
2SK2938(L), 2SK2938(S)

Silicon N Channel MOS FET
High Speed Power Switching

HITACHI

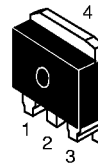
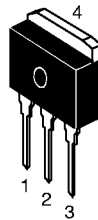
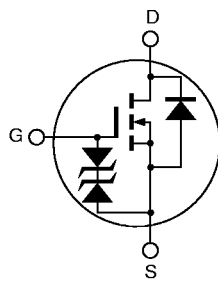
ADE-208-561B (Z)
3rd. Edition
June 1, 1998

Features

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

Outline

LDPAK



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

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Absolute Maximum Ratings (Ta = 25°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	25	A
Drain peak current	I _{D(pulse)} ^{Note1}	100	A
Body-drain diode reverse drain current	I _{DR}	25	A
Avalanche current	I _{AP} ^{Note3}	20	A
Avalanche energy	E _{AR} ^{Note3}	34	mJ
Channel dissipation	P _{ch} ^{Note2}	50	W
Channel temperature	T _{ch}	150	°C
Storage temperature	T _{stg}	−55 to +150	°C

Note: 1. PW ≤ 10μs, duty cycle ≤ 1 %
2. Value at Tc = 25°C
3. Value at Tch = 25°C, Rg ≥ 50Ω

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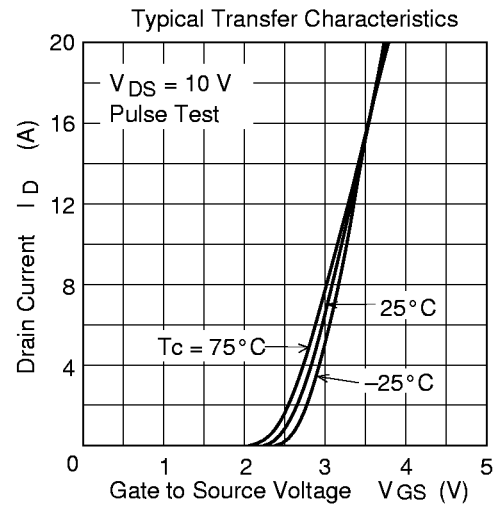
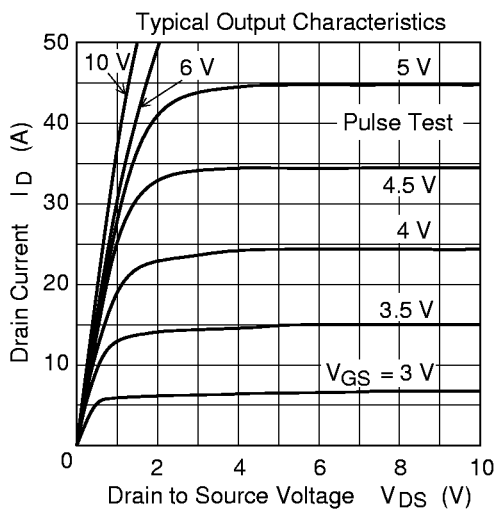
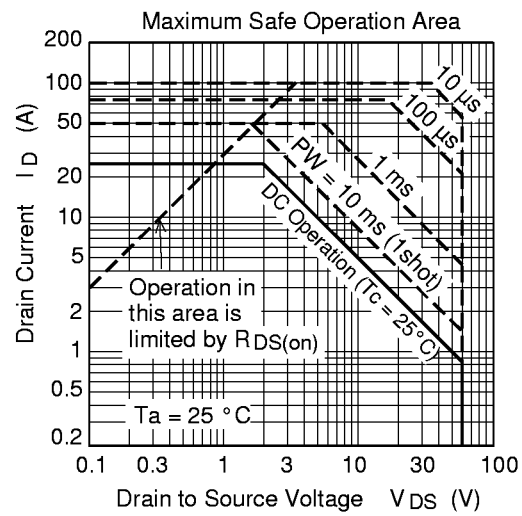
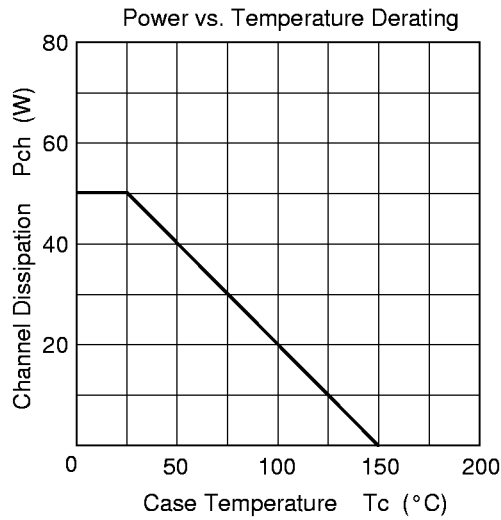
Electrical Characteristics (Ta = 25°C)

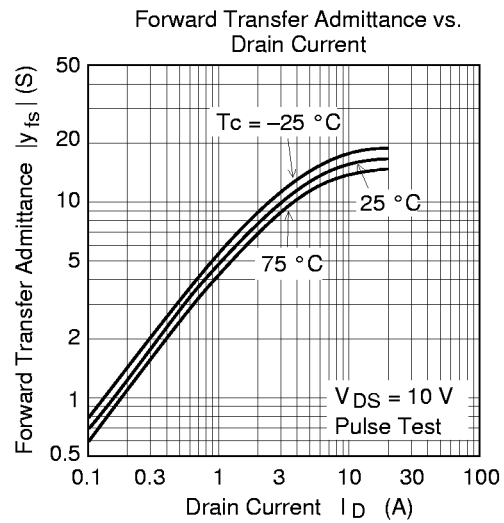
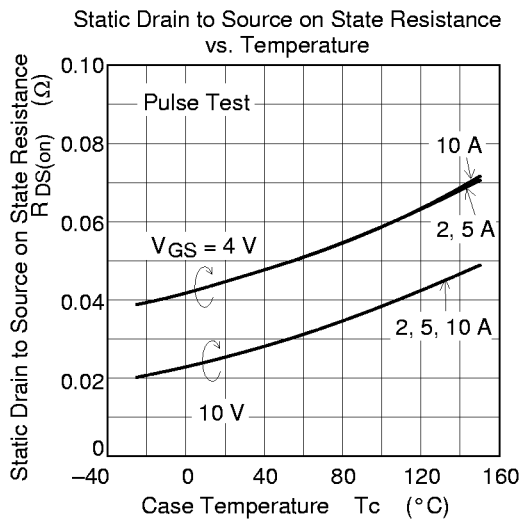
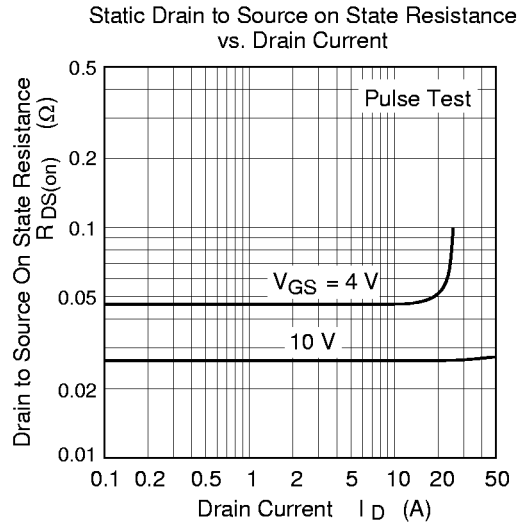
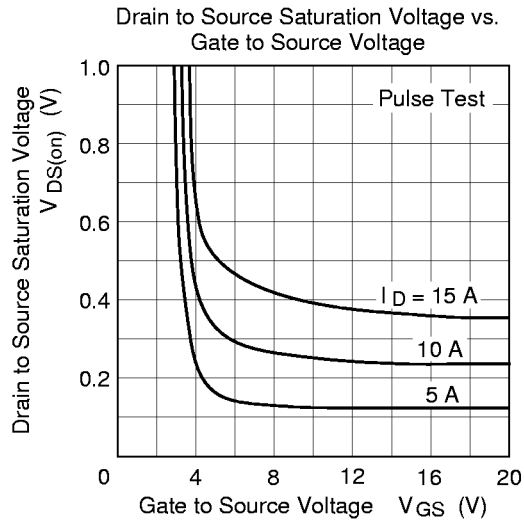
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	60	—	—	V	$I_D = 10mA, V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	± 20	—	—	V	$I_G = \pm 100\mu A, V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 16V, V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	10	μA	$V_{DS} = 60V, V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.5	—	2.5	V	$I_D = 1mA, V_{DS} = 10V$
Static drain to source on state	$R_{DS(on)}$	—	0.026	0.034	Ω	$I_D = 15A, V_{GS} = 10V$ ^{Note4}
resistance	$R_{DS(on)}$	—	0.045	0.07	Ω	$I_D = 15A, V_{GS} = 4V$ ^{Note4}
Forward transfer admittance	$ y_{fs} $	11	17	—	S	$I_D = 15A, V_{DS} = 10V$ ^{Note4}
Input capacitance	C_{iss}	—	740	—	pF	$V_{DS} = 10V$
Output capacitance	C_{oss}	—	380	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	140	—	pF	$f = 1MHz$
Turn-on delay time	$t_{d(on)}$	—	10	—	ns	$I_D = 15A, V_{GS} = 10V$
Rise time	t_r	—	160	—	ns	$R_L = 2\Omega$
Turn-off delay time	$t_{d(off)}$	—	100	—	ns	
Fall time	t_f	—	150	—	ns	
Body-drain diode forward voltage	V_{DF}	—	0.95	—	V	$I_F = 25A, V_{GS} = 0$
Body-drain diode reverse recovery time	t_{rr}	—	40	—	ns	$I_F = 25A, V_{GS} = 0$ $diF/dt = 50A/\mu s$

Note: 4. Pulse test

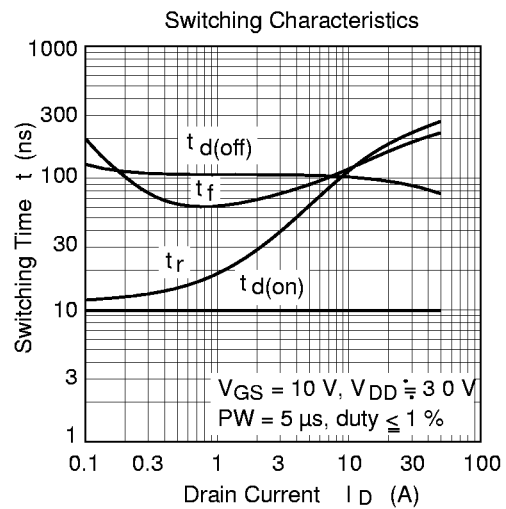
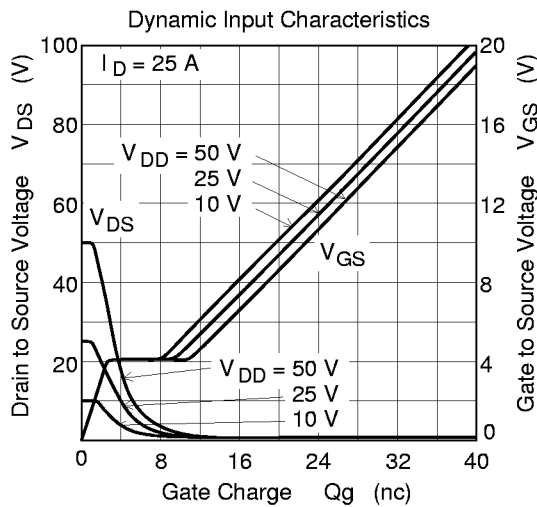
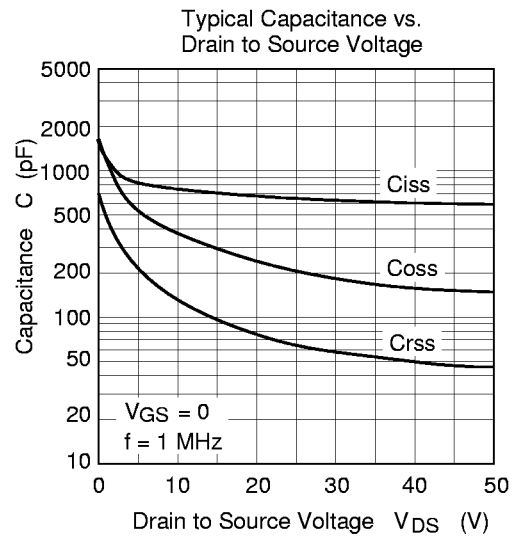
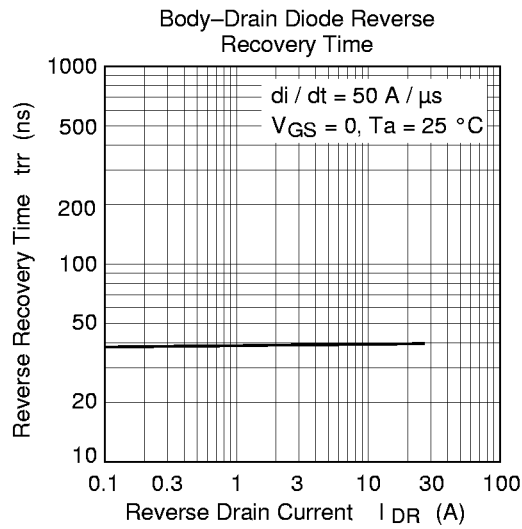
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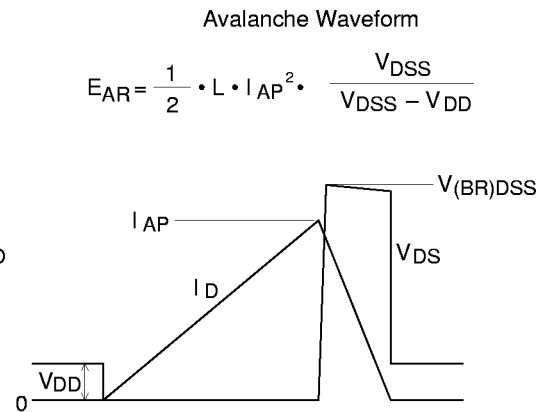
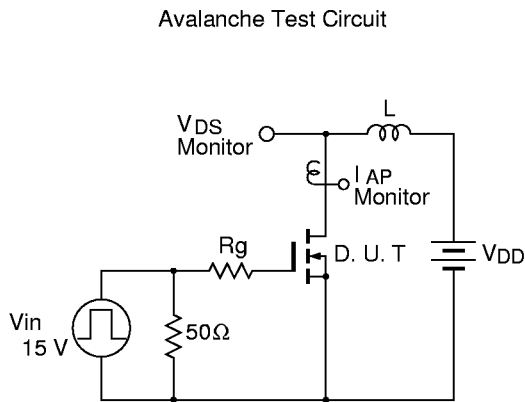
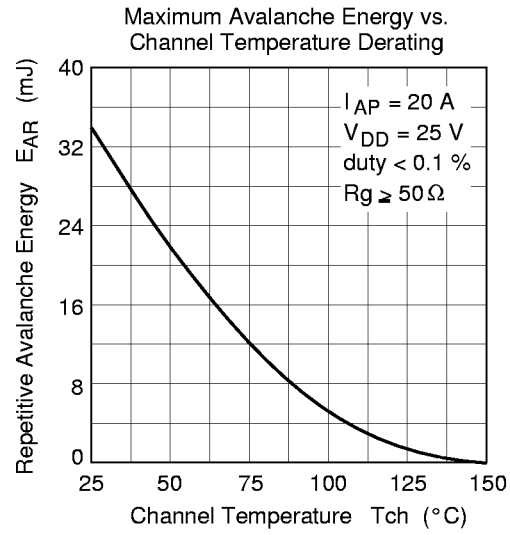
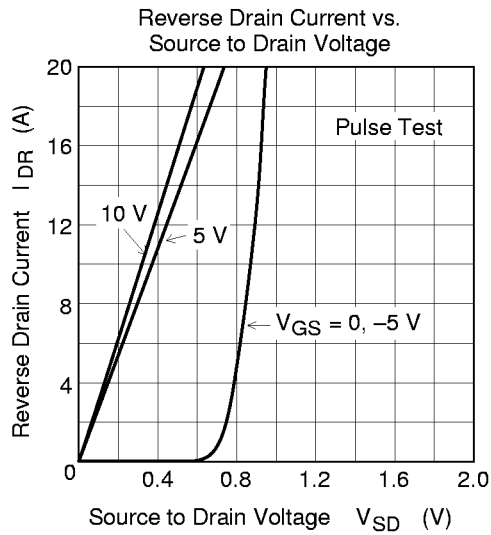
Main Characteristics



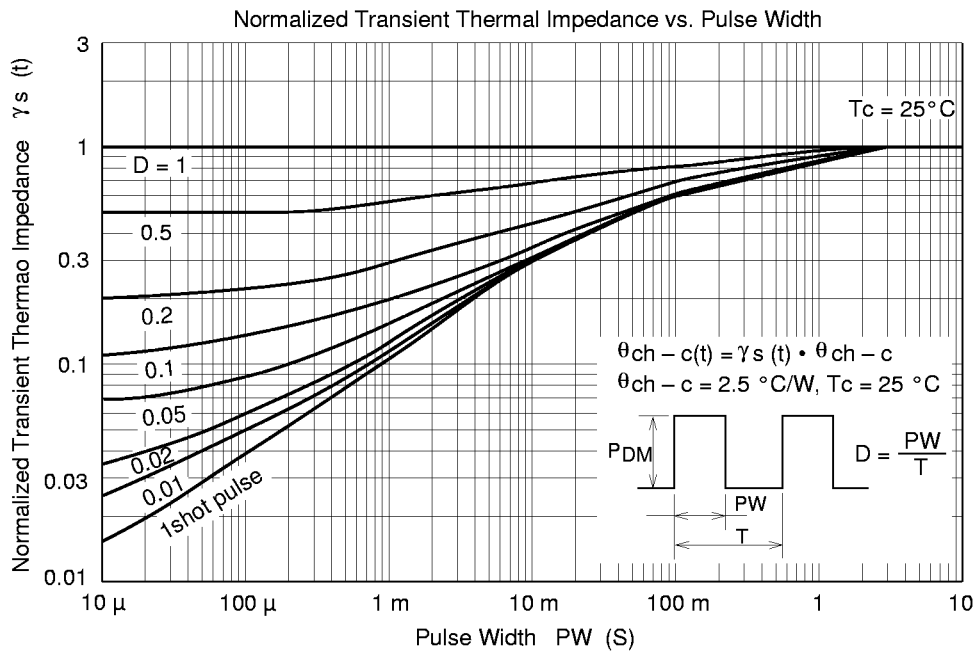


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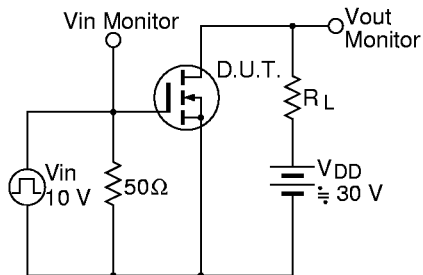




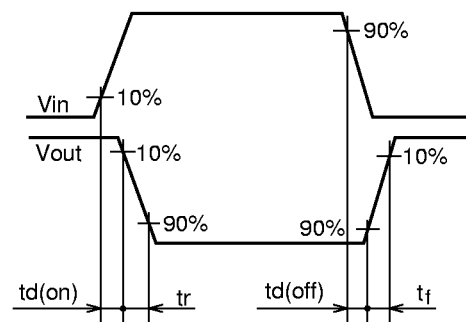
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Switching Time Test Circuit

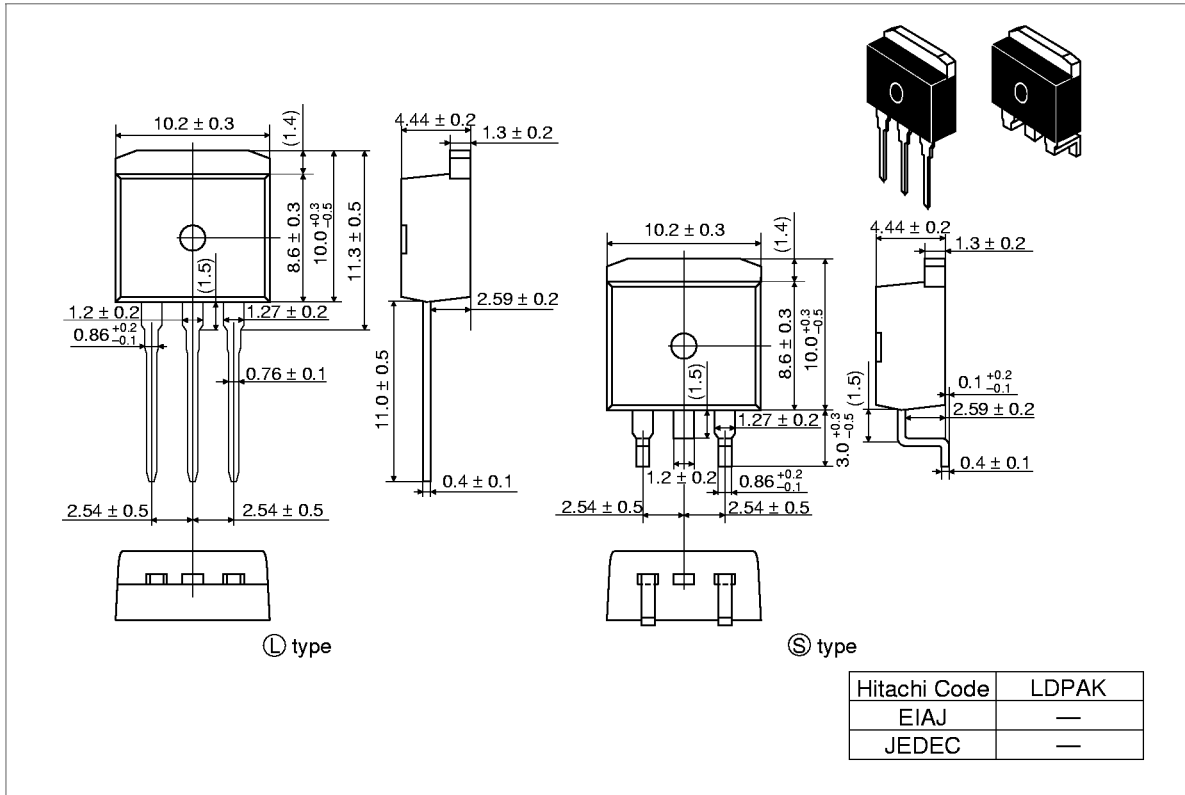


Waveform



2SK2938(L), 2SK2938(S)

Package Dimensions (Unit: mm)



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