2SK2978

Silicon N Channel MOS FET
High Speed Power Switching

HITACHI

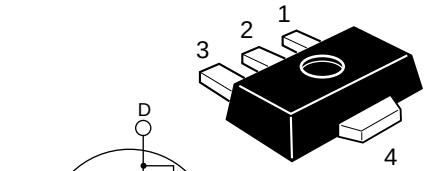
ADE-208-659B (Z)
3rd. Edition
June 1, 1998

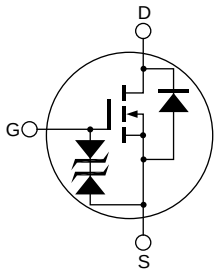
Features

- Low on-resistance
  $R_{DS(on)}$ = 0.09Ω typ. (V_{GS} = 4 V, I_D = 1.5 A)
- Low drive current
- High speed switching
- 2.5V gate drive devices.

Outline

UPAK





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

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	20	V
Gate to source voltage	V_{GSS}	±10	V
Drain current	I_D	2.5	A
Drain peak current	$I_{D(pulse)}$ Note1	5	A
Body-drain diode reverse drain current	I_{DR}	2.5	A
Channel dissipation	Pch Note2	1	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

Note: 1. PW ≤ 10µs, duty cycle ≤ 1 %
2. When using the alumina ceramic board (12.5 x 20 x 0.7 mm)

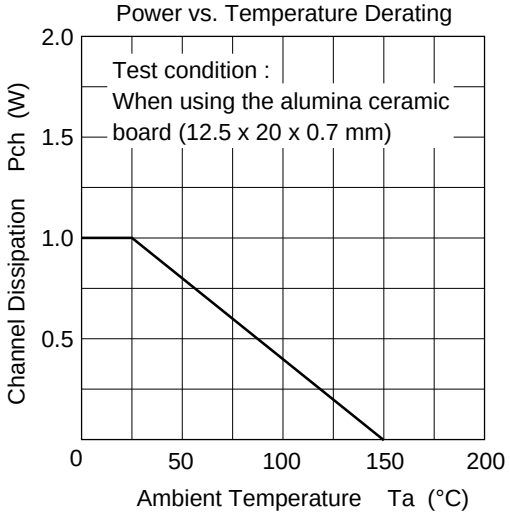
Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	20	—	—	V	I_D = 10mA, V_{GS} = 0
Gate to source breakdown voltage	$V_{(BR)GSS}$	±10	—	—	V	I_G = ±100µA, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	10	µA	V_{DS} = 20 V, V_{GS} = 0
Gate to source leak current	I_{GSS}	—	—	±10	µA	V_{GS} = ±8V, V_{DS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	0.5	—	1.5	V	I_D = 1mA, V_{DS} = 10V
Static drain to source on state resistance	$R_{DS(on)}$	—	0.09	0.12	Ω	I_D = 1.5A, V_{GS} = 4V Note3
Static drain to source on state resistance	$R_{DS(on)}$	—	0.12	0.20	Ω	I_D = 1.5A, V_{GS} = 2.5V Note3
Forward transfer admittance	$\|y_{fs}\|$	3.0	5.0	—	S	I_D = 1.5A, V_{DS} = 10V Note3
Input capacitance	Ciss	—	260	—	pF	V_{DS} = 10V
Output capacitance	Coss	—	150	—	pF	V_{GS} = 0
Reverse transfer capacitance	Crss	—	75	—	pF	f = 1MHz
Turn-on delay time	$t_{d(on)}$	—	15	—	ns	V_{GS} = 4V, I_D = 1.5A
Rise time	t_r	—	70	—	ns	R_L = 6.67Ω
Turn-off delay time	$t_{d(off)}$	—	55	—	ns	
Fall time	t_f	—	70	—	ns	
Body–drain diode forward voltage	V_{DF}	—	0.9	—	V	I_F = 2.5A, V_{GS} = 0
Body–drain diode reverse recovery time	t_{rr}	—	75	—	ns	I_F = 2.5A, V_{GS} = 0 diF/ dt =50A/µs

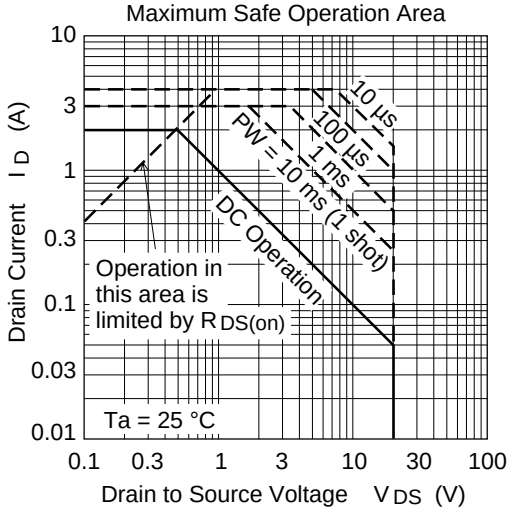
Note: 3. Pulse test
4. Marking is “ZY”

Main Characteristics

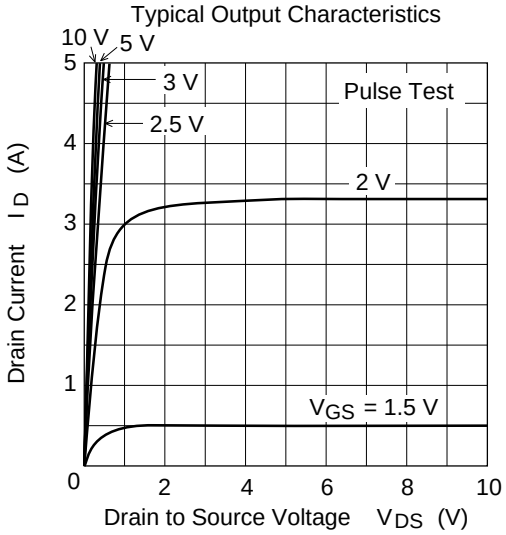
Power vs. Temperature Derating



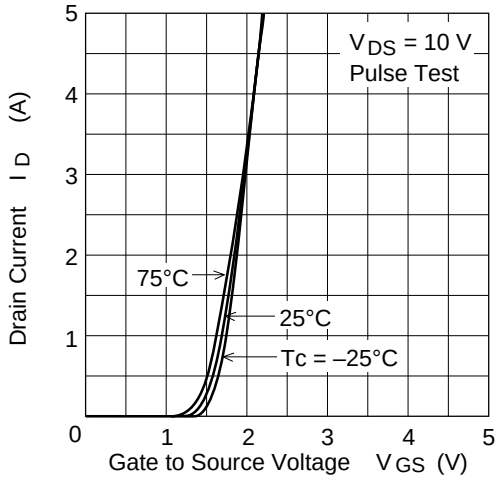
Maximum Safe Operation Area



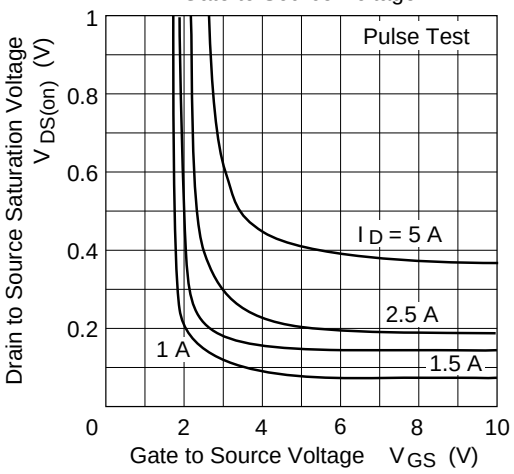
Typical Output Characteristics



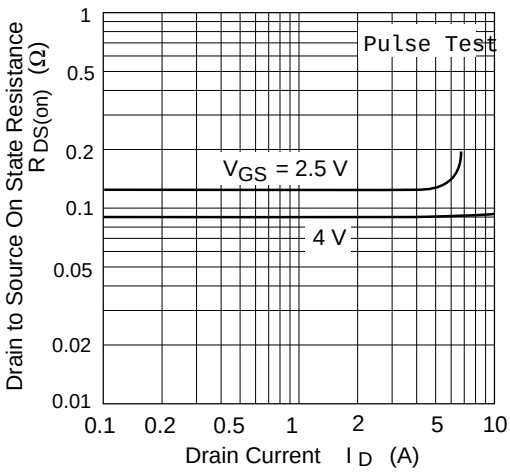
Typical Transfer Characteristics



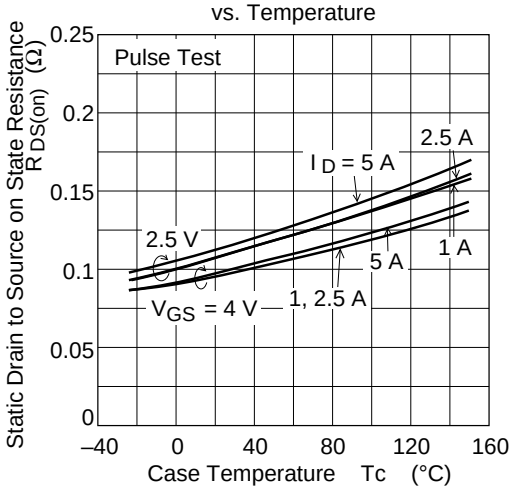
Drain to Source Saturation Voltage vs. Gate to Source Voltage



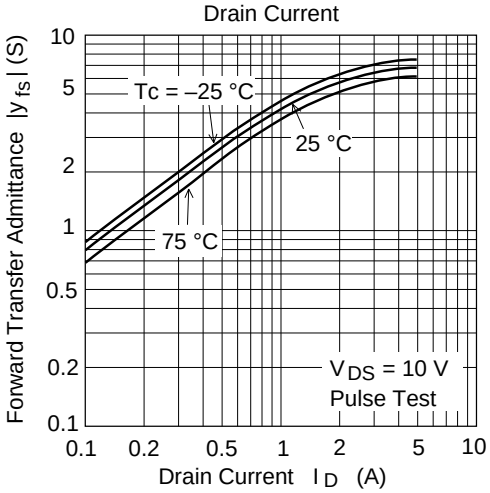
Static Drain to Source on State Resistance vs. Drain Current



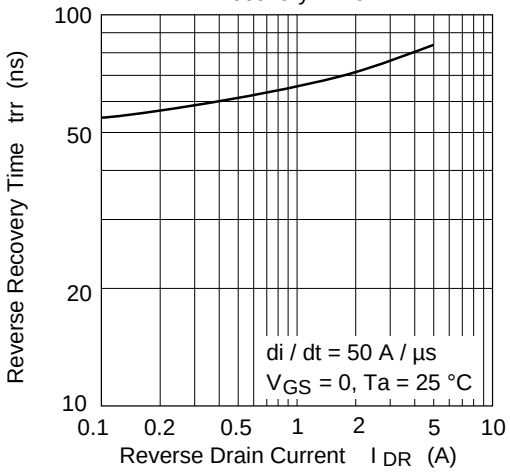
Static Drain to Source on State Resistance vs. Temperature



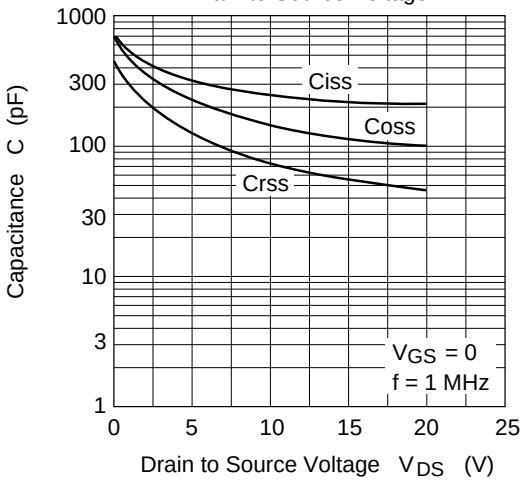
Forward Transfer Admittance vs. Drain Current



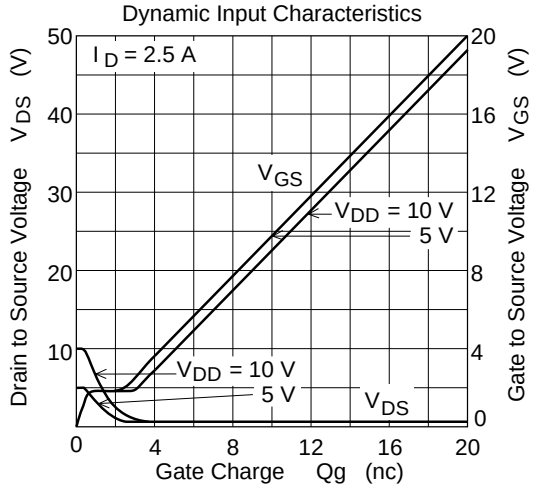
Body–Drain Diode Reverse Recovery Time



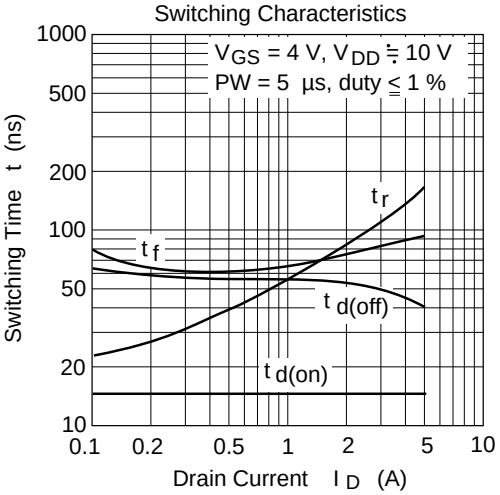
Typical Capacitance vs. Drain to Source Voltage



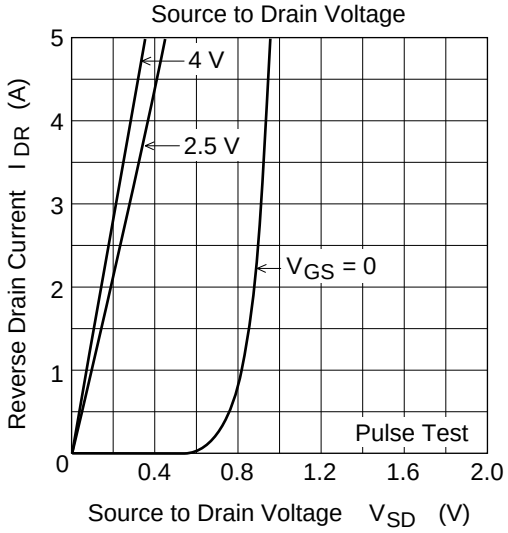
Dynamic Input Characteristics



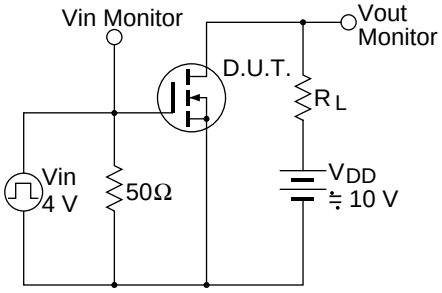
Switching Characteristics



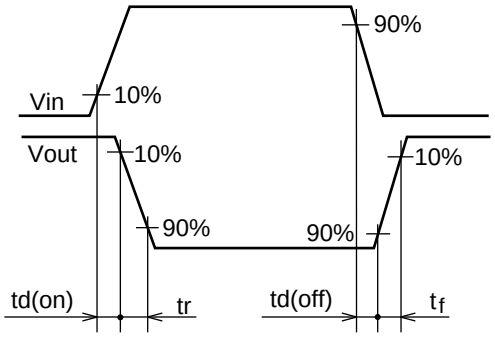
Reverse Drain Current vs.
Source to Drain Voltage



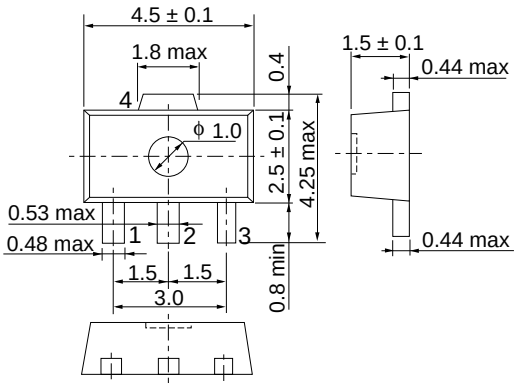
Switching Time Test Circuit

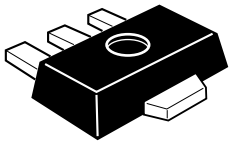


Waveform



Package Dimensions (Unit: mm)





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HITACHI

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

For further information write to:

Hitachi Semiconductor (America) Inc.
2000 Sierra Point Parkway
Brisbane, CA. 94005-1897
U S A
Tel: 800-285-1601
Fax:303-297-0447

Hitachi Europe GmbH
Continental Europe
Dornacher Straße 3
D-85622 Feldkirchen
München
Tel: 089-9 91 80-0
Fax: 089-9 29 30-00

Hitachi Europe Ltd.
Electronic Components Div.
Northern Europe Headquarters
Whitebrook Park
Lower Cookham Road
Maidenhead
Berkshire SL6 8YA
United Kingdom
Tel: 01628-585000
Fax: 01628-585160

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

Hitachi Asia (Hong Kong) Ltd.
Unit 706, North Tower,
World Finance Centre,
Harbour City, Canton Road
Tsim Sha Tsui, Kowloon
Hong Kong
Tel: 27359218
Fax: 27306071