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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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2SK3136

Silicon N Channel MOS FET
High Speed Power Switching

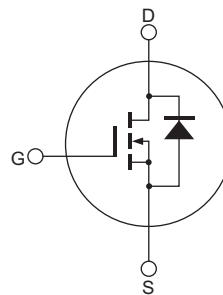
REJ03G1068-0400
(Previous: ADE-208-696B)
Rev.4.00
Sep 20, 2005

Features

- Low on-resistance
 $R_{DS(on)} = 4.5 \text{ m}\Omega$ typ.
- Low drive current
- 4 V gate drive device can be driven from 5 V source

Outline

RENESAS Package code: PRSS0004AC-A
(Package name: TO-220AB)



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

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	40	V
Gate to source voltage	V_{GSS}	±20	V
Drain current	I_D	75	A
Drain peak current	$I_{D(pulse)}$ ^{Note 1}	300	A
Body-drain diode reverse drain current	I_{DR}	75	A
Avalanche current	I_{AP} ^{Note 3}	50	A
Avalanche energy	E_{AR} ^{Note 3}	333	mJ
Channel dissipation	P_{ch} ^{Note 2}	100	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 $T_{ch} = 25^\circ C$, $R_g \geq 50 \Omega$

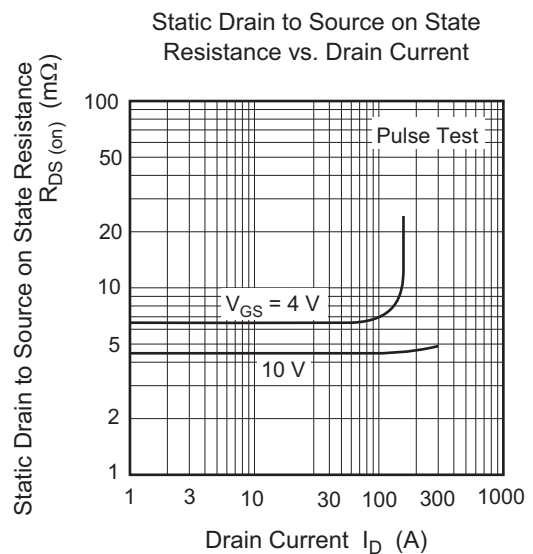
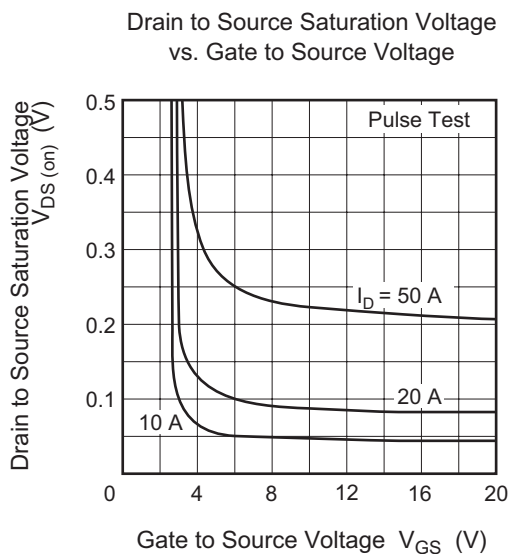
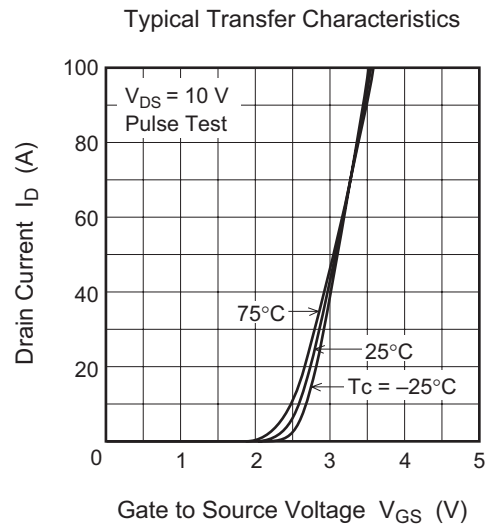
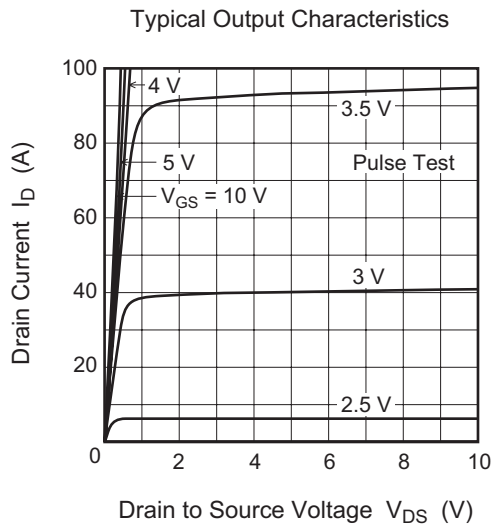
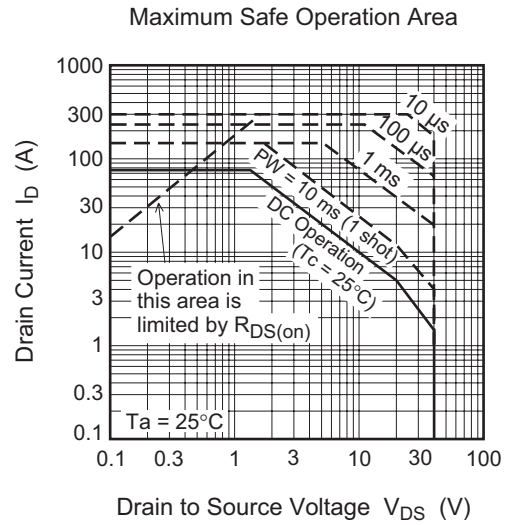
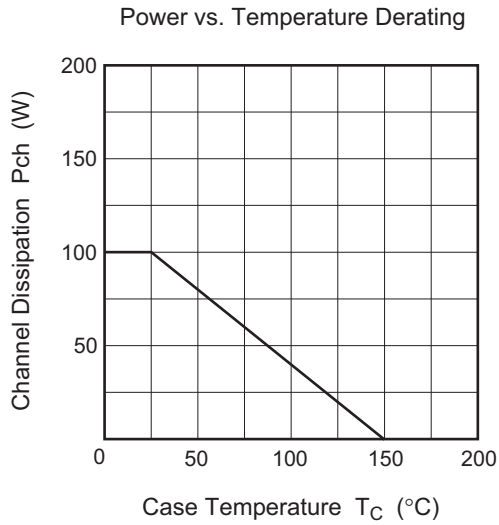
Electrical Characteristics

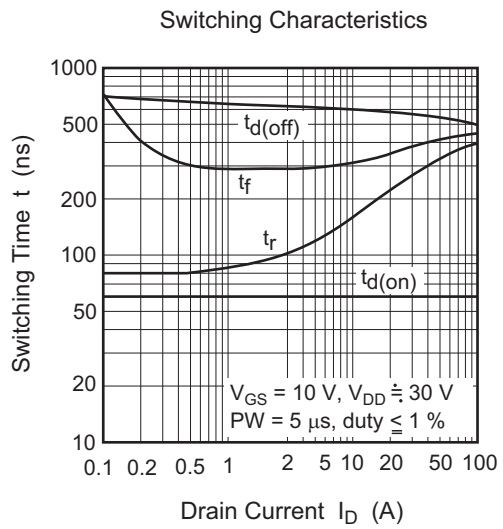
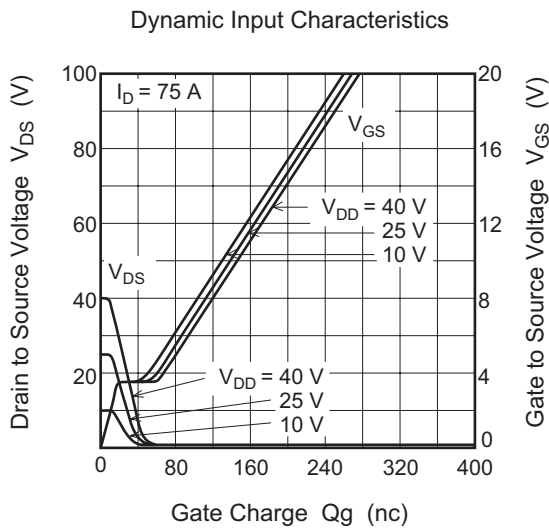
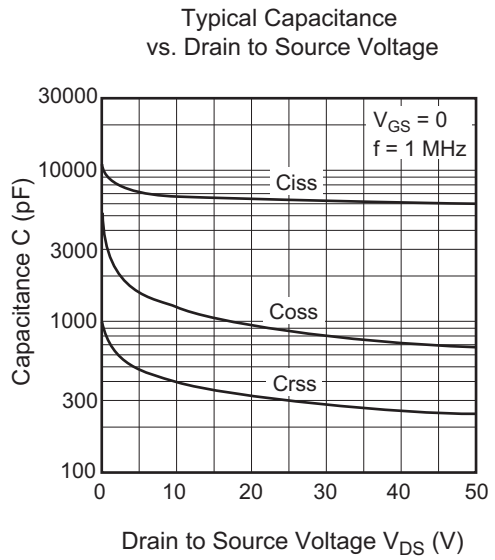
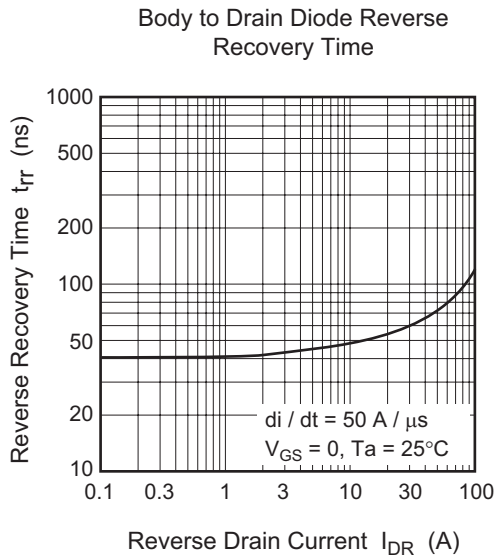
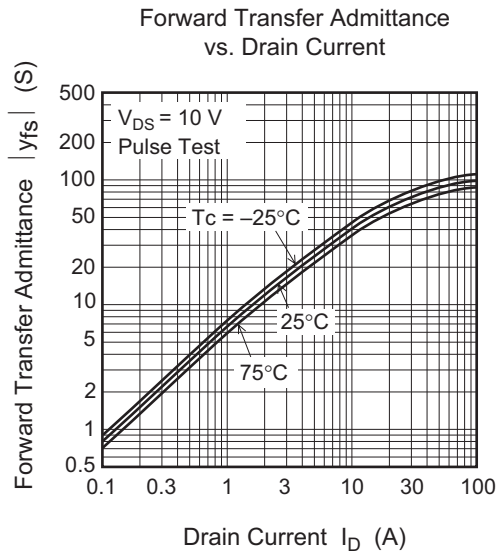
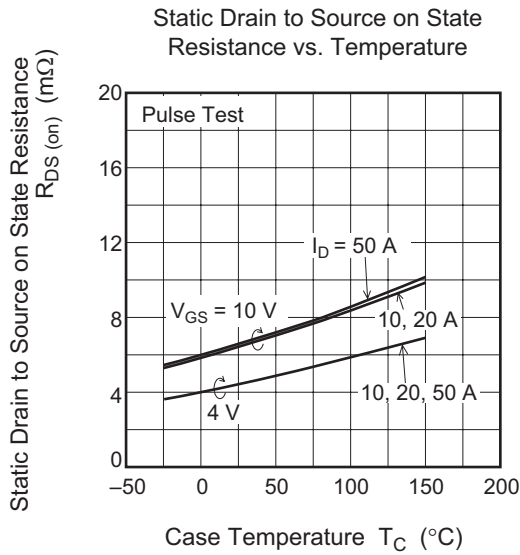
(Ta = 25°C)

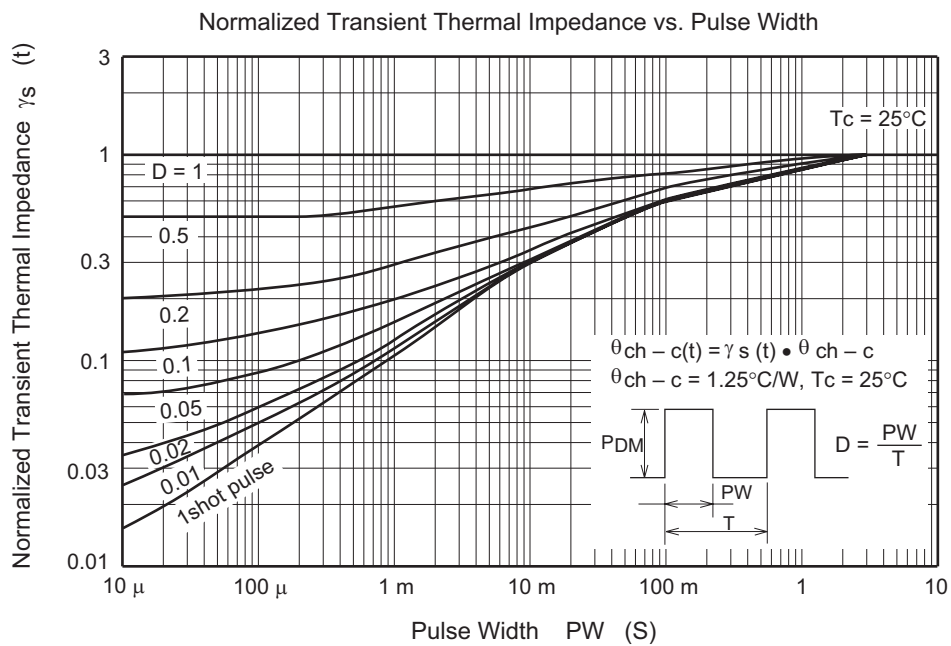
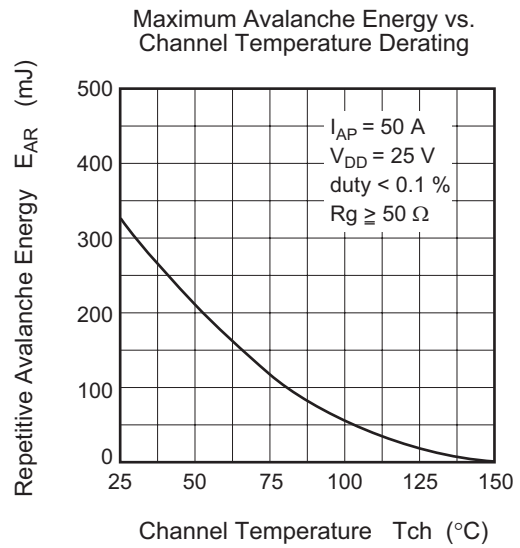
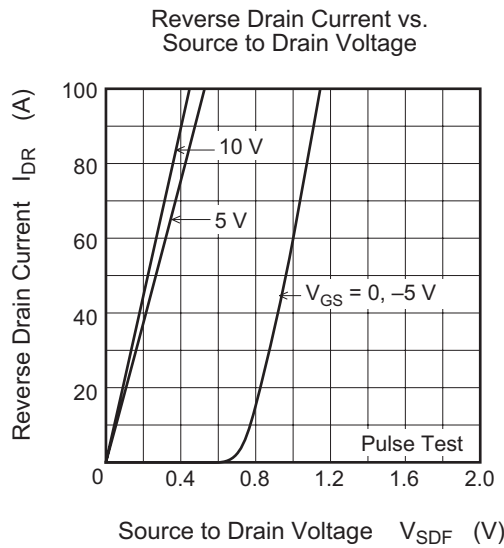
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	40	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	—	±0.1	μA	$V_{GS} = \pm 20 \text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	10	μA	$V_{DS} = 40 \text{ V}$, $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.5	V	$I_D = 1 \text{ mA}$, $V_{DS} = 10 \text{ V}$ ^{Note 4}
Static drain to source on state resistance	$R_{DS(on)}$	—	4.5	5.8	mΩ	$I_D = 40 \text{ A}$, $V_{GS} = 10 \text{ V}$ ^{Note 4}
		—	6.5	10	mΩ	$I_D = 40 \text{ A}$, $V_{GS} = 4 \text{ V}$ ^{Note 4}
Forward transfer admittance	$ y_{fs} $	50	80	—	S	$I_D = 40 \text{ A}$, $V_{DS} = 10 \text{ V}$ ^{Note 4}
Input capacitance	C_{iss}	—	6800	—	pF	$V_{DS} = 10 \text{ V}$, $V_{GS} = 0$, $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	1300	—	pF	
Reverse transfer capacitance	C_{rss}	—	380	—	pF	
Total gate charge	Q_g	—	130	—	nc	$V_{DD} = 25 \text{ V}$, $V_{GS} = 10 \text{ V}$, $I_D = 75 \text{ A}$
Gate to source charge	Q_{gs}	—	25	—	nc	
Gate to drain charge	Q_{gd}	—	30	—	nc	
Turn-on delay time	$t_{d(on)}$	—	60	—	ns	$V_{GS} = 10 \text{ V}$, $I_D = 40 \text{ A}$, $R_L = 0.75 \Omega$
Rise time	t_r	—	300	—	ns	
Turn-off delay time	$t_{d(off)}$	—	550	—	ns	
Fall time	t_f	—	400	—	ns	
Body-drain diode forward voltage	V_{DF}	—	1.05	—	V	$I_F = 75 \text{ A}$, $V_{GS} = 0$
Body-drain diode reverse recovery time	t_{rr}	—	90	—	ns	$I_F = 75 \text{ A}$, $V_{GS} = 0$ $di_F/dt = 50 \text{ A}/\mu s$

Note: 4. Pulse test

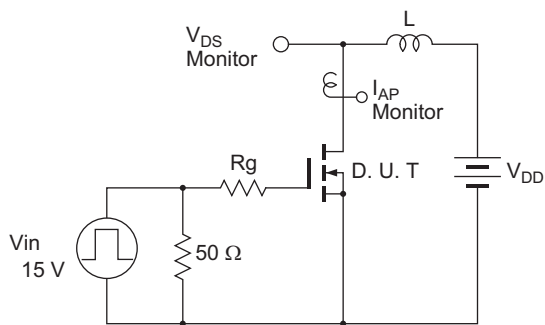
Main Characteristics



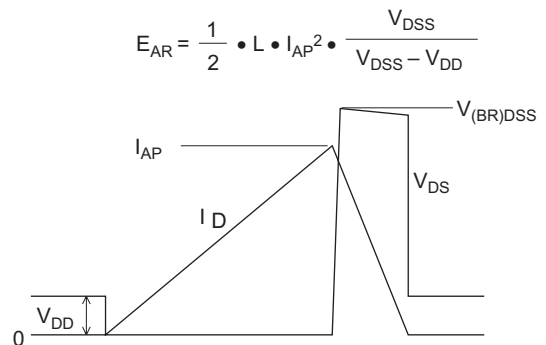


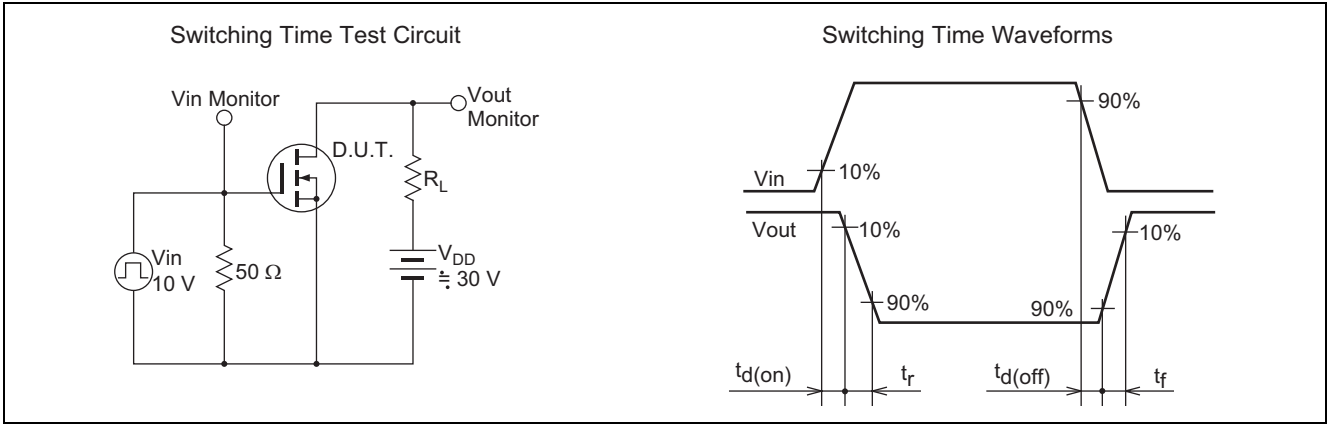


Avalanche Test Circuit

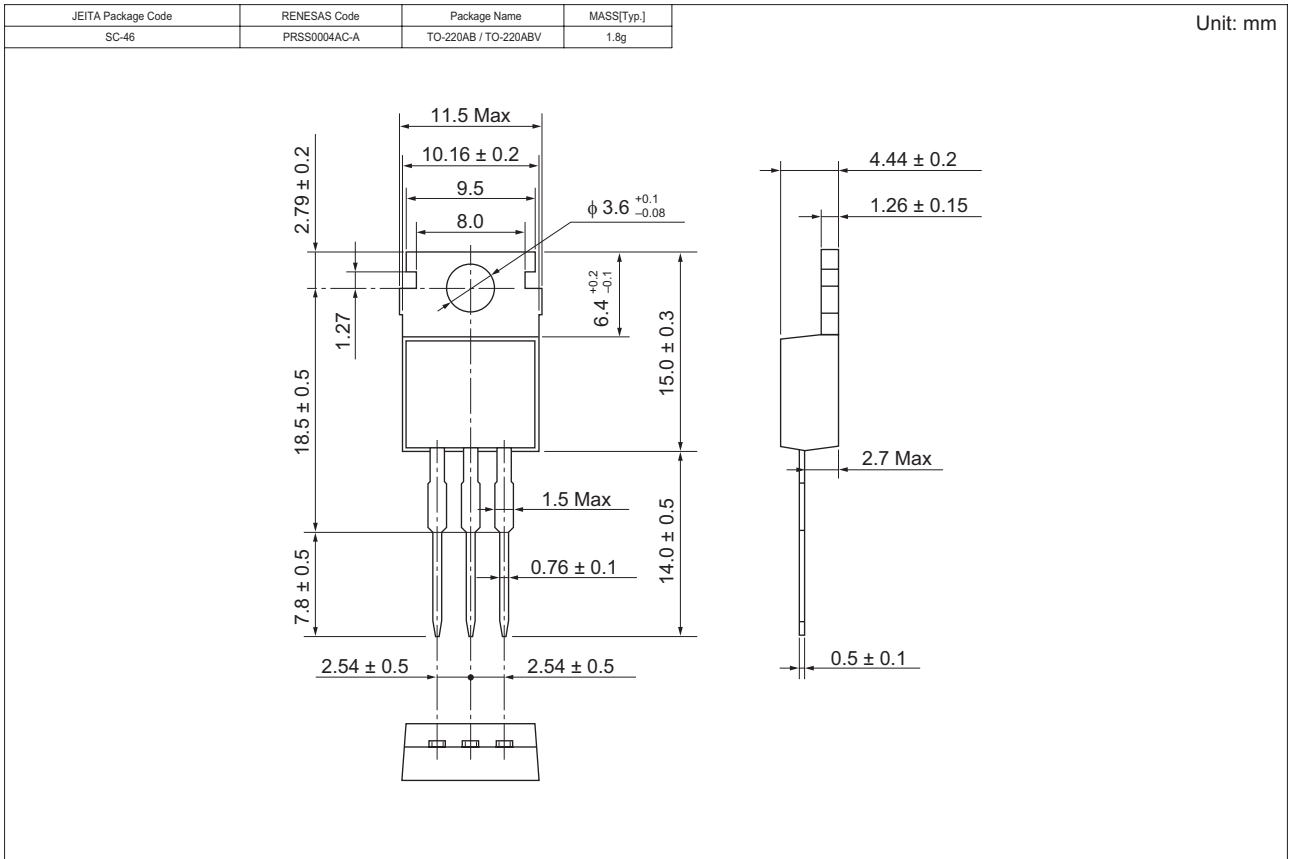


Avalanche Waveform





Package Dimensions



Ordering Information

Part Name	Quantity	Shipping Container
2SK3136-E	500 pcs	Box (Sack)

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