

RJP60D0DPE

Silicon N Channel IGBT
High Speed Power Switching

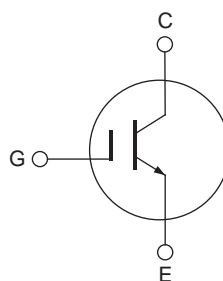
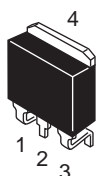
R07DS0172EJ0100
Rev.1.00
Nov 15, 2010

Features

- Short circuit withstand time (5 μ s typ.)
- Low collector to emitter saturation voltage
 $V_{CE(sat)} = 1.6$ V typ. ($I_C = 22$ A, $V_{GE} = 15$ V, $T_a = 25^\circ\text{C}$)
- Gate to emitter voltage rating ± 30 V
- Pb-free lead plating and chip bonding

Outline

RENESAS Package code: PRSS0004AE-B
(Package name: LDKPAK (S)-(1))



1. Gate
2. Collector
3. Emitter
4. Collector

Absolute Maximum Ratings

($T_a = 25^\circ\text{C}$)

| Item | Symbol | Ratings | Unit |
|------------------------------------|---------------------------------|-------------|---------------------------|
| Collector to emitter voltage | V_{CES} | 600 | V |
| Gate to emitter voltage | V_{GES} | ± 30 | V |
| Collector current | I_C | 45 | A |
| | I_C | 22 | A |
| Collector peak current | $i_{c(peak)}$ ^{Note1} | 90 | A |
| Collector dissipation | P_C ^{Note2} | 122 | W |
| Junction to case thermal impedance | θ_{j-c} ^{Note2} | 1.02 | $^\circ\text{C}/\text{W}$ |
| Junction temperature | T_j | 150 | $^\circ\text{C}$ |
| Storage temperature | T_{stg} | -55 to +150 | $^\circ\text{C}$ |

- Notes: 1. $PW \leq 10 \mu\text{s}$, duty cycle $\leq 1\%$
2. Value at $T_c = 25^\circ\text{C}$

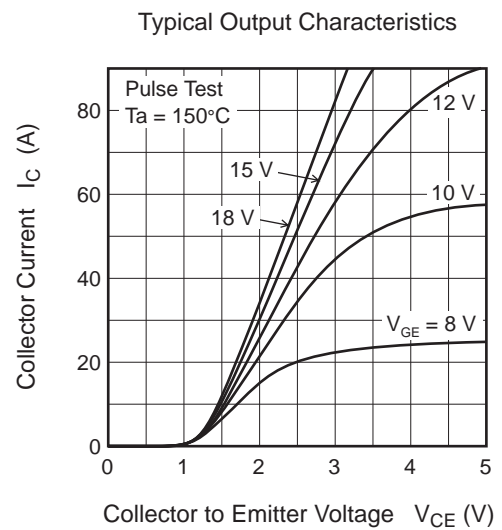
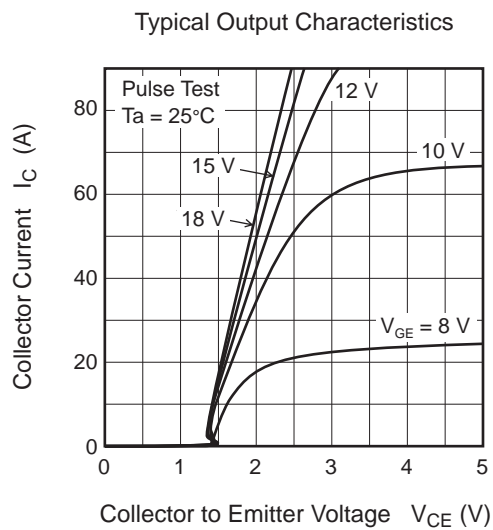
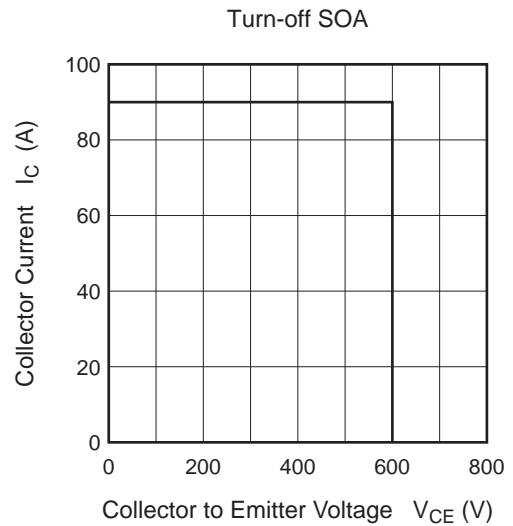
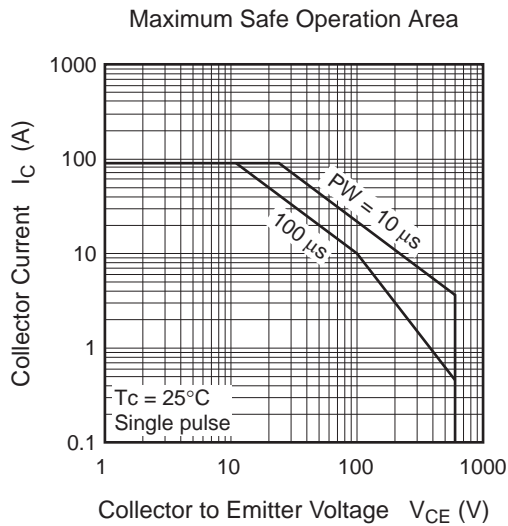
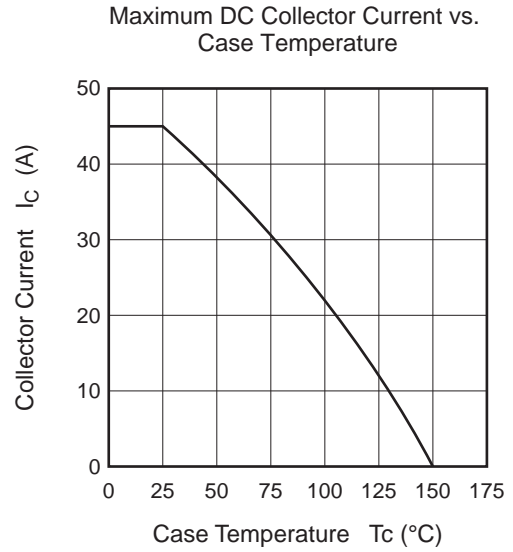
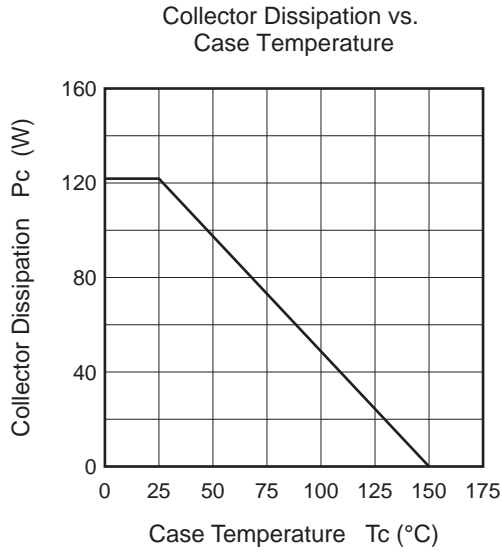
Electrical Characteristics

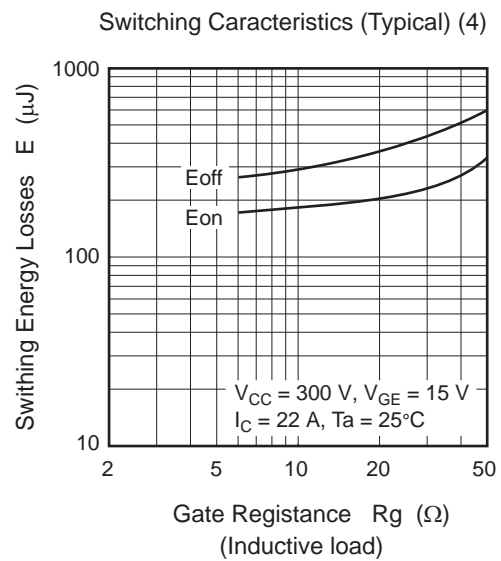
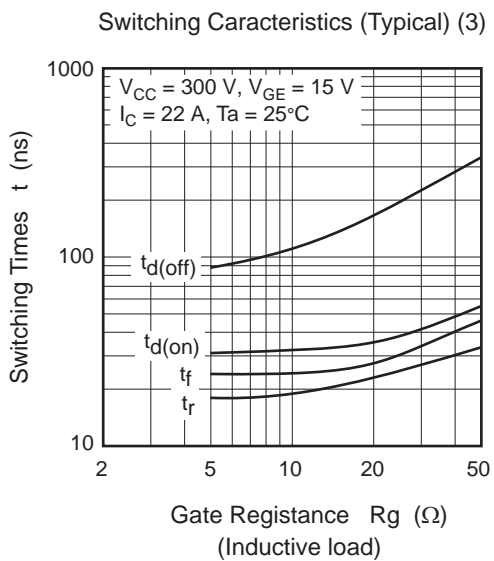
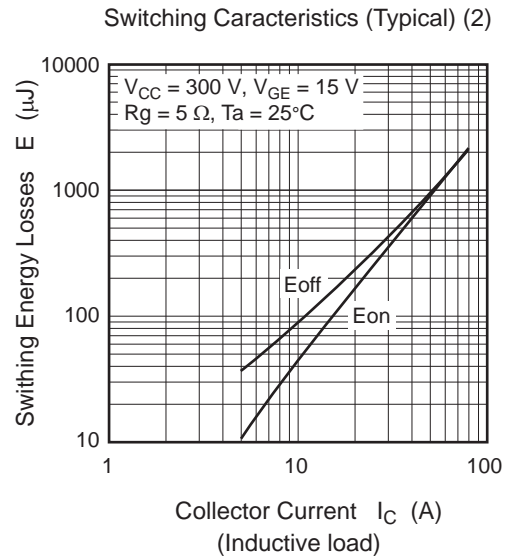
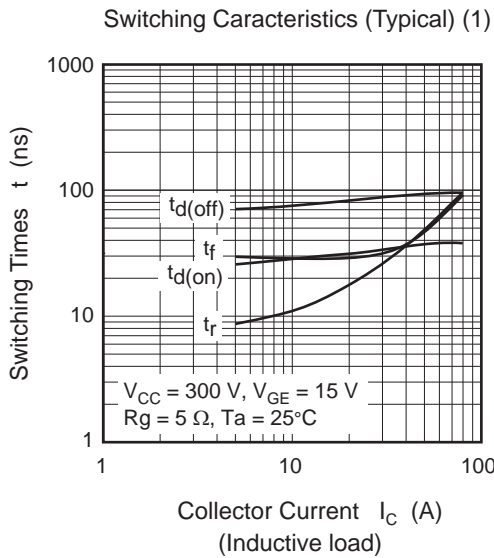
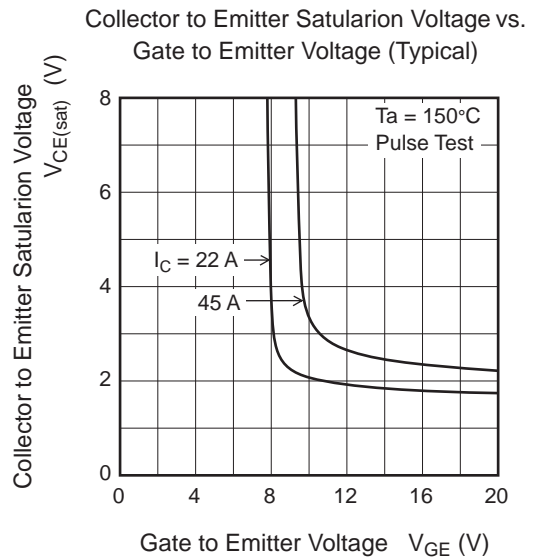
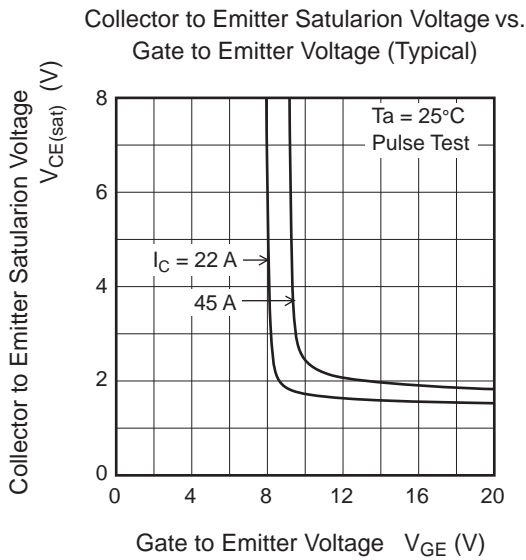
(Ta = 25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|---|---------------|-----|------|---------|---------------|--|
| Zero gate voltage collector current | I_{CES} | — | — | 5 | μA | $V_{CE} = 600\text{ V}, V_{GE} = 0$ |
| Gate to emitter leak current | I_{GES} | — | — | ± 1 | μA | $V_{GE} = \pm 30\text{ V}, V_{CE} = 0$ |
| Gate to emitter cutoff voltage | $V_{GE(off)}$ | 4.0 | — | 6.0 | V | $V_{CE} = 10\text{ V}, I_C = 1\text{ mA}$ |
| Collector to emitter saturation voltage | $V_{CE(sat)}$ | — | 1.6 | 2.2 | V | $I_C = 22\text{ A}, V_{GE} = 15\text{ V}$ ^{Note3} |
| | $V_{CE(sat)}$ | — | 2.0 | — | V | $I_C = 45\text{ A}, V_{GE} = 15\text{ V}$ ^{Note3} |
| Input capacitance | C_{ies} | — | 1050 | — | pF | $V_{CE} = 25\text{ V}$ |
| Output capacitance | C_{oes} | — | 70 | — | pF | $V_{GE} = 0$ |
| Reveres transfer capacitance | C_{res} | — | 32 | — | pF | $f = 1\text{ MHz}$ |
| Total gate charge | Q_g | — | 45 | — | nC | $V_{GE} = 15\text{ V}$ |
| Gate to emitter charge | Q_{ge} | — | 6 | — | nC | $V_{CE} = 300\text{ V}$ |
| Gate to collector charge | Q_{gc} | — | 20 | — | nC | $I_C = 22\text{ A}$ |
| Switching time | $t_{d(on)}$ | — | 35 | — | ns | $V_{CC} = 300\text{ V}, V_{GE} = 15\text{ V}$ |
| | t_r | — | 20 | — | ns | $I_C = 22\text{ A}$ |
| | $t_{d(off)}$ | — | 90 | — | ns | $R_g = 5\ \Omega$ |
| | t_f | — | 70 | — | ns | (Inductive load) |
| Short circuit withstand time | t_{sc} | 3.0 | 5.0 | — | μs | $V_{CC} \leq 400\text{ V}, V_{GE} = 15\text{ V}$ |

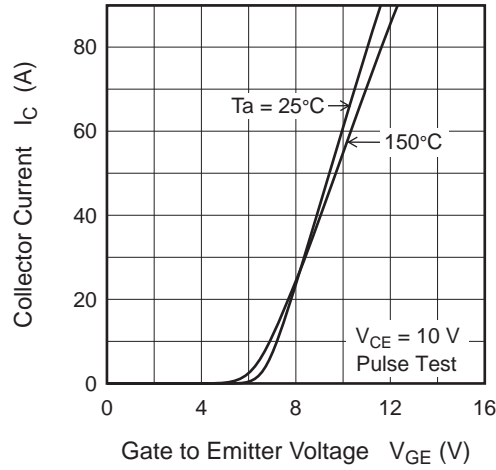
Notes: 3. Pulse test

Main Characteristics

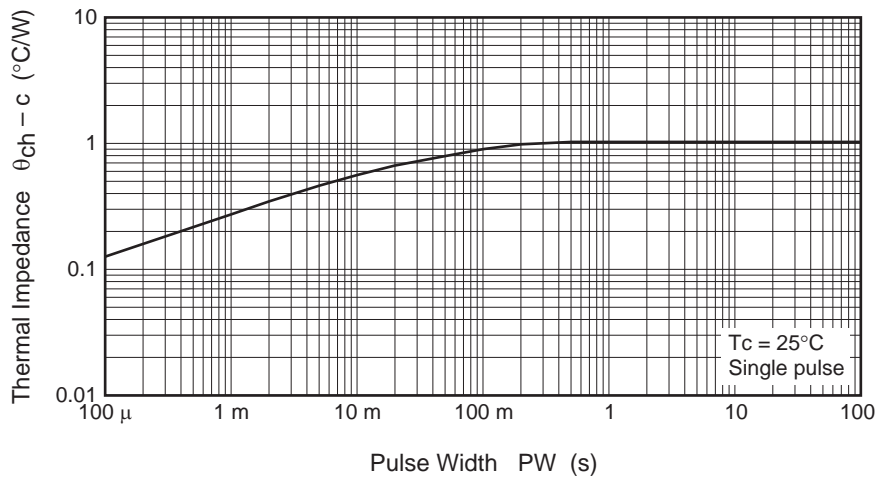




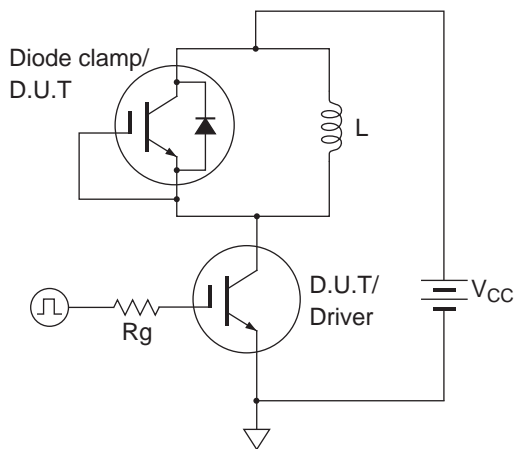
Transfer Characteristics (Typical)



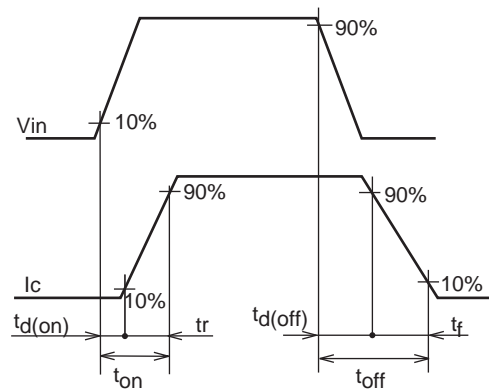
Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



Waveform



Package Dimension

| Package Name | JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] | Unit: mm |
|---------------|--------------------|--------------|--------------------------------|------------|----------|
| LDBPAK(S)-(1) | SC-83 | PRSS0004AE-B | LDBPAK(S)-(1) / LDBPAK(S)-(1)V | 1.30g | |

The drawing shows three views of the package with the following dimensions:

- Top View:**
 - Width: 10.2 ± 0.3
 - Height: 8.6 ± 0.3 (typical 1.4)
 - Lead width: 1.3 ± 0.2
 - Lead pitch: 2.54 ± 0.5
 - Lead length: 1.37 ± 0.2
 - Lead thickness: $0.86^{+0.2}_{-0.1}$
 - Lead angle: $3.0^{+0.5}$
- Side View:**
 - Maximum height: 4.44 ± 0.2
 - Lead height: 1.3 ± 0.15
 - Lead thickness: $0.1^{+0.2}_{-0.1}$
 - Lead length: 2.49 ± 0.2
 - Lead angle: 0.4 ± 0.1
- Bottom View:**
 - Width: 7.8
 - Lead pitch: 6.6
 - Lead length: 7.0
 - Lead thickness: 1.7
 - Lead angle: 2.2

Ordering Information

| Orderable Part Number | Quantity | Shipping Container |
|-----------------------|----------|--------------------|
| RJP60D0DPE-00-J3 | 1000 pcs | Taping |

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