

# RJH1CV7DPK

1200V - 35A - IGBT Application: Inverter R07DS0748EJ0300 Rev.3.00 Feb 14, 2013

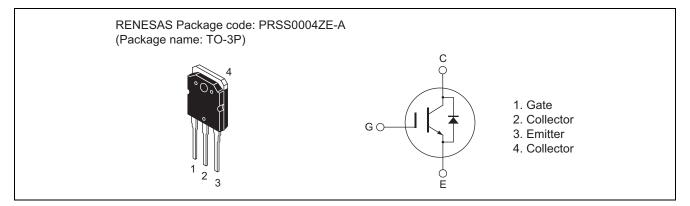
Datasheet

## Features

- Short circuit withstand time (5 µs typ.)
- Low collector to emitter saturation voltage  $V_{CE(sat)} = 1.8 \text{ V typ.}$  (at  $I_C = 35 \text{ A}$ ,  $V_{GE} = 15 \text{ V}$ ,  $Ta = 25^{\circ}C$ )
- Built-in fast recovery diode ( $t_{rr} = 200$  ns typ.) in one package
- Trench gate and thin wafer technology
- High speed switching

 $t_f = 280$  ns typ. (at  $V_{CC} = 600$  V,  $V_{GE} = 15$  V,  $I_C = 35$  A, Rg = 5  $\Omega$ ,  $Ta = 25^{\circ}C$ , inductive load)

## Outline



## **Absolute Maximum Ratings**

				$(Ta = 25^{\circ}C)$
Item		Symbol	Ratings	Unit
Collector to emitter voltage / diode reverse voltage		V <sub>CES</sub> / V <sub>R</sub>	1200	V
Gate to emitter voltage		V <sub>GES</sub>	±30	V
Collector current	Tc = 25°C	lc	70	А
	Tc = 100°C	lc	35	А
Collector peak current		ic(peak) Note1	105	А
Collector to emitter diode forward current		I <sub>DF</sub>	35	А
Collector to emitter diod	de forward peak current	i <sub>DF</sub> (peak) <sup>Note1</sup>	105	А
Collector dissipation		Pc <sup>Note2</sup>	320	W
Junction to case thermal resistance (IGBT)		θj-c <sup>Note2</sup>	0.39	°C/W
Junction to case thermal resistance (Diode)		θj-cd <sup>Note2</sup>	0.69	°C/W
Junction temperature		Tj	150	°C
Storage temperature		Tstg	-55 to +150	°C
		•		

Notes: 1.  $PW \le 10 \ \mu s$ , duty cycle  $\le 1\%$ 

2. Value at Tc =  $25^{\circ}C$ 



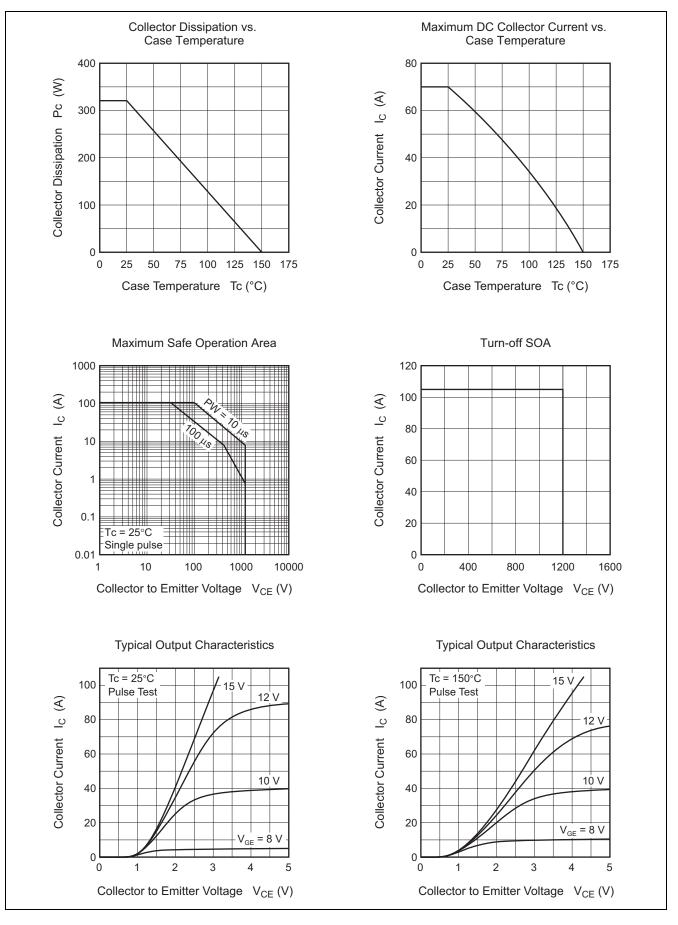
# **Electrical Characteristics**

						$(Ta = 25^{\circ}C)$	
Item	Symbol	Min	Тур	Max	Unit	Test Conditions	
Zero gate voltage collector current / Diode reverse current	I <sub>CES</sub> /I <sub>R</sub>	—	—	5	μA	$V_{CE} = 1200 \text{ V}, \text{ V}_{GE} = 0$	
Gate to emitter leak current	I <sub>GES</sub>		—	±1	μΑ	$V_{GE} = \pm 30 \text{ V}, \text{ V}_{CE} = 0$	
Gate to emitter cutoff voltage	V <sub>GE(off)</sub>	4.5	—	6.5	V	$V_{CE} = 10 \text{ V}, I_{C} = 1 \text{ mA}$	
Collector to emitter saturation voltage	V <sub>CE(sat)</sub>	_	1.8	2.3	V	$I_{C} = 35 \text{ A}, V_{GE} = 15 \text{ V}^{Note3}$	
	V <sub>CE(sat)</sub>		2.5	—	V	$I_C = 70 \text{ A}, V_{GE} = 15 \text{ V}^{Note3}$	
Input capacitance	Cies		2075	—	pF	V <sub>CE</sub> = 25 V	
Output capacitance	Coes		100	_	pF	$V_{GE} = 0$	
Reverse transfer capacitance	Cres		55	—	pF	f = 1 MHz	
Total gate charge	Qg	_	166	—	nC	V <sub>GE</sub> = 15 V V <sub>CE</sub> = 300 V	
Gate to emitter charge	Qge	_	20	_	nC		
Gate to collector charge	Qgc	_	95	—	nC	I <sub>C</sub> = 35 A	
Turn-on delay time	t <sub>d(on)</sub>	_	53	—	ns	$V_{CC} = 600 V$ $V_{GE} = 15 V$ $I_C = 35 A$	
Rise time	tr	_	45	_	ns		
Turn-off delay time	t <sub>d(off)</sub>		185	_	ns		
Fall time	t <sub>f</sub>	_	280	_	ns	$Rg = 5 \Omega$	
Turn-on energy	Eon	_	3.2	_	mJ	Inductive load	
Turn-off energy	E <sub>off</sub>	_	2.5	_	mJ		
Total switching energy	E <sub>total</sub>	_	5.7	_	mJ	1	
Short circuit withstand time	t <sub>sc</sub>	_	5	—	μs	$\label{eq:V_CC} \begin{array}{l} V_{CC} \leq 720 \mbox{ V},  V_{GE} = 15 \mbox{ V} \\ Tc \leq 125^{\circ}C \end{array}$	
		-			-		
FRD forward voltage	VF	_	2.1	—	V	$I_F = 35 A^{Note3}$	
FRD reverse recovery time	t <sub>rr</sub>	_	200	—	ns	I <sub>F</sub> = 35 A	
FRD reverse recovery charge	Q <sub>rr</sub>	_	0.7		μC	di <sub>F</sub> /dt = 100 A/µs	
FRD peak reverse recovery current	Irr		9.6	—	А		

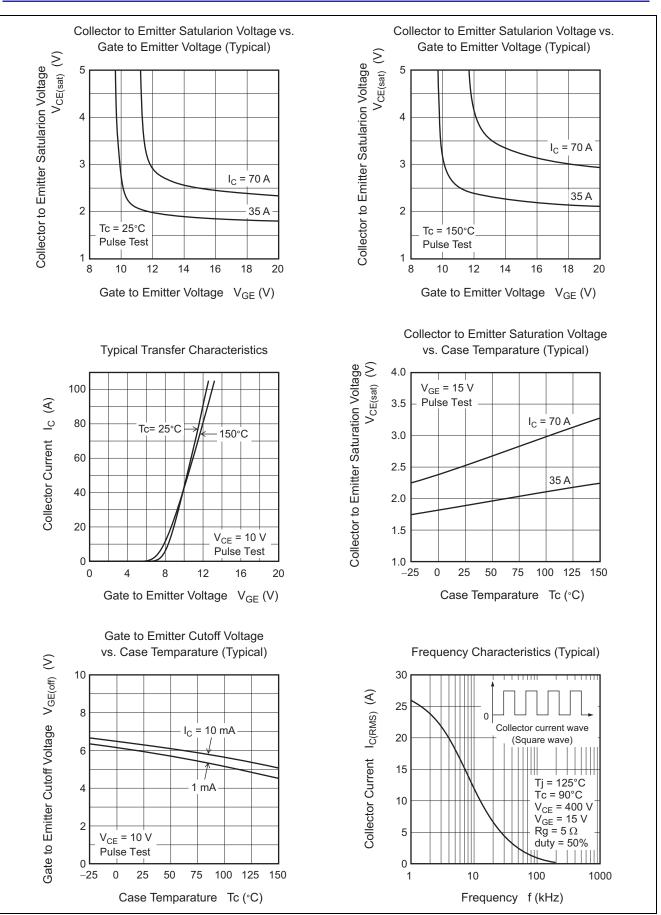
Notes: 3. Pulse test.

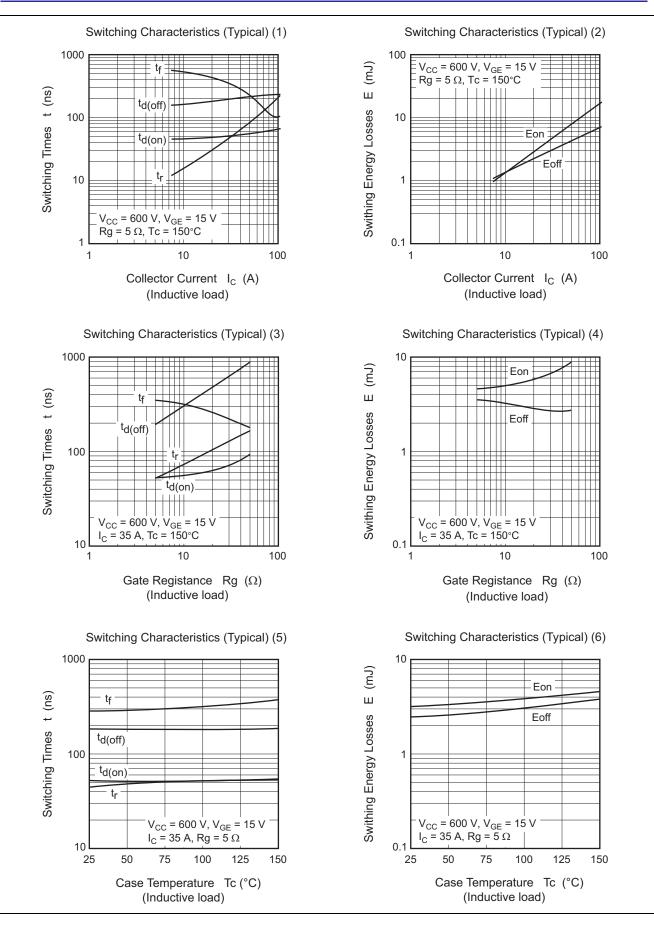


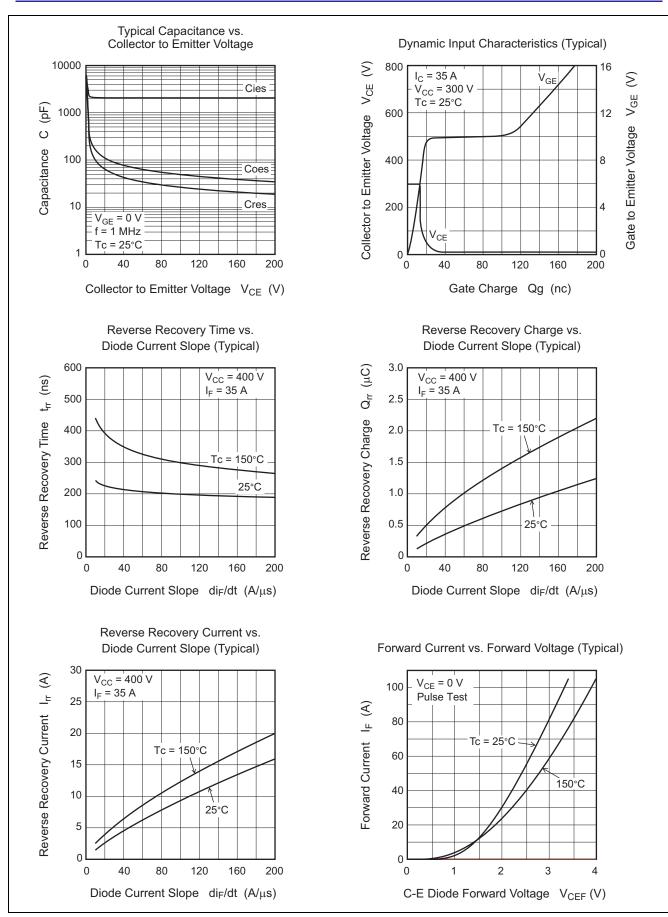
## **Main Characteristics**



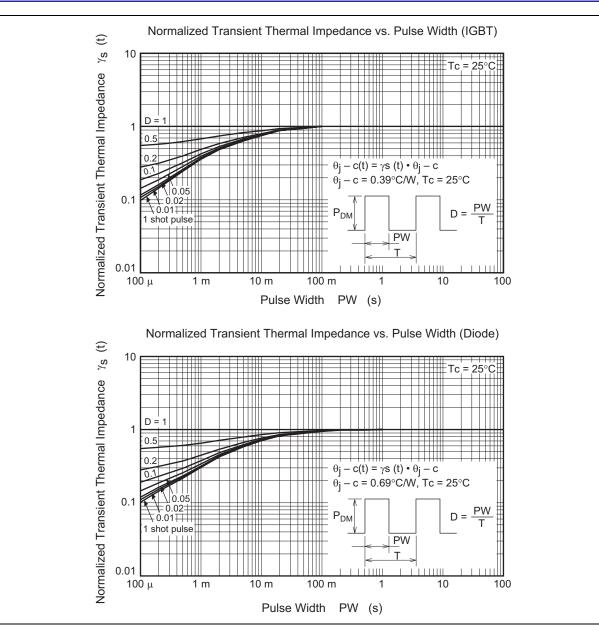




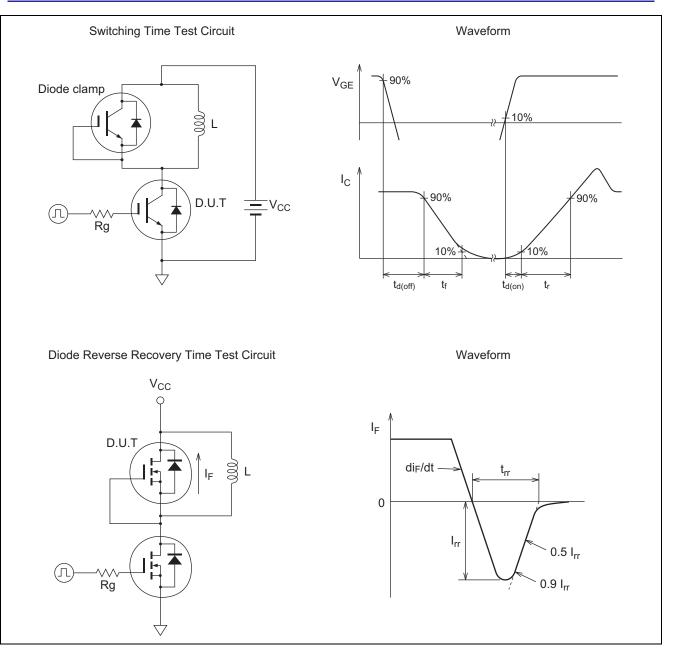














# Package Dimension

Package Name TO-3P	JEITA Package Code SC-65	RENESAS Code PRSS0004ZE-A	Previous Code TO-3P / TO-3PV	MASS[Typ.] 5.0g	
	<u>1.6</u> <u>1.4 Ma</u>	15.6 ± 0.3	$10 \pm 0.2$	4.8 ± 0.2 1.5 2.8 0.6 ± 0.2	Unit: mm
	<u>5.45 ± 0</u>		<u>.0</u> <u>5.45 ± 0.5</u>		

# **Ordering Information**

Orderable Part Number	Quantity	Shipping Container
RJH1CV7DPK-00#T0	30 pcs	Tube



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