

## CE EMC TEST REPORT

### FOR

<b>Applicant</b>	:	DELIXI ELECTRIC LTD.
<b>Address</b>	:	Delixi High Tech Industrial Park, Liushi Town, Yueqing City, Zhejiang Province, China 325604
<b>Equipment under Test</b>	:	Warning lights
<b>Model No.</b>	:	JDS100
<b>Trade Mark</b>	:	/
<b>Manufacturer</b>	:	DELIXI ELECTRIC LTD.
<b>Address</b>	:	Delixi High Tech Industrial Park, Liushi Town, Yueqing City, Zhejiang Province, China 325604

**Issued By: Dongguan Dongdian Testing Service Co., Ltd.**

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## TEST REPORT DECLARE

<b>Applicant</b>	:	DELIXI ELECTRIC LTD.
<b>Address</b>	:	Delixi High Tech Industrial Park, Liushi Town, Yueqing City, Zhejiang Province, China 325604
<b>Equipment under Test</b>	:	Warning lights
<b>Model No.</b>	:	JDS100
<b>Trade mark</b>	:	/
<b>Manufacturer</b>	:	DELIXI ELECTRIC LTD.
<b>Address</b>	:	Delixi High Tech Industrial Park, Liushi Town, Yueqing City, Zhejiang Province, China 325604

### Test Standard Used:

EN 61000-6-1:2007; EN 61000-6-3:2007/A1:2011/AC: 2012  
EN 61000-3-2:2014; EN 61000-3-3:2013

### We Declare:

The equipment described above is tested by Dongguan Dongdian Testing Service Co., Ltd. and in the configuration tested the equipment complied with the standards specified above (class B). The test results are contained in this test report and Dongguan Dongdian Testing Service Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

**After test and evaluation, our opinion is that the equipment in accordance with above standards about the electromagnetic compatibility requirements of Directive 2014/30/EU.**

<b>Report No.:</b>	DDT-R19090607-1E1		
<b>Date of Receipt:</b>	Sep. 12, 2019	<b>Date of Test:</b>	Sep. 12, 2019 ~ Sep. 13, 2019



**Prepared By:**

*Eddie Liu*

**Eddie Liu/Engineer**

**Approved By:**



**Damon Hu/EMC Manager**

Note: This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Dongguan Dongdian Testing Service Co., Ltd.

## Revision history

Rev.	Revisions	Issue Date	Revised By
---	Initial issue	Sep. 18, 2019	

## 1. Summary of test results

<b>EMISSION (EMI)</b>		
<b>Description of Test Item</b>	<b>Standard</b>	<b>Result</b>
Conducted disturbance at mains terminals	EN 61000-6-3:2007/A1:2011/AC:2012	PASS
Conducted disturbance at telecommunication port	EN 61000-6-3:2007/A1:2011/AC:2012	N/A
Radiated disturbance	EN 61000-6-3:2007/A1:2011/AC:2012	PASS
Harmonic current emissions	EN 61000-3-2:2014	N/A
Voltage fluctuations & flicker	EN 61000-3-3:2013	PASS
<b>IMMUNITY (EMS)</b>		
<b>Description of Test Item</b>	<b>Standard</b>	<b>Results</b>
Electrostatic discharge (ESD)	EN 61000-4-2:2009; EN 61000-6-1:2007	PASS
Continuous radio frequency disturbances	EN 61000-4-3: 2006+A1:2008+A2: 2010; EN 61000-6-1:2007	PASS
Electrical fast transients (EFT)	EN 61000-4-4:2012; EN 61000-6-1:2007	PASS
Surges	EN 61000-4-5:2014/AC:2017; EN 61000-6-1:2007	PASS
Continuous conducted disturbances	EN 61000-4-6-2014/AC:2015; EN 61000-6-1:2007	PASS
Power-frequency magnetic fields	EN 61000-4-8:2010; EN 61000-6-1:2007	PASS
Voltage dips and interruptions	EN 61000-4-11:2004/AC:2017; EN 61000-6-1:2007	PASS
Note: N/A is an abbreviation for Not Applicable, and means this item is not applicable for this device.		

### Note:

1. The EMI measurements had been made in the operating mode producing the largest emission in the frequency band being investigated consistent with normal applications. An attempt had been made to maximize the emission by varying the configuration of the EUT.

2. The EMS measurements had been made in the frequency bands being investigated, with the EUT in the most susceptible operating mode consistent with normal applications. The configuration of the test sample had been varied to achieve maximum susceptibility.

## 2. General test information

### 2.1. Description of EUT

EUT Name	: Warning lights
Model Number	: JDS100
EUT function description	: Please reference user manual of this device
Power supply	: AC 220V/50Hz
Maximum work frequency	: <108MHz
Sample Type	: Single production

Note1: EUT is the ab. of equipment under test.

### 2.2. Accessories of EUT

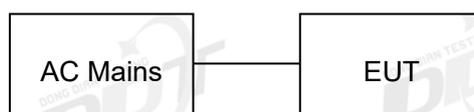
Description of Accessories	Manufacturer	Model number or Type	Serial No.	Other
N/A	N/A	N/A	N/A	N/A

### 2.3. Assistant equipment used for test

Assistant equipment	Manufacturer	Model number	Serial No.	Other
N/A	N/A	N/A	N/A	N/A

### 2.4. Block diagram EUT configuration for test

For mode 1: EUT ON



## 2.5. Decision of final test mode

According pre-test, the worst test modes decided as below and reported.

Emission	Conducted Emission (Mains Port)	Mode 1: EUT ON
	Radiated emission	Mode 1: EUT ON
	Voltage fluctuations & flicker	Mode 1: EUT ON
Immunity	Electrostatic discharge	Mode 1: EUT ON
	Continuous radio frequency disturbances	Mode 1: EUT ON
	Electrical fast transients	Mode 1: EUT ON
	Surges	Mode 1: EUT ON
	Continuous conducted disturbances	Mode 1: EUT ON
	Power-frequency magnetic fields	Mode 1: EUT ON
	Voltage dips and interruptions	Mode 1: EUT ON

## 2.6. Test environment conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature range:	21-25°C
Humidity range:	40-75%
Pressure range:	86-106kPa

## 2.7. Deviations of test standard

No Deviation.

## 2.8. Test laboratory

Dongguan Dongdian Testing Service Co., Ltd.

Add: No. 17, Zongbu Road 2, Songshan Lake Sci&Tech, Industry Park, Dongguan City, Guangdong Province, China, 523808

Tel: +86-0769-38826678, <http://www.dgddt.com>, Email: ddt@dgddt.com

CNAS Accreditation No. L6451; A2LA Accreditation No. 3870.01

FCC Designation Number: CN1182; Test Firm Registration Number: 540522

Industry Canada site registration number: 10288A-1

## 2.9. Measurement uncertainty

Test Item	Uncertainty
Conducted disturbance at mains terminals	3.32dB (150KHz-30MHz)
Uncertainty for telecommunication port conduction emission test	AAN with aLCL = 55 ... 40 dB c: 3.64dB AAN with aLCL = 65 ... 50 dB c: 4.08dB AAN with aLCL = 75 ... 60 dB c: 4.56dB
Uncertainty for Radiation Emission test (30MHz-1GHz)	4.70 dB (Antenna Polarize: V) 4.84 dB (Antenna Polarize: H)
Uncertainty for Radiation disturbance test (1GHz to 6GHz)	4.1dB
Uncertainty for Flicker test	0.2%
Uncertainty for Harmonic test	5%
Temperature	0.4°C
Humidity	2%

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

## 3. Equipment used during test

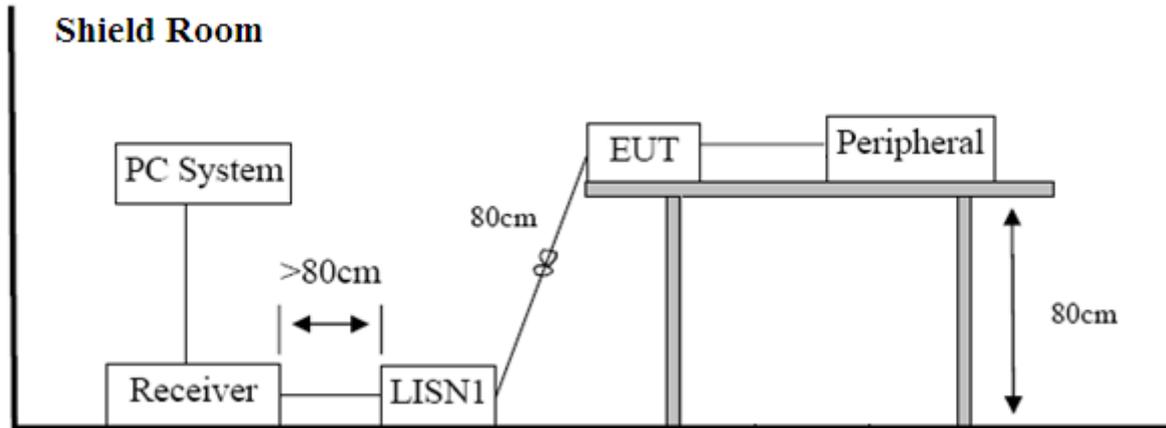
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
<b>Conducted disturbance at mains terminals</b>					
Test Receiver	R&S	ESCI	100551	Oct. 12, 2018	1 Year
LISN 1	R&S	ENV216	101109	Oct. 12, 2018	1 Year
LISN 2	R&S	ESH2-Z5	100309	Oct. 12, 2018	1 Year
Pulse Limiter	R&S	ESH3-Z2	101242	Oct. 12, 2018	1 Year
CE Cable 1	HUBSER	ESU8/RF2	W10.01	Oct. 12, 2018	1 Year
Test software	Audix	E3	V 6.11111b	N/A	N/A
<b>Radiation 2#chamber (below 1G)</b>					
Test Receiver	R&S	ESCI	101028	Sep. 21, 2018	1 Year
Trilog Broadband Antenna	Schwarzbeck	VULB 9163	9163-994	Nov. 16, 2018	1 Year
RF Cable	MI Cable	N/A	DDT-F02-23 3	Oct. 12, 2018	1 Year
RF Cable	MI Cable	N/A	DDT-F02-23 4	Oct. 12, 2018	1 Year
RF Cable	MI Cable	N/A	DDT-F02-23 5	Oct. 12, 2018	1 Year
Test software	Audix	E3	V 6.11111b	N/A	N/A
<b>Radiation 1#chamber (above 1G)</b>					
Spectrum analyzer	Agilent	E4447A	MY5018003 1	Jun. 25, 2019	1 Year
Active Loop antenna	Schwarzbeck	FMZB-1519	1519-038	Oct. 12, 2018	1 Year
Double Ridged Horn Antenna	R&S	HF907	100276	Oct. 12, 2018	1 Year
Broad Band Horn Antenna	Schwarzbeck	BBHA 9170	790	Oct. 25, 2018	1 Year
Pre-amplifier	TERA-MW	TRLA-0040G35	101303	Oct. 12, 2018	1 Year
RF Cable (up to	N/A	SMAJ-SMAJ-1M	17070133+1	Oct. 12, 2018	1 Year

40GHz)		+ 11M	7070131		
Test software	Audix	E3	V 6.11111b	N/A	N/A
<b>Harmonic current emissions/Voltage fluctuation and flicker</b>					
HARMONICS and Voltage fluctuation and flicker tester	EMC-PARTNER	HAR1000-1P	HAP1000-1 P230V-0205	Jul. 18, 2019	1 Year
Test Software	EMC-PARTNER	Harmonics-1000	4.19	N/A	N/A
<b>Electrostatic discharge</b>					
ESD Generator	TESEQ	NSG 437	981	Nov. 05, 2018	1 Year
<b>Electrical fast transients</b>					
EFT Generator	EMC PARTNER	TRA3000F	TRA3000F-1 502	Jun. 25, 2019	1 Year
Capacitive coupling clamp	EMC PARTNER	103648	CN-EFT100 0-1514	Jun. 25, 2019	1 Year
<b>Continuous conducted disturbances</b>					
Conducted immunity test system	FRANKONIA	CIT-10	126B1207	Jun. 25, 2019	1 Year
CDN	FRANKONIA	CDN M2+M3	A2210191	Oct. 12, 2018	1 Year
Attenuation	BIRD	DAM75W (6dB)	1143	Oct. 12, 2018	1 Year
EM lamp	FRANKONIA	EMCL	132A1143/2 012	Oct. 12, 2018	1 Year
CDN	FRANKONIA	CDNT8	A6100017/2 012	Oct. 12, 2018	1 Year
Test Software	CD-LAB	F5.318	1435V99920 15	N/A	N/A
<b>Surge</b>					
Surge Generator	EMC PARTNER	TRANSIENT200 0	MIG0603IN2 S-T-1504	Jun. 25, 2019	1 Year
<b>Power-frequency magnetic fields</b>					
Generator	EMC PARTNER	TRA3000F	TRA3000F-1 502	Jun. 25, 2019	1 Year
Magnetic Field Tester	EMC-PARTNER	MF1000-1	207	Jun. 25, 2019	1 Year
<b>RF Strength Susceptibility Test</b>					
Signal Generator	Agilent	N5172B	MY5305001 8	Oct. 12, 2018	1 Year
Amplifier	Wonder	HPA80M1000M5 00	101	Oct. 12, 2018	1 Year
Amplifier	Wonder	HPA1000M2500 M300	102	Oct. 12, 2018	1 Year
Amplifier	Wonder	HPA2500M6000 M200	103	Oct. 12, 2018	1 Year
Power meter	Agilent	N1912A	MY5000046 0	Oct. 12, 2018	1 Year
Power sensor	Agilent	E9323	MY4442090 7	Oct. 12, 2018	1 Year
Power sensor	Agilent	E9323	US4041040 5	Oct. 12, 2018	1 Year
Log-periodic antenna	Schwarzbeck	STLP 9149	587	Oct. 17, 2018	1 Year
Log-periodic antenna	Schwarzbeck	STLP 9128D	090	Oct. 17, 2018	1 Year

		special			
Field strength probe	PMM	EP-601	611WX80209	Nov. 17, 2018	1 Year
<b>Voltage dips and interruptions</b>					
DIPS TESTER	EMC PARTNER	TRA3000D	EXT-TRA3000D-1510	Jun. 25, 2019	1 Year
Notes. N/A means Not applicable.					

## 4. Conducted disturbance at mains terminals

### 4.1. Block diagram of test setup



### 4.2. Limits for conducted disturbance at the mains ports of class B

Frequency	Quasi-Peak Level dB( $\mu$ V)	Average Level dB( $\mu$ V)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. \* Decreasing linearly with logarithm of frequency.

2. The lower limit shall apply at the transition frequencies.

### 4.3. Test Procedure

- (1) The EUT was placed on a non-metallic table, 80cm above the ground plane.
- (2) Setup the EUT and assistant equipment as shown in section 2.3 and 4.1
- (3) The EUT's power adapter was connected to the power mains through a line impedance stabilization network (L.I.S.N). Which this provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). Both sides of power line were checked for maximum conducted disturbance. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to CISPR 22 on conducted disturbance emission test.
- (4) The bandwidth of test receiver is set at 9 KHz.
- (5) The frequency range from 150 KHz to 30MHz is checked.

### 4.4. Test Result

#### **PASS. (See below detailed test result)**

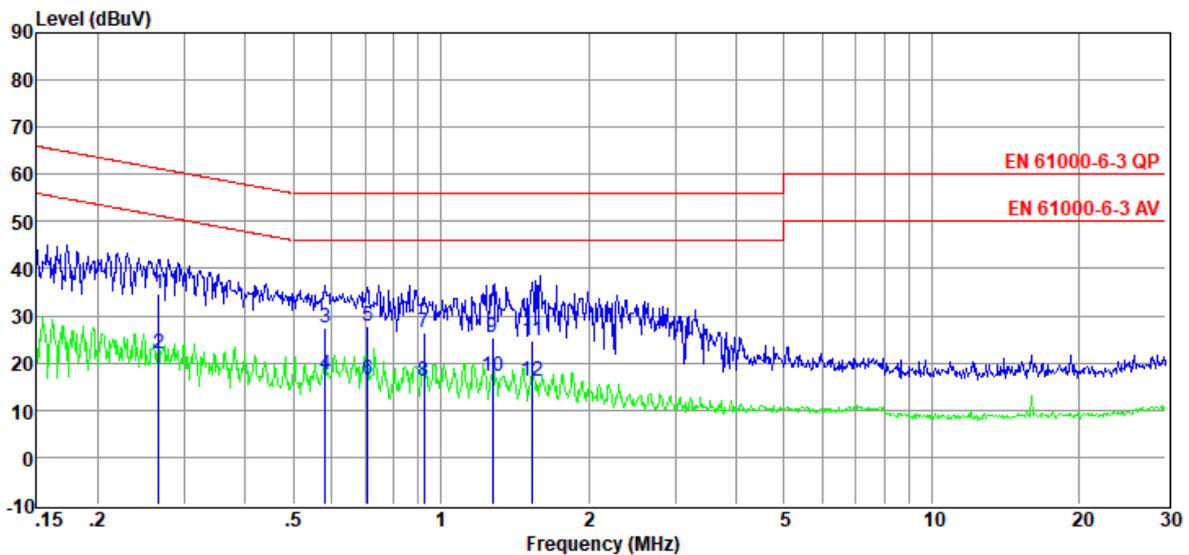
Note1: All emissions not reported below are too low against the prescribed limits.

Note2: "----" means Peak detection; "----" means Average detection

# TR-4-E-010 Conducted Emission Test Result

**Test Site** : DDT 1# Shield Room D:\2019 CE report data\Q19090607\20190913 CE.EM6  
**Test Date** : 2019-09-13 **Tested By** : Telamon  
**EUT** : Warming lights **Model Number** : JDS100  
**Power Supply** : AC 220V/50Hz **Test Mode** : EUT ON  
**Condition** : Temp:24.5°C,Humi:55%,Press:100.1KPa **LISN** : 2018 ENV216/NEUTRAL  
**Memo** :

Data: 2



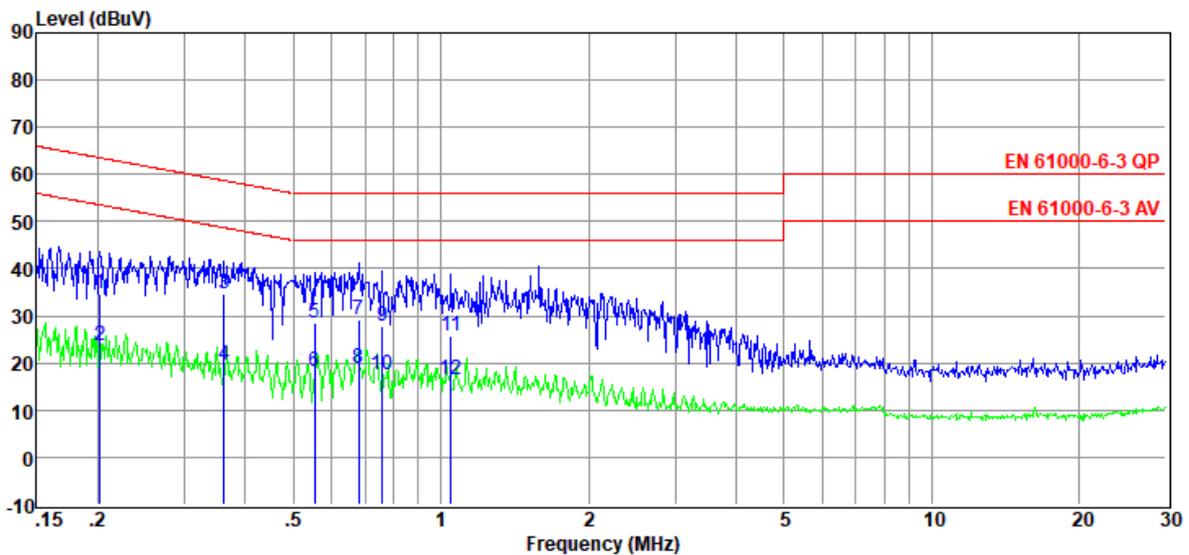
Item (Mark)	Freq. (MHz)	Read Level (dBUV)	LISN Factor (dB)	Cable Loss (dB)	Pulse Limiter Factor (dB)	Result Level (dBUV)	Limit Line (dBUV)	Over Limit (dB)	Detector	Phase
1	0.27	15.03	9.64	0.02	9.86	34.55	61.25	-26.70	QP	NEUTRAL
2	0.27	2.47	9.64	0.02	9.86	21.99	51.25	-29.26	Average	NEUTRAL
3	0.58	8.02	9.64	0.03	9.86	27.55	56.00	-28.45	QP	NEUTRAL
4	0.58	-1.98	9.64	0.03	9.86	17.55	46.00	-28.45	Average	NEUTRAL
5	0.71	8.34	9.64	0.04	9.86	27.88	56.00	-28.12	QP	NEUTRAL
6	0.71	-2.95	9.64	0.04	9.86	16.59	46.00	-29.41	Average	NEUTRAL
7	0.92	6.83	9.64	0.08	9.87	26.42	56.00	-29.58	QP	NEUTRAL
8	0.92	-3.48	9.64	0.08	9.87	16.11	46.00	-29.89	Average	NEUTRAL
9	1.28	5.63	9.65	0.08	9.87	25.23	56.00	-30.77	QP	NEUTRAL
10	1.28	-2.35	9.65	0.08	9.87	17.25	46.00	-28.75	Average	NEUTRAL
11	1.54	5.21	9.66	0.07	9.87	24.81	56.00	-31.19	QP	NEUTRAL
12	1.54	-3.34	9.66	0.07	9.87	16.26	46.00	-29.74	Average	NEUTRAL

- Note: 1. Result Level = Read Level + LISN Factor + Pulse Limiter Factor + Cable loss.  
 2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.  
 3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).  
 4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

# TR-4-E-010 Conducted Emission Test Result

**Test Site** : DDT 1# Shield Room D:\2019 CE report data\Q19090607\20190913 CE.EM6  
**Test Date** : 2019-09-13 **Tested By** : Telamon  
**EUT** : Warming lights **Model Number** : JDS100  
**Power Supply** : AC 220V/50Hz **Test Mode** : EUT ON  
**Condition** : Temp:24.5°C,Humi:55%,Press:100.1KPa **LISN** : 2018 ENV216/LINE  
**Memo** :

Data: 4



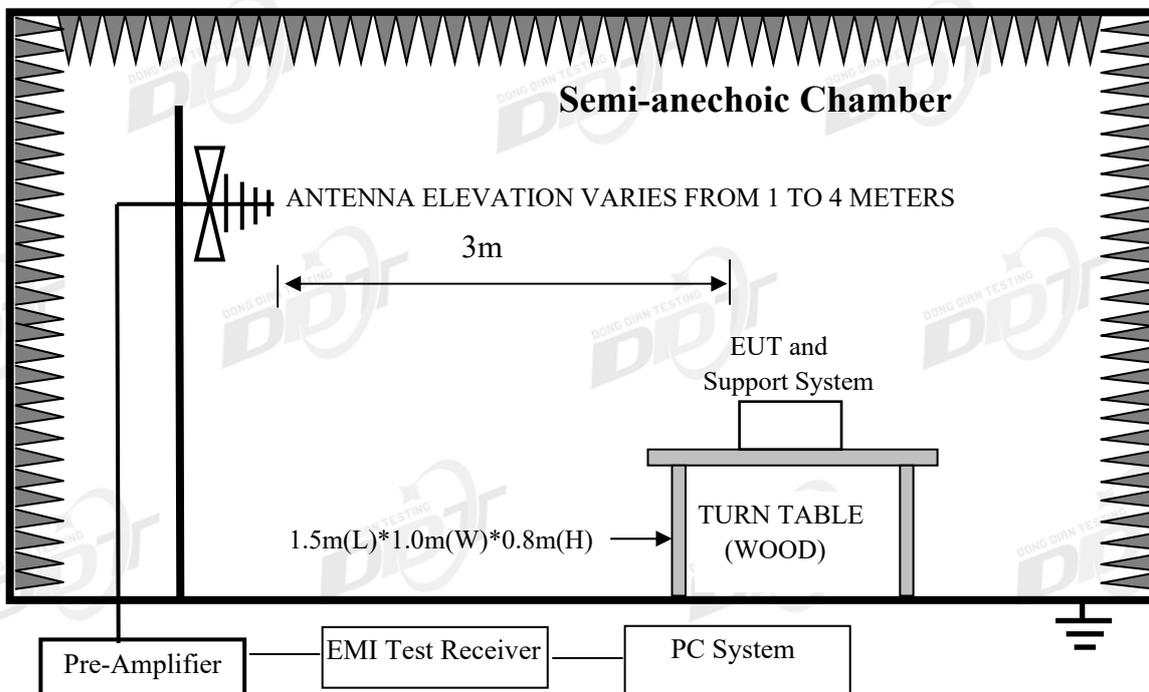
Item (Mark)	Freq. (MHz)	Read Level (dBμV)	LISN Factor (dB)	Cable Loss (dB)	Pulse Limiter Factor (dB)	Result Level (dBμV)	Limit Line (dBμV)	Over Limit (dB)	Detector	Phase
1	0.20	15.32	9.63	0.02	9.86	34.83	63.54	-28.71	QP	LINE
2	0.20	4.22	9.63	0.02	9.86	23.73	53.54	-29.81	Average	LINE
3	0.36	15.13	9.63	0.02	9.86	34.64	58.69	-24.05	QP	LINE
4	0.36	0.06	9.63	0.02	9.86	19.57	48.69	-29.12	Average	LINE
5	0.55	9.06	9.64	0.02	9.86	28.58	56.00	-27.42	QP	LINE
6	0.55	-1.24	9.64	0.02	9.86	18.28	46.00	-27.72	Average	LINE
7	0.68	9.67	9.64	0.04	9.86	29.21	56.00	-26.79	QP	LINE
8	0.68	-0.68	9.64	0.04	9.86	18.86	46.00	-27.14	Average	LINE
9	0.76	8.34	9.64	0.04	9.86	27.88	56.00	-28.12	QP	LINE
10	0.76	-2.03	9.64	0.04	9.86	17.51	46.00	-28.49	Average	LINE
11	1.05	6.09	9.64	0.10	9.87	25.70	56.00	-30.30	QP	LINE
12	1.05	-3.00	9.64	0.10	9.87	16.61	46.00	-29.39	Average	LINE

- Note: 1. Result Level = Read Level + LISN Factor + Pulse Limiter Factor + Cable loss.  
 2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.  
 3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).  
 4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

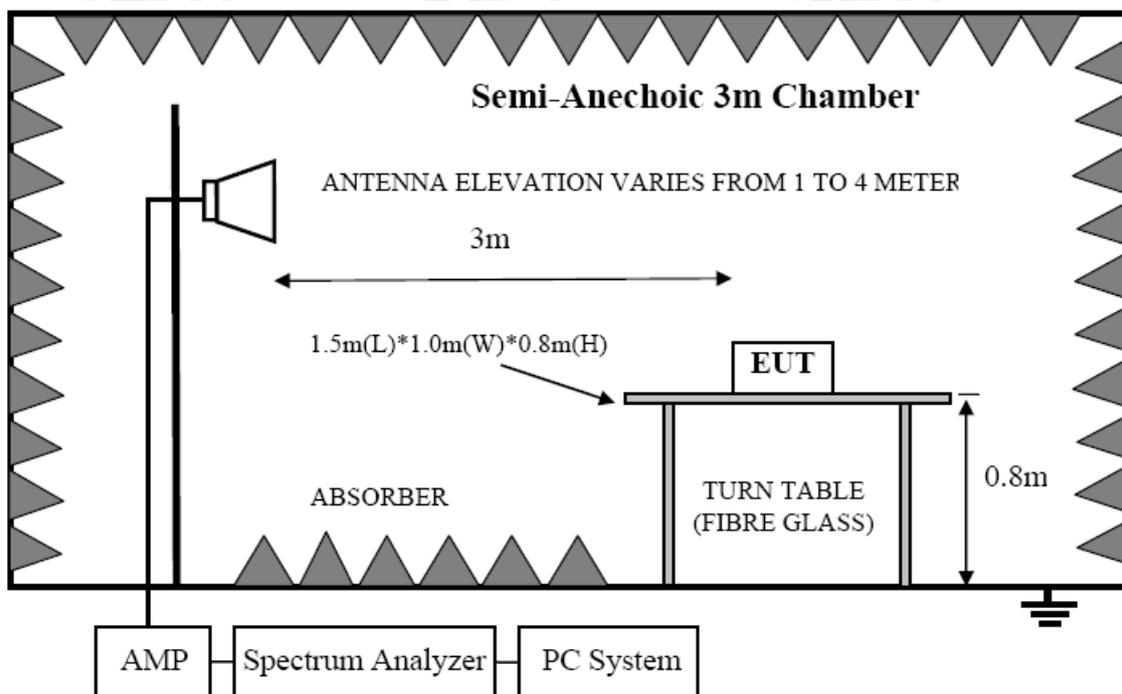
## 5. Radiated disturbance test

### 5.1. Block diagram of test setup

Below 1GHz



Above 1GHz



## 5.2. Radiated disturbance limit

Frequency	Field Strengths Limits at 10m measuring distance dB( $\mu$ V)/m	Field Strengths Limits at 3m measuring distance dB( $\mu$ V)/m
30MHz to 230MHz	30	40
230MHz to 1000MHz	37	47
1GHz to 3GHz	/	Average:50 ; Peak:70
3GHz to 6GHz	/	Average:54 ; Peak:74

Note: (1) The smaller limit shall apply at the cross point between two frequency bands.

(2) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

(3) According CISPR 22: 2010 clause 10.3.1, if the field-strength measurement at 10 m cannot be made because of high ambient noise levels, or for other reasons, measurement of class B EUTs may be made at a closer distance, for example 3 m. An inverse proportionality factor of 20 dB per decade should be used to normalize the measured data to specified distance for determining compliance. Care should be taken in the measurement of large EUTs at 3m at frequencies near 30MHz, due to near field effects.

## 5.3. Test Procedure

- (1) The EUT was placed on a non-metallic table, 80 cm above the ground plane inside an semi-anechoic chamber.
- (2) Setup EUT and simulator as shown in section 2.3 and 5.1
- (3) Test antenna was located 3m (see note) 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 CISPR 22: 2010 on radiated emission test.
- (4) Spectrum frequency from 30MHz to 1GHz was investigated.
- (5) 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 CISPR 22: 2010 on Radiated Emission test.
- (6) For emissions from 30MHz to 1GHz, Quasi-Peak values were measured with EMI

Receiver and the bandwidth of Receiver is 120 KHz.

(7)For emissions above 1GHz, both Peak and Average level were measured with Spectrum Analyzer, and the RBW is set at 1MHz VBW is set at 3MHz.

**5.4. Test result**

**PASS. (See below detailed test result)**

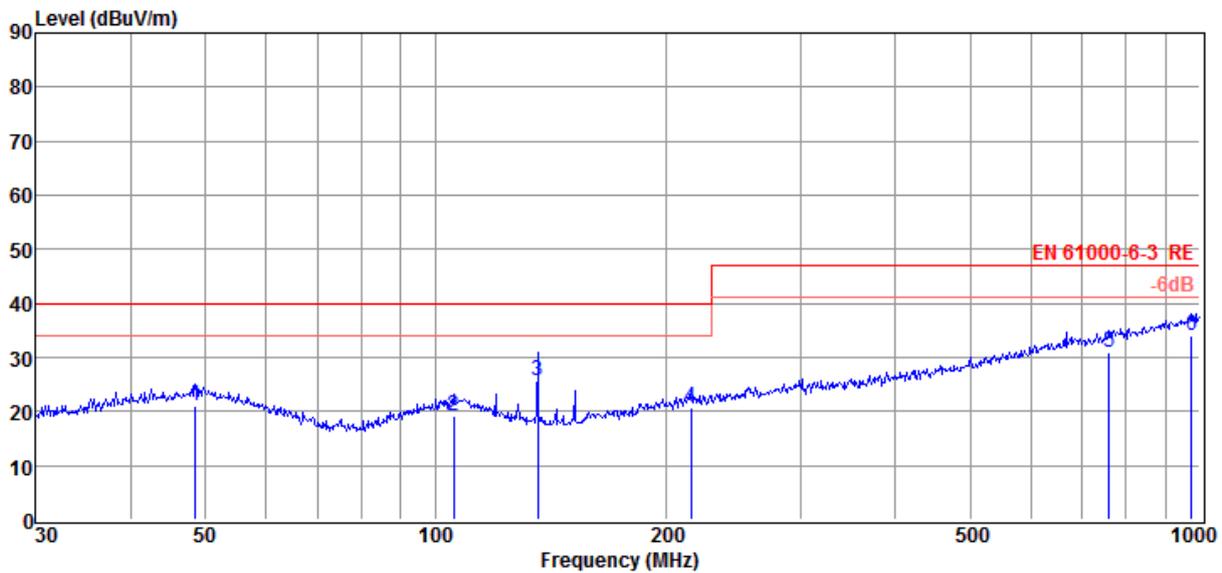
Note1: All emissions not reported below are too low against the prescribed limits.

**TR-4-E-009 Radiated Emission Test Result**

**Test Site** : DDT 3m Chamber 2# **E:\2019 RE2# Report Data\Q19090607-1E\20190913 RE.EM6**  
**Test Date** : 2019-09-13 **Tested By** : Telamon  
**EUT** : Warming lights **Model Number** : JDS100  
**Power Supply** : AC 220V/50Hz **Test Mode** : EUT ON  
**Condition** : Temp:24.5°C,Humi:55%,Press:100.1kPa **Antenna/Distance** : 2018 VULB 9163 2#/3m/HORIZONTAL

**Memo** :

Data: 1



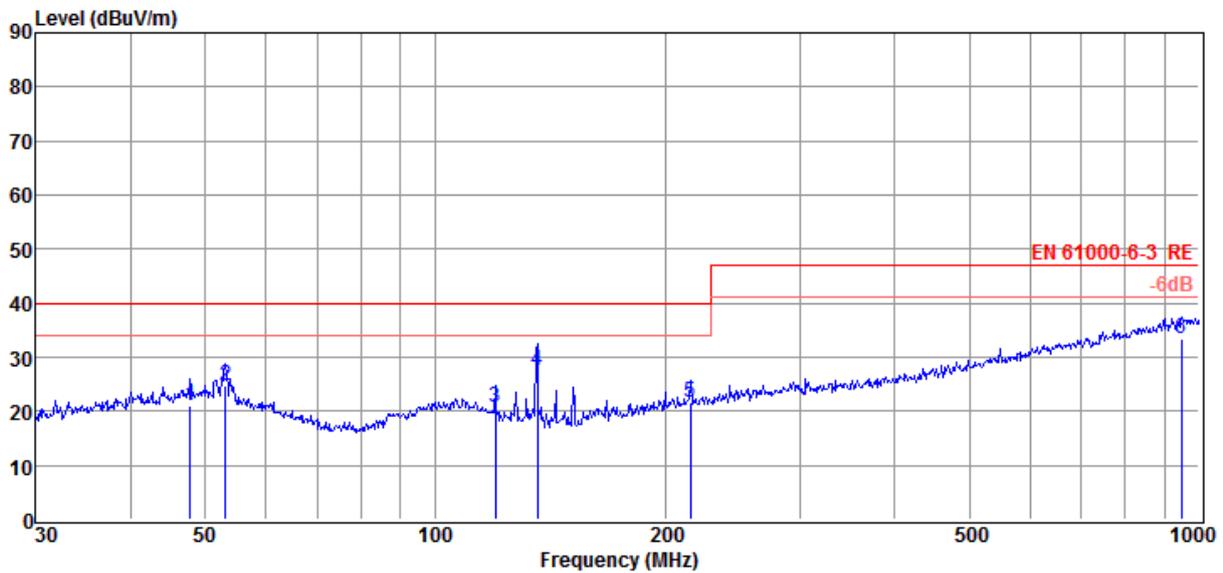
Item (Mark)	Freq. (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Result Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Detector	Polarization
1	48.50	2.61	14.61	3.84	21.06	40.00	-18.94	QP	HORIZONTAL
2	105.64	2.33	12.45	4.26	19.04	40.00	-20.96	QP	HORIZONTAL
3	135.98	12.60	8.72	4.46	25.78	40.00	-14.22	QP	HORIZONTAL
4	216.02	3.92	11.73	4.93	20.58	40.00	-19.42	QP	HORIZONTAL
5	760.70	2.96	20.30	7.60	30.86	47.00	-16.14	QP	HORIZONTAL
6	975.75	2.89	22.61	8.49	33.99	47.00	-13.01	QP	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.  
 2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.  
 3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

# TR-4-E-009 Radiated Emission Test Result

**Test Site** : DDT 3m Chamber 2# E:\2019 RE2# Report Data\Q19090607-1E\20190913 RE.EM6  
**Test Date** : 2019-09-13 **Tested By** : Telamon  
**EUT** : Warming lights **Model Number** : JDS100  
**Power Supply** : AC 220V/50Hz **Test Mode** : EUT ON  
**Condition** : Temp:24.5°C,Humi:55%,Press:100.1kPa **Antenna/Distance** : 2018 VULB 9163 2#/3m/VERTICAL  
**Memo** :

Data: 2

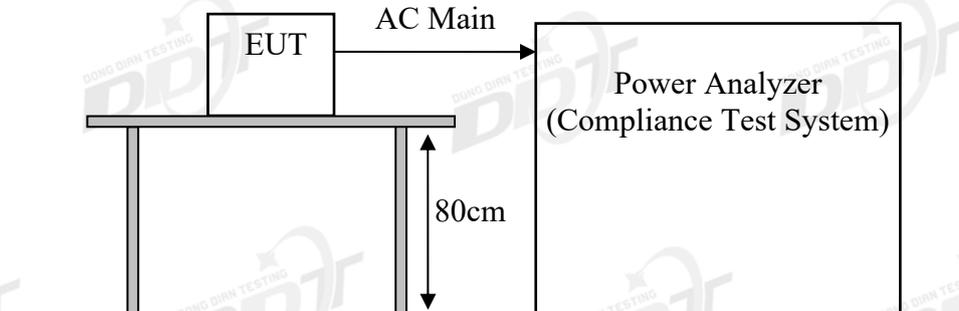


Item (Mark)	Freq. (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	47.83	2.65	14.52	3.83	21.00	40.00	-19.00	QP	VERTICAL
2	53.13	7.02	13.83	3.88	24.73	40.00	-15.27	QP	VERTICAL
3	119.86	5.94	10.43	4.35	20.72	40.00	-19.28	QP	VERTICAL
4	135.98	14.26	8.72	4.46	27.44	40.00	-12.56	QP	VERTICAL
5	216.02	5.09	11.73	4.93	21.75	40.00	-18.25	QP	VERTICAL
6	948.76	2.64	22.40	8.32	33.36	47.00	-13.64	QP	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.  
 2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.  
 3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

## 6. Harmonic current emissions

### 6.1. Block diagram of test setup



### 6.2. 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 for each successive harmonic component in turn. The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the necessary for the EUT to be exercised.

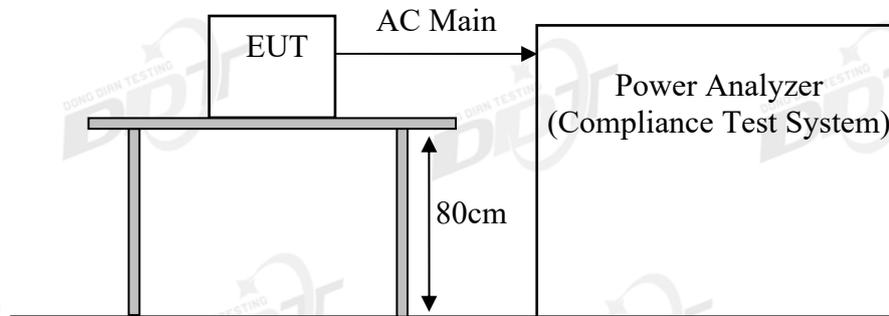
### 6.3. Test result

#### Test Result: Not Applicable.

Remark: This product is not defined as lighting equipment, and has rated power less than 75W, therefore, no limit apply according to EN 61000-3-2 harmonics currents emissions test.

## 7. Voltage fluctuations & flicker

### 7.1. Block diagram of test setup



### 7.2. Limit

Test Item	Limit	Note
$P_{st}$	1.0	$P_{st}$ means Short-term flicker indicator
$P_{lt}$	0.65	$P_{lt}$ means long-term flicker indicator
$T_{dt}$	0.2	$T_{dt}$ means maximum time that dt exceeds 3%
$d_{max}(\%)$	4%	$d_{max}$ means maximum relative voltage change.
$d_c(\%)$	3%	$d_c$ means relative steady-state voltage change.

### 7.3. Test Procedure

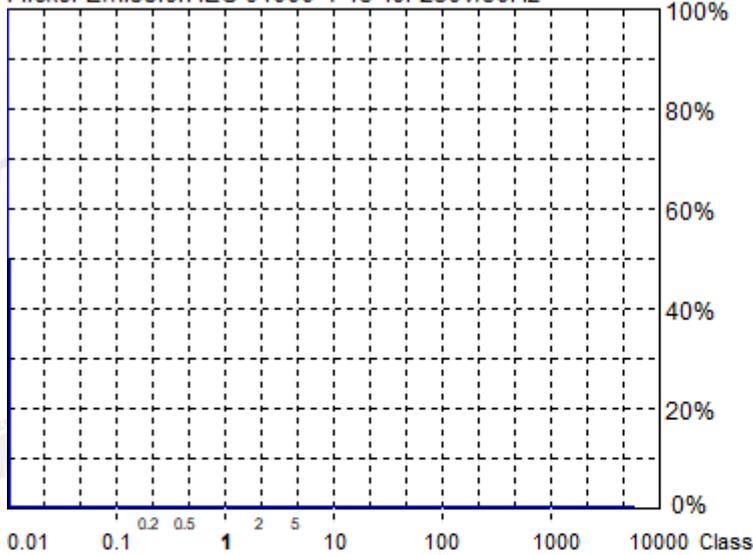
The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under normal conditions. During the flicker measurement, the measure time shall include that part of whole operation changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.

### 7.4. Test result

**PASS.** (See below detailed test result)

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

Flicker Emission IEC 61000-4-15 for 230V/50Hz



<b>Actual Flicker (Fli):</b>	<b>0.00</b>
<b>Short-term Flicker (Pst):</b>	<b>0.07</b>
Limit (Pst):	1.00
<b>Long-term Flicker (Plt):</b>	<b>0.07</b>
Limit (Plt):	0.65
<b>Maximum Relative Volt. Change (dmax):</b>	<b>0.00%</b>
Limit (dmax):	4.00%
<b>Relative Steady-state Voltage Change (dc):</b>	<b>0.00%</b>
Limit (dc):	3.00%
<b>Tmax 3.00% (dt):</b>	<b>0.00ms</b>
Limit (dt>Lim):	200ms

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

2019/9/12 9:55:18

Urms = 231.7 V P = 2.626 W  
 Irms = 0.144 A pf = 0.079

Range: 0.5 A  
 V-nom: 230 V  
 TestTime: 10 min (100%)

**Test completed, Result: PASSED**

HAR-1000 EMC-Partner

Full Bar : Actual Values  
 Empty Bar : Maximum Values  
 Circles : Average Values  
 Blue : Current , Green : Voltage , Red : Failed

**Measurement**

Urms = 231.7V Freq = 50.000 Range: 0.5 A  
 Irms = 0.144A Ipk = 0.211A cf = 1.462  
 P = 2.626W S = 33.43VA pf = 0.079

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

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

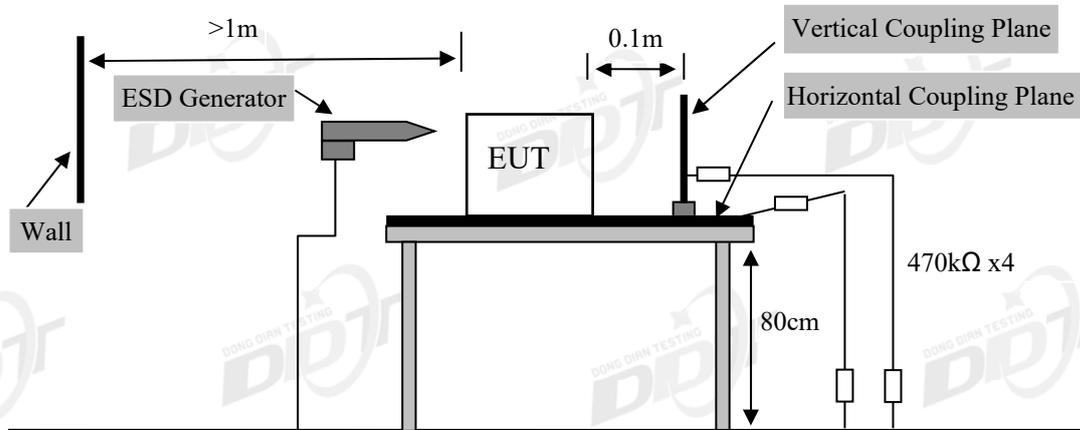
Limits : Plt : 0.65 Pst : 1.00  
 dmax : 4.00 % dc : 3.00 %  
 dtLim: 3.00 % dt>Lim: 200ms

Test completed, Result: PASSED

	dmax
	[ % ]
1	0.000

## 8. Electrostatic discharge (ESD)

### 8.1. Block diagram of test setup



### 8.2. Test levels and performance criterion

Test Level		Performance Criteria
Air Discharge	$\pm 2\text{kV}$ , $\pm 4\text{kV}$ and $\pm 8\text{kV}$	<b>B</b>
Contact Discharge	$\pm 4\text{kV}$	

Performance criteria B description: During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test. After the test, the EUT shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the EUT is used as intended.

### 8.3. Test Procedure

#### 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.

#### Contact Discharge:

All the procedure was same as air discharge. 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 touching the EUT before the discharge switch was operated.

#### Indirect discharge for horizontal coupling plane:

At least 20 single discharges were applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

#### Indirect discharge for vertical coupling plane:

At least 20 single discharges were applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, was placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges were applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

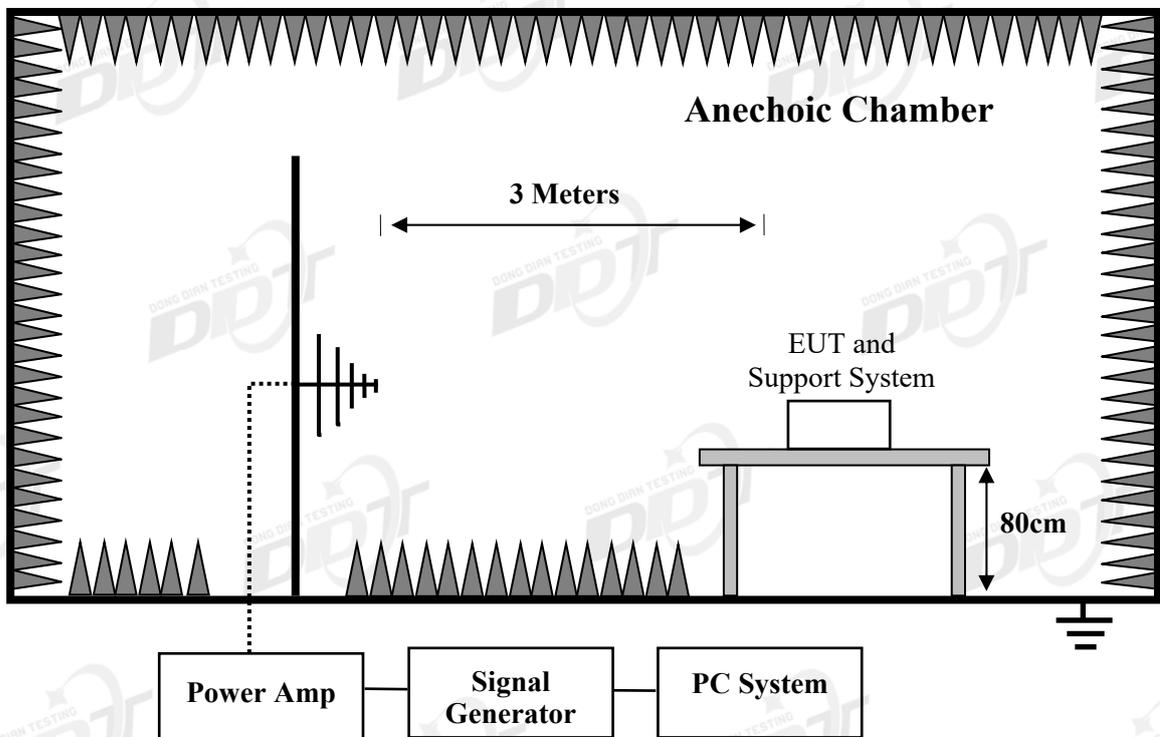
**8.4. Test result**

**PASS. (See below detailed test result)**

Test power Supply : AC 220V/50Hz				Test Site: DDT 3# Shield Room		
Ambient Condition: <u>24.5</u> °C <u>58</u> %RH <u>101.4</u> kPa						
Test Times: 50 times at each point for contact discharge; 50 times at each point for air discharge.						
Operation Mode	Type of discharge	Test Level	Test Point	Performance		Result (Pass/Fail)
				Required	Observation	
Mode 1	Contact to EUT	±4kV	/	B	/	/
	Contact to Coupling Planes	±4kV	Coupling Planes	B	A	Pass
	Air	±2kV, ±4kV, and ±8kV	1	B	A	Pass
Test Point:						
No	Description	No	Description	No	Description	
1	Surface and gap	/	/	/	/	
/	/	/	/	/	/	
/	/	/	/	/	/	
<b>Observation Description:</b> A: Operation as intend, no loss of function during test and after test.						
<b>Test Date:</b> Sep. 13, 2019				<b>Test Engineer:</b> Eddie Liu		

**9. Continuous radio frequency disturbances**

**9.1. Block diagram of test setup**



## 9.2. Test levels and performance criterion

Test Level		Performance Criteria
Frequency	80MHz-1GHz, 1.4GHz-2.7GHz	A
Field Strength	3V/m measured unmodulated	
Modulation	AM modulated to a depth of 80% by a sinusoidal audio signal of 1KHz	
Step Size	1% increments	
Dwell time	1 Sec.	

Performance criteria A description: During and after the test the EUT shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a minimum performance level specified by the manufacturer when the EUT is used as intended.

## 9.3. Test Procedure

The field sensor is placed on the EUT table (0.8 meter above the ground) which is 3 meters away from the transmitting antenna. Through the signal generator, power amplifier and transmitting antenna to produce a uniformity field strength (3V/m measured by field sensor) around the EUT table from frequency range specified and records the signal generator's output level at the same time for whole measured frequency range. Then, put EUT and its simulators on the EUT turn table and keep them 3 meters away from the transmitting antenna which is mounted on an antenna tower and fixes at 1 meter height above the ground. Using the recorded signal generator's output level to measure the EUT from frequency range specified and both horizontal & vertical polarization of antenna must be set and measured. Each of the four sides of EUT must be faced this transmitting antenna and measures individually.

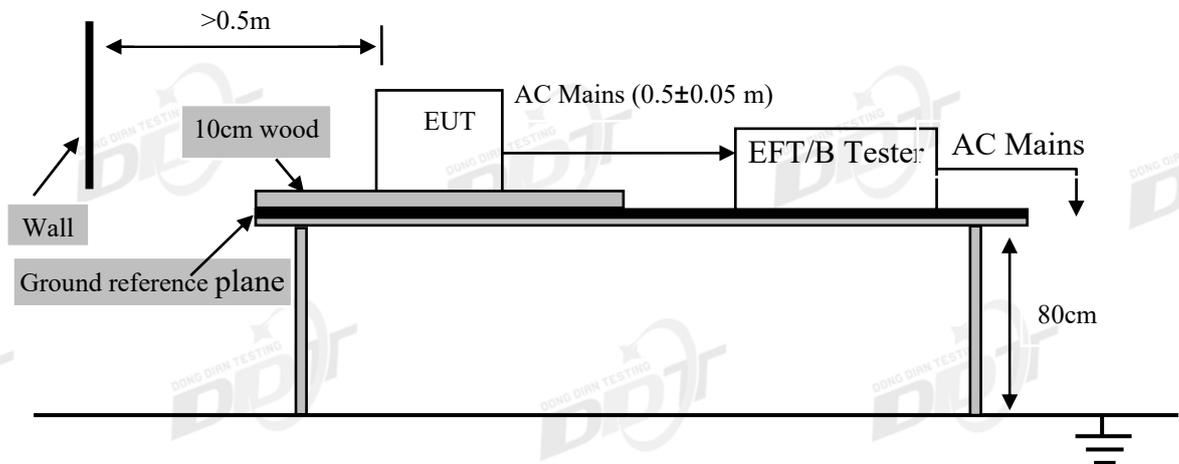
## 9.4. Test result

**PASS. (See below detailed test result)**

Test power Supply : AC 220V/50Hz						
Ambient Condition: <u>24.5</u> °C <u>58</u> %RH <u>101.4</u> kPa						
Field Strength: <input checked="" type="checkbox"/> 3V/m <input type="checkbox"/> 10V/m <input type="checkbox"/> Other: Steps: <input checked="" type="checkbox"/> 1% <input type="checkbox"/> other: Dwell time: <input checked="" type="checkbox"/> 1s <input type="checkbox"/> other:						
Frequency Range: <input checked="" type="checkbox"/> 80MHz---1GHz; <input checked="" type="checkbox"/> 1.4GHz---2.7GHz; <input type="checkbox"/> other:						
Modulation: <input type="checkbox"/> None <input checked="" type="checkbox"/> AM <input checked="" type="checkbox"/> 1KHz <input type="checkbox"/> 400Hz Modulation depth: <input checked="" type="checkbox"/> 80% <input type="checkbox"/> other:						
Operation Mode	EUT Position towards antenna	Antenna: Horizontal		Antenna: Vertical		Result (Pass/Fail)
		Required	Observation	Required	Observation	
Mode 1	Front	A	A	A	A	Pass
	Right	A	A	A	A	Pass
	Rear	A	A	A	A	Pass
	Left	A	A	A	A	Pass
Observation Description: A: Operation as intend, no loss of function during test and after test.						
Test Date: Sep. 13, 2019				Test Engineer: Eddie Liu		

## 10. Electrical fast transients (EFT)

### 10.1. Block diagram of test setup



### 10.2. Test levels and performance criterion

Test Level		Performance Criteria
Test voltage	±1KV For AC mains Port	B
Repetition Frequency	5KHz	
Burst Duration	15ms	
Burst Period	300ms	
Inject Time(s)	120s	
Inject Method	Direct For AC mains port	
Inject Line	AC Mains of adapter	

Performance criteria B description: During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test. After the test, the EUT shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the EUT is used as intended.

### 10.3. Test Procedure

The EUT and its simulators were placed on the ground reference plane and were insulated from it by a 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.

For input and AC power ports:

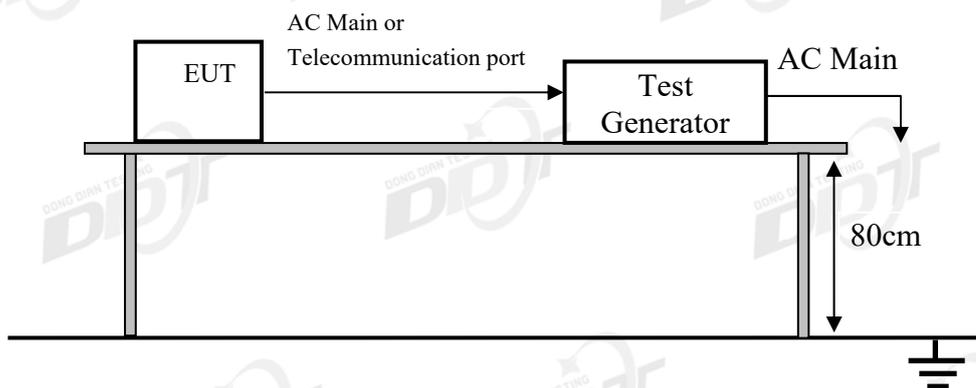
The EUT was connected to the power mains by using a coupling device that couples the EFT interference signal to AC power lines. Both positive transients and negative transients of test voltage were applied during compliance test and the duration of the test can't less than 2mins.

## 10.4. Test result

Test power Supply : AC 220V/50Hz			Test Site: DDT 4# Shield Room			
Ambient Condition: <u>24.5</u> °C <u>58</u> %RH <u>101.4</u> kPa						
Port : <input checked="" type="checkbox"/> AC Mains <input type="checkbox"/> DC Supply <input type="checkbox"/> Signal :			Burst Period: <input checked="" type="checkbox"/> 300ms <input type="checkbox"/> Other:			
Coupling : <input checked="" type="checkbox"/> Direct <input type="checkbox"/> Capacitive Clamp			Test Time : <input checked="" type="checkbox"/> 120S <input type="checkbox"/> Other:			
Repetition Frequency : <input checked="" type="checkbox"/> 5KHz <input type="checkbox"/> Other:			Burst Duration : <input checked="" type="checkbox"/> 15ms <input type="checkbox"/> Other:			
Operation Mode	Line/port	Test Voltage	Performance			Result (Pass/Fail)
			Required	Observation(+)	Observation(-)	
Mode 1	L	1KV	B	A	A	Pass
	N	1KV	B	A	A	Pass
	L-N	1KV	B	A	A	Pass
Observation Description: A: Operation as intend, no loss of function during test and after test						
Test Date: Sep. 13, 2019			Test Engineer: Eddie Liu			

## 11. Surges

### 11.1. Block diagram of test setup



### 11.2. Test levels and performance criterion

Test level for AC mains ports		Performance Criterion
Line to Line	1KV	B
Line to ground	2KV	B
Test level for telecommunication ports		Performance Criterion
Line to Ground	1KV	B

Performance criteria B description: During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test. After the test, the EUT shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the EUT is used as intended.

### 11.3. Test Procedure

Set up the EUT and test generator as shown on Section 11.1

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 lines to ground are same except test level is 2kV.

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

Different phase angles are done individually.

For telecommunication surge test, each line of internet port to ground coupling mode, provide a 1kV 10/700us voltage surge (at pen-circuit condition) and 5/320us current surge to EUT selected points.

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

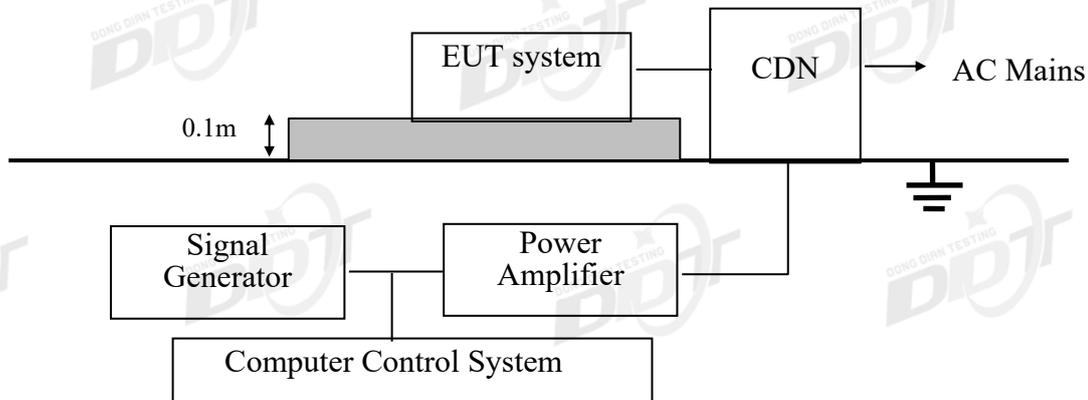
Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

### 11.4. Test result

Test power Supply : AC 220V/50Hz				Test Site: DDT 3# Shield Room							
Ambient Condition: <u>24.5</u> °C <u>58</u> %RH <u>101.4</u> kPa											
Line : <input checked="" type="checkbox"/> AC Mains <input type="checkbox"/> DC Supply <input type="checkbox"/> Signal											
Wave Type: <input checked="" type="checkbox"/> 1.2/50us-8/20us <input type="checkbox"/> 10/700 us-5/320us											
Pluse times: 5 times at each polarity				Pulse Interval: 60S				Voltage Phase: 0°,90°, 180°, 270°			
Operation Mode	Line/Port	0.5KV			1KV			2KV			Result (Pass/Fail)
		Performance			Performance			Performance			
		Required	+	-	Required	+	-	Required	+	-	
Mode 1	L-N	B	A	A	B	A	A	/	/	/	Pass
	L-PE	/	/	/	/	/	/	/	/	/	/
	N-PE	/	/	/	/	/	/	/	/	/	/
Observation Description: A: Operation as intend, no loss of function during test and after test.											
Test Date: Sep. 13, 2019						Test Engineer: Eddie Liu					

## 12. Continuous conducted disturbances

### 12.1. Block diagram of test setup



### 12.2. Test levels and performance criterion

Test Level		Performance Criteria
Frequency	0.15MHz to 80MHz	A
Field Strength	3V measured unmodulated	
Modulation	AM modulated to a depth of 80% by a sinusoidal audio signal of 1KHz(Note)	
Step Size	1% increments	
Dwell time	1 Sec.	

Performance criteria A description: During and after the test the EUT shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a minimum performance level specified by the manufacturer when the EUT is used as intended.

### 12.3. Test Procedure

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).

The disturbance signal described below is injected to EUT through CDN.

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

The frequency range is swept from 0.150MHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 400Hz sine wave.

The rate of sweep shall not exceed  $1.5 \times 10^{-3}$  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.

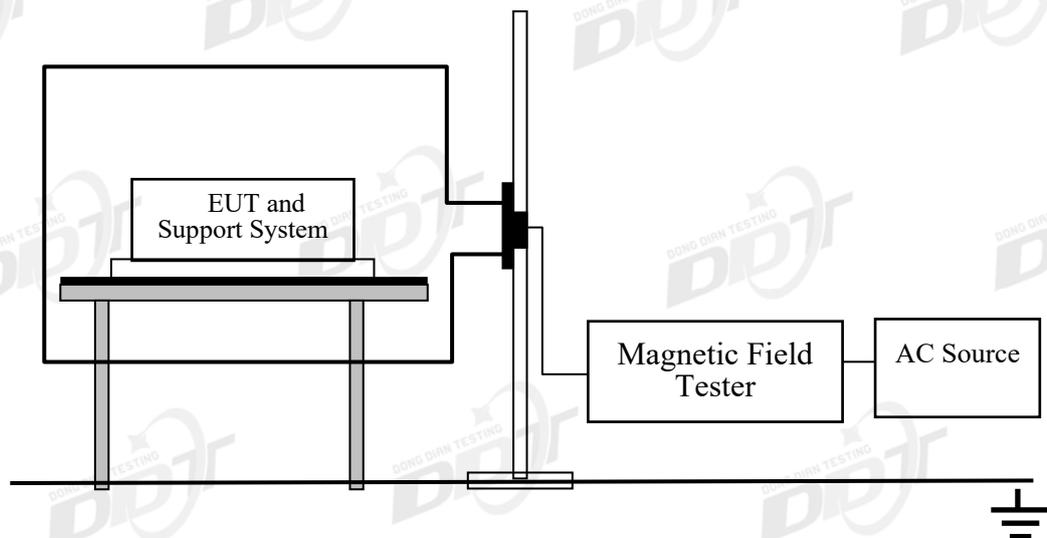
Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

## 12.4. Test result

Test power Supply : AC 220V/50Hz			Test Site: DDT 4# Shield Room			
Ambient Condition: <u>24.5</u> °C <u>58</u> %RH <u>101.4</u> kPa						
Modulation Signal: <input checked="" type="checkbox"/> 1KHz 80% AM <input type="checkbox"/> Other:			Dwell time: <input checked="" type="checkbox"/> 1s <input type="checkbox"/> other:			
Operation mode	Frequency Range	Injected Position	Strength(e.m.f) (unmodulated)	Required	Observation	Result (Pass/Fail)
Mode 1	0.15MHz-80MHz	AC port	3V	A	A	Pass
Observation Description: A: Operation as intend, no loss of function during test and after test.						
Test Date: Sep. 13, 2019			Test Engineer: Eddie Liu			

## 13. Power-frequency magnetic fields

### 13.1. Block diagram of test setup



### 13.2. Test levels and performance criterion

Level	Magnetic Field Strength A/m	Performance Criterion
1	3	A

Performance criteria A description: During and after the test the EUT shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a minimum performance level specified by the manufacturer when the EUT is used as intended.

### 13.3. Test Procedure

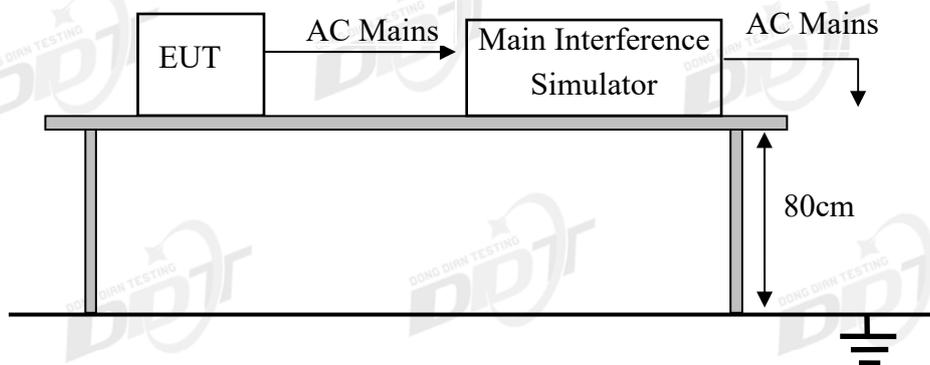
The EUT shall be subjected to the test magnetic field by using the induction coil of standard dimensions (1m\*1m) and shown in Section 13.1 The induction coil shall then be rotated by 90° in order to expose the EUT to the test field with different orientations.

### 13.4. Test result

Test power Supply : AC 220V/50Hz		Test Site: DDT 4# Shield Room				
Ambient Condition: <u>24.5</u> °C <u>58</u> %RH <u>101.4</u> kPa						
Operation Mode	Test Level	Testing Duration	Coil Orientation	Required	Observation	Result (Pass/Fail)
Mode 1	3A/m	5 min / coil	X	A	A	PASS
	3A/m	5 min / coil	Y	A	A	PASS
	3A/m	5 min / coil	Z	A	A	PASS
Observation Description: A: Operation as intend, no loss of function during test and after test						
Test Date: Sep. 13, 2019				Test Engineer: Eddie Liu		

## 14. Voltage dips and interruptions

### 14.1. Block diagram of test setup



## 14.2. Test levels and performance criterion

Test Level %UT	Duration (in period)	Performance Criterion
0	0.5	B
0	1	B
70	25/30*	C
0	250/300*	C
* "25/30" means 25 periods for 50Hz test and 30 periods for 60Hz test		

Performance criteria B description: During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test. After the test, the EUT shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the EUT is used as intended.

Performance criteria C description: During and after testing, a temporary loss of function is allowed, provided the function is self recoverable, or can be restored by the operation of the controls or cycling of the power to the EUT by the user in accordance with the manufacturer's instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

## 14.3. Test Procedure

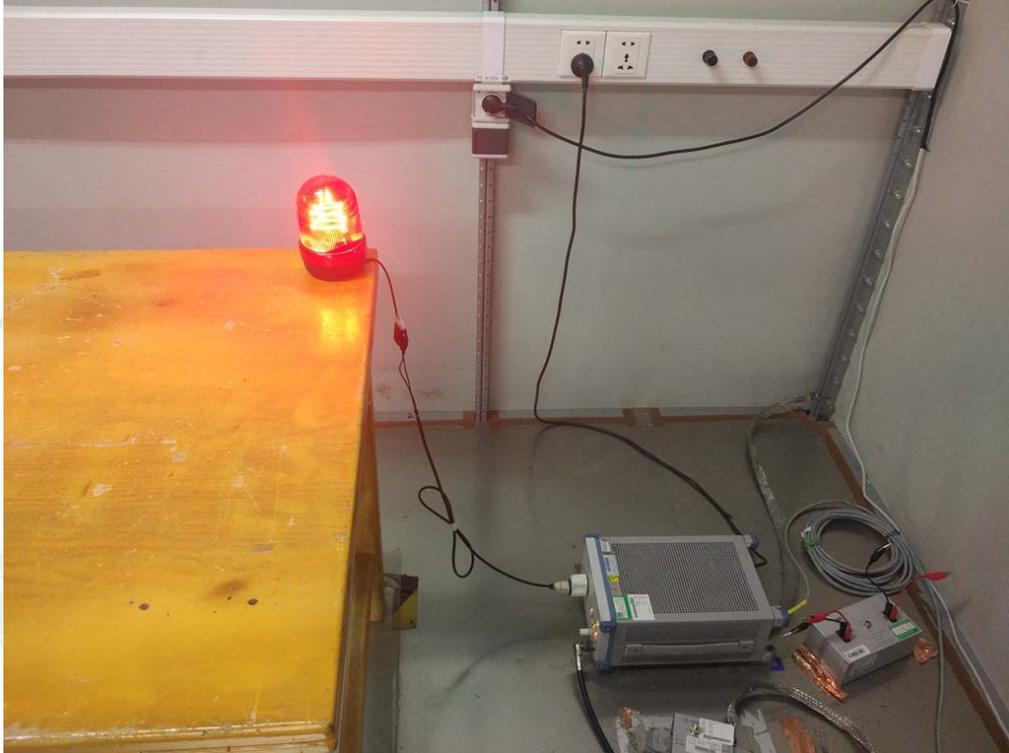
The EUT and test generator were setup as shown on Section 14.1. The interruptions are introduced at selected phase angles with specified duration. Record any degradation of performance.

## 14.4. Test result

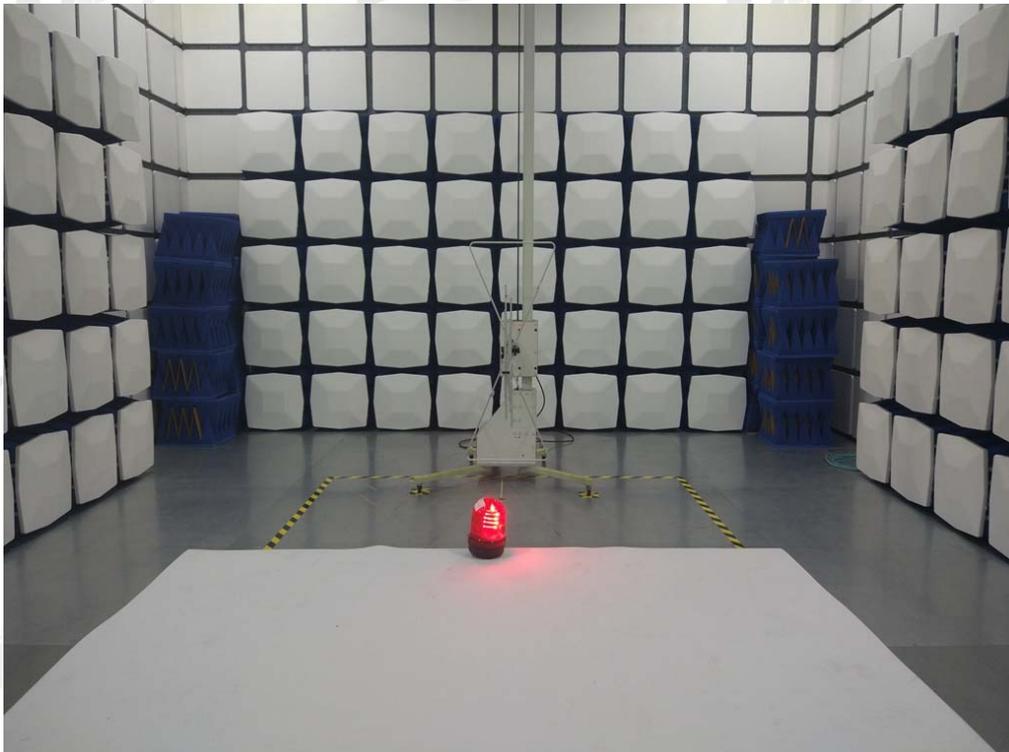
Test power Supply : AC 220V/50Hz		Test Site: DDT 4# Shield Room				
Ambient Condition: <u>24.5</u> °C <u>58</u> %RH <u>101.4</u> kPa						
Operation Mode	Voltage Dips & Short Interruptions %Ur	Duration (in period)	Phase Angle	Required	Observation	Result (Pass/Fail)
Mode 1	0	0.5P	0°, 180°	B	A	Pass
	0	1P	0°, 180°	B	A	Pass
	70	25P	0°, 180°	C	A	Pass
	0	250P	0°, 180°	C	B	Pass
Observation Description: A: Operation as intend no loss of function during test and after test. B: Stop working during the test and return to normal after the test is completed.						
Test Date: Sep. 13, 2019				Test Engineer: Eddie Liu		

## 15. Test setup photograph

### 15.1. Photos of conducted disturbance test



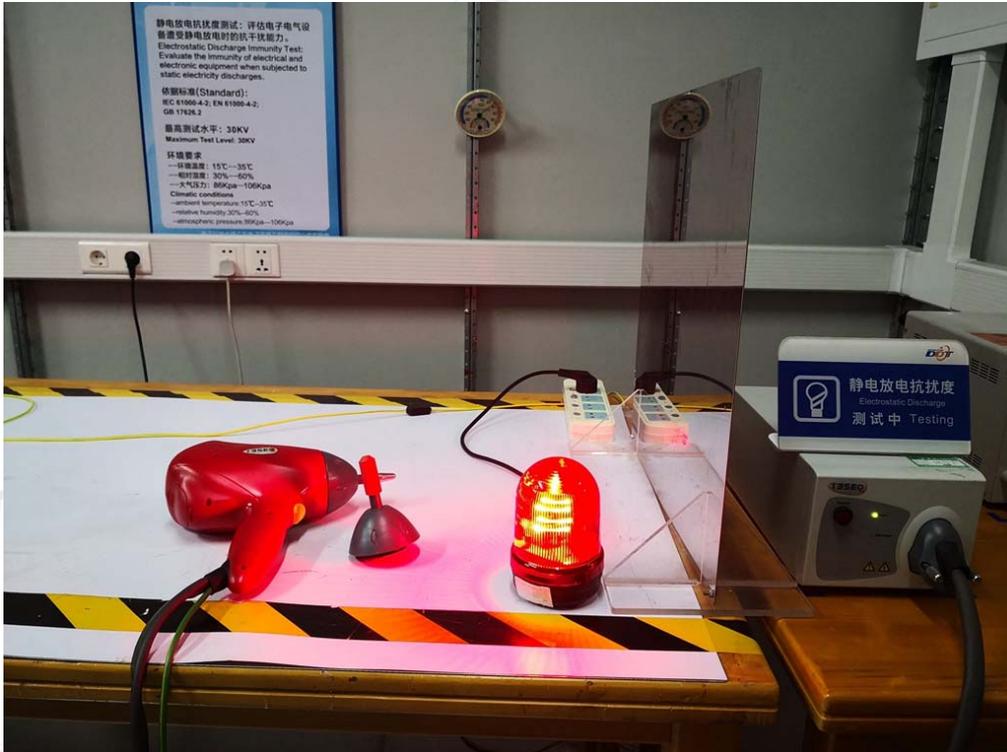
### 15.2. Photos of radiated disturbance test



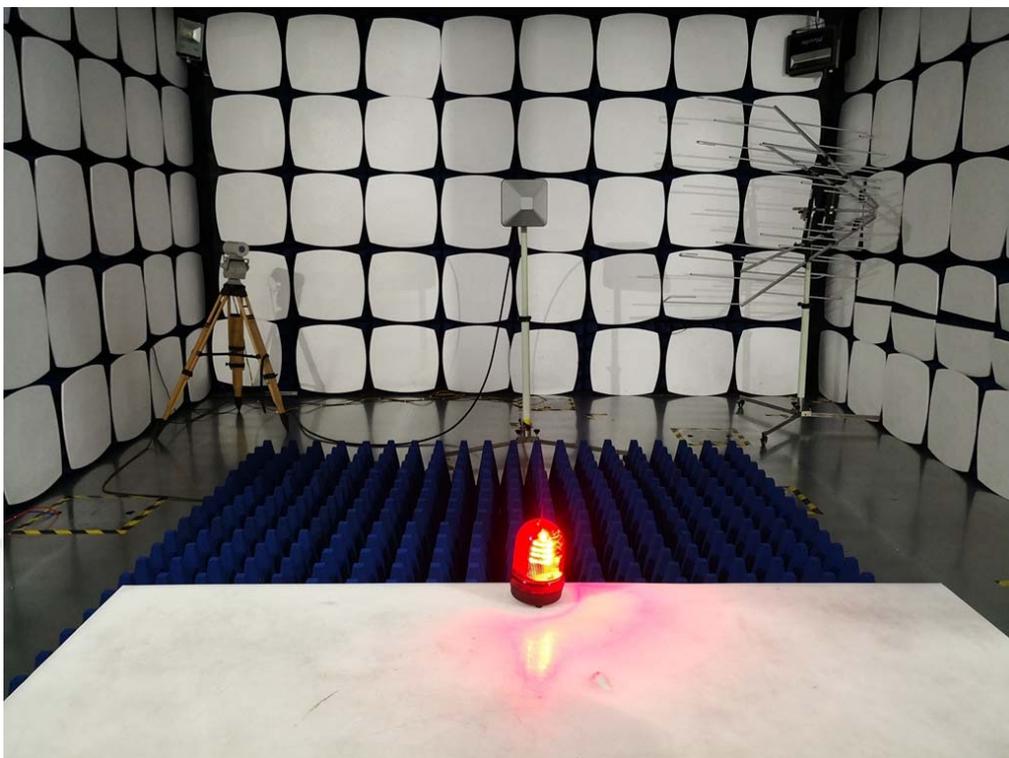
### 15.3. Photos of voltage fluctuations & flicker test



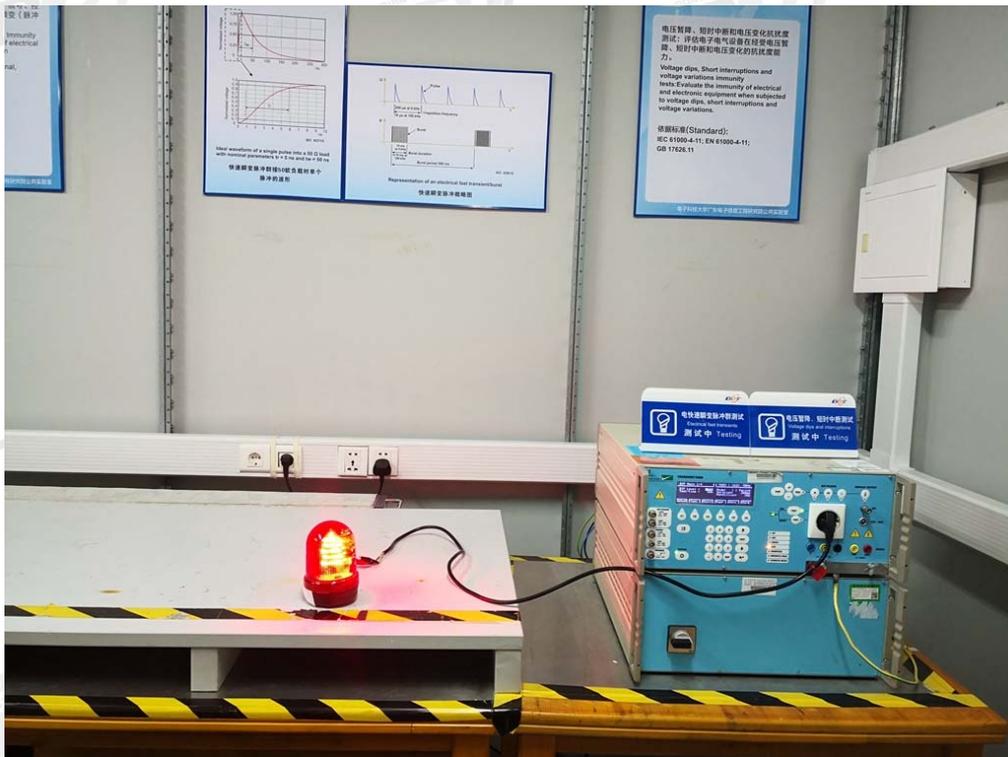
### 15.4. Photos of electrostatic discharge test



### 15.5. Photos of continuous radio frequency disturbances test



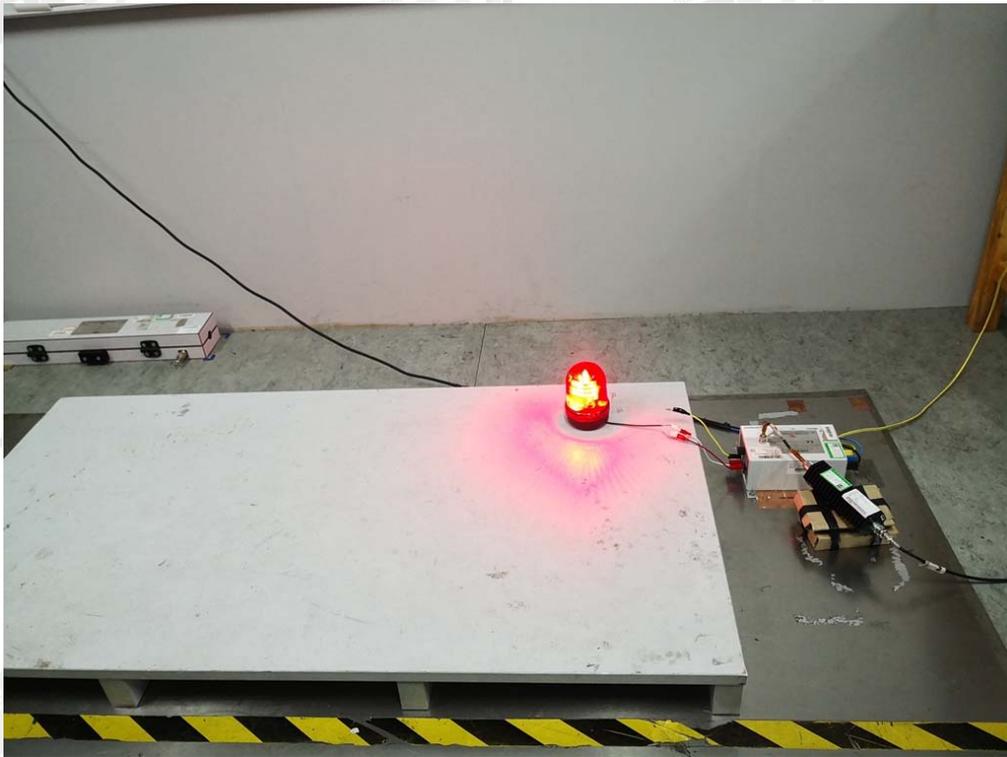
### 15.6. Photos of electrical fast transients & voltage dips and interruptions test



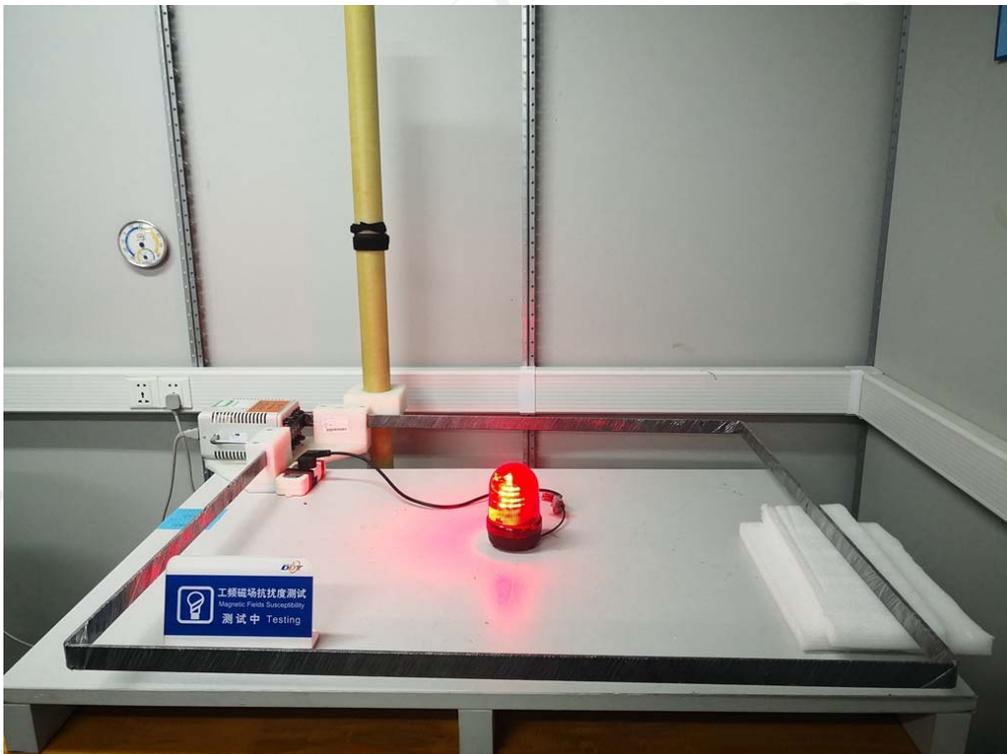
### 15.7. Photos of surge test



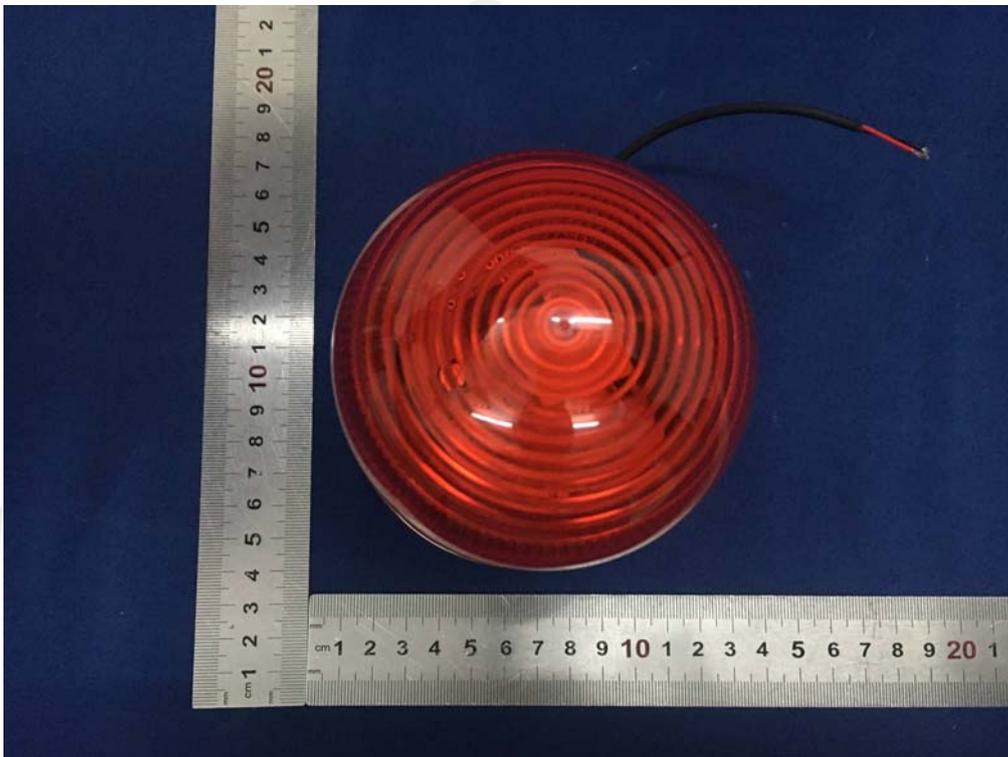
**15.8. Photos of continuous conducted disturbances test**

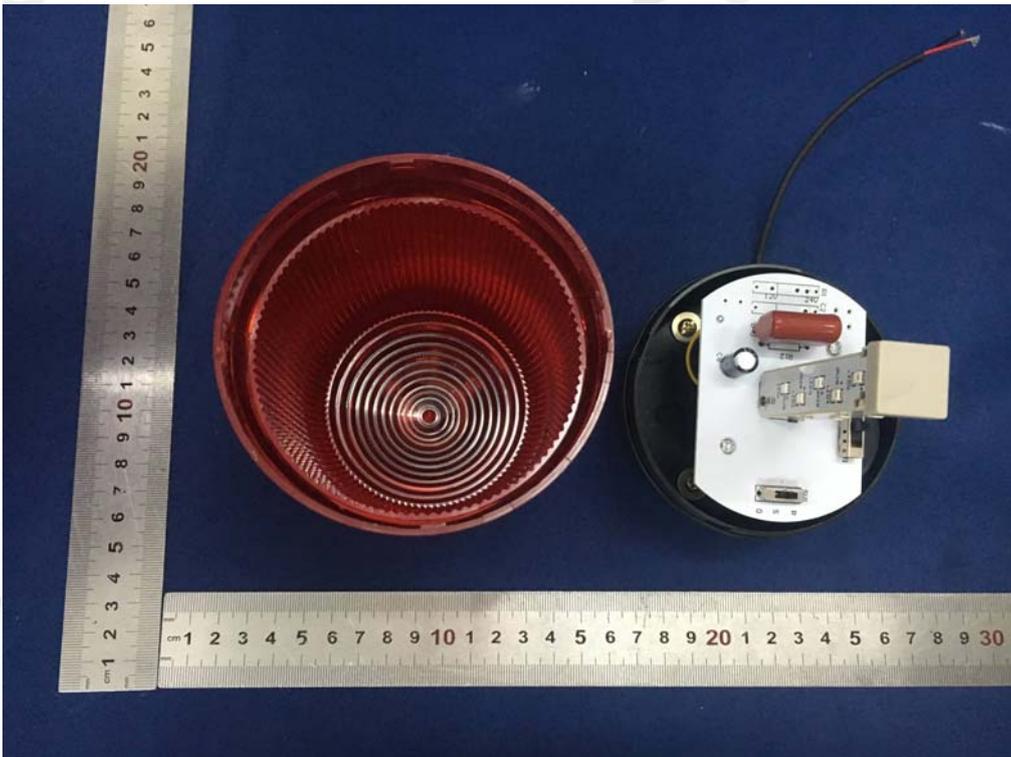
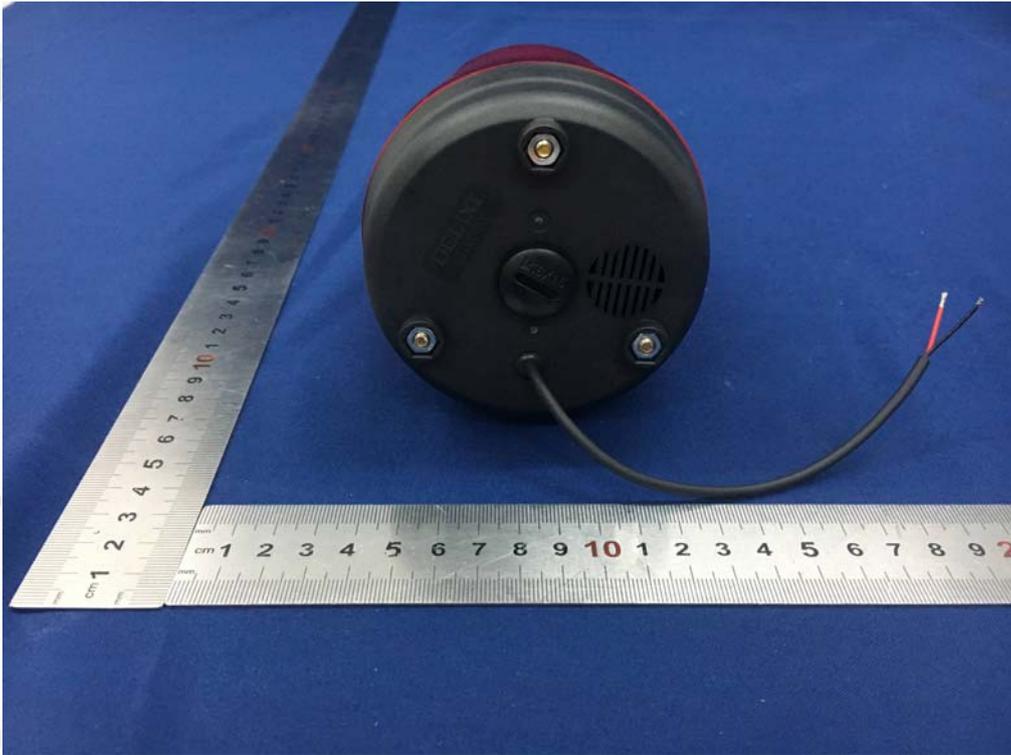


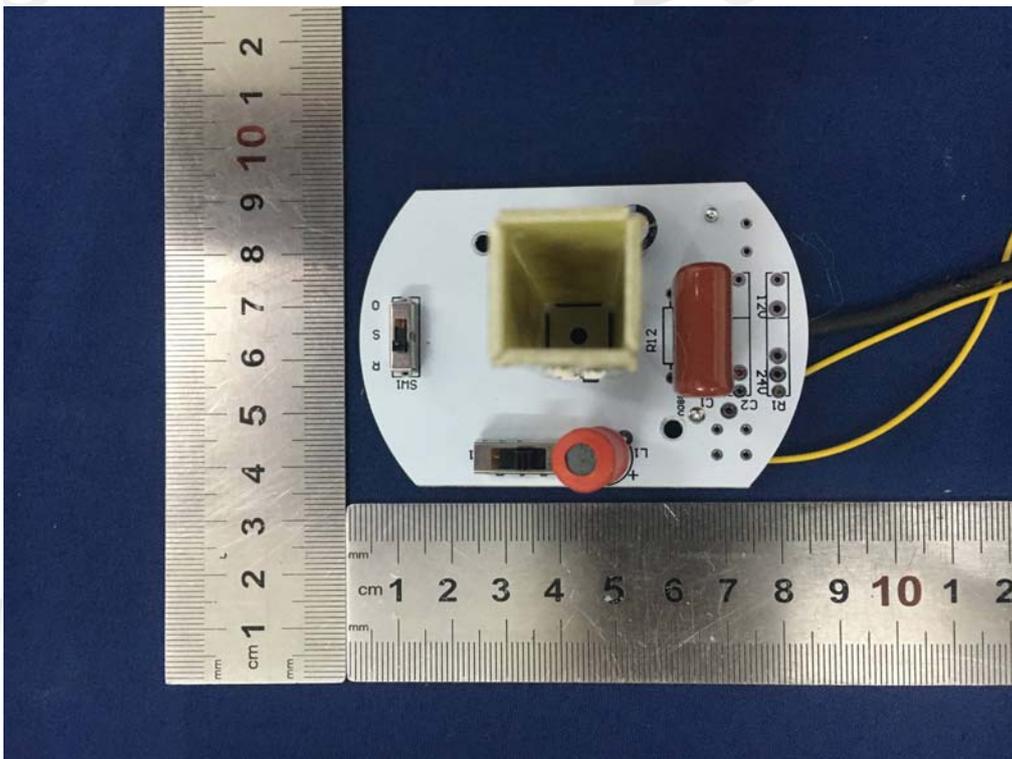
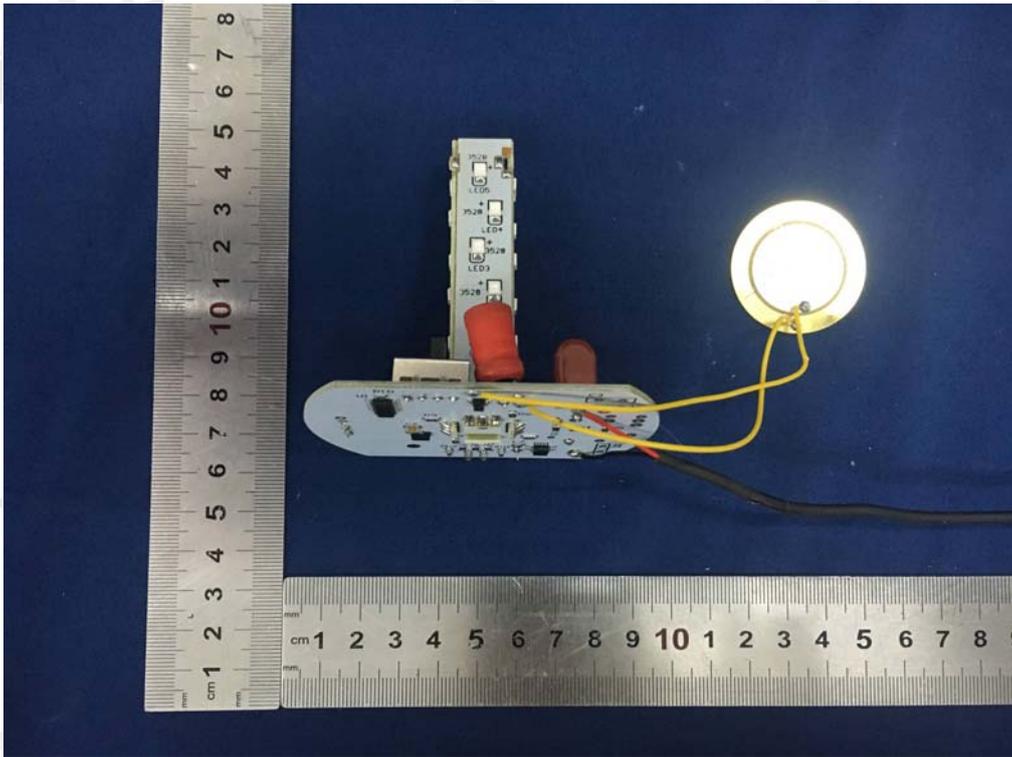
**15.9. Photos of power-frequency magnetic fields test**

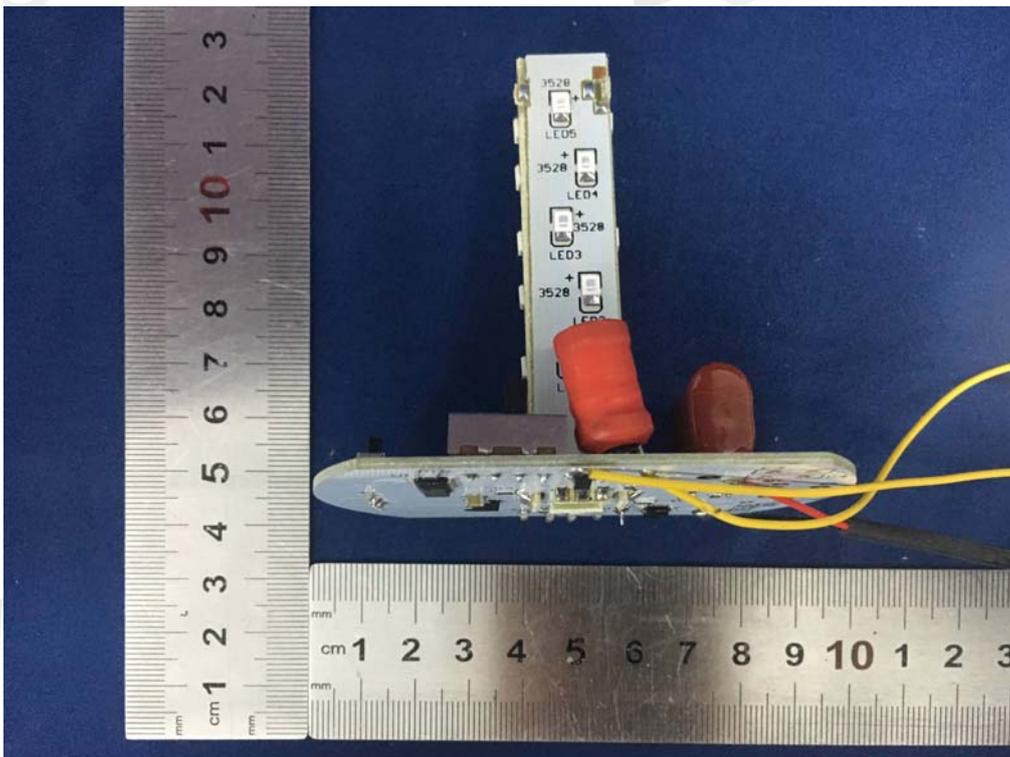
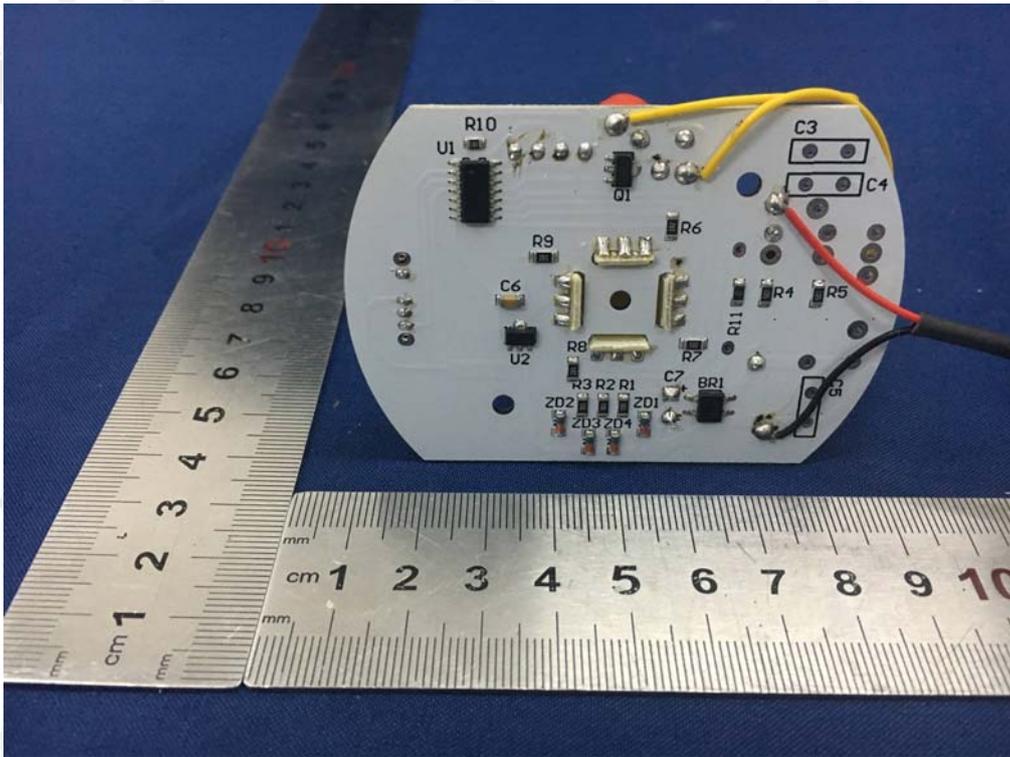


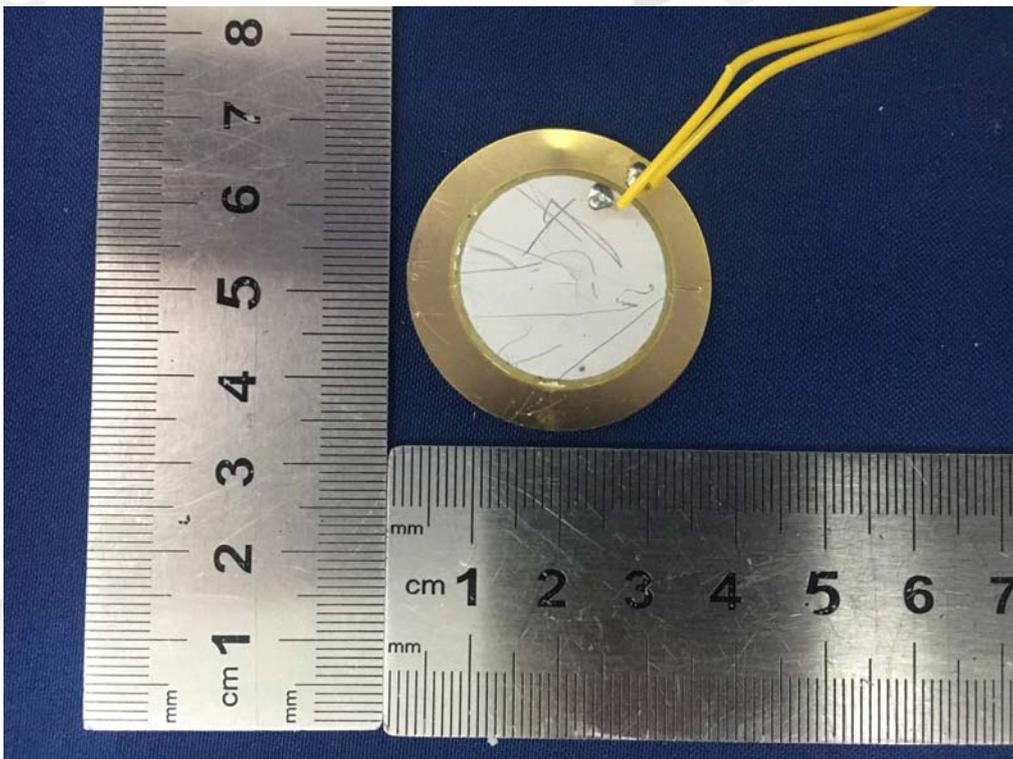
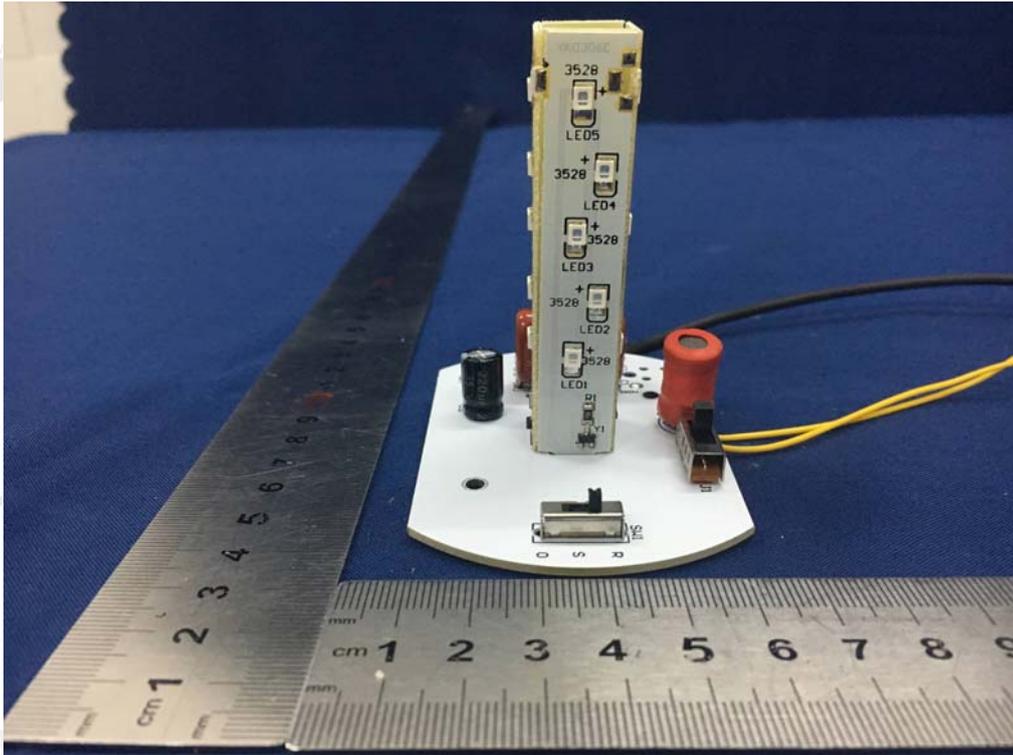
### 16. Photos of the EUT

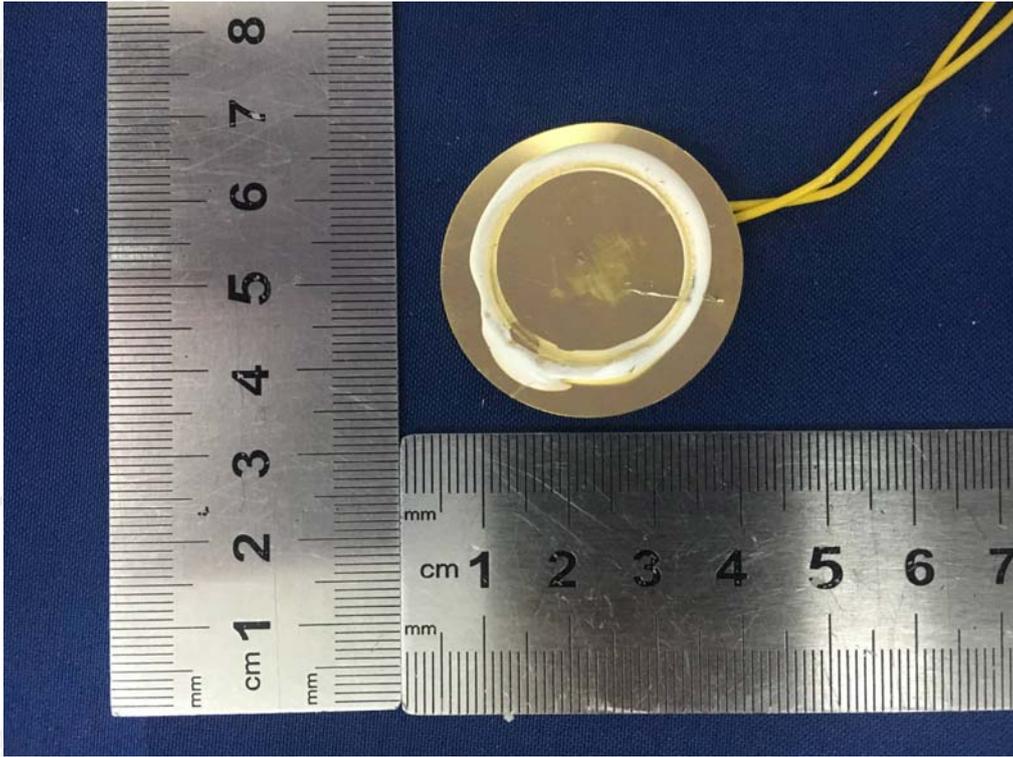












**END OF REPORT**