

RJP60D0DPE

Silicon N Channel IGBT
High Speed Power Switching

R07DS0172EJ0100

Rev.1.00

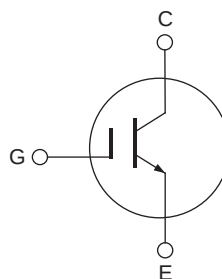
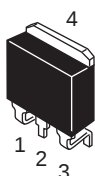
Nov 15, 2010

Features

- Short circuit withstand time (5 μ 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 ± 30 V
- Pb-free lead plating and chip bonding

Outline

RENESAS Package code: PRSS0004AE-B
(Package name: LDKPAK (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}	± 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		$i_{c(peak)}$ ^{Note1}	90	A
Collector dissipation		P_C ^{Note2}	122	W
Junction to case thermal impedance		θ_{j-c} ^{Note2}	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 $T_c = 25^\circ\text{C}$

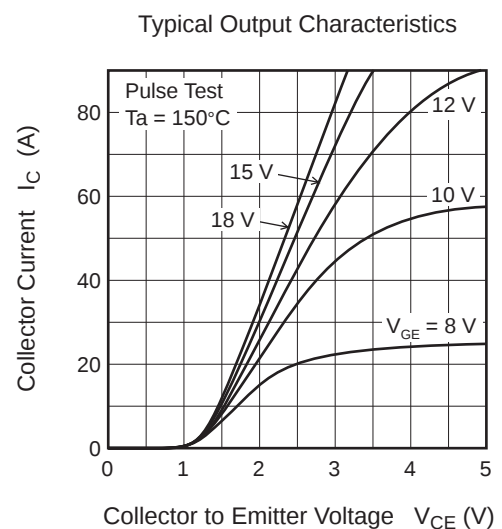
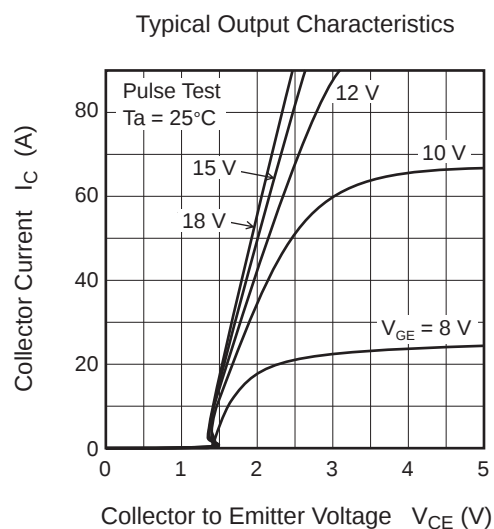
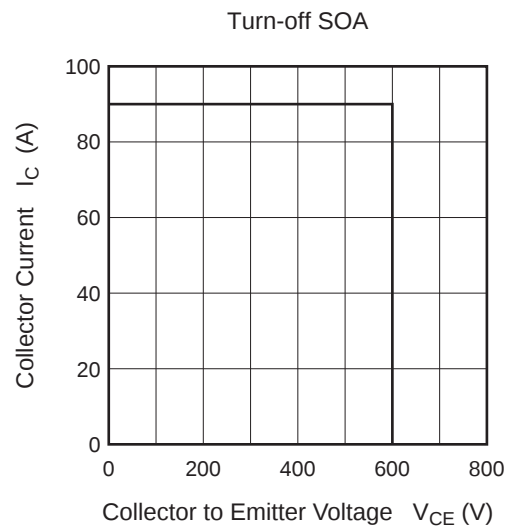
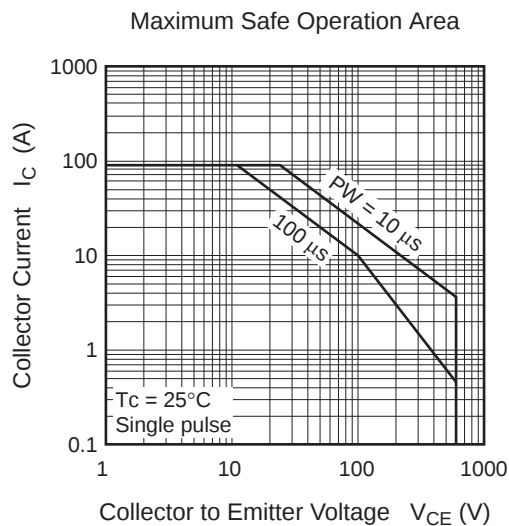
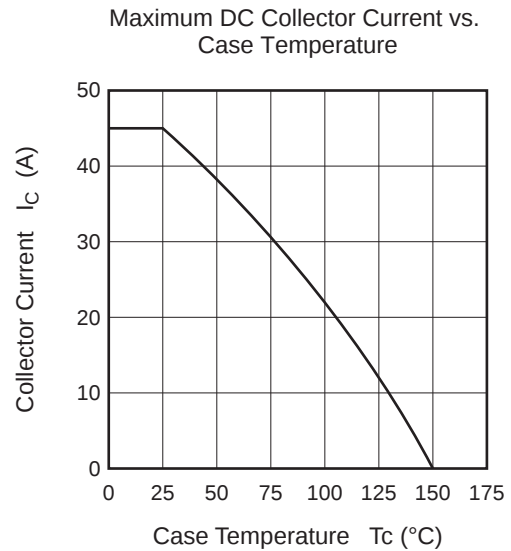
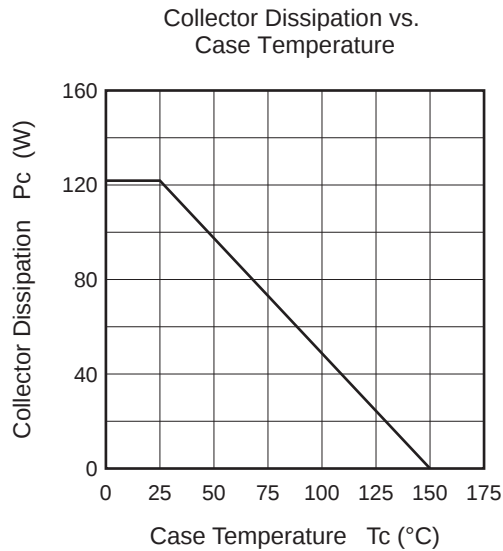
Electrical Characteristics

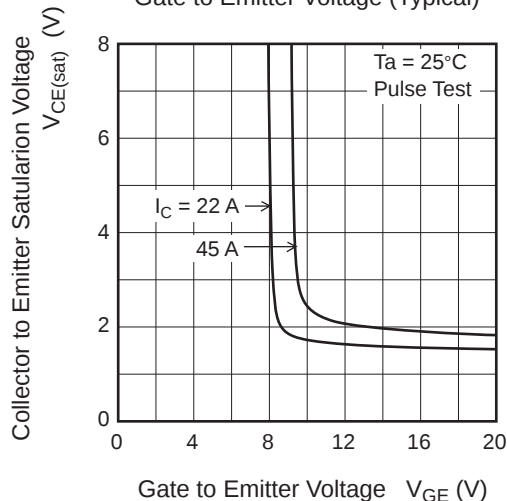
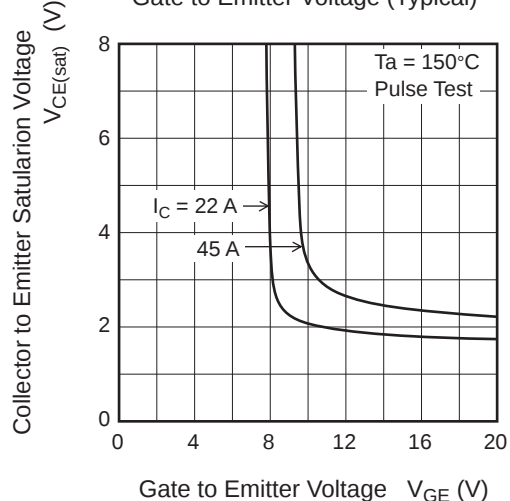
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Zero gate voltage collector current	I_{CES}	—	—	5	μA	$V_{CE} = 600 V, V_{GE} = 0$
Gate to emitter leak current	I_{GES}	—	—	± 1	μA	$V_{GE} = \pm 30 V, V_{CE} = 0$
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	$I_C = 22 A, V_{GE} = 15 V$ ^{Note3}
	$V_{CE(sat)}$	—	2.0	—	V	$I_C = 45 A, V_{GE} = 15 V$ ^{Note3}
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	—	μs	$V_{CC} \leq 400 V, V_{GE} = 15 V$

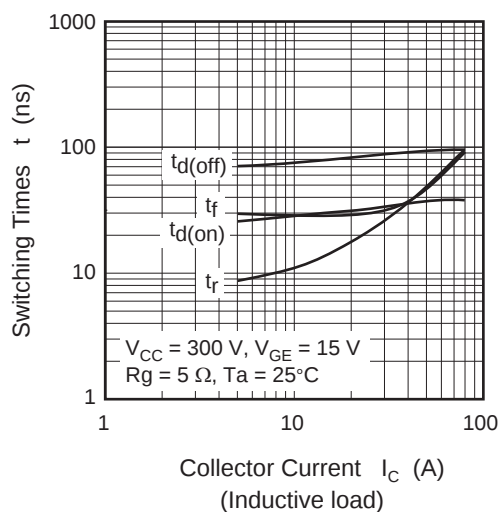
Notes: 3. Pulse test

Main Characteristics

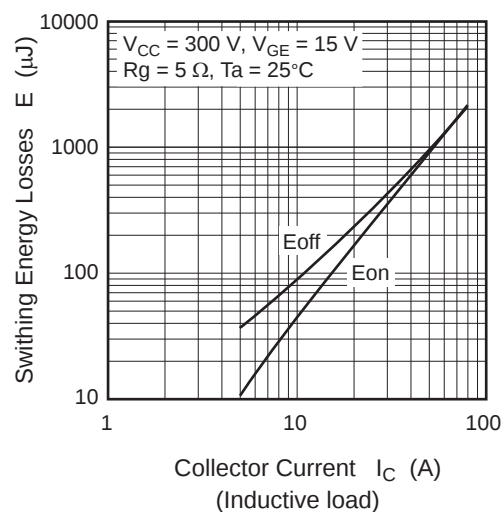


Collector to Emitter Saturation Voltage vs.
Gate to Emitter Voltage (Typical)Collector to Emitter Saturation Voltage vs.
Gate to Emitter Voltage (Typical)

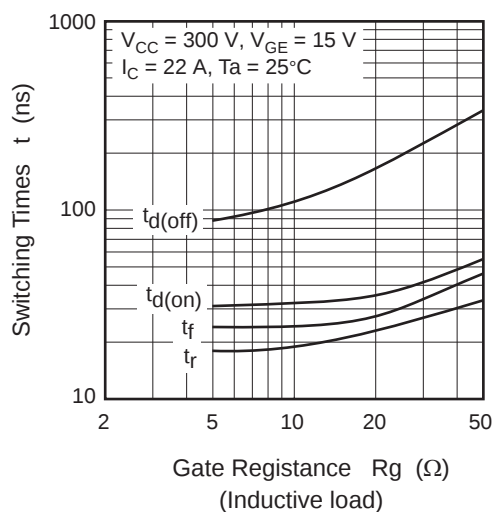
Switching Characteristics (Typical) (1)



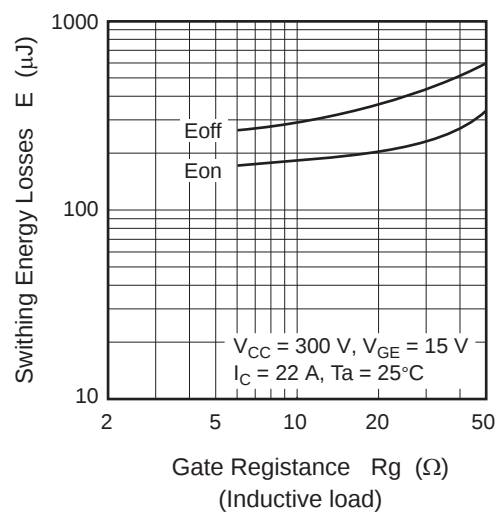
Switching Characteristics (Typical) (2)



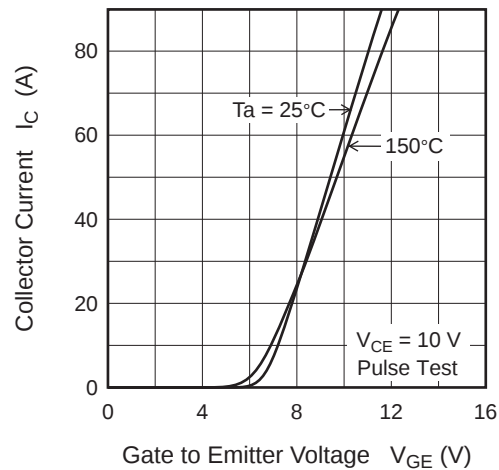
Switching Characteristics (Typical) (3)



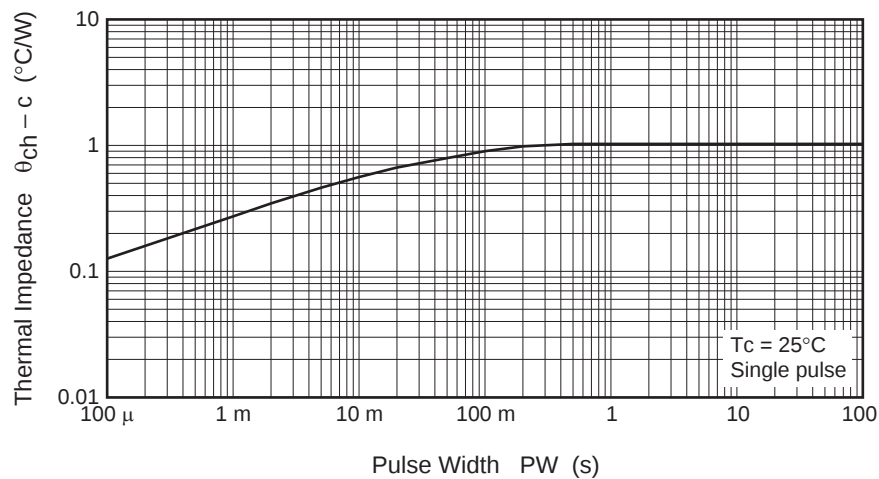
Switching Characteristics (Typical) (4)



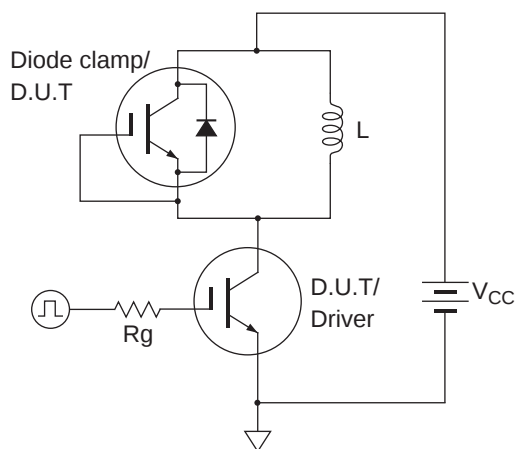
Transfer Characteristics (Typical)



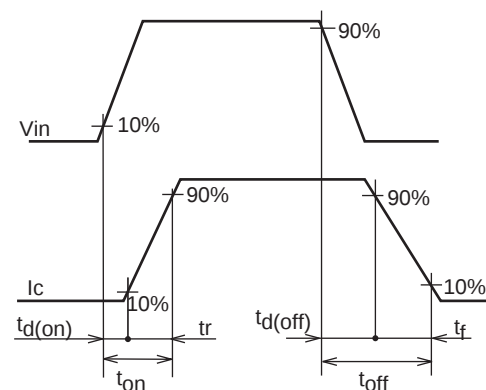
Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



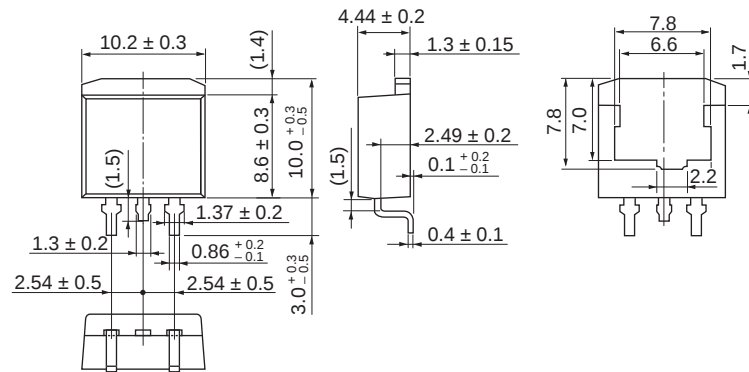
Waveform



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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