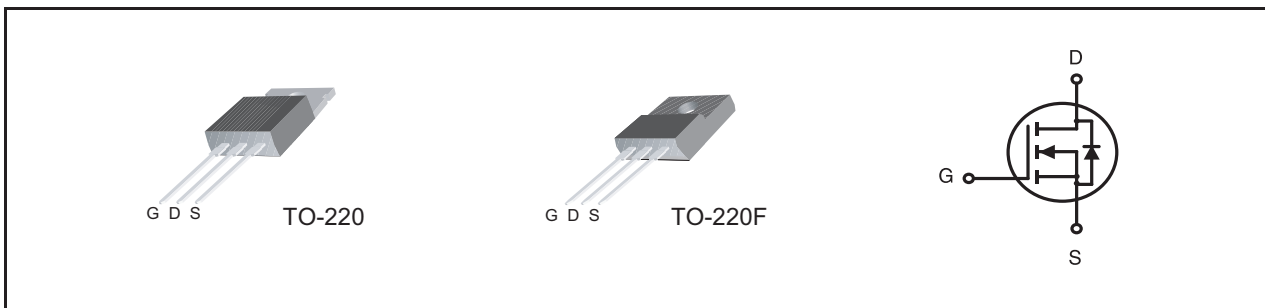


**500V N-Channel Planar MOSFET****PRODUCT SUMMARY**

V _{DSS}	I _D	R _{DS(ON)} (mΩ) Max
500V	8A	0.85 @ V _{GS} =10V, I _D =4A

FEATURES

- Fast Switching.
- 100% Avalanche Rated.

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

Symbol	Parameter	SDP840	SDF840	Units	
V _{DSS}	Drain-Source Voltage	500		V	
V _{GS}	Gate-Source Voltage	±30		V	
I _D	Continuous Drain Current	T _C =25°C	8	8 *	A
		T _C =100°C	5.1	5.1 *	A
I _{DM}	Pulsed Drain Current, V _{GS} =10V ^a	32	32 *	A	
E _{AS}	Single Pulse Avalanche Energy ^b	350		mJ	
dv/dt	Peak Diode Recovery Energy ^c	4.5		V/ns	
P _D	Power Dissipation	T _C =25°C	125	42	W
	Linear Derating Factor	T _C >25°C	1	0.33	W/°C
T _J , T _{STG}	Operating and Storage Temperature Range	-55 to 150		°C	

* Drain current limited by maximum junction temperature

THERMAL CHARACTERISTICS

Symbol	Parameter	SDP840	SDF840	Units
R _{θ JC}	Thermal Resistance, Junction-to-Case	1	3	°C/W
R _{θ JA}	Thermal Resistance, Junction-to-Ambient	62.5	62.5	°C/W

SDP/F840

Preliminary

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 =250uA	500			V
ΔV _{(BR)DSS} / ΔT _J	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I _D =250uA		0.5		V/°C
I _{DSS}	Drain-to-Source Leakage Current	V _{DS} =500V, V _{GS} =0V			20	uA
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 =250uA	2.0		4.0	V
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =4A ^d			0.85	ohm
g _{FS}	Forward Transconductance	V _{DS} =15V, I _D =4A ^d			15	S
DYNAMIC CHARACTERISTICS						
C _{ISS}	Input Capacitance	V _{DS} =25V, V _{GS} =0V f=1.0MHz		880		pF
C _{OSS}	Output Capacitance			120		pF
C _{RSS}	Reverse Transfer Capacitance			10		pF
SWITCHING CHARACTERISTICS						
t _{D(on)}	Turn-On Delay Time	V _{DD} =250V I _D =8A R _G =10 ohm, R _D =31.3 ohm V _{GS} =10V ^d		20		ns
t _r	Turn-On Rise Time			40		ns
t _{D(off)}	Turn-Off Delay Time			45		ns
t _f	Turn-Off Fall Time			30		ns
Q _g	Total Gate Charge	V _{DS} =250V, I _D =8A, V _{GS} =10V ^d		18		nC
Q _{gs}	Gate-Source Charge			5		nC
Q _{gd}	Gate-Drain("Miller") Charge			7.5		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
I _S	Maximum Continuous Source Current(Body Diode)				8	A
I _{SM}	Maximum Pulsed Source Current(Body Diode)				32	A
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} =0V, I _S =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=10.9mH, R _G =25Ω, I _{AS} =8A						
c. I _{SD} ≤ 8A, di/dt ≤ 100A/us, V _{DD} ≤ V _{(BR)DSS} , T _J ≤ 150°C						
d. Pulse Test : Pulse width ≤ 300us, Duty cycle ≤ 2%.						

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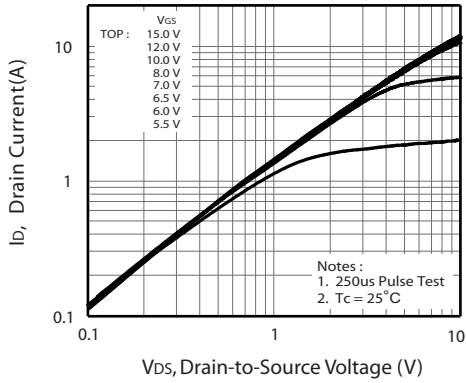


Figure 1. Output Characteristics

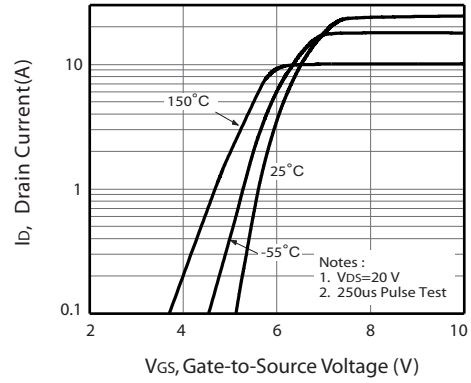


Figure 2. Transfer Characteristics

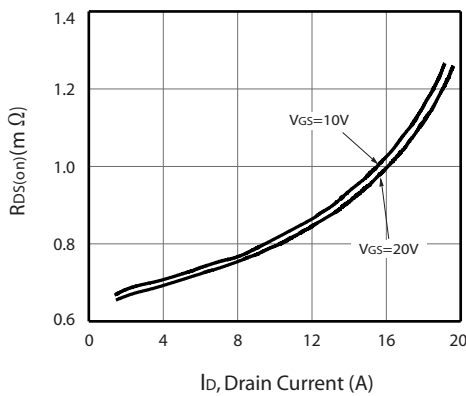


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

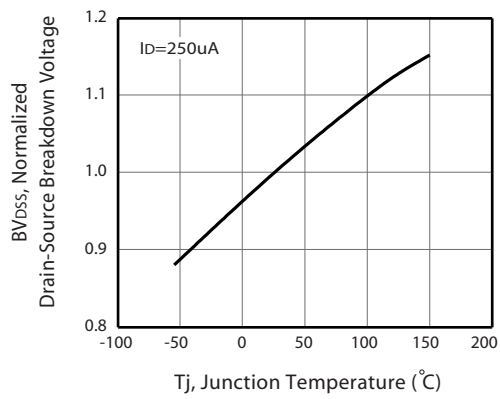


Figure 4. Breakdown Voltage Variation with Temperature

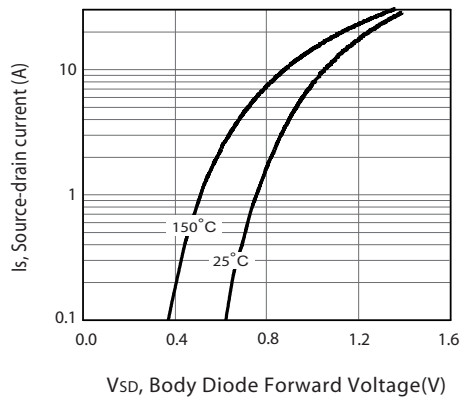


Figure 5. Body Diode Forward Voltage Variation with Source Current

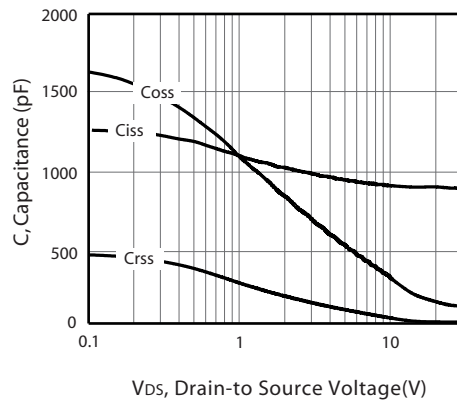


Figure 6. Capacitance

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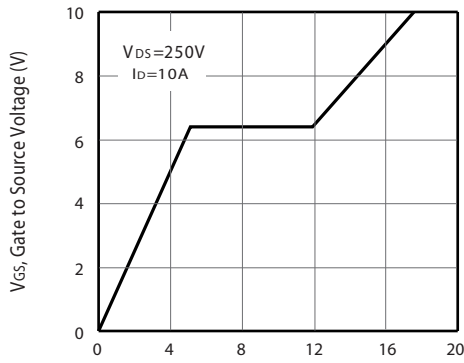


Figure 7. Gate Charge

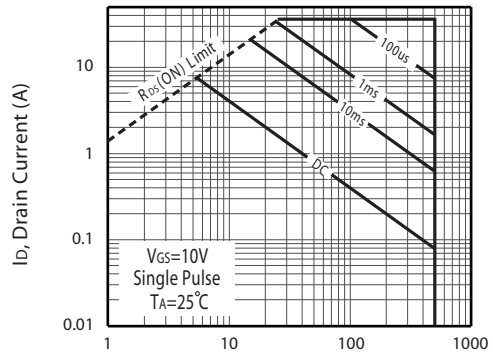


Figure 8. Maximum Safe Operating Area

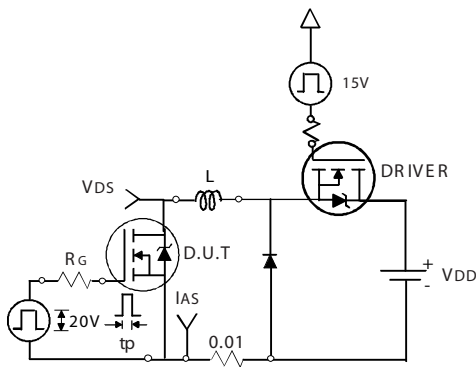


Figure 9a. Unclamped Inductive Test Circuit

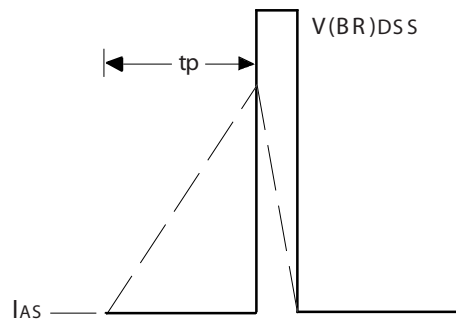


Figure 9b. Unclamped Inductive Waveforms

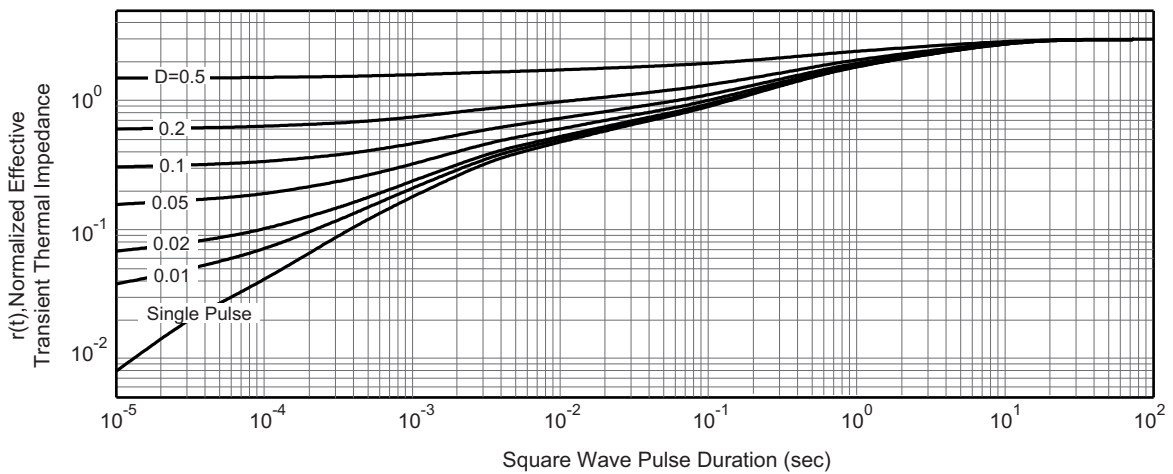
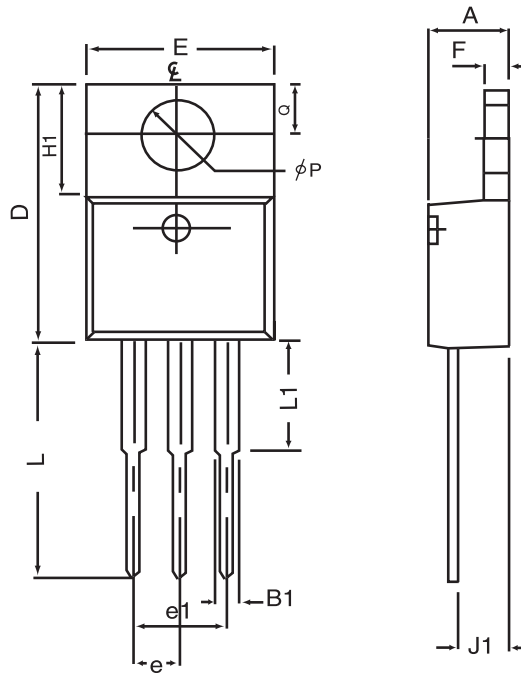


Figure 10. Normalized Thermal Transient Impedance Curve for SDP840

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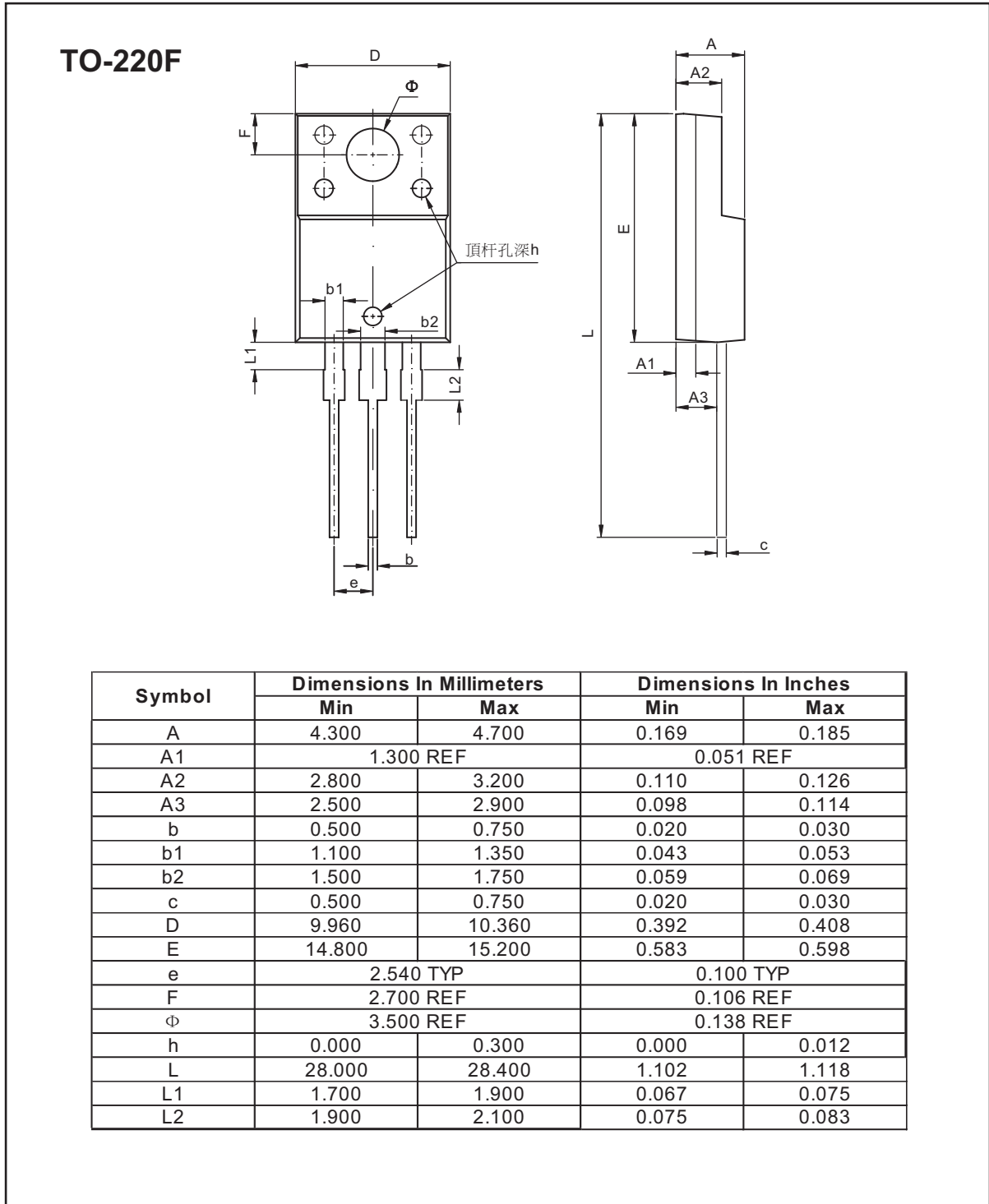
PACKAGE OUTLINE DIMENSIONS

TO-220



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.32	4.80	0.170	0.189
B1	1.27	1.65	0.050	0.630
D	14.6	16.00	0.575	0.610
E	9.70	10.41	0.382	0.410
e	2.34	2.74	0.092	0.108
e1	4.68	5.48	0.184	0.216
F	1.14	1.40	0.045	0.055
H1	5.97	6.73	0.235	0.265
J1	2.20	2.79	0.087	0.110
L	12.88	14.22	0.507	0.560
L1	3.00	6.35	0.120	0.250
phi P	3.50	3.94	0.138	0.155
Q	2.54	3.05	0.100	0.120

PACKAGE OUTLINE DIMENSIONS



TO-220/220F Tube

