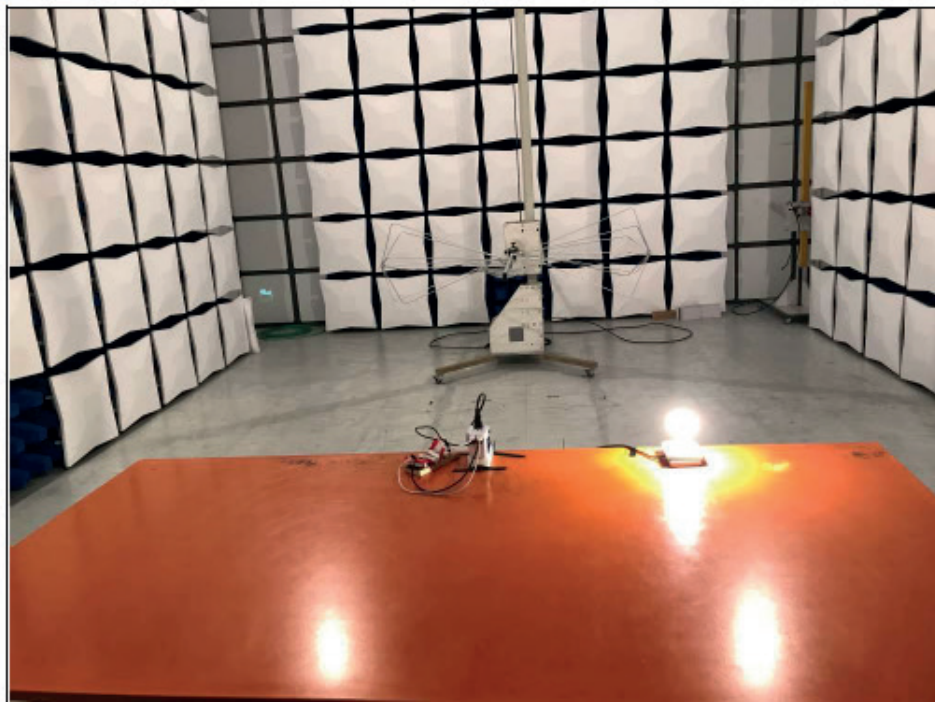
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- Conducted emission test



- Radiated emission test :



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Appendix 2



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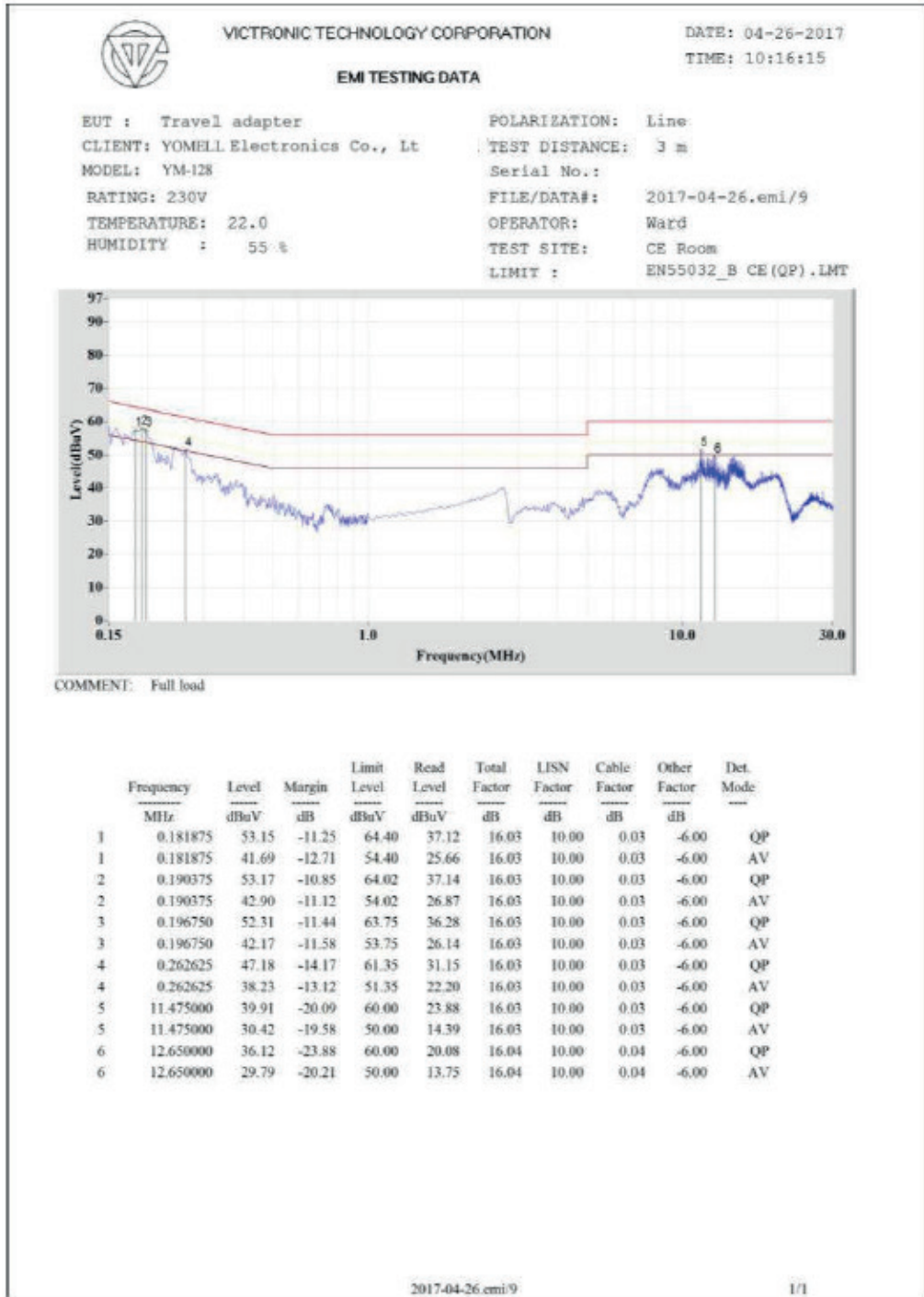


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Test Data Of Conducted Emission Measurement (Line)



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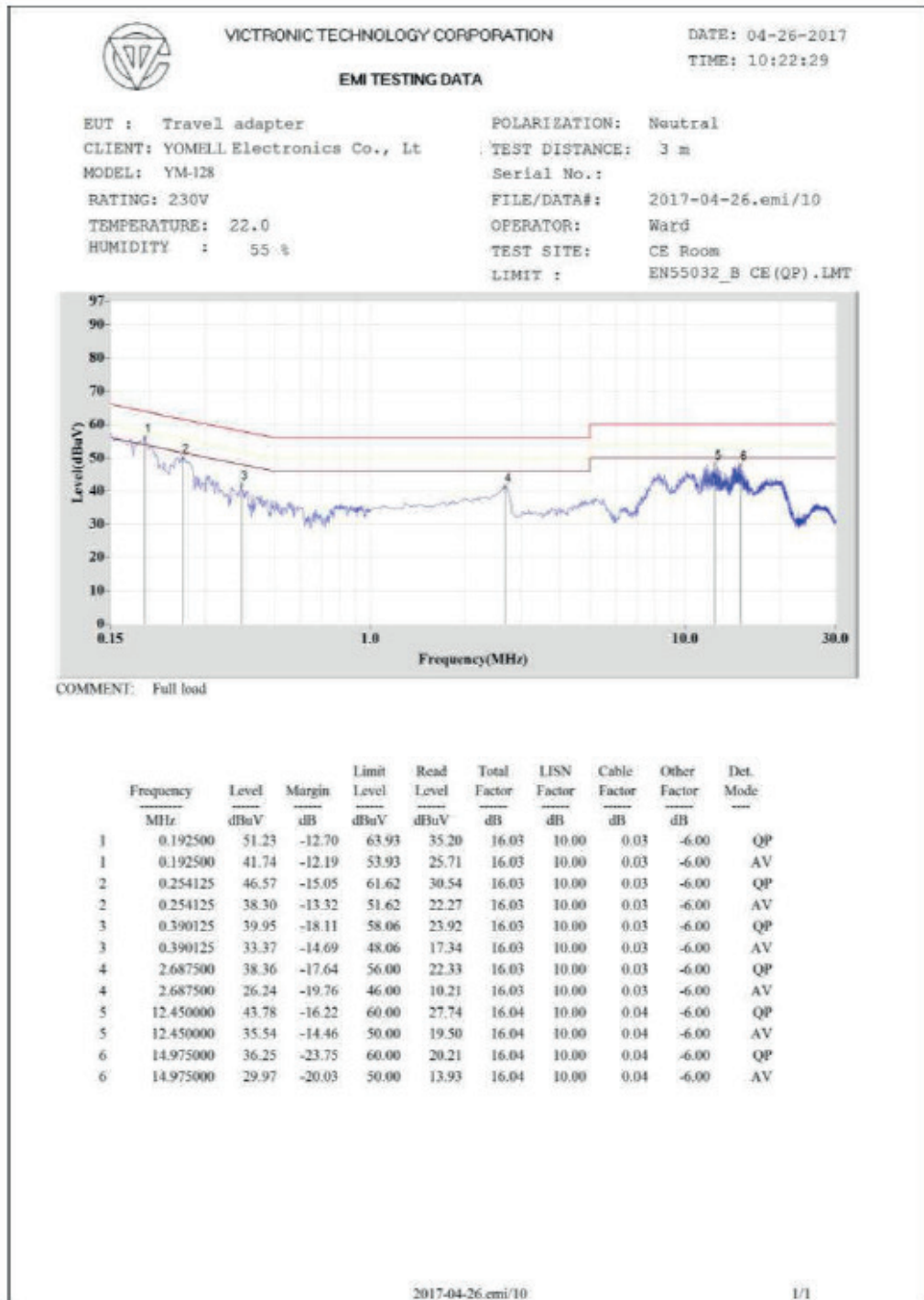
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Test Data Of Conducted Emission Measurement (Neutral)



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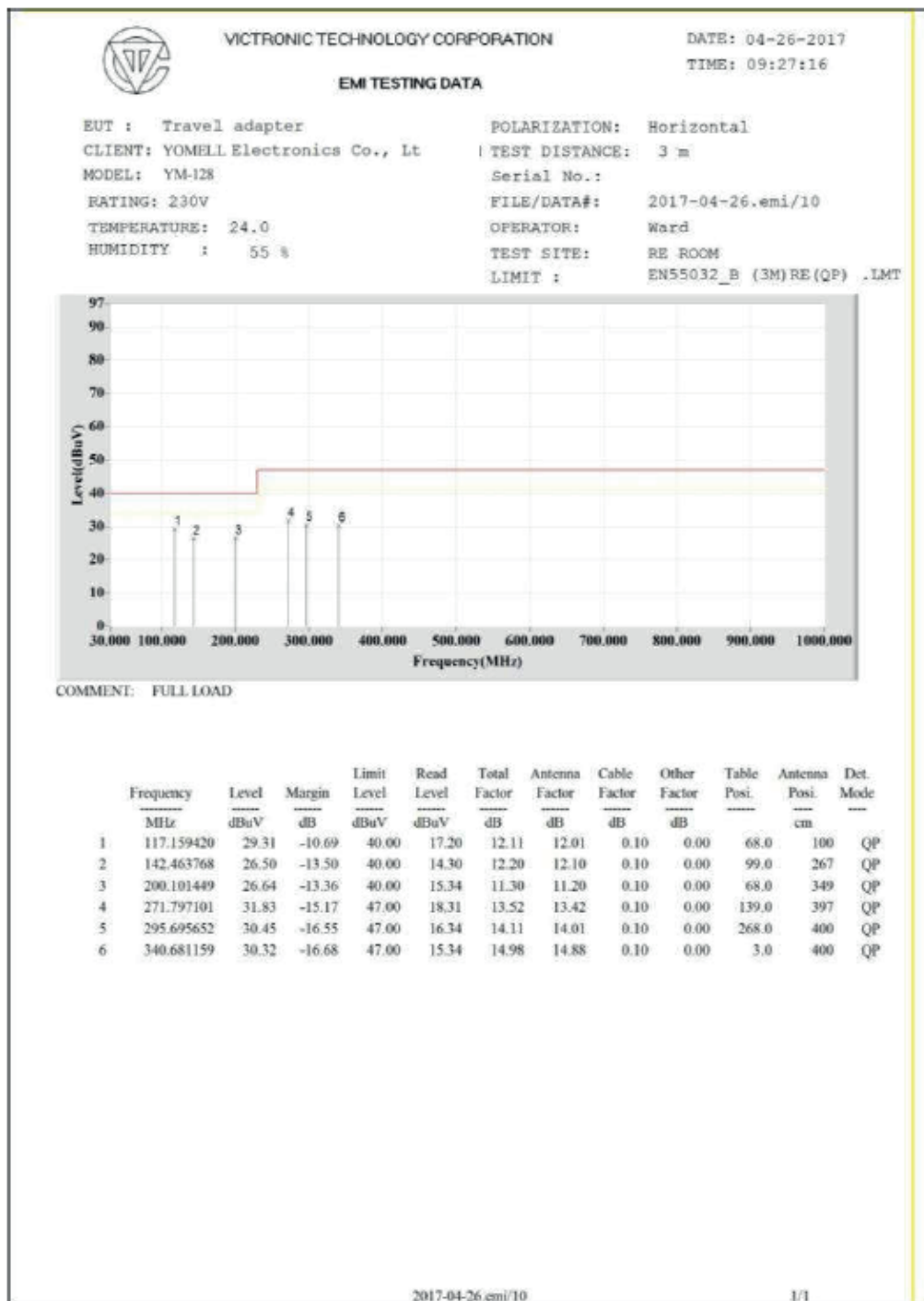


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Test Data Of Radiated Emission Measurement (Horizontal)



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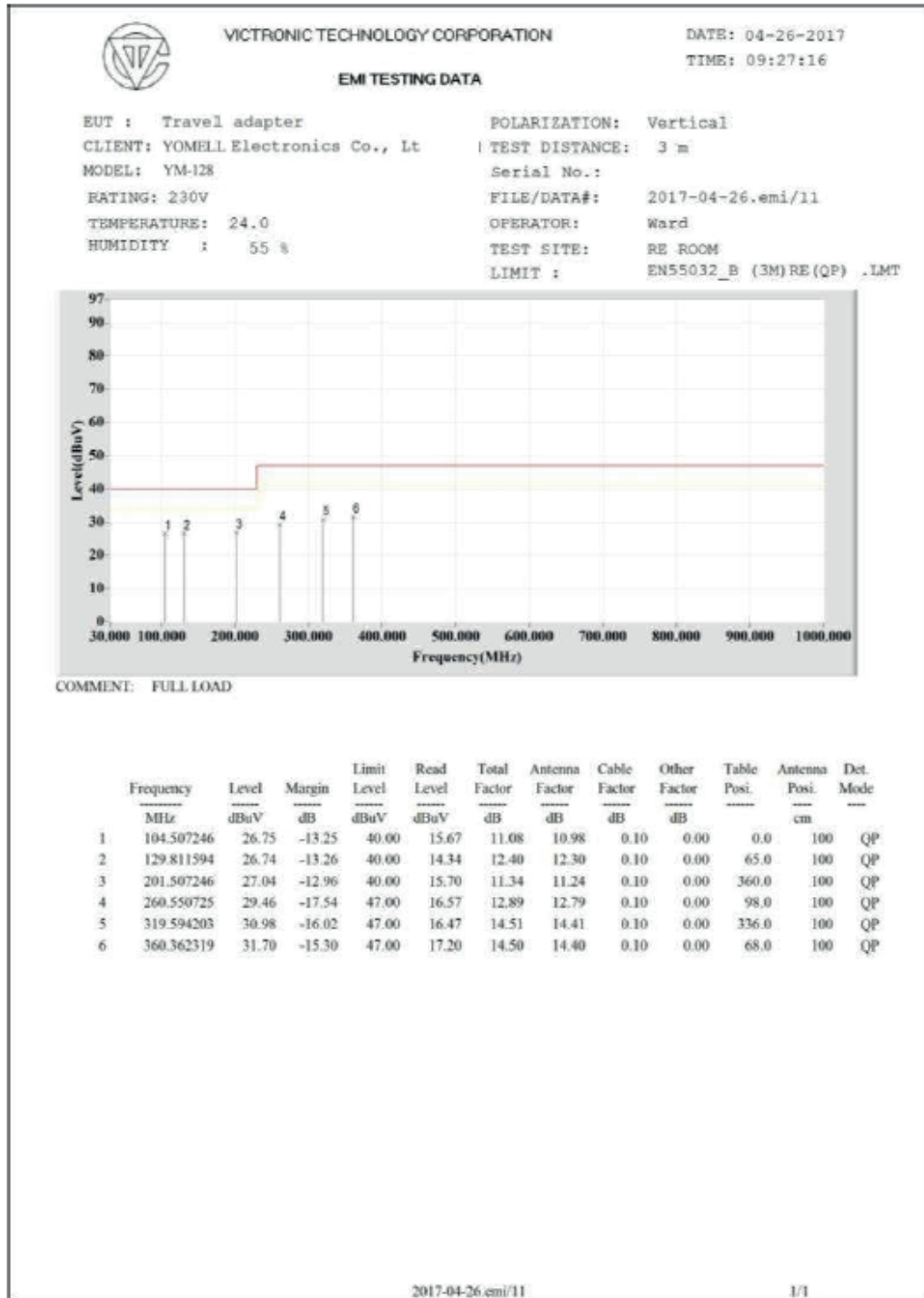


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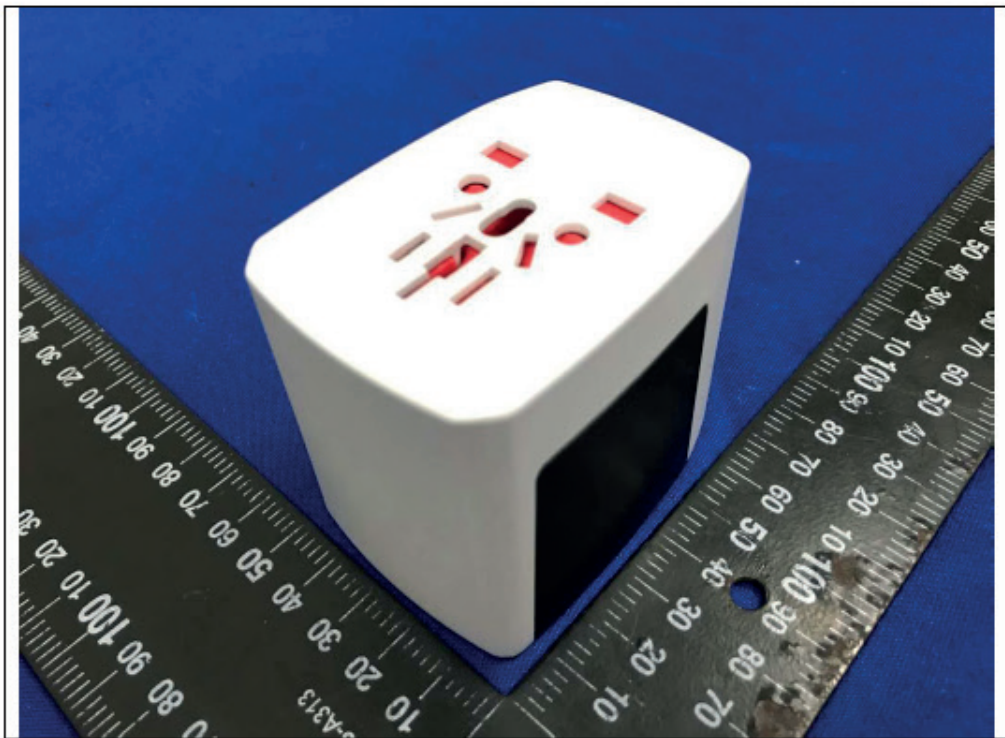


Test Data Of Radiated Emission Measurement (Vertical)





PHOTOS OF EUT



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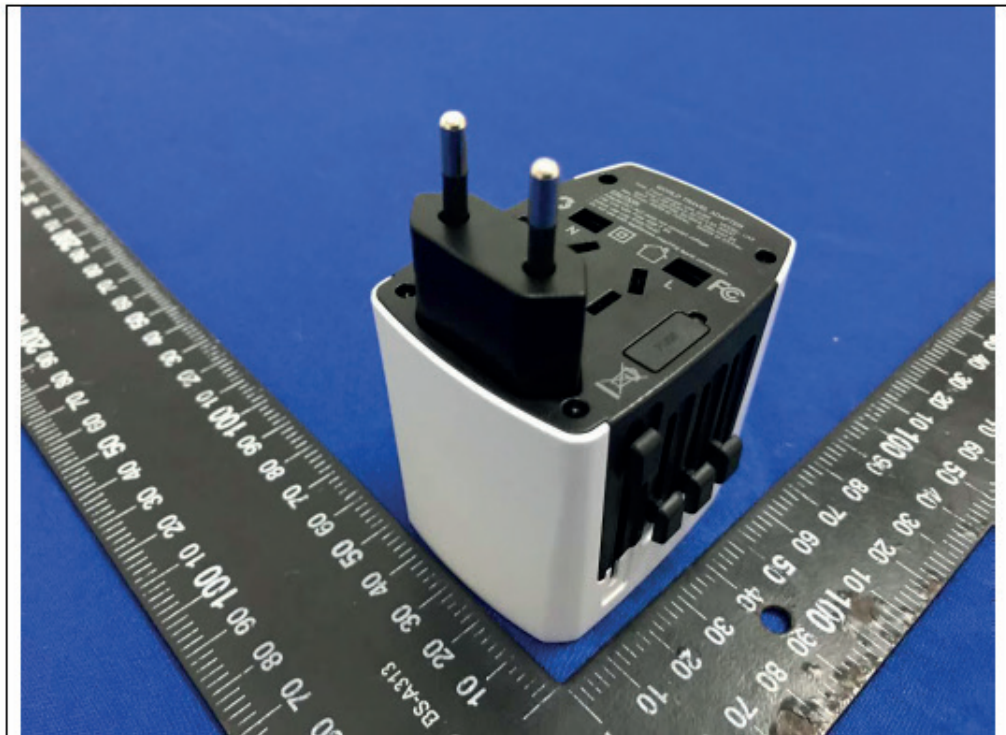


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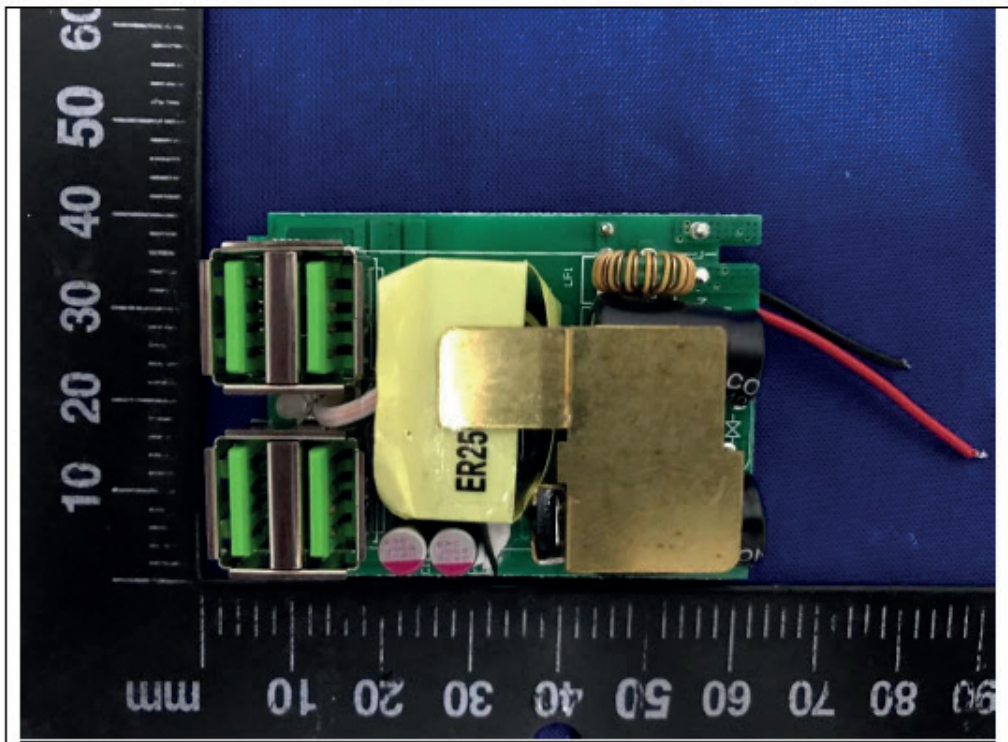
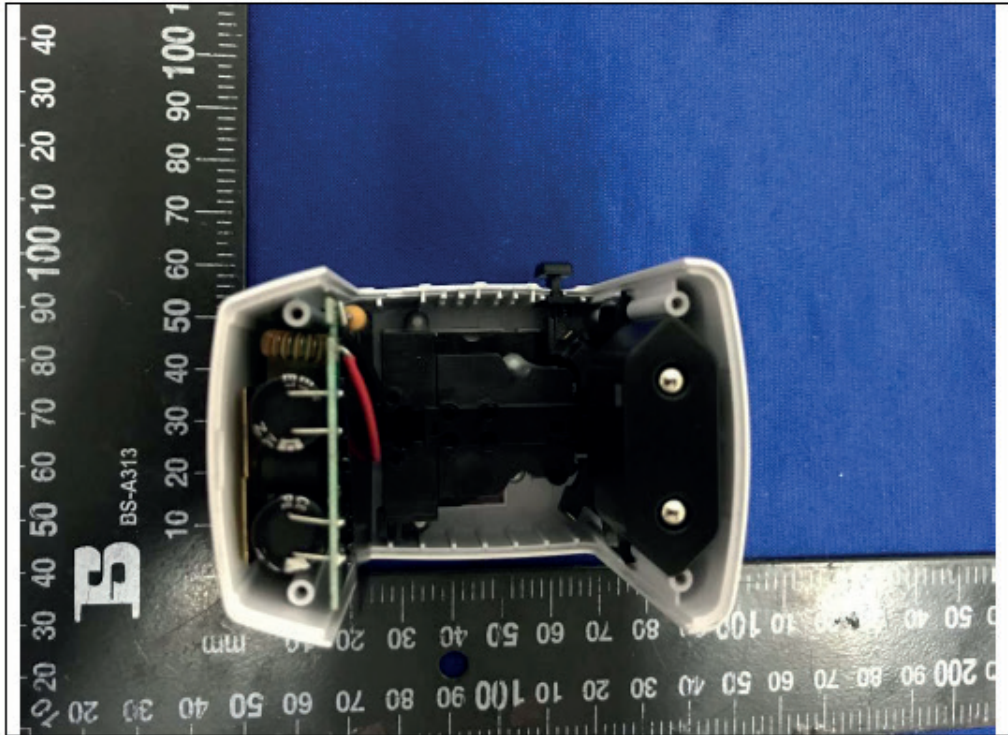
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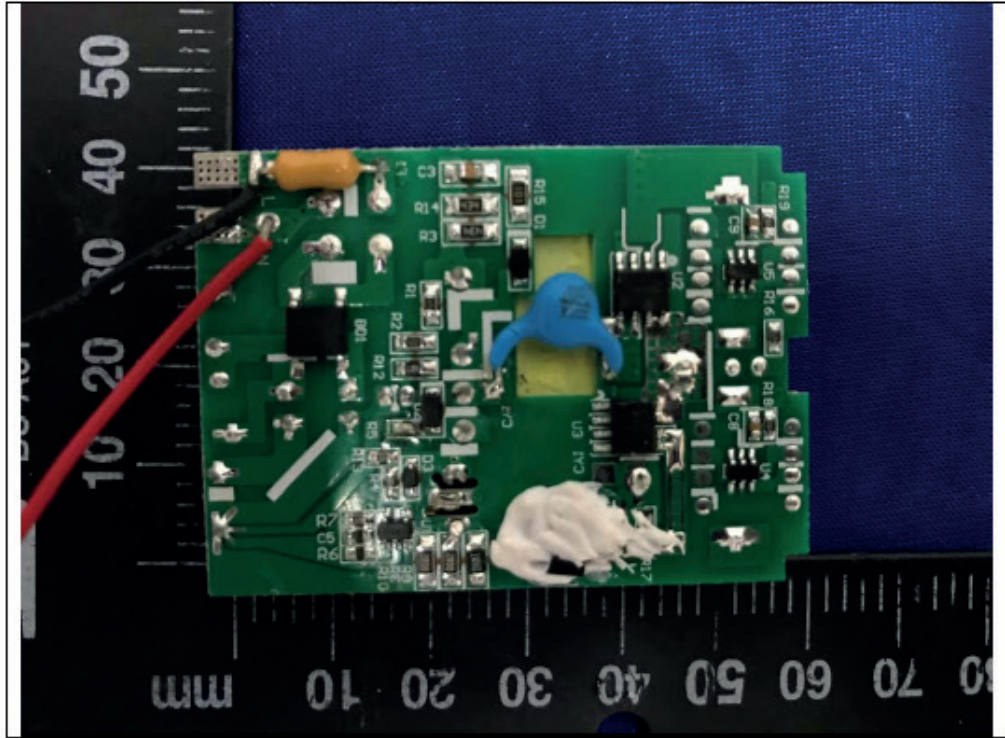


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