# RJP63F3DPP-M0

## Silicon N Channel IGBT
## High Speed Power Switching

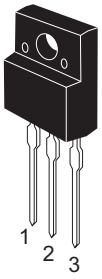
R07DS0321EJ0200
Rev.2.00
May 26, 2011

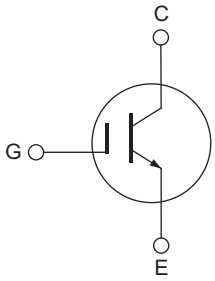
### Features

- Trench gate and thin wafer technology (G6H series)
- Low collector to emitter saturation voltage $V_{CE(sat)}$ = 1.7 V typ
- High speed switching tf = 100 ns typ
- Low leak current $I_{CES}$ = 1 μA max
- Isolated package TO-220FL

### Outline

RENESAS Package code: PRSS0003AF-A)
(Package name: TO-220FL)




1. Gate
2. Collector
3. Emitter

### Absolute Maximum Ratings

(Ta = 25°C)

| Item | Symbol | Ratings | Unit |
|---|---|---|---|
| Collector to emitter voltage | $V_{CES}$ | 630 | V |
| Gate to emitter voltage | $V_{GES}$ | ±30 | V |
| Collector current | $I_C$ | 40 | A |
| Collector peak current | ic(peak) Note1 | 200 | A |
| Collector dissipation | $P_C$ Note2 | 30 | W |
| Junction to case thermal impedance | θj-c | 4.17 | °C/ W |
| Junction temperature | Tj | 150 | °C |
| Storage temperature | Tstg | –55 to +150 | °C |

Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1%
2. Tc = 25°C

## Electrical Characteristics

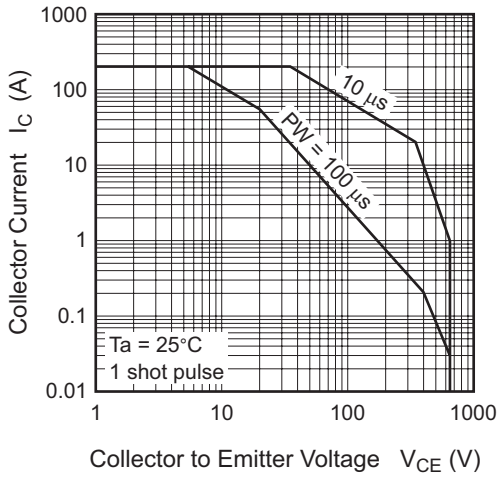
(Ta = 25°C)

| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| Zero gate voltage collector current | $I_{CES}$ | — | — | 1 | μA | $V_{CE}$ = 630 V, $V_{GE}$ = 0 |
| Gate to emitter leak current | $I_{GES}$ | — | — | ±100 | nA | $V_{GE}$ = ±30 V, $V_{CE}$ = 0 |
| Gate to emitter cutoff voltage | $V_{GE(off)}$ | 2.5 | — | 5 | V | $V_{CE}$ = 10 V, $I_C$ = 1 mA |
| Collector to emitter saturation voltage | $V_{CE(sat)}$ | — | 1.7 | 2.2 | V | $I_C$ = 40 A, $V_{GE}$ = 15 V Note3 |
| Input capacitance | Cies | — | 1250 | — | pF | $V_{CE}$ = 25 V<br>$V_{GE}$ = 0<br>f = 1 MHz |
| Output capacitance | Coes | — | 48 | — | pF | |
| Reveres transfer capacitance | Cres | — | 22 | — | pF | |
| Total gate charge | Qg | — | 36 | — | nC | $V_{GE}$ = 15 V<br>$V_{CE}$ = 300 V<br>$I_C$ = 40 A |
| Gate to emitter charge | Qge | — | 7 | — | nC | |
| Gate to collector charge | Qgc | — | 10 | — | nC | |
| Switching time | $t_{d(on)}$ | — | 0.02 | — | μs | $I_C$ = 40 A<br>$R_L$ = 7.5 Ω<br>$V_{GE}$ = 15 V<br>Rg = 5 Ω |
| | $t_r$ | — | 0.07 | — | μs | |
| | $t_{d(off)}$ | — | 0.05 | — | μs | |
| | $t_f$ | — | 0.1 | — | μs | |

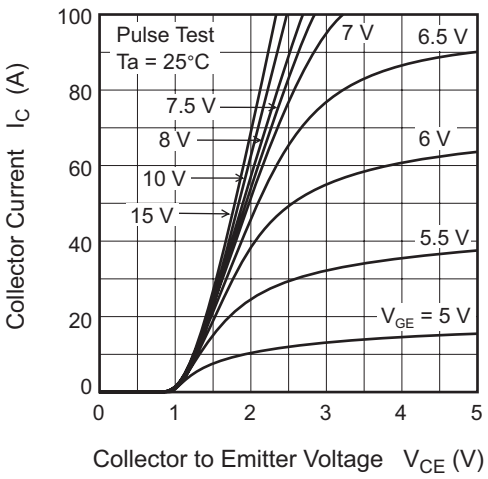
Notes: 3. Pulse test.

## Main Characteristics

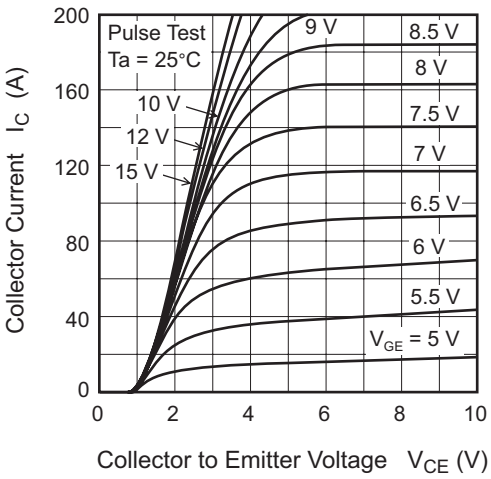
Maximum Safe Operation Area



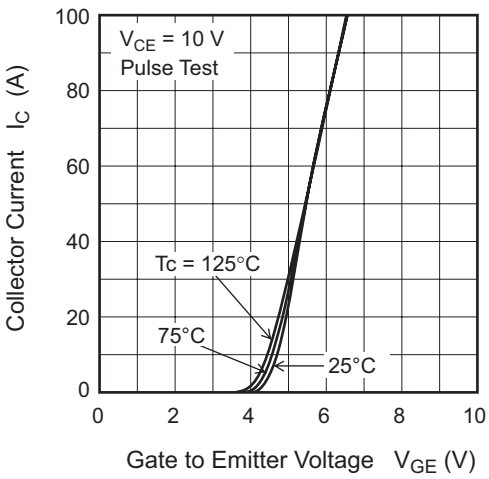

Typical Output Characteristics (1)



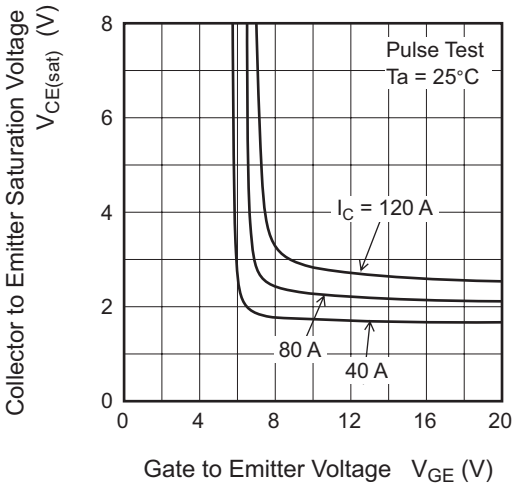

Typical Output Characteristics (2)



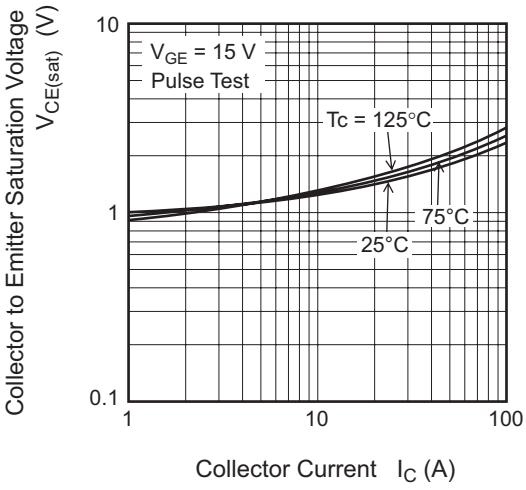

Typical Transfer Characteristics



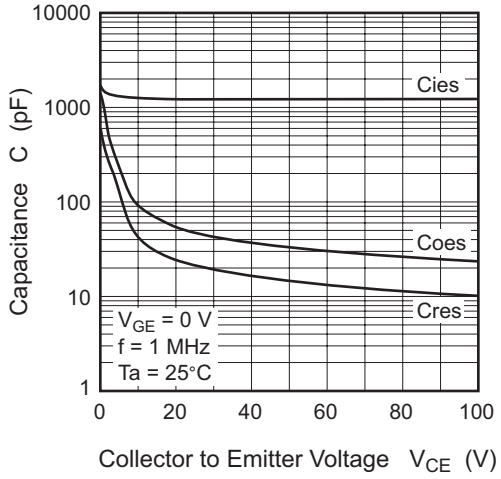

Collector to Emitter Saturation Voltage vs. Gate to Emitter Voltage (Typical)



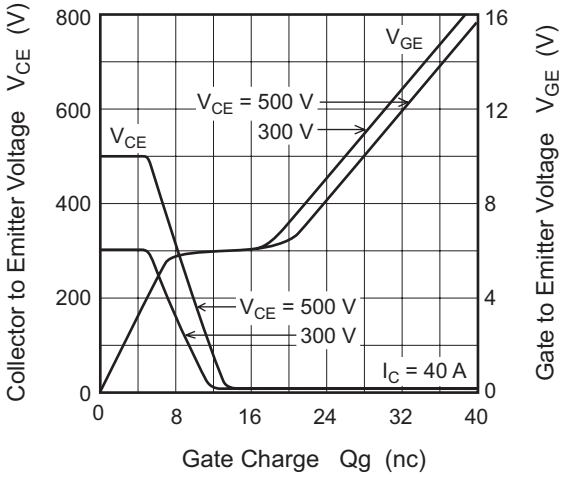

Collector to Emitter Saturation Voltage vs. Collector Current (Typical)



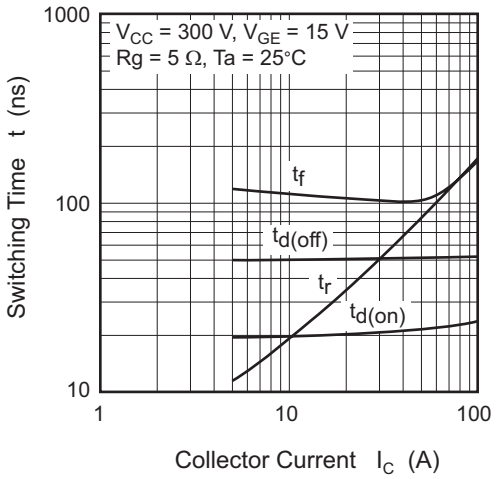
Typical Capacitance vs.
Collector to Emitter Voltage (Typical)



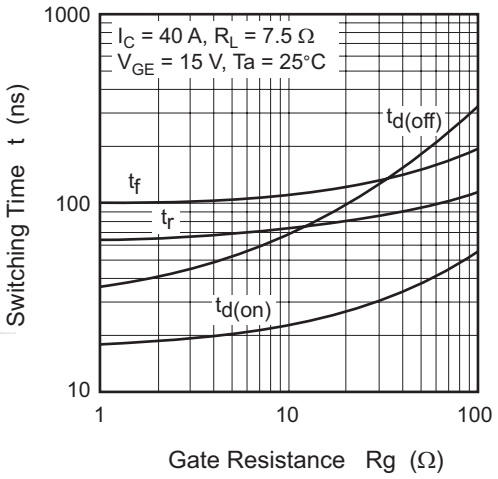

Dynamic Input Characteristics (Typical)



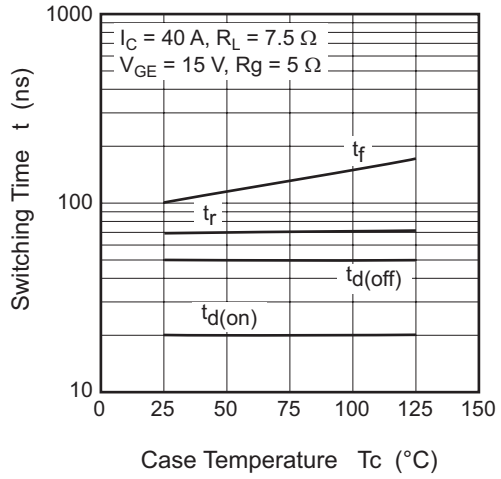

Switching Characteristics (Typical) (1)



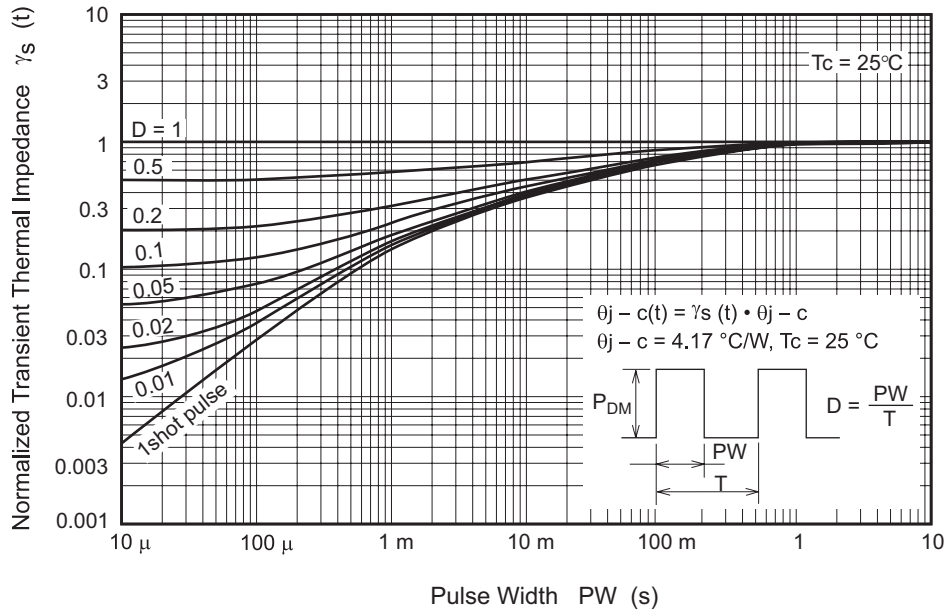

Switching Characteristics (Typical) (2)



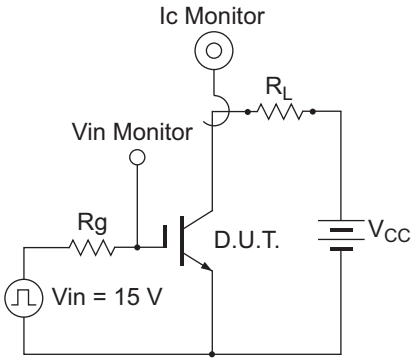

Switching Characteristics (Typical) (3)



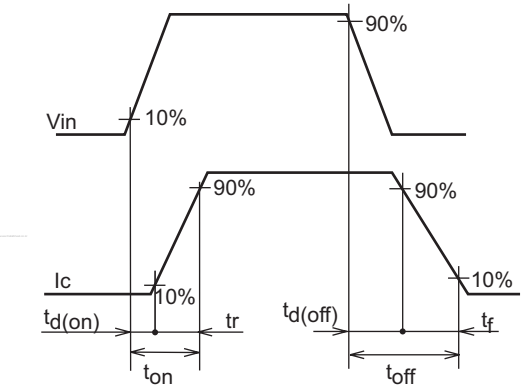
Normalized Transient Thermal Impedance vs. Pulse Width




Switching Time Test Circuit



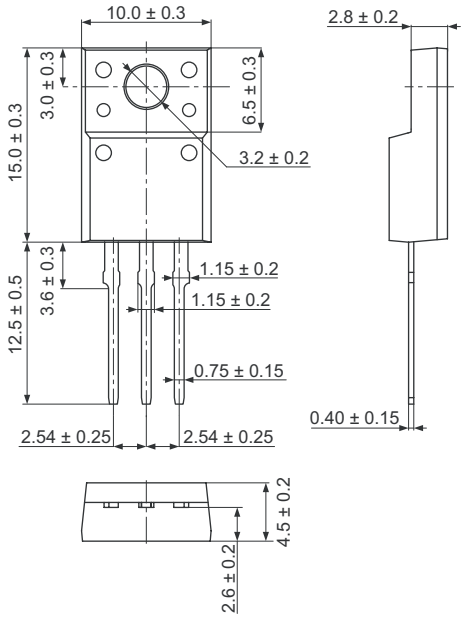

Waveform



## Package Dimension

| Package Name | JEITA Package Code | RENESAS Code | Previous Code | MASS[Typ.] |
|---|---|---|---|---|
| TO-220FL | — | PRSS0003AF-A | TO-220FL | 1.5g |

Unit: mm




## Ordering Information

| Orderable Part No. | Quantity | Shipping Container |
|---|---|---|
| RJP63F3DPP-M0-T2 | 600 pcs | Box (Tube) |

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