

## POWER MOSFET N CHANNEL

### Devices

**IRF450**

**13 AMPERE  
500 VOLTS  
0.4 W**

- REPETITIVE AVALANCHE RATINGS
- LOW  $R_{DS(ON)}$
- LOW DRIVE REQUIREMENT
- DYNAMIC  $dv/dt$  RATING

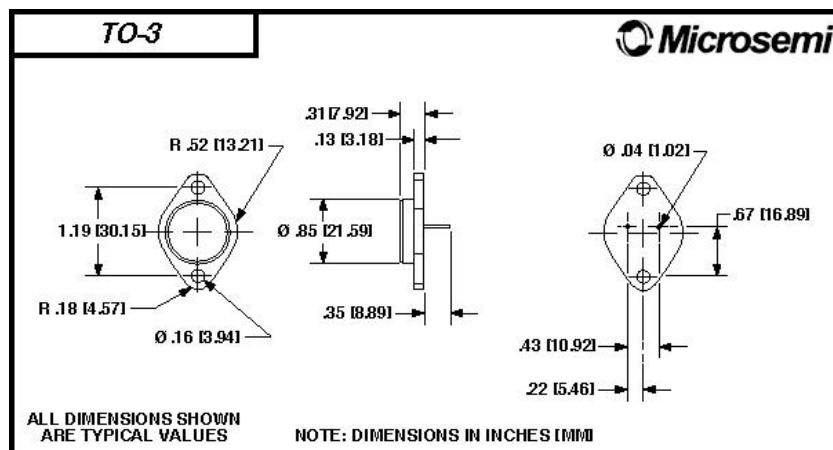
### ABSOLUTE MAXIMUM RATINGS ( $T_C = 25^{\circ}C$ unless otherwise noted)

Parameters / Test Conditions		Symbol	Value	Units
Drain-Source Voltage		$V_{DS}$	500	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$T_C = 25^{\circ}C$	$I_D$	13	A
Pulsed Drain Current (1)		$I_{DM}$	52	A
Power Dissipation	$T_C = 25^{\circ}C$	$P_D$	150	W
Operating Junction & Storage Temperature Range		$T_J, T_{stg}$	-55 to +150	$^{\circ}C$
Lead Temperature (1/16" from case for 10 secs.)		$T_L$	300	$^{\circ}C$

### THERMAL RESISTANCE RATINGS

Thermal Resistance	Symbol	Typ.	Max.	Units
Junction-to-Case	$R_{thJC}$		0.83	$^{\circ}C/W$
Junction-to-Ambient	$R_{thJA}$	0.15	30	$^{\circ}C/W$
Case-to-Sink	$R_{thCS}$			$^{\circ}C/W$

(1)Pulse width limited by maximum junction temperature



**ELECTRICAL CHARACTERISTICS ( $T_J = 25^{\circ}\text{C}$  unless otherwise noted)**

PARAMETERS / TEST CONDITIONS		SYMBOL	MIN.	TYP.	MAX.	UNITS
Drain-Source Breakdown Voltage $V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$		$V_{(BR)DSS}$	500			V
Gate Threshold Voltage $V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$		$V_{GS(th)}$	2.0		4.0	V
Gate-Body Leakage $V_{GS} = \text{At Rated } V_{GS}$		$I_{GSS}$			100	nA
Zero Gate Voltage Drain Current $V_{DS} = \text{max Rating}, V_{GS} = 0\text{ V}$		$I_{DSS}$			250	$\mu\text{A}$
Zero Gate Voltage Drain Current $V_{DS} = 80\% \text{ max } V_{(BR)DSS}, V_{GS} = 0\text{ V}, T_J = 125^{\circ}\text{C}$		$I_{DSS}$			1000	$\mu\text{A}$
Drain-Source On-State Resistance (2) $V_{GS} = 10\text{ V}, I_D = 7.2\text{ A}$		$r_{DS(on)}$			0.40	$\Omega$
Forward Transconductance (2) $V_{DS} = 50\text{ V}, I_D = 7.2\text{ A}$		$g_{fs}$	8.7			S( $\Omega$ )
Input Capacitance	$V_{GS} = \text{V}$	$C_{iss}$		2700		pF
Output Capacitance	$V_{DS} = 25\text{ V}$	$C_{oss}$		350		
Reverse Transfer Capacitance	$f = \text{MHz}$	$C_{rss}$		75		
Total Gate Charge	$V_{DS} = V_{(BR)DSS} * 0.8$ $V_{GS} = 10\text{ V}, I_D = 13\text{ A}$ (Gate charge is essentially independent of operating temperature.)	$Q_g$			130	nC
Gate-Source Charge		$Q_{gs}$			17	
Gate -Drain Charge		$Q_{gd}$			64	
Turn-On Delay Time	$V_{dd} = 250\text{ V},$ $I_D = 13\text{ A},$ $R_G = 6.2\ \Omega$ $R_O = 20\ \Omega$  (Switching time is essentially independent of operating temperature.)	$t_{d(on)}$			27	ns
Rise Time		$t_r$			66	
Turn-Off Delay Time		$t_{d(off)}$			100	
Fall Time		$t_f$			60	

**SOURCE-DRAIN DIODE RATINGS & CHARACTERISTICS ( $T_J = 25^{\circ}\text{C}$  unless otherwise noted)**

PARAMETERS / TEST CONDITIONS		SYMBOL	MIN.	TYP.	MAX.	UNITS
Continuous Current		$I_S$			13	A
Pulsed Current (1)		$I_{SM}$			52	A
Forward Voltage (2) $I_F = I_S, V_{GS} = 0\text{ V}$		$V_{SD}$			1.4	V
Reverse Recovery Time $I_F = I_S, dI/dt = \text{A}/\mu\text{S}$		$t_{rr}$			1200	ns
Reverse Recovered Charge $I_F = I_S, dI/dt = \text{A}/\mu\text{S}$		$Q_{rr}$	3.2		14	$\mu\text{C}$

(1) Pulsed width limited by maximum junction temperature.

(2) Pulse Test: Pulse width < 300  $\mu\text{sec}$ . Duty cycle  $\leq 2\%$ .