



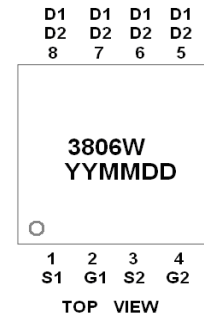
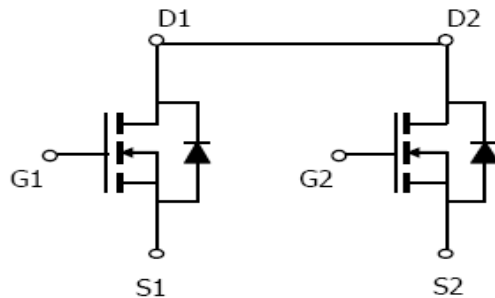
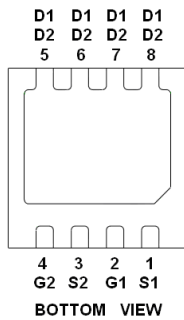
## General Description

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,  $R_{DS(ON)}=26m\Omega@V_{GS}=4.5V$
- 20V/ 8A,  $R_{DS(ON)}=32m\Omega@V_{GS}=2.5V$
- 20V/ 6A,  $R_{DS(ON)}=42m\Omega@V_{GS}=1.8V$
- 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

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

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	$V_{DSS}$	20	V
Gate-Source Voltage	$V_{GSS}$	$\pm 12$	V
Continuous Drain Current( $T_J=150^\circ\text{C}$ )	$I_D$	$T_A=25^\circ\text{C}$	9
		$T_A=70^\circ\text{C}$	6
Pulsed Drain Current	$I_{DM}$	20	A
Continuous Source Current(Diode Conduction)	$I_S$	1.5	A
Power Dissipation	$P_D$	$T_A=25^\circ\text{C}$	2
		$T_A=70^\circ\text{C}$	1.5
Operating Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55/150	$^\circ\text{C}$
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$

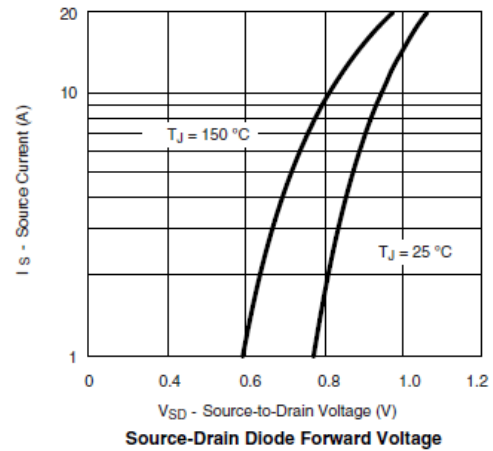
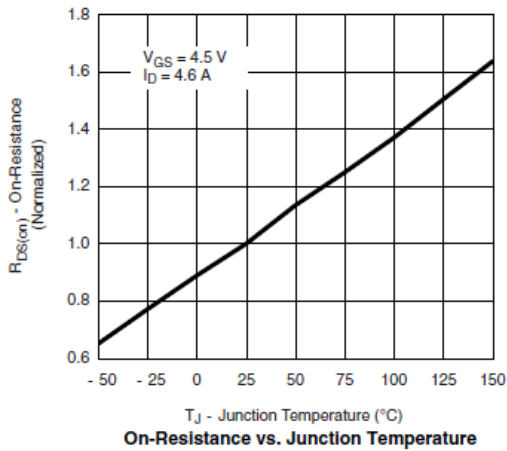
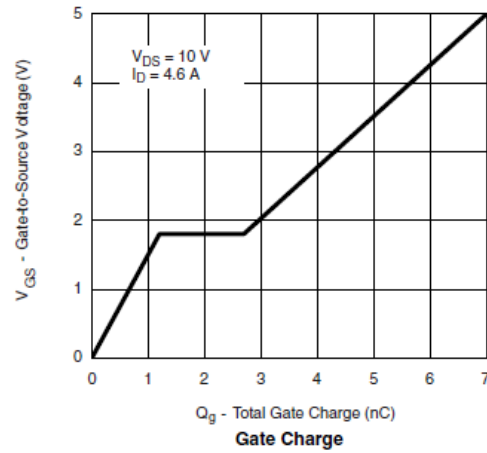
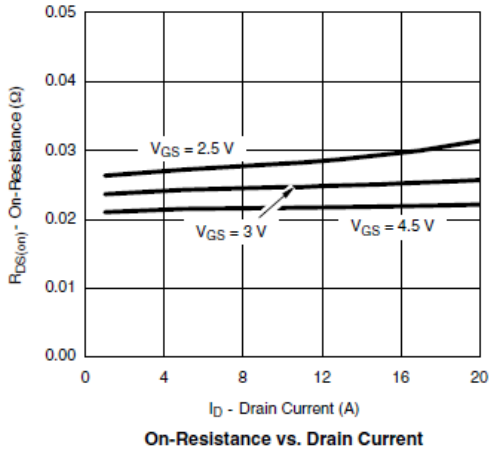
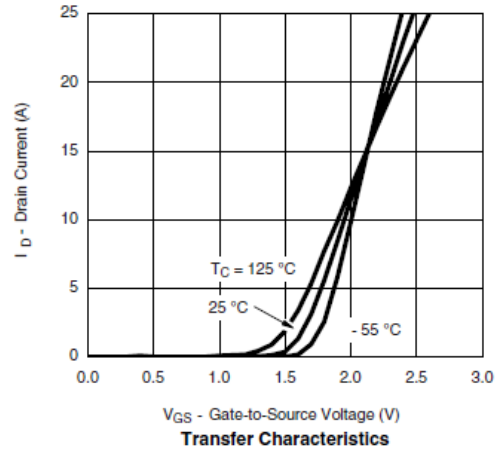
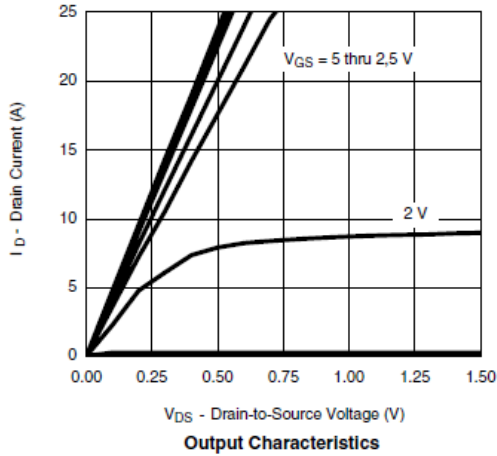
### Electrical Characteristics

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

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu\text{A}$	20			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	0.3		0.8	V
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 12V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=16V, V_{GS}=0V$			1	uA
		$V_{DS}=16V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			30	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq 5V, V_{GS}=4.5V$	10			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=9A$		21	26	m $\Omega$
		$V_{GS}=2.5V, I_D=8A$		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
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=10V, V_{GS}=4.5V$ $I_D \equiv 7.0A$		650		pC
Gate-Source Charge	$Q_{GS}$			200		
Gate-Drain Charge	$Q_{GD}$			180		
Input Capacitance	$C_{iss}$	$V_{DS}=20V, V_{GS}=0V$ $f=1\text{MHz}$		700		pF
Output Capacitance	$C_{oss}$			75		
Reverse Transfer Capacitance	$C_{rss}$			45		
Turn-On Time	$t_{d(on)}$	$V_{DD}=10V, R_L=1.4\Omega$ $I_D \equiv 1.0A, V_{GEN}=4.5V$ $R_G=3\Omega$		8	12	ns
	$t_r$			12	20	
Turn-Off Time	$t_{d(off)}$			32	40	
	$t_f$			10	15	

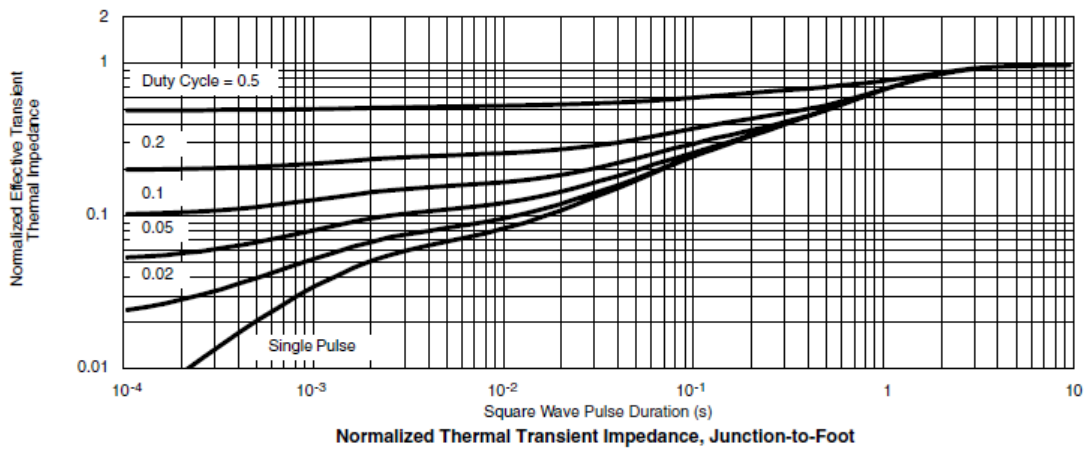
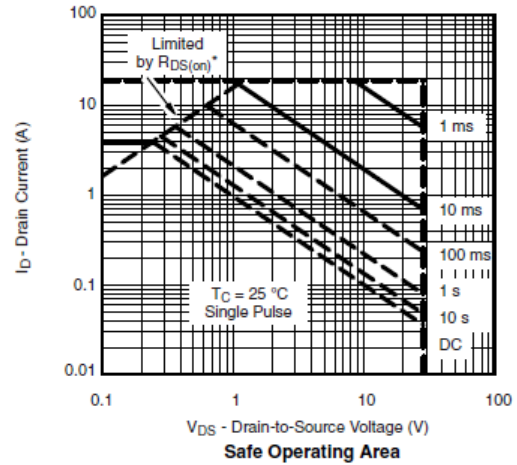
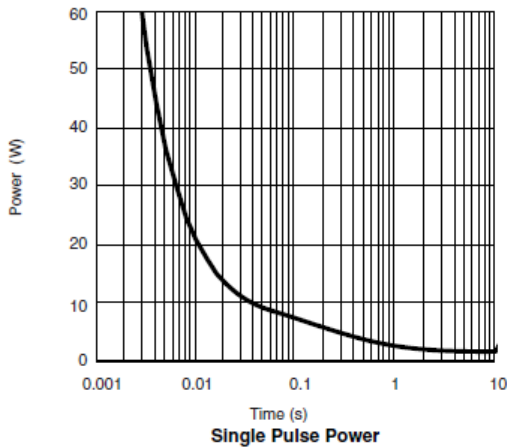
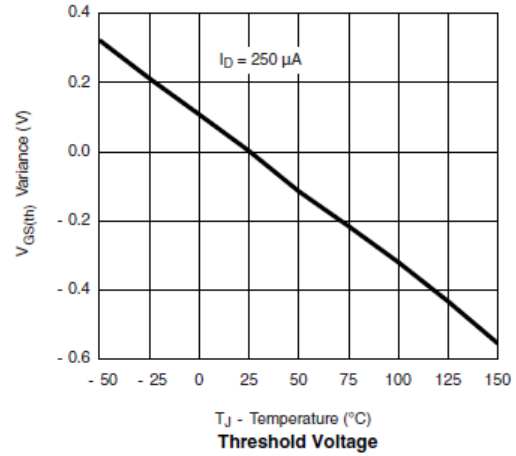
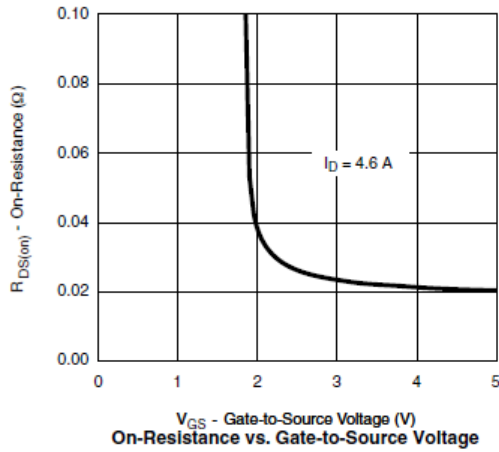


## Typical Characteristics





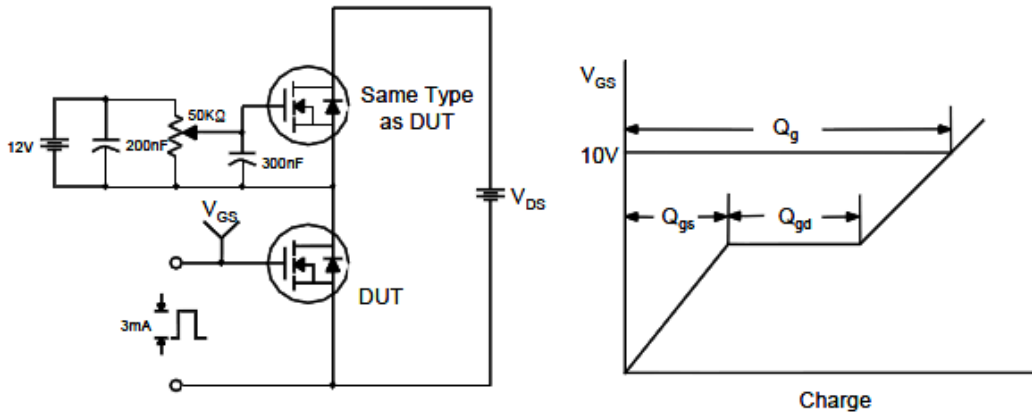
## Typical Characteristics



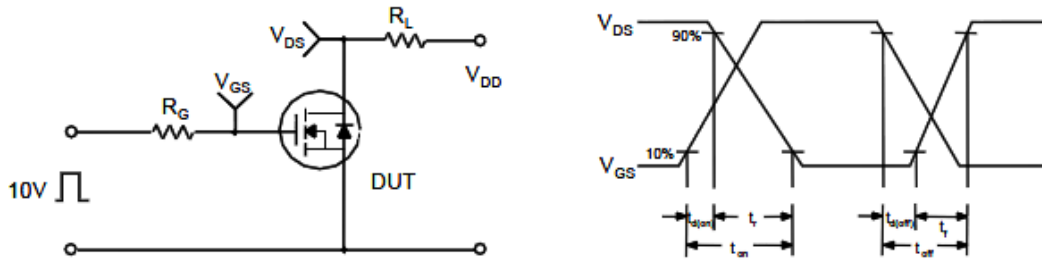


Typical Characteristics

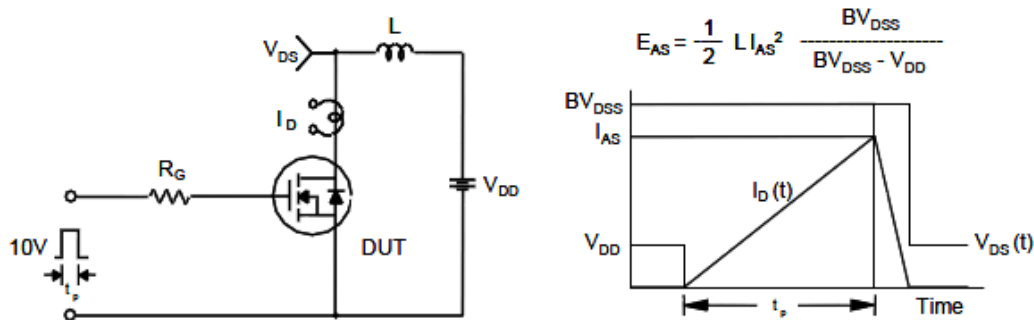
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

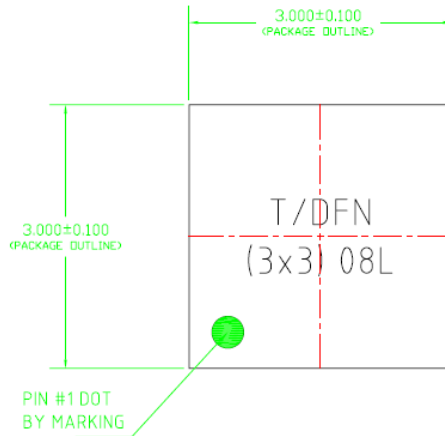


Unclamped Inductive Switching Test Circuit & Waveforms

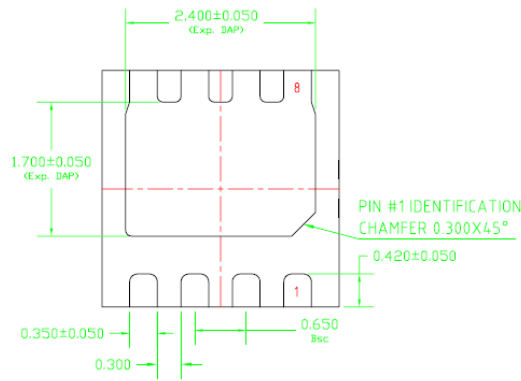




**Package Information ( DFN3X3-8L )**

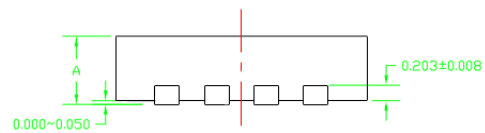


TOP VIEW



BOTTOM VIEW

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



SIDE VIEW

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