2SK3000

Silicon N Channel MOS FET
Low Frequency Power Switching

REJ03G0379-0300Z
(Previous ADE-208-585A (Z))
Rev.3.00
Jun.15.2004

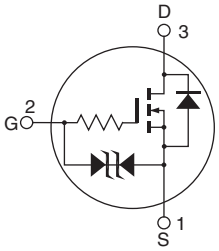
Features

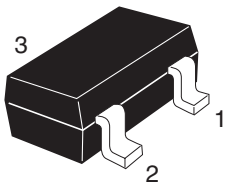
www.DataSheet4U.com

- Low on-resistance
  $R_{DS(on)}$ = 0.16 Ω typ. (V_{GS} = 10 V, I_D = 450 mA)
- 4 V gate drive devices.
- Small package (MPAK)
- Expansive drain to source surge power capability

Outline

MPAK





1. Source
2. Gate
3. Drain

Note: Marking is “ZY–”.

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

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

www.DataSheet4U.com

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 µA, V_{GS} = 0
Drain to source voltage	$V_{DS(SUS)}$	40	—	—	V	L = 100 µH, I_D = 3 A
Gate to source breakdown voltage	$V_{(BR)GSS}$	±10	—	—	V	I_G = ±100 µA, 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} = ±6.5V, V_{DS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	1.1	—	2.1	V	I_D = 10 µA, V_{DS} = 5 V
Forward transfer admittance	$\|y_{fs}\|$	0.5	1.2	—	S	I_D = 450 mA, V_{DS} = 10 V Note3
Static drain to source on state resistance	$R_{DS(on)}$	—	0.24	0.5	Ω	I_D = 450 mA, V_{GS} = 4V Note3
	$R_{DS(on)}$	—	0.16	0.3	Ω	I_D = 450 mA, V_{GS} = 10 V Note3
Input capacitance	Ciss	—	14.0	—	pF	V_{DS} = 10 V
Output capacitance	Coss	—	68	—	pF	V_{GS} = 0
Reverse transfer capacitance	Crss	—	3.0	—	pF	f = 1 MHz
Turn-on delay time	$t_{d(on)}$	—	0.12	—	µs	V_{GS} = 4 V, I_D = 450 mA
Rise time	t_r	—	0.6	—	µs	R_L = 22 Ω
Turn-off delay time	$t_{d(off)}$	—	1.7	—	µs	
Fall time	t_f	—	1.4	—	µs	

Notes: 3. Pulse test

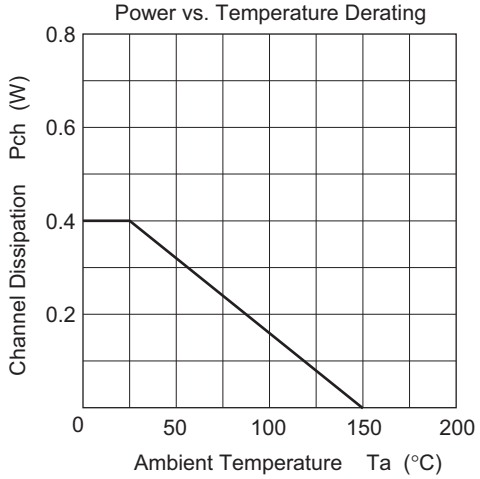
www.DataSheet4U.com

RENESAS

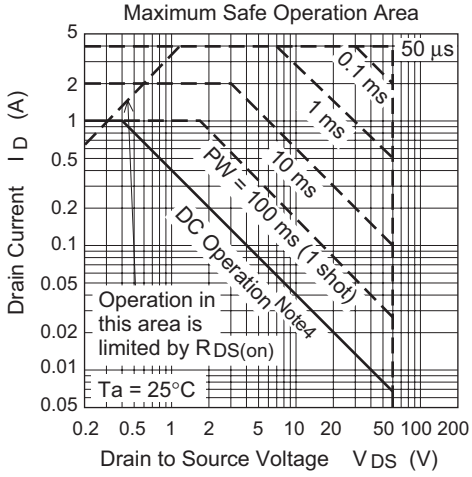
www.DataSheet4U.com

Main Characteristics

Power vs. Temperature Derating

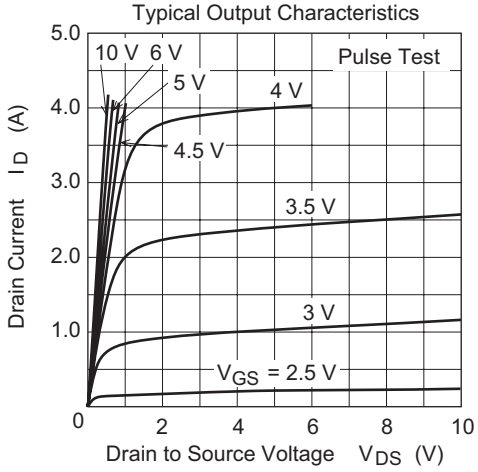


Maximum Safe Operation Area

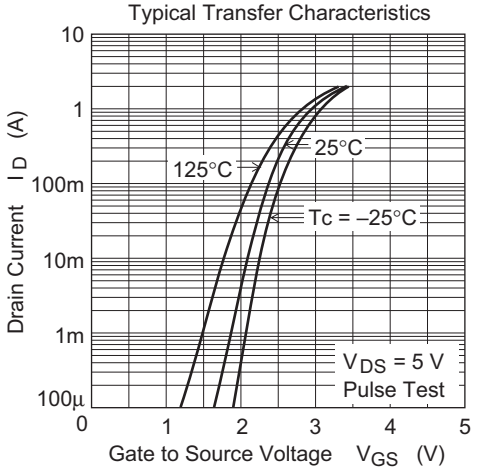


Note4 : When using the glass epoxy board (10mm x 10mm x 1mmt)

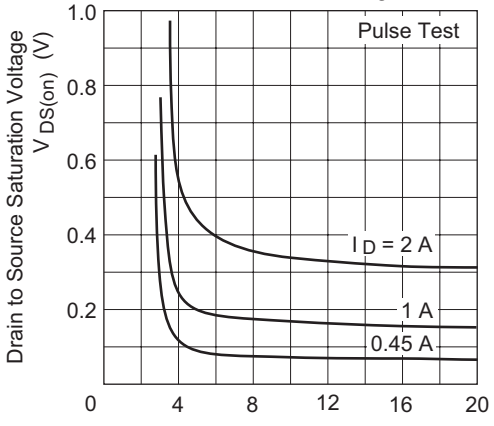
Typical Output Characteristics



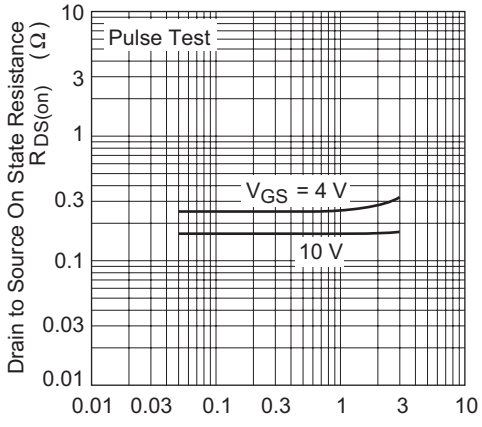
Typical Transfer Characteristics



Drain to Source Saturation Voltage vs. Gate to Source Voltage



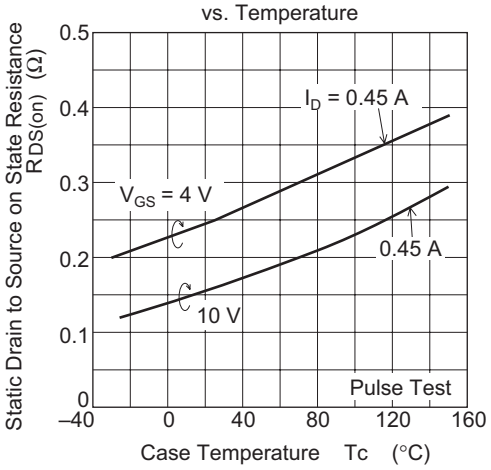
Static Drain to Source on State Resistance vs. Drain Current



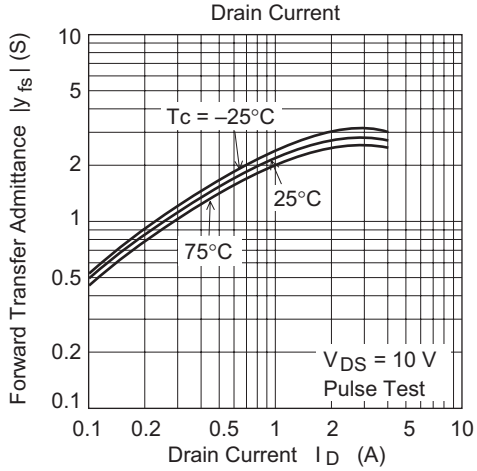
www.DataSheet4U.com

RENESAS
www.DataSheet4U.com

Static Drain to Source on State Resistance vs. Temperature

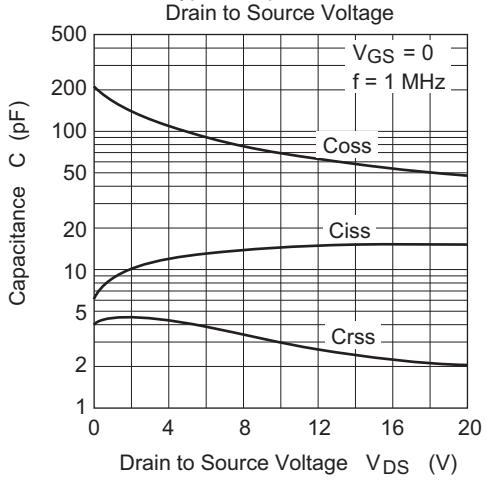


Forward Transfer Admittance vs. Drain Current

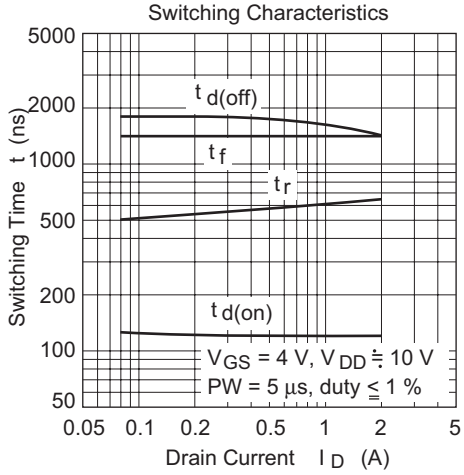


www.DataSheet4U.com

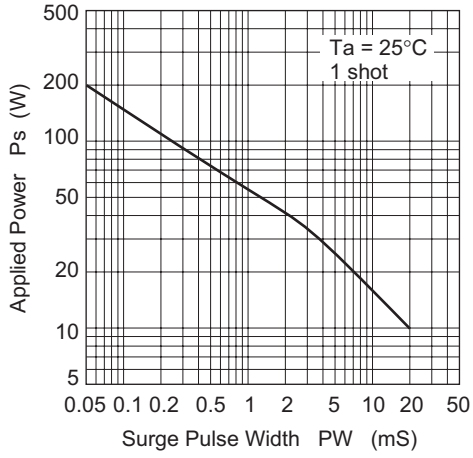
Typical Capacitance vs. Drain to Source Voltage



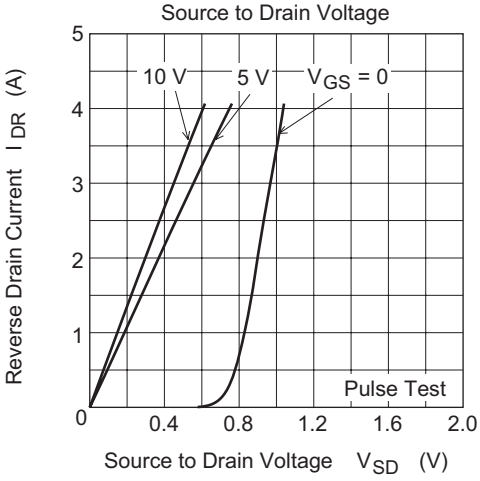
Switching Characteristics



Drain to Source DiodeReverse Surge Destruction Characteristics

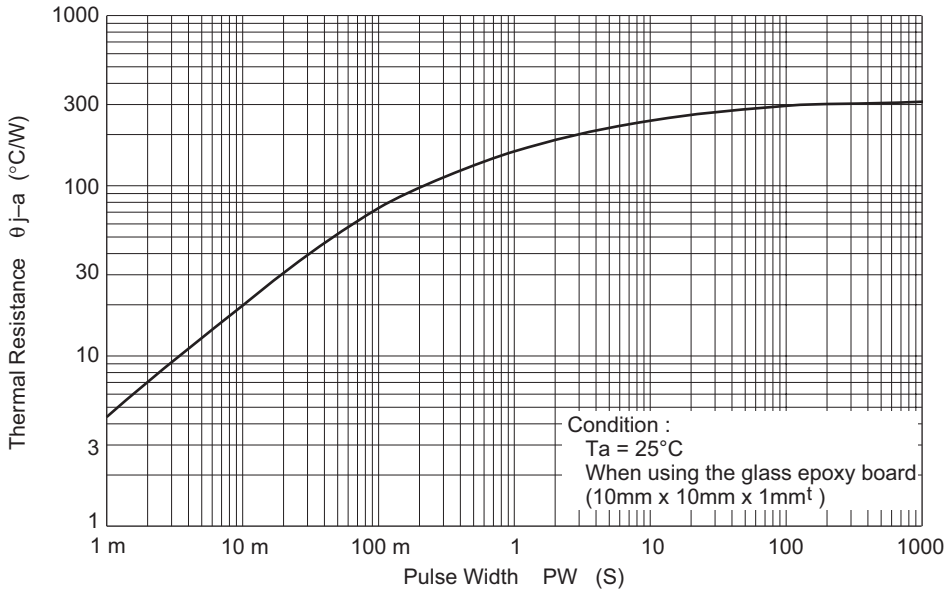


Reverse Drain Current vs. Source to Drain Voltage



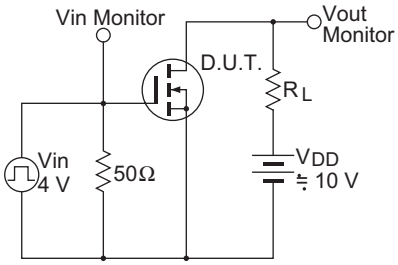
RENESAS
www.DataSheet4U.com

Transient Thermal Resistance

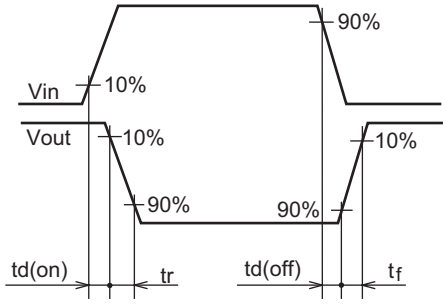


www.DataSheet4U.com

Switching Time Test Circuit



Switching Time Waveforms

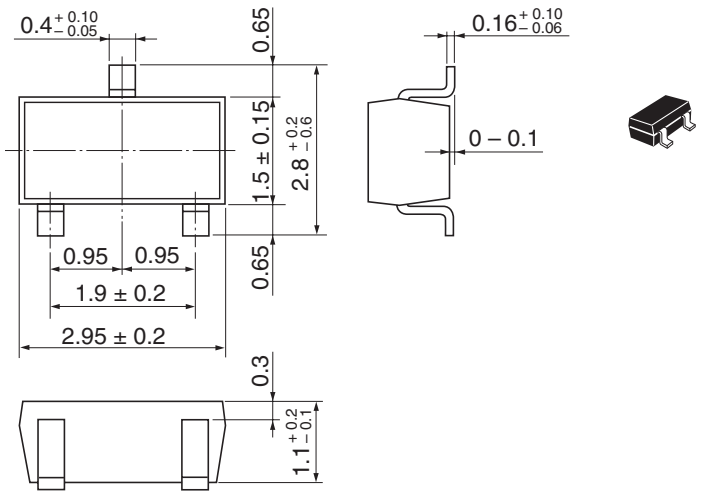


RENESAS
www.DataSheet4U.com

Package Dimensions

As of January, 2003

Unit: mm



Package Code	MPAK(T)
JEDEC	—
JEITA	Conforms
Mass (reference value)	0.011 g

www.DataSheet4U.com

Ordering Information

Part Name	Quantity	Shipping Container
2SK3000	3000 pcs	ϕ178 mm Reel Taping (TL)

Note: For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.

RENESAS
www.DataSheet4U.com

Renesas Technology Corp. Sales Strategic Planning Div. Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan

www.DataSheet4U.com

Keep safety first in your circuit designs!

1. Renesas Technology Corp. puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage.
   Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of nonflammable material or (iii) prevention against any malfunction or mishap.

Notes regarding these materials

1. These materials are intended as a reference to assist our customers in the selection of the Renesas Technology Corp. product best suited to the customer's application; they do not convey any license under any intellectual property rights, or any other rights, belonging to Renesas Technology Corp. or a third party.
2. Renesas Technology Corp. assumes no responsibility for any damage, or infringement of any third-party's rights, originating in the use of any product data, diagrams, charts, programs, algorithms, or circuit application examples contained in these materials.
3. All information contained in these materials, including product data, diagrams, charts, programs and algorithms represents information on products at the time of publication of these materials, and are subject to change by Renesas Technology Corp. without notice due to product improvements or other reasons. It is therefore recommended that customers contact Renesas Technology Corp. or an authorized Renesas Technology Corp. product distributor for the latest product information before purchasing a product listed herein.
   The information described here may contain technical inaccuracies or typographical errors.
   Renesas Technology Corp. assumes no responsibility for any damage, liability, or other loss rising from these inaccuracies or errors.
   Please also pay attention to information published by Renesas Technology Corp. by various means, including the Renesas Technology Corp. Semiconductor home page (http://www.renesas.com).
4. When using any or all of the information contained in these materials, including product data, diagrams, charts, programs, and algorithms, please be sure to evaluate all information as a total system before making a final decision on the applicability of the information and products. Renesas Technology Corp. assumes no responsibility for any damage, liability or other loss resulting from the information contained herein.
5. Renesas Technology Corp. semiconductors are not designed or manufactured for use in a device or system that is used under circumstances in which human life is potentially at stake. Please contact Renesas Technology Corp. or an authorized Renesas Technology Corp. product distributor when considering the use of a product contained herein for any specific purposes, such as apparatus or systems for transportation, vehicular, medical, aerospace, nuclear, or undersea repeater use.
6. The prior written approval of Renesas Technology Corp. is necessary to reprint or reproduce in whole or in part these materials.
7. If these products or technologies are subject to the Japanese export control restrictions, they must be exported under a license from the Japanese government and cannot be imported into a country other than the approved destination.
   Any diversion or reexport contrary to the export control laws and regulations of Japan and/or the country of destination is prohibited.
8. Please contact Renesas Technology Corp. for further details on these materials or the products contained therein.

RENESAS SALES OFFICES

http://www.renesas.com

Renesas Technology America, Inc.
450 Holger Way, San Jose, CA 95134-1368, U.S.A
Tel: <1> (408) 382-7500 Fax: <1> (408) 382-7501

Renesas Technology Europe Limited.
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, United Kingdom
Tel: <44> (1628) 585 100, Fax: <44> (1628) 585 900

Renesas Technology Europe GmbH
Dornacher Str. 3, D-85622 Feldkirchen, Germany
Tel: <49> (89) 380 70 0, Fax: <49> (89) 929 30 11

Renesas Technology Hong Kong Ltd.
7/F., North Tower, World Finance Centre, Harbour City, Canton Road, Hong Kong
Tel: <852> 2265-6688, Fax: <852> 2375-6836

Renesas Technology Taiwan Co., Ltd.
FL 10, #99, Fu-Hsing N. Rd., Taipei, Taiwan
Tel: <886> (2) 2715-2888, Fax: <886> (2) 2713-2999

Renesas Technology (Shanghai) Co., Ltd.
26/F., Ruijin Building, No.205 Maoming Road (S), Shanghai 200020, China
Tel: <86> (21) 6472-1001, Fax: <86> (21) 6415-2952

Renesas Technology Singapore Pte. Ltd.
1, Harbour Front Avenue, #06-10, Keppel Bay Tower, Singapore 098632
Tel: <65> 6213-0200, Fax: <65> 6278-8001

© 2004. Renesas Technology Corp., All rights reserved. Printed in Japan.

www.DataSheet4U.com