

EMC TEST REPORT

For

**HUIZHOU FORYOU OPTOELECTRONICS TECHNOLOGY CO.,
LTD.**

**Product Name: Photovoltaic energy storage DC integrated
machine**

Test Model(s).: LS4850

Report Reference No. : DACE240719015RL001

Applicant's Name : HUIZHOU FORYOU OPTOELECTRONICS TECHNOLOGY CO., LTD.

Address : Building No.6, Foryou Industrial Park Area B, No.1 North Shangxia
Road,Dongjiang High-tech Industry Park, Huizhou, Guangdong,China.

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Guangdong, China

Test Specification Standard : EN IEC 61000-6-3:2021
EN IEC 61000-6-1:2019
EN IEC 61000-3-2:2019+A1:2021+A2:2024
EN 61000-3-3:2013+A1:2019+A2:2021

Date of Receipt : July 19, 2024

Date of Test : July 19, 2024 to July 24, 2024

Data of Issue : July 24, 2024

Result : **Pass**

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Revision History Of Report

Version	Description	REPORT No.	Issue Date
V1.0	Original	DACE240719015RL001	July 24, 2024

NOTE1:

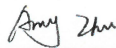
The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EC Declaration of Conformity and compliance with all relevant EU Directives.



NOTE2:

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

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CONTENTS

1	TEST SUMMARY	4
	1.1 TEST STANDARDS	4
	1.2 SUMMARY OF TEST RESULT	4
2	GENERAL INFORMATION	5
	2.1 CLIENT INFORMATION	5
	2.2 DESCRIPTION OF DEVICE (EUT)	5
	2.3 DESCRIPTION OF TEST MODES	5
	2.4 DESCRIPTION OF SUPPORT UNITS	5
	2.5 EQUIPMENTS USED DURING THE TEST	6
	2.6 STATEMENT OF THE MEASUREMENT UNCERTAINTY	8
3	EMISSION TEST RESULTS (EMI)	9
	3.1 RADIATION DISTURBANCE (30MHZ-1GHZ)	9
	3.1.1 E.U.T. Operation:	9
	3.1.2 Test Setup Diagram:	9
	3.1.3 Test Data:	10
4	IMMUNITY TEST RESULTS (EMS)	12
	4.1 ELECTROSTATIC DISCHARGE	13
	4.1.1 E.U.T. Operation:	13
	4.1.2 Test Setup Diagram:	13
	4.1.3 Test Data:	14
	4.2 RADIO-FREQUENCY ELECTROMAGNETIC FIELD	15
	4.2.1 E.U.T. Operation:	15
	4.2.2 Test Setup Diagram:	15
	4.2.3 Test Data:	16
5	TEST SETUP PHOTOS	17
6	PHOTOS OF THE EUT	18

1 TEST SUMMARY

1.1 Test Standards

The tests were performed according to following standards:

EN IEC 61000-6-3:2021: Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for equipment in residential environments

EN IEC 61000-6-1:2019: Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity standard for residential, commercial and light-industrial environments

EN IEC 61000-3-2:2019+A1:2021+A2:2024: Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16A 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 ≤ 16A per phase and not subject to conditional connection

1.2 Summary of Test Result

Item	Standard	Method	Requirement	Result
Radiation disturbance (30MHz-1GHz)	EN IEC 61000-6-3:2021	CISPR 16-2-3 Clause 7.3	Table 3	Pass
Electrostatic discharge	EN IEC 61000-6-1:2019	EN 61000-4-2: 2009	Table 1.4	Pass
Radio-frequency electromagnetic field	EN IEC 61000-6-1:2019	EN IEC 61000-4-3:2020	Table 1.2 & 1.3	Pass

2 GENERAL INFORMATION

2.1 Client Information

Applicant's Name : HUIZHOU FORYOU OPTOELECTRONICS TECHNOLOGY CO., LTD.
Address : Building No.6, Foryou Industrial Park Area B, No.1 North Shangxia Road,Dongjiang High-tech Industry Park, Huizhou, Guangdong,China.

Manufacturer : HUIZHOU FORYOU OPTOELECTRONICS TECHNOLOGY CO., LTD.
Address : Building No.6, Foryou Industrial Park Area B, No.1 North Shangxia Road,Dongjiang High-tech Industry Park, Huizhou, Guangdong,China.

2.2 Description of Device (EUT)

Product Name:	Photovoltaic energy storage DC integrated machine
Model/Type reference:	LS4850
Trade Mark:	ADAYO
Product Description:	Battery: DC 3.2V
Power Supply:	DC 3.2V
Highest Internal Frequency:	Less than 108MHz

2.3 Description of Test Modes

No	Title	Description
TM1	Discharging	EUT connection resistance discharge

2.4 Description of Support Units

The EUT was tested as an independent device.

2.5 Equipments Used During The Test

Radiation disturbance (30MHz-1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Cable(HF)2	SCHWARZ BECK	50Ω	/	2024-03-20	2025-03-19
Cable(HF)1	SCHWARZ BECK	50Ω	/	2024-03-20	2025-03-19
Cable(LF)2	SCHWARZ BECK	50Ω	/	2024-03-20	2025-03-19
Cable(LF)1	SCHWARZ BECK	50Ω	/	2024-03-20	2025-03-19
control	Positioning Controller	Model MF-7802	MF780208362	2023-12-27	2024-12-26
Test Receiver	Rohde & Schwarz	ESPI TEST RECEIVER	ID:1164.6607 K03-102109-MH	2024-06-12	2025-06-11
EMI Test software	Farad	EZ -EMC	V1.1.42	/	/
Positioning Controller	/	MF-7802	/	/	/
Amplifier(18-40G)	COM-POWER	AH-1840	10100008-1	2022-04-05	2025-04-04
Horn antenna	COM-POWER	AH-1840 (18-40G)	10100008	2023-04-05	2025-04-04
Loop antenna	ZHINAN	ZN30900C	ZN30900C	2024-06-14	2026-06-13
Power amplifier(LF)	Schwarzbeck	BBV9743	9743-151	2024-06-12	2025-06-11
Power amplifier(HF)	Schwarzbeck	BBV9718	9718-282	2024-06-12	2025-06-11
Horn Antenna	Sunol Sciences	DRH-118	A091114	2023-05-13	2025-05-12
Broadband Antenna	Sunol Sciences	JB6 Antenna	A090414	2023-05-21	2025-05-20

Electrostatic discharge					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
ESD Tester	Prima	ESD61002A	144305	2023-12-11	2024-12-10

Radio-frequency electromagnetic field					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
PC	/	486DX2	/	/	/
Log-periodic Antenna	AR	AT1080	16812	/	/
Biconic Antenna	EMCO	3108	9507-2534	/	/
Isotropic Field Probe	AR	FP2000	16755	2023-12-12	2024-12-11
Isotropic Field Monitor	AR	FM2000	16829	/	/
Amplifier	AR	100W/1000M1	17028	/	/
Amplifier	AR	500A100	17034	/	/
Signal Generator	HP	8648A	3625U00573	2023-12-12	2024-12-11

2.6 Statement Of The Measurement Uncertainty

Test Item	Measurement Uncertainty
Radiated Emission (Below 1GHz)	±5.79dB
Note: (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

3 Emission Test Results (EMI)

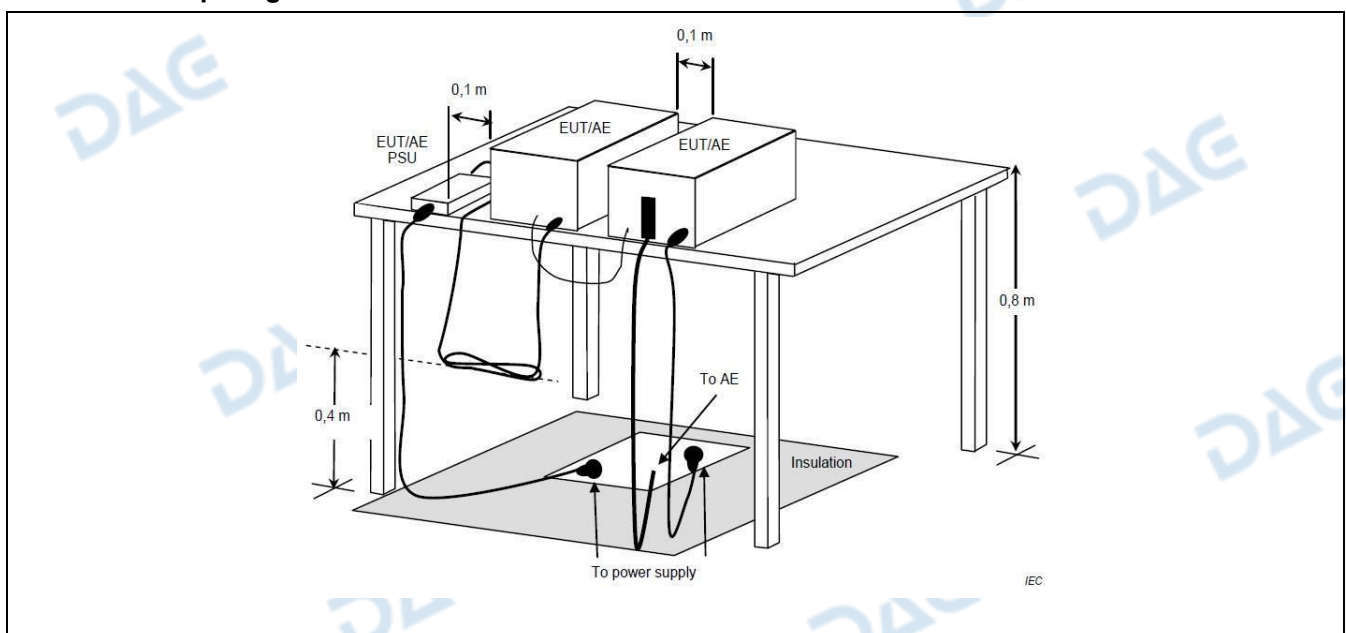
3.1 Radiation disturbance (30MHz-1GHz)

Test Requirement:	Table 3		
Test Limit:	Frequency range	Limits at 10m	Limits at 3m
	30 MHz to 230 MHz	30 dB(uV/m) quasi-peak	40 dB(uV/m) quasi-peak
	230 MHz to 1 000 MHz	37 dB(uV/m) quasi-peak	47 dB(uV/m) quasi-peak
	At transitional frequencies the lower limit applies.		
Test Method:	CISPR 16-2-3 Clause 7.3		
Procedure:	An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities. Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor		

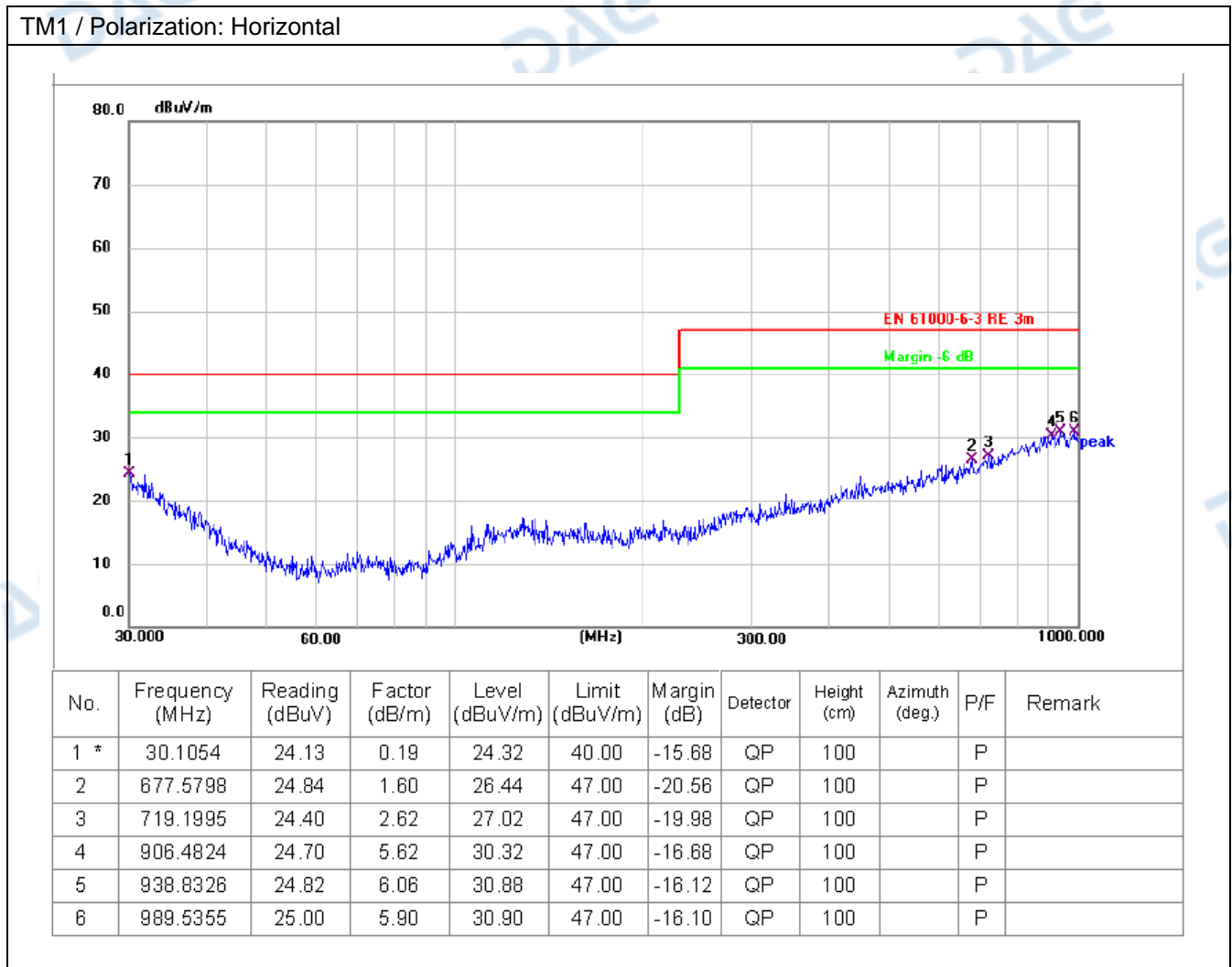
3.1.1 E.U.T. Operation:

Operating Environment:			
Temperature:	23.9 °C	Humidity:	49 %
Atmospheric Pressure:		101 kPa	
Pretest mode:	TM1		
Final test mode:	TM1		

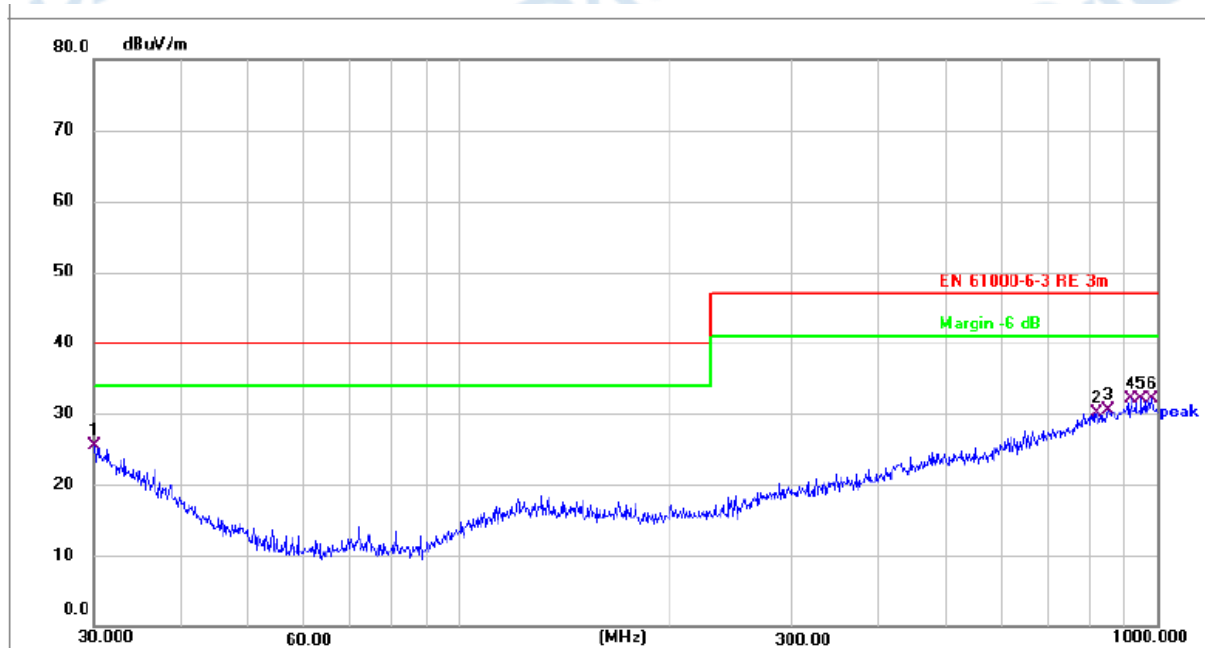
3.1.2 Test Setup Diagram:



3.1.3 Test Data:



TM1 / Polarization: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1 *	30.1052	25.40	0.19	25.59	40.00	-14.41	QP			P	
2	818.8340	25.62	4.44	30.06	47.00	-16.94	QP			P	
3	851.0353	26.03	4.45	30.48	47.00	-16.52	QP			P	
4	916.0685	26.19	5.83	32.02	47.00	-14.98	QP			P	
5	948.7610	26.18	5.92	32.10	47.00	-14.90	QP			P	
6	982.6200	26.01	6.02	32.03	47.00	-14.97	QP			P	peak

4 Immunity Test Results (EMS)

Performance criteria 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.

Performance criteria 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.

Performance criteria 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.

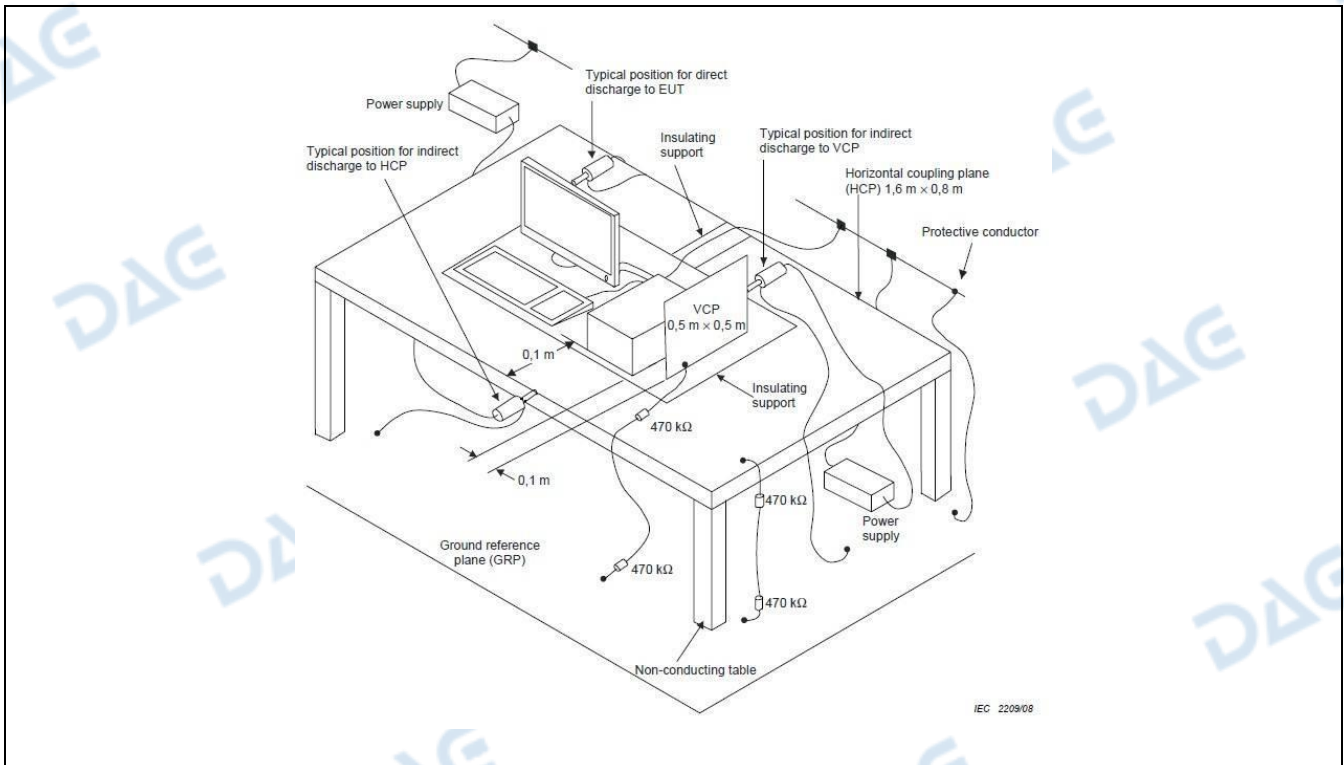
4.1 Electrostatic discharge

Test Requirement:	Table 1.4
Test Method:	EN 61000-4-2: 2009
Procedure:	Discharge Impedance: 330 Ω / 150 pF Discharge Voltage: Air Discharge: 8 kV; Contact Discharge: 4 kV; VCP/HCP: 4 kV. Polarity: Positive & Negative Number of Discharge: Minimum 10 times at each test point Discharge Mode: Single Discharge Discharge Period: 1 second minimum
Performance Criteria:	B

4.1.1 E.U.T. Operation:

Operating Environment:					
Temperature:	23.9 °C	Humidity:	49 %	Atmospheric Pressure:	101 kPa
Pretest mode:	TM1				
Final test mode:	TM1				

4.1.2 Test Setup Diagram:



4.1.3 Test Data:

Discharge type	Volt (kV)	Polarity	Test Point	Result/ Observations
Air discharge	8	+	6	A
Air discharge	8	-	6	A
Contact discharge	4	+	2	A
Contact discharge	4	-	2	A
Horizontal Coupling	4	+	3	A
Horizontal Coupling	4	-	3	A
Vertical Coupling	4	+	3	A
Vertical Coupling	4	-	3	A

Test Point: 1. All insulated enclosure and seams.

2. All accessible metal parts of the enclosure.

3. All side.

A: No degradation in the performance of the EUT was observed.

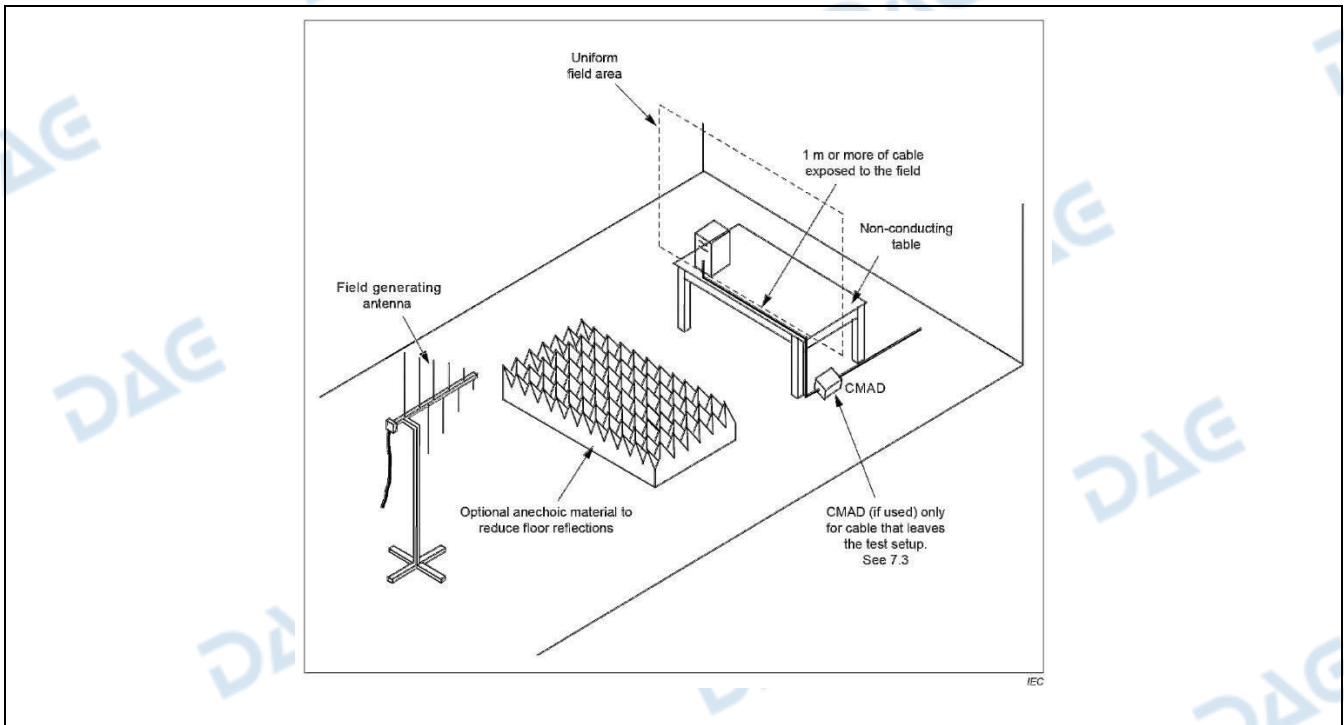
4.2 Radio-frequency electromagnetic field

Test Requirement:	Table 1.2 & 1.3
Test Method:	EN IEC 61000-4-3:2020
Procedure:	Antenna Polarisation: Vertical and Horizontal Modulation: 1kHz, 80% Amp. Mod, 1% increment Frequency Range: 80MHz to 1GHz, 1.4GHz to 6GHz
Performance Criteria:	A

4.2.1 E.U.T. Operation:

Operating Environment:					
Temperature:	23.9 °C	Humidity:	49 %	Atmospheric Pressure:	101 kPa
Pretest mode:	TM1				
Final test mode:	TM1				

4.2.2 Test Setup Diagram:



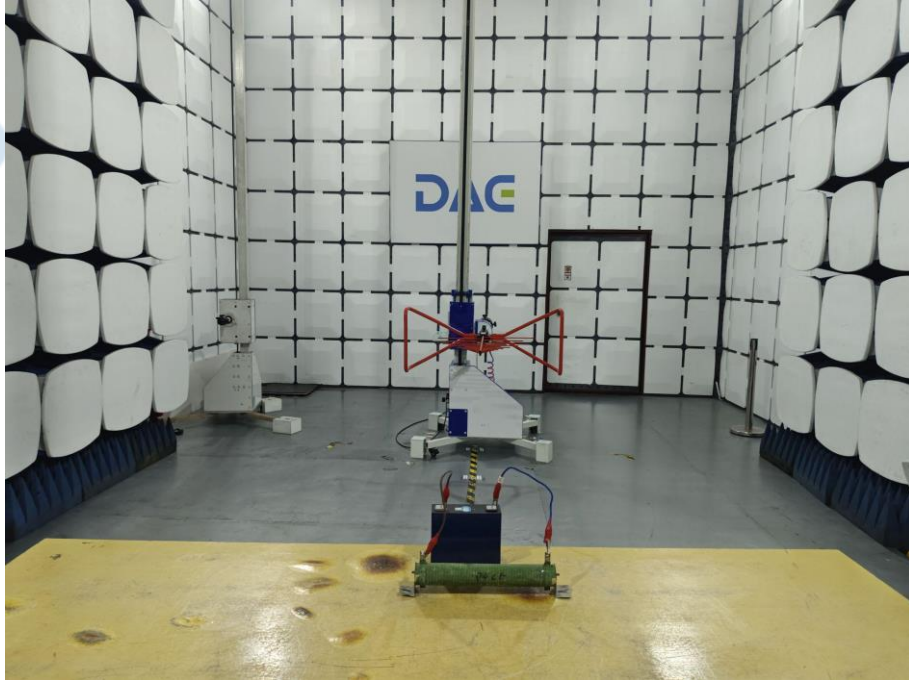
4.2.3 Test Data:

Frequency	Field Strength (V/m)	EUT face	Dwell time	Result/ Observations
80MHz-1GHz	3	Front	2s	A
80MHz-1GHz	3	Back	2s	A
80MHz-1GHz	3	Left	2s	A
80MHz-1GHz	3	Right	2s	A
80MHz-1GHz	3	Top	2s	A
80MHz-1GHz	3	Bottom	2s	A
1.4GHz-6GHz	3	Front	2s	A
1.4GHz-6GHz	3	Back	2s	A
1.4GHz-6GHz	3	Left	2s	A
1.4GHz-6GHz	3	Right	2s	A
1.4GHz-6GHz	3	Top	2s	A
1.4GHz-6GHz	3	Bottom	2s	A

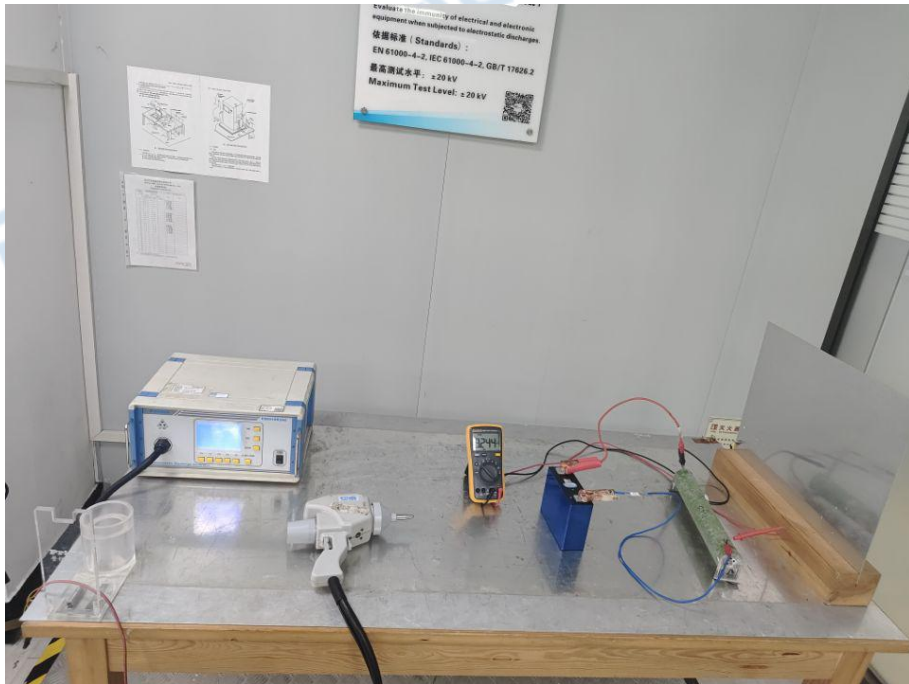
A: No degradation in the performance of the EUT was observed.

5 TEST SETUP PHOTOS

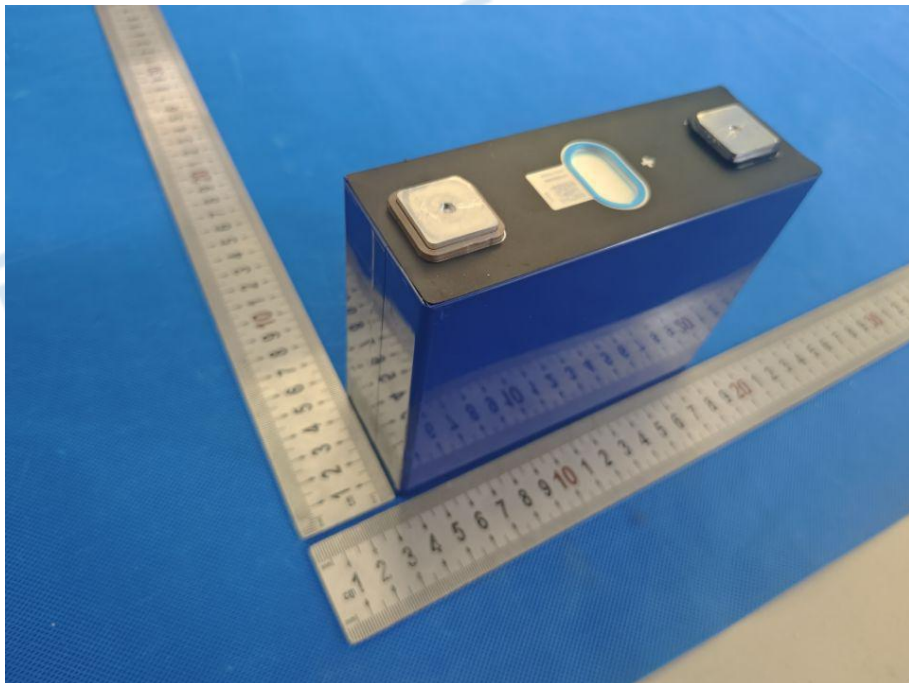
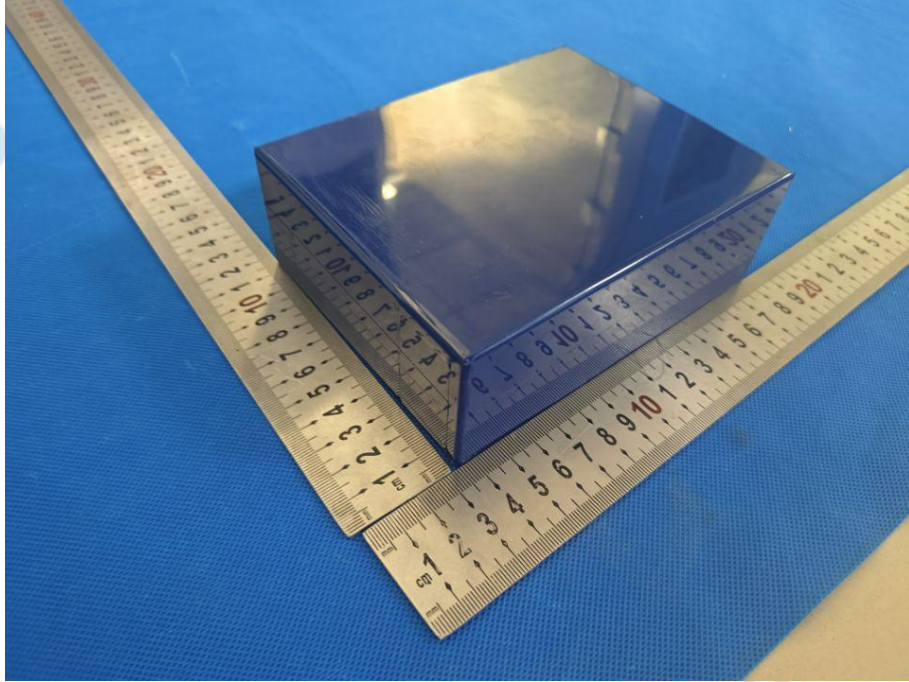
Radiation disturbance (30MHz-1GHz)

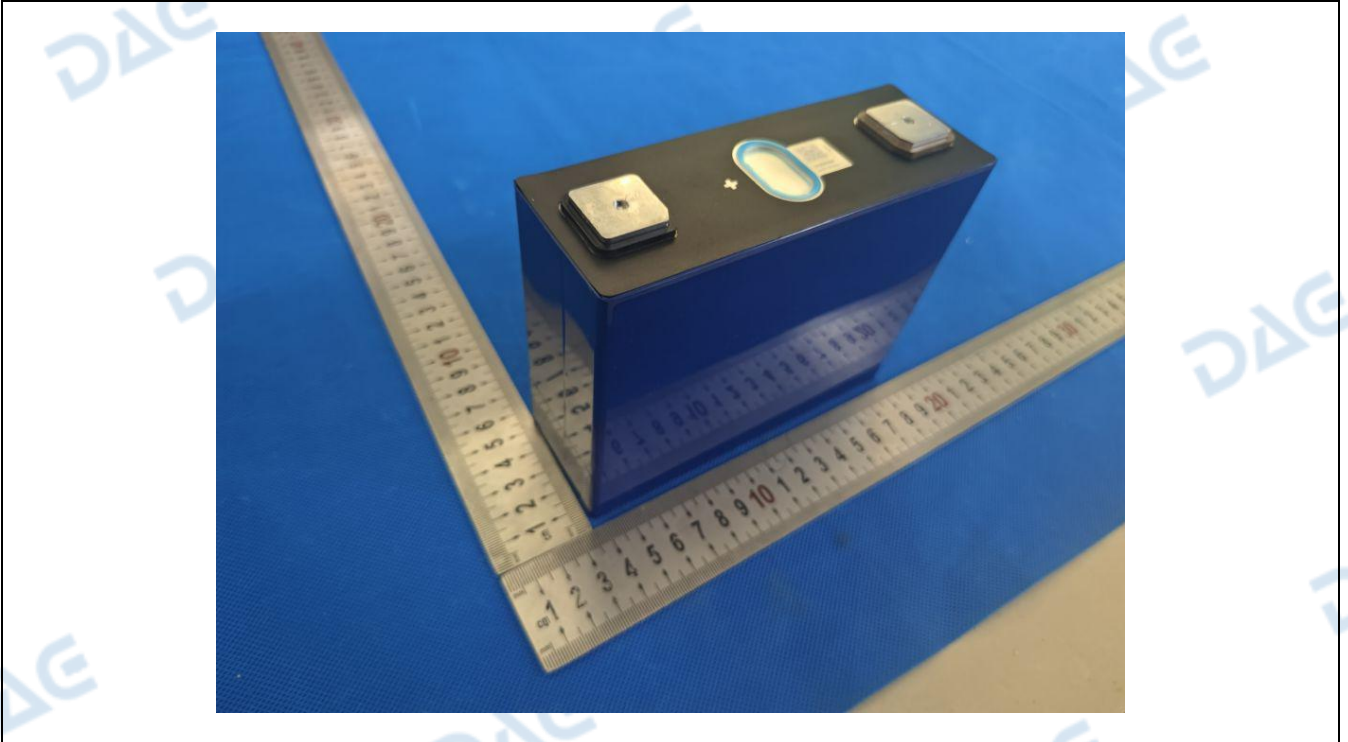


Electrostatic discharge



6 PHOTOS OF THE EUT





***** End of Report *****