

HAT2039R

Silicon N Channel Power MOS FET
High Speed Power Switching

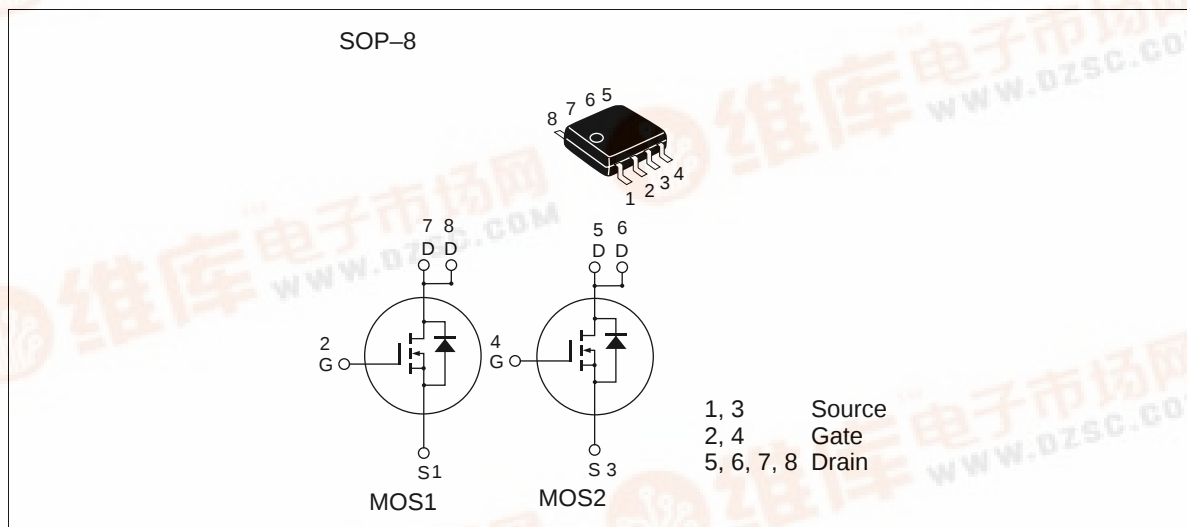
HITACHI

ADE-208-667C (Z)
4th. Edition
February 1999

Features

- Low on-resistance
- Capable of 2.5 V gate drive
- Low drive current
- High density mounting

Outline



HAT2039R

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	30	V
Gate to source voltage	V_{GSS}	± 12	V
Drain current	I_D	8.0	A
Drain peak current	$I_{D(pulse)}$ ^{Note1}	64	A
Body-drain diode reverse drain current	I_{DR}	8.0	A
Channel dissipation	P_{ch} ^{Note2}	2.0	W
Channel dissipation	P_{ch} ^{Note3}	3.0	W
Channel temperature	T_{ch}	150	°C
Storage temperature	T_{stg}	- 55 to + 150	°C

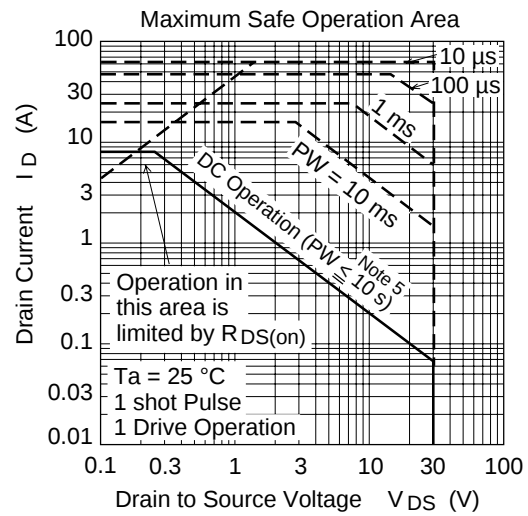
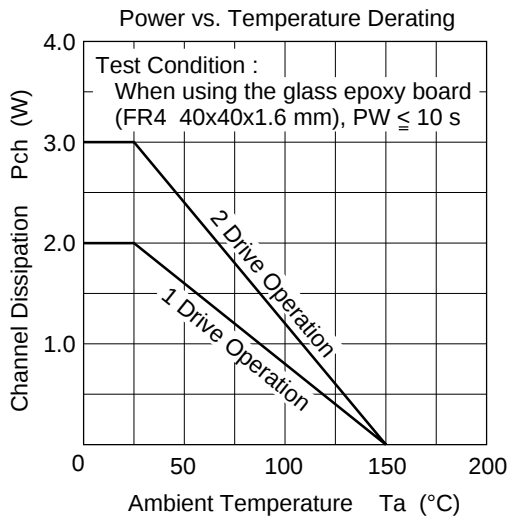
Note: 1. $PW \leq 10\mu s$, duty cycle $\leq 1\%$
2. 1 Drive operation ; When using the glass epoxy board (FR4 40 x 40 x 1.6 mm), $PW \leq 10s$
3. 2 Drive operation ; When using the glass epoxy board (FR4 40 x 40 x 1.6 mm), $PW \leq 10s$

Electrical Characteristics (Ta = 25°C)

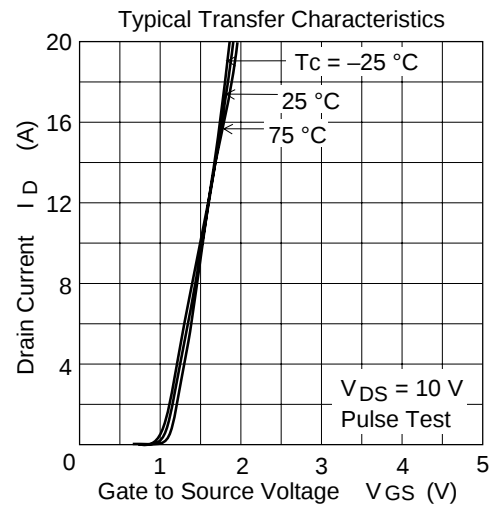
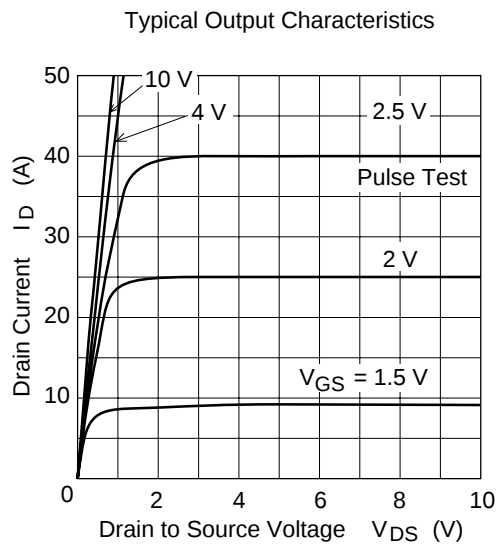
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	30	—	—	V	$I_D = 10\text{ mA}$, $V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 0.1	μA	$V_{GS} = \pm 12\text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	1	μA	$V_{DS} = 30\text{ V}$, $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	0.4	—	1.4	V	$V_{DS} = 10\text{ V}$, $I_D = 1\text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.017	0.022	Ω	$I_D = 4\text{ A}$, $V_{GS} = 4\text{ V}$ ^{Note4}
	$R_{DS(on)}$	—	0.022	0.032	Ω	$I_D = 4\text{ A}$, $V_{GS} = 2.5\text{ V}$ ^{Note4}
Forward transfer admittance	$ y_{fs} $	13	20	—	S	$I_D = 4\text{ A}$, $V_{DS} = 10\text{ V}$ ^{Note4}
Input capacitance	C_{iss}	—	1420	—	pF	$V_{DS} = 10\text{ V}$
Output capacitance	C_{oss}	—	410	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	260	—	pF	$f = 1\text{ MHz}$
Total gate charge	Q_g	—	20	—	nc	$V_{DD} = 10\text{ V}$
Gate to source charge	Q_{gs}	—	12	—	nc	$V_{GS} = 4\text{ V}$
Gate to drain charge	Q_{gd}	—	8	—	nc	$I_D = 8\text{ A}$
Turn-on delay time	$t_{d(on)}$	—	23	—	ns	$V_{GS} = 4\text{ V}$, $I_D = 4\text{ A}$
Rise time	t_r	—	165	—	ns	$V_{DD} \cong 10\text{ V}$
Turn-off delay time	$t_{d(off)}$	—	215	—	ns	
Fall time	t_f	—	185	—	ns	
Body-drain diode forward voltage	V_{DF}	—	0.85	1.1	V	$I_F = 8.0\text{ A}$, $V_{GS} = 0$ ^{Note4}
Body-drain diode reverse recovery time	t_{rr}	—	30	—	ns	$I_F = 8.0\text{ A}$, $V_{GS} = 0$ $diF/dt = 20\text{ A}/\mu s$

Note: 4. Pulse test

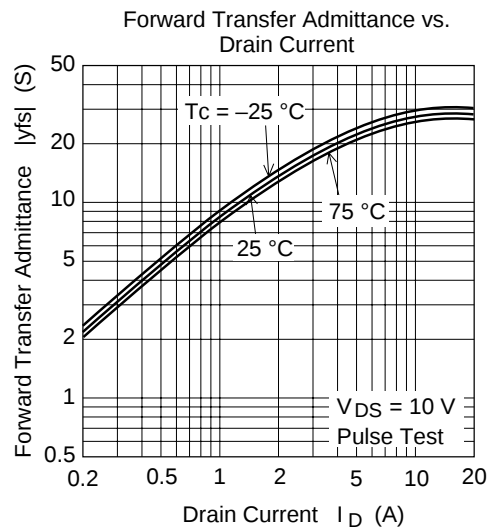
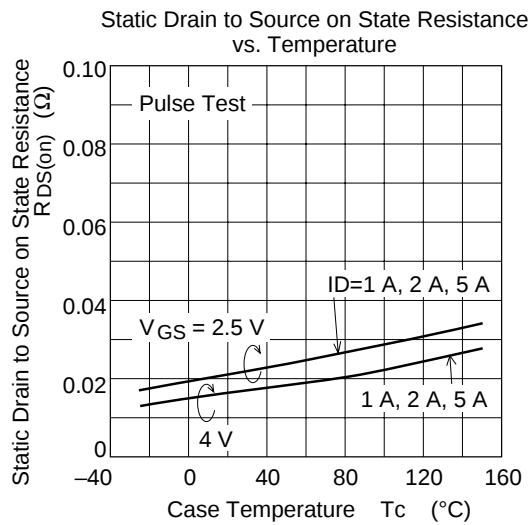
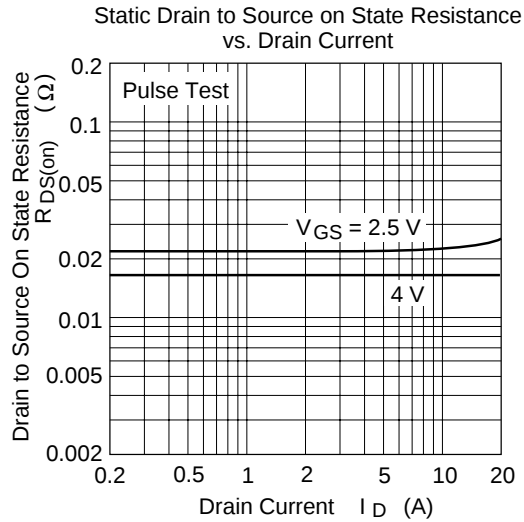
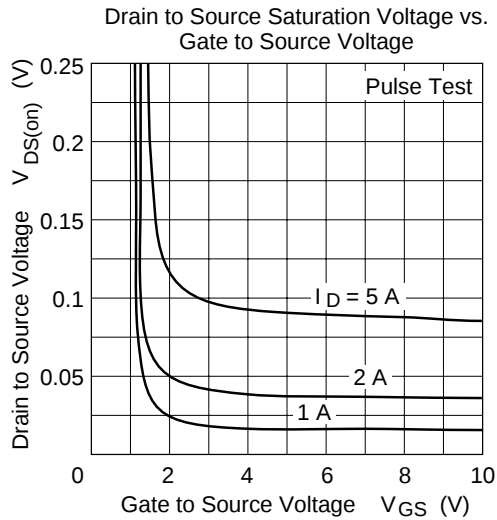
Main Characteristics

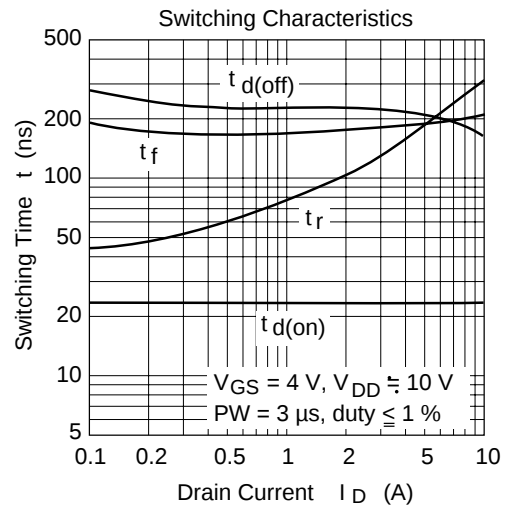
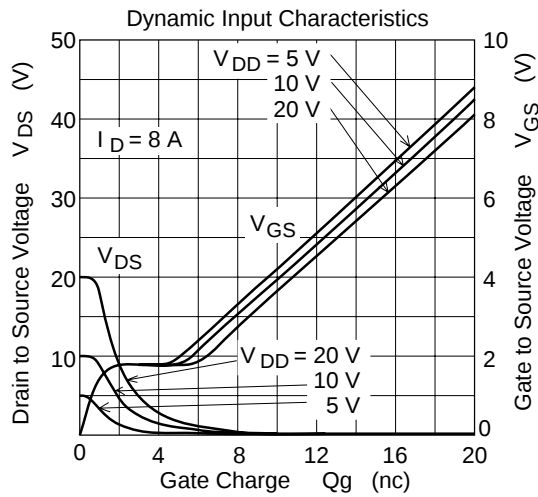
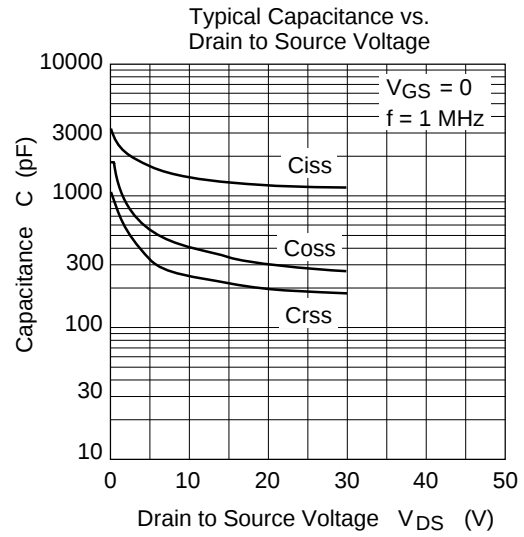
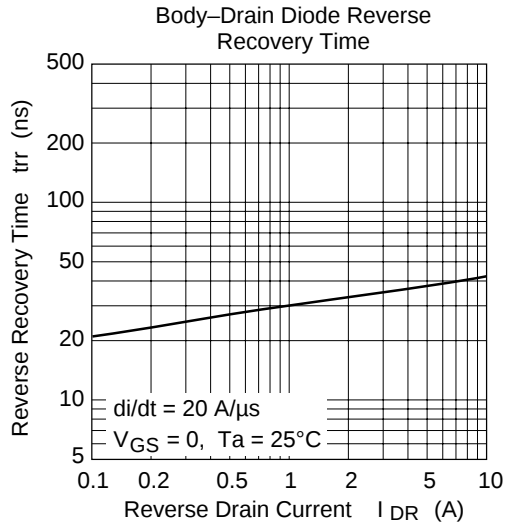


Note 5 :
When using the glass epoxy board
(FR4 40x40x1.6 mm)

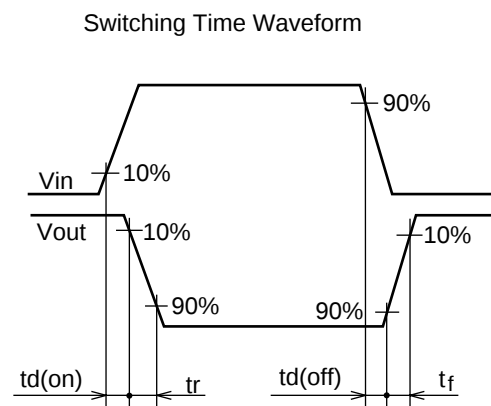
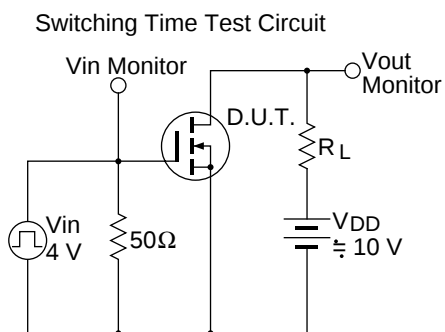
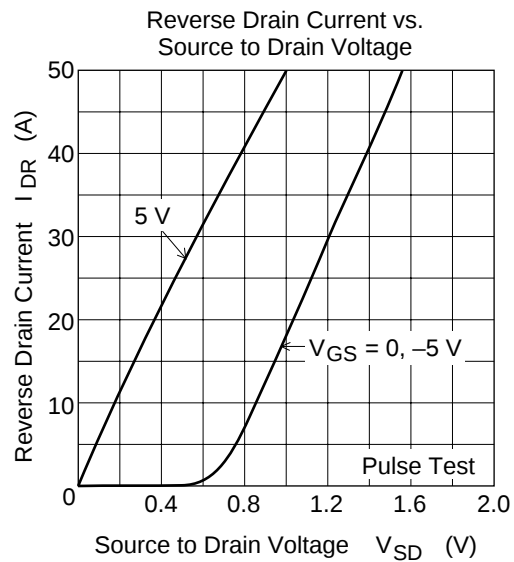


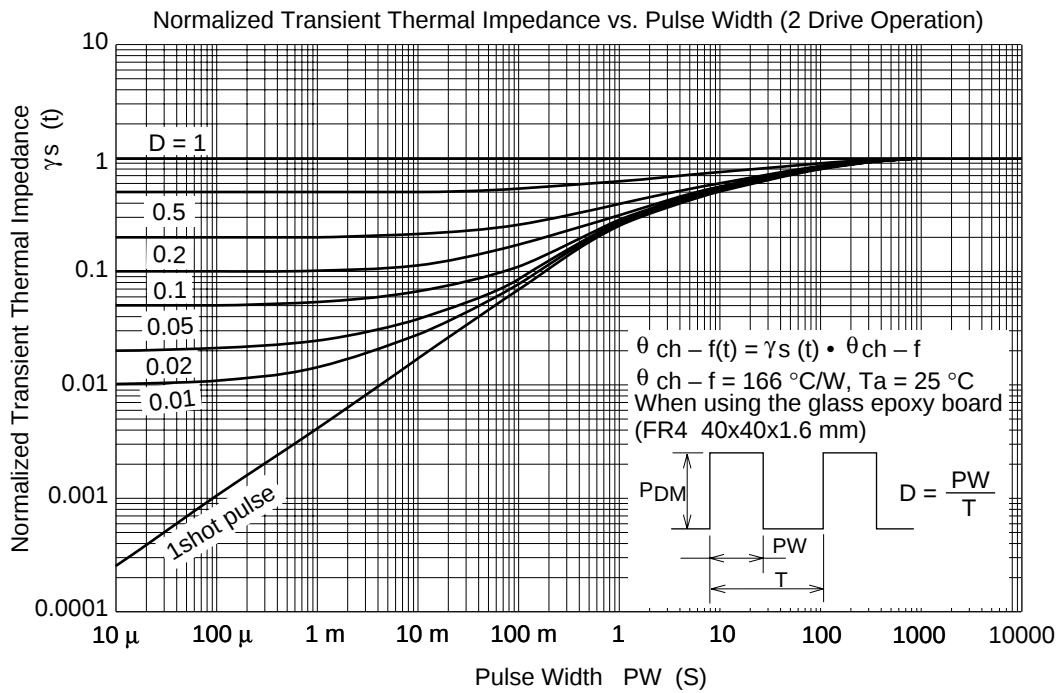
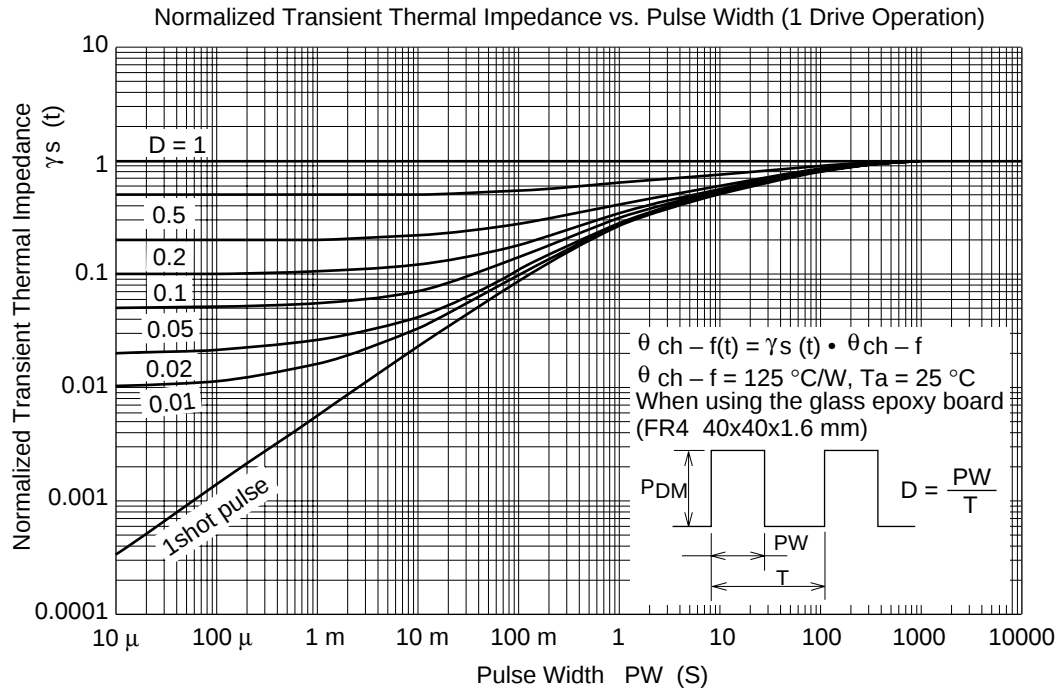
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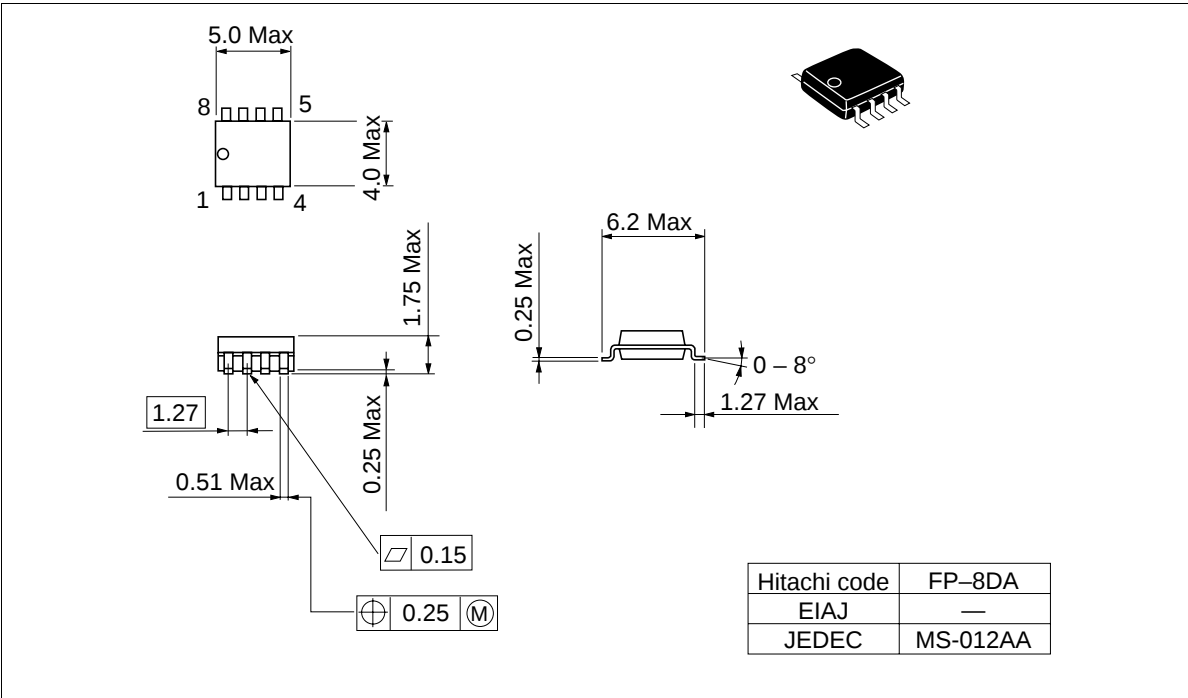




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Package Dimensions

Unit: mm



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HITACHI

Hitachi, Ltd.

Semiconductor & Integrated Circuits.
Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan
Tel: Tokyo (03) 3270-2111 Fax: (03) 3270-5109

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For further information write to:

Hitachi Semiconductor
(America) Inc.
179 East Tasman Drive,
San Jose, CA 95134
Tel: <1> (408) 433-1990
Fax: <1> (408) 433-0223

Hitachi Europe GmbH
Electronic components Group
Dornacher StraÙe 3
D-85622 Feldkirchen, Munich
Germany
Tel: <49> (89) 9 9180-0
Fax: <49> (89) 9 29 30 00

Hitachi Europe Ltd.
Electronic Components Group.
Whitebrook Park
Lower Cookham Road
Maidenhead
Berkshire SL6 8YA, United Kingdom
Tel: <44> (1628) 585000
Fax: <44> (1628) 778322

Hitachi Asia Pte. Ltd.
16 Collyer Quay #20-00
Hitachi Tower
Singapore 049318
Tel: 535-2100
Fax: 535-1533

Hitachi Asia Ltd.
Taipei Branch Office
3F, Hung Kuo Building, No.167,
Tun-Hwa North Road, Taipei (105)
Tel: <886> (2) 2718-3666
Fax: <886> (2) 2718-8180

Hitachi Asia (Hong Kong) Ltd.
Group III (Electronic Components)
7/F., North Tower, World Finance Centre,
Harbour City, Canton Road, Tsim Sha Tsui,
Kowloon, Hong Kong
Tel: <852> (2) 735 9218
Fax: <852> (2) 730 0281
Telex: 40815 HITEC HX