

## 2SK3151

Silicon N Channel MOS FET  
High Speed Power Switching

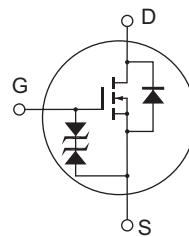
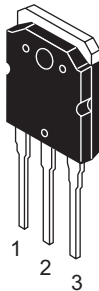
REJ03G1076-0400  
(Previous: ADE-208-747B)  
Rev.4.00  
Sep 07, 2005

### Features

- Low on-resistance  
 $R_{DS(on)} = 11.5 \text{ m}\Omega$  typ.
- High speed switching
- 4 V gate drive device can be driven from 5 V source

### Outline

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



1. Gate
2. Drain  
(Flange)
3. Source

## Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	$V_{DSS}$	100	V
Gate to source voltage	$V_{GSS}$	±20	V
Drain current	$I_D$	50	A
Drain peak current	$I_{D(pulse)}$ <sup>Note1</sup>	200	A
Body-drain diode reverse drain current	$I_{DR}$	50	A
Avalanche current	$I_{AP}$ <sup>Note3</sup>	50	A
Avalanche energy	$E_{AR}$ <sup>Note3</sup>	250	mJ
Channel dissipation	$P_{ch}$ <sup>Note2</sup>	125	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  $T_c = 25^\circ C$   
 3. Value at  $T_{ch} = 25^\circ C$ ,  $R_g \geq 50 \Omega$

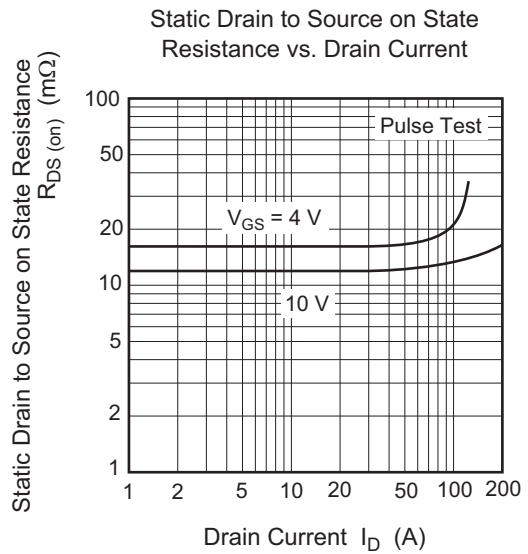
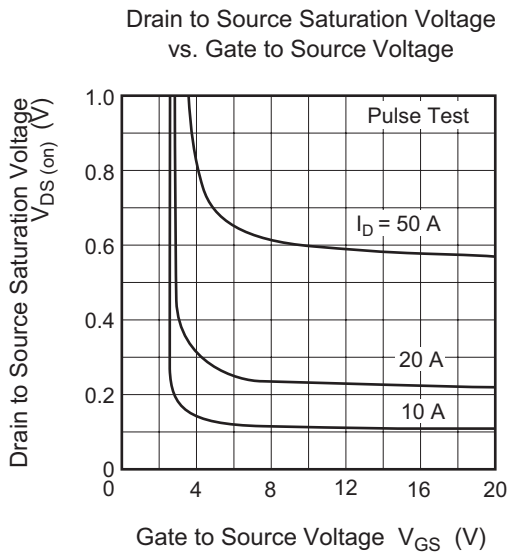
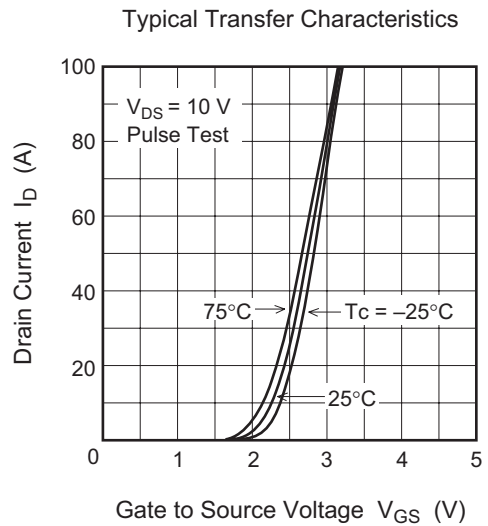
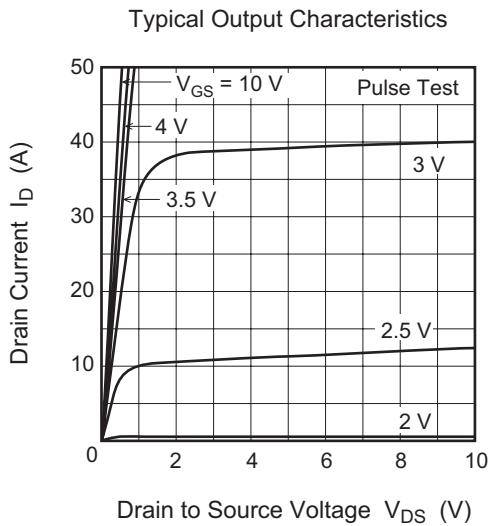
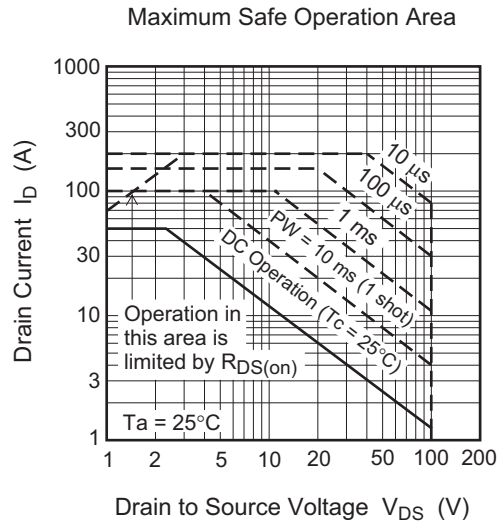
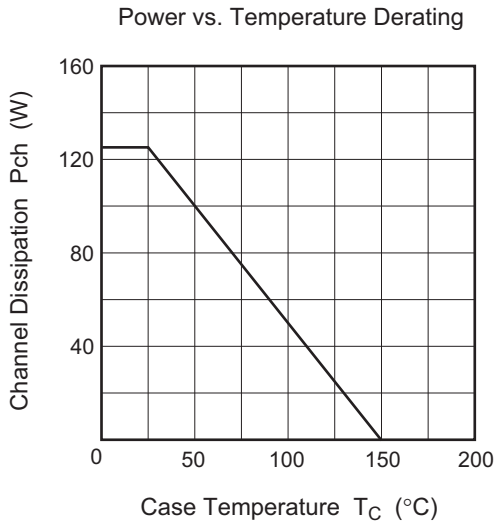
## Electrical Characteristics

(Ta = 25°C)

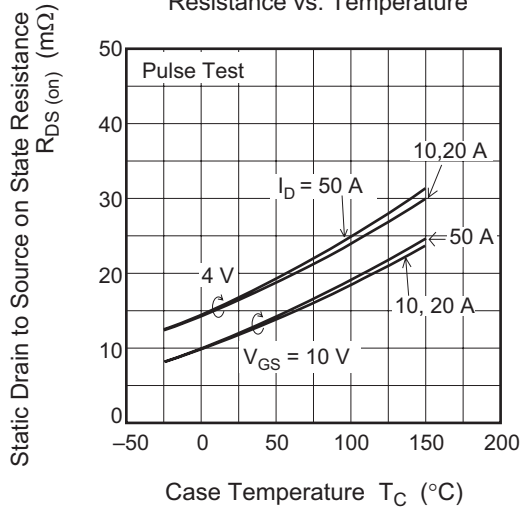
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	100	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	±20	—	—	V	$I_G = \pm 100 \mu A$ , $V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	±10	μA	$V_{GS} = \pm 16 \text{ V}$ , $V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	10	μA	$V_{DS} = 100 \text{ V}$ , $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.5	V	$I_D = 1 \text{ mA}$ , $V_{DS} = 10 \text{ V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	11.5	15	mΩ	$I_D = 25 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note4</sup>
	$R_{DS(on)}$	—	16	25	mΩ	$I_D = 25 \text{ A}$ , $V_{GS} = 4 \text{ V}$ <sup>Note4</sup>
Forward transfer admittance	$ y_{fs} $	30	50	—	S	$I_D = 25 \text{ A}$ , $V_{DS} = 10 \text{ V}$ <sup>Note4</sup>
Input capacitance	$C_{iss}$	—	4000	—	pF	$V_{DS} = 10 \text{ V}$ , $V_{GS} = 0$ ,
Output capacitance	$C_{oss}$	—	1650	—	pF	$f = 1 \text{ MHz}$
Reverse transfer capacitance	$C_{rss}$	—	590	—	pF	
Turn-on delay time	$t_{d(on)}$	—	30	—	ns	$I_D = 25 \text{ A}$ , $V_{GS} = 10 \text{ V}$ , $R_L = 1.2 \Omega$
Rise time	$t_r$	—	280	—	ns	
Turn-off delay time	$t_{d(off)}$	—	830	—	ns	
Fall time	$t_f$	—	450	—	ns	
Body-drain diode forward voltage	$V_{DF}$	—	0.95	—	V	$I_F = 50 \text{ A}$ , $V_{GS} = 0$
Body-drain diode reverse recovery time	$t_{rr}$	—	100	—	V	$I_F = 50 \text{ A}$ , $V_{GS} = 0$ $di_F/dt = 50 \text{ A}/\mu s$

Note: 4. Pulse test

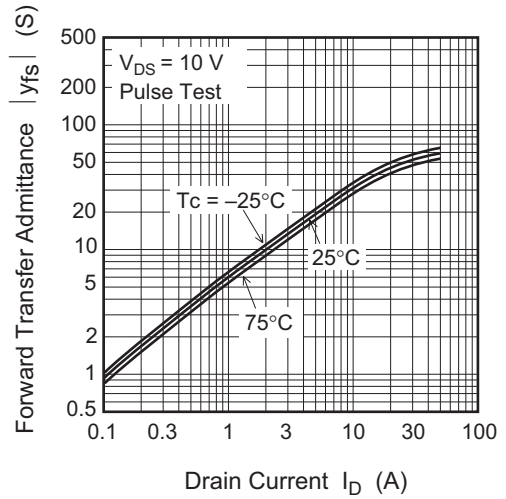
### Main Characteristics



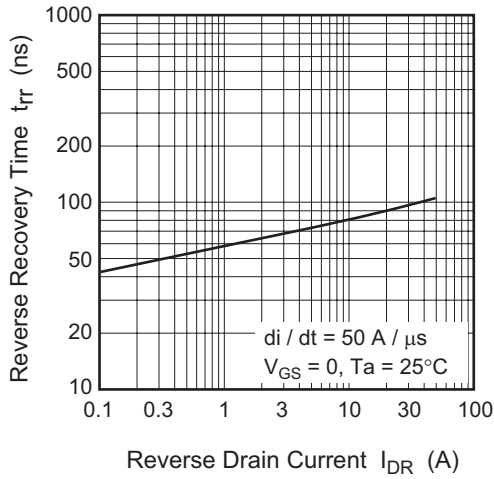
Static Drain to Source on State Resistance vs. Temperature



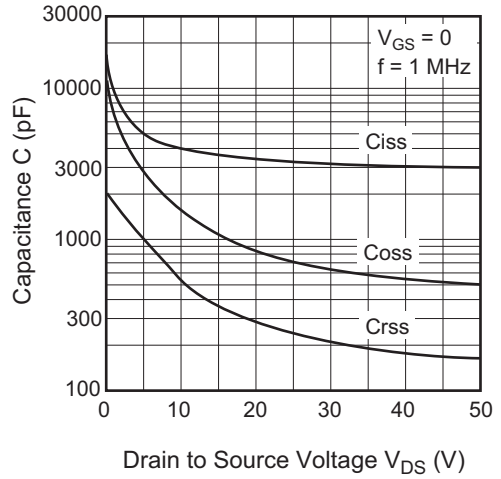
Forward Transfer Admittance vs. Drain Current



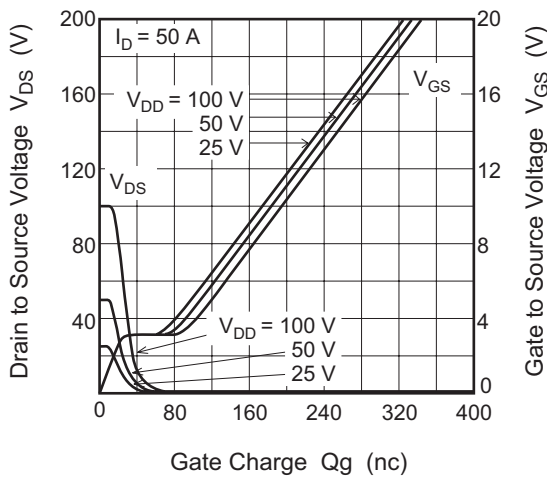
Body to Drain Diode Reverse Recovery Time



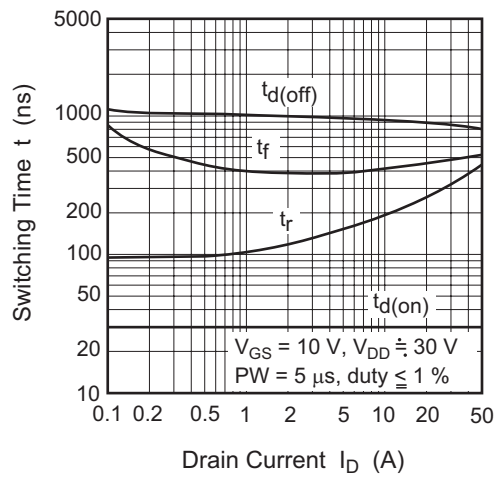
Typical Capacitance vs. Drain to Source Voltage

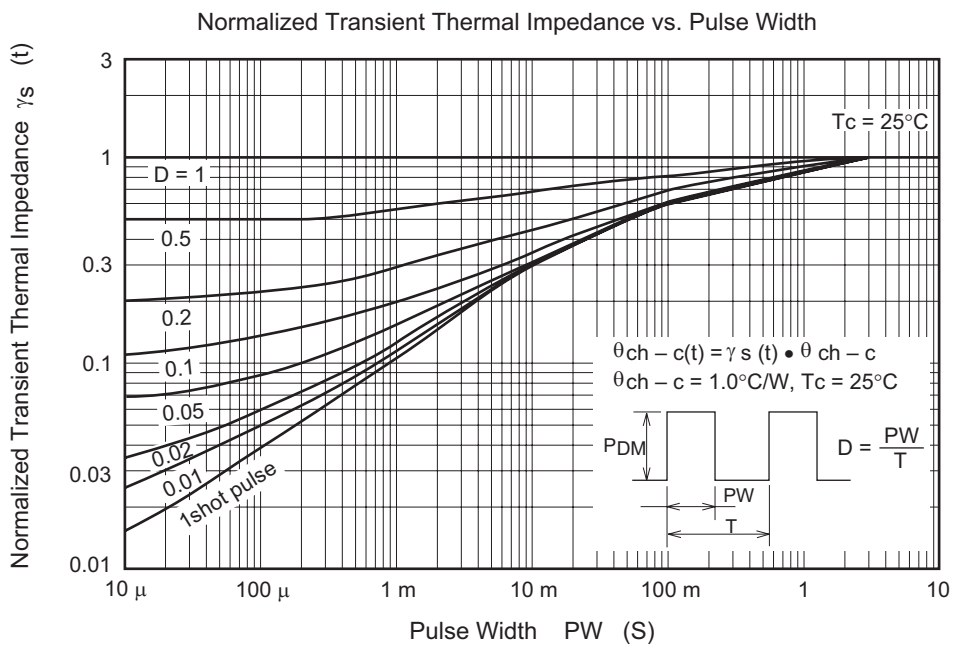
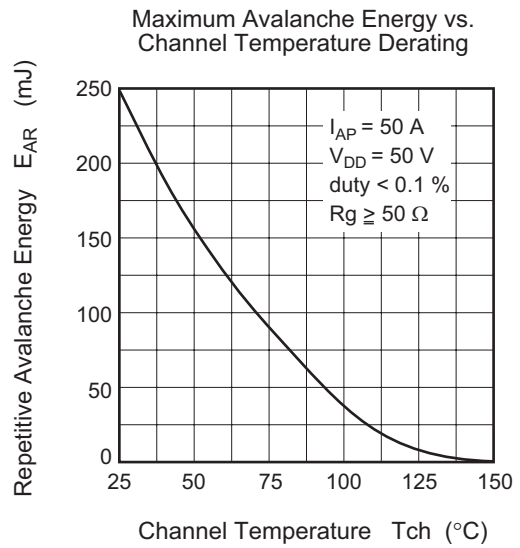
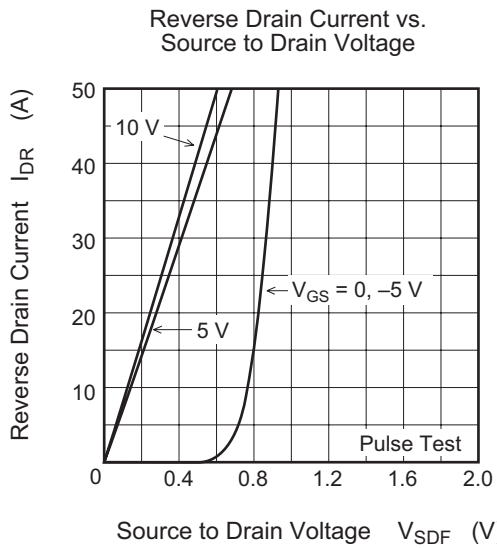


Dynamic Input Characteristics

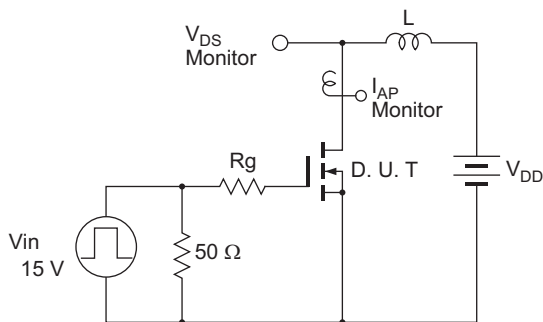


Switching Characteristics

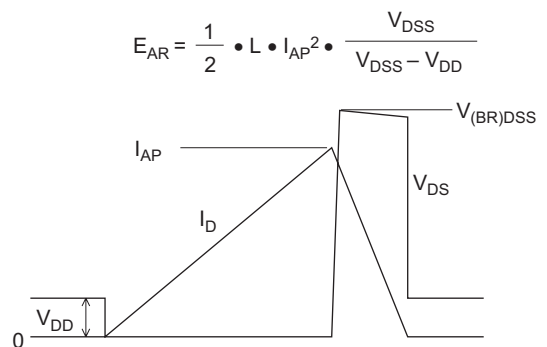


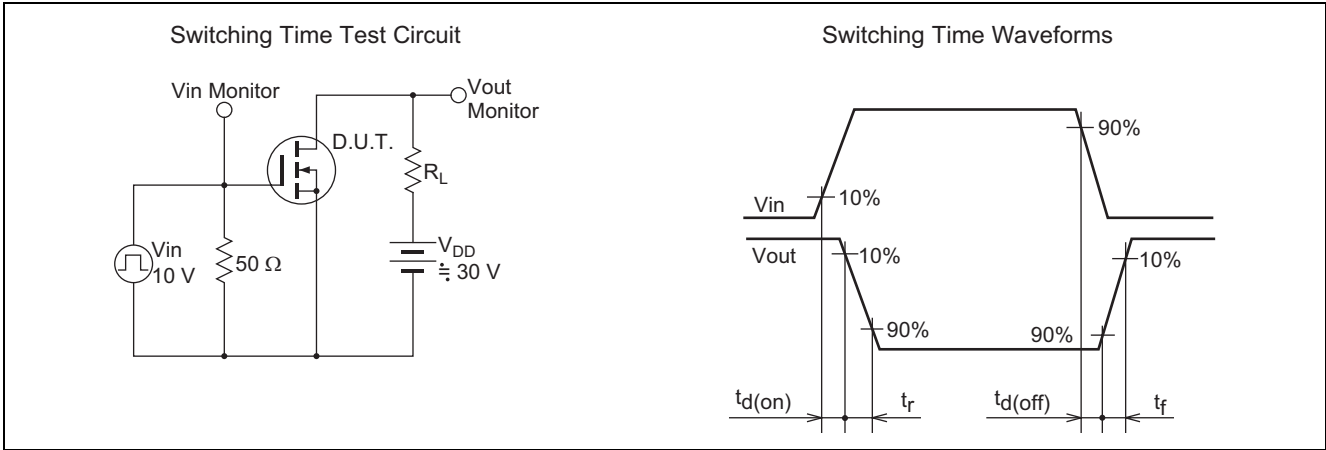


Avalanche Test Circuit

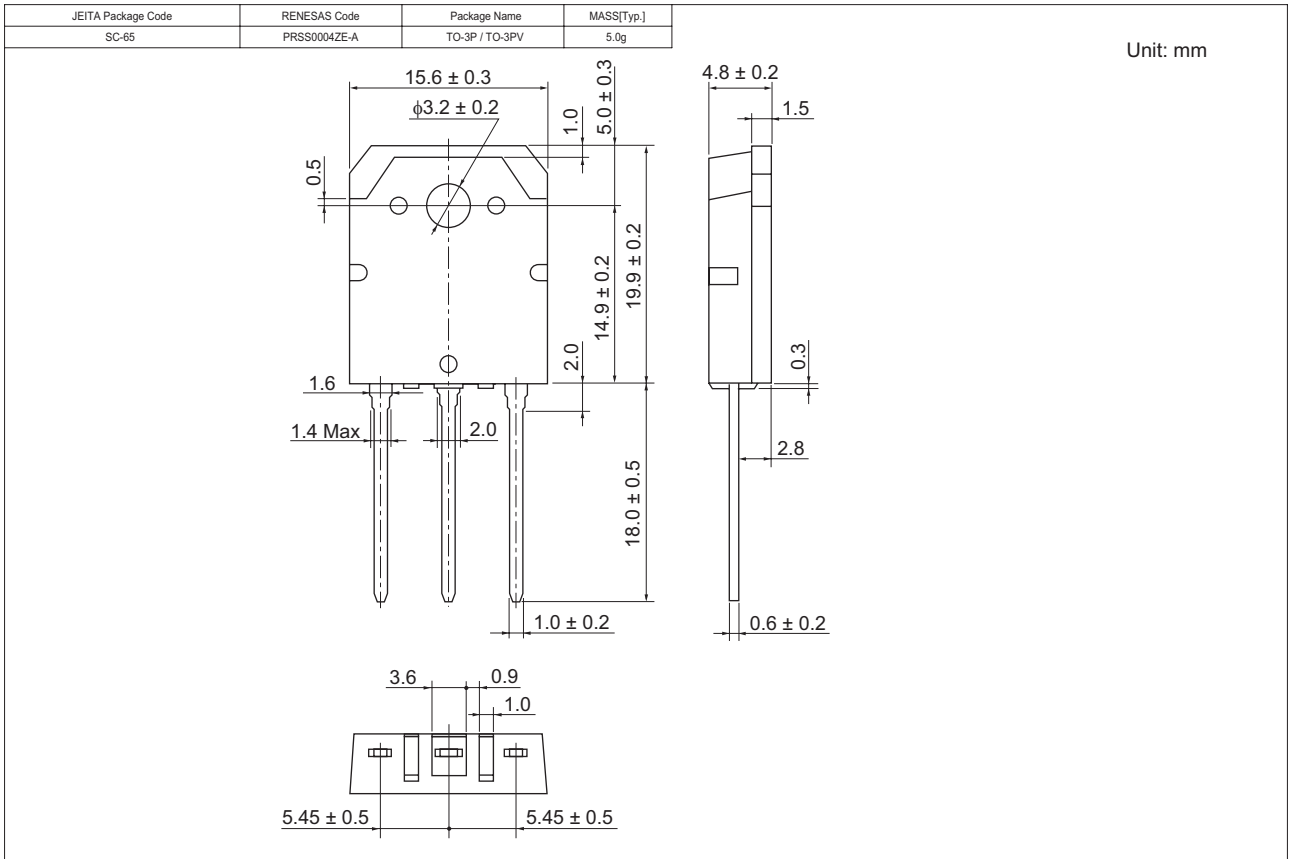


Avalanche Waveform





## Package Dimensions



## Ordering Information

Part Name	Quantity	Shipping Container
2SK3151-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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