

RJH6086BDPK

600 V - 45 A - IGBT
High Speed Power Switching

R07DS0470EJ0100

Rev.1.00

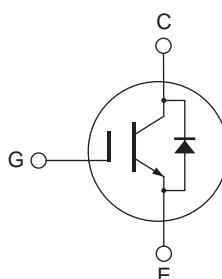
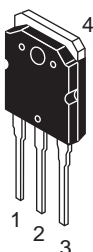
Sep 28, 2011

Features

- Ultra high speed switching
 $t_f = 36 \text{ ns typ.}$ (at $I_C = 30 \text{ A}$, $V_{CC} = 300 \text{ V}$, $V_{GE} = 15 \text{ V}$, $R_g = 5 \Omega$, Inductive Load)
- Low on-state voltage
- Fast recovery diode

Outline

RENESAS Package code: PRSS0004ZE-A
(Package name: TO-3P)



1. Gate
2. Collector
3. Emitter
4. Collector (Flange)

Absolute Maximum Ratings

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

Item	Symbol	Ratings	Unit
Collector to emitter voltage	V_{CES}	600	V
Gate to emitter voltage	V_{GES}	± 30	V
Collector current	I_C	45	A
Collector peak current	$i_{c(\text{peak})}$ ^{Note1}	90	A
Collector to emitter diode forward peak current	$I_{DF(\text{peak})}$ ^{Note2}	90	A
Collector dissipation	P_C	198.4	W
Junction to case thermal impedance (IGBT)	θ_{j-c}	0.63	/W
Junction temperature	T_j	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

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

2. Pulse width limited by maximum junction temperature.

Electrical Characteristics

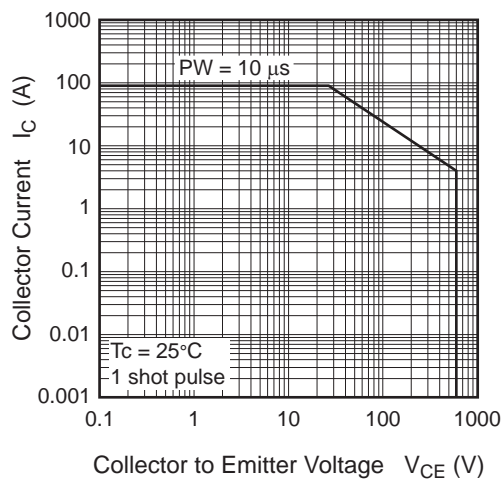
(Ta = 25°C)

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	$V_{GE} = \pm 30 V, V_{CE} = 0$
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	$I_C = 22 A, V_{GE} = 15 V$ ^{Note3}
	$V_{CE(sat)}$	—	3.4	—	V	$I_C = 45 A, V_{GE} = 15 V$ ^{Note3}
Input capacitance	C_{ies}	—	1420	—	pF	$V_{CE} = 25 V$ $V_{GE} = 0$ $f = 1 MHz$
Output capacitance	C_{oes}	—	165	—	pF	
Reveres transfer capacitance	C_{res}	—	15	—	pF	
Switching time	$t_{d(on)}$	—	41	—	ns	$I_C = 30 A$ $V_{CC} = 300 V, V_{GE} = 15 V$ $R_g = 5 \Omega$ Inductive Load
	t_r	—	71	—	ns	
	$t_{d(off)}$	—	84	—	ns	
	t_f	—	36	—	ns	
Collector to emitter diode forward voltage	V_{ECF}	—	1.4	1.9	V	$I_F = 30 A$ ^{Note3}
Collector to emitter diode reverse recovery time	t_{rr}	—	100	—	ns	$I_F = 30 A$ $diF/dt = 100 A/\mu s$

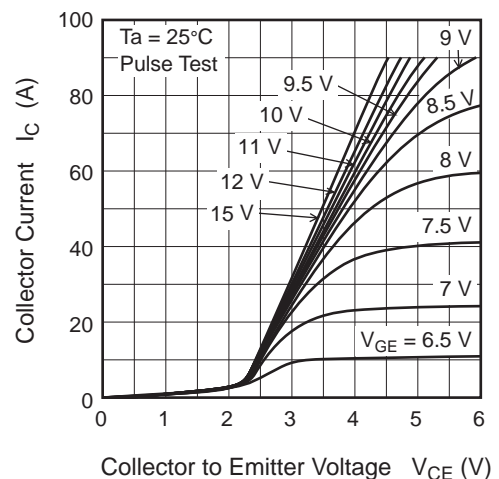
Notes: 3. Pulse test

Main Characteristics

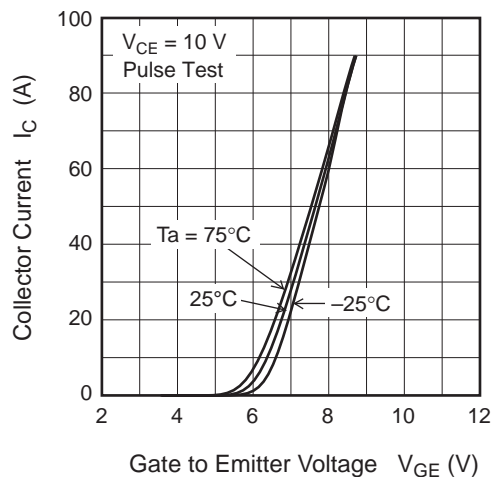
Maximum Safe Operation Area



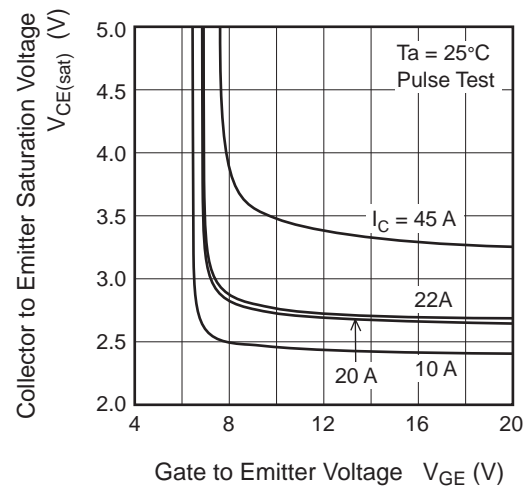
Typical Output Characteristics



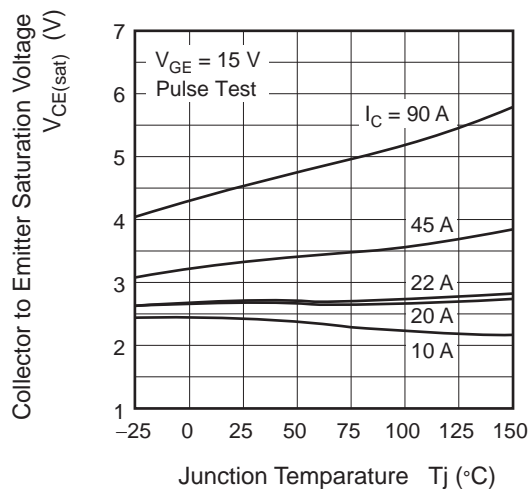
Typical Transfer Characteristics



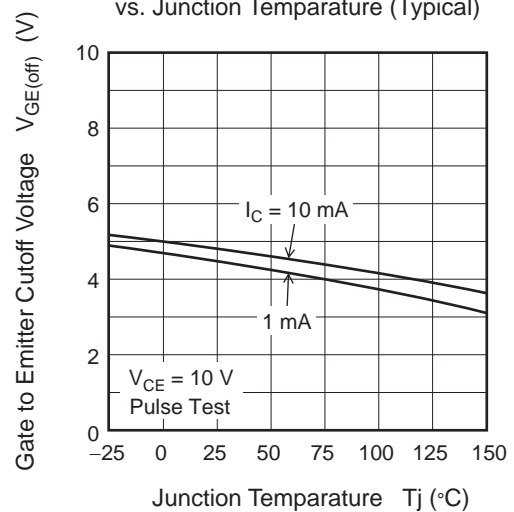
Collector to Emitter Saturation Voltage vs. Gate to Emitter Voltage (Typical)



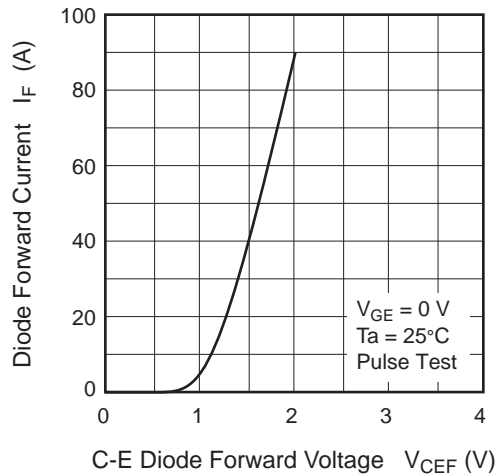
Collector to Emitter Saturation Voltage vs. Junction Temperature (Typical)



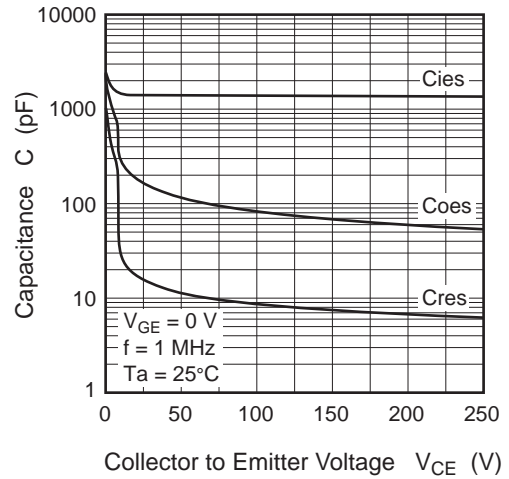
Gate to Emitter Cutoff Voltage vs. Junction Temperature (Typical)



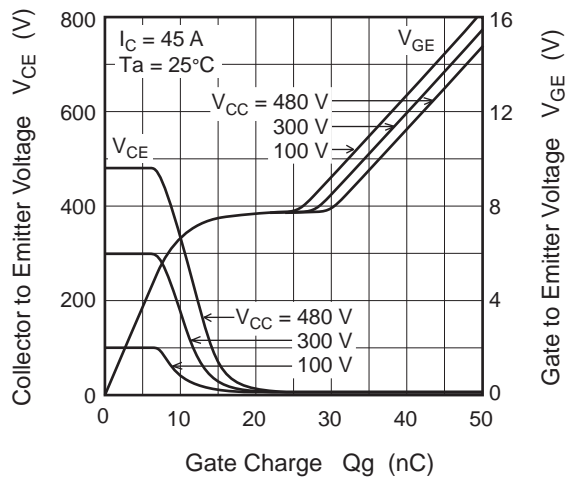
Forward Current vs. Forward Voltage (Typical)



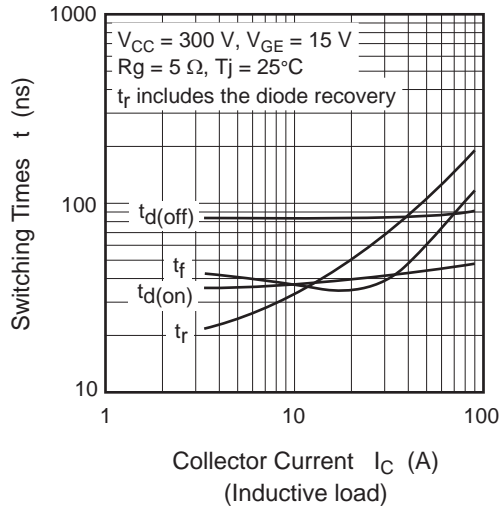
Typical Capacitance vs. Collector to Emitter Voltage



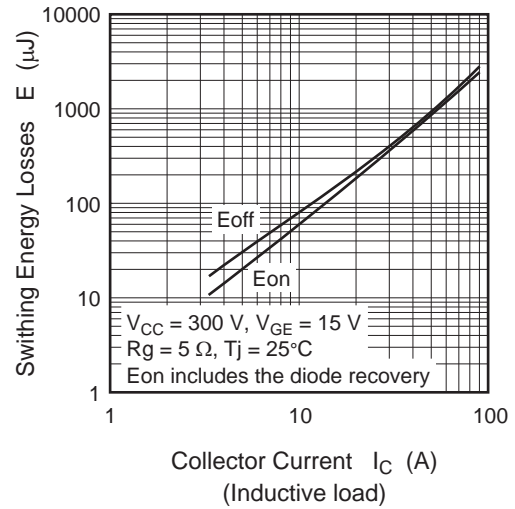
Dynamic Input Characteristics (Typical)



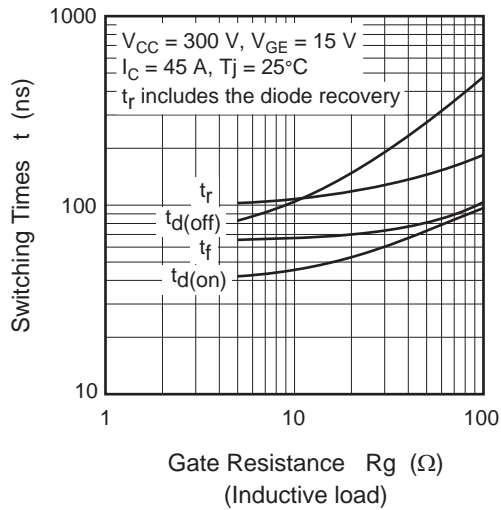
Switching Characteristics (Typical) (1)



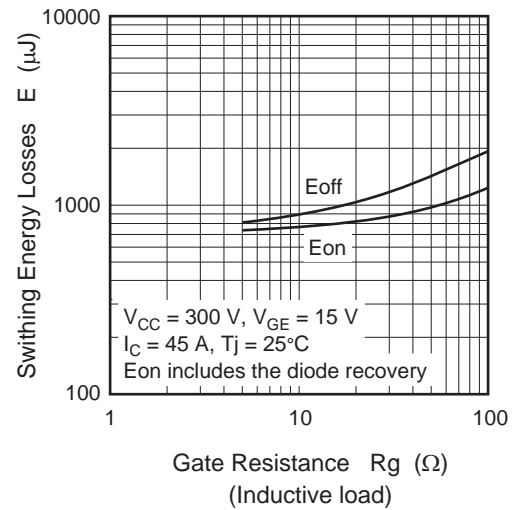
Switching Characteristics (Typical) (2)



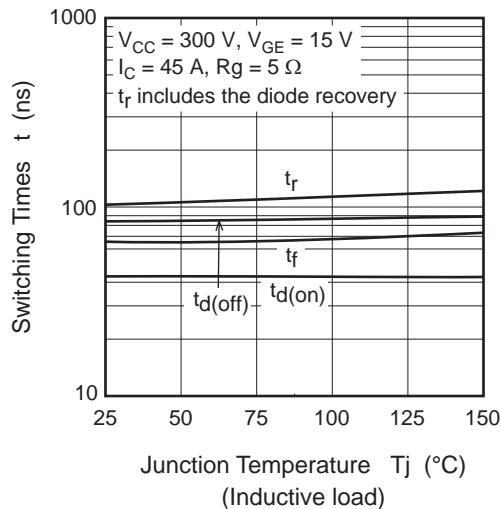
Switching Characteristics (Typical) (3)



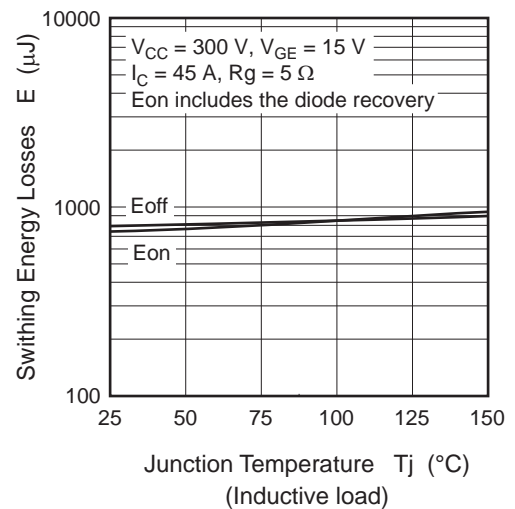
Switching Characteristics (Typical) (4)

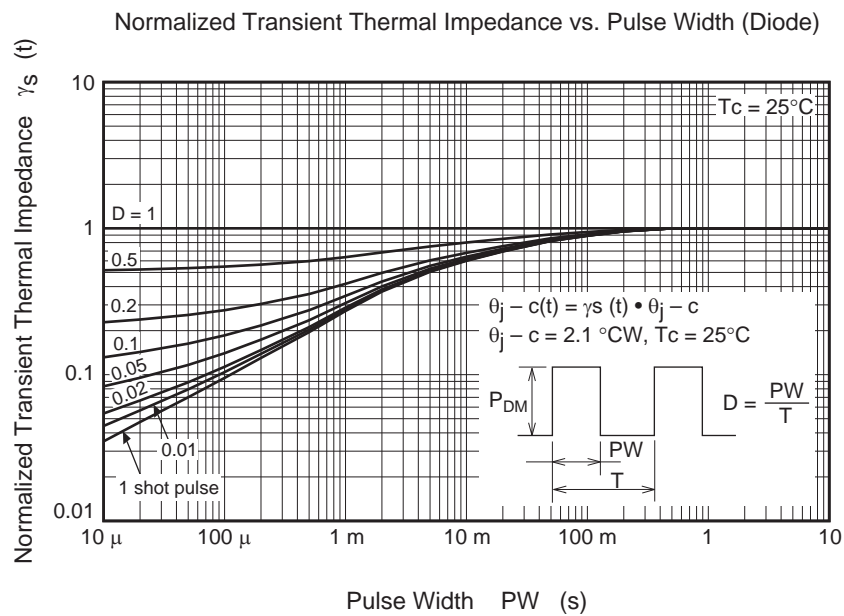
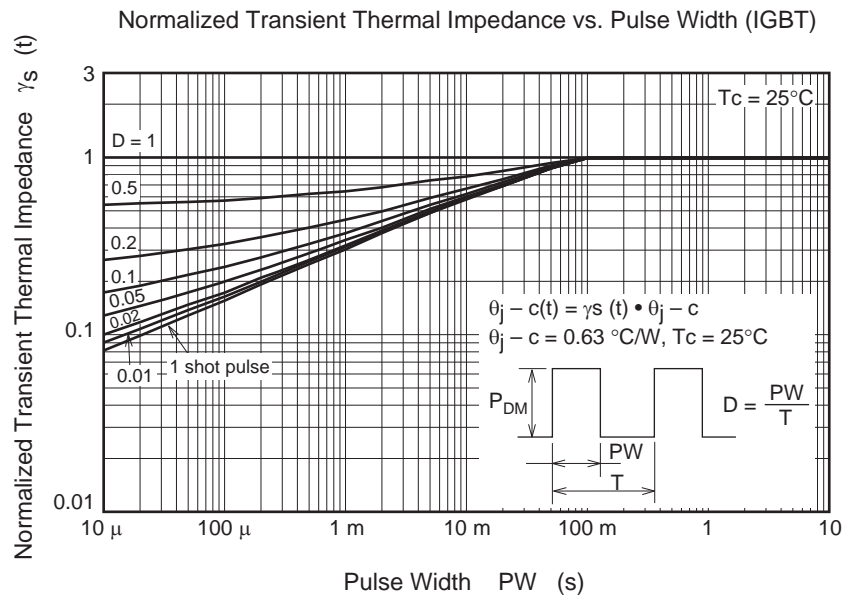


Switching Characteristics (Typical) (5)

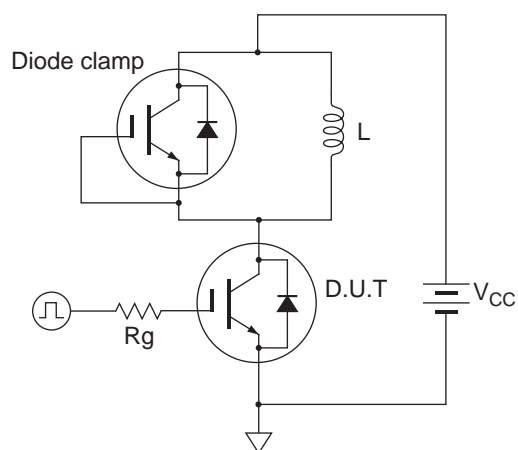


Switching Characteristics (Typical) (6)

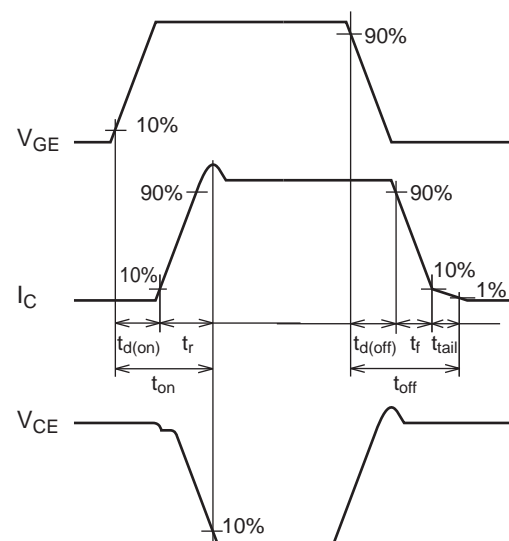




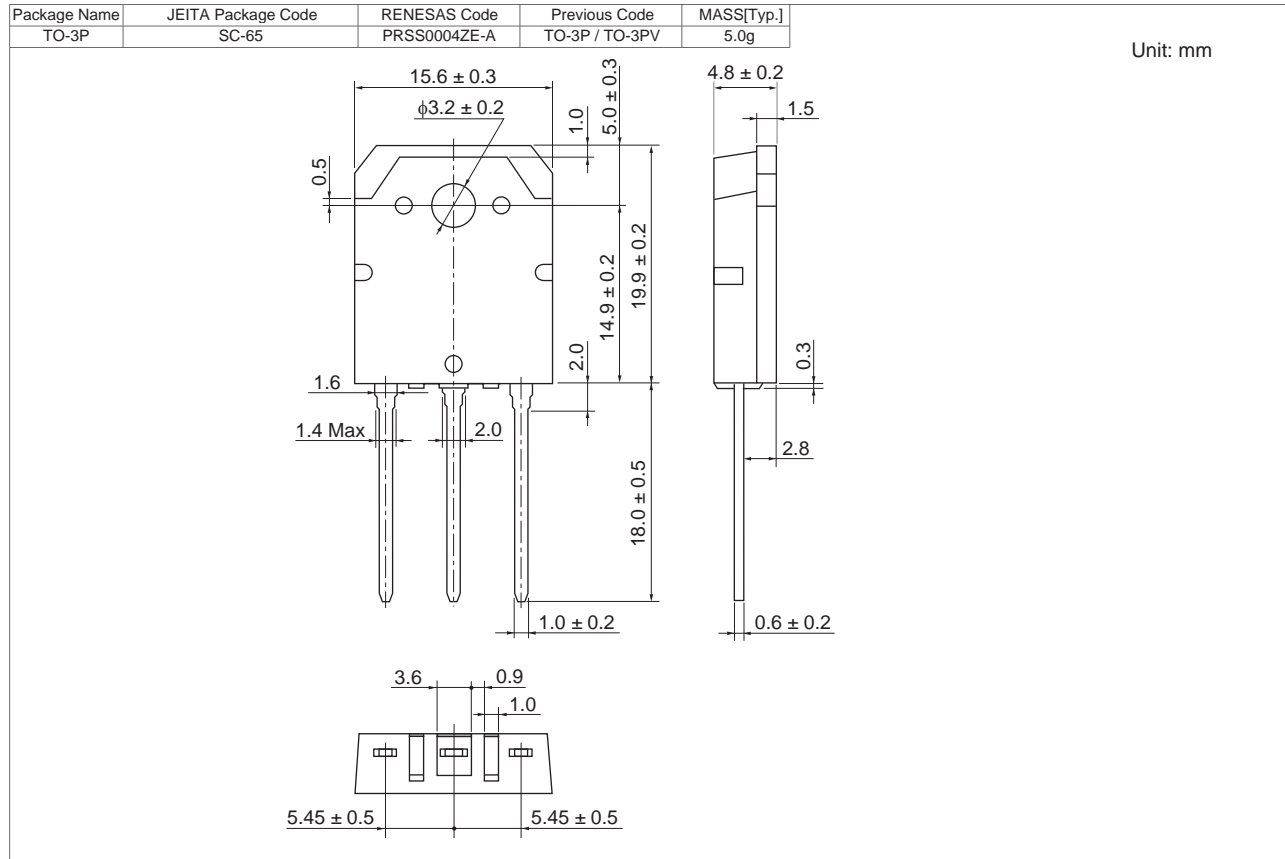
Switching Time Test Circuit



Waveform



Package Dimensions



Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJH6086BDPK-00-T0	360 pcs	Box (Tube)

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