

# RJP60D0DPE

Silicon N Channel IGBT  
High Speed Power Switching

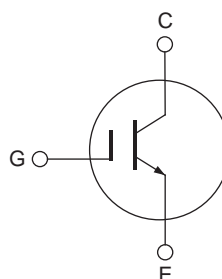
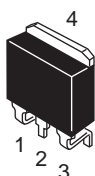
R07DS0172EJ0100  
Rev.1.00  
Nov 15, 2010

## 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: LPAK (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	$T_c = 25^\circ\text{C}$	$I_C$	45	A
	$T_c = 100^\circ\text{C}$	$I_C$	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  $T_c = 25^\circ\text{C}$

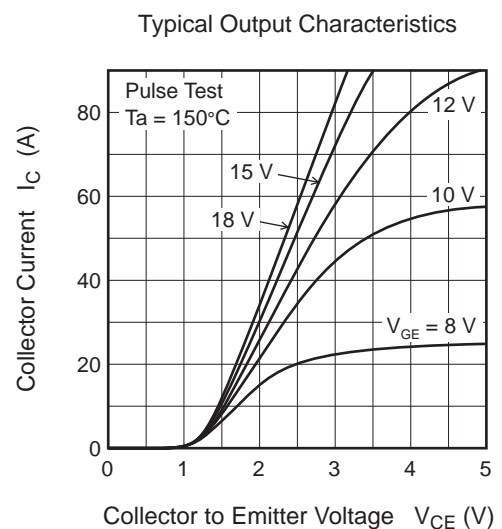
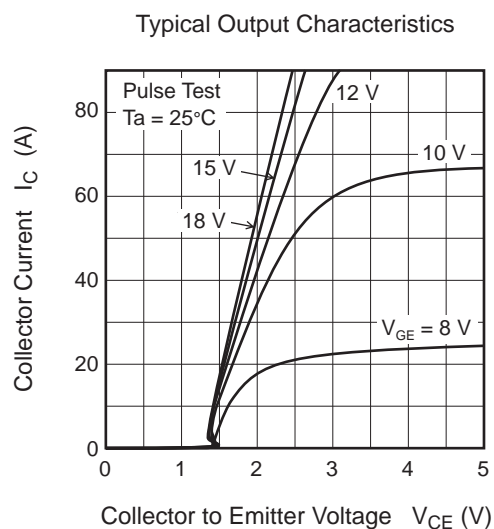
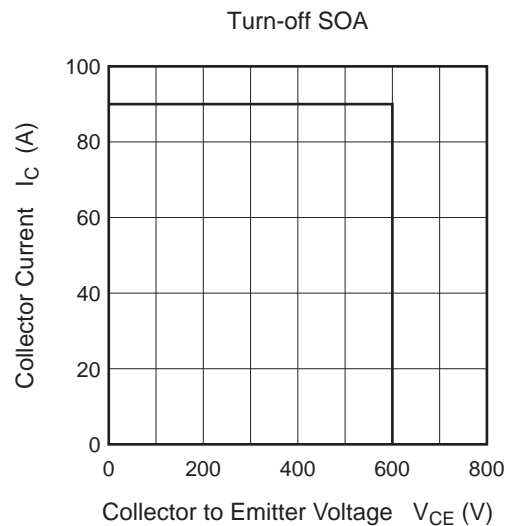
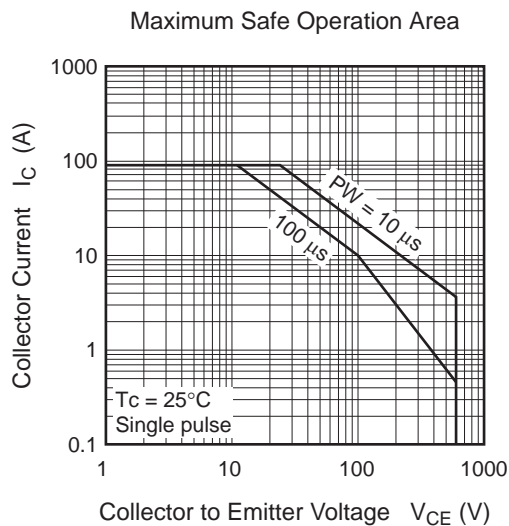
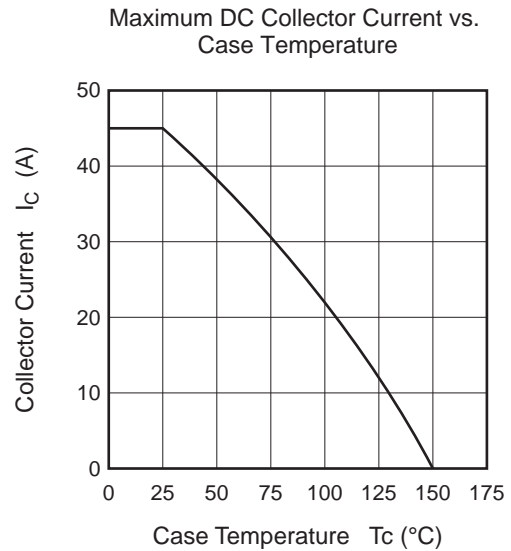
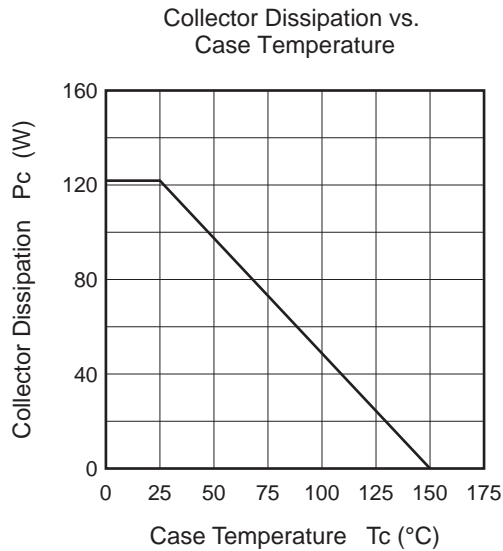
## Electrical Characteristics

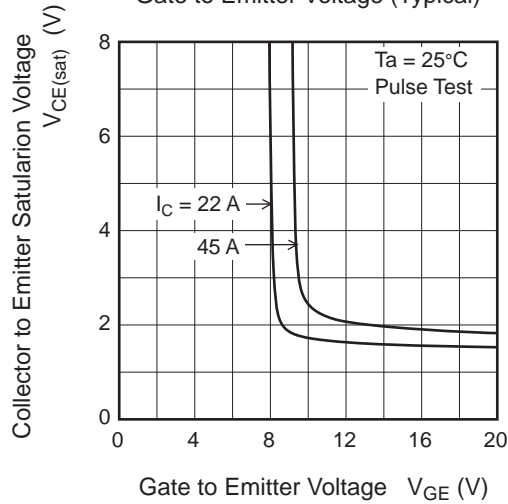
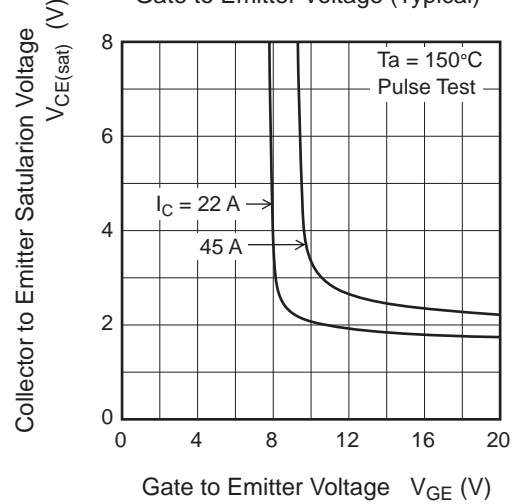
(Ta = 25°C)

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

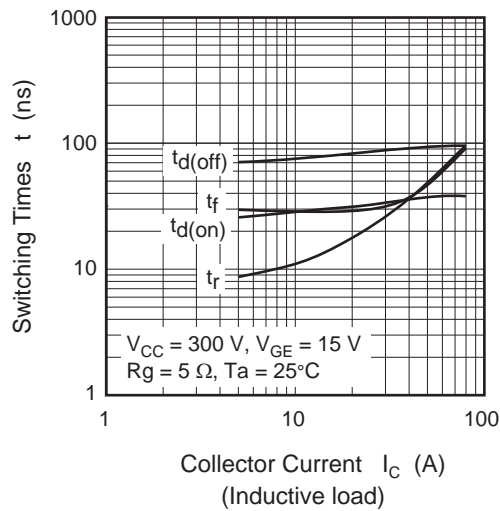
Notes: 3. Pulse test

## Main Characteristics

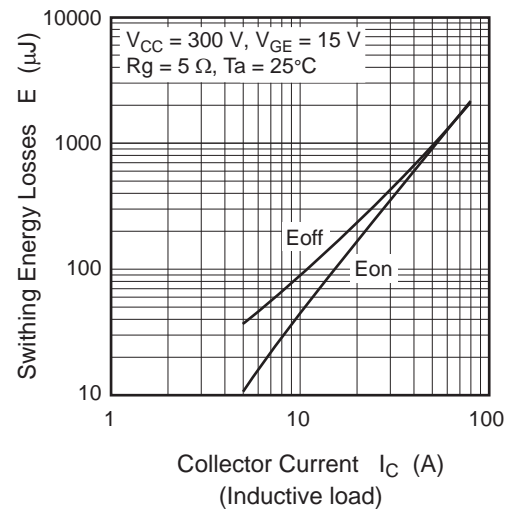


Collector to Emitter Saturation Voltage vs.  
Gate to Emitter Voltage (Typical)Collector to Emitter Saturation Voltage vs.  
Gate to Emitter Voltage (Typical)

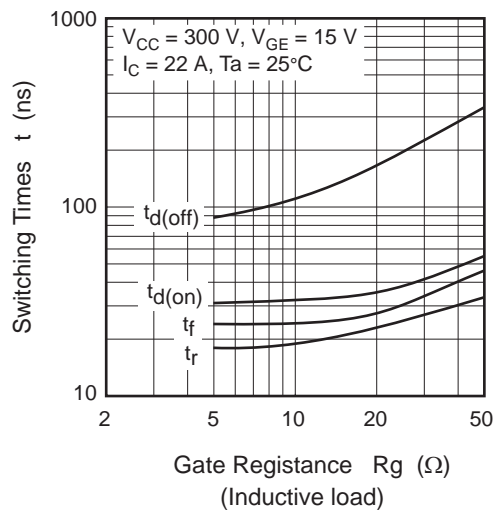
Switching Characteristics (Typical) (1)



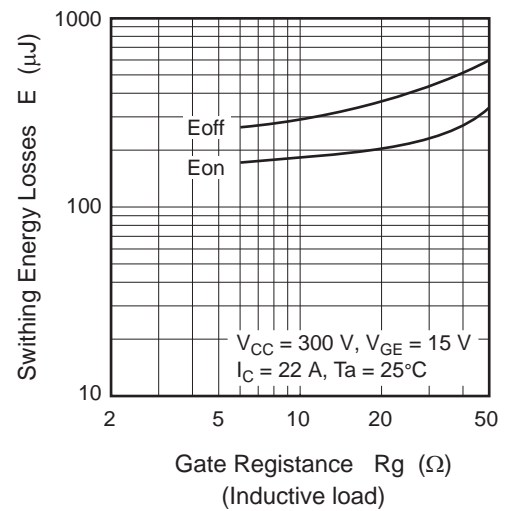
Switching Characteristics (Typical) (2)



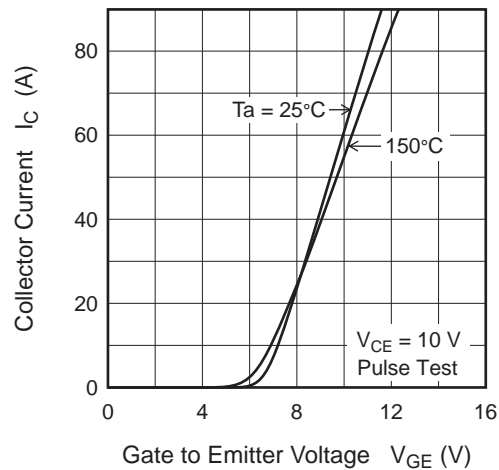
Switching Characteristics (Typical) (3)



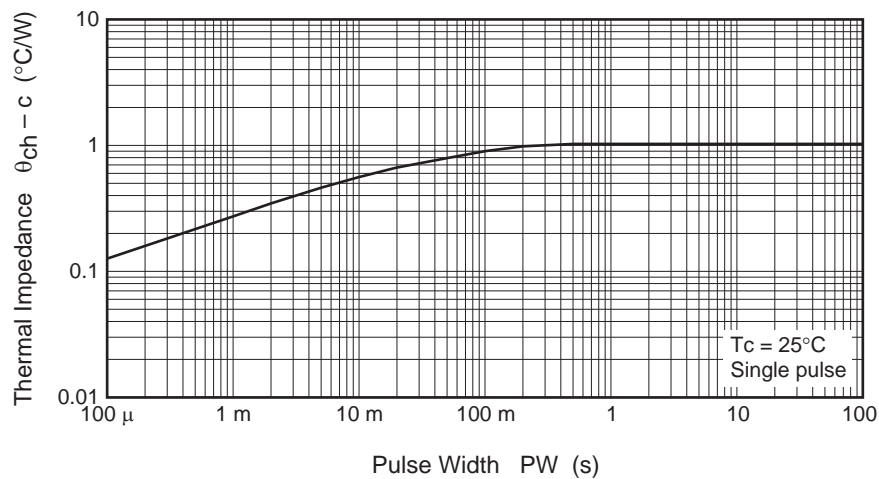
Switching Characteristics (Typical) (4)



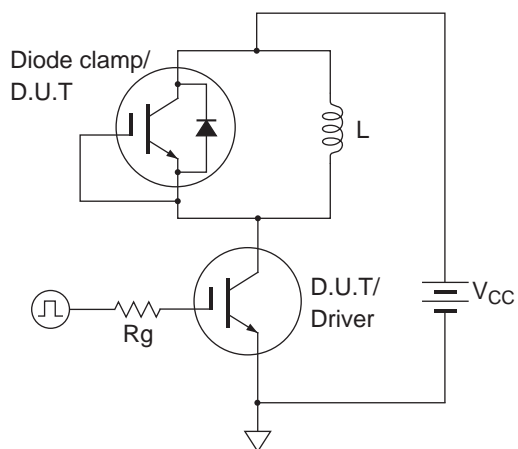
Transfer Characteristics (Typical)



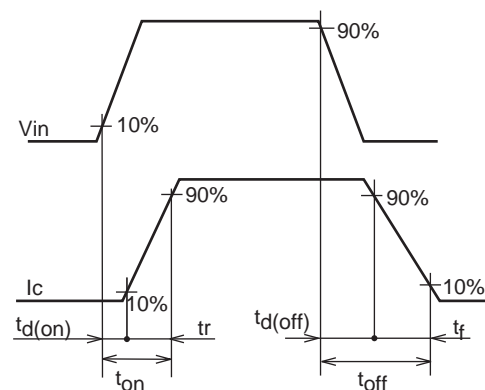
Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



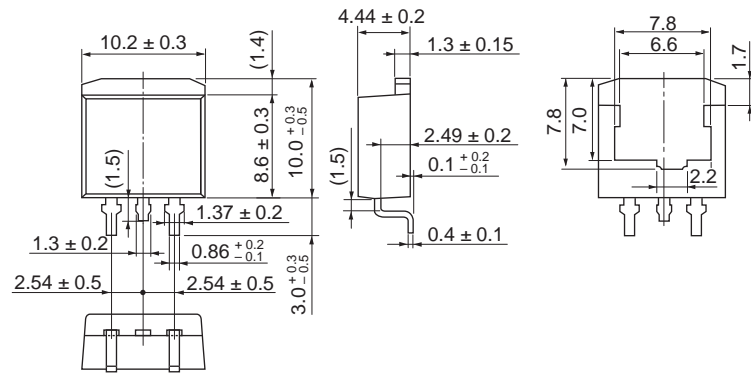
Waveform



## Package Dimension

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
LDBAK(S)-(1)	SC-83	PRSS0004AE-B	LDBAK(S)-(1) / LDBAK(S)-(1)V	1.30g

Unit: mm



## Ordering Information

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

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