

HAT1020R

Silicon P Channel Power MOS FET
High Speed Power Switching

HITACHI

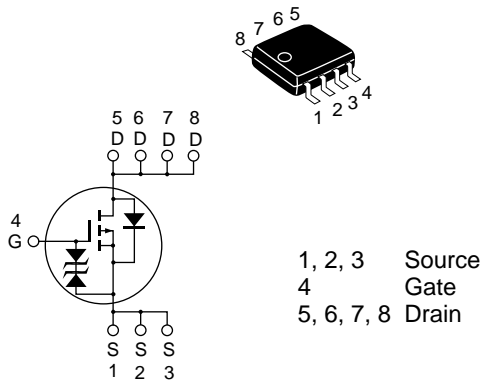
ADE-208-435 H (Z)
9th. Edition
February 1999

Features

- Low on-resistance
- 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	− 5	A
Drain peak current	$I_{D(pulse)}$ ^{Note1}	− 40	A
Body–drain diode reverse drain current	I_{DR}	− 5	A
Channel dissipation	P_{ch} ^{Note2}	2.5	W
Channel temperature	T_{ch}	150	°C
Storage temperature	T_{stg}	−55 to +150	°C

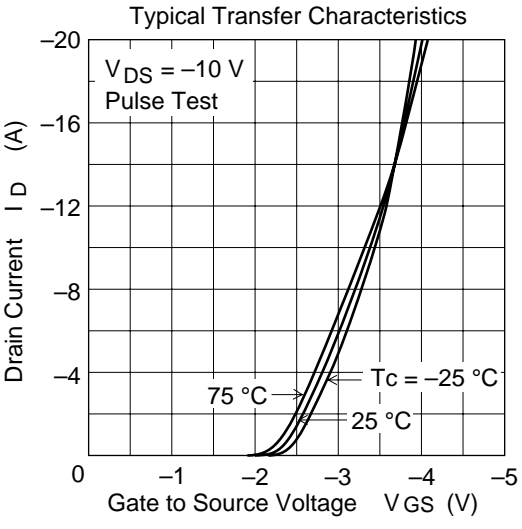
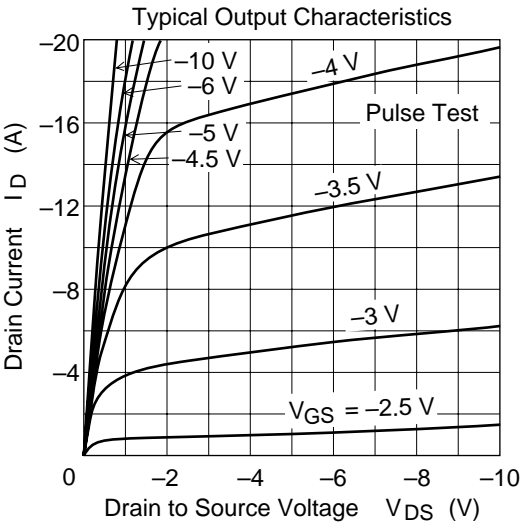
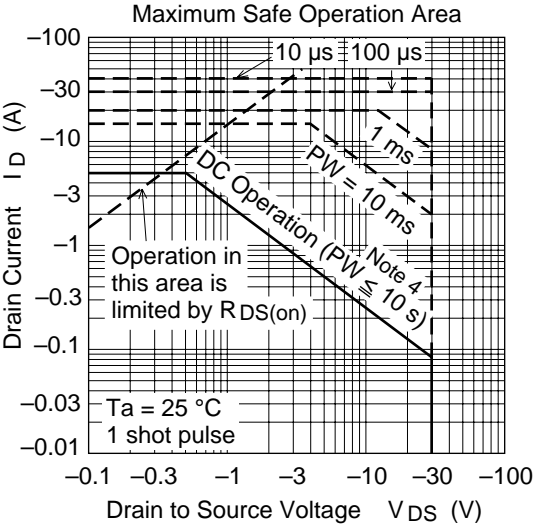
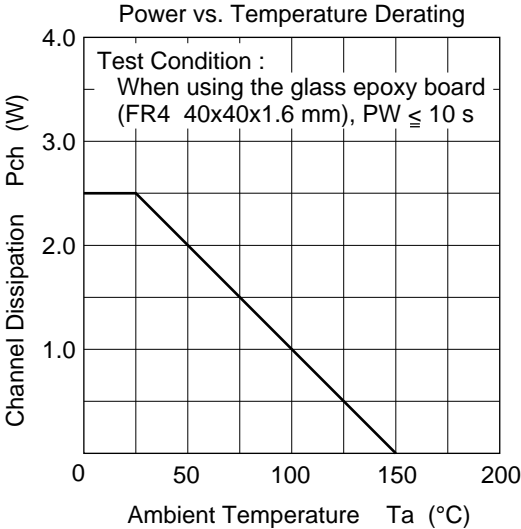
Note: 1. $PW \leq 10\mu s$, duty cycle $\leq 1\%$
2. When using the glass epoxy board (FR4 40 x 40 x 1.6 mm), $PW \leq 10s$

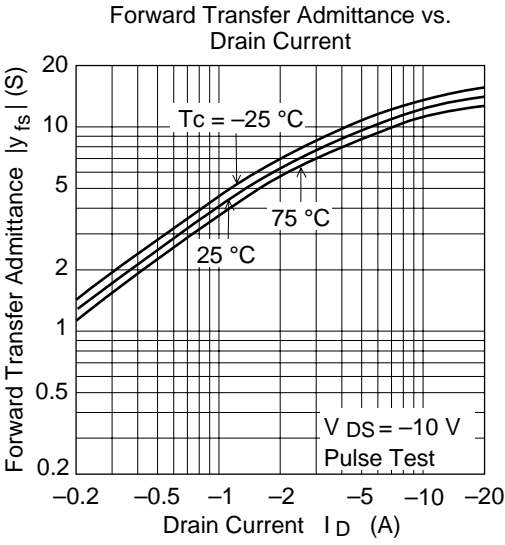
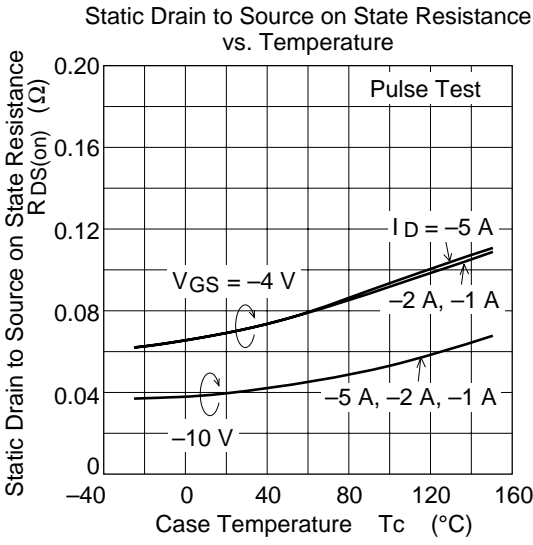
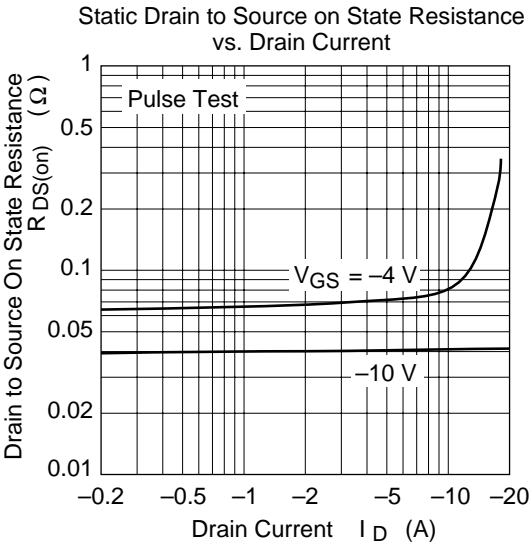
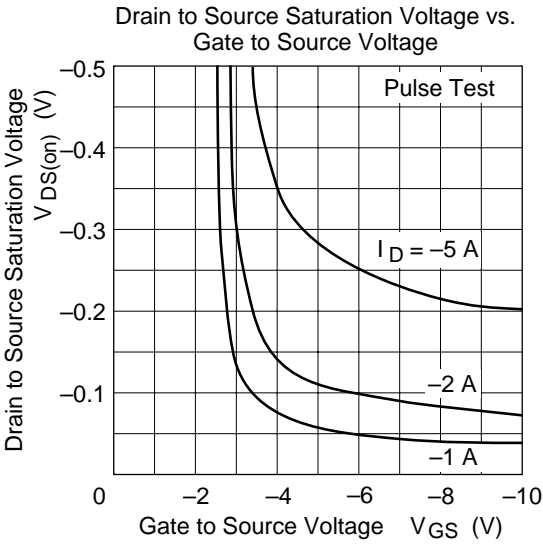
Electrical Characteristics (Ta = 25°C)

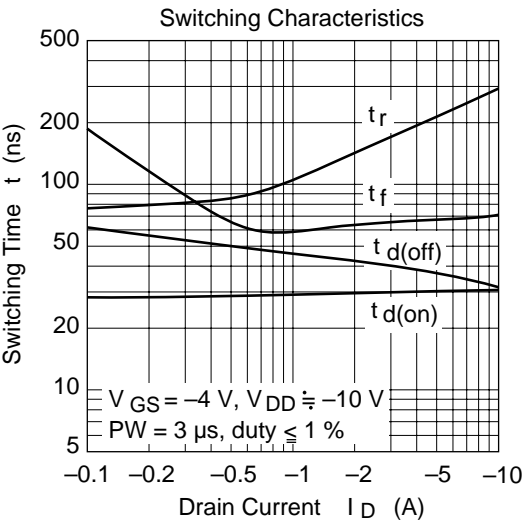
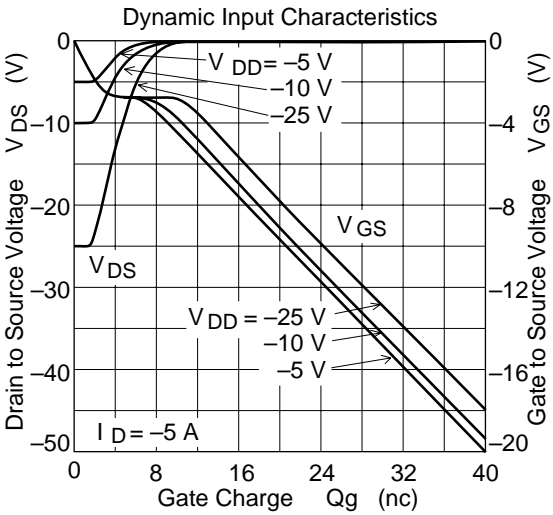
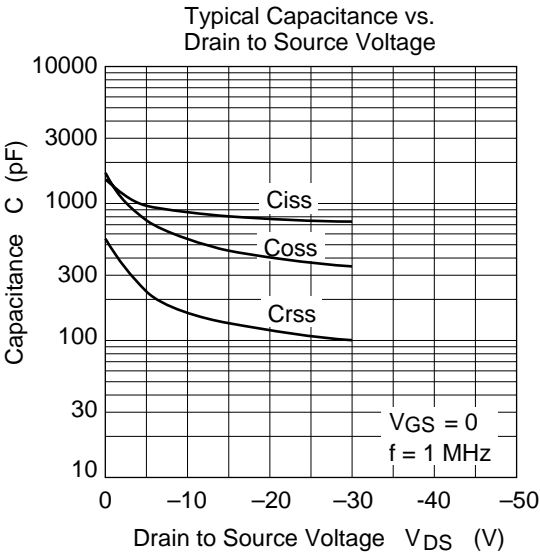
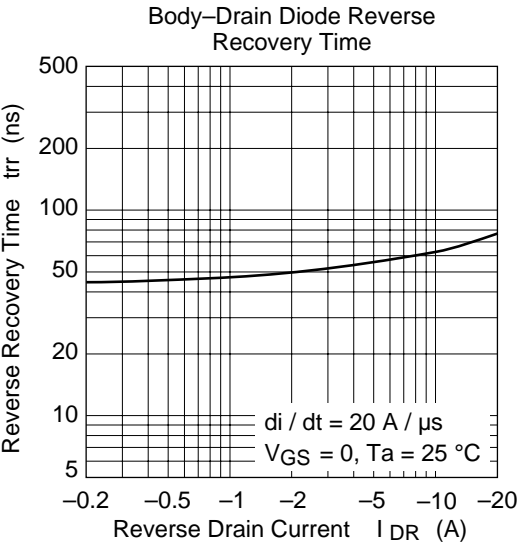
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	− 30	—	—	V	$I_D = -10\text{ mA}$, $V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	± 20	—	—	V	$I_G = \pm 100\text{ }\mu A$, $V_{DS} = 0$
Gate to source leak current	I_{GSS}	—	—	± 10	μA	$V_{GS} = \pm 16\text{ V}$, $V_{DS} = 0$
Zero gate voltage drain current	I_{DSS}	—	—	−10	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	$R_{DS(on)}$	—	0.04	0.07	Ω	$I_D = -3\text{ A}$, $V_{GS} = -10\text{ V}$ ^{Note3}
	$R_{DS(on)}$	—	0.07	0.13	Ω	$I_D = -3\text{ A}$, $V_{GS} = -4\text{ V}$ ^{Note3}
Forward transfer admittance	$ y_{fs} $	5.0	7.5	—	S	$I_D = -3\text{ A}$, $V_{DS} = -10\text{ V}$ ^{Note3}
Input capacitance	C_{iss}	—	860	—	pF	$V_{DS} = -10\text{ V}$
Output capacitance	C_{oss}	—	560	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	165	—	pF	$f = 1\text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	30	—	ns	$V_{GS} = -4\text{ V}$, $I_D = -3\text{ A}$
Rise time	t_r	—	170	—	ns	$V_{DD} \cong -10\text{ V}$
Turn-off delay time	$t_{d(off)}$	—	40	—	ns	
Fall time	t_f	—	65	—	ns	
Body–drain diode forward voltage	V_{DF}	—	− 0.9	− 1.4	V	$IF = -5\text{ A}$, $V_{GS} = 0$ ^{Note3}
Body–drain diode reverse recovery time	t_{rr}	—	55	—	ns	$IF = -5\text{ A}$, $V_{GS} = 0$ $diF/dt = 20\text{ A}/\mu s$

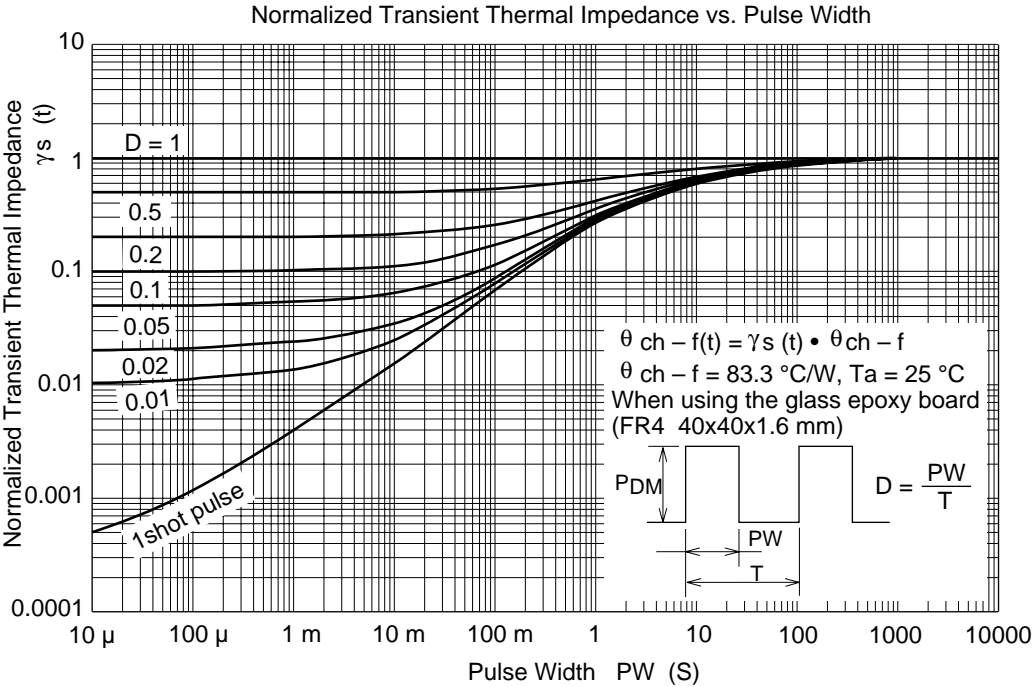
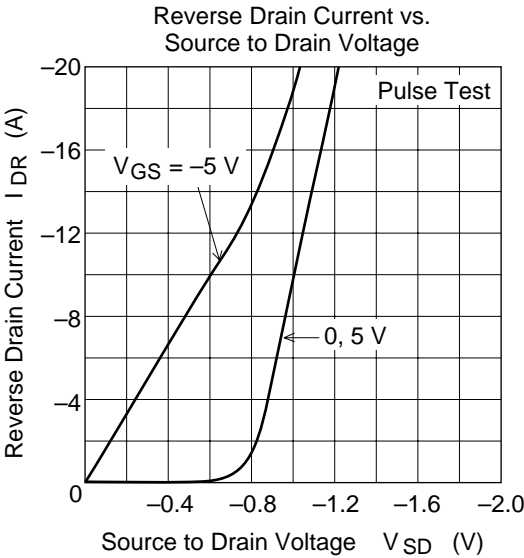
Note: 3. Pulse test

Main Characteristics

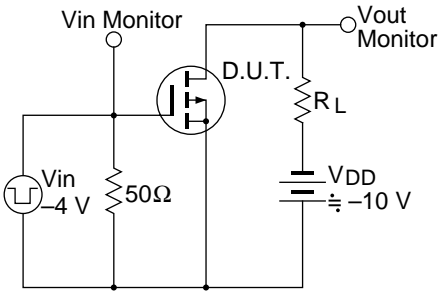




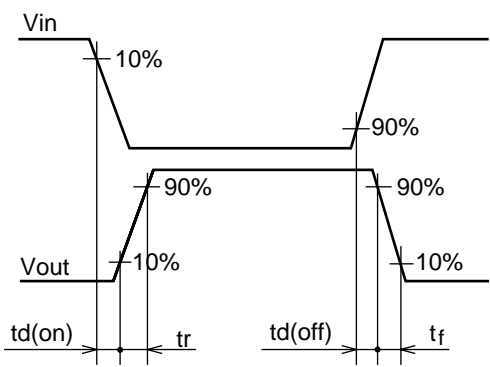




Switching Time Test Circuit

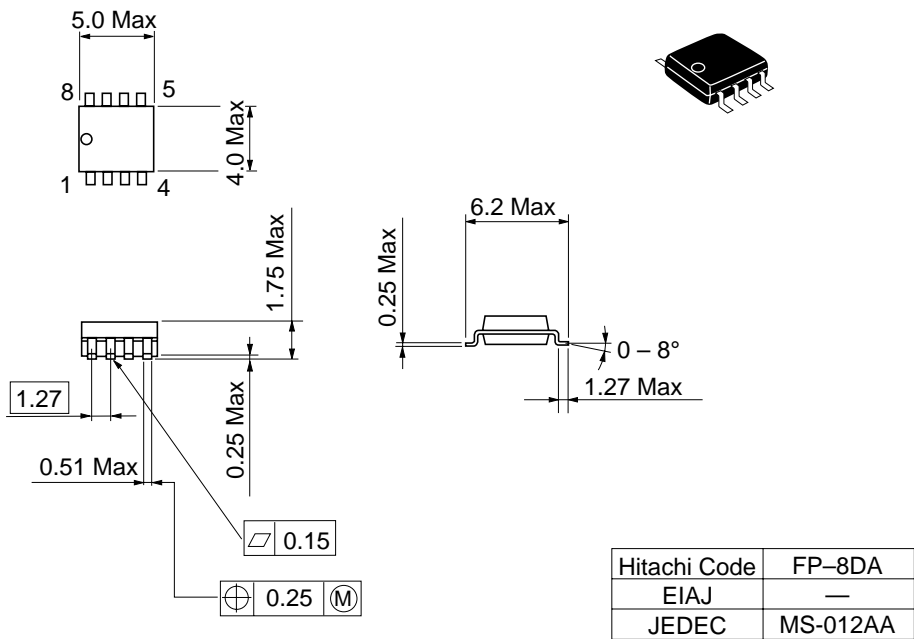


Switching Time Waveform



Package Dimensions

Unit: mm



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