
HAT1020R

Silicon P-Channel Power MOS FET

HITACHI

Preliminary
November 1996

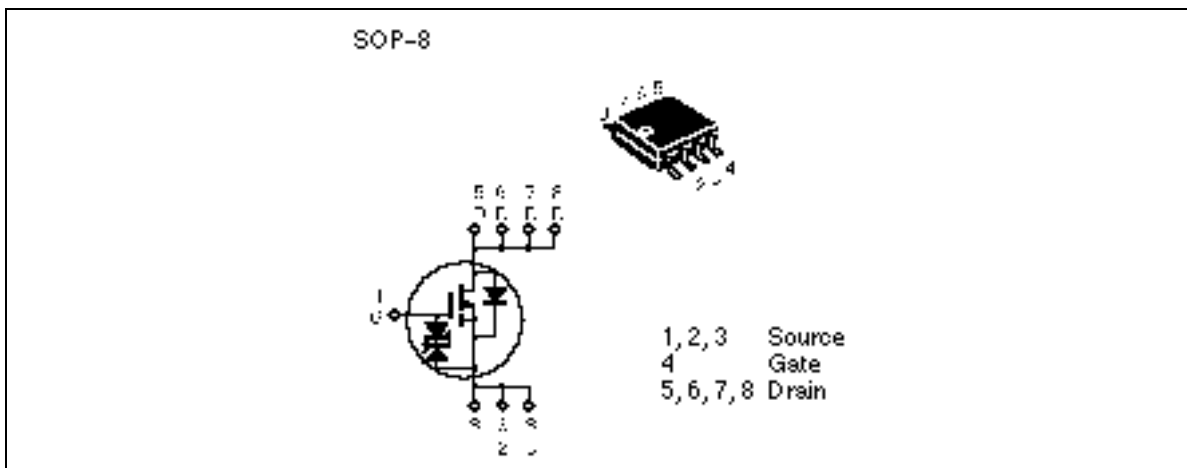
Application

High speed power switching

Features

- Low on-resistance
- Capable of 4 V gate drive
- Low drive current
- High density mounting

Outline



HAT1020R

Ordering Information

Hitachi Code	FP-8DA
EIAJ Code	—
JEDEC Code	MS-012AA

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	−4.5	A
Drain peak current	$I_{D(pulse)}^{*1}$	−18	A
Body to drain diode reverse drain current	I_{DR}	−4.5	A
Channel dissipation	P_{ch}^{*2}	2.0	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	−55 to +150	°C

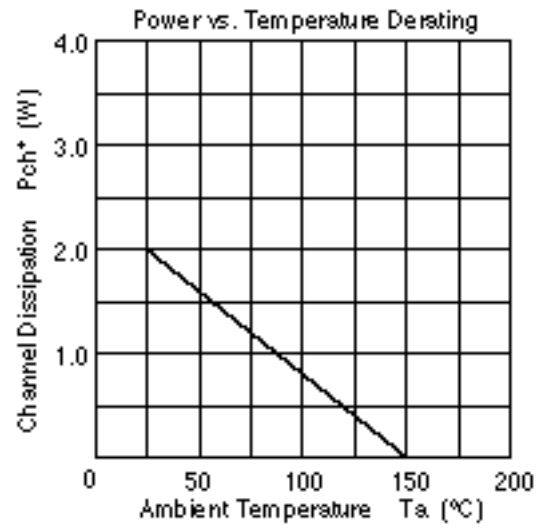
Notes 1. $PW \leq 10 \mu s$, duty cycle $\leq 1\%$
2. When using surface mounted on FR4 board

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	$I_G = \pm 100 \text{ } \mu\text{A}$, $V_{DS} = 0$
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	—	-2.0	V	$V_{DS} = -10 \text{ V}$, $I_D = -1 \text{ mA}$
Static drain to source on state resistance	$R_{DS(on)}$	—	(0.05)	0.07	½	$I_D = -3 \text{ A}$ $V_{GS} = -10 \text{ V}^{*1}$
		—	(0.09)	0.13	½	$I_D = -3 \text{ A}$ $V_{GS} = -4 \text{ V}^{*1}$
Forward transfer admittance	$ y_{fs} $	(5.0)	(8.0)	—	S	$I_D = -3 \text{ A}$ $V_{DS} = -10 \text{ V}^{*1}$
Input capacitance	C_{iss}	—	(670)	—	pF	$V_{DS} = -10 \text{ V}$
Output capacitance	C_{oss}	—	(440)	—	pF	$V_{GS} = 0$
Reverse transfer capacitance	C_{rss}	—	(170)	—	pF	$f = 1 \text{ MHz}$
Turn-on delay time	$t_{d(on)}$	—	(35)	—	ns	$V_{GS} = -4 \text{ V}$, $I_D = -3 \text{ A}$
Rise time	t_r	—	(200)	—	ns	$V_{DD} = -10 \text{ V}$
Turn-off delay time	$t_{d(off)}$	—	(35)	—	ns	
Fall time	t_f	—	(60)	—	ns	
Body to drain diode forward voltage	V_{DF}	—	(-0.8)	—	V	$I_F = -4.5 \text{ A}$, $V_{GS} = 0$
Body to drain diode reverse recovery time	t_{rr}	—	(60)	—	ns	$I_F = -4.5 \text{ A}$, $V_{GS} = 0$ $diF/dt = 20 \text{ A}/\mu\text{s}$

Note 1. Pulse Test

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