



General Description

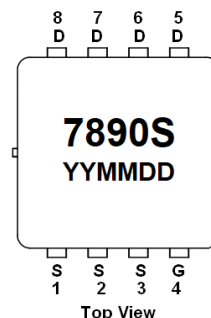
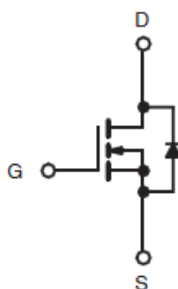
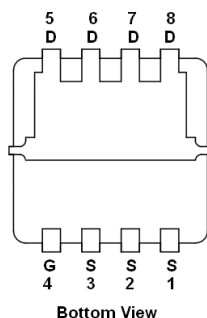
AFN7890S, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

These devices are particularly suited for low voltage power management, such as smart phone and notebook computer and other battery powered circuits, and low in-line power loss are needed in commercial industrial surface mount applications.

Features

- 100V/10A, $R_{DS(ON)}=24m\Omega@V_{GS}=10V$
- 100V/10A, $R_{DS(ON)}=29m\Omega@V_{GS}=4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- DFN3.3X3.3-8L package design

Pin Description (DFN3.3X3.3-8L)



Application

- DC-DC Converter
- POL

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
AFN7890SFN308RG	7890S	DFN3.3X3.3-8L	Tape & Reel	5000 EA

※ YY year code

※ MM month code

※ DD date code

※ AFN7890SFN308RG : 13" Tape & Reel ; Pb- Free ; Halogen -Free



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

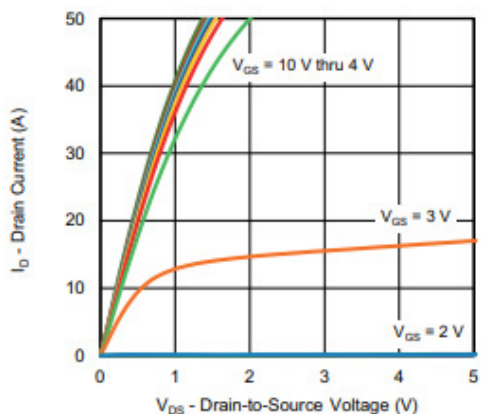
Parameter	Symbol	Typical	Unit
Drain-Source Voltage	V _{DSS}	100	V
Gate –Source Voltage	V _{GSS}	±20	V
Continuous Drain Current (T _J =150°C)	I _D	25	A
		7.6	
Pulsed Drain Current (t=100us)	I _{DM}	40	
Continuous Source Current (Diode Conduction)	I _S	35	
Single pulse avalanche current	I _{AS}	12	
Single pulse avalanche energy	E _{AS}	7.2	mJ
Power Dissipation	P _D	39	W
		3.6	
Operating Junction Temperature	T _J	150	°C
Storage Temperature Range	T _{STG}	-55/150	°C
Thermal Resistance-Junction to Ambient	R _{θJA}	26	°C/W
Maximum junction-to-case (drain)	R _{θJC}	2.4	

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

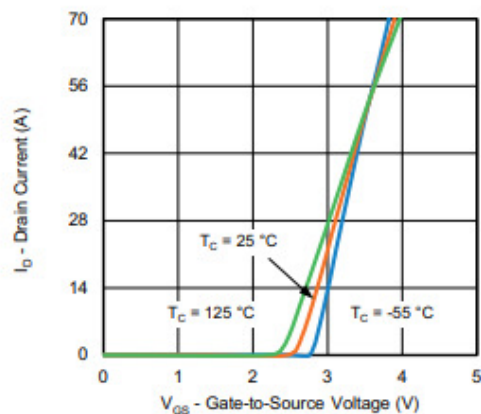
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250uA	100			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	1.0		2.5	
Gate Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =80V, V _{GS} =0V			1	uA
		V _{DS} =80V, V _{GS} =0V T _J =85°C			10	
On-State Drain Current	I _{D(on)}	V _{DS} ≥ 10V, V _{GS} =10V	20			A
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =10A		18	24	mΩ
		V _{GS} =4.5V, I _D =10A		24	29	
Forward Transconductance	g _{FS}	V _{DS} =15V, I _D =10A		46		S
Diode Forward Voltage	V _{SD}	I _S =5.0A, V _{GS} =0V		0.75	1.2	V
Dynamic						
Total Gate Charge	Q _g	V _{DS} =50V, V _{GS} =4.5V I _D ≡10A		8.5	14	nC
Gate-Source Charge	Q _{gs}			4.2		
Gate-Drain Charge	Q _{gd}			2.3		
Gate resistance	R _g	f=1MHz	0.3	0.85	1.5	Ω
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V f=1MHz		1350		pF
Output Capacitance	C _{oss}			85		
Reverse Transfer Capacitance	C _{rss}			8		
Turn-On Time	t _{d(on)}	V _{DD} =50V, R _L =5Ω I _D ≡10A, V _{GEN} =10V R _G =1.0Ω		10	20	ns
	t _r			6	12	
Turn-Off Time	t _{d(off)}			20	40	
	t _f			5	10	



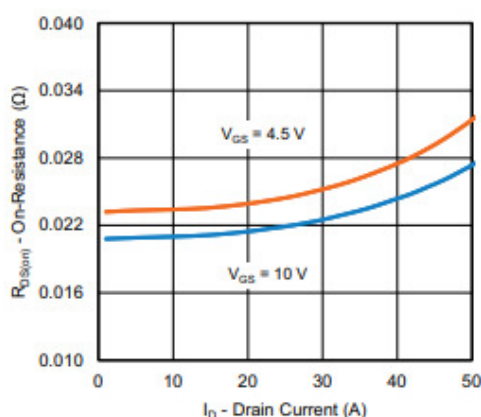
Typical Characteristics



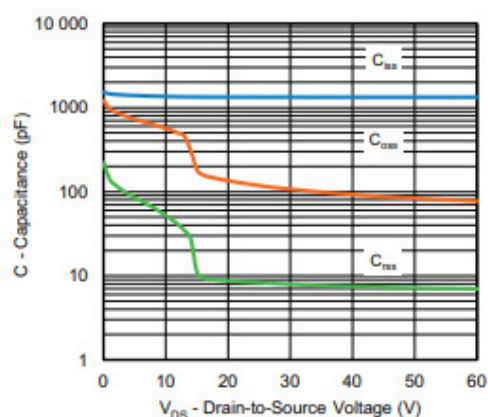
Output Characteristics



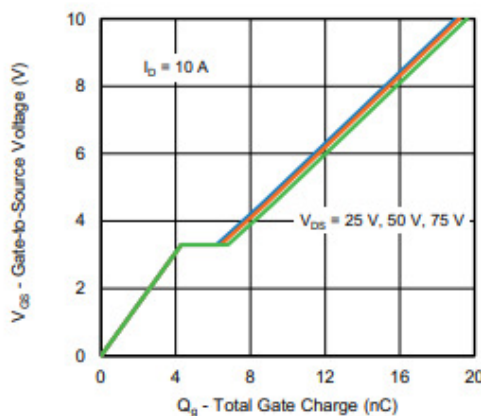
Transfer Characteristics



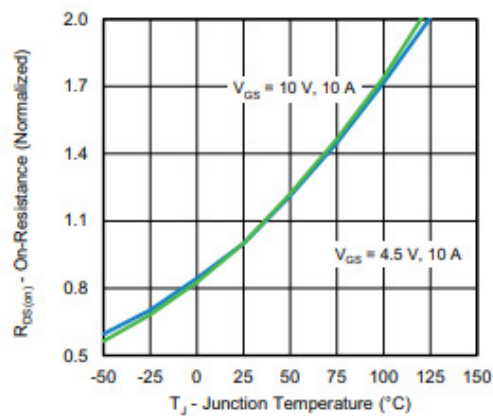
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



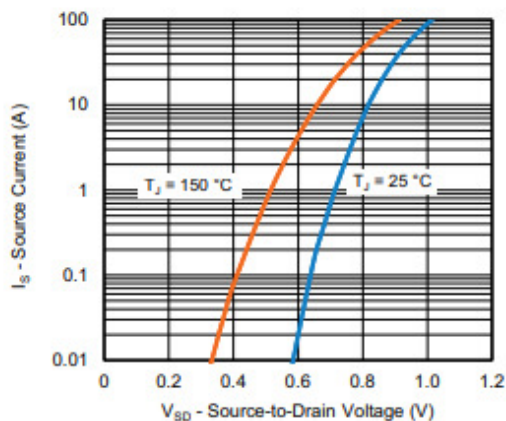
Gate Charge



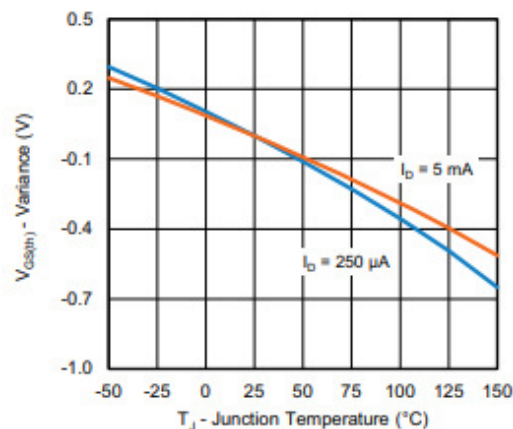
On-Resistance vs. Junction Temperature



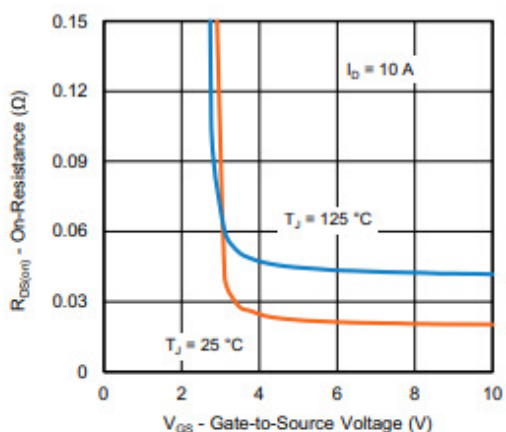
Typical Characteristics



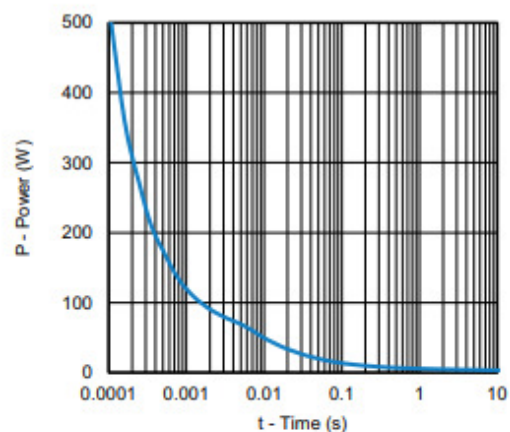
Source-Drain Diode Forward Voltage



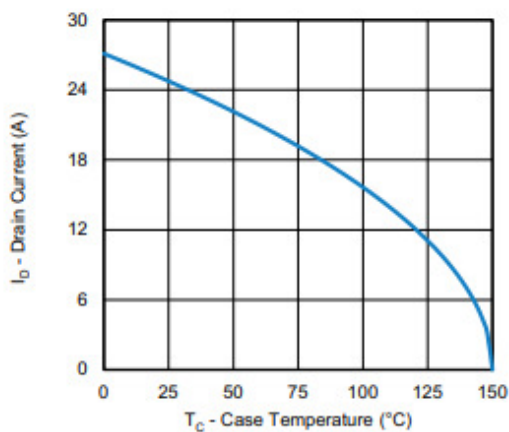
Threshold Voltage



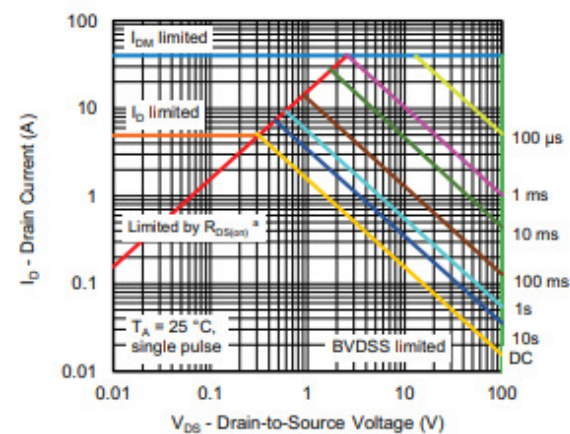
On-Resistance vs. Gate-to-Source Voltage



Single Pulse Power, Junction-to-Ambient



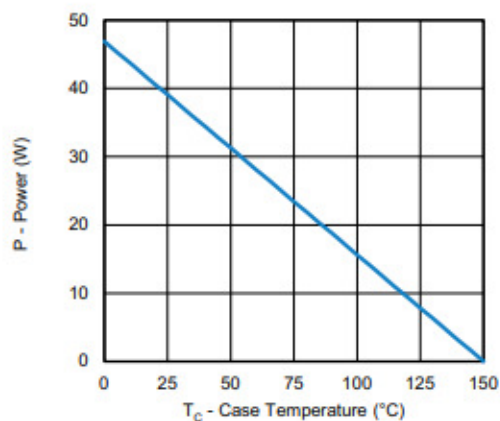
Current Derating ^a



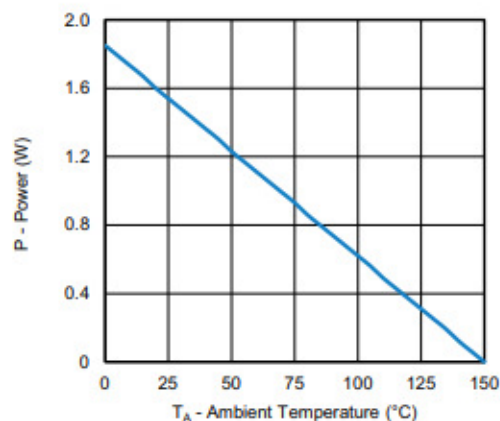
Safe Operating Area, Junction-to-Ambient



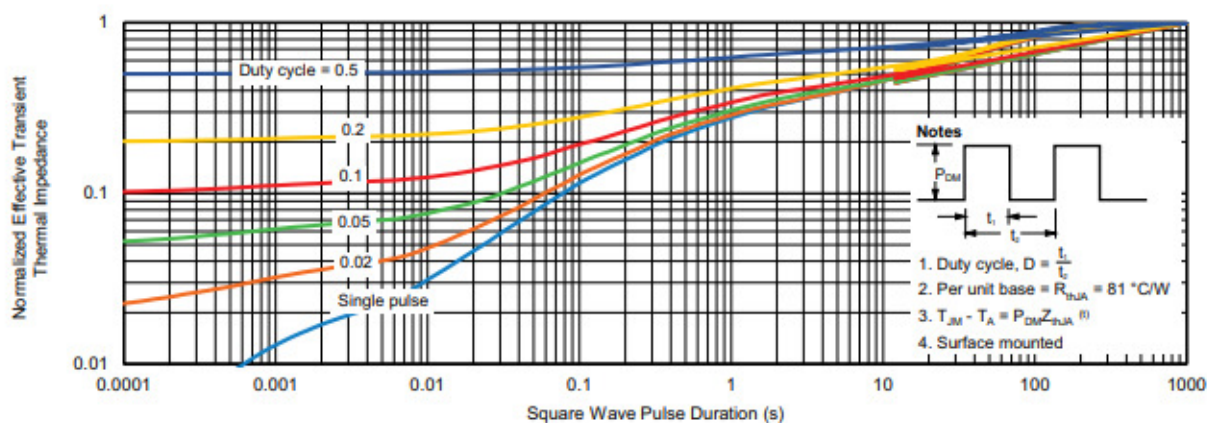
Typical Characteristics



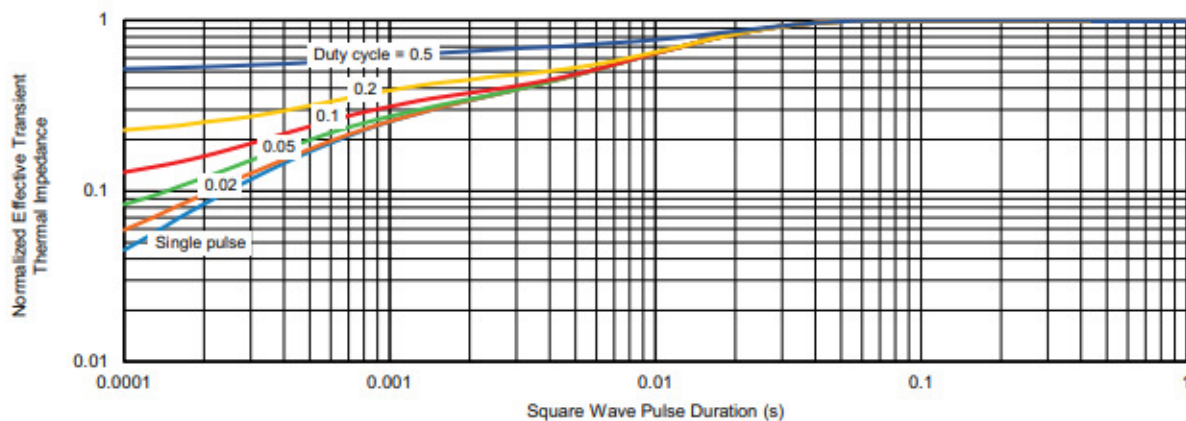
Power, Junction-to-Case



Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient

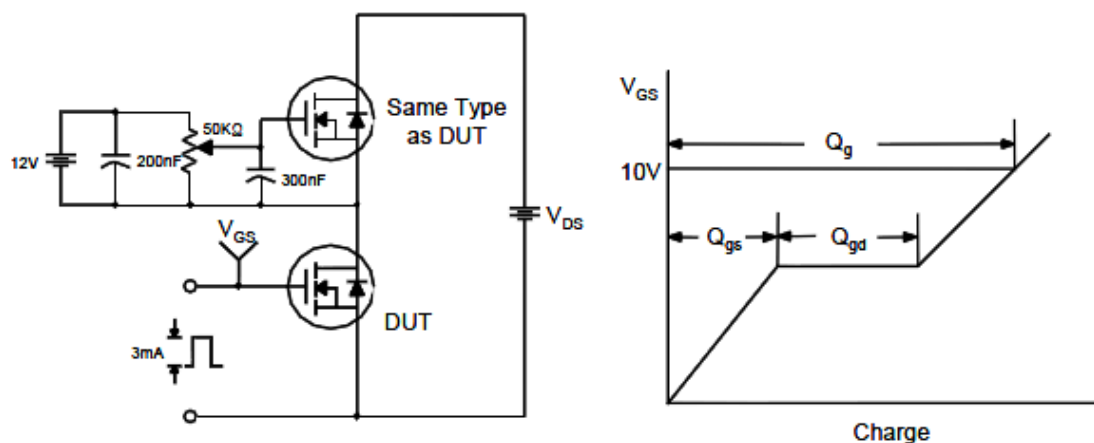


Normalized Thermal Transient Impedance, Junction-to-Case

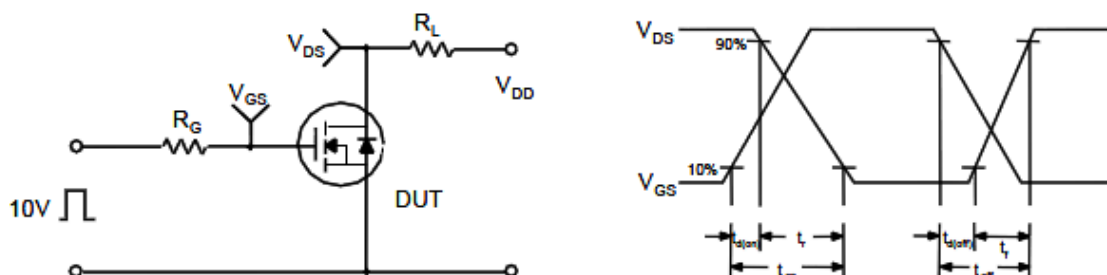


Typical Characteristics

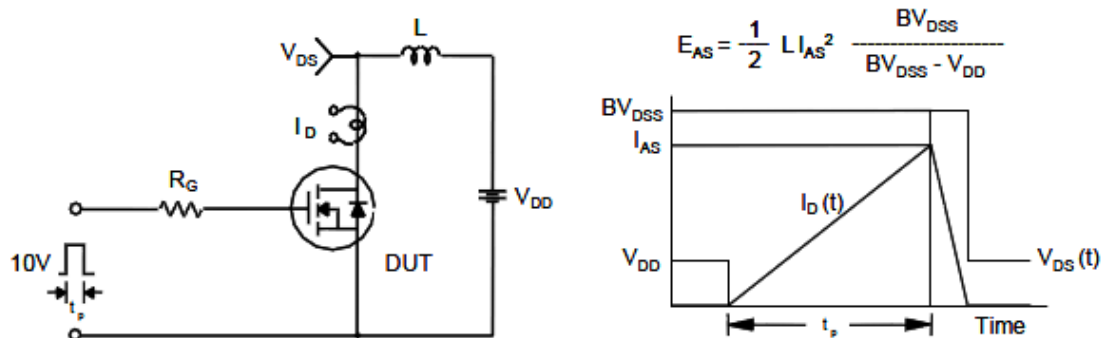
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

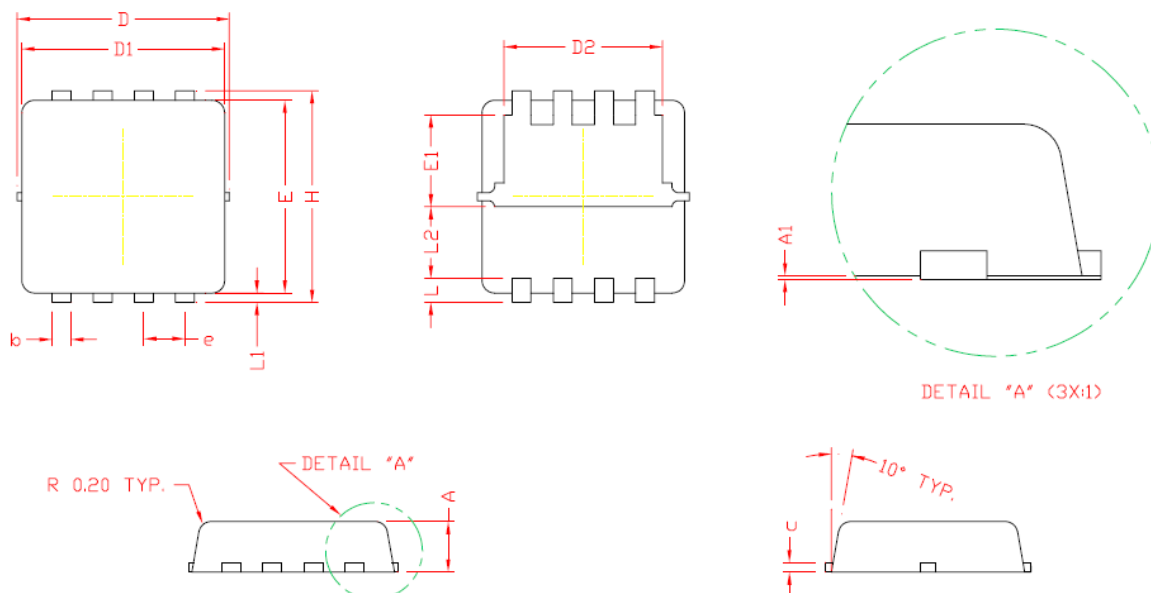


Unclamped Inductive Switching Test Circuit & Waveforms





Package Information (DFN3.3X3.3-8L)



DIMENSIONS

REF.	Millimeters		REF.	Millimeters	
	Min.	Max.		Min.	Max.
A	0.70	0.90	E	3.00	3.20
A1	0.00	0.05	E1	1.35	1.55
b	0.24	0.35	e	0.65 BSC.	
c	0.10	0.20	H	3.20	3.40
D	3.25	3.40	L	0.30	0.50
D1	3.05	3.25	L1	0.10	0.20
D2	2.40	2.60	L2	1.13 Ref.	

©2010 Alfa-MOS Technology Corp.
2F, No.80, Sec.1, Cheng Kung Rd., Nan Kang Dist., Taipei City 115, Taiwan (R.O.C.)
Tel : 886 2) 2651 3928
Fax : 886 2) 2786 8483
©http://www.alfa-mos.com