



**CTS (NINGBO) TESTING SERVICE TECHNOLOGY
INTERNATIONAL**

OPERATE ACCORDING TO ISO/IEC 17025

EMC TEST REPORT

TEST REPORT NUMBER : CGZ3181121-02393-EE



CTS (Ningbo) Testing Service Technology Co., Ltd.

Fl.1 & 8 West, Bldg. B, No. 66, Qingyi Rd., Hi-Tech Zone, Ningbo, Zhejiang, China

EMC TEST REPORT

Report Reference No. CGZ3181121-02393-EE

Date of issue 14 December 2018

Testing Laboratory Name **CTS (Ningbo) Testing Service Technology Co., Ltd.**

Address GZ test site: A101, No.65, Zhuji Road, Tianhe District, Guangzhou, Guangdong, China.

Testing location/ procedure Full application of Harmonised standards
 Partial application of Harmonised standards
 Other standard testing method

Applicant's name Shenzhen Aglare Lighting Co., Ltd.

Address Factory 4, Supply and Marketing Cooperative Park Guanlan Avenue, Guanlan Town Longhua New District, Shenzhen City, Guangdong, China

Test specification:

Standard **ETSI EN 301 489-1 V2.1.1, ETSI EN 301 489-3 V2.1.1, EN 61000-3-2:2014, EN 61000-3-3:2013**

Test Report Form No. CTSEMC-1.0

TRF Originator CTS (Ningbo) Testing Service Technology Co., Ltd.

Master TRF Dated 2009-01

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Test item description RGB led floodlight

Trade Mark Aglare

Manufacturer Shenzhen Aglare Lighting Co., Ltd.

Model/Type reference AT-243

Ratings Transmitter: DC 12V by Battery
Receiver: AC 230V/50Hz

Result **PASSED**

Compiled by:



Kate zhang / File administrators

Supervised by:



Duke yang / Technique principal

Approved by:



Vincent yao / Manager

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EMC -- TEST REPORT

Test Report No. : CGZ3181121-02393-EE	<u>14 December 2018</u> Date of issue
--	--

Type / Model.....	AT-243
EUT.....	RGB led floodlight
Applicant	Shenzhen Aglare Lighting Co., Ltd.
Address.....	Factory 4, Supply and Marketing Cooperative Park Guanlan Avenue, Guanlan Town Longhua New District, Shenzhen City, Guangdong, China
Telephone.....	+86-755-88868631
Fax.....	+86-755-27659398
Contact.....	Cheng Jun
Manufacturer	Shenzhen Aglare Lighting Co., Ltd.
Address.....	Factory 4, Supply and Marketing Cooperative Park Guanlan Avenue, Guanlan Town Longhua New District, Shenzhen City, Guangdong, China
Telephone.....	+86-755-88868631
Fax.....	+86-755-27659398
Contact.....	Cheng Jun
Factory	Shenzhen Aglare Lighting Co., Ltd.
Address.....	Factory 4, Supply and Marketing Cooperative Park Guanlan Avenue, Guanlan Town Longhua New District, Shenzhen City, Guangdong, China
Telephone.....	+86-755-88868631
Fax.....	+86-755-27659398
Contact.....	Cheng Jun

The test report merely corresponds to the test sample.
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1 TEST STANDARDS

The tests were performed according to following standards:

ETSI EN 301 489-1 V2.1.1
ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU
ETSI EN 301 489-3 V2.1.1
ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU
EN 61000-3-2:2014
Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)
EN 61000-3-3: 2013
Electromagnetic compatibility (EMC) -- Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current \leq 16 A per phase and not subject to conditional connection.

2 SUMMARY

2.1 GENERAL REMARKS

Date of receipt of test sample	21 November 2018
Testing commenced on	21 November ~14 December 2018
Testing concluded on	14 December 2018

2.2 FINAL ASSESSMENT

The EMC requirements pertaining to the technical standards and tested operation modes are

- fulfilled.

- **not** fulfilled.

The equipment under test

- fulfils the EMC requirements cited on page 1.

- **does not** fulfil the EMC requirements cited on page 1.

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3 EQUIPMENT UNDER TEST

3.1 Power supply system utilised

Power supply voltage: AC 230V/50Hz
 Others

3.2 Short description of the Equipment under Test (EUT)

Number of tested samples: 1
Serial number: Prototype

3.3 EUT operation mode

The equipment under test was operated during the measurement under the following conditions:

- Normal

Operating Mode: Normal

Emissions tests.....: According to ETSI EN 301 489-1 V2.1.1 and ETSI EN 301 489-3 V2.1.1, searching for the highest disturbance.

Immunity tests: According to ETSI EN 301 489-1 V2.1.1 and ETSI EN 301 489-3 V2.1.1, searching for the highest susceptibility.

Harmonic current..... : According to EN 61000-3-2, searching for the highest disturbance.

Voltage fluctuation.....: According to EN 61000-3-3, searching for the highest disturbance.

3.4 EUT configuration

(The CDF filled by the applicant can be viewed at the test laboratory.)

The following peripheral devices and interface cables were connected during the measurement:

Not Applicable

3.5 Performance level

The test results shall be classified in terms of the loss of function or degradation of performance of the equipment under test, relative to a performance level defined by its manufacturer or the requestor of the test, or agreed between the manufacturer and the purchaser of the product.

3.6 Definition related to the performance level

Performance table for ETSI EN 301 489-3 V2.1.1		
Criteria	During test	After test
A	Shall operate as intended. May show degradation of performance (see note 1). Shall be no loss of function . Shall be no unintentional transmissions.	Shall operate as intended . Shall be no degradation of performance (see note 2) Shall be no loss of function . Shall be no loss of stored data or user programmable Functions.
B	May show loss of function (one or more) .. May show degradation of performance (see note 1). No unintentional transmissions.	Functions shall be self-recoverable . Shall operate as intended after recovering . Shall be no degradation of performance (see note 2). Shall be no loss of stored data or user programmable functions.
C	May be loss of function (one or more).	Functions shall be recoverable by the operator . Shall operate as intended after recovering . Shall be no degradation of performance (see note 2).

NOTE 1: Degradation of performance during the test is understood as a degradation to a level not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance.

If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

NOTE 2: No degradation of performance after the test is understood as no degradation below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. After the test no change of actual operating data or user retrievable data is allowed.

If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

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4 TEST ENVIRONMENT

4.1 Address of the test laboratory

GZ test site: A101, No.65, Zhuji Road, Tianhe District, Guangzhou, Guangdong, China

Tel: +86-20-85543113 (32 lines)

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4.2 Environmental conditions

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

Temperature:	15~35 ° C
Humidity:	25~75 %
Atmospheric pressure:	86~106 kPa

4.3 Definitions of symbols used in this test report

- - The black square indicates that the listed condition, standard or equipment is applicable for this report.
- - The empty square indicates that the listed condition, standard or equipment is **not** applicable for this report.

4.4 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the CTS quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

4.5 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conduction disturbance	150kHz~30MHz	±1.22dB	(1)
Power disturbance	30MHz~300MHz	±1.38dB	(1)
Radiation emission (3m)	30MHz~300MHz	±3.14dB	(1)
	300MHz~1000MHz	±3.18dB	(1)

- (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
- (2) The actual EUT tested items in this test report, only applies to this "measurement uncertainty" in part / all of the corresponding data.

4.6 Test Description

4.6.1 Description of Standards and Results

EMISSION(ETSI EN 301 489-1 V2.1.1 and ETSI EN 301 489-3 V2.1.1)			
Description of Test Item	Standard	Limits	Results
Conducted disturbance at mains terminals	EN 55032:2015	Class B	PASS
Radiated disturbance	EN 55032:2015	Class B	PASS
Harmonic current emissions	EN 61000-3-2:2014	Class A	PASS
Voltage fluctuations & flicker	EN 61000-3-3:2013	-----	PASS
IMMUNITY (ETSI EN 301 489-1 V2.1.1 and ETSI EN 301 489-3 V2.1.1)			
Description of Test Item	Basic Standard	Performance Criteria	Results
Electrostatic discharge (ESD)	EN 61000-4-2:2009	B	PASS
Radio-frequency, Continuous radiated disturbance	EN 61000-4-3:2006+A1:2008+A2:2010	A	PASS
Electrical fast transient (EFT)	EN 61000-4-4:2012	B	PASS
Surge (Input a.c. power ports)	EN 61000-4-5:2006	B	PASS
Surge (Telecommunication ports)		B	N/A
Radio-frequency, Continuous conducted disturbance	EN 61000-4-6:2009	A	PASS
Voltage dips, >95% reduction	EN 61000-4-11:2004	B	PASS
Voltage dips, 30% reduction		B	PASS
Voltage interruptions		C	PASS
N/A is an abbreviation for Not Applicable.			

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5 TEST CONDITIONS AND RESULTS

5.1 Conducted disturbance

For test instruments and accessories used see section 6 part 6.2.

5.1.1 Description of the test location

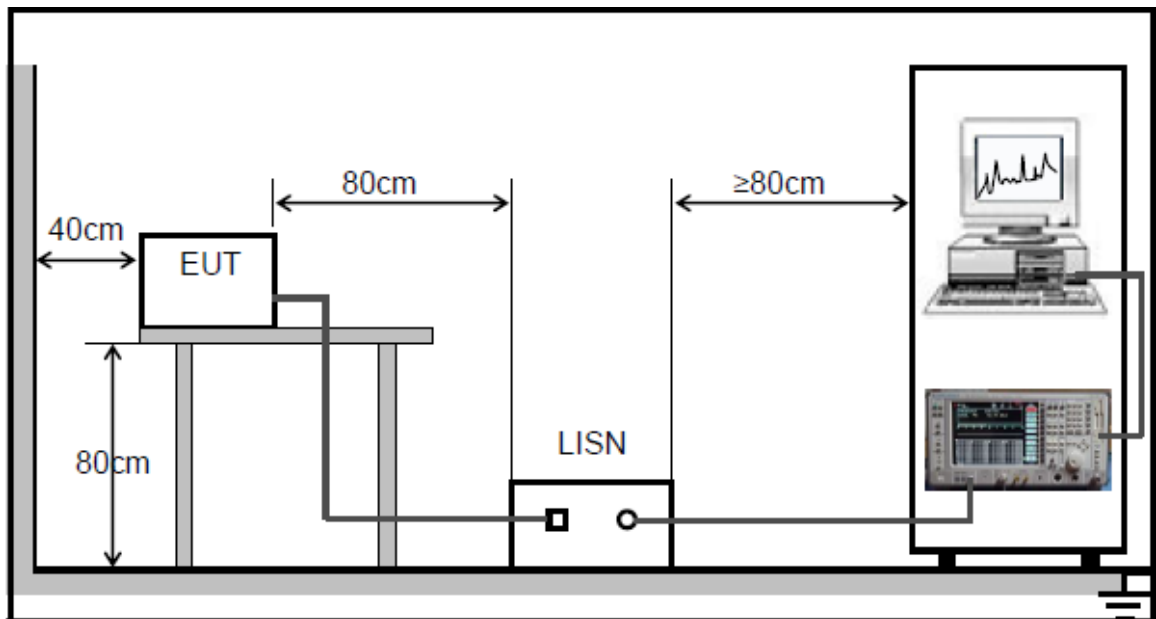
Test location: Shielded room

5.1.2 Description of the test set-up

5.1.2.1 Operating Condition

The EUT is normal during the test, and the results of the maximum emanation are recorded

5.1.2.2 Block Diagram of Test Setup



5.1.3 Limits disturbance

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

Note: (1) The tighter limit shall apply at the edge between two frequency bands.

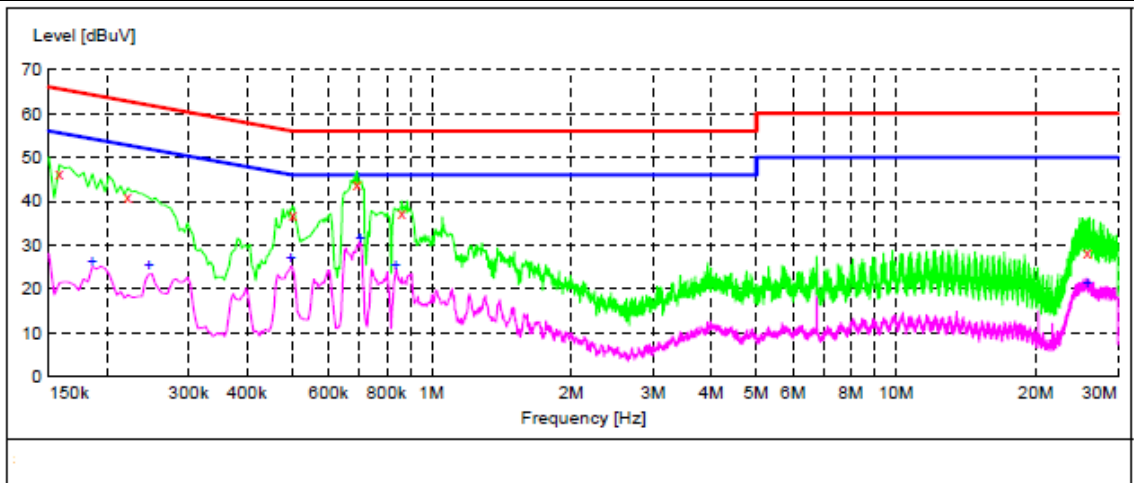
5.1.4 Test result

The requirements are	Fulfilled
Test Condition	Ambient Temperature: 24°C Humidity: 56%
Band width	9kHz
Frequency range	0.15 MHz - 30 MHz
Min. limit margin	>11.50 dB at 0.15 - 30 MHz
Operator	Duke

Remarks: The limits are kept. For detailed results, please see the following page(s).

5.1.5 Test protocol

Test point	L	Result:	<input checked="" type="checkbox"/> - passed
Operation mode	Normal		<input type="checkbox"/> - not passed
Remarks:			



MEASUREMENT RESULT: "TEST_fin"

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.158000	46.20	11.4	66	19.4	QP	L1	FLO
0.222000	40.90	11.4	63	21.8	QP	L1	FLO
0.502000	37.00	11.4	56	19.0	QP	L1	FLO
0.690000	44.00	11.4	56	12.0	QP	L1	FLO
0.862000	37.50	11.3	56	18.5	QP	L1	FLO
25.786000	28.20	11.0	60	31.8	QP	L1	FLO

MEASUREMENT RESULT: "TEST_fin2"

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.186000	26.30	11.4	54	27.9	AV	L1	FLO
0.246000	25.60	11.3	52	26.3	AV	L1	FLO
0.498000	27.20	11.4	46	18.8	AV	L1	FLO
0.702000	31.60	11.4	46	14.4	AV	L1	FLO
0.838000	25.60	11.3	46	20.4	AV	L1	FLO
25.742000	21.20	11.0	50	28.8	AV	L1	FLO

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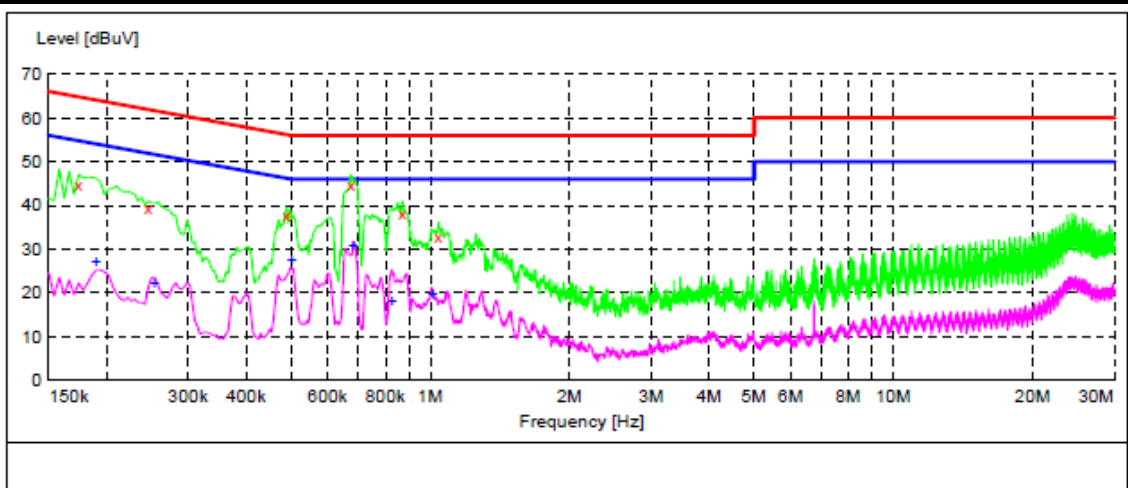
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Test point:	N	Result:	■ - passed
Operation mode:	Normal		□ - not passed
Remarks:			



MEASUREMENT RESULT: "TEST_fin"

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.174000	44.80	11.4	65	20.0	QP	N	FLO
0.246000	39.20	11.3	62	22.7	QP	N	FLO
0.490000	37.70	11.4	56	18.5	QP	N	FLO
0.674000	44.50	11.4	56	11.5	QP	N	FLO
0.870000	38.10	11.3	56	17.9	QP	N	FLO
1.042000	32.60	11.3	56	23.4	QP	N	FLO

MEASUREMENT RESULT: "TEST_fin2"

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.190000	26.90	11.4	54	27.1	AV	N	FLO
0.254000	22.30	11.3	52	29.3	AV	N	FLO
0.502000	27.50	11.4	46	18.5	AV	N	FLO
0.682000	30.80	11.4	46	15.2	AV	N	FLO
0.826000	17.90	11.3	46	28.1	AV	N	FLO
1.010000	19.70	11.3	46	26.3	AV	N	FLO

Note: Level=Reading+Factor. Margin= Limit-Level

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5.2 Radiated disturbance (electric field)

For test instruments and accessories used see section 6 part 6.1.

5.2.1 Description of the test location

Test location : Semi-Anechoic chamber

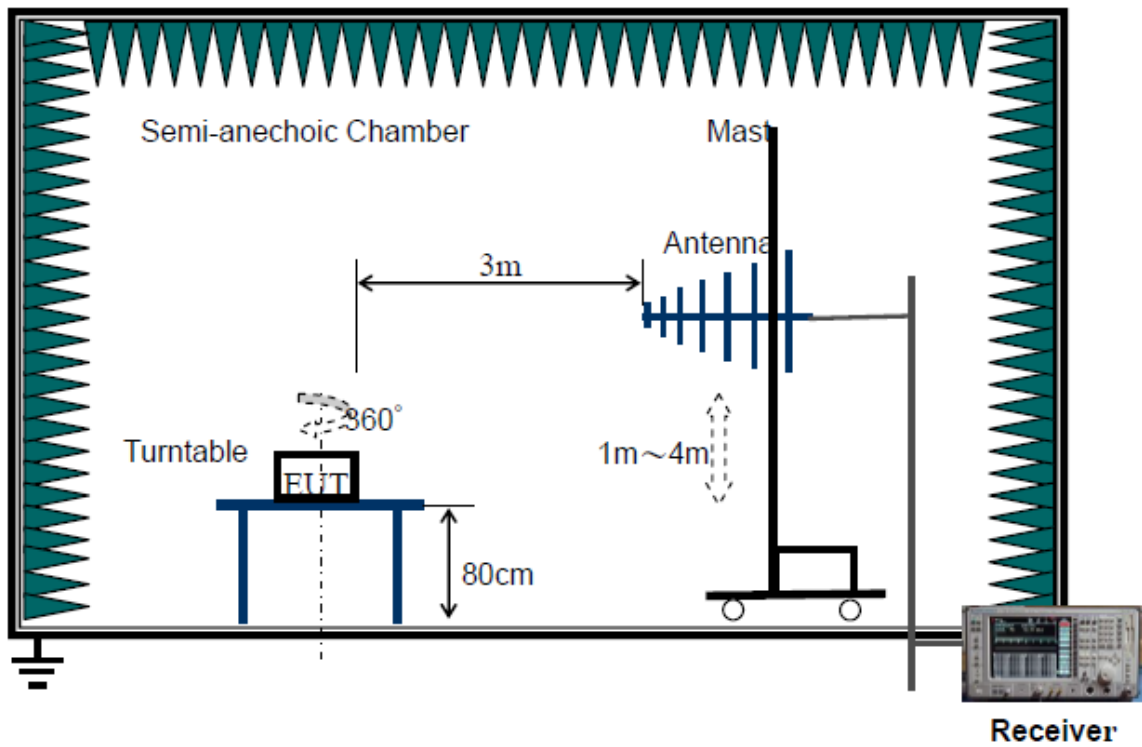
Test disturbance: 3 Meter

5.2.2 Description of the test set-up

5.2.2.1 Operating Condition

The EUT is normal during the test, and the results of the maximum emanation are recorded

5.2.2.2 Block Diagram of Test Setup



Radiated Disturbance Below 1GHz

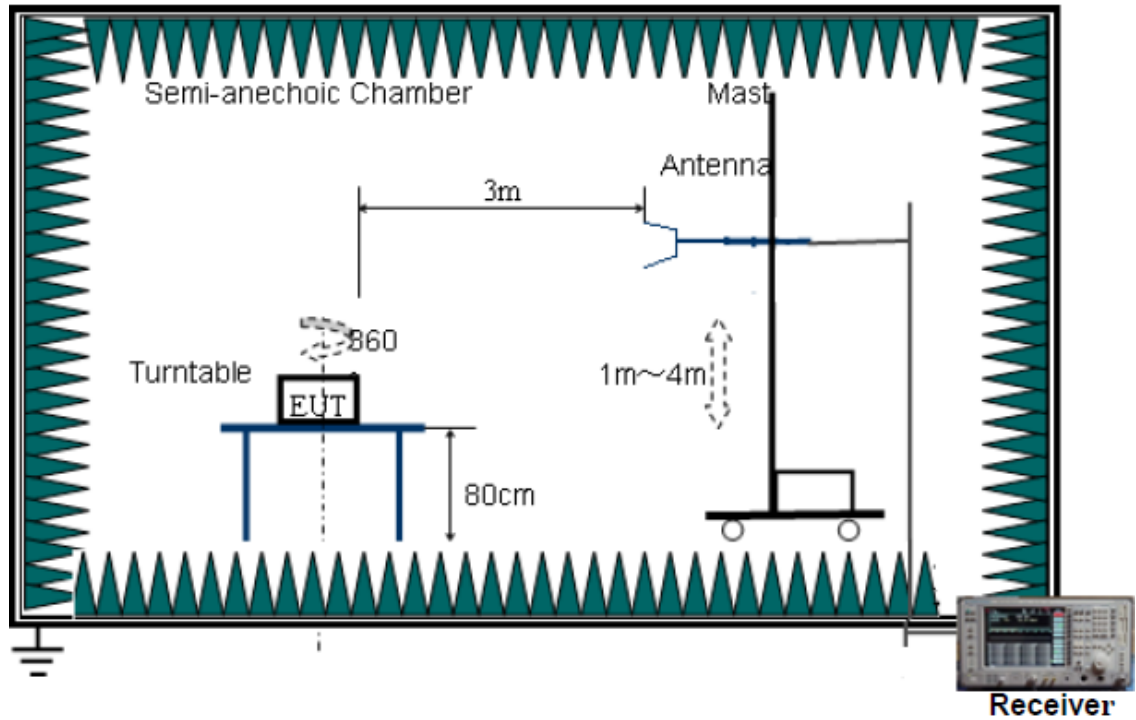
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Radiated Disturbance Above 1GHz

5.2.3 Limits of disturbance (Class B)

Frequency (MHz)	Distance (Meters)	Field Strengths Limits (dB μ V/m)		
		Peak	QP	Average
30 ~ 230	3	---	40	---
230 ~ 1000	3	---	47	---
1000~3000	3	70	---	50
3000~6000	3	74	---	54

Note: (1) The tighter limit shall apply at the edge between two frequency bands.
 (2) Distance refers to the distance in meters between the test instrument antenna and the closest point of any part of the E.U.T.

5.2.4 Test result

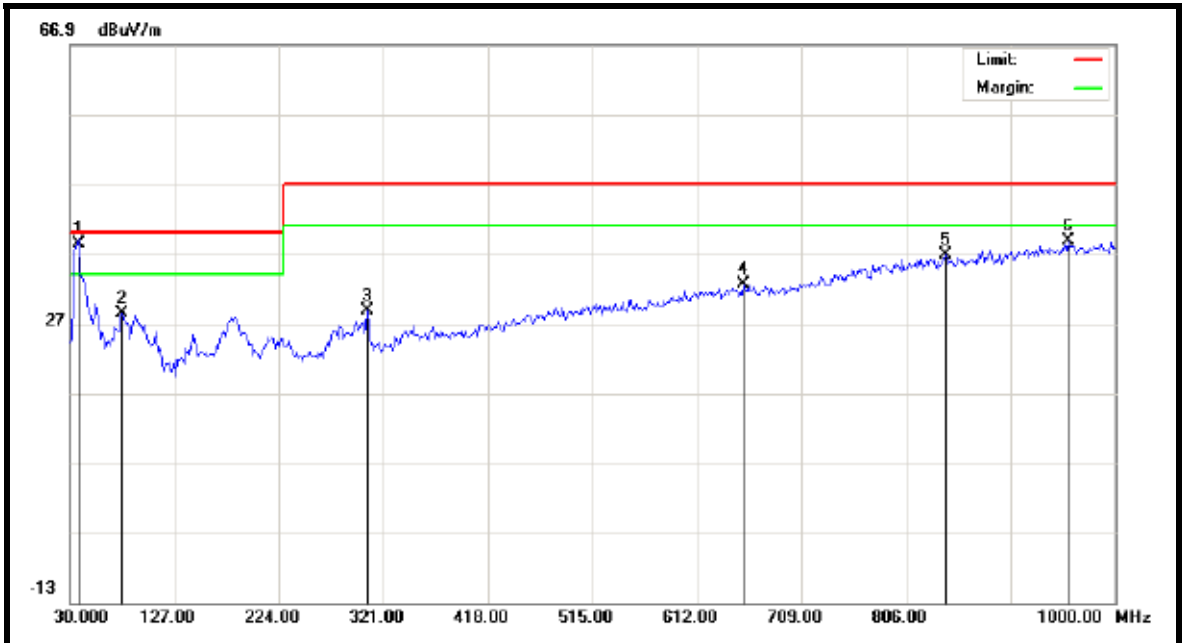
The requirements are	Fulfilled
Test Condition	Ambient Temperature: 24°C Humidity: 56%
Band width	120kHz for below 1GHz, 1MHz for above 1GHz
Frequency range	30 MHz - 6000 MHz
Min. limit margin	>0.85 dB at 30 - 6000 MHz
Operator	Duke

Remarks: The limits are kept. For detailed results, please see the following page(s).

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5.2.5 Test protocol

Test point:	Horizontal	Result:	<input checked="" type="checkbox"/> - passed
Operation mode:	Normal		<input type="checkbox"/> - not passed
Remarks:			



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	38.0833	17.68	20.79	38.47	40.00	-1.53	QP			
2		78.5000	12.41	16.03	28.44	40.00	-11.56	QP			
3		306.4500	7.41	21.36	28.77	47.00	-18.23	QP			
4		655.6500	2.63	30.07	32.70	47.00	-14.30	QP			
5		843.1833	2.91	33.82	36.73	47.00	-10.27	QP			
6		956.3500	3.64	35.23	38.87	47.00	-8.13	QP			

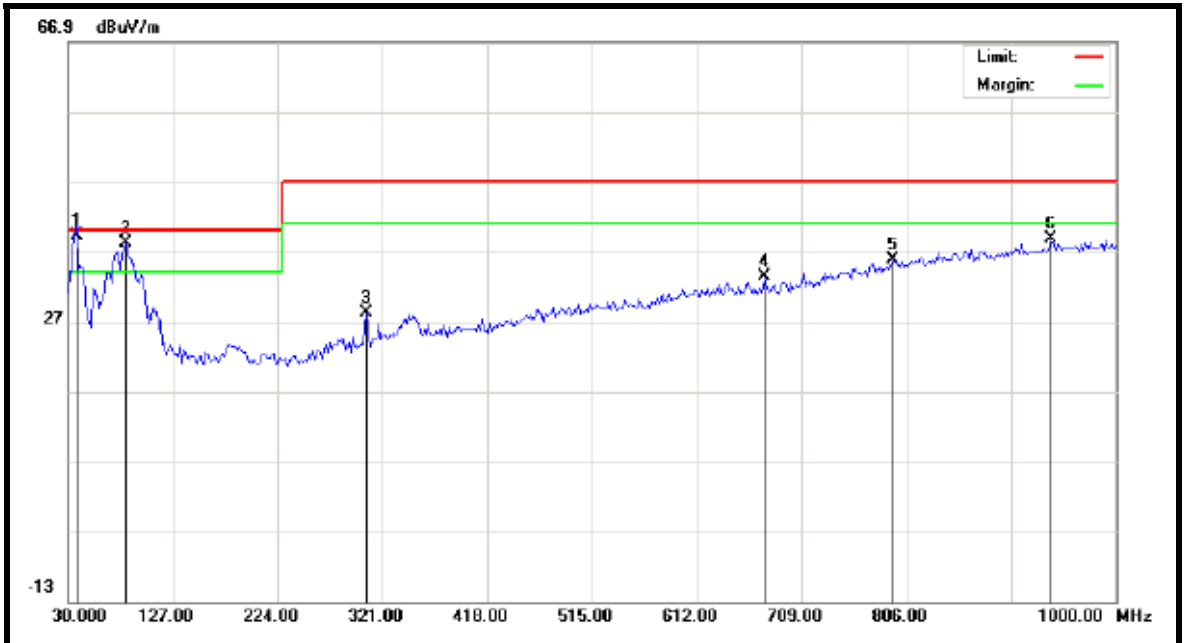
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Test point:	Vertical	Result:	<input checked="" type="checkbox"/> - passed
Operation mode:	Normal		<input type="checkbox"/> - not passed
Remarks:			



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB		cm	degree	
1	*	38.0833	18.36	20.79	39.15	40.00	-0.85	QP			
2	!	83.3500	22.40	15.75	38.15	40.00	-1.85	QP			
3		306.4500	6.85	21.36	28.21	47.00	-18.79	QP			
4		675.0500	3.01	30.37	33.38	47.00	-13.62	QP			
5		793.0667	2.86	33.00	35.86	47.00	-11.14	QP			
6		940.1833	3.64	35.07	38.71	47.00	-8.29	QP			

Note: Level=Reading+Factor. Margin= Level-Limit

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5.3 Harmonic current

For test instruments and accessories used see section 6 part 6.3.

5.3.1 Description of the test location

Test location : Test location no. 1

5.3.2 Limits of harmonic current

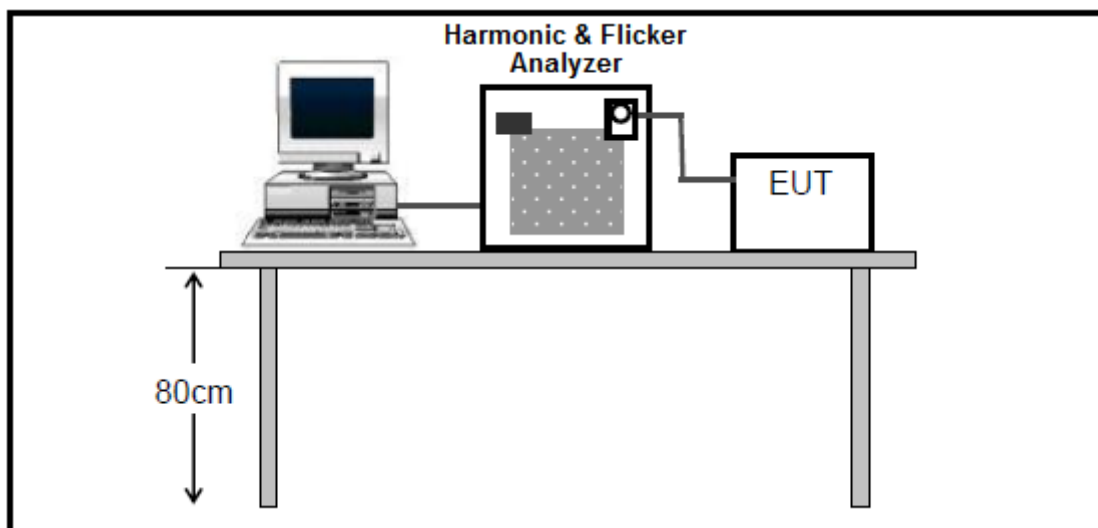
Test configuration and procedure see clause 7.1 of standard EN 61000-3-2:2014.

5.3.3 Description of the test set-up

5.3.3.1 Operating Condition

The EUT is normal during the test, and the results of the maximum emanation are recorded

5.3.3.2 Block Diagram of Test Setup



5.3.4 Test result

Remarks: No limits apply for equipment with an active input power up to and including 75W.

5.4 Voltage fluctuations and flicker

For test instruments and accessories used see section 6 part 6.4.

5.4.1 Description of the test location

Test location : Test location no. 1

5.4.2 Limits of voltage fluctuation and flicker

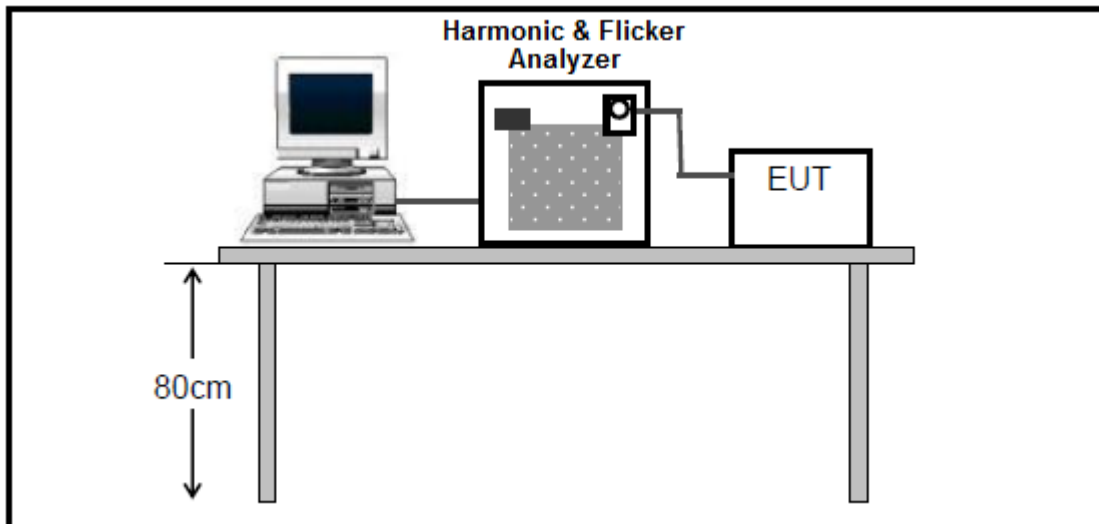
Test configuration and procedure see clause 5 of standard EN 61000-3-3:2013.

5.4.3 Description of the test set-up

5.4.3.1 Operating Condition

The EUT is normal during the test, and the results of the maximum emanation are recorded

5.4.3.2 Block Diagram of Test Setup



5.4.4 Test result

The requirements are **Fulfilled**

Remarks: The limits are kept. For detailed results, please see the following page(s).

5.4.5 Test protocol

Operation mode	Normal	Result:	<input checked="" type="checkbox"/> - passed
Remarks:			<input type="checkbox"/> - not passed

Standard used:	EN 61000-3-3 Flicker
Short time (Pst):	10 min
Observation time:	10 min (1 Flicker measurement)
Flickermeter:	AC 230V/50Hz
Ambient Temperature:	24°C
Humidity:	56%
Barometric Pressure:	86~106KPa
E. U. T.:	RGB led floodlight
M/N:	AT-243
Date of test:	21 November~14 December 2018
Tester:	Duke

Maximum Flicker results

	EUT values	Limit	Result
P_{st}	0.76	1.0	PASS
P_{lt}	0.31	0.65	PASS
$T_{dt(s)}$	0.24	0.5	PASS
$d_{max}(\%)$	1.629%	4%	PASS

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5.5 Electrostatic discharge

For test instruments and accessories used see section 6 part 6.5.

5.5.1 Description of the test location

Test location :	EMS Test Site
Power supply:	AC 230V/50Hz
Test condition:	Ambient Temperature: 24°C, Humidity:56%
Date of test :	21 November ~14 December 2018
Operator :	Duke

5.5.2 Severity of levels electrostatic discharge

5.5.2.1 Severity level: Contact discharge at $\pm 4KV$ air discharge at $\pm 8KV$

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

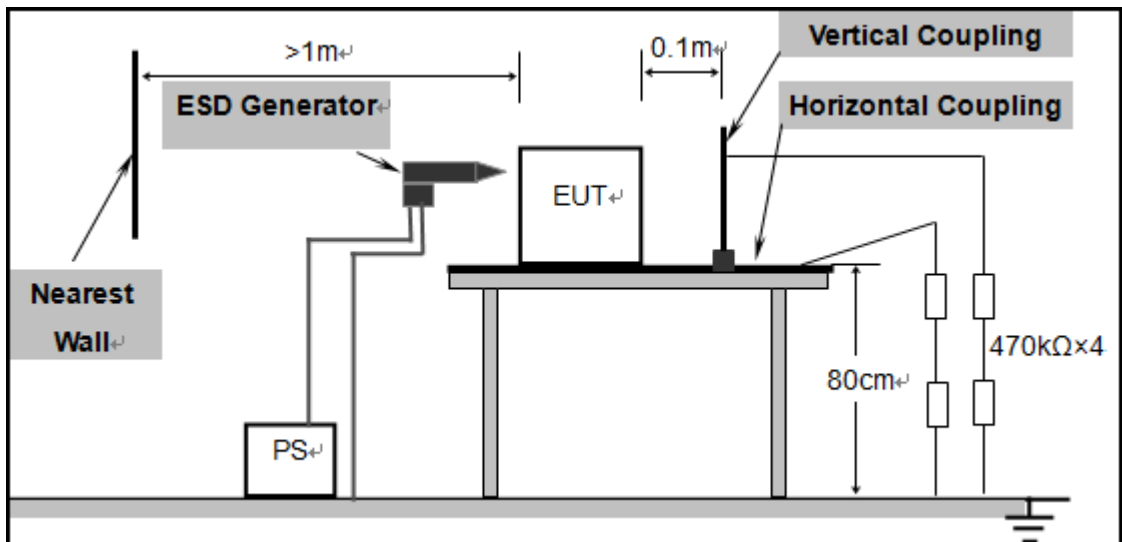
5.5.2.2 Performance criterion: B

5.5.3 Description of the test set-up

5.5.3.1 Operating Condition

The EUT is normal during the test, and the results of the maximum emanation are recorded

5.5.3.2 Block Diagram of Test Setup



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5.5.4 Test specification:

Contact discharge voltage:	<input type="checkbox"/> 2 kV	<input type="checkbox"/> 4 kV	
Air discharge voltage:	<input type="checkbox"/> 2 kV	<input type="checkbox"/> 4 kV	<input type="checkbox"/> 8 kV
Discharge impedance:	<input type="checkbox"/> 330 Ω / 150 pF		
Discharge factor:	<input type="checkbox"/> ≥ 1 sec.		
Number of discharges:	<input type="checkbox"/> ≥ 10		
Type of discharge:	Direct discharge	<input type="checkbox"/> Air discharge	
		<input type="checkbox"/> Contact discharge	
	Indirect discharge	<input type="checkbox"/> Contact discharge	
Polarity:	<input type="checkbox"/> Positive	<input type="checkbox"/> Negative	
Discharge location:	<input type="checkbox"/> see photo documentation of the test set-up		
	<input type="checkbox"/> all external locations accessible by hand		
	<input type="checkbox"/> horizontal plate (HCP)		
	<input type="checkbox"/> vertical coupling plate (VCP)		

5.5.5 Test result

The requirements are **Fulfilled**Performance Criterion: **B****Remarks:** During the test no deviation was detected to the selected operation mode(s).

5.6 Radiated, radio-frequency, electromagnetic field

For test instruments and accessories used see section 6 part 6.6.

5.6.1 Description of the test location

Test location :	GTEM chamber
Power supply:	AC 230V/50Hz
Test condition:	Ambient Temperature: 24°C, Humidity:56%
Date of test :	21 November ~14 December 2018
Operator :	Duke

5.6.2 Severity levels of radiated, Radio-frequency, electromagnetic field

5.6.2.1 Severity level: 3V/m

Level	Field strenght(V/m)
1	1
2	3
3	10
X	Special

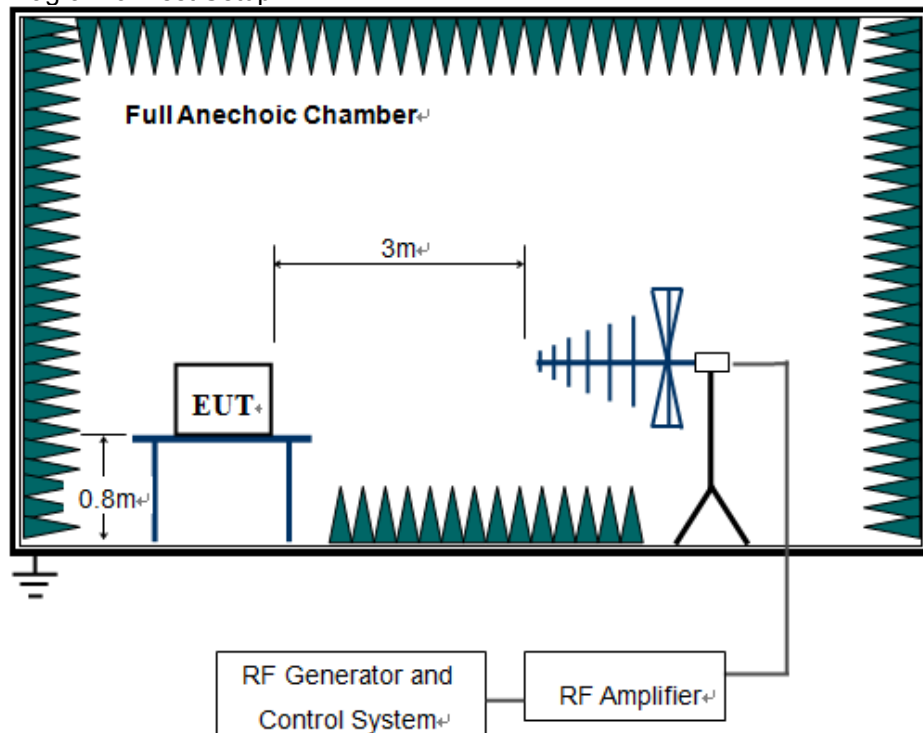
5.6.2.2 Performance criterion: A

5.6.3 Description of the test set-up

5.6.3.1 Operating Condition

The EUT is normal during the test, and the results of the maximum emanation are recorded

5.6.3.2 Block Diagram of Test Setup



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5.6.4 Test specification:

Frequency range:	■ 80 MHz to 6000 MHz
Field strength:	■ 3 V/m
EUT - antenna separation:	■ 3 m
Modulation:	■ AM: 80 % ■ sinusoidal 1000Hz
Frequency step:	■ 1 % with 3 s dwell time
Antenna polarisation:	■ horizontal ■ vertical

5.6.5 Test result

The requirements are **Fulfilled**

Performance Criterion: **A**

Remarks: During the test no deviation was detected to the selected operation mode(s).

5.7 Electrical fast transients / Burst

For test instruments and accessories used see section 6 part 6.7.

5.7.1 Description of the test location

Test location :	EMS Test Site
Power supply:	AC 230V/50Hz
Test condition:	Ambient Temperature: 24°C, Humidity:56%
Date of test :	21 November ~14 December 2018
Operator :	Duke

5.7.2 Severity levels of electrical fast transients / Burst

5.7.2.1 Severity level: ±1000V for AC power supply lines

Open circuit output test voltage and repetition rate of the impulses				
Level	On power port, PE		On I/O signal, data and control ports	
	V peak (KV)	Repetition rate (KHz)	Voltage peak	Repetition rate (KHz)
1	0.5	5 or 100	0.25	5 or 100
2	1	5 or 100	0.5	5 or 100
3	2	5 or 100	1	5 or 100
4	4	5 or 100	2	5 or 100
X	Special	Special	Special	Special

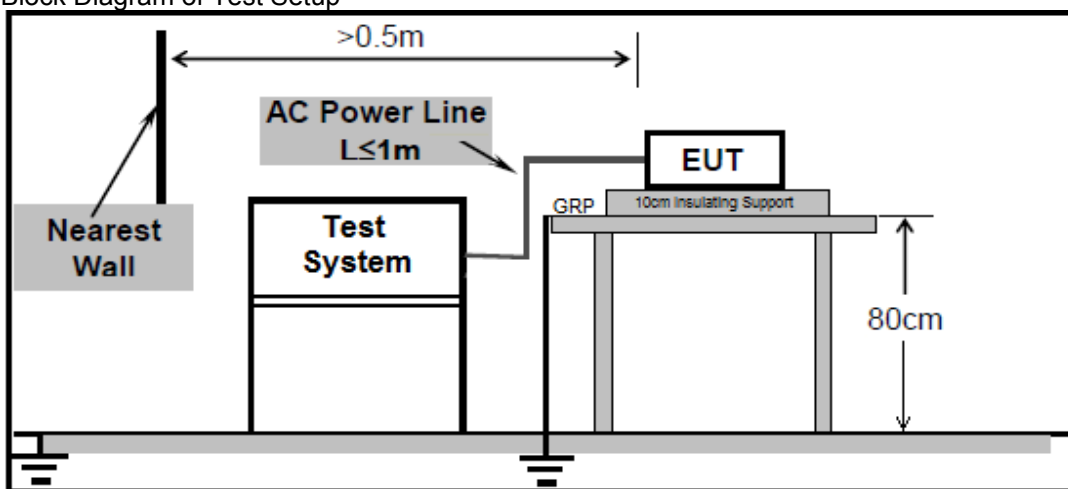
5.7.2.2 Performance criterion: B

5.7.3 Description of the test set-up

5.7.3.1 Operating Condition

The EUT is normal during the test, and the results of the maximum emanation are recorded

5.7.3.2 Block Diagram of Test Setup



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5.8 Surge

For test instruments and accessories used see section 6 part 6.8.

5.8.1 Description of the test location

Test location :	EMS Test Site
Power supply:	AC 230V/50Hz
Test condition:	Ambient Temperature: 24°C, Humidity:56%
Date of test :	21 November ~14 December 2018
Operator :	Duke

5.8.2 Severity levels of surge

5.8.2.1 Severity level: Line to line: ±1KV Line to earth: ±2KV

Level	Test Voltage (KV)
1	0.5
2	1.0
3	2.0
4	4.0
X	Special

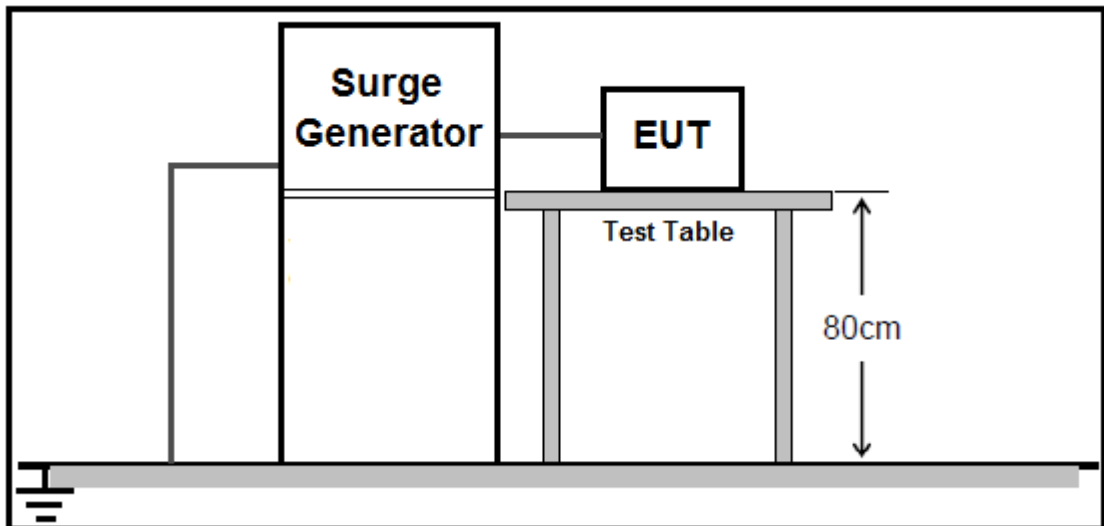
5.8.2.2 Performance Criterion: B

5.8.3 Description of the test set-up

5.8.3.1 Operating Condition

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5.8.3.2 Block Diagram of Test Setup



5.8.4 Test specification:

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Pulse amplitude-Power line sym.: Source impedance: 2 Ω + 18 μ F	<input checked="" type="checkbox"/> 0.5 kV <input checked="" type="checkbox"/> 1 kV <input type="checkbox"/> 2 kV <input type="checkbox"/> 4 kV
Pulse amplitude-Power line unsym.: Source impedance: 12 Ω + 9 μ F	<input checked="" type="checkbox"/> 0.5 kV <input checked="" type="checkbox"/> 1 kV <input checked="" type="checkbox"/> 2 kV <input type="checkbox"/> 4 kV
Number of surges:	<input checked="" type="checkbox"/> 5 Surges/Phase angle
Phase angle:	<input checked="" type="checkbox"/> 0 ° <input checked="" type="checkbox"/> 90 ° <input checked="" type="checkbox"/> 180 ° <input checked="" type="checkbox"/> 270 °
Repetition rate:	<input checked="" type="checkbox"/> 60 s
Polarity:	<input checked="" type="checkbox"/> positive <input checked="" type="checkbox"/> negative

5.8.5 Coupling points

Cable description:	AC power line: L+N, L+PE, N+PE
Screening:	<input type="checkbox"/> screened <input checked="" type="checkbox"/> unscreened
Status:	<input type="checkbox"/> passive <input checked="" type="checkbox"/> active
Signal transmission:	<input checked="" type="checkbox"/> analogue <input type="checkbox"/> digital
Length:	<input checked="" type="checkbox"/> 1.5 m

5.8.6 Test result

The requirements are **Fulfilled**

Performance Criterion: **B**

Remarks: During the test no deviation was detected to the selected operation mode(s).

5.9 Conducted disturbances induced by radio-frequency fields

For test instruments and accessories used see section 6 part 6.9.

5.9.1 Description of the test location

Test location :	EMS Test Site
Power supply:	AC 230V/50Hz
Test condition:	Ambient Temperature: 24°C, Humidity:56%
Date of test :	21 November ~14 December 2018
Operator :	Duke

5.9.2 Severity levels of conducted disturbances induced by radio-frequency fields discharge

5.9.2.1 Severity Level: 3V

Level	Field Strength (V)
1	1
2	3
3	10
X	Special

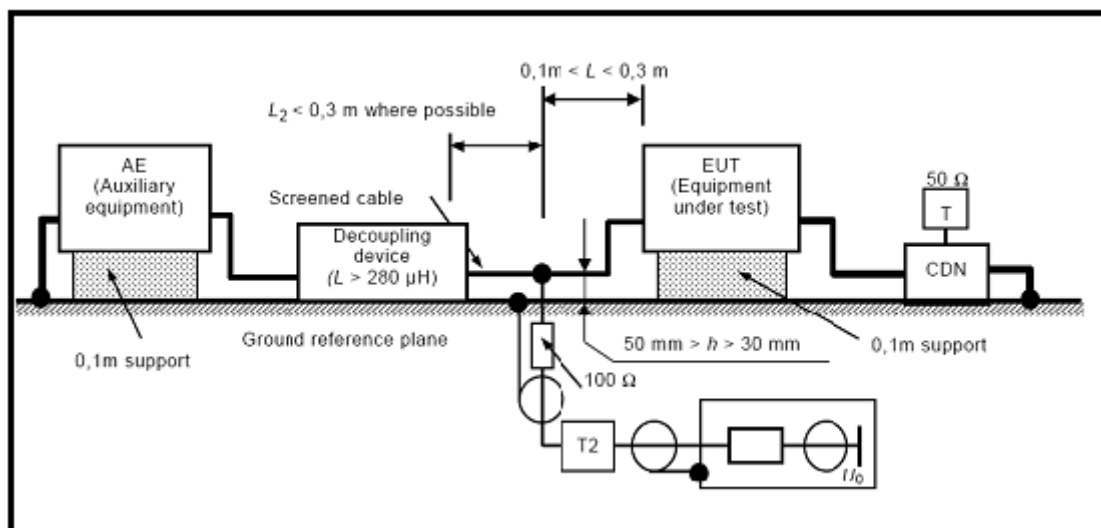
5.9.2.2 Performance Criterion: A

5.9.3 Description of the test set-up

5.9.3.1 Operating Condition

The EUT is normal during the test, and the results of the maximum emanation are recorded

5.9.3.2 Block Diagram of Test Setup



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5.9.4 Test specification:

Frequency range:	■ 0.15 MHz to 80 MHz
Test voltage:	■ 3 V
Modulation:	■ AM: 80 % ■ sinusoidal 1000Hz
Frequency step:	■ 1 % with 3 s dwell time

5.9.5 Coupling points

Cable description (Port1):	AC power line:	L+N+PE
Screening:	<input type="checkbox"/> screened	■ unscreened
Status:	<input type="checkbox"/> passive	■ active
Signal transmission:	■ analogue	<input type="checkbox"/> digital
Length:	■ 0.3 m	

5.9.6 Test resultThe requirements are **Fulfilled**Performance Criterion: **A****Remarks:** During the test no deviation was detected to the selected operation mode(s).

5.10 Voltage dips

For test instruments and accessories used see section 6 part 6.10.

5.10.1 Description of the test location

Test location :	EMS Test Site
Power supply:	AC 230V/50Hz
Test condition:	Ambient Temperature: 24°C, Humidity:56%
Date of test :	21 November ~14 December 2018
Operator :	Duke

5.10.2 Severity levels of voltage dips

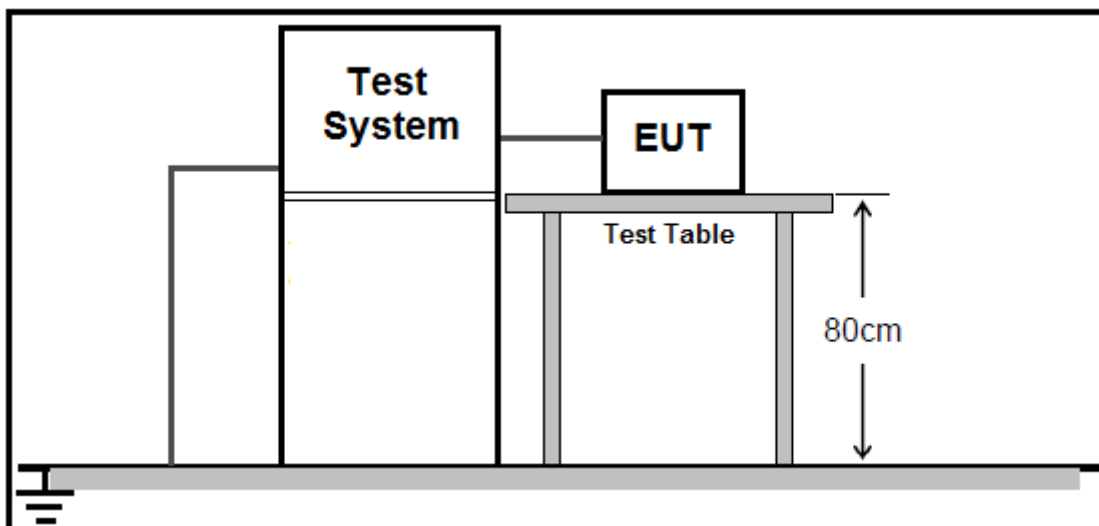
Test Level (%Ut)	Voltage Dips (%Ut)	Performance Criterion	Duration (in period)
0	100	B	0.5
0	100	B	1
70	30	C	25

5.10.3 Description of the test set-up

5.10.3.1 Operating Condition

The EUT is normal during the test, and the results of the maximum emanation are recorded

5.10.3.2 Block Diagram of Test Setup



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5.10.4 Test specification:

Nominal Mains Voltage (V_N):	■ AC 230V
Number of voltage fluctuations:	■ 3
Level of reduction(dip) / duration:	■ 100 % / 10ms
Level of reduction(dip) / duration:	■ 100 % / 20ms
Level of reduction(dip) / duration:	■ 30 % / 500ms

5.10.5 Test resultThe requirements are **Fulfilled**Performance Criterion: **B****Remarks:** During the test no deviation was detected to the selected operation mode(s).

5.11 Voltage Short interruptions

For test instruments and accessories used see section 6 part 6.11.

5.11.1 Description of the test location

Test location :	EMS Test Site
Power supply:	AC 230V/50Hz
Test condition:	Ambient Temperature: 24°C, Humidity:56%
Date of test :	21 November ~14 December 2018
Operator :	Duke

5.11.2 Severity levels of voltage short interruptions

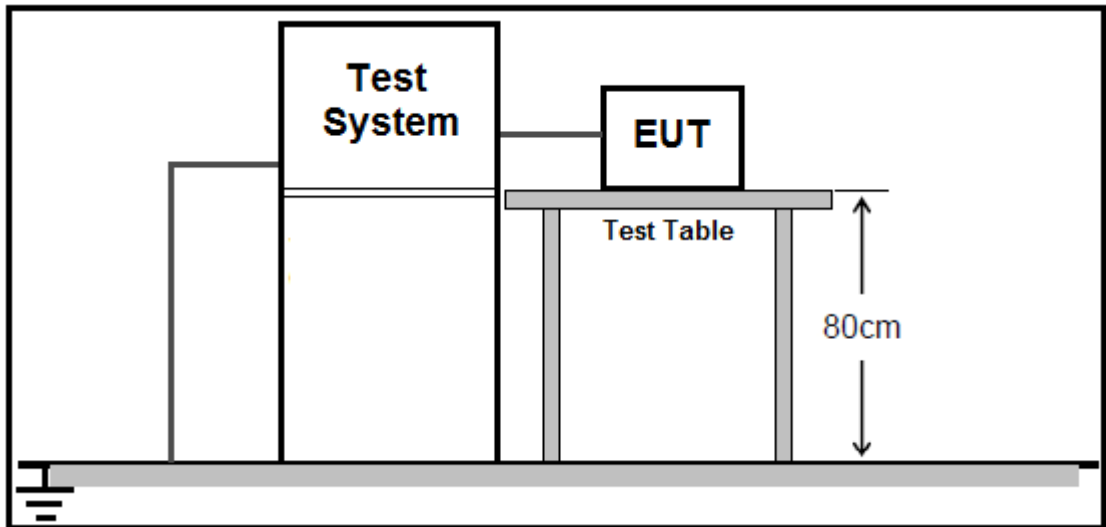
Test Level (%Ut)	Voltage Short Interruptions (%Ut)	Performance Criterion	Duration (in period)
0	100	C	250

5.11.3 Description of the test set-up

5.11.3.1 Operating Condition

The EUT is normal during the test, and the results of the maximum emanation are recorded

5.11.3.2 Block Diagram of Test Setup



5.11.4 Test specification:

Nominal Mains Voltage (V_N):	■ AC 230 V
Number of voltage fluctuations:	■ 3
Level of reduction(dip) / duration:	■ 5000 ms

5.11.5 Test resultThe requirements are **Fulfilled**Performance Criterion: **C****Remarks:** During the test no deviation was detected to the selected operation mode(s).

6 USED TEST EQUIPMENT

6.1					
Radiated disturbance (Electric field)					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Signal analyzer	ROHDE & SCHWARZ	FSIQ26	100311	2018/03/20
2	EMI Test Receiver	ROHDE & SCHWARZ	ESVS 10	842885/001	2018/10/23
3	Log per Antenna	ETS	3142C	00060447	2018/03/20
4	Log per Antenna	ROHDE & SCHWARZ	HL050	100186	2018/03/20
5	Pre-Amplifier	EMC	EMC330	980113	2018/03/20
6	Pre-Amplifier	EMC	EMC012645	980114	2018/03/20
7	EMI Test Software	Farad	EZ-EMC	N/A	N/A
6.2					
Conducted Disturbance					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	100868	2018/10/23
2	Artificial Mains	ROHDE & SCHWARZ	ESH3-Z5	832479/025	2018/10/23
3	Artificial Mains	ROHDE & SCHWARZ	ESH3-Z6	100140	2018/10/23
4	Pulse Limiter	ROHDE & SCHWARZ	ESHS-Z2	100301	2018/10/23
5	EMI Test Software	Farad	EZ-EMC	N/A	N/A
6.3					
Harmonic Current					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Harmonic And Flicker Analyzer	EMC Partner	Harmonics1000-1P	103488	2018/10/23
2	Harmonics-1000	EMC Partner	N/A	N/A	N/A
6.4					
Voltage Fluctuation and Flicker					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Harmonic And Flicker Analyzer	EMC Partner	Harmonics1000-1P	103488	2018/10/23
2	Harmonics-1000	EMC Partner	N/A	N/A	N/A
6.5					
Electrostatic Discharge					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ESD Simulator	Schlöder	SESD 230	106003	2018/10/23

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6.6					
RF Field Strength Susceptibility					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Signal Generator	ROHDE & SCHWARZ	SMY 01	843215/014	2018/10/23
2	Signal Generator	ROHDE & SCHWARZ	SML03	102986	2018/10/23
3	Amplifier	KALMUS	713FC	7385-1	2018/10/23
4	Power Meter	ROHDE & SCHWARZ	NRVS	842856/049	2018/10/23
5	Field Probe	ETS	HI-6005	00075047	2018/10/23
6	RS Test Software	Farad	EZ-RS	N/A	N/A
6.7					
Electrical Fast Transient/Burst					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMC test system Transient-1000	EMC Partner	Transient-1000	HAR1000-78	2018/10/23
2	3-Phase Coupling Network	EMC Partner	CDN1000	CDN1000-08	2018/10/23
3	Coupling Clamp	EMC Partner	SFT 410	0302015	2018/10/23
4	Genecs Software	EMC Partner	N/A	N/A	N/A
6.8					
Surge					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMC test system Transient-1000	EMC Partner	Transient-1000	HAR1000-78	2018/10/23
2	3-Phase Coupling Network	EMC Partner	CDN1000	CDN1000-08	2018/10/23
3	Coupling Clamp	EMC Partner	SFT 410	0302015	2018/10/23
4	Genecs Software	EMC Partner	N/A	N/A	N/A
6.9					
Conducted Susceptibility					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	RF generator / amplifier	Schlöder	CDG 6000	HU906007	2018/10/23
2	CDN	Schlöder	CDN M3	A3003008	2018/10/23
3	CDN	Schlöde	CDN T2	A3010005	2018/10/23
4	Attenuator	Abschwächer	DC-500MHz	N/A	2018/10/23
5	EM injection clamp	Liithi	EM101	35670	2018/10/23
6	CDG-6000 Software	Schlöder	N/A	N/A	N/A

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6.10					
Voltage Dips					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMC test system Transient-1000	EMC Partner	Transient-1000	HAR1000-78	2018/10/23
2	3-Phase Coupling Network	EMC Partner	CDN1000	CDN1000-08	2018/10/23
3	GenecsSoftware	EMC Partner	N/A	N/A	N/A
6.11					
Voltage Short Interruptions					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMC test system Transient-1000	EMC Partner	Transient-1000	HAR1000-78	2018/10/23
2	3-Phase Coupling Network	EMC Partner	CDN1000	CDN1000-08	2018/10/23
3	GenecsSoftware	EMC Partner	N/A	N/A	N/A

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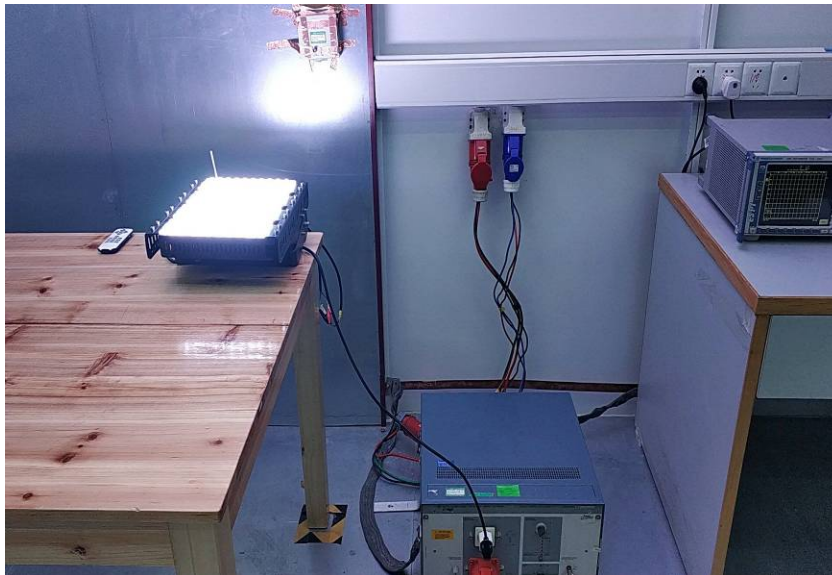
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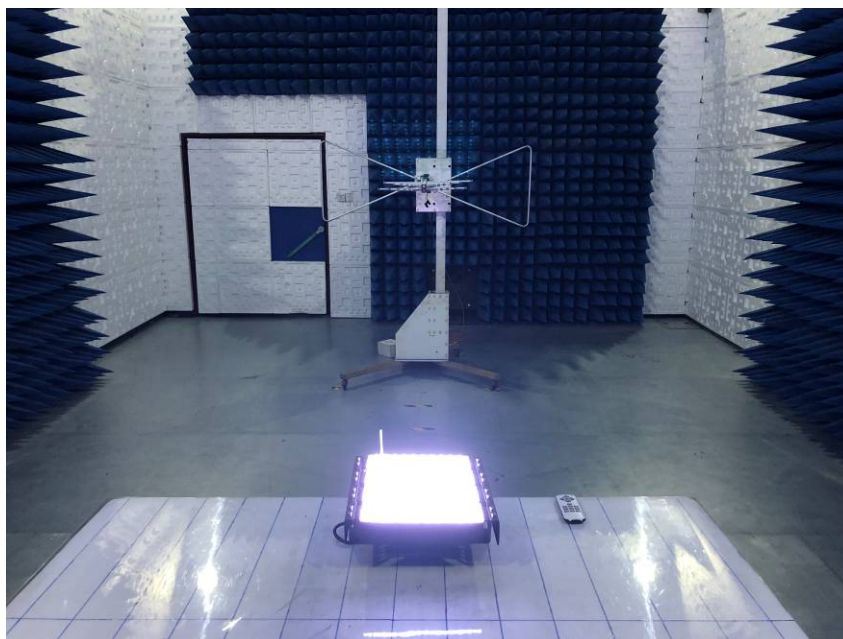
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7 TEST PHOTOGRAPHS

7.1. Photo of power line conducted emission measurement (C.E.)



7.2. Photo of radiated emission measurement (R.E. Electric field)



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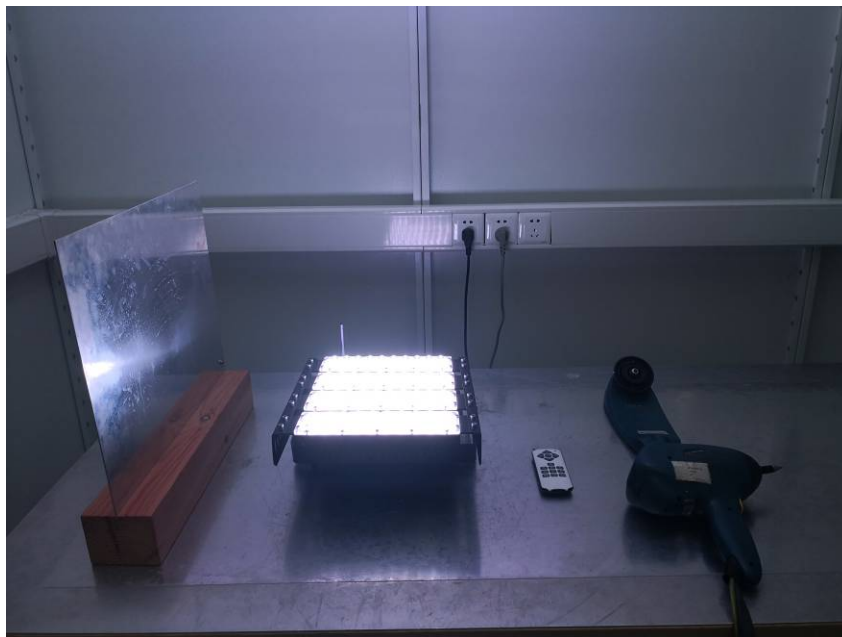
Fax: +86-20-38780406
E-mail: cts@cts-lab.com.cn

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7.3. Photo of harmonic current and flicker emission measurement (H.&F.)



7.4. Photo of electrostatic discharge Immunity measurement (E.S.D.)



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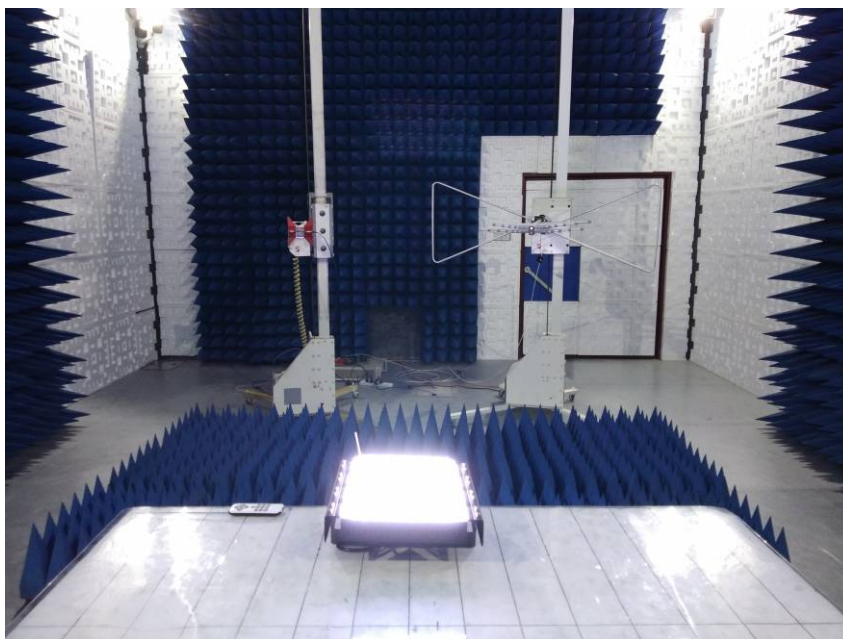
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7.5. Photo of RF field strength Immunity measurement (R.S.)



7.6. Photo of EFT/surge/Dips immunity measurement (E.F.T./Surge./Dips.)



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7.7. Photo of conducted disturbance Immunity measurement (C.S.)



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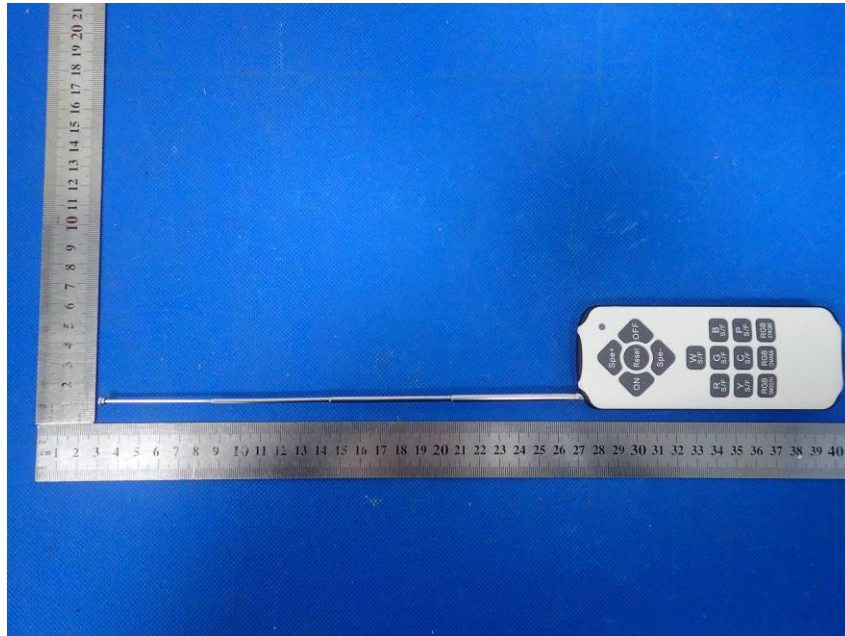
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8 External and Internal Photos of the EUT



TX External view 1



TX External view 2

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TX External view 3



TX External view 4

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TX External view 5



TX External view 6

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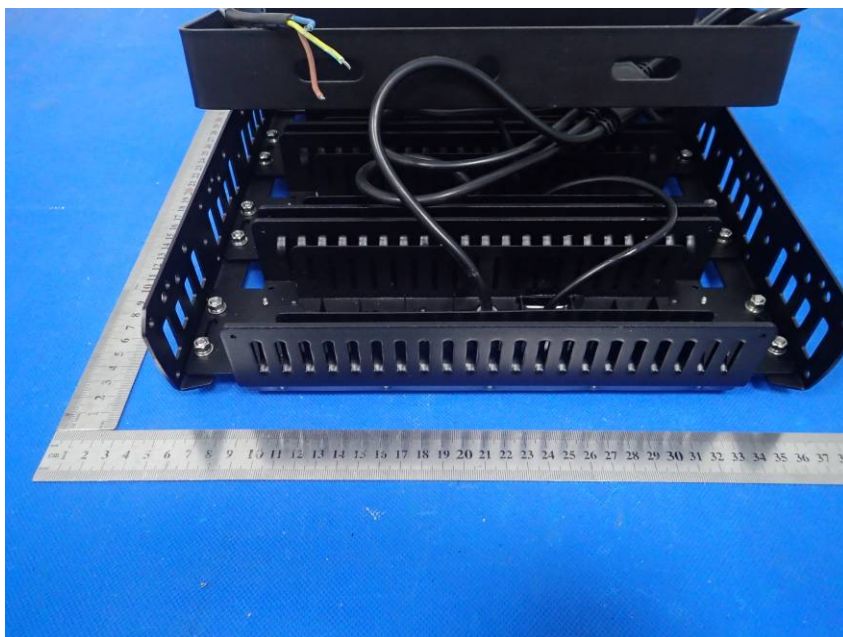
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RX External view 1



RX External view 2

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RX External view 3



RX External view 4

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RX External view 5



RX External view 6

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9 Manufacturer/ Approval holder Declaration

The following identical model(s):

AT247, T246, AT245, AT244, AT242, AT241, AT240, MFR-400

Belong to the tested device:

Product description: **RGB led floodlight**
Model name: **AT-243**

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