

# RJP65M04DWA / RJP65M04DWS

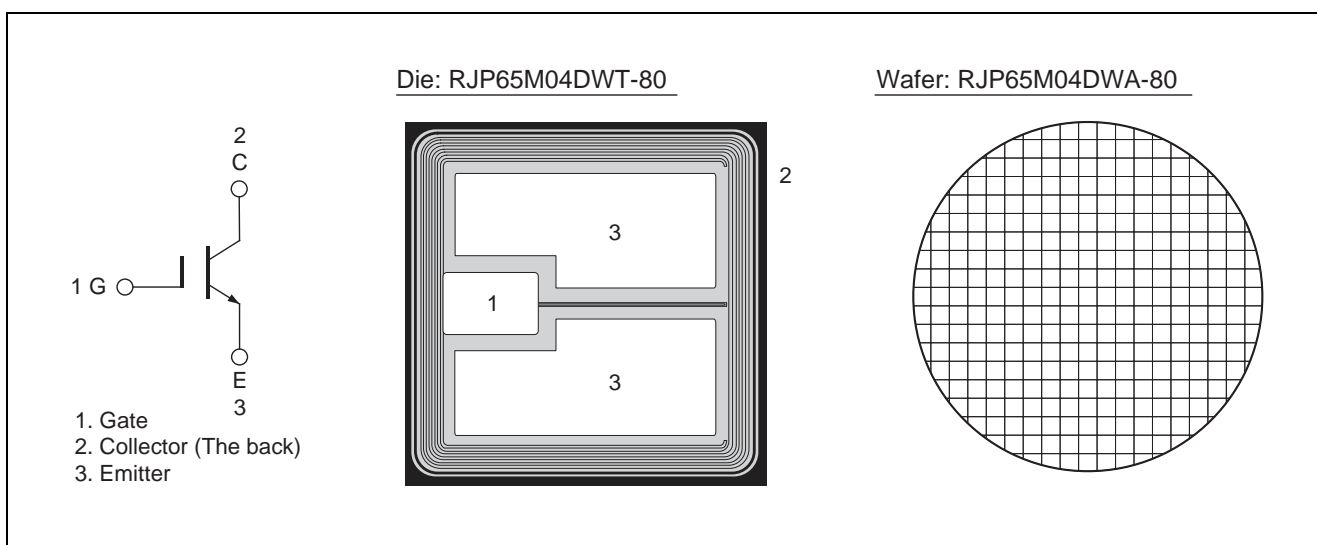
650V - 50A - IGBT  
Application: Inverter

R07DS1312EJ0100  
Rev.1.00  
Nov. 06, 2015

## Features

- Low collector to emitter saturation voltage  
 $V_{CE(sat)} = 1.55 \text{ V typ. (at } I_C = 50 \text{ A, } V_{GE} = 15 \text{ V, } T_a = 25^\circ\text{C)}$
- High speed Switching
- Short circuit withstands time  
 $t_{sc} = 5 \mu\text{s min. (at } V_{CC} \leq 400 \text{ V, } V_{GE} = 15 \text{ V, } T_j = 150^\circ\text{C)}$

## Outline



## Absolute Maximum Ratings

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

Item	Symbol	Ratings	Unit	
Collector to emitter voltage	$V_{CES}$	650	V	
Gate to emitter voltage	$V_{GES}$	$\pm 30$	V	
Collector current	$T_c = 25^\circ\text{C}$	$I_C$ <sup>Note1</sup>	100	A
	$T_c = 100^\circ\text{C}$	$I_C$ <sup>Note1</sup>	50	A
Junction temperature	$T_j$	175 <sup>Note1</sup>	$^\circ\text{C}$	

Note 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.)

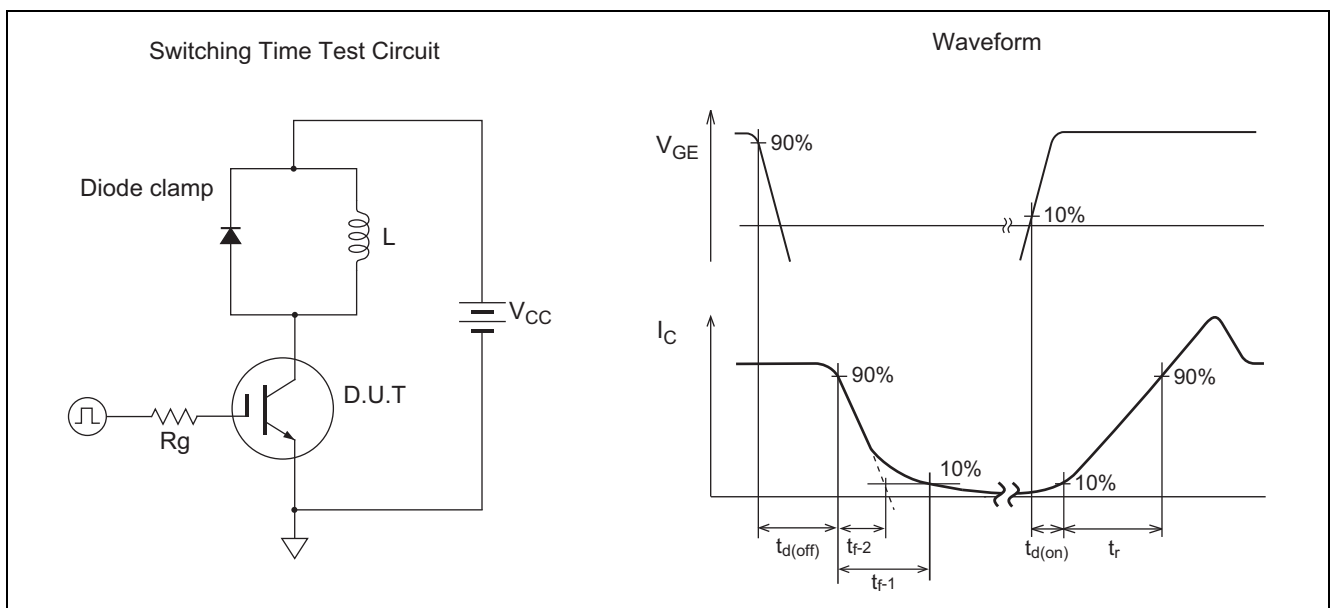
(Tc = 25°C unless otherwise described)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Zero gate voltage collector current	$I_{CES}$	—	—	1	$\mu\text{A}$	$V_{CE} = 650\text{ V}, V_{GE} = 0$
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	$V_{GE(off)}$	4.5	—	6.8	V	$V_{CE} = 10\text{ V}, I_C = 1\text{ mA}$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	1.55	2.05	V	$I_C = 50\text{ A}, V_{GE} = 15\text{ V}$ <sup>Note2</sup>
Input capacitance	$C_{ies}$	—	2800	—	pF	$V_{CE} = 25\text{ V}$
Output capacitance	$C_{oes}$	—	120	—	pF	$V_{GE} = 0$
Reverse transfer capacitance	$C_{res}$	—	80	—	pF	$f = 1\text{ MHz}$
Total gate charge	$Q_g$	—	140	—	nC	$V_{GE} = 15\text{ V}$
Gate to emitter charge	$Q_{ge}$	—	25	—	nC	$V_{CE} = 400\text{ V}$
Gate to collector charge	$Q_{gc}$	—	70	—	nC	$I_C = 50\text{ A}$
Switching time <sup>Note3</sup>	$t_{d(on)}$	—	20	—	ns	$V_{CC} = 400\text{ V}$
	$t_r$	—	30	—	ns	$I_C = 50\text{ A}$
	$t_{d(off)}$	—	150	—	ns	$V_{GE} = \pm 15\text{ V}$
	$t_{f-1}$	—	95	—	ns	$R_g = 10\Omega, T_c = 150\text{ }^\circ\text{C}$
	$t_{f-2}$	—	60	—	ns	Inductive load
Short circuit withstand time <sup>Note4</sup>	$t_{sc}$	5	—	—	$\mu\text{s}$	$V_{CC} \leq 400\text{ V}, V_{GE} = 15\text{ V}$ $T_C = 150\text{ }^\circ\text{C}$

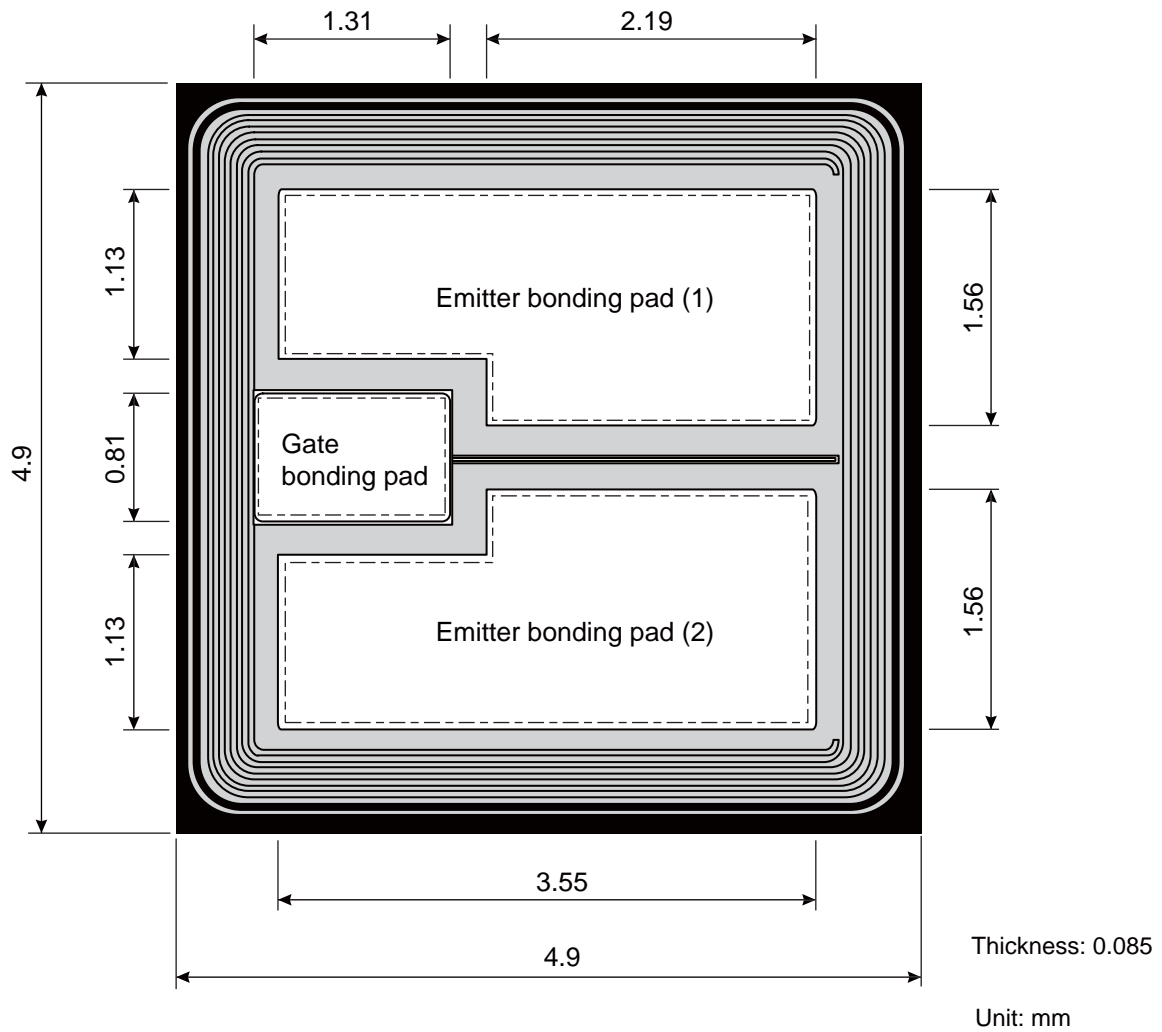
Notes: 2. Pulse test.

3. Switching time test circuit and symbol definitions of switching time 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 Diode operation, may be changed without notice.

**Ordering Information**

Orderable Part Number	Shipment form
RJP65M04DWA-80#W0	Unsaun wafer
RJP65M04DWS-80#W0	Sawn wafer

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