

# RJH60M6DPQ-A0

600 V - 40 A - IGBT  
Application: Inverter

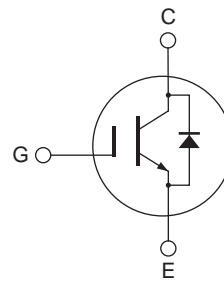
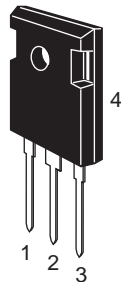
R07DS0537EJ0100  
Rev.1.00  
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## Features

- Short circuit withstand time (8  $\mu$ s typ.)
- Low collector to emitter saturation voltage  
 $V_{CE(sat)} = 1.8$  V typ. (at  $I_C = 40$  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,  $I_C = 40$  A,  $R_g = 5 \Omega$ ,  $T_a = 25^\circ\text{C}$ , inductive load)

## Outline

RENESAS Package code: PRSS0003ZH-A  
(Package name: TO-247A)



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	$T_C = 25^\circ\text{C}$	$I_C$	80	A
	$T_C = 100^\circ\text{C}$	$I_C$	40	A
Collector peak current	$i_{c(peak)}$ <sup>Note1</sup>	160	A	
Collector to emitter diode forward current	$i_{DF}$	50	A	
Collector to emitter diode forward peak current	$i_{DF(peak)}$ <sup>Note1</sup>	200	A	
Collector dissipation	$P_C$ <sup>Note2</sup>	260	W	
Junction to case thermal resistance (IGBT)	$\theta_{j-c}$ <sup>Note2</sup>	0.48	$^\circ\text{C} / \text{W}$	
Junction to case thermal resistance (Diode)	$\theta_{j-cd}$ <sup>Note2</sup>	1.07	$^\circ\text{C} / \text{W}$	
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  $T_C = 25^\circ\text{C}$

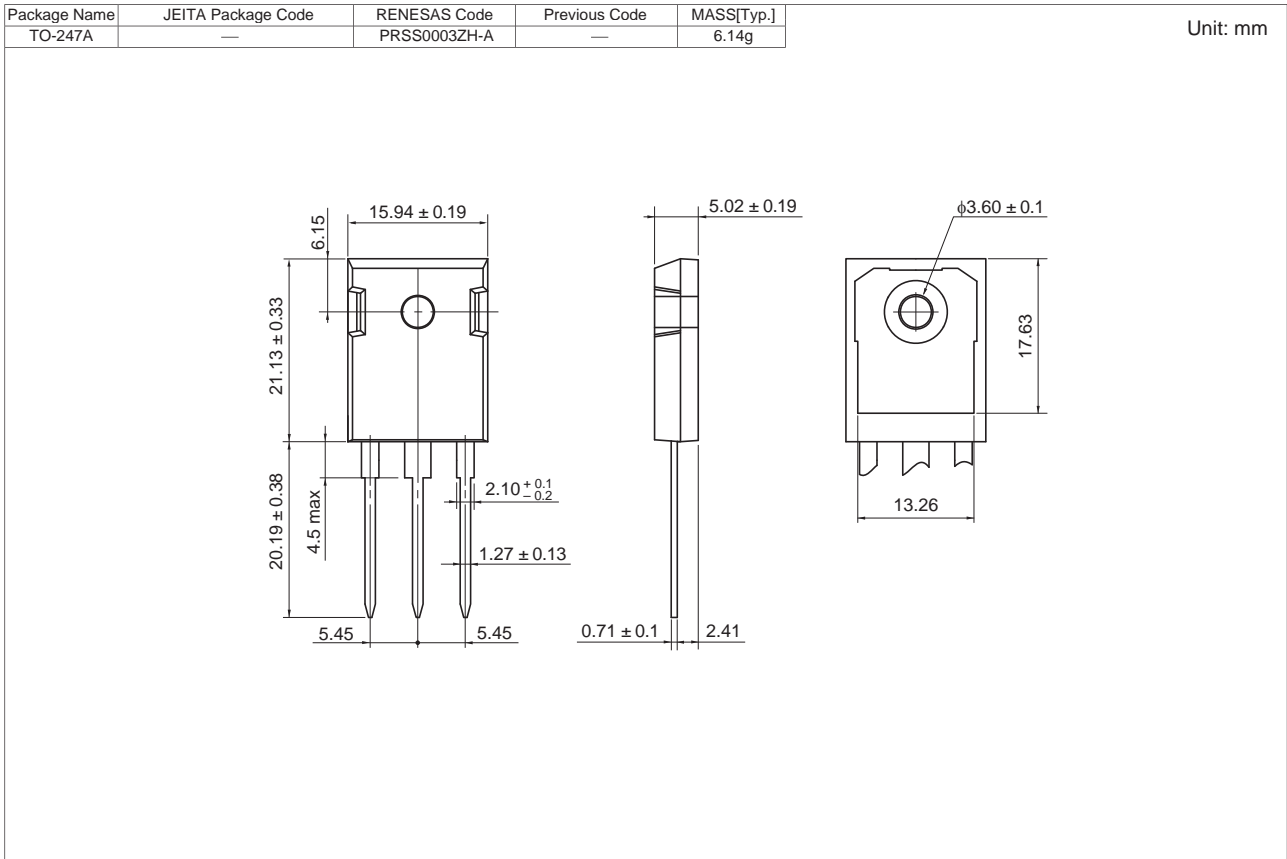
## Electrical Characteristics

(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	$V_{CE(sat)}$	—	1.8	2.3	V	$I_C = 40 \text{ A}, V_{GE} = 15 \text{ V}$ <sup>Note3</sup>
	$V_{CE(sat)}$	—	2.2	—	V	$I_C = 80 \text{ A}, V_{GE} = 15 \text{ V}$ <sup>Note3</sup>
Input capacitance	$C_{ies}$	—	2500	—	pF	$V_{CE} = 25 \text{ V}$
Output capacitance	$C_{oes}$	—	140	—	pF	$V_{GE} = 0$
Reveres transfer capacitance	$C_{res}$	—	80	—	pF	$f = 1 \text{ MHz}$
Total gate charge	$Q_g$	—	104	—	nC	$V_{GE} = 15 \text{ V}$
Gate to emitter charge	$Q_{ge}$	—	15	—	nC	$V_{CE} = 300 \text{ V}$
Gate to collector charge	$Q_{gc}$	—	45	—	nC	$I_C = 40 \text{ A}$
Switching time	$t_{d(on)}$	—	55	—	ns	$V_{CC} = 300 \text{ V}, V_{GE} = 15 \text{ V}$
	$t_r$	—	40	—	ns	$I_C = 40 \text{ A}$
	$t_{d(off)}$	—	150	—	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	$V_F$	—	1.3	1.8	V	$I_F = 40 \text{ A}$ <sup>Note3</sup>
FRD reverse recovery time	$t_{rr}$	—	100	—	ns	$I_F = 40 \text{ A}$ $di_F/dt = 100 \text{ A}/\mu\text{s}$

Notes: 3. Pulse test.

### Package Dimension



### Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJH60M6DPQ-A0-T0	240 pcs	Box (Tube)

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**Renesas Electronics America Inc.**  
2880 Scott Boulevard Santa Clara, CA 95050-2554, U.S.A.  
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

**Renesas Electronics (Shanghai) Co., Ltd.**  
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.**  
13F, No. 363, Fu Shing North Road, Taipei, Taiwan  
Tel: +886-2-8175-9600, Fax: +886 2-8175-9670

**Renesas Electronics Singapore Pte. Ltd.**  
1 HarbourFront Avenue, #06-10, Keppel Bay Tower, Singapore 098632  
Tel: +65-6213-0200, Fax: +65-6278-8001

**Renesas Electronics Malaysia Sdn.Bhd.**  
Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No. 18, Jin Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia  
Tel: +60-3-7955-9390, Fax: +60-3-7955-9510

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