

RJP60F4DPQ-A0

600V - 30A - IGBT
High Speed Power Switching

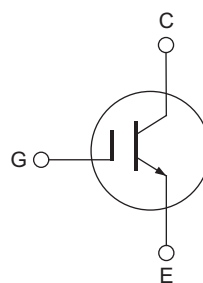
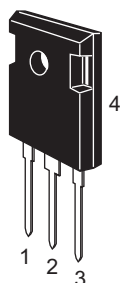
R07DS0675EJ0100
Rev.1.00
Jul 30, 2012

Features

- Low collector to emitter saturation voltage
 $V_{CE(sat)} = 1.4 \text{ V typ. (at } I_C = 30 \text{ A, } V_{GE} = 15 \text{ V, } T_a = 25^\circ\text{C)}$
- Trench gate and thin wafer technology
- High speed switching
 $t_f = 80 \text{ ns typ. (at } I_C = 30 \text{ A, } V_{CE} = 400 \text{ V, } V_{GE} = 15 \text{ V, } R_g = 5 \Omega, T_a = 25^\circ\text{C, inductive load)}$

Outline

RENESAS Package code: PRSS0003ZH-A
(Package name: TO-247A)



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}	600	V
Gate to emitter voltage	V_{GES}	± 30	V
Collector current	$T_c = 25^\circ\text{C}$	I_C ^{Note1}	60
	$T_c = 100^\circ\text{C}$	I_C ^{Note1}	30
Collector peak current	$i_{c(peak)}$ ^{Note1}	120	A
Collector dissipation	P_C	235.8	W
Junction to case thermal impedance	θ_{j-c}	0.53	$^\circ\text{C/W}$
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

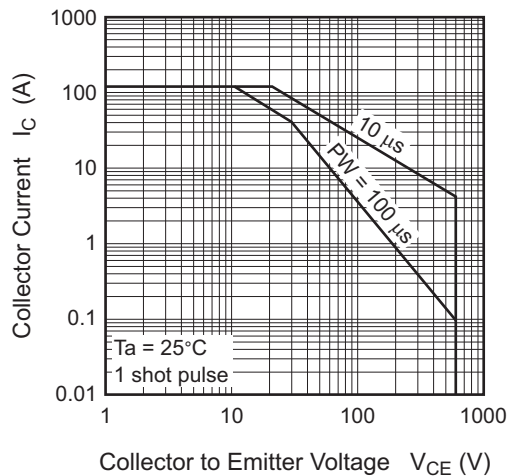
(T_j = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Zero gate voltage collector current	I _{CES}	—	—	100	μA	V _{CE} = 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} = 10V, I _C = 1 mA
Collector to emitter saturation voltage	V _{CE(sat)}	—	1.4	1.82	V	I _C = 30 A, V _{GE} = 15V ^{Note2}
	V _{CE(sat)}	—	1.7	—	V	I _C = 60 A, V _{GE} = 15V ^{Note2}
Input capacitance	C _{ies}	—	1900	—	pF	V _{CE} = 25 V
Output capacitance	C _{oes}	—	70	—	pF	V _{GE} = 0 V
Reverse transfer capacitance	C _{res}	—	33	—	pF	f = 1 MHz
Switching time	t _{d(on)}	—	45	—	ns	I _C = 30 A, V _{CE} = 400 V, V _{GE} = 15 V R _g = 5 Ω ^{Note2} Inductive load
	t _r	—	150	—	ns	
	t _{d(off)}	—	85	—	ns	
	t _f	—	80	—	ns	

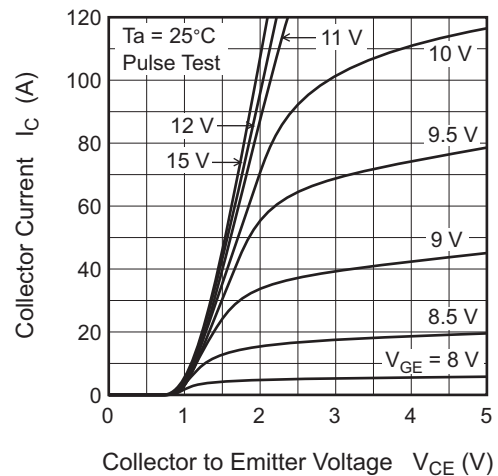
Notes: 2. Pulse test

Main Characteristics

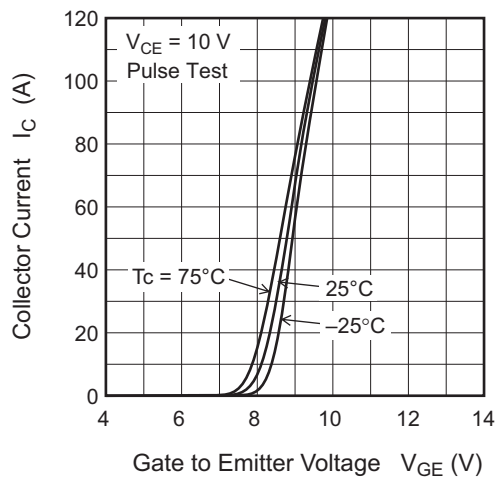
Maximum Safe Operation Area



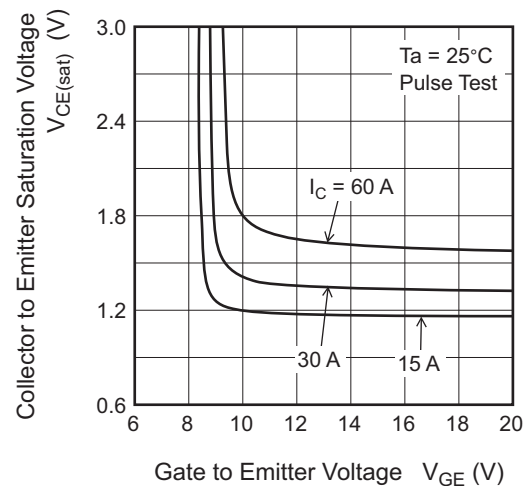
Typical Output Characteristics



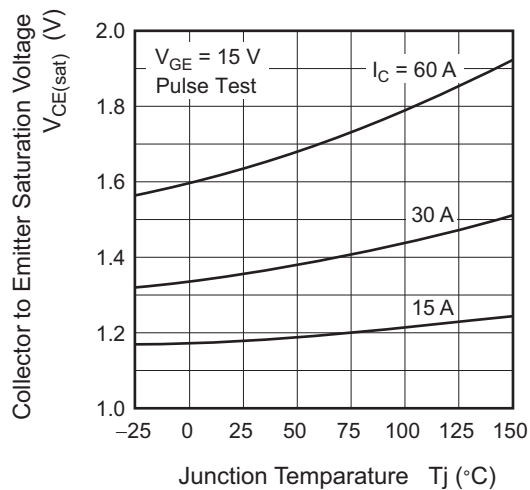
Typical Transfer Characteristics



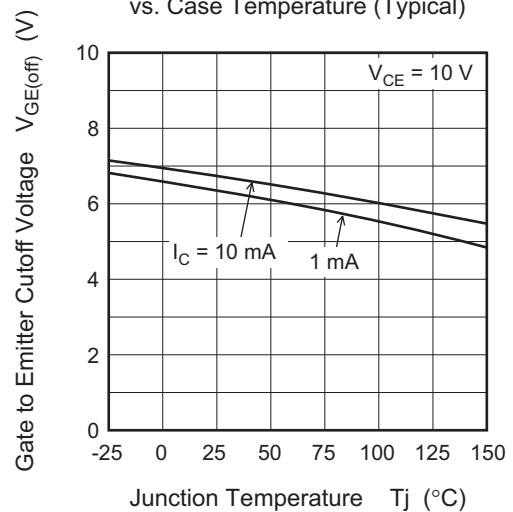
Collector to Emitter Saturation Voltage vs. Gate to Emitter Voltage (Typical)

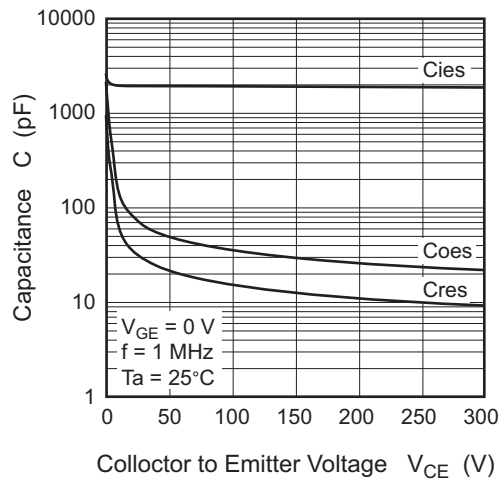


Collector to Emitter Saturation Voltage vs. Junction Temperature (Typical)

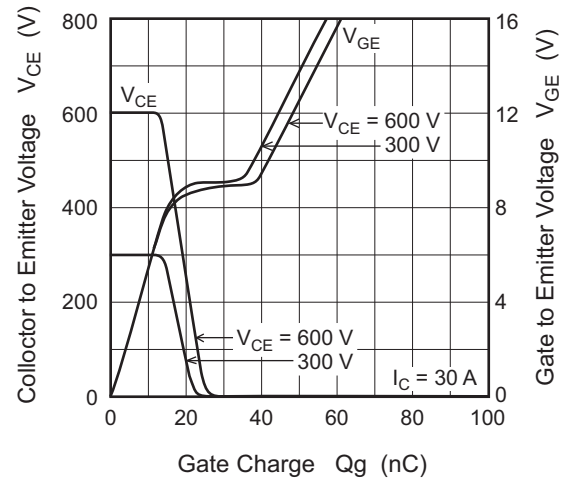


Gate to Emitter Cutoff Voltage vs. Case Temperature (Typical)

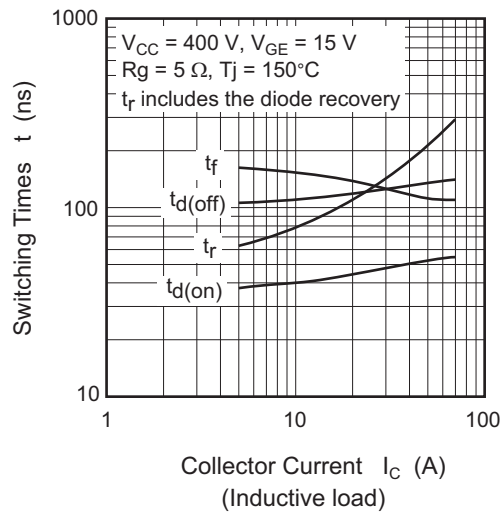


Typical Capacitance vs.
Collector to Emitter Voltage

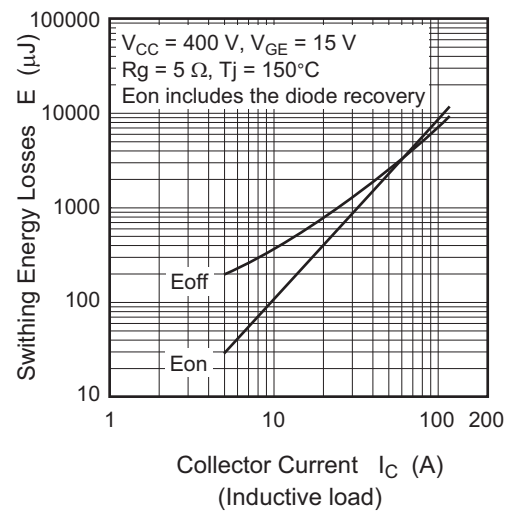
Dynamic Input Characteristics (Typical)



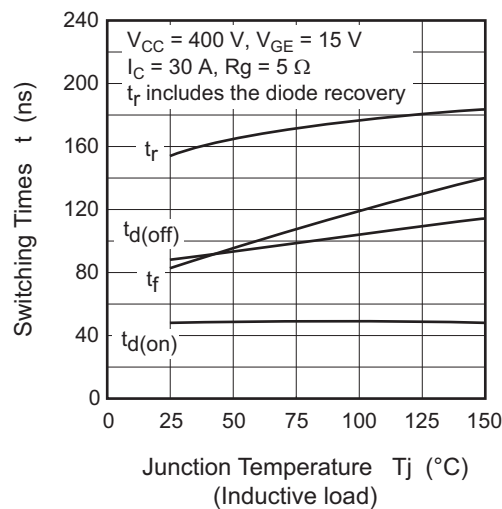
Switching Characteristics (Typical) (1)



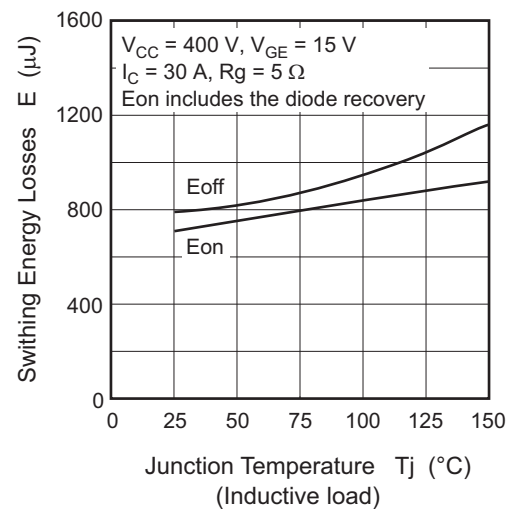
Switching Characteristics (Typical) (2)

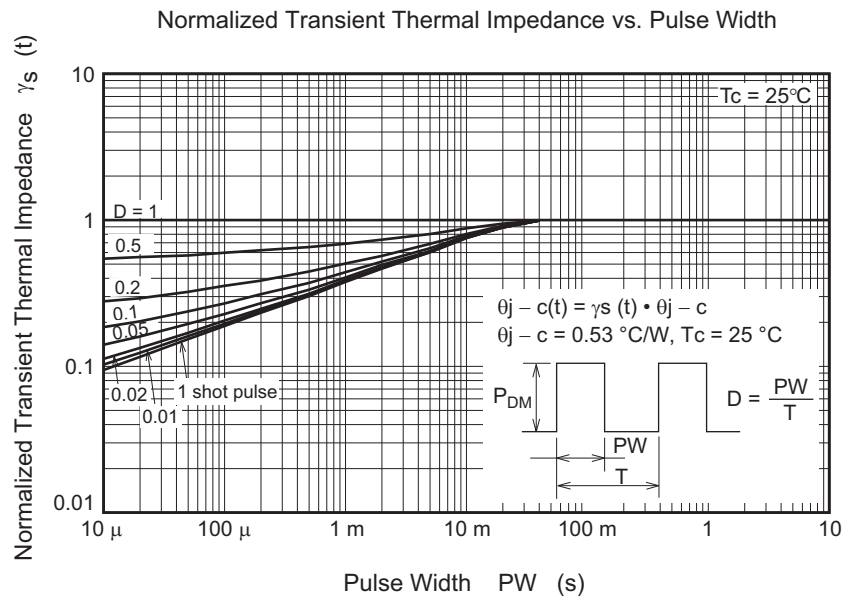


Switching Characteristics (Typical) (3)

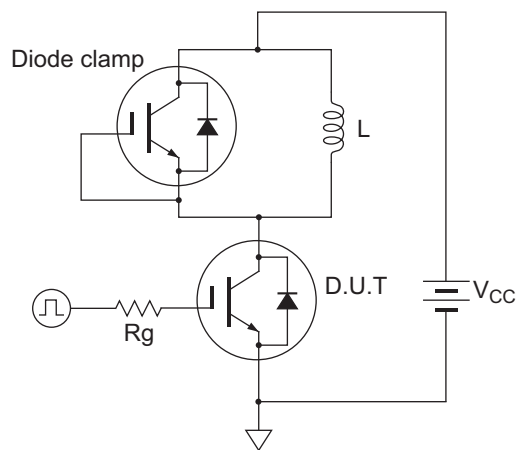


Switching Characteristics (Typical) (4)

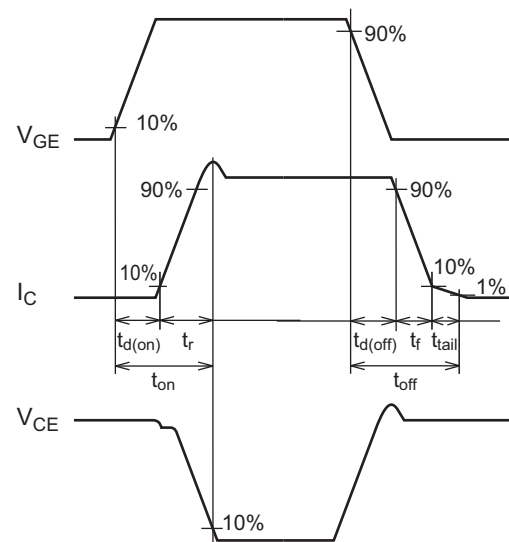




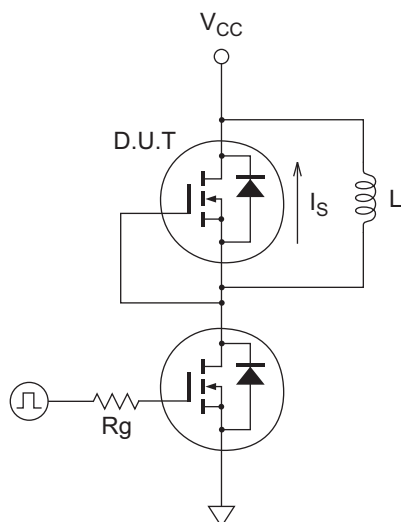
Switching Time Test Circuit



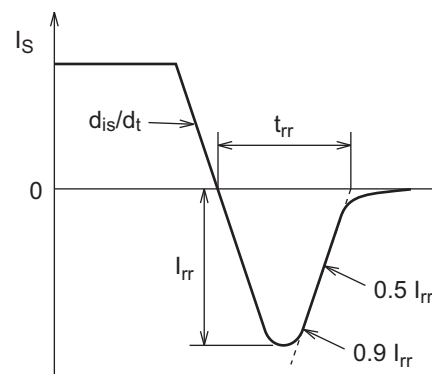
Waveform



Diode Reverse Recovery Time Test Circuit



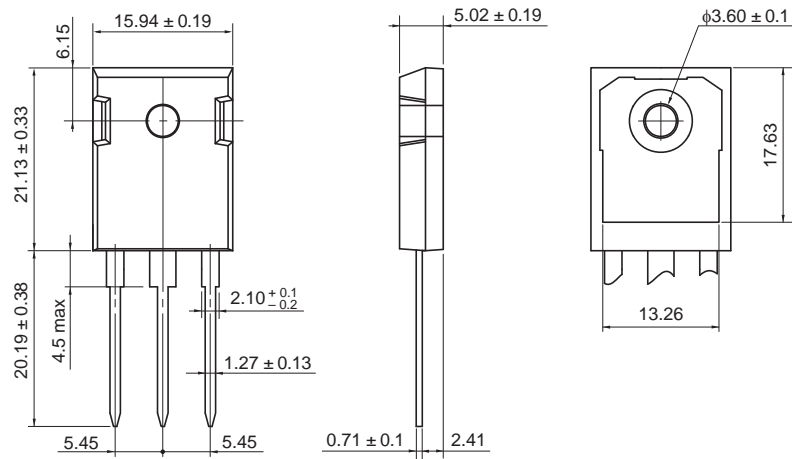
Waveform



Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
TO-247A	—	PRSS0003ZH-A	—	6.14g

Unit: mm



Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJP60F4DPQ-A0#T0	240 pcs	Box (Tube)

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