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# 2SJ176

Silicon P-Channel MOS FET

## HITACHI

November 1996

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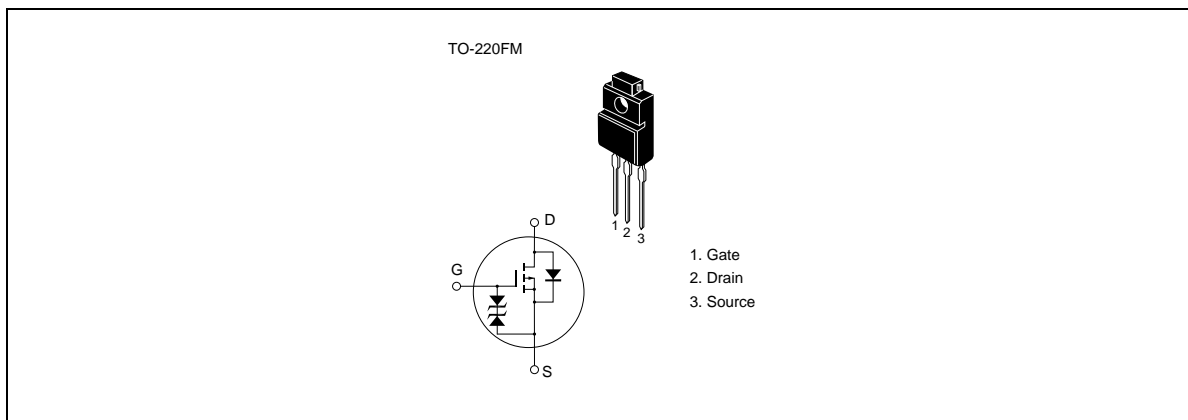
### Application

High speed power switching

### Features

- Low on-resistance
- High speed switching
- Low drive current
- 4 V gate drive device
  - Can be driven from 5 V source
- Suitable for motor drive, DC-DC converter, power switch and solenoid drive

### Outline



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### Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	$V_{DSS}$	-60	V
Gate to source voltage	$V_{GSS}$	±20	V
Drain current	$I_D$	-15	A
Drain peak current	$I_{D(pulse)}^{*1}$	-60	A
Body to drain diode reverse drain current	$I_{DR}$	-15	A
Channel dissipation	$Pch^{*2}$	30	W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	-55 to +150	°C

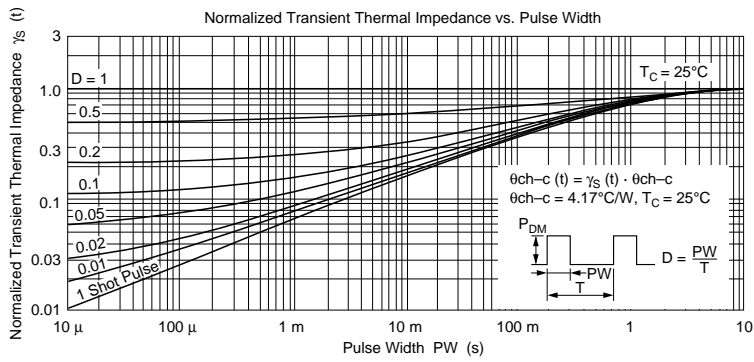
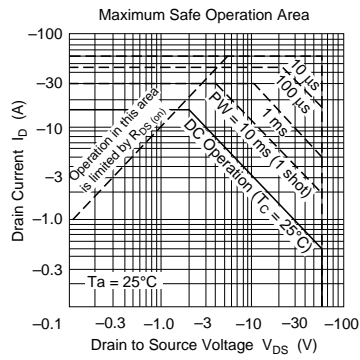
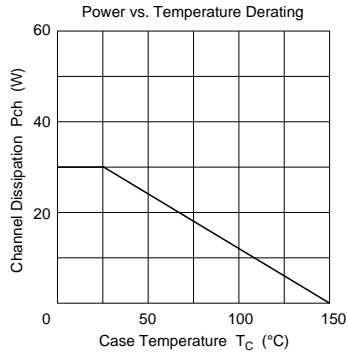
Notes 1.  $PW \leq 10 \mu s$ , duty cycle  $\leq 1\%$   
2. Value at  $T_c = 25^\circ C$

## Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	$V_{(BR)DSS}$	-60	—	—	V	$I_D = -10 \text{ mA}, V_{GS} = 0$
Gate to source breakdown voltage	$V_{(BR)GSS}$	$\pm 20$	—	—	V	$I_G = \pm 100 \text{ }\mu\text{A}, V_{DS} = 0$
Gate to source leak current	$I_{GSS}$	—	—	$\pm 10$	$\mu\text{A}$	$V_{GS} = \pm 16 \text{ V}, V_{DS} = 0$
Zero gate voltage drain current	$I_{DSS}$	—	—	-250	$\mu\text{A}$	$V_{DS} = -50 \text{ V}, V_{GS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	-1.0	—	-2.0	V	$I_D = -1 \text{ mA}, V_{DS} = -10 \text{ V}$
Static drain to source on state resistance	$R_{DS(on)}$	—	0.09	0.11	$\Omega$	$I_D = -8 \text{ A}, V_{GS} = -10 \text{ V}^{*1}$
		—	0.13	0.17		$I_D = -8 \text{ A}, V_{GS} = -4 \text{ V}^{*1}$
Forward transfer admittance	$ y_{fs} $	6.0	9.5	—	S	$I_D = -8 \text{ A}, V_{DS} = -10 \text{ V}^{*1}$
Input capacitance	$C_{iss}$	—	1400	—	pF	$V_{DS} = -10 \text{ V}, V_{GS} = 0,$ $f = 1 \text{ MHz}$
Output capacitance	$C_{oss}$	—	720	—	pF	
Reverse transfer capacitance	$C_{rss}$	—	220	—	pF	
Turn-on delay time	$t_{d(on)}$	—	15	—	ns	$I_D = -8 \text{ A}, V_{GS} = -10 \text{ V},$ $R_L = 3.75 \text{ }\Omega$
Rise time	$t_r$	—	120	—	ns	
Turn-off delay time	$t_{d(off)}$	—	220	—	ns	
Fall time	$t_f$	—	160	—	ns	
Body to drain diode forward voltage	$V_{DF}$	—	-1.2	—	V	$I_F = -15 \text{ A}, V_{GS} = 0$
Body to drain diode reverse recovery time	$t_{rr}$	—	230	—	ns	$I_F = -15 \text{ A}, V_{GS} = 0,$ $di_F/dt = 50 \text{ A}/\mu\text{s}$

Note 1. Pulse test

See characteristic curves of 2SJ173



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