Alfa-MOS Technology

AFN4440W

60V N-Channel Enhancement Mode MOSFET

General Description

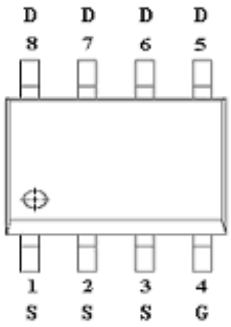
AFN4440W, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

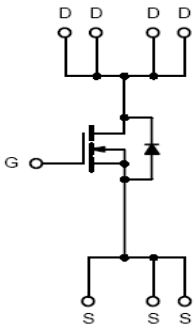
These devices are particularly suited for low voltage power management, and low in-line power loss are needed in commercial industrial surface mount applications.

Features

- I_D=6.8A,$R_{DS(ON)}$=40mΩ@V_{GS}=10V
- I_D=5.6A,$R_{DS(ON)}$=45mΩ@V_{GS}=4.5V
- Super high density cell design for extremely low $R_{DS\ (ON)}$
- SOP-8P package design

Pin Description (SOP-8P)





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	S	Source
2	S	Source
3	S	Source
4	G	Gate
5	D	Drain
6	D	Drain
7	D	Drain
8	D	Drain

Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFN4440WS8RG	4440W	SOP-8P	Tape & Reel	2500 EA

※ A Lot code
※ B Date code
※ AFN4440WS8RG : 13" Tape & Reel ; Pb- Free ; Halogen –Free

※ Absolute Maximum Ratings

(T_A=25℃ Unless otherwise noted)

Parameter		Symbol	Value	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_D	6.8	A
	T_A=70℃		5.6	
Pulsed Drain Current		I_{DM}	30	A
Continuous Source Current(Diode Conduction)		I_S	1.5	A
Power Dissipation	T_A=25℃	P_D	2.8	W
	T_A=70℃		1.8	
Operating Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{STG}	-55/150	℃
Thermal Resistance-Junction to Ambient		$R_{\theta JA}$	62.5	℃/W

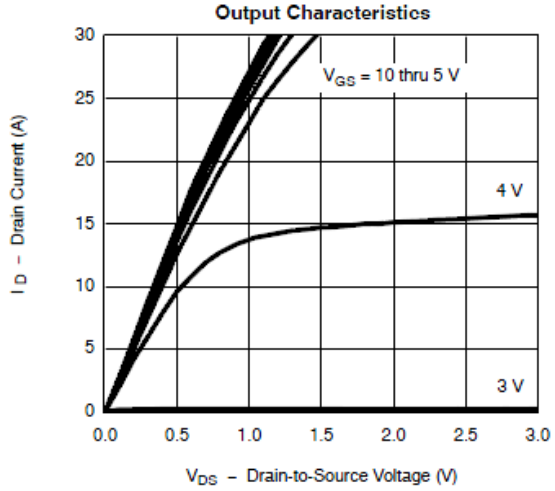
Electrical Characteristics

(T_A=25℃ Unless otherwise noted)

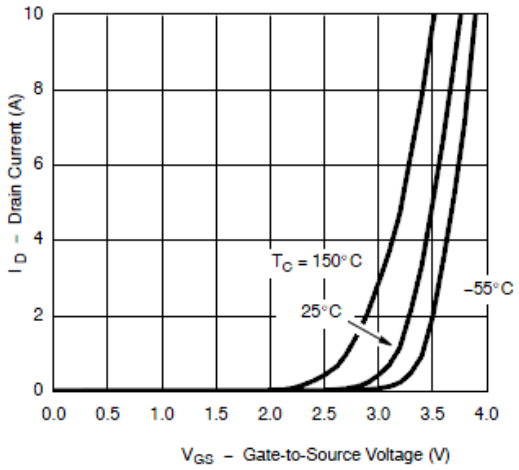
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=250uA	60			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	1.0		2.5	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V,V_{GS}=0V			1	uA
		V_{DS}=60V,V_{GS}=0V T_J=85℃			5	
On-State Drain Current	$I_{D(on)}$	V_{DS}≧5V,V_{GS}=4.5V	30			A
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=6.8A		38	40	mΩ
		V_{GS}=4.5V,I_D=5.6A		42	45	
Forward Transconductance	g_{FS}	V_{DS}=15V,I_D=5.3A		24		S
Diode Forward Voltage	V_{SD}	I_S=2.0A,V_{GS}=0V		0.8	1.2	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=30V,V_{GS}=5V I_D≡5.6A		10	15	nC
Gate-Source Charge	Q_{gs}			3.5		
Gate-Drain Charge	Q_{gd}			3.6		
Input Capacitance	C_{iss}	V_{DS}=30V,V_{GS}=0V f=1MHz		890		pF
Output Capacitance	C_{oss}			85		
Reverse Transfer Capacitance	C_{rss}			48		
Turn-On Time	$t_{d(on)}$	V_{DD}=30V,R_L=6.8Ω I_D≡5.0A,V_{GEN}=4.5V R_G=6Ω		10	15	ns
	t_r			12	20	
Turn-Off Time	$t_{d(off)}$			25	35	
	t_f			10	15	

Typical Characteristics

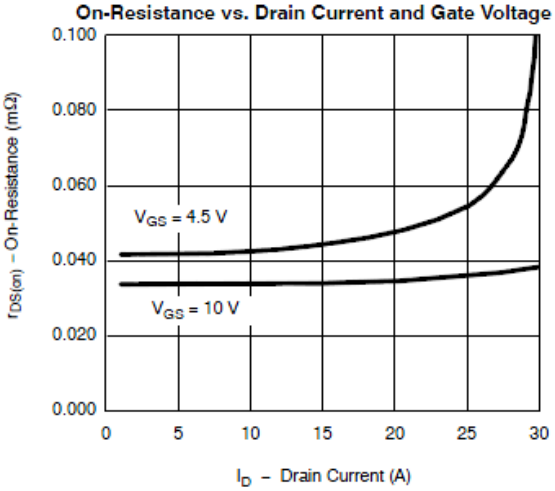
Output Characteristics



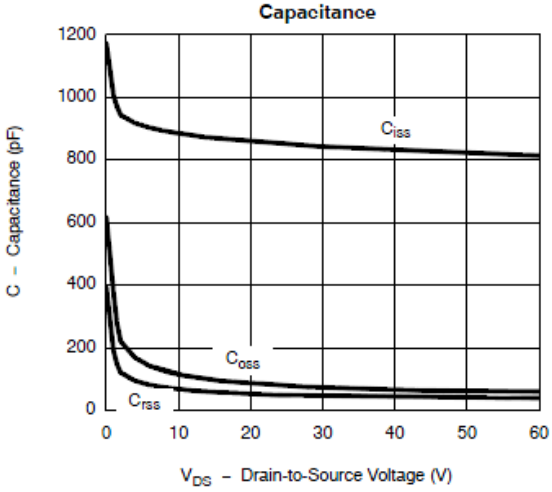
Transfer Characteristics



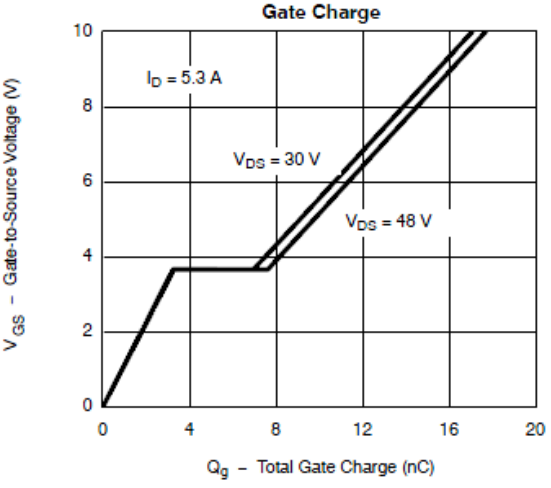
On-Resistance vs. Drain Current and Gate Voltage



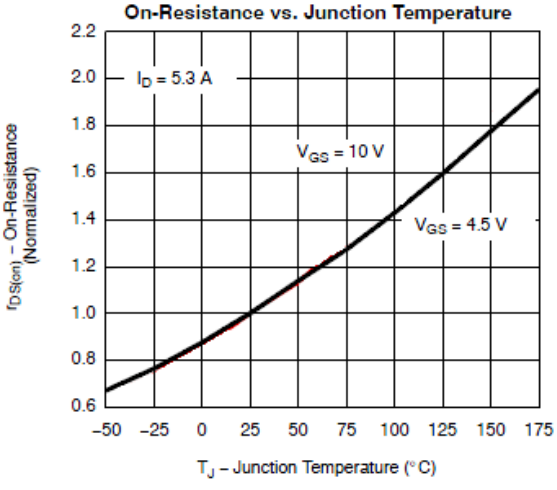
Capacitance



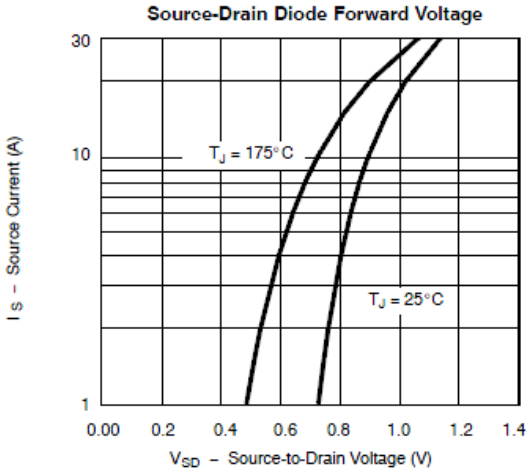
Gate Charge

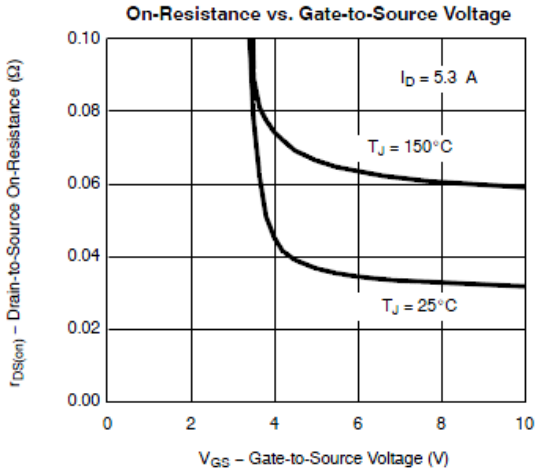


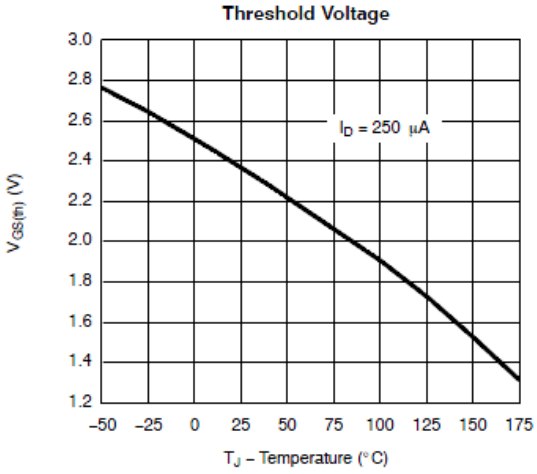
On-Resistance vs. Junction Temperature

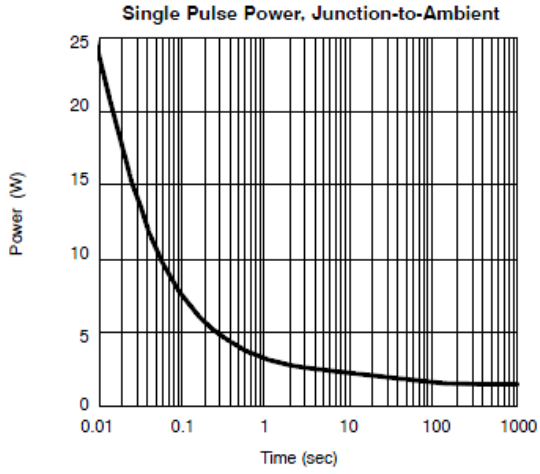


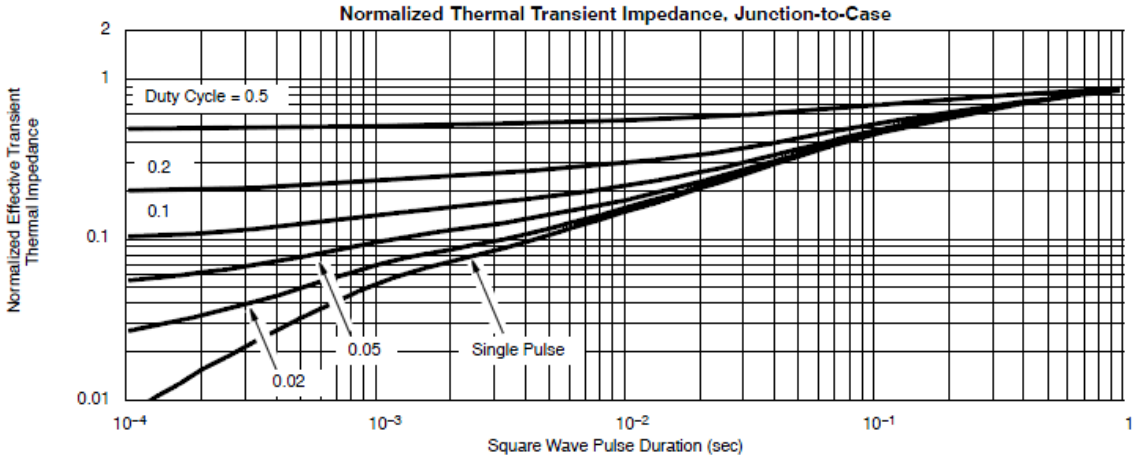
Typical Characteristics





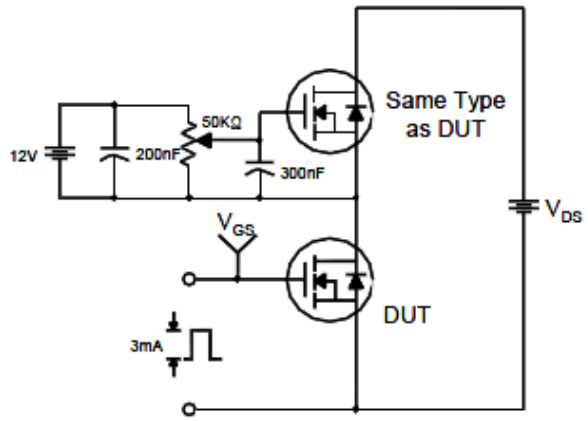


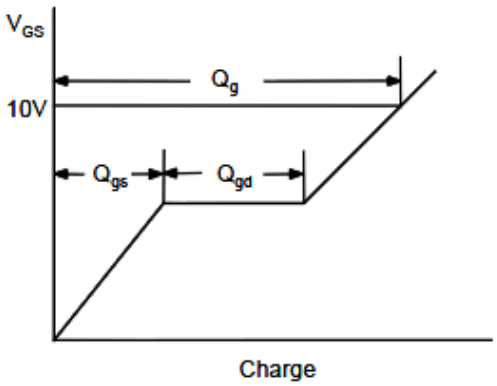




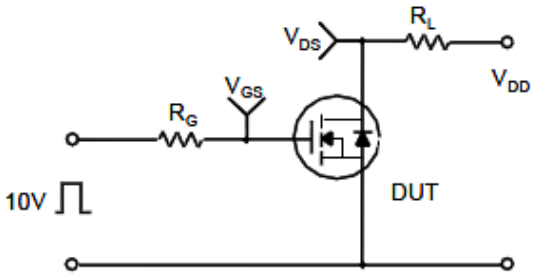
Typical Characteristics

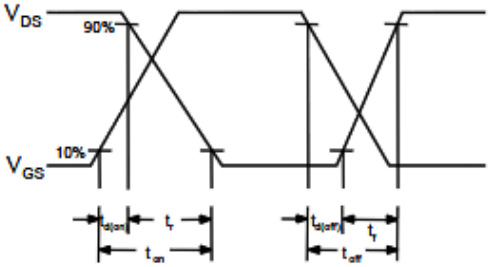
Gate Charge Test Circuit & Waveform



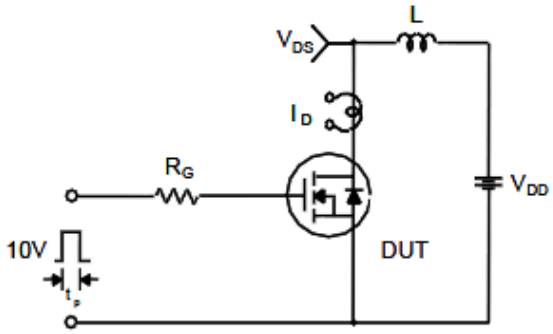


Resistive Switching Test Circuit & Waveforms

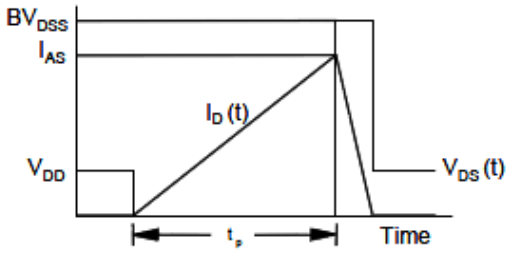




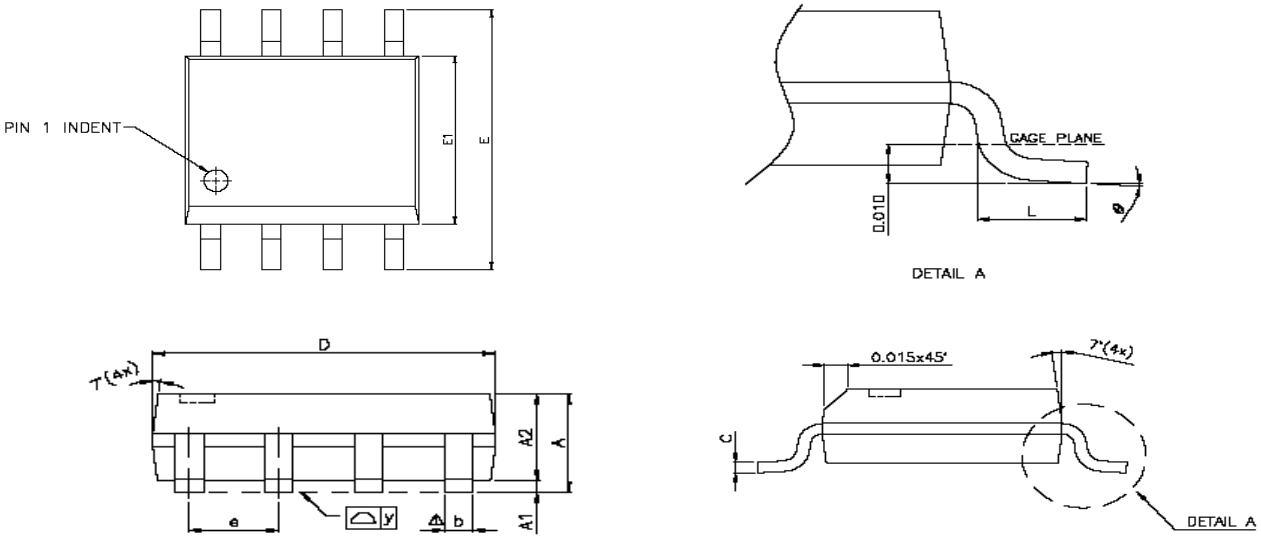
Unclamped Inductive Switching Test Circuit & Waveforms



$$E_{AS} = \frac{1}{2} L I_{AS}^2 \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$



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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