EMC TEST REPORT

For Electromagnetic Interference of

Report Reference No. ..... :	EA2001209E 02001
Engineer (name + signature) ..... :	Wite Chen
Reviewed by (name + signature) ..... :	Tiger Xu
Approved by (name + signature) ..... :	Alan He
Date of Receipt of EUT ..... :	Jan. 06, 2020
Date of Test..... :	Jan. 06, 2020 to Jan. 17, 2020
Date of issue ..... :	Jan. 17, 2020
Testing Laboratory ..... :	Dong Guan Anci Electronic Technology Co., Ltd
Address..... :	1-2 Floor, Building A, No.11, Headquarters 2 Road, Songshan Lake Hi-tech Industrial Development Zone, Dongguan City, Guangdong Pr., China.
Laboratory location ..... :	EMC Laboratory
Applicant's name..... :	Shenzhen Fluence Technology PLC.
Address..... :	A701 Room,07F,1# Building A,TianAn Cyber Park,Longgang, Shenzhen,Guangdong Province,China
Manufacturer..... :	Shenzhen Fluence Technology PLC.
Address..... :	A701 Room,07F,1# Building A,TianAn Cyber Park,Longgang, Shenzhen,Guangdong Province,China
First Factory's name……:	Huizhou Fluence Optoelectronic Technology CO., Ltd.
Address……..……:	No.3 Xingping West Road, Dongjiang Hi-tech Industry Park, Zhongkai Hi-tech District, Huizhou City, GuangDong Province, China

Test specification:

EUT description ..... :	LED High Bay
Trade Mark..... :	
Model/Type reference ..... :	H500, H400, H300, H200, H150, H120, H100
Test Sample……:	H500
Input Ratings……:	220-240VAC, 50/60Hz, Class I
Tested Power……..:	I/P: 230Vac, 50Hz
Standards. ……....:	EN 55015:2013+A1:2015
	EN 61547:2009
	EN 61000-3-2:2014
	EN 61000-3-3:2013

The device described above was tested by Dong Guan Anci Electronic Technology Co., Ltd. to determine the maximum emission levels emanated from the device and severity levels of the device endure and its performance criterion. The measurement results are contained in this test report and Dong Guan Anci Electronic Technology Co., Ltd. assumes full responsibility for the accuracy and completeness of these measurements. This report shows the EUT is technically compliance with the above official standards.

This report applies to the above sample only and shall not be reproduced in part without written approval of Dong Guan Anci Electronic Technology Co., Ltd.

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1.GENERAL INFORMATION

1.1 PRODUCT INFORMATION

1. The equipment is LED High Bay Luminaires for the use in lighting equipment.
2. .All models are the same except for rated power, LED DRIVER, size, CCT and appearance dimensions.
3. Model List

Model	Rating	LED Driver No.	Dimensions (L*W*H)
H500	220-240VAC 50/60Hz, 500W	HLG-240H-36A	500mm*384mm*374mm
H400	220-240VAC 50/60Hz, 400W	XLG-200-H-A	500mm*327mm*374mm
H300	220-240VAC 50/60Hz, 300W	HLG-150H-36A	461mm*327mm*374mm
H200	220-240VAC 50/60Hz, 200W	ELG-240-36A-3Y	467mm*266mm*374mm
H150	220-240VAC 50/60Hz, 150W	XLG-150-H-A	459mm*323mm*374mm
H120	220-240VAC 50/60Hz, 120W	HLG-120H-36A	467mm*266mm*374mm
H100	220-240VAC 50/60Hz, 100W	ELG-150-36A	459mm*246mm*374mm

All tests was performed on model H500.

The EUT passed the test.

1.2 Details about the Test Laboratory

Test Site 1 (CNAS number L6214):

Company name: Dongguan Anci Electronic Technology Co., Ltd.

Address: 1-2 Floor, Building A, No.11, Headquarters 2 Road, Songshan Lake Hi-tech Industrial Development Zone, Dongguan City, Guangdong Pr., China.

Telephone: +86-769- 8507 5888

Fax: +86-769- 8507 5898

Test Site 2 (Subcontract test: CNAS number L0468):

Company name: Guangdong Dongguan Quality Supervision Testing Center

Address: No.2 South Industry Road, Dongguan Songshan Lake Sci.&Tech. Industrial Park, Guangdong Province, China

Telephone: +86 769 2307 1111

Fax: +86 769 2307 7221

Standard	Test Item	Test Site
EN 55015: 2013+A1:2015	Conducted Emission	1
	Radiated Emission	1
	Magnetic Emission	1
EN 61000-3-2:2014	Harmonic Current Emission	1
EN 61000-3-3:2013	Voltage Fluctuations & Flicker	1
EN 61000-4-2:2009	Electrostatic Discharge	1
EN 61000-4-3:2006 +A1:2008+A2: 2010	RF electromagnetic field	2
EN 61000-4-4:2012	Fast transients	1
EN 61000-4-5:2014	Surges	1
EN 61000-4-6:2014	Injected Current	2
EN 61000-4-8:2010	Power Frequency Magnetic Field	2
EN 61000-4-11:2004	Volt. Interruptions Volt. Dips	1

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

Emission			
Standard	Test Item	Judgment	Remark
EN 55015: 2013+A1:2015	Conducted Emission	PASS	
	Radiated Emission	PASS	
	Magnetic Emission	PASS	
EN 61000-3-2:2014	Harmonic Current Emission	PASS	
EN 61000-3-3:2013	Voltage Fluctuations & Flicker	PASS	

Immunity (EN61547:2009)				
Section	Test Item	Performance Criteria	Judgment	Remark
EN 61000-4-2:2009	Electrostatic Discharge	B	PASS	
EN 61000-4-3:2006 +A1:2008+A1:2010	RF electromagnetic field	A	PASS	
EN 61000-4-4:2012	Fast transients	B	PASS	
EN 61000-4-5:2014	Surges	B	PASS	
EN 61000-4-6:2014	Injected Current	A	PASS	
EN 61000-4-8:2010	Power Frequency Magnetic Field	A	PASS	
EN 61000-4-11:2004	Volt. Interruptions Volt. Dips	C / B	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

2.1 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **U**，where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95** %。

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U，(dB)	NOTE
C01	ANSI	9 KHz ~ 30MHz	3.19	

B. Magnetic Measurement :

Test Site	Method	Measurement Frequency Range	U，(dB)	NOTE
Magnetic	ANSI	9KHz ~ 30MHz	3.0	

C. Radiated Measurement :

Test Sit	Method	Measurement Frequency Range	Ant. H / V	U，(dB)	NOTE
S02	ANSI	30MHz ~ 200MHz	V	3.69	
		30MHz ~ 200MHz	H	3.69	
		200MHz ~ 1,000MHz	V	3.67	
		200MHz ~ 1,000MHz	H	3.67	

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pre-scan mode	
Mode 1	Normal Operation

Final-scan mode	
Mode 1	Normal Operation

3. EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 LIMIT OF CONDUCTED EMISSION(MAINS PORT) (Frequency Range 9KHz-30MHz)

FREQUENCY (MHz)	(dBuV)	
	Quasi-peak	Average
0.009-0.05	110	--
0.05-0.15	90-80	--
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

(3) The test result calculated as following:

Measurement Value = Reading Level + Correct Factor

Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor (if use)

Margin Level = Measurement Value - Limit Value

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.2 MEASUREMENT INSTRUMENTS LIST

Item	Instr.Code	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	AN-E024	EMI Test Receiver	ROHDE&SCHWARZ	ESPI	101144	2020-11-28
2	AN-E025	LISN	ROHDE&SCHWARZ	ENV216	101413	2020-11-28
3	AN-E029	RF Cable	N/A	ZT06S-NJ-NJ-2.5M	19044022	2020-05-19
5	AN-E044	2# Shielded Room	chengyu	8m*4m*3m	N/A	2020-06-18
6	AN-E046	Test Software	Farad	EZ-EMC Ver:ANCI-8A1	N/A	N/A

Remark: ” N/A” denotes No Model No. , Serial No. or No Calibration specified.

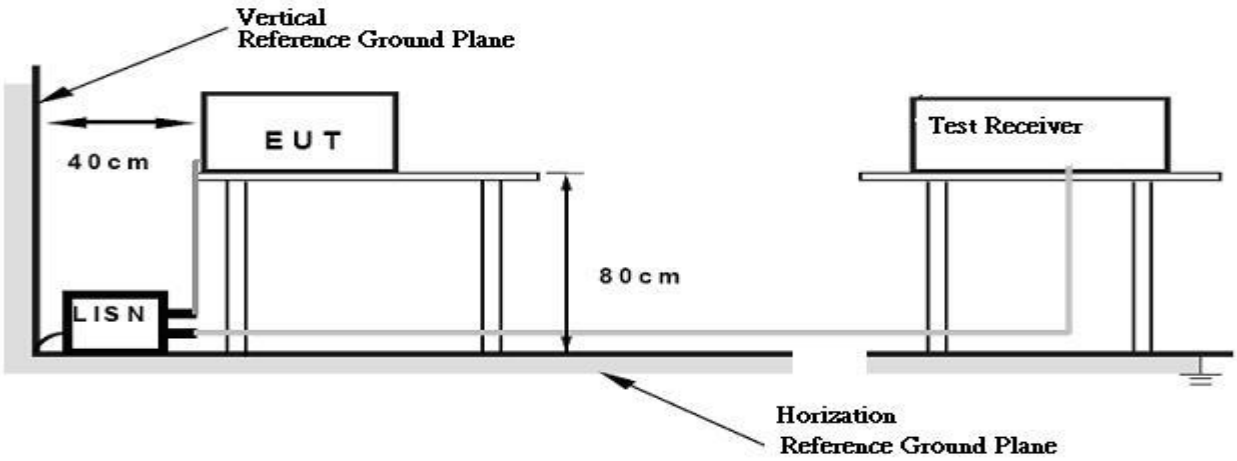
3.1.3 TEST PROCEDURE

a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.4 DEVIATION FROM TEST STANDARD

No deviation

3.1.5 TEST SETUP



3.1.6 EUT OPERATING CONDITIONS

The EUT exercise program used during radiated and/or conducted emission measurement was designed to exercise the various system components in a manner similar to a typical use.

3.1.7 TEST RESULTS

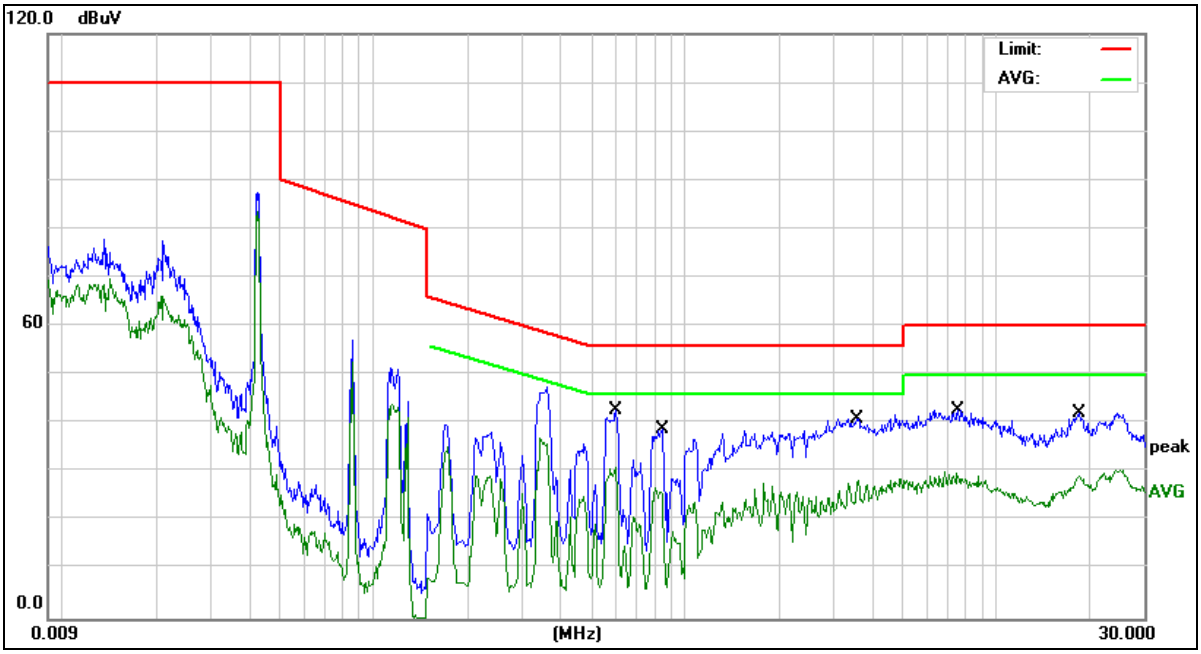
EUT：	LED High Bay	**Model No.:**	H500
Temperature：	24℃	**Relative Humidity：**	53%
Pressure：	1008 hPa	**Test Power ：**	AC 230V/50Hz
Test Mode ：	Normal Operation		

Remark：

(1) Reading in which marked as QP means measurements by using Quasi-Peak Detector ,and AV means measurements by using Average Detector.

(2) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a " * " marked in AVG Mode column of Interference Voltage Measured.

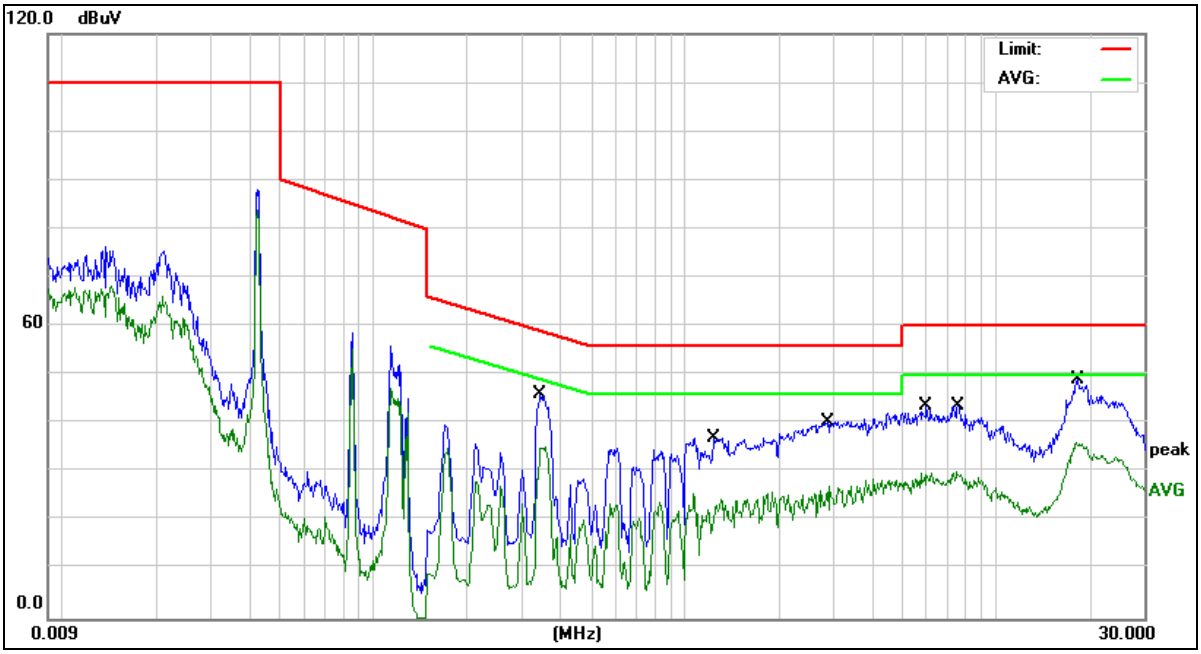
(3) Measuring frequency range from 150KHz to 30MHz.



Site:	**843**	**Phase:N**	**Temperature(C):24(C)**
Limit:	**EN 55015-QP (9K-30M)**		**Humidity(%):53%**
EUT:	**LED High Bay**	**Test Time:**	**2020-01-16**
M/N.:	**H500**	**Power Rating:**	**AC 230V/50Hz**
Mode:	**Normal Operation**	**Test Engineer:**	**Jack**
Note:			

No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Measure-ment(dBuV)	Limit (dBuV)	Over (dB)	Detector	Comment
1	0.6020	29.61	9.93	39.54	56.00	-16.46	QP	
2 *	0.6020	21.34	9.93	31.27	46.00	-14.73	AVG	
3	0.8460	26.01	9.94	35.95	56.00	-20.05	QP	
4	0.8460	16.33	9.94	26.27	46.00	-19.73	AVG	
5	3.6060	26.63	9.91	36.54	56.00	-19.46	QP	
6	3.6060	13.16	9.91	23.07	46.00	-22.93	AVG	
7	7.5820	26.44	9.90	36.34	60.00	-23.66	QP	
8	7.5820	18.67	9.90	28.57	50.00	-21.43	AVG	
9	18.6100	25.22	10.07	35.29	60.00	-24.71	QP	
10	18.6100	17.76	10.07	27.83	50.00	-22.17	AVG	

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



Site:	**843**	**Phase:L1**	**Temperature(C):24(C)**
Limit:	**EN 55015-QP (9K-30M)**		**Humidity(%):53%**
EUT:	**LED High Bay**	**Test Time:**	**2020-01-16**
M/N.:	**H500**	**Power Rating:**	**AC 230V/50Hz**
Mode:	**Normal Operation**	**Test Engineer:**	**Jack**
Note:			

No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Measure-ment(dBuV)	Limit (dBuV)	Over (dB)	Detector	Comment
1	0.3460	30.97	9.92	40.89	59.06	-18.17	QP	
2 *	0.3460	25.55	9.92	35.47	49.06	-13.59	AVG	
3	1.2420	24.00	9.92	33.92	56.00	-22.08	QP	
4	1.2420	11.07	9.92	20.99	46.00	-25.01	AVG	
5	2.8820	25.58	9.91	35.49	56.00	-20.51	QP	
6	2.8820	12.92	9.91	22.83	46.00	-23.17	AVG	
7	5.9980	27.53	9.90	37.43	60.00	-22.57	QP	
8	5.9980	18.76	9.90	28.66	50.00	-21.34	AVG	
9	7.5740	25.84	9.90	35.74	60.00	-24.26	QP	
10	7.5740	18.56	9.90	28.46	50.00	-21.54	AVG	
11	18.3700	31.48	10.06	41.54	60.00	-18.46	QP	
12	18.3700	24.69	10.06	34.75	50.00	-15.25	AVG	

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

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT (Below 1000MHz)

FREQUENCY (MHz)	LIMIT (at 3m)
	dBuV/m
30 – 230	40
230 – 300	47

Notes:

(1) The limit for radiated test was performed according to as following: EN 55015 / CISPR 15.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

3.2.2 MEASUREMENT INSTRUMENTS LIST

3m Radiated Emission Measurement 30MHz-1GHz

Item	Instr.Code	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	AN-E060	EMI Test Receiver	Rohde & Schwarz	ESCI	100302	2020-06-13
2	AN-E061	Pre-Amplifier	Anritsu	MH648A	M57886	2020-06-13
3	AN-E076	Bilog Antenna	Schwarzbeck	VULB9163	VULB9163-1290	2020-11-15
4	AN-E063	RF Cable	N/A	ZT06S-NJ-NJ-11M	19060398	2020-06-13
5	AN-E064	RF Cable	N/A	ZT06S-NJ-NJ-0.5M	19060400	2020-06-13
6	AN-E065	RF Cable	N/A	ZT06S-NJ-NJ-2.5M	19060404	2020-06-13
7	AN-E056	3m Semi-anechoic Chamber	chengyu	9m*6m*6m	N/A	2022-05-19
8	AN-E069	Test Software	Farad	EZ-EMC Ver:ANCI-2A1	N/A	N/A

3m Radiated Emission Measurement 1GHz-18GHz

Item	Instr.Code	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	AN-E037	Spectrum Analyzer	Rohde & Schwarz	FSV40	102257	2020-11-28
2	AN-E015	Low noise Amplifiers	A-INFO	LA1018N4009	J1013130524001	2020-05-19
3	AN-E014	Horn antenna	A-INFO	LB-10180-SF	J2031090612123	2020-05-17
4	AN-E065	RF Cable	N/A	ZT26-NJ-NJ-11M	19060401	2020-06-13
5	AN-E067	RF Cable	N/A	ZT26-NJ-NJ-2.5M	19060402	2020-06-13
6	AN-E068	RF Cable	N/A	ZT26-NJ-NJ-0.5M	19060403	2020-06-13
7	AN-E056	3m Semi-anechoic Chamber	chengyu	9m*6m*6m	N/A	2022-05-19
8	AN-E069	Test Software	Farad	EZ-EMC Ver:ANCI-2A1	N/A	N/A

Remark: ” N/A” denotes No Model No. / Serial No. and No Calibration specified.

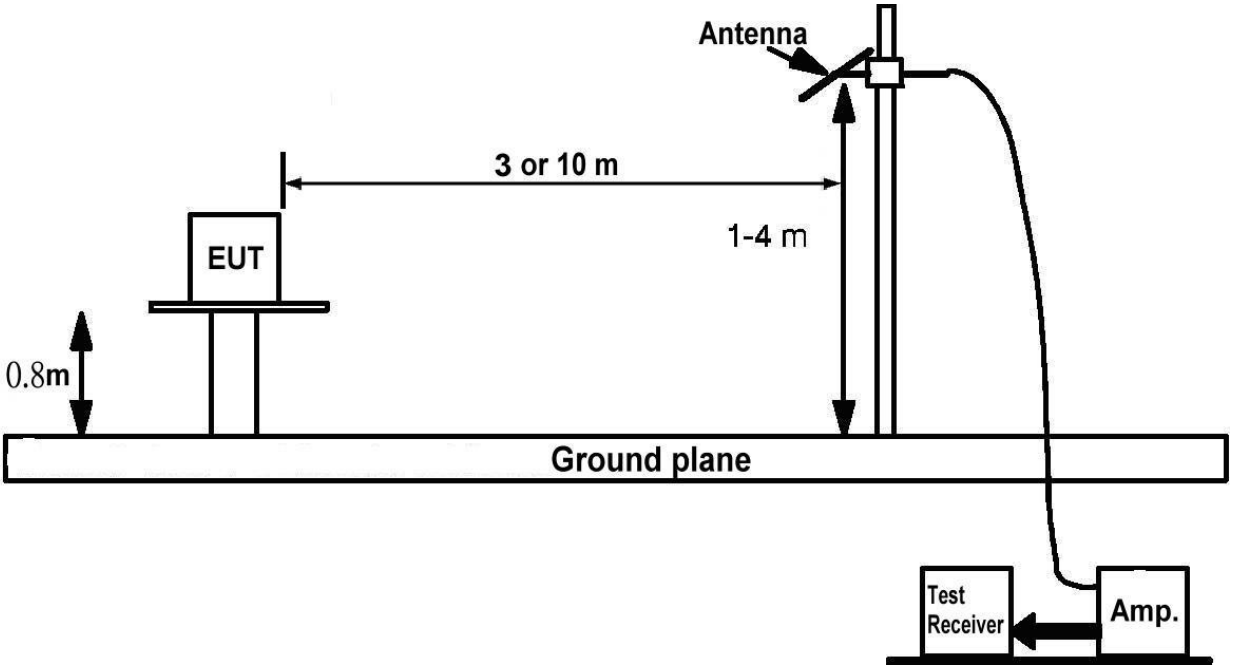
3.2.3 TEST PROCEDURE

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m or 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.2.4 DEVIATION FROM TEST STANDARD

No deviation

3.2.5 TEST SETUP



3.2.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 3**.1.6** Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.7 TEST RESULTS

EUT：	LED High Bay	**Model No.:**	H500
Temperature：	23℃	**Relative Humidity：**	57%
Pressure：	1008 hPa	**Test Power ：**	AC 230V/50Hz
Test Mode ：	Normal Operation		

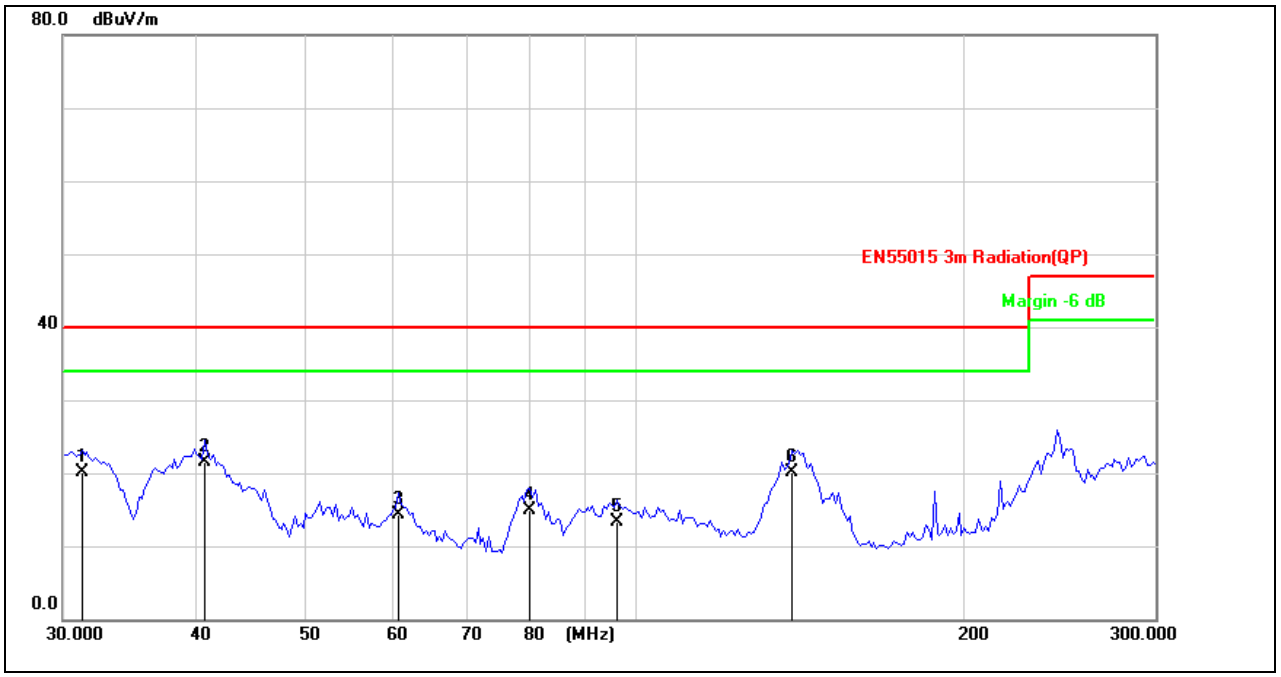
Remark：

(1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Detector or Peak Detector.

(2) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.

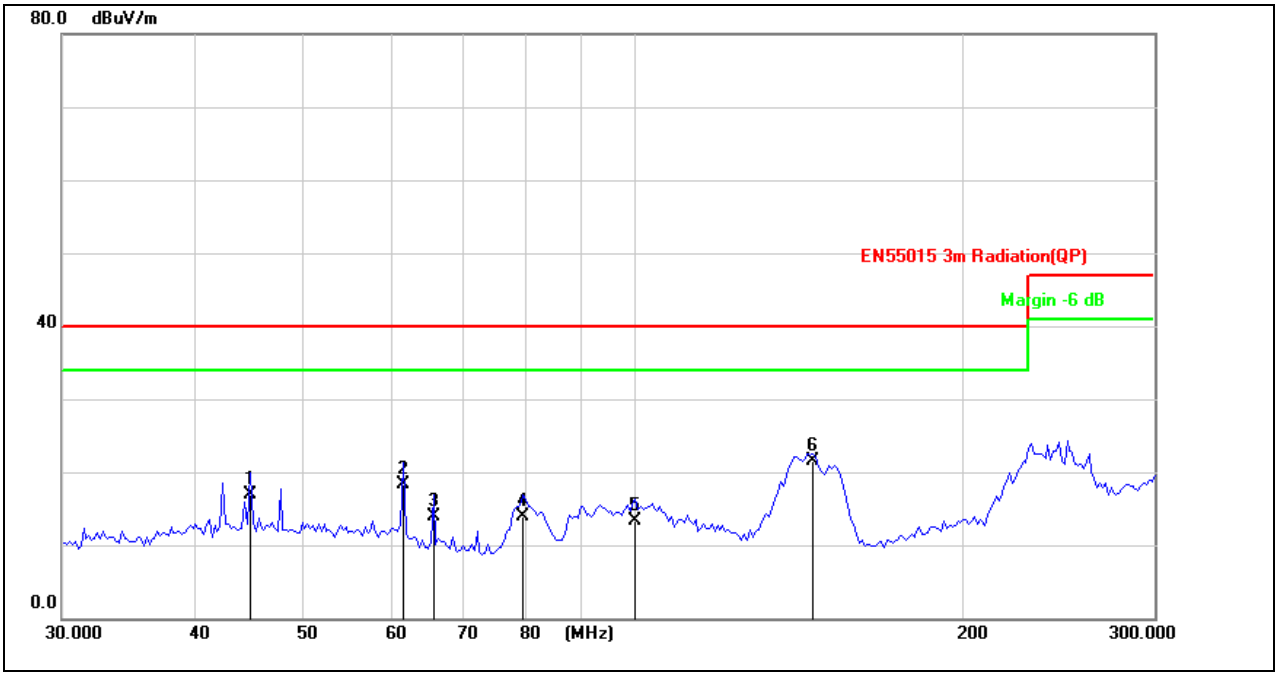
(3) Measuring frequency range from 30MHz to 300MHz.

(4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table.



Site:	**966 LAB**	**Antenna:: Vertical**	**Temperature(C):23(C)**
Limit:	**EN55015 3m Radiation(QP)**		**Humidity(%):57%**
EUT:	**LED High Bay**	**Test Time:**	**2020-01-16**
M/N.:	**H500**	**Power Rating:**	**AC 230V/50Hz**
Mode:	**Normal Operation**	**Test Engineer:**	**Jack**
Note:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1	31.2335	35.21	-15.11	20.10	40.00	-19.90	QP			
2 *	40.4689	34.63	-13.20	21.43	40.00	-18.57	QP			
3	60.9006	28.31	-14.07	14.24	40.00	-25.76	QP			
4	80.2825	31.95	-17.11	14.84	40.00	-25.16	QP			
5	96.5209	26.33	-13.03	13.30	40.00	-26.70	QP			
6	139.5151	35.41	-15.24	20.17	40.00	-19.83	QP			



Site:	**966 LAB**	**Antenna::Horizontal**	**Temperature(C):23(C)**
Limit:	**EN550153m Radiation(QP)**		**Humidity(%):57%**
EUT:	**LED High Bay**	**Test Time:**	**2020-01-16**
M/N.:	**H500**	**Power Rating:**	**AC 230V/50Hz**
Mode:	**Normal Operation**	**Test Engineer:**	**Jack**
Note:			

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)	Remark
1	44.6294	30.17	-13.19	16.98	40.00	-23.02	QP			
2	61.6058	32.57	-14.33	18.24	40.00	-21.76	QP			
3	65.6328	29.60	-15.67	13.93	40.00	-26.07	QP			
4	79.3636	31.03	-17.18	13.85	40.00	-26.15	QP			
5	100.4896	25.87	-12.49	13.38	40.00	-26.62	QP			
6 *	146.0903	37.22	-15.71	21.51	40.00	-18.49	QP			

3.3 MAGNETIC EMISSION MEASUREMENT

3.3.1 MEASUREMENT INSTRUMENTS LIST

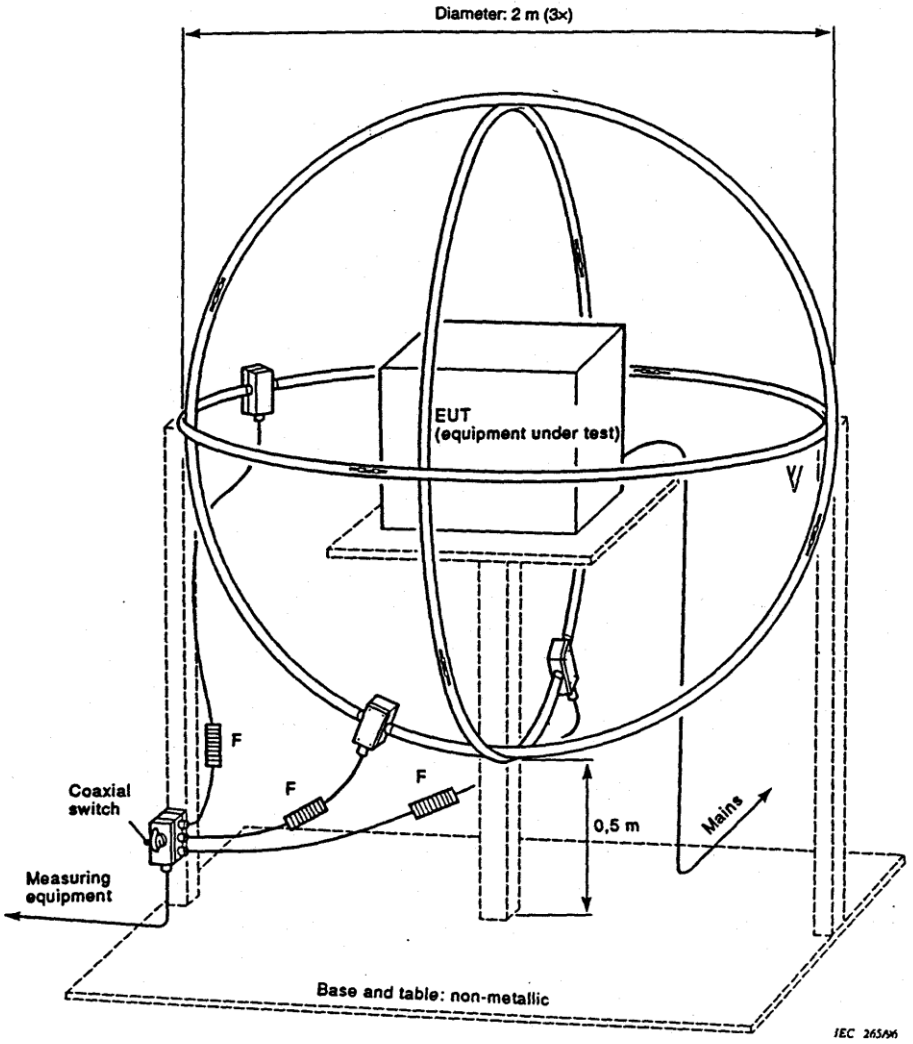
Item	Instr.Code	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	AN-E013	Loop Antenna	Da Ze	ZN30401	2944A09491	2020-05-19
3	AN-E026	RF Cable	N/A	ZT06S-NJ-NJ-3M	19044021	2020-05-19
4	AN-E020	EMI Test Receiver	ROHDE&SCHWARZ	ESCI	101358	2020-05-19
5	AN-E058	1# Shielded Room	chengyu	8m*4m*3.3m	N/A	2020-05-06
6	AN-E046	Test Software	Farad	EZ-EMC Ver:ANCI-8A1	N/A	N/A

Remark: ” N/A” denotes No Model No. / Serial No. and No Calibration specified.

3.3.2 LIMITS OF MAGNETIC EMISSION MEASUREMENT

Frequency Range	Limits for loop diameter dB(A)(1)
	2m
9KHz-70KHz	88
70KHz-150KHz	88-58
150KHz-3.0MHz	58-22
3.0MHz-30MHz	22

3.3.3 LARGE LOOP ANTENNA SETUP DIAGRAM



3.3.4 OPERATING CONDITIONS OF THE EUT

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

1. Setup the EUT and simulators as shown on 3.3.
2. Turn on the power of all equipments.
3. Start test.

3.3.5 MAGNETIC EMISSION DATA

The quasi-peak limits of the magnetic component of the radiated electromagnetic disturbance field strength in the frequency range **9kHz to 30MHz** measured as a current in 2m, loop antennas around the lighting equipment.

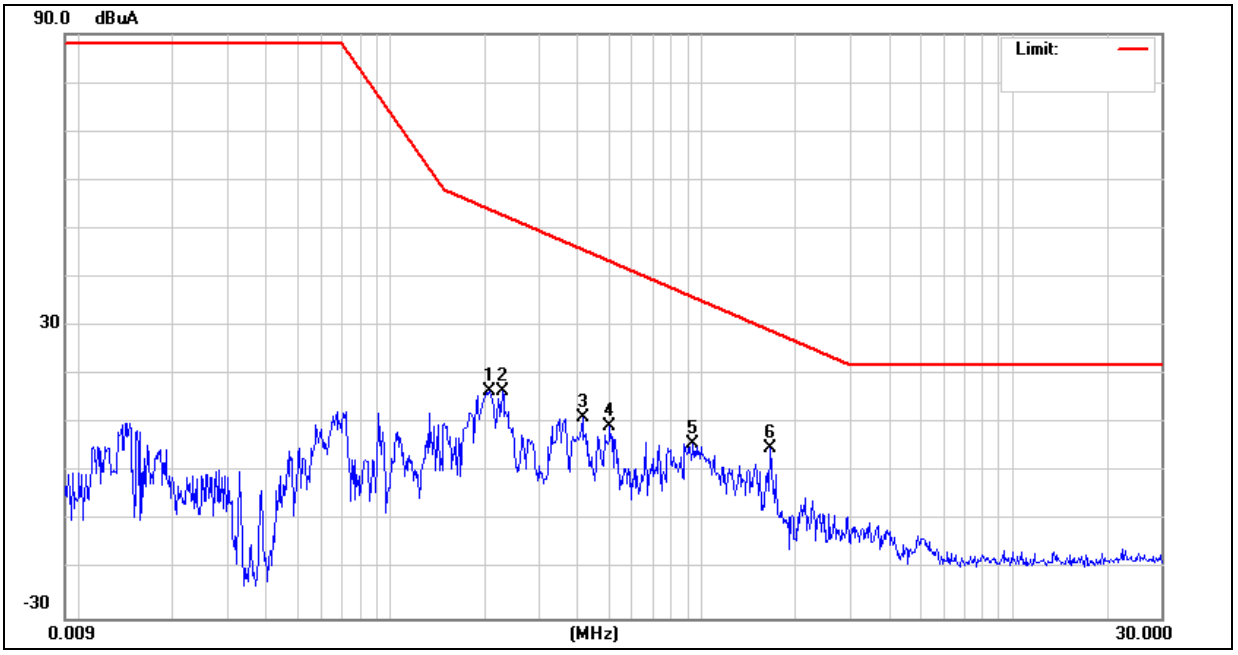
The measurement range of radiated emission, which is from **9kHz to 30MHz,** was investigated. All readings are quasi-peak values with a proper resolution Bandwidth. The initial step in collecting radiated emission data is a spectrum analyzer peak scans of the measurement range for all the test modes and then use test receiver for final measurement. Then the worst modes were reported the following data pages.

3.3.6 TEST RESULTS

EUT：	LED High Bay	**Model No.:**	H500
Temperature：	23℃	**Relative Humidity：**	52%
Pressure：	1008 hPa	**Test Power ：**	AC 230V/50Hz
Test Mode ：	Normal Operation		

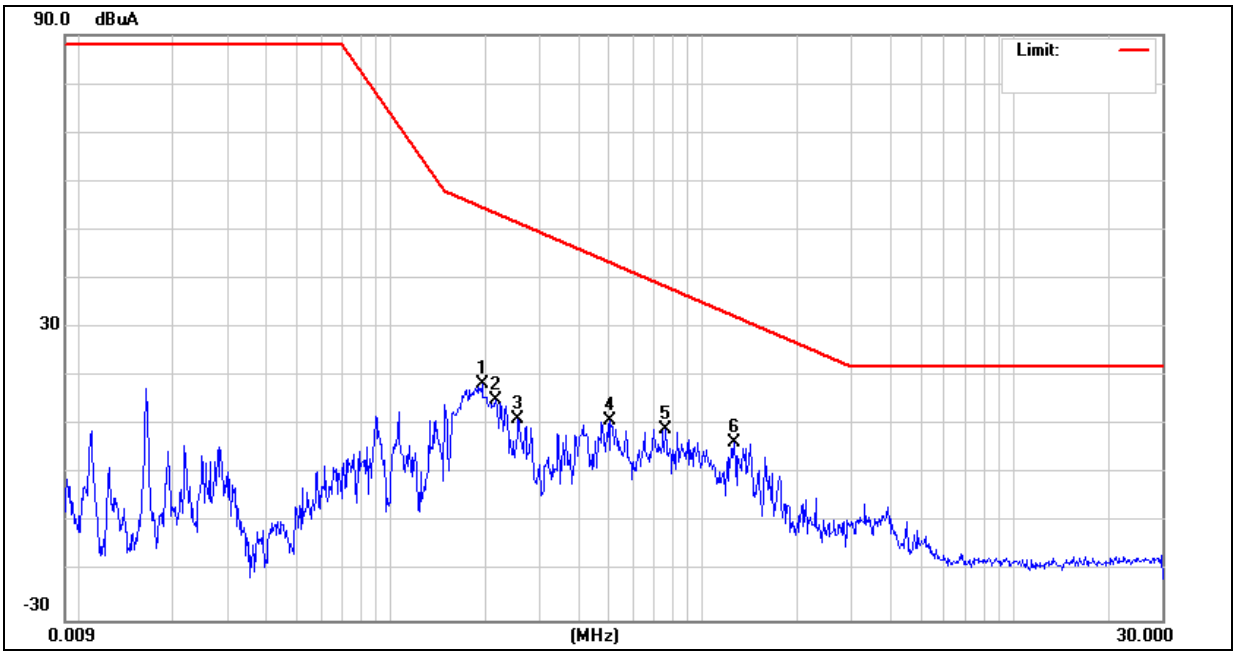
Remarks :

1. Measurement = Reading + Factor
2. Over Limit (Margin Value)=Measurement level-Limit value.



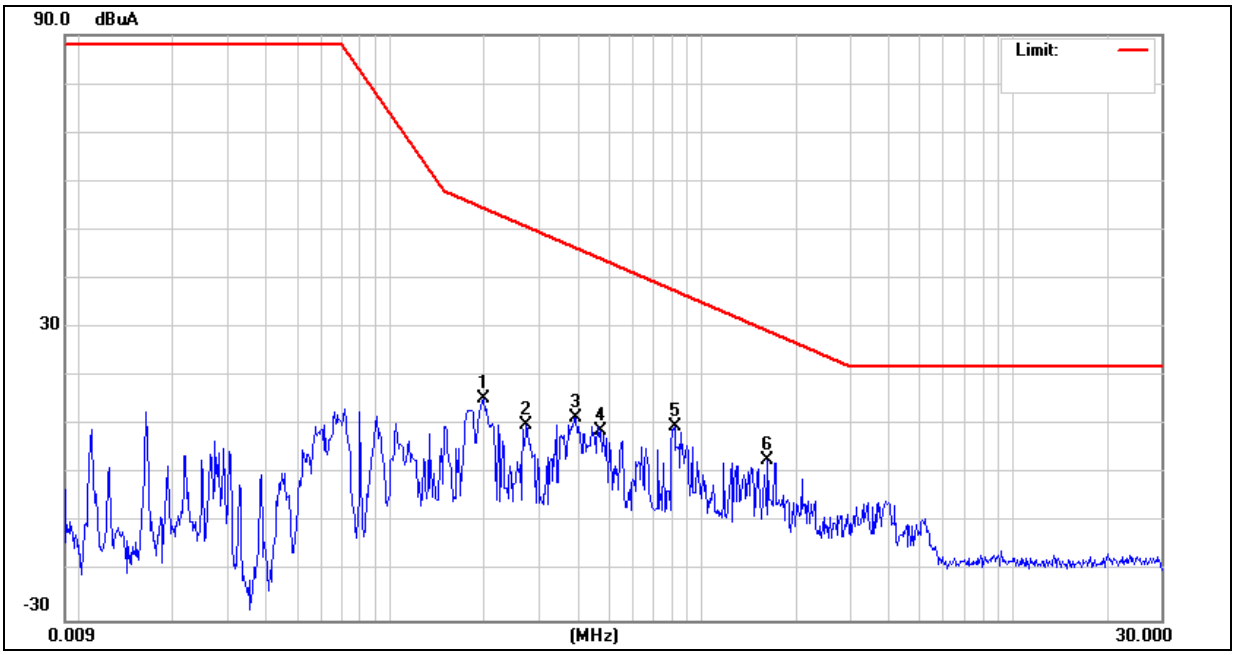
Site:	**843**	**Phase:X**	**Temperature(C):23(C)**
Limit:	**EN 55015 TRIPLE LOOP**		**Humidity(%):52%**
EUT:	**LED High Bay**	**Test Time:**	**2020-01-17**
M/N.:	**H500**	**Power Rating:**	**AC 230V/50Hz**
Mode:	**Normal Operation**	**Test Engineer:**	**Jack**
Note:			

No.	Frequency (MHz)	Reading Level(dBuA)	Factor (dB)	Measure-ment(dBuA)	Limit (dBuA)	Over (dB)	Detector	Comment
1	0.2076	6.26	10.47	16.73	54.09	-37.36	peak	
2	0.2300	6.34	10.46	16.80	52.86	-36.06	peak	
3	0.4138	0.99	10.41	11.40	45.80	-34.40	peak	
4	0.5100	-1.08	10.39	9.31	43.29	-33.98	peak	
5	0.9418	-4.56	10.47	5.91	35.92	-30.01	peak	
6 *	1.6618	-5.54	10.41	4.87	29.10	-24.23	peak	



Site:	**843**	**Phase:Y**	**Temperature(C):23(C)**
Limit:	**EN 55015 TRIPLE LOOP**		**Humidity(%):52%**
EUT:	**LED High Bay**	**Test Time:**	**2020-01-17**
M/N.:	**H500**	**Power Rating:**	**AC 230V/50Hz**
Mode:	**Normal Operation**	**Test Engineer:**	**Jack**
Note:			

No.	Frequency (MHz)	Reading Level(dBuA)	Factor (dB)	Measure-ment(dBuA)	Limit (dBuA)	Over (dB)	Detector	Comment
1	0.1963	7.85	10.47	18.32	54.76	-36.44	peak	
2	0.2179	4.81	10.47	15.28	53.51	-38.23	peak	
3	0.2580	0.73	10.46	11.19	51.48	-40.29	peak	
4	0.5100	0.66	10.39	11.05	43.29	-32.24	peak	
5	0.7620	-1.27	10.44	9.17	38.46	-29.29	peak	
6 *	1.2780	-3.99	10.45	6.46	32.25	-25.79	peak	



Site:	**843**	**Phase:Z**	**Temperature(C):23(C)**
Limit:	**EN 55015 TRIPLE LOOP**		**Humidity(%):52%**
EUT:	**LED High Bay**	**Test Time:**	**2020-01-17**
M/N.:	**H500**	**Power Rating:**	**AC 230V/50Hz**
Mode:	**Normal Operation**	**Test Engineer:**	**Jack**
Note:			

No.	Frequency (MHz)	Reading Level(dBuA)	Factor (dB)	Measure-ment(dBuA)	Limit (dBuA)	Over (dB)	Detector	Comment
1	0.1995	4.85	10.47	15.32	54.57	-39.25	peak	
2	0.2740	-0.51	10.45	9.94	50.75	-40.81	peak	
3	0.3941	1.10	10.42	11.52	46.39	-34.87	peak	
4	0.4737	-1.50	10.40	8.90	44.18	-35.28	peak	
5	0.8216	-0.74	10.45	9.71	37.56	-27.85	peak	
6 *	1.6376	-7.70	10.41	2.71	29.27	-26.56	peak	

3.4 HARMONICS CURRENT MEASUREMENT

3.4.1 LIMITS OF HARMONICS CURRENT MEASUREMENT

Table 1 – Limits for Class A equipment

Harmonic order n	Maximum permissible harmonic current A
Odd harmonics	
3	2,30
5	1,14
7	0,77
9	0,40
11	0,33
13	0,21
$15 \le n \le 39$	$0,15 \frac{15}{n}$
Even harmonics	
2	1,08
4	0,43
6	0,30
$8 \le n \le 40$	$0,23 \frac{8}{n}$

Table 2 – Limits for Class C equipment

Harmonic order n	Maximum permissible harmonic currrent expressed as a percentage of the input current at the fundamental frequency %
2	2
3	$30 \cdot \lambda$ *
5	10
7	7
9	5
$11 \le n \le 39$ (odd harmonics only)	3
* λ is the circuit power factor	

Table 3 – Limits for Class D equipment

Harmonic order n	Maximum permissible harmonic current per watt mA/W	Maximum permissible harmonic current A
3	3,4	2,30
5	1,9	1,14
7	1,0	0,77
9	0,5	0,40
11	0,35	0,33
$13 \le n \le 39$ (odd harmonics only)	$\frac{3,85}{n}$	See Table 1

3.4.2 MEASUREMENT INSTRUMENTS LIST

Item	Instr.Code	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	AN-E036	Harmonic and Fliker Analyzer	EMC PARTNER	Harmonics 1000-1P 230V	0241	2020-05-19

Remark: ” N/A” denotes No Model No. / Serial No. and No Calibration specified.

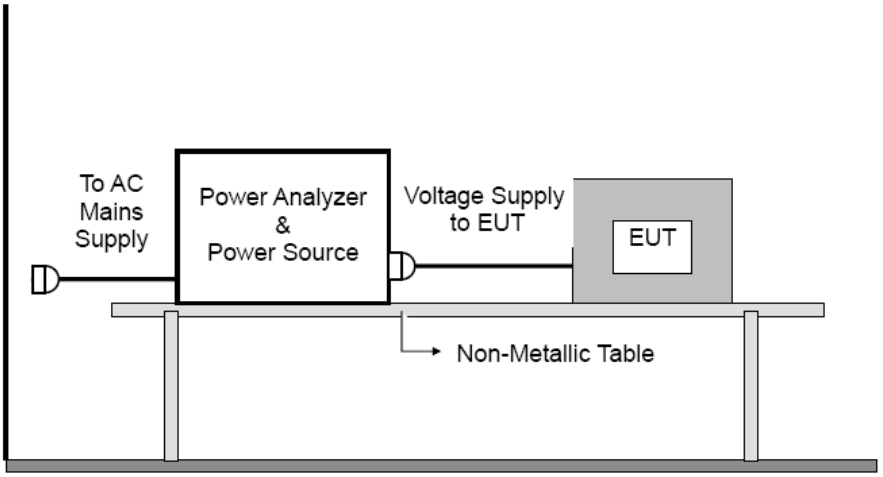
3.4.3 TEST PROCEDURE

a. Test was performed according to the procedures specified in Clause 5.0 of IEC555-2 and/or Sub-clause 6.2 of IEC/EN 61000-3-2 depend on which standard adopted for compliance measurement.
b. All types of harmonic current and/or voltage fluctuation in this report are assessed by direct measurement using flicker-meter.
c. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.4.4 DEVIATION FROM TEST STANDARD

No deviation

3.4.5 TEST SETUP



3.4.6 EUT OPERATING CONDITIONS

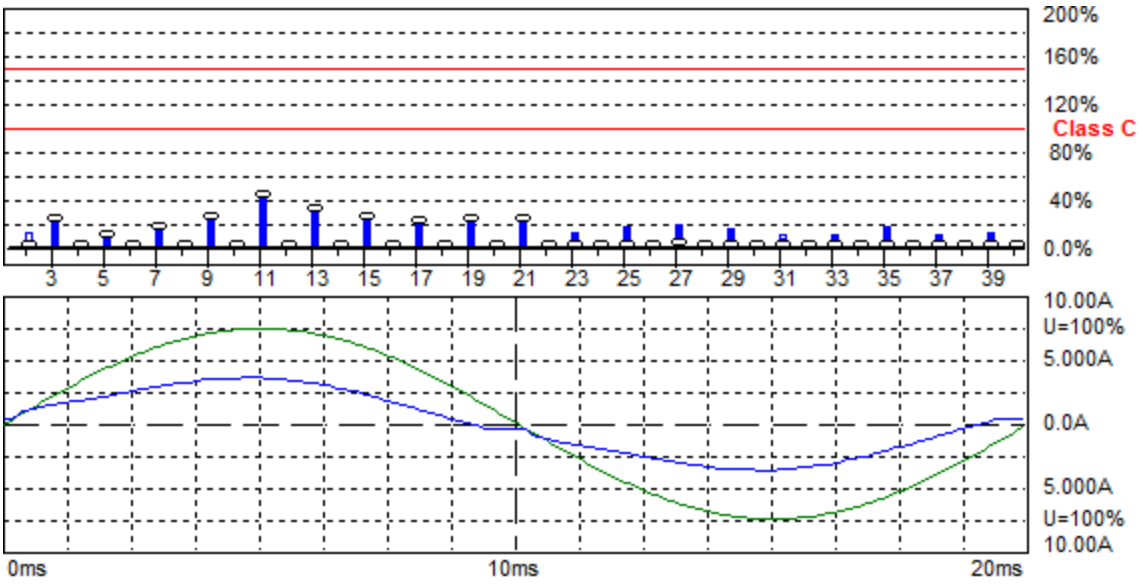
The EUT tested system was configured as the statements of 3.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

3.4.7 TEST RESUL

EUT：	LED High Bay	**Model No.:**	H500
Temperature：	23℃	**Relative Humidity：**	52%
Pressure：	1008 hPa	**Test Power ：**	AC 230V/50Hz
Observation Time	3 mins	**Test Mode**	Normal Operation

Remark: The test data see next page.

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



Harmonic Emission - IEC 61000-3-2 , EN 61000-3-2 , (EN60555-2) 2020/1/17 13:48:08

Urms =	230.1	V	P =	542.1	W	THC =	0.216	A	Range: 10 A
Irms =	2.407	A	pf =	0.979		H1max =	2.983	A	V-nom: 230 V
									TestTime: 3 min (100%)

Test completed, Result: PASSED

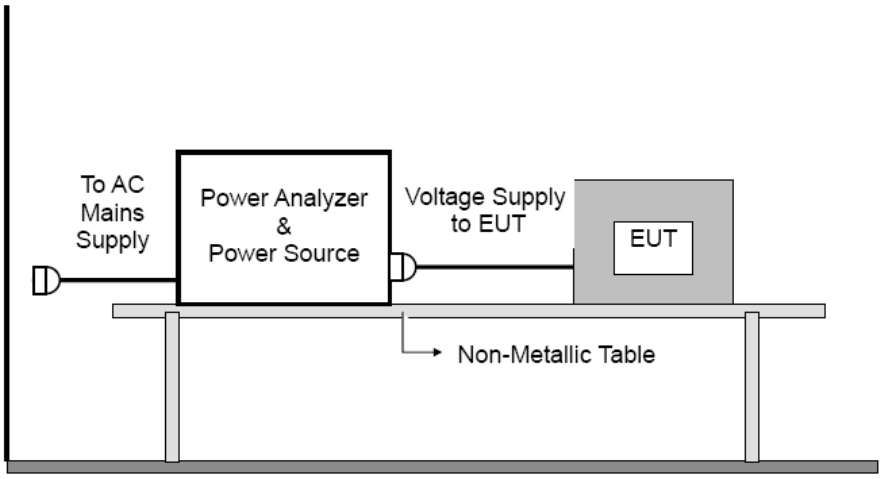
HAR-1000 EMC-Partner

```
Urms =  230.1V  Freq =  49.974  Range:  10 A
Irms =  2.407A  Ipk  =  3.628A  cf    =  1.507
P    =  542.1W  S    =  553.9VA pf    =  0.979
THDi =  9.04 %  THDu =  0.10 %  Class C

Test - Time :  3min    ( 100 %)

Limit Reference:       H1(max)= 2.9833A       pf(max)= 0.981

Test completed, Result: PASSED
```

Order	Freq. Limit [Hz] [A]	Iavg Limit% [A] [%]	Irms Status [A]	Irms% [%]	Irms%L [%]	Imax [A]	Imax% [%]	Imax%L [%]
1	50	2.3728	2.3950	99.493		2.6428	109.79	
2	100 0.0597	0.0000 2.4786	0.0024	0.1014	4.0918	0.0061	0.2535	10.230
3	150 0.8783	0.1888 36.486	0.1971	8.1897	22.446	0.2106	8.7475	23.975
4	200	0.0000	0.0006	0.0254		0.0012	0.0507	
5	250 0.2983	0.0268 12.393	0.0250	1.0396	8.3882	0.0305	1.2677	10.230
6	300	0.0000	0.0006	0.0254		0.0006	0.0254	
7	350 0.2088	0.0332 8.6751	0.0336	1.3945	16.075	0.0366	1.5213	17.536
8	400	0.0000	0.0006	0.0254		0.0006	0.0254	
9	450 0.1492	0.0351 6.1965	0.0360	1.4959	24.142	0.0385	1.5974	25.778
10	500	0.0000	0.0006	0.0254		0.0006	0.0254	
11	550 0.0895	0.0372 3.7179	0.0372	1.5467	41.600	0.0409	1.6988	45.692
12	600	0.0000	0.0006	0.0254		0.0006	0.0254	
13	650 0.0895	0.0275 3.7179	0.0275	1.1410	30.689	0.0305	1.2677	34.098
14	700	0.0000	0.0006	0.0254		0.0006	0.0254	
15	750 0.0895	0.0209 3.7179	0.0208	0.8621	23.187	0.0226	0.9381	25.233
16	800	0.0000	0.0006	0.0254		0.0006	0.0254	
17	850 0.0895	0.0181 3.7179	0.0189	0.7860	21.141	0.0195	0.8114	21.823
18	900	0.0000	0.0006	0.0254		0.0006	0.0254	
19	950 0.0895	0.0203 3.7179	0.0208	0.8621	23.187	0.0226	0.9381	25.233
20	1000	0.0000	0.0006	0.0254		0.0006	0.0254	

21	1050	0.0188	0.0183	0.7606	20.459	0.0214	0.8874	23.869
	0.0895	3.7179						
22	1100	0.0000	0.0006	0.0254		0.0006	0.0254	
23	1150	0.0000	0.0085	0.3550	9.5476	0.0092	0.3803	10.230
	0.0895	3.7179						
24	1200	0.0000	0.0006	0.0254		0.0006	0.0254	
25	1250	0.0000	0.0116	0.4817	12.957	0.0128	0.5325	14.321
	0.0895	3.7179						
26	1300	0.0000	0.0006	0.0254		0.0006	0.0254	
27	1350	0.0011	0.0140	0.5832	15.685	0.0153	0.6339	17.049
	0.0895	3.7179						
28	1400	0.0000	0.0006	0.0254		0.0006	0.0254	
29	1450	0.0000	0.0110	0.4564	12.275	0.0116	0.4817	12.957
	0.0895	3.7179						
30	1500	0.0000	0.0006	0.0254		0.0006	0.0254	
31	1550	0.0000	0.0049	0.2028	5.4558	0.0073	0.3043	8.1836
	0.0895	3.7179						
32	1600	0.0000	0.0006	0.0254		0.0006	0.0254	
33	1650	0.0000	0.0079	0.3296	8.8656	0.0079	0.3296	8.8656
	0.0895	3.7179						
34	1700	0.0000	0.0006	0.0254		0.0006	0.0254	
35	1750	0.0000	0.0116	0.4817	12.957	0.0128	0.5325	14.321
	0.0895	3.7179						
36	1800	0.0000	0.0006	0.0254		0.0006	0.0254	
37	1850	0.0000	0.0073	0.3043	8.1836	0.0079	0.3296	8.8656
	0.0895	3.7179						
38	1900	0.0000	0.0006	0.0254		0.0006	0.0254	
39	1950	0.0000	0.0085	0.3550	9.5476	0.0085	0.3550	9.5476
	0.0895	3.7179						
40	2000	0.0000	0.0006	0.0254		0.0006	0.0254	

3.5.5 TESTSETUP



3.5.6 EUT OPERATING CONDITIONS

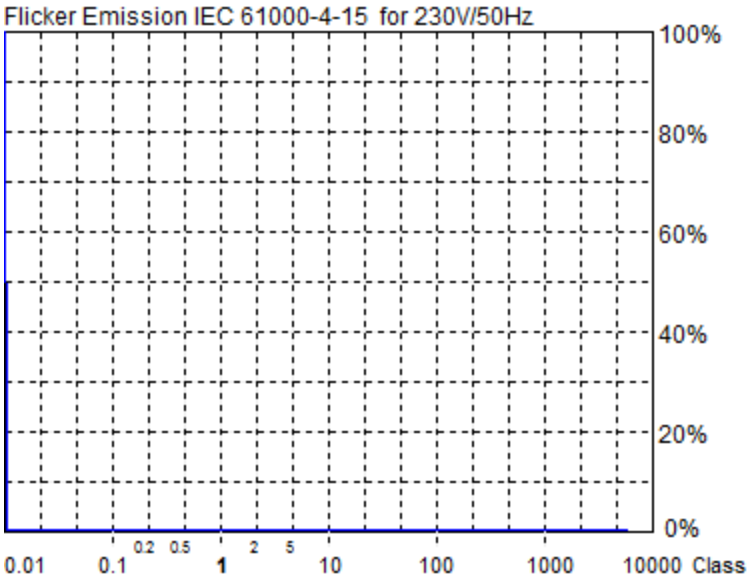
The EUT tested system was configured as the statements of 3**.1.6** Unless otherwise a special operating condition is specified in the follows during the testing.

3.5.7 TEST RESULTS

EUT：	LED High Bay	**Model No.:**	H500
Temperature：	23℃	**Relative Humidity：**	52%
Pressure：	1008 hPa	**Test Power ：**	AC 230V/50Hz
Observation Time	10 mins	**Test Mode**	Normal Operation

Remark: The test data see next page.

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



Actual Flicker (Fli):	**0.00**
Short-term Flicker (Pst):	**0.07**
Limit (Pst):	1.00
Long-term Flicker (Plt):	**0.07**
Limit (Plt):	0.65
Maximum Relative Volt. Change (dmax):	**0.00%**
Limit (dmax):	4.00%
Relative Steady-state Voltage Change (dc):	**0.01%**
Limit (dc):	3.00%
Tmax 3.00% (dt):	**0.00ms**
Limit (dt>Lim):	200ms

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

2020/1/17 14:00:35

Urms =	229.3	V	P =	532.1	W
Irms =	2.368	A	pf =	0.980	

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

Test completed, Result: PASSED

HAR-1000 EMC-Partner

```
Urms =  229.3V  Freq =  49.974  Range:  10 A
Irms =  2.368A  Ipk  =  3.555A  cf    =  1.501
P    =  532.1W  S    =  543.1VA pf    =  0.980

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

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

Limits :        P1t  :  0.65    Pst   : 1.00
                dmax :  4.00 %  dc    : 3.00 %
                dtLim:  3.00 %  dt>Lim: 200ms

Test completed, Result: PASSED
```

4. EMC IMMUNITY TEST

4.1 STANDARD COMPLIANCE/SERVRITY LEVEL/CRITERIA

Tests Standard No.	Test Specification	Test Mode Test Ports	Perform. Criteria	Remark
1. ESD IEC/EN 61000-4-2	8KV air discharge 4KV contact discharge	Direct Mode	B	PASS
	4KV HCP discharge 4KV VCP discharge	Indirect Mode	B	PASS
2. RS IEC/EN 61000-4-3	80 MHz to 1000 MHz 3V/m(rms), 1 KHz, 80%, AM modulated	Enclosure	A	PASS
3. EFT/Burst IEC/EN 61000-4-4	1.0KV(peak) 5/50ns Tr/Th 5KHz Repetition Freq.	Switching LED string light Port	B	PASS
	0.5 KV(peak) 5/50ns Tr/Th 5KHz Repetition Freq.	CTL/Signal Data Line Port	B	N/A
4. Surges IEC/EN 61000-4-5	For Self-ballast lamp and semi-luminaries: L-N: 0.5 KV L-PE, N-PE: 1 KV For luminaries and independent auxiliary: ≦25W: L-N: 0.5 KV L-PE, N-PE: 1 KV 〉25W: L-N: 1KV L-PE, N-PE: 2 KV 1.2/50(8/20) Tr/Th us	L-N,L-PE,N-PE	C	PASS
5 Injected Current IEC/EN 61000-4-6	0.15 MHz to 80 MHz 3V(rms), 1KHz 80%, AM Modulated 150Ω source impedance	AC Power Port DC Power Port CTL/Signal Port	A	PASS
6. Power Frequency Magnetic Field IEC/EN 61000-4-8	50 Hz, 3A/m	Enclosure	A	PASS
7. Volt. Interruptions Volt. Dips IEC/EN 61000-4-11	Voltage dip 30% Interruption 100%	70% / 0%	B / C	PASS

* Remark:

(1) “N/A”: denotes test is not applicable in this Test Report.

(2) Voltage dip: 30% reduction – Performance Criteria **C**

Voltage Interruption: 100% reduction – Performance Criteria **C**

4.2 GENERAL PERFORMANCE CRITERIA

According to **EN61547:2009** standard, the general performance criteria as following:

Criterion A	During the test no change of the luminous intensity shall be observed and the regulating control, if any shall operate during the test as intended.
Criterion B	During the test the luminous intensity may change to any value. After the test the luminous intensity shall be restored to its initial value within 1 min. Regulating controls need not function during the test, but after the test the mode of the control shall be the same as before the test provided that during the test no mode changing commands were given.
Criterion C	During and after the test any change of the luminous intensity is allowed and the lamps(s) ma be extinguished. After the test, within 30 min, all function shall return to normal if necessary by temporary interruption of the mains supply and/or operating the regulating control. Additional requirement for lighting equipment incorporating a starting device.: After the test the lighting equipment is switched off. After half an hour it is switched on again. The lighting equipment shall start and operate as intended.

4.3 GENERAL PERFORMANCE CRITERIA TEST SETUP

The EUT tested system was configured as the statements of **3.1.6** Unless otherwise a special operating condition is specified in the follows during the testing.

4.4 ESD TESTING

4.4.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Required Performance	B
Discharge Voltage:	Air Discharge：2kV/4kV/8kV (Direct) Contact Discharge：2kV/4kV (Direct/Indirect)
Polarity:	Positive & Negative
Number of Discharge:	Air Discharge: min. 10 times at each test point Contact Discharge: min. 200 times in total
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

4.4.2 MEASUREMENT INSTRUMENTS

Item	Instr.Code	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	AN-E002	ESD Simulator	Prima	ESD61002B	PR13012530	2020-05-19

Remark: ” N/A” denotes No Model No. / Serial No. and No Calibration specified.

4.4.3 TEST PROCEDURE

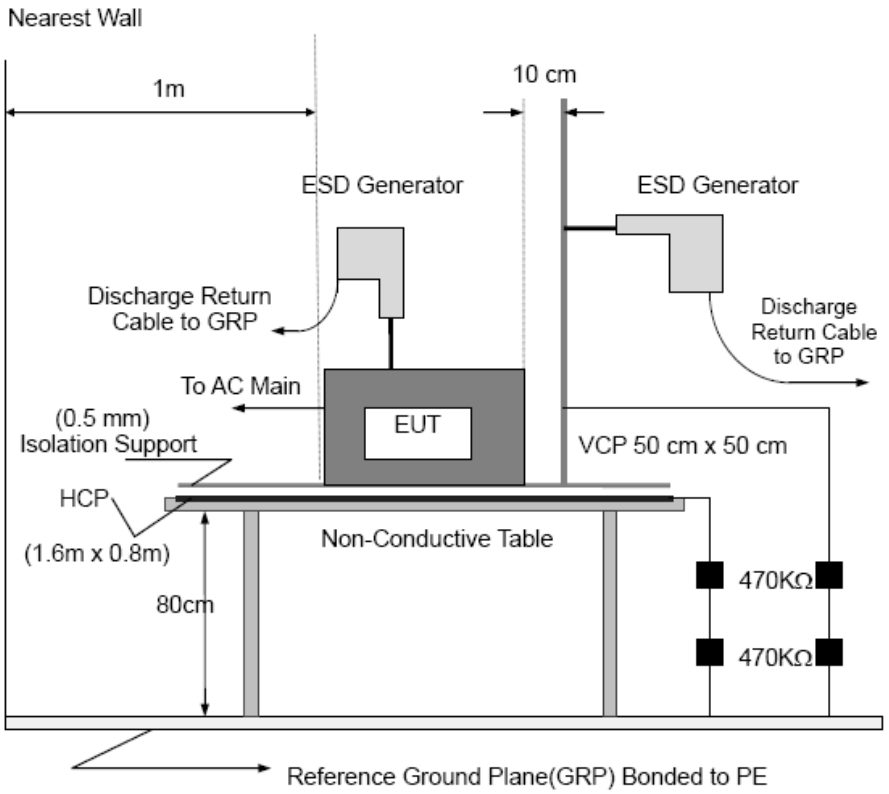
The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

a. Contact discharge was applied to conductive surfaces and coupling planes of the EUT.
   During the test, it was performed with single discharges. For the single discharge time between successive single discharges was at least 1 second. The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points. One of the test points shall be subjected to at least 50 indirect discharges to the center of the front edge of the horizontal coupling plane. The remaining three test points shall each receive at least 50 direct contact discharges.
   If no direct contact test points are available, then at least 200 indirect discharges shall be applied in the indirect mode. Test shall be performed at a maximum repetition rate of one discharge per second.
   Vertical Coupling Plane (VCP):
   The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the Discharge Electrode touching the coupling plane.
   The four faces of the EUT will be performed with electrostatic discharge.
   Horizontal Coupling Plane (HCP):
   The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane.
   The four faces of the EUT will be performed with electrostatic discharge.
b. Air discharges at insulation surfaces of the EUT.
   It was at least ten single discharges with positive and negative at the same selected point.
c. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meters high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940k total impedance. The equipment under test, was installed in a representative system as described in section 7 of IEC /EN 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

FLOOR-STANDING EQUIPMENT

The equipment under test was installed in a representative system as described in section 7 of IEC/EN 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of0.1-meter thickness. The GRP consisted of a sheet of aluminum that is at least 0.25mm thick, and 2.5meters square connected to the protective grounding system and extended at least 0.5 meters from the EUT on all sides.

4.4.6 TEST RESULTS

Mode	Air Discharge								Contact Discharge							
	2KV		4KV		8KV		12KV		2KV		4KV		6KV		8KV	
Location	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N
1	--	--	A	A	B	B	--	--	--	--	--	--	--	--	--	--
2	--	--	--	--	--	--	--	--	A	A	B	B	--	--	--	--
3	-	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
5	--	--	--	--	--	--			--	--	--	--	--	--	--	--
6	-	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
8	--	--	--	--	-	--	--	--	--	--	--	--	--	--	--	--
9	-	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Criteria	**B**								**B**							
Result	**B**								**B**							
Judgment	**PASS**								**PASS**							

Mode	HCP Discharge								VCP Discharge							
	2KV		4KV		6KV		8KV		2KV		4KV		6KV		8KV	
Location	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N
1	-	--	A	A	--	--	--	--	-	--	A	A	--	--	--	--
2	--	--	A	A	--	--	--	--	--	--	A	A	--	--	--	--
3	--	--	A	A	-	--	--	--	--	--	A	A	-	--	--	--
4	-	--	A	A	--	--	--	--	--	--	A	A	--	--	--	--
Criteria	**B**								**B**							
Result	**A**								**A**							
Judgment	**PASS**								**PASS**							

Note:

1) P/N denotes the Positive/Negative polarity of the output voltage.
2) Test condition:
   Direct discharges: Minimum 20 times (Positive/Negative) at each point. Air discharges / Indirect (HCP/VCP): Minimum 20 times (Positive/Negative) at each point.
3) Test location(s) in which discharge (Air and contact discharge) to be described as following
4) The Indirect (HCP/VCP) discharges description of test point as following:
   1.left side 2.right side 3.front side 4.rear side
5) N/A - denotes test is not applicable in this test report

Test Point:

No	Description	No	Description	No	Description
1	Output 7Points	4			
2	Non-metal 5 Points	5			
3		6			

4.5 RS TESTING

4.5.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-3
Required Performance	A
Frequency Range:	80 MHz - 1000 MHz
Field Strength:	3 V/m
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Polarity of Antenna:	Horizontal and Vertical
Test Distance:	3 m
Antenna Height:	1.5 m
Dwell Time:	at least 3 seconds

4.5.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Signal Generator	Aglilet	N517113-50B	MY53050160	2020-10-17
2	Amplifier	A&R	150W1000M3	313157	2020-10-17
3	Amplifier	A&R	50SIG6M2	0342835	2020-10-17
4	Log-periodic Antenna	SCHWARZBECK	STLP 9128E	9128E-012	2020-01-19
5	Microwave log-periodic antenna	SCHWARZBECK	STLP 9149	9149.222	2020-10-17
6	Isotropic Field Probe	A&R	FL700	0342652	2020-10-17
7	10 meter anechoic chamber	Albatross	10m	/	2020-06-26

Remark: ” N/A” denotes No Model No. / Serial No. and No Calibration specified.

4.5.3 TEST PROCEDURE

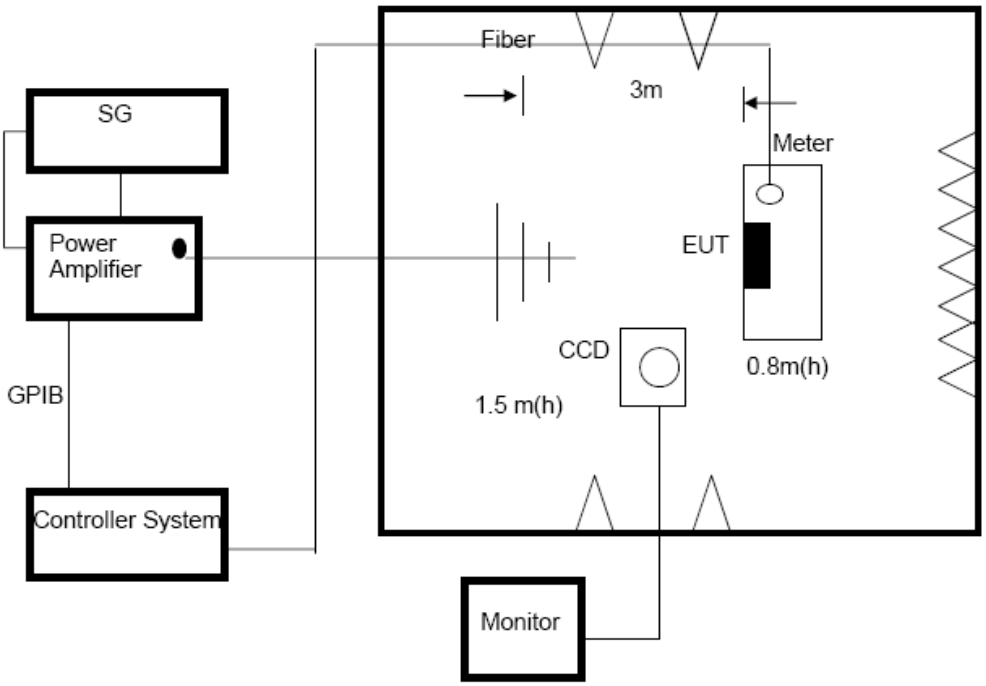
The EUT and support equipment, which are placed on a table that is 0.8 meter above ground and the testing was performed in a fully-anechoic chamber.
The testing distance from antenna to the EUT was 3 meters.
The other condition as following manner:

a. The field strength level was 3V/m.
b. The frequency range is swept from 80 MHz to 1000 MHz, with the signal 80%amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed 1.5x 10-3 decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
c. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
d. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

4.5.6 TEST RESULTS

Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Azimuth	Perform. Criteria	Results	Judgment
80MHz - 1000MHz	H / V	3 V/m (rms) AM Modulated 1000Hz, 80%	0	A	A	PASS
			90			
			180			
			270			

Note:

1) P/N denotes the Positive/Negative polarity of the output voltage.
2) N/A - denotes test is not applicable in this test report.
3) Criteria A: There was no change operated with initial operating during the test.
4) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
5) Criteria C: The system shut down during the test.

4.6 EFT/BURST TESTING

4.6.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-4
Required Performance	B
Test Voltage:	Power Line：1 kV Signal/Control Line：0.5 KV
Polarity:	Positive & Negative
Impulse Frequency:	5 kHz
Impulse Wave shape :	5/50 ns
Burst Duration:	15 ms
Burst Period:	300 ms
Test Duration:	Not less than 2 min.

4.6.2 MEASUREMENT INSTRUMENTS

Item	Instr.Code	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	AN-E032	Electrical Intelligent Transient Generator	Everfine	EMS61000-4B	G114921CA1341115	2020-05-19

Remark: ” N/A” denotes No Model No. / Serial No. and No Calibration specified.

4.6.3 TEST PROCEDURE

The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m min. and 0.65mm thick min.
The other condition as following manner:

a. The length of power cord between the coupling device and the EUT should not exceed 1 meter.

b. Both positive and negative polarity discharges were applied.

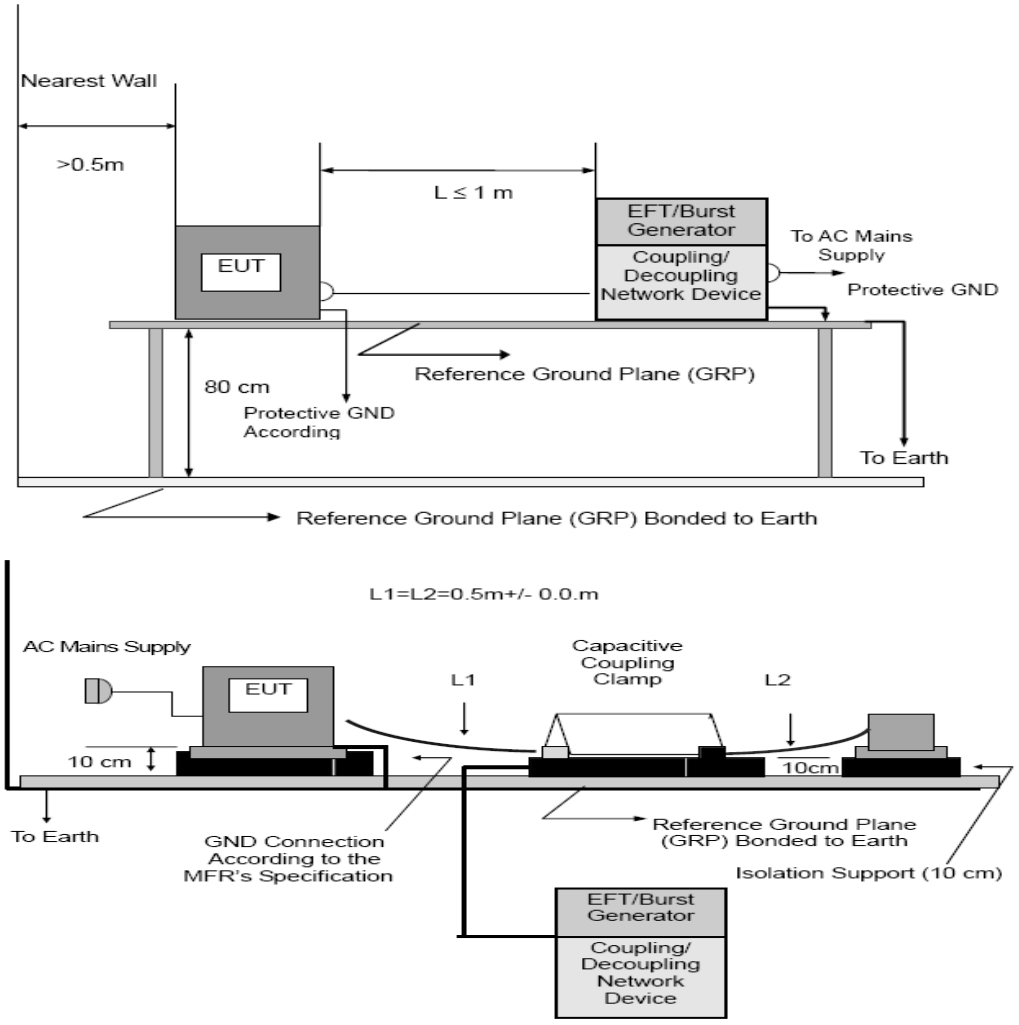
c. The duration time of each test sequential was 1 minute

d. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table (0.8m high) standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system. A minimum distance of 0.5m was provided between the EUT and the walls of the laboratory or any other metallic structure.

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-4 and its cables, were isolated from the Ground Reference Plane by an insulating support that is 0.1-meter thick. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system.

4.6.6 TEST RESULTS

Mode	(**X**) AC Power Line		( ) DC Power Line		( ) Signal/Control Line	
Test Level	1KV		0.5KV		0.5KV	
Port(s)	Polarity	Results	Polarity	Results	Polarity	Results
Line (L)	P	A	P		P	
	N	A	N		N	
Neutral (N)	P	A	P		P	
	N	A	N		N	
Ground (PE)	P	A	P		P	
	N	A	N		N	
Signal/Control Line	P		P		P	
	N		N		N	
Criteria	**B**		**B**		**B**	
Result	**A**		**--**		**--**	
Judgment	**PASS**		**N/A**		**N/A**	

Note:

1) P/N denotes the Positive/Negative polarity of the output voltage.
2) N/A - denotes test is not applicable in this test report
3) Criteria A: There was no change operated with initial operating during the test.
4) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
5) Criteria C: The system shut down during the test.

4.7 SURGE TESTING

4.7.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-5
Required Performance	C
Wave-Shape:	Combination Wave 1.2/50 us Open Circuit Voltage 8 /20 us Short Circuit Current
Test Voltage:	Power Line：±0.5KV,±1 KV, ±2KV, ±4KV,
Surge Input/Output:	L-N, L-PE, N-PE
Generator Source:	2 ohm between networks
Impedance:	12 ohm between network and ground
Polarity:	Positive/Negative
Phase Angle:	90/270
Pulse Repetition Rate:	1 time / min. (maximum)
Number of Tests:	5 positive at 90 and 5 negative at 270

4.7.2 MEASUREMENT INSTRUMENTS

Item	Instr.Code	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	AN-E001	Lightning surge generator	Prima	SUG61005CX	PR13065597	2020-05-19

Remark: ” N/A” denotes No Model No. / Serial No. and No Calibration specified.

4.7.3 TEST PROCEDURE

a. For test applied to unshielded unsymmetrically operated interconnection lines of EUT:
The surge is applied to the lines via the capacitive coupling. The coupling /decoupling networks shall not influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

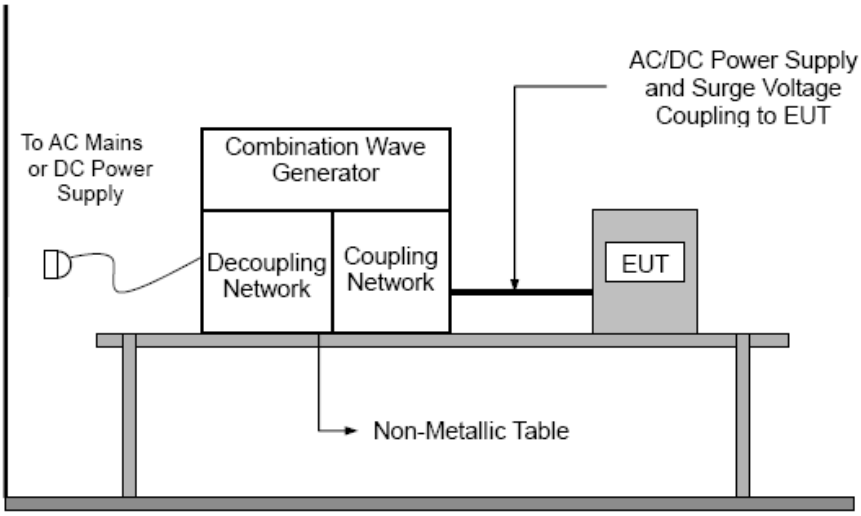
b. For test applied to unshielded symmetrically operated interconnection /telecommunication lines of EUT:
The surge is applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestor cannot be specified. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

c. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.7.4 DEVIATION FROM TEST STANDARD

No deviation

4.7.5 TEST SETUP



4.7.6 TEST RESULTS

Wave Form / EUT Ports Tested	1.2/50(8/20)Ti/Th us						Criteria	Judgment
	Polarity	Phase	Voltage					
			0.5kV	1kV	2kV	4kV		
L - N	+/-	0°					B	PASS
	+	90°		B				
	+/-	180°						
	-	270°		B				
L - PE	+/-	0°					B	PASS
	+	90°			B			
	+/-	180°						
	-	270°			B			
N - PE	+/-	0°					B	PASS
	+	90°			B			
	+/-	180°						
	-	270°			B			
Signal Line (N/A)	+/-	0°					N/A	N/A
	+/-	90°						
	+/-	180°						
	+/-	270°						
Signal Line (N/A)	+/-	0°					N/A	N/A
	+/-	90°						
	+/-	180°						
	+/-	270°						

Note:

1) P/N denotes the Positive/Negative polarity of the output voltage.
2) Polarity and Numbers of Impulses：5 Pst / Ngt at each tested mode
3) N/A - denotes test is not applicable in this Test Report
4) All voltages of the lower levels shall be satisfied

4.8 INJECTION CURRENT TESTING

4.8.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-6
Required Performance	A
Frequency Range:	0.15 MHz - 80 MHz
Field Strength:	3 Vr.m.s.
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Dwell Time:	at least 3 seconds

4.8.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	CONDUCTED IMMUNITY TEST SYSTEM	FRANKONIA	CIT-10	102D1253	2020-10-17
2	CDN	FRANKONIA	CDN M2+M3	A3011059	2020-10-17
3	Electromagnetic clamp	FRANKONIA	KEMZ-801	21044	2020-10-17

Remark: ” N/A” denotes No Model No. / Serial No. and No Calibration specified.

4.8.3 TEST PROCEDURE

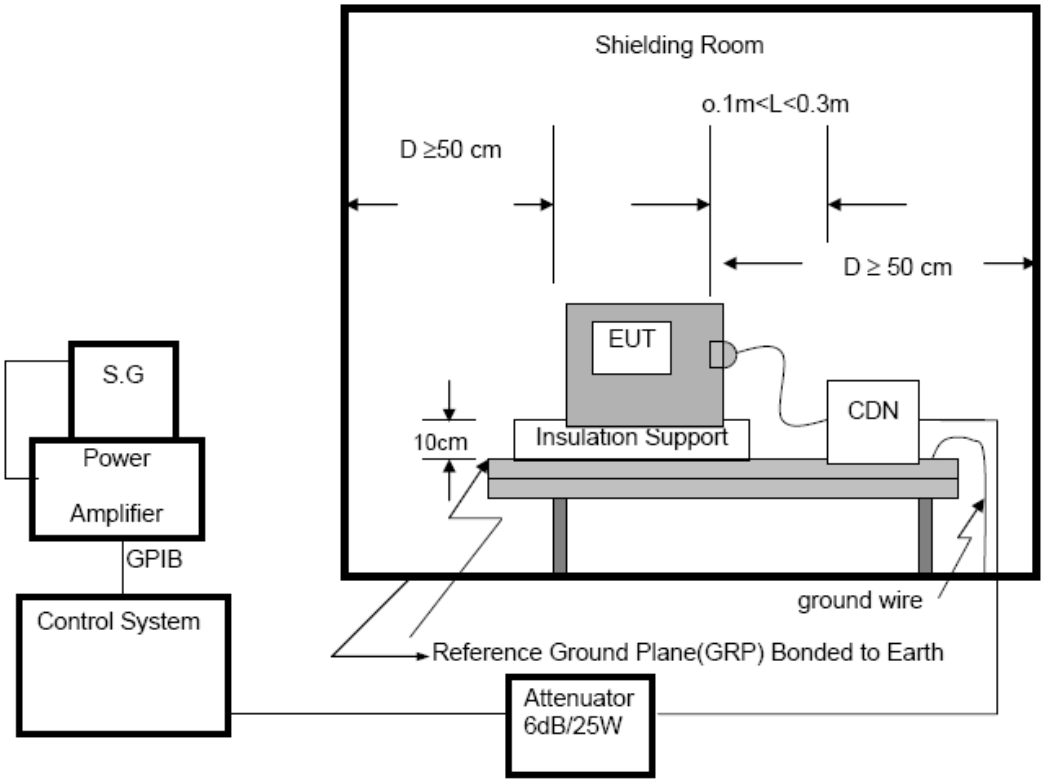
The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m min. and 0.65mm thick min.
The other condition as following manner:

a. The field strength level was 3V.
b. The frequency range is swept from 150 KHz to 80 MHz, with the signal 80%amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed 1.5x 10-3 decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
c. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
d. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.8.4 DEVIATION FROM TEST STANDARD

No deviation

4.8.5 TEST SETUP



For the actual test configuration, please refer to the related Item –EUT Test Photos.

NOTE:

FLOOR-STANDING EQUIPMENT

The equipment to be tested is placed on an insulating support of 0.1 meters height above a ground reference plane. All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0.1 meters and 0.3 meters from the projected geometry of the EUT on the ground reference plane.

4.8.6 TEST RESULTS

Test Ports (Mode)	Freq. Range MHz)	Field Strength	Perform. Criteria	Results	Judgment
Input/ Output AC. Power Port	0.15 ---80	3V(rms) AM Modulated 1000Hz, 80%	**A**	**A**	**PASS**
Input/ Output DC. Power Port	0.15 --- 80		**A**	**--**	**N/A**
Signal Line (N/A)	0.15 --- 80		**A**	**--**	**N/A**
Signal Line (N/A)	0.15 --- 80		**A**	**--**	**N/A**

Note:

1) P/N denotes the Positive/Negative polarity of the output voltage.
2) N/A - denotes test is not applicable in this Test Report.

4.9 VOLTAGE INTERRUPTION/DIPS TESTING

4.9.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-11
Required Performance**:**	C (For 30% Voltage Dips) B (For 100% Voltage Interruptions)
Test Duration Time:	Minimum three test events in sequence
Interval between Event:	Minimum ten seconds
Phase Angle:	0°-360°
Test Cycle:	3 times

4.9.2 MEASUREMENT INSTRUMENTS

Item	Instr.Code	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	AN-E031	Voltage Dips And Interruptions Generator	Everfine	EMS61000-11K	G113317CA8341117	2020-05-19

Remark: ” N/A” denotes No Model No. / Serial No. and No Calibration specified.

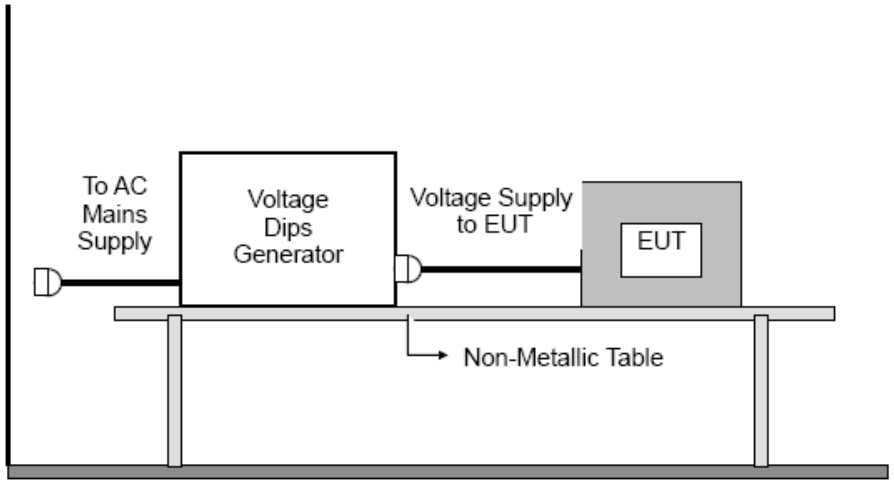
4.9.3 TEST PROCEDURE

The EUT shall be tested for each selected combination of test levels and duration with a sequence of three dips/interruptions with intervals of 10 s minimum (between each test event). Each representative mode of operation shall be tested. Abrupt changes in supply voltage shall occur at zero crossings of the voltage waveform.

4.9.4 DEVIATION FROM TEST STANDARD

No deviation

4.9.5 TEST SETUP



For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.9.6 TEST RESULTS

Voltage Reduction	Periods	Perform Criteria	Results	Judgment
Voltage dip 30%	10	**C**	**B**	**PASS**
Interruption100%	0.5	**B**	**B**	**PASS**

Note:

1) P/N denotes the Positive/Negative polarity of the output voltage.

2). N/A - denotes test is not applicable in this test report.

4.10 POWER-FREQUENCY MAGNETIC FILDS

4.10.1 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Magnetic Field Tester	EMC-PARTNER	MF1000-1	121	2020-10-17

Remark: ” N/A” denotes No Model No. / Serial No. and No Calibration specified.

4.10.2 TEST LEVEL AND PERFORMANCE CRITERION

Level	Magnetic Field Strength A/m	Performance criterion
2	3	A

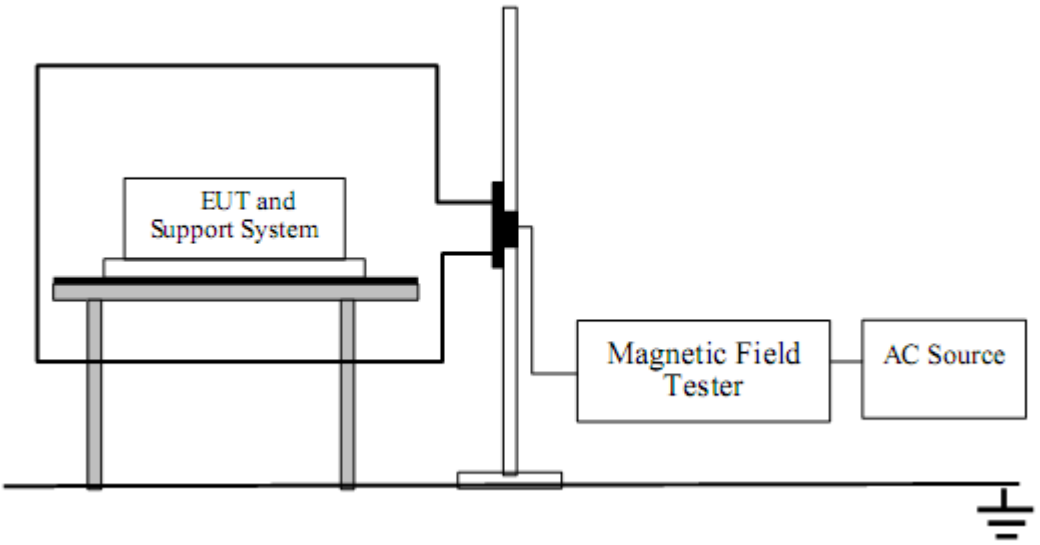
4.10.3 TEST PROCEDURE

The EUT shall be subjected to the test magnetic field by using the induction coil of standard dimensions (1m*1m) and shown in Section 13.3 The induction coil shall then be rotated by 90 ein order to expose the EUT to the test field with different orientations. .

4.10.4 DEVIATION FROM TEST STANDARD

No deviation

4.10.5 TEST SETUP



4.10.6 TEST RESULTS

Operation Mode	Test Level	Testing Duration	Coil Orientation	Required	Observation	Result (Pass/Fail)
Normal operation	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**

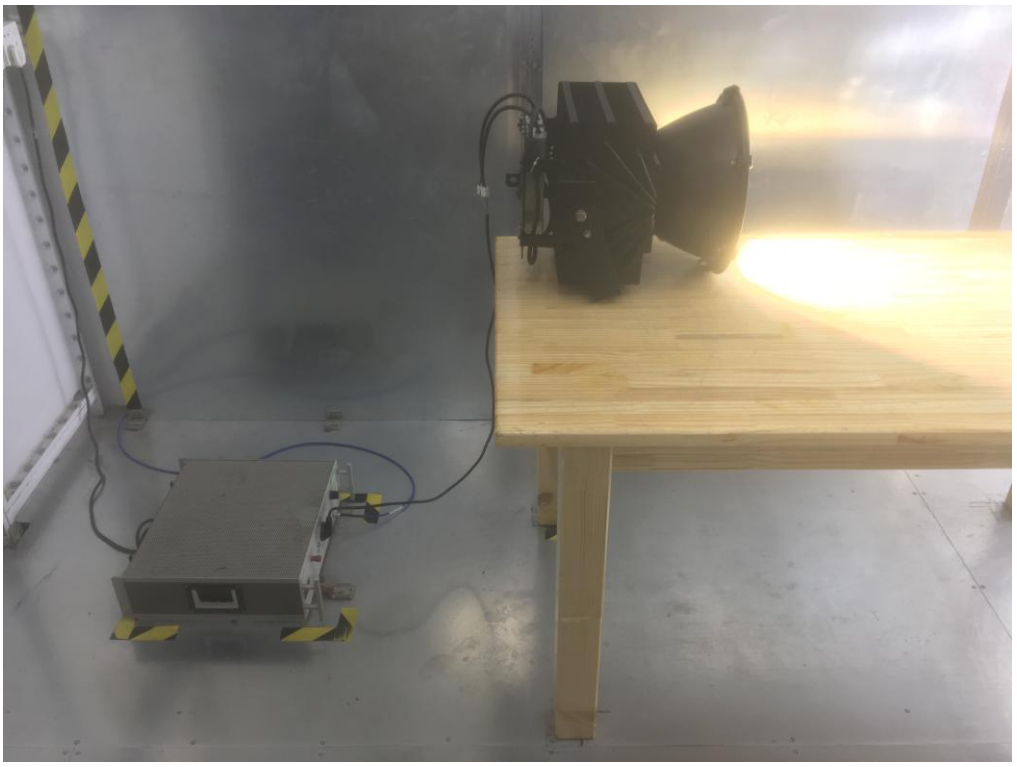
Note:

Operation as intend, no loss of function during test and after test

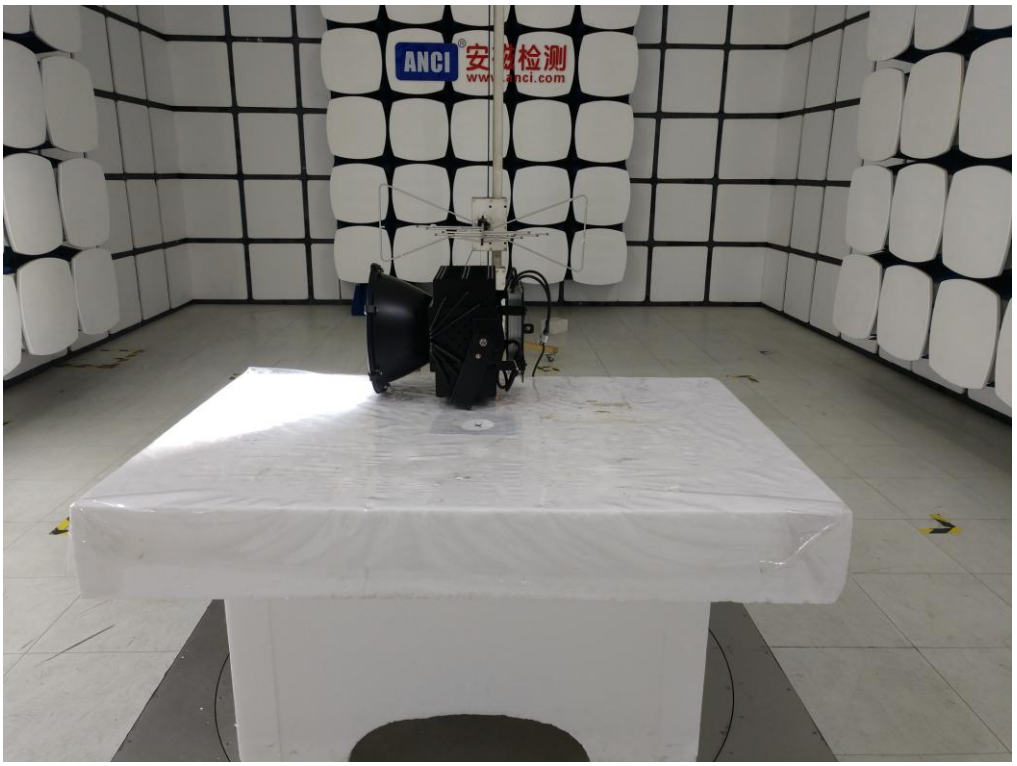
5. ATTACHMENT

5.1 EUT Test Photo

Conducted Measurement Photo



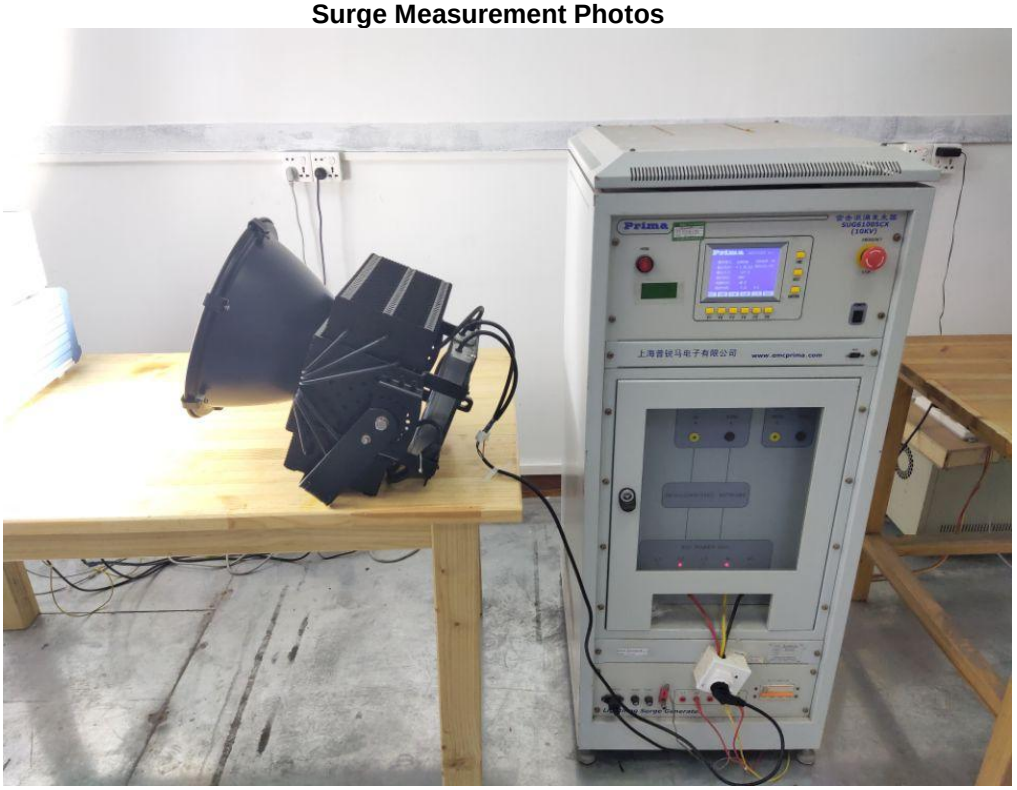
Radiated Measurement Photo



Magnetic Emission Test Photo

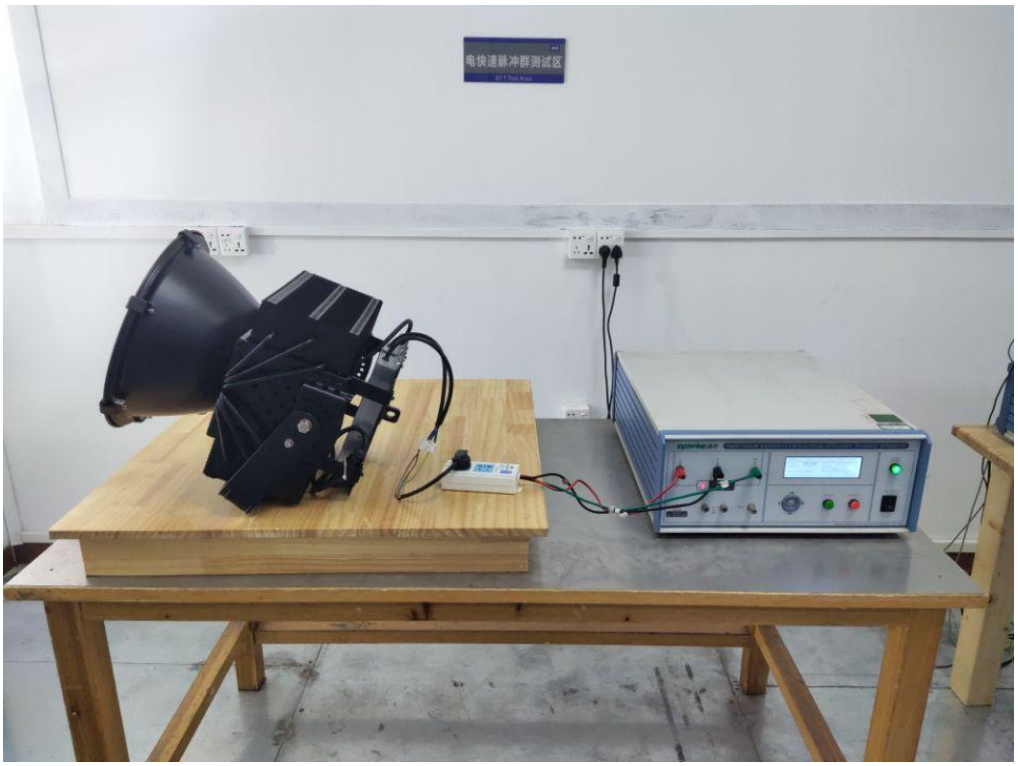
ESD Measurement Photos

Surge Measurement Photos

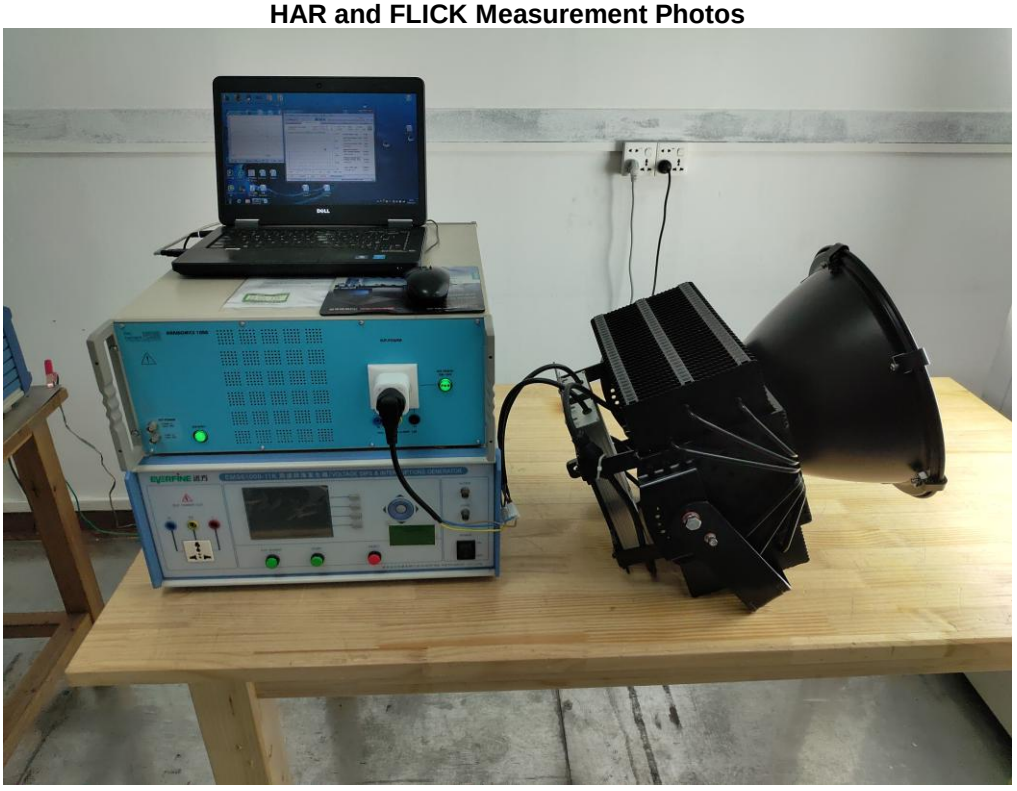


Dips Measurement Photos

EFT Measurement Photos



HAR and FLICK Measurement Photos



5.2 EUT Photo

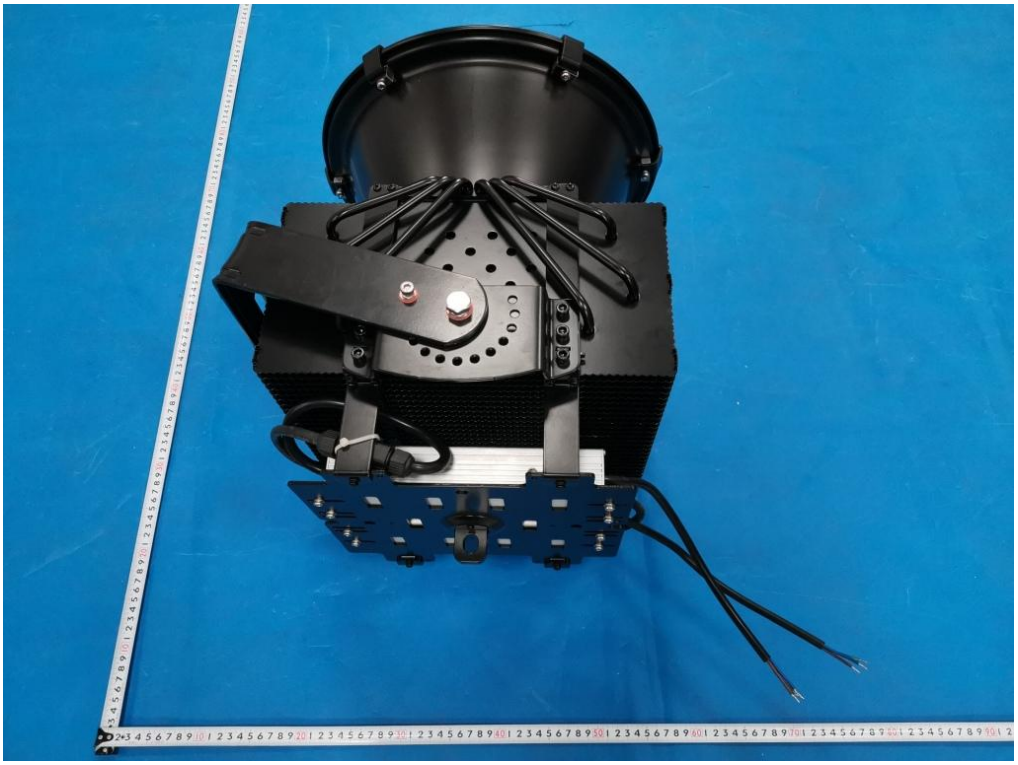


Figure 1.Overall view of unit

Figure 2. Overall view of unit

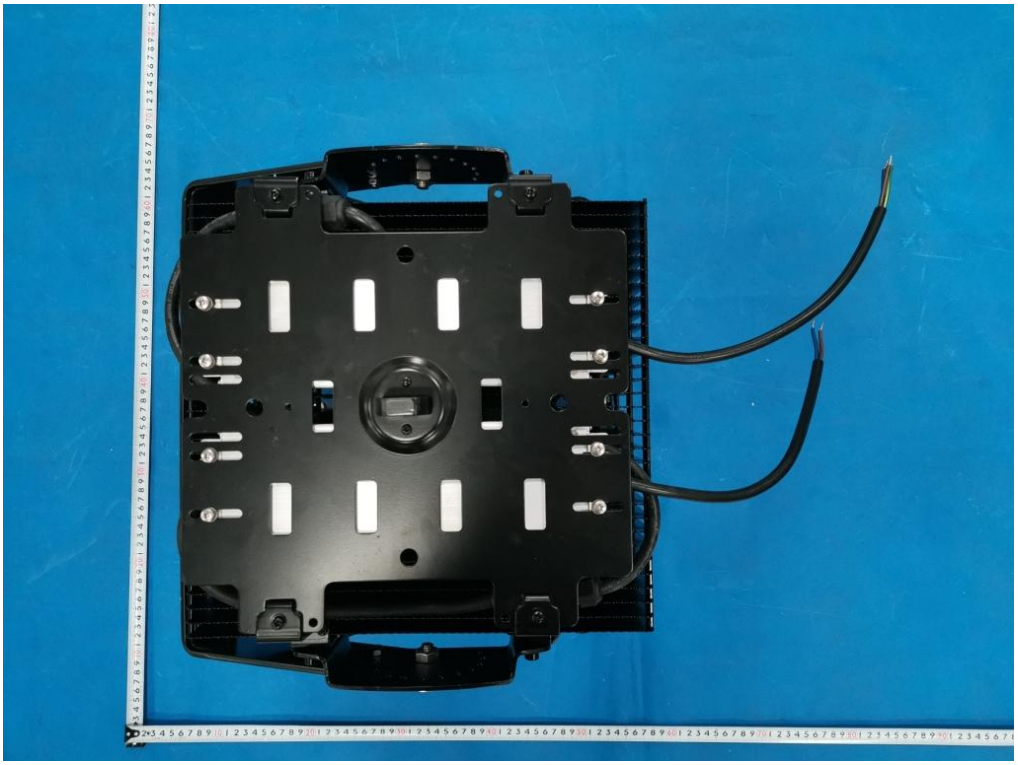


Figure 3.Overall view of unit

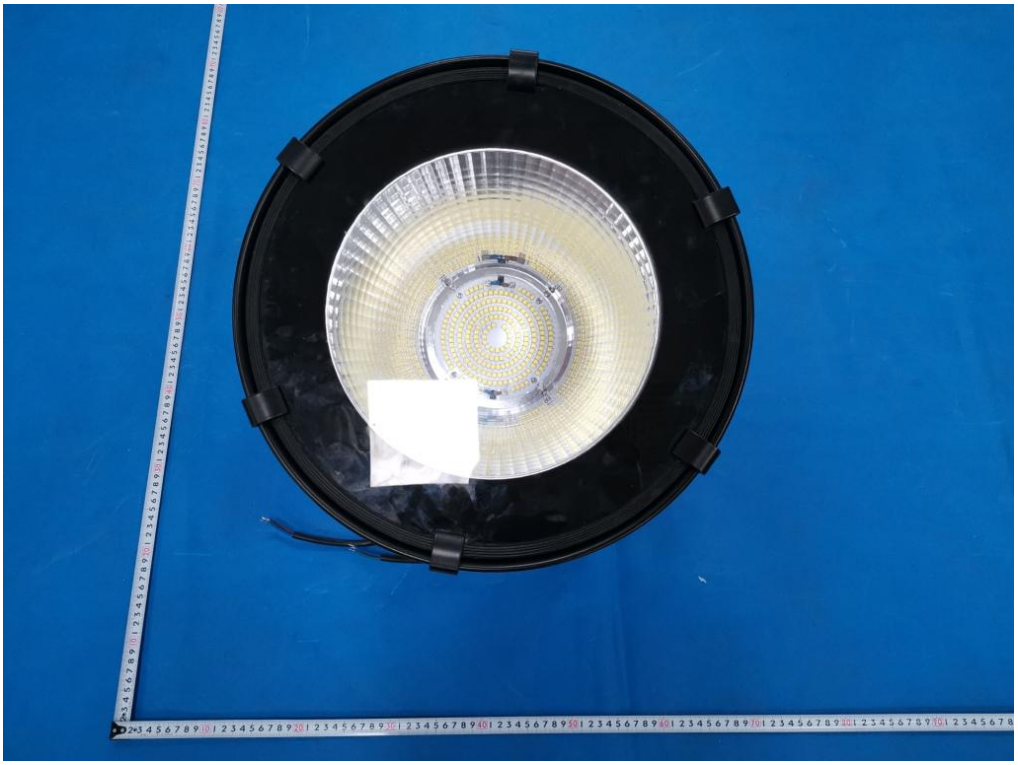


Figure 4. Overall view of unit

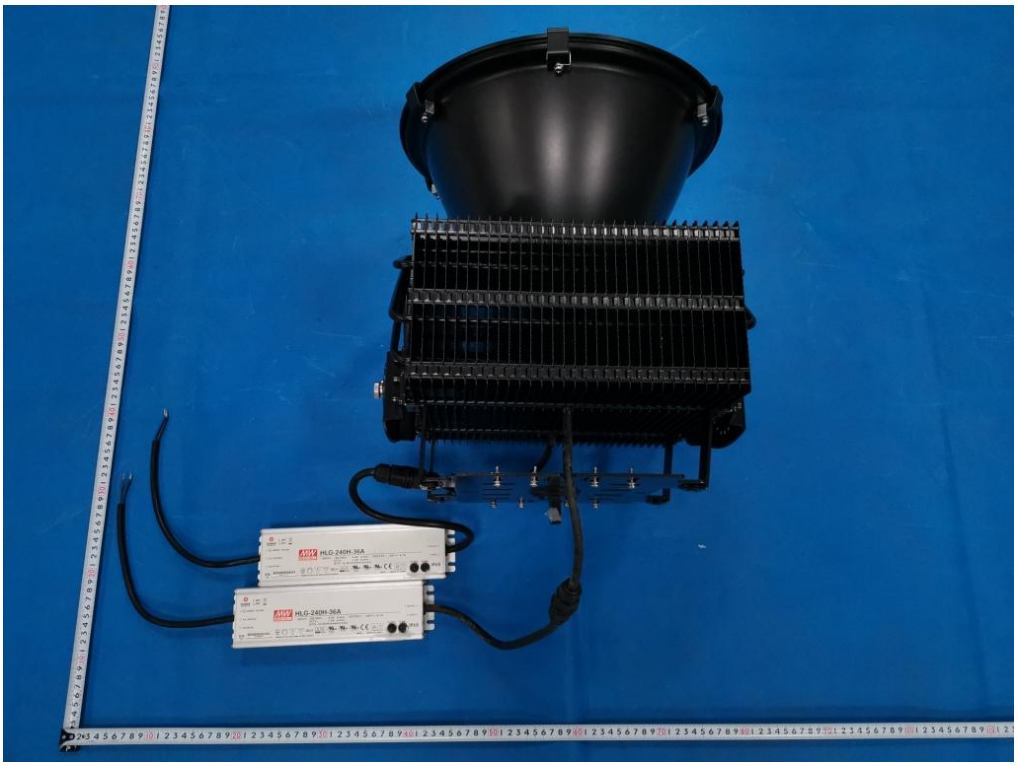


Figure 5. Internal view of unit

Figure 6. Overall view of unit

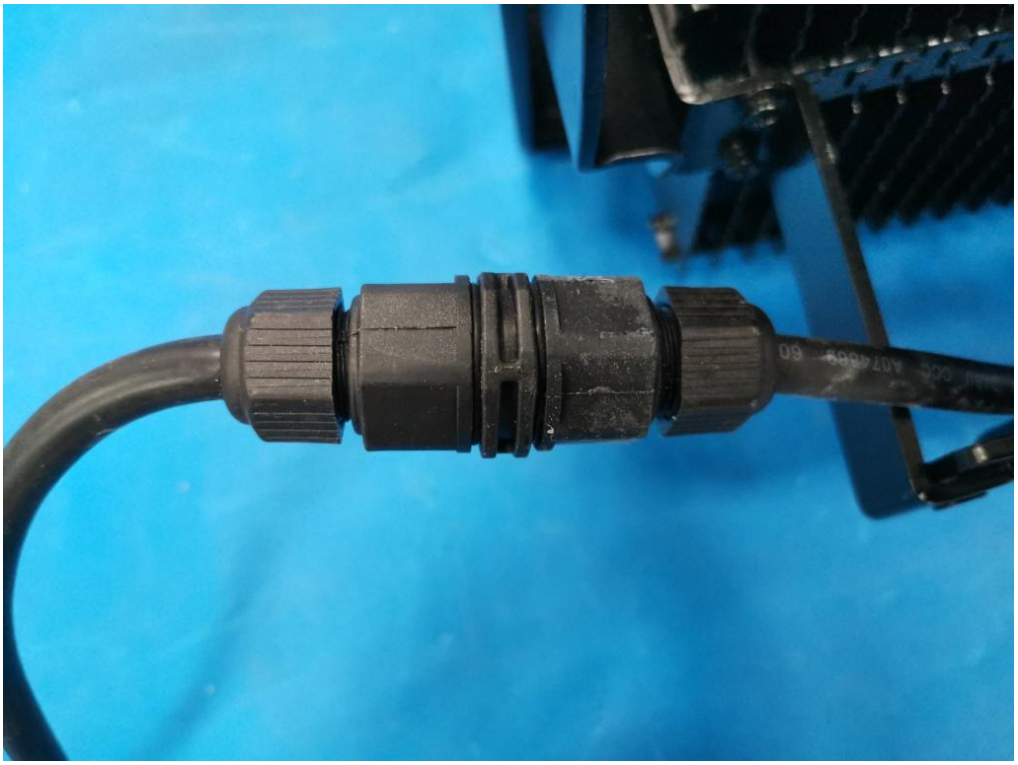


Figure 7. Overall view of unit

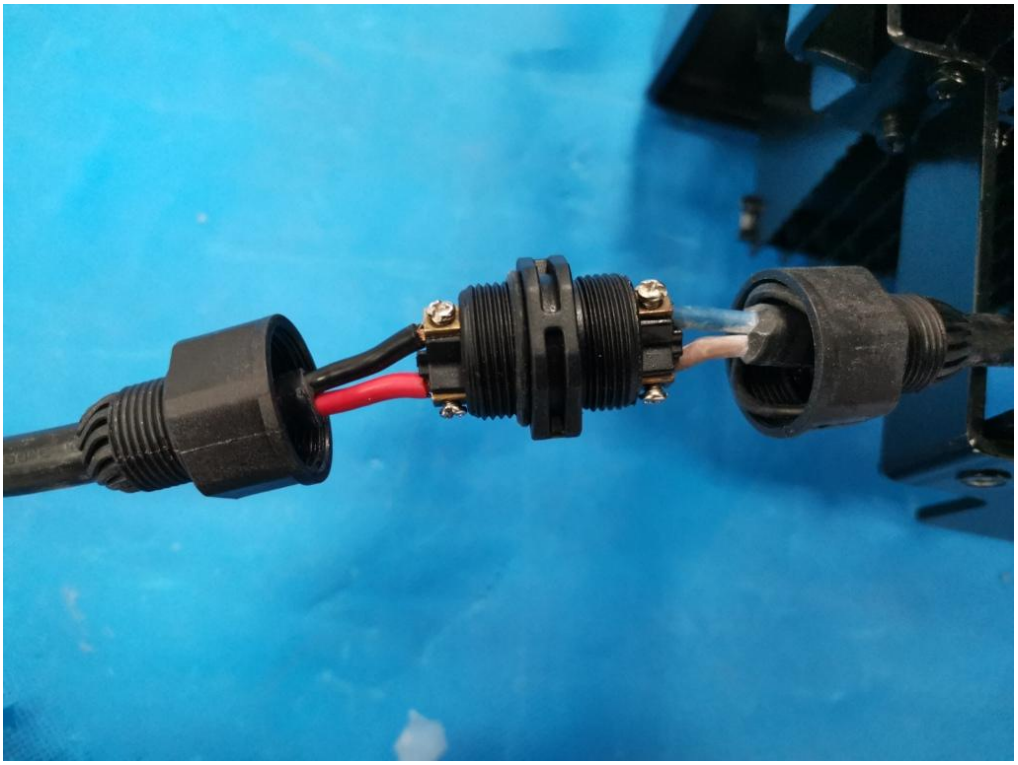


Figure 8. Internal view of unit

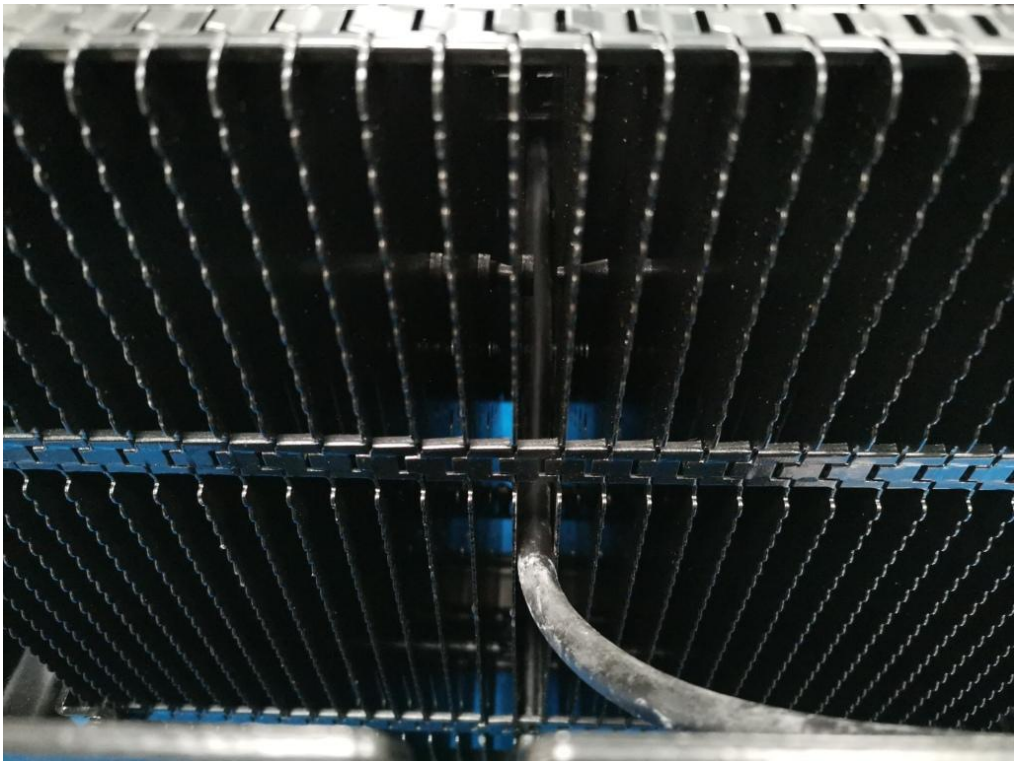


Figure 9. Overall view of unit

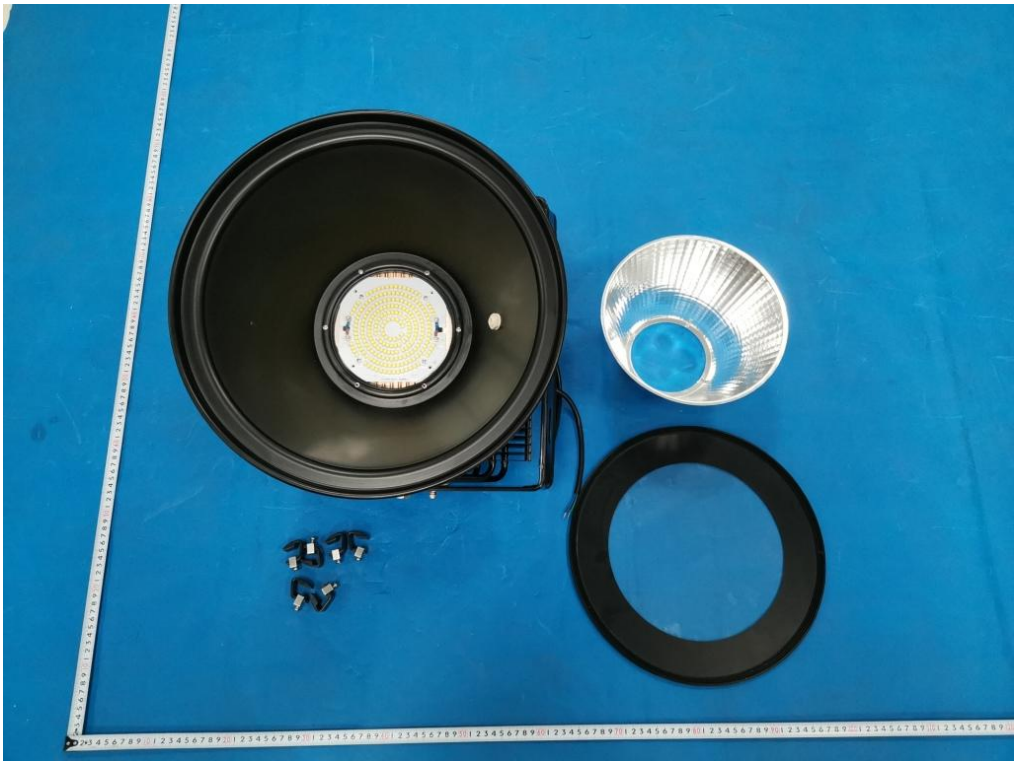


Figure 10. Internal view of unit

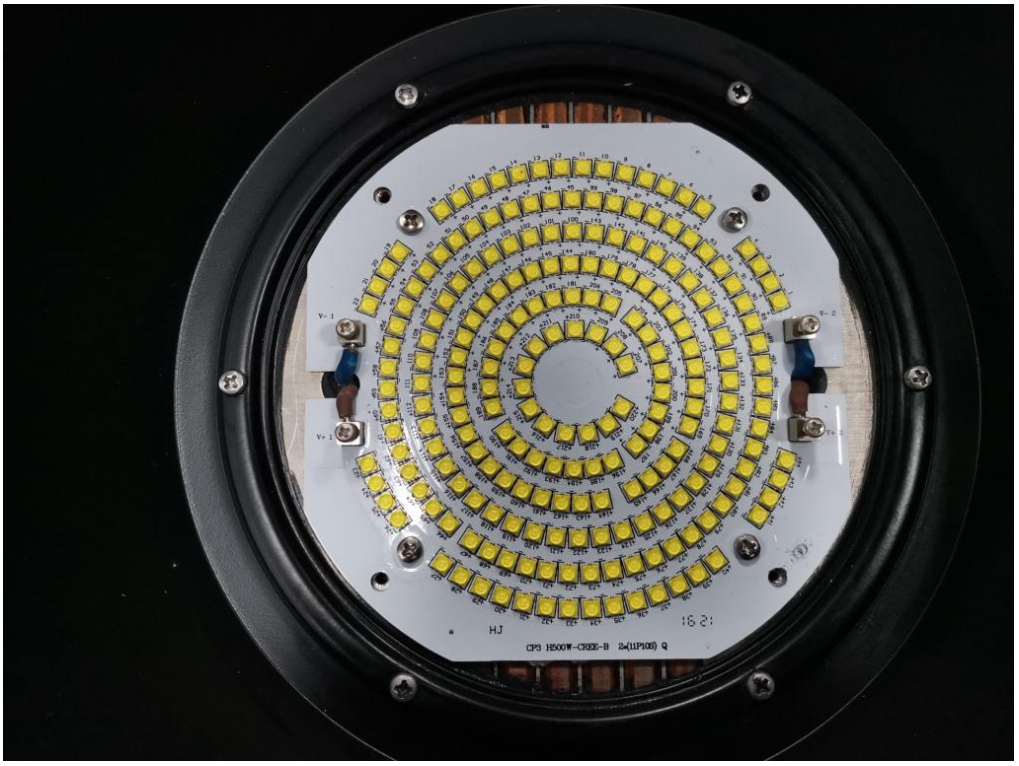


Figure 11. Internal view of unit

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