



General Description

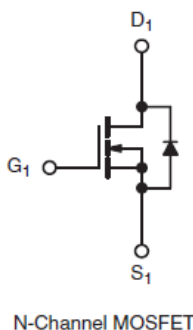
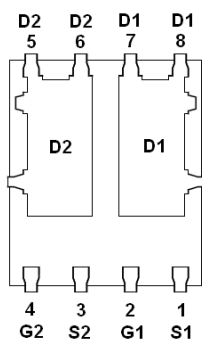
AFN7972S, Dual N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

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

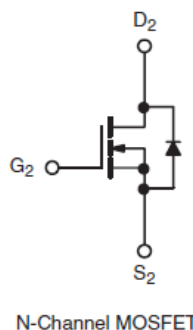
Features

- 60V/12A, $R_{DS(ON)} = 17m\Omega @ V_{GS}=10V$
- 60V/10A, $R_{DS(ON)} = 24m\Omega @ V_{GS}=4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- DFN 5X6-8L package design

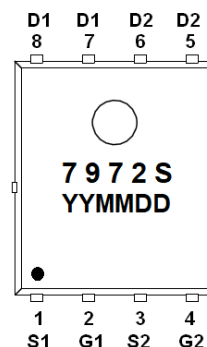
Pin Description (DFN5X6-8L)



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
AFN7972SFN568RG	7972S	DFN 5X6-8L	Tape & Reel	2500 EA

※ 7972S : Parts Code

※ YYMMDD : Date Code

※ AFN7972SFN568RG : 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}	60		V
Gate –Source Voltage			V _{GSS}	±20		V
Continuous Drain Current(T _J =150℃)	T _C =25℃	T _C =70℃	I _D	16	14	A
	T _A =25℃	T _A =70℃		12	10	
Pulsed Drain Current			I _{DM}	40		A
Continuous Source Current (Diode Conduction)	T _C =25℃	T _A =25℃	I _S	19	3	A
Power Dissipation	T _C =25℃	T _C =70℃	P _D	22	14	W
	T _A =25℃	T _A =70℃		3.6	2.3	
Operating Junction Temperature			T _J	150		℃
Storage Temperature Range			T _{STG}	-55/150		℃
Thermal Resistance-Junction to Ambient	t ≤ 10 s		R _{θJA}	35		℃/W
Thermal Resistance-Junction-to-case	Steady state		R _{θJC}	5.5		

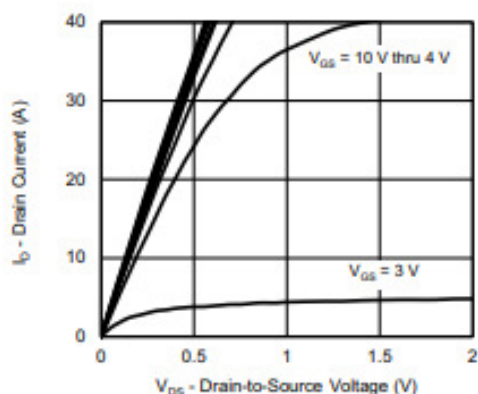
Electrical Characteristics

(T_A=25°C Unless otherwise noted)

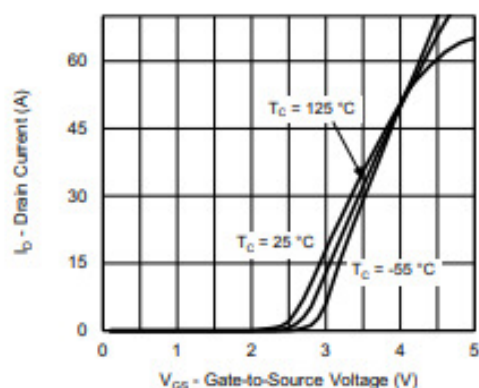
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250uA	60			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	1.0		2.5	
Gate Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =48V, V _{GS} =0V			1	uA
		V _{DS} =48V, V _{GS} =0V T _J =85°C			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		13	17	mΩ
		V _{GS} =4.5V, I _D =10A		19	24	
Forward Transconductance	g _{FS}	V _{DS} =30V, I _D =11A		38		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} =4.5V I _D ≡10A		7.5	15	nC
Gate-Source Charge	Q _{gs}			4.5		
Gate-Drain Charge	Q _{gd}			1.5		
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V f=1MHz		950		pF
Output Capacitance	C _{oss}			420		
Reverse Transfer Capacitance	C _{rss}			20		
Turn-On Time	t _{d(on)}	V _{DD} =30V, R _L =3.45Ω I _D ≡8.7A, V _{GEN} =10V R _G =1Ω		10	20	ns
	t _r			20	40	
Turn-Off Time	t _{d(off)}			25	50	
	t _f			10	20	



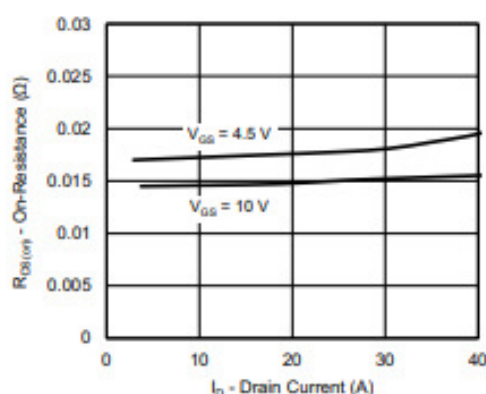
Typical Characteristics



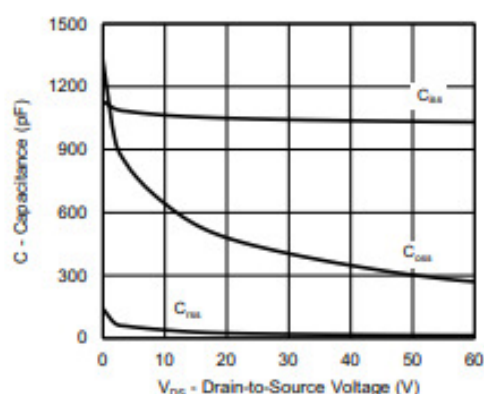
Output Characteristics



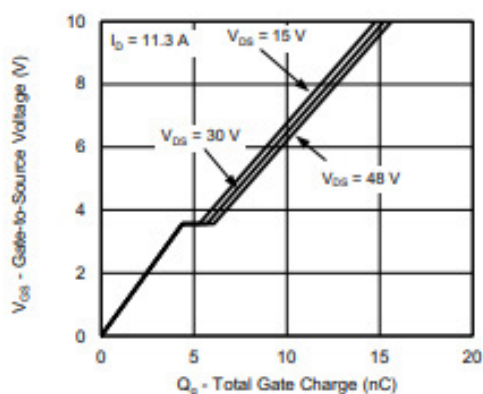
Transfer Characteristics



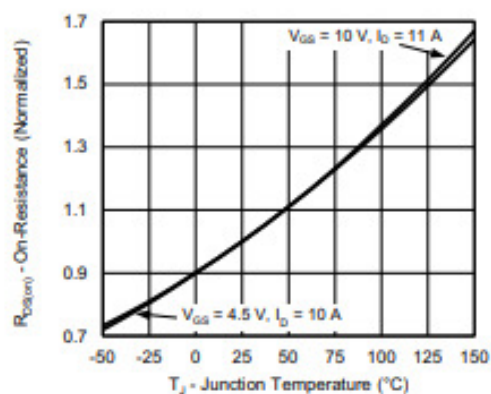
On-Resistance vs. Drain Current



Capacitance



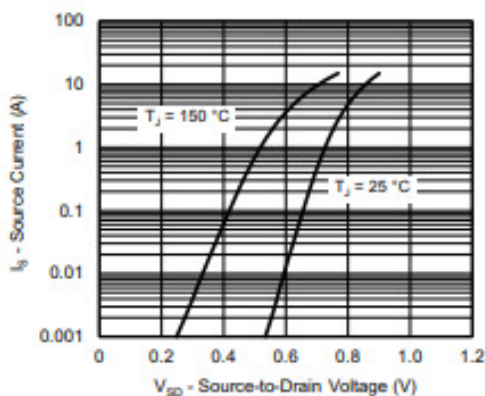
Gate Charge



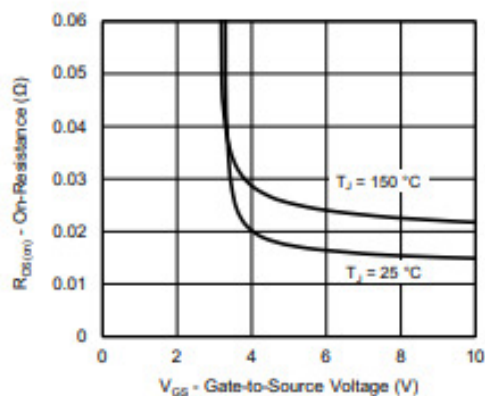
On-Resistance vs. Junction Temperature



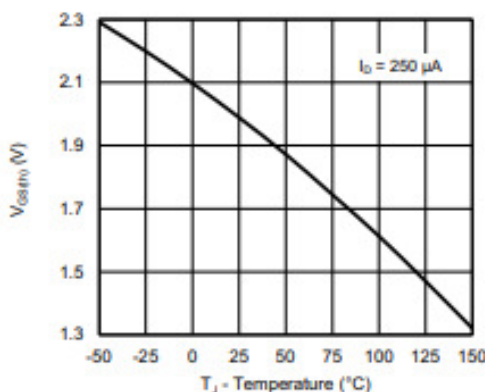
Typical Characteristics



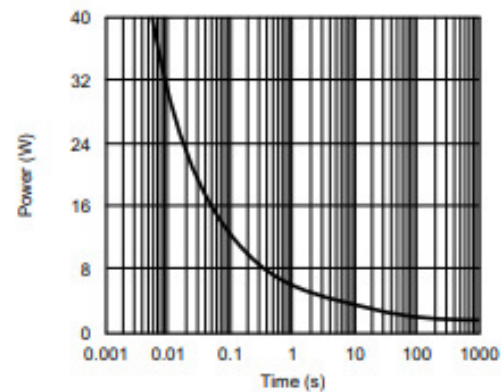
Source-Drain Diode Forward Voltage



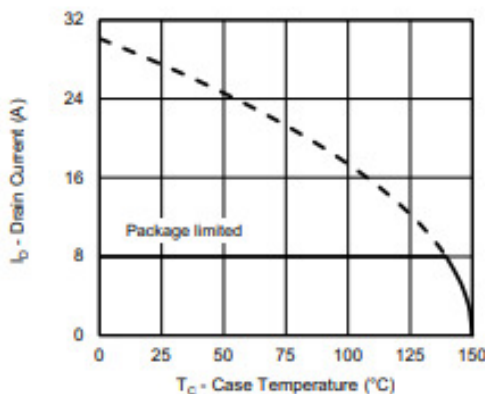
On-Resistance vs. Gate-to-Source Voltage



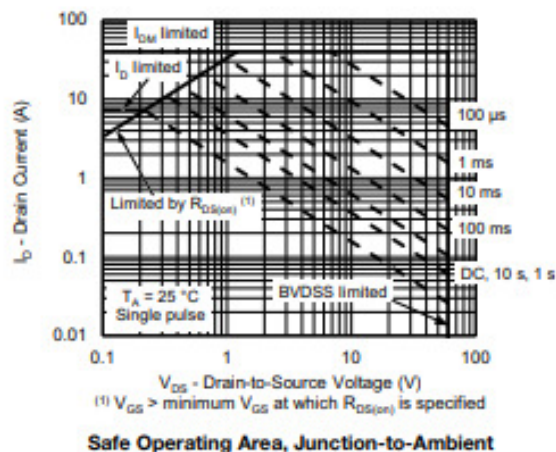
Threshold Voltage



Single Pulse Power



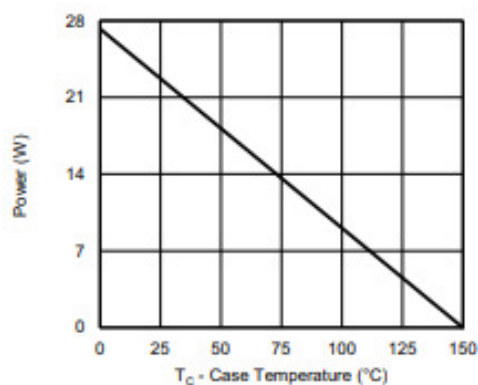
Current Derating ^a



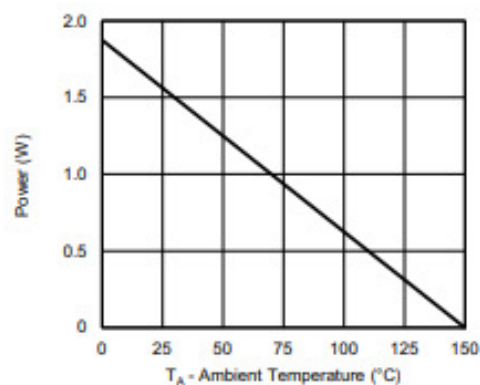
Safe Operating Area, Junction-to-Ambient



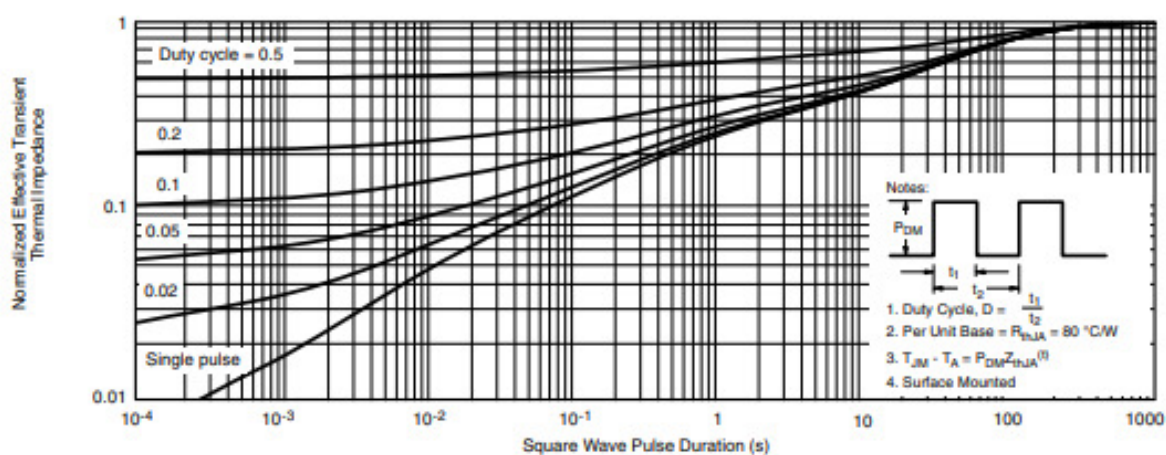
Typical Characteristics



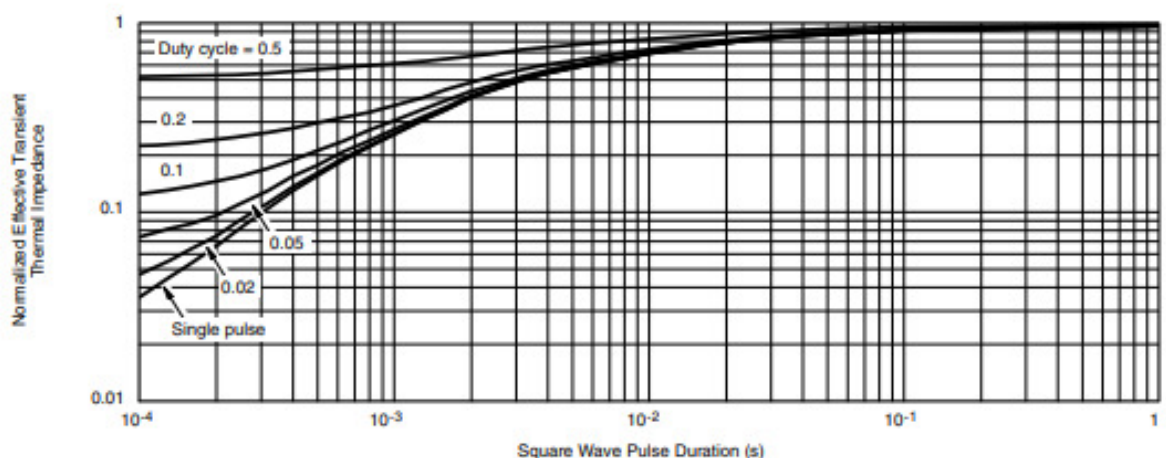
Power, Junction-to-Case



Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient

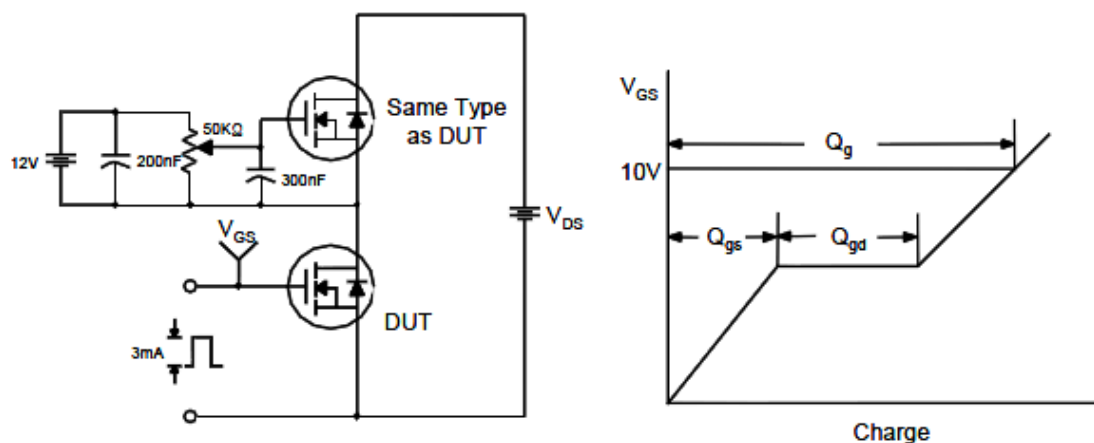


Normalized Thermal Transient Impedance, Junction-to-Case

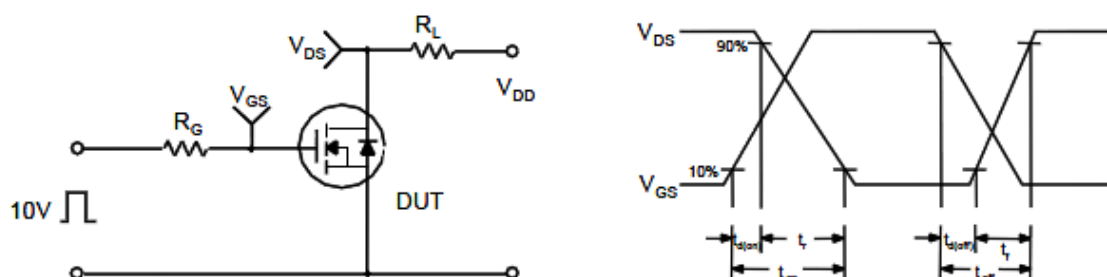


Typical Characteristics

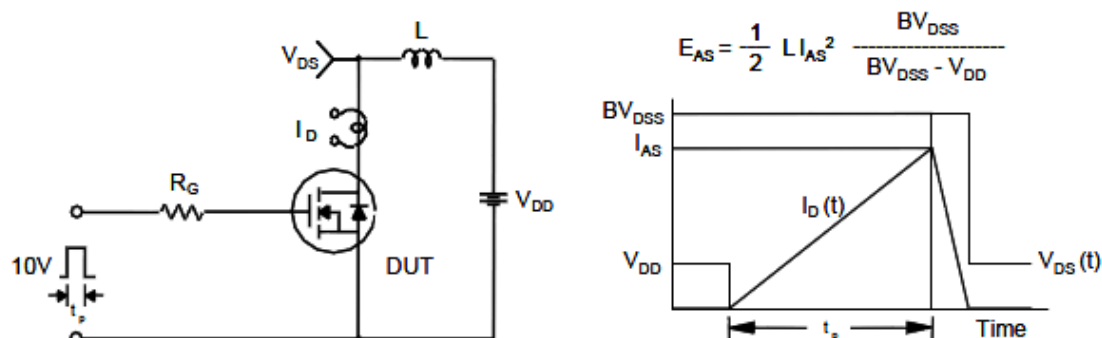
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

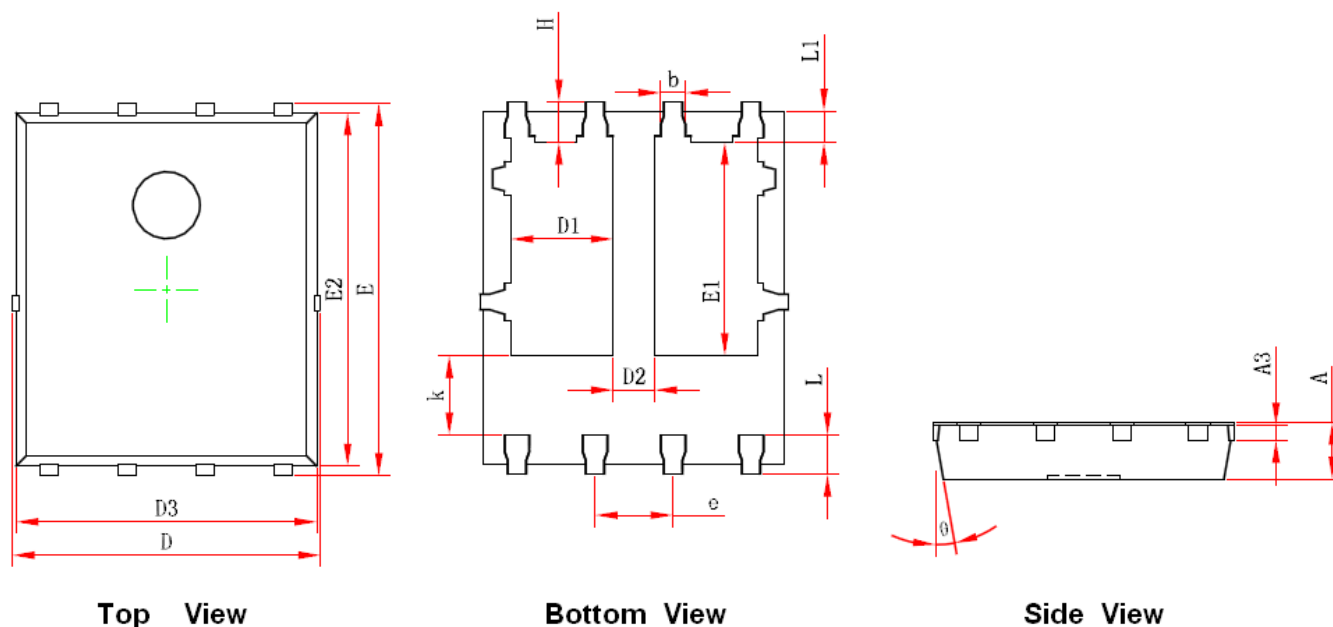


Unclamped Inductive Switching Test Circuit & Waveforms





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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