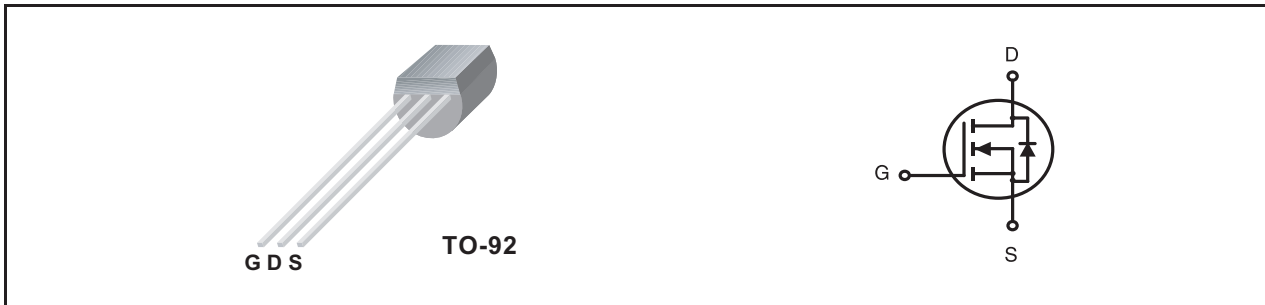


**500V N-Channel Planar MOSFET****PRODUCT SUMMARY**

V _{DSS}	I _D	R _{DS(ON)} (mΩ) Max
500V	0.4A	5.6 @ V _{GS} =10V, I _D =0.2A

FEATURES

- Fast Switching.
- 100% Avalanche Rated.

**ABSOLUTE MAXIMUM RATINGS (T_A=25°C unless otherwise noted)**

Symbol	Parameter	Max.	Units
V _{DSS}	Drain-Source Voltage	500	V
V _{GS}	Gate-Source Voltage	±30	V
I _D	Continuous Drain Current	T _C =25°C	0.4
		T _C =100°C	0.25
I _{DM}	Pulsed Drain Current, V _{GS} =10V ^a	2	A
E _{AS}	Single Pulse Avalanche Energy ^b	40	mJ
dv/dt	Peak Diode Recovery Energy ^c	4.5	V/ns
P _D	Power Dissipation	T _C =25°C	2.08
	Linear Derating Factor	T _C >25°C	0.017
T _J , T _{STG}	Operating and Storage Temperature Range	-55 to 150	°C

THERMAL CHARACTERISTICS

R _{θ JC}	Thermal Resistance, Junction-to-Case	60	°C/W
R _{θ JA}	Thermal Resistance, Junction-to-Ambient	140	°C/W

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ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	500			V
ΔV _{(BR)DSS} / ΔT _J	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I _D =250μA		0.5		V/°C
I _{DSS}	Drain-to-Source Leakage Current	V _{DS} =500V, V _{GS} =0V			20	μA
I _{GSSF}	Gate-Body Leakage Current, Forward	V _{DS} =0V, V _{GS} =30V			100	nA
I _{GSSR}	Gate-Body Leakage Current, Reverse	V _{DS} =0V, V _{GS} =-30V			-100	nA
ON CHARACTERISTICS						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	2.0		4.0	V
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =0.2A ^d			5.6	ohm
g _{FS}	Forward Transconductance	V _{DS} =15V, I _D =0.2A ^d			10	S
DYNAMIC CHARACTERISTICS						
C _{ISS}	Input Capacitance	V _{DS} =25V, V _{GS} =0V f=1.0MHz		150		pF
C _{OSS}	Output Capacitance			28		pF
C _{RSS}	Reverse Transfer Capacitance			4.1		pF
SWITCHING CHARACTERISTICS						
t _{D(on)}	Turn-On Delay Time	V _{DD} =250V I _D =1A R _G =10 ohm, R _D =280 ohm V _{GS} =10V ^d		10		ns
t _r	Turn-On Rise Time			10		ns
t _{D(off)}	Turn-Off Delay Time			20		ns
t _f	Turn-Off Fall Time			15		ns
Q _g	Total Gate Charge	V _{DS} =250V, I _D =1A, V _{GS} =10V ^d		4.9		nC
Q _{gs}	Gate-Source Charge			0.66		nC
Q _{gd}	Gate-Drain("Miller") Charge			2.9		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
I _S	Maximum Continuous Source Current(Body Diode)				0.4	A
I _{SM}	Maximum Pulsed Source Current(Body Diode)				2	A
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} =0V, I _S =0.4A ^d			1.5	V
Notes :						
a. Repetitive Rating : Pulse width limited by maximum junction temperature.						
b. V _{DD} =50V, starting T _J =25°C, L=80mH, R _G =25Ω, I _{AS} =1A						
c. I _{SD} ≤ 1.2A, di/dt ≤ 100A/μs, V _{DD} ≤ V _{(BR)DSS} , T _J ≤ 150°C						
d. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.						

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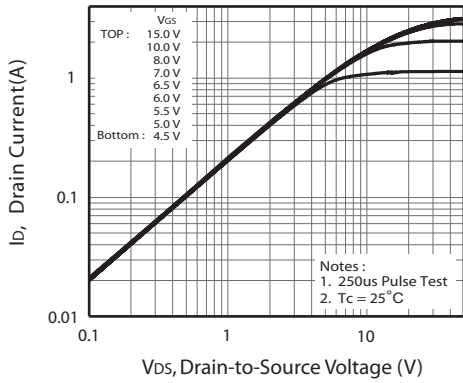


Figure 1. Output Characteristics

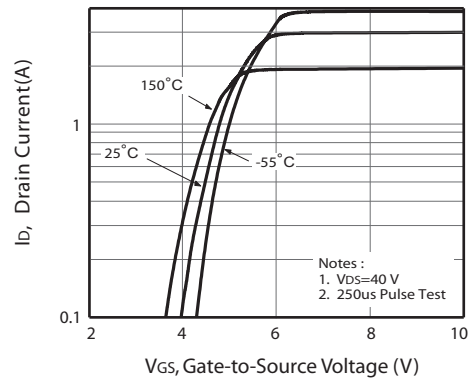


Figure 2. Transfer Characteristics

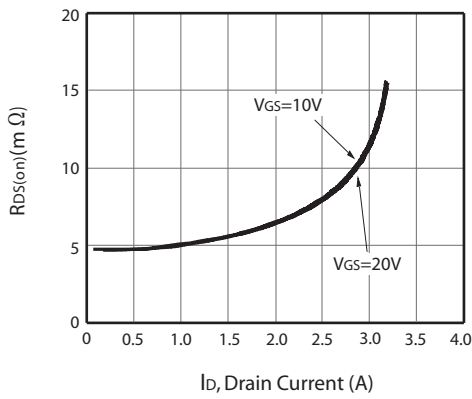


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

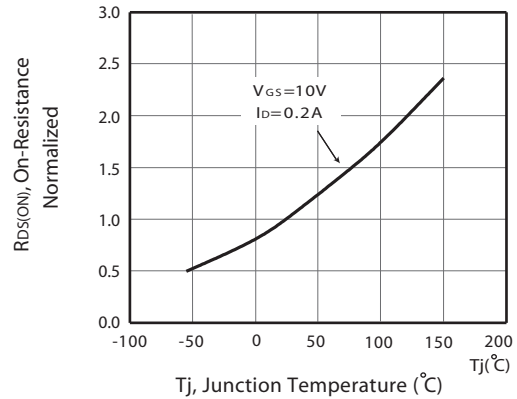


Figure 4. On-Resistance Variation with Drain Current and Temperature

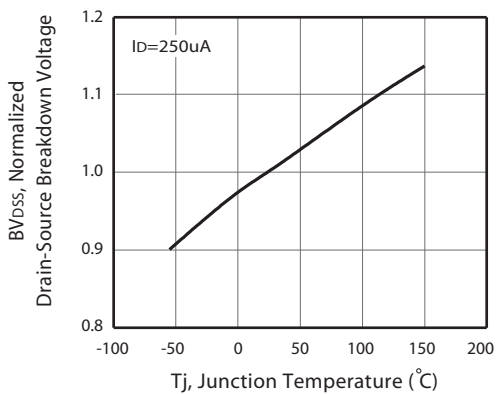


Figure 5. Breakdown Voltage Variation with Temperature

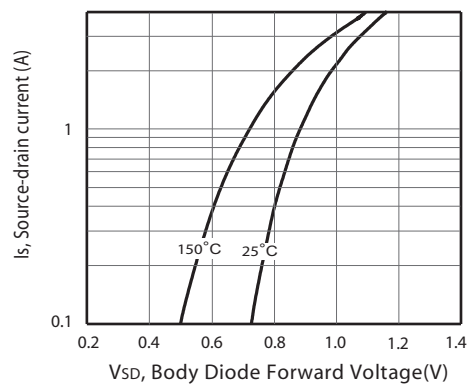
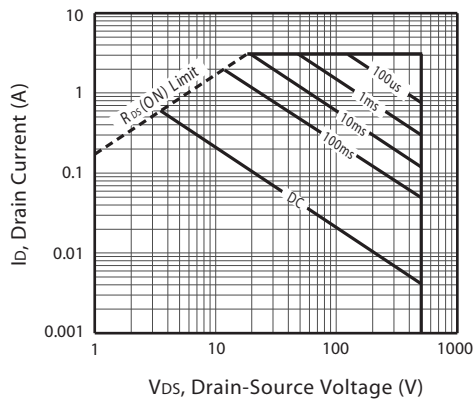
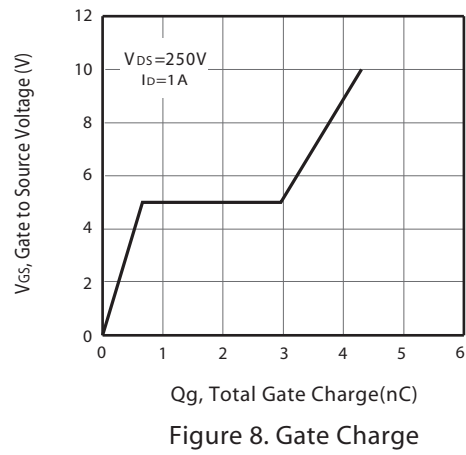
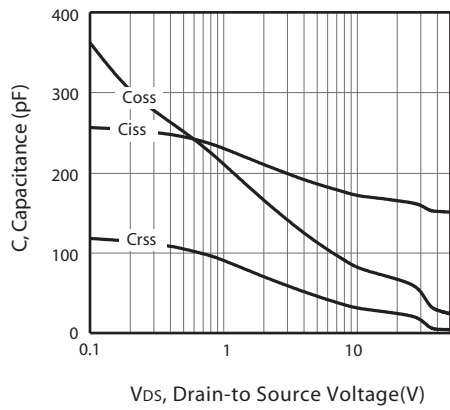


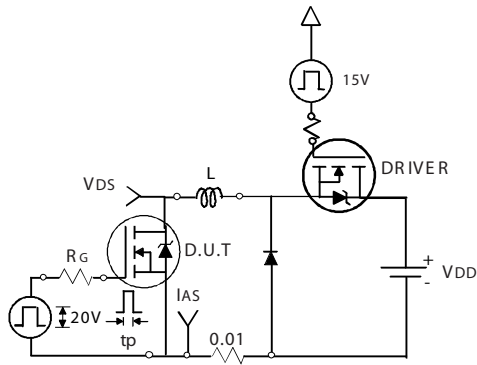
Figure 6. Body Diode Forward Voltage Variation with Source Current

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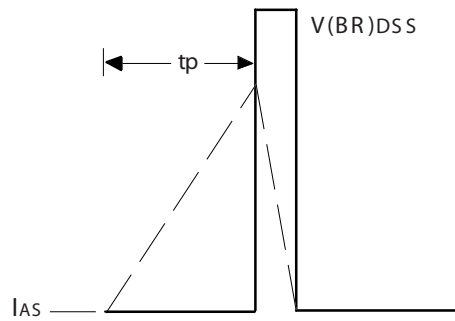


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Unclamped Inductive Test Circuit

Figure 10a.



Unclamped Inductive Waveforms

Figure 10b.

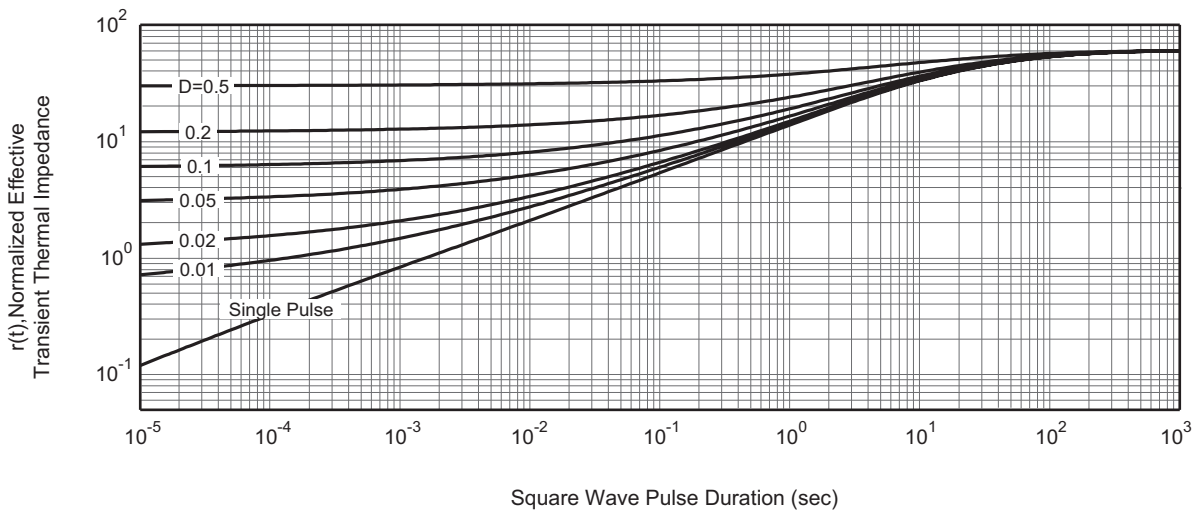


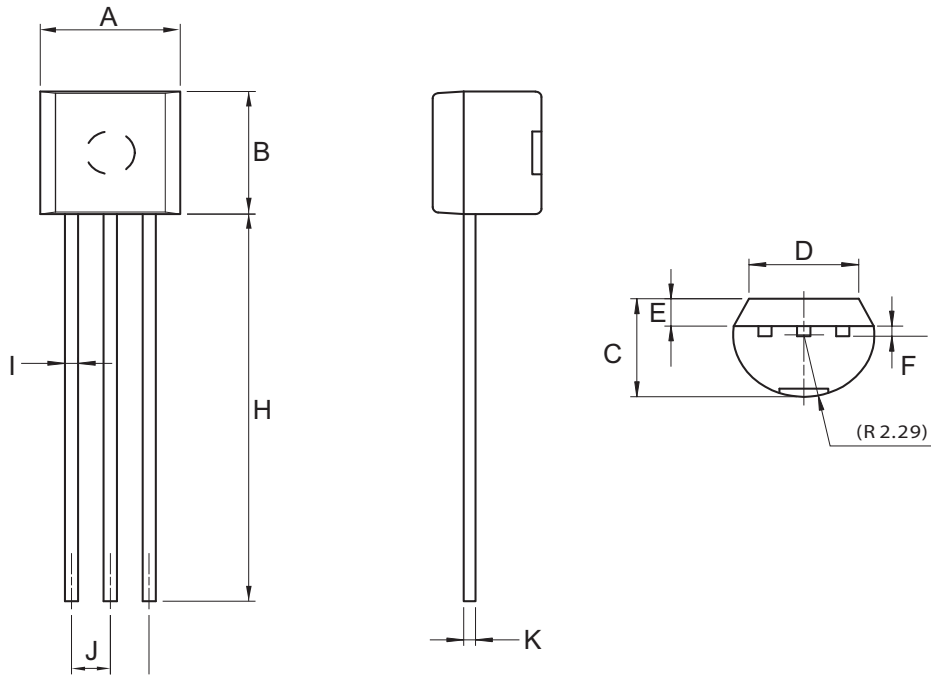
Figure 11 Normalized Thermal Transient Impedance Curve

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PACKAGE OUTLINE DIMENSIONS

TO-92



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.43	4.83	0.174	0.190
B	4.38	4.78	0.172	0.188
C	---	3.86	---	0.152
D	3.40	3.80	0.134	0.150
E	0.92	1.12	0.036	0.044
F	0.33	0.43	0.013	0.017
H	14.07	14.87	0.554	0.585
I	0.36	0.56	0.014	0.022
J	1.07	1.47	0.042	0.058
K	0.33	0.48	0.013	0.019

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