RJK0855DPB
80V, 30A, 11 mΩ max.
Silicon N Channel Power MOS FET
Power Switching

Features
- High speed switching
- Low drive current
- Low on-resistance
  \( R_{DS(on)} = 8.2 \text{ mΩ typ. (at } V_{GS} = 10 \text{ V)} \)
- Pb-free
- Halogen-free
- High density mounting

Outline

**Absolute Maximum Ratings** *(Ta = 25°C)*

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>Ratings</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drain to source voltage</td>
<td>( V_{DSS} )</td>
<td>80</td>
<td>V</td>
</tr>
<tr>
<td>Gate to source voltage</td>
<td>( V_{GS} )</td>
<td>±20</td>
<td>V</td>
</tr>
<tr>
<td>Drain current</td>
<td>( I_D )</td>
<td>30</td>
<td>A</td>
</tr>
<tr>
<td>Drain peak current</td>
<td>( I_{D(pulse)} )</td>
<td>120</td>
<td>A</td>
</tr>
<tr>
<td>Body-drain diode reverse drain current</td>
<td>( I_{DR} )</td>
<td>30</td>
<td>A</td>
</tr>
<tr>
<td>Avalanche current</td>
<td>( I_{AP} )</td>
<td>30</td>
<td>A</td>
</tr>
<tr>
<td>Avalanche energy</td>
<td>( E_{AS} )</td>
<td>12</td>
<td>mJ</td>
</tr>
<tr>
<td>Channel dissipation</td>
<td>( P_{ch} )</td>
<td>60</td>
<td>W</td>
</tr>
<tr>
<td>Channel to Case Thermal Resistance</td>
<td>( \theta_{ch-C} )</td>
<td>2.08</td>
<td>°C/W</td>
</tr>
<tr>
<td>Channel temperature</td>
<td>( T_{ch} )</td>
<td>150</td>
<td>°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>( T_{stg} )</td>
<td>-55 to +150</td>
<td>°C</td>
</tr>
</tbody>
</table>

Notes:
1. PW ≤ 10 μs, duty cycle ≤ 1%
2. Value at L=10uH, Tch = 25°C, Rg ≥ 50 Ω
3. Tc = 25°C
### Electrical Characteristics

*(Ta = 25°C)*

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
<th>Test Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drain to source breakdown voltage</td>
<td>$V_{BRDSS}$</td>
<td>80</td>
<td>—</td>
<td>—</td>
<td>V</td>
<td>$I_D = 10\ mA, V_{GS} = 0\ V$</td>
</tr>
<tr>
<td>Gate to source leak current</td>
<td>$I_{GSS}$</td>
<td>—</td>
<td>—</td>
<td>±0.1</td>
<td>µA</td>
<td>$V_{GS} = \pm 20\ V, V_{DS} = 0\ V$</td>
</tr>
<tr>
<td>Zero gate voltage drain current</td>
<td>$I_{DSS}$</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>µA</td>
<td>$V_{DS} = 80\ V, V_{GS} = 0\ V$</td>
</tr>
<tr>
<td>Gate to source cutoff voltage</td>
<td>$V_{GS(off)}$</td>
<td>2.0</td>
<td>—</td>
<td>4.0</td>
<td>V</td>
<td>$V_{DS} = 10\ V, I_D = 1\ mA$</td>
</tr>
<tr>
<td>Static drain to source on state resistance</td>
<td>$R_{DS(on)}$</td>
<td>—</td>
<td>8.2</td>
<td>11</td>
<td>mΩ</td>
<td>$I_D = 15\ A, V_{GS} = 10\ V$</td>
</tr>
<tr>
<td>Forward transfer admittance</td>
<td>$</td>
<td>V_{th}</td>
<td>$</td>
<td>—</td>
<td>42</td>
<td>—</td>
</tr>
<tr>
<td>Input capacitance</td>
<td>$C_{iss}$</td>
<td>—</td>
<td>2550</td>
<td>—</td>
<td>pF</td>
<td>$V_{DS} = 10\ V, V_{GS} = 0\ V, f = 1\ MHz$</td>
</tr>
<tr>
<td>Output capacitance</td>
<td>$C_{oss}$</td>
<td>—</td>
<td>500</td>
<td>—</td>
<td>pF</td>
<td>$f = 1\ MHz$</td>
</tr>
<tr>
<td>Reverse transfer capacitance</td>
<td>$C_{rss}$</td>
<td>—</td>
<td>130</td>
<td>—</td>
<td>pF</td>
<td></td>
</tr>
<tr>
<td>Gate Resistance</td>
<td>$R_g$</td>
<td>—</td>
<td>0.5</td>
<td>—</td>
<td>Ω</td>
<td></td>
</tr>
<tr>
<td>Total gate charge</td>
<td>$Q_g$</td>
<td>—</td>
<td>35</td>
<td>—</td>
<td>nC</td>
<td>$V_{DD} = 25\ V, V_{GS} = 10\ V, I_D = 30\ A$</td>
</tr>
<tr>
<td>Gate to source charge</td>
<td>$Q_{gs}$</td>
<td>—</td>
<td>11</td>
<td>—</td>
<td>nC</td>
<td></td>
</tr>
<tr>
<td>Gate to drain charge</td>
<td>$Q_{gd}$</td>
<td>—</td>
<td>6.5</td>
<td>—</td>
<td>nC</td>
<td></td>
</tr>
<tr>
<td>Turn-on delay time</td>
<td>$t_{(on)}$</td>
<td>—</td>
<td>14</td>
<td>—</td>
<td>ns</td>
<td>$V_{GS} = 10\ V, I_D = 15\ A, V_{DD} = 30\ V, R_L = 2\ Ω, R_g = 4.7\ Ω$</td>
</tr>
<tr>
<td>Rise time</td>
<td>$t_r$</td>
<td>—</td>
<td>6.4</td>
<td>—</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Turn-off delay time</td>
<td>$t_{(off)}$</td>
<td>—</td>
<td>34</td>
<td>—</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Fall time</td>
<td>$t_f$</td>
<td>—</td>
<td>8.0</td>
<td>—</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Body–drain diode forward voltage</td>
<td>$V_{DF}$</td>
<td>—</td>
<td>0.8</td>
<td>1.1</td>
<td>V</td>
<td>$I_F = 30\ A, V_{GS} = 0\ V$</td>
</tr>
<tr>
<td>Body–drain diode reverse recovery time</td>
<td>$t_{tr}$</td>
<td>—</td>
<td>44</td>
<td>—</td>
<td>ns</td>
<td>$I_F = 30\ A, V_{GS} = 0\ V, \frac{di_F}{dt} = 100\ A/\ μs$</td>
</tr>
</tbody>
</table>

Notes: 4. Pulse test
Main Characteristics

- **Power vs. Temperature Derating**
- **Maximum Safe Operation Area**
- **Typical Output Characteristics**
- **Typical Transfer Characteristics**
- **Drain to Source Saturation Voltage vs. Gate to Source Voltage**
- **Static Drain to Source on State Resistance vs. Drain Current**
Avalanche Test Circuit

V \text{in} \quad 15 \text{ V}

\[ V_{\text{DS}} \text{ Monitor} \quad \text{L} \quad I_{\text{AP}} \text{ Monitor} \quad \text{D. U. T.} \quad \text{V}_{\text{DD}} \]

\[ R_{\text{g}} \quad 60 \text{ } \Omega \]

Avalanche Waveform

\[ E_{\text{AS}} = \frac{1}{2} L \cdot I_{\text{AP}}^2 \cdot \frac{V_{\text{DSS}}}{V_{\text{DSS}} - V_{\text{DD}}} \]

Switching Time Test Circuit

\[ \text{Vin Monitor} \quad \text{D. U. T.} \quad \text{Vout Monitor} \]

\[ R_{\text{g}} \quad \text{Vin} \quad 10 \text{ V} \quad \text{Vout} \quad \text{D. U. T.} \quad \text{V}_{\text{DS}} \quad \text{R}_{\text{L}} \quad \text{30} \text{ V} \]

Switching Time Waveform

\[ \text{Vin} \quad \text{Vout} \]

\[ I_{\text{d(on)}} \quad \text{I}_{\text{f}} \quad I_{\text{d(off)}} \quad I_{\text{f}} \]
### Package Dimensions

<table>
<thead>
<tr>
<th>Package Name</th>
<th>JEITA Package Code</th>
<th>RENESAS Code</th>
<th>Previous Code</th>
<th>MASS [Typ]</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPPAK</td>
<td>SC-100</td>
<td>PTZ20055DA-A</td>
<td>LPPARV</td>
<td>0.080g</td>
</tr>
</tbody>
</table>

Unit: mm

- **0.25 ± 0.06**
- **0.07 ± 0.02**
- **0.07 ± 0.02**
- **0.10 ± 0.04**
- **0.07 ± 0.02**
- **0.07 ± 0.02**
- **0.07 ± 0.02**
- **0.07 ± 0.02**

(Ni/Pd/Au plating)

### Ordering Information

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Quantity</th>
<th>Shipping Container</th>
</tr>
</thead>
<tbody>
<tr>
<td>RJK0855DPB-00-J5</td>
<td>2500 pcs</td>
<td>Taping</td>
</tr>
</tbody>
</table>
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