

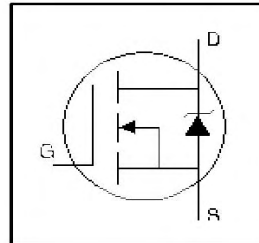
IRLI620GPbF

- Isolated Package
- High Voltage Isolation = 2.5KVRMS③
- Sink to Lead Creepage Dist. 4.8mm
- Logic-Level Gate Drive
- $R_{DS(on)}$ Specified at $V_{GS} = 4V$ & $5V$
- Fast Switching
- Ease of paralleling
- 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.

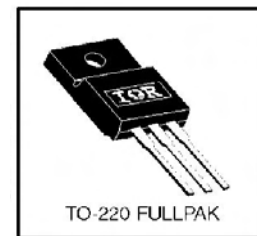
The TO-220 Fullpak eliminates the need for additional insulating hardware in commercial-industrial applications. The moulding compound used provides a high isolation capability and a low thermal resistance between the tab and external heatsink. This isolation is equivalent to using a 100 micron mica barrier with standard TO-220 product. The Fullpak is mounted to a heatsink using a single clip or by a single screw fixing.



$$V_{DSS} = 200V$$

$$R_{DS(on)} = 0.80\Omega$$

$$I_D = 4.0A$$



Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 5.0V$	4.0	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 5.0V$	2.6	
I_{DM}	Pulsed Drain Current ①	16	
$P_D @ T_C = 25^\circ C$	Power Dissipation	30	W
	Linear Derating Factor	0.24	W/°C
V_{GS}	Gate-to-Source Voltage	± 10	V
E_{AS}	Single Pulse Avalanche Energy ②	62	mJ
I_{AR}	Avalanche Current ①	4.0	A
E_{AR}	Repetitive Avalanche Energy ①	3.0	mJ
dv/dt	Peak Diode Recovery dv/dt ③	5.0	V/ns
T_J	Operating Junction and	-55 to + 150	°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	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	—	—	4.1	°C/W
$R_{\theta JA}$	Junction-to-Ambient	—	—	65	

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	$V_{GS} = 0V, I_D = 250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.27	—	$V/^\circ C$	Reference to $25^\circ C, I_D = 1mA$
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	—	—	0.80	Ω	$V_{GS} = 5.0V, I_D = 2.4A$ ①
		—	—	1.0		$V_{GS} = 4.0V, I_D = 2.0A$ ②
$V_{GS(th)}$	Gate Threshold Voltage	1.0	—	2.0	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
g_{fs}	Forward Transconductance	1.2	—	—	S	$V_{DS} = 50V, I_D = 3.1A$
I_{DSS}	Drain-to-Source Leakage Current	—	—	25	μA	$V_{DS} = 200V, V_{GS} = 0V$
		—	—	250		$V_{DS} = 160V, V_{GS} = 0V, T_J = 125^\circ C$
I_{GSS}	Gate-to-Source Forward Leakage	—	—	100	nA	$V_{GS} = 10V$
	Gate-to-Source Reverse Leakage	—	—	-100		$V_{GS} = -10V$
Q_g	Total Gate Charge	—	—	16	nC	$I_D = 5.2A$
Q_{gs}	Gate-to-Source Charge	—	—	2.7		$V_{DS} = 160V$
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	—	9.6		$V_{GS} = 10V$, See Fig. 6 and 13 ③
$t_{d(on)}$	Turn-On Delay Time	—	4.2	—	ns	$V_{DD} = 100V$ $I_D = 5.2A$ $R_G = 9.0\Omega$ $R_D = 20\Omega$, See Fig. 10 ④
t_r	Rise Time	—	31	—		
$t_{d(off)}$	Turn-Off Delay Time	—	18	—		
t_f	Fall Time	—	17	—		
L_D	Internal Drain Inductance	—	4.5	—	nH	Between lead, 6mm (0.25in.) from package and center of die contact
L_S	Internal Source Inductance	—	7.5	—		
C_{iss}	Input Capacitance	—	360	—	pF	$V_{GS} = 0V$
C_{oss}	Output Capacitance	—	91	—		$V_{DS} = 25V$
C_{rss}	Reverse Transfer Capacitance	—	27	—		$f = 1.0MHz$, See Fig. 5



Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	4.0	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ①	—	—	16		
V_{SD}	Diode Forward Voltage	—	—	1.8	V	$T_J = 25^\circ C, I_S = 4.0A, V_{GS} = 0V$ ②
t_{rr}	Reverse Recovery Time	—	180	270	ns	$T_J = 25^\circ C, I_F = 5.2A$
Q_{rr}	Reverse Recovery Charge	—	1.1	1.7	μC	$di/dt = 100A/\mu s$ ③
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 fig. 11)

② $I_{SD} \leq 5.2A, di/dt \leq 95A/\mu s, V_{DD} \leq V_{(BR)DSS}, T_J \leq 150^\circ C$

③ $t = 60s, f = 60Hz$

④ $V_{DD} = 25V$, starting $T_J = 25^\circ C, L = 5.8mH$
 $R_G = 25\Omega, I_{AS} = 4.0A$. (See Figure 12)

⑤ Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.

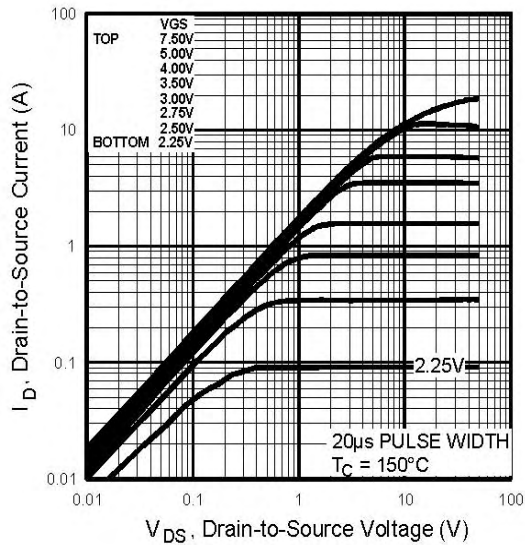


Fig 1. Typical Output Characteristics,
 $T_C = 25^\circ\text{C}$

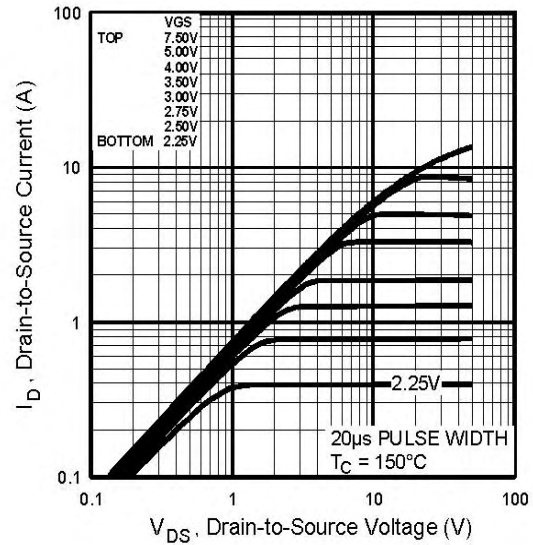


Fig 2. Typical Output Characteristics,
 $T_C = 150^\circ\text{C}$

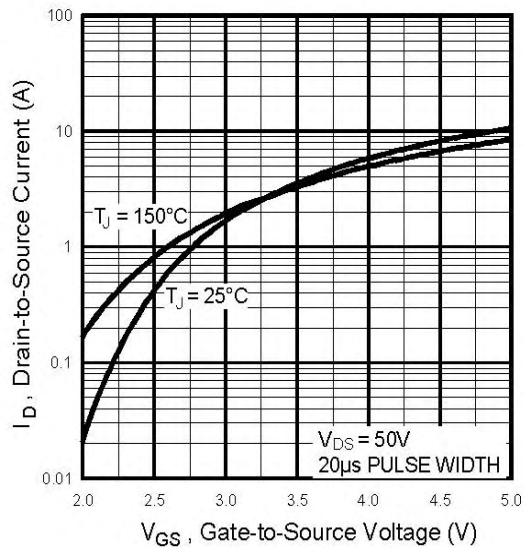


Fig 3. Typical Transfer Characteristics

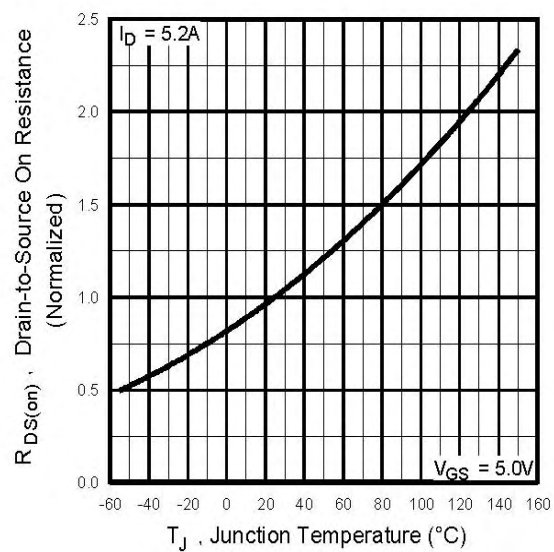
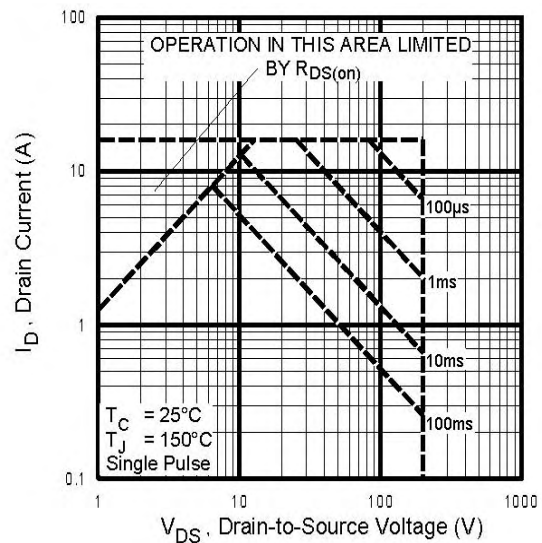
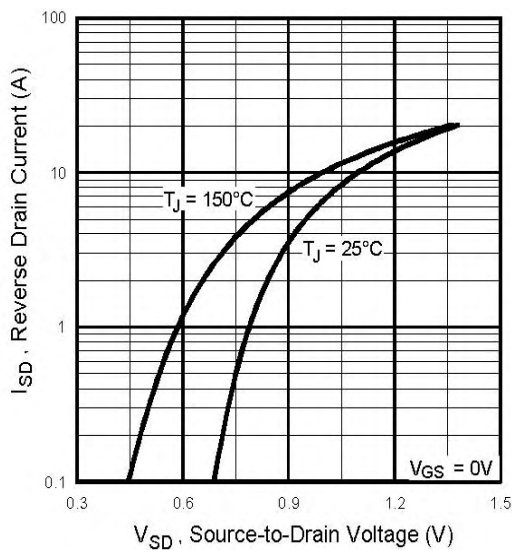
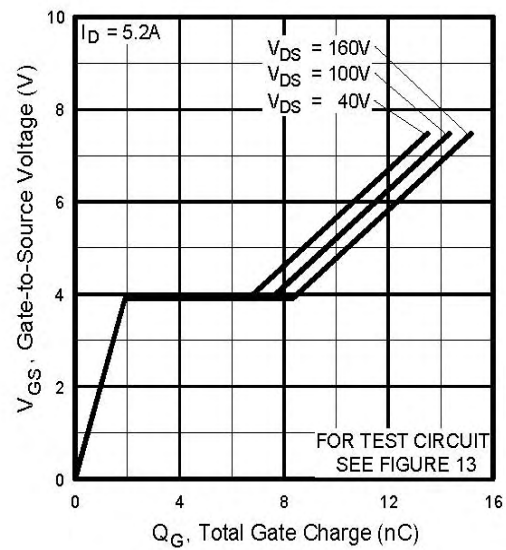
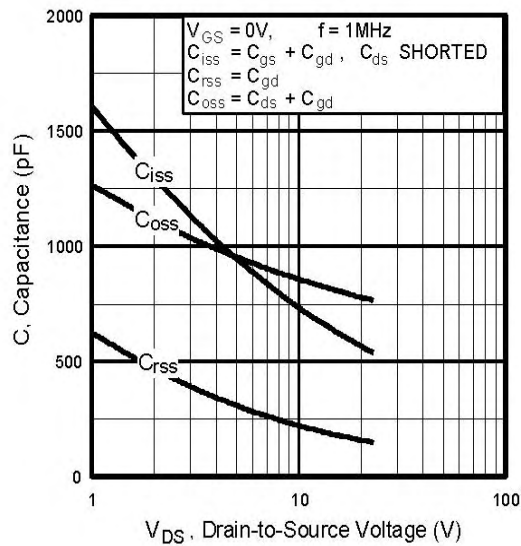


Fig 4. Normalized On-Resistance
Vs. Temperature

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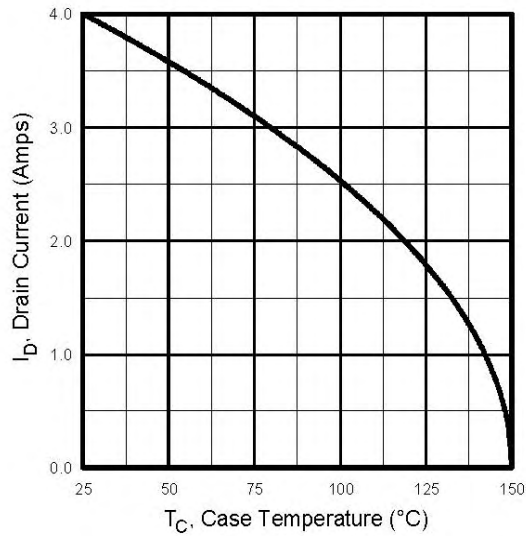


Fig 9. Maximum Drain Current Vs. Case Temperature

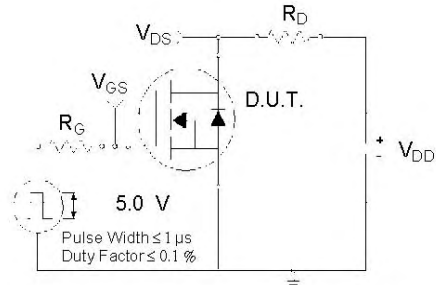


Fig 10a. Switching Time Test Circuit

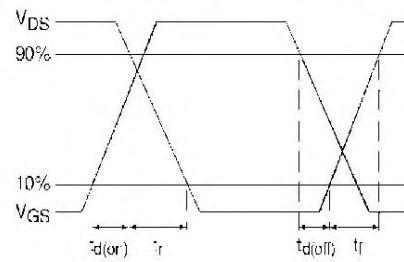


Fig 10b. Switching Time Waveforms

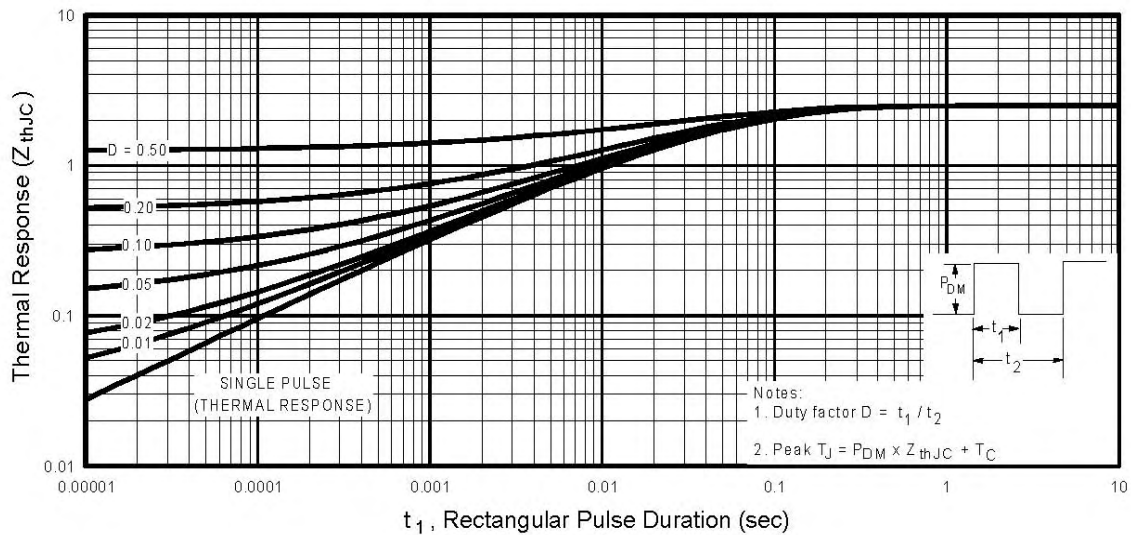
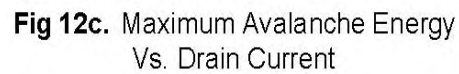
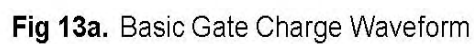
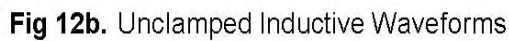
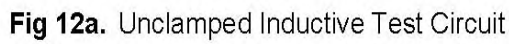
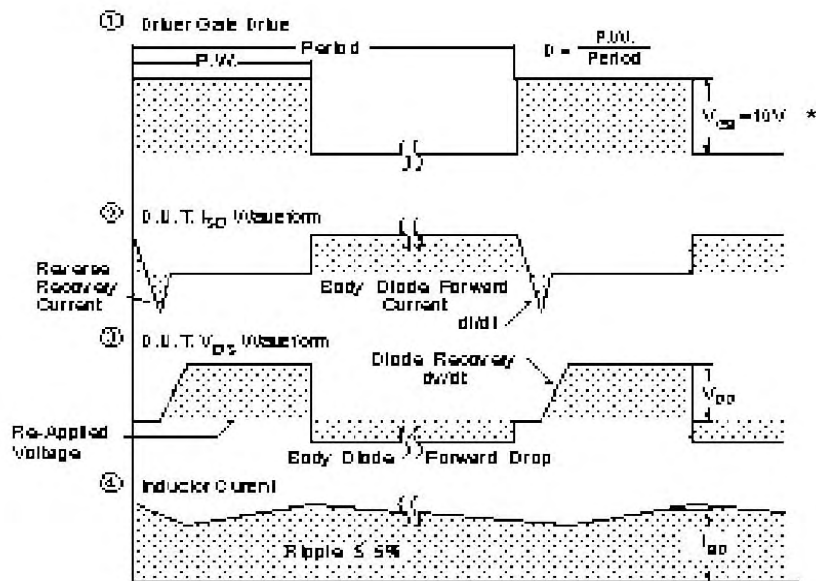
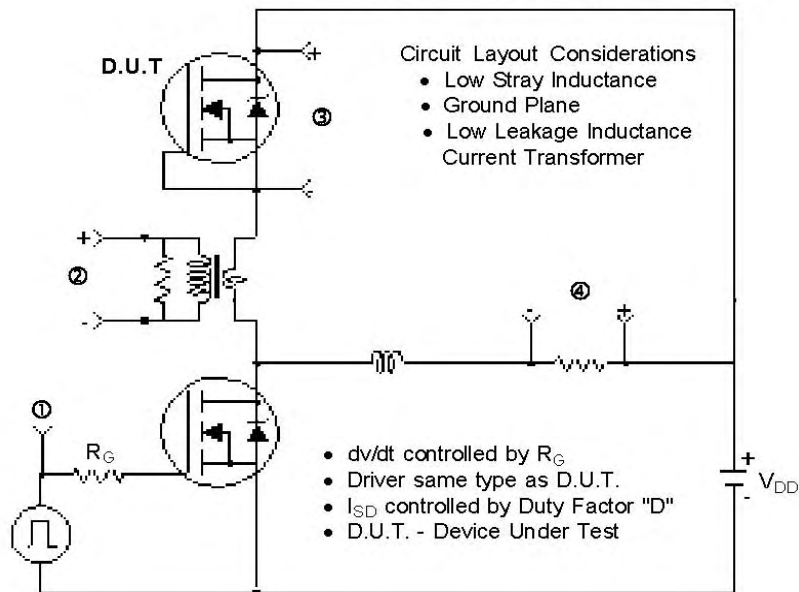


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

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IOR Rectifier



Peak Diode Recovery dv/dt Test Circuit



* $V_{GS} = 5V$ for Logic Level Devices

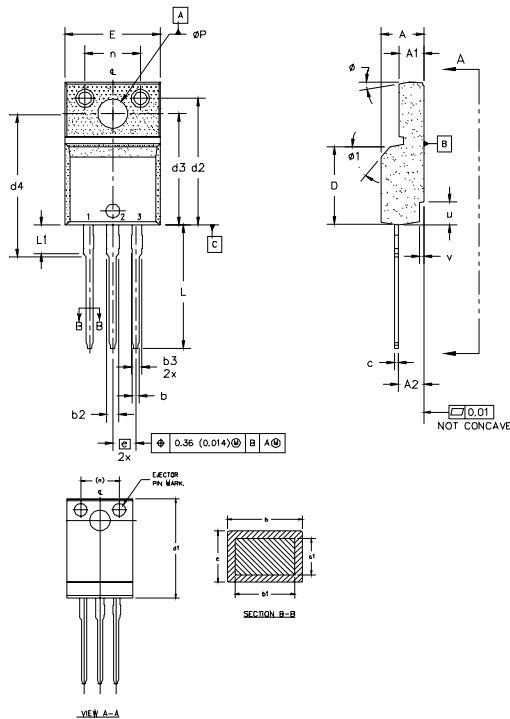
Fig 14. For N-Channel HEXFETS

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TO-220 Full-Pak Package Outline

Dimensions are shown in millimeters (inches)

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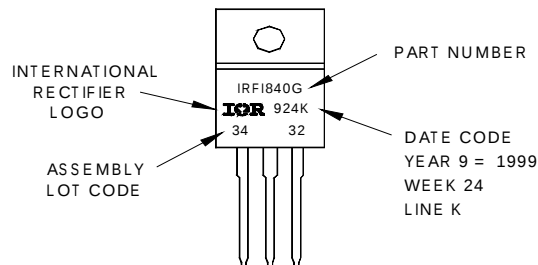
- NOTES:
- 1.0 DIMENSIONING AND TOLERANCING PER ASME Y14.5 M-1994.
 - 2.0 DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
 - 3.0 LEAD DIMENSION AND FINISH UNCONTROLLED IN L1.
 - 4.0 DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.005" (0.127) PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
 - 5.0 DIMENSION b1 APPLY TO BASE METAL ONLY.
 - 6.0 STEP OPTIONAL ON PLASTIC BODY DEFINED BY DIMENSIONS u & v.
 - 7.0 CONTROLLING DIMENSION: INCHES.

SYMBOL	DIMENSIONS				NOTES	LEAD ASSIGNMENTS
	MILLIMETERS		INCHES			
	MIN.	MAX.	MIN.	MAX.		
A	4.57	4.83	0.180	0.190	5	HEXFET 1. - GATE 3. - DRAIN 3. - SOURCE
A1	2.51	2.83	0.101	0.114		
A2	2.57	2.85	0.099	0.112		
b	0.622	0.89	0.024	0.035		
b1	0.622	0.838	0.024	0.033		
b2	1.229	1.400	0.048	0.055		
b3	1.229	1.400	0.048	0.055		
c	0.440	0.629	0.017	0.025		
c1	0.440	0.584	0.017	0.023		
D	8.65	9.80	0.341	0.386		
d1	15.80	16.12	0.622	0.635		
d2	13.97	14.22	0.550	0.560		
d3	12.30	12.92	0.484	0.509		
d4	8.64	9.91	0.340	0.390	4	
E	10.36	10.63	0.408	0.419		
e	2.54 BSC		0.100 BSC			
L	13.20	13.73	0.520	0.541		
L1	3.10	3.50	0.122	0.138	3	
n	6.05	6.15	0.238	0.242		
øP	3.05	3.45	0.120	0.136		
u	2.40	2.50	0.094	0.098		
v	0.40	0.50	0.016	0.020	6	
ø	3"	7"	3"	7"		
ø1		45°		45°		

TO-220 Full-Pak Part Marking Information

EXAMPLE: THIS IS AN IRF1840G
WITH ASSEMBLY
LOT CODE 3432
ASSEMBLED ON WW 24 1999
IN THE ASSEMBLY LINE "K"

Note: "P" in assembly line
position indicates "Lead-Free"



Data and specifications subject to change without notice.

International
IOR Rectifier

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