
4AK21

Silicon N-Channel Power MOS FET Array

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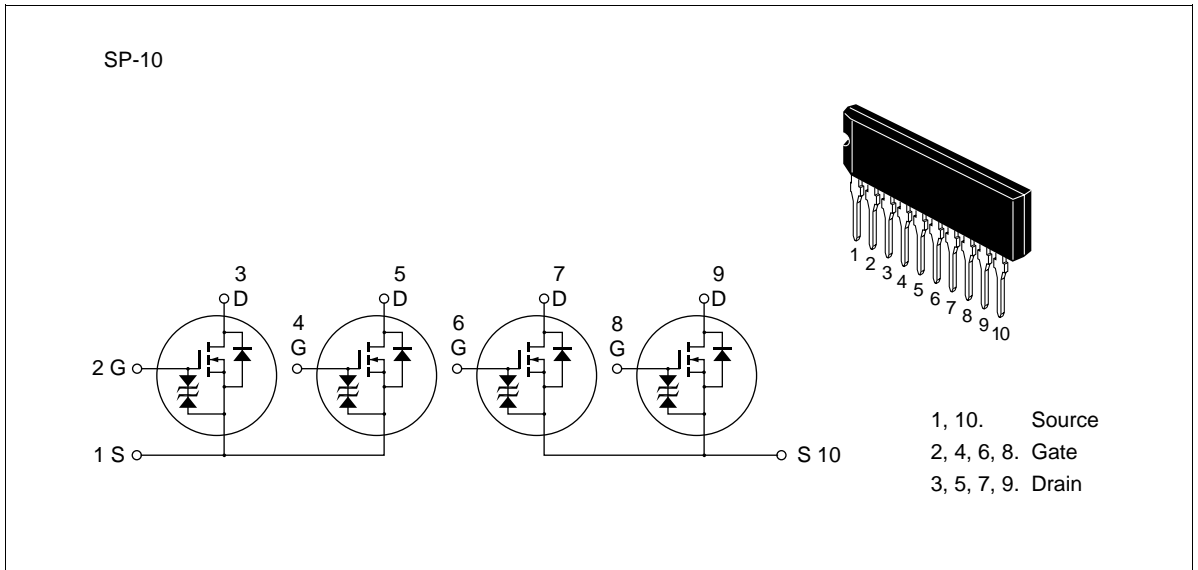
Application

High speed power switching

Features

- Low on-resistance
 $R_{DS(on)} = 0.09 \Omega$, $V_{GS} = 10 \text{ V}$, $I_D = 4 \text{ A}$
 $R_{DS(on)} = 0.12 \Omega$, $V_{GS} = 4 \text{ V}$, $I_D = 4 \text{ A}$
- 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



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	$P_{ch} (T_c = 25^\circ C)^{*2}$	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 $\leq 1\%$

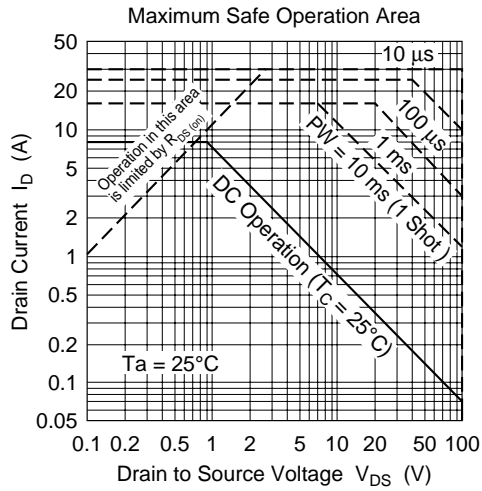
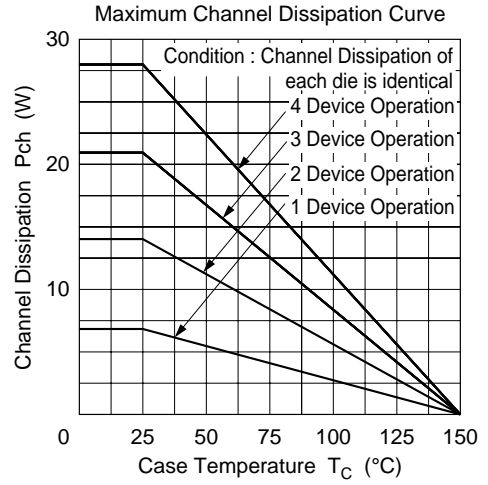
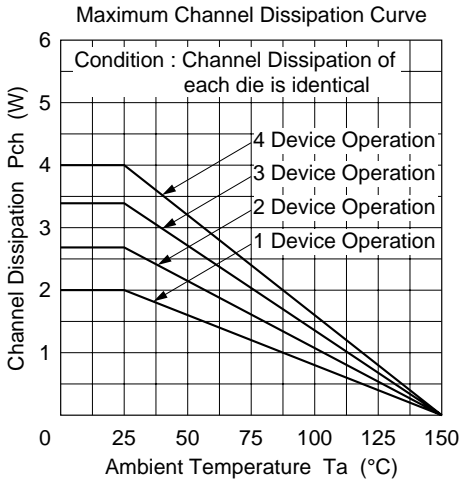
2. 4 devices operation

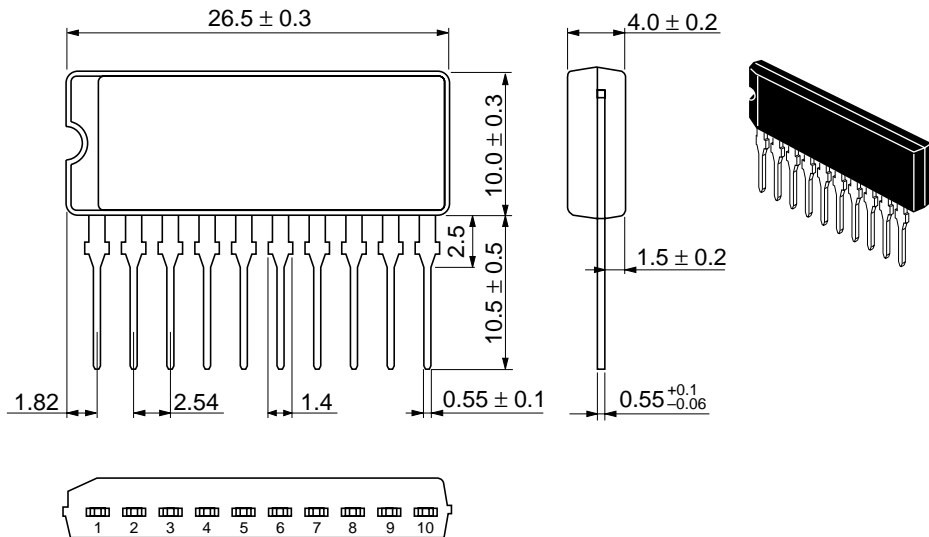
Electrical Characteristics (Ta = 25°C) (1 Unit)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	100	—	—	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	$V_{DS} = 80 \text{ V}, V_{GS} = 0$
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	$R_{DS(on)}$	—	0.07	0.09	Ω	$I_D = 4 \text{ A}, V_{GS} = 10 \text{ V}^{*1}$
		—	0.09	0.125	Ω	$I_D = 4 \text{ A}, V_{GS} = 4 \text{ V}^{*1}$
Forward transfer admittance	$ y_{fs} $	6.0	10.0	—	S	$I_D = 4 \text{ A}, V_{DS} = 10 \text{ V}^{*1}$
Input capacitance	Ciss	—	1300	—	pF	$V_{DS} = 10 \text{ V}, V_{GS} = 0,$
Output capacitance	Coss	—	540	—	pF	$f = 1 \text{ MHz}$
Reverse transfer capacitance	Crss	—	160	—	pF	
Turn-on delay time	$t_{d(on)}$	—	12	—	ns	$I_D = 4 \text{ A}, V_{GS} = 10 \text{ V},$
Rise time	t_r	—	60	—	ns	$R_L = 7.5 \text{ }\Omega$
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	$I_F = 8 \text{ A}, V_{GS} = 0$
Body to drain diode reverse recovery time	t_{rr}	—	200	—	ns	$I_F = 8 \text{ A}, V_{GS} = 0$ $dI_F/dt = 50 \text{ A}/\mu\text{s}$

Note: 1. Pulse Test

See characteristic curves of 2SK1302





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

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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 North America : <http://semiconductor.hitachi.com/>
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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) 778322

Hitachi Asia Pte. Ltd.
16 Collyer Quay #20-00
Hitachi Tower
Singapore 049318
Tel: 535-2100
Fax: 535-1533

Hitachi Asia Ltd.
Taipei Branch Office
3F, Hung Kuo Building, No.167,
Tun-Hwa North Road, Taipei (105)
Tel: <886> (2) 2718-3666
Fax: <886> (2) 2718-8180

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
Telex: 40815 HITEC HX

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