

RJH60A01RDPD-A0

600V - 5A - IGBT

Application: Inverter

R07DS1091EJ0200

Rev.2.00

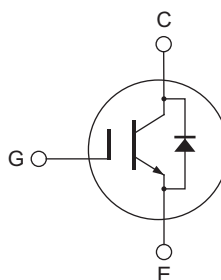
Mar 24, 2015

Features

- Reverse conducting IGBT with monolithic diode
- Short circuit withstand time (5 μ s typ.)
- Low collector to emitter saturation voltage
 $V_{CE(sat)} = 1.9$ V typ. (at $I_C = 5$ A, $V_{GE} = 15$ V, $T_a = 25^\circ\text{C}$)
- Built-in fast recovery diode ($t_{rr} = 100$ ns typ.) in one package
- Trench gate and thin wafer technology
- High speed switching
 $t_f = 85$ ns typ. (at $V_{CC} = 300$ V, $V_{GE} = 15$ V, $I_C = 5$ A, $R_g = 5$ Ω , $T_a = 25^\circ\text{C}$, inductive load)

Outline

RENESAS Package code: PRSS0004ZK-A
(Package name : TO-252A)



1. Gate
2. Collector
3. Emitter
4. Collector

Absolute Maximum Ratings

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

Item	Symbol	Ratings	Unit
Collector to emitter voltage / diode reverse voltage	V_{CES} / V_R	600	V
Gate to emitter voltage	V_{GES}	± 30	V
Collector current	$T_C = 25^\circ\text{C}$	I_C	10
	$T_C = 100^\circ\text{C}$	I_C	5
Collector peak current	$I_{C(peak)}$ ^{Note1}	15	A
Collector to emitter diode forward current	I_{DF}	5	A
Collector to emitter diode forward peak current	$I_{DF(peak)}$ ^{Note1}	15	A
Collector dissipation	P_C ^{Note2}	29.4	W
Junction to case thermal resistance	θ_{j-c} ^{Note2}	4.25	$^\circ\text{C}/\text{W}$
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

Notes: 1. $PW \leq 10$ μ s, duty cycle $\leq 1\%$

2. Value at $T_C = 25^\circ\text{C}$

Electrical Characteristics

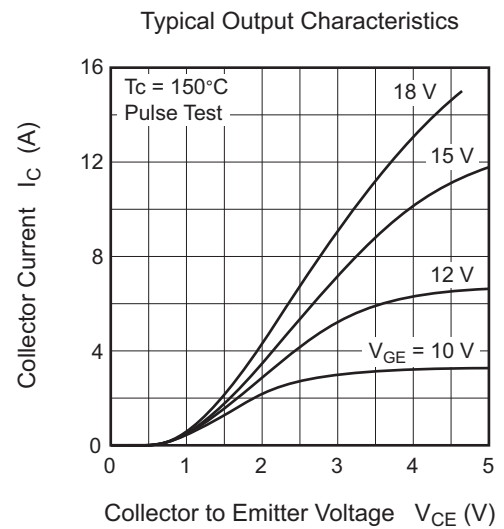
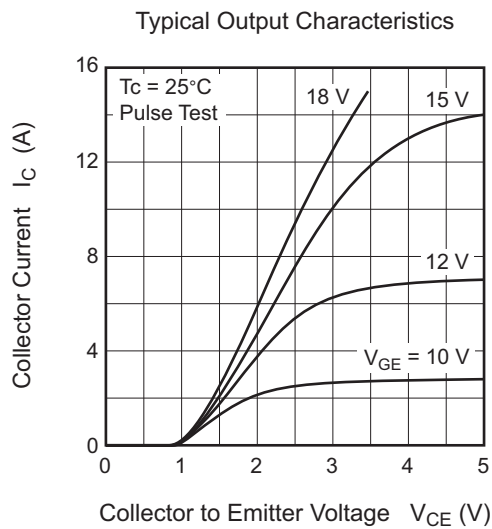
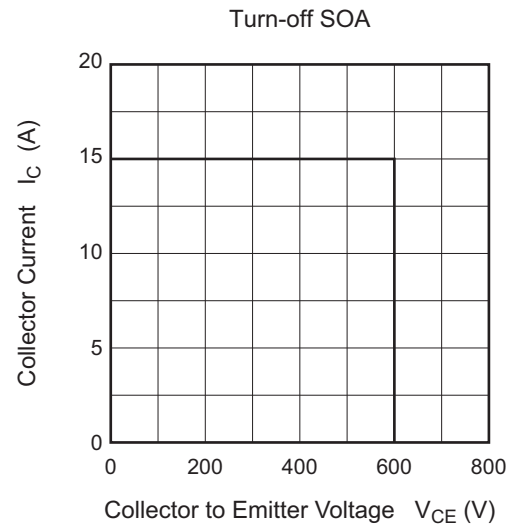
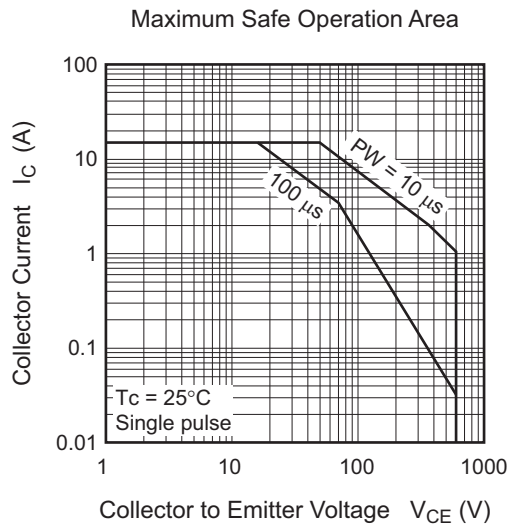
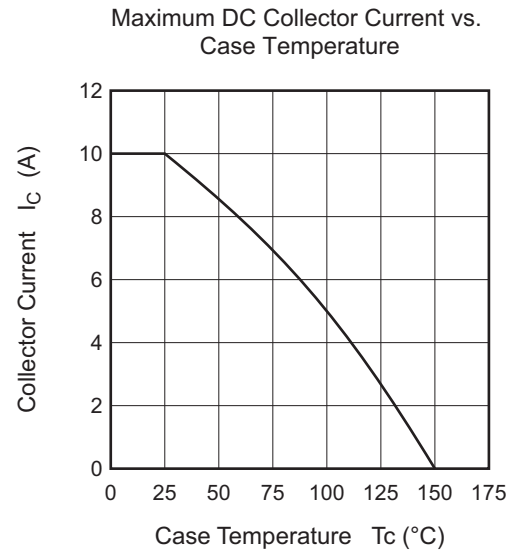
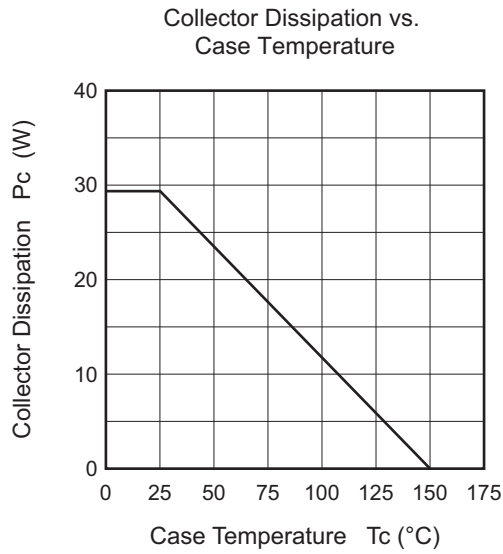
(Ta = 25°C)

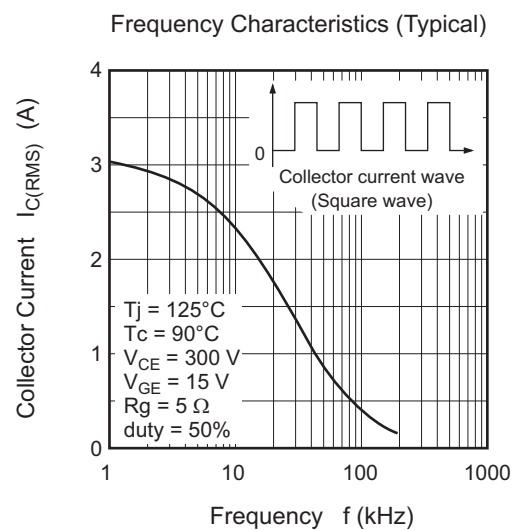
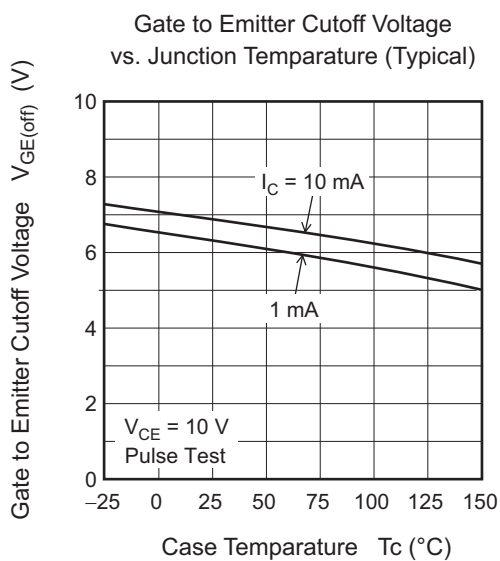
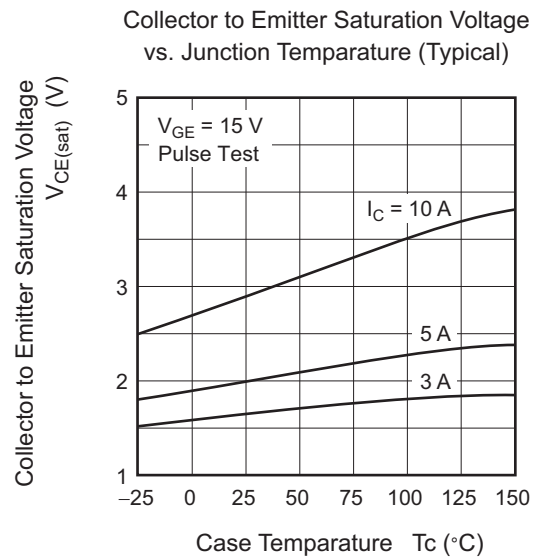
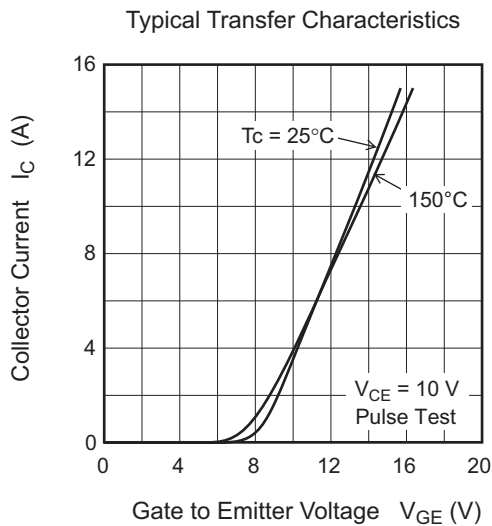
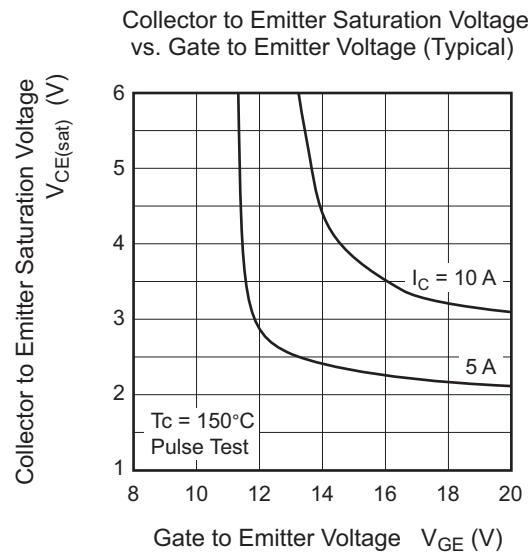
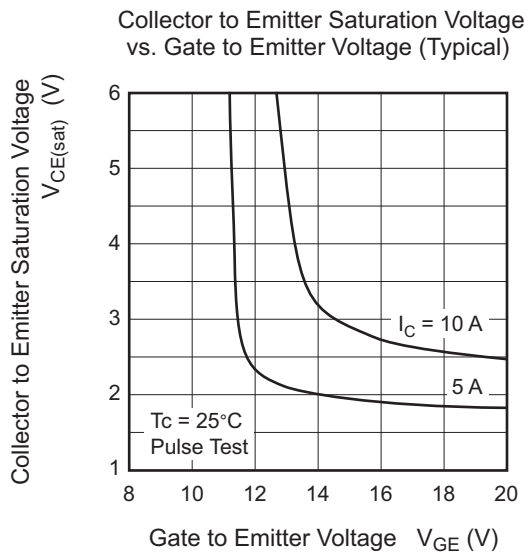
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Zero gate voltage collector current / diode reverse current	I_{CES} / I_R	—	—	1	μA	$V_{CE} = 600 V, V_{GE} = 0 V$
Gate to emitter leak current	I_{GES}	—	—	± 100	nA	$V_{GE} = \pm 30 V, V_{CE} = 0 V$
Gate to emitter cutoff voltage	$V_{GE(off)}$	4.5	—	7.5	V	$V_{CE} = 10 V, I_C = 1 mA$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	1.9	2.3	V	$I_C = 5 A, V_{GE} = 15 V$ Note3
	$V_{CE(sat)}$	—	2.8	—	V	$I_C = 10 A, V_{GE} = 15 V$ Note3
Input capacitance	C_{ies}	—	160	—	pF	$V_{CE} = 25 V$ $V_{GE} = 0 V$ $f = 1 MHz$
Output capacitance	C_{oes}	—	12	—	pF	
Reveres transfer capacitance	C_{res}	—	6	—	pF	
Total gate charge	Q_g	—	11	—	nC	$V_{GE} = 15 V$ $V_{CE} = 300 V$ $I_C = 5 A$
Gate to emitter charge	Q_{ge}	—	2.5	—	nC	
Gate to collector charge	Q_{gc}	—	6.7	—	nC	
Turn-on delay time	$t_{d(on)}$	—	30	—	ns	$V_{CC} = 300 V$ $V_{GE} = 15 V$ $I_C = 5 A,$ $R_g = 5 \Omega$ Inductive load
Rise time	t_r	—	10	—	ns	
Turn-off delay time	$t_{d(off)}$	—	40	—	ns	
Fall time	t_f	—	85	—	ns	
Turn-on energy	E_{on}	—	0.13	—	mJ	
Turn-off energy	E_{off}	—	0.07	—	mJ	
Total switching energy	E_{total}	—	0.20	—	mJ	
Short circuit withstand time	t_{sc}	3	5	—	μs	$V_{CE} \leq 360 V, V_{GE} = 15 V$ $T_j = 100^\circ C$

FRD Forward voltage	V_F	—	2.0	—	V	$I_F = 5 A$ Note3
FRD reverse recovery time	t_{rr}	—	100	—	ns	$I_F = 5 A$ $di_F/dt = 100 A/\mu s$
FRD reverse recovery charge	Q_{rr}	—	0.25	—	μC	
FRD peak reverse recovery current	I_{rr}	—	5	—	A	

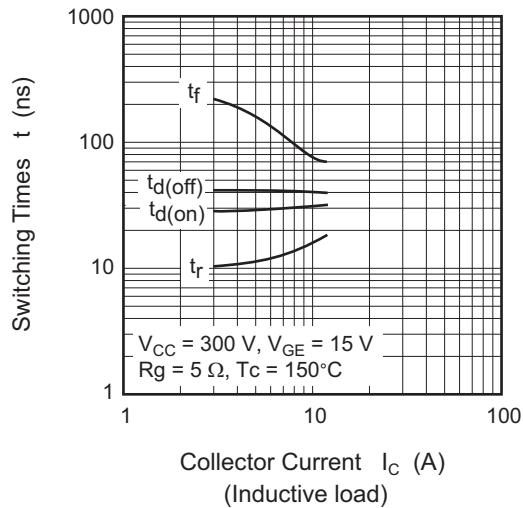
Notes: 3. Pulse test.

Main Characteristics

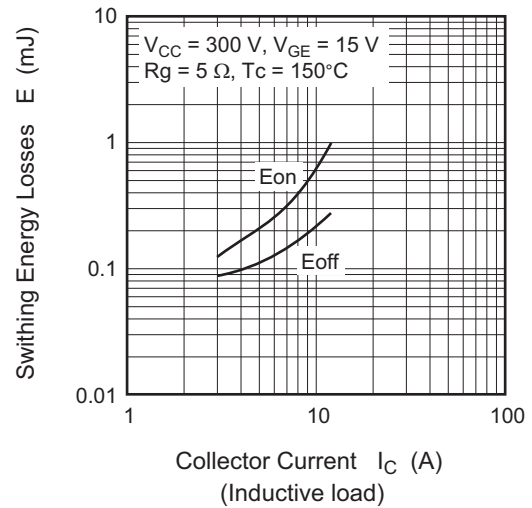




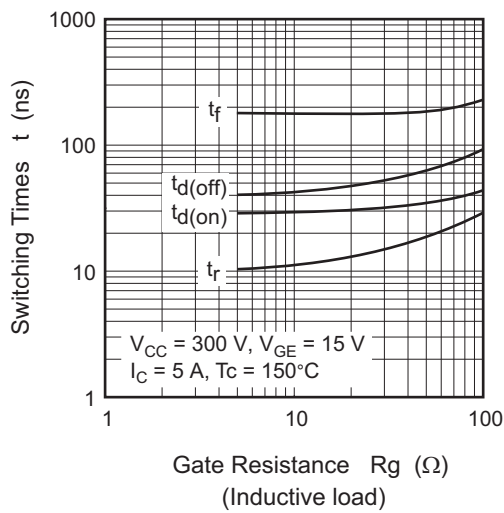
Switching Characteristics (Typical) (1)



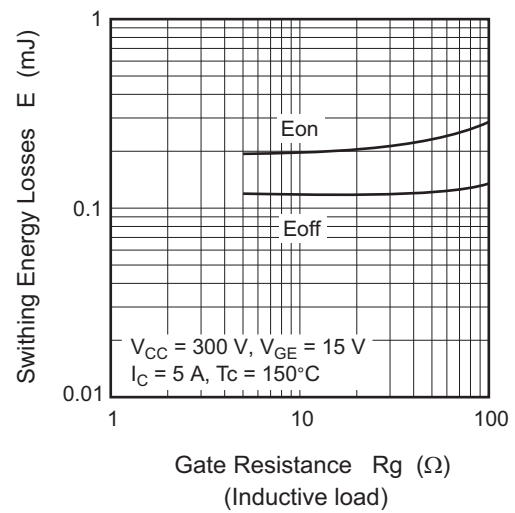
Switching Characteristics (Typical) (2)



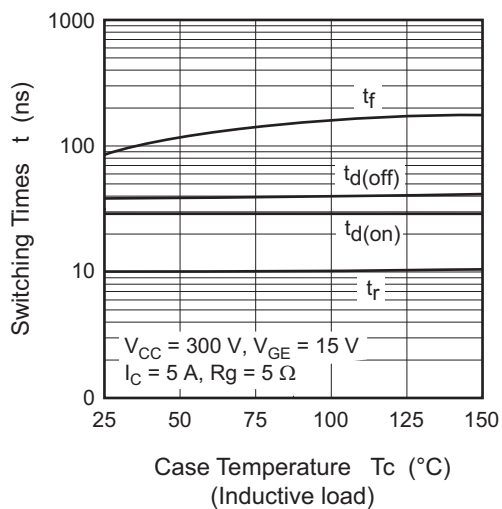
Switching Characteristics (Typical) (3)



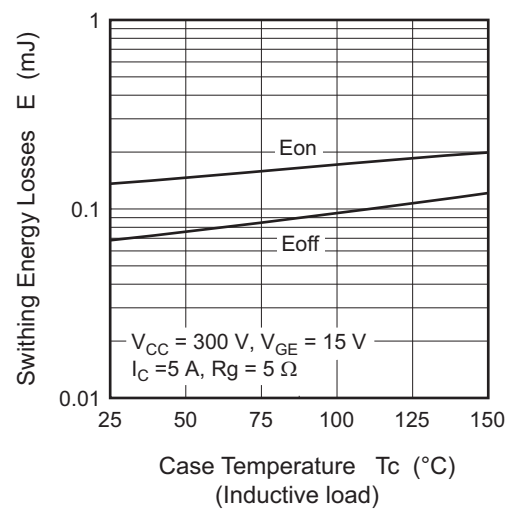
Switching Characteristics (Typical) (4)

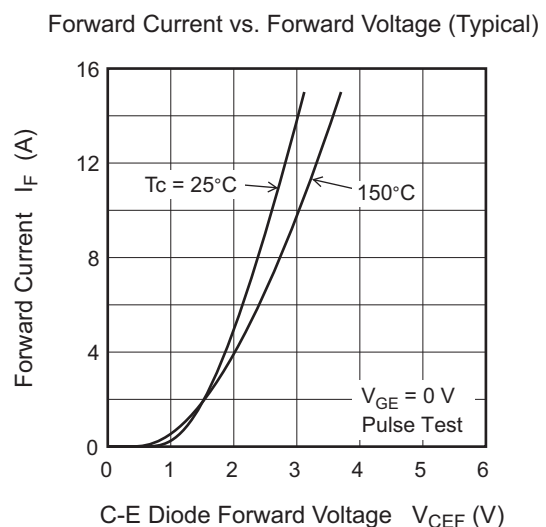
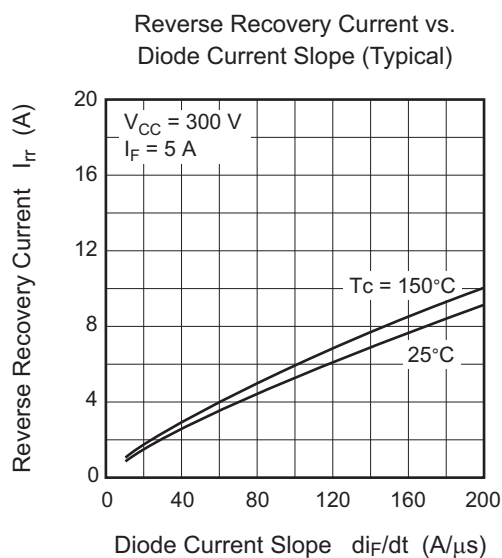
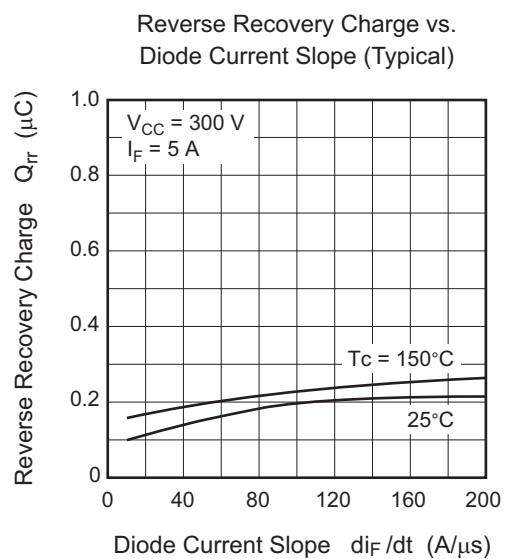
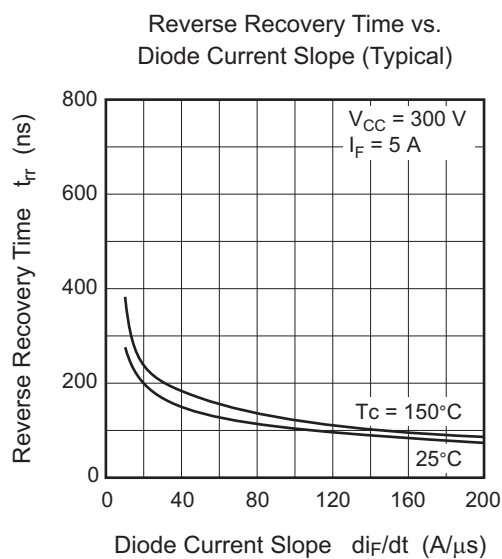
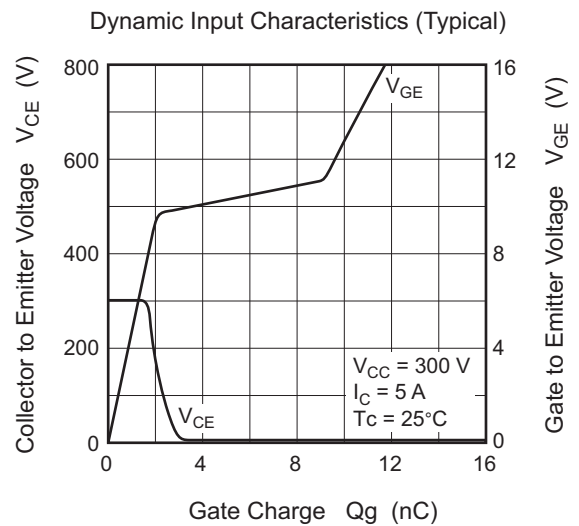
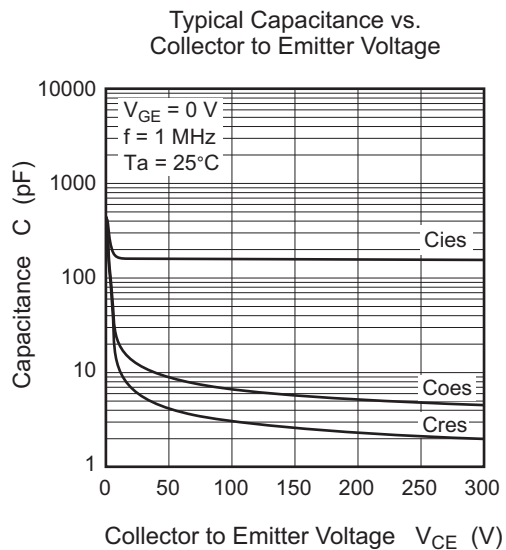


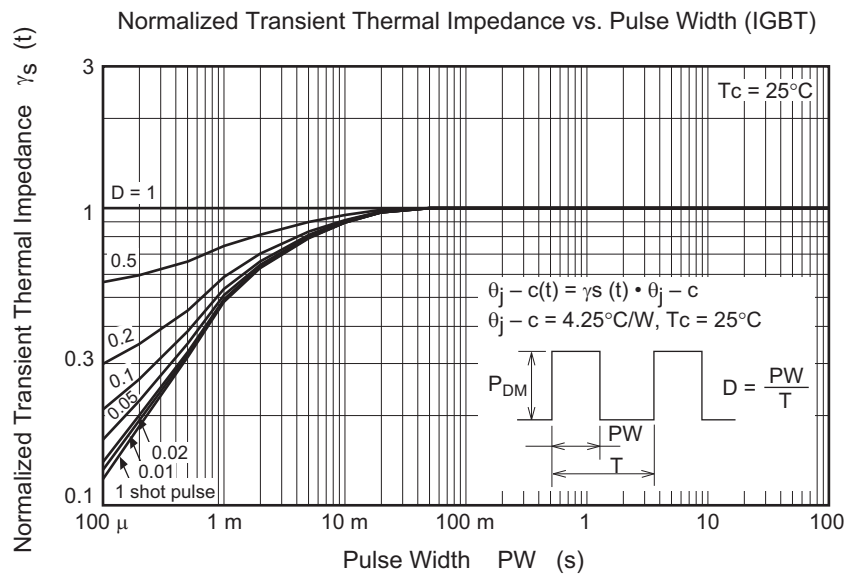
Switching Characteristics (Typical) (5)



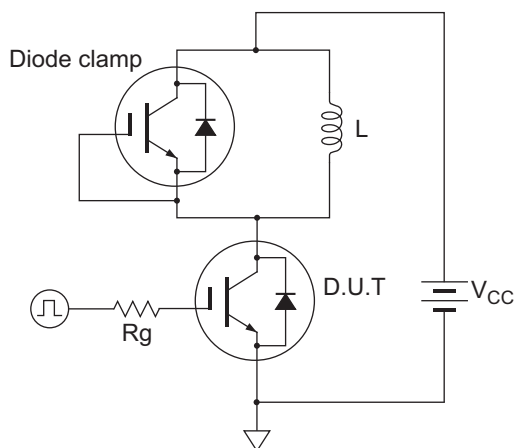
Switching Characteristics (Typical) (6)



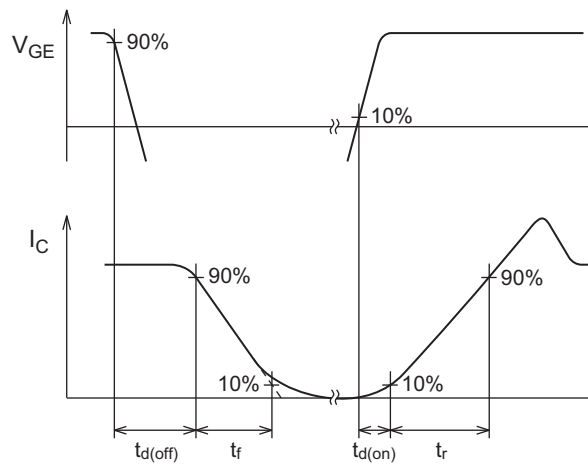




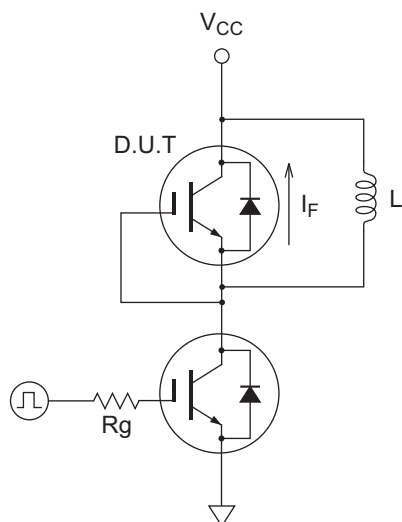
Switching Time Test Circuit



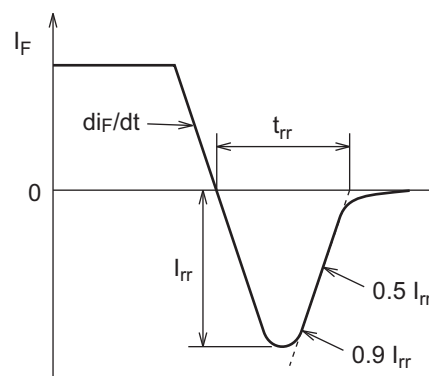
Waveform



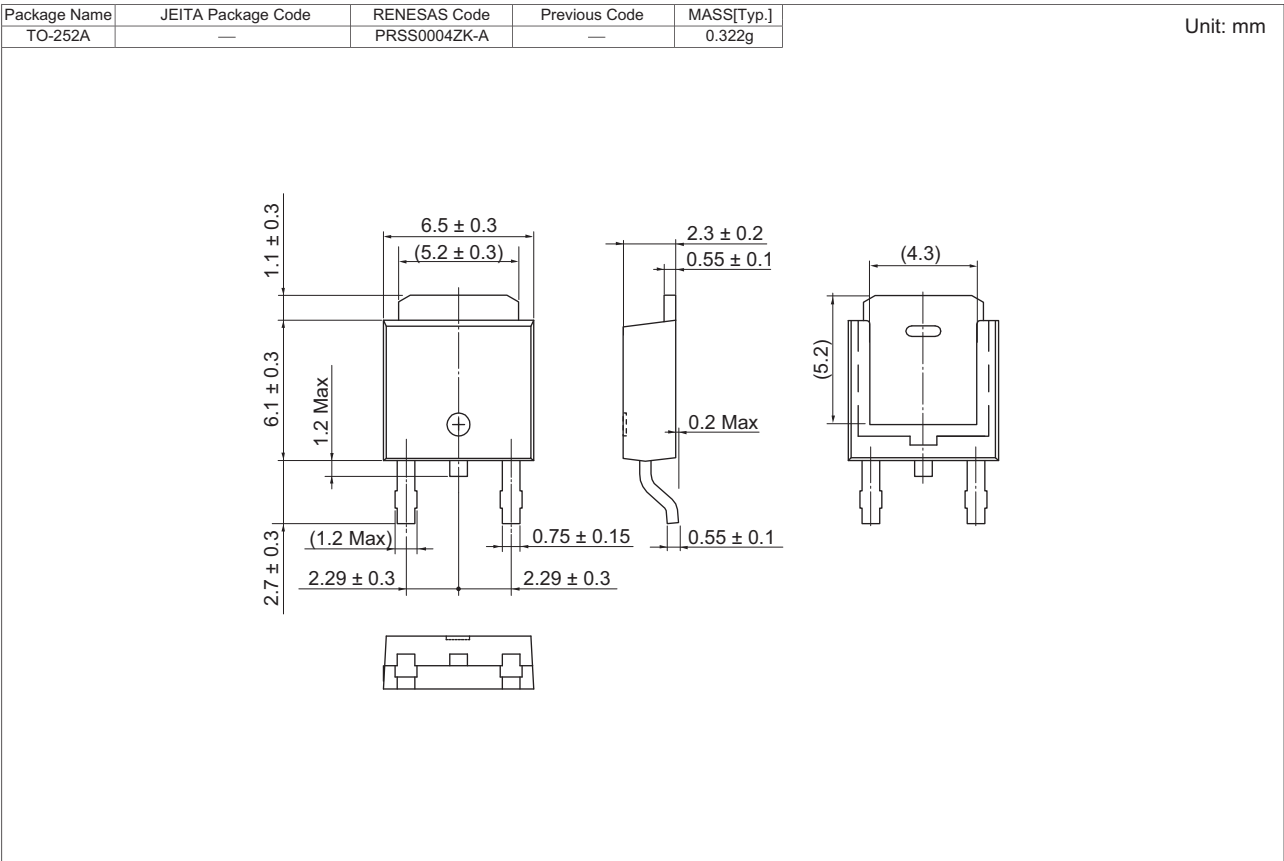
Diode Reverse Recovery Time Test Circuit



Waveform



Package Dimension



Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJH60A01RDPD-A0#J2	3000 pcs	Taping

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Renesas Electronics America Inc.

2801 Scott Boulevard Santa Clara, CA 95050-2549, U.S.A.
Tel: +1-408-588-6000, Fax: +1-408-588-6130

Renesas Electronics Canada Limited

9251 Yonge Street, Suite 8309 Richmond Hill, Ontario Canada L4C 9T3
Tel: +1-905-237-2004

Renesas Electronics Europe Limited

Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K
Tel: +44-1628-585-100, Fax: +44-1628-585-900

Renesas Electronics Europe GmbH

Arcadiastrasse 10, 40472 Düsseldorf, Germany
Tel: +49-214-6503-0, Fax: +49-214-6503-1327

Renesas Electronics (China) Co., Ltd.

Room 1709, Quantum Plaza, No.27 ZhichunLu Haidian District, Beijing 100191, P.R.China
Tel: +86-10-8235-1155, Fax: +86-10-8235-7679

Renesas Electronics (Shanghai) Co., Ltd.

Unit 301, Tower A, Central Towers, 555 Langao Road, Putuo District, Shanghai, P. R. China 200333
Tel: +86-21-2226-0888, Fax: +86-21-2226-0999

Renesas Electronics Hong Kong Limited

Unit 1601-1611, 16/F., Tower 2, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hong Kong
Tel: +852-2265-6688, Fax: +852 2886-9022

Renesas Electronics Taiwan Co., Ltd.

13F, No. 363, Fu Shing North Road, Taipei 10543, Taiwan
Tel: +886-2-8175-9600, Fax: +886 2-8175-9670

Renesas Electronics Singapore Pte. Ltd.

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Renesas Electronics India Pvt. Ltd.

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