NEW PRODUCT
ADVANCED INFORMATION

4A TRENCH SCHOTTKY BARRIER RECTIFIER CHIP SCALE PACKAGE

Product Summary

<table>
<thead>
<tr>
<th>VRRM (V)</th>
<th>Io (A)</th>
<th>Vf Max (V)</th>
<th>IR Max (µA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>4.0</td>
<td>0.55</td>
<td>150</td>
</tr>
</tbody>
</table>

Features and Benefits

- Low forward voltage (Vf) minimizes conduction losses and improves efficiency.
- Reduced high temperature reverse leakage; Increased reliability against thermal runaway failure in high temperature operation.
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. “Green” Device (Note 3)
- For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](https://www.diodes.com/quality/product-definitions/)

Description and Applications

The SDT4U40EP3 is a 40-volt 4A trench Schottky barrier rectifier that is optimized for low forward voltage drop and low leakage current, housed in a compact chip scale package (CSP) that occupies only 1.28mm² board space with low profile. The low thermal resistance enables designers to meet design challenges of increasing efficiency whilst at the same time reducing board space. It is ideally suited for use in portable applications as a:

- Blocking Diode
- Boost Diode
- Switching Diode
- Reverse Protection Diode

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Mechanical Data

- Package: X3-TSN1608-2
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: NiAu Bump. solderable per MIL-STD-202, Method 208
- Polarity: Cathode Dot
- Weight: 0.001 grams (Approximate)

Ordering Information (Note 4)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
<th>Packing</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDT4U40EP3-7B</td>
<td>X3-TSN1608-2</td>
<td>10,000 Tape &amp; Reel</td>
</tr>
</tbody>
</table>

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See [https://www.diodes.com/quality/lead-free/](https://www.diodes.com/quality/lead-free/) for more information about Diodes Incorporated’s definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free “Green” products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at [https://www.diodes.com/design/support/packaging/diodes-packaging/](https://www.diodes.com/design/support/packaging/diodes-packaging/).

Marking Information

- T1 = Product Type Marking Code
- Y = Date Code Marking
- Y or Y = Year (ex: I = 2021)
- Dot Denotes Cathode Pin

Date Code Key

<table>
<thead>
<tr>
<th>Year</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
<th>2028</th>
<th>2029</th>
<th>2030</th>
<th>2031</th>
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<tbody>
<tr>
<td>Code</td>
<td>H</td>
<td>I</td>
<td>J</td>
<td>K</td>
<td>L</td>
<td>M</td>
<td>N</td>
<td>O</td>
<td>P</td>
<td>R</td>
<td>S</td>
<td>T</td>
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</tbody>
</table>

SDT4U40EP3
Document number: DS42900 Rev. 3 - 2

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November 2021
Maximum Ratings (@TA = +25°C, unless otherwise specified.)

Single phase, half wave, 60Hz, resistive or inductive load.
For capacitive load, derate current by 20%.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Symbol</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Repetitive Reverse Voltage</td>
<td>VRRM</td>
<td>40</td>
<td>V</td>
</tr>
<tr>
<td>Average Rectified Output Current</td>
<td>IO</td>
<td>4.0</td>
<td>A</td>
</tr>
<tr>
<td>Non-Repetitive Peak Forward Surge Current 8.3ms</td>
<td>IFSM</td>
<td>28</td>
<td>A</td>
</tr>
<tr>
<td>ESD (Human Body Model)</td>
<td>ESD</td>
<td>8</td>
<td>kV</td>
</tr>
<tr>
<td>ESD (Machine Model)</td>
<td></td>
<td>0.4</td>
<td></td>
</tr>
</tbody>
</table>

Thermal Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Symbol</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Thermal Resistance Junction to Ambient (Note 5)</td>
<td>RΘJA</td>
<td>150</td>
<td>°C/W</td>
</tr>
<tr>
<td>Typical Thermal Resistance Junction to Ambient (Note 6)</td>
<td>RΘJA</td>
<td>55</td>
<td>°C/W</td>
</tr>
<tr>
<td>Typical Thermal Resistance Junction to Case (Note 5)</td>
<td>RΘJC</td>
<td>35</td>
<td>°C/W</td>
</tr>
<tr>
<td>Typical Thermal Resistance Junction to Case (Note 6)</td>
<td>RΘJC</td>
<td>10</td>
<td>°C/W</td>
</tr>
<tr>
<td>Operating and Storage Temperature Range</td>
<td>TJ, TSTG</td>
<td>-55 to +150</td>
<td>°C</td>
</tr>
</tbody>
</table>

Electrical Characteristics (@TA = +25°C, unless otherwise specified.)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Symbol</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
<th>Test Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward Voltage Drop</td>
<td>VF</td>
<td>—</td>
<td>0.40</td>
<td>0.45</td>
<td>V</td>
<td>IF = 2.0A, TJ = +25°C</td>
</tr>
<tr>
<td>Reverse Current (Note 7)</td>
<td>IR</td>
<td>—</td>
<td>30</td>
<td>150</td>
<td>µA</td>
<td>VR = 40V, TJ = +25°C</td>
</tr>
<tr>
<td>Junction Capacitance</td>
<td>CT</td>
<td>—</td>
<td>295</td>
<td>—</td>
<td>pF</td>
<td>VR = 4V, f = 1.0MHz</td>
</tr>
</tbody>
</table>

Notes:
6. Device mounted on 1 inch sq. copper pad, 2oz.
7. Short duration pulse test used to minimize self-heating effect.
Figure 1. Typical Forward Characteristics

Figure 2. Typical Reverse Characteristics

Figure 3. Typical Junction Capacitance

Figure 4. Forward Power Dissipation
Package Outline Dimensions (Note 8)

Please see http://www.diodes.com/package-outlines.html for the latest version.

X3-TSN1608-2

Note 8: Device side walls are electrically active bare silicon. Avoid contact of solder or flux on the side walls during the PCB assembly process.

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

Dimensions | Value (in mm) |
---|---|
X | 0.385 |
X1 | 1.035 |
X2 | 1.622 |
Y | 0.690 |
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