



China

Report No. 48.400.20.7187.00-00/05  
Dated 2020-04-23

## Technical Report

**Client:** Jianguo 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:** Transmitter/变送器  
**Model:** BD-4P  
**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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**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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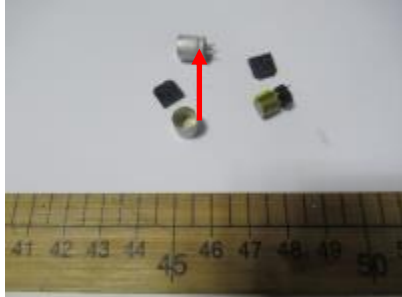
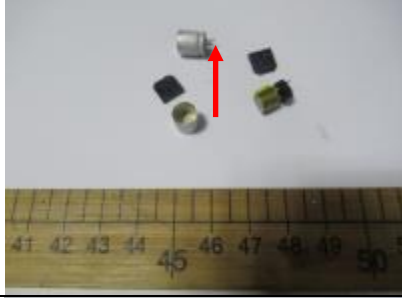




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## 2. Description of the tested specimen

| Sample No. | Result | Description (Material, colour)                                | Photograph/Location   |
|------------|--------|---|---|
| 01         | Pass   | CD470uF/16V( $\pm 20\%$ 105°C)(8*10)<br>Shell, silvery, metal |    |
| 02         | Pass   | Pin, silvery, copper alloy                                    |   |
| 03         | Pass   | Cushion, black, plastic                                       |  |
| 04         | Pass   | Tape, yellow, plastic   |  |

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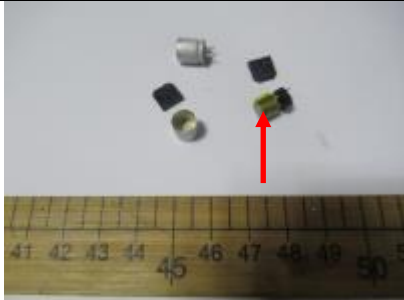
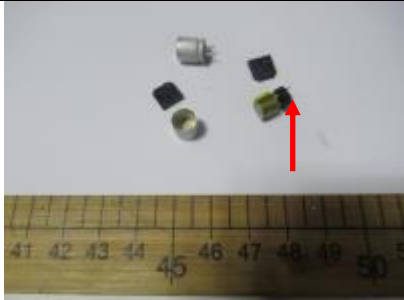
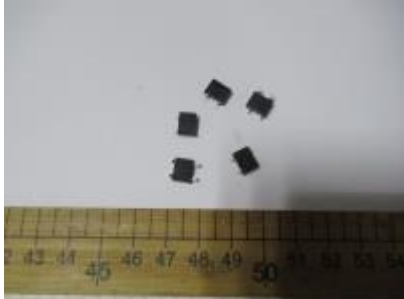

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| Sample No. | Result | Description (Material, colour)     | Photograph/Location   |
|------------|--------|------------------------------------|---|
| 05         | Pass   | Film, silvery, plastic             |    |
| 06         | Pass   | Plug, black, plastic               |    |
| 07         | Pass   | DB107S<br>IC, black, plastic       |   |
| 08         | Pass   | TLV70033DDCR<br>IC, black, plastic |  |

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| Sample No. | Result | Description (Material, colour)                  | Photograph/Location |
|------------|--------|---|---------------------|
| 09         | Pass   | RN7302 (代替ADE7858AAPZ-RL)<br>IC, black, plastic |                     |
| 10         | Pass   | SMAJ5.0A<br>Diode, black, plastic               |                     |
| 11         | Pass   | SS310-SMD<br>Diode, black, plastic              |                     |
| 12         | Pass   | SMBJ200A<br>Diode, black, plastic               |                     |

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| Sample No. | Result | Description (Material, colour)                                   | Photograph/Location   |
|------------|--------|--|---|
| 13         | Pass   | L-1210-100uH-40mA-<br>±10%(NL10KT101)<br>IC, black, plastic      |    |
| 14         | Pass   | HC-49US 16.384MHz/20PF/±30PPM-<br>SMD<br>Crystal, silvery, metal |    |
| 15         | Pass   | Cushion, black, plastic  |   |
| 16         | Pass   | Pin, silvery, copper alloy                                       |  |

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| Sample No. | Result | Description (Material, colour)                                       | Photograph/Location |
|------------|--------|--|---------------------|
| 17         | Pass   | BLM18BD102SN1<br>Chip ic, dark                                       |                     |
| 18         | Pass   | SOP4-LTV-356T-B<br>IC, black, plastic                                |                     |
| 19         | Pass   | MZ11-08E800-161RM/14D391(213C)<br>正引线 弯脚<br>Resistor, green, plastic |                     |
| 20         | Pass   | Pin, silvery, copper alloy   |                     |

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|------------|--------|---|---------------------|
| 21         | Pass   | CD10 $\mu$ F/400V( $\pm$ 20%,105 $^{\circ}$ C) 10*16<br>Cover, black, plastic |                     |
| 22         | Pass   | Shell, silvery, metal   |                     |
| 23         | Pass   | Film, brown, plastic  |                     |
| 24         | Pass   | Plug, black, plastic  |                     |

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| Sample No. | Result | Description (Material, colour)   | Photograph/Location   |
|------------|--------|--|---|
| 25         | Pass   | Pin, silvery, copper alloy   |    |
| 26         | Pass   | 2.2nF/400V(±20%) L=4.0mm Capacitor, blue, plastic                                      |    |
| 27         | Pass   | Pin, silvery, copper alloy   |   |
| 28         | Pass   | C-18X12X6 L=3.5±0.5mm-275V-0.1uF-±20%(X2 100nF 275VAC P=15) Capacitor, yellow, plastic |  |

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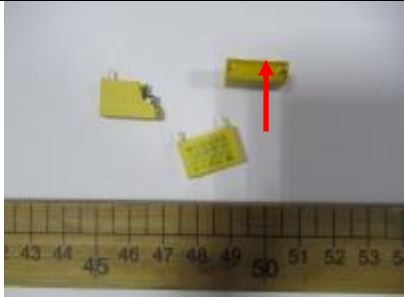
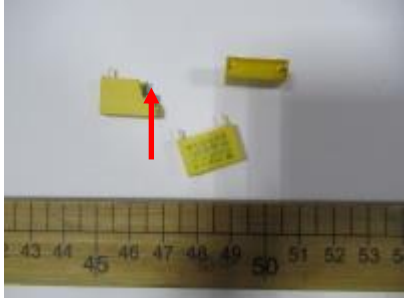


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| Sample No. | Result | Description (Material, colour)             | Photograph/Location   |
|------------|--------|--|---|
| 29         | Pass   | Resin, yellow, plastic                     |    |
| 30         | Pass   | Film, silvery, plastic                     |    |
| 31         | Pass   | Pin, silvery, copper alloy                 |   |
| 32         | Pass   | TNY286PG(可替代TNY276P)<br>IC, black, plastic |  |

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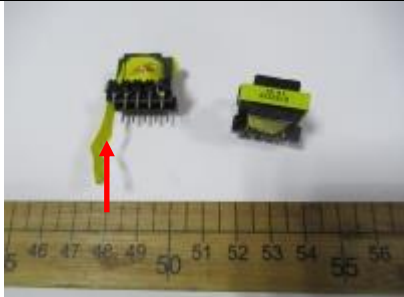



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| Sample No. | Result | Description (Material, colour)   | Photograph/Location   |
|------------|--------|----------------------------------|---|
| 33         | Pass   | EI51515<br>Tape, yellow, plastic |    |
| 34         | Pass   | Pin, silvery, copper alloy       |    |
| 35         | Pass   | Frame, black, plastic            |   |
| 36         | Pass   | Wire, golden, copper alloy       |  |

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| Sample No. | Result | Description (Material, colour)         | Photograph/Location   |
|------------|--------|--|---|
| 37         | Pass   | Magnet ring, grey, metal               |    |
| 38         | Pass   | CT-E 5A:2.5mA<br>Frame, black, plastic |    |
| 39         | Pass   | Pin, golden, copper alloy              |   |
| 40         | Pass   | Resin, black, plastic                  |  |

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|------------|--------|--------------------------------------|---|
| 41         | Pass   | Wire, golden, copper alloy           |    |
| 42         | Pass   | 47μH/40mΩ<br>Coating, green, plastic |    |
| 43         | Pass   | Magnet ring, grey, metal             |   |
| 44         | Pass   | Board, yellow, plastic               |  |

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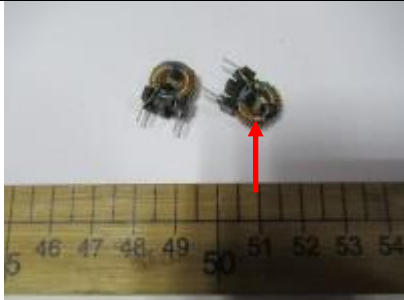



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|------------|--------|--------------------------------|---|
| 45         | Pass   | Wire, golden, copper alloy     |    |
| 46         | Pass   | Frame, black, plastic          |    |
| 47         | Pass   | Pin, silvery, copper alloy     |   |
| 48         | Pass   | Resin, black, plastic          |  |

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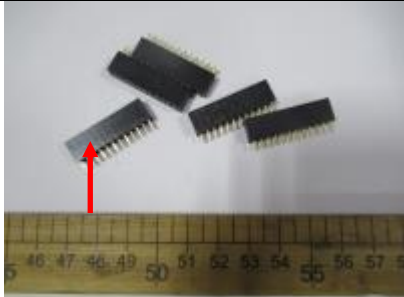



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|------------|--------|--|---|
| 49         | Pass   | 22P8562-24S10B-01G-3.2<br>Plug, black, plastic |    |
| 50         | Pass   | Pin, golden, copper alloy                      |    |
| 51         | Pass   | OQ-C/90D-5.08-3P<br>Plug, green, plastic       |   |
| 52         | Pass   | Pin, silvery, copper alloy                     |  |

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|------------|--------|--|---------------------|
| 53         | Pass   | CR1206-100k( $\pm 5\%$ , 100PPM)<br>Resistor, black, plastic |                     |
| 54         | Pass   | 10k(10P8)( $\pm 5\%$ )<br>Resistor, black, plastic           |                     |
| 55         | Pass   | HCPL0601-500E<br>IC, black, plastic                          |                     |
| 56         | Pass   | ISL3152EIBZ-T<br>IC, black, plastic                          |                     |

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China

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| Sample No. | Result | Description (Material, colour)                             | Photograph/Location |
|------------|--------|--|---------------------|
| 57         | Pass   | SN74LVC245APW(TSSOP20)<br>IC, black, plastic               |                     |
| 58         | Pass   | MB85RC16 (可与FM24CL16B-GTR互<br>相替换使用)<br>IC, black, plastic |                     |
| 59         | Pass   | STM32F051R8T6<br>IC, black, plastic                        |                     |
| 60         | Pass   | MMBT4401(LMBT4401LT1G)<br>Triode, black, plastic           |                     |

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|------------|--------|---|---|
| 61         | Pass   | 3225-12MHz(SMD3225-4P<br>12.000MHz 20pF/±20ppm)<br>Crystal, golden, metal |    |
| 62         | Pass   | SMD1812P010TF (SMD1812B010TF)<br>Fuse, black, plastic                     |    |
| 63         | Pass   | FBD-4E-04<br>Pannel, grey, palstic  |   |
| 64         | Pass   | ARTU透明窗<br>Window, transparent, plastic                                   |  |

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| Sample No. | Result | Description (Material, colour)                             | Photograph/Location |
|------------|--------|--|---------------------|
| 65         | Pass   | 综合槽盘头螺钉 M2.5*8 铁镀镍 (带弹垫,平垫)<br>Screw, silvery, metal       |                     |
| 66         | Pass   | SJ24*14.4-S05A-J01(灰色阻燃 PC/ABS合金)<br>Frame, black, plastic |                     |
| 67         | Pass   | Component, black, plastic                                  |                     |
| 68         | Pass   | Nut, golden, copper alloy                                  |                     |

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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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|--------------------------------|-----------------------------|--------------------------|-----------------------------|------------------------------|-----------------------------|-------------------|
| <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<br/>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                         | <30                      | <30                         | 528                          | --                          | <b>Pass</b>       |
| <b>02</b>                      | <30                         | 73                       | <30                         | <30                          | --                          | <b>Pass</b>       |
| <b>03</b>                      | <30                         | <30                      | <30                         | 39                           | <30                         | <b>Pass</b>       |
| <b>04</b>                      | <30                         | <30                      | <30                         | <30                          | <30                         | <b>Pass</b>       |
| <b>05</b>                      | <30                         | <30                      | <30                         | <30                          | <30                         | <b>Pass</b>       |
| <b>06</b>                      | <30                         | <30                      | <30                         | 75                           | <30                         | <b>Pass</b>       |
| <b>07</b>                      | <30                         | 124                      | <30                         | <30                          | <30                         | <b>Pass</b>       |
| <b>08</b>                      | <30                         | <30                      | <30                         | <30                          | <30                         | <b>Pass</b>       |
| <b>09</b>                      | <30                         | <30                      | <30                         | <30                          | <30                         | <b>Pass</b>       |
| <b>10</b>                      | <30                         | 95                       | <30                         | <30                          | <30                         | <b>Pass</b>       |
| <b>11</b>                      | <30                         | 461                      | <30                         | <30                          | <30                         | <b>Pass</b>       |
| <b>12</b>                      | <30                         | 145                      | <30                         | <30                          | <30                         | <b>Pass</b>       |
| <b>13</b>                      | <30                         | 108                      | <30                         | <30                          | <30                         | <b>Pass</b>       |
| <b>14</b>                      | <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<br/>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                         | 54                           | <30                         | <b>Pass</b>         |
| <b>16</b>                      | <30                         | <30                      | <30                         | 56                           | --                          | <b>Pass</b>         |
| <b>17</b>                      | <30                         | <30                      | <30                         | <30                          | <30                         | <b>Pass</b>         |
| <b>18</b>                      | <30                         | <30                      | <30                         | 40                           | <30                         | <b>Pass</b>         |
| <b>19</b>                      | <30                         | <30                      | <30                         | <30                          | <30                         | <b>Pass</b>         |
| <b>20</b>                      | <30                         | <30                      | <30                         | 33                           | --                          | <b>Pass</b>         |
| <b>21</b>                      | <30                         | <30                      | <30                         | 52                           | <30                         | <b>Pass</b>         |
| <b>22</b>                      | <30                         | <30                      | <30                         | 61                           | --                          | <b>Pass</b>         |
| <b>23</b>                      | <30                         | <30                      | <30                         | <30                          | <30                         | <b>Pass</b>         |
| <b>24</b>                      | <30                         | <30                      | <30                         | <30                          | <30                         | <b>Pass</b>         |
| <b>25</b>                      | <30                         | <30                      | <30                         | <30                          | --                          | <b>Pass</b>         |
| <b>26</b>                      | <30                         | <30                      | <30                         | <30                          | <30                         | <b>Pass</b>         |
| <b>27</b>                      | <30                         | 36                       | <30                         | <30                          | --                          | <b>Pass</b>         |
| <b>28</b>                      | <30                         | <30                      | <30                         | <30                          | <b>29316</b>                | <b>Inconclusive</b> |
| <b>29</b>                      | <30                         | <30                      | <30                         | <30                          | <b>4861</b>                 | <b>Inconclusive</b> |

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| <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<br/>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                          | 138                         | <b>Pass</b>         |
| <b>31</b>                      | <30                         | <30                      | <30                         | <30                          | --                          | <b>Pass</b>         |
| <b>32</b>                      | <30                         | <30                      | <30                         | <30                          | <30                         | <b>Pass</b>         |
| <b>33</b>                      | <30                         | <30                      | <30                         | <30                          | 74                          | <b>Pass</b>         |
| <b>34</b>                      | <30                         | 64                       | <30                         | <30                          | --                          | <b>Pass</b>         |
| <b>35</b>                      | <30                         | <30                      | <30                         | <30                          | 66                          | <b>Pass</b>         |
| <b>36</b>                      | <30                         | 84                       | <30                         | <30                          | --                          | <b>Pass</b>         |
| <b>37</b>                      | <30                         | <30                      | <30                         | <30                          | --                          | <b>Pass</b>         |
| <b>38</b>                      | <30                         | <30                      | <30                         | <30                          | <b>44336</b>                | <b>Inconclusive</b> |
| <b>39</b>                      | <30                         | <30                      | <30                         | <30                          | --                          | <b>Pass</b>         |
| <b>40</b>                      | <30                         | <30                      | <30                         | <30                          | 36                          | <b>Pass</b>         |
| <b>41</b>                      | <30                         | <30                      | <30                         | <30                          | --                          | <b>Pass</b>         |
| <b>42</b>                      | <30                         | <30                      | <30                         | <30                          | <30                         | <b>Pass</b>         |
| <b>43</b>                      | <30                         | 138                      | <30                         | 482                          | --                          | <b>Pass</b>         |
| <b>44</b>                      | <30                         | <30                      | <30                         | <30                          | <30                         | <b>Pass</b>         |

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| <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>                  | <30                         | <30                      | <30                         | <30                          | --                          | <b>Pass</b>         |
| <b>46</b>                  | <30                         | <30                      | <30                         | <30                          | <30                         | <b>Pass</b>         |
| <b>47</b>                  | <30                         | <30                      | <30                         | <30                          | --                          | <b>Pass</b>         |
| <b>48</b>                  | <30                         | <30                      | <30                         | <30                          | <30                         | <b>Pass</b>         |
| <b>49</b>                  | <30                         | <30                      | <30                         | <30                          | <30                         | <b>Pass</b>         |
| <b>50</b>                  | <30                         | <30                      | <30                         | <30                          | --                          | <b>Pass</b>         |
| <b>51</b>                  | <30                         | <30                      | <30                         | <30                          | <b>138401</b>               | <b>Inconclusive</b> |
| <b>52</b>                  | <30                         | 55                       | <30                         | <30                          | --                          | <b>Pass</b>         |
| <b>53</b>                  | <30                         | 4650***                  | <30                         | 303                          | <30                         | <b>Pass</b>         |
| <b>54</b>                  | 95                          | 3179***                  | <30                         | 136                          | <30                         | <b>Pass</b>         |
| <b>55</b>                  | <30                         | <30                      | <30                         | <30                          | <b>9024</b>                 | <b>Inconclusive</b> |
| <b>56</b>                  | <30                         | <30                      | <30                         | <30                          | <30                         | <b>Pass</b>         |
| <b>57</b>                  | <30                         | <30                      | <30                         | <30                          | <30                         | <b>Pass</b>         |
| <b>58</b>                  | <30                         | <30                      | <30                         | <30                          | <b>5201</b>                 | <b>Inconclusive</b> |
| <b>59</b>                  | <30                         | <30                      | <30                         | <30                          | <30                         | <b>Pass</b>         |

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|                                | TOTAL<br>CADMIUM<br>[mg/kg] | TOTAL<br>LEAD<br>[mg/kg] | TOTAL<br>MERCURY<br>[mg/kg] | TOTAL<br>CHROMIUM<br>[mg/kg] | TOTAL<br>BROMINE<br>[mg/kg] | OVERALL<br>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<br/>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>60</b>                      | <30                         | <30                      | <30                         | <30                          | <30                         | <b>Pass</b>         |
| <b>61</b>                      | <30                         | <30                      | <30                         | 242                          | --                          | <b>Pass</b>         |
| <b>62</b>                      | <30                         | <30                      | <30                         | <30                          | <30                         | <b>Pass</b>         |
| <b>63</b>                      | <30                         | <30                      | <30                         | <30                          | <30                         | <b>Pass</b>         |
| <b>64</b>                      | <30                         | <30                      | <30                         | <30                          | <30                         | <b>Pass</b>         |
| <b>65</b>                      | <30                         | <30                      | <30                         | 56                           | --                          | <b>Pass</b>         |
| <b>66</b>                      | <30                         | <30                      | <30                         | <30                          | <b>2933</b>                 | <b>Inconclusive</b> |
| <b>67</b>                      | <30                         | <30                      | <30                         | <30                          | <b>33515</b>                | <b>Inconclusive</b> |
| <b>68</b>                      | <30                         | <b>13839**</b>           | <30                         | 45                           | --                          | <b>Inconclusive</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 6(a,b,c): Lead as an alloying element in steel containing up to 0.35 % lead by weight, aluminum containing up to 0.4 % lead by weight and as a copper alloy containing up to 4 % lead by weight.
6. “\*\*\*” 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<br>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                |                |
| 28          | --              | --                 | --              | --                    | <50                | <50                 | Pass           |
| 29          | --              | --                 | --              | --                    | <50                | <50                 | Pass           |
| 38          | --              | --                 | --              | --                    | <50                | <50                 | Pass           |
| 51          | --              | --                 | --              | --                    | <50                | <50                 | Pass           |
| 55          | --              | --                 | --              | --                    | <50                | <50                 | Pass           |
| 58          | --              | --                 | --              | --                    | <50                | <50                 | Pass           |
| 66          | --              | --                 | --              | --                    | <50                | <50                 | Pass           |
| 67          | --              | --                 | --              | --                    | <50                | <50                 | Pass           |
| 68          | --              | 13681 <sup>4</sup> | --              | --                    | --                 | --                  | 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.
4. According to 2011/65/EU ANNEX item 6(a,b,c): Lead as an alloying element in steel containing up to 0.35 % lead by weight, aluminum containing up to 0.4 % lead by weight and as a copper alloy containing up to 4 % lead by weight.

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| Test Sample | DEHP [mg/kg] | DBP [mg/kg] | BBP [mg/kg] | DIBP [mg/kg] | RESULT |
|-------------|--------------|-------------|-------------|--------------|--------|
| Limit       | 1000         | 1000        | 1000        | 1000         |        |
| 03+04+05    | <200         | <200        | <200        | <200         | Pass   |
| 06+07+08    | <200         | <200        | <200        | <200         | Pass   |
| 09+10+11    | <200         | <200        | <200        | <200         | Pass   |
| 12+13+15    | <200         | <200        | <200        | <200         | Pass   |
| 17+18+19    | <200         | <200        | <200        | <200         | Pass   |
| 21+23+24    | <200         | <200        | <200        | <200         | Pass   |
| 26+28+29    | <200         | <200        | <200        | <200         | Pass   |
| 30+32+33    | <200         | <200        | <200        | <200         | Pass   |
| 35+38+40    | <200         | <200        | <200        | <200         | Pass   |
| 42+44+46    | <200         | <200        | <200        | <200         | Pass   |
| 48+49+51    | <200         | <200        | <200        | <200         | Pass   |
| 53+54+55    | <200         | <200        | <200        | <200         | Pass   |
| 56+57+58    | <200         | <200        | <200        | <200         | Pass   |
| 59+60+62    | <200         | <200        | <200        | <200         | Pass   |
| 63+64+67    | <200         | <200        | <200        | <200         | Pass   |
| 66          | <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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## APPENDIX I: Product Model

|  |                   |
|--|-------------------|
| Product: Transmitter/变送器   | Test model: BD-4P |
|                                       |                   |
| Additional model: BD-F, BD-PF, BD-3I3, BD-3V3, BD-4V3, BD-3P, BD-3Q, BD-4Q, BD-3P/Q/I, BD-4P/Q/I, BD-3E, BD-4E, BD-4EA |                   |

### 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(≤500mm)  | 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 ≤ 1 500mm)   | 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 Ra >60; |   |
| 4(b)-I    | P≤155 W   | No limitation of use until 31 December 2011; 30mg may be used per burner after 31 December 2011 |
| 4(b)-II   | 155 W < P ≤ 405 W   | No limitation of use until 31 December 2011; 40mg may be used per burner after 31 December 2011 |
| 4(b)-III  | P > 405 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≤155 W   | No limitation of use until 31 December 2011; 30mg may be used per burner after 31 December 2011 |
| 4(c)-II   | 155 W < P ≤ 405 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:<br>(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;<br>(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:<br>— 21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments;<br>— 21 July 2023 for category 8 in vitro diagnostic medical devices;<br>— 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:<br>— 21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments,<br>— 21 July 2023 for category 8 in vitro diagnostic medical devices,<br>— 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:<br>— 21 July 2021 for categories 1-7 and 10,<br>— 21 July 2021 for categories 8 and 9 other than in vitro diag-nostic medical devices and industrial monitoring and control instruments,<br>— 21 July 2023 for category 8 in vitro diagnostic medical de-vices,<br>— 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.<br>For categories 8 and 9 other than in vitro diagnostic medical de-vices and industrial monitoring and control instruments expires on 21 July 2021.<br>For category 8 in vitro diagnostic medical devices expires on 21 July 2023.<br>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.<br>For categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments expires on 21 July 2021.<br>For category 8 in vitro diagnostic medical devices expires on 21 July 2023.<br>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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China

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Dated 2020-04-23

| 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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|-----------|--|---|
| 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:<br>— 21 July 2021 for categories 1-7 and 10,<br>— 21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments,<br>— 21 July 2023 for category 8 in vitro diagnostic medical devices,<br>— 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:<br>— 21 July 2021 for categories 1-7 and 10,<br>— 21 July 2021 for categories 8 and 9 other than in vitro diag-nostic medical devices and industrial monitoring and control instruments,<br>— 21 July 2023 for category 8 in vitro diagnostic medical de-vices,<br>— 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:<br><br>with engine total displacement $\geq$ 15 litres; or<br>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:<br>(a) 30 % by weight of the rubber for<br>(i) gasket coatings;<br>(ii) solid-rubber gaskets; or<br>(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.<br>(b) 10 % by weight of the rubber for rubber-containing components not referred to in point (a).<br>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.   |

--END OF REPORT--

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