

RJH1CF5RDPQ-80

Silicon N Channel IGBT
High Speed Power Switching

R07DS0355EJ0100

Rev.1.00

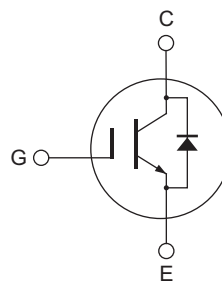
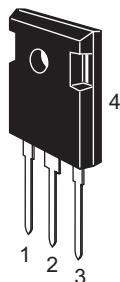
May 12, 2011

Features

- Voltage resonance circuit use
- Reverse conducting IGBT with monolithic body diode
- High efficiency device for induction heating
- Low collector to emitter saturation voltage
 $V_{CE(sat)} = 1.95 \text{ V typ. (at } I_C = 25 \text{ A, } V_{GE} = 15 \text{ V, } T_j = 25^\circ\text{C)}$
- Gate to emitter voltage rating $\pm 30 \text{ V}$
- Pb-free lead plating

Outline

RENESAS Package code: PRSS0003ZE-A
(Package name: TO-247)



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

Absolute Maximum Ratings

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

| Item | Symbol | Ratings | Unit | |
|--|--------------------------------|-------------|--------------------|---|
| Collector to emitter voltage | V_{CES} | 1200 | V | |
| Gate to emitter voltage | V_{GES} | ± 30 | V | |
| Collector current | $T_c = 25^\circ\text{C}$ | I_C | 50 | A |
| | $T_c = 100^\circ\text{C}$ | I_C | 25 | A |
| Collector peak current | $i_{c(peak)}$ ^{Note1} | 100 | A | |
| Collector to emitter diode forward current | i_{DF} | 16 | A | |
| Collector dissipation | P_C | 192.3 | W | |
| Junction to case thermal impedance | θ_{j-c} | 0.65 | $^\circ\text{C/W}$ | |
| Junction temperature | T_j | 150 | $^\circ\text{C}$ | |
| Storage temperature | T_{stg} | -55 to +150 | $^\circ\text{C}$ | |

Notes: 1. Pulse width limited by safe operating area.

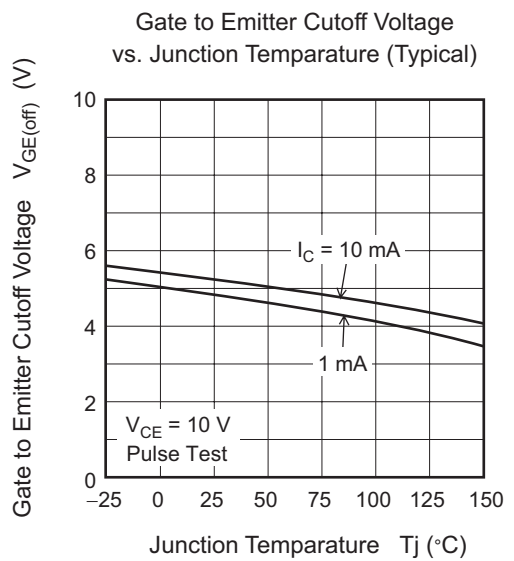
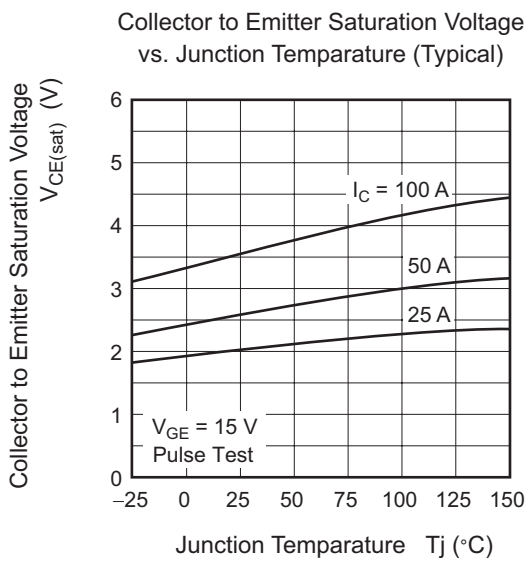
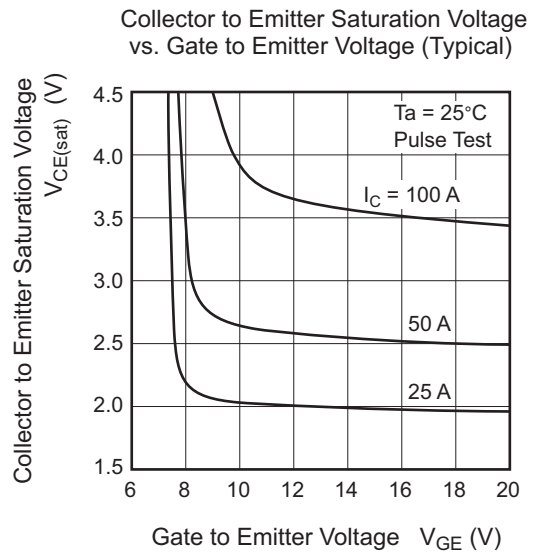
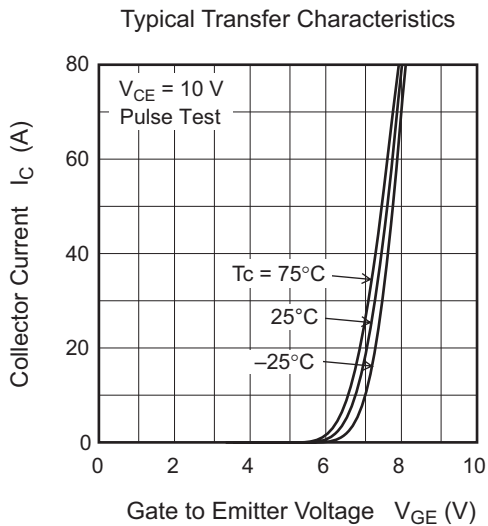
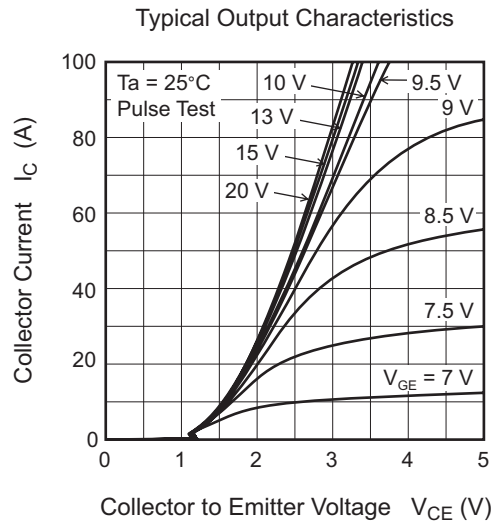
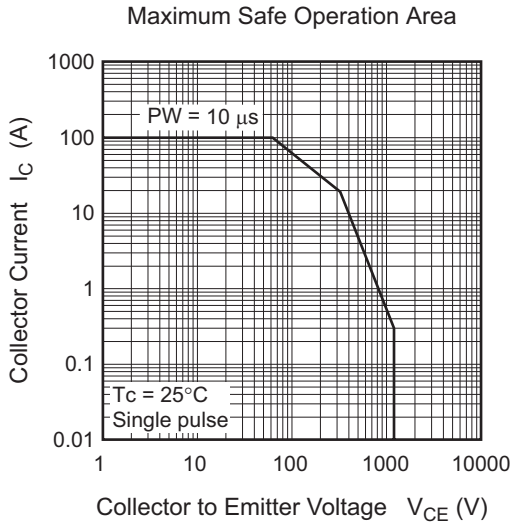
Electrical Characteristics

(T_j = 25°C)

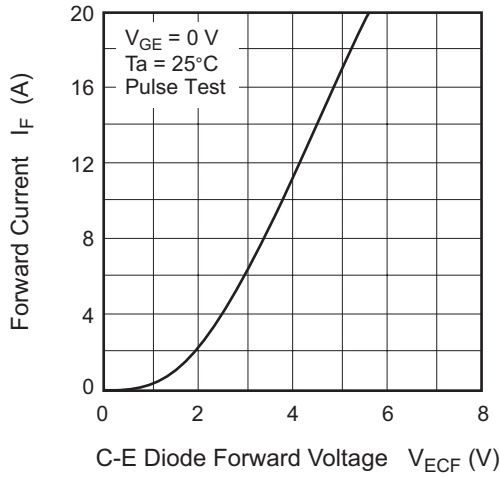
| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|---|----------------------|-----|------|------|------|---|
| Zero gate voltage collector current | I _{CES} | — | — | 100 | μA | V _{CE} = 1200 V, V _{GE} = 0 |
| Gate to emitter leak current | I _{GES} | — | — | ±0.1 | μA | V _{GE} = ±30 V, V _{CE} = 0 |
| Gate to emitter cutoff voltage | V _{GE(off)} | 3.5 | 5.0 | 7.0 | V | V _{CE} = 10V, I _C = 1 mA |
| Collector to emitter saturation voltage | V _{CE(sat)} | — | 1.95 | 2.4 | V | I _C = 25 A, V _{GE} = 15V ^{Note2} |
| | | — | 2.4 | — | V | I _C = 50 A, V _{GE} = 15V ^{Note2} |
| Input capacitance | C _{ies} | — | 1765 | — | pF | V _{CE} = 25 V |
| Output capacitance | C _{oes} | — | 36 | — | pF | V _{GE} = 0 V |
| Reverse transfer capacitance | C _{res} | — | 28 | — | pF | f = 1 MHz |
| Switching time | t _{d(on)} | — | 45 | — | ns | I _C = 25 A |
| | t _r | — | 57 | — | ns | V _{CE} = 600 V, V _{GE} = 15 V |
| | t _{d(off)} | — | 110 | — | ns | R _g = 5 Ω ^{Note2} |
| | t _f | — | 272 | — | ns | Resistive Load |
| C-E diode forward voltage | V _F | — | 4.2 | 5.4 | V | I _F = 10 A ^{Note2} |

Notes: 2. Pulse test

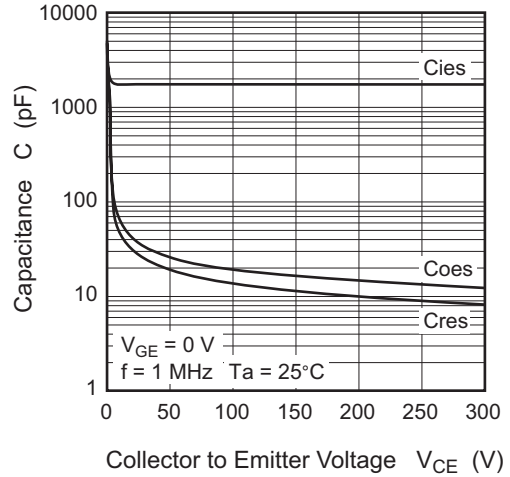
Main Characteristics



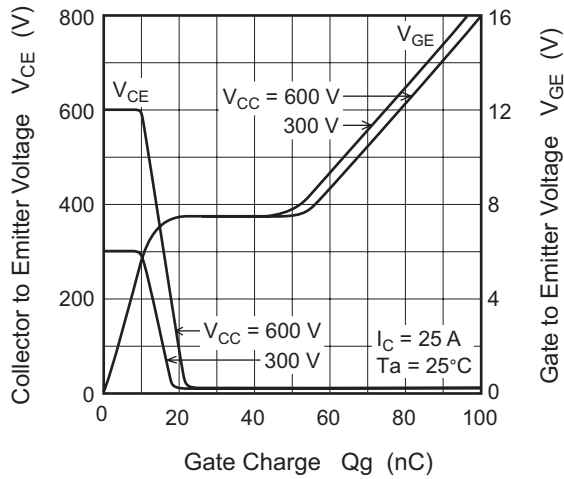
Forward Current vs. Forward Voltage (Typical)



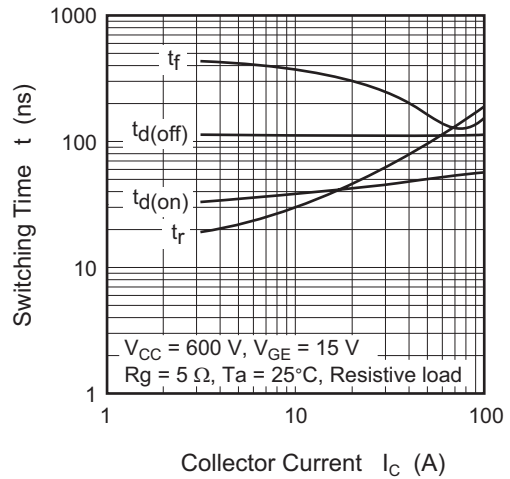
Typical Capacitance vs. Collector to Emitter Voltage



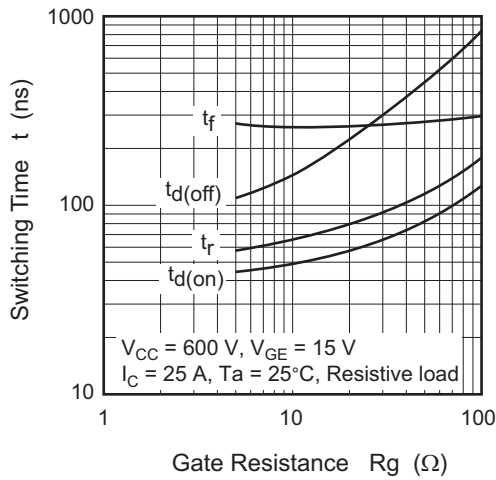
Dynamic Input Characteristics (Typical)



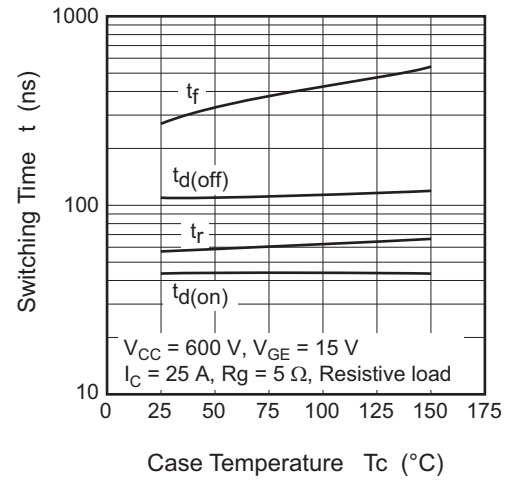
Switching Characteristics (Typical) (1)

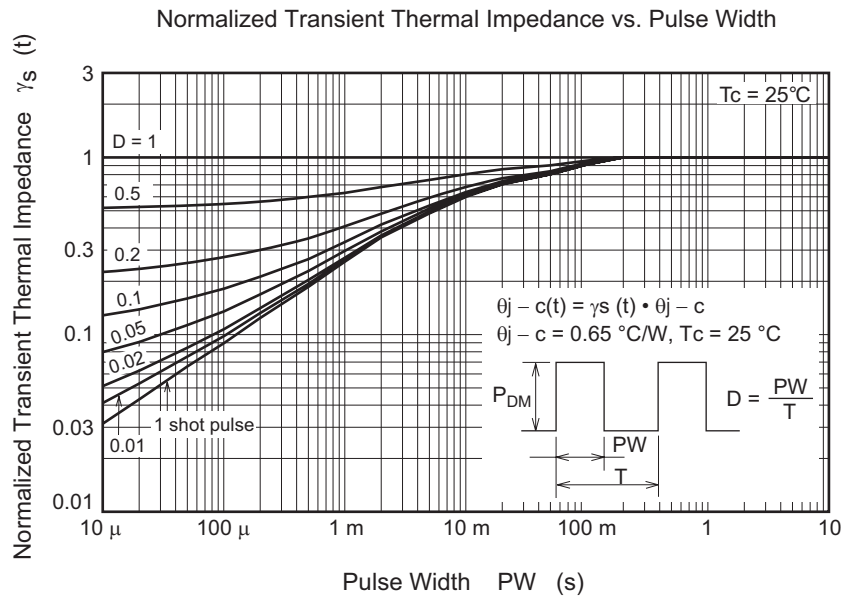


Switching Characteristics (Typical) (2)

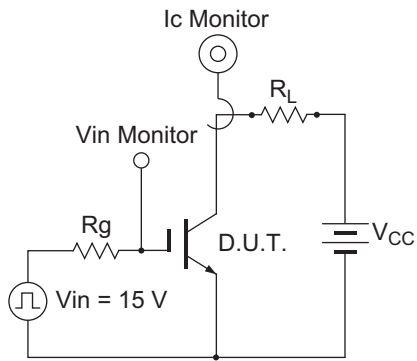


Switching Characteristics (Typical) (3)

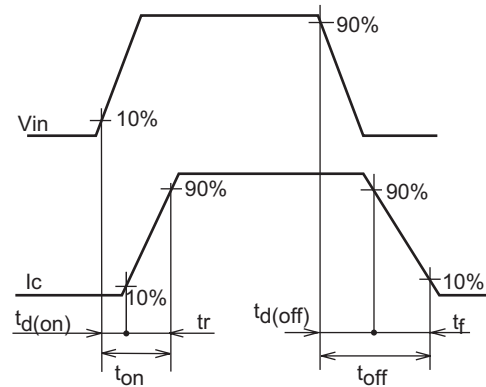




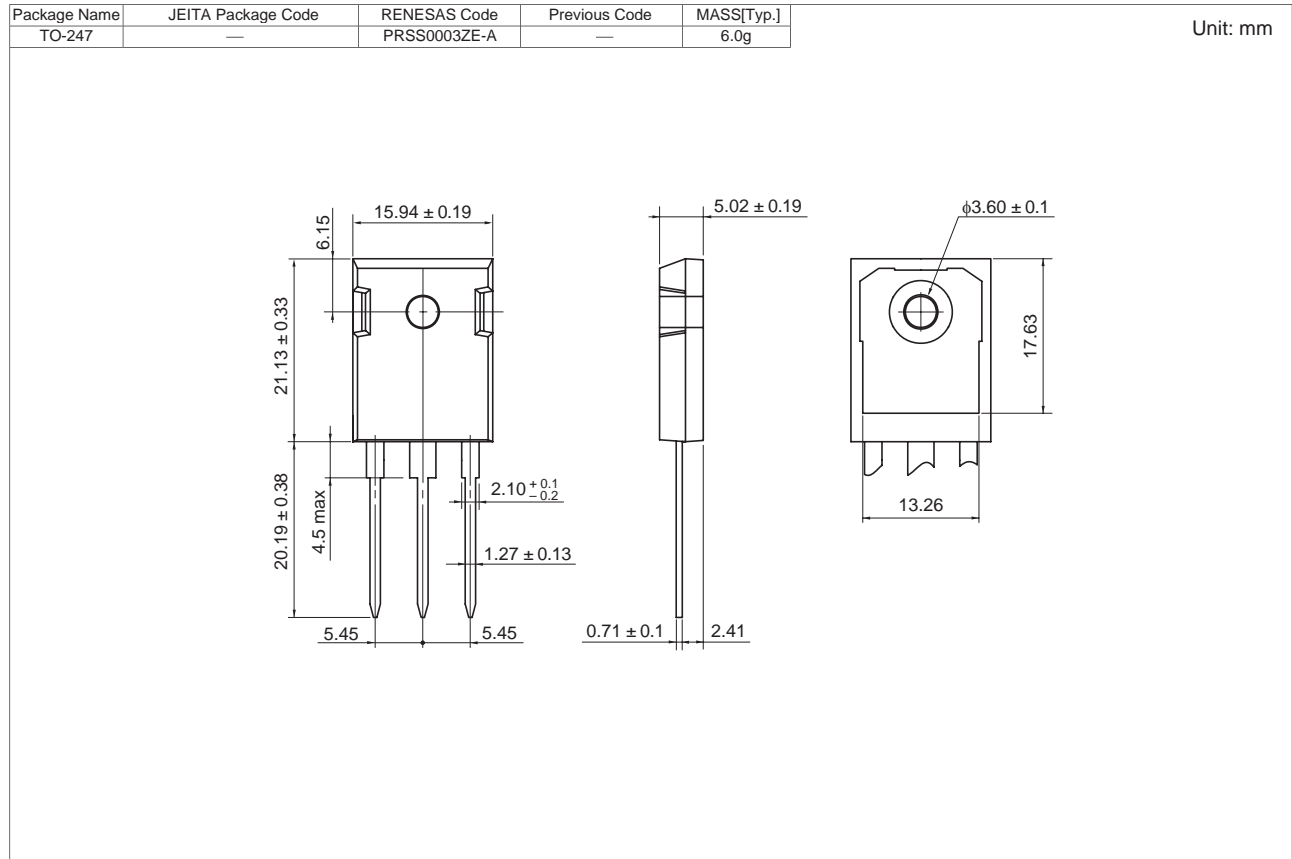
Switching Time Test Circuit



Waveform



Package Dimensions



Ordering Information

| Orderable Part Number | Quantity | Shipping Container |
|-----------------------|----------|--------------------|
| RJH1CF5RDPQ-80-T2 | 450 pcs | Box (Tube) |

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