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Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

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Keep safety first in your circuit designs!

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4AK17

Silicon N-Channel Power MOS FET Array



ADE-208-1202 (Z)
1st. Edition
Mar. 2001

Application

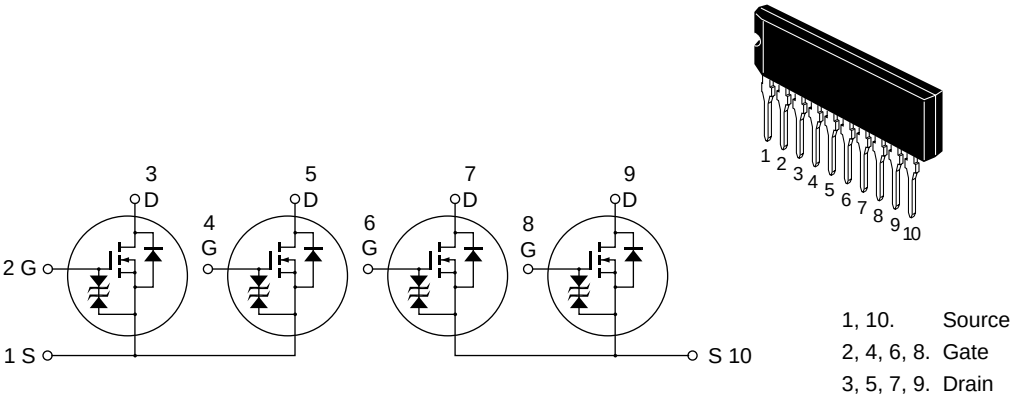
High speed power switching

Features

- Low on-resistance
 $R_{DS(on)} \leq 0.045$, $V_{GS} = 10$ V, $I_D = 10$ A
 $R_{DS(on)} \leq 0.065$, $V_{GS} = 4$ V, $I_D = 10$ A
- Capable of 4 V gate drive
- Low drive current
- High speed switching
- High density mounting
- Suitable for motor driver, solenoid driver and lamp driver

Outline

SP-10



Absolute Maximum Ratings (Ta = 25°C) (1 Unit)

Item	Symbol	Rating	Unit
Drain to source voltage	V_{DSS}	60	V
Gate to source voltage	V_{GSS}	±20	V
Drain current	I_D	10	A
Drain peak current	$I_{D(pulse)}^{*1}$	40	A
Body to drain diode reverse drain current	I_{DR}	10	A
Channel dissipation	$P_{ch} (T_c = 25^{\circ}C)^{*2}$	28	W
Channel dissipation	P_{ch}^{*2}	4	W
Channel temperature	T_{ch}	150	°C
Storage temperature	T_{stg}	-55 to +150	°C

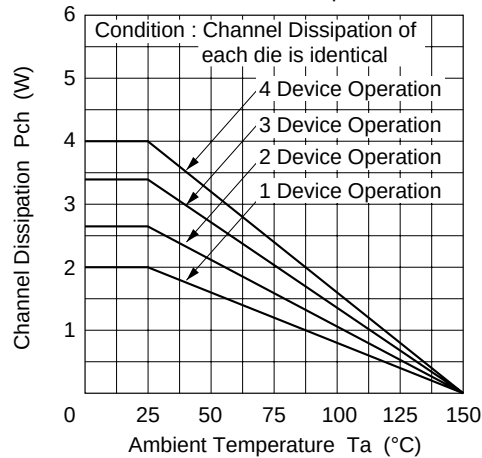
Notes: 1. $PW \leq 10 \mu s$, duty cycle $\leq 1\%$
2. 4 devices operation

Electrical Characteristics (Ta = 25°C) (1 Unit)

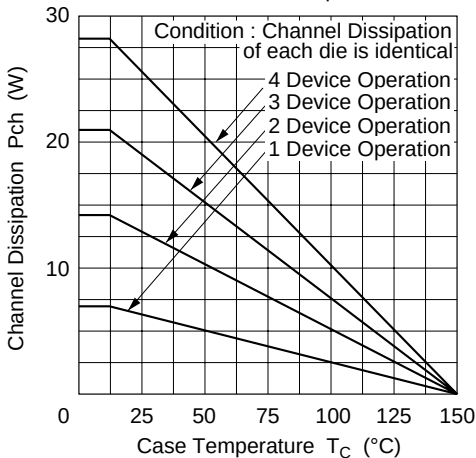
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	60	—	—	V	$I_D = 10 \text{ mA}$, $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	±20	—	—	V	$I_G = \pm 100 \text{ } \mu\text{A}$, $V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	±10	μA	$V_{GS} = \pm 16 \text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	250	μA	$V_{DS} = 50 \text{ V}$, $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.0	V	$I_D = 1 \text{ mA}$, $V_{DS} = 10 \text{ V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.033	0.045	Ω	$I_D = 10 \text{ A}$ $V_{GS} = 10 \text{ V}^{*1}$
			0.04	0.065	Ω	$I_D = 10 \text{ A}$ $V_{GS} = 4 \text{ V}^{*1}$
Forward transfer admittance	$ y_{fs} $	10	17	—	S	$I_D = 10 \text{ A}$ $V_{DS} = 10 \text{ V}^{*1}$
Input capacitance	C_{iss}	—	1400	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	C_{oss}	—	720	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	220	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	15	—	ns	$I_D = 10 \text{ A}$
Rise time	t_r	—	95	—	ns	$V_{GS} = 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	300	—	ns	$R_L = 3 \text{ } \Omega$
Fall time	t_f	—	170	—	ns	
Body to drain diode forward voltage	V_{DF}	—	1.05	—	V	$I_F = 10 \text{ A}$, $V_{GS} = 0$
Body to drain diode reverse recovery time	t_{rr}	—	110	—	ns	$I_F = 10 \text{ A}$, $V_{GS} = 0$ $dI_F/dt = 50 \text{ A}/\mu\text{s}$

Note: 1. Pulse test

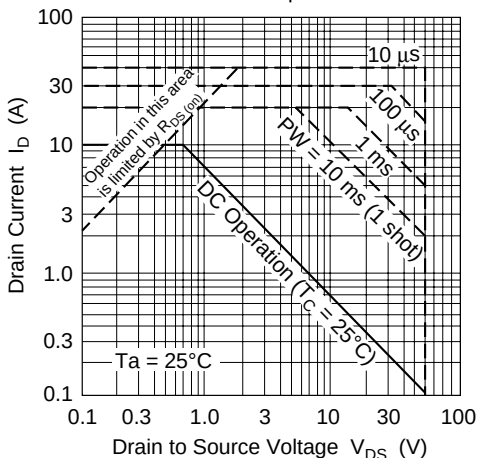
Maximum Channel Dissipation Curve



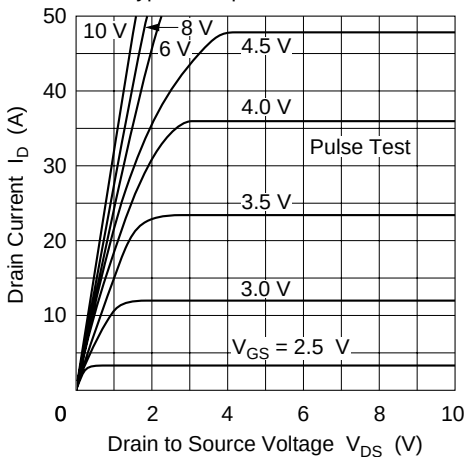
Maximum Channel Dissipation Curve



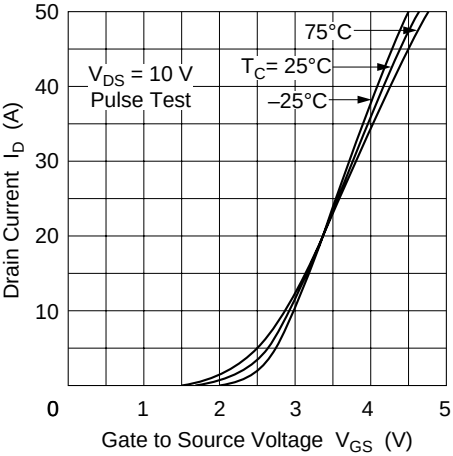
Maximum Safe Operation Area



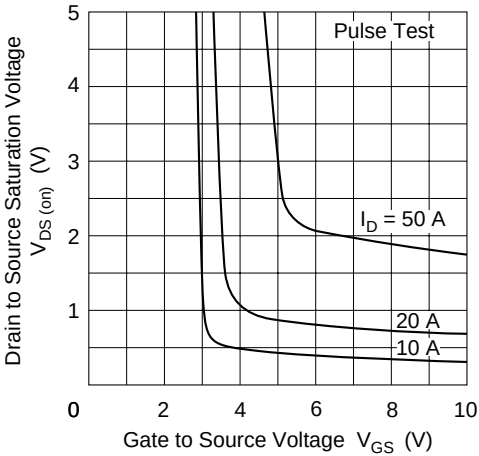
Typical Output Characteristics



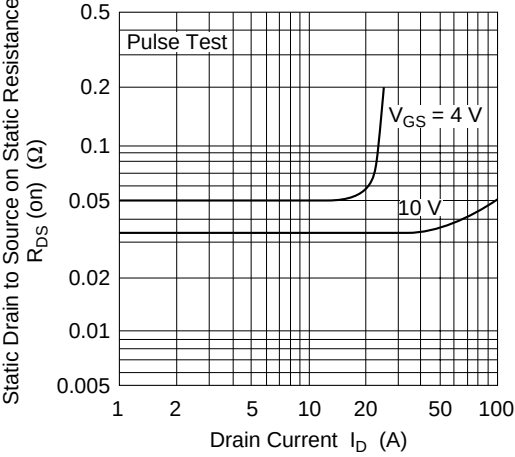
Typical Transfer Characteristics



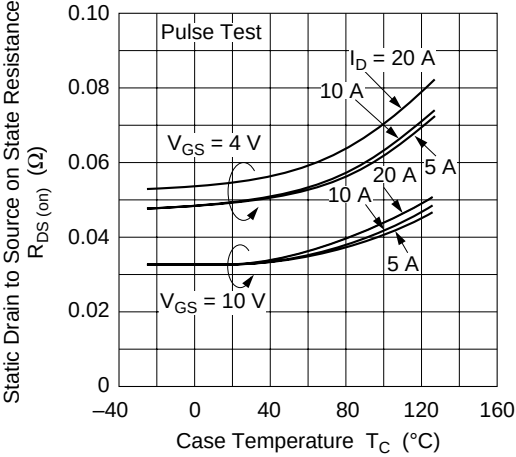
Drain to Source Saturation Voltage vs. Gate to Source Voltage



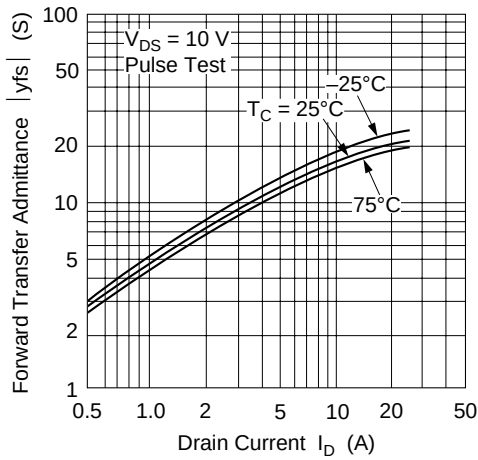
Static Drain to Source on State Resistance vs. Drain Current



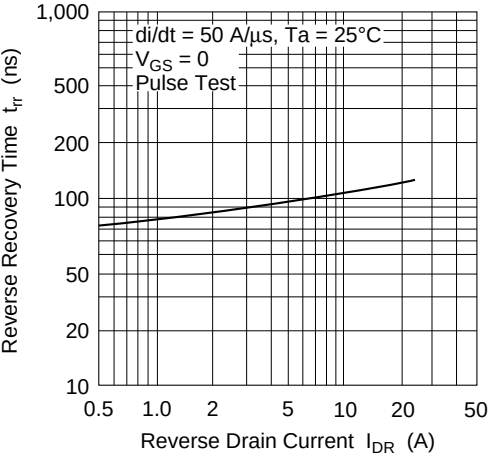
Static Drain to Source on State Resistance vs. Temperature



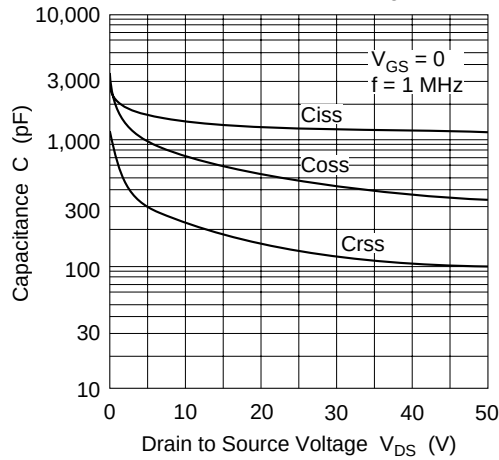
Forward Transfer Admittance
vs. Drain Current



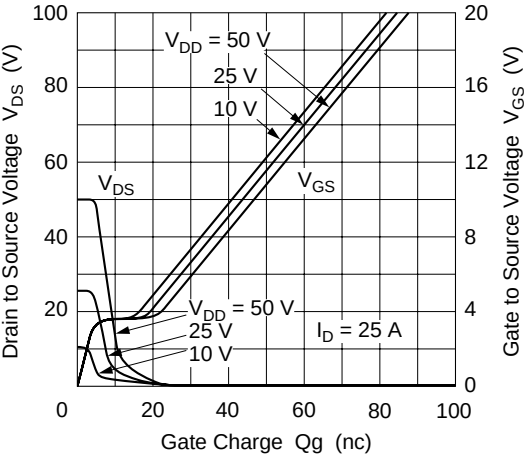
Body to Diode Reverse
Recovery Time

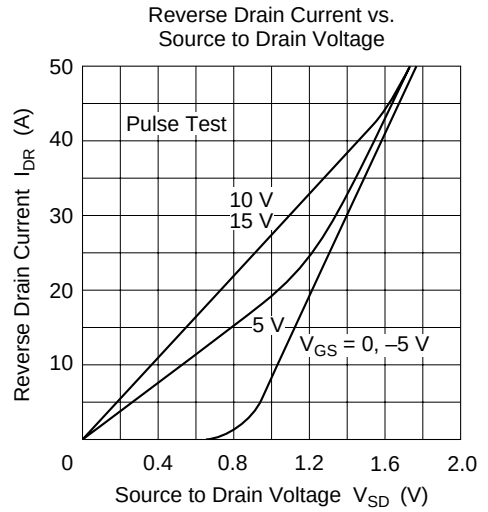
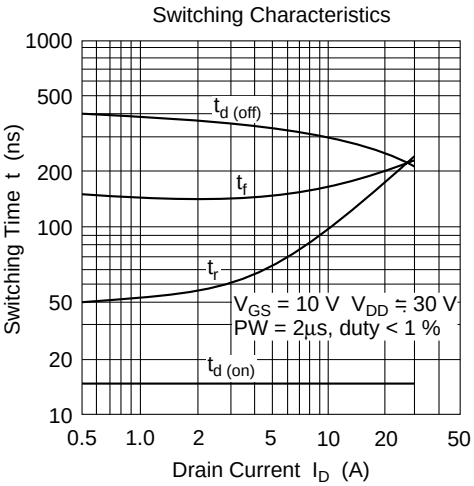


Typical Capacitance vs.
Drain to Source Voltage



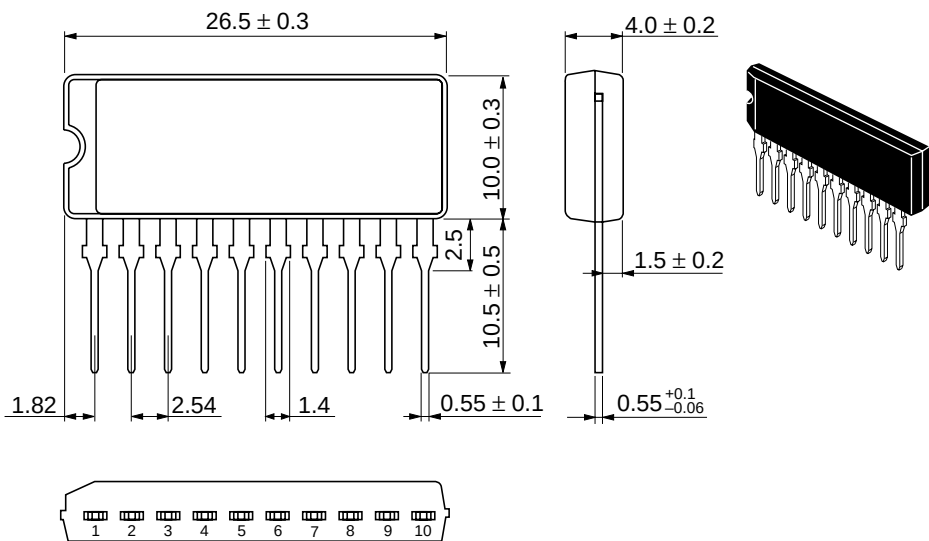
Dynamic Input Characteristics





Package Dimensions

As of January, 2001
Unit: mm



Hitachi Code	SP-10
JEDEC	—
EIAJ	—
Mass (reference value)	2.9 g

Cautions

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HITACHI

Hitachi, Ltd.

Semiconductor & Integrated Circuits.

Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan

Tel: Tokyo (03) 3270-2111 Fax: (03) 3270-5109

URL	NorthAmerica	: http://semiconductor.hitachi.com/
	Europe	: http://www.hitachi-eu.com/hel/ecg
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For further information write to:

Hitachi Semiconductor
(America) Inc.

179 East Tasman Drive,
San Jose, CA 95134

Tel: <1> (408) 433-1990

Fax: <1> (408) 433-0223

Hitachi Europe GmbH
Electronic Components Group

Dornacher Straße 3
D-85622 Feldkirchen, Munich

Germany

Tel: <49> (89) 9 9180-0

Fax: <49> (89) 9 29 30 00

Hitachi Europe Ltd.

Electronic Components Group.

Whitebrook Park

Lower Cookham Road

Maidenhead

Berkshire SL6 8YA, United Kingdom

Tel: <44> (1628) 585000

Fax: <44> (1628) 585160

Hitachi Asia Ltd.

Hitachi Tower

16 Collyer Quay #20-00,

Singapore 049318

Tel: <65>-538-6533/538-8577

Fax: <65>-538-6933/538-3877

URL: <http://www.hitachi.com.sg>

Hitachi Asia Ltd.

(Taipei Branch Office)

4/F, No. 167, Tun Hwa North Road,

Hung-Kuo Building,

Taipei (105), Taiwan

Tel: <886>-(2)-2718-3666

Fax: <886>-(2)-2718-8180

Telex: 23222 HAS-TP

URL: <http://www.hitachi.com.tw>

Hitachi Asia (Hong Kong) Ltd.

Group III (Electronic Components)

7/F., North Tower,

World Finance Centre,

Harbour City, Canton Road

Tsim Sha Tsui, Kowloon,

Hong Kong

Tel: <852>-(2)-735-9218

Fax: <852>-(2)-730-0281

URL: <http://www.hitachi.com.hk>