Alfa-MOS Technology

AFN7862WS

60V N-Channel
Enhancement Mode MOSFET

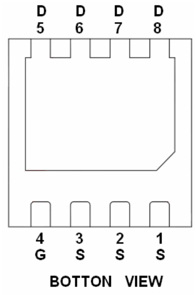
General Description

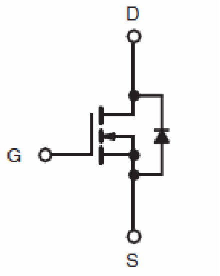
AFN7862WS, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.
These devices are particularly suited for low voltage power management, such as smart phone and notebook computer and other battery powered circuits, and low in-line power loss are needed in commercial industrial surface mount applications.

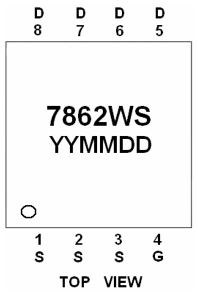
Features

- 60V/ 8.7A,$R_{DS(ON)}$=15mΩ@V_{GS}=10V
- 60V/ 7.3A,$R_{DS(ON)}$=17mΩ@V_{GS}=4.5V
- Super high density cell design for extremely low $R_{DS\ (ON)}$
- Exceptional on-resistance and maximum DC current capability
- DFN3X3-8L package design

Pin Description (DFN3X3-8L)







Application

- Primary Side Switch
- Synchronous Rectification
- DC/DC Converters & DC/AC Inverters
- Boost Converters

Pin Define

Pin	Symbol	Description
1~3	S	Source
4	G	Gate
5~8	D	Drain

Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFN7862WSFN338RG	7862WS	DFN3X3-8L	Tape & Reel	5000 EA

※ YY year code
※ MM month code
※ DD date code
※ AFN7862WSFN338RG : 13"Tape & Reel ; Pb- Free ; Halogen –Free

Absolute Maximum Ratings

(T_A=25℃ Unless otherwise noted)

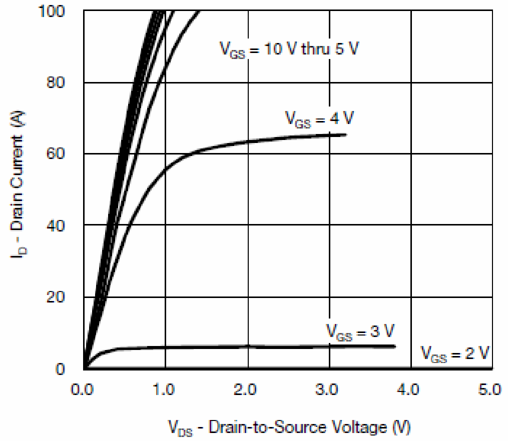
Parameter		Symbol	Typical	Unit
Drain-Source Voltage		V_{DSS}	60	V
Gate –Source Voltage		V_{GSS}	±20	V
Continuous Drain Current(T_J=150℃)	T_A=25℃	I_D	11	A
	T_A=70℃		8	
Pulsed Drain Current		I_{DM}	90	A
Continuous Source Current(Diode Conduction)	T_C=25℃	I_S	3.2	A
Power Dissipation	T_A=25℃	P_D	3.8	W
	T_A=70℃		2	
Operating Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{STG}	-55/150	℃
Thermal Resistance-Junction to Ambient	t ≤ 10 s	$R_{\theta JA}$	26	℃/W
Thermal Resistance-Junction to Case	Steady-State	$R_{\theta JC}$	1.9	

Electrical Characteristics

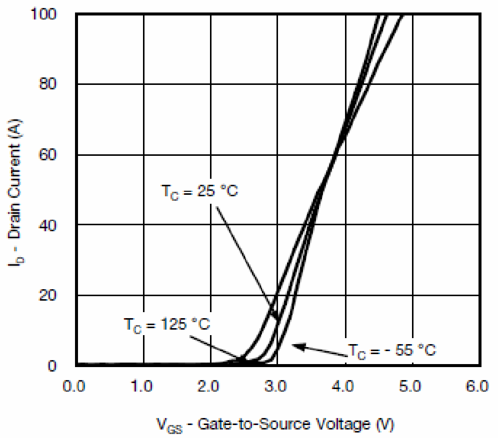
(T_A=25℃ Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=250uA	60			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	1.0		2.0	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=48V,V_{GS}=0V			1	uA
		V_{DS}=48V,V_{GS}=0V T_J=85℃			5	
On-State Drain Current	$I_{D(on)}$	V_{DS}≧5V,V_{GS}=10V	20			A
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=8.7A		12	15	mΩ
		V_{GS}=4.5V,I_D=7.3A		14	17	
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=10A		24		S
Diode Forward Voltage	V_{SD}	I_S=2.0A,V_{GS}=0V		0.85	1.3	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=30V,V_{GS}=4.5V I_D≡10A		10	20	nC
Gate-Source Charge	Q_{gs}			5		
Gate-Drain Charge	Q_{gd}			4		
Input Capacitance	C_{iss}	V_{DS}=30V,V_{GS}=0V f=1MHz		1350		pF
Output Capacitance	C_{oss}			450		
Reverse Transfer Capacitance	C_{rss}			40		
Turn-On Time	$t_{d(on)}$	V_{DD}=30V,R_L=3Ω I_D≡10A,V_{GEN}=10V R_G=1Ω		25	50	ns
	t_r			100	200	
Turn-Off Time	$t_{d(off)}$			25	50	
	t_f			10	20	

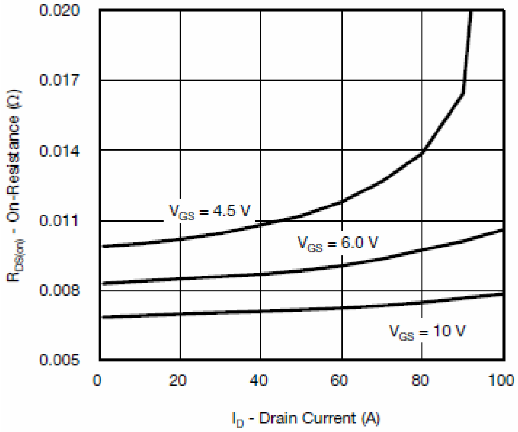
Typical Characteristics



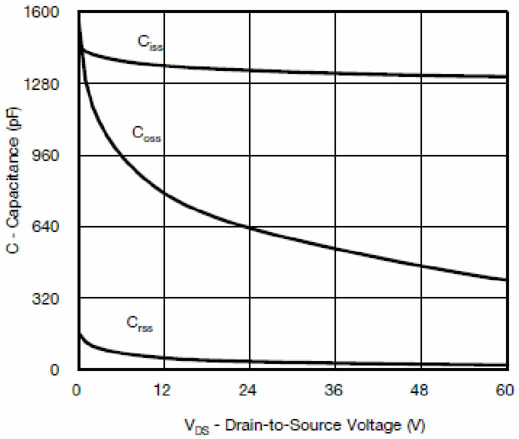
Output Characteristics



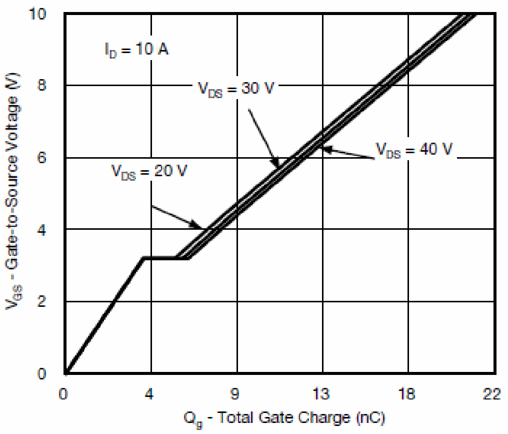
Transfer Characteristics



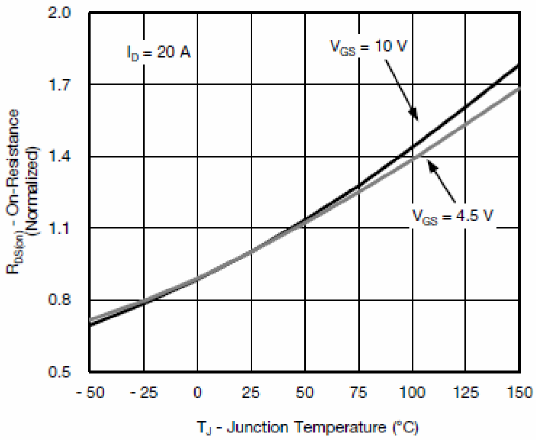
On-Resistance vs. Drain Current and Gate Voltage



Capacitance

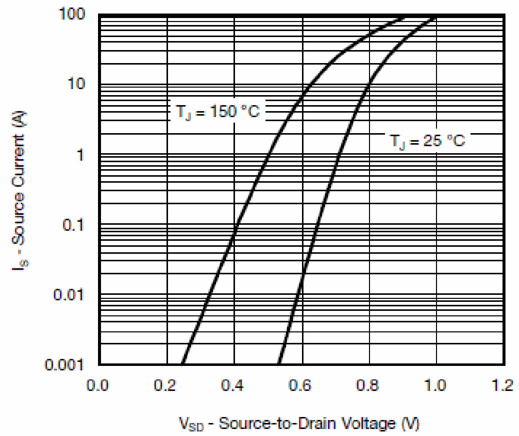


Gate Charge

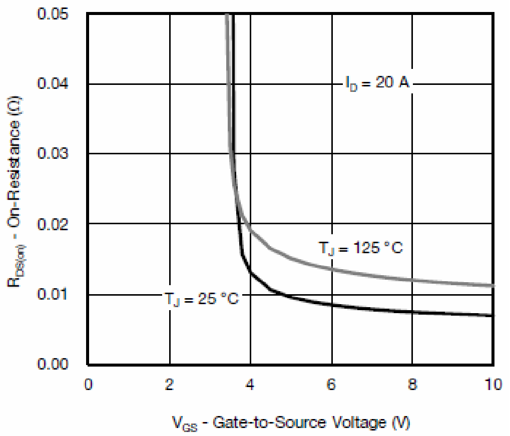


On-Resistance vs. Junction Temperature

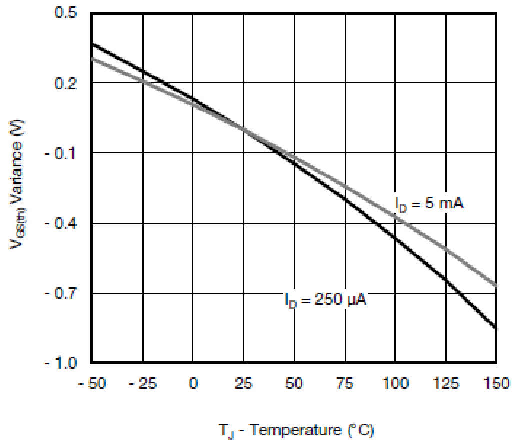
Typical Characteristics



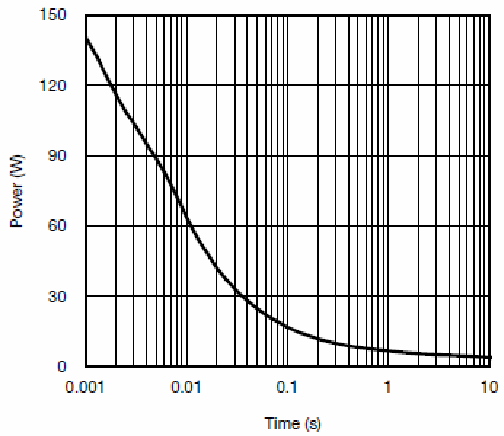
Source-Drain Diode Forward Voltage



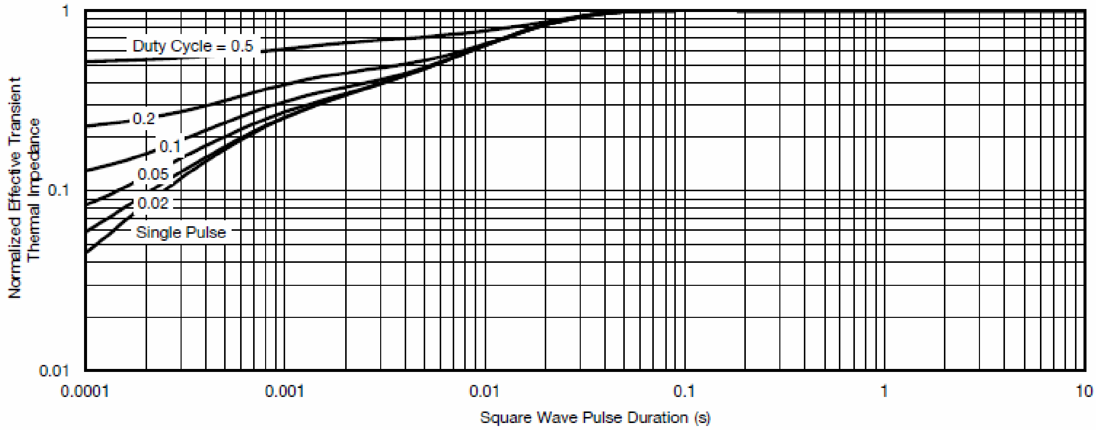
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



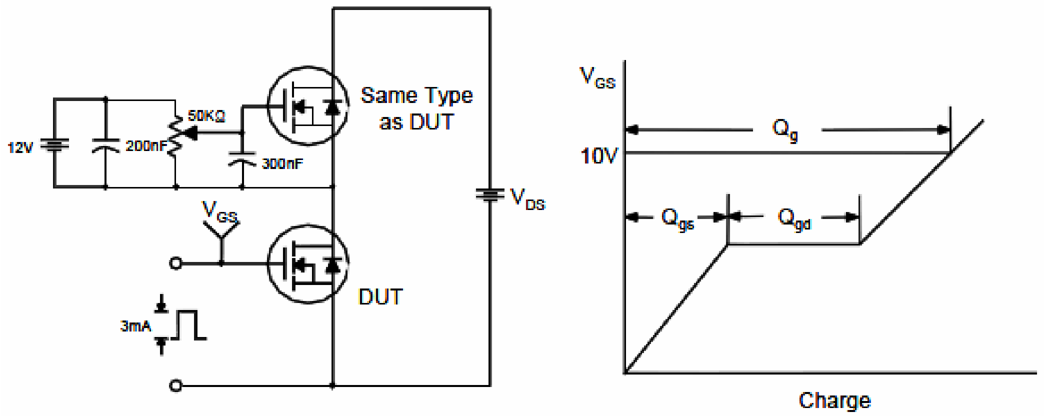
Single Pulse Power, Junction-to-Ambient



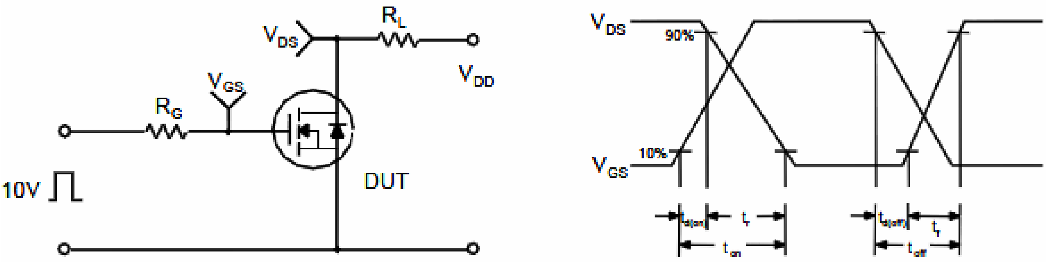
Normalized Thermal Transient Impedance, Junction-to-Case

Typical Characteristics

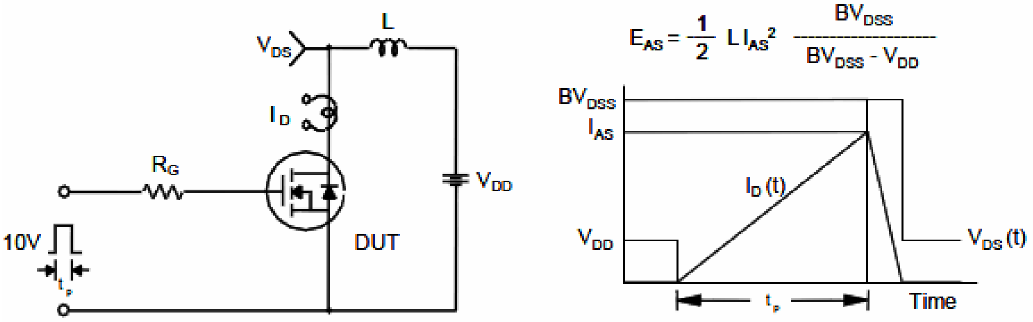
Gate Charge Test Circuit & Waveform



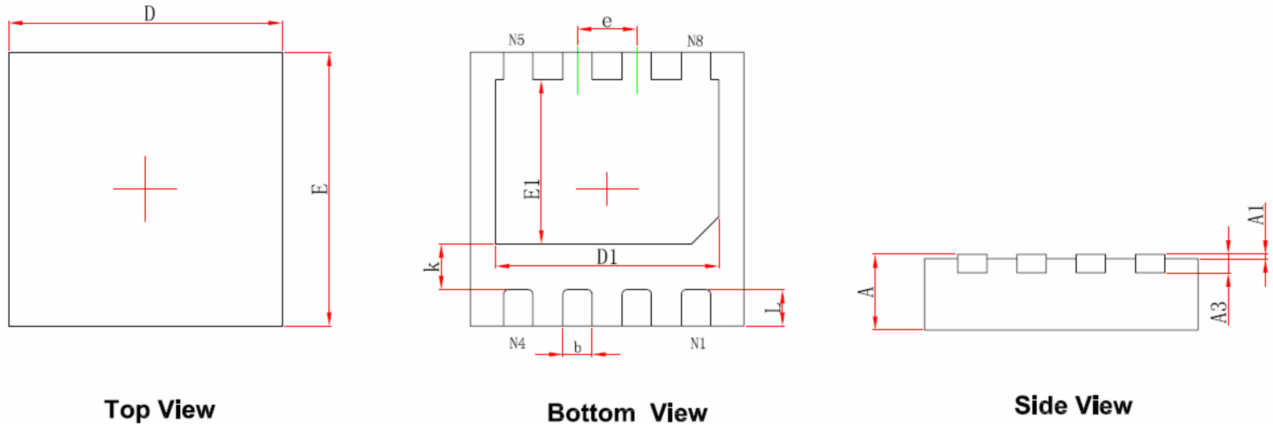
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



Package Information (DFN3X3-8L)



Top View

Bottom View

Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.800	0.900	0.031	0.035
A1	0.000	0.050	0.000	0.002
A3	0.203REF.		0.008REF.	
D	2.924	3.076	0.115	0.121
E	2.924	3.076	0.115	0.121
D1	2.350	2.550	0.093	0.100
E1	1.700	1.900	0.067	0.075
k	0.450	0.550	0.018	0.022
b	0.270	0.370	0.011	0.015
e	0.650TYP.		0.026TYP.	
L	0.324	0.476	0.013	0.019

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