
HAT1020R

Silicon P Channel Power MOS FET
High Speed Power Switching

HITACHI

ADE-208-435 H (Z)

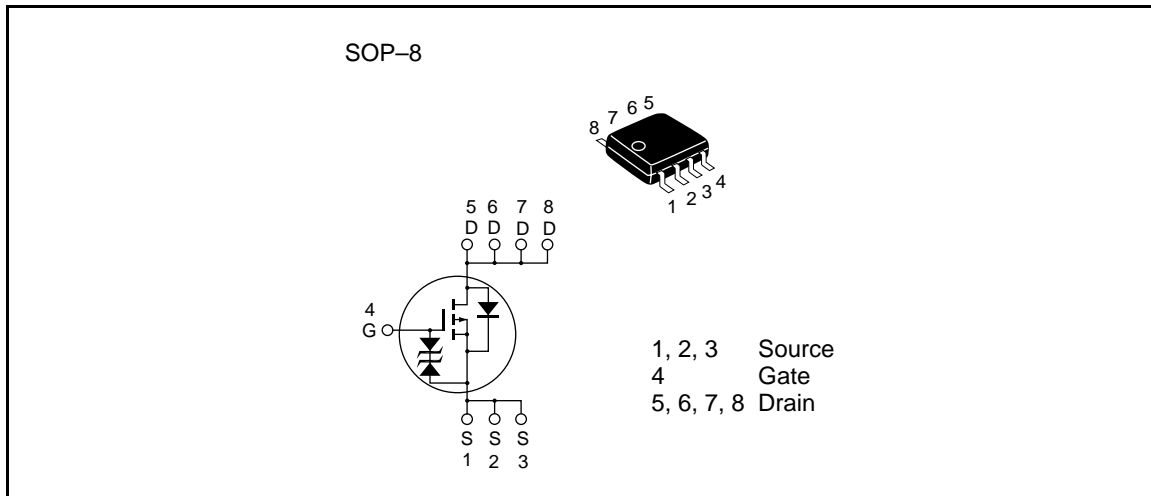
9th. Edition

February 1999

Features

- Low on-resistance
- Capable of 4 V gate drive
- Low drive current
- High density mounting

Outline



HAT1020R

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	- 5	A
Drain peak current	$I_{D(pulse)}$ ^{Note1}	- 40	A
Body-drain diode reverse drain current	I_{DR}	- 5	A
Channel dissipation	P_{ch} ^{Note2}	2.5	W
Channel temperature	T_{ch}	150	°C
Storage temperature	T_{stg}	-55 to +150	°C

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

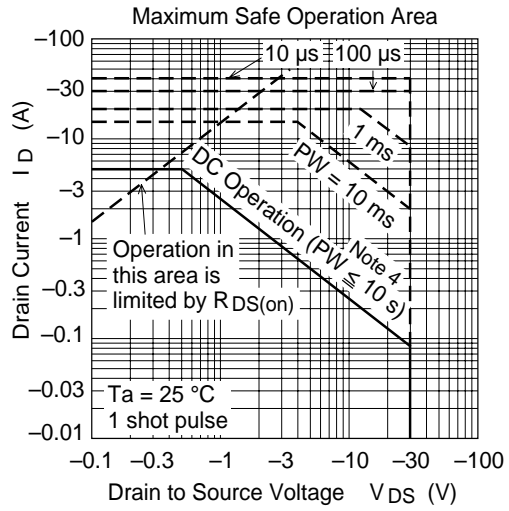
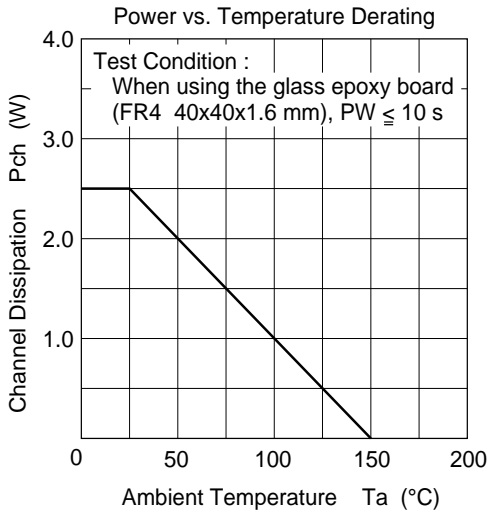
When using the glass epoxy board (FR4 40 x 40 x 1.6 mm), $PW \leq 10s$

Electrical Characteristics (Ta = 25°C)

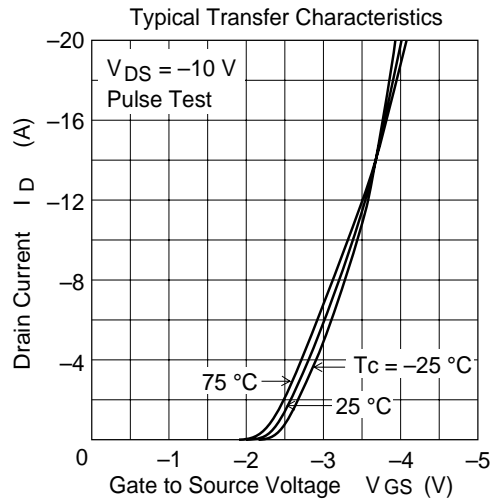
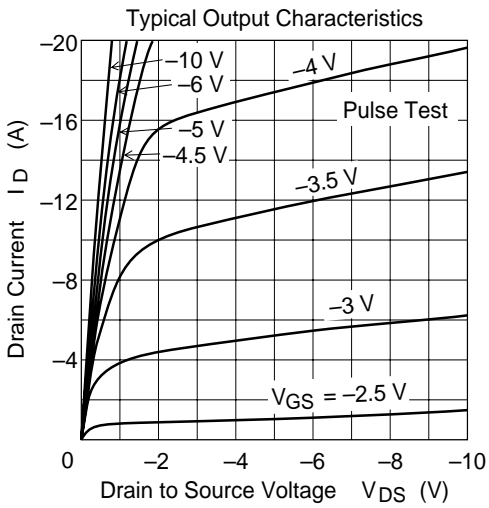
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DS}$	- 30	—	—	V	$I_D = -10\text{ mA}$, $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GS}$	± 20	—	—	V	$I_G = \pm 100\ \mu A$, $V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 16\text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	-10	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	$R_{DS(on)}$	—	0.04	0.07	Ω	$I_D = -3\text{ A}$, $V_{GS} = -10\text{ V}$ ^{Note3}
	$R_{DS(on)}$	—	0.07	0.13	Ω	$I_D = -3\text{ A}$, $V_{GS} = -4\text{ V}$ ^{Note3}
Forward transfer admittance	$ y_{fs} $	5.0	7.5	—	S	$I_D = -3\text{ A}$, $V_{DS} = -10\text{ V}$ ^{Note3}
Input capacitance	C_{iss}	—	860	—	pF	$V_{DS} = -10\text{ V}$
Output capacitance	C_{oss}	—	560	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	165	—	pF	$f = 1\text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	30	—	ns	$V_{GS} = -4\text{ V}$, $I_D = -3\text{ A}$
Rise time	t_r	—	170	—	ns	$V_{DD} @ -10\text{ V}$
Turn-off delay time	$t_{d(off)}$	—	40	—	ns	
Fall time	t_f	—	65	—	ns	
Body-drain diode forward voltage	V_{DF}	—	- 0.9	- 1.4	V	$I_F = -5\text{ A}$, $V_{GS} = 0$ ^{Note3}
Body-drain diode reverse recovery time	t_{rr}	—	55	—	ns	$I_F = -5\text{ A}$, $V_{GS} = 0$ $diF/dt = 20\text{ A}/\mu s$

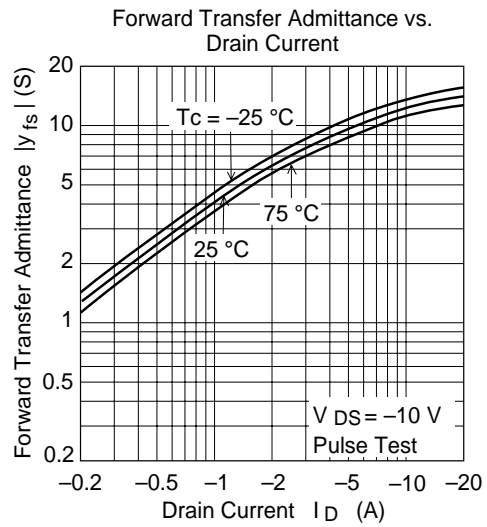
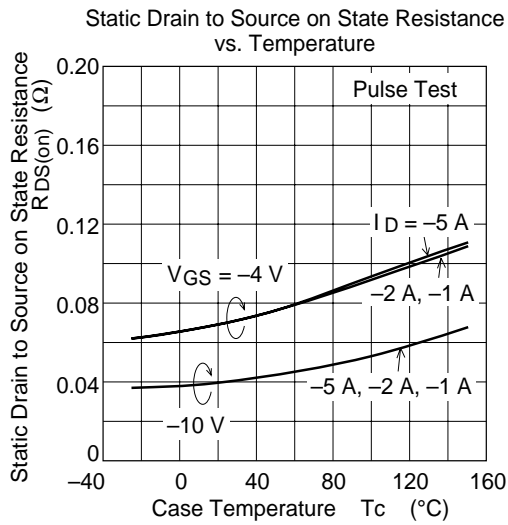
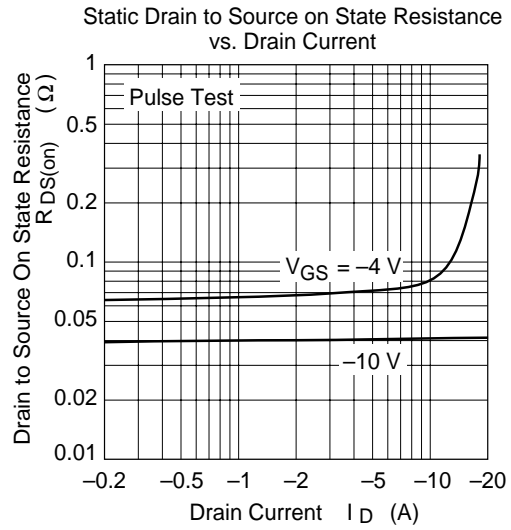
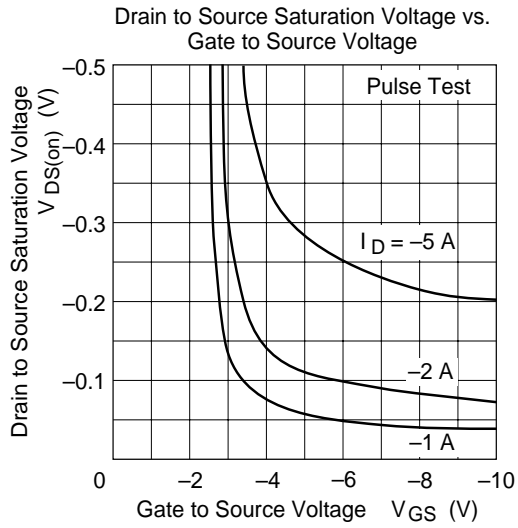
Note: 3. Pulse test

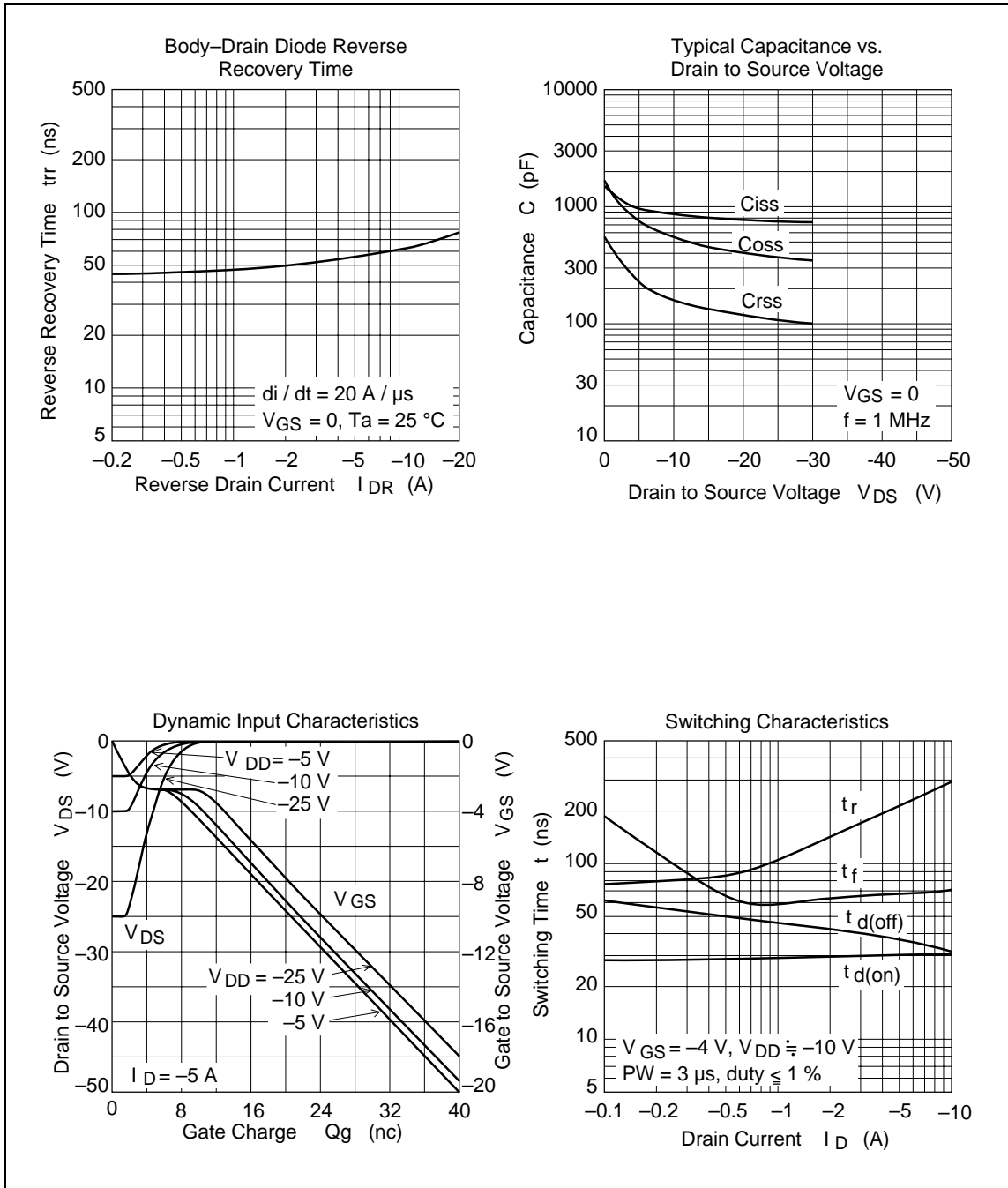
Main Characteristics

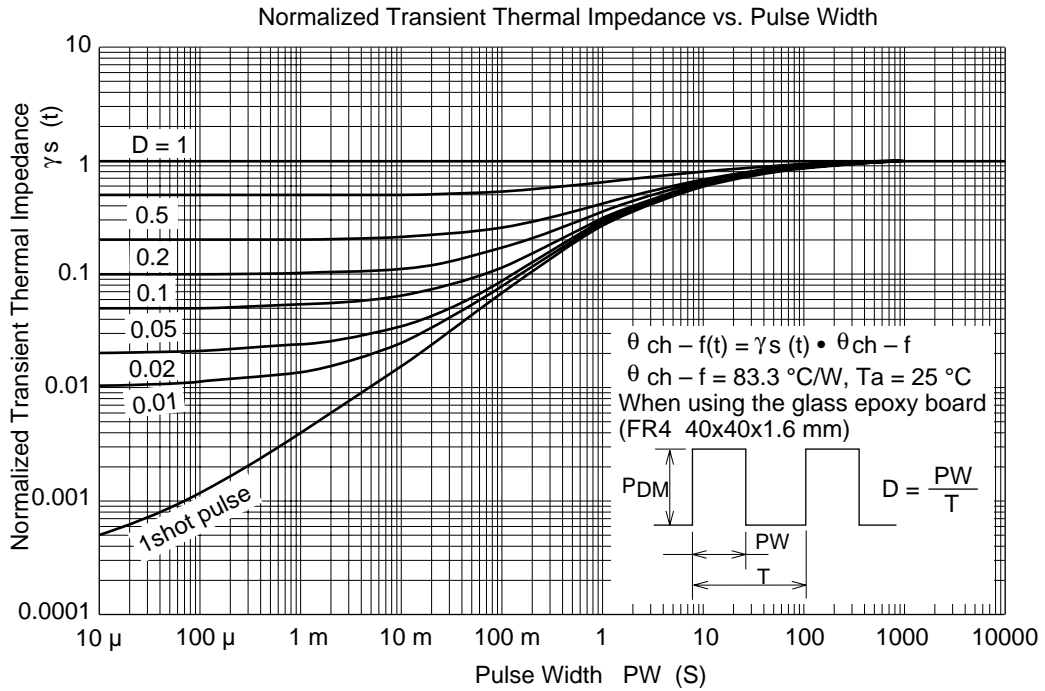
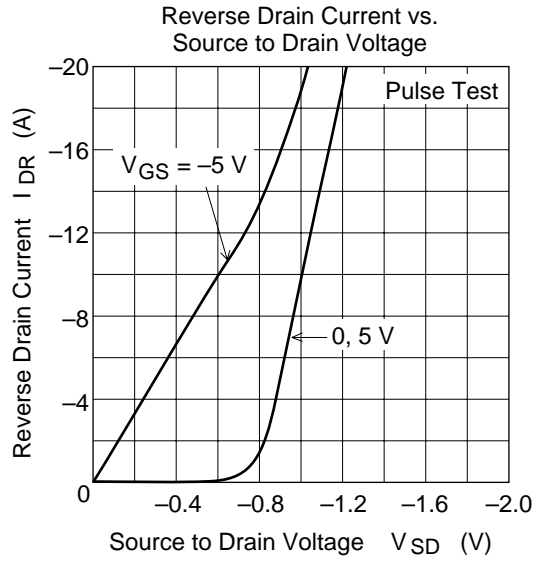


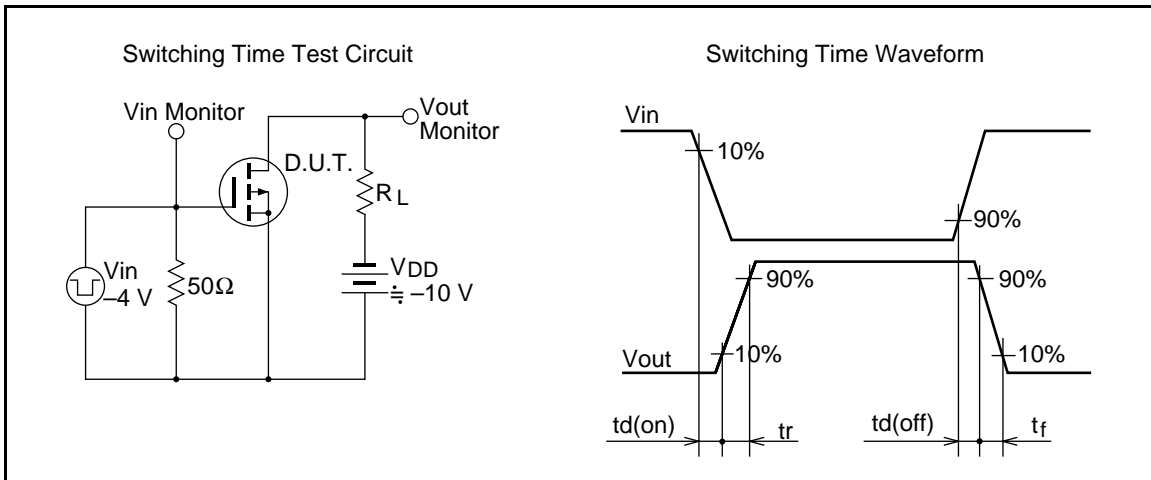
Note 4 :
When using the glass epoxy board (FR4 40 x 40 x 1.6 mm)





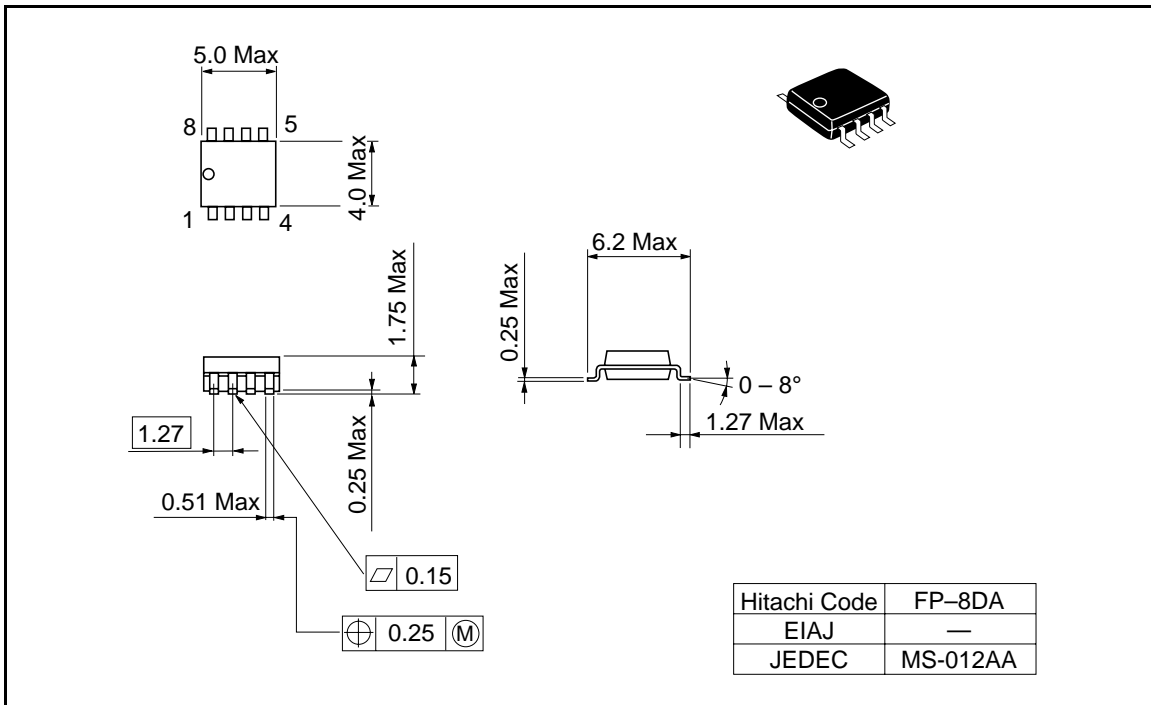






Package Dimensions

Unit: mm



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