

HAT1031T

Silicon P Channel Power MOS FET
High Speed Power Switching

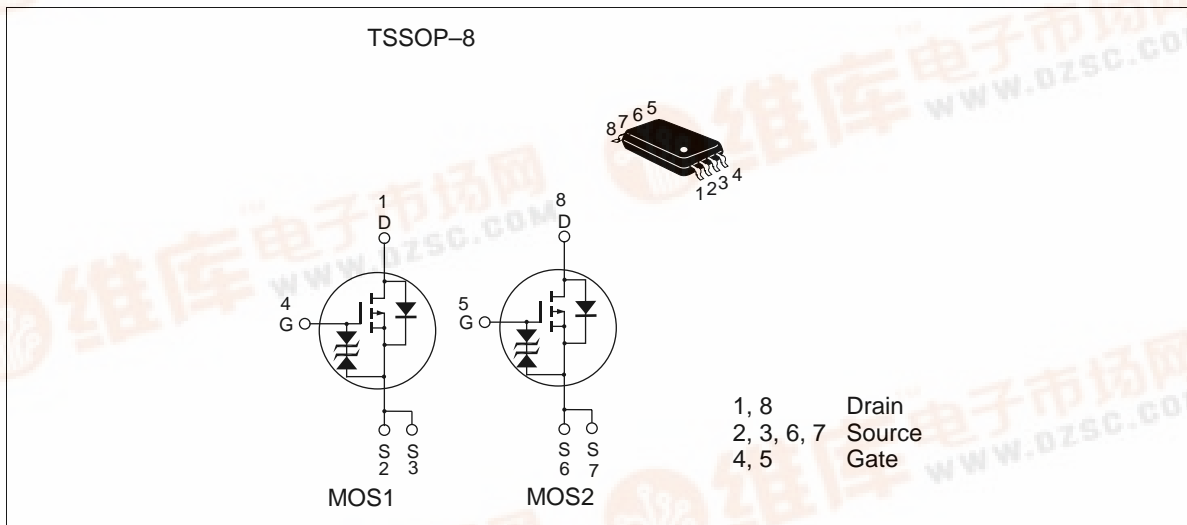
HITACHI

ADE-208-528D (Z)
5th. Edition
December 1998

Features

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

Outline



HAT1031T

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	-20	V
Gate to source voltage	V_{GSS}	±10	V
Drain current	I_D	-2.5	A
Drain peak current	$I_{D(pulse)}$ ^{Note1}	-20	A
Body-drain diode reverse drain current	I_{DR}	-2.5	A
Channel dissipation	P_{ch} ^{Note2}	1	W
Channel dissipation	P_{ch} ^{Note3}	1.5	W
Channel temperature	T_{ch}	150	°C
Storage temperature	T_{stg}	-55 to +150	°C

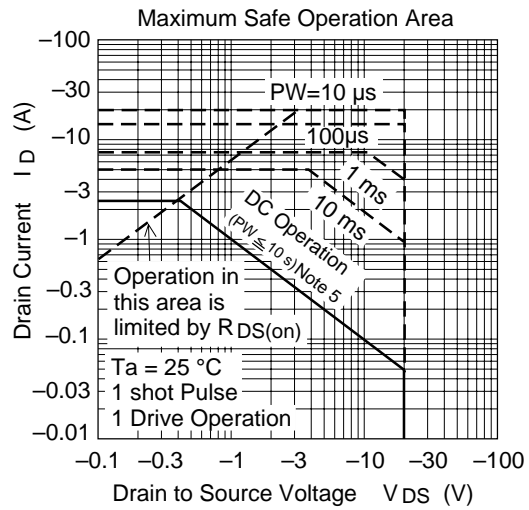
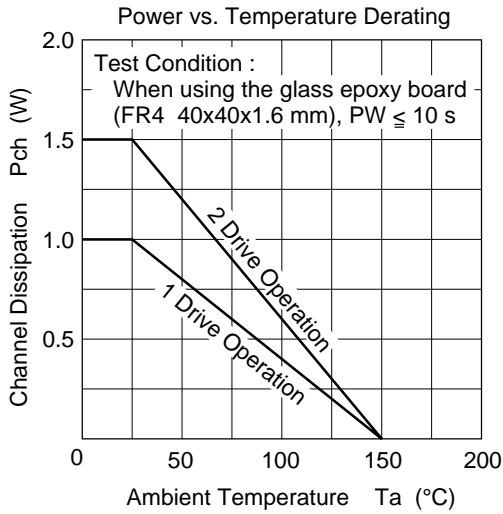
Note: 1. $PW \leq 10\mu s$, duty cycle $\leq 1\%$
 2. 1 Drive operation ; When using the glass epoxy board (FR4 40 x 40 x 1.6 mm), $PW \leq 10s$
 3. 2 Drive operation ; When using the glass epoxy board (FR4 40 x 40 x 1.6 mm), $PW \leq 10s$

Electrical Characteristics (Ta = 25°C)

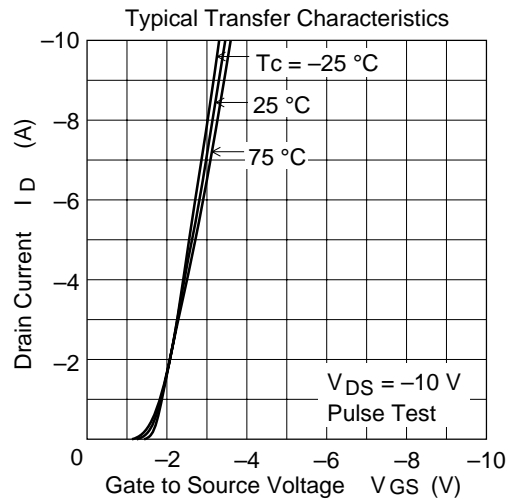
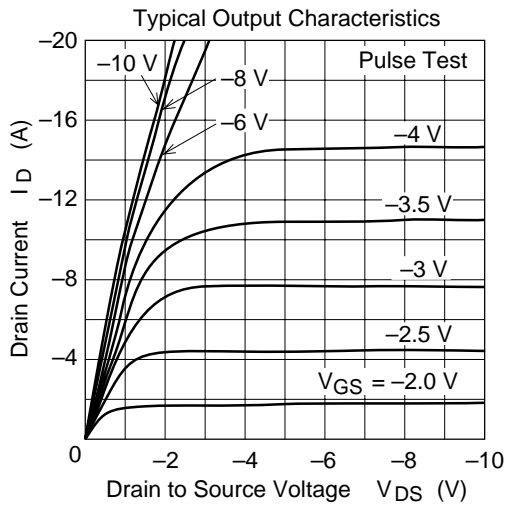
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	-20	—	—	V	$I_D = -10mA$, $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	±10	—	—	V	$I_G = \pm 100\mu A$, $V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	±10	μA	$V_{GS} = \pm 8V$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	-1	μA	$V_{DS} = -20V$, $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	-0.5	—	-1.5	V	$V_{DS} = -10V$, $I_D = -1mA$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.13	0.16	Ω	$I_D = -2A$, $V_{GS} = -4V$ ^{Note4}
	$R_{DS(on)}$	—	0.21	0.28	Ω	$I_D = -2A$, $V_{GS} = -2.5V$ ^{Note4}
Forward transfer admittance	$ y_{fs} $	2.6	4	—	S	$I_D = -2A$, $V_{DS} = -10V$ ^{Note4}
Input capacitance	C_{iss}	—	390	—	pF	$V_{DS} = -10V$
Output capacitance	C_{oss}	—	200	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	70	—	pF	$f = 1MHz$
Turn-on delay time	$t_{d(on)}$	—	14	—	ns	$V_{GS} = -4V$, $I_D = -2A$
Rise time	t_r	—	75	—	ns	$V_{DD} \approx -10V$
Turn-off delay time	$t_{d(off)}$	—	60	—	ns	
Fall time	t_f	—	55	—	ns	
Body-drain diode forward voltage	V_{DF}	—	-0.9	-1.17	V	$I_F = -2.5A$, $V_{GS} = 0$ ^{Note4}
Body-drain diode reverse recovery time	t_{rr}	—	45	—	ns	$I_F = -2.5A$, $V_{GS} = 0$ $diF/dt = 20A/\mu s$

Note: 4. Pulse test

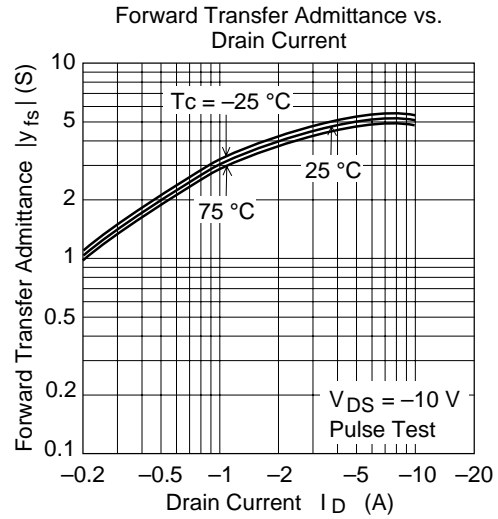
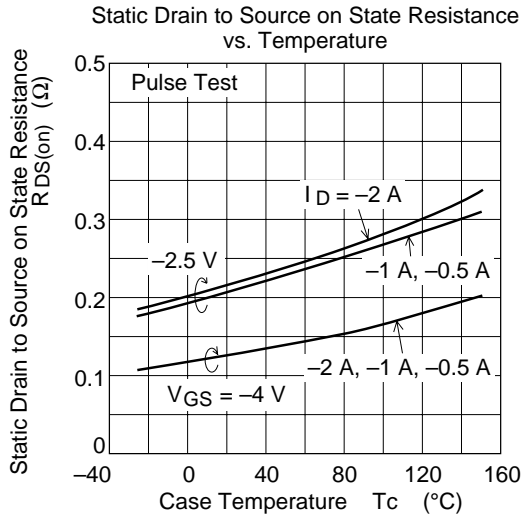
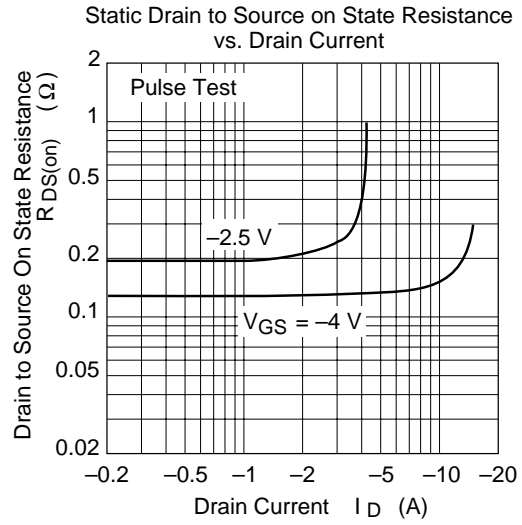
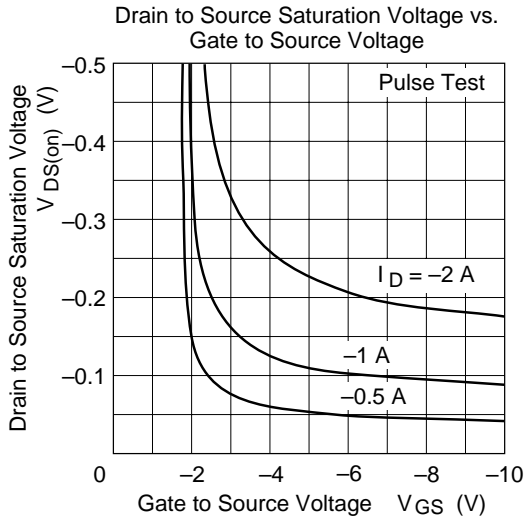
Main Characteristics

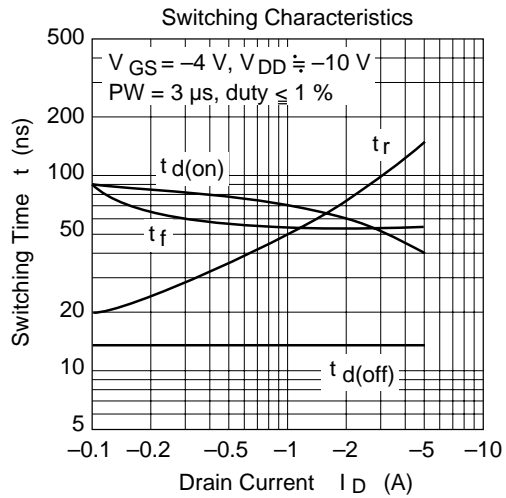
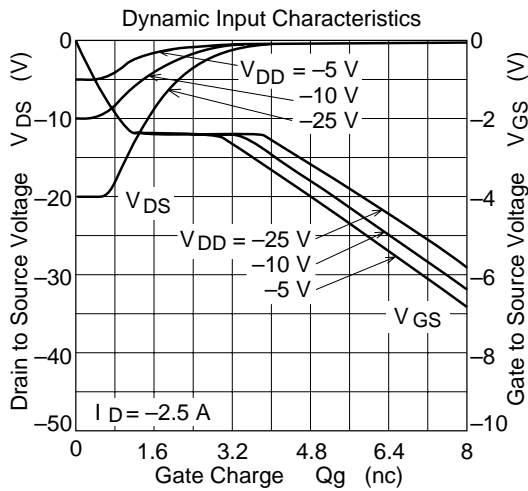
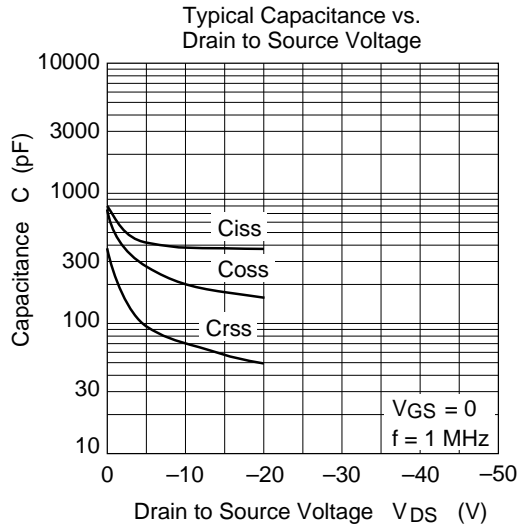
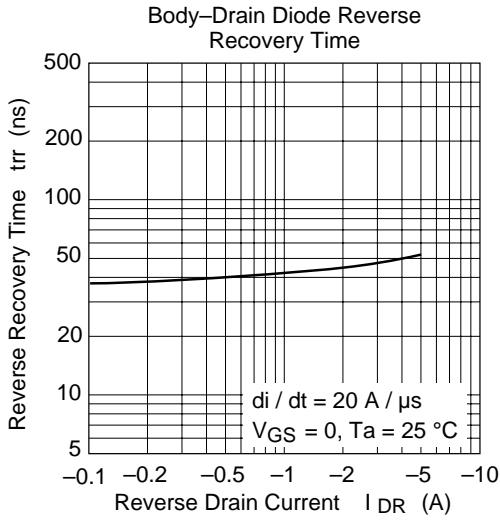


Note 5 :
When using the glass epoxy board (FR4 40x40x1.6 mm)

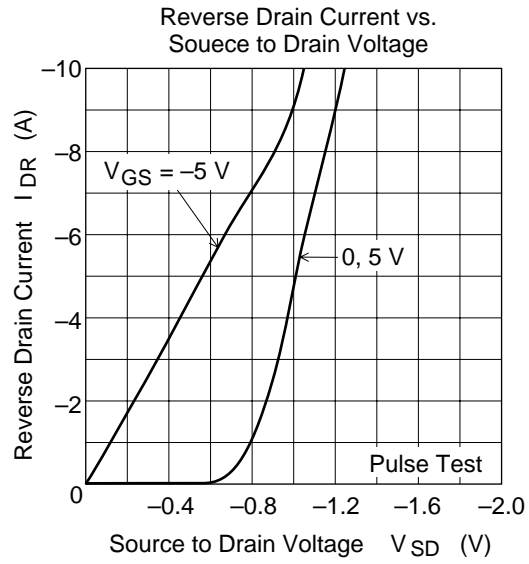


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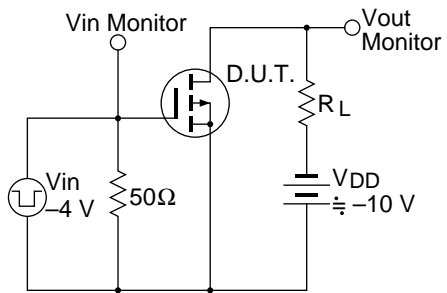




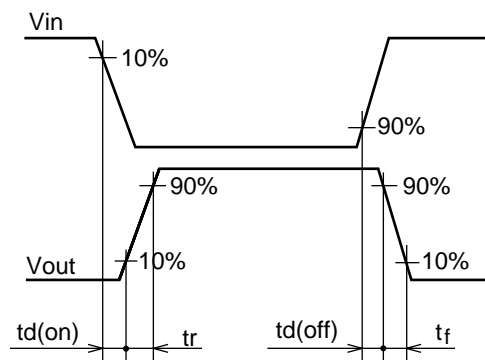
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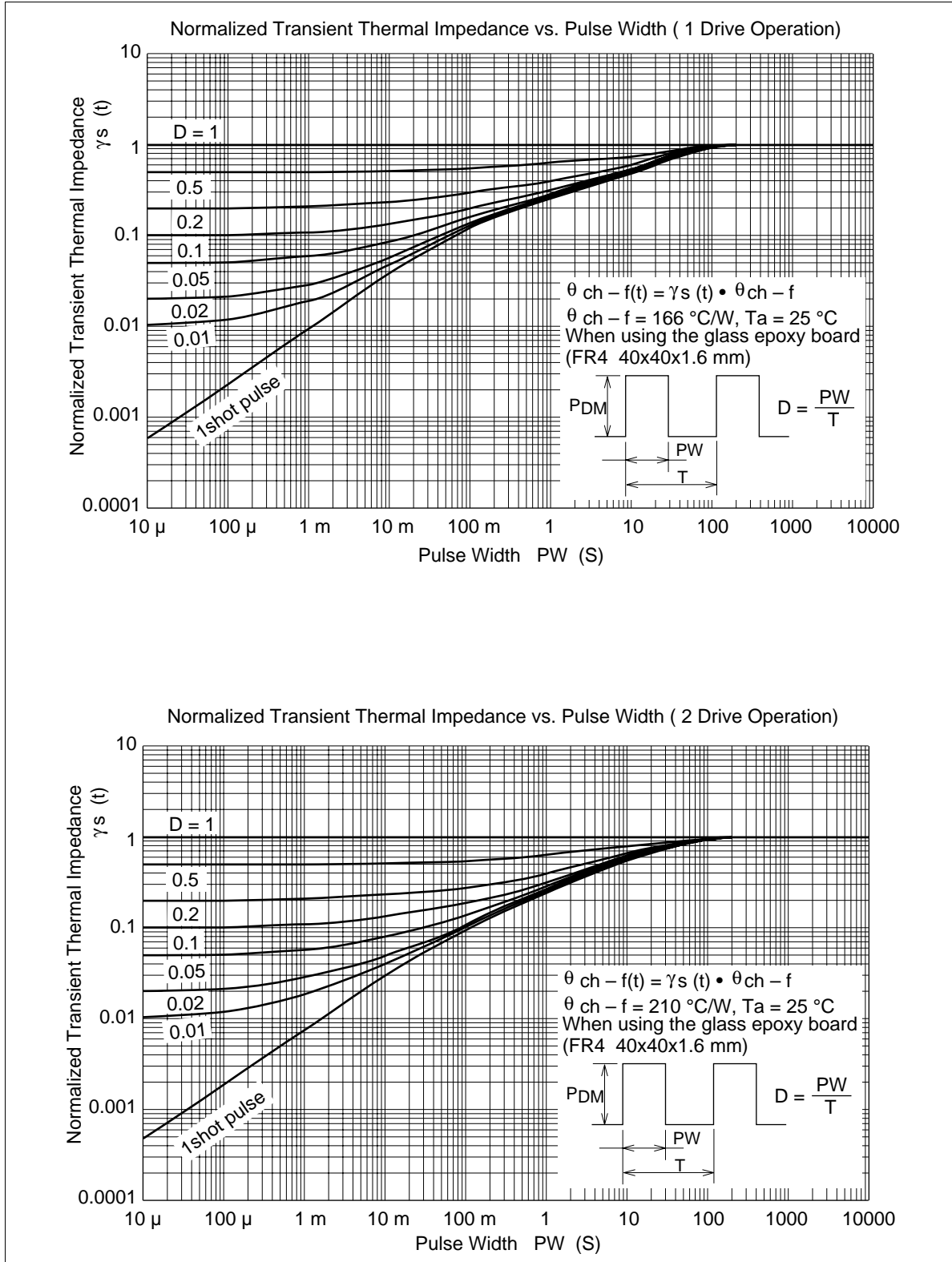


Switching Time Test Circuit



Switching Time Waveform

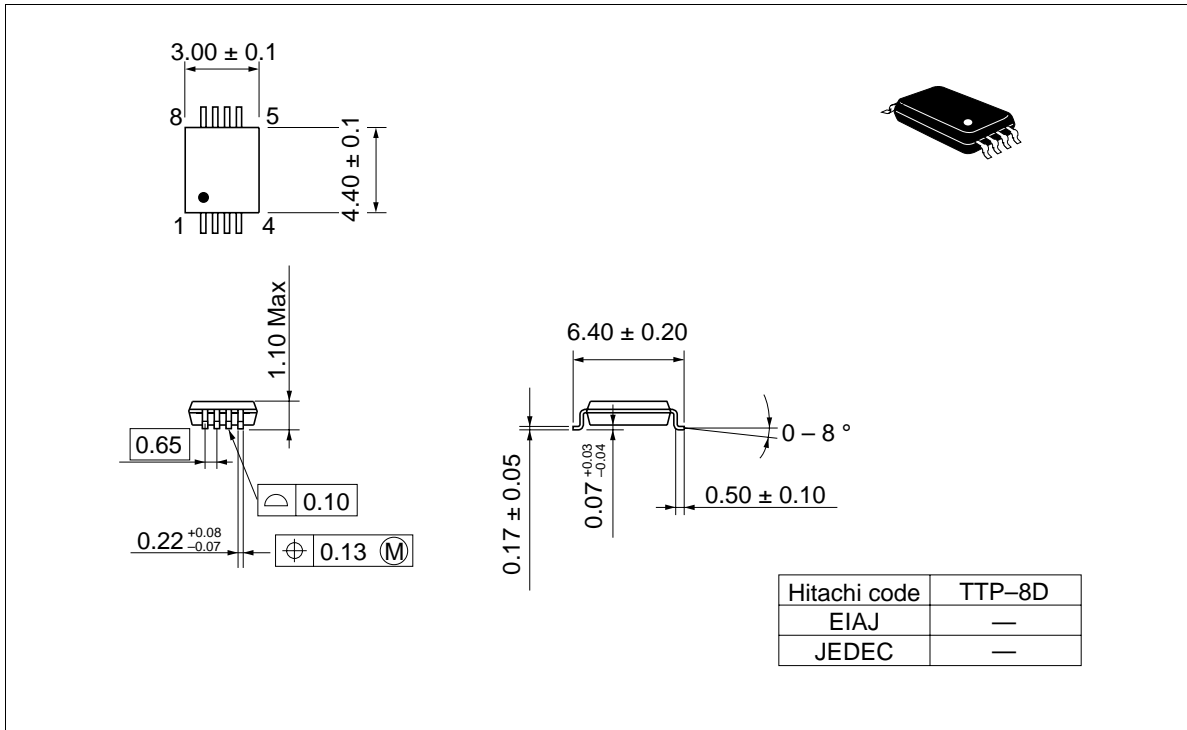




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Package Dimentions

Unit: mm



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