

## 2SK2939(L), 2SK2939(S)

Silicon N Channel MOS FET  
High Speed Power Switching

REJ03G1053-0600  
(Previous: ADE-208-562D)  
Rev.6.00  
Sep 07, 2005

### Features

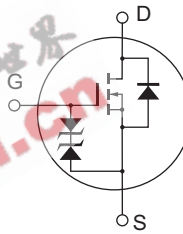
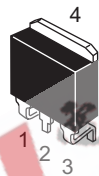
- Low on-resistance  
 $R_{DS} = 0.020 \Omega$  typ.
- High speed switching
- 4 V gate drive device can be driven from 5 V source

### Outline

RENESAS Package code: PRSS0004AE-A  
(Package name: LDKPAK(L))



RENESAS Package code: PRSS0004AE-B  
(Package name: LDKPAK(S)-(1))



1. Gate
2. Drain
3. Source
4. Drain

## Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	$V_{DSS}$	60	V
Gate to source voltage	$V_{GSS}$	$\pm 20$	V
Drain current	$I_D$	35	A
Drain peak current	$I_{D(pulse)}$ <sup>Note1</sup>	140	A
Body-drain diode reverse drain current	$I_{DR}$	35	A
Avalanche current	$I_{AP}$ <sup>Note3</sup>	35	A
Avalanche energy	$E_{AR}$ <sup>Note3</sup>	105	mJ
Channel dissipation	$P_{ch}$ <sup>Note2</sup>	50	W
Channel temperature	$T_{ch}$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C

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

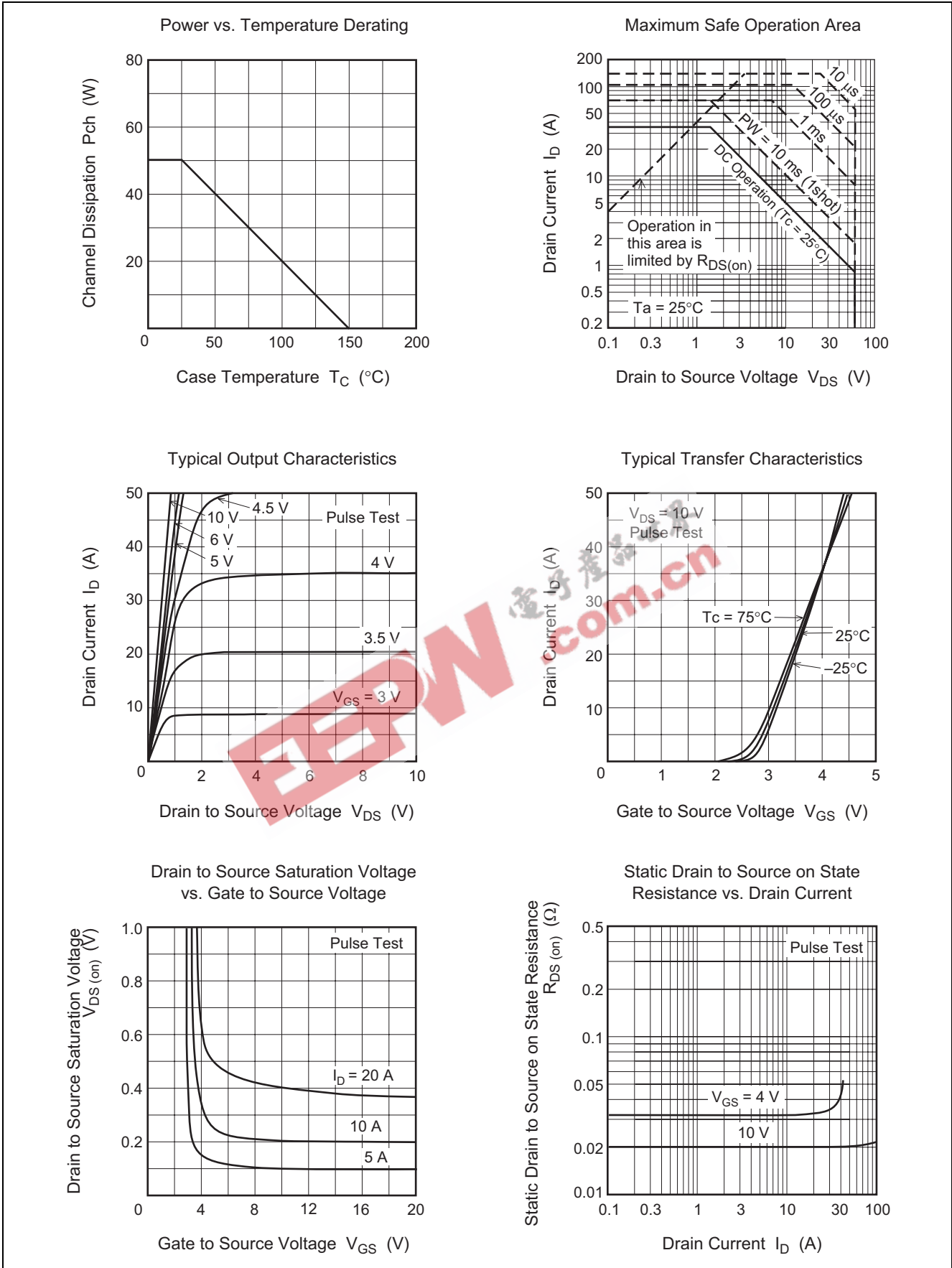
## Electrical Characteristics

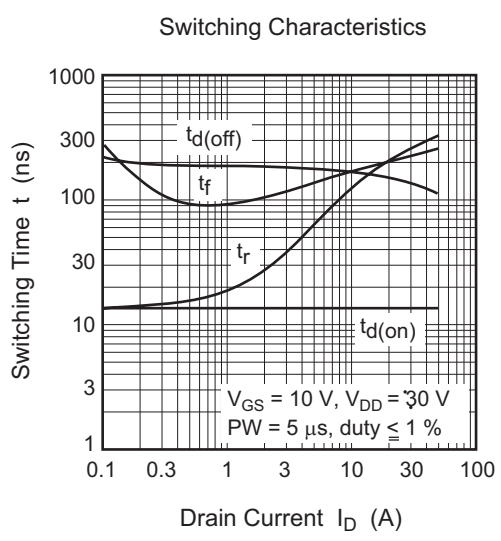
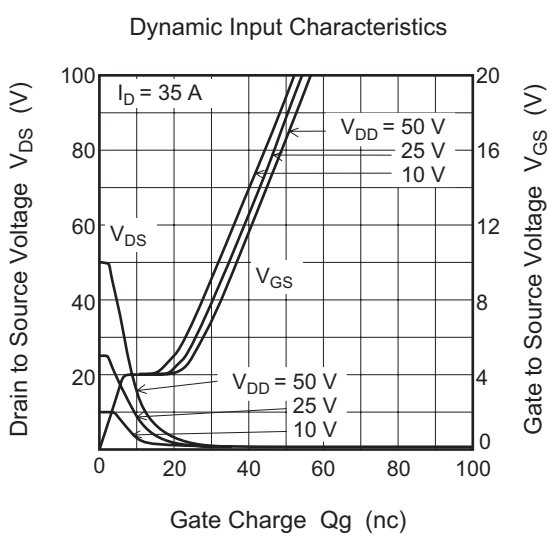
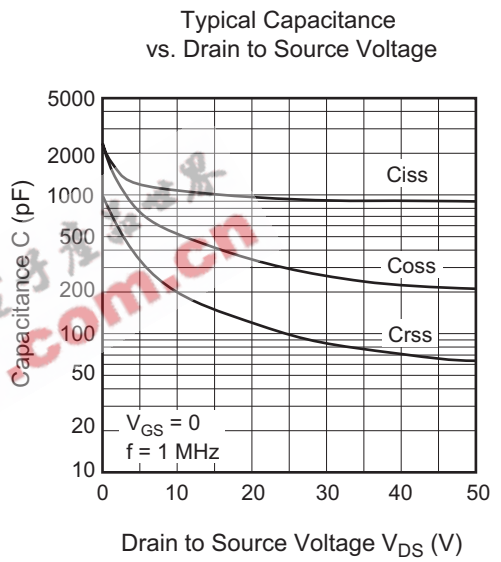
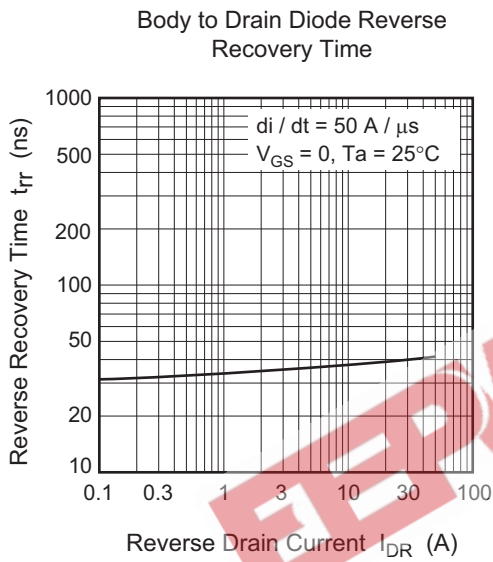
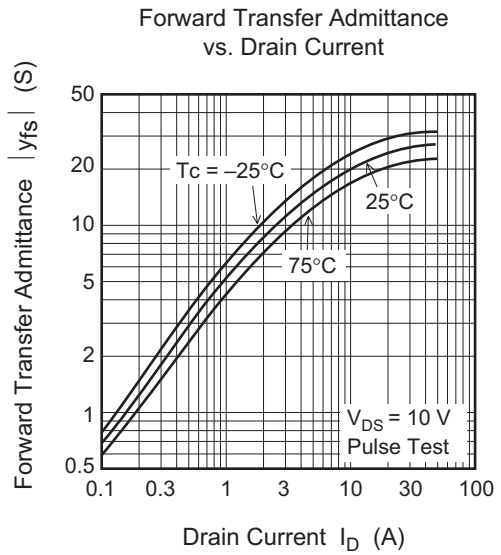
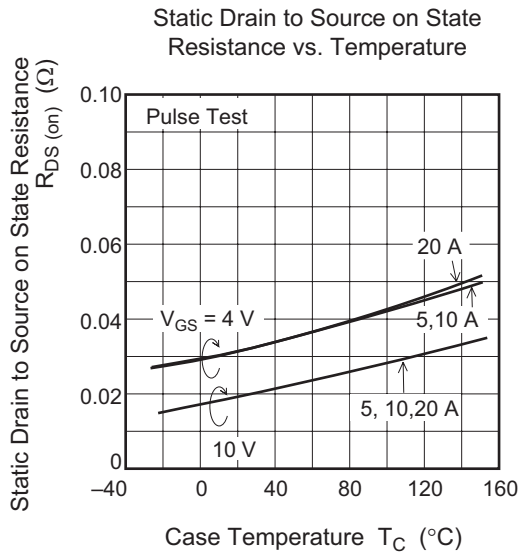
(Ta = 25°C)

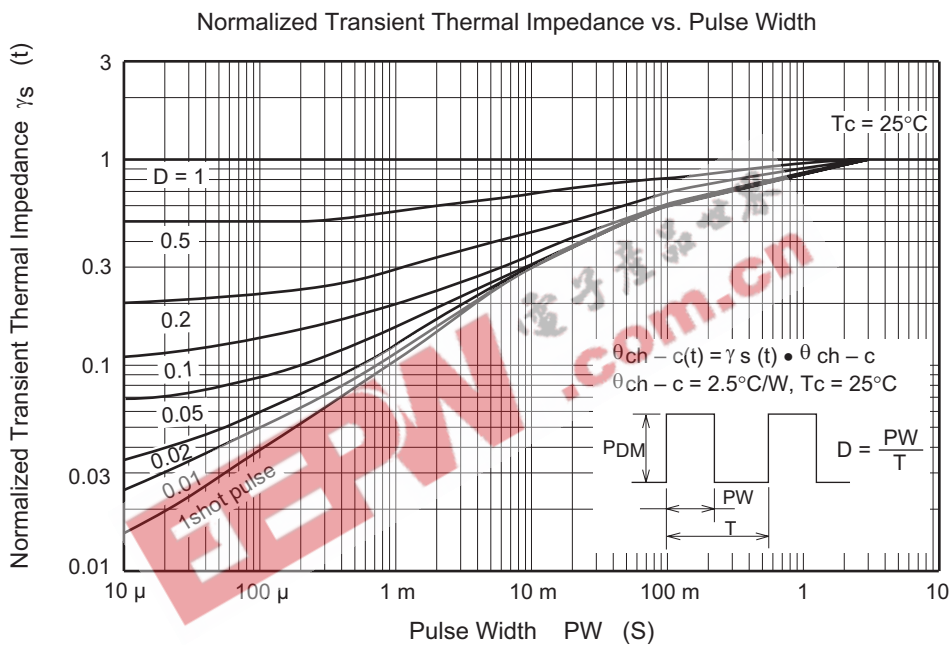
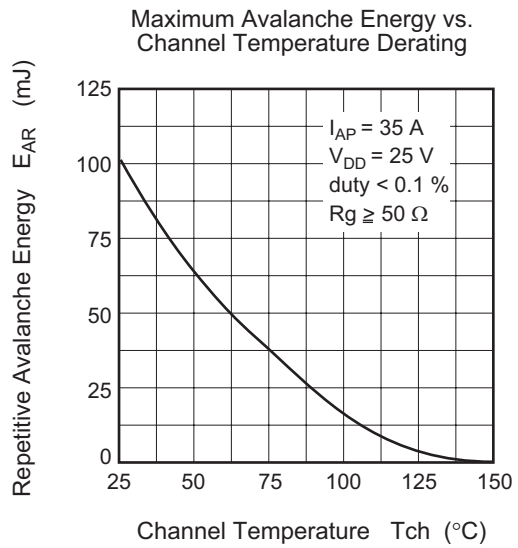
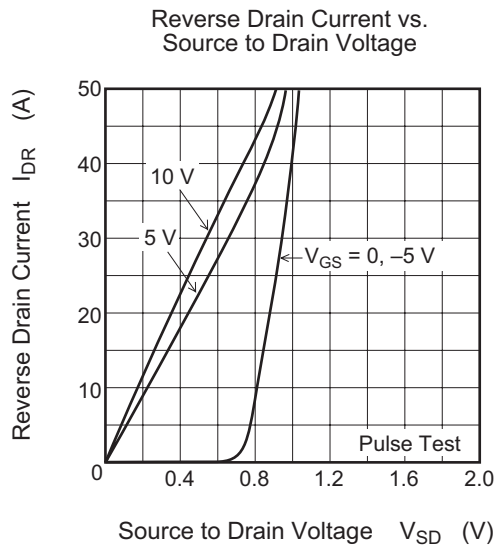
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	60	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	$\pm 20$	—	—	V	$I_G = \pm 100 \mu A$ , $V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 10$	$\mu A$	$V_{GS} = \pm 16 \text{ V}$ , $V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	10	$\mu A$	$V_{DS} = 60 \text{ V}$ , $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.5	—	2.5	V	$I_D = 1 \text{ mA}$ , $V_{DS} = 10 \text{ V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.020	0.026	$\Omega$	$I_D = 15 \text{ A}$ , $V_{GS} = 10 \text{ V}$ <sup>Note4</sup>
	$R_{DS(on)}$	—	0.032	0.050	$\Omega$	$I_D = 15 \text{ A}$ , $V_{GS} = 4 \text{ V}$ <sup>Note4</sup>
Forward transfer admittance	$ y_{fs} $	14	23	—	S	$I_D = 15 \text{ A}$ , $V_{DS} = 10 \text{ V}$ <sup>Note4</sup>
Input capacitance	$C_{iss}$	—	1100	—	pF	$V_{DS} = 10 \text{ V}$ , $V_{GS} = 0$ ,
Output capacitance	$C_{oss}$	—	540	—	pF	$f = 1 \text{ MHz}$
Reverse transfer capacitance	$C_{rss}$	—	200	—	pF	
Turn-on delay time	$t_{d(on)}$	—	15	—	ns	$I_D = 15 \text{ A}$ , $V_{GS} = 10 \text{ V}$ ,
Rise time	$t_r$	—	180	—	ns	$R_L = 2 \Omega$
Turn-off delay time	$t_{d(off)}$	—	175	—	ns	
Fall time	$t_f$	—	195	—	ns	
Body-drain diode forward voltage	$V_{DF}$	—	0.95	—	V	$I_F = 35 \text{ A}$ , $V_{GS} = 0$
Body-drain diode reverse recovery time	$t_{rr}$	—	40	—	ns	$I_F = 35 \text{ A}$ , $V_{GS} = 0$ $di_F/dt = 50 \text{ A}/\mu s$

Note: 4. Pulse test

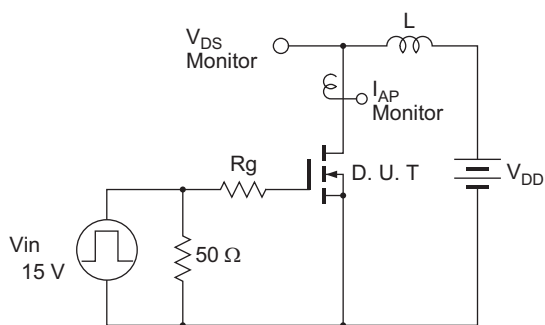
### Main Characteristics



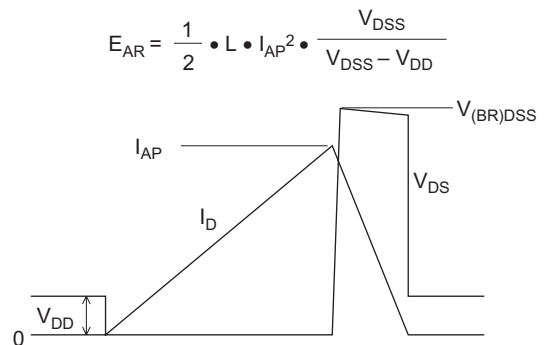


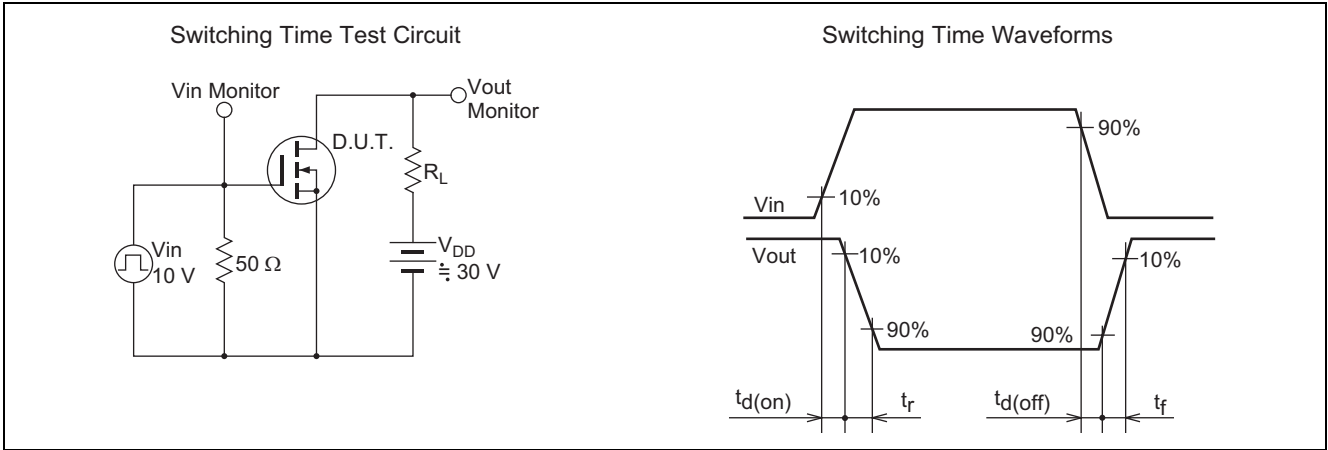


Avalanche Test Circuit



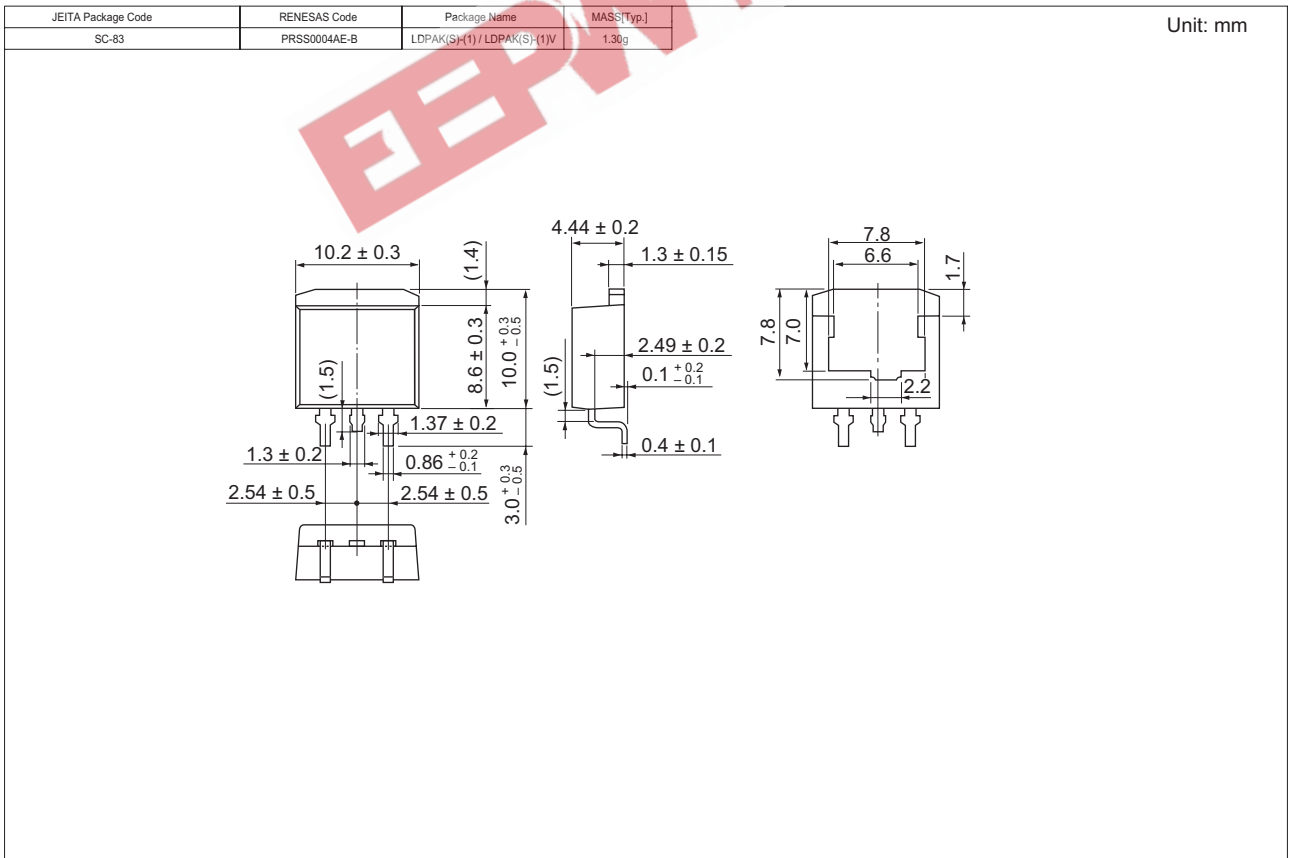
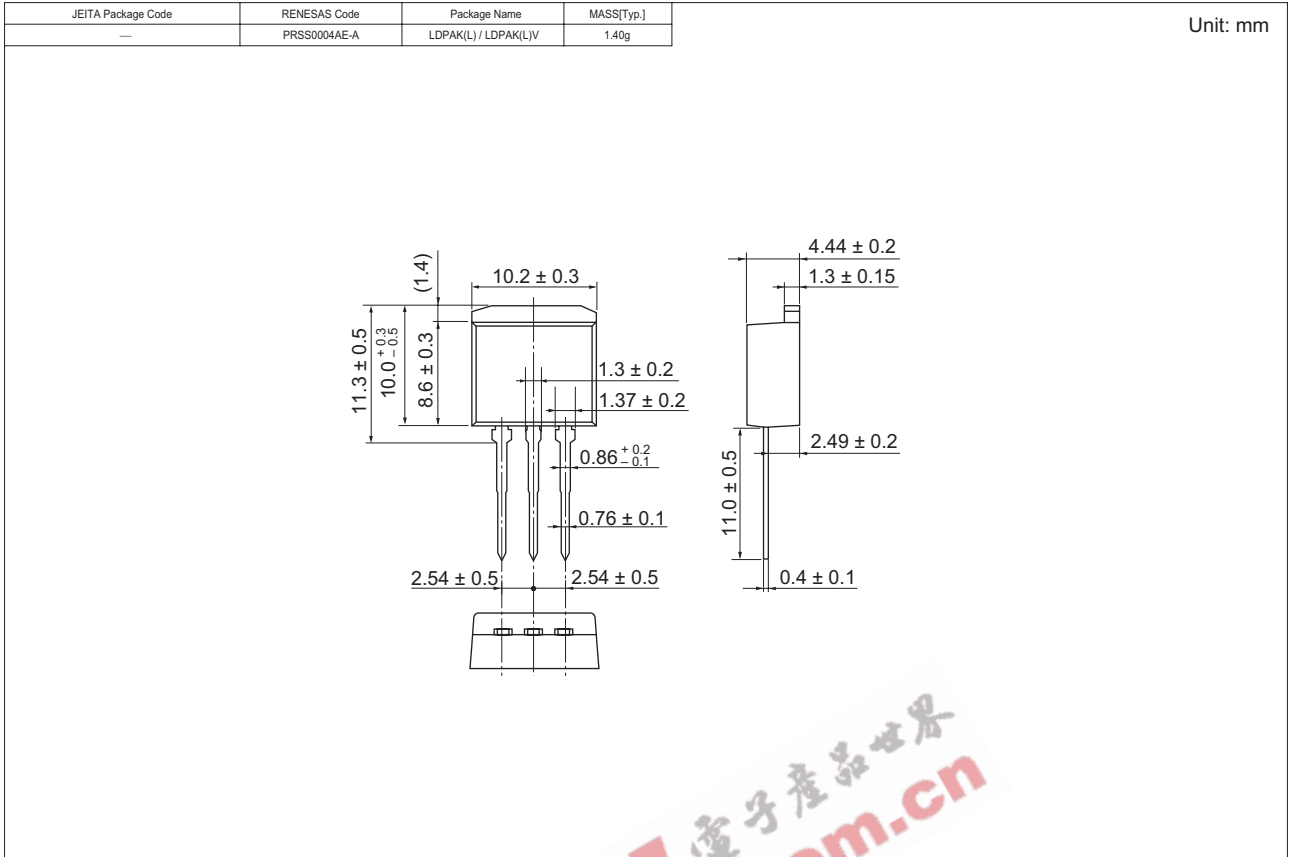
Avalanche Waveform





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Package Dimensions



### Ordering Information

Part Name	Quantity	Shipping Container
2SK2939L-E	500 pcs	Box (Sack)
2SK2939STL-E	1000 pcs	Taping

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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