



General Description

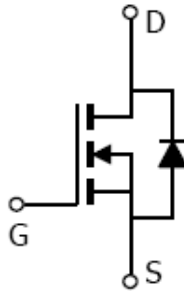
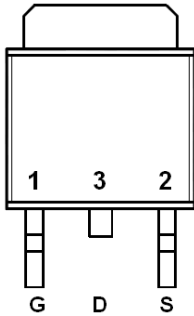
AFN2512S, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

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/15A, $R_{DS(ON)} = 24m\Omega @ V_{GS} = 10V$
- 150V/10A, $R_{DS(ON)} = 26m\Omega @ V_{GS} = 6V$
- 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
AFN2512ST252RG	2512S	TO-252-2L	Tape & Reel	2500 EA

※ A Lot code

※ B Date code

※ AFN2512ST252RG : 13" Tape & Reel ; Pb- Free ; Halogen -Free



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

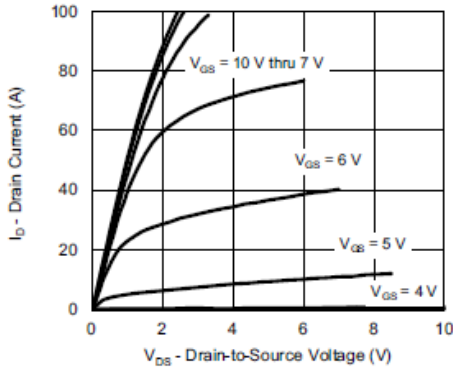
Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	± 25	V
Continuous Drain Current ($T_J=150^\circ\text{C}$)	I_{DSM}	$T_C=25^\circ\text{C}$	36
		$T_C=70^\circ\text{C}$	28
Pulsed Drain Current ($t=100\mu\text{s}$)	I_{DM}	$T_A=25^\circ\text{C}$	9.8
		$T_A=70^\circ\text{C}$	7.8
Continuous Source Current (Diode Conduction)	I_S	36	A
Single Pulse Avalanche Current	I_{AS}	$T_C=25^\circ\text{C}$	30
		$T_A=25^\circ\text{C}$	4.5
Power Dissipation	P_D	$L=0.1\text{mH}$	45
		$T_C=25^\circ\text{C}$	68
Operating Junction Temperature	T_J	$T_C=75^\circ\text{C}$	45
		$T_A=75^\circ\text{C}$	5.0
Storage Temperature Range	T_{STG}	-55/150	$^\circ\text{C}$
Maximum Junction-to-Ambient	$R_{\theta JA}$	25	$^\circ\text{C/W}$
Maximum Junction-to-Case (Drain)	$R_{\theta JA}$	1.8	

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

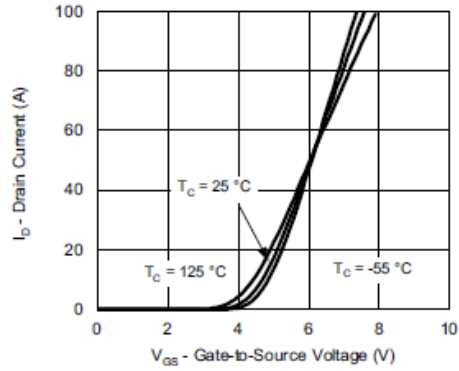
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu\text{A}$	150			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	2.0	3.0	4.0	
Gate Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=120V, V_{GS}=0V$			1	uA
		$V_{DS}=120V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			30	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq 10V, V_{GS}=10V$	30			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=15A$		20	24	m Ω
		$V_{GS}=6V, I_D=10A$		22	26	
Forward Transconductance	g_{FS}	$V_{DS}=10V, I_D=15A$		25		S
Diode Forward Voltage	V_{SD}	$I_S=8A, V_{GS}=0V$		0.75	1.3	V
Dynamic						
Total Gate Charge	Q_g	$V_{DS}=75V, V_{GS}=7.5V$ $I_D=15A$		16	25	nC
Gate-Source Charge	Q_{gs}			5.5		
Gate-Drain Charge	Q_{gd}			6.8		
Gate Resistance	R_g	$f=1\text{MHz}$	0.3	1.0	2.0	Ω
Input Capacitance	C_{iss}	$V_{DS}=75V, V_{GS}=0V$ $f=1\text{MHz}$		1100		pF
Output Capacitance	C_{oss}			250		
Reverse Transfer Capacitance	C_{rss}			25		
Turn-On Time	$t_{d(on)}$	$V_{DD}=75V, R_L=5\Omega$ $I_D=15A, V_{GEN}=10V$ $R_G=1\Omega$		10	20	ns
	t_r			20	40	
Turn-Off Time	$t_{d(off)}$			15	30	
	t_f			10	20	



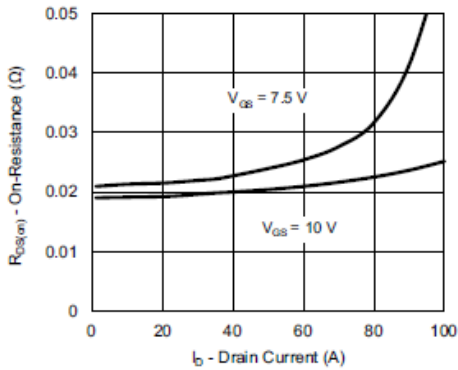
Typical Characteristics



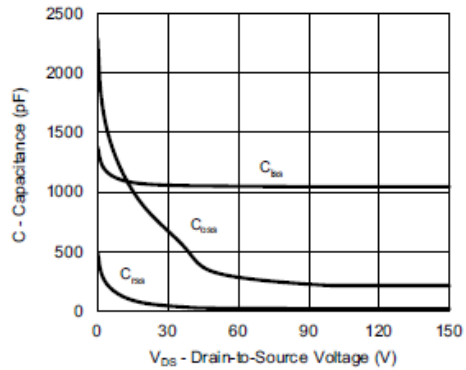
Output Characteristics



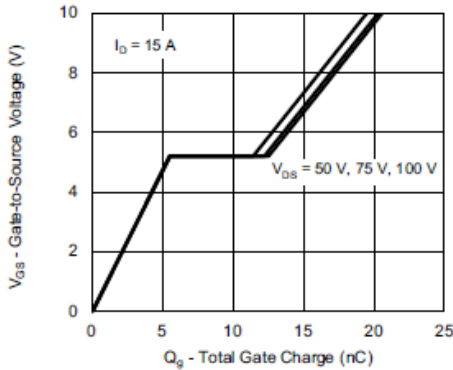
Transfer Characteristics



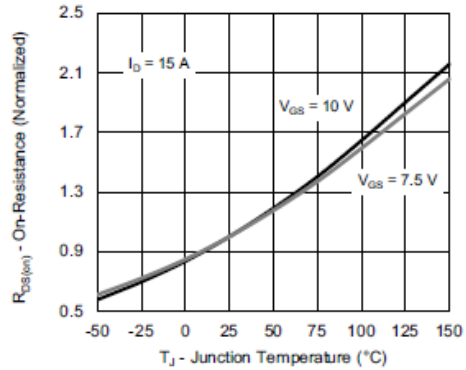
On-Resistance vs. Drain Current



Capacitance



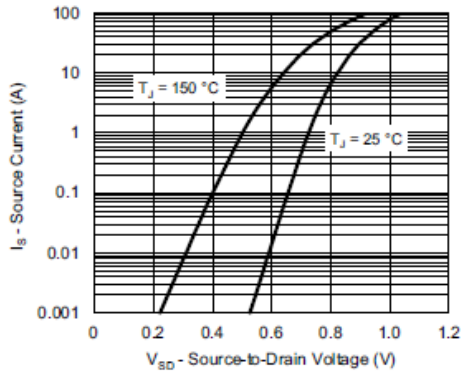
Gate Charge



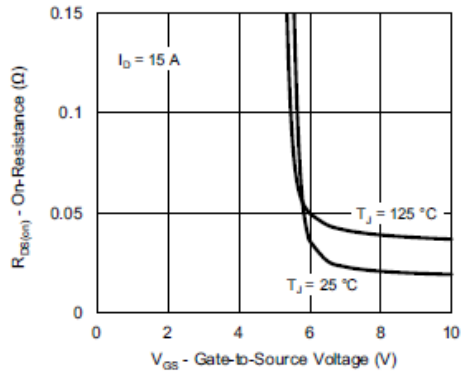
On-Resistance vs. Junction Temperature



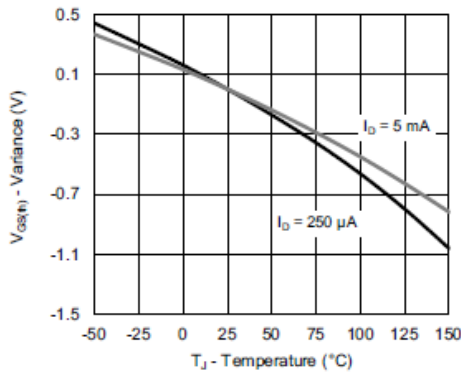
Typical Characteristics



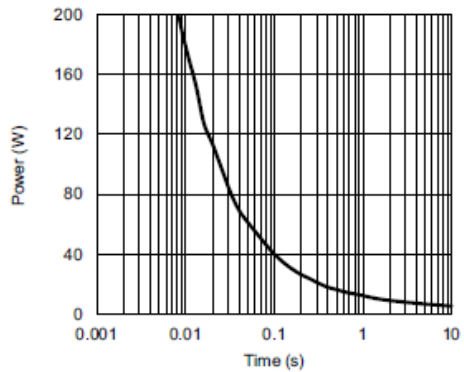
Source-Drain Diode Forward Voltage



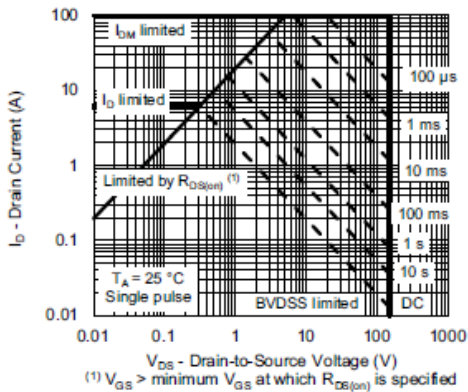
On-Resistance vs. Gate-to-Source Voltage



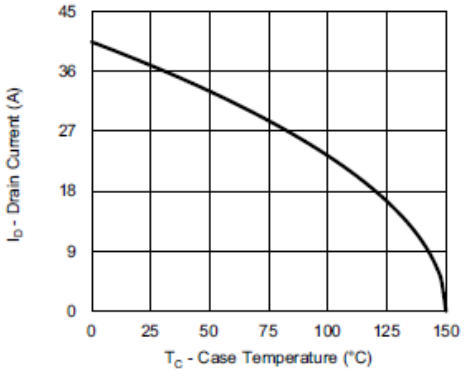
Threshold Voltage



Single Pulse Power, Junction-to-Ambient



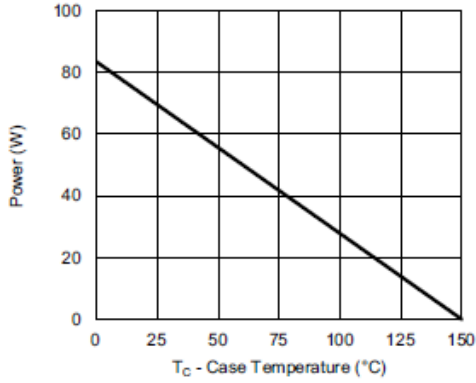
Safe Operating Area, Junction-to-Ambient



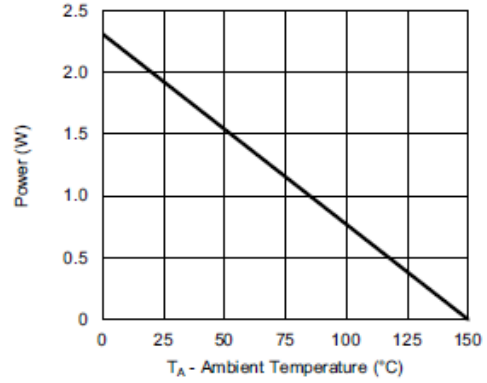
Current Derating ^a



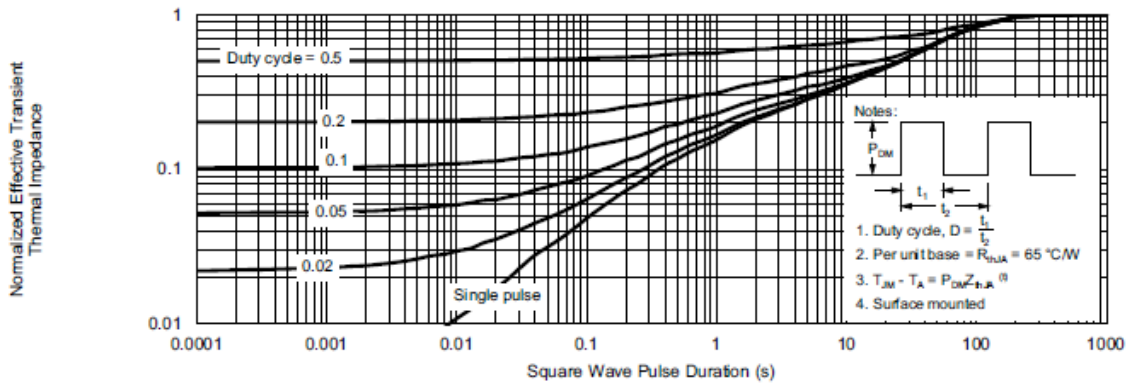
Typical Characteristics



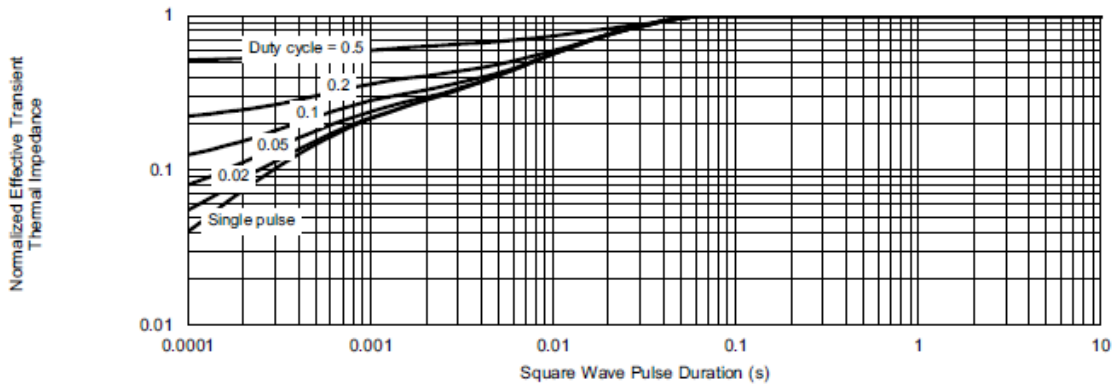
Power, Junction-to-Case



Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient

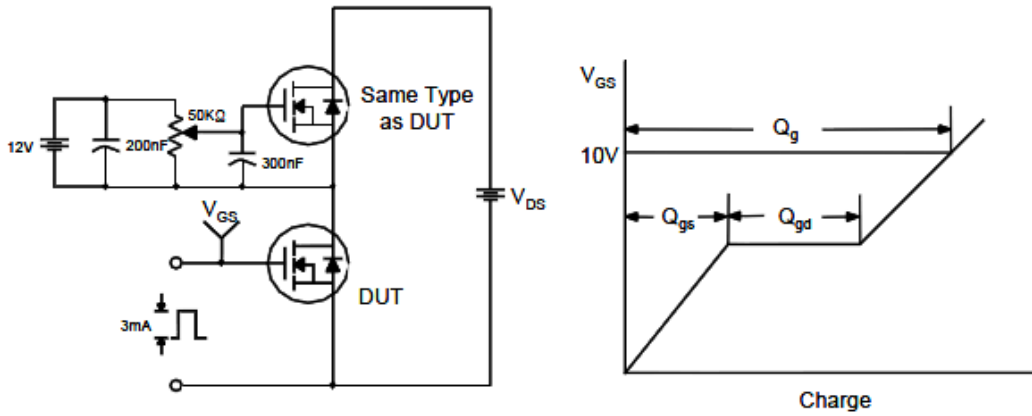


Normalized Thermal Transient Impedance, Junction-to-Case

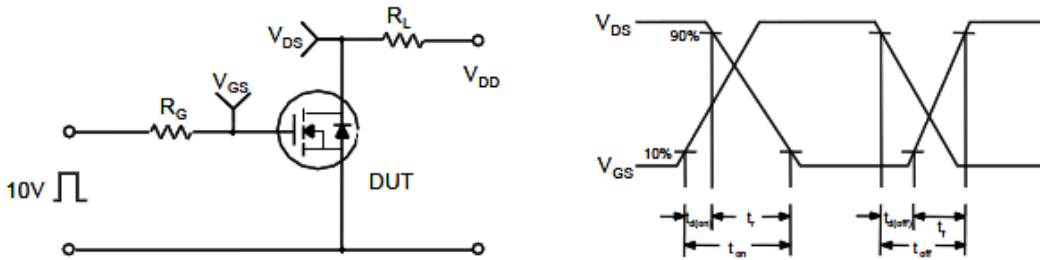


Typical Characteristics

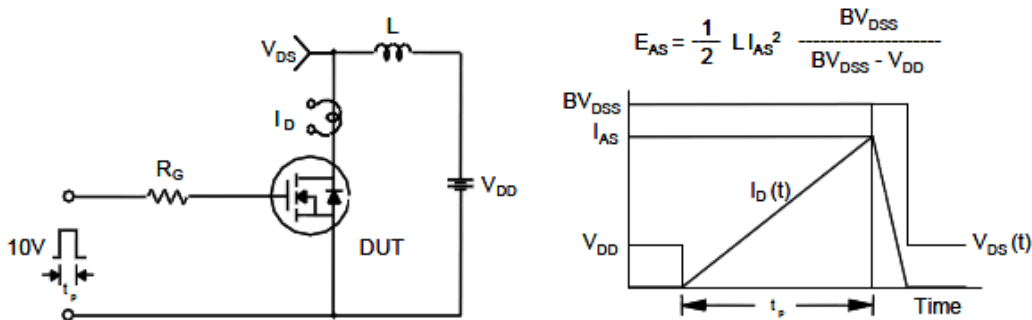
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

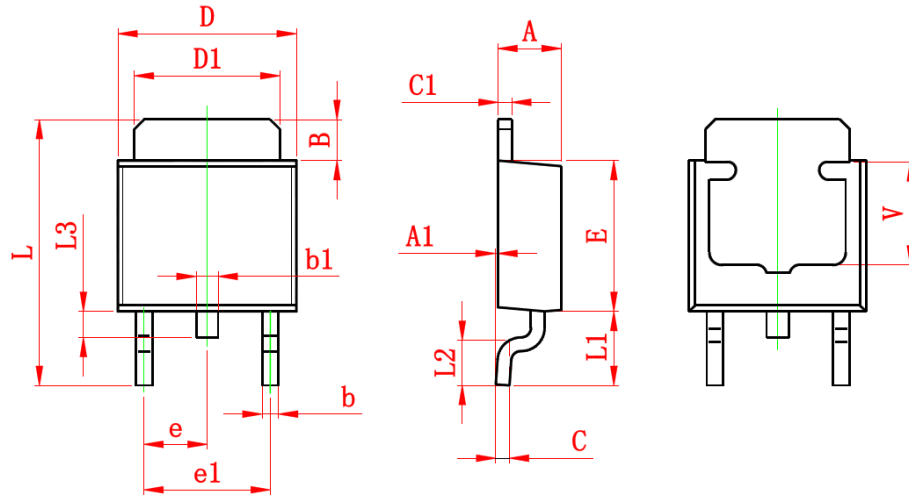


Unclamped Inductive Switching Test Circuit & Waveforms





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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 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
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