4AM17

Silicon N/P Channel MOS FET
High Speed Power Switching

HITACHI

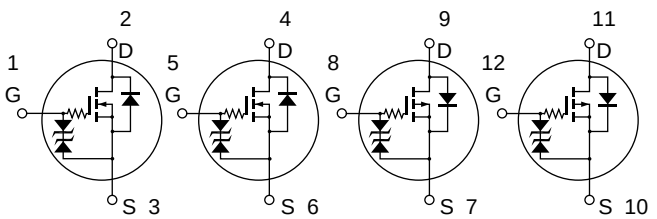
ADE-208-729 (Z)
1st. Edition
February 1999

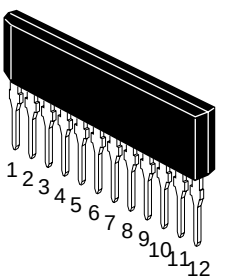
Features

- Low on-resistance
  N Channel: $R_{DS(on)} \leq 0.17\ \Omega$, $V_{GS} = 10$ V, $I_D = 4$ A
  P Channel : $R_{DS(on)} \leq 0.2\ \Omega$, $V_{GS} = -10$ V, $I_D = -4$ 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 mA, V_{GS} = 0
Gate to source breakdown voltage	$V_{(BR)GSS}$	±20	—	—	V	I_G = ±100 µA, V_{DS} = 0
Gate to source leak current	I_{GSS}	—	—	±10	µA	V_{GS} = ±16 V, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	250	µA	V_{DS} = 50 V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	1.0	—	2.5	V	V_{DS} = 10 V, I_D = 1 mA
Static drain to source on state resistance	$R_{DS(on)}$	—	0.13	0.17	Ω	I_D = 4 A, V_{GS} = 10 V [Note3]
	$R_{DS(on)}$	—	0.19	0.24	Ω	I_D = 4 A, V_{GS} = 4 V [Note3]
Forward transfer admittance	$\|y_{fs}\|$	3.5	5.5	—	S	I_D = 4 A, V_{DS} = 10 V [Note3]
Input capacitance	Ciss	—	33	—	pF	V_{DS} = 10 V
Output capacitance	Coss	—	220	—	pF	V_{GS} = 0
Reverse transfer capacitance	Crss	—	5.2	—	pF	f = 1 MHz
Gate series resistance	Rg	—	1.5	—	kΩ	V_{DS} = 10 V, V_{GS} = 0 f = 1 MHz
Turn-on delay time	$t_{d(on)}$	—	0.15	—	ns	V_{GS} = 10 V, I_D = 4 A
Rise time	t_r	—	0.5	—	ns	R_L = 7.5 Ω
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 A, V_{GS} = 0
Body–drain diode reverse recovery time	t_{rr}	—	850	—	ns	I_F = 8 A, V_{GS} = 0 diF/ dt = 50 A/ µs

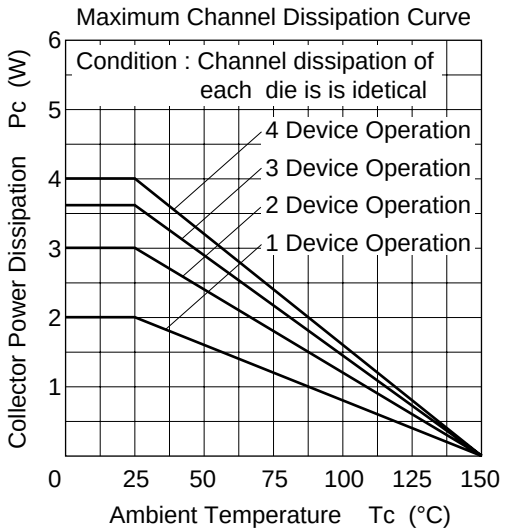
Note: 3. Pulse test

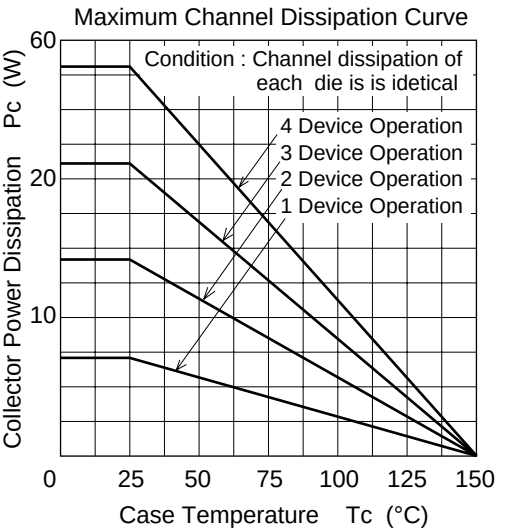
(P Channel)

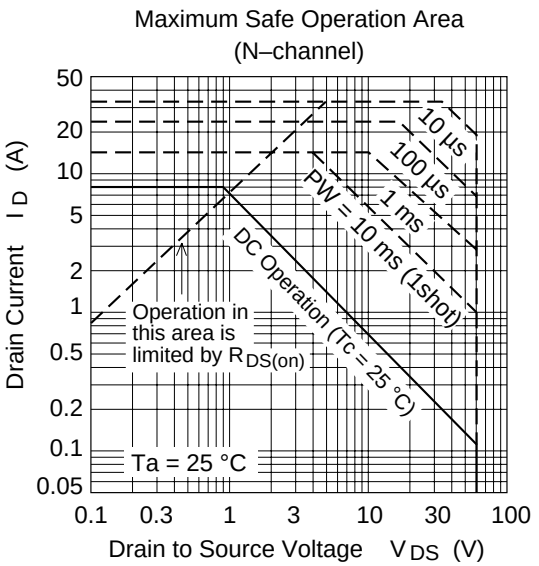
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	–60	—	—	V	I_D = –10 mA, V_{GS} = 0
Gate to source breakdown voltage	$V_{(BR)GSS}$	±20	—	—	V	I_G = ±100 µA, V_{DS} = 0
Gate to source leak current	I_{GSS}	—	—	±10	µA	V_{GS} = ±16 V, V_{DS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	–250	µA	V_{DS} = –50 V, V_{GS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	–1.0	—	–2.5	V	V_{DS} = –10 V, I_D = –1 mA
Static drain to source on state resistance	$R_{DS(on)}$	—	0.15	0.2	Ω	I_D = –4 A, V_{GS} = –10 V Note3
	$R_{DS(on)}$	—	0.2	0.27	Ω	I_D = –4 A, V_{GS} = –4 V Note3
Forward transfer admittance	$\|y_{fs}\|$	3.5	6.0	—	S	I_D = –4 A, V_{DS} = –10 V Note3
Input capacitance	Ciss	—	17	—	pF	V_{DS} = –10 V
Output capacitance	Coss	—	460	—	pF	V_{GS} = 0
Reverse transfer capacitance	Crss	—	1.2	—	pF	f = 1 MHz
Gate series resistance	Rg	—	3.2	—	kΩ	V_{DS} = 0, V_{GS} = 0 f = 1 MHz
Turn-on delay time	$t_{d(on)}$	—	0.6	—	ns	V_{GS} = –10 V, I_D = –4 A
Rise time	t_r	—	2.1	—	ns	R_L = 7.5 Ω
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 A, V_{GS} = 0
Body–drain diode reverse recovery time	t_{rr}	—	2.5	—	ns	I_F = –8 A, V_{GS} = 0 diF/ dt = 50 A/ µs

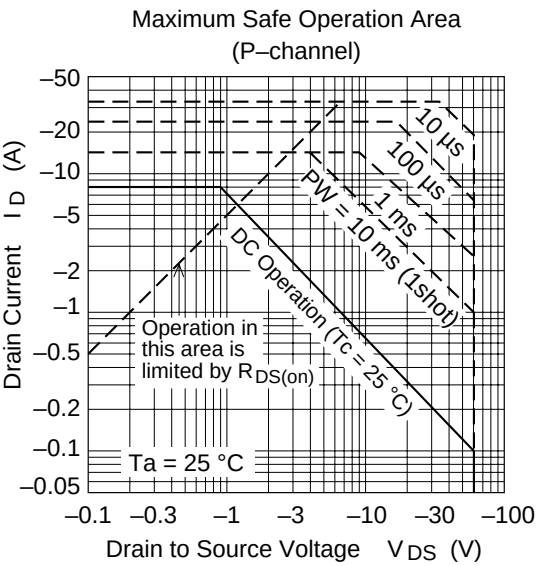
Note: 3. Pulse test

Main Characteristics



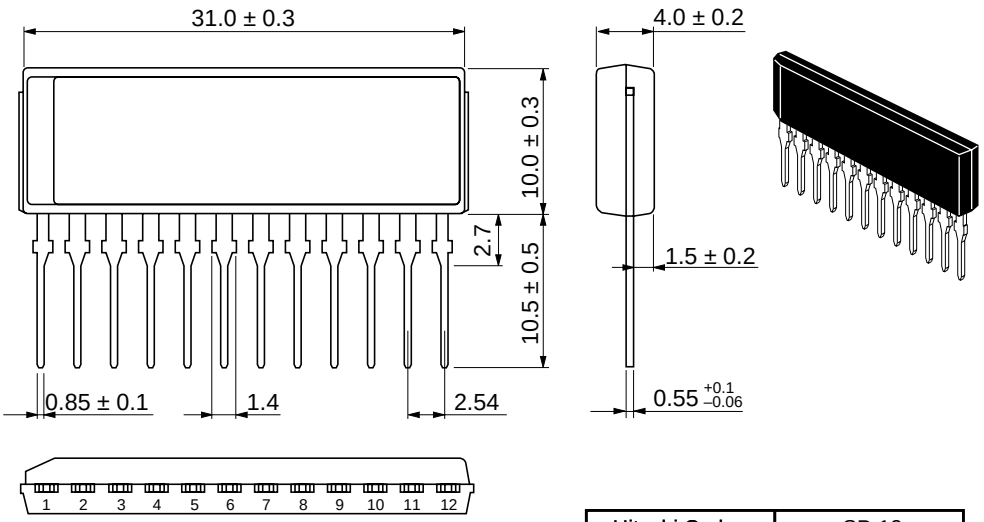






Package Dimensions

Unit: mm



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