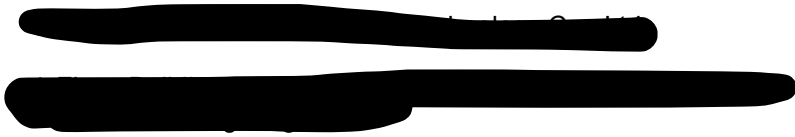


XRF Screening And Chemical Confirmation Test Report

Applicant:



Sample Description:

The following submitted sample(s) said to be:

Item Name : **Smart Charger**
Model No. : ZX-1U08
Factory's Name :
Date of Sample Received : Aug 24, 2017
Testing Period : Aug 24, 2017 to Sep 01, 2017

Tests conducted:

As requested by the applicant, refer to following page(s) for details.

Conclusion:

<u>Tested Sample</u>	<u>Standard</u>	<u>Result</u>
Screened components of submitted sample	Screening by XRF spectroscopy and chemical confirmation test for RoHS Directive (2011/65/EU)	Pass

Authorized by:

For Intertek Testing Services Shenzhen Ltd. Guangzhou Branch:

Martin He
Senior Project Engineer



XRF Screening And Chemical Confirmation Test Report

Screening Test by XRF Spectroscopy

Cadmium (Cd), Lead (Pb), Mercury (Hg), Chromium (Cr) and Bromine (Br) content were measured with reference to IEC 62321-3-1 Edition 1.0: 2013by XRF spectroscopy and chemical confirmation test for RoHS restricted substances.

(A) Results:

Screened Components	XRF Results		Chemical Confirmation Result
(1)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(2)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(3)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(4)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	
(5a)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(5b)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	
(5c)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	



XRF Screening And Chemical Confirmation Test Report

Screened Components	XRF Results		Chemical Confirmation Result
(5d)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	
(5e)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	
(5f)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(5g)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	
(6a)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(6b)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	
(6c)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(6d)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	



XRF Screening And Chemical Confirmation Test Report

Screened Components	XRF Results		Chemical Confirmation Result
(6e)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	
(6f)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(6g)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	
(7a)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(7b)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	
(8a)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(8b)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(8c)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	



XRF Screening And Chemical Confirmation Test Report

Screened Components	XRF Results		Chemical Confirmation Result
(8d)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	
(9a)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(9b)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(9c)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	
(10)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	
(11a)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(11b)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(11c)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	



XRF Screening And Chemical Confirmation Test Report

Screened Components	XRF Results		Chemical Confirmation Result
(11d)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	
(11e)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(11f)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	
(11g)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(11h)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	
(12)	Cd	ND	PBBs : ND(<5mg/kg) PBDEs : ND(<5mg/kg)
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	Inconclusive	
(13a)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(13b)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	



XRF Screening And Chemical Confirmation Test Report

Screened Components	XRF Results		Chemical Confirmation Result
(13c)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(13d)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	
(13e)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	
(13f)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(13g)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	
(14a)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	
(14b)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(14c)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	



XRF Screening And Chemical Confirmation Test Report

Screened Components	XRF Results		Chemical Confirmation Result
(14d)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	
(14e)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	
(14f)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(14g)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	
(15)	Cd	ND	PBBs : ND(<5mg/kg) PBDEs : ND(<5mg/kg)
	Pb	>1500mg/kg ^{#2}	
	Hg	ND	
	Cr	ND	
	Br	Inconclusive	
(16)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(17)	Cd	ND	Cr ⁶⁺ : ND(<1mg/kg)
	Pb	Detected	
	Hg	ND	
	Cr	Inconclusive	
	Br	ND	
(18)	Cd	ND	NT
	Pb	Detected	
	Hg	ND	
	Cr	Detected	
	Br	ND	



XRF Screening And Chemical Confirmation Test Report

Screened Components	XRF Results		Chemical Confirmation Result
(19)	Cd	ND	Cr ⁶⁺ : ND(<1mg/kg)
	Pb	Detected	
	Hg	ND	
	Cr	Inconclusive	
	Br	ND	
(20)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(21)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(22)	Cd	ND	PBBs : ND(<5mg/kg) PBDEs : ND(<5mg/kg)
	Pb	>1500mg/kg ^{#2}	
	Hg	ND	
	Cr	ND	
	Br	Inconclusive	
(23)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(24)	Cd	ND	NT
	Pb	>1500mg/kg ^{#1}	
	Hg	ND	
	Cr	ND	
	Br	ND	
(25)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	
(26)	Cd	ND	PBBs : ND(<5mg/kg) PBDEs : ND(<5mg/kg)
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	Inconclusive	



XRF Screening And Chemical Confirmation Test Report

Screened Components	XRF Results		Chemical Confirmation Result
(27)	Cd	ND	NT
	Pb	>1500mg/kg ^{#2}	
	Hg	ND	
	Cr	ND	
	Br	ND	
(28)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(29)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	
(30)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	ND	
(31)	Cd	ND	NT
	Pb	ND	
	Hg	ND	
	Cr	ND	
	Br	NT	

Detected = Below the lower screening limit of table (B) and pass

ND = Not detected

NT = Not tested

Negative = The Cr (VI) concentration is less than 0.10 µg/cm². The sample is negative for Cr (VI).

Remark:

(#1) = As claimed by the declaration submitted from the supplier of applicant, the Lead content of the components is coming from the constituent of glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or a glass or ceramic matrix compound of the electrical and electronic component only. According to the RoHS recast directive 2011/65/EU, Lead in this component can be exempted.

(#2) = As claimed by the declaration submitted from the supplier of applicant, the Lead content of the component comes from the constituent of high melting temperature type solders (i.e. Lead-based alloys containing 85% by weight or more Lead) only. According to EU RoHS Directive (2011/65/EU), Lead in high melting temperature type solders of the component can be exempted.



XRF Screening And Chemical Confirmation Test Report

(B) XRF Screening Limits in mg/kg for Regulated Elements in Various Matrices

Element	Polymer Materials	Metallic Materials	Composite Materials
Cd	$P \leq 70 < X < 130 \leq F$	$P \leq 70 < X < 130 \leq F$	$P \leq 70 < X < 150 \leq F$
Pb	$P \leq 700 < X < 1300 \leq F$	$P \leq 700 < X < 1300 \leq F$	$P \leq 500 < X < 1500 \leq F$
Hg	$P \leq 700 < X < 1300 \leq F$	$P \leq 700 < X < 1300 \leq F$	$P \leq 500 < X < 1500 \leq F$
Cr	$P \leq 700 < X$	$P \leq 700 < X$	$P \leq 500 < X$
Br	$P \leq 300 < X$	Not applicable	$P \leq 250 < X$

P = Pass

X = Inconclusive result

F = Fail

mg/kg = milligram per kilogram = ppm

(C) Estimated Detection Limits in mg/kg for Regulated Elements in Various Matrices

Element	Polymer Materials	Metallic Materials	Composite Materials
Cd	50	70	70
Pb	100	200	200
Hg	100	200	200
Cr	100	200	200
Br	200	Not applicable	200

Disclaimers:

This XRF Screening and Chemical Confirmation Test Report is for reference purposes only. The applicant shall make its/his/her own judgment as to whether the information provided in this XRF Screening and Chemical Confirmation Test Report is sufficient for its/his/her purposes.

The results shown in this XRF Screening and Chemical Confirmation Test Report will differ based on various factors, including but not limited to, the sample size, thickness, area, surface flatness, equipment parameters and matrix effect (e.g. plastic, rubber, metal, glass, ceramic etc.). Further wet chemical pre-treatment with relevant chemical equipment analysis is required to obtain quantitative data.



XRF Screening And Chemical Confirmation Test Report

(D) Chemical Confirmation Test Methods:

Testing Item	Testing Method	Reporting Limit
Chromium (VI) (Cr ⁶⁺) Content	With reference to IEC 62321 edition 1.0:2008, by alkaline digestion and determined by UV-VIS spectrophotometer	1 mg/kg
Polybrominated Biphenyls (PBBs) & Polybrominated Diphenyl Ethers (PBDEs)	With reference to IEC 62321-6 edition 1.0:2015, by solvent extraction and determined by GC/MS and further HPLC confirmation when necessary	5 mg/kg

(E) RoHS Requirement:

Restricted Substances	Limits
Cadmium (Cd)	0.01% (100 mg/kg)
Lead (Pb)	0.1% (1000 mg/kg)
Mercury (Hg)	0.1% (1000 mg/kg)
Chromium (VI) (Cr ⁶⁺)	0.1% (1000 mg/kg)
Polybrominated Biphenyls (PBBs)	0.1% (1000 mg/kg)
Polybrominated Diphenyl Ethers (PBDEs)	0.1% (1000 mg/kg)

The above limits were quoted from 2011/65/EU for homogeneous material.



XRF Screening And Chemical Confirmation Test Report

Screened components:

- (1) White plastic
- (2) White plastic
- (3) White plastic
- (4) Silvery metal
- (5) Capacitor
 - (a) Black plastic with white printing
 - (b) Silvery metal (case)
 - (c) Beige paper (electrolytic paper)
 - (d) Dull silvery-grey metal sheet (electrolytic paper)
 - (e) Bright silvery-grey metal sheet (electrolytic paper)
 - (f) Black soft plastic
 - (g) Silvery metal (pin)
- (6) Capacitor
 - (a) Black plastic with white printing
 - (b) Silvery metal (case)
 - (c) Beige paper (electrolytic paper)
 - (d) Dull silvery-grey metal sheet (electrolytic paper)
 - (e) Bright silvery-grey metal sheet (electrolytic paper)
 - (f) Black soft plastic
 - (g) Silvery metal (pin)
- (7) Capacitor
 - (a) Blue body
 - (b) Silvery metal (pin)
- (8) Inductor
 - (a) Green plastic with coatings
 - (b) Black magnet
 - (c) Copper color metal wire
 - (d) Silvery metal (pin)
- (9) Resistor
 - (a) Black plastic with white printing
 - (b) Ceramic with coatings
 - (c) Silvery metal(pin)
- (10) Silvery metal
- (11) Transformer
 - (a) Yellow adhesive plastic
 - (b) Transparent plastic
 - (c) Yellow plastic(wire covering)
 - (d) Copper color metal wire
 - (e) Black magnet
 - (f) Copper color metal wire



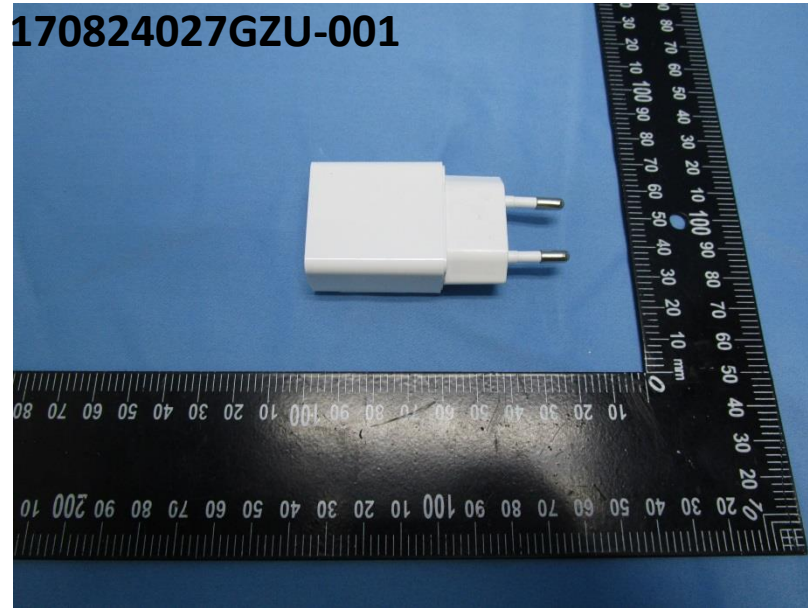
XRF Screening And Chemical Confirmation Test Report

- (g) Black plastic
- (h) Silvery metal(pin)
- (12) Black plastic
- (13) Capacitor
 - (a) Black plastic with white printing
 - (b) Silvery metal (case)
 - (c) Beige paper (electrolytic paper)
 - (d) Dull silvery-grey metal sheet (electrolytic paper)
 - (e) Bright silvery-grey metal sheet (electrolytic paper)
 - (f) Black soft plastic
 - (g) Silvery metal (pin)
- (14) Capacitor
 - (a) Silvery metal with red printing (case)
 - (b) Transparent adhesive plastic tape
 - (c) Grey-white paper (electrolytic paper)
 - (d) Silver-grey metal sheet (electrolytic paper)
 - (e) Dull silver-grey metal sheet (electrolytic paper)
 - (f) Black soft plastic
 - (g) Silvery metal (pin)
- (15) Black body with silvery metal (SMD diode)
- (16) Black body with silvery metal (IC)
- (17) White ceramic with black material & white printing & silvery metal (SMD resistor)
- (18) White ceramic with black material & white printing & silvery metal (SMD resistor)
- (19) White ceramic with black material & white printing & silvery metal (SMD resistor)
- (20) Brown ceramic with silvery metal (SMD capacitor)
- (21) Brown ceramic with silvery metal (SMD capacitor)
- (22) Black body with silvery metal
- (23) Black ceramic with silvery metal
- (24) White ceramic with black material & white printing & silvery metal (SMD resistor)
- (25) Solder
- (26) Green PCB
- (27) Black body with silvery metal (SMD diode)
- (28) Brown ceramic with silvery metal (SMD capacitor)
- (29) Silvery metal
- (30) White plastic
- (31) Silvery metal

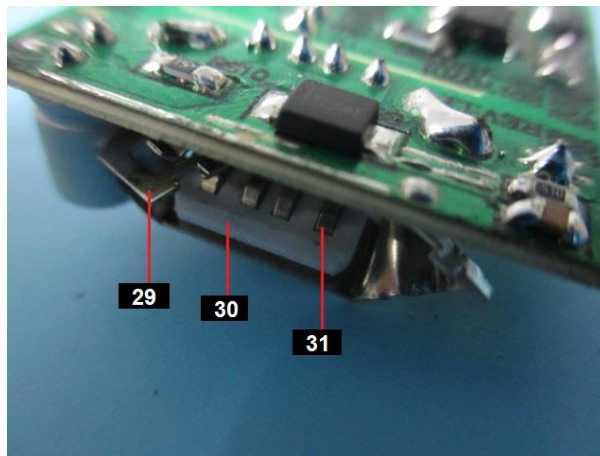
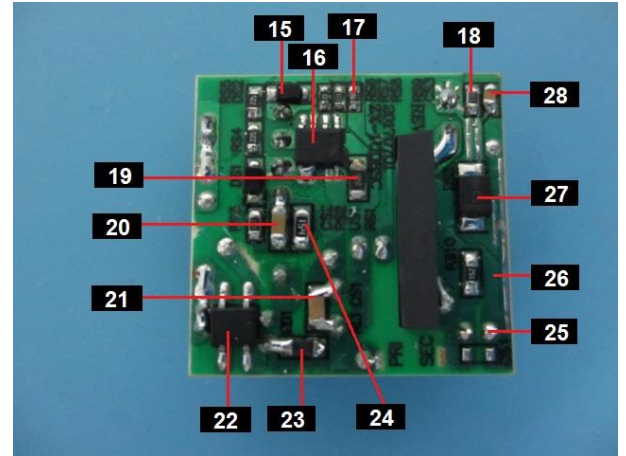
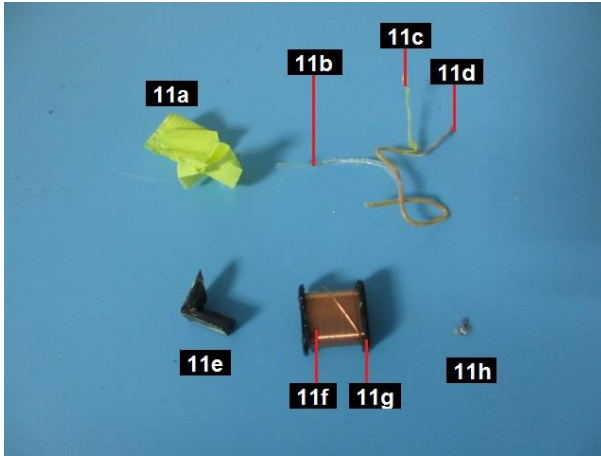
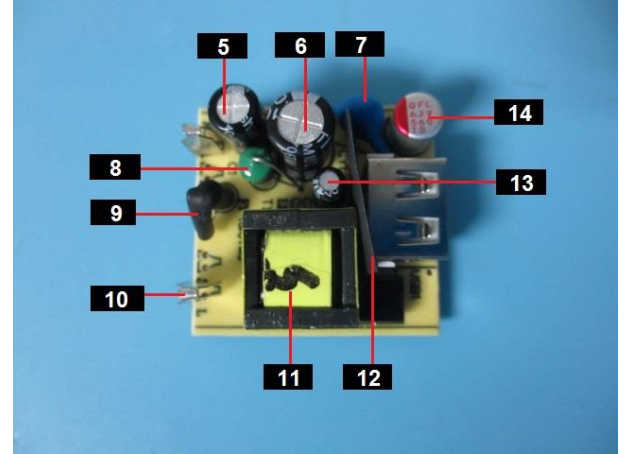
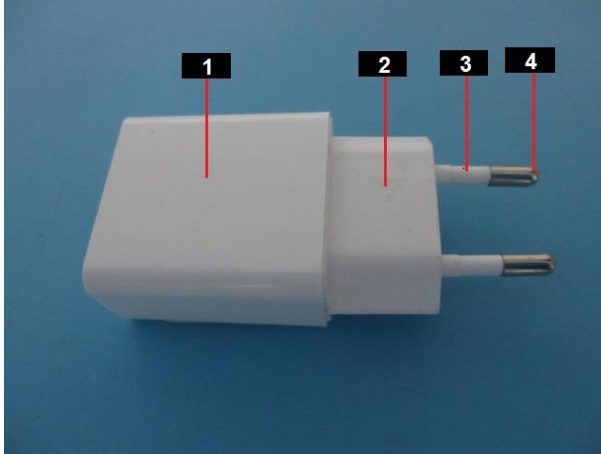


XRF Screening And Chemical Confirmation Test Report

Sample photo



XRF Screening And Chemical Confirmation Test Report



End of report

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