

RJP30E3DPK-M0

Silicon N Channel IGBT
High Speed Power Switching

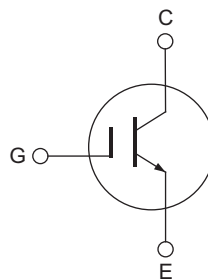
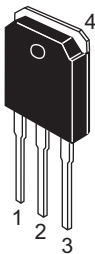
R07DS0352EJ0200
Rev.2.00
Apr 15, 2011

Features

- Trench gate technology (G5H series)
- Low collector to emitter saturation voltage $V_{CE(sat)} = 1.6 \text{ V typ}$
- High speed switching $t_f = 150 \text{ ns typ}$
- Low leak current $I_{CES} = 1 \mu\text{A max}$

Outline

RENESAS Package code: PRSS0004ZH-A
(Package name: TO-3PSG)



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

Absolute Maximum Ratings

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

Item	Symbol	Ratings	Unit
Collector to Emitter voltage	V_{CES}	360	V
Gate to Emitter voltage	V_{GES}	± 30	V
Collector current	I_C	40	A
Collector peak current	$i_{c(peak)}$ ^{Note1}	250	A
Collector dissipation	P_C ^{Note2}	60	W
Junction to case thermal impedance	θ_{j-c}	2.08	$^\circ\text{C}/\text{W}$
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. $T_c = 25^\circ\text{C}$

Electrical Characteristics

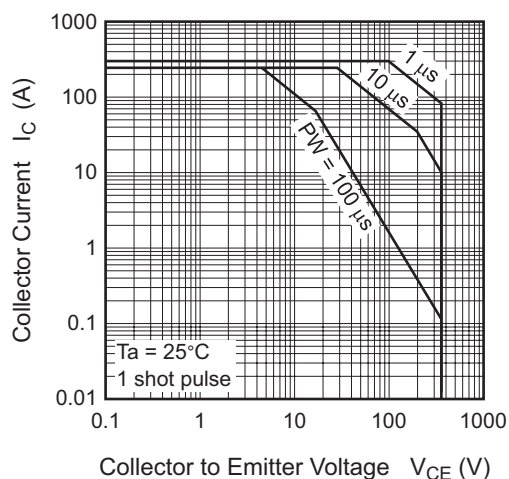
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Zero gate voltage collector current	I_{CES}	—	—	1	μA	$V_{CE} = 360 V, V_{GE} = 0$
Gate to emitter leak current	I_{GES}	—	—	± 100	nA	$V_{GE} = \pm 30 V, V_{CE} = 0$
Gate to emitter cutoff voltage	$V_{GE(off)}$	2.5	—	5	V	$V_{CE} = 10 V, I_C = 1 mA$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	1.6	2.1	V	$I_C = 40 A, V_{GE} = 15 V$ ^{Note3}
Input capacitance	C_{ies}	—	1700	—	pF	$V_{CE} = 25 V$ $V_{GE} = 0$ $f = 1 MHz$
Output capacitance	C_{oes}	—	85	—	pF	
Reveres transfer capacitance	C_{res}	—	40	—	pF	
Total gate charge	Q_g	—	52	—	nC	$V_{GE} = 15 V$ $V_{CE} = 150 V$ $I_C = 40 A$
Gate to emitter charge	Q_{ge}	—	9	—	nC	
Gate to collector charge	Q_{gc}	—	15	—	nC	
Switching time	$t_{d(on)}$	—	0.04	—	μs	$I_C = 40 A$ $R_L = 4 \Omega$ $V_{GE} = 15 V$ $R_G = 5 \Omega$
	t_r	—	0.12	—	μs	
	$t_{d(off)}$	—	0.09	—	μs	
	t_f	—	0.15	—	μs	

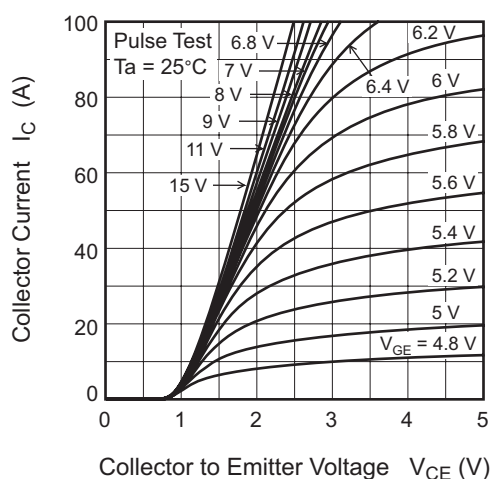
Notes: 3. Pulse test.

Main Characteristics

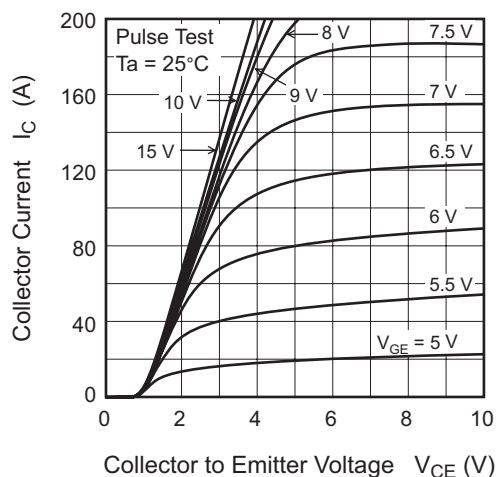
Maximum Safe Operation Area



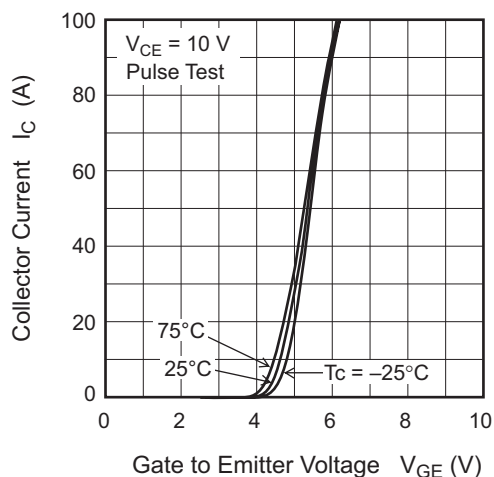
Typical Output Characteristics (1)



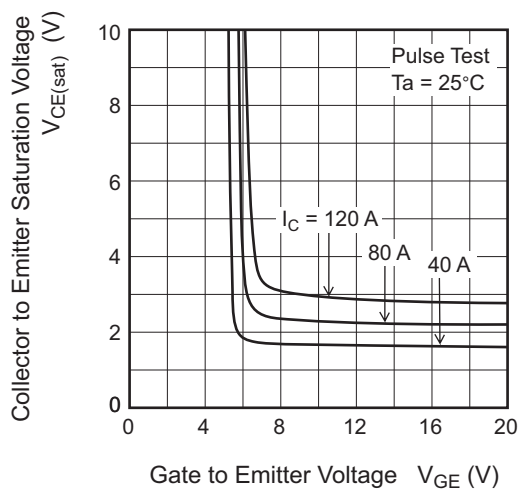
Typical Output Characteristics (2)



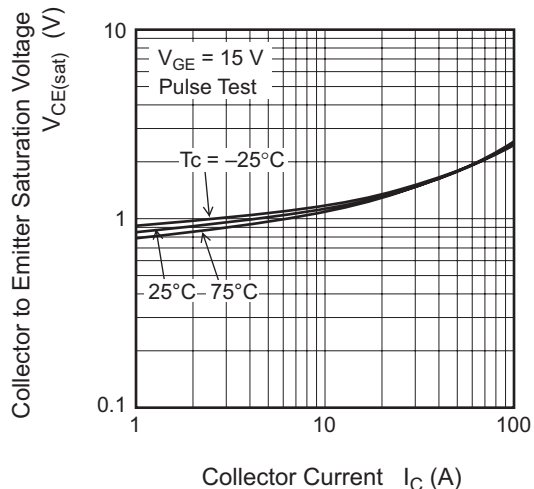
Typical Transfer Characteristics

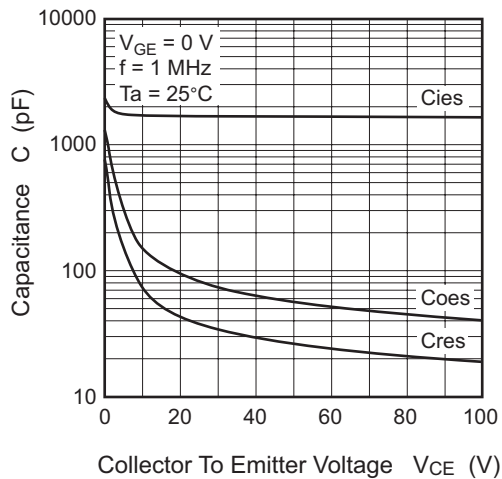


Collector to Emitter Saturation Voltage vs. Gate to Emitter Voltage (Typical)

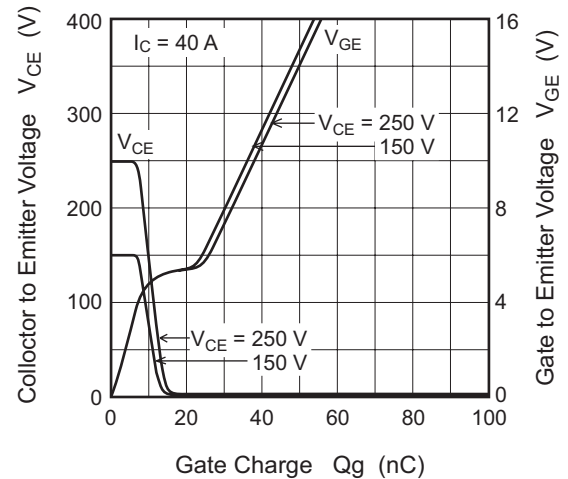


Collector to Emitter Saturation Voltage vs. Collector Current (Typical)

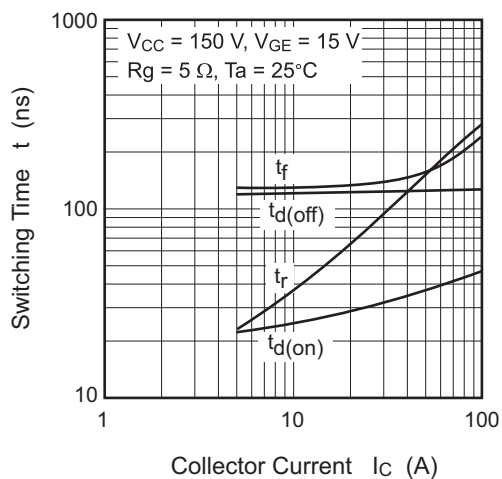


Typical Capacitance vs.
Collector To Emitter Voltage

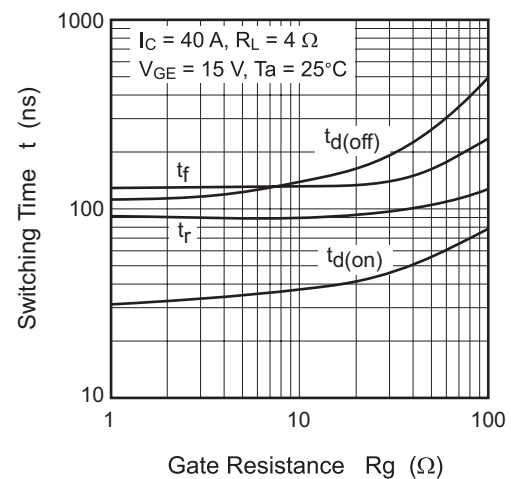
Dynamic Input Characteristics (Typical)



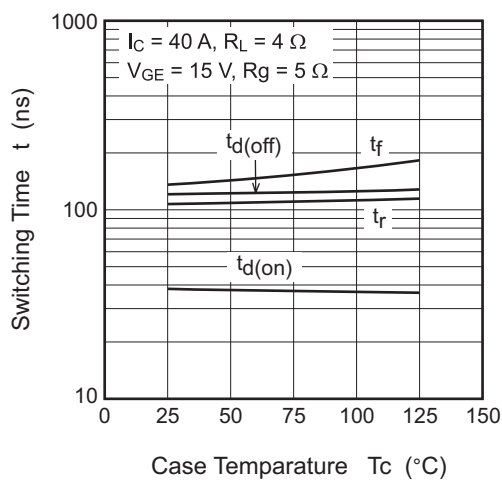
Switching Characteristics (Typical) (1)



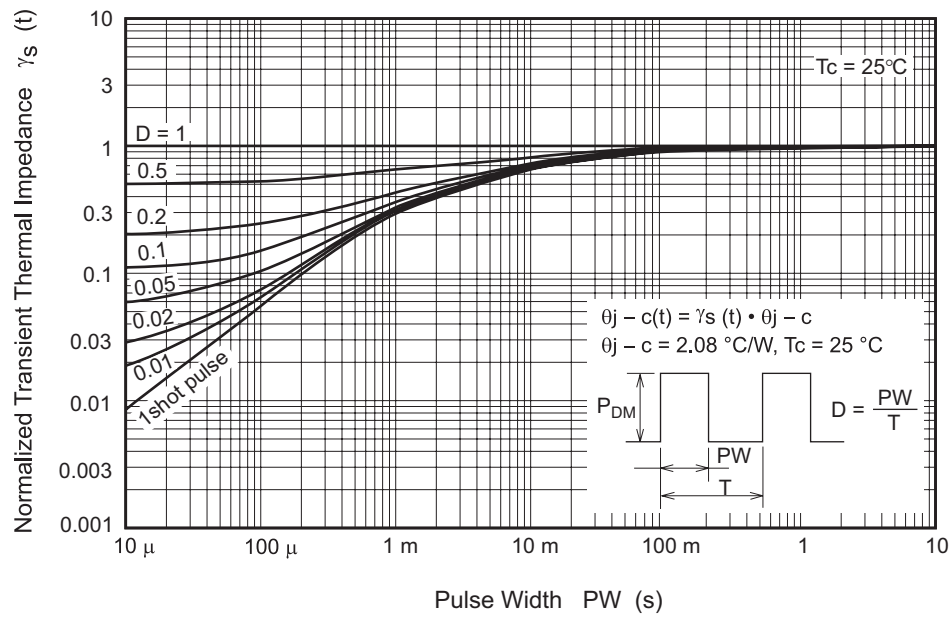
Switching Characteristics (Typical) (2)



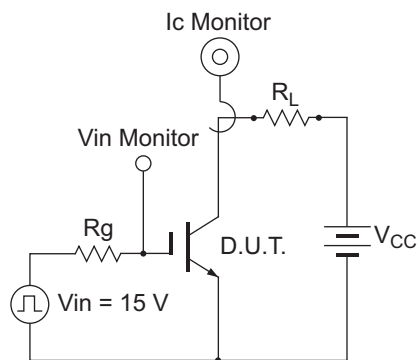
Switching Characteristics (Typical) (3)



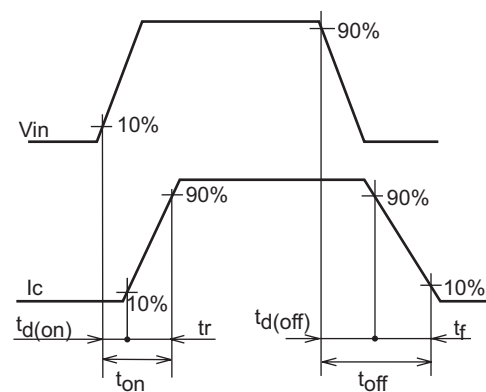
Normalized Transient Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



Waveform



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