**Features**
- Lead free
- RoHS compliant*
- 9 RC termination circuits to IEEE 1284 standard
- Stable thin-film-on-silicon technology
- Ultra-miniature packages to JEDEC standards

**Applications**
- Bidirectional parallel port communications
- Specially designed for PC/printer interface
- Ideal for space-constrained applications

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**General Information**

The IEEE 1284 Terminator is used to provide filtering and pull-up termination on bidirectional, high-speed parallel ports connecting computer to printer. These Silicon-based, Tantalum-Nitride resistors and capacitors feature excellent stability, temperature coefficients and tracking performance. This product series conforms to JEDEC standards.

**Electrical & Environmental Characteristics**

<table>
<thead>
<tr>
<th>Electrical Characteristics</th>
<th>Symbol</th>
<th>Minimum</th>
<th>Nominal</th>
<th>Maximum</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resistance Range</td>
<td>R</td>
<td>10</td>
<td></td>
<td>4.7K</td>
<td>Ω</td>
</tr>
<tr>
<td>Resistor Tolerance</td>
<td></td>
<td>±10 %</td>
<td></td>
<td></td>
<td>Ω</td>
</tr>
<tr>
<td>Power Rating per Resistor @ 70 °C</td>
<td>C</td>
<td>33</td>
<td></td>
<td>220</td>
<td>pF</td>
</tr>
<tr>
<td>Capacitor Range</td>
<td></td>
<td>±20 %</td>
<td></td>
<td></td>
<td>pF</td>
</tr>
<tr>
<td>Capacitor Breakdown Voltage</td>
<td></td>
<td>25</td>
<td>35</td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>Operating Voltage</td>
<td></td>
<td></td>
<td></td>
<td>50</td>
<td>V</td>
</tr>
</tbody>
</table>

**Environmental Characteristics**

- ESD: 2 K
- Operating Temperature: T_J = -55 +125 °C
- Storage Temperature: T_stg = -65 +150 °C
- Power Rating per Package @ 70 °C: 1.0 Watt

**Filter Response**

![Filter Response Graph](image)

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Specifications are subject to change without notice.

Customers should verify actual device performance in their specific applications.
Thin Film on Silicon 2CTE IEEE 1284 Terminator

Mechanical Characteristics

QSOP Package Dimensions

<table>
<thead>
<tr>
<th>Model</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>2QSP20</td>
<td>8.56 - 8.74 ( .337 - .344 )</td>
</tr>
</tbody>
</table>

Governing dimensions are in mm. Dimensions in parentheses are in inches and are approximate.

JEDEC Reference Number MO-137.

QSOP Package Power Temperature Derating Curve

Typical Part Marking

Standard RC Values

<table>
<thead>
<tr>
<th>Value Code</th>
<th>R1 Value (ohms)</th>
<th>R2 Value (ohms)</th>
<th>C1 Value (pF)</th>
<th>Cap. BV (typ.)</th>
<th>Part Number (Tape &amp; Reel)</th>
<th>Part Number (Tubes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>V01</td>
<td>1 K</td>
<td>33</td>
<td>180</td>
<td>25</td>
<td>2CTE-V01M-Q20R</td>
<td>2CTE-V01M-Q20T</td>
</tr>
<tr>
<td>V02</td>
<td>2.2 K</td>
<td>33</td>
<td>220</td>
<td>25</td>
<td>2CTE-V02M-Q20R</td>
<td>2CTE-V02M-Q20T</td>
</tr>
<tr>
<td>V03</td>
<td>4.7 K</td>
<td>10</td>
<td>180</td>
<td>25</td>
<td>2CTE-V03M-Q20R</td>
<td>2CTE-V03M-Q20T</td>
</tr>
<tr>
<td>V04</td>
<td>4.7 K</td>
<td>33</td>
<td>180</td>
<td>25</td>
<td>2CTE-V04M-Q20R</td>
<td>2CTE-V04M-Q20T</td>
</tr>
<tr>
<td>V05</td>
<td>4.7 K</td>
<td>270</td>
<td>33</td>
<td>25</td>
<td>2CTE-V05M-Q20R</td>
<td>2CTE-V05M-Q20T</td>
</tr>
<tr>
<td>V08</td>
<td>1 K</td>
<td>33</td>
<td>47</td>
<td>25</td>
<td>2CTE-V08M-Q20R</td>
<td>2CTE-V08M-Q20T</td>
</tr>
<tr>
<td>V09</td>
<td>2.2 K</td>
<td>33</td>
<td>47</td>
<td>25</td>
<td>2CTE-V09M-Q20R</td>
<td>2CTE-V09M-Q20T</td>
</tr>
</tbody>
</table>

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Thin Film on Silicon 2CTE IEEE 1284 Terminator

Dispensing

For large quantities, the product will be dispensed in Tape and Reel (see diagram below).

<table>
<thead>
<tr>
<th>Package</th>
<th>Package A</th>
<th>Package B</th>
<th>Package K</th>
<th>Width</th>
<th>Pitch</th>
<th>No. of Pieces per 13</th>
<th>No. of Pieces per tube</th>
</tr>
</thead>
<tbody>
<tr>
<td>QSOP</td>
<td>20 Pin</td>
<td>6.5 (0.256)</td>
<td>9.0 (0.354)</td>
<td>2.1 (0.083)</td>
<td>16 (0.630)</td>
<td>8 (0.315)</td>
<td>3,500</td>
</tr>
</tbody>
</table>

How To Order

Product Class
Thin-Film-on-Silicon

Product Function
CTE = IEEE 1284 Terminator

Value Code
(Refer to Standard RC Value Table)

Standard Grade
M = ±10 % ±20 %

Standard Package Style
Q = QSOP

Pin Count
Q = 20

Dispensing
R = Reel
T = Tube

Terminations
LF = 100 % Sn (lead free)

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