LQA16T300
Qspeed™ Family
300 V, 16 A Q-Series Diode

Product Summary

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>(I_{F(AVG)})</td>
<td>16 A</td>
</tr>
<tr>
<td>(V_{RRM})</td>
<td>300 V</td>
</tr>
<tr>
<td>(Q_{RR}) (Typ at 125 °C)</td>
<td>44 nC</td>
</tr>
<tr>
<td>(I_{RRM}) (Typ at 125 °C)</td>
<td>2.65 A</td>
</tr>
<tr>
<td>Softness (t_d/t_s) (Typ at 125 °C)</td>
<td>0.7</td>
</tr>
</tbody>
</table>

General Description
This device has the lowest \(Q_{RR}\) of any 300 V Silicon diode. Its recovery characteristics increase efficiency, reduce EMI and eliminate snubbers.

Applications
- AC/DC and DC/DC output rectification
- Output and freewheeling diodes
- DC-AC Inverters

Features
- Low \(Q_{RR}\), Low \(I_{RRM}\), Low \(t_{RR}\)
- High \(dI/dt\) capable (1000 A/μs)
- Soft recovery

Benefits
- Increases efficiency
- Eliminates need for snubber circuits
- Reduces EMI filter component size & count
- Enables extremely fast switching

RoHS Compliant
Package uses Lead-free plating and Green mold compound. Halogen free per IEC 61249-2-21.

For other details, please refer to the full datasheet available on www.powerint.com.
### Electrical Specifications at $T_J = 25 \, ^\circ C$ (unless otherwise specified)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>DC Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$I_R$</td>
<td>Reverse current</td>
<td>$V_R = 300V$, $T_J = 25 , ^\circ C$</td>
<td>-</td>
<td>-</td>
<td>25 $\mu A$</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R = 300V$, $T_J = 125 , ^\circ C$</td>
<td></td>
<td>0.45 $\mu A$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$V_F$</td>
<td>Forward voltage</td>
<td>$I_F = 16A$, $T_J = 25 , ^\circ C$</td>
<td>-</td>
<td>1.6</td>
<td>1.9</td>
<td>mA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$I_F = 16A$, $T_J = 150 , ^\circ C$</td>
<td>-</td>
<td>1.4</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td>$C_J$</td>
<td>Junction capacitance</td>
<td>$V_R = 10V$, 1 MHz</td>
<td>-</td>
<td>50</td>
<td>-</td>
<td>pF</td>
</tr>
<tr>
<td></td>
<td><strong>Dynamic Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$I_{RR}$</td>
<td>Reverse recovery time</td>
<td>$dI/dt = 200A/\mu s$ $V_R=200V$, $I_R=16A$</td>
<td>$T_J=25 , ^\circ C$</td>
<td>-</td>
<td>13</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R=200V, I_R=16A$ $T_J=125 , ^\circ C$</td>
<td></td>
<td></td>
<td>25</td>
<td>-</td>
</tr>
<tr>
<td>$Q_{RR}$</td>
<td>Reverse recovery charge</td>
<td>$dI/dt = 200A/\mu s$ $V_R=200V, I_R=16A$</td>
<td>$T_J=25 , ^\circ C$</td>
<td>-</td>
<td>11.5</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R=200V$, $I_R=16A$ $T_J=125 , ^\circ C$</td>
<td></td>
<td></td>
<td>44</td>
<td>-</td>
</tr>
<tr>
<td>$I_{RRM}$</td>
<td>Maximum reverse</td>
<td>$dI/dt = 200A/\mu s$ $V_R=200V, I_R=16A$</td>
<td>$T_J=25 , ^\circ C$</td>
<td>-</td>
<td>1.5</td>
<td>1.85</td>
</tr>
<tr>
<td></td>
<td>recovery current</td>
<td>$V_R=200V$, $I_R=16A$ $T_J=125 , ^\circ C$</td>
<td></td>
<td></td>
<td>2.65</td>
<td>-</td>
</tr>
<tr>
<td>$S$</td>
<td>Softness factor = $\frac{t_b}{t_a}$</td>
<td>$dI/dt = 200A/\mu s$ $V_R=200V, I_R=16A$</td>
<td>$T_J=25 , ^\circ C$</td>
<td>-</td>
<td>0.7</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$V_R=200V$, $I_R=16A$ $T_J=125 , ^\circ C$</td>
<td></td>
<td></td>
<td>0.7</td>
<td>-</td>
</tr>
</tbody>
</table>

**Note to component engineers:** Q-Series diodes employ Schottky technologies in their design and construction. Therefore, Component Engineers should plan their test setups to be similar to those for traditional Schottky test setups. (For additional details, see Application Note AN-300.)

**Figure 1. Reverse Recovery Definitions**

**Figure 2. Reverse Recovery Test Circuit**
Electrical Specifications at $T_J = 25 \, ^\circ\text{C}$ (unless otherwise specified)

Figure 3. Typical $I_F$ vs $V_F$

Figure 4. Typical $I_F$ vs $V_F$

Figure 5. Typical $C_j$ vs $V_R$

Figure 6. DC Current Derating Curve

Figure 7. Typical $Q_{\text{rr}}$ vs $I_F$ at $T_J = 125 \, ^\circ\text{C}$

Figure 8. Typical $t_{\text{rr}}$ vs $I_F$ at $T_J = 125 \, ^\circ\text{C}$
Figure 9. Power Derating Curve

Figure 10. $I_r(\text{PEAK})$ vs $T_c$, $f=70$ kHz

Figure 10. Normalized Maximum Transient Thermal Impedance
**Dimensional Outline Drawings**

<table>
<thead>
<tr>
<th>Dim</th>
<th>MIN</th>
<th>MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4.32</td>
<td>4.70</td>
</tr>
<tr>
<td>A1</td>
<td>1.14</td>
<td>1.40</td>
</tr>
<tr>
<td>A2</td>
<td>2.03</td>
<td>2.79</td>
</tr>
<tr>
<td>C</td>
<td>0.34</td>
<td>0.610</td>
</tr>
<tr>
<td>D</td>
<td>9.65</td>
<td>10.67</td>
</tr>
<tr>
<td>E</td>
<td>2.49</td>
<td>2.59</td>
</tr>
<tr>
<td>E1</td>
<td>4.98</td>
<td>5.18</td>
</tr>
<tr>
<td>F</td>
<td>0.508</td>
<td>1.016</td>
</tr>
<tr>
<td>F1</td>
<td>1.14</td>
<td>1.78</td>
</tr>
<tr>
<td>H</td>
<td>14.71</td>
<td>16.51</td>
</tr>
<tr>
<td>H1</td>
<td>5.84</td>
<td>6.55</td>
</tr>
<tr>
<td>H2</td>
<td>8.51</td>
<td>9.25</td>
</tr>
<tr>
<td>H3</td>
<td>3.53</td>
<td>3.96</td>
</tr>
<tr>
<td>H4</td>
<td>2.54</td>
<td>3.05</td>
</tr>
<tr>
<td>L</td>
<td>12.70</td>
<td>14.22</td>
</tr>
<tr>
<td>L1</td>
<td>-</td>
<td>6.35</td>
</tr>
</tbody>
</table>

**Mechanical Mounting Method**

<table>
<thead>
<tr>
<th>Method</th>
<th>Maximum Torque / Pressure specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screw through hole in package tab</td>
<td>1 Newton Meter (nm) or 8.8 inch-pounds (lb-in)</td>
</tr>
<tr>
<td>Clamp against package body</td>
<td>12.3 kilogram-force per square centimeter (kgf/cm²) or 175 lbf/in²</td>
</tr>
</tbody>
</table>

**Soldering time and temperature**: This product has been designed for use with high-temperature, lead-free solder. The component leads can be subjected to a maximum temperature of 300 °C, for up to 10 seconds. See Application Note AN-303, for more details.

**Ordering Information**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Package</th>
<th>Packing</th>
</tr>
</thead>
<tbody>
<tr>
<td>LQA16T300</td>
<td>TO-220AC</td>
<td>50 units/tube</td>
</tr>
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<table>
<thead>
<tr>
<th>Revision</th>
<th>Notes</th>
<th>Date</th>
</tr>
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<tr>
<td>1.6</td>
<td>Released by Qspeed</td>
<td>05/09</td>
</tr>
<tr>
<td>1.7</td>
<td>Converted to Power Integrations Document</td>
<td>01/11</td>
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</table>
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