



General Description

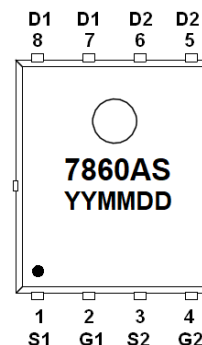
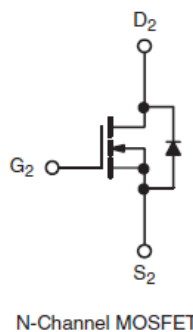
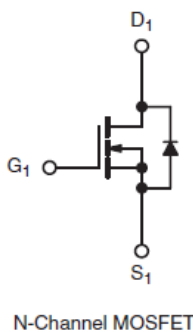
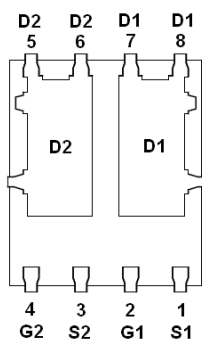
AFN7680AS, Dual N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

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

- 80V/15A, $R_{DS(ON)}=10m\Omega@V_{GS}=10V$
- 80V/10A, $R_{DS(ON)}=13m\Omega@V_{GS}=4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- DFN 5X6-8L package design

Pin Description (DFN5X6-8L)



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
AFN7680ASFN568RG	7860AS	DFN 5X6-8L	Tape & Reel	2500 EA

※ 7860AS : Parts Code

※ YYMMDD : Date Code

※ AFN7680ASFN568RG : 13" Tape & Reel ; Pb- Free ; Halogen -Free



Absolute Maximum Ratings (T_A=25°C Unless otherwise noted)

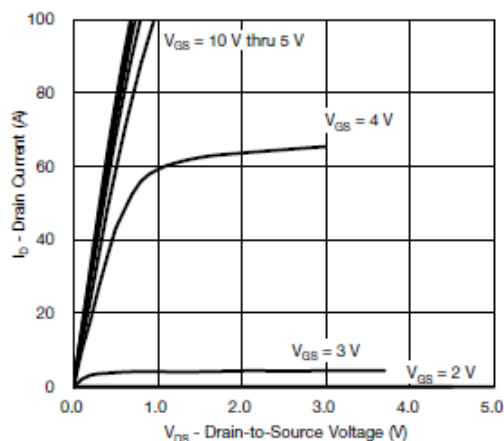
Parameter			Symbol	Typical		Unit
Drain-Source Voltage			V _{DSS}	80		V
Gate –Source Voltage			V _{GSS}	±20		V
Continuous Drain Current(T _J =150°C)	T _C =25°C	T _C =70°C	I _{DSM}	60	52	A
	T _A =25°C	T _A =70°C		18	15	
Pulsed Drain Current (t=100us)			I _{DM}	150		
Continuous Source Current(Diode Conduction)	T _C =25°C		I _S	60		
	T _A =25°C			4.5		
Single Pulse Avalanche Current	L=0.1mH		I _{AS}	30		
			E _{AS}	45		mJ
Power Dissipation	T _C =25°C	T _C =75°C	P _D	62.5	40	W
	T _A =25°C	T _A =75°C		5.0	3.2	
Operating Junction Temperature			T _J	150		°C
Storage Temperature Range			T _{STG}	-55/150		°C
Thermal Resistance-Junction to Ambient	t ≤ 10 s		R _{θJA}	20		°C/W
Maximum Junction-to-Case (Drain)	Steady-State		R _{θJA}	1.5		

Electrical Characteristics (T_A=25°C Unless otherwise noted)

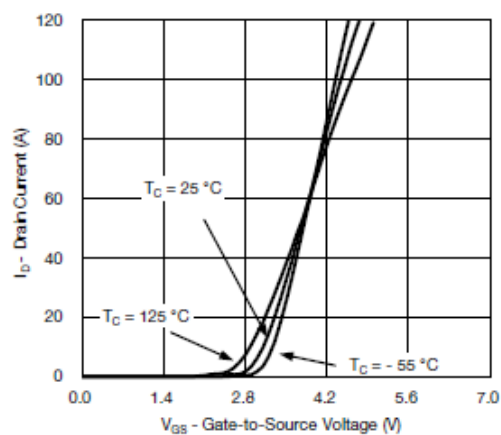
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250uA	80			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	1.0	1.75	2.0	
Gate Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =64V, V _{GS} =0V			1	uA
		V _{DS} =64V, V _{GS} =0V T _J =85°C			10	
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 =15A		7	10	mΩ
		V _{GS} =4.5V, I _D =10A		10	13	
Forward Transconductance	g _{FS}	V _{DS} =10V, I _D =20A		60		S
Diode Forward Voltage	V _{SD}	I _S =5A, V _{GS} =0V		0.75	1.2	V
Dynamic						
Total Gate Charge	Q _g	V _{DS} =40V, V _{GS} =4.5V I _D ≡10A		18	36	nC
Gate-Source Charge	Q _{gs}			7.5		
Gate-Drain Charge	Q _{gd}			8.5		
Gate Resistance	R _g	f=1MHz	0.4	1.4	2.4	Ω
Input Capacitance	C _{iss}	V _{DS} =40V, V _{GS} =0V f=1MHz		1850		pF
Output Capacitance	C _{oss}			950		
Reverse Transfer Capacitance	C _{rss}			75		
Turn-On Time	t _{d(on)}	V _{DD} =40V, R _L =4.0Ω I _D ≡10A, V _{GEN} =10V R _G =1Ω		12	24	ns
	t _r			8	16	
Turn-Off Time	t _{d(off)}			32	64	
	t _f			7	14	



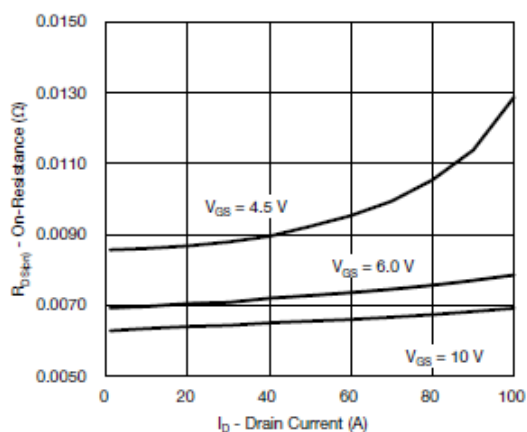
Typical Characteristics



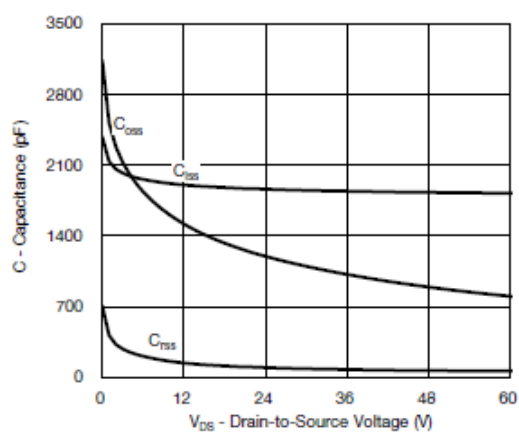
Output Characteristics



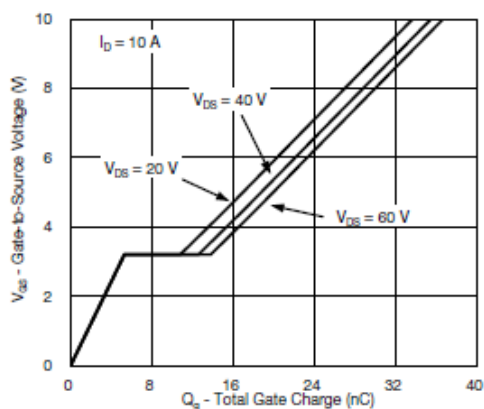
Transfer Characteristics



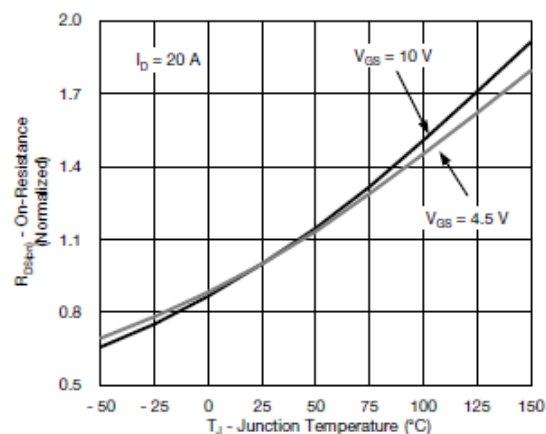
On-Resistance vs. Drain Current



Capacitance



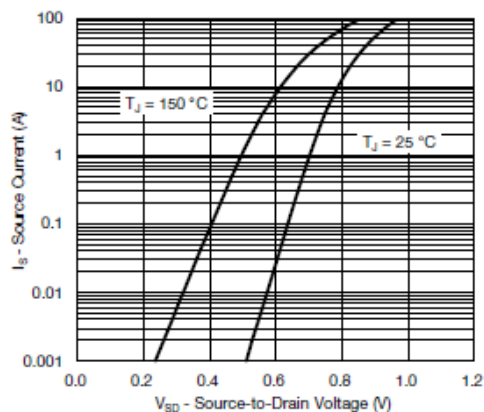
Gate Charge



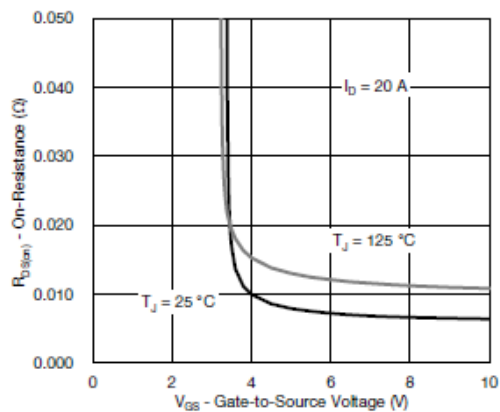
On-Resistance vs. Junction Temperature



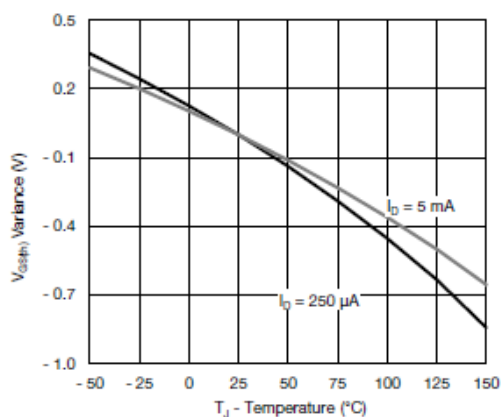
Typical Characteristics



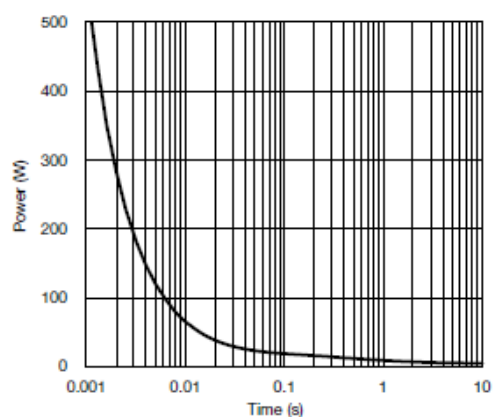
Source-Drain Diode Forward Voltage



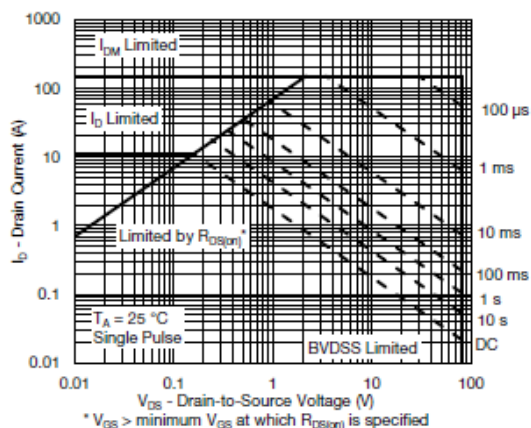
On-Resistance vs. Gate-to-Source Voltage



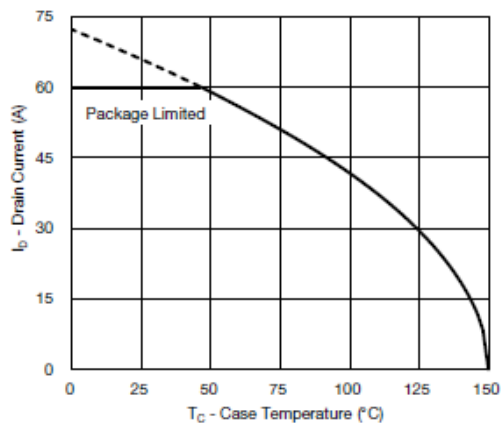
Threshold Voltage



Single Pulse Power, Junction-to-Ambient



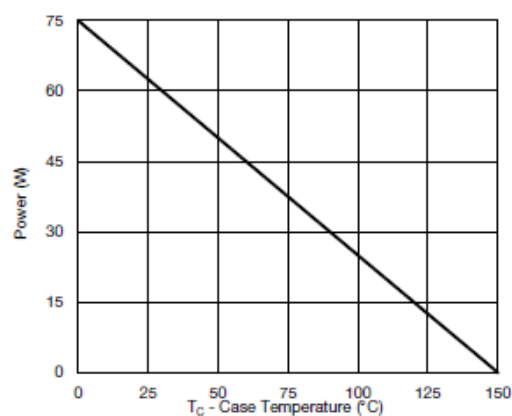
Safe Operating Area, Junction-to-Ambient



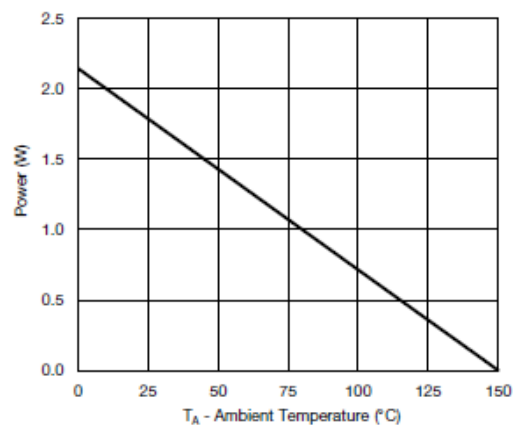
Current Derating ^a



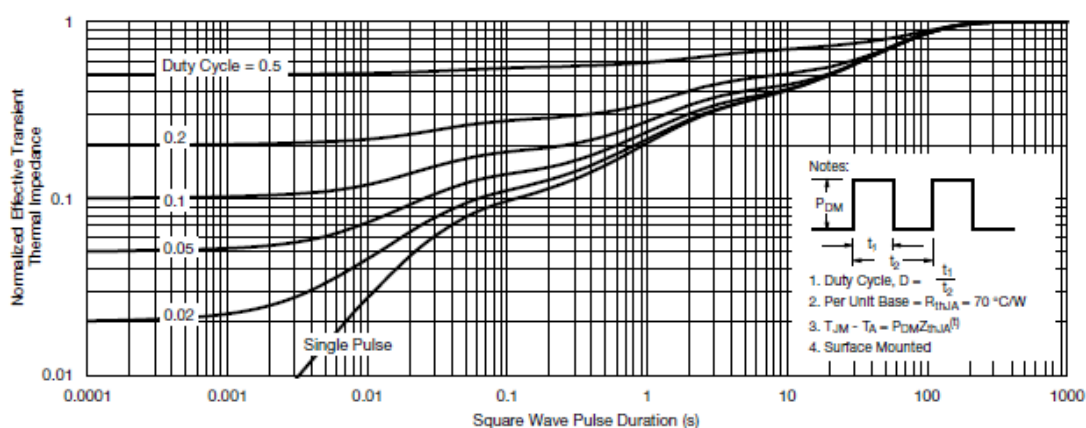
Typical Characteristics



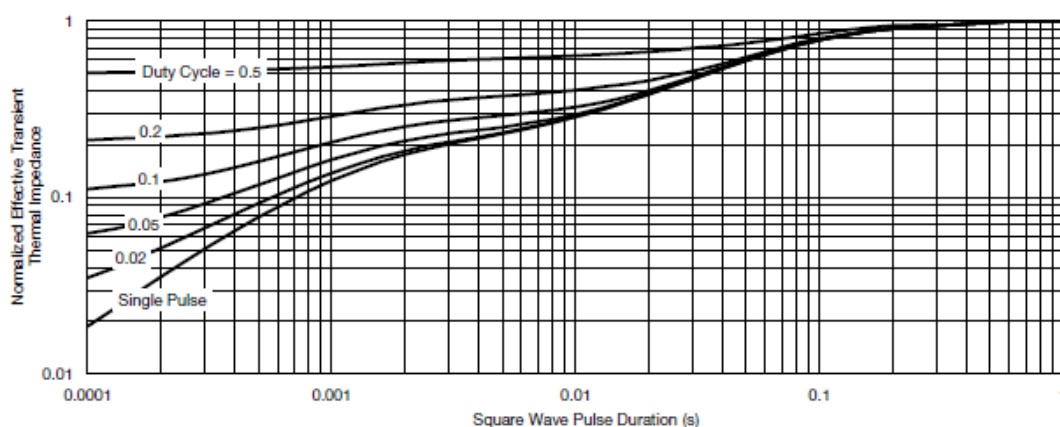
Power, Junction-to-Case



Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient

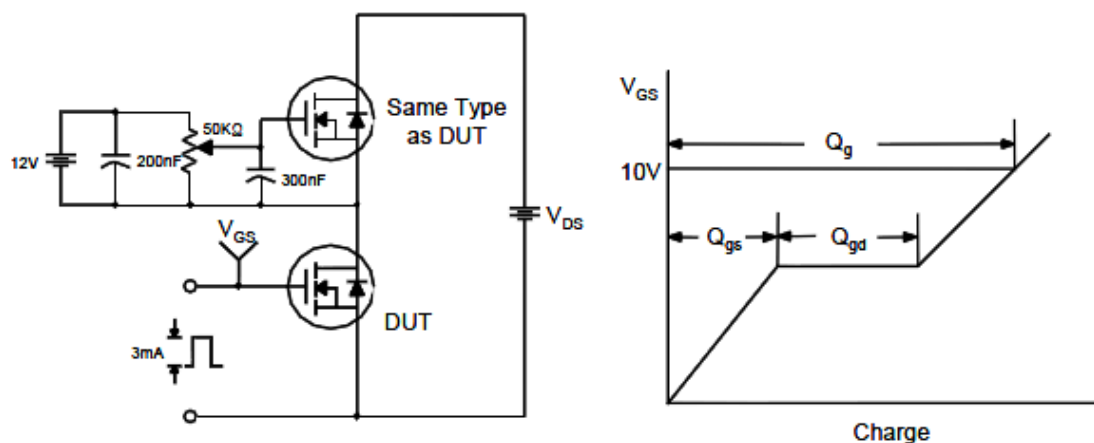


Normalized Thermal Transient Impedance, Junction-to-Case

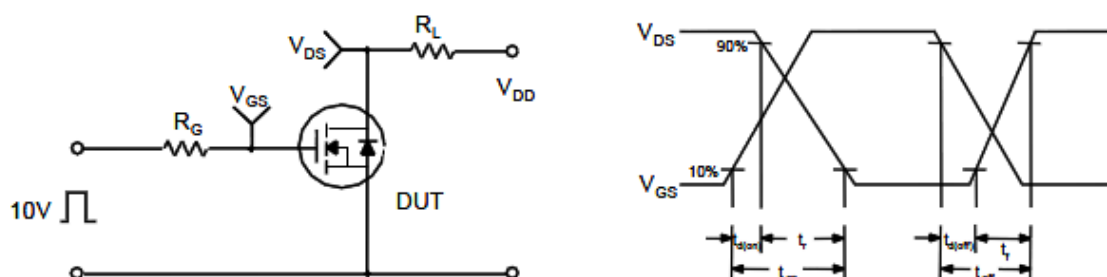


Typical Characteristics

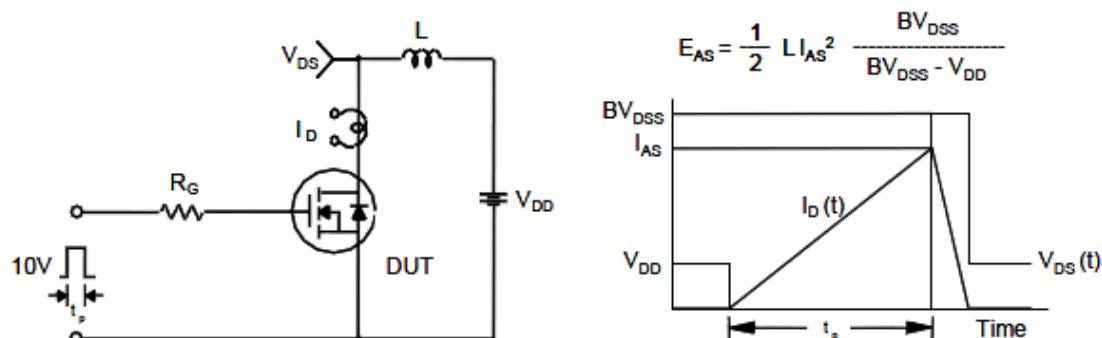
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

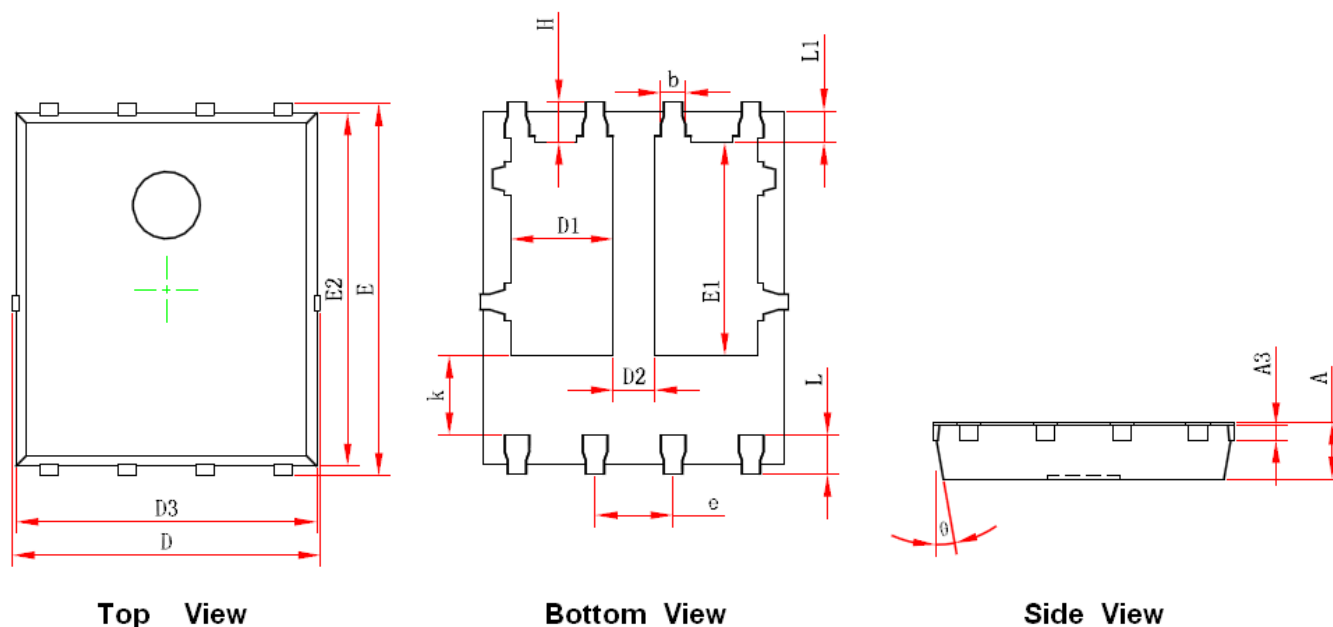


Unclamped Inductive Switching Test Circuit & Waveforms





Package Information (DFN 5X6-8L)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254 REF.		0.010 REF.	
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	1.270 TYP.		0.050 TYP.	
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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