40V P-Channel Enhancement Mode MOSFET

Features

- -40V/-10A,$R_{DS(ON)}$=38m@V_{GS}=-10V
- -40V/ -8A,$R_{DS(ON)}$=54m @V_{GS}= -4.5V
- Super high density cell design for extremely
- low $R_{DS\ (ON)}$
- TO-252-2L package design

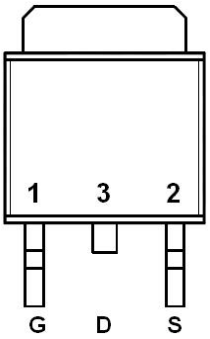
Applications

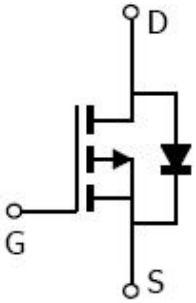
- Backlight Inverter for LCD Display
- Full Bridge DC/DC Converter
- LED Display
- Load Switch
- CCFL Inverter

General Description

LSP52H, P-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.

Pin Description (TO-252-2L)





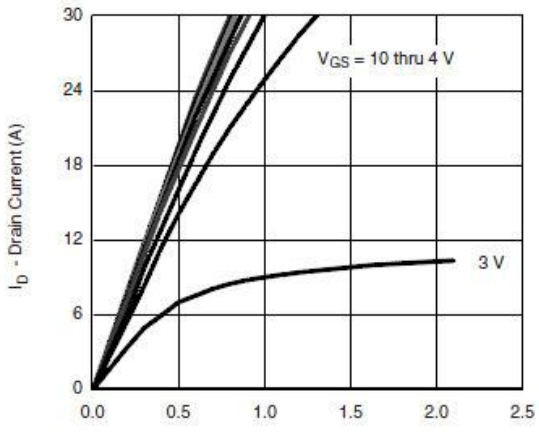
- **Absolute Maximum Ratings**(T_A=25℃ Unless otherwise noted)

Parameter		Symbol	Typical	Unit
Drain-Source Voltage		V_{DSS}	-40	V
Gate –Source Voltage		V_{GSS}	±20	
Continuous Drain Current(T_J=150℃)	T_A=25℃	I_D	-22	A
	T_A=70℃		-16	
Pulsed Drain Current		I_{DM}	-30	
Continuous Source-Drain Diode Current		I_S	-8	
Single Pulse Avalanche Current	L = 0.1 mH	I_{AS}	-30	
Avalanche Energy		E_{AS}	35	mJ
Power Dissipation	T_A=25℃	P_D	40	W
	T_A=70℃		15	
Operating Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{STG}	-55/150	
Thermal Resistance-Junction to Ambient		R_{JA}	62.5	℃/W

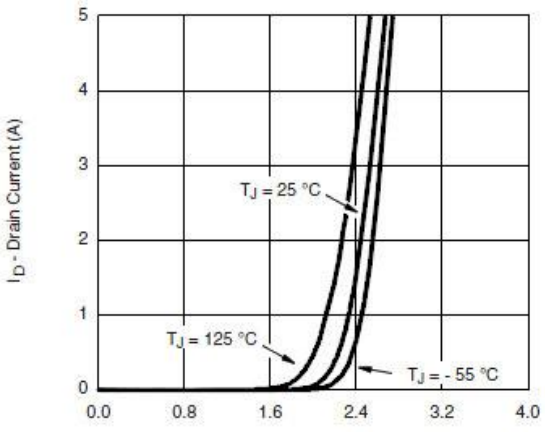
- **Electrical Characteristics**(T_A=25℃ Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D= -250uA	-40			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D= -250uA	-1.0		-3.0	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}= ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= -32V,V_{GS}=0V			-1	uA
		V_{DS}= -32V,V_{GS}=0V，T_J=85℃			-20	
On-State Drain Current	$I_{D(on)}$	V_{DS}≥-5V,V_{GS}= -10V	-20			A
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = -10V,I_D=10A		32	38	mΩ
		V_{GS} = -4.5V,I_D= -8A		42	54	
Forward Transconductance	g_{FS}	V_{DS}= -15V,I_D= -5A		20		S
Diode Forward Voltage	V_{SD}	I_S= -2A,V_{GS}=0V		-0.8	-1.2	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=-20V,V_{GS}=-4.5V,I_D= -5.0A		13	20	nC
Gate-Source Charge	Q_{gs}			4.5		
Gate-Drain Charge	Q_{gd}			6.5		
Input Capacitance	C_{iss}	V_{DS}=-20V,V_{GS}=0V,f=1MHz		1100		pF
Output Capacitance	C_{oss}			145		
Reverse Transfer Capacitance	C_{rss}			115		
Turn-On Time	$t_{d(on)}$	V_{DD}=-20V,R_L=4Ω,I_D= -5.0A, V_{GEN}=-4.5V,R_G=1Ω		40	80	ns
	t_r			55	100	
Turn-Off Time	$t_{d(off)}$			30	60	
	t_f			12	20	

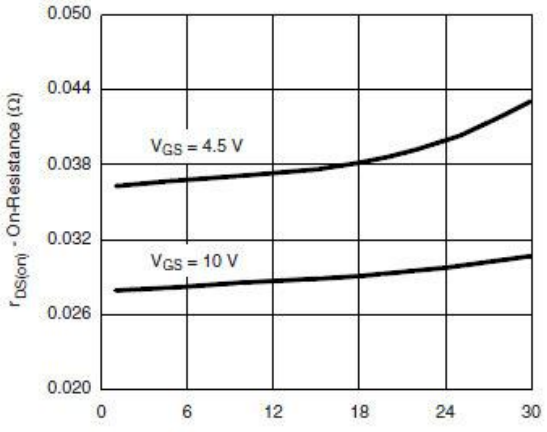
- **Typical Characteristics**



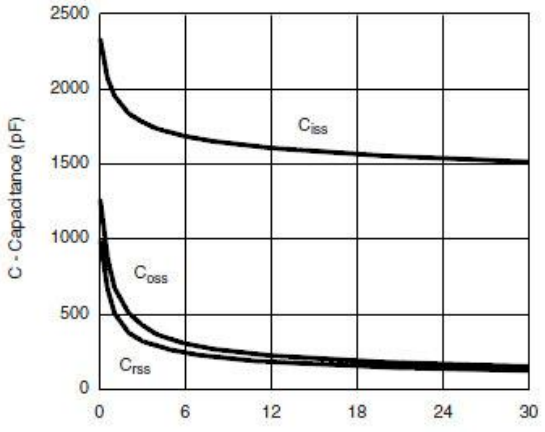
Output Characteristics



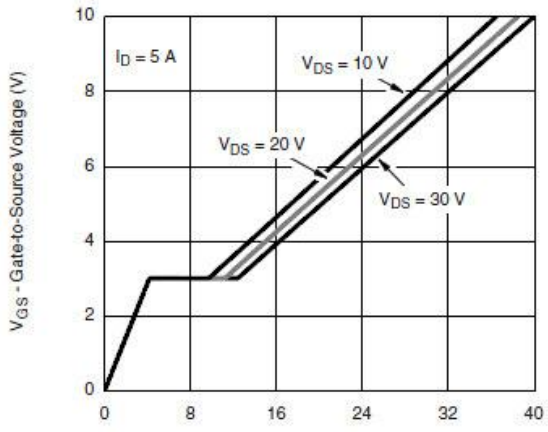
Transfer Characteristics



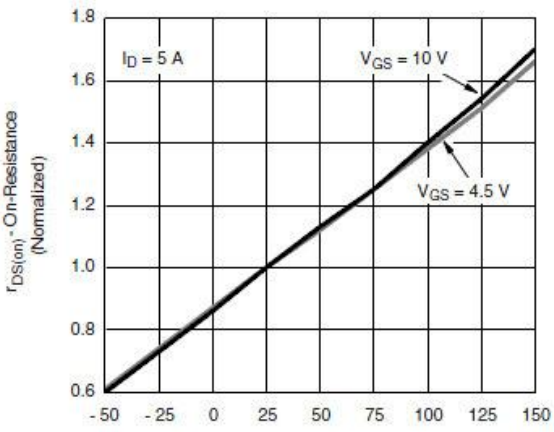
On-Resistance vs. Drain Current



Capacitance

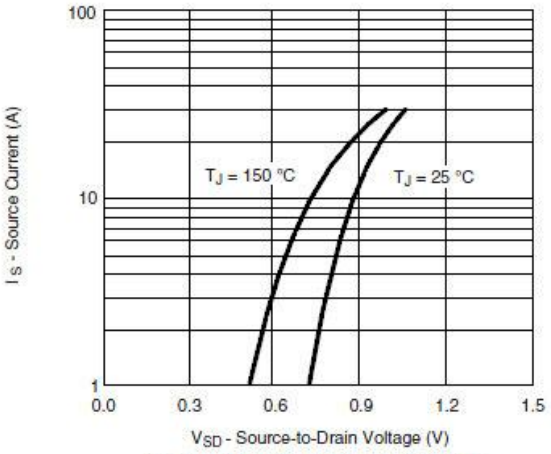


Gate Charge

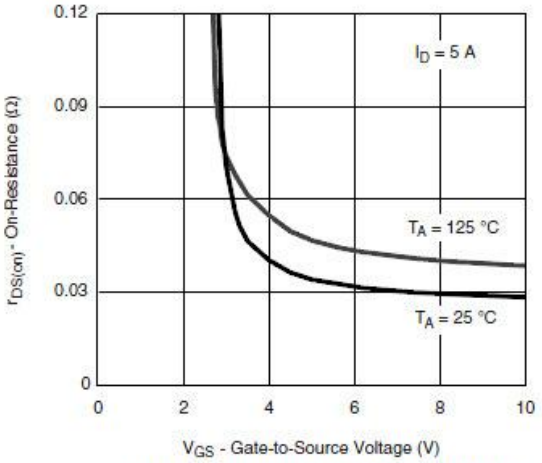


On-Resistance vs. Junction Temperature

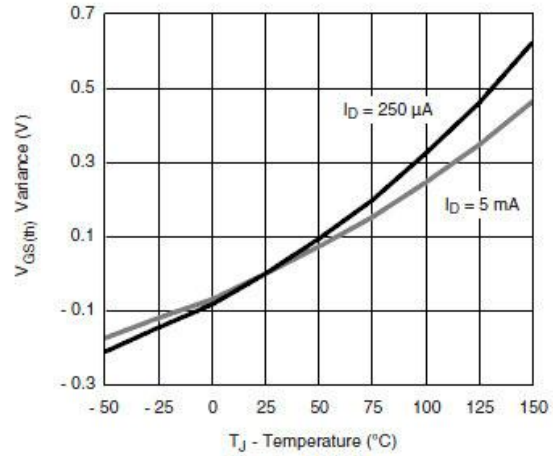
- **Typical Characteristics**



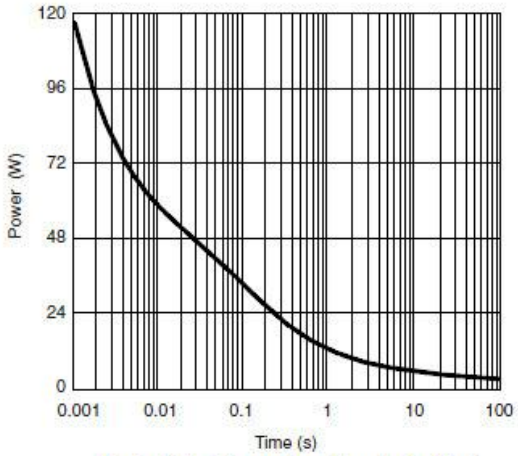
Source-Drain Diode Forward Voltage



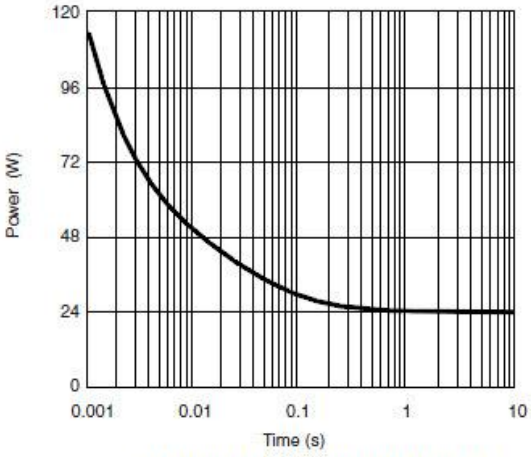
On-Resistance vs. Gate-to-Source Voltage



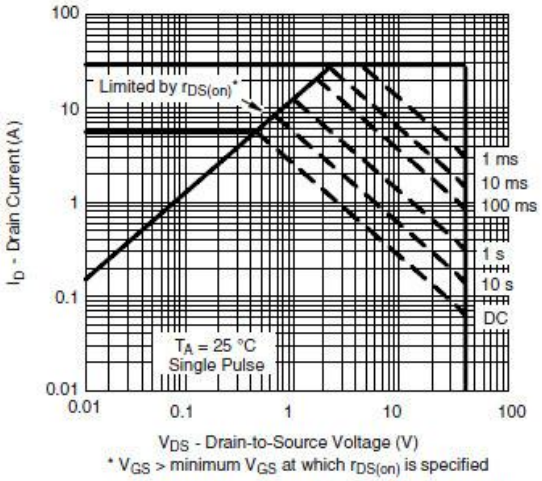
Threshold Voltage



Single Pulse Power, Junction-to-Ambient



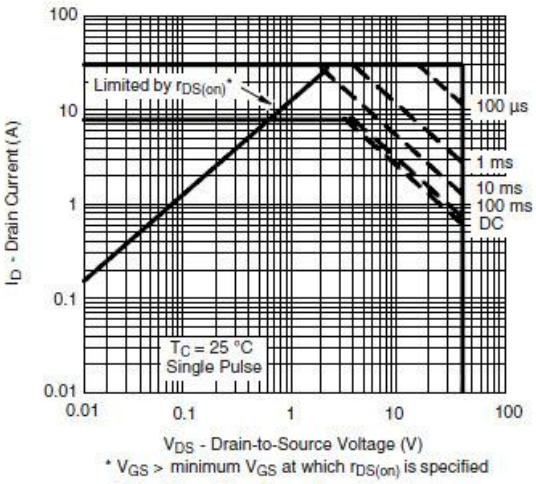
Single Pulse Power, Junction-to-Case



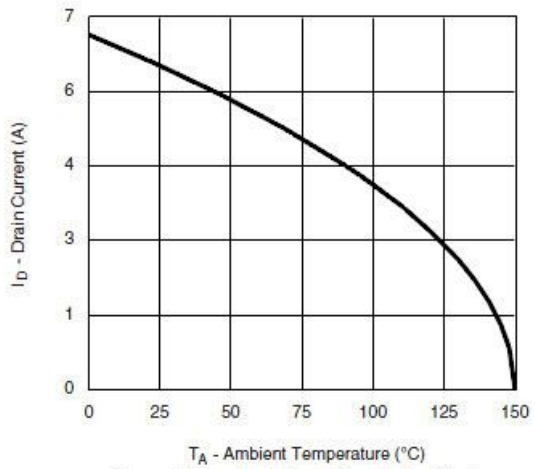
* V_{GS} > minimum V_{GS} at which $r_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Ambient

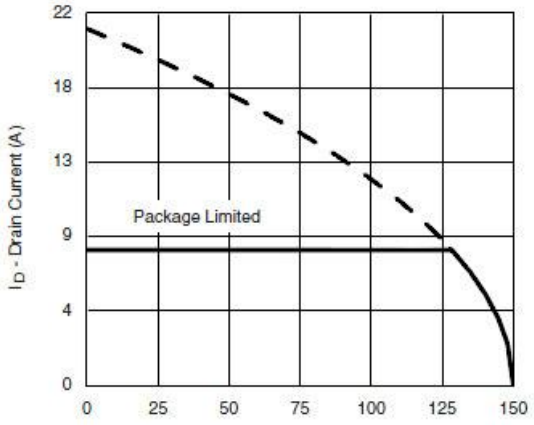
- **Typical Characteristics**



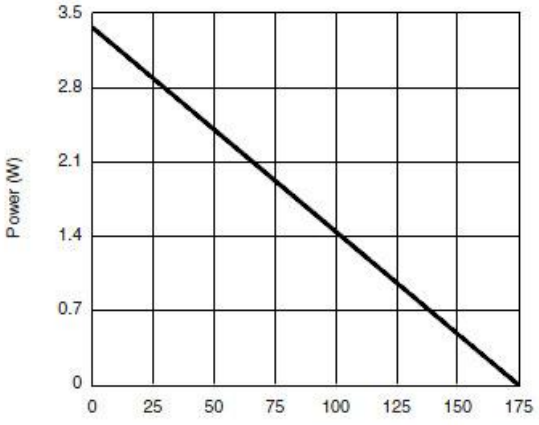
Safe Operating Area, Junction-to-Case



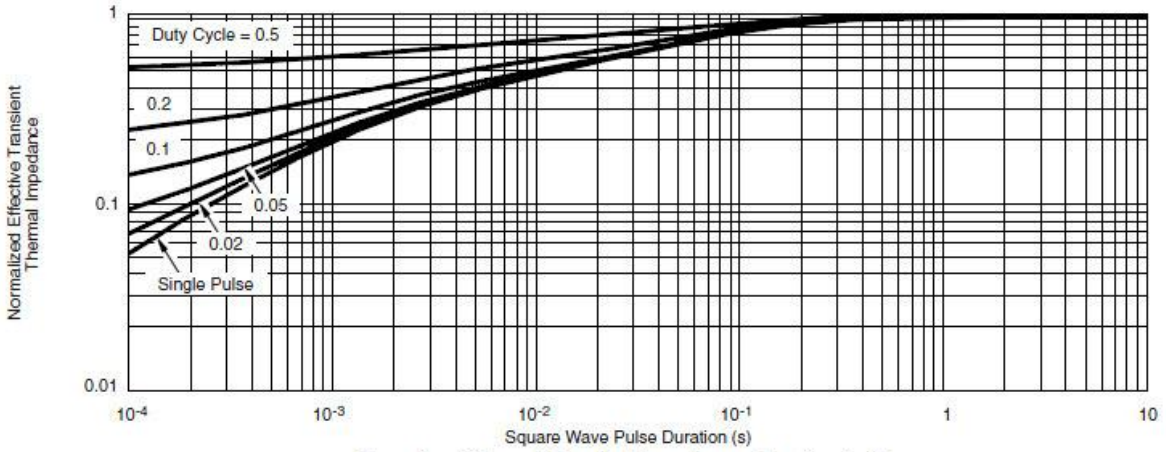
Current Derating*, Junction-to-Ambient



Current Derating*, Junction-to-Case



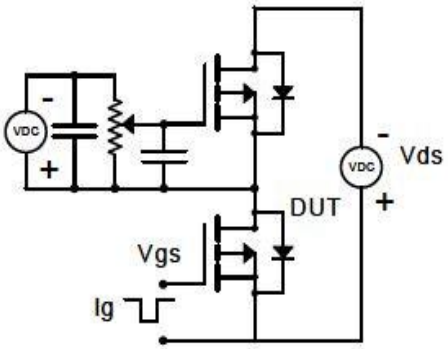
Power Derating*, Junction-to-Ambient

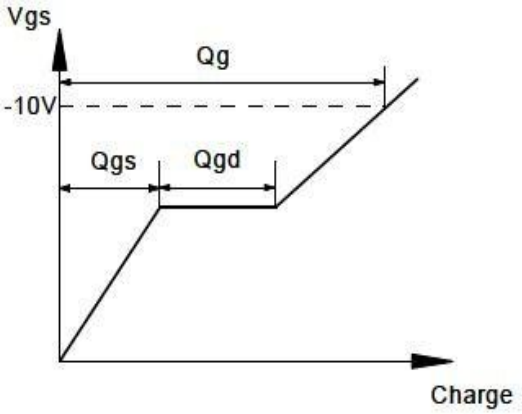


Normalized Thermal Transient Impedance, Junction-to-Case

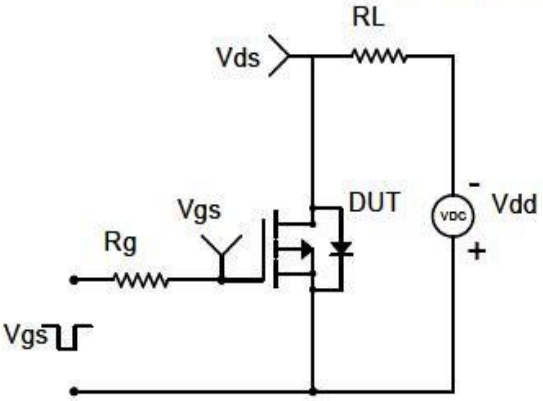
- **Typical Characteristics**

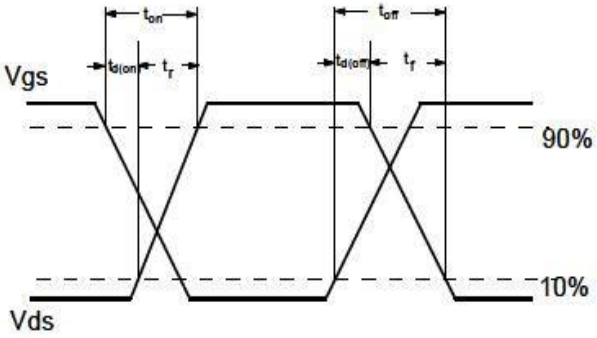
Gate Charge Test Circuit & Waveform



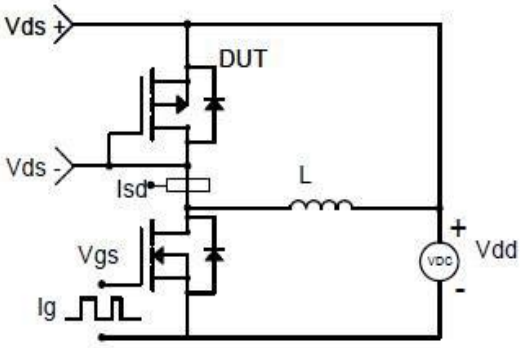


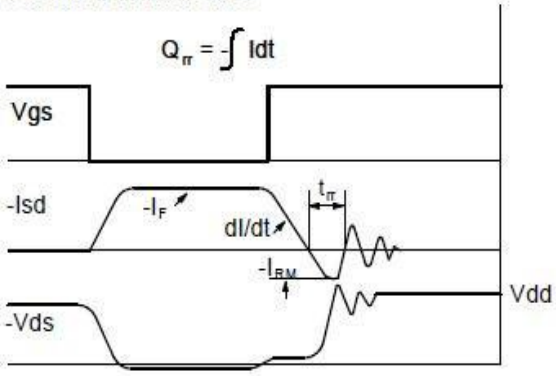
Resistive Switching Test Circuit & Waveforms



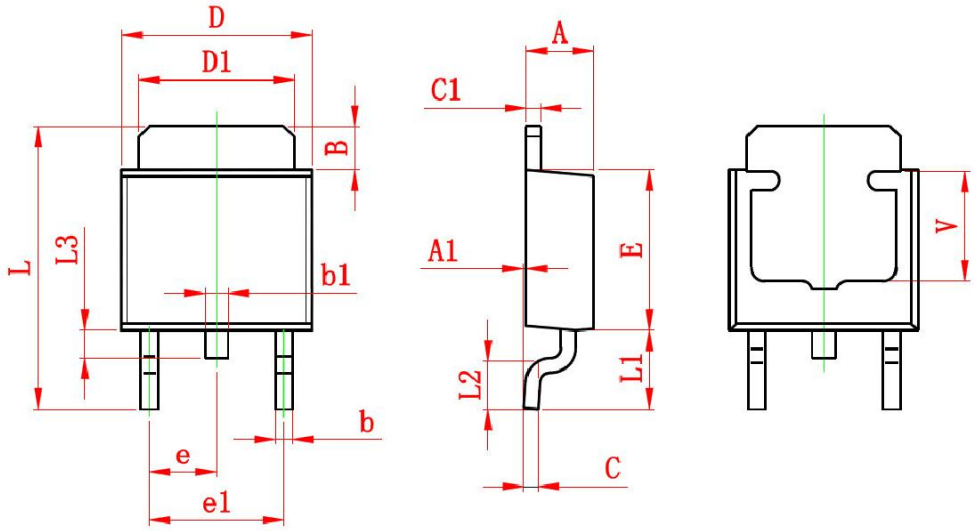


Diode Recovery Test Circuit & Waveforms





- **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.	