

TEST REPORT

Report Number	:	T-TST-2310302B Rev.01	Date of Issue:	<u>2023-11-29</u>
Model / Serial No.	:	<u>See Page 2&3 for details</u>		
Product Type	:	<u>EC Fan (Cooling fan)</u>		
Applicant	:	<u>Dongguan Saiji Electric Technology Co. Ltd.</u>		
Manufacturing site and address	:	<u>The third floor of Building A4, Zhigu Science and Technology Park, Gekeng Village, hengli Town, 523469 Dongguan City, Guangdong Province, P. R. China</u>		
License holder	:	<u>Dongguan Saiji Electric Technology Co. Ltd.</u>		
Address	:	<u>The third floor of Building A4, Zhigu Science and Technology Park,</u>		
		<u>Gekeng Village, hengli Town, 523469 Dongguan City,</u>		
		<u>Guangdong Province, P. R. China</u>		
Test Result	:	☒ Positive ☐ Negative		
Total pages including Appendices	:	<u>31 pages</u>		

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1 Model List:

Item	Model No.	Rated Voltage (V)	Rated frequency (Hz)	Rated current (A)	Rated Power (W)	Motor No.	Size (mm)
1	SZ4028HE2	220-240	50/60	0.02	2.0	32#Motor	40*40*28
2	SZ6025HE2	220-240	50/60	0.02	2.0	32#Motor	60*60*25
3	SZ6028HE2	220-240	50/60	0.02	2.0	32#Motor	60*60*28
4	SZ6038HE2	220-240	50/60	0.03	3.5	32#Motor	60*60*38
5	SZ8025HE2	220-240	50/60	0.03	3.5	41#Motor	80*80*25
6	SZ8038HE2	220-240	50/60	0.04	4.5	41#Motor	80*80*38
7	SZ9225HE2	220-240	50/60	0.04	4.0	41#Motor	92*92*25
8	SZ9238HE2	220-240	50/60	0.05	5.5	41#Motor	92*92*38
9	SZ12025HE2	220-240	50/60	0.05	6.0	41#Motor	120*120*25
10	SZ12038HE2	220-240	50/60	0.25	28	50#Motor	120*120*38
11	SZ12038ME2	220-240	50/60	0.04	4.5	50#Motor	120*120*38
12	SZ14038ME2	220-240	50/60	0.15	17	68#Motor	140*140*38
13	SZ14038HE2	220-240	50/60	0.60	75	68#Motor	140*140*38
14	SZ15050ME2	220-240	50/60	0.15	17	68#Motor	150*150*51
15	SZ15050HE2	220-240	50/60	0.60	75	68#Motor	150*150*51
16	SZ17238ME2	220-240	50/60	0.15	17	68#Motor	172*150*38
17	SZ17238HE2	220-240	50/60	0.60	75	68#Motor	172*150*38
18	SZ17251ME2	220-240	50/60	0.15	17	68#Motor	172*150*51
19	SZ17251HE2	220-240	50/60	0.60	75	108#Motor	172*150*51
20	SZ18060ME2	220-240	50/60	0.58	69	72#Motor	200*200*60
21	SZ18060HE2	220-240	50/60	0.70	85	72#Motor	200*200*60
22	SZ20053ME2	220-240	50/60	0.58	45	92#Motor	200*200*53
23	SZ20053HE2	220-240	50/60	0.58	95	92#Motor	200*200*53
24	SZ20060ME2	220-240	50/60	0.58	69	72#Motor	200*200*60
25	SZ20060HE2	220-240	50/60	0.70	85	72#Motor	200*200*60
26	SZ20572HE2	220-240	50/60	0.98	135	92#Motor	205*205*72
27	SZ20572LE2	220-240	50/60	1.1	115	92#Motor	205*205*72
28	SZ22580ME2	220-240	50/60	0.85	100	92#Motor	225*225*80
33	SZ22580HE2	220-240	50/60	0.98	140	92#Motor	225*225*80
28	SZ25489HE2	220-240	50/60	1.2	140	92#Motor	φ254*89
29	SZ25489ME2	220-240	50/60	0.85	100	92#Motor	φ254*89
31	SZ28080ME2	220-240	50/60	0.85	100	92#Motor	280*280*80
32	SZ28080HE2	220-240	50/60	1.2	140	92#Motor	280*280*80
33	SL280HE2	220-240	50/60	1.0	140	108#Motor	φ280*131
34	SL250HE2	220-240	50/60	0.98	140	92#Motor	φ250*131
35	SL225HE2	220-240	50/60	0.7	78	92#Motor	φ225*125
36	SL220HE2	220-240	50/60	0.65	75	92#Motor	φ220*97
37	SL190HE2	220-240	50/60	0.6	73	92#Motor	φ190*95
39	SL175HE2	220-240	50/60	0.65	75	72#Motor	φ175*95
40	SL133HE2	220-240	50/60	0.6	72	72#Motor	φ133*110
41	SL310HE2	220-240	50/60	1.2	140	108#Motor	Φ310*159
42	SL355HE2	220-240	50/60	2.6	400	108#Motor	Φ355*205
43	SL400HE2	220-240	50/60	2.8	400	108#Motor	Φ400*205

Item	Model No.	Rated Voltage (V)	Rated frequency(Hz)	Rated current(A)	Rated Power (W)	Motor No.	Size (mm)
1	SZ4028HE1	100-127	50/60	0.06	2.2	32#Motor	40*40*28
2	SZ6025HE1	100-127	50/60	0.06	2.2	32#Motor	60*60*25
3	SZ6028HE1	100-127	50/60	0.06	2.2	32#Motor	60*60*28
4	SZ6038HE1	100-127	50/60	0.08	3.7	32#Motor	60*60*38
5	SZ8025HE1	100-127	50/60	0.08	3.7	41#Motor	80*80*25
6	SZ8038HE1	100-127	50/60	0.1	4.7	41#Motor	80*80*38
7	SZ9225HE1	100-127	50/60	0.1	4.3	41#Motor	92*92*25
8	SZ9238HE1	100-127	50/60	0.12	5.7	41#Motor	92*92*38
9	SZ12025HE1	100-127	50/60	0.12	6.2	41#Motor	120*120*25
10	SZ12038HE1	100-127	50/60	0.52	30	50#Motor	120*120*38
11	SZ12038ME1	100-127	50/60	0.1	4.7	50#Motor	120*120*38
12	SZ14038ME1	100-127	50/60	0.32	19	68#Motor	140*140*38
13	SZ14038HE1	100-127	50/60	1.22	80	68#Motor	140*140*38
14	SZ15050ME1	100-127	50/60	0.32	19	68#Motor	150*150*51
15	SZ15050HE1	100-127	50/60	1.22	80	68#Motor	150*150*51
16	SZ17238ME1	100-127	50/60	0.32	19	68#Motor	172*150*38
17	SZ17238HE1	100-127	50/60	1.22	80	68#Motor	172*150*38
18	SZ17251ME1	100-127	50/60	0.32	19	68#Motor	172*150*51
19	SZ17251HE1	100-127	50/60	1.22	80	108#Motor	172*150*51
20	SZ18060ME1	100-127	50/60	1.18	72	72#Motor	180*180*60
21	SZ18060HE1	100-127	50/60	1.42	88	72#Motor	180*180*60
22	SZ20053ME1	100-127	50/60	1.18	47	92#Motor	200*200*53
23	SZ20053HE1	100-127	50/60	1.18	95	92#Motor	200*200*53
24	SZ20060ME1	100-127	50/60	1.18	73	72#Motor	200*200*60
25	SZ20060HE1	100-127	50/60	1.42	88	72#Motor	200*200*60
26	SZ20572HE1	100-127	50/60	1.98	140	92#Motor	205*205*72
27	SZ20572LE1	100-127	50/60	2.22	120	92#Motor	205*205*72
28	SZ22580ME1	100-127	50/60	1.72	106	92#Motor	225*225*80
33	SZ22580HE1	100-127	50/60	1.98	146	92#Motor	225*225*80
28	SZ25489HE1	100-127	50/60	2.42	146	92#Motor	φ254*89
29	SZ25489ME1	100-127	50/60	1.72	106	92#Motor	φ254*89
31	SZ28080ME1	100-127	50/60	1.72	106	92#Motor	280*280*80
32	SZ28080HE1	100-127	50/60	2.42	146	92#Motor	280*280*80
33	SL280HE1	100-127	50/60	2.02	146	108#Motor	φ280*131
34	SL250HE1	100-127	50/60	1.98	146	92#Motor	φ250*131
35	SL225HE1	100-127	50/60	1.42	82	92#Motor	φ225*125
36	SL220HE1	100-127	50/60	1.32	78	92#Motor	φ220*97
37	SL190HE1	100-127	50/60	1.22	76	92#Motor	φ190*95
39	SL175HE1	100-127	50/60	1.32	78	72#Motor	φ175*95
40	SL133HE1	100-127	50/60	1.22	76	72#Motor	φ133*110
41	SL310HE1	100-127	50/60	2.42	146	108#Motor	Φ310*159
42	SL355HE1	100-127	50/60	5.22	420	108#Motor	Φ355*205
43	SL400HE1	100-127	50/60	5.62	450	108#Motor	Φ400*205

Remark:

The difference between models is describe as above table, same as circuit diagram, so the EMC full testing was applied on SZ28080HE2, SL400HE2, other models are deemed to fulfil relevant EMC requirement without further testing.

2 TEST REGULATIONS :

The emissions tests were performed according to the following regulations:

☐ - EN 55032: 2015

■ - EN 61000-3-2: 2019+A1: 2021

■ - EN 61000-3-3: 2013+A1: 2019+A2: 2021

■ - EN IEC 55014-2 :2021

■ - EN IEC 55014-1: 2021

■ - Household appliances and similar

☐ - Portable tools

☐ - Semiconductor devices

☐ - EN 60601-1-2: 2015

☐ - VCCI

☐ - Class A

☐ - Class B

☐ - FCC Part 15

☐ - Class A

☐ - Class B

☐ - AS 3548 (1992)

☐ - Class A

☐ - Class B

☐ - EN 55035: 2017

Following basic standards were used as reference:

☐ - IEC 61000-4-2: 2008

☐ - IEC 61000-4-3: 2006+A1: 2007+A2: 2010

☐ - IEC 61000-4-4: 2012

☐ - IEC 61000-4-5: 2014

☐ - IEC 61000-4-6: 2013

☐ - IEC 61000-4-8: 1993+A1: 2000

☐ - IEC 61000-4-11: 2004

Remark: This report issued as required for customer.

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4 General Information

4.1 Client Information

Applicant: **Dongguan Saiji Electric Technology Co. Ltd.**

Address of Applicant: The third floor of Building A4, Zhigu Science and Technology Park, Gekeng Village, hengli Town, 523469 Dongguan City, Guangdong Province, P. R. China

4.2 General Description of E.U.T.

Product Name: EC Fan

Product description: -

Model No.: See page 2&3 for details

4.3 Details of E.U.T.

Power Supply: See page 2&3 for details

4.4 Description of Support Units

The EUT has been tested as an independent unit..

4.5 Deviation from Standards

None.

4.6 General Test Climate During Testing

Temperature: 15-30°C Humidity: 30-70 %RH Atmospheric Pressure: 860-1060 mbar

4.7 Abnormalities from Standard Conditions

None.

4.8 Monitoring of EUT for All Immunity Test

Audio: N/A

Visual: N/A.

4.9 Test Location

STAFIT Electronic Technology Co., Ltd.

Testing Start Date: 2023-10-12

Testing End Date: 2023-11-23

Reviewed by: Technical Certifier


Freda Shao
Manager



Prepared by:



Victor Wu

Engineer

5 Equipment Used during Test

Conducted Emission				
No.	Test Equipment	Manufacturer	Model No.	Serial No.
EMC0306	Shielding Room	Zhong Yu	8 x 3 x 3.8 m ³	N/A
EMC0118	Two-line v-netwok	R&S	ENV216	100359
EMC0102	LISN	SCHAFFNERCH ASE	MN2050D/1	1421
EMC2046	Artificial Mains Network(LISN)	AFJ Instruments	LT32C	S.N.3203112 0150
EMC0506	EMI Test Receiver	Rohde & Schwarz	ESCS30	100085
EMC0107	Coaxial Cable	--	2m	N/A
EMC0106	Voltage Probe	--	N/A	N/A
EMC0120	8 Line ISN	Fischer CustomCommuni cations Inc.	FCC-TLISN-T8-02	20550
EMC0121	4 Line ISN	Fischer CustomCommuni cations Inc.	FCC-TLISN-T4-02	20549
EMC0122	2 Line ISN	Fischer CustomCommuni cations Inc.	FCC-TLISN-T2-02	20548
EMC167	Conical metal housing	EMC	N/A	N/A

Disturbance Power				
No.	Test Equipment	Manufacturer	Model No.	Serial No.
EMC0306	Shielding Room	Zhong Yu	8 x 3 x 3.8 m ³	N/A
EMC2040	Absorbing Clamp	Beijing Dazhe Co.Ltd.	ZN23201	N/A
EMC0303	7m Coaxial Cable	SGS	7m	N/A
EMC0506	EMI Test Receiver	Rohde & Schwarz	ESCS30	100085
EMC0305	Slide Controller Bar	HD-GmbH	HD50	050/490
EMC0103	Slide Bar RP	HD-GmbH	KMS560	560/392

Harmonics / Flicker test				
No.	Test Equipment	Manufacturer	Model No.	Serial No.
EMC0608	AC Power Source	California	50001iX	56627
EMC0607	Power Analyzer	California	PACS	72400

General used equipment				
No.	Test Equipment	Manufacturer	Model No.	Serial No.
EMC0006	DMM	Fluke	73	70681569
EMC0007	DMM	Fluke	73	70671122

6 Electromagnetic Interference Test Results

6.1 Conducted Emissions on Mains Terminals, 150 kHz to 30 MHz

Test Requirement: EN55014-1
 Test Method: EN55014-1
 Test voltage: AC 230V 50Hz
 Frequency Range: 150 kHz to 30 MHz
 Class / Severity: Group 2, Class B
 Detector: Peak for pre-scan
 Quasi-Peak or (and) Average for final measurement
 Limit:

Frequency range MHz	At mains terminals dB (μV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	59 to 46
0.50 to 5	56	46
5 to 30	60	50

Note1: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

Note2: The lower limit is applicable at the transition frequency.

6.1.1 E.U.T. Operation

EUT Operation:

Operating environment:

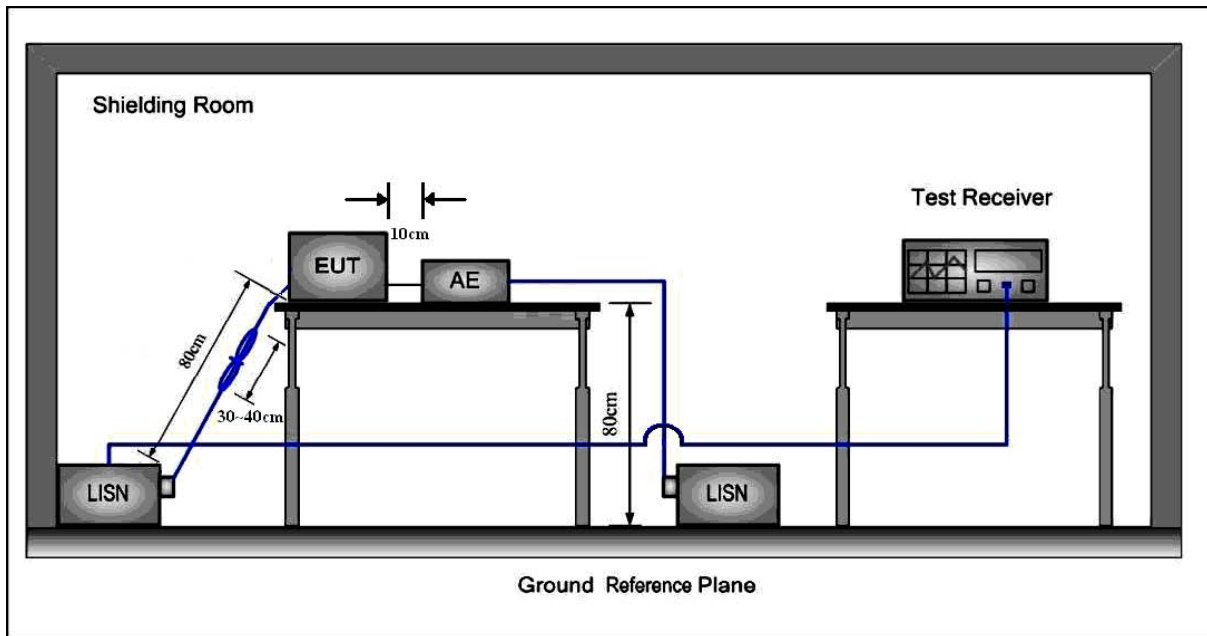
Temperature :25℃ Humidity: 45% RH

Atmospheric pressure: 101 k pa

EUT Operation:

Normal working

6.1.2 Test Setup and Procedure



1. The mains terminal disturbance voltage was measured with the EUT in a shielded room.
2. The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides $50\Omega/50\mu\text{H} + 5\Omega$ linear impedance. The power cables of all other units of the EUT were connected to a second LISN, which was bonded to the ground reference plane in the same way as the LISN for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
3. 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.
4. The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN was placed 0.8m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN and the EUT. The mains lead of EUT excess 0.8m was folded back and forth parallel to the lead so as to form a horizontal bundle with a length between 0.3m and 0.4m. All other units of the EUT and associated equipment were at least 0.8m from the LISN.

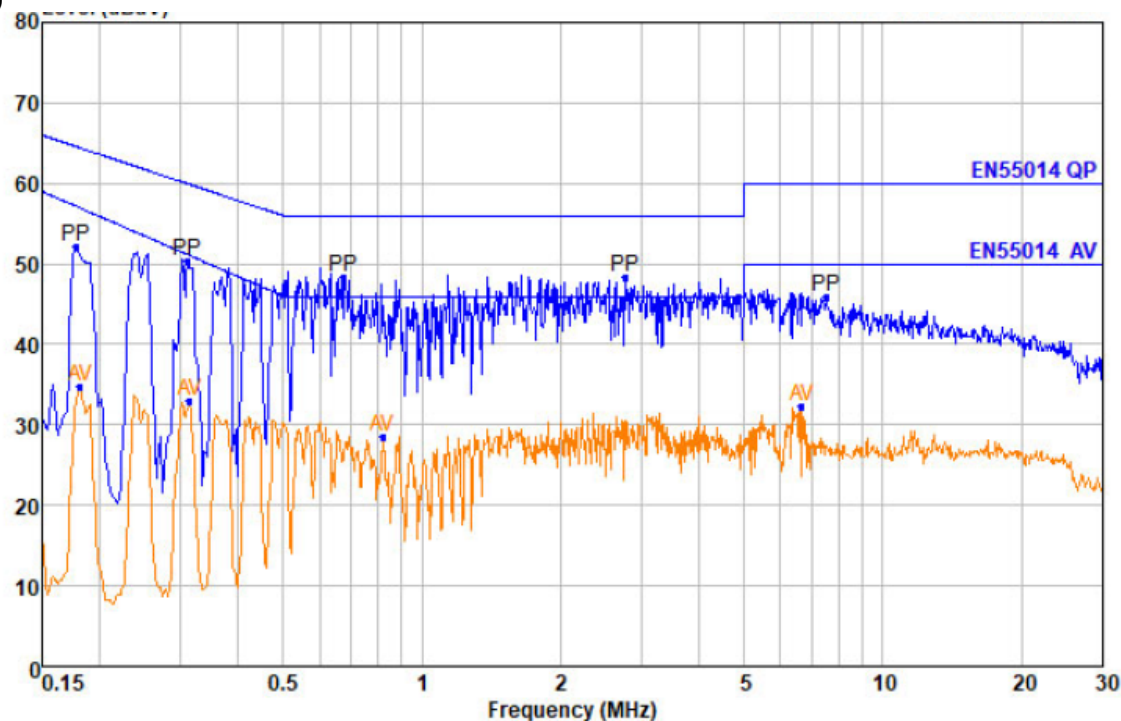
6.1.3 Measurement Data

Model No.: SZ28080HE2

Live Line

Peak Scan:

Level (dBμV)



NO.	Freq MHz	Level dBμV	Remark	LISN Factor dB	Cable Loss dB	Limit Line dBμV	Margin dB
1	0.178	52.25	Peak	9.69	0.21	64.59	-12.34
2	0.182	34.80	Average	9.69	0.21	56.94	-22.14
3	0.310	50.47	Peak	9.67	0.24	59.97	-9.50
4	0.313	32.89	Average	9.67	0.24	51.05	-18.16
5	0.679	48.46	Peak	9.70	0.29	56.00	-7.54
6	0.822	28.56	Average	9.69	0.30	46.00	-17.44
7	2.765	48.36	Peak	9.63	0.37	56.00	-7.64
8	6.662	32.31	Average	9.69	0.41	50.00	-17.69
9	7.526	45.86	Peak	9.69	0.42	60.00	-14.14

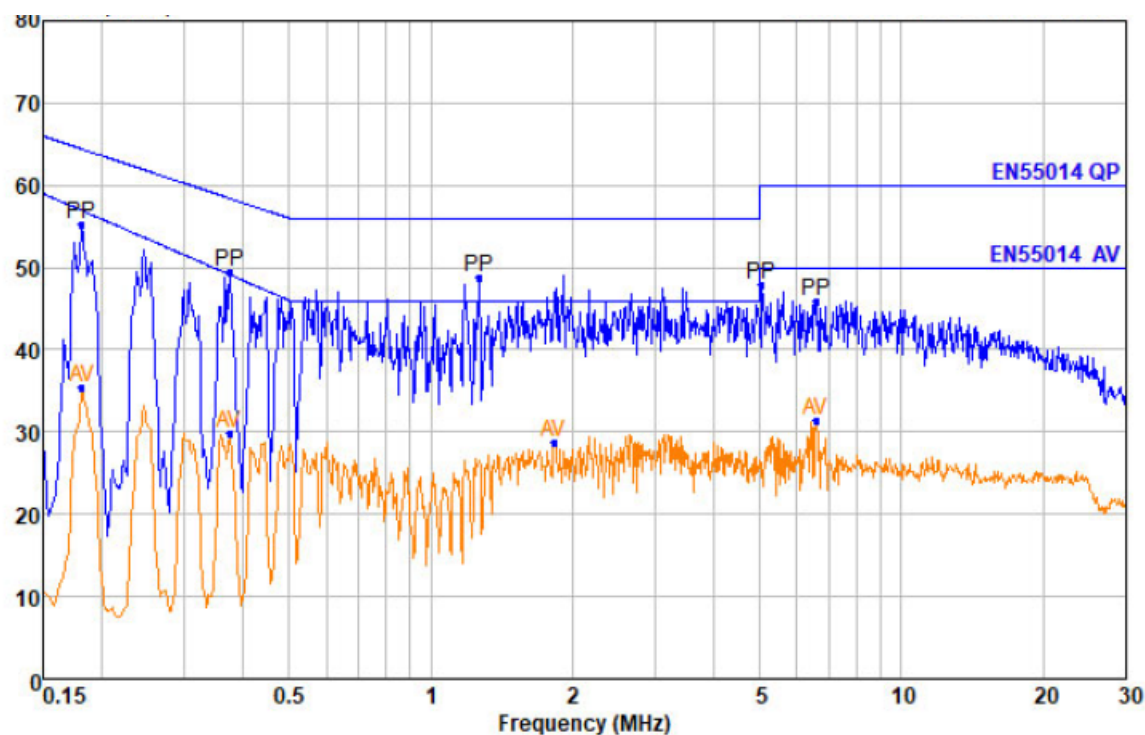
Level=Read Level + LISN Factor + Cable Loss

Model No.: SZ28080HE2

Neutral Line

Peak Scan:

Level (dBμV)



NO.	Freq MHz	Level dBμV	Remark	LISN Factor dB	Cable Loss dB	Limit Line dBμV	Margin dB
1	0.182	55.22	Peak	9.66	0.21	64.42	-9.20
2	0.182	35.41	Average	9.66	0.21	56.94	-21.53
3	0.373	49.36	Peak	9.66	0.25	58.43	-9.07
4	0.373	29.97	Average	9.66	0.25	49.16	-19.19
5	1.262	48.69	Peak	9.63	0.32	56.00	-7.31
6	1.829	28.64	Average	9.62	0.34	46.00	-17.36
7	5.058	47.83	Peak	9.62	0.40	60.00	-12.17
8	6.592	45.88	Peak	9.62	0.41	60.00	-14.12
9	6.592	31.45	Average	9.62	0.41	50.00	-18.55

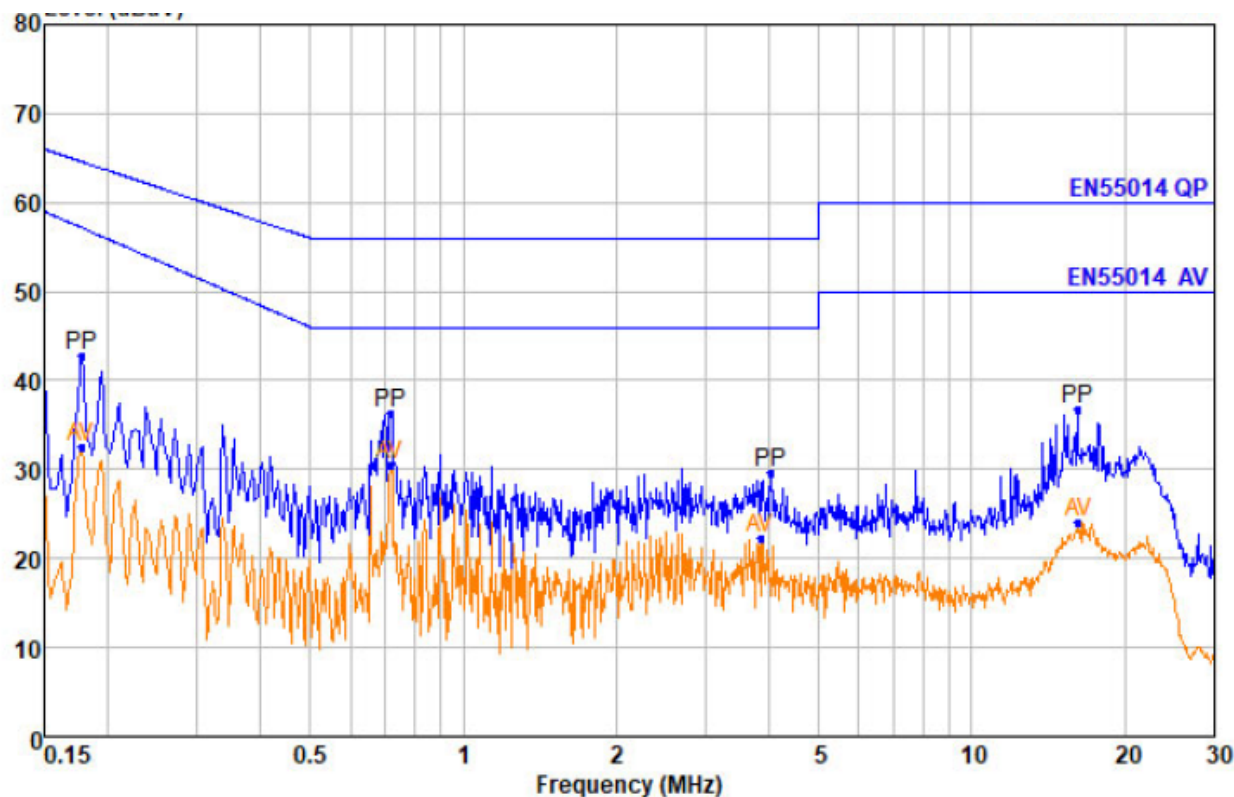
Level=Read Level + LISN Factor + Cable Loss

Model No.: SL400HE2

Live Line

Peak Scan:

Level (dBμV)



NO.	Freq MHz	Level dBuV	Remark	LISN Factor dB	Cable Loss dB	Limit Line dBuV	Margin dB
1	0.178	42.76	Peak	9.69	0.21	64.59	-21.83
2	0.178	32.52	Average	9.69	0.21	57.17	-24.65
3	0.720	36.41	Peak	9.71	0.29	56.00	-19.59
4	0.720	30.64	Average	9.71	0.29	46.00	-15.36
5	3.840	22.18	Average	9.61	0.38	46.00	-23.82
6	4.027	29.69	Peak	9.61	0.39	56.00	-26.31
7	16.140	36.78	Peak	9.70	0.46	60.00	-23.22
8	16.226	24.09	Average	9.70	0.47	50.00	-25.91

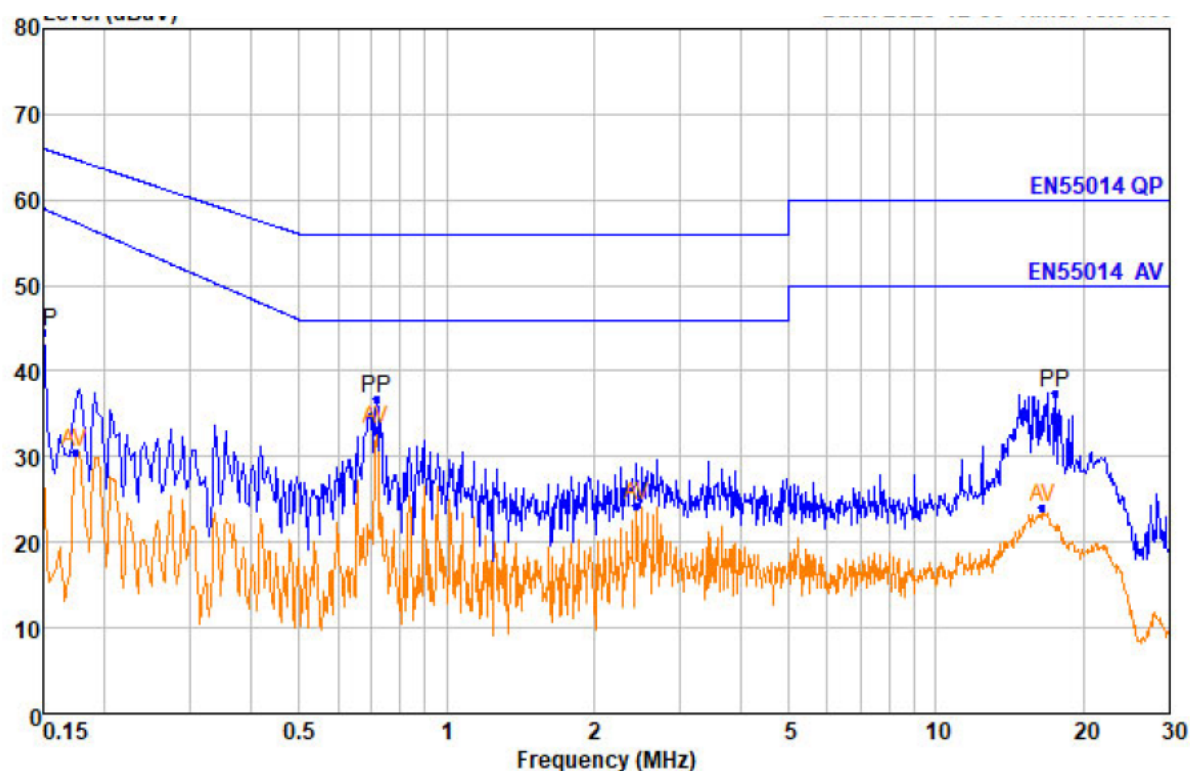
Level=Read Level + LISN Factor + Cable Loss

Model No.: SL400HE2

Neutral Line

Peak Scan:

Level (dBμV)



NO.	Freq MHz	Level dBuV	Remark	LISN Factor dB	Cable Loss dB	Limit Line dBuV	Margin dB
1	0.150	44.48	Peak	9.71	0.20	66.00	-21.52
2	0.174	30.54	Average	9.67	0.21	57.40	-26.86
3	0.720	36.75	Peak	9.62	0.29	56.00	-19.25
4	0.720	33.12	Average	9.62	0.29	46.00	-12.88
5	2.448	24.32	Average	9.62	0.36	46.00	-21.68
6	16.486	23.96	Average	9.63	0.47	50.00	-26.04
7	17.568	37.44	Peak	9.62	0.47	60.00	-22.56

Level=Read Level + LISN Factor + Cable Loss

6.2 Disturbances Power Test, 30 MHz to 300 MHz

Test Requirement:	EN55014-1
Test Method:	EN55014-1
Test voltage:	AC 230V 50Hz
Frequency Range:	30 MHz to 300 MHz
Detector:	Peak for pre-scan Quasi-Peak and Average at frequency with maximum peak (120kHz resolution bandwidth)

Limit:

Table 2a, Columns 2&3 for household and similar appliances

Disturbance power limits for the frequency range 30 MHz to 300 MHz

Frequency range MHz	At mains terminals (dB (pW))	
	Quasi-peak	Average
30 to 300	45 to 55	35 to 45

Note1: The limit increases linearly with the frequency in the range 30 MHz to 300 MHz

Table 2b, Columns 2&3 for household and similar appliances

Margin when performing disturbance power measurement in the frequency range 30 MHz to 300 MHz

Frequency range MHz	Margin (dB)	
	Quasi-peak	Average
200 to 300	0 to 10 dB	--

NOTE 1: Appliances are deemed to comply in the frequency range from 300 MHz to 1 000 MHz if both of the following conditions (1) and 2)) are fulfilled:

- 1) All the measurement result are lower than the applicable limits (Table 2a) minus the corresponding margin (Table 2b); or the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector.
- 2) No clock frequency or oscillator frequency of the EUT is more than or equal to 30 MHz.

NOTE 2: The measured result at a particular frequency shall be less than the relevant limit minus the corresponding margin (at that frequency).

6.2.1 E.U.T. Operation

EUT Operation:

Operating environment:

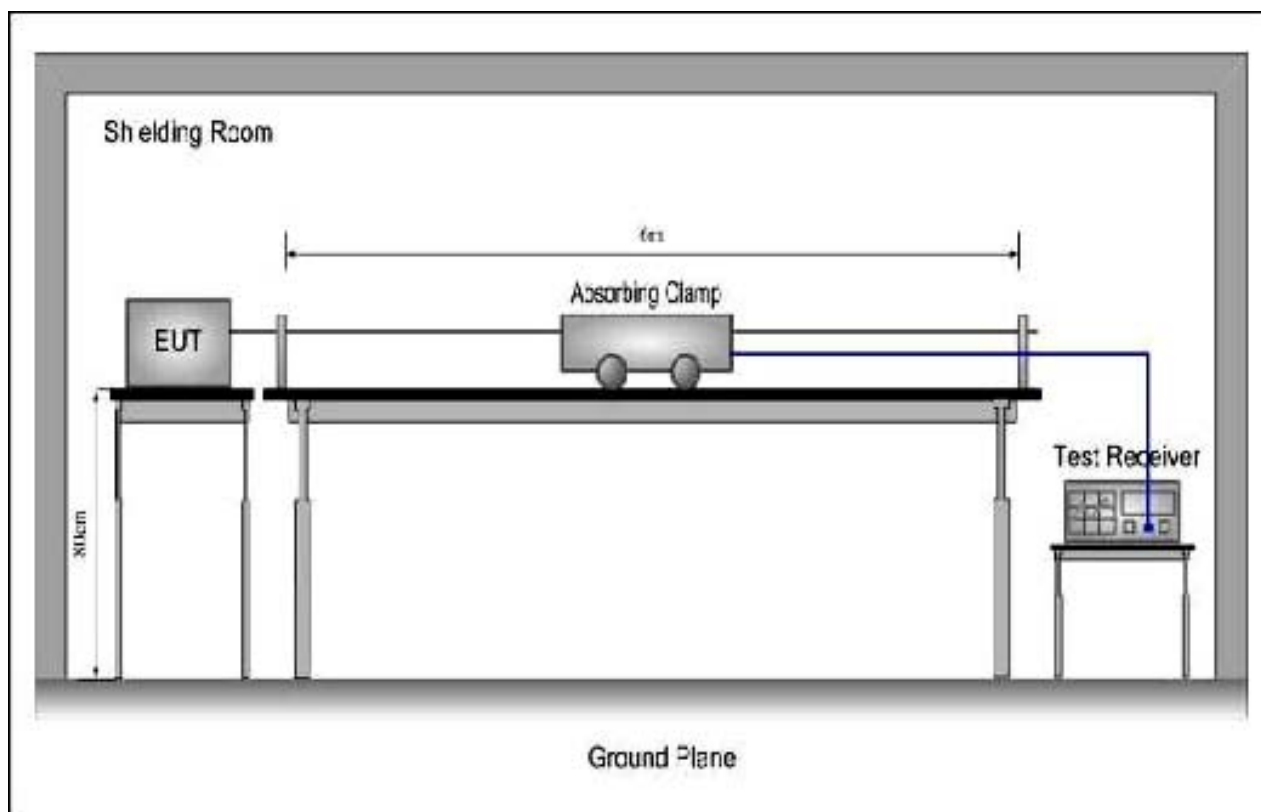
Temperature :25℃ Humidity: 45% RH

Atmospheric pressure: 101 k pa

EUT Operation:

Normal working

6.2.2 Test Setup



1. The disturbance power was measured with the EUT in a shielded room.
2. The distance between the clamp test set-up (the appliance, the lead to be measured and the absorbing clamp) and any other conductive objects (including persons, walls and ceiling, but excluding the floor) shall be at least 0,8 m. The appliance to be tested shall be placed on a non-metallic support table parallel to the floor. The height of the table shall be $0,1\text{ m} \pm 0,025\text{ m}$ for appliances primarily intended to be positioned on the floor in normal use, and $0,8\text{ m} \pm 0,05\text{ m}$ for other appliances.
3. Auxiliary leads normally extendible by the user, for instance with a loose end or leads fitted with a (by the user) easily replaceable plug or socket on one or both ends, shall in accordance with 6.2.3 be extended to a length of about 6 m. Any plug or socket which will not pass through the absorbing clamp due to its size shall be removed (see 6.2.3).
4. If the auxiliary lead is permanently fixed to the appliance and to the auxiliary apparatus and:
 - is shorter than 0,25 m, measurement are not to be made on these leads;
 - is longer than 0,25 m but shorter than twice the length of the absorbing clamp, it shall be extended to twice the length of the absorbing clamp;
 - is longer than twice the length of the absorbing clamp, measurements shall be made using the original lead.
5. The absorbing clamp was moved along the lead to obtain maximum disturbance.

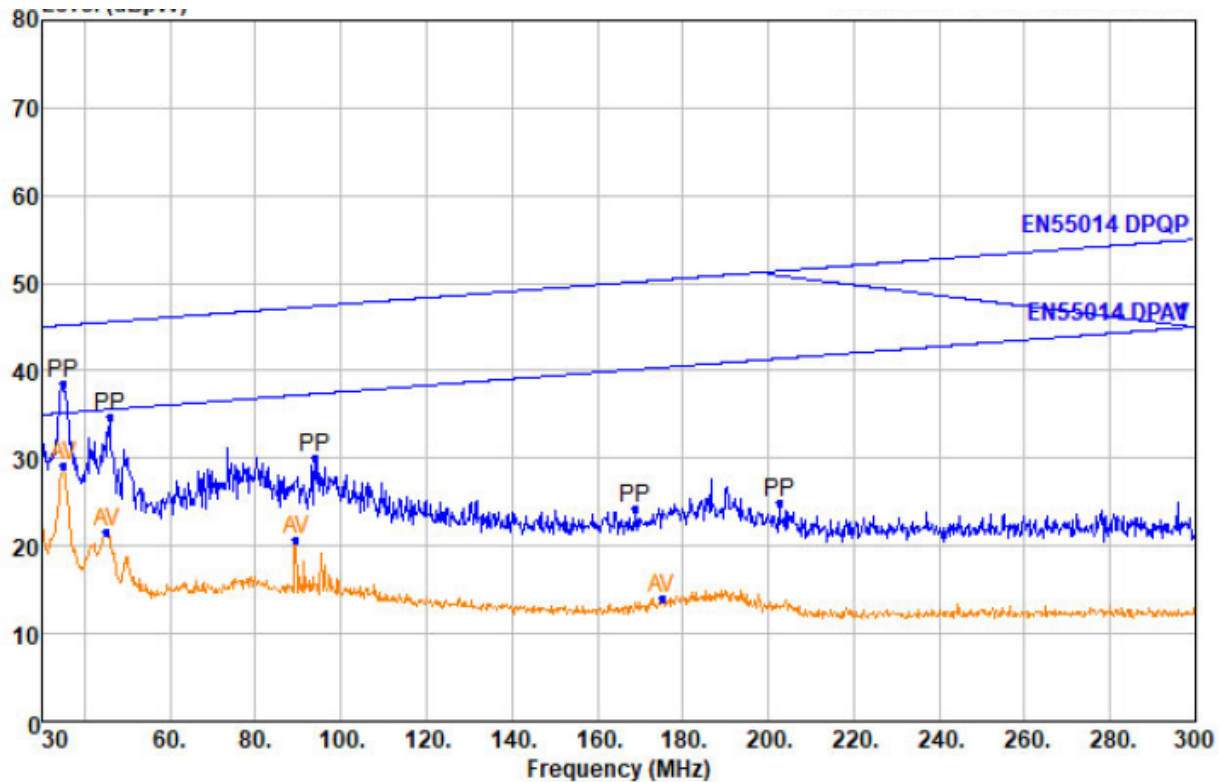
6.2.3 Measurement Data

Model No.:SZ28080HE2

AC Mains

Peak Scan:

Level (dBpW)



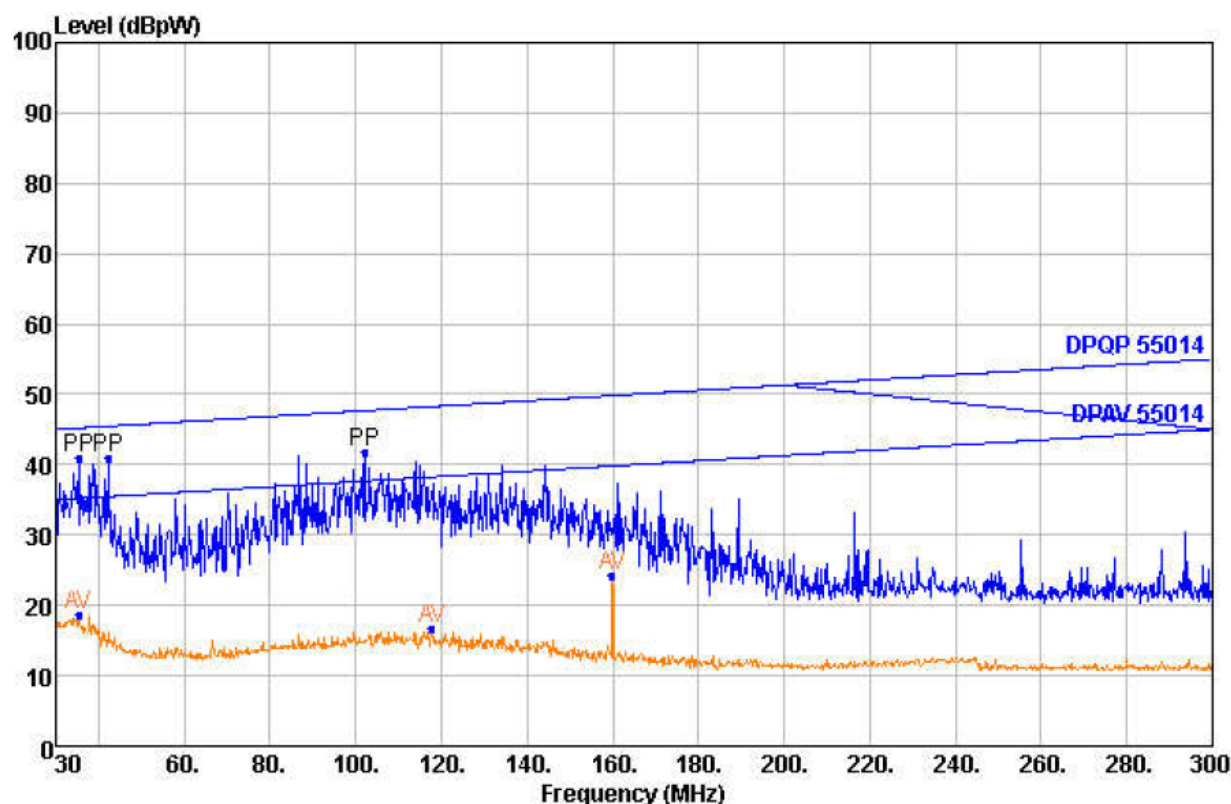
No.	Freq MHz	Level dBpW	Remark	CLAMP Factor dB	Limit Line dBpW	Margin dB
1	35.130	38.64	Peak	9.49	45.20	-6.56
2	35.130	29.18	Average	9.49	35.20	-6.02
3	45.120	21.64	Average	7.81	35.57	-13.93
4	45.930	34.67	Peak	7.69	45.60	-10.93
5	89.400	20.77	Average	6.30	37.21	-16.44
6	93.990	30.13	Peak	6.31	47.38	-17.25
7	169.050	24.22	Peak	4.02	50.16	-25.94
8	175.260	14.06	Average	4.04	40.39	-26.33
9	202.530	24.90	Peak	3.99	51.40	-26.50

Model No.: SL400HE2

AC Mains

Peak Scan:

Level (dBpW)



No.	Freq MHz	Level dBpW	Remark	CLAMP Factor dB	Limit Line dBpW	Over Limit dB
1	35.400	41.07	Peak	9.43	45.21	-4.14
2	35.400	18.57	Average	9.43	35.21	-16.64
3	42.150	40.99	Peak	8.14	45.46	-4.47
4	102.090	41.80	Peak	6.25	47.68	-5.88
5	117.750	16.75	Average	5.85	38.26	-21.51
6	159.870	24.34	Average	4.23	39.82	-15.48

6.3 Harmonics test result

Test Requirement:	EN 61000-3-2
Test Method:	EN 61000-3-2
Test voltage	AC 230V 50Hz
Frequency range	100Hz to 2Khz
Measure time	3 mins
Class:	Class A

6.3.1 E.U.T. Operation

EUT Operation:

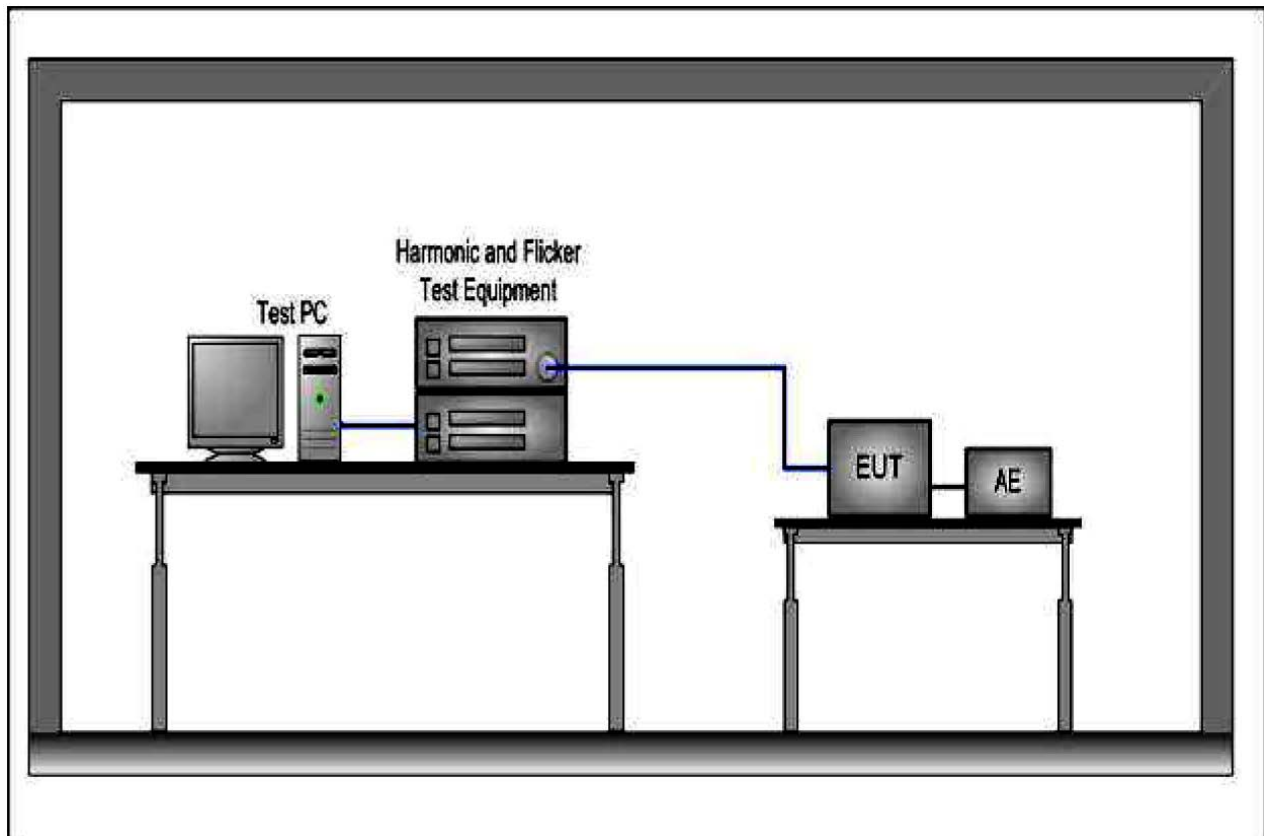
Operating environment:

Temperature :25℃ Humidity: 45% RH Atmospheric pressure: 101 k pa

EUT Operation:

Normal working

6.3.2 Test Setup and Procedure

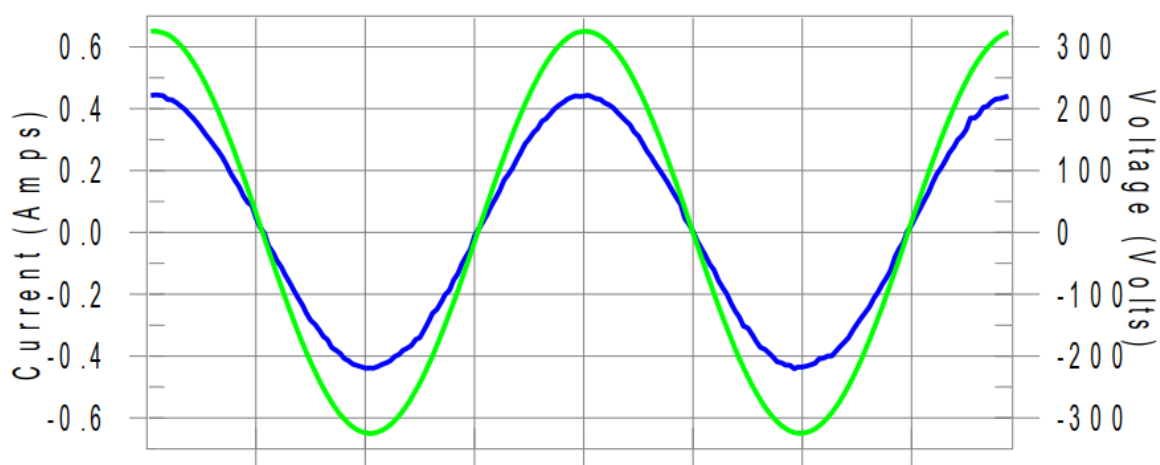


1. The EUT was tested with the equipment configured to its rated current.
2. The measurements were carried out under steady conditions. When a piece of EUT is brought into operation or is taken out of operation, manually or automatically, harmonic currents and power are not taken into account at first 10s following the switching event. EUT shall not be in standby mode for more than 10% of any observation period.
3. Harmonics of the fundamental current were measured using a digital power meter with an analogue output and frequency analyser which was integrated in the harmonic & flicker test system.
4. For each harmonic order, measure the 1.5 s smoothed r.m.s. harmonic current in each DFT time window and calculate the arithmetic average of the measured values from the DFT time windows, over the entire observation period. Each harmonic order, all 1.5 s smoothed r.m.s. harmonic current values and the average values for the individual harmonic currents, taken over the entire test observation period shall be less than or equal to the applicable limits.

6.3.3 Measurement Data

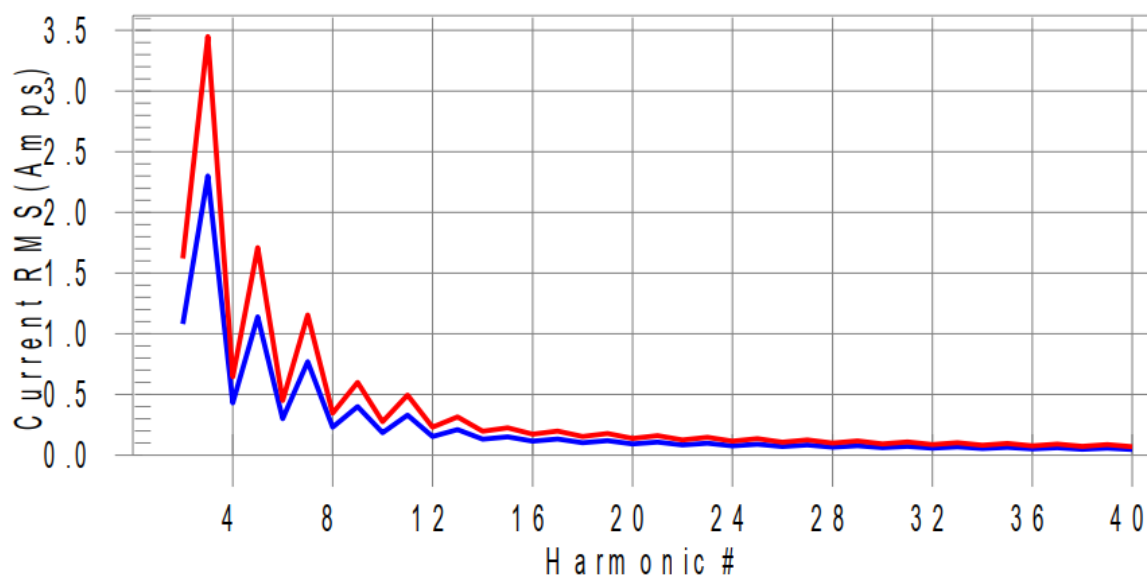
Test Result: Pass Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



Test result: Pass Worst harmonics H0-0.0% of 150% limit, H0-0% of 100% limit.

Current Test Result Summary (Run time)

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.002	1.080	N/A	0.002	1.620	N/A	Pass
3	0.002	2.300	N/A	0.003	3.450	N/A	Pass
4	0.001	0.430	N/A	0.001	0.645	N/A	Pass
5	0.000	1.140	N/A	0.001	1.710	N/A	Pass
6	0.000	0.300	N/A	0.000	0.450	N/A	Pass
7	0.001	0.770	N/A	0.001	1.155	N/A	Pass
8	0.000	0.230	N/A	0.000	0.345	N/A	Pass
9	0.000	0.400	N/A	0.001	0.600	N/A	Pass
10	0.000	0.184	N/A	0.000	0.276	N/A	Pass
11	0.000	0.330	N/A	0.001	0.495	N/A	Pass
12	0.000	0.153	N/A	0.000	0.230	N/A	Pass
13	0.000	0.210	N/A	0.000	0.315	N/A	Pass
14	0.000	0.131	N/A	0.000	0.197	N/A	Pass
15	0.000	0.150	N/A	0.001	0.225	N/A	Pass
16	0.000	0.115	N/A	0.000	0.173	N/A	Pass
17	0.000	0.132	N/A	0.000	0.198	N/A	Pass
18	0.000	0.102	N/A	0.000	0.153	N/A	Pass
19	0.000	0.118	N/A	0.000	0.178	N/A	Pass
20	0.000	0.092	N/A	0.000	0.138	N/A	Pass
21	0.000	0.107	N/A	0.000	0.161	N/A	Pass
22	0.000	0.084	N/A	0.000	0.125	N/A	Pass
23	0.000	0.098	N/A	0.000	0.147	N/A	Pass
24	0.000	0.077	N/A	0.000	0.115	N/A	Pass
25	0.000	0.090	N/A	0.000	0.135	N/A	Pass
26	0.000	0.071	N/A	0.000	0.107	N/A	Pass
27	0.000	0.083	N/A	0.000	0.125	N/A	Pass
28	0.000	0.066	N/A	0.000	0.099	N/A	Pass
29	0.000	0.078	N/A	0.000	0.116	N/A	Pass
30	0.000	0.061	N/A	0.000	0.092	N/A	Pass
31	0.000	0.073	N/A	0.000	0.109	N/A	Pass
32	0.000	0.058	N/A	0.000	0.086	N/A	Pass
33	0.000	0.068	N/A	0.000	0.102	N/A	Pass
34	0.000	0.054	N/A	0.000	0.081	N/A	Pass
35	0.000	0.064	N/A	0.000	0.096	N/A	Pass
36	0.000	0.051	N/A	0.000	0.077	N/A	Pass
37	0.000	0.061	N/A	0.000	0.091	N/A	Pass
38	0.000	0.048	N/A	0.000	0.073	N/A	Pass
39	0.000	0.058	N/A	0.000	0.087	N/A	Pass
40	0.000	0.046	N/A	0.000	0.069	N/A	Pass

6.4 Flicker test result

Test Requirement:	EN 61000-3-3
Test Method:	EN 61000-3-3
Test voltage	AC 230V 50Hz
Frequency range	100Hz to 2Khz
Measure time	10 mins
Class:	Clause 5 of EN 61000-3-3

6.4.1 E.U.T. operation

EUT Operation:

Operating environment:

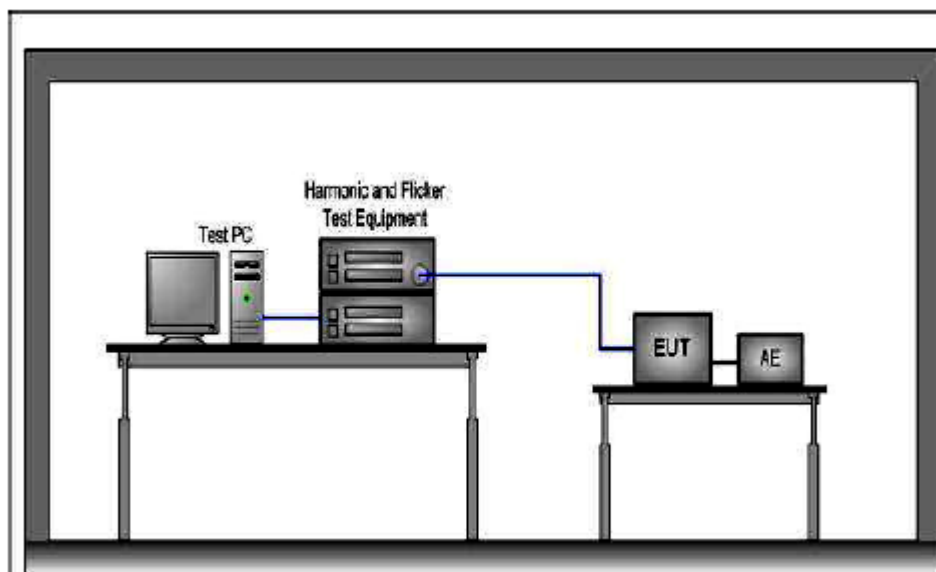
Temperature :25℃ Humidity: 45% RH Atmospheric pressure: 101 k pa

EUT Operation:

Normal working

Operating environment:

6.4.2 Test setup and procedure



1. The test supply voltage (open-circuit voltage) was the rated voltage of the EUT. The test voltage was maintained within $\pm 2\%$ of the nominal value. The frequency was $50\text{ Hz} \pm 0.5\%$.
 2. The voltage fluctuations and flicker were measured at the supply terminals of the EUT.
 3. The observation period, T_p , for the assessment of flicker values by flicker measurement, flicker simulation, or analytical method was:
 - for P_{st} , $T_p = 10\text{ min}$.
 - for P_{lt} , $T_p = 2\text{ h}$.
- The observation period included that part of the whole operation cycle in which the EUT produces the most unfavorable sequence of voltage changes.

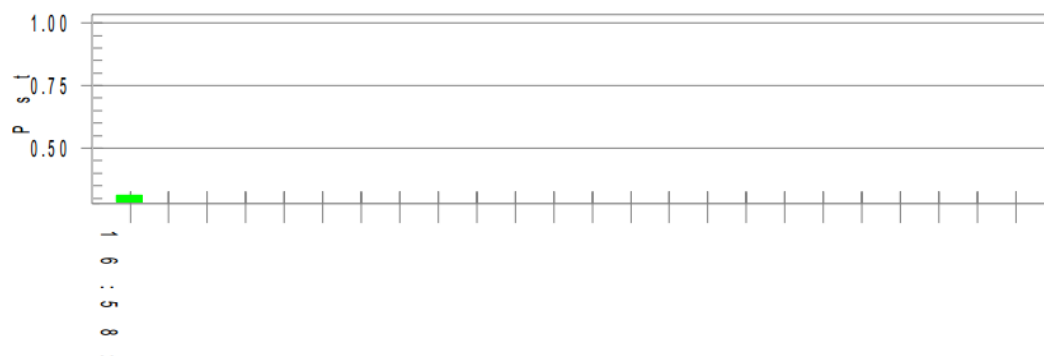
6.4.3 Measurement data

Flicker Test Summary per EN 61000-3-3 (Run time)

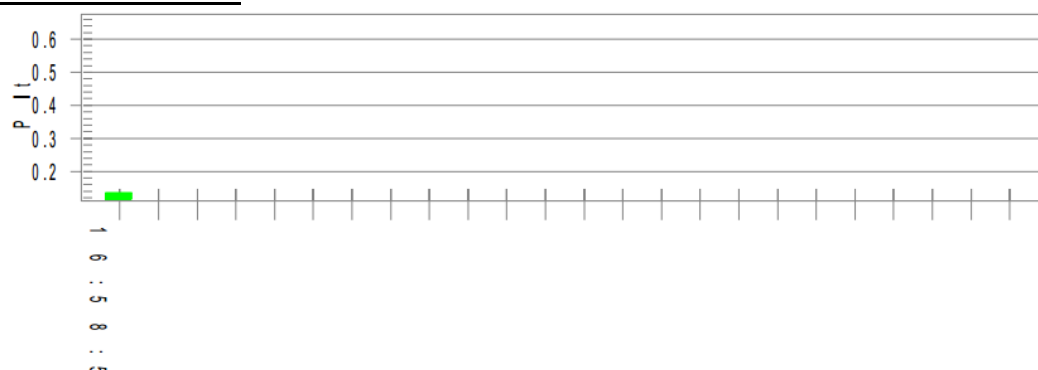
Test Result: Pass

Status: Test Completed

Pst_i and limit line



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt): 230.02

Highest dt (%):	0.88	Test limit (%):	N/A	N/A
Time(mS) > dt:	0.00	Test limit (MS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	-0.04	Test limit (%):	6.00	Pass
Highest Pst (10 min. period):	0.149	Test limit :	1.000	Pass
Highest Plt (2 hr. period):	0.065	Test limit :	0.650	Pass

7 Electromagnetic Susceptibility Test Results

7.1 Electrostatic discharge immunity test

7.1.1 Specification Reference

Test Requirement: IEC 61000-4-2 & IEC 61000-4-3

7.1.2 Environmental Conditions

Ambient Temperature	15-30℃
Relative Humidity	30-70 %RH
Atmospheric Pressure	860-1060mbar

7.1.3 Test Specification

Discharge Voltage(Air):	☐ - 2 kV	☒ - 8 kV	☐ - 6 kV
	☐ - 4 kV	☐ - 15 kV	☐ - _ kV
Discharge Voltage(Contact):	☐ - 2 kV	☐ - 6 kV	☐ - _kV
	☒ - 4 kV	☐ - 8 kV	
Discharge Impedance:	☒ - 330 Ω /150 pF	☐ - 150 Ω /150 pF	
Discharge Repetition Rate:	☒ - ≥1 sec		
Number of Discharges:	☒ - ≥10 at all locations		
Kind of Discharges:	☒ - Air diacharge	☒ - Conducted discharge (relay)	
	☒ - Direct	☒ - Indirect	
Polarity:	☒ - Positive	☒ -Negative	
Location of Discharge:	☒ - HCP & VCP ☒ - Each location on the surface touchable by hand ☐ - See drawing in Appendix A ☐ -		

7.1.3 Test Specification

☒ - No degradation of function	- Met Criterion A
☐ - Distortion of function	- Met Criterion B
☐ - Error of function	- Met Criterion C
☐ - Loss of function	- Unrecoverable Failure

8 Photographs





SL400HE2



SL400HE2



SL400HE2

Attachment No. 1: QUALIFIED CERTIFICATE for STAFIT LAB

资质认可 Recognized lab

