

# RJH60M2DPE

600 V - 12 A - IGBT

Application: Inverter

R07DS0531EJ0100

Rev.1.00

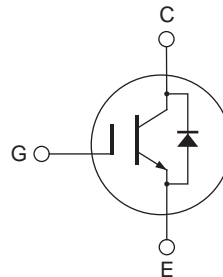
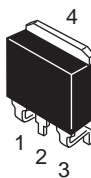
Aug 30, 2011

## Features

- Short circuit withstand time (8  $\mu$ s typ.)
- Low collector to emitter saturation voltage  
 $V_{CE(sat)} = 1.9$  V typ. (at  $I_C = 12$  A,  $V_{GE} = 15$  V,  $T_a = 25^\circ\text{C}$ )
- Built in fast recovery diode (100 ns typ.) in one package
- Trench gate and thin wafer technology
- High speed switching  
 $t_f = 80$  ns typ. (at  $V_{CC} = 300$  V,  $V_{GE} = 15$  V,  $I_C = 12$  A,  $R_g = 5 \Omega$ ,  $T_a = 25^\circ\text{C}$ , inductive load)

## 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 / diode reverse voltage	$V_{CES} / V_R$	600	V	
Gate to emitter voltage	$V_{GES}$	$\pm 30$	V	
Collector current	$T_c = 25^\circ\text{C}$	$I_C$	25	A
	$T_c = 100^\circ\text{C}$	$I_C$	12	A
Collector peak current	$i_{c(peak)}$ <sup>Note1</sup>	50	A	
Collector to emitter diode forward current	$i_{DF}$	12	A	
Collector to emitter diode forward peak current	$i_{D(peak)}$ <sup>Note1</sup>	50	A	
Collector dissipation	$P_C$ <sup>Note2</sup>	63	W	
Junction to case thermal resistance (IGBT)	$\theta_{j-c}$ <sup>Note2</sup>	1.98	$^\circ\text{C} / \text{W}$	
Junction to case thermal resistance (Diode)	$\theta_{j-cd}$ <sup>Note2</sup>	4.2	$^\circ\text{C} / \text{W}$	
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  $T_c = 25^\circ\text{C}$

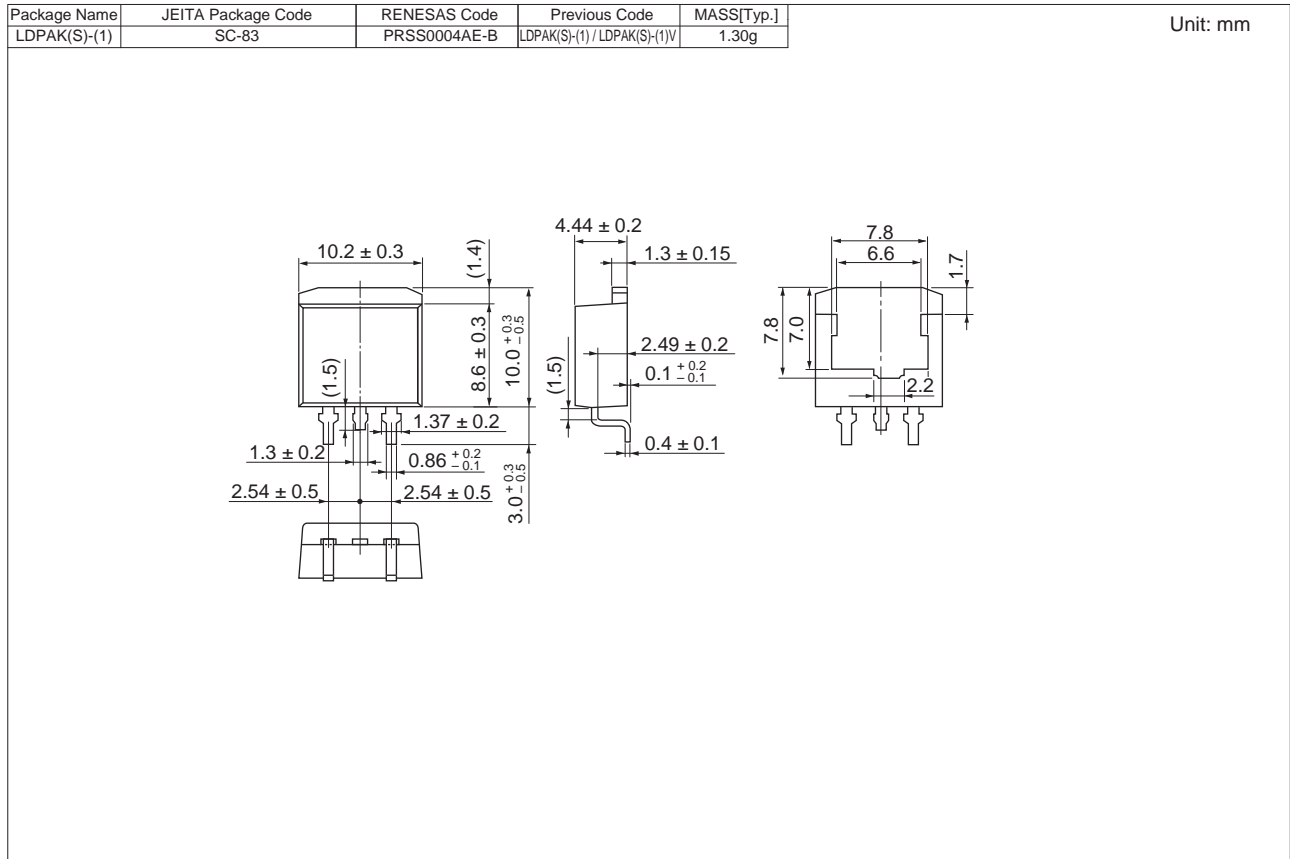
## Electrical Characteristics

(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Zero gate voltage collector current / diode reverse current	$I_{CES} / I_R$	—	—	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	$V_{GE(off)}$	5	—	7	V	$V_{CE} = 10 \text{ V}, I_C = 1 \text{ mA}$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	1.9	2.5	V	$I_C = 12 \text{ A}, V_{GE} = 15 \text{ V}$ <sup>Note3</sup>
	$V_{CE(sat)}$	—	2.3	—	V	$I_C = 25 \text{ A}, V_{GE} = 15 \text{ V}$ <sup>Note3</sup>
Input capacitance	$C_{ies}$	—	430	—	pF	$V_{CE} = 25 \text{ V}$
Output capacitance	$C_{oes}$	—	40	—	pF	$V_{GE} = 0$
Reverse transfer capacitance	$C_{res}$	—	15	—	pF	$f = 1 \text{ MHz}$
Total gate charge	$Q_g$	—	19	—	nC	$V_{GE} = 15 \text{ V}$
Gate to emitter charge	$Q_{ge}$	—	4	—	nC	$V_{CE} = 300 \text{ V}$
Gate to collector charge	$Q_{gc}$	—	8	—	nC	$I_C = 12 \text{ A}$
Switching time	$t_{d(on)}$	—	30	—	ns	$V_{CC} = 300 \text{ V}, V_{GE} = 15 \text{ V}$
	$t_r$	—	15	—	ns	$I_C = 12 \text{ A}$
	$t_{d(off)}$	—	90	—	ns	$R_g = 5 \Omega$
	$t_f$	—	80	—	ns	Inductive load
Short circuit withstand time	$t_{sc}$	6	8	—	$\mu\text{s}$	$T_C = 100 \text{ }^\circ\text{C}$ $V_{CC} \leq 360 \text{ V}, V_{GE} = 15 \text{ V}$
FRD forward voltage	$V_F$	—	1.2	1.6	V	$I_F = 12 \text{ A}$ <sup>Note3</sup>
FRD reverse recovery time	$t_{rr}$	—	100	—	ns	$I_F = 12 \text{ A}$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

Notes: 3. Pulse test.

### Package Dimension



### Ordering Information

Orderable Part No.	Quantity	Shipping Container
RJH60M2DPE-00-J3	1000 pcs	Taping

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