

TEST REPORT

Reference No. : HKT19076025-C
Applicant : Zhongshan MingLian Electronic Co.,Ltd
Address : FengYu Road, the 12-team of Bonggong village, Dongfeng Town, Zhongshan City, Guangdong Province, China
Manufacturer : Zhongshan MingLian Electronic Co.,Ltd
Address : FengYu Road, the 12-team of Bonggong village, Dongfeng Town, Zhongshan City, Guangdong Province, China
Sample Description : **Switching Mode Power Supply**
Model No. : DS-X-Y ('X', 'Y' are variable, X=12,25,36,40,50,60,80,100,120,150, 180,200,250,300,360,400,500, which represent product power in watts; Y=5,12,24, which represent DC output voltage in Volt;)
Test Requested : In accordance with the RoHS Directive 2011/65/EU and its Commission delegated Directive(EU) 2015/863
Test Method : With Reference to EN 62321:2009 Procedures for the Determination of level of Six Regulated Substance in Electrotechnical Products.
1) Screening by XRF Spectroscopy
2) Wet Chemical Test Method
- Determination of Lead, Mercury and Cadmium by ICP-OES
- Determination of Hexavalent Chromium by Colorimetric Method
- Determination of PBBs and PBDEs by GC-MS
Test Conclusion..... : Based on the performed tests on the submitted samples, the results comply with the RoHS Directive 2011/65/EU and its Commission delegated Directive(EU) 2015/863
Date of Receipt sample : 2019-07-15
Date of Test..... : 2019-07-15 to 2019-07-29
Date of Issue : 2019-07-29
Test Result : Please refer to next page (s)

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:

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Compiled by:



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Approved by:



Almon Zhao / Lab. Manager



Test Results:

Part No.	Part Description	Result of XRF		Result of Wet Chemical Testing (mg/kg)	Conclusion on RoHS
1	Yellow label	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
2	Silvery metal	Cd	BL	PBBs :ND PBDEs : ND	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
3	White label	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
4	Fuse(FS1)	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
5	Yellow enclosure of CX1	Cd	BL	PBBs :ND PBDEs : ND	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
6	Inside material of CX1	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
7	Coppery wire of Inductor	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
8	Bobbin of Inductor	Cd	BL	PBBs :ND PBDEs : ND	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
9	Y capacitor blue shell	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		

Part No.	Part Description	Result of XRF		Result of Wet Chemical Testing (mg/kg)	Conclusion on RoHS
		Cr	BL		
		Br	BL		
10	Y capacitor inside material	Cd	BL	PBBs :ND PBDEs : ND	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
11	Plastic film of electrolytic capacitor	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
12	Silvery metal shell of electrolytic capacitor	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
13	Brown shell	Cd	BL	PBBs :ND PBDEs : ND	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
14	Copper wire of Inductor (L2)	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
15	Ceramic material of Inductor (L2)	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
16	PCB	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
17	Black material of Switch	Cd	BL	PBBs :ND PBDEs : ND	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
18	Plastic film of electrolytic capacitor	Cd	BL	Not tested	Comply

Part No.	Part Description	Result of XRF		Result of Wet Chemical Testing (mg/kg)	Conclusion on RoHS
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
19	Inside material of electrolytic capacitor	Cd	BL	PBBs :ND PBDEs : ND	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
20	Tube of NTC	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
21	Inside material of NTC	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
22	Resistor (R43)	Cd	BL	PBBs :ND PBDEs : ND	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
23	Black plastics	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
24	U1	Cd	BL	PBBs :ND PBDEs : ND	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
25	Wire	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
26	Transformer Tape	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		

Part No.	Part Description	Result of XRF		Result of Wet Chemical Testing (mg/kg)	Conclusion on RoHS
		Br	BL		
27	Transformer winding	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
28	Transformer Bobbin	Cd	BL	PBBs :ND PBDEs : ND	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
29	Transformer tube	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
30	Transformer core	Cd	BL	Not tested	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		
31	White plastics port	Cd	BL	PBBs :ND PBDEs : ND	Comply
		Pb	BL		
		Hg	BL		
		Cr	BL		
		Br	BL		

Test Item(s)	Unit	Test Method & Test Equipment	Results	MDL	Limit
			No.1		
Bis (2-ethylhexyl)- phthalate (DEHP)	mg/kg	IEC 62321-8:2017, GC-MS	ND	50	1000
Dibutyl phthalate (DBP)	mg/kg		ND	50	1000
Benzylbutyl phthalate (BBP)	mg/kg		ND	50	1000
Diisobutyl phthalate (DIBP)	mg/kg		ND	50	1000
Conclusion	--	--	Pass	--	--

Remark:

- (1) Results are obtained by EDXRF for primary screening, and further chemical testing by ICP (for Cd, Pb, Hg), UV-VIS (for Cr⁶⁺) and GC-MS (for PBBs, PBDEs) is recommended to be performed, if the concentration exceeds the below warning value according to EN 62321:2009 (unit: mg/kg)

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

BL= Below Limit

OL= Over Limit

LOD = Limit of Detection

-- = Not Regulated

- (2) "IN" expresses the inconclusive region, and further chemical testing to confirm whether it complies with the requirement of RoHS Directive.
- (3) The XRF screening test for RoHS elements – the reading may be different to the actual content in the sample be of non-uniformity composition
- (4) ppm = mg / kg, based on the dry weight of tested sample.
- (5) ND = Not Detected, less than the value of Method Detection Limit.
- (6) MDL= Method Detection Limit in wet chemical test

Test Items	Pb	Cd	Hg	Cr ⁶⁺	PBB	PBDE
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MDL	2	2	2	2	5	5

The MDL for single compound of PBBs and PBDEs is 5mg/kg and MDL of Cr⁶⁺ for polymer and composite sample is 2mg/kg

- (7) According to EN 62321:2009, determined of Cr⁶⁺ on metal sample by spot test /boiling water extraction test method, and result is shown as Positive/Negative.

Spot test:

Negative = Absence of Cr⁶⁺ coating, Positive = Presence of Cr⁶⁺ coating.

(The tested sample should be further verified by boiling water extraction method if the spot test result is Negative or cannot be confirmed.)

Boiling water extraction:

Negative = Absence of Cr⁶⁺ coating

Positive = Presence of Cr⁶⁺ coating, the detected concentration in boiling water extraction solution is equal or greater than 0.02mg/kg with 50cm² sample surface area.

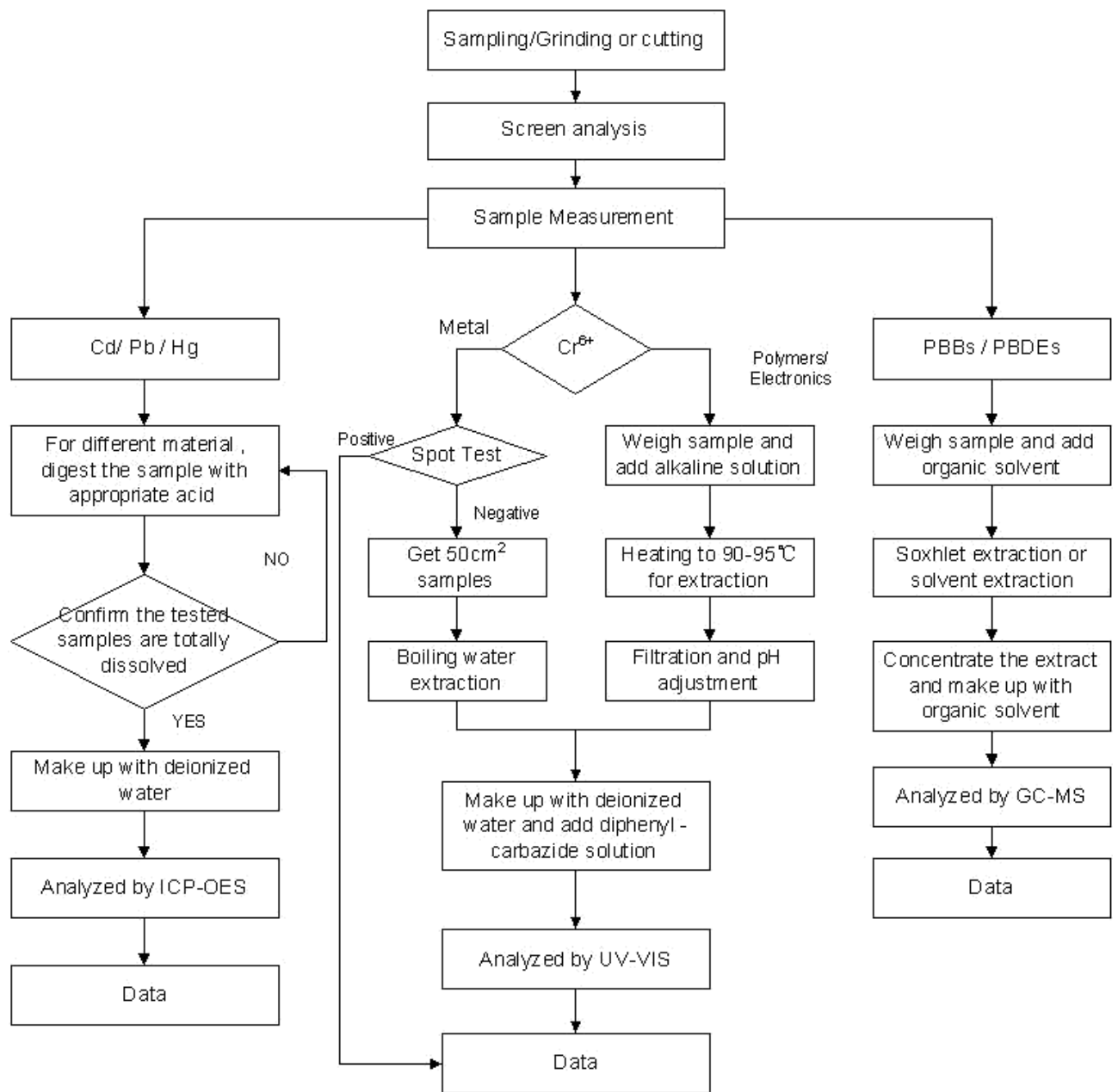
Information on storage conditions and production date of the tested sample is unavailable and thus Cr⁶⁺ results represent status of the sample at the time of testing.

- (8) * = According to the declaration from client, the source of lead in test sample could be from the glass or ceramic material of that electronic component which is exempted by Directive 2011/65/EU.
- (9) *¹ = According to the declaration from client, the source of cadmium in test sample could be from cadmium and its compounds in electrical contacts which is exempted by Directive 2011/65/EU.
- (10)[#] = According to the declaration from client, the source of lead in test sample could be from copper alloy while lead as copper alloy containing up to 4% lead by weight is exempted by Directive 2011/65/EU.
- (11)^{#1} = According to the declaration from client, the source of lead in test sample could be from alloying element in steel for machining purposes and in galvanised steel containing up to 0.35% lead by weight is exempted by Directive 2011/65/EU.

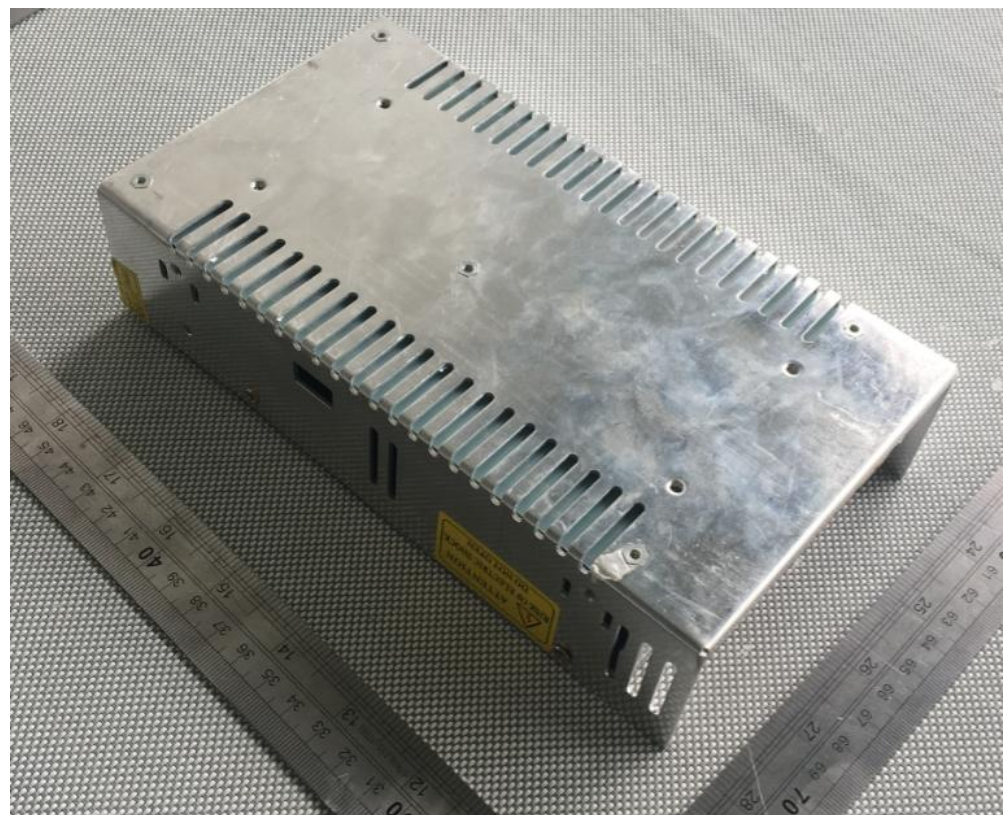
(12)^{#2} = According to the declaration from client, the source of lead in test sample could be from alloying element in aluminium containing up to 0.4% lead by weight is exempted by Directive 2011/65/EU.

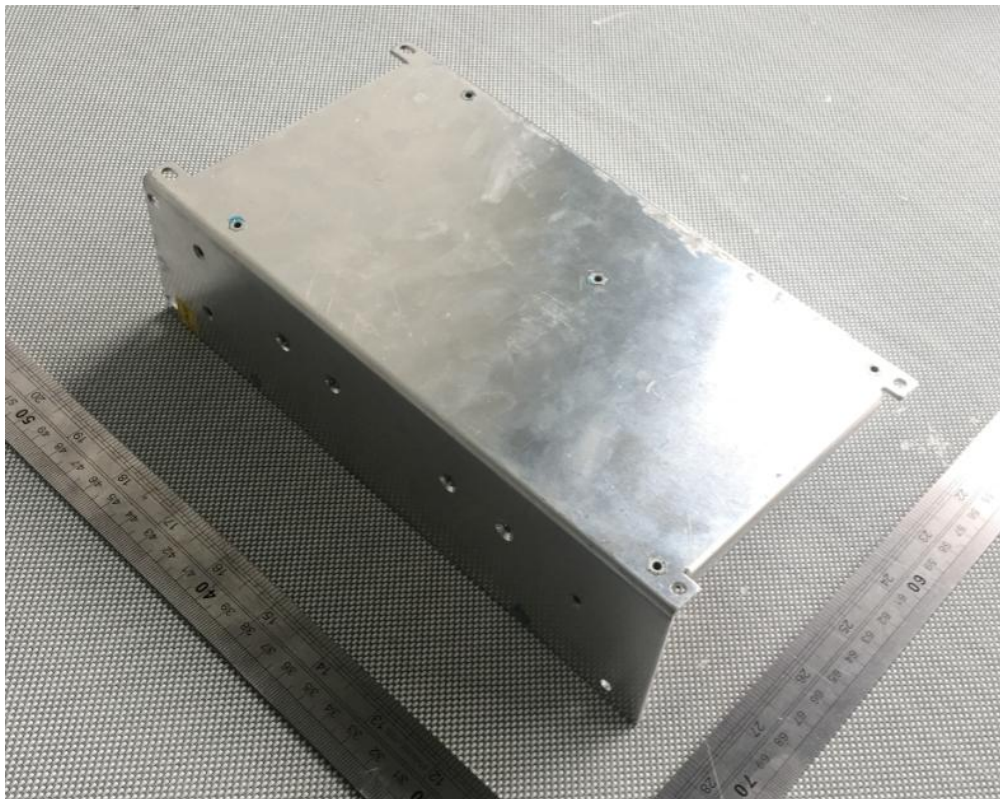
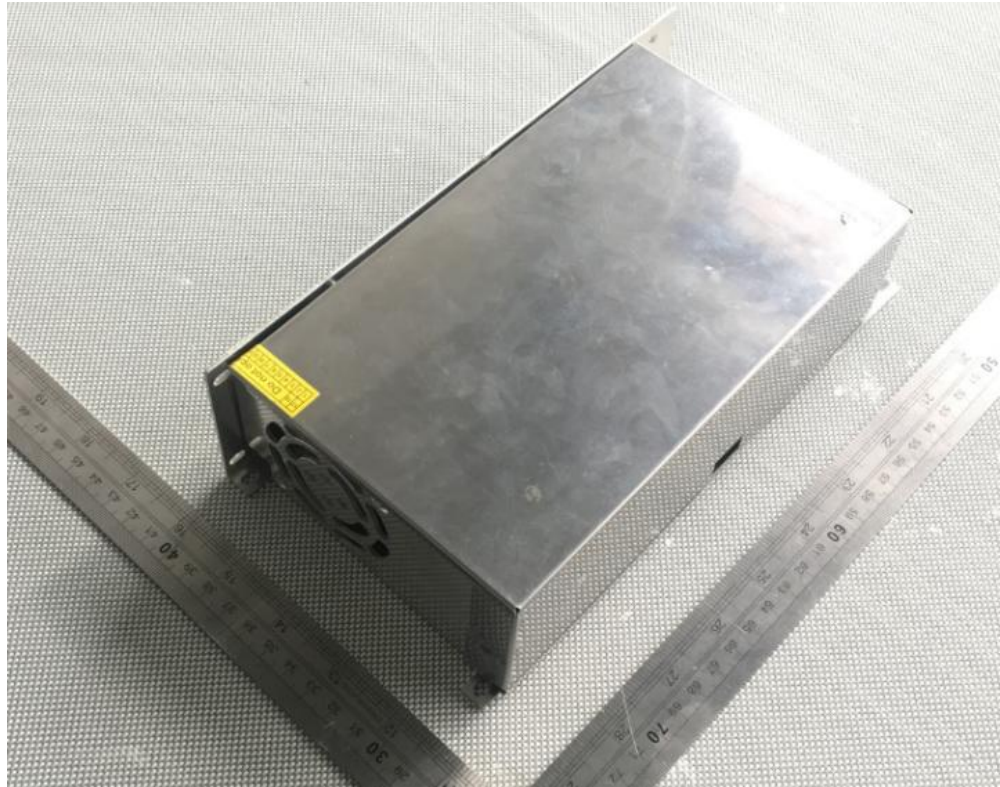
(13)^{#3} = According to the declaration from client, the source of lead in test sample could be from the high melting temperature type solders (i.e. lead based alloys containing 85% by weight or more lead) is exempted by Directive 2011/65/EU.

Measurement Flowchart:

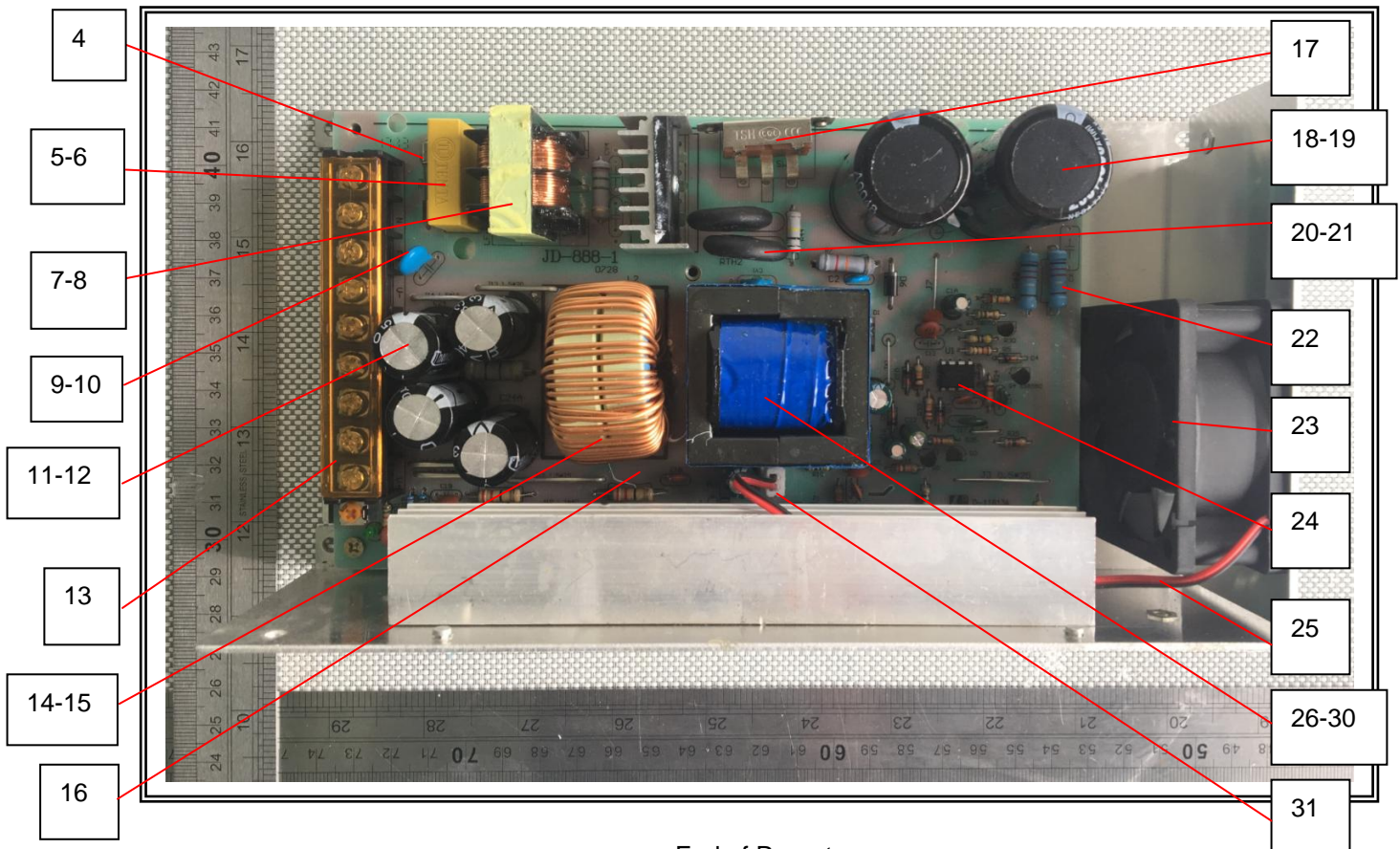
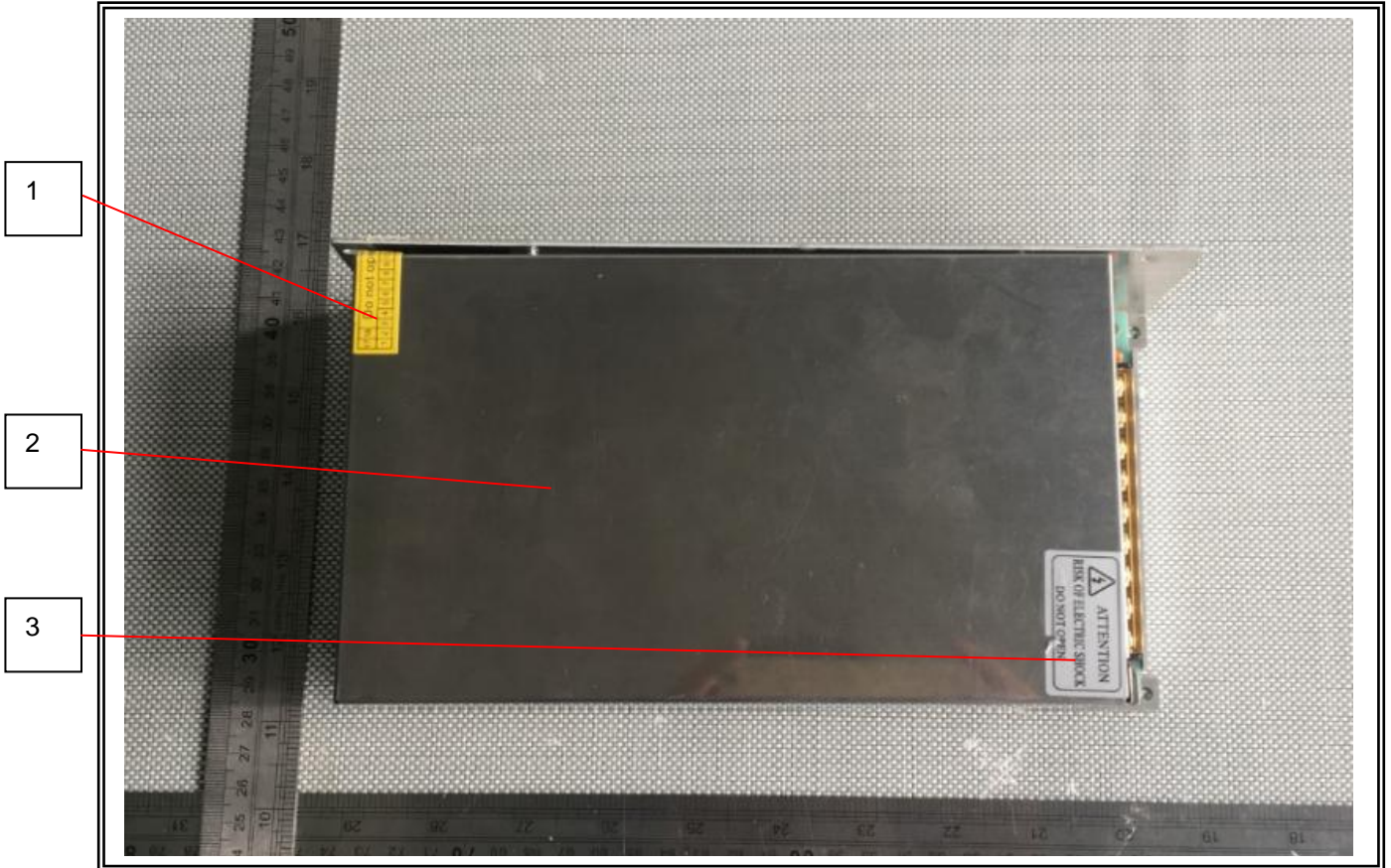


Sample Photo:





Photograph of parts tested:



===== End of Report =====