

2SK2938(L), 2SK2938(S)

Silicon N Channel MOS FET
High Speed Power Switching

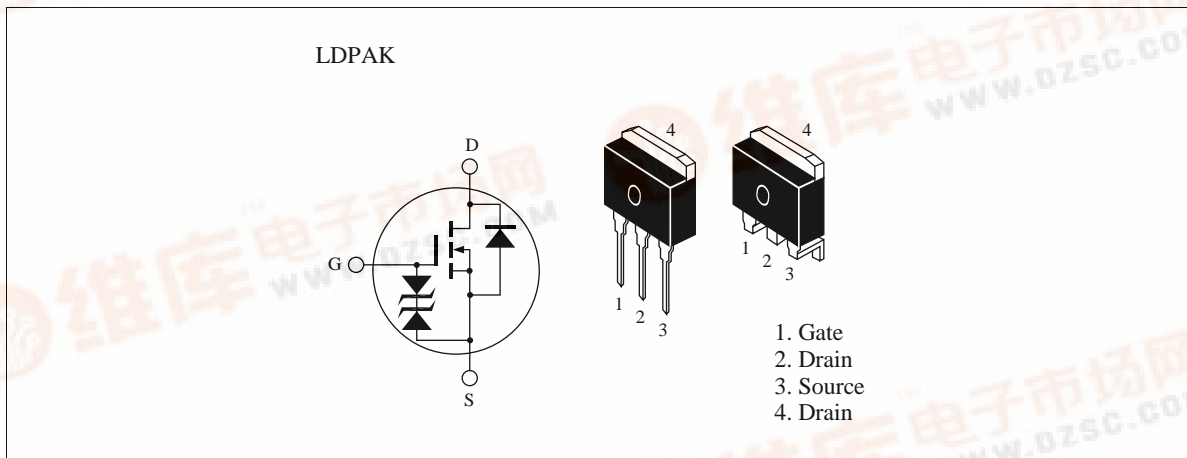
HITACHI

ADE-208-561B (Z)
3rd. Edition
Jun 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



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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	Tch	150	°C
Storage temperature	Tstg	-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 $T_{ch} = 25^\circ C$, $R_g \geq 50\Omega$

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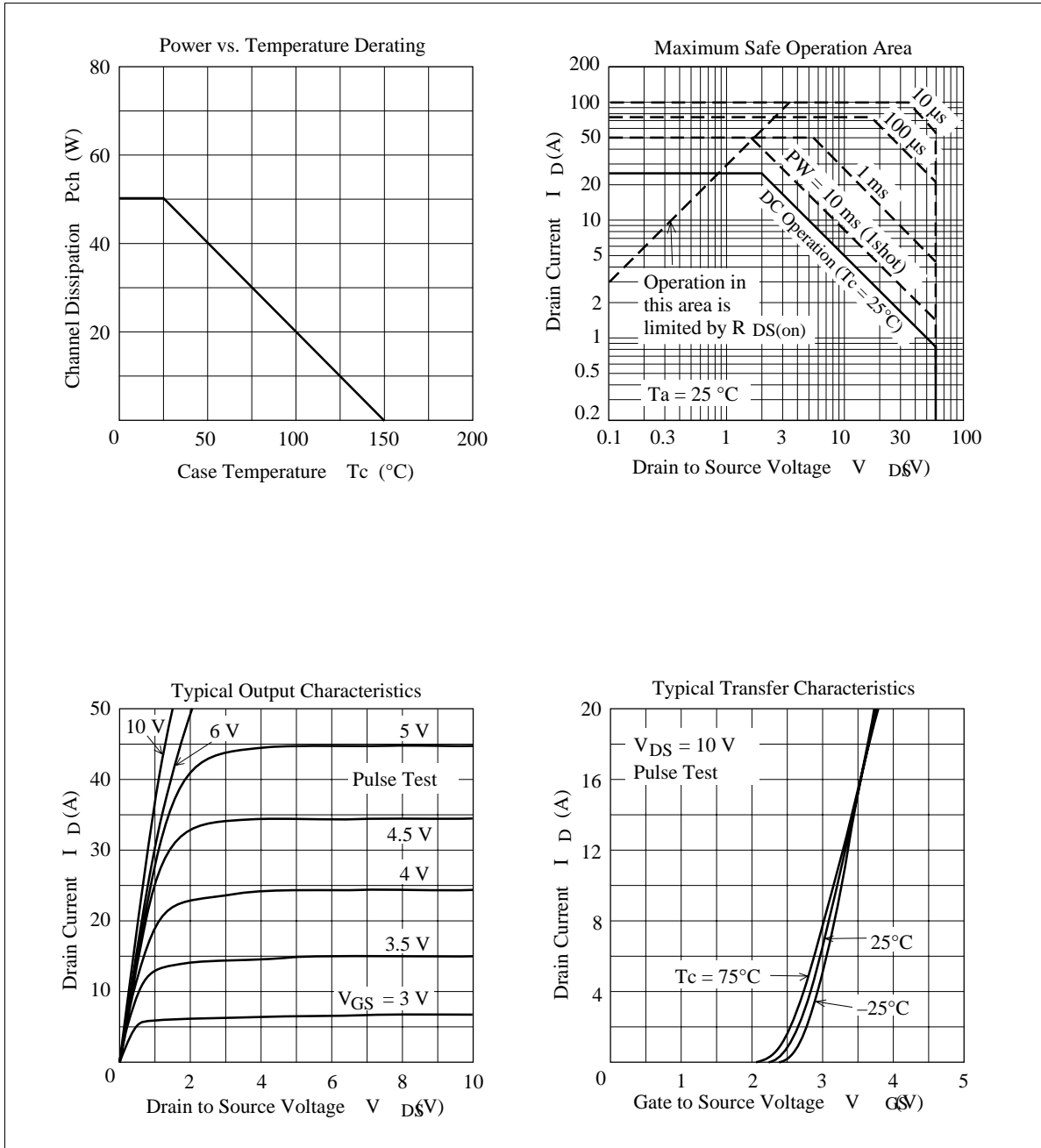
Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	60	—	—	V	$I_D = 10\text{mA}, V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	± 20	—	—	V	$I_G = \pm 100\mu\text{A}, V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 16\text{V}, V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	10	μA	$V_{DS} = 60\text{V}, V_{GS} = 0$
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	$R_{DS(on)}$	—	0.026	0.034	Ω	$I_D = 15\text{A}, V_{GS} = 10\text{V}$ ^{Note4}
	$R_{DS(on)}$	—	0.045	0.07	Ω	$I_D = 15\text{A}, V_{GS} = 4\text{V}$ ^{Note4}
Forward transfer admittance	$ y_{fs} $	11	17	—	S	$I_D = 15\text{A}, V_{DS} = 10\text{V}$ ^{Note4}
Input capacitance	Ciss	—	740	—	pF	$V_{DS} = 10\text{V}$
Output capacitance	Coss	—	380	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	Crss	—	140	—	pF	$f = 1\text{MHz}$
Turn-on delay time	$t_{d(on)}$	—	10	—	ns	$I_D = 15\text{A}, V_{GS} = 10\text{V}$
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	$I_F = 25\text{A}, V_{GS} = 0$
Body-drain diode reverse recovery time	t_{rr}	—	40	—	ns	$I_F = 25\text{A}, V_{GS} = 0$ $di_F/dt = 50\text{A}/\mu\text{s}$

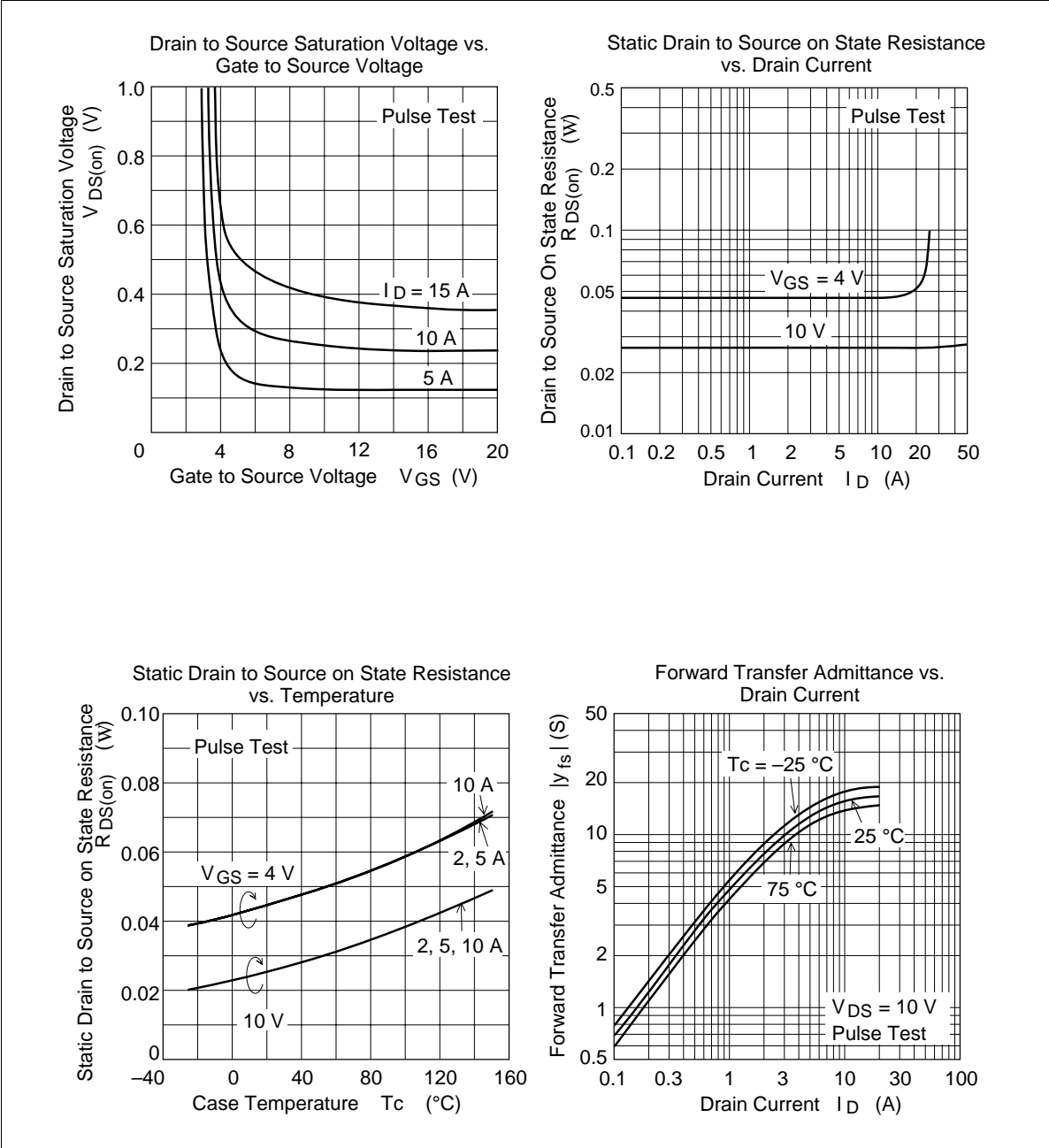
Note: 4. Pulse test

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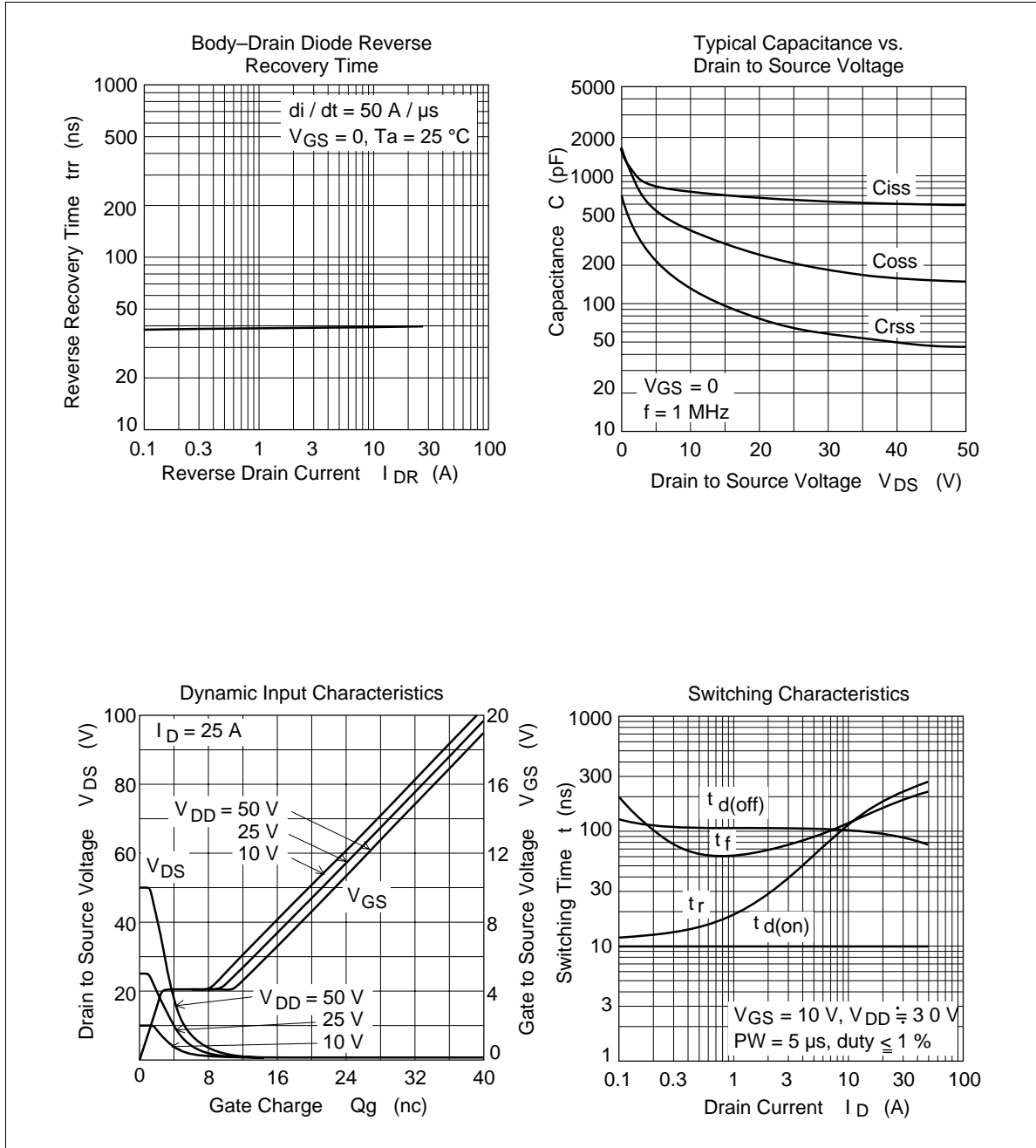
Main Characteristics



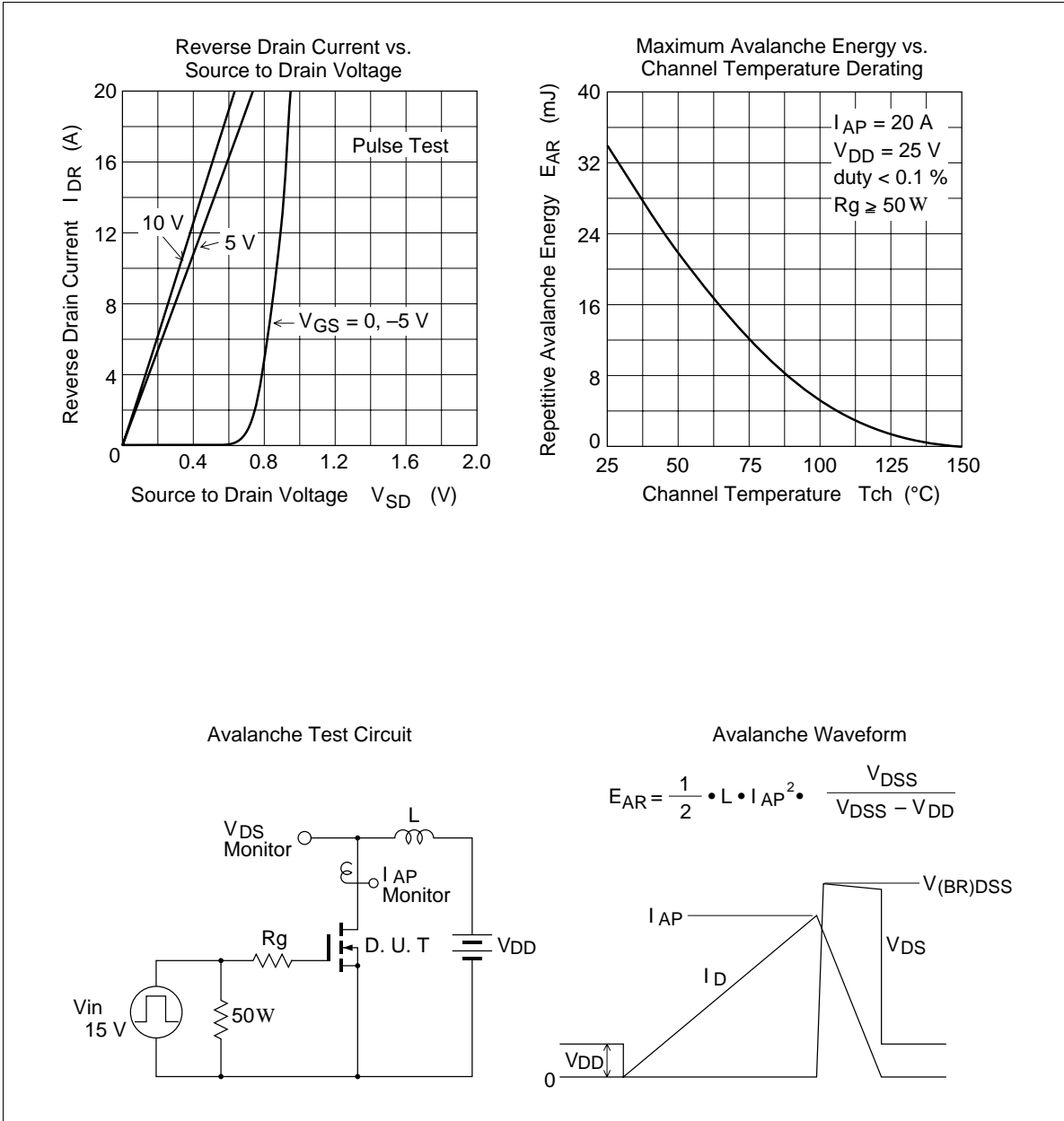
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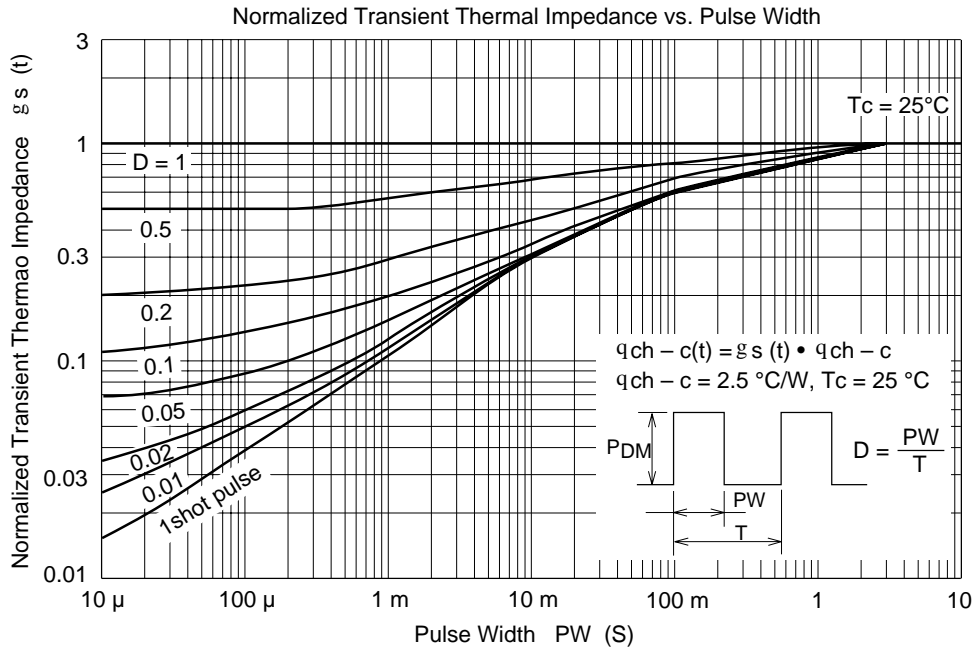
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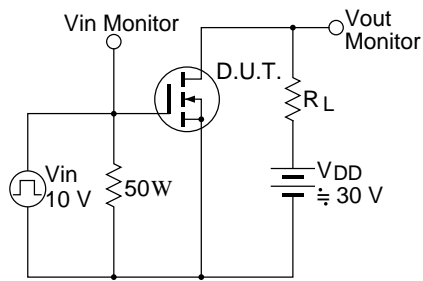
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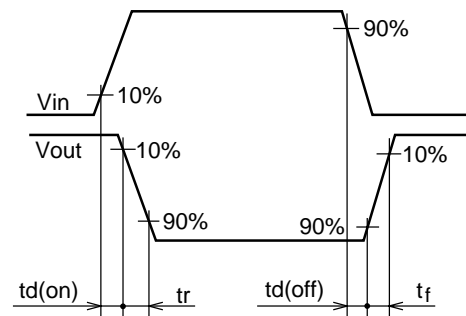
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Switching Time Test Circuit



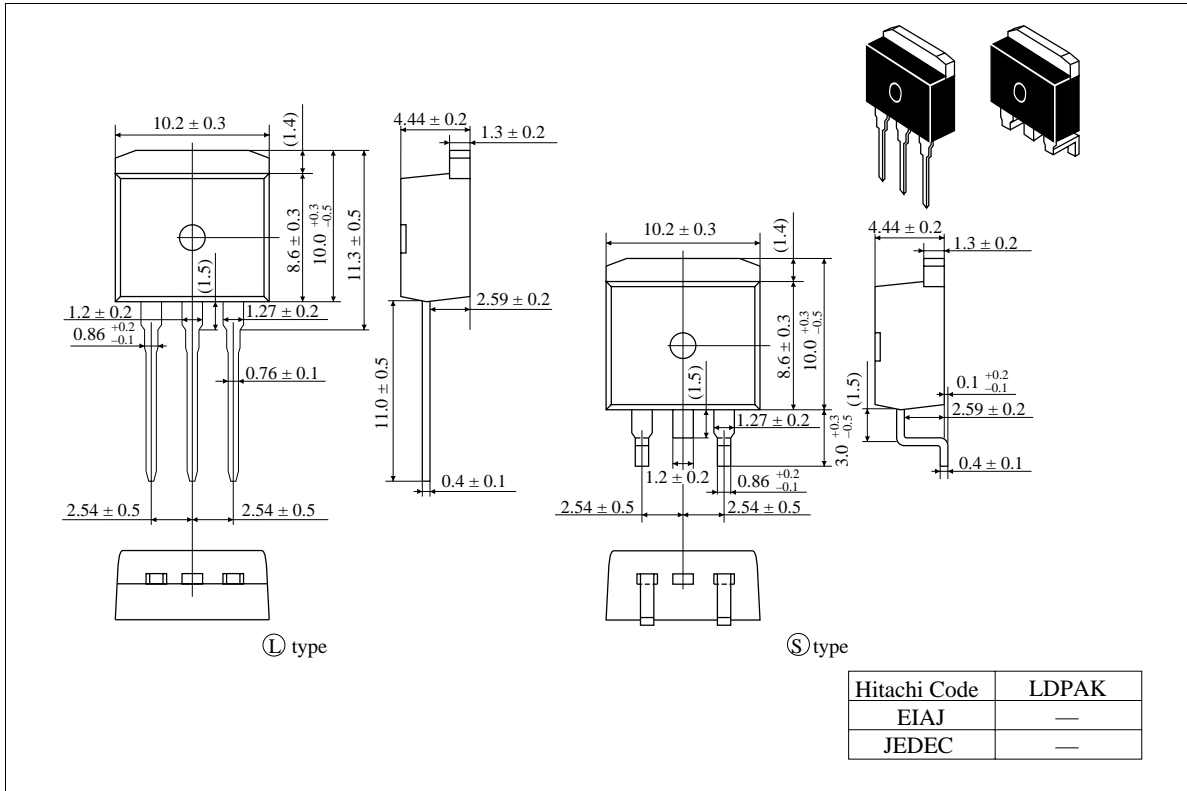
Waveform



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Package Dimentions

Unit: mm



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HITACHI

Hitachi, Ltd.

Semiconductor & Integrated Circuits.
Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan
Tel: Tokyo (03) 3270-2111 Fax: (03) 3270-5109

URL NorthAmerica : <http://semiconductor.hitachi.com/>
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For further information write to:

Hitachi Semiconductor
(America) Inc.
179 East Tasman Drive,
San Jose, CA 95134
Tel: <1> (408) 433-1990
Fax: <1> (408) 433-0223

Hitachi Europe GmbH
Electronic components Group
Dornacher StraÙe 3
D-85622 Feldkirchen, Munich
Germany
Tel: <49> (89) 9 9180-0
Fax: <49> (89) 9 29 30 00

Hitachi Europe Ltd.
Electronic Components Group.
Whitebrook Park
Lower Cookham Road
Maidenhead
Berkshire SL6 8YA, United Kingdom
Tel: <44> (1628) 585000
Fax: <44> (1628) 778322

Hitachi Asia Pte. Ltd.
16 Collyer Quay #20-00
Hitachi Tower
Singapore 049318
Tel: 535-2100
Fax: 535-1533

Hitachi Asia Ltd.
Taipei Branch Office
3F, Hung Kuo Building, No.167,
Tun-Hwa North Road, Taipei (105)
Tel: <886> (2) 2718-3666
Fax: <886> (2) 2718-8180

Hitachi Asia (Hong Kong) Ltd.
Group III (Electronic Components)
7/F., North Tower, World Finance Centre,
Harbour City, Canton Road, Tsim Sha Tsui,
Kowloon, Hong Kong
Tel: <852> (2) 735 9218
Fax: <852> (2) 730 0281
Telex: 40815 HITEC HX