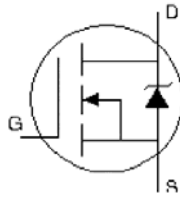
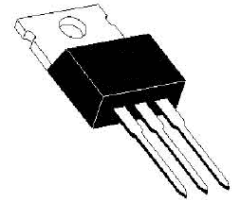


Advanced Process Technology
 Dynamic dv/dt Rating
 175 Operating Temperature
 Fast Switching
 Fully Avalanche Rated



$V_{DSs}=55V$
 $R_{DS(on)}=0.040\Omega$
 $I_D=26A$



TO-220AB

Description

Fifth Generation HEXFETs from international Rectifier utilize advanced processing techniques to achieve the lowest possible 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 device for use in a wide variety of applications.

The TO-220 package 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

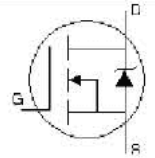
	Parameter	Max.	Units
I_D @ $T_c=25$	Continuous Drain Current, V_{GS} @ 10V	26	A
I_D @ $T_c=100$	Continuous Drain Current, V_{GS} @ 10V	18	
I_{DM}	Pulsed Drain Current	100	
P_D @ $T_c=25$	Power Dissipation	56	W
	Linear Derating Factor	0.37	W/
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy	110	mJ
I_{AR}	Avalanche Current	16	A
E_{AR}	Repetitive Avalanche Energy	5.6	mJ
Dv/dt	Peak Diode Recovery dv/dt	4.6	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 screw.	10 lbf•in (1.1N•m)	

Thermal Resistance

	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	-	-	2.7	/W
$R_{\theta CS}$	Case-to-Sink,	-	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	-	0.052	-	V/	Reference to 25 °C, I _D =1mA
R _{DS(ON)}	Static Drain-to-Source On-Resistance	-	-	0.040	Ω	V _{GS} =10V, I _D =16A
V _{GS(th)}	Gate Threshold Voltage	2.0	-	4.0	V	V _{DS} =V _{GS} , I _D =250μA
g _{fs}	Forward Transconductance	6.5	-	-	s	V _{DS} =25V, I _D =16A
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 °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	-	-	34	nC	I _D =16A
Q _{gs}	Gate-to-Source Charge	-	-	6.8		V _{DS} =44V
Q _{gd}	Gate-to-Drain ("Miller") Charge	-	-	14		V _{GS} =10V, See Fig. 6 and 13
t _{d(on)}	Turn-On Delay Time	-	7.0	-	ns	V _{DD} =28V
t _r	Rise Time	-	49	-		I _D =16A
t _{d(off)}	Turn-Off Delay Time	-	31	-		R _G =18Ω
t _f	Fall Time	-	40	-		R _D =1.8Ω, See Fig. 10
LD	Internal Drain Inductance	-	4.5	-	nH	Between lead, 6mm (0.25in.)
LS	Internal source inductance	-	7.5	-		From package and center of die contact
C _{iss}	Input Capacitance	-	700	-	pF	V _{GS} =0V
C _{oss}	Output Capacitance	-	240	-		V _{DS} =25V
Cr _{ss}	Reverse Transfer Capacitance	-	100	-		F=1.0MHz, See Fig.5


Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode)	-	-	26	A	MOSFET symbol showing the integral reverse p-n junction diode.
I _{SM}	Diode Forward Voltage	-	-	100		
V _{SD}	Reverse Recovery Time	-	-	1.6	V	T _J =25 °C, I _S =16A, V _{GS} =0V
t _{rr}	Reverse Recovery Charge	-	57	86	ns	T _J =25 °C, I _F =16A
Q _{rr}	Reverse Recovery Charge	-	130	200	nC	ti/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)

V_{DD}=25V, starting T_J=25 °C, L=610μH, R_G=25Ω, I_{AS}=16A. (See Figure 12)

I_{SD}≤16A, di/dt ≤ 420A/μs, V_{DD}≤V_{(BR)DSS}, T_J≤175 °C.

Pulse width ≤300μs; duty cycle ≤2%.

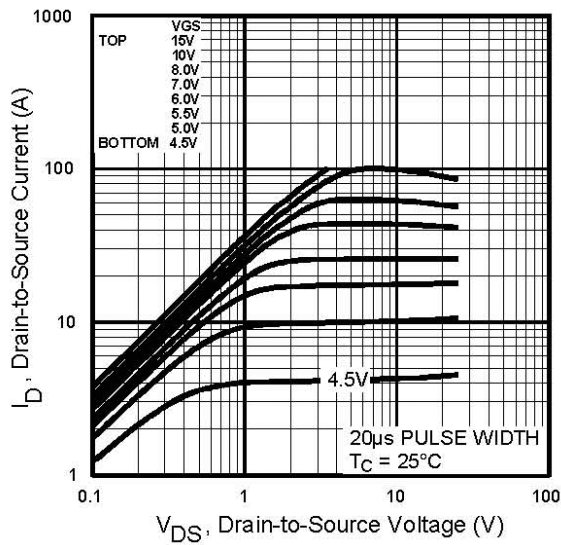


Fig 1. Typical Output Characteristics,
Tc=25

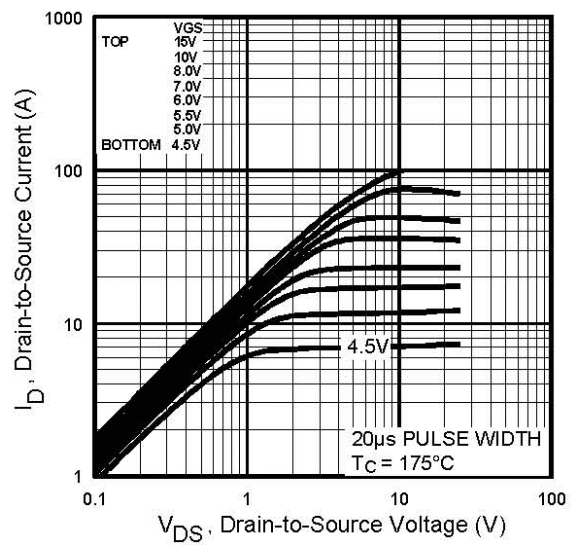


Fig 2. Typical Output Characteristics,
Tc = 175

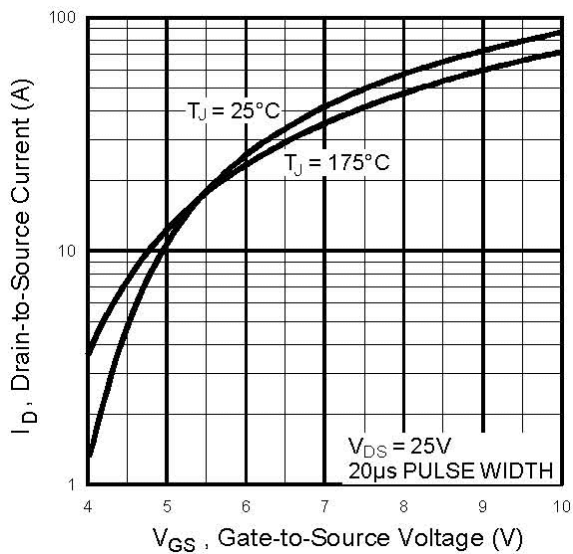


Fig 3. Typical Transfer Characteristics

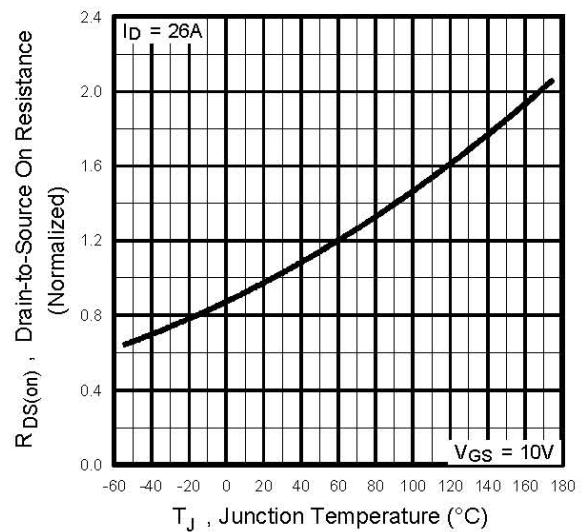
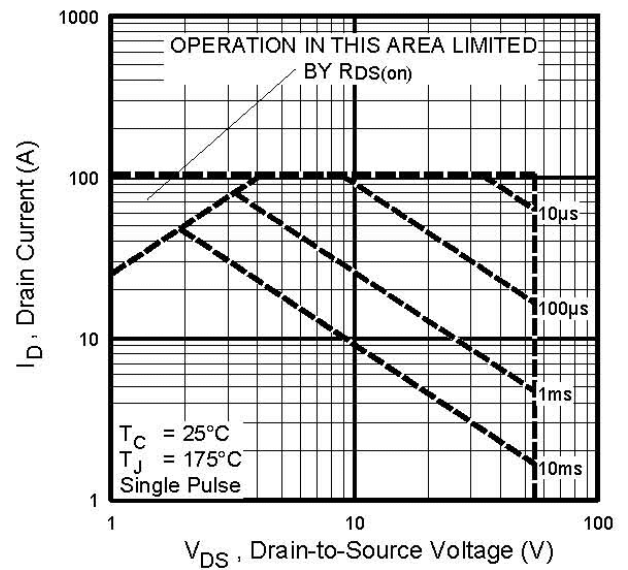
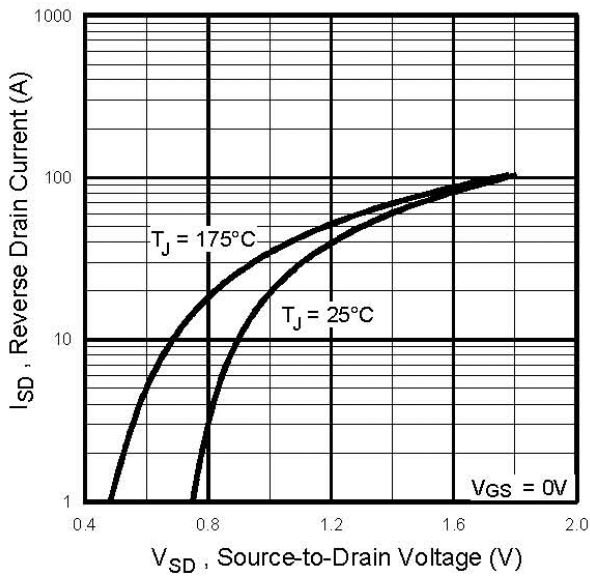
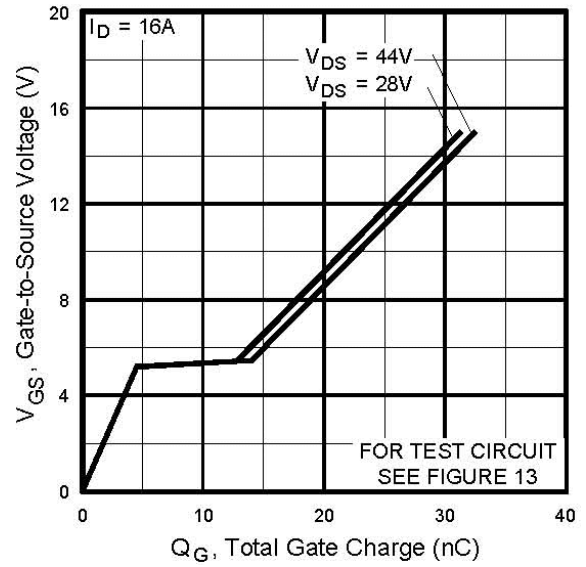
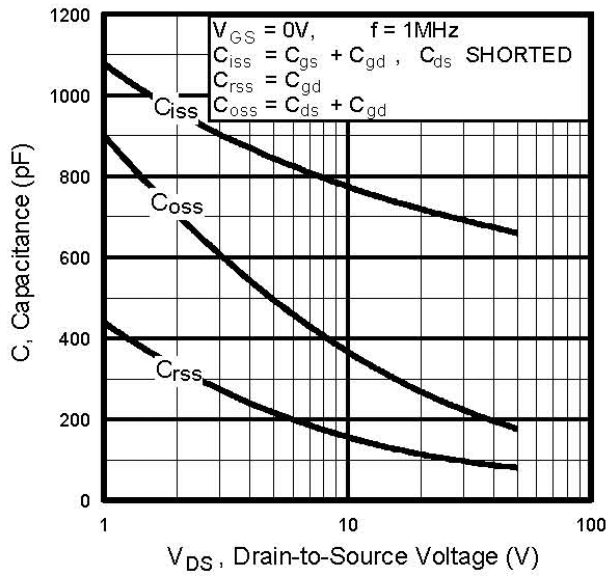


Fig 4. Normalized On-Resistance
Vs. Temperature



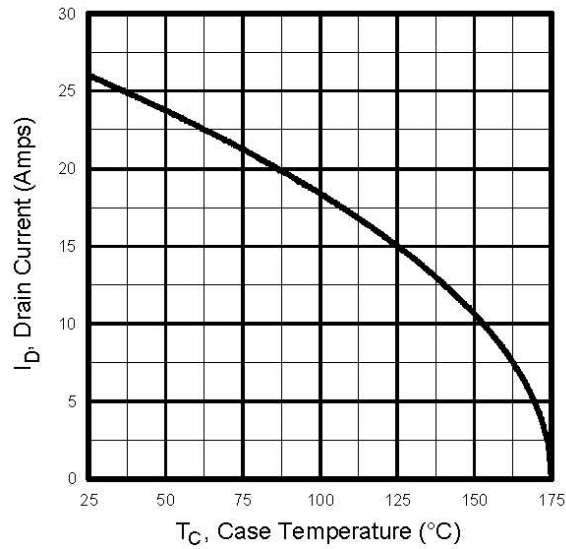


Fig 9. Maximum Drain Current Vs.
Case Temperature

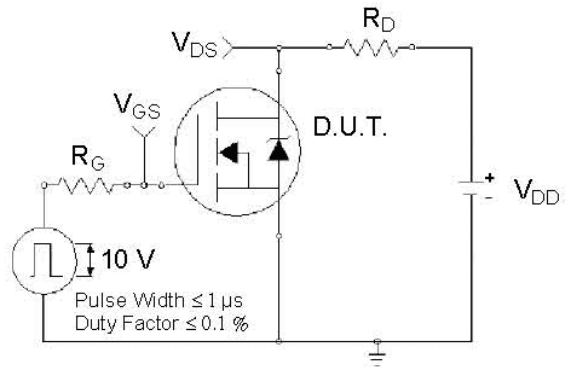


Fig 10a. Switching Time Test Circuit

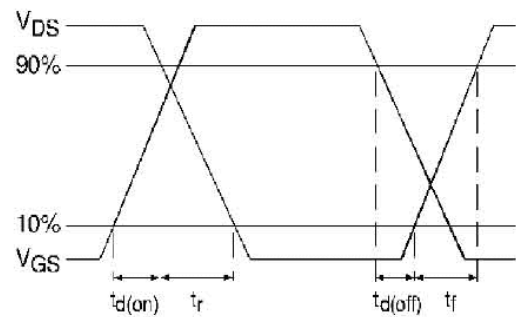


Fig 10b. Switching Time Waveforms

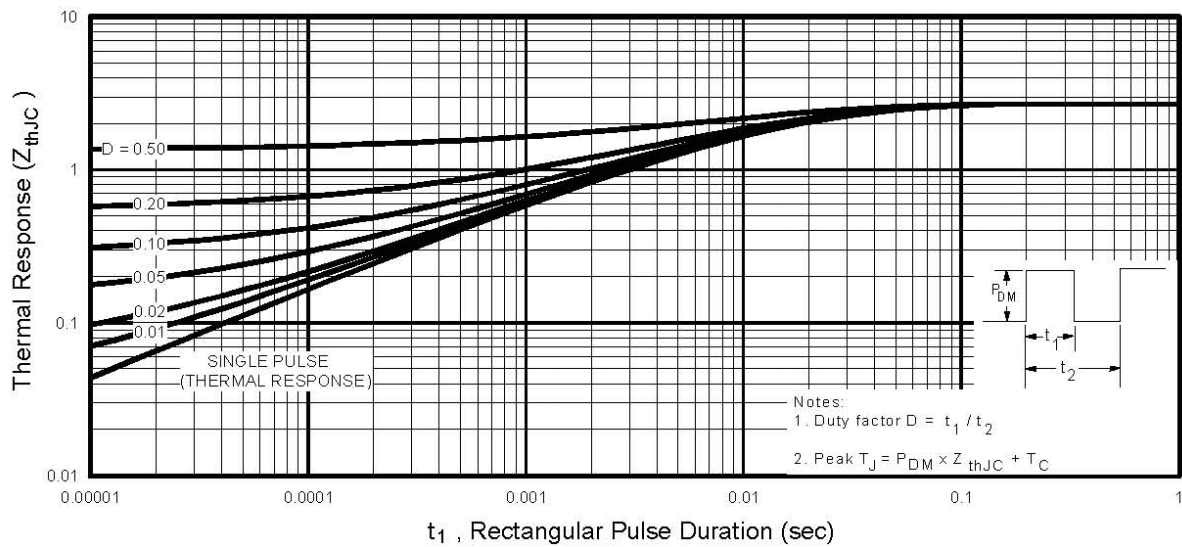


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

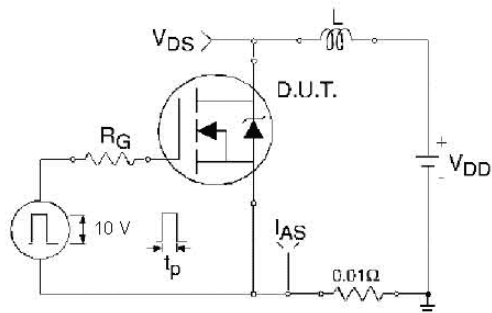


Fig 12a. Unclamped Inductive Test Circuit

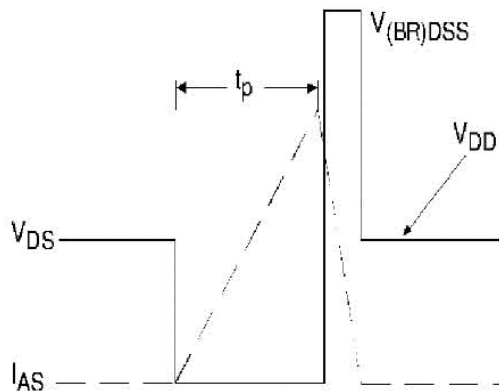


Fig 12b. Unclamped Inductive Waveforms

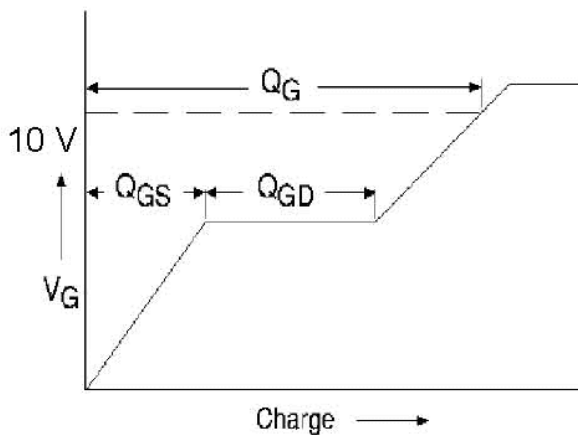


Fig 13a. Basic Gate Charge Waveform

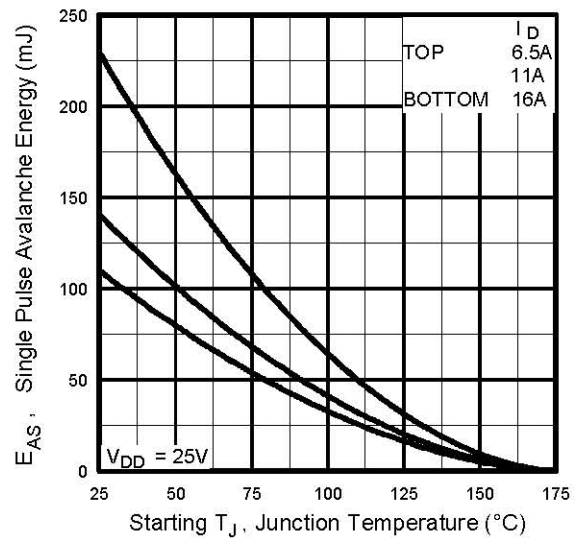


Fig 12c. Maximum Avalanche Energy
Vs. Drain Current

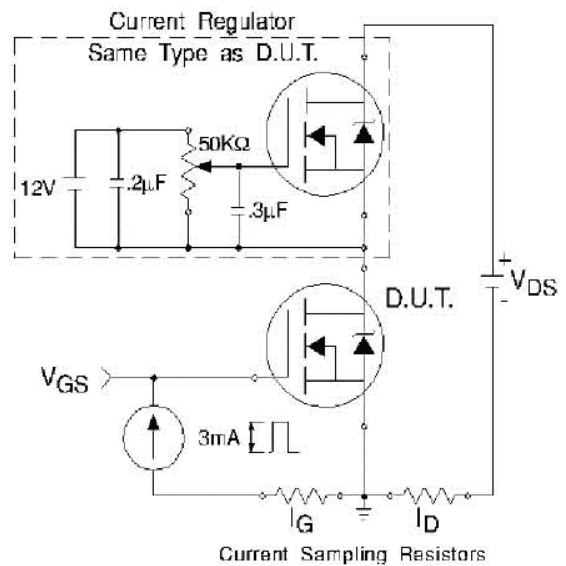


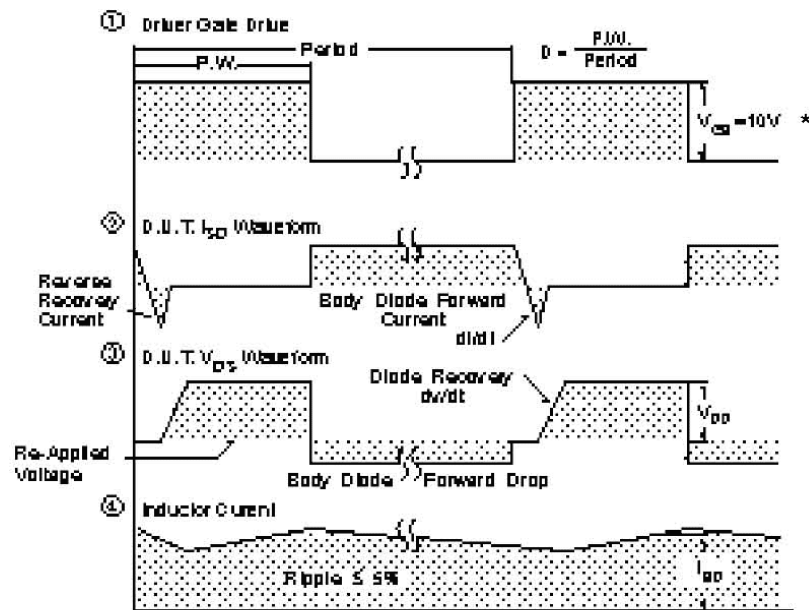
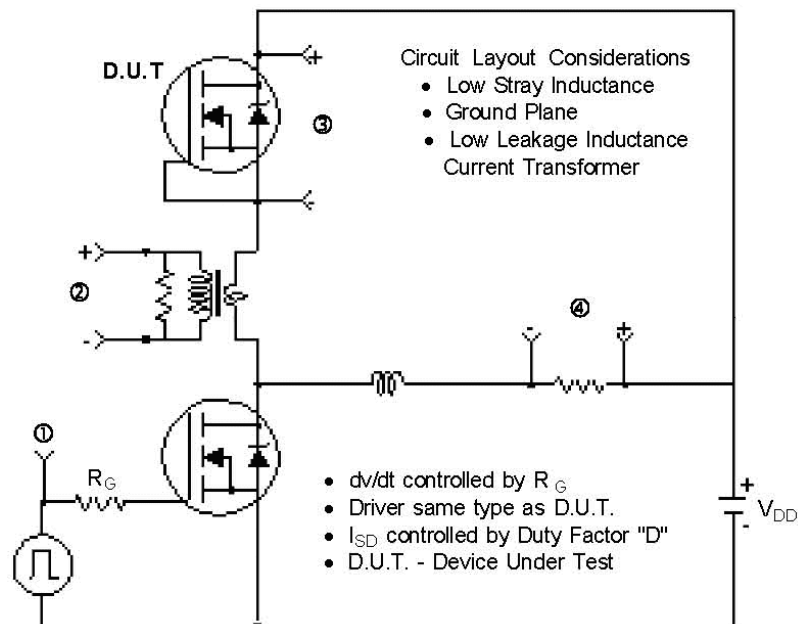
Fig 13b. Gate Charge Test Circuit

Appendix A: Figure 14, Peak Diode Recovery dv/dt Test Circuit

Appendix B: Package Outline Mechanical Drawing

Appendix C: Part Marking Information

Peak Diode Recovery dv/dt Test Circuit

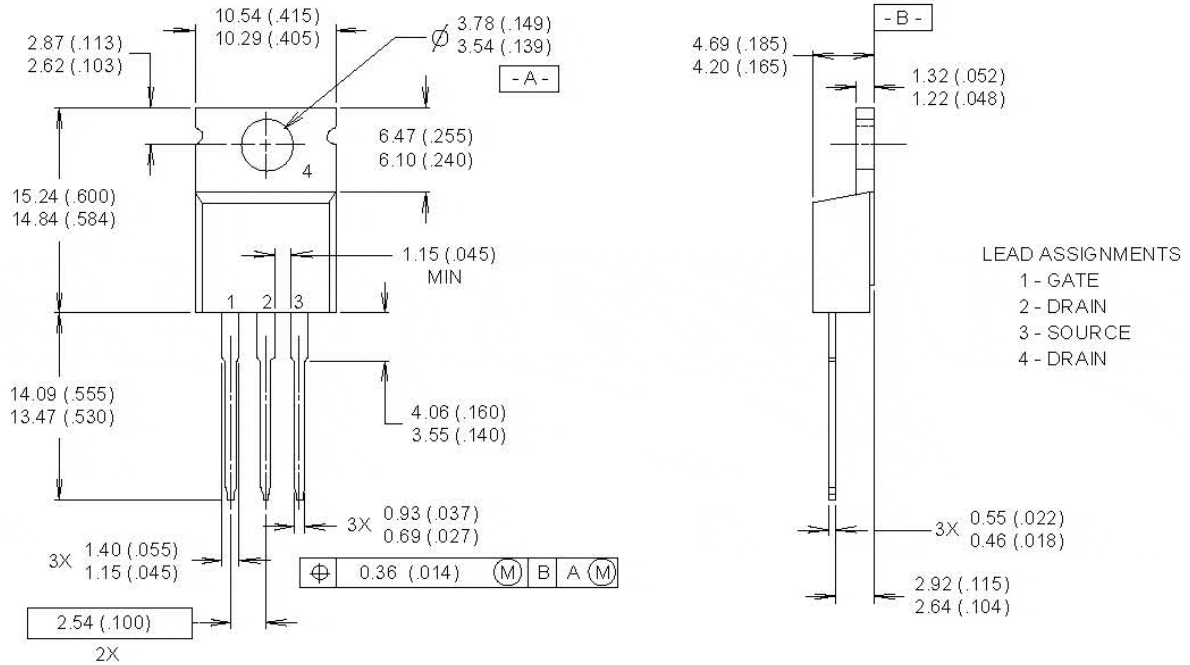


* $V_{GS} = 5V$ for Logic Level Devices

Fig 14. For N-Channel HEXFETS

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.