TEST REPORT

Test Report #	23A-003480(A5)	Date of Report Issue:	April 23, 2023
Date of Sample Received:	April 12, 2023	Pages:	Page 1 of 36

CLIENT INFORMATION:

Company:	Mid Ocean Brands B.V.
Address:	7/F, Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong

SAMPLE INFORMATION:

Product Name:	MDF Wood ornament LED light		
Style No.:	CX1527	Labeled Age Grade:	-
Order No.(PO No.):	-	Client Request Age Grade:	-
Country of Origin:	-	Recommended Age Grade:	-
Country of Distribution:	Europe	Tested Age Grade:	-
Composition/Main Material:	MDF		
Testing Period:	04/12/2023-04/18/2023		

OVERALL RESULT: **PASS**

Please refer to the following pages for test result summary and appropriate notes.

QIMA (HANGZHOU) TESTING CO., LTD.

Ada Guo

Ada Guo
Assist Physical Laboratory Manager

Test(s) marked with 'φ' was subcontracted to external laboratory.
The test result(s) and conclusion(s) in this report relate only to the sample(s) as received and method /regulation section(s) tested as described herein. If it is not further specified in the report, the decision rule for stating conformity is based on the QIMA decision rule (https://www.qima.com/conditions-of-service#decisionRule).

TEST RESULTS SUMMARY:

At the request of the client, the following tests were conducted:

CONCLUSION	TEST(S) CONDUCTED
PASS	EN IEC 55015: 2019 + A11: 2020 & EN 61547: 2009-Lighting Equipment (D.C.)-Electromagnetic Compatibility (EMC)$^{\phi}$

Test(s) marked with 'ϕ' was subcontracted to external laboratory.
The test result(s) and conclusion(s) in this report relate only to the sample(s) as received and method /regulation section(s) tested as described herein. If it is not further specified in the report, the decision rule for stating conformity is based on the QIMA decision rule (https://www.qima.com/conditions-of-service#decisionRule).

DETAILED RESULTS:

SYSTEM DESCRIPTION

TEST MODE DESCRIPTION		
NO.	**TEST MODE DESCRIPTION**	**WORST**
1	Lighting mode	V
Note: 1. V means EMI worst mode.		

MEASUREMENT UNCERTAINTY

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in measurement" (GUM) published by ISO.

- Uncertainty of Radiated Emission, Uc = ±3.9 dB

DETAILED RESULTS:

PRODUCT INFORMATION

Housing Type	Plastic and wood
EUT Input Rating	DC 4.5V by battery
Hardware Version	N/A
Software Version	N/A

I/O Port Information (☐Applicable ☒Not Applicable)

I/O Port of EUT			
I/O Port Type	**Number**	**Cable Description**	**Tested With**
--	--	--	--

DETAILED RESULTS:

SUPPORT EQUIPMENT

Device Type	Manufacturer	Model Name	Serial No.	Data Cable	Power Cable
--	--	--	--	--	--

Note:
"-- "means no any support device during testing.

DETAILED RESULTS:

TEST FACILITY

Location	4-5/F A2 BLDG NO. 1213 HUOJU SOUTH ROAD PUYAN STREET BINJIANG DISTRICT HANGZHOU CHINA

DETAILED RESULTS:

TEST EQUIREMENT LIST

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Test Receiver	R&S	ESCI	10096	Feb. 18, 2023	Feb. 17, 2024
Antenna	SCHWARZBECK	VULB9168	494	Jan. 05, 2023	Jan. 04, 2025
Test software	FARA	EZ-EMC	Ver.RA-03A	N/A	N/A

TEST EQUIPMENT OF RADIATED ELECTROMAGNETIC DISTURBANCE TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Triple Loop Antenna	LAPLACE	RF300	9070	Jun. 23, 2022	Jun. 22, 2023
Test Receiver	R&S	ESCI	10096	Feb. 18, 2023	Feb. 17, 2024

TEST EQUIPMENT OF ESD TEST

Description	Manufacturer	Model	S/N	Cal. Date	Cal. Due
ESD Simulator	Schaffner	NSG 438	782	Dec. 30, 2022	Dec. 29, 2023

DETAILED RESULTS:

TEST EQUIPMENT OF RS IMMUNITY TEST

Description	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Signal Generator	R&S	E4421B	MY43351603	Feb. 17, 2023	Feb. 16, 2024
Power Sensor	R&S	URV5-Z4	100124	Apr. 26, 2021	Apr. 25, 2023
Power Meter	R&S	NRVD	8323781027	Apr. 26, 2021	Apr. 25, 2023
Power Amplifier	KALMUS	7100LC	04-02/17-06-001	N/A	N/A
Power Amplifier	Milmega	AS0104-55_55	1004793	N/A	N/A
Antenna	ETS	3142C	00060447	N/A	N/A

TEST EQUIPMENT OF PFMF TEST

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
PFMF system	HTEC	HPFMF	161701	Jun. 23, 2022	Jun. 22, 2023

DETAILED RESULTS:

TEST SUNMMER LIST

Test item	Test Requirement	Test Method	Class/Severity	Result
Conducted emission	EN IEC 55015	EN IEC 55015	0.009MHz -30MHz	N/A
Radiated emission	EN IEC 55015	EN IEC 55015	30MHz -1000MHz	Pass
Radiated electromagnetic disturbance	EN IEC 55015	EN IEC 55015	0.009MHz -30MHz	Pass
Harmonic current emission	EN IEC 61000-3-2	EN IEC 61000-3-2	Class C	N/A
Voltage fluctuations & flicker	EN 61000-3-3	EN 61000-3-3	§5 of EN 61000-3-3	N/A
Electrostatic discharge immunity	EN 61547	EN 61000-4-2	± 8.0 kV (Air Discharge) ± 4.0 kV (Contact Discharge) ± 4.0 kV (Indirect Discharge)	Pass
Radiated electromagnetic field immunity	EN 61547	EN 61000-4-3	3V/m with 80% AM. 1kHz Modulation.	Pass
Electrical fast transient/burst Immunity	EN 61547	EN 61000-4-4	+/- 1kV for Power Supply Lines	N/A
Surge immunity	EN 61547	EN 61000-4-5	>25W +/-1kV (Line to Line) +/-2kV (Line to Ground) <25W +/-0.5kV (Line to Line) +/-1kV (Line to Ground)	N/A
Immunity to Conducted Disturbances Induced by RF fields	EN 61547	EN 61000-4-6	3V with 80% AM. 1 kHz Modulation	N/A
Power frequency magnetic fields	EN 61547	EN 61000-4-8	50/60 Hz, 3A/m	Pass
Voltage dips and short interruptions immunity	EN 61547	EN 61000-4-11	PHASE ANGLE 0, 45, 90, 135, 180,225, 270, 315 degrees	N/A

Note： N/A means not applicable.

DETAILED RESULTS:

EN IEC 55015 RADIATED EMISSION TEST

LIMITS OF RADIATED DISTURBANCES

AT 10M DISTANCES

Frequency (MHz)	Distance (m)	Maximum Field Strength Limit (dBuV/m Q.P.)
30-230	10	30.00
230-1000	10	37.00

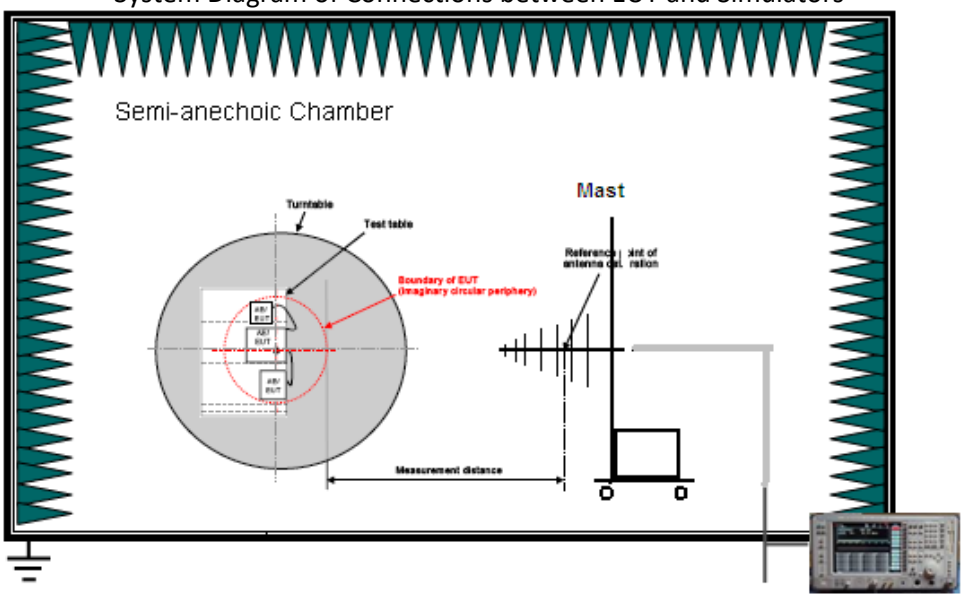
AT 3M DISTANCES

Frequency (MHz)	Distance (m)	Maximum Field Strength Limit (dBuV/m Q.P.)
30-230	3	40.00
230-1000	3	47.00

Note: The lower limit shall apply at the transition frequency.

BLOCK DIAGRAM OF TEST SETUP

System Diagram of Connections between EUT and Simulators



DETAILED RESULTS:

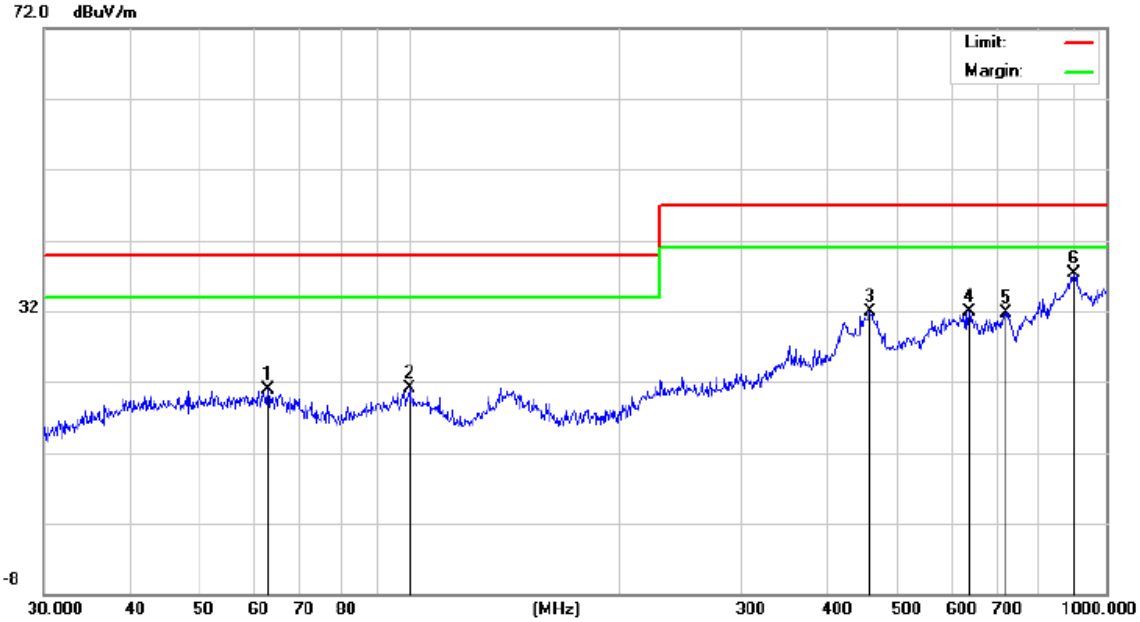
PROCEDURE OF RADIATED EMISSION TEST

(1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane as per EN IEC 55015 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 10cm non-conductive covering to insulate the EUT from the ground plane.
(2) Support equipment, if needed, was placed as per EN IEC 55015.
(3) All I/O cables were positioned to simulate typical actual usage as per EN IEC 55015.
(4) The EUT was turned on.
(5) The antenna was placed at 3 meters away from the EUT as stated in EN IEC 55015. The antenna connected to the Analyzer via a cable and at times a pre-amplifier would be used.
(6) The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
(7) The test mode(s) were scanned during the test:
(8) Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and Q.P./Peak reading is presented.

DETAILED RESULTS:

TEST RESULT OF RADIATED EMISSION TEST

Radiated Emission Test at 3m Distance-Horizontal

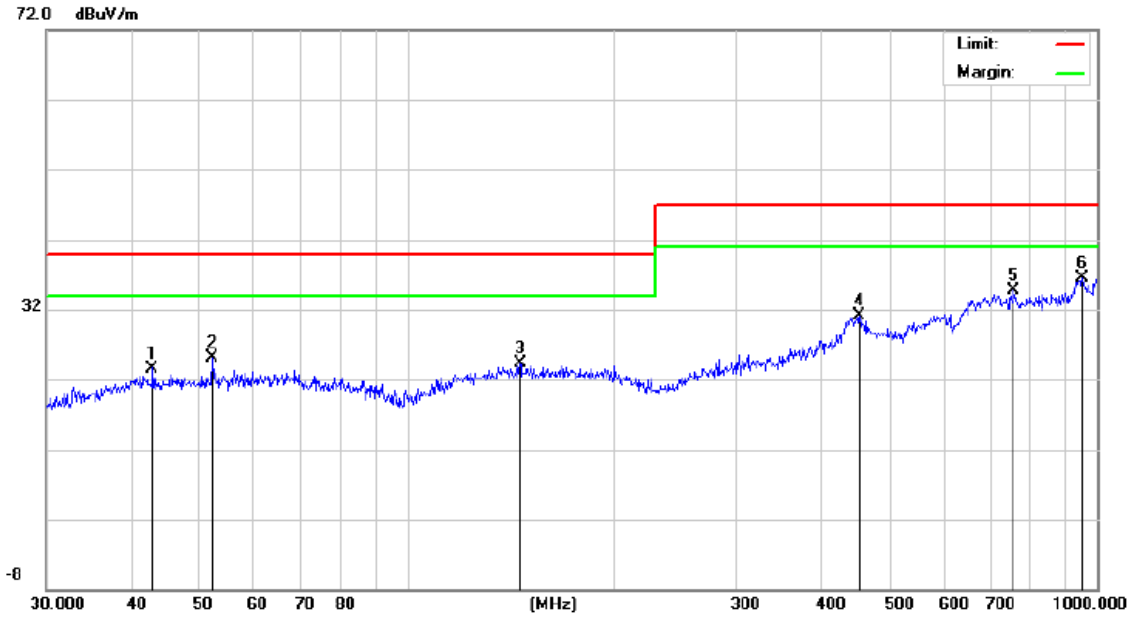


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		62.8708	6.77	14.16	20.93	40.00	-19.07	peak
2		100.2286	5.96	15.16	21.12	40.00	-18.88	peak
3		459.1144	4.62	27.25	31.87	47.00	-15.13	peak
4		636.1340	6.65	25.28	31.93	47.00	-15.07	peak
5		719.1995	5.02	26.69	31.71	47.00	-15.29	peak
6	*	900.1474	5.61	31.78	37.39	47.00	-9.61	peak

RESULT: PASS

DETAILED RESULTS:

Radiated Emission Test at 3m Distance-Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		42.7496	6.67	16.93	23.60	40.00	-16.40	peak
2		52.2079	8.17	17.02	25.19	40.00	-14.81	peak
3		145.8610	6.17	18.20	24.37	40.00	-15.63	peak
4		452.7196	5.53	25.53	31.06	47.00	-15.94	peak
5		758.0407	6.57	28.07	34.64	47.00	-12.36	peak
6	*	952.0937	6.04	30.52	36.56	47.00	-10.44	peak

RESULT: PASS

Note：

Level(dBuV/m)=Reading(dBuV)+Factor(dB/m)

Factor(dB/m)=Antenna Factor(dB/m)+Cable loss(dB)+Attenuation(dB)for Attenuator

Over= Measurement- Limit

DETAILED RESULTS:

EN IEC 55015 RADIATED ELECTROMAGNETIC DISTURBANCE TEST

LIMITS OF RADIATED ELECTROMAGNETIC DISTURBANCE IN THE RANGE 9 KHZ TO 30 MHZ

Frequency Range	Limits for Loop Diameter dB(uA)*		
	2m	3m	4m
9 KHz-70 KHz	88*	81*	75*
70 KHz-150 KHz	88 to 58**	81 to 51**	75 to 45**
150 kHz-3.0 MHz	58 to 22**	51 to 15**	45 to 9**
3.0 MHz-30 MHz	22***	15 to 16***	9 to 12***

Note:

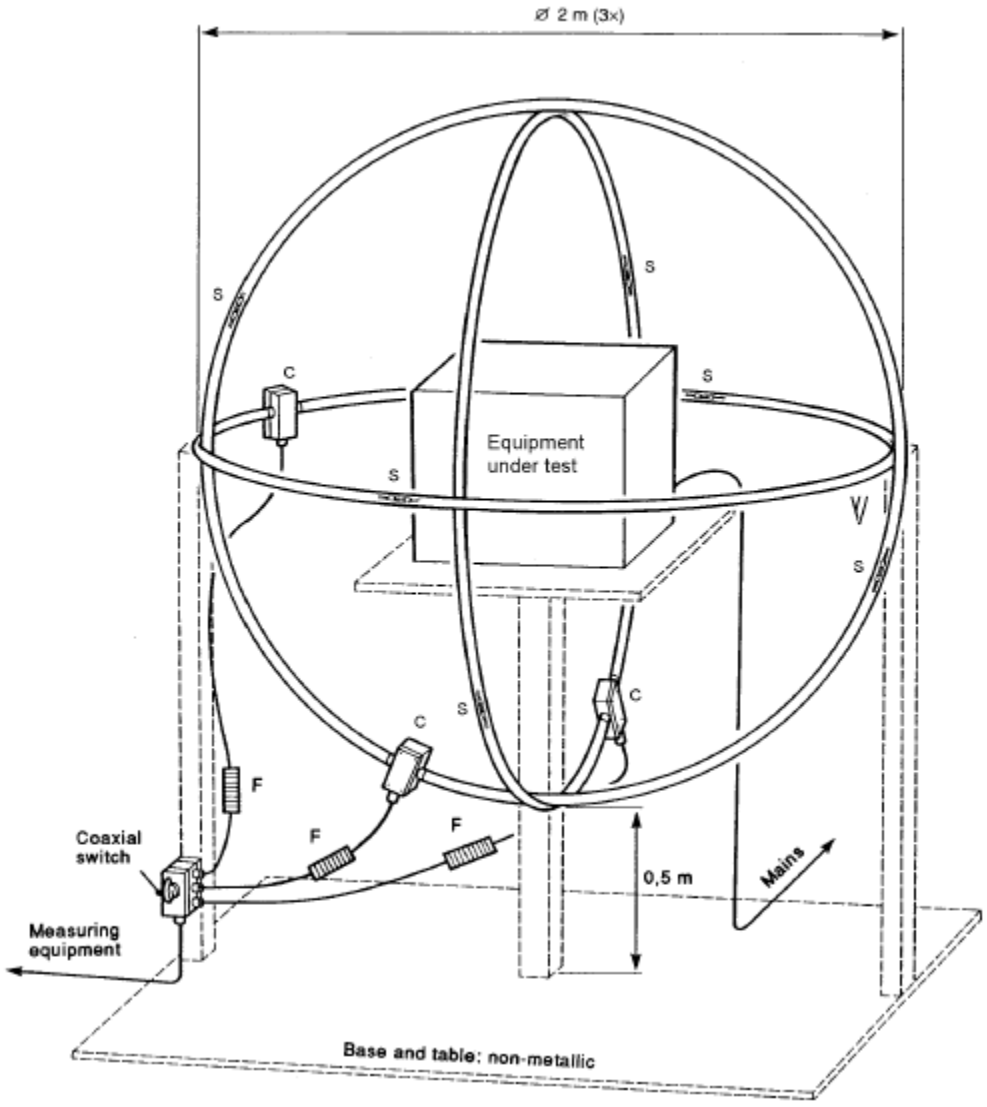
* At the transition frequency, the lower limit applies.

** Decreasing linearly with the logarithm of the frequency. For electrode less lamps and luminaries, the limit in the frequency range of 2.2 MHz to 3.0 MHz is 58 dB(uA) for 2m, 51 dB(uA) for 3m and 45 dB(uA) for 4m loop diameter.

*** Increasing linearly with the logarithm of the frequency.

DETAILED RESULTS:

BLOCK DIAGRAM OF TEST SETUP



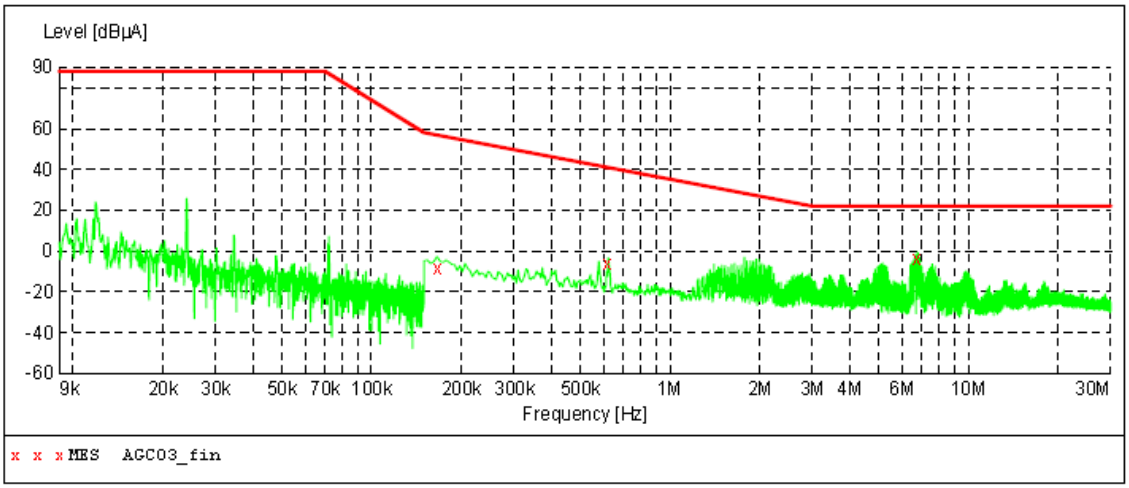
TEST PROCEDURE

The magnetic component shall be measured by means of a loop antenna as described in EN IEC 55015. The lighting equipment shall be placed in the centre of the antenna, and the position is not critical. The test object was operated at its upper limit of its rated voltage and its rated frequency. The induced current in the loop antenna is measured by means of a current probe(1V/A) and the CISPR measuring receiver. By means of a coaxial switch the three field directions can be measured in sequence. Each value shall fulfill the requirements given.

DETAILED RESULTS:

TEST RESULTS OF RADIATED ELECTROMAGNETIC DISTURBANCE

X



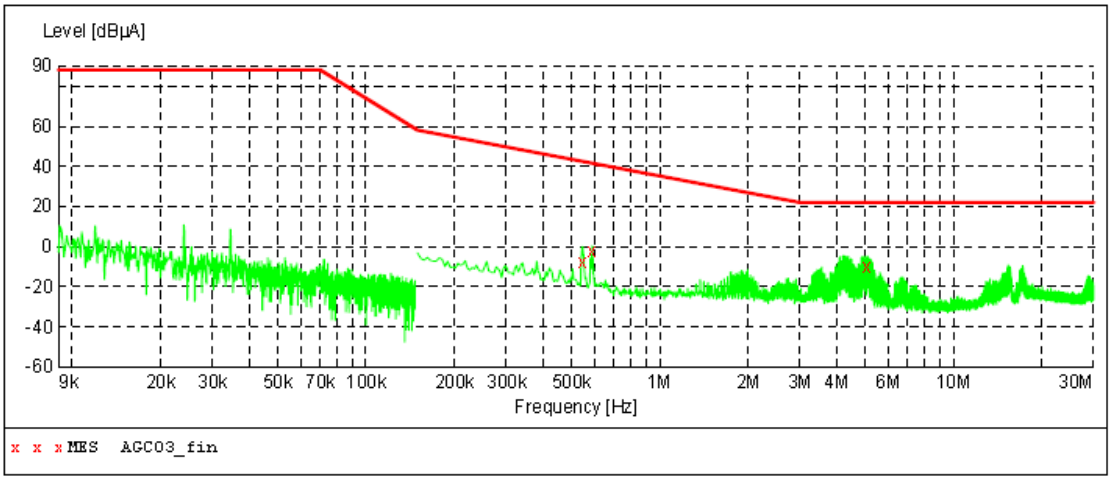
MEASUREMENT RESULT: "AGC03_fin"

Frequency MHz	Level dBµA	Transd dB	Limit dBµA	Margin dB	Det.	Loop
0.166000	-8.80	-13.7	57	65.6	QP	X
0.622000	-6.00	-22.5	41	46.9	QP	X
6.746000	-4.10	-24.9	22	26.1	QP	X

RESULT: PASS

DETAILED RESULTS:

Y



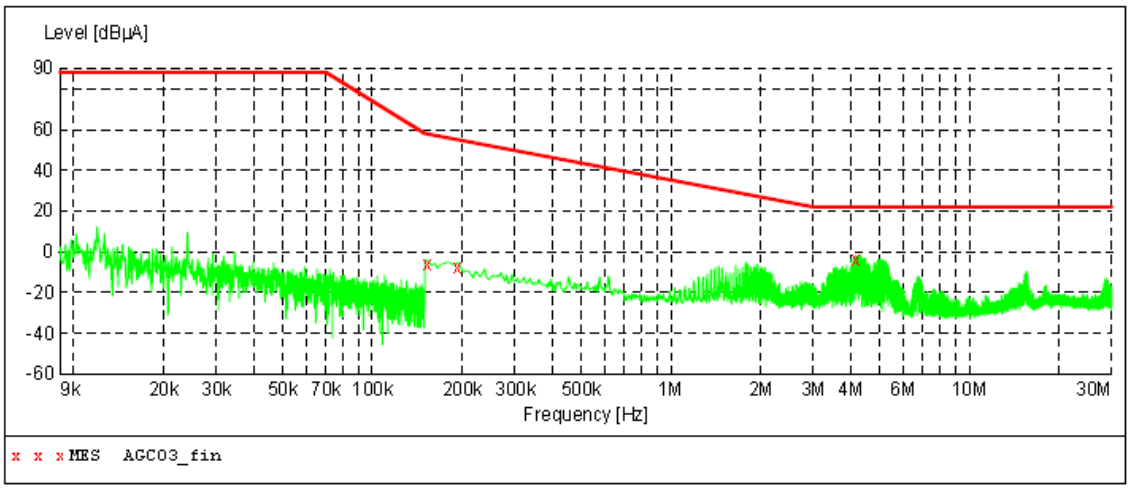
MEASUREMENT RESULT: "AGC03_fin"

Frequency MHz	Level dBµA	Transd dB	Limit dBµA	Margin dB	Det.	Loop
0.546000	-7.30	-21.8	43	49.8	QP	Y
0.590000	-1.90	-22.2	42	43.4	QP	Y
5.094000	-10.20	-25.0	22	32.2	QP	Y

RESULT: PASS

DETAILED RESULTS:

Z



MEASUREMENT RESULT: "AGC03_fin"

Frequency MHz	Level dBµA	Transd dB	Limit dBµA	Margin dB	Det.	Loop
0.154000	-6.00	-13.1	58	63.7	QP	Z
0.194000	-7.90	-15.0	55	62.8	QP	Z
4.166000	-4.10	-25.1	22	26.1	QP	Z

RESULT: PASS

DETAILED RESULTS:

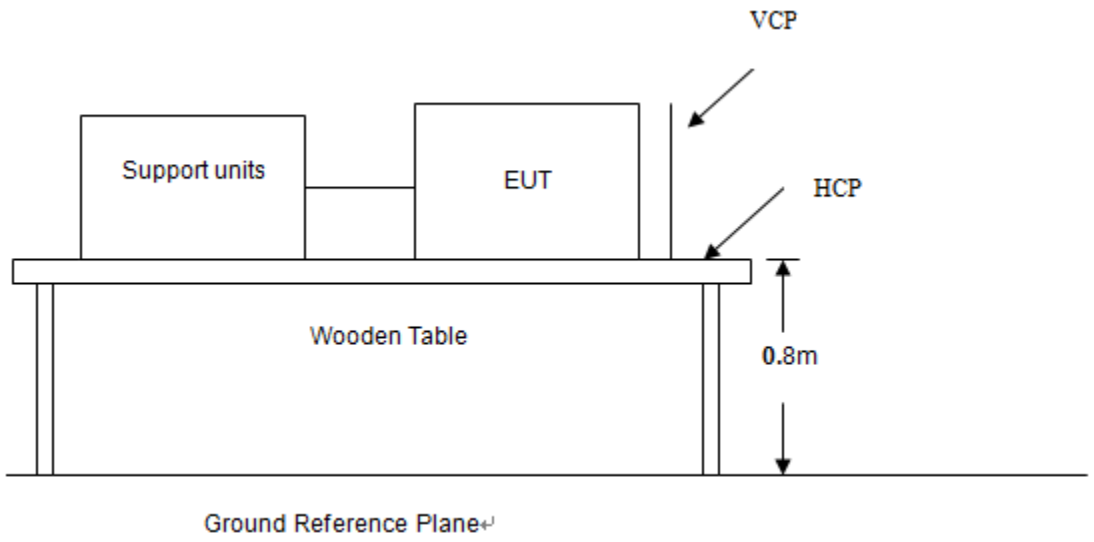
EN 61000-4-2 ESD IMMUNITY TEST

ELECTROMAGENTIC DISCHARGE (ESD) IMMUNITY TEST

Port	Enclosure
Basic Standard	EN 61000-4-2
Test Level	± 8.0 kV (Air Discharge) ± 4.0 kV (Contact Discharge) ± 4.0 kV (Indirect Discharge)
Standard require	B
Temperature	24°C
Humidity	57% RH

BLOCK DIAGRAM OF TEST SETUP

(The 470 k ohm resistors are installed per standard requirement)

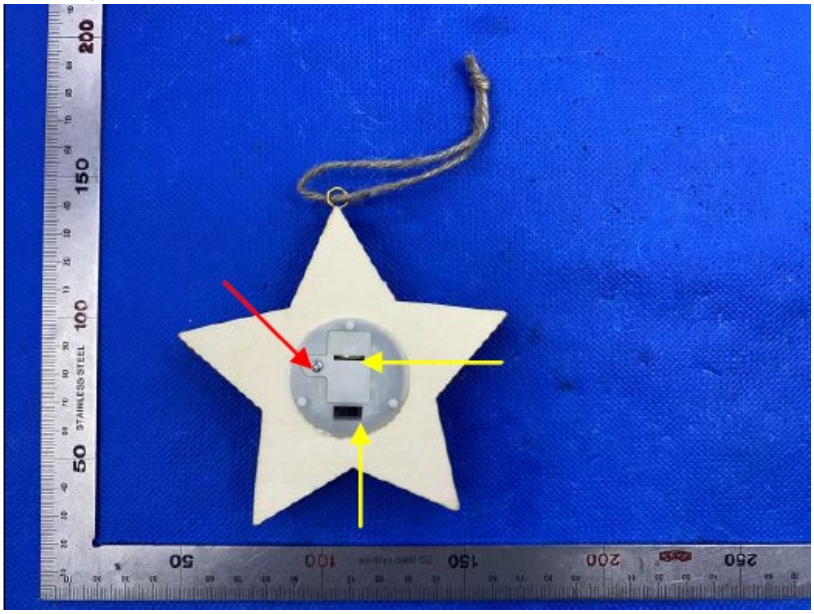


DETAILED RESULTS:

ESD LOCATION:

Yellow line: Air discharge

Red line: Contact discharge



DETAILED RESULTS:

TEST PROCEDURE

The EUT was located 0.1 m minimum from all side of the HCP.
The support units were located 1 m minimum away from the EUT.
EUT worked with resistance load, and make sure EUT worked normally.
Actives the communication function if the EUT with such port(s).
As per the requirement of EN 61547: Contact discharge is the preferred test method, twenty discharges (10 with positive and 10 with negative polarity) shall be applied on each accessible metallic part of the enclosure, terminals are excluded. Air discharges shall be used where contact discharges cannot be applied. Discharges shall be applied on the horizontal or vertical coupling planes as specified in EN 61000-4-2.
The following test condition was followed during the tests.

Note: As per the A2 to EN 61000-4-2, a bleed resistor cable is connected between the EUT and HCP during the test.

The electrostatic discharges were applied as follows:

Voltage	Coupling	Test Performance	Result
± 4kV	Contact Discharge	No function loss	A
± 4kV	Indirect Discharge HCP (Front)	No function loss	A
± 4kV	Indirect Discharge HCP (Left)	No function loss	A
± 4kV	Indirect Discharge HCP (Right)	No function loss	A
± 4kV	Indirect Discharge HCP (Back)	No function loss	A
± 4kV	Indirect Discharge VCP (Front)	No function loss	A
± 4kV	Indirect Discharge VCP (Left)	No function loss	A
± 4kV	Indirect Discharge VCP (Back)	No function loss	A
± 4kV	Indirect Discharge VCP (Right)	No function loss	A
± 8kV	Air Discharge	No function loss	A

DETAILED RESULTS:

PERFORMANCE & RESULT

Criteria A:	The apparatus continues 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. In some cases the performance level may be replaced by a permissible loss of performance.
Criteria B:	The apparatus continues 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. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒PASS ☐FAIL

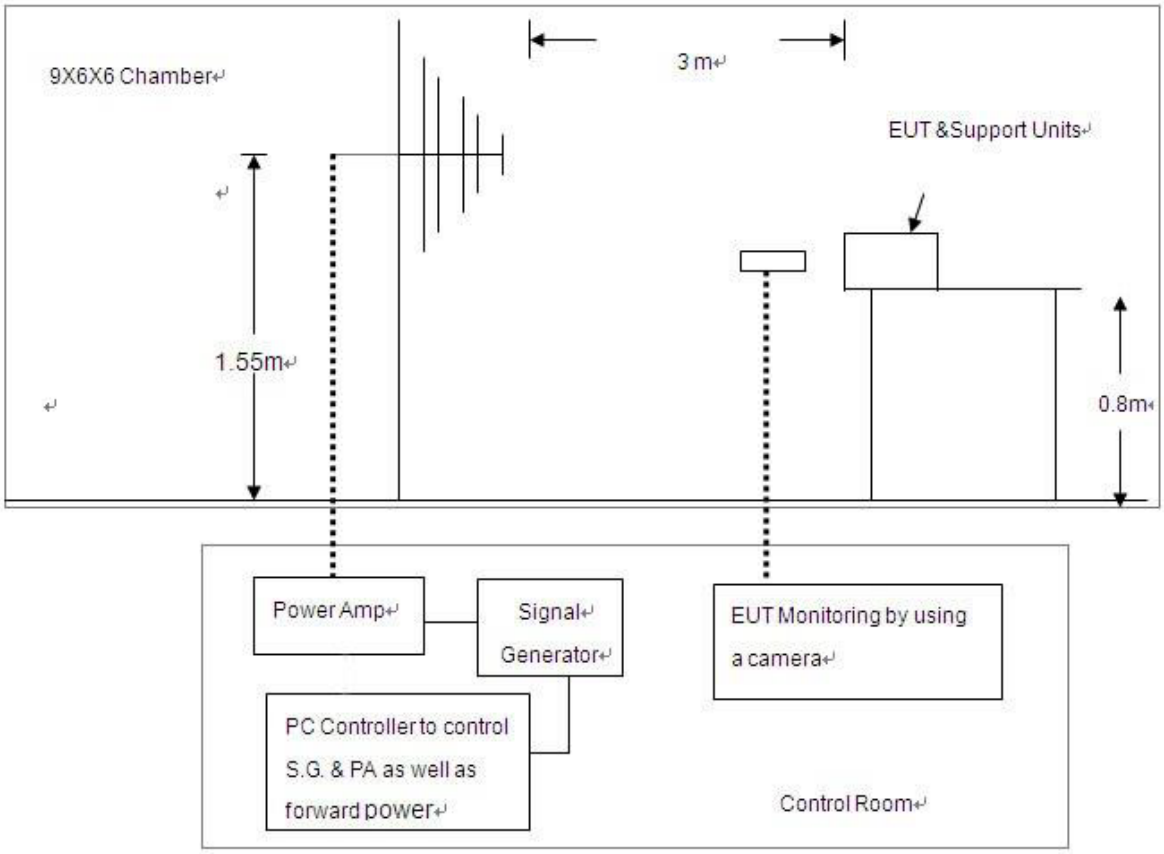
DETAILED RESULTS:

EN 61000-4-3 RS IMMUNITY TEST

RADIATED ELECTROMAGNETIC FIELD IMMUNITY TEST

Port	Enclosure
Basic Standard	EN 61000-4-3
Test Level	3V/m with 80% AM. 1kHz Modulation.
Standard require	A
Temperature	23.4 °C
Humidity	54.9% RH

BLOCK DIAGRAM OF TEST SETUP



DETAILED RESULTS:

TEST PROCEDURE

The EUT was located at the edge of supporting table keep 3 meter away from transmitting antenna, it just the calibrated square area of field uniformity. The support units were located outside of the uniformity area, but the cable(s) connected with EUT were exposed to the calibrated field as per EN 61000-4-3.
EUT worked with resistance load, and make sure EUT worked normally.
Setting the testing parameters of RS test software per EN 61000-4-3.
Performing the test at each side of with specified level (3V/m) at 1% steps and test frequency from 80MHz to 1000MHz.
Recording the test result in following table.

EN 61000-4-3 Final test conditions:
Test level: 3V/m
Steps: 1 % of fundamental
Dwell Time: 1 sec

Range (MHz)	Field	Modulation	Polarity	Position	Test Performance	Result
80-1000	3V/m	AM	H	Front	No function loss	A
80-1000	3V/m	AM	H	Left	No function loss	A
80-1000	3V/m	AM	H	Back	No function loss	A
80-1000	3V/m	AM	H	Right	No function loss	A
80-1000	3V/m	AM	V	Front	No function loss	A
80-1000	3V/m	AM	V	Left	No function loss	A
80-1000	3V/m	AM	V	Back	No function loss	A
80-1000	3V/m	AM	V	Right	No function loss	A

DETAILED RESULTS:

PERFORMANCE & RESULT

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Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒PASS ☐FAIL

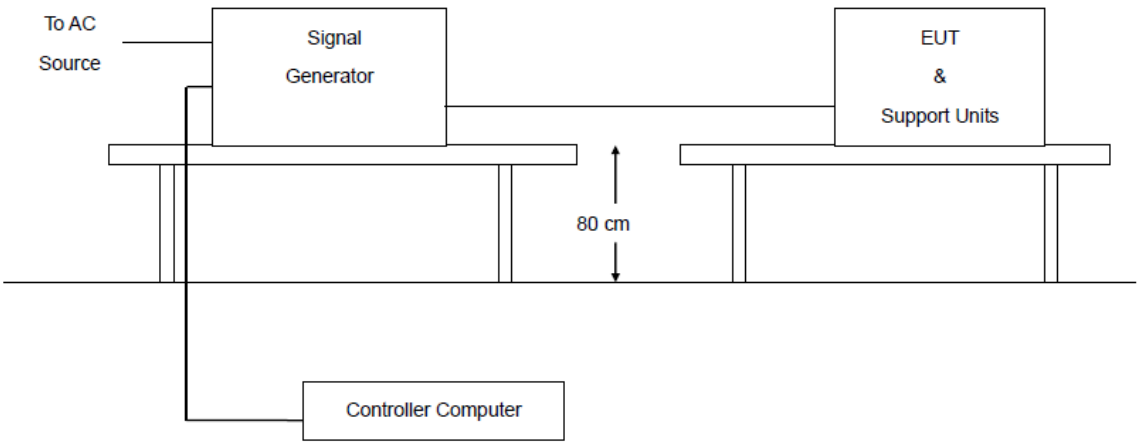
DETAILED RESULTS:

EN 61000-4-8 PFMF TEST

POWER FREQUENCY MAGNETIC FIELDS IMMUNITY TEST

Port	Enclosure
Basic Standard	EN 61000-4-8
Requirements	50/60 Hz, 3A/m
Standard require	A
Temperature	24 °C
Humidity	62% RH

BLOCK DIAGRAM OF TEST SETUP



DETAILED RESULTS:

TEST PROCEDURE

The EUT shall be subjected to the test magnetic field by using the induction coil of standard dimensions(1m × 1m). The induction coil shall then be rotated by 90° in order to expose the EUT to the test field with different orientations.

Test Condition:

Frequency	Polarity	Level	Test Performance	Performance Result
50 Hz	X	3 A/m	No function loss	A
50 Hz	Y	3 A/m	No function loss	A
50 Hz	Z	3 A/m	No function loss	A

PERFORMANCE & RESULT

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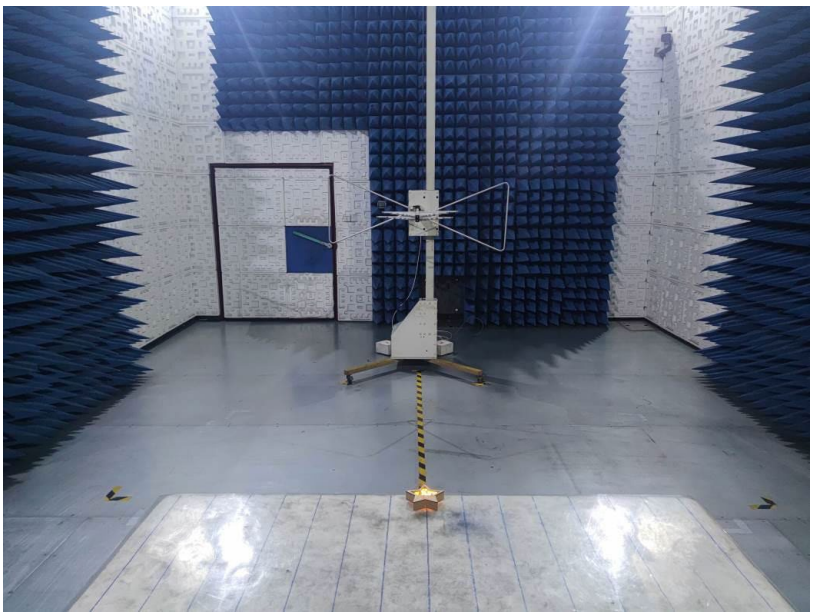
Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

☒PASS ☐FAIL

PHOTOGRAPHS OF TEST SETUP

EN IEC 55015 RADIATED EMISSION TEST SETUP

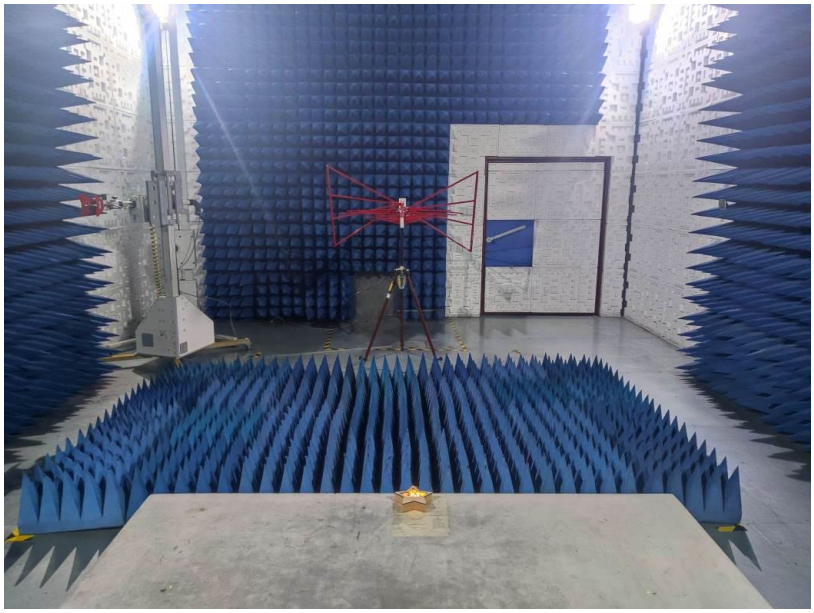


EN IEC 55015 RADIATED ELECTROMAGNETIC DISTURBANCE TEST SETUP

PHOTOGRAPHS OF TEST SETUP

EN 61000-4-2 ESD IMMUNITY TEST SETUP

EN 61000-4-3 RS IMMUNITY TEST SETUP

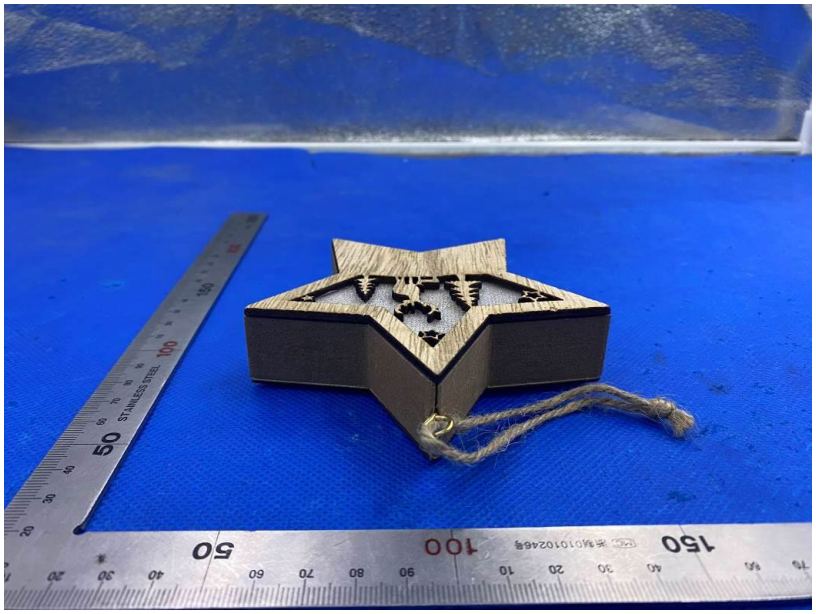


PHOTOGRAPHS OF TEST SETUP

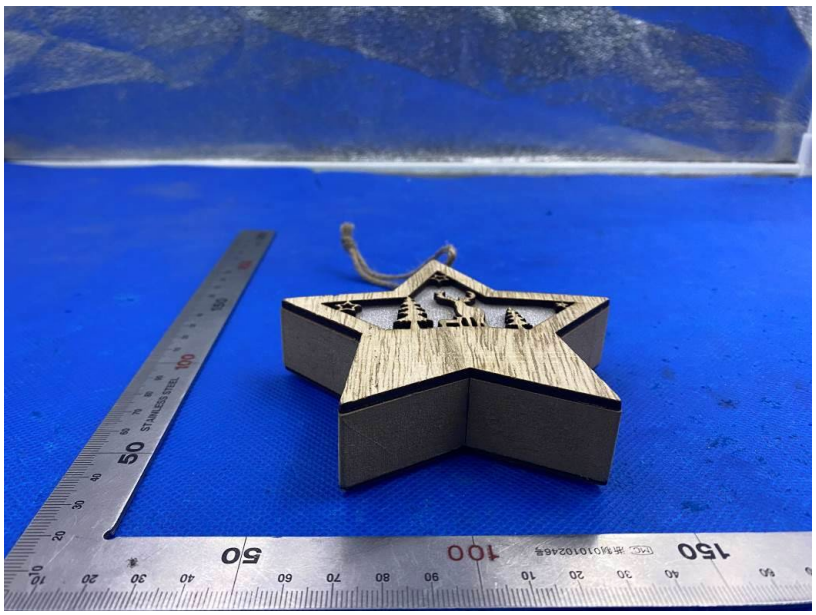
EN 61000-4-8 PFMF TEST SETUP

PHOTOGRAPHS OF EUT

TOP VIEW OF EUT



BOTTOM VIEW OF EUT



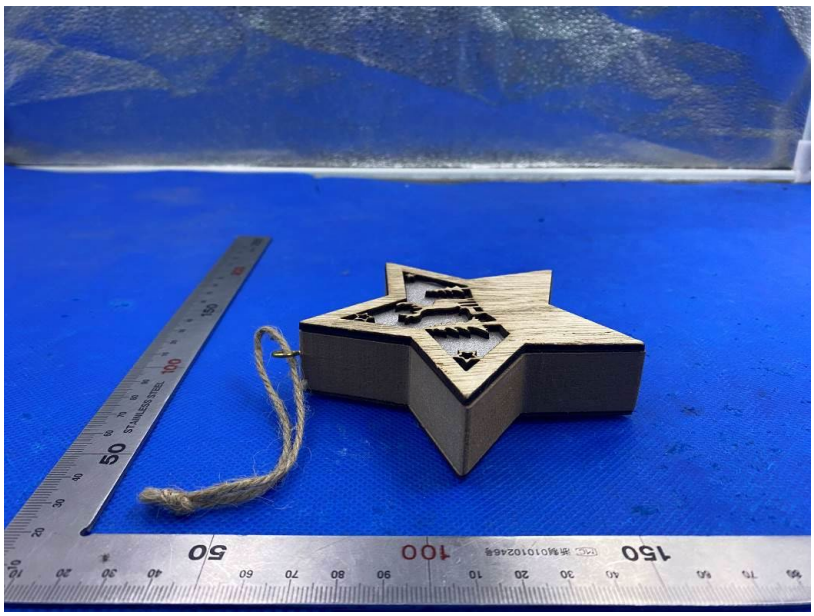
PHOTOGRAPHS OF EUT

FRONT VIEW OF EUT

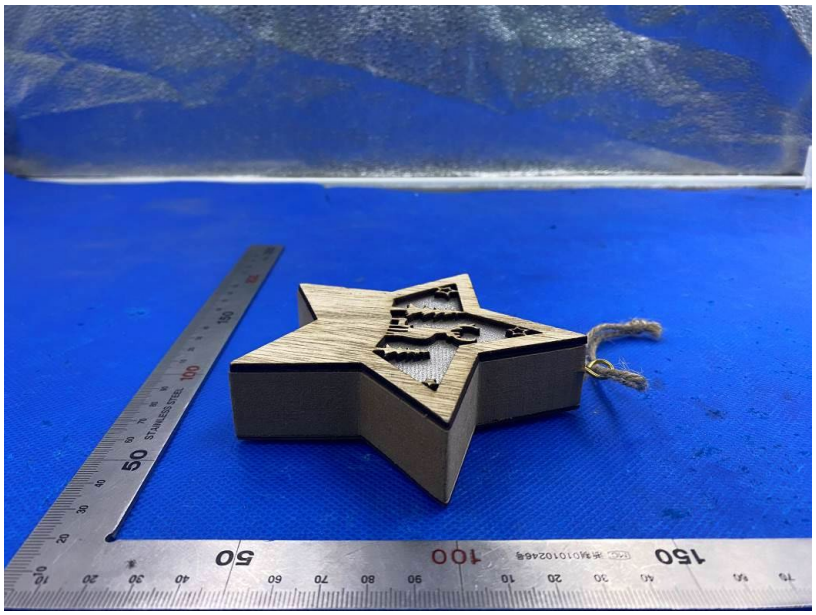
BACK VIEW OF EUT

PHOTOGRAPHS OF EUT

LEFT VIEW OF EUT



RIGHT VIEW OF EUT



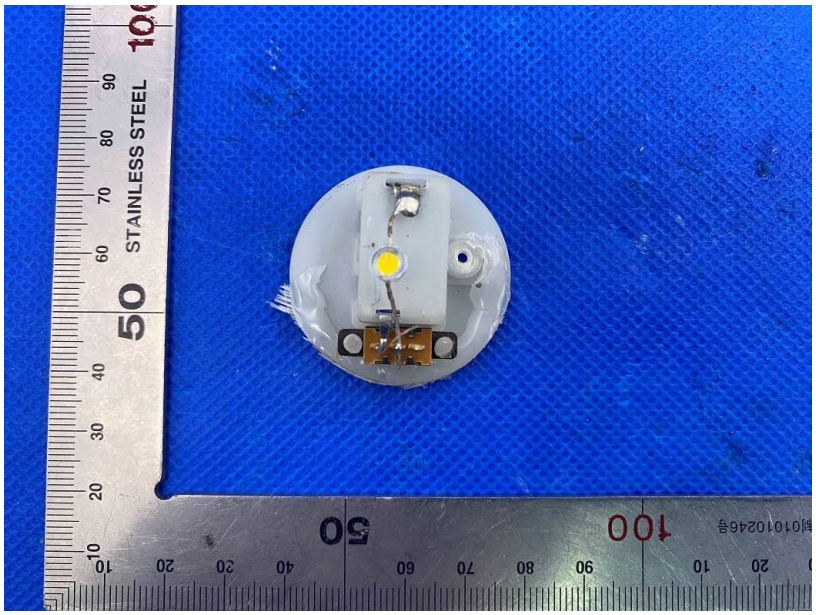
PHOTOGRAPHS OF EUT

OPEN VIEW OF EUT-1

OPEN VIEW OF EUT-2

PHOTOGRAPHS OF EUT

INTERNAL VIEW OF EUT



SAMPLE PHOTO:

-End Report-