



Report No. 48.400.20.7187.00-00/08  
Dated 2020-04-23

## Technical Report

**Client:** Jiangsu Acrel Electric MFG. Co., Ltd.  
No. 5, Dongmeng Road, Nanzha Street, Jiangyin, Jiangsu, P. R. China

**Contact person:** Han Zhonghua

**Test object:** The submitted samples were received and described by client as:  
**Product Name:** Voltage Sensor/电压传感器  
**Model:** ACTDS  
**Product picture refer to the APPENDIX I**

**Tested sample description:** Refer to next page(s).

**Test specification:** 2011/65/EU (RoHS) Directive and 2015/863/EU (RoHS amendment) Directive  
Test with reference to EN 62321-1:2013, EN 62321-2:2014, EN 62321-3-1:2014, EN 62321-4:2014, EN 62321-5:2014, EN 62321-6:2015, EN 62321-7-1:2015, EN 62321-7-2:2017 and EN 62321-8:2017.

**Test result:** Refer to the data listed in following pages

**Conclusion:** With regard to the data of tested components, the requirements of Directive 2011/65/EU (RoHS) and 2015/863/EU are **complied**.

**Remarks:**

1. The tested samples were identified and appointed by client.
2. The result relates only to the items tested.

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Shanghai Chemical Lab  
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Shanghai City

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China

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Dated 2020-04-23

**1 Order**

**1.1 Date of Order:**

2020-03-25

**1.2 Receipt Date of Test Sample:**

2020-03-12

**1.3 Date of Testing:**

2020-03-12 – 2020-03-30

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## 2. Description of the tested specimen

Sample No.	Result	Description (Material, colour)	Photograph/Location
01	Pass	CR0805-5.1K( $\pm 1\%$ , 100PPM) Resistor, black, plastic	
02	Pass	CR1206-62K( $\pm 5\%$ , 100PPM) Resistor, black, plastic	
03	Pass	CR2010-0 $\Omega$ // 390k( $\pm 1\%$ , 100PPM) Resistor, black, plastic	
04	Pass	CR0603-1K( $\pm 5\%$ , 100PPM) Resistor, black, plastic	

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Sample No.	Result	Description (Material, colour)	Photograph/Location
05	Pass	CC0805X5R10 $\mu$ F/16V( $\pm$ 10%) Capacitor, grey, plastic	
06	Pass	CC1206X5R10 $\mu$ F/25V( $\pm$ 10%) Capacitor, grey, plastic	
07	Pass	0603-100pF/50V Capacitor, grey, plastic	
08	Pass	0P07-SMD IC, black, plastic	

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Sample No.	Result	Description (Material, colour)	Photograph/Location
09	Pass	Pin, silvery, metal	
10	Pass	LM358-SMD IC, black, plastic	
11	Pass	Pin, silvery, metal	
12	Pass	78L05-SMD IC, black, plastic	

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Sample No.	Result	Description (Material, colour)	Photograph/Location
13	Pass	Pin, silvery, metal	
14	Pass	AMS431AM(BM)-SMD IC, black, plastic	
15	Pass	ICL7660CBAZ-T IC, black, plastic	
16	Pass	Pin, silvery, metal	

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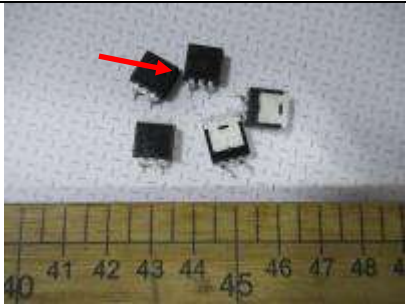
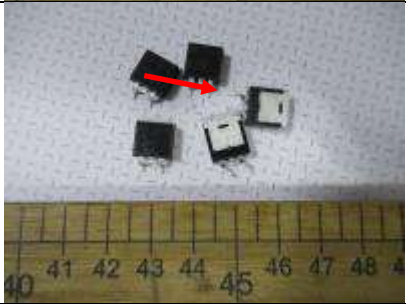






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Sample No.	Result	Description (Material, colour)	Photograph/Location
17	Pass	LM317BD2T IC, black, plastic	
18	Pass	Pin, silvery, metal	
19	Pass	LL4148-SMD Diode, orange, plastic	
20	Pass	1N4007-SMD(M7) Diode, black, plastic	

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Sample No.	Result	Description (Material, colour)	Photograph/Location
21	Pass	SMJ12CA Diode, black, plastic	
22	Pass	1206-R Diode, white, plastic	
23	Pass	S0T-23 9013 Triode, black, plastic	
24	Pass	ACTDS-V1 PCB, green, plastic	

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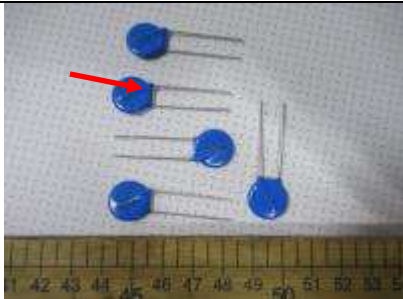
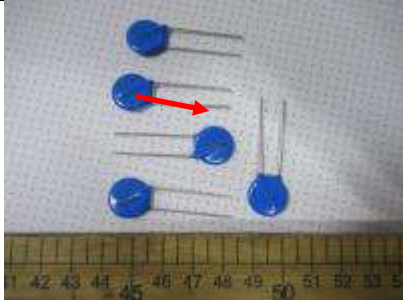
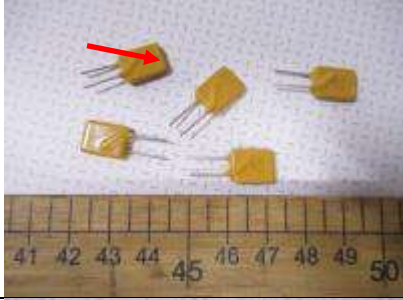
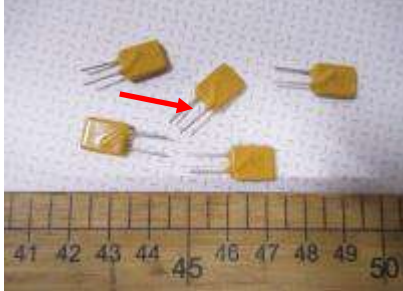




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Sample No.	Result	Description (Material, colour)	Photograph/Location
25	Pass	820KD14J Resistor, blue, plastic	
26	Pass	Pin, silvery, metal	
27	Pass	BK250-400-SZ Resistor, yellow, plastic	
28	Pass	Pin, silvery, metal	

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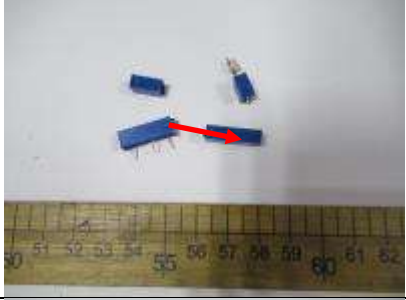

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Sample No.	Result	Description (Material, colour)	Photograph/Location
29	Pass	3006P-10K Shell, blue, plastic	
30	Pass	Pin, silvery, metal	
31	Pass	Resin, blue, plastic	
32	Pass	Frame, silvery, metal	

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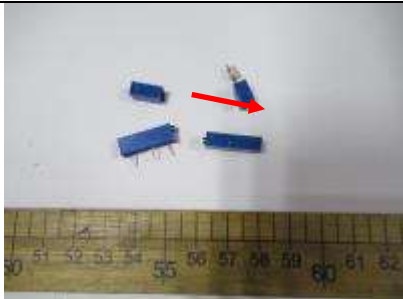

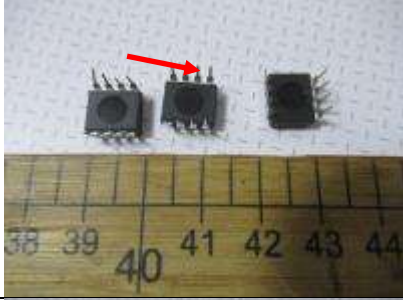
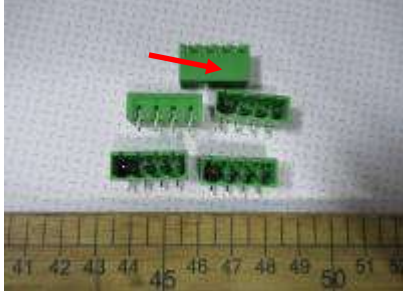
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Sample No.	Result	Description (Material, colour)	Photograph/Location
33	Pass	Screw, golden, copper alloy	
34	Pass	DIP-HCNR201-000E IC, black, plastic	
35	Pass	Pin, silvery, metal	
36	Pass	0Q-C/90D-5.08-4P Terminal, green, plastic	

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37	Pass	Pin, silvery, metal	
38	Pass	0Q-C/90D-5.08-5P Screw, silvery, metal	
39	Pass	Lump, silvery, copper alloy	
40	Pass	ACTDS-V1 PCB, green, plastic	

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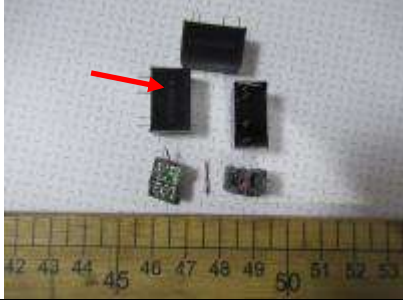
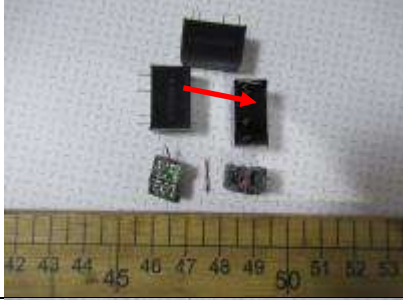

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41	Pass	H1212S-1W Shell, black, plastic	
42	Pass	Pin, silvery, metal	
43	Pass	Resin, black, plastic	
44	Pass	Wire, golden, copper alloy	

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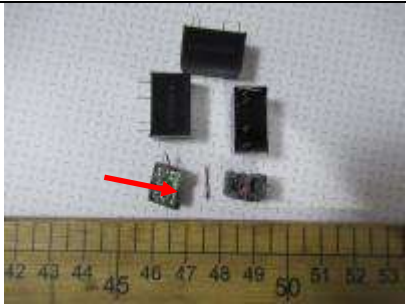
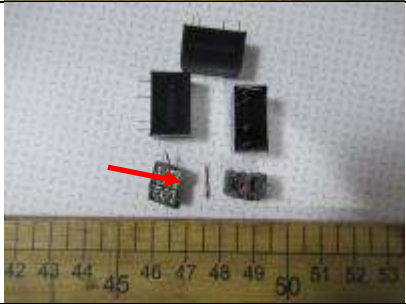
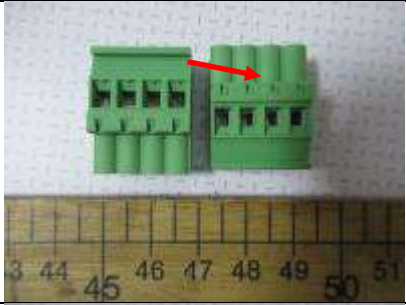





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Sample No.	Result	Description (Material, colour)	Photograph/Location
45	Pass	PCB, green, plastic	
46	Pass	Solder, silvery, metal	
47	Pass	TS-B-5.08 Plug, green, plastic	
48	Pass	Screw, silvery, metal	

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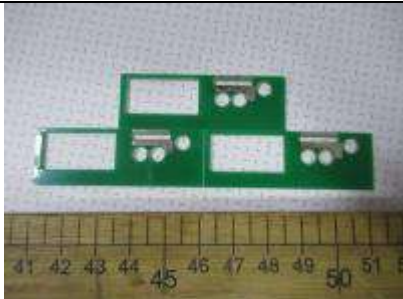


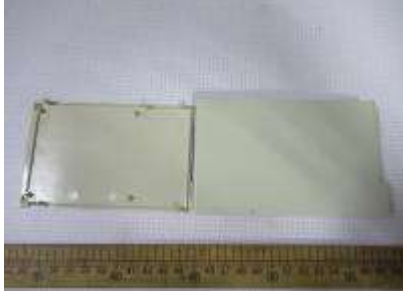
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Sample No.	Result	Description (Material, colour)	Photograph/Location
49	Pass	ACTDS-Z-T PCB, green, plastic	
50	Pass	FACTDS-02 Panel, blue, plastic	
51	Pass	BACTDS-01 Panel, silvery, plastic	
52	Pass	B03乳白色外壳-R Shell, white, plastic	

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 10 Huaxia Road(M), Dongting, Wuxi  
 Jiangsu, 214100, P. R. China

Shanghai Chemical Lab  
 No.1999 Duhui Road  
 Shanghai City

Tel.: +86-510-88203737  
 Fax: +86-510-88203636  
[www.tuv-sud.cn](http://www.tuv-sud.cn)  
[info@tuv-sud.cn](mailto:info@tuv-sud.cn)

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Report No. 48.400.20.7187.00-00/08

Dated 2020-04-23

Sample No.	Result	Description (Material, colour)	Photograph/Location
53	Pass	SJ24*14.4-S50C-J01 Button, white, plastic	
54	Pass	弹簧3*9 Spring, grey, metal	
55	Pass	合格标签 Label, yellow and silvery, plastic	

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### 3. Test Results

#### 3.1 ED-XRF Spectrometer test for total Cadmium, Chromium, Mercury, Lead and Bromine according to EN 62321-3-1:2014

##### Criteria of XRF test results

##### **Pass:**

Because of the nature of the testing procedure (caused by the uncertainty of the used, XRF method), a definite pass is given only if the XRF test score is less than 60% of the respective RoHS limit.

##### **Inconclusive:**

If the XRF test score is between 60% and 150% of the respective RoHS limit, further chemical test on the sample is required.

##### **Fail:**

A definite FAIL is given if the XRF test score is above 150% of the respective RoHS limit

##### **\*Explanation for RoHS limit**

Regarding Chromium and Bromine, the XRF test score shows the total Chromium and the total Bromine, but the RoHS limit of 1000 mg/kg, according to the directive 2011/65/EU, is only for Hexavalent Chromium and Brominated Flame Retardants. Therefore, if the XRF test result for the total Chromium and the total Bromine is more than 600 mg/kg and 300 mg/kg respectively, further analytical tests are necessary to find out the exact amount of Hexavalent Chromium and Brominated Flame Retardants

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	TOTAL CADMIUM [mg/kg]	TOTAL LEAD [mg/kg]	TOTAL MERCURY [mg/kg]	TOTAL CHROMIUM [mg/kg]	TOTAL BROMINE [mg/kg]	OVERALL RESULT
<b>ROHS LIMIT</b>	<b>100</b>	<b>1000</b>	<b>1000</b>	<b>1000</b>	<b>1000</b>	
<b>Pass result</b>	<b>&lt; 60</b>	<b>&lt; 600</b>	<b>&lt; 600</b>	<b>&lt; 600</b>	<b>&lt; 300</b>	
<b>Inconclusive result</b>	<b>60 – 150</b>	<b>600 – 1500</b>	<b>600 – 1500</b>	<b>&gt; 600</b>	<b>&gt; 300</b>	
<b>Fail result</b>	<b>&gt; 150</b>	<b>&gt; 1500</b>	<b>&gt; 1500</b>	<b>-</b>	<b>-</b>	
<b>01</b>	<30	2695***	<30	211	<30	<b>Pass</b>
<b>02</b>	<30	5379***	<30	456	<30	<b>Pass</b>
<b>03</b>	<30	1304***	<30	118	<30	<b>Pass</b>
<b>04</b>	<30	1533***	<30	273	<30	<b>Pass</b>
<b>05</b>	<30	<30	<30	<30	<30	<b>Pass</b>
<b>06</b>	48	<30	<30	<30	<30	<b>Pass</b>
<b>07</b>	<30	<30	<30	<30	<30	<b>Pass</b>
<b>08</b>	<30	<30	<30	<30	<30	<b>Pass</b>
<b>09</b>	48	<30	<30	<30	--	<b>Pass</b>
<b>10</b>	<30	<30	<30	<30	<30	<b>Pass</b>
<b>11</b>	<30	<30	<30	<30	--	<b>Pass</b>
<b>12</b>	<30	<30	<30	<30	<b>13507</b>	<b>Inconclusive</b>
<b>13</b>	<30	<30	<30	<30	--	<b>Pass</b>
<b>14</b>	<30	<30	<30	<30	<30	<b>Pass</b>

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	TOTAL CADMIUM [mg/kg]	TOTAL LEAD [mg/kg]	TOTAL MERCURY [mg/kg]	TOTAL CHROMIUM [mg/kg]	TOTAL BROMINE [mg/kg]	OVERALL RESULT
<b>ROHS LIMIT</b>	<b>100</b>	<b>1000</b>	<b>1000</b>	<b>1000</b>	<b>1000</b>	
<b>Pass result</b>	<b>&lt; 60</b>	<b>&lt; 600</b>	<b>&lt; 600</b>	<b>&lt; 600</b>	<b>&lt; 300</b>	
<b>Inconclusive result</b>	<b>60 – 150</b>	<b>600 – 1500</b>	<b>600 – 1500</b>	<b>&gt; 600</b>	<b>&gt; 300</b>	
<b>Fail result</b>	<b>&gt; 150</b>	<b>&gt; 1500</b>	<b>&gt; 1500</b>	<b>-</b>	<b>-</b>	
<b>15</b>	<30	<30	<30	<30	<b>7320</b>	<b>Inconclusive</b>
<b>16</b>	<30	<30	<30	<30	--	<b>Pass</b>
<b>17</b>	<30	41	<30	<30	<30	<b>Pass</b>
<b>18</b>	<30	<30	<30	<30	--	<b>Pass</b>
<b>19</b>	50	117541***	399	<30	<30	<b>Pass</b>
<b>20</b>	<30	<30	<30	<30	<30	<b>Pass</b>
<b>21</b>	<30	94	<30	31	<30	<b>Pass</b>
<b>22</b>	<30	<30	<30	<30	<30	<b>Pass</b>
<b>23</b>	<30	<30	<30	<30	<30	<b>Pass</b>
<b>24</b>	<30	<30	<30	<30	<b>35700</b>	<b>Inconclusive</b>
<b>25</b>	<30	<30	<30	<30	<30	<b>Pass</b>
<b>26</b>	<30	<30	<30	<30	--	<b>Pass</b>
<b>27</b>	<30	<30	<30	<30	113	<b>Pass</b>
<b>28</b>	<30	<30	<30	<30	--	<b>Pass</b>
<b>29</b>	<30	<30	<30	<30	<30	<b>Pass</b>

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<b>ROHS LIMIT</b>	<b>100</b>	<b>1000</b>	<b>1000</b>	<b>1000</b>	<b>1000</b>	
<b>Pass result</b>	<b>&lt; 60</b>	<b>&lt; 600</b>	<b>&lt; 600</b>	<b>&lt; 600</b>	<b>&lt; 300</b>	
<b>Inconclusive result</b>	<b>60 – 150</b>	<b>600 – 1500</b>	<b>600 – 1500</b>	<b>&gt; 600</b>	<b>&gt; 300</b>	
<b>Fail result</b>	<b>&gt; 150</b>	<b>&gt; 1500</b>	<b>&gt; 1500</b>	<b>-</b>	<b>-</b>	
<b>30</b>	<30	<30	<30	<30	--	<b>Pass</b>
<b>31</b>	<30	<30	<30	<30	<30	<b>Pass</b>
<b>32</b>	<30	<30	<30	<30	<30	<b>Pass</b>
<b>33</b>	<30	190	<30	<30	--	<b>Pass</b>
<b>34</b>	<30	<30	<30	<30	<b>12392</b>	<b>Inconclusive</b>
<b>35</b>	46	<30	<30	<30	--	<b>Pass</b>
<b>36</b>	<30	32	<30	<30	<b>138486</b>	<b>Inconclusive</b>
<b>37</b>	33	<30	<30	<30	--	<b>Pass</b>
<b>38</b>	<30	40	<30	569	--	<b>Pass</b>
<b>39</b>	<30	<30	<30	<30	--	<b>Pass</b>
<b>40</b>	<30	<30	<30	<30	<b>55748</b>	<b>Inconclusive</b>
<b>41</b>	<30	<30	<30	55	74	<b>Pass</b>
<b>42</b>	<30	<30	133	<30	--	<b>Pass</b>
<b>43</b>	<30	<30	<30	<30	<30	<b>Pass</b>
<b>44</b>	<30	<30	<30	<30	--	<b>Pass</b>

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Shanghai Chemical Lab  
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	TOTAL CADMIUM [mg/kg]	TOTAL LEAD [mg/kg]	TOTAL MERCURY [mg/kg]	TOTAL CHROMIUM [mg/kg]	TOTAL BROMINE [mg/kg]	OVERALL RESULT
<b>ROHS LIMIT</b>	<b>100</b>	<b>1000</b>	<b>1000</b>	<b>1000</b>	<b>1000</b>	
<b>Pass result</b>	<b>&lt; 60</b>	<b>&lt; 600</b>	<b>&lt; 600</b>	<b>&lt; 600</b>	<b>&lt; 300</b>	
<b>Inconclusive result</b>	<b>60 – 150</b>	<b>600 – 1500</b>	<b>600 – 1500</b>	<b>&gt; 600</b>	<b>&gt; 300</b>	
<b>Fail result</b>	<b>&gt; 150</b>	<b>&gt; 1500</b>	<b>&gt; 1500</b>	<b>-</b>	<b>-</b>	
<b>45</b>	52	<30	<30	<30	<b>30724</b>	<b>Inconclusive</b>
<b>46</b>	<30	66	<30	<30	--	<b>Pass</b>
<b>47</b>	<30	125	<30	31	89	<b>Pass</b>
<b>48</b>	<30	39	<30	562	--	<b>Pass</b>
<b>49</b>	<30	<30	<30	<30	<b>58765</b>	<b>Inconclusive</b>
<b>50</b>	<30	<30	<30	<30	<30	<b>Pass</b>
<b>51</b>	<30	<30	<30	<30	<30	<b>Pass</b>
<b>52</b>	<30	<30	<30	<30	<30	<b>Pass</b>
<b>53</b>	<30	<30	<30	<30	<b>16879</b>	<b>Inconclusive</b>
<b>54</b>	<30	30	<30	541	--	<b>Pass</b>
<b>55</b>	<30	<30	<30	<30	<30	<b>Pass</b>

**Remark:**

1. "<" means "less than".
2. "mg/kg" denotes "milligram per kilogram".
3. With regard to the stoichiometry of Br in PBBs and PBDEs, the lower limit for Br is set at 300 mg/kg.
4. "--" means the substance for this sample are not tested.
5. "\*\*\*" means the result is exempted according to 2011/65/EU ANNEX item 7(c)-I: Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors.

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### 3.2 Wet chemical test

#### Main instruments used for wet chemical test

Testing Target	Instrument	Method
Lead & Cadmium	ICP-OES	EN 62321-5:2014
Mercury	ICP-OES	EN 62321-4:2014
Hexavalent Chromium	UV-Vis	EN 62321-7-1:2015 EN 62321-7-2:2017
PBBs & PBDEs	GC/MS	EN62321-6:2015
DEHP, BBP, DBP & DIBP	GC/MS	EN 62321-8:2017

#### Criteria of chemical test results

##### Pass:

A definite Pass is given If the chemical test result meets the requirements of RoHS.

##### Fail:

A definite Fail is given If the chemical test result exceeds the full respective RoHS limit.

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Test Sample	Cadmium [mg/kg]	Lead [mg/kg]	Mercury [mg/kg]	Chromium (VI) [mg/kg]	PBBs (Sum) [mg/kg]	PBDEs (Sum) [mg/kg]	OVERALL RESULT
Limit	100	1000	1000	1000	1000	1000	
12	--	--	--	--	<50	<50	Pass
15	--	--	--	--	<50	<50	Pass
24	--	--	--	--	<50	<50	Pass
34	--	--	--	--	<50	<50	Pass
36	--	--	--	--	<50	<50	Pass
40	--	--	--	--	<50	<50	Pass
45	--	--	--	--	<50	<50	Pass
49	--	--	--	--	<50	<50	Pass
53	--	--	--	--	<50	<50	Pass

## Remark:

1. ND = Not detected (Detected limit of Cd :2mg/kg;Pb, Hg, and Cr(VI):5mg/kg; PBBs and PBDEs: 5mg/kg)
2. "mg/kg" denotes "milligram per kilogram".
3. "--" means the substance for this sample are not tested.

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Test Sample	DEHP [mg/kg]	DBP [mg/kg]	BBP [mg/kg]	DIBP [mg/kg]	RESULT
Limit	1000	1000	1000	1000	
01+02+03	<200	<200	<200	<200	Pass
04+05+06	<200	<200	<200	<200	Pass
07+08+10	<200	<200	<200	<200	Pass
12+14+15	<200	<200	<200	<200	Pass
17+19+20	<200	<200	<200	<200	Pass
21+22+23	<200	<200	<200	<200	Pass
24+25+27	<200	<200	<200	<200	Pass
29+31+32	<200	<200	<200	<200	Pass
34+36+40	<200	<200	<200	<200	Pass
41+43+45	<200	<200	<200	<200	Pass
47+49+50	<200	<200	<200	<200	Pass
51+53+55	<200	<200	<200	<200	Pass
52	<200	<200	<200	<200	Pass

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**Remark:**

1. < means "less than" (Detected limit : 50mg/kg)
2. "mg/kg" denotes "milligram per kilogram".
3. DEHP = Di-(2-ethyl-hexyl)phthalate, DBP = Di-butyl phthalate  
BBP = Butyl-benzyl phthalate, DIBP = Di-iso-butyl phthalate

**TÜV SÜD Certification and Testing (China) Co., Ltd.**

**Prepared by:**



**Mr. Guo XU**

**Checked by:**



**Mr. Feng ZHANG**

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10 Huaxia Road(M), Dongting, Wuxi  
Jiangsu, 214100, P. R. China

Tel.: +86-510-88203737  
Fax: +86-510-88203636  
[www.tuv-sud.cn](http://www.tuv-sud.cn)  
[info@tuv-sud.cn](mailto:info@tuv-sud.cn)

Shanghai Chemical Lab  
No.1999 Duhui Road  
Shanghai City

Tel.: +86-21-60376368



China

Report No. 48.400.20.7187.00-00/08

Dated 2020-04-23

## APPENDIX I: Product Model

<b>Product: Voltage Sensor/电压传感器</b>	<b>Test model: ACTDS</b>
	
<b>Additional model: AHVS</b>	

### Remark:

1. The report covers material testing on specified samples.
2. tested materials covered by the report were declared by the manufacturer to be used on the models listed in the annex of the report.

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## APPENDIX II: Official Exemption Items

Below items are quoted based on Directives of 2011/65/EU and its valid Amending Directives.

Exemption		Scope and dates of applicability
1	Mercury in single capped (compact) fluorescent lamps not exceeding (per burner)	
1(a)	For general lighting purpose < 30 W:5mg	Expires on 31 December 2011; 3,5mg maybe used per burner after 31 December 2011 until 31 December 2012; 2.5mg shall be used per burner after 31 December 2012
1(b)	For general lighting purposes $\geq 30$ W and < 50 W:5mg	Expires on 31 December 2011; 3,5mg maybe used per burner after 31 December 2011 until 31 December 2012; 2.5mg shall be used per burner after 31 December 2012
1(c)	For general lighting purposes $\geq 50$ W and < 150 W:5mg	
1(d)	For general lighting purpose $\geq 30$ W and $\geq 150$ W:15mg	
1(e)	For general lighting purpose with circular or square structural shape and tube diameter < 17mm	No limitation of use until 31 December 2011; 7 mg may be used per burner after 31 December 2011
1(f)	For special purposes:5mg	
2(a)	Mercury in double capped linear fluorescent lamps for general lighting purposes not exceeding (per lamp)	
2(a)(1)	Tri-band phosphor with normal lifetime and a tube diameter < 9 mm (e.g. T2): 5mg	Expires on 31 December 2011; 4mg may be used per lamp after 31 December 2011
2(a)(2)	Tri-band phosphor with normal lifetime and a tube diameter $\geq 9$ mm and $\leq 17$ mm (e.g. T5): 5mg	Expires on 31 December 2011; 3mg may be used per lamp after 31 December 2011
2(a)(3)	Tri-band phosphor with normal lifetime and a tube diameter > 17 mm and $\leq 28$ mm (e.g. T8): 5mg	Expires on 31 December 2011; 3,5 mg may be used per lamp after 31 December 2011
2(a)(4)	Tri-band phosphor with normal lifetime and a tube diameter > 28mm (e.g. T12): 5mg	Expires on 31 December 2011; 3,5 mg may be used per lamp after 31 December 2011
2(a)(5)	Tri-band phosphor with long lifetime ( $\geq 25$ 000h):8mg	Expires on 13 December 2011; 5mg may be used per lamp after 31 December 2011
2(b)	Mercury in other fluorescent lamps not exceeding (per lamp):	

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Exemption		Scope and dates of applicability
2(b)(1)	Linear halophosphate lamps with tube >28 mm(e.g.T10 and T12): 10mg	Expires on 13 April 2012
2(b)(2)	Non-linear halophosphate lamps (all diameters):15mg	Expires on 13 April 2016
2(b)(3)	Non-linear tri-band phosphor lamps with tube diameter >17mm (e.g. T9)	No limitation of use until 31 December 2011; 15 mg may be used per lamp after 31 December 2011
2(b)(4)	Lamps for other general lighting and special purposes (e.g. induction lamps)	No limitation of use until 31 December 2011; 15 mg may be used per lamp after 31 December 2011
3	Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for special purposes not exceeding (per lamp)	
3(a)	Short length( $\leq 500$ mm)	No limitation of use until 31 December 2011; 3,5 mg may be used per lamp after 31 December 2011
3(b)	Medium length (> 500mm and $\leq 1\ 500$ mm)	No limitation of use until 31 December 2011; 5 mg may be used per lamp after 31 December 2011
3(c)	Long length (> 1 500mm)	No limitation of use until 31 December 2011; 13 mg may be used per lamp after 31 December 2011
4(a)	Mercury in other low pressure discharge lamps (per lamp)	No limitation of use until 31 December 2011; 15 mg may be used per lamp after 31 December 2011
4(b)	Mercury in High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner) in lamps with improved colour rendering index $R_a > 60$ ;	
4(b)-I	$P \leq 155$ W	No limitation of use until 31 December 2011; 30mg may be used per burner after 31 December 2011
4(b)-II	$155\text{ W} < P \leq 405\text{ W}$	No limitation of use until 31 December 2011; 40mg may be used per burner after 31 December 2011
4(b)-III	$P > 405\text{ W}$	No limitation of use until 31 December 2011; 40mg may be used per burner after 31 December 2011
4(c)	Mercury in other High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner)	
4(c)-I	$P \leq 155\text{ W}$	No limitation of use until 31 December 2011; 30mg may be used per burner after 31 December 2011
4(c)-II	$155\text{ W} < P \leq 405\text{ W}$	No limitation of use until 31 December 2011; 40mg may be used per burner after 31 December 2011

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4(c)-III	P > 405 W	No limitation of use until 31 December 2011; 40mg may be used per burner after 31 December 2011
4(d)	Mercury in High Pressure Mercury (vapour) lamps (HPMV)	Expires on 13 April 2015
4(e)	Mercury in metal halide lamps (MH)	
4(f)	Mercury in other discharge lamps for special purposes not specifically mentioned in this Annex	
4(g)	Mercury in hand crafted luminous discharge tubes used for signs, decorative or architectural and specialist lighting and light-artwork, where the mercury content shall be limited as follows: (a) 20 mg per electrode pair + 0,3 mg per tube length in cm, but not more than 80 mg, for outdoor applications and indoor applications exposed to temperatures below 20 °C; (b) 15 mg per electrode pair + 0,24 mg per tube length in cm, but not more than 80 mg, for all other indoor applications.	Expires on 1 December 2018
5(a)	Lead in glass of cathode ray tubes	
5(b)	Lead in glass of fluorescent tubes not exceeding 0,2 % by weight	
6(a)	Lead as an alloying element in steel for machining purposes and in galvanised steel containing up to 0,35 % lead by weight	Expires on: — 21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments; — 21 July 2023 for category 8 in vitro diagnostic medical devices; — 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
6(a)-I	Lead as an alloying element in steel for machining purposes containing up to 0,35 % lead by weight and in batch hot dip galvanised steel components containing up to 0,2 % lead by weight	Expires on 21 July 2021 for categories 1-7 and 10.'
6(b)	Lead as an alloying element in aluminium containing up to 0,4 % lead by weight	Expires on: — 21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments, — 21 July 2023 for category 8 in vitro diagnostic medical devices, — 21 July 2024 for category 9 industrial monitoring and control instruments, and for

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Exemption		Scope and dates of applicability
		category 11.
6(b)-I	Lead as an alloying element in aluminium containing up to 0,4 % lead by weight, provided it stems from lead-bearing aluminium scrap recycling	Expires on 21 July 2021 for categories 1-7 and 10.
6(b)-II	Lead as an alloying element in aluminium for machining purposes with a lead content up to 0,4 % by weight	Expires on 18 May 2021 for categories 1-7 and 10.'
6(c)	Copper alloy containing up to 4 % lead by weight	Expires on: — 21 July 2021 for categories 1-7 and 10, — 21 July 2021 for categories 8 and 9 other than in vitro diag-nostic medical devices and industrial monitoring and control instruments, — 21 July 2023 for category 8 in vitro diagnostic medical de-vices, — 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.'
7(a)	Lead in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead)	Applies to categories 1-7 and 10 (except applications covered by point 24 of this Annex) and expires on 21 July 2021. For categories 8 and 9 other than in vitro diagnostic medical de-vices and industrial monitoring and control instruments expires on 21 July 2021. For category 8 in vitro diagnostic medical devices expires on 21 July 2023. For category 9 industrial monitoring and control instruments, and for category 11 expires on 21 July 2024.'
7(b)	Lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signalling, transmission, and network management for telecommunications	
7(c)-I	Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound	Applies to categories 1-7 and 10 (except applications covered under point 34) and expires on 21 July 2021. For categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments expires on 21 July 2021. For category 8 in vitro diagnostic medical devices expires on 21 July 2023. For category 9 industrial monitoring and control instruments, and for category 11 expires on 21 July 2024.
7(c)-II	Lead in dielectric ceramic in capacitors for a rated voltage of 125 V AC or 250 V DC or higher	

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Exemption		Scope and dates of applicability
7(c)-III	Lead in dielectric ceramic in capacitors for a rated voltage of less than 125 V AC or 250 V DC	Expires on 1 January 2013 and after that date may be used in spare parts for EEE placed on the market before 1 January 2013
7(c)-IV	Lead in PZT based dielectric ceramic materials for capacitors being part of integrated circuits or discrete semiconductors'	
8(a)	Cadmium and its compounds in one shot pellet type thermal cut-offs	Expires on 1 January 2012 and after that date may be used in spare parts for EEE placed on the market before 1 January 2012
8(b)	Cadmium and its compounds in electrical contacts	
9	Hexavalent chromium as an anticorrosion agent of the carbon steel cooling system in absorption refrigerators up to 0,75 % by weight in the cooling solution	
9(b)	Lead in bearing shells and bushes for refrigerant-containing compressors for heating, ventilation, air conditioning and refrigeration (HVACR) applications	
11(a)	Lead used in C-press compliant pin connector systems	May be used in spare parts for EEE placed on the market before 24 September 2010
11(b)	Lead used in other than C-press compliant pin connector systems	Expires on 1 January 2013 and after that date may be used in spare parts for EEE placed on the market before 1 January 2013
12	Lead as a coating material for the thermal conduction module C-ring	May be used in spare parts for EEE placed on the market before 24 September 2010
13(a)	Lead in white glasses used for optical applications	
13(b)	Cadmium and lead in filter glasses and glasses used for reflectance standards	
14	Lead in solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a lead content of more than 80 % and less than 85 % by weight	Expires on 1 January 2011 and after that date may be used in spare parts for EEE placed on the market before 1 January 2011
15	Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit flip chip packages	
16	Lead in linear incandescent lamps with silicate coated tubes	Expires on 1 September 2013
17	Lead halide as radiant agent in high intensity discharge (HID) lamps used for professional reprography applications	

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Exemption		Scope and dates of applicability
18(a)	Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps when used as speciality lamps for diazoprinting reprography, lithography, insect traps, photochemical and curing processes containing phosphors such as SMS ((Sr,Ba)2MgSi2O7:Pb)	Expires on 1 January 2011
18(b)	Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps when used as sun tanning lamps containing phosphors such as BSP(BaSi 2O5 :Pb)	Categories 1-7 and 10, Expires on 21 July 2021
		Categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments, Expires on 21 July 2021
		Category 8 in vitro diagnostic medical devices, Expires on 21 July 2023
		Category 9 industrial monitoring and control instruments, and for category 11, Expires on 21 July 2024
18(b)-I	Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps containing phosphors such as BSP (BaSi2O5:Pb) when used in medical phototherapy equipment	Categories 5 and 8, excluding applications covered by entry 34 of Annex IV, Expires on 21 July 2021
19	Lead with PbBiSn-Hg and PblnSn-Hg in specific compositions as main amalgam and with PbSn-Hg as auxiliary amalgam in very compact energy saving lamps (ESL)	Expires on 1 June 2011
20	Lead oxide in glass used for bonding front and rear substrates of flat fluorescent lamps used for Liquid Crystal Displays (LCDs)	Expires on 1 June 2011
21	Lead and cadmium in printing inks for the application of enamels on glasses, such as borosilicate and soda lime glasses	
23	Lead in finishes of fine pitch components other than connectors with a pitch of 0,65 mm and less	May be used in spare parts for EEE placed on the market before 24 September 2010
24	Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitors	Expires on: — 21 July 2021 for categories 1-7 and 10, — 21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments, — 21 July 2023 for category 8 in vitro diagnostic medical devices, — 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.'
25	Lead oxide in surface conduction electron emitter displays (SED) used in structural elements, notably in the seal frit and frit ring	
26	Lead oxide in the glass envelope of black light blue lamps	Expires on 1 June 2011

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Exemption		Scope and dates of applicability
27	Lead alloys as solder for transducers used in high-powered (designated to operate for several hours at acoustic power levels of 125 dB SPL and above) loudspeakers	Expired on 24 September 2010
29	Lead bound in crystal glass as defined in Annex I (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC ( 1 )	
30	Cadmium alloys as electrical/mechanical solder joints to electrical conductors located directly on the voice coil in transducers used in high-powered loudspeakers with sound pressure levels of 100 dB (A) and more	
31	Lead in soldering materials in mercury free flat fluorescent lamps (which e.g. are used for liquid crystal displays, design or industrial lighting)	
32	Lead oxide in seal frit used for making window assemblies for Argon and Krypton laser tubes	
33	Lead in solders for the soldering of thin copper wires of 100 um diameter and less in power transformers	
34	Lead in cermet-based trimmer potentiometer elements	Applies to all categories; expires on: — 21 July 2021 for categories 1-7 and 10, — 21 July 2021 for categories 8 and 9 other than in vitro diag-nostic medical devices and industrial monitoring and control instruments, — 21 July 2023 for category 8 in vitro diagnostic medical de-vices, — 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.'
36	Mercury used as a cathode sputtering inhibitor in DC plasma displays with a content up to 30 mg per display	Expired on 1 July 2010
37	Lead in the plating layer of high voltage diodes on the basis of a zinc borate glass body	
38	Cadmium and cadmium oxide in thick film pastes used on aluminium bonded beryllium oxide	
39(a)	Cadmium selenide in downshifting cadmium-based semiconductor nanocrystal quantum dots for use in display lighting applications (< 0,2 µg Cd per mm2 of display screen area)	Expires for all categories on [two years after the publication of the Delegated Directive in the Official Journal]
40	Cadmium in photoresistors for analogue optocouplers applied in professional audio equipment	Expires on 31 December 2013
41	Lead in solders and termination finishes of electrical and electronic components and finishes of printed circuit boards used in ignition modules and other electrical and electronic engine control systems, which for technical reasons must be mounted	Expires on 1 December 2018

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Exemption		Scope and dates of applicability
	directly on or in the crankcase or cylinder of hand-held combustion engines (classes SH:1, SH:2, SH:3 of Directive 97/68/EC of the European Parliament and of the Council.	
42	Lead in bearings and bushes of diesel or gaseous fuel powered internal combustion engines applied in non-road professional use equipment:  with engine total displacement $\geq$ 15 litres; or with engine total displacement $<$ 15 litres and the engine is designed to operate in applications where the time between signal to start and full load is required to be less than 10 seconds; or regular maintenance is typically performed in a harsh and dirty outdoor environment, such as mining, construction, and agriculture applications.	Category 11, excluding applications covered by entry 6(c) of Annex III, Expires on 21 July 2024
43	Bis(2-ethylhexyl) phthalate in rubber components in engine systems, designed for use in equipment that is not intended solely for consumer use and provided that no plasticised material comes into contact with human mucous membranes or into prolonged contact with human skin and the concentration value of bis(2-ethylhexyl) phthalate does not exceed: (a) 30 % by weight of the rubber for (i) gasket coatings; (ii) solid-rubber gaskets; or (iii) rubber components included in assemblies of at least three components using electrical, mechanical or hydraulic energy to do work, and attached to the engine. (b) 10 % by weight of the rubber for rubber-containing components not referred to in point (a). For the purposes of this entry, "prolonged contact with human skin" means continuous contact of more than 10 minutes duration or intermittent contact over a period of 30 minutes, per day.	Applies to category 11 and expires on 21 July 2024.
44	Lead in solder of sensors, actuators, and engine control units of combustion engines within the scope of Regulation (EU) 2016/1628 of the European Parliament and of the Council (*1), installed in equipment used at fixed positions while in operation which is designed for professionals, but also used by non-professional users	Applies to category 11 and expires on 21 July 2024.

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Fax: +86-510-88203636  
[www.tuv-sud.cn](http://www.tuv-sud.cn)  
[info@tuv-sud.cn](mailto:info@tuv-sud.cn)

Tel.: +86-21-60376368