

RJH60M7DPQ-A0

600 V - 50 A - IGBT
Application: Inverter

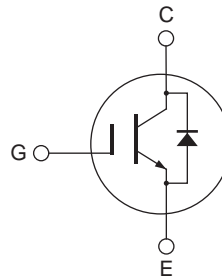
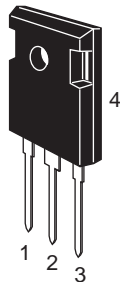
R07DS0538EJ0100
Rev.1.00
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Features

- Short circuit withstand time (8 μ s typ.)
- Low collector to emitter saturation voltage
 $V_{CE(sat)} = 1.6$ V typ. (at $I_C = 50$ 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, $I_C = 50$ 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}	± 30	V
Collector current	$T_C = 25^\circ\text{C}$	I_C	90 A
	$T_C = 100^\circ\text{C}$	I_C	50 A
Collector peak current	$i_{c(peak)}$ ^{Note1}	200	A
Collector to emitter diode forward current	i_{DF}	50	A
Collector to emitter diode forward peak current	$i_{DF(peak)}$ ^{Note1}	200	A
Collector dissipation	P_C ^{Note2}	300	W
Junction to case thermal resistance (IGBT)	θ_{j-c} ^{Note2}	0.42	$^\circ\text{C} / \text{W}$
Junction to case thermal resistance (Diode)	θ_{j-cd} ^{Note2}	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 $T_C = 25^\circ\text{C}$

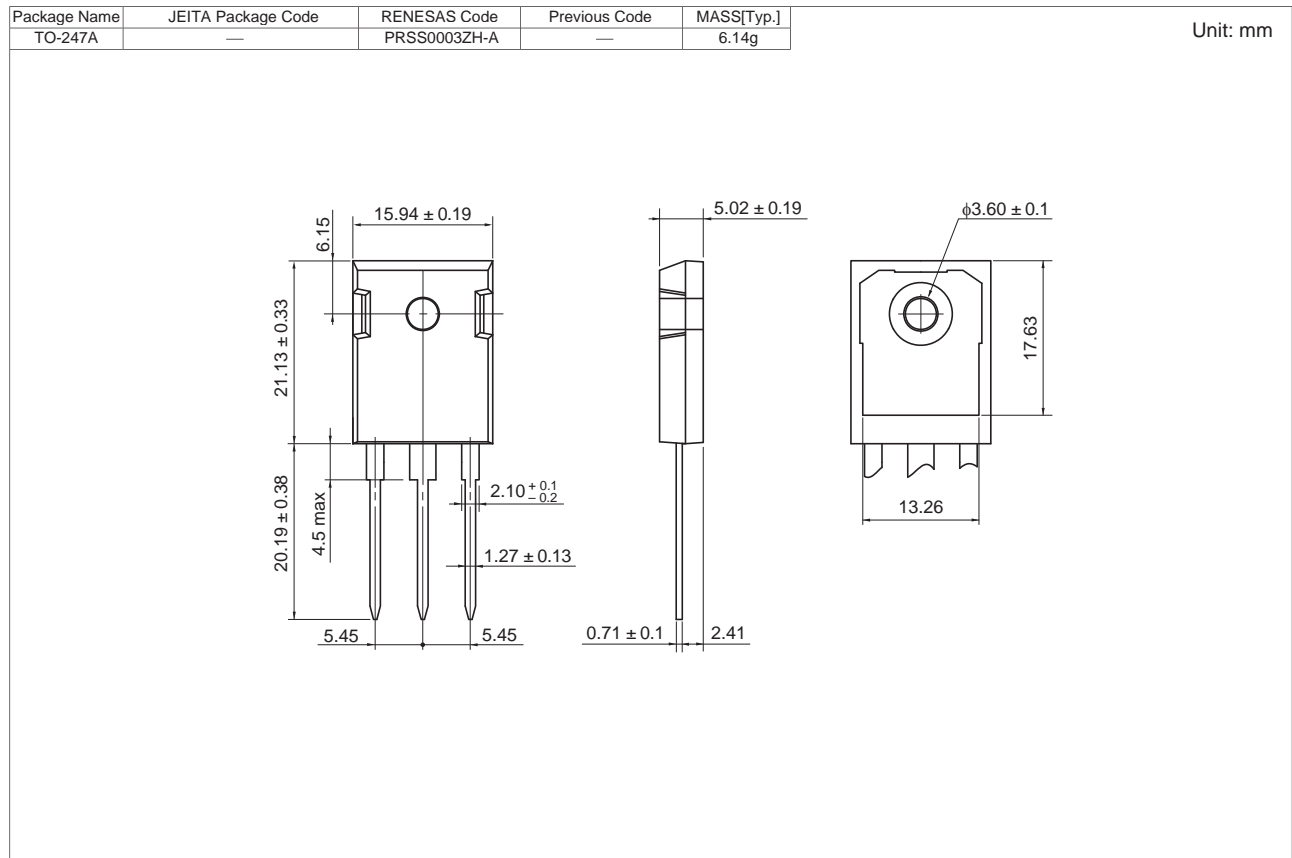
Electrical Characteristics

(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Zero gate voltage collector current / Diode reverse current	I_{CES} / I_R	—	—	5	μA	$V_{CE} = 600 \text{ V}, V_{GE} = 0$
Gate to emitter leak current	I_{GES}	—	—	± 1	μA	$V_{GE} = \pm 30 \text{ V}, V_{CE} = 0$
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	$V_{CE(sat)}$	—	1.6	2.1	V	$I_C = 50 \text{ A}, V_{GE} = 15 \text{ V}$ ^{Note3}
	$V_{CE(sat)}$	—	1.9	—	V	$I_C = 90 \text{ A}, V_{GE} = 15 \text{ V}$ ^{Note3}
Input capacitance	C_{ies}	—	3150	—	pF	$V_{CE} = 25 \text{ V}$
Output capacitance	C_{oes}	—	180	—	pF	$V_{GE} = 0$
Reverse transfer capacitance	C_{res}	—	95	—	pF	$f = 1 \text{ MHz}$
Total gate charge	Q_g	—	125	—	nC	$V_{GE} = 15 \text{ V}$
Gate to emitter charge	Q_{ge}	—	25	—	nC	$V_{CE} = 300 \text{ V}$
Gate to collector charge	Q_{gc}	—	50	—	nC	$I_C = 50 \text{ A}$
Switching time	$t_{d(on)}$	—	60	—	ns	$V_{CC} = 300 \text{ V}, V_{GE} = 15 \text{ V}$
	t_r	—	50	—	ns	$I_C = 50 \text{ A}$
	$t_{d(off)}$	—	180	—	ns	$R_g = 5 \Omega$
	t_f	—	80	—	ns	(Inductive load)
Short circuit withstand time	t_{sc}	6	8	—	μs	$T_C = 100 \text{ }^\circ\text{C}$ $V_{CC} \leq 360 \text{ V}, V_{GE} = 15 \text{ V}$
FRD forward voltage	V_F	—	1.4	2.0	V	$I_F = 50 \text{ A}$ ^{Note3}
FRD reverse recovery time	t_{rr}	—	100	—	ns	$I_F = 50 \text{ A}$ $diF/dt = 100 \text{ A}/\mu\text{s}$

Notes: 3. Pulse test

Package Dimension



Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJH60M7DPQ-A0-T0	240 pcs	Box (Tube)

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