

HAT1036R

Silicon P Channel Power MOS FET
Power Switching

HITACHI

ADE-208-662E (Z)

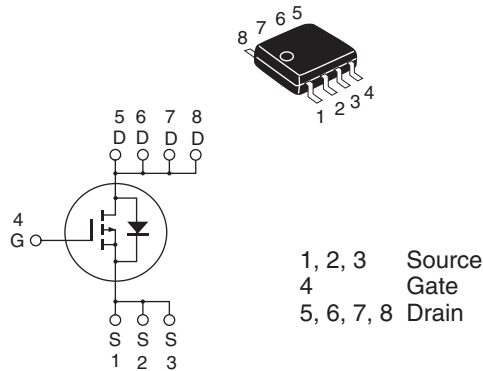
6th. Edition
Dec. 2002

Features

- Low on-resistance
 $R_{DS(on)} = 11 \text{ m}\Omega$ typ
- Capable of -4 V gate drive
- Low drive current
- High density mounting

Outline

SOP-8



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	-12	A
Drain peak current	I _{D(pulse)} ^{Note1}	-96	A
Body-drain diode reverse drain current	I _{DR}	-12	A
Channel dissipation	P _{ch} ^{Note2}	2.5	W
Channel temperature	T _{ch}	150	°C
Storage temperature	T _{stg}	−55 to +150	°C

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

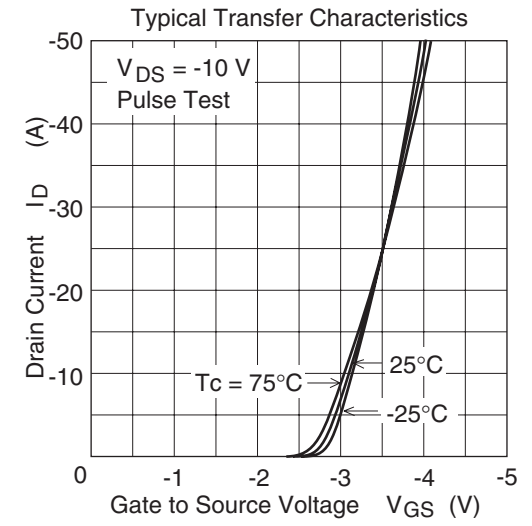
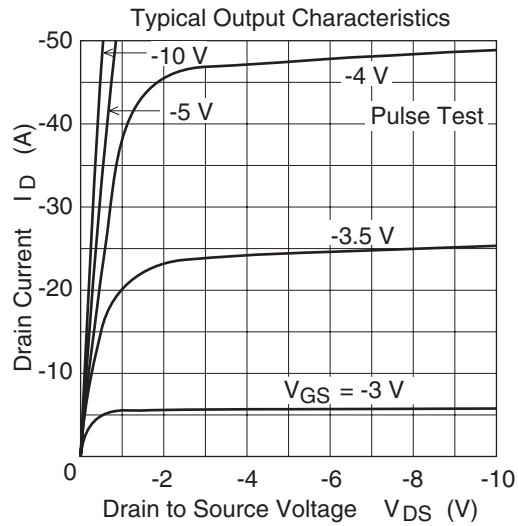
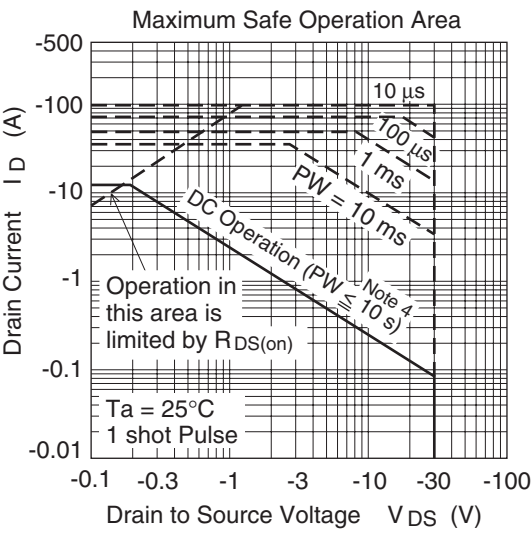
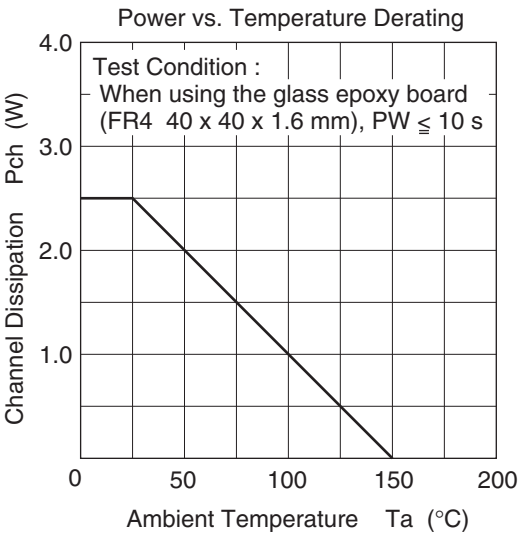
Electrical Characteristics

(Ta = 25°C)

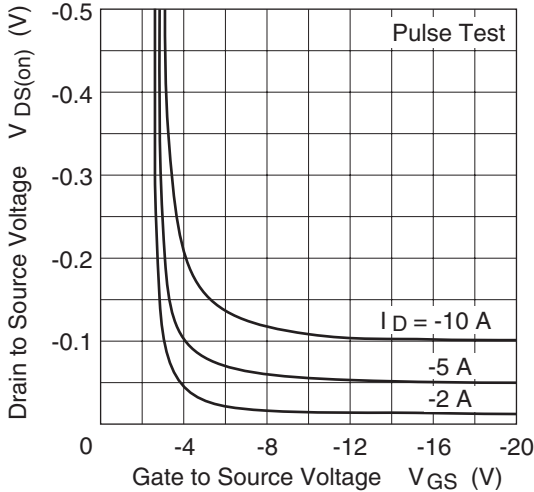
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	-30	—	—	V	$I_D = -10 \text{ mA}$, $V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 0.1	μA	$V_{GS} = \pm 20 \text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	-1	μA	$V_{DS} = -30 \text{ V}$, $V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	-1.0	—	-2.5	V	$V_{DS} = -10 \text{ V}$, $I_D = -1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	11	14	$\text{m}\Omega$	$I_D = -6 \text{ A}$, $V_{GS} = -10 \text{ V}$ ^{Note1}
	$R_{DS(on)}$	—	21	34	$\text{m}\Omega$	$I_D = -6 \text{ A}$, $V_{GS} = -4 \text{ V}$ ^{Note1}
Forward transfer admittance	$ y_{fs} $	12	20	—	S	$I_D = -6 \text{ A}$, $V_{DS} = -10 \text{ V}$ ^{Note1}
Input capacitance	C_{iss}	—	4200	—	pF	$V_{DS} = -10 \text{ V}$
Output capacitance	C_{oss}	—	870	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	360	—	pF	$f = 1 \text{ MHz}$
Total gate charge	Q_g	—	70	—	nc	$V_{DD} = -10 \text{ V}$
Gate to source charge	Q_{gs}	—	12	—	nc	$V_{GS} = -10 \text{ V}$
Gate to drain charge	Q_{gd}	—	14	—	nc	$I_D = -12 \text{ A}$
Turn-on delay time	$t_{d(on)}$	—	120	—	ns	$V_{GS} = -4 \text{ V}$, $I_D = -6 \text{ A}$
Rise time	t_r	—	350	—	ns	$V_{DD} \cong -10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	100	—	ns	
Fall time	t_f	—	120	—	ns	
Body-drain diode forward voltage	V_{DF}	—	-0.85	-1.11	V	$I_F = -12 \text{ A}$, $V_{GS} = 0$ ^{Note1}
Body-drain diode reverse recovery time	t_{rr}	—	55	—	ns	$I_F = -12 \text{ A}$, $V_{GS} = 0$ $di_F/dt = 20 \text{ A}/\mu\text{s}$

Note: 1. Pulse test

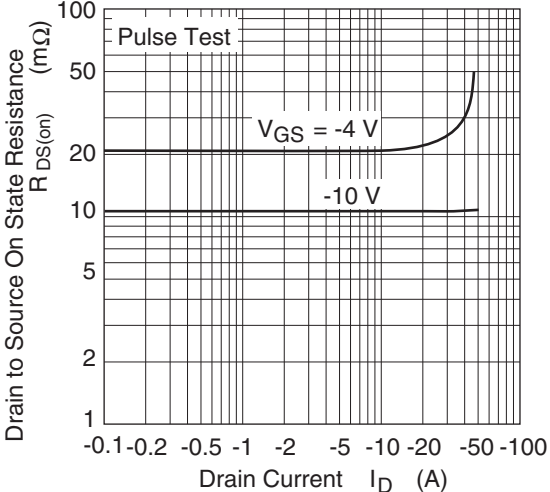
Main Characteristics



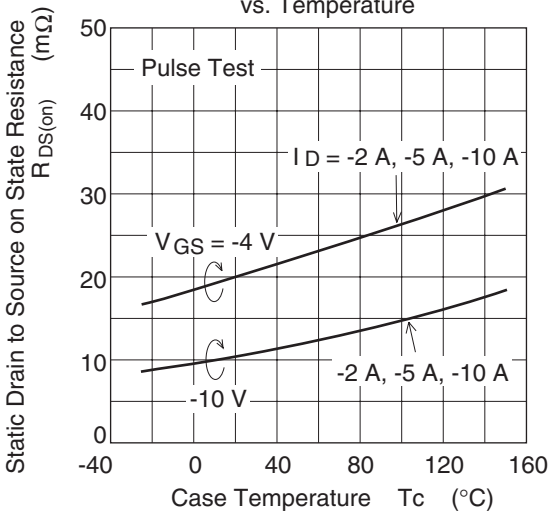
Drain to Source Saturation Voltage vs.
Gate to Source Voltage



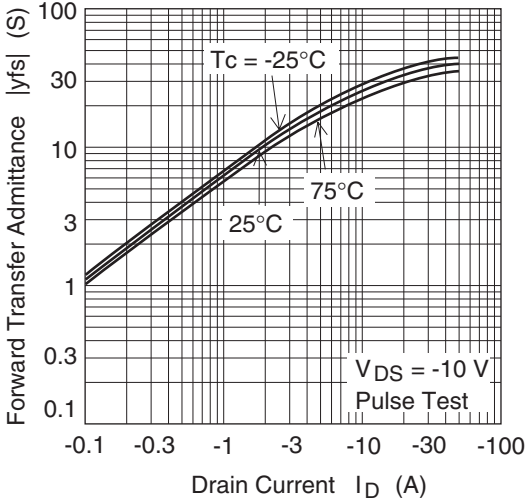
Static Drain to Source on State Resistance
vs. Drain Current

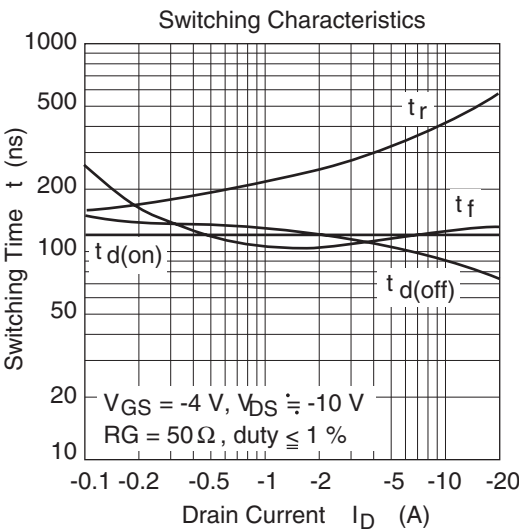
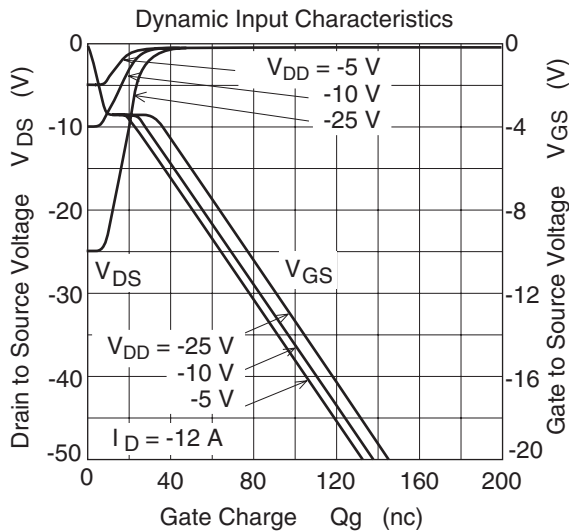
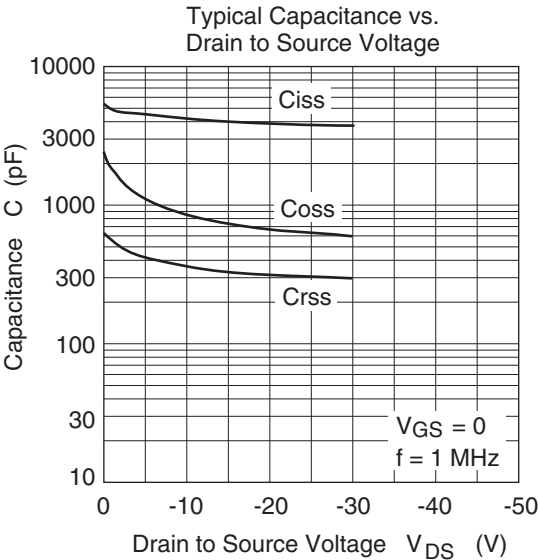
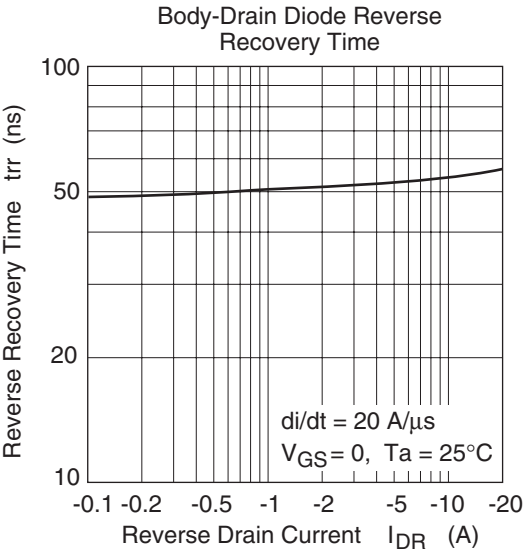


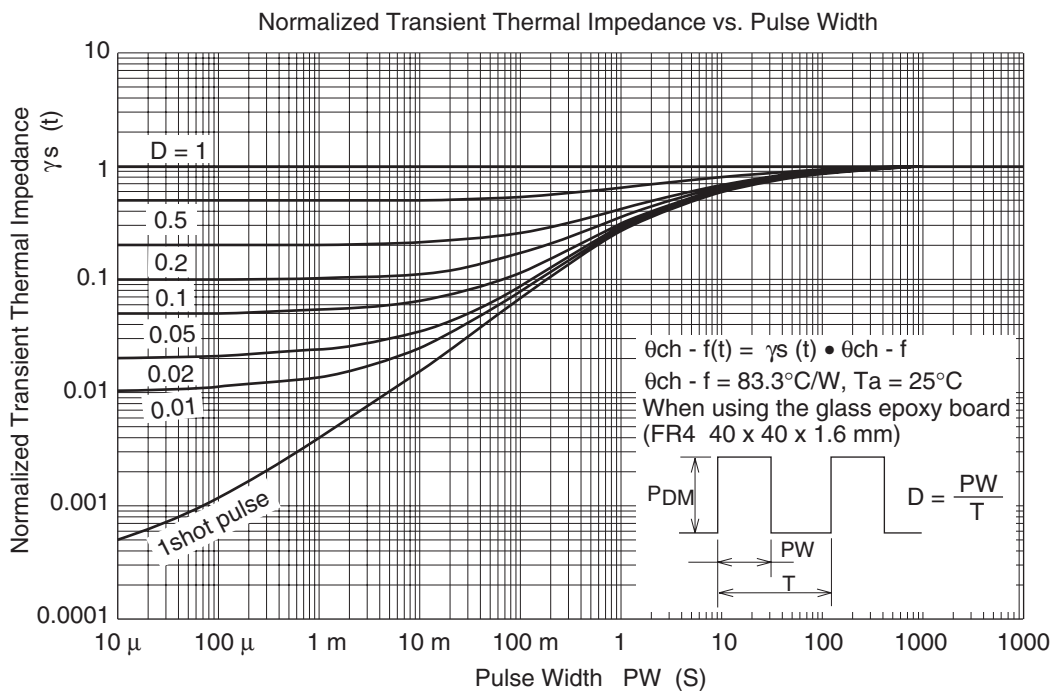
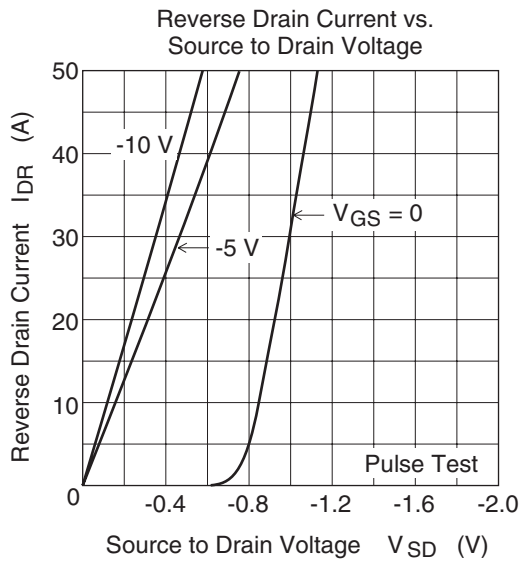
Static Drain to Source on State Resistance
vs. Temperature



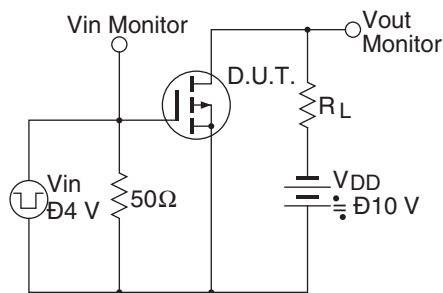
Forward Transfer Admittance vs.
Drain Current



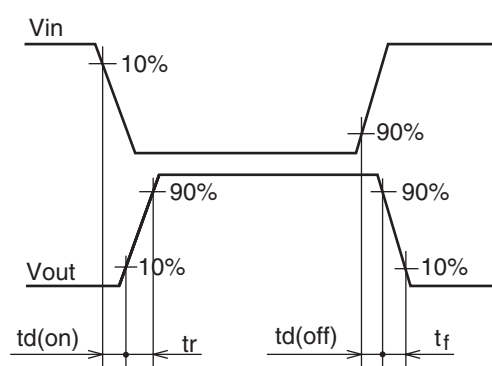




Switching Time Test Circuit



Switching Time Waveforms



Unit: mm



Hitachi Code	FP-8DA
JEDEC	Conforms
JEITA	—
Mass (reference value)	0.085 g

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

URL <http://www.hitachisemiconductor.com/>

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 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 Ltd. Hitachi Tower 16 Collyer Quay #20-00 Singapore 049318 Tel : <65>-6538-6533/6538-8577 Fax : <65>-6538-6933/6538-3877 URL : http://semiconductor.hitachi.com.sg	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>-2735-9218 Fax : <852>-2730-0281 URL : http://semiconductor.hitachi.com.hk
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