

# RJH6086BDPK

600 V - 45 A - IGBT  
High Speed Power Switching

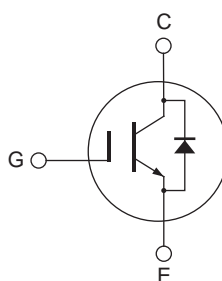
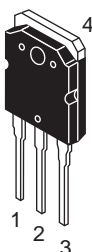
R07DS0470EJ0100  
Rev.1.00  
Sep 28, 2011

## 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	$V_{GES}$	$\pm 30$	V
Collector current	$I_C$	45	A
Collector peak current	$i_{c(\text{peak})}$ <sup>Note1</sup>	90	A
Collector to emitter diode forward peak current	$I_{DF(\text{peak})}$ <sup>Note2</sup>	90	A
Collector dissipation	$P_C$	198.4	W
Junction to case thermal impedance (IGBT)	$\theta_{j-c}$	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.

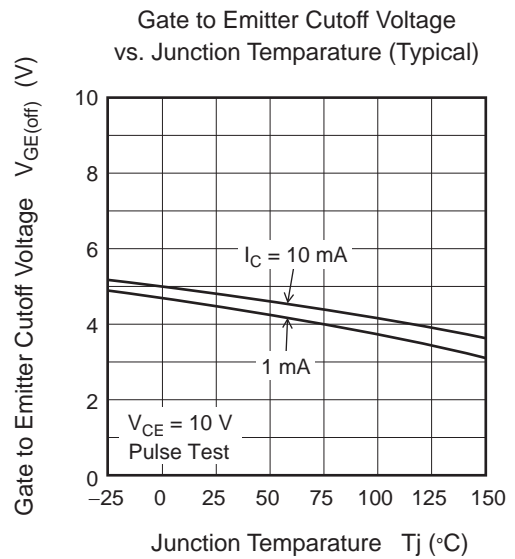
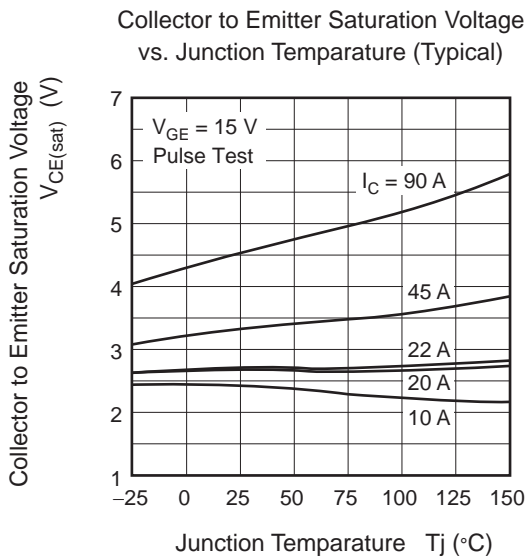
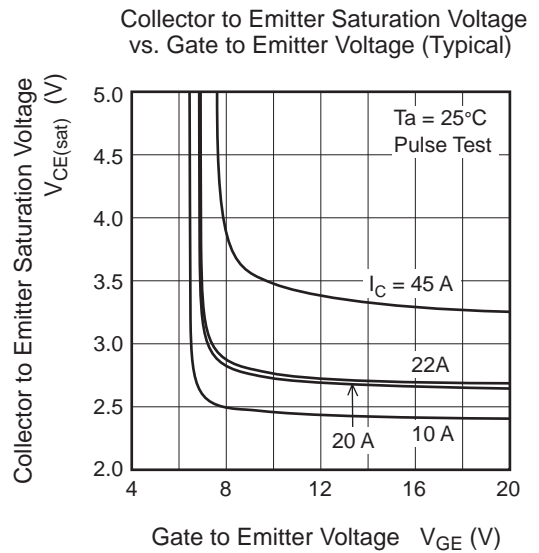
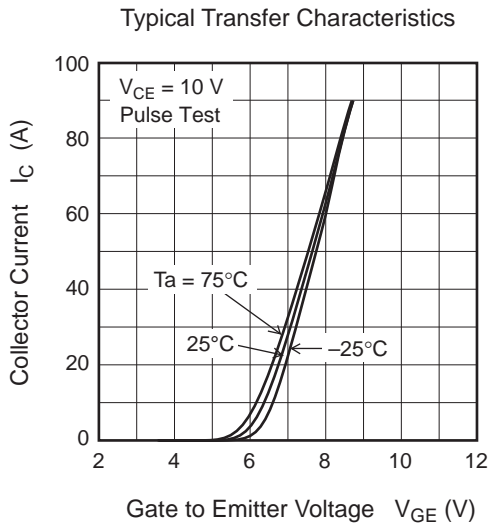
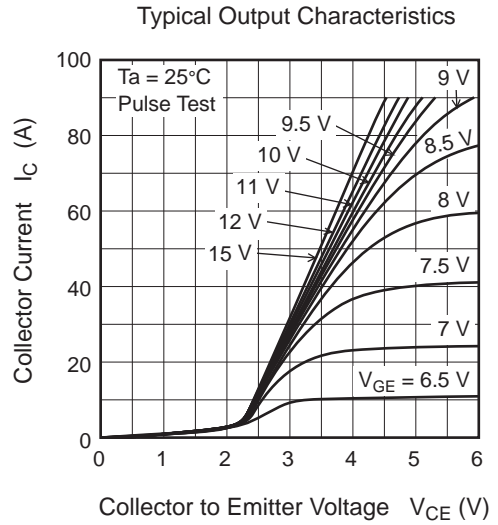
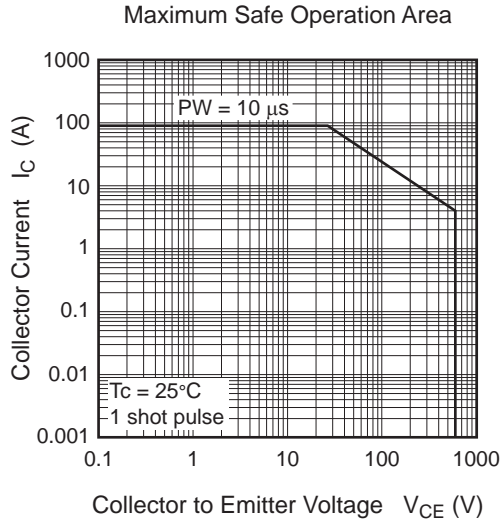
## Electrical Characteristics

(Ta = 25°C)

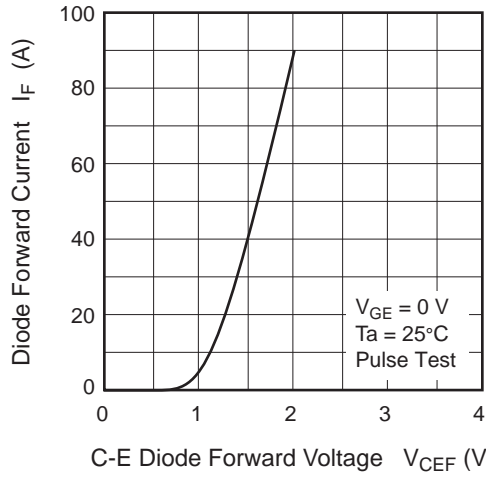
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Zero gate voltage collector current	$I_{CES}$	—	—	10	$\mu\text{A}$	$V_{CE} = 600\text{ V}, V_{GE} = 0$
Gate to emitter leak current	$I_{GES}$	—	—	$\pm 1$	$\mu\text{A}$	$V_{GE} = \pm 30\text{ V}, V_{CE} = 0$
Gate to emitter cutoff voltage	$V_{GE(off)}$	3.0	—	5.5	V	$V_{CE} = 10\text{ V}, I_C = 1\text{ mA}$
Collector to Emitter saturation voltage	$V_{CE(sat)}$	—	2.65	3.5	V	$I_C = 22\text{ A}, V_{GE} = 15\text{ V}$ <sup>Note3</sup>
	$V_{CE(sat)}$	—	3.4	—	V	$I_C = 45\text{ A}, V_{GE} = 15\text{ V}$ <sup>Note3</sup>
Input capacitance	$C_{ies}$	—	1420	—	pF	$V_{CE} = 25\text{ V}$
Output capacitance	$C_{oes}$	—	165	—	pF	$V_{GE} = 0$
Reveres transfer capacitance	$C_{res}$	—	15	—	pF	$f = 1\text{ MHz}$
Switching time	$t_{d(on)}$	—	41	—	ns	$I_C = 30\text{ A}$ $V_{CC} = 300\text{ V}, V_{GE} = 15\text{ V}$ $R_g = 5\ \Omega$ 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	$I_F = 30\text{ A}$ <sup>Note3</sup>
Collector to emitter diode reverse recovery time	$t_{rr}$	—	100	—	ns	$I_F = 30\text{ A}$ $di_F/dt = 100\text{ A}/\mu\text{s}$

Notes: 3. Pulse test

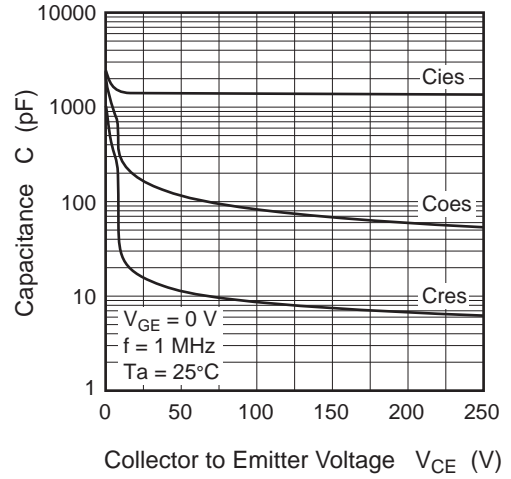
Main Characteristics



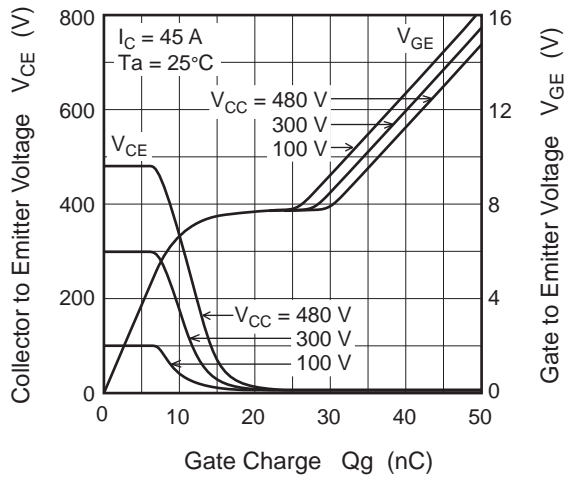
Forward Current vs. Forward Voltage (Typical)



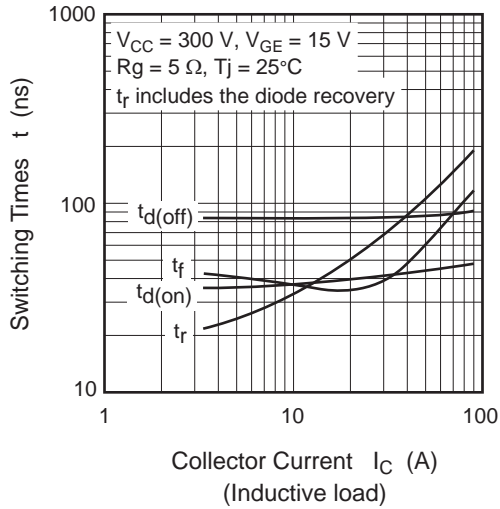
Typical Capacitance vs. Collector to Emitter Voltage



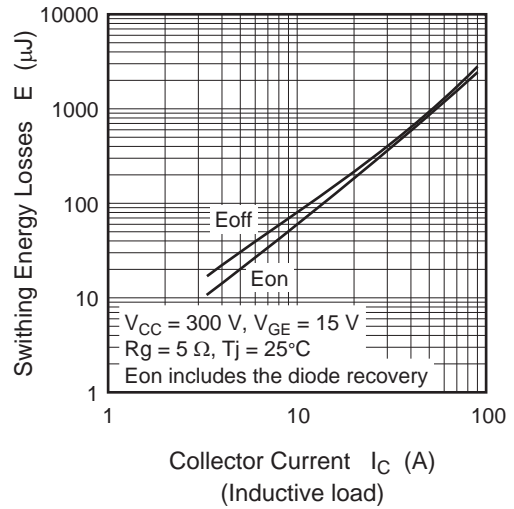
Dynamic Input Characteristics (Typical)



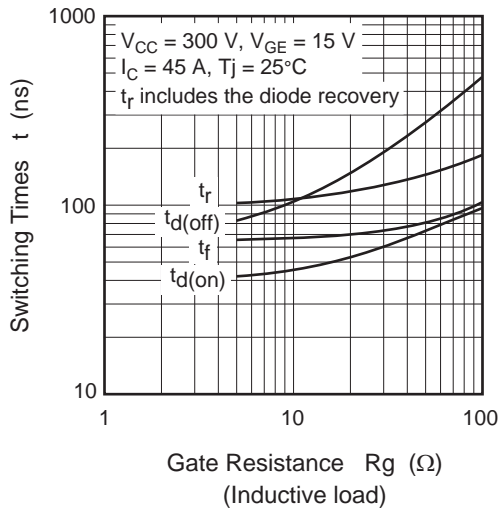
Switching Characteristics (Typical) (1)



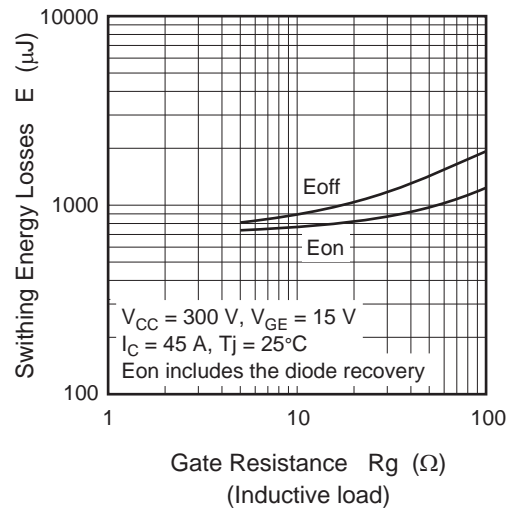
Switching Characteristics (Typical) (2)



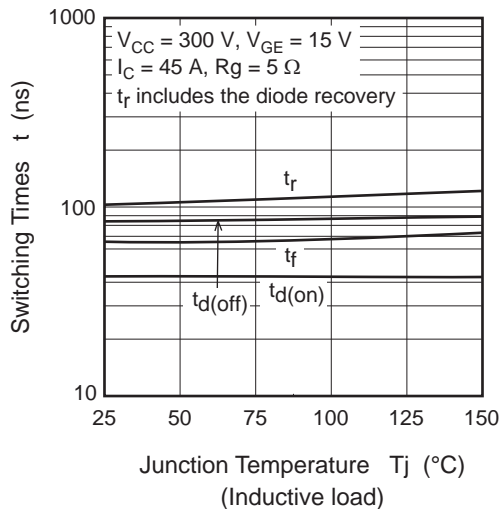
Switching Characteristics (Typical) (3)



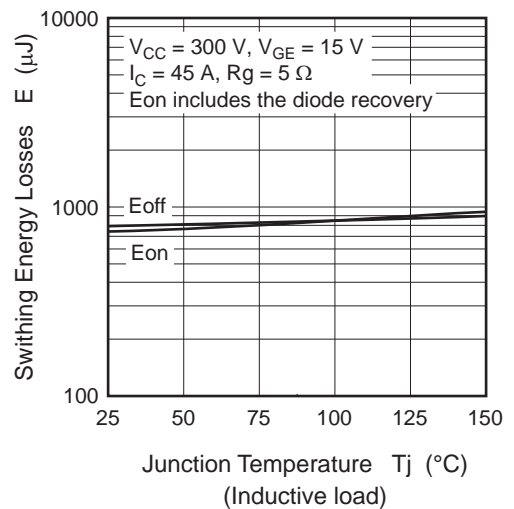
Switching Characteristics (Typical) (4)

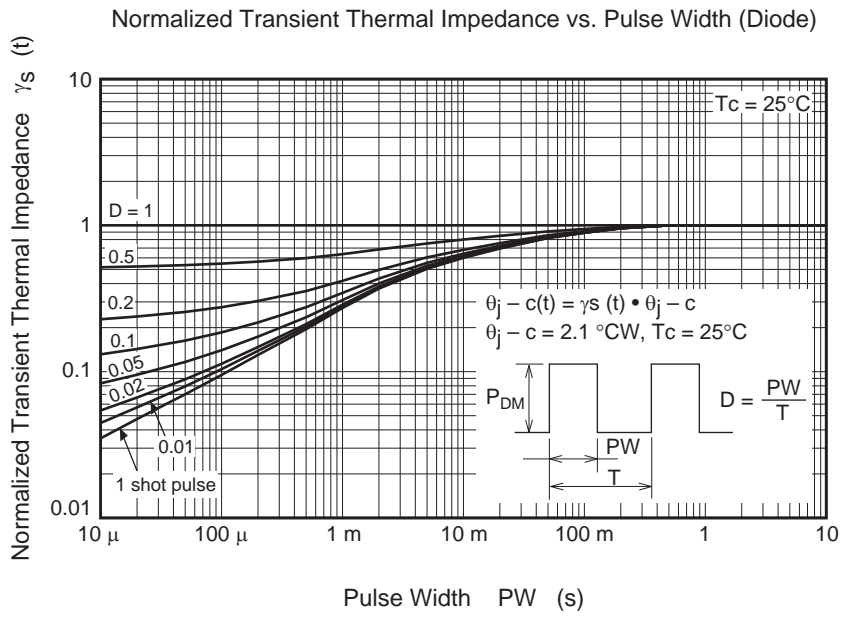
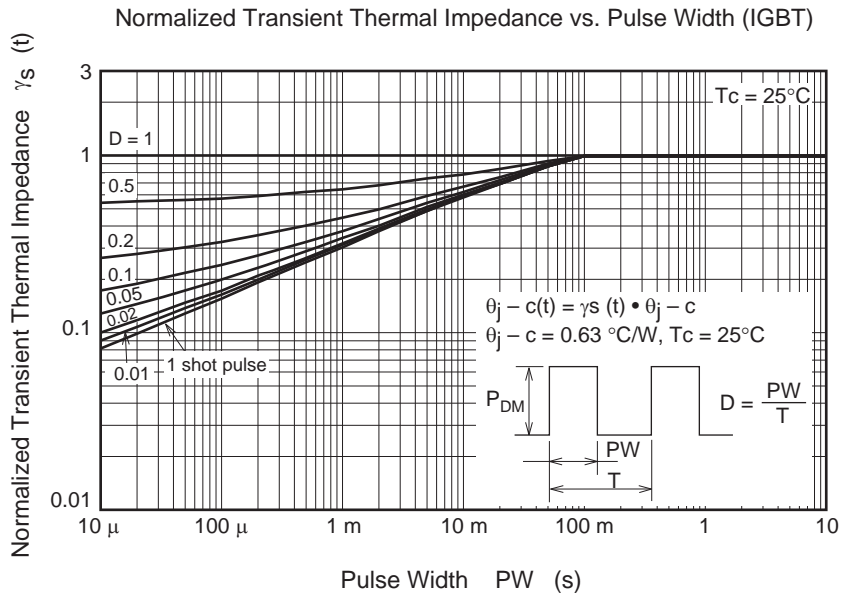


Switching Characteristics (Typical) (5)

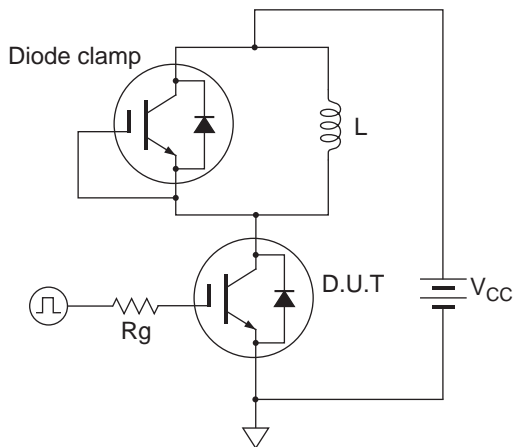


Switching Characteristics (Typical) (6)

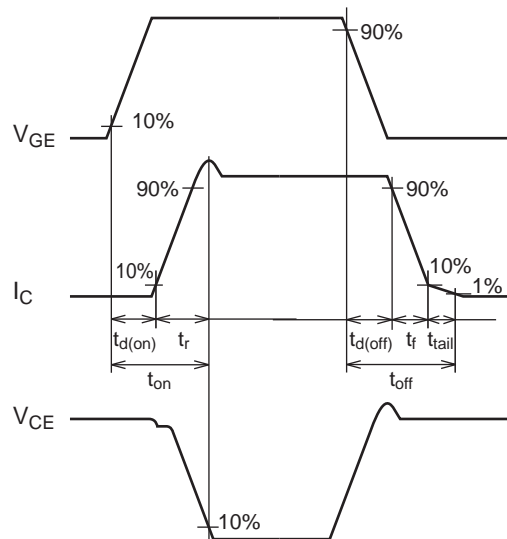




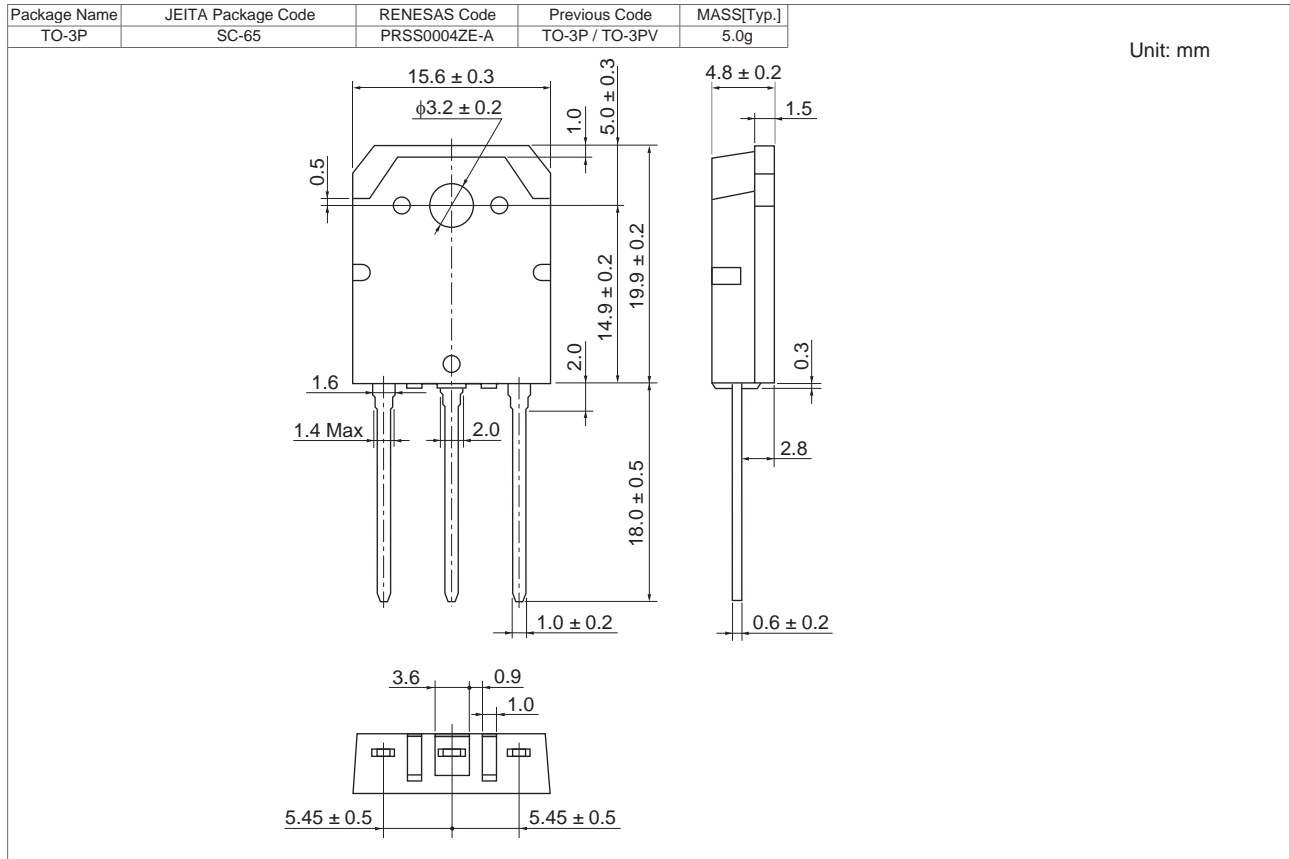
Switching Time Test Circuit



Waveform



### Package Dimensions



### Ordering Information

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

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