

# 2SK3418

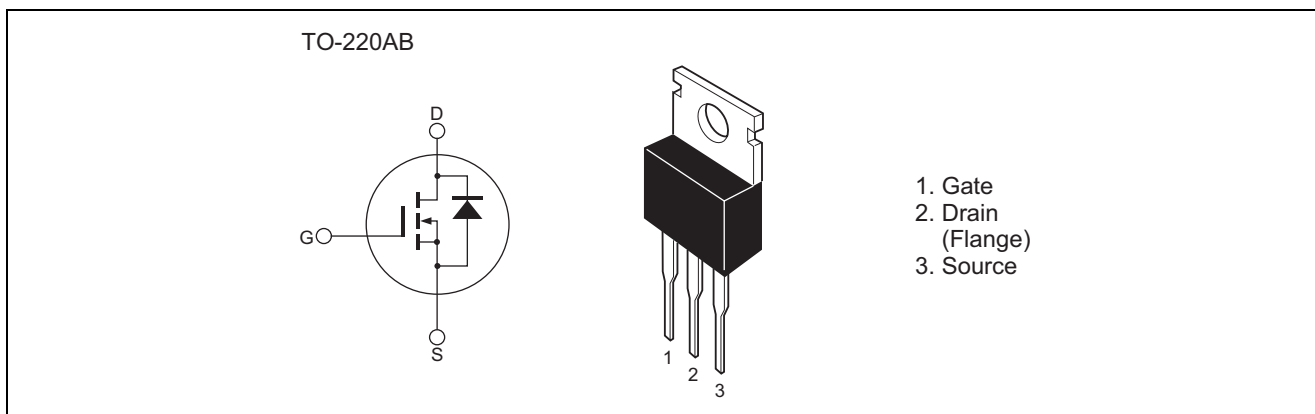
## Silicon N Channel MOS FET High Speed Power Switching

REJ03G0407-0200  
(Previous ADE-208-941 (Z))  
Rev.2.00  
Sep.10.2004

### Features

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

### Outline



### Absolute Maximum Ratings

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

Item	Symbol	Ratings	Unit
Drain to source voltage	$V_{DSS}$	60	V
Gate to source voltage	$V_{GSS}$	$\pm 20$	V
Drain current	$I_D$	85	A
Drain peak current	$I_D$ (pulse) <sup>Note1</sup>	340	A
Body-drain diode reverse drain current	$I_{DR}$	85	A
Avalanche current	$I_{AP}$ <sup>Note3</sup>	60	A
Avalanche energy	$E_{AR}$ <sup>Note3</sup>	308	mJ
Channel dissipation	$P_{ch}$ <sup>Note2</sup>	110	W
Channel temperature	$T_{ch}$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	- 55 to +150	$^\circ\text{C}$

Notes: 1.  $PW \leq 10\mu\text{s}$ , duty cycle  $\leq 1\%$   
2. Value at  $T_c = 25^\circ\text{C}$   
3. Value at  $T_{ch} = 25^\circ\text{C}$ ,  $R_g \geq 50 \Omega$

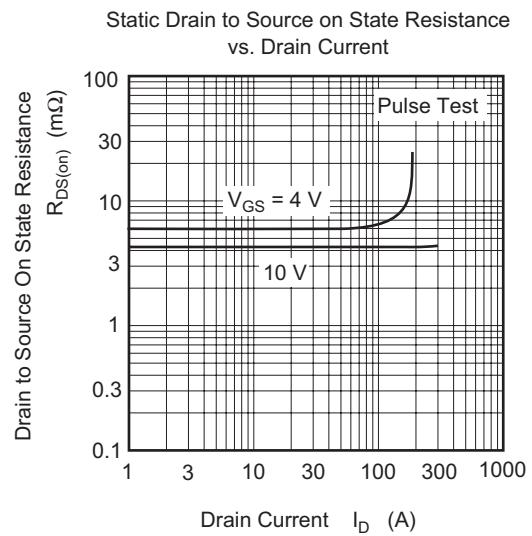
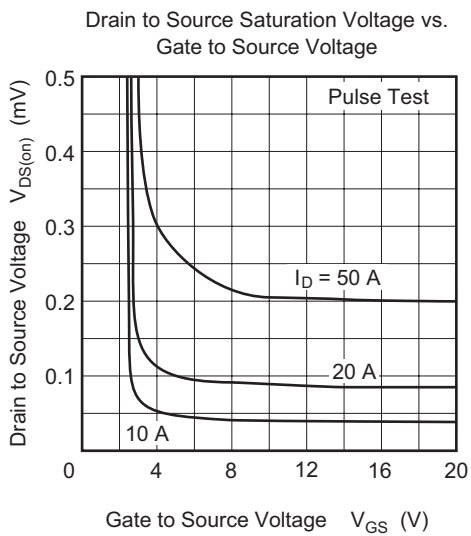
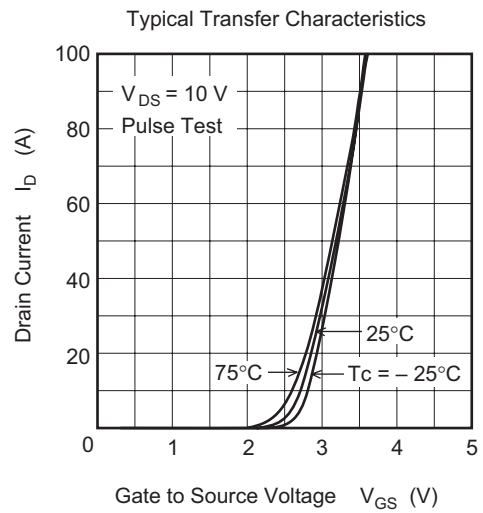
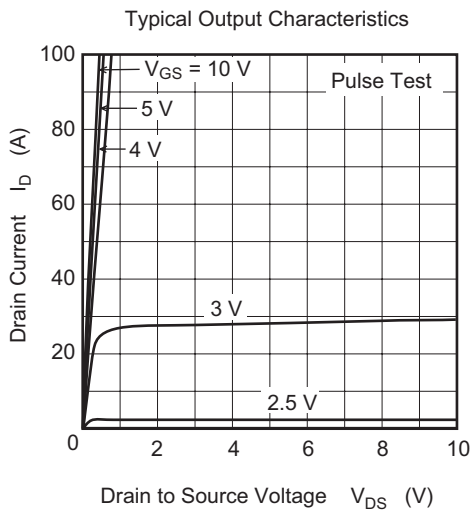
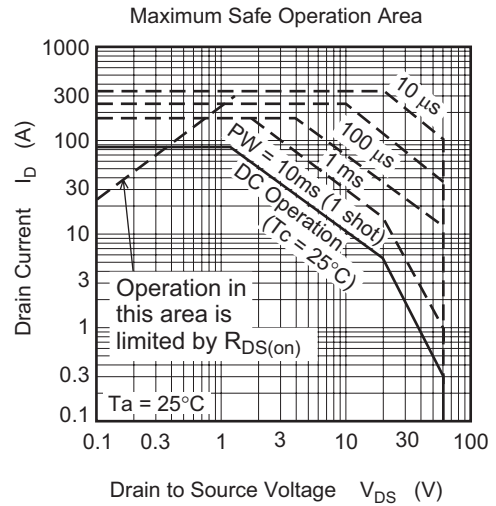
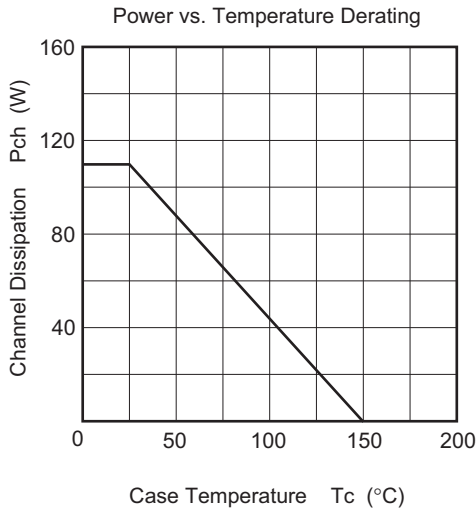
## Electrical Characteristics

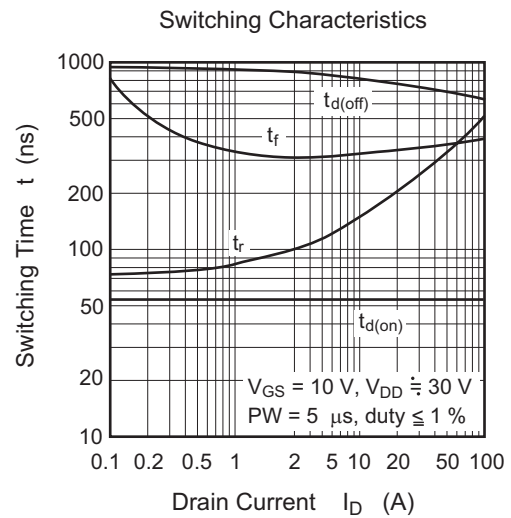
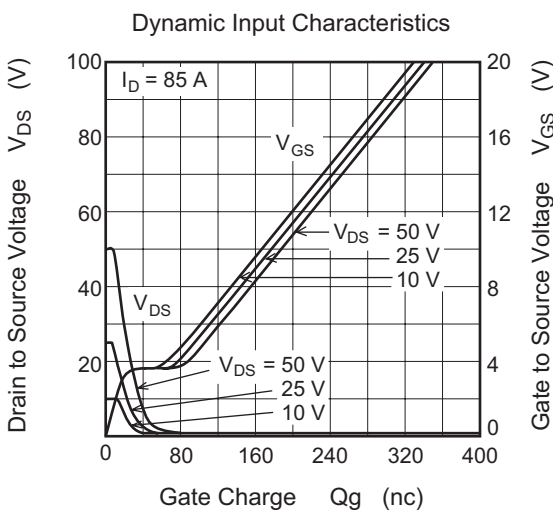
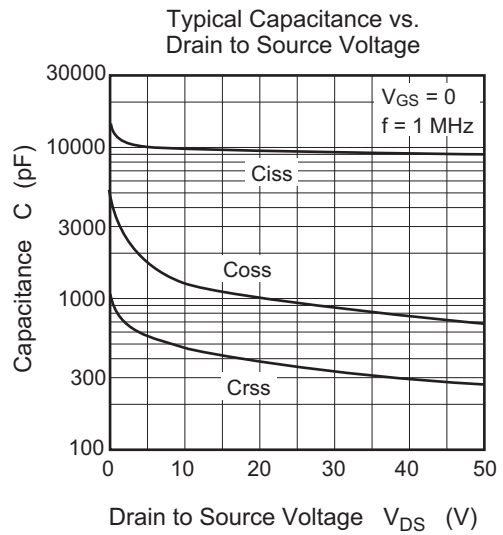
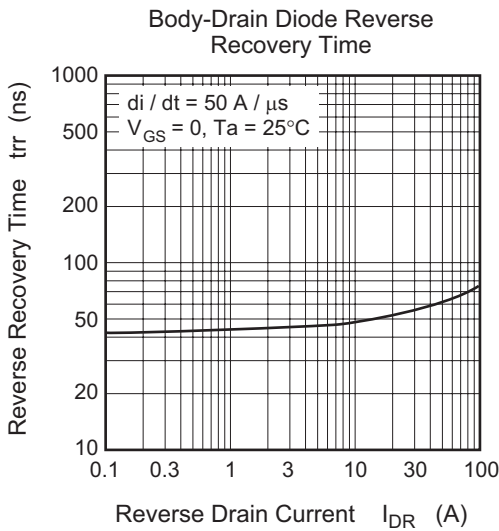
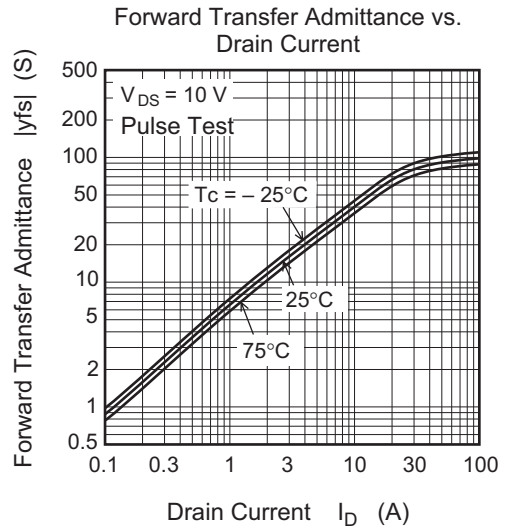
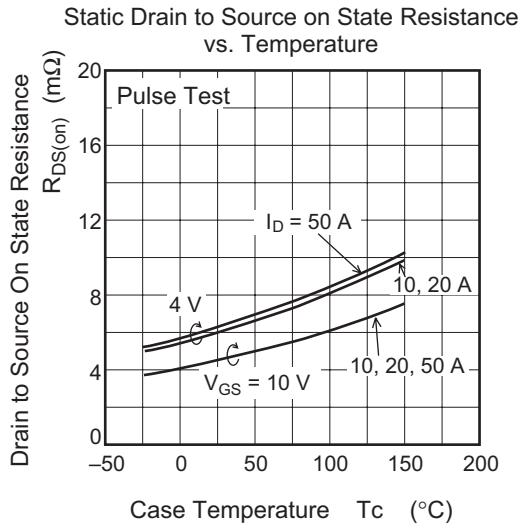
(Ta = 25°C)

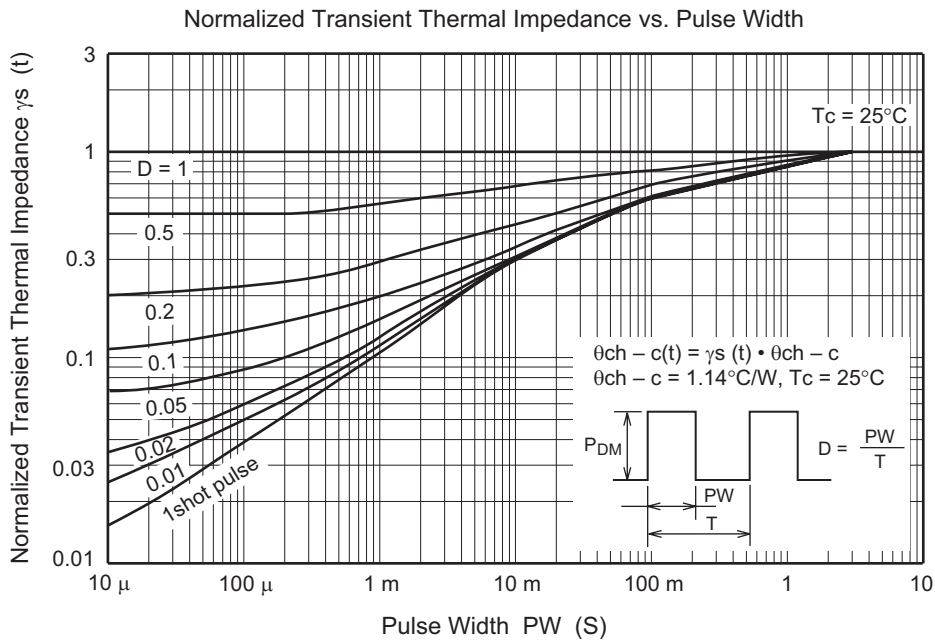
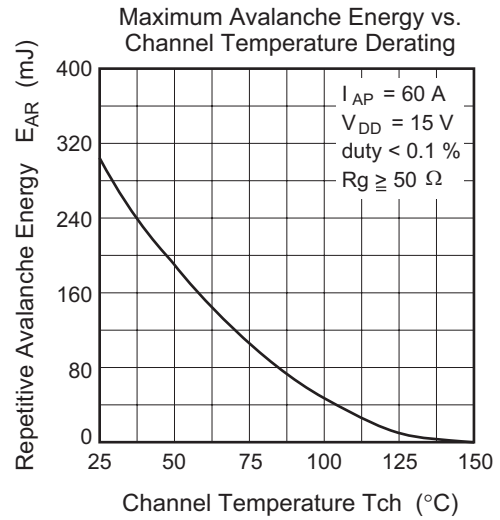
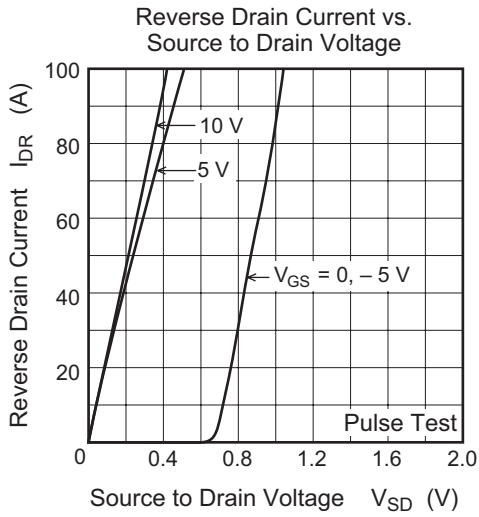
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	60	—	—	V	$I_D = 10 \text{ mA}, V_{GS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	10	$\mu\text{A}$	$V_{DS} = 60 \text{ V}, V_{GS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 0.1$	$\mu\text{A}$	$V_{GS} = \pm 20 \text{ V}, V_{DS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.5	V	$V_{DS} = 10 \text{ V}, I_D = 1 \text{ mA}$ <sup>Note1</sup>
Forward transfer admittance	$ y_{fs} $	55	90	—	S	$I_D = 45 \text{ A}, V_{DS} = 10 \text{ V}$ <sup>Note1</sup>
Static drain to source on state resistance	$R_{DS(on)}$	—	4.3	5.5	$\text{m}\Omega$	$I_D = 45 \text{ A}, V_{GS} = 10 \text{ V}$ <sup>Note1</sup>
	$R_{DS(on)}$	—	6.0	9.0	$\text{m}\Omega$	$I_D = 45 \text{ A}, V_{GS} = 4 \text{ V}$ <sup>Note1</sup>
Input capacitance	$C_{iss}$	—	9770	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	$C_{oss}$	—	1340	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	470	—	pF	$f = 1 \text{ MHz}$
Total gate charge	$Q_g$	—	180	—	nC	$V_{DD} = 50 \text{ V}$
Gate to source charge	$Q_{gs}$	—	32	—	nC	$V_{GS} = 10 \text{ V}$
Gate to drain charge	$Q_{gd}$	—	36	—	nC	$I_D = 85 \text{ A}$
Turn-on delay time	$t_{d(on)}$	—	53	—	ns	$V_{GS} = 10 \text{ V}$
Rise time	$t_r$	—	320	—	ns	$I_D = 45 \text{ A}$
Turn-off delay time	$t_{d(off)}$	—	700	—	ns	$R_L = 0.67 \Omega$
Fall time	$t_f$	—	380	—	ns	
Body-drain diode forward voltage	$V_{DF}$	—	1.0	—	V	$I_F = 85 \text{ A}, V_{GS} = 0$
Body-drain diode reverse recovery time	$t_{rr}$	—	70	—	ns	$I_F = 85 \text{ A}, V_{GS} = 0$ $diF / dt = 50 \text{ A} / \mu\text{s}$

Note: 1. Pulse test

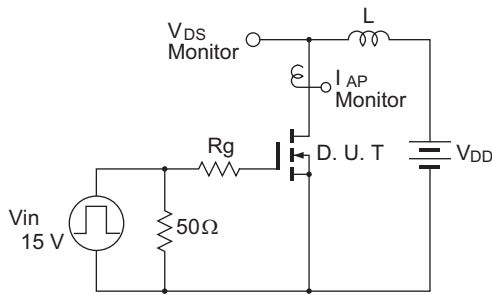
### Main Characteristics



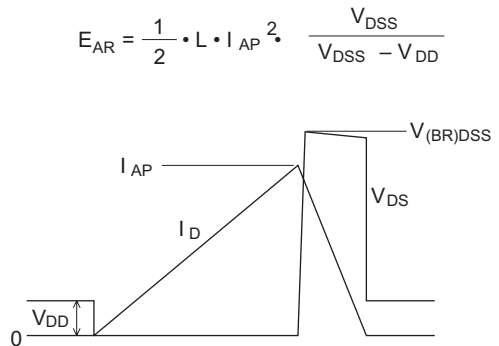


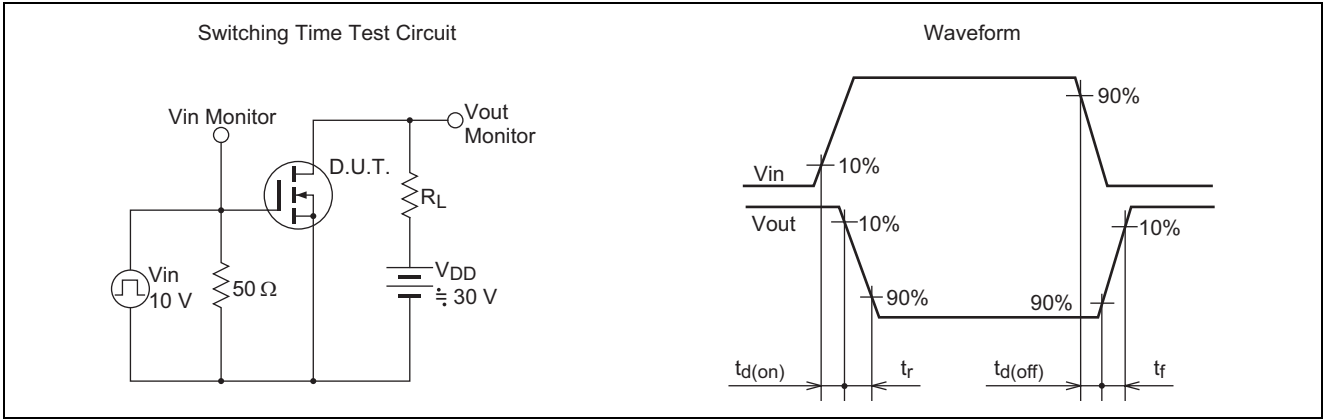


Avalanche Test Circuit



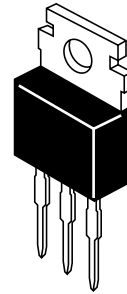
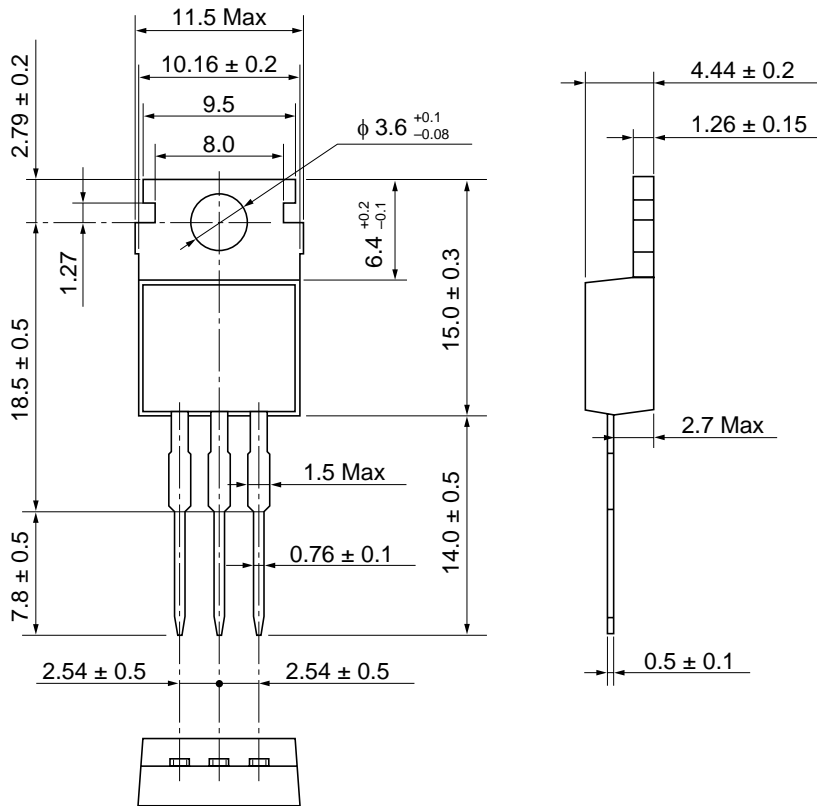
Avalanche Waveform





Package Dimensions

As of January, 2003  
Unit: mm



Package Code	TO-220AB
JEDEC	Conforms
JEITA	Conforms
Mass (reference value)	1.8 g

Ordering Information

Part Name	Quantity	Shipping Container
2SK3418-E	50 pcs	sack

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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