

RJH60M3DPE

600 V - 17 A - IGBT

Application: Inverter

R07DS0533EJ0100

Rev.1.00

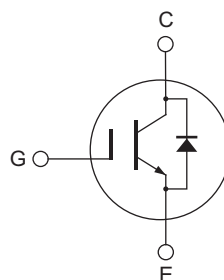
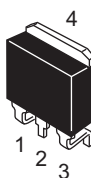
Sep 02, 2011

Features

- Short circuit withstand time (8 μ s typ.)
- Low collector to emitter saturation voltage
 $V_{CE(sat)} = 1.8$ V typ. (at $I_C = 17$ 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, $I_C = 17$ A, $R_g = 5$ Ω , $T_a = 25^\circ\text{C}$, inductive load)

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 / diode reverse voltage		V_{CES} / V_R	600	V
Gate to emitter voltage		V_{GES}	± 30	V
Collector peak current	$T_c = 25^\circ\text{C}$	I_C	35	A
	$T_c = 100^\circ\text{C}$	I_C	17	A
Collector peak current		$i_{c(peak)}$ ^{Note1}	70	A
Collector to emitter diode forward current		i_{DF}	17	A
Collector to emitter diode forward peak current		$i_{DF(peak)}$ ^{Note1}	70	A
Collector dissipation		P_C ^{Note2}	113	W
Junction to case thermal resistance (IGBT)		θ_{j-c} ^{Note2}	1.11	$^\circ\text{C} / \text{W}$
Junction to case thermal resistance (Diode)		θ_{j-cd} ^{Note2}	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. $PW \leq 10$ 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	—	—	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	$V_{GE(off)}$	5	—	7	V	$V_{CE} = 10 V, I_C = 1 mA$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	1.8	2.3	V	$I_C = 17 A, V_{GE} = 15 V$ ^{Note3}
	$V_{CE(sat)}$	—	2.2	—	V	$I_C = 35 A, V_{GE} = 15 V$ ^{Note3}
Input capacitance	C_{ies}	—	900	—	pF	$V_{CE} = 25 V$
Output capacitance	C_{oes}	—	60	—	pF	$V_{GE} = 0$
Reverse transfer capacitance	C_{res}	—	30	—	pF	$f = 1 MHz$
Total gate charge	Q_g	—	36	—	nC	$V_{GE} = 15 V$
Gate to emitter charge	Q_{ge}	—	6	—	nC	$V_{CE} = 300 V$
Gate to collector charge	Q_{gc}	—	16	—	nC	$I_C = 17 A$
Switching time	$t_{d(on)}$	—	30	—	ns	$V_{CC} = 300 V, V_{GE} = 15 V$
	t_r	—	15	—	ns	$I_C = 17 A$
	$t_{d(off)}$	—	80	—	ns	$R_g = 5 \Omega$
	t_f	—	80	—	ns	Inductive load
Short circuit withstand time	t_{sc}	6	8	—	μs	$T_C = 100 ^\circ C$ $V_{CC} \leq 360 V, V_{GE} = 15 V$

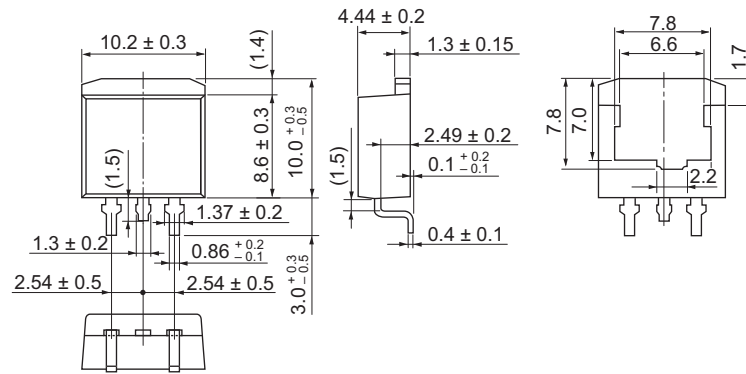
FRD Forward voltage	V_F	—	1.3	1.7	V	$I_F = 17 A$ ^{Note3}
FRD reverse recovery time	t_{rr}	—	100	—	ns	$I_F = 17 A$ $di_F/dt = 100 A/\mu s$

Notes: 3. Pulse test.

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 No.	Quantity	Shipping Container
RJH60M3DPE-00-J3	1000 pcs	Taping