

HAT2057RA

Silicon N Channel Power MOS FET
High Speed Power Switching

HITACHI

ADE-208-1636 (Z)

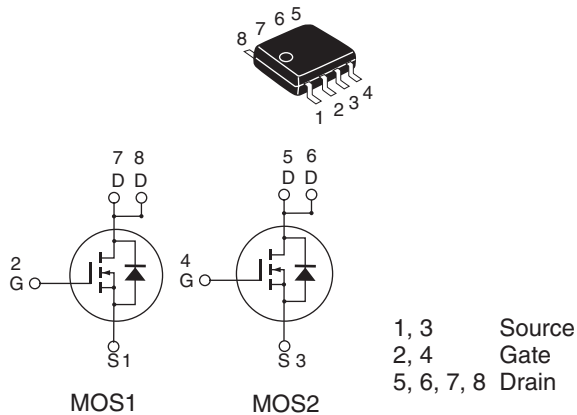
1st. Edition
Feb. 2003

Features

- Low on-resistance
- Capable of 1.5 V gate drive
- Low drive current
- High density mounting

Outline

SOP-8



Absolute Maximum Ratings

($T_a = 25^\circ\text{C}$)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	20	V
Gate to source voltage	V_{GSS}	+6,-3	V
Drain current	I_D	4	A
Drain peak current	$I_{D(pulse)}$ ^{Note1}	32	A
Body-drain diode reverse drain current	I_{DR}	4	A
Channel dissipation	P_{ch} ^{Note2}	2	W
Channel dissipation	P_{ch} ^{Note3}	3	W
Channel temperature	T_{ch}	150	$^\circ\text{C}$
Storage temperature	T_{stg}	-55 to +150	$^\circ\text{C}$

Notes: 1. $PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$

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

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

Electrical Characteristics

(Ta = 25°C)

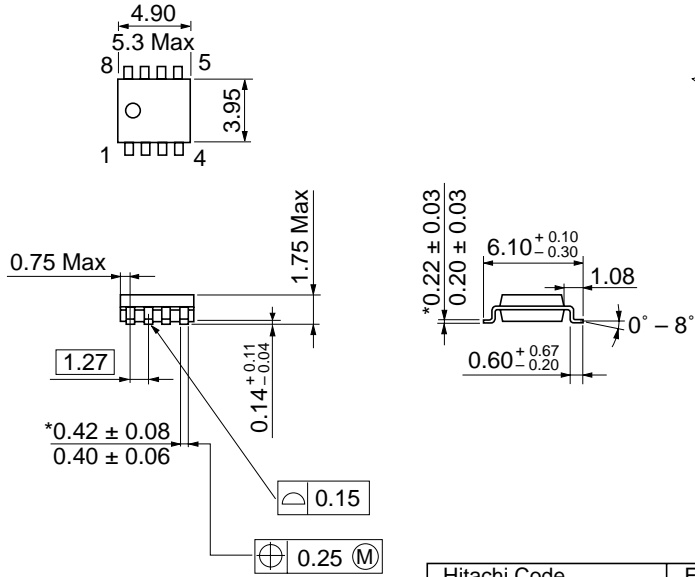
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	20	—	—	V	$I_D = 10 \text{ mA}, V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 0.2	μA	$V_{GS} = +6 \text{ V}, -3\text{V}, V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	10	μA	$V_{DS} = 10 \text{ V}, V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	0.15	—	0.90	V	$V_{DS} = 10 \text{ V}, I_D = 1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	26	33	$\text{m}\Omega$	$I_D = 2 \text{ A}, V_{GS} = 4 \text{ V}$ ^{Note4}
	$R_{DS(on)}$	—	40	60	$\text{m}\Omega$	$I_D = 2 \text{ A}, V_{GS} = 1.5 \text{ V}$ ^{Note4}
Forward transfer admittance	$ y_{fs} $	8	13	—	S	$I_D = 2 \text{ A}, V_{DS} = 10 \text{ V}$ ^{Note4}
Input capacitance	C_{iss}	—	1100	—	pF	$V_{DS} = 10 \text{ V}$
Output capacitance	C_{oss}	—	155	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	125	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	15	—	ns	$V_{GS} = 4 \text{ V}, I_D = 2 \text{ A}$
Rise time	t_r	—	25	—	ns	$V_{DD} \cong 10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	65	—	ns	$R_g = 4.7 \Omega$
Fall time	t_f	—	13	—	ns	$R_L = 5 \Omega$
Body-drain diode forward voltage	V_{DF}	—	0.80	1.04	V	$I_F = 4, V_{GS} = 0$ ^{Note4}
Body-drain diode reverse recovery time	t_{rr}	—	40	—	ns	$I_F = 4\text{A}, V_{GS} = 0$ $diF/dt = 20 \text{ A}/\mu\text{s}$

Notes: 4. Pulse test

Package Dimensions

As of July, 2002

Unit: mm



*Dimension including the plating thickness
Base material dimension

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

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