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# HAT1031T

Silicon P Channel Power MOS FET  
High Speed Power Switching

## HITACHI

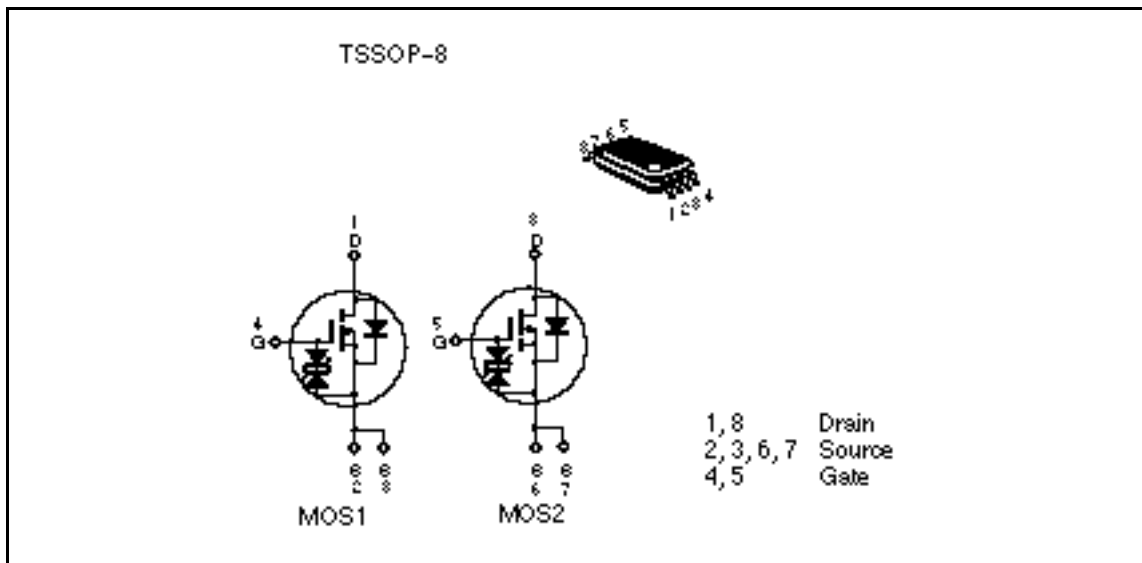
ADE-208-528D (Z)  
5th. Edition  
December 1998

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### 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	$I_{D(pulse)}$ <sup>Note1</sup>	-20	A
Body-drain diode reverse drain current	$I_{DR}$	-2.5	A
Channel dissipation	$P_{ch}$ <sup>Note2</sup>	1	W
Channel dissipation	$P_{ch}$ <sup>Note3</sup>	1.5	W
Channel temperature	$T_{ch}$	150	°C
Storage temperature	$T_{stg}$	-55 to +150	°C

Note: 1. PW = 10µs, duty cycle = 1 %

2. 1 Drive operation ; When using the glass epoxy board (FR4 40 x 40 x 1.6 mm), PW = 10s

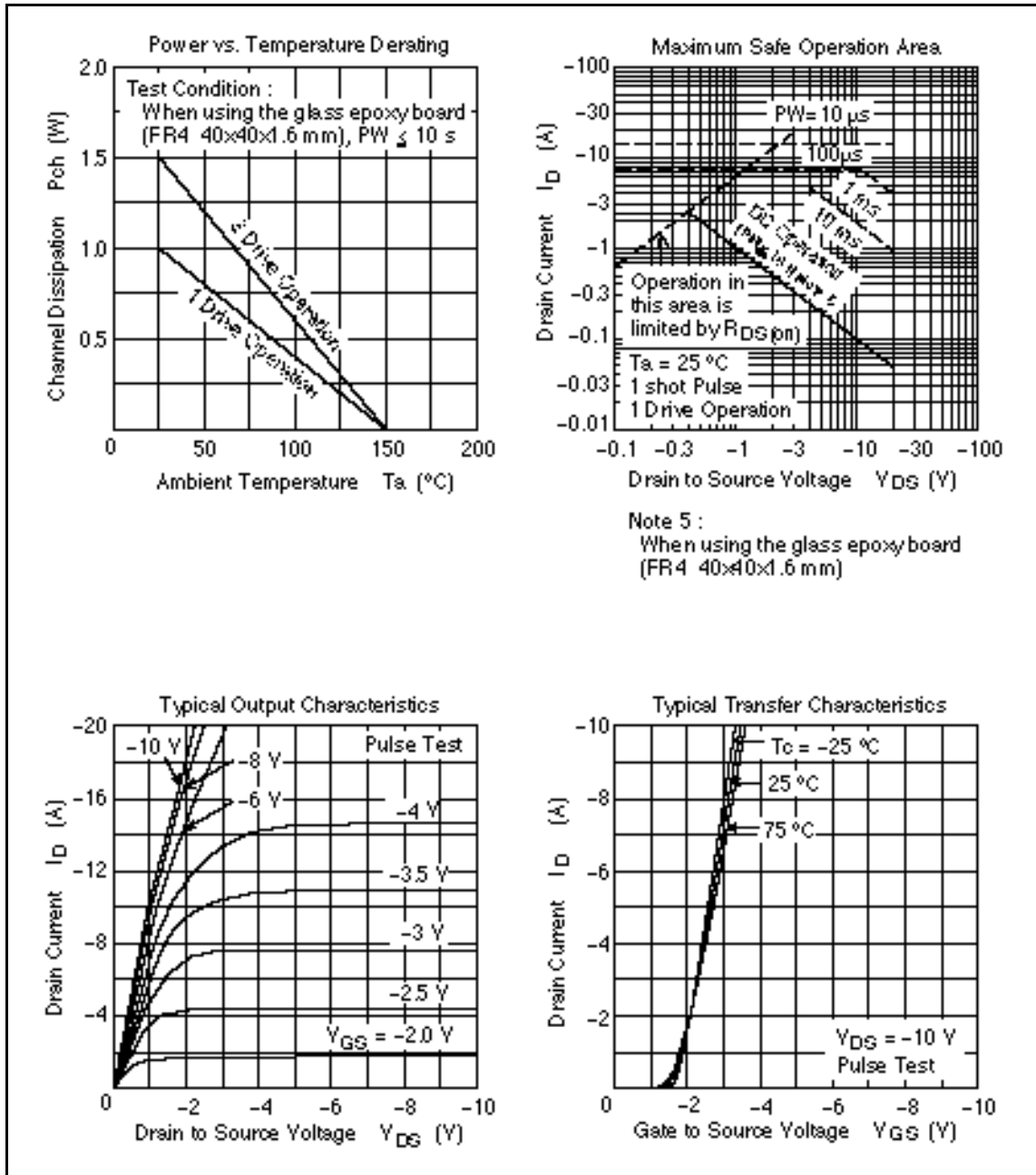
3. 2 Drive operation ; When using the glass epoxy board (FR4 40 x 40 x 1.6 mm), PW = 10s

## Electrical Characteristics (Ta = 25°C)

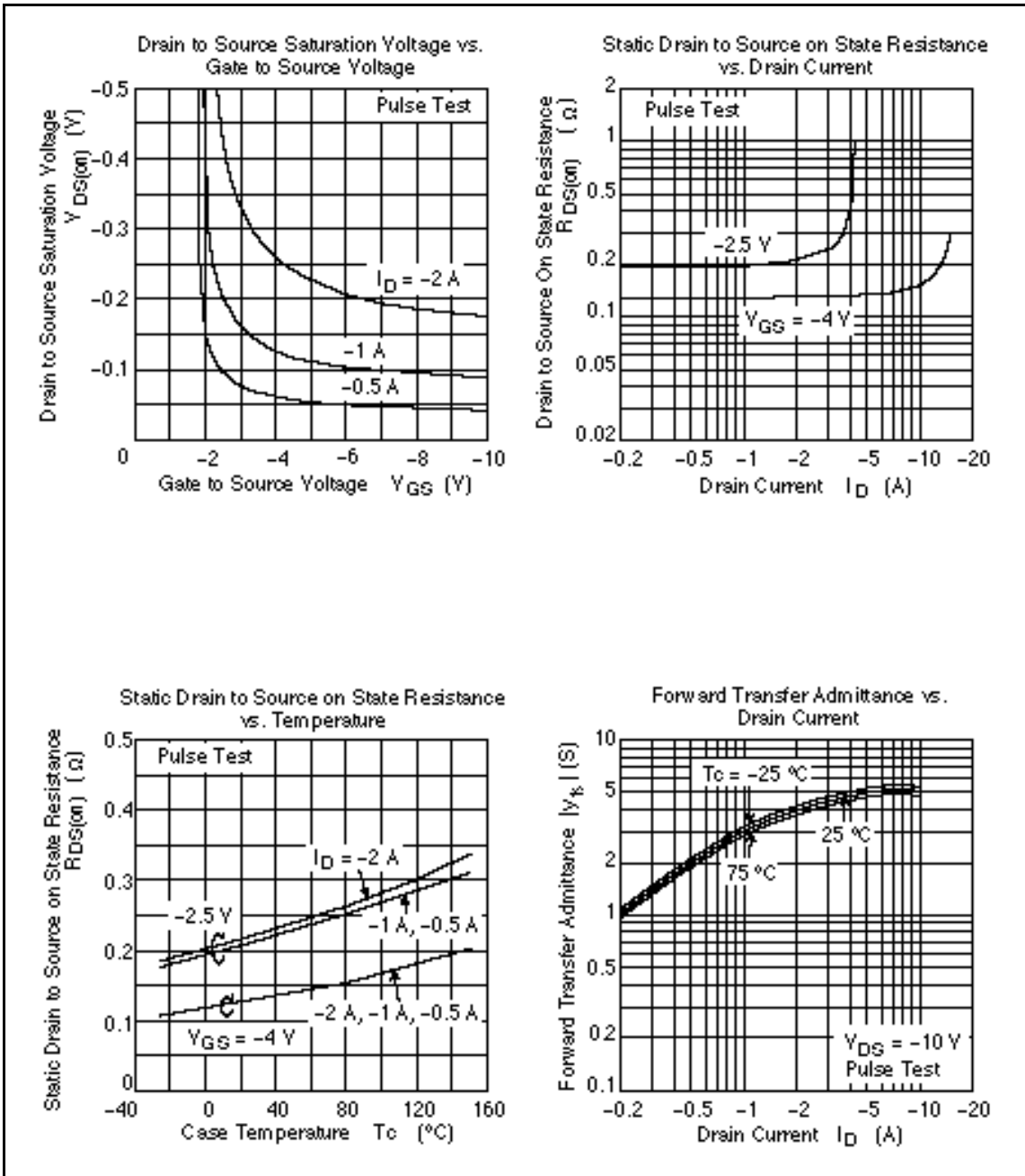
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	-20	—	—	V	$I_D = -10mA, V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	±10	—	—	V	$I_G = ±100µA, V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	±10	µA	$V_{GS} = ±8V, V_{DS} = 0$
Zero gate voltage 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		$I_D = -2A, V_{GS} = -4V$ <sup>Note4</sup>
	$R_{DS(on)}$	—	0.21	0.28		$I_D = -2A, V_{GS} = -2.5V$ <sup>Note4</sup>
Forward transfer admittance	$ y_{fs} $	2.6	4	—	S	$I_D = -2A, V_{DS} = -10V$ <sup>Note4</sup>
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	$V_{DD} = -10V$
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	$I_F = -2.5A, V_{GS} = 0$ <sup>Note4</sup>
Body-drain diode reverse recovery time	$t_{rr}$	—	45	—	ns	$I_F = -2.5A, V_{GS} = 0$ $diF/dt = 20A/µs$

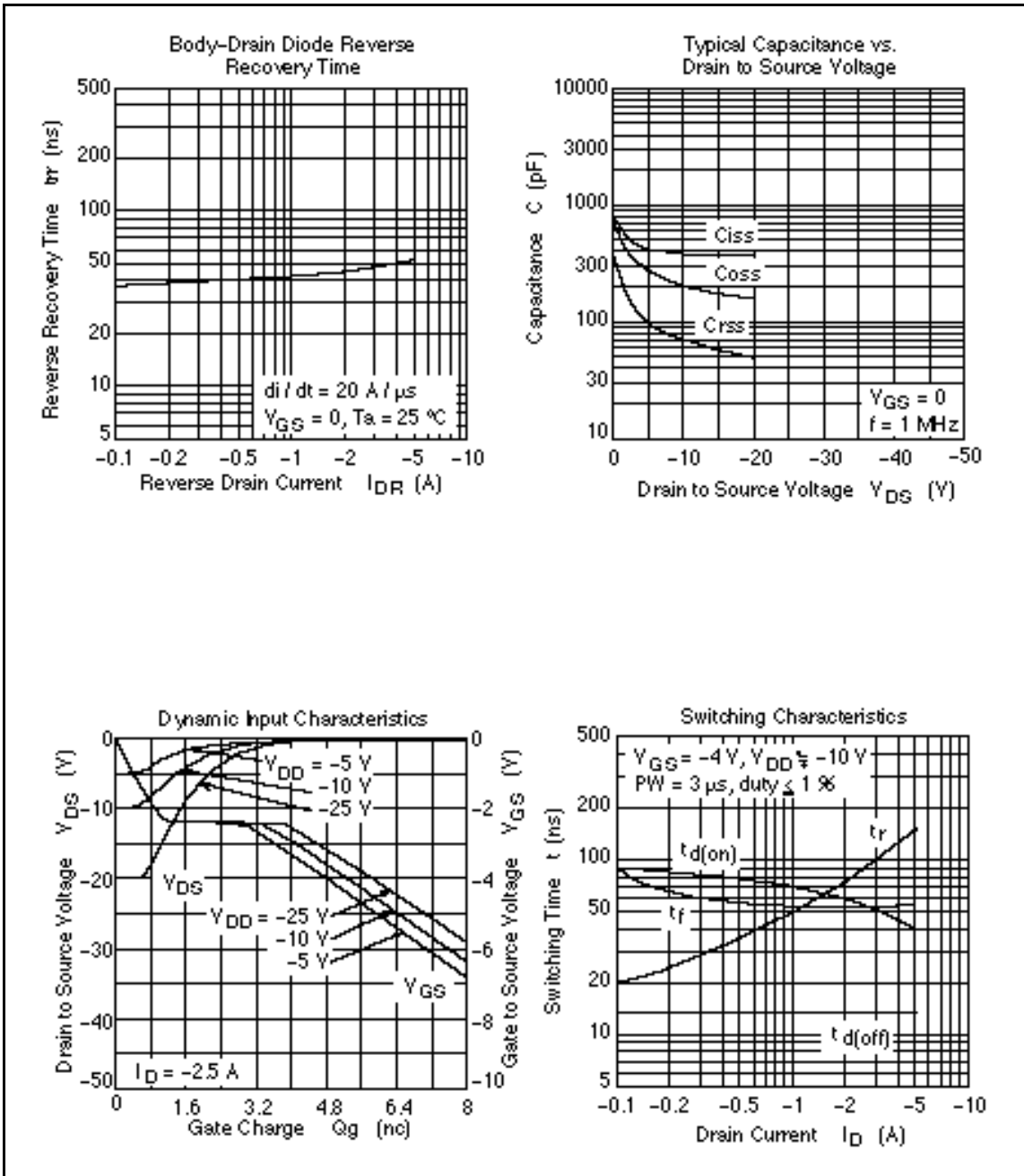
Note: 4. Pulse test

Main Characteristics

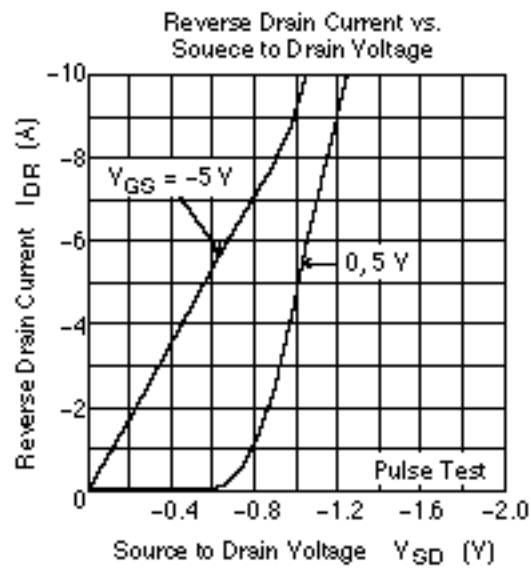


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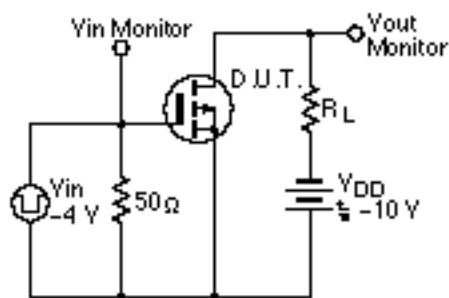




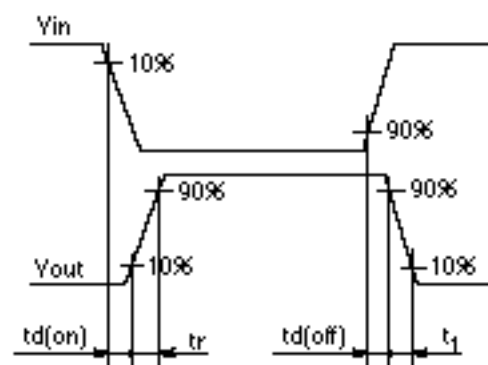
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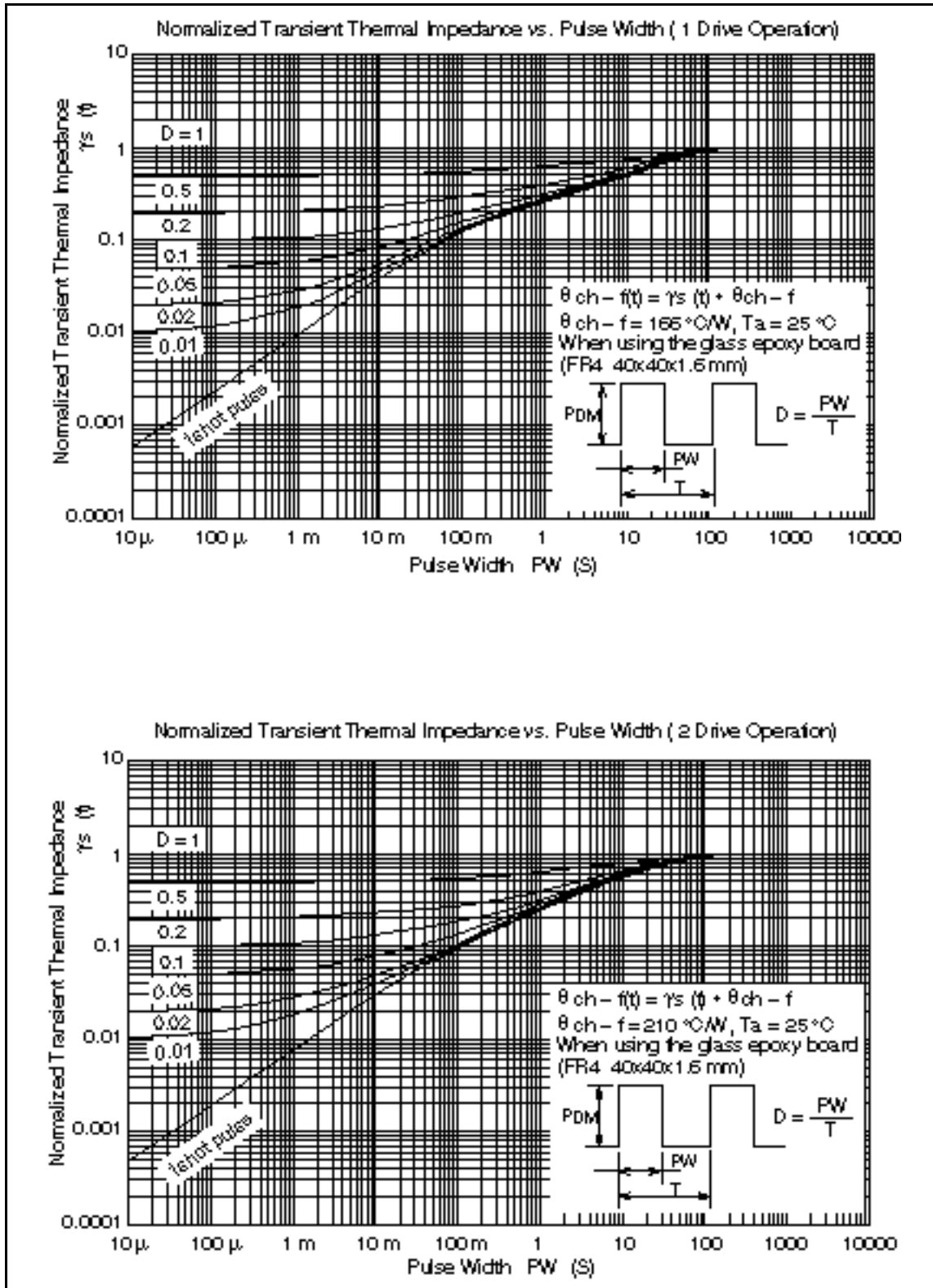


Switching Time Test Circuit



Switching Time Waveform

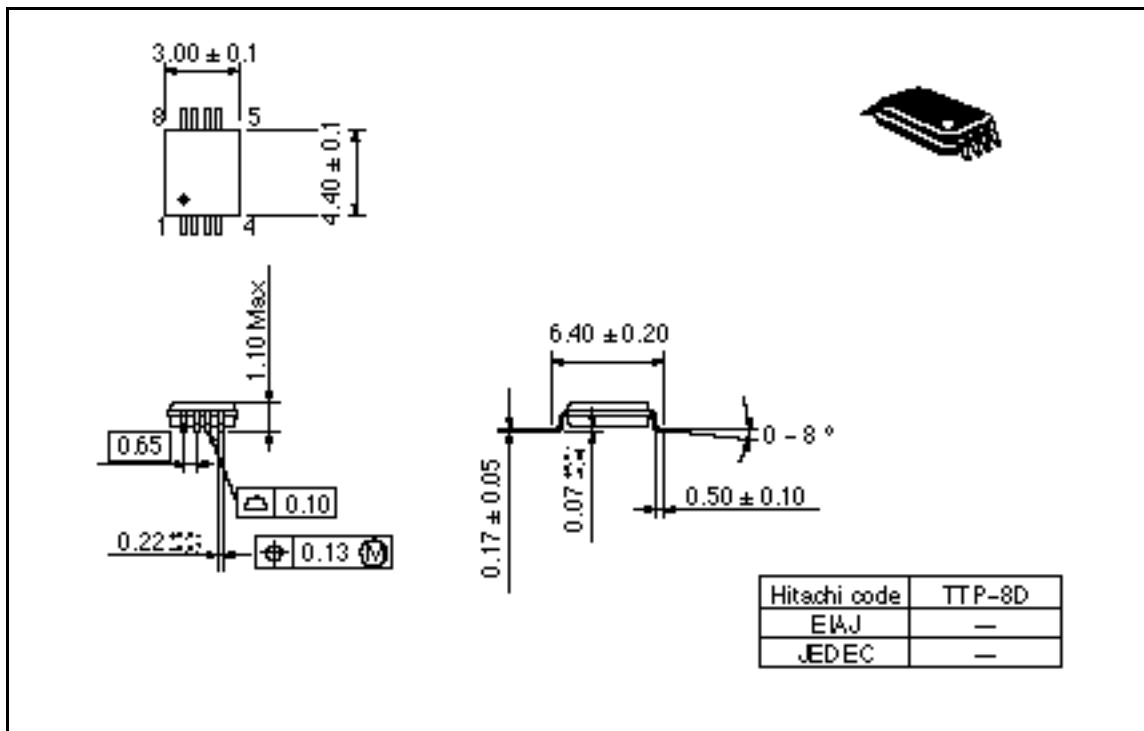




Package Dimentions

Unit: mm

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