

RJH60F4DPQ-A0

Silicon N Channel IGBT
High Speed Power Switching

R07DS0325EJ0100

Rev.1.00

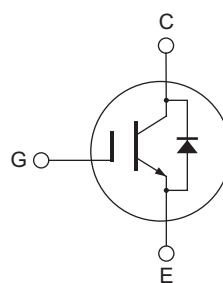
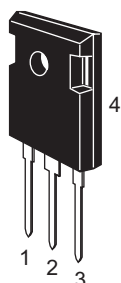
Apr 06, 2011

Features

- Low collector to emitter saturation voltage
 $V_{CE(sat)} = 1.4 \text{ V typ. (at } I_C = 30 \text{ A, } V_{GE} = 15\text{V, } T_a = 25^\circ\text{C)}$
- Built in fast recovery diode in one package
- Trench gate and thin wafer technology
- High speed switching
 $t_f = 80 \text{ ns typ. (at } I_C = 30 \text{ A, } V_{CE} = 400 \text{ V, } V_{GE} = 15 \text{ V, } R_g = 5 \Omega, T_a = 25^\circ\text{C, inductive load)}$

Outline

RENESAS Package code: PRSS0003ZH-A
(Package name: TO-247A)



1. Gate
2. Collector
3. Emitter
4. Collector

Absolute Maximum Ratings

 (T_c = 25°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}	60	A
	$T_c = 100^\circ\text{C}$	I_C ^{Note1}	30	A
Collector peak current	$i_{c(peak)}$ ^{Note1}	120	A	
Collector to emitter diode forward peak current	$i_{DF(peak)}$ ^{Note2}	100	A	
Collector dissipation	P_C	235.8	W	
Junction to case thermal impedance (IGBT)	θ_{j-c}	0.53	°C/W	
Junction to case thermal impedance (Diode)	θ_{j-cd}	2.0	°C/W	
Junction temperature	T_j	150	°C	
Storage temperature	T_{stg}	-55 to +150	°C	

Notes: 1. Pulse width limited by safe operating area.

2. $PW \leq 5 \mu\text{s}$, duty cycle $\leq 1\%$

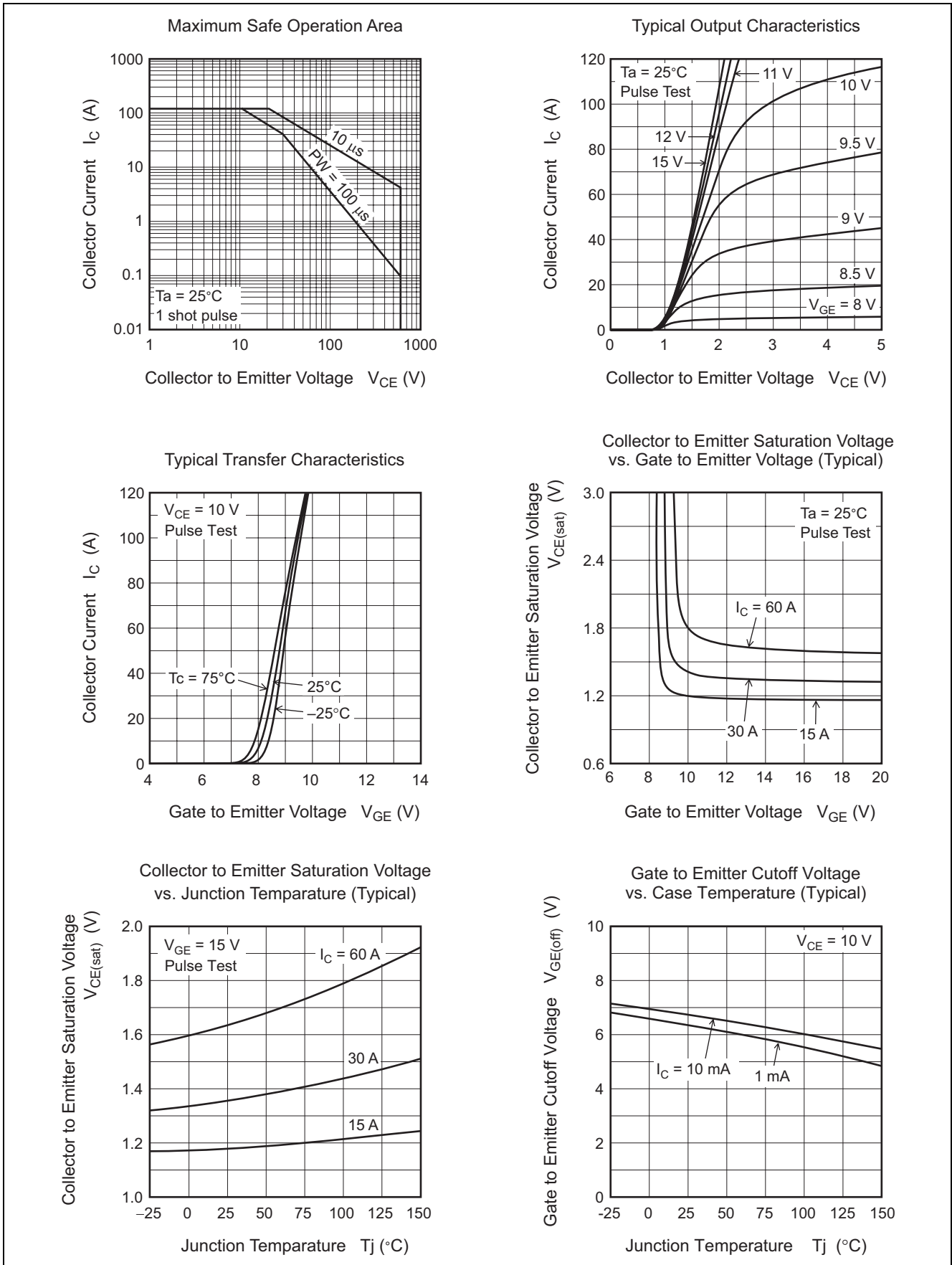
Electrical Characteristics

(T_j = 25°C)

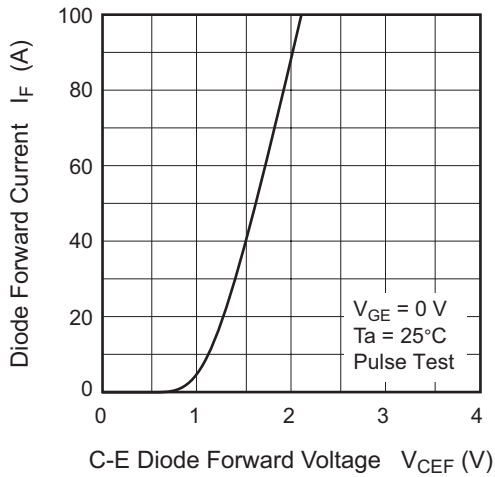
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Zero gate voltage collector current	I _{CES}	—	—	100	μA	V _{CE} = 600V, V _{GE} = 0
Gate to emitter leak current	I _{GES}	—	—	±1	μA	V _{GE} = ±30 V, V _{CE} = 0
Gate to emitter cutoff voltage	V _{GE(off)}	4	—	8	V	V _{CE} = 10V, I _C = 1 mA
Collector to emitter saturation voltage	V _{CE(sat)}	—	1.4	1.82	V	I _C = 30 A, V _{GE} = 15V ^{Note3}
	V _{CE(sat)}	—	1.7	—	V	I _C = 60 A, V _{GE} = 15V ^{Note3}
Input capacitance	C _{ies}	—	1900	—	pF	V _{CE} = 25 V
Output capacitance	C _{oes}	—	93	—	pF	V _{GE} = 0 V
Reverse transfer capacitance	C _{res}	—	33	—	pF	f = 1 MHz
Switching time	t _{d(on)}	—	45	—	ns	I _C = 30 A, V _{CE} = 400 V, V _{GE} = 15 V R _g = 5 Ω ^{Note3} Inductive load
	t _r	—	150	—	ns	
	t _{d(off)}	—	85	—	ns	
	t _f	—	80	—	ns	
C-E diode forward voltage	V _{ECF1}	—	1.2	2.1	V	I _F = 20 A ^{Note3}
	V _{ECF2}	—	1.5	—	V	I _F = 40 A ^{Note3}
C-E diode reverse recovery time	t _{rr}	—	90	—	ns	I _F = 20 A di _F /dt = 100 A/μs

Notes: 3. Pulse test

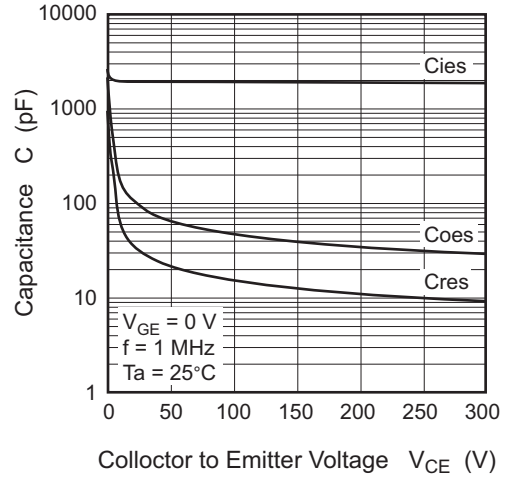
Main Characteristics



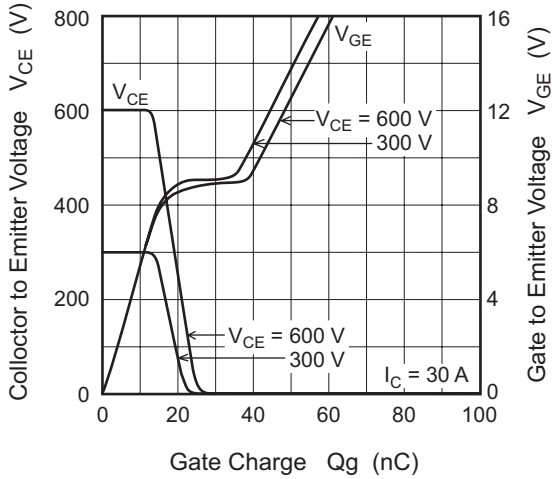
Forward Current vs. Forward Voltage (Typical)



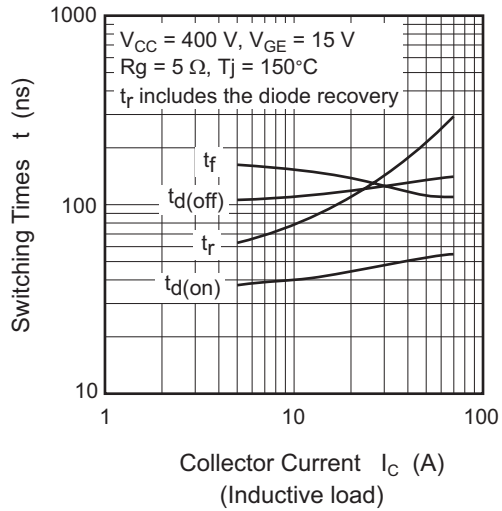
Typical Capacitance vs. Collector to Emitter Voltage



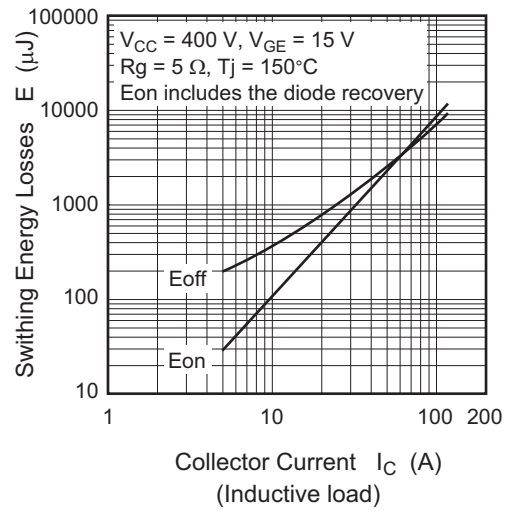
Dynamic Input Characteristics (Typical)



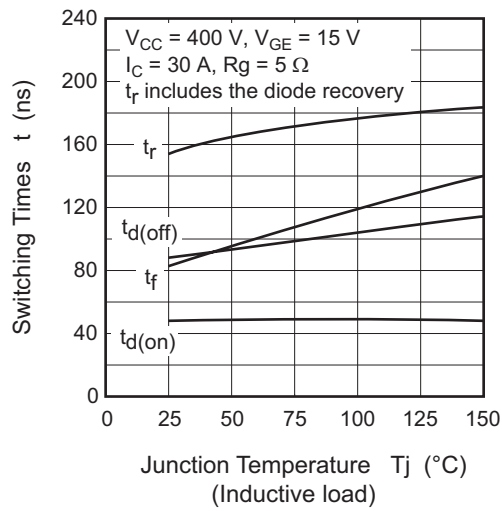
Switching Characteristics (Typical) (1)



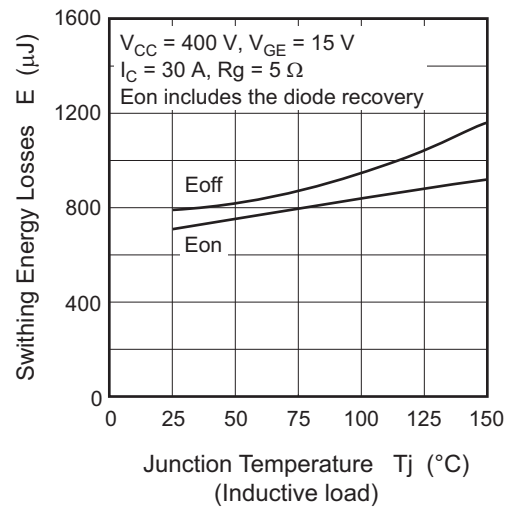
Switching Characteristics (Typical) (2)

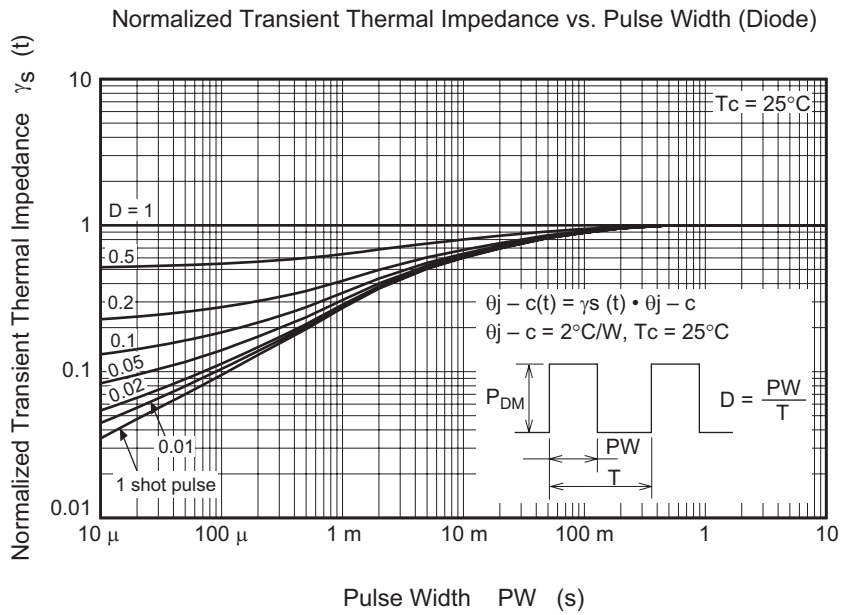
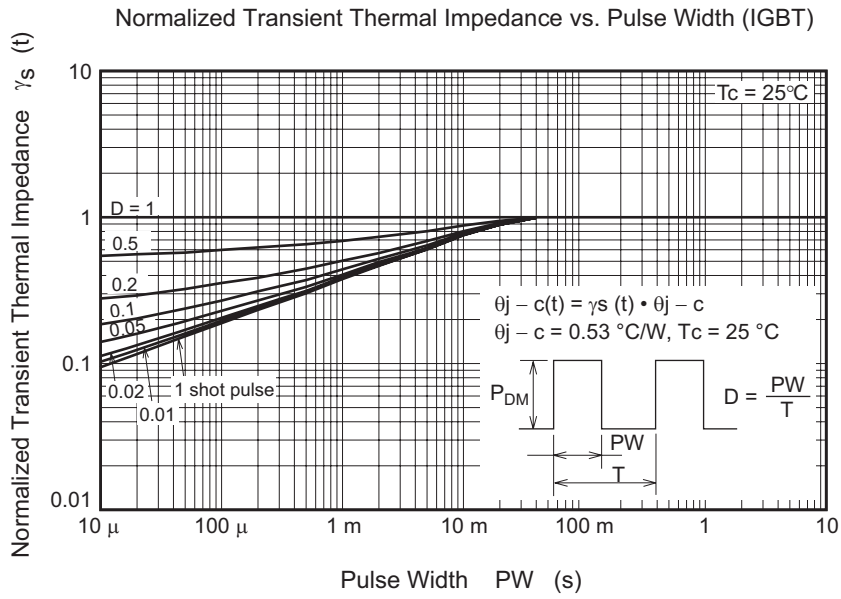


Switching Characteristics (Typical) (3)

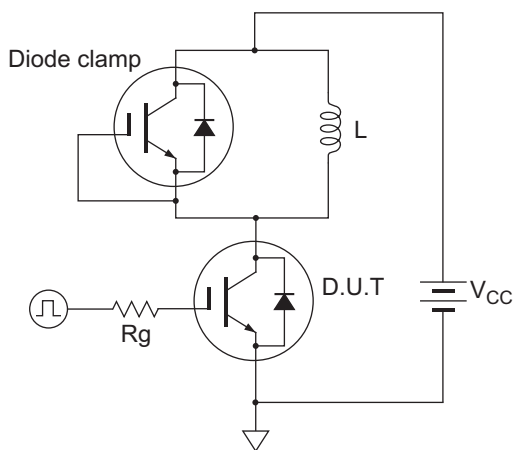


Switching Characteristics (Typical) (4)

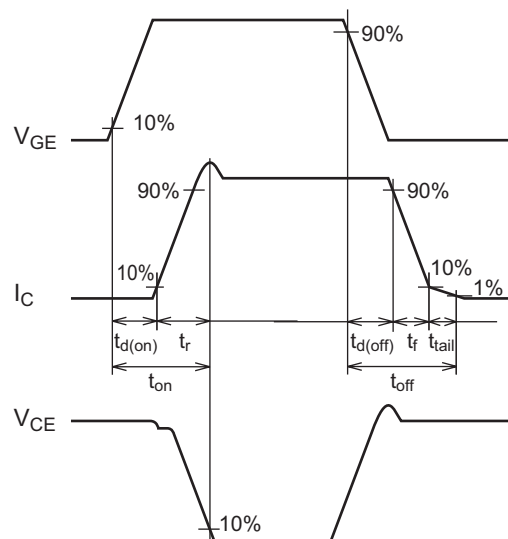




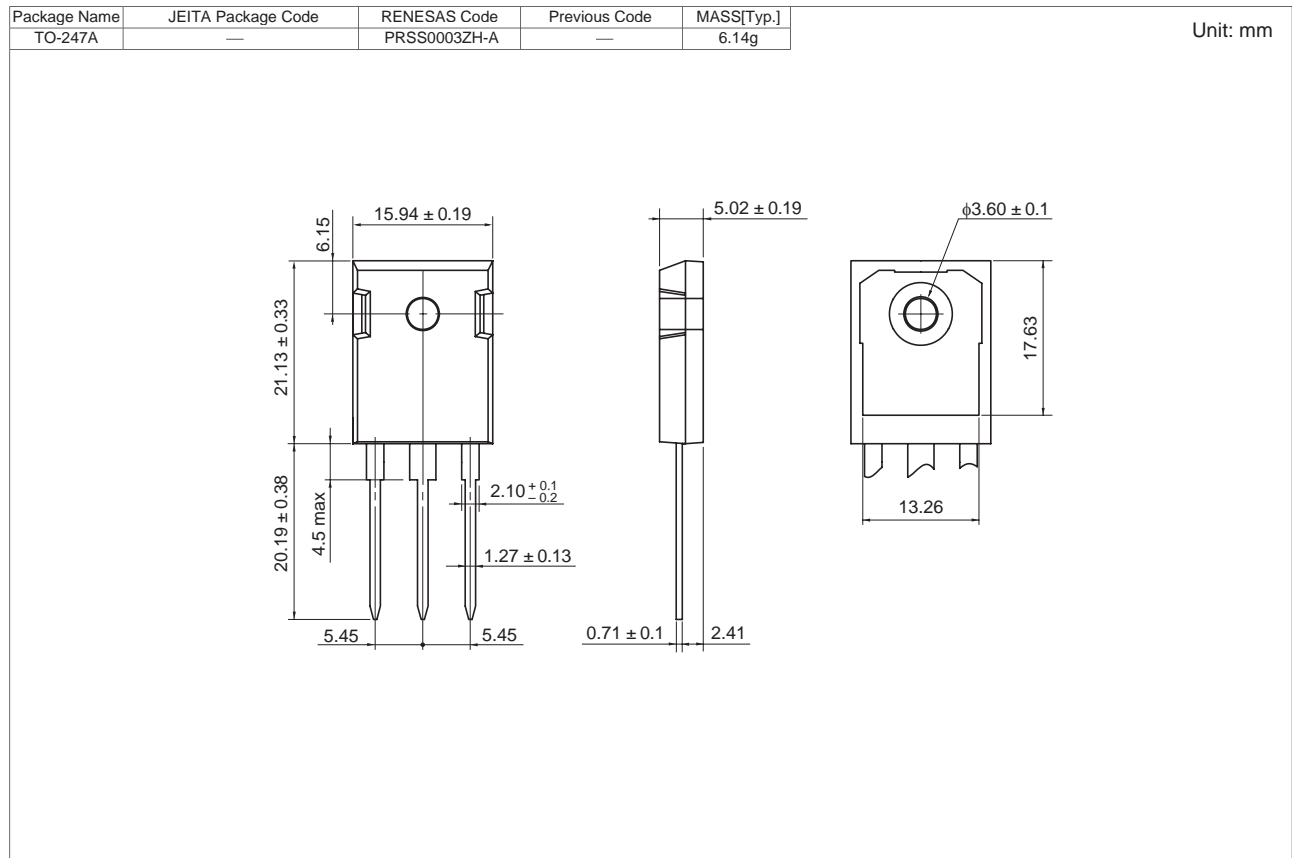
Switching Time Test Circuit



Waveform



Package Dimensions



Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJH60F4DPQ-A0-T0	240 pcs	Box (Tube)

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