



General Description

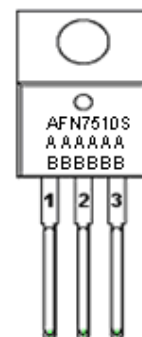
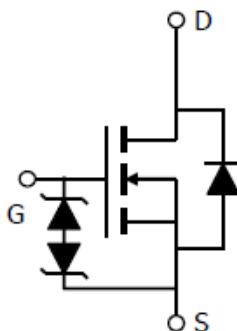
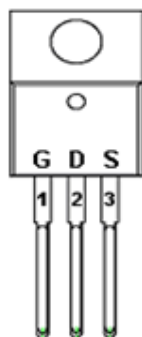
AFN7510S, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

These devices are particularly suited for low voltage power management, and low in-line power loss are needed in commercial industrial surface mount applications.

Features

- 100V/30A, $R_{DS(ON)} = 12m\Omega @ V_{GS} = 10V$
- 100V/15A, $R_{DS(ON)} = 18m\Omega @ V_{GS} = 6V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- TO-220-3L package design

Pin Description (TO-220-3L)



Application

- DC/DC Primary Side Switch
- POL Synchronous buck converter
- LED Backlight for LCD TV industrial

Pin Define

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

Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFN7510ST220TG	AFN7510S AAAAAA BBBBBB	TO-220-3L	Tube	50 EA

- ※ A Lot code
- ※ B Date code
- ※ AFN7510ST220TG : Tube ; Pb- Free ; Halogen -Free



Absolute Maximum Ratings

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	100	V
Gate-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current($T_J=150^\circ\text{C}$)	I_D	$T_C=25^\circ\text{C}$	60
		$T_C=70^\circ\text{C}$	35
Pulsed Drain Current	I_{DM}	130	A
Continuous Source Current(Diode Conduction)	I_S	70	
Single Pulse Avalanche Current	I_{AS}	20	
Power Dissipation	P_D	75	W
Operating Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55/150	$^\circ\text{C}$
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$

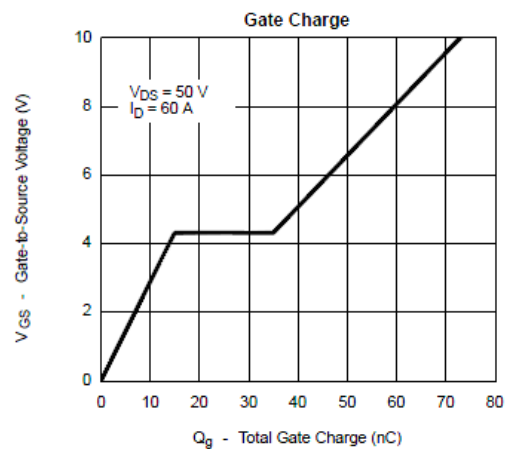
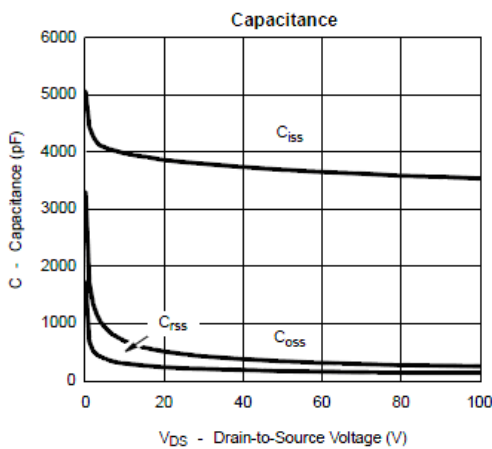
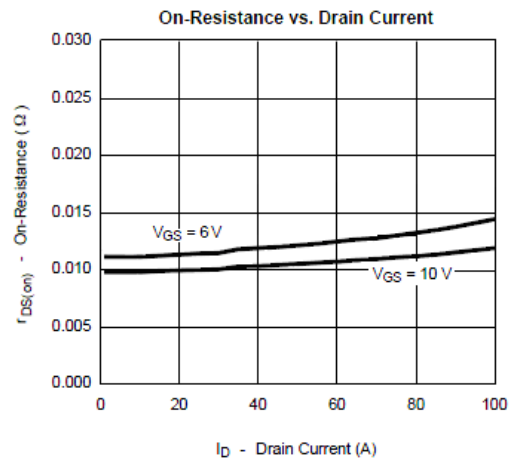
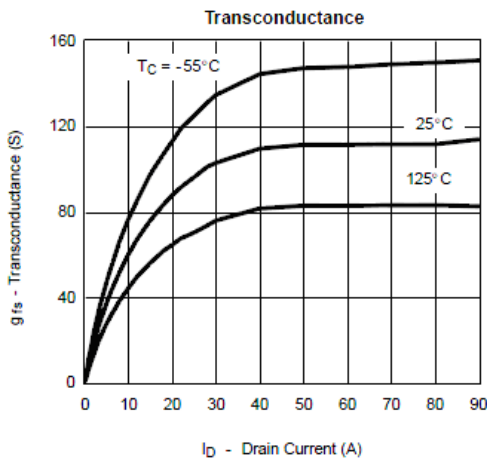
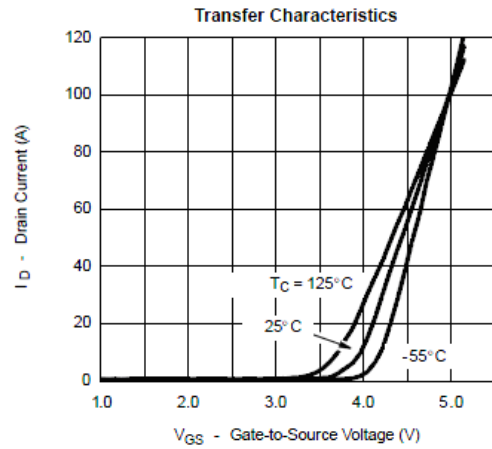
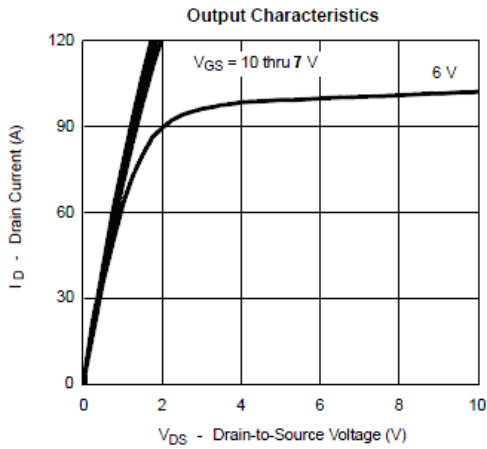
Electrical Characteristics

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

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu\text{A}$	100			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	2.0		4.0	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 5	μA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=80V, V_{GS}=0V$			51	μA
		$V_{DS}=80V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			30	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq 10V, V_{GS}=10V$	130			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=30A$		9.5	12	m Ω
		$V_{GS}=6V, I_D=15A$		12.4	18	
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=20A$		30		S
Diode Forward Voltage	V_{SD}	$I_S=20A, V_{GS}=0V$		0.8	1.3	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=50V, V_{GS}=10V$ $I_D \equiv 60A$		75	150	nC
Gate-Source Charge	Q_{gs}			15		
Gate-Drain Charge	Q_{gd}			20		
Input Capacitance	C_{iss}	$V_{DS}=40V, V_{GS}=0V$ $f=1\text{MHz}$		3800		pF
Output Capacitance	C_{oss}			450		
Reverse Transfer Capacitance	C_{rss}			210		
Turn-On Time	$t_{d(on)}$	$V_{DD}=50V, R_L=0.8\Omega$ $I_D \equiv 60A, V_{GEN}=10V$ $R_G=2.5\Omega$		15	30	ns
	t_r			80	150	
Turn-Off Time	$t_{d(off)}$			50	100	
	t_f			130	250	

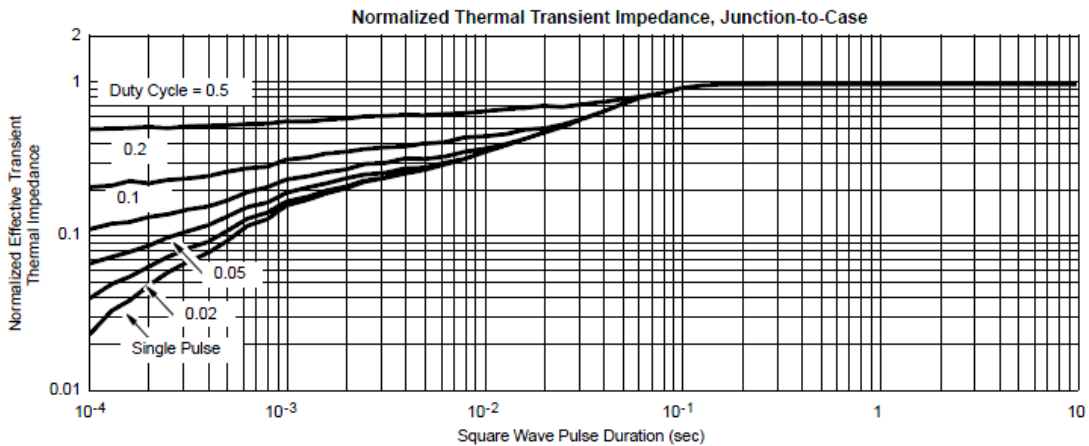
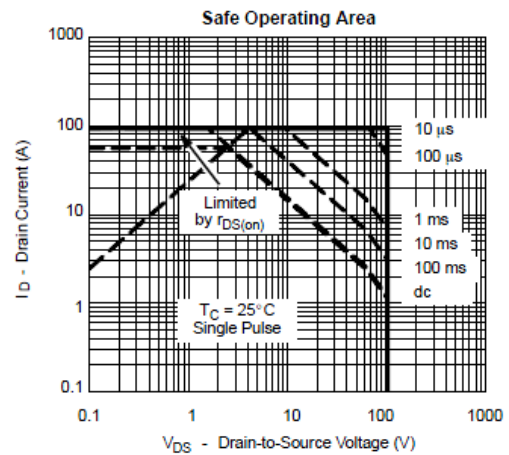
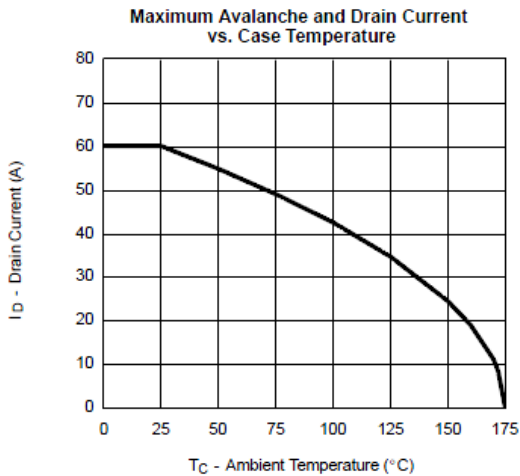
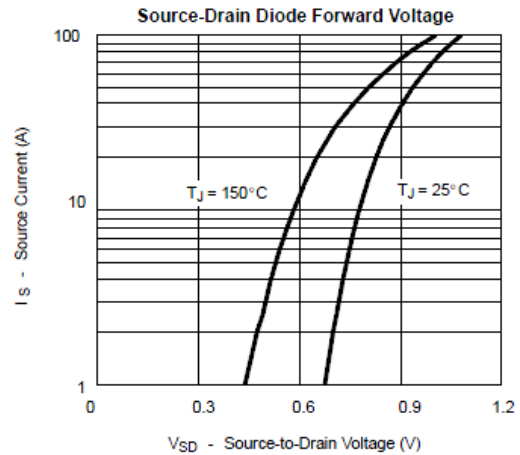
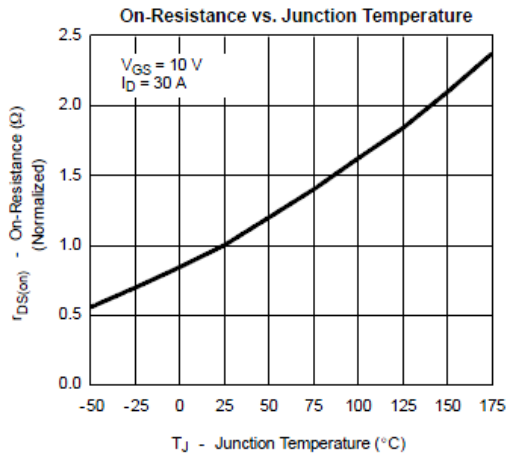


Typical Characteristics





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Typical Characteristics

Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

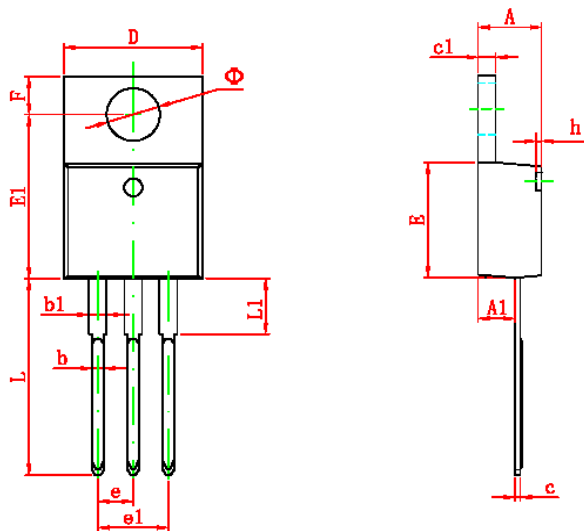


Unclamped Inductive Switching Test Circuit & Waveforms





Package Information (TO-220-3L)



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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