



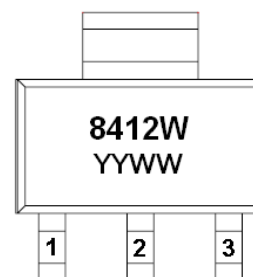
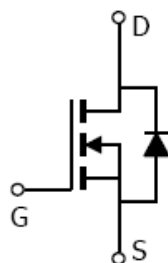
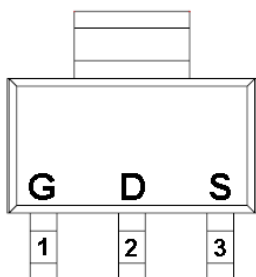
### General Description

AFN8412W, 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

- 100V/3.6A,  $R_{DS(ON)}=300m\Omega@V_{GS}=10V$
- 100V/3.0A,  $R_{DS(ON)}=310m\Omega@V_{GS}=4.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- SOT-223 package design

### Pin Description ( SOT-223 )



### Application

- Motor and Load Control
- Power Management in White LED System
- Push Pull Converter
- LCD TV Inverter & AD/DC Inverter Systems.

### Pin Define

Pin	Symbol	Description
1	G	Gate
2	D	Drain
3	S	Source

### Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFN8412WS223RG	8412W	SOT-223	Tape & Reel	2500 EA

- ※ YY year code
- ※ WW week code
- ※ AFN8412WS223RG : 13" Tape & Reel ; Pb- Free ; Halogen -Free



### Absolute Maximum Ratings

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current( $T_J=150^\circ\text{C}$ )	$I_D$	$T_c=25^\circ\text{C}$	3.6
		$T_c=70^\circ\text{C}$	2.6
Pulsed Drain Current	$I_{DM}$	8	A
Continuous Source Current(Diode Conduction)	$I_S$	1.6	A
Power Dissipation	$P_D$	$T_A=25^\circ\text{C}$	2.8
		$T_A=70^\circ\text{C}$	1.2
Operating Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55/150	$^\circ\text{C}$
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	120	$^\circ\text{C/W}$

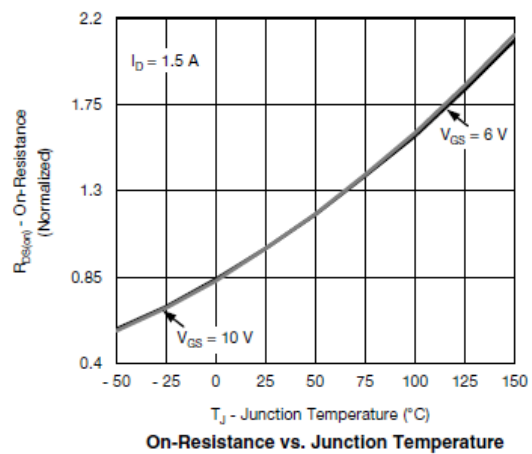
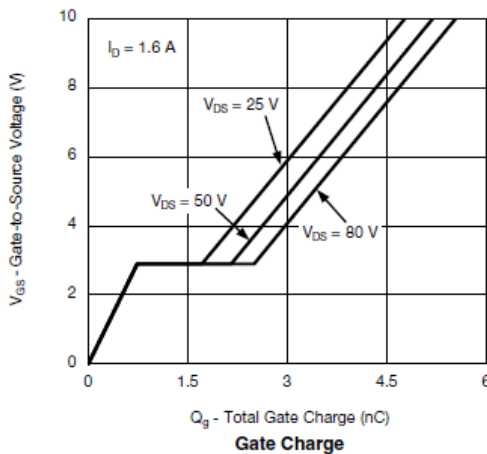
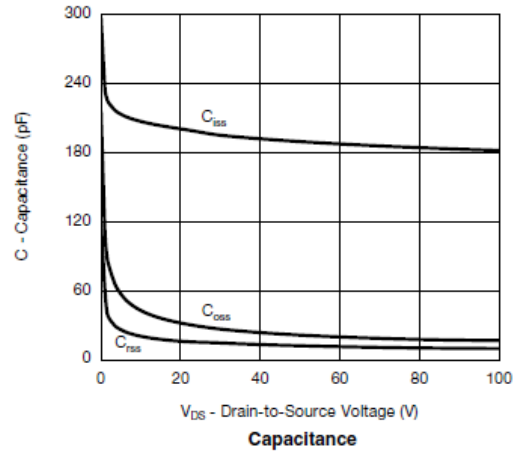
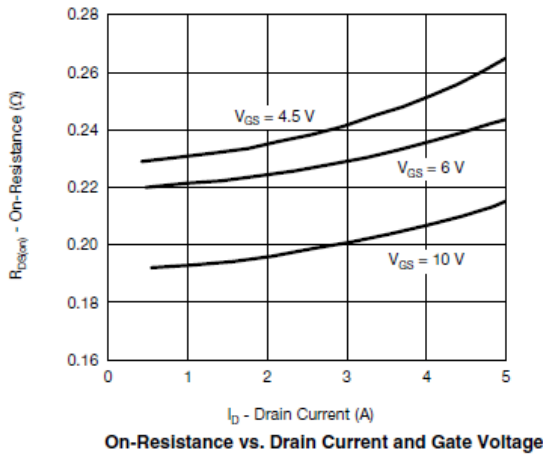
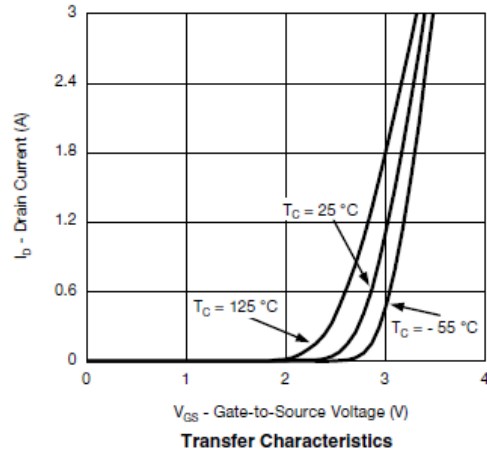
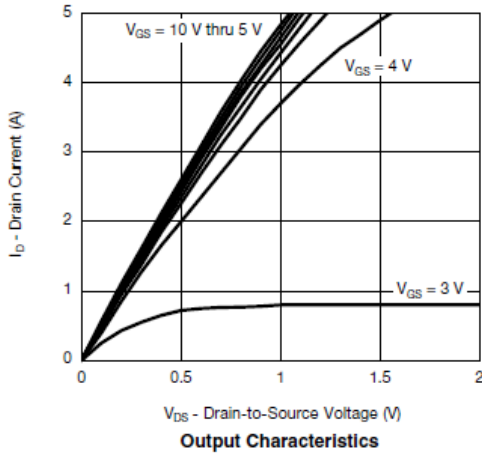
### Electrical Characteristics

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

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DS}$	$V_{GS}=0V, I_D=250\mu\text{A}$	100			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1.0		2.0	
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=80V, V_{GS}=0V$			1	uA
		$V_{DS}=80V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			10	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq 5V, V_{GS}=4.5V$	5			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=3.6A$		284	300	m $\Omega$
		$V_{GS}=4.5V, I_D=3.0A$		288	310	
Forward Transconductance	$g_{FS}$	$V_{DS}=20V, I_D=1.5A$		2		S
Diode Forward Voltage	$V_{SD}$	$I_S=1.3A, V_{GS}=0V$		0.85	1.2	V
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=50V, V_{GS}=4.5V$ $I_D \equiv 1.6A$		2.8	5.8	nC
Gate-Source Charge	$Q_{gs}$			0.75		
Gate-Drain Charge	$Q_{gd}$			1.4		
Input Capacitance	$C_{iss}$	$V_{DS}=50V, V_{GS}=0V$ $f=1\text{MHz}$		200		pF
Output Capacitance	$C_{oss}$			22		
Reverse Transfer Capacitance	$C_{rss}$			13		
Turn-On Time	$t_{d(on)}$	$V_{DD}=50V, R_L=39\Omega$ $I_D \equiv 1.3A, V_{GEN}=4.5V$ $R_G=1\Omega$		25	50	ns
	$t_r$			20	50	
Turn-Off Time	$t_{d(off)}$			15	30	
	$t_f$			10	25	

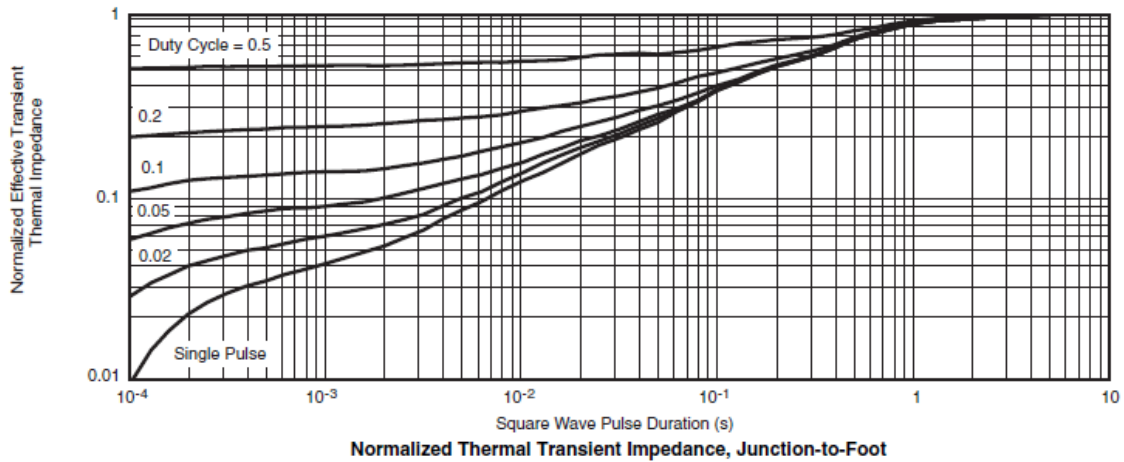
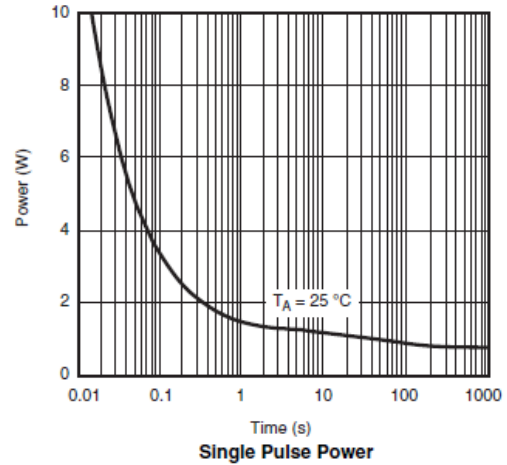
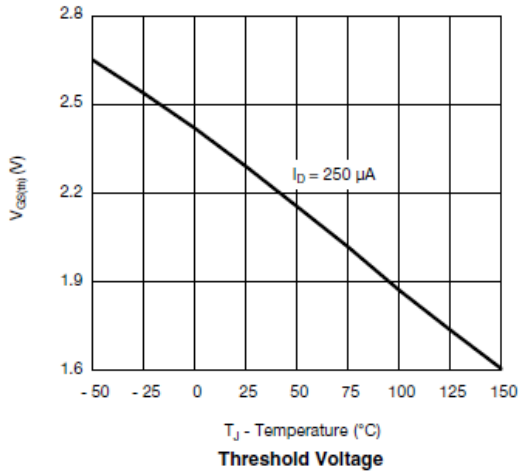
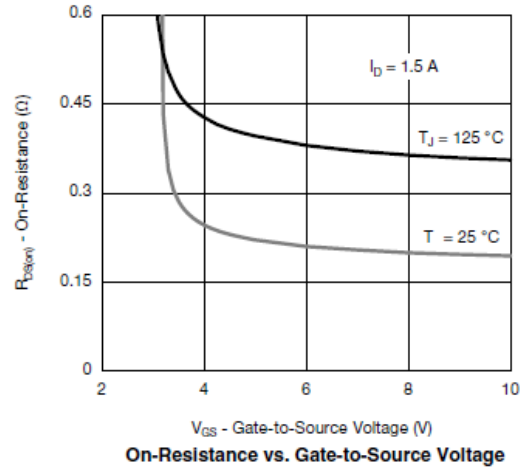
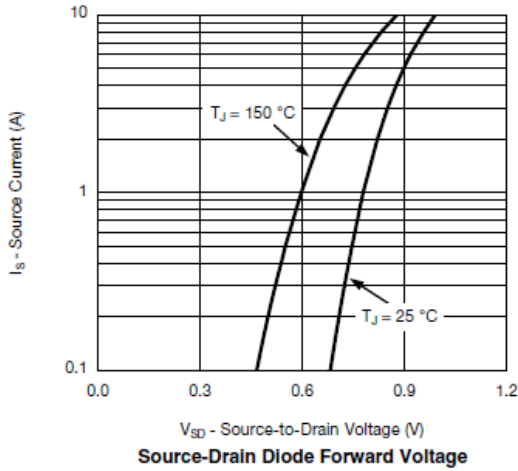


## Typical Characteristics





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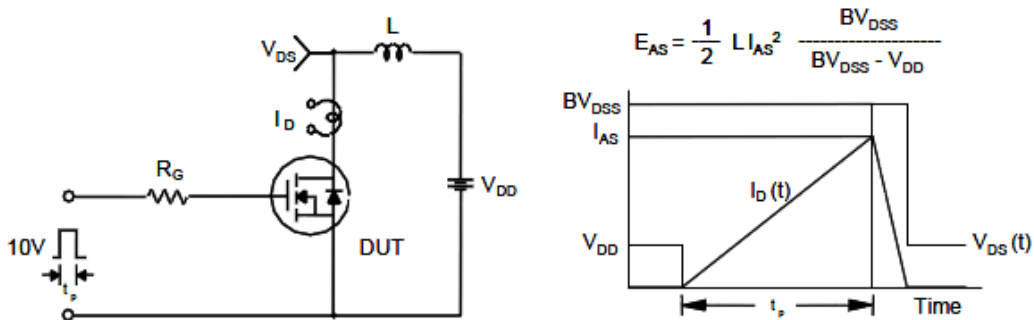
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

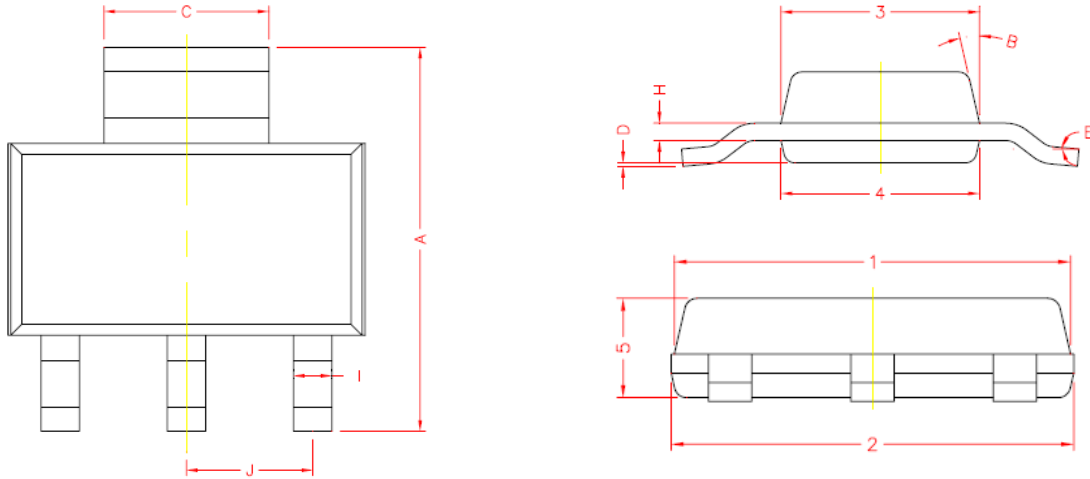


Unclamped Inductive Switching Test Circuit & Waveforms





**Package Information ( SOT-223 )**



REF.	DIMENSIONS	
	Millimeters	
	Min.	Max.
A	6.70	7.30
C	2.90	3.10
D	0.02	0.10
E	0°	10°
I	0.60	0.80
H	0.25	0.35
B	13° TYP.	
J	2.30 REF.	
1	6.30	6.70
2	6.30	6.70
3	3.30	3.70
4	3.30	3.70
5	1.40	1.80

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