

# RJP1CS27DWA / RJP1CS27DWS

1250V - 150A - IGBT

R07DS1305EJ0100

Application: Inverter

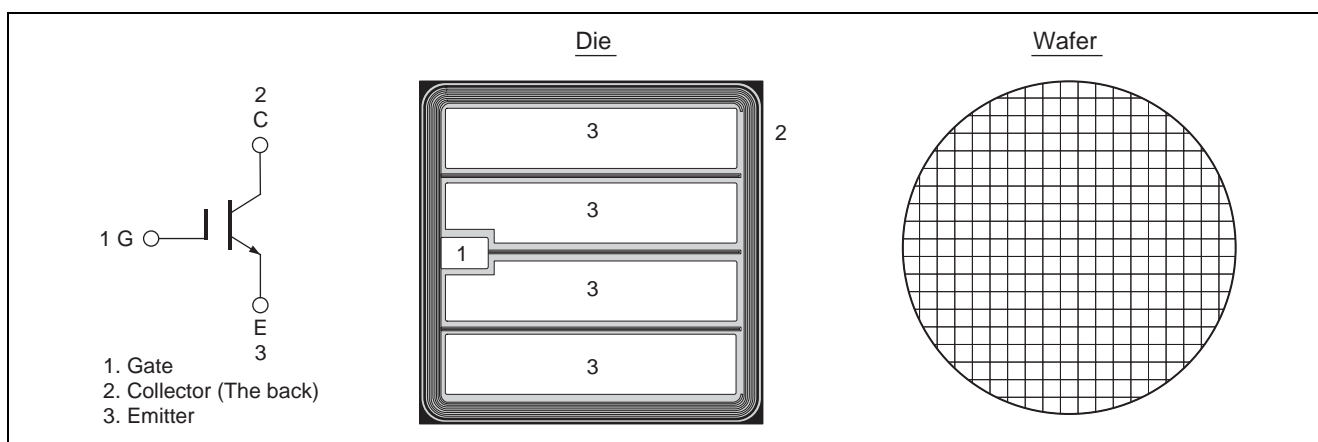
Rev.1.00

Sep 30, 2015

## Features

- Renesas generation 7<sup>th</sup> Trench IGBT
- Low collector to emitter saturation voltage  
 $V_{CE(sat)} = 1.55 \text{ V typ. (at } I_c = 150 \text{ A, } V_{GE} = 15 \text{ V, } T_c = 25^\circ\text{C)}$
- Moderate 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	$T_c = 25^\circ\text{C}$	$I_c$	300	A
	$T_c = 100^\circ\text{C}$	$I_c$	150	A
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 $^\circ\text{C}$ .

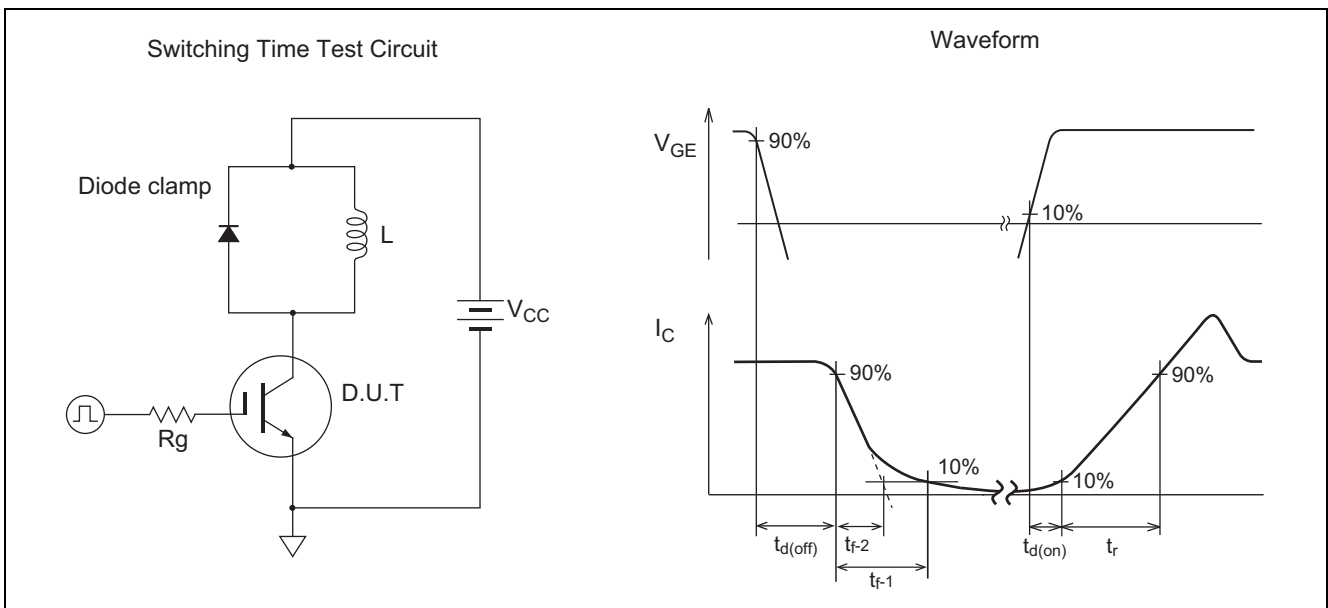
IGBT Application Note is disclosed about reliability test and application condition up to  $T_j = 175^\circ\text{C}$ .

**Electrical Characteristics** (These data are actual measurement values in an evaluation package.)

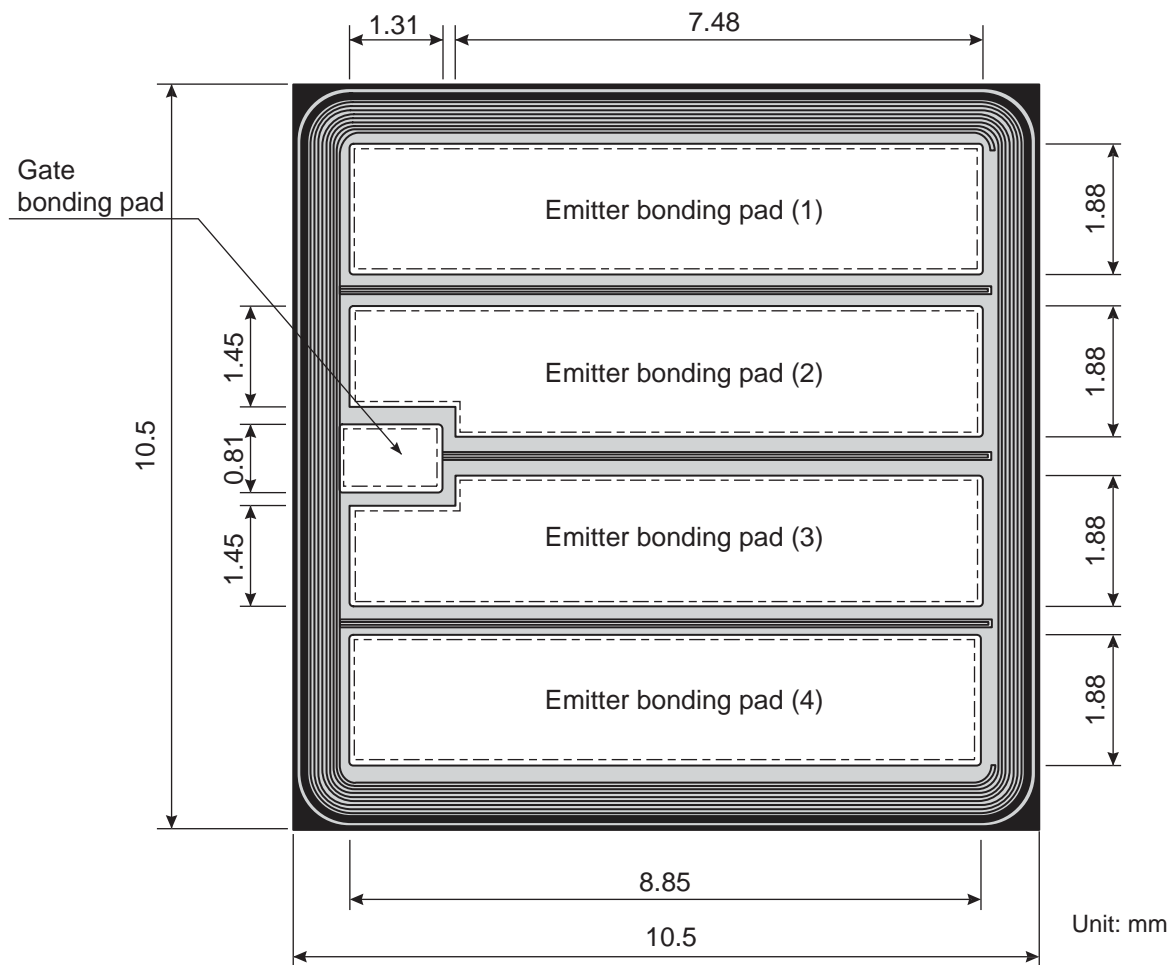
( Tc = 25°C unless otherwise noted )

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Zero gate voltage collector current	$I_{CES}$	—	—	1	$\mu A$	$V_{CE} = 1250 V, V_{GE} = 0$
Gate to emitter leak current	$I_{GES}$	—	—	$\pm 1$	$\mu A$	$V_{GE} = \pm 30 V, V_{CE} = 0$
Gate to emitter cutoff voltage	$V_{GE(off)}$	5.0	—	6.8	V	$V_{CE} = 10 V, I_C = 5.0 mA$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	1.55	2.0	V	$I_C = 150 A, V_{GE} = 15 V$ <sup>Note2</sup>
Input capacitance	$C_{ies}$	—	15.0	—	nF	$V_{CE} = 25 V$
Output capacitance	$C_{oes}$	—	0.40	—	nF	$V_{GE} = 0$
Reveres transfer capacitance	$C_{res}$	—	0.32	—	nF	$f = 1 MHz$
Total gate charge	$Q_g$	—	910	—	nC	$V_{GE} = 15 V$
Gate to emitter charge	$Q_{ge}$	—	130	—	nC	$V_{CE} = 600 V$
Gate to collector charge	$Q_{gc}$	—	490	—	nC	$I_C = 150 A$
Switching time <sup>Note3</sup>	$t_{d(on)}$	—	95	—	ns	$V_{CC} = 600 V$
	$t_r$	—	70	—	ns	$I_C = 150 A$
	$t_{d(off)}$	—	600	—	ns	$V_{GE} = \pm 15 V$
	$t_{f-1}$	—	320	—	ns	$R_g = 10 \Omega, T_c = 150 \text{ }^\circ C$
	$t_{f-2}$	—	160	—	ns	Inductive load
Short circuit withstand time <sup>Note4</sup>	$t_{sc}$	10	—	—	$\mu s$	$V_{CC} \leq 720 V, V_{GE} = 15 V$ $T_c = 150 \text{ }^\circ C$

- 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	Shipment form
RJP1CS27DWA-80#W0	Unsawn wafer
RJP1CS27DWS-80#W0	Sawn wafer

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