

# RJK60S5DPN

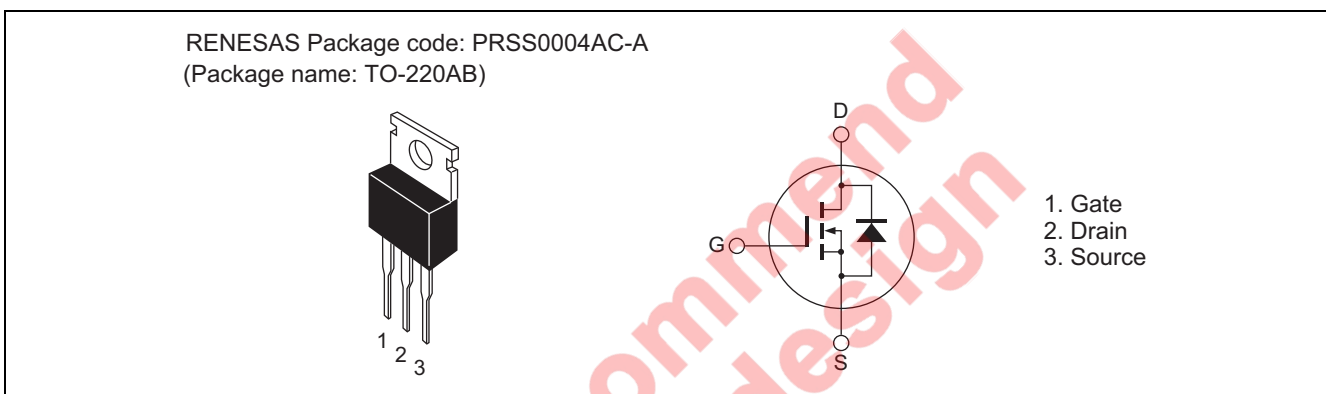
600V - 20A - MOS FET  
High Speed Power Switching

R07DS0952EJ0200  
Rev.2.00  
Jan 23, 2013

## Features

- Superjunction MOSFET
- Low on-resistance  
 $R_{DS(on)} = 0.150 \Omega$  typ. (at  $I_D = 10 \text{ A}$ ,  $V_{GS} = 10 \text{ V}$ ,  $T_a = 25^\circ\text{C}$ )
- High speed switching  
 $t_f = 23 \text{ ns}$  typ. (at  $I_D = 10 \text{ A}$ ,  $V_{GS} = 10 \text{ V}$ ,  $R_L = 30 \Omega$ ,  $R_g = 10 \Omega$ ,  $T_a = 25^\circ\text{C}$ )

## Outline



## Absolute Maximum Ratings

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

Item	Symbol	Ratings	Unit
Drain to source voltage	$V_{DSS}$	600	V
Gate to source voltage	$V_{GSS}$	+30, -20	V
Drain current	$T_c = 25^\circ\text{C}$	$I_D^{\text{Note1}}$	20
	$T_c = 100^\circ\text{C}$	$I_D^{\text{Note1}}$	12.6
Drain peak current	$I_{D(pulse)}^{\text{Note1}}$	40	A
Body-drain diode reverse drain current	$I_{DR}^{\text{Note1}}$	20	A
Body-drain diode reverse drain peak current	$I_{DR(pulse)}^{\text{Note1}}$	40	A
Avalanche current	$I_{AP}^{\text{Note2}}$	5	A
Avalanche energy	$E_{AR}^{\text{Note2}}$	1.36	mJ
MOSFET dv/dt ruggedness	$dv/dt^{\text{Note3}}$	150	V/ns
Channel dissipation	$P_{ch}^{\text{Note2}}$	166.6	W
Channel to case thermal impedance	$\theta_{ch-c}$	0.75	$^\circ\text{C}/\text{W}$
Channel temperature	$T_{ch}$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

- Notes: 1. Limited by  $T_{ch}$  max.  
 2.  $ST_{ch} = 25^\circ\text{C}$ ,  $T_{ch} \leq 150^\circ\text{C}$   
 3. Value at  $T_j = 25^\circ\text{C}$ ,  $V_{DS} \leq 480 \text{ V}$   
 4. Value at  $T_c = 25^\circ\text{C}$

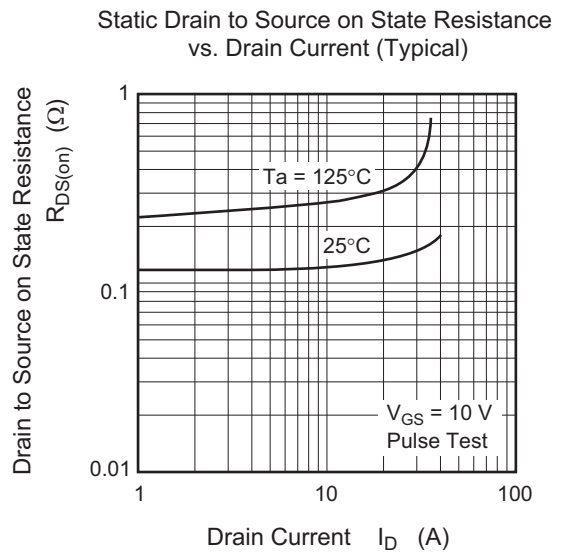
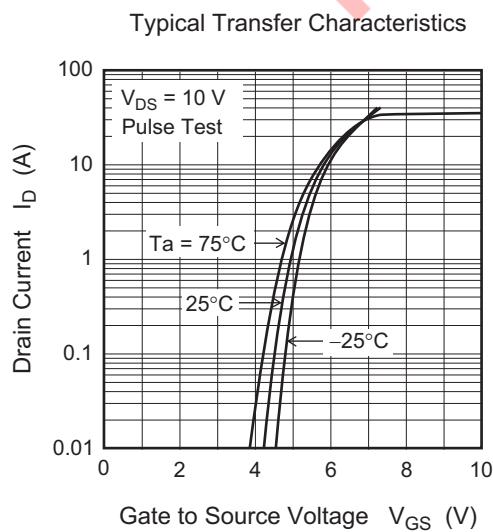
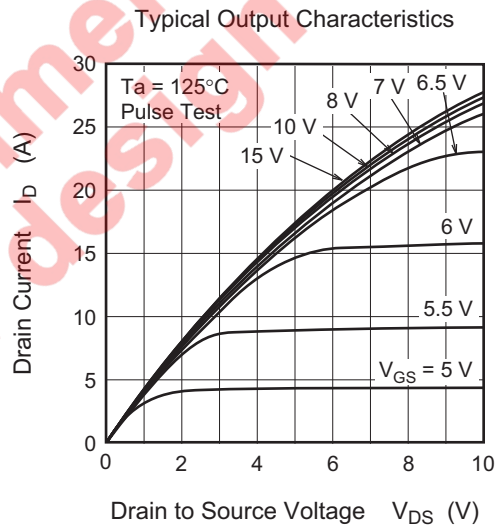
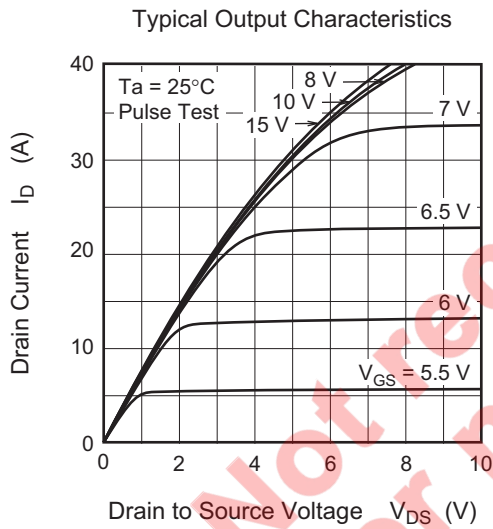
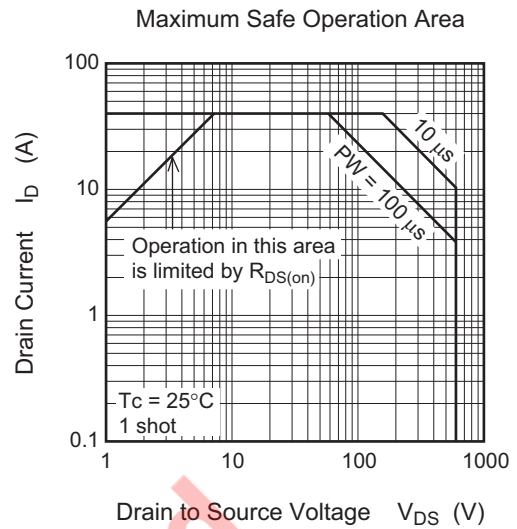
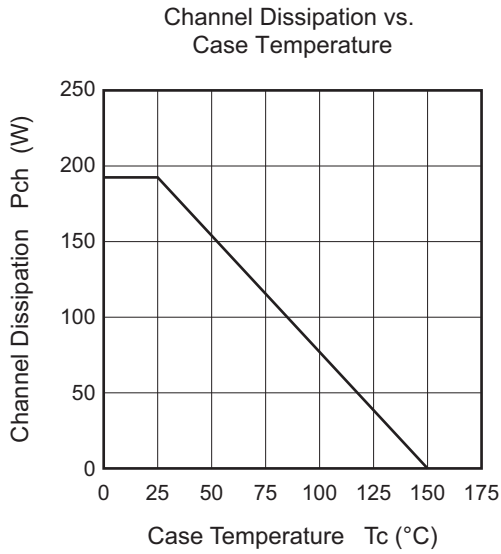
## Electrical Characteristics

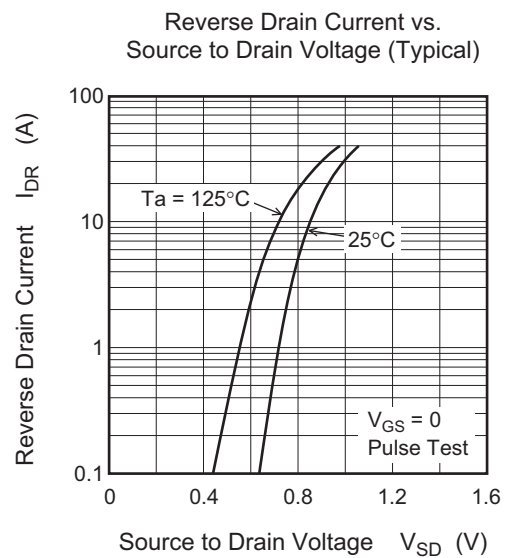
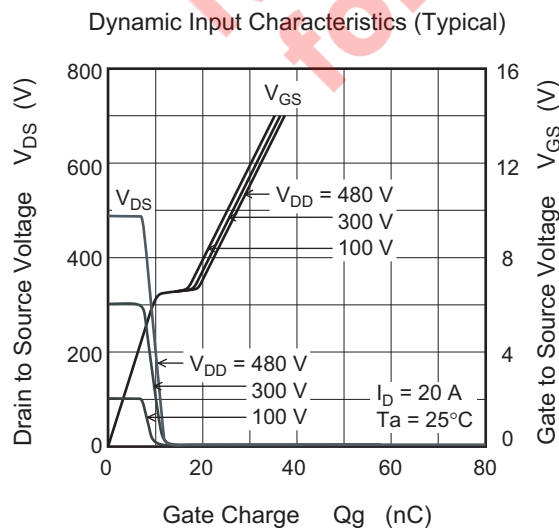
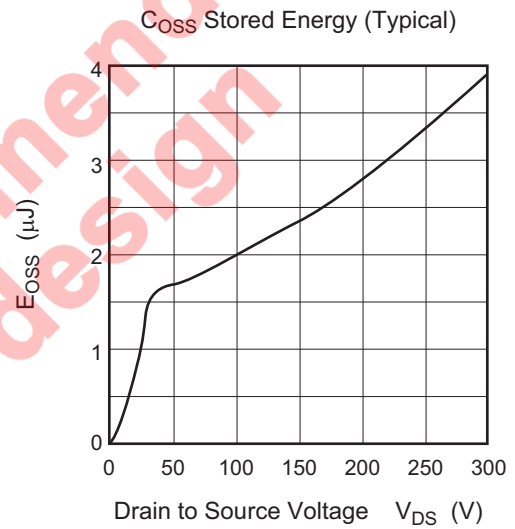
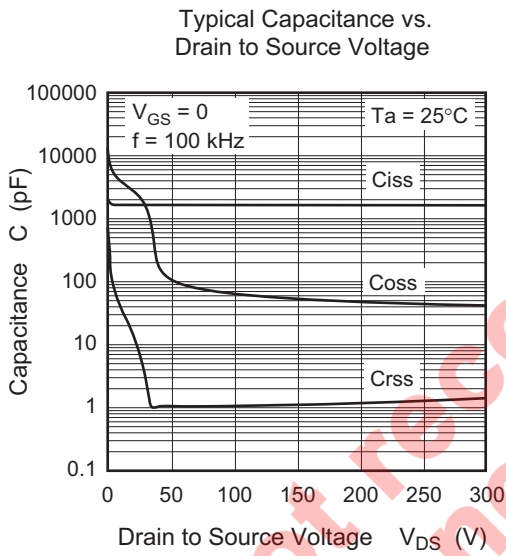
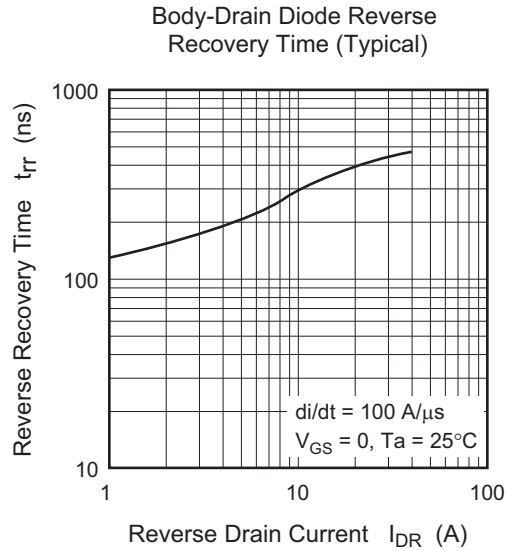
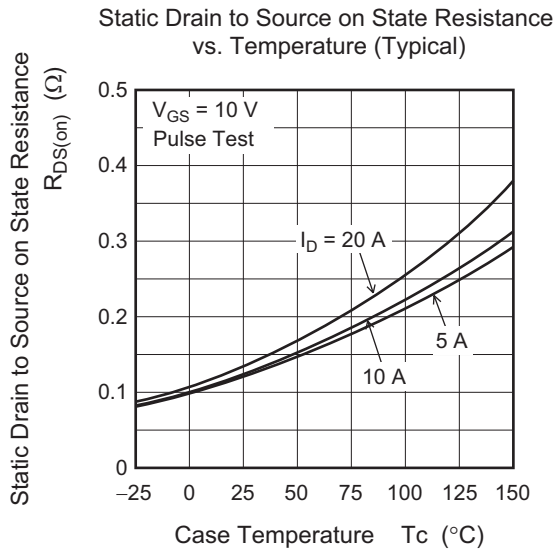
(Ta = 25°C)

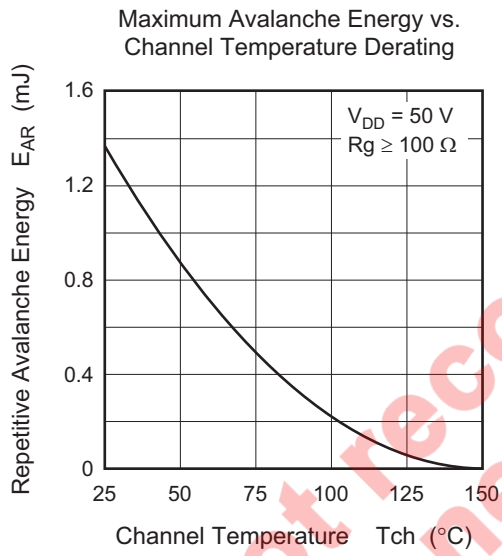
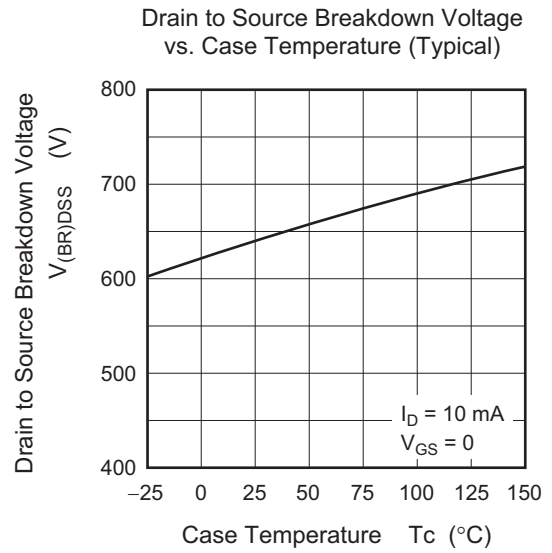
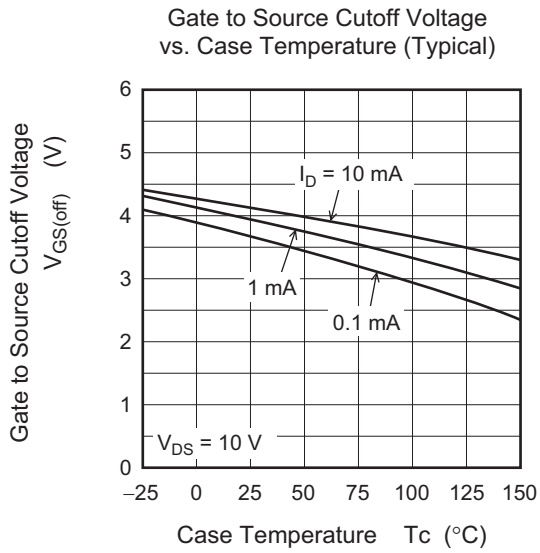
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	600	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	1	mA	$V_{DS} = 600 \text{ V}$ , $V_{GS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 0.1$	$\mu\text{A}$	$V_{GS} = +30\text{V}$ , $-20 \text{ V}$ , $V_{DS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	3	—	5	V	$V_{DS} = 10 \text{ V}$ , $I_D = 1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.150	0.178	$\Omega$	$I_D = 10 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note5</sup>
	$R_{DS(on)}$	—	0.375	—	$\Omega$	Ta = 150°C $I_D = 10 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note5</sup>
Gate resistance	Rg	—	2.5	—	$\Omega$	f = 1 MHz $V_{DS} = 25 \text{ V}$ , $V_{GS} = 0$
Input capacitance	Ciss	—	1600	—	pF	$V_{DS} = 25 \text{ V}$
Output capacitance	Coss	—	2160	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	Crss	—	8.2	—	pF	f = 100kHz
Turn-on delay time	$t_{d(on)}$	—	23	—	ns	$I_D = 10 \text{ A}$
Rise time	$t_r$	—	25	—	ns	$V_{GS} = 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	49	—	ns	$R_L = 30 \Omega$
Fall time	$t_f$	—	23	—	ns	Rg = 10 $\Omega$ <sup>Note5</sup>
Total gate charge	Qg	—	27	—	nC	$V_{DD} = 480 \text{ V}$
Gate to source charge	Qgs	—	10.5	—	nC	$V_{GS} = 10 \text{ V}$
Gate to drain charge	Qgd	—	8.5	—	nC	$I_D = 20 \text{ A}$ <sup>Note4</sup>
Body-drain diode forward voltage	$V_{DF}$	—	0.96	1.60	V	$I_F = 20 \text{ A}$ , $V_{GS} = 0$ <sup>Note5</sup>
Body-drain diode reverse recovery time	$t_{rr}$	—	400	—	ns	$I_F = 20 \text{ A}$
Body-drain diode reverse recovery current	$I_{rr}$	—	25	—	A	$V_{GS} = 0$ $di_F/dt = 100 \text{ A}/\mu\text{s}$ <sup>Note5</sup>
Body-drain diode reverse recovery charge	Q <sub>rr</sub>	—	5.6	—	$\mu\text{C}$	

Notes: 5. Pulse test

### Main Characteristics

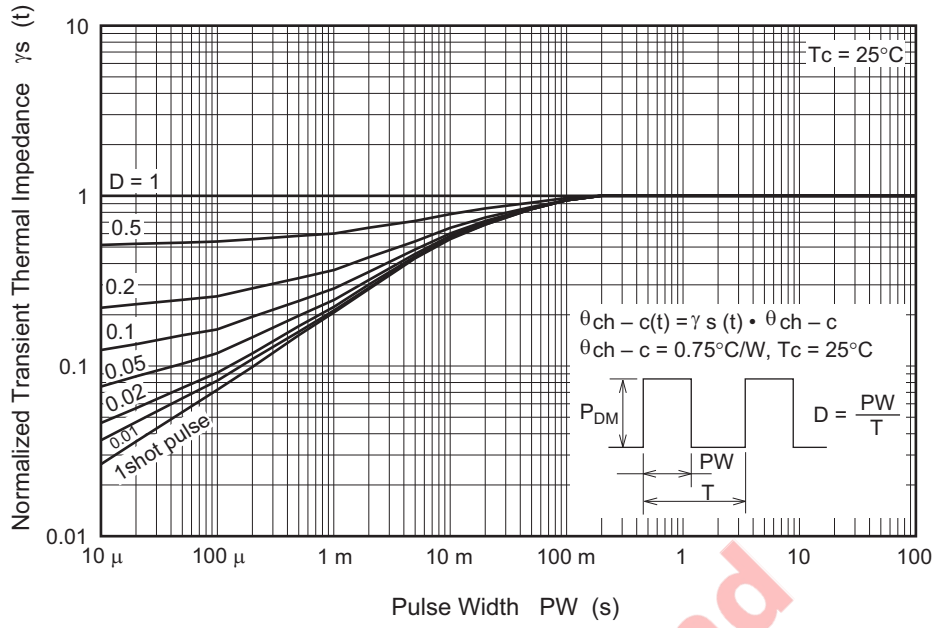




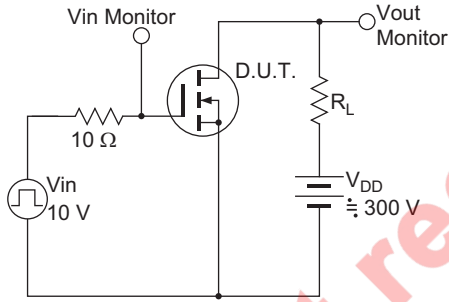


Not recommended for new design

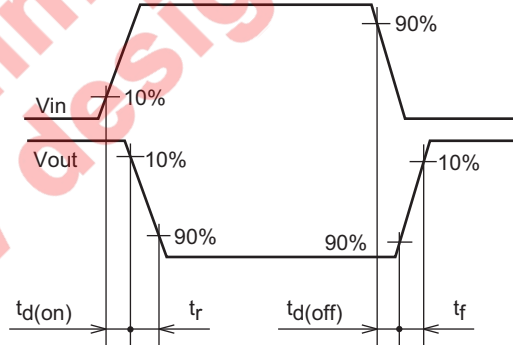
Normalized Transient Thermal Impedance vs. Pulse Width



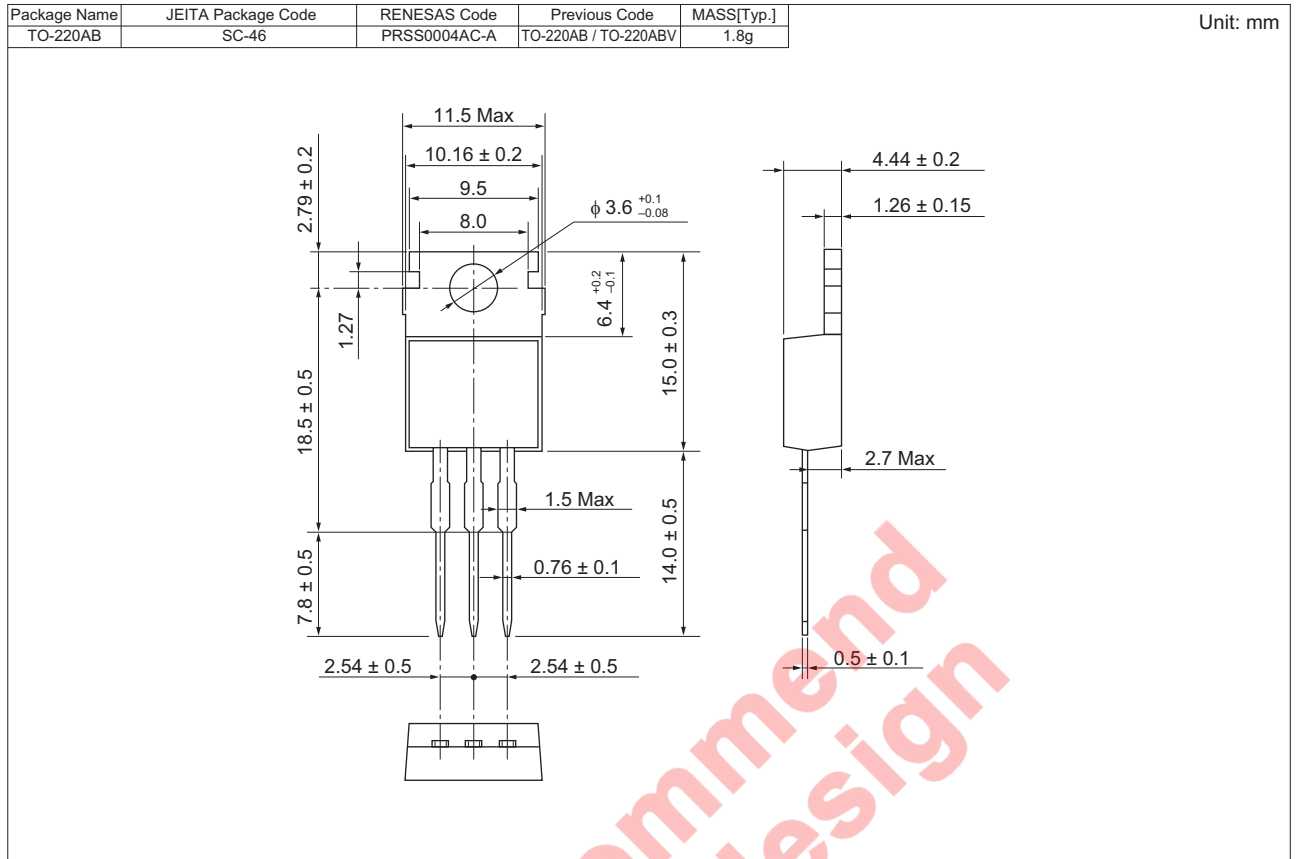
Switching Time Test Circuit



Waveform



Package Dimension



Ordering Information

Orderable Part Number	Quantity	Shipping Container
RJK60S5DPN-00#T2	50 pcs	Tube

Not recommended for new design

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