

To all our customers

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

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# 4AK22

## Silicon N-Channel Power MOS FET Array



ADE-208-1206 (Z)  
1st. Edition  
Mar. 2001

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### Application

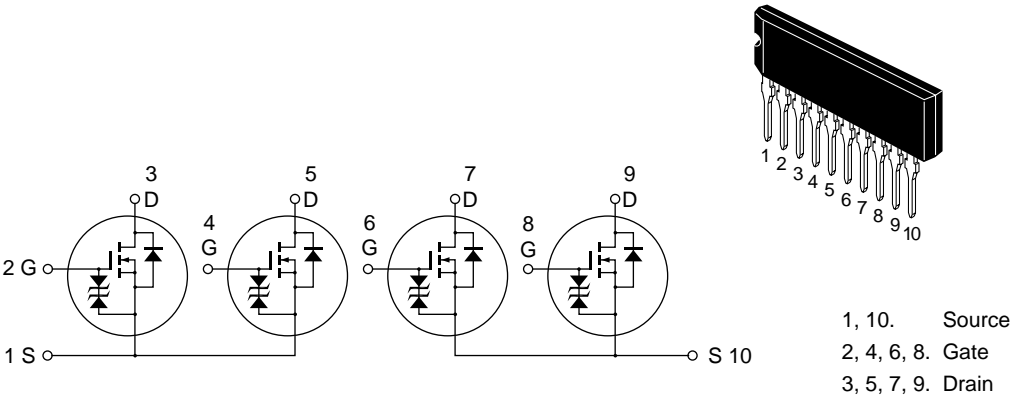
High speed power switching

### Features

- Low on-resistance  
 $R_{DS(on)} \ 0.4 \ , \ V_{GS} = 10 \ V, I_D = 1.5 \ A$   
 $R_{DS(on)} \ 0.55 \ , \ V_{GS} = 4 \ V, I_D = 1.5 \ A$
- Capable of 4 V gate drive
- Low drive current
- High speed switching
- High density mounting
- Suitable for motor driver, solenoid driver and lamp driver
- Discrete packaged devices of same die: 2SK1254(L), 2SK1254(S)

Outline

SP-10



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

Item	Symbol	Rating	Unit
Drain to source voltage	$V_{DSS}$	120	V
Gate to source voltage	$V_{GSS}$	±20	V
Drain current	$I_D$	3	A
Drain peak current	$I_{D(pulse)}^{*1}$	12	A
Body to drain diode reverse drain current	$I_{DR}$	3	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

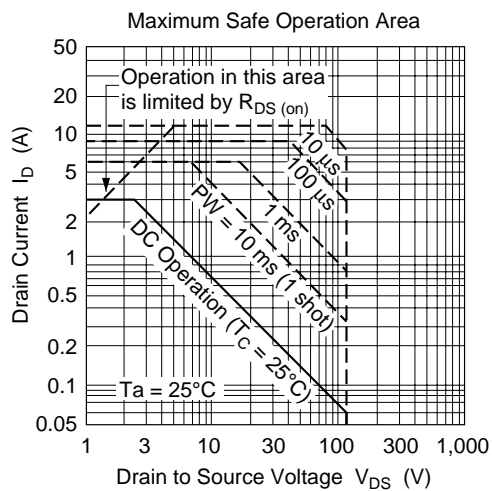
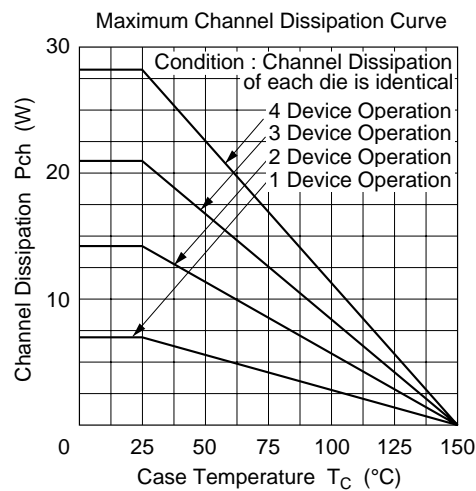
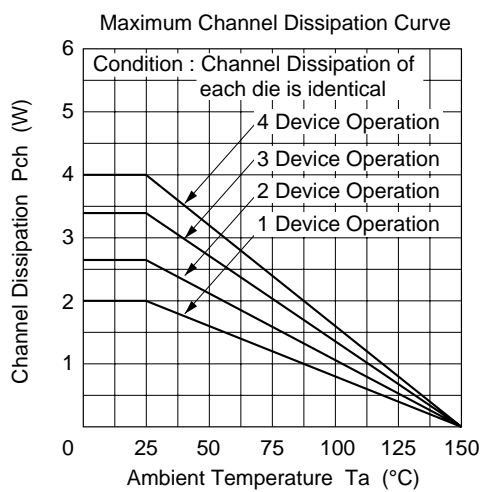
Notes: 1. PW 10 μs, duty cycle 1%  
2. 4 devices operation

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

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	120	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	$\pm 20$	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}$ , $V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 16 \text{ V}$ , $V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	100	$\mu\text{A}$	$V_{DS} = 100 \text{ V}$ , $V_{GS} = 0$
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	$R_{DS(on)}$	—	0.3	0.4		$I_D = 1.5 \text{ A}$ , $V_{GS} = 10 \text{ V}^{*1}$
		—	0.35	0.55		$I_D = 1.5 \text{ A}$ , $V_{GS} = 4 \text{ V}^{*1}$
Forward transfer admittance	$ y_{fs} $	2.0	3.5	—	S	$I_D = 1.5 \text{ A}$ , $V_{DS} = 10 \text{ V}^{*1}$
Input capacitance	$C_{iss}$	—	420	—	pF	$V_{DS} = 10 \text{ V}$ , $V_{GS} = 0$ ,
Output capacitance	$C_{oss}$	—	190	—	pF	$f = 1 \text{ MHz}$
Reverse transfer capacitance	$C_{rss}$	—	25	—	pF	
Turn-on delay time	$t_{d(on)}$	—	5	—	ns	$I_D = 1.5 \text{ A}$ , $V_{GS} = 10 \text{ V}$ ,
Rise time	$t_r$	—	20	—	ns	$R_L = 20$
Turn-off delay time	$t_{d(off)}$	—	160	—	ns	
Fall time	$t_f$	—	40	—	ns	
Body to drain diode forward voltage	$V_{DF}$	—	0.95	—	V	$I_F = 3 \text{ A}$ , $V_{GS} = 0$
Body to drain diode reverse recovery time	$t_{rr}$	—	160	—	ns	$I_F = 3 \text{ A}$ , $V_{GS} = 0$ $dI_F/dt = 50 \text{ A}/\mu\text{s}$

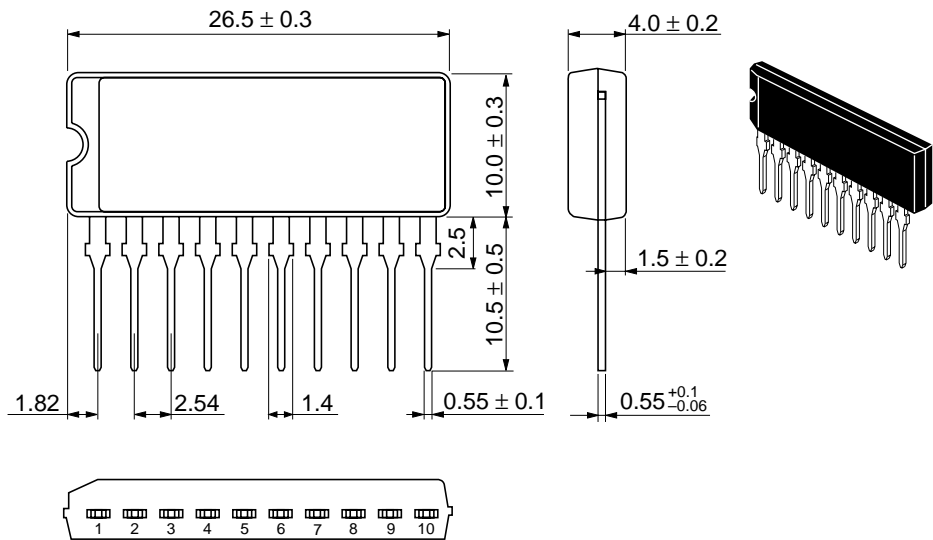
Note: 1. Pulse Test

See characteristic curves of 2SK1254(L), 2SK1254(S)



Package Dimensions

As of January, 2001  
Unit: mm



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

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