

RJQ6008DPM

600V - 10A - IGBT and Diode
High Speed Power Switching

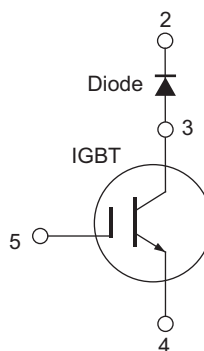
R07DS0847EJ0100
Rev.1.00
Jul 17, 2012

Features

- Low collector to emitter saturation voltage
 $V_{CE(sat)} = 2.65$ V typ. ($I_C = 25$ A, $V_{GE} = 15$ V, $T_a = 25^\circ\text{C}$)
- Built in fast recovery diode in one package
- Trench gate and thin wafer technology
- High speed switching

Outline

RENESAS Package code: PRSS0005ZB-A
(Package name: TO-3PFM-5)



1. NC
2. Cathode
3. Anode, Collector
4. Emitter
5. Gate

Absolute Maximum Ratings

IGBT

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

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 ^{Note1}	20	A
	$T_c = 100^\circ\text{C}$	I_C ^{Note1}	10	A
Collector peak current	$I_{C(peak)}$ ^{Note3}	100	A	
Collector dissipation	P_C ^{Note2}	48	W	
Junction to case thermal impedance	θ_{j-c}	2.3	$^\circ\text{C}/\text{W}$	
Junction temperature	T_j	150	$^\circ\text{C}$	
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$	

- Notes: 1. Limited by T_j max.
2. Value at $T_c = 25^\circ\text{C}$
3. Pulse width limited by maximum safe operating area.

Diode

(T_c = 25°C)

Item	Symbol	Ratings	Unit
Maximum reverse voltage	V _{RM}	600	V
Average rectified forward current	I _o	20	A
Peak surge forward current	PW = 10 ms	I _{FSM} ^{Note4}	A
	PW = 1 ms	I _{FSM} ^{Note5}	A
Junction to case thermal impedance	θ _{j-cd}	3.0	°C/W
Junction temperature	T _j	150	°C
Storage temperature	T _{stg}	-55 to +150	°C

Notes: 4. 50Hz sine half wave, Non-repetitive 1 cycle value, T_j = 25°C.5. PW = 1ms sine half wave, Non-repetitive peak value, T_j = 25°C.

Electrical Characteristics

IGBT

(T_j = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Zero gate voltage collector current	I _{CES}	—	—	10	μA	V _{CE} = 600 V, V _{GE} = 0
Gate to emitter leak current	I _{GES}	—	—	±1	μA	V _{GE} = ±30 V, V _{CE} = 0
Gate to emitter cutoff voltage	V _{GE(off)}	3.0	—	5.5	V	V _{CE} = 10 V, I _C = 1 mA
Collector to emitter saturation voltage	V _{CE(sat)}	—	2.65	3.5	V	I _C = 25 A, V _{GE} = 15 V ^{Note6}
	V _{CE(sat)}	—	3.2	—	V	I _C = 50 A, V _{GE} = 15 V ^{Note6}
Input capacitance	C _{ies}	—	1800	—	pF	V _{CE} = 25 V
Output capacitance	C _{oes}	—	200	—	pF	V _{GE} = 0
Reverses transfer capacitance	C _{res}	—	16	—	pF	f = 1 MHz
Switching time	t _{d(on)}	—	48	—	ns	I _C = 30 A, Resistive Load V _{CC} = 300 V V _{GE} = 15 V R _g = 5 Ω
	t _r	—	68	—	ns	
	t _{d(off)}	—	95	—	ns	
	t _f	—	55	—	ns	

Notes: 6. Pulse test

Diode

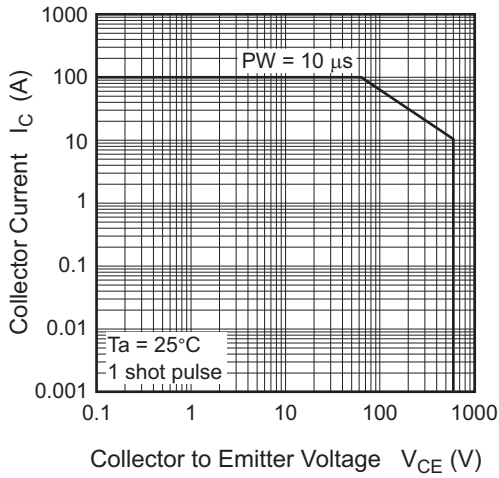
(T_j = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Forward voltage	V _F	—	1.2	1.8	V	I _F = 20 A
Reverse current	I _R	—	—	10	μA	V _R = 600 V
Reverse recovery time	t _{rr}	—	100	—	ns	I _F = 20 A di/dt = -100 A/μs
FRD reverse recovery charge	Q _{rr}	—	0.29	—	μC	
FRD peak reverse recovery current	I _{rr}	—	5.9	—	A	

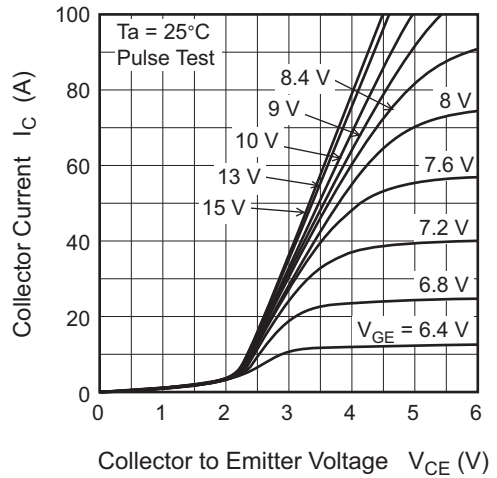
Main Characteristics

IGBT

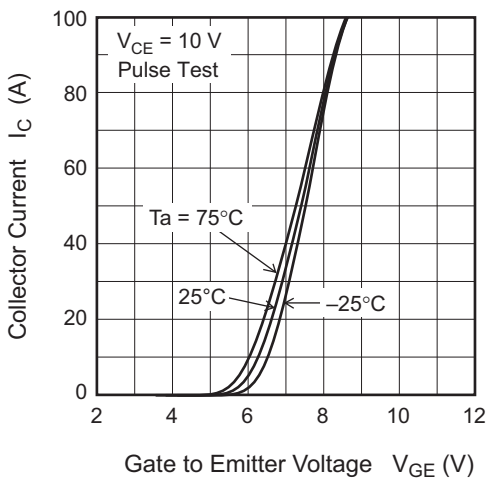
Maximum Safe Operation Area



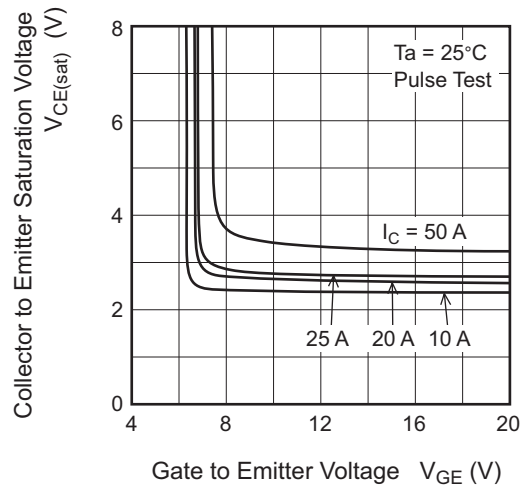
Typical Output Characteristics



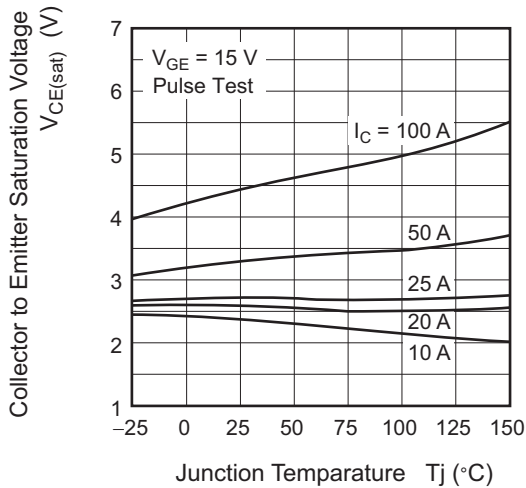
Typical Transfer Characteristics



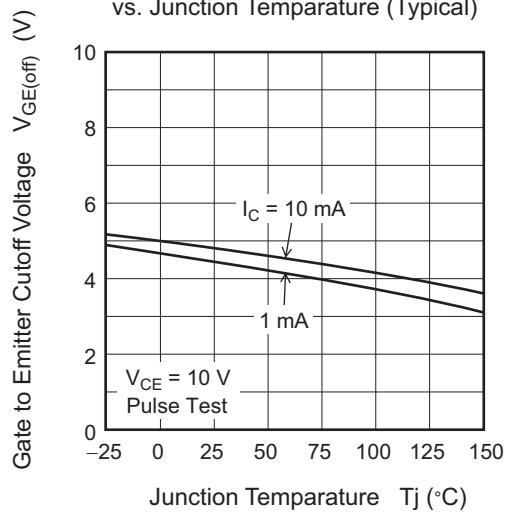
Collector to Emitter Saturation Voltage vs. Gate to Emitter Voltage (Typical)



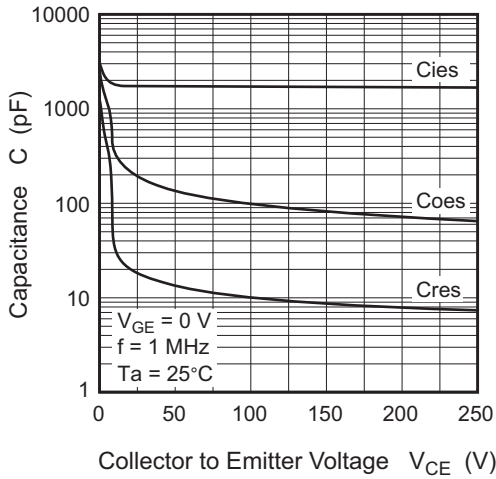
Collector to Emitter Saturation Voltage vs. Junction Temperature (Typical)



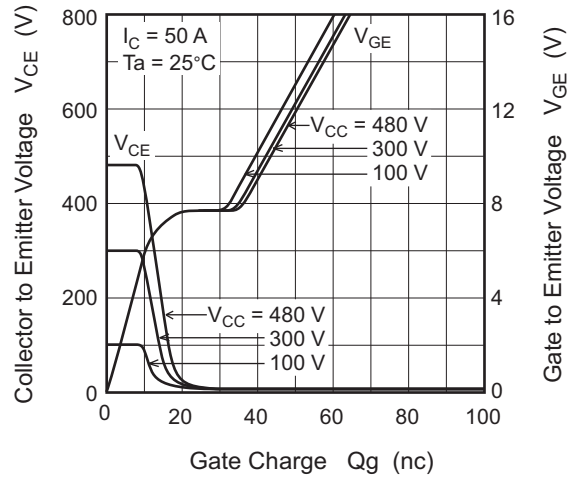
Gate to Emitter Cutoff Voltage vs. Junction Temperature (Typical)



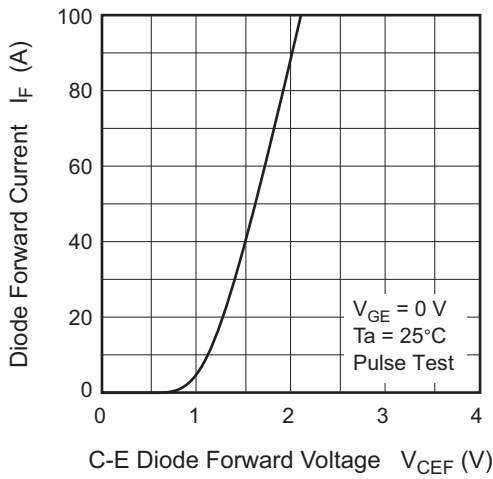
Typical Capacitance vs. Collector to Emitter Voltage



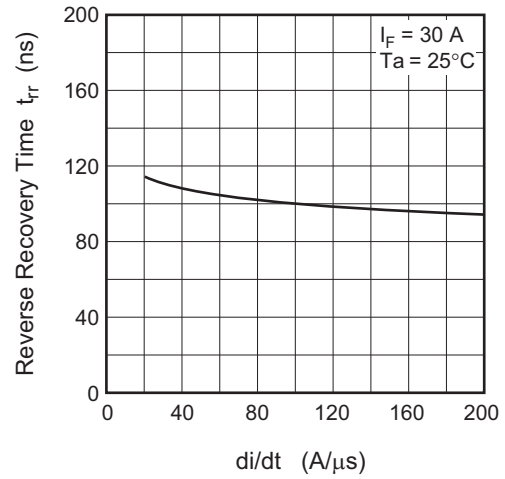
Dynamic Input Characteristics (Typical)



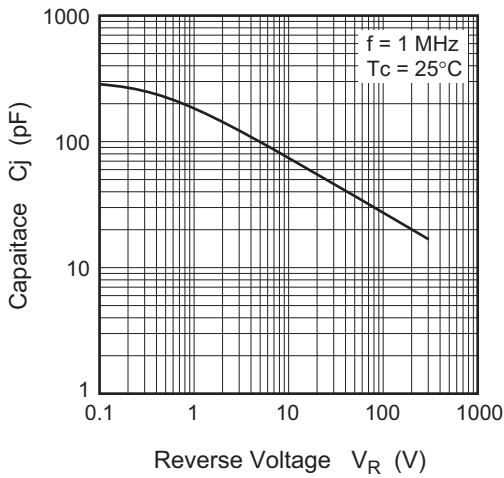
Forward Current vs. Forward Voltage (Typical)



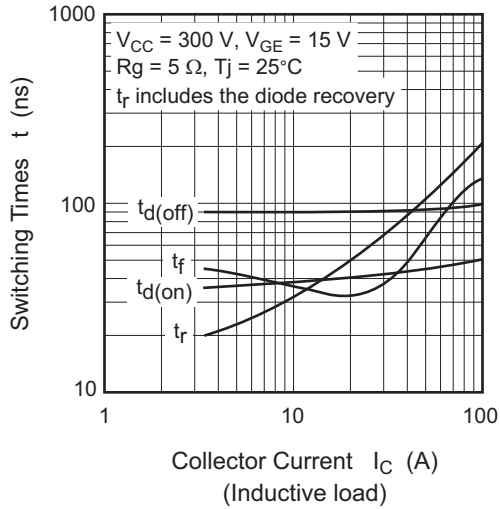
Reverse Recovery Time vs. di/dt (Typical)



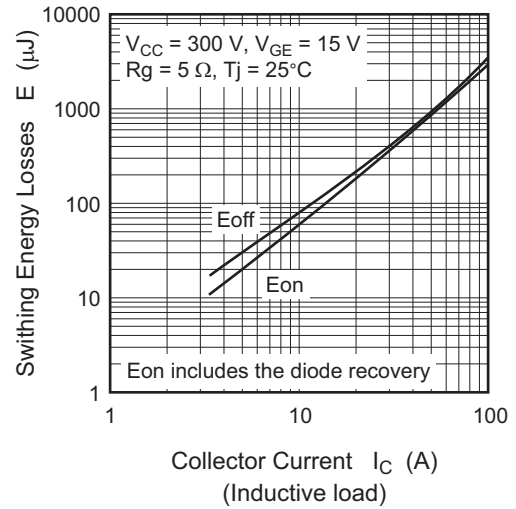
Capacitance vs. Reverse Voltage (Typical)



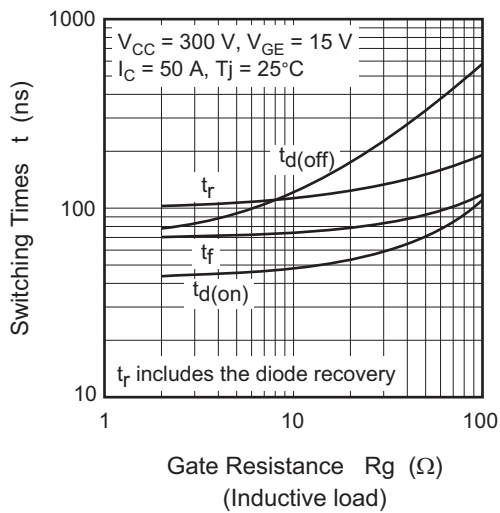
Switching Characteristics (Typical) (1)



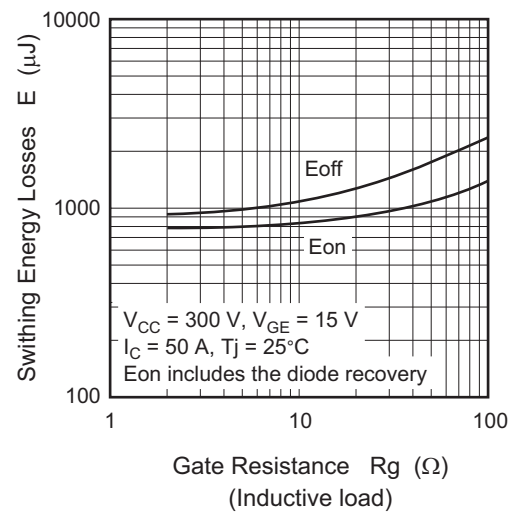
Switching Characteristics (Typical) (2)



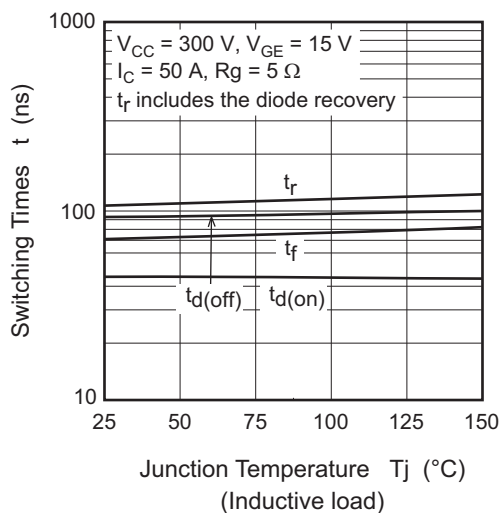
Switching Characteristics (Typical) (3)



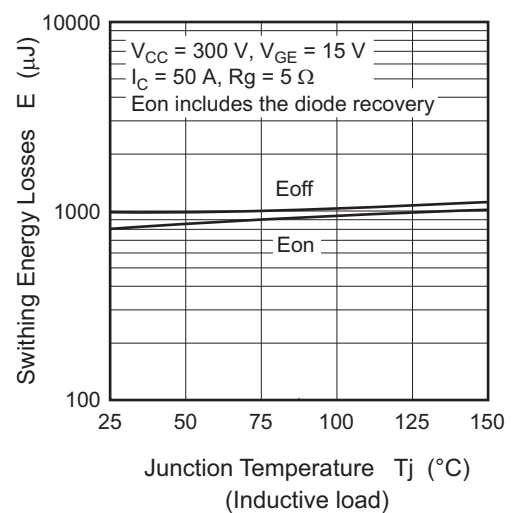
Switching Characteristics (Typical) (4)

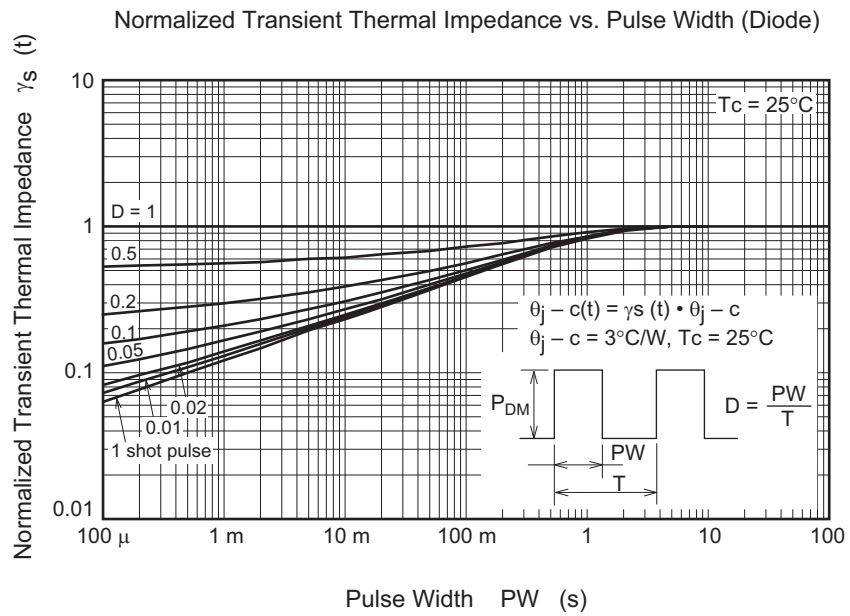
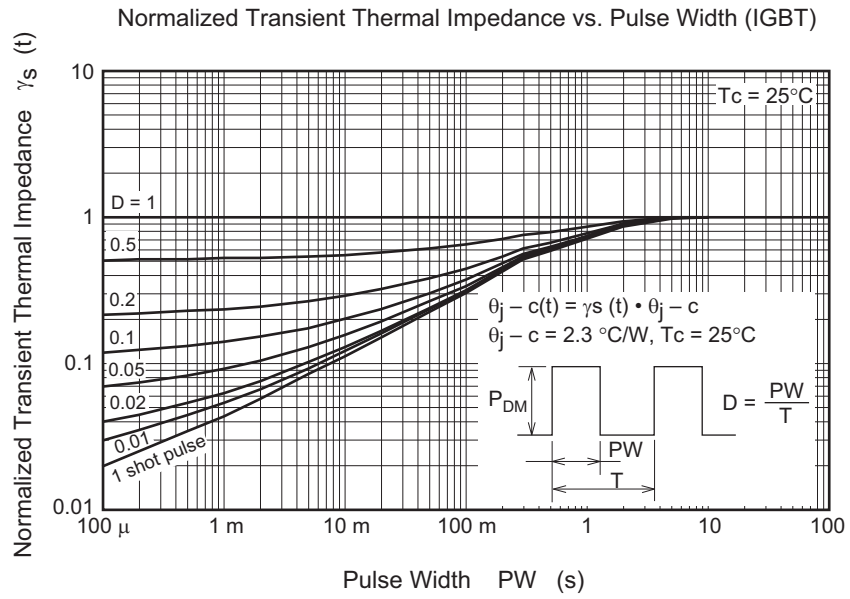


Switching Characteristics (Typical) (5)

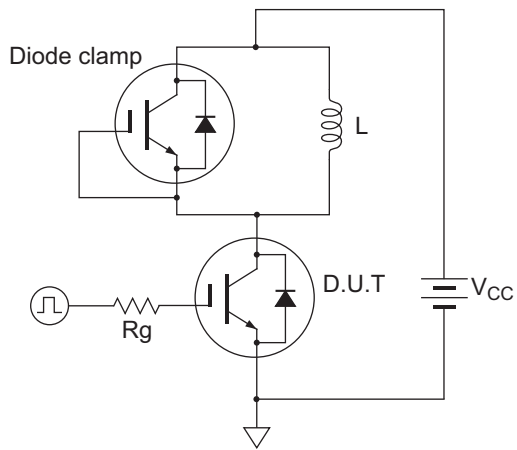


Switching Characteristics (Typical) (6)

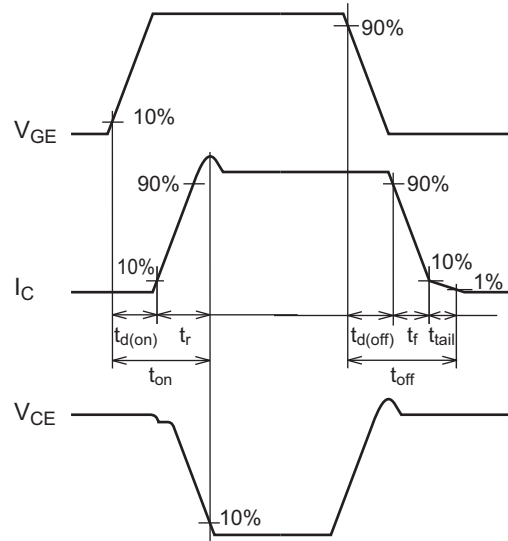




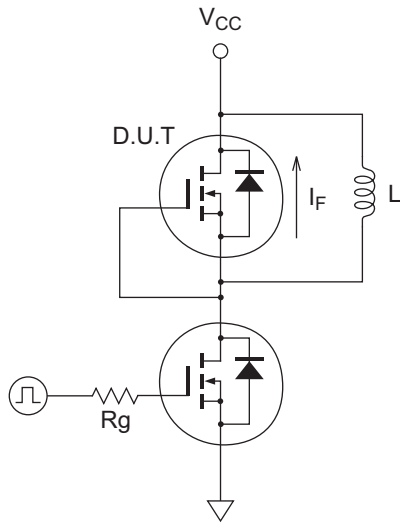
Switching Time Test Circuit



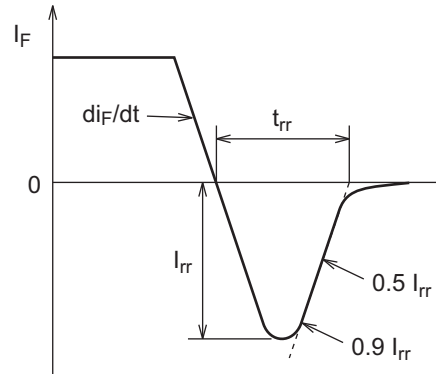
Waveform



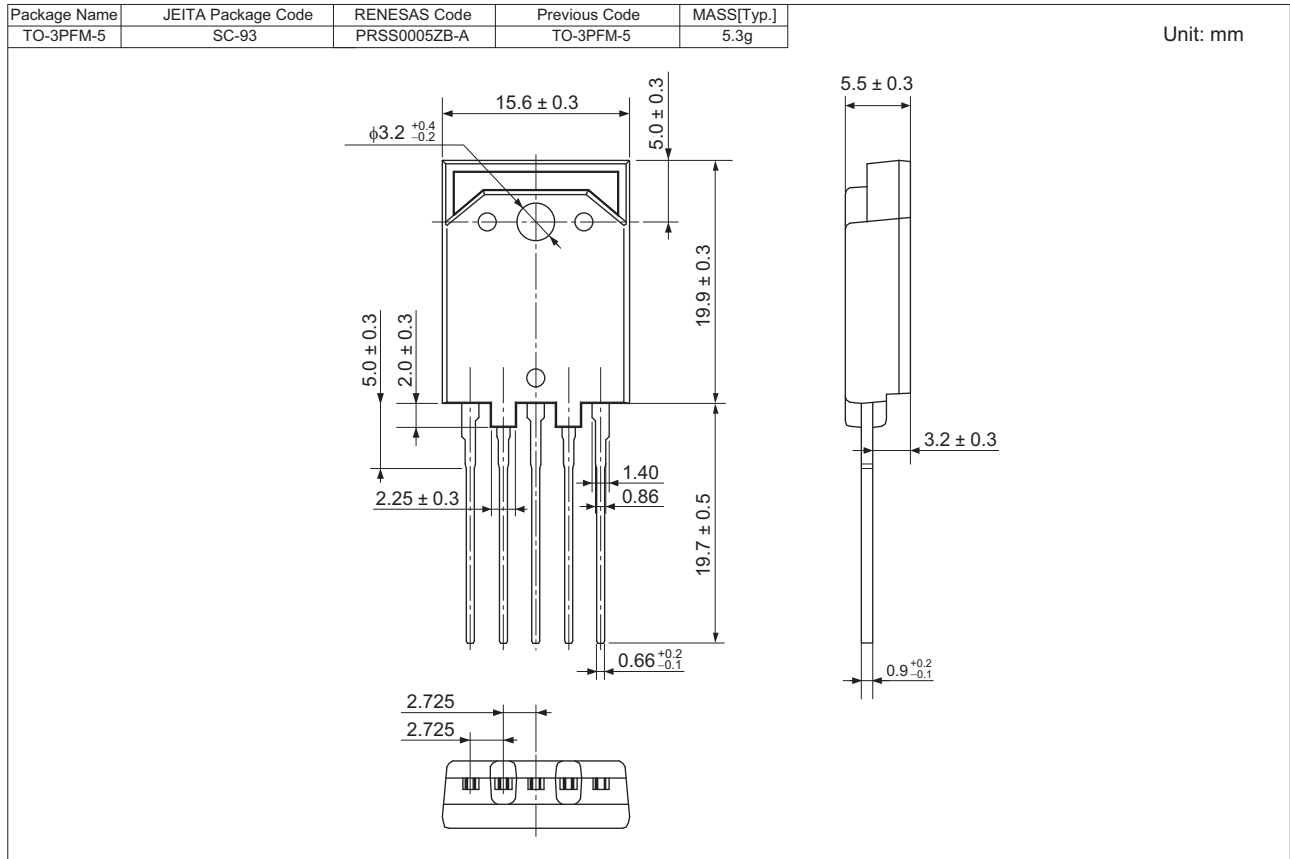
Diode Reverse Recovery Time Test Circuit



Waveform



Package Dimensions



Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJQ6008DPM-00#T0	360 pcs	Box (tube)

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