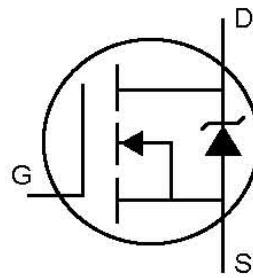


- Advanced Process Technology
- Ultra Low On-Resistance
- Dynamic dv/dt Rating
- 175 Operating Temperature
- Fast Switching
- Fully Avalanche Rated



$V_{DSS}=55V$
 $R_{DS(on)}=8.0m\Omega$
 $I_D=110A$

Description

Advanced HEXFET ® Power MOSFETs 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-220 packages is universally preferred for all commercial-industrial applications at power dissipation levels to approximately 50 watts. The low thermal resistance and low package cost of the TO-220 contribute to its wide acceptance throughout the industry.

Absolute Maximum Ratings

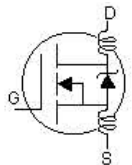
	Parameter	Max.	Units
$I_D@T_C=25$	Continuous Drain Current, V_{GS} @ 10V	110	A
$I_D@T_C=100$	Continuous Drain Current, V_{GS} @ 10V	80	
I_{DM}	Pulsed Drain Current	390	
$P_D @ T_C=25$	Power Dissipation	200	W
	Linear Derating Factor	1.3	W/
V_{GS}	Gate-to-Source Voltage	± 20	V
I_{AR}	Avalanche Current	62	A
E_{AR}	Repetitive Avalanche Energy	20	mJ
dv/dt	Peak Diode Recovery dv/dt	5.0	V/ns
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +175	
	Soldering Temperature, for 10 seconds	300 (1.6mm from case)	
	Mounting torque, 6-32 or M3 srew	10 lbf•in (1.1 N•m)	

Thermal Resistance

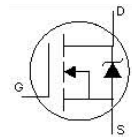
	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	-	0.75	/W
$R_{\theta CS}$	Case-to-Sink, Flat, Greased Surface	0.50	-	
$R_{\theta JA}$	Junction-to-Ambient	-	62	

Electrical Characteristics @ T_J=25 (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{(BR)DSS}	Drain-to-Source Breakdown Voltage	55	-	-	V	V _{GS} =0V, I _D =250μA
ΔV _{(BR)DSS/ΔT_J}	Breakdown Voltage Temp. Coefficient	-	0.057	-	V/	Reference to 25 , I _D =1mA
R _{DS(on)}	Static Drain-to-Source On-Resistance	-	-	8.0	mΩ	V _{GS} =10V, I _D =62A
V _{GS(th)}	Gate Threshold Voltage	2.0	-	4.0	V	V _{DS} =V _{GS} , I _D =250μA
g _{fs}	Forward Transconductance	44	-	-	S	V _{DS} =25V, I _D =62A
I _{DSS}	Drain-to-Source Leakage Current	-	-	25	μA	V _{DS} =55V, V _{GS} =0V
		-	-	250		V _{DS} =44V, V _{GS} =0V, T _J =150
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	-	-	146	nC	I _D =62A
Q _{gs}	Gate-to-Source Charge	-	-	35		V _{DS} =44V
Q _{gd}	Gate-to-Drain ("Miller") Charge	-	-	54		V _{GS} =10V, See Fig.6 and 13
t _{d(on)}	Turn-On Delay Time	-	14	-	ns	V _{DD} =28V
t _r	Rise Time	-	-101	-		I _D =62A
t _{d(off)}	Turn-Off Delay Time	-	50	-		R _G =4.5 Ω
t _f	Fall Time	-	65	-		V _{GS} =10V, See Fig.10
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	-	3247	-	pF	V _{GS} =0V
C _{oss}	Output Capacitance	-	781	-		V _{DS} =25V
C _{rss}	Reverse Transfer Capacitance	-	211	-		f=1.0MHz, See Fig.5
E _{AS}	Single Pulse Avalanche Energy	-	1050	264	mJ	I _{AS} =62A, L=138μH


Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode)	-	-	110	A	MOSFET symbol showing the integral reverse p-n junction diode.
I _{SM}	Pulsed Source Current (Body Diode)	-	-	390		
V _{DS}	Diode Forward Voltage	-	-	1.3	V	T _J =25 , I _S =62A, V _{GS} =0V
t _{rr}	Reverse Recovery Time	-	69	104	ns	T _J =25 , I _F =62A
Q _{rr}	Reverse Recovery Charge	-	143	215	nC	di/dt=100A/μS
t _{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by L _S +L _D)				


Notes:

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

Starting T_J=25 , L=138μH, R_G=25Ω, I_{AS}=62A. (See fig. 12)

I_{SD}≤62A, di/dt≤207A/μs, V_{DD} ≤V_{(BR)DSS}, T_J≤175

Pulse width ≤400μs; duty cycle ≤2%.

Calculated continuous current based on maximum allowable junction temperature. Package limitation current is 75A.

This is a typical value at device destruction and represents operation outside rated limits.

This is a calculated value limited to T_J=175 .

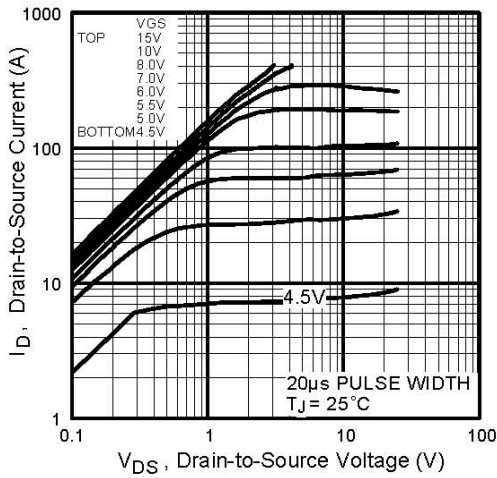


Fig 1. Typical Output Characteristics

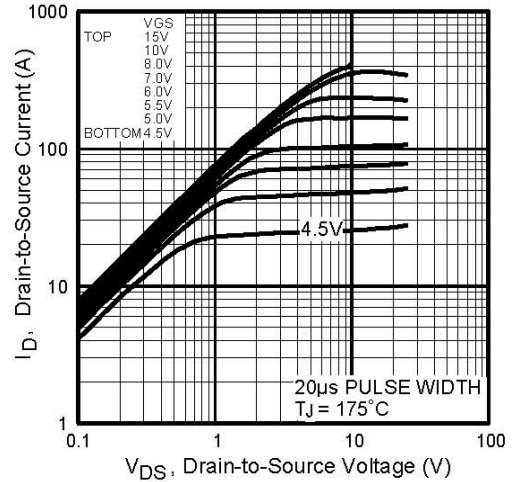


Fig2. Typical Output Characteristics

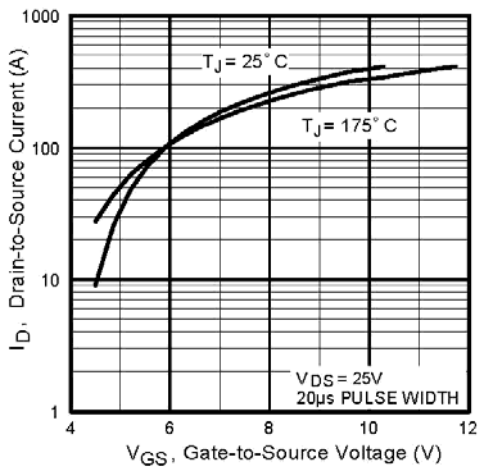


Fig 3. Typical Transfer Characteristics

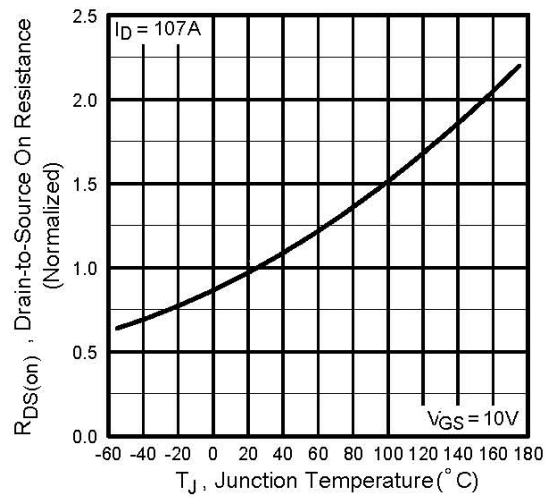


Fig 4. Normalized On-Resistance
Vs. Temperature

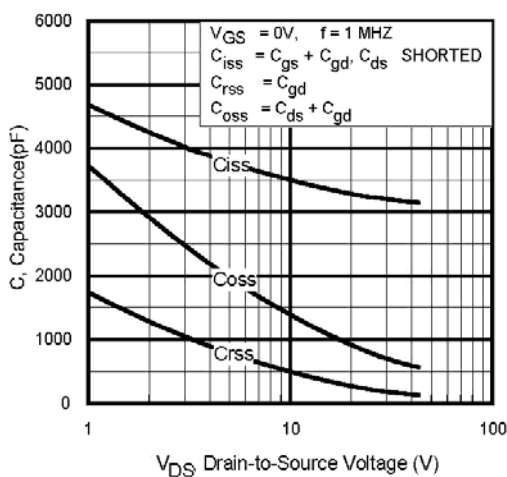


Fig 5. Typical Capacitance Vs.
Drain-to-Source Voltage

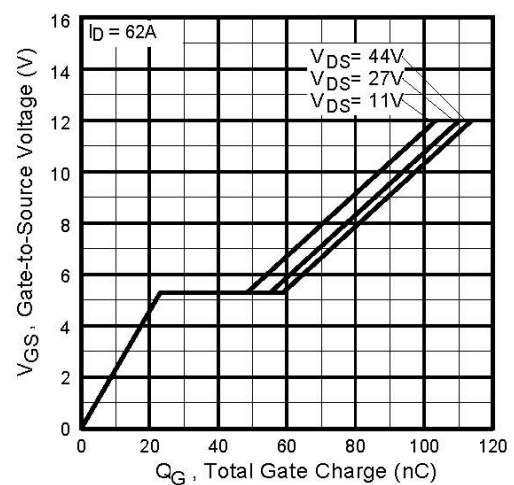


Fig 6. Typical Gate Charge Vs.
Gate-to-Source Voltage

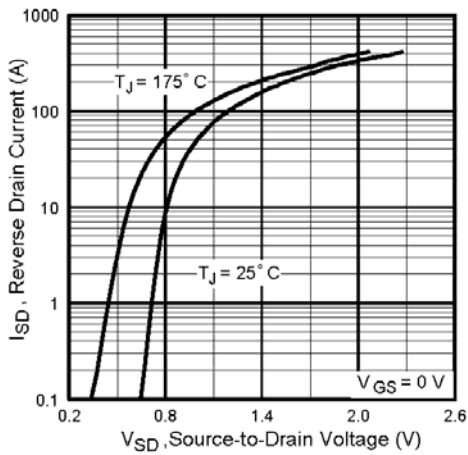


Fig 7. Typical Source-Drain Diode Forward Voltage

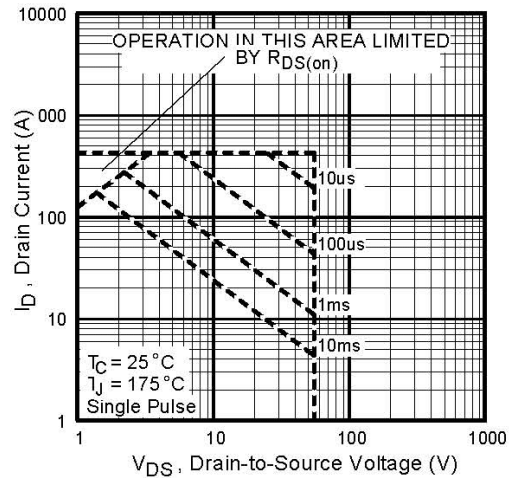


Fig 8. Maximum Safe Operating Area

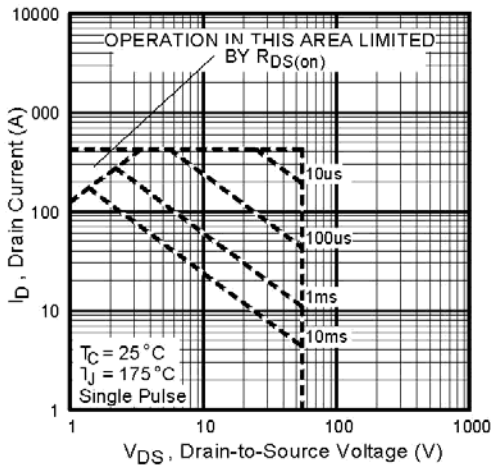


Fig 9. Maximum Drain Current Vs. Case Temperature

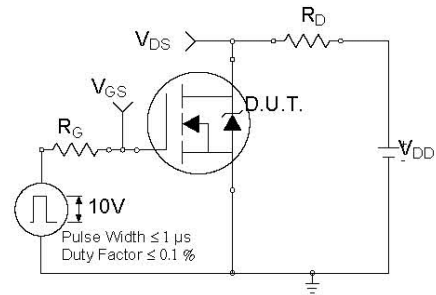


Fig 10a. Switching Time Test Circuit

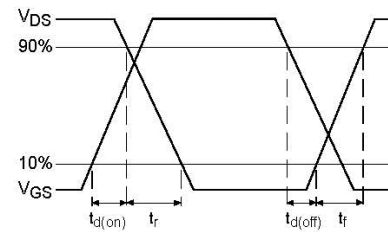


Fig 10b. Switching Time Waveforms

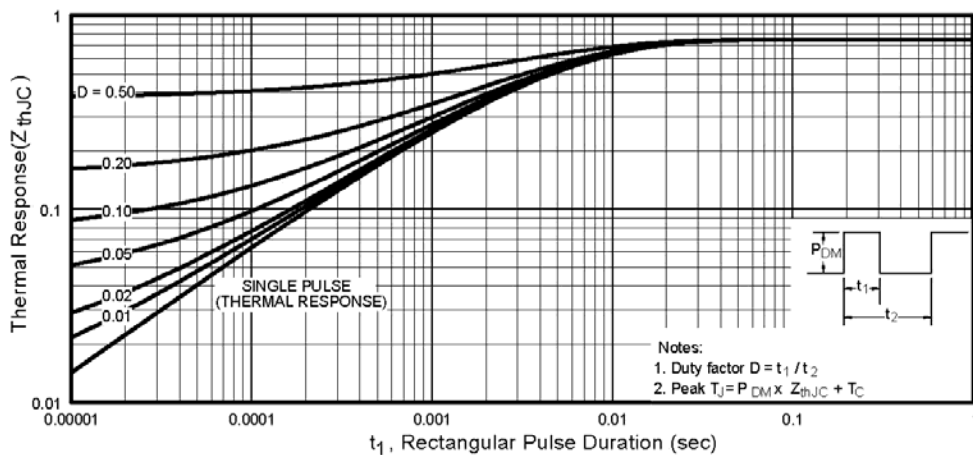


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

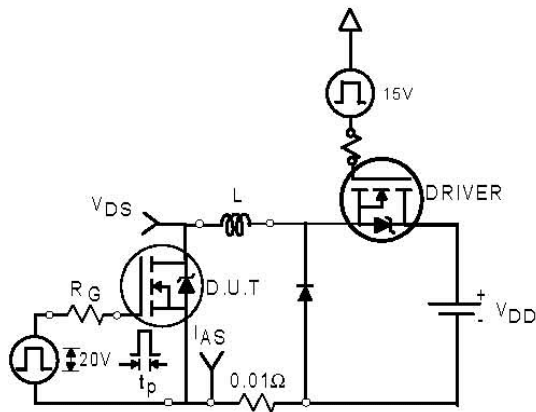


Fig 12a. Unclamped Inductive Test Circuit

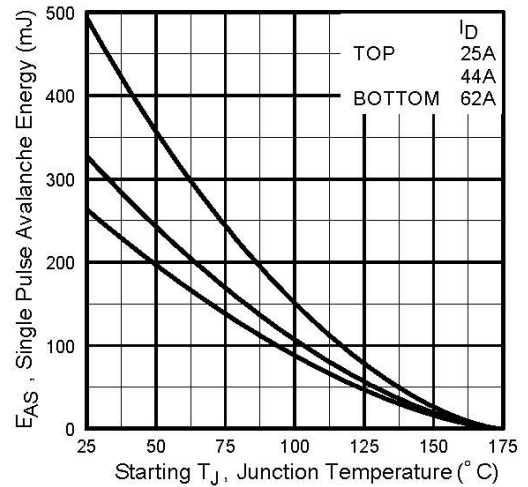


Fig 12c. Maximum Avalanche Energy
Vs. Drain Current

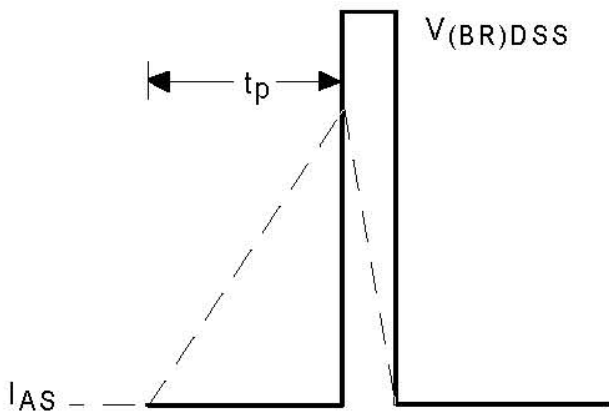


Fig 12b. Unclamped Inductive Waveforms

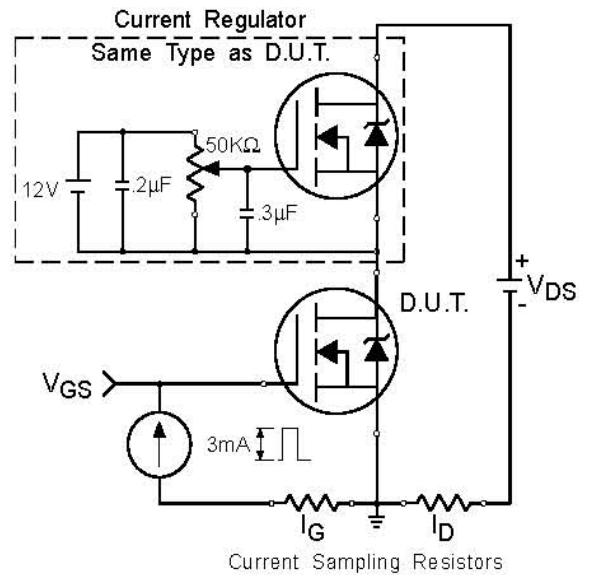


Fig 13b. Gate Charge Test Circuit

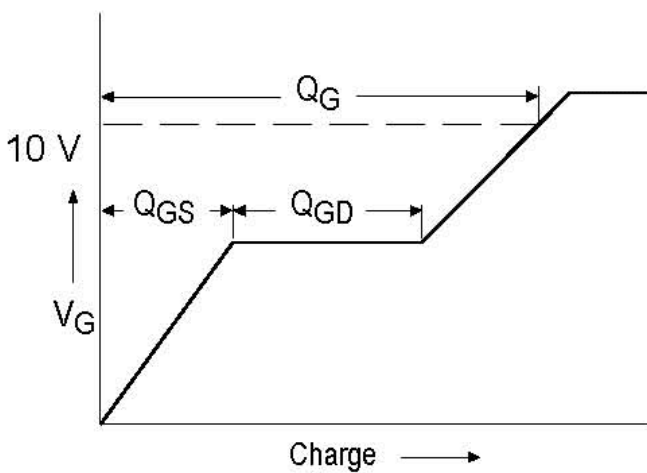
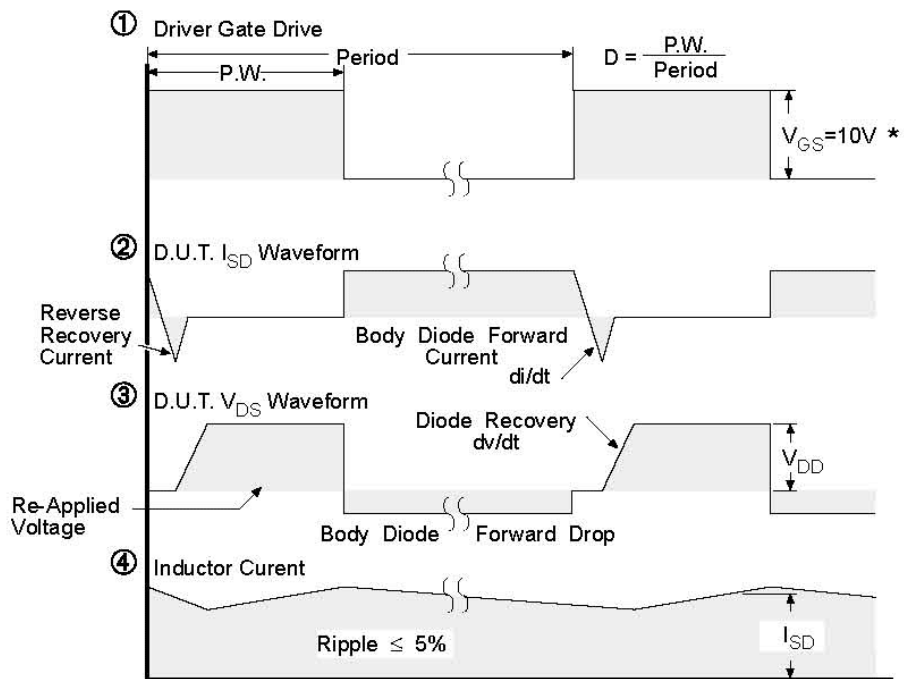
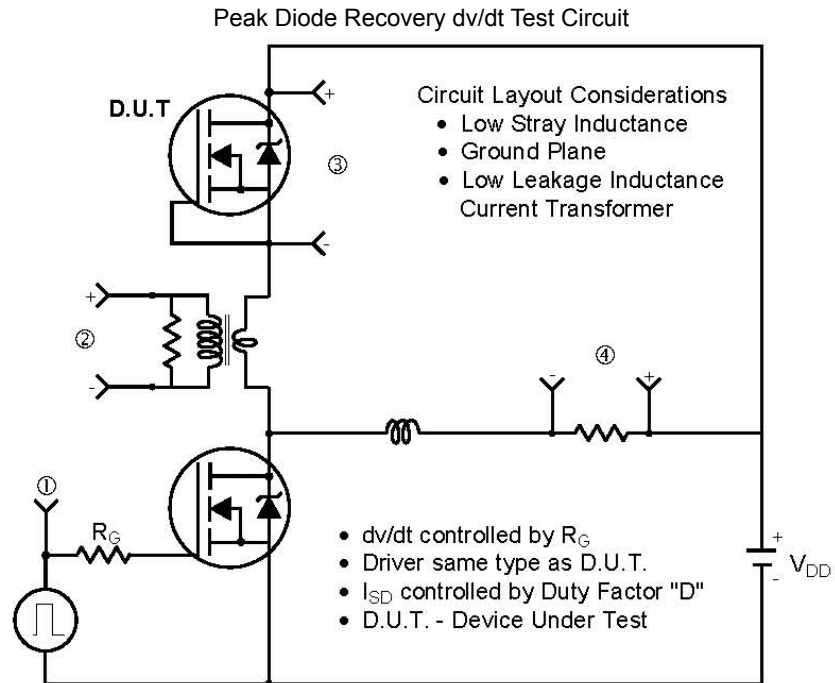


Fig 13a. Basic Gate Charge Waveform

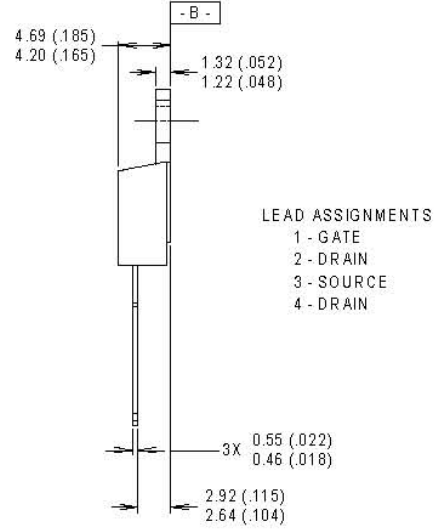
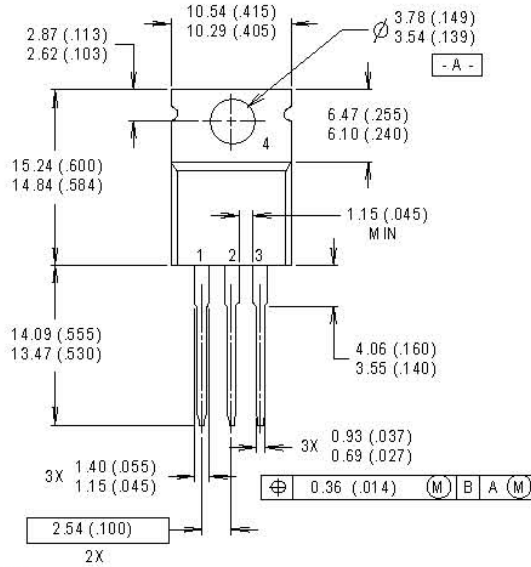


* $V_{GS} = 5V$ for Logic Level Devices

Fig 14. For N-Channel HEXFETs

Package Outline
TO-220AB Outline

Dimensions are shown in millimeters (inches)



NOTES:

- 1 DIMENSIONING & TOLERANCING PER ANSI Y14.5M, 1982.
- 2 CONTROLLING DIMENSION : INCH
- 3 OUTLINE CONFORMS TO JEDEC OUTLINE TO-220AB.
- 4 HEATSINK & LEAD MEASUREMENTS DO NOT INCLUDE BURRS.