

2SK2978

Silicon N Channel MOS FET
High Speed Power Switching

HITACHI

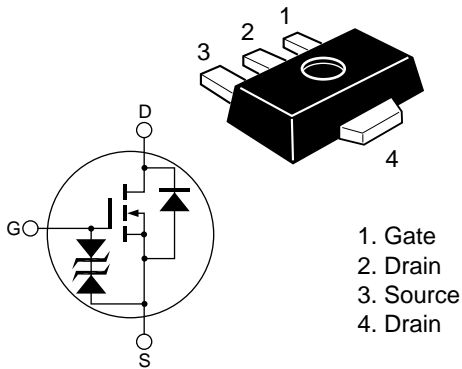
ADE-208-659B (Z)
3rd. Edition
Jun 1998

Features

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

Outline

UPAK



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

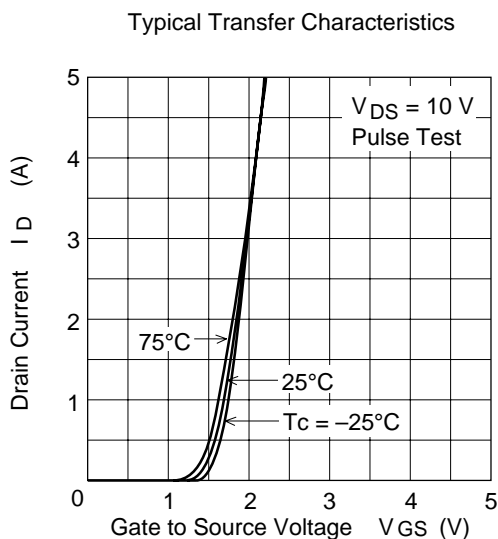
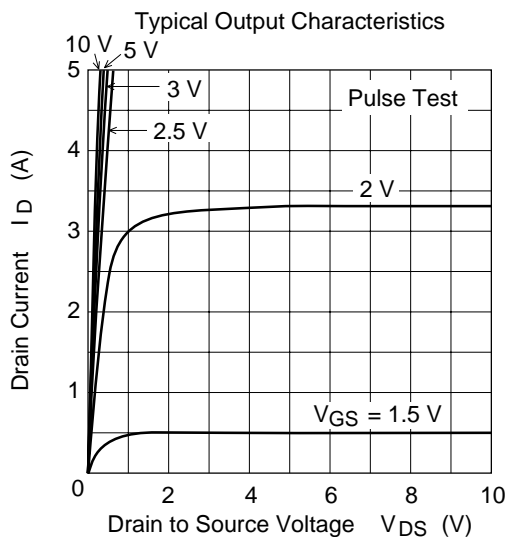
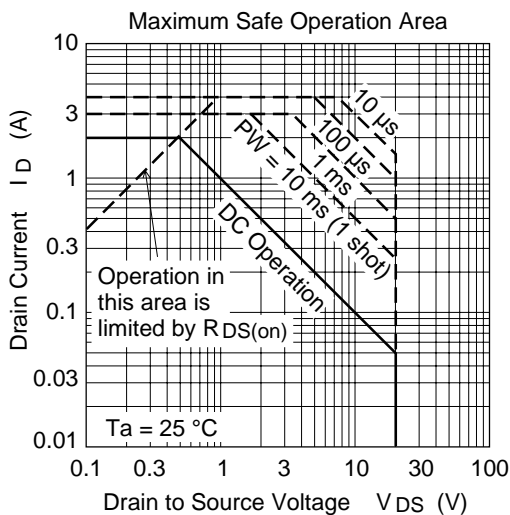
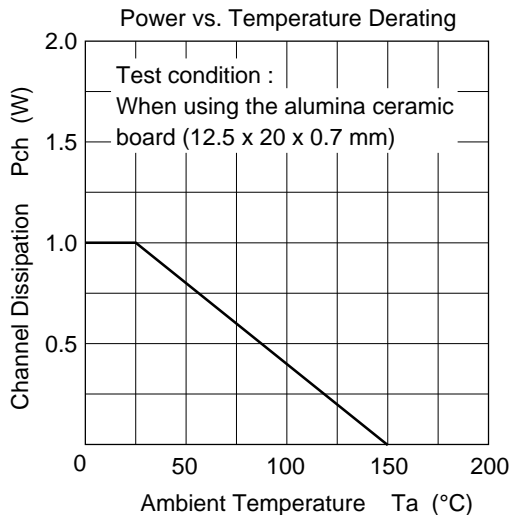
Note: 1. $PW \leq 10\mu s$, duty cycle $\leq 1\%$
 2. When using the alumina ceramic board (12.5 x 20 x 0.7 mm)

Electrical Characteristics (Ta = 25°C)

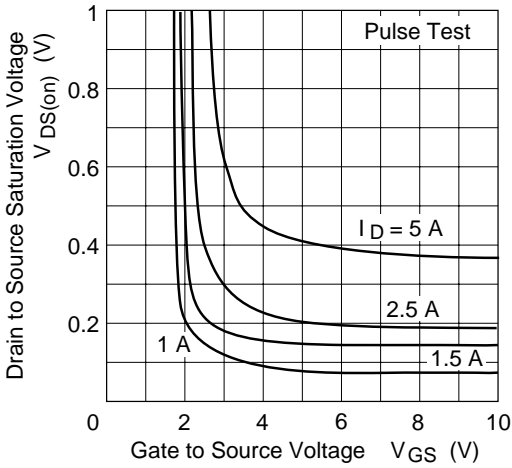
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	20	—	—	V	$I_D = 10mA, V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	±10	—	—	V	$I_G = \pm 100\mu A, V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	10	μA	$V_{DS} = 20V, V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	—	±10	μA	$V_{GS} = \pm 8V, V_{DS} = 0$
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	$R_L = 6.67\Omega$
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"

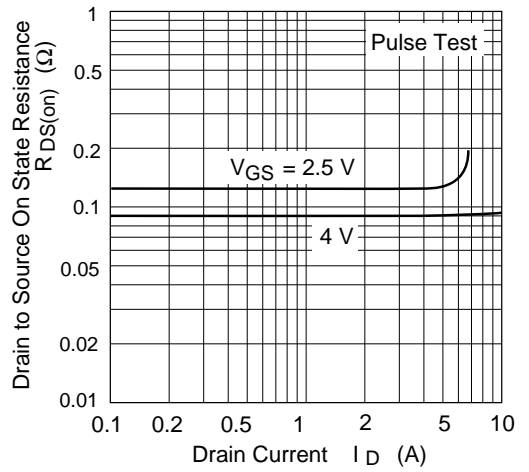
Main Characteristics



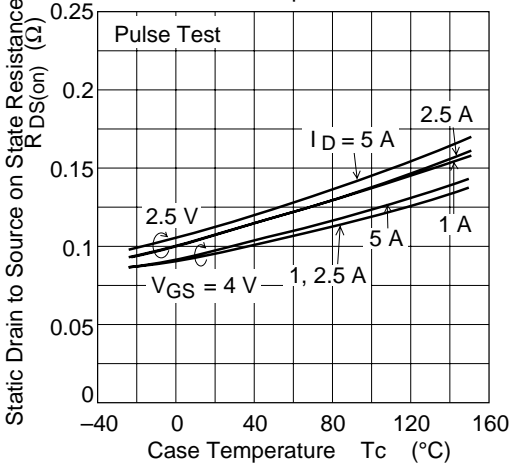
Drain to Source Saturation Voltage vs. Gate to Source Voltage



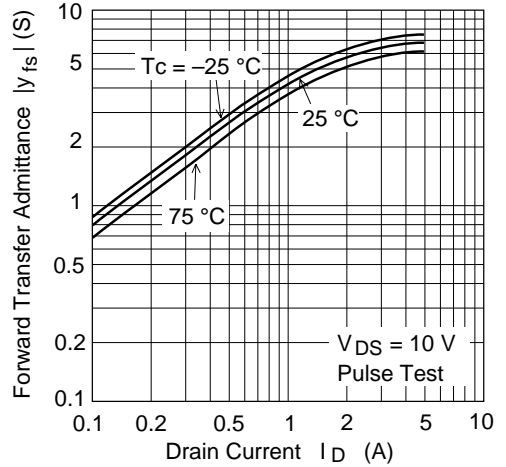
Static Drain to Source on State Resistance vs. Drain Current

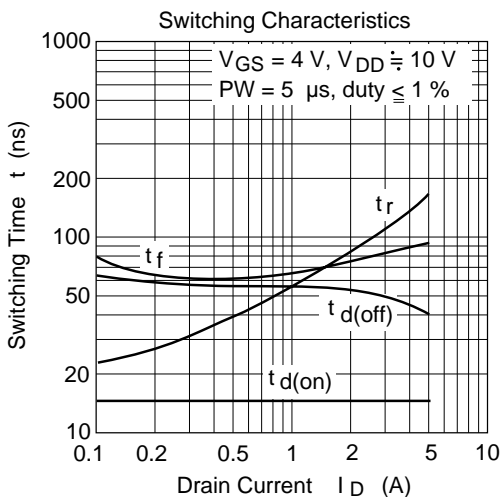
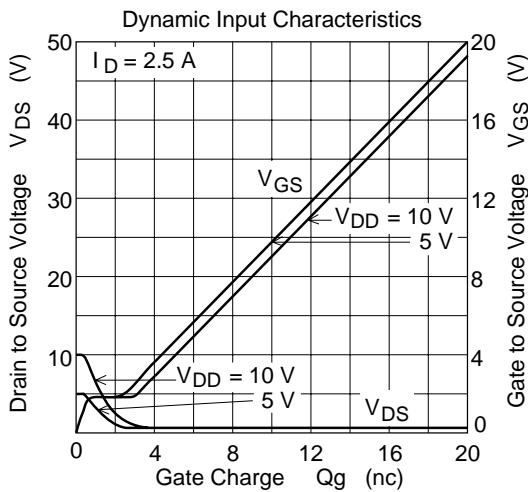
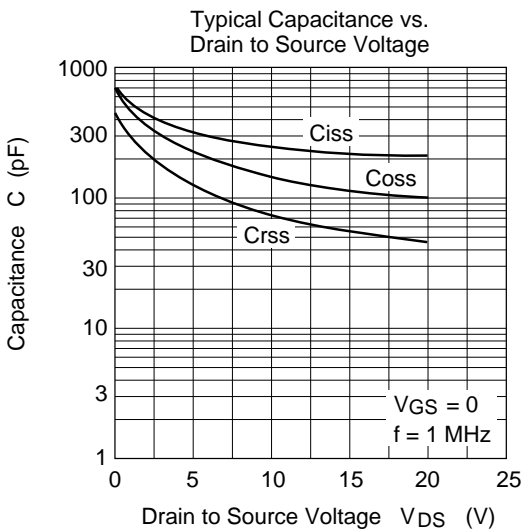
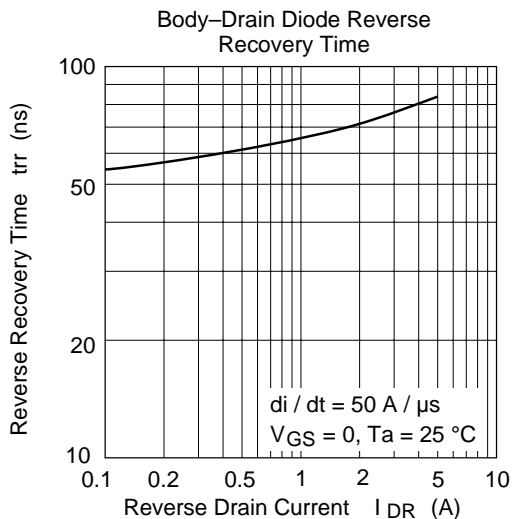


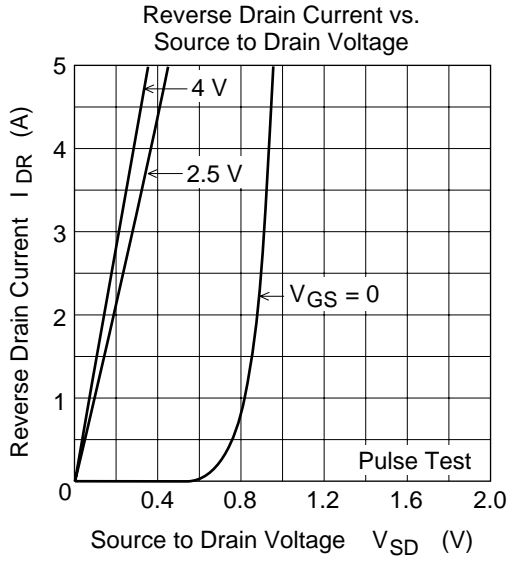
Static Drain to Source on State Resistance vs. Temperature



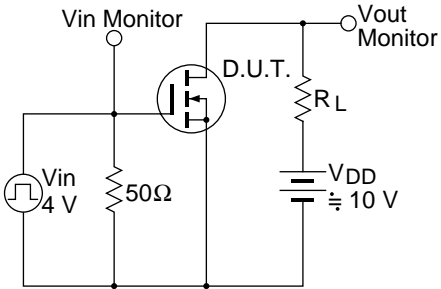
Forward Transfer Admittance vs. Drain Current



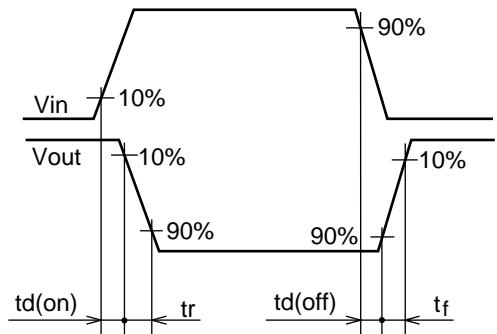




Switching Time Test Circuit

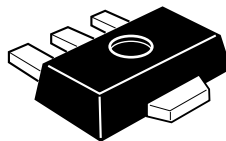
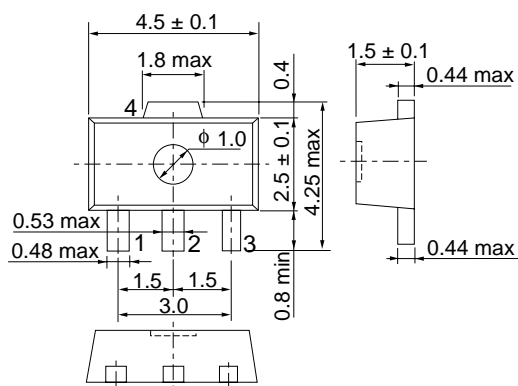


Waveform



Package Dimensions

Unit: mm



Hitachi Code	UPAK
EIAJ	SC-62
JEDEC	-

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