Alfa-MOS Technology

AFN7960AS

60V Dual N-Channel Enhancement Mode MOSFET

General Description

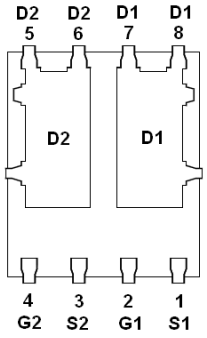
AFN7960AS, Dual N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS\ (ON)}$, low gate charge.

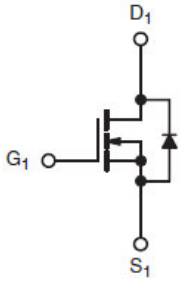
These devices are particularly suited for low voltage power management, and low in-line power loss are needed in commercial industrial surface mount applications.

Features

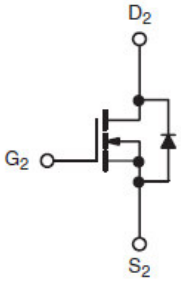
- 60V/12A,$R_{DS(ON)}$= 20mΩ@V_{GS}=10V
- 60V/10A,$R_{DS(ON)}$= 24mΩ@V_{GS}=4.5V
- Super high density cell design for extremely low $R_{DS\ (ON)}$
- DFN 5X6-8L package design

Pin Description (DFN5X6-8L)

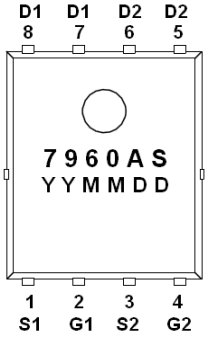




N-Channel MOSFET



N-Channel MOSFET



Application

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

Pin Define

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

Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFN7960ASFN568RG	7960AS	DFN 5X6-8L	Tape & Reel	2500 EA

※ 7 9 6 0 A S : Parts Code
※ YYMMDD : Date Code
※ AFN7960ASFN568RG : 13”Tape & Reel ; Pb- Free ; Halogen- Free

Absolute Maximum Ratings (T_A=25℃ Unless otherwise noted)

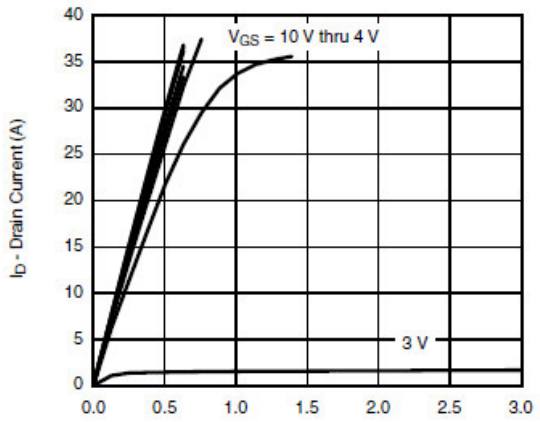
Parameter		Symbol	Typical	Unit
Drain-Source Voltage		V_{DSS}	60	V
Gate –Source Voltage		V_{GSS}	±20	V
Continuous Drain Current(T_J=150℃)	T_A=25℃	I_D	12	A
	T_A=85℃		10	
Pulsed Drain Current		I_{DM}	40	A
Continuous Source Current(Diode Conduction)	T_A=25℃	I_S	2.9	A
Power Dissipation	T_A=25℃	P_D	3.5	W
	T_A=70℃		2.2	
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

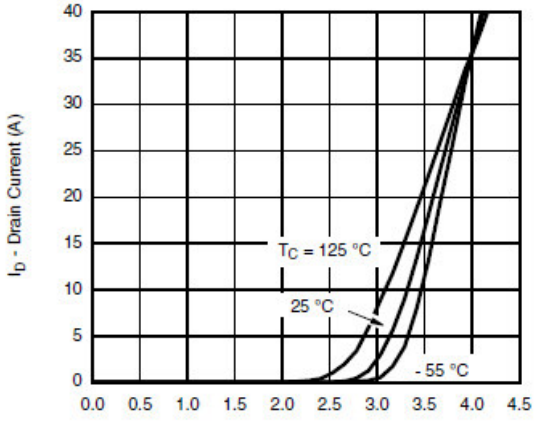
(T_A=25℃ Unless otherwise noted)

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		2.0	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=48V,V_{GS}=0V			1	uA
		V_{DS}=48V,V_{GS}=0V T_J=85℃			5	
On-State Drain Current	$I_{D(on)}$	V_{DS}≧5V,V_{GS}=10V	30			A
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=12A		17	20	mΩ
		V_{GS}=4.5V,I_D=10A		19	24	
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		0.85	1.3	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=30V,V_{GS}=10V I_D≡9.7A		50	75	nC
Gate-Source Charge	Q_{gs}			6		
Gate-Drain Charge	Q_{gd}			9		
Input Capacitance	C_{iss}	V_{DS}=30V,V_{GS}=0V f=1MHz		3200		pF
Output Capacitance	C_{oss}			300		
Reverse Transfer Capacitance	C_{rss}			250		
Turn-On Time	$t_{d(on)}$	V_{DD}=30V,R_L=30Ω I_D≡1A,V_{GEN}=10V R_G=6Ω		12	20	ns
	t_r			12	20	
Turn-Off Time	$t_{d(off)}$			60	90	
	t_f			20	30	

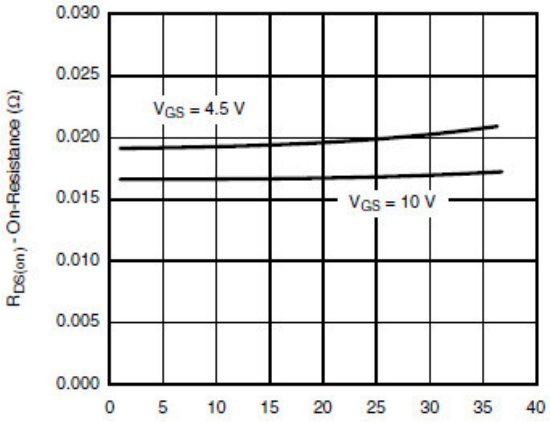
Typical Characteristics



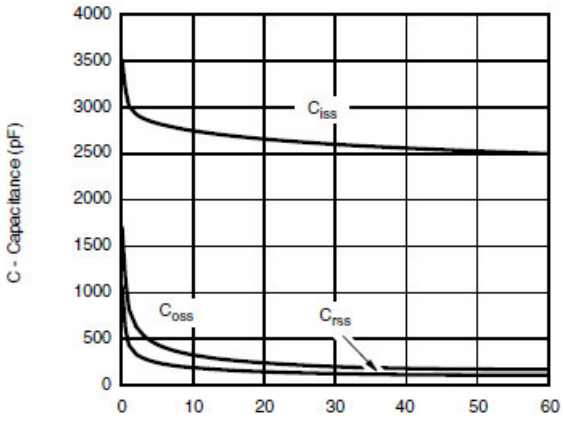
Output Characteristics



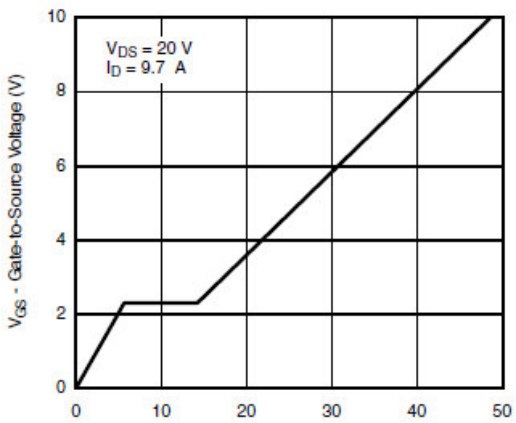
Transfer Characteristics



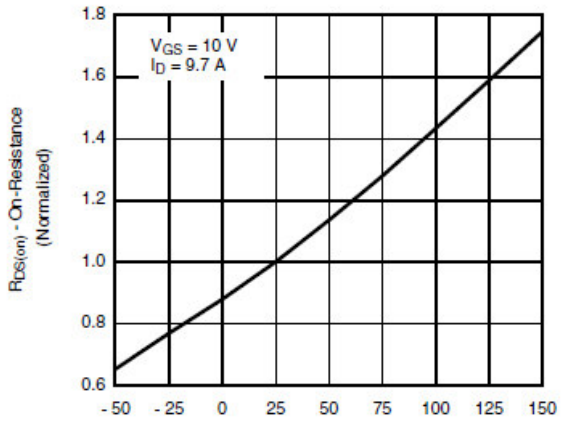
On-Resistance vs. Drain Current



Capacitance

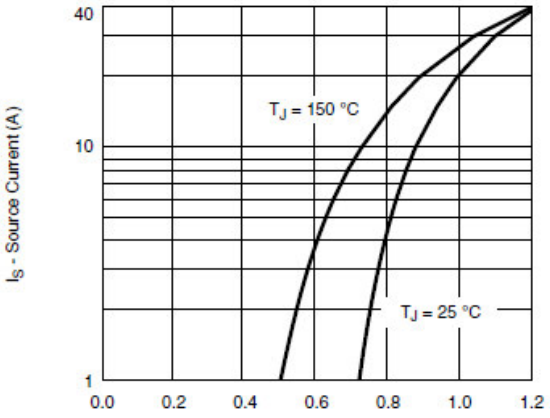


Gate Charge

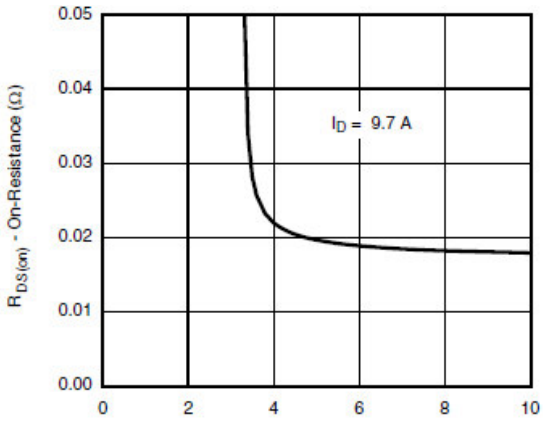


On-Resistance vs. Junction Temperature

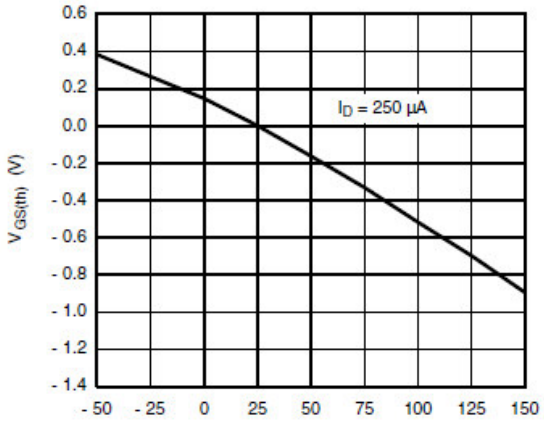
Typical Characteristics



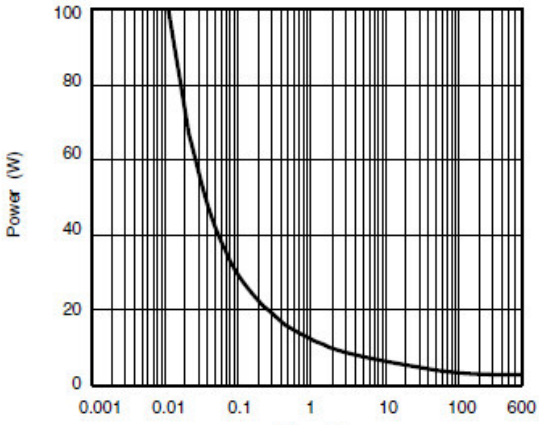
Source-Drain Diode Forward Voltage



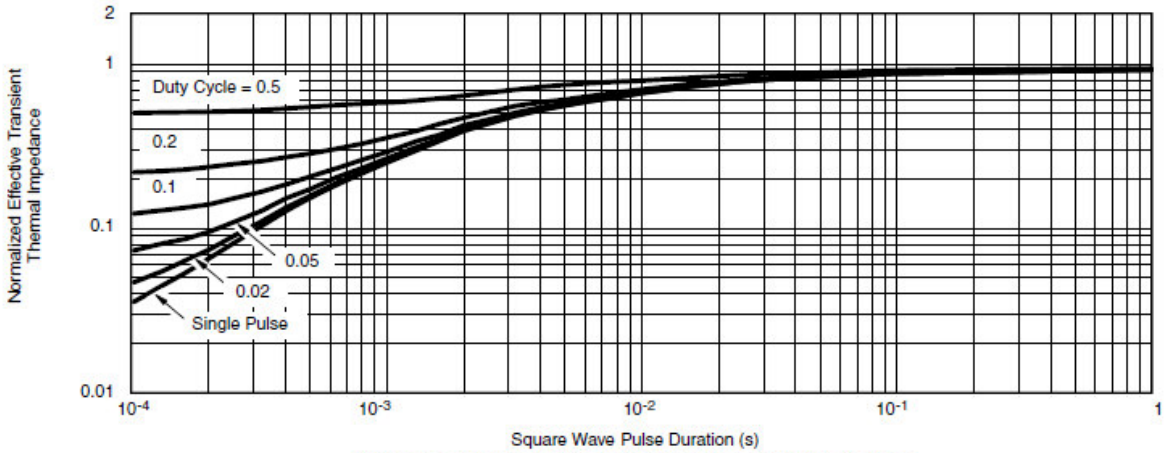
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



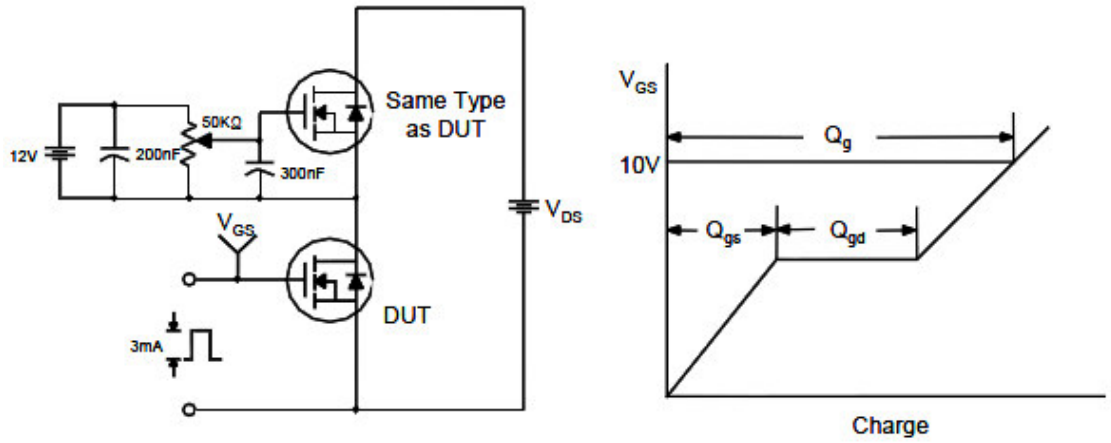
Single Pulse Power



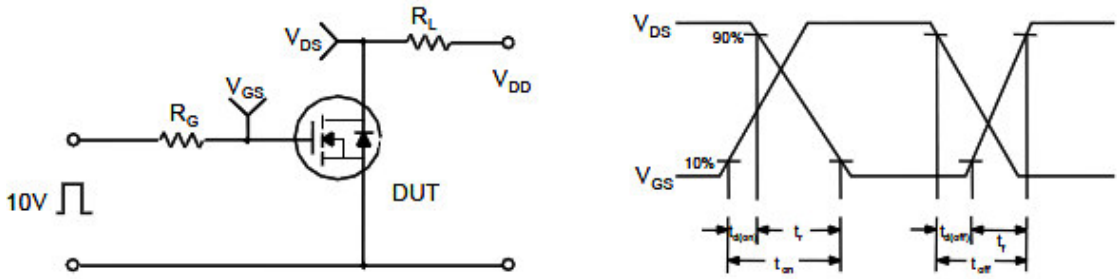
Normalized Thermal Transient Impedance, Junction-to-Case

Typical Characteristics

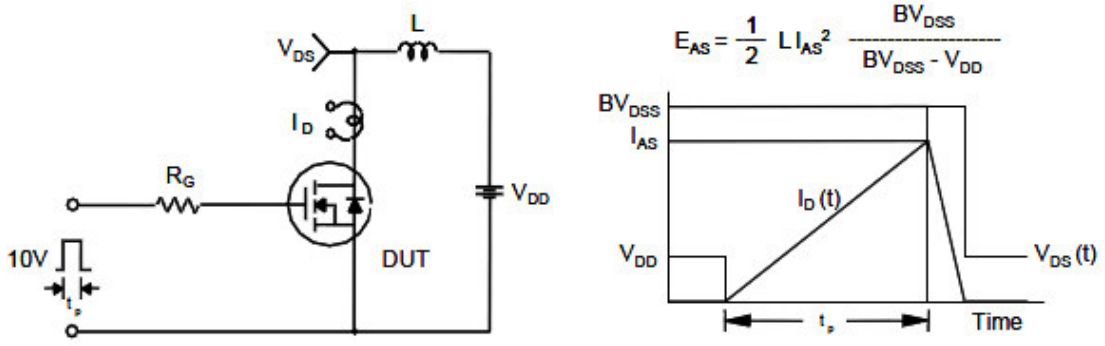
Gate Charge Test Circuit & Waveform



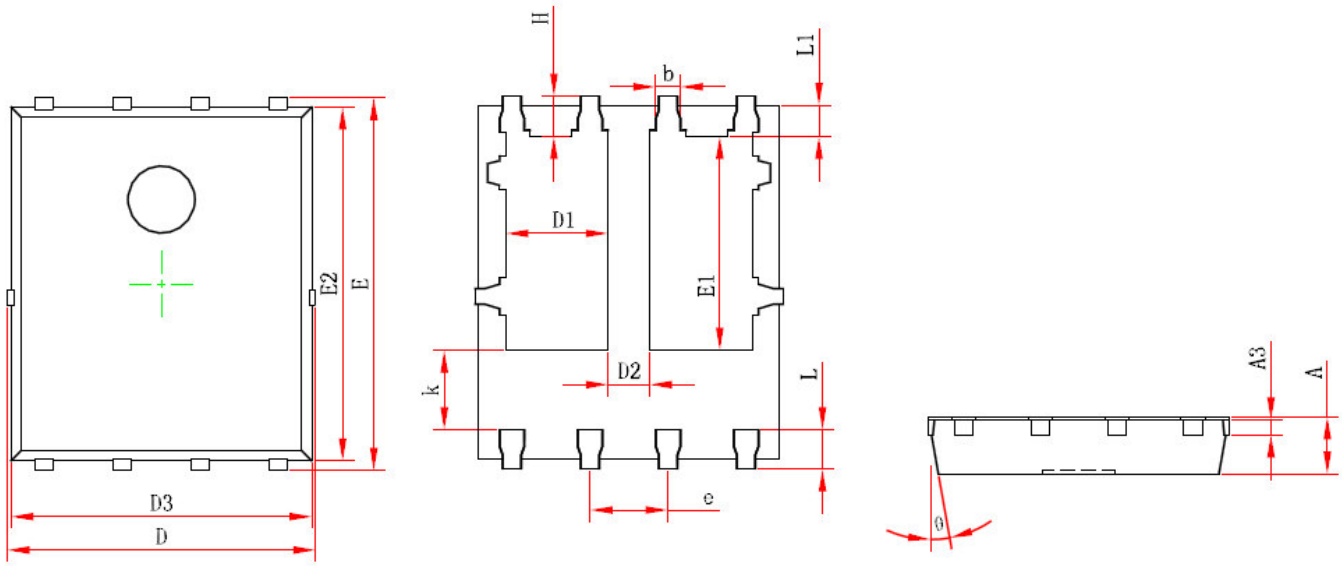
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



Package Information (DFN 5X6-8L)



Top View Bottom View Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254 REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	1.470	1.870	0.058	0.074
D2	0.470	0.870	0.019	0.034
E1	3.375	3.575	0.133	0.141
D3	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	10°	12°	10°	12°

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