



TEST REPORT

Product Name: LED Strip Light

Trademark: 

Model Number: IK-FSL-005S IK-FSL-010S IK-FSL-015S IK-FSL-020S IK-FSL-025S
IK-FSL-050S IK-FSL-005P IK-FSL-010P IK-FSL-015P IK-FSL-020P
IK-FSL-025P IK-FSL-050P

Applicant's name: SHEN ZHEN IK TECHNIK CO., LIMITED

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Manufacturer: SHEN ZHEN IK TECHNIK CO., LIMITED

Address: Floor 4, Building 4, Tongtai Times Center, Fuyong, Bao'an, Shenzhen, China 518103

Prepared By: Shenzhen Southern LCS Compliance Testing Laboratory Ltd.

Address: B Area, 1-2F, Building B, Zhongyu Green High-Tech Industrial Park, Wenge Road, Heshuikou, Gongming Street, Guangming New District, Shenzhen, China

Sample Received Date: July. 21, 2020

Sample tested Date: July. 21, 2020 to Sept. 15, 2020

Issue Date: Sept. 16, 2020

Report No.: LCS200526807EK

Test Standards: EN 55015:2013+A1:2015, EN 61547: 2009
EN 61000-3-2: 2014, EN 61000-3-3: 2013

Test Results: PASS

Compiled by:



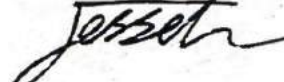
Kris Mai

Reviewed by:



Dm Gu

Approved by:



Jessie Liu/Manager

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(Note: N/A means not applicable)



1. VERSION

Report No.	Issue Date	Description	Approved
LCS200526807EK	Sept. 16, 2020	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)	Pass
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 ¹
IEC 61000-4-11	Voltage dips and interruptions(DIPS)	Pass

Remark:

1. 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)
Radiated Emission (30MHz-1000MHz)	4.80
Conducted Emission (150K-30MHZ)	3.20
Conducted Emission (9K-150KHZ)	3.10



4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Ratings: AC230V/50Hz

Model difference: All models are identical except for the appearance color, the test model is IK-FSL-025P and the test results are applicable to other tests.

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>C</u>	Working	AC 230V/50Hz
Voltage fluctuations & flicker(F)	Working	AC 230V/50Hz
Electrostatic discharge (ESD) B ☒ Air Discharge: $\pm 2,4,8\text{kV}$ Contact Discharge: $\pm 2,4\text{kV}$ HCP & VCP: $\pm 2,4\text{kV}$	Working	AC 230V/50Hz
Radio frequency electromagnetic fields(RS) A 80MHz-1000MHz, 3V/m,80% Front, Rear, Left, Right H/V	Working	AC 230V/50Hz
Electrical fast transients/burst (EFT) B ☒ 1kV AC(Input) ☐ 0.5kV DC(Input) ☐ 0.5kV signal,Telec,control	Working	AC 230V/50Hz
Surges ☒ 0.5, 1kV Line-Line, C ☐ 0.5, 1, 2kV Line-PE, N-PE C Line-Line: $90^\circ +0.5\&+1\text{kV}, 270^\circ -0.5\&-11\text{kV}$ Line-PE, N-PE: $90^\circ +0.5,+1,+2\text{kV}, 270^\circ -0.5,-1,-2\text{kV}$	Working	AC 230V/50Hz
Injected Currents (CS) A 0.15MHz to 80MHz 3V ☒ AC(Input) ☐ DC(Input) ☐ signal,control	Working	AC 230V/50Hz
Voltage dips and interruptions (DIPS) 0% 0.5P B 70%10P 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 Shenzhen Southern LCS Compliance Testing Laboratory Ltd. Address: B Area, 1-2F, Building B, Zhongyu Green High-Tech Industrial Park, Wenge Road, Heshuikou, Gongming Street, Guangming New 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	ESR3	102075	July. 24, 2020	July. 23, 2021
LISN	R&S	ENV216	101375	July. 26, 2020	July. 25, 2021
Software	Frad	EZ-EMC	EMC-CON 3A1	\	\

ME Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
Receiver	R&S	ESR3	102075	July. 24, 2020	July. 23, 2021
3-Loop Antenna	DAZE	ZN30401	13017	July. 26, 2020	July. 25, 2021
Software	Frad	EZ-EMC	EMC-CON 3A1	\	\

Radiated disturbance Test (966 chamber)					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
966 chamber	ChengYu	966 Room	966	July. 27, 2020	July. 26, 2021
Receiver	R&S	ESR3	102075	July. 29, 2020	July. 28, 2021
Receiver	R&S	ESRP	101154	July. 29, 2020	July. 28, 2021
Amplifier	Schwarzbeck	BBV9718	9718-309	July. 25, 2020	July. 24, 2021
Amplifier	Schwarzbeck	BBV9744	9744-0037	July. 25, 2020	July. 24, 2021
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	VULB9163-942	July. 29, 2020	July. 28, 2021
Horn Antenna	SCHWARZBECK	BBHA9120 D	1201	July. 29, 2020	July. 28, 2021
Software	Frad	EZ-EMC	FA-03A2 RE	\	\



Harmonic / Flicker Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
Harmonic & Flicker Tester	LAPLAEC	AC2000 A	439263	July. 29, 2020	July. 28, 2021
AC Power Supply	LAPLAEC	PCR400 0M	631589	July. 29, 2020	July. 28, 2021
Software	TTI	HA-PC Link	3.01	\	\

Electrostatic discharge immunity Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
ESD Tester	KIKISUI	KES4201 A	UH002321	July. 28, 2020	July. 27, 2021

Radio frequency electromagnetic fieldsTest					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
Power meter	Keysight	E4419	GB4242144 0	July. 29, 2020	July. 28, 2021
Power sensor	Keysight	E9300A	US3921130 5	July. 29, 2020	July. 28, 2021
Power sensor	Keysight	E9300A	US3921165 9	July. 29, 2020	July. 28, 2021
Amplifier	SKET	HAP-8010 00M-250W	/	July. 25, 2020	July. 24, 2021
Amplifier	SKET	HAP-8010 00M-75W	/	July. 25, 2020	July. 24, 2021
Amplifier	SKET	HAP-8010 00M-50W	/	July. 25, 2020	July. 24, 2021
Stacked double Log.-Per. Antenna	Schwarzbeck	STLP 9129	077	\	\
Field Probe	Narda	EP-601	80256	July. 25, 2020	July. 24, 2021
Signal Generator	Agilent	N5181A	MY5014374 8	July. 25, 2020	July. 24, 2021
Software	SKET	EMC-S	1.2.0.18	\	\

Fast transients and Surge and Voltage dips and interruptions immunity Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
Compact Generator	TRANSIENT	TRA2000	646	July. 29, 2020	July. 28, 2021
Coupling Clamp	PARTNER	CN-EFT1000	CN-EFT100 0-1624	July. 29, 2020	July. 28, 2021

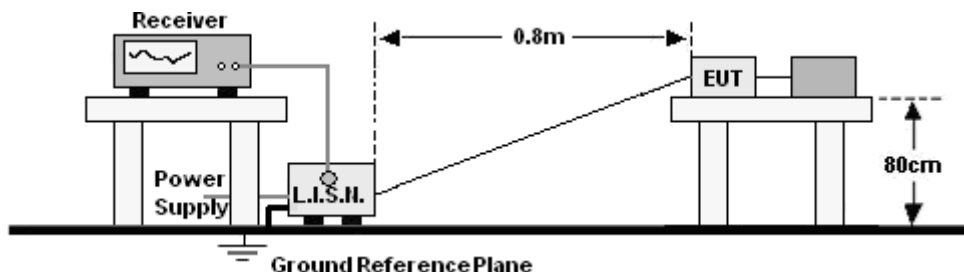


Injected currents immunity Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
C/S Test System	SCHLODER	CDG-600 0-75	126B1405/ 2016	July. 25, 2020	July. 24, 2021
Attenuator	SCHLODER	6DB DC-1G	HA1630	July. 25, 2020	July. 24, 2021
CDN	SCHLODER	CDN M2/M3	A2210389/ 2016	July. 25, 2020	July. 24, 2021
Injection Clamp	SCHLOBER	EMCL-20	132A1272/ 2016	July. 25, 2020	July. 24, 2021
Software	HUBERT	HUBERT EN 61000-4-6	1.4.1.0	\	\

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(μV)	
	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(μV) quasi-peak and 63 dB(μV) average.

6.3 Test procedure

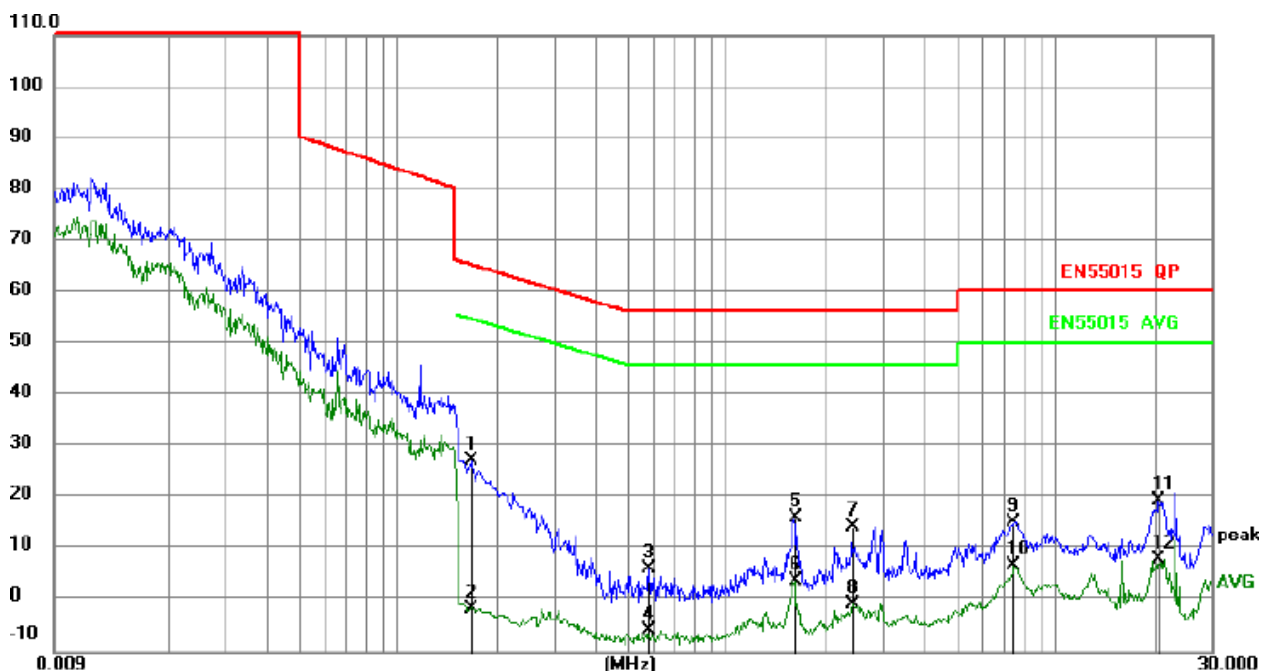
For mains ports:

- 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

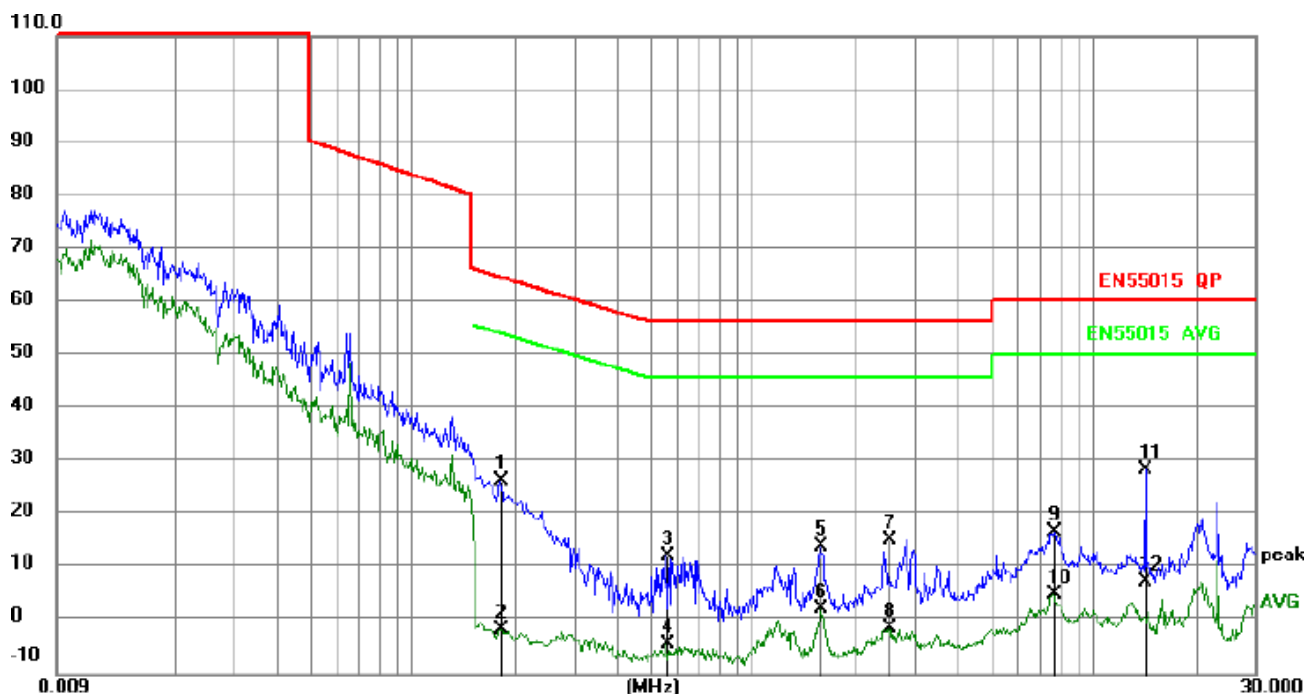
Temperature:	23	Relative Humidity:	54%
Pressure:	101kPa	Phase :	Line
Test Voltage :	AC 230V/50Hz	Test Mode:	Working



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	Level	Factor	ment			Detector	Comment
1	*	0.1669	17.86	9.50	27.36	65.11	-37.75	QP	
2		0.1669	-11.09	9.50	-1.59	55.11	-56.70	AVG	
3		0.5821	-3.53	9.93	6.40	56.00	-49.60	QP	
4		0.5821	-15.69	9.93	-5.76	46.00	-51.76	AVG	
5		1.6046	6.52	9.58	16.10	56.00	-39.90	QP	
6		1.6046	-5.53	9.58	4.05	46.00	-41.95	AVG	
7		2.4267	4.96	9.62	14.58	56.00	-41.42	QP	
8		2.4267	-10.11	9.62	-0.49	46.00	-46.49	AVG	
9		7.4939	5.77	9.72	15.49	60.00	-44.51	QP	
10		7.4939	-2.88	9.72	6.84	50.00	-43.16	AVG	
11		20.4902	9.91	9.79	19.70	60.00	-40.30	QP	
12		20.4902	-1.53	9.79	8.26	50.00	-41.74	AVG	



Temperature:	23 °C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	Neutral
Test Voltage :	AC 230V/50Hz	Test Mode:	Working



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	Level	Factor	ment			Detector	Comment
				dB	dBuV	dBuV	dB		
1		0.1815	16.87	9.48	26.35	64.42	-38.07	QP	
2		0.1815	-10.79	9.48	-1.31	54.42	-55.73	AVG	
3		0.5595	2.64	9.83	12.47	56.00	-43.53	QP	
4		0.5595	-14.05	9.83	-4.22	46.00	-50.22	AVG	
5		1.5900	4.50	9.58	14.08	56.00	-41.92	QP	
6		1.5900	-7.16	9.58	2.42	46.00	-43.58	AVG	
7		2.5081	5.73	9.63	15.36	56.00	-40.64	QP	
8		2.5081	-10.67	9.63	-1.04	46.00	-47.04	AVG	
9		7.6246	7.18	9.71	16.89	60.00	-43.11	QP	
10		7.6246	-4.52	9.71	5.19	50.00	-44.81	AVG	
11	*	14.2396	18.88	9.70	28.58	60.00	-31.42	QP	
12		14.2396	-2.09	9.70	7.61	50.00	-42.39	AVG	

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

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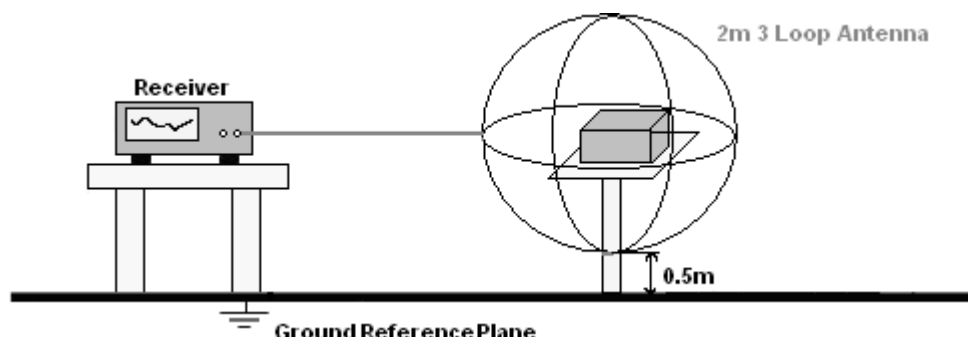
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7. RADIATED DISTURBANCE (9KHz-30MHz)

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.

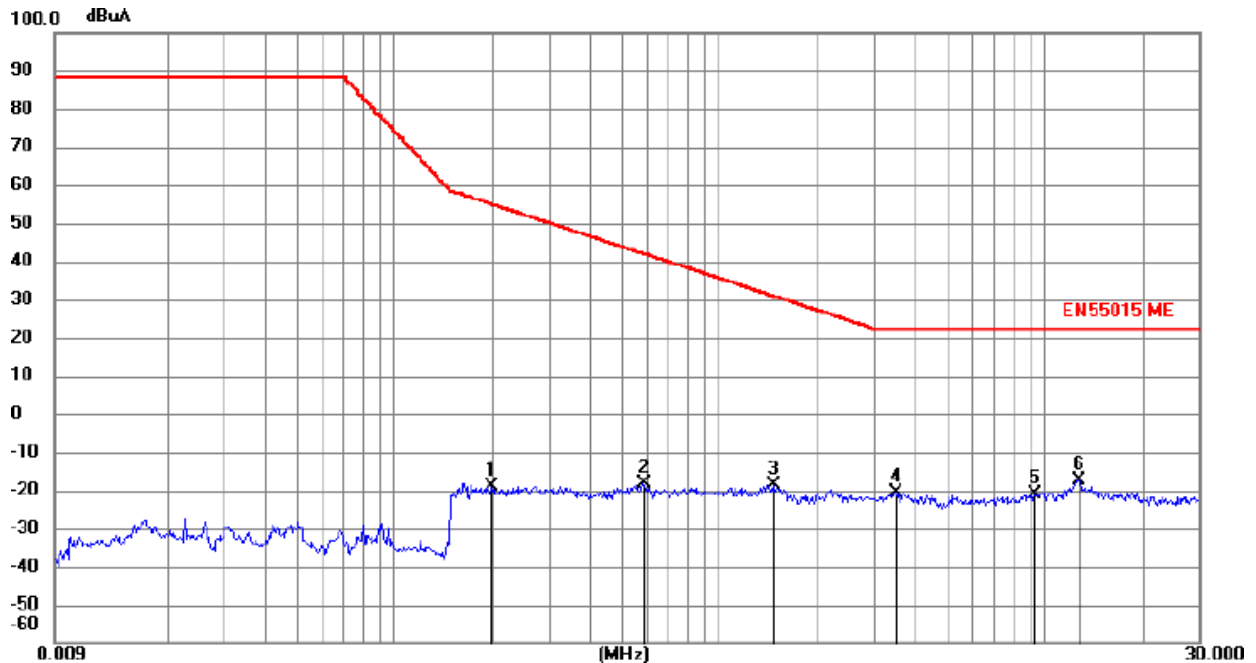
7.3 Test Procedure

- 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

Temperature:	23°C	Relative Humidity:	54%
Pressure:	101kPa	Ant. Polarity	X
Test Voltage :	AC 230V/50Hz	Test Mode:	Working



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuA	Limit dBuA	Over dB	Detector	Comment
1		0.1995	-29.61	10.43	-19.18	54.57	-73.75	QP	
2		0.5856	-28.71	10.51	-18.20	41.63	-59.83	QP	
3		1.4700	-29.50	10.98	-18.52	30.57	-49.09	QP	
4		3.4940	-31.49	11.03	-20.46	22.00	-42.46	QP	
5		9.3460	-30.78	9.94	-20.84	22.00	-42.84	QP	
6	*	12.7420	-27.18	9.87	-17.31	22.00	-39.31	QP	

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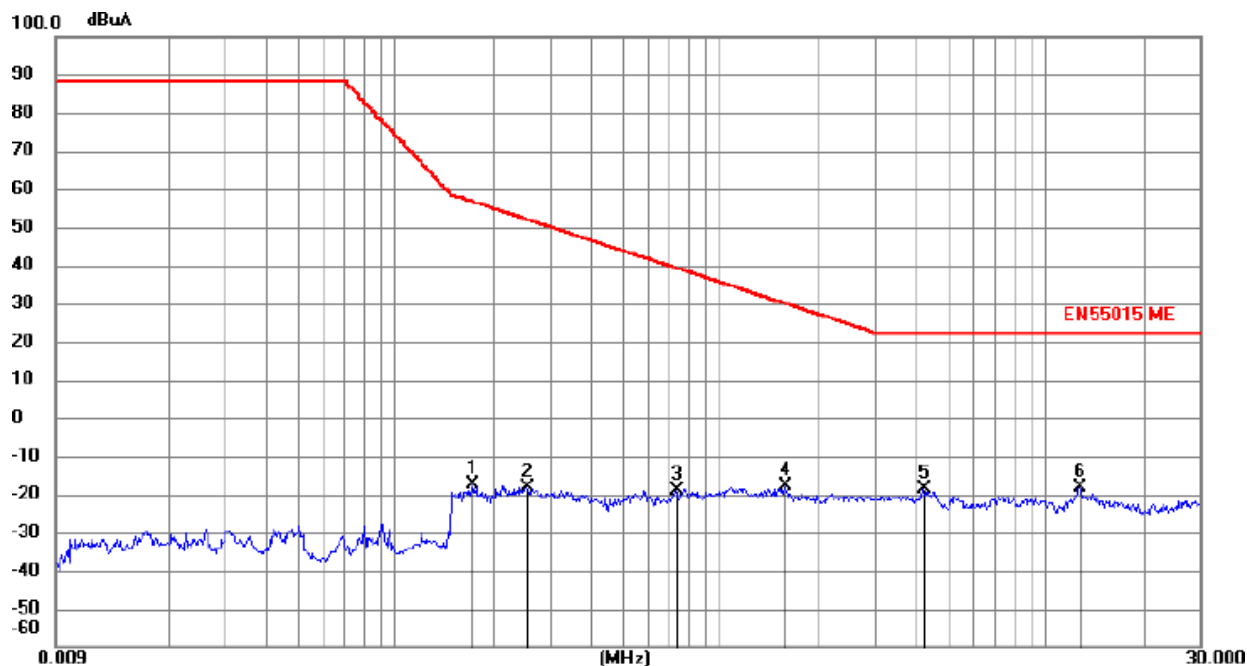
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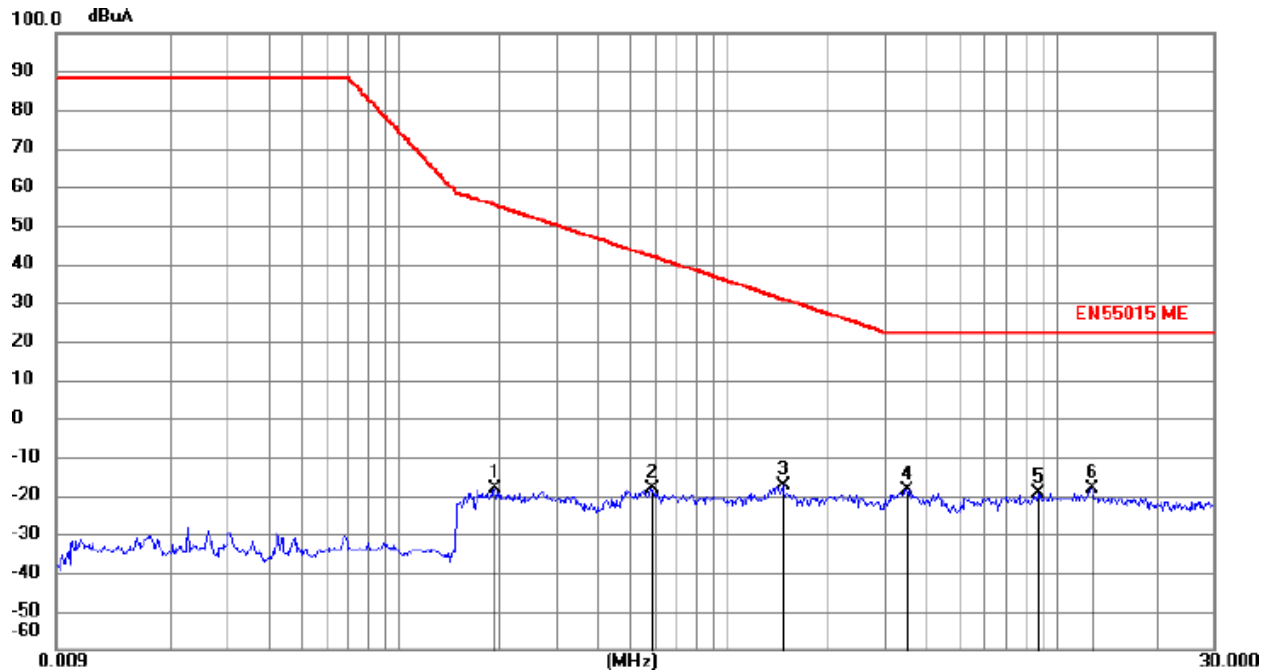
Temperature:	23°C	Relative Humidity:	54%
Pressure:	101kPa	Ant. Polarity	Y
Test Voltage :	AC 230V/50Hz	Test Mode:	Working



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuA	dBuA	dB	Detector	Comment
1		0.1737	-27.84	10.43	-17.41	56.24	-73.65	QP	
2		0.2540	-28.71	10.44	-18.27	51.67	-69.94	QP	
3		0.7338	-29.45	10.57	-18.88	38.92	-57.80	QP	
4		1.5859	-28.83	11.05	-17.78	29.66	-47.44	QP	
5		4.2419	-29.23	10.60	-18.63	22.00	-40.63	QP	
6	*	12.7420	-28.18	9.87	-18.31	22.00	-40.31	QP	



Temperature:	23°C	Relative Humidity:	54%
Pressure:	101kPa	Ant. Polarity	Z
Test Voltage :	AC 230V/50Hz	Test Mode:	Working



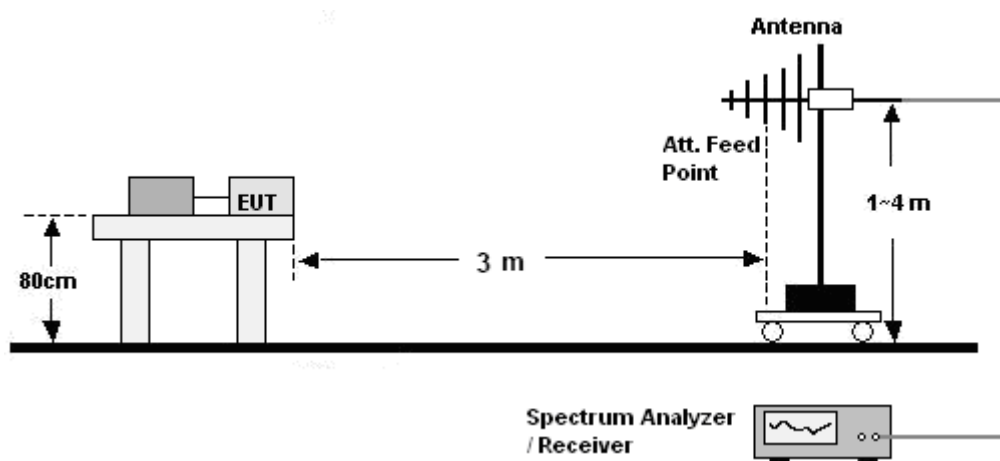
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuA	Limit dBuA	Over dB	Detector	Comment
1		0.1940	-28.71	10.43	-18.28	54.91	-73.19	QP	
2		0.5856	-28.71	10.51	-18.20	41.63	-59.83	QP	
3		1.4700	-28.50	10.98	-17.52	30.57	-48.09	QP	
4		3.4940	-29.49	11.03	-18.46	22.00	-40.46	QP	
5		8.7620	-29.52	9.97	-19.55	22.00	-41.55	QP	
6	*	12.7420	-28.18	9.87	-18.31	22.00	-40.31	QP	

Remark:

1. All readings are Quasi-Peak values.
2. Factor = Antenna factor+ Cable Loss.

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.

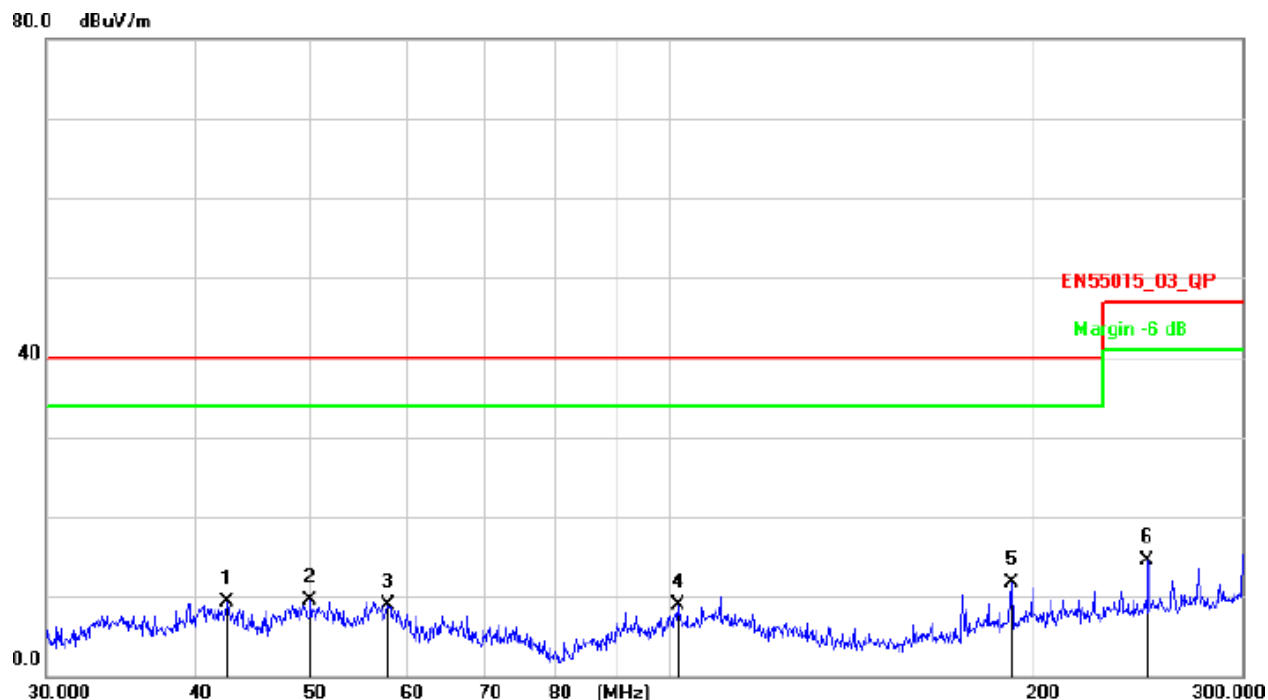
8.3 Test Procedure

- 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

Temperature:	23 °C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	Horizontal
Test Voltage :	AC 230V/50Hz	Test Mode:	Working

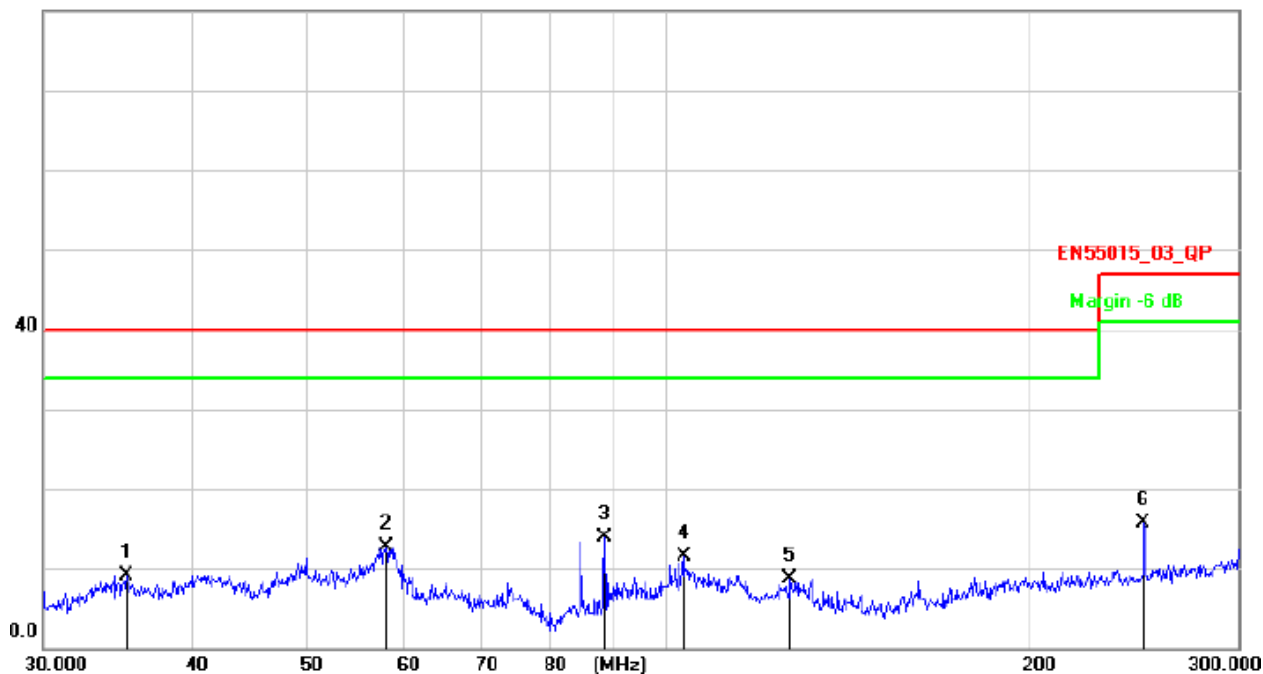


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1		42.4738	24.58	-15.27	9.31	40.00	-30.69	QP		
2		49.9024	24.32	-14.86	9.46	40.00	-30.54	QP		
3		57.9590	24.62	-15.69	8.93	40.00	-31.07	QP		
4		101.1862	25.19	-16.36	8.83	40.00	-31.17	QP		
5	*	192.3629	28.40	-16.79	11.61	40.00	-28.39	QP		
6		250.1044	29.62	-15.15	14.47	47.00	-32.53	QP		



Temperature:	23 °C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	Vertical
Test Voltage :	AC 230V/50Hz	Test Mode:	Working

80.0 dBuV/m



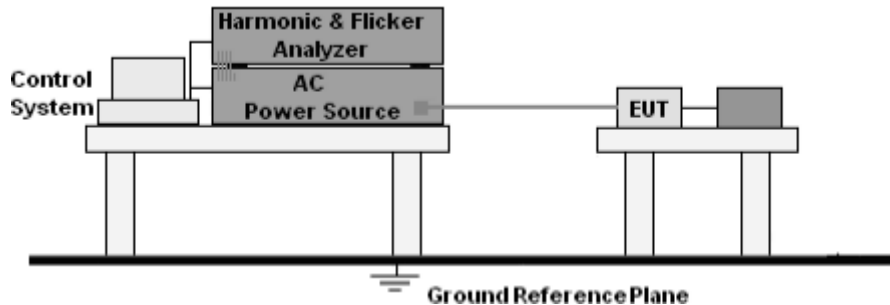
No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dB/m	dB	cm	degree	Comment
1		35.2469	25.40	-16.30	9.10	40.00	-30.90	QP		
2		58.0927	28.34	-15.71	12.63	40.00	-27.37	QP		
3	*	88.5363	32.35	-18.44	13.91	40.00	-26.09	QP		
4		103.0674	28.08	-16.48	11.60	40.00	-28.40	QP		
5		126.5090	26.61	-17.99	8.62	40.00	-31.38	QP		
6		250.1044	30.94	-15.15	15.79	47.00	-31.21	QP		

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

9. HARMONIC CURRENT EMISSION(H)

9.1 Block Diagram of Test Setup



9.2 Limit

EN 61000-3-2:2014 Clause 7.

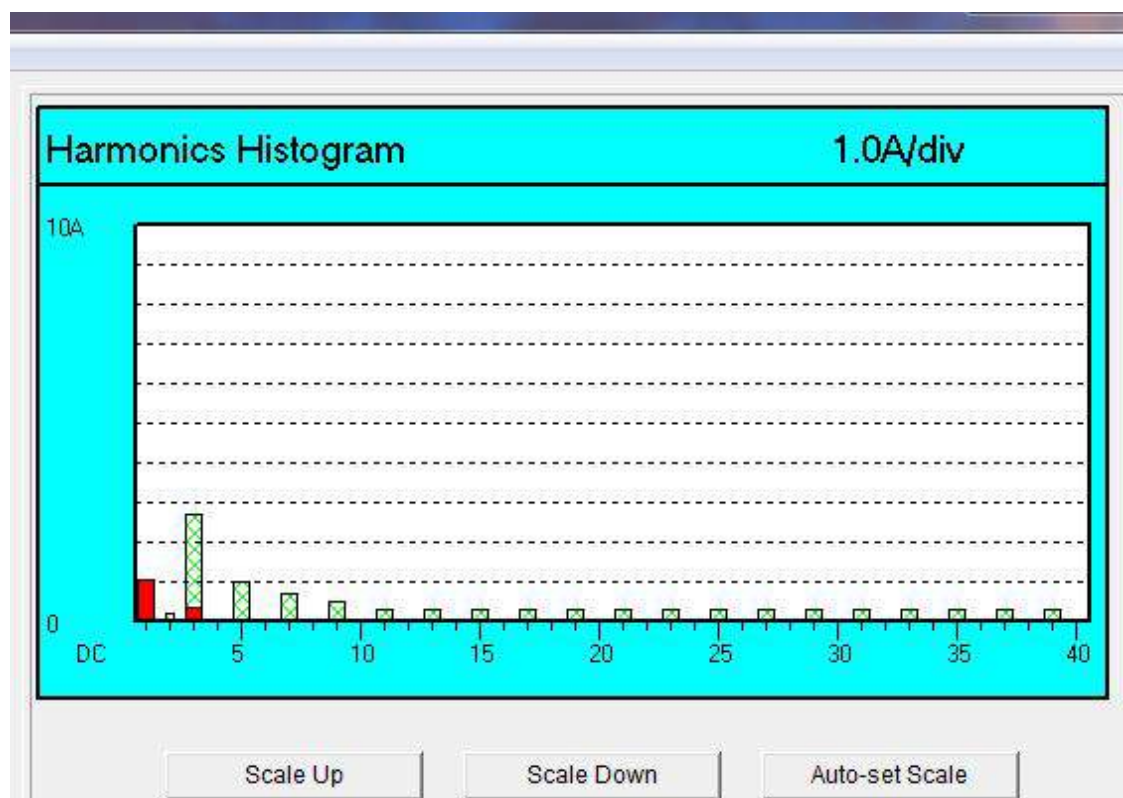
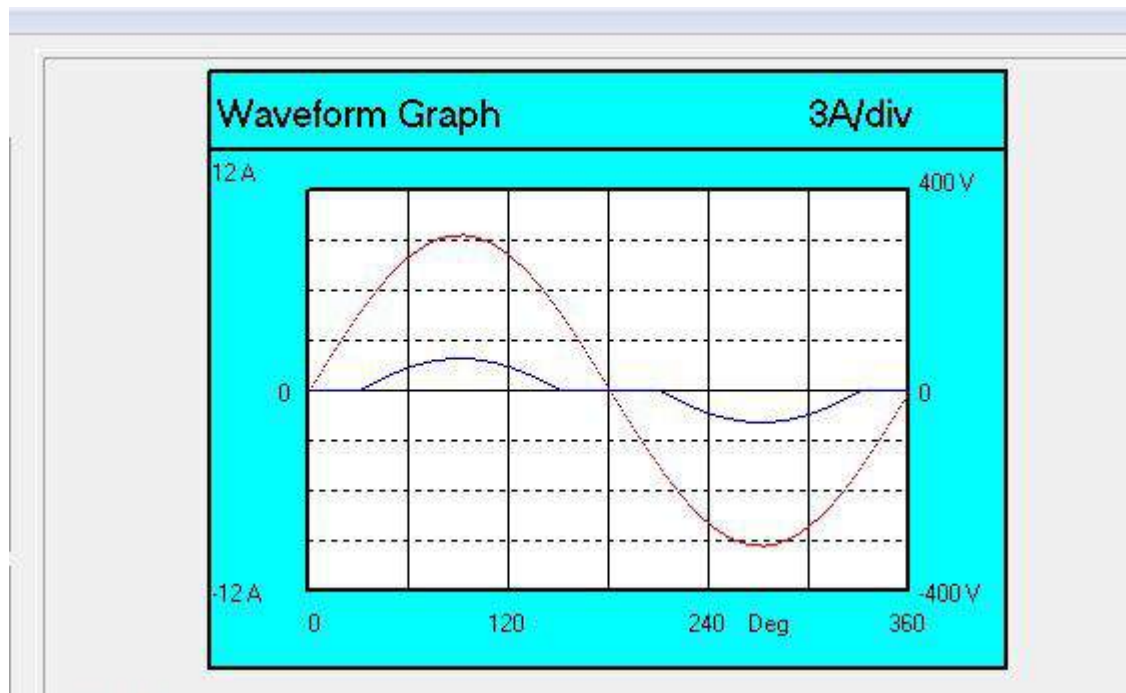
9.3 Test Procedure

- The Product was placed on the top of a non-conductive table above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.
- The correspondent test program of test instrument to measure the current harmonics emanated from Product was chosen. The measure time shall be not less than the time necessary for the Product to be exercised.



9.4 Test Results

Temperature:	23 °C	Relative Humidity:	54%
Pressure:	101kPa	Test Mode:	Working
Test Voltage :	AC 230V/50Hz		



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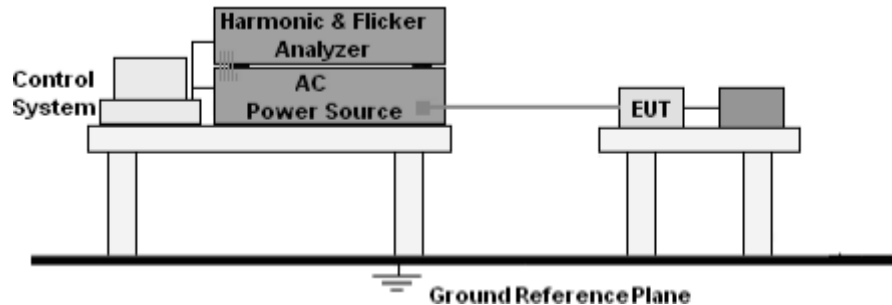
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N	Filtered	Limit	Aug.	%Limi	k\ ax.	%Limi	N	Filtered	Limit	Avg.	%Limi	I.tax.	%Limi
1	ICE 3.6						2	C.7	200.0	1.3	0.6	2.E	1.3
3	*7 0.^	270 0.2	370.3	13.7	370.8	13.7	4	1.0		0.9		1.4	
E	71.2	100 0.0	70.8	7.1	71.2	7.1	6	0.0		0.4		1.0	
7	2 -.£	70 0.0	24.5	3.5	24.8	3.E	8	0.3		0.2		0.7	
9	* -.?	E0 0.0	34.3	6.9	34.5	6.9	10	0.0		0.2		0.7	
11	1z.?	30 0.0	12.8	4.3	12.9	4.3	12	0.0		0.2		0.3	
13	.1	30 0.0	6.3	2.1	6.4	2.1	14	0.0		0.2		0.3	
1E	11.1	30 0.0	11.3	3.8	11.5	3.B	16	0.0		0.1		0.3	
17	? *	30 0.0	5.2	1.7	5.3	1.B	18	0.0		0.0		0.0	
19	z.?	30 0.0	2.4	0.8	2.5	0.B	20	0.0		0.0		0.0	
21	-.	30 0.0	4.8	1.6	5.0	1.7	22	0.0		0.2		0.3	
23	*.x	30 0.0	3.4	1.1	3.5	1.2	24	0.0		0.0		0.0	
2E	1.£	30 0.0	0.9	0.3	1.0	0.3	US	0.0		0.0		0.0	
27	z.*	30 0.0	3.1	1.0	3.2	1.1	28	0.0		0.0		0.0	
29	1.^	30 0.0	1.6	0.5	1.7	0.E	30	0.0		0.0		0.0	
31	0.7	30 0.0	0.5	0.2	0.7	0.2	*2	0.0		0.0		0.0	
33	1.^	30 0.0	1.4	0.5	1.4	0.E	34	0.0		0.0		0.0	
3E	1.£	30 0.0	1.2	0.4	1.4	0.E	36	0.0		0.0		0.0	
7	0.	30 0.0	0.2	0.1	0.3	0.1	GB	0.0		0.0		0.0	
39	1.£	30 0.0	0.9	0.3	1.0	0.3	40	0.0		0.0		0.0	
P	8.*	94B.7	7.1	0.7	7.5	0.B							

10. VOLTAGE FLUCTUATIONS & FLICKER(F)

10.1 Block Diagram of Test Setup



10.2 Limit

EN 61000-3-3:2013 Clause 5.

10.3 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.

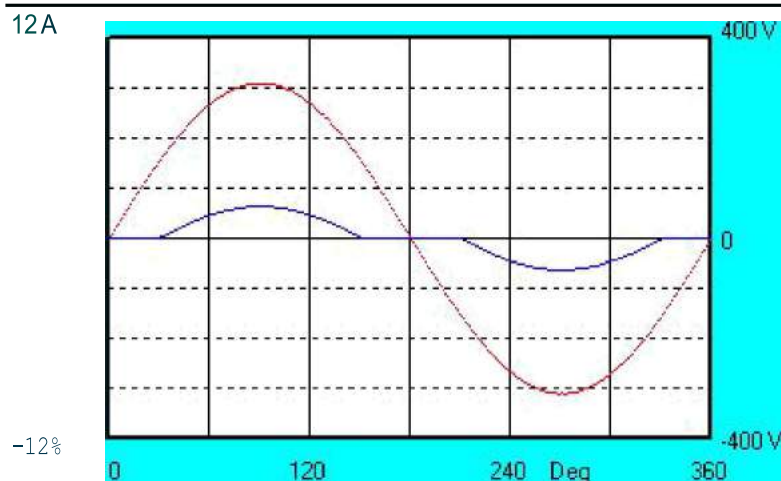
10.4 Test Results

Temperature:	23 °C	Relative Humidity:	54%
Pressure:	101kPa	Test Mode:	Working
Test Voltage :	AC 230V/50Hz		



Waveform Graph

3@div



fl OIN D OtS

voltage variations

var4at4on over last 1000ms: +4.56%
within: +0.03% and -0.02%
Exar eve leVels: +4.686 and +4.496
Tol erance band cenze: +4.56a
Pre se no so ase: Soeady
Dur azJ on: 599.384 seconds

d(max): 0.00% PASS
Lass dur azJ on of d(z) over 3.3&: 0.00 seconds
z{max) oVer 3.36: 0.00 seconds PASS

Gr eacesc d(c) upwar d: +0.006
cr eazesz d(c) downwar d: 0.006
Lass d{c) differ ence: 0.006
maximun d(c): 0.00% PASS

s h o r z Ter n Fl ñ c k e r P s z : 0.00 PAS 5



11. IMMUNITY TEST OF GENERAL THE PERFORMANCE CRITERIA

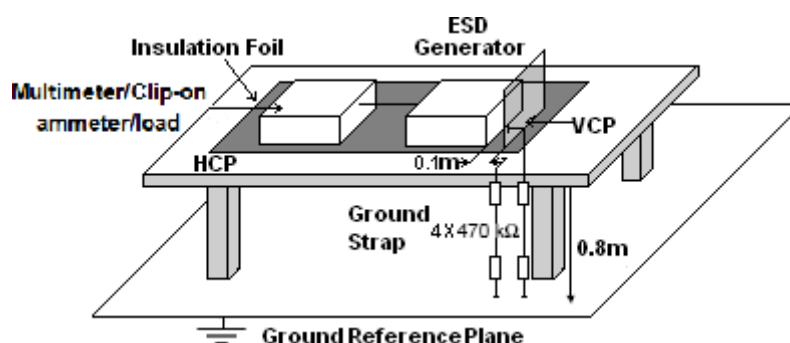
Product Standard	EN 61547: 2009
CRITERION A	During the test, no change of the luminous intensity shall be observed and the regulating control, if any, shall operate during the test as intended.
CRITERION B	During the test the luminous intensity may change to any value. After the test the luminous intensity 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.

12. ELECTROSTATIC DISCHARGE (ESD)

12.1 Test Specification

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

12.2 Block Diagram of Test Setup



12.3 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.



g. 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.

.

12.4 Test Results

Temperature:	23 °C	Relative Humidity:	54%
Pressure:	101kPa	Test Mode:	Working
Test Voltage :	AC 230V/50Hz		

Discharge Method	Discharge Position	Voltage (±kV)	Min. No. of Discharge per polarity (Each Point)	Required Level	Performance Criterion
Contact Discharge	Conductive Surfaces	2, 4	10	B	A
	Indirect Discharge HCP	2, 4	10	B	A
	Indirect Discharge VCP	2, 4	10	B	A
Air Discharge	Slots, Apertures, and Insulating Surfaces	2, 4, 8	10	B	A

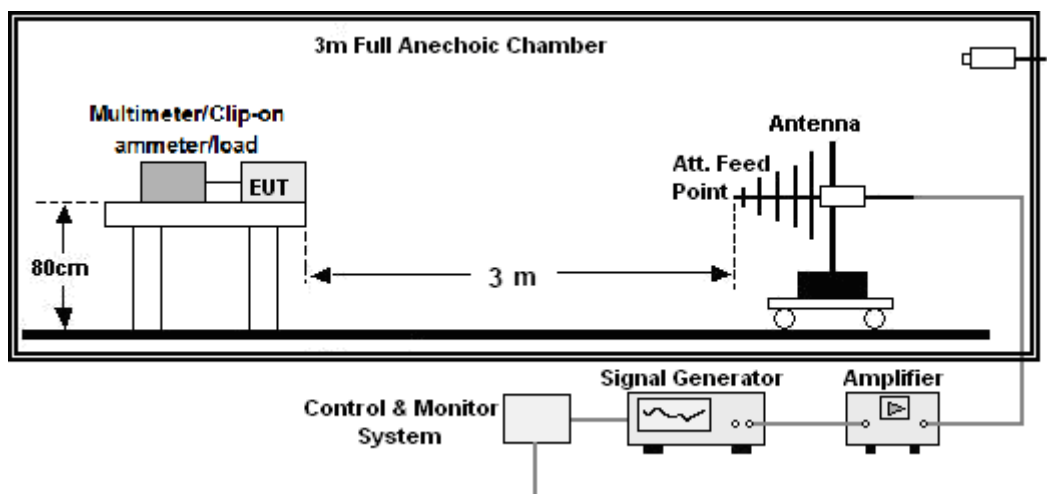
Note: N/A

13. RADIO FREQUENCY ELECTROMAGNETIC FIELDS(RS)

13.1 Test Specification

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

13.2 Block Diagram of Test Setup



13.3 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.

13.4 Test Results

Temperature:	23 °C	Relative Humidity:	54%
Pressure:	101kPa	Test Mode:	Working
Test Voltage :	AC 230V/50Hz		

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

Note: N/A

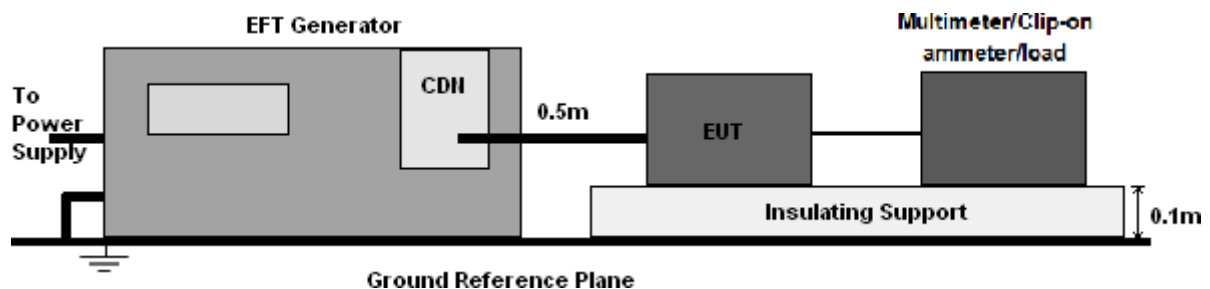
14. FAST TRANSIENTS(EFT)

14.1 Test Specification

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

14.2 Block Diagram of EUT Test Setup

For input a.c. power port:



14.3 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.

14.4 Test Results

Temperature:	23 °C	Relative Humidity:	54%
Pressure:	101kPa	Test Mode:	Working
Test Voltage :	AC 230V/50Hz		

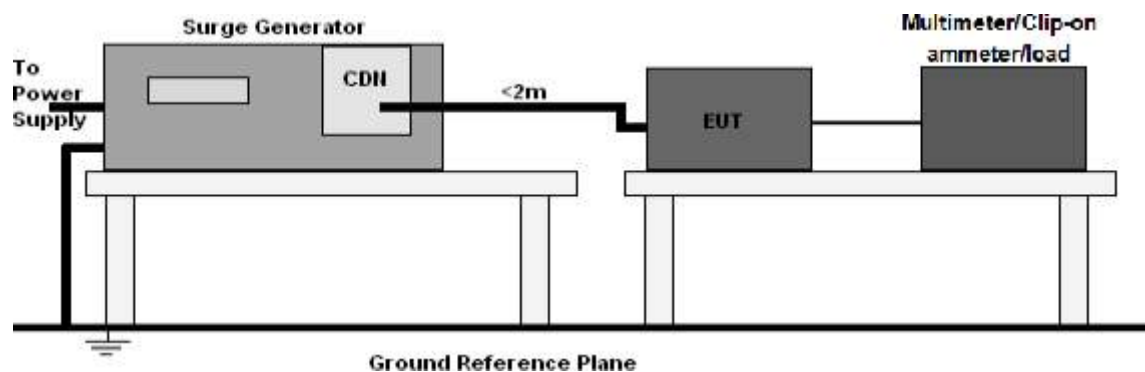
Coupling	Voltage (kV)	Polarity	Required Level	Performance Criterion
AC MainsL-N	1.0	±	B	A
Note: N/A				

15. SURGES IMMUNITY TEST

15.1 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

15.2 Block Diagram of EUT Test Setup



15.3 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).



15.4 Test Result

Temperature:	23 °C	Relative Humidity:	54%
Pressure:	101kPa	Test Mode:	Working
Test Voltage :	AC 230V/50Hz		

Coupling Line	Voltage (kV)	Phase Angle	Required Level	Performance Criterion
L + N	+1	90°	C	A
	-1	270°		
Note: N/A				

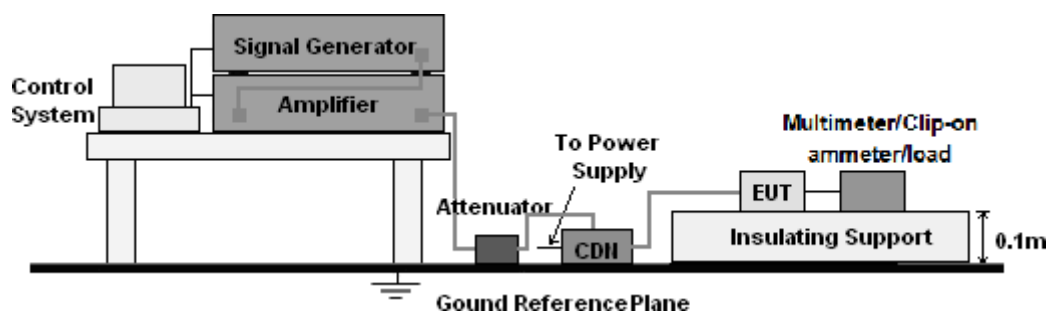
16. INJECTED CURRENTS(CS)

16.1 Test Specification

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

16.2 Block Diagram of EUT Test Setup

For input a.c. power port:



16.3 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.

16.4 Test Result

Temperature:	23 °C	Relative Humidity:	54%
Pressure:	101kPa	Test Mode:	Working
Test Voltage :	AC 230V/50Hz		

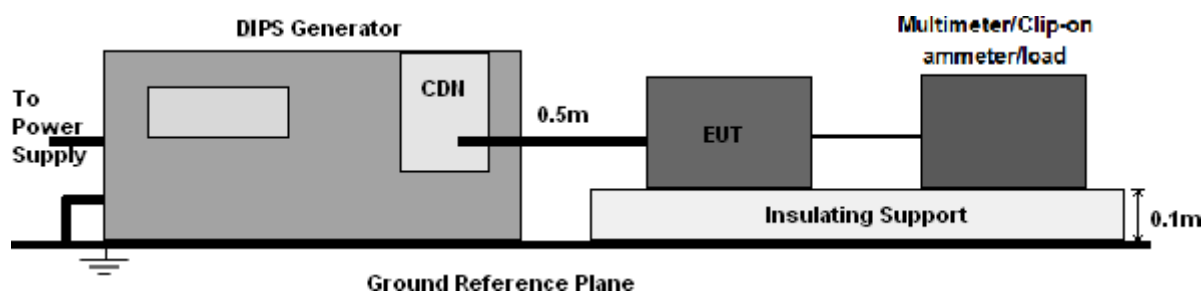
Inject Line	Frequency (MHz)	Voltage Level (V r.m.s.)	Required Level	Performance Criterion
a.c. port	0.15 - 80	3	A	A
Note: N/A				

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

Temperature:	23 °C	Relative Humidity:	54%
Pressure:	101kPa	Test Mode:	Working
Test Voltage :	AC 240V/50Hz		

Voltage Dips:				
Test Level % U_T	Voltage dips in % U_T	Duration (cycles)	Required Level	Performance Criterion
70	30	10	C	B*
Voltage Interruptions:				
Test Level % U_T	Voltage dips in % U_T	Duration (cycles)	Required Level	Performance Criterion
0	100	0.5	B	B*
Note: The EUT Unable to working during testing, and it end of the test can be restored automatically				

18. EUT PHOTOGRAPHS

EUT Photo 1



EUT Photo 2



EUT Photo 3**EUT Photo 4**

19. EUT TEST SETUP PHOTOGRAPHS

CE



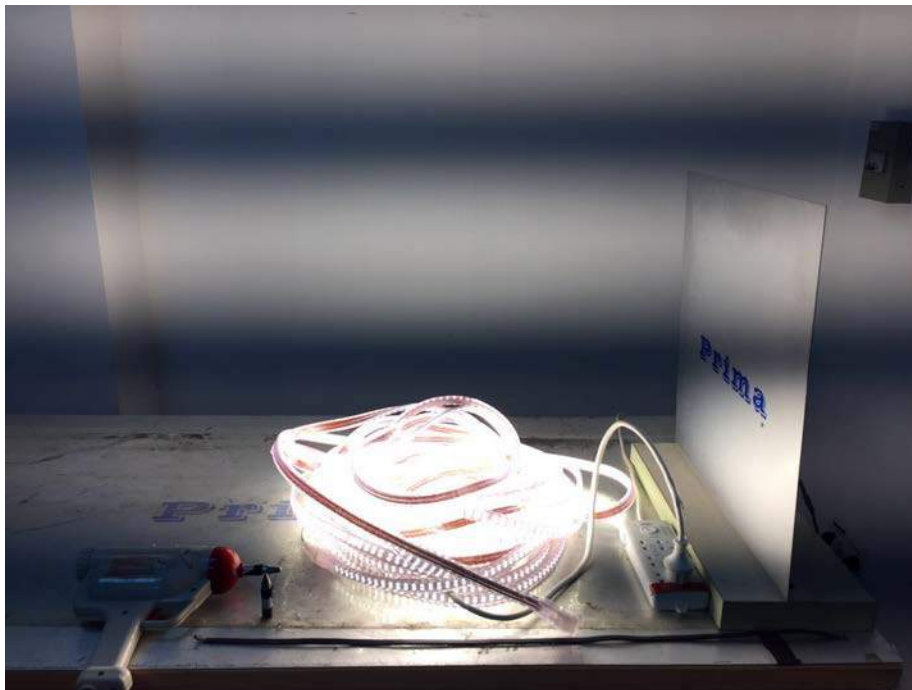
RE



H/F



ESD



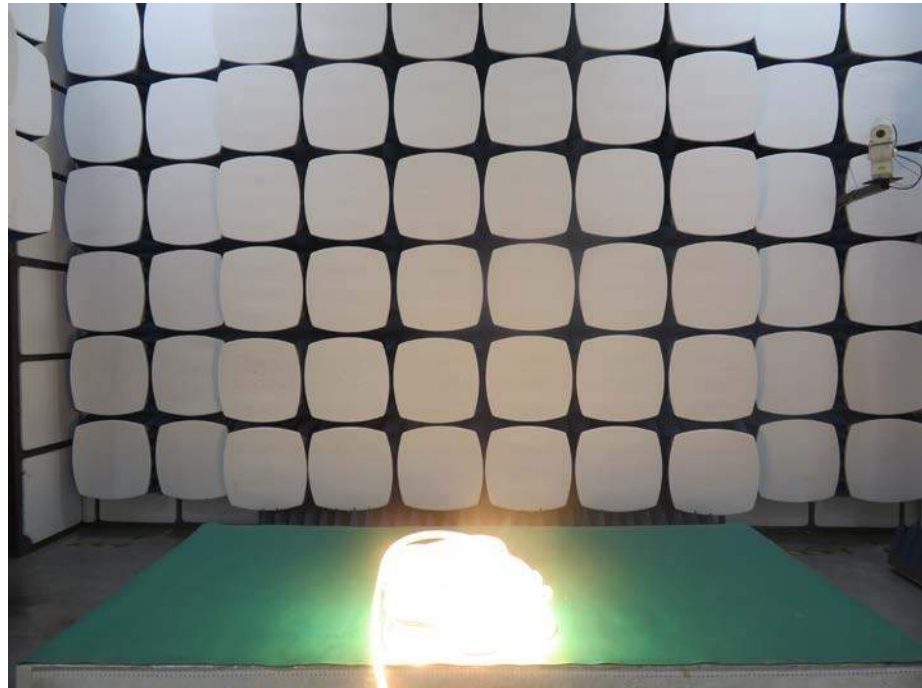
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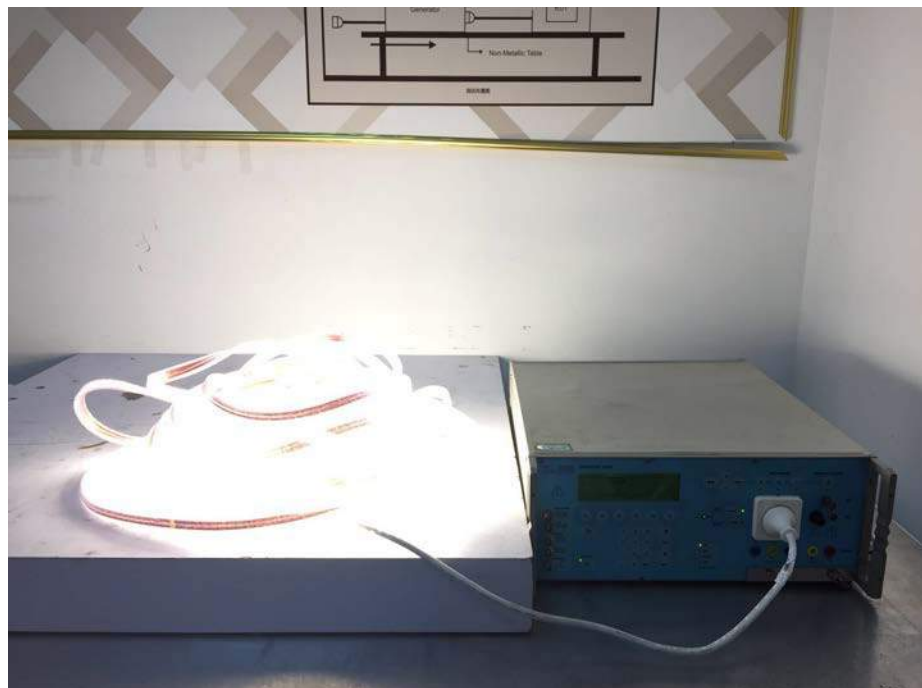
AddB Area, 1-2F, Building B, Zhongyu Green High-tech Industrial Park, Wenge Road, Heshuikou, Gongming Street, Guangming New District, Shenzhen, China

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RS



EFT& Surges & DIPS



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