



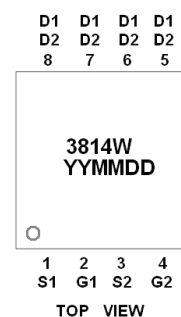
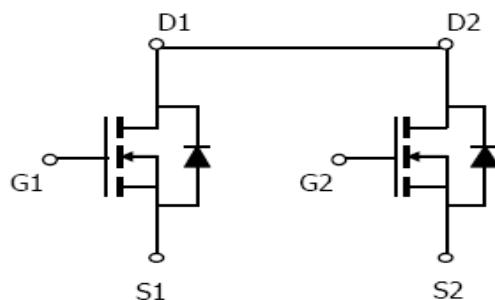
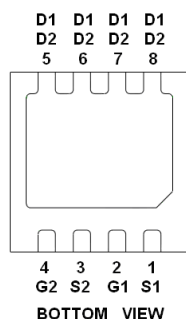
### General Description

AFN3814W, 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/ 14A,  $R_{DS(ON)}=14m\Omega@V_{GS}=4.5V$
- 20V/ 12A,  $R_{DS(ON)}=18m\Omega@V_{GS}=2.5V$
- 20V/ 10A,  $R_{DS(ON)}=30m\Omega@V_{GS}=1.8V$
- 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
AFN3814WFN338RG	3814W	DFN3X3-8L	Tape & Reel	5000 EA

- ※ YY year code
- ※ MM month code
- ※ DD date code
- ※ AFN3814WFN338RG : 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( $T_J=150^\circ\text{C}$ )	$I_D$	$T_A=25^\circ\text{C}$	14
		$T_A=70^\circ\text{C}$	10
Pulsed Drain Current	$I_{DM}$	20	A
Continuous Source Current(Diode Conduction)	$I_S$	1.5	A
Power Dissipation	$P_D$	$T_C=25^\circ\text{C}$	2
		$T_C=70^\circ\text{C}$	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-Case (Drain)	$R_{\theta JC}$	5	$^\circ\text{C/W}$
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	40	

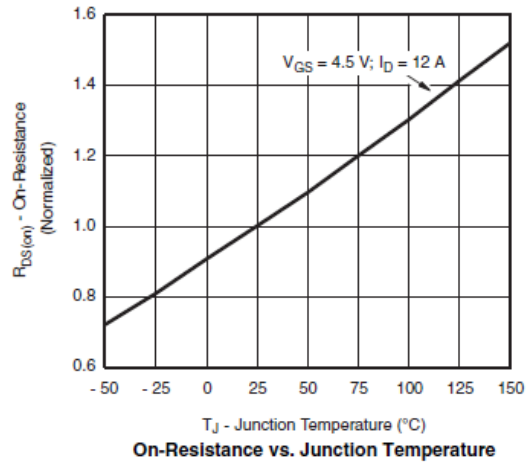
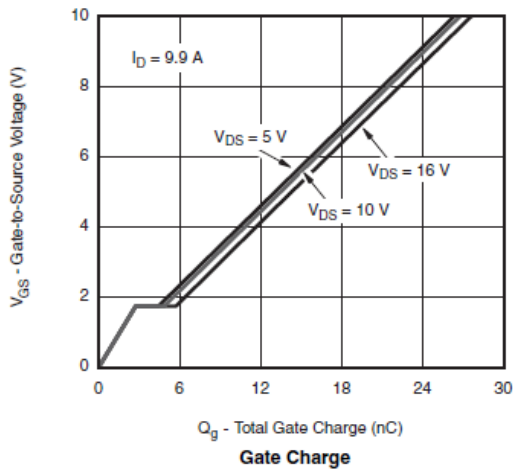
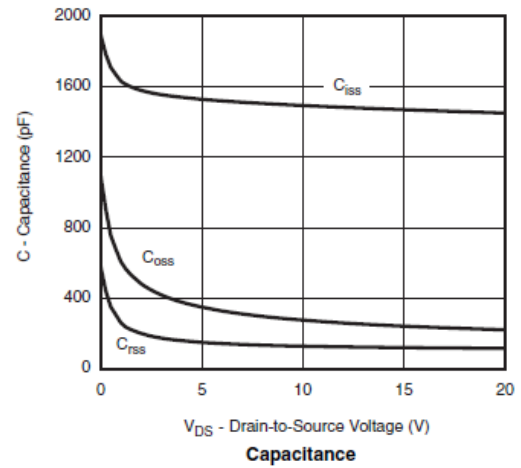
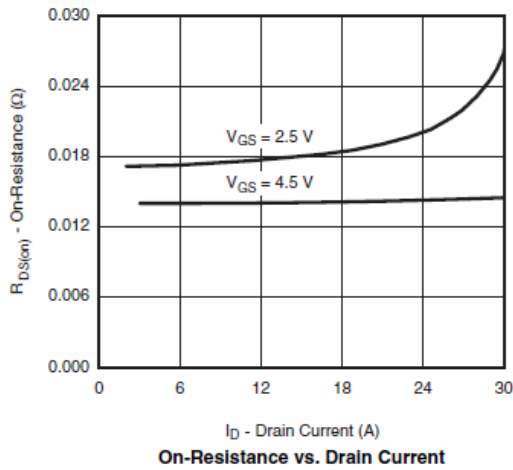
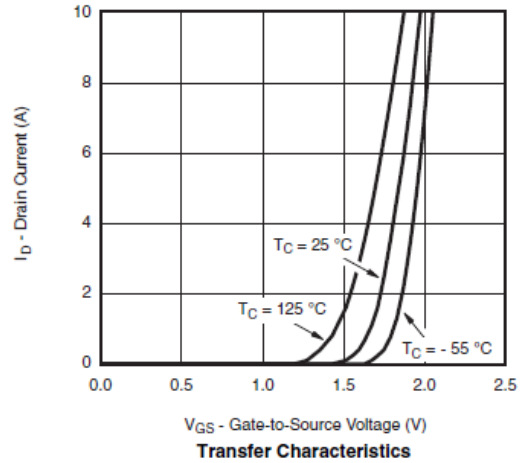
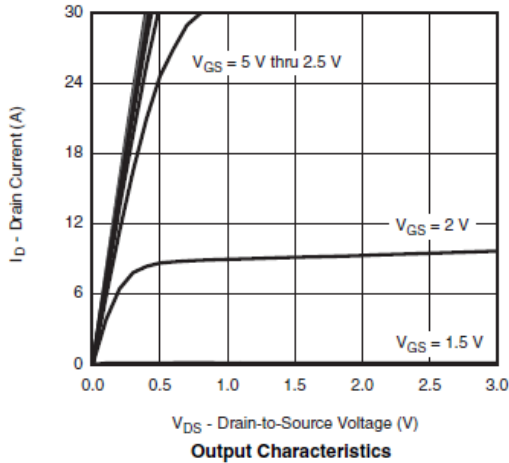
**Electrical Characteristics**

( $T_A=25^\circ\text{C}$  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	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	0.4		1.0	
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 12V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=20V, V_{GS}=0V$			1	uA
		$V_{DS}=20V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			10	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq 5V, V_{GS}=4.5V$	30			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=14A$		10	14	m $\Omega$
		$V_{GS}=2.5V, I_D=12A$		14	18	
		$V_{GS}=1.8V, I_D=10A$		23	30	
Forward Transconductance	$g_{FS}$	$V_{DS}=10V, I_D=7.0A$		40		S
Diode Forward Voltage	$V_{SD}$	$I_S=1.6A, V_{GS}=0V$		0.8	1.3	V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=10V, V_{GS}=4.5V$ $I_D \equiv 6.0A$		13	19	nC
Gate-Source Charge	$Q_{GS}$			2.8		
Gate-Drain Charge	$Q_{gd}$			2.0		
Input Capacitance	$C_{iss}$	$V_{DS}=10V, V_{GS}=0V$ $f=1\text{MHz}$		1450		pF
Output Capacitance	$C_{oss}$			285		
Reverse Transfer Capacitance	$C_{rss}$			145		
Turn-On Time	$t_{d(on)}$	$V_{DD}=10V, R_L=1.3\Omega$ $I_D \equiv 6.0A, V_{GEN}=10V$ $R_G=1\Omega$		10	20	ns
	$t_r$			10	20	
Turn-Off Time	$t_{d(off)}$			25	40	
	$t_f$			10	20	

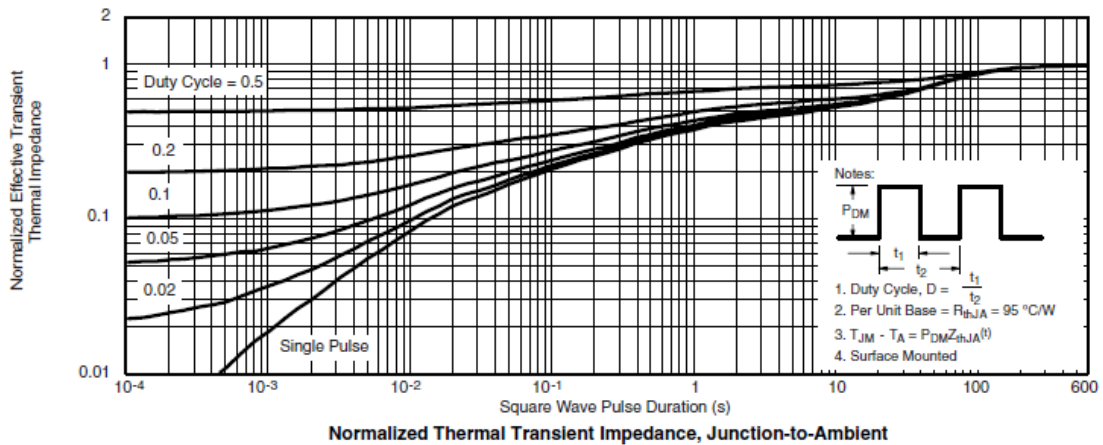
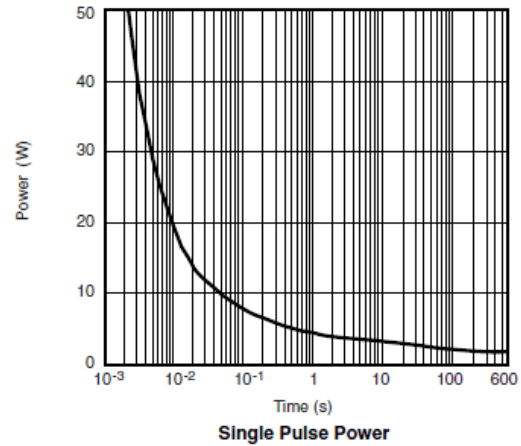
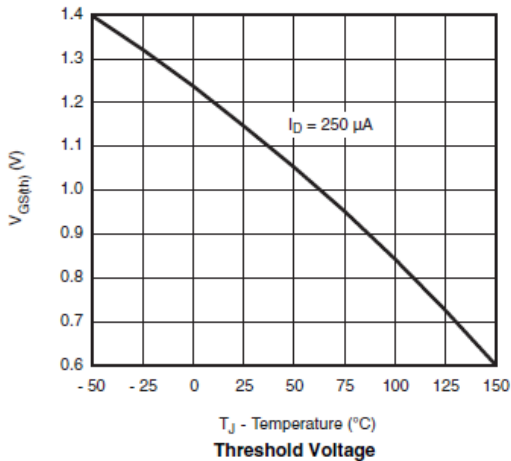
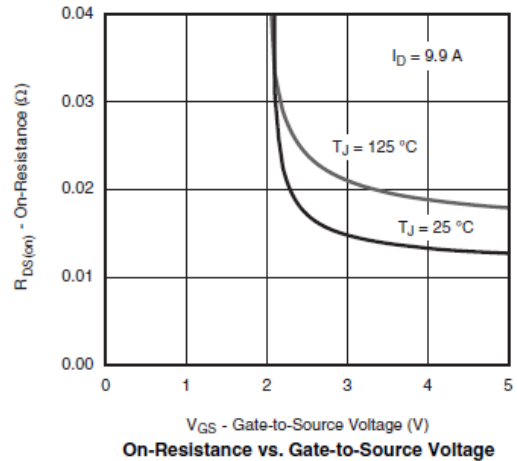
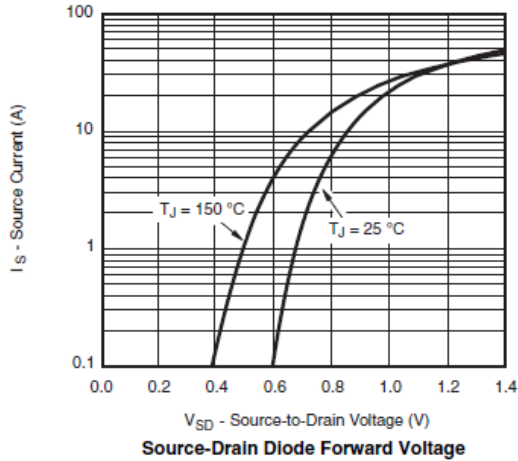


## Typical Characteristics





**Typical Characteristics**



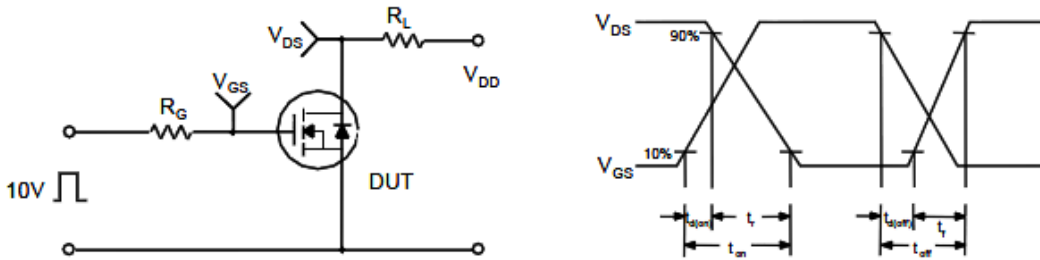


Typical Characteristics

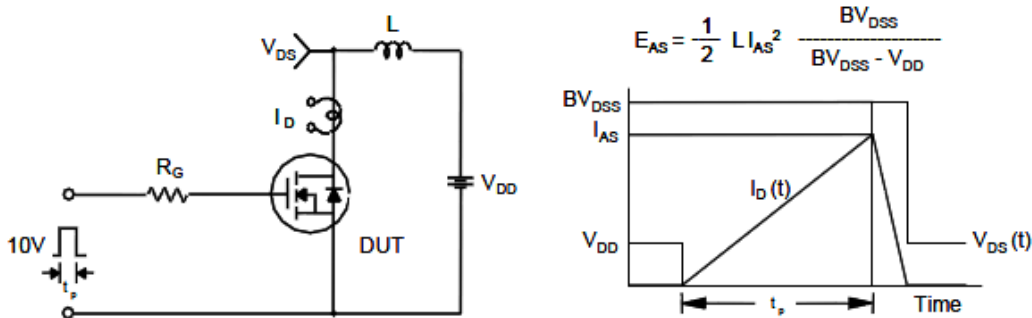
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

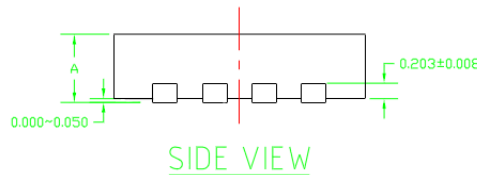
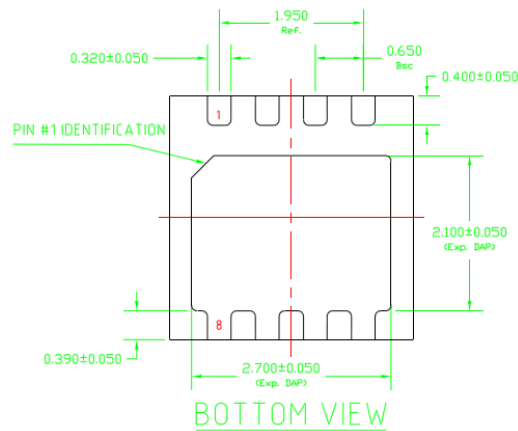
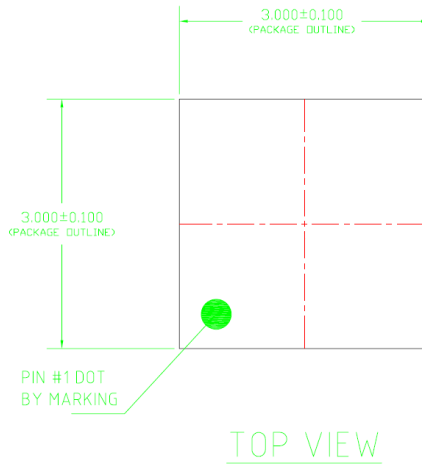


Unclamped Inductive Switching Test Circuit & Waveforms





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



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