
4AK21

Silicon N-Channel Power MOS FET Array

HITACHI

Application

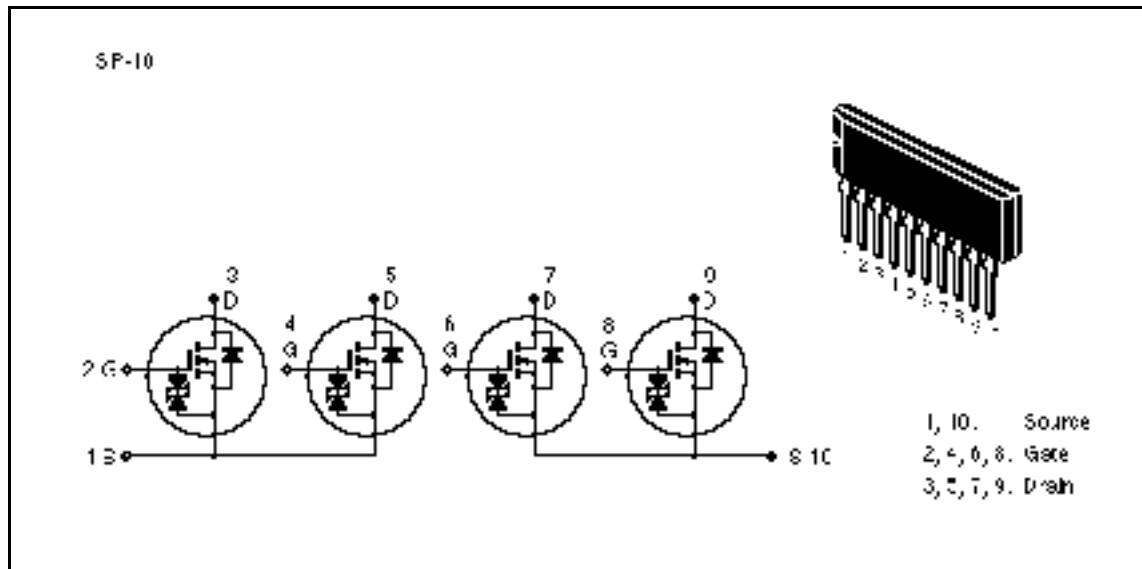
High speed power switching

Features

- Σ Low on-resistance
 - $R_{DS(on)} \leq 0.09 \Omega, V_{GS} = 10 \text{ V}, I_D = 4 \text{ A}$
 - $R_{DS(on)} \leq 0.12 \Omega, V_{GS} = 4 \text{ V}, I_D = 4 \text{ A}$
- Σ Capable of 4 V gate drive
- Σ Low drive current
- Σ High speed switching
- Σ High density mounting
- Σ Suitable for motor driver, solenoid driver and lamp driver
- Σ Discrete packaged devices of same die: 2SK1302, 2SK1307

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Outline



Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$) (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	$P_{ch} (T_c = 25^\circ\text{C})^{*2}$	28	W
Channel dissipation	P_{ch}^{*2}	4	W
Channel temperature	T_{ch}	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to $+150$	$^\circ\text{C}$

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

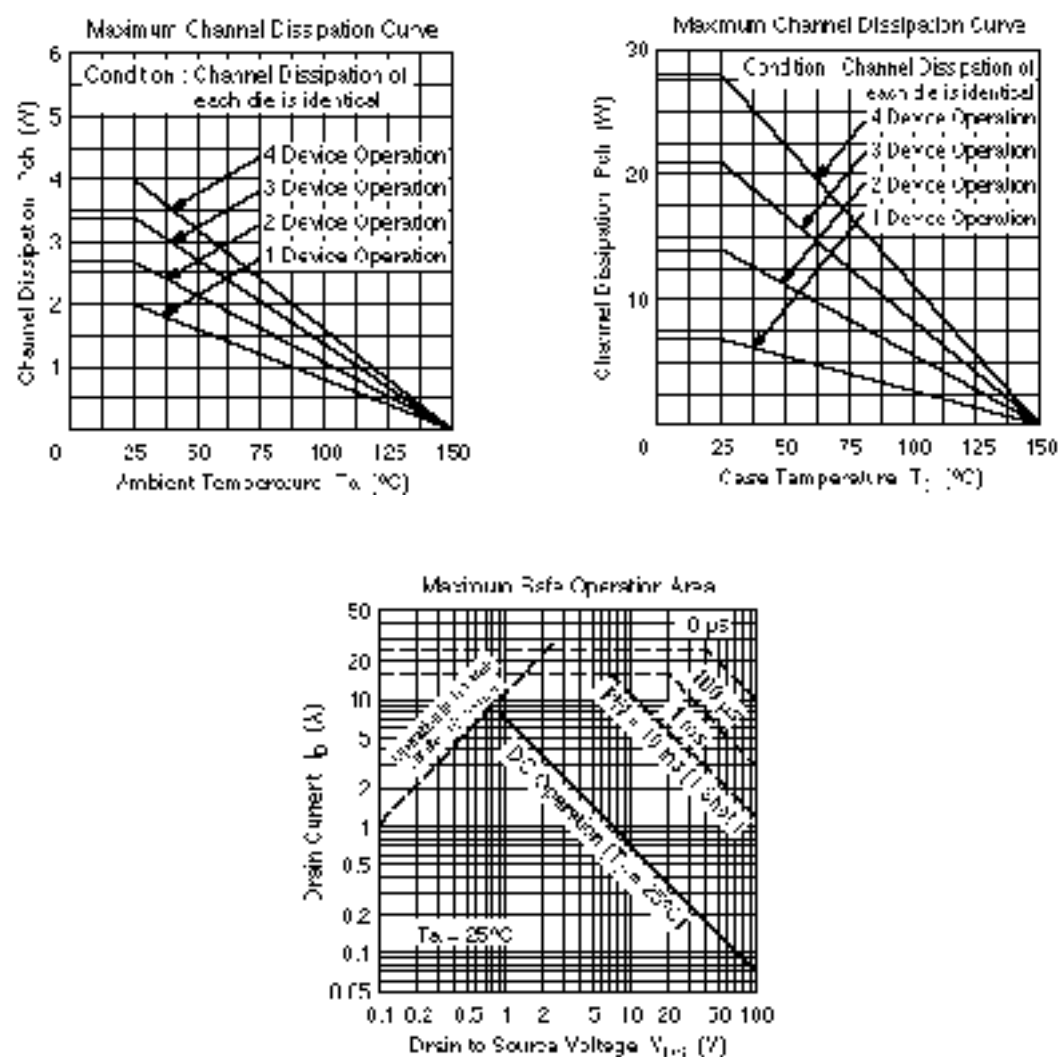
2. 4 devices operation

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	$V_{(BR)GSS}$	±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	W	$I_D = 4 \text{ A}$, $V_{GS} = 10 \text{ V}^{*1}$
		—	0.09	0.125	W	$I_D = 4 \text{ A}$, $V_{GS} = 4 \text{ V}^{*1}$
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



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