SamHop Microelectronics Corp.

SDF07N50T

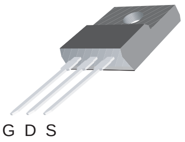
Ver 2.1

N-Channel Enhancement Mode Field Effect Transistor

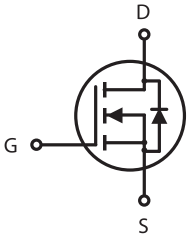
PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (Ω) Typ
500V	7A	1.2 @ VGS=10V

FEATURES

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



SDF SERIES
TO-220F



ORDERING INFORMATION

Ordering Code	Package	Marking Code	Delivery Mode	RoHS Status
SDF07N50PT	TO-220F	07N50T	Tube	Pb Free

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

Symbol	Parameter		Limit	Units
V_{DS}	Drain-Source Voltage		500	V
V_{GS}	Gate-Source Voltage		±30	V
I_D	Drain Current-Continuous [a]	T_C=25°C	7.0	A
		T_C=100°C	4.9	A
I_{DM}	-Pulsed [a]		20	A
E_{AS}	Single Pulse Avalanche Energy [c]		225	mJ
P_D	Maximum Power Dissipation	T_C=25°C	31	W
		T_C=100°C	16	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range		-55 to 175	°C

THERMAL CHARACTERISTICS

$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	4.8	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62.5	°C/W

ELECTRICAL CHARACTERISTICS (T_C=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	500			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=400V , V_{GS}=0V			1	uA
I_{GSS}	Gate-Body Leakage Current	V_{GS}= ±30V , V_{DS}=0V			±100	nA
ON CHARACTERISTICS						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_D=250uA	2	3	4	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V , I_D=3.5A		1.2	1.5	ohm
g_{FS}	Forward Transconductance	V_{DS}=20V , I_D=3.5A		4.2		S
DYNAMIC CHARACTERISTICS [c]						
C_{ISS}	Input Capacitance	V_{DS}=25V,V_{GS}=0V f=1.0MHz		581		pF
C_{OSS}	Output Capacitance			65		pF
C_{RSS}	Reverse Transfer Capacitance			9		pF
SWITCHING CHARACTERISTICS [c]						
$t_{D(ON)}$	Turn-On Delay Time	V_{DD}=250V I_D=1A V_{GS}=10V R_{GEN}=25 ohm		27		ns
t_r	Rise Time			17		ns
$t_{D(OFF)}$	Turn-Off Delay Time			34		ns
t_f	Fall Time			10		ns
Q_g	Total Gate Charge	V_{DS}=250V,I_D=1A,V_{GS}=10V		7		nC
Q_{gs}	Gate-Source Charge	V_{DS}=250V,I_D=1A, V_{GS}=10V		1.8		nC
Q_{gd}	Gate-Drain Charge			2.8		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
V_{SD}	Diode Forward Voltage	V_{GS}=0V,I_S=2A		0.79	1.4	V

Notes

a.Drain current limited by maximum junction temperatrue.

b.Guaranteed by design, not subject to production testing.

c.Starting T_J=25°C,L=50mH,V_{DD} = 50V.(See Figure12)

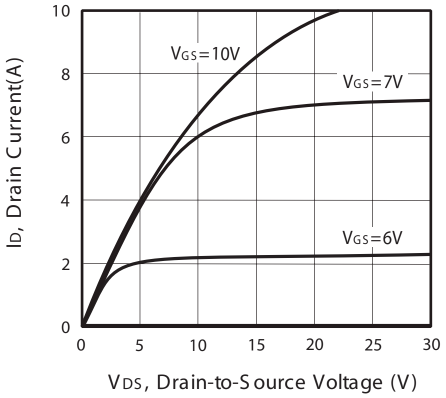


Figure 1. Output Characteristics

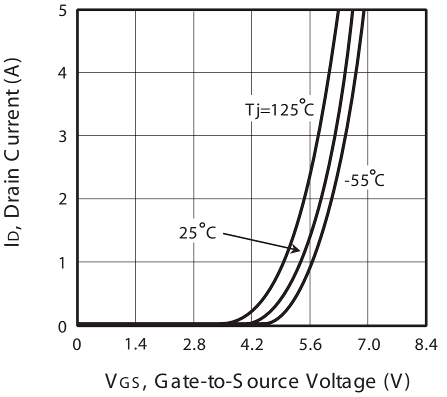


Figure 2. Transfer Characteristics

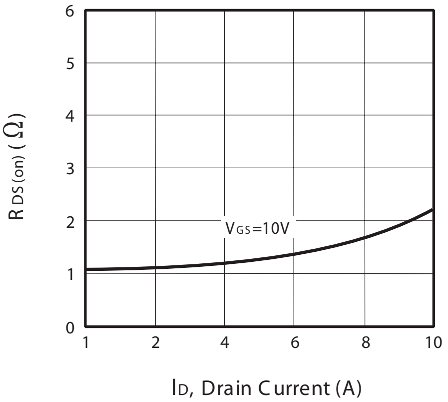


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

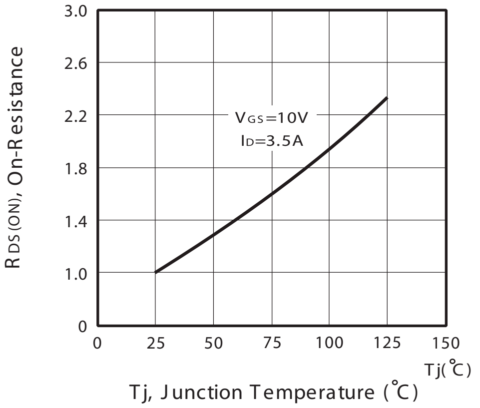


Figure 4. On-Resistance Variation with Drain Current and Temperature

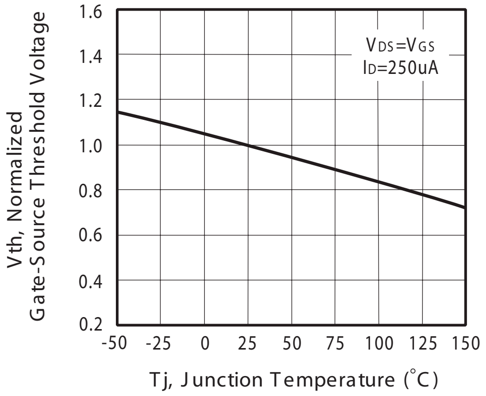


Figure 5. Gate Threshold Variation with Temperature

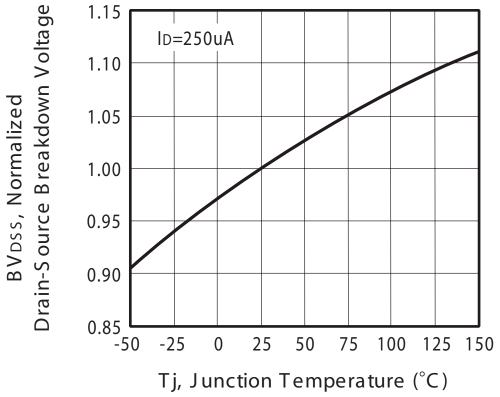


Figure 6. Breakdown Voltage Variation with Temperature

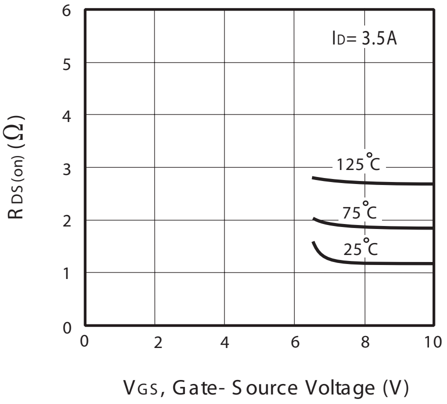


Figure 7. On-Resistance vs. Gate-Source Voltage

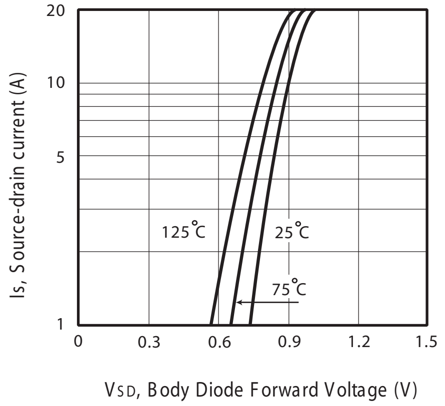


Figure 8. Body Diode Forward Voltage Variation with Source Current

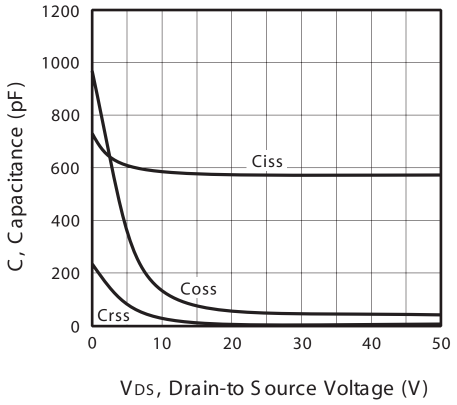


Figure 9. Capacitance

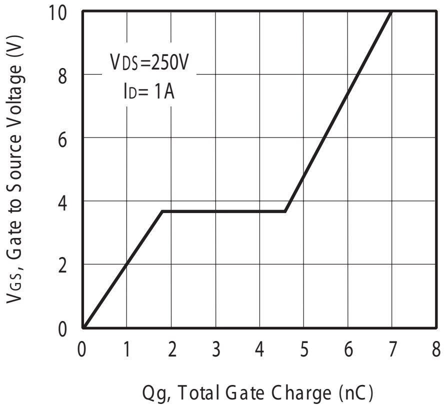


Figure 10. Gate Charge

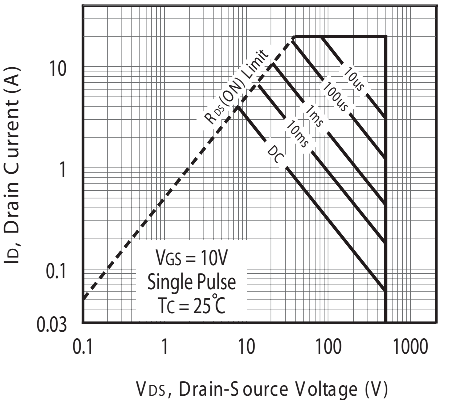
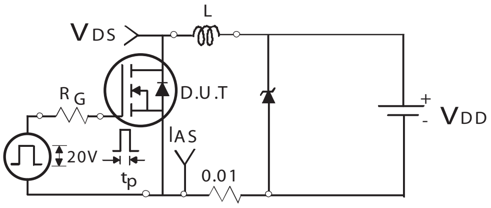
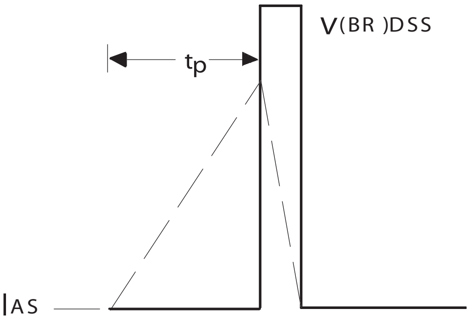


Figure 11a. Maximum Safe Operating Area for SDF07N50T



Unclamped Inductive Test Circuit

Figure 12a.



Unclamped Inductive Waveforms

Figure 12b.

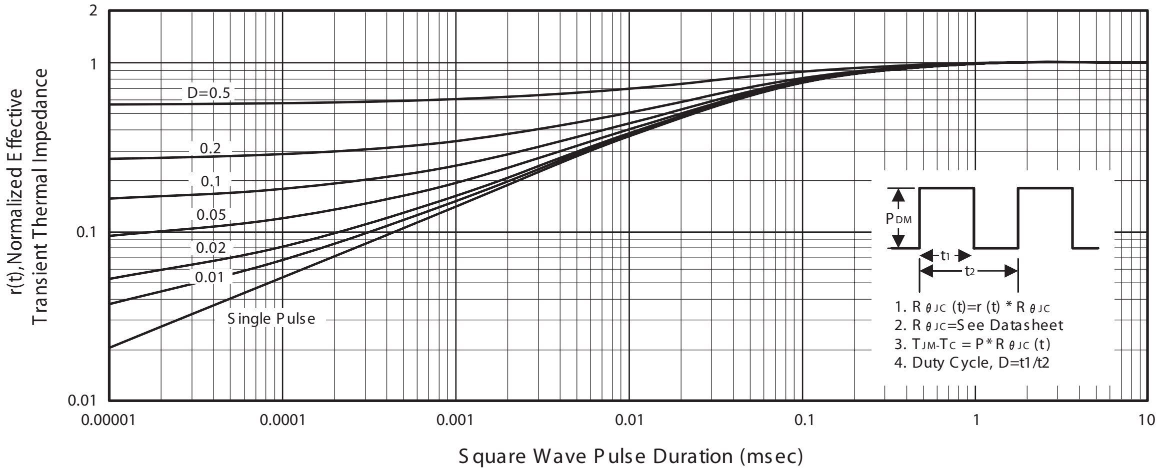
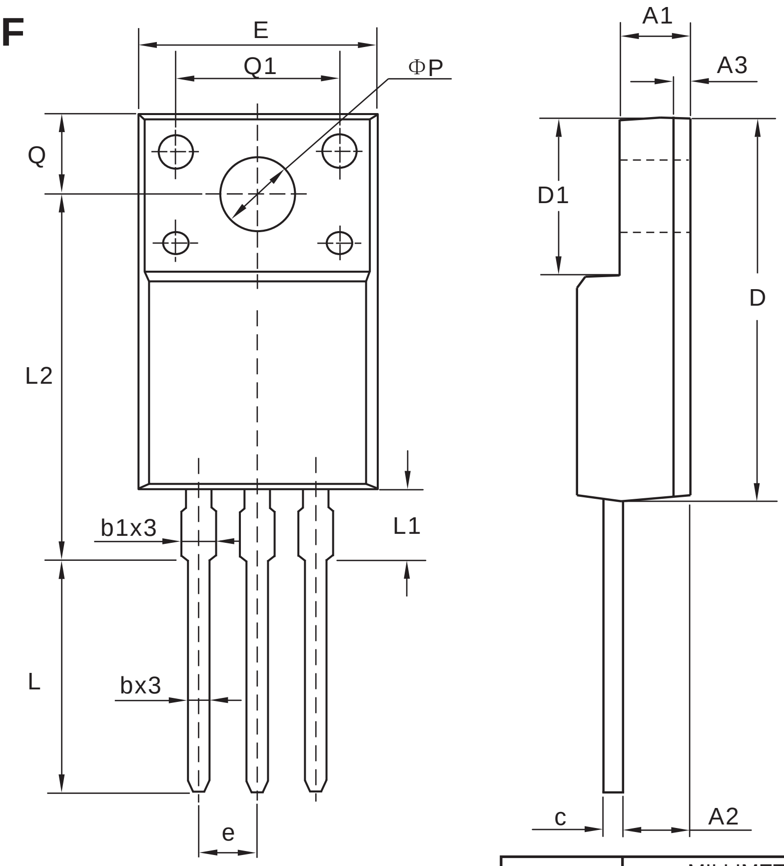
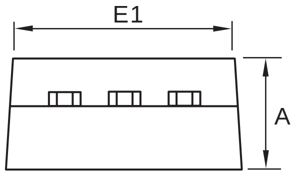


Figure 13b. Normalized Thermal Transient Impedance Curve for SDF07N50T

PACKAGE OUTLINE DIMENSIONS

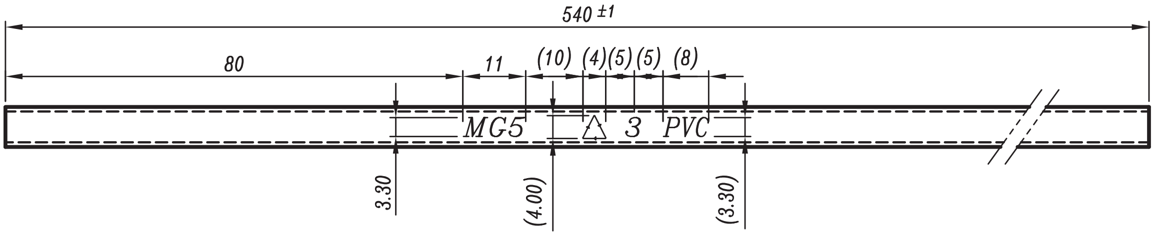
TO-220F



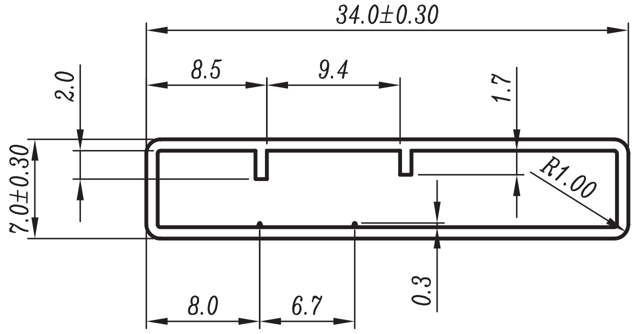


SYMBOL	MILLIMETERS	
	MIN	MAX
A	4.50	4.90
A1	2.35	2.75
A2	2.15	2.92
A3	0.50	0.65
b	0.70	0.90
b1	1.15	1.55
c	0.45	0.70
D	15.30	16.30
D1	6.67	6.77
E	9.90	10.32
E1	9.20	9.40
e	2.54 REF.	
L	9.45	10.05
L1	2.79	3.60
L2	15.60	16.00
Q	3.20	3.40
Q1	6.90	7.10
ΦP	2.90	3.55

TO-220F Tube



t=0.8 ±0.15



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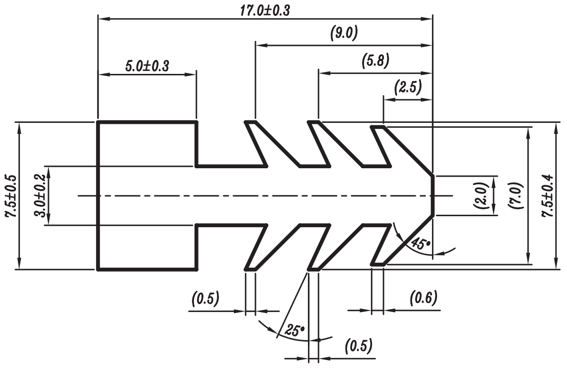

L=8.0 $^{+0.5}_{-1}$

TOP MARKING DEFINITION

TO-220F