2SK1317
Silicon N Channel MOS FET

Application
High speed power switching

Features
- High breakdown voltage $V_{DSS} = 1500$ V
- High speed switching
- Low drive current
- No secondary breakdown
- Suitable for switching regulator, DC-DC converter and motor driver

Outline

RENESAS Package code: PRSS0004ZE-A
(Package name: TO-3P)
### 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>1500</td>
<td>V</td>
</tr>
<tr>
<td>Gate to source voltage</td>
<td>V_GSS</td>
<td>±20</td>
<td>V</td>
</tr>
<tr>
<td>Drain current</td>
<td>I_D</td>
<td>2.5</td>
<td>A</td>
</tr>
<tr>
<td>Drain peak current</td>
<td>I_{D(pulse)}</td>
<td>7</td>
<td>A</td>
</tr>
<tr>
<td>Body to drain diode reverse drain current</td>
<td>I_{DR}</td>
<td>2.5</td>
<td>A</td>
</tr>
<tr>
<td>Channel dissipation</td>
<td>Pch</td>
<td>100</td>
<td>W</td>
</tr>
<tr>
<td>Channel temperature</td>
<td>Tch</td>
<td>150</td>
<td>°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>Tstg</td>
<td>−55 to +150</td>
<td>°C</td>
</tr>
</tbody>
</table>

Notes:
1. PW ≤ 10 μs, duty cycle ≤ 1%
2. Value at T_C = 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>1500</td>
<td>—</td>
<td>—</td>
<td>V</td>
<td>I_D = 10 mA, V_GS = 0</td>
</tr>
<tr>
<td>Gate to source leak current</td>
<td>I_{GSS}</td>
<td>—</td>
<td>—</td>
<td>±1</td>
<td>μA</td>
<td>V_GS = ±20 V, V_DSS = 0</td>
</tr>
<tr>
<td>Zero gate voltage drain current</td>
<td>I_{DSS}</td>
<td>—</td>
<td>—</td>
<td>500</td>
<td>μA</td>
<td>V_DSS = 1200 V, V_GS = 0</td>
</tr>
<tr>
<td>Gate to source cutoff voltage</td>
<td>V_{GSS(soft)}</td>
<td>2.0</td>
<td>—</td>
<td>4.0</td>
<td>V</td>
<td>I_D = 1 mA, V_DSS = 10 V</td>
</tr>
<tr>
<td>Static drain to source on state resistance</td>
<td>R_{DSS(on)}</td>
<td>—</td>
<td>9</td>
<td>12</td>
<td>Ω</td>
<td>I_D = 2 A, V_GS = 15 V *3</td>
</tr>
<tr>
<td>Forward transfer admittance</td>
<td></td>
<td>0.45</td>
<td>0.75</td>
<td>—</td>
<td>S</td>
<td>V_DSS = 10 V, V_GS = 0, f = 1 MHz</td>
</tr>
<tr>
<td>Input capacitance</td>
<td>Ciss</td>
<td>—</td>
<td>990</td>
<td>—</td>
<td>pF</td>
<td></td>
</tr>
<tr>
<td>Output capacitance</td>
<td>Coss</td>
<td>—</td>
<td>125</td>
<td>—</td>
<td>pF</td>
<td></td>
</tr>
<tr>
<td>Reverse transfer capacitance</td>
<td>Crss</td>
<td>—</td>
<td>60</td>
<td>—</td>
<td>pF</td>
<td></td>
</tr>
<tr>
<td>Turn-on delay time</td>
<td>t_{d(on)}</td>
<td>—</td>
<td>17</td>
<td>—</td>
<td>ns</td>
<td>I_D = 2 A, V_GS = 10 V, R_L = 15 Ω</td>
</tr>
<tr>
<td>Rise time</td>
<td>t_{r}</td>
<td>—</td>
<td>70</td>
<td>—</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Turn-off delay time</td>
<td>t_{d(off)}</td>
<td>—</td>
<td>110</td>
<td>—</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Fall time</td>
<td>t_{f}</td>
<td>—</td>
<td>60</td>
<td>—</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Body to drain diode forward voltage</td>
<td>V_{DF}</td>
<td>—</td>
<td>0.9</td>
<td>—</td>
<td>V</td>
<td>I_F = 2 A, V_GS = 0</td>
</tr>
<tr>
<td>Body to drain diode reverse recovery time</td>
<td>t_{rr}</td>
<td>—</td>
<td>1750</td>
<td>—</td>
<td>ns</td>
<td>I_F = 2 A, V_GS = 0, diF/dt = 100 A/μs</td>
</tr>
</tbody>
</table>

Note: 3. 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
Reverse Drain Current vs. Source to Drain Voltage

Reverse Drain Current $I_{DR}$ (A)

Source to Drain Voltage $V_{SD}$ (V)

10 V, 15 V $V_{DS} = 0, -5 V$

Normalized Transient Thermal Impedance vs. Pulse Width

Normalized Transient Thermal Impedance $\gamma_S(t)$

Pulse Width $PW$ (S)

Switching Time Test Circuit

Vin Monitor

D.U.T

Vout Monitor

Vin $10 V$

RL

50 $\Omega$

VDD $= 30 V$

Waveforms

Vin

10%

90%

10%

Vout

10%

90%

10%

$V_{DD}$

$t_{d(on)}$

$t_r$

$t_{d(off)}$

$t_f$
### Package Dimensions

<table>
<thead>
<tr>
<th>JEITA Package Code</th>
<th>RENESAS Code</th>
<th>Package Name</th>
<th>MASS (Typ.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC-42</td>
<td>PRSS0042S-A</td>
<td>TO-3P/TO-3PV</td>
<td>5.0g</td>
</tr>
</tbody>
</table>

Unit: mm

### Ordering Information

<table>
<thead>
<tr>
<th>Part Name</th>
<th>Quantity</th>
<th>Shipping Container</th>
</tr>
</thead>
<tbody>
<tr>
<td>2SK1317-E</td>
<td>360 pcs</td>
<td>Box (Tube)</td>
</tr>
</tbody>
</table>

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