Alfa-MOS Technology

AFN4062S

60V N-Channel Enhancement Mode MOSFET

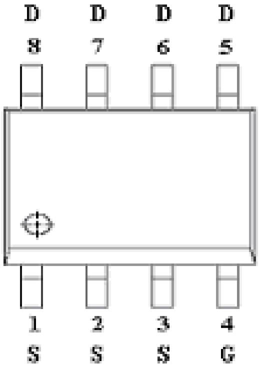
General Description

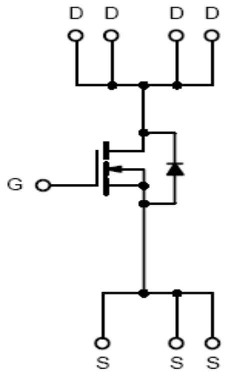
AFN4062S, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge. These devices are particularly suited for low voltage power management, and low in-line power loss are needed in commercial industrial surface mount applications.

Features

- 60V/20A,$R_{DS(ON)}$= 4.8mΩ@V_{GS}=10V
- 60V/15A,$R_{DS(ON)}$= 6.0mΩ@V_{GS}=6.0V
- 60V/10A,$R_{DS(ON)}$= 7.5mΩ@V_{GS}=4.5V
- Super high density cell design for extremely low $R_{DS\ (ON)}$
- SOP-8P package design

Pin Description (SOP-8P)





Application

- DC/DC Primary Side Switch
- Industrial
- Synchronous Rectification
- Load Switch
- DC/DC Converters
- DC/AC Inverters

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
AFN4062SS8RG	4062S	SOP-8P	Tape & Reel	2500 EA

※ A Lot code
※ B Date code
※ AFN4062SS8RG : 13” Tape & Reel ; Pb- Free ; Halogen –Free

Absolute Maximum Rating

(T_A=25℃ Unless otherwise noted)

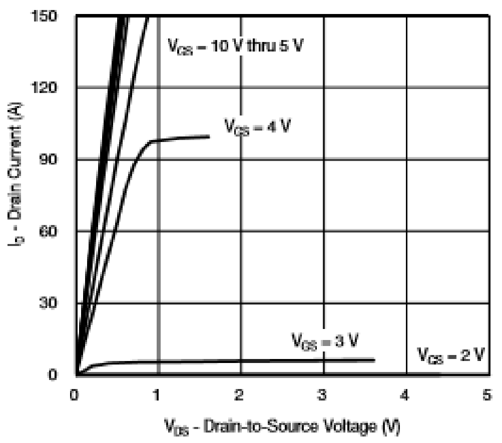
Parameter		Symbol	Typical	Unit
Drain-Source Voltage		V_{DSS}	60	V
Gate –Source Voltage		V_{GSS}	±20	V
Continuous Drain Current(T_J=150℃)	T_A=25℃	I_{DSM}	22	A
	T_A=70℃		18	
Pulsed Drain Current		I_{DM}	150	
Continuous Source Current(Diode Conduction)	T_A=25℃	I_S	3.2	
Single Pulse Avalanche Current	L=0.1mH	I_{AS}	25	
		E_{AS}	30	mJ
Power Dissipation	T_A=25℃	P_D	3.5	W
	T_A=75℃		2.2	
Operating Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{STG}	-55/150	℃
Thermal Resistance-Junction to Ambient	t ≤ 10 s	$R_{\theta JA}$	29	℃/W
Maximum Junction-to-Foot (Drain)	Steady-State	$R_{\theta JF}$	13	

Electrical Characteristics

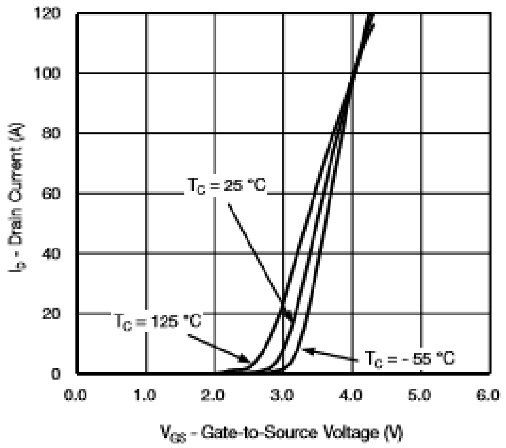
(T_A=25℃ Unless otherwise noted)

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		2.5	
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℃			30	
On-State Drain Current	$I_{D(on)}$	$V_{DS}\geqq 5$V,V_{GS}=10V	30			A
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=20A		3.7	4.8	mΩ
		V_{GS}=6.0V,I_D=15A		4.6	6.0	
		V_{GS}=4.5V,I_D=10A		5.8	7.5	
Forward Transconductance	g_{FS}	V_{DS}=15V,I_D=20A		80		S
Diode Forward Voltage	V_{SD}	I_S=20A,V_{GS}=0V		0.8	1.3	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=30V,V_{GS}=4.5V I_D≡10A		18	35	nC
Gate-Source Charge	Q_{gs}			9		
Gate-Drain Charge	Q_{gd}			6		
Input Capacitance	C_{iss}	V_{DS}=30V,V_{GS}=0V f=1MHz		3175		pF
Output Capacitance	C_{oss}			1250		
Reverse Transfer Capacitance	C_{rss}			100		
Turn-On Time	$t_{d(on)}$	V_{DD}=30V,R_L=30Ω I_D≡10A,V_{GEN}=10V R_G=1Ω		20	40	ns
	t_r			10	20	
Turn-Off Time	$t_{d(off)}$			30	60	
	t_f			10	20	

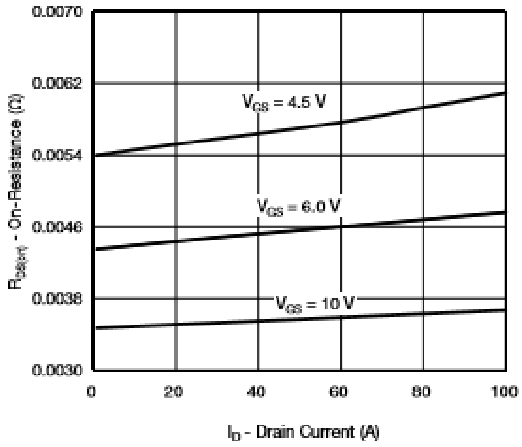
Typical Characteristics



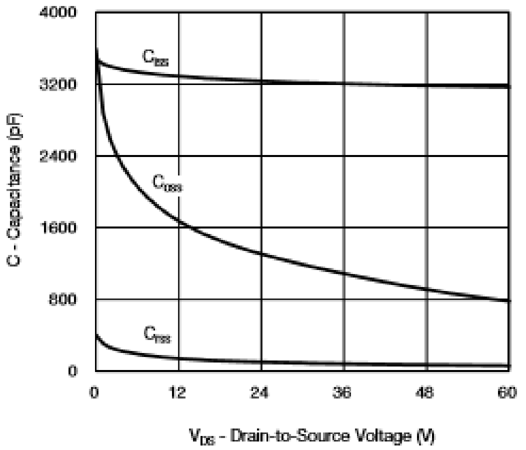
Output Characteristics



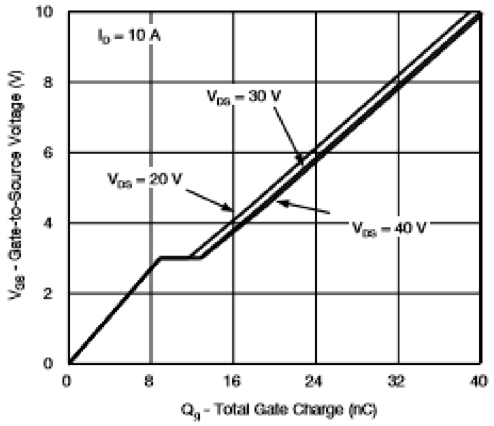
Transfer Characteristics



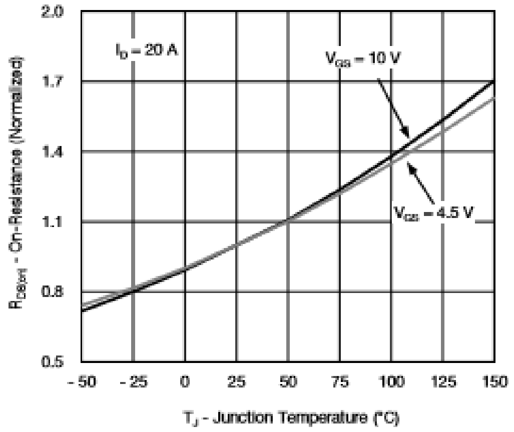
On-Resistance vs. Drain Current



Capacitance

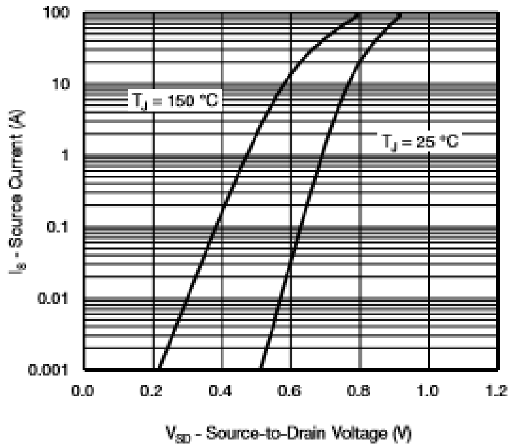


Gate Charge

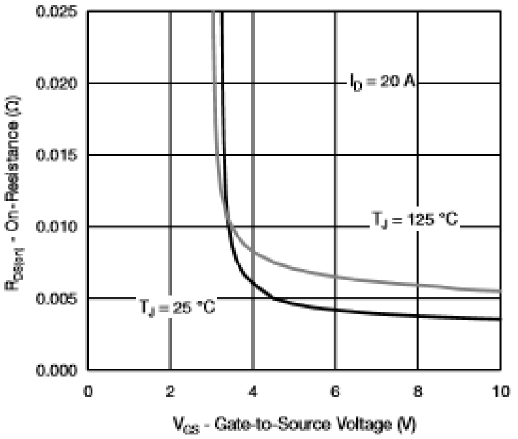


On-Resistance vs. Junction Temperature

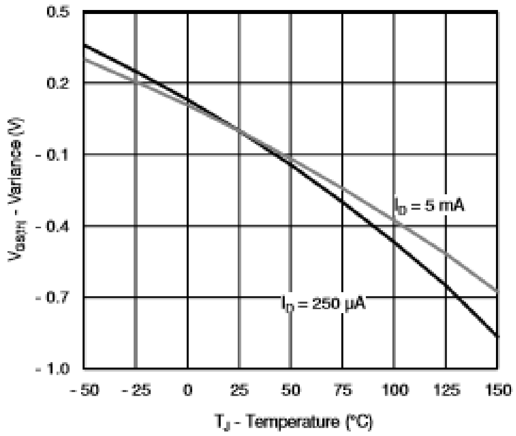
Typical Characteristics



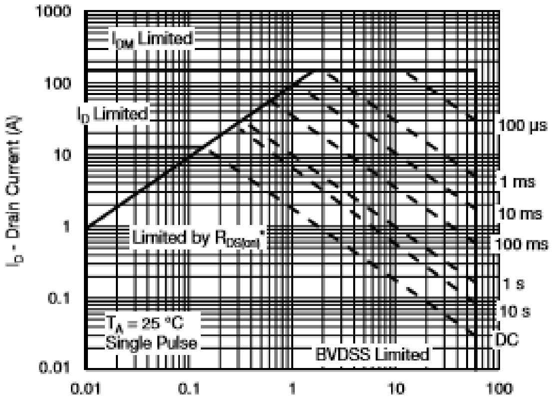
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage

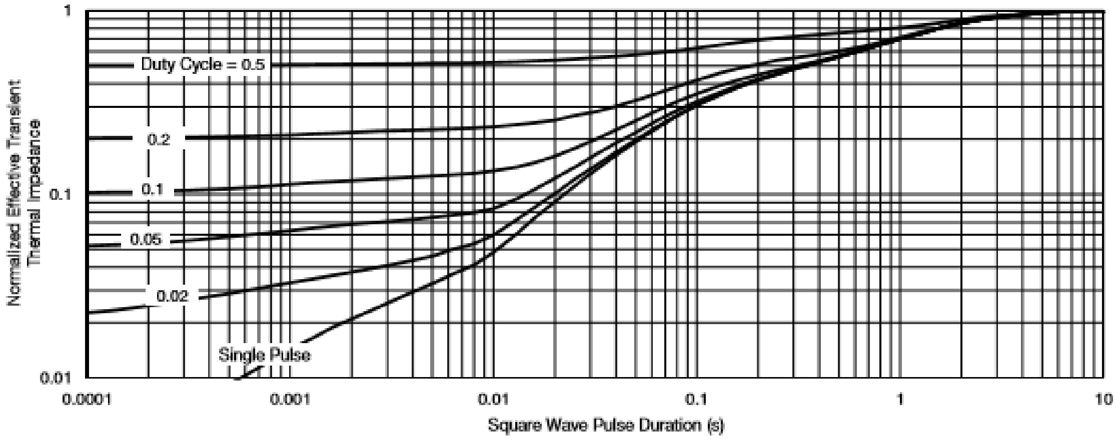


Threshold Voltage



* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

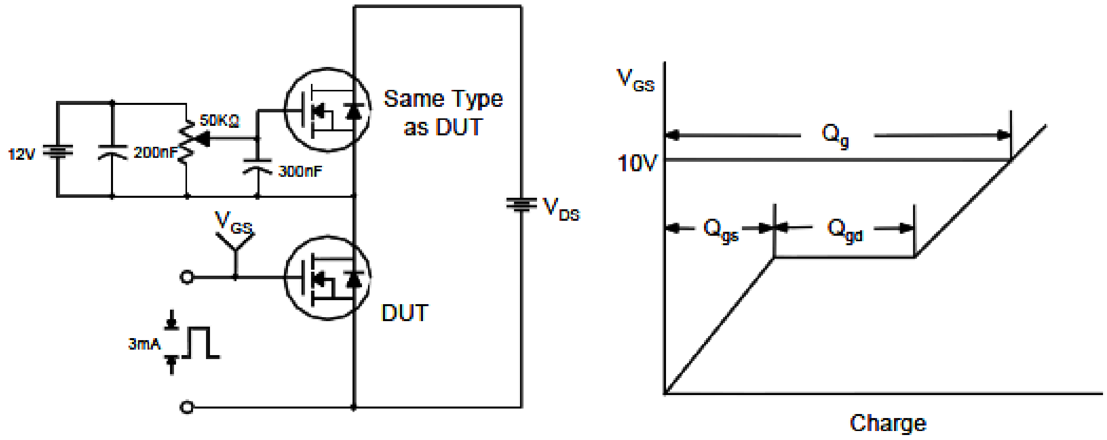
Safe Operating Area, Junction-to-Ambient



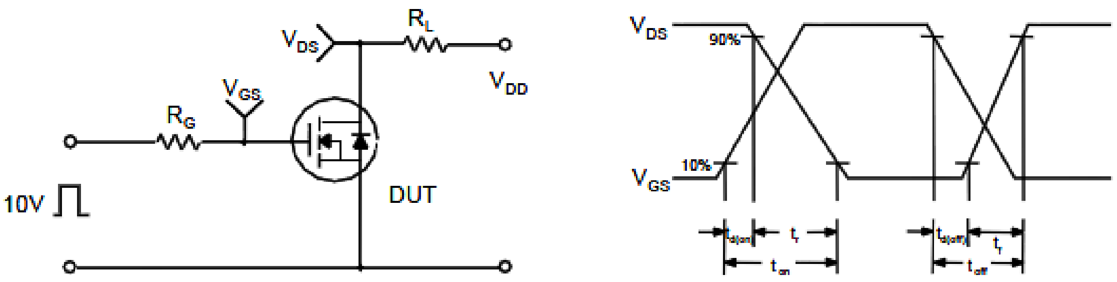
Normalized Thermal Transient Impedance, Junction-to-Foot

Typical Characteristics

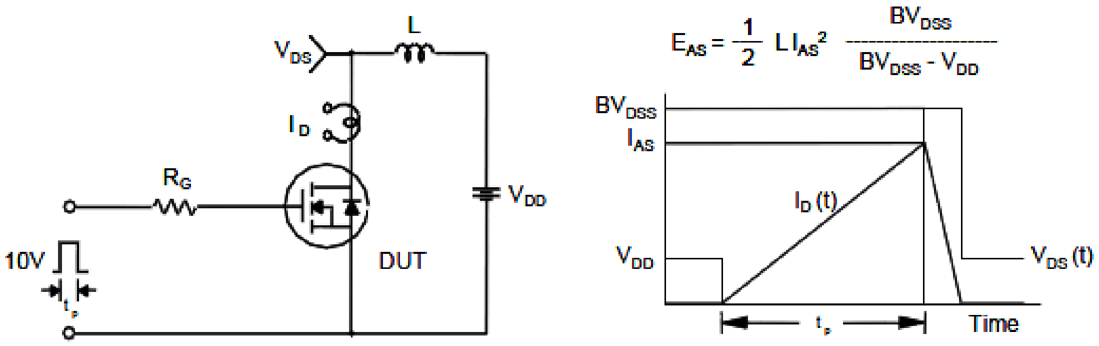
Gate Charge Test Circuit & Waveform



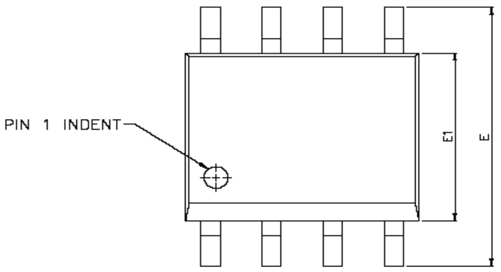
Resistive Switching Test Circuit & Waveforms

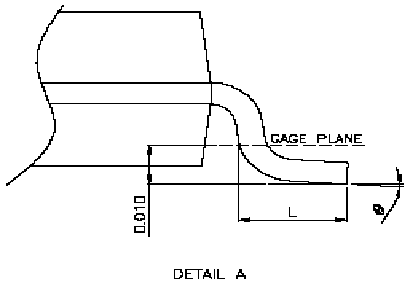


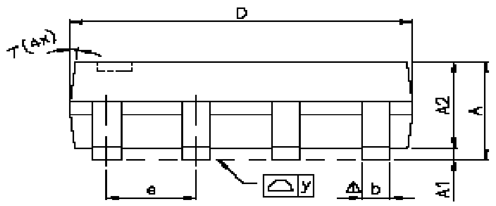
Unclamped Inductive Switching Test Circuit & Waveforms

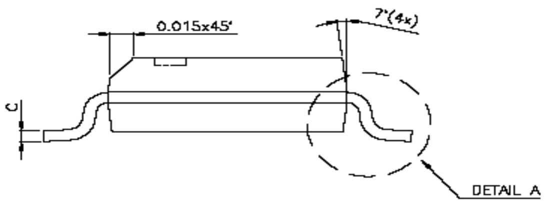


Package Information (SOP-8P)









SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.47	1.60	1.73	0.058	0.063	0.068
A1	0.10	——	0.25	0.004	——	0.010
A2	——	1.45	——	——	0.057	——
b	0.33	0.41	0.51	0.013	0.016	0.020
C	0.19	0.20	0.25	0.0075	0.008	0.0098
D	4.80	4.85	4.95	0.189	0.191	0.195
E	5.80	6.00	6.20	0.228	0.236	0.244
E1	3.80	3.90	4.00	0.150	0.154	0.157
e	——	1.27	——	——	0.050	——
L	0.38	0.71	1.27	0.015	0.028	0.050
△2 y	——	——	0.076	——	——	0.003
θ	0°	——	8°	0°	——	8°

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