

# RJP60V0DPM

600V - 22A - IGBT

Application: Inverter

R07DS0669EJ0100

Rev.1.00

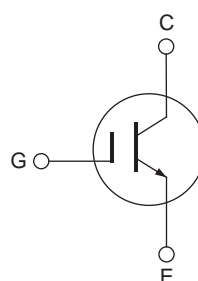
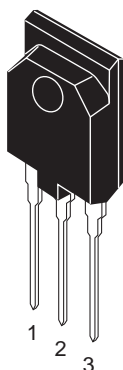
Feb 07, 2012

## Features

- High breakdown-voltage
- Low Collector to Emitter saturation Voltage  
 $V_{CE(sat)} = 1.5 \text{ V typ. (at } I_C = 22 \text{ A, } V_{GE} = 15 \text{ V, } T_a = 25^\circ\text{C)}$
- Short circuit withstand time (6  $\mu\text{s typ.}$ )
- Trench gate and thin wafer technology (G6H series)

## Outline

RENESAS Package code: PRSS0003ZA-A  
 (Package name: TO-3PFM)



1. Gate
2. Collector
3. Emitter

## Absolute Maximum Ratings

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

Item		Symbol	Ratings	Unit
Collector to emitter voltage / diode reverse voltage		$V_{CES} / V_R$	600	V
Gate to emitter voltage		$V_{GES}$	$\pm 30$	V
Collector current	$T_c = 25^\circ\text{C}$	$I_C$	45	A
	$T_c = 100^\circ\text{C}$	$I_C$	22	A
Collector peak current		$I_{C(peak)}$ <sup>Note1</sup>	90	A
Collector dissipation		$P_C$ <sup>Note2</sup>	40	W
Junction to case thermal impedance		$\theta_{j-c}$ <sup>Note2</sup>	3.125	$^\circ\text{C/W}$
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

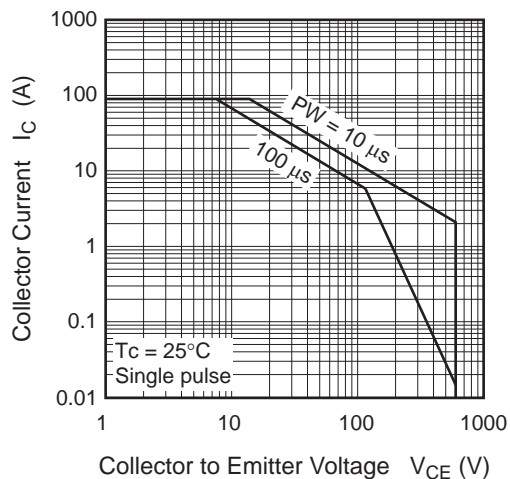
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Zero gate voltage collector current	$I_{CES}$	—	—	1	$\mu A$	$V_{CE} = 600 V, V_{GE} = 0$
Gate to emitter leak current	$I_{GES}$	—	—	$\pm 1$	$\mu A$	$V_{GE} = \pm 30 V, V_{CE} = 0$
Gate to emitter cutoff voltage	$V_{GE(off)}$	5.5	—	7.5	V	$V_{CE} = 10 V, I_C = 1 mA$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	1.5	2.1	V	$I_C = 22 A, V_{GE} = 15 V$ <sup>Note3</sup>
	$V_{CE(sat)}$	—	1.9	—	V	$I_C = 45 A, V_{GE} = 15 V$ <sup>Note3</sup>
Input capacitance	$C_{ies}$	—	1080	—	pF	$V_{CE} = 25 V$
Output capacitance	$C_{oes}$	—	58	—	pF	$V_{GE} = 0$
Reveres transfer capacitance	$C_{res}$	—	42	—	pF	$f = 1 MHz$
Total gate charge	$Q_g$	—	75	—	nC	$V_{CE} = 15 V$
Gate to emitter charge	$Q_{ge}$	—	10	—	nC	$V_{CE} = 300 V$
Gate to collector charge	$Q_{gc}$	—	45	—	nC	$I_C = 22 A$
Switching time	$t_{d(on)}$	—	45	—	ns	$V_{CE} = 300 V, V_{GE} = 15 V$
	$t_r$	—	40	—	ns	$I_C = 22 A$
	$t_{d(off)}$	—	100	—	ns	$R_g = 5 \Omega$
	$t_f$	—	70	—	ns	Inductive load
Short circuit withstand time	$t_{sc}$	—	6	—	$\mu s$	$V_{CC} \leq 360 V, V_{GE} = 15 V$ $T_C = 100^\circ C$

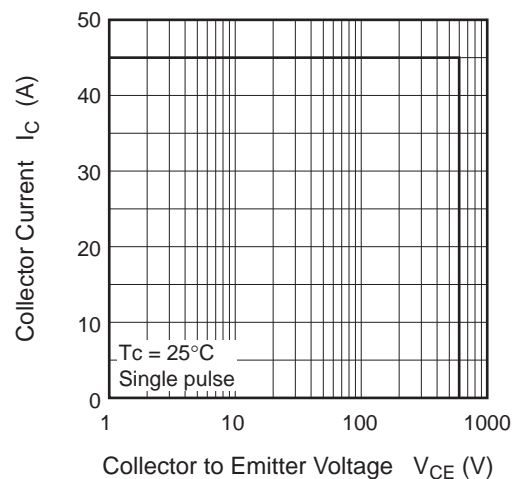
Notes: 3. Pulse test.

## Main Characteristics

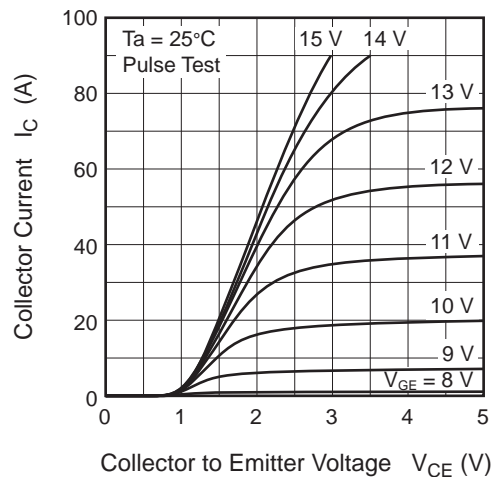
Maximum Safe Operation Area



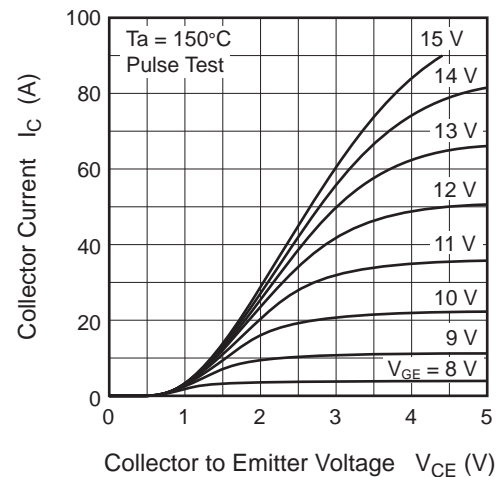
Turn-off Safe Operation Area



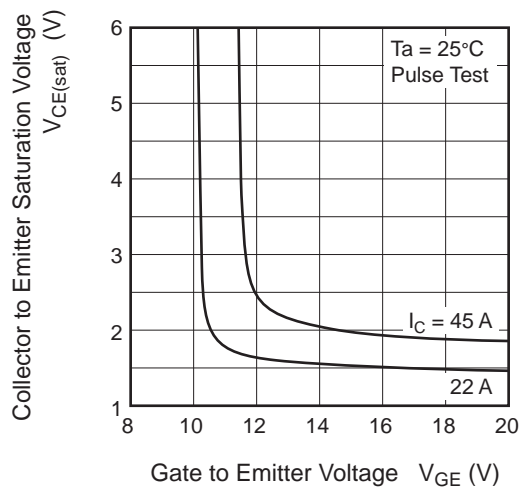
Typical Output Characteristics



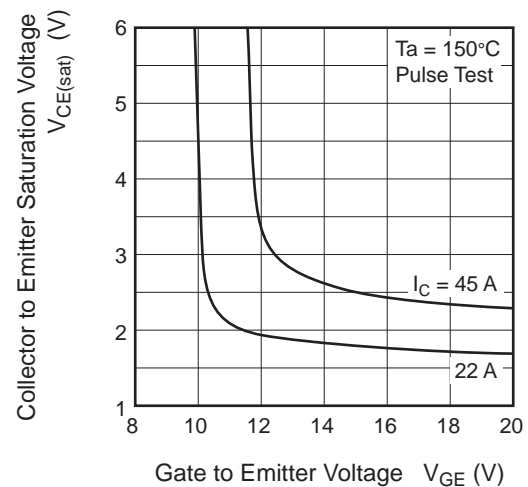
Typical Output Characteristics



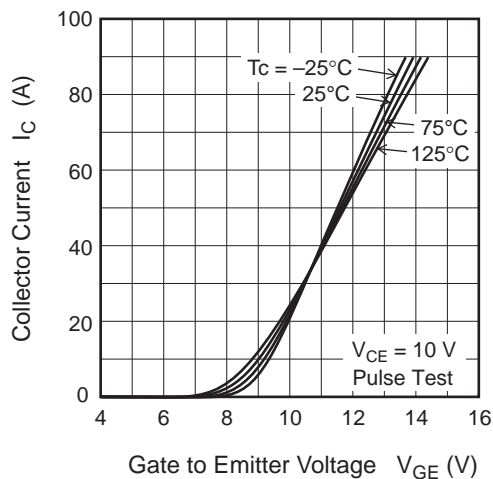
Collector to Emitter Saturation Voltage vs. Gate to Emitter Voltage (Typical)



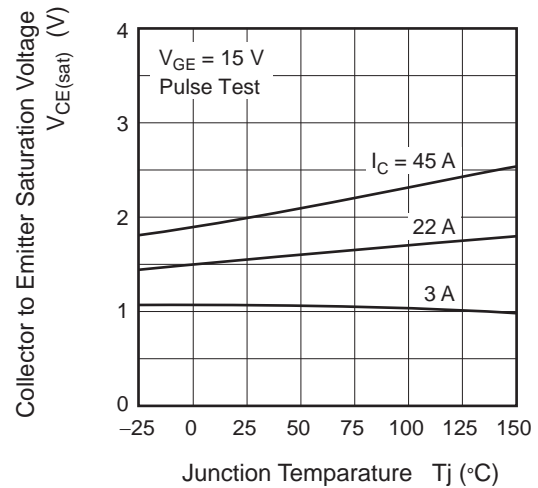
Collector to Emitter Saturation Voltage vs. Gate to Emitter Voltage (Typical)



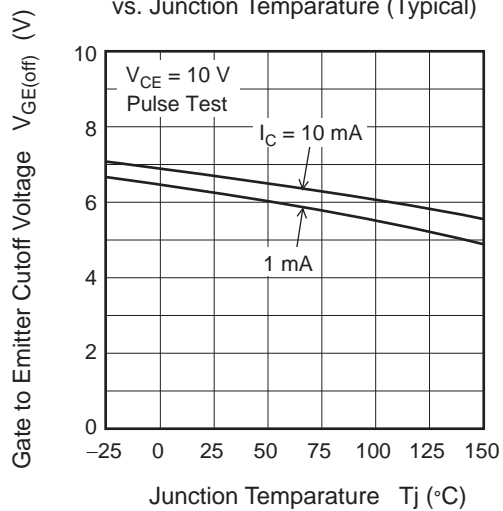
Typical Transfer Characteristics



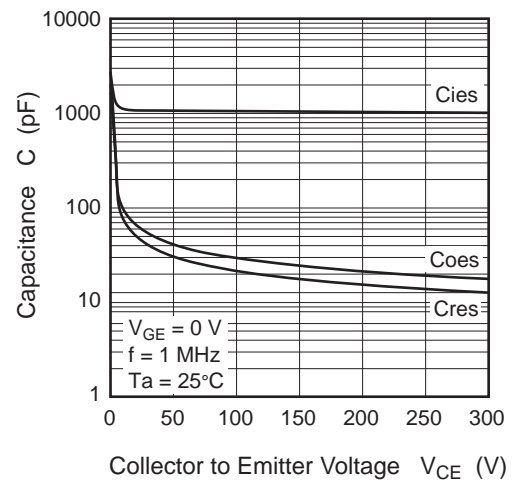
Collector to Emitter Saturation Voltage vs. Junction Temperature (Typical)



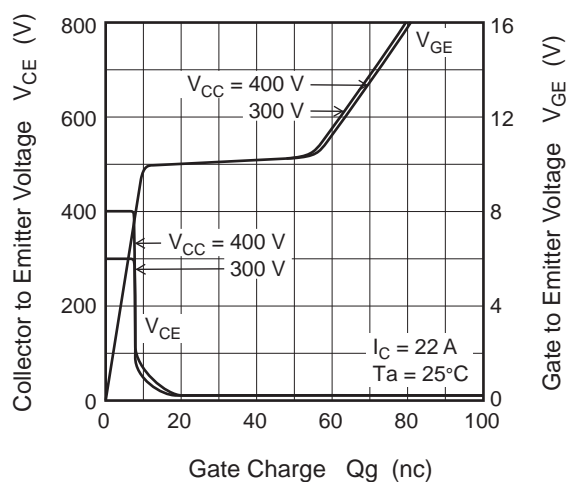
Gate to Emitter Cutoff Voltage vs. Junction Temperature (Typical)



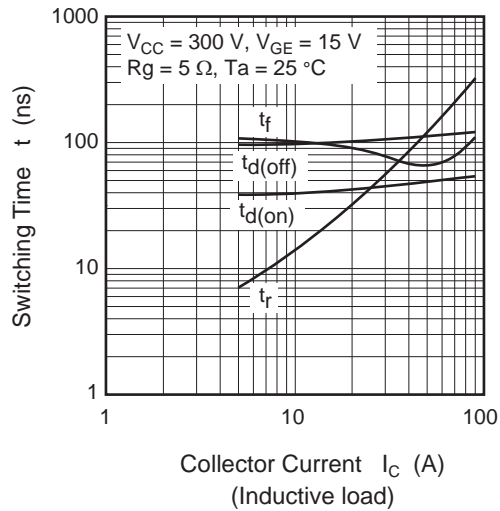
Typical Capacitance vs. Collector to Emitter Voltage



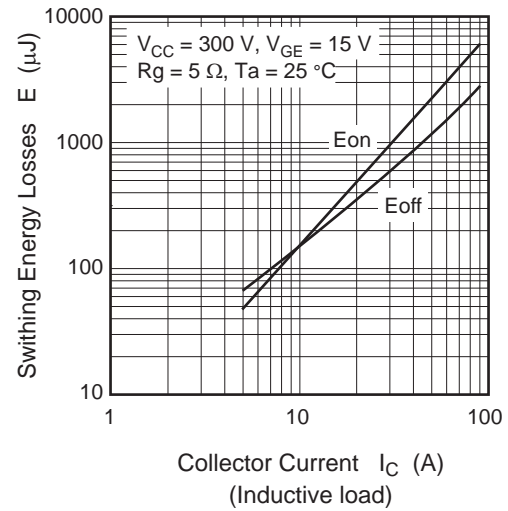
Dynamic Input Characteristics (Typical)



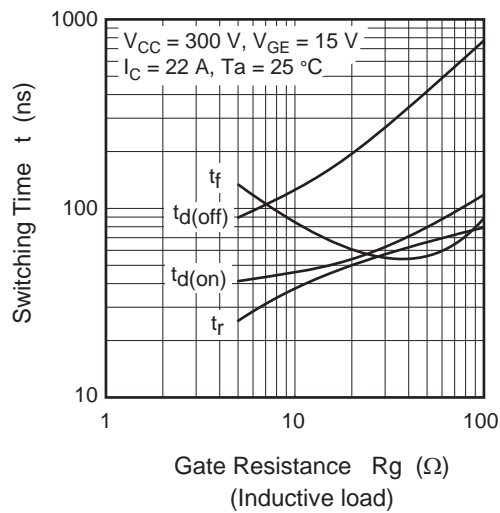
Switching Characteristics (Typical) (1)



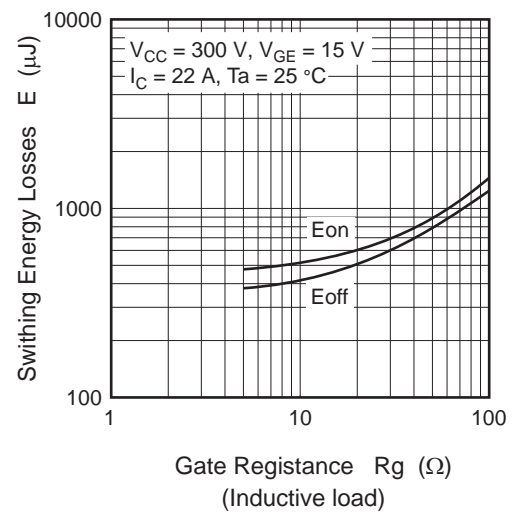
Switching Characteristics (Typical) (2)



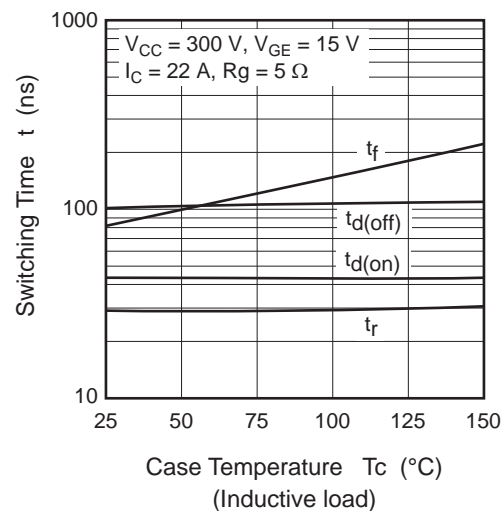
Switching Characteristics (Typical) (3)



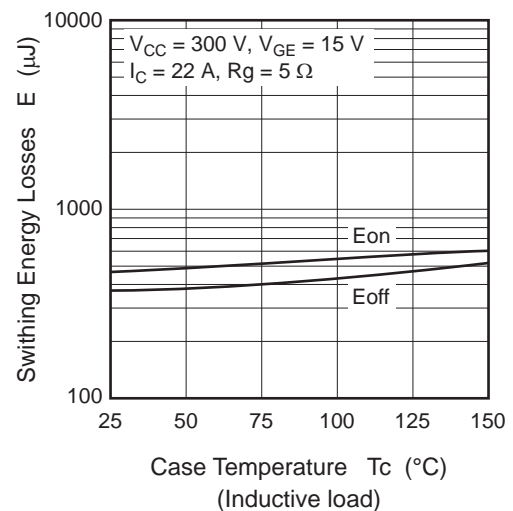
Switching Characteristics (Typical) (4)



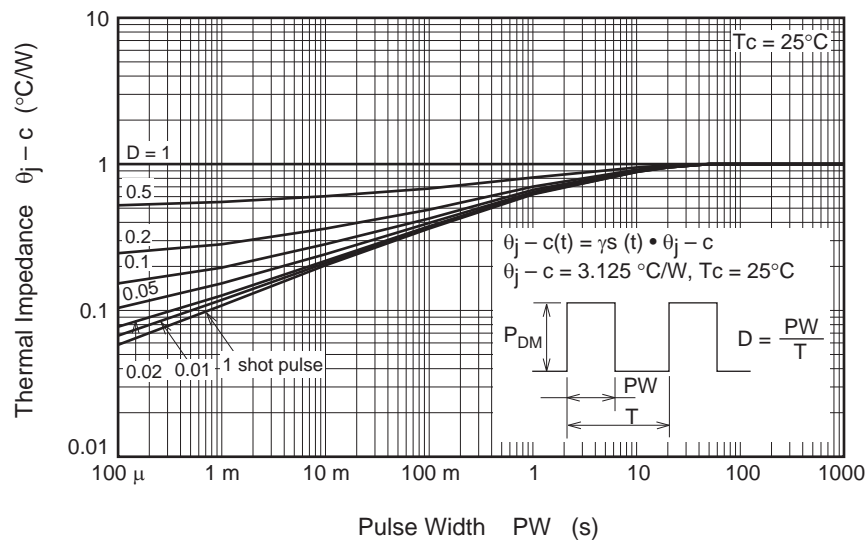
Switching Characteristics (Typical) (5)



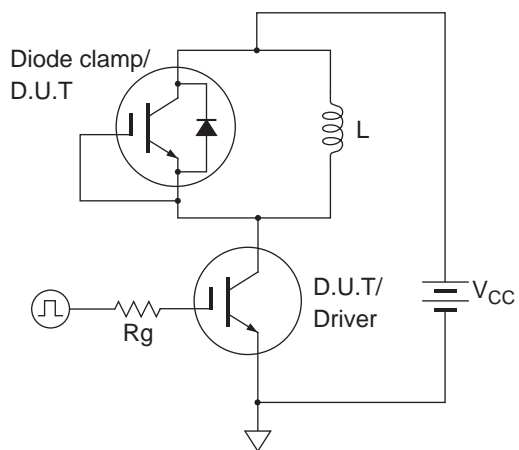
Switching Characteristics (Typical) (6)



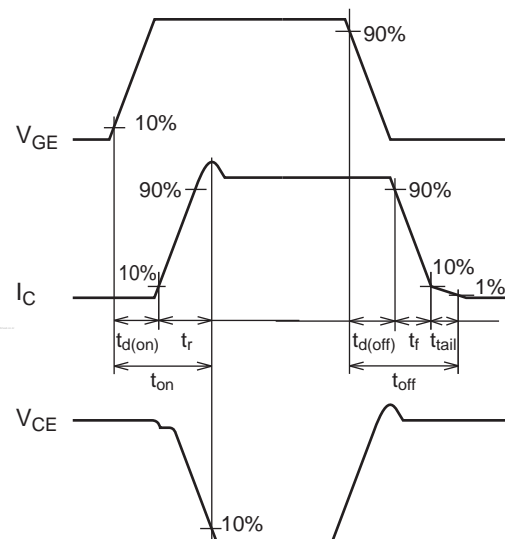
Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



Waveform





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