

# RJH60F4DPK

Silicon N Channel IGBT  
High Speed Power Switching

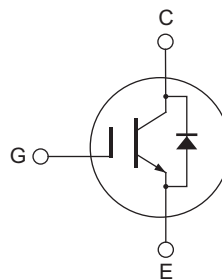
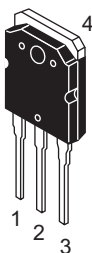
REJ03G1835-0100  
Rev.1.00  
Oct 13, 2009

## Features

- High speed switching
- Low on-state voltage
- Fast recovery diode

## Outline

RENESAS Package code: PRSS0004ZE-A  
(Package name: TO-3P)



1. Gate
2. Collector
3. Emitter
4. Collector (Flange)

## Absolute Maximum Ratings

(T<sub>c</sub> = 25°C)

Item	Symbol	Ratings	Unit
Collector to emitter voltage	V <sub>CES</sub>	600	V
Gate to emitter voltage	V <sub>GES</sub>	±30	V
Collector current	I <sub>c</sub> <sup>Note1</sup>	T <sub>c</sub> = 25 °C	60
		T <sub>c</sub> = 100 °C	30
Collector peak current	i <sub>c(peak)</sub> <sup>Note1</sup>	120	A
Collector to emitter diode forward peak current	i <sub>DF(peak)</sub> <sup>Note2</sup>	100	A
Collector dissipation	P <sub>C</sub>	235.8	W
Junction to case thermal impedance	θ <sub>j-c</sub>	0.53	°C/W
Junction temperature	T <sub>j</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

Notes: 1. Pulse width limited by safe operating area.

2. PW ≤ 5 μs, duty cycle ≤ 1%

## Electrical Characteristics

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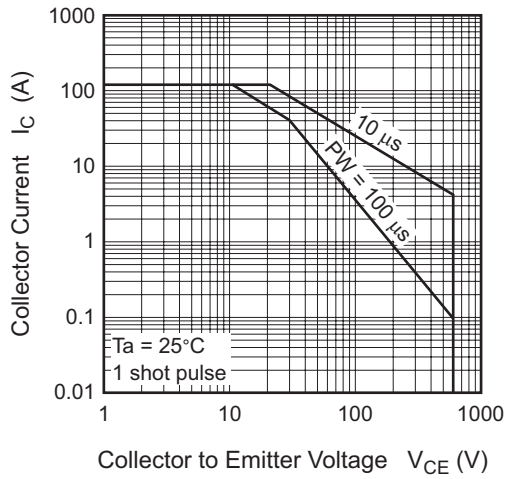
(T<sub>j</sub> = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Zero gate voltage collector current	I <sub>CEs</sub>	—	—	100	μA	V <sub>CE</sub> = 600V, V <sub>GE</sub> = 0
Gate to emitter leak current	I <sub>GES</sub>	—	—	±1	μA	V <sub>GE</sub> = ±30 V, V <sub>CE</sub> = 0
Gate to emitter cutoff voltage	V <sub>GE(off)</sub>	4	—	8	V	V <sub>CE</sub> = 10V, I <sub>C</sub> = 1 mA
Collector to emitter saturation voltage	V <sub>CE(sat)</sub>	—	1.4	1.82	V	I <sub>C</sub> = 30 A, V <sub>GE</sub> = 15V <sup>Note3</sup>
	V <sub>CE(sat)</sub>	—	1.7	—	V	I <sub>C</sub> = 60 A, V <sub>GE</sub> = 15V <sup>Note3</sup>
Input capacitance	C <sub>ies</sub>	—	1945	—	pF	V <sub>CE</sub> = 25 V
Output capacitance	C <sub>oes</sub>	—	93	—	pF	V <sub>GE</sub> = 0 V
Reverse transfer capacitance	C <sub>res</sub>	—	33	—	pF	f = 1 MHz
Switching time	t <sub>d(on)</sub>	—	30	—	ns	I <sub>C</sub> = 30 A, Resistive Load V <sub>CC</sub> = 300V V <sub>GE</sub> = 15V R <sub>g</sub> = 5 Ω <sup>Note3</sup>
	t <sub>r</sub>	—	32	—	ns	
	t <sub>d(off)</sub>	—	65	—	ns	
	t <sub>f</sub>	—	80	—	ns	
C-E diode forward voltage	V <sub>ECF1</sub>	—	1.6	2.1	V	I <sub>F</sub> = 20 A <sup>Note3</sup>
	V <sub>ECF2</sub>	—	1.8	—	V	I <sub>F</sub> = 40 A <sup>Note3</sup>
C-E diode reverse recovery time	t <sub>rr</sub>	—	140	—	ns	I <sub>F</sub> = 20 A di <sub>F</sub> /dt = 100 A/μs

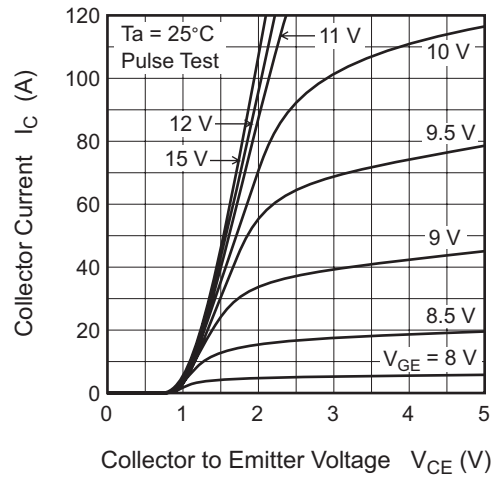
Notes: 3. Pulse test

Main Characteristics

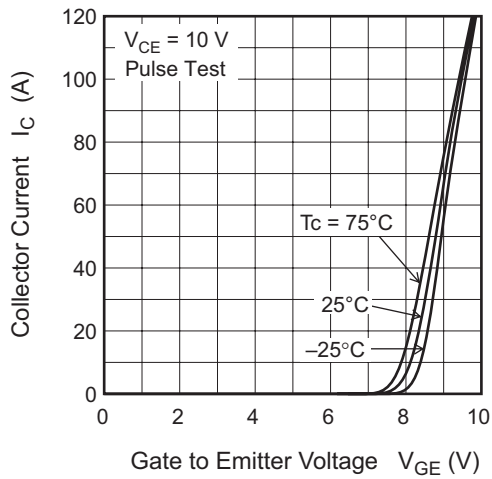
Maximum Safe Operation Area



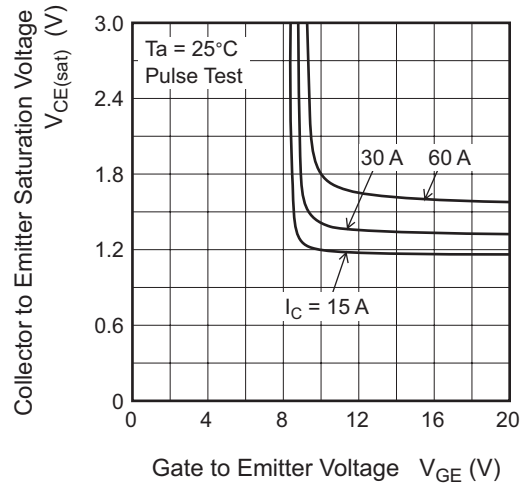
Typical Output Characteristics



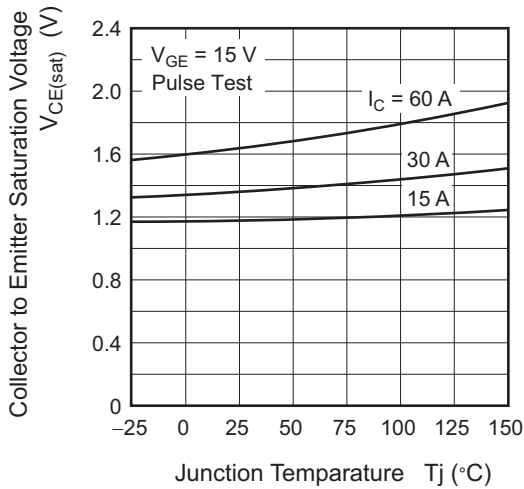
Typical Transfer Characteristics



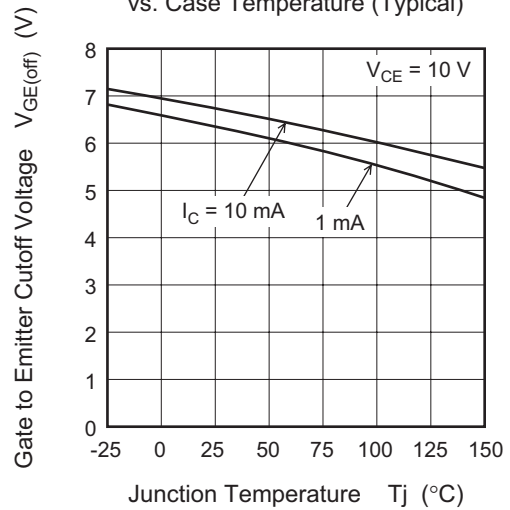
Collector to Emitter Saturation Voltage vs. Gate to Emitter Voltage (Typical)



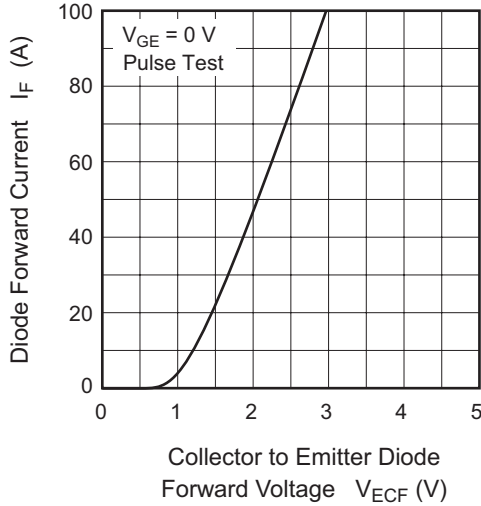
Collector to Emitter Saturation Voltage vs. Junction Temperature (Typical)



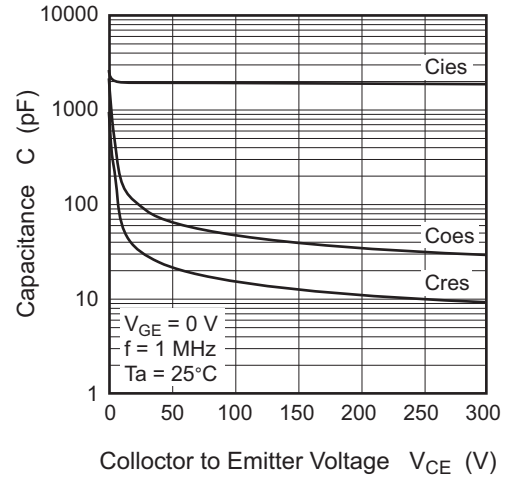
Gate to Emitter Cutoff Voltage vs. Case Temperature (Typical)



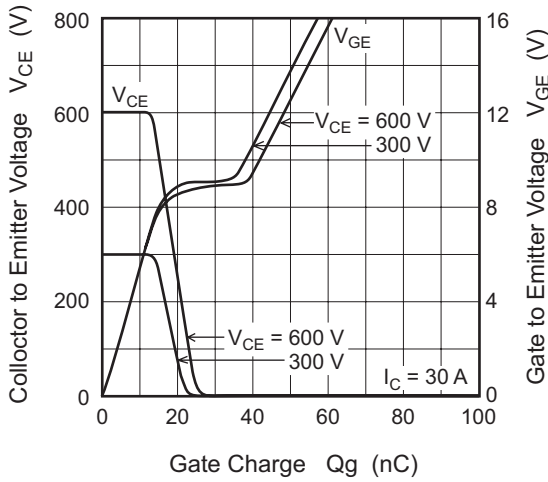
Collector to Emitter Diode Forward Voltage vs. Diode Forward Current Characteristics (Typical)



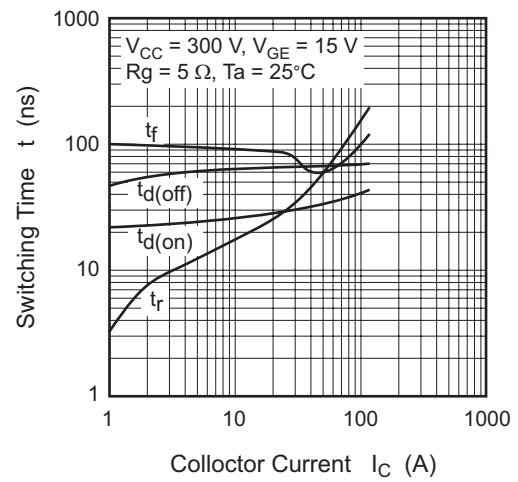
Typical Capacitance vs. Collector to Emitter Voltage



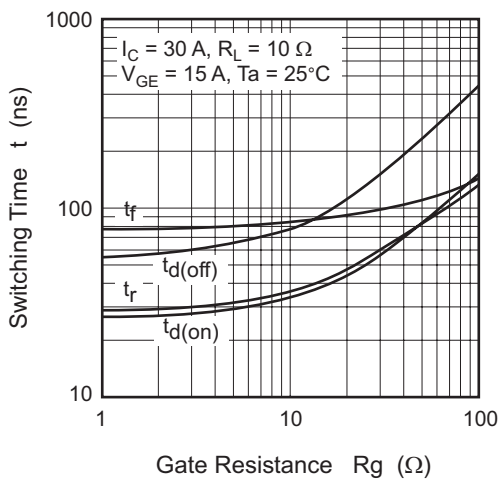
Dynamic Input Characteristics (Typical)



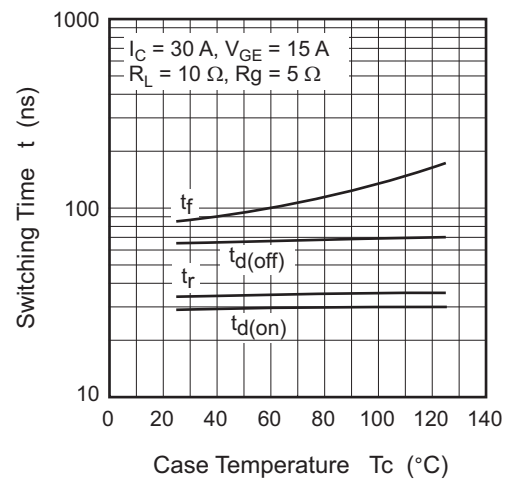
Switching Characteristics (Typical) (1)

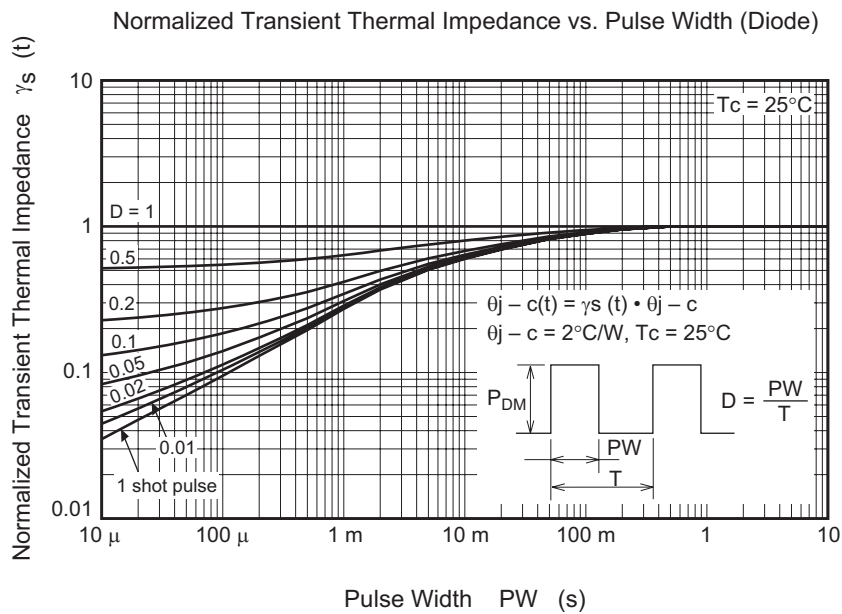
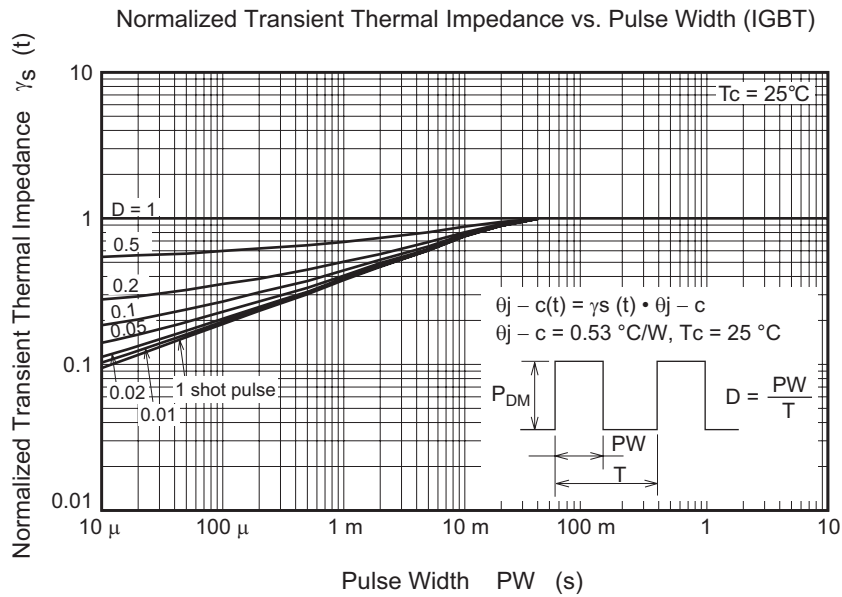


Switching Characteristics (Typical) (2)

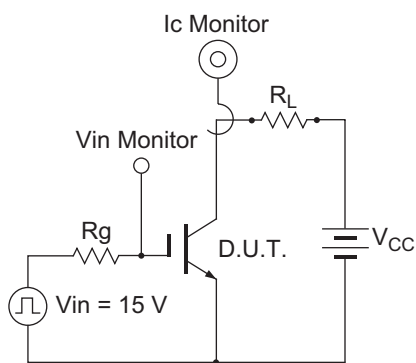


Switching Characteristics (Typical) (3)

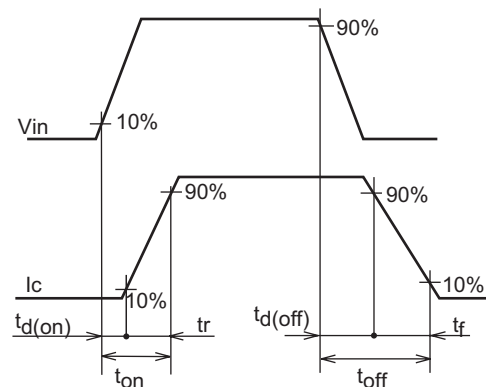




Switching Time Test Circuit

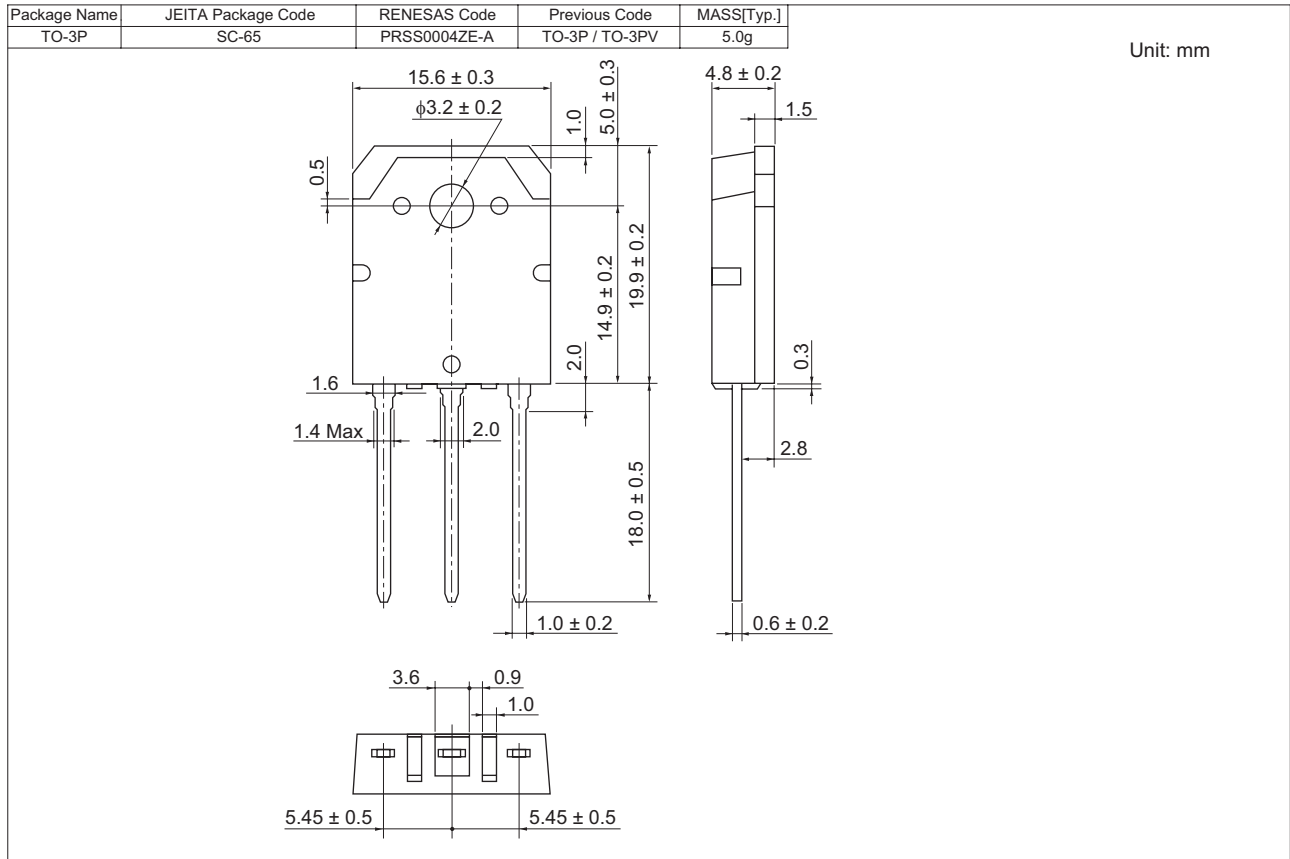


Waveform



Package Dimensions

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Ordering Information

Part No.	Quantity	Shipping Container
RJH60F4DPK-00-T0	360 pcs	Box (Tube)

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