To all our customers

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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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4AK21

Silicon N-Channel Power MOS FET Array

ADE-208-1205 (Z)
1st. Edition
Mar. 2001

Application

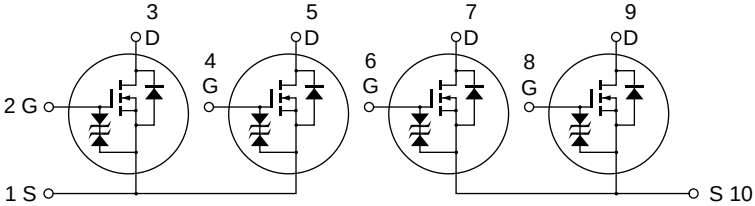
High speed power switching

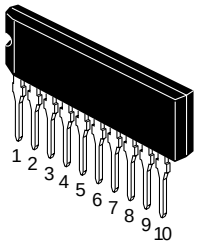
Features

- Low on-resistance
  $R_{DS(on)}$ 0.09 , V_{GS} = 10 V, I_D = 4 A
  $R_{DS(on)}$ 0.12 , V_{GS} = 4 V, I_D = 4 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: 2SK1302, 2SK1307

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_{DSS}	100	V
Gate to source voltage	V_{GSS}	±20	V
Drain current	I_D	8	A
Drain peak current	$I_{D(pulse)}$*[1]	32	A
Body to drain diode reverse drain current	I_{DR}	8	A
Channel dissipation	Pch (Tc = 25°C)*[2]	28	W
Channel dissipation	Pch*[2]	4	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

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

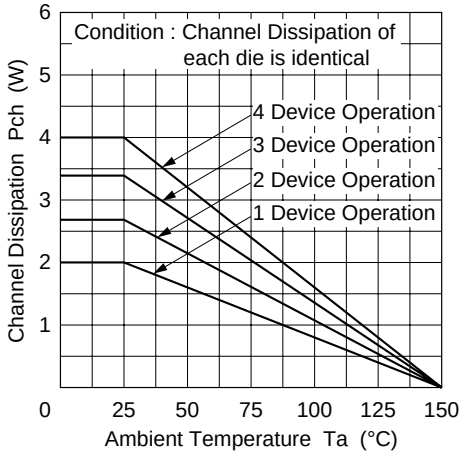
Electrical Characteristics (Ta = 25°C) (1 Unit)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	100	—	—	V	I_D = 10 mA, V_{GS} = 0
Gate to source breakdown voltage	$V_{(BR)GSS}$	±20	—	—	V	I_G = ±100 µA, V_{DS} = 0
Gate to source leak current	I_{GSS}	—	—	±10	µA	V_{GS} = ±16 V, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	250	µA	V_{DS} = 80 V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.0	V	I_D = 1 mA, V_{DS} = 10 V
Static drain to source on state resistance	$R_{DS(on)}$	—	0.07	0.09		I_D = 4 A, V_{GS} = 10 V*[1]
		—	0.09	0.125		I_D = 4 A, V_{GS} = 4 V*[1]
Forward transfer admittance	$\|y_{fs}\|$	6.0	10.0	—	S	I_D = 4 A, V_{DS} = 10 V*[1]
Input capacitance	Ciss	—	1300	—	pF	V_{DS} = 10 V, V_{GS} = 0, f = 1 MHz
Output capacitance	Coss	—	540	—	pF	
Reverse transfer capacitance	Crss	—	160	—	pF	
Turn-on delay time	$t_{d(on)}$	—	12	—	ns	I_D = 4 A, V_{GS} = 10 V, R_L = 7.5
Rise time	t_r	—	60	—	ns	
Turn-off delay time	$t_{d(off)}$	—	320	—	ns	
Fall time	t_f	—	120	—	ns	
Body to drain diode forward voltage	V_{DF}	—	1.0	—	V	I_F = 8 A, V_{GS} = 0
Body to drain diode reverse recovery time	t_{rr}	—	200	—	ns	I_F = 8 A, V_{GS} = 0 dIF/dt = 50 A/µs

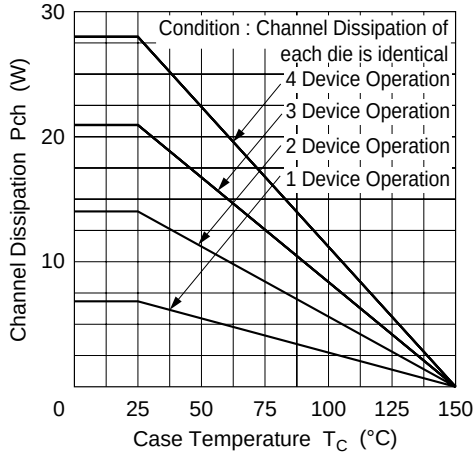
Note: 1. Pulse Test

See characteristic curves of 2SK1302

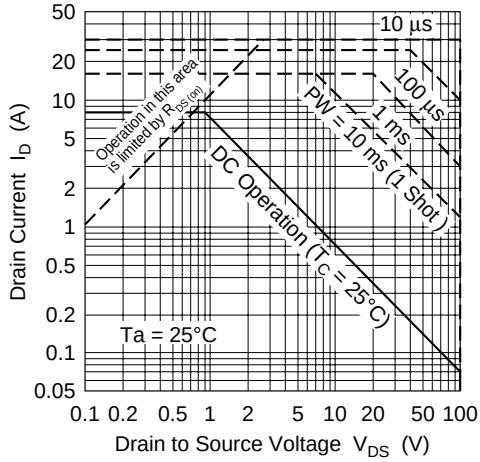
Maximum Channel Dissipation Curve



Maximum Channel Dissipation Curve



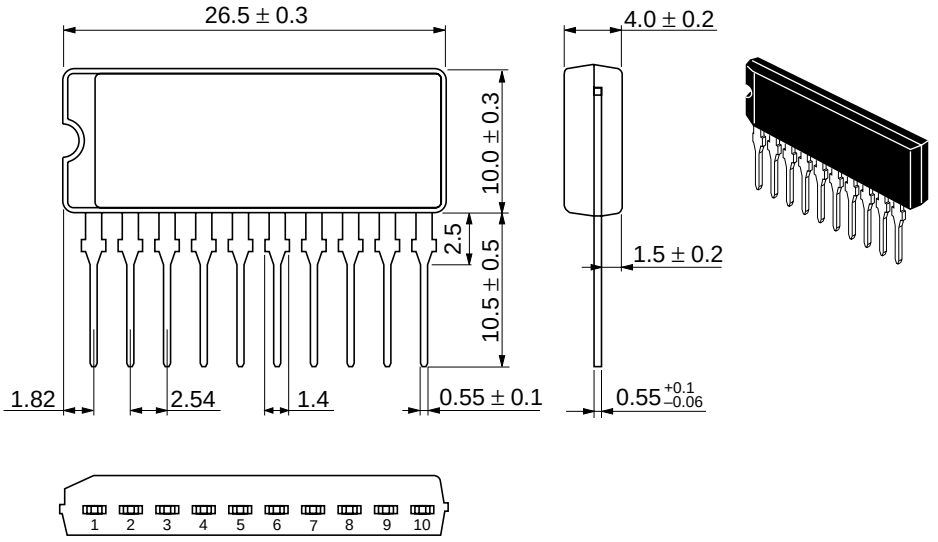
Maximum Safe Operation Area



Package Dimensions

As of January, 2001

Unit: mm



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

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