

HAT2042T

Silicon N Channel Power MOS FET
High Speed Power Switching

HITACHI

ADE-208-669F (Z)

7th. Edition

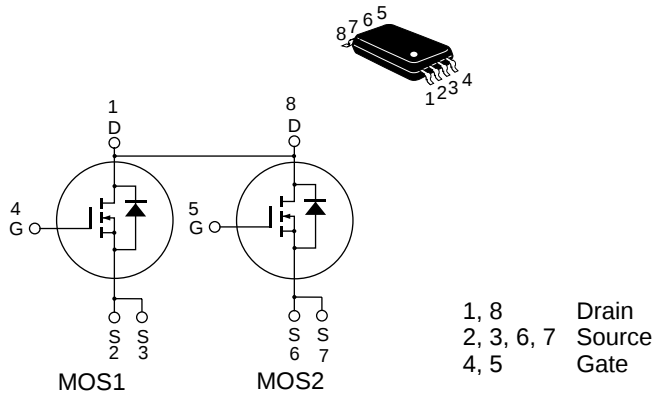
Feb. 1999

Features

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

Outline

TSSOP-8



Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	28	V
Gate to source voltage	V_{GSS}	± 12	V
Drain current	I_D	5.0	A
Drain peak current	$I_{D(pulse)}^{Note1}$	40	A
Body-drain diode reverse drain current	I_{DR}	5.0	A
Channel dissipation	P_{ch}^{Note2}	1.0	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), $PW \leq 10 s$

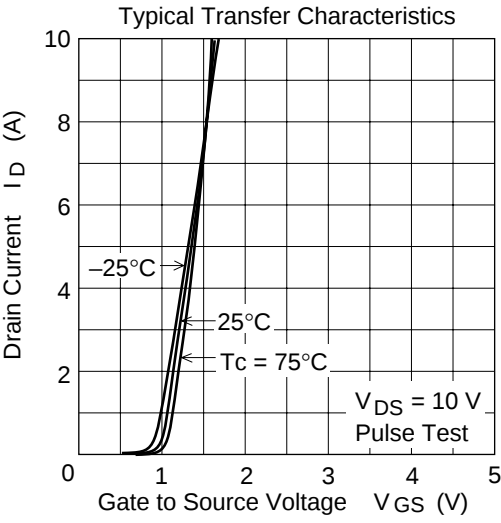
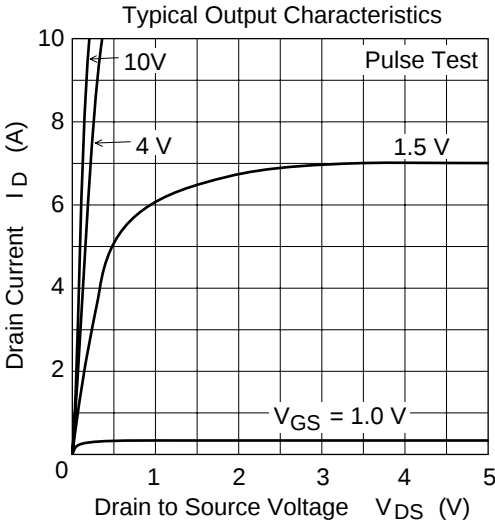
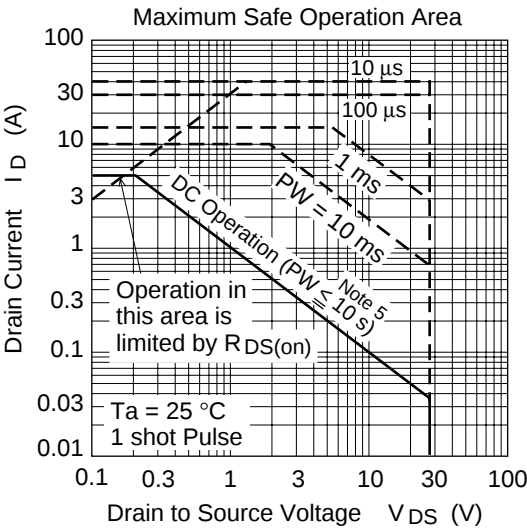
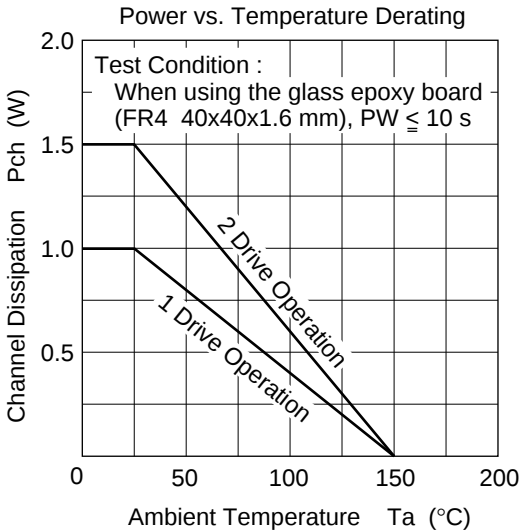
3. 2 Drive operation ; When using the glass epoxy board (FR4 40 x 40 x 1.6 mm), $PW \leq 10 s$

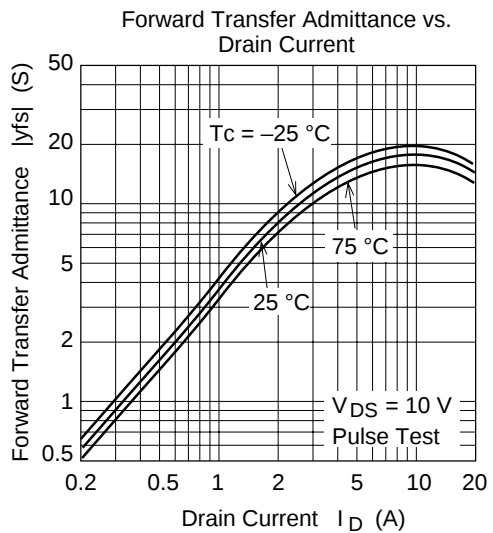
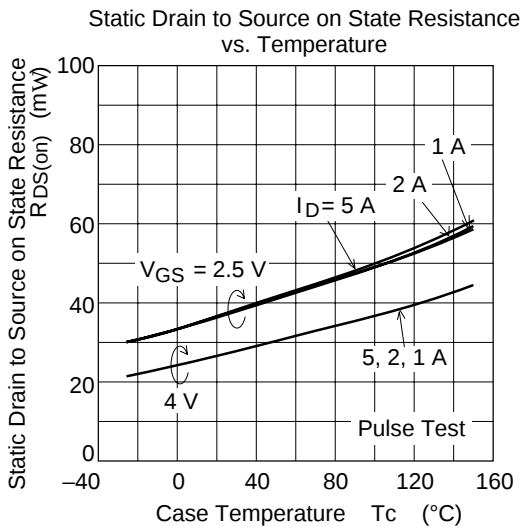
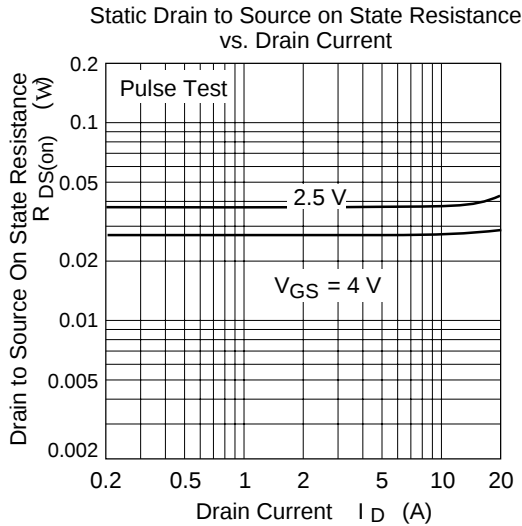
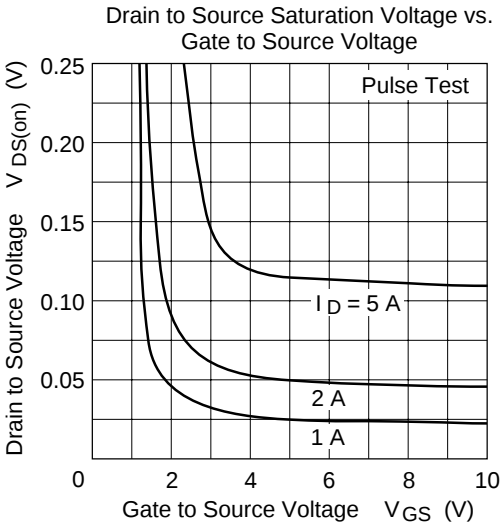
Electrical Characteristics (Ta = 25°C)

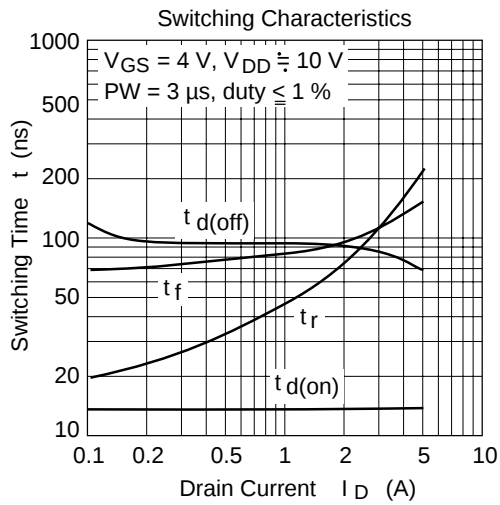
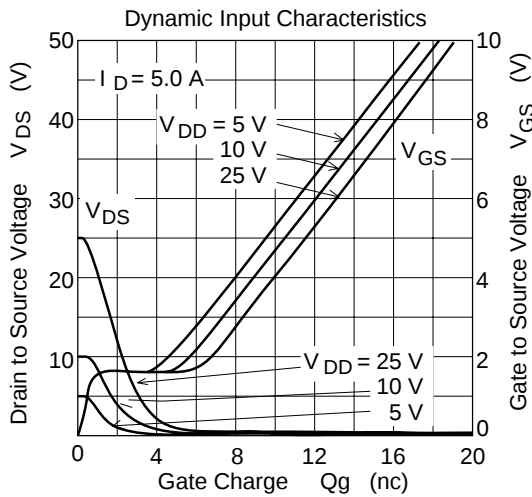
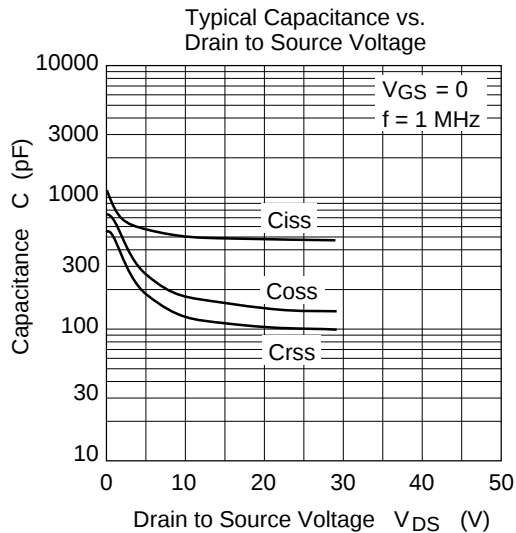
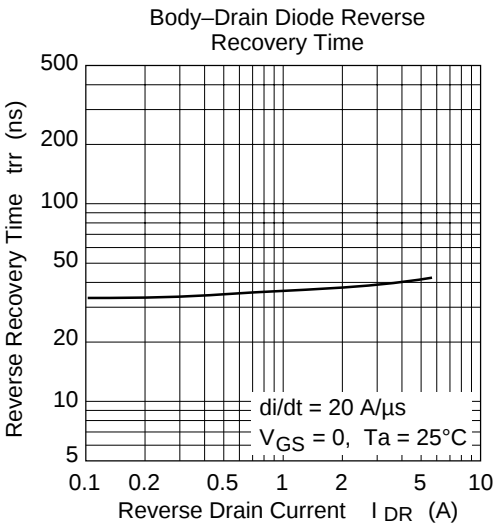
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	28	—	—	V	$I_D = 10mA$, $V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 0.1	μA	$V_{GS} = \pm 12 V$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	1	μA	$V_{DS} = 28 V$, $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	0.4	—	1.4	V	$V_{DS} = 10 V$, $I_D = 1 mA$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.027	0.034	Ω	$I_D = 3 A$, $V_{GS} = 4 V^{Note4}$
	$R_{DS(on)}$	—	0.037	0.044	Ω	$I_D = 3 A$, $V_{GS} = 2.5 V^{Note4}$
Forward transfer admittance	$ y_{fs} $	7	11	—	S	$I_D = 3 A$, $V_{DS} = 10 V^{Note4}$
Input capacitance	C_{iss}	—	510	—	pF	$V_{DS} = 10 V$
Output capacitance	C_{oss}	—	190	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	140	—	pF	$f = 1 MHz$
Total gate charge	Q_g	—	8.5	—	nc	$V_{DD} = 10 V$
Gate to source charge	Q_{gs}	—	4.5	—	nc	$V_{GS} = 4 V$
Gate to drain charge	Q_{gd}	—	4	—	nc	$I_D = 5 A$
Turn-on delay time	$t_{d(on)}$	—	14	—	ns	$V_{GS} = 4 V$, $I_D = 3 A$
Rise time	t_r	—	120	—	ns	$V_{DD} \cong 10 V$
Turn-off delay time	$t_{d(off)}$	—	85	—	ns	
Fall time	t_f	—	120	—	ns	
Body-drain diode forward voltage	V_{DF}	—	0.85	1.1	V	$IF = 5.0 A$, $V_{GS} = 0^{Note4}$
Body-drain diode reverse recovery time	t_{rr}	—	40	—	ns	$IF = 5.0 A$, $V_{GS} = 0$ $diF/dt = 20 A/\mu s$

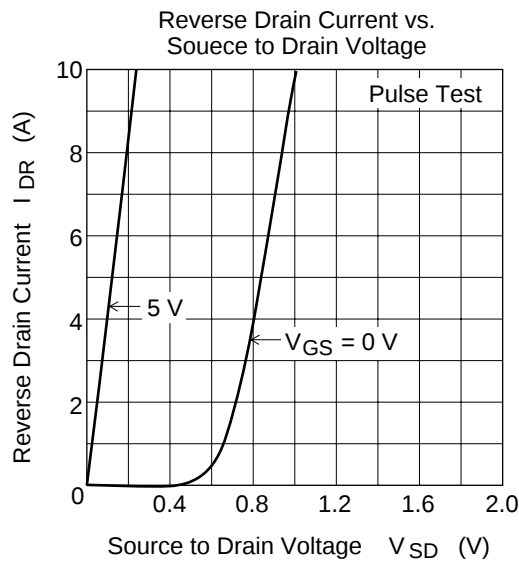
Note: 4. Pulse test

Main Characteristics

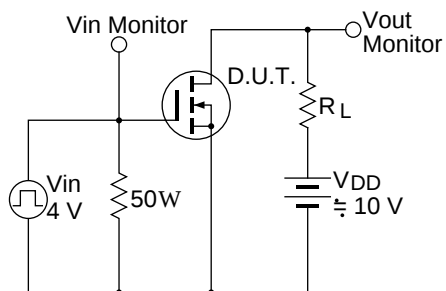




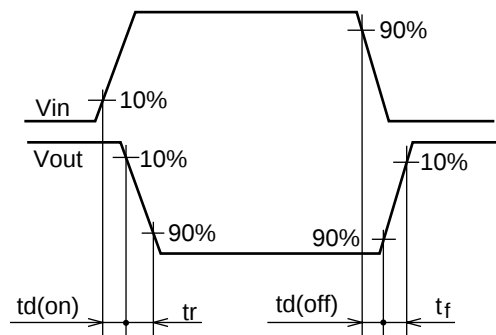


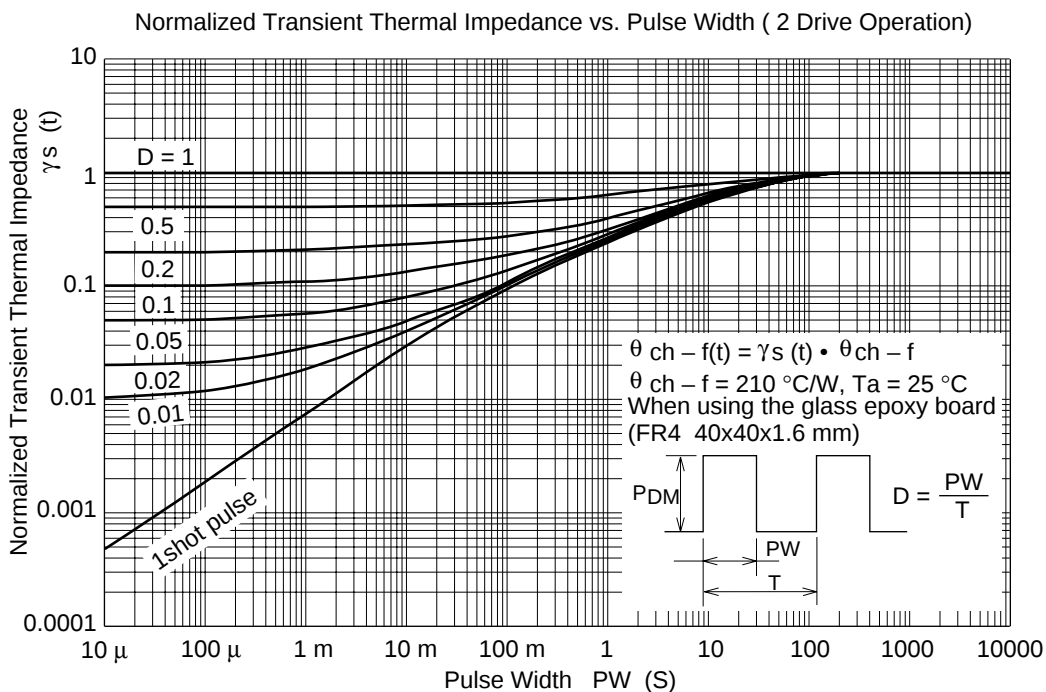
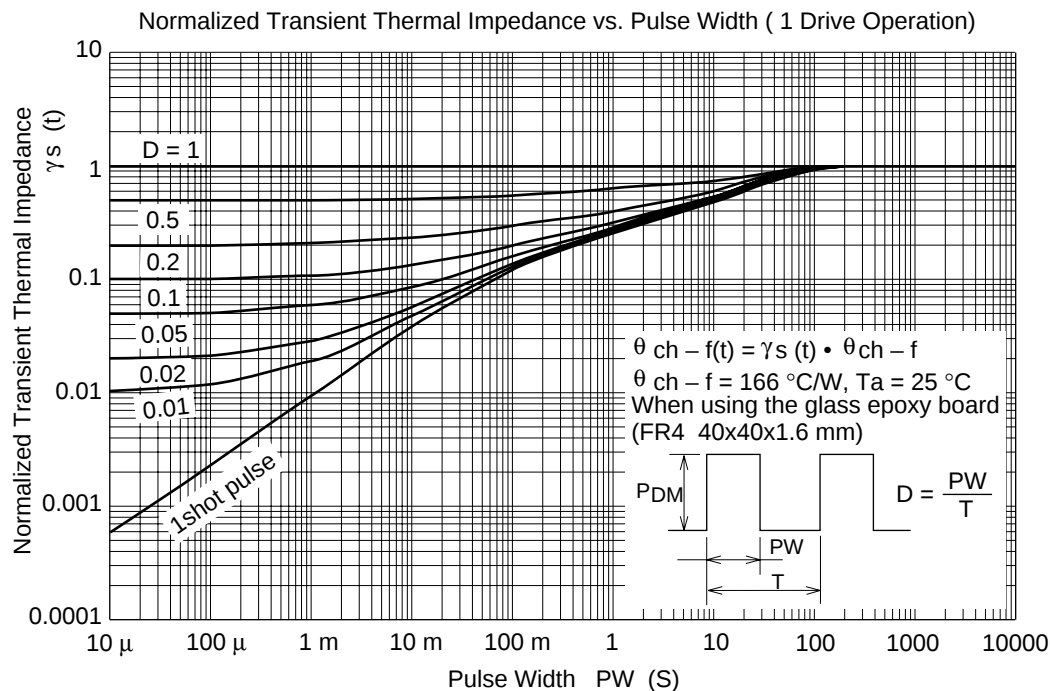


Switching Time Test Circuit



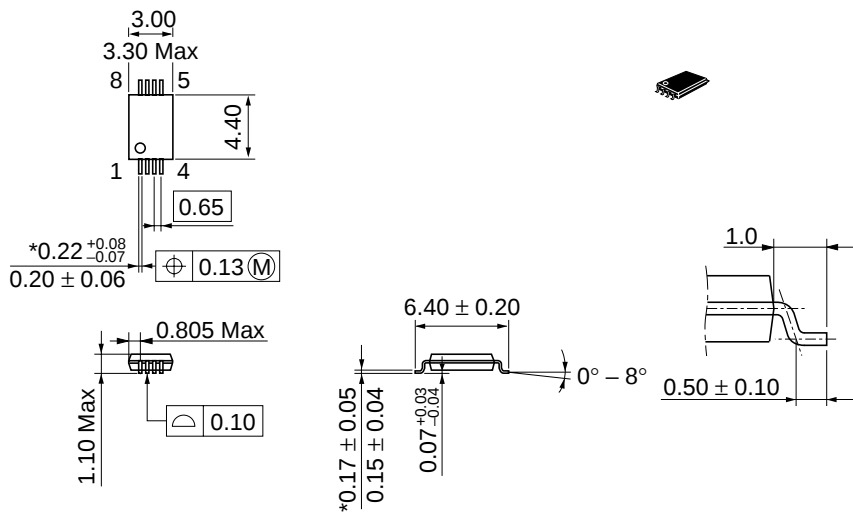
Switching Time Waveform





Package Dimensions

As of January, 2001
Unit: mm



*Dimension including the plating thickness
Base material dimension

Hitachi Code	TTP-8D
JEDEC	—
EIAJ	—
Mass (reference value)	—

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