

Test Report

Report No.: PTC18012701803C-EN01

Date: Feb. 09, 2018

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Applicant: Microtech Srl

Address: Via Aldo Moro 9 - 20090 Buccinasco (MI)

The following merchandise was (were) submitted and identified by client as:

Sample Description: MINI PC
Order No.: PTC180127-01803
Style No.: AC1, AC2, e-cube
Qty of Sample Submitted: 1
Sample Received Date: Jan. 30, 2018
Completed Date: Feb. 09, 2018

Test Requested and Conclusion(s):

No.	Test Sample	Standard and Requirement	Conclusion(s)
1	Submitted sample	RoHS Directive 2011/65/EU and its subsequent amendments - Lead (Pb), Cadmium(Cd), Mercury(Hg), Hexavalent Chromium(Cr ⁶⁺), PBBs and PBDEs	PASS

Test Result(s): Please refer to next page(s).

Signed for and on Behalf of PTC



Raul Cheng / P & C Department General Manager
DongGuan Precise Testing and Certification Corp. Ltd.

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Test Result(s):

RoHS - Lead (Pb)/Cadmium(Cd)/Mercury(Hg)/Hexavalent Chromium(Cr⁶⁺)/PBBs/PBDEs

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

No.	Material Description	EDXRF Result					Chemical Result (mg/kg)	Conclusion
		Pb	Cd	Hg	Cr	Br		
1	Black plastic (shell)	BL	BL	BL	BL	BL	--	PASS
2	White plastic with silvery coating(shell)	BL	BL	BL	BL	BL	--	PASS
3	Black soft plastic(pad)	BL	BL	BL	BL	BL	--	PASS
4	Silvery metal (fixer)	BL	BL	BL	BL	--	--	PASS
5	Blue PCB (PCB"AK1-V2-1")	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	PASS
6	White paper with black printing(label)	BL	BL	BL	BL	BL	--	PASS
7	Silvery metal(radiator)	BL	BL	BL	BL	--	--	PASS
8	Blue silica gel(inner)	BL	BL	BL	BL	BL	--	PASS
9	Silvery metal(neck shell)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative	PASS
10	Silvery metal(neck pin)	BL	BL	BL	BL	--	--	PASS
11	Silvery metal(neck spring)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative	PASS
12	Black plastic(neck pin fixer)	BL	BL	BL	BL	BL	--	PASS
13	Golden metal with silvery plating(USB socket shell)	211	BL	BL	BL	--	--	PASS
14	Golden metal(pin)	BL	BL	BL	BL	--	--	PASS
15	Blue plastic(pin fixer)	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	PASS
16	Black plastic(pin fixer)	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	PASS
17	Black plastic(DC socket shell)	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	PASS
18	Silvery metal(DC socket pin)	BL	BL	BL	BL	--	--	PASS

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19	Golden metal(HDMI socket shell)	BL	BL	BL	BL	--	--	PASS
20	Golden plastic(film)	BL	BL	BL	BL	BL	--	PASS
21	Silvery metal(reticle socket shell)	BL	BL	BL	BL	--	--	PASS
22	Yellow body(LED)	BL	BL	BL	BL	BL	--	PASS
23	Green body(LED)	BL	BL	BL	BL	BL	--	PASS
24	Black plastic(phone connector shell)	BL	BL	BL	BL	BL	--	PASS
25	Black plastic(switch key)	BL	BL	BL	BL	BL	--	PASS
26	Silvery metal(switch shell)	BL	BL	BL	BL	--	--	PASS
27	Silvery metal(chaff)	BL	BL	BL	BL	--	--	PASS
28	Black plastic(switch pedestal)	BL	BL	BL	BL	BL	--	PASS
29	Grey body with black printing(inductor)	BL	BL	BL	BL	BL	--	PASS
30	Black body with white printing (transformer)	BL	BL	BL	BL	BL	--	PASS
31	Yellow body(capacitor)	BL	BL	BL	BL	BL	--	PASS
32	Silvery body(crystal)	BL	BL	BL	BL	BL	--	PASS
33	Grey plastic(socket shell)	BL	BL	BL	BL	BL	--	PASS
34	White plastic(socket shell)	BL	BL	BL	BL	BL	--	PASS
35	Brown body (chip capacitor)	BL	BL	BL	BL	BL	--	PASS
36	Black body with white printing (chip resistor)	BL	BL	BL	BL	BL	--	PASS
37	Black body (IC)	BL	BL	BL	BL	BL	--	PASS
38	Black body (diode)	BL	BL	BL	BL	BL	--	PASS
39	Black body (audion)	BL	BL	BL	BL	BL	--	PASS
40	Silvery solder (PCB"AK1-V2-1")	180	BL	BL	BL	--	--	PASS
41	Green PCB (PCB"X712E826")	BL	BL	BL	BL	BL	--	PASS

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42	Silvery solder (PCB"X712E826")	BL	BL	BL	BL	--	--	PASS
43	Grass green PCB(small PCB)	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	PASS
44	Silvery solder(small PCB)	BL	BL	BL	BL	--	--	PASS
45	Green PCB (PCB"CK1-LED-V1.0")	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	PASS
46	Silvery solder (PCB"CK1-LED-V1.0")	180	BL	BL	BL	--	--	PASS
47	Black plastic (fan shell)	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	PASS
48	White plastic with black/green printing(label)	BL	BL	BL	BL	103	--	PASS
49	Grey magnet(core)	BL	BL	BL	BL	--	--	PASS
50	Green PCB(fan PCB)	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	PASS
51	White plastic(gasket)	BL	BL	BL	BL	BL	--	PASS
52	Silvery metal(axle)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative	PASS
53	Silvery metal(plate)	BL	BL	BL	BL	--	--	PASS
54	Black plastic(bobbin)	BL	BL	BL	BL	BL	--	PASS
55	Coppery metal with red plating(coil)	BL	BL	BL	BL	--	--	PASS
56	Silvery solder(fan PCB)	BL	BL	BL	BL	--	--	PASS
57	Black plastic(adapter shell)	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	PASS
58	Silvery plastic with black/white printing(label)	BL	BL	BL	BL	BL	--	PASS
59	Golden metal with silvery plating(pin)	BL	BL	BL	BL	--	--	PASS
60	Silvery solder(pin)	BL	BL	BL	BL	--	--	PASS
61	Green paper(inner)	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	PASS
62	Green PCB(adapter PCB)	BL	BL	BL	BL	IN	PBBs: N.D. PBDEs: N.D.	PASS

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63	Black plastic with white printing(capacitor sleeve)	BL	BL	BL	BL	BL	--	PASS
64	Silvery metal(capacitor shell)	BL	BL	BL	BL	--	--	PASS
65	Black rubber(capacitor)	BL	BL	BL	BL	BL	--	PASS
66	Transparent soft plastic(capacitor)	BL	BL	BL	BL	BL	--	PASS
67	Brown paper with liquid(capacitor film)	BL	BL	BL	BL	BL	--	PASS
68	Silvery metal(capacitor foil)	BL	BL	BL	BL	--	--	PASS
69	Dull silvery metal(capacitor foil)	BL	BL	BL	BL	--	--	PASS
70	Silvery metal(capacitor connector)	BL	BL	BL	BL	--	--	PASS
71	Silvery metal(capacitor pin)	BL	BL	BL	BL	--	--	PASS
72	Green plastic with white printing(capacitor sleeve)	BL	BL	BL	BL	BL	--	PASS
73	Yellow plastic(transformer tape)	BL	BL	BL	BL	BL	--	PASS
74	Transparent plastic with black printing(label)	BL	BL	BL	BL	BL	--	PASS
75	Black plastic (bobbin)	BL	BL	BL	BL	BL	--	PASS
76	Black plastic (coil sleeve)	BL	BL	BL	BL	BL	--	PASS
77	Translucent plastic (coil sleeve)	BL	BL	BL	BL	BL	--	PASS
78	Coppery metal (coil)	BL	BL	BL	BL	--	--	PASS
79	Blue body(capacitor)	BL	BL	BL	BL	BL	--	PASS
80	Green body(capacitor)	BL	BL	BL	BL	BL	--	PASS
81	Black body with white printing(fuse)	BL	BL	BL	BL	BL	--	PASS
82	Silvery metal(inductor shell)	BL	BL	BL	BL	--	--	PASS

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83	Black plastic(inductor bobbin)	BL	BL	BL	BL	BL	--	PASS
84	White glue(on PCB)	BL	BL	BL	BL	BL	--	PASS
85	Silvery solder(adapter PCB)	BL	BL	BL	BL	--	--	PASS
86	Black plastic with white printing(cable jacket)	BL	BL	BL	BL	BL	--	PASS
87	Red plastic(wire jacket)	BL	BL	BL	BL	BL	--	PASS
88	Black plastic(wire jacket)	BL	BL	BL	BL	BL	--	PASS
89	Copper metal(wire)	BL	BL	BL	BL	--	--	PASS
90	Black plastic(trailer card)	BL	BL	BL	BL	BL	--	PASS
91	Silvery metal(DC plug shell)	BL	BL	BL	BL	--	--	PASS
92	Silvery metal(DC plug pin)	BL	BL	BL	BL	--	--	PASS
93	Black plastic(pin fixer)	BL	BL	BL	BL	BL	--	PASS
94	Silvery solder(DC plug pin)	180	BL	BL	BL	--	--	PASS
95	Black plastic(small wire jacket)	BL	BL	BL	BL	BL	--	PASS
96	Red plastic(small wire jacket)	BL	BL	BL	BL	BL	--	PASS
97	White plastic(small wire jacket)	BL	BL	BL	BL	BL	--	PASS
98	Silvery metal(wire)	BL	BL	BL	BL	--	--	PASS
99	Silvery solder(wire)	180	BL	BL	BL	--	--	PASS
100	Black fabric (drivepipe)	BL	BL	BL	BL	BL	--	PASS
101	Black plastic (inner)	BL	BL	BL	BL	BL	--	PASS
102	White plastic(inner)	BL	BL	BL	BL	BL	--	PASS
103	Silvery metal(screw)	BL	BL	BL	BL	--	--	PASS
104	Silvery metal with black plating(screw)	BL	BL	BL	BL	--	--	PASS
105	Silvery metal(spring)	BL	BL	BL	IN	--	Cr ⁶⁺ : Negative	PASS
106	Bright silvery body(chip)	BL	BL	BL	BL	BL	--	PASS

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- Note:**
1. mg/kg = milligram per kilogram (ppm).
 2. N.D. = Not Detected (<RL).
 3. Negative = Absence of Cr^{6+} .
 4. Positive = Presence of Cr^{6+} : the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm^2 sample surface area.
 5. The result are obtained by EDXRF for primary screening, if the result exceeds the below limit (BL), and further chemical testing.
 6. "E" = This material is tin-lead solder or metal alloy proved by client, lead in tin-lead solder or copper alloy is exempted on the requirements of RoHS directive (EU Directive 2011/65/EU).

Screening limits in mg/kg for regulated elements in various matrices

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

BL = Below Limit, OL = Over Limit, IN = Inconclusive, LOD = Limit of Detection

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Chemical Testing - Detection Limit & 2011/65/EU Limit:

No	Name of Chemicals	Detection Limit (mg/kg)	2011/65/EU Limit (mg/kg)
1	Lead (Pb)	5	1000
2	Cadmium (Cd)	5	100
3	Mercury (Hg)	5	1000
4	Chromium VI (Cr VI)	Non-metal: 10 Metal: Negative	Non-metal: 1000 Metal: Negative
5	Polybromobiphenyls (PBBs) -Bromobiphenyl (MonoBB) -Dibromobiphenyl (DiBB) -Tribromobiphenyl (TriBB) -Tetrabromobiphenyl (TetraBB) -Pentabromobiphenyl (PentaBB) -Hexabromobiphenyl (HexaBB) -Heptabromobiphenyl (HeptaBB) -Octabromobiphenyl (OctaBB) -Nonabromobiphenyl (NonaBB) -Decabromobiphenyl (DecaBB)	Each 5	Sum: 1 000
6	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)	Each 5	Sum: 1 000

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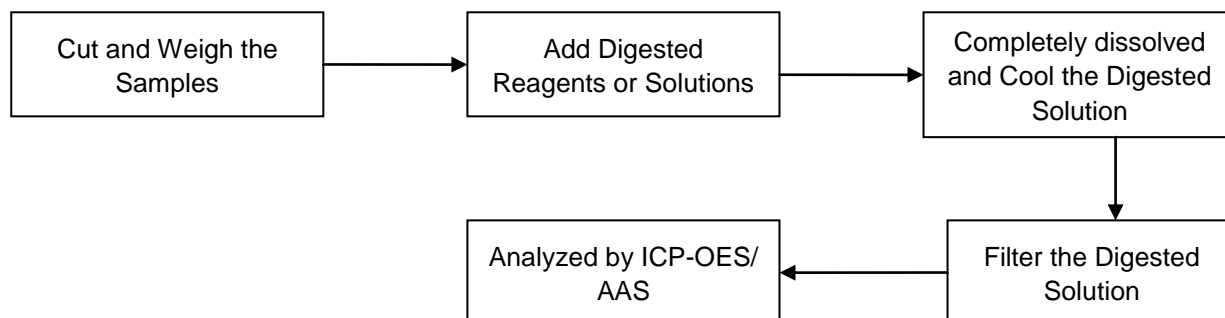
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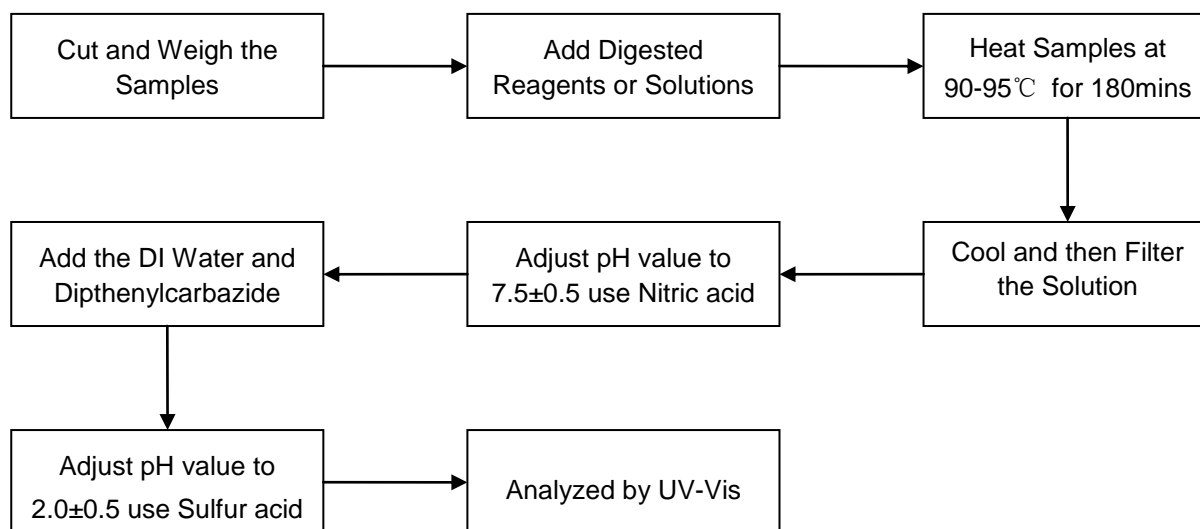
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Test Process Flow:

1. Lead, Cadmium, Mercury



2. Hexavalent Chromium (Non-metal)



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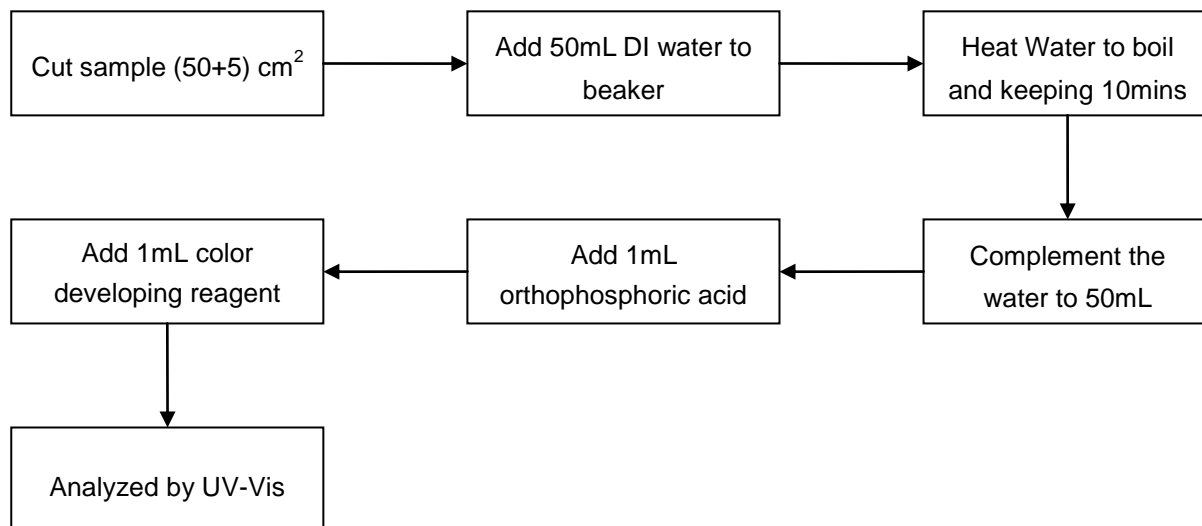
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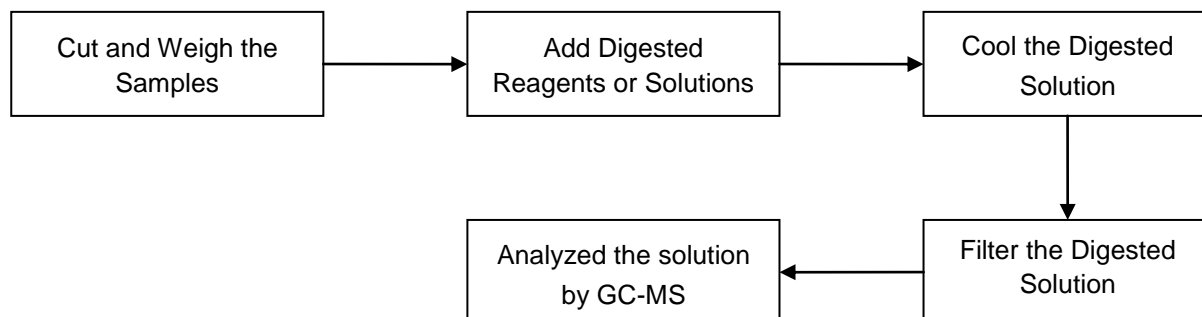
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Hexavalent Chromium (Metal)



3. PBBs & PBDEs



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Photo(s) of Sample:



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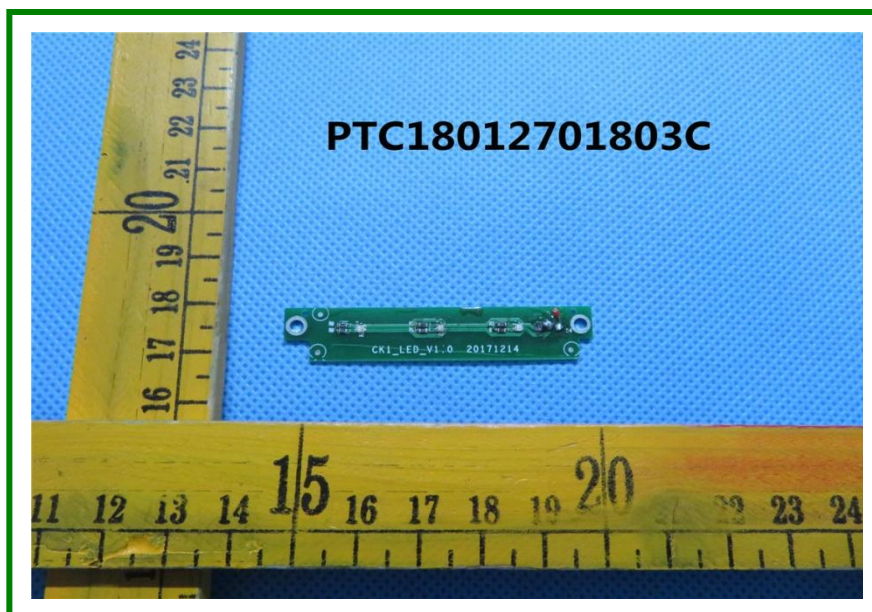
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