

# RJP60D0DPE

Silicon N Channel IGBT  
High Speed Power Switching

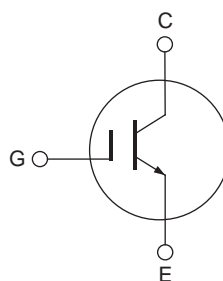
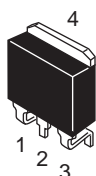
R07DS0172EJ0100  
Rev.1.00  
Nov 15, 2010

## Features

- Short circuit withstand time (5  $\mu$ s typ.)
- Low collector to emitter saturation voltage  
 $V_{CE(sat)} = 1.6$  V typ. ( $I_C = 22$  A,  $V_{GE} = 15$  V,  $T_a = 25^\circ\text{C}$ )
- Gate to emitter voltage rating  $\pm 30$  V
- Pb-free lead plating and chip bonding

## Outline

RENESAS Package code: PRSS0004AE-B  
(Package name: LDPAK (S)-(1) )



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	$V_{CES}$	600	V	
Gate to emitter voltage	$V_{GES}$	$\pm 30$	V	
Collector current	$I_C$	$T_c = 25^\circ\text{C}$	45	A
		$T_c = 100^\circ\text{C}$	22	A
Collector peak current	$i_{c(peak)}$ <sup>Note1</sup>	90	A	
Collector dissipation	$P_C$ <sup>Note2</sup>	122	W	
Junction to case thermal impedance	$\theta_{j-c}$ <sup>Note2</sup>	1.02	$^\circ\text{C}/\text{W}$	
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. Value at  $T_c = 25^\circ\text{C}$

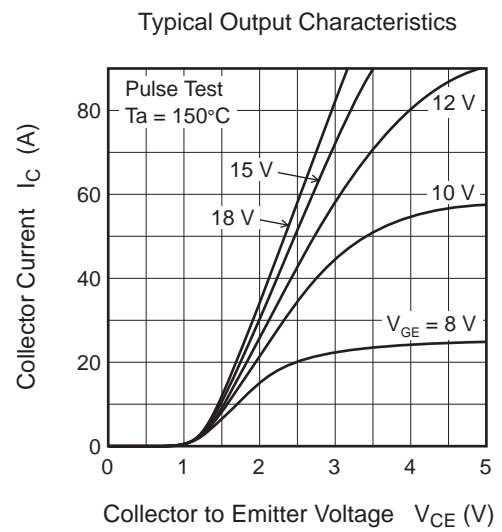
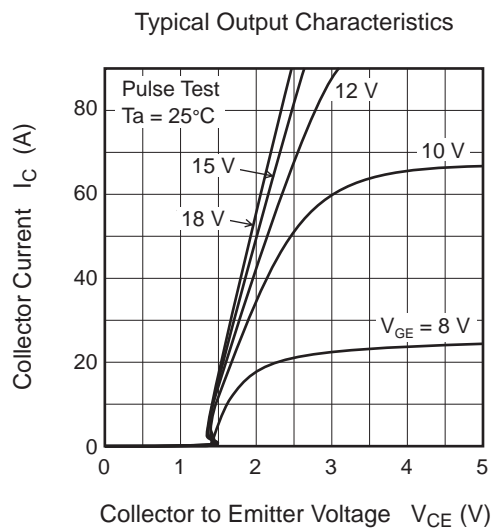
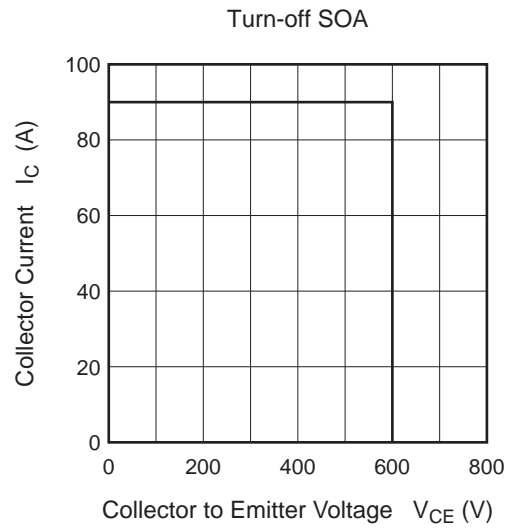
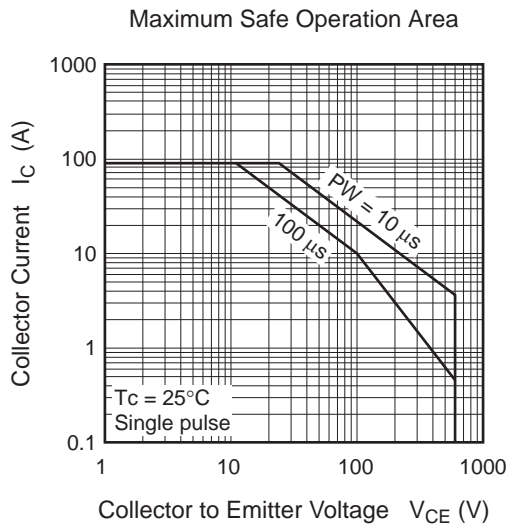
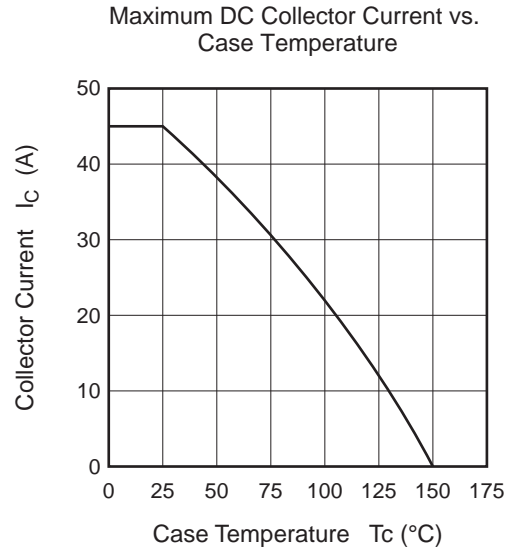
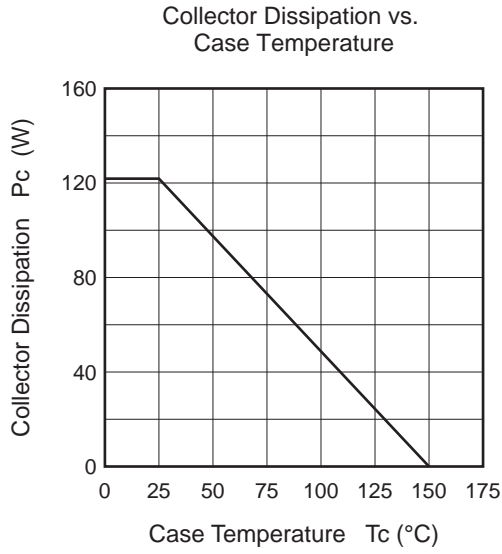
## Electrical Characteristics

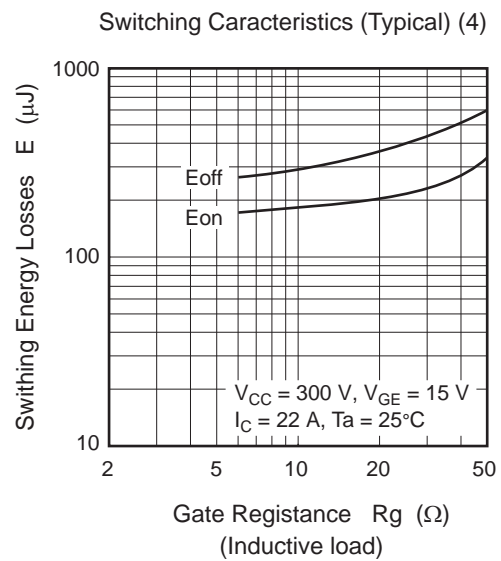
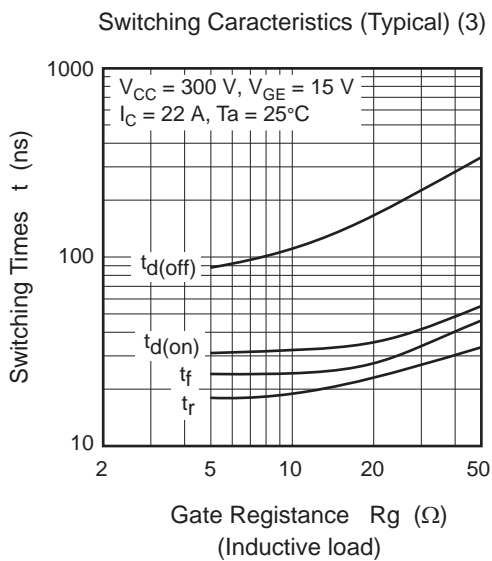
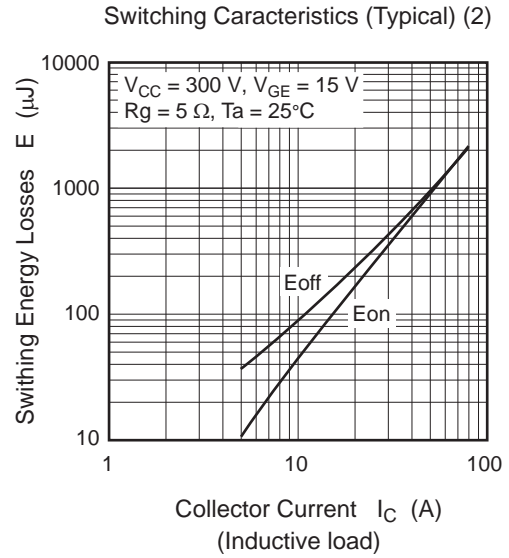
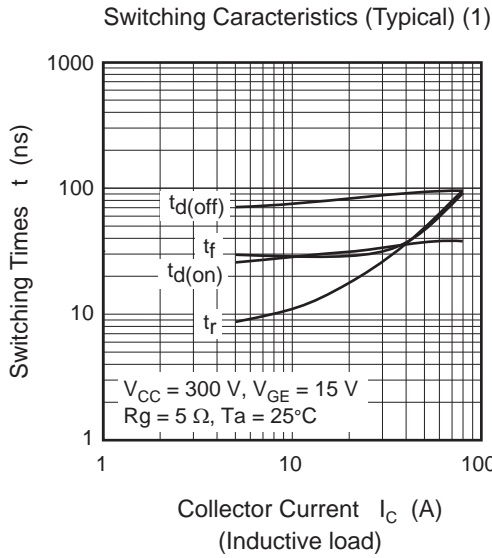
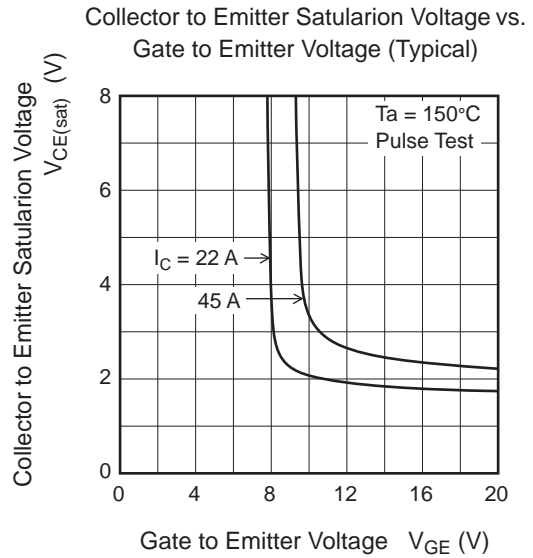
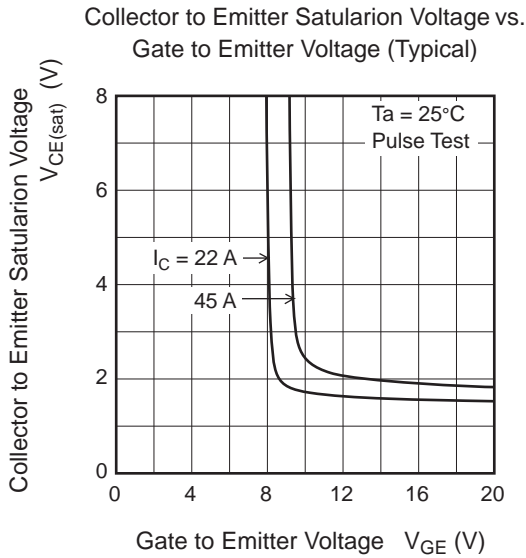
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Zero gate voltage collector current	$I_{CES}$	—	—	5	$\mu\text{A}$	$V_{CE} = 600\text{ V}, V_{GE} = 0$
Gate to emitter leak current	$I_{GES}$	—	—	$\pm 1$	$\mu\text{A}$	$V_{GE} = \pm 30\text{ V}, V_{CE} = 0$
Gate to emitter cutoff voltage	$V_{GE(off)}$	4.0	—	6.0	V	$V_{CE} = 10\text{ V}, I_C = 1\text{ mA}$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	1.6	2.2	V	$I_C = 22\text{ A}, V_{GE} = 15\text{ V}$ <sup>Note3</sup>
	$V_{CE(sat)}$	—	2.0	—	V	$I_C = 45\text{ A}, V_{GE} = 15\text{ V}$ <sup>Note3</sup>
Input capacitance	$C_{ies}$	—	1050	—	pF	$V_{CE} = 25\text{ V}$
Output capacitance	$C_{oes}$	—	70	—	pF	$V_{GE} = 0$
Reveres transfer capacitance	$C_{res}$	—	32	—	pF	$f = 1\text{ MHz}$
Total gate charge	$Q_g$	—	45	—	nC	$V_{GE} = 15\text{ V}$
Gate to emitter charge	$Q_{ge}$	—	6	—	nC	$V_{CE} = 300\text{ V}$
Gate to collector charge	$Q_{gc}$	—	20	—	nC	$I_C = 22\text{ A}$
Switching time	$t_{d(on)}$	—	35	—	ns	$V_{CC} = 300\text{ V}, V_{GE} = 15\text{ V}$
	$t_r$	—	20	—	ns	$I_C = 22\text{ A}$
	$t_{d(off)}$	—	90	—	ns	$R_g = 5\ \Omega$
	$t_f$	—	70	—	ns	(Inductive load)
Short circuit withstand time	$t_{sc}$	3.0	5.0	—	$\mu\text{s}$	$V_{CC} \leq 400\text{ V}, V_{GE} = 15\text{ V}$

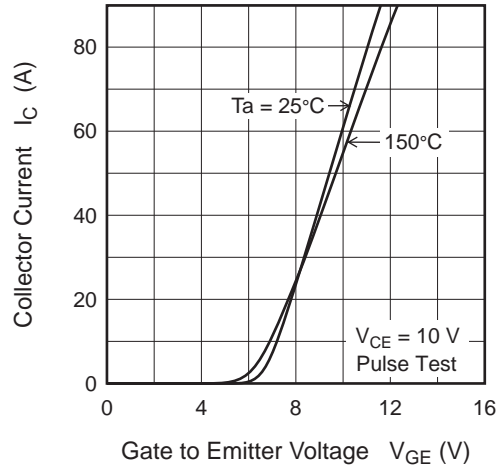
Notes: 3. Pulse test

Main Characteristics

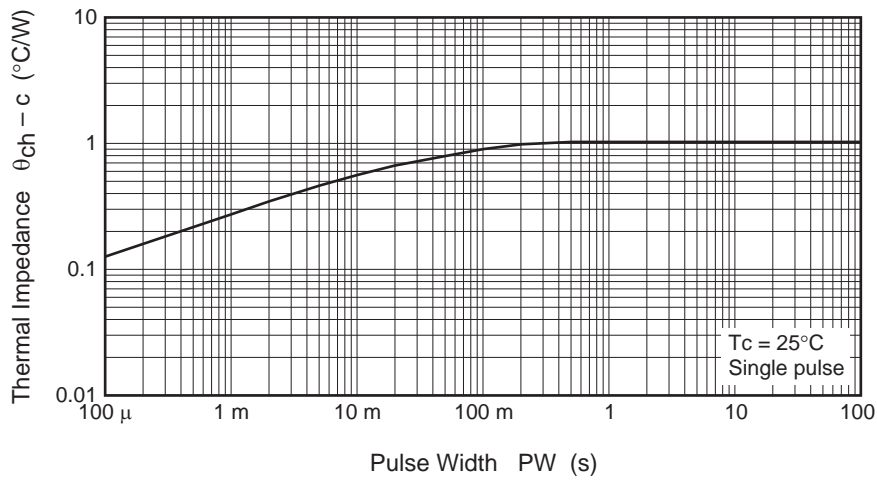




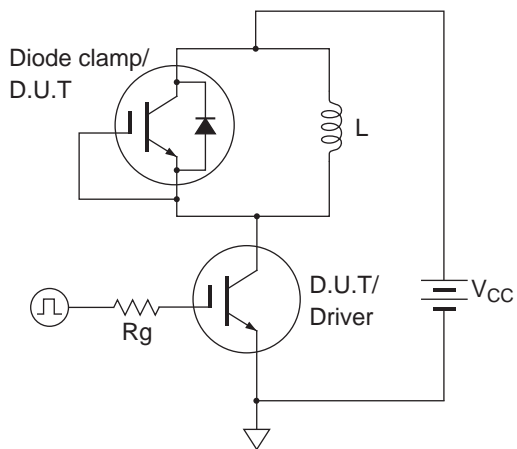
Transfer Characteristics (Typical)



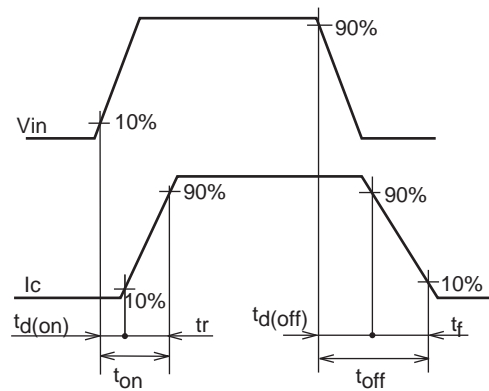
Thermal Impedance vs. Pulse Width



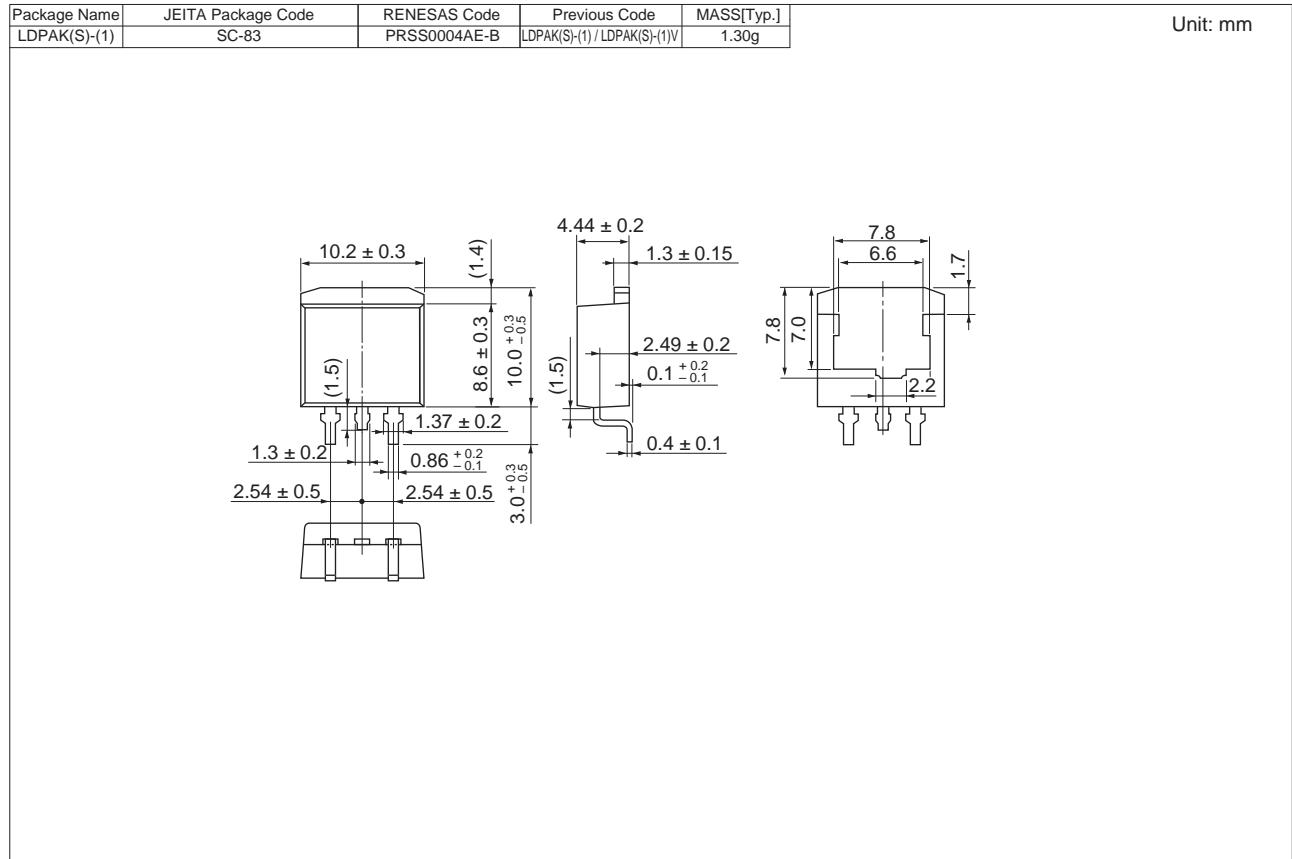
Switching Time Test Circuit



Waveform



### Package Dimension



### Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJP60D0DPE-00-J3	1000 pcs	Taping

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Tel: +1-408-588-6000, Fax: +1-408-588-6130

**Renesas Electronics Canada Limited**  
1101 Nicholson Road, Newmarket, Ontario L3Y 9C3, Canada  
Tel: +1-905-898-5441, Fax: +1-905-898-3220

**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: +49-211-65030, Fax: +49-211-6503-1327

**Renesas Electronics (China) Co., Ltd.**  
7th Floor, Quantum Plaza, No.27 Zhichunlu Haidian District, Beijing 100083, P.R.China  
Tel: +86-10-8235-1155, Fax: +86-10-8235-7679

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Unit 204, 205, AZIA Center, No.1233 Lujiazui Ring Rd., Pudong District, Shanghai 200120, China  
Tel: +86-21-5877-1818, Fax: +86-21-6887-7858 / -7898

**Renesas Electronics Hong Kong Limited**  
Unit 1601-1613, 16/F., Tower 2, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hong Kong  
Tel: +852-2886-9318, Fax: +852-2886-9022/9044

**Renesas Electronics Taiwan Co., Ltd.**  
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Tel: +60-3-7955-9390, Fax: +60-3-7955-9510

**Renesas Electronics Korea Co., Ltd.**  
11F., Samik Laviel'or Bldg., 720-2 Yeoksam-Dong, Kangnam-Ku, Seoul 135-080, Korea  
Tel: +82-2-558-3737, Fax: +82-2-558-5141