

# 2SK3210(L), 2SK3210(S)

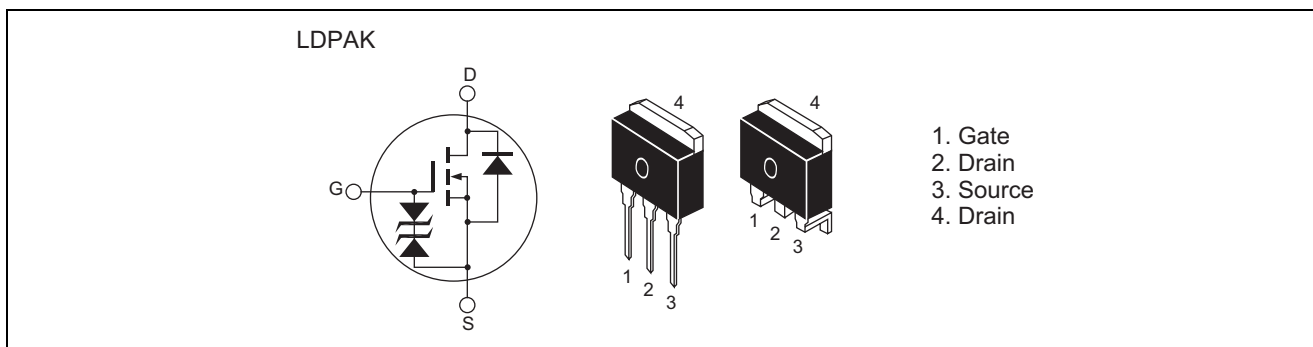
Silicon N Channel MOS FET  
High Speed Power Switching

REJ03G0414-0300  
(Previous ADE-208-760A (Z))  
Rev.3.00  
Sep. 30, 2004

## Features

- Low on-resistance  
 $R_{DS} = 40 \text{ m}\Omega$  typ.
- High speed switching
- 4 V gate drive device can be driven from 5 V source

## Outline



## Absolute Maximum Ratings

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

Item	Symbol	Ratings	Unit
Drain to source voltage	$V_{DSS}$	150	V
Gate to source voltage	$V_{GSS}$	$\pm 20$	V
Drain current	$I_D$	30	A
Drain peak current	$I_D$ (pulse) <sup>Note1</sup>	120	A
Body-drain diode reverse drain current	$I_{DR}$	30	A
Avalanche current	$I_{AP}$ <sup>Note3</sup>	30	A
Avalanche energy	$E_{AR}$ <sup>Note3</sup>	67	mJ
Channel dissipation	$P_{ch}$ <sup>Note2</sup>	100	W
Channel temperature	$T_{ch}$	150	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$

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

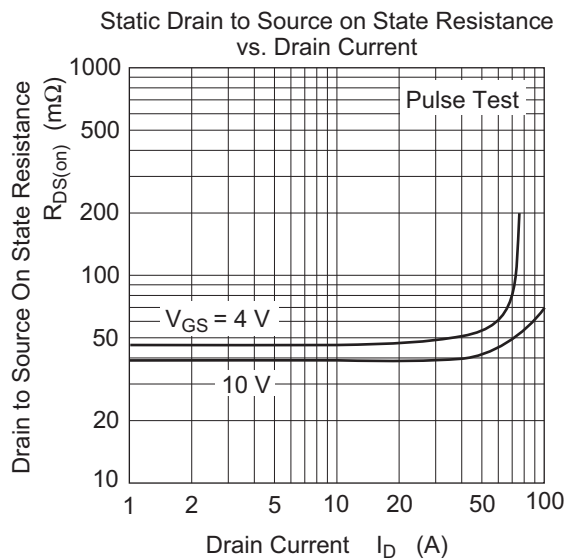
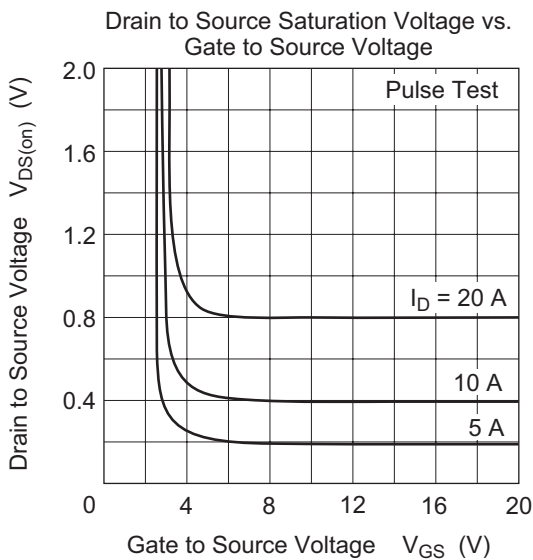
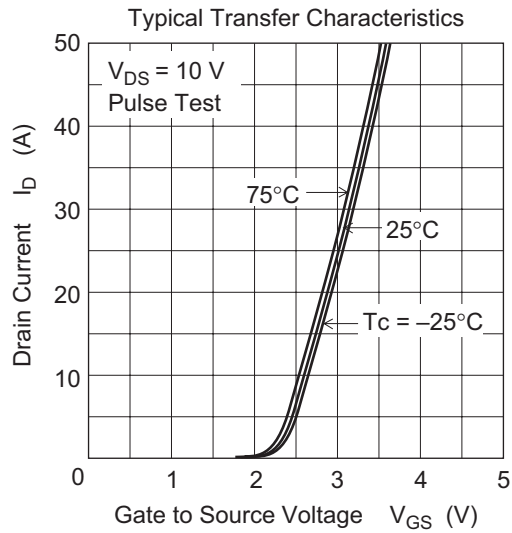
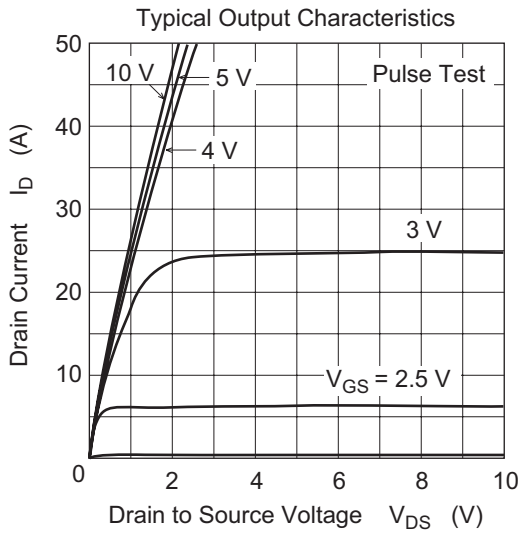
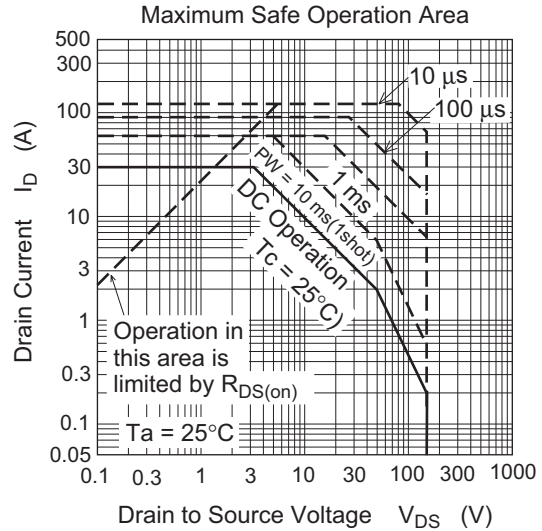
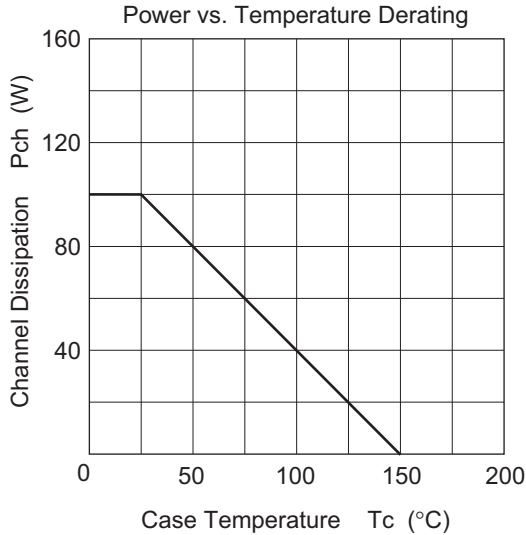
## Electrical Characteristics

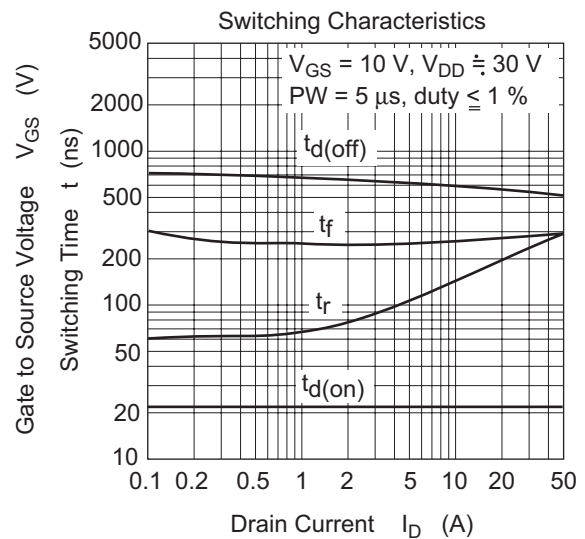
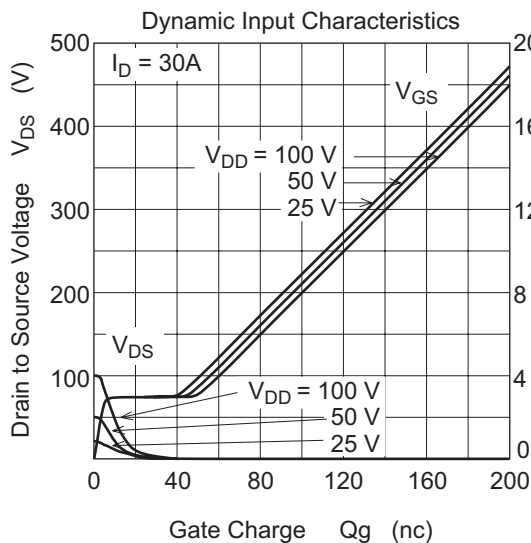
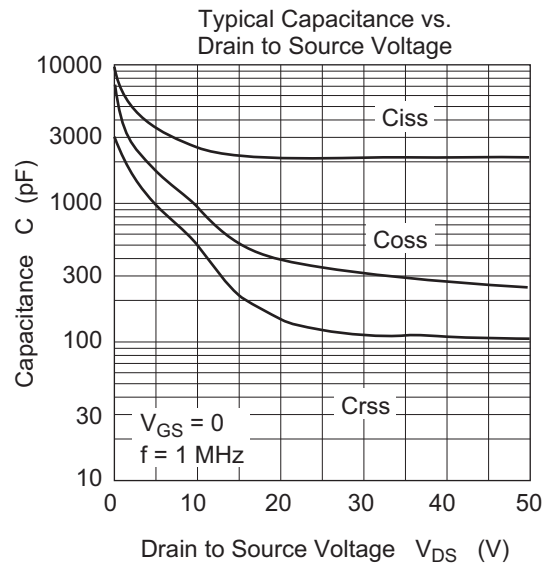
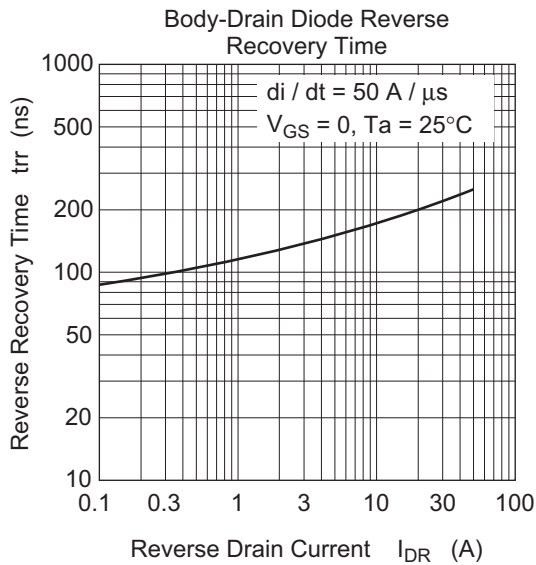
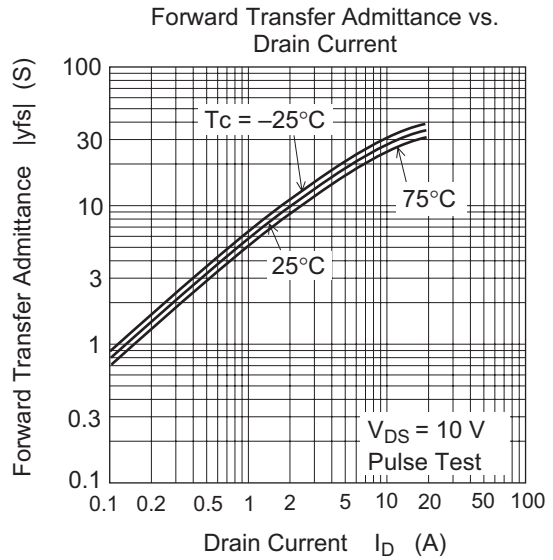
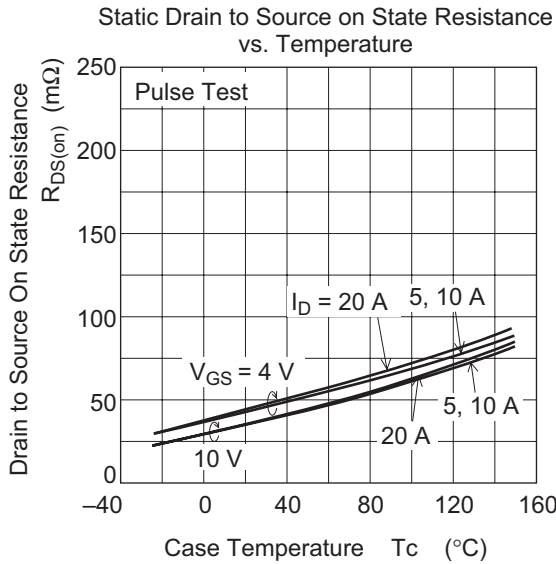
(Ta = 25°C)

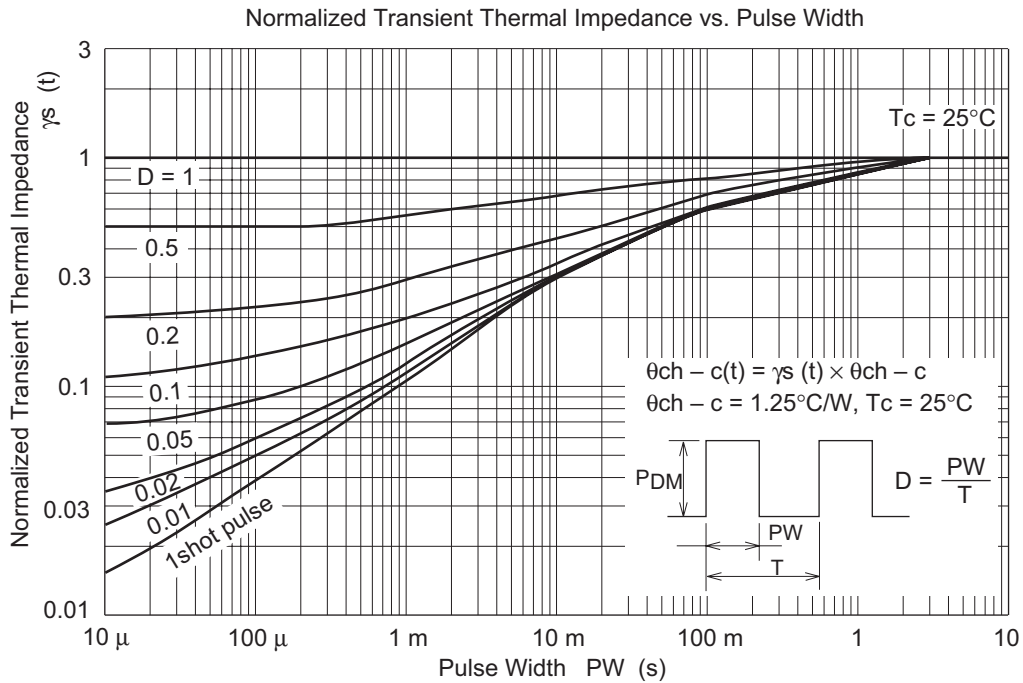
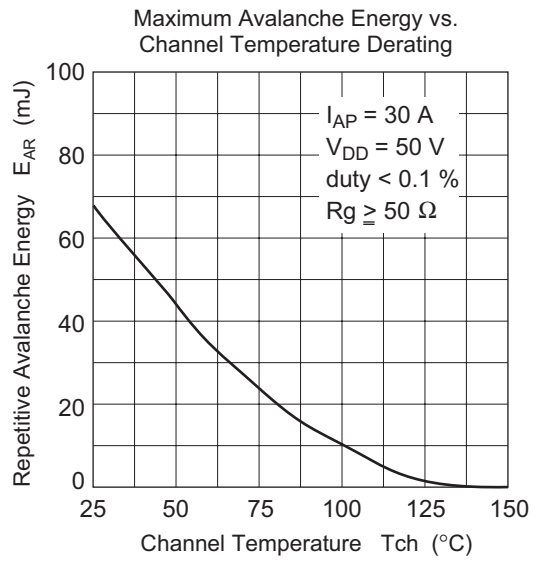
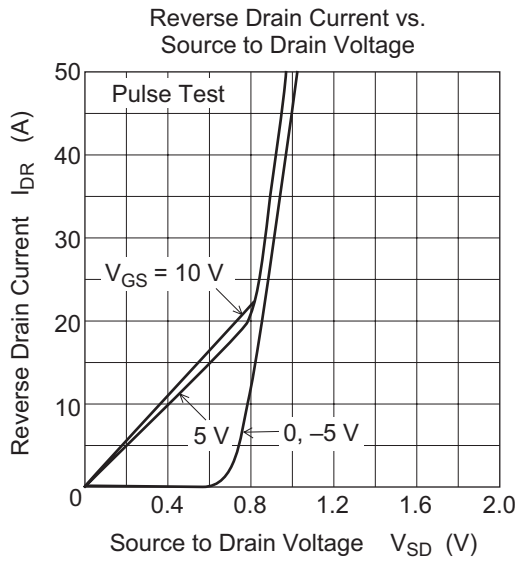
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	150	—	—	V	$I_D = 10 \text{ mA}, V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	$\pm 20$	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}, V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 16 \text{ V}, V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	10	$\mu\text{A}$	$V_{DS} = 150 \text{ V}, V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.5	V	$V_{DS} = 10 \text{ V}, I_D = 1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	40	45	$\text{m}\Omega$	$I_D = 15 \text{ A}, V_{GS} = 10 \text{ V}$ <sup>Note4</sup>
	$R_{DS(on)}$	—	45	63	$\text{m}\Omega$	$I_D = 15 \text{ A}, V_{GS} = 4 \text{ V}$ <sup>Note4</sup>
Forward transfer admittance	$ y_{fs} $	18	30	—	S	$I_D = 15 \text{ A}, V_{DS} = 10 \text{ V}$ <sup>Note4</sup>
Input capacitance	$C_{iss}$	—	2600	—	pF	$V_{DS} = 10 \text{ V}, V_{GS} = 0$ $f = 1 \text{ MHz}$
Output capacitance	$C_{oss}$	—	820	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	350	—	pF	
Turn-on delay time	$t_{d(on)}$	—	25	—	ns	$V_{GS} = 10 \text{ V}, I_D = 15 \text{ A}$ $R_L = 2 \text{ }\Omega$
Rise time	$t_r$	—	180	—	ns	
Turn-off delay time	$t_{d(off)}$	—	600	—	ns	
Fall time	$t_f$	—	280	—	ns	
Body-drain diode forward voltage	$V_{DF}$	—	0.91	—	V	$I_F = 30 \text{ A}, V_{GS} = 0$
Body-drain diode reverse recovery time	$t_{rr}$	—	110	—	ns	$I_F = 30 \text{ A}, V_{GS} = 0$ $diF/dt = 50 \text{ A}/\mu\text{s}$

Notes: 4. Pulse test

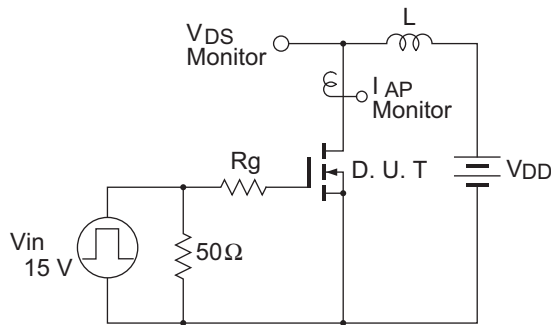
Main Characteristics



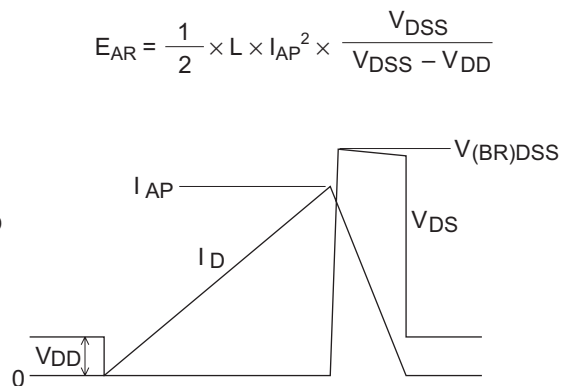




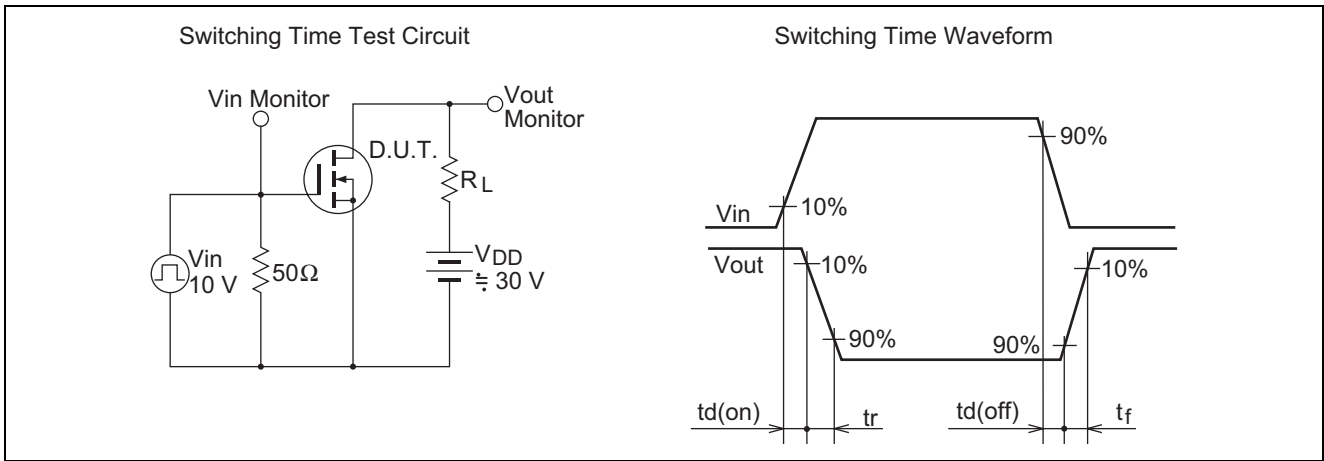
Avalanche Test Circuit



Avalanche Waveform



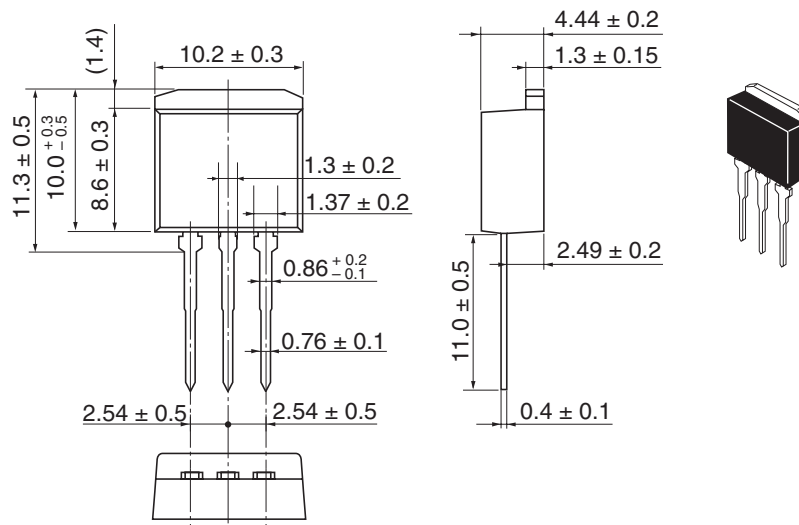
$$E_{AR} = \frac{1}{2} \times L \times I_{AP}^2 \times \frac{V_{DSS}}{V_{DSS} - V_{DD}}$$



Package Dimensions

• 2SK3210(L)

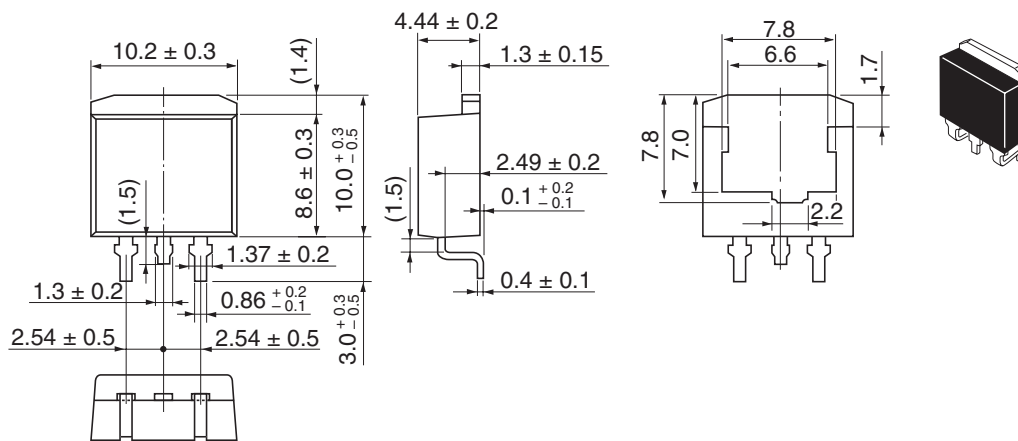
As of January, 2003  
Unit: mm



Package Code	LDBPAK (L)
JEDEC	—
JEITA	—
Mass (reference value)	1.40 g

• 2SK3210(S)

As of January, 2003  
Unit: mm



Package Code	LDBPAK (S)-(1)
JEDEC	—
JEITA	—
Mass (reference value)	1.30 g

### Ordering Information

Part Name	Quantity	Shipping Container
2SK3210L	50 pcs.	Loose packing
2SK3210STL	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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