



N-Channel Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY

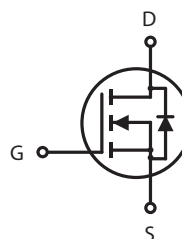
V _{DSS}	I _D	R _{DS(ON)} (mΩ) Typ
100V	40A	20 @ V _{GS} =10V

FEATURES

- Super high dense cell design for low R_{DS(ON)}.
- Rugged and reliable.
- TO-220F Package.



STF SERIES
TO-220F



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

Symbol	Parameter		Limit	Units
V _{DS}	Drain-Source Voltage		100	V
V _{GS}	Gate-Source Voltage		±20	V
I _D	Drain Current-Continuous ^a	T _C =25°C	40	A
		T _C =70°C	32	A
I _{DM}	-Pulsed ^b		118	A
E _{AS}	Avalanche Energy ^d		560	mJ
P _D	Maximum Power Dissipation ^a	T _C =25°C	62.5	W
		T _C =70°C	40	W
T _J , T _{STG}	Operating Junction and Storage Temperature Range		-55 to 150	°C

THERMAL CHARACTERISTICS

R _{θJC}	Thermal Resistance, Junction-to-Case ^a	2	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient ^a	50	°C/W

STP45L01F

Ver1.0

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V , I _D =250uA	100			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =80V , V _{GS} =0V			1	uA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±20V , V _{DS} =0V			±100	nA
ON CHARACTERISTICS						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	2	2.9	4	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V , I _D =20A		20	25	m ohm
g _{FS}	Forward Transconductance	V _{DS} =10V , I _D =20A		24		S
DYNAMIC CHARACTERISTICS °						
C _{ISS}	Input Capacitance	V _{DS} =25V,V _{GS} =0V f=1.0MHz		3200		pF
C _{OSS}	Output Capacitance			241		pF
C _{RSS}	Reverse Transfer Capacitance			176		pF
SWITCHING CHARACTERISTICS °						
t _{d(ON)}	Turn-On Delay Time	V _{DD} =50V I _D =1A V _{GS} =10V R _{GEN} = 6 ohm		81		ns
t _r	Rise Time			74		ns
t _{d(OFF)}	Turn-Off Delay Time			67		ns
t _f	Fall Time			39		ns
Q _g	Total Gate Charge	V _{DS} =50V,I _D =20A,V _{GS} =10V		40		nC
Q _{gs}	Gate-Source Charge	V _{DS} =50V,I _D =20A, V _{GS} =10V		8		nC
Q _{gd}	Gate-Drain Charge			10.2		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V _{SD}	Diode Forward Voltage	V _{GS} =0V,I _S =7A		0.78	1.3	V
Notes						
a.Surface Mounted on FR4 Board,t ≤ 10sec.						
b.Pulse Test:Pulse Width ≤ 300us, Duty Cycle ≤ 2%.						
c.Guaranteed by design, not subject to production testing.						
d.Starting T _J =25°C,L=5mH,V _{DD} = 80V.(See Figure13)						

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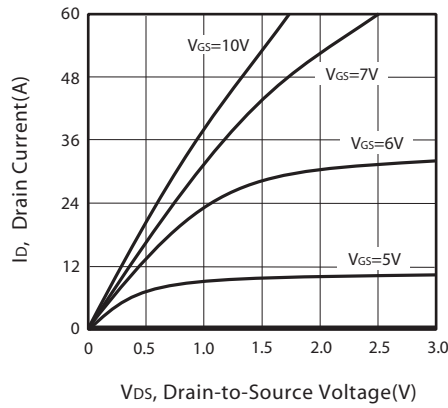


Figure 1. Output Characteristics

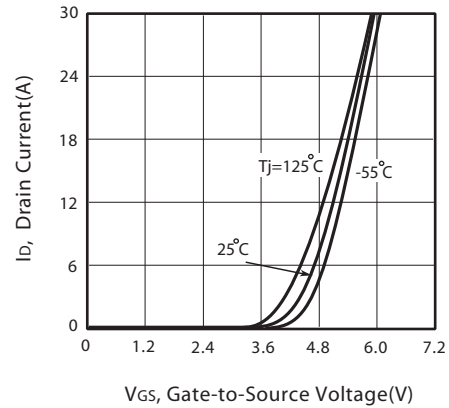


Figure 2. Transfer Characteristics

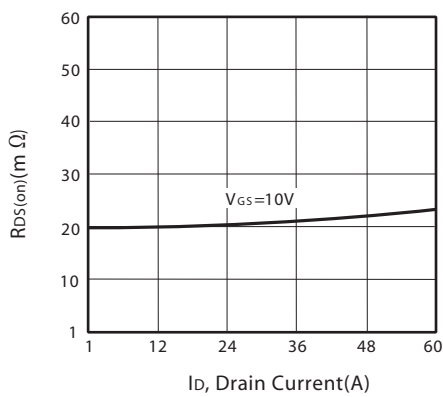


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

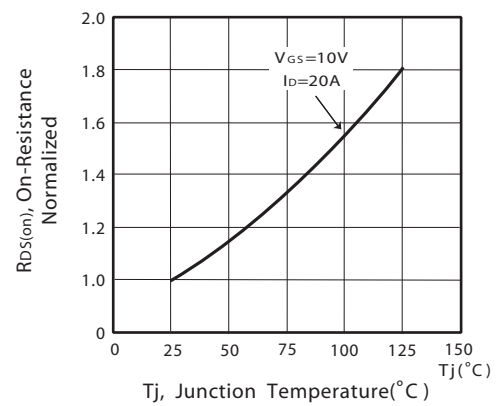


Figure 4. On-Resistance Variation with Drain Current and Temperature

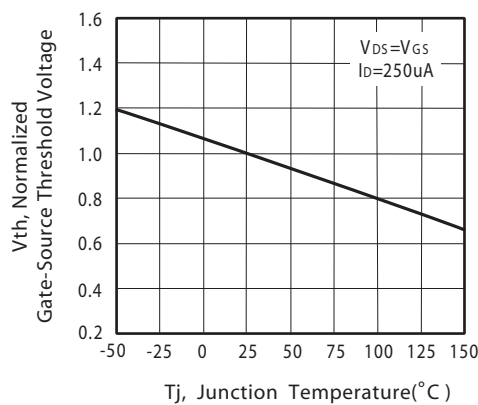


Figure 5. Gate Threshold Variation with Temperature

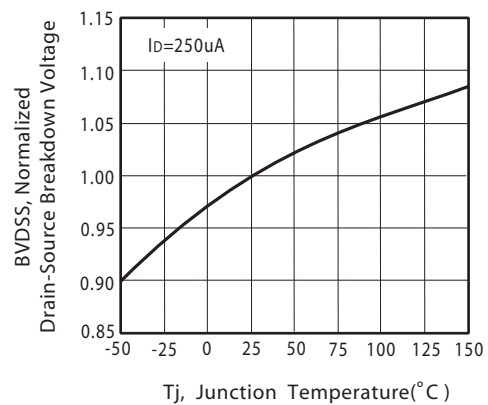


Figure 6. Breakdown Voltage Variation with Temperature

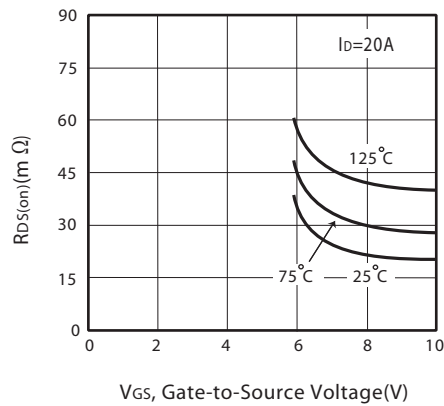


Figure 7. On-Resistance vs. Gate-Source Voltage

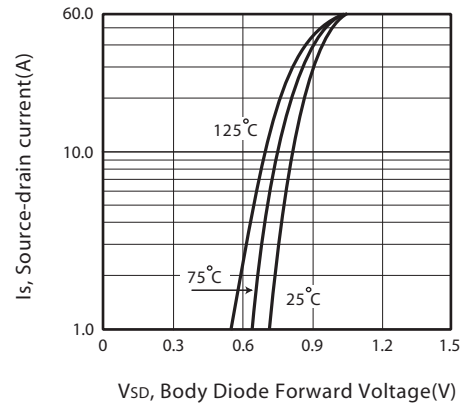


Figure 8. Body Diode Forward Voltage Variation with Source Current

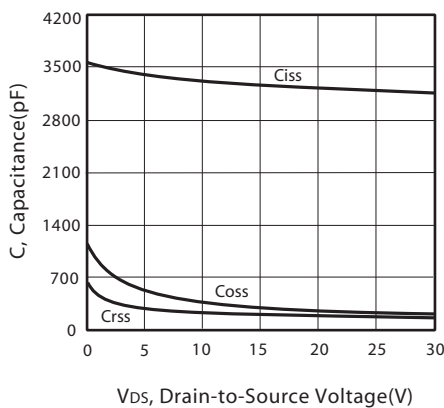


Figure 9. Capacitance

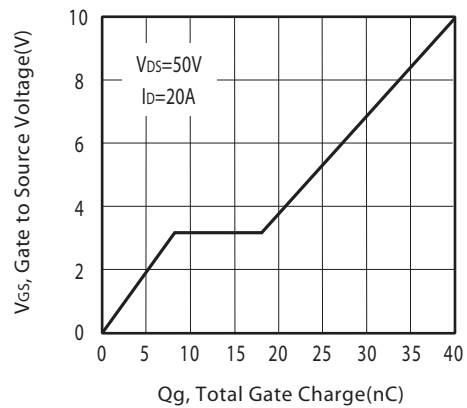


Figure 10. Gate Charge

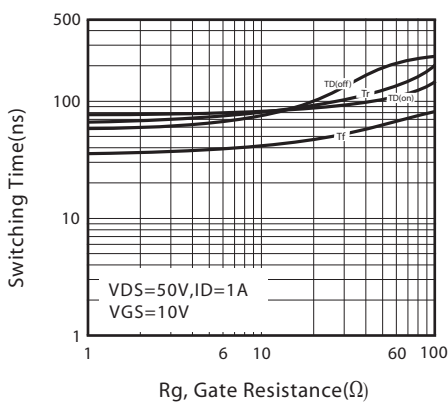


Figure 11. switching characteristics

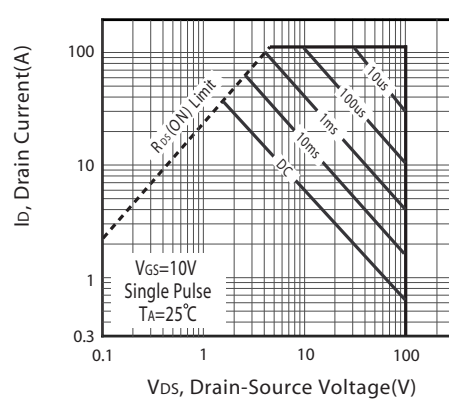
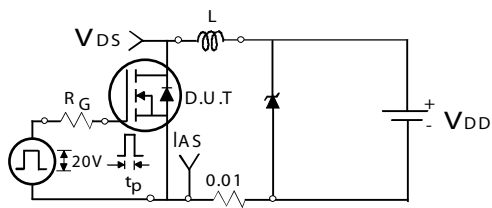
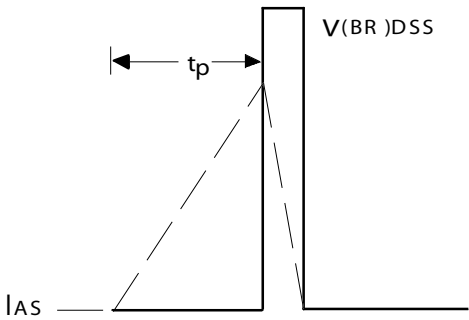


Figure 12. Maximum Safe Operating Area



Unclamped Inductive Test Circuit

Figure 13a.



Unclamped Inductive Waveforms

Figure 13b.

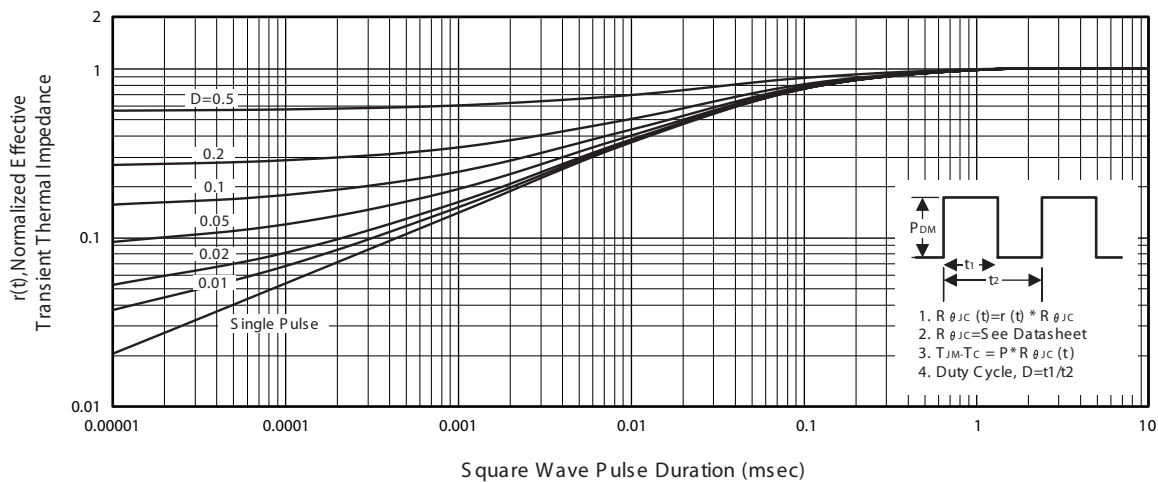
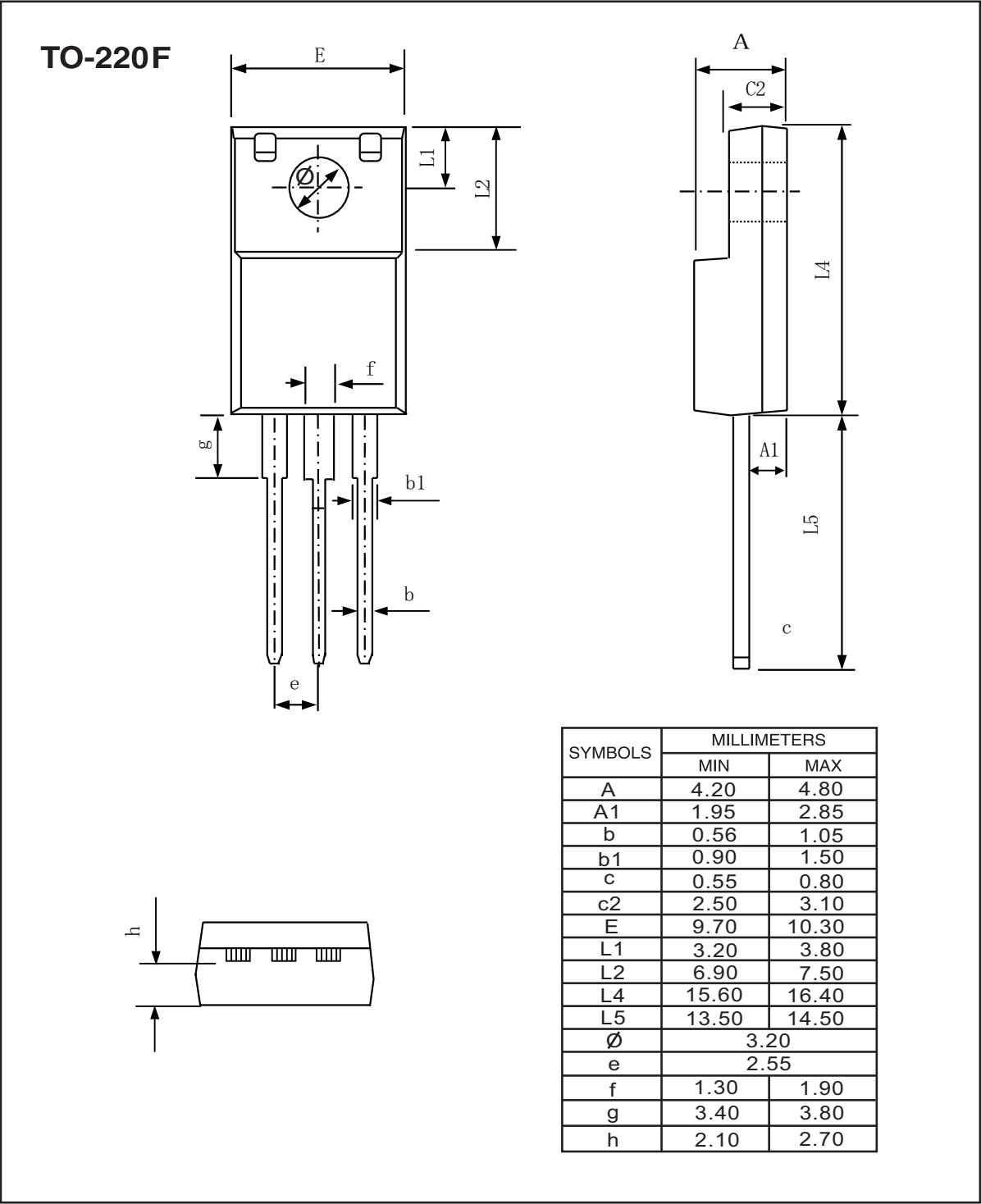


Figure 14. Normalized Thermal Transient Impedance Curve

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PACKAGE OUTLINE DIMENSIONS

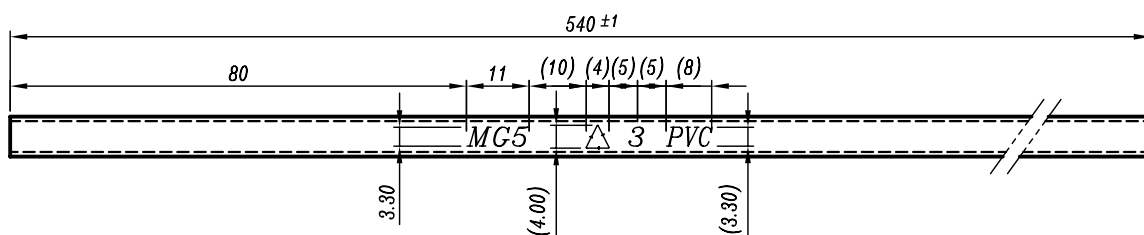


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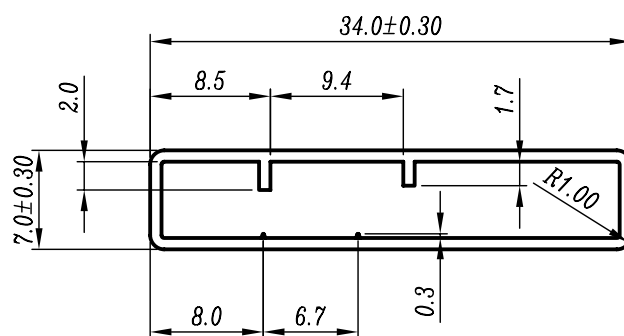
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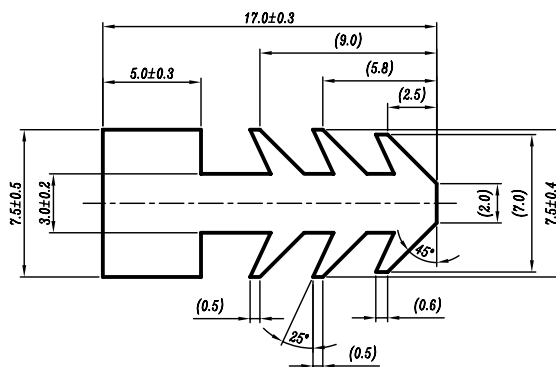
TO-220F Tube



$$t = 0.8 \pm 0.15$$



$$SCALE = 2/1$$



$$L = 8.0 \pm 0.5$$

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