

RJP60F5DPM

600V - 40A - IGBT
High Speed Power Switching

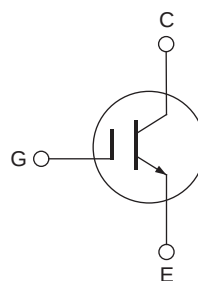
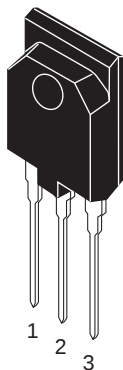
R07DS0587EJ0200
Rev.2.00
May 31, 2012

Features

- Low collector to emitter saturation voltage
 $V_{CE(sat)} = 1.37 \text{ V typ. (} I_C = 40 \text{ A, } V_{GE} = 15 \text{ V, } T_a = 25^\circ\text{C)}$
- Trench gate and thin wafer technology
- High speed switching
 $t_f = 85 \text{ ns typ. (at } I_C = 30 \text{ A, } V_{CE} = 400 \text{ V, } V_{GE} = 15 \text{ V, } R_g = 5 \Omega, T_a = 25^\circ\text{C, inductive load)}$

Outline

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



1. Gate
2. Collector
3. Emitter

Absolute Maximum Ratings

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

Item		Symbol	Ratings	Unit
Collector to emitter voltage		V_{CES}	600	V
Gate to emitter voltage		V_{GES}	± 30	V
Collector current	$T_c = 25^\circ\text{C}$	I_C	80	A
	$T_c = 100^\circ\text{C}$	I_C	40	A
Collector peak current		$i_{c(peak)}$ ^{Note1}	160	A
Collector dissipation		P_C	45	W
Junction to case thermal impedance		θ_{j-c}	2.78	$^\circ\text{C/W}$
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.
2. $PW \leq 5 \mu\text{s}$, duty cycle $\leq 1\%$

Electrical Characteristics

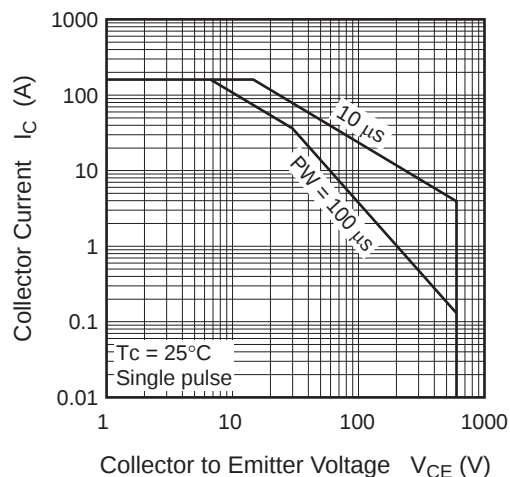
(T_j = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Zero gate voltage collector current	I _{CES}	—	—	100	μA	V _{CE} = 600V, V _{GE} = 0
Gate to emitter leak current	I _{GES}	—	—	±1	μA	V _{GE} = ±30 V, V _{CE} = 0
Gate to emitter cutoff voltage	V _{GE(off)}	4	—	8	V	V _{CE} = 10 V, I _C = 1 mA
Collector to emitter saturation voltage	V _{CE(sat)}	—	1.37	1.8	V	I _C = 40 A, V _{GE} = 15 V ^{Note2}
	V _{CE(sat)}	—	1.7	—	V	I _C = 80 A, V _{GE} = 15 V ^{Note2}
Input capacitance	C _{ies}	—	2780	—	pF	V _{CE} = 25 V V _{GE} = 0 V f = 1 MHz
Output capacitance	C _{oes}	—	100	—	pF	
Reverse transfer capacitance	C _{res}	—	43	—	pF	
Total gate charge	Q _g	—	74	—	nC	V _{GE} = 15 V V _{CC} = 300 V I _C = 40 A
Gate to emitter charge	Q _{ge}	—	24	—	nC	
Gate to collector charge	Q _{gc}	—	26	—	nC	
Switching time	t _{d(on)}	—	53	—	ns	I _C = 30 A V _{CE} = 400 V, V _{GE} = 15 V R _g = 5 Ω ^{Note2} Inductive load
	t _r	—	77	—	ns	
	t _{d(off)}	—	90	—	ns	
	t _f	—	85	—	ns	

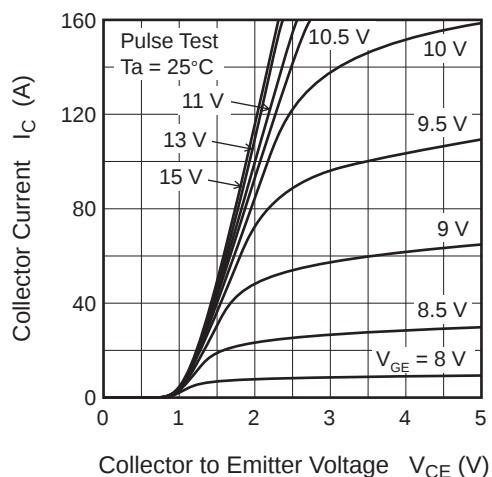
Notes: 2. Pulse test

Main Characteristics

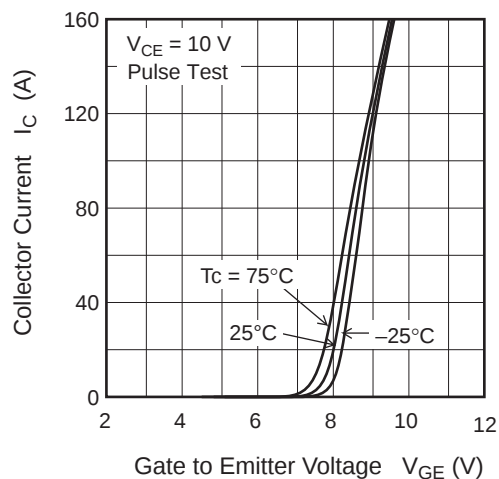
Maximum Safe Operation Area



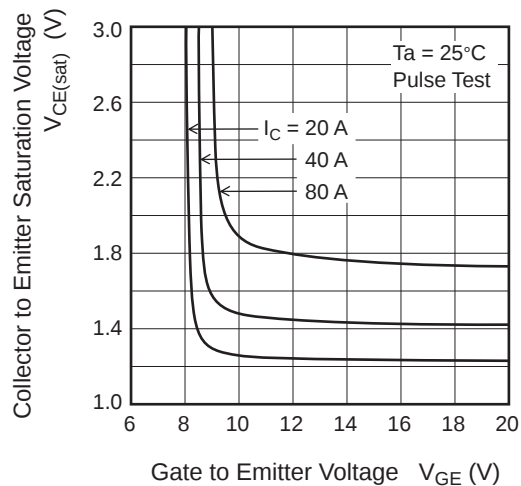
Typical Output Characteristics



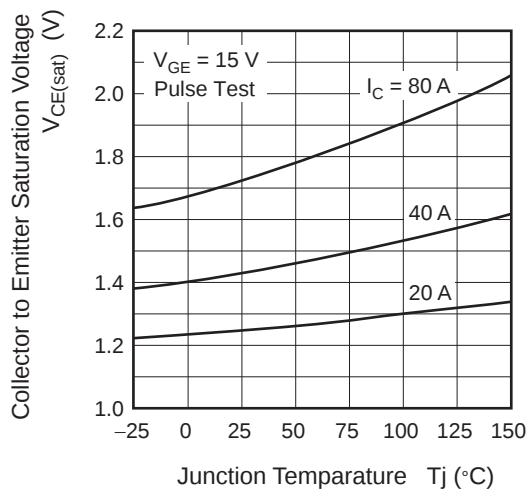
Typical Transfer Characteristics



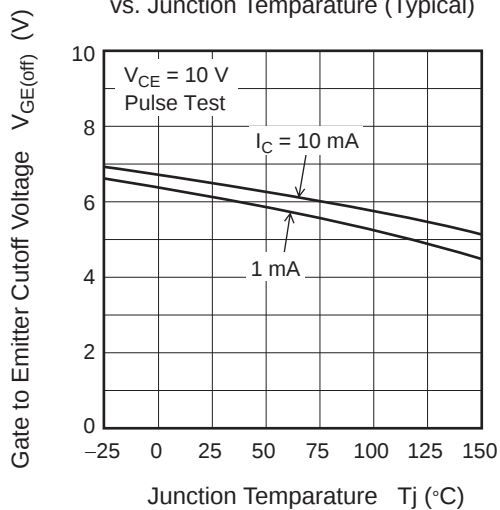
Collector to Emitter Saturation Voltage vs. Gate to Emitter Voltage (Typical)

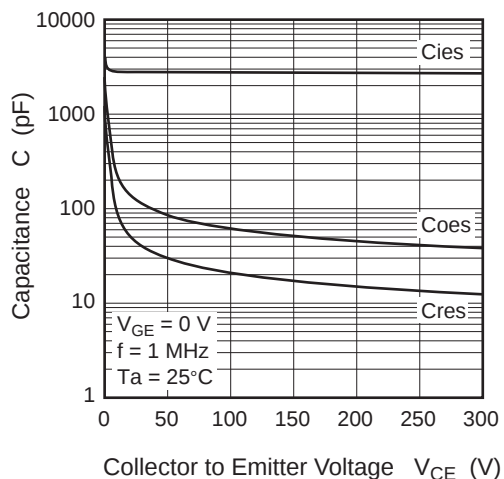


Collector to Emitter Saturation Voltage vs. Junction Temperature (Typical)

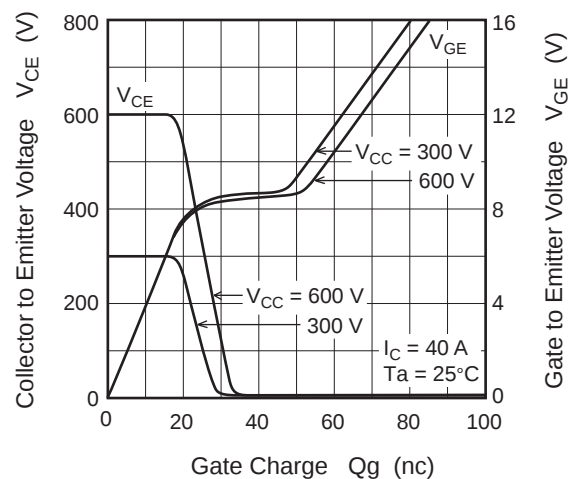


Gate to Emitter Cutoff Voltage vs. Junction Temperature (Typical)

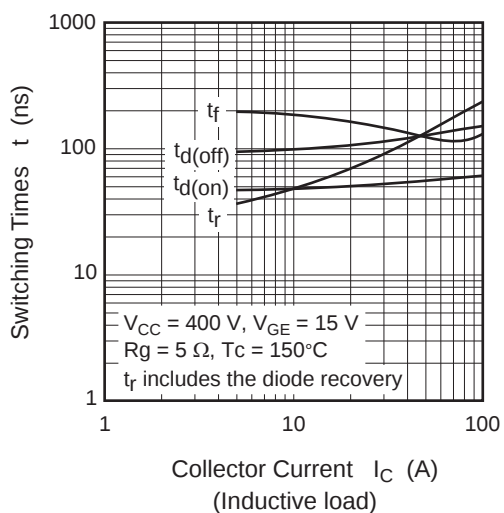


Typical Capacitance vs.
Collector to Emitter Voltage

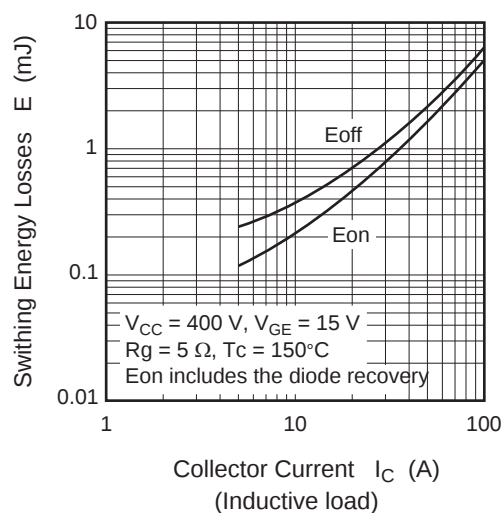
Dynamic Input Characteristics (Typical)



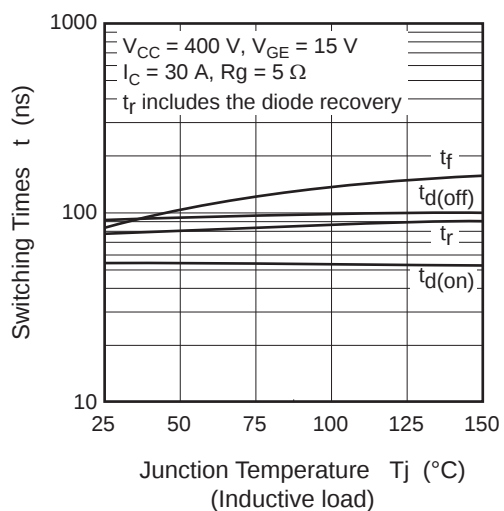
Switching Characteristics (Typical) (1)



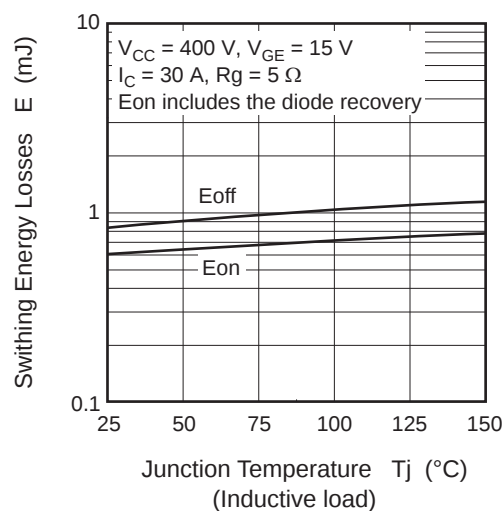
Switching Characteristics (Typical) (2)

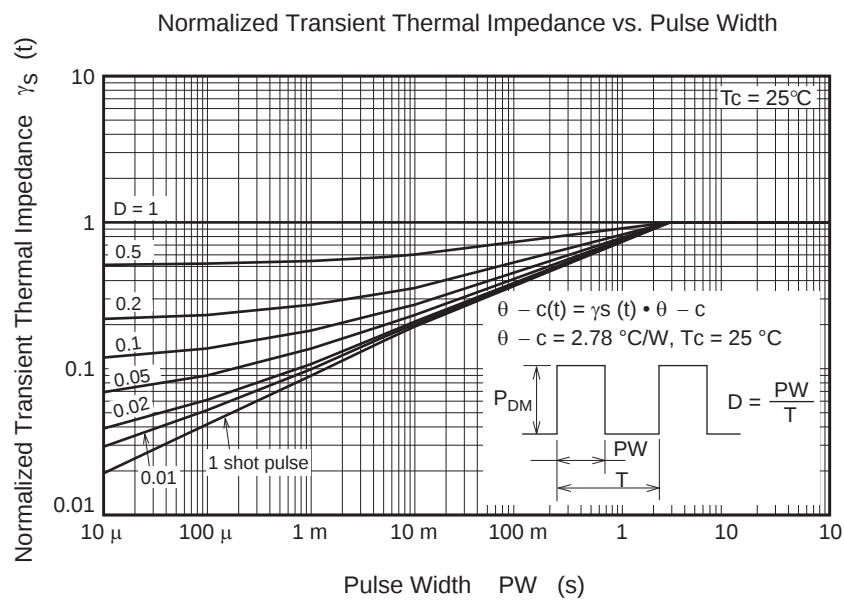


Switching Characteristics (Typical) (3)

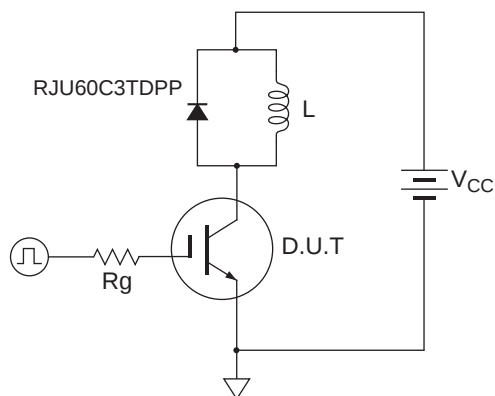


Switching Characteristics (Typical) (4)

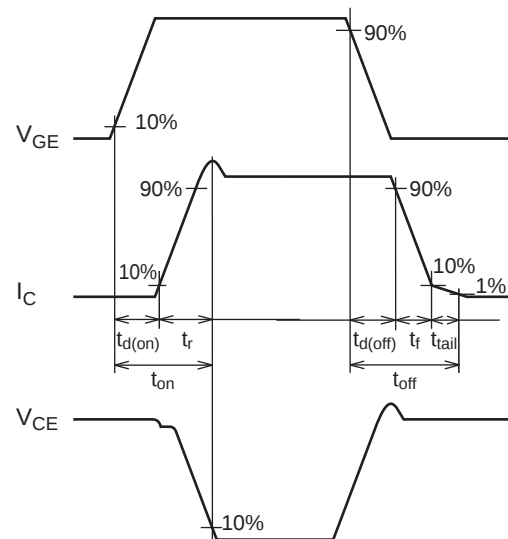




Switching Time Test Circuit



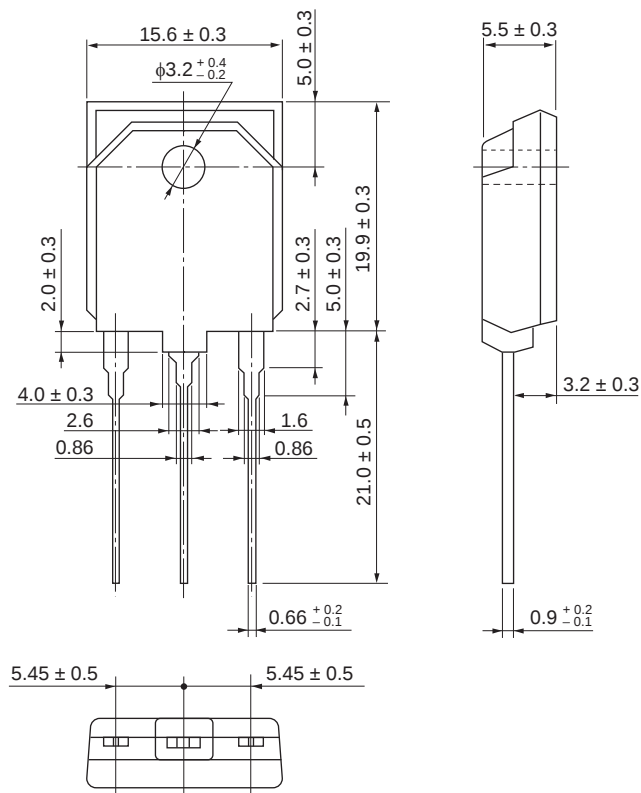
Waveform



Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
TO-3PFM	SC-93	PRSS0003ZA-A	TO-3PFM / TO-3PFMV	5.2g

Unit: mm



Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJP60F5DPM-00#T1	360 pcs	Box (Tube)

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