

TEST REPORT

Test Report # 23D-000634(A1) Date of Report Issue: November 20, 2023
Date of Sample Received: July 12, 2023 Pages: Page 1 of 28

08CLIENT INFORMATION:

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



SAMPLE INFORMATION:

Description:	Solar Backpack	
Assortment:	-	Purchase Order Number: -
SKU/Style/UPC No.:	MO9640	Toy Co./Agency: -
Factory/Supplier/Vendor:	-	Buyer: -
Country of Origin:	-	Labeled Age Grade: -
Country of Distribution:	Europe	Recommended Age Grade: -
Quantity Submitted:	2 pcs + 5 lot parts	Tested Age Grade: -
Testing Period:	07/14/2023 – 08/07/2023 08/08/2023 – 08/10/2023 08/16/2023 – 08/23/2023 09/25/2023 – 09/28/2023 10/19/2023 – 10/23/2023 11/10/2023 – 11/13/2023 11/15/2023 – 11/16/2023	Materials: Polyester
	Vendor code:	118518

OVERALL RESULT:

PASS

Refer to page 3 for test result summary and appropriate notes.

TEST REPORT

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Pages: Page 2 of 28

QIMA Hansecontrol Testing Service (Dongguan)
Co. Ltd.



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Alex Ye
Supervisor, Textile & Footwear Laboratory

TEST RESULTS SUMMARY:

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

CONCLUSION	TEST(S) CONDUCTED
PASS	Directive 2011/65/EU and its amendment Directive (EU) 2015/863, Restriction of the Use of Certain Hazardous Substances (RoHS), Phthalates Content (DBP, BBP, DEHP, DIBP)
PASS	Directive 2011/65/EU and amendments, Restriction of the Use of Certain Hazardous Substances in Electrical and electronic equipment (RoHS)
PASS	Regulation (EC) No. 1907/2006 REACH Annex XVII, Item 43 Azocolorants in Textiles
PASS	Regulation (EC) No. 1907/2006 REACH Annex XVII as Amended, Item 51 and 52 Phthalates – Mouthable (DBP, BBP, DEHP, DIBP, DnOP, DINP, DIDP)
PASS	Regulation (EC) No. 1907/2006 REACH Annex XVII, Item 50 Polycyclic Aromatic Hydrocarbon (PAH)
PASS	Regulation (EC) No. 1907/2006 REACH Annex XVII, Item 23 Cadmium in Substrate Materials
PASS	Regulation (EC) No. 1907/2006 REACH Annex XVII, Item 63 Lead in Substrate Materials
PASS	EN IEC 61000-6-1:2019, EN IEC 61000-6-3:2021 Electromagnetic compatibility (EMC) ^ϕ
PASS	ISO 105-X12-Textiles-Color fastness to Rubbing

Appendix I attached.

DETAILED RESULTS:**Directive 2011/65/EU and its amendment Directive (EU) 2015/863, Restriction of the Use of Certain Hazardous Substances (RoHS), Phthalates Content (DBP, BBP, DEHP, DIBP)**

Test Method: IEC 62321-8:2017

Test Instrument: Gas Chromatography with Mass Spectrometry

Specimen No.		11+12+13	14+15+16	17+18+19	20+21+22	Limit (% w/w)
Test Item	CAS No.	Result (% w/w)	Result (% w/w)	Result (% w/w)	Result (% w/w)	
Dibutyl phthalate (DBP)	84-74-2	ND	ND	ND	ND	0.1
Benzyl butyl phthalate (BBP)	85-68-7	ND	ND	ND	ND	0.1
Di-(2-ethylhexyl) phthalate (DEHP)	117-81-7	ND	ND	ND	ND	0.1
Diisobutyl phthalate (DIBP)	84-69-5	ND	ND	ND	ND	0.1
Conclusion		PASS	PASS	PASS	PASS	

Specimen No.		23+24	37+38+39	40+41+42	43+44+45	Limit (% w/w)
Test Item	CAS No.	Result (% w/w)	Result (% w/w)	Result (% w/w)	Result (% w/w)	
Dibutyl phthalate (DBP)	84-74-2	ND	ND	ND	0.02	0.1
Benzyl butyl phthalate (BBP)	85-68-7	ND	ND	ND	ND	0.1
Di-(2-ethylhexyl) phthalate (DEHP)	117-81-7	ND	ND	ND	ND	0.1
Diisobutyl phthalate (DIBP)	84-69-5	ND	ND	ND	ND	0.1
Conclusion		PASS	PASS	PASS	PASS	

Note:

% w/w = Percent by weight

LT = Less than

ND = Not detected (Reporting Limit = 0.015 % w/w)

Composite results are based on specimen of least mass resulting in highest potential concentration.

Remark:

By client's request, selected components were tested.

DETAILED RESULTS:**Directive 2011/65/EU and its amendment Directive (EU) 2015/863, Restriction of the Use of Certain Hazardous Substances (RoHS), Phthalates Content (DBP, BBP, DEHP, DIBP)**

Test Method: IEC 62321-8:2017
 Test Instrument: Gas Chromatography with Mass Spectrometry

Specimen No.		50+51	52+53	56+57+58	---	Limit (% w/w)
Test Item	CAS No.	Result (% w/w)	Result (% w/w)	Result (% w/w)	Result (% w/w)	
Dibutyl phthalate (DBP)	84-74-2	ND	ND	ND	---	0.1
Benzyl butyl phthalate (BBP)	85-68-7	ND	ND	ND	---	0.1
Di-(2-ethylhexyl) phthalate (DEHP)	117-81-7	ND	ND	ND	---	0.1
Diisobutyl phthalate (DIBP)	84-69-5	ND	ND	ND	---	0.1
Conclusion		PASS	PASS	PASS	---	

Note:

% w/w = Percent by weight

LT = Less than

ND = Not detected (Reporting Limit = 0.015 % w/w)

Composite results are based on specimen of least mass resulting in highest potential concentration.

DETAILED RESULTS:

Directive 2011/65/EU and amendments, Restriction of the Use of Certain Hazardous Substances in Electrical and electronic equipment (RoHS)

Test Method: IEC 62321-3-1:2013 for Cadmium, Lead, Mercury, Chromium and Bromine by XRF
 IEC 62321-4:2013/AMD1:2017 for Mercury by ICP-OES
 IEC 62321-5:2013 for Lead, Cadmium and Chromium by ICP-OES
 IEC 62321-6:2015 for PBBs and PBDEs by GC-MS
 IEC 62321-7-1:2015, IEC62321-7-2:2017 for Hexavalent Chromium by UV- Vis

Analytical Method: X-ray Fluorescence Spectrometry
 Inductively Coupled Plasma-Optical Emission Spectrometry
 Gas Chromatography Mass Spectrometry
 UV-Visible Spectrophotometry

No.	Specimen Description	Test Item (mg/kg)						Conclusion
		Pb	Cd	Hg	CrVI	PBBs	PBDEs	
	Limit	1000	100	1000	1000	1000	1000	
	XRF RL	700	70	700	700	300	300	
1	Black fabric(Back)	BL	BL	BL	BL	BL	BL	PASS
2	Black fabric(Belt)	BL	BL	BL	BL	BL	BL	PASS
3	Black fabric(Zipper fabric)	BL	BL	BL	BL	BL	BL	PASS
4	Black fabric(String of zipper puller)	BL	BL	BL	BL	BL	BL	PASS
5	Black fabric(Shell of elastic cord of lobster buckle)	BL	BL	BL	BL	BL	BL	PASS
6	Blue fabric(Lining)	BL	BL	BL	BL	BL	BL	PASS
7	Black fabric(Lining binding)	BL	BL	BL	BL	BL	BL	PASS
8	Black fabric(Lining zipper fabric)	BL	BL	BL	BL	BL	BL	PASS
9	Dark grey fabric(Lining band)	BL	BL	BL	BL	BL	BL	PASS
10	Black hook and loop fastener(Lining velcro)	BL	BL	BL	BL	BL	BL	PASS
11	Grey fabric with black soft plastic(Shell)	BL	BL	BL	BL	BL	BL	PASS

12	Black fabric with black soft plastic(Elastic cord of belt)	BL	BL	BL	BL	BL	BL	PASS
13	Green fabric with grey soft plastic(Band of belt)	BL	BL	BL	BL	BL	BL	PASS
14	Black fabric with black soft plastic(Lining elastic cord)	BL	BL	BL	BL	BL	BL	PASS
15	Transparent plastic(Shell of solar energy)	BL	BL	BL	BL	BL	BL	PASS
16	Black plastic(Zipper teeth)	BL	BL	BL	BL	BL	BL	PASS
17	Black plastic(Zipper puller)	BL	BL	BL	BL	BL	BL	PASS
18	Black plastic(Buckle of belt)	BL	BL	BL	BL	BL	BL	PASS
19	Black soft plastic(Sucking disc of belt)	BL	BL	BL	BL	BL	BL	PASS
20	Black plastic(Charging port)	BL	BL	BL	BL	ND*	ND*	PASS
21	Black plastic(Lining zipper teeth)	BL	BL	BL	BL	BL	BL	PASS
22	Black soft plastic(Wire)	690*	BL	BL	BL	BL	BL	PASS
23	Black soft plastic(Small plug)	284*	BL	BL	BL	ND*	ND*	PASS
24	White plastic(Tip of small plug)	BL	BL	BL	BL	BL	BL	PASS
25	Silvery metal(Zipper slider)	131*	BL	BL	BL	NA	NA	PASS
26	Silvery metal(Small zipper puller)	176*	BL	BL	BL	NA	NA	PASS
27	Silvery metal(Big zipper puller)	259*	BL	BL	BL	NA	NA	PASS
28	Silvery metal(Holder of lobster buckle)	BL	BL	BL	BL	NA	NA	PASS
29	Silvery metal(Body of lobster buckle)	BL	BL	BL	BL	NA	NA	PASS
30	Silvery metal(Buckle of lobster buckle)	BL	BL	BL	BL	NA	NA	PASS
31	Silvery metal(Rivet of lobster buckle)	BL	BL	BL	BL	NA	NA	PASS
32	Silvery metal with black printing(Lining zipper slider)	BL	BL	BL	BL	NA	NA	PASS

33	Silvery metal with black printing(Lining zipper puller)	BL	BL	BL	BL	NA	NA	PASS
34	Golden metal(Lining female buckles)	BL	BL	BL	BL	NA	NA	PASS
35	Golden metal(Lining male buckles)	BL	BL	BL	BL	NA	NA	PASS
36	Silvery metal(Small plug)	BL	BL	BL	BL	NA	NA	PASS
37	Black soft plastic(Core of elastic cord of lobster buckle(Inaccessible))	BL	BL	BL	BL	BL	BL	PASS
38	Black foam(Interlayer of body(Inaccessible))	BL	BL	BL	BL	BL	BL	PASS
39	White foam(Interlayer of body(Inaccessible))	BL	BL	BL	BL	BL	BL	PASS
40	Black plastic(Interlayer of handle(Inaccessible))	BL	BL	BL	BL	BL	BL	PASS
41	Black soft plastic(Big plush(Inaccessible))	BL	BL	BL	BL	BL	BL	PASS
42	Red soft plastic(Small wire(Inaccessible))	BL	BL	BL	ND*	BL	BL	PASS
43	Black soft plastic(Small wire(Inaccessible))	BL	BL	BL	ND*	BL	BL	PASS
44	Cyan soft plastic(Small wire(Inaccessible))	BL	BL	BL	ND*	BL	BL	PASS
45	White soft plastic(Small wire(Inaccessible))	BL	BL	BL	ND*	BL	BL	PASS
46	Coppery metal(Core of wire(Inaccessible))	BL	BL	BL	BL	NA	NA	PASS
47	Golden metal(Pin of big plug(Inaccessible))	BL	BL	BL	BL	NA	NA	PASS
48	Silvery metal(Pin of small plug(Inaccessible))	BL	BL	BL	BL	NA	NA	PASS
49	Silvery metal(Big plug(Inaccessible))	BL	BL	BL	BL	NA	NA	PASS
50	White plastic(Tip of big plug(Inaccessible))	BL	BL	BL	BL	BL	BL	PASS
51	Black board(Solar energy(Inaccessible))	BL	BL	BL	BL	BL	BL	PASS
52	Black glue(Glue(Inaccessible))	BL	BL	BL	BL	BL	BL	PASS
53	Black plastic(Inside shell(Inaccessible))	BL	BL	BL	BL	BL	BL	PASS

54	Silvery metal(Connection strap(Inaccessible))	BL	BL	BL	BL	NA	NA	PASS
55	Black plated silvery metal(Screw(Inaccessible))	BL	BL	BL	BL	NA	NA	PASS
56	Transparent red plastic(Shell of led(Inaccessible))	BL	BL	BL	BL	ND*	ND*	PASS
57	Green PCB(PCB(Inaccessible))	BL	BL	BL	BL	ND*	ND*	PASS
58	Beige plastic(Tip of plug of PCB(Inaccessible))	BL	BL	BL	BL	BL	BL	PASS
59	Silvery metal(Plug of PCB(Inaccessible))	BL	BL	BL	BL	NA	NA	PASS
60	Silvery metal(Soldering tin of PCB(Inaccessible))	BL	BL	BL	BL	NA	NA	PASS
61	Silvery metal(Pin of LED(Inaccessible))	BL	BL	BL	BL	NA	NA	PASS
62	Black resistor(Resistor(Inaccessible))	545*	BL	BL	BL	ND*	ND*	PASS
63	Brown capacitor(Capacitor(Inaccessible))	BL	BL	BL	BL	ND*	ND*	PASS
64	Grey capacitor(Capacitor(Inaccessible))	BL	BL	BL	BL	ND*	ND*	PASS
65	White capacitor(Capacitor(Inaccessible))	BL	ND*	BL	BL	ND*	ND*	PASS
66	Black material(U1(Inaccessible))	BL	BL	BL	BL	BL	BL	PASS
67	Black material(D1(Inaccessible))	BL	BL	BL	BL	BL	BL	PASS
68	Black material(Sensillum opticum(Inaccessible))	BL	BL	BL	ND*	BL	BL	PASS
69	Copper metal(Coil of sensillum opticum(Inaccessible))	BL	BL	BL	BL	NA	NA	PASS

Note:

mg/kg (Milligrams per kilogram) = ppm (Parts per million)

LT = Less than

NA = Not Regulated or Not Applicable

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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.

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BL = Below Limit by XRF screening;

NE = Negative, Absence of Cr (VI), the concentration of Cr (VI) in sample solution is less than 0.10 µg/cm².

PO = Positive, Presence of Cr (VI), the concentration of Cr (VI) in sample solution is more than 0.13 µg/cm².

Total Chromium by XRF screening method is reported for Chromium (VI) unless specified.

Total Bromine by XRF screening method is reported for PBBs and PBDEs unless specified.

Remark:

*Result reported with wet chemical confirmation test with ICP-OES / GC-MS / UV-Vis.

ND = Not detected. Result value is less than below reporting limit (RL).

Test item	RL
Lead	20 mg/kg
Cadmium	20 mg/kg
Chromium VI	20 mg/kg
Mercury	20 mg/kg
PBBs	100 mg/kg
PBDEs	100 mg/kg

Remark:

By client's request, selected components were tested.

DETAILED RESULTS:

Regulation (EC) No. 1907/2006 REACH Annex XVII, Item 43 Azocolorants in Textiles

Test Method: EN ISO 14362-1:2017, EN ISO 14362-3:2017

Analytical Method: Gas Chromatography with Mass Spectrometry, Liquid Chromatography with Diode Array Detection / Liquid Chromatography with Mass Spectrometry

Specimen No.		1+2+3	4+5+6	7+8+9	10+11+12	Limit (mg/kg)
Test Item	CAS No.	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	
4-aminobiphenyl	92-67-1	ND	ND	ND	ND	30
Benzidine	92-87-5	ND	ND	ND	ND	30
4-chloro-o-toluidine	95-69-2	ND	ND	ND	ND	30
2-naphtylamine	91-59-8	ND	ND	ND	ND	30
o-Aminoazotoluene	97-56-3	ND	ND	ND	ND	30
5-nitro-o-toluidine	99-55-8	ND	ND	ND	ND	30
4-chloroaniline	106-47-8	ND	ND	ND	ND	30
2,4-diaminoanisole	615-05-4	ND	ND	ND	ND	30
4,4'-methylenedianiline	101-77-9	ND	ND	ND	ND	30
3,3'-dichlorobenzidine	91-94-1	ND	ND	ND	ND	30
o-dianisidine	119-90-4	ND	ND	ND	ND	30

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3,3'-dimethylbenzidine	119-93-7	ND	ND	ND	ND	30
4,4'-methylenedi-o-toluidine	838-88-0	ND	ND	ND	ND	30
p-cresidine	120-71-8	ND	ND	ND	ND	30
4,4'-methylene-bis-(2-chloro-aniline)	101-14-4	ND	ND	ND	ND	30
4,4'-oxydianiline	101-80-4	ND	ND	ND	ND	30
4,4'-thiodianiline	139-65-1	ND	ND	ND	ND	30
o-toluidine	95-53-4	ND	ND	ND	ND	30
2,4-diaminotoluene	95-80-7	ND	ND	ND	ND	30
2,4,5-trimethylaniline	137-17-7	ND	ND	ND	ND	30
2-methoxyaniline	90-04-0	ND	ND	ND	ND	30
4-aminoazobenzene	60-09-3	ND	ND	ND	ND	30
Conclusion		PASS	PASS	PASS	PASS	

Note:

mg/kg = Milligrams per kilogram

LT = Less than

ND = Not detected (Reporting Limit = 5 mg/kg)

Composite results are based on total mass of the composite test portion.

Remark:

In the case of levels per amine component less than or equal to 30 mg/kg, according to the analysis as carried out, azo colorants which can release one or more of certain listed amines by cleavage of their azo group/s were not detected in the commodity submitted.

In the case of levels per amine component more than 30 mg/kg, the analytical result suggests that the commodity submitted has been manufactured or treated using azo colorant/s which can release one or more of certain listed amines by cleavage of their azo group/s.

The analytical result of detected amine is confirmed by LC-DAD / LC-MS.

DETAILED RESULTS:

Regulation (EC) No. 1907/2006 REACH Annex XVII, Item 43 Azocolorants in Textiles

Test Method: EN ISO 14362-1:2017, EN ISO 14362-3:2017
 Analytical Method: Gas Chromatography with Mass Spectrometry, Liquid Chromatography with Diode Array Detection / Liquid Chromatography with Mass Spectrometry

Specimen No.	13+14	---	---	---	---	Limit (mg/kg)
Test Item	CAS No.	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	Limit (mg/kg)
4-aminobiphenyl	92-67-1	ND	---	---	---	30
Benidine	92-87-5	ND	---	---	---	30
4-chloro-o-toluidine	95-69-2	ND	---	---	---	30
2-naphtylamine	91-59-8	ND	---	---	---	30
o-Aminoazotoluene	97-56-3	ND	---	---	---	30
5-nitro-o-toluidine	99-55-8	ND	---	---	---	30
4-chloroaniline	106-47-8	ND	---	---	---	30
2,4-diaminoanisole	615-05-4	ND	---	---	---	30
4,4'-methylenedianiline	101-77-9	ND	---	---	---	30
3,3'-dichlorobenzidine	91-94-1	ND	---	---	---	30
o-dianisidine	119-90-4	ND	---	---	---	30
3,3'-dimethylbenzidine	119-93-7	ND	---	---	---	30
4,4'-methylenedi-o-toluidine	838-88-0	ND	---	---	---	30
p-cresidine	120-71-8	ND	---	---	---	30
4,4'-methylene-bis-(2-chloro-aniline)	101-14-4	ND	---	---	---	30
4,4'-oxydianiline	101-80-4	ND	---	---	---	30
4,4'-thiodianiline	139-65-1	ND	---	---	---	30
o-toluidine	95-53-4	ND	---	---	---	30
2,4-diaminotoluene	95-80-7	ND	---	---	---	30
2,4,5-trimethylaniline	137-17-7	ND	---	---	---	30
2-methoxyaniline	90-04-0	ND	---	---	---	30
4-aminoazobenzene	60-09-3	ND	---	---	---	30
Conclusion	PASS	---	---	---	---	

Note:

mg/kg = Milligrams per kilogram

LT = Less than

ND = Not detected (Reporting Limit = 5 mg/kg)

Composite results are based on total mass of the composite test portion.

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DETAILED RESULTS:**Regulation (EC) No. 1907/2006 REACH Annex XVII as Amended, Item 51 and 52 Phthalates – Mouthable (DBP, BBP, DEHP, DIBP, DnOP, DINP, DIDP)**

Test Method: CPSC-CH-C1001-09.4

Test Instrument: Gas Chromatography with Mass Spectrometry

Specimen No.		11+12+13	14+15+16	17+18+19	Limit (% w/w)
Test Item	CAS No.	Result (% w/w)	Result (% w/w)	Result (% w/w)	
Dibutyl Phthalate (DBP)	84-74-2	ND	ND	ND	0.1
Benzyl Butyl Phthalate (BBP)	85-68-7	ND	ND	ND	0.1
Di-(2-Ethylhexyl) Phthalate (DEHP)	117-81-7	ND	ND	ND	0.1
Diisobutyl Phthalate (DIBP)	84-69-5	ND	ND	ND	0.1
Sum of DBP, BBP, DEHP, DIBP		ND	ND	ND	0.1
Di-n-Octyl Phthalate (DnOP)	117-84-0	ND	ND	ND	
Diisononyl Phthalate (DINP)	28553-12-0 68515-48-0	ND	ND	ND	
Diisodecyl Phthalate (DIDP)	26761-40-0 68515-49-1	ND	ND	ND	
Sum of DnOP, DINP, DIDP		ND	ND	ND	0.1
Conclusion		PASS	PASS	PASS	

Note:

% w/w = Percent by weight

LT = Less than

ND = Not detected (Reporting Limit = 0.015 % w/w)

Composite results are based on specimen of least mass resulting in highest potential concentration.

DETAILED RESULTS:**Regulation (EC) No. 1907/2006 REACH Annex XVII as Amended, Item 51 and 52 Phthalates – Mouthable (DBP, BBP, DEHP, DIBP, DnOP, DINP, DIDP)**

Test Method: CPSC-CH-C1001-09.4

Test Instrument: Gas Chromatography with Mass Spectrometry

Specimen No.		20+21+22	23+24	37+38+39	Limit (% w/w)
Test Item	CAS No.	Result (% w/w)	Result (% w/w)	Result (% w/w)	
Dibutyl Phthalate (DBP)	84-74-2	ND	ND	ND	0.1
Benzyl Butyl Phthalate (BBP)	85-68-7	ND	ND	ND	0.1
Di-(2-Ethylhexyl) Phthalate (DEHP)	117-81-7	ND	ND	ND	0.1
Diisobutyl Phthalate (DIBP)	84-69-5	ND	ND	ND	0.1
Sum of DBP, BBP, DEHP, DIBP		ND	ND	ND	0.1
Di-n-Octyl Phthalate (DnOP)	117-84-0	ND	ND	ND	
Diisononyl Phthalate (DINP)	28553-12-0 68515-48-0	ND	ND	ND	
Diisodecyl Phthalate (DIDP)	26761-40-0 68515-49-1	ND	ND	ND	
Sum of DnOP, DINP, DIDP		ND	ND	ND	0.1
Conclusion		PASS	PASS	PASS	

Note:

% w/w = Percent by weight

LT = Less than

ND = Not detected (Reporting Limit = 0.015 % w/w)

Composite results are based on specimen of least mass resulting in highest potential concentration.

Remark:

By client's request, selected components were tested.

DETAILED RESULTS:**Regulation (EC) No. 1907/2006 REACH Annex XVII as Amended, Item 51 and 52 Phthalates – Mouthable (DBP, BBP, DEHP, DIBP, DnOP, DINP, DIDP)**

Test Method: CPSC-CH-C1001-09.4

Test Instrument: Gas Chromatography with Mass Spectrometry

Specimen No.		40+41+42	43+44+45	50+51	Limit (% w/w)
Test Item	CAS No.	Result (% w/w)	Result (% w/w)	Result (% w/w)	
Dibutyl Phthalate (DBP)	84-74-2	ND	0.02	ND	0.1
Benzyl Butyl Phthalate (BBP)	85-68-7	ND	ND	ND	0.1
Di-(2-Ethylhexyl) Phthalate (DEHP)	117-81-7	ND	ND	ND	0.1
Diisobutyl Phthalate (DIBP)	84-69-5	ND	ND	ND	0.1
Sum of DBP, BBP, DEHP, DIBP		ND	0.02	ND	0.1
Di-n-Octyl Phthalate (DnOP)	117-84-0	ND	ND	ND	
Diisononyl Phthalate (DINP)	28553-12-0 68515-48-0	ND	ND	ND	
Diisodecyl Phthalate (DIDP)	26761-40-0 68515-49-1	ND	ND	ND	
Sum of DnOP, DINP, DIDP		ND	ND	ND	0.1
Conclusion		PASS	PASS	PASS	

Note:

% w/w = Percent by weight

LT = Less than

ND = Not detected (Reporting Limit = 0.015 % w/w)

Composite results are based on specimen of least mass resulting in highest potential concentration.

DETAILED RESULTS:**Regulation (EC) No. 1907/2006 REACH Annex XVII as Amended, Item 51 and 52 Phthalates – Mouthable (DBP, BBP, DEHP, DIBP, DnOP, DINP, DIDP)**

Test Method: CPSC-CH-C1001-09.4

Test Instrument: Gas Chromatography with Mass Spectrometry

Specimen No.		52+53	56+57+58	---	Limit (% w/w)
Test Item	CAS No.	Result (% w/w)	Result (% w/w)	Result (% w/w)	
Dibutyl Phthalate (DBP)	84-74-2	ND	ND	---	0.1
Benzyl Butyl Phthalate (BBP)	85-68-7	ND	ND	---	0.1
Di-(2-Ethylhexyl) Phthalate (DEHP)	117-81-7	ND	ND	---	0.1
Diisobutyl Phthalate (DIBP)	84-69-5	ND	ND	---	0.1
Sum of DBP, BBP, DEHP, DIBP		ND	ND	---	0.1
Di-n-Octyl Phthalate (DnOP)	117-84-0	ND	ND	---	
Diisononyl Phthalate (DINP)	28553-12-0 68515-48-0	ND	ND	---	
Diisodecyl Phthalate (DIDP)	26761-40-0 68515-49-1	ND	ND	---	
Sum of DnOP, DINP, DIDP		ND	ND	---	0.1
Conclusion		PASS	PASS	---	

Note:

% w/w = Percent by weight

LT = Less than

ND = Not detected (Reporting Limit = 0.015 % w/w)

Composite results are based on specimen of least mass resulting in highest potential concentration.

DETAILED RESULTS:

Regulation (EC) No. 1907/2006 REACH Annex XVII, Item 50 Polycyclic Aromatic Hydrocarbon (PAH)

Test Method: AfPS GS 2019:01

Analytical Method: Gas Chromatography with Mass Spectrometry

Specimen No.		11+12+13	14+15+16	17+18+19	20+21+22	Limit (mg/kg)
Test Item	CAS No.	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	
Benzo [a] pyrene (BaP)	50-32-8	ND	ND	ND	ND	1
Benzo [e] pyrene (BeP)	192-97-2	ND	ND	ND	ND	1
Benzo [a] anthracene (BaA)	56-55-3	ND	ND	ND	ND	1
Chrysene (CHR)	218-01-9	ND	ND	ND	ND	1
Benzo [b] fluroanthene (BbFA)	205-99-2	ND	ND	ND	ND	1
Benzo [j] fluroanthene (BjFA)	205-82-3	ND	ND	ND	ND	1
Benzo [k] fluroanthene (BkFA)	207-08-9	ND	ND	ND	ND	1
Dibenzo [a,h] anthracene (DBAhA)	53-70-3	ND	ND	ND	ND	1
Conclusion		PASS	PASS	PASS	PASS	

Note:

mg/kg = Milligrams per kilogram

LT = Less than

ND = Not detected (Reporting Limit = 0.2 mg/kg)

DETAILED RESULTS:

Regulation (EC) No. 1907/2006 REACH Annex XVII, Item 50 Polycyclic Aromatic Hydrocarbon (PAH)

Test Method: AfPS GS 2019:01

Analytical Method: Gas Chromatography with Mass Spectrometry

Specimen No.		23+24	---	---	---	Limit (mg/kg)
Test Item	CAS No.	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	
Benzo [a] pyrene (BaP)	50-32-8	ND	---	---	---	1
Benzo [e] pyrene (BeP)	192-97-2	ND	---	---	---	1
Benzo [a] anthracene (BaA)	56-55-3	ND	---	---	---	1
Chrysene (CHR)	218-01-9	ND	---	---	---	1
Benzo [b] fluoranthene (BbFA)	205-99-2	ND	---	---	---	1
Benzo [j] fluoranthene (BjFA)	205-82-3	ND	---	---	---	1
Benzo [k] fluoranthene (BkFA)	207-08-9	ND	---	---	---	1
Dibenzo [a,h] anthracene (DBA _h A)	53-70-3	ND	---	---	---	1
Conclusion		PASS	---	---	---	

Note:

mg/kg = Milligrams per kilogram

LT = Less than

ND = Not detected (Reporting Limit = 0.2 mg/kg)

DETAILED RESULTS:**Regulation (EC) No. 1907/2006 REACH Annex XVII, Item 23 Cadmium in Substrate Materials**

Test Method: ASTM F963-17 Clause 8.3.1

Analytical Method: Inductively Coupled Plasma-Optical Emission Spectrometry

Specimen No.	11+12+13	14+15+16	17+18+19	20+21+22	23+24	Limit (mg/kg)
Test Item	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	
Total Cadmium (Cd)	ND	ND	ND	ND	ND	100
Conclusion	PASS	PASS	PASS	PASS	PASS	

Specimen No.	37+38+39	40+41+42	43+44+45	50+51	52+53	Limit (mg/kg)
Test Item	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	
Total Cadmium (Cd)	ND	ND	ND	ND	ND	100
Conclusion	PASS	PASS	PASS	PASS	PASS	

Specimen No.	56+57+58	---	---	---	---	Limit (mg/kg)
Test Item	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	
Total Cadmium (Cd)	ND	---	---	---	---	100
Conclusion	PASS	---	---	---	---	

Note:

mg/kg = Milligrams per kilogram

LT = Less than

ND = Not detected (Reporting Limit = 20 mg/kg)

Composite results are based on specimen of least mass resulting in highest potential concentration.

DETAILED RESULTS:

Regulation (EC) No. 1907/2006 REACH Annex XVII, Item 63 Lead in Substrate Materials

Test Method: CPSC-CH-E1001-08.3 (Metal) and/or CPSC-CH-E1002-08.3 (Non-Metal)

Analytical Method: Inductively Coupled Plasma-Optical Emission Spectrometry

Specimen No.	11+12+13	14+15+16	17+18+19	20+21+22	23+24	Limit (mg/kg)
Test Item	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	
Total Lead (Pb)	ND	ND	ND	417	ND	500
Conclusion	PASS	PASS	PASS	PASS	PASS	

Specimen No.	25	26	27	28	29	Limit (mg/kg)
Test Item	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	
Total Lead (Pb)	175	146	201	33	23	500
Conclusion	PASS	PASS	PASS	PASS	PASS	

Specimen No.	30	31	32	33	34	Limit (mg/kg)
Test Item	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	
Total Lead (Pb)	30	29	ND	ND	30	500
Conclusion	PASS	PASS	PASS	PASS	PASS	

Specimen No.	35	36	---	---	---	Limit (mg/kg)
Test Item	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	Result (mg/kg)	
Total Lead (Pb)	35	39	---	---	---	500
Conclusion	PASS	PASS	---	---	---	

Note:

mg/kg = Milligrams per kilogram

LT = Less than

ND = Not detected (Reporting Limit = 20 mg/kg)

Composite results are based on specimen of least mass resulting in highest potential concentration.

Remark:

By client's request, selected components were tested.

DETAILED RESULTS:**ISO 105-X12-Textiles-Colour Fastness to Rubbing**

Test Method: ISO 105-X12: 2016; Size of rubbing finger: 16mm dia.

Specimen No.	1	2	6	11	---	Client's requirement
Items	Result (Grade)	Result (Grade)	Result (Grade)	Result (Grade)	Result (Grade)	
Dry staining	4-5	4	4-5	4-5	---	Min.2-3
Wet staining	4-5	4-5	4-5	4-5	---	Min.2-3
Conclusion	PASS	PASS	PASS	PASS	---	

Remark: Grey Scale rating is based on the 5-step scale of 1 to 5, where 1 is bad and 5 is good.

SPECIMEN DESCRIPTION:

Specimen No.	Specimen Description	Location
1	Black fabric	Back
2	Black fabric	Belt
3	Black fabric	Zipper fabric
4	Black fabric	String of zipper puller
5	Black fabric	Shell of elastic cord of lobster buckle
6	Blue fabric	Lining
7	Black fabric	Lining binding
8	Black fabric	Lining zipper fabric
9	Dark grey fabric	Lining band
10	Black hook and loop fastener	Lining velcro
11	Grey fabric with black soft plastic	Shell
12	Black fabric with black soft plastic	Elastic cord of belt
13	Green fabric with grey soft plastic	Band of belt
14	Black fabric with black soft plastic	Lining elastic cord
15	Transparent plastic	Shell of solar energy
16	Black plastic	Zipper teeth
17	Black plastic	Zipper puller
18	Black plastic	Buckle of belt
19	Black soft plastic	Sucking disc of belt
20	Black plastic	Charging port
21	Black plastic	Lining zipper teeth
22	Black soft plastic	Wire
23	Black soft plastic	Small plug
24	White plastic	Tip of small plug
25	Silvery metal	Zipper slider
26	Silvery metal	Small zipper puller
27	Silvery metal	Big zipper puller
28	Silvery metal	Holder of lobster buckle

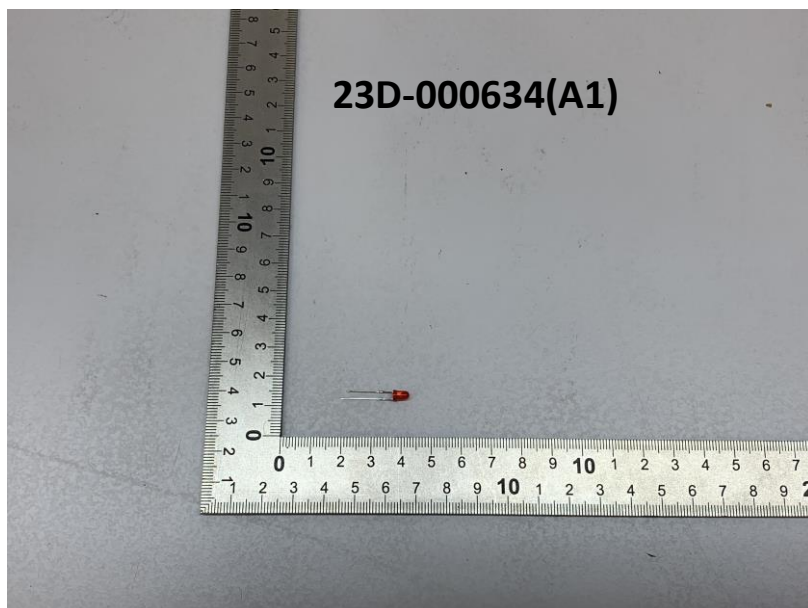
29	Silvery metal	Body of lobster buckle
30	Silvery metal	Buckle of lobster buckle
31	Silvery metal	Rivet of lobster buckle
32	Silvery metal with black printing	Lining zipper slider
33	Silvery metal with black printing	Lining zipper puller
34	Golden metal	Lining female buckles
35	Golden metal	Lining male buckles
36	Silvery metal	Small plug
37	Black soft plastic	Core of elastic cord of lobster buckle(Inaccessible)
38	Black foam	Interlayer of body(Inaccessible)
39	White foam	Interlayer of body(Inaccessible)
40	Black plastic	Interlayer of handle(Inaccessible)
41	Black soft plastic	Big plush(Inaccessible)
42	Red soft plastic	Small wire(Inaccessible)
43	Black soft plastic	Small wire(Inaccessible)
44	Cyan soft plastic	Small wire(Inaccessible)
45	White soft plastic	Small wire(Inaccessible)
46	Coppery metal	Core of wire(Inaccessible)
47	Golden metal	Pin of big plug(Inaccessible)
48	Silvery metal	Pin of small plug(Inaccessible)
49	Silvery metal	Big plug(Inaccessible)
50	White plastic	Tip of big plug(Inaccessible)
51	Black board	Solar energy(Inaccessible)
52	Black glue	Glue(Inaccessible)
53	Black plastic	Inside shell(Inaccessible)
54	Silvery metal	Connection strap(Inaccessible)
55	Black plated silvery metal	Screw(Inaccessible)
56	Transparent red plastic	Shell of led(Inaccessible)
57	Green PCB	PCB(Inaccessible)
58	Beige plastic	Tip of plug of PCB(Inaccessible)

59	Silvery metal	Plug of PCB(Inaccessible)
60	Silvery metal	Soldering tin of PCB(Inaccessible)
61	Silvery metal	Pin of LED(Inaccessible)
62	Black resistor	Resistor(Inaccessible)
63	Brown capacitor	Capacitor(Inaccessible)
64	Grey capacitor	Capacitor(Inaccessible)
65	White capacitor	Capacitor(Inaccessible)
66	Black material	U1(Inaccessible)
67	Black material	D1(Inaccessible)
68	Black material	Sensillum opticum(Inaccessible)
69	Copper metal	Coil of sensillum opticum(Inaccessible)

SAMPLE PHOTO:



SAMPLE PHOTO:



SAMPLE PHOTO:



-End Report-

Appendix I

The test was performed by EMTEK (DONGGUAN) CO., LTD.

Test Report No. EDG2307180184E00401C

Test Report No. EDG2307180184E00401R

Certificate of Conformity

NO.:EDG2307180184E00401C

The following products have been tested by us with the listed standards and found in conformity with the council EMC directive 2014/30/EU. This is to certify that the specimen is in conformity with the assessment requirement mentioned follow. This certificate does not imply assessment to the production of the product.

Applicant : QIMA Hansecontrol Testing service (Dongguan) Co. Ltd.
Address : Room 101, Building 1, Changsheng Rd No. 6, Changkeng, Liaobu Town, Dongguan City 523400 Guangdong P.R.China

Manufacturer : QIMA Hansecontrol Testing service (Dongguan) Co. Ltd.
Address : Room 101, Building 1, Changsheng Rd No. 6, Changkeng, Liaobu Town, Dongguan City 523400 Guangdong P.R.China

EUT : Solar Backpack

Brand Name : N/A

M/N : /

Test Standards : EN IEC 61000-6-3:2021
EN IEC 61000-6-1:2019

Version : Ver.1.0



EMITEK (DONGGUAN) CO., LTD.
CERTIFICATE

Sam Lv(Manager)

July 26, 2023

The certificate is based on a single evaluation of one sample of above-mentioned products, It does not imply an assessment of the whole production and does not permit the use of the test lab. logo .

EMTEK (Dongguan) Co., Ltd.

Add: -1&2/F., Building 2, Zone A, Zhongda Marine Biotechnology Research and Development Base, No.9, Xincheng Avenue, Songshanhu High-technology Industrial Development Zone, Dongguan, Guangdong, China [Http://www.emtek.com.cn](http://www.emtek.com.cn) E-mail: project@emtek.com.cn



TEST REPORT

Product Name : Solar Backpack

Model Number : /

Prepared for : QIMA Hansecontrol Testing service (Dongguan) Co. Ltd.
Address : Room 101, Building 1, Changsheng Rd No. 6, Changkeng,
Liaobu Town, Dongguan City 523400 Guangdong P.R.China

Prepared by : EMTEK(DONGGUAN) CO., LTD.
Address : -1&2/F., Building 2, Zone A, Zhongda Marine Biotechnology
Research and Development Base, N.9, Xincheng
Avenue, Songshanhu High-technology Industrial
Development Zone, Dongguan, Guangdong, China

Tel : +86-0769-22807078

Fax: +86-0769-22807079

Report Number : EDG2307180184E00401R
Date(s) of Tests : July 18, 2023 to July 25, 2023
Date of issue : July 26, 2023



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APPENDIX (Photos of the EUT) (4 pages)

TEST REPORT DESCRIPTION

Applicant : QIMA Hansecontrol Testing service (Dongguan) Co. Ltd.
Brand Name : N/A
EUT : Solar Backpack
Model Number : /
Rating : /

Measurement Procedure Used:

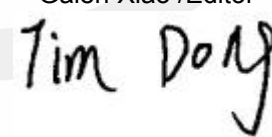
EN IEC 61000-6-3:2021
EN IEC 61000-6-1:2019
(IEC 61000-4-2: 2008, IEC 61000-4-3: 2020)

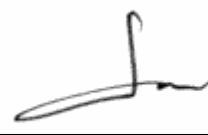

The device described above is tested by EMTEK (DONGGUAN) CO. and EMTEK (SHENZHEN) CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and EMTEK (DONGGUAN) CO., LTD. is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the EN IEC 61000-6-3, EN IEC 61000-6-1 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of EMTEK (DONGGUAN) CO., LTD.

Date of Test : July 18, 2023 to July 25, 2023

Prepared by : 
Galen Xiao /Editor

Reviewer : 
Tim Dong /Supervisor

Approved & Authorized Signer :  
Sam Iv /Manager

Modified Information

Version	Report No.	Revision Date	Summary
	EDG2307180184E00401R	/	Original Report



1. DESCRIPTION OF STANDARDS AND RESULTS (EUT)

EMISSION				
Description of Test Item		Standard	Limits	Results
Conducted Emissions -	low voltage AC Mains port	EN IEC 61000-6-3	Table 4.3	N/A
Conducted Emissions -	DC power port		Table 5.1	N/A
Conducted Emissions -	Wired network port		Table 6.1	N/A
Radiated emissions at frequencies up to 1 GHz			Table 3.1	Pass
Radiated emissions at frequencies above 1 GHz			Table 3.4	N/A
IMMUNITY				
Description of Test Item		Basic Standard	Performance Criteria	Results
Electrostatic Discharge	Enclosure ports	IEC 61000-4-2:2008	B	Pass
Radio-frequency electromagnetic field	Enclosure ports	IEC 61000-4-3:2020	A	Pass
Note: N/A is an abbreviation for Not Applicable.				

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT : Solar Backpack
Model Number : /
Input Voltage :
Date of Received : July 18, 2023
Date of Test : July 18, 2023 to July 25, 2023

2.2. Independent Operation Modes

A. ON

2.3. Test Manner

Test Items	Test Voltage	Operation Modes	Worst case
Conducted Emissions - low voltage AC Mains port	N/A	N/A	N/A
Radiated emissions at frequencies up to 1 GHz	/	Mode A	/
Radiated emissions at frequencies above 1 GHz	/	/	/
Electrostatic Discharge	/	Mode A	/
Radio-frequency electromagnetic field	/	Mode A	/

2.4. Description of Support Device

/ : /

2.5. Description of Test Facility

Site Description
EMC Lab. : Accredited by CNAS, 2020.08.27
The certificate is valid until 2024.07.05
The Laboratory has been assessed and proved to be in compliance with
CNAS/CL01:2018
The Certificate Registration Number is L3150
Name of Firm : EMTEK(DONGGUAN) CO., LTD.
Site Location : -1&2/F., Building 2, Zone A, Zhongda Marine Biotechnology Reserch and
Development Base, No.9, Xincheng Avenue, Songshanhu High-technology
Industrial Development Zone, Dongguan, Guangdong, China.

2.6. Measurement Uncertainty

Test Item : Uncertainty
Conducted Emission Uncertainty : 2.08dB(9K-150KHz)
2.42dB(150K-30MHz)

Radiated Emission Uncertainty (3m Chamber)	:	3.32dB (30M~1GHz Polarize: H)
	:	3.24dB (30M~1GHz Polarize: V)
	:	4.46dB (1~6GHz)
	:	4.96dB (6~18GHz)
Uncertainty for Flicker test	:	0.07%
Uncertainty for Harmonic test	:	1.8%
Uncertainty for C/S Test	:	1.45(Using CDN Test)
Uncertainty for R/S Test	:	2.10dB(80MHz-200MHz)
	:	1.76dB(200MHz-1000MHz)
Uncertainty for test site temperature and humidity	:	0.6℃
	:	4%



3. MEASURING DEVICE AND TEST EQUIPMENT

3.1. For Radiated Emission Measurement (3m)

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Test Receiver	Rohde&Schwarz	ESCI	101415	2023/5/11	1 Year
2.	Bi-log Hybrid Antenna	Schwarzbeck	VULB9163	141	2023/5/15	1 Year
3.	Pre-Amplifie	HP	8447F	OPH64	2023/5/11	1 Year
4.	Signal Analyzer	R&S	FSV30	103039	2023/5/11	1 Year
5.	Horn Antenna	Schwarzbeck	BBHA9120D	1272	2023/5/15	1 Year
6.	Pre-Amplifie	LUNAR EM	PM1-18-40	J1010000008 1	2023/5/11	1 Year

3.2. For Electrostatic Discharge Immunity

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	TESEQ	NSG 437	409	2023/5/15	1 Year

3.3. For Continuous RF Electromagnetic Field Disturbances Immunity

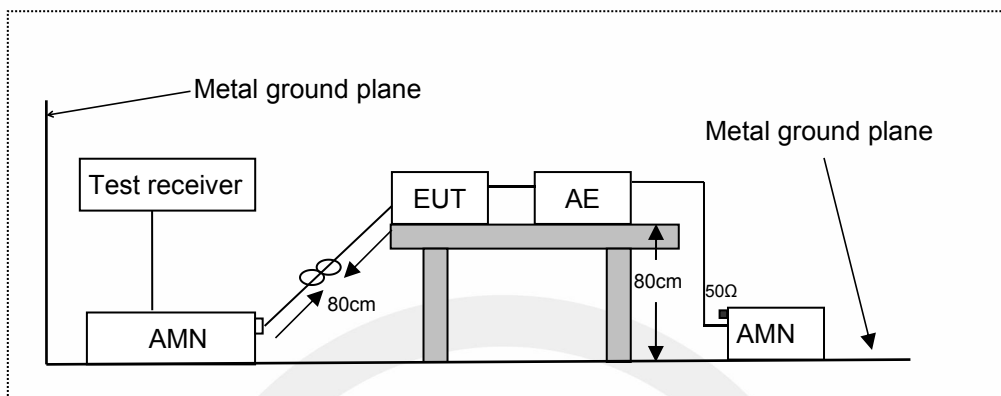
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Power Amplifier	MILMEGA	AS0102-55	1018770	2023/5/13	1 Year
2.	50ohm Diode Power Sensor	BOONTON	51011EMC	34236	2023/5/13	1 Year
3.	RF Power Meter. Dual Channel	BOONTON	4232A	10539	2023/5/13	1 Year
4.	Log.-Per. Antenna	SCHWARZBECK	STLP 9129-7/16	3050	N/A	N/A
5.	Signal Generator	Agilent	N5181A	MY50145187	2023/5/13	1 Year
6.	Broad-Band Horn Antenna	SCHWARZBECK	STLP 9149	9149-227	N/A	N/A
7.	Field Strength Meter	DARE	RSS1006A	10I00037SNO 22	2023/5/13	1 Year
8.	Multi-function interface system	DARE	CTR1009B	12I00250SNO 72	N/A	N/A
9.	Automatic switch group	DARE	RSW1004A	N/A	N/A	N/A
10.	Power Amplifier	MILMEGA	AS1860-50	1059346	2023/5/13	1 Year
11.	Power Amplifier	Vectawave	VBA 1000-600C	133627	2022/10/31	1 Year
12.	Directional Coupler	BONN	BDC 0810-50/1500	2229689	2022/10/31	1 Year

13.	Audio Analyzer	R&S	UPV	101473	2023/5/13	1 Year
14.	Audio Test System	AUDIO PRECISION	ATS-1	41100	2023/5/13	1 Year



4. CONDUCTED EMISSIONS AT MAINS POWER PORTS

4.1. Block Diagram of Test Setup



AMN: Artificial Mains Network

AE: Associated equipment

EUT: Equipment under test

4.2. Limits

EN IEC 61000-6-3:2021

AC power ports limit:

Frequency range MHz	Coupling device (see Table 4)	Detector type / bandwidth	Limits dB(μV)
0.15 to 0.5	AMN	Quasi Peak / 9 kHz	66 to 56
0.5 to 5			56
5 to 30			60
0.15 to 0.5	AMN	Average / 9 kHz	56 to 46
0.5 to 5			46
5 to 30			50

DC power ports limit:

Frequency range MHz	Coupling device (see Table 5)	Detector type / bandwidth	Limits dB(μV)
0.5 to 5	V-AMN	Quasi Peak / 9 kHz	79
5 to 30			73
0.5 to 5	V-AMN	Average / 9 kHz	66
5 to 30			60

4.3. Test Procedure

The EUT was placed on a desk 0.8 m height from the metal ground plane and 0.4 m from the conducting wall of the shielding room and it was kept at least 0.8 m from any other grounded conducting surface. The size of the table will nominally be 1.5 m x1.0 m.

The rear of the arrangement shall be flush with the back of the supporting tabletop unless that would not be possible or typical of normal use.

All units of equipment forming the system under test (includes the EUT as well as connected peripherals and associated equipment or devices) shall be arranged such that a nominal 0.1 m separation is achieved between the neighboring units.

Connect EUT to the power mains through a artificial mains network (AMN). Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the centre into a bundle no longer than 0.4 m, so that its length is shortened to 1 m.

All the support units are connecting to the other AMN.

The AMN provides 50 ohm coupling impedance for the measuring instrument.

The CISPR states that the AMN with 50 ohm and 50 microhenry should be used.

Both sides of AC line were checked for maximum conducted interference.

The frequency range from 150 kHz to 30 MHz was sweep.

Set the test-receiver system to quasi peak detect function and average detect function, and to measure the conducted emissions values.

Test results were obtained from the following equation:

Emission Level (dB μ V) = AMN Factor (dB) + Cable Loss (dB) + Reading (dB μ V)

Margin (dB) = Emission Level (dB μ V) - Limit (dB μ V)

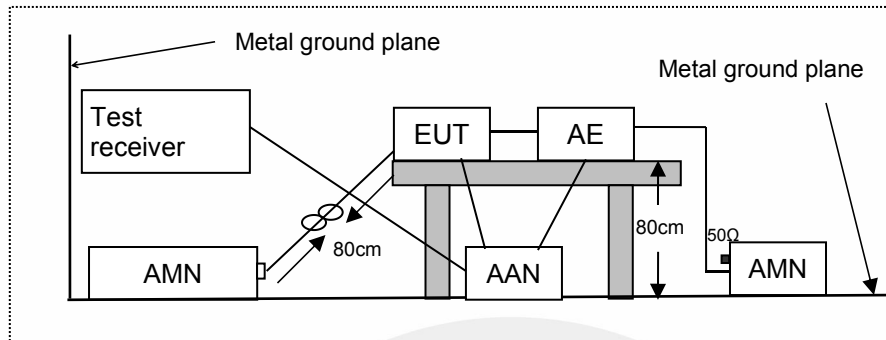
4.4. Measuring Results

N/A.

No AC power port. Intended DC power cable connection is less than 3m.

5. CONDUCTED EMISSIONS - WIRED NETWORK PORT

5.1. Block Diagram of Test Setup



AMN: Artificial mains network
AE: Associated equipment
EUT: Equipment under test
AAN: Asymmetric artificial network

5.2. Limits

EN IEC 61000-6-3:2021

Frequency range (MHz)	Coupling device (see Table 6)	Detector type / bandwidth	Voltage limits dB(μV)	Current limits dB(μA)
0.15 to 0.5	AAN	Quasi Peak / 9 kHz	84 to 74	N/A
0.5 to 30			74	
0.15 to 0.5	AAN	Average / 9 kHz	74 to 64	
0.5 to 30			64	

5.3. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and connected to the AC mains through artificial mains network(AMN) or connected to the wired network port through an asymmetric artificial network(ANN). AMN provided a 50ohm coupling impedance for the tested equipment AC mains port, ANN provided a common mode (asymmetric mode) impedance of 150 Ω to the wired network port under test. Both sides of AC line and the wired network line are investigated to find out the maximum conducted emission according to the EN IEC 61000-6-3 regulations during conducted emission measurement.

The bandwidth of the receiver is set at 9kHz in 150kHz~30MHz. The frequency range from 150kHz to 30MHz is investigated.

Test results were obtained from the following equation:

Emission Level (dBμV) = ANN Factor (dB) + Cable Loss (dB) + Reading (dBμV)

Margin (dB) = Emission Level (dBμV) - Limit (dBμV)

5.4. Measuring Results

This test result outsourced to EMTEK(SHENZHEN) CO., LTD.

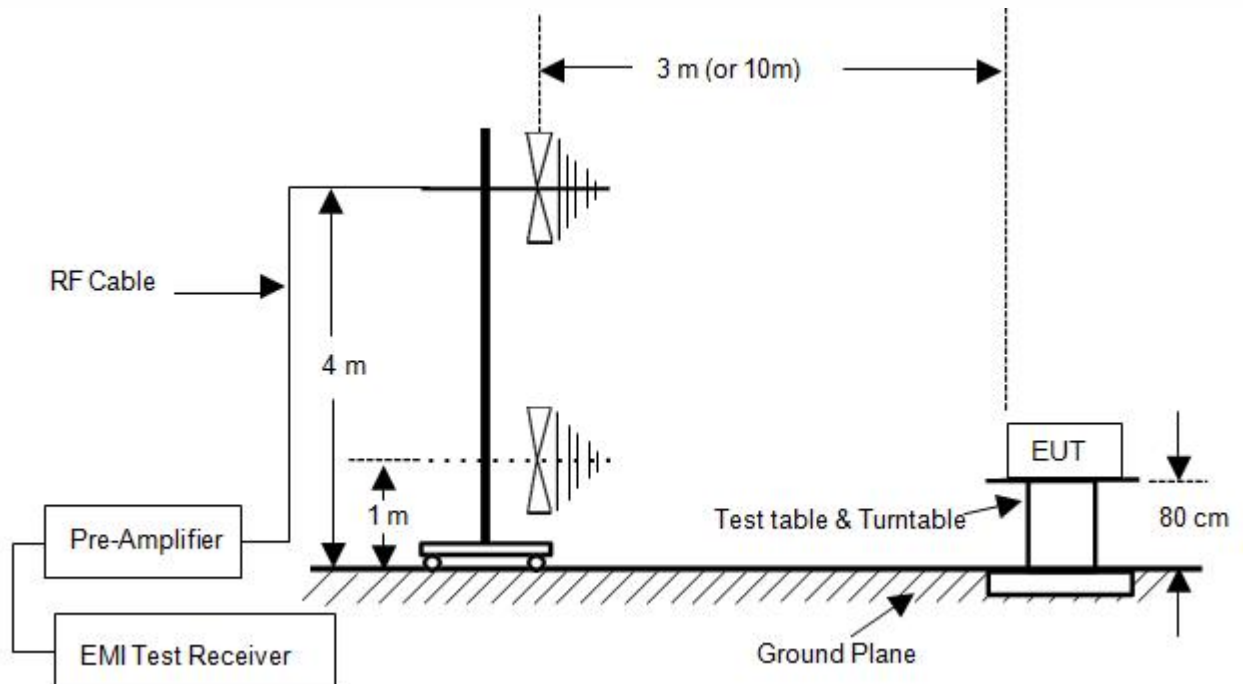
N/A.

No wired network ports.



6. RADIATED EMISSION MEASUREMENT (UP TO 1GHz)

6.1. Block Diagram of Test Setup



6.2. Radiated Limit

EN IEC 61000-6-3:2021, Table 3.1

Frequency range MHz	Measurement			Limits dB(μV/m)
	Facility	Distance (m)	Detector type / bandwidth	
30 to 230	OATS/SAC	10	Quasi Peak / 120 kHz	30
230 to 1 000				37
30 to 230	OATS/SAC	3		40
230 to 1 000				47

6.3. Test Procedure

The EUT was placed on a non-conductive table whose total height equaled 80cm. All units of equipment forming the system under test (includes the EUT as well as connected peripherals and associated equipment or devices) shall be arranged such that a nominal 0.1 m separation is achieved between the neighboring units. Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the centre into a bundle no longer than 0.4 m, so that its length is shortened to 1 m.

The EUT was set 3 meters (or 10 meters) away from the receiving antenna that was mounted on a non-conductive mast. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level.

The turntable can rotate 360 degree to determine the position of the maximum emission level.

The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.

The identification of the frequency of highest emission with respect to the limit was found by investigating emissions at a number of significant frequencies. The probable frequency of maximum emission had been found and that the associated cable and EUT configuration and mode of operation had been identified.

The bandwidth of the Receiver is set at 120 kHz.

Test results were obtained from the following equation:

Emission level (dB μ V/m) = Antenna Factor - Amp Factor + Cable Loss + Reading

Margin (dB) = Emission Level (dB μ V/m) - Limit (dB μ V/m)

6.4. Measuring Results

PASS.

The data are attached the following pages.



Site Chamber #1

Polarization: **Horizontal**

Temperature: 23.7 C

Limit: EN61000-6-3 3m(RE)

Power:

Humidity: 66 %

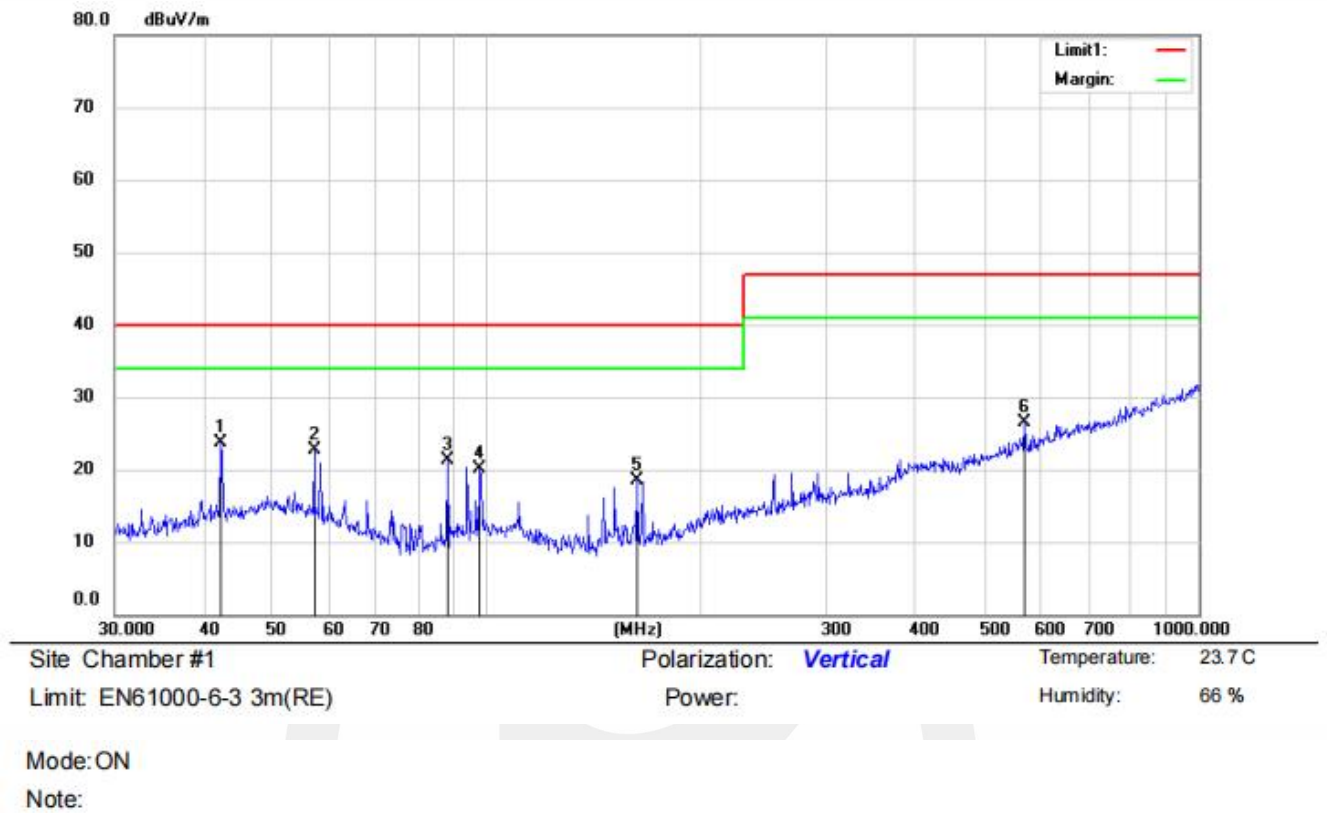
Mode: ON

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Ant. Factor dB/m	Pre Amp Gain dB	Cable loss dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	HI	Degree	Comment
1		63.7588	35.81	11.25	30.53	1.07	17.60	40.00	-22.40	QP		
2		112.5244	35.15	11.05	30.82	1.17	16.55	40.00	-23.45	QP		
3		153.7385	39.83	8.65	30.61	1.46	19.33	40.00	-20.67	QP		
4	*	183.8440	40.56	10.16	30.45	1.62	21.89	40.00	-18.11	QP		
5		289.0021	35.50	13.7	29.89	2.15	21.46	47.00	-25.54	QP		
6		399.0302	32.54	16.27	29.82	3.67	22.66	47.00	-24.34	QP		

*:Maximum data x:Over limit !:over margin

Operator: Ccyf



No.	Mk.	Freq. MHz	Reading Level dBuV	Ant. Factor dB/m	Pre Amp Gain dB	Cable loss dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	HI cm	Degree deg.	Comment
1	*	42.3022	40.22	13.31	30.51	0.66	23.68	40.00	-16.32	QP			
2		57.1914	39.26	12.97	30.51	0.97	22.69	40.00	-17.31	QP			
3		88.0330	41.55	9.39	30.71	1.07	21.30	40.00	-18.70	QP			
4		97.7983	38.56	11.25	30.86	1.08	20.03	40.00	-19.97	QP			
5		162.6106	38.50	9.01	30.56	1.51	18.46	40.00	-21.54	QP			
6		568.6126	34.07	19.31	29.91	3.1	26.57	47.00	-20.43	QP			

*:Maximum data x:Over limit !:over margin

Operator: Ccyf

7. IMMUNITY GENERAL PERFORMANCE CRITERIA DESCRIPTION

General performance criteria are defined in EN IEC 61000-6-1 clause 4. These criteria shall be used during the testing of primary functions where no relevant annex is applicable.

When assessing the impact of a disturbance on a function, the assessment should take into consideration the function's performance prior to the application of the disturbance and only identify as failures those changes in performance that are a result of the disturbance.

EN IEC 61000-6-1:

Performance 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.

Performance 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 ENIEC 61000-6-1:2019 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.

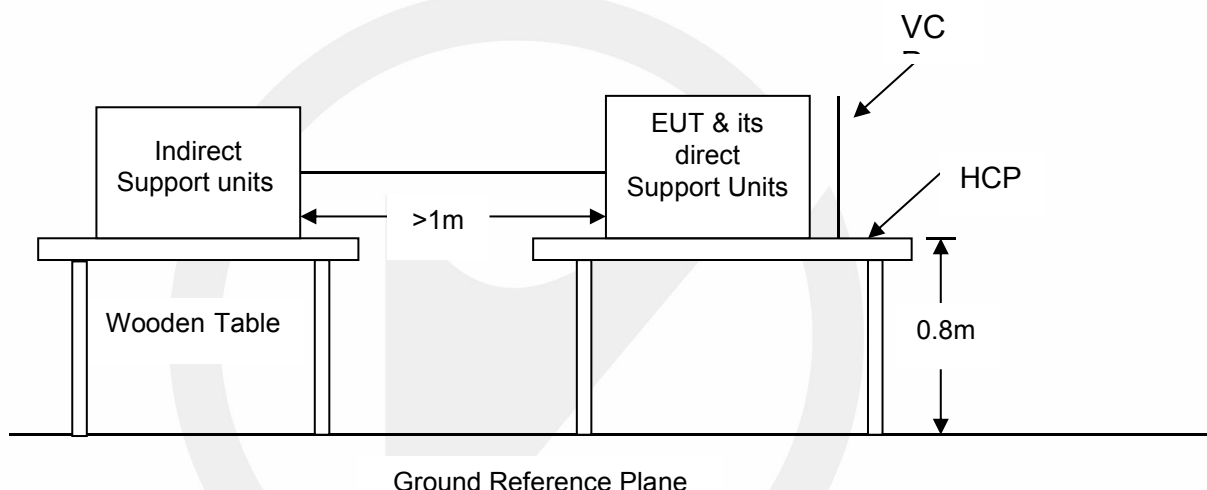
Performance criterion C: Temporary loss of function is allowed during the test, provided the function is self-recoverable or can be restored by the operation of the controls. If, as a result of the application of the tests defined in this standard, the EUT becomes dangerous or unsafe, it shall be deemed to have failed the test.

8. ELECTROSTATIC DISCHARGE

8.1. Test Specification

Test standard	: EN IEC 61000-6-1
Basic standard	: IEC 61000-4-2
Performance criterion	: B
Test level	: $\pm 8.0\text{kV}$ (Air discharge)
	: $\pm 4.0\text{kV}$ (Contact discharge)

8.2. Block Diagram of Test Setup



8.3. Test Procedure

- In the case of air discharge testing, the climatic conditions shall be within the following ranges:
 - ambient temperature: 15°C to 35°C ;
 - relative humidity : 30% to 60%;
 - atmospheric pressure : 86 kPa (860 mbar) to 106 kPa (1060 mbar)
- Test programs and software shall be chosen so as to exercise all normal modes of operation of the EUT. The use of special exercising software is encouraged, but permitted only where it can be shown that the EUT is being comprehensively exercised.
- In the case of contact discharges, the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.
- In the case of painted surface covering a conducting substrate, the following procedure shall be adopted :
 - If the coating is not declared to be an insulating coating by the equipment manufacturer, then the pointed tip of the generator shall penetrate the coating so as to make contact with the conducting substrate.
 - Coating declared as insulating by the manufacturer shall only be submitted to the air discharge.
 - The contact discharge test shall not be applied to such surfaces.
- In the case of air discharges, the round discharge tip of the discharge electrode shall be approached as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator (discharge electrode) shall be removed from the EUT. The generator is then retriggered for a new single discharge. This procedure shall be repeated until the discharges are completed. In the case of an air discharge test, the discharge switch, which is used for contact discharge, shall be closed.
- The test voltage shall be increased from the minimum to the selected test severity level, in order to

determine any threshold of failure. The final test level should not exceed the product specification value in order to avoid damage to the equipment.

g. The test shall be performed with both air discharge and contact discharge. The test shall be performed with single discharges. On each pre-selected point at least 10 single discharges (in the most sensitive polarity) shall be applied. For the time interval between successive single discharges an initial value of 1 s is recommended. Longer intervals may be necessary to determine whether a system failure has occurred.

h. Ensure that the applied charge on the EUT has been dis-charged before next ESD pulse.

8.4. Test Results

PASS

Temperature : 24.6°C
Humidity : 57.1%
Atmospheric Pressure : 101kpa
Test Engineer : Ccyf
Test Date : 2023-07-24

Air Discharge:

Test Voltage	Location	Actual criterion	Required performance criterion	Result (Pass/Fail)
±2; 4; 8 kV	Gap	A	B	Pass
±2; 4; 8 kV	Plastic enclosure	A	B	Pass

Contact Discharge

Test Voltage	Location	Actual criterion	Required performance criterion	Result (Pass/Fail)
±2; 4kV	Metal Parts	A	B	Pass

Indirect Discharge

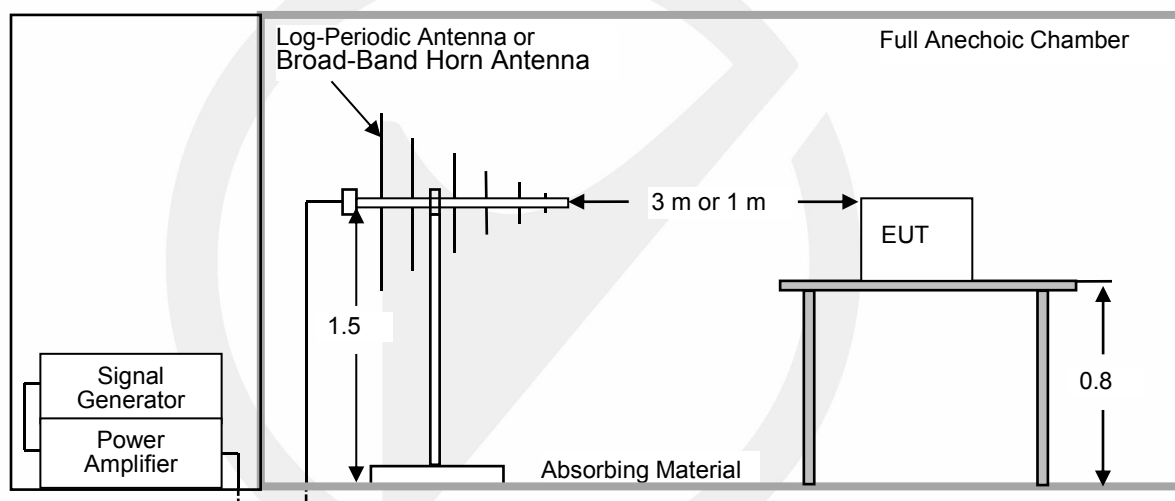
Test Voltage	Location	Actual criterion	Required performance criterion	Result (Pass/Fail)
±2; 4 kV	HCP	A	B	Pass
±2; 4kV	VCP	A	B	Pass

9. RADIO-FREQUENCY ELECTROMAGNETIC FIELD

9.1. Test Specification

Test standard	: EN IEC 61000-6-1	
Basic standard	: IEC 61000-4-3	
Performance criterion	: A	
Frequency range &	: <input checked="" type="checkbox"/> 80M-1000MHz	3V/m
Test level	: <input checked="" type="checkbox"/> 1400M-6000MHz	3V/m
Modulation	: AM, 80%, 1kHz sine-wave	

9.2. Block Diagram of Test Setup



9.3. Test procedure

The procedure defined in this part requires the generation of electromagnetic fields within which the test sample is placed and its operation observed. To generate fields that are useful for simulation of actual (field) conditions may require significant antenna drive power and the resultant high field strength levels. To comply with local regulations and to prevent biological hazards to the testing personnel, it is recommended that these tests be carried out in a shielded enclosure or semi-anechoic chamber.

- The antenna which is enabling the complete frequency range of 80-1000 MHz is placed 3m (or 1m) away from the equipment. The required field strength is determined by placing the field strength meter(s) on top of or directly alongside the equipment under test and monitoring the field strength meter via a remote field strength indicator outside the enclosure while adjusting the continuous-wave to the antenna.
- The test is performed with the antenna facing the front and back sides of the EUT with. Both vertical and horizontal polarizations from antenna are tested.

9.4. Test results

This test result outsourced to EMTEK(SHENZHEN) CO., LTD.

PASS

Temperature : 25.9 °C
Humidity : 58.7%
Atmospheric Pressure : 101kpa
Test Engineer : Ccyf
Test Date : 2023-07-25

☒ 80M-1000MHz:

Freq. Range (MHz)	Field	Modulation	Polarity	Position (°)	Actual criterion	Required performance criterion	Result
80-1000	3V/m	AM, 80%	H / V	0, 90,180, 270	A	A	Pass

☒ 1400M-6000MHz:

Freq (MHz)	Field	Modulation	Polarity	Position (°)	Actual criterion	Required performance criterion	Result
1400-6000	3V/m	AM, 80%	H / V	0, 90,180, 270	A	A	Pass

10. PHOTOGRAPHS

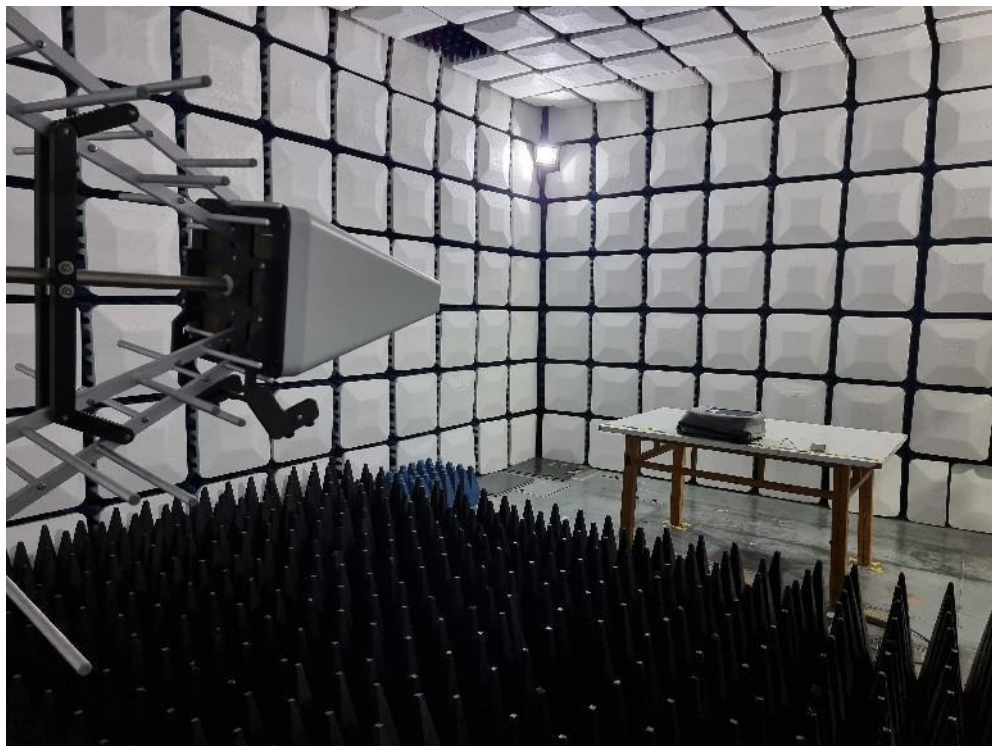
10.1. Photos of Radiation Emission Measurement



10.2.Photo of Electrostatic Discharges

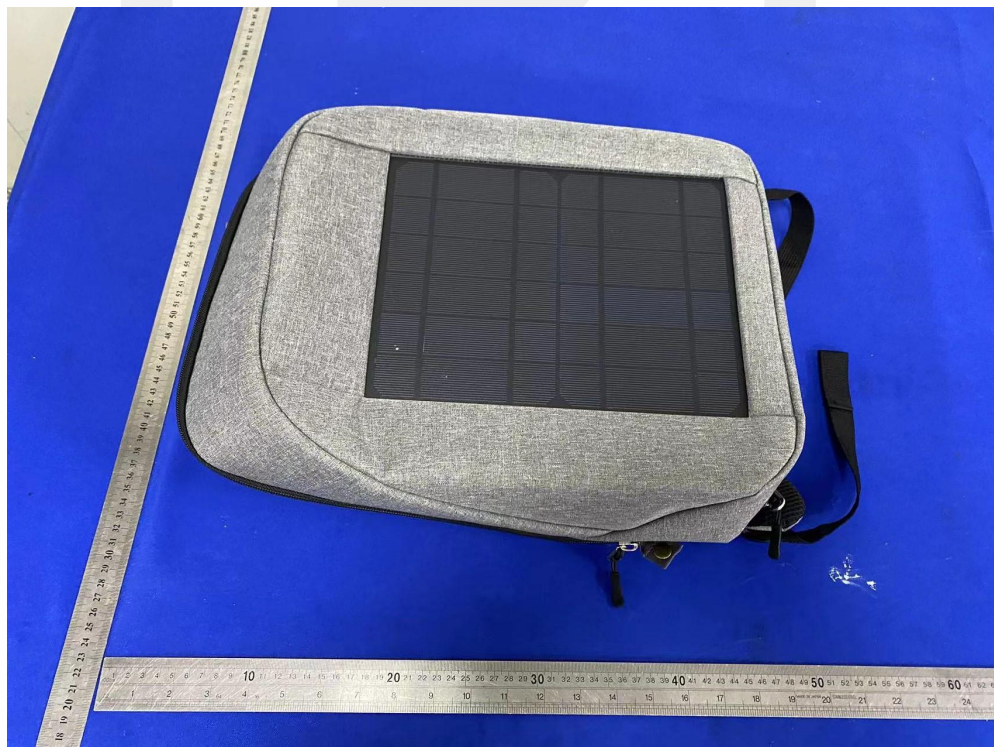


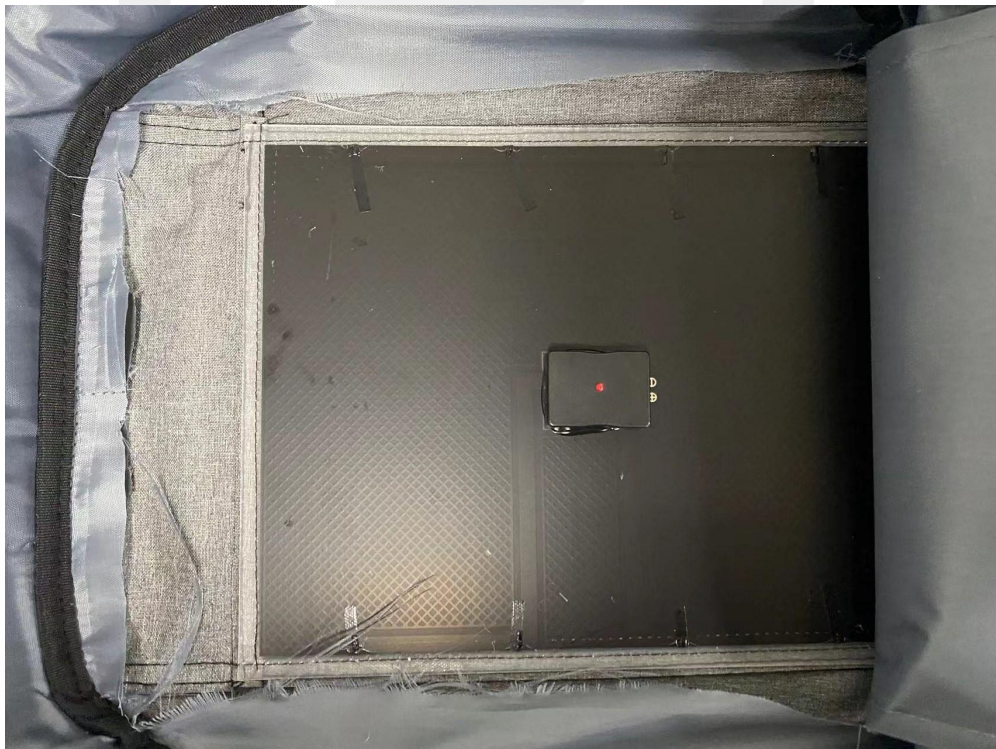
10.3.Photo of Radio-frequency electromagnetic field





APPENDIX (PHOTOS OF EUT)







---The end---

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