SDT73V Platinum Thin Film Thermal Chip Sensors (For Automotive)

Coating color: Black

Features
- SMD platinum thin film thermal sensors for automotive.
- T.C.R. is equivalent to JIS - IEC standards.
- Suitable for both flow and reflow solderings.
- AEC-Q200 qualified.
- Products meet EU-RoHS requirements.

Applications
- Temperature compensation of the electronic component for automotive.
- Temperature compensation for various kinds of sensor drive circuits.
- Temperature compensation for telecommunication and measuring equipment.

Reference Standards
IEC 60751™ JIS C 1604™

Ratings

<table>
<thead>
<tr>
<th>Type</th>
<th>Resistance (Ω at 0℃)</th>
<th>Resistance tolerance (%)</th>
<th>T.C.R. (×10⁻⁶/K)</th>
<th>Thermal Time Constant (s)</th>
<th>Thermal Dissipation Constant (mW/℃)</th>
<th>Operating Temperature Range (℃)</th>
<th>Specified Current (mA) max.</th>
<th>Taping &amp; Q’ty/Reel (pcs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDT73V 2B</td>
<td>100 500</td>
<td>C: ±0.2, F: ±1</td>
<td>3850</td>
<td>6.5</td>
<td>2.4</td>
<td>±50</td>
<td>1000: 1</td>
<td>1,000</td>
</tr>
</tbody>
</table>

Precautions for Use
- When measuring current higher than rated current (100Ω: 1mA, 500Ω: 0.1mA) is used, calculate a rise in temperature by self-heating and confirm the error range.
- Ionic impurities such as flux etc. that are attached to these products or those mounted onto a PCB, negatively affect their moisture resistance, corrosion resistance, etc. The flux may contain ionic substances like chlorine, acid, etc. Please wash them to get rid of these ionic substances especially when using lead-free solder that may contain much of the said substances for improving a wetting characteristic. Using RMA solder or RMA flux, or well-washing is needed. Also, attaching ionic impurities such as perspiration, salt etc. by storage environments or mounting conditions/environments negatively affects their moisture resistance, corrosion resistance etc. Please wash them to remove the ionic substances when they are polluted.
- When the components are polluted by ionic impurities like sodium(Na⁺), chlorine(Cl⁻) etc. included in perspiration and saliva, it leads to electric erosion. Avoid the pollution when storage, mounting and using. Consider not to remain ionic substances on the components. Wash by pure water etc. and dry them when you find pollution.
- Please pay attention that the top of an iron does not direct touch to the components. There is a risk that may cause a change in resistance. Take care that another risk may happen that the protecting coat is carbonized in an instant when touched directly by the top of the iron, also climatic-proof for electric corrosion or insulation of protecting coat may be dropped down. Be sure not to give high temperature on the top of the iron as it will degrade the protecting coat.

Specifications given herein may be changed at any time without prior notice. Please confirm technical specifications before you order and/or use. Oct. 2019

Malfunction or failure of the products in such applications may cause loss of human life or serious damage.

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Thermal Sensors

■ Temperature Characteristics

Approximate Expression for Resistance-Temperature Characteristics

-55℃〜0℃: \[RT = R_0 \{1 + C_1 T + C_2 T^2 + C_3 (T-100) T^3\} \]

0℃〜+155℃: \[RT = R_0 (1 + C_1 T + C_2 T^2) \]

\(RT\): Resistance value at \(T\)℃
\(R_0\): Resistance value at 0℃
\(T\): Ambient temperature (℃)

Constants \(C_1\), \(C_2\), \(C_3\):
\(C_1 = 3.9083 \times 10^{-3} \text{℃}^{-1}\)
\(C_2 = -5.775 \times 10^{-7} \text{℃}^{-2}\)
\(C_3 = -4.183 \times 10^{-12} \text{℃}^{-4}\)

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Contact our sales representatives before you use our products for applications including automobiles, medical equipment and aerospace equipment.

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■ Performance

Test Items | Performance Requirements | Test Methods (According to AEC-Q200 specification)
---|---|---
High temperature exposure | 0.5 | −0.022 | +155℃, 1000h
Rapid change of temperature | 0.5 | −0.058 | −25℃(30min)/+25℃(2〜3min)/+155℃(30min)/+25℃(2〜3min) 1000 cycles
Moisture resistance | 0.5 | −0.041 | 25℃-65℃(90%〜100%RH)
Mechanical Shock | 0.5 | −0.001 | 100g max, 6Dms(Standard),12,31t/s
Vibration | 0.5 | −0.009 | Test from 10-2000Hz 5g for 20 min. 12 cycles each of 3 orientations.
Resistance to Soldering Heat | 0.5 | −0.004 | 260℃, 10s
Thermal Shock | 0.5 | −0.032 | −55℃(15min)/+155℃(15min) 300cycles
Solderability | 0.5 | −0.016 | 25℃-65℃ (90%〜100%RH) t=24 hours/cycle. Unpowered. It is carried out 10 times.
Terminal Strength | 0.5 | −0.011 | 1.8kg force is kept on the samples for 60 seconds.

Note:
Desired temperature values are obtained by adding temperatures in the vertical and horizontal axes. When calculating a resistance value of 105℃, read the value in the column where 100℃ in the vertical axis and 5℃ in the horizontal axis cross. The value will be 140.40Ω. The value for 500Ω at 0℃ will be the value obtained by multiplying the resistance value in this table by 5.

■ Pt100 Resistance-Temperature Characteristic (JIS C 1604-2007)

<table>
<thead>
<tr>
<th>Temperature (℃)</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resistance (Ω)</td>
<td>80.31</td>
<td>80.69</td>
<td>81.07</td>
<td>81.46</td>
<td>81.85</td>
<td>82.24</td>
<td>82.63</td>
<td>83.02</td>
<td>83.41</td>
<td>83.81</td>
</tr>
<tr>
<td>Temperature (℃)</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>70</td>
<td>80</td>
<td>90</td>
<td>100</td>
</tr>
<tr>
<td>Resistance (Ω)</td>
<td>104.29</td>
<td>104.68</td>
<td>105.07</td>
<td>105.46</td>
<td>105.85</td>
<td>106.24</td>
<td>106.63</td>
<td>107.02</td>
<td>107.41</td>
<td>107.80</td>
</tr>
<tr>
<td>Temperature (℃)</td>
<td>110</td>
<td>120</td>
<td>130</td>
<td>140</td>
<td>150</td>
<td>160</td>
<td>170</td>
<td>180</td>
<td>190</td>
<td>200</td>
</tr>
<tr>
<td>Resistance (Ω)</td>
<td>127.46</td>
<td>127.85</td>
<td>128.24</td>
<td>128.63</td>
<td>128.99</td>
<td>129.53</td>
<td>129.99</td>
<td>130.28</td>
<td>130.57</td>
<td>130.86</td>
</tr>
<tr>
<td>Temperature (℃)</td>
<td>200</td>
<td>250</td>
<td>300</td>
<td>350</td>
<td>400</td>
<td>450</td>
<td>500</td>
<td>550</td>
<td>600</td>
<td>650</td>
</tr>
<tr>
<td>Resistance (Ω)</td>
<td>164.82</td>
<td>165.21</td>
<td>165.60</td>
<td>165.99</td>
<td>166.38</td>
<td>166.77</td>
<td>167.16</td>
<td>167.55</td>
<td>167.94</td>
<td>168.33</td>
</tr>
</tbody>
</table>

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