

2SK1336

Silicon N-Channel MOS FET

HITACHI

ADE-208-1273 (Z)

1st. Edition

Mar. 2001

Application

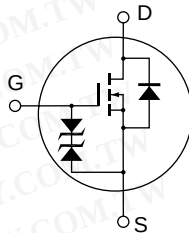
High speed power switching

Features

- Low on-resistance
- High speed switching
- Low drive current
- 4 V gate drive device
 - Can be driven from 5 V source
- Suitable for motor drive, DC-DC converter, power switch and solenoid drive

Outline

TO-92



1. Source
2. Drain
3. Gate

Absolute Maximum Ratings (Ta = 25°C)

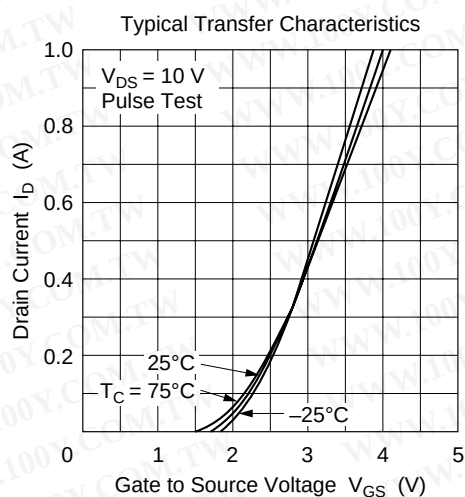
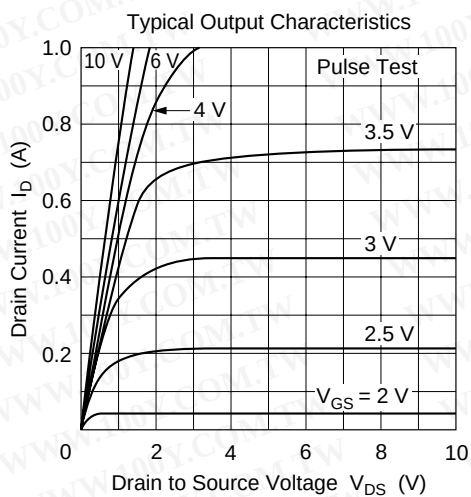
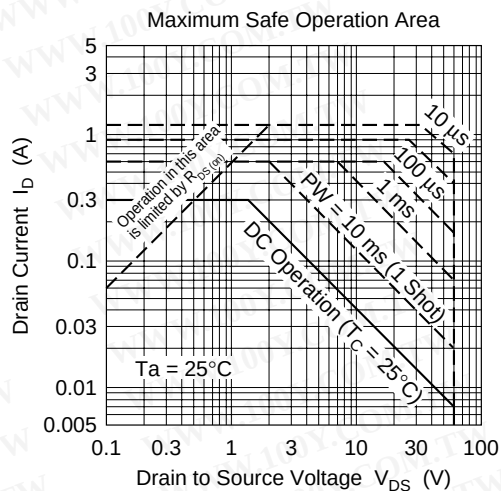
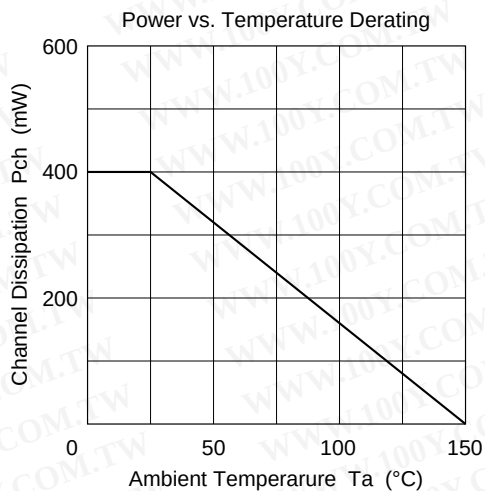
Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	60	V
Gate to source voltage	V_{GSS}	±20	V
Drain current	I_D	0.3	A
Drain peak current	$I_{D(pulse)}^{*1}$	1.2	A
Body to drain diode reverse drain current	I_{DR}	0.3	A
Channel dissipation	Pch	400	mW
Channel temperature	Tch	150	°C
Storage temperature	Tstg	-55 to +150	°C

Notes: 1. PW 10 μs, duty cycle 1%

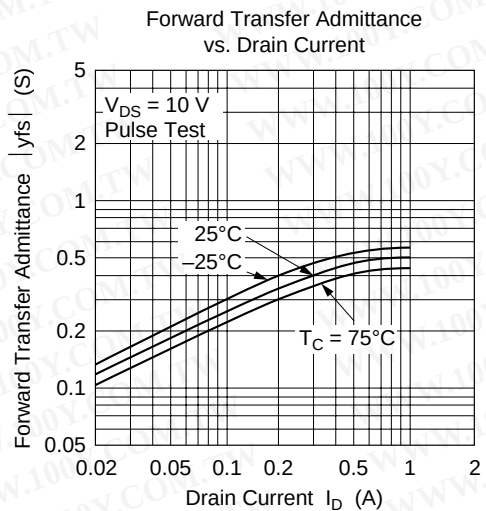
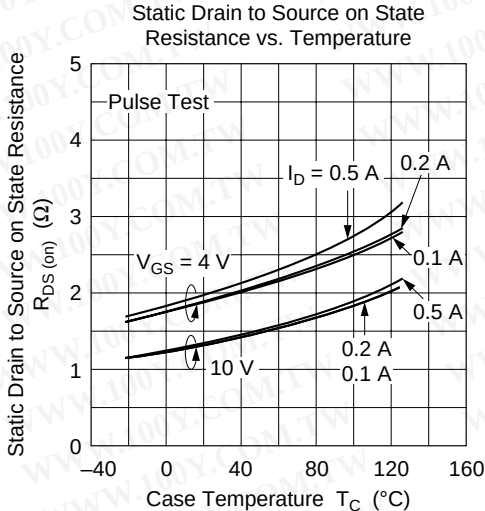
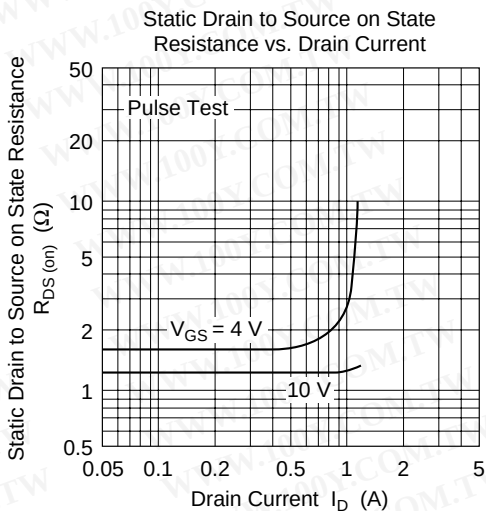
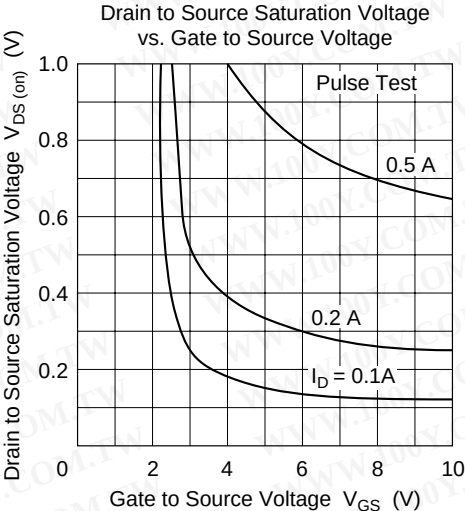
Electrical Characteristics (Ta = 25°C)

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	$I_G = \pm 100 \text{ } \mu\text{A}$, $V_{DS} = 0$
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}	—	—	50	μA	$V_{DS} = 50 \text{ V}$, $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.0	V	$I_D = 1 \text{ mA}$, $V_{DS} = 10 \text{ V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	1.3	1.7		$I_D = 0.2 \text{ A}$, $V_{GS} = 10 \text{ V}^{*1}$
		—	1.8	2.5		$I_D = 0.2 \text{ A}$, $V_{GS} = 4 \text{ V}^{*1}$
Forward transfer admittance	yfs	0.22	0.35	—	S	$I_D = 0.2 \text{ A}$, $V_{DS} = 10 \text{ V}^{*1}$
Input capacitance	Ciss	—	33	—	pF	$V_{DS} = 10 \text{ V}$, $V_{GS} = 0$,
Output capacitance	Coss	—	17	—	pF	f = 1 MHz
Reverse transfer capacitance	Crss	—	5	—	pF	
Turn-on delay time	$t_{d(on)}$	—	2	—	ns	$I_D = 0.2 \text{ A}$, $V_{GS} = 10 \text{ V}$, $R_L = 150$
Rise time	t_r	—	4	—	ns	
Turn-off delay time	$t_{d(off)}$	—	18	—	ns	
Fall time	t_f	—	16	—	ns	
Body to drain diode forward voltage	V_{DF}	—	0.9	—	V	$I_F = 0.3 \text{ A}$, $V_{GS} = 0$
Body to drain diode reverse recovery time	t_{rr}	—	45	—	ns	$I_F = 0.3 \text{ A}$, $V_{GS} = 0$, $di_F/dt = 50 \text{ A}/\mu\text{s}$

Note: 1. Pulse test

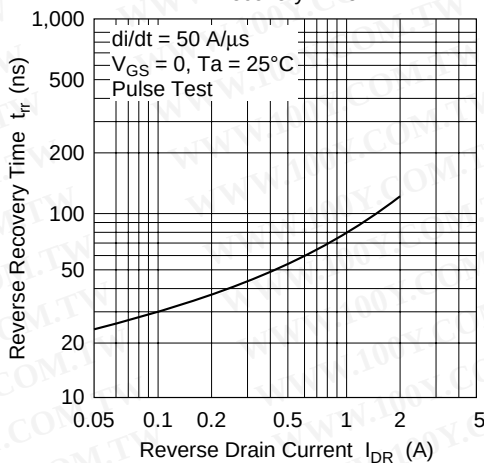


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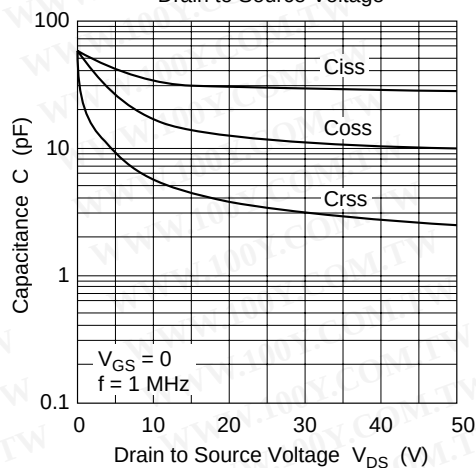


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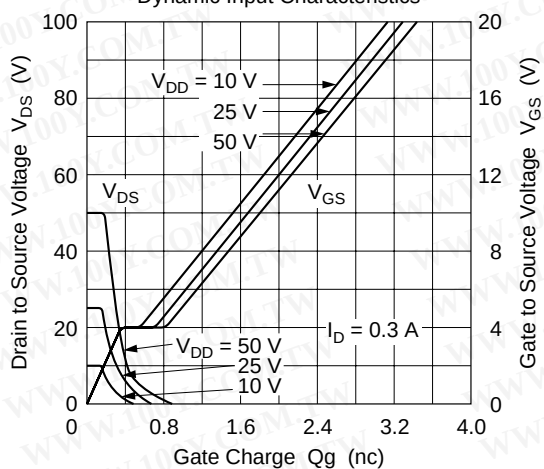
Body to Drain Diode Reverse Recovery Time



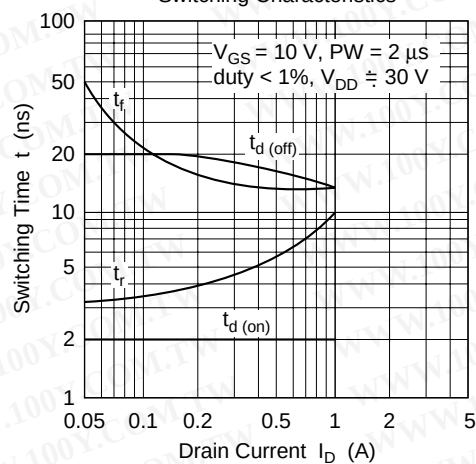
Typical Capacitance vs. Drain to Source Voltage



Dynamic Input Characteristics

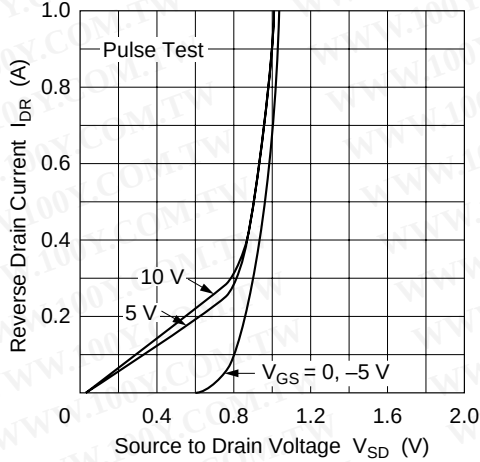


Switching Characteristics



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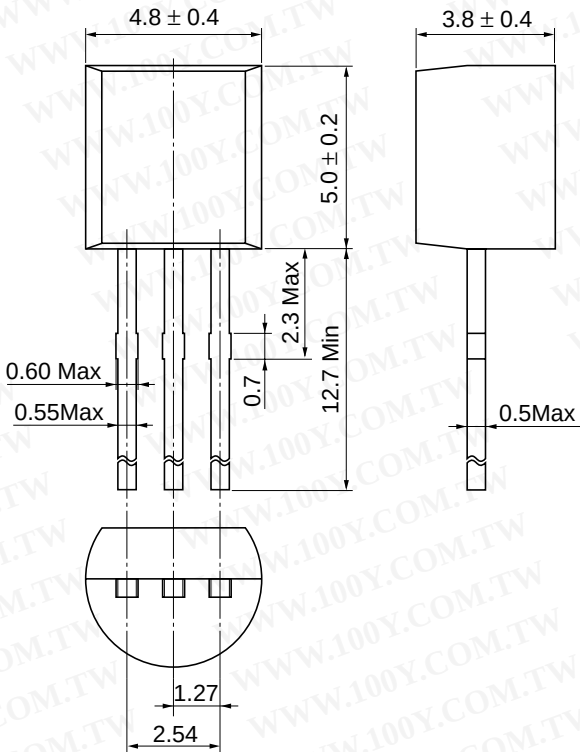
Reverse Drain Current vs.
Source to Drain Voltage



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Package Dimensions

As of January, 2001
Unit: mm



Hitachi Code	TO-92 (1)
JEDEC	Conforms
EIAJ	Conforms
Mass (reference value)	0.25 g

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