

# Test Report

Report No.: U05101220112208E

Query Password: QW3934

Date: Jan. 20, 2022

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**Applicant:** Shenzhen Growatt New Energy Co., Ltd.**Contact information:** 4-13/F, Building A, Sino-German(Europe) Industrial Park, Hangcheng Ave, Bao'an District, Shenzhen, China**The following sample(s) was (were) submitted and identified by client as:**

Sample Name : Shine4G-X  
Model No. : Shine4G-X  
Manufacturer : Guangdong Growatt New Energy Co., Ltd.  
Address : Growatt Industrial Park, No.17 Pingheng Road Pingtan Town, Huiyang District, Huizhou, Guangdong, China  
Received Date : Jan. 17, 2022  
Testing Period : From Jan. 17, 2022 to Jan. 20, 2022  
Test Request : Please refer to next page(s).  
Test Result(s) : Please refer to next page(s).

Shen Zhen UONE Test Co., LTD.

Prepared by



Lili Zeng

Checked by



Lin Zhu

Approved by



Levent Liang



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**Summary of test results:****TEST REQUEST**

RoHS Directive 2011/65/EU and its subsequent amendments Directive (EU) 2015/863

To determine Lead (Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)),

(1) Polybrominated Biphenyls (PBBs) and Polybrominated DiphenylEthers (PBDEs) content by screening test and chemical test

(2) To determine Phthalates (DBP, BBP, DEHP, DIBP) content by chemical test

**CONCLUSION****PASS****PASS**

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## Test Material List

Material No.	Description (Location)	Photo(s) of tested materials
1	Silver label	
2	Black plastic (housing)	
3	White label	
4	White soft plastic (seal)	
5	Black soft plastic (washer)	
6	Black plastic (nut)	
7	Silver metal (screws)	
8	Silver metal (USB socket)	
9	Blue inner plastic	
10	Copper-colored metal (pin)	
11	Blue printing (capacitor, PCB)	
12	Silver metal shell (capacitor, PCB)	
13	Black rubber base (capacitor, PCB)	
14	Silver metal pins (capacitor, PCB)	
15	Silver foil (capacitor, PCB)	
16	Dark silver foil (capacitor, PCB)	
17	Yellow paper with liquid (capacitor, PCB)	
18	Black body (transistor, PCB)	
19	Brown body (capacitor, PCB)	
20	Black body (resistor, PCB)	
21	Silver metal (card slot)	
22	Copper-colored metal (pin)	
23	Black plastic (card slot)	
24	Silver metal (nut)	
25	Black foam	
26	Black body (EC, PCB)	
27	Silver metal (pin)	
28	Black plastic (socket)	
29	White body (capacitor, PCB)	
30	Black plastic sheet	

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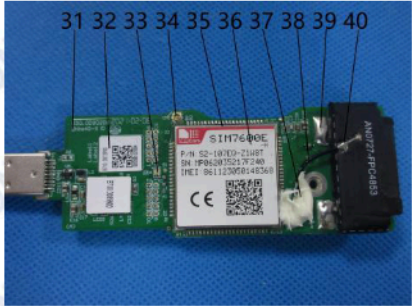
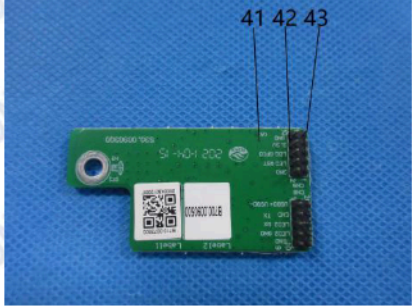
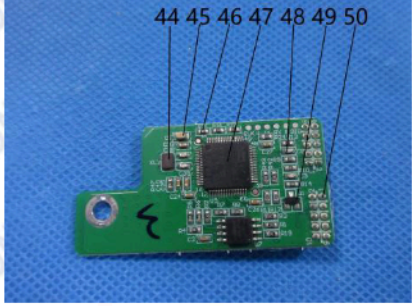
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Material No.	Description (Location)	Photo(s) of tested materials
31	Green PCB	
32	White label	
33	Yellow body (LED light)	
34	Gold Metal (terminal)	
35	Silver metal cover	
36	White paper	
37	White glass glue	
38	Black plastic (cable wire)	
39	Silver Metal (solder)	
40	Silver wire	
41	Green PCB	
42	Black plastic (socket)	
43	Copper-colored metal (pin)	
44	Black body (EC, PCB)	
45	Brown body (capacitor, PCB)	
46	Black body (resistor, PCB)	
47	Black body (integrated circuit, PCB)	
48	White body (capacitor, PCB)	
49	Black body (transistor, PCB)	
50	Silver metal (solder)	

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## Test Result(s):

(1) Lead (Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr(VI)), Polybrominated Biphenyls (PBBs) and Polybrominated DiphenylEthers (PBDEs)

Test Method: IEC62321-3-1: 2013, IEC62321-4: 2013+A1:2017, IEC62321-5: 2013, IEC62321-6: 2015, IEC 62321-7-1:2015, IEC 62321-7-2: 2017, analyzed by EDXRF & ICP-OES & GC-MS & UV-Vis.

No.	EDXRF Result <sup>(1)</sup>					Chemical Result <sup>(2)</sup> (mg/kg)	Remark <sup>(3)</sup>	Conclusion
	Pb	Cd	Hg	Cr	Br			
1	BL	BL	BL	BL	BL	—	—	PASS
2	BL	BL	BL	BL	BL	—	—	PASS
3	BL	BL	BL	BL	BL	—	—	PASS
4	BL	BL	BL	BL	BL	—	—	PASS
5	BL	BL	BL	BL	BL	—	—	PASS
6	BL	BL	BL	BL	BL	—	—	PASS
7	BL	BL	BL	BL	NA	—	—	PASS
8	BL	BL	BL	BL	NA	—	—	PASS
9	BL	BL	BL	BL	BL	—	—	PASS
10	BL	BL	BL	BL	NA	—	—	PASS
11	BL	BL	BL	BL	BL	—	—	PASS
12	BL	BL	BL	BL	NA	—	—	PASS
13	BL	BL	BL	BL	BL	—	—	PASS
14	BL	BL	BL	BL	NA	—	—	PASS
15	BL	BL	BL	BL	BL	—	—	PASS
16	BL	BL	BL	BL	BL	—	—	PASS
17	BL	BL	BL	BL	BL	—	—	PASS
18	BL	BL	BL	BL	BL	—	—	PASS
19	BL	BL	BL	BL	BL	—	—	PASS
20	BL	BL	BL	BL	BL	—	—	PASS
21	BL	BL	BL	BL	NA	—	—	PASS
22	BL	BL	BL	BL	NA	—	—	PASS
23	BL	BL	BL	BL	BL	—	—	PASS

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No.	EDXRF Result <sup>(1)</sup>					Chemical Result <sup>(2)</sup> (mg/kg)	Remark <sup>(3)</sup>	Conclusion
	Pb	Cd	Hg	Cr	Br			
24	BL	BL	BL	BL	NA	—	—	PASS
25	BL	BL	BL	BL	BL	—	—	PASS
26	BL	BL	BL	BL	BL	—	—	PASS
27	BL	BL	BL	BL	NA	—	—	PASS
28	BL	BL	BL	BL	BL	—	—	PASS
29	BL	BL	BL	BL	BL	—	—	PASS
30	BL	BL	BL	BL	BL	—	—	PASS
31	BL	BL	BL	BL	BL	—	—	PASS
32	BL	BL	BL	BL	BL	—	—	PASS
33	BL	BL	BL	BL	BL	—	—	PASS
34	BL	BL	BL	BL	NA	—	—	PASS
35	BL	BL	BL	BL	NA	—	—	PASS
36	BL	BL	BL	BL	BL	—	—	PASS
37	BL	BL	BL	BL	BL	—	—	PASS
38	BL	BL	BL	BL	BL	—	—	PASS
39	BL	BL	BL	BL	NA	—	—	PASS
40	BL	BL	BL	BL	NA	—	—	PASS
41	BL	BL	BL	BL	BL	—	—	PASS
42	BL	BL	BL	BL	BL	—	—	PASS
43	BL	BL	BL	BL	NA	—	—	PASS
44	BL	BL	BL	BL	BL	—	—	PASS
45	BL	BL	BL	BL	BL	—	—	PASS
46	BL	BL	BL	BL	BL	—	—	PASS
47	BL	BL	BL	BL	BL	—	—	PASS
48	BL	BL	BL	BL	BL	—	—	PASS
49	BL	BL	BL	BL	BL	—	—	PASS
50	BL	BL	BL	BL	NA	—	—	PASS

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**Remark:**

- (1) ① Results are obtained by EDXRF for primary screening, and further wet chemical testing by ICP-OES (for Cd, Pb, Hg), UV-VIS (for Cr(VI)) and GC/MS (for PBBs, PBDEs) is recommended to be performed, if an inconclusive result was found (as "X" in below table) (unit: mg/kg).
- ② OL = Over Limit, BL = Below Limit, X = Inconclusive, NA = Not Applicable.
- ③ The EDXRF screening test for RoHS elements – The reading may be different to the actual content in the sample be of non-uniformity composition.

Element	Polymer	Metal	Composite Materials
Cd	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$LOD < X < (150+3\sigma) \leq OL$
Pb	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Hg	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Br	$BL \leq (300-3\sigma) < X$	NA	$BL \leq (250-3\sigma) < X$
Cr	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$

**Units and limits in EU RoHS Directive 2011/65/EU:**

Element	Pb	Cd	Hg	Cr(VI)	PBBs(single)	PBDEs(single)
Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Limit	1000	100	1000	1000	1000	1000

- (2) ① mg/kg = ppm = 0.0001%, N.D. = Not Detected (Less than MDL).

② Unit and MDL (Method detection limit) in wet chemical test.

Element	Pb	Cd	Hg	Cr(VI)	PBBs(single)	PBDEs(single)
Unit	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MDL	2	2	2	8	5	5

③ According to IEC 62321-7-1:2015, result on Cr(VI) for metal sample is shown as Positive/Negative. Negative = Absence of Cr(VI) coating, Positive = Presence of Cr(VI) coating.

Storage condition and production date of the tested sample are unavailable and thus results of Cr(VI) represent status of the sample at the time of testing.

④ According to IEC 62321-3-1:2013, this column represents the results of wet chem test.

- (3) This column represents the exempted decoration of material or other related testing sample's information.

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## (2) Phthalates (DBP, BBP, DEHP, DIBP) content

Test Method: IEC 62321-8: 2017, analyzed by gas chromatographic- mass spectrometer (GC-MS).

Substances	DBP	BBP	DEHP	DIBP	Conclusion
CAS No.	84-74-2	85-68-7	117-81-7	84-69-5	
Limit (mg/kg)	1000	1000	1000	1000	
MDL (mg/kg)	20	20	20	20	
Material No.	Result (mg/kg)				
1	N.D.	N.D.	N.D.	N.D.	PASS
2	N.D.	N.D.	N.D.	N.D.	PASS
3	N.D.	N.D.	N.D.	N.D.	PASS
4	N.D.	N.D.	N.D.	N.D.	PASS
5	N.D.	N.D.	N.D.	N.D.	PASS
6	N.D.	N.D.	N.D.	N.D.	PASS
9	N.D.	N.D.	N.D.	N.D.	PASS
11	N.D.	N.D.	N.D.	N.D.	PASS
13	N.D.	N.D.	N.D.	N.D.	PASS
15	N.D.	N.D.	N.D.	N.D.	PASS
16	N.D.	N.D.	N.D.	N.D.	PASS
17	N.D.	N.D.	N.D.	N.D.	PASS
18	N.D.	N.D.	N.D.	N.D.	PASS
19	N.D.	N.D.	N.D.	N.D.	PASS
20	N.D.	N.D.	N.D.	N.D.	PASS
23	N.D.	N.D.	N.D.	N.D.	PASS
25	N.D.	N.D.	N.D.	N.D.	PASS
26	N.D.	N.D.	N.D.	N.D.	PASS
28	N.D.	N.D.	N.D.	N.D.	PASS
29	N.D.	N.D.	N.D.	N.D.	PASS
30	N.D.	N.D.	N.D.	N.D.	PASS
31	N.D.	N.D.	N.D.	N.D.	PASS

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Substances	DBP	BBP	DEHP	DIBP	Conclusion
CAS No.	84-74-2	85-68-7	117-81-7	84-69-5	
Limit (mg/kg)	1000	1000	1000	1000	
MDL (mg/kg)	20	20	20	20	
Material No.	Result (mg/kg)				
32	N.D.	N.D.	N.D.	N.D.	PASS
33	N.D.	N.D.	N.D.	N.D.	PASS
36	N.D.	N.D.	N.D.	N.D.	PASS
37	N.D.	N.D.	N.D.	N.D.	PASS
38	N.D.	N.D.	N.D.	N.D.	PASS
41	N.D.	N.D.	N.D.	N.D.	PASS
42	N.D.	N.D.	N.D.	N.D.	PASS
44	N.D.	N.D.	N.D.	N.D.	PASS
45	N.D.	N.D.	N.D.	N.D.	PASS
46	N.D.	N.D.	N.D.	N.D.	PASS
47	N.D.	N.D.	N.D.	N.D.	PASS
48	N.D.	N.D.	N.D.	N.D.	PASS
49	N.D.	N.D.	N.D.	N.D.	PASS

- Note:**
1. mg/kg = milligram per kilogram (ppm).
  2. MDL= method detection limit.
  3. N.D.=not detected(less than MDL).

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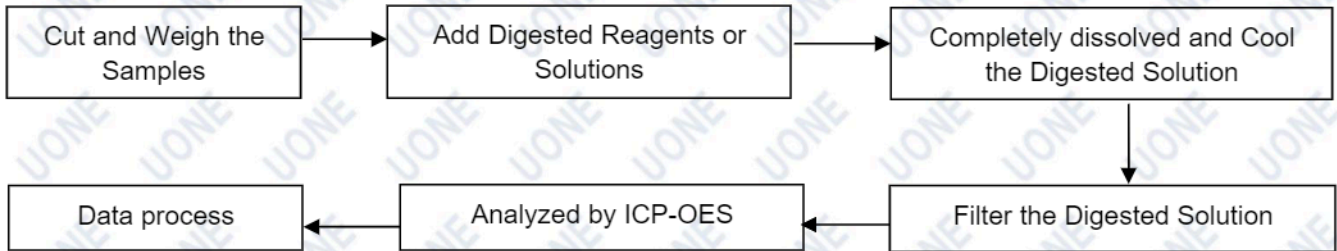
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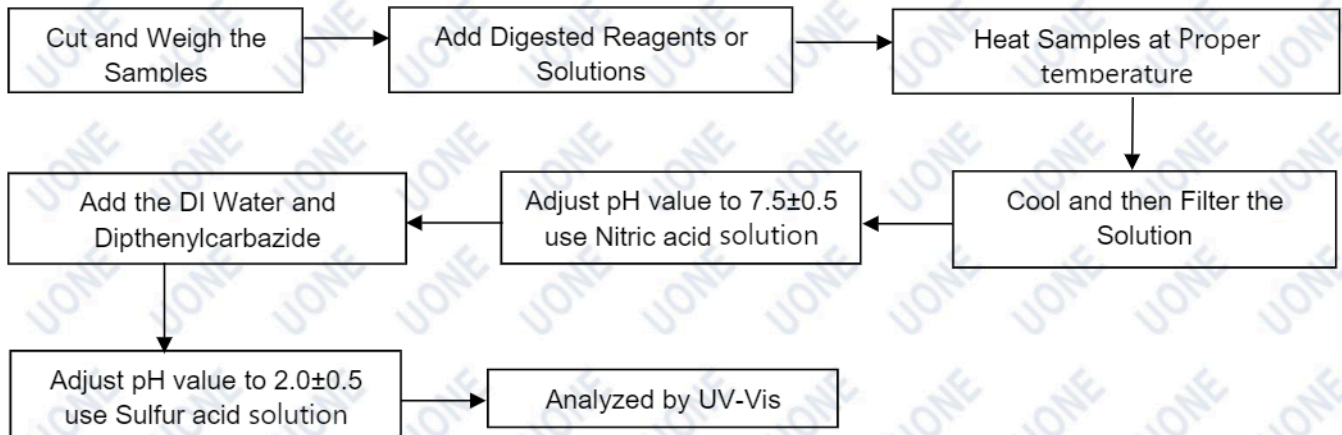
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## Test Process Flow

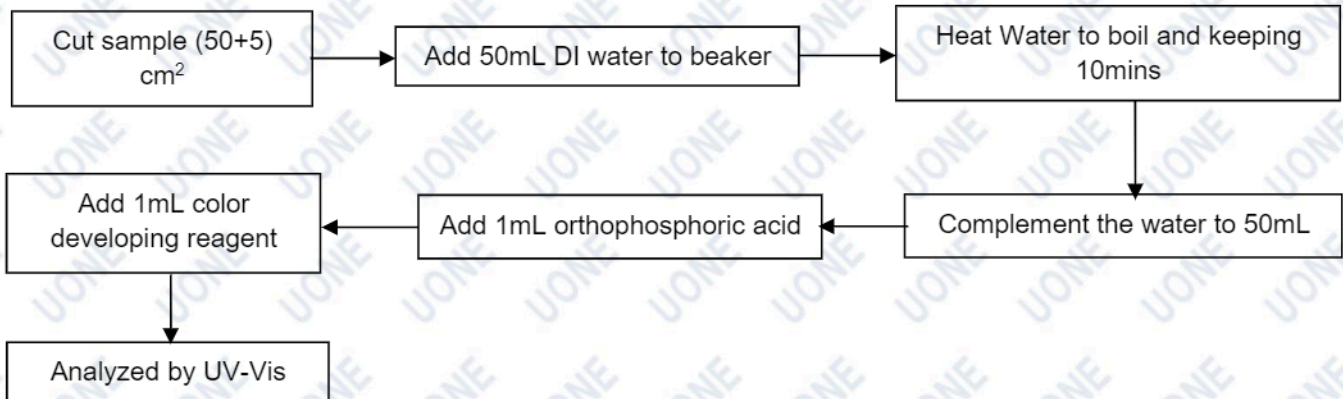
### 1. Lead, Cadmium, Mercury



### 2. Hexavalent Chromium (Non-metal)



### Hexavalent Chromium (Metal)



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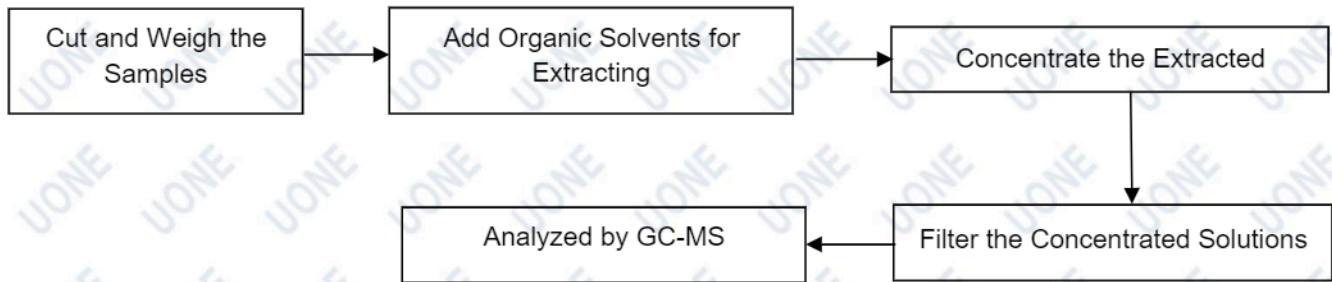
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**Test Process Flow (Continued):**

3. PBBs & PBDEs, Phthalates



**Photo(s) of Sample:**



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

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## Statement

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2. Unless otherwise stated the results shown in this report refer only the sample(s) tested and does not bear other joint and several liabilities.
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