



### General Description

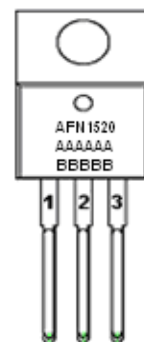
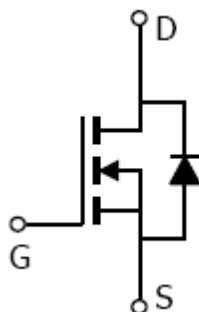
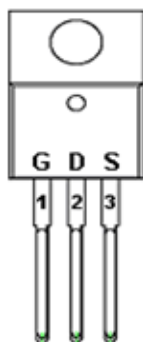
AFN1520, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent  $R_{DS(ON)}$ , low gate charge.

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/4.0A,  $R_{DS(ON)} = 320m\Omega @ V_{GS} = 10V$
- 100V/4.0A,  $R_{DS(ON)} = 340m\Omega @ V_{GS} = 4.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- TO-220-3L package design

### Pin Description ( TO-220-3L )



### Application

- High Frequency Boost Converter
- LED Backlight for LCD TV

### Pin Define

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

### Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFN1520T220TG	AFN1520 AAAAAA BBBBBB	TO-220-3L	Tube	50 EA

- ※ A Lot code
- ※ B Date code
- ※ AFN1520T220TG : 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	$V_{GSS}$	$\pm 20$	V
Continuous Drain Current( $T_J=150^\circ\text{C}$ )	$I_D$	$T_C=25^\circ\text{C}$	7.0
		$T_C=70^\circ\text{C}$	6.0
Pulsed Drain Current	$I_{DM}$	20	A
Continuous Source Current(Diode Conduction)	$I_S$	6.5	
Single Pulse Avalanche Current	$I_{AS}$	10	
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	$^\circ\text{C/W}$

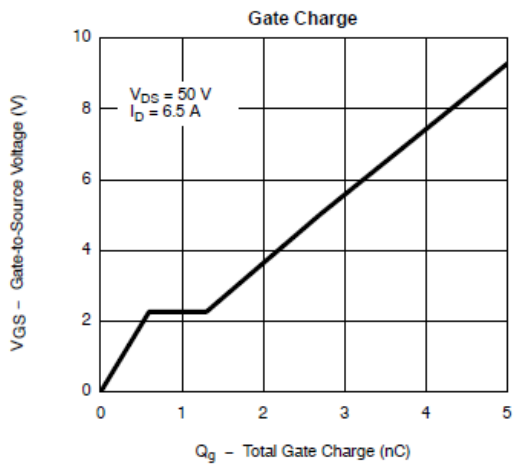
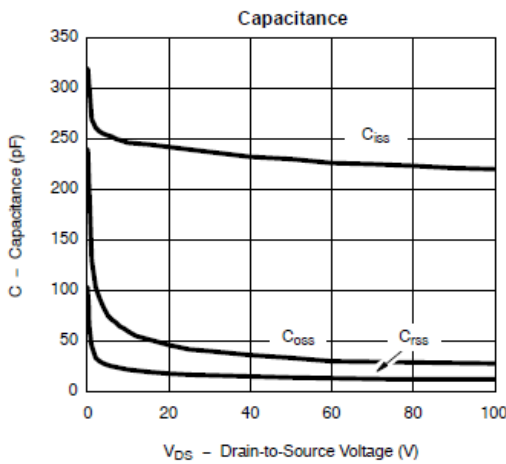
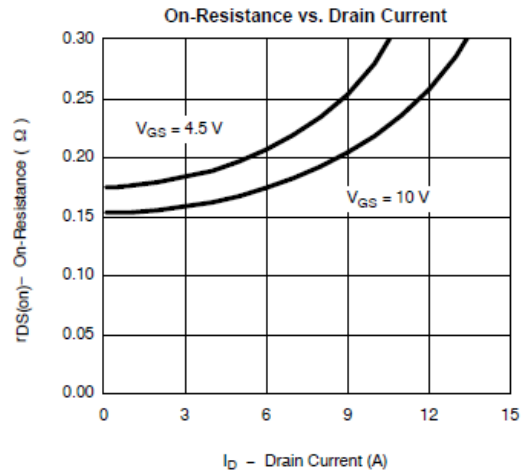
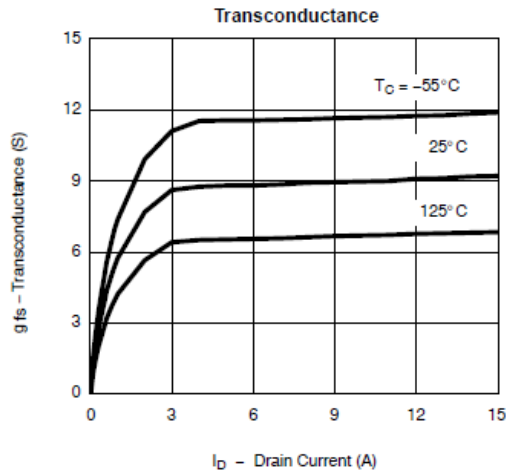
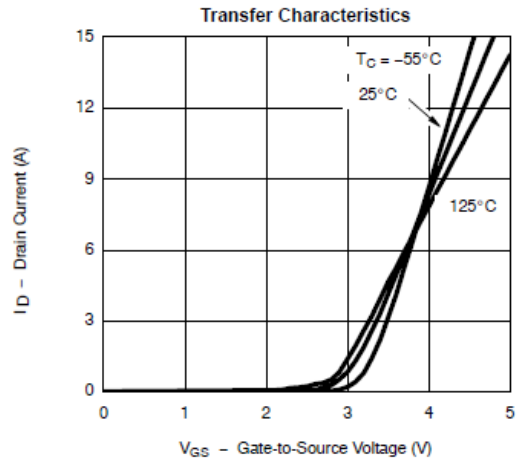
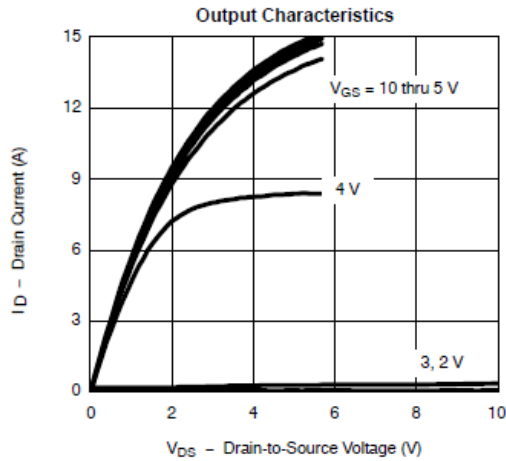
### Electrical Characteristics

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

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu\text{A}$	100			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1.0		2.0	
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=80V, V_{GS}=0V$			1	uA
		$V_{DS}=80V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			5	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq 5V, V_{GS}=4.5V$	8			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=4.0A$		277	320	m $\Omega$
		$V_{GS}=4.5V, I_D=4.0A$		291	340	
Forward Transconductance	$g_{FS}$	$V_{DS}=15V, I_D=3A$		8.5		S
Diode Forward Voltage	$V_{SD}$	$I_S=6A, V_{GS}=0V$		0.8	1.3	V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=50V, V_{GS}=5V$ $I_D \equiv 6.5A$		2.7	5	nC
Gate-Source Charge	$Q_{gs}$			0.7		
Gate-Drain Charge	$Q_{gd}$			0.7		
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V$ $f=1\text{MHz}$		250		pF
Output Capacitance	$C_{oss}$			40		
Reverse Transfer Capacitance	$C_{rss}$			20		
Turn-On Time	$t_{d(on)}$	$V_{DD}=50V, R_L=7.5\Omega$ $I_D \equiv 6.5A, V_{GEN}=10V$ $R_G=2.5\Omega$		7	12	ns
	$t_r$			8	15	
Turn-Off Time	$t_{d(off)}$			8	15	
	$t_f$			10	18	

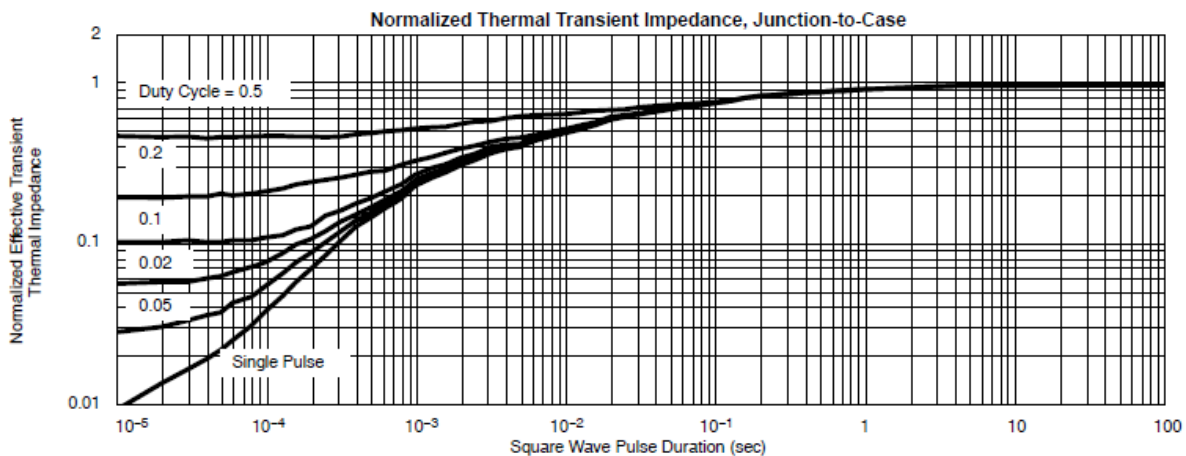
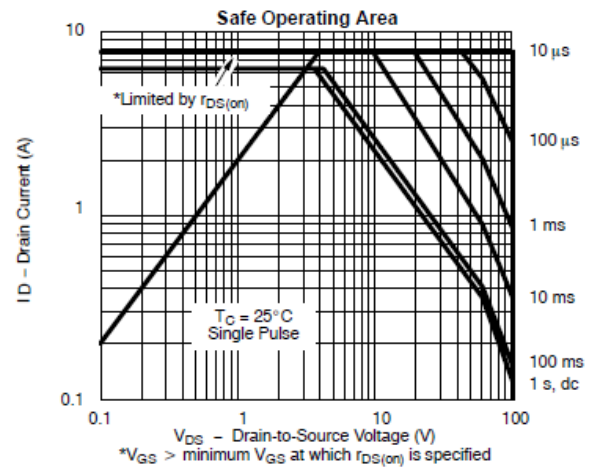
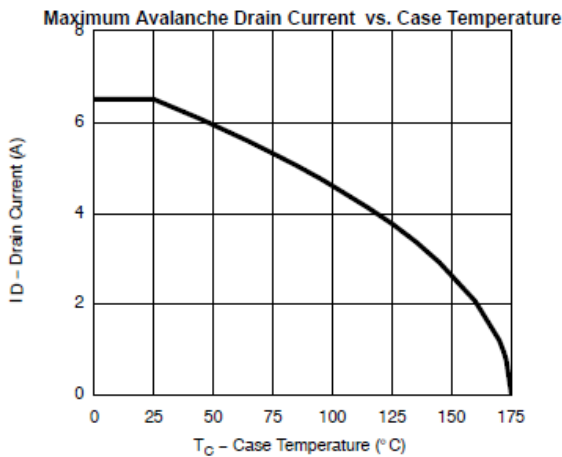
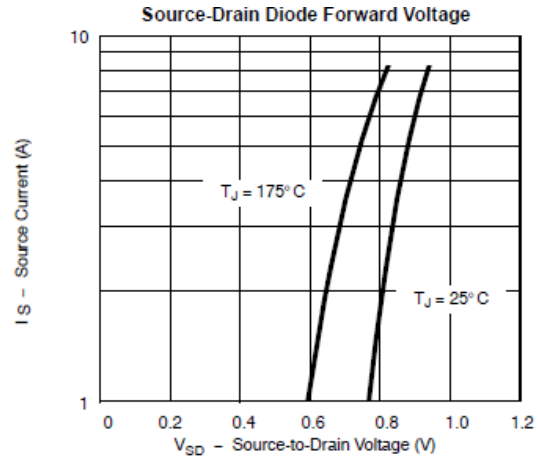
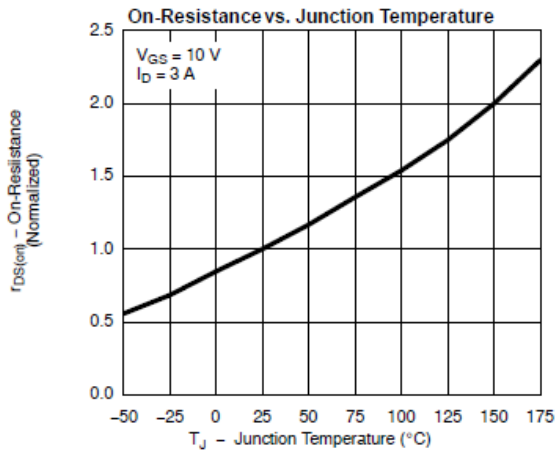


## Typical Characteristics





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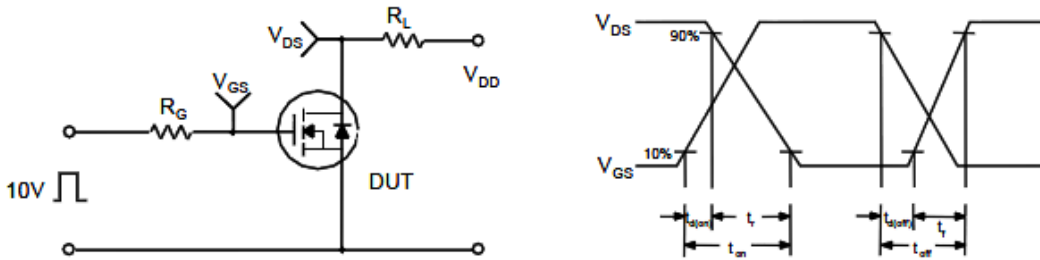


## Typical Characteristics

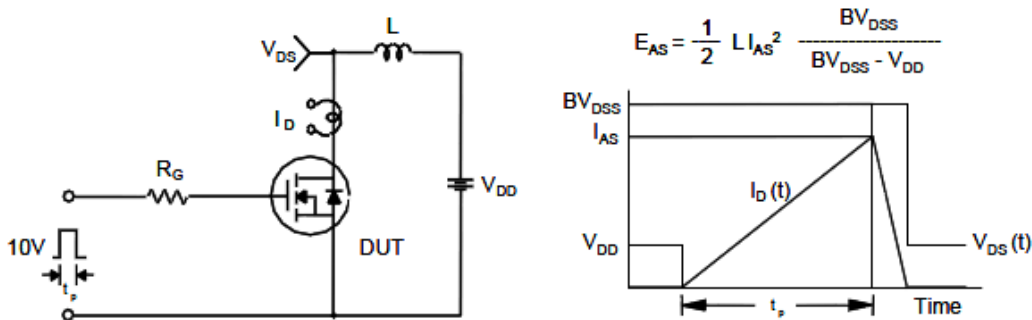
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

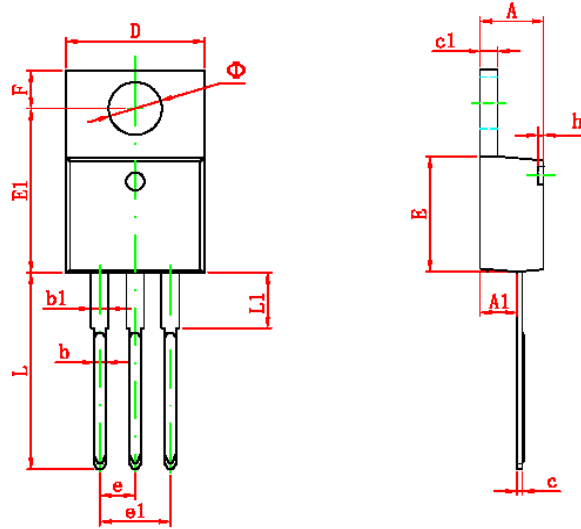


Unclamped Inductive Switching Test Circuit & Waveforms





**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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