

GSM3804

40V P-Channel Enhancement Mode MOSFET

Product Description

GSM3804, 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.

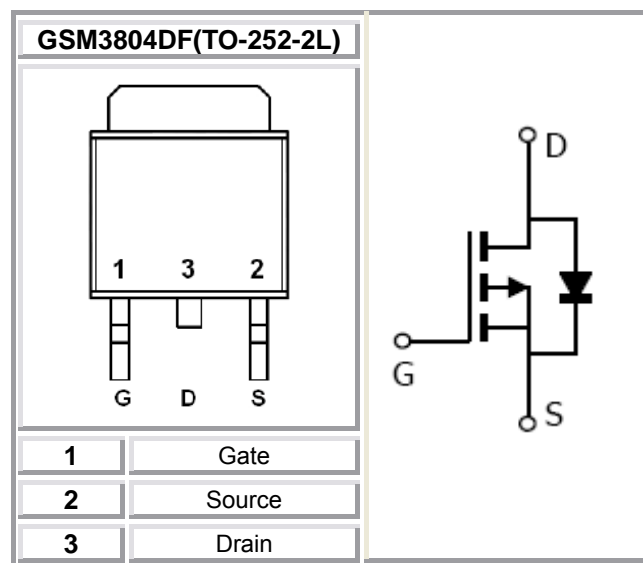
Features

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

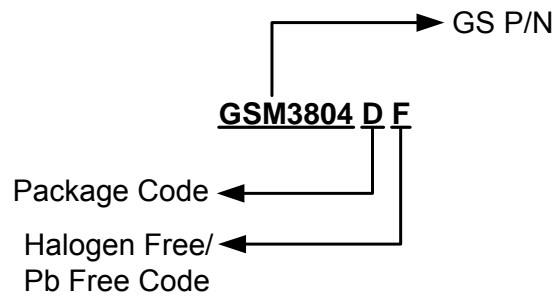
Applications

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

Packages & Pin Assignments

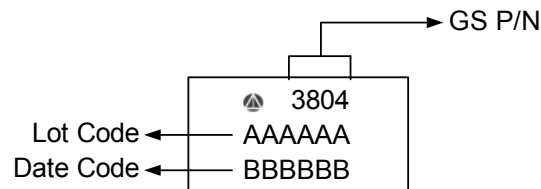


Ordering Information



Part Number	Package	Quantity Reel
GSM3804DF	TO-252-2L	2500 PCS

Marking Information



Absolute Maximum Ratings

(T_A=25°C unless otherwise noted)

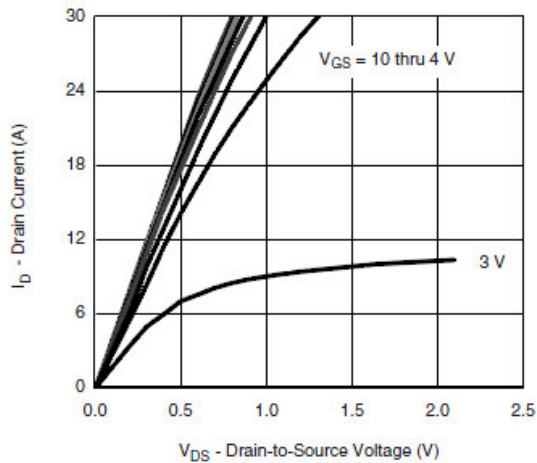
Symbol	Parameter	Typical	Unit
V _{DSS}	Drain-Source Voltage	-40	V
V _{GSS}	Gate -Source Voltage	±20	V
I _D	Continuous Drain Current(T _J =150°C)	T _A =25°C	-22
		T _A =70°C	-16
I _{DM}	Pulsed Drain Current	-30	A
I _S	Continuous Source Current(Diode Conduction)	-8	A
I _{AS}	Single Pulse Avalanche Current	-30	A
E _{AS}	Avalanche Energy	35	mJ
P _D	Power Dissipation	T _A =25°C	40
		T _A =70°C	15
T _J	Operating Junction Temperature	150	°C
T _{STG}	Storage Temperature Range	-55/150	°C
R _{θJA}	Thermal Resistance-Junction to Ambient	62.5	°C/ W

Electrical Characteristics

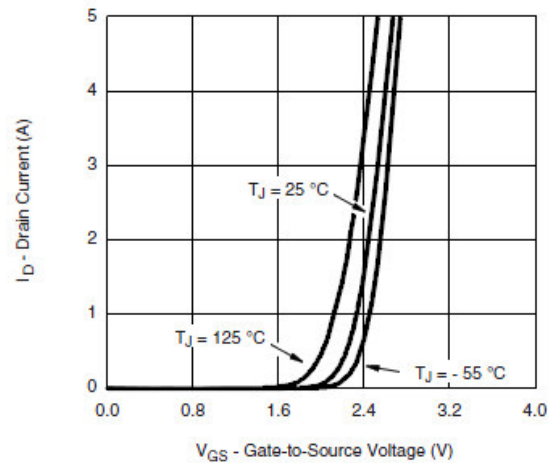
($T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ	Max.	Unit
Static						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-40			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.0		-3.0	
I_{GSS}	Gate Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-40V, V_{GS}=0V$			-1	uA
		$V_{DS}=-40V, V_{GS}=0V, T_J=85^\circ\text{C}$			-20	
$I_{D(on)}$	On-State Drain Current	$V_{DS} \leq -5V, V_{GS}=-10V$	-20			A
$R_{DS(on)}$	Drain-Source On-Resistance	$V_{GS}=-10V, I_D=-10A$		30	38	m Ω
		$V_{GS}=-4.5V, I_D=-8A$		44	54	
g_{fs}	Forward Transconductance	$V_{DS}=-15V, I_D=-5A$		20		S
V_{SD}	Diode Forward Voltage	$I_S=-2A, V_{GS}=0V$		-0.8	-1.2	V
Dynamic						
C_{iss}	Input Capacitance	$V_{DS}=-20V, V_{GS}=0V, f=1\text{MHz}$		1100		pF
C_{oss}	Output Capacitance			145		
C_{riss}	Reverse Transfer Capacitance			115		
Q_g	Total Gate Charge	$V_{DS}=-20V, V_{GS}=-4.5V, I_D=-5.0A$		13	20	nC
Q_{gs}	Gate-Source Charge			4.5		
Q_{gd}	Gate-Drain Charge			6.5		
$t_{d(on)}$	Turn-On Time	$V_{DD}=-20V, R_L=4\Omega, I_D=-5.0A, V_{GEN}=-4.5V, R_G=1\Omega$		40	80	ns
T_r				55	100	
$t_{d(off)}$				30	60	
T_f				12	20	

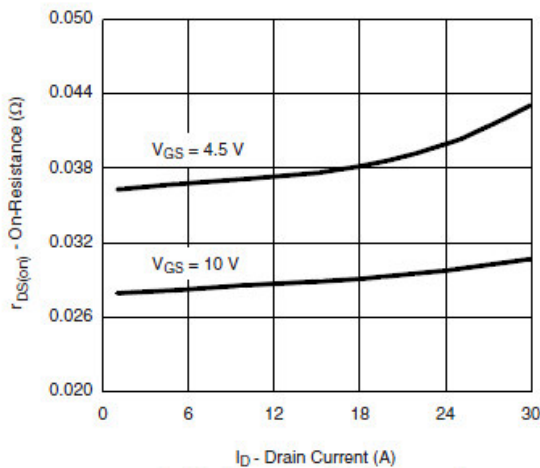
Typical Performance Characteristics



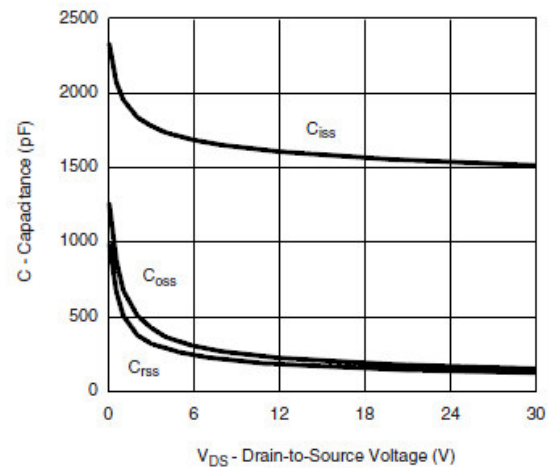
Output Characteristics



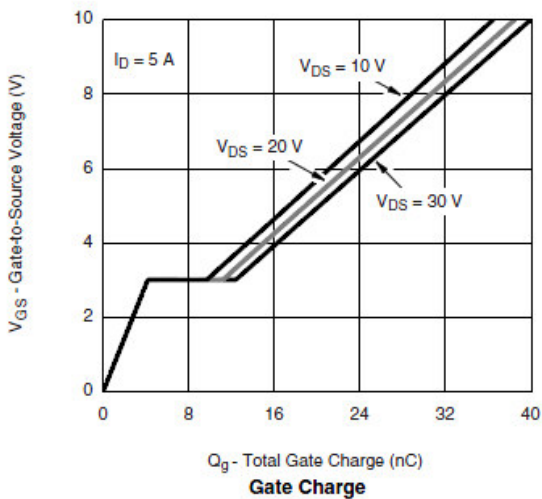
Transfer Characteristics



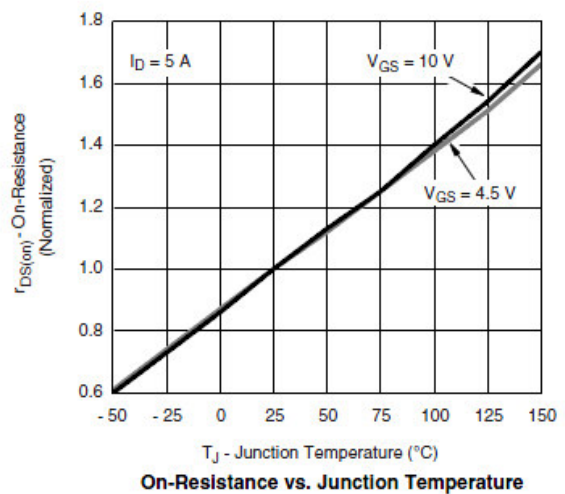
On-Resistance vs. Drain Current



Capacitance

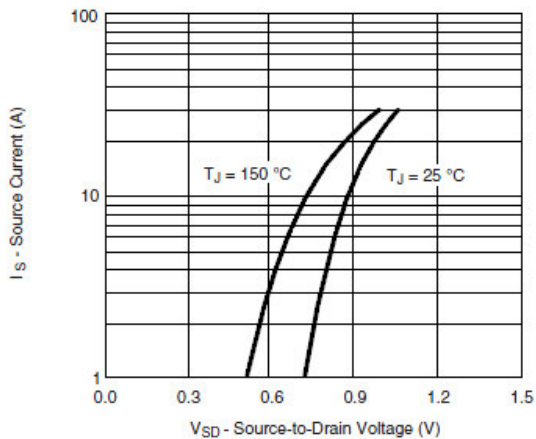


Gate Charge

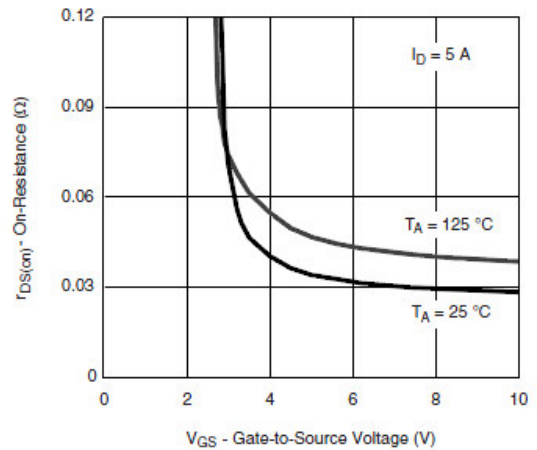


On-Resistance vs. Junction Temperature

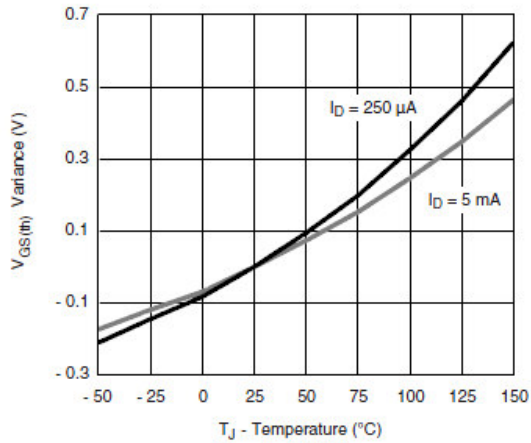
Typical Performance Characteristics (continue)



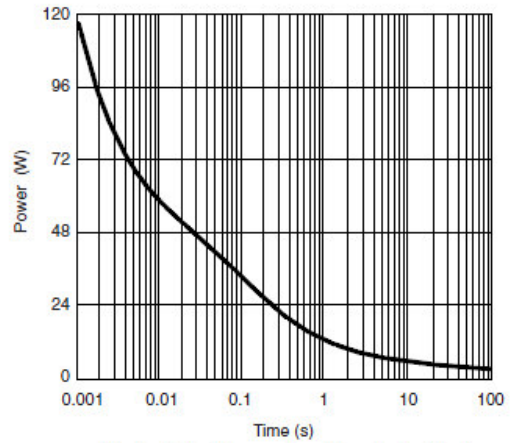
Source-Drain Diode Forward Voltage



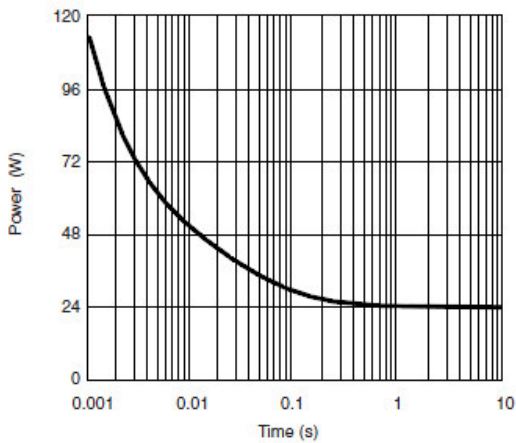
On-Resistance vs. Gate-to-Source Voltage



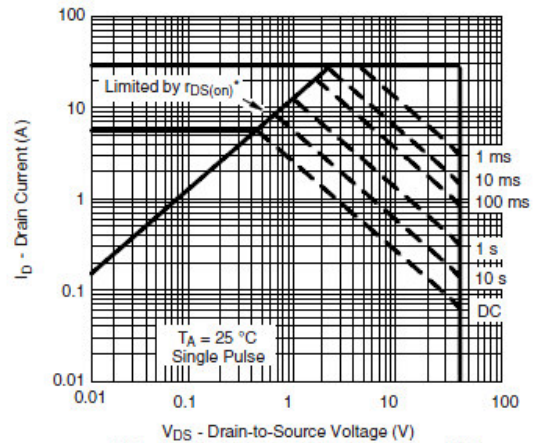
Threshold Voltage



Single Pulse Power, Junction-to-Ambient

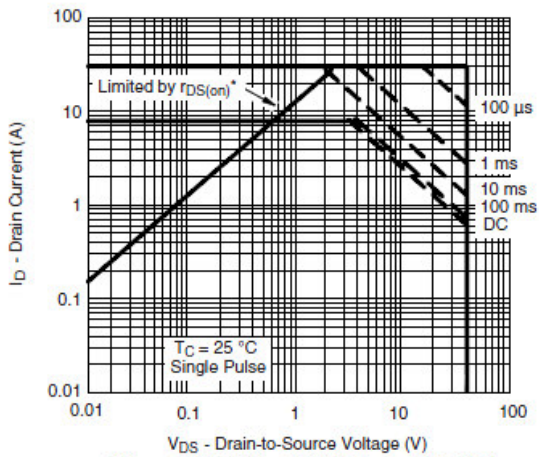


Single Pulse Power, Junction-to-Case

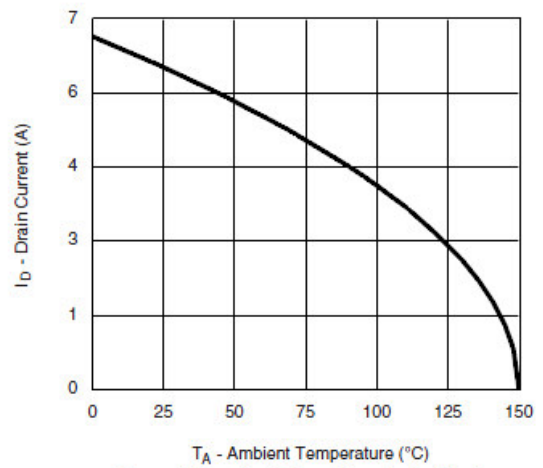


Safe Operating Area, Junction-to-Ambient

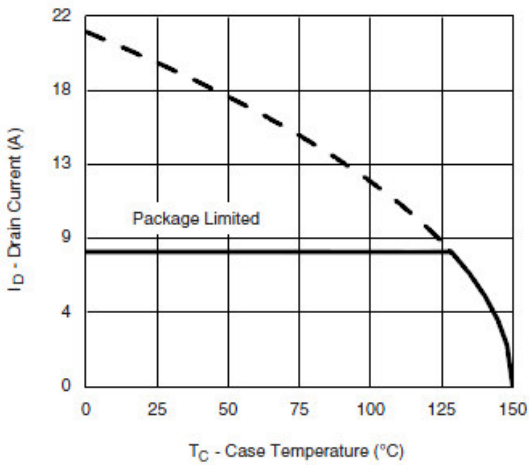
Typical Characteristics



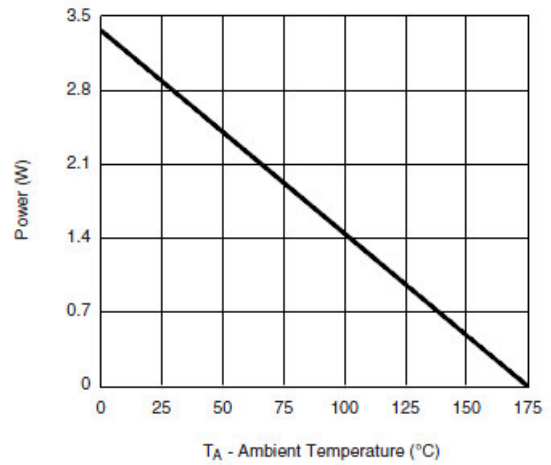
* $V_{GS} >$ minimum V_{GS} at which $r_{DS(on)}$ is specified
Safe Operating Area, Junction-to-Case



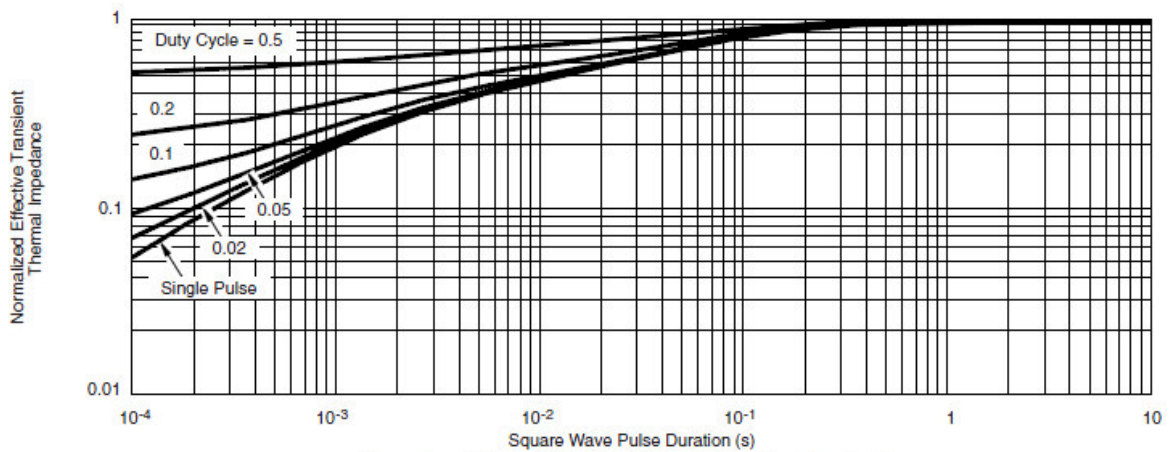
Current Derating*, Junction-to-Ambient



Current Derating*, Junction-to-Case



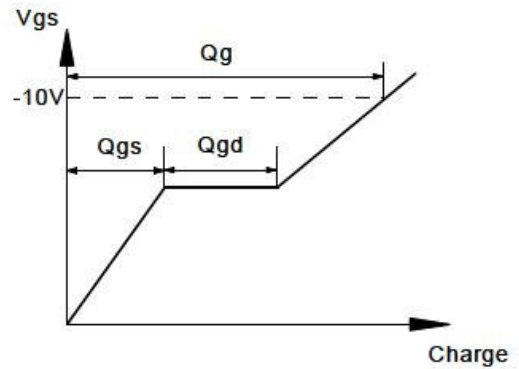
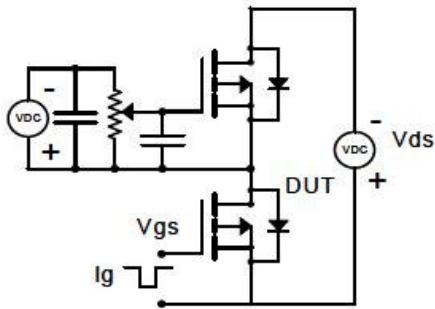
Power Derating*, Junction-to-Ambient



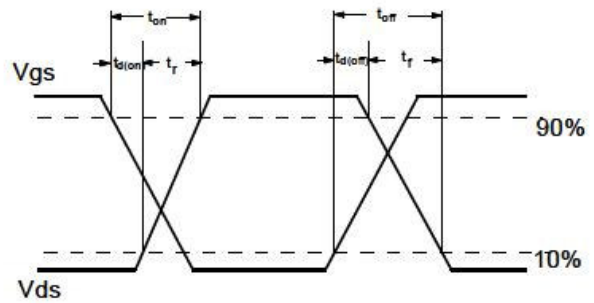
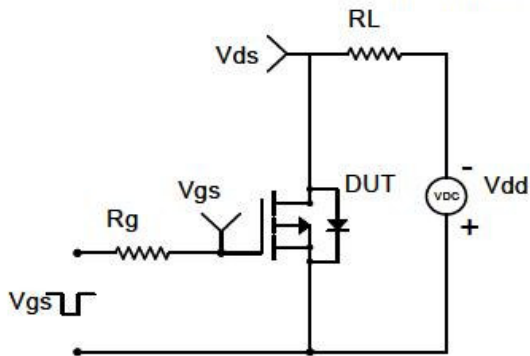
Normalized Thermal Transient Impedance, Junction-to-Case

Typical Characteristics

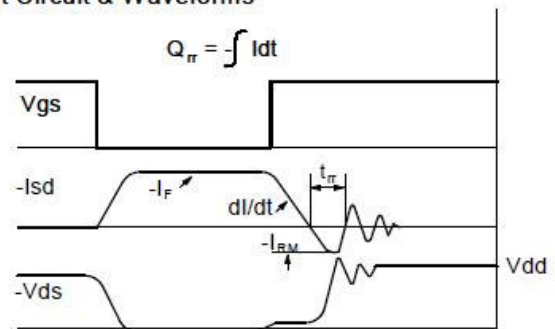
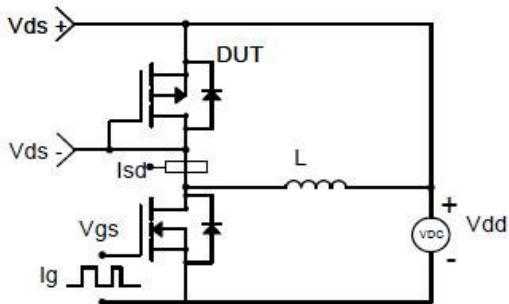
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

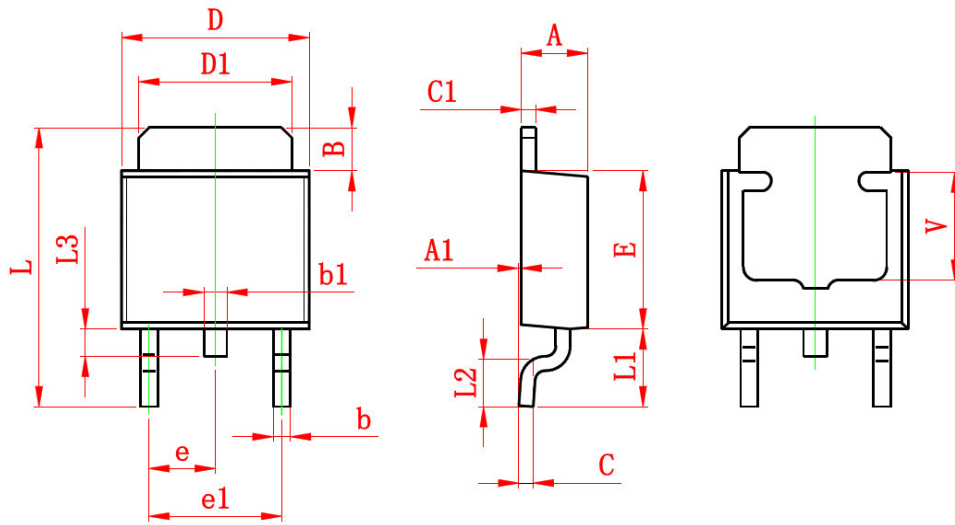


Diode Recovery Test Circuit & Waveforms



Package Dimension

TO-252-2L







Dimensions





SYMBOL	Millimeters		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	0.700	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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