



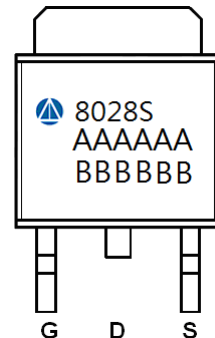
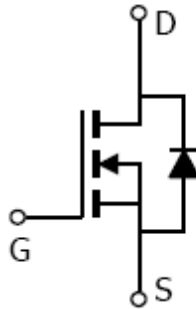
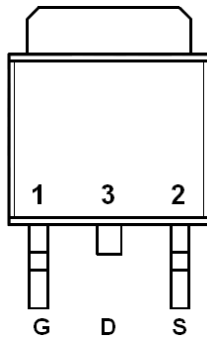
## General Description

AFN8028S, 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,  $R_{DS(ON)}=8.0m\Omega@V_{GS}=10V$
- 80V/10A,  $R_{DS(ON)}=11.5m\Omega@V_{GS}=4.5V$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- TO-252-2L package design

## Pin Description ( TO-252-2L )



## Application

- Motor and Load Control
- Power Management in White LED System
- Push Pull Converter
- LCD TV Inverter & AD/DC Inverter Systems.

## Pin Define

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

## Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFN8028ST252RG	8028S	TO-252-2L	Tape & Reel	2500 EA

- ※ A Lot code
- ※ B Date code
- ※ AFN8028ST252RG : 13" Tape & Reel ; Pb- Free ; Halogen -Free



### Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ Unless otherwise noted)

Parameter	Symbol	Typical	Unit
Drain-Source Voltage	$V_{DS}$	80	V
Gate -Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current ( $T_J=150^\circ\text{C}$ )	$I_{DSM}$	$T_C=25^\circ\text{C}$	60
		$T_C=70^\circ\text{C}$	52
Pulsed Drain Current ( $t=100\mu\text{s}$ )	$I_{DM}$	$T_A=25^\circ\text{C}$	18
		$T_A=70^\circ\text{C}$	15
Continuous Source Current (Diode Conduction)	$I_S$	$T_C=25^\circ\text{C}$	60
		$T_A=25^\circ\text{C}$	4.5
Single Pulse Avalanche Current	$I_{AS}$	30	mJ
	$E_{AS}$	45	
Power Dissipation	$P_D$	$T_C=25^\circ\text{C}$	62.5
		$T_C=75^\circ\text{C}$	40
Operating Junction Temperature	$T_J$	$T_A=25^\circ\text{C}$	5.0
		$T_A=75^\circ\text{C}$	3.2
Storage Temperature Range	$T_{STG}$	150	$^\circ\text{C}$
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	-55/150	$^\circ\text{C}$
Maximum Junction-to-Case (Drain)	$R_{\theta JA}$	20	$^\circ\text{C/W}$
		Steady-State	1.5

### Electrical Characteristics ( $T_A=25^\circ\text{C}$ Unless otherwise noted)

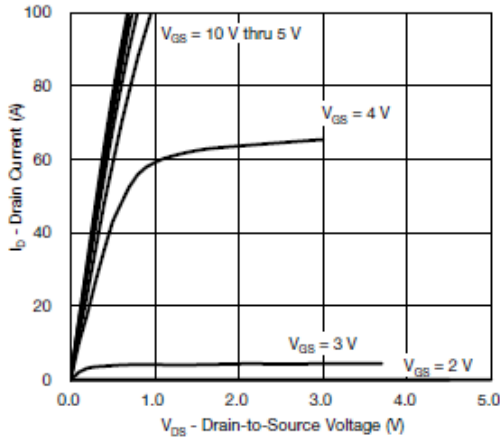
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DS}$	$V_{GS}=0V, I_D=250\mu\text{A}$	80			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	1.0		2.5	
Gate Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 20V$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=64V, V_{GS}=0V$			1	uA
		$V_{DS}=64V, V_{GS}=0V$ $T_J=85^\circ\text{C}$			10	
On-State Drain Current	$I_{D(on)}$	$V_{DS} \geq 5V, V_{GS}=10V$	30			A
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=15A$		6.5	8.0	m $\Omega$
		$V_{GS}=4.5V, I_D=10A$		9.5	11.5	
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
<b>Dynamic</b>						
Total Gate Charge	$Q_g$	$V_{DS}=40V, V_{GS}=4.5V$ $I_D \equiv 10A$		18	36	nC
Gate-Source Charge	$Q_{gs}$			7.5		
Gate-Drain Charge	$Q_{gd}$			8.5		
Gate Resistance	$R_g$	$f=1\text{MHz}$	0.4	1.4	2.4	$\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=40V, V_{GS}=0V$ $f=1\text{MHz}$		1850		pF
Output Capacitance	$C_{oss}$			950		
Reverse Transfer Capacitance	$C_{rss}$			75		
Turn-On Time	$t_{d(on)}$	$V_{DD}=40V, R_L=4.0\Omega$ $I_D \equiv 10A, V_{GEN}=10V$		12	24	ns
	$t_r$			8	16	
Turn-Off Time	$t_{d(off)}$	$R_G=1\Omega$		32	64	



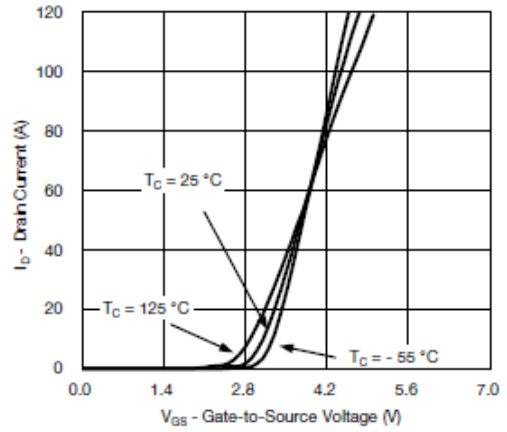
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	$t_r$			7	14	
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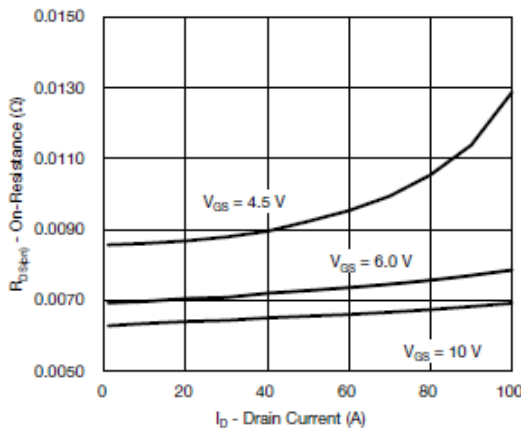
**Typical Characteristics**



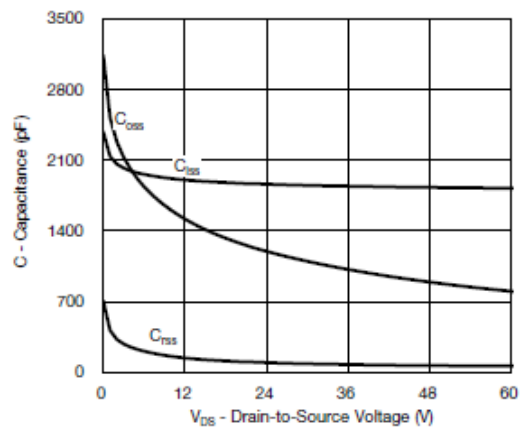
Output Characteristics



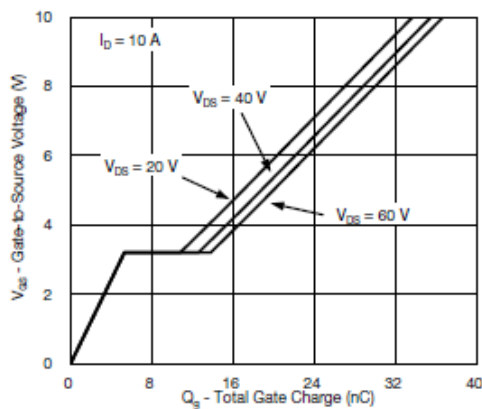
Transfer Characteristics



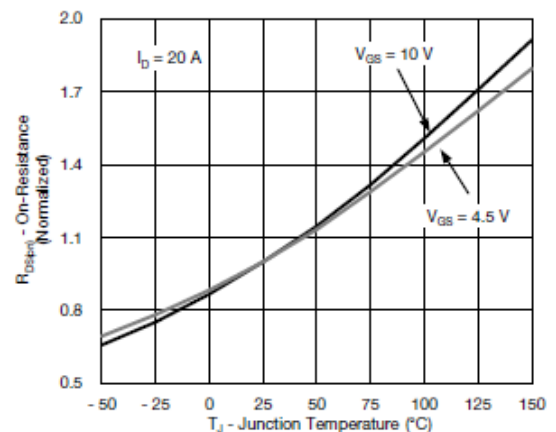
On-Resistance vs. Drain Current



Capacitance

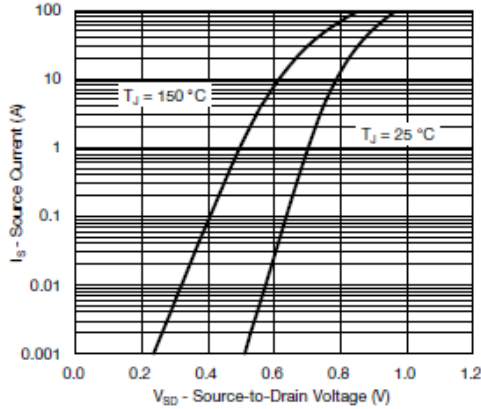


Gate Charge

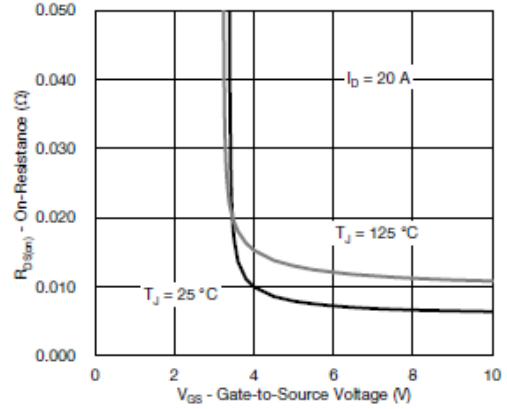


On-Resistance vs. Junction Temperature

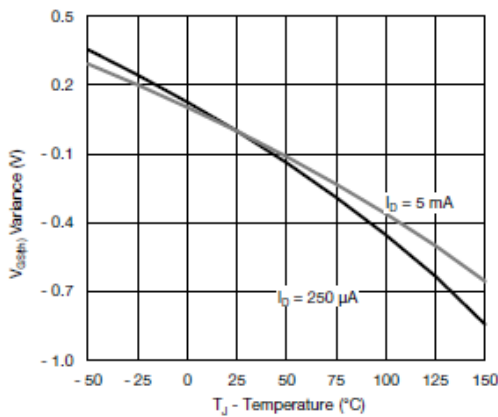
## Typical Characteristics



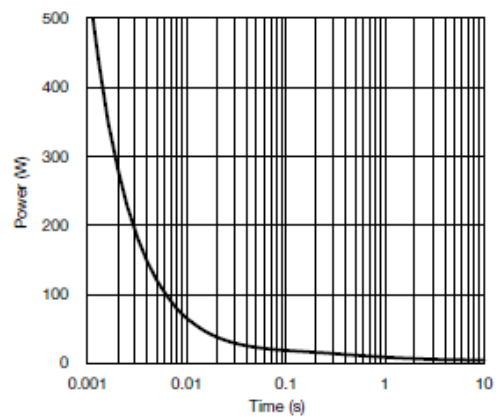
Source-Drain Diode Forward Voltage



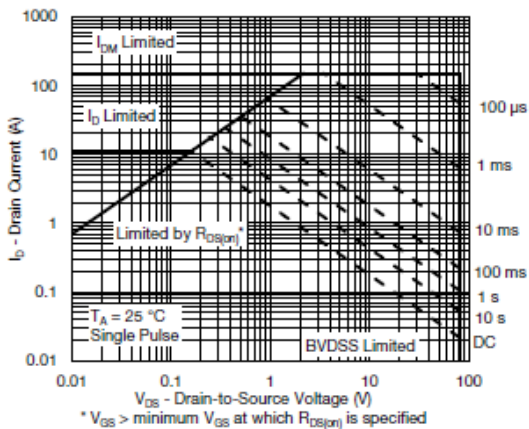
On-Resistance vs. Gate-to-Source Voltage



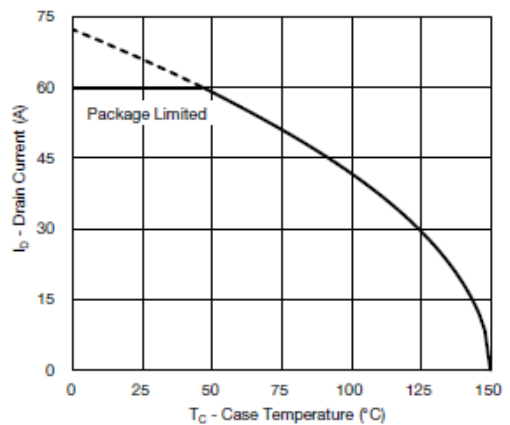
Threshold Voltage



Single Pulse Power, Junction-to-Ambient

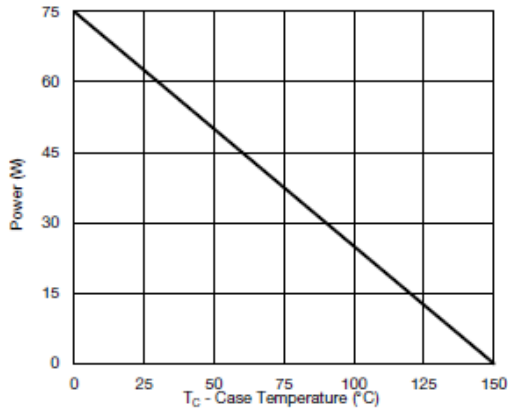


Safe Operating Area, Junction-to-Ambient

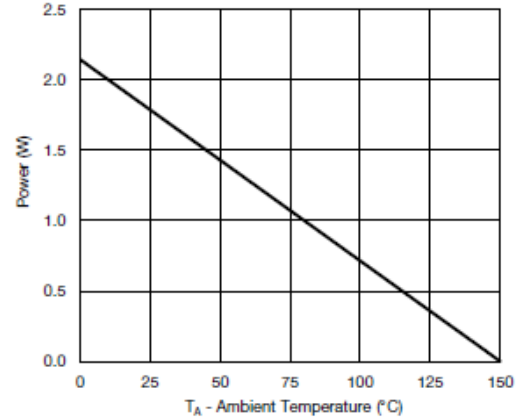


Current Derating <sup>a</sup>

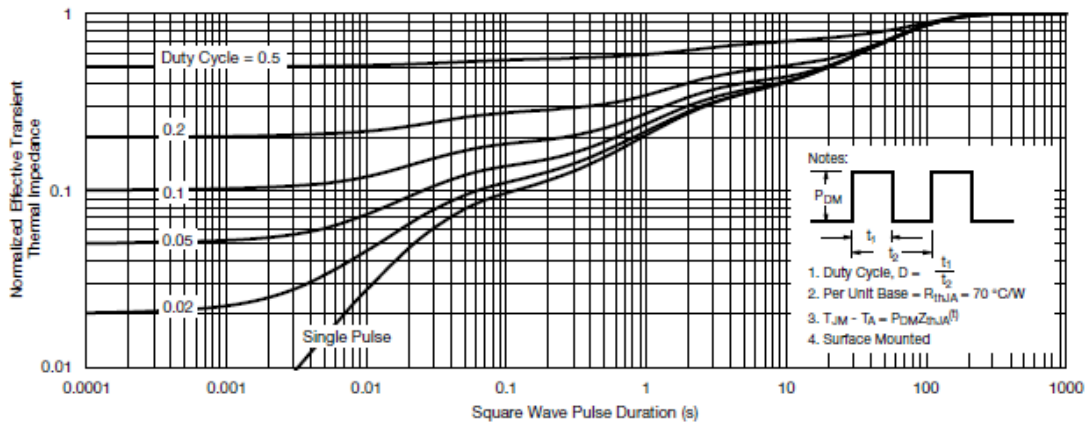
## Typical Characteristics



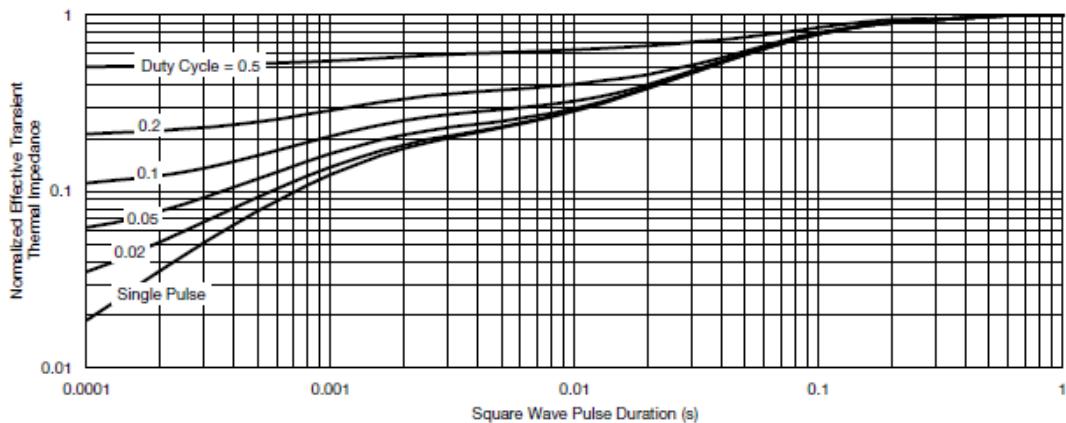
Power, Junction-to-Case



Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient

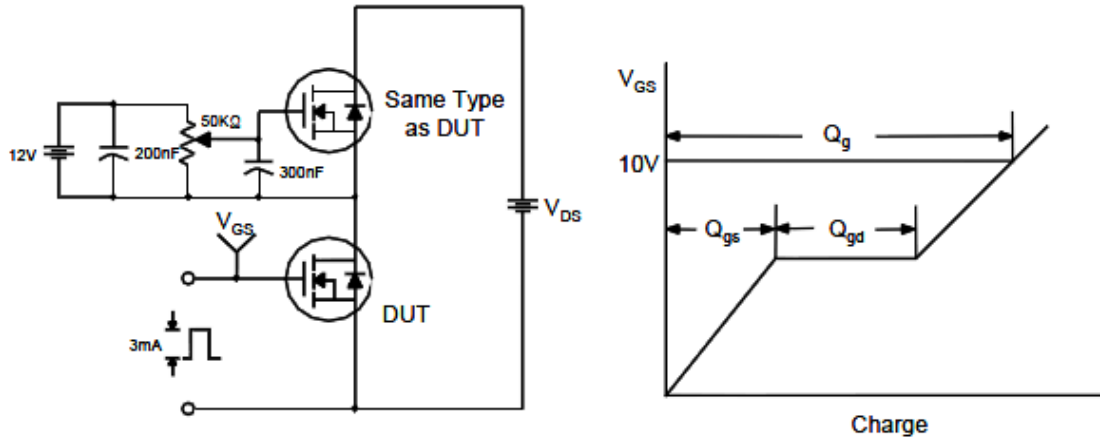


Normalized Thermal Transient Impedance, Junction-to-Case

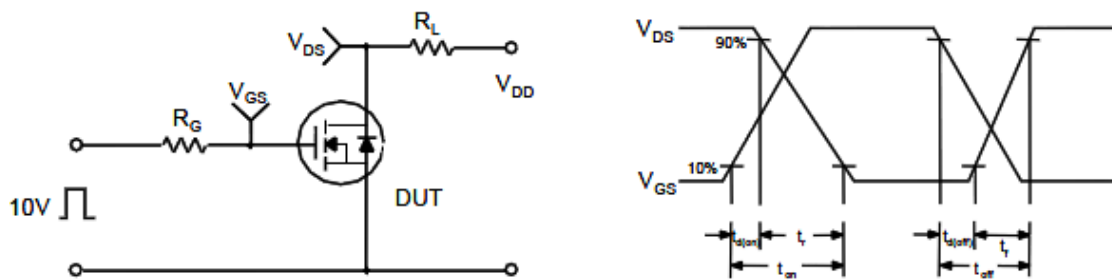
## Typical Characteristics



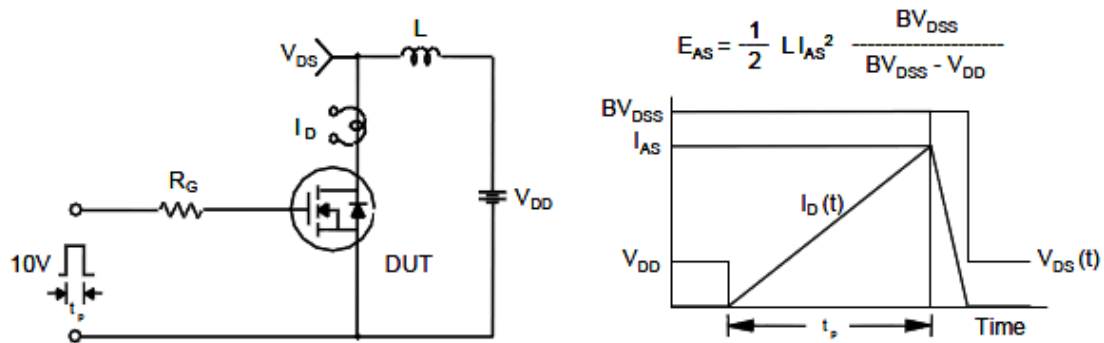
Gate Charge Test Circuit & Waveform



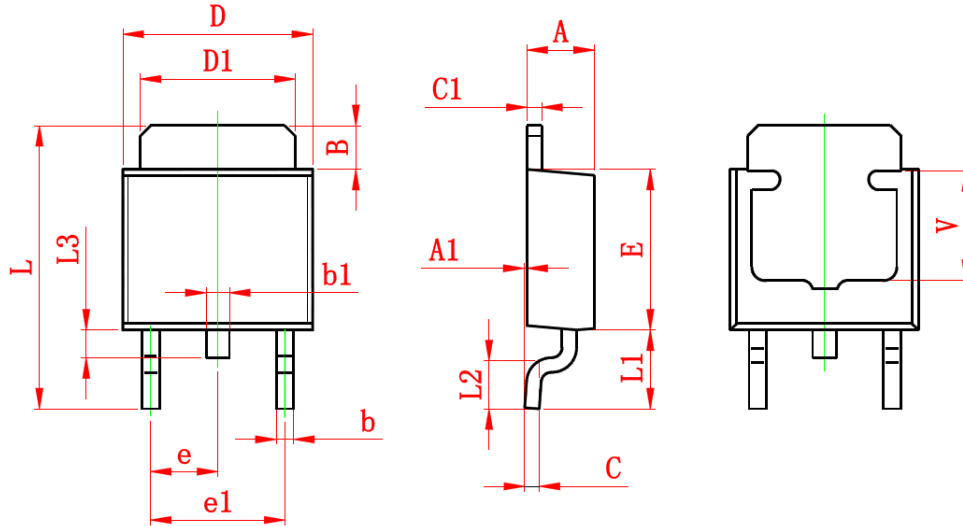
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



**Package Information ( TO-252-2L )**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300 TYP.		0.091 TYP.	
e1	4.500	4.700	0.177	0.185
L	9.500	9.900	0.374	0.390
L1	2.550	2.900	0.100	0.114
L2	1.400	1.780	0.055	0.070
L3	0.600	0.900	0.024	0.035
V	3.800 REF.		0.150 REF.	

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