

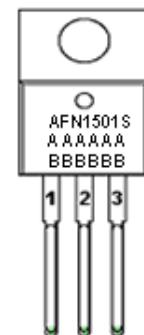
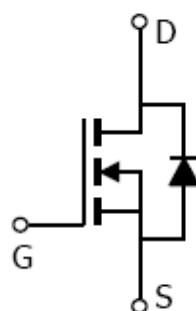
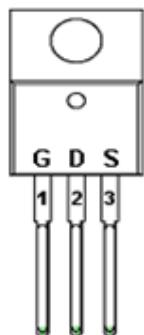


General Description

AFN1501S, 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.

Pin Description (TO-220-3L)



Features

- 100V/60A, $R_{DS(ON)} = 6.4\text{m}\Omega$ @ $V_{GS} = 10\text{V}$
- Super high density cell design for extremely low $R_{DS(ON)}$
- TO-220-3L package design

Application

- Power Supply - Secondary Synchronous Rectification
- Industrial
- Primary Switch

Pin Define

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

Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFN1501ST220TG	AFN1501S AAAAAA BBBBBB	TO-220-3L	Tube	50 EA

※ A Lot code

※ B Date code

※ AFN1501ST220TG : Tube ; Pb- Free ; Halogen -Free



**Alfa-MOS
Technology**

**AFN1501S
100V N-Channel
Enhancement Mode MOSFET**

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	120	A
$T_A=70^\circ\text{C}$		90	
Pulsed Drain Current	I_{DM}	350	
Continuous Source Current(Diode Conduction)	I_S	100	
Single Pulse Avalanche Current	I_{AS}	60	
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	$^\circ\text{C}/\text{W}$

Electrical Characteristics

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

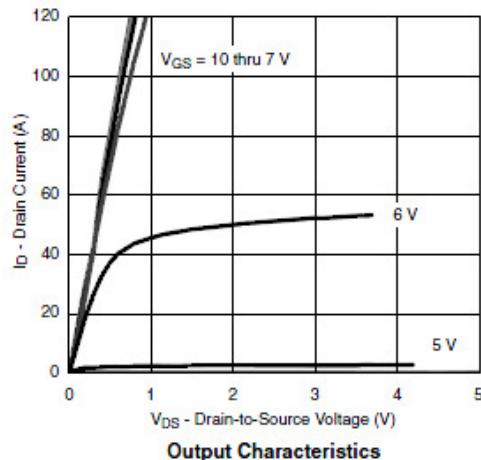
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$	100			V
Gate Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	2.0		4.0	
Gate Leakage Current	I_{GSS}	$V_{DS}=0\text{V}, V_{GS}=\pm 20\text{V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=80\text{V}, V_{GS}=0\text{V}$			1	uA
		$V_{DS}=80\text{V}, V_{GS}=0\text{V}$ $T_J=85^\circ\text{C}$			30	
On-State Drain Current	$I_{D(\text{on})}$	$V_{DS}\geq 10\text{V}, V_{GS}=10\text{V}$	70			A
Drain-Source On-Resistance	$R_{DS(\text{on})}$	$V_{GS}=10\text{V}, I_D=60\text{A}$		5.6	6.4	$\text{m}\Omega$
Forward Transconductance	g_{FS}	$V_{DS}=15\text{V}, I_D=20\text{A}$		62		S
Diode Forward Voltage	V_{SD}	$I_S=30\text{A}, V_{GS}=0\text{V}$		0.8	1.3	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=50\text{V}, V_{GS}=10\text{V}$ $I_D=85\text{A}$		95	115	nC
Gate-Source Charge	Q_{gs}			45		
Gate-Drain Charge	Q_{gd}			35		
Input Capacitance	C_{iss}	$V_{DS}=50\text{V}, V_{GS}=0\text{V}$ $f=1\text{MHz}$		6250		pF
Output Capacitance	C_{oss}			580		
Reverse Transfer Capacitance	C_{rss}			235		
Turn-On Time	$t_{d(on)}$	$V_{DD}=50\text{V}, R_L=0.6\Omega$ $I_D=85\text{A}, V_{GEN}=10\text{V}$ $R_G=1\Omega$		32	65	ns
	t_r			25	55	
Turn-Off Time	$t_{d(off)}$			40	80	
	t_f			15	40	



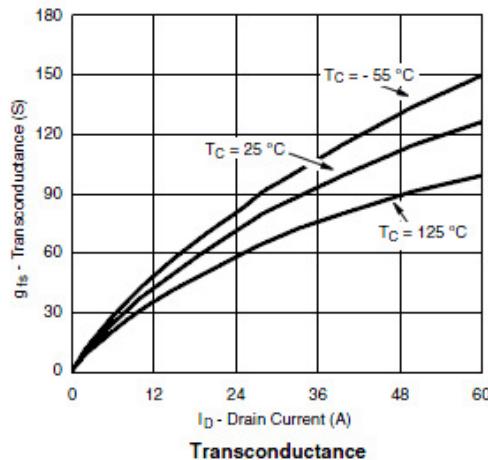
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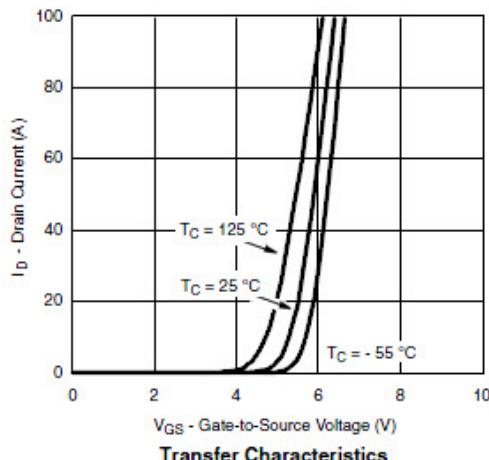
Typical Characteristics



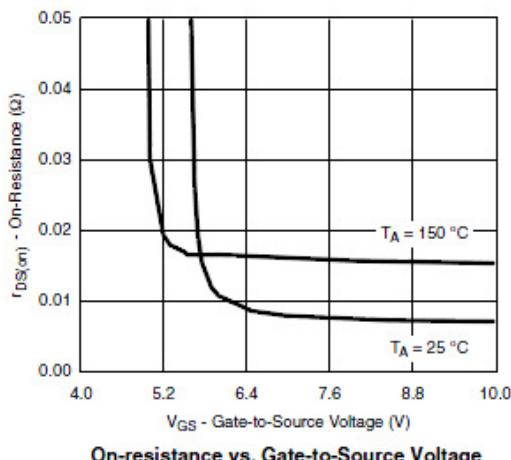
Output Characteristics



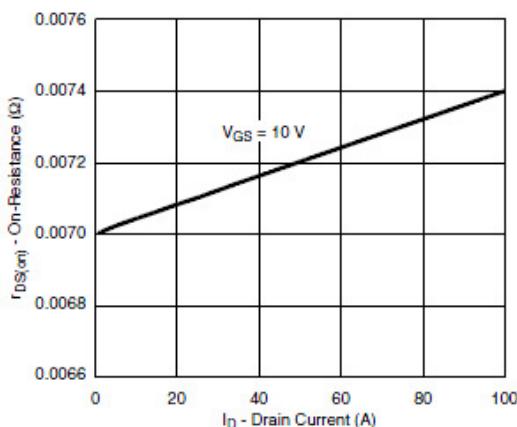
Transconductance



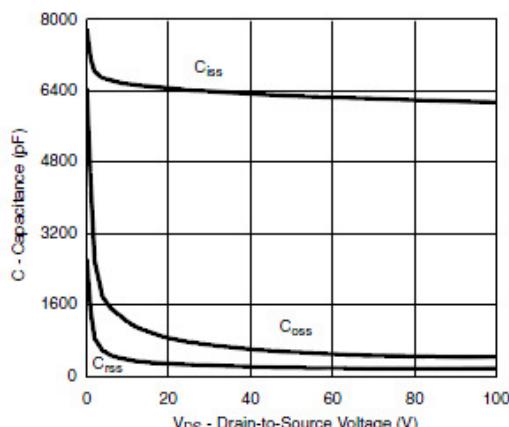
Transfer Characteristics



On-resistance vs. Gate-to-Source Voltage



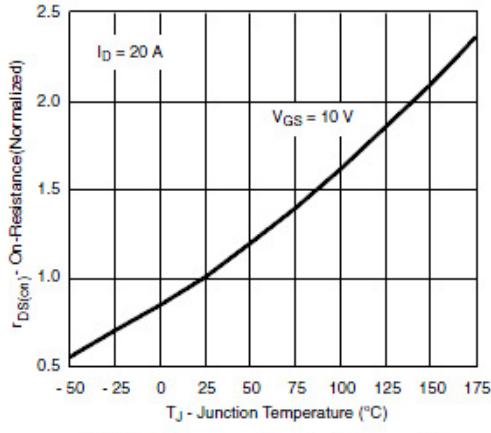
On-Resistance vs. Drain Current



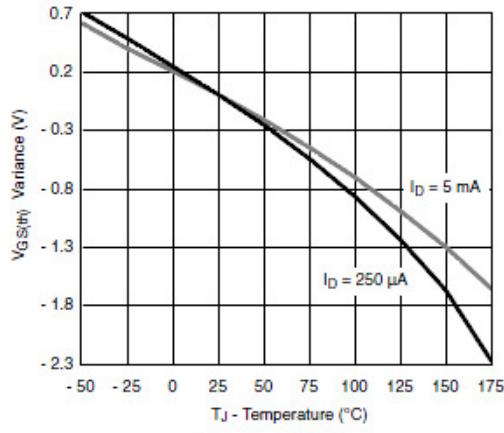
Capacitance



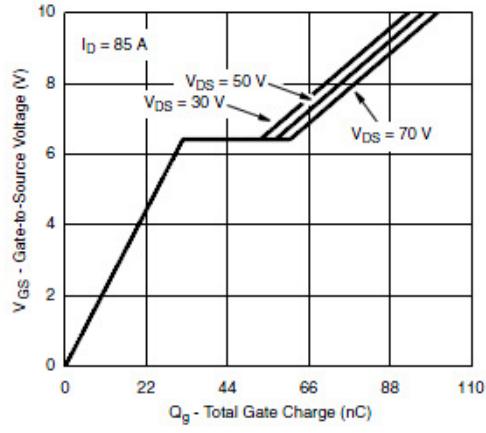
Typical Characteristics



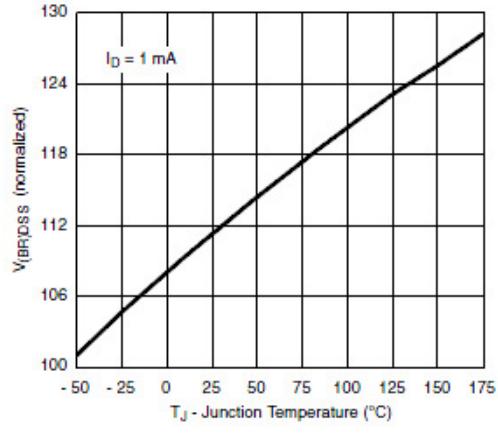
On-Resistance vs. Junction Temperature



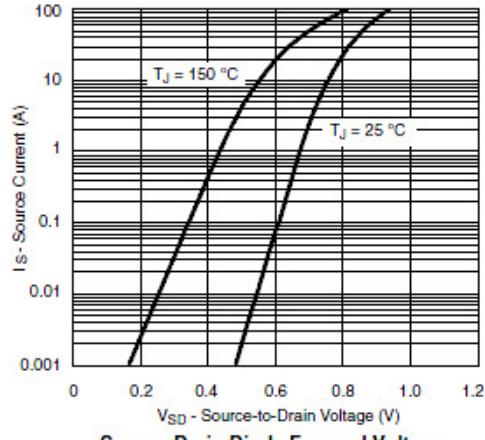
Threshold Voltage



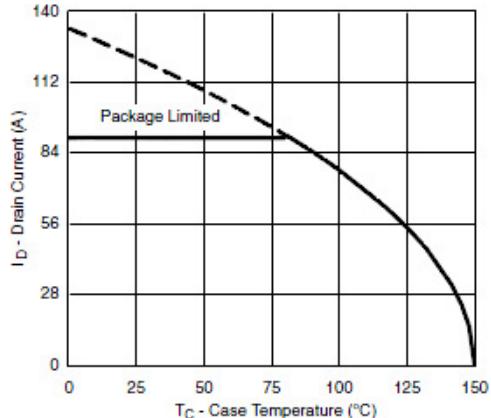
Gate Charge



Drain Source Breakdown vs. Junction Temperature



Source-Drain Diode Forward Voltage



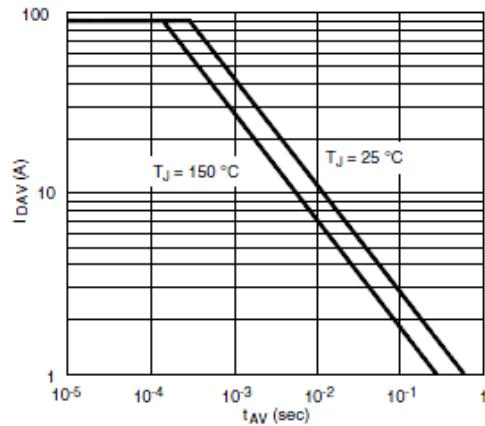
Maximum Drain Current vs. Case Temperature



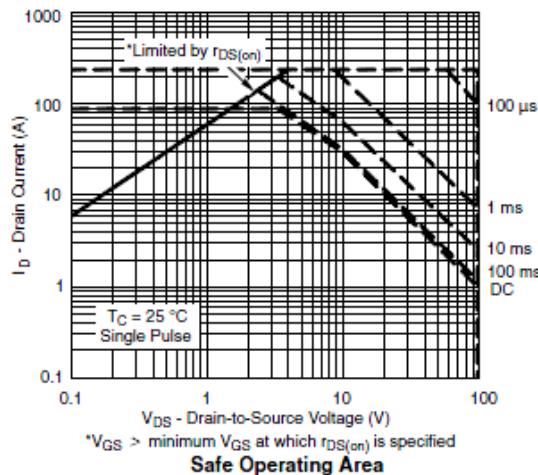
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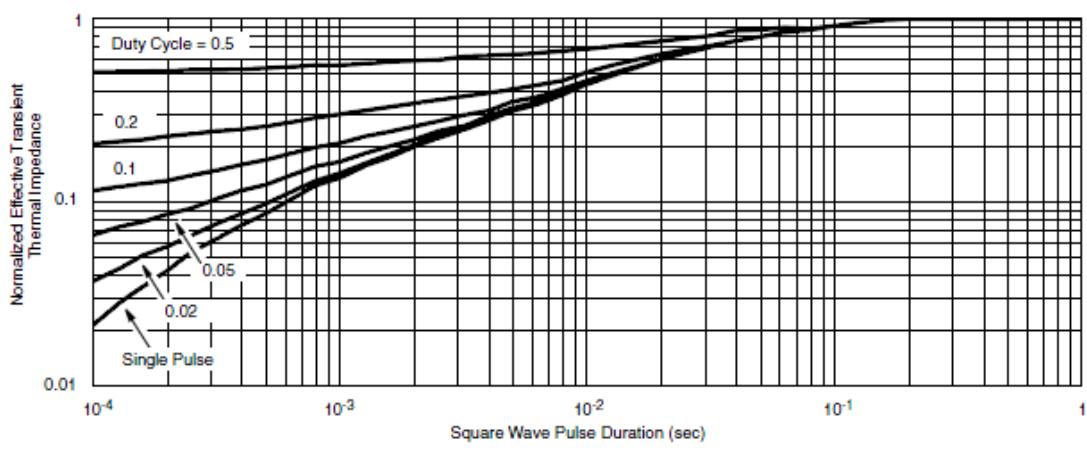
Typical Characteristics



Single Pulse Avalanche Current Capability vs. Time



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

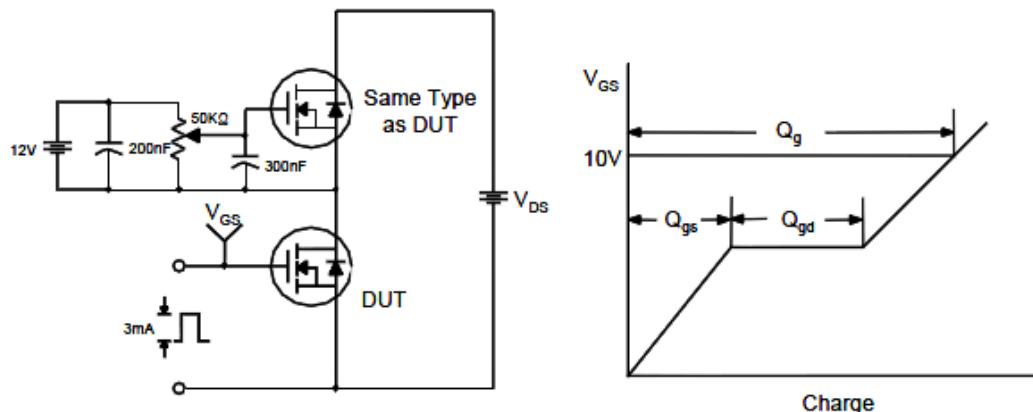


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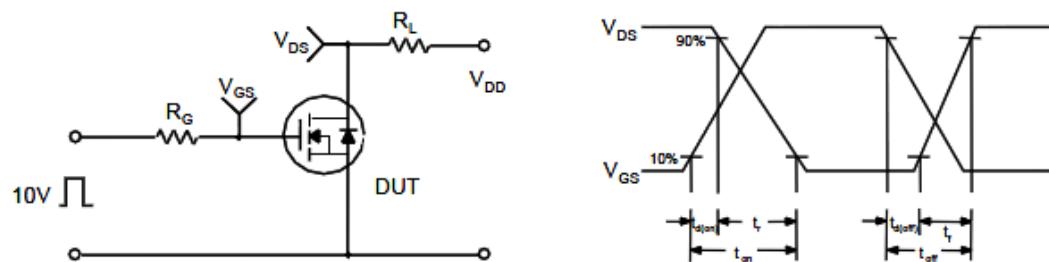
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Typical Characteristics

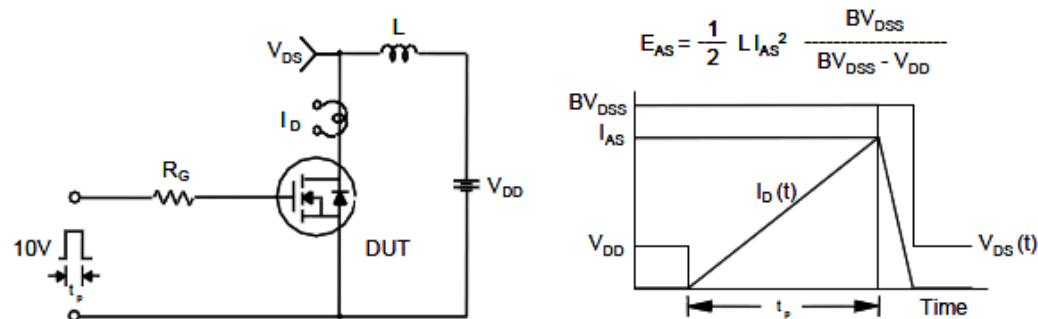
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

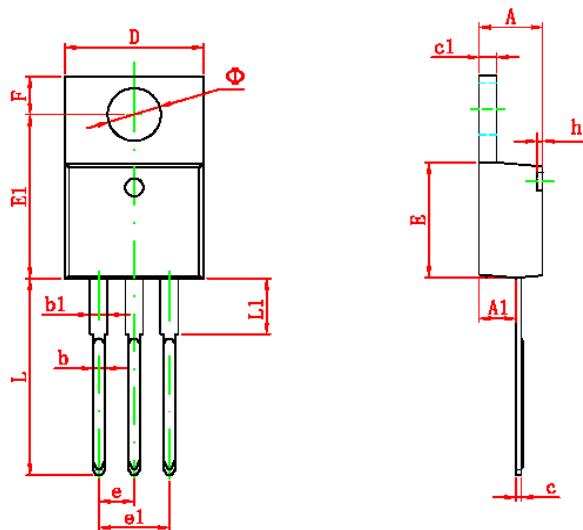


Unclamped Inductive Switching Test Circuit & Waveforms





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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2F, No.80, Sec.1, Cheng Kung Rd., Nan Kang Dist., Taipei City 115, Taiwan (R.O.C.)
Tel : 886 2) 2651 3928
Fax : 886 2) 2786 8483
<http://www.alfa-mos.com>