

## 2SJ176

### SILICON P CHANNEL MOS FET 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

#### ABSOLUTE MAXIMUM RATINGS ( $T_a=25^\circ\text{C}$ )

Item	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	-60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current	$I_D$	-15	A
Drain Peak Current	$I_{D(\text{pulse})}^*$	-60	A
Body-Drain Diode Reverse Drain Current	$I_{DR}$	-15	A
Channel Dissipation	$P_{ch}^{**}$	30	W
Channel Temperature	$T_{ch}$	150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-55 ~ +150	$^\circ\text{C}$

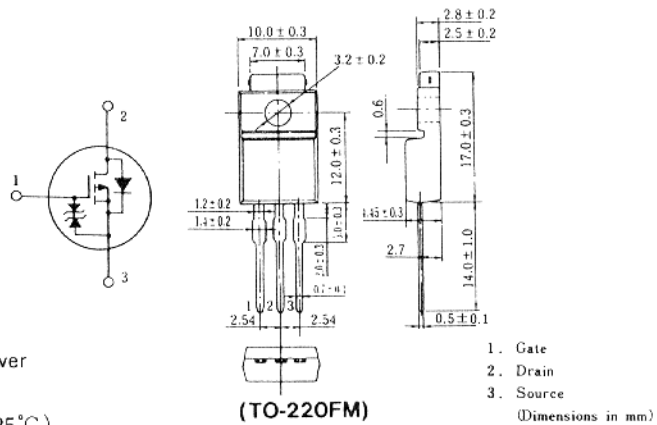
\*  $PW \leq 10 \mu\text{s}$ , duty cycle  $\leq 1\%$   
 \*\* Value at  $T_c = 25^\circ\text{C}$

#### ELECTRICAL CHARACTERISTICS ( $T_a=25^\circ\text{C}$ )

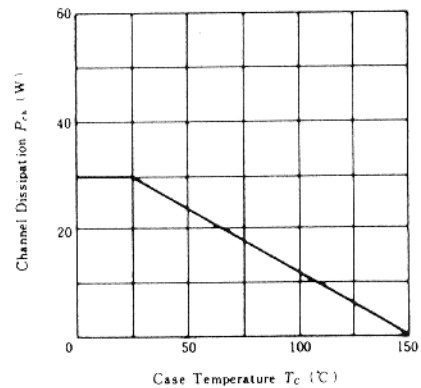
Item	Symbol	Test Condition	min.	typ.	max.	Unit
Drain-Source Breakdown Voltage	$V_{(BR)DS}$	$I_D = -10\text{mA}$ , $V_{GS} = 0$	-60	—	—	V
Gate-Source Breakdown Voltage	$V_{(BR)GS}$	$I_G = \pm 100 \mu\text{A}$ , $V_{DS} = 0$	$\pm 20$	—	—	V
Gate-Source Leak Current	$I_{GSS}$	$V_{GS} = \pm 16\text{V}$ , $V_{DS} = 0$	—	—	$\pm 10$	$\mu\text{A}$
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -50\text{V}$ , $V_{GS} = 0$	—	—	-250	$\mu\text{A}$
Gate-Source Cutoff Voltage	$V_{GS(\text{off})}$	$I_D = -1\text{mA}$ , $V_{DS} = -10\text{V}$	-1.0	—	-2.0	V
Static Drain-Source on State Resistance	$R_{DS(\text{on})}$	$I_D = -8\text{A}$ , $V_{GS} = -10\text{V}^*$	—	0.09	0.11	$\Omega$
		$I_D = -8\text{A}$ , $V_{GS} = -4\text{V}^*$	—	0.13	0.17	
Forward Transfer Admittance	$ y_{fs} $	$I_D = -8\text{A}$ , $V_{DS} = -10\text{V}^*$	6.0	9.5	—	S
Input Capacitance	$C_{in}$	$V_{DS} = -10\text{V}$ , $V_{GS} = 0$ , $f = 1\text{MHz}$	—	1400	—	pF
Output Capacitance	$C_{out}$		—	720	—	pF
Reverse Transfer Capacitance	$C_{rss}$		—	220	—	pF
Turn-on Delay Time	$t_{d(\text{on})}$		—	15	—	ns
Rise Time	$t_r$	$I_D = -8\text{A}$ , $V_{GS} = -10\text{V}$ , $R_L = 3.75 \Omega$	—	120	—	ns
Turn-off Delay Time	$t_{d(\text{off})}$		—	220	—	ns
Fall Time	$t_f$		—	160	—	ns
Body-Drain Diode Forward Voltage	$V_{DF}$	$I_F = -15\text{A}$ , $V_{GS} = 0$	—	-1.2	—	V
Body-Drain Diode Reverse Recovery Time	$t_{rr}$	$I_F = -15\text{A}$ , $V_{GS} = 0$ , $di_F/dt = 50\text{A}/\mu\text{s}$	—	230	—	ns

\* Pulse Test

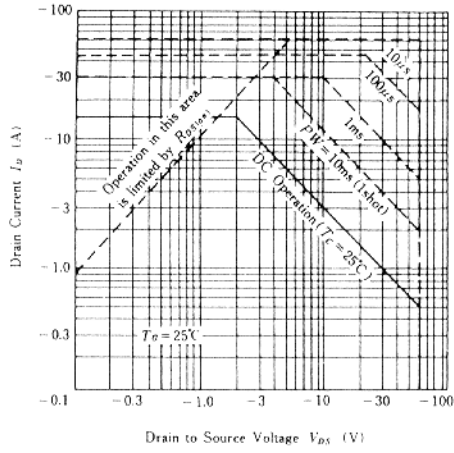
■ See characteristic curves of 2SJ173



POWER VS. TEMPERATURE DERATING



### MAXIMUM SAFE OPERATION AREA



### NORMALIZED TRANSIENT THERMAL IMPEDANCE VS. PULSE WIDTH

