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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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2SK3418

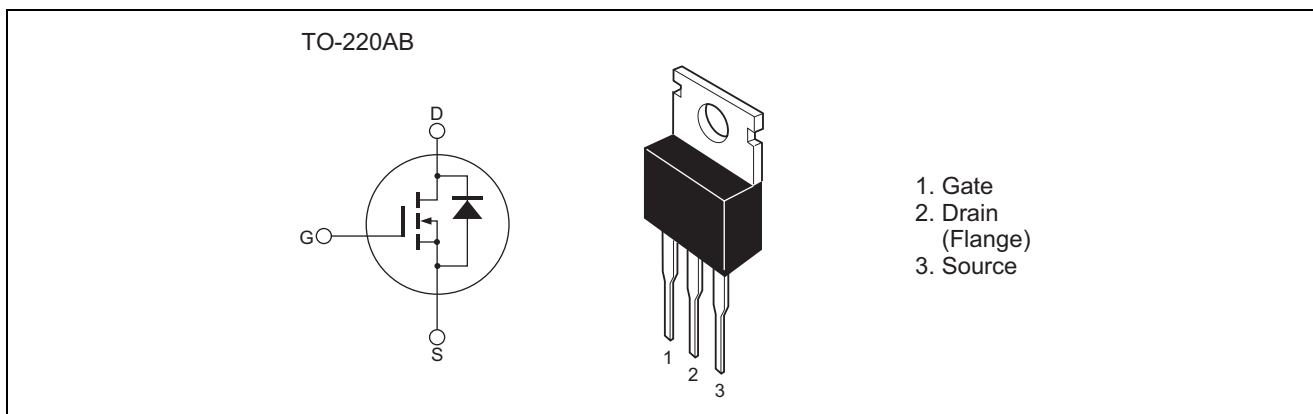
Silicon N Channel MOS FET High Speed Power Switching

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}	± 20	V
Drain current	I_D	85	A
Drain peak current	I_D (pulse) ^{Note1}	340	A
Body-drain diode reverse drain current	I_{DR}	85	A
Avalanche current	I_{AP} ^{Note3}	60	A
Avalanche energy	E_{AR} ^{Note3}	308	mJ
Channel dissipation	P_{ch} ^{Note2}	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 $T_{ch} = 25^\circ\text{C}$, $R_g \geq 50 \Omega$

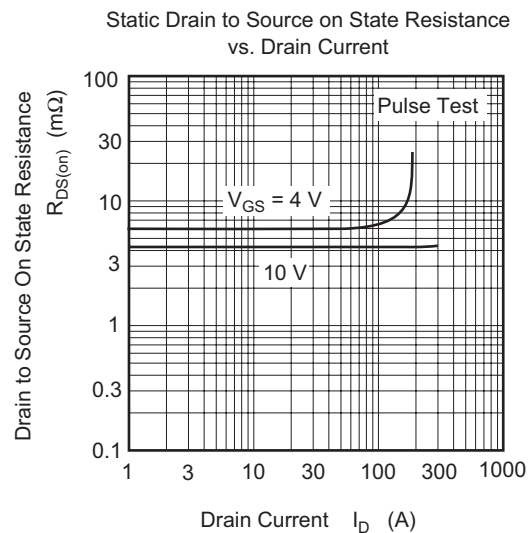
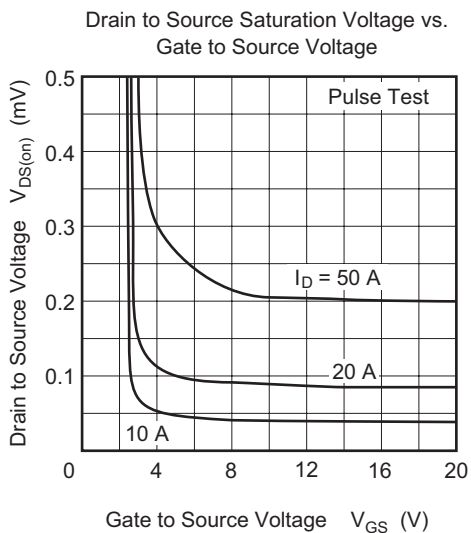
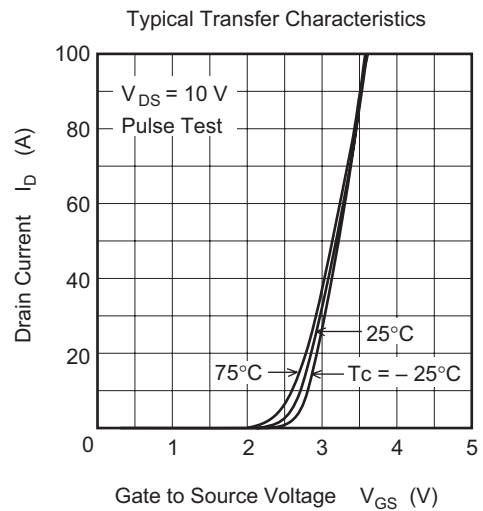
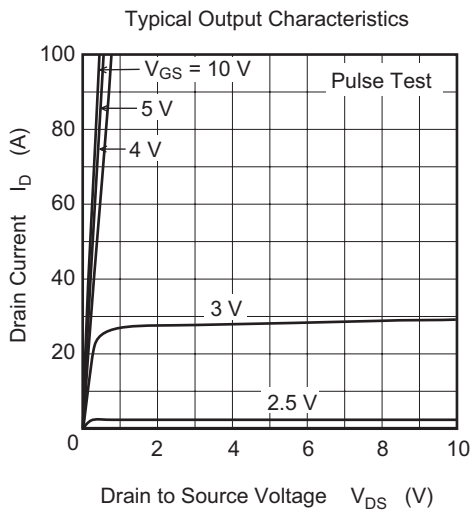
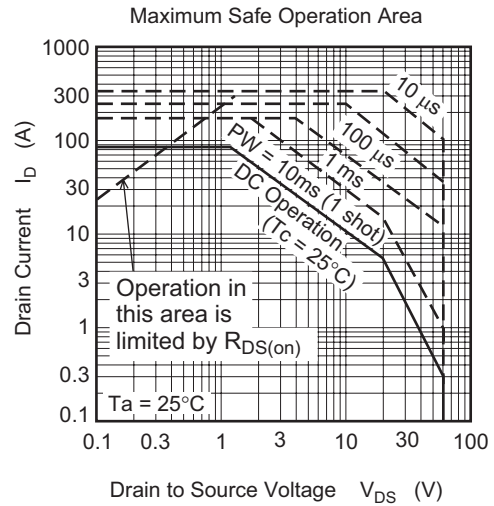
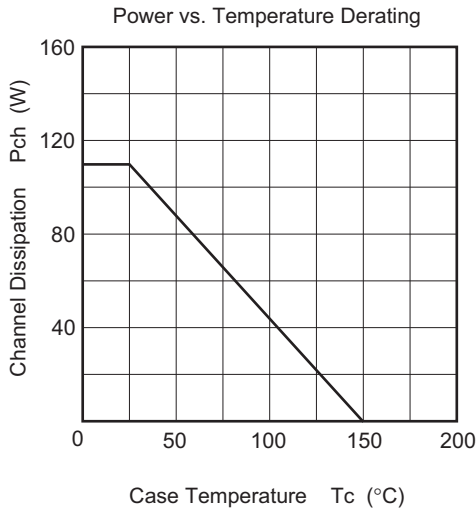
Electrical Characteristics

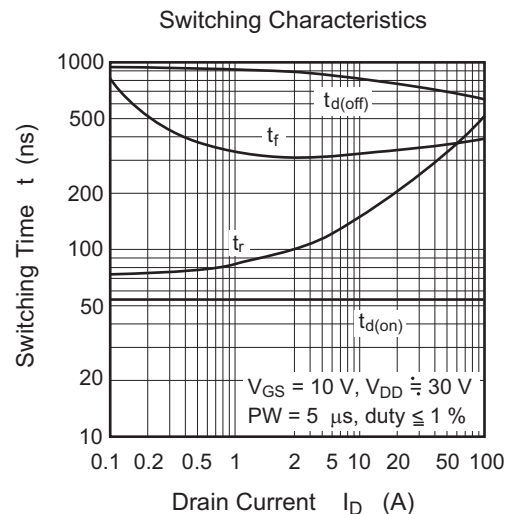
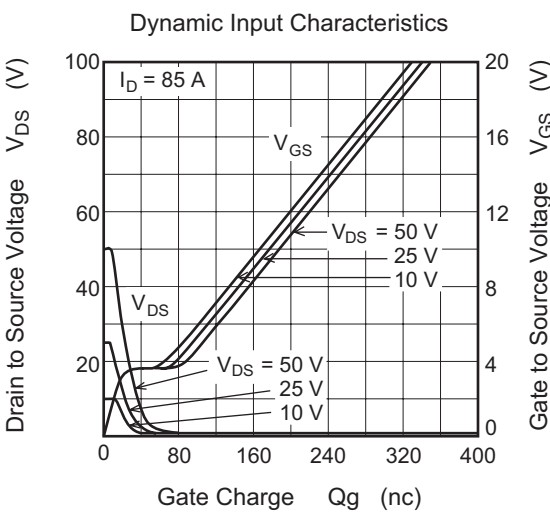
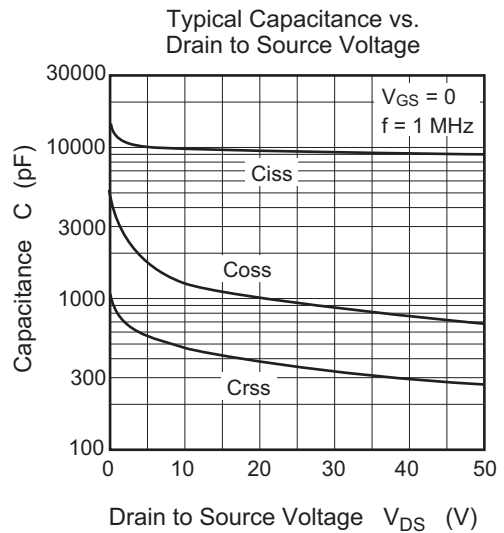
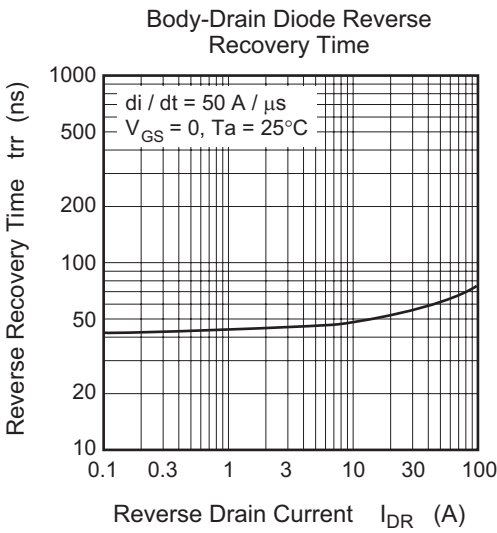
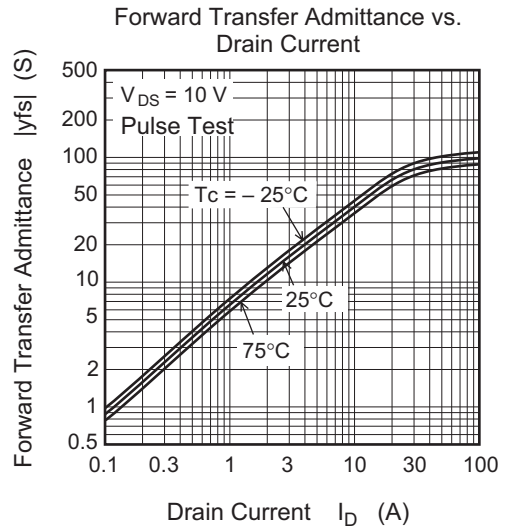
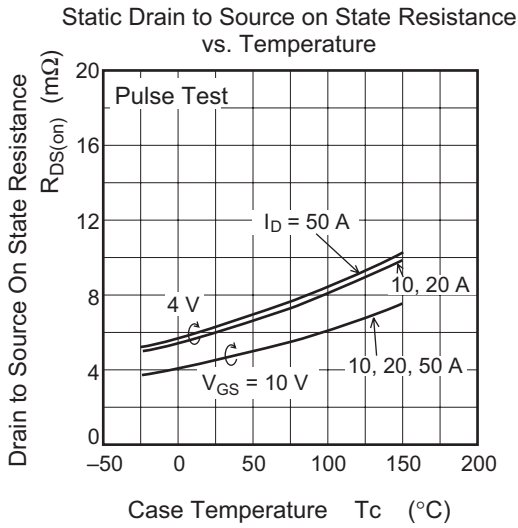
(Ta = 25°C)

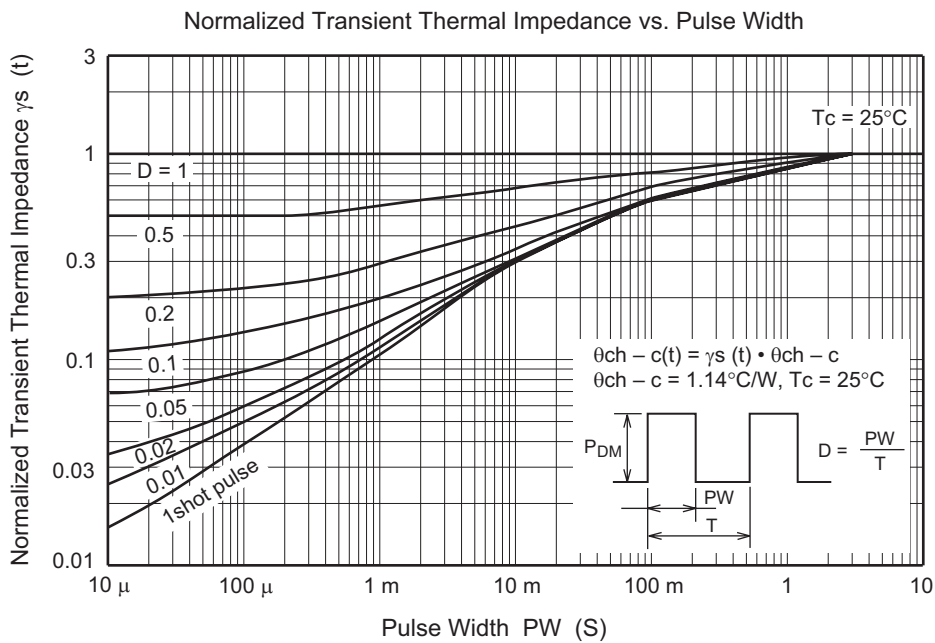
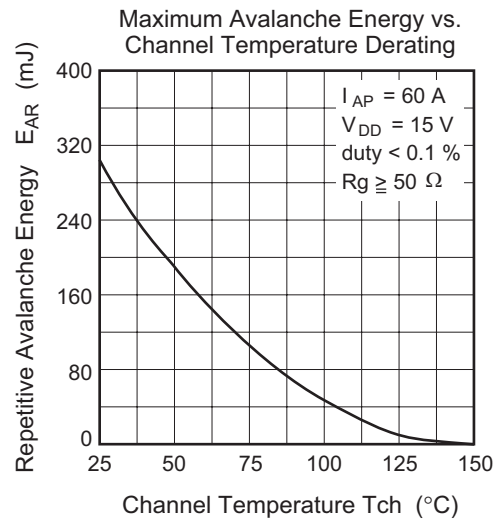
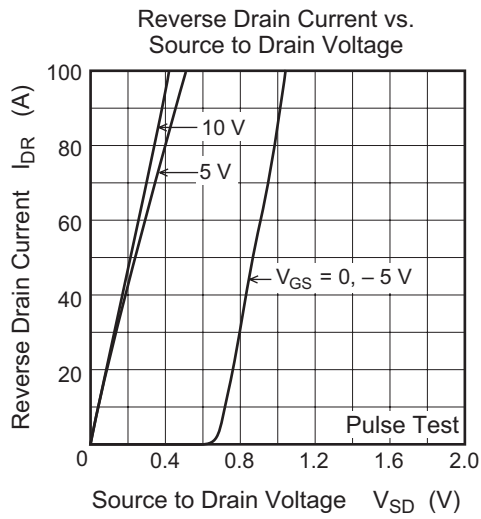
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	60	—	—	V	$I_D = 10 \text{ mA}, V_{GS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	10	μA	$V_{DS} = 60 \text{ V}, V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 0.1	μA	$V_{GS} = \pm 20 \text{ V}, V_{DS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.5	V	$V_{DS} = 10 \text{ V}, I_D = 1 \text{ mA}$ ^{Note1}
Forward transfer admittance	$ y_{fs} $	55	90	—	S	$I_D = 45 \text{ A}, V_{DS} = 10 \text{ V}$ ^{Note1}
Static drain to source on state resistance	$R_{DS(on)}$	—	4.3	5.5	$\text{m}\Omega$	$I_D = 45 \text{ A}, V_{GS} = 10 \text{ V}$ ^{Note1}
	$R_{DS(on)}$	—	6.0	9.0	$\text{m}\Omega$	$I_D = 45 \text{ A}, V_{GS} = 4 \text{ V}$ ^{Note1}
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

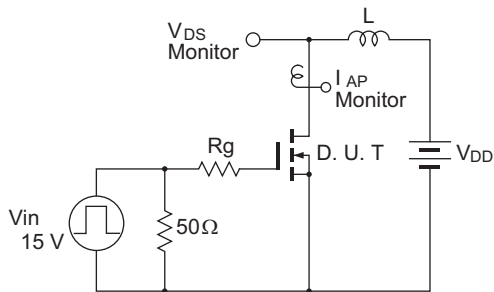
Main Characteristics



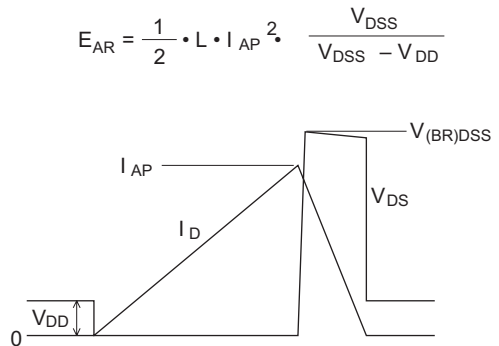


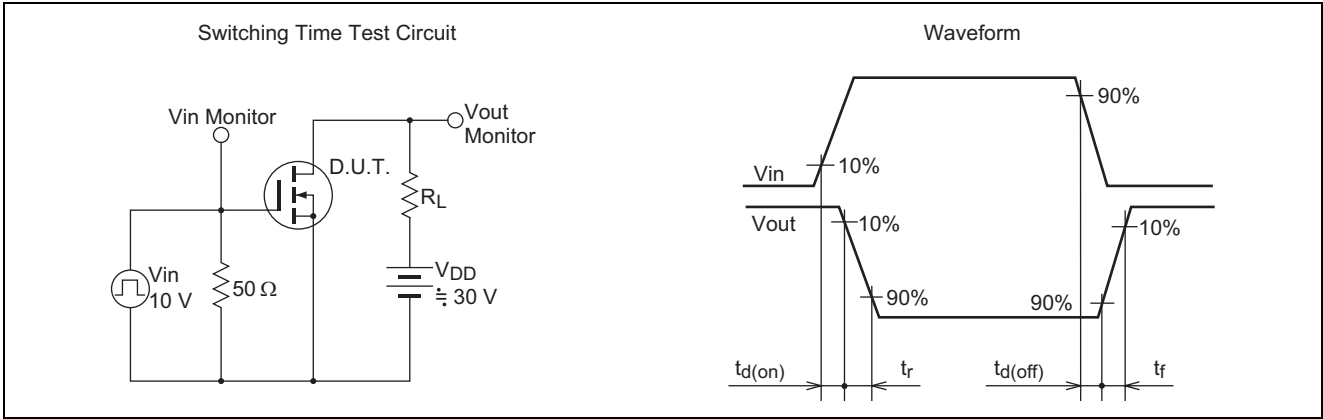


Avalanche Test Circuit



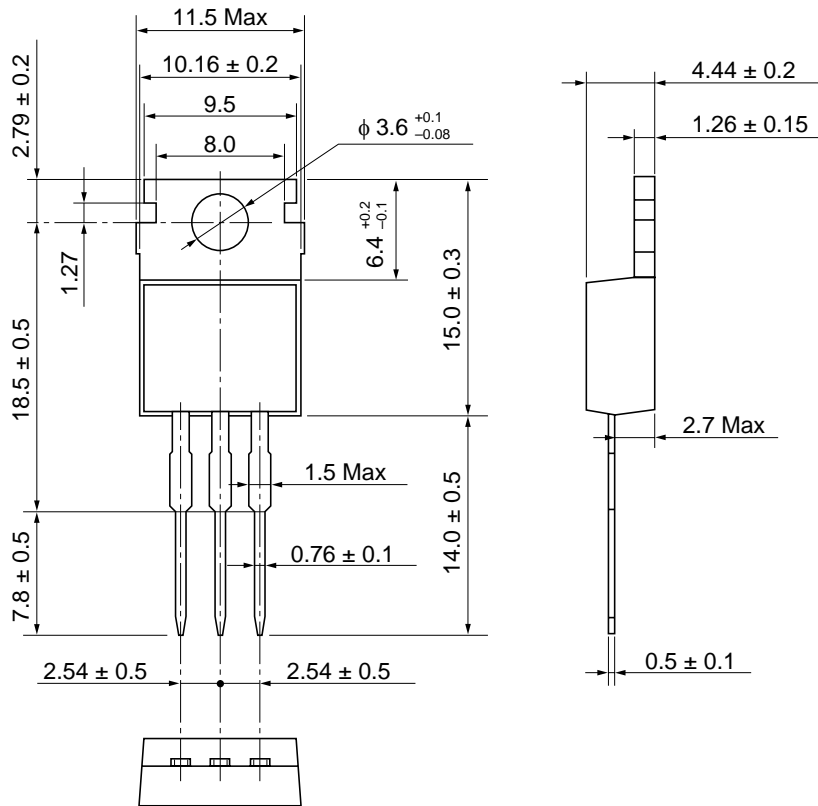
Avalanche Waveform





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

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