



General Description

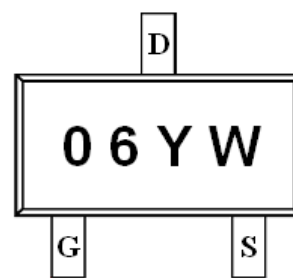
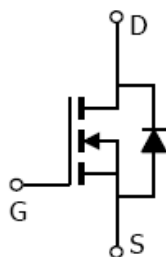
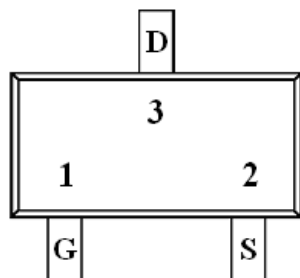
AFN1306, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

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

- 30V/1.5A, $R_{DS(ON)}=430m\Omega@V_{GS}=4.5V$
- 30V/1.2A, $R_{DS(ON)}=580m\Omega@V_{GS}=2.5V$
- 30V/0.6A, $R_{DS(ON)}=860m\Omega@V_{GS}=1.8V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOT-323 package design

Pin Description (SOT-323)



Application

- Net Working System
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories
- Battery Operated Systems
- Power Supply Converter Circuits
- Load/Power Switching Smart Phones, Paggers

Pin Define

Pin	Symbol	Description
1	G	Gate
2	S	Source
3	D	Drain

Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFN1306S32RG	06YW	SOT-323	Tape & Reel	3000 EA

- ※ 06 parts code
- ※ Y year code (0 ~ 9)
- ※ W week code (A ~ Z = 1 ~ 26 / a ~ z = 27 ~ 52)
- ※ AFN1306S32RG : 7" 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}	30	V
Gate –Source Voltage	V _{GSS}	±12	V
Continuous Drain Current(T _J =150°C)	I _D	T _A =25°C 1.0	A
		T _A =70°C 0.6	
Pulsed Drain Current	I _{DM}	6	A
Continuous Source Current(Diode Conduction)	I _S	1	A
Power Dissipation	P _D	T _A =25°C 0.35	W
		T _A =70°C 0.22	
Operating Junction Temperature	T _J	150	°C
Storage Temperature Range	T _{STG}	-55/150	°C
Thermal Resistance-Junction to Ambient	R _{θJA}	120	°C/W

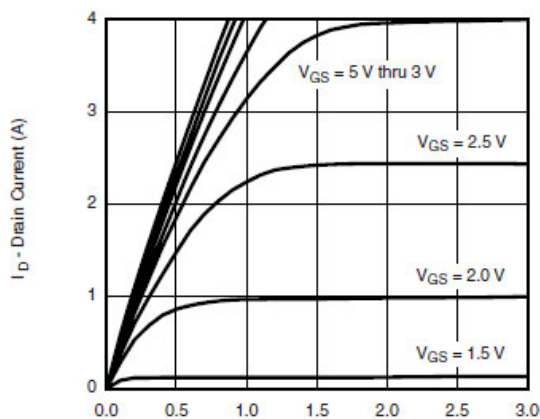
Electrical Characteristics

(T_A=25°C Unless otherwise noted)

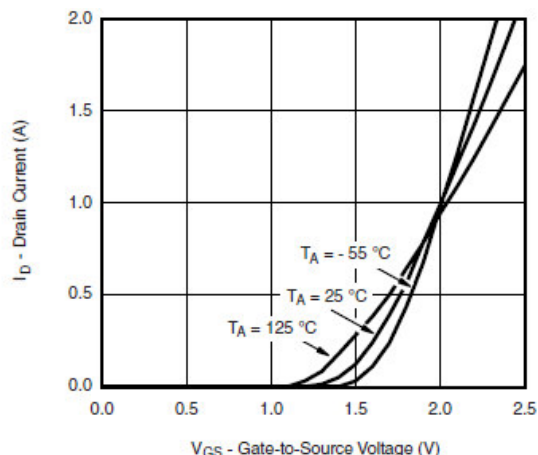
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250uA	30			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	0.5		1.0	
Gate Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±12V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =24V, V _{GS} =0V			1	uA
		V _{DS} =24V, V _{GS} =0V T _J =85°C			5	
On-State Drain Current	I _{D(on)}	V _{DS} ≥5V, V _{GS} =4.5V	1.8			A
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =4.5V, I _D =1.5A		380	430	mΩ
		V _{GS} =2.5V, I _D =1.2A		500	580	
		V _{GS} =1.8V, I _D =0.6A		760	860	
Forward Transconductance	g _{FS}	V _{DS} =10V, I _D =1.0A		1		S
Diode Forward Voltage	V _{SD}	I _S =1.0A, V _{GS} =0V		0.65	1.2	V
Dynamic						
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V f=1MHz		85		pF
Output Capacitance	C _{oss}			25		
Reverse Transfer Capacitance	C _{rss}			15		
Total Gate Charge	Q _g	V _{DS} =15V, V _{GS} =4.5V I _D ≡1.2A		1.4	1.8	nC
Gate-Source Charge	Q _{gs}			0.3		
Gate-Drain Charge	Q _{gd}			0.6		
Turn-On Time	t _{d(on)}	V _{DD} =15V, R _L =20Ω I _D ≡1.2A, V _{GEN} =4.5V R _G =1Ω		15	25	ns
	t _r			25	45	
Turn-Off Time	t _{d(off)}			15	25	
	t _f			10	20	



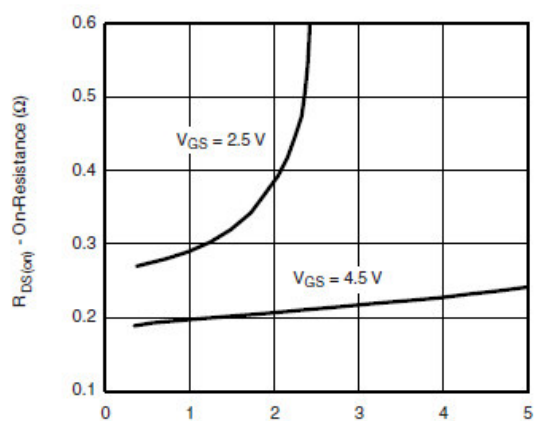
Typical Characteristics



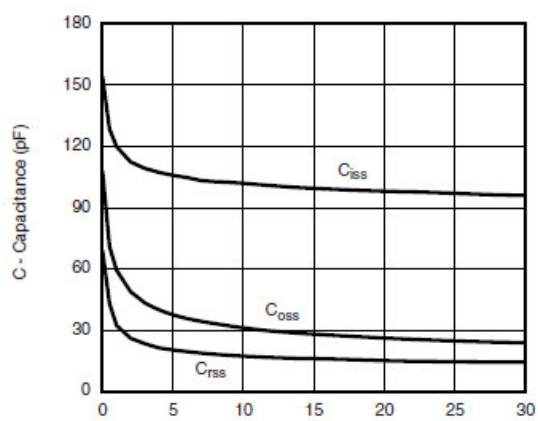
V_{DS} - Drain-to-Source Voltage (V)
Output Characteristics



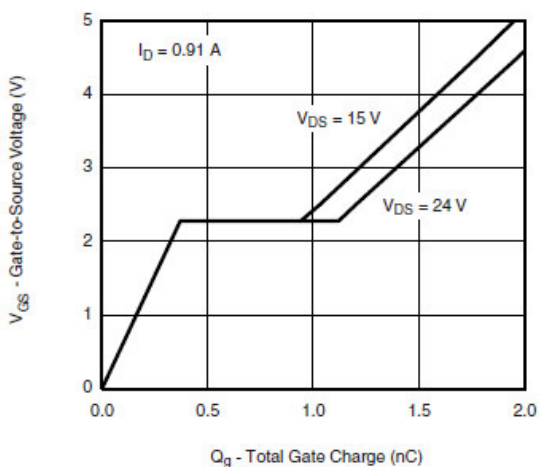
V_{GS} - Gate-to-Source Voltage (V)
Transfer Characteristics Curves vs. Temperature



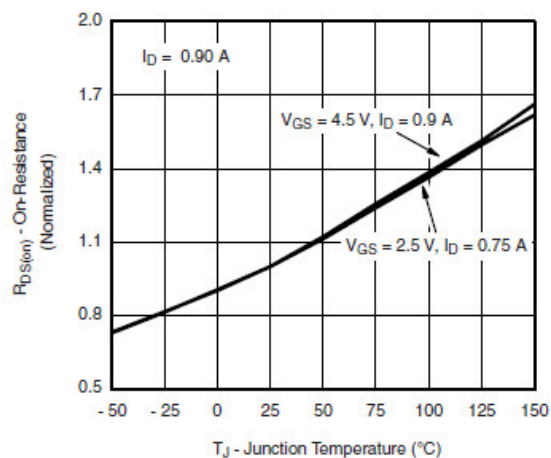
I_D - Drain Current (A)
On-Resistance vs. Drain Current



V_{DS} - Drain-Source Voltage (V)
Capacitance



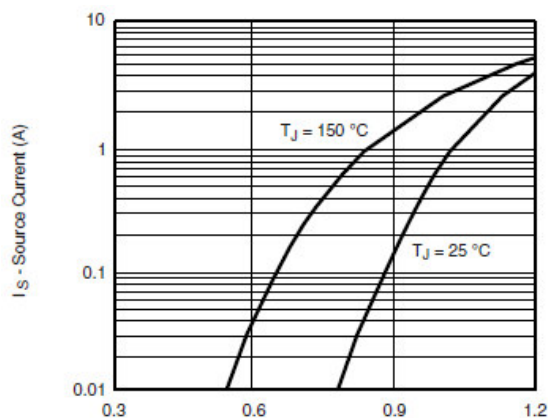
Q_g - Total Gate Charge (nC)
Gate Charge



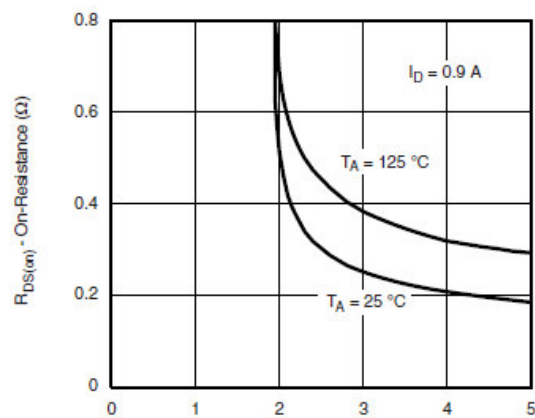
T_J - Junction Temperature (°C)
On-Resistance vs. Junction Temperature



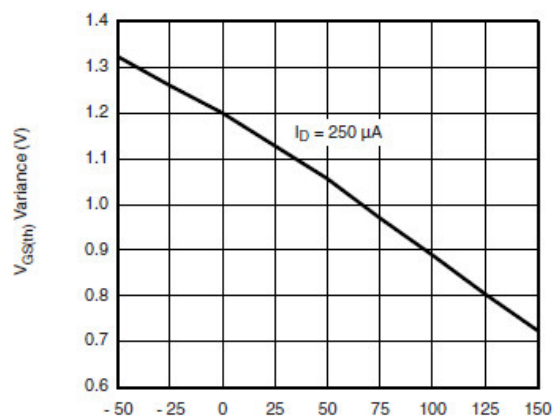
Typical Characteristics



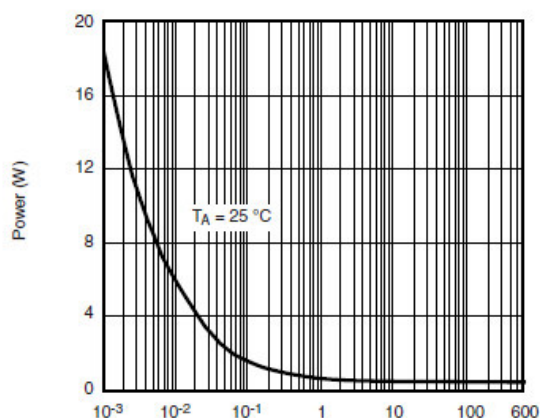
Forward Diode Voltage vs. Temperature



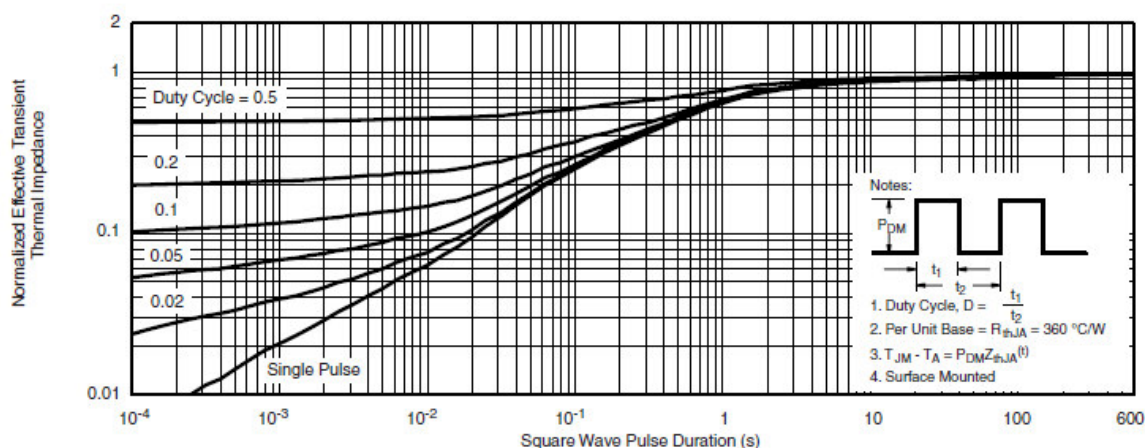
$R_{DS(on)}$ vs. V_{GS} vs. Temperature



Threshold Voltage



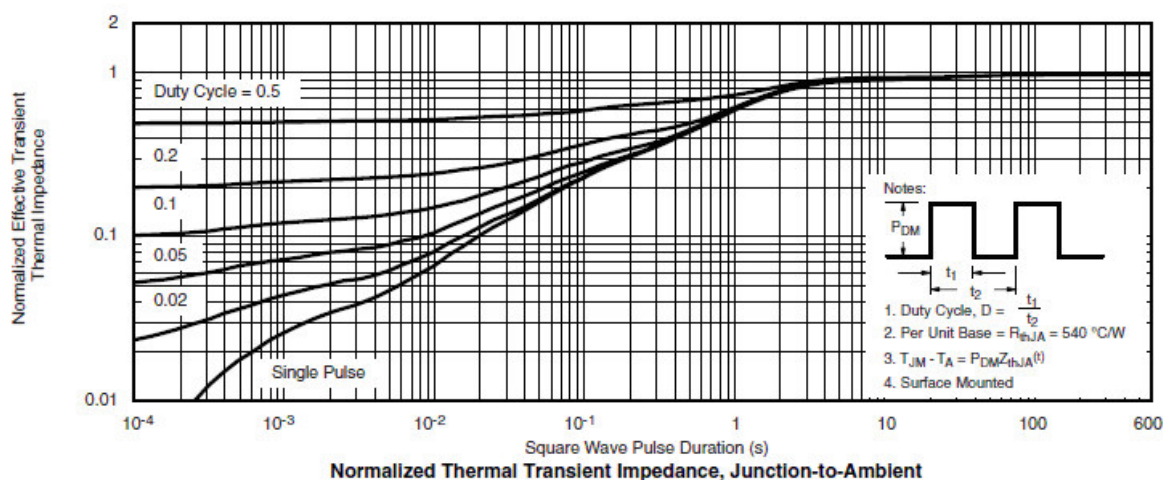
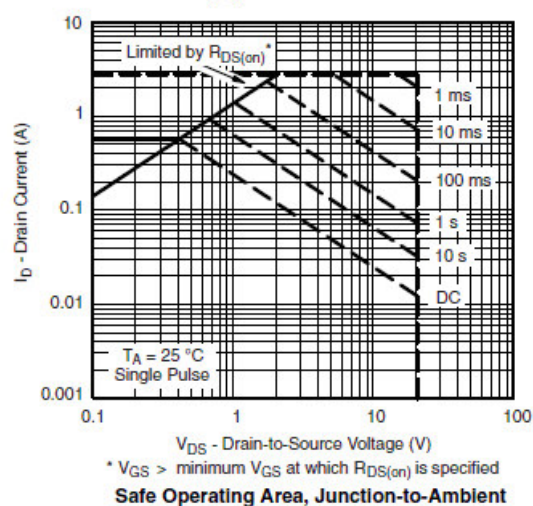
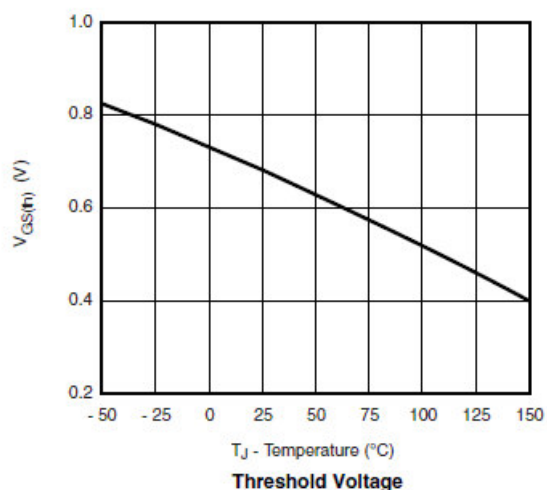
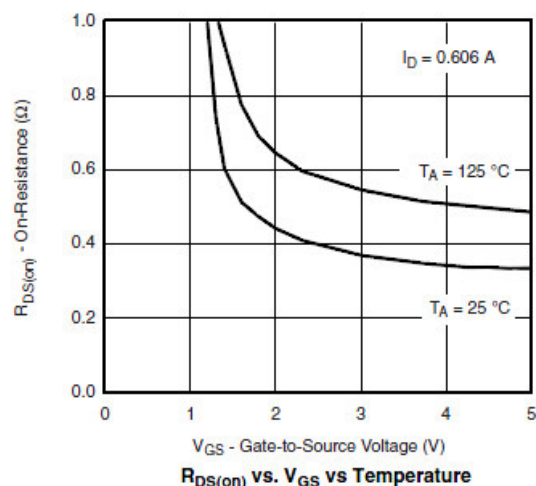
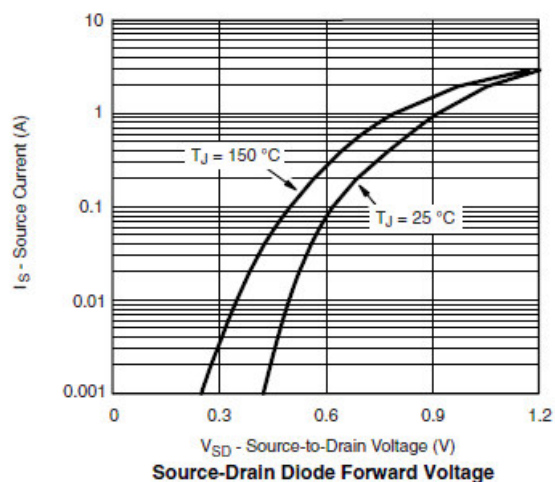
Single Pulse Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient



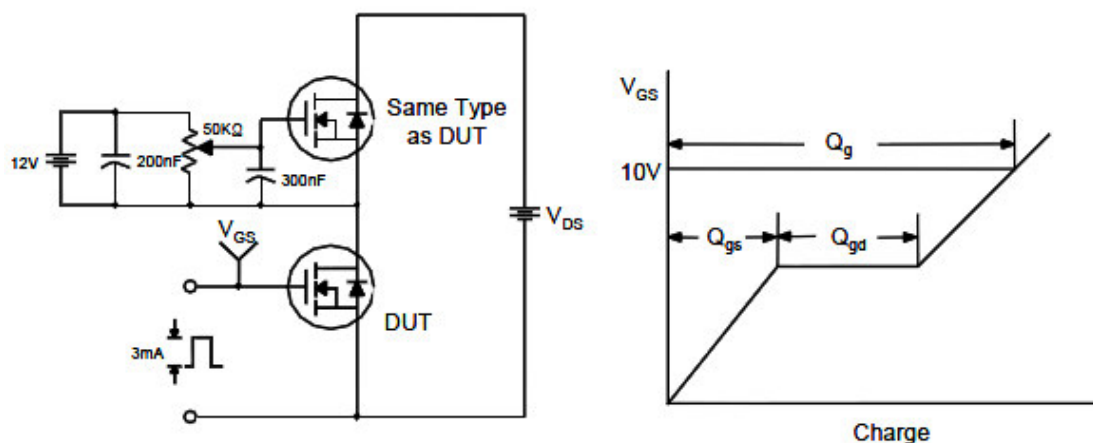
Typical Characteristics



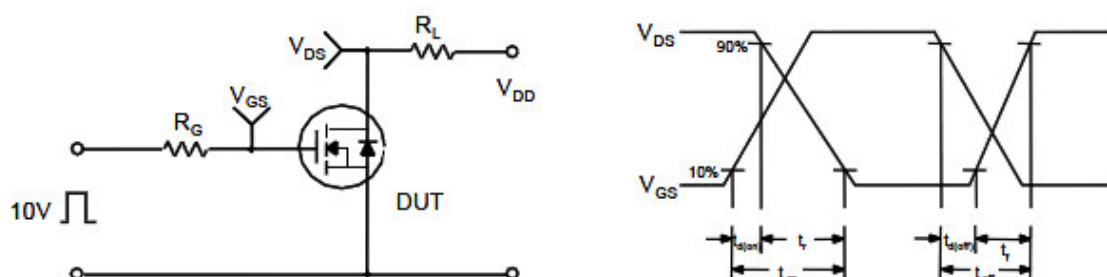


Typical Characteristics

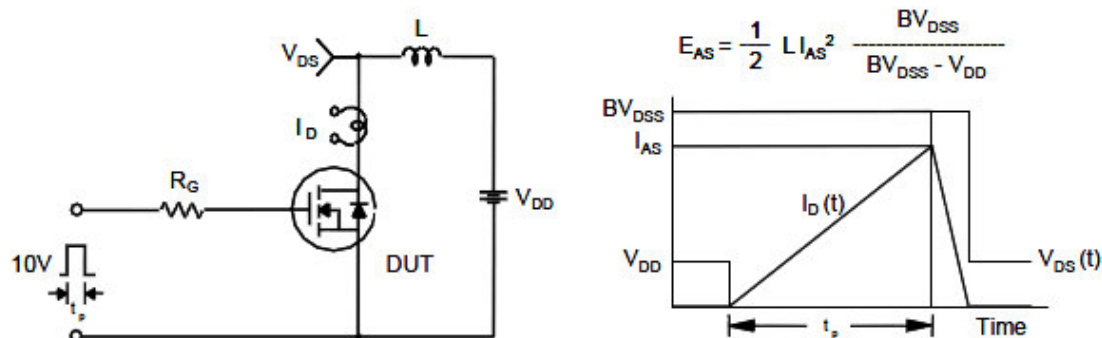
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

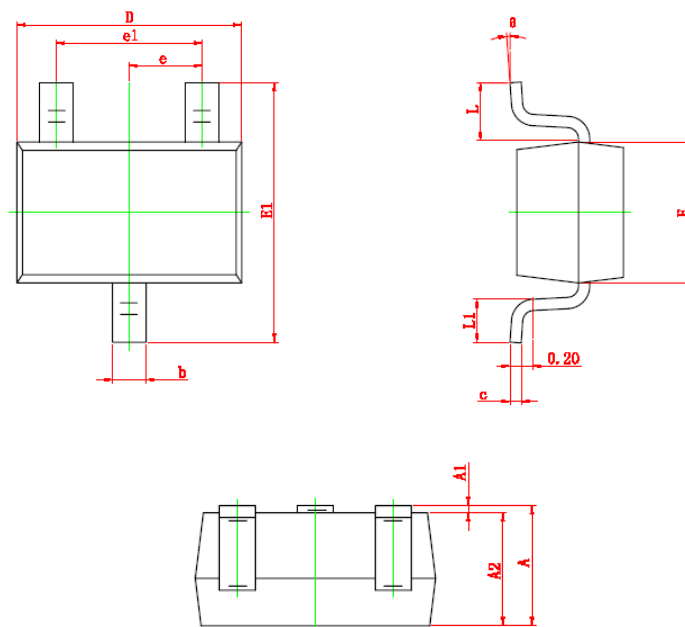


Unclamped Inductive Switching Test Circuit & Waveforms





Package Information (SOT-323)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

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