



EUROFINS PRODUCT TESTING SERVICE (SHANGHAI) CO., LTD

EMC TEST- REPORT

TEST REPORT NUMBER: EFSH18090273-IE-01-E01



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Page 1 of 18

TABLE OF CONTENTS

1 Contents

1	Contents	2
2	General Information	3
2.1	Notes	3
2.2	Testing laboratory	4
2.3	Details of approval holder	5
2.4	Application details	5
2.5	EUT Information	5
2.6	Test standards	5
3	Technical test	6
3.1	Summary of test results	6
3.2	Test environment	6
3.3	Test mode	6
3.4	Test equipment utilized	7
3.5	Test results	8
4	Emission Test	9
4.1	Radiated emission	9
5	Immunity Test	12
5.1	Performance Criteria Description in Clause 7 of EN 55024	12
5.2	ESD	13
5.3	Continuous radiated disturbances	14
6	Test Setup Photos	15
7	EUT Photos	17

2 General Information

2.1 Notes

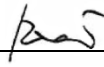
The results of this test report relate exclusively to the item tested as specified in chapter "Description of test item" and are not transferable to any other test items.

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Operator:

2018-09-18		Perry Li / Testing Engineer	
Date	Eurofins-Lab.	Name / Title	Signature

Technical responsibility for area of testing:

2018-09-18		Stefan Zhao / Project Engineer	
Date	Eurofins	Name / Title	Signature

Test Report No.: EFSH18090273-IE-01-E01

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2.2 Testing laboratory

Eurofins Product Testing Service (Shanghai) Co., Ltd.
No.395 West Jiangchang Road, Jing'an District, Shanghai, 200436, P.R. China
Telephone : +86-21-61819181
Telefax : +86-21-61819180

Test location, where different:

Subcontractor	
Name	: Jiangsu Product Quality Testing & Inspection Institute- National Quality Supervision And Testing Center For Information Network Products
Address	: No.1368, Wuzhong Avenue, Suzhou, Jiangsu, China
Telephone	: + 86-025-84470214
Fax	: + 86-025-84470260

Radiated emission and radiated immunity tests were performed at Jiangsu Product Quality Testing & Inspection Institute-National Quality Supervision And Testing Center For Information Network Products.

2.3 Details of approval holder

Name : Xindao B.V.
Address : P.O. Box 3082, 2280 GB, Rijswijk, The Netherlands
Telephone : ./.
Fax : ./.

2.4 Application details

Date of receipt of application : 2018-09-05
Date of receipt of test item : 2018-09-05
Date of test : 2018-09-05 to 2018-09-18

2.5 EUT Information

Product type : Solar panel power hiking backpack
Model name : P762.38
Brand name : ./.
Serial number : ./.
Ratings : USB Output: 5V/1A max. x2
Additional information : The product is a Solar panel power, to transfer solar power to USB output.

2.6 Test standards

Technical standard :

EN 55032:2015

EN 55024:2010+A1:2015

3 Technical test

3.1 Summary of test results

No deviations from the technical specification(s) were ascertained in the course of the tests performed.



or

The deviations as specified were ascertained in the course of the tests performed.



3.2 Test environment

Eurofins Product Testing Service (Shanghai) Co., Ltd.

Temperature	:	20	...	25°C
Relative humidity content	:	30	...	60%
Air pressure	:	100	...	103kPa

Jiangsu Product Quality Testing & Inspection Institute-National Quality Supervision And Testing Center For Information Network Products.

Temperature	:	24°C
Relative humidity content	:	41%
Air pressure	:	101kPa

3.3 Test mode

Operating

3.4 Test equipment utilized

Measurement Equipment List				
No.	Name	Model	Manufacturer	Cal. due date
1	ESD Gun	NSG 437	TESEQ	2019-07-11
2	EMI test receiver	ESU26	R&S	2018-10-08
3	Broadband Antenna	VULB 9163	Schwarzbeck	2019-06-08
4	Amplifier	SCU03	HKM	2018-10-09
5	Signal Generator	SMB 100A	R&S	2018-10-08
6	Power meter	NRP2	R&S	2018-10-15
7	Power Amplifier	80RF1000-1000	MILMEGA	2018-10-15
8	Power Amplifier	AS0104-400/200	MILMEGA	2018-10-15
9	Logarithmic Periodic Antenna	HL046E	R&S	N/A

3.5 Test results

☒ 1st test

☐ test after modification

☐ production test

Test case	Sub clause	Required	Test passed	Test failed
Radiated emission	Annex A of EN 55032	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Conducted emission	Annex A of EN 55032	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Harmonics current emission	EN 61000-3-2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Voltage changes, voltage fluctuations and flicker	EN 61000-3-3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electrostatic discharge	Clause 4.2.1 of EN 55024 & IEC 61000-4-2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Electrical fast transients(EFT)	Clause 4.2.2 of EN 55024 & IEC 61000-4-4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Continuous radio frequency disturbances	Clause 4.2.3.2 of EN 55024 & IEC 61000-4-3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Continuous conducted disturbances	Clause 4.2.3.3 of EN 55024 & IEC 61000-4-6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Power-frequency magnetic fields	Clause 4.2.4 of EN 55024 & IEC 61000-4-8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Surges	Clause 4.2.5 of EN 55024 & IEC 61000-4-5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Voltage dips and interruptions	Clause 4.2.6 of EN 55024 & IEC 61000-4-11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note 1: The highest frequency of the internal sources of this EUT is less than 108 MHz, the radiated emission measurement shall only be made up to 1 GHz.

Note 2: Power frequency magnetic fields test was not required as the EUT did not contained components susceptible to magnetic fields.

Test Report No.: EFSH18090273-IE-01-E01

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4 Emission Test

4.1 Radiated emission

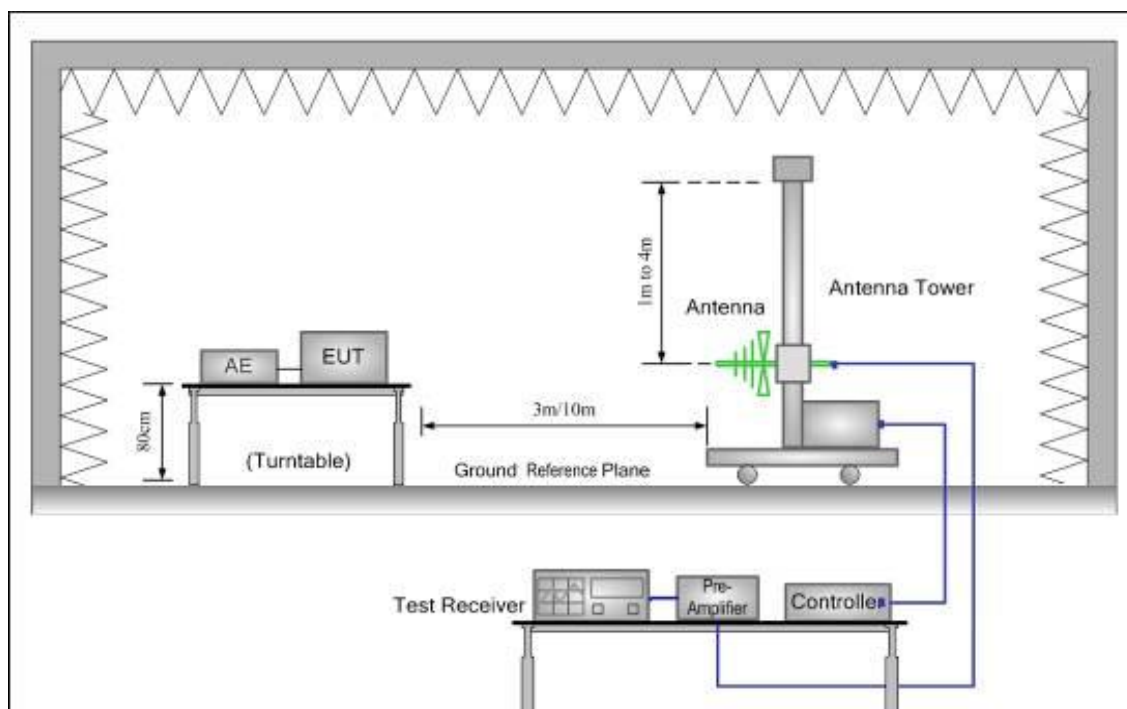
This clause lays down the general requirements for the measurement of Radiated disturbance produced at the space of apparatus.

4.1.1 Limits

Frequency range	Quasi-peak limits at 10m	Quasi-peak limits at 3m
MHz	dB ($\mu\text{V/m}$)	dB ($\mu\text{V/m}$)
30 to 230	30	40
230 to 1000	37	47

At transitional frequencies the lower limit applies.

4.1.2 Measurement procedure



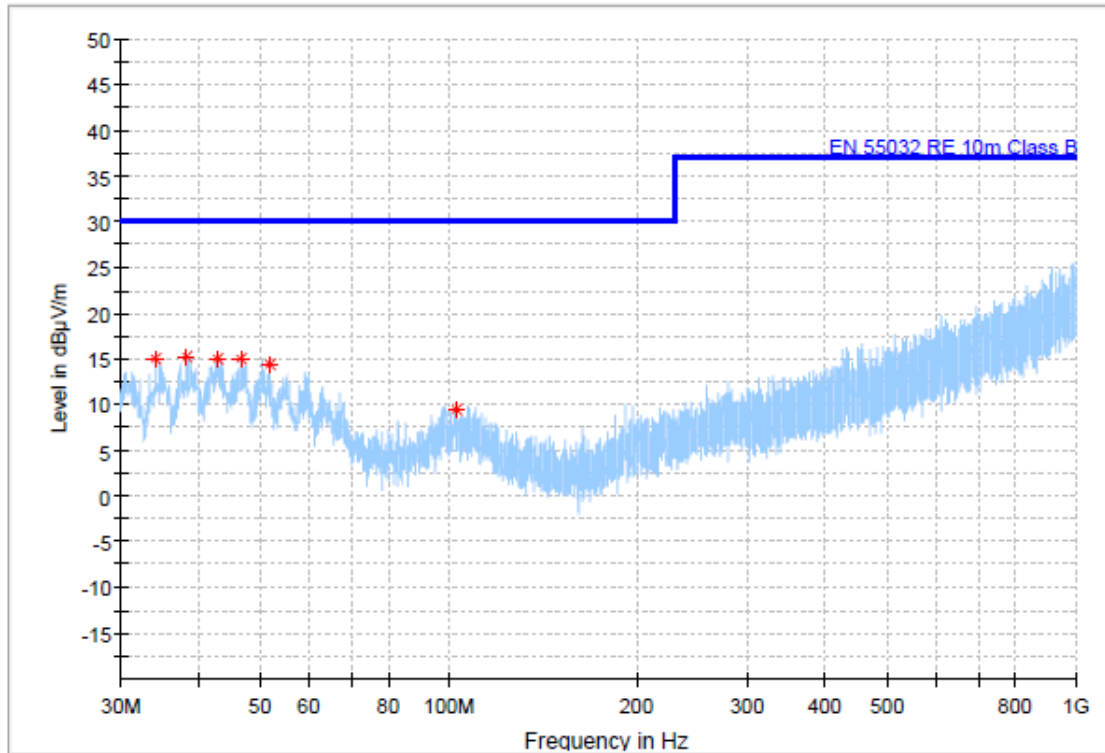
1. The radiated emissions test was conducted in a 10m semi-anechoic chamber. The EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
2. The frequencies of maximum emission were determined in the final radiated emissions measurement, the physical arrangement of the test system and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization. Test was performed on subcontractor.

4.1.3 Measurement uncertainty

U_{lab(cond)} = 3.80dB at 95% level of confidence, k=2

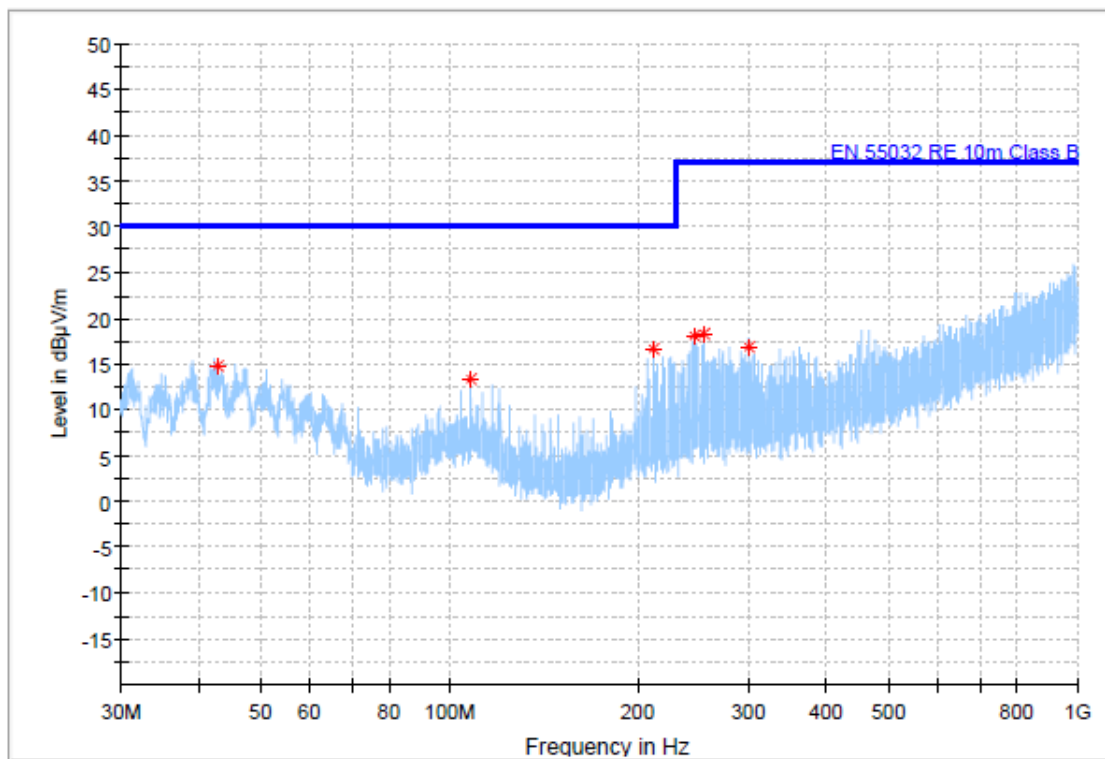
4.1.4 Results

Horizontal Level



Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
34.122500	15.08	30.00	14.92	---	---	100.0	H	90.0	-24.0
38.293500	15.14	30.00	14.86	---	---	100.0	H	90.0	-22.8
42.949500	14.95	30.00	15.05	---	---	200.0	H	90.0	-21.7
46.635500	15.00	30.00	15.00	---	---	100.0	H	180.0	-21.4
51.873500	14.48	30.00	15.52	---	---	200.0	H	0.0	-21.6
103.138000	9.44	30.00	20.56	---	---	100.0	H	180.0	-22.8

Vertical Level



Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
42.901000	14.78	30.00	15.22	---	---	200.0	V	270.0	-21.7
108.521500	13.27	30.00	16.73	---	---	200.0	V	0.0	-22.6
210.905000	16.56	30.00	13.44	---	---	200.0	V	270.0	-22.4
245.728000	18.12	37.00	18.88	---	---	100.0	V	270.0	-21.1
253.924500	18.39	37.00	18.61	---	---	100.0	V	270.0	-21.0
299.805500	16.87	37.00	20.13	---	---	100.0	V	180.0	-18.9

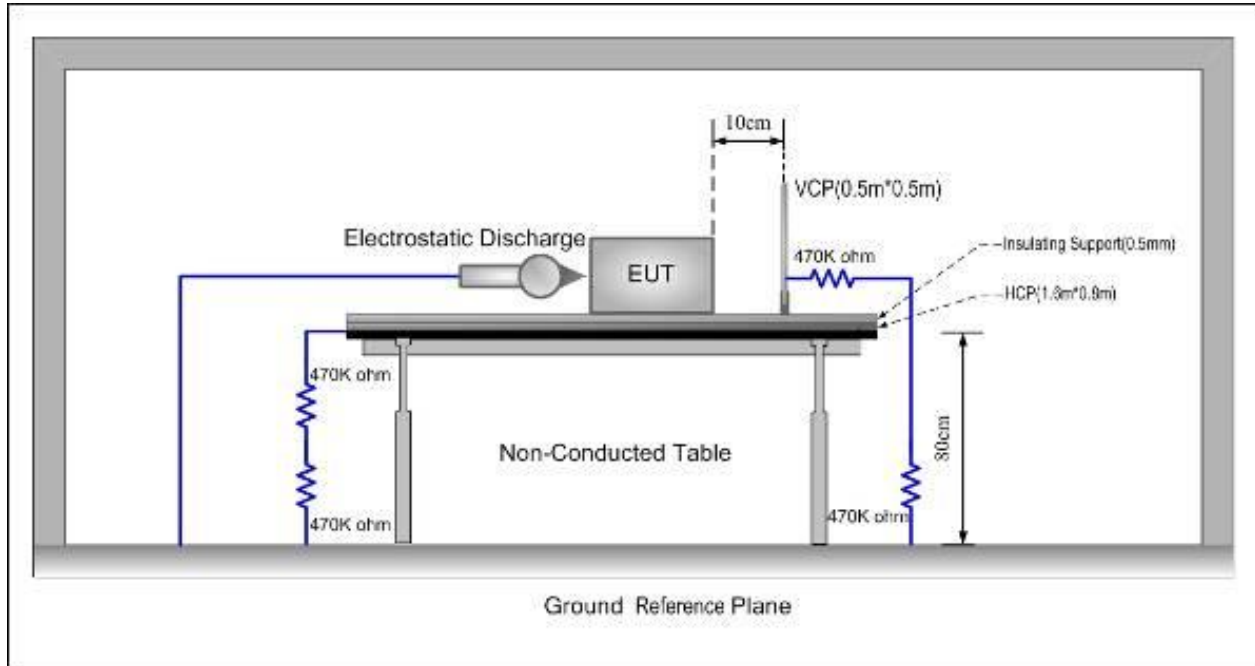
5 Immunity Test

5.1 Performance Criteria Description in Clause 7 of EN 55024

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

5.2 ESD

5.2.1 Test Procedures



1. Contact discharge was applied only to conductive surfaces of the EUT. Air discharge was applied only to non-conducted surfaces of the EUT.
2. The EUT was put on a 0.8m high wooden table for table-top equipment or 0.1m high for floor standing equipment standing on the ground reference plane (GRP).
3. A horizontal coupling plane(HCP) 1.6m by 0.8m in size was placed on the table, and the EUT with its cables were isolated from the HCP by an insulating support thick than 0.5mm. The VCP 0.5m by 0.5m in size while HCP were constructed from the same material type and thickness as that of the GRP, and connected to the GRP via a 470kΩ resistor at each end. The distance between EUT and any of the other metallic surface excepted the GRP, HCP and VCP was greater than 1m.
4. During the contact discharges, the tip of the discharge electrode was touch the EUT before the discharge switch is operated. During the air discharges, the round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT. After each discharge, the ESD generator was removed from the EUT, the generator is then retriggered for a new single discharge. For ungrounded product, a discharge cable with two resistances were used after each discharge to remove remnant electrostatic voltage. 10 times of each polarity single discharge were applied to HCP and VCP.

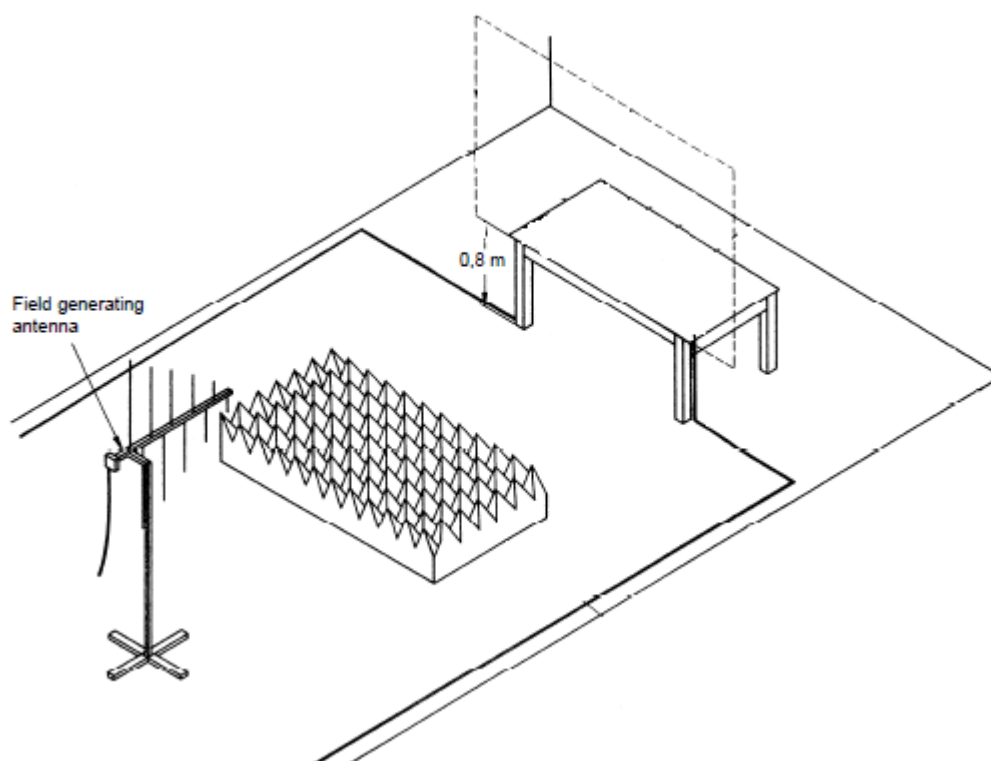
5.2.2 Results

Test point	Table (T) Floor (F)	Contact (C) Air (A)	Voltage (kV)	Number of discharge	Polarity (+ / -)	Opinion
Air discharge	T	A	±2, ±4, ±8	25 of each polarity	+ / -	N/A
Contact discharge	T	C	±2, ±4	25 of each polarity	+ / -	A
HCP	T	C	±2, ±4	25 of each polarity	+ / -	A
VCP	T	C	±2, ±4	25 of each polarity	+ / -	A

A: no loss of function.

5.3 Continuous radiated disturbances

5.3.1 Measurement procedure



1. The EUT was placed on 0.8m high wooden table for table-top equipment. For floor standing equipment, the EUT was placed on a 0.1m high wooden support above the GRP. The tests normally shall be performed with the generating antenna facing each of four sides of the EUT. When equipment can be used in different orientations (e.g. vertical or horizontal) the test shall be performed on all possible sides of the EUT.
2. The tests are carried out with a field strength by 3 V/m (measured in the unmodulated field) with amplitude modulated signal by a depth of 80 % by a sinusoidal audio signal of 1 kHz. The logarithmic step was 1% and the dwell time was 3s dependent of the EUT cycle time. Test was performed on subcontractor.

5.3.2 Results

Frequency Range	Field Strength	Modulation	Antenna Polarity	Opinion
80MHz-1GHz	3V/m	80% AM 1kHz	Horizontal	A
80MHz-1GHz	3V/m	80% AM 1kHz	Vertical	A

A: no loss of function.

6 Test Setup Photos

Radiated disturbance



ESD



Radio frequency electromagnetic fields

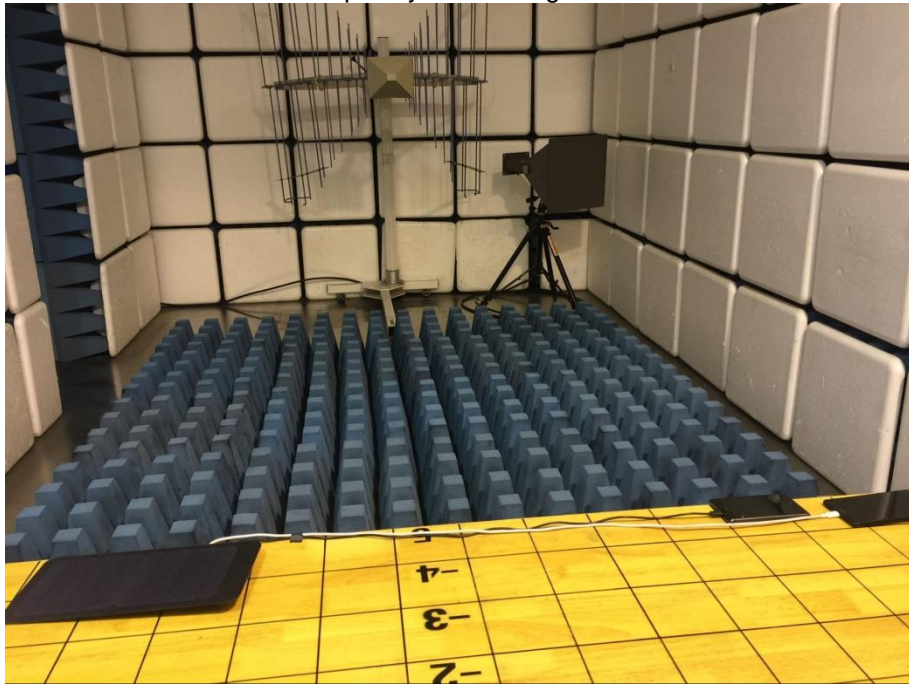


Photo 1: Overall view

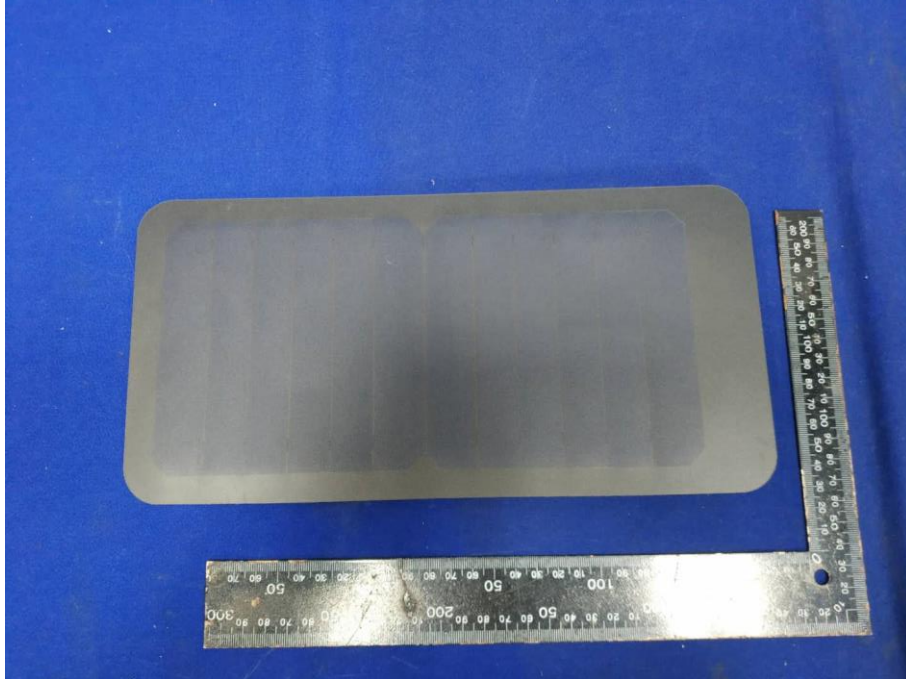


Photo 2: Bottom view



Photo 3: PCB view

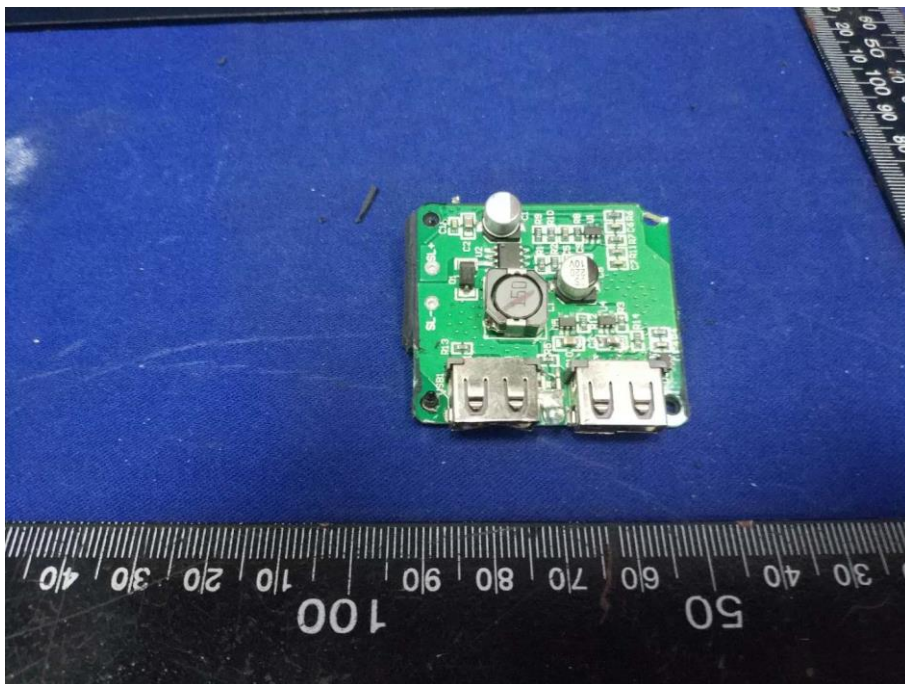


Photo 4: PCB view

