

To our customers,

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## Old Company Name in Catalogs and Other Documents

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Renesas Electronics website: <http://www.renesas.com>

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

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The Renesas logo, featuring the word "RENESAS" in a bold, sans-serif font with a stylized square symbol to the left.

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## 2SK2938(L), 2SK2938(S)

Silicon N Channel MOS FET  
High Speed Power Switching

REJ03G1052-0400  
(Previous: ADE-208-561B)  
Rev.4.00  
Sep 07, 2005

### Features

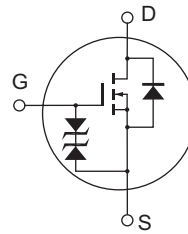
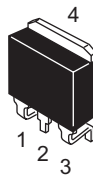
- Low on-resistance  
 $R_{DS} = 0.026 \Omega$  typ.
- High speed switching
- 4 V gate drive device can be driven from 5 V source

### 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 <sub>DSS</sub>	60	V
Gate to source voltage	V <sub>GSS</sub>	±20	V
Drain current	I <sub>D</sub>	25	A
Drain peak current	I <sub>D(pulse)</sub> <sup>Note1</sup>	100	A
Body-drain diode reverse drain current	I <sub>DR</sub>	25	A
Avalanche current	I <sub>AP</sub> <sup>Note3</sup>	20	A
Avalanche energy	E <sub>AR</sub> <sup>Note3</sup>	34	mJ
Channel dissipation	P <sub>ch</sub> <sup>Note2</sup>	50	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

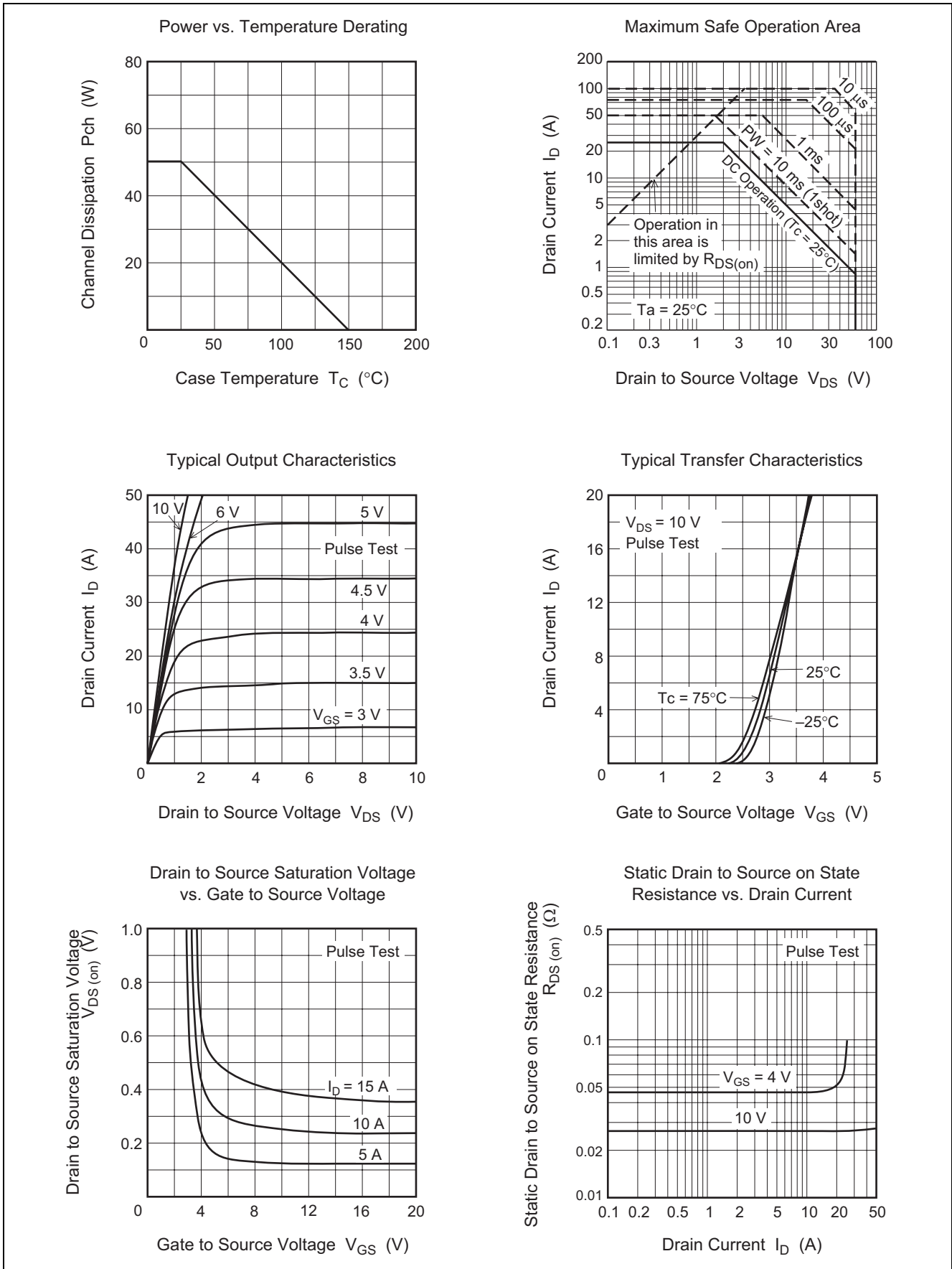
## Electrical Characteristics

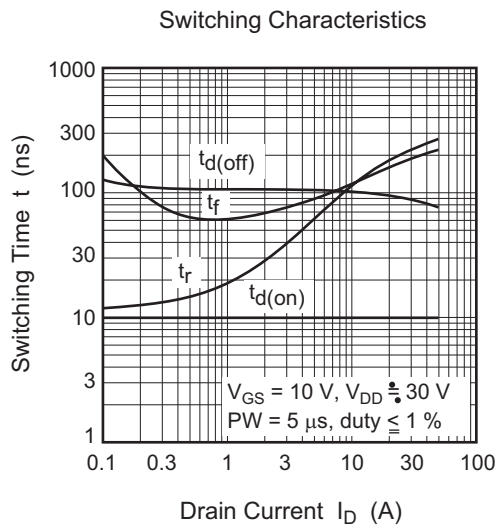
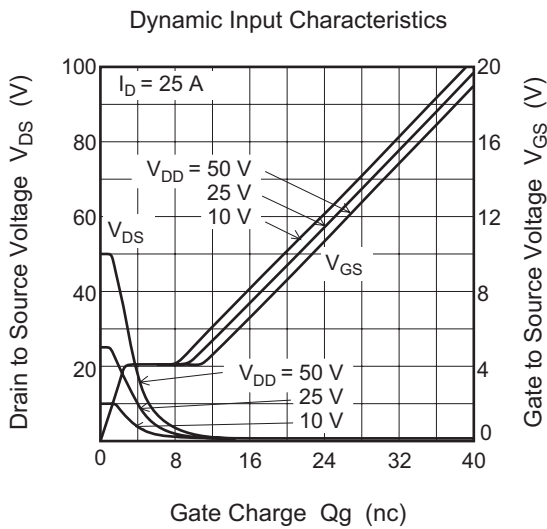
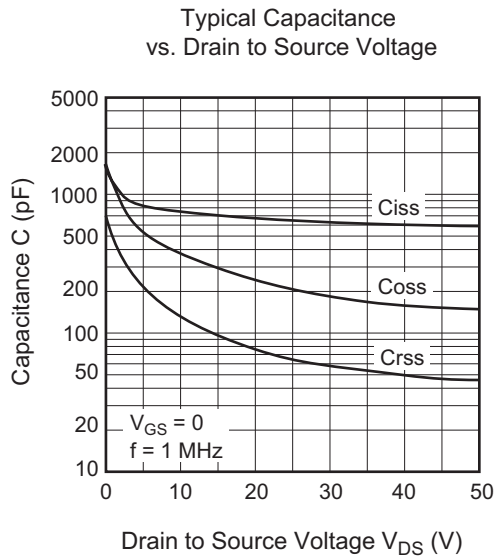
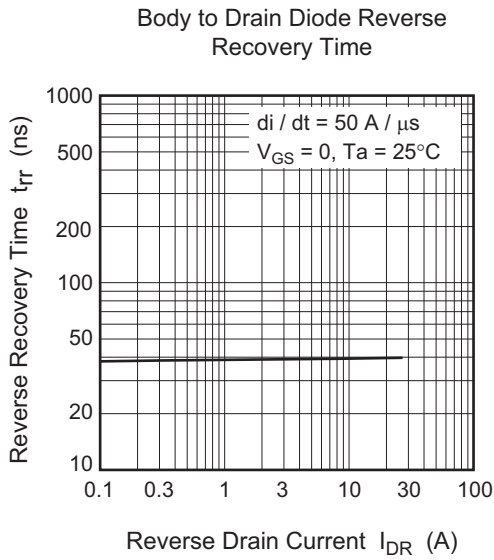
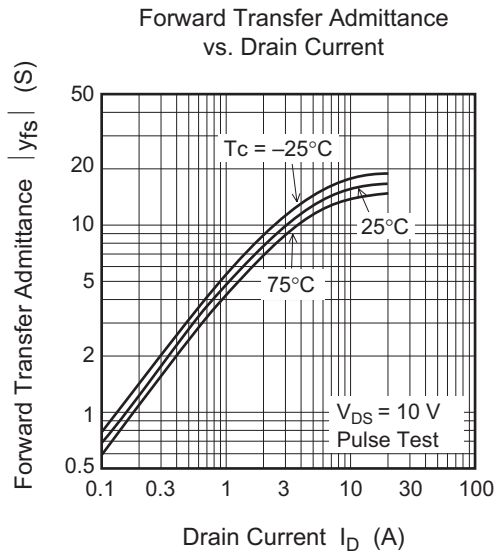
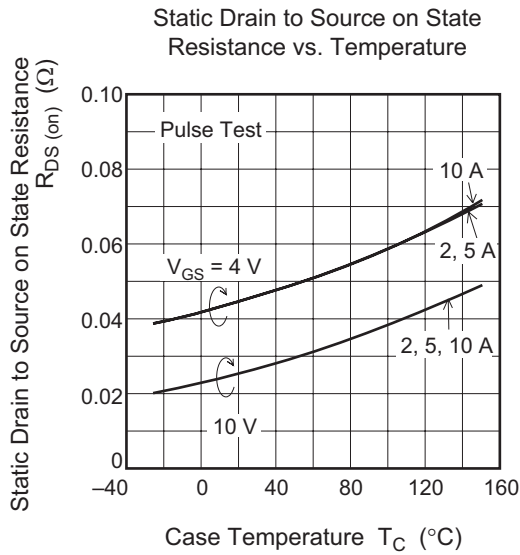
(Ta = 25°C)

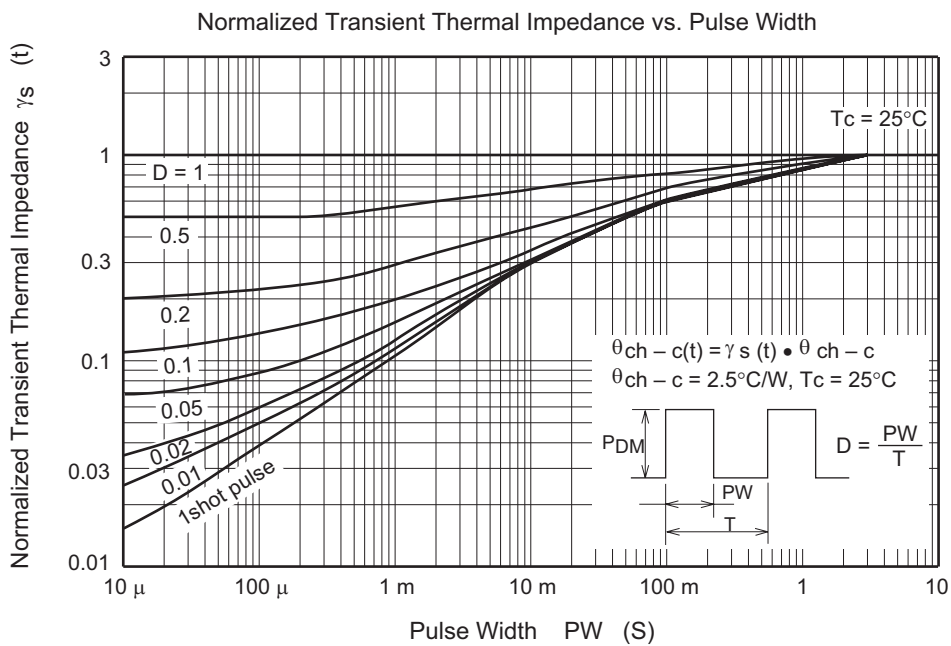
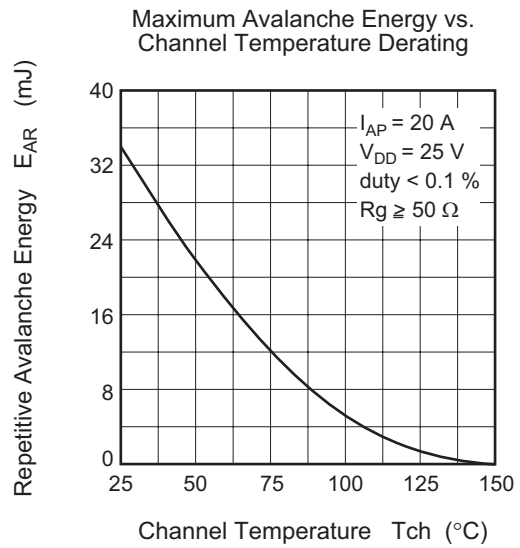
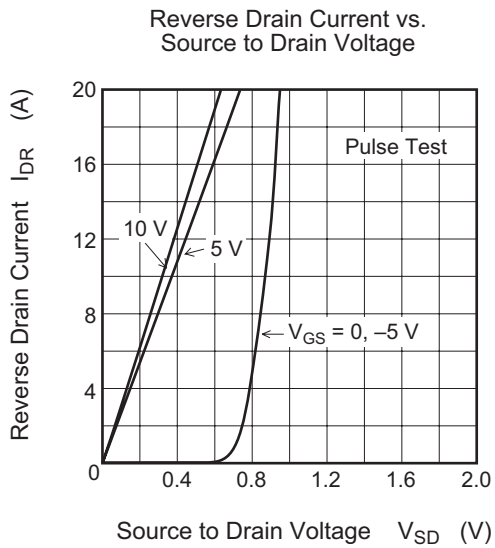
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	V <sub>(BR)DSS</sub>	60	—	—	V	I <sub>D</sub> = 10 mA, V <sub>GS</sub> = 0
Gate to source breakdown voltage	V <sub>(BR)GSS</sub>	±20	—	—	V	I <sub>G</sub> = ±100 μA, V <sub>DS</sub> = 0
Gate to source leak current	I <sub>GSS</sub>	—	—	±10	μA	V <sub>GS</sub> = ±16 V, V <sub>DS</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 cutoff voltage	V <sub>GS(off)</sub>	1.5	—	2.5	V	I <sub>D</sub> = 1 mA, V <sub>DS</sub> = 10 V
Static drain to source on state resistance	R <sub>DS(on)</sub>	—	0.026	0.034	Ω	I <sub>D</sub> = 15 A, V <sub>GS</sub> = 10 V <sup>Note4</sup>
	R <sub>DS(on)</sub>	—	0.045	0.07	Ω	I <sub>D</sub> = 15 A, V <sub>GS</sub> = 4 V <sup>Note4</sup>
Forward transfer admittance	y <sub>fs</sub>	11	17	—	S	I <sub>D</sub> = 15 A, V <sub>DS</sub> = 10 V <sup>Note4</sup>
Input capacitance	C <sub>iss</sub>	—	740	—	pF	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 0, f = 1 MHz
Output capacitance	C <sub>oss</sub>	—	380	—	pF	
Reverse transfer capacitance	C <sub>rss</sub>	—	140	—	pF	
Turn-on delay time	t <sub>d(on)</sub>	—	10	—	ns	I <sub>D</sub> = 15 A, V <sub>GS</sub> = 10 V, R <sub>L</sub> = 2 Ω
Rise time	t <sub>r</sub>	—	160	—	ns	
Turn-off delay time	t <sub>d(off)</sub>	—	100	—	ns	
Fall time	t <sub>f</sub>	—	150	—	ns	
Body-drain diode forward voltage	V <sub>DF</sub>	—	0.95	—	V	I <sub>F</sub> = 25 A, V <sub>GS</sub> = 0
Body-drain diode reverse recovery time	t <sub>rr</sub>	—	40	—	ns	I <sub>F</sub> = 25 A, V <sub>GS</sub> = 0 di <sub>F</sub> / dt = 50 A/μs

Note: 4. Pulse test

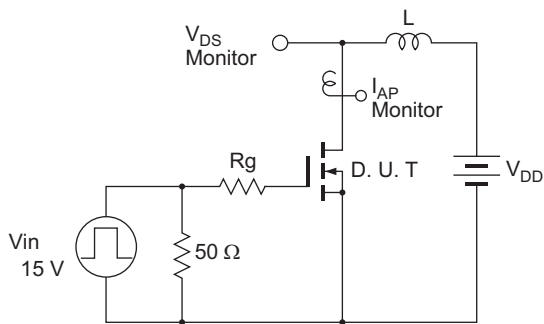
### Main Characteristics



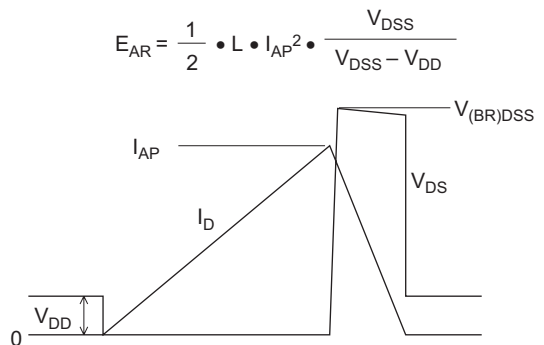


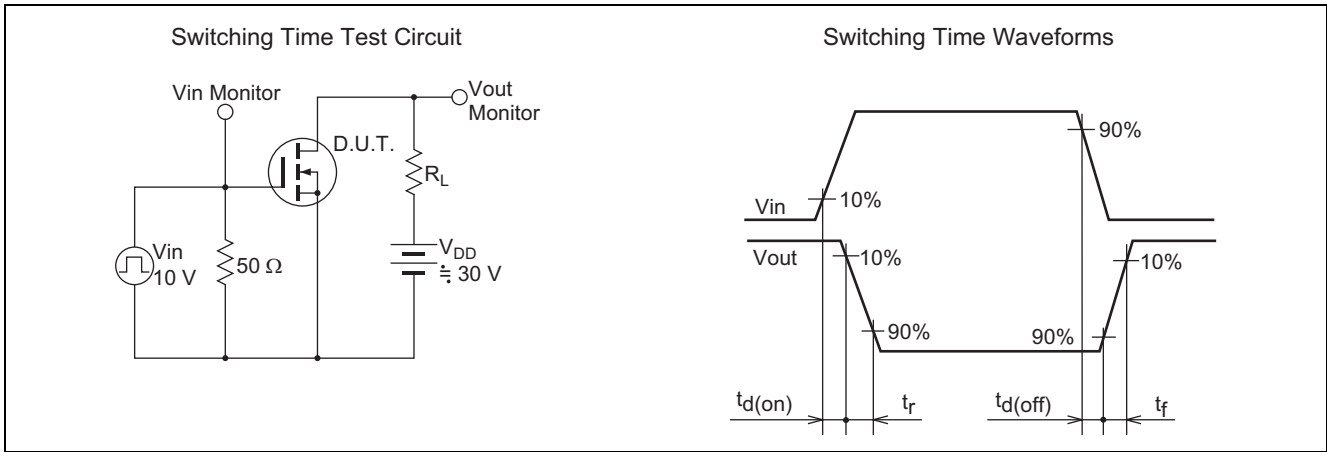


Avalanche Test Circuit

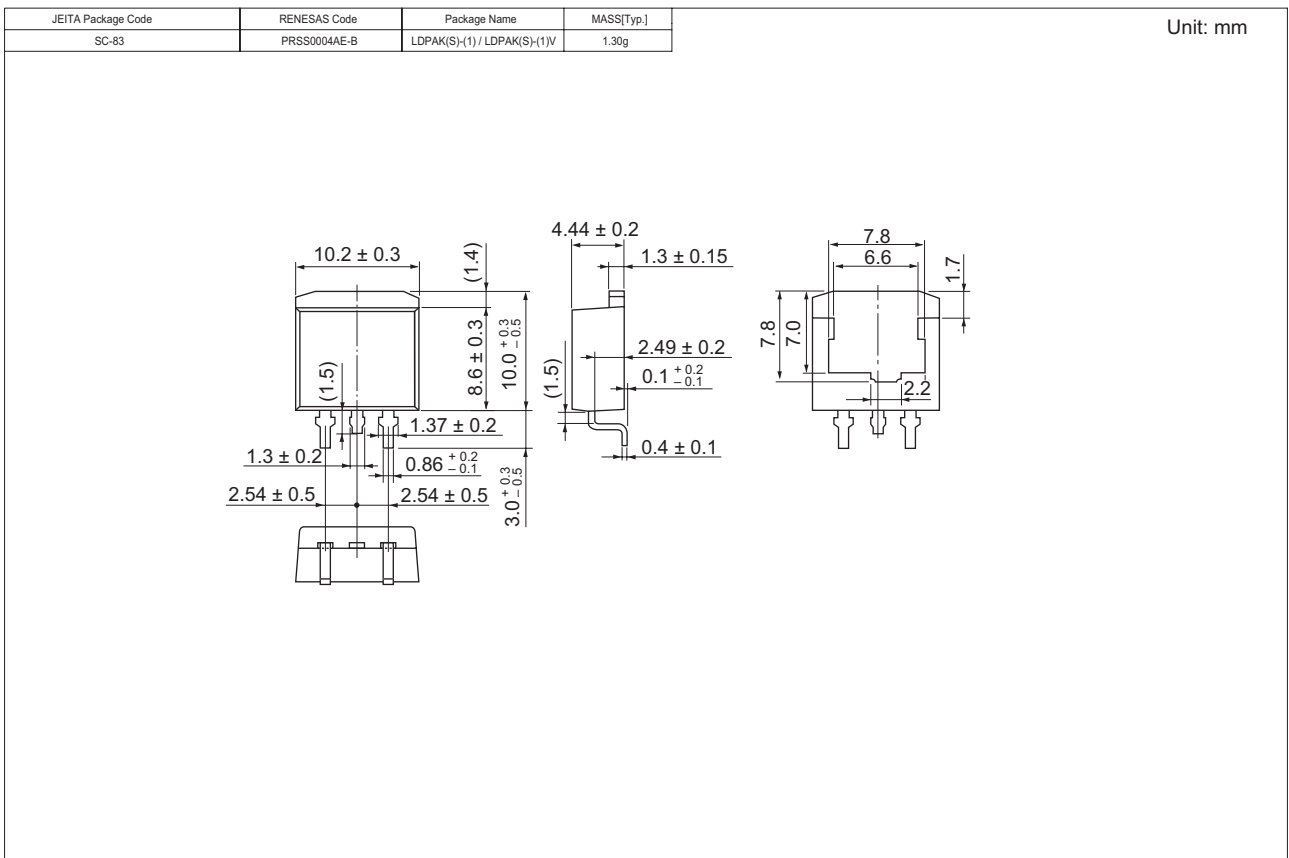
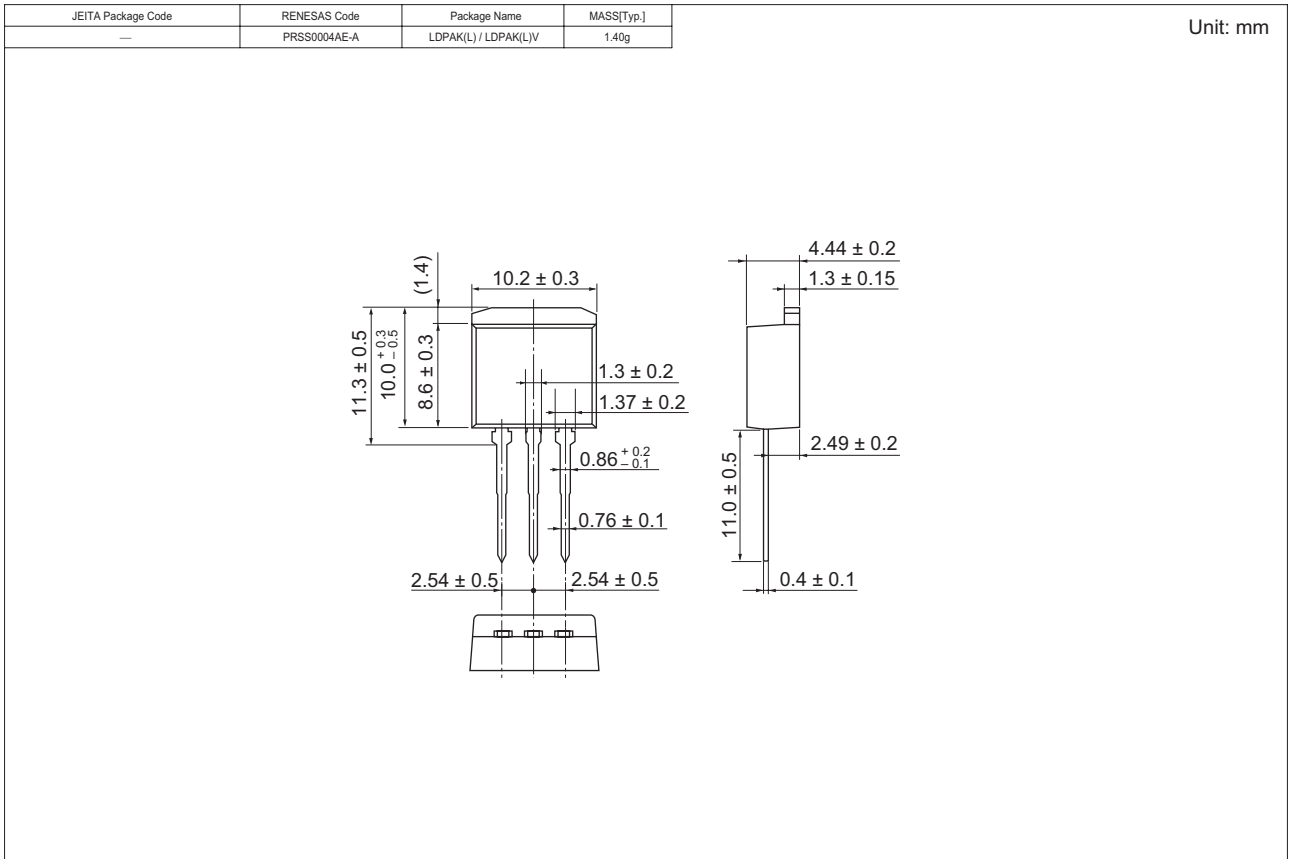


Avalanche Waveform





Package Dimensions



### Ordering Information

Part Name	Quantity	Shipping Container
2SK2938L-E	500 pcs	Box (Tube)
2SK2938STL-E	1000 pcs	Taping

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