TEST REPORT

REPORT NO. : (8824)359-0164
DATE : Feb 12, 2025
PAGE : 1 OF 12

Applicant Name:	**PARTICLE INDUSTRIES,INC**
Applicant Address:	325 9TH STREET, SAN FRANCISCO, CA 94103, UNITED STATES OF AMERICA
Date of Submission:	DEC 24, 2024
Test Period:	DEC 24, 2024 TO FEB 12, 2025
Sample Description:	MUON
Style No. :	MUONCBKIT
Manufacturer :	UMEC (SHENZHEN) COMPANY LTD.
Sample Size:	1

BUREAU VERITAS SHENZHEN CO.,LTD
DONGGUAN BRANCH

Lisa Bai
Analytical lab technical ass. manager

RT/ Olivia Yin

REMARK

If there are questions or concerns on this report, please contact the following persons:

Report Enquiry: (86) 0769 89952999 Ext. 8175 CPSAnalytical.DG@bureauveritas.com

Business Contact: (86) 0769 85893595

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Bureau Veritas Shenzhen Co., Ltd., Dongguan Branch
No.96, Houjie, Guantai Road., Houjie,
Dongguan,Guangdong, China
Tel: +86-769-89982098
Fax: +86-769-85991080
www.cps.bureauveritas.com

SUMMARY OF TEST RESULTS

TEST REQUESTED	CONCLUSION	REMARK
European Parliament and Council Directive 2011/65/EU on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) with its Amendment Directive (EU)2015/863	PASS	-

Photo of the Submitted Sample

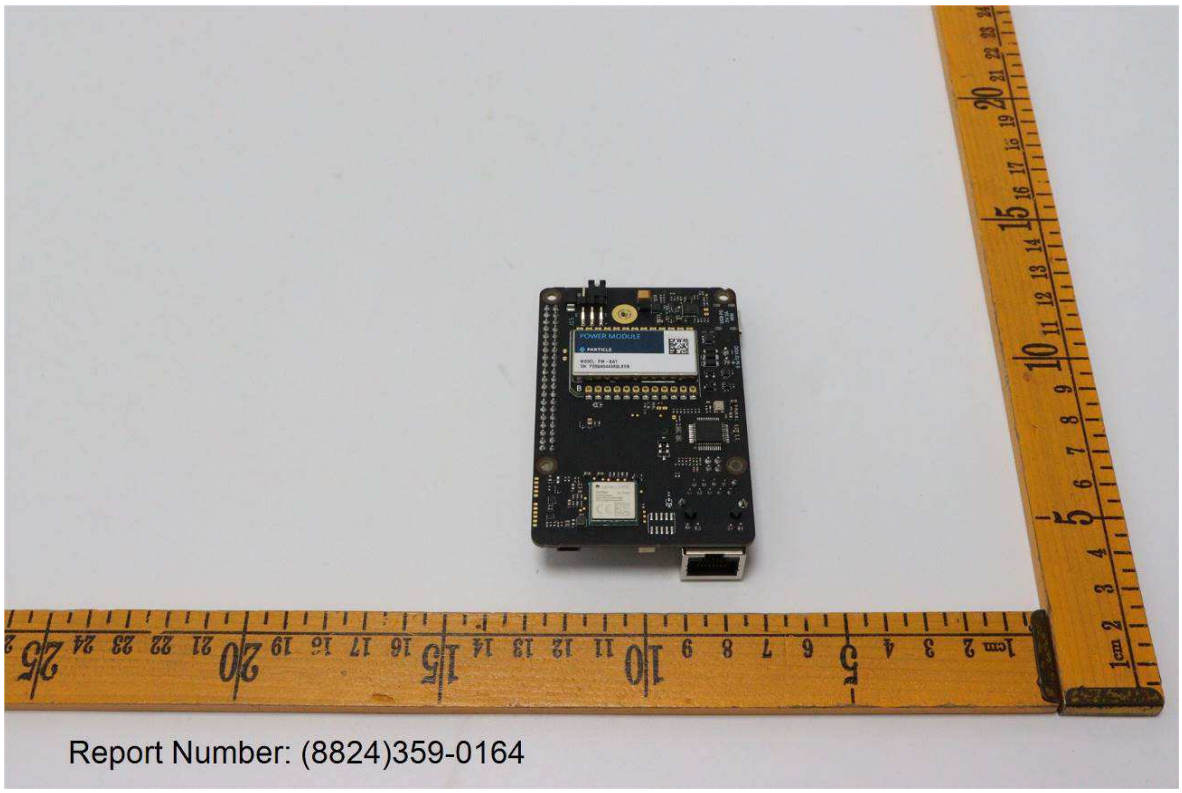
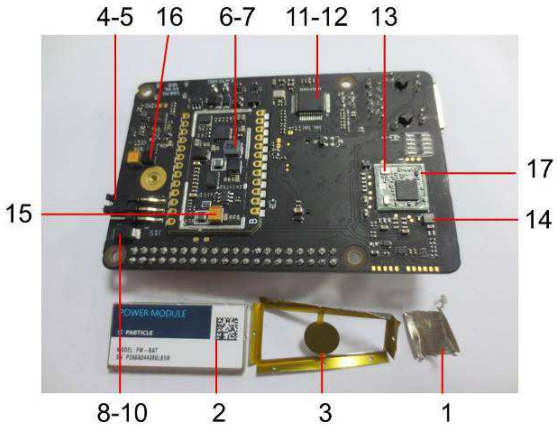
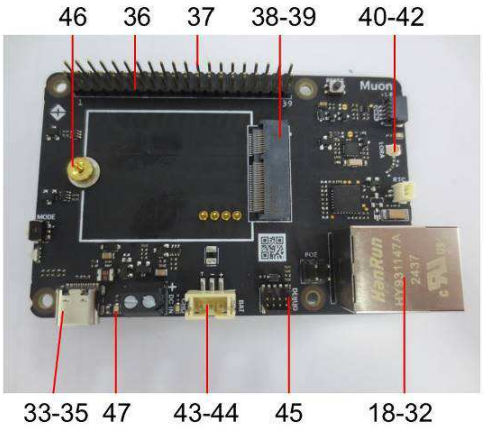
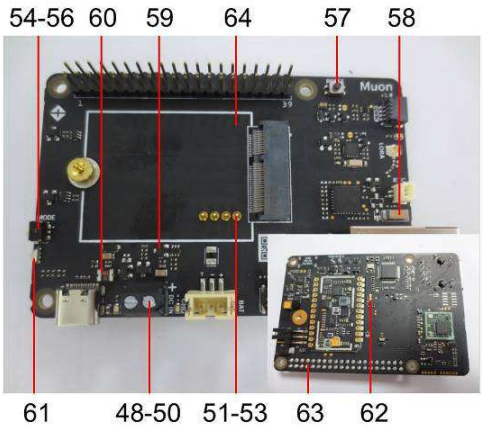


Photo of Test Item(s)







Component Description List

Test Item(s)	Component Description(s)	Location	Style(s)
1	Silvery metal	Cover, PCB	-
2	Black/white/blue coated yellow plastic with adhesive	Sticker, PCB	-
3	Silvery/golden metal	Cover, PCB	-
4	Black plastic	Socket, PCB	-
5	Silvery metal	Pin, socket, PCB	-
6	Black metal	Inductor, PCB	-
7	Coppery metal	Coil, inductor, PCB	-
8	Black body	Diode, PCB	-
9	Silvery/coppery metal	Plate, diode, PCB	-
10	Silvery solder	Solder inside, diode, PCB	-
11	Black body	SMD IC, PCB	-
12	Silvery/coppery metal	Plate, SMD IC, PCB	-
13	Silvery/coppery metal	SMD EC, PCB	-
14	Grey body	SMD EC, PCB	-
15	Yellow body	EC, PCB	-
16	Black body	SMD EC, PCB	-
17	Green PCB	Small PCB, PCB	-
18	Silvery metal	Case, ethernet, PCB	-
19	Black plastic	Case, ethernet, PCB	-
20	Silvery/coppery metal	Pin, ethernet, PCB	-
21	Yellow/translucent plastic	LED, ethernet, PCB	-
22	Silvery metal	Pin, LED, ethernet, PCB	-
23	Green/translucent plastic	LED, ethernet, PCB	-
24	Black body	General diode, small PCB, ethernet, PCB	-
25	Silvery/coppery metal	Plate, general diode, small PCB, ethernet, PCB	-
26	Silvery solder	Solder inside, general diode, small PCB, ethernet, PCB	-
27	Green printed black metal	Inductor, small PCB, ethernet, PCB	-
28	Coppery metal	Coil, inductor, small PCB, ethernet, PCB	-
29	Red metal	Coil, inductor, small PCB, ethernet, PCB	-
30	Black glue	Glue, small PCB, ethernet, PCB	-
31	Green PCB	Small PCB, ethernet, PCB	-
32	Silvery solder	Solder, small PCB, ethernet, PCB	-
33	Silvery metal	Cover, type c plug, PCB	-
34	Silvery metal	Pin, type c plug, PCB	-
35	Black plastic	Pin holder, type c plug, PCB	-
36	Black plastic	Socket, PCB	-

Test Item(s)	Component Description(s)	Location	Style(s)
37	Silvery/golden metal	Pin, socket, PCB	-
38	Grey plastic	Socket, PCB	-
39	Silvery metal	Pin, socket, PCB	-
40	Silvery/golden metal	Socket, PCB	-
41	White plastic	Base, socket, PCB	-
42	Silvery/golden metal	Pin, socket, PCB	-
43	Beige plastic	Socket, PCB	-
44	Silvery metal	Pin, socket, PCB	-
45	Black plastic	Socket, PCB	-
46	Golden metal	Nut, PCB	-
47	Translucent body	SMD LED, PCB	-
48	Black plastic	Socket, PCB	-
49	Bright silvery metal	Screw, socket, PCB	-
50	Silvery/golden metal	Pin, socket, PCB	-
51	Golden metal	Terminal, plug, PCB	-
52	Silvery metal	Spring, plug, PCB	-
53	Golden metal	Tube, plug, PCB	-
54	Beige plastic	Touch switch, PCB	-
55	Silvery metal	Touch switch, PCB	-
56	Black plastic	Touch switch, PCB	-
57	Black plastic	Touch switch, PCB	-
58	Brown body	SMD capacitor, PCB	-
59	Black body	SMD resistor, PCB	-
60	Orange printed white body	SMD fuse, PCB	-
61	White body	SMD LED, PCB	-
62	Black printed white body	SMD resistor, PCB	-
63	Silvery solder	Solder, PCB	-
64	Black PCB	PCB	-

TEST RESULT

Compliance Test – European Parliament and Council Directive 2011/65/EU on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) with its Amendment Directive 2015/863/EU

Test Method : See Appendix.

See Analytes and their corresponding Maximum Allowable Limit in Appendix

-	Result						
Parameter	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Chromium VI (Cr VI)	PBBs	PBDEs	Conclusion
Limit (mg/kg):	1000	1000	100	1000/ Negative	1000	1000	-
Test Item(s)	-	-	-	-	-	-	-
1.	BL	BL	BL	BL	NA	NA	PASS
2.	BL	BL	BL	BL	BL	BL	PASS
3.	BL	BL	BL	BL	NA	NA	PASS
4.	BL	BL	BL	BL	BL	BL	PASS
5.	BL	BL	BL	BL	NA	NA	PASS
6.	BL	BL	BL	BL	NA	NA	PASS
7.	BL	BL	BL	BL	NA	NA	PASS
8.	BL*	BL	BL	BL	BL	BL	PASS
9.	BL	BL	BL	BL	NA	NA	PASS
10.	OL*	BL	BL	BL	NA	NA	EXEMPTED#
11.	16*	BL	BL	BL	BL	BL	PASS
12.	BL	BL	BL	BL	NA	NA	PASS
13.	BL	BL	BL	BL	NA	NA	PASS
14.	BL	BL	BL	BL	BL	BL	PASS
15.	BL	BL	BL	BL	BL	BL	PASS
16.	30*	BL	BL	BL	BL	BL	PASS
17.	BL	BL	BL	BL	BL	BL	PASS
18.	BL	BL	BL	BL	NA	NA	PASS
19.	BL	BL	BL	BL	BL*	BL*	PASS
20.	BL	BL	BL	BL	NA	NA	PASS
21.	BL	BL	BL	BL	BL	BL	PASS
22.	BL	BL	BL	BL	NA	NA	PASS
23.	BL	BL	BL	BL	BL	BL	PASS
24.	BL	BL	BL	BL	BL	BL	PASS
25.	BL	BL	BL	BL	NA	NA	PASS
26.	OL*	BL	BL	BL	NA	NA	EXEMPTED#
27.	BL	BL	BL	BL	NA	NA	PASS
28.	BL	BL	BL	BL	NA	NA	PASS

29.	BL	BL	BL	BL	NA	NA	PASS
30.	BL	BL	BL	BL	BL	BL	PASS
31.	BL	BL	BL	BL	BL*	BL*	PASS
32.	BL	BL	BL	BL	NA	NA	PASS
33.	BL	BL	BL	BL	NA	NA	PASS
34.	BL	BL	BL	BL	NA	NA	PASS
35.	BL	BL	BL	BL	BL	BL	PASS
36.	BL	BL	BL	BL	BL*	BL*	PASS
37.	BL	BL	BL	BL	NA	NA	PASS
38.	BL	BL	BL	BL	BL	BL	PASS
39.	BL	BL	BL	BL	NA	NA	PASS
40.	BL	BL	BL	BL	NA	NA	PASS
41.	BL	BL	BL	BL	BL	BL	PASS
42.	BL	BL	BL	BL	NA	NA	PASS
43.	BL	BL	BL	BL	BL*	BL*	PASS
44.	BL	BL	BL	BL	NA	NA	PASS
45.	BL	BL	BL	BL	BL*	BL*	PASS
46.	24540*	BL	BL	BL	NA	NA	EXEMPTED#
47.	BL	BL	BL	BL	BL	BL	PASS
48.	BL	BL	BL	BL	BL	BL	PASS
49.	BL	BL	BL	BL	NA	NA	PASS
50.	23260*	BL	BL	Negative*	NA	NA	EXEMPTED#
51.	18710*	BL	BL	BL	NA	NA	EXEMPTED#
52.	BL	BL	BL	Negative*	NA	NA	PASS
53.	19250*	BL	BL	BL	NA	NA	EXEMPTED#
54.	BL	BL	BL	BL	BL	BL	PASS
55.	BL	BL	BL	BL	NA	NA	PASS
56.	BL	BL	BL	BL	BL	BL	PASS
57.	BL	BL	BL	BL	BL	BL	PASS
58.	BL	BL	BL	BL	BL	BL	PASS
59.	BL	BL	BL	BL	BL	BL	PASS
60.	BL	BL	BL	BL	BL	BL	PASS
61.	BL	BL	BL	BL	BL	BL	PASS
62.	BL	BL	BL	BL	BL	BL	PASS
63.	BL	BL	BL	BL	NA	NA	PASS
64.	BL	BL	BL	BL	BL*	BL*	PASS

Note / Key:

ND = Not detected	">" = Greater than	"<" = Less than
NR = Not requested	mg/kg = milligram(s) per kilogram = ppm = part(s) per million	
NA = Not applicable	% = percent	10000 mg/kg = 1 %
BL = Below limit	OL = Over limit	
Detection Limit : See Appendix.		

Remark:

- *Denotes as reported result(s) was (were) performed by wet chemistry method. Others were screened by XRF. For XRF screening, the result(s) of Cr VI was (were) reported as total chromium and the result(s) of PBBs and PBDEs was (were) reported as total bromine. Also, the XRF result(s) may be different to the actual content based on various factors including, but not limit to, sample size, thickness, area, non-uniformity composition, surface flatness.
- *Result(s) of Cr VI for metallic material(s) was (were) expressed in term of positive and negative. Negative means the absence of Cr VI on the tested areas and the result(s) was (were) regarded as in compliance with European Council Directive 2011/65/EU, Article 4(1). While, positive means the presence of Cr VI on tested areas and the result(s) was (were) regarded as in conflict with European Council Directive 2011/65/EU, Article 4(1).
- According to European Council Directive 2011/65/EU, Article 5 "Adaptation of the Annexes to scientific and technical progress", exemption(s) should be granted to the materials and components of Test Item(s) in the lists in Annexes III and IV of this directive.
- #According to Annex III of European Council Directive 2011/65/EU, exemptions were granted a few materials and Clause 6(c) is reiterated here "Copper alloy containing up to 4 % lead by weight". Test Item(s) 46, 50, 51, 53 was (were) claimed as is by client (received as is). Therefore, this (these) Test Item(s) containing the found lead level should be exempted.
- #According to Annex III of European Council Directive 2011/65/EU, exemptions were granted a few materials and Clause 7(a) is reiterated here "Lead in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead).". Test Item(s) 10, 26 was (were) claimed as is by client (received as is). Therefore, this (these) Test Item(s) containing the found lead level should be exempted.

APPENDIX

List of Analytes and their Corresponding Test Methods, Detection Limit and Maximum Allowable Limit
[Compliance Test for European Parliament and Council Directive 2011/65/EU] :

No.	Name of Analytes	Detection Limit (mg/kg)				Maximum Allowable Limit (mg/kg)
		X-ray fluorescence (XRF)[a]			Wet Chemistry	
		Plastic	Metallic / glass / ceramic	Others		
1	Lead (Pb)	100	200	200	10[b]	1000
2	Cadmium (Cd)	50	50	50	10[b]	100
3	Mercury (Hg)	100	200	200	10[c]	1000
4	Chromium (Cr)	100	200	200	NA	NA
5	Chromium VI (Cr VI)	NA	NA	NA	3[g, h] / 10[d] / See [e, j]	1000 / Negative[j]
6	Bromine (Br)	200	NA	200	NA	NA
7	Polybromobiphenyls (PBBs) - Bromobiphenyl (MonoBB) - Dibromobiphenyl (DiBB) - Tribromobiphenyl (TriBB) - Tetrabromobiphenyl (TetraBB) - Pentabromobiphenyl (PentaBB) - Hexabromobiphenyl (HexaBB) - Heptabromobiphenyl (HeptaBB) - Octabromobiphenyl (OctaBB) - Nonabromobiphenyl (NonaBB) - Decabromobiphenyl (DecaBB)	NA	NA	NA	Each 50[f]	Sum 1000
8	Polybromodiphenyl ethers (PBDEs) - Bromodiphenyl ether (MonoBDE) - Dibromodiphenyl ether (DiBDE) - Tribromodiphenyl ether (TriBDE) - Tetrabromodiphenyl ether (TetraBDE) - Pentabromodiphenyl ether (PentaBDE) - Hexabromodiphenyl ether (HexaBDE) - Heptabromodiphenyl ether (HeptaBDE) - Octabromodiphenyl ether (OctaBDE) - Nonabromodiphenyl ether (NonaBDE) - Decabromodiphenyl ether (DecaBDE)	NA	NA	NA	Each 50[f]	Sum 1000

List of Analytes and their Corresponding Test Methods, Detection Limit and Maximum Allowable Limit [Compliance Test for European Parliament and Council Directive 2011/65/EU] :

NA = Not applicable

[a] Test method with reference to International Standard IEC 62321-3-1: 2013.

[b] Test method with reference to International Standard IEC 62321-5: 2013.

[c] Test method with reference to International Standard IEC 62321-4:2013+A1:2017.

[d] Polymers and Electronics - Test method with reference to International Standard IEC 62321-7-2:2017.

[e] Metal - Test method with reference to International Standard IEC 62321-7-1: 2015.

[f] Test method with reference to International Standard IEC 62321-6: 2015.

[g] Leather - Test method International Standard ISO 17075-1:2017.

[h] Other Than Metal, Leather, Polymers and Electronics - Test method with reference to International Standard ISO 17075-1:2017.

[i] The principle of this method was evaluated and supported by two studies organized by IEC TC 111 WG3. These studies were focused on detecting the presence of Cr VI in the corrosion protection coatings on metallic samples.

[j] Result(s) of Cr VI for metallic material(s) was (were) expressed in term of positive and negative. Negative means the absence of Cr VI on the tested areas and the result(s) was (were) regarded as in compliance with European Parliament and Council Directive 2011/65/EU, Article 4(1). While, positive means the presence of Cr VI on tested areas and the result(s) was (were) regarded as in conflict with European Parliament and Council Directive 2011/65/EU, Article 4(1).

Testing Approach [Compliance Test for European Parliament and Council Directive 2011/65/EU] :

The testing approach was with reference to the following document(s).

1	International Standards IEC 62321-1: 2013 and IEC 62321-2: 2021
2	“RoHS Enforcement Guidance Document Version 1” by EU RoHS Enforcement Authorities Informal Network. (May 2006)
3	“RoHS Regulations - Government Guidance Notes” by United Kingdom Department for Business Innovation & Skills. (February 2011)
4	“Final Report to RoHS substances (Hg, Pb, Cr(VI), Cd, PBB and PBDE) in electrical and electronic equipment in Belgium” by Belgium Federal Public Service Health, Food Chain Safety and Environment. (November 2005)

TEST RESULT

BBP/DBP/DEHP/DIBP Content – European Parliament and Council Directive 2011/65/EU on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) with its Amendment Directive 2015/863/EU

Test Method : With reference to International Standard IEC 62321-8:2017

Test Parameter:	BBP	DBP	DEHP	DiBP	-
Limit (%):	0.1	0.1	0.1	0.1	-
Test Item(s)	Result (%)				Conclusion
2+30	ND	ND	ND	ND	PASS
4+8+11	ND	ND	ND	ND	PASS
14+15+16	ND	ND	ND	ND	PASS
17+19+21	ND	ND	ND	ND	PASS
23+24+31	ND	ND	ND	ND	PASS
35+36+38	ND	ND	ND	ND	PASS
41+43+45	ND	ND	ND	ND	PASS
47+48+54	ND	ND	ND	ND	PASS
56+57+58	ND	ND	ND	ND	PASS
59+60+61	ND	ND	ND	ND	PASS
62+64	ND	ND	ND	ND	PASS

Note / key:

BBP = Butyl benzyl phthalate (CAS No: 85-68-7)
DBP = Dibutyl phthalate (CAS No: 84-74-2)
DEHP = Di(2-ethylhexyl) phthalate (CAS No: 117-81-7)
DiBP = Diisobutyl phthalate (CAS No: 84-69-5)
ND = Not detected % = percent 10000 mg/kg = 1 %
BL = Below limit OL = Over limit
mg/kg = milligram(s) per kilogram
Detection Limit (%) : Each 0.005
* denotes as reported result(s) was (were) performed by wet chemistry method.

Remark:

- The amendment will be effective on 22 July 2019. For medical devices and control instruments, effective date will be 22 July 2021.

*** End of Report ***