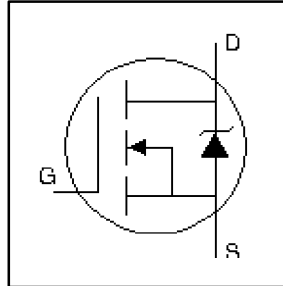


### HEXFET® Power MOSFET

- Isolated Package
- High Voltage Isolation = 2.5KVRMS<sup>⑤</sup>
- 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



$$V_{DSS} = 200V$$

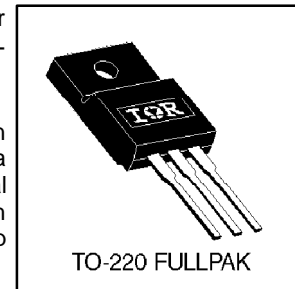
$$R_{DS(on)} = 0.80\Omega$$

$$I_D = 4.0A$$

### 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.



### 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 <sup>①</sup>	16	
$P_D$ @ $T_C = 25^\circ C$	Power Dissipation	30	W
	Linear Derating Factor	0.24	W/ $^\circ C$
$V_{GS}$	Gate-to-Source Voltage	$\pm 10$	V
$E_{AS}$	Single Pulse Avalanche Energy <sup>②</sup>	62	mJ
$I_{AR}$	Avalanche Current <sup>③</sup>	4.0	A
$E_{AR}$	Repetitive Avalanche Energy <sup>④</sup>	3.0	mJ
dv/dt	Peak Diode Recovery dv/dt <sup>⑤</sup>	5.0	V/ns
$T_J$	Operating Junction and	-55 to + 150	$^\circ C$
$T_{STG}$	Storage Temperature Range		
	Soldering Temperature, for 10 seconds		
	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	$^\circ C/W$
$R_{\theta JA}$	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/ $^\circ\text{C}$	Reference to $25^\circ\text{C}, I_D = 1\text{mA}$
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	—	—	0.80	$\Omega$	$V_{GS} = 5.0V, I_D = 2.4A$ ④
		—	—	1.0		$V_{GS} = 4.0V, I_D = 2.0A$ ④
$V_{GS(th)}$	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	$\mu A$	$V_{DS} = 200V, V_{GS} = 0V$
		—	—	250		$V_{DS} = 160V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
$I_{GSS}$	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	nH	$I_D = 5.2A$ $V_{DS} = 160V$ $V_{GS} = 10V$ , See Fig. 6 and 13 ④
$Q_{gs}$	Gate-to-Source Charge	—	—	2.7		
$Q_{gd}$	Gate-to-Drain ("Miller") Charge	—	—	9.6		
$t_{d(on)}$	Turn-On Delay Time	—	4.2	—		
$t_r$	Rise Time	—	31	—	ns	$V_{DD} = 100V$ $I_D = 5.2A$ $R_G = 9.0\Omega$ $R_D = 20\Omega$ , See Fig. 10 ④
$t_{d(off)}$	Turn-Off Delay Time	—	18	—		
$t_f$	Fall Time	—	17	—		
$L_D$	Internal Drain Inductance	—	4.5	—		
$L_S$	Internal Source Inductance	—	7.5	—	nH	Between lead, 6mm (0.25in.) from package and center of die contact
$C_{iss}$	Input Capacitance	—	360	—		
$C_{oss}$	Output Capacitance	—	91	—	pF	$V_{GS} = 0V$ $V_{DS} = 25V$ $f = 1.0\text{MHz}$ , See Fig. 5
$C_{rss}$	Reverse Transfer Capacitance	—	27	—		

**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	$T_J = 25^\circ\text{C}, I_S = 4.0A, V_{GS} = 0V$ ②
$t_{rr}$	Reverse Recovery Time	—	180	270	ns	$T_J = 25^\circ\text{C}, I_F = 5.2A$
$Q_{rr}$	Reverse Recovery Charge	—	1.1	1.7	$\mu C$	$di/dt = 100A/\mu s$ ③
$t_{on}$	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by $L_S+L_D$ )				

**Notes:**

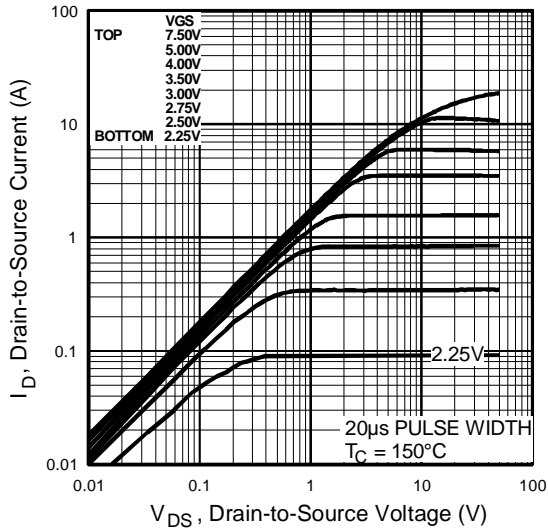
① Repetitive rating; pulse width limited by max. junction temperature. ( See fig. 11 )

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

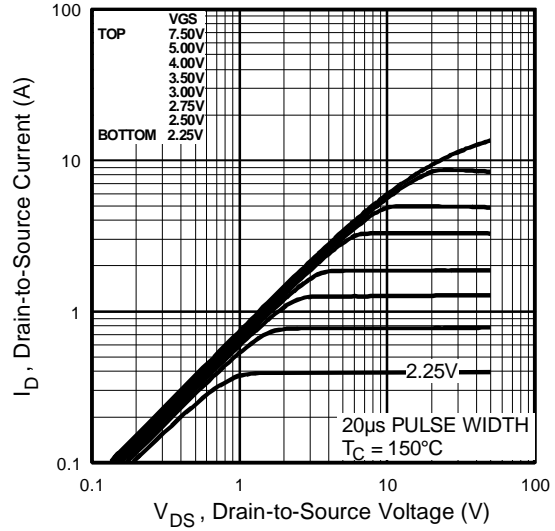
③  $t=60s, f=60\text{Hz}$

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

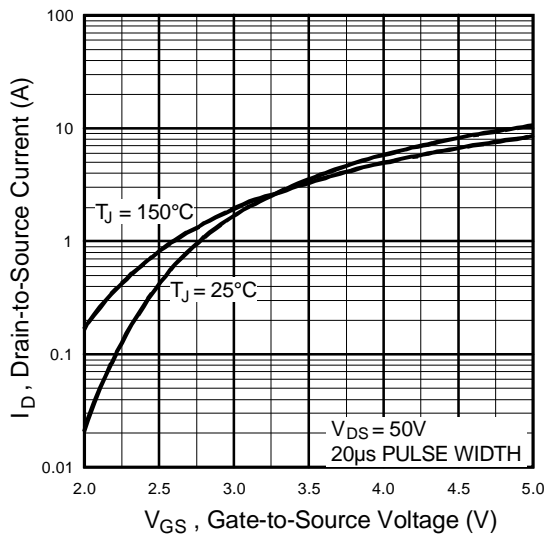
⑤ Pulse width  $\leq 300\mu s$ ; duty cycle  $\leq 2\%$ .



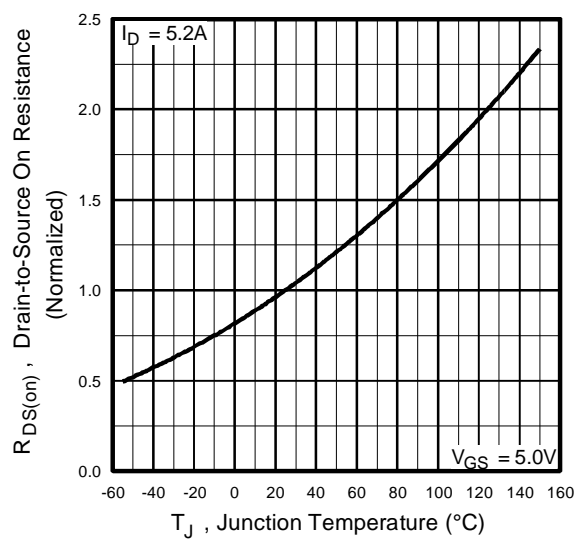
**Fig 1.** Typical Output Characteristics,  
 $T_C = 25^\circ\text{C}$



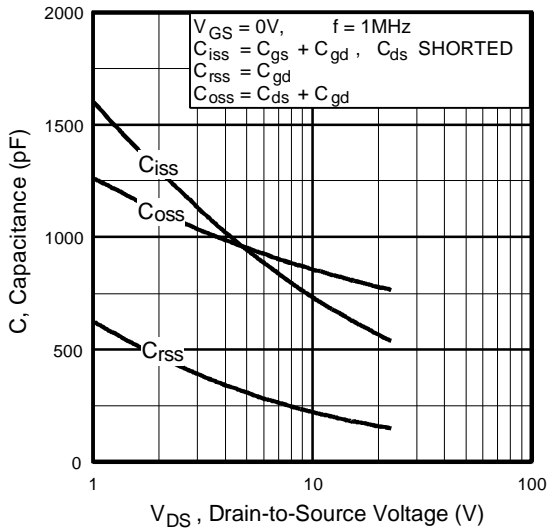
**Fig 2.** Typical Output Characteristics,  
 $T_C = 150^\circ\text{C}$



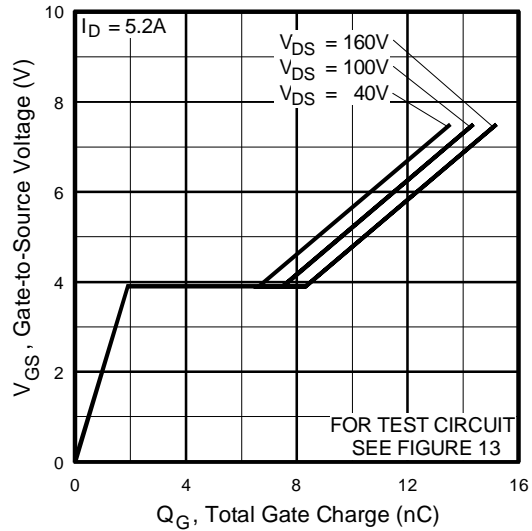
**Fig 3.** Typical Transfer Characteristics



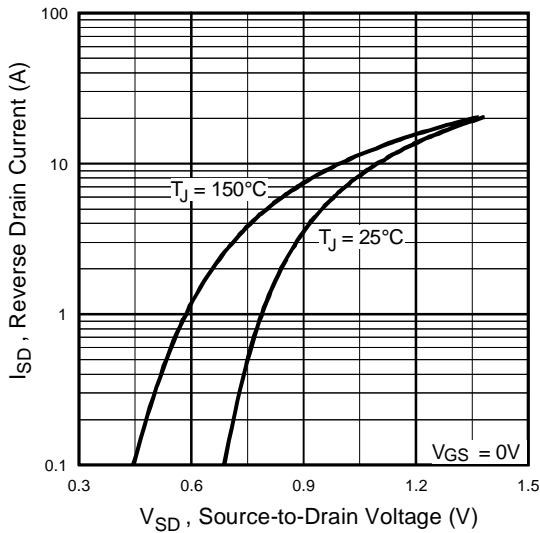
**Fig 4.** Normalized On-Resistance  
Vs. Temperature



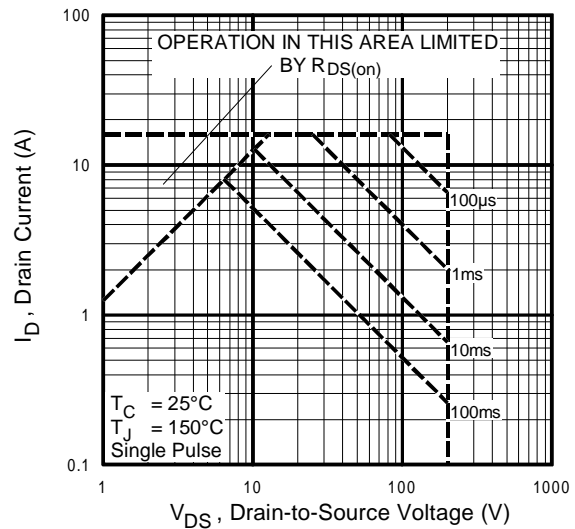
**Fig 5.** Typical Capacitance Vs. Drain-to-Source Voltage



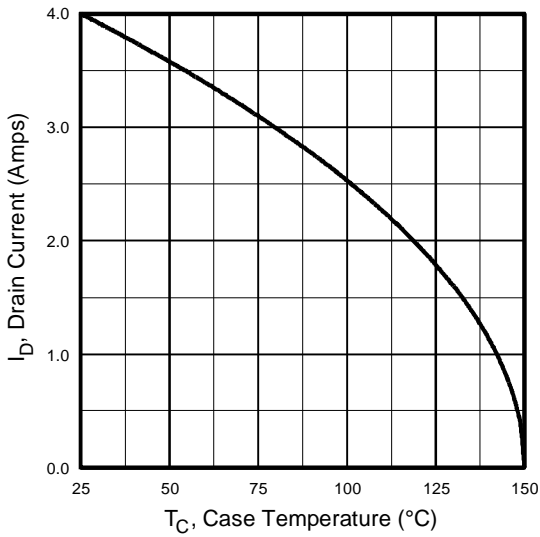
**Fig 6.** Typical Gate Charge Vs. Gate-to-Source Voltage



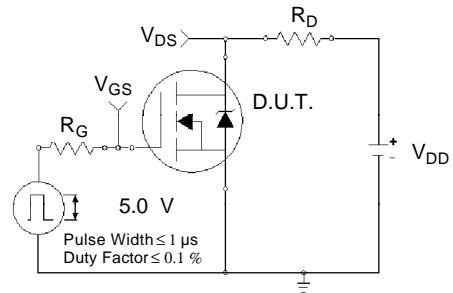
**Fig 7.** Typical Source-Drain Diode Forward Voltage



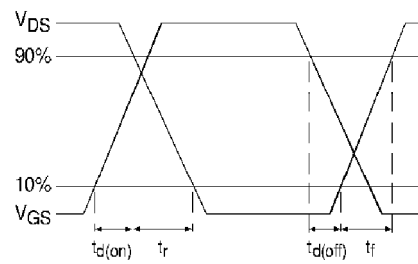
**Fig 8.** Maximum Safe Operating Area



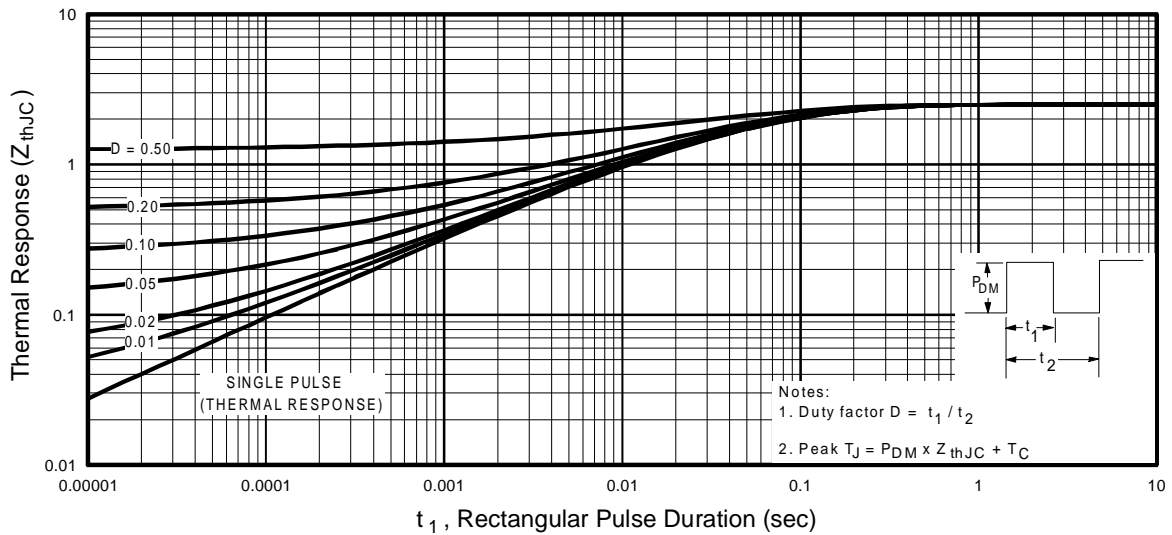
**Fig 9.** Maximum Drain Current Vs. Case Temperature



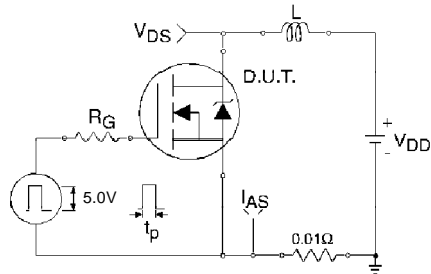
**Fig 10a.** Switching Time Test Circuit



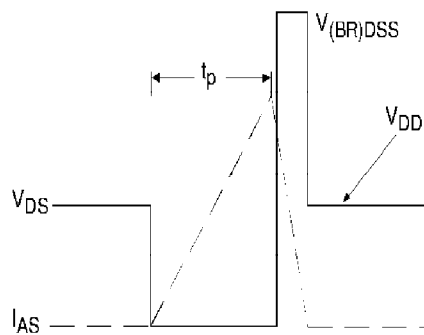
**Fig 10b.** Switching Time Waveforms



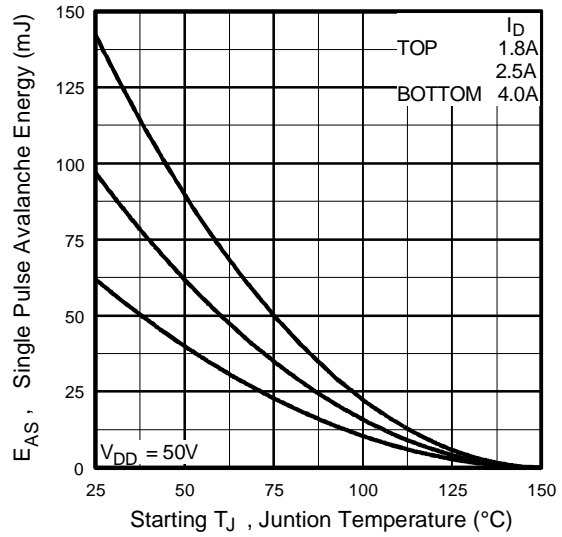
**Fig 11.** Maximum Effective Transient Thermal Impedance, Junction-to-Case



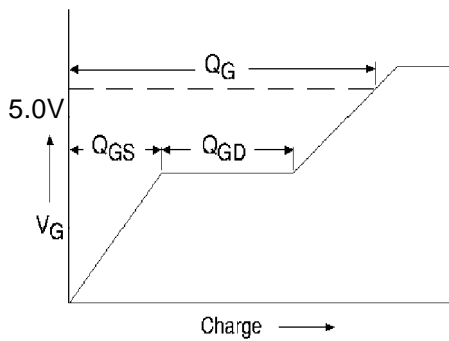
**Fig 12a.** Unclamped Inductive Test Circuit



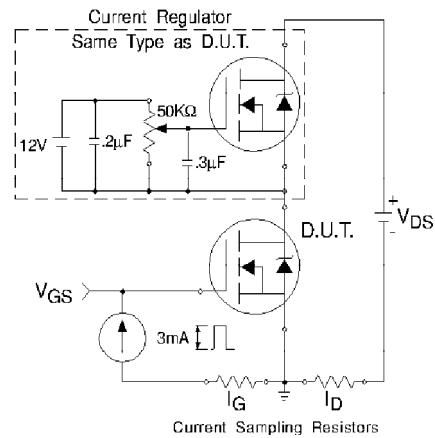
**Fig 12b.** Unclamped Inductive Waveforms



**Fig 12c.** Maximum Avalanche Energy Vs. Drain Current

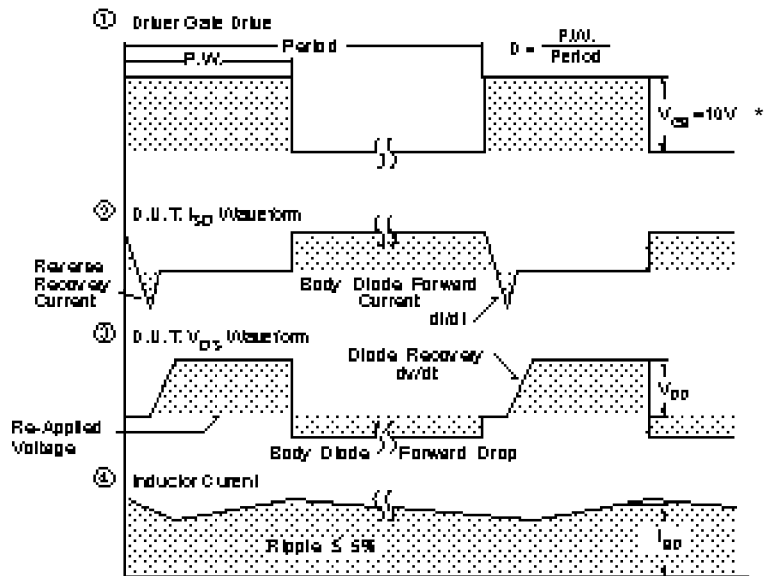
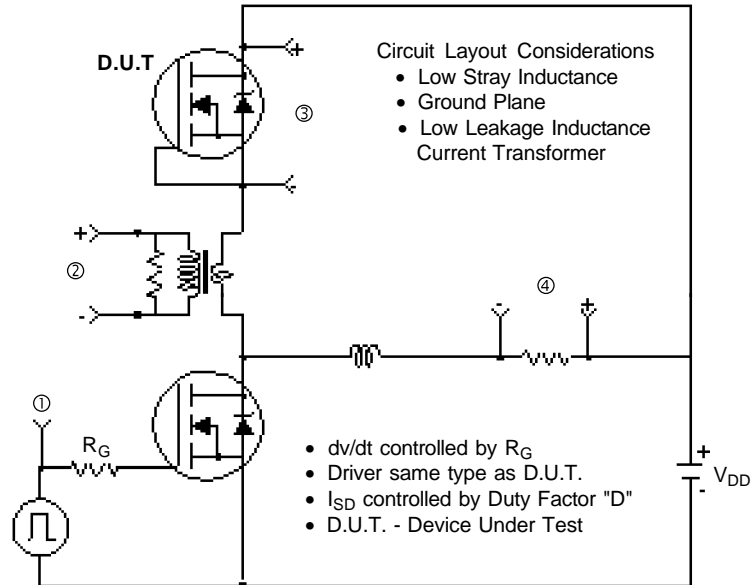


**Fig 13a.** Basic Gate Charge Waveform



**Fig 13b.** Gate Charge Test Circuit

## Peak Diode Recovery dv/dt Test Circuit



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

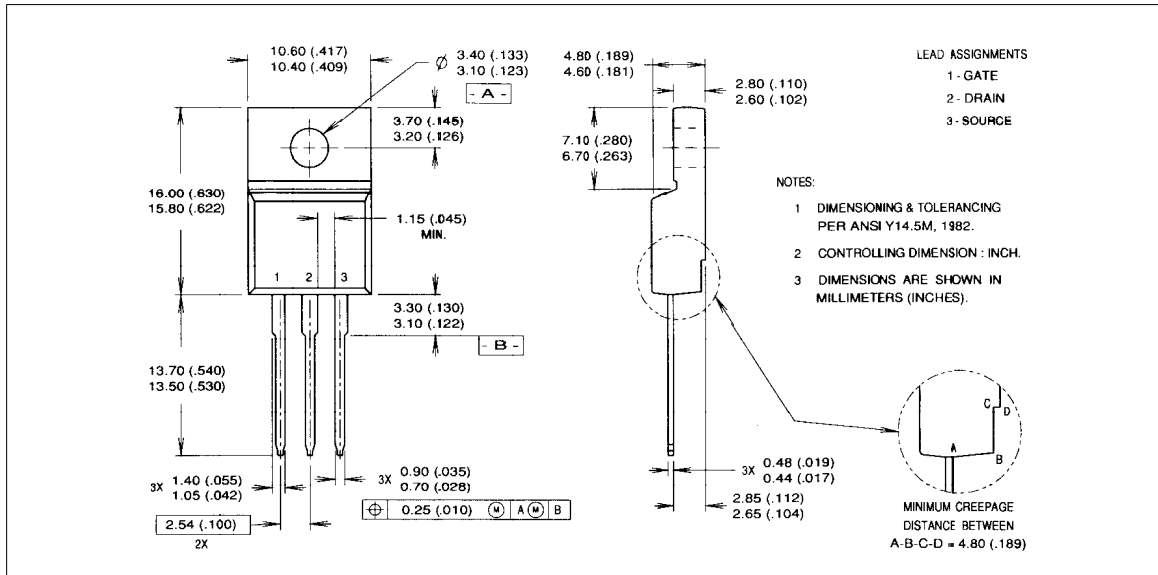
**Fig 14.** For N-Channel HEXFETS

# IRLI620G



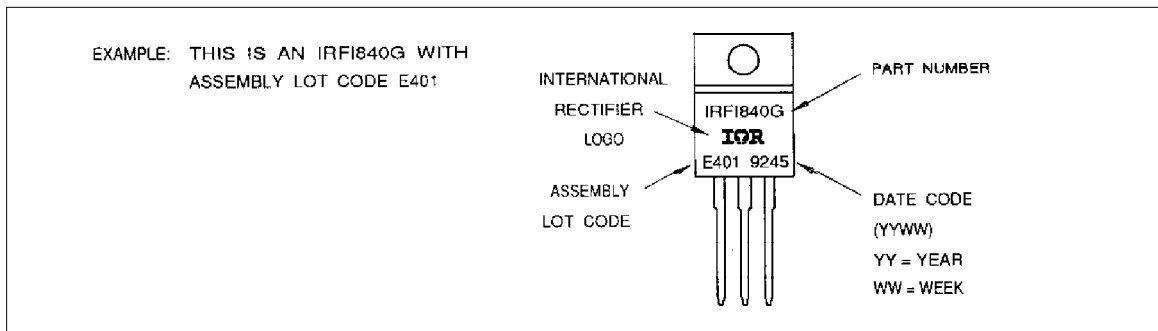
## Package Outline

### TO-220 Full-Pak



## Part Marking Information

### TO-220 Full-Pak



**WORLD HEADQUARTERS:** 233 Kansas St., El Segundo, California 90245, Tel: (310) 322 3331  
**EUROPEAN HEADQUARTERS:** Hurst Green, Oxted, Surrey RH8 9BB, UK Tel: (44) 0883 713215  
**IR CANADA:** 7321 Victoria Park Ave., Suite 201, Markham, Ontario L3R 3L1, Tel: (905) 475 1897 **IR GERMANY:** Saalburgstrasse 157, 61350 Bad Homburg Tel: 6172 37066 **IR ITALY:** Via Liguria 49, 10071 Borgaro, Torino Tel: (39) 1145 10111 **IR FAR EAST:** K&H Bldg., 2F, 3-30-4 Nishi-Ikeburo 3-Chome, Toshima-Ki, Tokyo 171 Tel: (03)3983 0641 **IR SOUTHEAST ASIA:** 315 Outram Road, #10-02 Tan Boon Liat Building, 0316 Tel: 65 221 8371

*Data and specifications subject to change without notice.*



LittleDiode supplies new, hard to find or obsolete electronic components and semiconductors all over the world.

With over two million different components listed you are sure to find the part you need.

Feel free to visit us today at our online store:

[LittleDiode.com](http://LittleDiode.com)

Looking forward to providing you with the best possible service.