RJP30H1DPD
Silicon N Channel IGBT
High speed power switching

Features
- Trench gate and thin wafer technology (G6H-II series)
- High speed switching: $t_i = 80 \text{ ns typ.}$, $t_f = 150 \text{ ns typ.}$
- Low collector to emitter saturation voltage: $V_{\text{CE(sat)}} = 1.5 \text{ V typ.}$
- Low leak current: $I_{\text{CES}} = 1 \mu\text{A max.}$

Outline

Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>Ratings</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collector to emitter voltage</td>
<td>$V_{\text{CES}}$</td>
<td>360</td>
<td>V</td>
</tr>
<tr>
<td>Gate to emitter voltage</td>
<td>$V_{\text{GES}}$</td>
<td>±30</td>
<td>V</td>
</tr>
<tr>
<td>Collector current</td>
<td>$I_C$</td>
<td>30</td>
<td>A</td>
</tr>
<tr>
<td>Collector peak current</td>
<td>$i_C(\text{peak})$</td>
<td>200</td>
<td>A</td>
</tr>
<tr>
<td>Collector dissipation</td>
<td>$P_C$</td>
<td>40</td>
<td>W</td>
</tr>
<tr>
<td>Junction to case thermal impedance</td>
<td>$\theta_j-c$</td>
<td>3.13</td>
<td>°C/W</td>
</tr>
<tr>
<td>Junction temperature</td>
<td>$T_j$</td>
<td>150</td>
<td>°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>$T_{\text{stg}}$</td>
<td>–55 to +150</td>
<td>°C</td>
</tr>
</tbody>
</table>

Notes:
1. $PW \leq 10 \mu\text{s}$, duty cycle $\leq 1\%$
2. $T_c = 25\degree\text{C}$
## Electrical Characteristics

\((T_j = 25^\circ C)\)

<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>Zero gate voltage collector current</td>
<td>(I_{CES})</td>
<td>—</td>
<td>—</td>
<td>1</td>
<td>(\mu A)</td>
<td>(V_{CE} = 360, V, V_{GE} = 0)</td>
</tr>
<tr>
<td>Gate to emitter leak current</td>
<td>(I_{GES})</td>
<td>—</td>
<td>—</td>
<td>(\pm 100)</td>
<td>nA</td>
<td>(V_{GE} = \pm 30, V, V_{CE} = 0)</td>
</tr>
<tr>
<td>Gate to emitter cutoff voltage</td>
<td>(V_{GE(off)})</td>
<td>2.5</td>
<td>—</td>
<td>5</td>
<td>V</td>
<td>(V_{CE} = 10, V, I_C = 1, mA)</td>
</tr>
<tr>
<td>Collector to emitter saturation voltage</td>
<td>(V_{GE(sat)})</td>
<td>—</td>
<td>1.5</td>
<td>2</td>
<td>V</td>
<td>(I_C = 30, A, V_{GE} = 15, V^{Note3})</td>
</tr>
<tr>
<td>Input capacitance</td>
<td>(C_{ies})</td>
<td>—</td>
<td>740</td>
<td>—</td>
<td>pF</td>
<td>(V_{CE} = 25, V)</td>
</tr>
<tr>
<td>Output capacitance</td>
<td>(C_{oes})</td>
<td>—</td>
<td>40</td>
<td>—</td>
<td>pF</td>
<td>(V_{GE} = 0)</td>
</tr>
<tr>
<td>Reverse transfer capacitance</td>
<td>(C_{res})</td>
<td>—</td>
<td>17</td>
<td>—</td>
<td>pF</td>
<td>(f = 1, MHz)</td>
</tr>
<tr>
<td>Total gate charge</td>
<td>(Q_g)</td>
<td>—</td>
<td>23</td>
<td>—</td>
<td>nC</td>
<td>(V_{GE} = 15, V)</td>
</tr>
<tr>
<td>Gate to emitter charge</td>
<td>(Q_{ge})</td>
<td>—</td>
<td>4</td>
<td>—</td>
<td>nC</td>
<td>(V_{CE} = 150, V)</td>
</tr>
<tr>
<td>Gate to collector charge</td>
<td>(Q_{gc})</td>
<td>—</td>
<td>8</td>
<td>—</td>
<td>nC</td>
<td>(I_C = 30, A)</td>
</tr>
<tr>
<td>Switching time</td>
<td>(t_{d(on)})</td>
<td>—</td>
<td>0.02</td>
<td>—</td>
<td>(\mu s)</td>
<td>(I_C = 30, A)</td>
</tr>
<tr>
<td></td>
<td>(t_r)</td>
<td>—</td>
<td>0.08</td>
<td>—</td>
<td>(\mu s)</td>
<td>(R_L = 5, \Omega)</td>
</tr>
<tr>
<td></td>
<td>(t_{d(off)})</td>
<td>—</td>
<td>0.04</td>
<td>—</td>
<td>(\mu s)</td>
<td>(V_{GE} = 15, V)</td>
</tr>
<tr>
<td></td>
<td>(t_i)</td>
<td>—</td>
<td>0.15</td>
<td>—</td>
<td>(\mu s)</td>
<td>(R_G = 5, \Omega)</td>
</tr>
</tbody>
</table>

Notes: 3. Pulse test
Main Characteristics

### Maximum Safe Operation Area

![Maximum Safe Operation Area Graph](image)

- Collector Current \( I_C \) (A) vs. Collector to Emitter Voltage \( V_{CE} \) (V)
- Ta = 25°C
- 1 shot pulse

### Typical Output Characteristics (1)

![Typical Output Characteristics (1) Graph](image)

- Collector Current \( I_C \) (A) vs. Collector to Emitter Voltage \( V_{CE} \) (V)
- Ta = 25°C
- Pulse Test

### Typical Output Characteristics (2)

![Typical Output Characteristics (2) Graph](image)

- Collector Current \( I_C \) (A) vs. Collector to Emitter Voltage \( V_{CE} \) (V)
- Ta = 25°C
- Pulse Test

### Typical Transfer Characteristics

![Typical Transfer Characteristics Graph](image)

- Collector Current \( I_C \) (A) vs. Gate to Emitter Voltage \( V_{GE} \) (V)
- Ta = 25°C
- Pulse Test

### Collector to Emitter Saturation Voltage vs. Gate to Emitter Voltage (Typical)

![Collector to Emitter Saturation Voltage Graph](image)

- Collector to Emitter Voltage \( V_{CE(sat)} \) (V) vs. Gate to Emitter Voltage \( V_{GE} \) (V)
- Ta = 25°C
- 1 shot pulse

### Collector to Emitter Saturation Voltage vs. Collector Current (Typical)

![Collector to Emitter Saturation Voltage Graph](image)

- Collector to Emitter Voltage \( V_{CE(sat)} \) (V) vs. Collector Current \( I_C \) (A)
- VGE = 15 V
- Ta = 25°C
- Pulse Test

### Collector to Emitter Voltage \( V_{CE} \) (V) vs. Gate to Emitter Voltage \( V_{GE} \) (V)

- Collector to Emitter Voltage \( V_{CE} \) (V) vs. Gate to Emitter Voltage \( V_{GE} \) (V)
- Ta = 25°C
- 1 shot pulse
Normalized Transient Thermal Impedance vs. Pulse Width

Switching Time Test Circuit

Waveform
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>TO-251</td>
<td>—</td>
<td>PRSS0004ZJA</td>
<td>—</td>
<td>0.319g</td>
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</tbody>
</table>

Unit: mm

Ordering Information

<table>
<thead>
<tr>
<th>Orderable Part Number</th>
<th>Quantity</th>
<th>Shipping Container</th>
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</thead>
<tbody>
<tr>
<td>RJP30H1DPD-00-J2</td>
<td>3000 pcs</td>
<td>Taping</td>
</tr>
</tbody>
</table>

EOL announced Product
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