

TEST REPORT

Report No.: R-cn5-1603706-2-E

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Applicant:

Product Name: MFI Licensed 2 in 1 keychain cable

Brand Name: N/A

Model No.: P302.042

Date of Receipt : Sep.13, 2016

Date of Test: Sep.13~Sep.23, 2016

Date of Report: Sep.30, 2016

Prepared by: Hangzhou Asiainspection Testing Technology Co.,Ltd.

The EMC testing has been performed on the submitted samples and found in compliance with the council EMC directive 2014/30/EU.

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APPENDIX I	(2 pages)
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TEST REPORT DECLARATION

Report Number	R-cn5-1603706-2-E	
Applicant		
Manufacturer	/	
Product	Product Name	MFI licensed 2 in 1 keychain cable
	Model No.	P302.042
	Power Supply	DC 5V
Test Result	The EUT was found compliant with the requirement(s) of the standards.	
Standard	EN 55022:2010, EN 61000-3-2:2014, EN 61000-3-3:2013, EN 55024:2010 +A1:2015 (IEC 61000-4-2:2008, IEC 61000-4-3:2006+A1:2007+A2:2010, IEC 61000-4-4:2012, IEC 61000-4-5:2014, IEC 61000-4-6:2013, IEC 61000-4-8:2009, IEC 61000-4-11:2004)	
<p>*Note</p> <p>The above device has been tested by Wenzhou Asiainspection Testing Technology Co.,Ltd To determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The test record, data evaluation & Equipment Under Test (EUT) configurations represented are contained in this test report and Most Technology Service Co., Limited Is assumed full responsibility for the accuracy and completeness of test. Also, this report shows that the EUT is technically compliant with the requirement of the above standards.</p> <p>This report applies to above tested sample only. This report shall not be reproduced except in full, without written approval of Wenzhou Asiainspection Testing Technology Co.,Ltd, this document may be altered or revised by Wenzhou Asiainspection Testing Technology Co.,Ltd personal only, and shall be noted in the revision of the document.</p>		
Approved by	Kevin Lee <i>Kevin Lee</i> Technical manager	

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1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	:	MFI Licensed 2 in 1 keychain cable
	:	
Model Number	:	P302.042
	:	
Remark	:	N/A

1.2. Operational Mode(s) of EUT

Order Number	:	Test Mode(s)
1	:	Running
	:	
	:	
	:	
	:	

1.3. Test Voltage(s) of EUT

Order Number	:	Test Voltage(s)
1	:	DC 5V
	:	
	:	
	:	
	:	

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2. DESCRIPTION OF TEST STANDARD

The intention of this publication is to establish uniform requirements for the radio disturbance level of the equipment contained in the scope, to fix limits of disturbance, to describe methods of measurement and to standardize operating conditions and interpretation of results.

The following referenced standard are indispensable for the application of this report.

Referenced Description below:

EN 55022:2010

Information Technology Equipment-Radio disturbance characteristics-Limits and methods of measurement.

EN 61000-3-2:2014

Limits for harmonic current emissions (equipment input current ≤ 16 A per phase).

EN 61000-3-3: 2013

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.

EN 55024:2010 +A1:2015

Alarm systems-Part 4: Electromagnetic compatibility-Product family standard: Immunity requirements for components of fire, intruder and social alarm systems.

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3. LABORATORY INFORMATION

3.1. Laboratory Name

Hangzhou Asiainspection Testing Technology Co.,Ltd

3.2. Location

5th Floor, A2 Building, No. 1213 Huo Ju South Road, Binjiang District, Hangzhou, China

3.3. Test facility

3m Anechoic Chamber : Nov. 28, 2012 File on Federal
Communication Commission
Registration Number:490827

Shielding Room : Nov. 28, 2012 File on Federal
Communication Commission
Registration Number:490827

EMC Lab. : Accredited by TUV Rheinland Shenzhen
Audit Report: UA 50149851
Mar. 12, 2009

Accredited by Industry Canada
Registration Number: 7103A-1
Oct. 22, 2012

Accredited by TIMCO
Registration Number: Q1460
March 28, 2010

3.4. Measurement Uncertainty

No.	Item	Uncertainty
1.	Uncertainty for Conducted Disturbance Test	1.25dB
2.	Uncertainty for Radiated Disturbance Test	3.15dB

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4. SUMMARY OF TEST RESULTS

EMISSION			
Test Item	Standard	Limits	Results
Conducted disturbance at mains terminals	EN 55022:2010	Class B	PASS
Radiated disturbance	EN 55022:2010	Class B	PASS
Conducted disturbance at telecommunication ports terminals test	EN 55022:2010	Class B	N/A
Harmonic current emissions	EN 61000-3-2:20014	Class A	PASS
Voltage fluctuations & flicker	EN 61000-3-3:2013	---	PASS
IMMUNITY (EN 55024:2010 +A1:2015)			
Test Item	Basic Standard	Performance Criteria	Results
Electrostatic discharge (ESD)	IEC 61000-4-2:2008	---	PASS
Radio-frequency, Continuous radiated disturbance	IEC 61000-4-3:2006 +A1:2007+A2+2010	---	PASS
Electrical fast transient (EFT)	IEC 61000-4-4:2012	---	PASS
Surge (Input a.c. power ports)	IEC 61000-4-5:2014	---	PASS
Surge (Telecommunication ports)		---	N/A
Radio-frequency, Continuous conducted disturbance	IEC 61000-4-6:2013	---	PASS
Power frequency magnetic field	IEC 61000-4-8:2009	---	PASS
Voltage dips, >95% reduction	IEC 61000-4-11:2004	---	PASS
Voltage dips, 30% reduction		---	PASS
Voltage interruptions		---	PASS
N/A is an abbreviation for Not Applicable.			

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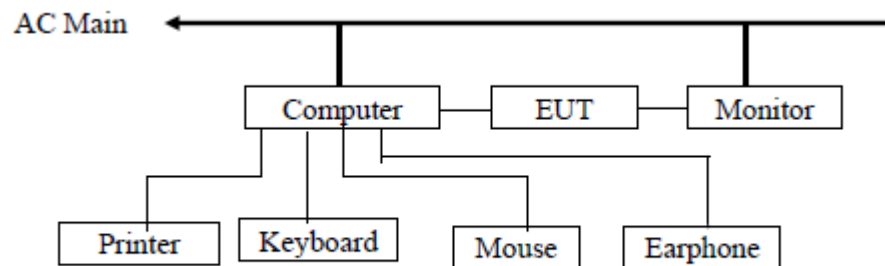
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5. BLOCK DIAGRAM OF TEST SETUP

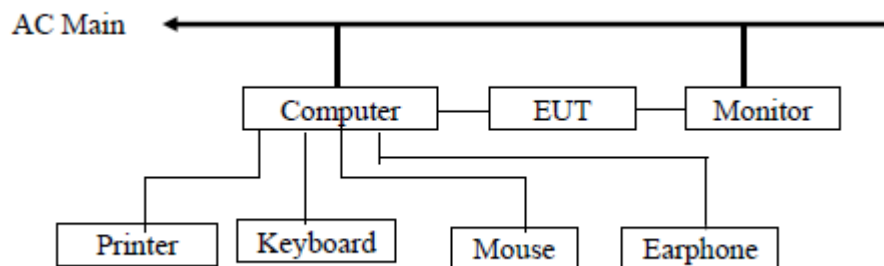
The equipments are installed test to meet EN 55015 requirement and operating in a manner which tends to maximize its emission characteristics in a normal application. EUT was tested in normal configuration (Please See following Block diagrams)

5.1. Block Diagram of connection between EUT and simulation-EMI



(EUT: MFI Licensed 2 in 1 keychain cable)

5.2. Block Diagram of connection between EUT and simulation-EMS



(EUT: MFI Licensed 2 in 1 keychain cable)

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6. TEST INSTRUMENT USED

6.1. For Conducted Disturbance at Mains Terminals Emission Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCI	100492	Mar. 10, 16	1 Year
2.	L.I.S.N.	Rohde & Schwarz	ENV216	100093	Mar. 10, 16	1 Year
3.	Coaxial Switch	Anritsu Corp	MP59B	6200283933	Mar. 07, 16	1 Year
4.	Terminator	Hubersuhner	50 Ω	No.1	Mar. 07, 16	1 Year
5.	RF Cable	SchwarzBeck	N/A	No.1	Mar. 07, 16	1 Year

6.2. For Radiation Test (In Anechoic Chamber)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESPI	101202	Mar. 10, 16	1 Year
2.	Bilog Antenna	Sunol	JB3	A121206	Mar. 14, 16	1 Year
3.	Cable	Resenberger	N/A	NO.1	Mar. 07, 16	1 Year
4.	Cable	SchwarzBeck	N/A	NO.2	Mar. 07, 16	1 Year
5.	Cable	SchwarzBeck	N/A	NO.3	Mar. 07, 16	1 Year
6.	DC Power Filter	DuoJi	DL2×30B	N/A	N/A	N/A
7.	Single Phase Power Line Filter	DuoJi	FNF 202B30	N/A	N/A	N/A
8.	3 Phase Power Line Filter	DuoJi	FNF 402B30	N/A	N/A	N/A

6.3. For Harmonic / Flicker Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	AC Power Source	Kikusui	AC40MA	LM003232	Mar. 10, 16	1 Year
2.	Test Analyzer	Kikusui	KHA1000	LM003720	Mar. 10, 16	1 Year
3.	Line Impedence Network	Kikusui	LIN40MAPCR-L	LM002352	Mar. 10, 16	1 Year

6.4. For Electrostatic Discharge Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	Zhongsheng	ESD-203AX	023K14538	Sept. 25, 15	1 Year

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6.5 For RF Strength Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	IFR	2032	203002/100	Mar. 14, 16	1 Year
1.	Amplifier	A&R	150W1000	301584	NCR	NCR
2.	Dual Directional Coupler	A&R	DC6080	301508	Mar. 14, 16	1 Year
3.	Power Sensor	Anritsu	MA2491A	32263	Mar. 14, 16	1 Year
4.	Power Meter	R&S	NRVS	100444	Mar. 14, 16	1 Year
5.	Field Monitor	A&R	FM5004	300329	Mar. 14, 16	1 Year
6.	Field Probe	A&R	FP5000	300221	Mar. 14, 16	1 Year
7.	Log-periodic Antenna	A&R	AT1080	16512	Mar. 14, 16	1 Year
8.	RF Cable	MIYAZAKI	N/A	No.1/No.2	Mar. 07, 16	1 Year

6.6 For Electrical Fast Transient/Burst Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMC PRO System	EM Test	UCS-500-M4	V0648102026	Mar. 10, 16	1 Year

6.7. For Surge Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMC PRO System	EM Test	UCS-500-M4	V0648102026	Mar. 10, 16	1 Year

6.8. For Injected Currents Susceptibility Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	IFR	2032	203002/100	Mar. 10, 16	1 Year
2.	Amplifier	A&R	150W1000	301584	NCR	NCR
3.	CDN	FCC	FCC-801-M2-2	47	Mar. 10, 16	1 Year
4.	CDN	FCC	FCC-801-M3-2	107	Mar. 10, 16	1 Year
5.	EM Injection Clamp	FCC	F-203I-23mm	403	Mar. 10, 16	1 Year
6.	RF Cable	MIYAZAKI	N/A	No.1/No.2	Mar. 07, 16	1 Year

6.9. For Magnetic Field Immunity Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMC PRO System	EM Test	UCS-500-M4	V0648102026	Mar. 10, 16	1 Year

6.10. For Voltage Dips and Interruptions Test

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMC PRO System	EM Test	UCS-500-M4	V0648102026	Mar. 10, 16	1 Year

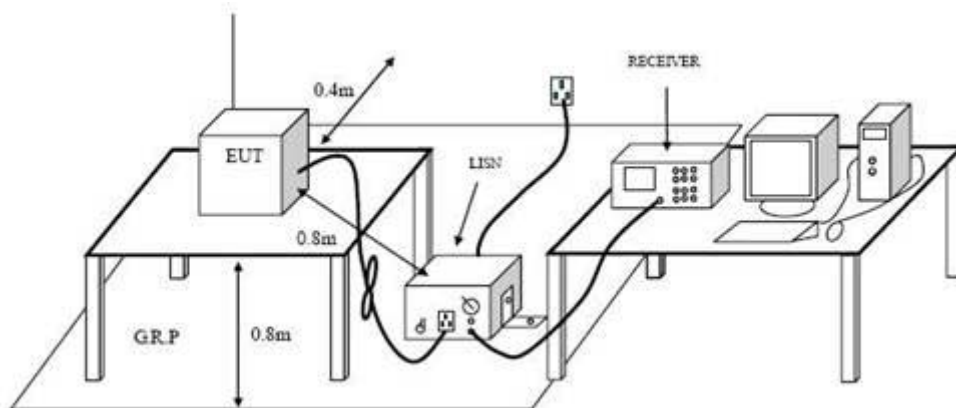
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7. CONDUCTED DISTURBANCE AT MAINS TERMINALS TEST

7.1. Configuration of Test System



7.2. Test Standard
EN 55022:2010

7.3. Magnetic Field Emission Limit

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

Note: 1. Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

7.4. Test Procedure

The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. 1#). This provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N.#2). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to EN 55022 Class B on conducted Disturbance test. The bandwidth of test receiver is set at 9 kHz. The frequency range from 150kHz to 30MHz is checked. The test result are reported on Section 7.5.

7.5. Conducted Disturbance at Mains Terminals Test Results

7.5.1. Test Results: PASS

7.5.2. If the average limit is met when using a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

7.5.3. Emission Level= Correct Factor + Reading Level.

7.5.4. The test data and the scanning waveform are attached within Appendix I.

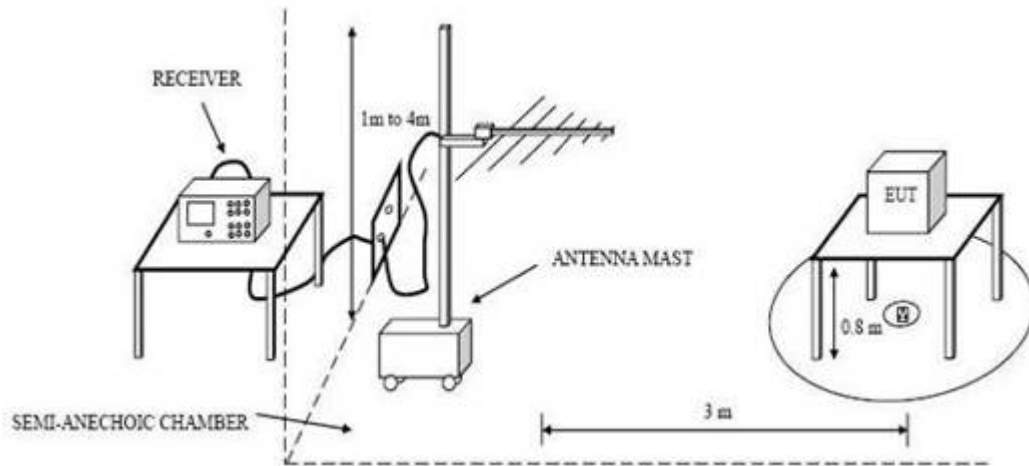
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8. RADIATED DISTURBANCE TEST

8.1. Configuration of Test System



8.2. Test Standard

EN 55022:2010

8.3. Radiated Disturbance Limit

All emanations from devices or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMITS (dB μ V/m)	
30 ~ 230	3	40(QP)	
230 ~ 1000	3	47(QP)	
1000-3000	3	70(Peak)	50(AV)
3000-6000	3	74(Peak)	54(AV)

- Note: 1. The lower limit shall apply at the transition frequencies.
2. Distance refers to the distance in meters between the test antenna and the closed point of any part of the EUT.

8.4. Test Procedure

The EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber. An antenna was located 3m from the EUT on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to EN 55015 on Radiated Disturbance test.

The bandwidth setting on the test receiver is 120 kHz. (frequency range from 30MHz to 1000MHz) and 1MHz (frequency range from 1000MHz to 6000MHz).

The frequency range from 30MHz to 6000MHz is checked. The test result are reported on Section 9.5.

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8.5. Radiated Disturbance Test Results

8.5.1. Test Results: PASS

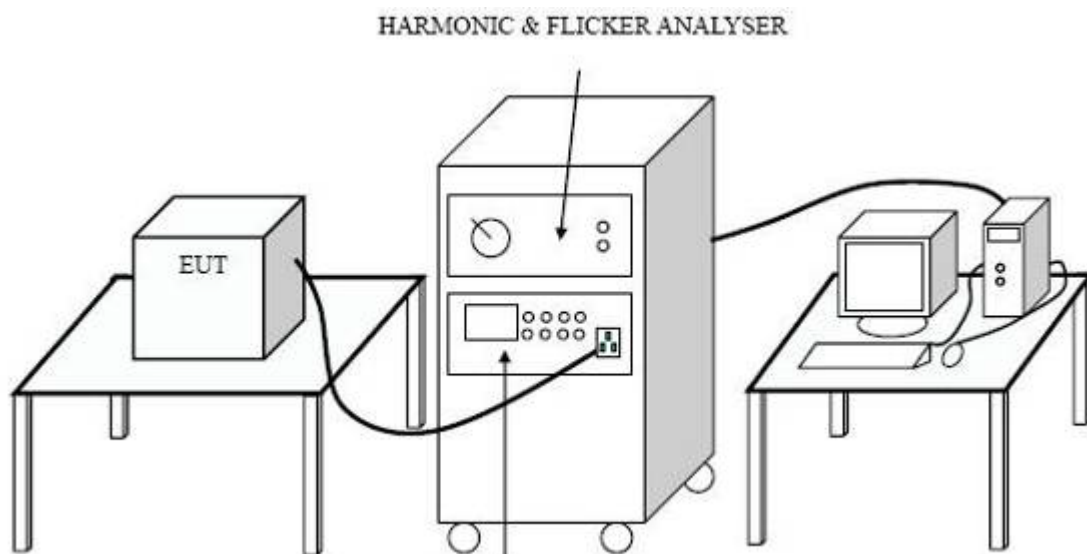
8.5.2. Emission Level= Correct Factor + Reading Level.

8.5.3. All reading are Quasi-Peak values.

8.5.4. The test data and the scanning waveform are attached within Appendix II.

9. HARMONIC CURRENT TEST

9.1. Configuration of Test System



9.2. Test Standard

EN 61000-3-2:2014, Class A

9.3. Test Results

9.3.1. Test Results: PASS.

No limits apply for equipment with an active input power less than or equal to 75W.

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10. VOLTAGE FLUCTUATIONS & FLICKER TEST

10.1. Configuration of Test System

Same as Section 10.1.

10.2. Test Standard

EN 61000-3-3:2013

10.3. Test Limits

The limits shall be applicable to voltage fluctuations and flicker at the supply terminals of the equipment under test, the following limits apply:

the value of P_{st} shall not be greater than 1.0;

the value of P_{lt} shall not be greater than 0.65;

the value of $d(t)$ during a voltage change shall not exceed 3.3% for more than 500ms;

the relative steady-state voltage change, d_c , shall not exceed 3.3%;

the maximum relative voltage change d_{max} , shall not exceed

a) 4% without additional conditions;

b) 6% for equipment which is:

Switched manually, or

Switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.

c) 7% for equipment which is

Attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or

switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.

10.4. Test Results

10.4.1. Test Results: PASS

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Voltage Fluctuation and Flicker TEST REPORT

Company	AsiaInspection	Test Engineer	hzy
Model name	MFI Licensed 2 in 1 keychain cable		
Type	MFI Licensed 2 in 1 keychain cable		
Serial No.		Type of test	EN61000-3-3:2013 *IEC61000-3-3:2013 EN61000-4-15:2011 *IEC61000-4-15:2010
Operating mode	Running		
Date of test	2016/09/20 17:33:12		
Climatic condition	T:26;H:53%		
Memo		Power analyzer	KHA1000,Ver1.50
		Supply Source	DC 5V
		Reference Impedance	

Test Data of Voltage Fluctuation and Flicker

FINAL TEST RESULT	PASS
Nominal Voltage	230V
Nominal Frequency	50Hz
Pft Test duration	600s
Flicker Margin	100%
d Measurement Margin	100%

	Pst	dc(%)	dmax(%)	d(t)>3.3%(ms)	Judge
Limit	1.000	3.300	4.000	500	
Seg. 1	0.010	0.004	0.035	0	Pass
Seg. 2	-,-,-,-	-,-,-,-	-,-,-,-	-,-,-,-	
Seg. 3	-,-,-,-	-,-,-,-	-,-,-,-	-,-,-,-	
Seg. 4	-,-,-,-	-,-,-,-	-,-,-,-	-,-,-,-	
Seg. 5	-,-,-,-	-,-,-,-	-,-,-,-	-,-,-,-	
Seg. 6	-,-,-,-	-,-,-,-	-,-,-,-	-,-,-,-	
Seg. 7	-,-,-,-	-,-,-,-	-,-,-,-	-,-,-,-	
Seg. 8	-,-,-,-	-,-,-,-	-,-,-,-	-,-,-,-	
Seg. 9	-,-,-,-	-,-,-,-	-,-,-,-	-,-,-,-	
Seg. 10	-,-,-,-	-,-,-,-	-,-,-,-	-,-,-,-	
Seg. 11	-,-,-,-	-,-,-,-	-,-,-,-	-,-,-,-	
Seg. 12	-,-,-,-	-,-,-,-	-,-,-,-	-,-,-,-	

	Pft	Judge
Limit	0.650	
Measurement	0.004	Pass

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11. FUNCTIONAL TEST

The variety and the diversity of the equipment within the scope of this standard makes it difficult to define a precise functional test for evaluation of the EUT performance.

--Where a relevant European product performance standard exists, which defines a suitable functional test for assessing the performance of the EUT before and after environmental or EMC tests, the functional test to be applied and its acceptance criteria shall be as defined in that standard.

--Where no relevant European product performance standard exists, the functional test shall be at least a test or measurement of the main function of the equipment. The acceptance criteria for this Functional test shall be that there is no change in the functioning of the equipment and no significant change in any measurement, which shall also remain within specification.

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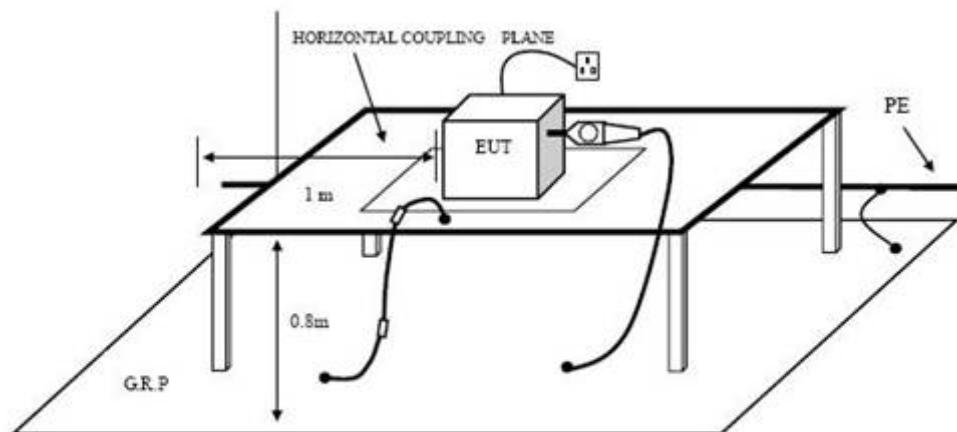
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12.ELECTROSTATIC DISCHARGE IMMUNITY TEST

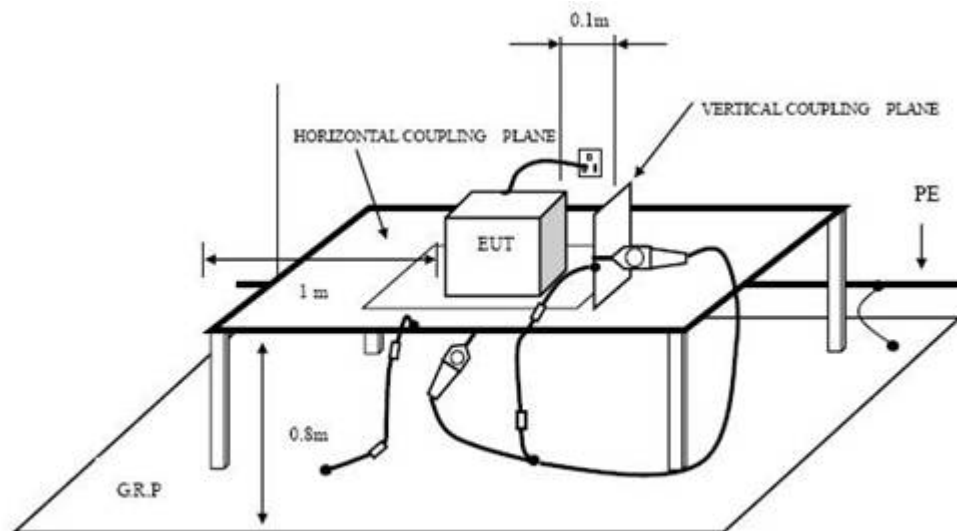
12.1.Configuration of Test System

12.1.1. Configuration of ESD Test System(Direct Discharge)



DIRECT DISCHARGE SETUP

12.1.2.Configuration of ESD Test System(Indirect Discharge)



INDIRECT DISCHARGE SETUP

12.2.Test Standard

EN 55024:2010 +A1:2015 (IEC 61000-4-2:2008)

(Severity Level 3 for Air Discharge at 8KV,

Severity Level 3 for Contact Discharge at 6KV)

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12.3. Severity Levels and Performance Criterion

12.3.1. Severity level

Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1.	2	2
2.	4	4
3.	6	8
4.	8	15
X	Special	Special

12.3.2. criteria for compliance

The EUT shall meet the acceptance criteria for the functional test after the conditioning.

12.4. Test Procedure

12.4.1. Air Discharge:

The test was applied on non-conductive surfaces of EUT. The round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT. After each discharge, the discharge electrode was removed from the EUT. The generator was re-triggered for a new single discharge and repeated 20 times for each pre-selected test point. This procedure was repeated until all the air discharge completed

12.4.2. Contact Discharge:

All the procedure was same as Section 13.4.1. except that the generator was re-triggered for a new single discharge and repeated 50 times for each pre-selected test point. the tip of the discharge electrode was touch the EUT before the discharge switch was operated.

12.5. Test Results

12.5.1. Test Results: PASS

12.5.2. Test data on the following pages.

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Electrostatic Discharge Test Results
 Asiainspection Testing Technology Co.,Ltd

Test Voltage :	1	Test Date:	Sep.20,2016
Test Mode:	1	Criterion:	N/A
Temperature:	24	Humidity:	56%

Air Discharge: $\pm 8KV$ # For Air Discharge each Point Positive 10 times and negative 10 times discharge.

Contact Discharge: $\pm 6KV$ # For Contact Discharge each point positive 10 times and negative 10 times discharge

Test Results Description

Location	Kind A-Air Discharge C-Contact Discharge	Result
Housing	A	PASS
Gaps	A	PASS
Port	C	PASS
HCP	C	PASS
VCP of Front	C	PASS
VCP of Rear	C	PASS
VCP of Left	C	PASS
VCP of Right	C	PASS

Remark:

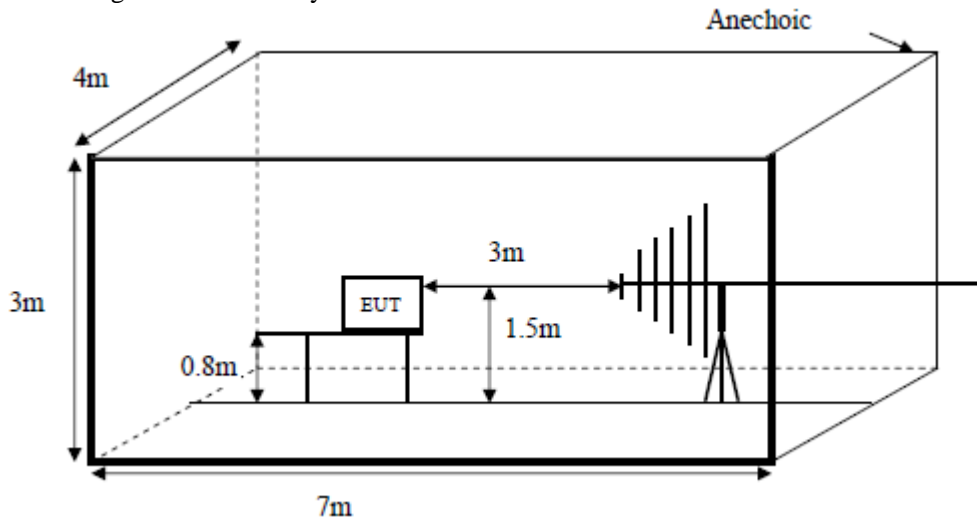
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13.RF FIELD STRENGTH SUSCEPTIBILITY TEST

13.1.Configuration of Test System



13.2.Test Standard

EN 55024:2010 +A1:2015 (IEC 61000-4-3:2006+A1:2007+A2:2010)

(Severity Level: 2 at 3V / m)

13.3.Severity Levels and Performance Criterion

13.3.1.Severity level

Level	Test Field Strength V/m
1.	1
2.	3
3.	10
X	Special

13.3.2.Criteria for compliance

The EUT shall meet the acceptance criteria for the functional test after the conditioning.

13.4.Test Procedure

Testing was performed in a Fully anechoic chamber as recommended by IEC 61000-4-3. The EUT was placed on an 80 cm high non-conductive table located in the area of field uniformity. The radiating antenna was placed 3m in front of the EUT and Support system, and dwell time of the radiated interference was controlled by an automated, computer-controlled system. The signal source was stepped through the applicable frequency range at a rate no faster than 1% of the fundamental. The signal was amplitude modulated 80% over the frequency range 80 MHz to 2GHz at a level of 10 V/m. The dwell time was set at 1.5 s. Field presence was monitored during testing via a field probe placed in close proximity to the EUT. Throughout testing, the EUT was closely monitored for signs of susceptibility. The test was performed with the antennae oriented in both a horizontal and vertical polarization.

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All the scanning conditions are as follows :

Condition of Test	Remarks

1. Test Fielded Strength	10 V/m (Severity Level 2)
2. Radiated Signal	80% amplitude modulated with a 1kHz sine wave
3. Scanning Frequency	80 - 2000 MHz
4. Sweeping time of radiated	0.0015 decade/s
5. Dwell Time	1.5 Sec.

13.5. Test Results

13.5.1. Test Results: PASS

13.5.2. Test data on the following pages.

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RF Field Strength Susceptibility Test Results
Asiainspection Testing Technology Co.,Ltd

Test Voltage :	1	Test Date:	Sep.08,2016
Test Mode :	1	Criterion :	A
Field Strength :	10 V/m	Criterion :	N/A
Temperature:	24 °C	Humidity:	56%
Modulation: <input checked="" type="checkbox"/> AM <input type="checkbox"/> Pulse <input type="checkbox"/> none 1 kHz 80%			
Test Results Description			
Frequency Rang 1: 80MHz - 2000 MHz			
Steps	1%	1%	
	Horizontal	Vertical	
Front	PASS	PASS	
Right	PASS	PASS	
Rear	PASS	PASS	
Left	PASS	PASS	
Remark: No function loss			

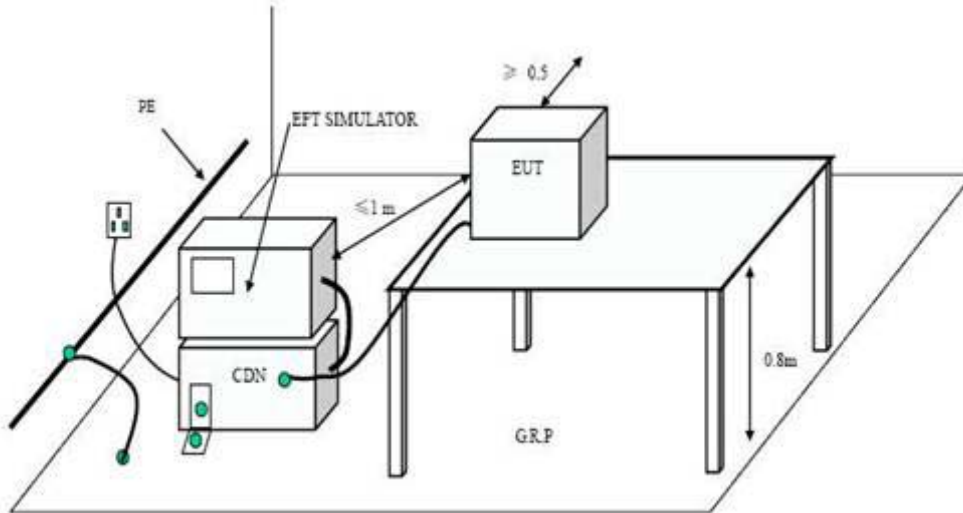
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14.ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST

14.1.Configuration of Test System



14.2.Test Standard

EN 55024:2010 +A1:2015 (IEC 61000-4-4:2012)
(Severity Level 3 at 2KV)

14.3.Severity Levels and Performance Criterion

14.3.1.Severity level

Level	Open Circuit Output Test Voltage $\pm 10\%$	
	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1.	0.5 KV	0.25 KV
2.	1 KV	0.5 KV
3.	2 KV	1 KV
4.	4 KV	2 KV
X	Special	Special

14.3.2.Criteria for compliance

The EUT shall meet the acceptance criteria for the functional test after the conditioning.

14.4.Test Procedure

The EUT and its simulators were placed on a the ground reference plane and were insulated from it by an wood support 0.1m + 0.01m thick. The ground reference plane was 1m*1m metallic sheet with 0.65mm minimum thickness. This reference ground plane was project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane was more than 0.5m. All cables to the EUT was placed on the wood support, cables not subject to EFT/B was routed as far as possible from the cable under test to minimize the coupling between the cables.

14.4.1.For input and AC power ports:

The EUT was connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both positive transients and

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negative transients of test voltage was applied during compliance test and the duration of the test can't less than 2mins.

14.4.2.For signal lines and control lines ports:

It's unnecessary to test.

14.4.3.For DC input and DC output power ports:

It's unnecessary to test.

14.5.Test Results

14.5.1.Test Results: PASS

14.5.2.Test data on the following pages.

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Electrical Fast Transient/Burst Test Results
 Asiainspection Testing Technology Co.,Ltd

Test Voltage :	1	Test Date:	Sep.20.2016
Test Mode :	1	Criterion :	N/A
Temperature:	24 °C	Humidity:	56%

Test Results Description

Inject Line	Voltage KV	Inject Time(s)	Inject Method	Results	Inject Line	Voltage KV	Inject Time(s)	Inject Method	Results
L	±1	120	Direct	PASS					
N	±1	120	Direct	PASS					
LN	±1	120	Direct	PASS					

Remark:

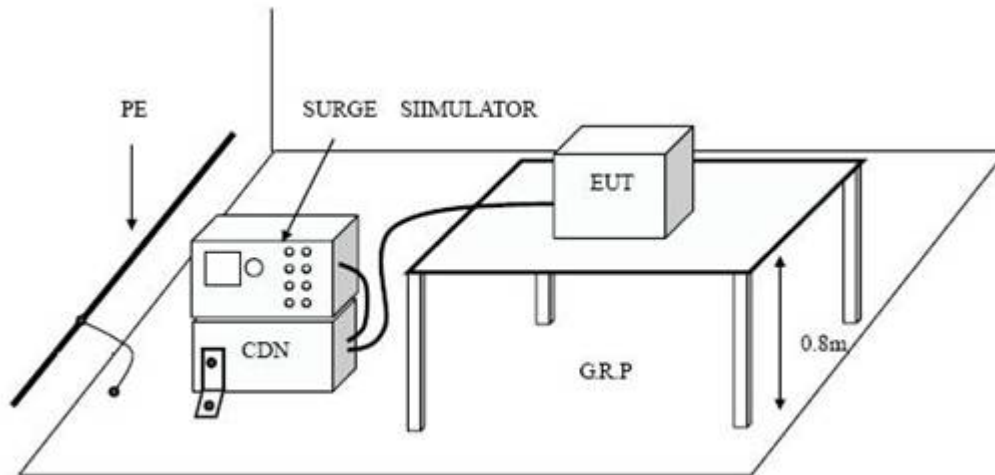
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15.SURGE TEST

15.1.Configuration of Test System



15.2.Test Standard

EN 55024:2010 +A1:2015 (IEC 61000-4-5:2013)
(Severity Level : Line to Line was Level 2 at 1KV
Line to PE was Level 3 at 2KV)

15.3.Severity Levels and Performance Criterion

15.3.1.Severity level

Severity Level	Open-Circuit Test Voltage KV
1.	0.5
2.	1
3.	2
4.	4
*	Special

15.3.2.Criteria for compliance

The EUT shall meet the acceptance criteria for the functional test after the conditioning.

15.4.Test Procedure

15.4.1.Set up the EUT and test generator as shown on Section 16.1.

15.4.2.For line to line coupling mode, provide a 1KV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points, and for active line / neutral line to ground are same except test level is 2KV.

15.4.3.At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are applied during test.

15.4.4.Different phase angles are done individually.

15.4.5.Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

15.5.Test Results

15.5.1.Test Results: PASS

15.5.2.Test data on the following pages.

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Surge Immunity Test Results Asiainspection Testing Technology Co.,Ltd

Test Voltage :	1	Test Date:	Sep.20.2016
Test Mode :	1	Criterion :	N/A
Temperature:	24 °C	Humidity:	56%

Test Results Description

Location	Polarity	Phase Angle	No of Pulse	Pulse Voltage (KV)	Results
L-N	±	0	5	1.0	PASS
	±	90	5	1.0	PASS
	±	180	5	1.0	PASS
	±	270	5	1.0	PASS

Remark:

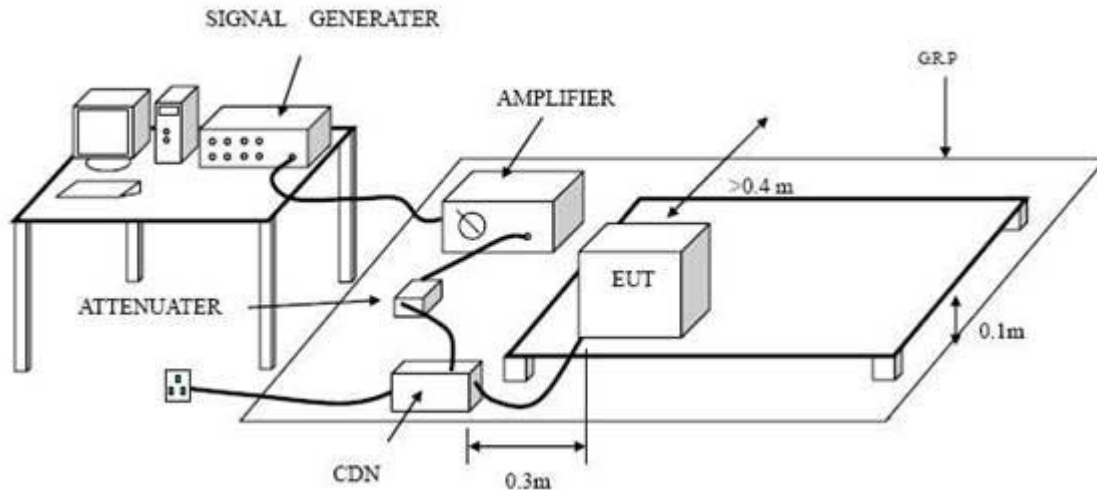
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16. INJECTED CURRENTS SUSCEPTIBILITY TEST

16.1. Configuration of Test System



16.2. Test Standard

EN 55024:2010 +A1:2015(IEC 61000-4-6:2014)

(Severity Level 2 at 3V (r.m.s.) and frequency is from 0.15MHz to 80MHz)

16.3. Severity Levels and Performance Criterion

16.3.1. Severity level

Level	Voltage Level (e.m.f.) V
1.	1
2.	3
3.	10
X	Special

16.3.2. Criteria for compliance

The EUT shall meet the acceptance criteria for the functional test after the conditioning.

16.4. Test Procedure

16.4.1. Set up the EUT, CDN and test generators as shown on Section 17.1.

16.4.2. Let the EUT work in test mode and test it.

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

16.4.4. The disturbance signal description below is injected to EUT through CDN.

16.4.5. The EUT operates within its operational mode(s) under intended climatic conditions after power on.

16.4.6. The frequency range is swept from 0.150MHz to 100MHz using 10V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave.

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16.4.7. The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.

16.4.8. Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

16.5. Test Results

16.5.1. Test Results: PASS

16.5.2. Test data on the following pages.

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Injected Currents Susceptibility Test Results
Asiainspection Testing Technology Co.,Ltd

Test Voltage :	1	Test Date:	Sep.20.2016	
Test Mode :	1	Criterion :	N/A	
Temperature:	24 °C	Humidity:	56%	
Test Results Description				
Frequency Range (MHz)	Injected Position	Voltage Level (e.m.f.)	Criterion	Results
0.15 ~ 100	AC Mains	10V(rms), Unmodulated	A	PASS
Remark: No function loss				

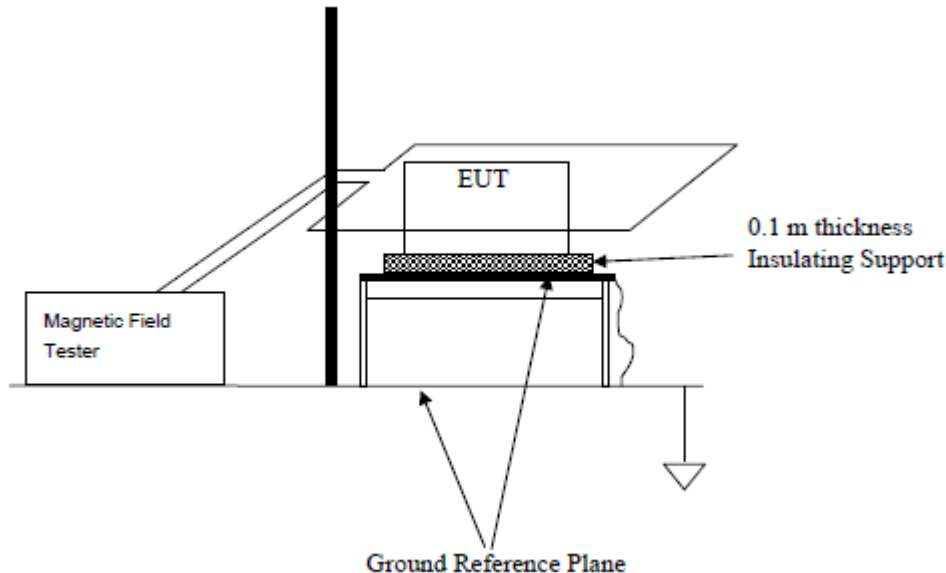
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17.MAGNETIC FIELD IMMUNITY TEST

17.1.Configuration of Test System



17.2.Test Standard

EN 55024:2010 +A1:2015 (IEC 61000-4-8:2009)
(Severity Level 1 at 1A/m)

17.3.Severity Levels and Performance Criterion

17.3.1.Severity level

Level	Magnetic Field Strength A/m
1.	1
2.	3
3.	10
4.	30
5.	100
X.	Special

17.3.2.Criteria for compliance

The EUT shall meet the acceptance criteria for the functional test after the conditioning.

17.4.Test Procedure

The EUT was subjected to the test magnetic field by using the induction coil of standard dimensions (1m*1m) and shown in Section 18.1. The induction coil was then rotated by 90° in order to expose the EUT to the test field with different orientations.

17.5.Test Results

17.5.1.Test Results: PASS

17.5.2.Test data on the following pages.

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Magnetic Field Immunity Test Results
Asiainspection Testing Technology Co.,Ltd

Test Voltage	:	1	Test Date:	Sep.20.2016	
Test Mode	:	1	Criterion :	N/A	
Temperature:		24 °C	Humidity:	57%	
Test Results Description					
Test Level		Testing Duration	Coil Orientation	Criterion	Result
1A/m(50Hz/60Hz)		5 mins	X	A	PASS
1A/m(50Hz/60Hz)		5 mins	Y	A	PASS
1A/m(50Hz/60Hz)		5 mins	Z	A	PASS
Remark: No function loss					

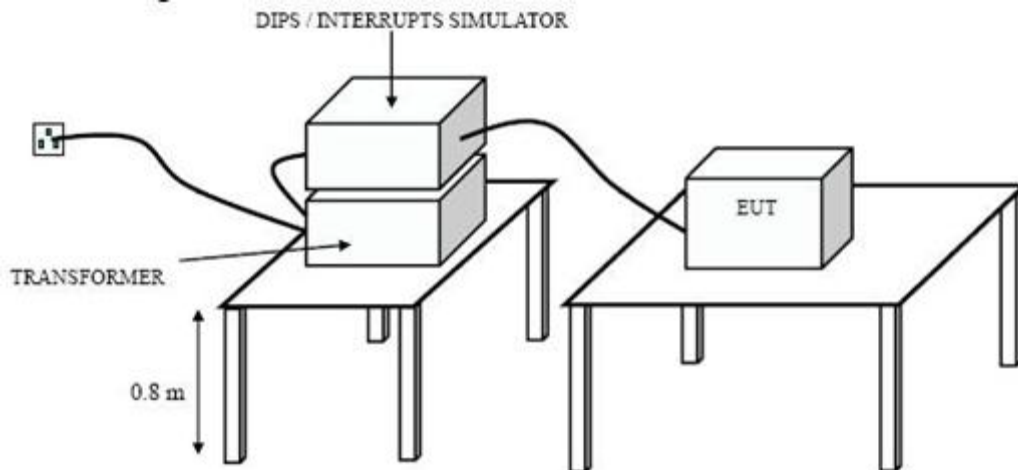
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18.VOLTAGE DIPS AND INTERRUPTIONS TEST

18.1.Configuration of Test System



18.2.Test Standard

EN 55024:2010 +A1:2015 (IEC 61000-4-11:2004)

(Severity level: 0% 250 period
0% 0.5 periods
70% 25 periods)

18.3.Severity Levels and Performance Criterion

18.3.1.Severity level

Test Level %UT	Voltage dip and short interruptions %UT	Duration (in period)
0	100	0.5, 1 and 5
40	60	0.5, 1, 5 and 10
70	30	0.5, 1, 5 and 10

18.3.2.Criteria for compliance

The EUT shall meet the acceptance criteria for the functional test after the conditioning.

18.4.Test Procedure

18.4.1.The EUT and test generator were setup as shown on Section 19.1.

18.4.2.The interruptions is introduced at selected phase angles with specified duration.

18.4.3.Record any degradation of performance.

18.5.Test Results

18.5.1.Test Results: PASS

18.5.2.Test data on the following pages.

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Voltage Dips And Interruptions Test Results

Asiainspection Testing Technology Co.,Ltd

Test Voltage :	1	Test Date:	Sep.20.2016
Test Mode :	1	Criterion :	N/A
Temperature:	24 °C	Humidity:	56%

Test Results Description

Test Level % U_T	Voltage Dips & Short Interruptions % U_T	Duration (in period)	Phase Angle Criterion	Result
40	60	0.5,1,5 and 10P	0°~360°	PASS
70	30	0.5,1,5 and 10P	0°~360°	PASS
0	100	0.5,1,5P	0°~360°	PASS

Remark: U_T is the rated voltage for the equipment.

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APPENDIX I

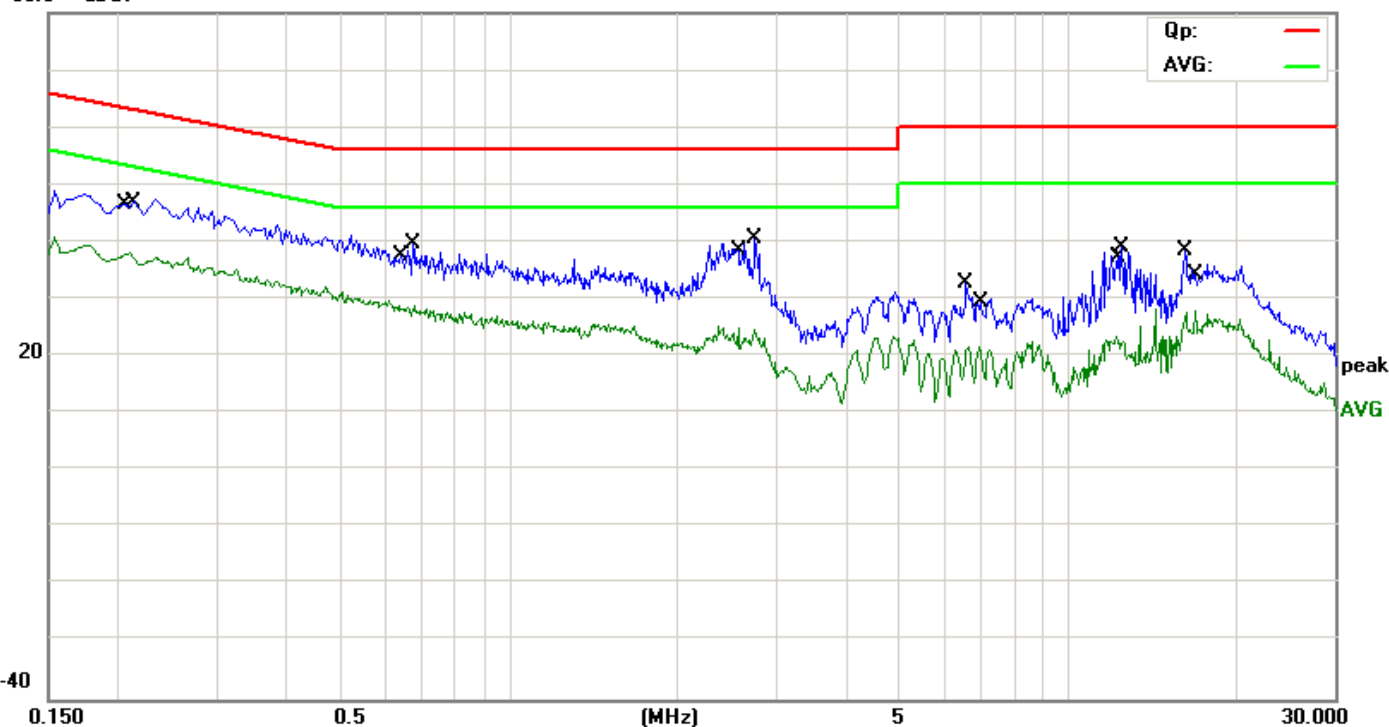
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EUT:	MFI Licensed 2 in 1 keychain cable	M/N:	P302.042
Mode:	Running	Phase	L
Test by:	hzy	Power:	DC 5V
Temperature: / Humidity	24.1°C/ 50.5%	Test date:	2016-09-23

80.0 dBuV



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.2060	37.07	9.60	46.67	63.37	-16.70	QP	
2	*	0.2100	28.54	9.60	38.14	53.21	-15.07	AVG	
3		0.6380	19.41	9.59	29.00	46.00	-17.00	AVG	
4		0.6740	30.13	9.60	39.73	56.00	-16.27	QP	
5		2.5780	15.25	9.61	24.86	46.00	-21.14	AVG	
6		2.7580	30.97	9.61	40.58	56.00	-15.42	QP	
7		6.5740	22.98	9.65	32.63	60.00	-27.37	QP	
8		6.9340	12.05	9.65	21.70	50.00	-28.30	AVG	
9		12.2380	13.88	9.69	23.57	50.00	-26.43	AVG	
10		12.4500	29.38	9.69	39.07	60.00	-20.93	QP	
11		16.2020	28.76	9.71	38.47	60.00	-21.53	QP	
12		16.9060	18.11	9.71	27.82	50.00	-22.18	AVG	

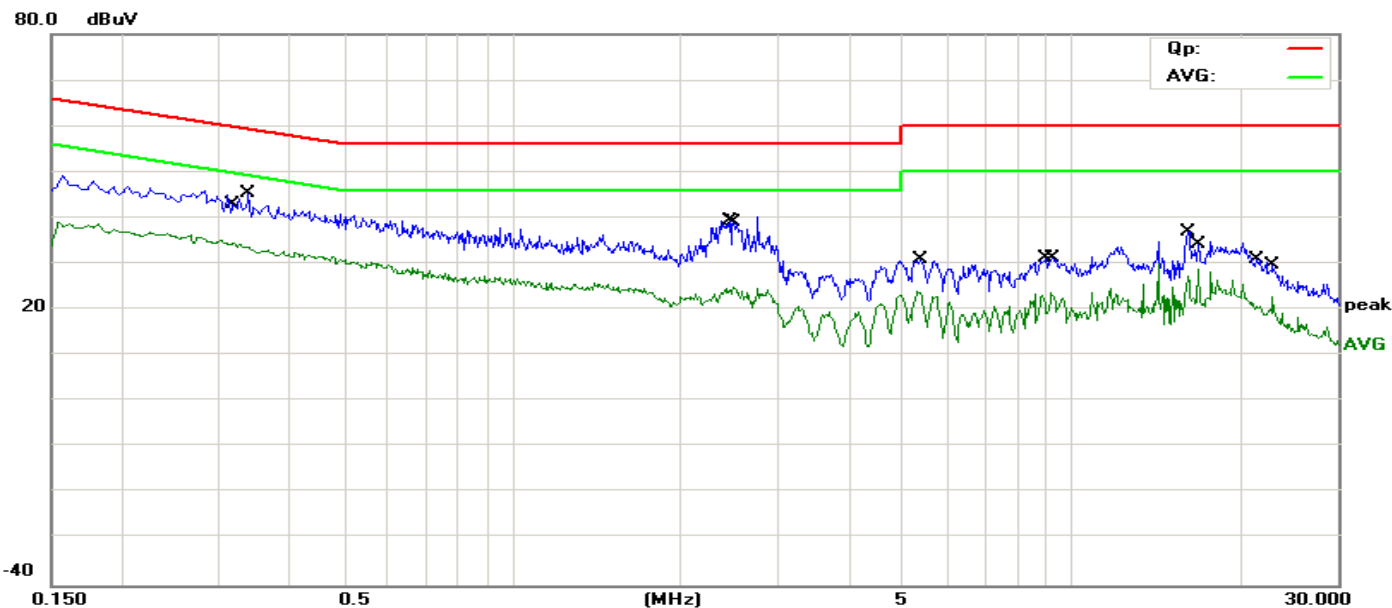
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EUT:	MFI Licensed 2 in 1 keychain cable	M/N:	P302.042
Mode:	Running	Phase	N
Test by:	hzy	Power:	DC 5V
Temperature: / Humidity	24.1°C/ 50.5%	Test date:	2016-09-23



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.3180	25.03	9.59	34.62	49.76	-15.14	AVG	
2	*	0.3380	35.70	9.59	45.29	50.00	-4.71	QP	
3		2.4500	29.83	9.61	39.44	50.00	-10.56	QP	
4		2.4900	15.20	9.61	24.81	46.00	-21.19	AVG	
5		5.3180	14.38	9.63	24.01	50.00	-25.99	AVG	
6		5.3620	21.19	9.63	30.82	60.00	-29.18	QP	
7		9.0140	21.66	9.68	31.34	60.00	-28.66	QP	
8		9.2500	14.02	9.68	23.70	50.00	-26.30	AVG	
9		16.2020	27.32	9.71	37.03	60.00	-22.97	QP	
10		16.9060	19.22	9.71	28.93	50.00	-21.07	AVG	
11		21.4100	21.10	9.74	30.84	60.00	-29.16	QP	
12		22.9220	12.99	9.74	22.73	50.00	-27.27	AVG	

*:Maximum data x:Over limit !:over margin

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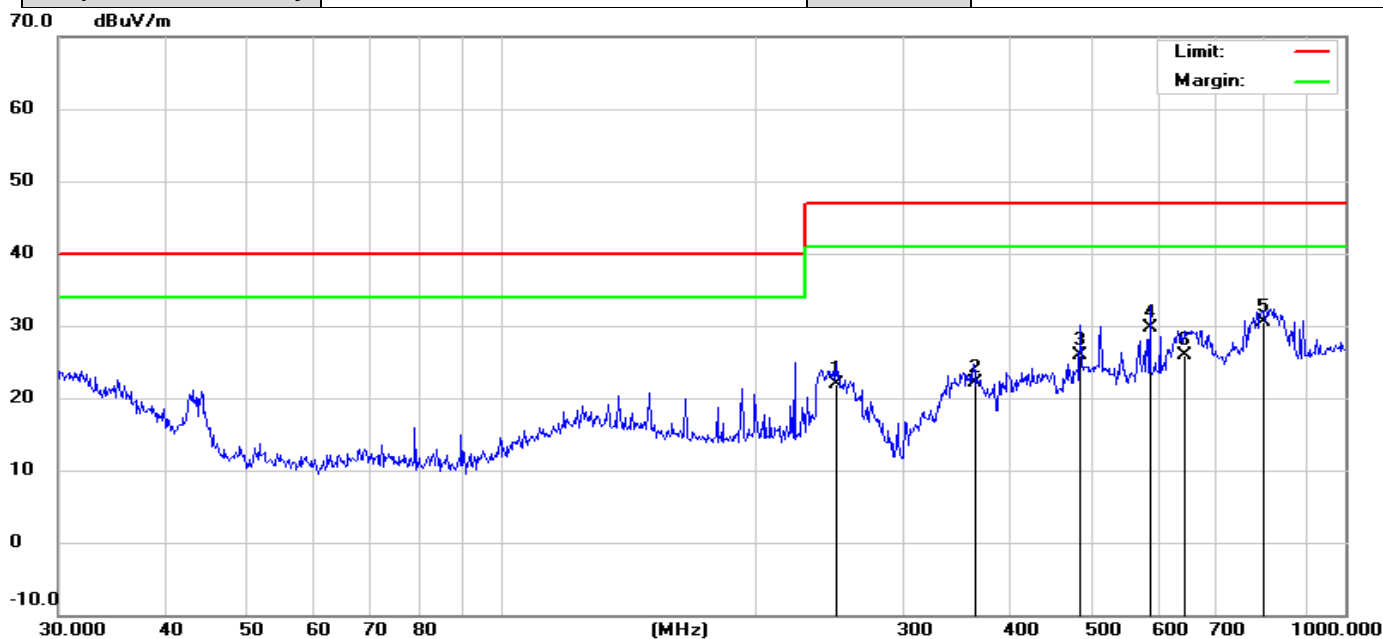
APPENDIX II

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EUT:	MFI Licensed 2 in 1 keychain cable	M/N:	MFI Licensed 2 in 1 keychain cable
Mode:	Running	Polarization:	Vertical
Test by:	hzy	Power:	DC 5V
Temperature: / Humidity	25.5°C/52.5%	Test date:	2016-09-23



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1		249.4250	10.10	11.80	21.90	47.00	-25.10	QP		
2		362.9844	7.50	14.70	22.20	47.00	-24.80	QP		
3		485.6092	8.60	17.37	25.97	47.00	-21.03	QP		
4		586.8436	11.10	18.66	29.76	47.00	-17.24	QP		
5	*	798.9797	9.60	20.89	30.49	47.00	-16.51	QP		
6		645.1194	6.60	19.39	25.99	47.00	-21.01	QP		

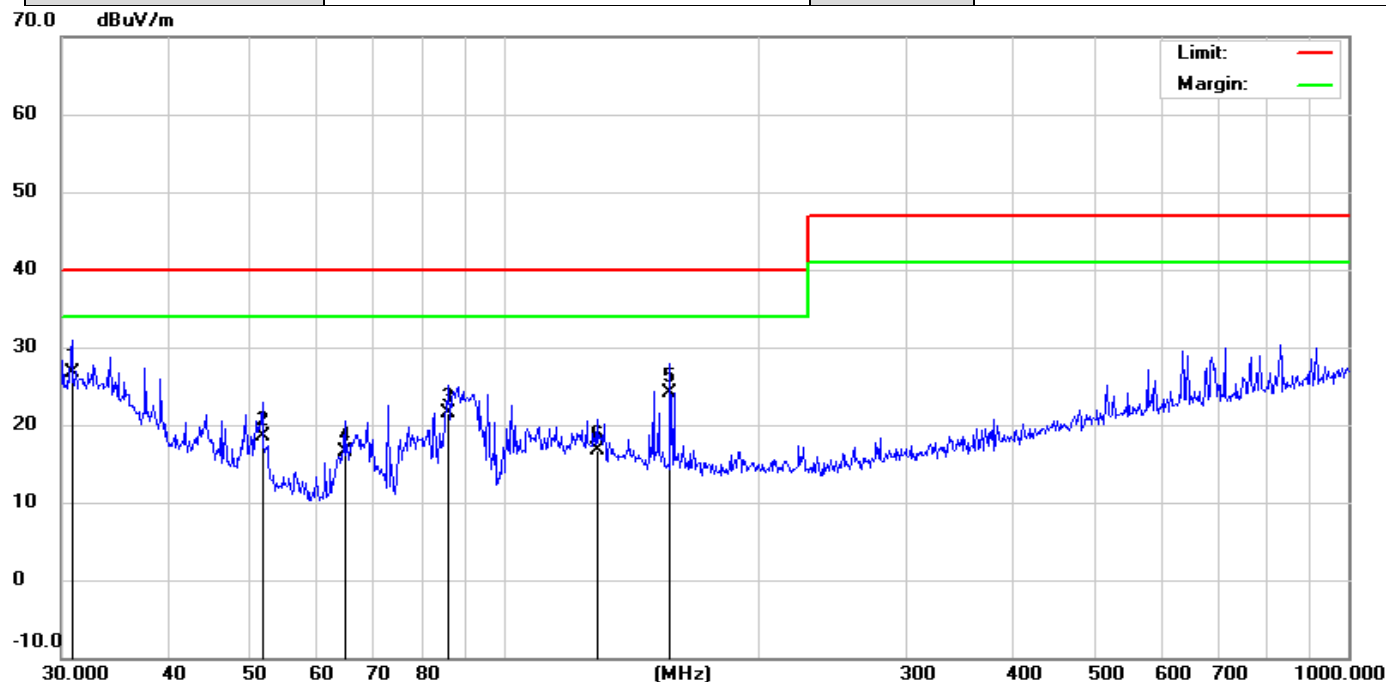
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EUT:	MFI Licensed 2 in 1 keychain cable	M/N:	MFI Licensed 2 in 1 keychain cable
Mode:	Running	Polarization:	Vertical
Test by:	hzy	Power:	DC 5V
Temperature: / Humidity	25.5°C/52.5%	Test date:	2016-09-23



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	30.8534	6.30	20.32	26.62	40.00	-13.38	QP		
2		51.8430	10.40	8.01	18.41	40.00	-21.59	QP		
3		86.2000	13.50	7.98	21.48	40.00	-18.52	QP		
4		64.8864	8.50	7.94	16.44	40.00	-23.56	QP		
5		157.5588	11.70	12.40	24.10	40.00	-15.90	QP		
6		129.0144	2.90	13.84	16.74	40.00	-23.26	QP		

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APPENDIX III (Test Photos of the EUT)

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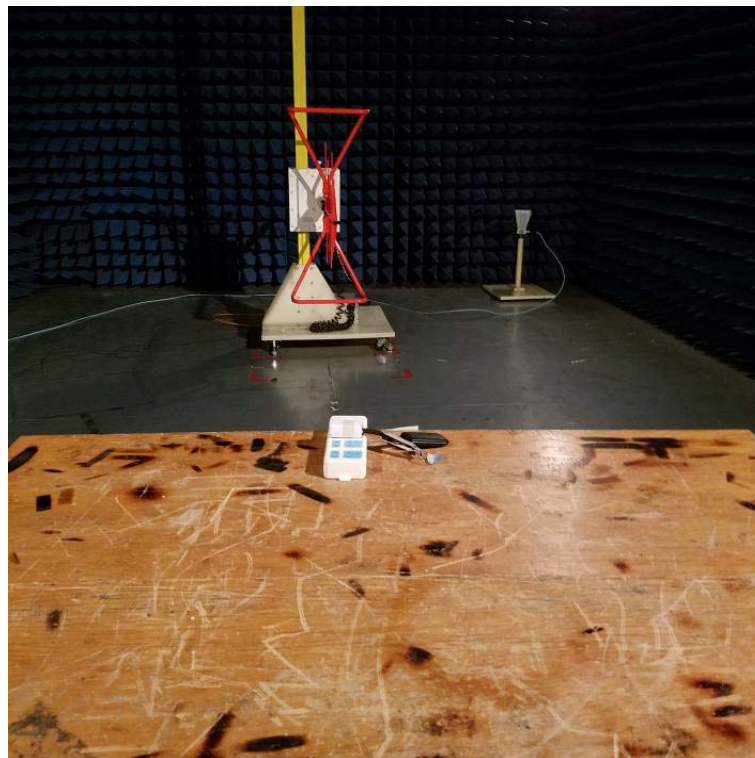
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CE TEST SETUP



RE TEST SETUP



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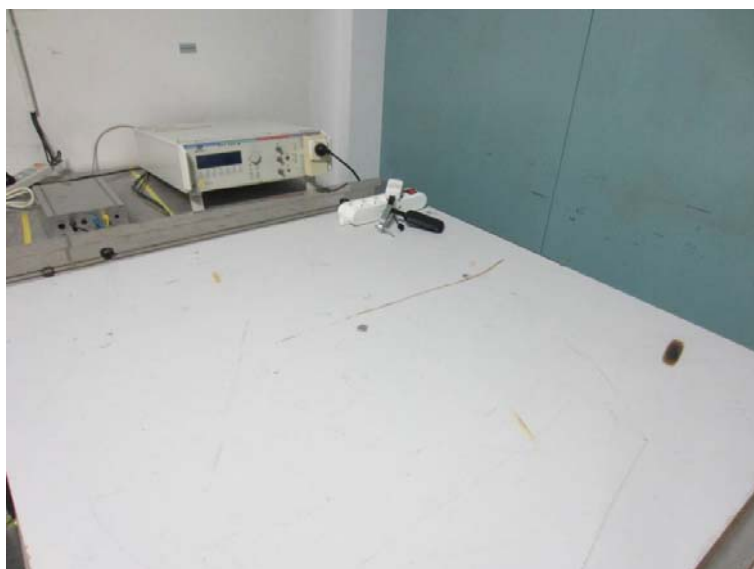
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ESD TEST SETUP



EFT/SURGE/ DIPS TEST SETUP



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APPENDIX IV (Photos of the EUT)

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Figure 1
General Appearance of the EUT

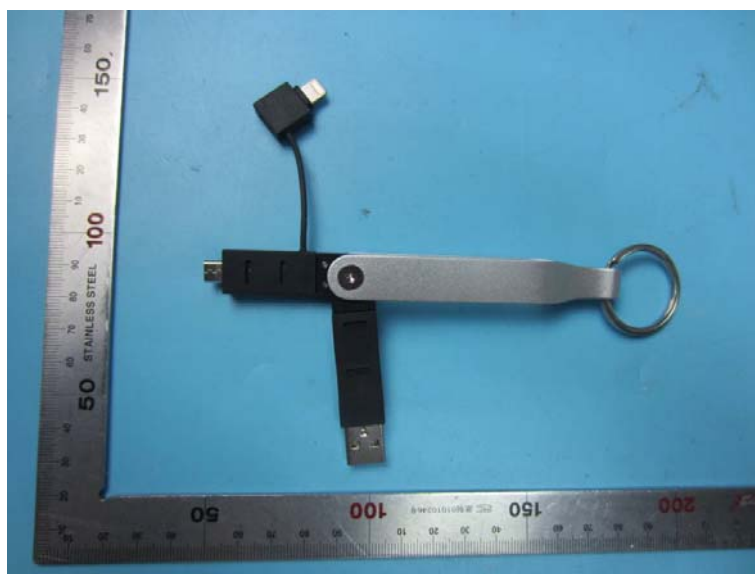


Figure 2
General Appearance of the EUT



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Just for photo

The results shown here refer only to the sample(s) tested, unless otherwise stated. This report can only be reproduced in full, not partially, except by explicit written permission of the laboratory.

***** End of Report *****