

## 4AM16

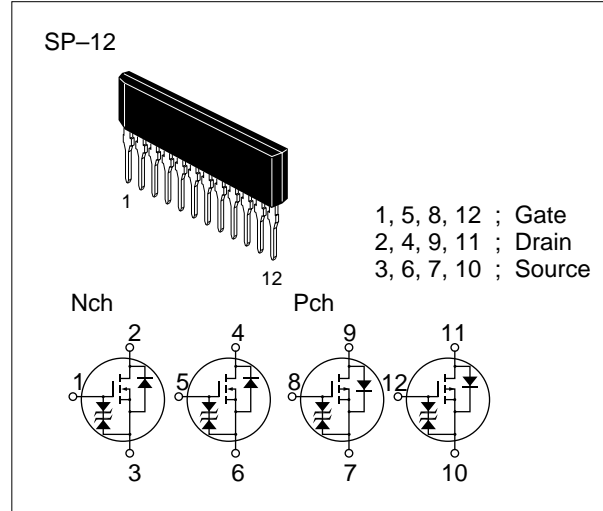
### Silicon N Channel/P Channel Power MOS FET Array

#### Application

High speed power switching

#### Features

- Low on-resistance  
 N Channel :  $R_{DS(on)} \leq 0.17\Omega$ ,  
 $V_{GS} = 10V$ ,  $I_D = 4A$   
 P Channel :  $R_{DS(on)} \leq 0.2\Omega$ ,  
 $V_{GS} = -10V$ ,  $I_D = -4A$
- High speed switching
- High density mounting
- Suitable for H-bridged motor driver



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

Item	Symbol	Ratings		Unit
		Nch	Pch	
Drain to source voltage	$V_{DSS}$	60	-60	V
Gate to source voltage	$V_{GSS}$	$\pm 20$	$\pm 20$	V
Drain current	$I_D$	8	-8	A
Drain peak current	$I_{D(pulse)}^*$	32	-32	A
Body-drain diode reverse drain current	$I_{DR}$	8	-8	A
Channel dissipation	$P_{ch}^{**}$ ( $T_c = 25^\circ\text{C}$ )	28		W
			4.0	W
Channel temperature	$T_{ch}$	150		$^\circ\text{C}$
Storage temperature	$T_{stg}$	-55 to +150		$^\circ\text{C}$

\*  $PW \leq 10 \mu\text{s}$ , duty cycle  $\leq 1\%$

\*\* 4 Device Operation

**Table 2 Electrical Characteristics** (Ta = 25°C)

Item	Symbol	N Channel			Unit	Test conditions
		Min	Typ	Max		
Drain to source breakdown voltage	$V_{(BR)DSS}$	60	—	—	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	$V_{DS} = 50 \text{ V}, V_{GS} = 0$
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	$R_{DS(on)}$	—	0.13	0.17	Ω	$I_D = 4 \text{ A}, V_{GS} = 10 \text{ V}^*$
		—	0.18	0.24		$I_D = 4 \text{ A}, V_{GS} = 4 \text{ V}^*$
Forward transfer admittance	$ y_{fs} $	3.5	5.5	—	S	$I_D = 4 \text{ A}$ $V_{DS} = 10 \text{ V}^*$
Input capacitance	$C_{iss}$	—	400	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	$C_{oss}$	—	220	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	60	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	5	—	ns	$I_D = 4 \text{ A}$
Rise time	$t_r$	—	45	—	ns	$V_{GS} = 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	150	—	ns	$R_L = 7.5 \text{ } \Omega$
Fall time	$t_f$	—	85	—	ns	
Body-drain diode forward voltage	$V_{DF}$	—	1.2	—	V	$I_F = 8 \text{ A}, V_{GS} = 0$
Body-drain diode reverse recovery time	$t_{rr}$	—	120	—	ns	$I_F = 8 \text{ A}, V_{GS} = 0,$ $di_F / dt = 50 \text{ A} / \mu\text{s}$

\* Pulse Test

See characteristic curves of 2SK970

**Table 3 Electrical Characteristics** (Ta = 25°C)

Item	Symbol	P Channel			Unit	Test conditions
		Min	Typ	Max		
Drain to source breakdown voltage	$V_{(BR)DSS}$	-60	—	—	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	$\mu\text{A}$	$V_{DS} = -50 \text{ V}, V_{GS} = 0$
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	$R_{DS(on)}$	—	0.15	0.20	$\Omega$	$I_D = -4 \text{ A}, V_{GS} = -10 \text{ V}^*$
		—	0.20	0.27		$I_D = -4 \text{ A}, V_{GS} = -4 \text{ V}^*$
Forward transfer admittance	$ y_{fs} $	3.5	6.0	—	S	$I_D = -4 \text{ A}$ $V_{DS} = -10 \text{ V}^*$
Input capacitance	$C_{iss}$	—	900	—	pF	$V_{DS} = -10 \text{ V}$
Output capacitance	$C_{oss}$	—	460	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	130	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	8	—	ns	$I_D = -4 \text{ A}$
Rise time	$t_r$	—	50	—	ns	$V_{GS} = -10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	180	—	ns	$R_L = 7.5 \text{ }\Omega$
Fall time	$t_f$	—	95	—	ns	
Body-drain diode forward voltage	$V_{DF}$	—	-1.2	—	V	$I_F = -8 \text{ A}, V_{GS} = 0$
Body-drain diode reverse recovery time	$t_{rr}$	—	185	—	ns	$I_F = -8 \text{ A}, V_{GS} = 0,$ $di_F / dt = 50 \text{ A} / \mu\text{s}$

\* Pulse Test

See characteristics curves of 2SJ172

