
4AM12

Silicon N-Channel/P-Channel Power MOS FET Array

HITACHI

Application

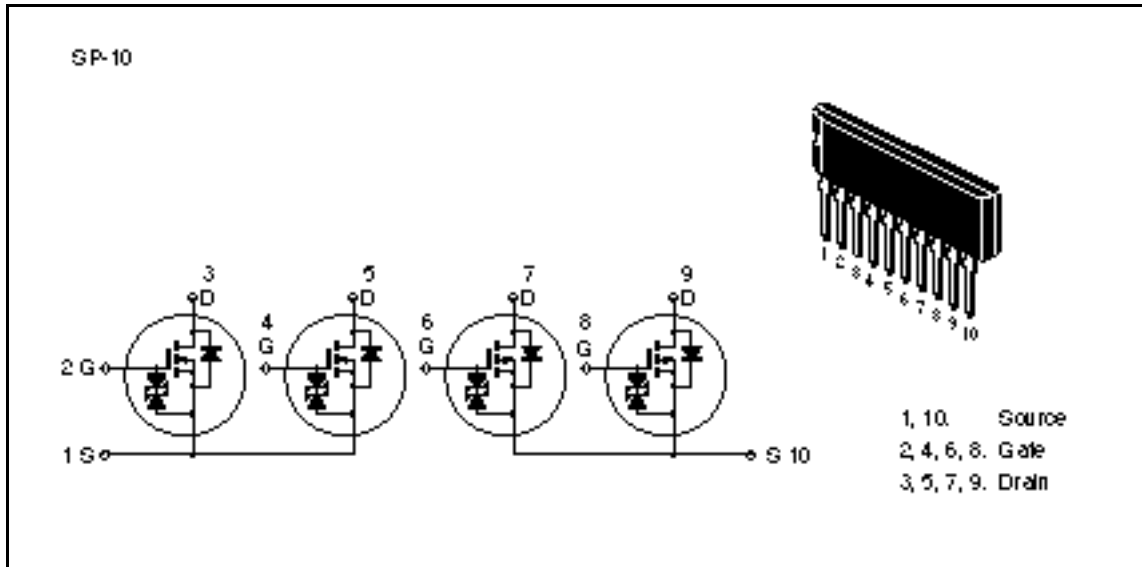
High speed power switching

Features

- Low on-resistance
N-channel: $R_{DS(on)} = 0.075 \Omega$, $V_{GS} = 10 \text{ V}$, $I_D = 4 \text{ A}$
P-channel: $R_{DS(on)} = 0.12 \Omega$, $V_{GS} = -10 \text{ V}$, $I_D = -4 \text{ A}$
- Capable of 4 V gate drive
- Low drive current
- High speed switching
- High density mounting
- Suitable for H-bridged motor driver
- Discrete packaged devices of same die
N-channel: 2SK971, 2SK1094
P-channel: 2SJ173, 2SJ176

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Outline



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

Item	Symbol	Rating		
		Nch	Pch	Unit
Drain to source voltage	V_{DSS}	60	-60	V
Gate to source voltage	V_{GSS}	±20	±20	V
Drain current	I_D	8	-8	A
Drain peak current	$I_{D(pulse)}^{*1}$	32	-32	A
Body to drain diode reverse drain current	I_{DR}	8	-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	N channel			P channel			Unit	Test conditions
		Min	Typ	Max	Min	Typ	Max		
Drain to source breakdown voltage	$V_{(BR)DSS}$	60	—	—	-60	—	—	V	$I_D = 10 \text{ mA}, V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	± 20	—	—	± 20	—	—	μA	$I_G = \pm 100 \mu\text{A}, V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 10	—	—	± 10	μA	$V_{GS} = \pm 16 \text{ V}, V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	250	—	—	-250	V	$V_{DS} = 50 \text{ V}, V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.0	-1.0	—	-2.0	V	$I_D = 1 \text{ mA}, V_{DS} = 10 \text{ V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.06	0.075	—	0.09	0.12		$I_D = 4 \text{ A}, V_{GS} = 10 \text{ V}^{*1}$
		—	0.08	0.11	—	0.12	0.18		$I_D = 4 \text{ A}, V_{GS} = 4 \text{ V}^{*1}$
Forward transfer admittance	$ y_{fs} $	5.5	9.0	—	5.5	7.5	—	S	$I_D = 4 \text{ A}, V_{DS} = 10 \text{ V}^{*1}$
Input capacitance	C_{iss}	—	860	—	—	1400	—	pF	$V_{DS} = 10 \text{ V}, V_{GS} = 0,$ $f = 1 \text{ MHz}$
Output capacitance	C_{oss}	—	450	—	—	720	—	pF	
Reverse transfer capacitance	C_{rss}	—	140	—	—	220	—	pF	
Turn-on delay time	$t_{d(on)}$	—	10	—	—	15	—	ns	$I_D = 4 \text{ A}, V_{GS} = 10 \text{ V},$
Rise time	t_r	—	45	—	—	90	—	ns	$R_L = 7.5$
Turn-off delay time	$t_{d(off)}$	—	200	—	—	250	—	ns	
Fall time	t_f	—	100	—	—	150	—	ns	
Body to drain diode forward voltage	V_{DF}	—	1.05	—	—	-1.05	—	V	$I_F = 8 \text{ A}, V_{GS} = 0$
Body to drain diode reverse recovery time	t_{rr}	—	110	—	—	180	—	ns	$I_F = 8 \text{ A}, V_{GS} = 0,$ $dI_F/dt = 50 \text{ A}/\mu\text{s}$

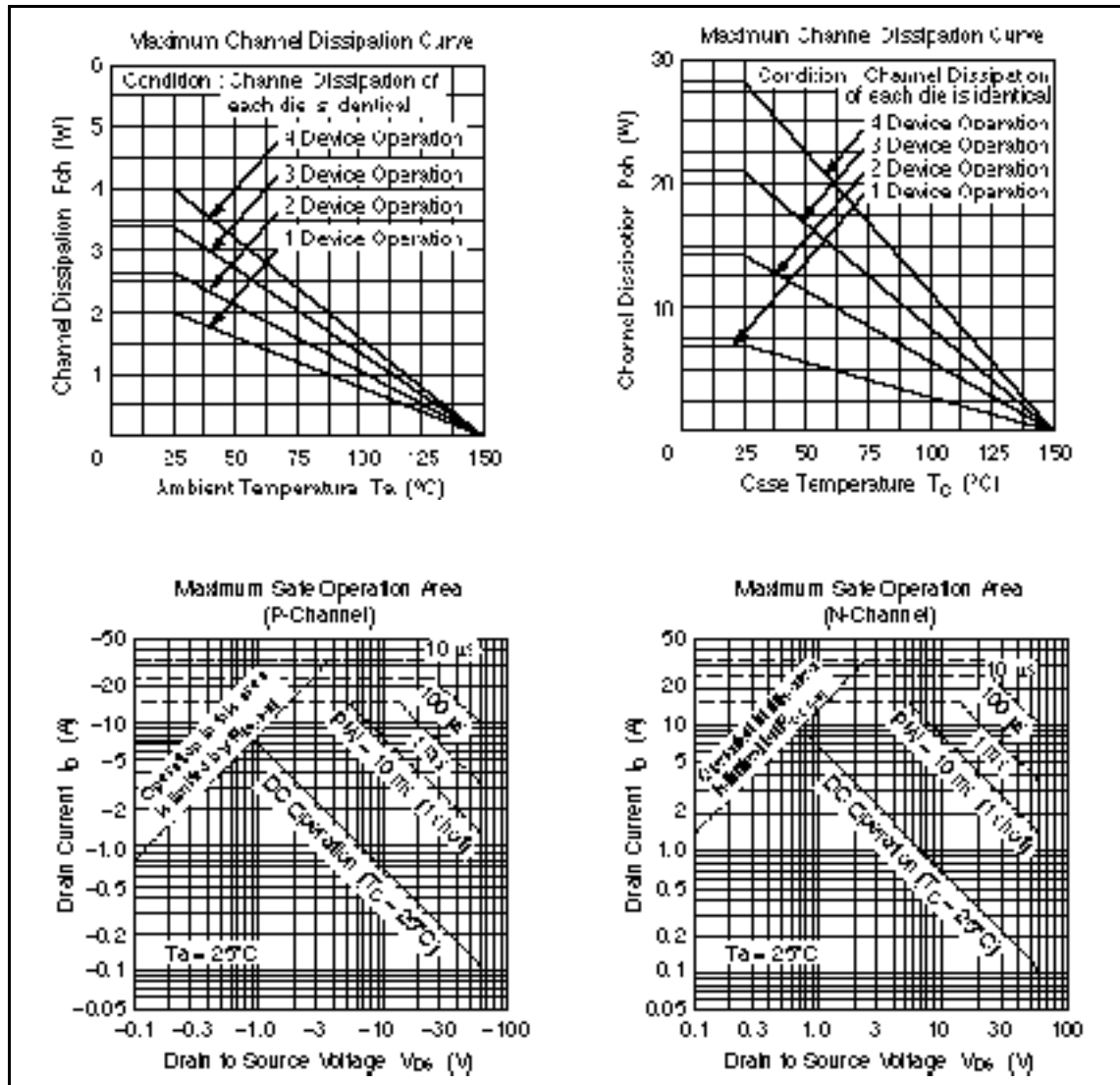
Note: 1. Pulse Test

Polarity of test conditions for P channel device is reversed.

Nch: See characteristic curves of 2SK971

Pch: See characteristic curves of 2SJ173

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