

Dual N-Channel 30V(D-S) MOSFET

Product summary		
V_{DS}	30	V
$R_{DS(ON)}$ (at $V_{GS}=4.5V$) Typ.	36	m Ω
$R_{DS(ON)}$ (at $V_{GS}=2.5V$) Typ.	39	m Ω
I_D ($T_A=25^\circ C$)	3.5	A

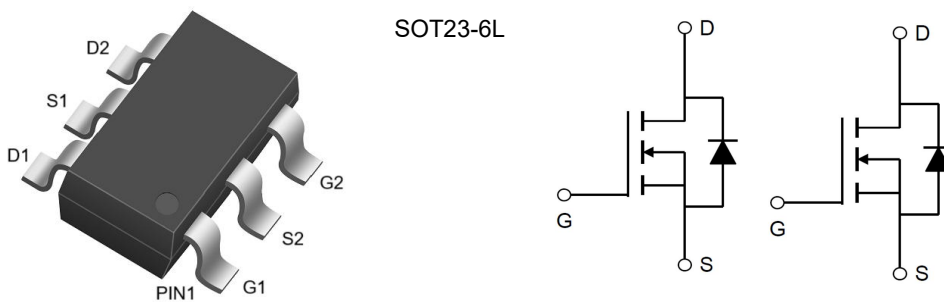
Features

- Trench Power LV MOSFET technology
- Low $R_{DS(ON)}$
- Low C_{rss}

Applications

- Load switch
- Power management

Pin Configuration



Packing Information

Device	Package	Reel Size	Quantity(Min. Package)
ECDE3402D	SOT23-6L	7"	3000pcs

Absolute Maximum Ratings (at $T_A=25^\circ C$ Unless Otherwise Noted)

Symbol	Parameter	Rating	Units	
V_{DS}	Drain-Source Voltage	30	V	
V_{GS}	Gate-Source Voltage	± 12	V	
I_D	Continuous Drain Current at $V_{GS}=10V$	$T_A=25^\circ C$	3.5	A
		$T_A=70^\circ C$	2.8	A
I_{DM}	Pulse Drain Current Tested ^A	12	A	
P_D	Power Dissipation	$T_A=25^\circ C$	1.1	W
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to +150	$^\circ C$	

Thermal Characteristics

Symbol	Parameter	Typical	Units
$R_{\theta JA}$	Thermal Resistance-Junction to ambient ^B	114	$^\circ C/W$

Electrical Characteristics (at $T_J = 25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V$	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 12V$	--	--	± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	0.6	0.9	1.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance ^C	$V_{GS}=10V, I_D=3A$	--	36	49	m Ω
		$V_{GS}=4.5V, I_D=2A$	--	39	56	m Ω
V_{SD}	Forward Voltage	$I_S=3A, V_{GS}=0V$	--	--	1.2	V
I_S	Maximum Body-Diode Continuous Current		--	--	3.5	A
Dynamic Parameters ^D						
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=15V$ $f=1\text{MHz}$	--	340	--	pF
C_{oss}	Output Capacitance		--	39	--	pF
C_{riss}	Reverse Transfer Capacitance		--	30	--	pF
Q_g	Total Gate Charge	$V_{DS}=15V, I_D=3A$ $V_{GS}=4.5V$	--	8.2	--	nC
Q_{gs}	Gate-Source Charge		--	0.6	--	nC
Q_{gd}	Gate-Drain Charge		--	1.1	--	nC
$t_{D(on)}$	Turn-on Delay Time	$V_{DS}=15V, I_D=3A,$ $R_G=3\Omega, R_L=2.7\Omega,$ $V_{GS}=4.5V$	--	16	--	nS
t_r	Turn-on Rise Time		--	45	--	nS
$t_{D(off)}$	Turn-off Delay Time		--	18	--	nS
t_f	Turn-off Fall Time		--	12	--	nS

A. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

B. Device mounted on FR-4 PCB, 1 inch x 1 inch x 0.062 inch.

C. Pulse Test: Pulse Width $\leq 300\mu s$, Duty cycle $\leq 0.5\%$.

D. Guaranteed by design, not subject to production testing.

Typical Characteristic

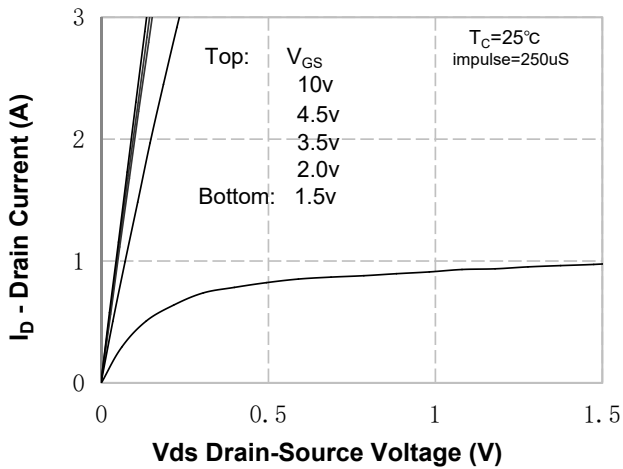


Figure 1. On-Region Characteristics

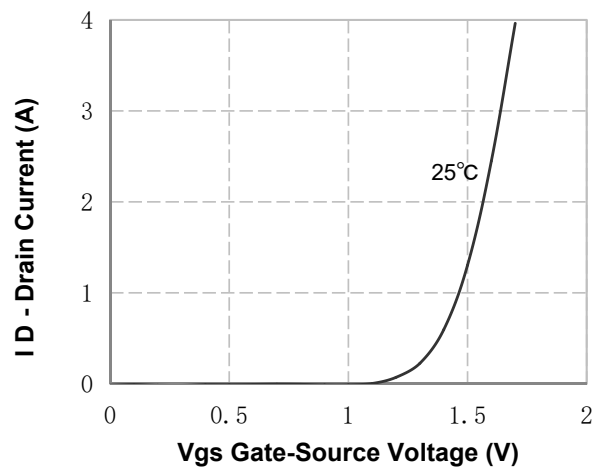


Figure 2. Transfer Characteristics

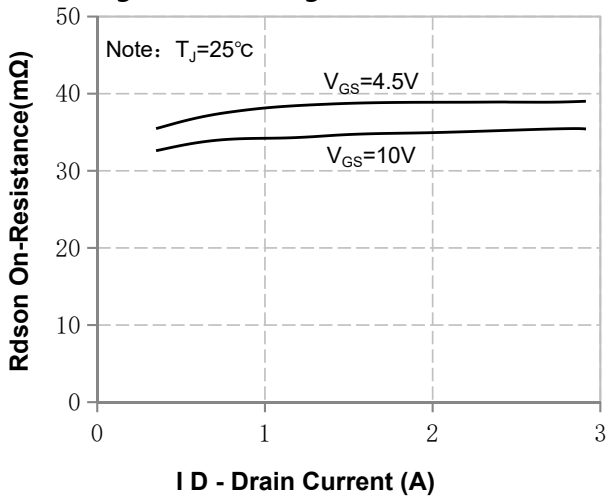


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

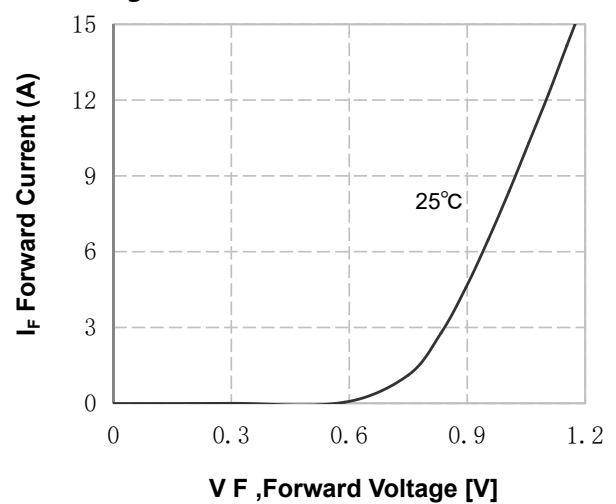


Figure 4. Body Diode Forward Voltage Variation with Source Current

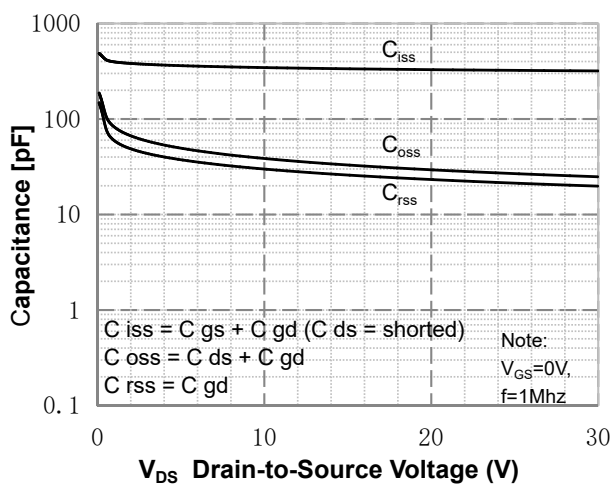


Figure 5. Capacitance Characteristics

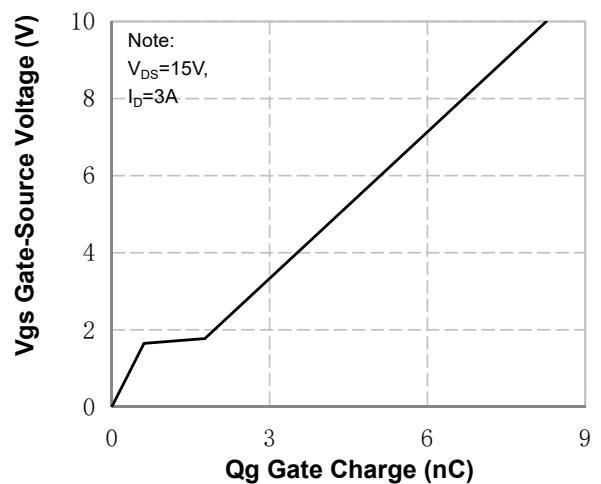


Figure 6. Gate Charge Characteristics

Typical Characteristics

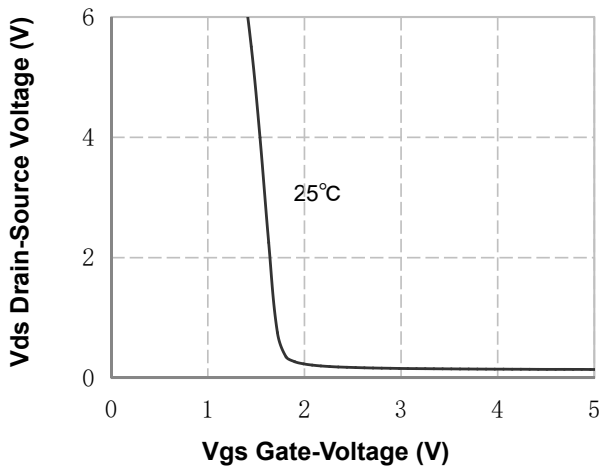


Figure 7. Vds Drain-Source Voltage vs Gate Voltage

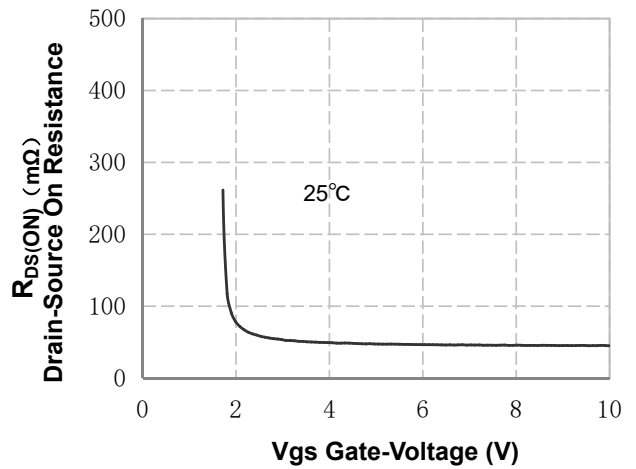


Figure 8. On-Resistance vs Gate Voltage

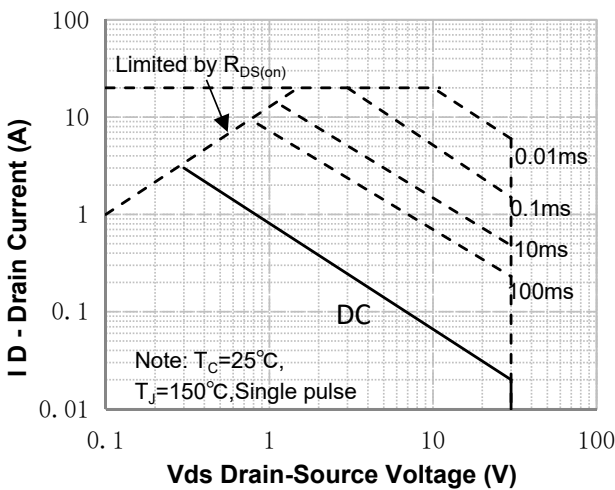


Figure 9. Maximum Safe Operating Area

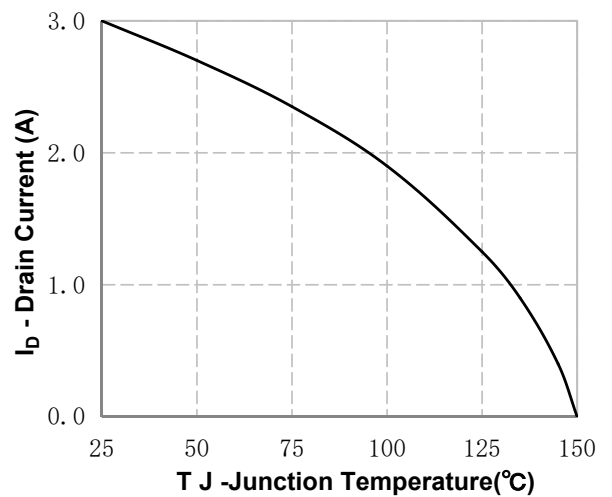


Figure 10. Maximum Continuous Drain Current vs Temperature

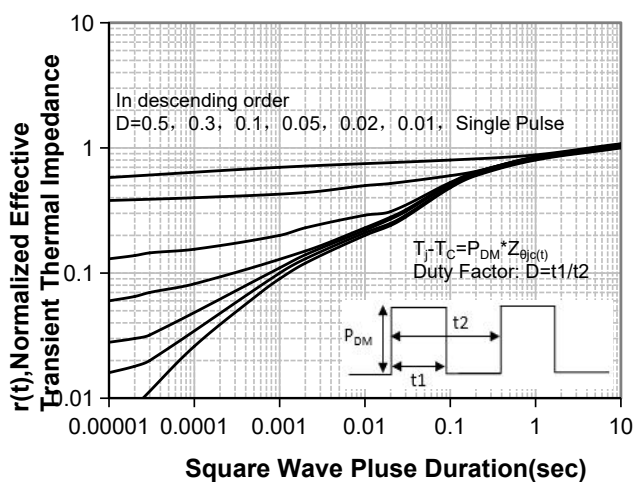
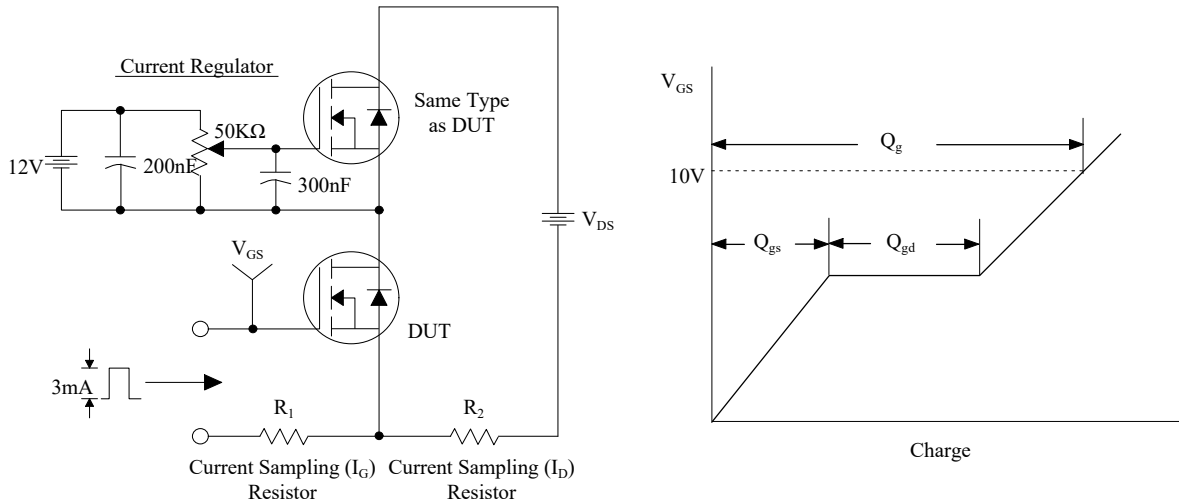


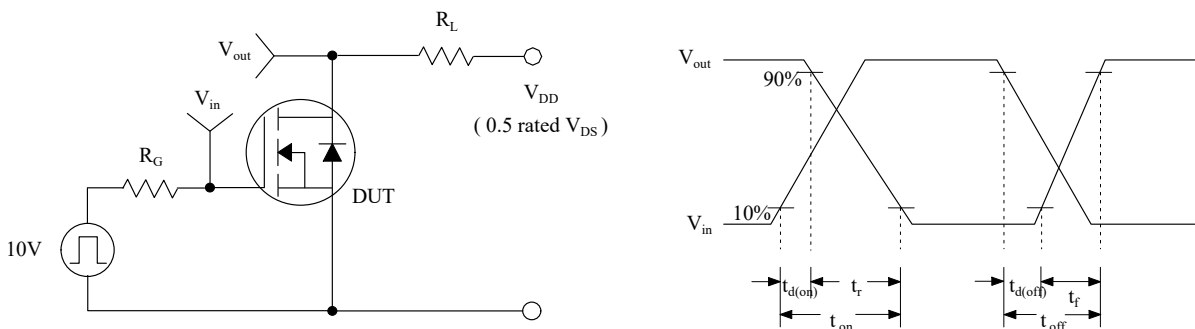
Figure 11. Transient Thermal Response Curve

Test Circuit

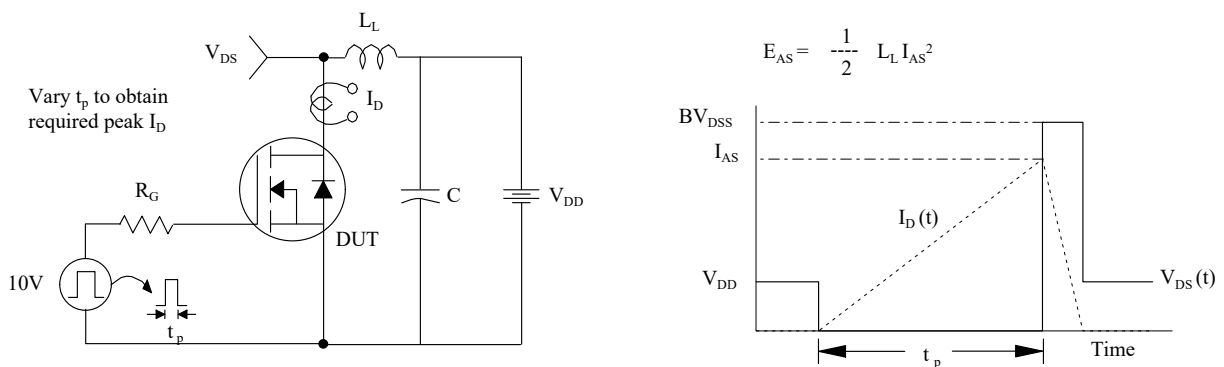
Gate Charge Test Circuit & Waveform



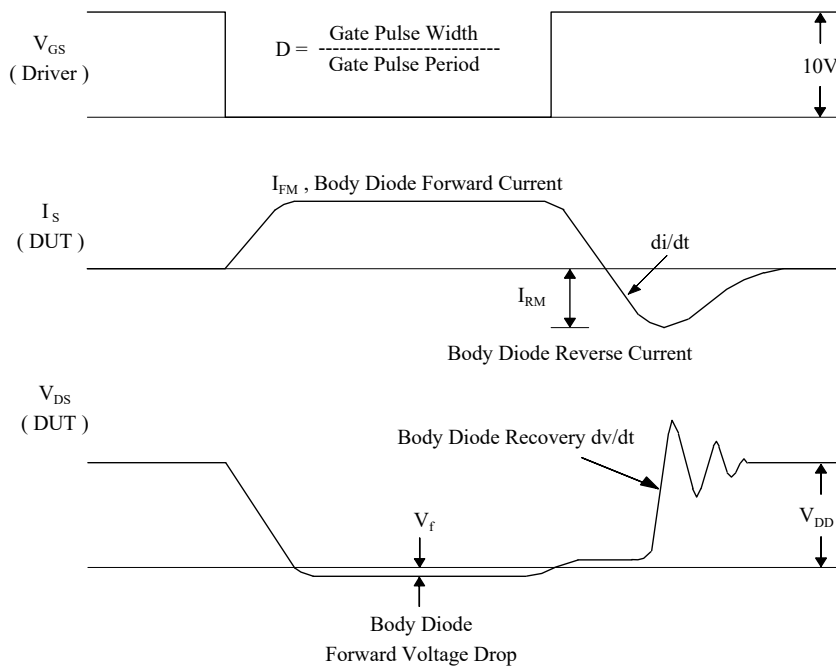
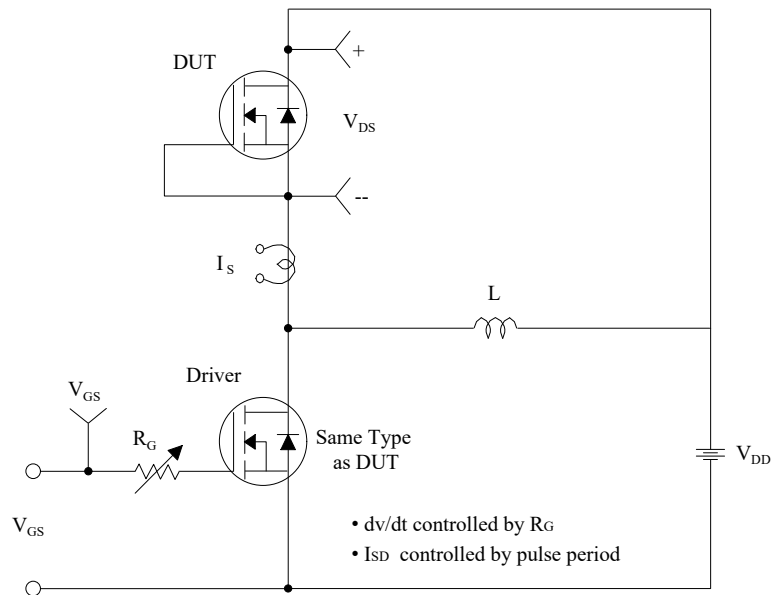
Resistive Switching Test Circuit & Waveforms



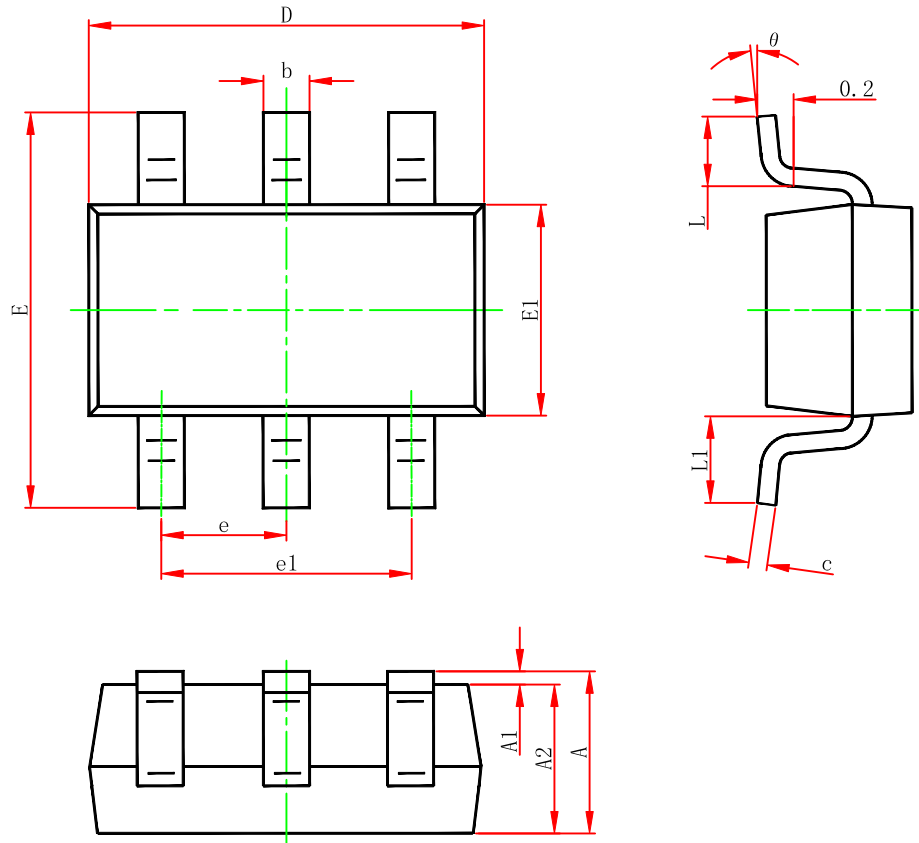
Unclamped Inductive Switching Test Circuit & Waveforms



Test Circuit



SOT23-6L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
L1	0.600REF.		0.024REF.	
θ	0°	8°	0°	8°