

600V - 22A - IGBT Application: Inverter

R07DS0156EJ0300 Rev.3.00 Apr 19, 2012

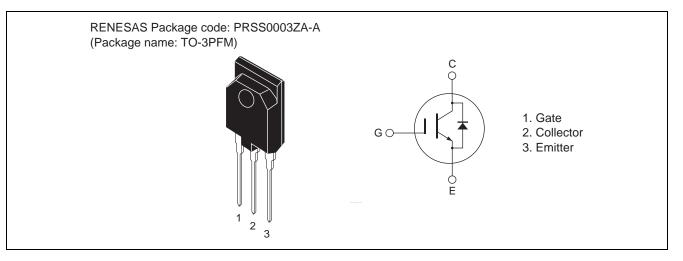
Datasheet

Features

- Short circuit withstand time (5 µs typ.)
- Low collector to emitter saturation voltage $V_{CE(sat)} = 1.6 V$ typ. (at $I_C = 22 A$, $V_{GE} = 15 V$, $Ta = 25^{\circ}C$)
- Built in fast recovery diode (100 ns typ.) in one package
- Trench gate and thin wafer technology
- High speed switching

 $t_f = 70$ ns typ. (at $V_{CC} = 300$ V, $V_{GE} = 15$ V, $I_C = 22$ A, Rg = 5 Ω , $Ta = 25^{\circ}C$, inductive load)

Outline



Absolute Maximum Ratings

		1	$(Ta = 25^{\circ}C)$
Item	Symbol	Ratings	Unit
tage / diode reverse voltage	V_{CES} / V_{R}	600	V
	V _{GES}	±30	V
$Tc = 25^{\circ}C$	Ι _C	45	А
Tc = 100°C	Ι _C	22	А
· ·	ic(peak) Note1	90	А
de forward current	I _{DF}	22	А
de forward peak current	i _{DF} (peak) ^{Note1}	90	А
	P _C ^{Note2}	40	W
al resistance (IGBT)		3.13	°C/W
al resistance (Diode)	θj-cd ^{Note2}	4.58	°C/W
	Tj	150	°C
	Tstg	-55 to +150	٥°
	$Tc = 25^{\circ}C$ $Tc = 100^{\circ}C$ de forward current de forward peak current al resistance (IGBT)	tage / diode reverse voltage V_{CES} / V_R Image / diode reverse voltage V_{CES} / V_R VGES V_{GES} Image / diode reverse voltage V_{CES} / V_R VGES Ic Image / diode reverse voltage I_C Image / diode reverse voltage Ic Image / diode reverse voltage <td>tage / diode reverse voltageV_{CES} / V_R600VGES$\frac{1}{300}$Tc = 25°CIcIc45Tc = 100°CIcIc(peak)90de forward currentIDFIDF(peak)90PcNote19090de forward peak currentIDF(peak)Note240al resistance (IGBT)θj-cdNote23.13al resistance (Diode)θj-cdTj150</td>	tage / diode reverse voltage V_{CES} / V_R 600VGES $\frac{1}{300}$ Tc = 25°CIcIc45Tc = 100°CIcIc(peak)90de forward currentIDFIDF(peak)90PcNote19090de forward peak currentIDF(peak)Note240al resistance (IGBT) θ j-cdNote23.13al resistance (Diode) θ j-cdTj150

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

2. Value at Tc = 25°C



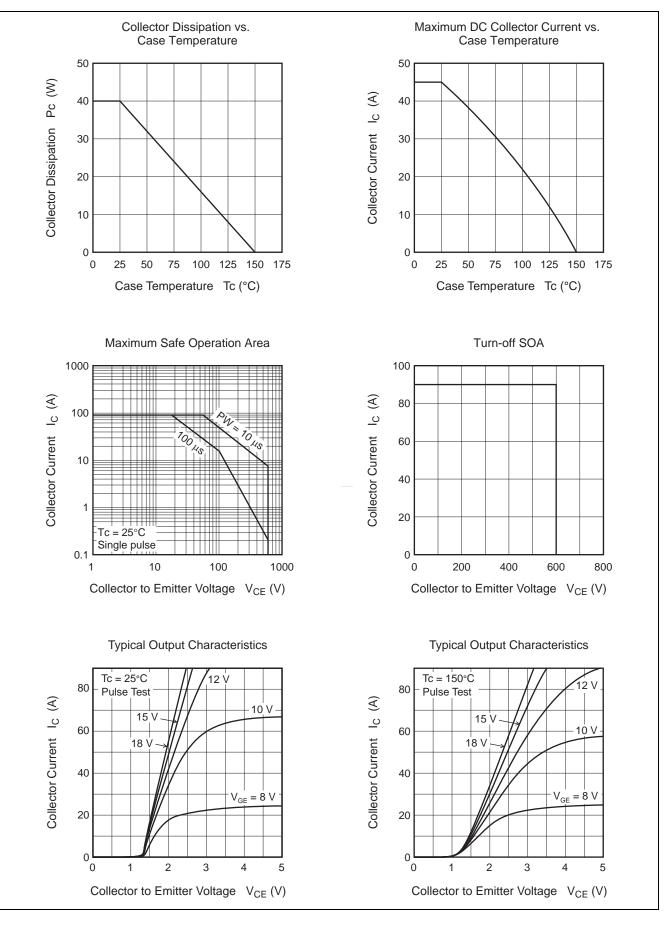
Electrical Characteristics

						$(Ta = 25^{\circ}C)$
Item	Symbol	Min	Тур	Max	Unit	Test Conditions
Collector to emitter breakdown voltage	$V_{BR(CES)}$	600	—	—	V	$I_{C} = 10 \ \mu A, \ V_{GE} = 0$
Zero gate voltage collector current / Diode reverse current	I _{CES} / I _R	_	_	5	μΑ	$V_{CE} = 600 \text{ V}, \text{ V}_{GE} = 0$
Gate to emitter leak current	I _{GES}		—	±1	μA	$V_{GE} = \pm 30 \text{ V}, V_{CE} = 0$
Gate to emitter cutoff voltage	V _{GE(off)}	4.0	—	6.0	V	$V_{CE} = 10 \text{ V}, I_{C} = 1 \text{ mA}$
Collector to emitter saturation voltage	V _{CE(sat)}		1.6	2.2	V	$I_{C} = 22 \text{ A}, V_{GE} = 15 \text{ V}^{\text{Note3}}$
	V _{CE(sat)}		2.0		V	$I_{C} = 45 \text{ A}, V_{GE} = 15 \text{ V}^{\text{Note3}}$
Input capacitance	Cies		1050		pF	V _{CE} = 25 V
Output capacitance	Coes		60	—	pF	$V_{GE} = 0$
Reveres transfer capacitance	Cres	_	28	_	pF	f = 1 MHz
Total gate charge	Qg	_	46	_	nC	$V_{GE} = 15 V$ $V_{CE} = 300 V$ $I_{C} = 22 A$
Gate to emitter charge	Qge	_	8	_	nC	
Gate to collector charge	Qgc	_	16	_	nC	
Turn-on delay time	t _{d(on)}	_	40		ns	$V_{CC} = 300 V$ $V_{GE} = 15 V$ $I_{C} = 22 A$ $Rg = 5 \Omega$ Inductive load
Rise time	tr		20	_	ns	
Turn-off delay time	t _{d(off)}	_	80	_	ns	
Fall time	t _f	_	70	_	ns	
Turn-on energy	Eon	_	0.23	_	mJ	
Turn-off energy	E _{off}	_	0.29	_	mJ	
Total switching energy	E _{total}	_	0.52	_	mJ	
Short circuit withstand time	t _{sc}	3.0	5.0	_	μS	$V_{CC} \leq 360~V$, V_{GE} = 15 V
FRD forward voltage	V _F	_	1.4	1.9	V	$I_F = 22 \text{ A}^{\text{Note3}}$
FRD reverse recovery time	t _{rr}	_	100		ns	I _F = 22 A
FRD reverse recovery charge	Q _{rr}	_	0.15		μC	di _F /dt = 100 A/µs
FRD peak reverse recovery current	l _{rr}	_	4.4		A	

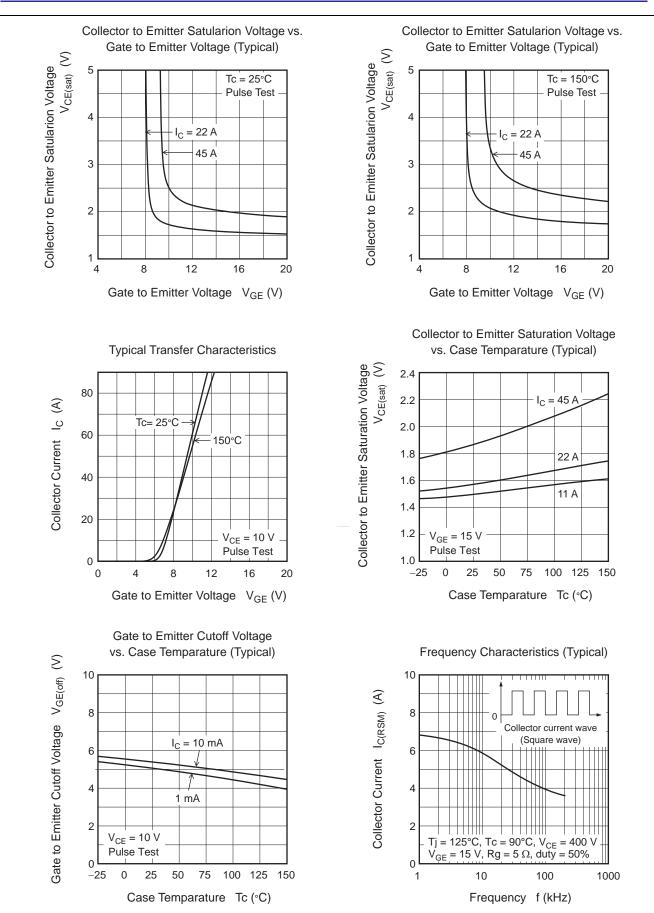
Notes: 3. Pulse test

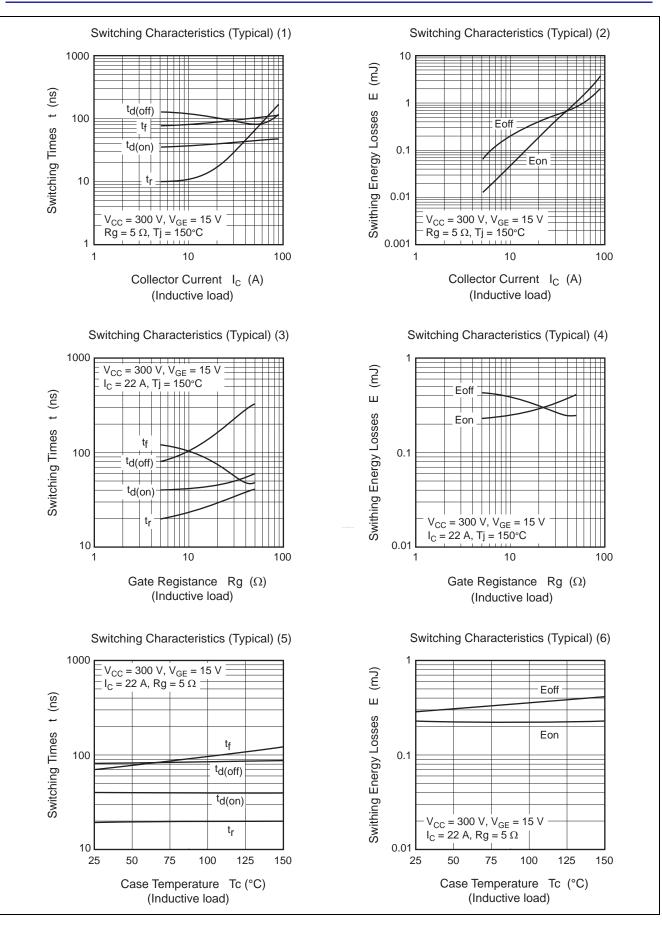


Main Characteristics

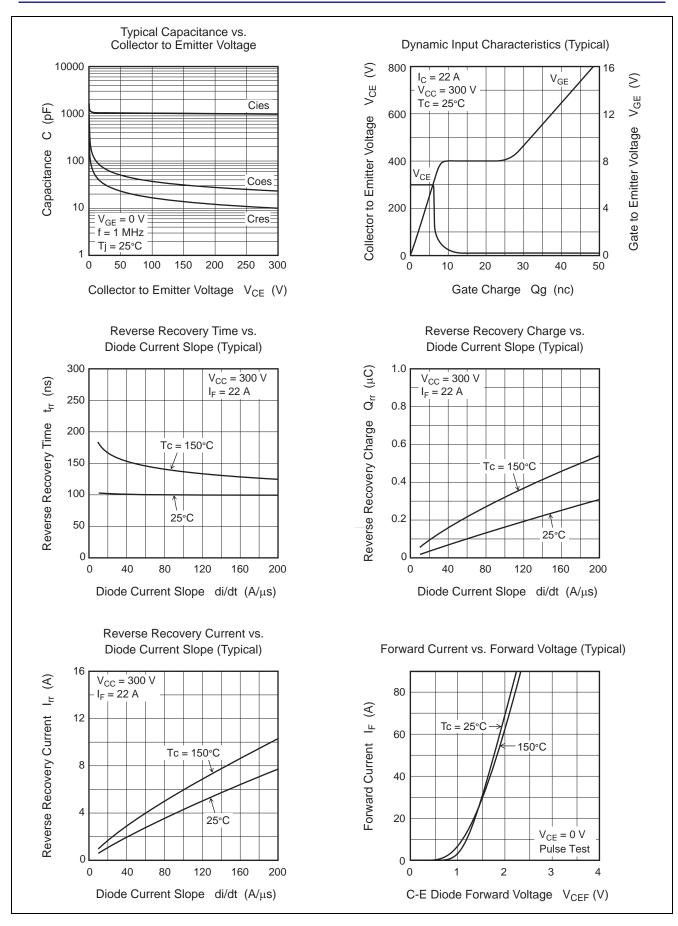




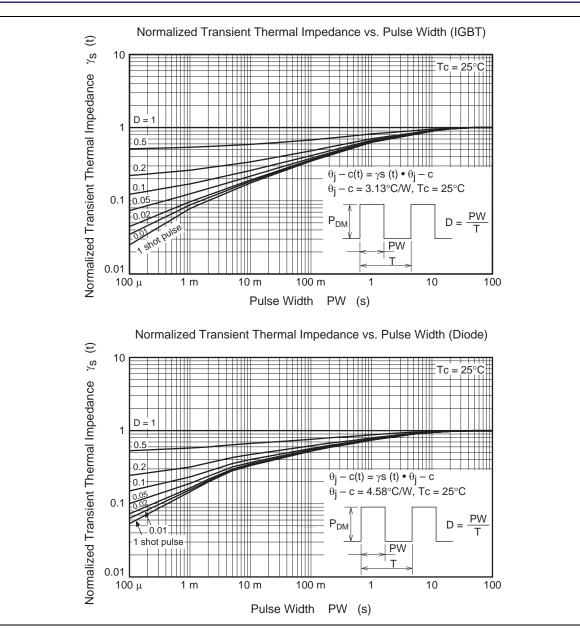




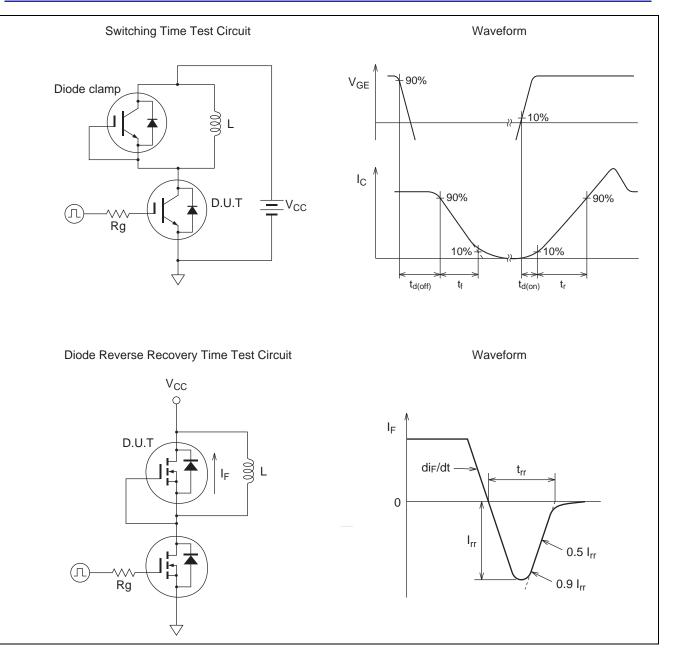






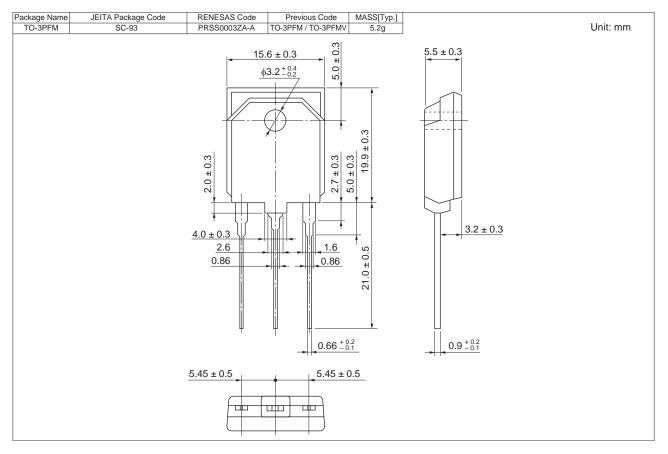








Package Dimension



Ordering Information

Orderable Part No.	Quantity	Shipping Container		
RJH60D0DPM-00#T1	360 pcs	Box (Tube)		



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