

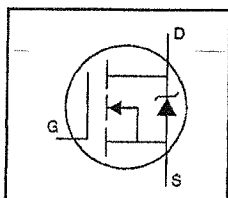


American Microsemiconductor, Inc.

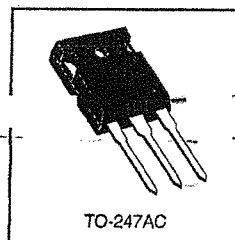
133 Kings Road P.O. Box 104
Madison, NJ 07940
Tel: (973) 377-9566 Fax: (973) 377-3078

IRFP450

- Dynamic dv/dt Rating
- Repetitive Avalanche Rated
- Isolated Central Mounting Hole
- Fast Switching
- Ease of Paralleling
- Simple Drive Requirements



$V_{DSS} = 500V$
 $R_{DS(on)} = 0.40\Omega$
 $I_D = 14A$



Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	14	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	8.7	
I_{DM}	Pulsed Drain Current ①	56	
$P_D @ T_C = 25^\circ C$	Power Dissipation	180	W
	Linear Derating Factor	1.5	W/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy ②	760	mJ
I_{AR}	Avalanche Current ①	8.7	A
E_{AR}	Repetitive Avalanche Energy ①	19	mJ
dv/dt	Peak Diode Recovery dv/dt ③	3.5	V/ns
T_J	Operating Junction and	-55 to +150	°C
T_{STG}	Storage Temperature Range		
	Soldering Temperature, for 10 seconds		
	Mounting Torque, 6-32 or M3 screw	300 (1.6mm from case) 10 lbf-in (1.1 N-m)	

Thermal Resistance

	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	—	—	0.65	°C/W
$R_{\theta CS}$	Case-to-Sink, Flat, Greased Surface	—	0.24	—	
$R_{\theta JA}$	Junction-to-Ambient	—	—	40	



American Microsemiconductor, Inc.

133 Kings Road P.O. Box 104
Madison, NJ 07940
Tel: (973) 377-9566 Fax: (973) 377-3078

IRFP450

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	500	—	—	V	$V_{GS}=0V, I_D=250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.63	—	V/°C	Reference to 25°C, $I_D=1mA$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	—	0.40	Ω	$V_{GS}=10V, I_D=8.4A$ ④
$V_{GS(th)}$	Gate Threshold Voltage	2.0	—	4.0	V	$V_{DS}=V_{GS}, I_D=250\mu A$
g_{fs}	Forward Transconductance	9.3	—	—	S	$V_{DS}=50V, I_D=8.4A$ ④
I_{DSS}	Drain-to-Source Leakage Current	—	—	25	μA	$V_{DS}=500V, V_{GS}=0V$
I_{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	$V_{DS}=400V, V_{GS}=0V, T_J=125^\circ C$
	Gate-to-Source Reverse Leakage	—	—	-100	nA	$V_{GS}=-20V$
Q_g	Total Gate Charge	—	—	150	nC	$I_D=14A$
Q_{GS}	Gate-to-Source Charge	—	—	20	nC	$V_{DS}=400V$
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	—	80	nC	$V_{GS}=10V$ See Fig. 6 and 13 ④
$t_{d(on)}$	Turn-On Delay Time	—	17	—	ns	$V_{DD}=250V$
t_r	Rise Time	—	47	—	ns	$I_D=14A$
$t_{d(off)}$	Turn-Off Delay Time	—	92	—	ns	$R_G=6.2\Omega$
t_f	Fall Time	—	44	—	ns	$R_D=17\Omega$ See Figure 10 ④
L_D	Internal Drain Inductance	—	5.0	—	nH	Between lead, 6 mm (0.25in.) from package and center of die contact
L_S	Internal Source Inductance	—	13	—	nH	
C_{iss}	Input Capacitance	—	2600	—	pF	$V_{GS}=0V$
C_{oss}	Output Capacitance	—	720	—	pF	$V_{DS}=25V$
C_{rss}	Reverse Transfer Capacitance	—	340	—	pF	$f=1.0MHz$ See Figure 5

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)	—	—	14	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ④	—	—	56	A	
V_{SD}	Diode Forward Voltage	—	—	1.4	V	$T_J=25^\circ C, I_S=14A, V_{GS}=0V$ ④
t_{rr}	Reverse Recovery Time	—	540	810	ns	$T_J=25^\circ C, I_F=14A$
Q_{rr}	Reverse Recovery Charge	—	4.8	7.2	μC	$di/dt=100A/\mu s$ ④
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by L_S+L_D)				