

To all our customers

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Renesas Technology Corp.  
Customer Support Dept.  
April 1, 2003

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# 6AM14

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

# RENESAS

### Application

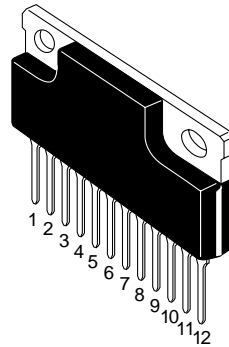
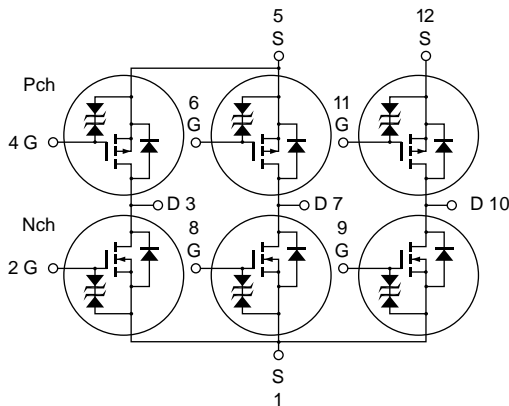
High speed power switching

### Features

- Low on-resistance
- Low drive current
- High speed switching
- High density mounting

### Outline

SP-12TA



- 1. N-ch Source
- 2, 8, 9 N-ch Gate
- 3, 7, 10. N-ch Drain  
P-ch Drain
- 4, 6, 11. P-ch Gate
- 5, 12. P-ch Source

## Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings		Unit
		Nch	Pch	
Drain to source voltage	V <sub>DSS</sub>	60	-60	V
Gate to source voltage	V <sub>GSS</sub>	±20	±20	V
Drain current	I <sub>D</sub>	7	-7	A
Drain peak current	I <sub>D(pulse)</sub> <sup>*1</sup>	28	-28	A
Reverse drain current	I <sub>DR</sub>	7	-7	A
Channel dissipation	Pch <sup>*2</sup>	42		W
Channel dissipation	Pch <sup>*2</sup>	4.8		W
Channel temperature	Tch	150		°C
Storage temperature	Tstg	-55 to +150		°C

Notes: 1. PW ≤ 10 μs, duty cycle ≤ 1%  
2. Value at 6 Drive operation

## Electrical Characteristics N Channel (Ta = 25°C)

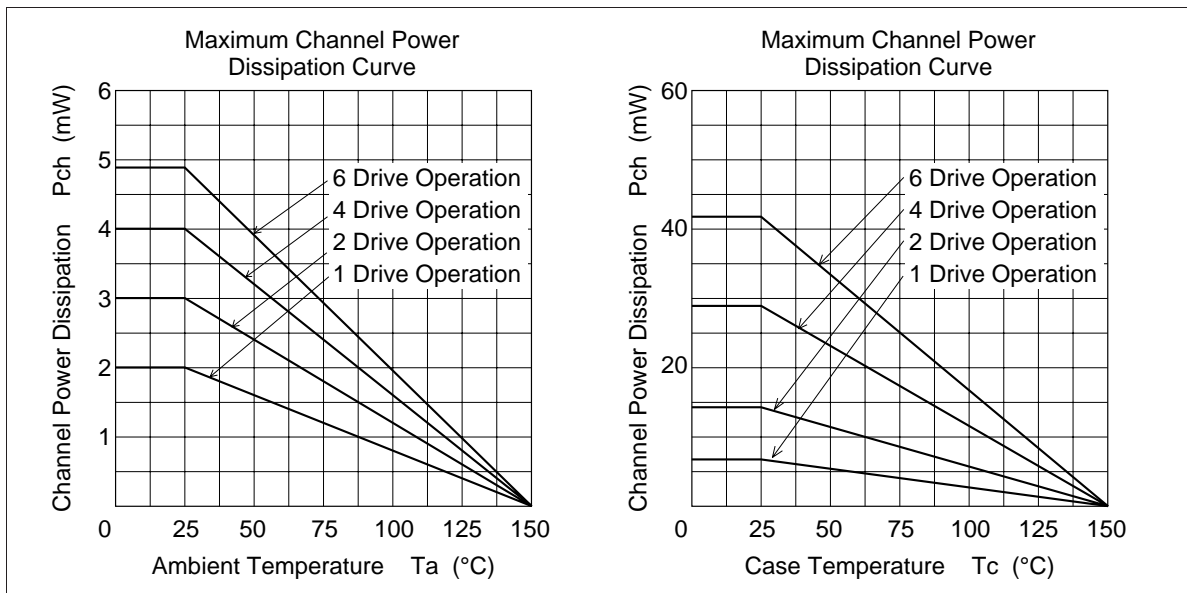
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	60	—	—	V	$I_D = 10 \text{ mA}$ , $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	$\pm 20$	—	—	V	$I_G = \pm 100 \mu\text{A}$ , $V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 16 \text{ V}$ , $V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	250	$\mu\text{A}$	$V_{DS} = 50 \text{ V}$ , $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	0.5	—	1.5	V	$V_{DS} = 10 \text{ V}$ , $I_D = 1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.14	0.2	$\Omega$	$I_D = 4 \text{ A}$ $V_{GS} = 4 \text{ V}^{*1}$
		—	0.22	0.5	$\Omega$	$I_D = 2 \text{ A}$ $V_{GS} = 2.5 \text{ V}^{*1}$
Forward transfer admittance	$ y_{fs} $	4.0	6.5	—	S	$I_D = 4 \text{ A}$ $V_{DS} = 10 \text{ V}^{*1}$
Input capacitance	$C_{iss}$	—	500	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	$C_{oss}$	—	240	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	30	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	15	—	ns	$V_{GS} = 10 \text{ V}$ , $I_D = 4 \text{ A}$
Rise time	$t_r$	—	90	—	ns	$R_L = 7.5 \Omega$
Turn-off delay time	$t_{d(off)}$	—	110	—	ns	
Fall time	$t_f$	—	250	—	ns	
Body to drain diode forward voltage	$V_{DF}$	—	1.0	—	V	$I_F = 7 \text{ A}$ , $V_{GS} = 0$
Body to drain diode reverse recovery time	$t_{rr}$	—	170	—	ns	$I_F = 7 \text{ A}$ , $V_{GS} = 0$ $diF/dt = 50 \text{ A}/\mu\text{s}$

Note: 1. Pulse Test

## Electrical Characteristics P Channel (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
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	$I_G = \pm 100 \mu\text{A}$ , $V_{DS} = 0$
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	$V_{GS(off)}$	-0.5	—	-1.5	V	$V_{DS} = -10 \text{ V}$ , $I_D = -1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.12	0.16	$\Omega$	$I_D = -4 \text{ A}$ $V_{GS} = -4 \text{ V}^{*1}$
		—	0.16	0.3	$\Omega$	$I_D = -2 \text{ A}$ $V_{GS} = -2.5 \text{ V}^{*1}$
Forward transfer admittance	$ y_{fs} $	5.0	8.0	—	S	$I_D = -4 \text{ A}$ $V_{DS} = -10 \text{ V}^{*1}$
Input capacitance	$C_{iss}$	—	1450	—	pF	$V_{DS} = -10 \text{ V}$
Output capacitance	$C_{oss}$	—	590	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	$C_{rss}$	—	120	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	15	—	ns	$V_{GS} = -10 \text{ V}$ , $I_D = -4 \text{ A}$
Rise time	$t_r$	—	75	—	ns	$R_L = 7.5 \Omega$
Turn-off delay time	$t_{d(off)}$	—	240	—	ns	
Fall time	$t_f$	—	180	—	ns	
Body to drain diode forward voltage	$V_{DF}$	—	-1.0	—	V	$I_F = -7 \text{ A}$ , $V_{GS} = 0$
Body to drain diode reverse recovery time	$t_{rr}$	—	210	—	ns	$I_F = -7 \text{ A}$ , $V_{GS} = 0$ $diF/dt = 50 \text{ A}/\mu\text{s}$

Note: 1. Pulse Test



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