



### General Description

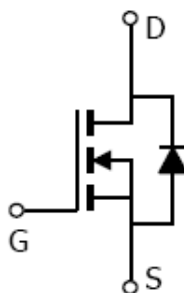
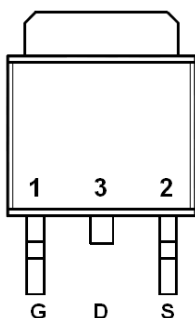
AFN2514S, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent  $R_{DS(ON)}$ , low gate charge.

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

- 150V/ 10A,  $R_{DS(ON)}=55m\Omega@V_{GS}=10V$
- 150V/ 8A,  $R_{DS(ON)}=60m\Omega@V_{GS}=4.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- TO-252-2L package design

### Pin Description ( TO-252-2L )



### Application

- High Frequency Boost Converter
- LED Backlight for LCD TV

### Pin Define

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

### Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFN2514ST252RG	2514S	TO-252-2L	Tape & Reel	2500 EA

※ A Lot code

※ B Date code

※ AFN2514ST252RG : 13" Tape & Reel ; Pb- Free ; Halogen -Free



**Absolute Maximum Ratings** (T<sub>A</sub>=25°C Unless otherwise noted)

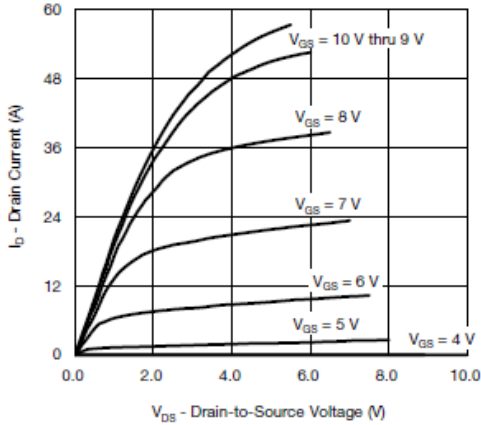
Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V <sub>DSS</sub>	150	V
Gate –Source Voltage	V <sub>GSS</sub>	±20	V
Continuous Drain Current(T <sub>J</sub> =150°C)	T <sub>C</sub> =25°C	20	A
	T <sub>C</sub> =70°C	16	
Pulsed Drain Current ( t=100us )	T <sub>A</sub> =25°C	5.2	
	T <sub>A</sub> =70°C	4.2	
Continuous Source Current(Diode Conduction)	I <sub>S</sub>	40	3.2
Single pulse avalanche current	I <sub>AS</sub>	10	
Single pulse avalanche energy	E <sub>AS</sub>	5	mJ
Power Dissipation	T <sub>C</sub> =25°C	52	33
	T <sub>A</sub> =25°C	3.7	2.4
Operating Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature Range	T <sub>STG</sub>	-55/150	°C
Thermal Resistance-Junction to Ambient	R <sub>θJA</sub>	33	°C/W
Maximum junction-to-case (drain)	R <sub>θJC</sub>	2.4	

**Electrical Characteristics** (T<sub>A</sub>=25°C Unless otherwise noted)

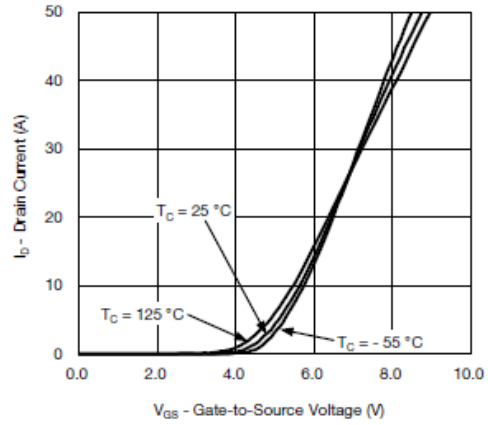
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	150			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	1.2		2.5	
Gate Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =120V, V <sub>GS</sub> =0V			1	uA
		V <sub>DS</sub> =120V, V <sub>GS</sub> =0V T <sub>J</sub> =85°C			10	
On-State Drain Current	I <sub>D(on)</sub>	V <sub>DS</sub> ≥ 10V, V <sub>GS</sub> =10V	40			A
Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =10A		45	55	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> = 8A		50	60	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =15V, I <sub>D</sub> =10A		12		S
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =4A, V <sub>GS</sub> =0V		0.8	1.2	V
<b>Dynamic</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =75V, V <sub>GS</sub> =7.5V I <sub>D</sub> ≡10A		8	16	nC
Gate-Source Charge	Q <sub>gs</sub>			2.5		
Gate-Drain Charge	Q <sub>gd</sub>			3.5		
Gate resistance	R <sub>g</sub>		0.2	1.3	2.0	Ω
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =75V, V <sub>GS</sub> =0V f=1MHz		450		pF
Output Capacitance	C <sub>oss</sub>			135		
Reverse Transfer Capacitance	C <sub>rss</sub>			15		
Turn-On Time	t <sub>d(on)</sub>	V <sub>DD</sub> =75V, R <sub>L</sub> =5Ω I <sub>D</sub> ≡10A, V <sub>GEN</sub> =10V R <sub>G</sub> =1.0Ω		15	30	ns
	t <sub>r</sub>			10	20	
Turn-Off Time	t <sub>d(off)</sub>			15	30	
	t <sub>f</sub>			10	20	



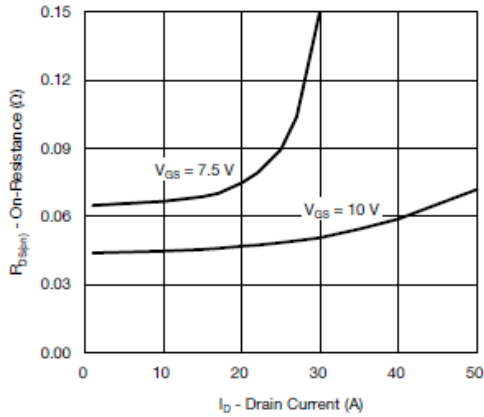
## Typical Characteristics



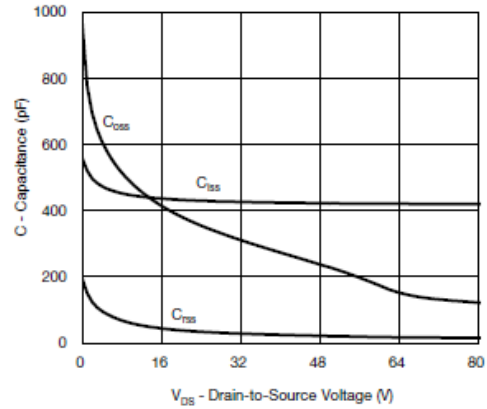
Output Characteristics



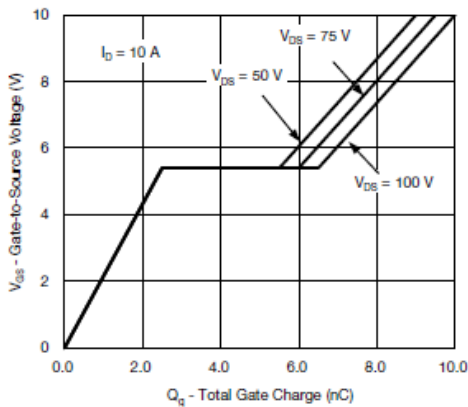
Transfer Characteristics



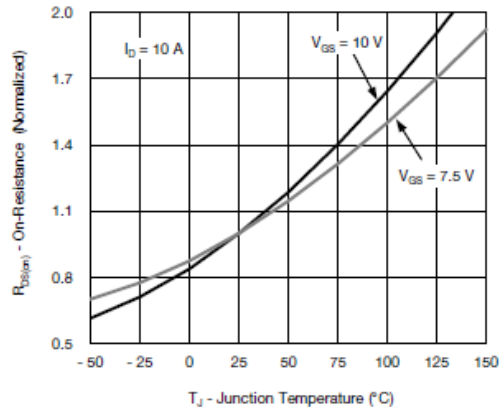
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



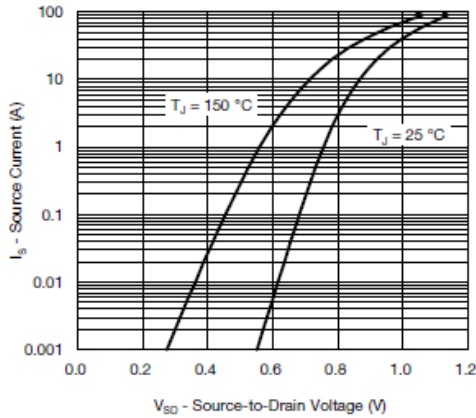
Gate Charge



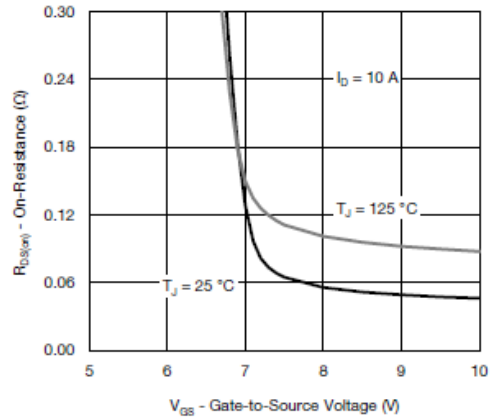
On-Resistance vs. Junction Temperature



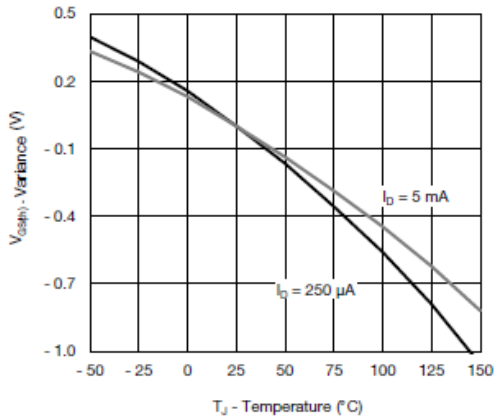
## Typical Characteristics



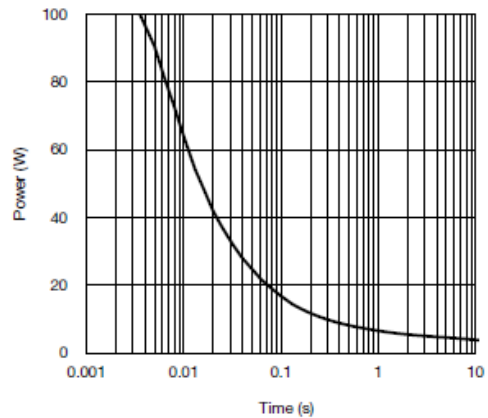
Source-Drain Diode Forward Voltage



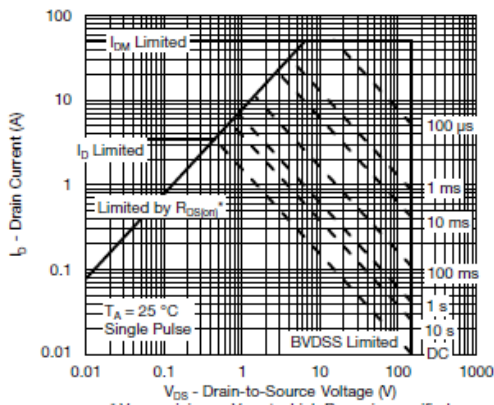
On-Resistance vs. Gate-to-Source Voltage



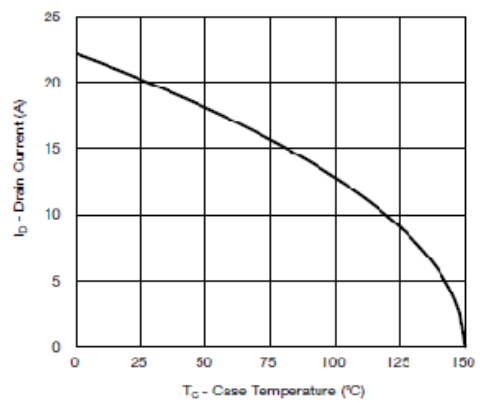
Threshold Voltage



Single Pulse Power, Junction-to-Ambient



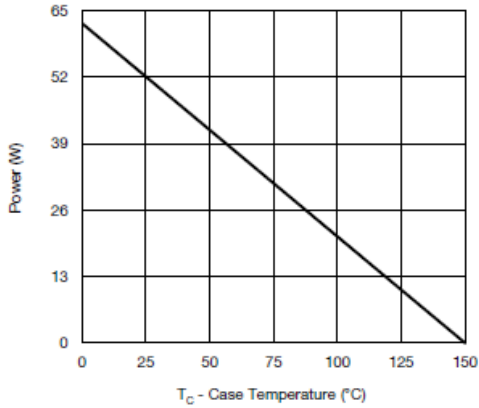
Safe Operating Area, Junction-to-Ambient



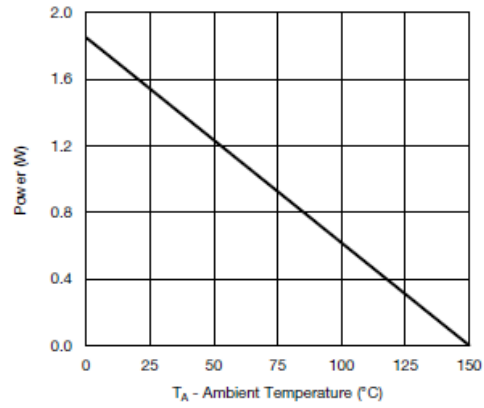
Current Derating\*



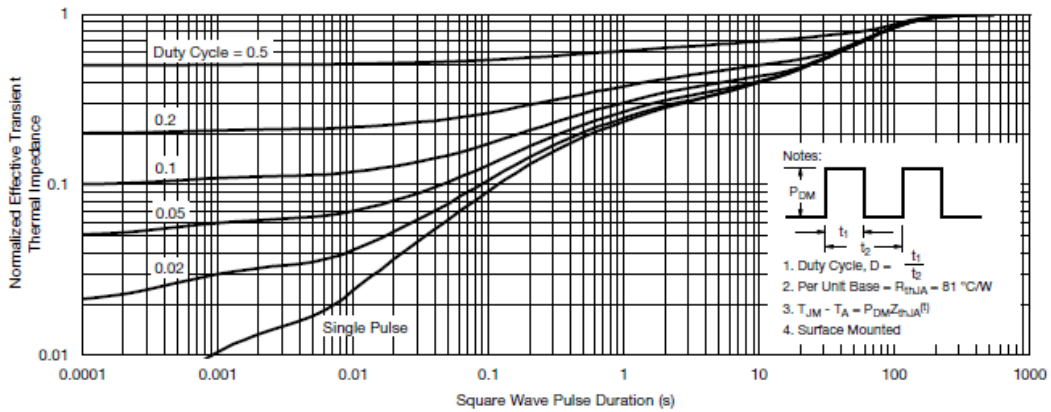
## Typical Characteristics



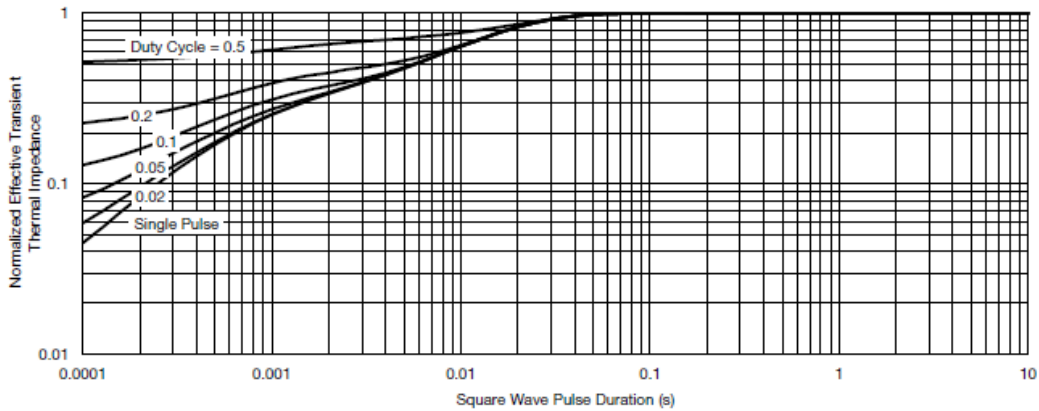
Power, Junction-to-Case



Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient

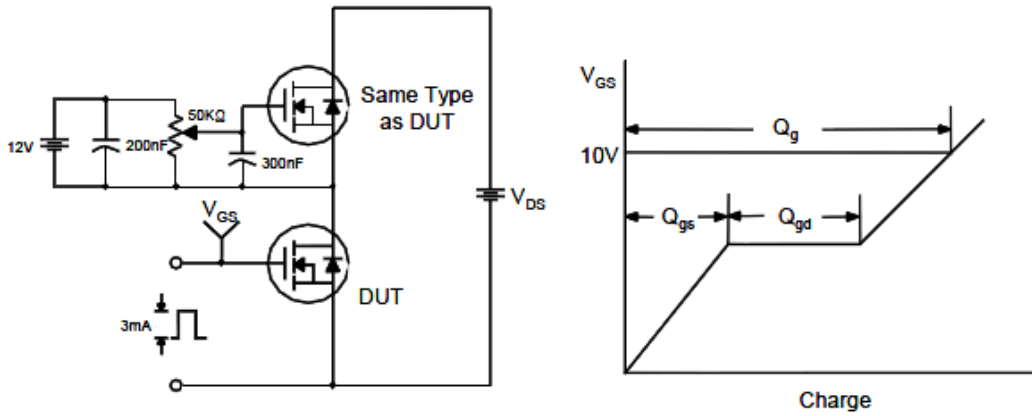


Normalized Thermal Transient Impedance, Junction-to-Case

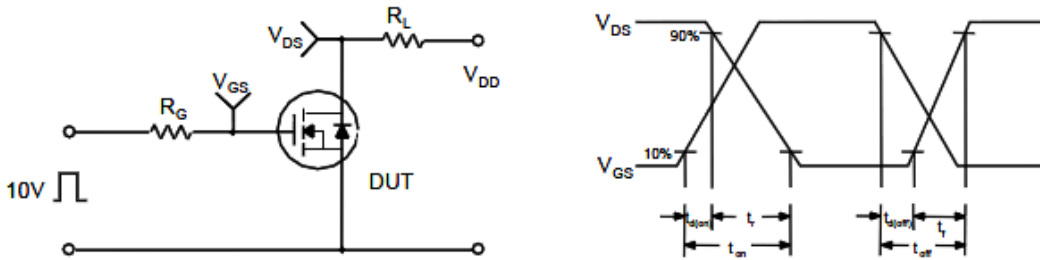


Typical Characteristics

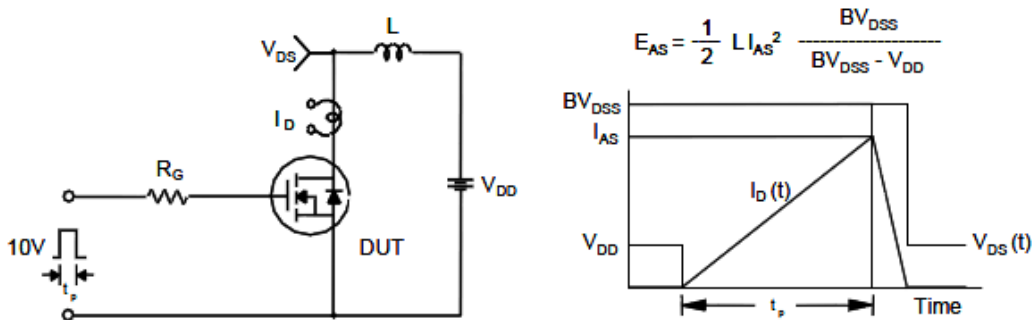
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

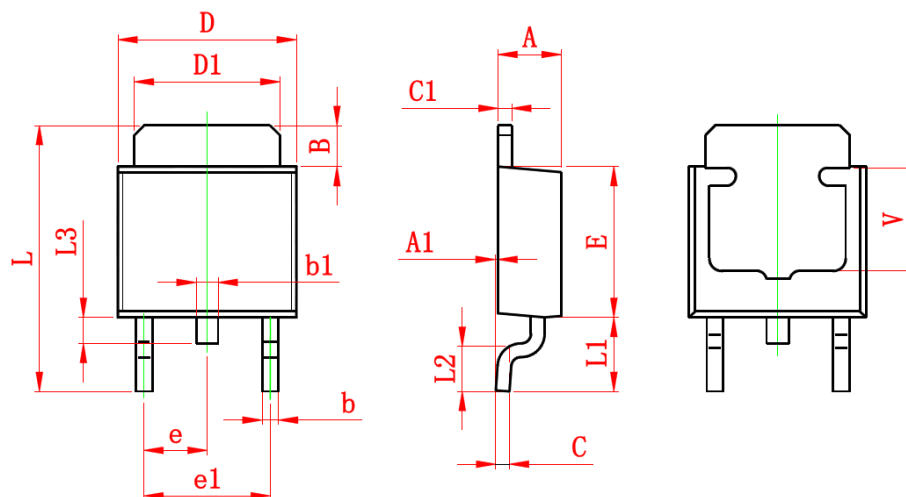


Unclamped Inductive Switching Test Circuit & Waveforms





**Package Information ( TO-252-2L )**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300 TYP.		0.091 TYP.	
e1	4.500	4.700	0.177	0.185
L	9.500	9.900	0.374	0.390
L1	2.550	2.900	0.100	0.114
L2	1.400	1.780	0.055	0.070
L3	0.600	0.900	0.024	0.035
V	3.800 REF.		0.150 REF.	

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