

IRFP064PbF

HEXFET[®] Power MOSFET

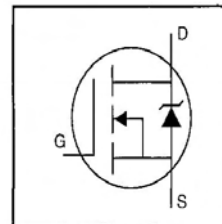
- Dynamic dv/dt Rating
- Repetitive Avalanche Rated
- Ultra-Low On-Resistance
- Very Low Thermal Resistance
- Isolated Central Mounting Hole
- 175°C Operating Temperature
- Fast Switching

- Lead-Free

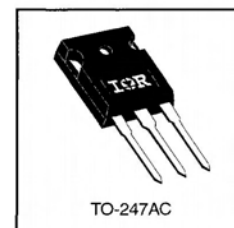
Description

Third Generation HEXFETs from International Rectifier provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The TO-247 package is preferred for commercial-industrial applications where higher power levels preclude the use of TO-220 devices. The TO-247 is similar but superior to the earlier TO-218 package because of its isolated mounting hole. It also provides greater creepage distance between pins to meet the requirements of most safety specifications.



$V_{DSS} = 60V$
$R_{DS(on)} = 0.009\Omega$
$I_D = 70^*A$



Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10 V$	70*	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10 V$	70*	
I_{DM}	Pulsed Drain Current ①	520	
$P_D @ T_C = 25^\circ C$	Power Dissipation	300	W
	Linear Derating Factor	2.0	W/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy ②	1000	mJ
I_{AR}	Avalanche Current ①	70	A
E_{AR}	Repetitive Avalanche Energy ①	30	mJ
dv/dt	Peak Diode Recovery dv/dt ③	4.5	V/ns
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +175	°C
	Soldering Temperature, for 10 seconds	300 (1.6mm from case)	
	Mounting Torque, 6-32 or M3 screw	10 lbf•in (1.1 N•m)	

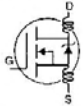
Thermal Resistance

	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	—	—	0.50	°C/W
$R_{\theta CS}$	Case-to-Sink, Flat, Greased Surface	—	0.24	—	
$R_{\theta JA}$	Junction-to-Ambient	—	—	40	

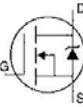
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International
IR Rectifier

Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	60	—	—	V	$V_{GS}=0V, I_D=250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.048	—	V/ $^\circ\text{C}$	Reference to 25°C , $I_D=1\text{mA}$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	—	0.009	Ω	$V_{GS}=10V, I_D=78A$ 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	38	—	—	S	$V_{DS}=25V, I_D=78A$ ④
I_{DSS}	Drain-to-Source Leakage Current	—	—	25	μA	$V_{DS}=60V, V_{GS}=0V$
		—	—	250		$V_{DS}=48V, V_{GS}=0V, T_J=150^\circ\text{C}$
I_{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	$V_{GS}=20V$
	Gate-to-Source Reverse Leakage	—	—	-100		$V_{GS}=-20V$
Q_g	Total Gate Charge	—	—	190	nC	$I_D=130A$
Q_{gs}	Gate-to-Source Charge	—	—	55		$V_{DS}=48V$
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	—	90		$V_{GS}=10V$ See Fig. 6 and 13 ④
$t_{d(on)}$	Turn-On Delay Time	—	21	—	ns	$V_{DD}=30V$
t_r	Rise Time	—	190	—		$I_D=130A$
$t_{d(off)}$	Turn-Off Delay Time	—	110	—		$R_G=4.3\Omega$
t_f	Fall Time	—	190	—		$R_D=0.22\Omega$ 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	—		
C_{iss}	Input Capacitance	—	7400	—	pF	$V_{GS}=0V$
C_{oss}	Output Capacitance	—	3200	—		$V_{DS}=25V$
C_{rss}	Reverse Transfer Capacitance	—	540	—		$f=1.0\text{MHz}$ See Figure 5

Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)	—	—	70*	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	520		
V_{SD}	Diode Forward Voltage	—	—	3.0	V	$T_J=25^\circ\text{C}, I_S=130A, V_{GS}=0V$ ④
t_{rr}	Reverse Recovery Time	—	160	250	ns	$T_J=25^\circ\text{C}, I_F=130A$
Q_{rr}	Reverse Recovery Charge	—	0.90	1.7	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)				

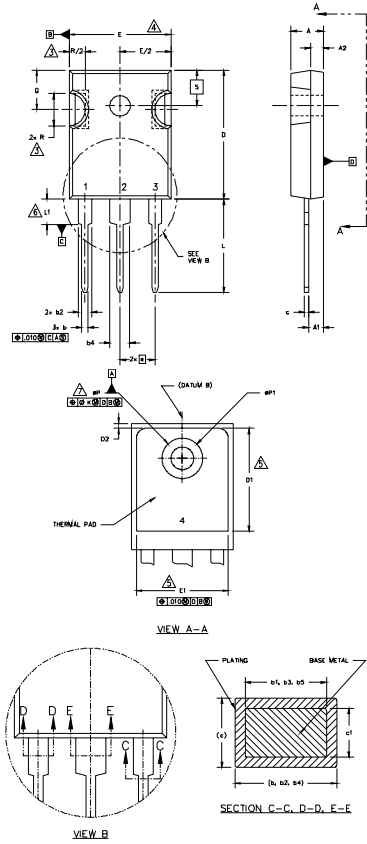
Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature (See Figure 11)
- ② $V_{DD}=25V$, starting $T_J=25^\circ\text{C}$, $L=69\mu H$, $R_G=25\Omega$, $I_{AS}=130A$ (See Figure 12)
- ③ $I_{SD}\leq 130A$, $di/dt\leq 300A/\mu s$, $V_{DD}\leq V_{(BR)DSS}$, $T_J\leq 175^\circ\text{C}$
- ④ Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.

* Current limited by the package, (Die Current =130A)

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TO-247AC Package Outline Dimensions are shown in millimeters (inches)



NOTES:

- DIMENSIONING AND TOLERANCING PER ASME Y14.5M 1994.
- DIMENSIONS ARE SHOWN IN INCHES [MILLIMETERS]
- CONTOUR OF SLOT OPTIONAL.
- DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED .005" (0.127) PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
- THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS D1 & E1.
- LEAD FINISH UNCONTROLLED IN L1.
- ØP TO HAVE A MAXIMUM DRAFT ANGLE OF 1.5 ° TO THE TOP OF THE PART WITH A MAXIMUM HOLE DIAMETER OF .154" [3.91].

B. OUTLINE CONFORMS TO JEDEC OUTLINE TO-247 WITH THE EXCEPTION OF DIMENSION c.

SYMBOL	DIMENSIONS				NOTES	LEAD ASSIGNMENTS
	INCHES		MILLIMETERS			
	MIN.	MAX.	MIN.	MAX.		
A	.183	.209	4.65	5.31		
A1	.087	.102	2.21	2.59		
A2	.059	.098	1.50	2.49		
b	.039	.055	0.99	1.40		HEXFET
b1	.039	.053	0.99	1.35		1.- GATE
b2	.065	.094	1.65	2.39		2.- DRAIN
b3	.065	.092	1.65	2.37		3.- SOURCE
b4	.102	.135	2.59	3.43		4.- DRAIN
b5	.102	.133	2.59	3.38		
c	.015	.034	0.38	0.86		IGBTs, CoPACK
c1	.015	.030	0.38	0.76		
D	.776	.815	19.71	20.70	4	
D1	.515	-	13.08	-	5	
D2	.020	.030	0.51	0.76		1.- GATE
E	.602	.625	15.29	15.87	4	2.- COLLECTOR
E1	.540	-	13.72	-		3.- EMITTER
e	.215 BSC		5.46 BSC			4.- COLLECTOR
Øk	.010		2.54			
L	.559	.634	14.20	16.10		DIODES
L1	.146	.169	3.71	4.29		1.- ANODE/OPEN
N	3		7.62 BSC			2.- CATHODE
ØP1	.140	.144	3.56	3.66		3.- ANODE
ØP	-	.275	-	6.98		
Q	.209	.224	5.31	5.69		
R	.178	.216	4.52	5.49		
S	.217 BSC		5.51 BSC			

TO-247AC Part Marking Information

EXAMPLE: THIS IS AN IRFPE30 WITH ASSEMBLY LOT CODE 5657 ASSEMBLED ON VVV 35, 2000 IN THE ASSEMBLY LINE "H"
Note: "P" in assembly line position indicates "Lead-Free"

