

EMC TEST REPORT

Report No. : 65.12.26.0355.01

Applicant : Zhongshan Sunde Lighting Co., Ltd.

Address : No.11 Yuxiang Dongdi Street Henglan Town, Zhongshan City Guangdong Province ,528478 China

Manufacturer : Zhongshan Sunde Lighting Co., Ltd.

Address : No.11 Yuxiang Dongdi Street Henglan Town, Zhongshan City Guangdong Province ,528478 China

Factory : Zhongshan Sunde Lighting Co., Ltd.

Address : No.11 Yuxiang Dongdi Street Henglan Town, Zhongshan City Guangdong Province ,528478 China

Product Type : LED Floodlight

Model No. : See model list

Standards : EN IEC 55015:2019+A11:2020
EN IEC 61547:2023
EN IEC 61000-3-2:2019+A1:2021+A2 :2024
EN 61000-3-3:2013+A1:2019+A2:2021

Date of Test : 2026-07-13 to 2026-07-23

Date of Issue : 2026-07-23

Test Engineer : Hank Kang

Reviewed By : Helen Li



Test Result :	PASS *
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* The sample detailed above has been tested to the requirements of Council Directives 2014/30/EU. The test results have been reviewed against the Directives above and found to meet their essential requirement.

Test Summary

Test	Test Requirement	Test Method	Class / Severity	Result
Mains Terminal Disturbance Voltage, 9kHz to 30MHz	EN IEC 55015	EN IEC 55015	4.3.1	PASS
Radiated Electromagnetic Disturbance: 9kHz to 30MHz	EN IEC 55015	EN IEC 55015	4.5.2	PASS
Radiation Emission, 30MHz to 1GHz	EN IEC 55015	EN IEC 55015	4.5.3	PASS
Harmonic Emission on AC	EN IEC 61000-3-2	EN IEC 61000-3-2	7	PASS
Flicker Emission on AC	EN 61000-3-3	EN 61000-3-3	5	N/A
Electrostatic Discharge (ESD)	EN IEC 61547	IEC 61000-4-2	5.2	PASS
Radiated Immunity, 80MHz to 1GHz	EN IEC 61547	IEC 61000-4-3	5.3	PASS
Electrical Fast Transients (EFT) on AC or DC or Signal	EN IEC 61547	IEC 61000-4-4	5.5	PASS
Surge Immunity on AC	EN IEC 61547	IEC 61000-4-5	5.7	PASS
Injected Currents on AC 150kHz to 80MHz	EN IEC 61547	IEC 61000-4-6	5.6	PASS
Voltage Dips and Interruptions on AC	EN IEC 61547	IEC 61000-4-11	5.8	PASS

Remark:

The EUT was within the minimum performance (e.g., the EUT made disturbance sound) level set by the applicant.

A.M. Amplitude Modulation.

P.M. Pulse Modulation.

† D.M. – Differential Model

† C.M. – Common Mode

* U_T is the nominal supply voltage

N/A means not applicable.

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1 General Information

1.1 Client Information

Please refer to page 1

1.2 General Description of E.U.T.

Name: LED Floodlight

Model No.: See model list

1.3 Details of E.U.T.

Rating: 165-265VAC, 50/60Hz, IP66, Class I, ta: 45°C, others see model list.

1.4 Description of Support Units

The EUT has been tested as an independent unit.

1.5 Test Location

All tests were performed at: N/A

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1.6 General product information:

These products are Class I LED Floodlight for outdoor use. Degree of protection is IP66.

All models only different in appearance and power. We choose model SD-SF22902-5 for full test.

Model list

Item No.	Model	Input voltage and frequency	Rated Power
1	SD-SF22902-1	165-265V~, 50/60Hz	50W
2	SD-SF22902-2	165-265V~, 50/60Hz	100W
3	SD-SF22902-3	165-265V~, 50/60Hz	200W
4	SD-SF22902-4	165-265V~, 50/60Hz	300W
5	SD-SF22902-5	165-265V~, 50/60Hz	400W

2 Equipment Used during Test

Table 1: List of Test and Measurement Equipment

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)
Radiated Emission(30MHz to 1000MHz) ☒						
1.	EMI Test Receiver	R&S	ESCI 7	100965	2026-06-05	2027-06-04
2.	Log-periodic Dipole Antenna	Schwarzbeck	VULB 9162	058	2025-06-14	2028-06-13
3.	3m Semi-anechoic	Zhongshuo Electronics	9mx6mx6m	N/A	2024-12-17	2027-12-16
4.	RF Cable	R&S	R01	10403	2025-11-28	2026-11-27
5.	CDNE	KeHuan	KH3663E	36630822	2026-06-05	2027-06-04
6.	EMI Test Software	AUDIX	E3	Version No: 6.111221a	N/A	N/A
Remark: Measurement uncertainty:4.85dB						
Mains Terminal Continuous Disturbance Voltage ☒						
7.	EMI Test Receiver	Rohde&Schwarz	ESCI	100939	2025-11-28	2026-11-27
8.	Artificial Mains Network	ROHDE&SCHWARZ	ENV216	3560.6550.12	2025-11-28	2026-11-27
9.	Shield Room	Rongxiang	8X5X3.5	992276296	2022-07-01	2027-06-30
10.	Conducted Emission Test Software	FALA	EZ-EMC	Version No: LCTECH-03A	N/A	N/A
11.	Voltage Probes	SCHWARZBECK	TK9420	VT9420-1987	2026-06-05	2027-06-04
12.	ISN	SCHWARZBECK	CAT5 8158	#220	2025-11-28	2026-11-27
13.	Current Probes	Rohde&Schwarz	EZ-17	0816.2063.02	2026-06-05	2027-06-04
Remark: Measurement uncertainty:3.45dB						
Harmonics & Flicker ☒						
14.	Harmonic and Flicker Analyzer	California Instruments	PACS-1	S59176	2026-06-05	2027-06-04
15.	AC Power Source	California Instruments	5001ix-CTS-400	59176	2026-06-05	2027-06-04
16.	Harmonic&Flicker Test Software	California Instruments	CTS	Version No: CTS_4_29	N/A	N/A
Radiated electromagnetic disturbances(9kHz to 30MHz) ☒						
17.	EMI Test Receiver	Rohde&Schwarz	ESCI	100939	2025-11-28	2026-11-27
18.	Triple-loop Antenna	SCHWARZBECK	HXYZ9170	HXYZ9170-171	2026-06-05	2027-06-04
19.	Loop Test Software	FALA	EZ-EMC	Version No: LCTECH-03A	N/A	N/A
Remark: Measurement uncertainty: 3.46dB						
Radiated disturbances(CDNE) ☐						
20.	EMI Test Receiver	Rohde&Schwarz	ESCI	100939	2025-11-28	2026-11-27
21.	Coupling Decoupling Network	KeHuan	KH3663E	36630822	2026-06-05	2027-06-04
22.	CDNE Test Software	FALA	EZ-EMC	Version No: LCTECH-03A	N/A	N/A
Click ☐						
23.	Click Analyzer	AFJ	CL55C	55040929140	2026-06-05	2027-06-04
24.	Artificial Mains Network	AFJ	LS16C	160108020208	2026-06-05	2027-06-04
25.	Click Test Software	AFJ	AFJ_CL55C	Version No: AFJ_CL55_V6_06	N/A	N/A

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)
Disturbance Power ☐						
26.	EMI Test Receiver	Rohde&Schwarz	ESCI	100939	2025-11-28	2026-11-27
27.	Absorbing Clamp	SCHWARZBECK	MDS-21	3892	2026-06-09	2027-06-08
28.	DP Test Software	FALA	EZ-EMC	Version No: LCTECH-03A	N/A	N/A
Remark: Measurement uncertainty: 3.80dB						
Electrostatic Discharge(ESD) ☒						
29.	ESD Simulator	TESEQ AG	NSG 437	268	2026-06-09	2027-06-08
Electrical Fast Transient(EFT) ☒						
30.	Ultra Compact Simulator	EM TEST	UCS 500N5	V0925104927	2026-06-05	2027-06-04
31.	Single-Phase Toroidal Transformer with autowinding	EM TEST	V4780S2	2538	2026-06-05	2027-06-04
32.	Coupling clamp	SHANGHAISANJI	EFTC	EFTC001	2025-11-28	2026-11-27
Surge ☒						
33.	Ultra Compact Simulator	EM TEST	UCS 500N5	V0925104927	2026-06-05	2027-06-04
34.	Single-Phase Toroidal Transformer with autowinding	EM TEST	V4780S2	2538	2026-06-05	2027-06-04
Conducted Susceptibility ☒						
35.	Conducted Immunity Test System	FEANKONIA	CIT-10/75	12B1113	2026-06-05	2027-06-04
36.	6dB Attenuator	Weinschel	WA59-6-33	A330	2026-06-05	2027-06-04
37.	Coupling Decoupling Network	SCHWARZBECK	L-801M2/M3	2531	2026-06-05	2027-06-04
38.	Coupling Decoupling Network	SCHWARZBECK	L-801AF2	2536	2026-06-05	2027-06-04
39.	Electromagnetic clamp	BEIJINGDAZE	ZN23203	21033	2025-11-28	2026-11-27
40.	CS Test Software	FEANKONIA	EN61000-4-6	Version No: IEC61000-4-6	N/A	N/A
Voltage Dips and Interruptions ☒						
41.	Ultra Compact Simulator	EM TEST	UCS 500N5	V0925104927	2026-06-05	2027-06-04
42.	Single-Phase Toroidal Transformer with autowinding	EM TEST	V4780S2	2538	2026-06-05	2027-06-04
Radio-frequency electromagnetic fields(RS) ☒						
43.	Signal generator	R&S	SMB 100A	102710	2025-11-28	2026-11-27
44.	Power amplifier	BONN Elektronik	BLWA 0810-160/100D	149644	2025-11-28	2026-11-27
45.	Isotropic Field Probe	Narda	EP-601	511WX30620	2025-12-04	2026-12-03
46.	Log-periodic Antenna	SCHWARZBECK	STLP 9128D	078	2025-06-13	2028-06-12
47.	Power Meter	FEANKONIA	PMS 1084	108B1289	2025-11-28	2026-11-27
48.	RS Test Software	Rongxiang	EMS-LAB	Version No:	N/A	N/A

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)
				WinEP600		

☐: Not Used

☒: Used

3 Emission Test Results

3.1 Mains Terminals Disturbance Voltage, 9 kHz to 30MHz

Test Requirement :	EN IEC 55015
Test Method :	EN IEC 55015
Test Date :	2026-07-15
Frequency Range:	9kHz to 30MHz
Clause	4.3.1
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth) Quasi-Peak & Average if maximised peak within 6dB of Average Limit

3.1.1 E.U.T. Operation

Operating Environment:

Temperature :	24.3 °C
Humidity :	53.4 % RH
Atmospheric Pressure :	1006 mbar

EUT Operation :

Compliance test was performed in ON mode.

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

3.1.2 Measurement Data

An initial pre-scan was performed on the live and neutral lines.

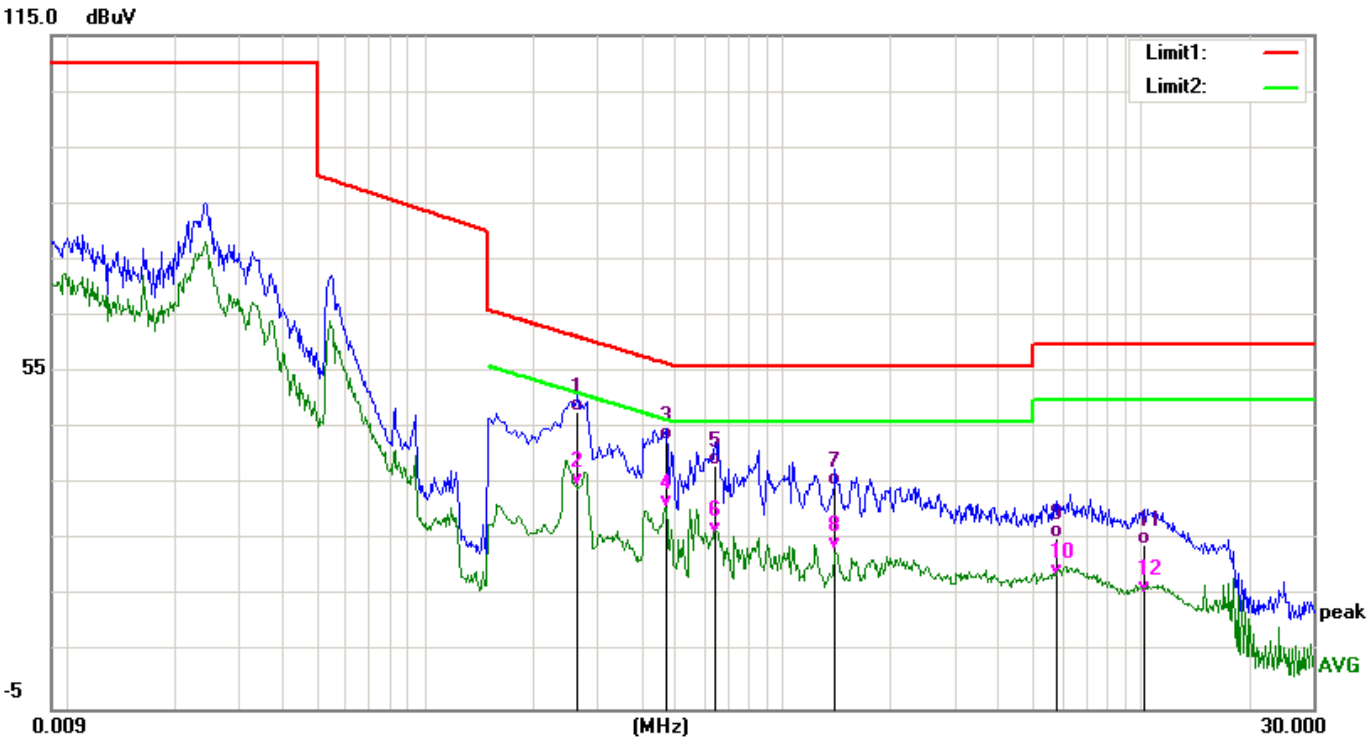
No further quasi-peak or average measurements were performed since no peak emissions were detected within 10dB line below the average limit.

Please refer to the following peak scan graph for reference.

3.1.3 Conducted Emissions Test Data

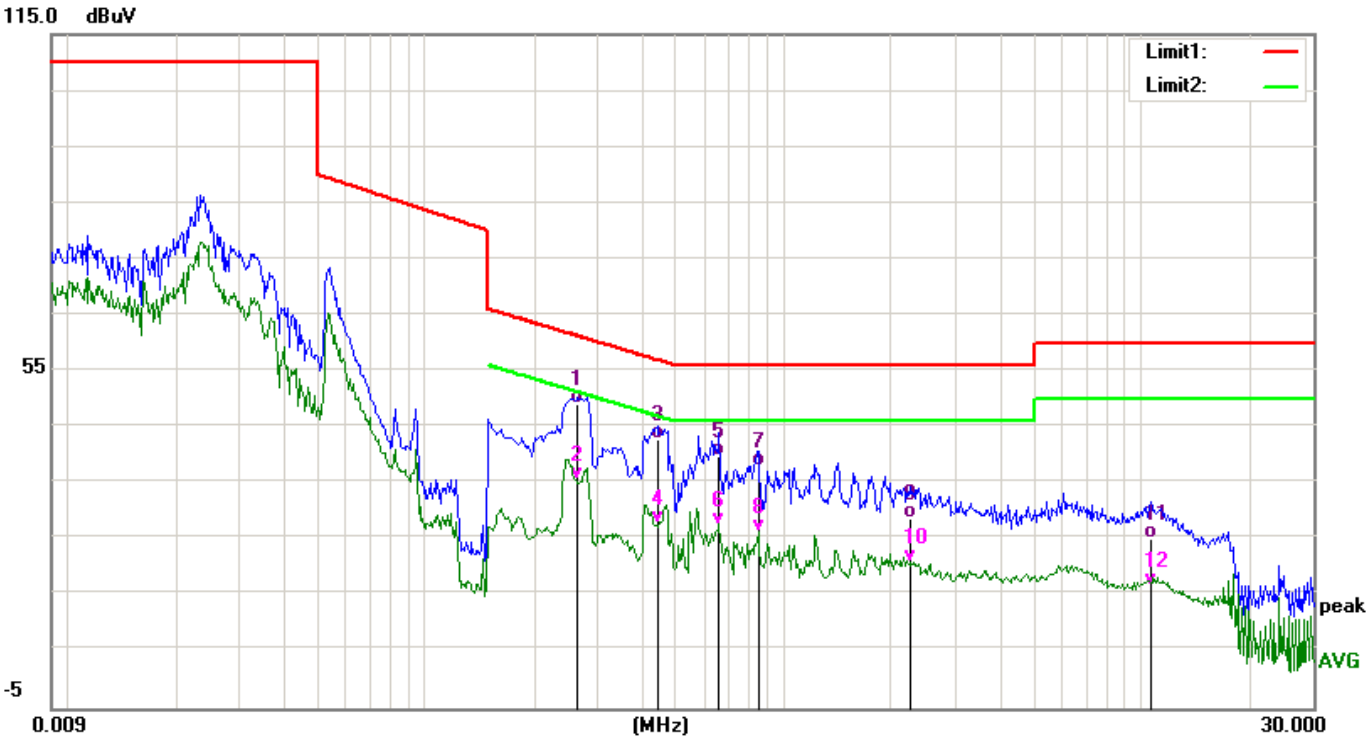
Live Line

Model: SD-SF22902-5



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB)	(dBuV)	(dBuV)	(dB)	
1	0.2660	48.28	-0.23	48.05	61.24	-13.19	QP
2	0.2660	34.89	-0.23	34.66	51.24	-16.58	AVG
3	0.4700	43.03	-0.11	42.92	56.51	-13.59	QP
4	0.4700	31.02	-0.11	30.91	46.51	-15.60	AVG
5	0.6460	38.32	-0.02	38.30	56.00	-17.70	QP
6	0.6460	26.08	-0.02	26.06	46.00	-19.94	AVG
7	1.3900	34.62	0.09	34.71	56.00	-21.29	QP
8	1.3900	23.16	0.09	23.25	46.00	-22.75	AVG
9	5.8180	23.98	1.48	25.46	60.00	-34.54	QP
10	5.8180	17.22	1.48	18.70	50.00	-31.30	AVG
11	10.1220	22.25	2.08	24.33	60.00	-35.67	QP
12	10.1220	13.60	2.08	15.68	50.00	-34.32	AVG

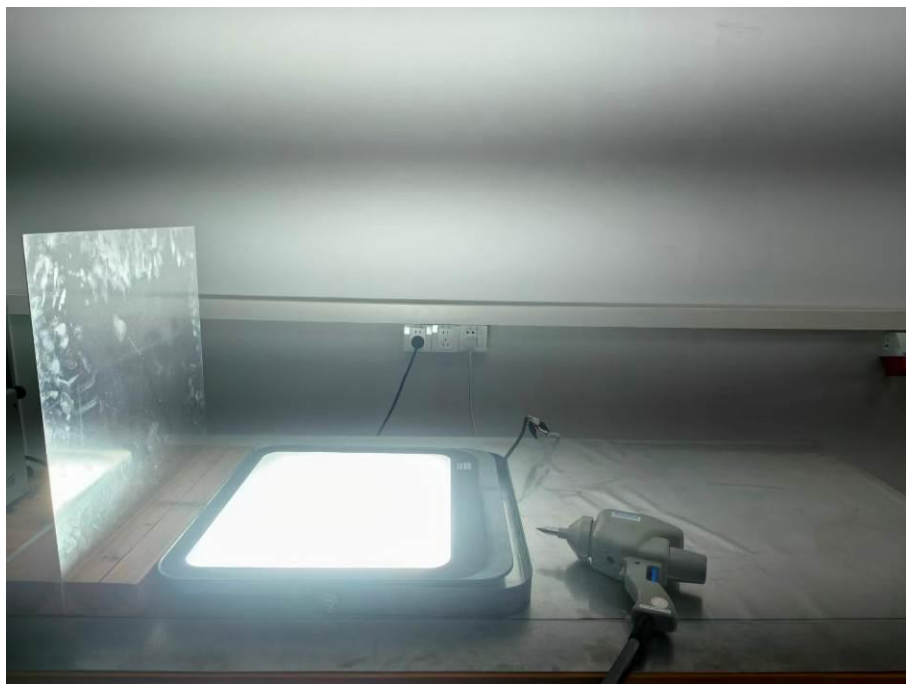
Neutral Line
Model: SD-SF22902-5



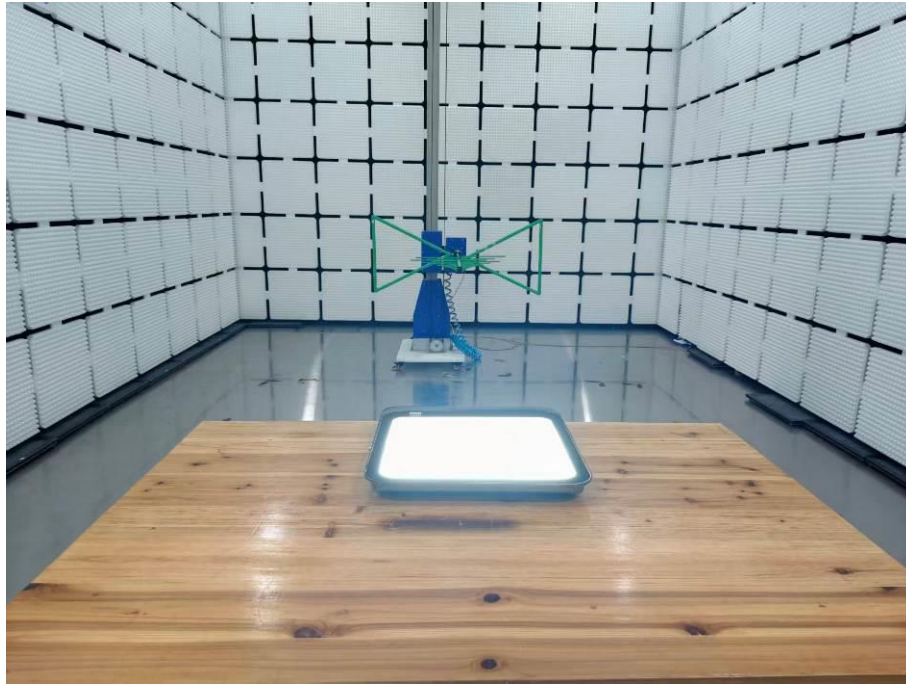
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB)	(dBuV)	(dBuV)	(dB)	
1	0.2660	49.29	-0.23	49.06	61.24	-12.18	QP
2	0.2660	35.74	-0.23	35.51	51.24	-15.73	AVG
3	0.4420	43.04	-0.13	42.91	57.02	-14.11	QP
4	0.4420	27.97	-0.13	27.84	47.02	-19.18	AVG
5	0.6580	39.99	-0.02	39.97	56.00	-16.03	QP
6	0.6580	27.69	-0.02	27.67	46.00	-18.33	AVG
7	0.8500	38.12	0.03	38.15	56.00	-17.85	QP
8	0.8500	26.35	0.03	26.38	46.00	-19.62	AVG
9	2.2460	28.75	0.04	28.79	56.00	-27.21	QP
10	2.2460	20.88	0.04	20.92	46.00	-25.08	AVG
11	10.6060	23.13	1.99	25.12	60.00	-34.88	QP
12	10.6060	14.73	1.99	16.72	50.00	-33.28	AVG

3.1.4 Mains Terminal Disturbance Voltage on AC Test Setup Drawing









3.2 Radiated Electromagnetic Disturbance: 9 kHz to 30MHz

Test Requirement :	EN IEC 55015
Test Method :	EN IEC 55015
Test Date :	2026-07-16
Frequency Range:	9kHz to 30MHz
Clause	4.5.2
Detector:	Peak for pre-scan (120kHz resolution bandwidth) Quasi-Peak & average if pre-scan peak within 15dB of average limit.

3.2.1 E.U.T. Operation

Temperature:	24.2 °C
Humidity:	53.1 % RH
Atmospheric Pressure:	1005mbar

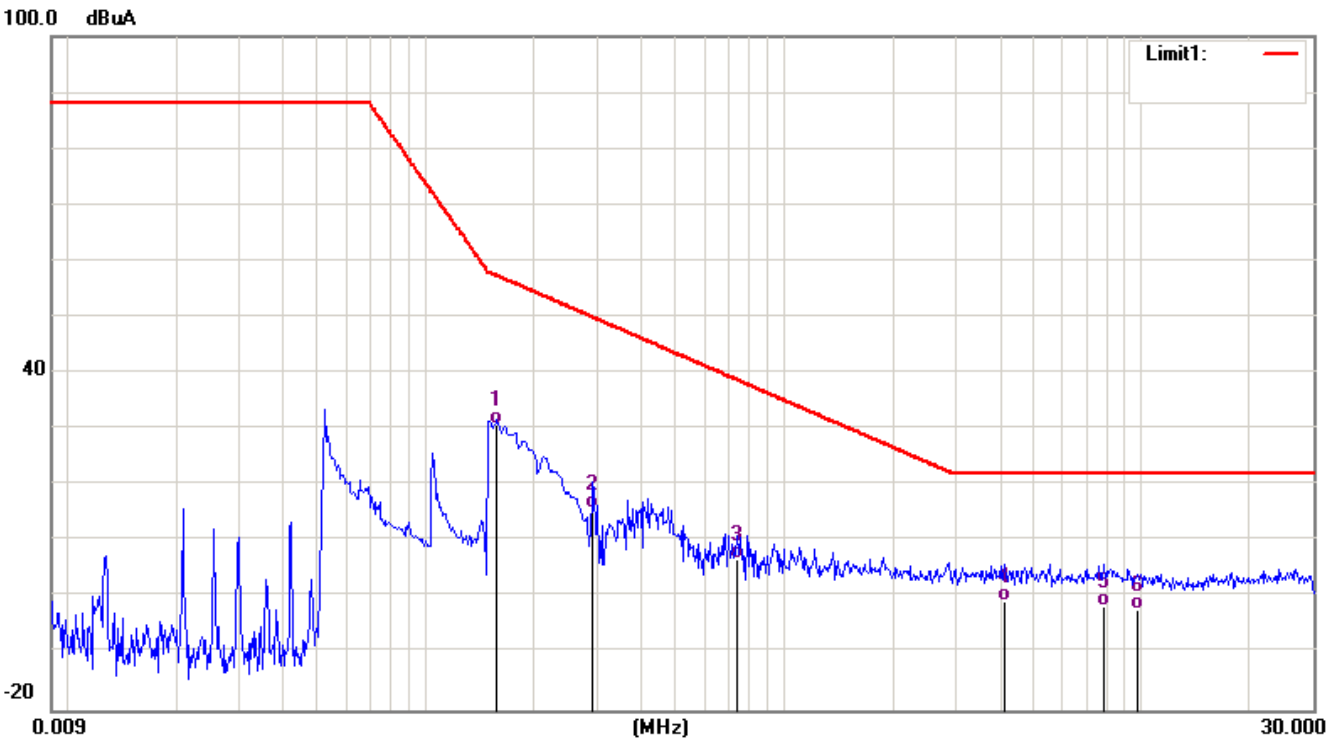
EUT Operation:
Compliance test was performed in ON mode.

3.2.2 Measurement Data

Please refer to the following peak scan graph for reference.

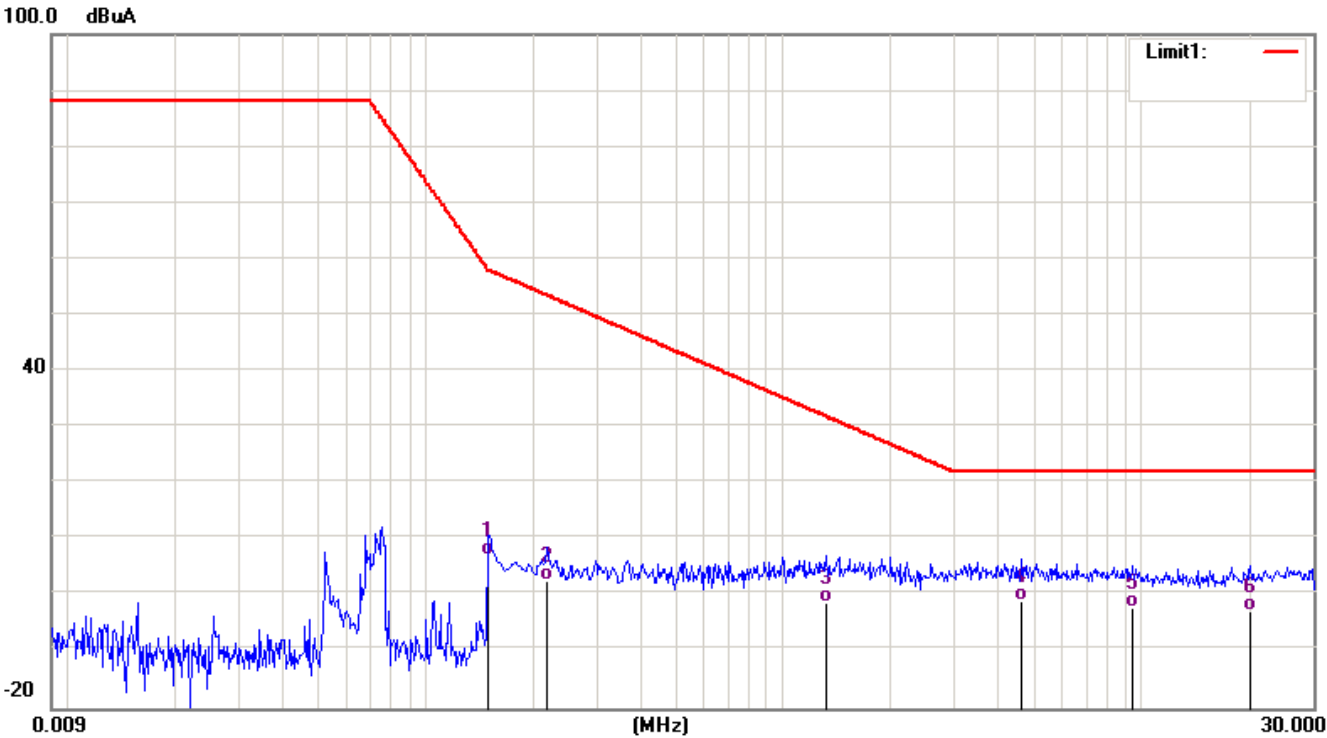
3.2.3 Radiated Electromagnetic Disturbance Test Data

Antenna polarity: X
Model: SD-SF22902-5



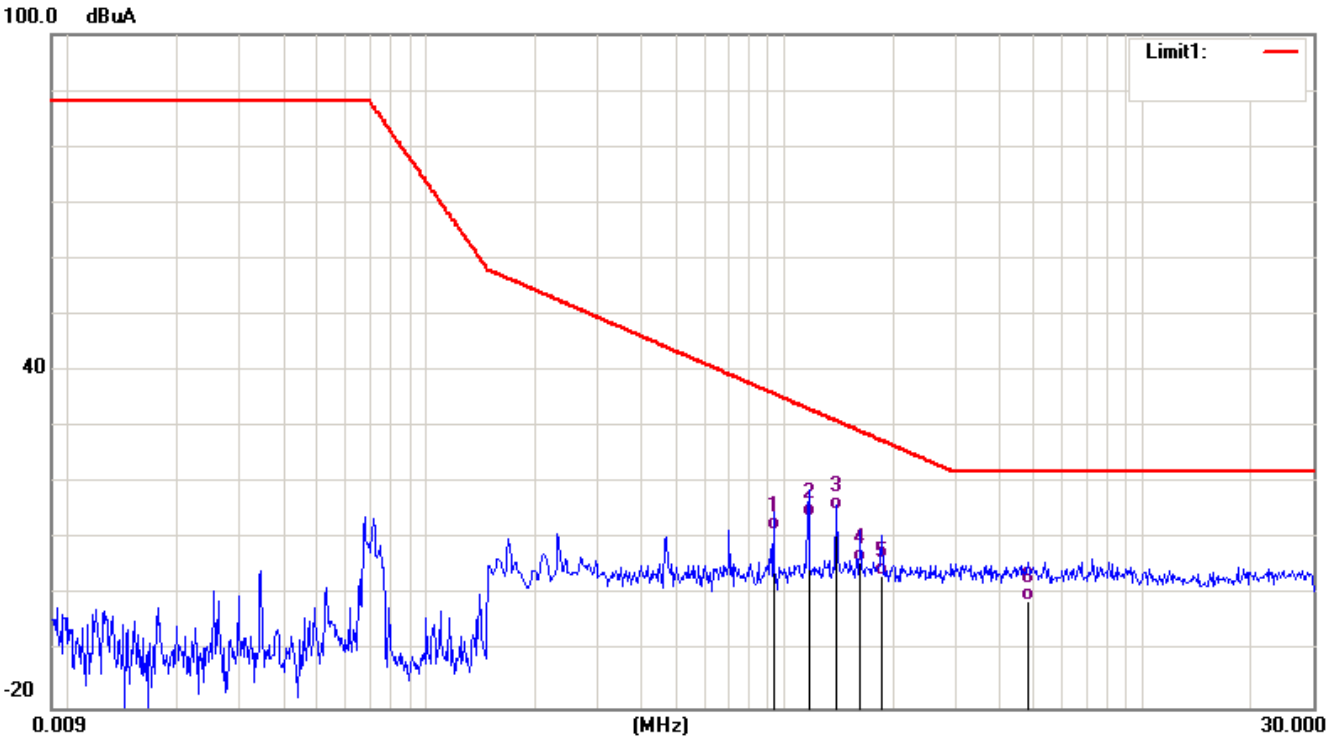
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuA)	Factor(dB)	(dBuA)	(dBuA)	(dB)	
1	0.1580	23.90	6.92	30.82	57.38	-26.56	QP
2	0.2940	8.79	7.05	15.84	49.91	-34.07	QP
3	0.7380	-0.34	7.27	6.93	38.85	-31.92	QP
4	4.1340	-8.04	7.31	-0.73	22.00	-22.73	QP
5	7.8060	-8.93	7.49	-1.44	22.00	-23.44	QP
6	9.7180	-10.54	8.36	-2.18	22.00	-24.18	QP

Antenna polarity: Y
Model: SD-SF22902-5



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuA)	Factor(dB)	(dBuA)	(dBuA)	(dB)	
1	0.1500	0.34	6.90	7.24	58.00	-50.76	QP
2	0.2181	-4.46	7.01	2.55	53.50	-50.95	QP
3	1.3140	-8.39	7.21	-1.18	31.92	-33.10	QP
4	4.6140	-8.31	7.33	-0.98	22.00	-22.98	QP
5	9.4220	-10.26	8.21	-2.05	22.00	-24.05	QP
6	20.1580	-9.15	6.46	-2.69	22.00	-24.69	QP

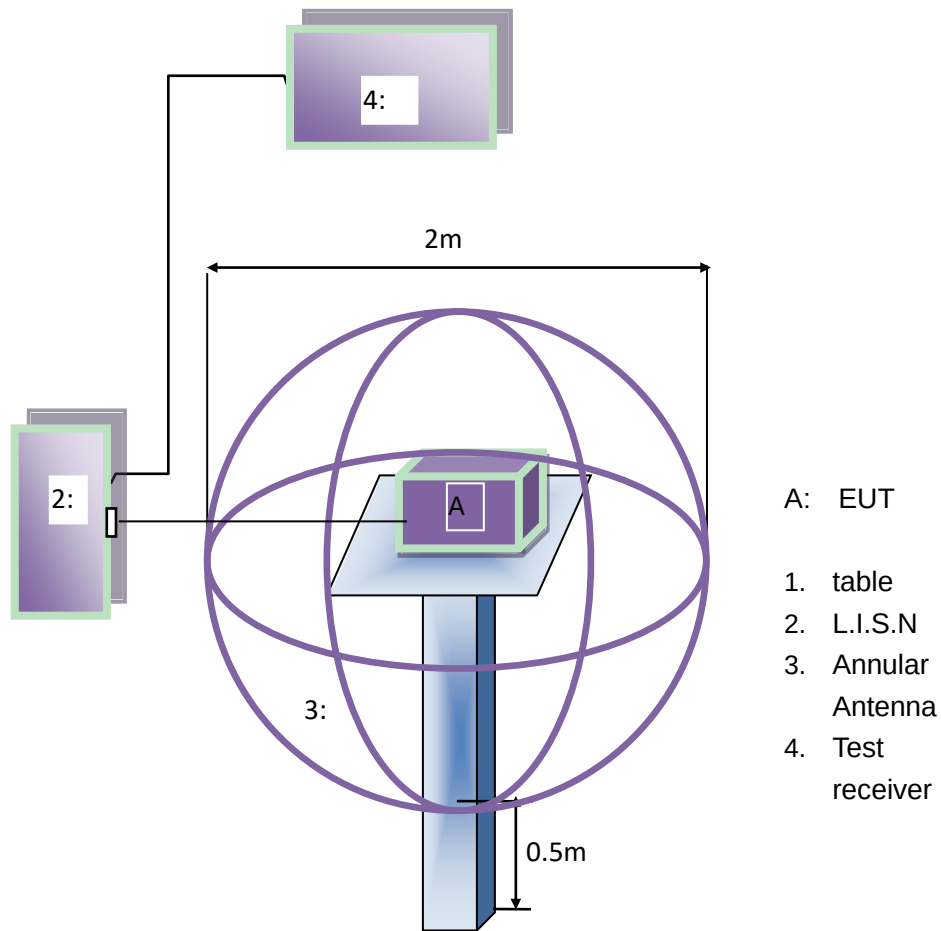
Antenna polarity: Z
Model: SD-SF22902-5



No.	Frequency (MHz)	Reading (dBuA)	Correct Factor(dB)	Result (dBuA)	Limit (dBuA)	Margin (dB)	Remark
1	0.9380	4.40	7.30	11.70	35.97	-24.27	QP
2	1.1740	6.94	7.25	14.19	33.27	-19.08	QP
3	1.4020	8.17	7.18	15.35	31.14	-15.79	QP
4	1.6420	-1.05	7.11	6.06	29.24	-23.18	QP
5	1.8740	-3.55	7.04	3.49	27.65	-24.16	QP
6	4.8140	-8.33	7.34	-0.99	22.00	-22.99	QP

Direction	X- Axis, Y-Axis, Z-Axis	
Frequency [MHz]	QP [dB(μA)]	
	Level	Limit
0,009 – 30,0	More than 20 dB below the limits	

3.2.4 Radiated Electromagnetic Disturbance Test Setup Drawing



Test Setup: Radiated Electromagnetic Disturbance 0.9 - 30MHz

For reference only

3.3 Radiated Emission: 30MHz to 1GHz

Test Requirement :	EN IEC 55015
Test Date :	2026-07-16
Frequency Range:	30MHz to 1GHz
Test Result :	Pass
Clause	4.5.3
Detector:	Peak for pre-scan (120kHz resolution bandwidth) Quasi-Peak & average if pre-scan peak within 15dB of average limit.

3.3.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC.

The factors contributing to uncertainties are spectrum analyser , cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at HTW is +4.0 dB.

3.3.2 E.U.T. Operation

Temperature:	23.7 °C
Humidity:	53.5 % RH
Atmospheric Pressure:	1006 mbar

EUT Operation:
Compliance test was performed in ON mode.

3.3.3 E.U.T. Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site,
The EUT was placed on the test table with the load on one side.
The external I/O cables were draped along the test table and bundled if necessary.

3.3.4 Test procedure

For the radiated emissions test, since the EUT does not have a power source, there was no connection to AC outlets.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combinations.

All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB μ V of specification limits), and are

distinguished with a "Qp" in the data table.

The EUT was under normal mode during the final qualification test and the configuration was used to represent the worst case results

3.3.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

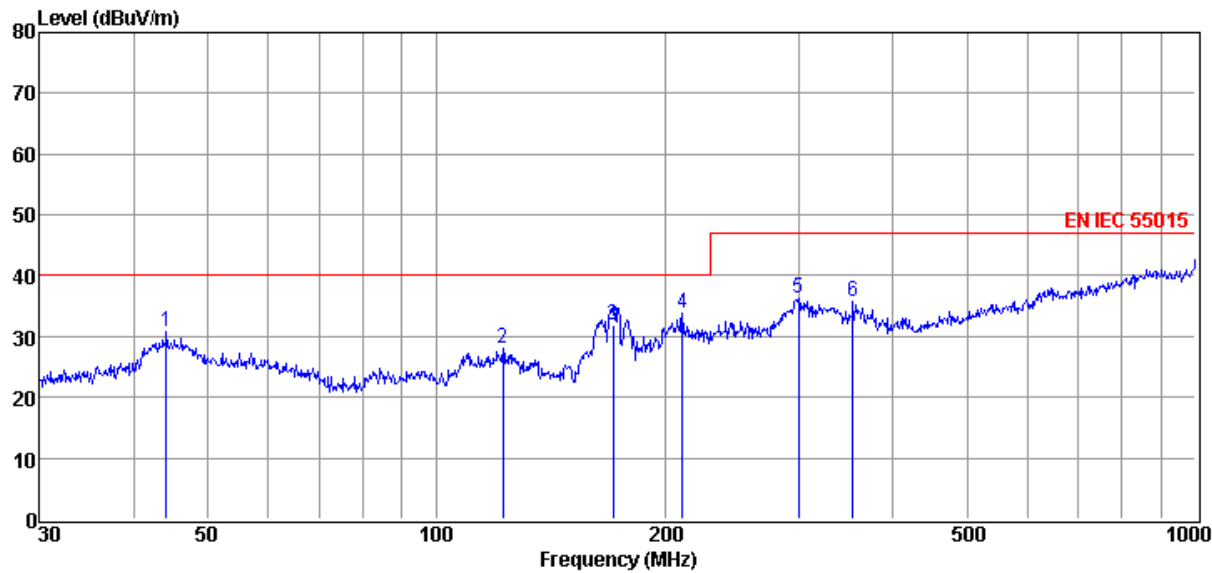
Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dBμV means the emission is 7dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Class B Limit}$$

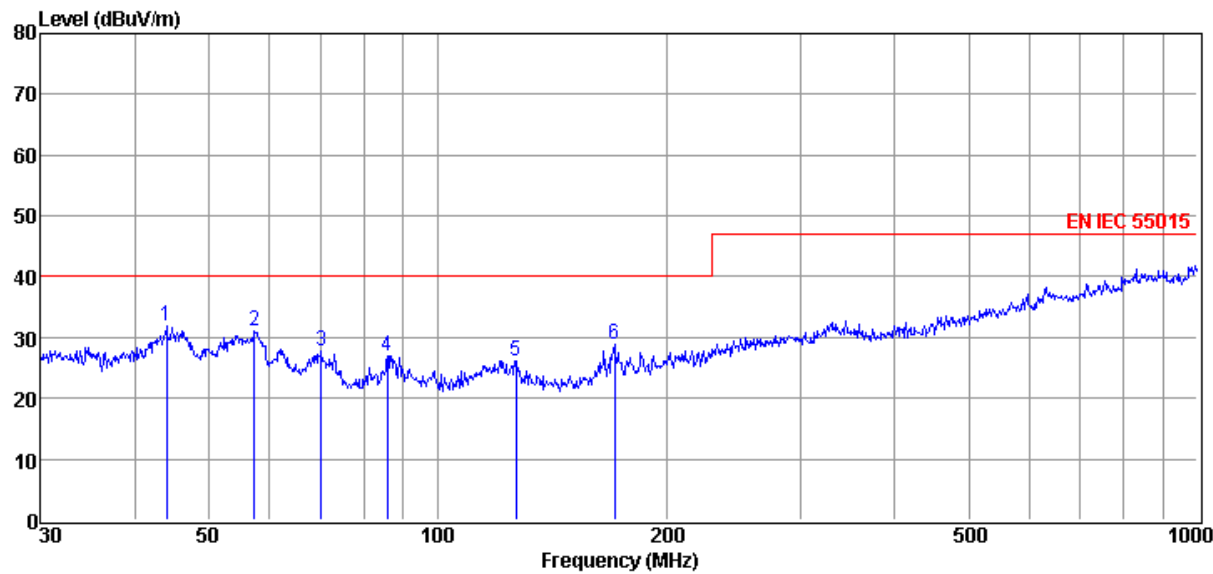
3.3.6 Radiated Emissions Test Data

Horizontal:
Model: SD-SF22902-5



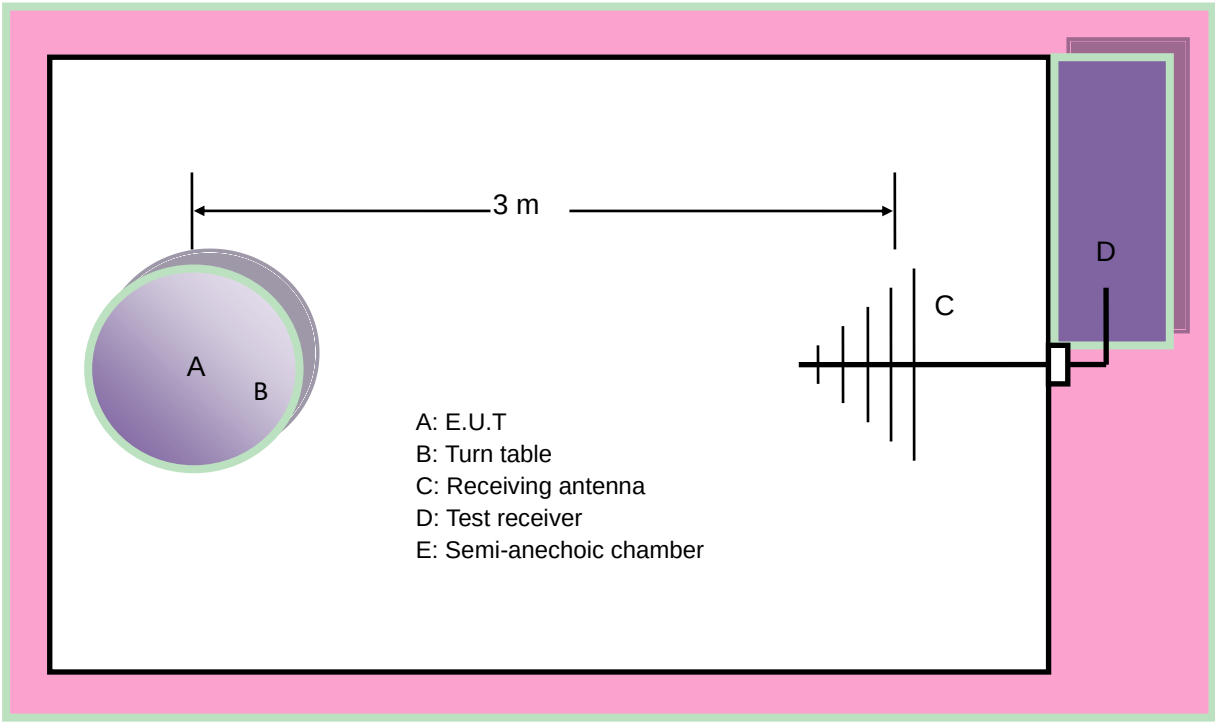
Item (Mark)	Freq (MHz)	Read Level (dBμV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBμV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	44.12	13.25	16.84	0.00	0.68	30.77	40.00	-9.23	Peak	HORIZONTAL
2	122.40	18.27	8.70	0.00	1.03	28.00	40.00	-12.00	Peak	HORIZONTAL
3	170.79	19.68	10.87	0.00	1.43	31.98	40.00	-8.02	QP	HORIZONTAL
4	210.79	21.10	11.03	0.00	1.72	33.85	40.00	-6.15	Peak	HORIZONTAL
5	300.37	20.02	14.10	0.00	2.09	36.21	47.00	-10.79	Peak	HORIZONTAL
6	354.18	18.21	14.88	0.00	2.66	35.75	47.00	-11.25	Peak	HORIZONTAL

Vertical:
Model: SD-SF22902-5



Item	Freq	Read	Antenna	PRM	Cable	Result	Limit	Over	Detector	Polarization
(Mark)	(MHz)	Level	Factor	Factor	Loss	Level	Line	Limit		
		(dBμV)	(dB/m)	dB	dB	(dBμV/m)	(dBμV/m)	(dB)		
1	43.97	14.36	16.88	0.00	0.68	31.92	40.00	-8.08	Peak	VERTICAL
2	57.39	16.16	14.12	0.00	0.80	31.08	40.00	-8.92	Peak	VERTICAL
3	70.34	17.63	9.57	0.00	0.66	27.86	40.00	-12.14	Peak	VERTICAL
4	85.90	17.19	8.94	0.00	0.77	26.90	40.00	-13.10	Peak	VERTICAL
5	126.77	16.54	8.53	0.00	1.05	26.12	40.00	-13.88	Peak	VERTICAL
6	170.79	18.84	8.66	0.00	1.43	28.93	40.00	-11.07	Peak	VERTICAL

3.3.7 Radiated Emissions Test Setup Drawing



Test-setup: Radiated emission

For reference only

3.4 Harmonics Test Results

Test requirement:	EN IEC 61000-3-2
Test Method:	EN IEC 61000-3-2
Test Date :	2026-07-17
Frequency Range:	100Hz to 2kHz
Measurement Time:	3 mins
Clause	7
Test Result:	PASS

3.4.1 E.U.T. Operation

Temperature:	23.7°C
Humidity:	51.4 % RH
Atmospheric Pressure:	1005 mbar

3.4.2 Measurement Data

Please refer to the following Measurement Data for reference.

Harmonics – Class-C per IEC 61000-3-2:2018/AMD1:2020(Run time) incl. inter-harmonics

EUT: SD-SF22902-5

Tested by: Alan

Test category: Class-C (European limits)

Test Margin: 100

Test date: 2026-07-17

Start time: 15:36:30

End time: 15:39:03

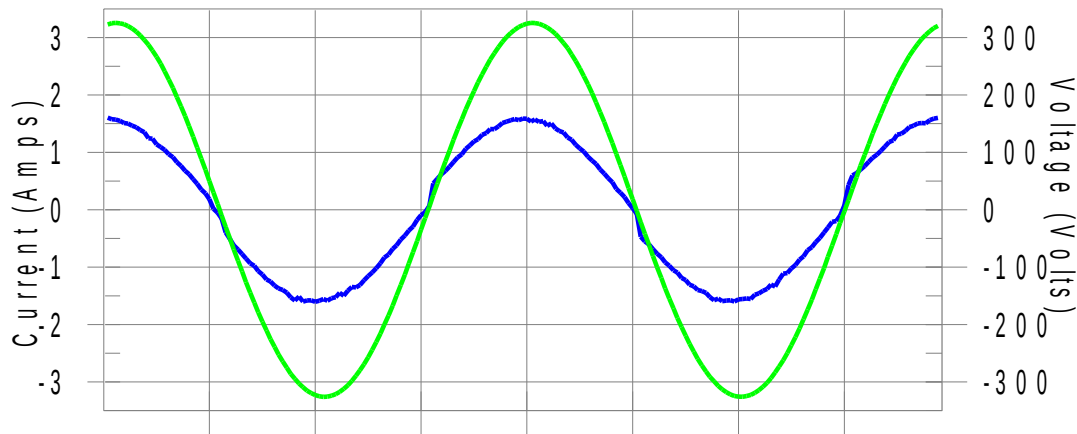
Test duration (min): 2.5

Data file name: H-000518.cts_data

Test Result: Pass

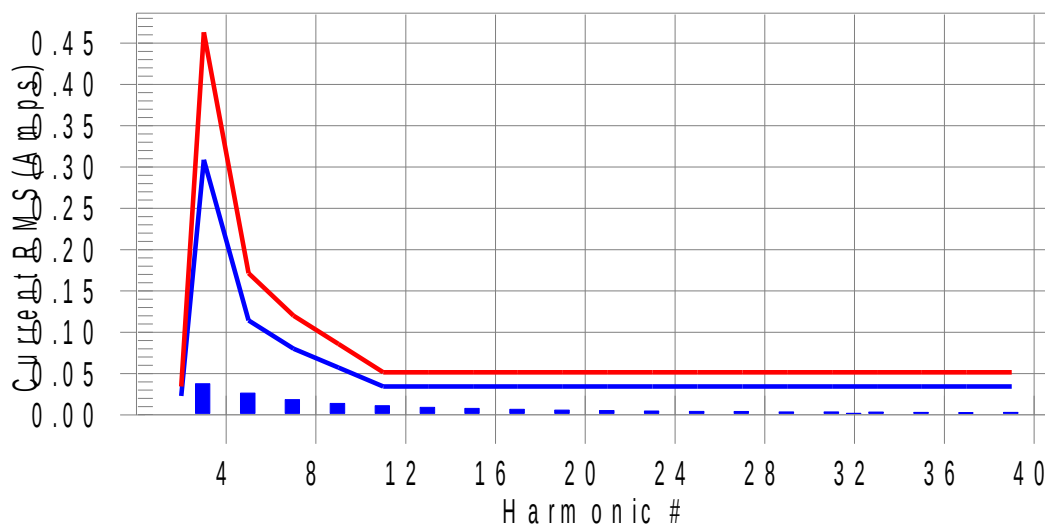
Source qualification: Normal

Current & voltage waveforms



Harmonics and Class C limit line

European Limits



Test result: Pass Worst harmonics H3-22.0% of 150% limit, H3-29.7% of 100% limit

EUT: SD-SF22902-5

Test category: Class-C (European limits) Test Margin: 100

Test date: 2026-07-17 Start time: 15:36:30 End time: 15:39:03

Test duration (min): 2.5 Data file name: H-000518.cts_data

Test Result: Pass Source qualification: Normal

THC(A): 0.056 I-THD(%): 4.9 POHC(A): 0.012 POHC Limit(A): 0.108

Highest parameter values during test:

V_RMS (Volts): 230.39 Frequency(Hz): 50.00
I_Peak (Amps): 1.987 I_RMS (Amps): 1.735
I_Fund (Amps): 1.144 Crest Factor: 1.475
Power (Watts): 404.7 Power Factor: 0.996

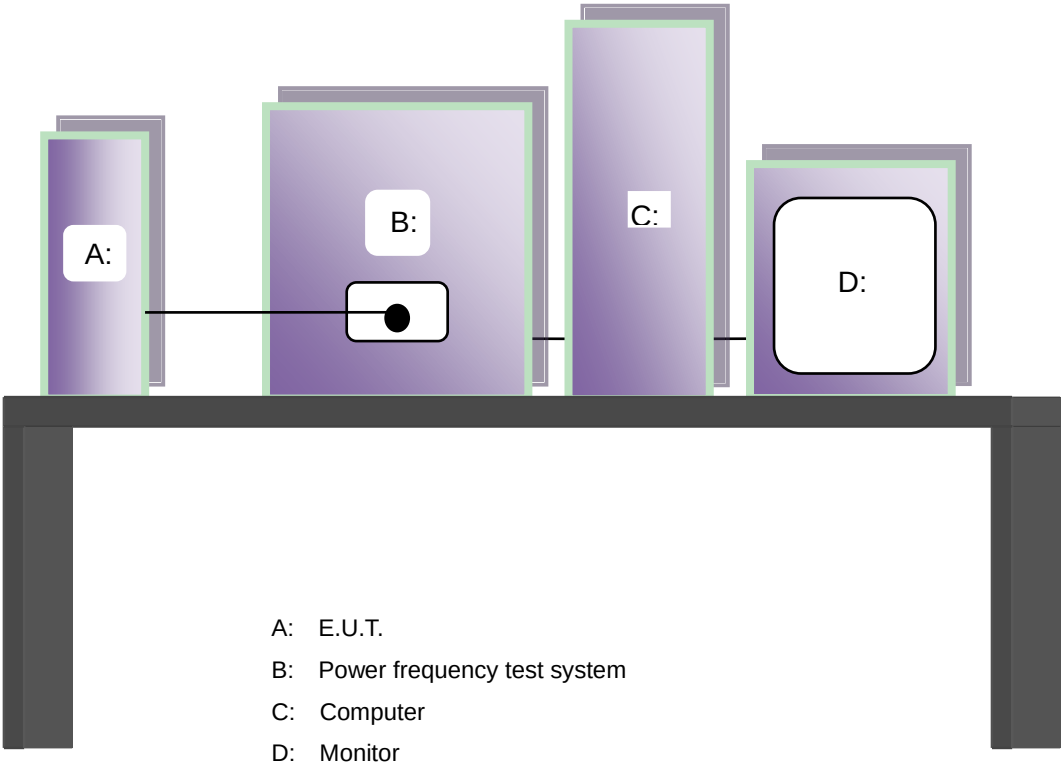
Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	0.023	N/A	0.001	0.034	N/A	Pass
3	0.038	0.309	12.2	0.039	0.463	8.4	Pass
4	0.001	0.000	N/A	0.001	0.000	N/A	Pass
5	0.026	0.114	23.1	0.027	0.172	15.7	Pass
6	0.001	0.000	N/A	0.001	0.000	N/A	Pass
7	0.018	0.080	23.1	0.019	0.120	15.7	Pass
8	0.001	0.000	N/A	0.001	0.000	N/A	Pass
9	0.014	0.057	24.3	0.014	0.086	16.6	Pass
10	0.001	0.000	N/A	0.001	0.000	N/A	Pass
11	0.011	0.034	32.5	0.011	0.051	22.1	Pass
12	0.001	0.000	N/A	0.001	0.000	N/A	Pass
13	0.009	0.034	26.8	0.009	0.051	18.3	Pass
14	0.001	0.000	N/A	0.001	0.000	N/A	Pass
15	0.008	0.034	22.8	0.008	0.051	15.7	Pass
16	0.001	0.000	N/A	0.001	0.000	N/A	Pass
17	0.007	0.034	N/A	0.007	0.051	N/A	Pass
18	0.001	0.000	N/A	0.001	0.000	N/A	Pass
19	0.006	0.034	N/A	0.006	0.051	N/A	Pass
20	0.001	0.000	N/A	0.001	0.000	N/A	Pass
21	0.005	0.034	N/A	0.006	0.051	N/A	Pass
22	0.001	0.000	N/A	0.001	0.000	N/A	Pass
23	0.005	0.034	N/A	0.005	0.051	N/A	Pass
24	0.001	0.000	N/A	0.002	0.000	N/A	Pass
25	0.004	0.034	N/A	0.005	0.051	N/A	Pass
26	0.001	0.000	N/A	0.002	0.000	N/A	Pass
27	0.004	0.034	N/A	0.005	0.051	N/A	Pass
28	0.002	0.000	N/A	0.002	0.000	N/A	Pass
29	0.004	0.034	N/A	0.004	0.051	N/A	Pass
30	0.002	0.000	N/A	0.002	0.000	N/A	Pass
31	0.004	0.034	N/A	0.004	0.051	N/A	Pass
32	0.002	0.000	N/A	0.002	0.000	N/A	Pass
33	0.003	0.034	N/A	0.004	0.051	N/A	Pass
34	0.002	0.000	N/A	0.002	0.000	N/A	Pass
35	0.003	0.034	N/A	0.003	0.051	N/A	Pass
36	0.002	0.000	N/A	0.002	0.000	N/A	Pass
37	0.003	0.034	N/A	0.003	0.051	N/A	Pass
38	0.002	0.000	N/A	0.002	0.000	N/A	Pass
39	0.003	0.034	N/A	0.003	0.051	N/A	Pass
40	0.001	0.000	N/A	0.001	0.000	N/A	Pass

Note: Dynamic limits were applied for this test. The highest harmonics values in the above table may not occur at the same window as the maximum harmonics/limit ratio.

3.5 Flicker Test Result

Test requirement:	EN 61000-3-3
Test Method:	EN 61000-3-3
Test Result:	N/A

3.5.1 Harmonics and Flicker Test Setup Drawing



Test-setup: Steady State Harmonics Test & Voltage Fluctuations (Flicker Meter Test)

For reference only

4 Immunity Test Results

4.1 Performance Criteria Description

- Criterion A: The apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.
- Criterion B: The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.
- Criterion C: Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

4.2 ESD

Test requirement:	EN IEC 61547
Test Method:	IEC 61000-4-2
Test Date:	2026-07-17
Discharge Impedance:	330 Ω / 150 pF
Discharge Voltage:	Air Discharge: $\pm 8\text{kV}$ Contact Discharge: $\pm 4\text{kV}$ 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

4.2.1 E.U.T Operation

Operating Environment:	
Temperature:	23.7 °C
Humidity:	53.3% RH
Atmospheric Pressure:	1007 mbar

EUT Operation:
Compliance test was performed in ON mode.

4.2.2 Direct Application Test Results

Observations: Test points: 1. All Exposed Surface & Seams;
2. All metallic part

Direct Application			Test Results	
Discharge Level (kV)	Polarity(+/-)	Test Point	Contact Discharge	Air Discharge
8	+/-	1	N/A	A
4	+/-	2	A	N/A

Results:

A: No degradation in the performance of the E.U.T. was observed.

N/A: Not applicable

4.2.3 Indirect Application Test Results

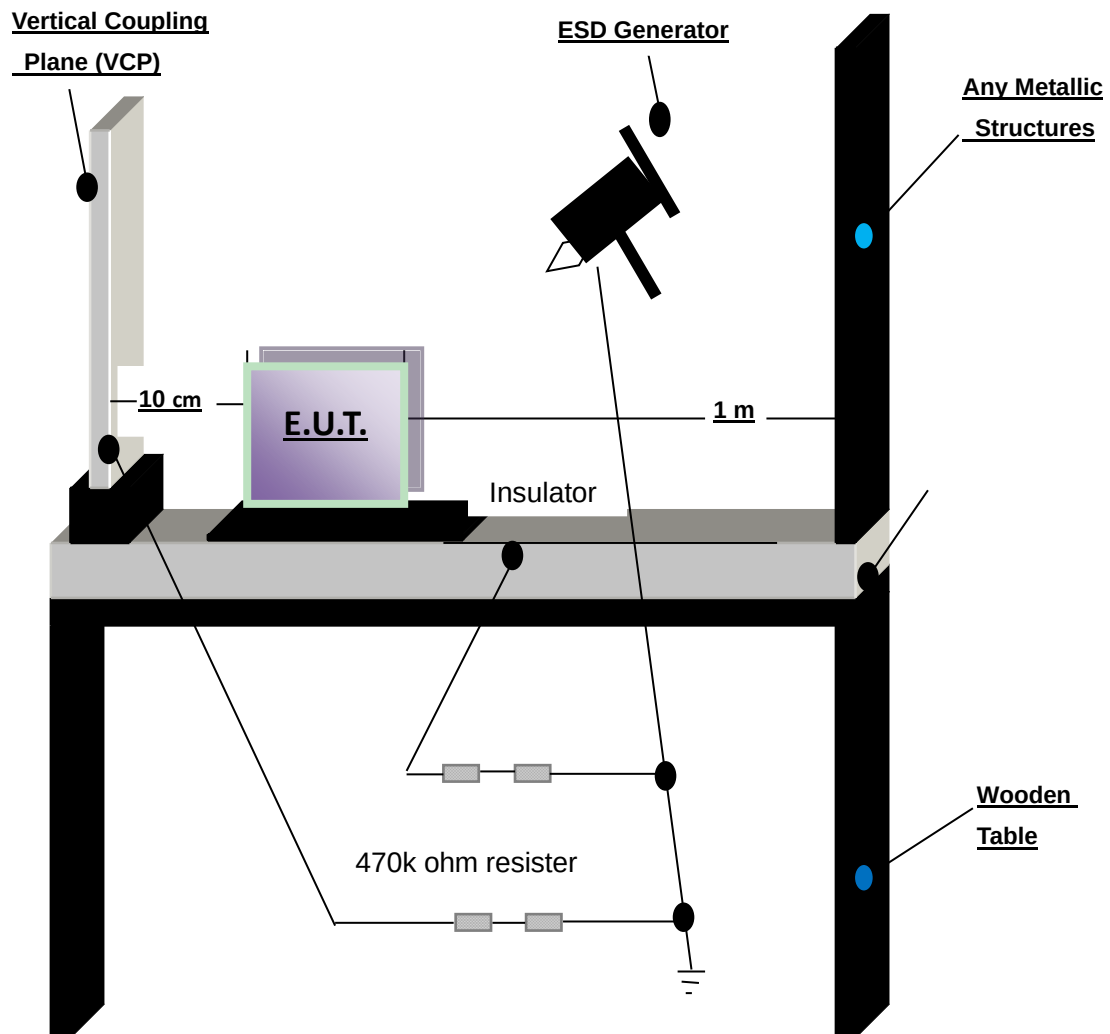
Observations: Test points: 1. All Sides.

Indirect Application			Test Results	
Discharge Level (kV)	Polarity(+/-)	Test Point	Horizontal Coupling	Vertical Coupling
2	+/-	1	A	A
4	+/-	1	A	A

Results: PASS

A: No degradation in the performance of the E.U.T. was observed.

4.2.4 ESD Test Setup Drawing



Test Setup: Electrostatic Discharge (ESD)

For reference only

4.3 Radiated Immunity

Test requirement : EN IEC 61547
Test Method : IEC 61000-4-3
Test Date: 2026-07-20
Frequency Range: 80MHz–1GHz
Face Under Test: Three Mutually Orthogonal Faces
Severity: 3V/m, 1kHz, 80% Amp. Mod. from 80MHz to 1GHz

4.3.1 E.U.T Operation

Operating Environment

Temperature: 24.2 °C
Humidity: 53.5% RH
Barometric Pressure: 1005mbar

EUT Operation:
Compliance test was performed in ON mode.

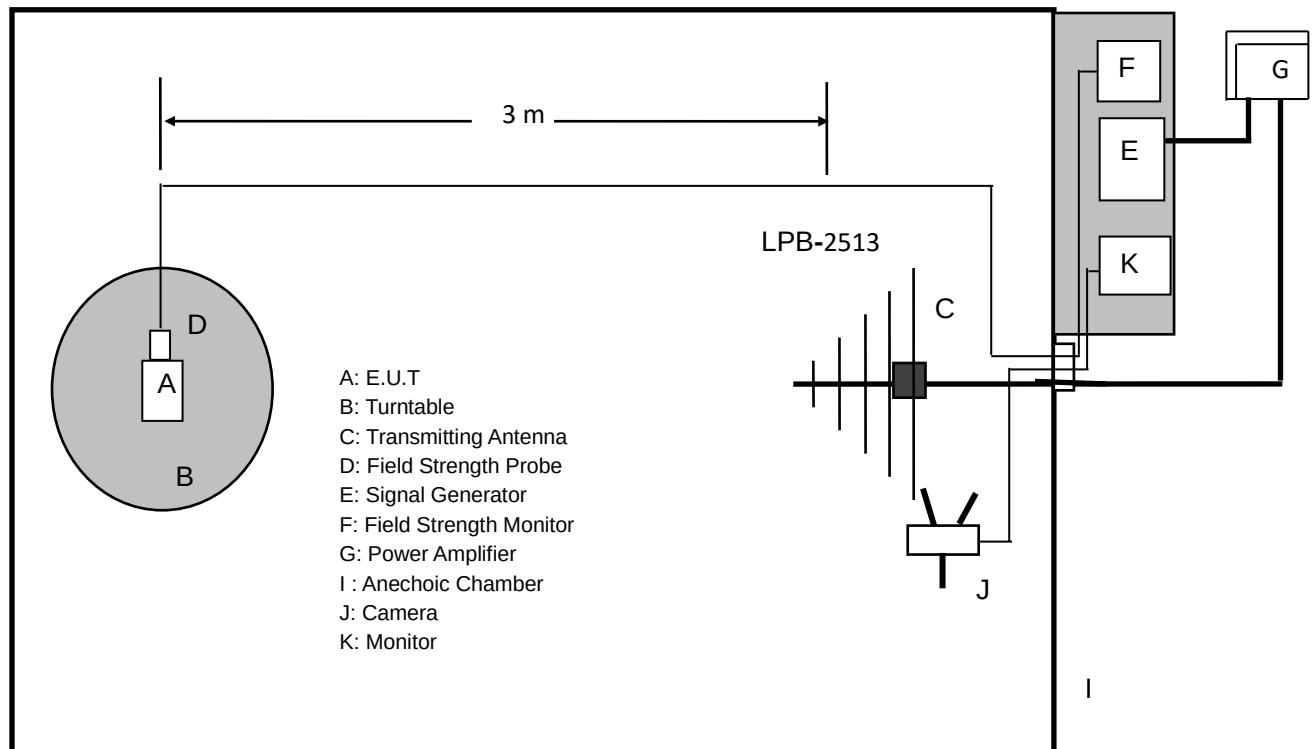
4.3.2 Test Results

Tabulated Results for RF Electromagnetic Field 80 - 1000 MHz					
Side of the equipment under test	Antenna polarization	Test Level	Dwell Time	Measuring distance	Results
All sides	Horizontal	3 V/m	1 s	3 m	Pass/(A)
All sides	Vertical	3 V/m	1 s	3 m	Pass/(A)

Results: Pass

A: No degradation in the performance of the E.U.T. was observed.

4.3.3 Radiated Immunity Test Setup Drawing



Test-setup: Radiated Immunity

For reference only

4.4 Electrical Fast Transients (EFT)

Test requirement: EN IEC 61547
Test Method: IEC 61000-4-4
Test Date: 2026-07-21
Test Level: $\pm 1.0\text{kV}$ on AC
Polarity: Positive & Negative
Repetition Frequency: 5kHz
Burst Duration: 300ms
Test Duration: 2 minutes per level & polarity

4.4.1 E.U.T Operation

Operating Environment

Temperature: 24.2 °C
Humidity: 53.6% RH
Barometric Pressure: 1005mbar

EUT Operation:

Compliance test was performed in ON mode.

4.4.2 Test Results

AC mains of AC Cable

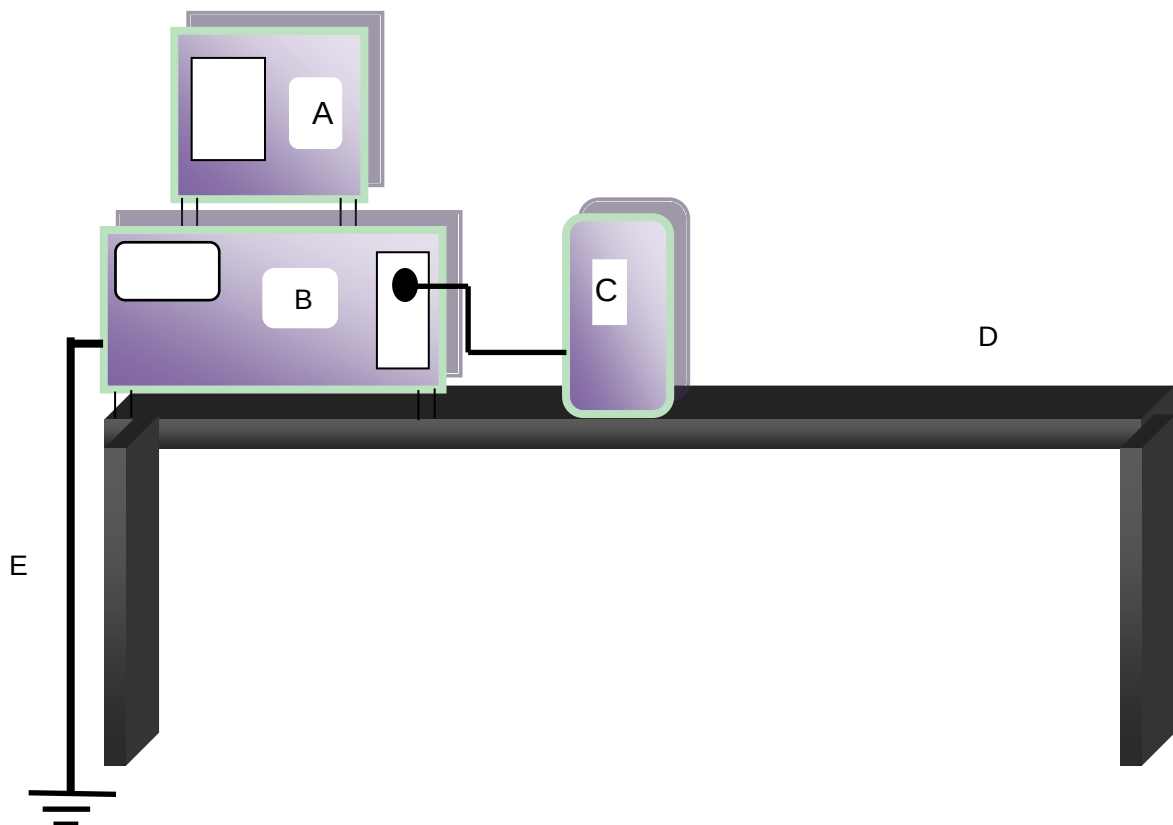
Coupling Line	Test Level	Test Time	Result
L-N-PE	+1KV	2 minute	Pass
L-N-PE	-1KV	2 minute	Pass

Results: Pass

A: No degradation in the performance of the E.U.T. was observed.

4.4.3 Fast Transients (Burst) Test Setup Drawing

- A: Digital Oscilloscope
- B: Burst Generator
- C: EUT
- D: Wooden Table
- E: Ground Wire



Test-setup: Fast Transients (Burst)

For reference only

4.5 Surge

Test requirement: EN IEC 61547
Test Method: IEC 61000-4-5
Test Date: 2026-07-22
Pulsform: Tr/Th=1.2/50 μ s
Test voltages: ± 1 kV ± 2 kV
Coupling: Coupling Network for AC Mains
Coupling phases : 0, $\pi/2$, π , $3\pi/2$
Number of surges : 5 (for each combination of parameters)
Repetition rate : max. 1/min
Performance criterion: A

4.5.1 E.U.T Operation

Operating Environment

Temperature: 23.2 °C
Humidity: 53.5% RH
Atmospheric Pressure: 1003mbar

EUT Operation:

Compliance test was performed in ON mode.

4.5.2 Test Results

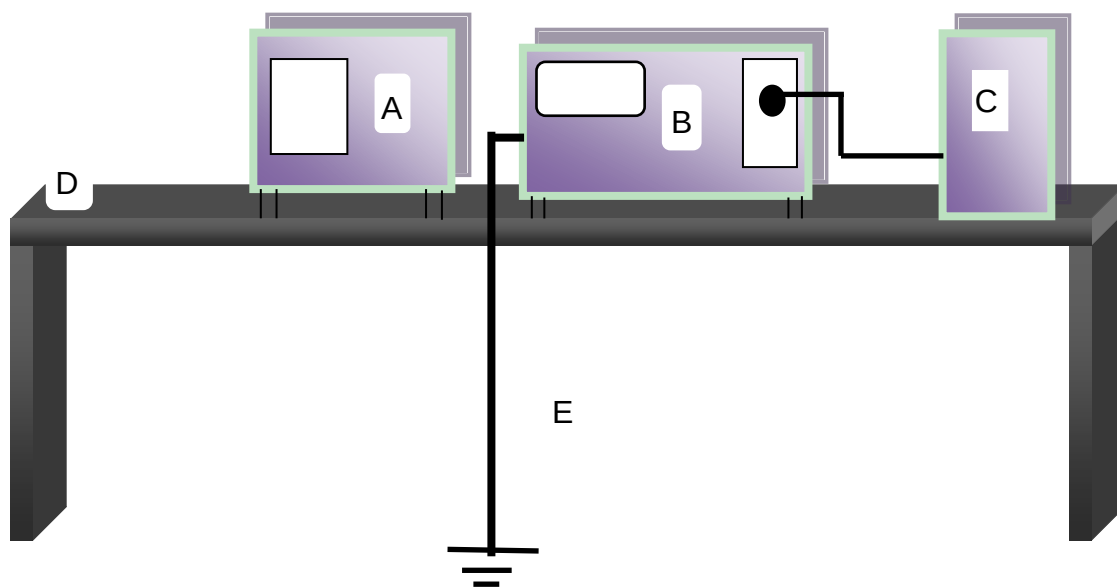
Coupling line	Test level	Repetition Rate	#of surges	Phase Angel	Result
L-N	1000V	60S	5(+)/5(-)	90(+)/270(-)	pass
L-PE	2000V	60S	5(+)/5(-)	90(+)/270(-)	pass
N-PE	2000V	60S	5(+)/5(-)	90(+)/270(-)	pass

Results: Pass

A: No degradation in the performance of the E.U.T. was observed.

4.5.3 Surge Test Setup Drawing

- A: Digital Oscilloscope
- B: Surge Generator
- C: EUT
- D: Wooden Table
- E: Ground Wire



Test-setup: Surges tests

For reference only

4.6 Conducted Immunity 0.15MHz to 80MHz

Test requirement: EN IEC 61547
Test Method: IEC 61000-4-6
Test Date: 2026-07-23
Frequency Range: 0.15MHz to 80MHz
Test level: 3V rms (unmodulated emf into 150 Ω)
Modulation : 80%, 1kHz Amplitude Modulation.

4.6.1 E.U.T Operation

Operating Environment
Temperature: 24.6 °C
Humidity: 53.4% RH
Atmospheric Pressure: 1003 mbar

EUT Operation:
Compliance test was performed in ON mode.

4.6.2 Test Results

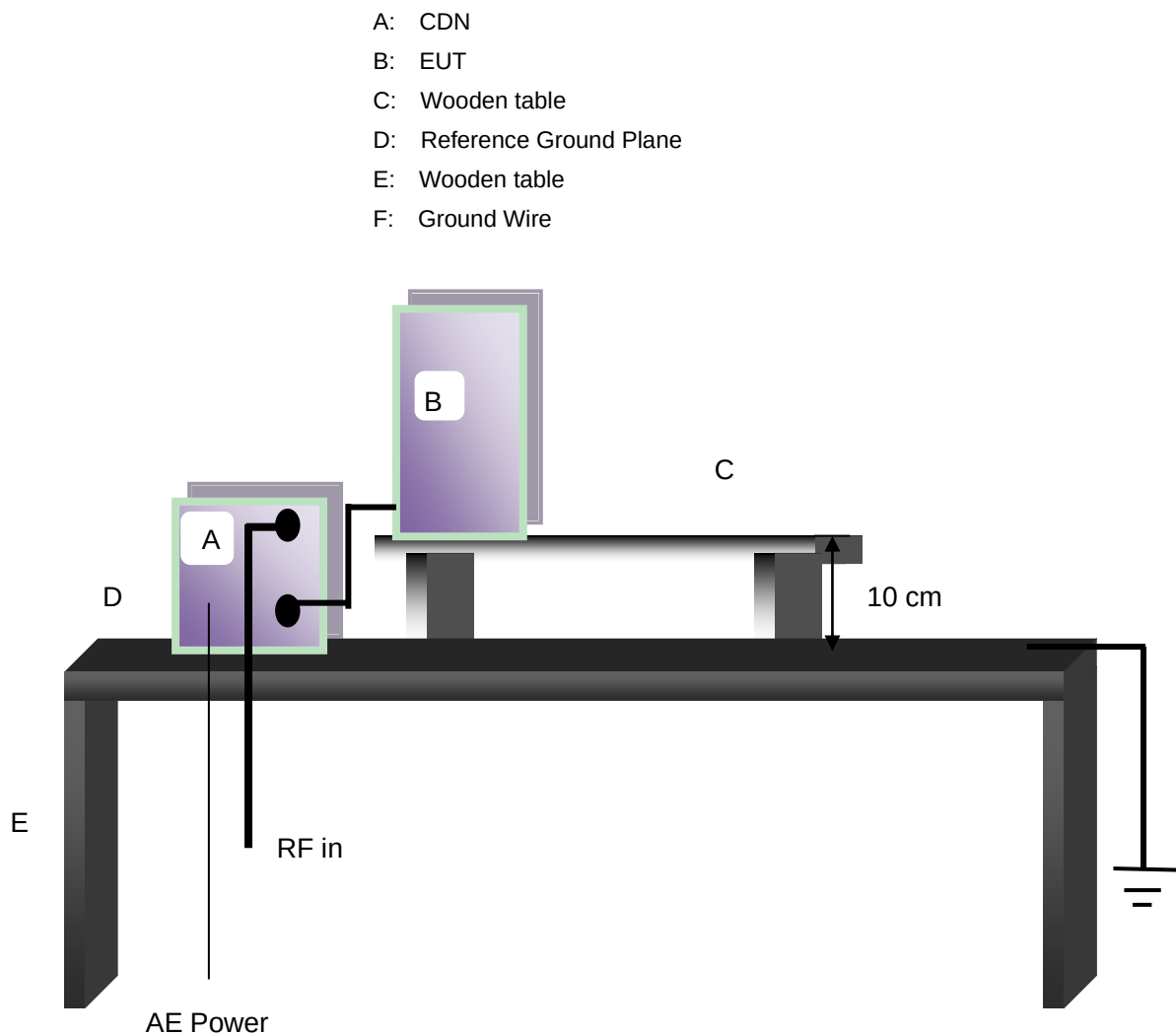
AC mains of AC Cable

Frequency	Line	Test Level	Modulation	Step Size	Dwell Time	Observations (Performance Criterion)
150kHz to 80MHz	2 Wire AC Supply Cable	3Vrms	80%, 1kHz Amp. Mod.	1%	1s	A

Results: Pass

A: No degradation in the performance of the E.U.T. was observed.

4.6.3 Conducted Immunity Test Setup Drawing



Test-setup: Conducted Immunity

For reference only

4.7 Voltage Dips and Interruptions

Test requirement: EN IEC 61547
Test Method: IEC 61000-4-11
Test Date: 2026-07-23
Test Level: 0% & 70 % of U_T (Supply Voltage)
No. of Dips/
Interruptions : 3 per Level at 10s intervals

4.7.1 E.U.T Operation

Operating Environment
Temperature: 23.7 °C
Humidity: 52.6% RH
Atmospheric Pressure: 1004 mbar

EUT Operation:
Compliance test was performed in ON mode.

4.7.2 Test Results

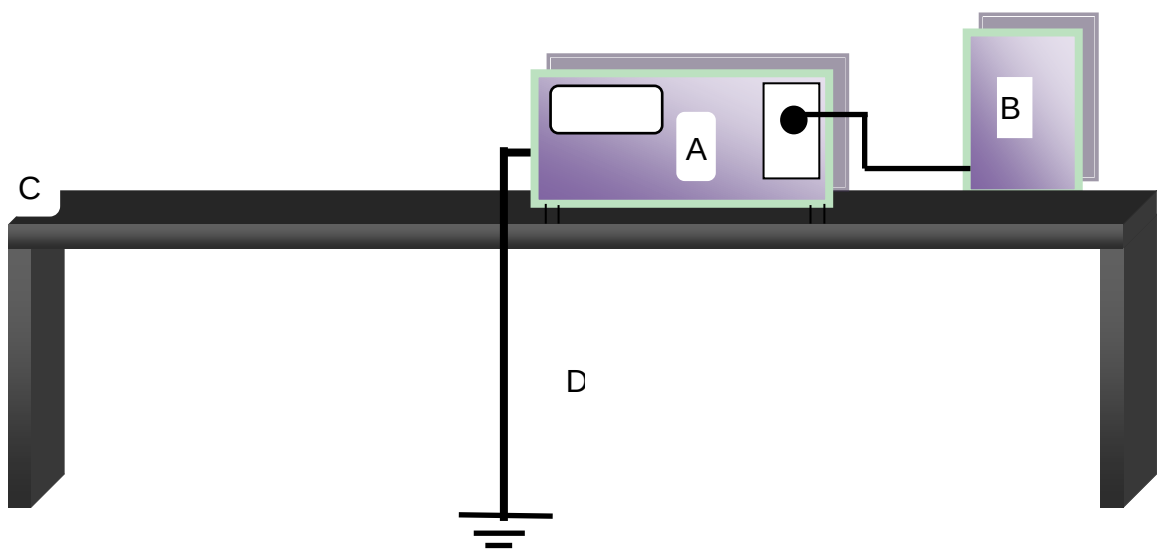
Interruptions				
EUT operating mode	Test Level in % U_T	Duration (cycle)	No. of interruptions	Observations (Performance Criterion)
On mode	0	0.5	3	A
Voltage Dips				
EUT operating mode	Test Level in % U_T	Duration (cycle)	No. of voltage Dips	Observations (Performance Criterion)
On mode	70	10	3	A

Results: Pass

A: No degradation in the performance of the E.U.T. was observed.

4.7.3 Voltage Dips and Interruptions Test Setup Drawing

- A: Mains Drop out Simulator
- B: EUT
- C: Wooden Table
- D: Ground Wire

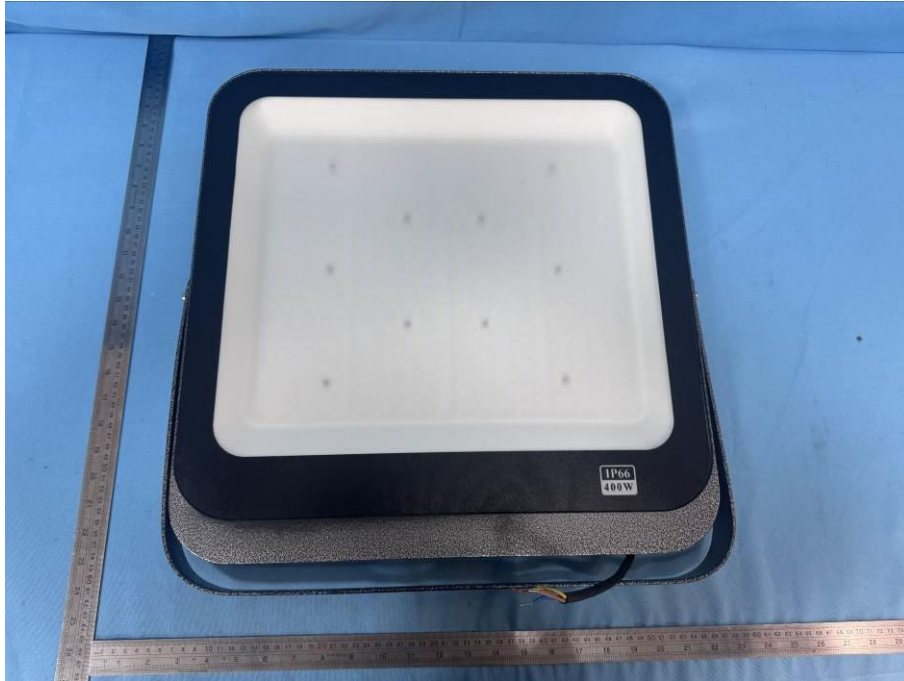


Test-setup: Voltage Dips, Interruptions & Variations

For reference

5 Photographs - Constructional Details

Details of: General view of SD-SF22902-5



Details of: General view of SD-SF22902-5



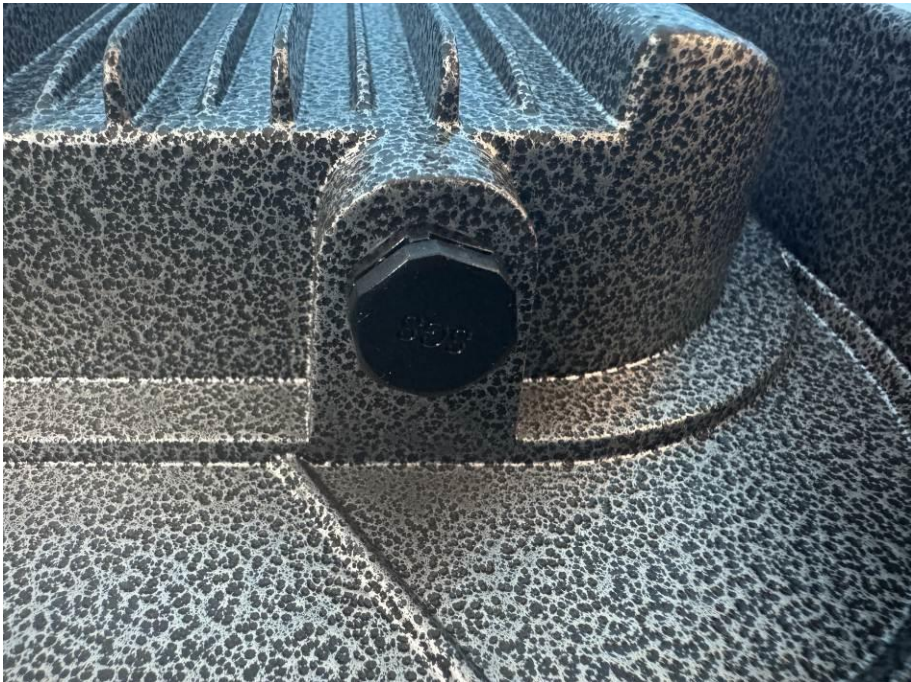
Details of: General view of SD-SF22902-5



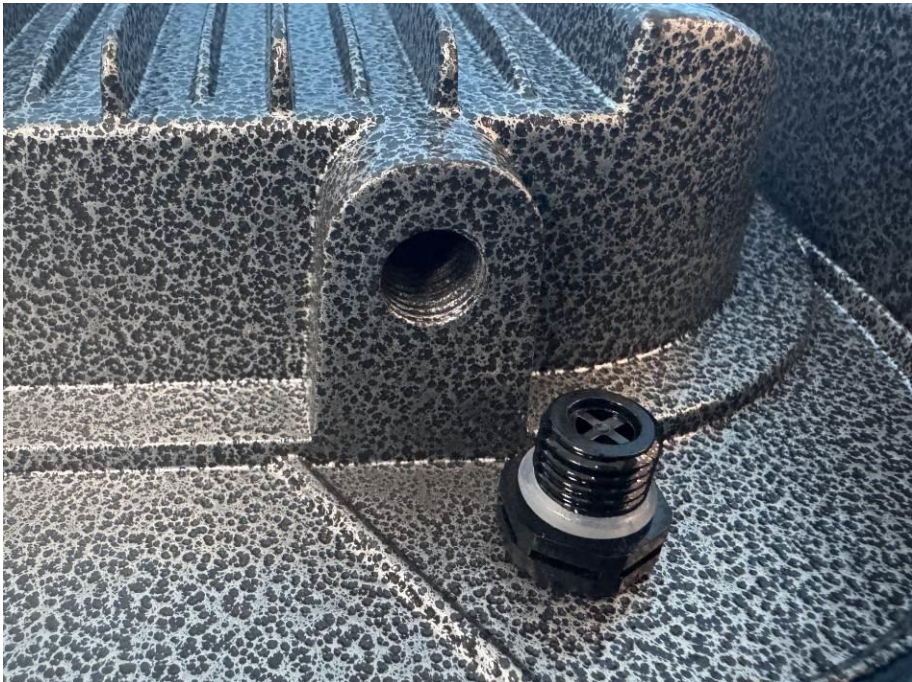
Details of: General view of SD-SF22902-5



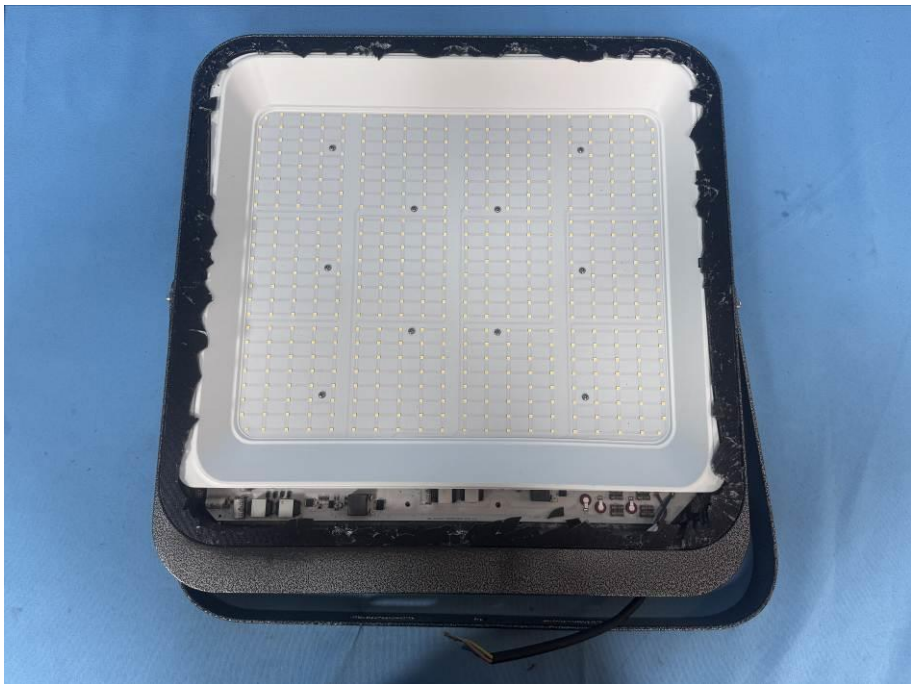
Details of: General view of SD-SF22902-5



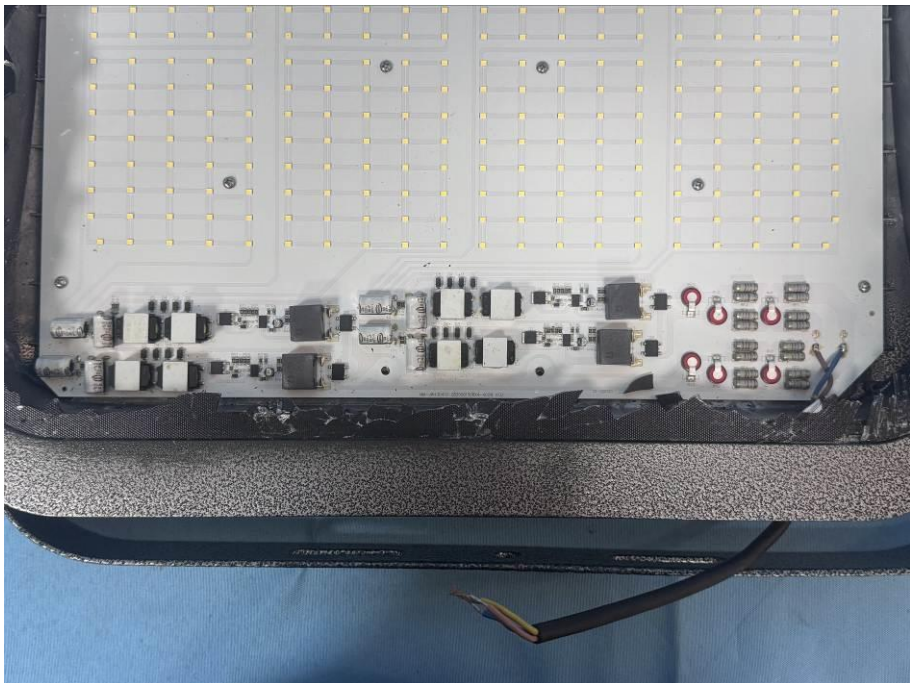
Details of: General view of SD-SF22902-5



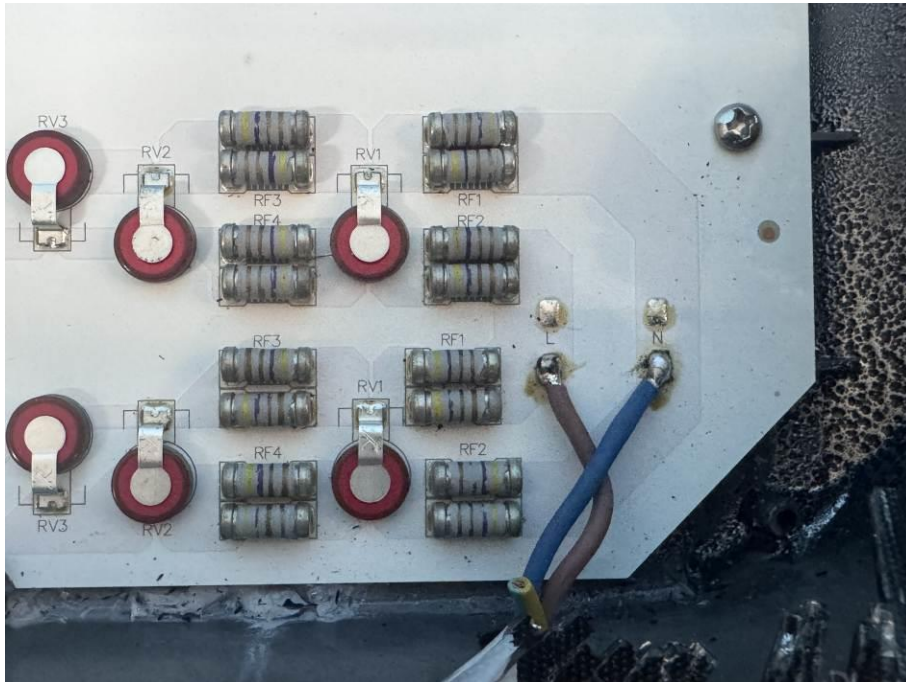
Details of: Internal view of SD-SF22902-5



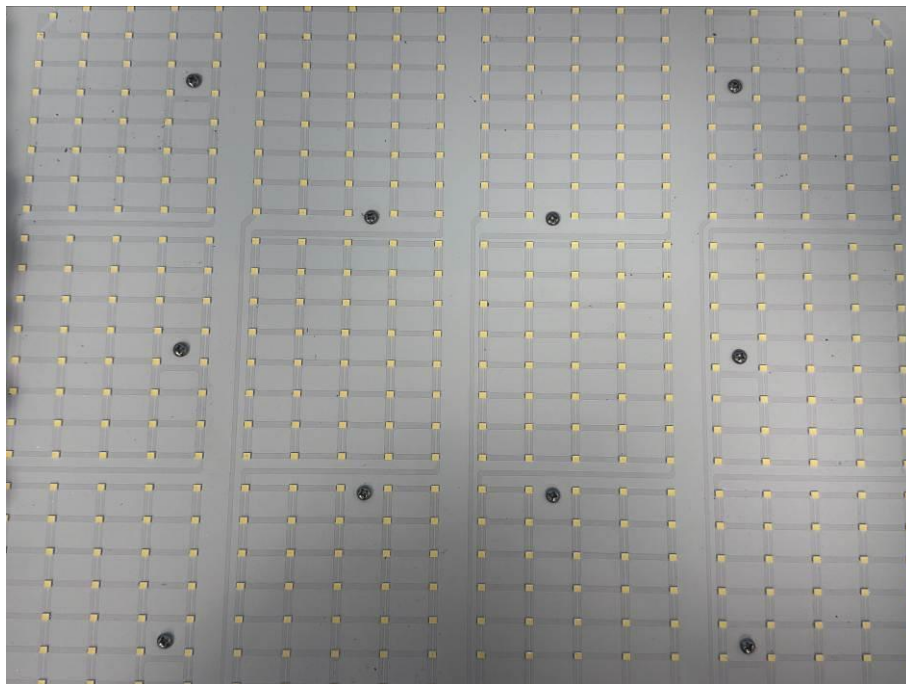
Details of: Internal view of SD-SF22902-5



Details of: Internal view of SD-SF22902-5



Details of: LED model of SD-SF22902-5



- END OF REPORT -