

# RJP1CS03DWT / RJP1CS03DWA

1250V - 30A - IGBT

Application: Inverter

R07DS0826EJ0300

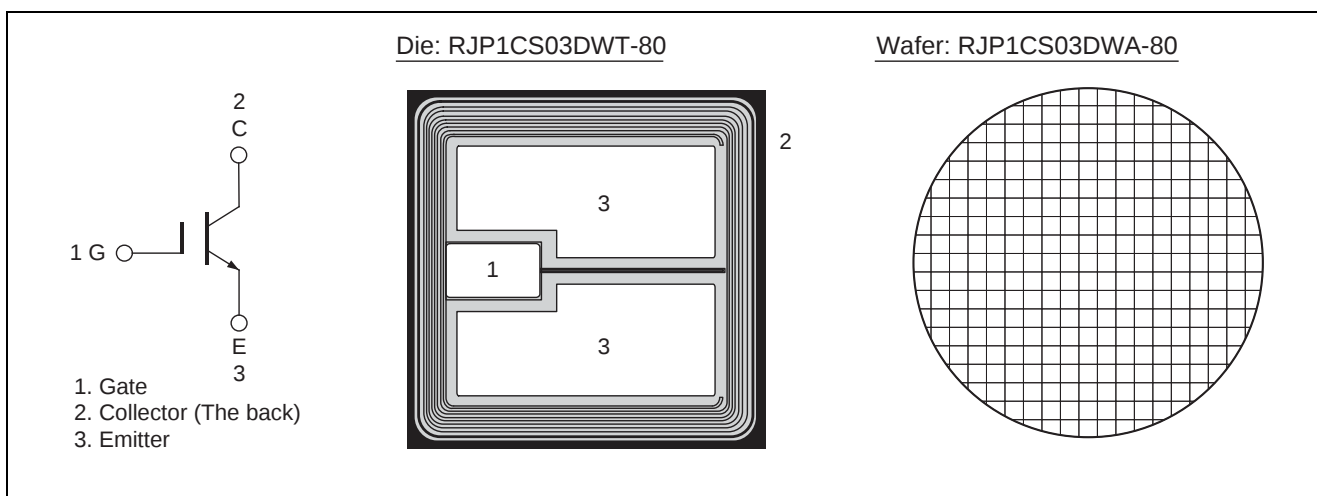
Rev.3.00

Oct 20, 2014

## Features

- Low collector to emitter saturation voltage  
 $V_{CE(sat)} = 1.8 \text{ V typ. (at } I_C = 30 \text{ A, } V_{GE} = 15 \text{ V, } T_c = 25^\circ\text{C)}$
- High speed switching
- Short circuit withstands time (10  $\mu\text{s min.}$ )

## Outline



## Absolute Maximum Ratings

( $T_c = 25^\circ\text{C}$  unless otherwise noted )

| Item                         | Symbol                    | Ratings              | Unit             |
|------------------------------|---------------------------|----------------------|------------------|
| Collector to emitter voltage | $V_{CES}$                 | 1250                 | V                |
| Gate to emitter voltage      | $V_{GES}$                 | $\pm 30$             | V                |
| Collector current            | $T_c = 25^\circ\text{C}$  | $I_C$                | 60               |
|                              | $T_c = 100^\circ\text{C}$ | $I_C$                | 30               |
| Junction temperature         | $T_j$                     | 175 <sup>Note1</sup> | $^\circ\text{C}$ |

Notes: 1. Please use this device in the thermal conditions where the junction temperature does not exceed 175°C.  
 IGBT Application Note is disclosed about reliability test and application condition up to  $T_j=175^\circ\text{C}$ .

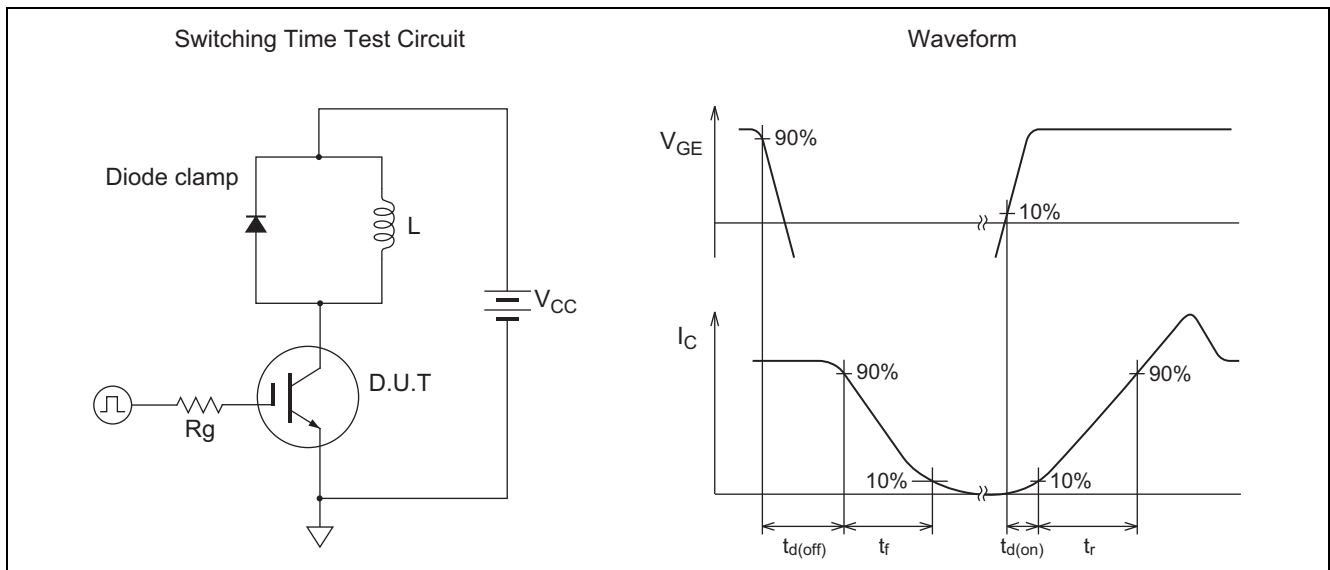
**Electrical Characteristics** (Datas below are measured values on a package configuration.)(T<sub>c</sub> = 25°C unless otherwise noted)

| Item                                          | Symbol               | Min | Typ  | Max  | Unit | Test Conditions                                                                                                                                 |
|-----------------------------------------------|----------------------|-----|------|------|------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Zero gate voltage collector current           | I <sub>CES</sub>     | —   | —    | 1    | μA   | V <sub>CE</sub> = 1250 V, V <sub>GE</sub> = 0                                                                                                   |
| Gate to emitter leak current                  | I <sub>GES</sub>     | —   | —    | ±1   | μA   | V <sub>GE</sub> = ±30 V, V <sub>CE</sub> = 0                                                                                                    |
| Gate to emitter cutoff voltage                | V <sub>GE(off)</sub> | 5.0 | —    | 6.8  | V    | V <sub>CE</sub> = 10 V, I <sub>C</sub> = 1.0 mA                                                                                                 |
| Collector to emitter saturation voltage       | V <sub>CE(sat)</sub> | —   | 1.80 | 2.25 | V    | I <sub>C</sub> = 30 A, V <sub>GE</sub> = 15 V <sup>Note2</sup>                                                                                  |
| Input capacitance                             | C <sub>ies</sub>     | —   | 3.2  | —    | nF   | V <sub>CE</sub> = 25 V<br>V <sub>GE</sub> = 0<br>f = 1 MHz                                                                                      |
| Output capacitance                            | C <sub>oes</sub>     | —   | 0.10 | —    | nF   |                                                                                                                                                 |
| Reveres transfer capacitance                  | C <sub>res</sub>     | —   | 0.07 | —    | nF   |                                                                                                                                                 |
| Switching time <sup>Note3</sup>               | t <sub>d(on)</sub>   | —   | 20   | —    | ns   | V <sub>CC</sub> = 600 V<br>I <sub>C</sub> = 30 A<br>V <sub>GE</sub> = ±15 V<br>R <sub>g</sub> = 10 Ω, T <sub>c</sub> = 150 °C<br>Inductive load |
|                                               | t <sub>r</sub>       | —   | 20   | —    | ns   |                                                                                                                                                 |
|                                               | t <sub>d(off)</sub>  | —   | 250  | —    | ns   |                                                                                                                                                 |
|                                               | t <sub>f</sub>       | —   | 160  | —    | ns   |                                                                                                                                                 |
| Short circuit withstand time <sup>Note4</sup> | t <sub>sc</sub>      | 10  | —    | —    | μs   | V <sub>CC</sub> ≤ 720 V, V <sub>GE</sub> = 15 V<br>T <sub>c</sub> = 150 °C                                                                      |

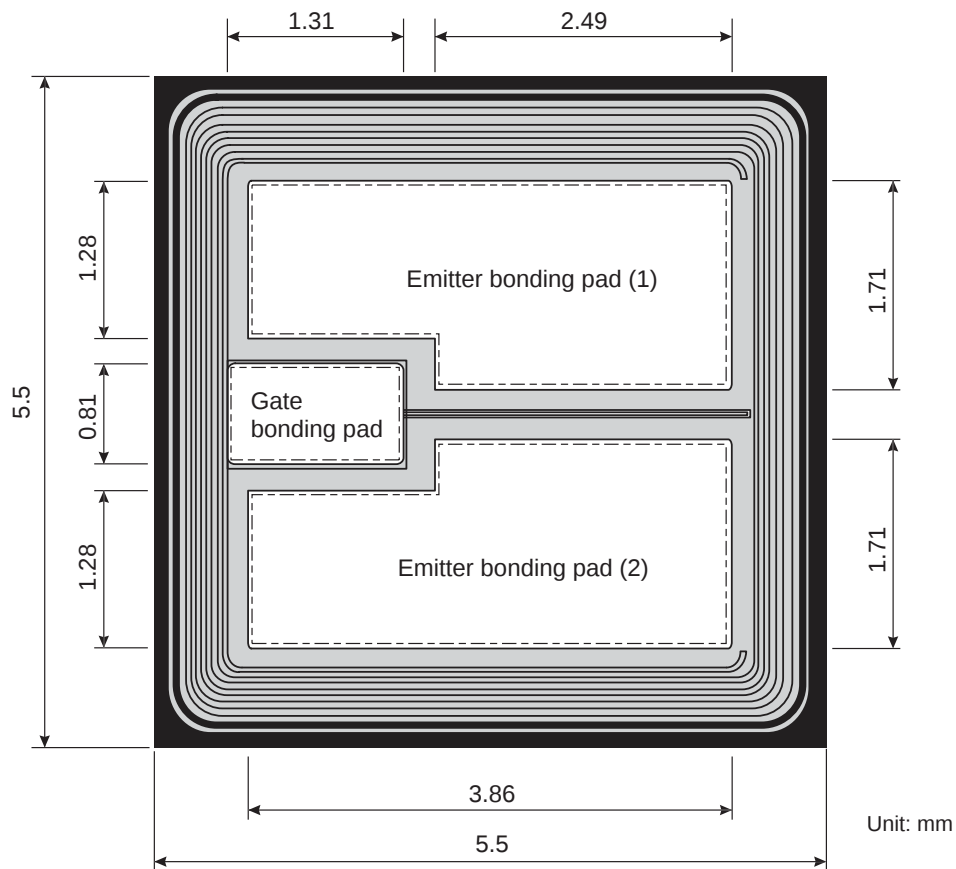
Notes: 2. Pulse test.

3. Switching time test circuit and waveform are shown below.

4. Verified by design.



## Die Dimension



Note 1.

| Illustration        | Definition        |
|---------------------|-------------------|
| Part of white       | Al pattern        |
| Part of dotted line | Bonding area      |
| Part of gray        | Final passivation |

Note 2. The back of the chip is processed with Au evaporation.

Note 3. Recognition, target and any other patterns which are not related to IGBT operation, may be changed without notice.

## Ordering Information

| Orderable Part Number |
|-----------------------|
| RJP1CS03DWA-80#W0     |
| RJP1CS03DWT-80#X0     |

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