

To all our customers

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

Cautions

Keep safety first in your circuit designs!

1. Renesas Technology Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage.

Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of nonflammable material or (iii) prevention against any malfunction or mishap.

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HAT2093R

Silicon N Channel Power MOS FET
High Speed Power Switching

RENESAS

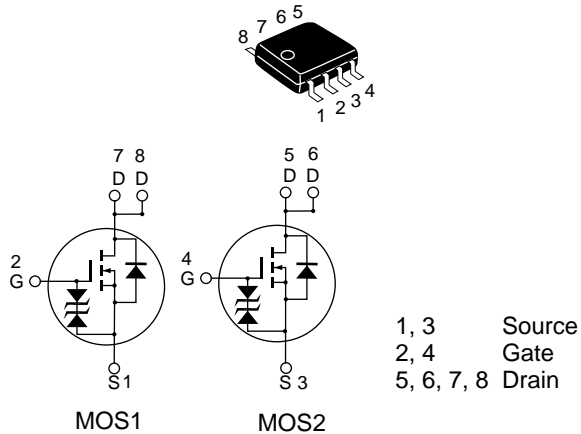
ADE-208-1237A (Z)
2nd. Edition
Jan. 2001

Features

- Low on-resistance
- Capable of 4.5 V gate drive
- Low drive current
- High density mounting

Outline

SOP-8



Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	30	V
Gate to source voltage	V_{GSS}	±20	V
Drain current	I_D	9	A
Drain peak current	$I_{D(pulse)}$ ^{Note1}	72	A
Body–drain diode reverse drain current	I_{DR}	9	A
Channel dissipation	Pch ^{Note2}	2	W
Channel dissipation	Pch ^{Note3}	3	W
Channel temperature	Tch	150	°C
Storage temperature	$Tstg$	–55 to +150	°C

Note: 1. $PW \leq 10\mu s$, duty cycle $\leq 1\%$

2. 1 Drive operation : When using the glass epoxy board (FR4 40 x 40 x 1.6 mm), $PW \leq 10s$

3. 2 Drive operation : When using the glass epoxy board (FR4 40 x 40 x 1.6 mm), $PW \leq 10s$

Electrical Characteristics (Ta = 25°C)

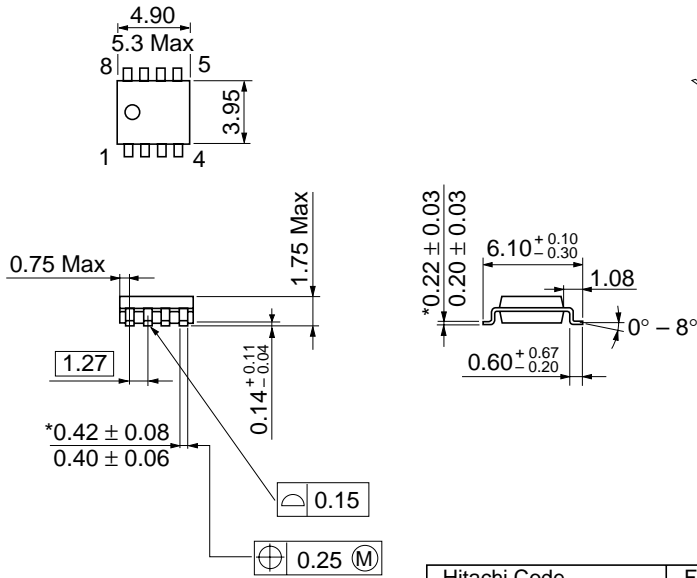
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	30	—	—	V	$I_D = 10\text{mA}$, $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	± 20	—	—	V	$I_G = \pm 100\ \mu\text{A}$, $V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 16\text{V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	1	μA	$V_{DS} = 30\ \text{V}$, $V_{GS} = 0$
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	$R_{DS(on)}$	—	18	23	$\text{m}\Omega$	$I_D = 4.5\text{A}$, $V_{GS} = 10\text{V}$ ^{Note4}
	$R_{DS(on)}$	—	27	39	$\text{m}\Omega$	$I_D = 4.5\text{A}$, $V_{GS} = 4.5\text{V}$ ^{Note4}
Forward transfer admittance	$ y_{fs} $	9	15	—	S	$I_D = 4.5\text{A}$, $V_{DS} = 10\text{V}$ ^{Note4}
Input capacitance	C_{iss}	—	750	—	pF	$V_{DS} = 10\text{V}$
Output capacitance	C_{oss}	—	200	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	110	—	pF	$f = 1\text{MHz}$
Total gate charge	Q_g	—	12	—	nc	$V_{DD} = 10\ \text{V}$
Gate to source charge	Q_{gs}	—	2.3	—	nc	$V_{GS} = 10\ \text{V}$
Gate to drain charge	Q_{gd}	—	2.2	—	nc	$I_D = 9\ \text{A}$
Turn-on delay time	$t_{d(on)}$	—	11	—	ns	$V_{GS} = 10\text{A}$, $I_D = 4.5\text{A}$
Rise time	t_r	—	16	—	ns	$V_{DD} \cong 10\text{V}$
Turn-off delay time	$t_{d(off)}$	—	40	—	ns	$R_L = 2.22\Omega$
Fall time	t_f	—	7	—	ns	$R_g = 4.7\Omega$
Body-drain diode forward voltage	V_{DF}	—	0.85	1.10	V	$I_F = 9\text{A}$, $V_{GS} = 0$ ^{Note4}
Body-drain diode reverse recovery time	t_{rr}	—	50	—	ns	$I_F = 9\text{A}$, $V_{GS} = 0$ $diF/dt = 50\text{A}/\mu\text{s}$

Note: 4. Pulse test

Package Dimensions

As of January, 2001

Unit: mm



*Dimension including the plating thickness
 Base material dimension

Hitachi Code	FP-8DA
JEDEC	Conforms
EIAJ	—
Mass (reference value)	0.085 g

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