### General Description
- Trench Power AlphaSGT™ technology
- Low $R_{DS(ON)}$
- Low Gate Charge

### Applications
- Primary Switch for 48V systems

### Product Summary
- $V_{DS}$ 150V
- $I_D$ (at $V_{GS}$=10V) 5A
- $R_{DS(ON)}$ (at $V_{GS}$=10V) < 63mΩ
- $R_{DS(ON)}$ (at $V_{GS}$=4.5V) < 70mΩ

### Applications
- 100% UIS Tested
- 100% $R_g$ Tested

### Orderable Part Number
| AOSP62530 | SO-8   | Tape & Reel | 3000 |

### Absolute Maximum Ratings $T_A=25°C$ unless otherwise noted

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Maximum</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drain-Source Voltage</td>
<td>$V_{DS}$</td>
<td>150</td>
<td>V</td>
</tr>
<tr>
<td>Gate-Source Voltage</td>
<td>$V_{GS}$</td>
<td>±20</td>
<td>V</td>
</tr>
<tr>
<td>Continuous Drain Current ($T_A=25°C$)</td>
<td>$I_D$</td>
<td>5</td>
<td>A</td>
</tr>
<tr>
<td>Continuous Drain Current ($T_A=70°C$)</td>
<td>$I_D$</td>
<td>3.8</td>
<td>A</td>
</tr>
<tr>
<td>Pulsed Drain Current</td>
<td>$I_{DM}$</td>
<td>20</td>
<td>A</td>
</tr>
<tr>
<td>Avalanche Current</td>
<td>$I_{AS}$</td>
<td>14</td>
<td>A</td>
</tr>
<tr>
<td>Avalanche energy ($L=0.3mH$)</td>
<td>$E_{AS}$</td>
<td>29</td>
<td>mJ</td>
</tr>
<tr>
<td>Power Dissipation ($T_A=25°C$)</td>
<td>$P_D$</td>
<td>3.1</td>
<td>W</td>
</tr>
<tr>
<td>Power Dissipation ($T_A=70°C$)</td>
<td>$P_D$</td>
<td>2.0</td>
<td>W</td>
</tr>
<tr>
<td>Junction and Storage Temperature Range</td>
<td>$T_J, T_{STG}$</td>
<td>-55 to 150</td>
<td>°C</td>
</tr>
</tbody>
</table>

### Thermal Characteristics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Typ</th>
<th>Max</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Junction-to-Ambient ($t \leq 10s$)</td>
<td>$R_{JA}$</td>
<td>31</td>
<td>40</td>
<td>°C/W</td>
</tr>
<tr>
<td>Maximum Junction-to-Ambient (Steady-State)</td>
<td>$R_{JA}$</td>
<td>59</td>
<td>75</td>
<td>°C/W</td>
</tr>
<tr>
<td>Maximum Junction-to-Lead (Steady-State)</td>
<td>$R_{JUL}$</td>
<td>16</td>
<td>24</td>
<td>°C/W</td>
</tr>
</tbody>
</table>
## Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)

<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>BVDSS</td>
<td>Drain-Source Breakdown Voltage</td>
<td>I&lt;sub&gt;D&lt;/sub&gt;=250μA, V&lt;sub&gt;GS&lt;/sub&gt;=0V</td>
<td>150</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>IDSS</td>
<td>Zero Gate Voltage Drain Current</td>
<td>V&lt;sub&gt;DS&lt;/sub&gt;=150V, V&lt;sub&gt;GS&lt;/sub&gt;=0V</td>
<td>1</td>
<td>5</td>
<td></td>
<td>μA</td>
</tr>
<tr>
<td>IGSS</td>
<td>Gate-Body leakage current</td>
<td>V&lt;sub&gt;DS&lt;/sub&gt;=0V, V&lt;sub&gt;GS&lt;/sub&gt;=±20V</td>
<td>±100</td>
<td></td>
<td></td>
<td>nA</td>
</tr>
<tr>
<td>VGS(th)</td>
<td>Gate Threshold Voltage</td>
<td>V&lt;sub&gt;DS&lt;/sub&gt;=V&lt;sub&gt;GS&lt;/sub&gt;, I&lt;sub&gt;D&lt;/sub&gt;=250μA</td>
<td>1.7</td>
<td>2.2</td>
<td>2.7</td>
<td>V</td>
</tr>
<tr>
<td>RDSON</td>
<td>Static Drain-Source On-Resistance</td>
<td>V&lt;sub&gt;GS&lt;/sub&gt;=10V, I&lt;sub&gt;G&lt;/sub&gt;=5A</td>
<td>52</td>
<td>63</td>
<td></td>
<td>mΩ</td>
</tr>
<tr>
<td>TJ</td>
<td>Forward Transconductance</td>
<td>V&lt;sub&gt;DS&lt;/sub&gt;=5V, I&lt;sub&gt;D&lt;/sub&gt;=5A</td>
<td>14</td>
<td></td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>VSD</td>
<td>Diode Forward Voltage</td>
<td>I&lt;sub&gt;D&lt;/sub&gt;=1A, V&lt;sub&gt;GS&lt;/sub&gt;=0V</td>
<td>0.7</td>
<td>1</td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>IS</td>
<td>Maximum Body-Diode Continuous Current</td>
<td></td>
<td>4</td>
<td>4</td>
<td></td>
<td>A</td>
</tr>
</tbody>
</table>

### STATIC PARAMETERS

- **Cgs** Input Capacitance, V<sub>GS</sub>=0V, V<sub>DS</sub>=75V, f=1MHz, 675 pF
- **Coss** Output Capacitance, 78 pF
- **Crss** Reverse Transfer Capacitance, 4 pF
- **Rds(ON)** Static Drain-Source On-Resistance, 1.5  Ω

### SWITCHING PARAMETERS

- **Qg(10V)** Total Gate Charge, V<sub>GS</sub>=10V, V<sub>DS</sub>=75V, I<sub>G</sub>=5A, 11.5 nC
- **Qg(4.5V)** Total Gate Charge, 5.5 nC
- **Qgs** Gate Source Charge, 2.0 nC
- **Qgd** Gate Drain Charge, 2.5 nC
- **t<sub>r</sub>** Turn-On Rise Time, 6.0 ns
- **t<sub>off</sub>** Turn-Off Fall Time, 5 ns
- **t<sub>rr</sub>** Body Diode Reverse Recovery Time, 37 ns
- **Q<sub>rr</sub>** Body Diode Reverse Recovery Charge, 210 nC

### DYNAMIC PARAMETERS

- **RqJA** Input Capacitance, 675 pF
- **RqJA** Output Capacitance, 78 pF
- **RqJA** Reverse Transfer Capacitance, 4 pF
- **R<sub>d</sub>s(ON)** Static Drain-Source On-Resistance, 1.5  Ω

### NOTES

- A. The value of R<sub>qJA</sub> is measured in a still air environment with T<sub>A</sub>=25°C. The value in any given application depends on the user's specific board design.
- B. The power dissipation P<sub>D</sub> is based on T<sub>J(MAX)</sub>=150°C, using ≤10s junction-to-ambient thermal resistance.
- C. The power dissipation P<sub>D</sub> is based on low frequency and duty cycles to keep initial T<sub>J</sub>=25°C.
- D. The R<sub>qJA</sub> is the sum of the thermal impedance from junction to lead R<sub>qJA</sub> and lead to ambient.
- E. The static characteristics in Figures 1 to 6 are obtained using <300μs pulses, duty cycle 0.5% max.
- F. These curves are based on the junction-to-ambient thermal impedance which is assuming a maximum junction temperature of T<sub>J(MAX)</sub>=150°C. The SOA curve provides a single pulse rating.
- G. The spike duty cycle 5% max, limited by junction temperature T<sub>J</sub>=125°C.

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Rev.1.0: February 2021
TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 1: On-Region Characteristics (Note E)

Figure 2: Transfer Characteristics (Note E)

Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

Figure 4: On-Resistance vs. Junction Temperature (Note E)

Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

Figure 6: Body-Diode Characteristics (Note E)
TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

**Figure 7: Gate-Charge Characteristics**

**Figure 8: Capacitance Characteristics**

**Figure 9: Maximum Forward Biased Safe Operating Area (Note F)**

**Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)**

**Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)**
Figure A: Gate Charge Test Circuit & Waveforms

Figure B: Resistive Switching Test Circuit & Waveforms

Figure C: Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

Figure D: Diode Recovery Test Circuit & Waveforms