



# SPN9507

## N-Channel Enhancement Mode MOSFET

### DESCRIPTION

The SPN9507 is the N-Channel logic enhancement mode power field effect transistors are produced using high cell density , DMOS trench technology.

This high density process is especially tailored to minimize on-state resistance.

These devices are particularly suited for low voltage application , notebook computer power management and other battery powered circuits where high-side switching .

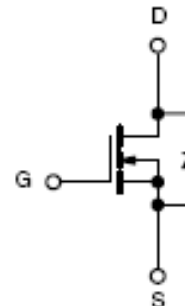
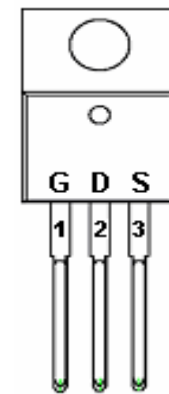
### FEATURES

- ◆ 75V/60A,  $R_{DS(ON)} = 5.0m\Omega @ V_{GS} = 10V$
- ◆ Super high density cell design for extremely low  $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ TO-220-3L package design

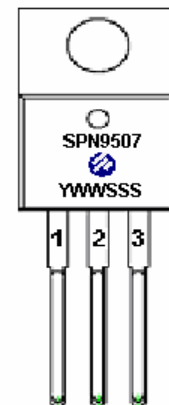
### APPLICATIONS

- DC/DC Converter
- Load Switch
- SMPS Secondary Side Synchronous Rectifier

### PIN CONFIGURATION( TO-220-3L )



### PART MARKING



Y : Last Digit of The Year  
W : Week  
S : Sequence



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### PIN DESCRIPTION

Pin	Symbol	Description
1	G	Gate
2	D	Drain
3	S	Source

### ORDERING INFORMATION

Part Number	Package	Part Marking
SPN9507T220TGB	TO-220-3L	SPN9507

※ SPN9507T220TGB: Tube ; Pb – Free; Halogen – Free

### ABSOLUTE MAXIMUM RATINGS

( $T_A=25^{\circ}\text{C}$  Unless otherwise noted)

Parameter	Symbol	Typical	Unit	
Drain-Source Voltage	$V_{DSS}$	75	V	
Gate –Source Voltage	$V_{GSS}$	$\pm 20$	V	
Continuous Drain Current( $T_J=150^{\circ}\text{C}$ )	$I_D$	$T_A=25^{\circ}\text{C}$	80	A
		$T_A=70^{\circ}\text{C}$	70	
Pulsed Drain Current	$I_{DM}$	240	A	
Power Dissipation	$P_D$	$T_A=25^{\circ}\text{C}$	300	W
		$T_A=70^{\circ}\text{C}$	3.38	
Avalanche Energy with Single Pulse ( $T_J=25^{\circ}\text{C}$ , $L = 0.12\text{mH}$ , $I_{AS} = 80\text{A}$ , $V_{DD} = 60\text{V}$ .)	EAS	380	mJ	
Operating Junction Temperature	$T_J$	-55/150	$^{\circ}\text{C}$	
Storage Temperature Range	$T_{STG}$	-55/150	$^{\circ}\text{C}$	
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	2	$^{\circ}\text{C}/\text{W}$	



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### ELECTRICAL CHARACTERISTICS

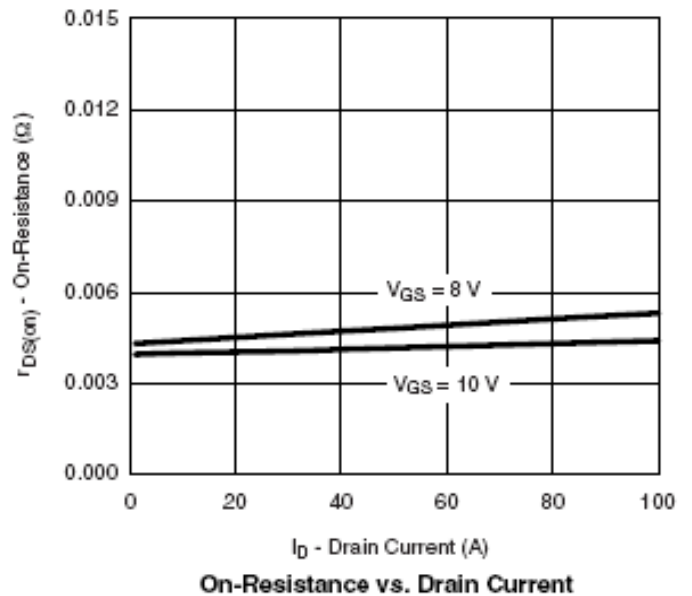
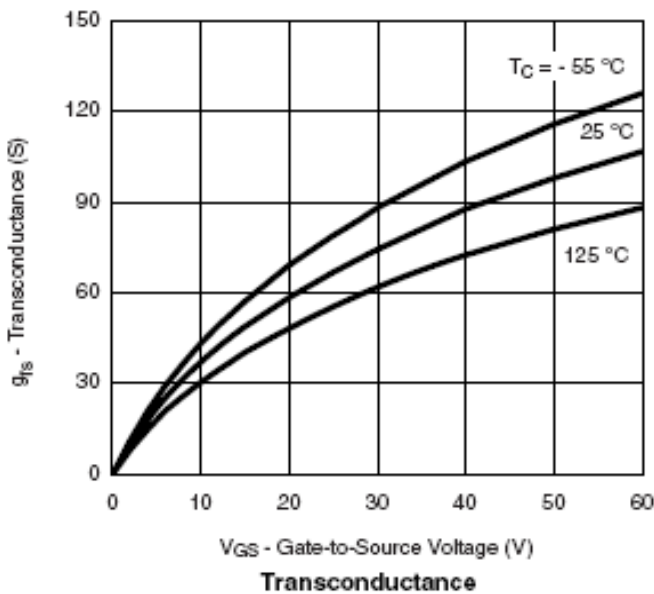
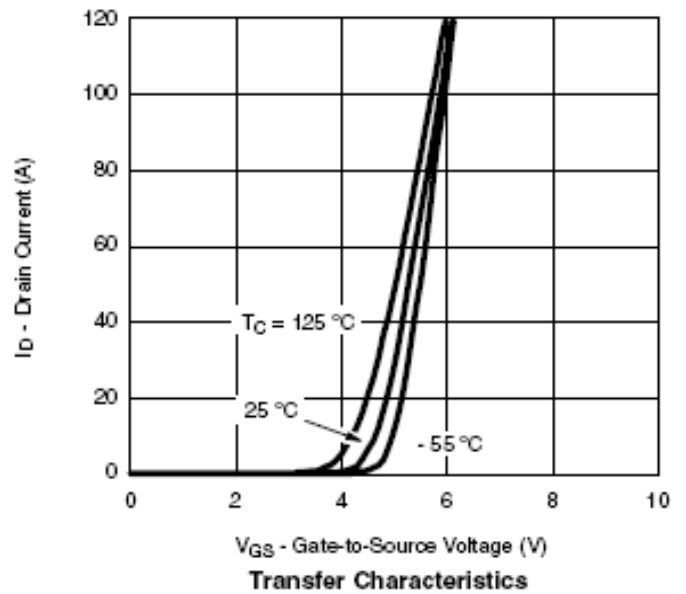
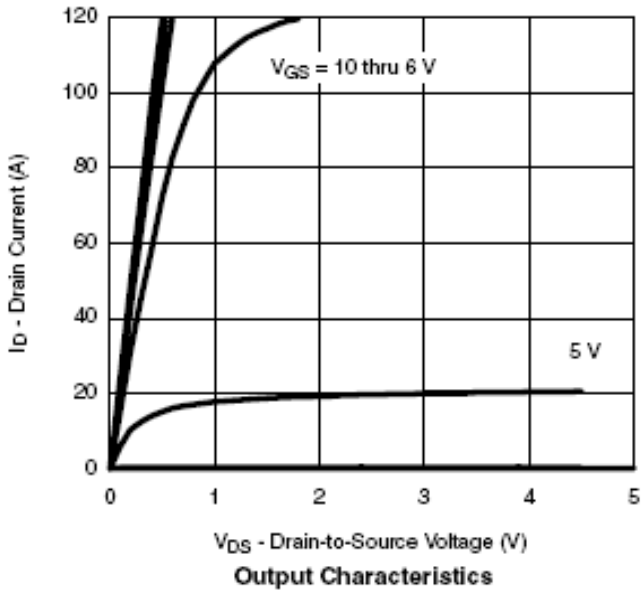
(TA=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	75			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0		4.0	
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=75V, V_{GS}=0V$			10	uA
		$V_{DS}=60V, V_{GS}=0V$ $T_J = 150^\circ C$			250	
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D=60A$			5.0	mΩ
Forward Transconductance	$g_{fs}$	$V_{DS}=10V, I_D=60A$		57		S
Diode Forward Voltage	$V_{SD}$	$I_S=60A, V_{GS} = 0V$			1.3	V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=40V, V_{GS}=10V$ $I_D= 80A$		85	135	nC
Gate-Source Charge	$Q_{gs}$			25		
Gate-Drain Charge	$Q_{gd}$			36		
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V$ $f=1MHz$		4290	6870	pF
Output Capacitance	$C_{oss}$			985		
Reverse Transfer Capacitance	$C_{rss}$			390		
Turn-On Time	$t_{d(on)}$	$V_{DD}=40V, R_L=0.5\Omega$ $I_D=80A, V_{GEN}=10V$ $R_G=3.3\Omega$		22		nS
	$t_r$			160		
Turn-Off Time	$t_{d(off)}$			38		
	$t_f$			165		



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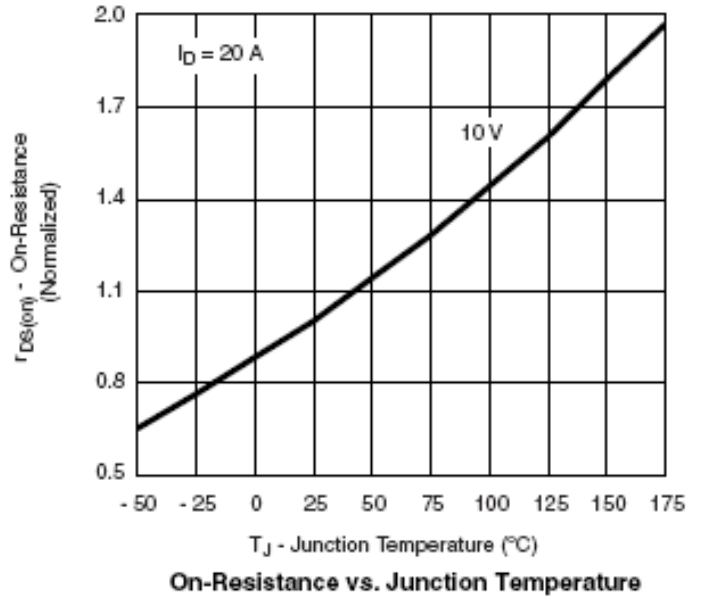
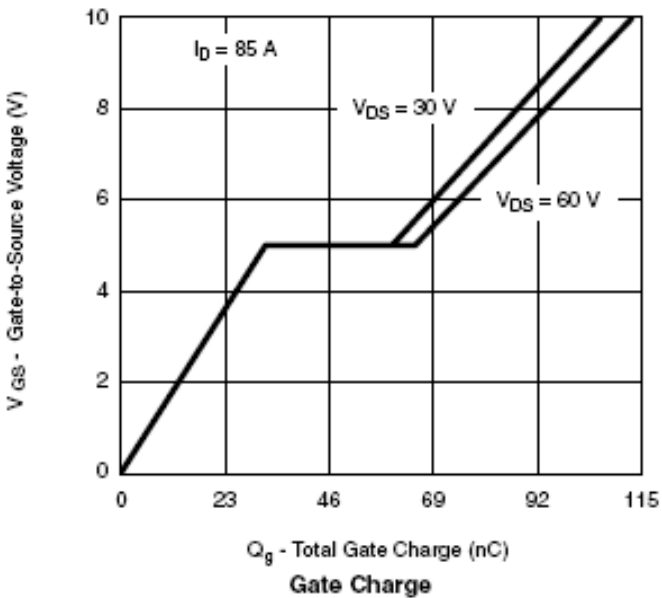
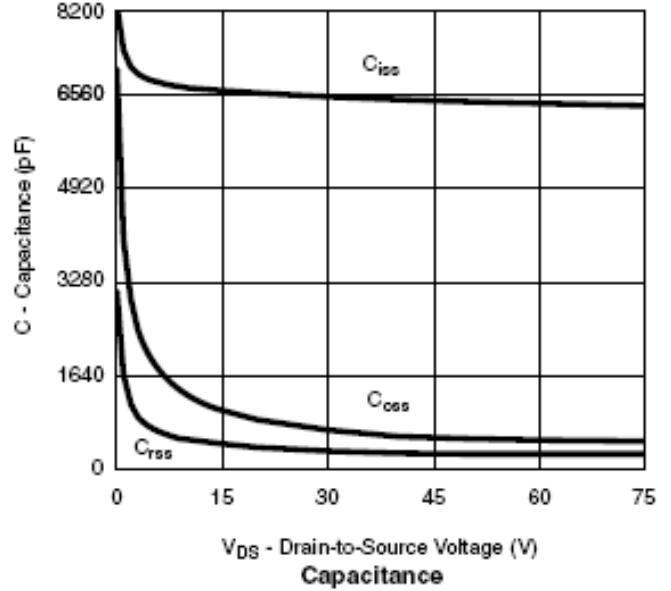
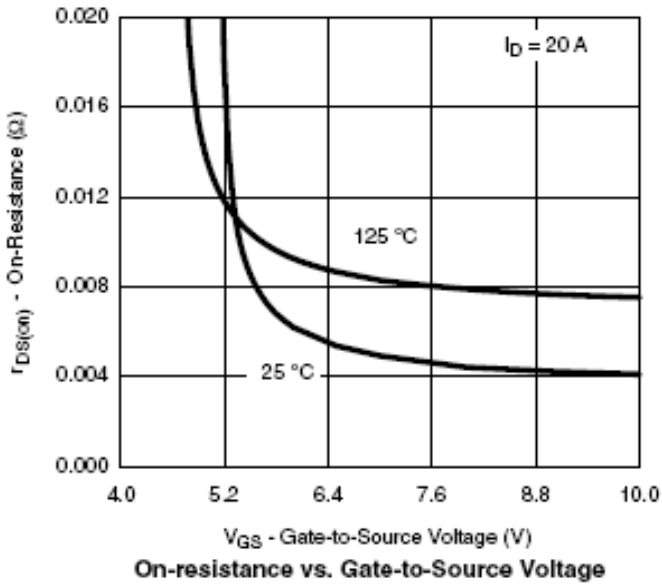
## TYPICAL CHARACTERISTICS





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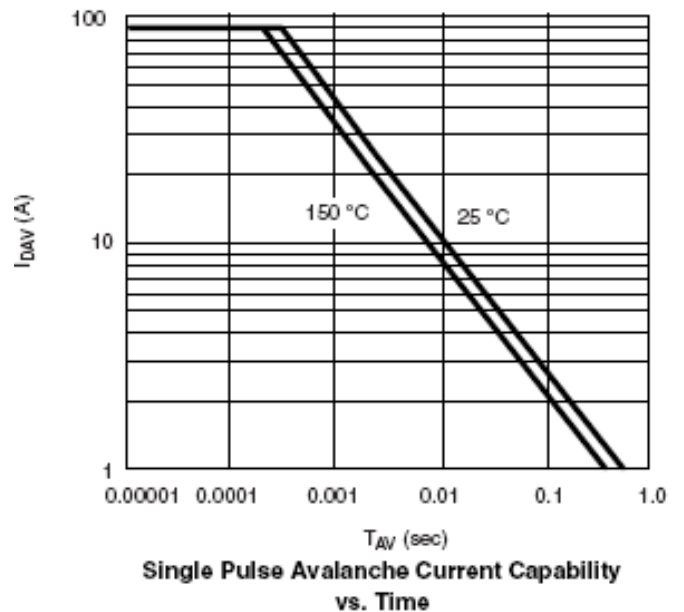
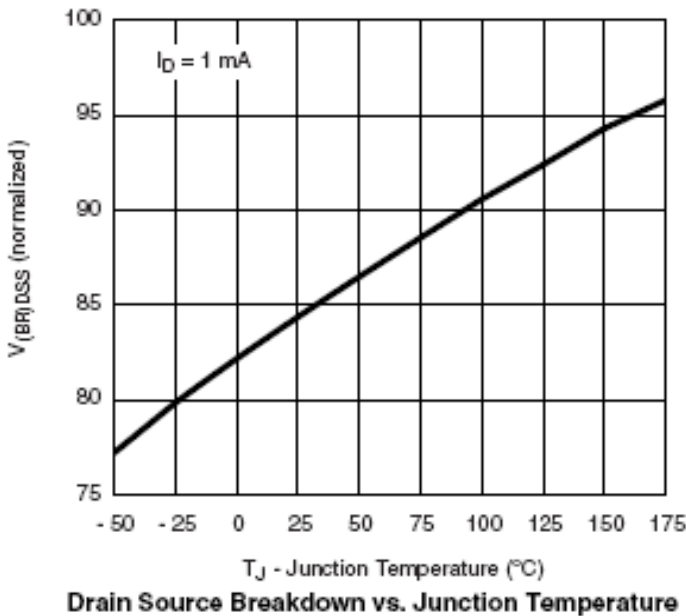
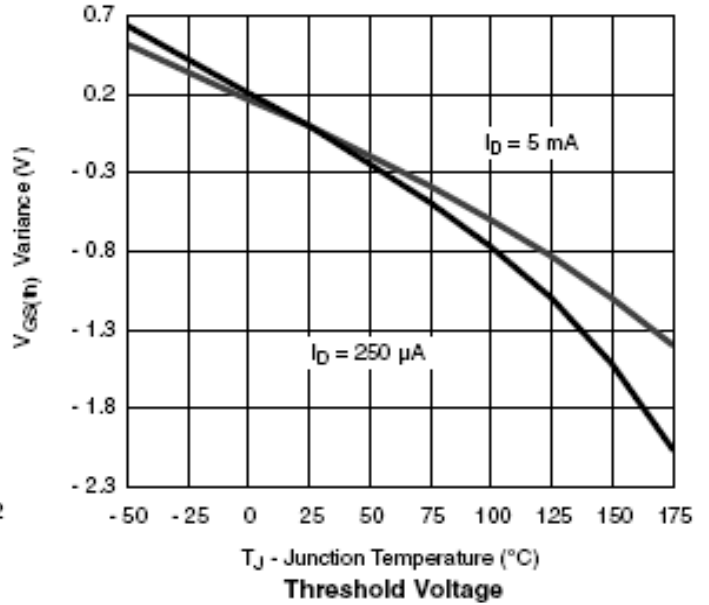
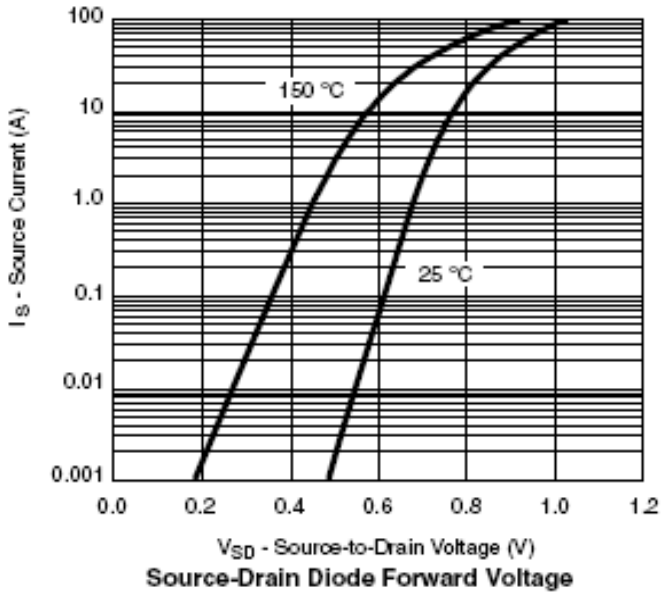
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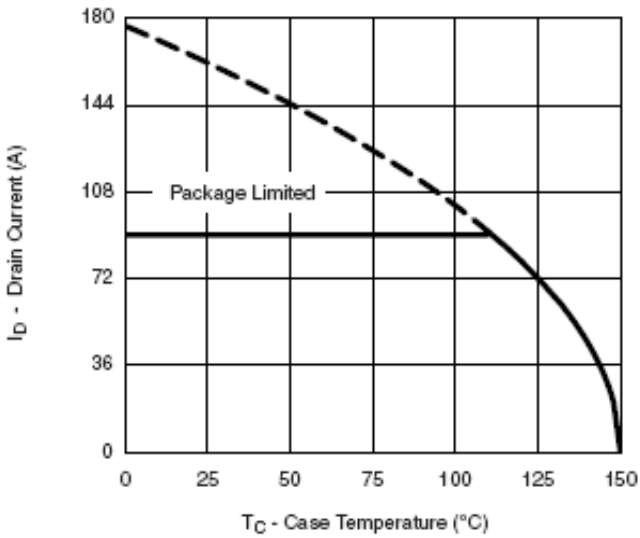
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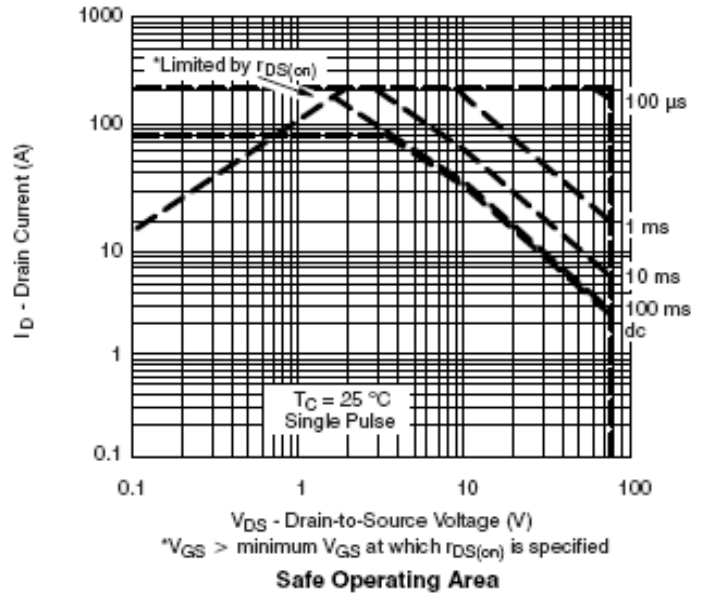


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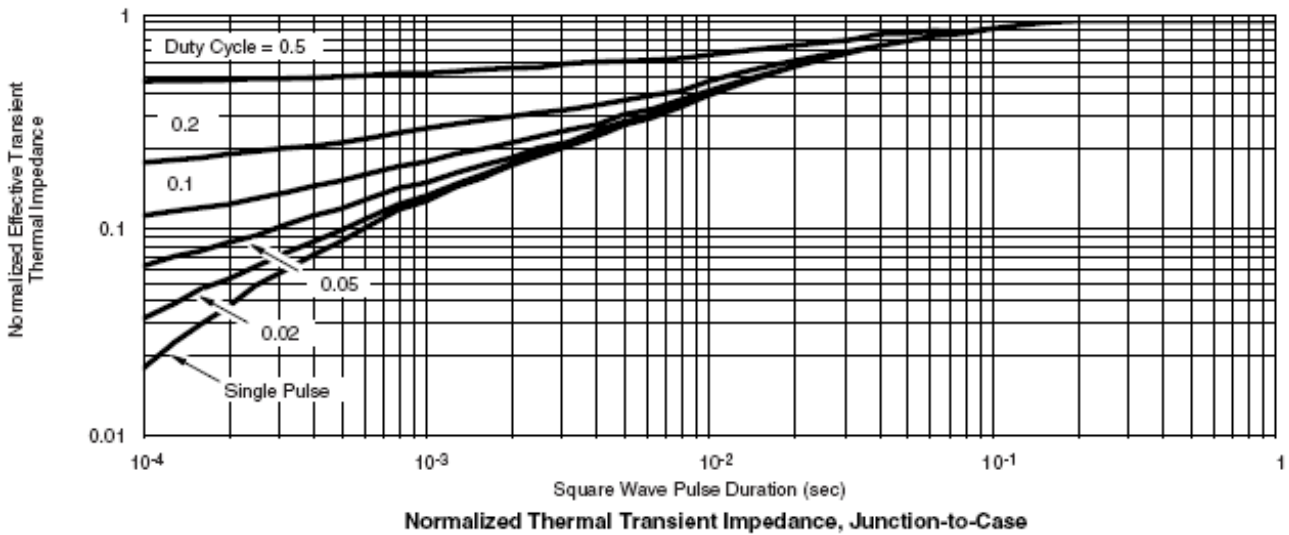
## TYPICAL CHARACTERISTICS



Maximum Drain Current vs. Case Temperature



Safe Operating Area



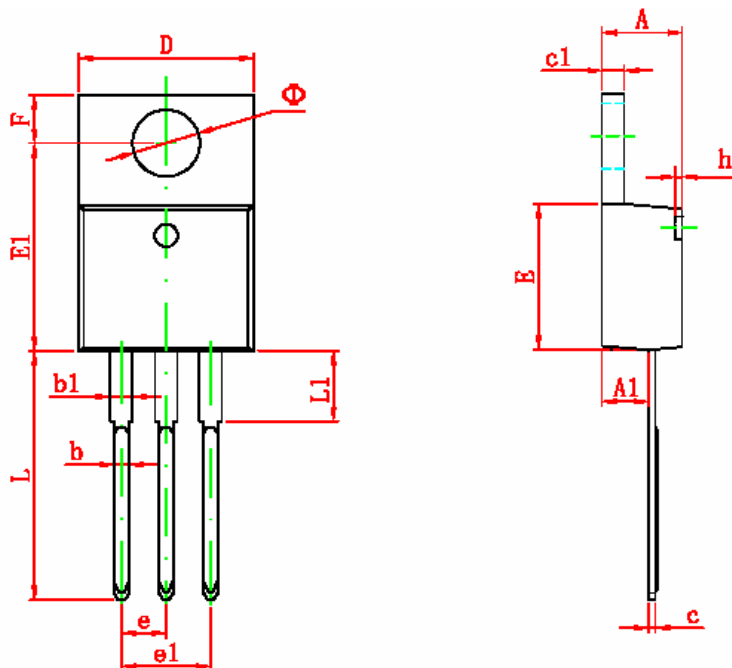
Normalized Thermal Transient Impedance, Junction-to-Case



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### TO-220-3L PACKAGE OUTLINE



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.470	4.670	0.176	0.184
A1	2.520	2.820	0.099	0.111
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
E1	12.060	12.460	0.475	0.491
e	2.540 TYP		0.100 TYP	
e1	4.980	5.180	0.196	0.204
F	2.590	2.890	0.102	0.114
h	0.000	0.300	0.000	0.012
L	13.400	13.800	0.528	0.543
L1	3.560	3.960	0.140	0.156
• •	3.735	3.935	0.147	0.155





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SYNC Power Corporation

9F-5, No.3-2, Park Street

NanKang District (NKSP), Taipei, Taiwan 115

Phone: 886-2-2655-8178

Fax: 886-2-2655-8468

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