
4AM17

Silicon N/P Channel MOS FET
High Speed Power Switching

HITACHI

ADE-208-729 (Z)

1st. Edition

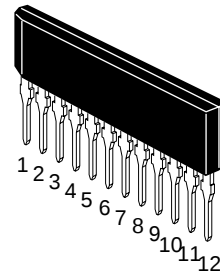
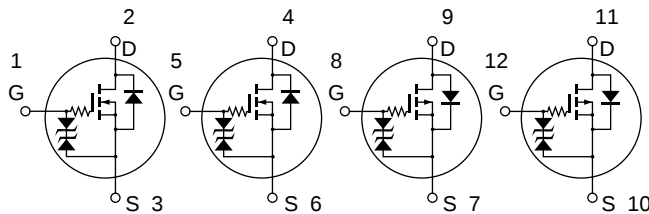
February 1999

Features

- Low on-resistance
N Channel: $R_{DS(on)} \leq 0.17 \Omega$, $V_{GS} = 10 \text{ V}$, $I_D = 4 \text{ A}$
P Channel: $R_{DS(on)} \leq 0.2 \Omega$, $V_{GS} = -10 \text{ V}$, $I_D = -4 \text{ A}$
- 4 V gate drive devices.
- High density mounting

Outline

SP-12



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

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Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings		Unit
		Nch	Pch	
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)} ^{Note1}	32	−32	A
Body-drain diode reverse drain current	I _{DR}	8	−8	A
Channel dissipation	Pch (Tc = 25°C) ^{Note2}		28	W
Channel dissipation	Pch ^{Note2}		4.0	W
Channel temperature	Tch		150	°C
Storage temperature	Tstg	−55 to +150		°C

Note: 1. PW ≤ 10 μs, duty cycle ≤ 1%
2. 4 devices operation

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

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	$V_{(BR)GSS}$	± 20	—	—	V	$I_G = \pm 100 \mu\text{A}$, $V_{DS} = 0$
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	—	2.5	V	$V_{DS} = 10 \text{ V}$, $I_D = 1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.13	0.17	Ω	$I_D = 4 \text{ A}$, $V_{GS} = 10 \text{ V}$ ^{Note3}
	$R_{DS(on)}$	—	0.19	0.24	Ω	$I_D = 4 \text{ A}$, $V_{GS} = 4 \text{ V}$ ^{Note3}
Forward transfer admittance	$ y_{fs} $	3.5	5.5	—	S	$I_D = 4 \text{ A}$, $V_{DS} = 10 \text{ V}$ ^{Note3}
Input capacitance	Ciss	—	33	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	Coss	—	220	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	Crss	—	5.2	—	pF	$f = 1 \text{ MHz}$
Gate series resistance	Rg	—	1.5	—	k Ω	$V_{DS} = 10 \text{ V}$, $V_{GS} = 0$ $f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	0.15	—	ns	$V_{GS} = 10 \text{ V}$, $I_D = 4 \text{ A}$
Rise time	t_r	—	0.5	—	ns	$R_L = 7.5 \Omega$
Turn-off delay time	$t_{d(off)}$	—	3.2	—	ns	
Fall time	t_f	—	1.4	—	ns	
Body-drain diode forward voltage	V_{DF}	—	1.5	—	V	$I_F = 8 \text{ A}$, $V_{GS} = 0$
Body-drain diode reverse recovery time	t_{rr}	—	850	—	ns	$I_F = 8 \text{ A}$, $V_{GS} = 0$ $di_F/dt = 50 \text{ A}/\mu\text{s}$

Note: 3. Pulse test

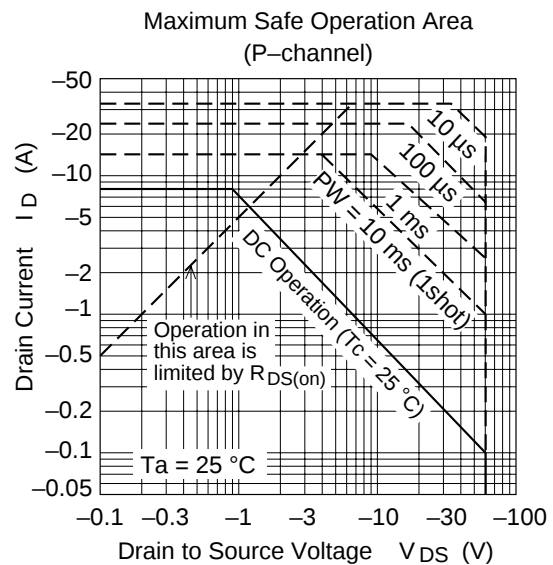
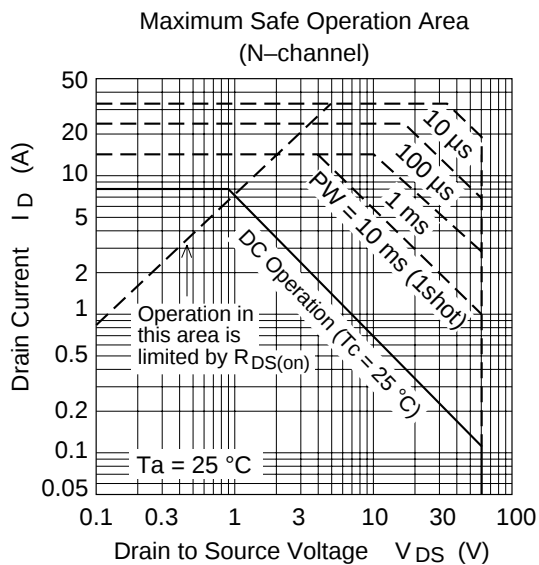
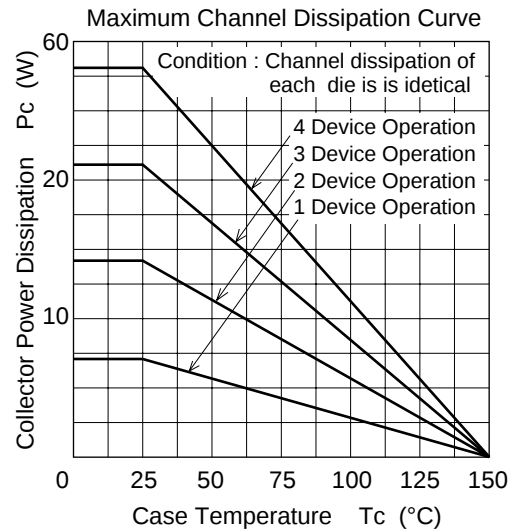
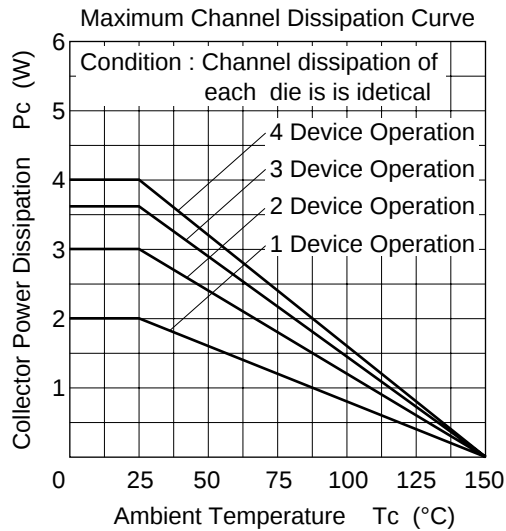
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(P Channel)

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	$V_{(BR)GSS}$	± 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	—	-2.5	V	$V_{DS} = -10 \text{ V}$, $I_D = -1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.15	0.2	Ω	$I_D = -4 \text{ A}$, $V_{GS} = -10 \text{ V}$ ^{Note3}
	$R_{DS(on)}$	—	0.2	0.27	Ω	$I_D = -4 \text{ A}$, $V_{GS} = -4 \text{ V}$ ^{Note3}
Forward transfer admittance	$ y_{fs} $	3.5	6.0	—	S	$I_D = -4 \text{ A}$, $V_{DS} = -10 \text{ V}$ ^{Note3}
Input capacitance	C_{iss}	—	17	—	pF	$V_{DS} = -10 \text{ V}$
Output capacitance	C_{oss}	—	460	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	1.2	—	pF	$f = 1 \text{ MHz}$
Gate series resistance	R_g	—	3.2	—	$k\Omega$	$V_{DS} = 0$, $V_{GS} = 0$ $f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	0.6	—	ns	$V_{GS} = -10 \text{ V}$, $I_D = -4 \text{ A}$
Rise time	t_r	—	2.1	—	ns	$R_L = 7.5 \Omega$
Turn-off delay time	$t_{d(off)}$	—	12	—	ns	
Fall time	t_f	—	5.8	—	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}	—	2.5	—	ns	$I_F = -8 \text{ A}$, $V_{GS} = 0$ $diF/dt = 50 \text{ A}/\mu\text{s}$

Note: 3. Pulse test

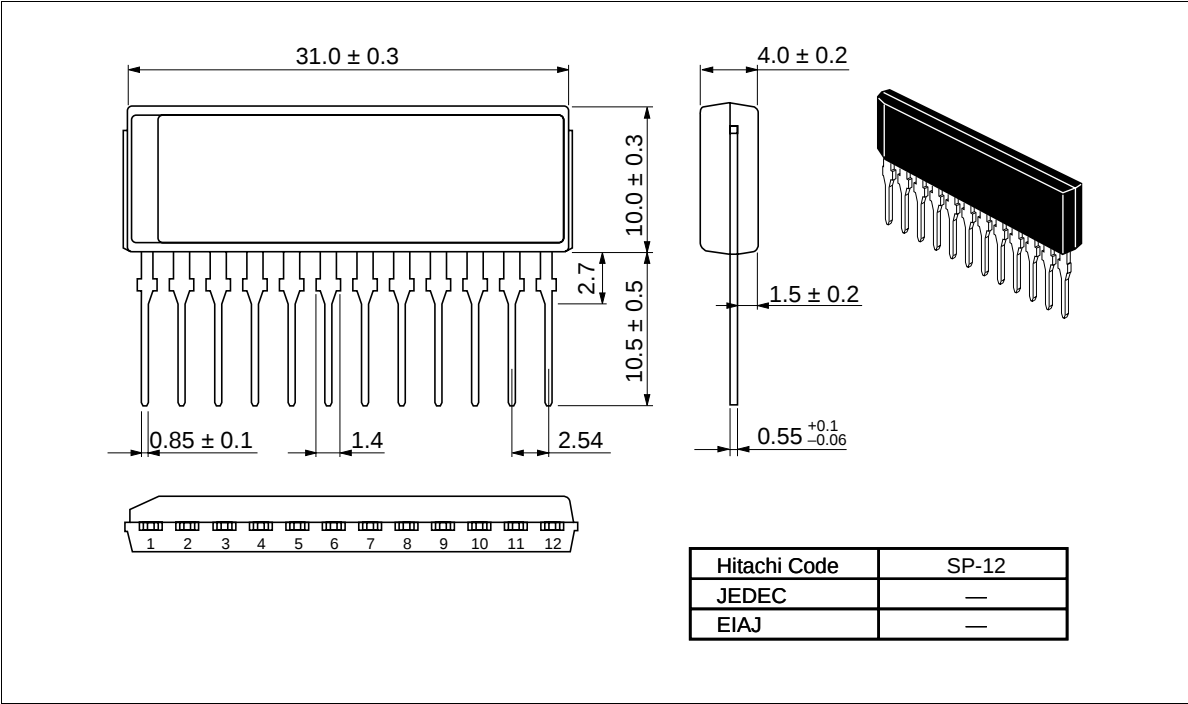
Main Characteristics



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Package Dimensions

Unit: mm



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