

RJH1CF6RDPQ-80

Silicon N Channel IGBT
High Speed Power Switching

R07DS0356EJ0100

Rev.1.00

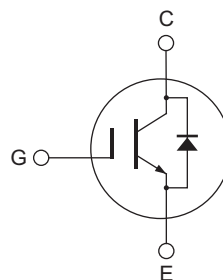
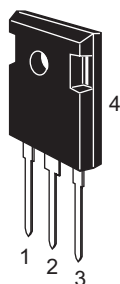
May 12, 2010

Features

- Voltage resonance circuit use
- Reverse conducting IGBT with monolithic body diode
- High efficiency device for induction heating
- Low collector to emitter saturation voltage
 $V_{CE(sat)} = 1.8 \text{ V typ. (at } I_C = 30 \text{ A, } V_{GE} = 15 \text{ V, } T_j = 25^\circ\text{C)}$
- Gate to emitter voltage rating $\pm 30 \text{ V}$
- Pb-free lead plating

Outline

RENESAS Package code: PRSS0003ZE-A
(Package name: TO-247)



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}	1200	V
Gate to emitter voltage		V_{GES}	± 30	V
Collector current	$T_c = 25^\circ\text{C}$	I_C	55	A
	$T_c = 100^\circ\text{C}$	I_C	30	A
Collector peak current		$i_{c(peak)}$ ^{Note1}	100	A
Collector to emitter diode forward current		i_{DF}	20	A
Collector dissipation		P_C	227.2	W
Junction to case thermal impedance		θ_{j-c}	0.55	$^\circ\text{C/W}$
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

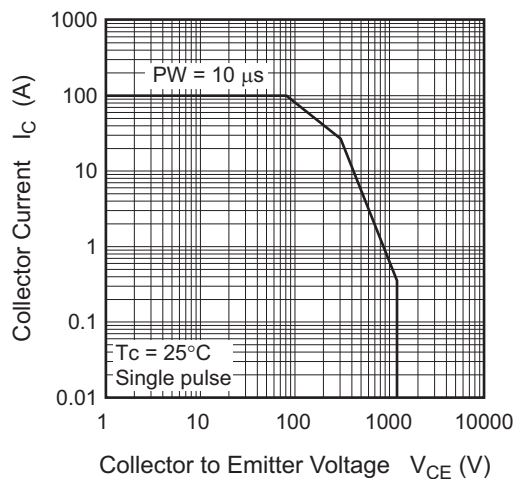
(T_j = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Zero gate voltage collector current	I _{CES}	—	—	100	μA	V _{CE} = 1200 V, 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)}	3.5	5.0	7.0	V	V _{CE} = 10V, I _C = 1 mA
Collector to emitter saturation voltage	V _{CE(sat)}	—	1.8	2.3	V	I _C = 30 A, V _{GE} = 15V ^{Note2}
		—	2.3	—	V	I _C = 55 A, V _{GE} = 15V ^{Note2}
Input capacitance	C _{ies}	—	2520	—	pF	V _{CE} = 25 V
Output capacitance	C _{oes}	—	50	—	pF	V _{GE} = 0 V
Reverse transfer capacitance	C _{res}	—	40	—	pF	f = 1 MHz
Switching time	t _{d(on)}	—	51	—	ns	I _C = 30 A
	t _r	—	65	—	ns	V _{CE} = 600 V, V _{GE} = 15 V
	t _{d(off)}	—	134	—	ns	R _g = 5 Ω ^{Note2}
	t _f	—	275	—	ns	Resistive Load
C-E diode forward voltage	V _F	—	3.0	3.9	V	I _F = 10 A ^{Note2}

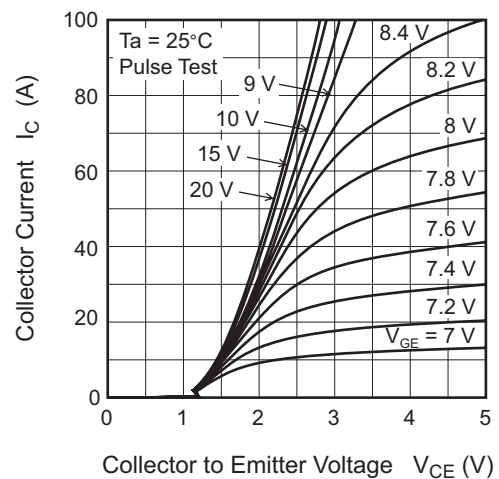
Notes: 2. Pulse test

Main Characteristics

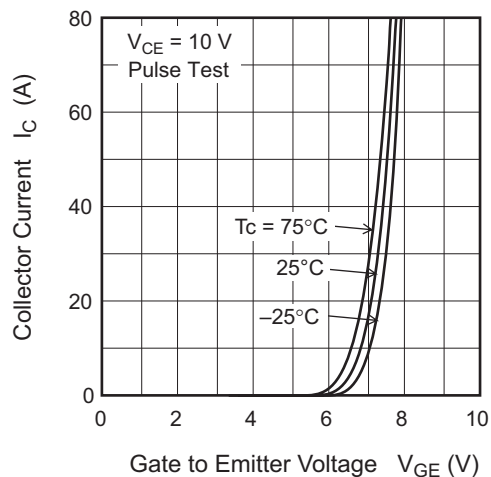
Maximum Safe Operation Area



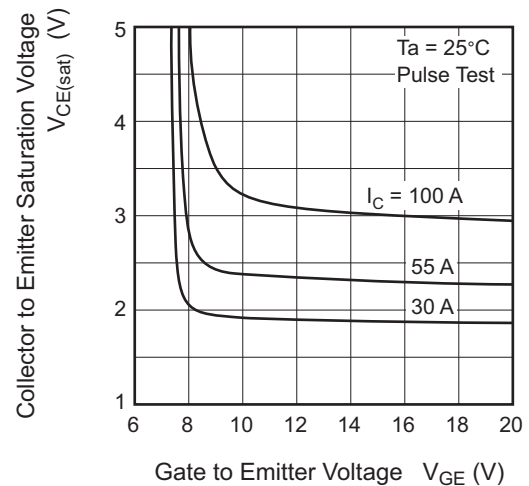
Typical Output Characteristics



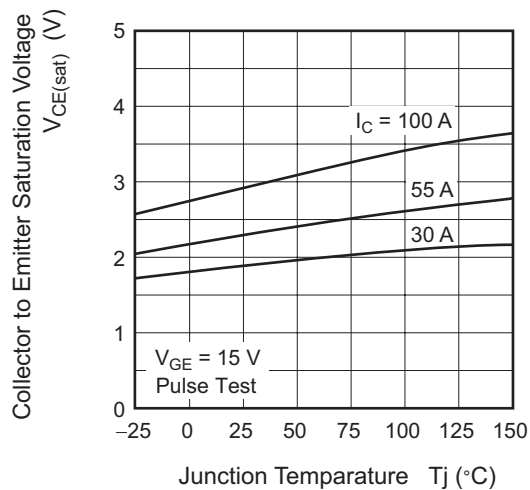
Typical Transfer Characteristics



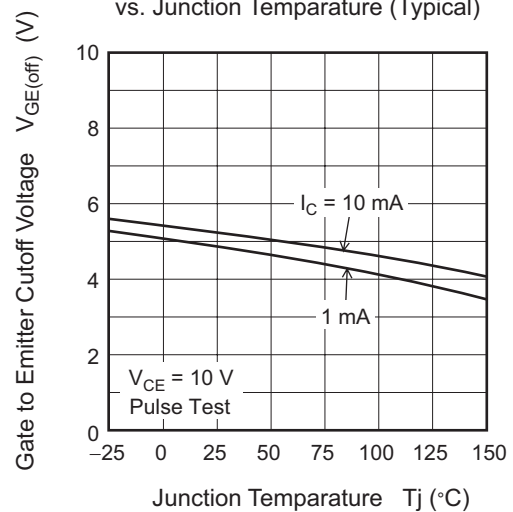
Collector to Emitter Saturation Voltage vs. Gate to Emitter Voltage (Typical)



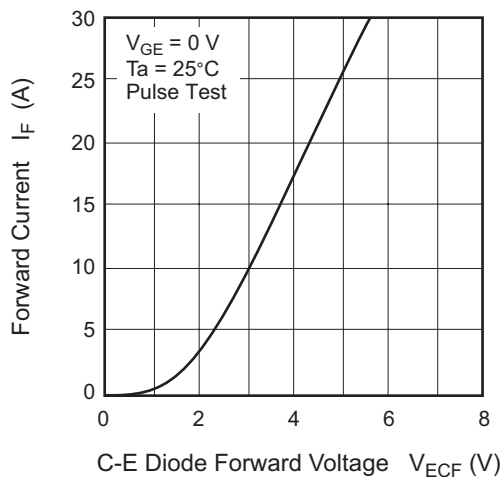
Collector to Emitter Saturation Voltage vs. Junction Temperature (Typical)



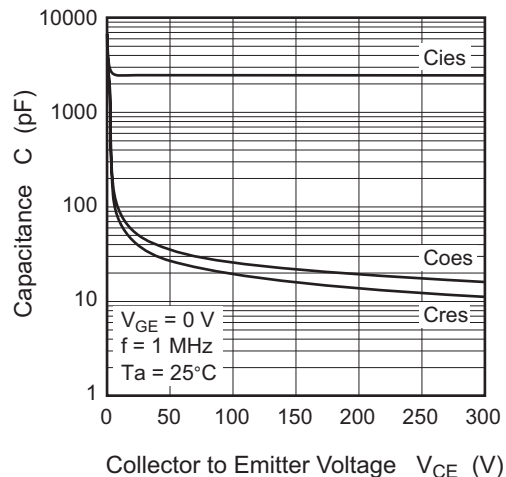
Gate to Emitter Cutoff Voltage vs. Junction Temperature (Typical)



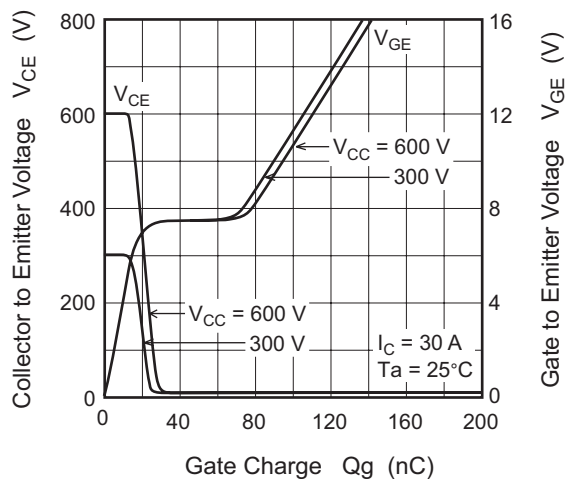
Forward Current vs. Forward Voltage (Typical)



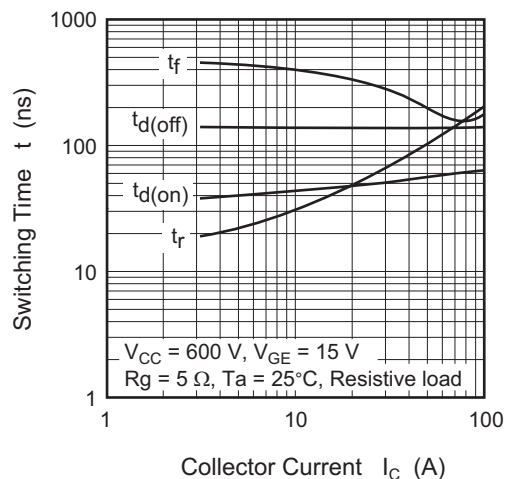
Typical Capacitance vs. Collector to Emitter Voltage



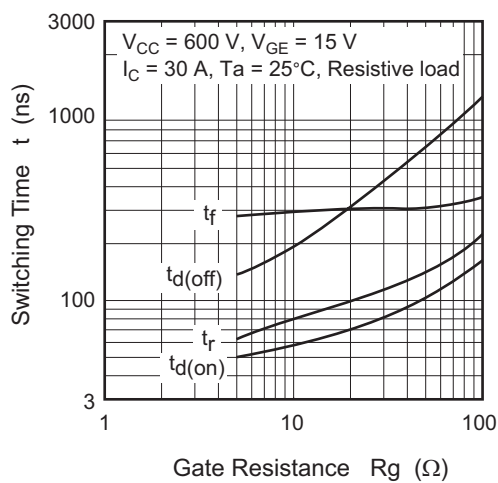
Dynamic Input Characteristics (Typical)



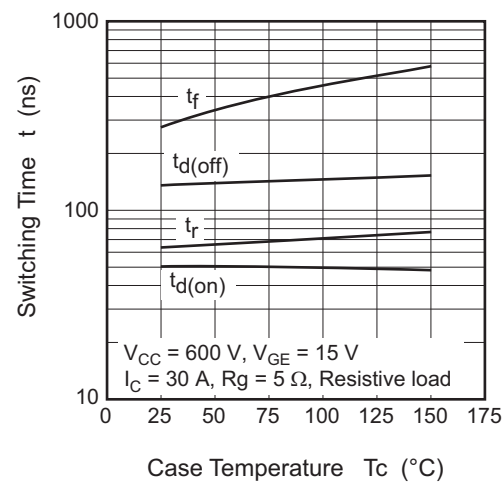
Switching Characteristics (Typical) (1)

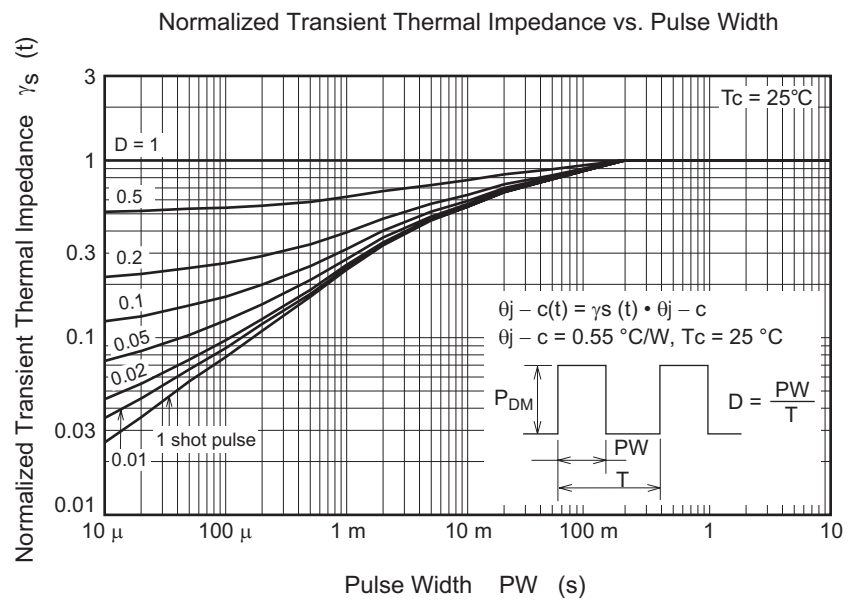


Switching Characteristics (Typical) (2)

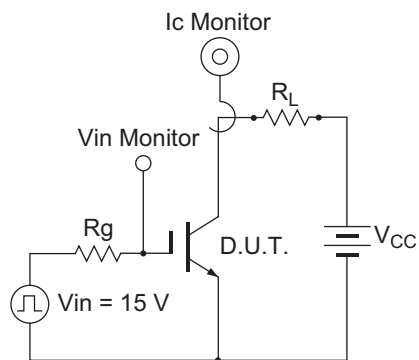


Switching Characteristics (Typical) (3)

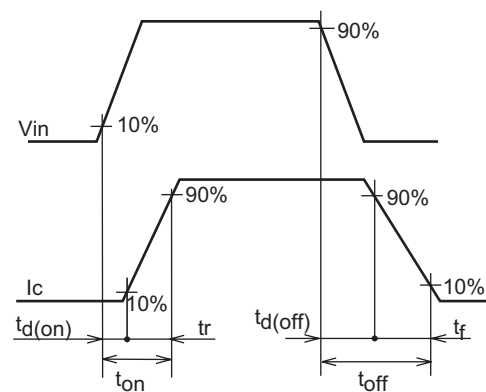




Switching Time Test Circuit



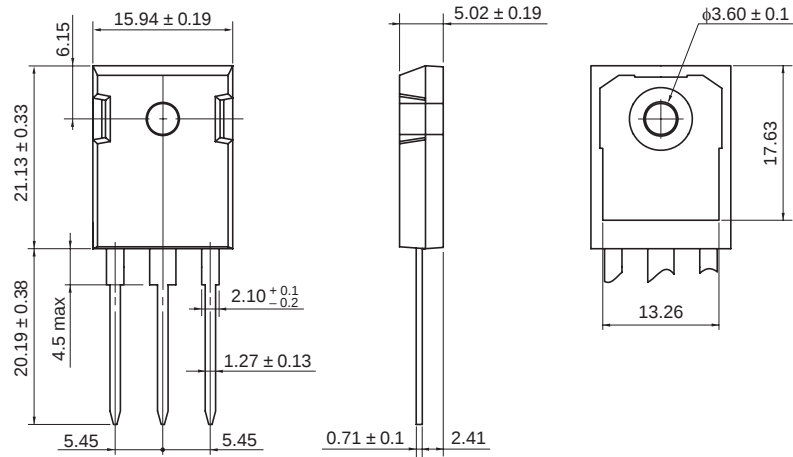
Waveform



Package Dimensions

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
TO-247	—	PRSS0003ZE-A	—	6.0g

Unit: mm



Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJH1CF6RDPQ-80-T2	450 pcs	Box (Tube)

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