

# RJH1CD7DPQ-E0

1200V - 30A - IGBT  
Application: Inverter

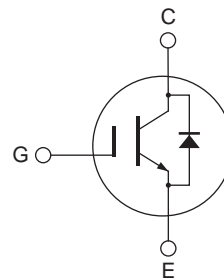
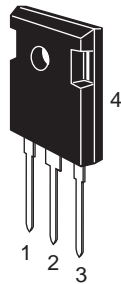
R07DS0519EJ0400  
Rev.4.00  
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## Features

- Short circuit withstand time (5  $\mu$ s typ.)
- Low collector to emitter saturation voltage  
 $V_{CE(sat)} = 2.0$  V typ. (at  $I_C = 30$  A,  $V_{GE} = 15$  V,  $T_a = 25^\circ\text{C}$ )
- Built-in fast recovery diode ( $t_{tr} = 200$  ns typ.) in one package
- Trench gate and thin wafer technology
- High speed switching  
 $t_f = 100$  ns typ. (at  $V_{CC} = 600$  V,  $V_{GE} = 15$  V,  $I_C = 30$  A,  $R_g = 5 \Omega$ ,  $T_a = 25^\circ\text{C}$ , inductive load)

## Outline

RENESAS Package code: PRSS0003ZE-A  
(Package name: TO-247)



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 | $V_{CES} / V_R$                 | 1200        | V                         |   |
| Gate to emitter voltage                              | $V_{GES}$                       | $\pm 30$    | V                         |   |
| Collector current                                    | $T_C = 25^\circ\text{C}$        | $I_C$       | 60                        | A |
|  | $T_C = 100^\circ\text{C}$       | $I_C$       | 30                        | A |
| Collector peak current                               | $i_{c(peak)}$ <sup>Note1</sup>  | 90          | A                         |   |
| Collector to emitter diode forward current           | $I_{DF}$                        | 30          | A                         |   |
| Collector to emitter diode forward peak current      | $i_{DF(peak)}$ <sup>Note1</sup> | 90          | A                         |   |
| Collector dissipation                                | $P_C$ <sup>Note2</sup>          | 328.9       | W                         |   |
| Junction to case thermal resistance (IGBT)           | $\theta_{j-c}$ <sup>Note2</sup> | 0.38        | $^\circ\text{C}/\text{W}$ |   |
| 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  $T_c = 25^\circ\text{C}$

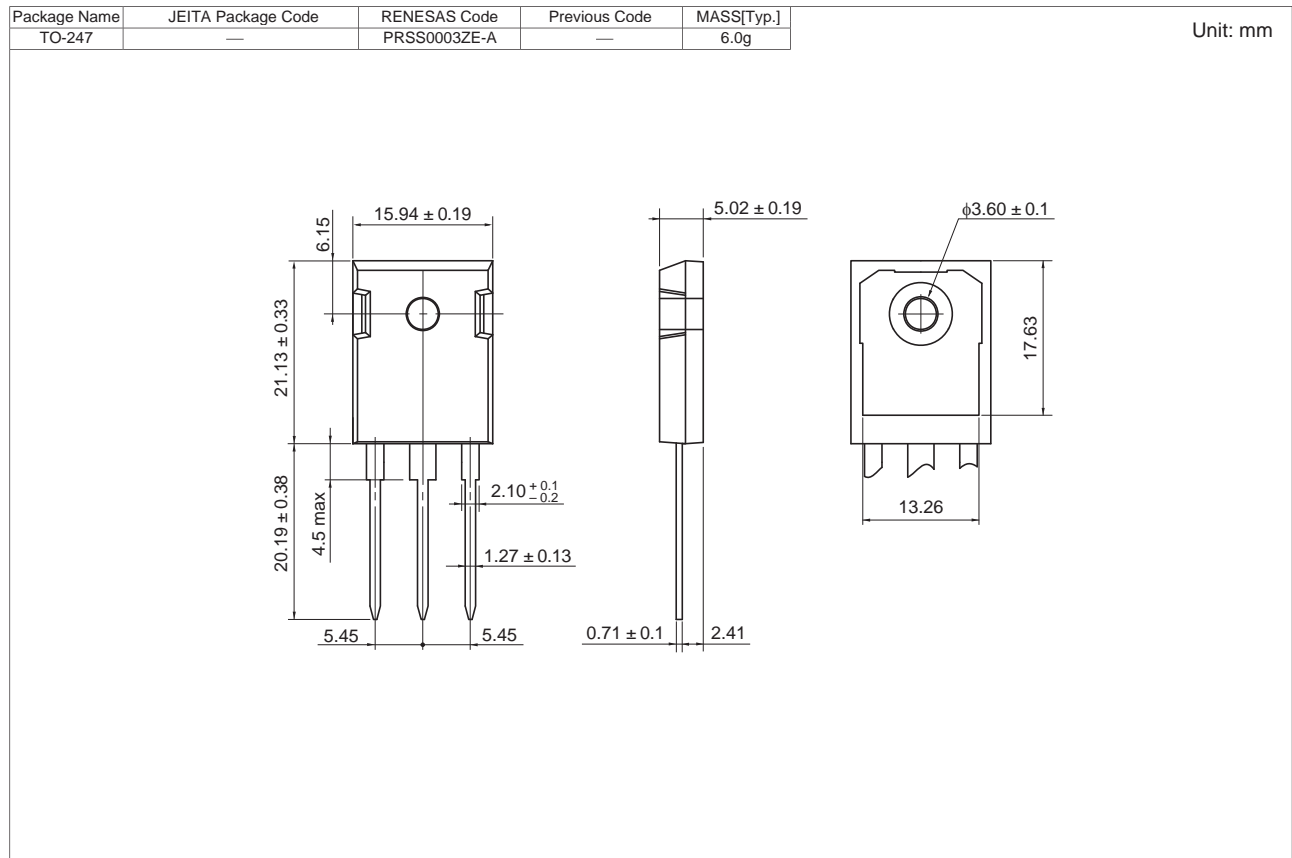
## Electrical Characteristics

(Ta = 25°C)

| Item   | Symbol          | Min | Typ  | Max     | Unit          | Test Conditions  |
|--|-----------------|-----|------|---------|---------------|--|
| Zero gate voltage collector current<br>/ Diode reverse current | $I_{CES} / I_R$ | —   | —    | 5       | $\mu\text{A}$ | $V_{CE} = 1200 \text{ V}, V_{GE} = 0$  |
| 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                                 | $V_{GE(off)}$   | 4   | —    | 8       | V             | $V_{CE} = 10 \text{ V}, I_C = 1 \text{ mA}$  |
| Collector to emitter saturation voltage                        | $V_{CE(sat)}$   | —   | 2.0  | —       | V             | $I_C = 30 \text{ A}, V_{GE} = 15 \text{ V}$ <sup>Note3</sup>                       |
| Input capacitance  | $C_{ies}$       | —   | 2000 | —       | pF            | $V_{CE} = 25 \text{ V}$  |
| Output capacitance   | $C_{oes}$       | —   | 70   | —       | pF            | $V_{GE} = 0$   |
| Reveres transfer capacitance                                   | $C_{res}$       | —   | 45   | —       | pF            | $f = 1 \text{ MHz}$  |
| Switching time   | $t_{d(on)}$     | —   | 50   | —       | ns            | $V_{CC} = 600 \text{ V}, V_{GE} = 15 \text{ V}$                                    |
|  | $t_r$           | —   | 20   | —       | ns            | $I_C = 30 \text{ A}$   |
|  | $t_{d(off)}$    | —   | 110  | —       | ns            | $R_g = 5 \Omega$   |
|  | $t_f$           | —   | 100  | —       | ns            | Inductive load   |
| Short circuit withstand time                                   | $t_{sc}$        | —   | 5    | —       | $\mu\text{s}$ | $V_{CC} \leq 720 \text{ V}, V_{GE} = 15 \text{ V}$<br>$T_C \leq 125^\circ\text{C}$ |
| FRD forward voltage  | $V_F$           | —   | 1.7  | —       | V             | $I_F = 30 \text{ A}$ <sup>Note3</sup>  |
| FRD reverse recovery time                                      | $t_{rr}$        | —   | 200  | —       | ns            | $I_F = 30 \text{ A}$<br>$di_F/dt = 100 \text{ A}/\mu\text{s}$                      |

Notes: 3. Pulse test.

### Package Dimension



### Ordering Information

| Orderable Part Number | Quantity | Shipping Container |
|-----------------------|----------|--------------------|
| RJH1CD7DPQ-E0#T2      | 450 pcs  | Box (Tube)         |

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