



TEST REPORT

Product Name: LED NIGHT LIGHT
Test Model: MZ3100
Prepared For: FUZHOU ZHONGXIN ELECTRONIC CO.LTD.
Address: 4th FLOOR HENGFA BUILDING 861 PANYU ROAD
CANGSHAN AREA FUZHOU FUJIAN CHINA
Manufacturer: FUZHOU ZHONGXIN ELECTRONIC CO.LTD.
Address: 4th FLOOR HENGFA BUILDING 861 PANYU ROAD
CANGSHAN AREA FUZHOU FUJIAN CHINA
Prepared By: Shenzhen BCTC Technology Co., Ltd.
Address: NO. 101, Yousong Road, Longhua New District, Shenzhen,
Guangdong P.R. China
Sample Received Date: Dec. 10, 2018
Sample tested Date: Dec. 10, 2018 to Dec. 17, 2018
Issue Date: Dec. 17, 2018
Report No.: BCTC-YLH1812100065E
Test Standards: EN 55015:2013+A1:2015, EN 61547: 2009
EN 61000-3-3: 2013
Test Results: PASS

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Approved by:



Galt. Ruan

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(Note: N/A means not applicable)



1. VERSION

Report No.	Issue Date	Description	Approved
BCTC-YLH1812100065E	Dec. 17, 2018	Original	Valid



2. TEST SUMMARY

The Product has been tested according to the following specifications:

EMISSION		
Standard	Test Item	Test result
EN 55015	Disturbance voltages (CE)	Pass
EN 55015	Radiated disturbance in frequency range 9KHz to 30MHz (ME)	Pass
EN 55015	Radiated disturbance in frequency range 30MHz to 300MHz (RE)	Pass
EN 61000-3-2	Harmonic current emission(H)	N/A
EN 61000-3-3	Voltage fluctuations & flicker(F)	Pass

IMMUNITY (EN 61547)		
Standard	Test Item	Test result
IEC 61000-4-2	Electrostatic discharge((ESD)	Pass
IEC 61000-4-3	Radio frequency electromagnetic fields(RS)	Pass [#]
IEC 61000-4-4	Fast transients(EFT)	Pass
IEC 61000-4-5	Surges	Pass
IEC 61000-4-6	Injected currents(CS)	Pass
IEC 61000-4-8	Power frequency magnetic fields(PFMF)	N/A ²
IEC 61000-4-11	Voltage dips and interruptions(DIPS)	Pass

Remark:

"#"indicates the testing item(s) was (were) fulfilled by subcontracted lab.

1. The Product is not discharging lamp and its power is less than 25W, so it deems to fulfil this standard without testing.
2. The Product doesn't contain any device susceptible to magnetic fields.



3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Test item	Value (dB)
Conducted Emission	1.82
Radiated Emission	2.51

4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Ratings: AC 230V 50/60Hz 0.5w

Model difference: N/A

4.2 Test Setup Configuration

See test photographs attached in EUT TEST SETUP PHOTOGRAPHS for the actual connections between Product and support equipment.



4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Data Cable	Power Cord
1.	---	---	---	---	---	---

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.



4.4 Test Mode

Test item	Test Mode	Test Voltage
Disturbance voltages (CE)(9KHz-30MHz)	Working	AC 230V/50Hz*
Radiated disturbance in frequency range 9KHz to 30MHz (ME)	Working	AC 230V/50Hz*
Radiated disturbance in frequency range 30MHz to 300MHz (RE)	Working	AC 230V/50Hz*
Harmonic current emission(H) Class <u>A</u>	Working	AC 230V/50Hz*
Voltage fluctuations & flicker(F)	Working	AC 230V/50Hz*
Electrostatic discharge (ESD) B <input checked="" type="checkbox"/> Air Discharge: ±2,4,8kV <input checked="" type="checkbox"/> Contact Discharge: ±2,4kV <input checked="" type="checkbox"/> HCP & VCP: ±2,4kV	Working	AC 230V/50Hz
Radio frequency electromagnetic fields(RS) A 80MHz-1000MHz, 3V/m,80%	Working	AC 230V/50Hz
Electrical fast transients/burst (EFT) B <input checked="" type="checkbox"/> 1kV AC(Input) <input type="checkbox"/> 0.5kV DC(Input) <input type="checkbox"/> 0.5kV signal,Telec,control	Working	AC 230V/50Hz
Surges <input checked="" type="checkbox"/> 0.5, 1kV Line-Line, B <input type="checkbox"/> 0.5, 1, 2kV Line-PE, N-PE B Line-Line:90°+0.5&+1kV,270°-0.5&-1kV Line-PE, N-PE:90°+0.5,+1,+2kV,270°-0.5,-1,-2kV	Working	AC 230V/50Hz
Injected Currents (CS) A 0.15MHz to 80MHz 3V <input checked="" type="checkbox"/> AC(Input) <input type="checkbox"/> DC(Input) <input type="checkbox"/> signal,control	Working	AC 230V/50Hz
Voltage dips and interruptions (DIPS) 0% 0.5P B 40% 500ms C 70% 5000ms C	Working	AC 230V/50Hz
All test mode were tested and passed, only Disturbance voltages, ME, Radiated disturbance, Harmonic Current Emissions and Voltage Fluctuations and Flicker shows (*) is the worst case mode which were recorded in this report.		



5. TEST FACILITY AND TEST INSTRUMENT USED

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

5.2 Test Instrument Used

Disturbance voltages Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
Receiver	R&S	ESR	102075	Jun. 13, 2018	Jun. 13, 2019
LISN	R&S	ENV216	101375	Jun. 13, 2018	Jun. 13, 2019

ME Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
Receiver	R&S	ESR	102075	Jun. 13, 2018	Jun. 13, 2019
3-Loop Antenna	DAZE	ZN30401	13017	Jun. 13, 2018	Jun. 13, 2019

Radiated disturbance Test (966 chamber)					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
966 chamber	ChengYu	966 Room	966	Jun. 13, 2018	Jun. 13, 2019
Receiver	R&S	ESRP	101154	Jun. 13, 2018	Jun. 13, 2019
Amplifier	Schwarzbeck	BBV9744	9744-0037	Jun. 13, 2018	Jun. 13, 2019
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	VULB9163-942	Jun. 13, 2018	Jun. 13, 2019

Harmonic / Flicker Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
Harmonic & Flicker Tester	LAPLAEC	AC2000A	439263	Jun. 13, 2018	Jun. 13, 2019
AC Power Supply	LAPLAEC	PCR4000 M	631589	Jun. 13, 2018	Jun. 13, 2019

Electrostatic discharge immunity Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.



ESD Tester	3C TEST	EDS 30V	ES0121614	Jun. 13, 2018	Jun. 13, 2019
ESD Tester	KIKISUI	KES4201A	UH002321	Jun. 13, 2018	Jun. 13, 2019

Radio frequency electromagnetic fieldsTest (SMQ --- site)					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
Signal Generator	HP	8648A	3625U0057 3	Jun. 13, 2018	Jun. 13, 2019
Amplifier	A&R	500A100	17034	Jun. 13, 2018	Jun. 13, 2019
Amplifier	A&R	100W/1000M 1	17028	Jun. 13, 2018	Jun. 13, 2019
Audio Analyzer (20Hz~1GHz)	Panasonic	2023B	202301/428	Jun. 13, 2018	Jun. 13, 2019
Isotropic Field Probe	A&R	FP2000	16755	Jun. 13, 2018	Jun. 13, 2019
Antenna	EMCO	3108	9507-2534	Jun. 13, 2018	Jun. 13, 2019
Log-periodic Antenna	A&R	AT1080	16812	Jun. 13, 2018	Jun. 13, 2019

Fast transients and Surge and Voltage dips and interruptions immunity Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
Compact Generator	TRANSIENT	TRA2000	646	Jun. 13, 2018	Jun. 13, 2019
Coupling Clamp	PARTNER	CN-EFT1000	CN-EFT1000-1624	Jun. 13, 2018	Jun. 13, 2019

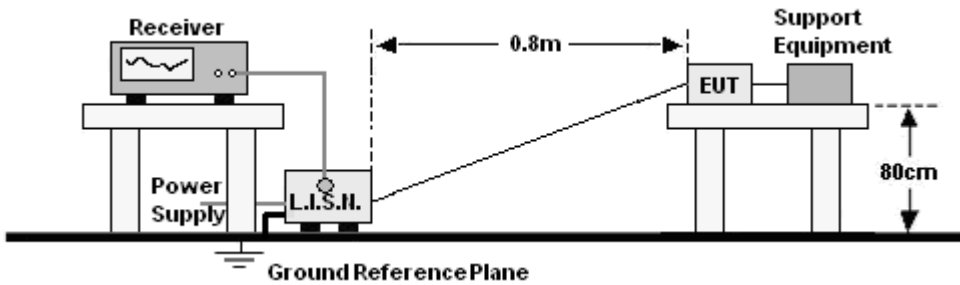
Injected currents immunity Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
C/S Test System	SCHLODER	CDG-6000-75	126B1405/2016	Jun. 13, 2018	Jun. 13, 2019
Attenuator	SCHLODER	6DB DC-1G	HA1630	Jun. 13, 2018	Jun. 13, 2019
CDN	SCHLODER	CDN M2/M3	A2210389/2016	Jun. 13, 2018	Jun. 13, 2019
Injection Clamp	SCHLOBER	EMCL-20	132A1272/2016	Jun. 13, 2018	Jun. 13, 2019

Power frequency magnetic fields immunity Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
Magnetic field generator	HTEC	HPFMF	15701	Jun. 13, 2018	Jun. 13, 2019

6. DISTURBANCE VOLTAGES

6.1 Block Diagram Of Test Setup

For mains ports:



6.2 Limit

Disturbance voltage limits at mains terminals

Frequency range (MHz)	Limits dB(μ V)	
	Quasi-peak	Average
0,009 to 0,05	110	--
0,05 to 0,15	90 to 80*	--
0,15 to 0,50	66 to 56*	56 to 46*
0,50 to 5	56	46
5 to 30	60	50

Note:

1. The lower limit shall apply at the transition frequencies.
2. *Decreasing linearly with logarithm of frequency.
3. For electrodeless lamps and luminaries, the limit in the frequency range of 2.51MHz to 3MHz is 73 dB(μ V) quasi-peak and 63 dB(μ V) average.

Frequency range (MHz)	Limits dB(μ V)	
	Quasi-peak	Average
0,15 to 0,50	84-74	74-64
0,50 to 30	74	64

Note: *Decreasing linearly with logarithm of frequency.



6.3 Test procedure

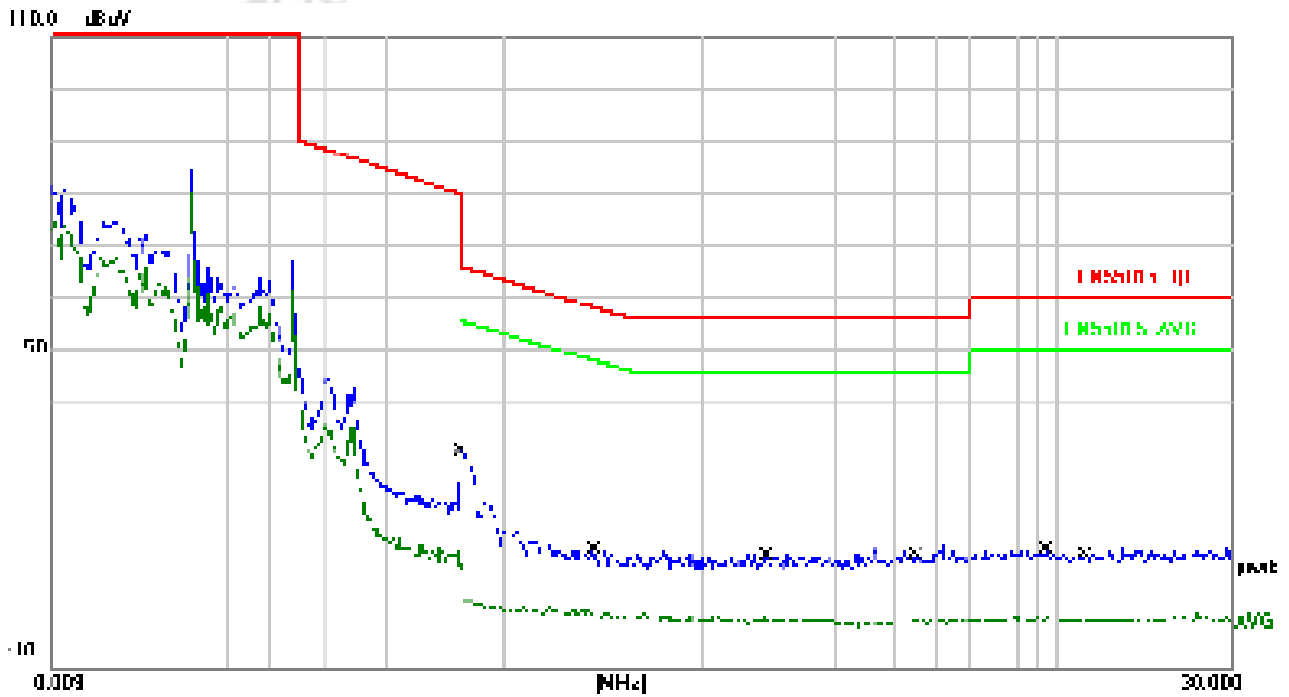
For mains ports:

- a. The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
- b. The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.
- c. For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.



6.4 Test Result

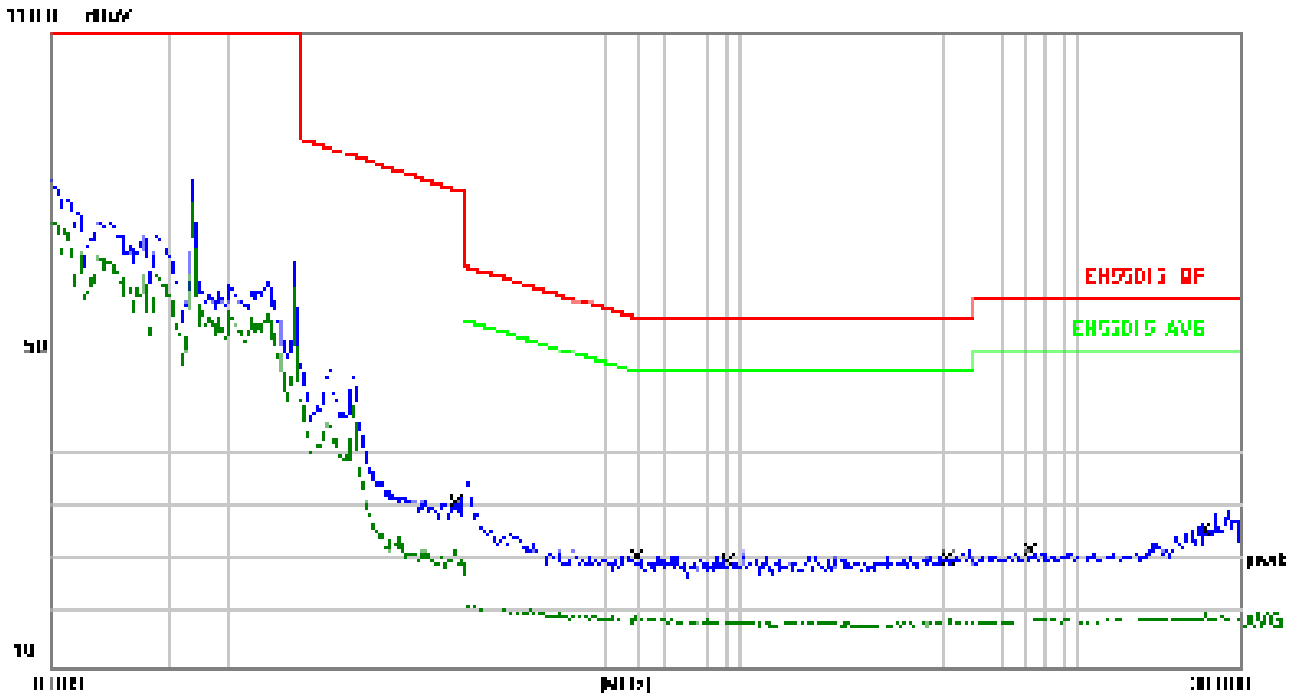
Conducted Emission At The Mains Terminals Test Data			
Temperature:	24.5 °C	Relative Humidity:	54%
Pressure:	1009hPa	Phase :	Line
Test Voltage :	AC 230V/50Hz	Test Mode:	Working Mode



No.	Mk.	f req. MHz	Reading Level dBμV	Correc-t factor dB	Measure-ment dBμV	Limit dBμV	Over dB	Detector	Comment
1		0.1471	30.58	0.51	31.09	80.17	-49.08	QP	
2		0.1471	11.29	0.51	11.80	56.16	-44.36	AVG	
3		0.3686	11.32	0.40	11.72	56.50	-44.78	QP	
4		0.3686	-0.20	0.40	-0.20	40.50	-40.70	AVG	
5		1.2220	11.12	0.38	11.50	56.00	-44.50	QP	
6		1.2220	-0.04	0.38	-0.50	46.00	-46.50	AVG	
7		3.4040	12.98	0.31	13.29	56.00	-42.71	QP	
8		3.4040	-1.24	0.31	-0.93	46.00	-46.93	AVG	
9		8.4080	12.19	0.28	12.47	60.00	-47.53	QP	
10		8.4080	0.77	0.28	0.49	50.00	50.49	AVG	
11		11.3139	12.67	0.28	12.95	60.00	-47.05	QP	
12		11.3139	0.81	0.28	0.53	50.00	50.53	AVG	



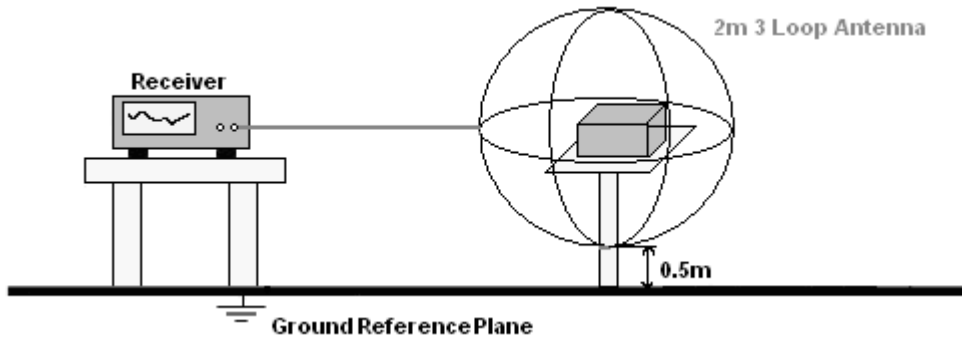
Conducted Emission At The Mains Terminals Test Data			
Temperature:	24.5 °C	Relative Humidity:	54%
Pressure:	1009hPa	Phase :	Neutral
Test Voltage :	AC 230V/50Hz	Test Mode:	Working Mode



No.	Mk.	f req. MHz	Reading Level dBμV	Conduct Factor dB	Measure- ment dBμV	Limit dBμV	Over dB	Detector	Comment
1		0.1419	25.51	0.54	26.05	80.50	-54.45	QP	
2		0.1419	11.73	0.54	12.27	56.48	-44.19	AVG	
3		0.4080	12.05	0.48	12.51	56.24	-43.73	QP	
4		0.4080	-0.63	0.48	-0.17	46.24	-46.41	AVG	
5		0.9180	11.63	0.30	12.01	56.00	-43.99	QP	
6		0.9180	-1.32	0.30	-0.94	46.00	-46.94	AVG	
7		4.2100	11.57	0.29	11.88	56.00	-44.14	QP	
8		4.2100	-1.23	0.29	-0.94	46.00	-46.94	AVG	
9		7.2480	11.05	0.27	12.12	60.00	-47.88	QP	
10		7.2480	0.71	0.27	0.41	50.00	50.41	AVG	
11		23.8260	19.34	0.37	19.71	60.00	-40.29	QP	
12		23.8260	0.10	0.37	0.47	50.00	-49.53	AVG	

7. RADIATED DISTURBANCE (9KHz-30MHz)

7.1 Block Diagram Of Test Setup



7.2 Limits

Frequency	Limits for Loop Diameter (dB μ A)
	2m
9KHz ~ 70KHz	88
70KHz ~ 150KHz	88 ~ 58*
150KHz ~ 3.0MHz	58 ~ 22*
3.0MHz ~ 30MHz	22

Note:

1. At the transition frequency the lower limit applies.
2. * Decreasing linearly with the logarithm of the frequency. For electrodeless lamps and luminaries, the limit in the frequency range of 2.2MHz to 3.0MHz is 58dB(μ A) for 2m.

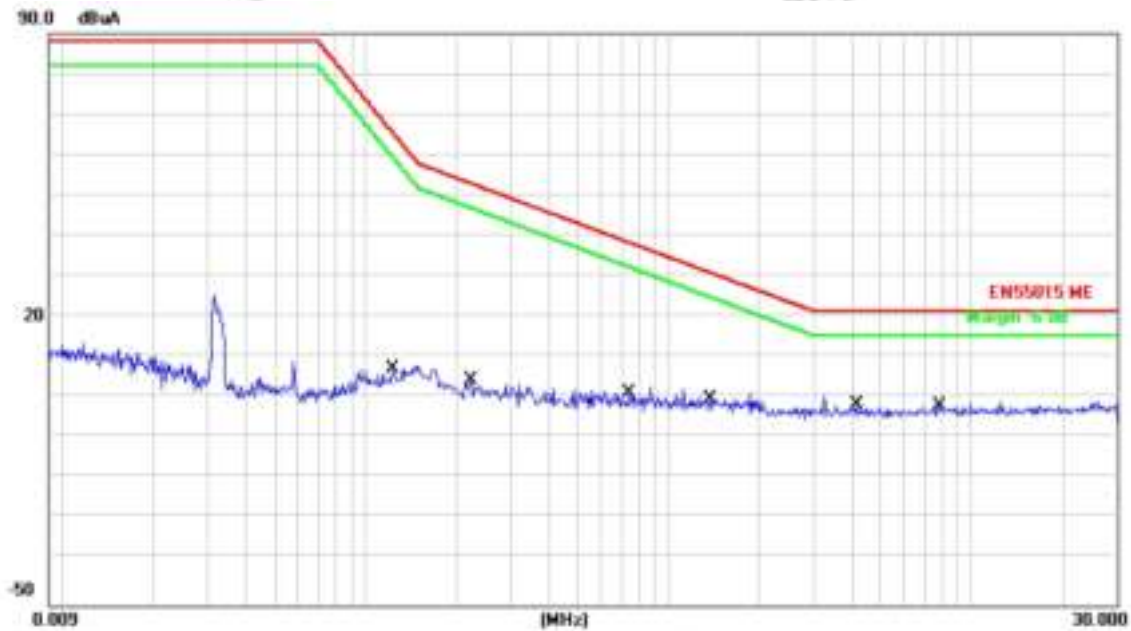
7.3 Test Procedure

- a. The Product was placed on a wooden table in the center of a loop antenna.
- b. The induced current in the loop antenna was measured by means of a current probe and the test receiver. Three field components were checked by means of a coaxial switch.
- c. The frequency range from 9 KHz to 30MHz is investigated. The receiver was measured with the quasi-peak detector. The RBW of the receiver was set at 200Hz in 9 kHz ~150 kHz and 9 kHz in 150 kHz ~ 30MHz.



7.4 Test Results

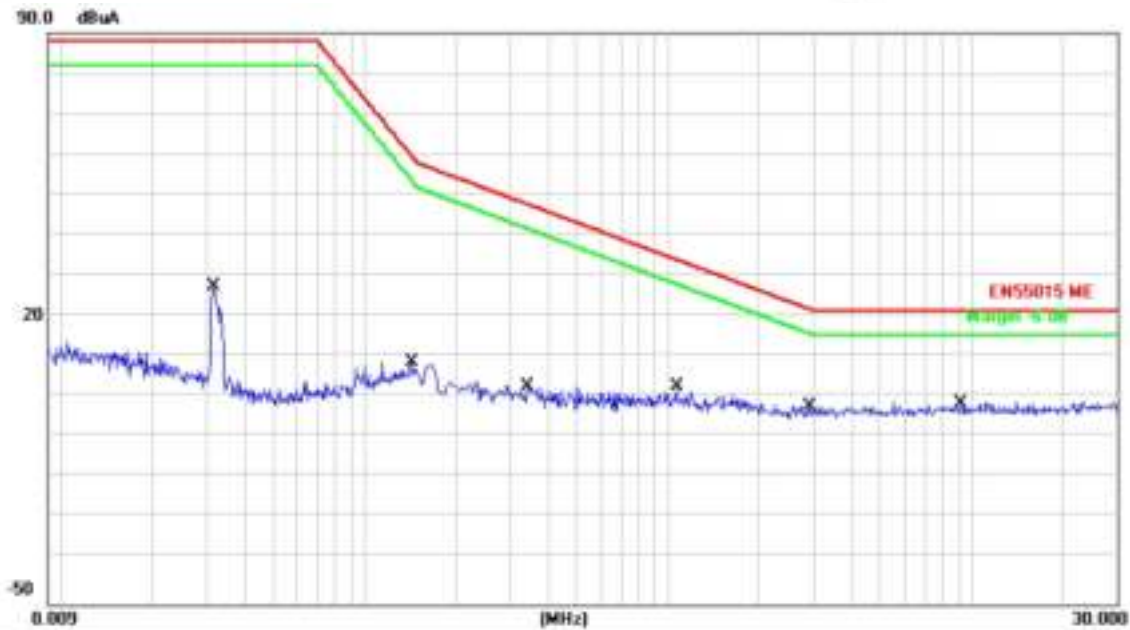
Magnetic Emission Test Data			
Temperature:	24.5 °C	Relative Humidity:	54%
Pressure:	1009hPa	Ant. Polarity	X
Test Voltage :	AC230V/50HZ	Test Mode:	Working



No.	Mk.	Freq. MHz	Reading Level dBuA	Correct Factor dB	Measurement dBuA	Limit dBuA	Over dB	Detector	Comment
1		0.1234	-17.26	25.14	7.88	65.86	-57.78	QP	
2		0.2220	-21.73	27.00	5.27	53.28	-48.01	QP	
3		0.7380	-24.91	27.00	2.09	38.85	-36.76	QP	
4		1.3660	-26.51	27.00	0.49	31.45	-30.96	QP	
5		4.1460	-27.97	27.00	-0.97	22.00	-22.97	QP	
6		7.8300	-28.02	27.00	-1.02	22.00	-23.02	QP	



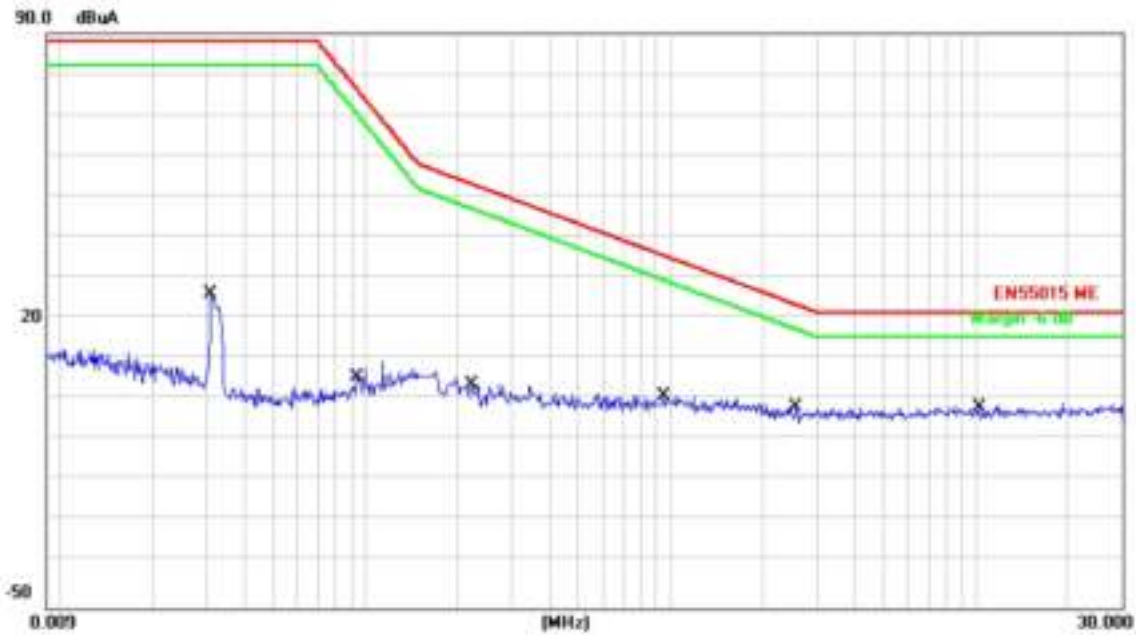
Magnetic Emission Test Data			
Temperature:	24.5 °C	Relative Humidity:	54%
Pressure:	1009hPa	Ant. Polarity	Y
Test Voltage :	AC230V/50HZ	Test Mode:	Working



No	Mk	Freq MHz	Reading Level dBuA	Correct Factor dB	Measure ment dBuA	Limit dBuA	Over dB	Detector	Comment
1		0.0318	5.28	22.41	27.70	88.00	60.30	QP	
2		0.1422	17.15	26.46	9.31	60.08	60.77	QP	
3		0.3160	23.78	27.00	3.22	47.95	44.73	QP	
4		1.0820	-23.48	27.00	3.52	34.48	-30.98	QP	
5		2.9219	-28.88	27.00	-1.88	22.32	-20.98	QP	
6		8.1868	-27.85	27.00	-0.85	22.00	-22.85	QP	



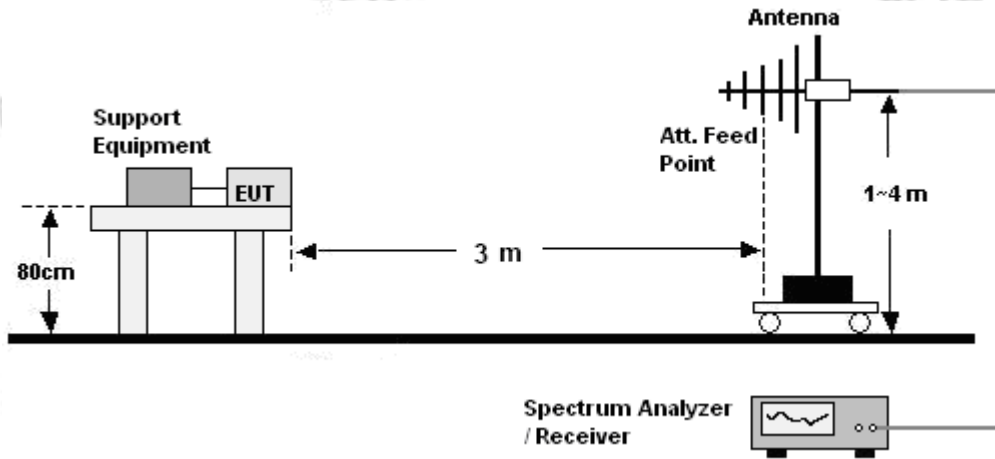
Magnetic Emission Test Data			
Temperature:	24.5 °C	Relative Humidity:	54%
Pressure:	1009hPa	Ant. Polarity	Z
Test Voltage :	AC230V/50HZ	Test Mode:	Working



No.	Mk.	Freq. MHz	Reading Level dBuA	Correct Factor dB	Measure- ment dBuA	Limit dBuA	Over dB	Detector	Comment
1		0.0313	3.87	22.49	26.36	88.00	-61.64	QP	
2		0.0936	-16.89	23.06	6.17	76.55	-70.38	QP	
3		0.2220	-22.48	27.00	4.52	53.28	-48.76	QP	
4		0.9500	-25.27	27.00	1.73	35.82	-34.09	QP	
5		2.5780	-28.03	27.00	-1.03	23.82	-24.85	QP	
6	*	10.2460	-28.28	27.00	-1.28	22.00	-23.28	QP	

8. RADIATED DISTURBANCE (30MHZ -300MHZ)

8.1 Block Diagram Of Test Setup



8.2 Limits

Frequency (MHz)	Quasi-peak limits at 3m dB(μ V/m)
30-230	40
230-300	47

Note: The lower limit shall apply at the transition frequencies.

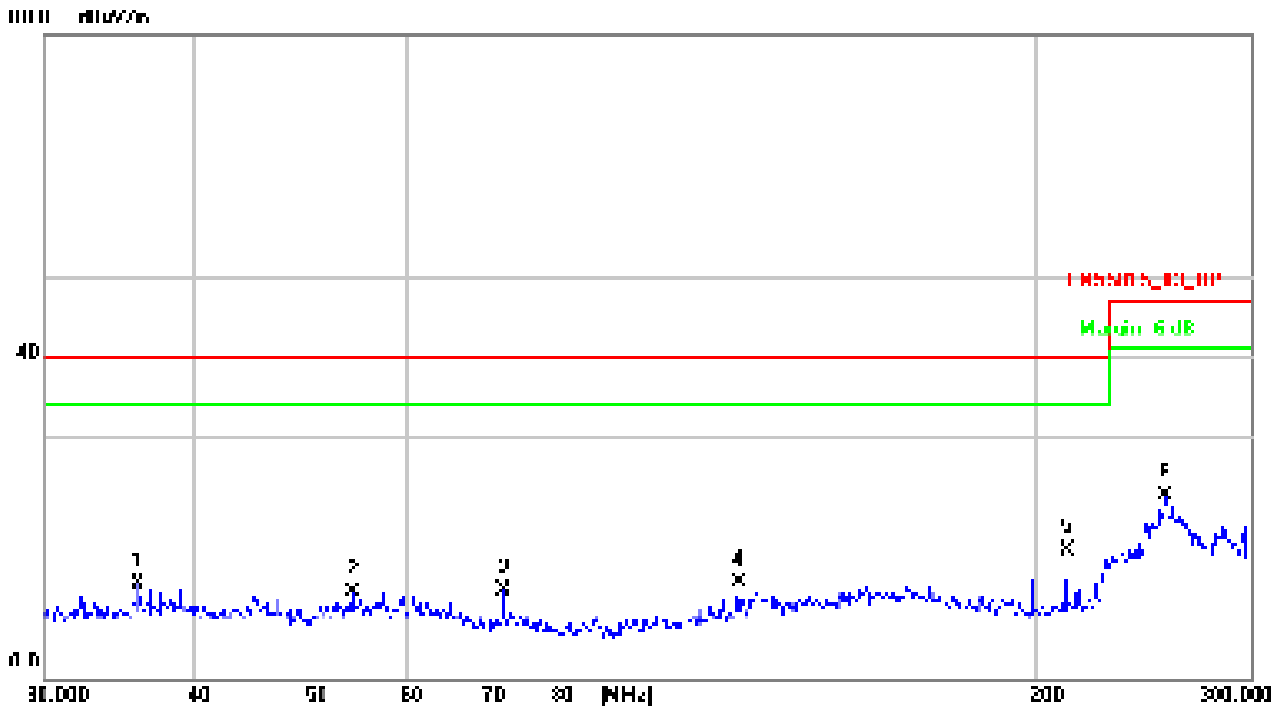
8.3 Test Procedure

- The Product was placed on the nonconductive turntable 0.8 m above the ground at a chamber.
- Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.



8.4 Test Results

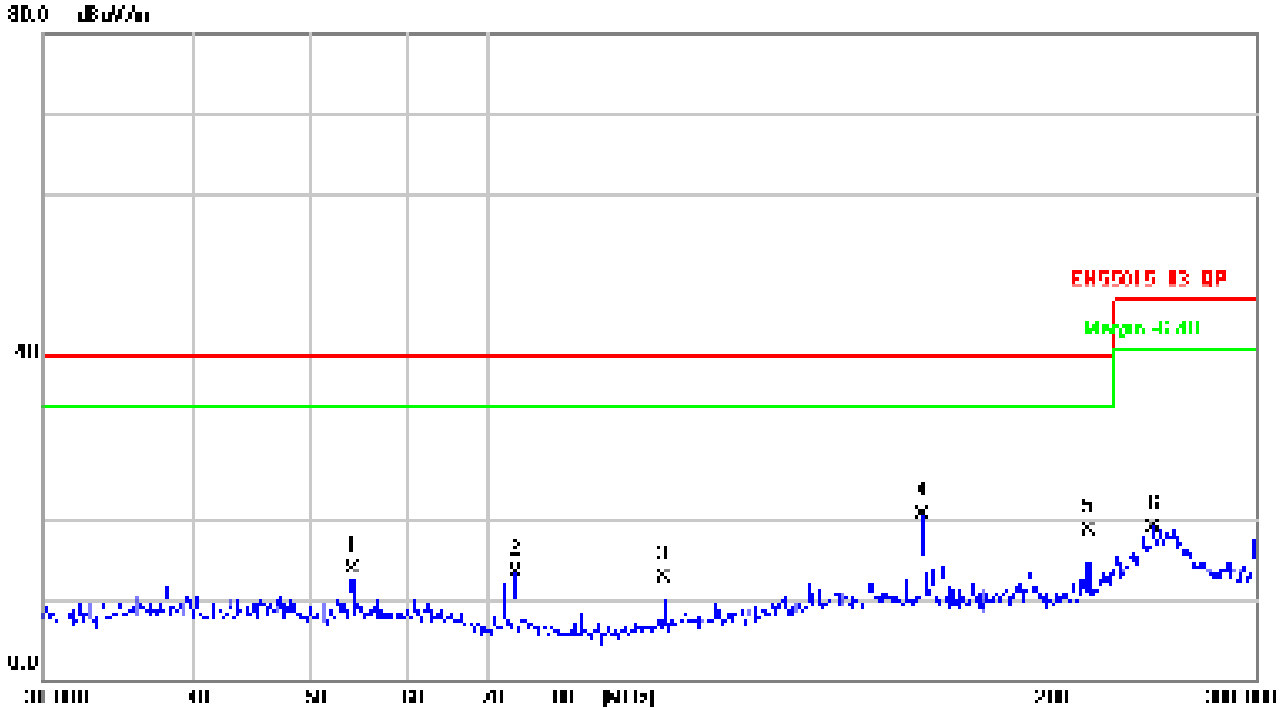
Radiation Emission Test Data			
Temperature:	24.5 °C	Relative Humidity:	54%
Pressure:	1009hPa	Phase :	Horizontal
Test Voltage :	AC 230V/50Hz	Test Mode:	Working



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Distance	Detector	Comment
		MHz	dBuV	dBm	dBuV/m	dBuV/m	dB	cm	degree		
1		36.9021	28.92	12.15	11.77	40.00	28.23	QP			
2		51.0805	28.27	12.55	10.72	40.00	28.28	QP			
3		71.9619	21.89	14.07	10.82	40.00	28.08	QP			
4		112.7512	25.06	-13.19	11.87	40.00	-20.13	QP			
5		211.4079	28.12	-12.20	15.92	40.00	-24.08	QP			
6		255.3414	32.40	-9.68	22.62	47.00	-24.38	QP			



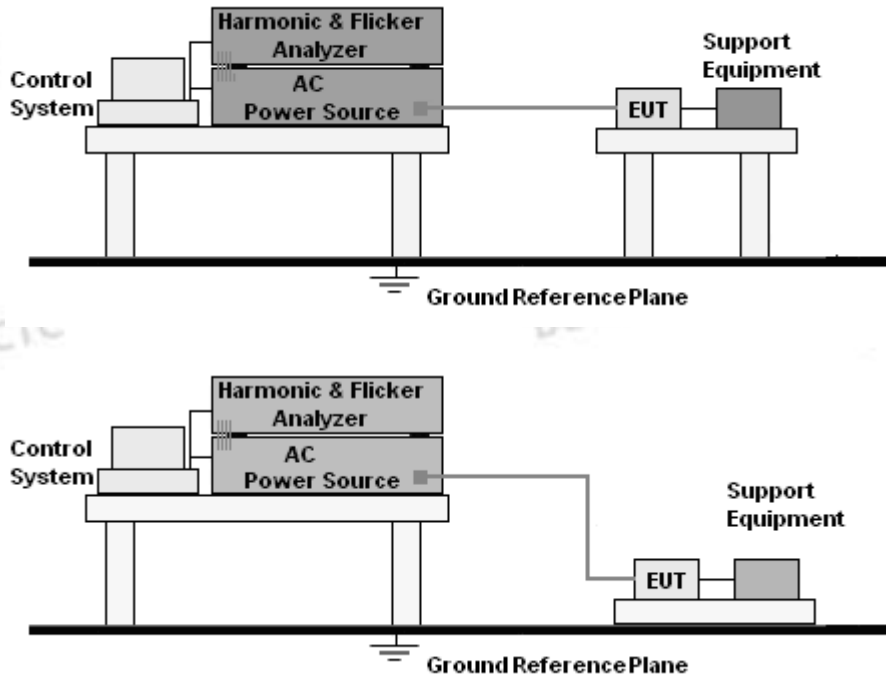
Radiation Emission Test Data			
Temperature:	24.5 °C	Relative Humidity:	54%
Pressure:	1009hPa	Phase :	Vertical
Test Voltage :	AC 230V/50Hz	Test Mode:	Working



No	Mk	Freq	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dBm	dBuV/m	dBuV/m	dB	meter	degree	Comment
1		53.9861	26.33	-12.58	13.77	40.00	-26.23	QP		
2		73.6413	27.80	-14.34	13.46	40.00	-26.54	QP		
3		97.7510	27.02	-14.27	12.75	40.00	-27.25	QP		
4	*	198.6326	31.57	11.01	20.53	40.00	19.47	QP		
5		218.8373	30.17	11.76	18.41	40.00	21.59	QP		
6		247.8114	28.82	10.06	18.86	47.00	28.14	QP		

9. VOLTAGE FLUCTUATIONS & FLICKER(F)

9.1 Block Diagram of Test Setup



9.2 Limit

EN 61000-3-3:2013 Clause 5.

9.3 Test Procedure

- The Product was placed on the top of a non-conductive table above the ground and operated to produce the most unfavorable sequence of voltage changes under normal operating conditions.
- During the flick test, the measure time shall include that part of whole operation cycle in which the Product produce the most unfavorable sequence of voltage changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.

9.4 Test Results

PASS

Please refer to the following page.



Flicker Test Data

Voltage Fluctuation	Limit	Value
Relative Voltage Change Characteristic Tmax ($dc > 3\%$)	500 ms	0 ms
Maximum Relative Voltage Change d_{max}	4%	0.00
	6%	/
	7%	/
Relative Steady-state Voltage Change dc	3.3%	0.00

Flicker	Limit	Value
Short-term Flicker Indicator Pst	1.0	0.064
Long-term Flicker Indicator Plt	0.65	/



10. IMMUNITY TEST OF GENERAL THE PERFORMANCE CRITERIA

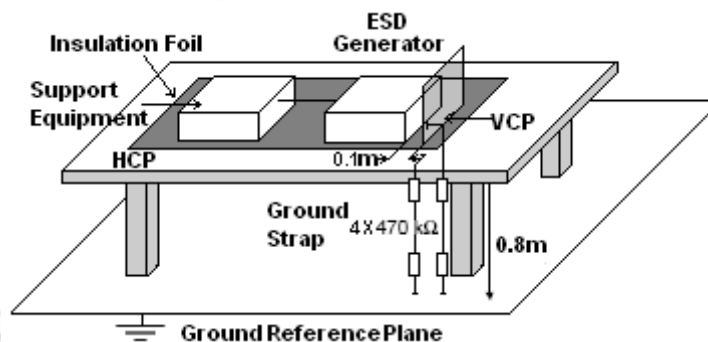
Product Standard	EN 61547: 2009
CRITERION A	During the test, no change of the luminous intensity shall be observed and the regulating control, if any, shall operate during the test as intended.
CRITERION B	<p>During the test the luminous intensity may change to any value. After the test the luminous intensity shall be restored to its initial value within 1 min.</p> <p>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.</p>
CRITERION C	<p>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.</p> <p>Additional requirement for lighting equipment incorporating a starting device:</p> <p>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.</p>

11. ELECTROSTATIC DISCHARGE (ESD)

11.1 Test Specification

Test Port	: Enclosure port
Discharge Impedance	: 330 ohm / 150 pF
Discharge Mode	: Single Discharge
Discharge Period	: one second between each discharge

11.2 Block Diagram of Test Setup



11.3 Test Procedure

- Electrostatic discharges were applied only to those points and surfaces of the Product that are accessible to users during normal operation.
- The test was performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.
- The time interval between two successive single discharges was at least 1 second.
- The ESD generator was held perpendicularly to the surface to which the discharge was applied and the return cable was at least 0.2 meters from the Product.
- Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.
- Air discharges were applied with the round discharge tip of the discharge electrode approaching the Product as fast as possible (without causing mechanical damage) to touch the Product. After each discharge, the ESD generator was removed from the Product and re-triggered for a new single discharge. The test was repeated until all discharges were complete.
- At least ten single discharges (in the most sensitive polarity) were applied to the Horizontal Coupling Plane at points on each side of the Product. The ESD generator was positioned



vertically at a distance of 0.1 meters from the Product with the discharge electrode touching the HCP.

h. At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the Vertical Coupling Plane in sufficiently different positions that the four faces of the Product were completely illuminated. The VCP (dimensions 0.5m x 0.5m) was placed vertically to and 0.1 meters from the Product.

11.4 Test Results

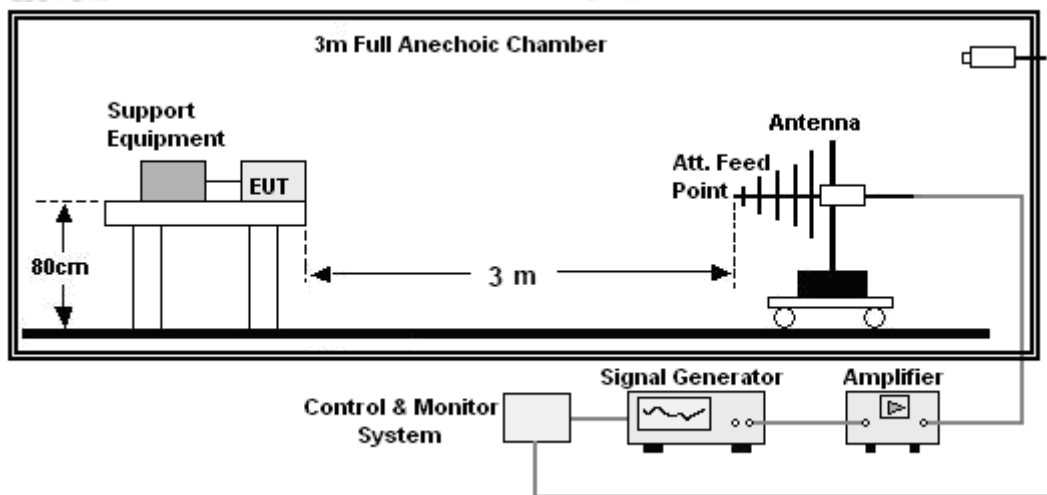
Discharge Method	Discharge Position	Voltage (\pm kV)	Min. No. of Discharge per polarity (Each Point)	Required Level	Performance Criterion
Contact Discharge	Indirect Discharge HCP	2, 4	10	B	A
	Indirect Discharge VCP	2, 4	10	B	A
Air Discharge	Insulating Surfaces	2, 4, 8	10	B	A
	Slots	2, 4, 8	10	B	A
	Switch	2, 4, 8	10	B	A
Note: N/A					

12. RADIO FREQUENCY ELECTROMAGNETIC FIELDS(RS)

12.1 Test Specification

Test Port	: Enclosure port
Step Size	: 1%
Modulation	: 1kHz, 80% AM
Dwell Time	: 1 second
Polarization	: Horizontal & Vertical

12.2 Block Diagram of Test Setup



12.3 Test Procedure

- The testing was performed in a fully-anechoic chamber. The transmit antenna was located at a distance of 3 meters from the Product.
- The frequency range is swept from 80MHz to 1000MHz, with the signal 80% amplitude modulated with a 1 kHz sine wave, and the step size was 1%.
- The test was performed with the Product exposed to both vertically and horizontally polarized fields on each of the four sides.



12.4 Test Results

Frequency	Position	Field Strength (V/m)	Required Level	Performance Criterion
80 - 1000MHz	Front, Right, Back, Left	3	A	A
Note: N/A				

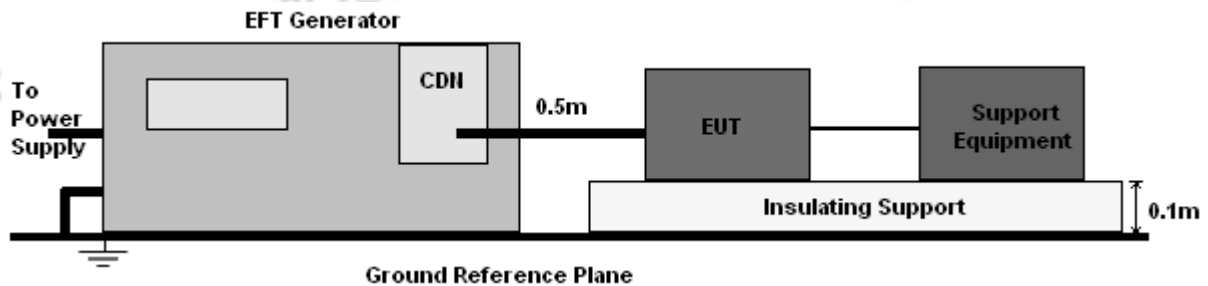
13. FAST TRANSIENTS(EFT)

13.1 Test Specification

Test Port	: input a.c. power port signal lines
Impulse Frequency	: 5 kHz
Impulse Wave-shape	: 5/50 ns
Burst Duration	: 15 ms
Burst Period	: 300 ms
Test Duration	: 2 minutes per polarity

13.2 Block Diagram of EUT Test Setup

For input a.c. power port:



13.3 Test Procedure

- The Product and support units were located on a non-conductive table above ground reference plane.
- A 0.5m-long power cord was attached to Product during the test.



13.4 Test Results

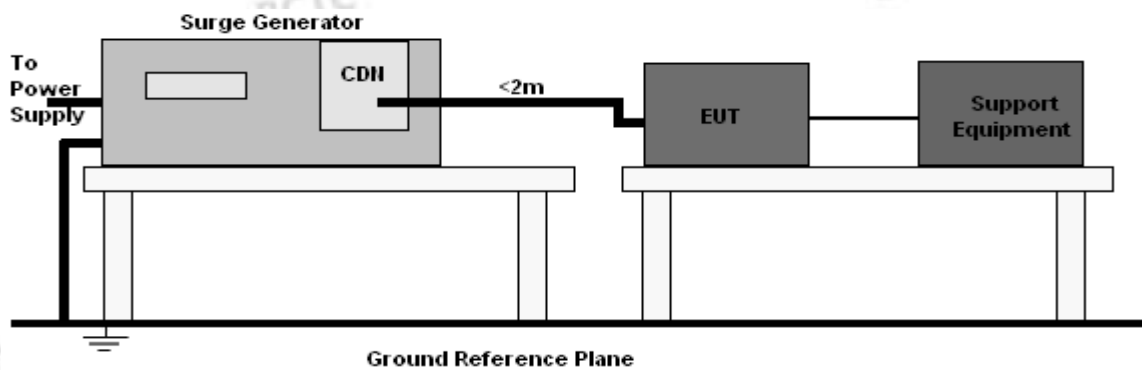
Coupling	Voltage (kV)	Polarity	Required Level	Performance Criterion
AC Mains L-N	1.0	±	B	A
Signal Line	0.5	±	B	N/A
Telec Ports	0.5	±	B	N/A
DC Ports	0.5	±	B	N/A
Note: N/A				

14. SURGES IMMUNITY TEST

14.1 Test Specification

Test Port	: input a.c. power port
Wave-Shape	: Open Circuit Voltage - 1.2 / 50 us Short Circuit Current - 8 / 20 us
Pulse Repetition Rate	: 1 pulse / min.
Test Events	: Five positive polarity pulses at the 90° phase angel Five negative polarity pulses at the 270° phase angle

14.2 Block Diagram of EUT Test Setup



14.3 Test Procedure

- The surge is to be applied to the Product power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave.
- The power cord between the Product and the coupling/decoupling networks shall be 2 meters in length (or shorter). Interconnection line between the Product and the coupling/decoupling networks shall be 2 meters in length (or shorter).



14.4 Test Result

Coupling Line	Voltage (kV)	Phase Angle	Required Level	Performance Criterion
L + N	+ 0.5	90°	C	A
	- 0.5	270°		
L - PE	+ 0.5, +1, +2	90°	C	N/A
	- 0.5, -1, -2	270°		
N - PE	+ 0.5, +1, +2	90°	C	N/A
	- 0.5, -1, -2	270°		

Note: N/A

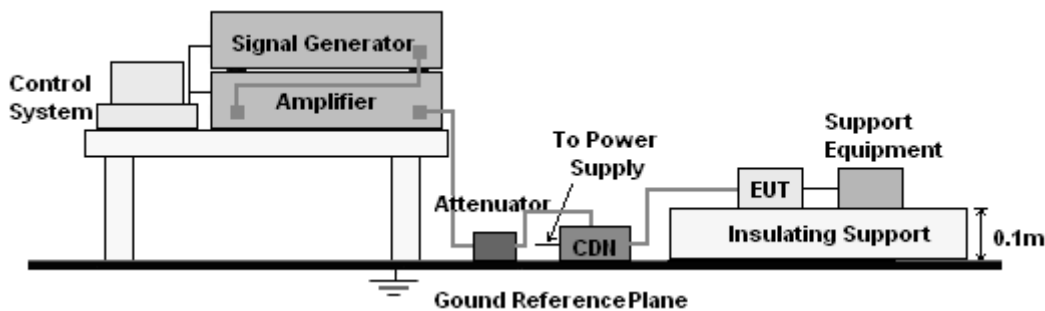
15. INJECTED CURRENTS(CS)

15.1 Test Specification

Test Port	: input a.c. power port signal lines
Step Size	: 1%
Modulation	: 1kHz, 80% AM
Dwell Time	: 1 second

15.2 Block Diagram of EUT Test Setup

For input a.c. power port:



15.3 Test Procedure

For input a.c. power port:

- The Product and support units were located at a ground reference plane with the interposition of a 0.1 m thickness insulating support and the CDN was located on GRP directly.
- The frequency range is swept from 150 kHz to 80, with the signal 80% amplitude modulated with a 1 kHz sine wave, and the step size was 1% of fundamental.
- The dwell time at each frequency shall be not less than the time necessary for the Product to be able to respond.

For signal lines:

- The Product and support units were located at a ground reference plane with the interposition of a 0.1 m thickness insulating support, and the telecommunication port under test was connected to support units through the current clamp.
- The frequency range is swept from 150 kHz to 80, with the signal 80% amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed 1.5×10^{-3} decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- The dwell time at each frequency shall be not less than the time necessary for the Product to be able to respond.



15.4 Test Result

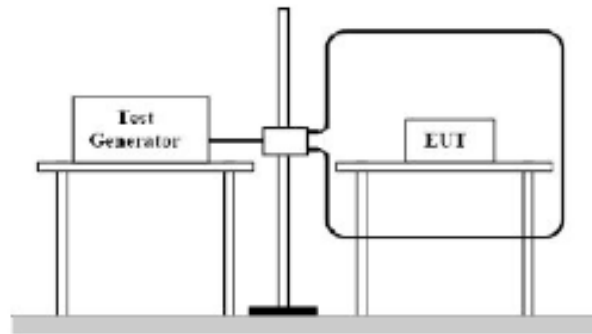
Inject Line	Frequency (MHz)	Voltage Level (V r.m.s.)	Required Level	Performance Criterion
a.c. port	0.15 - 80	3	A	A
Signal Line	0.15 - 80	3	A	N/A
Telec Ports	0.15 - 80	3	A	N/A
DC Ports	0.15 - 80	3	A	N/A
Note: N/A				

16. POWER FREQUENCY MAGNETIC FIELD (PFMF)

16.1 Test Specification

Test Port : Enclosure port
Power Frequency : 50Hz / 60Hz
Duration : 5 Min

16.2 Block Diagram of EUT Test Setup



16.3 Test Procedure

- The Product and support units were located on a table, 0.8m away from ground floor.
- The Product is configured and connected to satisfy its functional requirements.
- Setting the parameter of tests and then perform the test software of test simulator.
- The induction coil, shall enclose the Product placed at its centre.

16.4 Test Result

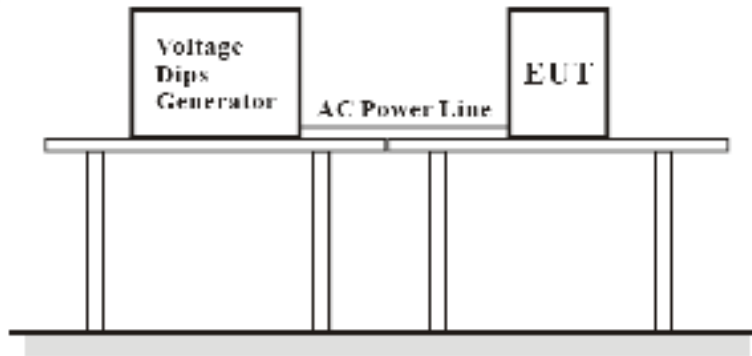
Direction	Field Strength (A/m)	Duration (Min)	Required Level	Performance criteria
X axis	1	5	A	A
Y axis	1	5	A	A
Z axis	1	5	A	A
Note: N/A				

17. VOLTAGE DIPS AND INTERRUPTIONS (DIPS)

17.1 Test Specification

Test Port	:	input a.c. power port
Phase Angle	:	0°, 180°
Test cycle	:	3 times

17.2 Block Diagram of EUT Test Setup



17.3 Test Procedure

- The Product and support units were located on a non-conductive table above ground floor.
- Set the parameter of tests and then perform the test software of test simulator.
- Conditions changes to occur at 0 degree crossover point of the voltage waveform.

17.4 Test Result

Voltage Dips:				
Test Level % U_T	Voltage dips in % U_T	Duration (cycles)	Required Level	Performance Criterion
70	30	10	C	A
Voltage Interruptions:				
Test Level % U_T	Voltage dips in % U_T	Duration (cycles)	Required Level	Performance Criterion
0	100	0.5	B	C*
Note: N/A				

18. EUT PHOTOGRAPHS

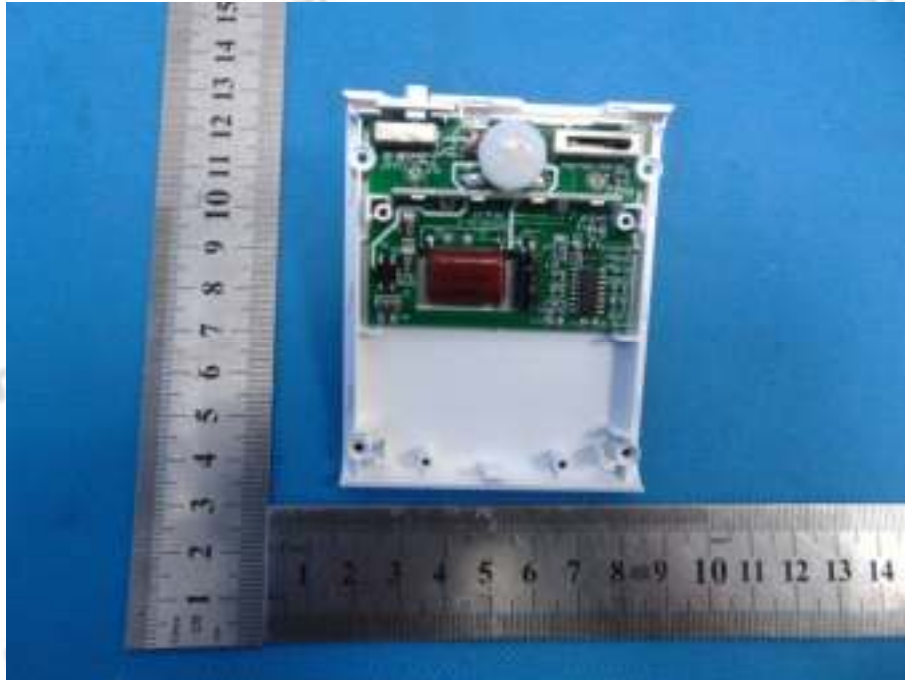
EUT Photo 1



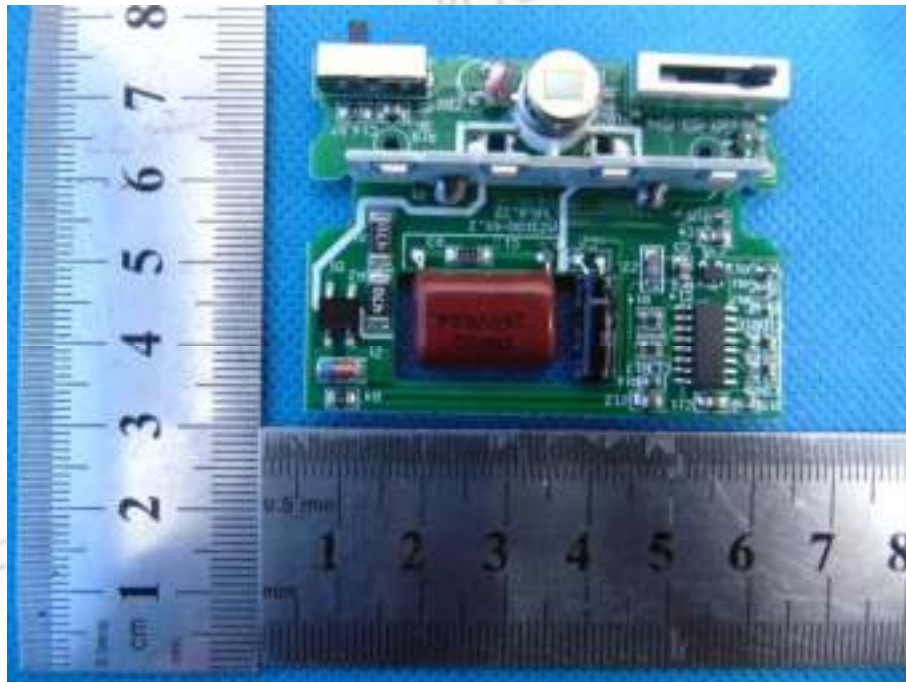
EUT Photo 2



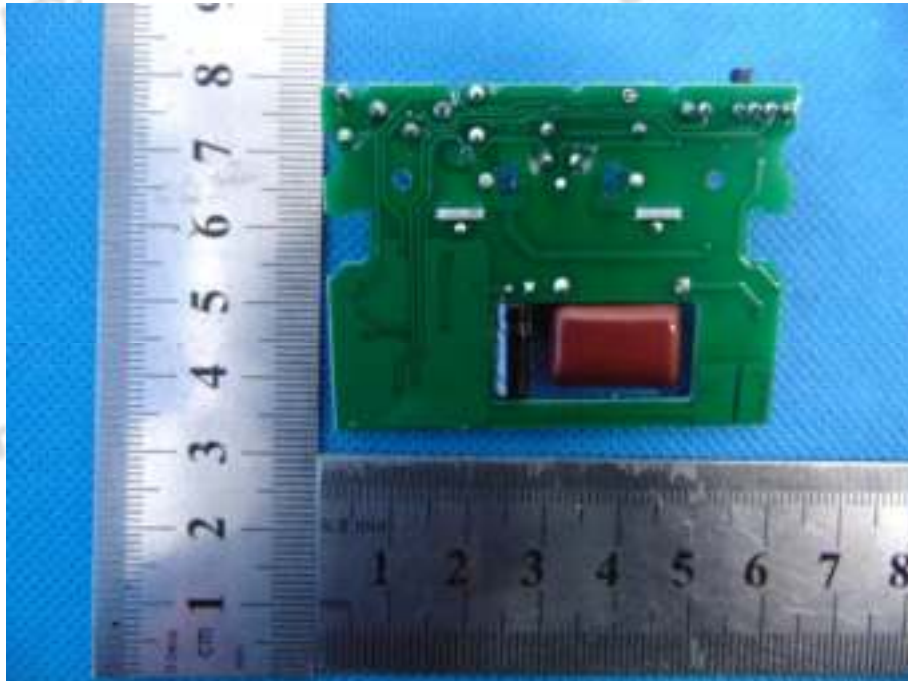
EUT Photo 3



EUT Photo 4



EUT Photo 5



19. EUT TEST SETUP PHOTOGRAPHS

CE



RE

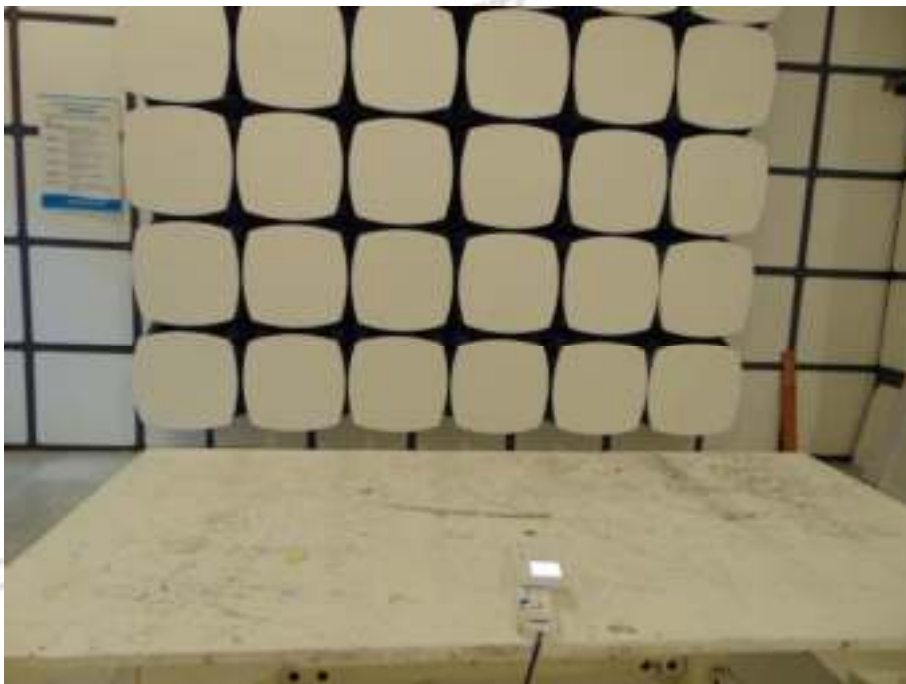




ESD



RS





EFT



Surges





DIPS



CS



***** END OF REPORT *****