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# 4AK21

Silicon N-Channel Power MOS FET Array

# HITACHI

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## Application

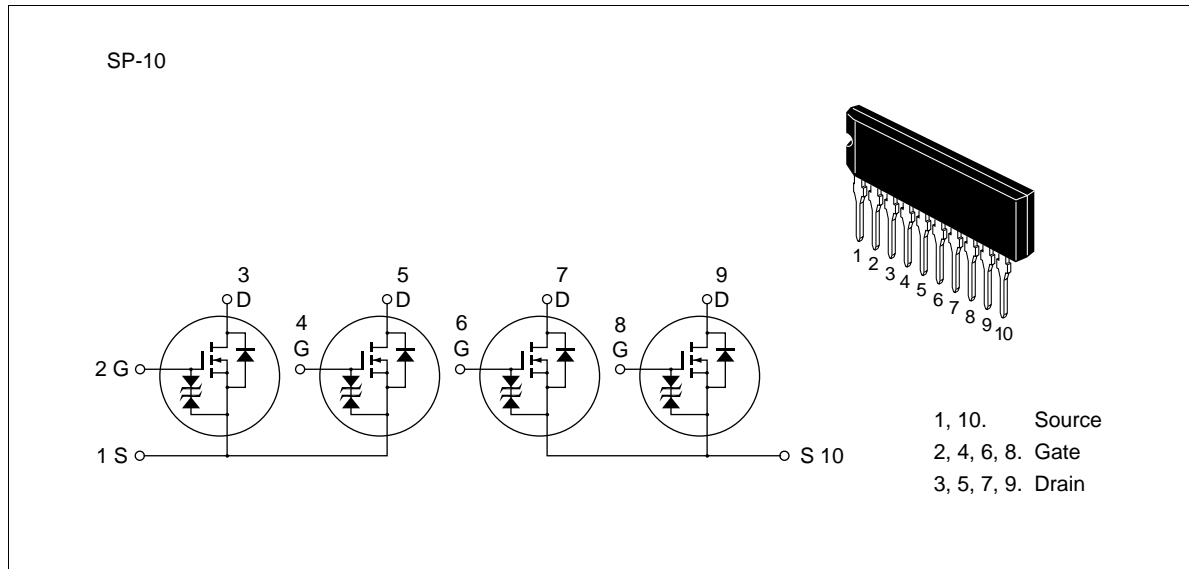
High speed power switching

## Features

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

## 4AK21

### Outline



### Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ ) (1 Unit)

Item	Symbol	Rating	Unit
Drain to source voltage	$V_{\text{DSS}}$	100	V
Gate to source voltage	$V_{\text{GSS}}$	$\pm 20$	V
Drain current	$I_{\text{D}}$	8	A
Drain peak current	$I_{\text{D(pulse)}}^{*1}$	32	A
Body to drain diode reverse drain current	$I_{\text{DR}}$	8	A
Channel dissipation	$P_{\text{ch}} (T_c = 25^\circ\text{C})^{*2}$	28	W
Channel dissipation	$P_{\text{ch}}^{*2}$	4	W
Channel temperature	$T_{\text{ch}}$	150	$^\circ\text{C}$
Storage temperature	$T_{\text{stg}}$	$-55$ to $+150$	$^\circ\text{C}$

Notes: 1.  $PW \leq 10 \mu\text{s}$ , duty cycle  $\leq 1\%$

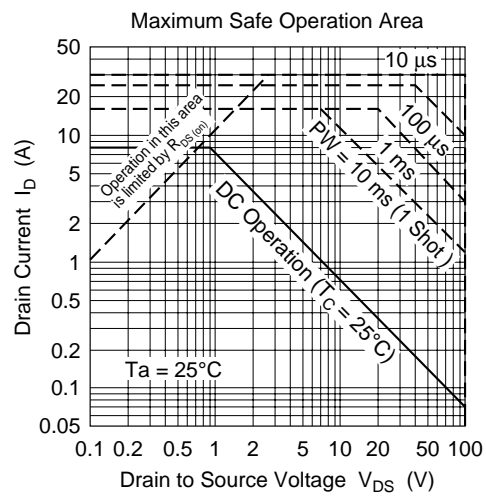
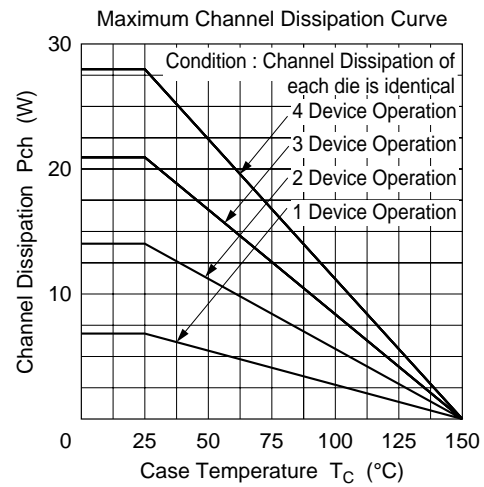
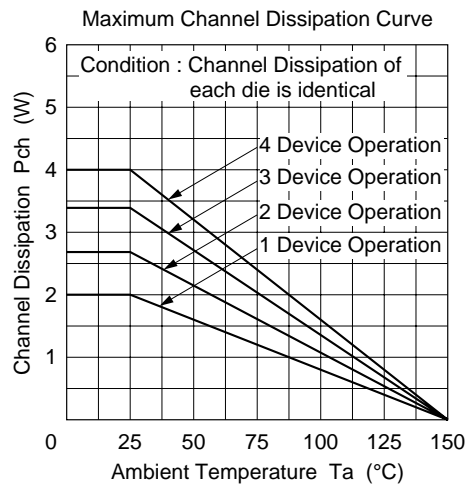
2. 4 devices operation

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

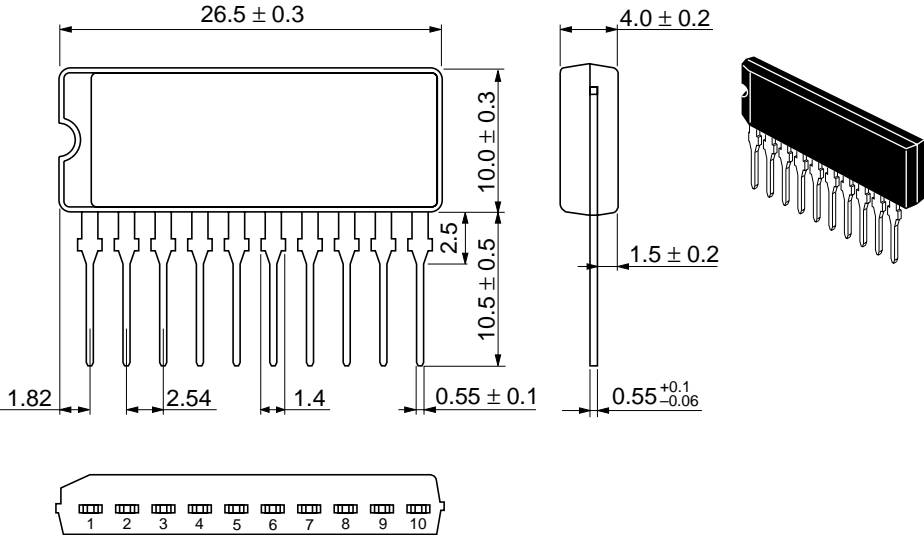
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	100	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	$\pm 20$	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}$ , $V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 16 \text{ V}$ , $V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	250	$\mu\text{A}$	$V_{DS} = 80 \text{ V}$ , $V_{GS} = 0$
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	$\Omega$	$I_D = 4 \text{ A}$ , $V_{GS} = 10 \text{ V}^{*1}$
			0.09	0.125	$\Omega$	$I_D = 4 \text{ A}$ , $V_{GS} = 4 \text{ V}^{*1}$
Forward transfer admittance	$ y_{fs} $	6.0	10.0	—	S	$I_D = 4 \text{ A}$ , $V_{DS} = 10 \text{ V}^{*1}$
Input capacitance	$C_{iss}$	—	1300	—	pF	$V_{DS} = 10 \text{ V}$ , $V_{GS} = 0$ , $f = 1 \text{ MHz}$
Output capacitance	$C_{oss}$	—	540	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	160	—	pF	
Turn-on delay time	$t_{d(on)}$	—	12	—	ns	$I_D = 4 \text{ A}$ , $V_{GS} = 10 \text{ V}$ , $R_L = 7.5 \text{ }\Omega$
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	$I_F = 8 \text{ A}$ , $V_{GS} = 0$
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



Unit: mm



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