2SK3000

Silicon N Channel MOS FET
Low Frequency Power Switching

HITACHI

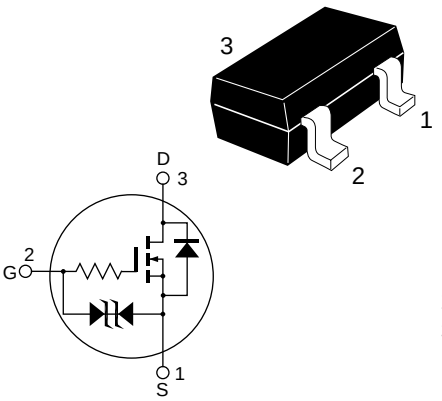
ADE-208-585 (Z)
1st. Edition
December 1997

Features

- Low on-resistance
  $R_{DS(on)}$ = 0. 25Ω typ. (V_{GS} = 10 V, I_D = 450 mA)
- 4V gate drive devices.
- Small package (MPAK)
- Expansive drain to source surge power capability

Outline

MPAK



1. Source
2. Gate
3. Drain

Hitachi semiconductor

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	40	V
Gate to source voltage	V_{GSS}	±10	V
Drain current	I_D	1.0	A
Drain peak current	$I_{D(pulse)}$ Note1	4.0	A
Reverse drain current	I_{DR}	1.0	A
Channel dissipation	Pch Note2	400	mW
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

Note: 1. PW ≤ 10µs, duty cycle ≤ 1 %
2. When using the glass epoxy board (10 mm x 10 mm x 1 mm^t)

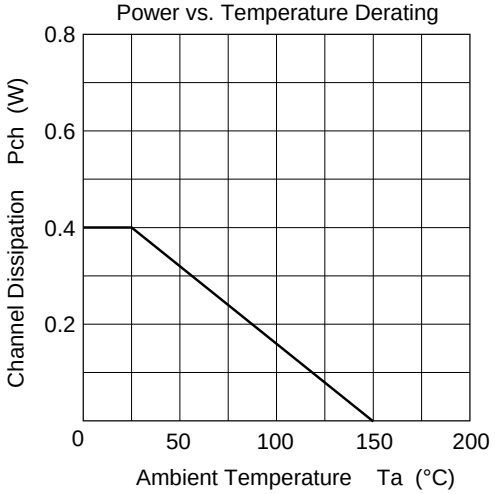
Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	40	—	60	V	I_D = 100µA, V_{GS} = 0
Drain to source voltage	$V_{DS(SUS)}$	40	—	—	V	L = 100µH, I_D = 3 A
Gate to source breakdown voltage	$V_{(BR)GSS}$	±10	—	—	V	I_G = ±100µA, V_{DS} = 0
Zero gate voltege drain current	I_{DSS}	—	—	1.0	µA	V_{DS} = 40 V, V_{GS} = 0
Gate to source leak current	I_{GSS}	—	—	±5	µA	V_{GS} = ±6.5V, V_{DS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	1.1	—	2.1	V	I_D = 10µA, V_{DS} = 5V
Static drain to source on state resistance	$R_{DS(on)}$	—	0.3	0.5	Ω	I_D = 450 mA V_{GS} = 4V Note3
Static drain to source on state resistance	$R_{DS(on)}$	—	0.25	0.3	Ω	I_D = 450 mA V_{GS} = 10V Note3
Forward transfer admittance	$\|y_{fs}\|$	0.5	1.2	—	S	I_D = 450 mA V_{DS} = 10V Note3
Input capacitance	Ciss	—	14.0	—	pF	V_{DS} = 10V
Output capacitance	Coss	—	68	—	pF	V_{GS} = 0
Reverse transfer capacitance	Crss	—	3.0	—	pF	f = 1MHz
Turn-on delay time	$t_{d(on)}$	—	0.12	—	µs	V_{GS} = 4V, I_D = 450 mA
Rise time	t_r	—	0.6	—	µs	R_L = 22Ω
Turn-off delay time	$t_{d(off)}$	—	1.7	—	µs	
Fall time	t_f	—	1.4	—	µs	

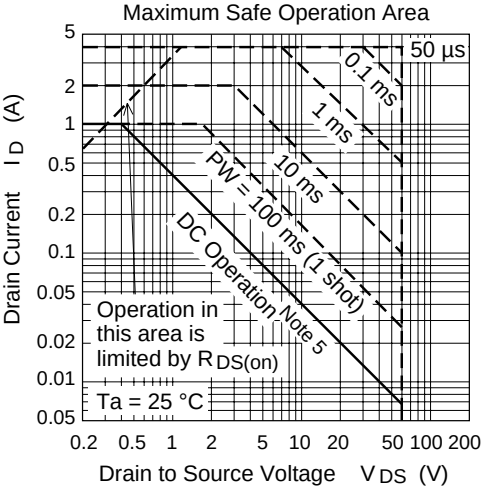
Note: 3. Pulse test
4. Marking is “ZY”.

Main Characteristics

Power vs. Temperature Derating

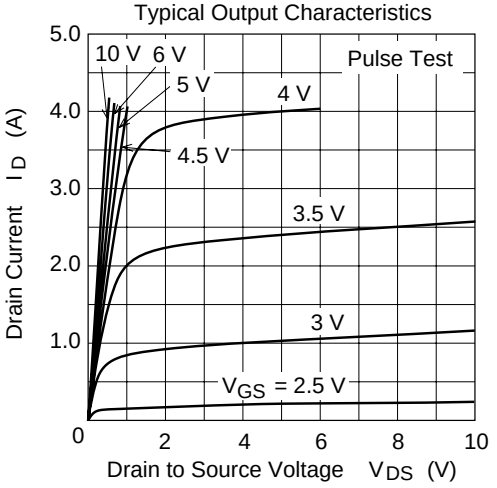


Maximum Safe Operation Area

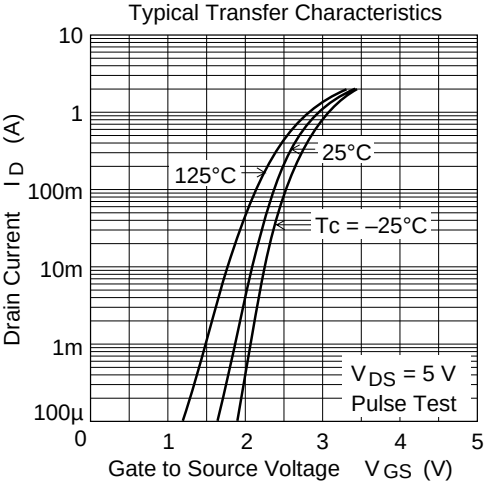


Note5 : When using the glass epoxy board (10mm x 10mm x 1mmt)

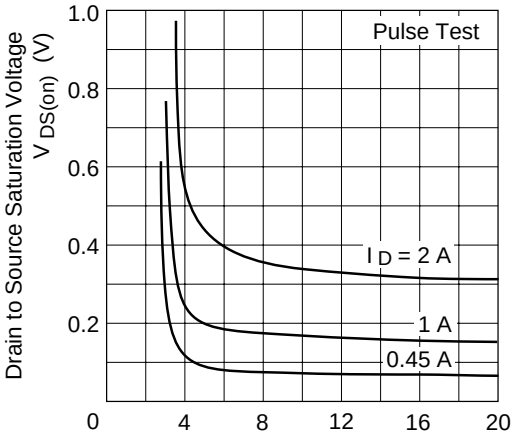
Typical Output Characteristics



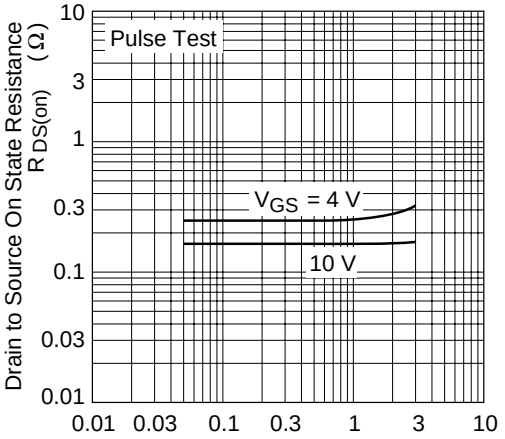
Typical Transfer Characteristics



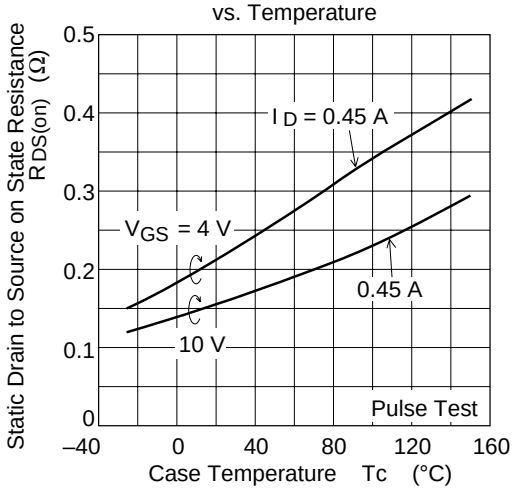
Drain to Source Saturation Voltage vs. Gate to Source Voltage



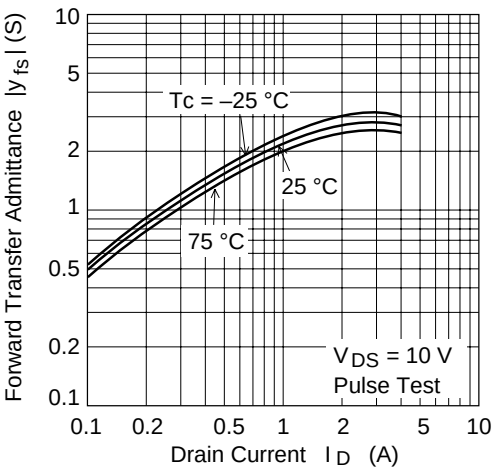
Static Drain to Source on State Resistance vs. Drain Current



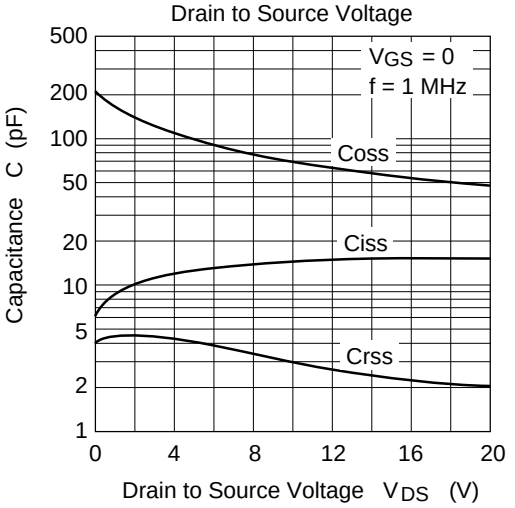
Static Drain to Source on State Resistance vs. Temperature



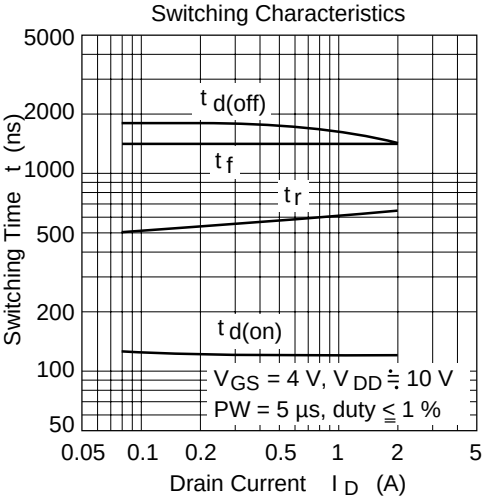
Forward Transfer Admittance vs. Drain Current



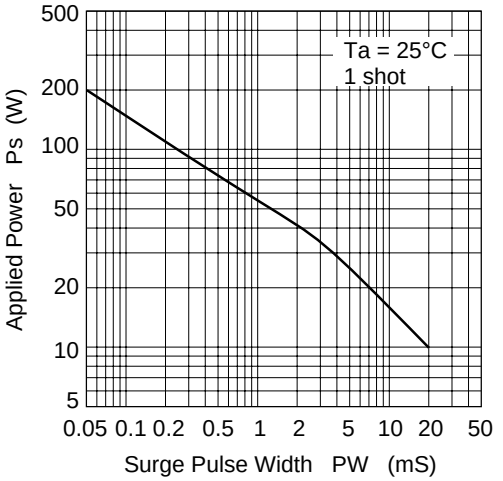
Typical Capacitance vs.
Drain to Source Voltage



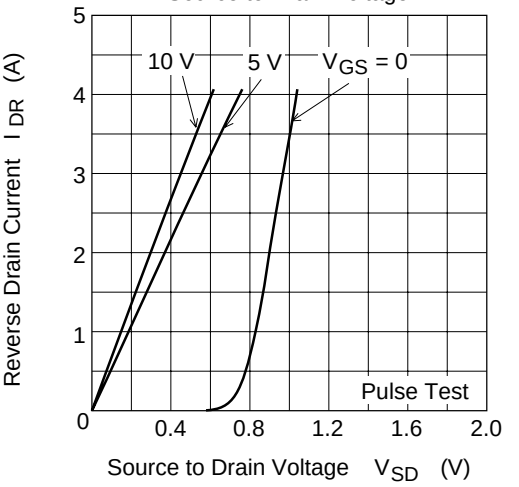
Switching Characteristics



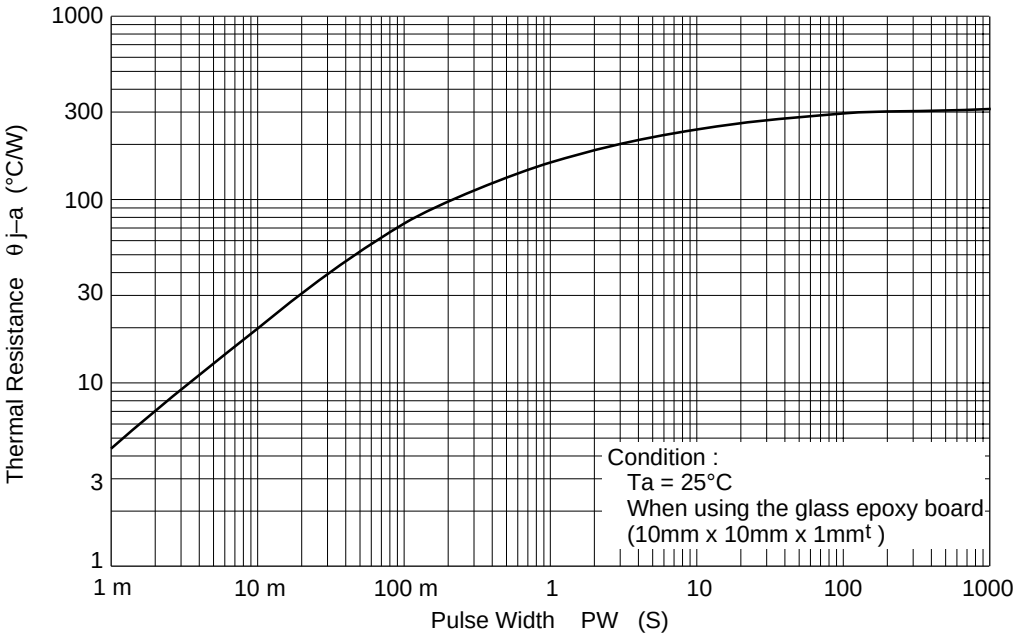
Drain to Source DiodeReverse Surge
Destruction Characteristics



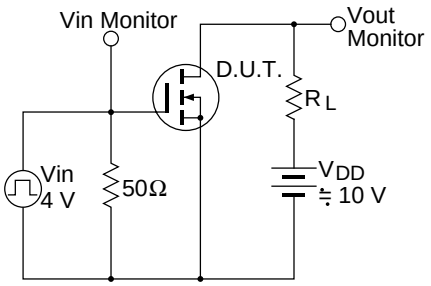
Reverse Drain Current vs.
Source to Drain Voltage



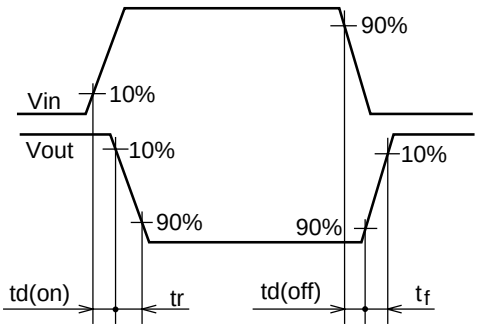
Transient Thermal Resistance



Switching Time Test Circuit

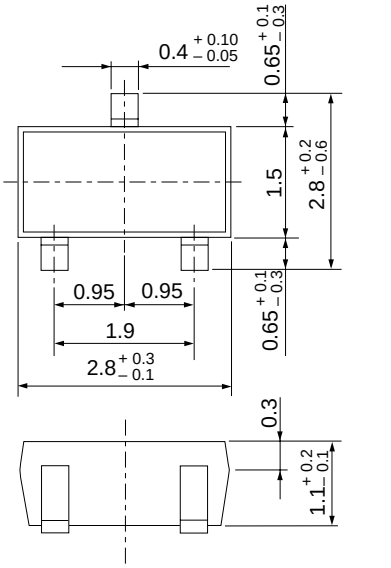


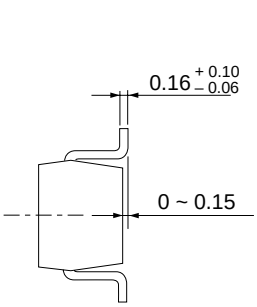
Switching Time Waveforms

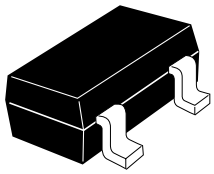


Package Dimensions

Unit: mm







Hitachi Code	MPAK
EIAJ	SC–59A
JEDEC	TO–236Mod.

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