

# 2SK3000

Silicon N Channel MOS FET  
Low Frequency Power Switching

# HITACHI

ADE-208-585 (Z)

1st. Edition

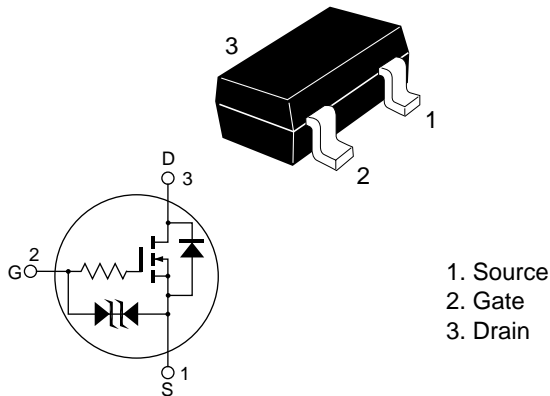
December 1997

## Features

- Low on-resistance  
 $R_{DS(on)} = 0.25\Omega$  typ. ( $V_{GS} = 10\text{ V}$ ,  $I_D = 450\text{ mA}$ )
- 4V gate drive devices.
- Small package (MPAK)
- Expansive drain to source surge power capability

## Outline

MPAK



## 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	$I_{D(pulse)}$ <sup>Note1</sup>	4.0	A
Reverse drain current	$I_{DR}$	1.0	A
Channel dissipation	Pch <sup>Note2</sup>	400	mW
Channel temperature	Tch	150	°C
Storage temperature	Tstg	-55 to +150	°C

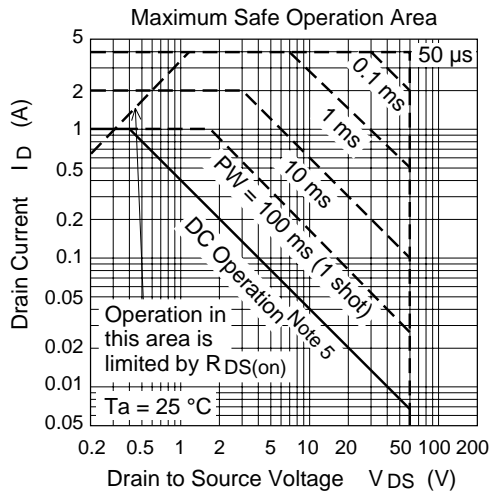
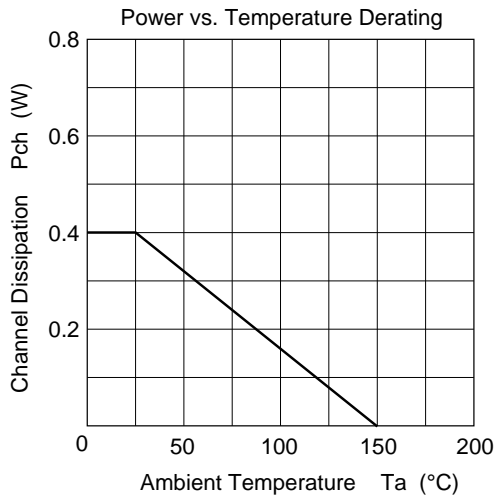
Note: 1.  $PW \leq 10\mu s$ , duty cycle  $\leq 1\%$   
 2. When using the glass epoxy board (10 mm x 10 mm x 1 mm<sup>1</sup>)

## Electrical Characteristics (Ta = 25°C)

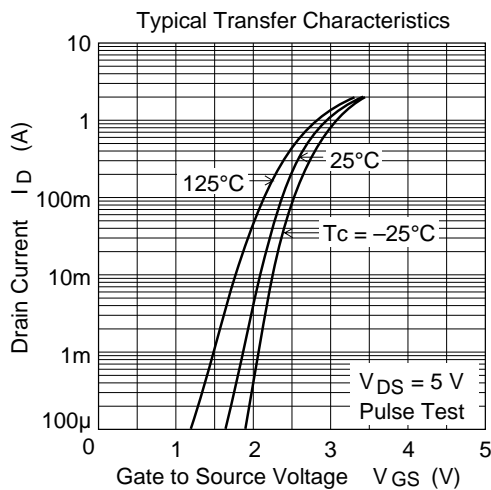
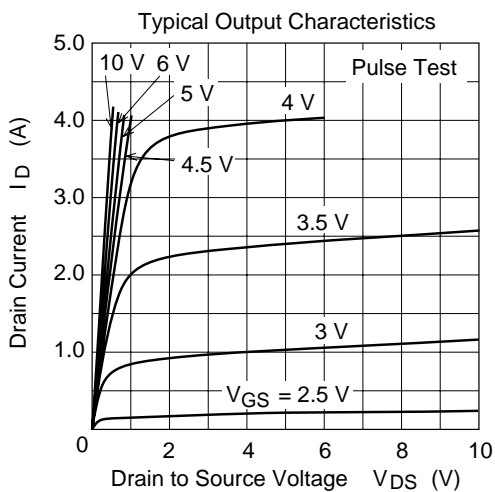
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	40	—	60	V	$I_D = 100\mu A$ , $V_{GS} = 0$
Drain to source voltage	$V_{DS(SUS)}$	40	—	—	V	$L = 100\mu H$ , $I_D = 3 A$
Gate to source breakdown voltage	$V_{(BR)GSS}$	±10	—	—	V	$I_G = \pm 100\mu A$ , $V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	1.0	μA	$V_{DS} = 40 V$ , $V_{GS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	±5	μA	$V_{GS} = \pm 6.5V$ , $V_{DS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.1	—	2.1	V	$I_D = 10\mu A$ , $V_{DS} = 5V$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.3	0.5	Ω	$I_D = 450 mA$ $V_{GS} = 4V$ <sup>Note3</sup>
Static drain to source on state resistance	$R_{DS(on)}$	—	0.25	0.3	Ω	$I_D = 450 mA$ $V_{GS} = 10V$ <sup>Note3</sup>
Forward transfer admittance	$ y_{fs} $	0.5	1.2	—	S	$I_D = 450 mA$ $V_{DS} = 10V$ <sup>Note3</sup>
Input capacitance	$C_{iss}$	—	14.0	—	pF	$V_{DS} = 10V$
Output capacitance	$C_{oss}$	—	68	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	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	$R_L = 22\Omega$
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".

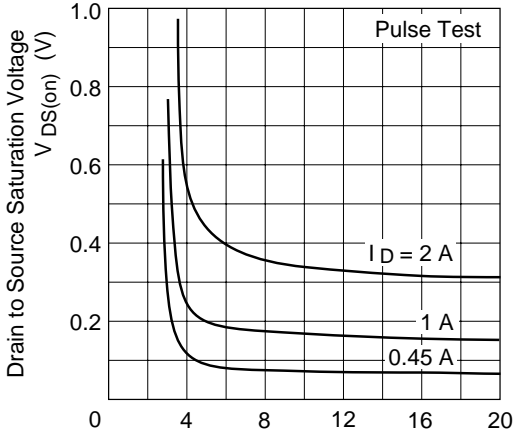
## Main Characteristics



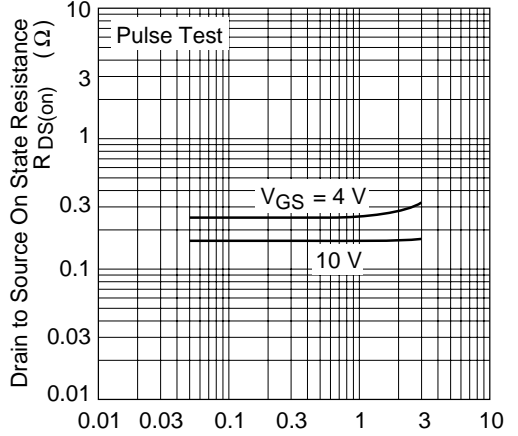
Note5 : When using the glass epoxy board (10mm x 10mm x 1mm<sup>t</sup>)



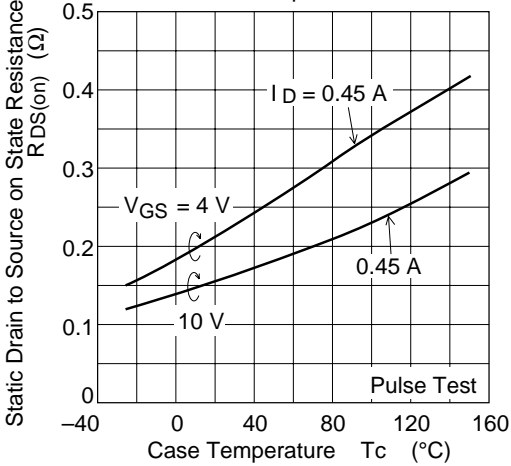
Drain to Source Saturation Voltage vs. Gate to Source Voltage



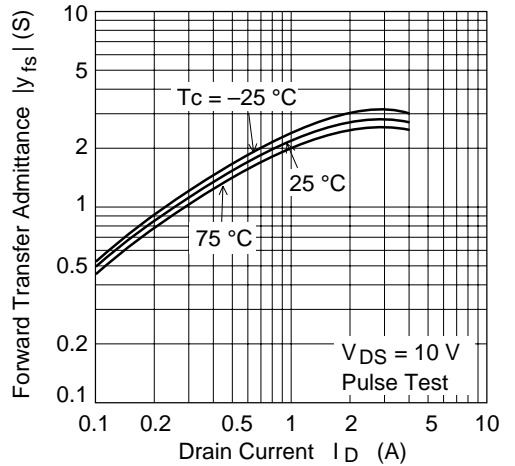
Static Drain to Source on State Resistance vs. Drain Current



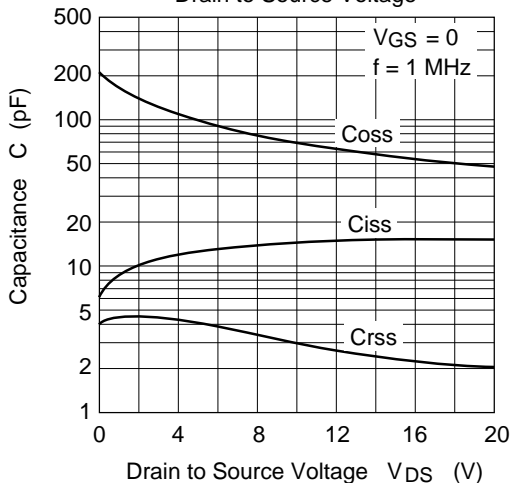
Static Drain to Source on State Resistance vs. Temperature



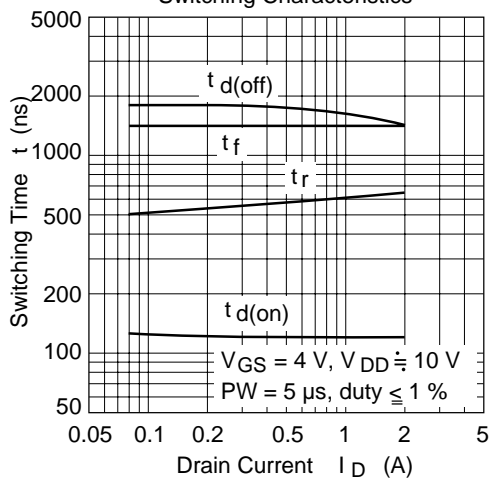
Forward Transfer Admittance vs. Drain Current



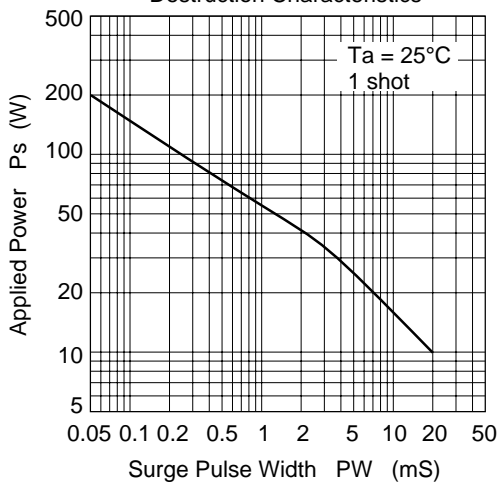
Typical Capacitance vs. Drain to Source Voltage



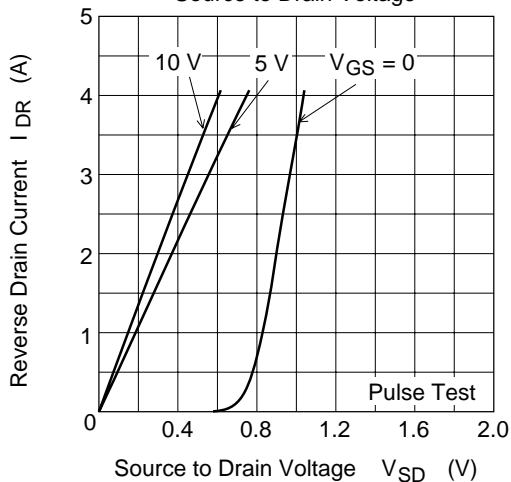
Switching Characteristics



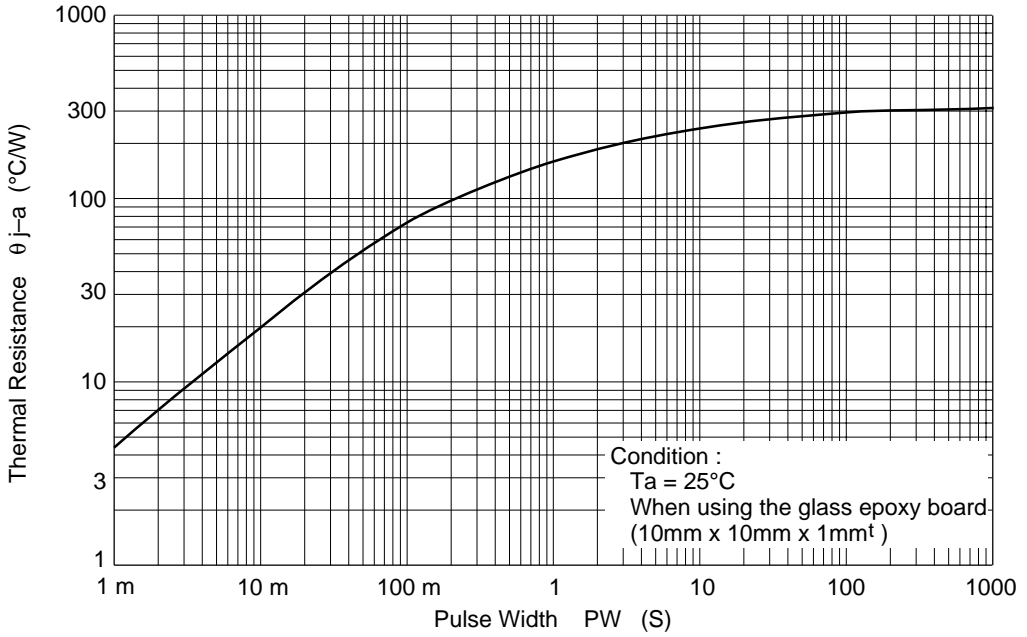
Drain to Source Diode Reverse Surge Destruction Characteristics



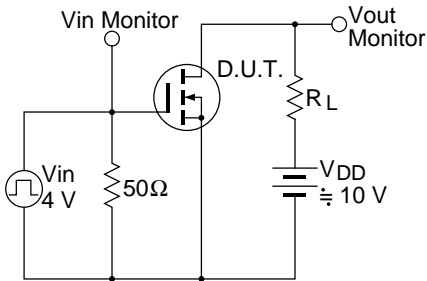
Reverse Drain Current vs. Source to Drain Voltage



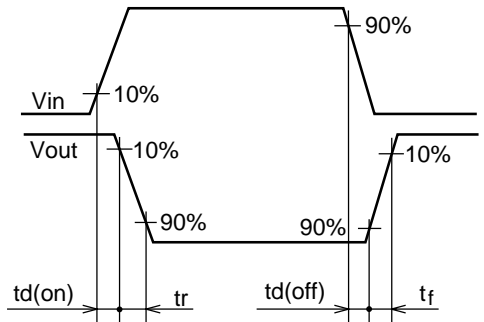
Transient Thermal Resistance



Switching Time Test Circuit

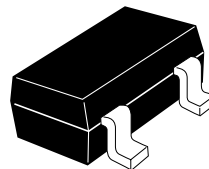
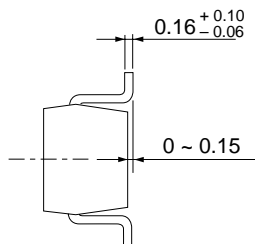
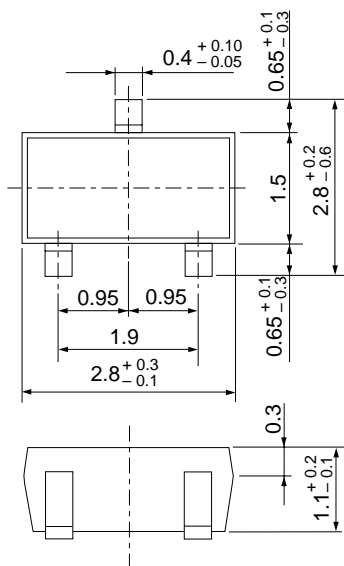


Switching Time Waveforms



## Package Dimensions

Unit: mm



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

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