

To our customers,

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## Old Company Name in Catalogs and Other Documents

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April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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## 2SK3419

### Silicon N Channel MOS FET High Speed Power Switching

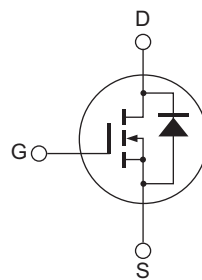
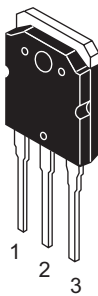
REJ03G1099-0200  
(Previous: ADE-208-942)  
Rev.2.00  
Sep 07, 2005

#### Features

- Low on-resistance  
 $R_{DS(on)} = 4.3 \text{ m}\Omega$  typ.
- 4 V gate drive device
- High speed switching

#### 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	Value	Unit
Drain to source voltage	V <sub>DSS</sub>	60	V
Gate to source voltage	V <sub>GSS</sub>	±20	V
Drain current	I <sub>D</sub>	90	A
Drain peak current	I <sub>D (pulse)</sub> <sup>Note 1</sup>	360	A
Body-drain diode reverse drain current	I <sub>DR</sub>	90	A
Avalanche current	I <sub>AP</sub> <sup>Note 3</sup>	65	A
Avalanche energy	E <sub>AR</sub> <sup>Note 3</sup>	362	mJ
Channel dissipation	P <sub>ch</sub> <sup>Note 2</sup>	150	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. Value at T<sub>ch</sub> = 25°C, R<sub>g</sub> ≥ 50 Ω

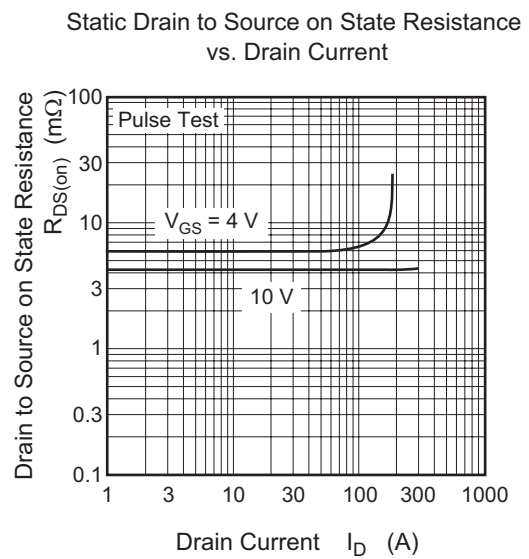
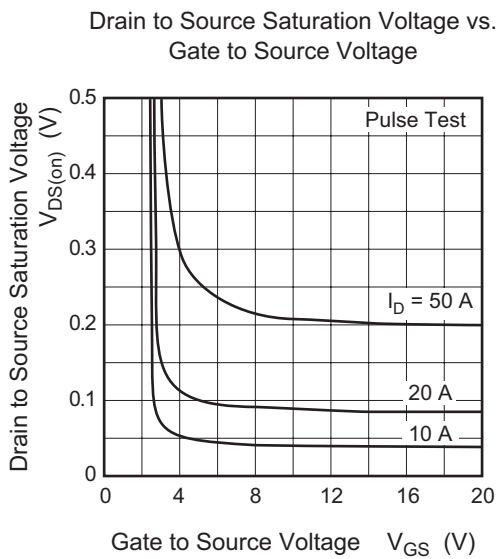
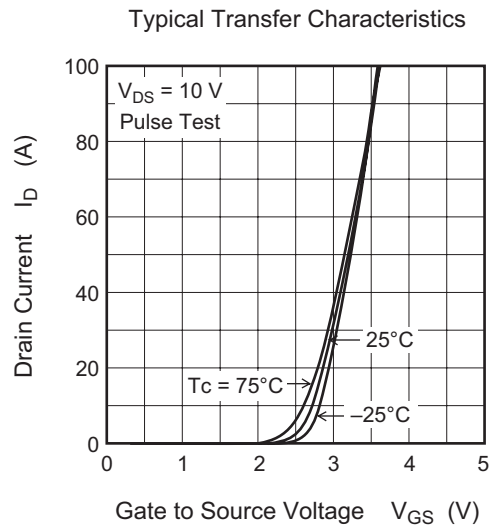
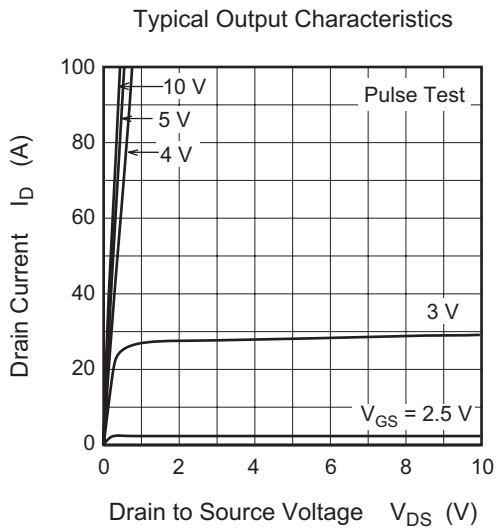
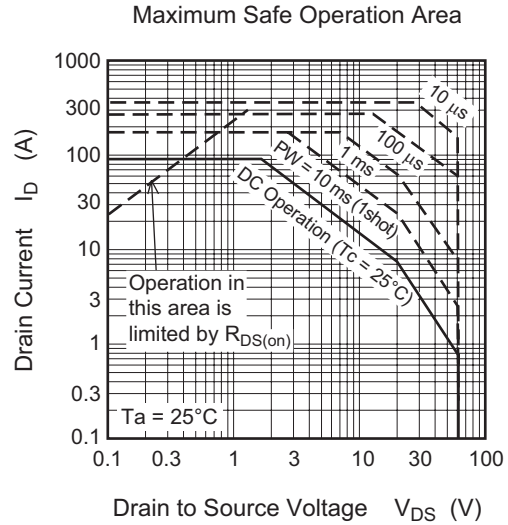
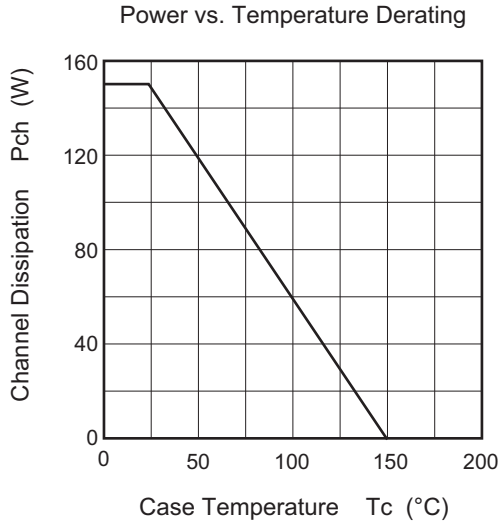
## Electrical Characteristics

(Ta = 25°C)

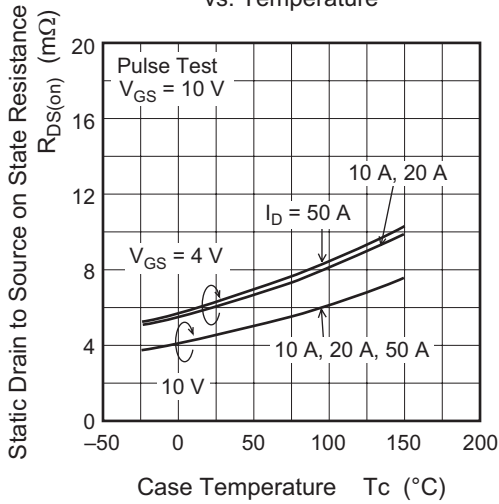
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	V <sub>(BR)DSS</sub>	60	—	—	V	I <sub>D</sub> = 10 mA, V <sub>GS</sub> = 0
Zero gate voltage drain current	I <sub>DSS</sub>	—	—	10	μA	V <sub>DS</sub> = 60 V, V <sub>GS</sub> = 0
Gate to source leak current	I <sub>GSS</sub>	—	—	±0.1	μA	V <sub>GS</sub> = ±20 V, V <sub>DS</sub> = 0
Gate to source cutoff voltage	V <sub>GS (off)</sub>	1.0	—	2.5	V	V <sub>DS</sub> = 10 V, I <sub>D</sub> = 1 mA <sup>Note 4</sup>
Forward transfer admittance	y <sub>fs</sub>	55	90	—	S	I <sub>D</sub> = 45 A, V <sub>DS</sub> = 10 V <sup>Note 4</sup>
Static drain to source on state resistance	R <sub>DS (on)</sub>	—	4.3	5.5	mΩ	I <sub>D</sub> = 45 A, V <sub>GS</sub> = 10 V <sup>Note 4</sup>
	R <sub>DS (on)</sub>	—	6.0	9.0	mΩ	I <sub>D</sub> = 45 A, V <sub>GS</sub> = 4 V <sup>Note 4</sup>
Input capacitance	C <sub>iss</sub>	—	9770	—	pF	V <sub>DS</sub> = 10 V V <sub>GS</sub> = 0 f = 1 MHz
Output capacitance	C <sub>oss</sub>	—	1340	—	pF	
Reverse transfer capacitance	C <sub>rss</sub>	—	470	—	pF	
Total gate charge	Q <sub>g</sub>	—	180	—	nC	V <sub>DD</sub> = 50 V V <sub>GS</sub> = 10 V I <sub>D</sub> = 90 A
Gate to source charge	Q <sub>gs</sub>	—	32	—	nC	
Gate to drain charge	Q <sub>gd</sub>	—	36	—	nC	
Turn-on delay time	t <sub>d (on)</sub>	—	53	—	ns	V <sub>GS</sub> = 10 V I <sub>D</sub> = 45 A R <sub>L</sub> = 0.67 Ω
Rise time	t <sub>r</sub>	—	320	—	ns	
Turn-off delay time	t <sub>d (off)</sub>	—	700	—	ns	
Fall time	t <sub>f</sub>	—	380	—	ns	
Body-drain diode forward voltage	V <sub>DF</sub>	—	1.0	—	V	I <sub>F</sub> = 90 A, V <sub>GS</sub> = 0
Body-drain diode reverse recovery time	t <sub>rr</sub>	—	75	—	ns	I <sub>F</sub> = 90 A, V <sub>GS</sub> = 0 di <sub>F</sub> /dt = 50 A/μs

Note: 4. Pulse test

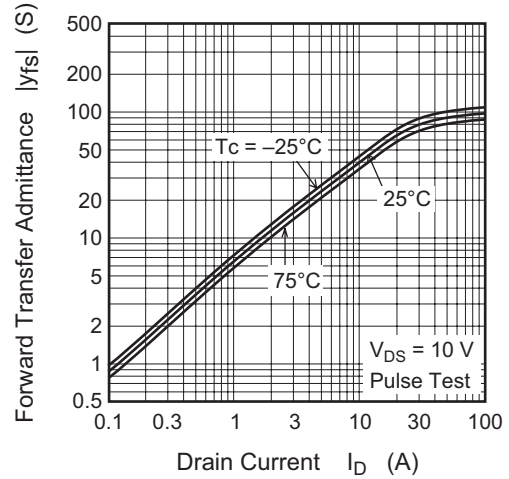
### Main Characteristics



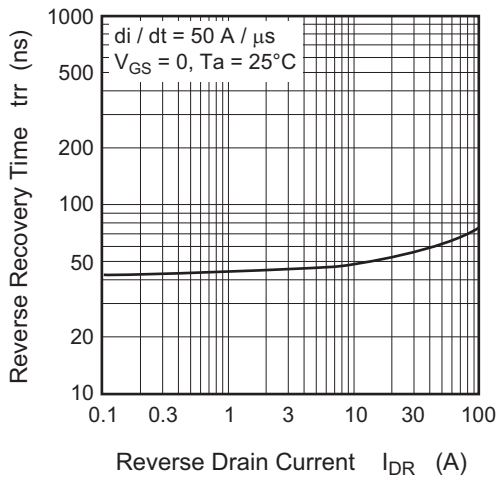
Static Drain to Source on State Resistance vs. Temperature



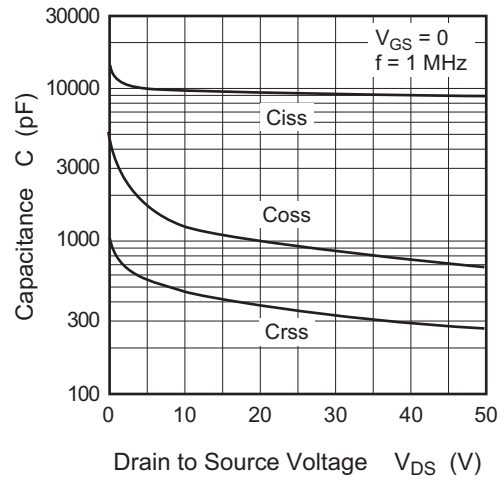
Forward Transfer Admittance vs. Drain Current



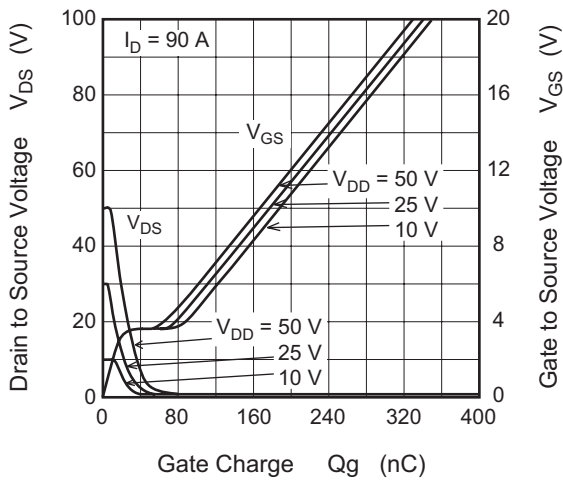
Body-Drain Diode Reverse Recovery Time



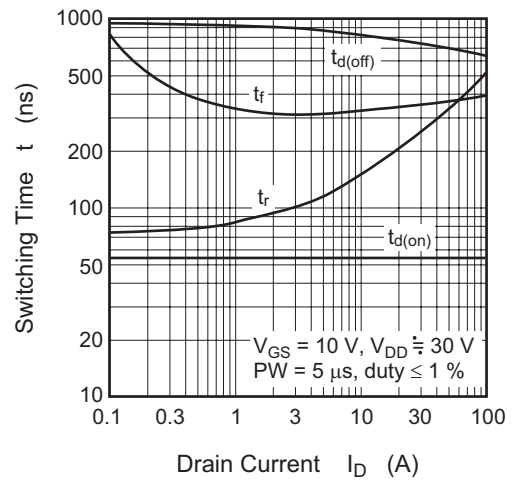
Typical Capacitance vs. Drain to Source Voltage

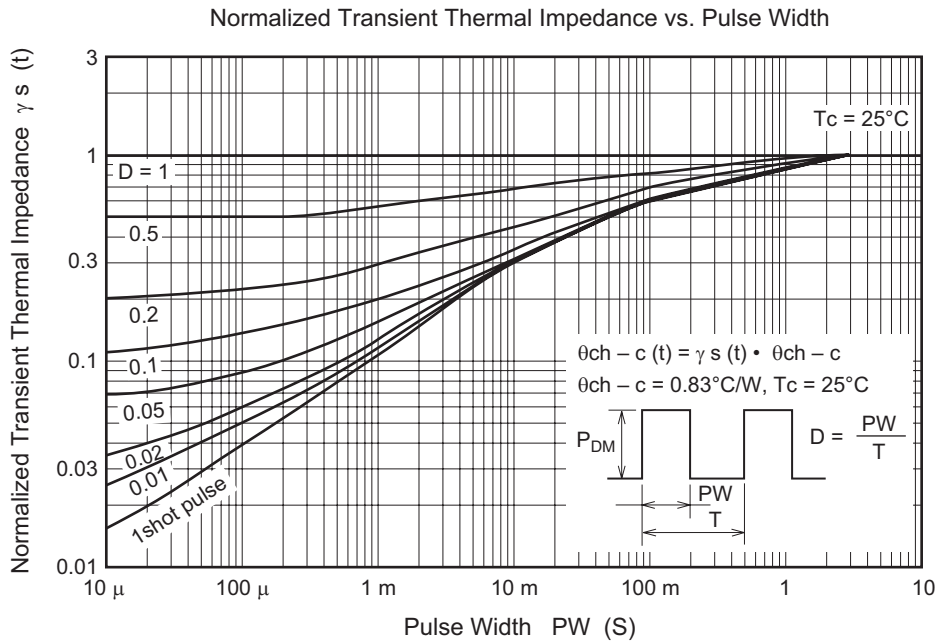
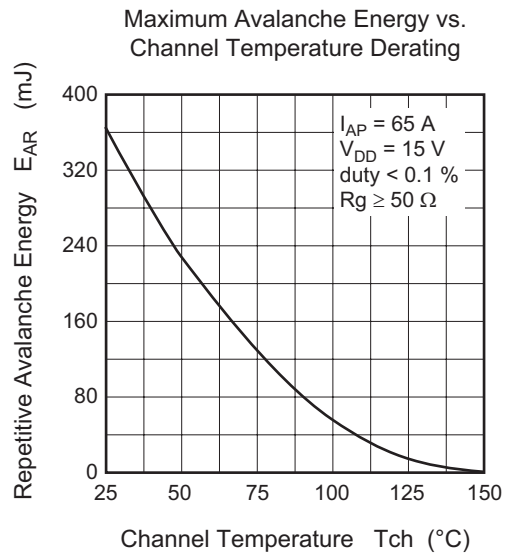
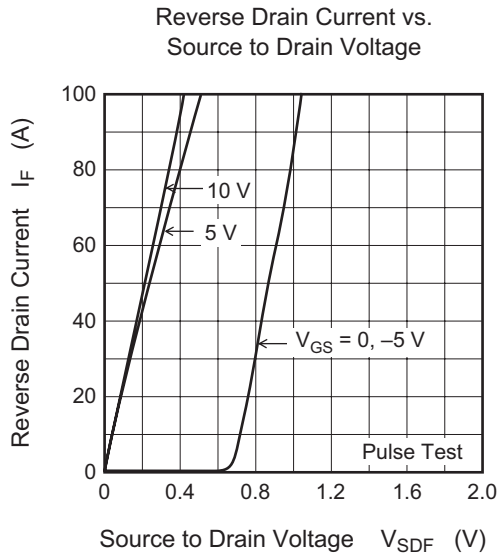


Dynamic Input Characteristics

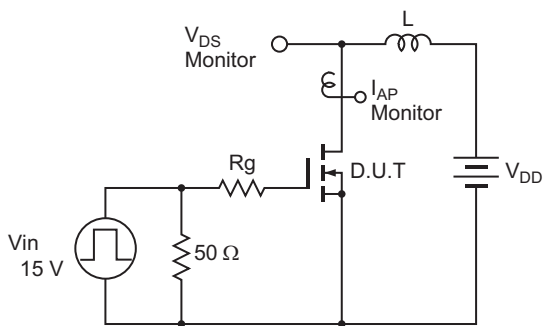


Switching Characteristics

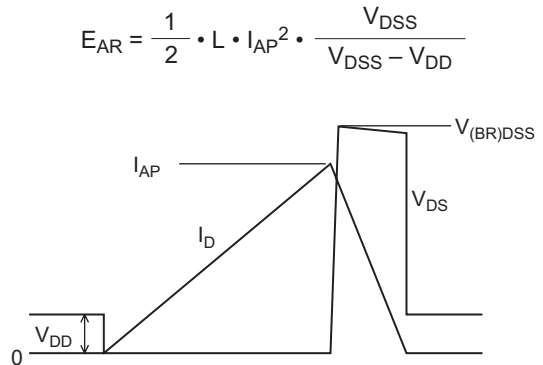


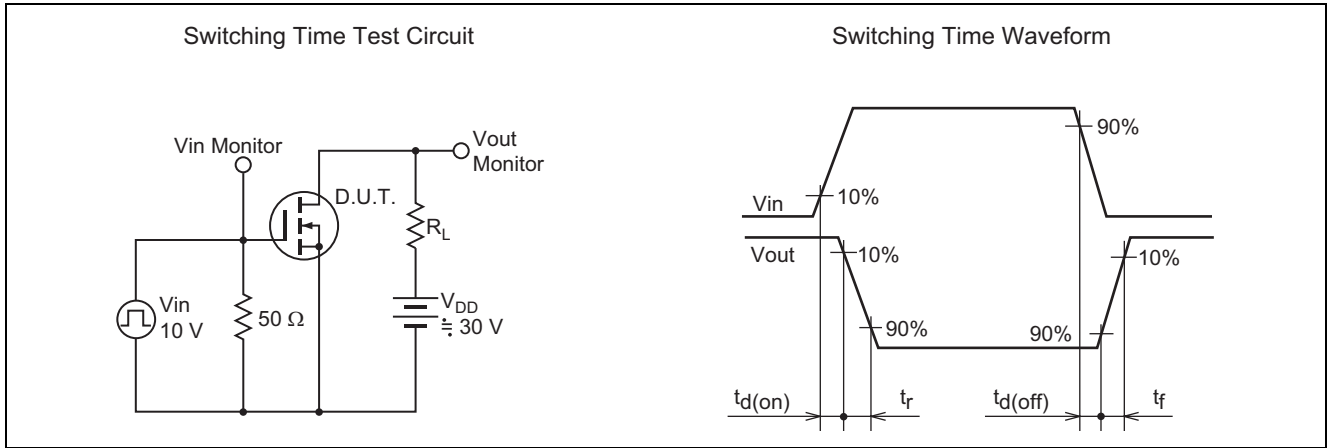


Avalanche Test Circuit



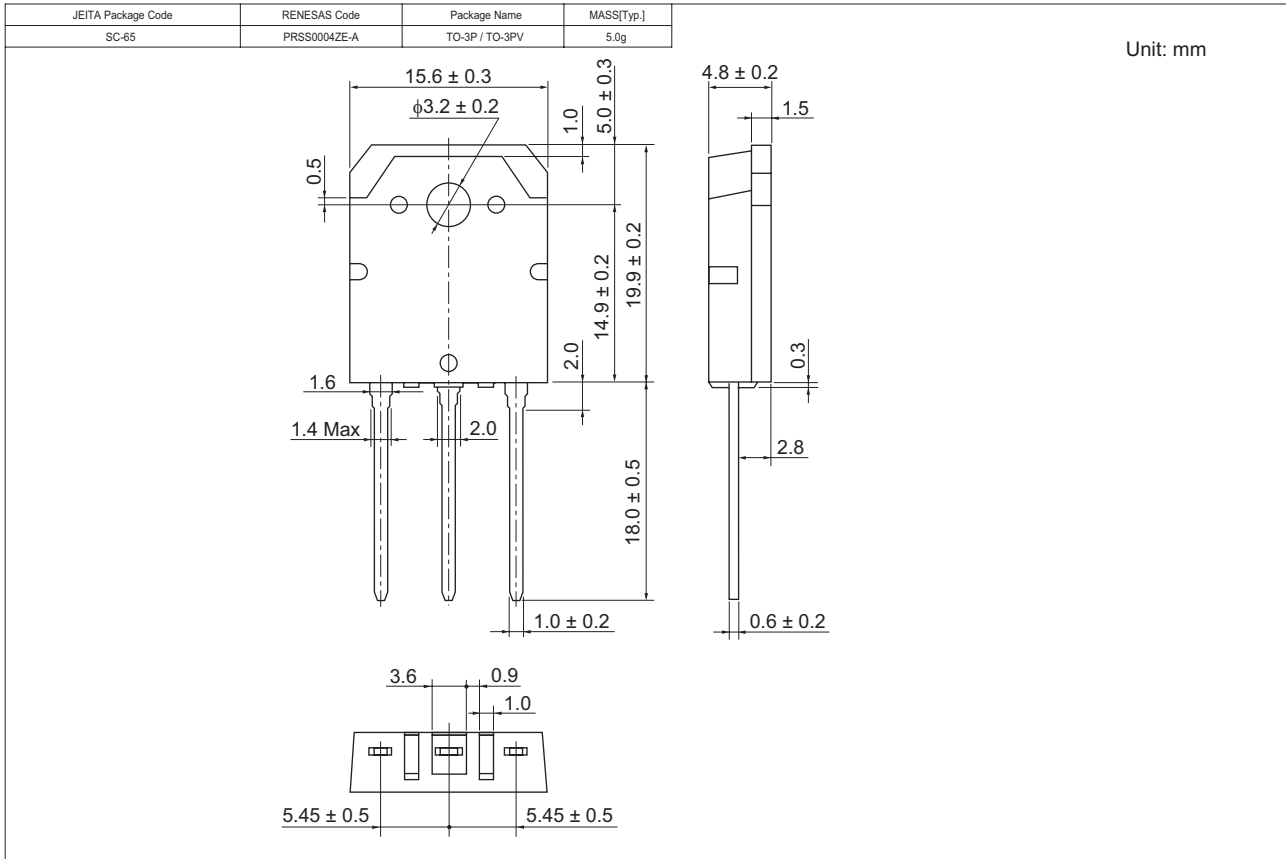
Avalanche Waveform







### Package Dimensions



### Ordering Information

Part Name	Quantity	Shipping Container
2SK3419-E	30 pcs	Plastic magazine

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