

RJP60V0DPM

600V - 22A - IGBT

Application: Inverter

R07DS0669EJ0100

Rev.1.00

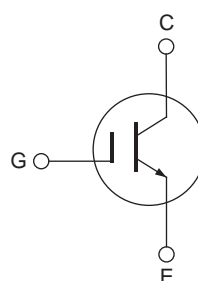
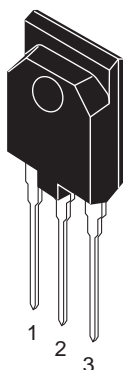
Feb 07, 2012

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}	± 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		$I_{C(peak)}$ ^{Note1}	90	A
Collector dissipation		P_C ^{Note2}	40	W
Junction to case thermal impedance		θ_{j-c} ^{Note2}	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

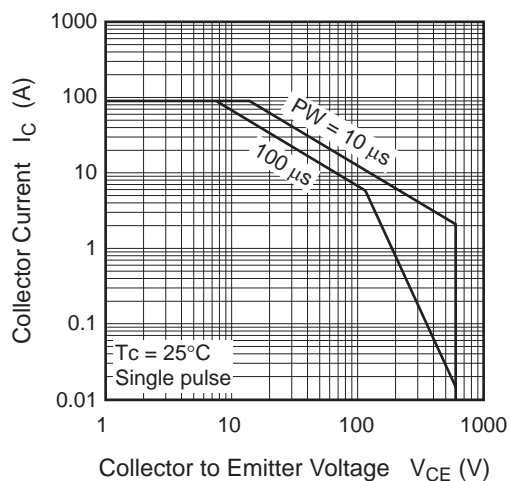
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Zero gate voltage collector current	I_{CES}	—	—	1	μA	$V_{CE} = 600 V, V_{GE} = 0$
Gate to emitter leak current	I_{GES}	—	—	± 1	μA	$V_{GE} = \pm 30 V, V_{CE} = 0$
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	$I_C = 22 A, V_{GE} = 15 V$ ^{Note3}
	$V_{CE(sat)}$	—	1.9	—	V	$I_C = 45 A, V_{GE} = 15 V$ ^{Note3}
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	—	μs	$V_{CC} \leq 360 V, V_{GE} = 15 V$ $T_C = 100 ^\circ C$

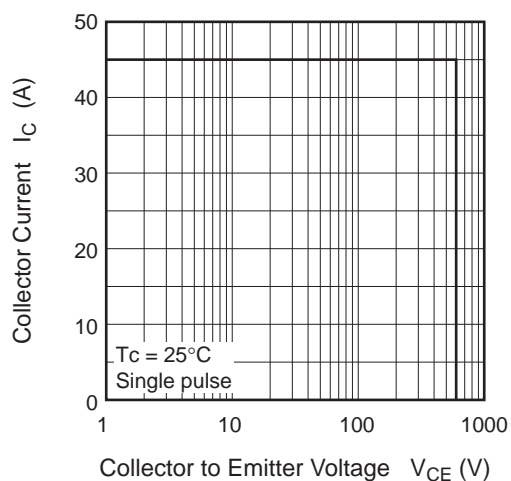
Notes: 3. Pulse test.

Main Characteristics

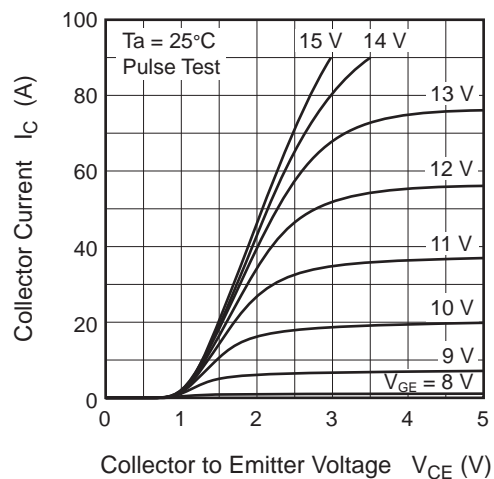
Maximum Safe Operation Area



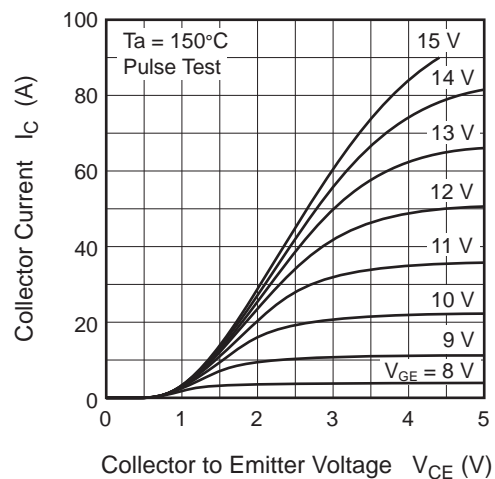
Turn-off Safe Operation Area



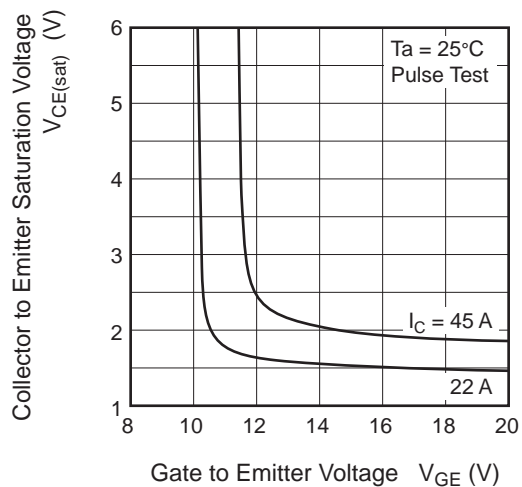
Typical Output Characteristics



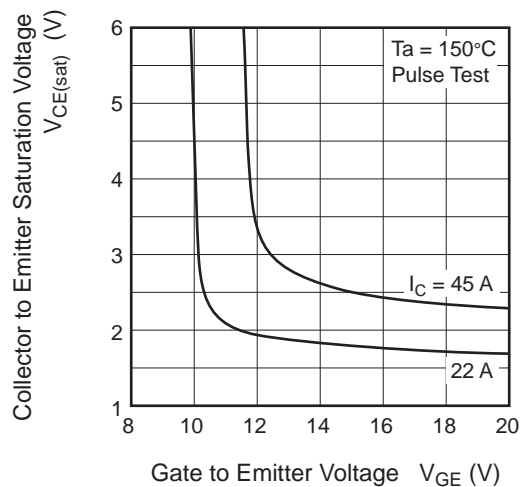
Typical Output Characteristics



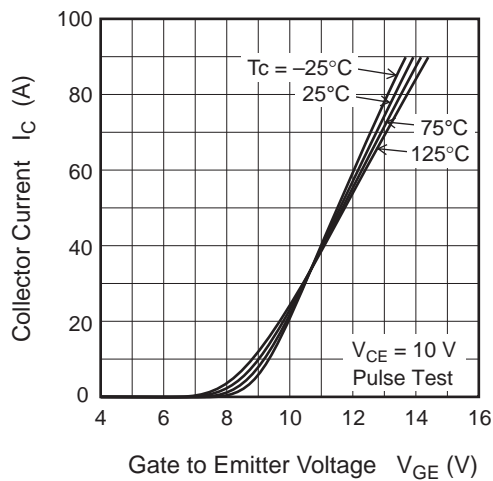
Collector to Emitter Saturation Voltage vs. Gate to Emitter Voltage (Typical)



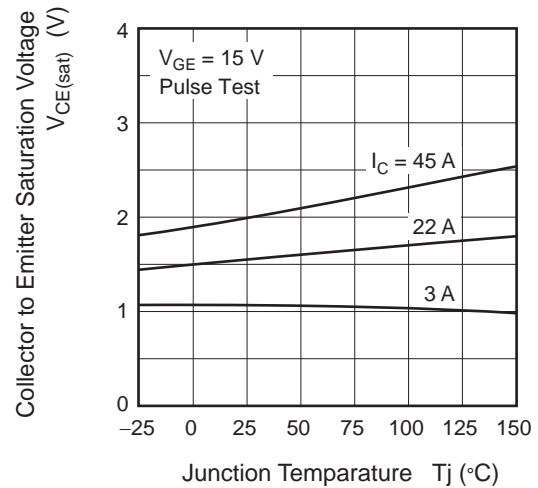
Collector to Emitter Saturation Voltage vs. Gate to Emitter Voltage (Typical)



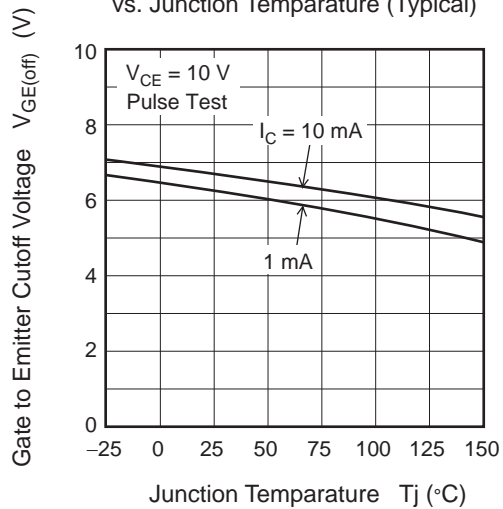
Typical Transfer Characteristics



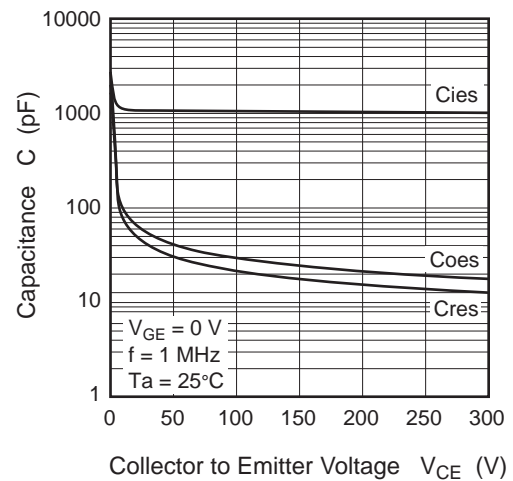
Collector to Emitter Saturation Voltage vs. Junction Temperature (Typical)



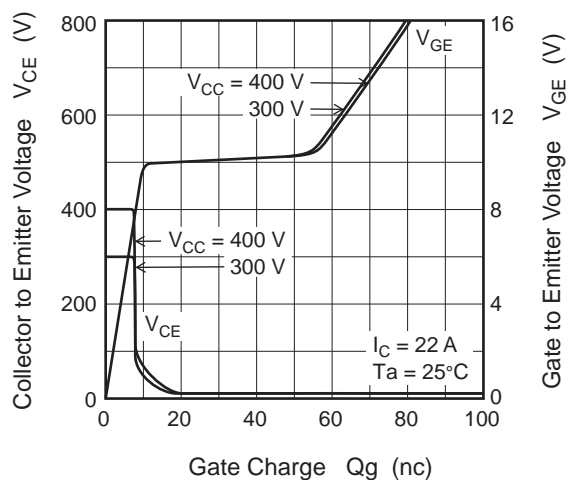
Gate to Emitter Cutoff Voltage vs. Junction Temperature (Typical)



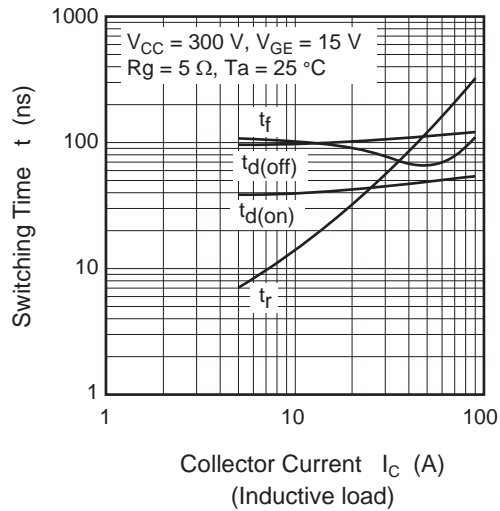
Typical Capacitance vs. Collector to Emitter Voltage



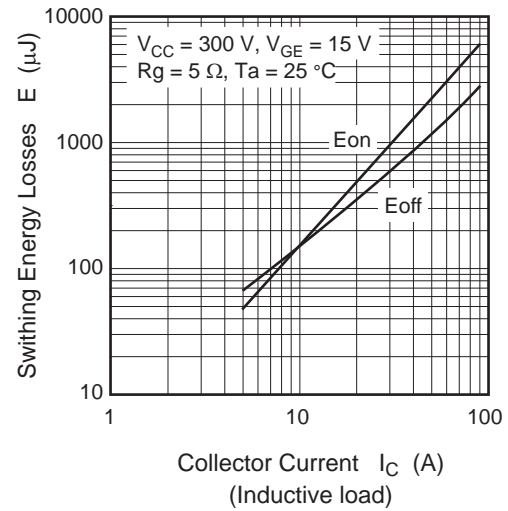
Dynamic Input Characteristics (Typical)



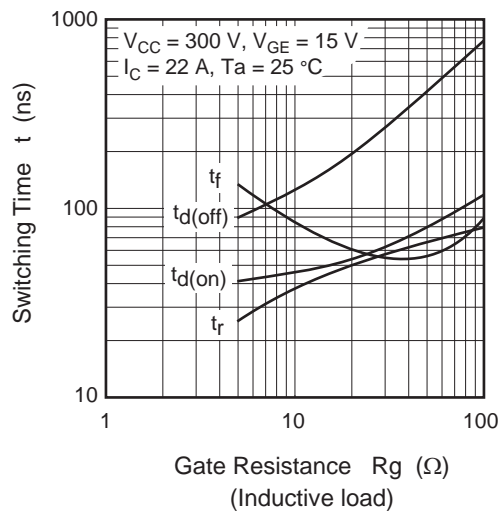
Switching Characteristics (Typical) (1)



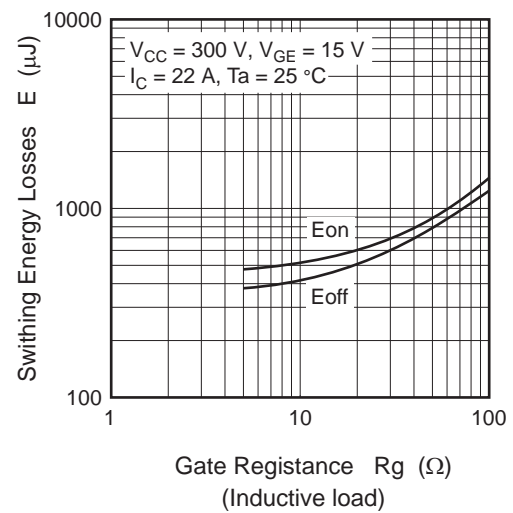
Switching Characteristics (Typical) (2)



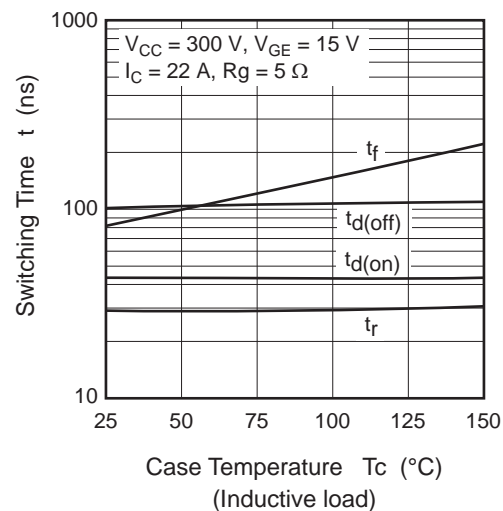
Switching Characteristics (Typical) (3)



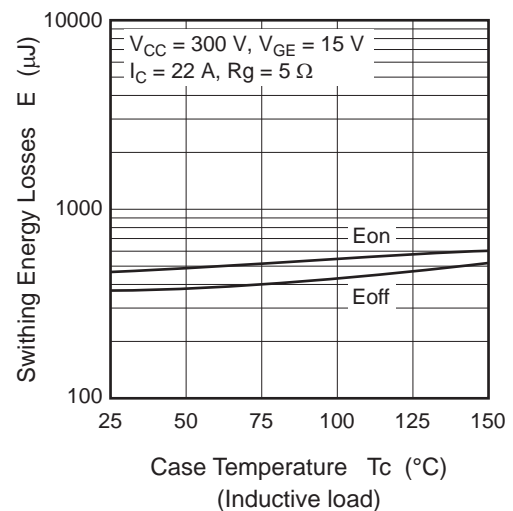
Switching Characteristics (Typical) (4)



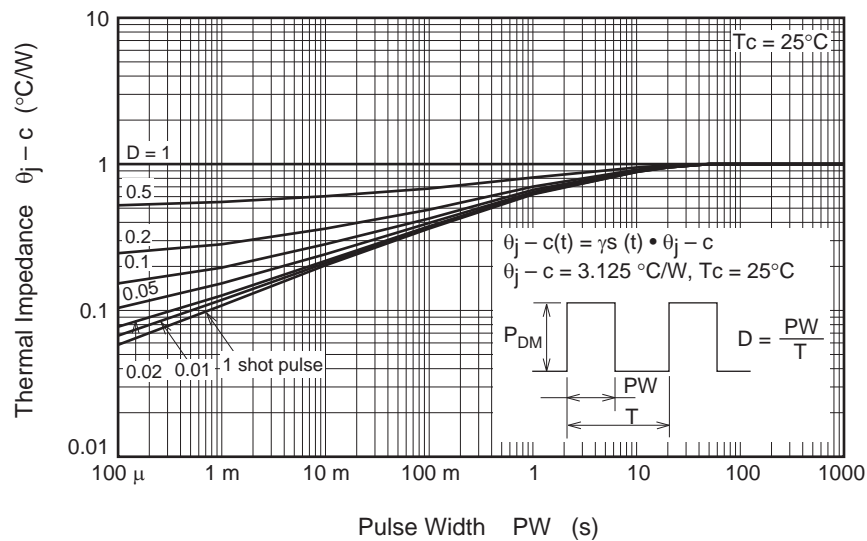
Switching Characteristics (Typical) (5)



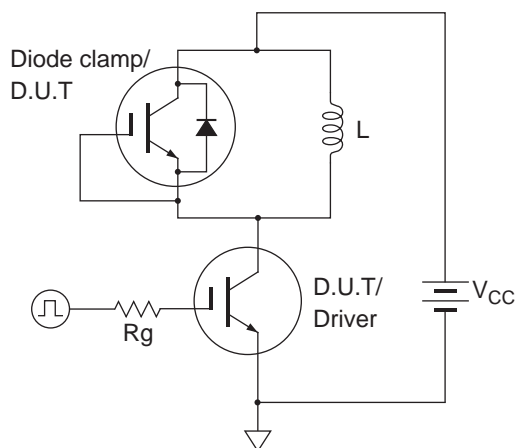
Switching Characteristics (Typical) (6)



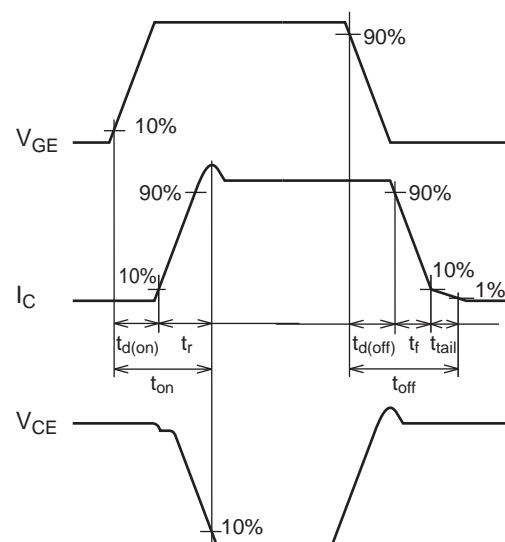
Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



Waveform



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