Alfa-MOS Technology

AFN3806W

20V N-Channel Enhancement Mode MOSFET

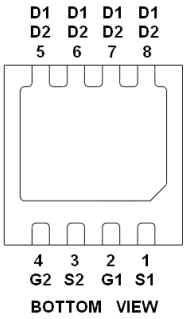
General Description

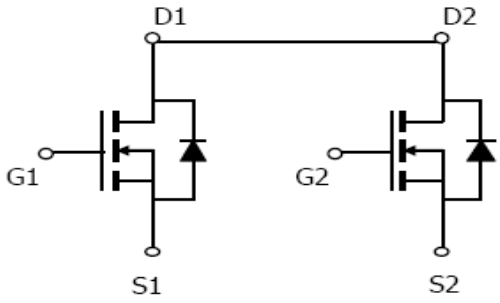
AFN3806W, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.
These devices are particularly suited for low voltage power management, and low in-line power loss are needed in commercial industrial surface mount applications.

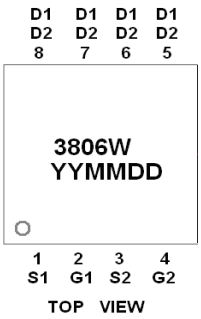
Features

- 20V/ 9A,$R_{DS(ON)}$=26mΩ@V_{GS}=4.5V
- 20V/ 8A,$R_{DS(ON)}$=32mΩ@V_{GS}=2.5V
- 20V/ 6A,$R_{DS(ON)}$=42mΩ@V_{GS}=1.8V
- Super high density cell design for extremely low $R_{DS\ (ON)}$
- DFN3X3-8L package design

Pin Description (DFN3X3-8L)







Application

- Load Switch
- Portable Equipment
- Battery Powered System

Pin Define

Pin	Symbol	Description
1	S1	Source 1
2	G1	Gate 1
3	S2	Source 2
4	G2	Gate 2
5	D1/D2	Drain 1 / Drain 2
6	D1/D2	Drain 1 / Drain 2
7	D1/D2	Drain 1 / Drain 2
8	D1/D2	Drain 1 / Drain 2

Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFN3806WFN338RG	3806W	DFN3X3-8L	Tape & Reel	5000 EA

※ YY year code
※ MM month code
※ DD date code
※ AFN3806WFN338RG : 13" Tape & Reel ; Pb- Free ; Halogen –Free

Absolute Maximum Ratings

(T_A=25℃ Unless otherwise noted)

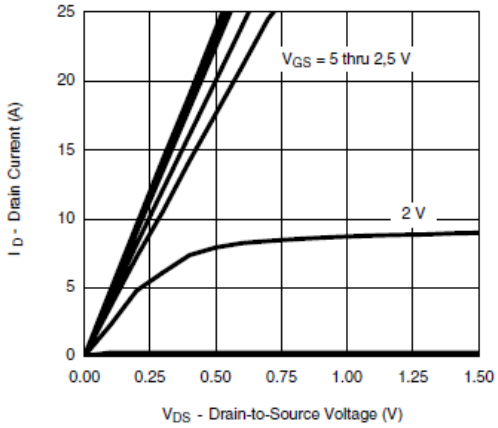
Parameter		Symbol	Typical	Unit
Drain-Source Voltage		V_{DSS}	20	V
Gate –Source Voltage		V_{GSS}	±12	V
Continuous Drain Current(T_J=150℃)	T_A=25℃	I_D	9	A
	T_A=70℃		6	
Pulsed Drain Current		I_{DM}	20	A
Continuous Source Current(Diode Conduction)		I_S	1.5	A
Power Dissipation	T_C=25℃	P_D	2	W
	T_C=70℃		1.5	
Operating Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{STG}	-55/150	℃
Thermal Resistance Junction-to-Case (Drain)		$R_{\theta JC}$	5	℃/W
Thermal Resistance-Junction to Ambient		$R_{\theta JA}$	40	

Electrical Characteristics

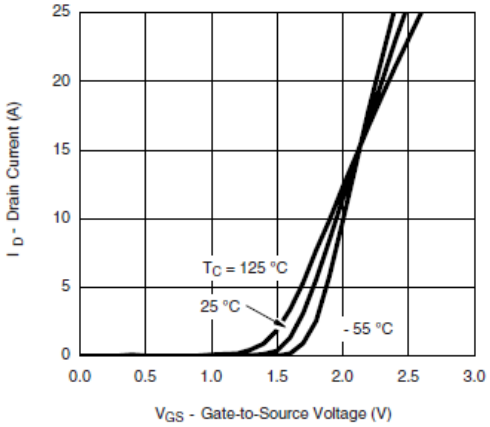
(T_A=25℃ Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=250uA	20			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	0.3		0.8	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±12V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=16V,V_{GS}=0V			1	uA
		V_{DS}=16V,V_{GS}=0V T_J=85℃			30	
On-State Drain Current	$I_{D(on)}$	V_{DS}≧5V,V_{GS}=4.5V	10			A
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}= 4.5V,I_D=9A		21	26	mΩ
		V_{GS}= 2.5V,I_D=8A		24	32	
		V_{GS}= 1.8V,I_D=6A		31	42	
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=7A		25		S
Diode Forward Voltage	V_{SD}	I_S=1.6A,V_{GS}=0V		0.7	1.2	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=10V,V_{GS}=4.5V I_D≡7.0A		650		pC
Gate-Source Charge	Q_{gs}			200		
Gate-Drain Charge	Q_{gd}			180		
Input Capacitance	C_{iss}	V_{DS}=20V,V_{GS}=0V f=1MHz		700		pF
Output Capacitance	C_{oss}			75		
Reverse Transfer Capacitance	C_{rss}			45		
Turn-On Time	$t_{d(on)}$	V_{DD}=10V,R_L=1.4Ω I_D≡1.0A,V_{GEN}=4.5V R_G=3Ω		8	12	ns
	t_r			12	20	
Turn-Off Time	$t_{d(off)}$			32	40	
	t_f			10	15	

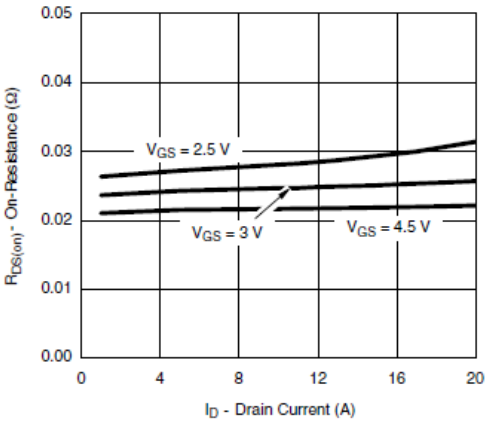
Typical Characteristics



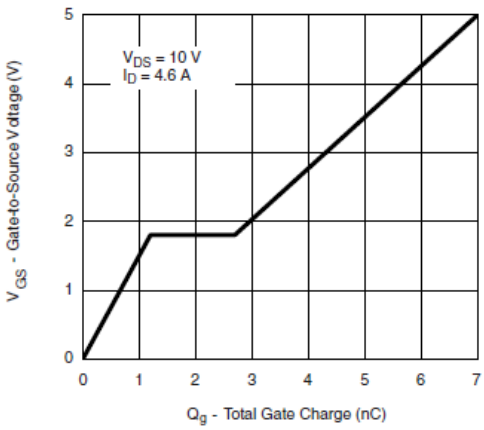
Output Characteristics



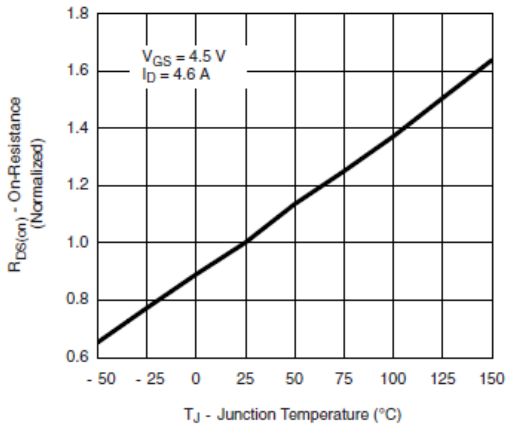
Transfer Characteristics



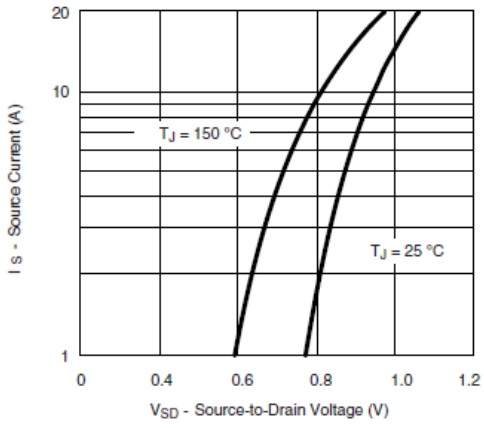
On-Resistance vs. Drain Current



Gate Charge

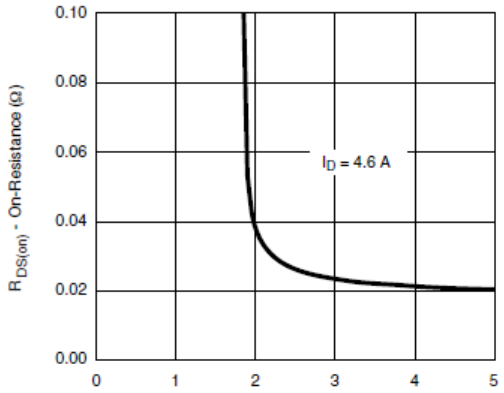


On-Resistance vs. Junction Temperature

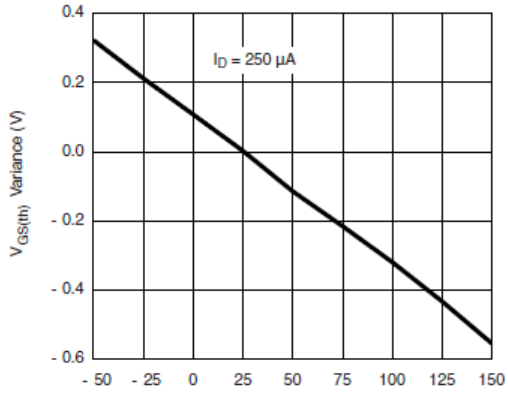


Source-Drain Diode Forward Voltage

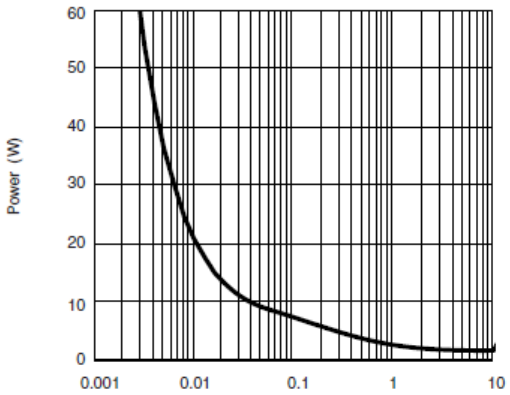
Typical Characteristics



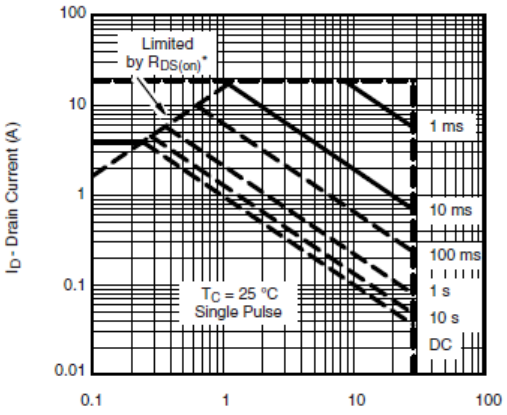
On-Resistance vs. Gate-to-Source Voltage



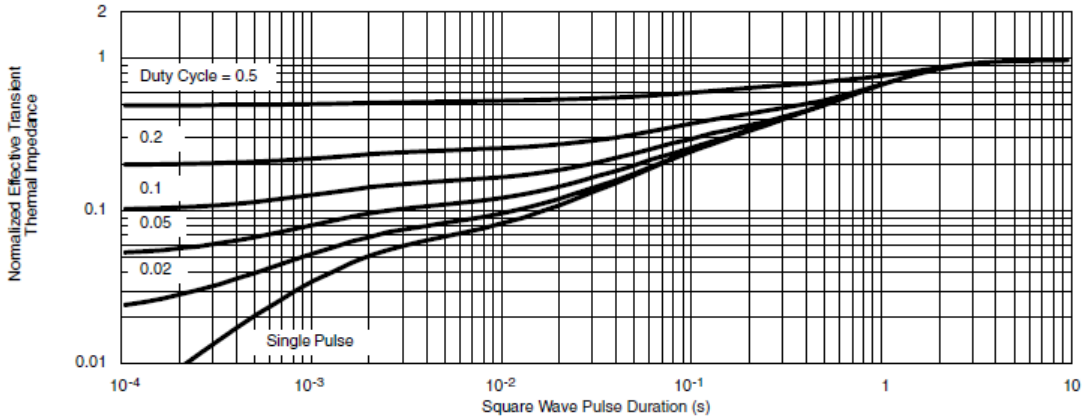
Threshold Voltage



Single Pulse Power



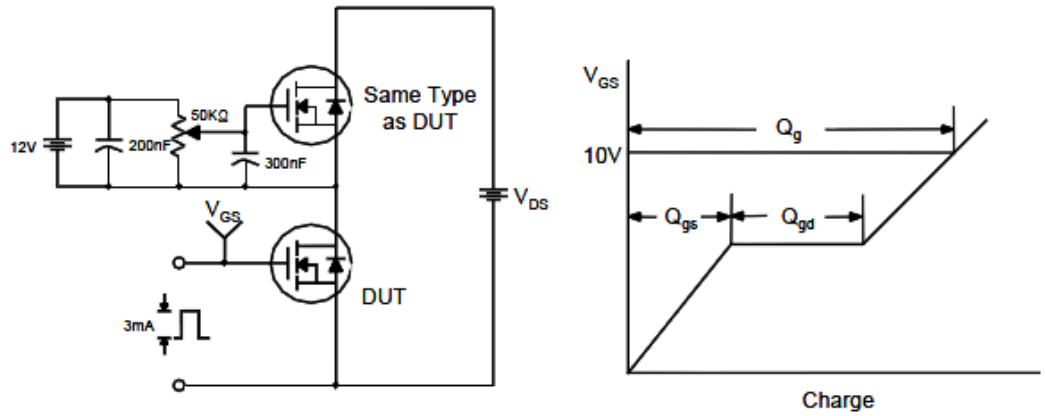
Safe Operating Area



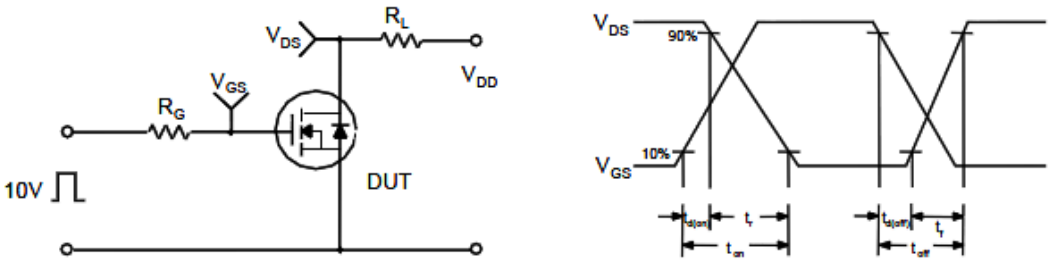
Normalized Thermal Transient Impedance, Junction-to-Foot

Typical Characteristics

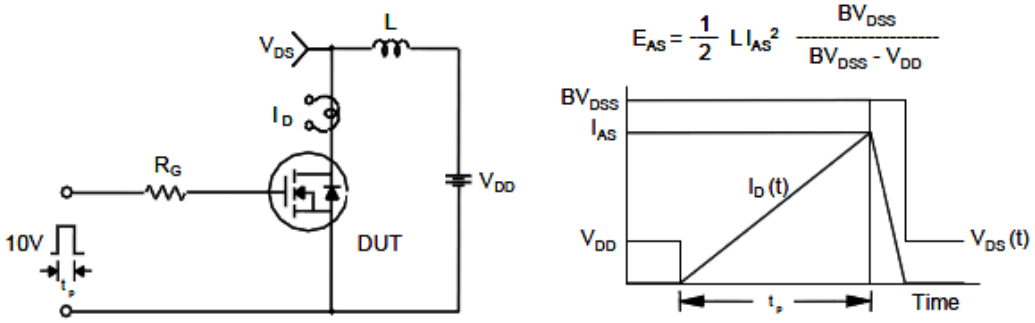
Gate Charge Test Circuit & Waveform



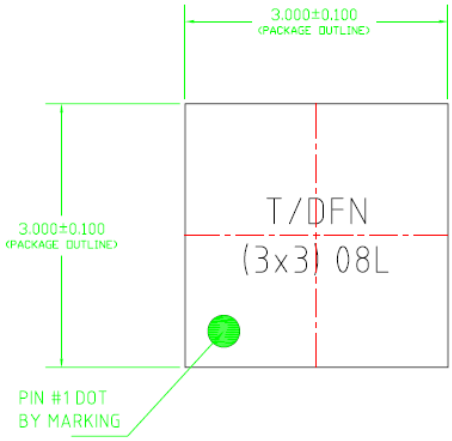
Resistive Switching Test Circuit & Waveforms



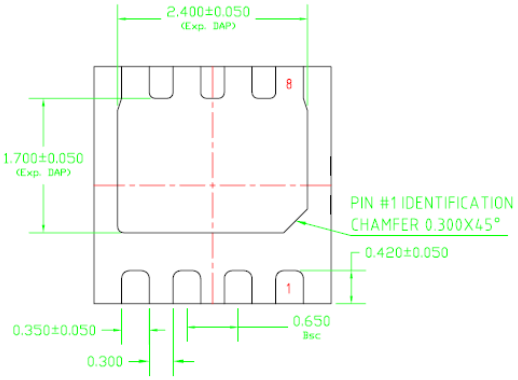
Unclamped Inductive Switching Test Circuit & Waveforms



Package Information (DFN3X3-8L)

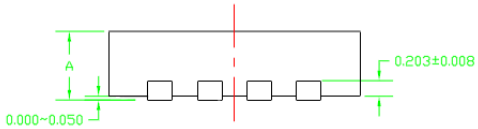


TOP VIEW



BOTTOM VIEW

		DFN	TDFN
A	MAX.	0.900	0.800
	NOM.	0.850	0.750
	MIN.	0.800	0.700



SIDE VIEW

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