

HAT1036R

Silicon P Channel Power MOS FET
Power Switching

HITACHI

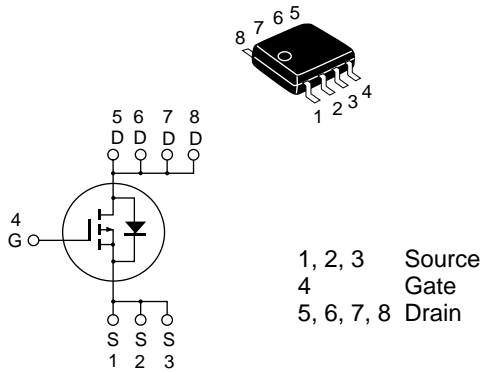
ADE-208-662D (Z)
5th. Edition
February 1999

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	Pch ^{Note2}	2.5	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	-55 to +150	°C

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

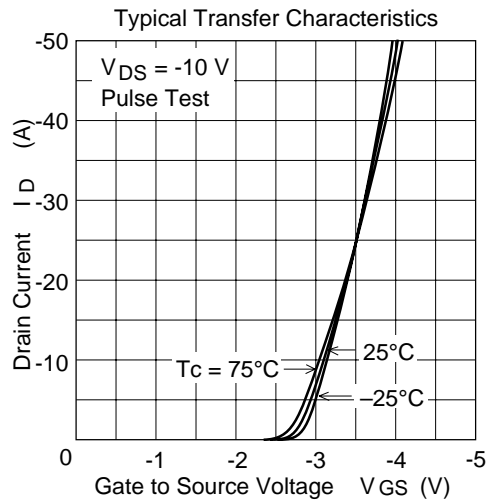
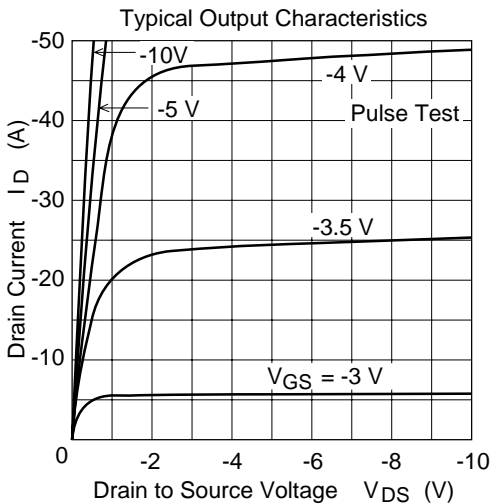
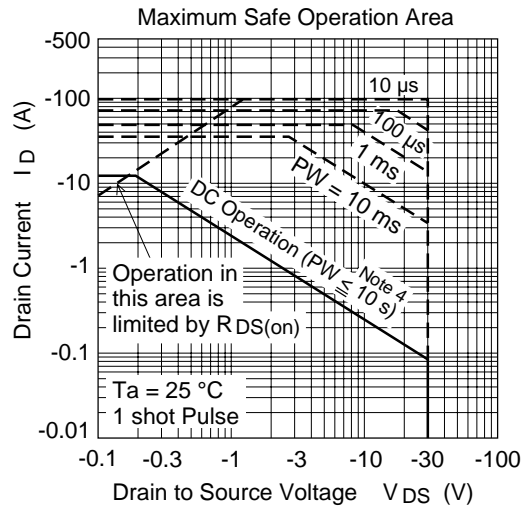
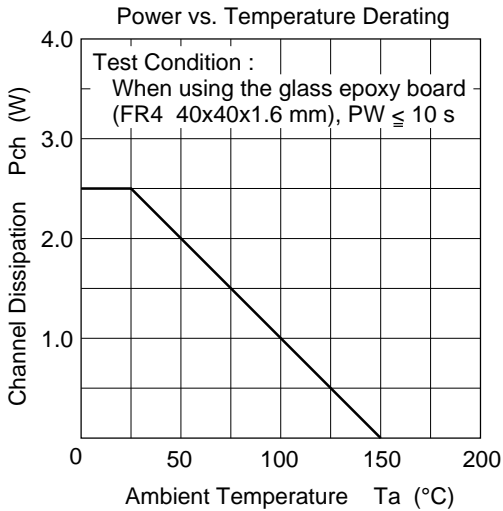
2. When using the glass epoxy board (FR4 40 x 40 x 1.6 mm), $PW \leq 10 s$

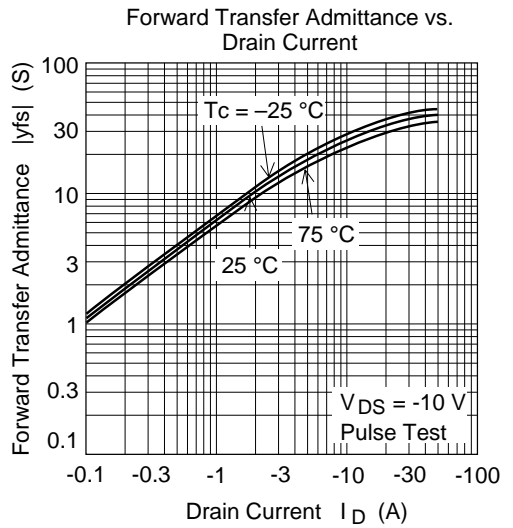
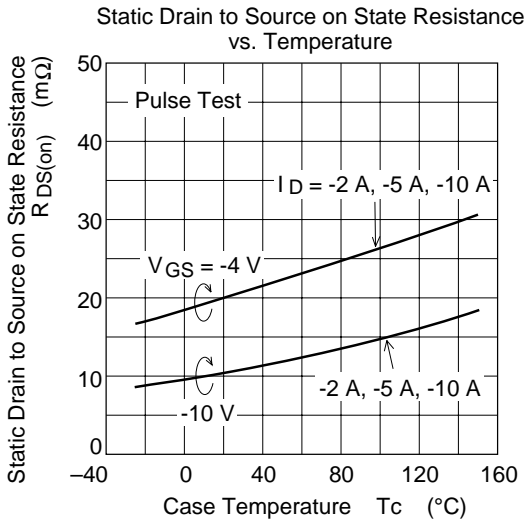
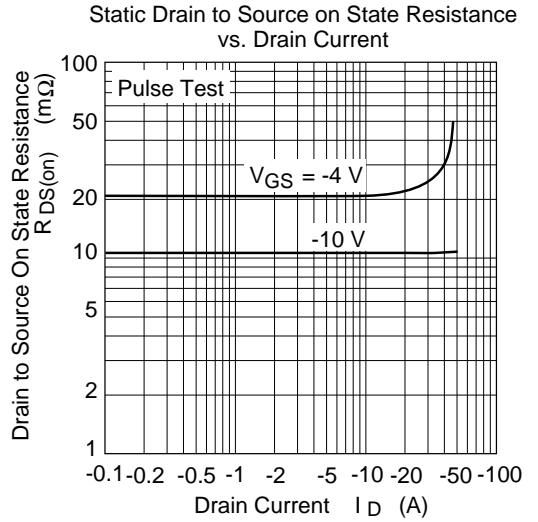
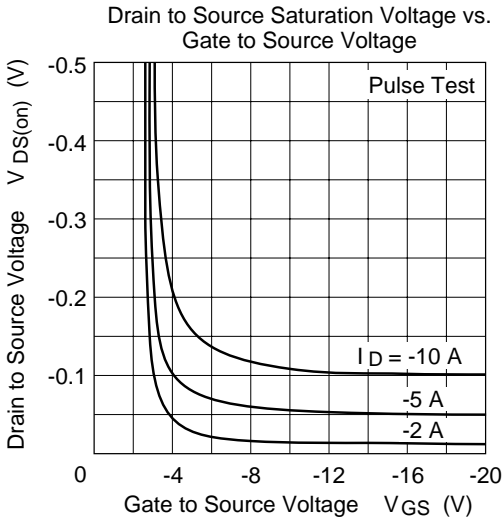
Electrical Characteristics (Ta = 25°C)

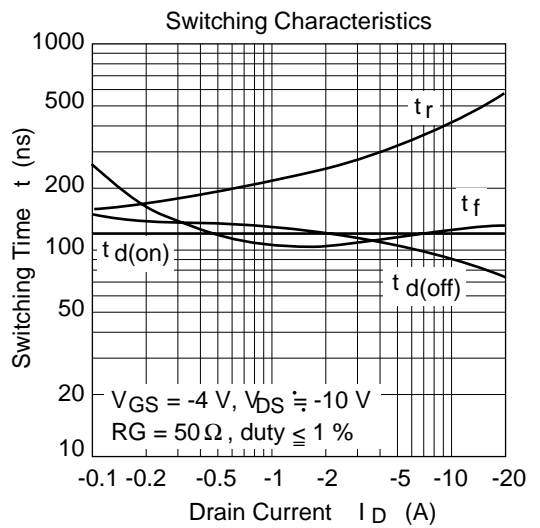
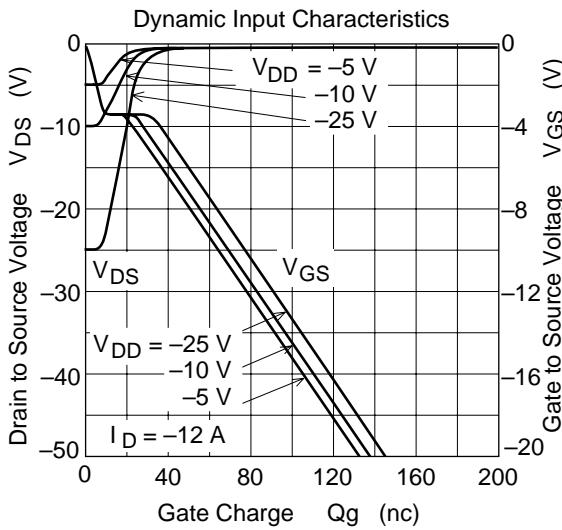
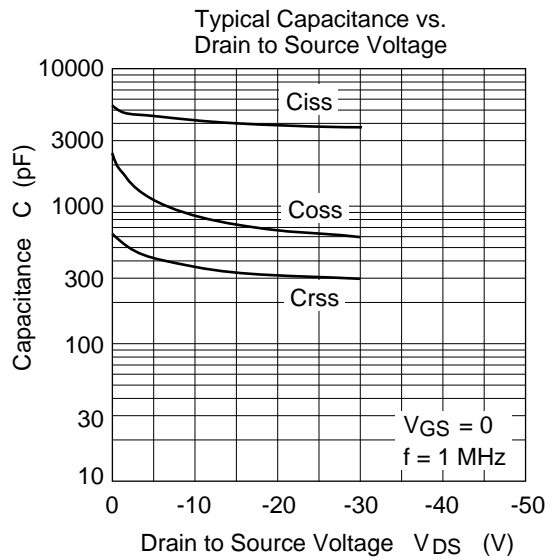
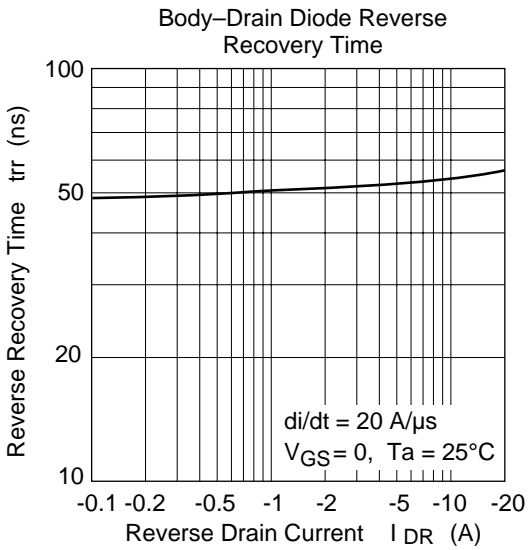
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	-30	—	—	V	$I_D = -10 \text{ mA}$, $V_{GS} = 0$
Gate to source leak current	I_{GSS}	—	—	±0.1	μA	$V_{GS} = \pm 20 \text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	-1	μA	$V_{DS} = -30 \text{ V}$, $V_{GS} = 0$
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	mΩ	$I_D = -6 \text{ A}$, $V_{GS} = -10 \text{ V}$ ^{Note1}
	$R_{DS(on)}$	—	21	34	mΩ	$I_D = -6 \text{ A}$, $V_{GS} = -4 \text{ V}$ ^{Note1}
Forward transfer admittance	$ y_{fs} $	12	20	—	S	$I_D = -6 \text{ A}$, $V_{DS} = -10 \text{ V}$ ^{Note1}
Input capacitance	Ciss	—	4200	—	pF	$V_{DS} = -10 \text{ V}$
Output capacitance	Coss	—	870	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	Crss	—	360	—	pF	$f = 1 \text{ MHz}$
Total gate charge	Qg	—	70	—	nc	$V_{DD} = -10 \text{ V}$
Gate to source charge	Qgs	—	12	—	nc	$V_{GS} = -10 \text{ V}$
Gate to drain charge	Qgd	—	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	$I_F = -12 \text{ A}$, $V_{GS} = 0$ $diF/dt = 20 \text{ A}/\mu s$

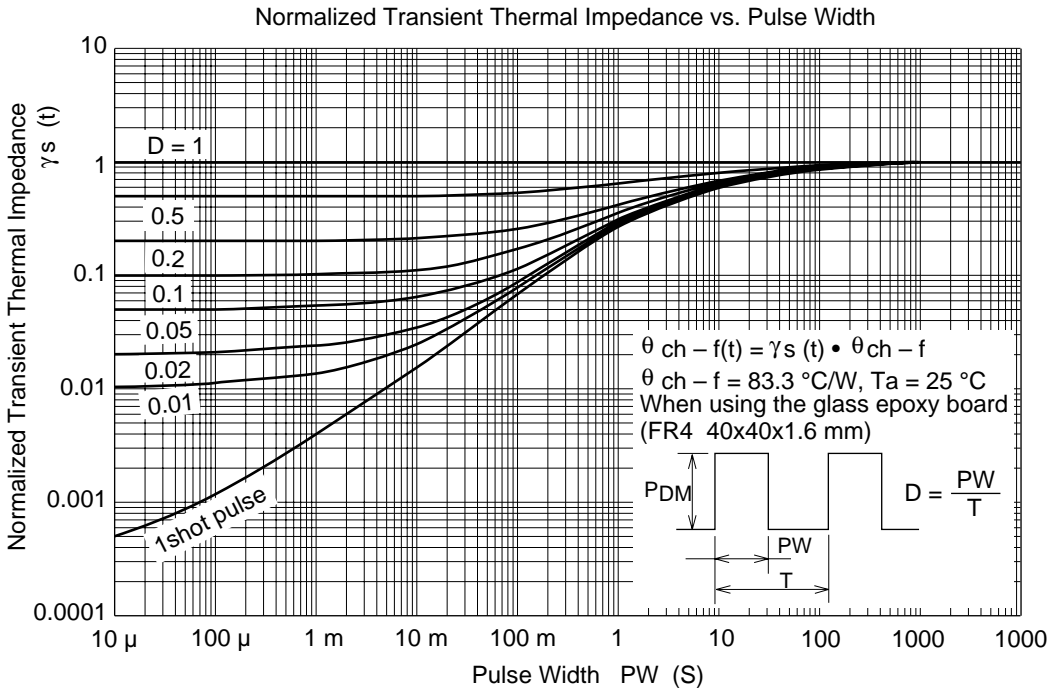
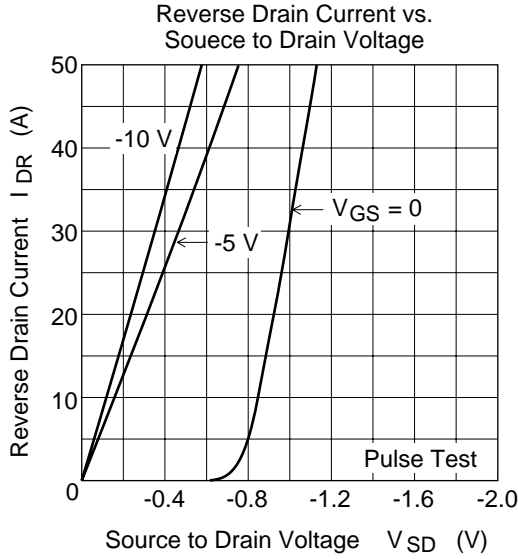
Note: 1. Pulse test

Main Characteristics

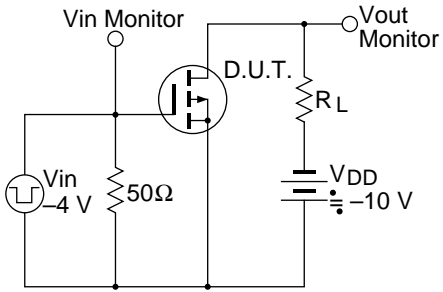




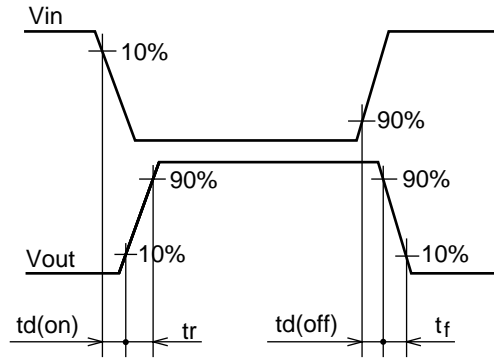




Switching Time Test Circuit

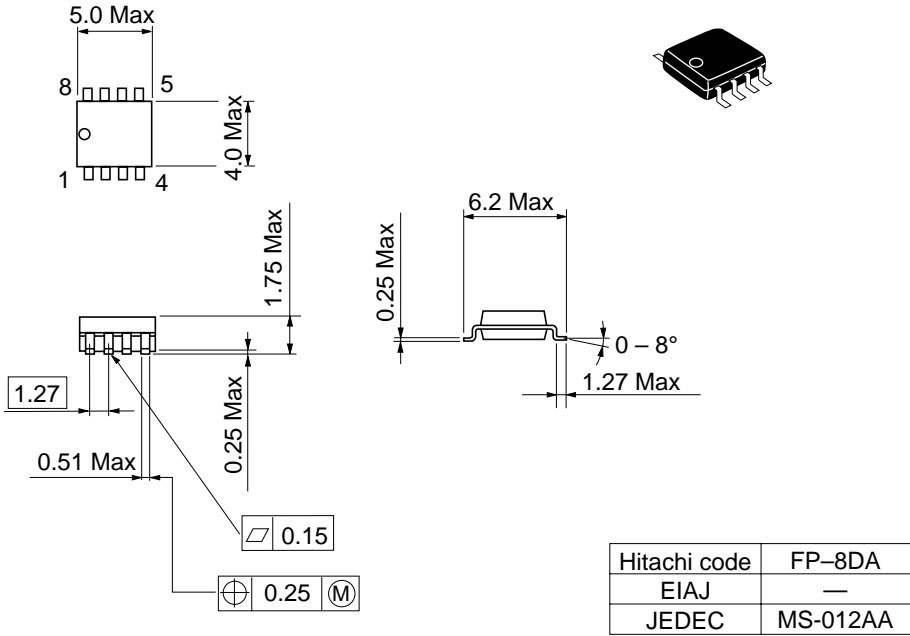


Switching Time Waveforms



Package Dimensions

Unit: mm



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