

## APÉNDICE E

# *IRFP260N: Power Mosfet*

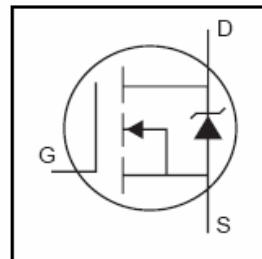
International  
**IR** Rectifier

PD - 94004A

## IRFP260N

HEXFET® Power MOSFET

- Advanced Process Technology
- Dynamic dv/dt Rating
- 175°C Operating Temperature
- Fast Switching
- Fully Avalanche Rated
- Ease of Paralleling
- Simple Drive Requirements



$$V_{DSS} = 200V$$

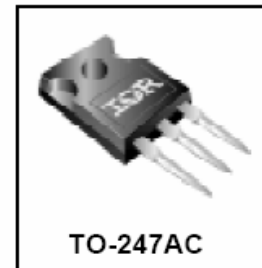
$$R_{DS(on)} = 0.04\Omega$$

$$I_D = 50A$$

### Description

Fifth Generation HEXFETs from International Rectifier utilize advanced processing techniques to achieve extremely low on-resistance per silicon area. This benefit, combined with the fast switching speed and ruggedized device design that HEXFET Power MOSFETs are well known for, provides the designer with an extremely efficient and reliable device for use in a wide variety of applications.

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.



TO-247AC

**Absolute Maximum Ratings**

	Parameter	Max.	Units
$I_D @ T_C = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$	50	A
$I_D @ T_C = 100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$	35	
$I_{DM}$	Pulsed Drain Current ①	200	
$P_D @ T_C = 25^\circ\text{C}$	Power Dissipation	300	W
	Linear Derating Factor	2.0	W/°C
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	V
$E_{AS}$	Single Pulse Avalanche Energy②	560	mJ
$I_{AR}$	Avalanche Current①	50	A
$E_{AR}$	Repetitive Avalanche Energy①	30	mJ
dv/dt	Peak Diode Recovery dv/dt ③	10	V/ns
$T_J$	Operating Junction and	-55 to +175	°C
$T_{STG}$	Storage Temperature Range		
	Soldering Temperature, for 10 seconds	300 (1.6mm from case )	
	Mounting torque, 6-32 or M3 screw	10 lbf·in (1.1N·m)	

**Thermal Resistance**

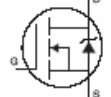
	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	—	0.50	°C/W
$R_{\theta CS}$	Case-to-Sink, Flat, Greased Surface	0.24	—	
$R_{\theta JA}$	Junction-to-Ambient	—	40	

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	200	—	—	V	$V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.26	—	V/°C	Reference to $25^\circ\text{C}, I_D = 1\text{mA}$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	—	0.04	$\Omega$	$V_{GS} = 10\text{V}, I_D = 28\text{A}$ ③
$V_{GS(th)}$	Gate Threshold Voltage	2.0	—	4.0	V	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$
$g_{fs}$	Forward Transconductance	27	—	—	S	$V_{DS} = 50\text{V}, I_D = 28\text{A}$ ③
$I_{DSS}$	Drain-to-Source Leakage Current	—	—	25	$\mu\text{A}$	$V_{DS} = 200\text{V}, V_{GS} = 0\text{V}$
		—	—	250		$V_{DS} = 160\text{V}, V_{GS} = 0\text{V}, T_J = 150^\circ\text{C}$
$I_{GSS}$	Gate-to-Source Forward Leakage	—	—	100	nA	$V_{GS} = 20\text{V}$
	Gate-to-Source Reverse Leakage	—	—	-100		$V_{GS} = -20\text{V}$
$Q_g$	Total Gate Charge	—	—	234	nC	$I_D = 28\text{A}$
$Q_{gs}$	Gate-to-Source Charge	—	—	38		$V_{DS} = 160\text{V}$
$Q_{gd}$	Gate-to-Drain ("Miller") Charge	—	—	110		$V_{GS} = 10\text{V}$ ④
$t_{d(on)}$	Turn-On Delay Time	—	17	—	ns	$V_{DD} = 100\text{V}$
$t_r$	Rise Time	—	60	—		$I_D = 28\text{A}$
$t_{d(off)}$	Turn-Off Delay Time	—	55	—		$R_G = 1.8\Omega$
$t_f$	Fall Time	—	48	—		$V_{GS} = 10\text{V}$ ④
$L_D$	Internal Drain Inductance	—	5.0	—	nH	Between lead, 6mm (0.25in.) from package and center of die contact
$L_S$	Internal Source Inductance	—	13	—		
$C_{iss}$	Input Capacitance	—	4057	—	pF	$V_{GS} = 0\text{V}$
$C_{oss}$	Output Capacitance	—	603	—		$V_{DS} = 25\text{V}$
$C_{rss}$	Reverse Transfer Capacitance	—	161	—		$f = 1.0\text{MHz}$



**Source-Drain Ratings and Characteristics**

	Parameter	Min.	Typ.	Max.	Units	Conditions
$I_S$	Continuous Source Current (Body Diode)	—	—	50	A	MOSFET symbol showing the integral reverse p-n junction diode. 
$I_{SM}$	Pulsed Source Current (Body Diode) <sup>①</sup>	—	—	200		
$V_{SD}$	Diode Forward Voltage	—	—	1.3	V	$T_J = 25^\circ\text{C}$ , $I_S = 28\text{A}$ , $V_{GS} = 0\text{V}$ <sup>④</sup>
$t_{rr}$	Reverse Recovery Time	—	268	402	ns	$T_J = 25^\circ\text{C}$ , $I_F = 28\text{A}$
$Q_{rr}$	Reverse Recovery Charge	—	1.9	2.8	$\mu\text{C}$	$di/dt = 100\text{A}/\mu\text{s}$ <sup>④</sup>
$t_{on}$	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.
- ② Starting  $T_J = 25^\circ\text{C}$ ,  $L = 1.5\text{mH}$ ,  $R_G = 25\Omega$ ,  $I_{AS} = 28\text{A}$ .
- ③  $I_{SD} \leq 28\text{A}$ ,  $di/dt \leq 486\text{A}/\mu\text{s}$ ,  $V_{DD} \leq V_{(BR)DSS}$ ,  $T_J \leq 175^\circ\text{C}$
- ④ Pulse width  $\leq 400\mu\text{s}$ ; duty cycle  $\leq 2\%$ .