

# EMC Test Report

Client Name : Designlight Scandinavian AB

Address : Toffelvägen 1, 342 60 Moheda

Product Name : LED DRIVER

Date : May 12, 2021



## Shenzhen Anbotech Compliance Laboratory Limited



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## TEST REPORT

Applicant : Designlight Scandinavian AB  
Manufacturer : Designlight Scandinavian AB  
Product Name : LED DRIVER  
Model No. : See Chapter 1.9 for model list  
Trade Mark : N.A.  
Rating(s) : Input: 200-240V, 50/60Hz, ta:40° C, tc:80° C

**Test Standard(s) : EN IEC 55015: 2019;  
EN IEC 61000-3-2: 2019;  
EN 61000-3-3: 2013+A1:2019;  
EN 61547: 2009;  
(IEC 61000-4-2; IEC 61000-4-3; IEC 61000-4-4;  
IEC 61000-4-5; IEC 61000-4-6; IEC 61000-4-11)**

The device described above is tested by Shenzhen Anbotech Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotech Compliance Laboratory Limited is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the EN IEC 55015, EN IEC 61000-3-2, EN 61000-3-3 and EN 61547 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotech Compliance Laboratory Limited.

Date of Receipt: Apr. 24, 2020

Date of Test: Apr. 24~May. 06, 2020

Prepared By:

*Yee Huang*

(Yee Huang)

Approved & Authorized Signer:

*KingKong Jin*

(KingKong Jin)

# 1. General Information

## 1.1. Client Information

Applicant	:	Designlight Scandinavian AB
Address	:	Toffelvägen 1, 342 60 Moheda
Manufacturer	:	Designlight Scandinavian AB
Address	:	Toffelvägen 1, 342 60 Moheda
Factory	:	Ningbo Yinzhou MOX Lighting Co., Ltd.
Address	:	Chenhuang Village, Yunlong Town, Yinzhou District, Ningbo, Zhejiang, China

## 1.2. Description of Device (EUT)

Product Name	:	LED DRIVER
Model No.	:	See Chapter 1.9 for model list (Note: All samples are the same except the model number & appearance, so we prepare "MDV360HH12" for test only.)
Trade Mark	:	N.A.
Test Power Supply	:	AC 230V, 50Hz
Test Sample No.	:	1-1-1
Product Description	:	Adapter: N/A
<b>Remark:</b> (1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual. (2) As specified by the client, all the results in this report were quoted from report 18240EC00010501.		

## 1.3. Auxiliary Equipment Used During Test

N/A	
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## 1.4. Description of Test Mode

Pretest Mode	Description
Mode 1	On

For Mode 1 Block Diagram of Test Setup



## 1.5. Test Summary

Test Items	Test Mode	Status
Power Line Conducted Emission Test (9KHz To 30MHz)	Mode 1	P
Radiated Emission Test (30MHz To 1000MHz)	Mode 1	P
Magnetic Radiated Emission Test (9KHz To 30MHz)	/	N
Harmonic Current Test	Mode 1	P
Voltage Fluctuations and Flicker Test	Mode 1	P
Electrostatic Discharge immunity Test	Mode 1	P
RF Field Strength susceptibility Test	Mode 1	P
Electrical Fast Transient/Burst Immunity Test	Mode 1	P
Surge Immunity Test	Mode 1	P
Injected Currents Susceptibility Test	Mode 1	P
Voltage Dips and Interruptions Test	Mode 1	P
P) Indicates "PASS". N) Indicates "Not applicable"		

## 1.6. Test Equipment List

### Conducted Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	Rohde & Schwarz	ENV216	100055	Nov. 04, 2019	1 Year
2.	L.I.S.N. Artificial Mains Network	Schwarzbeck	NSLK 8127	8127386	Nov. 04, 2019	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Nov. 04, 2019	1 Year
4.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Nov. 04, 2019	1 Year
5.	Software Name EZ-EMC	Ferrari Technology	ANB-03A	N/A	N/A	N/A

### Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Nov. 04, 2019	1 Year
2.	Pre-amplifier	Schwarzbeck	BBV-9745	9745-075	Nov. 04, 2019	1 Year
3.	Bilog Broadband Antenna	SCHWARZBECK	VULB 9163	01109	Nov. 01, 2019	1 Year
4.	Software Name EZ-EMC	Ferrari Technology	EMEC-3A1	N/A	N/A	N/A

### Magnetic Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Nov. 04, 2019	1 Year
2.	Triple-Loop Antenna(2M)	EVERFINE	LLA-2	905003	Nov. 04, 2019	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Nov. 04, 2019	1 Year
4.	Software Name EZ-EMC	Ferrari Technology	ANB-03A	N/A	N/A	N/A

### Harmonic and Flicker Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Programmable AC Power source	IVYTECH	APS-5005A	632734	Nov. 04, 2019	1 Year
2.	Harmonic and Flicker Analyzer	EMC-PARTNER	HMONICS 1000-1P	164	Nov. 04, 2019	1 Year
3.	Harmonics-1000	N/A	Ed.3.0+4.0	N.A	N/A	N/A

### Electrostatic Discharge Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Simulators	emtest	ESD NX30.1	11891	Mar. 07, 2020	1 Year



R/S Immunity Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Signal Generator	Agilent	N5182A	MY48180656	Nov. 04, 2019	1 Year
2	Amplifier	Micotoop	MPA-80-100 0-250	MPA1903096	Nov. 04, 2019	1 Year
3	Amplifier	Micotoop	MPA-1000-6 000-100	MPA1903122	Nov. 04, 2019	1 Year
4	Log-Periodic Antenna	Schwarzbeck	VULP9118E	00992	Apr.17, 2020	1 Year
5	Horn Antenna	Instruments corporation	GTH-0118	351600	Nov. 01, 2019	1 Year
6	Power Sensor	Agilent	E9301A	MY41498906	Nov. 04, 2019	1 Year
7	Power Sensor	Agilent	E9301A	MY41498088	Nov. 04, 2019	1 Year
8	Power Meter	Agilent	E4419B	GB40202909	Nov. 04, 2019	1 Year
9	Field Probe	ETS-Lindgren	HI-6006	00212747	Apr.17, 2020	1 Year
10	software	EMtrace	EM 3	N/A	N/A	N/A

Electrical Fast Transient/Burst Immunity Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.1	EFT Burst Simulator	PRIMA	EFT61004B	PR10114282	Nov. 04, 2019	1 Year
1.2	EFT-Clamp	PRIMA	EFT-Clamp	/	Nov. 04, 2019	1 Year
2.1	EFT Burst Simulator	TESEQ	NSG 3060	1480	Nov. 04, 2019	1 Year
2.2	CDN	TESEQ	CDN 3061	1408	Nov. 04, 2019	1 Year

Surge Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Surge Generator	TESEQ	NSG 3060	1480	Nov. 04, 2019	1 Year
2.	CDN	TESEQ	CDN 3061	1408	Nov. 04, 2019	1 Year
3.	Telecom port surge generator	PMI	TW101	190411	Apr.17,2020	1 Year

Injected Currents Susceptibility Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	C/S Conducted Immunity Test System	FRANKONIA	CIT-10	126A1196/2012	Nov. 04, 2019	1 Year
2.	CDN	FRANKONIA	CDN - M2+ M3	A2210178/2012	Nov. 04, 2019	1 Year
3.	6dB Attenuator	FRANKONIA	DAM 26W	1172202	Nov. 04, 2019	1 Year
4.	CIT-10	FRANKONIA	Version1.1.7	N/A	N.A	N/A
5.	EM-Clamp	FRANKONIA	EMCL-20	18101728-0103	May.19,2019	1 Year

## Voltage Dips and Interruptions Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	CYCLE SAG Simulator	PRIMA	DRP61011A G	PR12046234	Nov. 04, 2019	1 Year

**1.7. Description of Test Facility**

The test facility is recognized, certified, or accredited by the following organizations:

**FCC-Registration No.: 184111**

Shenzhen Anbotech Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 184111, September 30, 2020.

**ISED-Registration No.: 8058A**

Shenzhen Anbotech Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A, September 30, 2020.

**Test Location**

Shenzhen Anbotech Compliance Laboratory Limited.

1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.518128

### 1.8. EMS Performance Criteria

- ✓ A: Normal performance within the specification limits
- ✓ B: Temporary degradation or loss of function or performance which is self-recoverable
- ✓ C: Temporary degradation or loss of function or performance which requires operator 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

Note: The manufacturer's specification may define effects on the EUT which may be considered insignificant, and therefore acceptable.

This classification may be used as a guide in formulating performance criteria, by committees responsible for generic, product and product-family standards, or as a framework for the agreement on performance criteria between the manufacturer and the purchaser, for example where no suitable generic, product or product-family standard exists.



## 1.9. Model List

Model no	Input Voltage (VAC)	Output Voltage (VDC)	Output Current (A)	Output Wattage (W)
D-DC6W12D	200-240	12	0.5	6
D-DC6W24D	200-240	24	0.25	6
D-DC12W12D	200-240	12	1	12
D-DC12W24D	200-240	24	0.5	12
D-DC15W12D	200-240	12	1.25	15
D-DC15W24D	200-240	24	0.625	15
D-DC18W12D	200-240	12	1.5	18
D-DC18W24D	200-240	24	0.75	18
D-DC20W12D	200-240	12	1.667	20
D-DC20W24D	200-240	24	0.833	20
D-DC24W12D	200-240	12	2	24
D-DC24W24D	200-240	24	1	24
D-DC30W12D	200-240	12	2.5	30
D-DC30W24D	200-240	24	1.25	30
D-DC36W12D	200-240	12	3	36
D-DC36W12D-2	200-240	12	3	36
D-DC36W24D	200-240	24	1.5	36
D-DC36W24D-2	200-240	24	1.5	36
D-DC40W12D	200-240	12	3.333	40
D-DC40W24D	200-240	24	1.667	40
D-DC45W12D	200-240	12	3.75	45
D-DC45W24D	200-240	24	1.875	45
D-DC50W12D	200-240	12	4.167	50
D-DC50W24D	200-240	24	2.083	50
D-DC60W12D	200-240	12	5	60
D-DC60W24D	200-240	24	2.5	60
D-DC80W12D	200-240	12	6.667	80
D-DC80W24D	200-240	24	3.333	80
D-DC100W12D	200-240	12	8.333	100
D-DC100W24D	200-240	24	4.167	100
D-DC120W12D	200-240	12	10	120
D-DC120W24D	200-240	24	5	120
D-DC150W12D	200-240	12	12.5	150
D-DC150W24D	200-240	24	6.25	150
D-DC200W12D	200-240	12	16.667	200
D-DC200W24D	200-240	24	8.333	200
D-DC300W12D	200-240	12	25	300
D-DC300W24D	200-240	24	12.5	300
D-DC360W12D	200-240	12	30	360
D-DC360W24D	200-240	24	15	360
MDV360HH12	200-240	12	30	360

## 2. Power Line Conducted Emission Test

### 2.1. Test Standard and Limit

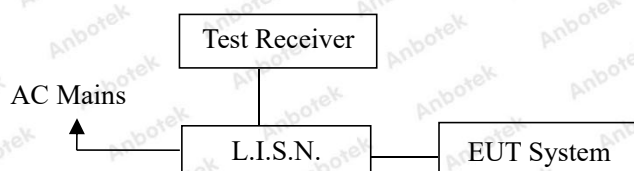
Test Standard	EN IEC 55015
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Limits for conducted emissions

Test Limit	Frequency	At mains terminals (dB $\mu$ V)	
		Quasi-peak Level	Average Level
	9kHz ~ 50kHz	110	--
	50kHz ~ 150kHz	90 ~ 80*	--
	150kHz ~ 0.5MHz	66 ~ 56*	56 ~ 46*
	0.5MHz ~ 5.0MHz	56	46
	5.0MHz ~ 30MHz	60	50

**Remark:** (1) At the transition frequency the lower limit applies.  
(2) \* decreasing linearly with logarithm of the frequency.

### 2.2. Test Setup



### 2.3. EUT Configuration on Measurement

The following equipments are installed on Conducted Emission Measurement to meet EN IEC 55015 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

### 2.4. Operating Condition of EUT

2.4.1. Setup the EUT as shown in Section 2.2.

2.4.2. Turn on the power of all equipments.

2.4.3. Let the EUT work in test mode and measure it.

## 2.5. Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground and connected to the AC mains through a Line Impedance Stabilization Network (L.I.S.N.). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are checked to find out the maximum conducted emission according to the EN IEC 55015 regulations during conducted emission measurement. And the voltage probe had been used for the load terminals measurement according to the EN IEC 55015 standard.

The bandwidth of the test receiver (R&S ESCI) is set at 200Hz in 9K~150KHz range and 9KHz in 150K~30MHz range.

The frequency range from 9KHz to 30MHz is checked.

All the test results are listed in Section 2.6.

## 2.6. Test Results

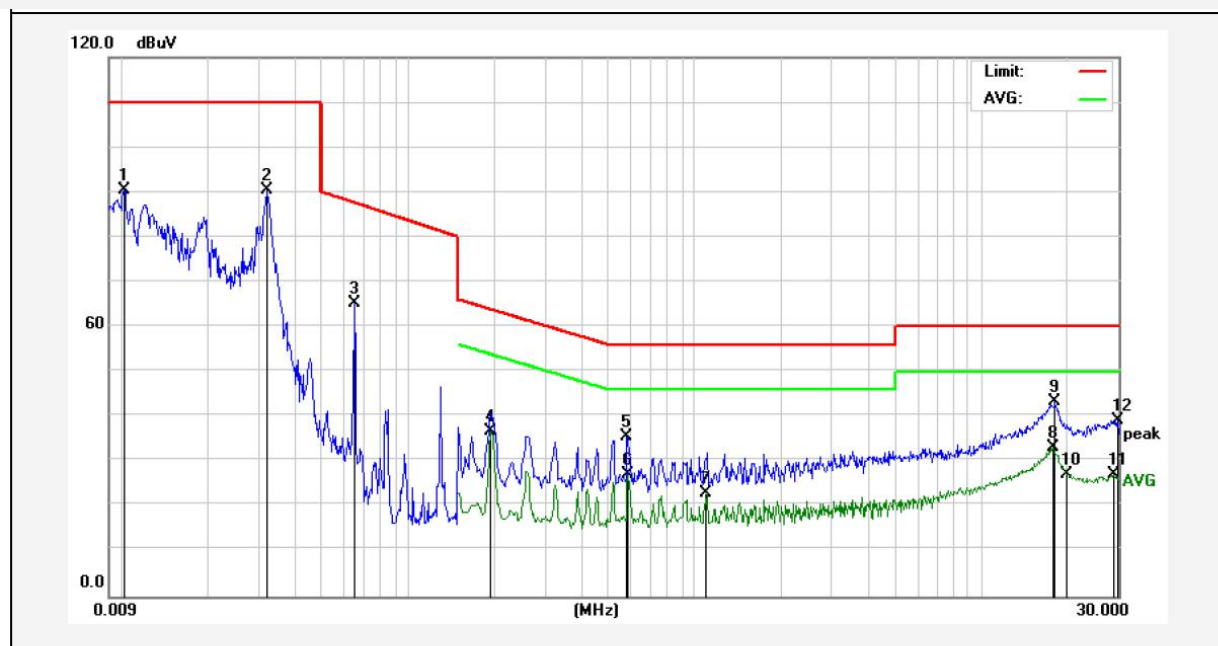
**PASS**

The test curves are shown in the following pages.



## Conducted Emission Test Data

Test Site: 1# Shielded Room  
Test Specification: AC 230V, 50Hz  
Comment: Live Line  
Temp.: 23.6°C Hum.: 58%

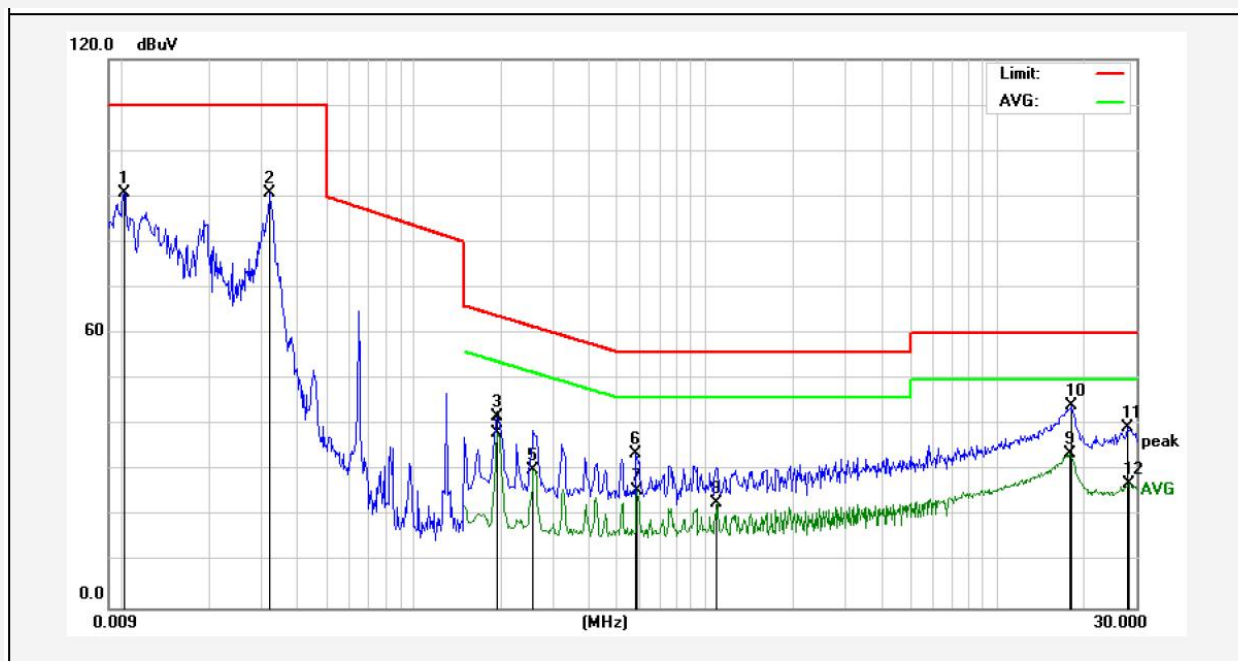


No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.0102	70.73	19.77	90.50	110.00	-19.50	QP	
2	0.0320	70.68	19.85	90.53	110.00	-19.47	QP	
3	0.0649	45.26	19.92	65.18	87.62	-22.44	QP	
4	0.1940	16.95	19.90	36.85	53.86	-17.01	AVG	
5	0.5820	15.61	20.00	35.61	56.00	-20.39	QP	
6	0.5860	7.05	20.01	27.06	46.00	-18.94	AVG	
7	1.1019	2.82	20.12	22.94	46.00	-23.06	AVG	
8	17.8420	12.71	20.31	33.02	50.00	-16.98	AVG	
9	18.1020	22.99	20.31	43.30	60.00	-16.70	QP	
10	19.9820	6.83	20.34	27.17	50.00	-22.83	AVG	
11	28.9940	6.97	20.27	27.24	50.00	-22.76	AVG	
12	29.8380	19.03	20.27	39.30	60.00	-20.70	QP	

Note: Result=Reading+Factor Over Limit=Result-Limit

**Conducted Emission Test Data**

Test Site: 1# Shielded Room  
Test Specification: AC 230V, 50Hz  
Comment: Neutral Line  
Temp.: 23.6°C Hum.: 58%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.0102	70.85	19.77	90.62	110.00	-19.38	QP	
2	0.0321	70.80	19.85	90.65	110.00	-19.35	QP	
3	0.1940	22.09	19.90	41.99	63.86	-21.87	QP	
4	0.1940	18.39	19.90	38.29	53.86	-15.57	AVG	
5	0.2580	10.35	19.89	30.24	51.49	-21.25	AVG	
6	0.5820	13.62	20.00	33.62	56.00	-22.38	QP	
7	0.5860	5.70	20.01	25.71	46.00	-20.29	AVG	
8	1.1019	2.87	20.12	22.99	46.00	-23.01	AVG	
9	17.7780	13.55	20.30	33.85	50.00	-16.15	AVG	
10	18.0380	23.91	20.31	44.22	60.00	-15.78	QP	
11	27.9660	19.15	20.27	39.42	60.00	-20.58	QP	
12	28.3500	6.84	20.27	27.11	50.00	-22.89	AVG	

**Note:** Result=Reading+Factor Over Limit=Result-Limit

### 3. Radiated Emission Test

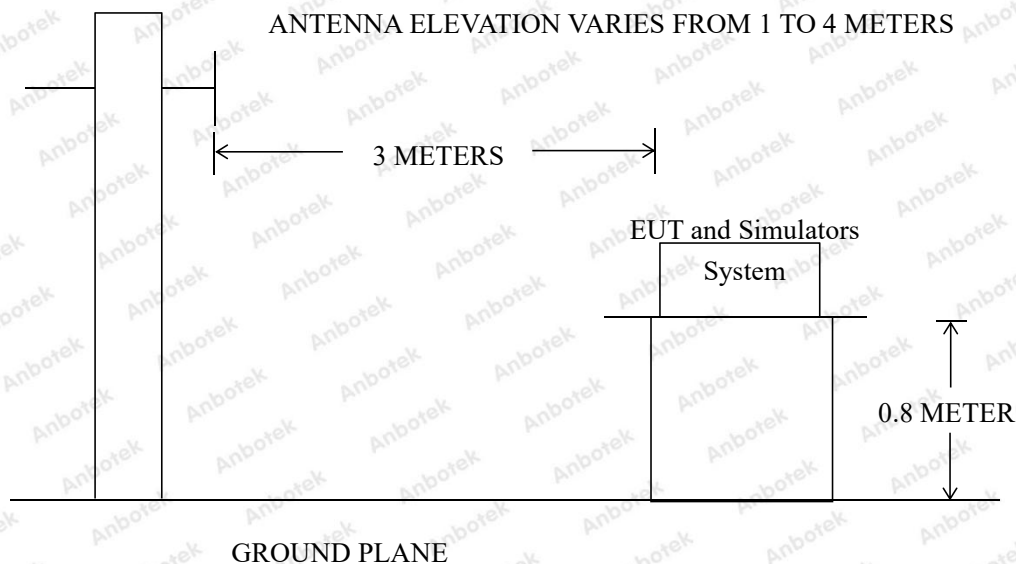
#### 3.1. Test Standard and Limit

Test Standard	EN IEC 55015
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Radiated Emission Test Limit

Test Limit	Frequency (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT (dB $\mu$ V/m)
	30 ~ 230	3	40
	230 ~ 1000	3	47
<b>Remark:</b> (1) The smaller limit shall apply at the combination point between two frequency bands. (2) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.			

#### 3.2. Test Setup



#### 3.3. EUT Configuration on Measurement

The EN IEC 55015 regulations test method must be used to find the maximum emission during radiated emission measurement.



### **3.4. Operating Condition of EUT**

3.4.1. Setup the EUT as shown in Section 3.2.

3.4.2. Turn on the power of all equipments.

3.4.3. Let the EUT work in test mode and measure it.

### **3.5. Test Procedure**

The EUT is placed on a turn table which is 0.8 meter high above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on an antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Bilog antenna is used as a receiving antenna. Both horizontal and vertical polarization of the antenna are set on test.

The bandwidth of the Receiver (ESCI) is set at 120kHz.

The EUT is tested in Chamber.

The test results are listed in Section 3.6.

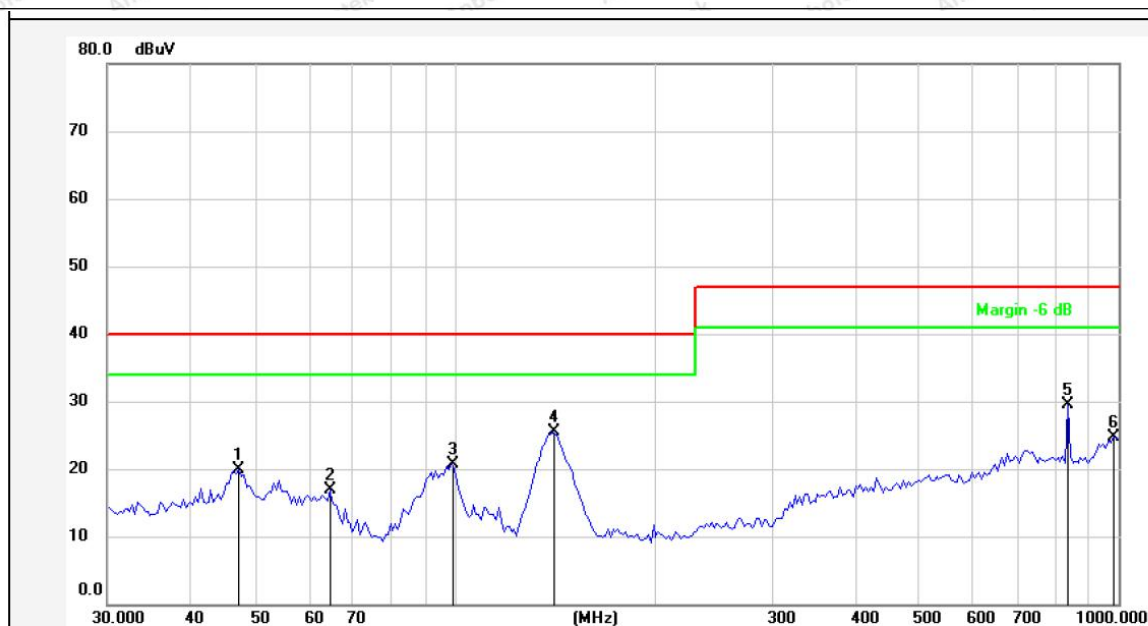
### **3.6. Test Results**

**PASS**

The frequency range from 30MHz to 1000MHz is investigated.

The test curves are shown in the following pages.

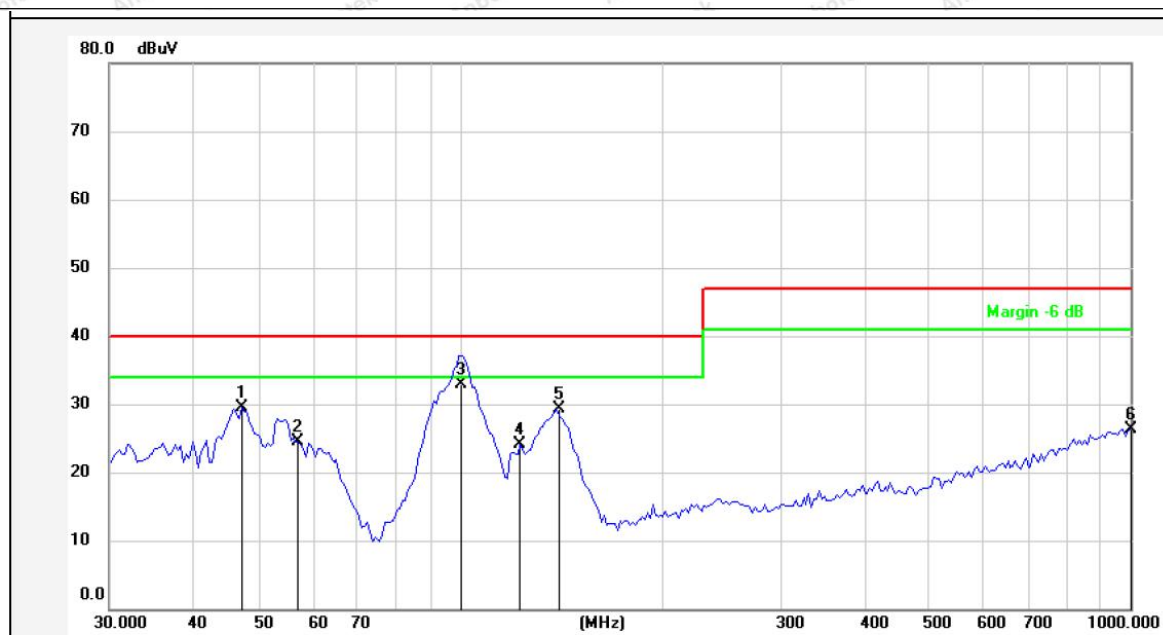
**Test item:** Radiation Test **Polarization:** Horizontal  
**Standard:** (RE)EN IEC 55015 **Power Source:** AC 230V, 50Hz  
**Distance:** 3m **Temp.(°C)/Hum.(%RH):** 23( °C)/56%RH



No.	Freq. (MHz)	Reading (dBuV)	Factor ( )	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	47.3255	36.67	-16.75	19.92	40.00	-20.08	peak			
2	64.8865	36.27	-19.33	16.94	40.00	-23.06	peak			
3	98.8326	42.54	-21.77	20.77	40.00	-19.23	peak			
4	140.3421	50.04	-24.47	25.57	40.00	-14.43	peak			
5	839.1818	38.85	-9.42	29.43	47.00	-17.57	peak			
6	982.6200	32.45	-7.80	24.65	47.00	-22.35	peak			

**Note:** Result=Reading+Factor Over Limit=Result-Limit

**Test item:** Radiation Test **Polarization:** Vertical  
**Standard:** (RE)EN IEC 55015 **Power Source:** AC 230V, 50Hz  
**Distance:** 3m **Temp.(°C)/Hum.(%RH):** 23( °C)/56%RH



No.	Freq. (MHz)	Reading (dBuV)	Factor ( )	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	47.3255	45.26	-15.75	29.51	40.00	-10.49	peak			
2	57.3923	40.78	-16.26	24.52	40.00	-15.48	peak			
3	100.3528	48.69	-15.72	32.97	40.00	-7.03	QP	100	0	
4	123.0495	42.75	-18.73	24.02	40.00	-15.98	peak			
5	139.1172	49.79	-20.41	29.38	40.00	-10.62	peak			
6	1000.0000	32.91	-6.64	26.27	47.00	-20.73	peak			

**Note:** Result=Reading+Factor Over Limit=Result-Limit



## 4. Magnetic Radiated Emission Test

### 4.1. Test Standard and Limit

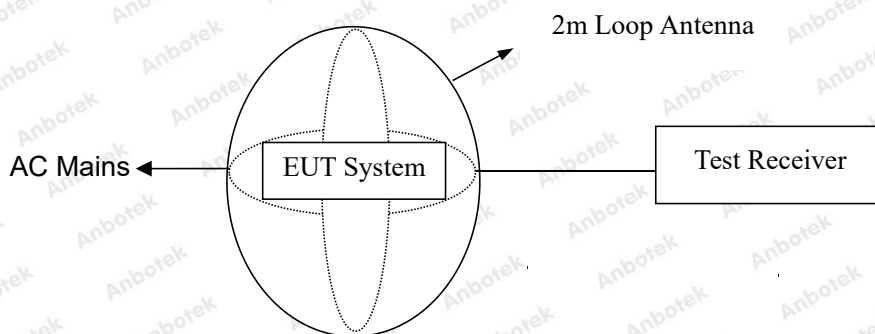
Test Standard	EN IEC 55015
---------------	--------------

Limits for Magnetic Radiated Emission

Test Limit	Frequency	Limits for loop diameter (dBμA)
		2m
	9KHz ~ 70KHz	88
	70KHz ~ 150KHz	88 ~ 58*
	150KHz ~ 3.0MHz	58 ~ 22*
	3.0MHz ~ 30MHz	22

**Remark:** (1) At the transition frequency the lower limit applies.  
(2) \* decreasing linearly with logarithm of the frequency.

### 4.2. Test Setup



### 4.3. EUT Configuration on Measurement

The following equipments are installed on Magnetic Radiated emission Measurement to meet EN IEC 55015 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

### 4.4. Operating Condition of EUT

- 4.4.1. Setup the EUT as shown in Section 4.2.
- 4.4.2. Turn on the power of all equipments.
- 4.4.3. Let the EUT work in test mode and measure it.

#### 4.5. Test Procedure

The EUT is placed on a wood table in the center of a loop antenna. The induced current in the loop antenna is measured by means of a current probe and the test receiver. Three field components are checked by means of a coaxial switch.

The frequency range from 9KHz to 30MHz is investigated. The receiver is measured with the quasi-peak detector. For frequency band 9KHz to 150KHz, the bandwidth of the test receiver (ESCI) is set at 200Hz. For frequency band 150KHz to 30MHz, the bandwidth is set at 9KHz.

All the test results are listed in Section 4.6.

#### 4.6. Test Results

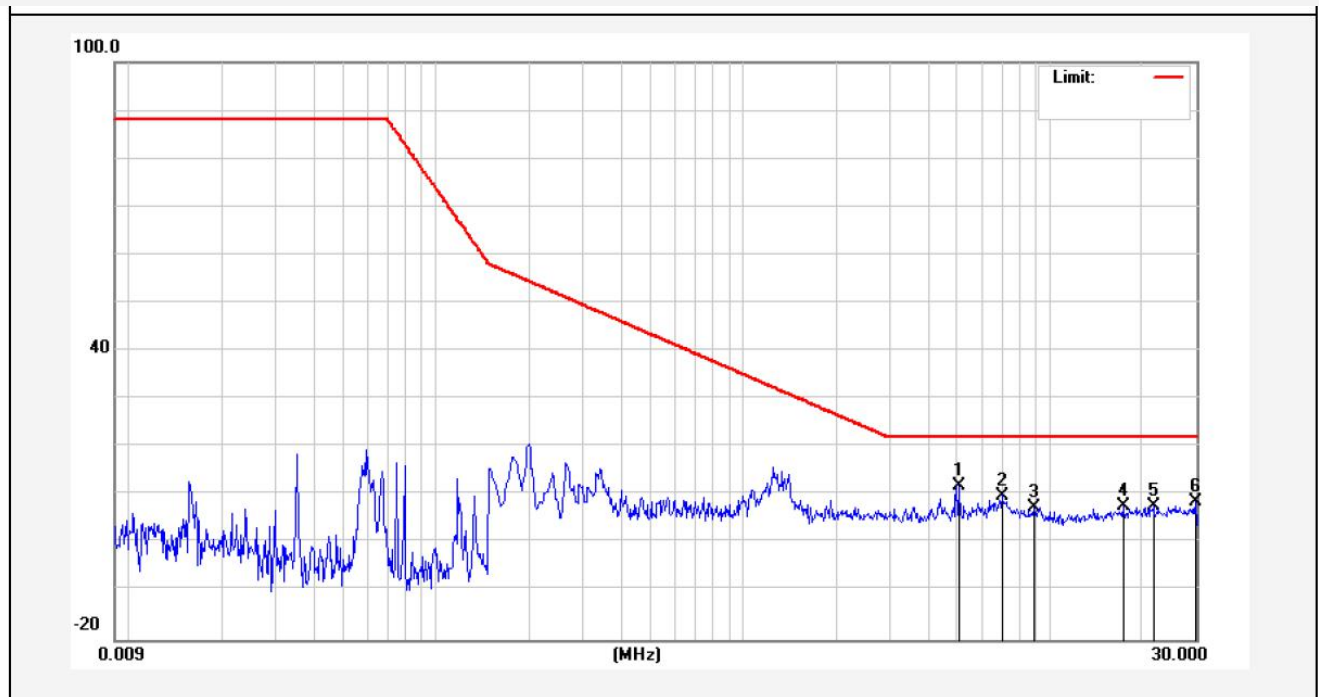
##### **PASS**

The frequency range from 9KHz to 30MHz is investigated.

The test curves are shown in the following pages.

## Magnetic Radiated Emission Test

Test Site: 1# Shielded Room  
Test Specification: AC 230V, 50Hz  
Comment: X  
Temp.: 22.3°C Hum.: 63%



No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit (dBuA)	Over Limit (dB)	Detector	Remark
1	5.0420	11.80	0.04	11.84	22.00	-10.16	QP	
2	7.0020	9.92	0.08	10.00	22.00	-12.00	QP	
3	8.8860	7.51	0.04	7.55	22.00	-14.45	QP	
4	17.3620	7.84	0.02	7.86	22.00	-14.14	QP	
5	21.7500	7.59	0.02	7.61	22.00	-14.39	QP	
6	29.8660	8.69	0.02	8.71	22.00	-13.29	QP	

**Note:** Result=Reading+Factor Over Limit=Result-Limit



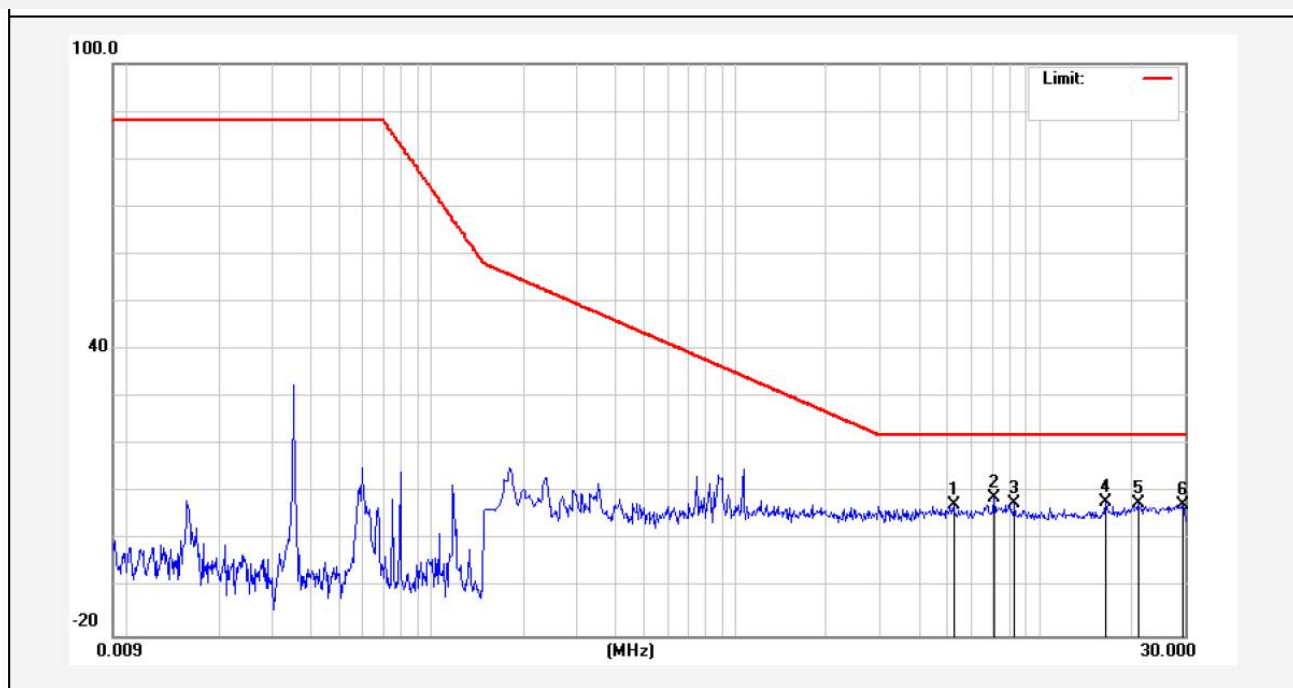
**Magnetic Radiated Emission Test**

Test Site: 1# Shielded Room

Test Specification: AC 230V, 50Hz

Comment: Y

Temp.: 22.3°C Hum.: 63%

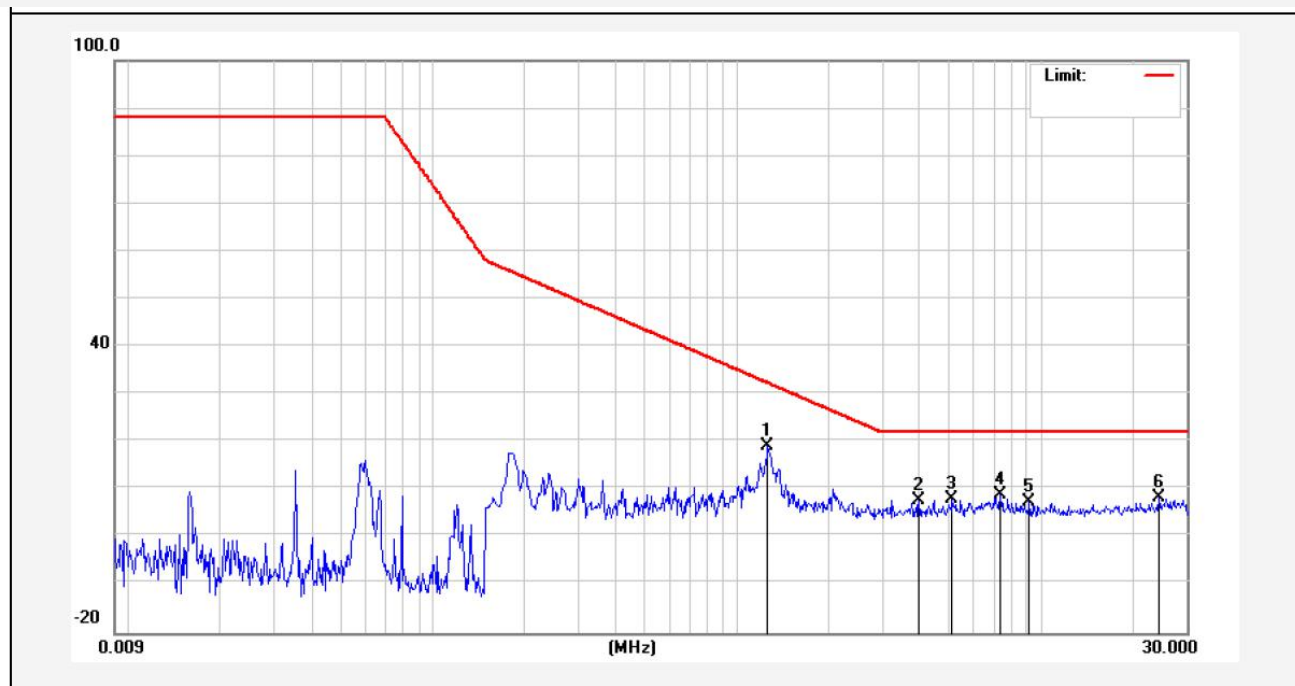


No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit (dBuA)	Over Limit (dB)	Detector	Remark
1	5.2220	7.37	0.04	7.41	22.00	-14.59	QP	
2	7.0860	9.01	0.08	9.09	22.00	-12.91	QP	
3	8.2739	7.57	0.05	7.62	22.00	-14.38	QP	
4	16.4700	8.12	0.02	8.14	22.00	-13.86	QP	
5	21.0500	7.84	0.02	7.86	22.00	-14.14	QP	
6	29.7220	7.36	0.02	7.38	22.00	-14.62	QP	

**Note:** Result=Reading+Factor Over Limit=Result-Limit

## Magnetic Radiated Emission Test

Test Site: 1# Shielded Room  
Test Specification: AC 230V, 50Hz  
Comment: Z  
Temp.: 22.3°C Hum.: 63%



No.	Freq. (MHz)	Reading (dBuA)	Factor (dB)	Result (dBuA)	Limit (dBuA)	Over Limit (dB)	Detector	Remark
1	1.2660	19.11	0.02	19.13	32.37	-13.24	QP	
2	3.9620	7.71	0.03	7.74	22.00	-14.26	QP	
3	5.1020	7.87	0.04	7.91	22.00	-14.09	QP	
4	7.3340	8.99	0.07	9.06	22.00	-12.94	QP	
5	9.1700	7.53	0.03	7.56	22.00	-14.44	QP	
6	24.3660	8.40	0.02	8.42	22.00	-13.58	QP	

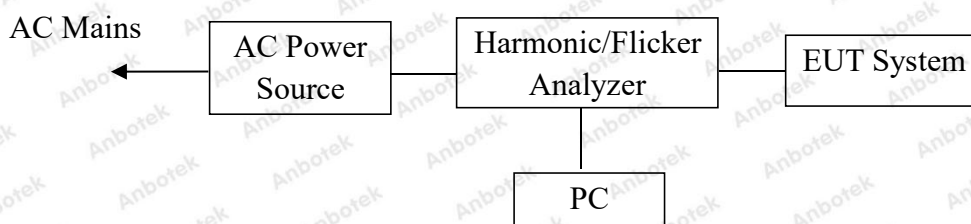
**Note:** Result=Reading+Factor Over Limit=Result-Limit

## 5. Harmonic Current Emission Test

### 5.1. Test Standard

Test Standard	EN IEC 61000-3-2
---------------	------------------

### 5.2. Test Setup



### 5.3. Operating Condition of EUT

5.3.1. Setup the EUT as shown on Section 5.2.

5.3.2. Turn on the power of all equipments.

5.3.3. After that, let the EUT work in test mode measure it.

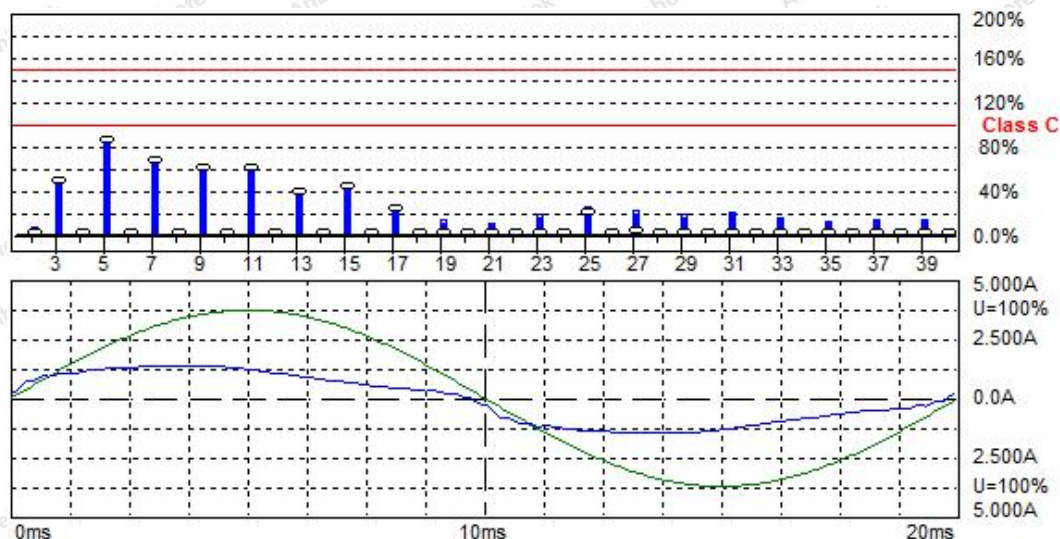
### 5.4. Test Results

**PASS**

The test curves are shown in the following pages.



## Harmonic Current Test Result Summary (Run time)



### Harmonic Emission - IEC 61000-3-2, EN 61000-3-2, (EN60555-2)

Urms =	229.7 V	P =	220.1 W	THC =	0.169 A	Range:	5 A
Irms =	1.021 A	pf =	0.939	H1max =	1.006 A	V-nom:	230 V

Test aborted, Result: PASSED

HAR-1000 EMC-Partner

Full Bar : Actual Values

Empty Bar : Maximum Values

Blue : Current, Green : Voltage, Red : Failed

## Harmonic Current Test Result Summary (Run time)

Urms = 229.7V    Freq = 50.000    Range: 5 A  
 Irms = 1.021A    Ipk = 1.472A    cf = 1.443  
 P = 220.1W    S = 234.4VA    pf = 0.939  
 THDi = 16.8 %    THDu = 0.10 %    Class C

Test - Time : 3min ( 100 %)

Limit Reference: H1(max)= 1.0059A pf(max)= 0.940

Test aborted, Result: PASSED

Order	Freq. Status [Hz]	Iavg [A]	Iavg%L [%]	Irms [A]	Irms% [%]	Irms%L [%]	I <sub>max</sub> [A]	I <sub>max</sub> %L [%]	Limit [A]
1	50	0.9818		1.0059	98.565		1.0062		
2	100	0.0000	0.0000	0.0006	0.0598	3.0340	0.0009	4.5510	0.0201
3	150	0.1334	47.039	0.1337	13.098	47.144	0.1337	47.144	0.2835
4	200	0.0000		0.0003	0.0299		0.0003		
5	250	0.0836	83.077	0.0839	8.2237	83.435	0.0839	83.435	0.1006
6	300	0.0000		0.0003	0.0299		0.0003		
7	350	0.0456	64.803	0.0458	4.4856	65.014	0.0464	65.881	0.0704
8	400	0.0000		0.0003	0.0299		0.0003		
9	450	0.0299	59.389	0.0299	2.9306	59.466	0.0302	60.073	0.0503
10	500	0.0000		0.0003	0.0299		0.0003		
11	550	0.0177	58.735	0.0177	1.7344	58.657	0.0183	60.680	0.0302
12	600	0.0000		0.0003	0.0299		0.0003		
13	650	0.0113	37.445	0.0110	1.0766	36.408	0.0116	38.431	0.0302
14	700	0.0000		0.0003	0.0299		0.0003		
15	750	0.0126	41.646	0.0122	1.1962	40.453	0.0128	42.476	0.0302
16	800	0.0000		0.0003	0.0299		0.0003		
17	850	0.0066	21.912	0.0064	0.6280	21.238	0.0067	22.249	0.0302
18	900	0.0000		0.0003	0.0299		0.0003		
19	950	0.0000	0.0000	0.0027	0.2691	9.1020	0.0034	11.125	0.0302
20	1000	0.0000		0.0000	0.0000		0.0003		
21	1050	0.0000	0.0000	0.0018	0.1794	6.0680	0.0024	8.0907	0.0302
22	1100	0.0000		0.0000	0.0000		0.0003		
23	1150	0.0000	0.0000	0.0043	0.4187	14.159	0.0049	16.181	0.0302
24	1200	0.0000		0.0003	0.0299		0.0003		
25	1250	0.0055	18.308	0.0061	0.5981	20.227	0.0073	24.272	0.0302
26	1300	0.0000		0.0003	0.0299		0.0003		
27	1350	0.0003	1.0373	0.0049	0.4785	16.181	0.0061	20.227	0.0302
28	1400	0.0000		0.0003	0.0299		0.0003		
29	1450	0.0000	0.0000	0.0043	0.4187	14.159	0.0052	17.193	0.0302
30	1500	0.0000		0.0003	0.0299		0.0003		
31	1550	0.0000	0.0000	0.0055	0.5383	18.204	0.0055	18.204	0.0302
32	1600	0.0000		0.0003	0.0299		0.0003		
33	1650	0.0000	0.0000	0.0043	0.4187	14.159	0.0043	14.159	0.0302
34	1700	0.0000		0.0003	0.0299		0.0003		
35	1750	0.0000	0.0000	0.0027	0.2691	9.1020	0.0031	10.113	0.0302
36	1800	0.0000		0.0003	0.0299		0.0003		
37	1850	0.0000	0.0000	0.0034	0.3289	11.125	0.0037	12.136	0.0302
38	1900	0.0000		0.0003	0.0299		0.0003		
39	1950	0.0000	0.0000	0.0034	0.3289	11.125	0.0034	11.125	0.0302
40	2000	0.0000		0.0003	0.0299		0.0003		



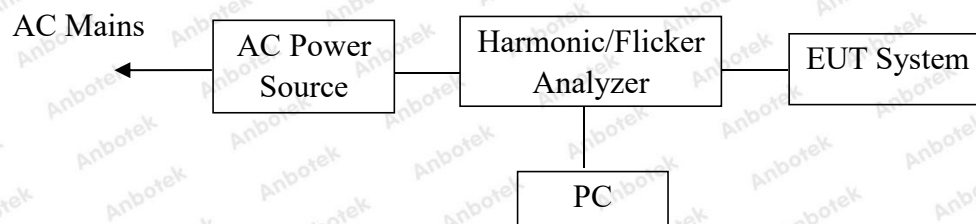


## 6. Voltage Fluctuations & Flicker Test

### 6.1. Test Standard

Test Standard	EN 61000-3-3
---------------	--------------

### 6.2. Test Setup



### 6.3. Operating Condition of EUT

6.3.1. Setup the EUT as shown on Section 6.2.

6.3.2. Turn on the power of all equipments.

6.3.3. After that, let the EUT work in test mode measure it.

### 6.4. Test Results

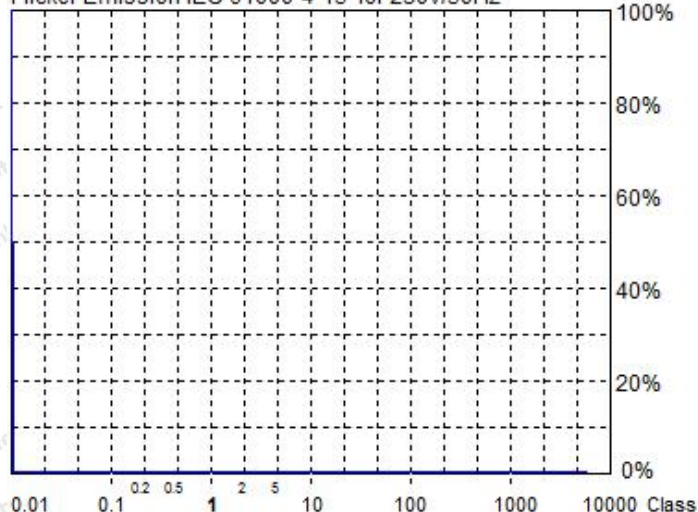
**PASS**

The test curves are shown in the following pages.



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

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



Actual Flicker (Fli): 0.00

Short-term Flicker (Pst): 0.07

Limit (Pst): 1.00

Long-term Flicker (Plt): 0.00

Limit (Plt): 0.65

Maximum Relative  
Volt. Change (dmax): 0.00%

Limit (dmax): 4.00%

Relative Steady-state  
Voltage Change (dc): 0.01%

Limit (dc): 3.00%

Tmax 3.30% (dt): 0.00ms

Limit (dt&gt;Lim): 500ms

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

Urms = 229.3 V P = 220.9 W  
 Irms = 1.025 A pf = 0.939

Range: 5 A  
 V-nom: 230 V

Test aborted, Result: PASSED

HAR-1000 EMC-Partner

Full Bar : Actual Values

Empty Bar : Maximum Values

Circles : Average Values

Blue : Current , Green : Voltage , Red : Failed

Urms = 229.3V Freq = 50.000 Range: 5 A  
 Irms = 1.025A Ipk = 1.479A cf = 1.443  
 P = 220.9W S = 235.1VA pf = 0.939

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

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

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

Test aborted, Result: PASSED

	dmax [%]	dc [%]	dt>Lim [ms]
1	0.000	0.010	0.000



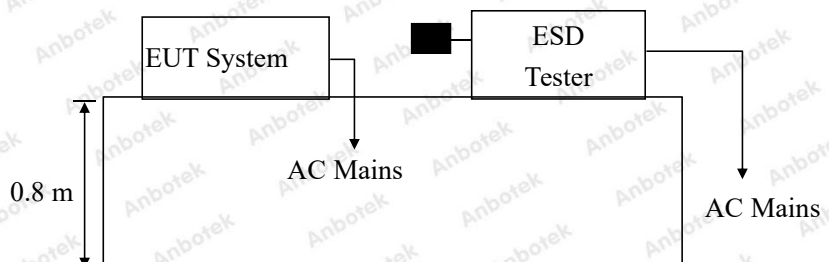
## 7. Electrostatic Discharge Immunity Test

### 7.1. Test Standard and Level

Test Standard:	EN 61547 (IEC 61000-4-2)
Performance Criterion:	B
Severity Level: 3 / Air Discharge: $\pm 8\text{kV}$ , Level: 2 / Contact Discharge: $\pm 4\text{kV}$	

Test Level		
Level	Test Voltage Contact Discharge (kV)	Test Voltage Air Discharge (kV)
1.	$\pm 2$	$\pm 2$
2.	$\pm 4$	$\pm 4$
3.	$\pm 6$	$\pm 8$
4.	$\pm 8$	$\pm 15$
X	Special	Special

### 7.2. Test Setup



### 7.3. EUT Configuration on Measurement

The following equipments are installed on Electrostatic Discharge immunity Measurement to meet EN 61547 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

### 7.4. Operating Condition of EUT

7.4.1. Setup the EUT as shown on Section 7.2.

7.4.2. Turn on the power of all equipments.

7.4.3. After that, let the EUT work in test mode measure it.



## 7.5. Test Procedure

### 7.5.1. Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

### 7.5.2. Contact Discharge:

All the procedure shall be same as Section 7.5.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

### 7.5.3. Indirect discharge for horizontal coupling plane

At least 20 single discharges shall be 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.

### 7.5.4. Indirect discharge for vertical coupling plane

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

## 7.6. Test Results

**PASS**

Please refer to the following page.



## Electrostatic Discharge Test Results

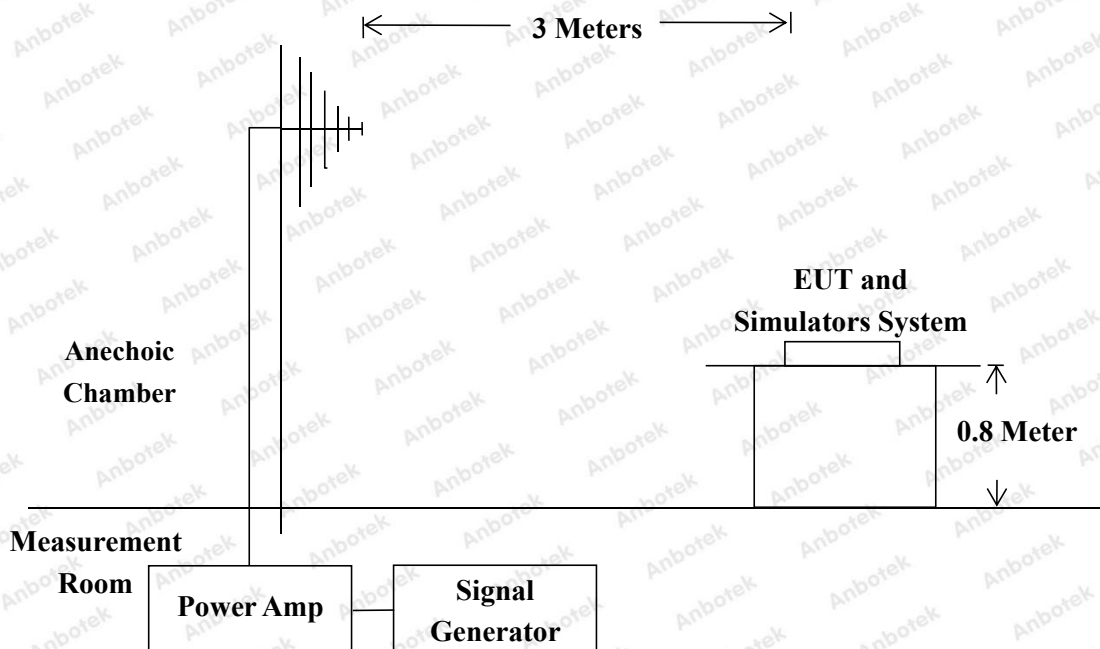
Air discharge :	±8.0kV	Temperature :	23.9℃
Contact discharge :	±4.0kV	Humidity :	50%
Power Supply :	AC 230V, 50Hz	Expert conclusion :	A
Test Result :	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail		
# For each point positive 10 times and negative 10 times discharge			
<b>Location</b>		<b>Kind</b> A-Air Discharge C-Contact Discharge	<b>Result</b>
Metal	8 points	C	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
HCP	4 points	C	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
VCP of the front	4 points	C	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
VCP of the rear	4 points	C	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
VCP of the left	4 points	C	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
VCP of the right	4 points	C	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
<b>Remark:</b> Discharge should be considered on Contact and Air and Horizontal Coupling Plane (HCP) and Vertical Coupling Plane (VCP).			

## 8. RF Field Strength Susceptibility Test

### 8.1. Test Standard and Level

Test Standard:	EN 61547 (IEC 61000-4-3)
Required Performance:	A
Frequency Range:	80MHz to 1000MHz
Field Strength:	3 V/m
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of preceding frequency value
Polarity of Antenna:	Horizontal and Vertical
Test Distance:	3 m
Antenna Height:	1.5 m
Dwell Time:	at least 0.5s

### 8.2. Test Setup



### 8.3. EUT Configuration on Measurement

The following equipments are installed on RF Field Strength susceptibility Measurement to meet EN 61547 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

#### **8.4. Operating Condition of EUT**

- 8.4.1. Setup the EUT as shown on Section 8.2.
- 8.4.2. Turn on the power of all equipments.
- 8.4.3. After that, let the EUT work in test mode measure it.

#### **8.5. Test Procedure**

The EUT and support equipment, which are placed on a table that is 0.8 meter above ground and the testing was performed in a fully-anechoic chamber. The testing distance from antenna to the EUT was 3 meters.

- 1) The field strength level was 3V/m.
- 2) The frequency range is swept from 80 MHz to 1000 MHz with the signal 80% amplitude modulated with a 1kHz sine wave.
- 3) The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond, but shall in no case be less than 0.5s.
- 4) The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

#### **8.6. Measuring Results**

**PASS**

Please refer to the following page.



## RF Field Strength Susceptibility Test Results

Field Strength :	3V/m	Temperature :	23.9℃
Expert conclusion :	A	Humidity :	50%
Power Supply :	AC 230V, 50Hz	Test Result :	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
Dwell Time:	1s		

Frequency Range (MHz)	Antenna Polarity	R.F. Field Strength	Azimuth	Result
80~1000	H / V	3 V/m (rms)	Front	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
			Rear	
			Left	
			Right	

## 9. Electrical Fast Transient/Burst Immunity Test

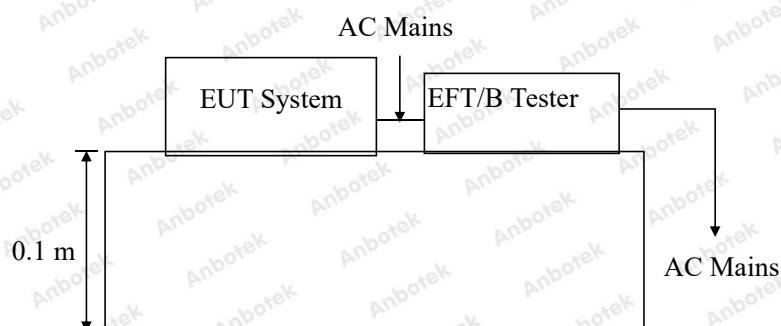
### 9.1. Test Standard and Level

Test Standard:	EN 61547 (IEC 61000-4-4)
Performance criterion:	B
Severity Level 2: 1.00kV	

Test Level

Open Circuit Output Test Voltage $\pm 10\%$		
Level	On Power Supply Lines (kV)	On I/O (Input/Output) Signal data and control lines (kV)
1.	0.50	0.25
2.	1.00	0.50
3.	2.00	1.00
4.	4.00	2.00
X.	Special	Special

### 9.2. Test Setup



### 9.3. EUT Configuration on Measurement

The following equipments are installed on Electrical Fast Transient/Burst Immunity Measurement to meet EN 61547 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

## **9.4. Operating Condition of EUT**

9.4.1. Setup the EUT as shown in Section 9.2.

9.4.2. Turn on the power of all equipments.

9.4.3. Let the EUT work in test mode and measure it.

## **9.5. Test Procedure**

The EUT is put on the table which is 0.1 meter high above the ground. This reference ground plane shall 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 beneath the EUT, shall be more than 0.5m.

### **9.5.1. For input and output AC power ports:**

The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 mins.

### **9.5.2. For signal lines and control lines ports:**

Select tests based on product characteristics.

### **9.5.3. For DC output line ports:**

Select tests based on product characteristics.

## **9.6. Test Results**

**PASS**

Please refer to the following page.



## Electrical Fast Transient/Burst Test Results

Ambient Condition : 23.9℃ / 50% RH		Expert conclusion : A	
Power Supply .: AC 230V, 50Hz		Test Result : <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
Inject Line : AC Mains		Inject Method: Direct	Inject Time(s): 120
Line	Polarity	Test Voltage (kV)	Result
AC Line	±	1.00kV	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
DC Line			
Signal Line			

## 10. Surge Immunity Test

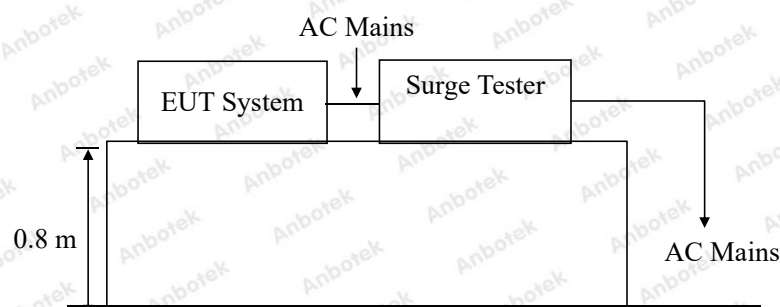
### 10.1. Test Standard and Level

Test Standard:	EN 61547 (IEC 61000-4-5)
Performance criterion:	C
Severity Level 2, Line to Line: 1.0kV; Severity Level 3, Line to Earth: 2.0kV	

Test Level

Severity Level	Open-Circuit Test Voltage (kV)
1.	0.5
2.	1.0
3.	2.0
4.	4.0
X.	Special

### 10.2. Test Setup



### 10.3. EUT Configuration on Measurement

The following equipments are installed on Surge immunity Measurement to meet EN 61547 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

### 10.4. Operating Condition of EUT

- 10.4.1. Setup the EUT as shown in Section 10.2.
- 10.4.2. Turn on the power of all equipments.
- 10.4.3. Let the EUT work in test mode and measure it.

## 10.5. Test Procedure

10.5.1. Set up the EUT and test generator as shown on Section 10.2.

10.5.2. For line to line coupling mode, provide a 1.0 kV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.

10.5.3. For line to earth coupling mode, provide a 2.0 kV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.

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

10.5.5. Different phase angles are done individually.

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

## 10.6. Test Results

**PASS**

Please refer to the following page.



## Surge Immunity Test Results

Humidity：	50%	Temperature：	23.9℃		
Power Supply：	AC 230V, 50Hz	Expert conclusion:	A		
Test Result：	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail				
Location	Polarity	Phase Angle	Number of Pulse	Pulse Voltage (kV)	Result
L-N	+	<input type="checkbox"/> 0° <input checked="" type="checkbox"/> 90° <input type="checkbox"/> 180° <input type="checkbox"/> 270°	5	1.0kV	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
L-N	-	<input type="checkbox"/> 0° <input type="checkbox"/> 90° <input type="checkbox"/> 180° <input checked="" type="checkbox"/> 270°	5	1.0kV	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
L-GND	+	<input type="checkbox"/> 0° <input checked="" type="checkbox"/> 90° <input type="checkbox"/> 180° <input type="checkbox"/> 270°	5	2.0kV	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
L-GND	-	<input type="checkbox"/> 0° <input type="checkbox"/> 90° <input type="checkbox"/> 180° <input checked="" type="checkbox"/> 270°	5	2.0kV	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
N-GND	+	<input type="checkbox"/> 0° <input checked="" type="checkbox"/> 90° <input type="checkbox"/> 180° <input type="checkbox"/> 270°	5	2.0kV	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
N-GND	-	<input type="checkbox"/> 0° <input type="checkbox"/> 90° <input type="checkbox"/> 180° <input checked="" type="checkbox"/> 270°	5	2.0kV	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D

## 11. Injected Currents Susceptibility Test

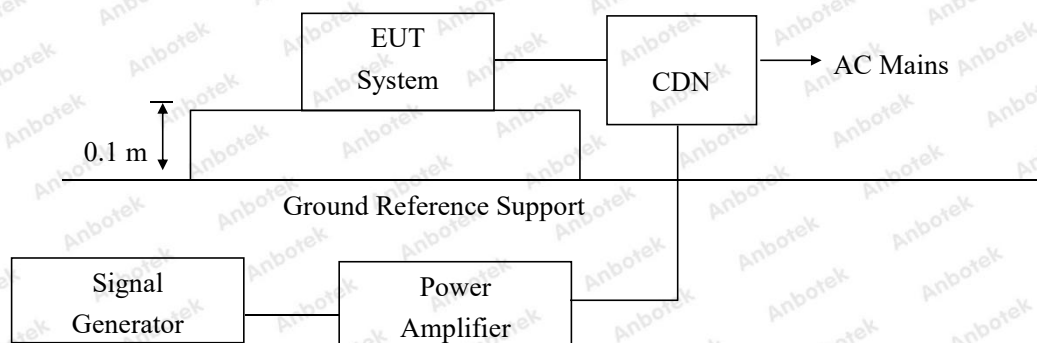
### 11.1. Test Standard and Level

Test Standard:	EN 61547 (IEC 61000-4-6)
Performance criterion:	A
Severity Level 2: 3V (rms), (0.15MHz ~80MHz)	

Test Level

Level	Field Strength V
1.	1
2.	3
3.	10
X.	Special

### 11.2. Test Setup



### 11.3. EUT Configuration

The following equipments are installed on currents susceptibility Measurement to meet EN 61547 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

### 11.4. Operating Condition of EUT

- 11.4.1. Setup the EUT as shown in Section 11.2.
- 11.4.2. Turn on the power of all equipments.
- 11.4.3. Let the EUT work in test mode and measure it.

### 11.5. Test Procedure

- 1) Set up the EUT, CDN and test generators as shown on Section 11.2.
- 2) Let the EUT work in test mode and measure it.
- 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).
- 4) The disturbance signal described below is injected to EUT through CDN.
- 5) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 6) The frequency range is swept from 150KHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave.
- 7) 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.
- 8) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

### 11.6. Test Results

**PASS**

Please refer to the following page.



## Injected Currents Susceptibility Test Results

Humidity : 50%				Temperature : 23.9℃			
Power Supply : AC 230V, 50Hz				Expert conclusion: A			
Test Result : <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail							
Frequency Range (MHz)		Injected Position		Strength (Unmodulated)		Result	
0.15 ~ 80		AC Mains		3V		<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D	
<b>Remark :</b> 1. Modulation Signal:1KHz 80% AM							

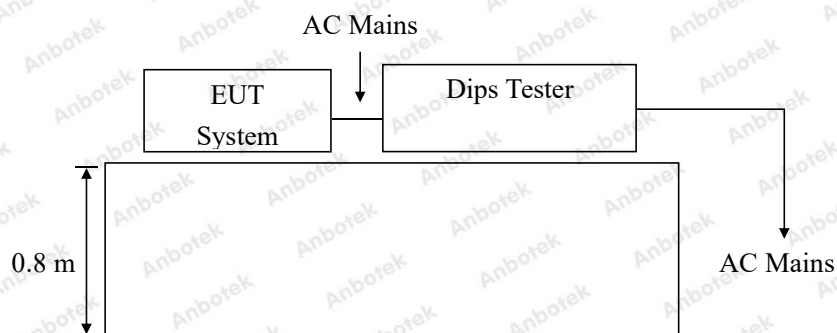
## 12. Voltage Dips And Interruptions Test

### 12.1. Test Standard and Level

Test Standard:	EN 61547 (IEC 61000-4-11)
Performance Criterion:	B&C

Test Level		
Test Level %UT	Voltage dip and short interruptions %UT	Duration (in period)
0	100	0.5
70	30	10 *

### 12.2. Test Setup



### 12.3. EUT Configuration on Measurement

The following equipments are installed on Voltage dips and interruptions Measurement to meet EN 61547 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

## **12.4. Operating Condition of EUT**

12.4.1. Setup the EUT as shown in Section 12.2.

12.4.2. Turn on the power of all equipments.

12.4.3. Let the EUT work in test mode and measure it.

## **12.5. Test Procedure**

- 1) Set up the EUT and test generator as shown on Section 12.2.
- 2) The interruptions is introduced at selected phase angles with specified duration.
- 3) Record any degradation of performance.

## **12.6. Test Results**

**PASS**

Please refer to the following page.



## Voltage Dips and Interruptions Test Results

Temperature : 23.9°C		Humidity : 50%	
Power Supply : AC 230V, 50Hz		Expert conclusion : B&C	
Test Result : <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail			
Test Level % UT	Voltage Dips % UT	Duration (in periods)	Result
70	30	10P	<input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D
Test Level % UT	Short Interruptions % UT	Duration (in periods)	Result
0	100	0.5P	<input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D

## APPENDIX I -- TEST SETUP PHOTOGRAPH

Photo of Power Line Conducted Emission Test



Photo of Radiated Emission Test

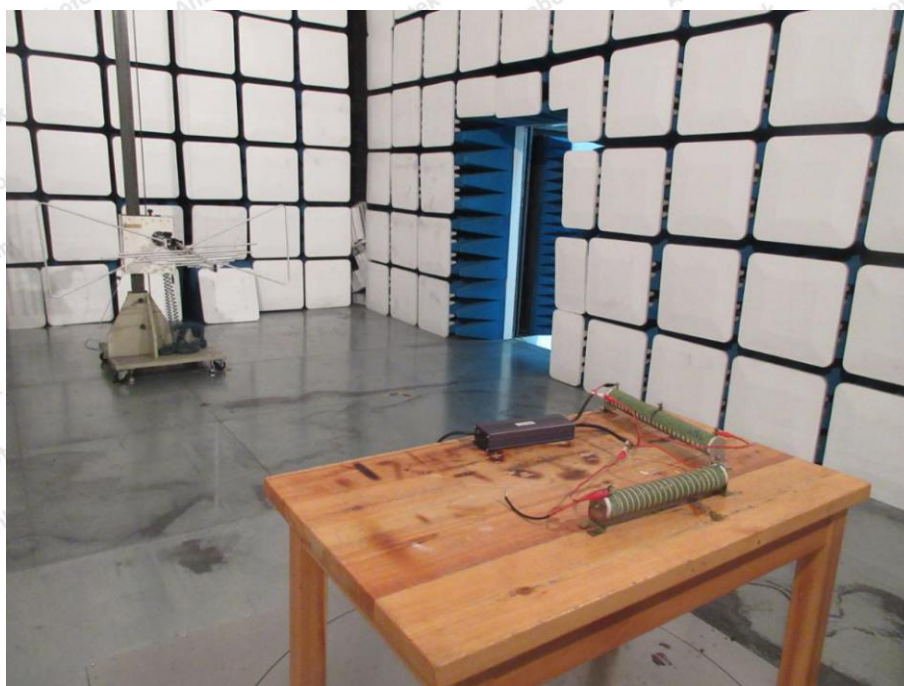




Photo of Magnetic Radiated Emission Test



Photo of Flicker/ Harmonic Test





Photo of Electrostatic Discharge Immunity Test



Photo of RF Field Strength susceptibility Test



Photo of Electrical Fast Transient/Burst Immunity Test



Photo of Surge Immunity Test





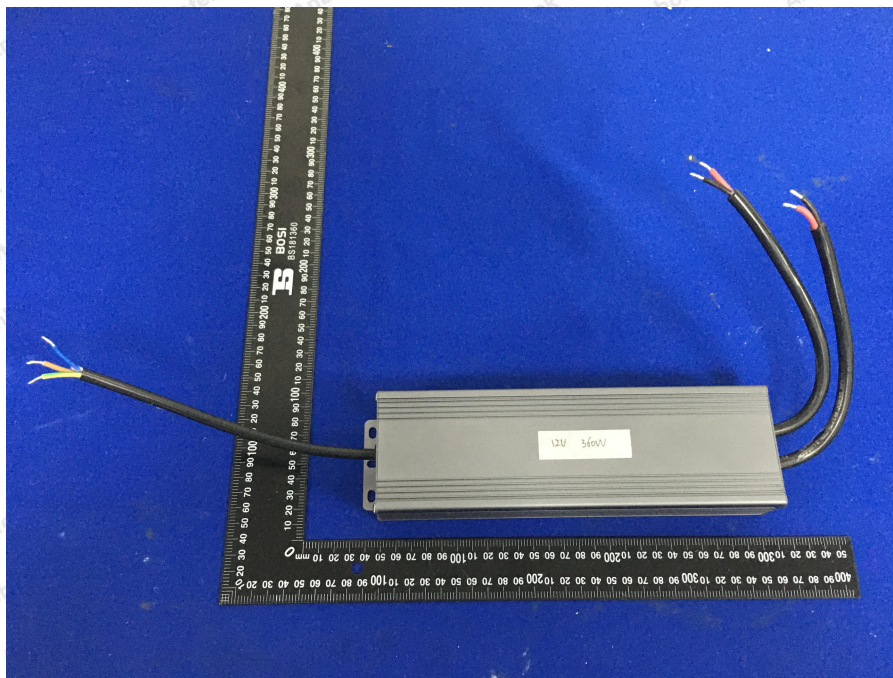
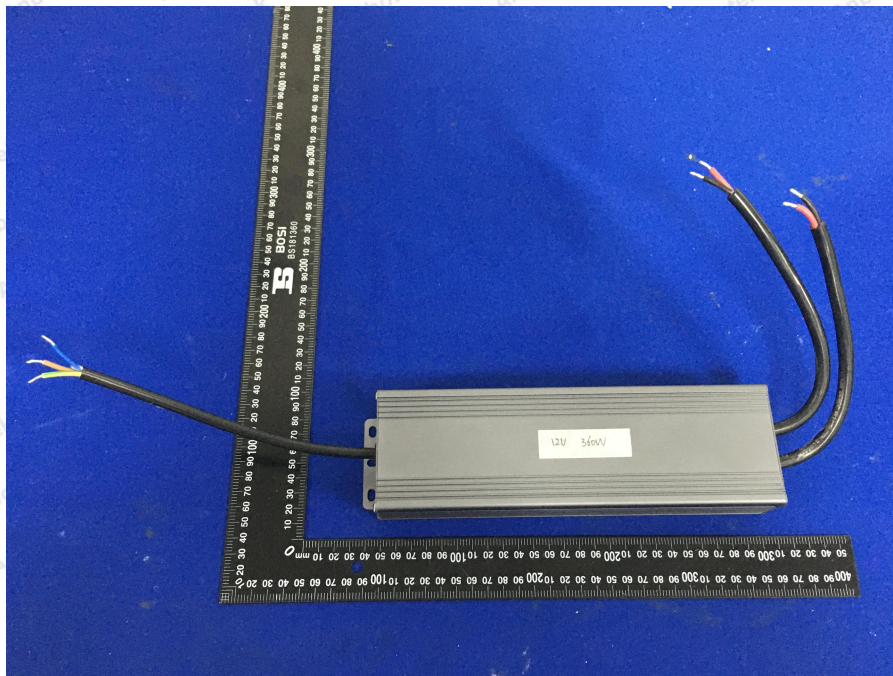
Photo of Injected currents susceptibility Test



Photo of Voltage Dips and Interruptions Test





**APPENDIX II -- EXTERNAL PHOTOGRAPH**

## CE Label

1. The CE conformity marking must consist of the initials 'CE' taking the following form:

If the CE marking is reduced or enlarged, the proportions given in the above graduated drawing must be respected.

2. The CE marking must have a height of at least 5 mm except where this is not possible on account of the nature of the apparatus.

3. The CE marking must be affixed to the product or to its data plate. Additionally it must be affixed to the packaging, if any, and to the accompanying documents.

4. The CE marking must be affixed visibly, legibly and indelibly.  
It must have the same height as the initials 'CE'.

----- End of Report -----