

To all our customers

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

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# 4AK15

Silicon N-Channel Power MOS FET Array



ADE-208-1200 (Z)

1st. Edition

Mar. 2001

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## Application

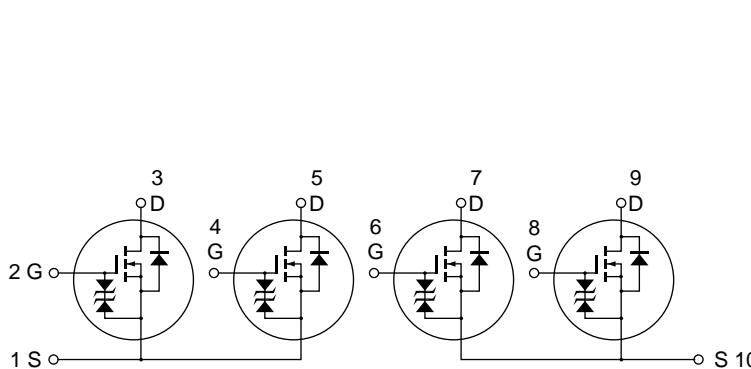
High speed power switching

## Features

- Low on-resistance  
 $R_{DS(on)} \leq 0.07$  ,  $V_{GS} = 10$  V,  $I_D = 8$  A  
 $R_{DS(on)} \leq 0.095$  ,  $V_{GS} = 4$  V,  $I_D = 8$  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



1, 10. Source  
2, 4, 6, 8. Gate  
3, 5, 7, 9. Drain

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

Item	Symbol	Rating	Unit
Drain to source voltage	V <sub>DSS</sub>	±60	V
Gate to source voltage	V <sub>GSS</sub>	±20	V
Drain current	I <sub>D</sub>	8	A
Drain peak current	I <sub>D(pulse)</sub> <sup>*1</sup>	32	A
Body to drain diode reverse drain current	I <sub>DR</sub>	8	A
Channel dissipation	P <sub>ch</sub> (T <sub>c</sub> = 25°C) <sup>*2</sup>	28	W
Channel dissipation	P <sub>ch</sub> <sup>*2</sup>	4	W
Channel temperature	T <sub>ch</sub>	150	°C
Storage temperature	T <sub>stg</sub>	-55 to +150	°C

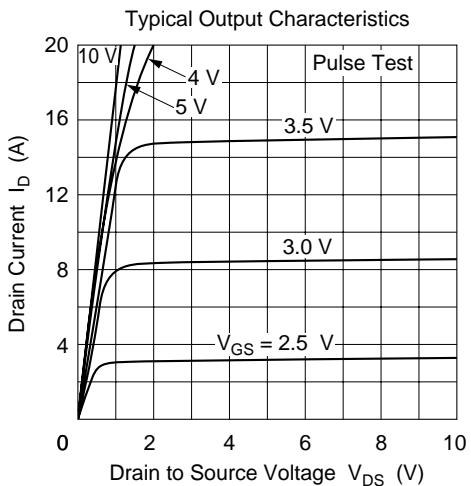
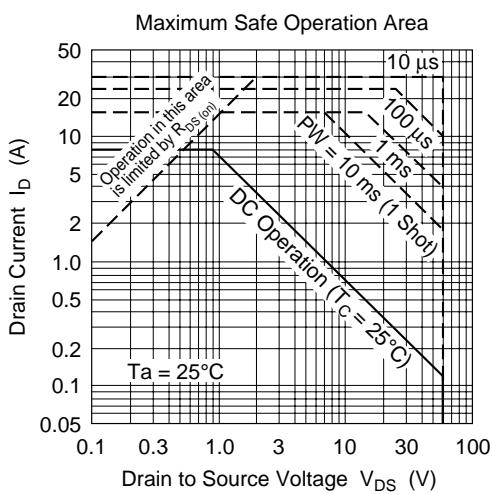
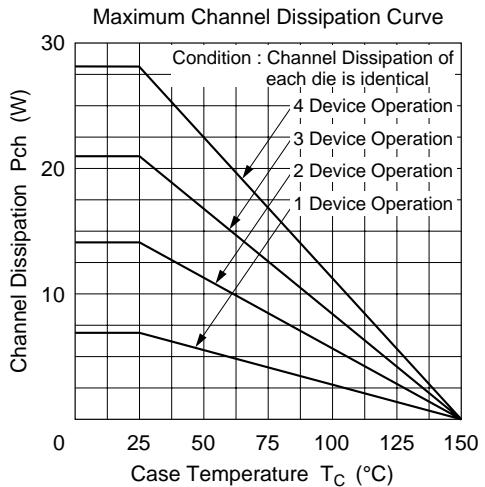
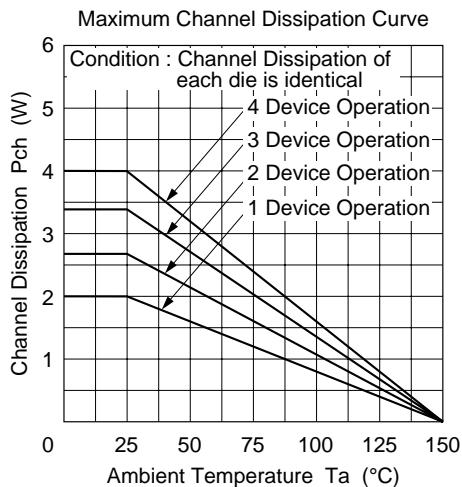
Notes: 1. PW ≤ 10 µs, duty cycle ≤ 1%

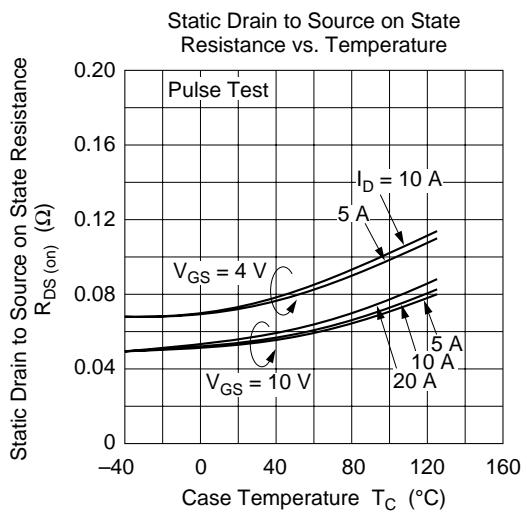
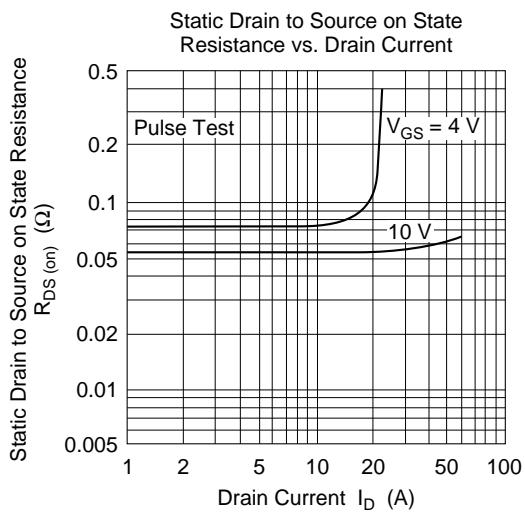
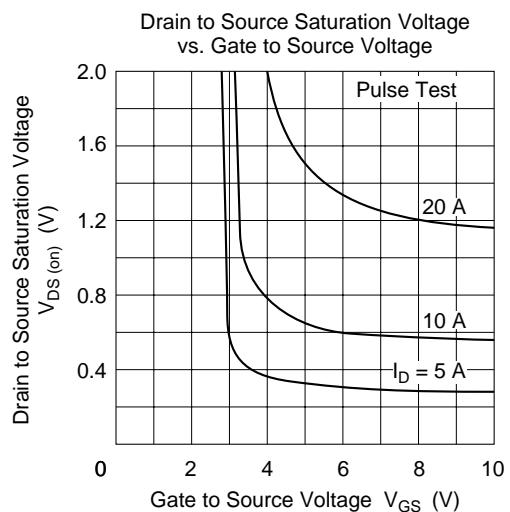
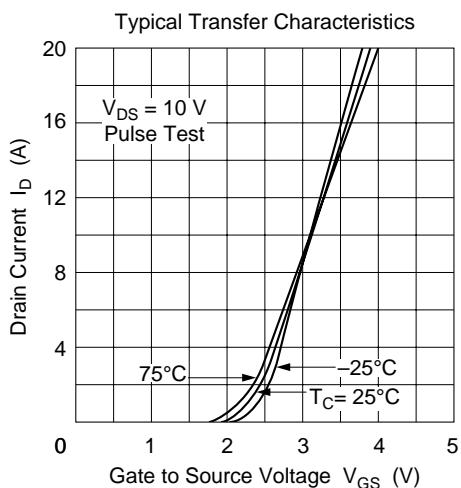
2. 4 devices operation

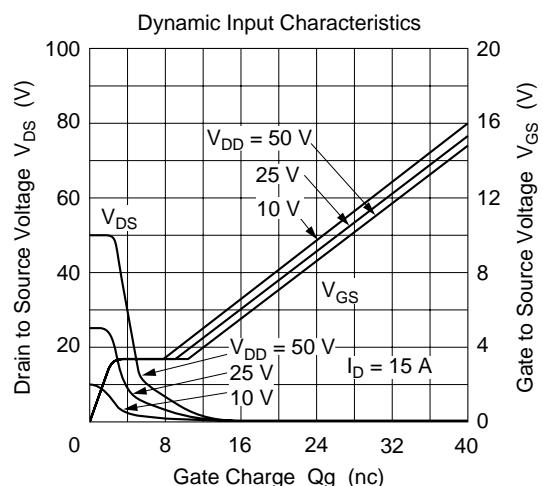
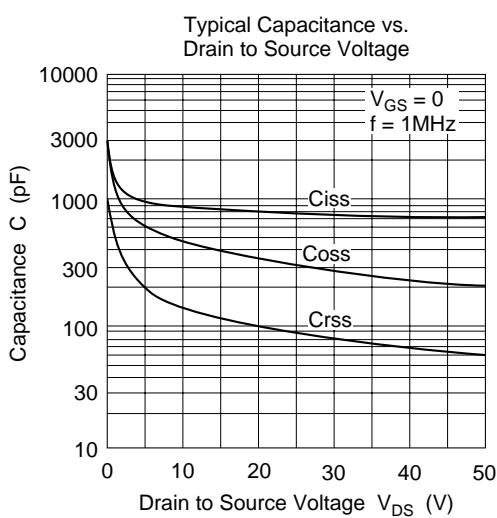
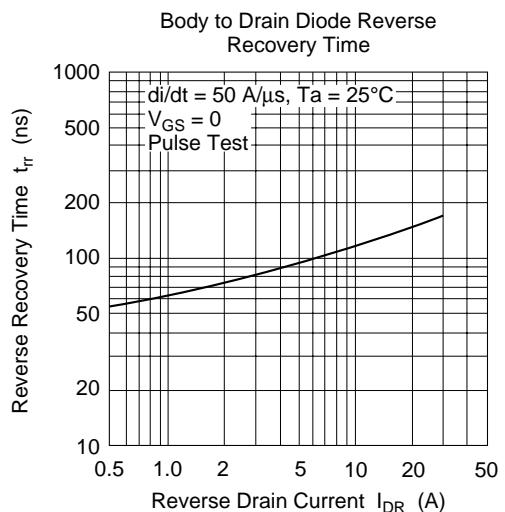
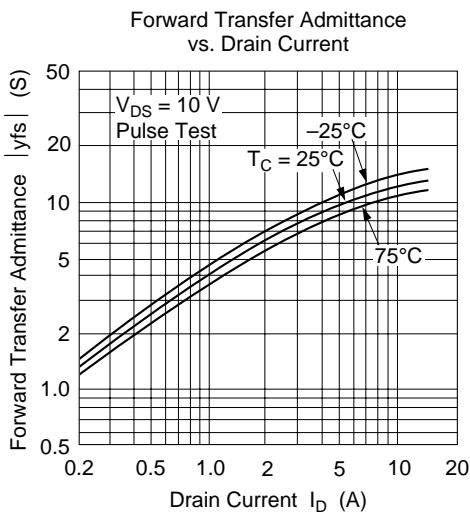
## Electrical Characteristics (Ta = 25°C) (1 Unit)

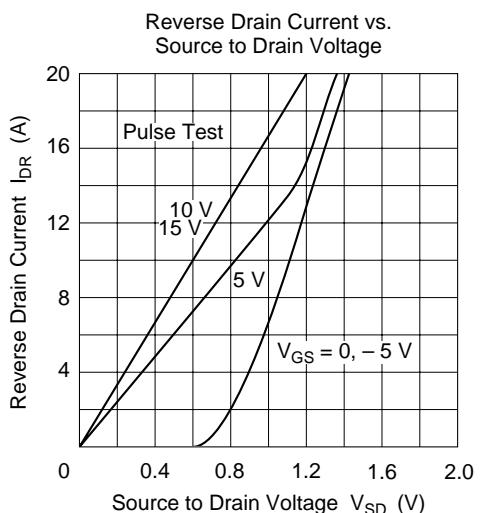
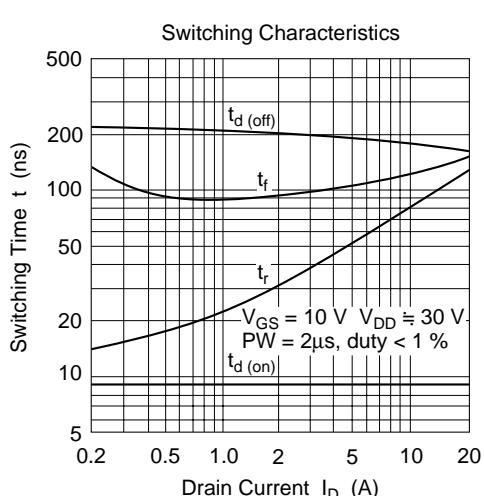
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	V <sub>(BR)DSS</sub>	60	—	—	V	I <sub>D</sub> = 10 mA, V <sub>GS</sub> = 0
Gate to source breakdown voltage	V <sub>(BR)GSS</sub>	±20	—	—	V	I <sub>G</sub> = ±100 μA, V <sub>DS</sub> = 0
Gate to source leak current	I <sub>GSS</sub>	—	—	±10	μA	V <sub>GS</sub> = ±16 V, V <sub>DS</sub> = 0
Zero gate voltage drain current	I <sub>DSS</sub>	—	—	250	μA	V <sub>DS</sub> = 50 V, V <sub>GS</sub> = 0
Gate to source cutoff voltage	V <sub>GS(off)</sub>	1.0	—	2.0	V	I <sub>D</sub> = 1 mA, V <sub>DS</sub> = 10 V
Static drain to source on state resistance	R <sub>DS(on)</sub>	—	0.055	0.07	Ω	I <sub>D</sub> = 8 A V <sub>GS</sub> = 10 V <sup>*1</sup>
		—	0.075	0.095	Ω	I <sub>D</sub> = 8 A V <sub>GS</sub> = 4 V <sup>*1</sup>
Forward transfer admittance	y <sub>fs</sub>	7	12	—	S	I <sub>D</sub> = 8 A V <sub>DS</sub> = 10 V <sup>*1</sup>
Input capacitance	C <sub>iss</sub>	—	860	—	pF	V <sub>DS</sub> = 10 V
Output capacitance	C <sub>oss</sub>	—	450	—	pF	V <sub>GS</sub> = 0
Reverse transfer capacitance	C <sub>rss</sub>	—	140	—	pF	f = 1 MHz
Turn-on delay time	t <sub>d(on)</sub>	—	10	—	ns	I <sub>D</sub> = 8 A
Rise time	t <sub>r</sub>	—	70	—	ns	V <sub>GS</sub> = 10 V
Turn-off delay time	t <sub>d(off)</sub>	—	180	—	ns	R <sub>L</sub> = 3.75 Ω
Fall time	t <sub>f</sub>	—	120	—	ns	
Body to drain diode forward voltage	V <sub>DF</sub>	—	1.05	—	V	I <sub>F</sub> = 8 A, V <sub>GS</sub> = 0
Body to drain diode reverse recovery time	t <sub>rr</sub>	—	110	—	ns	I <sub>F</sub> = 8 A, V <sub>GS</sub> = 0 dI/dt = 50 A/μs

Note: 1. Pulse test





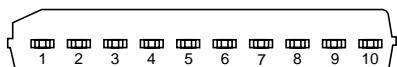
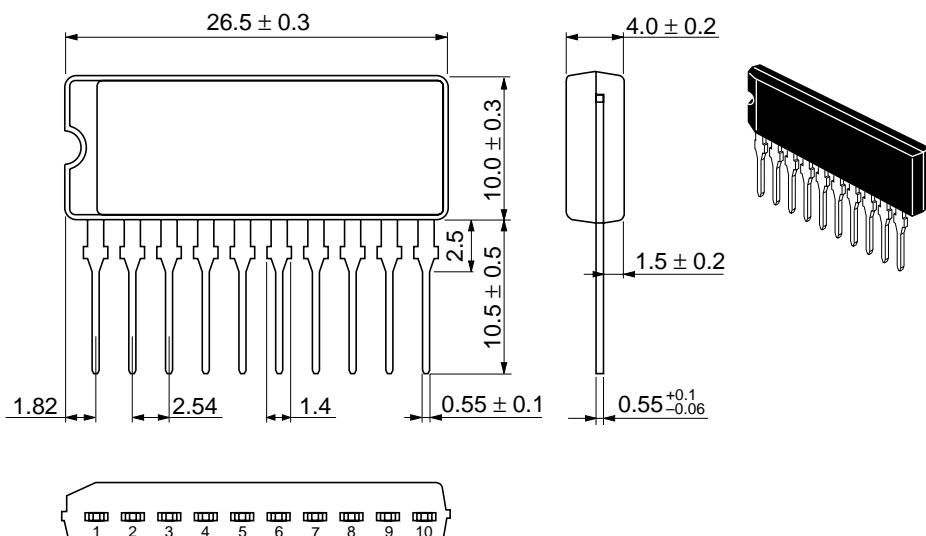




**Package Dimensions**

As of January, 2001

Unit: mm



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

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