

RJP60D0DPP-M0

Silicon N Channel IGBT
High Speed Power Switching

R07DS0173EJ0100

Rev.1.00

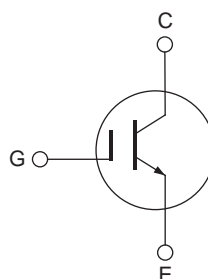
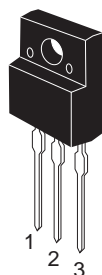
Mar 11, 2011

Features

- Short circuit withstand time (5 μ s typ.)
- Low collector to emitter saturation voltage
 $V_{CE(sat)} = 1.6$ V typ. ($I_C = 22$ A, $V_{GE} = 15$ V, $T_a = 25^\circ\text{C}$)
- Gate to emitter voltage rating ± 30 V
- Pb-free lead plating and chip bonding

Outline

RENESAS Package code: PRSS0003AF-A)
(Package name: TO-220FL)



1. Gate
2. Collector
3. Emitter

Absolute Maximum Ratings

($T_a = 25^\circ\text{C}$)

Item	Symbol	Ratings	Unit	
Collector to emitter voltage	V_{CES}	600	V	
Gate to emitter voltage	V_{GES}	± 30	V	
Collector current	$T_c = 25^\circ\text{C}$	I_C	45	A
	$T_c = 100^\circ\text{C}$	I_C	22	A
Collector peak current	$i_{c(peak)}$ ^{Note1}	90	A	
Collector dissipation	P_C ^{Note2}	35	W	
Junction to case thermal impedance	θ_{j-c} ^{Note2}	3.57	$^\circ\text{C}/\text{W}$	
Junction temperature	T_j	150	$^\circ\text{C}$	
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$	

- Notes: 1. $PW \leq 10 \mu\text{s}$, duty cycle $\leq 1\%$
2. Value at $T_c = 25^\circ\text{C}$

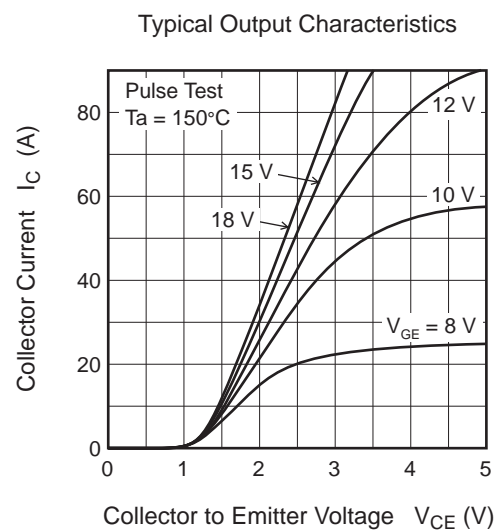
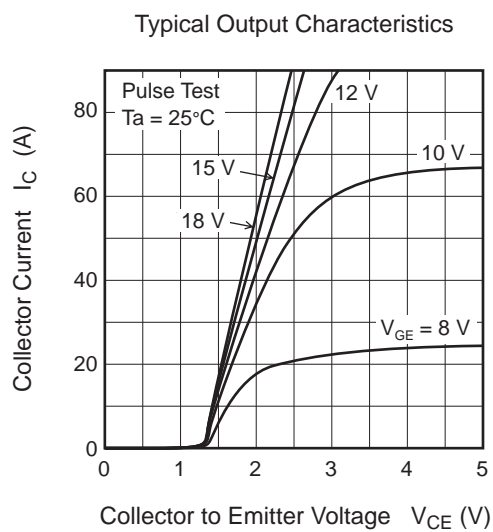
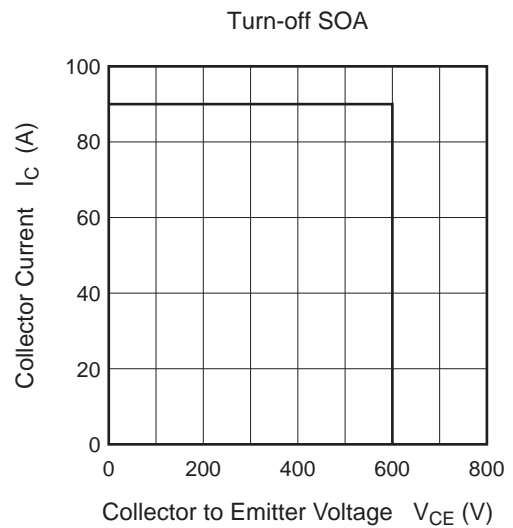
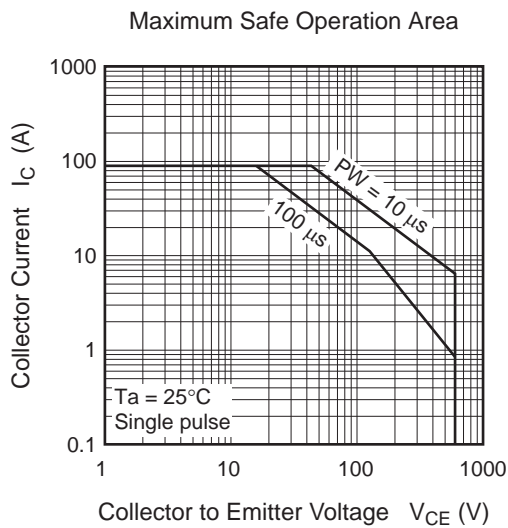
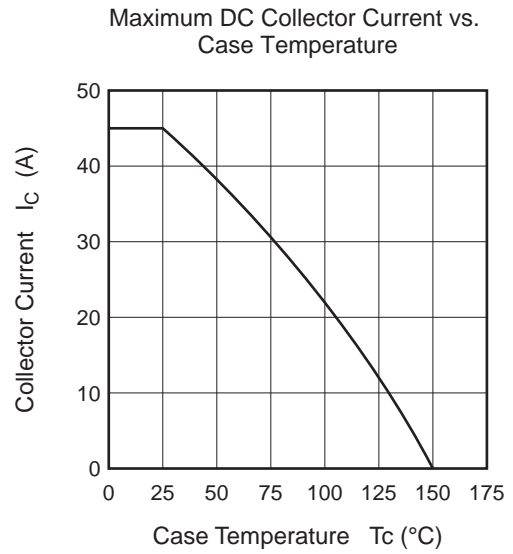
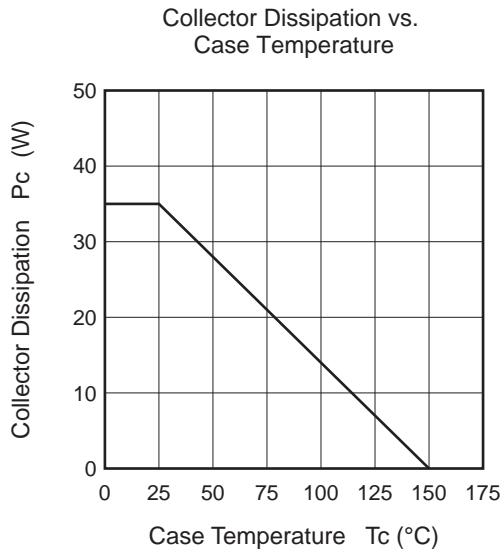
Electrical Characteristics

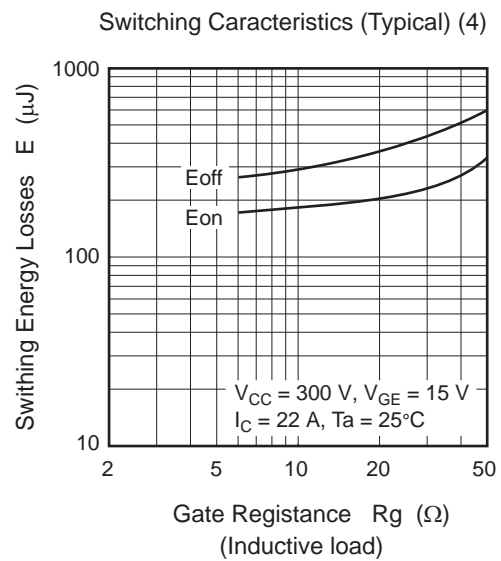
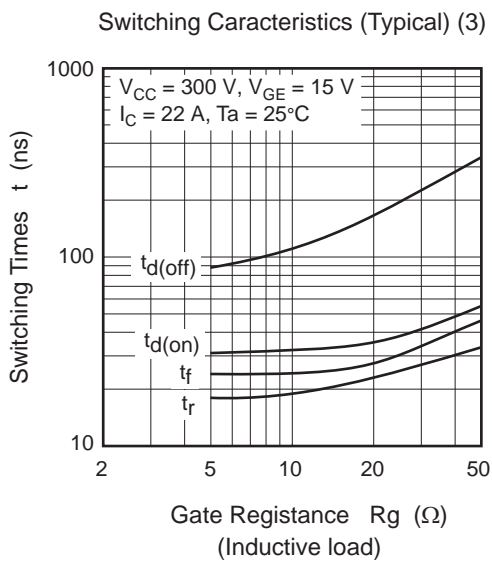
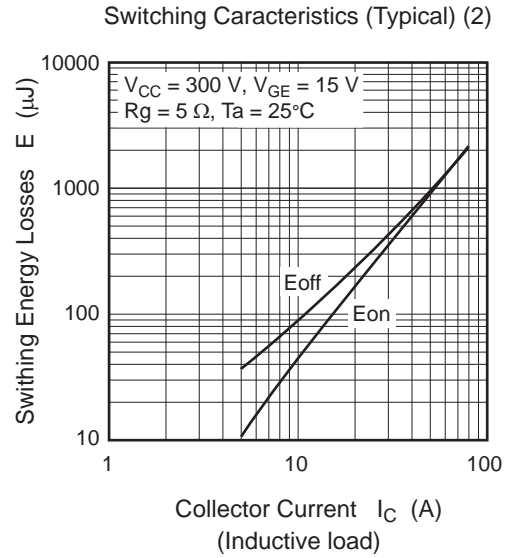
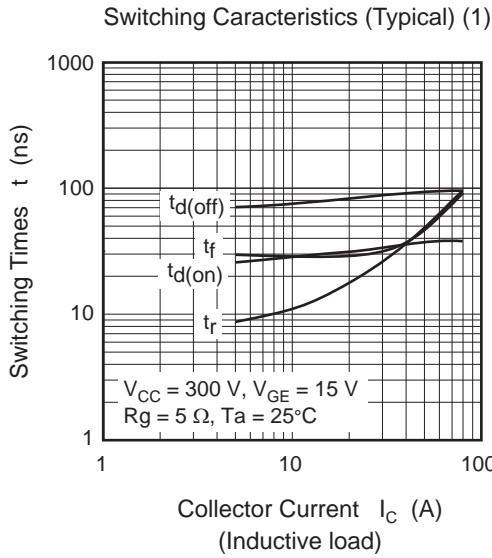
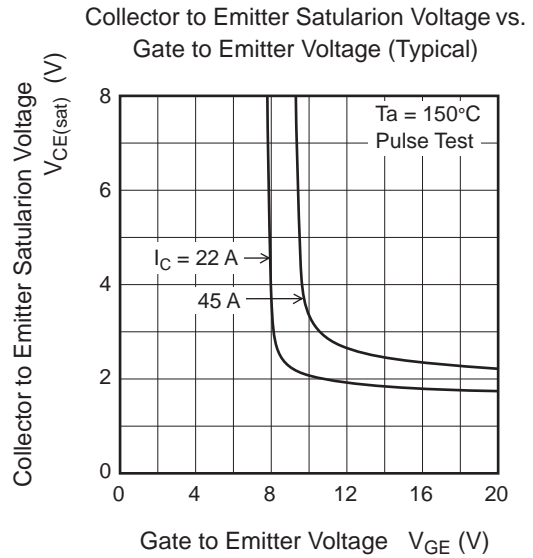
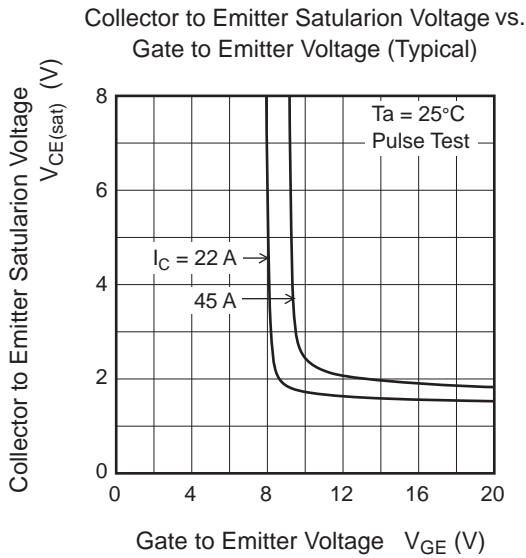
(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Zero gate voltage collector current	I_{CES}	—	—	5	μA	$V_{CE} = 600\text{ V}, V_{GE} = 0$
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	$I_C = 22\text{ A}, V_{GE} = 15\text{ V}$ ^{Note3}
	$V_{CE(sat)}$	—	2.0	—	V	$I_C = 45\text{ A}, V_{GE} = 15\text{ V}$ ^{Note3}
Input capacitance	C_{ies}	—	1050	—	pF	$V_{CE} = 25\text{ V}$
Output capacitance	C_{oes}	—	70	—	pF	$V_{GE} = 0$
Reveres transfer capacitance	C_{res}	—	32	—	pF	$f = 1\text{ MHz}$
Total gate charge	Q_g	—	45	—	nC	$V_{GE} = 15\text{ V}$
Gate to emitter charge	Q_{ge}	—	6	—	nC	$V_{CE} = 300\text{ V}$
Gate to collector charge	Q_{gc}	—	20	—	nC	$I_C = 22\text{ A}$
Switching time	$t_{d(on)}$	—	35	—	ns	$V_{CC} = 300\text{ V}, V_{GE} = 15\text{ V}$
	t_r	—	20	—	ns	$I_C = 22\text{ A}$
	$t_{d(off)}$	—	90	—	ns	$R_g = 5\ \Omega$
	t_f	—	70	—	ns	(Inductive load)
Short circuit withstand time	t_{sc}	3.0	5.0	—	μs	$V_{CC} \leq 400\text{ V}, V_{GE} = 15\text{ V}$

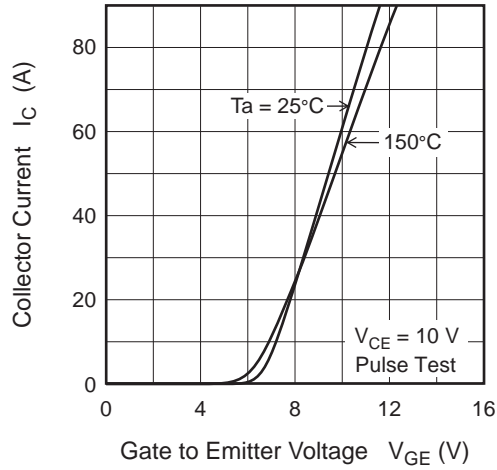
Notes: 3. Pulse test

Main Characteristics

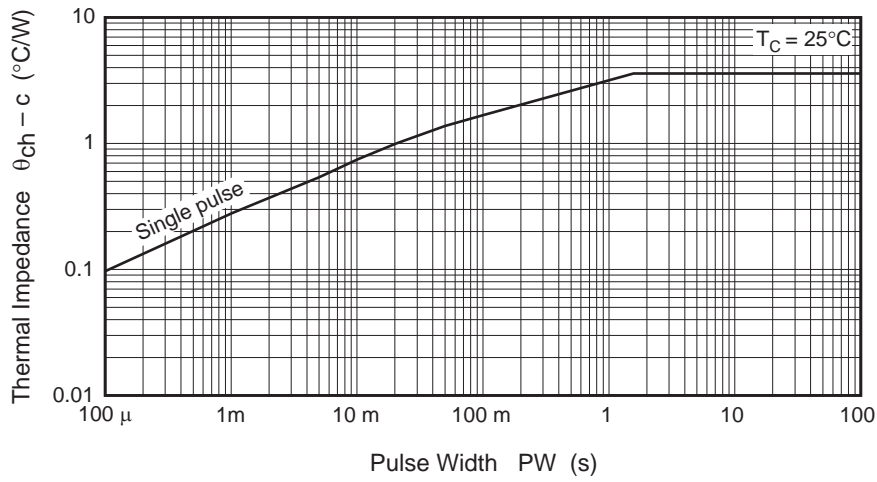




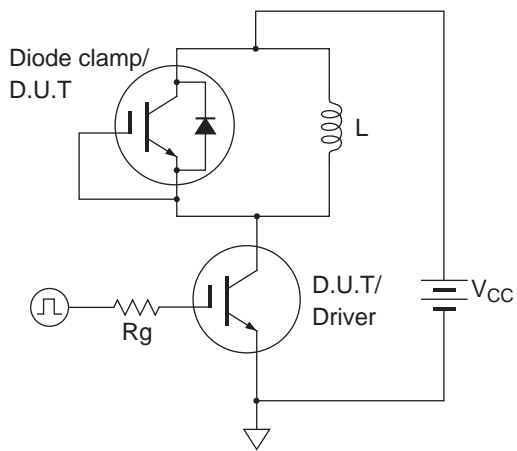
Transfer Characteristics (Typical)



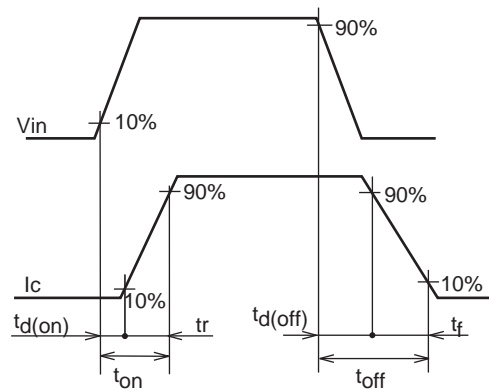
Thermal Impedance vs. Pulse Width



Switching Time Test Circuit



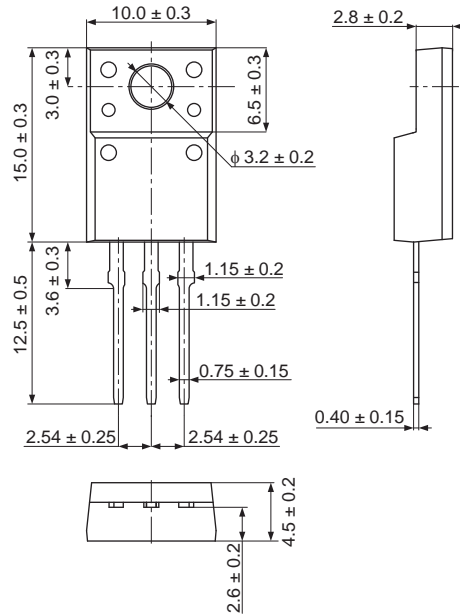
Waveform



Package Dimension

Package Name	JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
TO-220FL	—	PRSS0003AF-A	TO-220FL	1.5g

Unit: mm



Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJP60D0DPP-M0-T2	1050 pcs	Box (Tube)

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