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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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2SK1971

Silicon N Channel MOS FET

REJ03G0990-0300
Rev.3.00
May 13, 2009

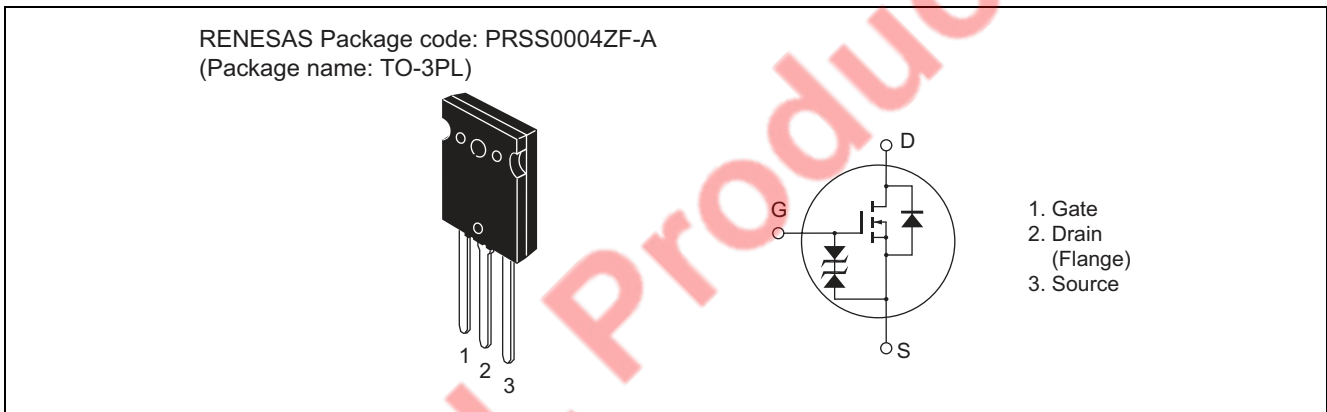
Application

High speed power switching

Features

- Low on-resistance
- High speed switching
- Low drive current
- No secondary breakdown
- Suitable for switching regulator, DC-DC converter, motor control

Outline



Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	500	V
Gate to source voltage	V_{GSS}	± 30	V
Drain current	I_D	35	A
Drain peak current	$I_{D(pulse)}^{*1}$	140	A
Body to drain diode reverse drain current	I_{DR}	35	A
Channel dissipation	P_{ch}^{*2}	200	W
Channel temperature	T_{ch}	150	°C
Storage temperature	T_{stg}	-55 to +150	°C

Notes: 1. $PW \leq 10 \mu s$, duty cycle $\leq 1\%$

2. Value at $T_c = 25^\circ C$

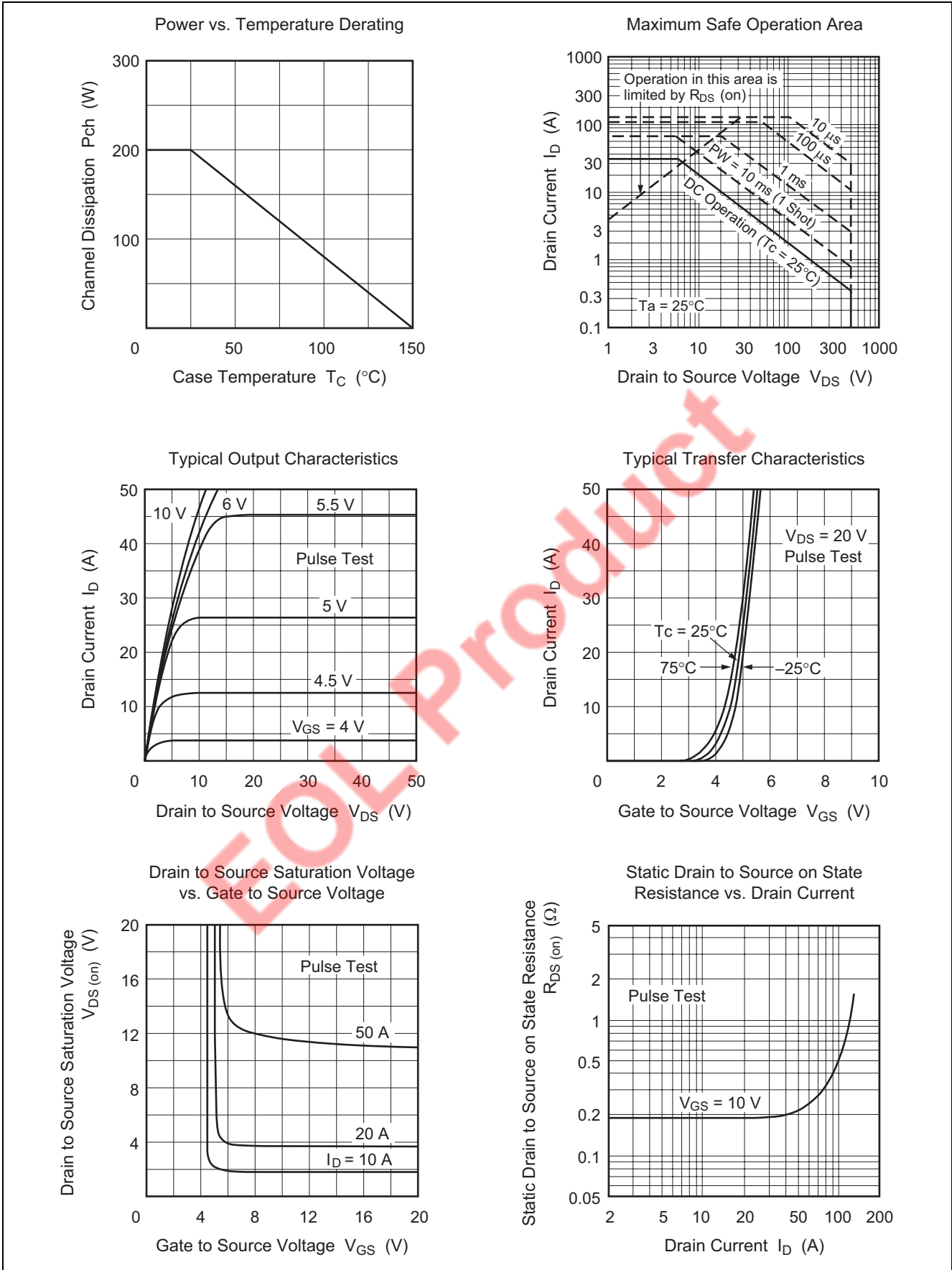
Electrical Characteristics

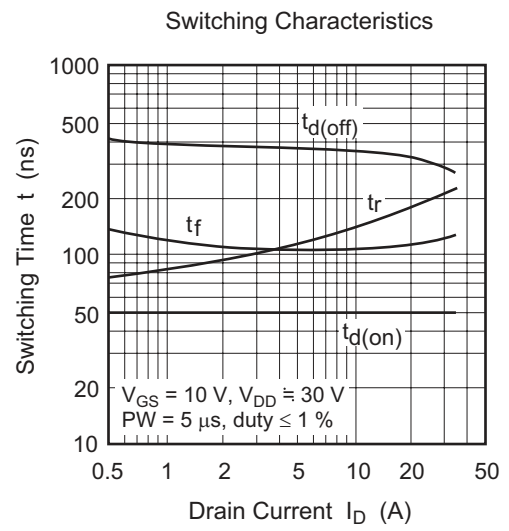
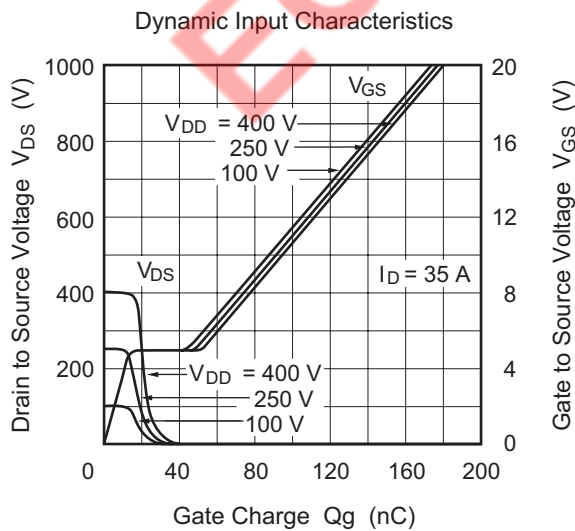
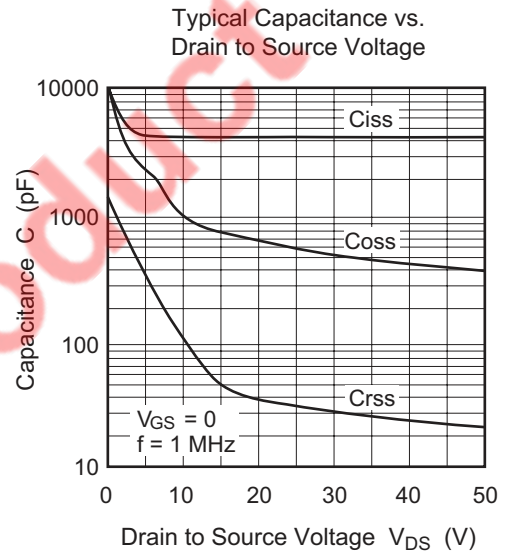
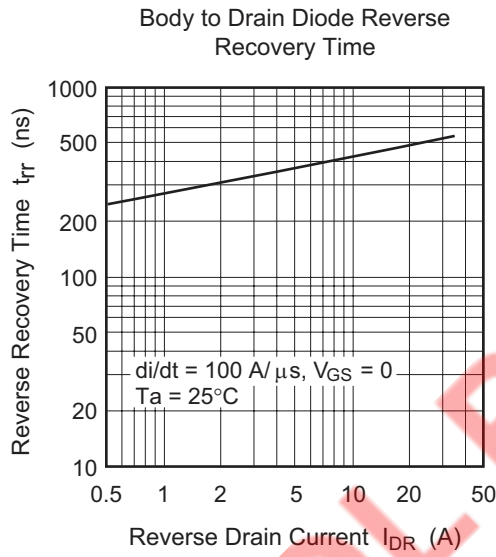
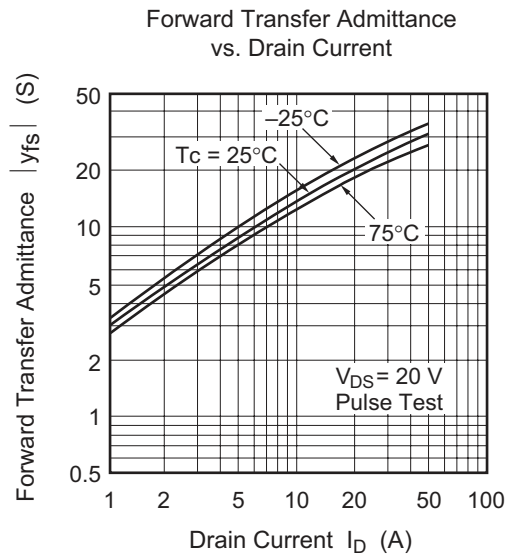
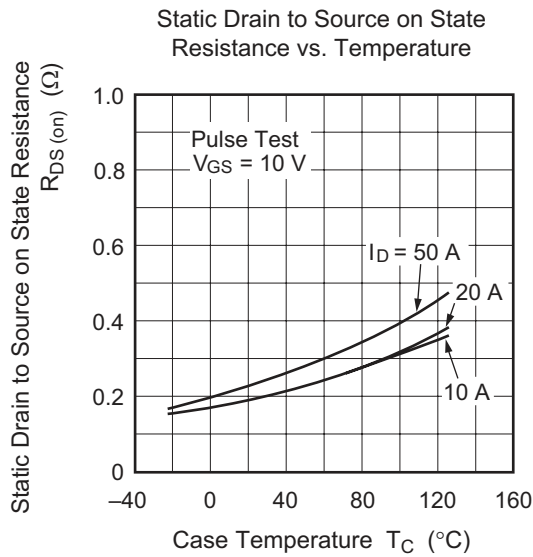
(Ta = 25°C)

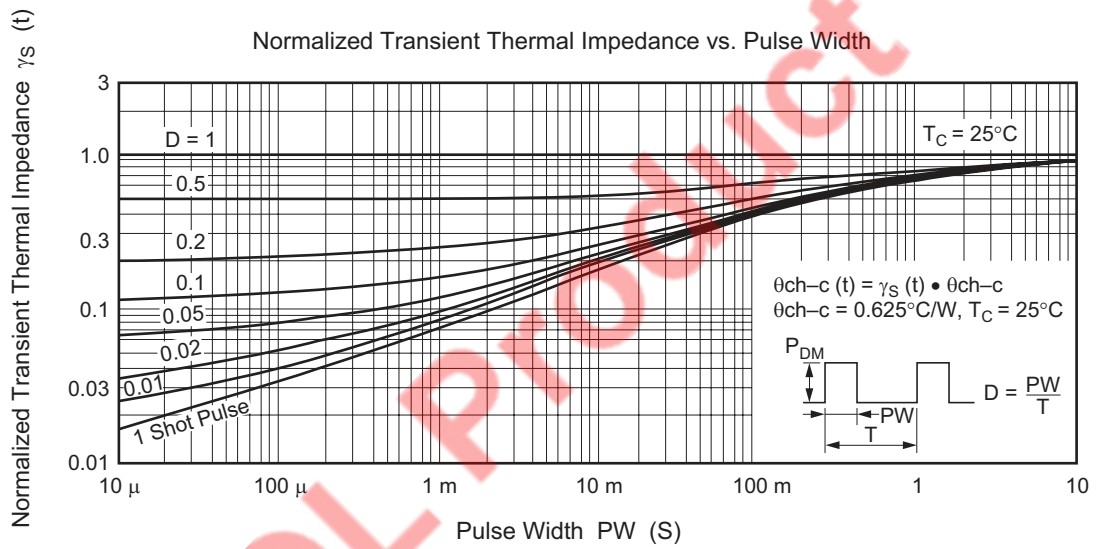
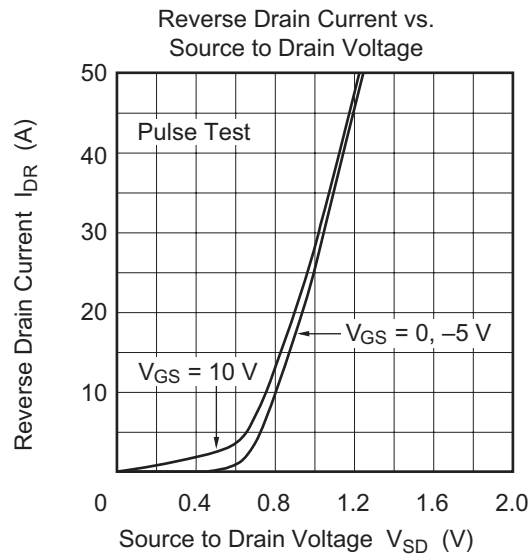
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	500	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	± 20	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}$, $V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 25 \text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	250	μA	$V_{DS} = 400 \text{ V}$, $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	2.0	—	3.0	V	$I_D = 1 \text{ mA}$, $V_{DS} = 10 \text{ V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.19	0.23	Ω	$I_D = 18 \text{ A}$, $V_{GS} = 10 \text{ V}^{*3}$
Forward transfer admittance	$ y_{fs} $	16	24	—	S	$I_D = 18 \text{ A}$, $V_{DS} = 10 \text{ V}^{*3}$
Input capacitance	C_{iss}	—	4320	—	pF	$V_{DS} = 10 \text{ V}$, $V_{GS} = 0$, $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	1120	—	pF	
Reverse transfer capacitance	C_{rss}	—	130	—	pF	
Turn-on delay time	$t_{d(on)}$	—	50	—	ns	$I_D = 18 \text{ A}$, $V_{GS} = 10 \text{ V}$, $R_L = 1.67 \text{ }\Omega$
Rise time	t_r	—	170	—	ns	
Turn-off delay time	$t_{d(off)}$	—	320	—	ns	
Fall time	t_f	—	130	—	ns	
Body to drain diode forward voltage	V_{DF}	—	1.1	—	V	$I_F = 35 \text{ A}$, $V_{GS} = 0$
Body to drain diode reverse recovery time	t_{rr}	—	530	—	ns	$I_F = 35 \text{ A}$, $V_{GS} = 0$, $di_F/dt = 100 \text{ A}/\mu\text{s}$

Note: 3. Pulse Test

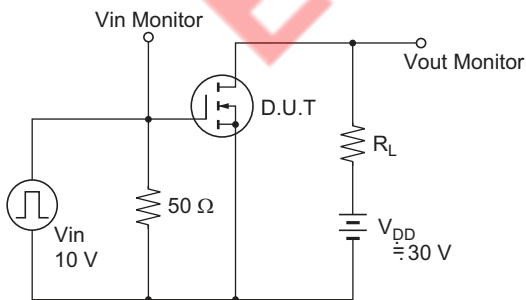
Main Characteristics



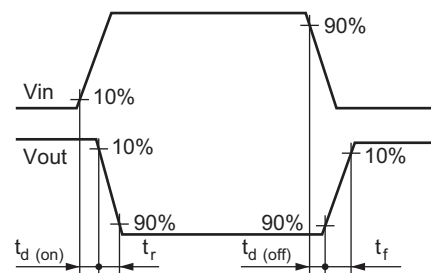




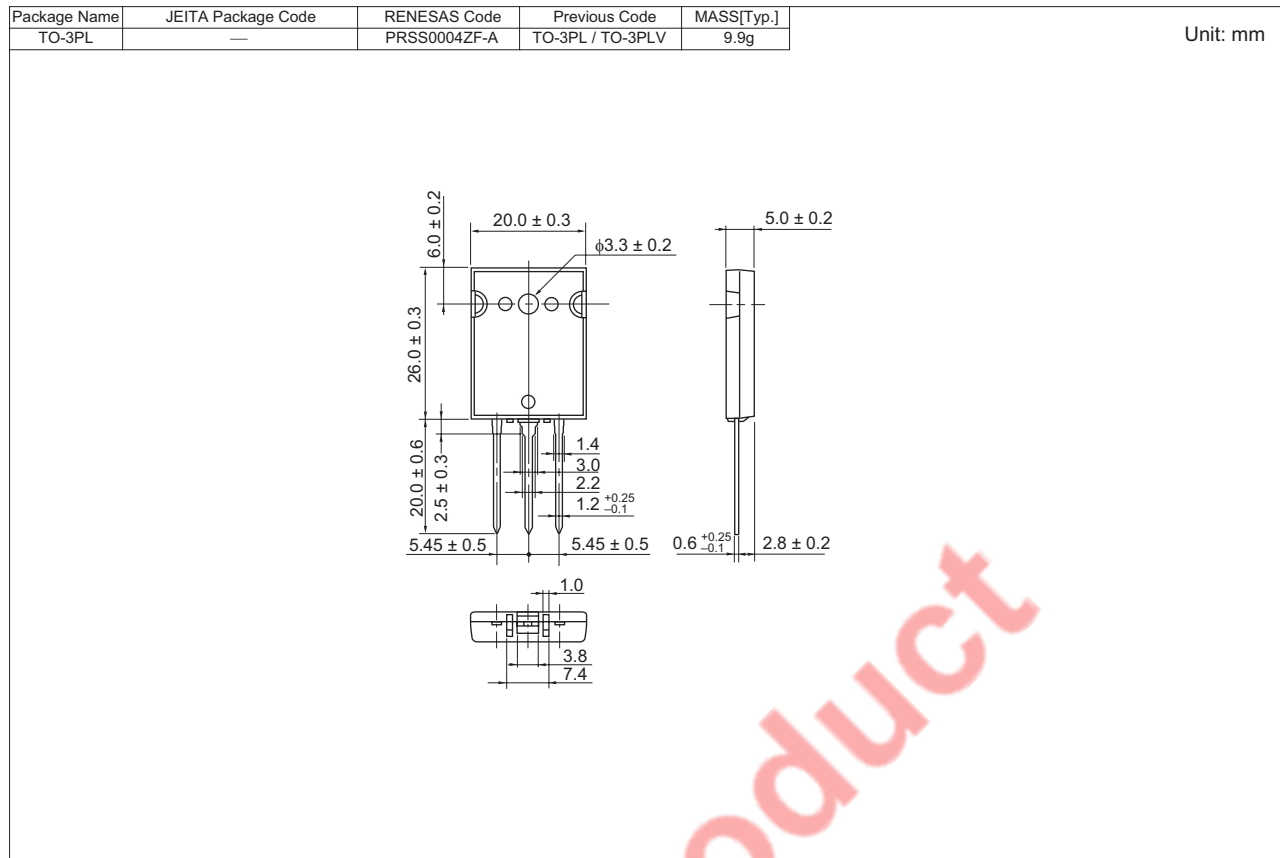
Switching Time Test Circuit



Waveforms



Package Dimensions



Ordering Information

Part Name	Quantity	Shipping Container
2SK1971-E	250 pcs	Box (Tube)

Notes:

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