

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

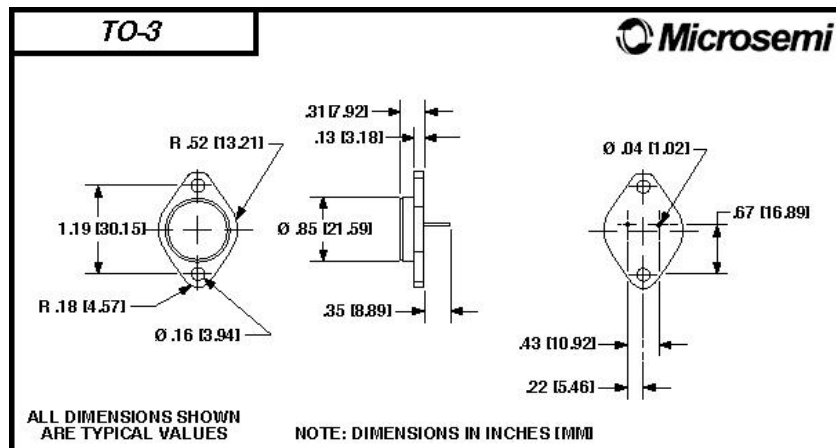
ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

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

THERMAL RESISTANCE RATINGS

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

(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 $V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$		$V_{(BR)DSS}$	500			V
Gate Threshold Voltage $V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$		$V_{GS(th)}$	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	μA
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	μA
Drain-Source On-State Resistance (2) $V_{GS} = 10\text{ V}, I_D = 7.2\text{ A}$		$r_{DS(on)}$			0.40	Ω
Forward Transconductance (2) $V_{DS} = 50\text{ V}, I_D = 7.2\text{ A}$		g_{fs}	8.7			S(Ω)
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	$V_{dd} = 250\text{ V},$ $I_D = 13\text{ A},$ $R_G = 6.2\text{ }\Omega$ $R_O = 20\text{ }\Omega$ (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	μC

(1) Pulsed width limited by maximum junction temperature.

(2) Pulse Test: Pulse width < 300 μsec . Duty cycle $\leq 2\%$.