

# TEST REPORT

**Applicant:** Shenzhen Sunricher Technology Limited  
**Address of Applicant:** 3rd Floor,B building,Jia'an Industrial Building,Liu Xian Third road,No.72 area,Xin'an Street, Baoan District,Shenzhen,China  
**Manufacturer/Factory:** Shenzhen Sunricher Technology Limited  
**Address of Manufacturer/Factory:** 3rd Floor,B building,Jia'an Industrial Building,Liu Xian Third road,No.72 area,Xin'an Street, Baoan District,Shenzhen,China

### Equipment Under Test (EUT)

**Product Name:** RF LED CONTROLLER  
**Model No.:** Transmitter: SR-2835DIM, SR-2836D, SR-2835DIM(2PIN), 4991706, SR-2835CCT, SR-2835CCT(2PIN), 5991702, SR-2835RGB, SR-2835N , SR-2835N-CCT, SR-2835N-RGB, SR-2836NF, SR-2836R, SR-2836RCCT, SR-2836RGB, SR-2836DCCT, SR-2836DRGB  
Receiver: SR-1009CS, SR-1009CS3, SR-1009CS7

**Applicable standards:** EN 55015:2013/A1:2015  
EN 61547:2009

**Date of sample receipt:** July 06, 2017

**Date of Test:** July 07-12, 2017

**Date of report issued:** July 13, 2017

**Test Result :** PASS \*

\* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



**Robinson Lo**  
**Laboratory Manager**



This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

## 2 Version

Version No.	Date	Description
00	July 13, 2017	Original

**Prepared By:**

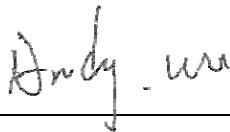


**Date:**

July 13, 2017

**Project Engineer**

**Reviewed By:**



**Date:**

July 13, 2017

**Reviewer**

### 3 Contents

	Page
1 COVER PAGE.....	1
2 VERSION .....	2
3 CONTENTS .....	3
4 TEST SUMMARY .....	4
5 GENERAL INFORMATION .....	5
5.1 GENERAL DESCRIPTION OF EUT .....	5
5.2 TEST MODE AND VOLTAGE .....	5
5.3 DESCRIPTION OF SUPPORT UNITS .....	5
5.4 MONITORING OF EUT FOR ALL IMMUNITY TEST .....	5
5.5 TEST FACILITY .....	6
5.6 TEST LOCATION.....	6
6 TEST INSTRUMENTS LIST .....	7
7 EMISSION TEST RESULTS .....	8
7.1 RADIATED ELECTROMAGNETIC DISTURBANCE(9kHz-30MHz).....	8
7.2 RADIATED ELECTROMAGNETIC DISTURBANCES(30MHz-300MHz).....	12
8 IMMUNITY TEST RESULTS .....	15
8.1 PERFORMANCE CRITERIA DESCRIPTION IN CLAUSE 4.2 OF EN 61547 .....	15
8.2 ELECTROSTATIC DISCHARGE.....	16
8.3 RADIO-FREQUENCY ELECTROMAGNETIC FIELDS .....	18
9 TEST SETUP PHOTO .....	20
10 EUT CONSTRUCTIONAL DETAILS .....	21

## 4 Test Summary

Test item	Test Requirement	Test Method	Class / Severity	Result
Radiated electromagnetic disturbances (9kHz-30MHz)	EN 55015	EN 55015	Table 3a	Pass
Radiated electromagnetic disturbances	EN 55015	EN 55015	Table 3b	Pass
Disturbance voltages	EN 55015	EN 55015	Table 2a	N/A
Harmonic Emission	EN 61000-3-2	EN 61000-3-2	Class C	N/A
Flicker Emission	EN 61000-3-3	EN 61000-3-3	Clause 5 of EN61000-3-3	N/A
Electrostatic discharges	EN 61547	EN 61000-4-2	Contact $\pm 4$ kV Air $\pm 8$ kV	Pass
Radio-frequency electromagnetic fields	EN 61547	EN 61000-4-3	3V/m 80%, 1kHz, AM	Pass
Fast Transients	EN 61547	EN 61000-4-4	AC $\pm 1.0$ kV	N/A
Surges	EN 61547	EN 61000-4-5	Table 10	N/A
Injected currents	EN 61547	EN 61000-4-6	3Vrms (emf), 80%, 1kHz Amp. Mod.	N/A
Voltage dips and short interruptions	EN 61547	EN 61000-4-11	0 % UT* for 0.5per 70 % UT* for 10per	N/A

Remark:

UT\* is the nominal supply voltage.

N/A: Not applicable.

## 5 General Information

### 5.1 General Description of EUT

Product Name:	RF LED CONTROLLER
Model No.:	Transmitter: SR-2835DIM, SR-2836D, SR-2835DIM(2PIN), 4991706, SR-2835CCT, SR-2835CCT(2PIN), 5991702, SR-2835RGB, SR-2835N , SR-2835N-CCT, SR-2835N-RGB, SR-2836NF, SR-2836R, SR-2836RCCT, SR-2836RGB, SR-2836DCCT, SR-2836DRGB Receiver: SR-1009CS, SR-1009CS3, SR-1009CS7
Test Model No.:	SR-1009CS
Remark:	<i>All above models are identical in the same PCB layout, interior structure and electrical circuits. The differences are color and model name for commercial purpose.</i>
Power supply:	DC12-48V

### 5.2 Test mode and voltage

<b>Test mode:</b>	
On mode	Keep the EUT in working status
<b>Test voltage:</b>	
RX:DC 12-48V	

### 5.3 Description of Support Units

None.
-------

### 5.4 Monitoring of EUT for All Immunity Test

Visual:	Monitor the work status
Audio:	N/A

## 5.5 Test Facility

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

• **FCC —Registration No.: 600491**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 600491, June 22, 2016.

• **Industry Canada (IC) —Registration No.: 9079A-2**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, August 15, 2016.

## 5.6 Test Location

Radiated immunity test was performed at:

China Shenzhen Academy of Metrology and Quality Inspection,  
Metrology and Quality Inspection building, Central Section of LongZhu Road, Nan Shan, Shenzhen

All other test items were performed at:

Global United Technology Services Co., Ltd.  
Address: No. 301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102  
Tel: 0755-27798480; Fax: 0755-27798960

## 6 Test Instruments List

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.0(L)*6.0(W)* 6.0(H)	GTS250	July.03 2015	July.02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	ESU EMI Test Receiver	R&S	ESU26	GTS203	June. 28 2017	June. 27 2018
4	BiConiLog Antenna	SCHWARZBECK	VULB9163	GTS214	June. 28 2017	June. 27 2018
5	RF Amplifier	HP	8347A	GTS204	June. 28 2017	June. 27 2018
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Coaxial cable	GTS	N/A	GTS210	N/A	N/A
8	Thermo meter	N/A	N/A	GTS256	June. 28 2017	June. 27 2018

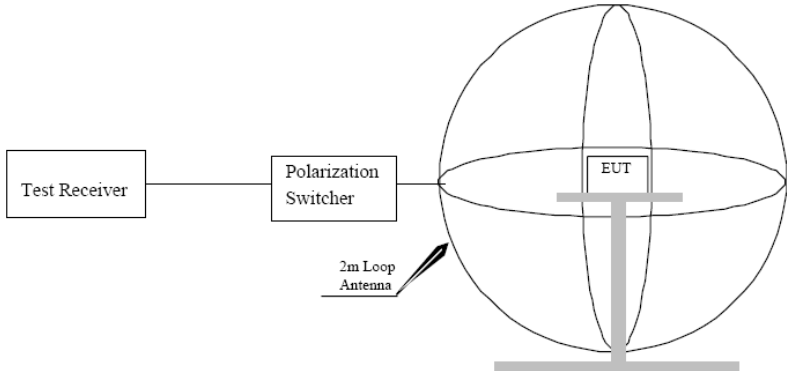
ESD						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	ESD Simulator	KIKUSUI	KES4021A	GTS242	June. 28 2017	June. 27 2018
2	Thermo meter	KTJ	TA328	GTS243	June. 28 2017	June. 27 2018

Radiated Electromagnetic Disturbance:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.16 2014	May.15 2019
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 28 2017	June. 27 2018
3	TPIPLE-LOOP ANTENNA	EVERFINE	LLA-2	GTS539	June. 28 2017	June. 27 2018
4	Pulse Limiter	R&S	ESH3-Z2	GTS224	June. 28 2017	June. 27 2018
5	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 28 2017	June. 27 2018
6	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	June. 28 2017	June. 27 2018

Radio-frequency electromagnetic fields:					
Item	Test Equipment	Manufacturer	Model No.	Serial NO.	Cal.Due Date (mm-dd-yy)
1	Signal Generator	Rohde & Schwarz	SMT03	100059	Jan. 16 2018
2	Power Amplifier	AR	150W1000	300999	Jan. 16 2018
3	Power Amplifier	AR	25S1G4AM1	305993	Jan. 18 2018
4	Power Amplifier	AR	150A220M6	305965	Mar. 05 2018
5	Broadband antenna	CHASE	CBL6111C	2576	Jan. 16 2018
6	Horn Antenna	AR	AT4002A	#N/A	#N/A
7	Anechoic Chamber	Albatross Projects	MCDC	----	Oct. 06 2017

## 7 Emission Test Results

### 7.1 Radiated Electromagnetic Disturbance(9kHz-30MHz)

Test Requirement:	EN 55015				
Test Method:	EN55015				
Test Frequency Range:	9kHz to 30MHz				
Receiver set:	Frequency	Detector	RBW	VBW	Value
	9KHz~150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
	150KHz~30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
Limit:	Frequency range (MHz)		Limits for loop diameter dBuA @2m		
	0.009-0.070		88		
	0.070-0.150		88 to 58*		
	0.15-3.0		58 to 22*		
	3.0-30		22		
*Decreasing linearly with the logarithm of the frequency. For electrodeless lamps and luminaires, the limit in the frequency range of 2,2 MHz to 3,0 MHz is 58 dB(μA) for 2 m, 51dB(μA) for 3 m and 45 dB(μA) for 4 m loop diameter.					
Test Setup:					
Test procedure	<ol style="list-style-type: none"> <li>1. An initial pre-scan was performed in the 2m loop antenna using the spectrum analyser in peak detection mode.</li> <li>2. The EUT was measured for X(A), Y(B), Z(C) polarities.</li> <li>3. No further quasi-peak measurements were performed since no peak emissions from the EUT were detected within 6dB of the limit for 2m diameter loop antenna.</li> </ol>				
Test Instruments:	Temp.: 25 °C	Humid.: 50%	Press.: 1 012mbar		
Measurement Record:	Uncertainty: ± 4.5dB				
Test Instruments:	Refer to section 6 for details				
Test mode:	Refer to section 5.2for details				
Test results:	Pass				



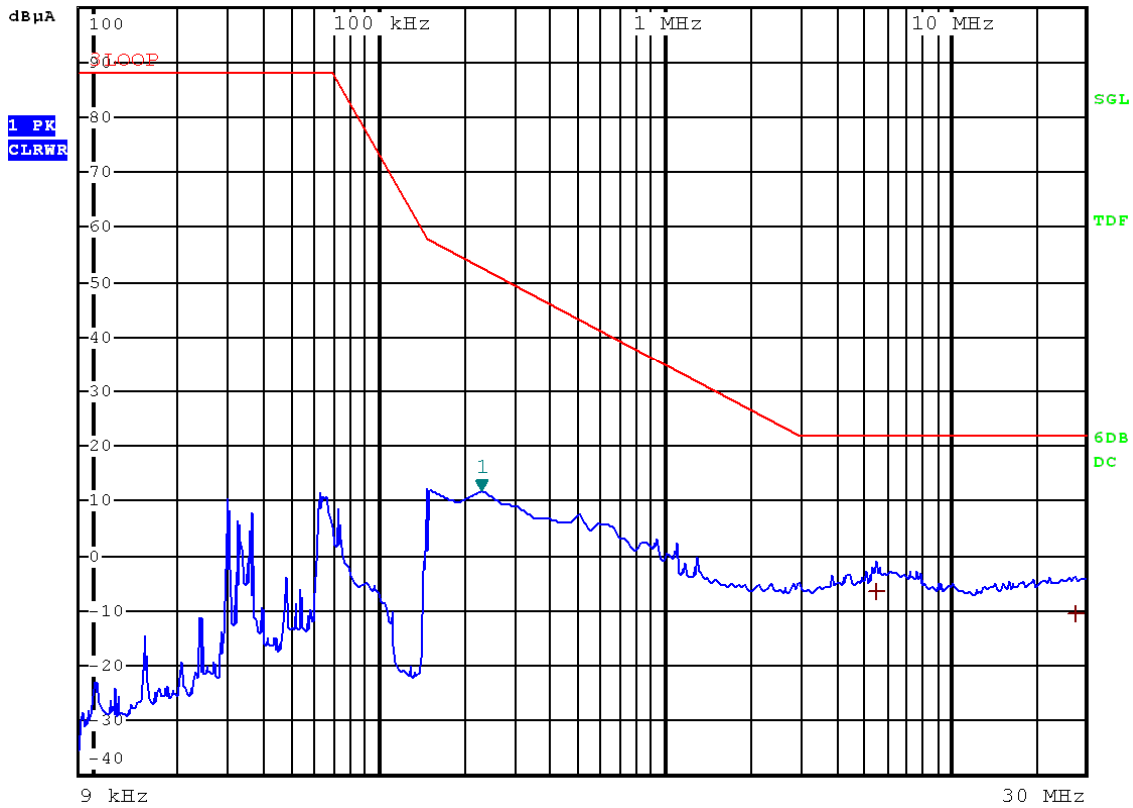
## Measurement Data

X:



RBW 9 kHz  
MT 1 s  
PREAMP OFF

Att 10 dB



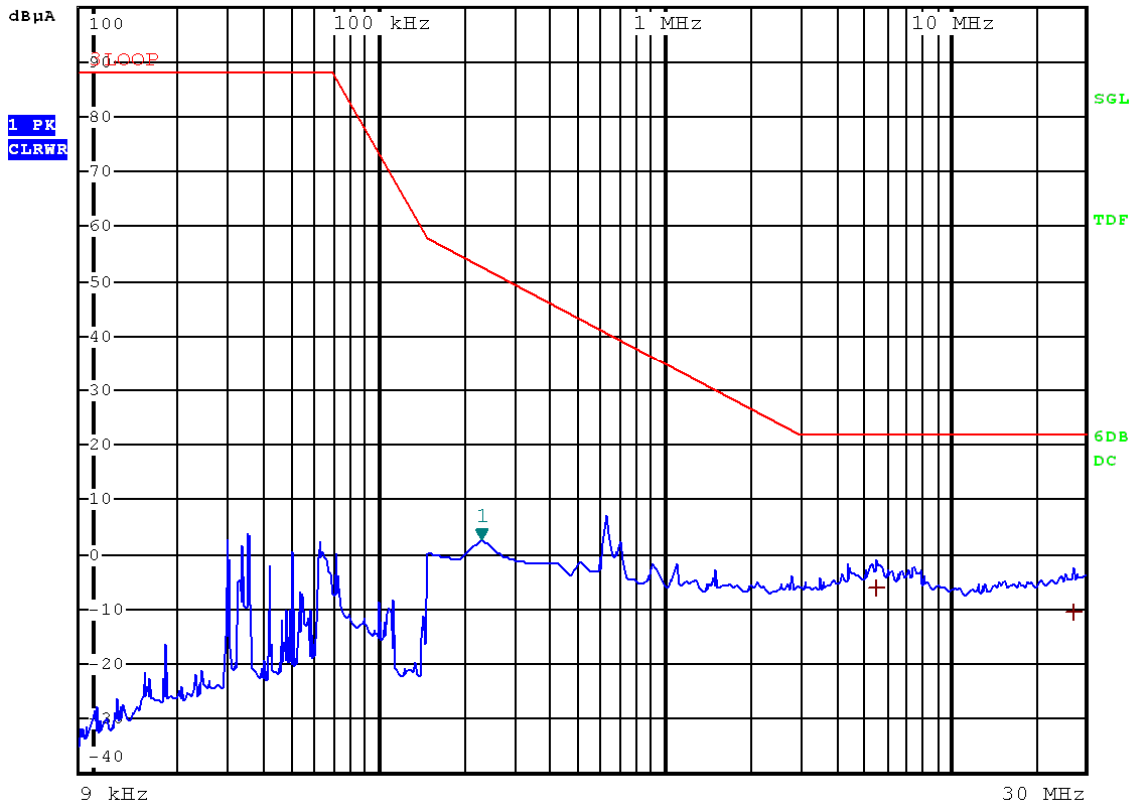
Trace1:	3LOOP		
Trace2:	---		
Trace3:	---		
	TRACE	FREQUENCY	LEVEL dBµA
1	Quasi Peak	5.51 MHz	-6.31
1	Quasi Peak	27.77 MHz	-10.37
			DELTA LIMIT dB
			-28.31
			-32.37

Y:



REW 9 kHz  
MT 1 s  
PREAMP OFF

Att 10 dB



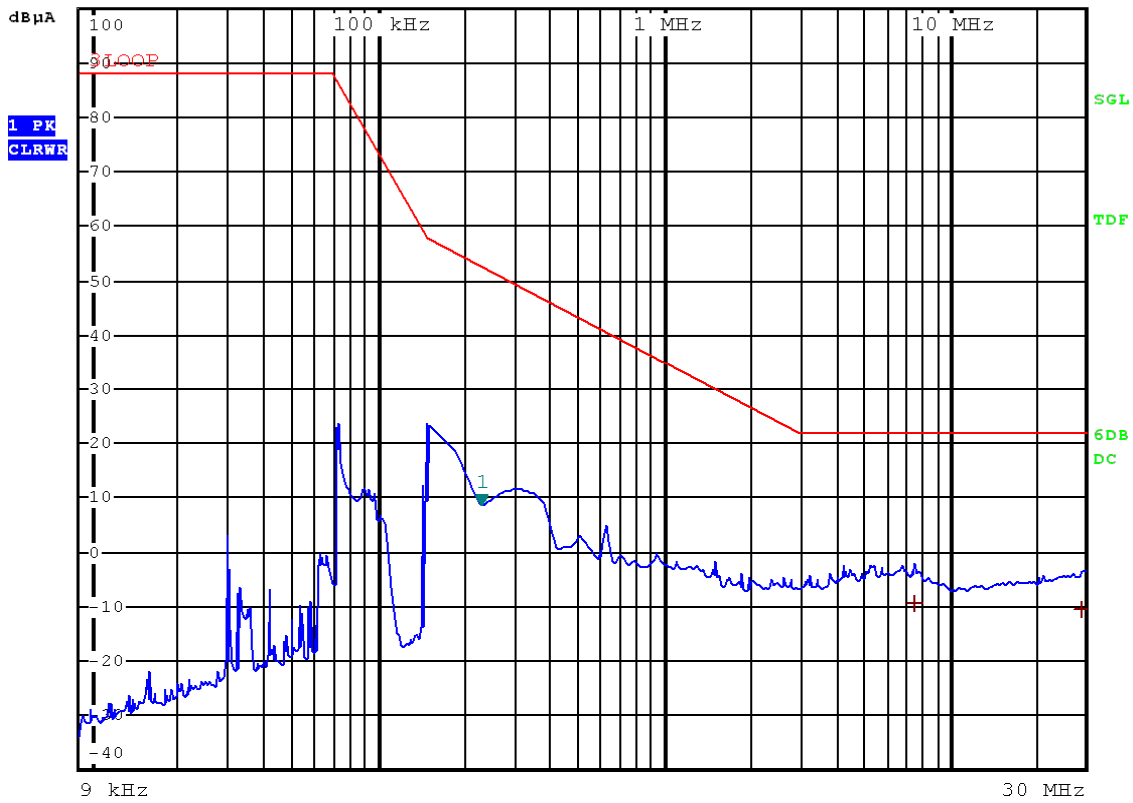
Trace1:	3LOOP		
Trace2:	---		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµA	DELTA LIMIT dB
1 Quasi Peak	5.51 MHz	-5.89	-27.89
1 Quasi Peak	27.02 MHz	-10.51	-32.51

Z:



REW 9 kHz  
MT 1 s  
PREAMP OFF

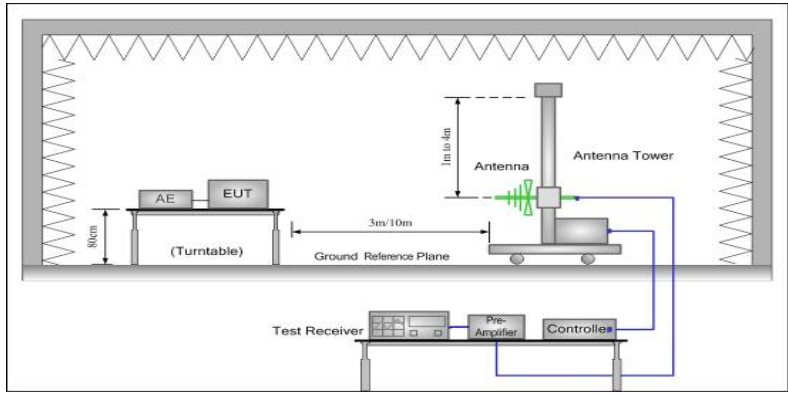
Att 10 dB



```
Trace1:      3LOOP
Trace2:      ---
Trace3:      ---
```

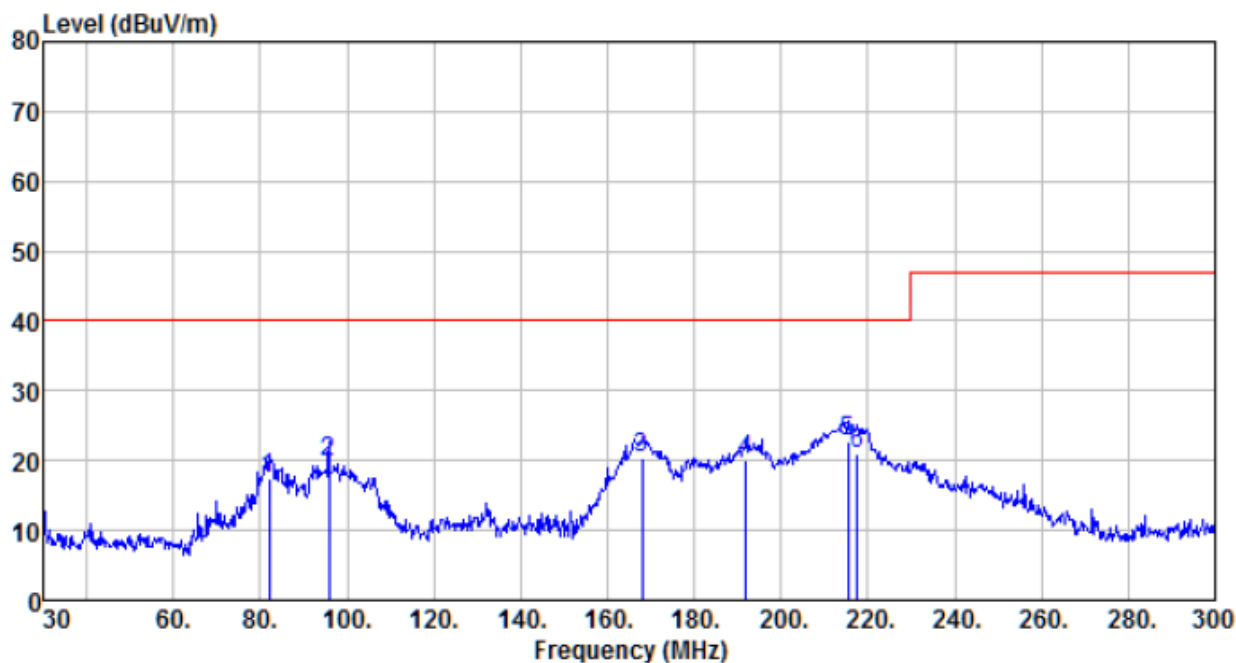
TRACE	FREQUENCY	LEVEL dBµA	DELTA LIMIT dB
1 Quasi Peak	7.44 MHz	-9.45	-31.45
1 Quasi Peak	28.98 MHz	-10.31	-32.31

## 7.2 Radiated electromagnetic disturbances(30MHz-300MHz)

Test Requirement:	EN 55015	
Test Method:	EN 55015	
Test Frequency Range:	30MHz to 300MHz	
Test site:	Measurement Distance: 3m	
Limit:	Frequency range(MHz)	Limit @3m (dBuV)
	30 to 230	40.00
	230 to 300	47.00
* At the transition frequency, the lower limit applies.		
Test setup:		
Test procedure	<ol style="list-style-type: none"> <li>1. The radiated emissions test was conducted in a semi-anechoic chamber.</li> <li>2. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.</li> <li>3. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT.</li> <li>4. The frequencies of maximum emission were determined in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.</li> </ol>	
Measurement Record:	Uncertainty: ± 4.50dB	
Test Instruments:	Refer to section 6 for details	
Test mode:	Refer to section 5.2for details	
Test results:	Pass	

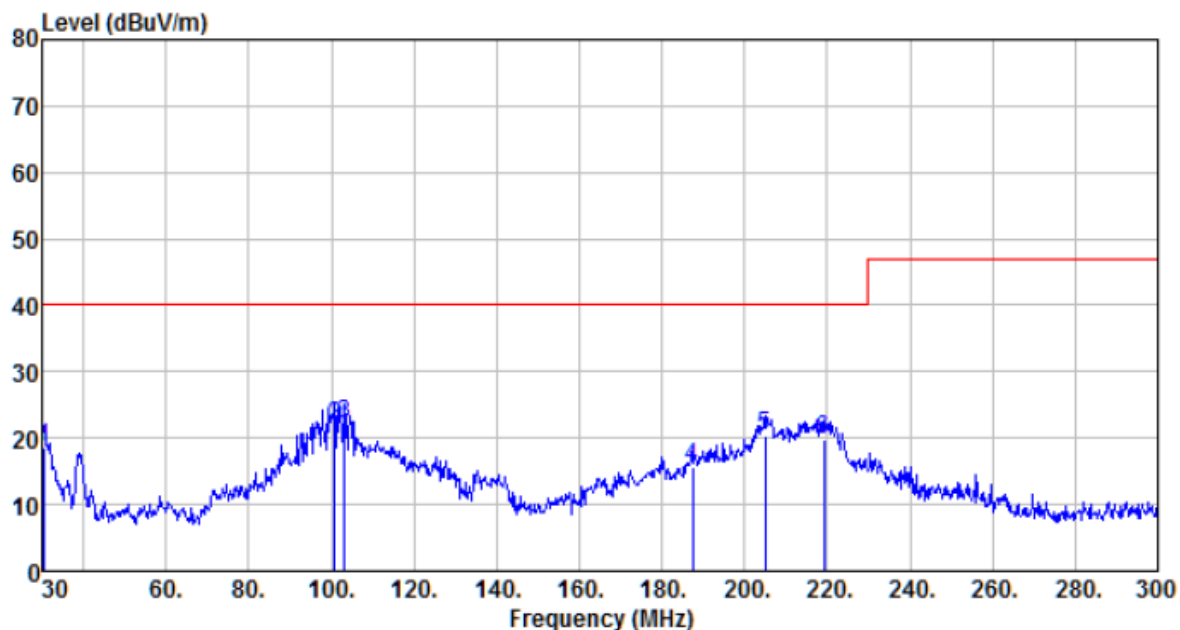
### Measurement Data

Test mode:	On mode	Antenna Polarity:	Horizontal
------------	---------	-------------------	------------



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
82.110	37.80	8.40	1.05	29.79	17.46	40.00	-22.54	QP
95.880	37.01	11.35	1.16	29.72	19.80	40.00	-20.20	QP
167.970	39.61	8.33	1.68	29.32	20.30	40.00	-19.70	QP
192.000	37.51	9.87	1.80	29.23	19.95	40.00	-20.05	QP
215.490	39.47	10.69	1.93	29.35	22.74	40.00	-17.26	QP
217.650	37.70	10.78	1.95	29.37	21.06	40.00	-18.94	QP

Test mode:	On mode	Antenna Polarity:	Vertical
------------	---------	-------------------	----------



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV	Limit level dBuV/m	Over limit dB	Remark
30.540	36.91	11.30	0.56	30.10	18.67	40.00	-21.33	QP
100.740	38.39	12.10	1.20	29.70	21.99	40.00	-18.01	QP
103.170	38.72	11.80	1.22	29.68	22.06	40.00	-17.94	QP
187.410	33.68	9.40	1.78	29.25	15.61	40.00	-24.39	QP
204.960	37.29	10.39	1.87	29.26	20.29	40.00	-19.71	QP
219.270	36.30	10.88	1.95	29.38	19.75	40.00	-20.25	QP

## 8 Immunity Test Results

### 8.1 Performance Criteria Description in Clause 4.2 of EN 61547

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 lamp(s) may be extinguished. After the test, within 30 min, all functions 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.

## 8.2 Electrostatic Discharge

Test Requirement:	EN 61547
Test Method:	EN 61000-4-2
Discharge Voltage:	Contact Discharge: $\pm 4\text{kV}$ Air Discharge: $\pm 2, \pm 4, \pm 8$ HCP/VCP: $\pm 4\text{kV}$
Polarity:	Positive & Negative
Number of Discharge:	Minimum 10 times at each test point.
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum
Limit:	Criteria B
Test setup:	
Test Procedure:	<p><b>1. Air discharge:</b> The test was applied on non-conductive surfaces of EUT. The round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT. After each discharge, the discharge electrode was removed from the EUT. The generator was re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure was repeated until all the air discharge completed</p> <p><b>2. Contact Discharge:</b> The test was applied on conductive surfaces of EUT. the generator was re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. the tip of the discharge electrode was touch the EUT before the discharge switch was operated.</p> <p><b>3. Indirect discharge for horizontal coupling plane</b> At least 10 single discharges shall be applied at the front edge of each HCP opposite the centre point of each unit of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge. Consideration should be given to exposing all sides of the EUT.</p> <p><b>4. Indirect discharge for vertical coupling plane</b></p>



	At least 10 single discharges were applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, was placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges were applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.
Test environment:	Temp.: 24 °C Humid.: 51% Press.: 1 012mbar
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

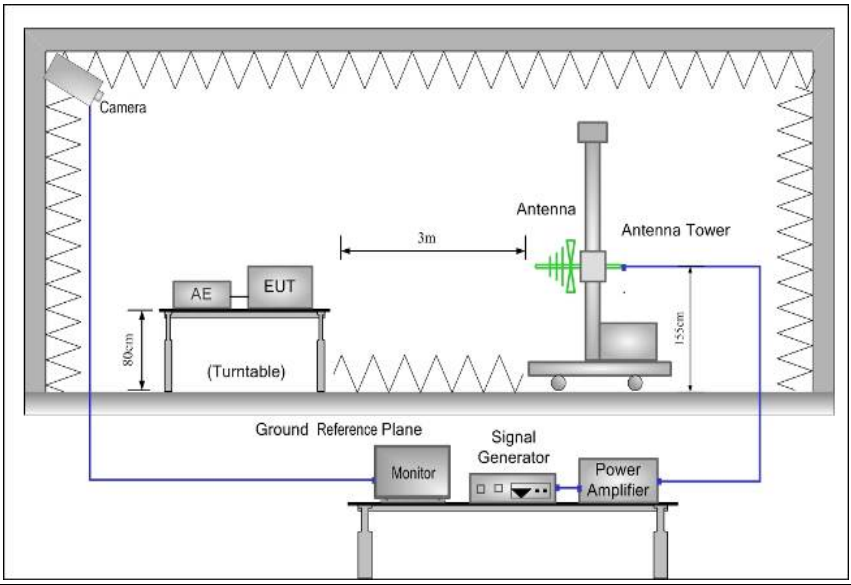
Measurement Record:

Test points:	I: Metal, Screws			
	II: Key press, Screen, Gap, Holes			
Direct discharge				
Discharge Voltage (KV)	Type of discharge	Test points	Observations (Performance Criterion)	Result
± 4	Contact	I	A	Pass
± 2, ± 4, ± 8	Air	II	A	Pass
Indirect discharge				
Discharge Voltage (KV)	Type of discharge	Test points	Observation Performance	Result
± 4	HCP-Bottom/Top/ Front/Back/Left/Right	Edge of the HCP	A	Pass
± 4	VCP-Front/Back /Left/Right	Center of the VCP	A	Pass

Remark:

A: No degradation in performance of the EUT was observed.

## 8.3 Radio-frequency electromagnetic fields

Test Requirement:	EN 61547
Test Method:	EN 61000-4-3
Frequency range:	80MHz to 1GHz
Test Level:	3V/m
Modulation:	80%, 1kHz Amplitude Modulation
Performance Criterion:	Criteria A
Test setup:	 <p>The diagram illustrates the test setup within an electromagnetic chamber. A camera is positioned at the top left. An antenna is mounted on a tower, with a distance of 3m between the antenna and the EUT. The EUT is placed on a turntable with an AE (Auxiliary Equipment) on top. The turntable is 80cm high. The antenna tower is 1.55m high. A ground reference plane is shown below the chamber. Below the chamber, a monitor, signal generator, and power amplifier are connected to the antenna tower.</p>
Test Procedure:	<ol style="list-style-type: none"> <li>1. For table-top equipment, the EUT was placed in the chamber on a non-conductive table 0.8m high. For arrangement of floor-standing equipment, the EUT was mounted on a non-conductive support 0.1m above the supporting plane. For human body-mounted equipment, the EUT may be tested in the same manner as table top items.</li> <li>2. If possible, a minimum of 1 m of cable is exposed to the electromagnetic field. Excess length of cables interconnecting units of the EUT shall be bundled low-inductively in the approximate center of the cable to form a bundle 30 cm to 40 cm in length.</li> <li>3. The EUT was initially placed with one face coincident with the calibration plane. The EUT face being illuminated was contained within the UFA (Uniform Field Area).</li> <li>4. The frequency ranges to be considered were swept with the signal modulated and pausing to adjust the RF signal level or to switch oscillators and antennas as necessary. Where the frequency range was swept incrementally, the step size was not exceed 1 % of the preceding frequency value.</li> <li>5. The dwell time of the amplitude modulated carrier at each frequency was not be less than the time necessary for the EUT to be exercised and to respond, and was not less than 0,5 s.</li> <li>6. The test normally was performed with the generating antenna facing</li> </ol>

	<p>each side of the EUT.</p> <p>7. The polarization of the field generated by each antenna necessitates testing each selected side twice, once with the antenna positioned vertically and again with the antenna positioned horizontally.</p> <p>8. The EUT was performed in a configuration to actual installation conditions, a video camera and/or a audio monitor were used to monitor the performance of the EUT.</p>
Test environment:	Temp.: 25 °C Humid.: 52% Press.: 1 012mbar
Test Instruments:	Refer to section 6 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

**Measurement Record:**

Frequency	Level	Modulation	Antenna Polarization	EUT Face	Observations (Performance Criterion)
80 MHz-1 GHz	3 V/m	1 kHz, 80 % Amp. Mod, 1 % increment, dwell time=3seconds	V	Front	A
			H		A
			V	Rear	A
			H		A
			V	Left	A
			H		A
			V	Right	A
			H		A
			V	Top	A
			H		A
			V	Bottom	A
			H		A

*Remarks:*

*A: No degradation in the performance of the EUT was observed.*

## 9 Test Setup Photo

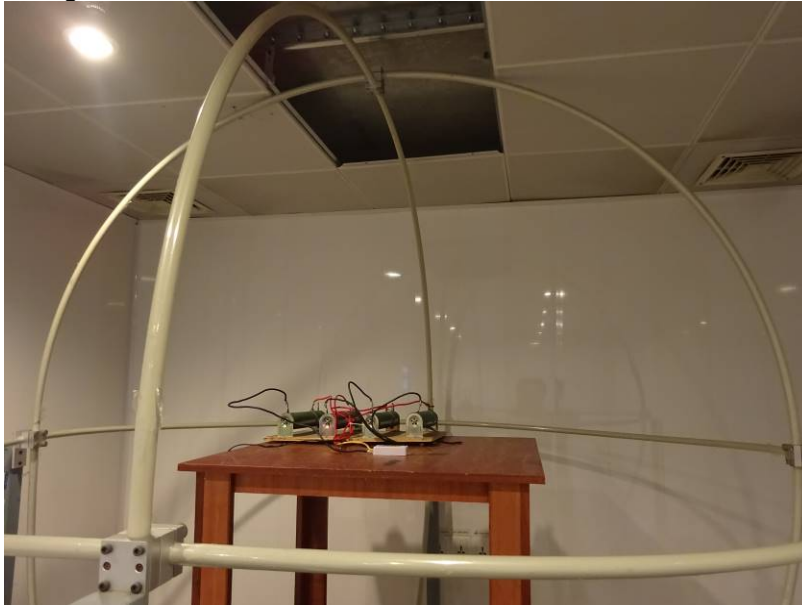
Radiated Emission



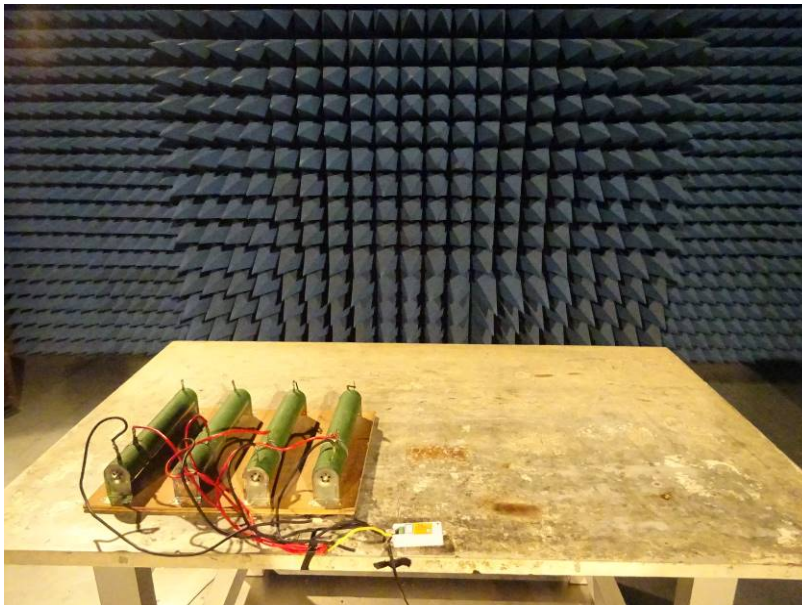
Electrostatic discharge



## Radiated Electromagnetic Disturbance



## RS



## 10 EUT Constructional Details

Reference to the test report No. GTS201707000039E01

-----End-----