

# RJK2009DPM

Silicon N Channel MOS FET  
High Speed Power Switching

REJ03G0474-0200

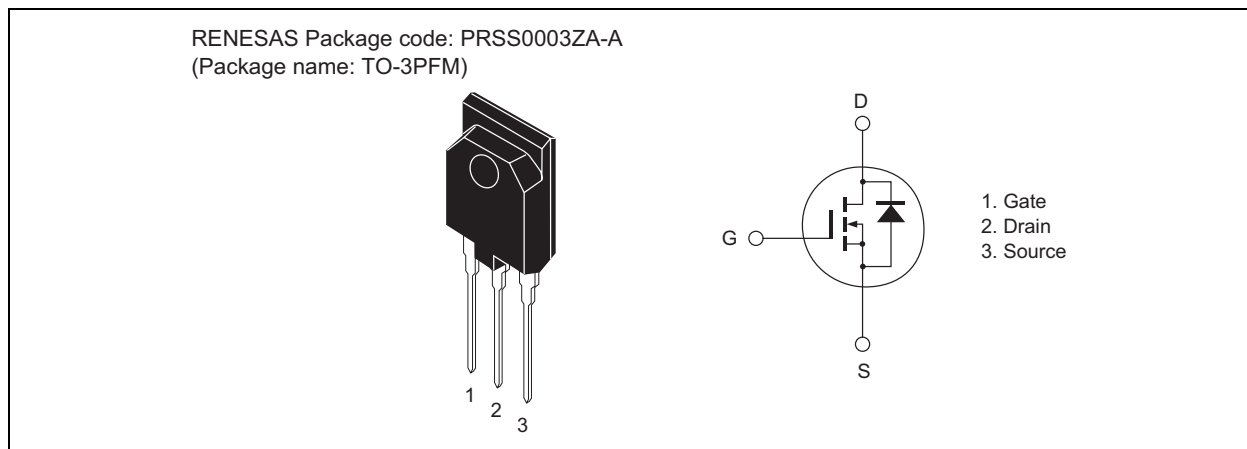
Rev.2.00

Aug.09.2005

## Features

- Low on-resistance
- Low leakage current
- High speed switching

## Outline



## Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V <sub>DSS</sub>	200	V
Gate to source voltage	V <sub>GSS</sub>	±30	V
Drain current	I <sub>D</sub>	40	A
Drain peak current	I <sub>D (pulse)</sub> <sup>Note1</sup>	160	A
Body-drain diode reverse drain current	I <sub>DR</sub>	40	A
Body-drain diode reverse drain peak current	I <sub>DR (pulse)</sub> <sup>Note1</sup>	160	A
Avalanche current	I <sub>AP</sub> <sup>Note3</sup>	40	A
Avalanche energy	E <sub>AR</sub> <sup>Note3</sup>	106	mJ
Channel dissipation	P <sub>ch</sub> <sup>Note2</sup>	60	W
Channel to case thermal impedance	θ <sub>ch-c</sub>	2.08	°C/W
Channel temperature	T <sub>ch</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

- Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1%  
 2. Value at T<sub>c</sub> = 25°C  
 3. ST<sub>ch</sub> = 25°C, T<sub>ch</sub> ≤ 150°C

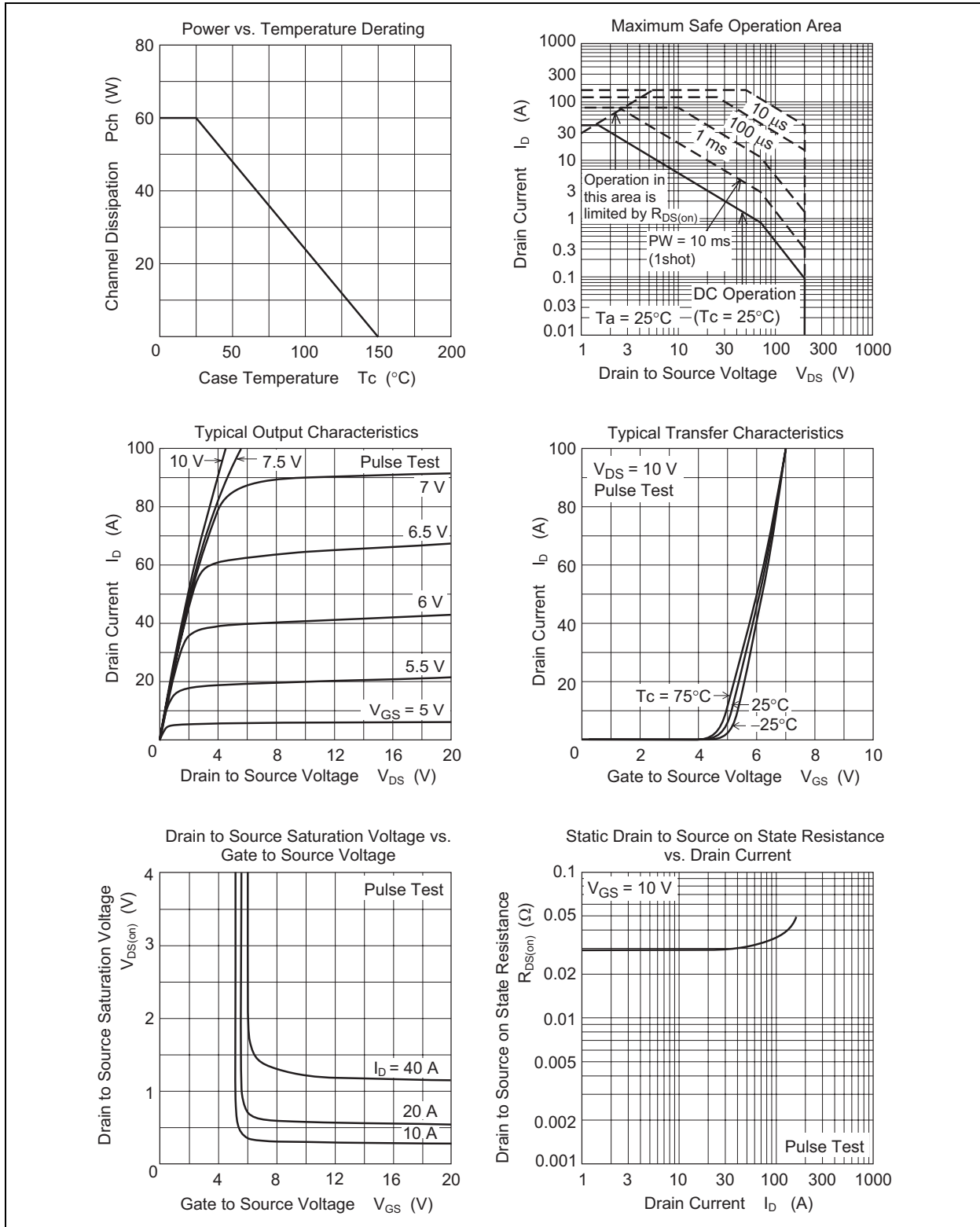
## Electrical Characteristics

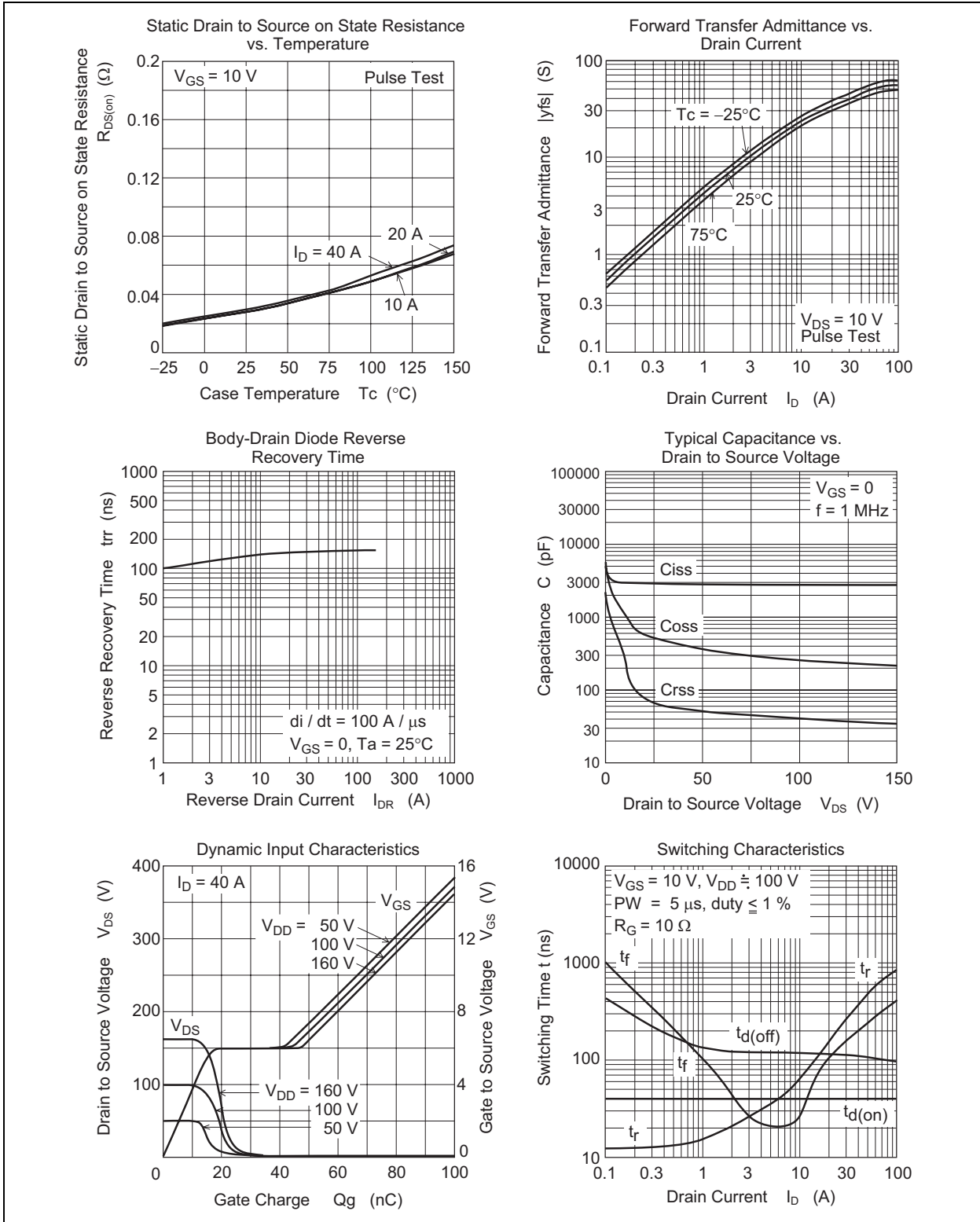
(Ta = 25°C)

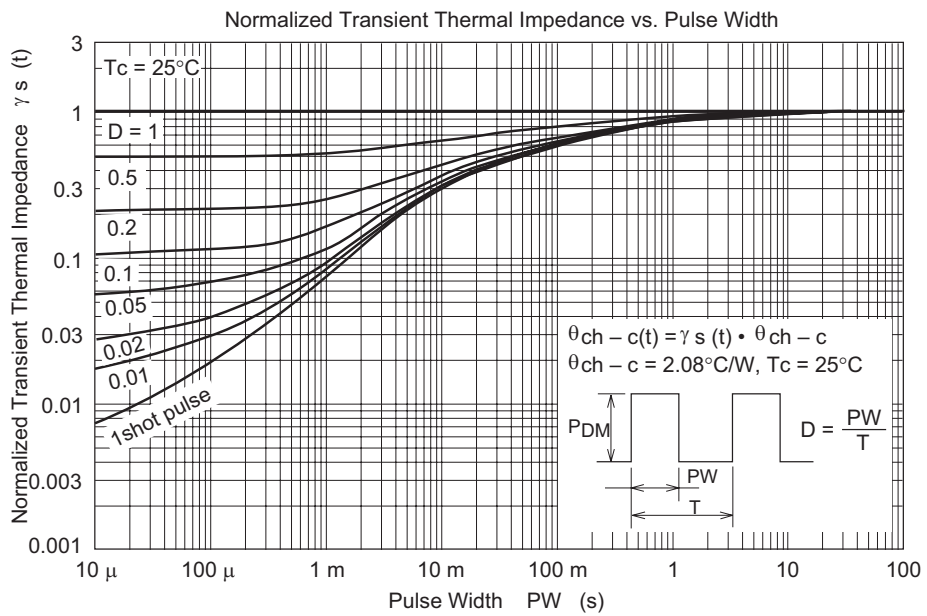
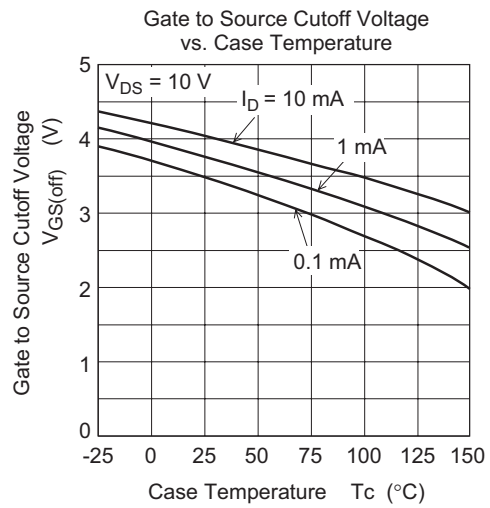
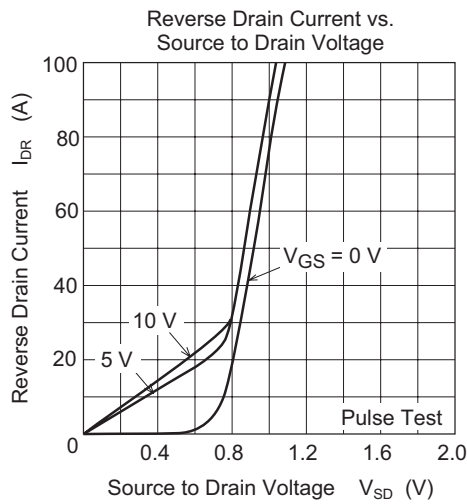
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	200	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	1	$\mu\text{A}$	$V_{DS} = 200 \text{ V}$ , $V_{GS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 0.1$	$\mu\text{A}$	$V_{GS} = \pm 30 \text{ V}$ , $V_{DS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	3.0	—	4.5	V	$V_{DS} = 10 \text{ V}$ , $I_D = 1 \text{ mA}$
Forward transfer admittance	$ y_{fs} $	20	33	—	S	$I_D = 20 \text{ A}$ , $V_{DS} = 10 \text{ V}$ <sup>Note4</sup>
Static drain to source on state resistance	$R_{DS(on)}$	—	0.029	0.036	$\Omega$	$I_D = 20 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note4</sup>
Input capacitance	$C_{iss}$	—	2900	—	pF	$V_{DS} = 25 \text{ V}$ , $V_{GS} = 0$ , $f = 1 \text{ MHz}$
Output capacitance	$C_{oss}$	—	520	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	66	—	pF	
Turn-on delay time	$t_{d(on)}$	—	40	—	ns	$I_D = 20 \text{ A}$ , $V_{GS} = 10 \text{ V}$ , $R_L = 5 \Omega$ , $R_g = 10 \Omega$
Rise time	$t_r$	—	160	—	ns	
Turn-off delay time	$t_{d(off)}$	—	120	—	ns	
Fall time	$t_f$	—	110	—	ns	
Total gate charge	$Q_g$	—	72	—	nC	$V_{DD} = 160 \text{ V}$ , $V_{GS} = 10 \text{ V}$ , $I_D = 40 \text{ A}$
Gate to source charge	$Q_{gs}$	—	16	—	nC	
Gate to drain charge	$Q_{gd}$	—	31	—	nC	
Body-drain diode forward voltage	$V_{DF}$	—	0.9	1.4	V	$I_F = 40 \text{ A}$ , $V_{GS} = 0$ <sup>Note4</sup>
Body-drain diode reverse recovery time	$t_{rr}$	—	150	—	ns	$I_F = 40 \text{ A}$ , $V_{GS} = 0$ , $diF/dt = 100 \text{ A}/\mu\text{s}$
Body-drain diode reverse recovery charge	$Q_{rr}$	—	0.8	—	$\mu\text{C}$	

Notes: 4. Pulse test

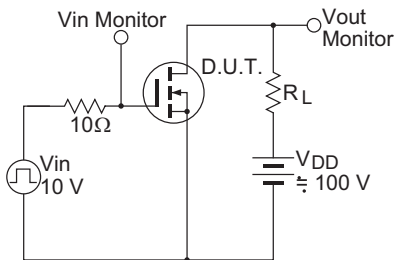
Main Characteristics



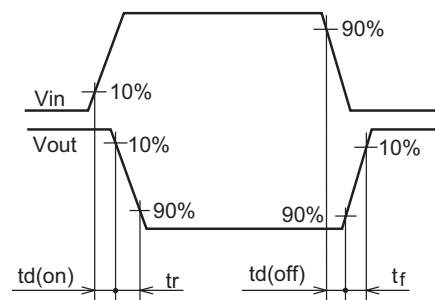




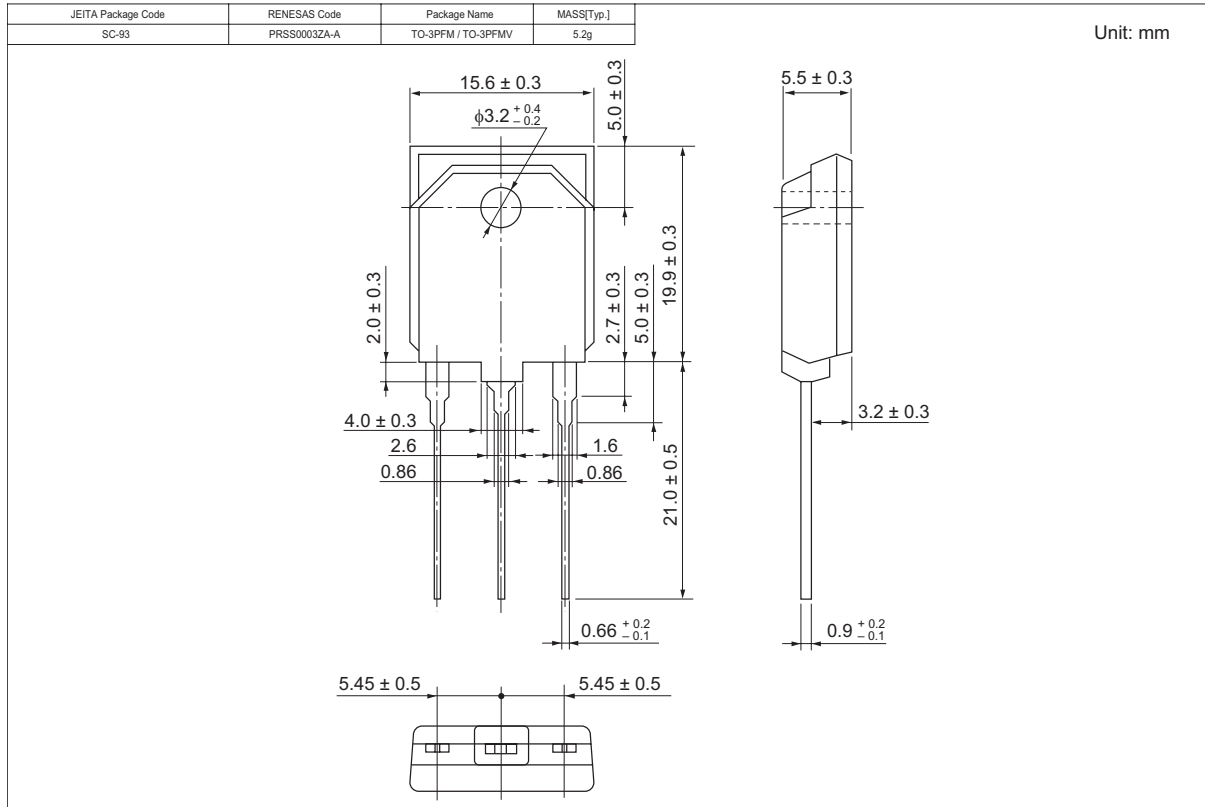
Switching Time Test Circuit



Waveform



## Package Dimensions



## Ordering Information

Part Name	Quantity	Shipping Container
RJK2009DPM-E	30 pcs	Plastic magazine

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

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