

Afore New Energy Technology (Shanghai) Co., Ltd.

TEST REPORT

SCOPE OF WORK:

EMC directive (2014/30/EU) – EMC report

Model:

AF1K-SL-0, AF1.5K-SL-0, AF2K-SL-0, AF2.5K-SL-0,
AF3K-SL-0, AF3.6K-SL-0, AF4K-SL-0, AF4.6K-SL-0,
AF5K-SL-0, AF5.5K-SL-0, AF6K-SL-0, AF1K-SL-1,
AF1.5K-SL-1, AF2K-SL-1, AF2.5K-SL-1, AF3K-SL-1,
AF3.6K-SL-1, AF3K-SL, AF3.6K-SL, AF4K-SL,
AF4.6K-SL, AF5K-SL, AF5.5K-SL, AF6K-SL,
AF4K-SLP, AF4.6K-SLP, AF5K-SLP, AF5.5K-SLP,
AF6K-SLP

REPORT NUMBER

2404B0471SHA-001

ISSUE DATE

2024-05-07

DOCUMENT CONTROL NUMBER

TTRF61000-6-3_V1

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Summary

The equipment complies with the requirements according to the following standard(s) or Specification:

EN IEC 61000-6-1:2019: Electromagnetic compatibility (EMC) - General standards – Immunity for residential, commercial and light-industrial environment

EN IEC 61000-6-3:2021: General standards – Emission standard for residential, commercial and light-industrial environment

EN IEC 61000-6-2: 2019: Electromagnetic compatibility (EMC) - General standards – Immunity for residential, commercial and light-industrial environment

EN IEC 61000-6-4: 2019: General standards – Emission standard for residential, commercial and light-industrial environment

EN IEC 61000-3-2:2019+A1:2021: Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)

EN 61000-3-3:2013+A1:2019+A2:2021: Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection

EN 61000-3-12:2011: Electromagnetic compatibility (EMC) - Part 3-12: Limits - Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current > 16 A and ≤ 75 A per phase

EN IEC 61000-3-11:2019: Electromagnetic compatibility (EMC) - Part 3-11: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems - Equipment with rated current ≤ 75 A and subject to conditional connection

EN 62920:2017+A1:2021: Photovoltaic power generating systems – EMC requirements and test methods for power conversion equipment

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Revision History

Report No.	Version	Description	Issued Date
2404B0471SHA-001	Rev. 01	Initial issue of report	2024-05-07

Measurement result summary

TEST ITEM	TEST RESULT	NOTE
Conducted disturbance voltage at mains terminals	Pass	
Electromagnetic radiation disturbance	Pass	
Harmonic current	Pass	
Voltage fluctuations and flicker	Pass	
Electrostatic discharge	Pass	
Radio frequency electromagnetic field	Pass	
Fast transients	Pass	
Surges	Pass	
Radio frequency, common mode	Pass	
Voltage dips	Pass	
Power frequency magnetic field	Pass	

Notes: 1: NA =Not Applicable

2: Determination of the test conclusion is based on IEC Guide 115 in consideration of measurement uncertainty.

3: Additions, Deviations and Exclusions from Standards: None.

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Product name : Hybrid inverter / AC Coupled inverter

Type/Model : AF1K-SL-0, AF1.5K-SL-0, AF2K-SL-0, AF2.5K-SL-0, AF3K-SL-0, AF3.6K-SL-0, AF4K-SL-0, AF4.6K-SL-0, AF5K-SL-0, AF5.5K-SL-0, AF6K-SL-0, AF1K-SL-1, AF1.5K-SL-1, AF2K-SL-1, AF2.5K-SL-1, AF3K-SL-1, AF3.6K-SL-1, AF3K-SL, AF3.6K-SL, AF4K-SL, AF4.6K-SL, AF5K-SL, AF5.5K-SL, AF6K-SL, AF4K-SLP, AF4.6K-SLP, AF5K-SLP, AF5.5K-SLP, AF6K-SLP

Description : AF*-SL-1 (*= 1K, 1.5K, 2K, 2.5K, 3K, 3.6K)
AF*-SL (*= 3K, 3.6K, 4K, 4.6K, 5K, 5.5K, 6K)
AF*-SLP (*=4K, 4.6K, 5K, 5.5K, 6K)
The testing item is a Hybrid inverter for indoor or outdoor installation. The Inverter is single-phase type and non-isolated between PV, BATT and AC output.
The internal control is redundantly built. It contains a main DSP and a slave DSP.
PE terminal on external and internal enclosure.
The final used earth system shall comply the local code requirement.

All models have same circuit diagram, PWB layout and software.
Differences between models are output rating, PV input string number and fan number.
Model AF*-SL-1 (*= 1K, 1.5K, 2K, 2.5K, 3K, 3.6K) have one MPPT tracker with one PV input string.
Model AF*-SL (*= 3K, 3.6K, 4K, 4.6K, 5K, 5.5K, 6K), AF*-SLP (*= 4K, 4.6K, 5K, 5.5K, 6K) have 2 MPPT trackers with 2 PV input strings.
Model AF*-SL-1 (*= 1K, 1.5K, 2K, 2.5K, 3K, 3.6K), AF*-SL (*= 3K, 3.6K) have no external fan.
Model AF*-SL (*= 4K, 4.6K, 5K, 5.5K, 6K), AF*-SLP (*= 4K, 4.6K, 5K, 5.5K, 6K) have 2 external fans.
The BAT port current of model AF*-SL (*= 4K, 4.6K, 5K, 5.5K, 6K) is 80A, and the BAT port current of model AF*-SLP (*= 4K, 4.6K, 5K, 5.5K, 6K) is 120A.
The output power is derated by software.

AF*-SL-0 (*= 1K, 1.5K, 2K, 2.5K, 3K, 3.6K, 4K, 4.6K, 5K, 5.5K, 6K):
The testing item is AC coupled inverter for indoor or outdoor installation. This product is similar Hybrid inverter and remove PV port. The Inverter is single-phase type and non-isolated between BATT and AC output.
The internal control is redundantly built. It contains a main DSP and a slave DSP.
PE terminal on external and internal enclosure.
The final used earth system shall comply the local code requirement.

The inverter has adjustable power factor function. But the function is not available for this test report.

All Mode are same except for output power. The function was achieved by software.

All models have same circuit, PWB layout and software.

Differences between models are output rating and fun number.

Model AF*-SL-0 (*= 1K, 1.5K, 2K, 2.5K, 3K, 3.6K) have no external fan.

Model AF*-SL-0 (*= 4K, 4.6K, 5K, 5.5K, 6K) have 2 external fans.

The output power is derated by software.

And The testing performed on typical model: Max power model.

This report is based on 230601235SHA-001. The modification is add new test datas on harmonics, flicker, and immunity items for meet EN62920 and EN61000-6-2 standard requirements.

Rating	:	See Appendix I specifications table
Trade Mark	:	Afore
EUT type	:	☒ Table-top ☐ Floor standing
Sample received date	:	2023-06-28
Sample identification number	:	NA
Date of test	:	2023-10-18 to 2023-12-08, 2024-03-14 to 2024-03-16

1.2 Description of Test Facility

Name : Intertek Testing Services Shanghai
Address : Building 86, No. 1198 Qinzhou Road(North), Shanghai 200233, P.R.
China
Telephone : 86 21 61278200
Telefax : 86 21 54262353

The test facility is : CNAS Accreditation Lab
recognized, certified, Registration No. CNAS L0139
or accredited by these FCC Accredited Lab
organizations Designation Number: CN0175
IC Registration Lab
CAB identifier.: CN0051
VCCI Registration Lab
Registration No.: R-14243, G-10845, C-14723, T-12252
A2LA Accreditation Lab
Certificate Number: 3309.02

2 TEST SPECIFICATIONS

2.1 Normative references

EN IEC 61000-6-1:2019: Electromagnetic compatibility (EMC) - General standards – Immunity for residential, commercial and light-industrial environment

EN IEC 61000-6-3:2021: General standards – Emission standard for residential, commercial and light-industrial environment

EN IEC 61000-3-2:2019+A1:2021: Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)

EN 61000-3-12:2011: Electromagnetic compatibility (EMC) - Part 3-12: Limits - Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current > 16 A and ≤ 75 A per phase

EN 61000-3-3:2013+A1:2019+A2:2021: Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection

EN IEC 61000-3-11:2019: Electromagnetic compatibility (EMC) - Part 3-11: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems - Equipment with rated current ≤ 75 A and subject to conditional connection

EN 62920:2017+A1:2021: Photovoltaic power generating systems – EMC requirements and test methods for power conversion equipment

2.2 Mode of operation during the test

Within this test report, EUT was tested under all available operation modes and tested under its rating voltage and frequency. Other voltage and frequency is specified if used.

2.3 Test peripherals used

Item No	Description	Brand and Model	S/No
-	-	-	-

2.4 Record of climatic conditions

Test Item	Temperature (°C)	Relative Humidity (%)	Pressure (Kpa)
Mains terminal disturbance voltage	24	37	NA
Electromagnetic radiation disturbance	24	37	NA
Harmonic current	26	38	NA
Voltage fluctuations and flicker	27	39	NA
Electrostatic discharge	24	37	101
Radio frequency electromagnetic field	28	36	NA
Fast transients	27	39	NA
Surges	29	36	NA
Radio frequency, common mode	24	37	NA
Voltage dips	24	37	NA
Power frequency magnetic field	28	36	NA

Notes: NA =Not Applicable

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2.5 Instrument list

Conducted Emission/Disturbance Power/Tri-loop Test/CDN method					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Test Receiver	R&S	ESCS 30	EC 2107	2024-07-14
☒	A.M.N.	R&S	ESH2-Z5	EC 3119	2024-11-29
Radiated Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Test Receiver	R&S	ESIB 26	EC 3045	2024-09-11
☒	Bilog Antenna	TESEQ	CBL 6112D	EC 4206	2024-06-09
ESD					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	ESD generator	TESEQ	NSG 437	EC 4792-4	2024-03-21
EFT/Surge Voltage Dips					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Conduct immunity system	EM TEST	UCS 500M6B	EC 2958	2024-04-06
☒	Automatic transformer	EM TEST	MV2616	EC 2957	2024-04-06
Conducted Immunity					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Signal generator	R&S	SML 01	EC 2338	2024-09-09
☒	Power amplifier	AR	75A250	EC 3043-1	2024-07-14
☒	Attenuator	EM TEST	ATT6/75	EC 3043-3	2024-02-04
☒	CDN	Frankonia	CDN M2M316	EC 5969	2024-03-14
Radiated Immunity					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Signal generator	R&S	SMR 20	EC 3044-1	2024-01-29
☒	Power amplifier	AR	250W1000B	EC 5818-2	2024-04-18

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☒	Power amplifier	BONN	BLMA1060-100	EC 5818-4	2024-04-18
☒	Log-period antenna	AR	AT 1080	EC 3044-7	2024-01-03
☒	Horn antenna	Schwarzbeck	STLP 9149	EC5881	2024-06-18
☒	Field meter	AR	FL17000	EC 5818-1	2024-05-20
☒	Power sensor	Keysight	N1914A	EC 5818-3	2024-04-18
Test Site					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Shielded room	Zhongyu	-	EC 2838	2024-01-14
☒	Shielded room	Zhongyu	-	EC 2839	2024-01-14
☒	Semi-anechoic chamber	Albatross project	-	EC 3048	2024-07-30
☒	Fully-anechoic chamber	Albatross project	-	EC 3047	2024-07-30
Additional instrument					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☒	Spectrum analyzer	Agilent	E7402A	EC 2254	2024-07-14
☒	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3783	2024-02-27
☒	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 2122	2024-03-10
☒	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 5198	2024-01-18
☒	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3326	2024-03-27
☒	Pressure meter	YM3	Shanghai Mengde	EC 3320	2024-06-30

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2.6 Measurement Uncertainty

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted emission at mains ports	9kHz ~ 150kHz	3.71 dB
	150kHz ~ 30MHz	3.31 dB
Continuous disturbance measurements using a VP	0.09MHz ~ 30MHz	2.75dB
Continuous disturbance voltage at telecom ports with AAN	150kHz ~ 30MHz	4.10 dB
Continuous disturbance current at telecom ports	150kHz ~ 30MHz	2.73 dB
Continuous disturbance power	30MHz ~ 300MHz	4.42 dB
Discontinuous disturbance voltage/click	150kHz ~ 30MHz	3.87dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.04 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	4.97 dB
	6GHz ~ 18GHz	5.29 dB
Harmonic current emission	-	3.90%
Voltage fluctuations and flicker	-	10.34%
ESD	-	6.65%
Radiated susceptibility	80MHz ~ 1000MHz	2.38%
EFT test at main terminal	-	11.57%
EFT test at signal/telecom terminal	-	11.62%
Surge test at main terminal	-	11.57%
Surge test at signal/telecom line	-	11.89%
Injected current test at main terminal	-	1.88 dB
Injected current test at unshielded signal terminal	-	3.41 dB
Injected current test at shielded signal terminal	-	3.30dB
Voltage dips and interruption	-	6.05%

3 Mains terminal disturbance voltage

Test result: **PASS**

3.1 Limits

3.1.1 Limits at the AC mains ports

Frequency range (MHz)	Limits (dBuV)	
	Quasi-peak	Average
0.15 ~ 0.5	66-56*	56-46*
0.5 ~ 5	56	46
5 ~ 30	60	50
Note: 1. * means the limit decreasing linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz 2. If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.		

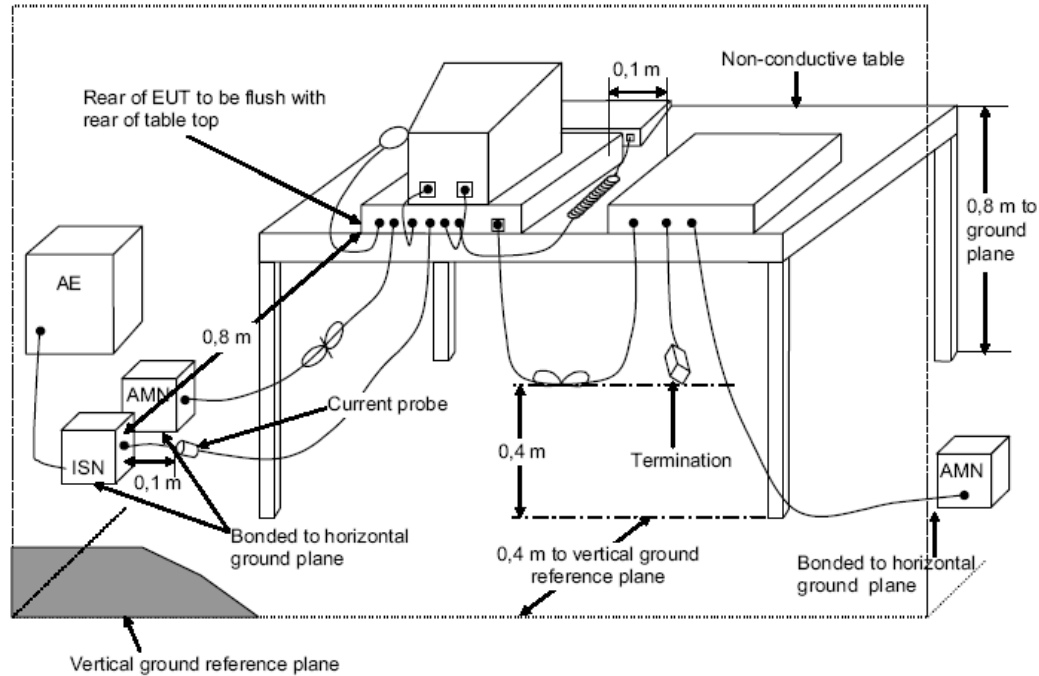
3.1.2 Limits at the DC mains ports

Frequency range (MHz)	Limits (dBuV)	
	Quasi-peak	Average
0.15 ~ 0.5	79	66
0.5 ~ 30	73	60
Note: 1. If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.		

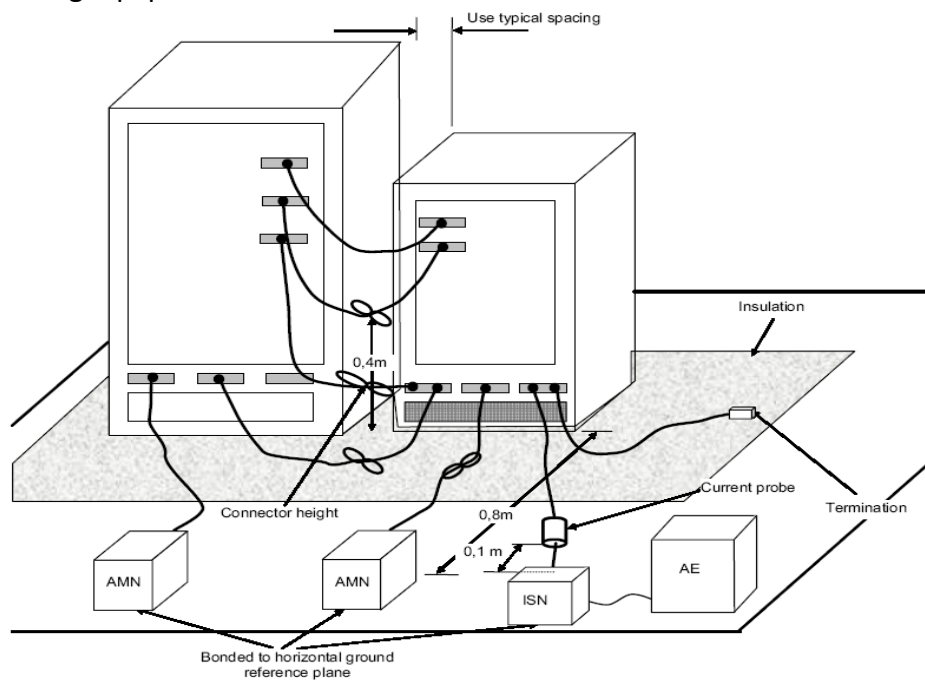
TEST REPORT

3.2 Test setup

For table top equipment



For floor standing equipment



3.3 Test Procedure

Measurement was performed in shielded room, and instruments used were following CISPR 16-1-2 clause 4.3.

Detailed test procedure was following CISPR 16-2-1 clause 7.4

EUT arrangement and operation conditions were according to CISPR 16-2-1 clause 7.4.

Frequency range 150kHz – 30MHz was checked and EMI receiver measurement bandwidth was set to 9 kHz.

TEST REPORT

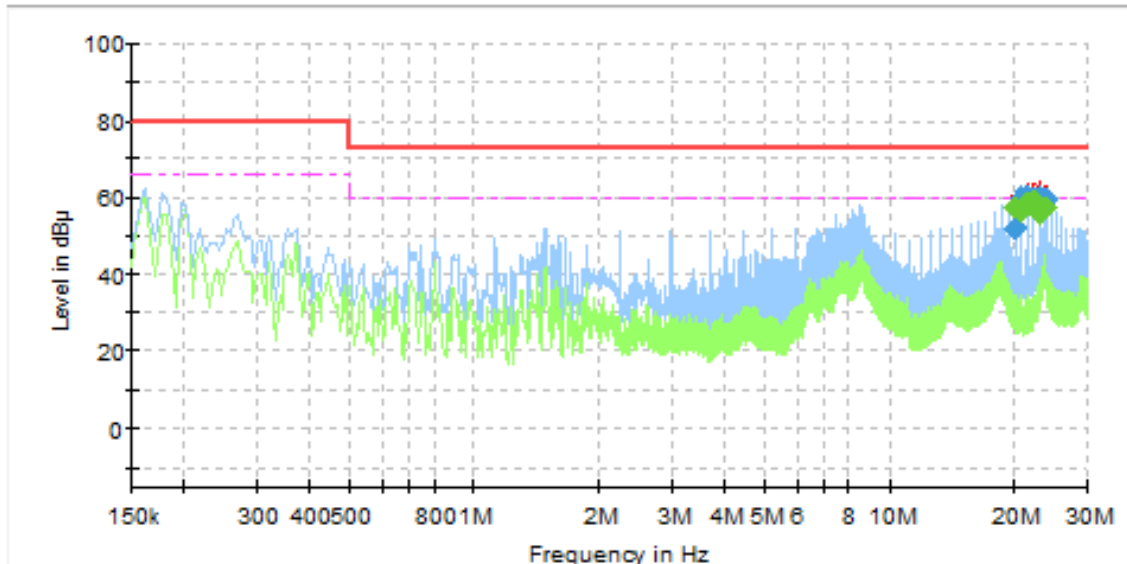
3.4 Test Result

TEST RESULT: PASS

Charging mode

Positive:

Test Curve:



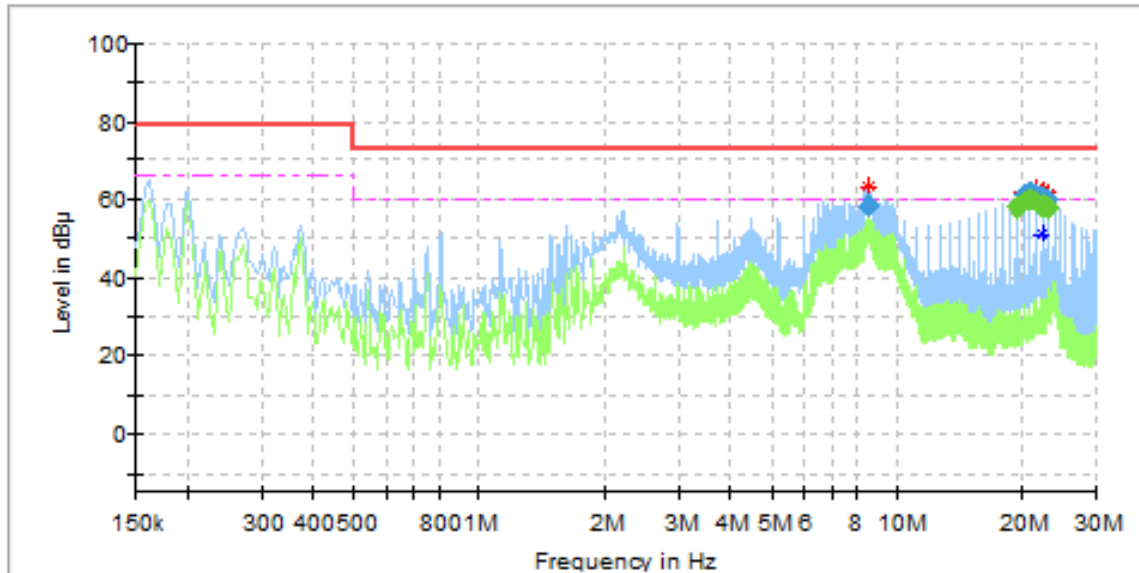
Final Result

Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line
20.126000	52.04	---	73.00	20.96	1000.0	9.000	+
20.134000	---	57.37	60.00	2.63	1000.0	9.000	+
20.882000	---	56.29	60.00	3.71	1000.0	9.000	+
20.882000	59.92	---	73.00	13.08	1000.0	9.000	+
21.626000	---	58.65	60.00	1.35	1000.0	9.000	+
21.626000	60.63	---	73.00	12.37	1000.0	9.000	+
22.366000	59.77	---	73.00	13.23	1000.0	9.000	+
22.370000	---	59.18	60.00	0.82	1000.0	9.000	+
23.114000	60.10	---	73.00	12.90	1000.0	9.000	+
23.114000	---	55.85	60.00	4.15	1000.0	9.000	+
23.862000	---	57.18	60.00	2.82	1000.0	9.000	+
23.862000	59.32	---	73.00	13.68	1000.0	9.000	+

Charging mode

Negative:

Test Curve:



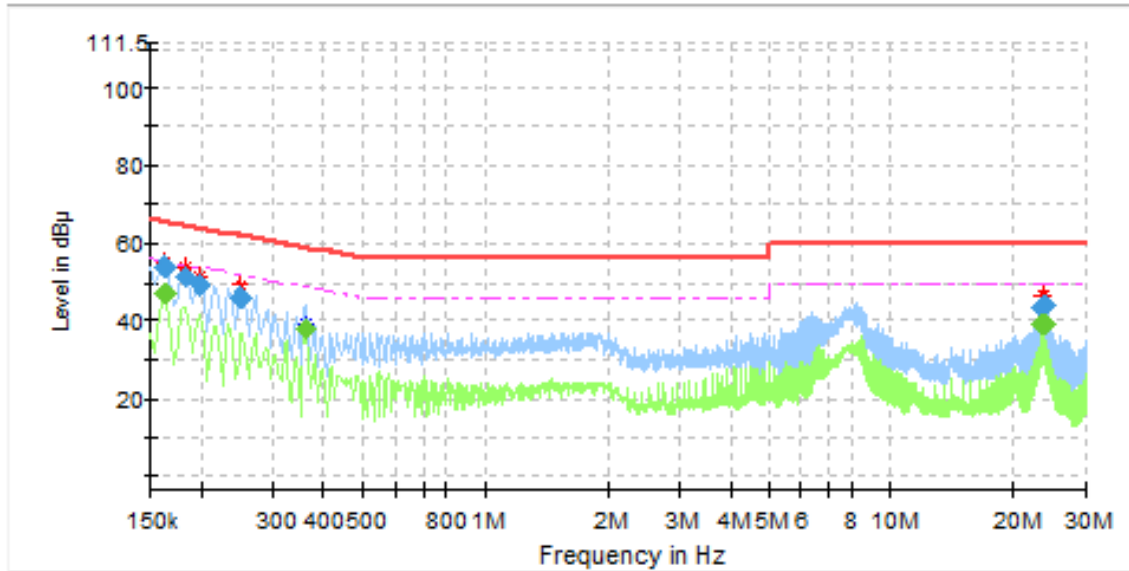
Final Result

Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line
8.530000	58.56	---	73.00	14.44	1000.0	9.000	-
19.382000	---	57.87	60.00	2.13	1000.0	9.000	-
20.130000	---	59.73	60.00	0.27	1000.0	9.000	-
20.130000	61.05	---	73.00	11.95	1000.0	9.000	-
20.874000	---	59.99	60.00	0.01	1000.0	9.000	-
20.874000	61.57	---	73.00	11.43	1000.0	9.000	-
21.618000	61.40	---	73.00	11.60	1000.0	9.000	-
21.622000	---	59.74	60.00	0.26	1000.0	9.000	-
22.362000	60.76	---	73.00	12.24	1000.0	9.000	-
22.362000	---	58.36	60.00	1.64	1000.0	9.000	-
23.110000	60.18	---	73.00	12.82	1000.0	9.000	-
23.114000	---	58.07	60.00	1.93	1000.0	9.000	-

Charging mode

L line:

Test Curve:



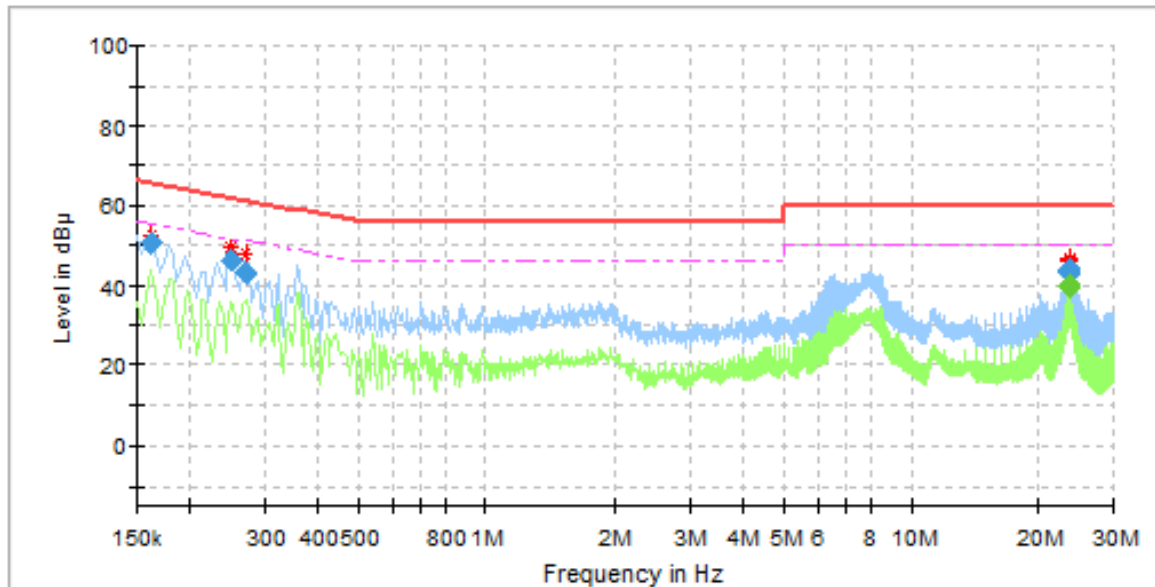
Final Result

Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line
0.162000	---	46.85	55.36	8.51	1000.0	9.000	L
0.162000	53.91	---	65.36	11.45	1000.0	9.000	L
0.182000	51.14	---	64.39	13.25	1000.0	9.000	L
0.198000	49.37	---	63.69	14.33	1000.0	9.000	L
0.250000	45.91	---	61.76	15.85	1000.0	9.000	L
0.362000	---	37.86	48.68	10.82	1000.0	9.000	L
23.434000	43.29	---	60.00	16.71	1000.0	9.000	L
23.506000	---	38.93	50.00	11.07	1000.0	9.000	L
23.578000	---	39.11	50.00	10.89	1000.0	9.000	L
23.614000	---	39.25	50.00	10.75	1000.0	9.000	L
23.650000	---	39.23	50.00	10.77	1000.0	9.000	L
23.650000	43.65	---	60.00	16.35	1000.0	9.000	L

Charging mode

N line:

Test Curve:



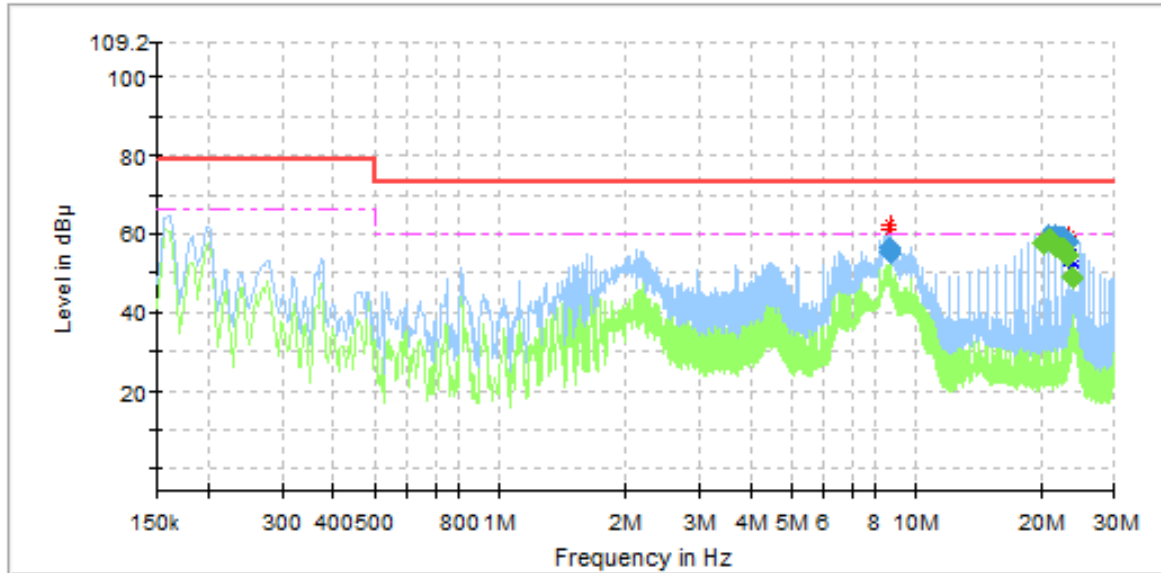
Final Result

Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line
0.162000	50.69	---	65.36	14.67	1000.0	9.000	N
0.250000	46.15	---	61.76	15.61	1000.0	9.000	N
0.270000	43.08	---	61.12	18.04	1000.0	9.000	N
23.542000	---	40.04	50.00	9.96	1000.0	9.000	N
23.542000	43.97	---	60.00	16.03	1000.0	9.000	N
23.578000	---	39.85	50.00	10.15	1000.0	9.000	N
23.614000	---	39.81	50.00	10.19	1000.0	9.000	N
23.614000	43.28	---	60.00	16.72	1000.0	9.000	N
23.650000	---	40.05	50.00	9.95	1000.0	9.000	N
23.650000	44.12	---	60.00	15.88	1000.0	9.000	N
23.686000	---	39.74	50.00	10.26	1000.0	9.000	N
23.722000	---	39.59	50.00	10.41	1000.0	9.000	N

PV mode

Positive:

Test Curve:



Final_Result

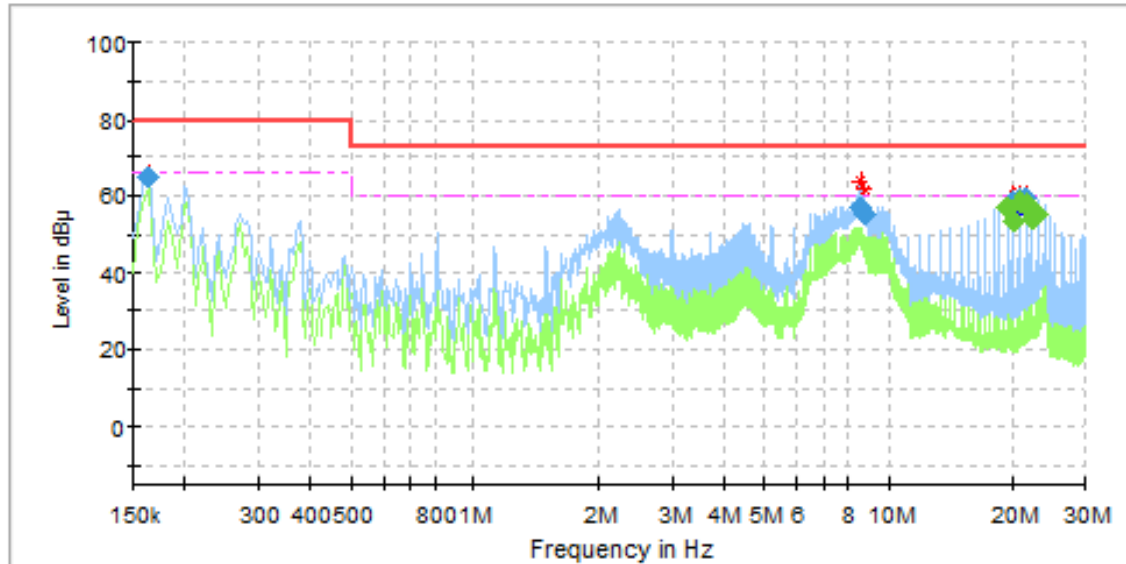
Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line
8.638000	56.24	---	73.00	16.76	1000.0	9.000	+
8.694000	55.37	---	73.00	17.63	1000.0	9.000	+
20.134000	---	57.67	60.00	2.33	1000.0	9.000	+
20.878000	---	58.75	60.00	1.25	1000.0	9.000	+
20.878000	59.74	---	73.00	13.26	1000.0	9.000	+
21.622000	59.61	---	73.00	13.39	1000.0	9.000	+
21.626000	---	57.07	60.00	2.93	1000.0	9.000	+
22.366000	---	56.55	60.00	3.45	1000.0	9.000	+
22.366000	59.22	---	73.00	13.78	1000.0	9.000	+
23.114000	---	54.60	60.00	5.40	1000.0	9.000	+
23.114000	58.17	---	73.00	14.83	1000.0	9.000	+
23.858000	---	49.19	60.00	10.81	1000.0	9.000	+

TEST REPORT

PV mode

Negative:

Test Curve:



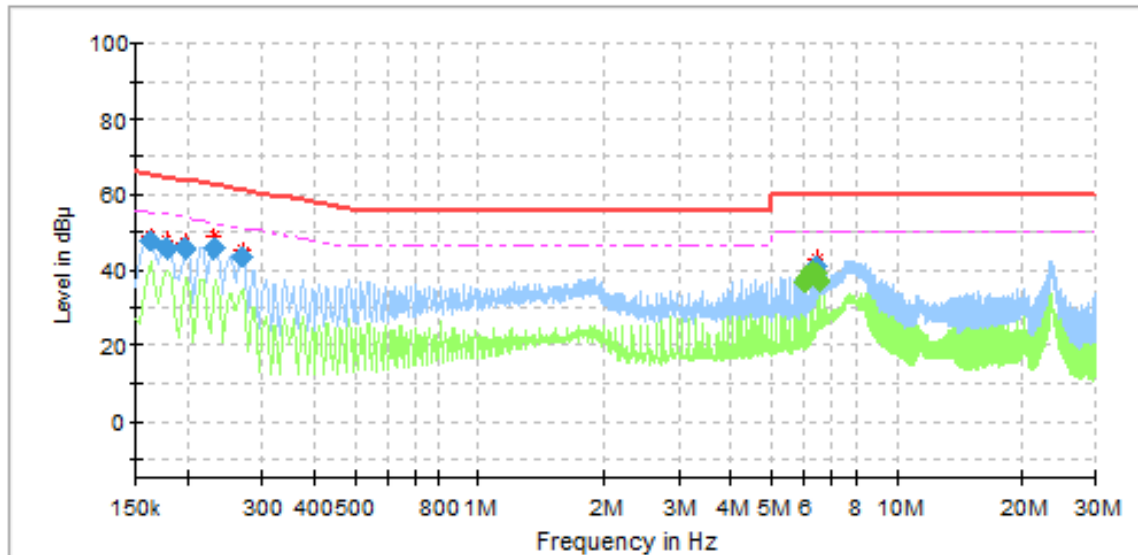
Final Result

Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line
0.162000	64.85	---	79.00	14.15	1000.0	9.000	-
8.534000	56.77	---	73.00	16.23	1000.0	9.000	-
8.746000	55.39	---	73.00	17.61	1000.0	9.000	-
19.386000	---	56.96	60.00	3.04	1000.0	9.000	-
20.126000	---	53.48	60.00	6.52	1000.0	9.000	-
20.126000	58.26	---	73.00	14.74	1000.0	9.000	-
20.874000	---	58.31	60.00	1.69	1000.0	9.000	-
20.874000	59.40	---	73.00	13.60	1000.0	9.000	-
21.622000	---	57.89	60.00	2.11	1000.0	9.000	-
21.622000	59.42	---	73.00	13.58	1000.0	9.000	-
22.370000	---	54.17	60.00	5.83	1000.0	9.000	-
23.114000	---	55.31	60.00	4.69	1000.0	9.000	-

PV mode

L line:

Test Curve:



Final_Result

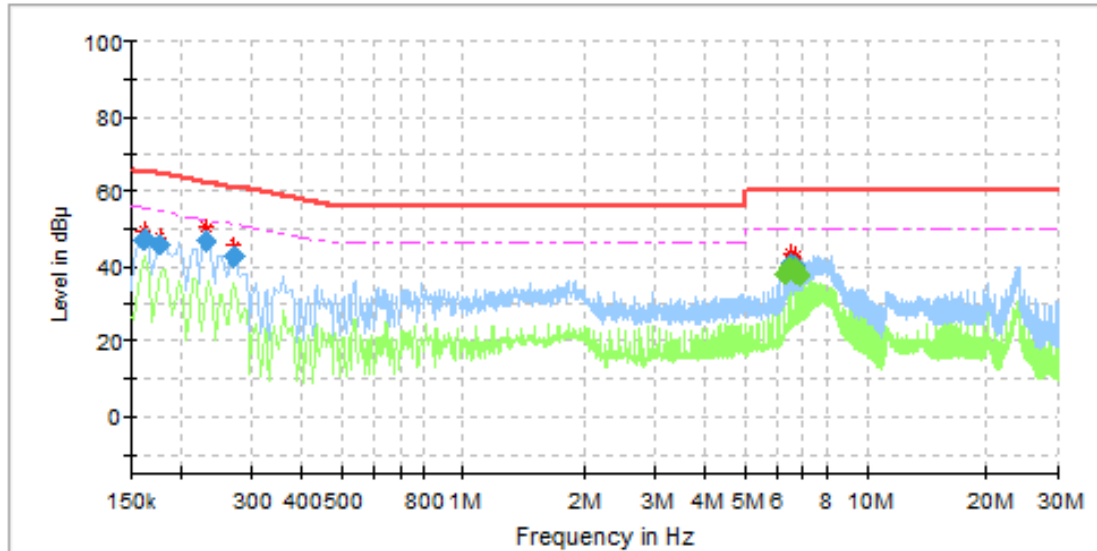
Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line
0.162000	47.85	---	65.36	17.51	1000.0	9.000	L
0.178000	45.61	---	64.58	18.97	1000.0	9.000	L
0.198000	45.55	---	63.69	18.15	1000.0	9.000	L
0.230000	45.85	---	62.45	16.60	1000.0	9.000	L
0.270000	43.74	---	61.12	17.38	1000.0	9.000	L
5.994000	---	36.86	50.00	13.14	1000.0	9.000	L
6.102000	---	38.05	50.00	11.95	1000.0	9.000	L
6.210000	---	39.03	50.00	10.97	1000.0	9.000	L
6.318000	---	39.61	50.00	10.39	1000.0	9.000	L
6.426000	---	39.17	50.00	10.83	1000.0	9.000	L
6.426000	40.65	---	60.00	19.35	1000.0	9.000	L
6.534000	---	37.38	50.00	12.62	1000.0	9.000	L

TEST REPORT

PV mode

N line:

Test Curve:



4

Final Result

Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line
0.162000	47.52	---	65.36	17.84	1000.0	9.000	N
0.178000	45.66	---	64.58	18.92	1000.0	9.000	N
0.230000	46.85	---	62.45	15.60	1000.0	9.000	N
0.270000	42.60	---	61.12	18.52	1000.0	9.000	N
6.318000	---	38.19	50.00	11.81	1000.0	9.000	N
6.426000	---	39.50	50.00	10.50	1000.0	9.000	N
6.534000	---	39.57	50.00	10.43	1000.0	9.000	N
6.534000	40.95	---	60.00	19.05	1000.0	9.000	N
6.642000	---	39.08	50.00	10.92	1000.0	9.000	N
6.642000	40.44	---	60.00	19.56	1000.0	9.000	N
6.750000	---	38.24	50.00	11.76	1000.0	9.000	N
6.858000	---	37.47	50.00	12.53	1000.0	9.000	N

4 Radiated emission

Test result: PASS

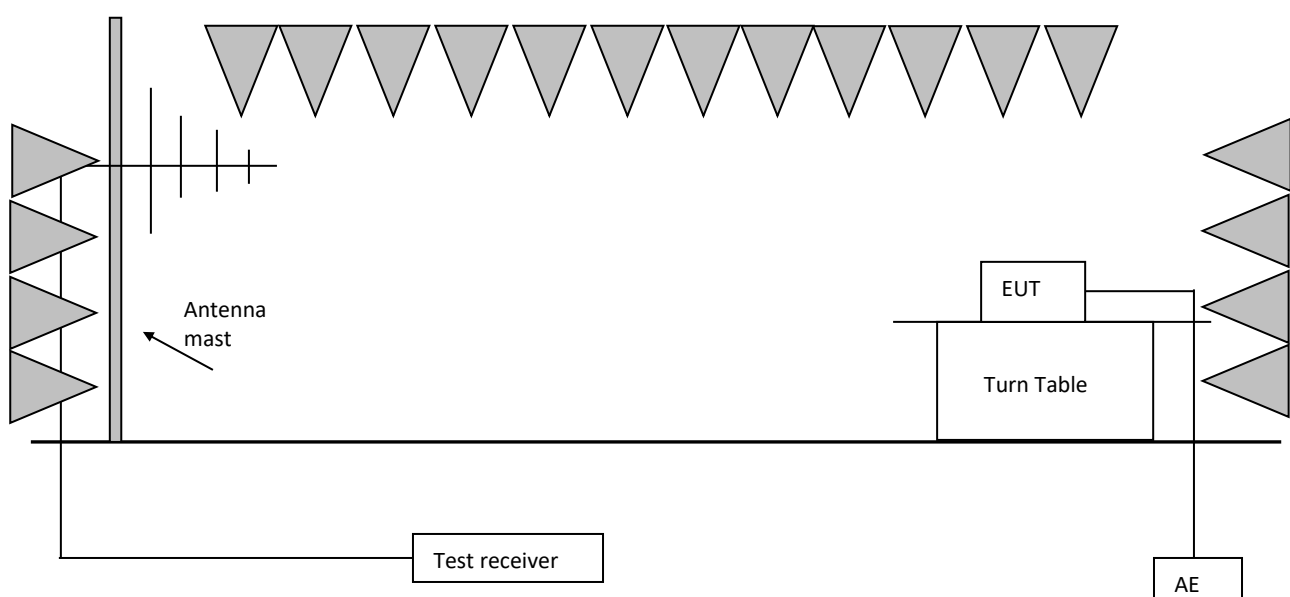
4.1 Limits

Frequency range (MHz)	Limit in dBuV/m (Quasi-peak) Of measurement distance 3m	Limit in dBuV/m (Quasi-peak) Of measurement distance 10m
30-230	40	30
230-1000	47	37
Note: - for the measurement distance other than 3m and 10m, the limit is varied according to 20dB/10 decades. - The gray rows are selected items. - If the internal emission source is operating at a frequency below 9kHz then measurements need only to be performed up to 230MHz.		

1-6GHz:

Frequency range (GHz)	Average limit in dBuV/m Of measurement distance 3m	Peak limit in dBuV/m Of measurement distance 3m
1-3	50	70
3-6	54	74
Note: for the measurement distance other than 3m and 10m, the limit is varied according to 20dB/10 decades.		

4.2 Block diagram of test set up



4.3 Test Procedure

The measurement was applied in a semi-anechoic chamber.
Measurement was performed according to CISPR 16-2-3.
Setting of EUT is according to CISPR 16-2-3.
The bandwidth setting on R&S Test Receiver ESI26 was 120 kHz.
The frequency range from 30MHz to 1000MHz was checked.
The bandwidth setting on R&S Test Receiver ESI26 was 1MHz.
The frequency range from 1000MHz to 6000MHz was checked.

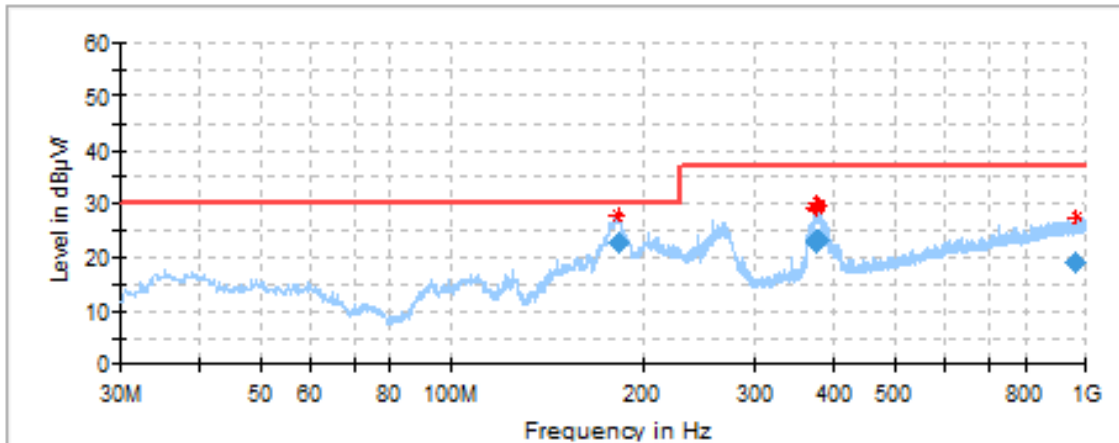
TEST REPORT

4.4 Test Result

Charging mode

Test Curve:

Horizontal polarization



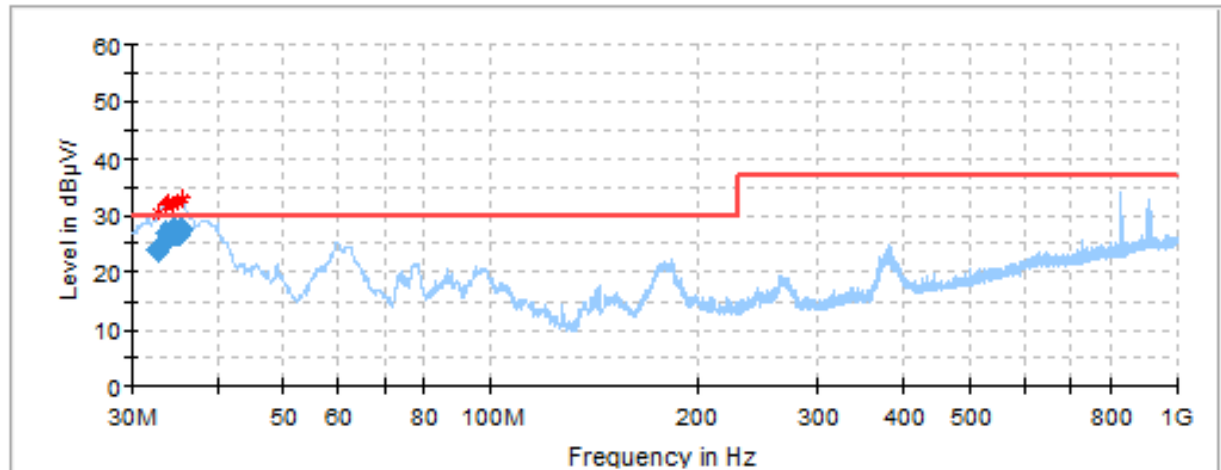
Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
183.260000	22.80	30.00	7.20	1000.0	120.000	400.0	H	-95.0
374.956250	22.68	37.00	14.32	1000.0	120.000	200.0	H	-70.0
378.108750	22.72	37.00	14.28	1000.0	120.000	200.0	H	-66.0
378.472500	22.98	37.00	14.02	1000.0	120.000	200.0	H	-70.0
378.957500	23.09	37.00	13.91	1000.0	120.000	200.0	H	-70.0
965.807500	19.16	37.00	17.84	1000.0	120.000	100.0	H	-85.0

Charging mode

Test Curve:

Vertical polarization



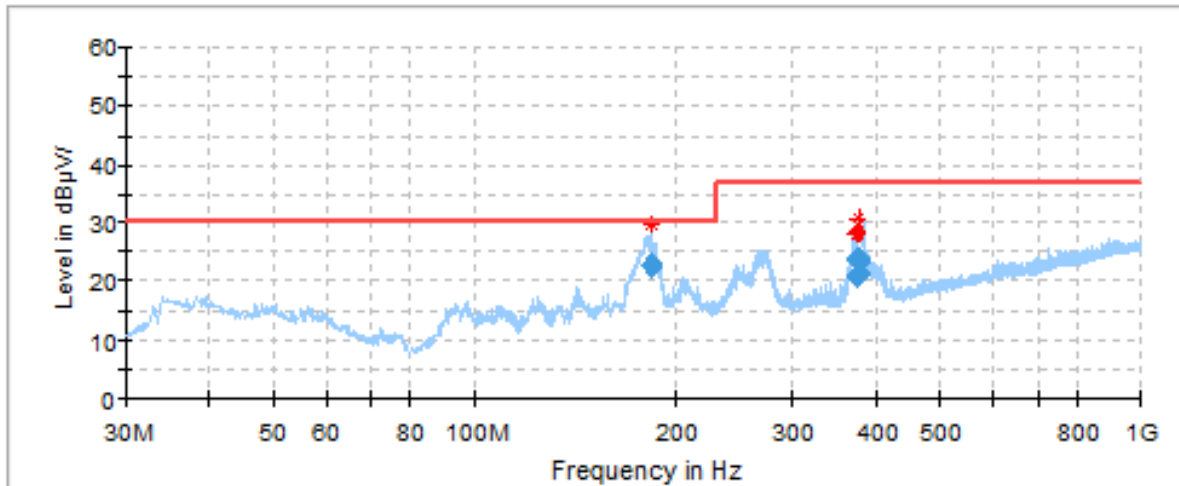
Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
32.788750	23.74	30.00	6.26	1000.0	120.000	100.0	V	-45.0
33.758750	26.92	30.00	3.08	1000.0	120.000	100.0	V	131.0
34.122500	26.33	30.00	3.67	1000.0	120.000	100.0	V	179.0
34.486250	27.77	30.00	2.23	1000.0	120.000	100.0	V	16.0
34.971250	26.55	30.00	3.45	1000.0	120.000	100.0	V	179.0
35.577500	27.70	30.00	2.30	1000.0	120.000	100.0	V	131.0

Discharging mode

Test Curve:

Horizontal polarization



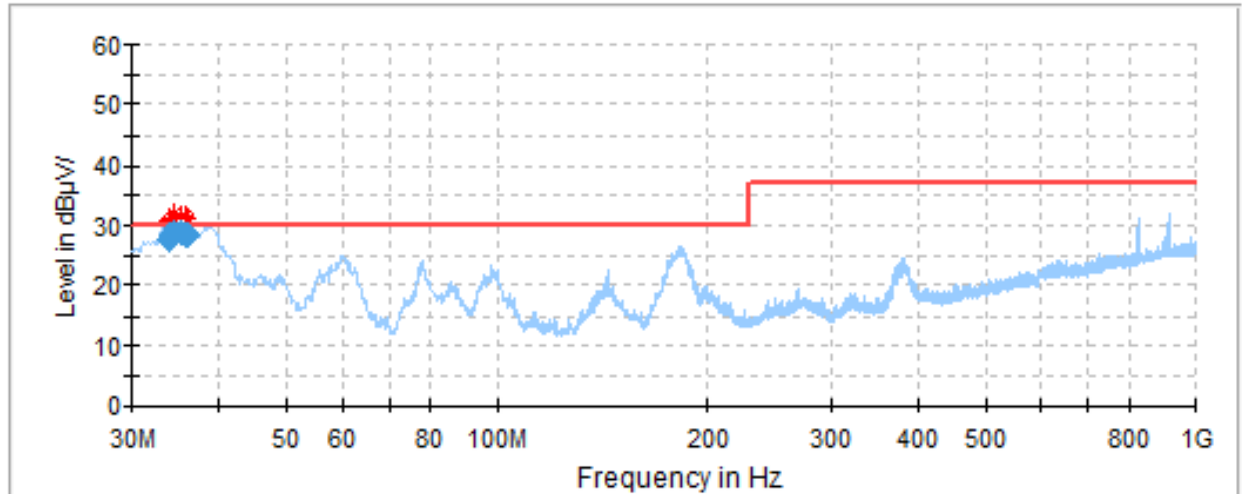
Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
184.593750	22.96	30.00	7.04	1000.0	120.000	400.0	H	-80.0
374.835000	21.01	37.00	15.99	1000.0	120.000	300.0	H	-67.0
377.260000	21.08	37.00	15.92	1000.0	120.000	300.0	H	-67.0
377.502500	23.45	37.00	13.55	1000.0	120.000	200.0	H	-85.0
377.987500	23.81	37.00	13.19	1000.0	120.000	200.0	H	-72.0
378.715000	23.74	37.00	13.26	1000.0	120.000	200.0	H	-72.0

Discharging mode

Test Curve:

Vertical polarization



Final_Result

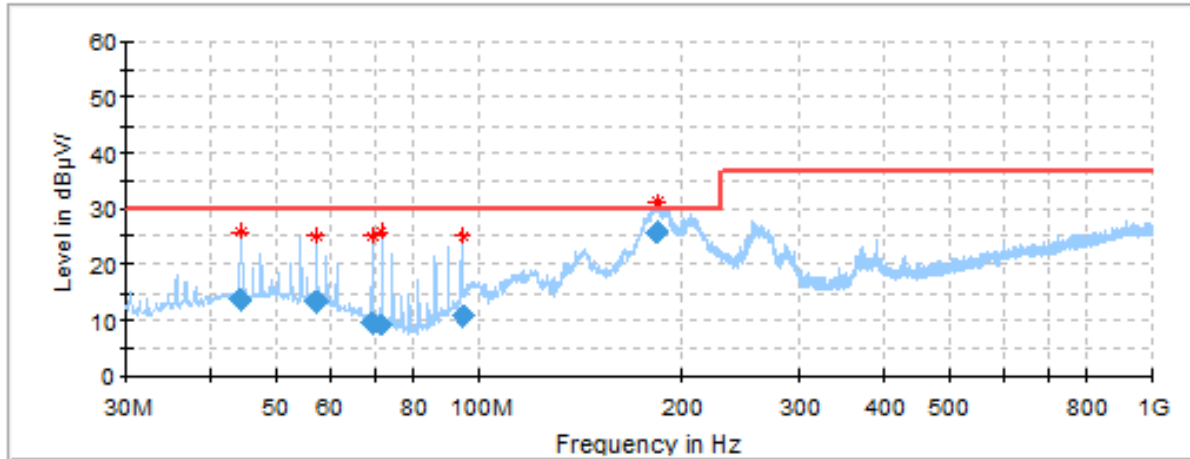
Frequency (MHz)	QuasiPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
33.637500	27.88	30.00	2.12	1000.0	120.000	100.0	V	8.0
34.001250	28.32	30.00	1.68	1000.0	120.000	100.0	V	68.0
34.486250	29.02	30.00	0.98	1000.0	120.000	100.0	V	-17.0
35.335000	28.97	30.00	1.03	1000.0	120.000	100.0	V	32.0
35.698750	28.63	30.00	1.37	1000.0	120.000	100.0	V	-36.0
36.062500	28.33	30.00	1.67	1000.0	120.000	100.0	V	36.0

TEST REPORT

Off grid mode

Test Curve:

Horizontal polarization



Final Result

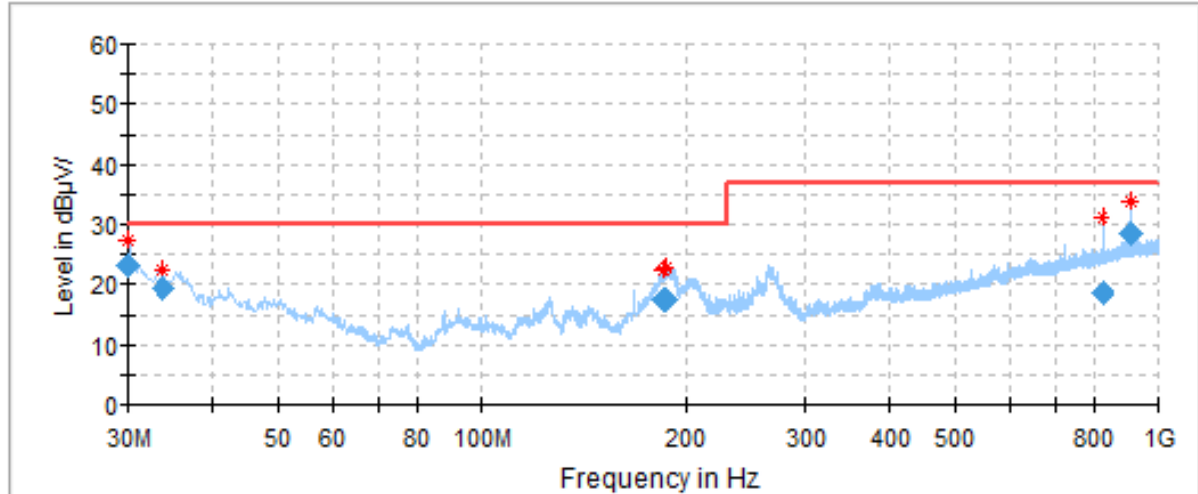
Frequency (MHz)	QuasiPeak (dB _i IV/m)	Limit (dB _i IV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
44.428750	13.72	30.00	16.28	1000.0	120.000	300.0	H	-115.0
57.523750	13.36	30.00	16.64	1000.0	120.000	300.0	H	-147.0
69.527500	9.55	30.00	20.45	1000.0	120.000	300.0	H	-170.0
71.588750	9.29	30.00	10.71	1000.0	120.000	300.0	H	-172.0
94.626250	10.73	30.00	19.27	1000.0	120.000	300.0	H	-180.0
184.957500	25.91	30.00	4.09	1000.0	120.000	400.0	H	79.0

TEST REPORT

Off grid mode

Test Curve:

Vertical polarization



Final Result

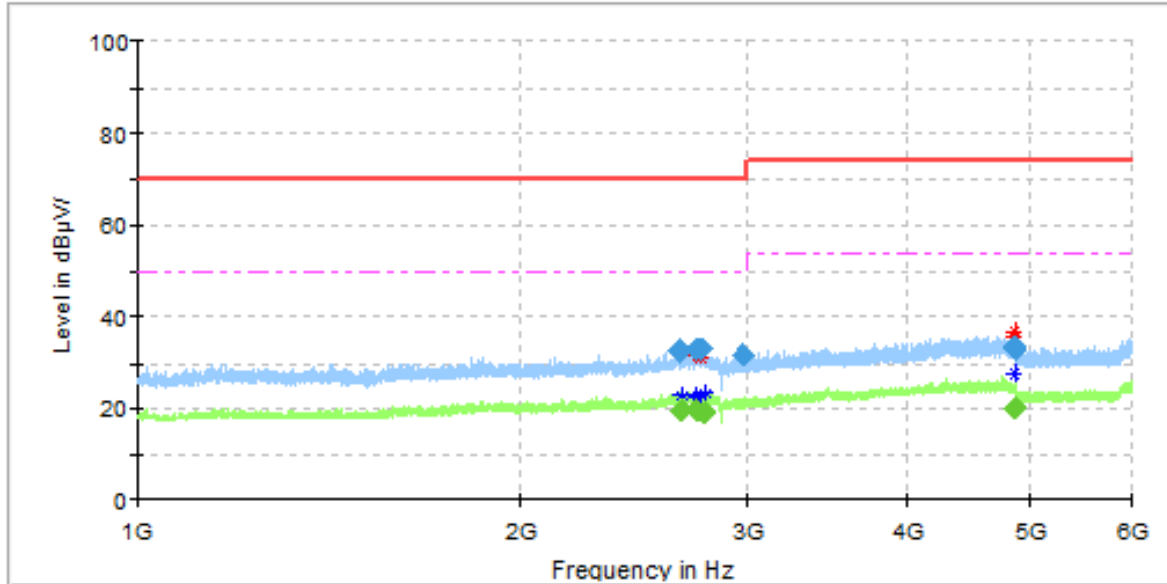
Frequency (MHz)	QuasiPeak (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
30.000000	23.18	30.00	6.82	1000.0	120.000	100.0	V	40.0
33.637500	19.45	30.00	10.55	1000.0	120.000	100.0	V	-180.0
186.291250	17.40	30.00	12.60	1000.0	120.000	400.0	V	-5.0
186.776250	17.46	30.00	12.54	1000.0	120.000	400.0	V	-5.0
827.097500	18.47	37.00	18.53	1000.0	120.000	100.0	V	-29.0
907.001250	28.50	37.00	8.50	1000.0	120.000	400.0	V	138.0

TEST REPORT

1-6GHz

Test Curve:

Horizontal polarization



Final Result

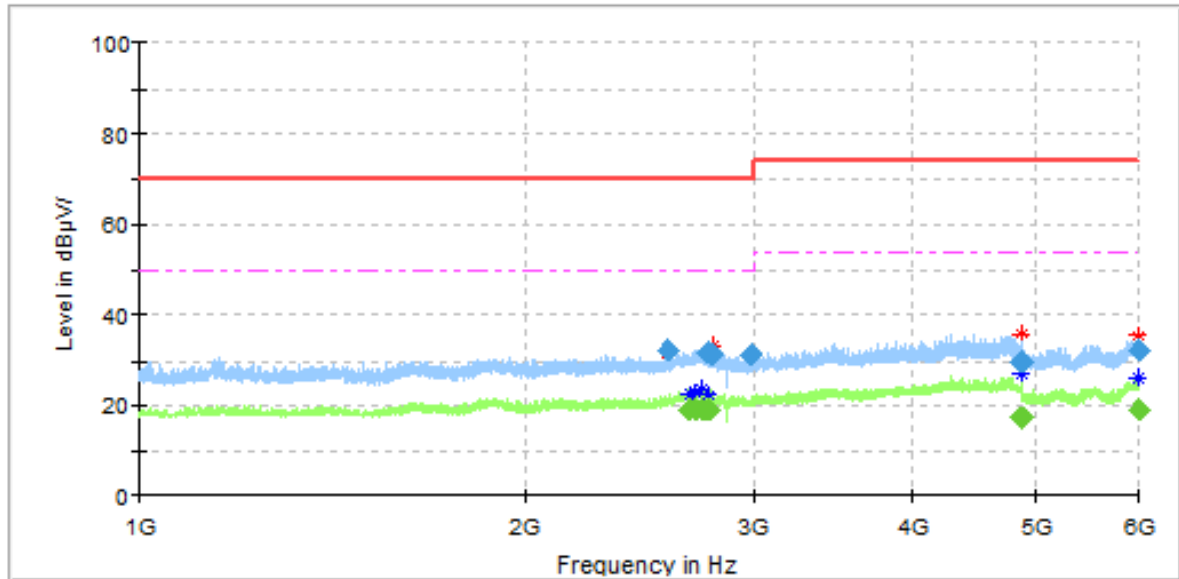
Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
2654.500000	32.59	---	70.00	37.41	1000.0	1000.000	100.0	H	-99.0
2670.500000	---	19.44	50.00	30.56	1000.0	1000.000	200.0	H	180.0
2737.833333	---	19.36	50.00	30.64	1000.0	1000.000	200.0	H	-44.0
2738.166667	32.86	---	70.00	37.14	1000.0	1000.000	200.0	H	180.0
2738.333333	---	19.41	50.00	30.59	1000.0	1000.000	200.0	H	180.0
2760.166667	32.96	---	70.00	37.04	1000.0	1000.000	100.0	H	-180.0
2787.666667	---	19.05	50.00	30.95	1000.0	1000.000	200.0	H	15.0
2979.833333	31.63	---	70.00	38.37	1000.0	1000.000	200.0	H	180.0
4861.166667	32.87	---	74.00	41.13	1000.0	1000.000	100.0	H	-175.0
4863.166667	33.54	---	74.00	40.46	1000.0	1000.000	100.0	H	-41.0
4863.166667	---	20.02	54.00	33.98	1000.0	1000.000	100.0	H	-41.0
4864.666667	---	20.03	54.00	33.97	1000.0	1000.000	200.0	H	-129.0

TEST REPORT

1-6GHz

Test Curve:

Vertical polarization



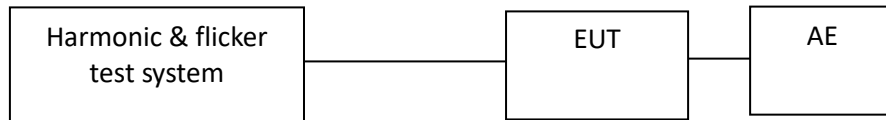
Final_Result

Frequency (MHz)	MaxPeak (dB μ V/m)	Average (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
2583.833333	32.07	---	70.00	37.93	1000.0	1000.000	200.0	V	180.0
2681.333333	---	18.94	50.00	31.06	1000.0	1000.000	100.0	V	-180.0
2714.833333	---	19.19	50.00	30.81	1000.0	1000.000	100.0	V	-180.0
2737.833333	---	19.29	50.00	30.71	1000.0	1000.000	100.0	V	-53.0
2771.000000	---	19.08	50.00	30.92	1000.0	1000.000	200.0	V	180.0
2771.333333	31.80	---	70.00	38.20	1000.0	1000.000	200.0	V	178.0
2791.666667	31.21	---	70.00	38.79	1000.0	1000.000	200.0	V	112.0
2994.500000	31.19	---	70.00	38.81	1000.0	1000.000	200.0	V	51.0
4863.000000	29.94	---	74.00	44.06	1000.0	1000.000	200.0	V	158.0
4864.666667	---	17.30	54.00	36.70	1000.0	1000.000	200.0	V	112.0
6000.000000	31.96	---	74.00	42.04	1000.0	1000.000	100.0	V	-145.0
6000.000000	---	19.07	54.00	34.93	1000.0	1000.000	200.0	V	-31.0

5 Harmonic current emission

Test result: **PASS**

5.1 Test Setup



5.2 Test Procedure

Harmonics of the fundamental current were measured up to 40 order harmonics using a digital power meter with an analogue output and frequency analyzer which was integrated in the harmonic & flicker test system. The measurements were carried out under steady conditions.

☐ Measuring instrumentation according to IEC 61000-4-7:2002+A1:2008

☐ This product is not defined as lighting equipment, and has rated power less than 75W, therefore, no limit applies according to EN 61000-3-2

☐ The EUT is kitchen machines as listed in the scope of IEC 60335-2-14, therefore, is deemed to conform to the harmonic current limits of this standard without further testing.

5.3 Test limit

TEST REPORT

5.3.1 Limits for equipment with input current $\leq 16A$ per phase

Harmonic order n	Maximum permissible harmonic current A
Odd harmonics	
3	2,30
5	1,14
7	0,77
9	0,40
11	0,33
13	0,21
$15 \leq n \leq 39$	$0,15 \frac{15}{n}$
Even harmonics	
2	1,08
4	0,43
6	0,30
$8 \leq n \leq 40$	$0,23 \frac{8}{n}$

5.3.2 Limits for equipment with input current $> 16A$ and $\leq 75A$ per phase

☐ Current emission limits for professional equipment with $I_{1max} \leq 75 A$ other than balanced three-phase equipment

Minimal R_{sce}	Admissible individual harmonic current I_n/I_1^a %						Admissible harmonic current distortion factors %	
	I_3	I_5	I_7	I_9	I_{11}	I_{13}	THD	$PWHD$
33	21,6	10,7	7,2	3,8	3,1	2	23	23
66	24	13	8	5	4	3	26	26
120	27	15	10	6	5	4	30	30
250	35	20	13	9	8	6	40	40
≥ 350	41	24	15	12	10	8	47	47
NOTE 1 The relative values of even harmonics up to order 12 must not exceed $16/n$ %. Even harmonics above order 12 are taken into account in THD and $PWHD$ in the same way as odd order harmonics.								
NOTE 2 Linear interpolation between successive R_{sce} values are permitted.								
^a I_1 = reference fundamental current; I_n = harmonic current component.								

☐ Current emission limits for professional balanced three-phase equipment
with $I_{1\max} \leq 75$ A

Minimal R_{scse}	Admissible individual harmonic current I_n/I_1 ^a				Admissible harmonic current distortion factors	
	%				%	
	I_5	I_7	I_{11}	I_{13}	THD	$PWHD$
33	10,7	7,2	3,1	2	13	22
66	14	9	5	3	16	25
120	19	12	7	4	22	28
250	31	20	12	7	37	38
≥ 350	40	25	15	10	48	46
NOTE 1 The relative values of even harmonics up to order 12 must not exceed $16/n$ %. Even harmonics above order 12 are taken into account in THD and $PWHD$ in the same way as odd order harmonics.						
NOTE 2 Linear interpolation between successive R_{scse} values are permitted.						
^a I_1 = reference fundamental current; I_n = harmonic current component.						

☐ Current emission limits for professional balanced three-phase equipment
with $I_{1\max} \leq 75$ A under specified conditions

Minimal R_{scse}	Admissible individual harmonic current I_n/I_1 ^a				Admissible harmonic current distortion factors	
	%				%	
	I_5	I_7	I_{11}	I_{13}	THD	$PWHD$
33	10,7	7,2	3,1	2	13	22
≥ 120	40	25	15	10	48	46
NOTE 1 The relative values of even harmonics up to order 12 must not exceed $16/n$ %. Even harmonics above order 12 are taken into account in THD and $PWHD$ in the same way as odd order harmonics.						
NOTE 2 Linear interpolation between successive R_{scse} values are permitted.						
^a I_1 = reference fundamental current; I_n = harmonic current component.						

TEST REPORT

5.4 Test Result

100 % of nominal power

Discharge mode:

Normal Mode		Uover : ■ ■ ■ ■		Update:500msec EAMP		YOKOGAWA ◆	
		Iover : ■ ■ ■ ■		Integ:Reset			
PLL	U1	Or .	I1 [A]	hdf[%]	Or .	I1 [A]	hdf[%]
Freq	50.000 Hz		25.940		dc		
Urms1	231.217 V	1	25.924	99.990	2	0.145	0.561
Irms1	25.940 A	3	0.220	0.850	4	0.018	0.069
P1	5.9932kW	5	0.156	0.603	6	0.031	0.121
S1	5.9978kVA	7	0.042	0.162	8	0.012	0.046
Q1	0.2348kvar	9	0.073	0.282	10	0.018	0.070
λ 1	0.99923	11	0.017	0.065	12	0.009	0.036
ϕ 1	2.243 °	13	0.036	0.139	14	0.015	0.057
Uthd1	0.186 %	15	0.022	0.086	16	0.022	0.085
Ithd1	1.394 %	17	0.029	0.112	18	0.018	0.071
Pthd1	0.001 %	19	0.032	0.122	20	0.034	0.132
Uthf1	0.145 %	21	0.005	0.021	22	0.018	0.068
Ithf1	0.786 %	23	0.023	0.089	24	0.012	0.048
Utif1	6.363	25	0.012	0.045	26	0.014	0.052
Itif1	34.715	27	0.005	0.021	28	0.015	0.059
		29	0.023	0.090	30	0.008	0.031
		31	0.023	0.089	32	0.012	0.046
		33	0.005	0.020	34	0.004	0.014
		35	0.005	0.018	36	0.030	0.117
		37	0.009	0.035	38	0.019	0.072
		39	0.011	0.042	40	0.010	0.040

Element1

U1 300Vrms

I1 200mVrms

Element2

U2 300Vrms

I2 200mVrms

Element3

U3 300Vrms

I3 200mVrms

Element4

U4 1000Vrms

I4 30Arms

Integ:Reset

Time

-----:--:--

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TEST REPORT

Charge mode:

Normal Mode		Uover: ■ ■ ■ ■		Update: 500msec EAMP		YOKOGAWA ◆	
		Iover: ■ ■ ■ ■		Integ: Reset			
PLL	U1	Or.	I1 [A]	hdf [%]	Or.	I1 [A]	hdf [%]
Freq	50.000 Hz		25.951		dc		
Urms1	231.208 V	1	25.911	99.990	2	0.144	0.556
Irms1	25.951 A	3	0.206	0.796	4	0.005	0.020
P1	-5.9954kW	5	0.169	0.653	6	0.029	0.110
S1	6.0000kVA	7	0.036	0.140	8	0.005	0.019
Q1	-0.2359kvar	9	0.052	0.199	10	0.018	0.069
λ 1	-0.99923	11	0.036	0.140	12	0.011	0.041
ϕ 1	182.253 °	13	0.011	0.042	14	0.046	0.177
Uthd1	0.188 %	15	0.026	0.099	16	0.021	0.081
Ithd1	1.384 %	17	0.025	0.096	18	0.025	0.098
Pthd1	0.001 %	19	0.042	0.164	20	0.025	0.095
Uthf1	0.149 %	21	0.013	0.048	22	0.018	0.070
Ithf1	0.793 %	23	0.035	0.133	24	0.017	0.066
Utif1	6.503	25	0.019	0.074	26	0.009	0.036
Itif1	35.002	27	0.012	0.047	28	0.007	0.028
		29	0.010	0.040	30	0.014	0.054
		31	0.016	0.063	32	0.016	0.062
		33	0.020	0.075	34	0.008	0.032
		35	0.007	0.025	36	0.027	0.104
		37	0.019	0.073	38	0.007	0.027
		39	0.011	0.044	40	0.003	0.011

Element1

U1 300Vrms

I1 200mVrms

Element2

U2 300Vrms

I2 200mVrms

Element3

U3 300Vrms

I3 200mVrms

Element4

U4 1000Vrms

I4 30Arms

Integ: Reset

Time

-----:--:--

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TEST REPORT

50 % of nominal power

Discharge mode:

Wide-Band Harmonics

Uover: ■ ■ ■ ■

Iover: ■ ■ ■ ■

YOKOGAWA ◆

change items

PLL	U4	Or.	I4 [A]	hdf[%]	Or.	I4 [A]	hdf[%]	Σ A(3P4W)
Freq	50.034 Hz	Tot.	13.150		dc			U1 300V
		1	13.146	99.973	2	0.009	0.070	I1 100mV
U4	230.587 V	3	0.116	0.880	4	0.008	0.060	U2 300V
I4	13.150 A	5	0.093	0.711	6	0.022	0.167	I2 100mV
P4	3.0307kW	7	0.047	0.355	8	0.024	0.184	U3 300V
S4	3.0307kVA	9	0.049	0.374	10	0.037	0.280	I3 100mV
Q4	-0.0022kvar	11	0.106	0.808	12	0.013	0.096	
λ4	1.00000	13	0.095	0.720	14	0.022	0.167	Element4
φ4	D 0.042 °	15	0.111	0.840	16	0.032	0.241	U4 300V
Uthd4	1.605 %	17	0.025	0.187	18	0.036	0.271	I4 100mV
Ithd4	2.310 %	19	0.035	0.270	20	0.017	0.133	
Pthd4	0.007 %	21	0.031	0.234	22	0.027	0.205	
Uthf4	0.456 %	23	0.009	0.071	24	0.025	0.191	
Ithf4	2.031 %	25	0.031	0.235	26	0.010	0.078	
Utif4	16.200	27	0.026	0.200	28	0.018	0.138	
Itif4	84.743	29	0.011	0.085	30	0.007	0.051	
		31	0.017	0.132	32	0.013	0.096	
		33	0.023	0.177	34	0.006	0.042	
		35	0.029	0.220	36	0.017	0.127	
		37	0.010	0.079	38	0.017	0.127	
		39	0.013	0.099	40	0.020	0.149	

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Update 3996

TEST REPORT

Charge mode:

Wide-Band Harmonics

Uover:■■■■

Iover:■■■■

YOKOGAWA

change items

PLL	U4	Or.	I4 [A]	hdf[%]	Or.	I4 [A]	hdf[%]
Freq	50.014 Hz	Tot.	13.375		dc		
		1	13.362	99.904	2	0.059	0.439
U4	226.402 V	3	0.432	3.231	4	0.004	0.032
I4	13.375 A	5	0.200	1.492	6	0.005	0.041
P4	-3.0250kW	7	0.214	1.600	8	0.011	0.084
S4	3.0253kVA	9	0.119	0.890	10	0.006	0.042
Q4	-0.0431kvar	11	0.070	0.523	12	0.012	0.092
λ4	-0.99990	13	0.081	0.608	14	0.004	0.028
φ4	D 179.184 °	15	0.101	0.752	16	0.024	0.181
Uthd4	1.676 %	17	0.012	0.087	18	0.003	0.025
Ithd4	4.378 %	19	0.012	0.086	20	0.019	0.144
Pthd4	0.016 %	21	0.016	0.116	22	0.033	0.249
Uthf4	0.462 %	23	0.044	0.330	24	0.006	0.046
Ithf4	2.041 %	25	0.038	0.283	26	0.019	0.142
Utif4	16.497	27	0.028	0.208	28	0.006	0.043
Itif4	87.259	29	0.033	0.243	30	0.002	0.014
		31	0.021	0.156	32	0.009	0.069
		33	0.045	0.335	34	0.015	0.110
		35	0.023	0.174	36	0.014	0.107
		37	0.018	0.138	38	0.012	0.090
		39	0.019	0.144	40	0.013	0.096

Σ A(3P4W)

U1 300V
I1 100mV
U2 300V
I2 100mV
U3 300V
I3 100mV

Element4

U4 300V
I4 100mV

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TEST REPORT

25 % of nominal power

Discharge mode:

Wide-Band Harmonics

Uover: ■ ■ ■ ■

Iover: ■ ■ ■ ■

YOKOGAWA

change items

PLL	U4	Or.	I4 [A]	hdf[%]	Or.	I4 [A]	hdf[%]
Freq	49.973 Hz	Tot.	6.350		dc		
		1	6.345	99.926	2	0.018	0.276
U4	229.539 V	3	0.094	1.484	4	0.012	0.188
I4	6.350 A	5	0.073	1.142	6	0.010	0.165
P4	1.4552kW	7	0.057	0.893	8	0.015	0.240
S4	1.4561kVA	9	0.046	0.731	10	0.019	0.292
Q4	-0.0514kvar	11	0.050	0.793	12	0.013	0.208
λ4	0.99938	13	0.066	1.043	14	0.020	0.309
φ4	D 2.025 °	15	0.046	0.722	16	0.016	0.254
Uthd4	1.580 %	17	0.047	0.745	18	0.034	0.539
Ithd4	3.853 %	19	0.038	0.605	20	0.008	0.132
Pthd4	0.013 %	21	0.013	0.206	22	0.015	0.236
Uthf4	0.466 %	23	0.023	0.361	24	0.016	0.255
Ithf4	3.326 %	25	0.016	0.250	26	0.003	0.042
Utif4	16.765	27	0.004	0.065	28	0.016	0.258
Itif4	142.823	29	0.005	0.074	30	0.011	0.173
		31	0.013	0.198	32	0.012	0.190
		33	0.016	0.250	34	0.021	0.335
		35	0.009	0.137	36	0.008	0.132
		37	0.040	0.625	38	0.006	0.092
		39	0.009	0.145	40	0.009	0.138

Σ A (3P4W)

U1 300V

I1 100mV

U2 300V

I2 100mV

U3 300V

I3 100mV

Element4

U4 300V

I4 100mV

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Update 3928

TEST REPORT

Charge mode:

Wide-Band Harmonics

Uover:■■■■

Iover:■■■■

YOKOGAWA

change items

PLL	U4	Or.	I4 [A]	hdf[%]	Or.	I4 [A]	hdf[%]
Freq	49.999 Hz	Tot.	6.5682		dc		
		1	6.5604	99.882	2	0.0318	0.484
U4	229.934 V	3	0.2377	3.619	4	0.0306	0.465
I4	6.5682 A	5	0.1547	2.356	6	0.0301	0.458
P4	1.5085kW	7	0.0751	1.144	8	0.0220	0.334
S4	1.5085kVA	9	0.0629	0.957	10	0.0077	0.117
Q4	0.0045kvar	11	0.0396	0.603	12	0.0183	0.279
λ4	1.00000	13	0.0249	0.379	14	0.0127	0.193
φ4	G 0.172 °	15	0.0237	0.360	16	0.0054	0.082
Uthd4	0.174 %	17	0.0192	0.293	18	0.0144	0.219
Ithd4	4.860 %	19	0.0228	0.348	20	0.0084	0.127
Pthd4	0.005 %	21	0.0043	0.065	22	0.0028	0.043
Uthf4	0.114 %	23	0.0063	0.096	24	0.0113	0.172
Ithf4	1.774 %	25	0.0067	0.102	26	0.0071	0.108
Utif4	4.351	27	0.0050	0.076	28	0.0062	0.094
Itif4	76.781	29	0.0102	0.155	30	0.0092	0.140
		31	0.0103	0.157	32	0.0078	0.119
		33	0.0071	0.109	34	0.0030	0.046
		35	0.0050	0.076	36	0.0175	0.267
		37	0.0080	0.122	38	0.0041	0.063
		39	0.0041	0.063	40	0.0034	0.052

Σ A(3P4W)

U1 300V

I1 100mV

U2 300V

I2 100mV

U3 300V

I3 100mV

Element4

U4 300V

I4 100mV

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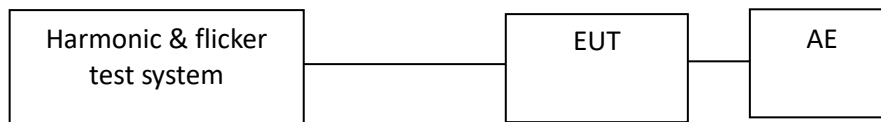
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Update 110

6 Voltage fluctuations and flicker

Test result: PASS

6.1 Test Setup



6.2 Test Procedure

6.2.1 Definition

- Flicker:** impression of unsteadiness of visual sensation induced by a lighting stimulus whose luminance or spectral distribution fluctuates with time.
- Pst:** Short-term flicker indicator the flicker severity evaluated over a short period (in minutes); Pst=1 is the conventional threshold of irritability
- Plt:** long-term flicker indicator; the flicker severity evaluated over a long period (a few hours) using successive Pst values.
- dc:** the relative steady-state voltage change
- dmax:** the maximum relative voltage change
- d(t):** the value during a voltage change

6.2.2 Test condition

The EUT was set to produce the most unfavorable sequence of voltage changes according to Clause A.15 of IEC61000-3-3: 2013.

6.2.3 Test protocol

The tested object operated under the operating condition specified in IEC 61000-3-3: 1994+A1:2001

The following limits apply

- "Plt" shall not exceed 0.65.
- "Pst" shall not exceed 1.0.
- "dc" shall not exceed 3.3%.
- "dmax" shall not exceed 4/6/7%*
- "d(t)" shall not exceed 3.3% for more than 500ms.

Notes:

* means for 4% limit, without additional conditions

6% limit, switched manually or automatically more than twice per day

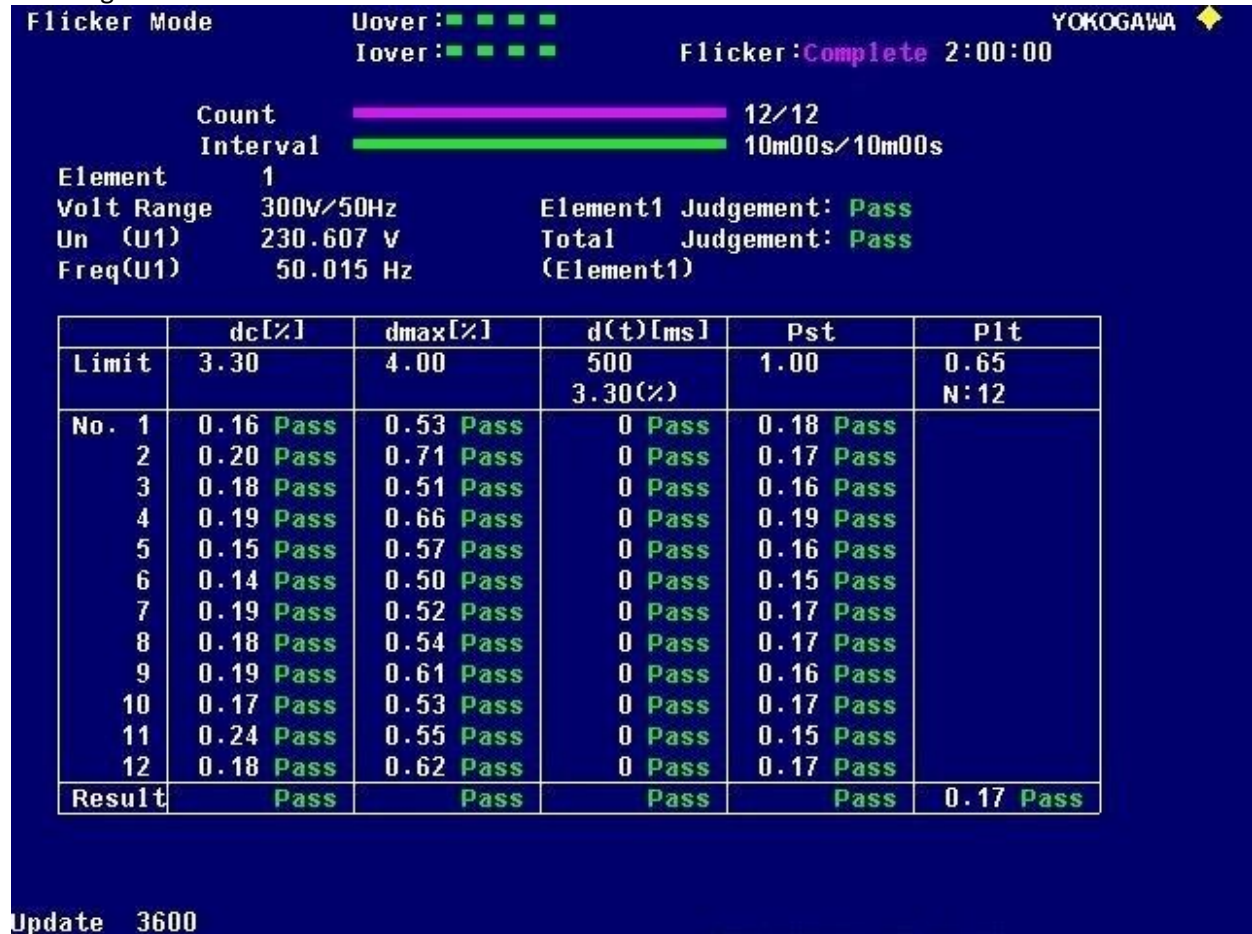
7% limit, switched automatically for no more than twice per day or attended while in use.

TEST REPORT

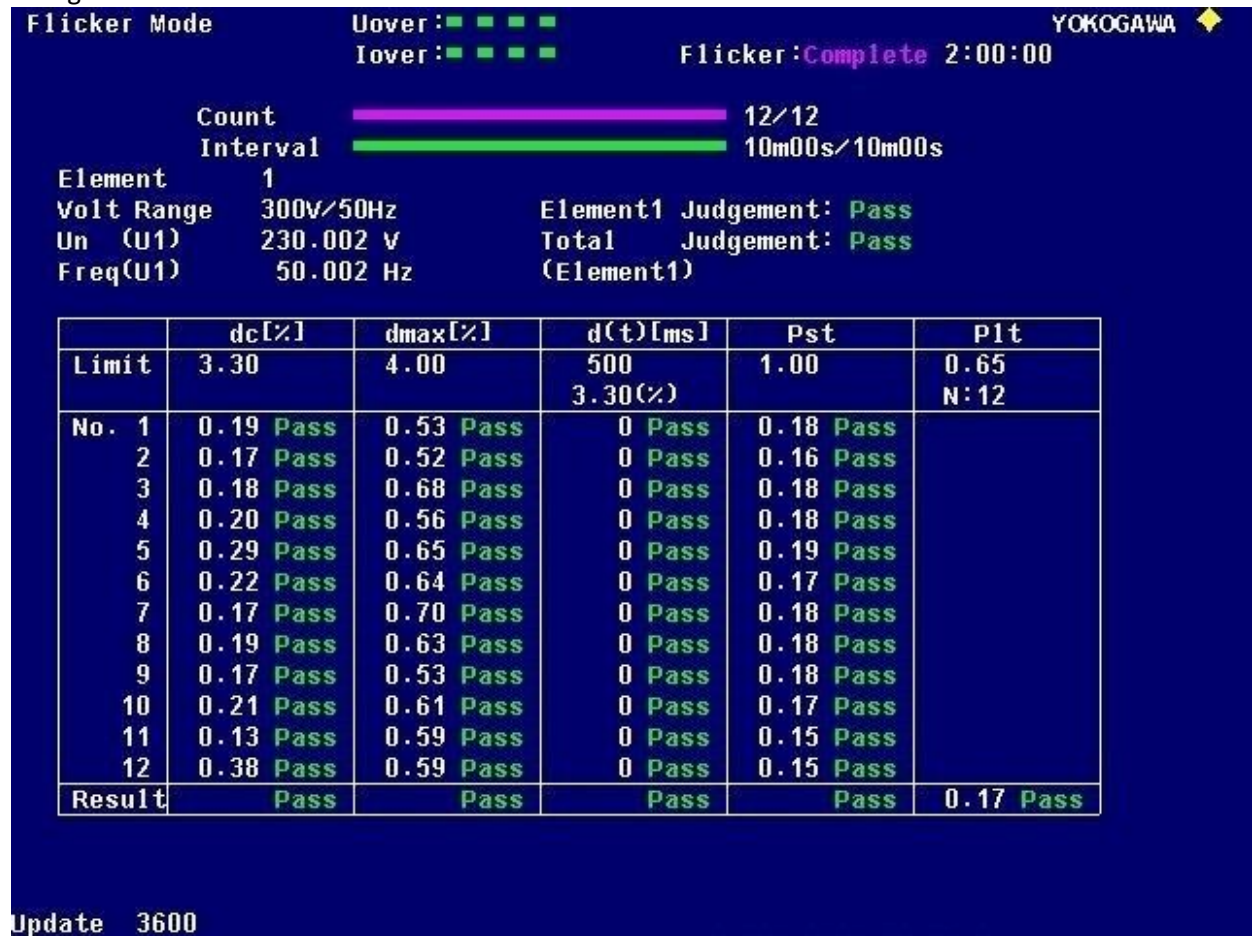
6.3 Test Result

100 % of nominal power

Discharge mode:



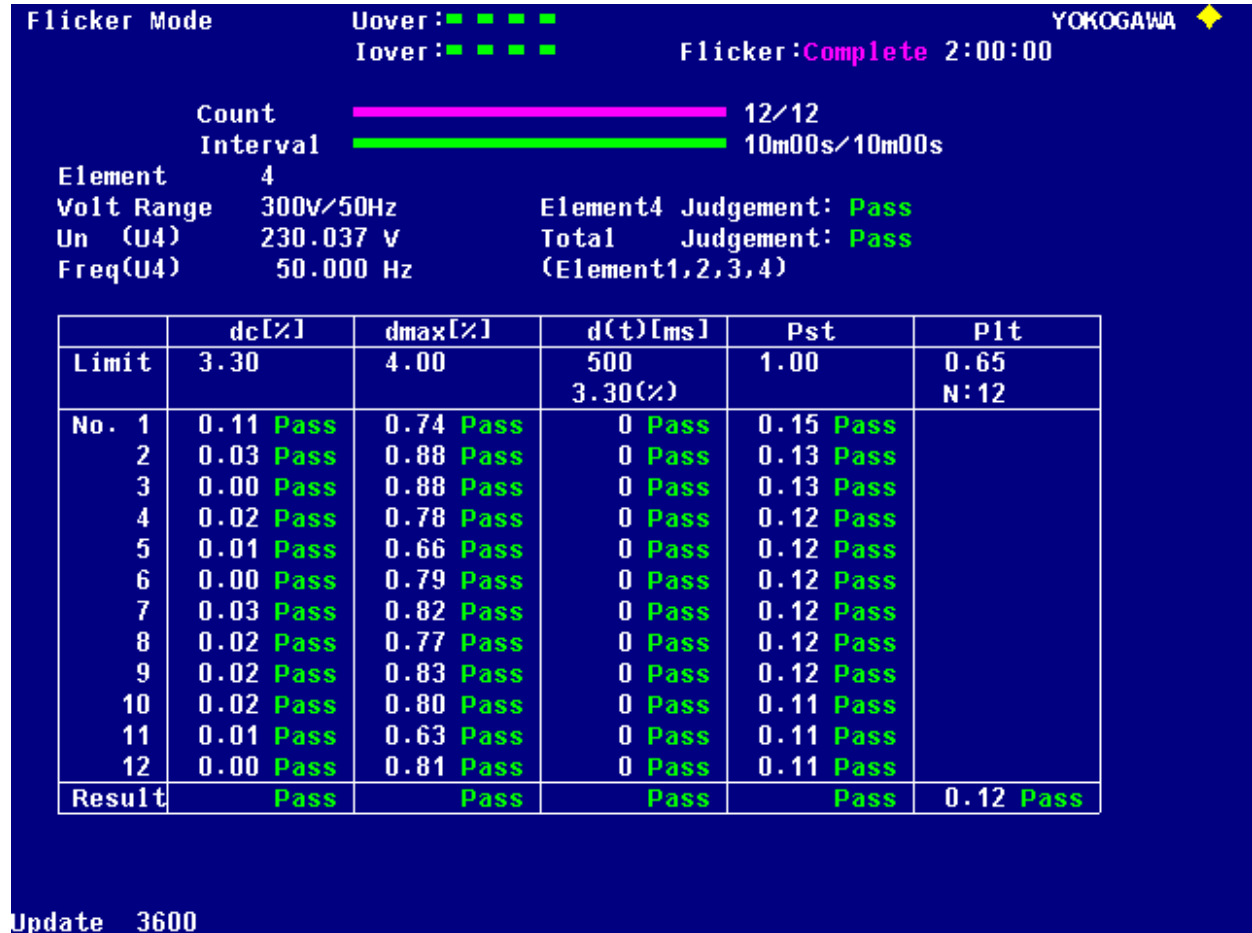
Charge mode:



TEST REPORT

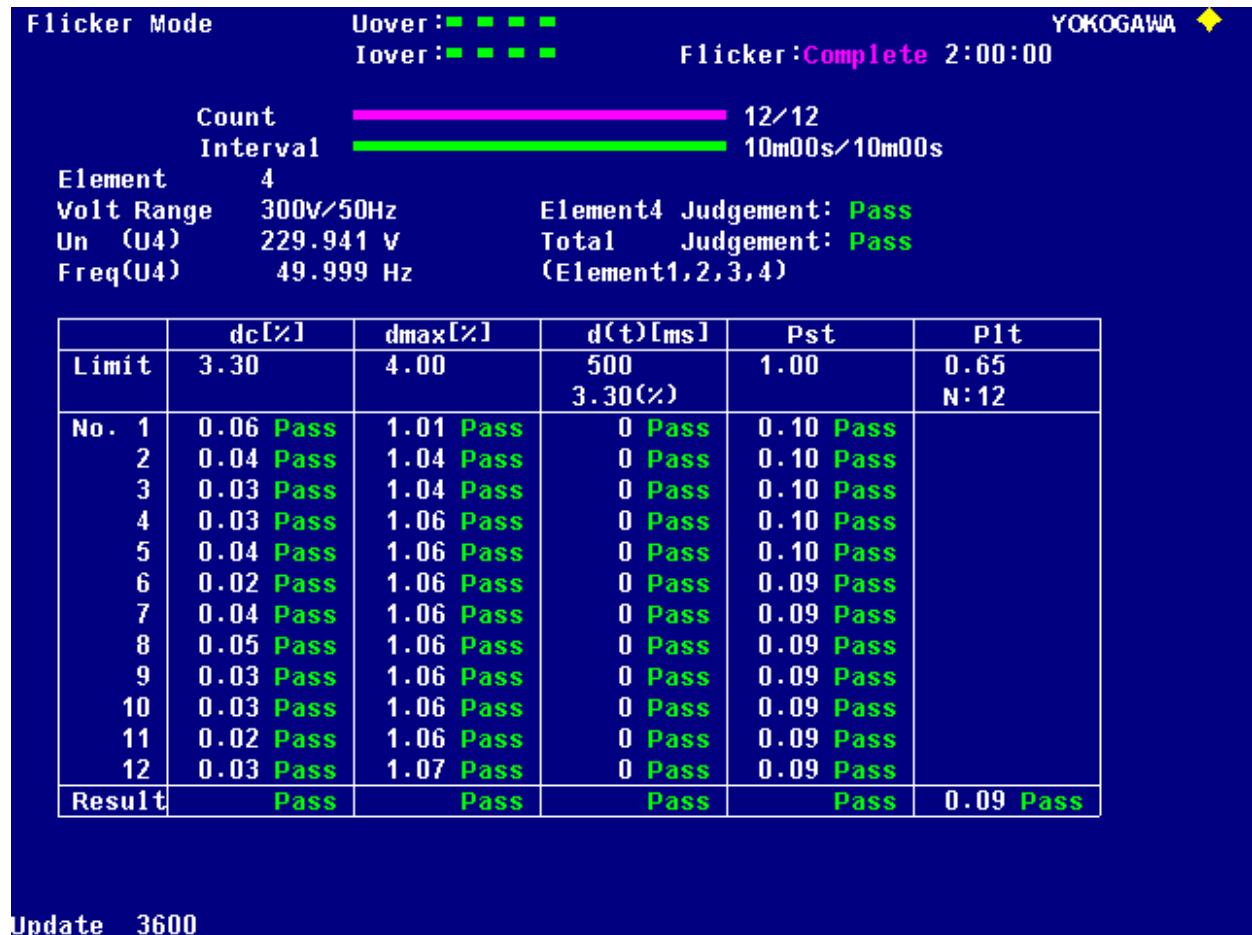
50 % of nominal power

Discharge mode:



TEST REPORT

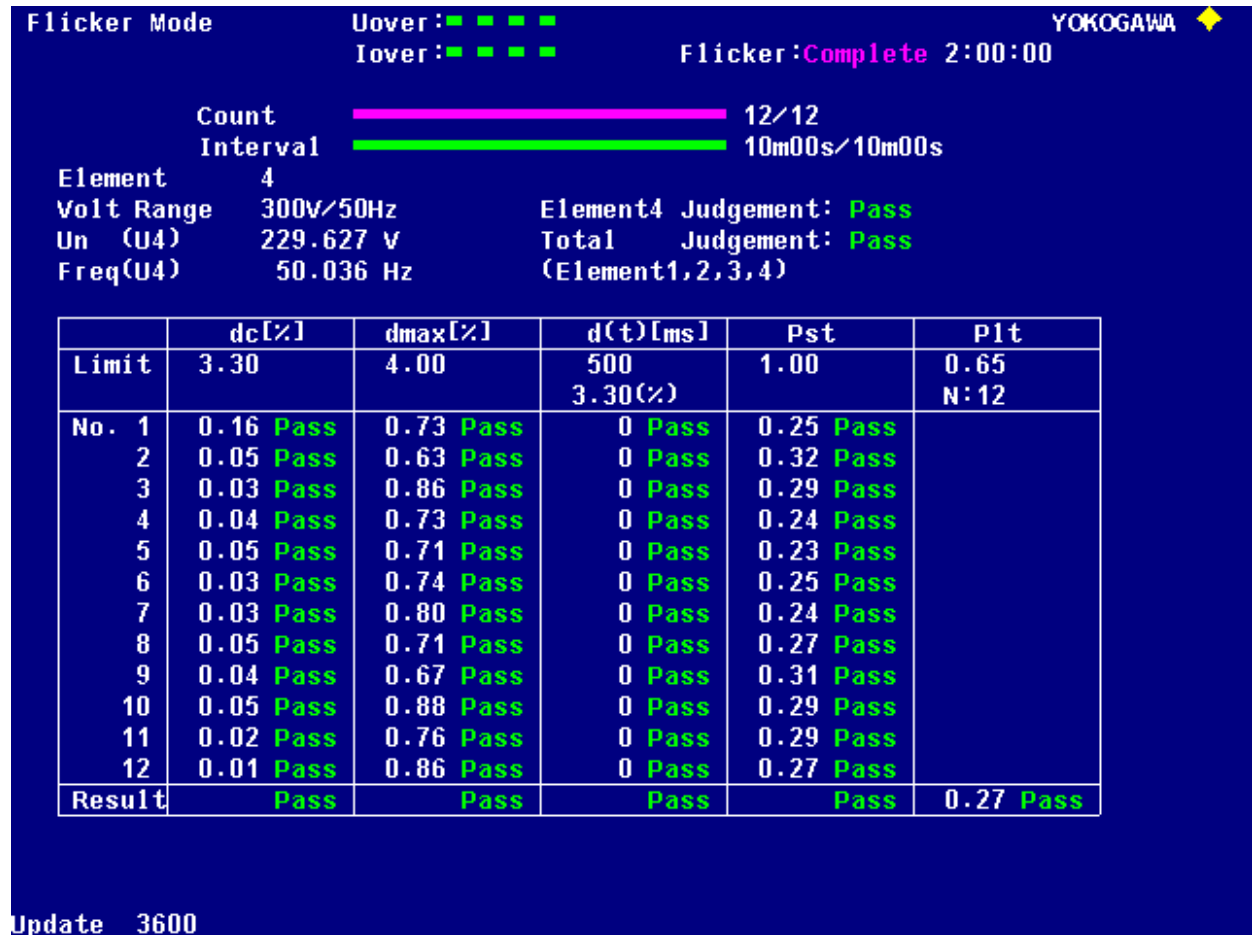
Charge mode:



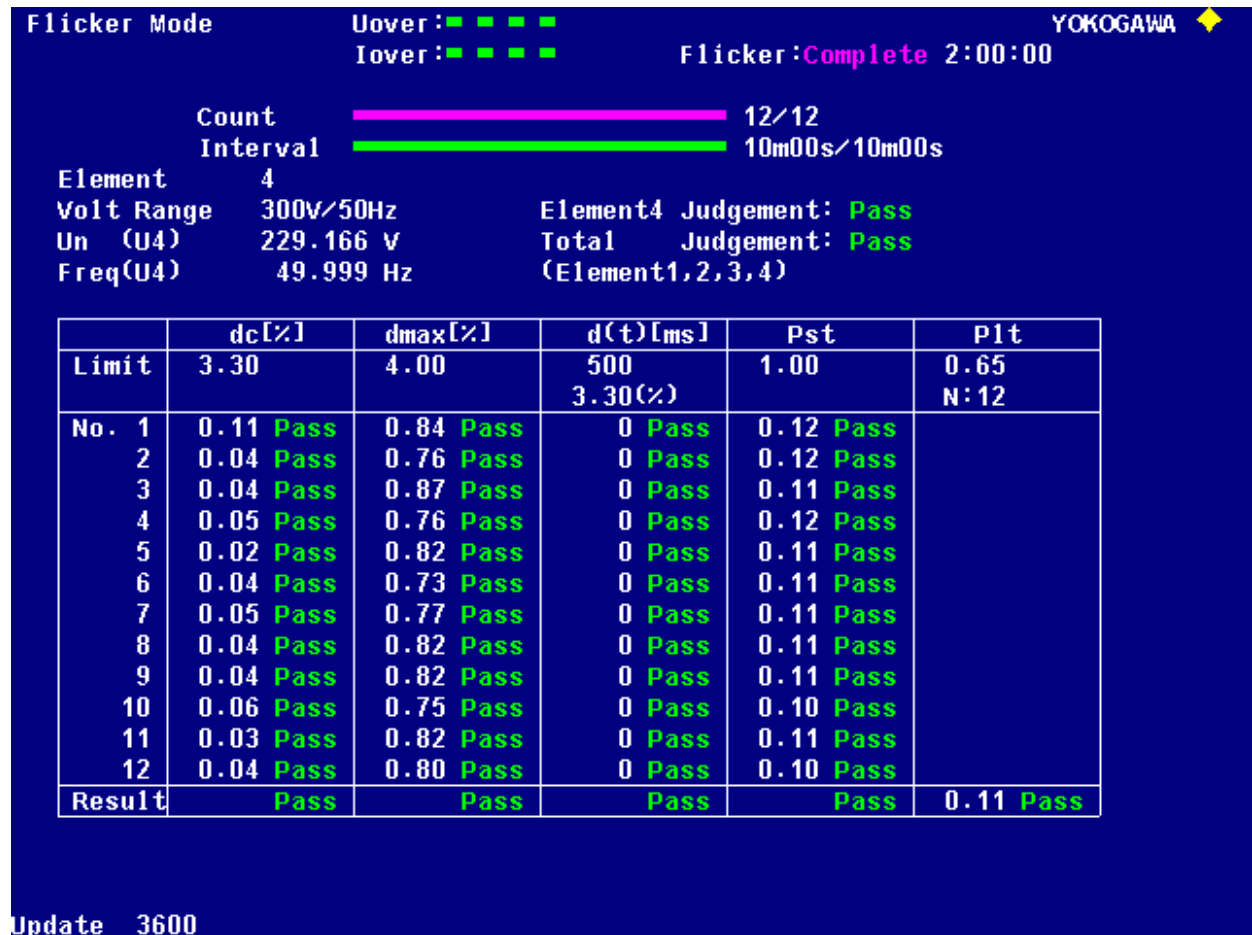
TEST REPORT

25 % of nominal power

Discharge mode:



Charge mode:



Immunity Test

Performance criteria

Criterion A: The EUT shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the EUT is used as intended. If the performance level is not specified by the manufacturer, this may be derived from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.

Criterion B: The EUT 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 EUT is used as intended. The performance level may be replaced by a permissible loss of performance. However, during the test degradation of performance is allowed but no change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.

Criterion C: Temporary loss of function is allowed during the test, provided the function is self-recoverable or can be restored by the operation of the controls.

7 Electrostatic Discharge (ESD)

Test result **PASS**

7.1 Severity Level and Performance Criterion

7.1.1 Test level

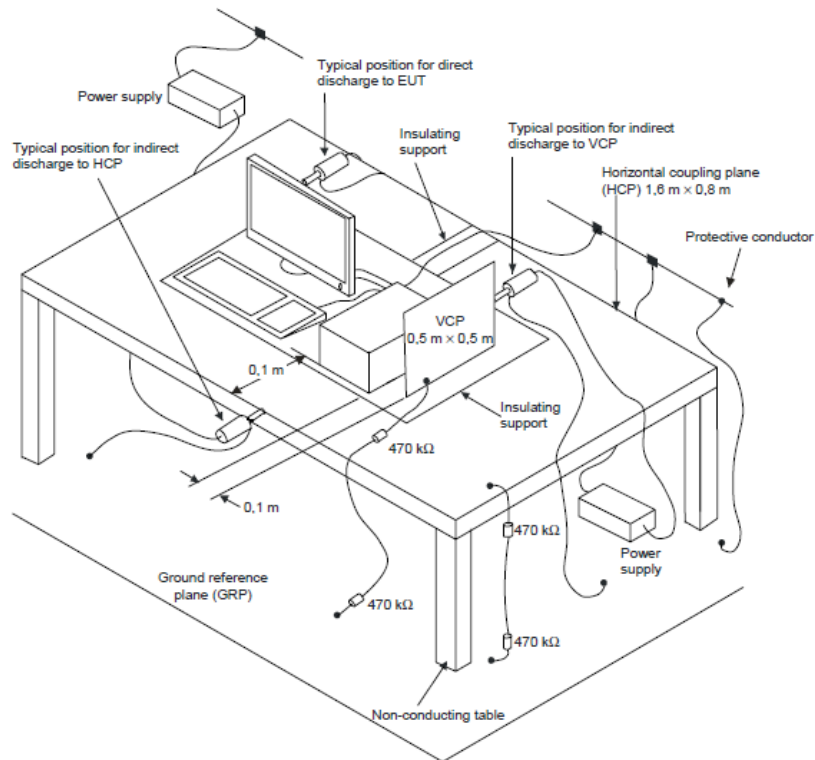
Contact discharge		Air discharge	
Level	Test voltage (kV)	Level	Test voltage (Kv)
1	2	1	2
2	4	2	4
3	6	3	8
4	8	4	15
X	Special	X	Special
Notes: 1. "X" is an open level. The level has to be specified in the dedicated equipment specification. If higher voltages than those shown are specified, special test equipment may be needed. 2. The gray rows were the selected test level.			

7.1.2 Performance Criterion

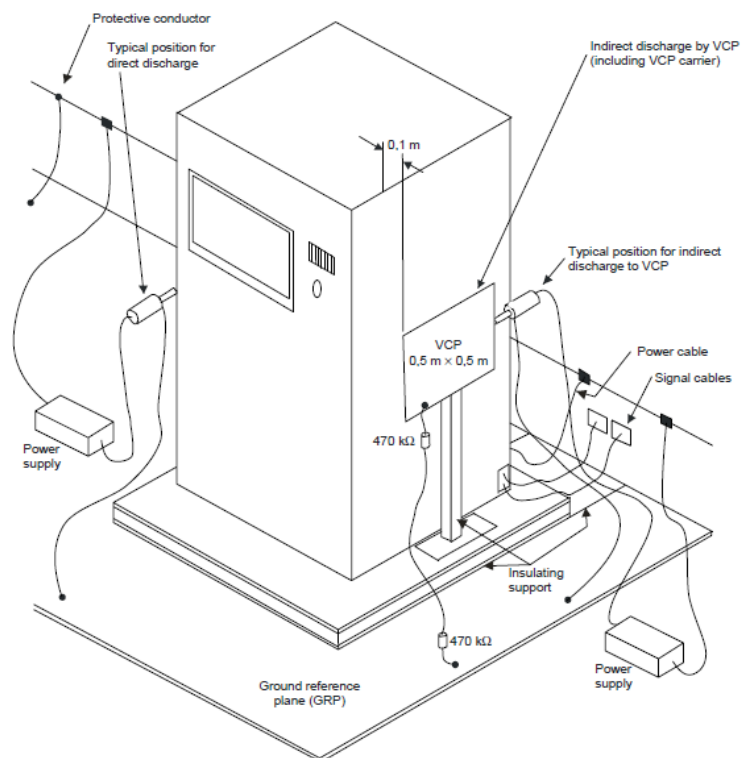
Criterion B

7.2 Test Setup

For table-top equipment



For floor standing equipment



7.3 Test Procedure

Measurement was performed in shielded room.

Measurement procedure was applied according to EN 61000-4-2 clause 8.

The test method and equipment was specified by EN 61000-4-2.

TEST REPORT

7.4 Test Result

Direct discharges were applied at the following selected points:

Test level [kV]	Air/Contact	Polarity (+/-)	Pass/Fail/NA	Comment
2/4	Contact	+/-	Pass	Accessible metal parts of the EUT
2/4	Contact	+/-	Pass	All touchable screws of enclosure
2/4/8	Air	+/-	Pass	Air gaps of the switch, button, connectors, fans
2/4/8	Air	+/-	Pass	Slots around the EUT, LED panel,

Indirect contact discharges were applied to the VCP and the HCP at the following selected points:

For table-top equipment

Position	Description	Point	Pass/Fail/NA
HCP front	0,1m from the front of the EUT	Edge of centre on HCP	Pass
HCP back	0,1m from the back of the EUT	Edge of centre on HCP	Pass
HCP right	0,1m from the right side of the EUT	Edge of centre on HCP	Pass
HCP left	0,1m from the left side of the EUT	Edge of centre on HCP	Pass
VCP front	0,1m from the front of the EUT	Edge of centre on VCP	Pass
VCP back	0,1m from the back of the EUT	Edge of centre on VCP	Pass
VCP right	0,1m from the right of the EUT	Edge of centre on VCP	Pass
VCP left	0,1m from the left of the EUT	Edge of centre on VCP	Pass

For floor standing equipment

Position	Description	Point	Pass/Fail/NA
CP front	0,1m from the front of the EUT	Edge of centre on VCP	NA
CP back	0,1m from the back of the EUT	Edge of centre on VCP	NA
CP right	0,1m from the right of the EUT	Edge of centre on VCP	NA
CP left	0,1m from the left of the EUT	Edge of centre on VCP	NA

Observation: All the functions were operated as normal after the test.

Conclusion: The EUT can meet the requirement of Performance Criterion B.

8 Radio frequency electromagnetic field

Test result **PASS**

8.1 Severity Level and Performance Criterion

8.1.1 Test level

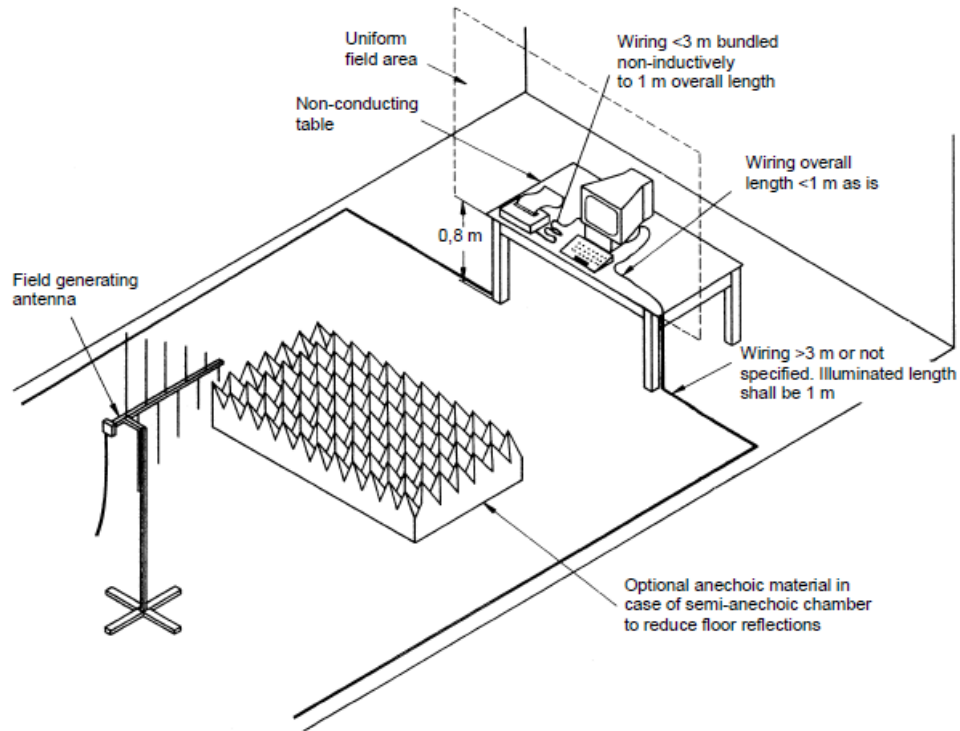
Level	Test field strength V/m
1	1
2	3
3	10
X	Special
Note: 1. X is an open test level. This level may be given in the product specification. 2. The gray row is the selected test level.	

8.1.2 Performance Criterion

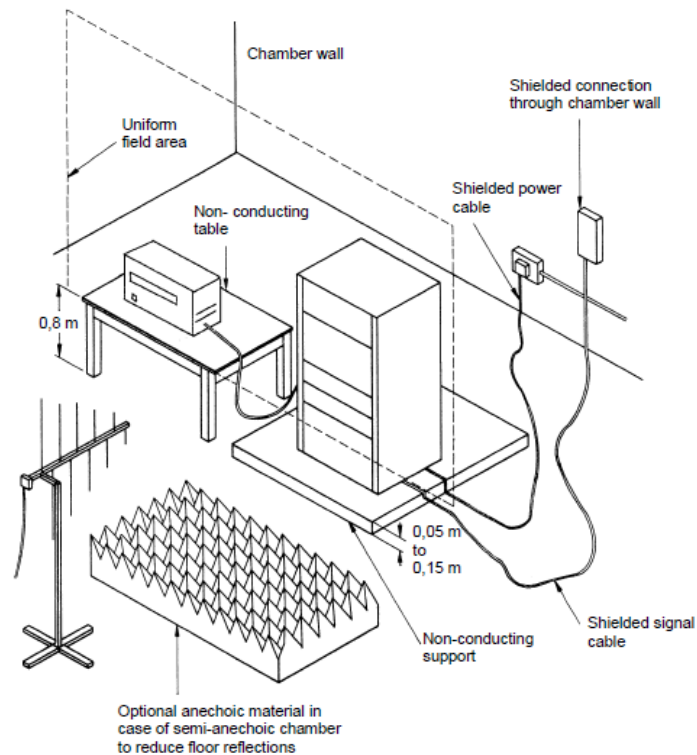
Criterion A

8.2 Test Setup

For table-top equipment



For floor standing equipment



8.3 Test Procedure

Measurement was performed in full-anechoic chamber.

Measurement procedure was applied according to EN 61000-4-3 clause 8.

The test method and equipment was specified by EN 61000-4-3.

8.4 Test Result

Test no.	Frequency (MHz)	Polarization	Test level (V/m)	Modulation	Exposed location	Pass/Fail/NA
1	80-1000	H & V	10	1 kHz, 80% AM 1 % increment	All sides	Pass
2	1400-6000	H & V	3	1 kHz, 80% AM 1 % increment	All sides	Pass

Observation: All the functions were operated as normal during and after test.

Conclusion: The EUT can meet the requirement of Performance Criterion A

9 Fast transients, common mode

Test result **PASS**

9.1 Severity Level and Performance Criterion

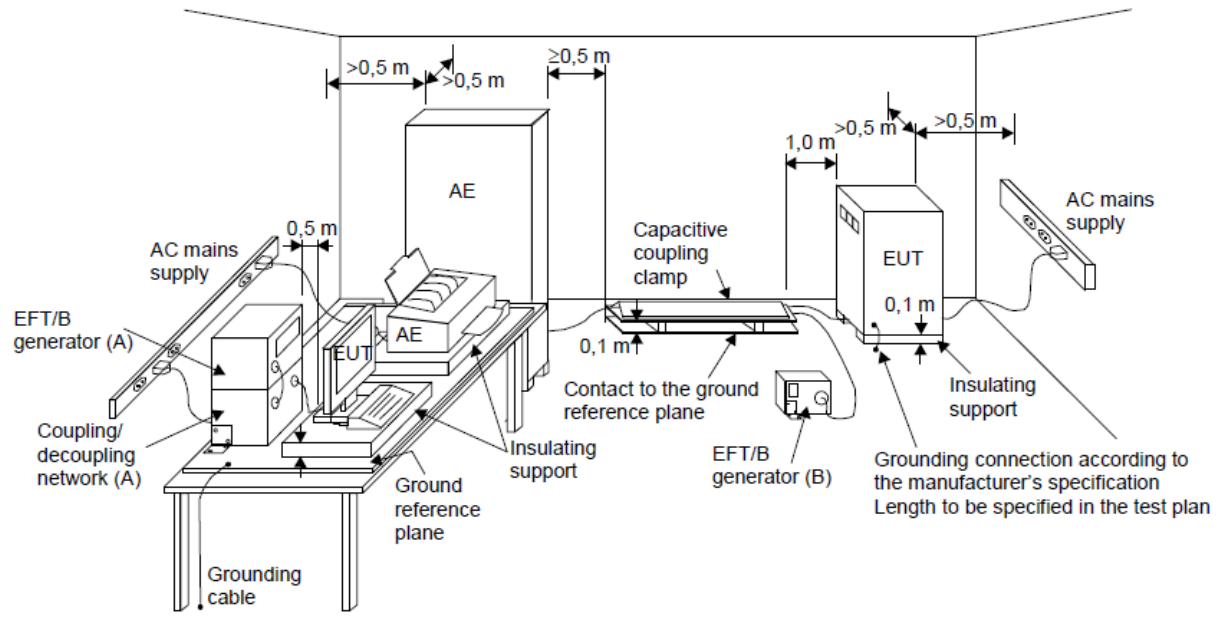
9.1.1 Test level

Open circuit output test voltage and repetition rate of the impulses				
Level	AC mains power input ports		Signal ports, DC power ports	
	Voltage peak (kV)	Repetition rate (kHz)	Voltage peak (kV)	Repetition rate (kHz)
1	0.5	5 or 100	0.25	5 or 100
2	1	5 or 100	0.5	5 or 100
3	2	5 or 100	1	5 or 100
4	4	2.5 or 100	2	5 or 100
X	Special	Special	Special	Special
Notes: 1. "X" is an open level. The level has to be specified in the dedicated equipment specification. 2. The gray rows were the selected test level.				

9.1.2 Performance Criterion

Criterion B

9.2 Test Setup



(A) location for supply line coupling

(B) location for signal lines coupling

9.3 Test Procedure

Measurement was performed in shielded room.

Measurement procedure was applied according to EN 61000-4-4 clause 8.

The test method and equipment was specified by EN 61000-4-4.

9.4 Test Result

Test No.	Level (kV)	Polarity (+/-)	Line for test	Pass/Fail/NA
1	2	+/-	AC power ports	Pass
2	1	+/-	Signal ports	NA
3	1	+/-	DC power ports	Pass

Observation: All the functions were operated as normal during and after test.

Conclusion: The EUT can meet the requirement of Performance Criterion B

10 Surges

Test result **PASS**

10.1 Severity Level and Performance Criterion

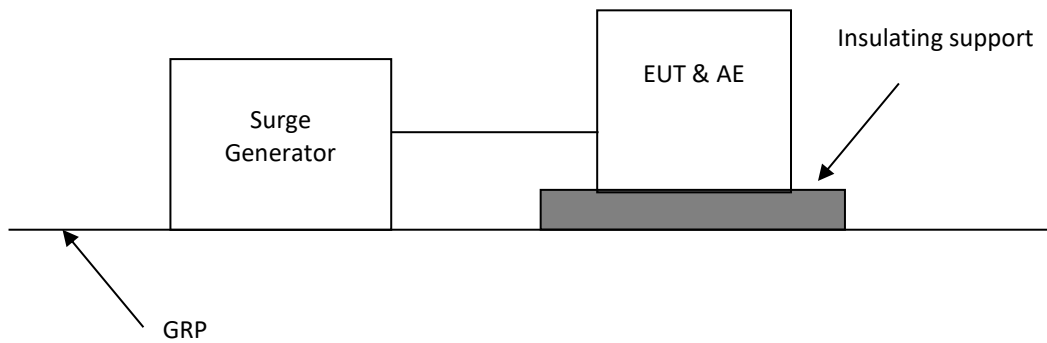
10.1.1 Test level

Level	Open-circuit test voltage (kV)
1	0.5
2	1.0
3	2.0
4	4.0
X*	Special
Notes: 1."X" is an open class. This level can be specified in the product specification 2. The gray rows are the selected level.	

10.1.2 Performance Criterion

Criterion B

10.2 Test Setup



10.3 Test Procedure

Measurement was performed in shielded room.

Measurement procedure was applied according to EN 61000-4-5 clause 8.

The test method and equipment was specified by EN 61000-4-5.

10.4 Test Result

Test No.	Level [kV]	Polarity +/-	Line for test	Pass/Fail/NA
1	0.5/1	+/-	AC mains power input port (line to line)	Pass
2	0.5/1/2	+/-	AC mains power input port (line to earth)	Pass
3	0.5/1	+/-	DC power ports	Pass

Observation: All the functions were operated as normal during and after test.

Conclusion: The EUT can meet the requirement of Performance Criterion B

11 Radio frequency, common mode

Test result **PASS**

11.1 Severity Level and Performance Criterion

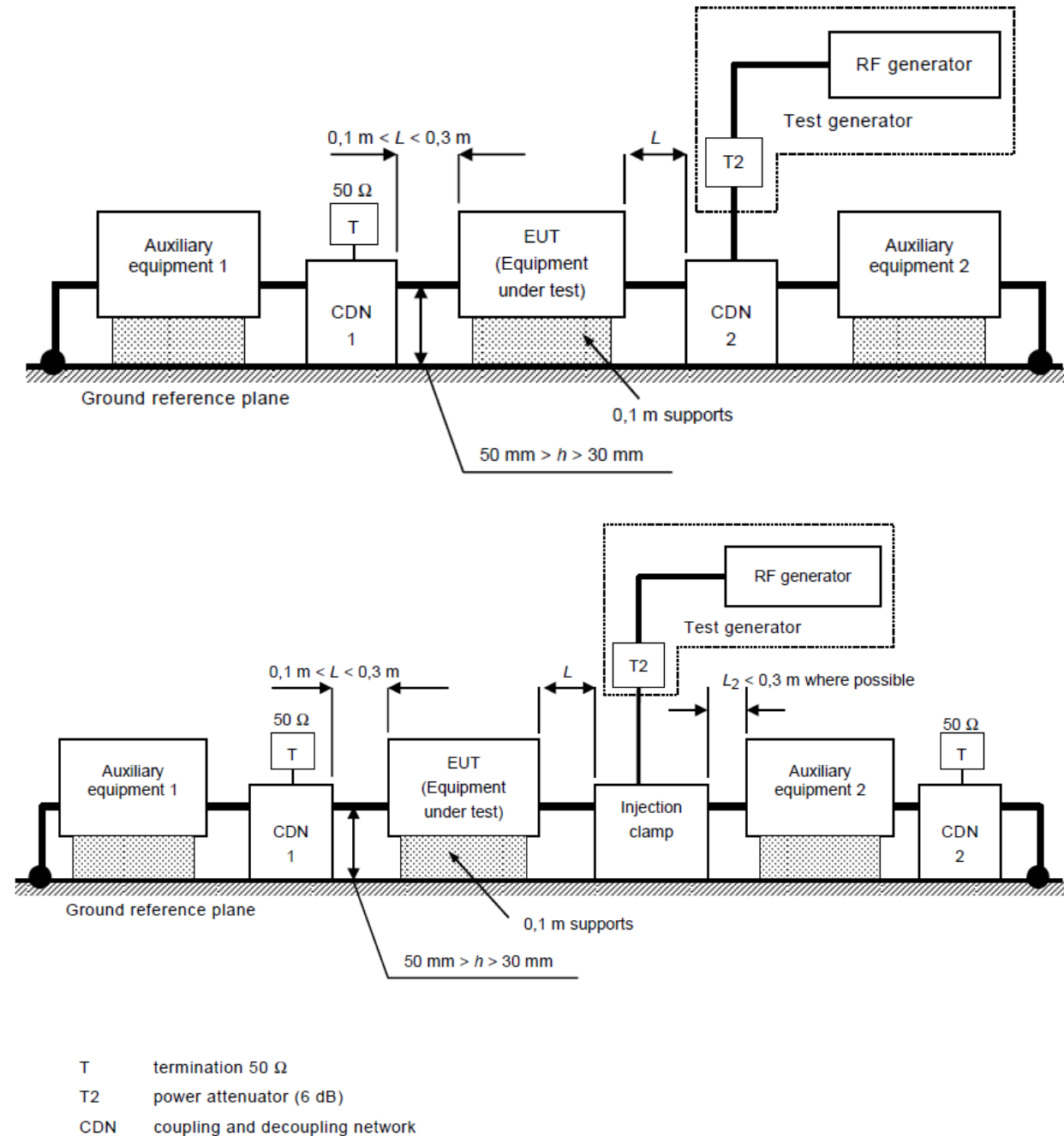
11.1.1 Test level

Frequency range 150kHz – 80MHz		
Level	Voltage level	
	U ₀ (dBuV)	U ₀ (V)
1	120	1
2	130	3
3	140	10
X	Special	Special
Notes: 1. "X" is an open level 2. The gray row is the selected test level.		

11.1.2 Performance Criterion

Criterion A

11.2 Block Diagram of Test Setup



11.3 Test Procedure

Measurement procedure was applied according to EN 61000-4-6 clause 8.
The test method and equipment was specified by EN 61000-4-6.

11.4 Test Result

Test No.	Frequency (MHz)	Level (V)	Modulation	Injected point	Pass/Fail/NA
1	0.15~80	10	80%, 1 kHz, AM	AC power port	Pass
2	0.15~80	10	80%, 1 kHz, AM	signal ports	NA
3	0.15~80	10	80%, 1 kHz, AM	DC power ports	Pass

Observation: All the functions were operated as normal during and after test.

Conclusion: The EUT can meet the requirement of Performance Criterion A

12 Voltage dips

Test result **PASS**

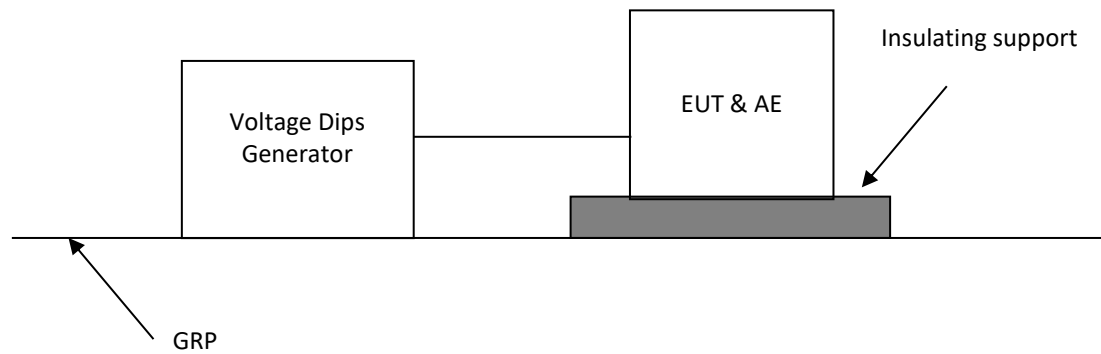
12.1 Severity Level and Performance Criterion

12.1.1 Test level

Test level Reduction (%)	Voltage level in % of rated Ut	Duration (cycles)	Performance criterion
100	0	0.5	B
		1	B
		250 (at 50Hz) 300 (at 60Hz)	C
30	70	25 (at 50Hz) 30 (at 60Hz)	C

Notes: The gray rows are selected test level.

12.2 Test Setup



12.3 Test Procedure

Measurement was performed in shielded room.

Measurement procedure was applied according to EN 61000-4-11 clause 8.

The test method and equipment was specified by EN 61000-4-11.

12.4 Test Result

Test no.	Test level % U_T	Voltage dip and short interruptions % U_T	Duration (in periods)	Pass/ Fail
1	70	30%	25 cycles at 50Hz	Pass
			30 cycles at 60Hz	Pass
2	0	100%	0.5 cycle	Pass
3	0	100%	1 cycle	Pass
4	0	100%	250 cycles at 50Hz	Pass
			300 cycles at 60Hz	Pass

Observation: At test level of 0%, the EUT worked interrupted during a short time. Once the interference is removed, it recovered its normal mode at once

Conclusion: The EUT met the requirements of Performance Criterion B and C.

13 Power Frequency Magnetic field

Test result: **PASS**

13.1 Severity Level and Performance Criterion

13.1.1 Test level

Level	Magnetic field strength A/m
1	1
2	3
3	10
4	30
5	100
X	Special
Note: 1. X is an open test level; this level may be given in the product specification. 2. The gray row is the selected test level.	

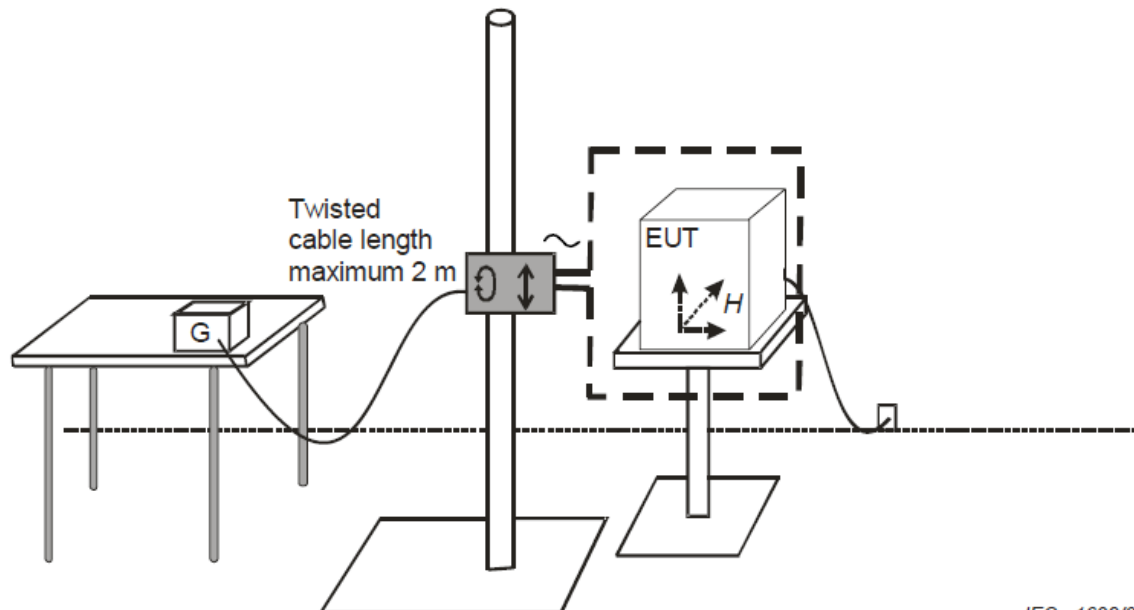
13.1.2 Performance Criterion

Performance criterion A

TEST REPORT

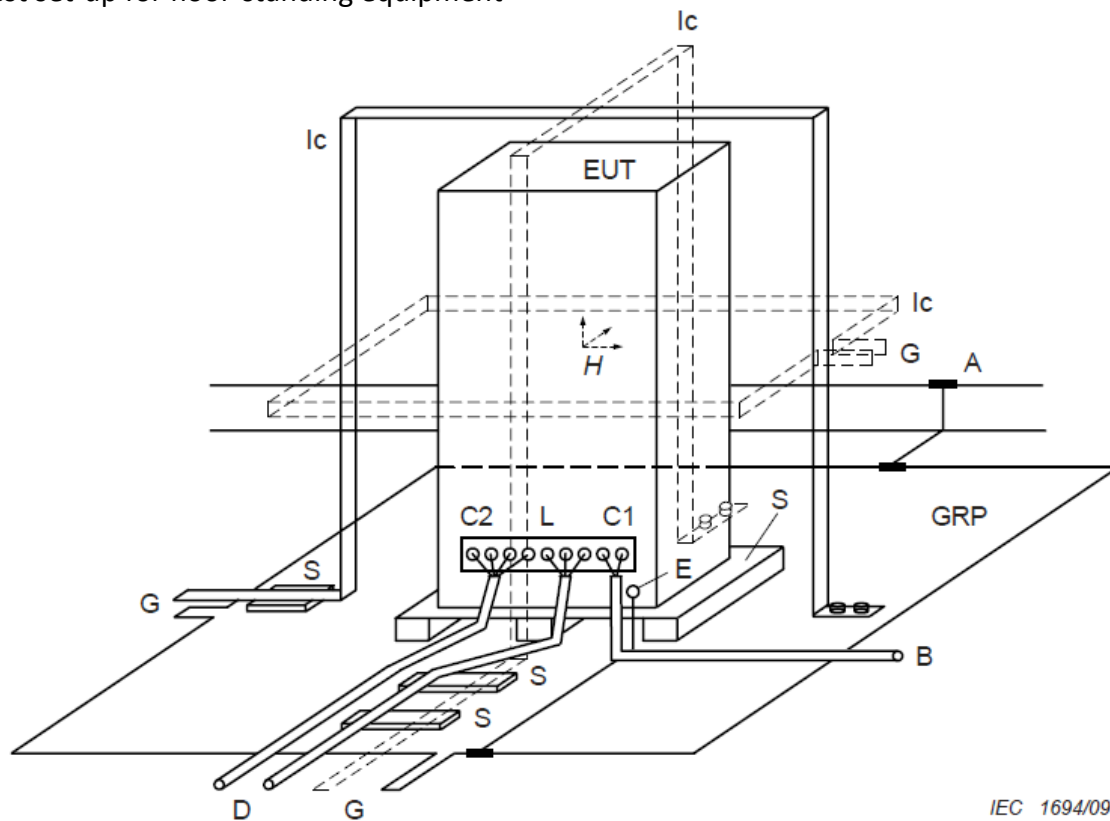
13.2 Diagram of Test Setup

Test set-up for table-top equipment



IEC 1692/09

Test set-up for floor-standing equipment



IEC 1694/09

13.3 Test Setup and Test Procedure

Measurement was performed in shielded room.

Measurement and setting of EUT was applied according to clause 7 of IEC 61000-4-8.

The test method and equipment was specified by IEC 61000-4-8 with the modifications by clause 8 of EN 61000-6-1.

13.4 Test Protocol

Test No.	Level A/m	Axis	Result
1	30	X	PASS
2	30	Y	PASS
3	30	Z	PASS

Observation: All the functions were operated as normal during and after test.

Conclusion: The EUT can meet the requirement of Performance Criterion A

Appendix I: Specifications table

Specifications table					
Model	AF1K-SL-1	AF1.5K-SL-1	AF2K-SL-1	AF2.5K-SL-1	AF3K-SL-1
PV input					
P pv Max(W)	1500	2300	3000	3800	4500
Vmax PV (Vdc) (absolute Max.)	550	550	550	550	550
Isc PV (absolute Max.) (A)	26	26	26	26	26
Number MPP trackers	1	1	1	1	1
Number input strings	1	1	1	1	1
Max. PV input current / strings (A)	18.5	18.5	18.5	18.5	18.5
MPPT voltage range (Vdc)	80-500	80-500	80-500	80-500	80-500
Vdc range @ full power (Vdc)	80-500	90-500	120-500	150-500	170-500
Battery (charge/discharge)					
Battery type	Li-ion/Lead-acid etc.				
Battery Normal Voltage (Range) (Vdc)	51.2V (40-60V)				
Max charge/discharge Current(A)	25	40	50	63	80
Max charge/discharge Power(W)	1000	1500	2000	2500	3000
AC Grid (input and output)					
Normal AC Voltage (VAC)	L/N/PE, 220Vac, 230Vac				
Frequency (Hz)	50 / 60				
Normal AC Current (A)	4.4	6.6	8.7	10.9	13.1
Max. cont. input/output current (A)	5	7	10	12	14
Rated Power(W)	1000	1500	2000	2500	3000
Rated Apparent Power (VA)	1000	1500	2000	2500	3000
Max. cont. Power (W)	1000	1500	2000	2500	3000
Max. cont. Apparent Power (VA)	1000	1500	2000	2500	3000
Power factor (adjustable)	1.0(-0.8~ +0.8)				
AC Load output (stand alone)					
Normal Voltage (VAC)	L/N/PE, 220Vac, 230Vac				
Frequency (Hz)	50 / 60				
Nominal Current(A)	4.4	6.6	8.7	10.9	13.1
Max. cont. current (A)	5	7	10	12	14
Max. cont. Power (W)	1000	1500	2000	2500	3000
Rated Apparent Power (VA)	1000	1500	2000	2500	3000
Max. cont. Apparent Power (VA)	1000	1500	2000	2500	3000
Power factor	1.0				
Others					
Ingress protection (IP)	IP65				
Protective class	Class I				
Temperature (°C)	-25°C to +60°C (Derating 45°C)				
Inverter Isolation	Non-isolated (PV - AC - BAT)				
Overvoltage category	OVC III (AC Main), OVC II (PV)				
Firmware	1.01				

Specifications table				
Model	AF3.6K-SL-1	AF3K-SL	AF3.6K-SL	AF4K-SL
PV input				
P pv Max(W)	5400	4500	5400	6000
Vmax PV (Vdc) (absolute Max.)	550	550	550	550
Isc PV (absolute Max.) (A)	26	26 x 2	26 x 2	26 x 2
Number MPP trackers	1	2	2	2
Number input strings	1	1/1	1/1	1/1
Max. PV input current / strings (A)	18.5	18.5 x 2	18.5 x 2	18.5 x 2
MPPT voltage range (Vdc)	80-500	80-500	80-500	80-500
Vdc range @ full power (Vdc)	210-500	90-500	110-500	120-500
Battery (charge/discharge)				
Battery type	Li-ion/Lead-acid etc.			
Battery Normal Voltage (Range) (Vdc)	51.2V (40-60V)			
Max charge/discharge Current(A)	80	80	80	80
Max charge/discharge Power(W)	3600	3000	3600	4000
AC Grid (input and output)				
Normal AC Voltage (VAC)	L/N/PE, 220Vac, 230Vac			
Frequency (Hz)	50 / 60			
Normal AC Current (A)	15.7	13.1	15.7	17.4
Max. cont. input/output current (A)	17	14	17	19
Normal Power (W)	3600	3000	3600	4000
Rated Apparent Power (VA)	3600	3000	3600	4000
Max. cont. input/output Power (W)	3600	3000	3600	4000
Max. cont. Apparent Power (VA)	3600	3000	3600	4000
Power factor(adjustable)	1.0(-0.8~ +0.8)			
AC Load output (stand alone)				
Normal Voltage (VAC)	L/N/PE, 220Vac, 230Vac			
Frequency (Hz)	50 / 60			
Nominal Current (A)	15.7	13.1	15.7	17.4
Max. cont. current (A)	17	14	17	19
Max. cont. Power (W)	3600	3000	3600	4000
Rated Apparent Power (VA)	3600	3000	3600	4000
Max. cont. Apparent Power (VA)	3600	3000	3600	4000
Power factor	1.0			
Others				
Ingress protection (IP)	IP65			
Protective class	Class I			
Temperature (°C)	-25°C to +60°C (Derating 45°C)			
Inverter Isolation	Non-isolated (PV - AC - BAT)			
Overvoltage category	OVC III (AC Main), OVC II (PV)			
Firmware	1.01			

Specifications table				
Model	AF4.6K-SL	AF5K-SL	AF5.5K-SL	AF6K-SL
PV input				
P pv Max(W)	6900	7500	8300	9000
Vmax PV (Vdc) (absolute Max.)	550	550	550	550
Isc PV (absolute Max.) (A)	26 x 2	26 x 2	26 x 2	26 x 2
Max. PV input current / strings (A)	18.5 x 2	18.5 x 2	18.5 x 2	18.5 x 2
Number MPP trackers	2	2	2	2
Number input strings	1/1	1/1	1/1	1/1
MPPT voltage range (Vdc)	80-500	80-500	80-500	80-500
Vdc range @ full power (Vdc)	130-500	150-500	160-500	170-500
Battery (charge/discharge)				
Battery type	Li-ion/Lead-acid etc.			
Battery Normal Voltage (Range) (Vdc)	51.2V (40-60V)			
Max charge/discharge Current(A)	80	80	80	80
Max charge/discharge Power(W)	4600	4800	4800	4800
AC Grid (input and output)				
Normal AC Voltage (VAC)	L/N/PE, 220Vac, 230Vac			
Frequency (Hz)	50 / 60			
Normal AC Current (A)	20	21.8	24	26.1
Max. cont. input/output current (A)	22	23	26	28
Normal Power (W)	4600	5000	5500	6000
Rated Apparent Power (VA)	4600	5000	5500	6000
Max. cont. input/output Power (W)	4600	5000	5500	6000
Max. cont. Apparent Power (VA)	4600	5000	5500	6000
Power factor(adjustable)	1.0(-0.8~ +0.8)			
AC Load output (stand alone)				
Normal Voltage (VAC)	L/N/PE, 220Vac, 230Vac			
Frequency (Hz)	50 / 60			
Nominal Current(A)	20	21.8	24	26.1
Max. cont. current (A)	22	23	26	28
Max. cont. Power (W)	4600	5000	5500	6000
Rated Apparent Power (VA)	4600	5000	5500	6000
Max. cont. Apparent Power (VA)	4600	5000	5500	6000
Power factor	1.0			
Others				
Ingress protection (IP)	IP65			
Protective class	Class I			
Temperature (°C)	-25°C to +60°C (Derating 45°C)			
Inverter Isolation	Non-isolated (PV - AC - BAT)			
Overvoltage category	OVC III (AC Main), OVC II (PV)			
Firmware	1.01			

Specifications table				
Model	AF1K-SL-0	AF1.5K-SL-0	AF2K-SL-0	AF2.5K-SL-0
Battery (charge/discharge)				
Battery type	Li-ion/Lead-acid etc.			
Battery Normal Voltage (Range) (Vdc)	51.2V (40-60V)			
Max charge/discharge Current(A)	25	40	50	63
Max charge/discharge Power(W)	1000	1500	2000	2500
AC Grid (input and output)				
Normal AC Voltage (VAC)	L/N/PE, 220Vac, 230Vac			
Frequency (Hz)	50 / 60			
Normal AC Current (A)	4.4	6.6	8.7	10.9
Max. cont. input/output current (A)	5	7	10	12
Normal Power (W)	1000	1500	2000	2500
Rated Apparent Power (VA)	1000	1500	2000	2500
Max. cont. input/output Power (W)	1000	1500	2000	2500
Max. cont. Apparent Power (VA)	1000	1500	2000	2500
Power factor(adjustable)	1.0(-0.8~ +0.8)			
AC Load output (stand alone)				
Normal Voltage (VAC)	L/N/PE, 220Vac, 230Vac			
Frequency (Hz)	50 / 60			
Nominal Current (A)	4.4	6.6	8.7	10.9
Max. cont. current (A)	5	7	10	12
Max. cont. Power (W)	1000	1500	2000	2500
Rated Apparent Power (VA)	1000	1500	2000	2500
Max. cont. Apparent Power (VA)	1000	1500	2000	2500
Power factor	1.0			
Others				
Ingress protection (IP)	IP65			
Protective class	Class I			
Temperature (°C)	-25°C to +60°C (Derating 45°C)			
Inverter Isolation	Non-isolated (AC-BAT)			
Overvoltage category	OVC III (AC Main)			
Firmware	1.01			

Specifications table				
Model	AF3K-SL-0	AF3.6K-SL-0	AF4K-SL-0	AF4.6K-SL-0
Battery (charge/discharge)				
Battery type	Li-ion/Lead-acid etc.			
Battery Normal Voltage (Range) (Vdc)	51.2V (40-60V)			
Max charge/discharge Current(A)	80	80	120	120
Max charge/discharge Power(W)	3000	3600	4000	4600
AC Grid (input and output)				
Normal AC Voltage (VAC)	L/N/PE, 220Vac, 230Vac			
Frequency (Hz)	50 / 60			
Normal AC Current (A)	13.1	15.7	17.4	20
Max. cont. input/output current (A)	14	17	19	22
Normal Power (W)	3000	3600	4000	4600
Rated Apparent Power (VA)	3000	3600	4000	4600
Max. cont. input/output Power (W)	3000	3600	4000	4600
Max. cont. Apparent Power (VA)	3000	3600	4000	4600
Power factor(adjustable)	1.0(-0.8~ +0.8)			
AC Load output (stand alone)				
Normal Voltage (VAC)	L/N/PE, 220Vac, 230Vac			
Frequency (Hz)	50 / 60			
Nominal Current (A)	13.1	15.7	17.4	20
Max. cont. current (A)	14	17	19	22
Max. cont. Power (W)	3000	3600	4000	4600
Rated Apparent Power (VA)	3000	3600	4000	4600
Max. cont. Apparent Power (VA)	3000	3600	4000	4600
Power factor	1.0			
Others				
Ingress protection (IP)	IP65			
Protective class	Class I			
Temperature (°C)	-25°C to +60°C (Derating 45°C)			
Inverter Isolation	Non-isolated (AC-BAT)			
Overvoltage category	OVC III (AC Main)			
Firmware	1.01			

Specifications table				
Model	AF5K-SL-0	AF5.5K-SL-0	AF6K-SL-0	
Battery (charge/discharge)				
Battery type	Li-ion/Lead-acid etc.			
Battery Normal Voltage (Range) (Vdc)	51.2V (40-60V)			
Max charge/discharge Current(A)	120	120	120	
Max charge/discharge Power(W)	5000	5500	6000	
AC Grid (input and output)				
Normal AC Voltage (VAC)	L/N/PE, 220Vac, 230Vac			
Frequency (Hz)	50 / 60			
Normal AC Current (A)	21.8	24	26.1	
Max. cont. input/output current (A)	23	26	28	
Normal Power (W)	5000	5500	6000	
Rated Apparent Power (VA)	5000	5500	6000	
Max. cont. input/output Power (W)	5000	5500	6000	
Max. cont. Apparent Power (VA)	5000	5500	6000	
Power factor(adjustable)	1.0(-0.8~ +0.8)			
AC Load output (stand alone)				
Normal Voltage (VAC)	L/N/PE, 220Vac, 230Vac			
Frequency (Hz)	50 / 60			
Nominal Current(A)	21.8	24	26.1	
Max. cont. current (A)	23	26	28	
Max. cont. Power (W)	5000	5500	6000	
Max. cont. Apparent Power (VA)	5000	5500	6000	
Power factor	1.0			
Others				
Ingress protection (IP)	IP65			
Protective class	Class I			
Temperature (°C)	-25°C to +60°C (Derating 45°C)			
Inverter Isolation	Non-isolated (AC-BAT)			
Overvoltage category	OVC III (AC Main)			
Firmware	1.01			

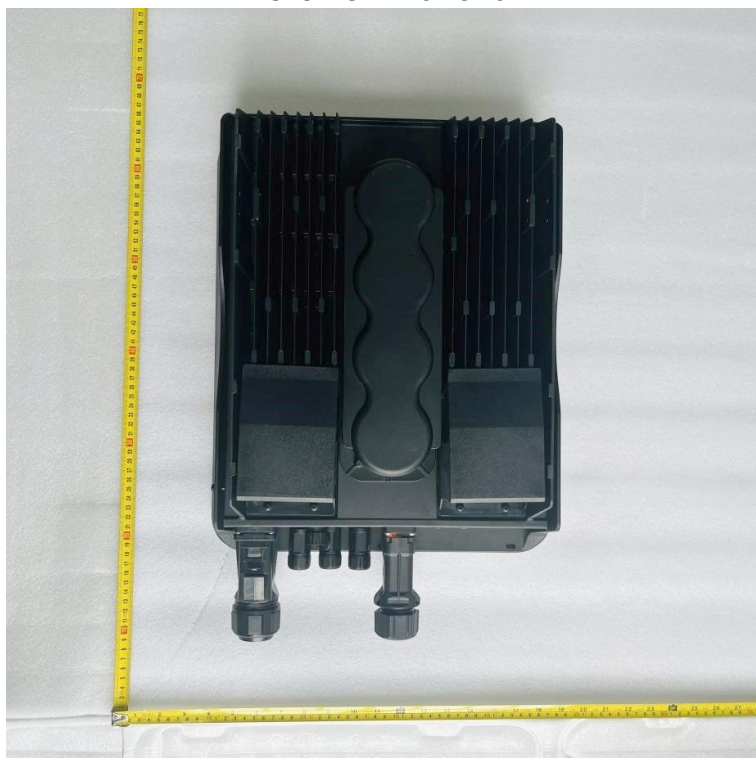
Specifications table					
Model	AF4K-SLP	AF4.6K-SLP	AF5K-SLP	AF5.5K-SLP	AF6K-SLP
PV input					
P pv Max(W)	6000	6900	7500	8300	9000
Vmax PV (Vdc) (absolute Max.)	550	550	550	550	550
Isc PV (absolute Max.) (A)	26 x 2	26 x 2	26 x 2	26 x 2	26 x 2
Number MPP trackers	2	2	2	2	2
Number input strings	1/1	1/1	1/1	1/1	1/1
Max. PV input current / strings (A)	18.5 x 2	18.5 x 2	18.5 x 2	18.5 x 2	18.5 x 2
MPPT voltage range (Vdc)	80-500	80-500	80-500	80-500	80-500
Vdc range @ full power (Vdc)	120-500	130-500	150-500	160-500	170-500
Battery (charge/discharge)					
Battery type	Li-ion/Lead-acid				
Battery Normal Voltage (Range) (Vdc)	51.2V (40-60V)				
Max charge/discharge Current(A)	120	120	120	120	120
Max charge/discharge Power(W)	4000	4600	5000	5500	6000
AC Grid (input and output)					
Normal AC Voltage (VAC)	L/N/PE, 230Vac				
Frequency (Hz)	50				
Normal AC Current (A)	17.4	20	21.8	24	26.1
Max. cont. input/output current (A)	19	22	23	26	28
Rated Power(W)	4000	4600	5000	5500	6000
Rated Apparent Power (VA)	4000	4600	5000	5500	6000
Max. cont. Power (W)	4000	4600	5000	5500	6000
Max. cont. Apparent Power (VA)	4000	4600	5000	5500	6000
Power factor (adjustable)	1.0(-0.8~ +0.8)				
AC Load output (stand alone)					
Normal Voltage (VAC)	L/N/PE, 230Vac				
Frequency (Hz)	50				
Nominal Current(A)	17.4	20	21.8	24	26.1
Max. cont. current (A)	19	22	23	26	28
Max. cont. Power (W)	4000	4600	5000	5500	6000
Max. cont. Apparent Power (VA)	4000	4600	5000	5500	6000
Power factor	1.0				
Others					
Ingress protection (IP)	IP65				
Protective class	Class I				
Temperature (°C)	-25°C to +60°C (Derating 45°C)				
Inverter Isolation	Non-isolated (PV - AC - BAT)				
Overvoltage category	OVC III (AC Main), OVC II (PV)				
Firmware	1.01				

Appendix II: Photograph of equipment under test

Overview-AF6K-SL-0



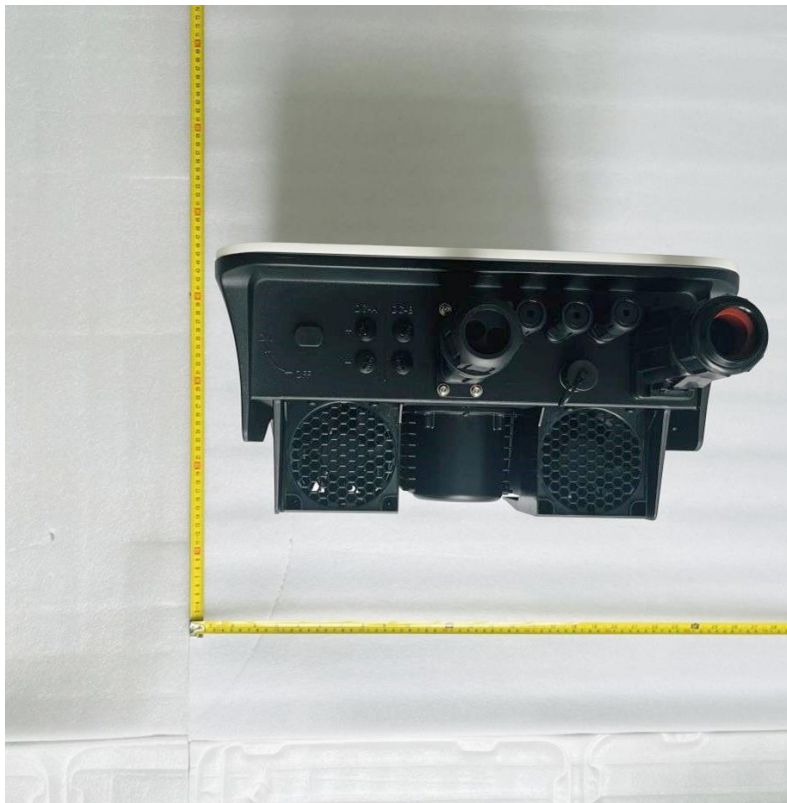
Overview-AF6K-SL-0



Overview-AF6K-SL-0



Overview-AF6K-SL-0



Overview-AF6K-SLP



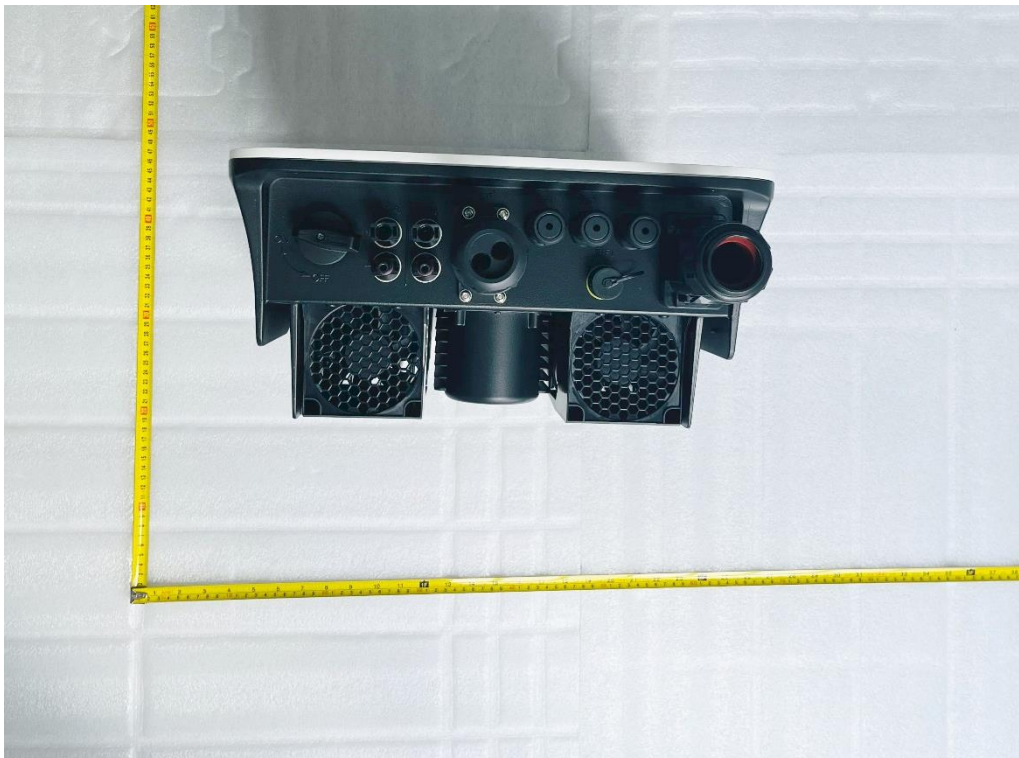
Overview-AF6K-SLP



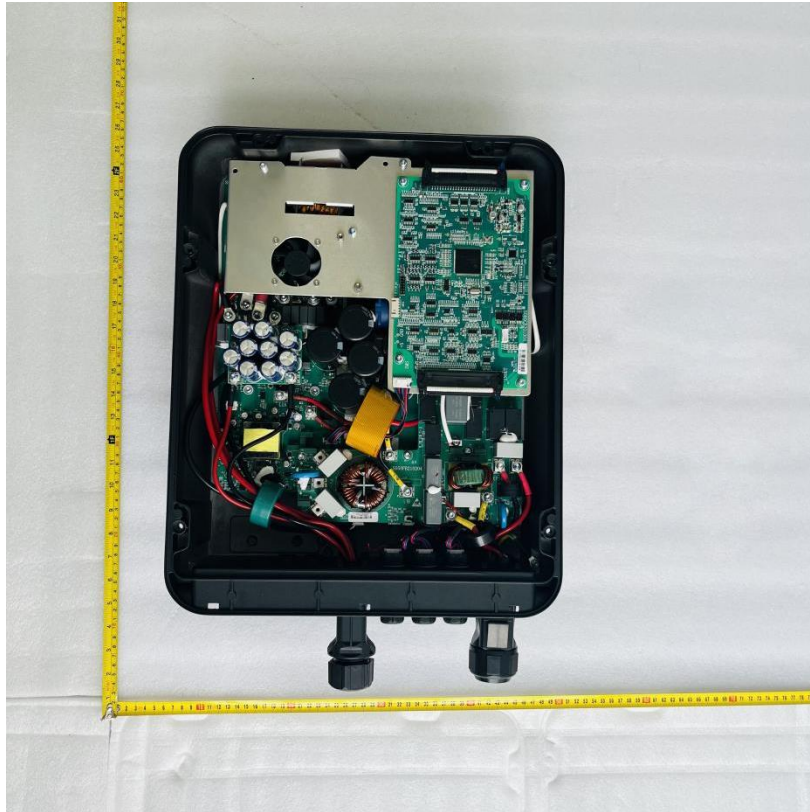
Overview-AF6K-SLP



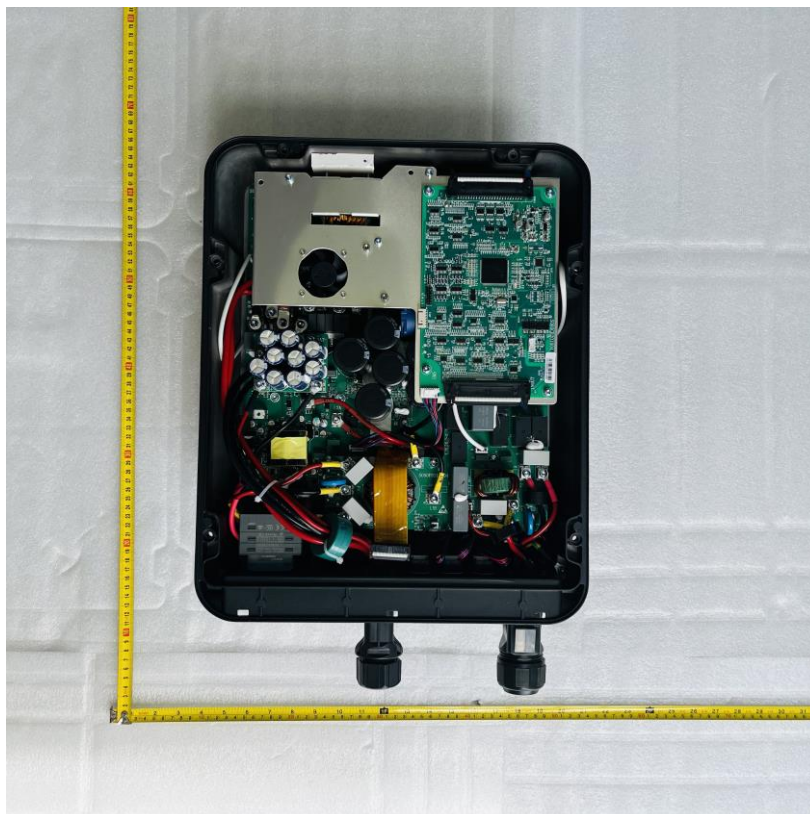
Overview-AF6K-SLP



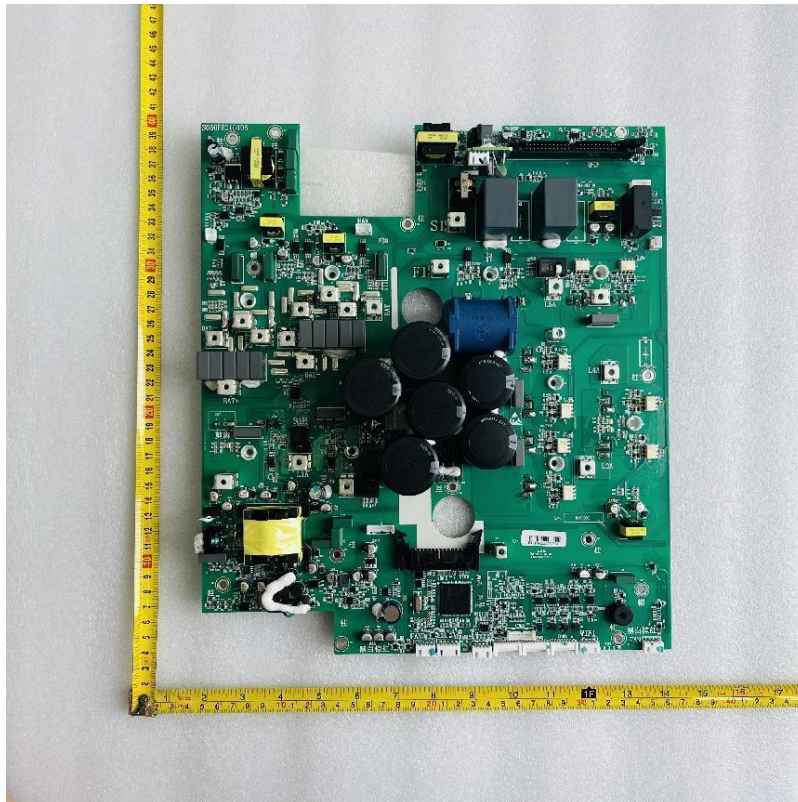
Internal view-AF6K-SL-0



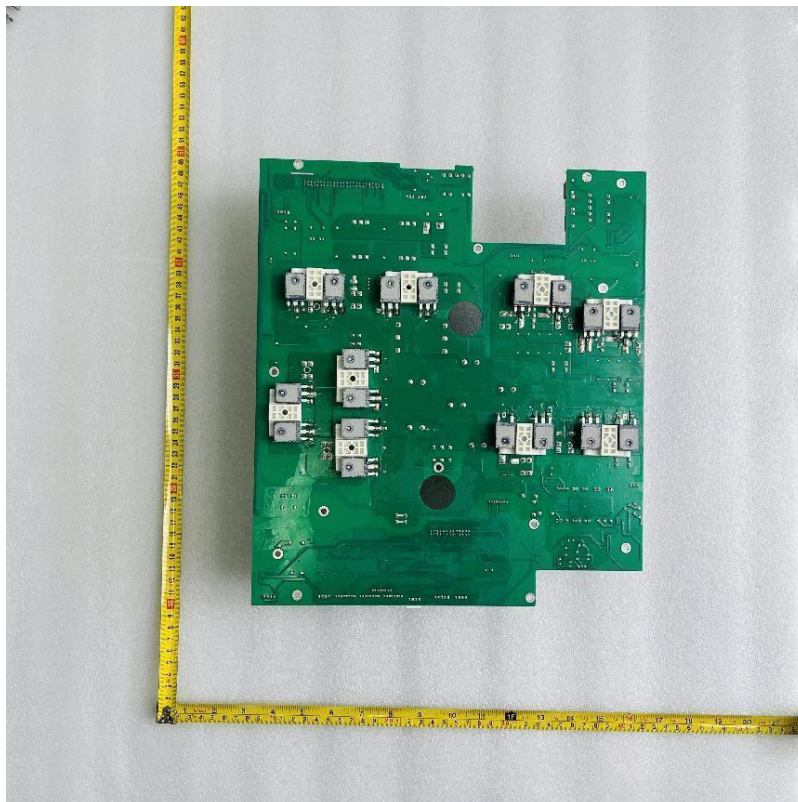
Internal view-AF6K-SLP



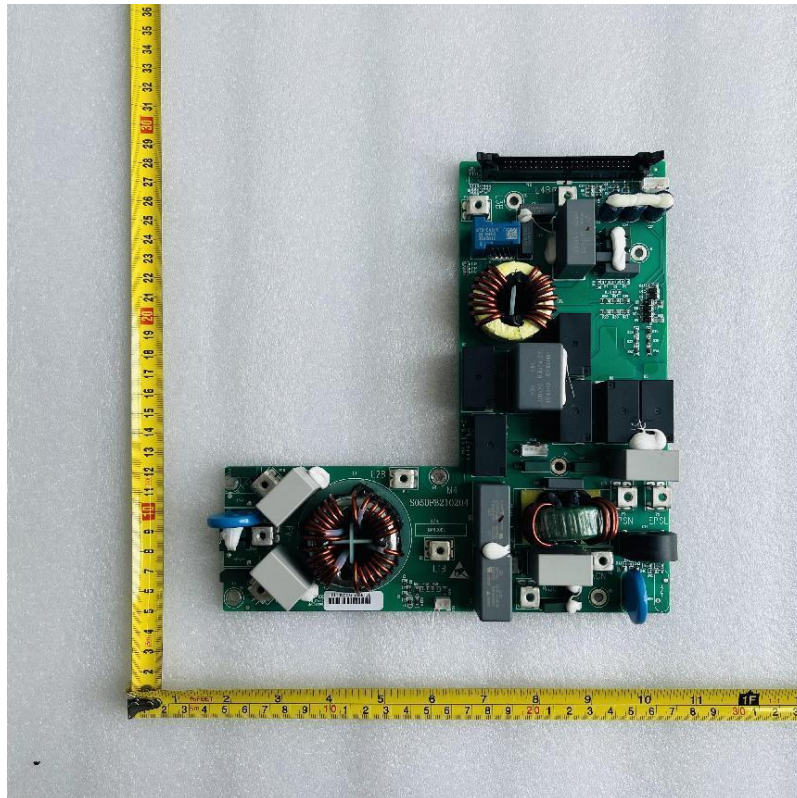
Internal view-



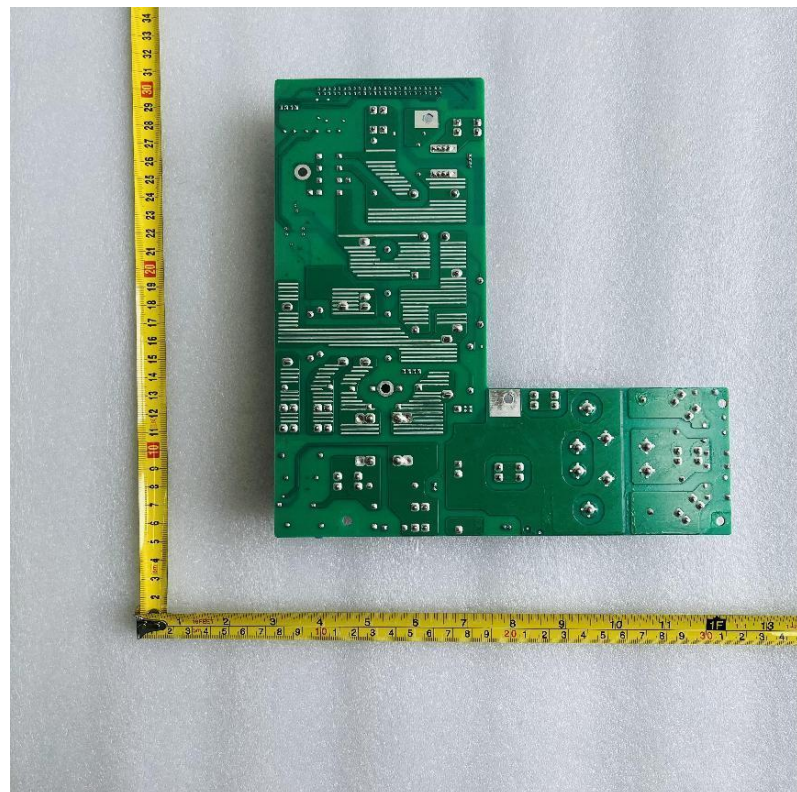
Internal view-



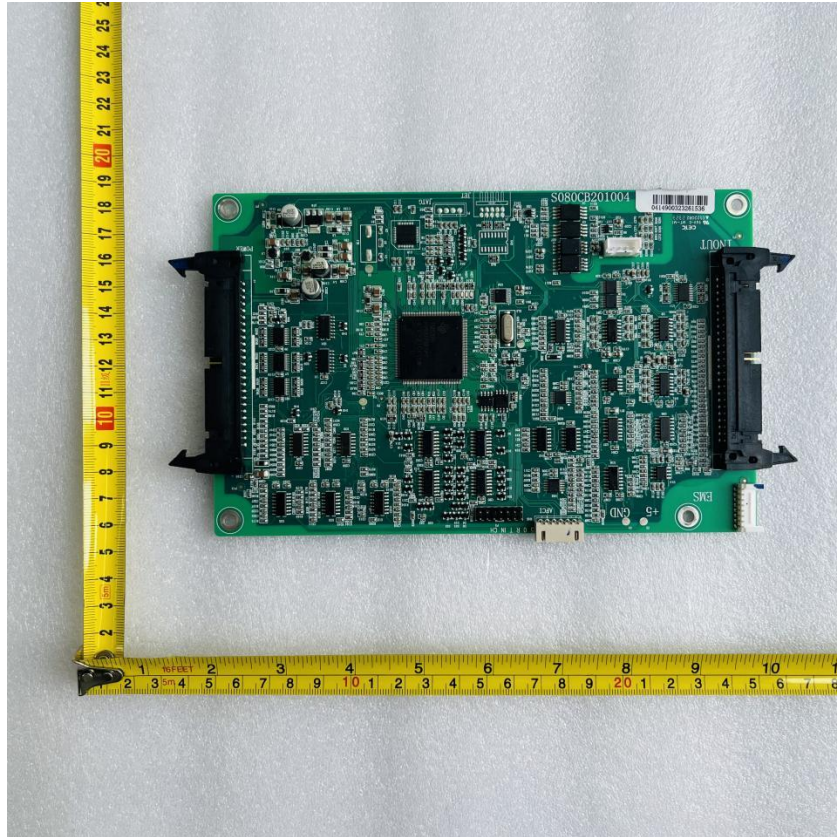
Internal view-



Internal view-



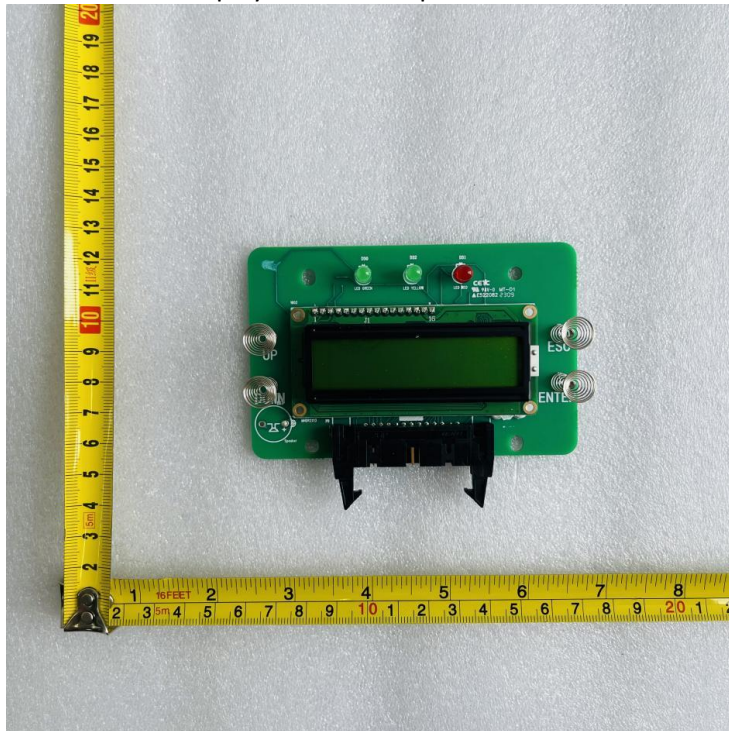
Internal view-



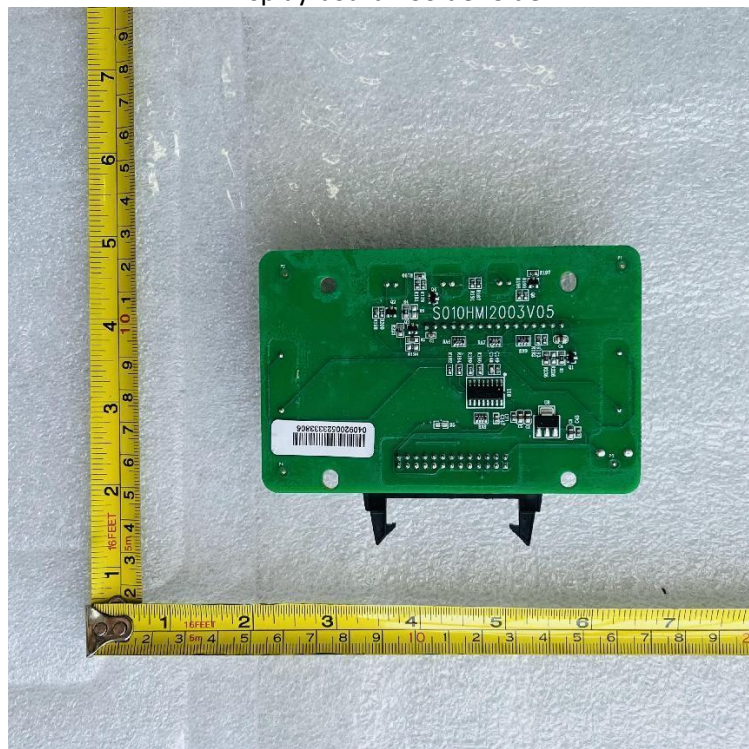
Internal view-



Display board - Component Side



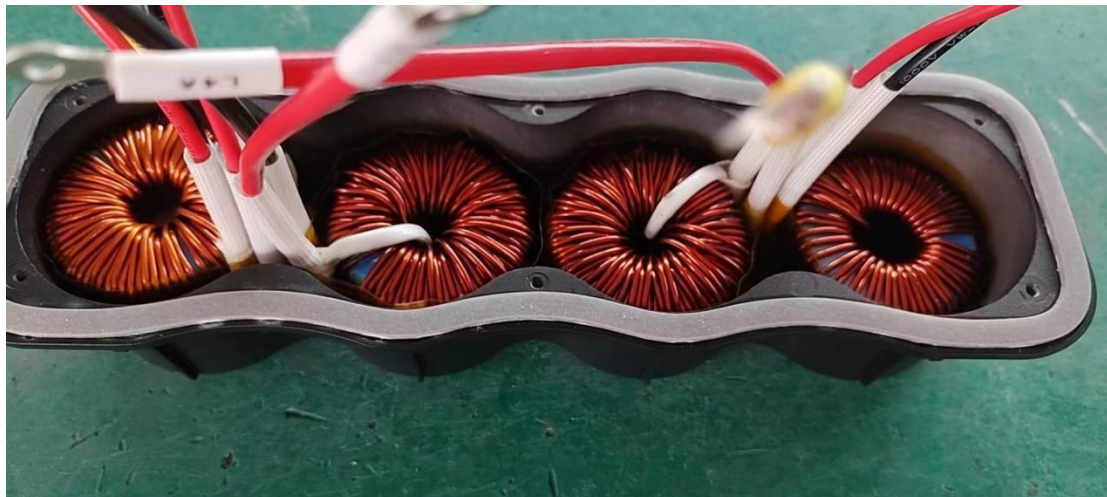
Display board - Solder Side



Internal view-



Internal view-



*** END OF REPORT ***