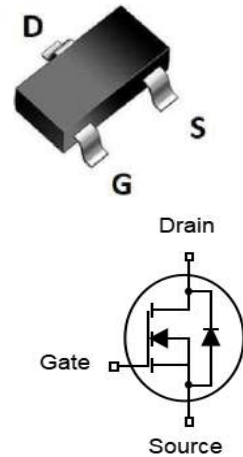


## Features

- N-Channel
- Fast Switching
- Low Gate Charge and  $R_{DS(ON)}$
- Low Reverse transfer capacitances

$V_{DS}$	100	V
$R_{DS(on),TYP@ V_{GS}=10V}$	92	m $\Omega$
$R_{DS(on),TYP@ V_{GS}=4.5V}$	110	m $\Omega$
$I_D$	5	A

SOT-23-3L



Part ID	Package Type	Marking	Packing
ZT0105	SOT-23-3L	0105	3000pcs/Reel

## Absolute Maximum Ratings $T_A = 25^\circ\text{C}$ , unless otherwise specified

Symbol	Parameter	Rating	Unit	
<b>Common Ratings (<math>T_c=25^\circ\text{C}</math> Unless Otherwise Noted)</b>				
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V	
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	100	V	
$T_J$	Maximum Junction Temperature	150	$^\circ\text{C}$	
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$	
$T_L$	Maximum Temperature for Soldering	260	$^\circ\text{C}$	
$I_{DM}$	Drain Current-Continuous@ Current-Pulsed (Note 1)	$T_c = 25^\circ\text{C}$ 20	A	
<b>Mounted on Large Heat Sink</b>				
$I_D$	Drain Current-Continuous	$T_c = 25^\circ\text{C}$	5	A
		$T_c = 100^\circ\text{C}$	3.5	A
$P_D$	Maximum Power Dissipation	2	W	
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	62.5	$^\circ\text{C/W}$	

**Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)**

Symbol	Parameter	Condition	Min	Typ	Max	Unit
<b>Static Electrical Characteristics @ T<sub>J</sub>=25°C (unless otherwise stated)</b>						
V(BR)DSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	100	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V	--	--	1	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	--	--	±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.3	1.7	2.4	V
R <sub>DS(on)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =3A	--	92	116	mΩ
R <sub>DS(on)</sub>	Drain-Source On-State Resistance	V <sub>GS</sub> =4.5V, I <sub>D</sub> =2A	--	110	140	mΩ
<b>Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1MHz	--	125	--	pF
C <sub>oss</sub>	Output Capacitance		--	40.5	--	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		--	1.95	--	pF
R <sub>g</sub>	Gate Resistance	f=1MHz	--	5.7	--	Ω
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =50V, I <sub>D</sub> =2A, V <sub>GS</sub> =10V	--	2.7	--	nC
Q <sub>gs</sub>	Gate-Source Charge		--	0.52	--	nC
Q <sub>gd</sub>	Gate-Drain Charge		--	0.7	--	nC
<b>Switching Characteristics</b>						
T <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> =50V, I <sub>D</sub> =2A, R <sub>G</sub> =5Ω, V <sub>GS</sub> =10V	--	4.4	--	ns
T <sub>r</sub>	Turn-on Rise Time		--	1.4	--	ns
T <sub>d(off)</sub>	Turn-Off Delay Time		--	8	--	ns
T <sub>f</sub>	Turn-Off Fall Time		--	3.3	--	ns
<b>Source- Drain Diode Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
I <sub>SD</sub>	Source-Drain Current (Body Diode)		--	--	5	A
V <sub>SD</sub>	Forward on voltage	I <sub>S</sub> =2A, V <sub>GS</sub> =0V	--	--	1.2	V

**Notes:**

1 : Repetitive rating; pulse width limited by maximum junction temperature

Characteristics Curve:

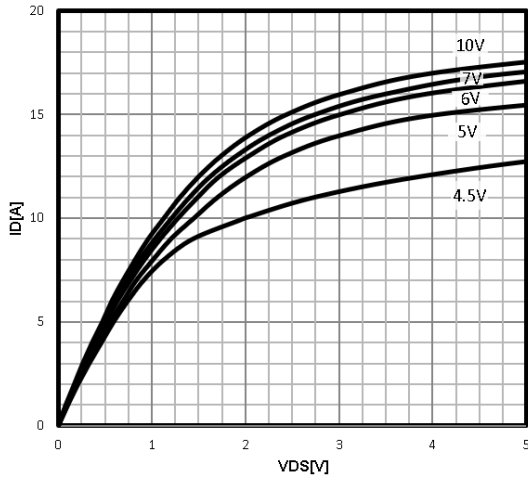


Figure 1 . output characteristics  
 $I_D=f(V_{DS})$

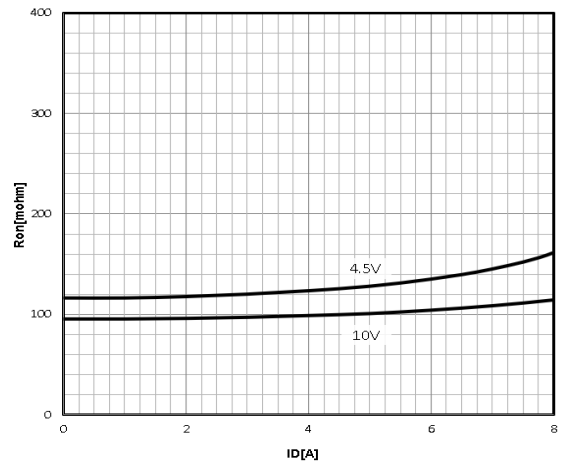


Figure 4 . drain -source on resistance  
 $R_{DS(on)}=f(I_D)$

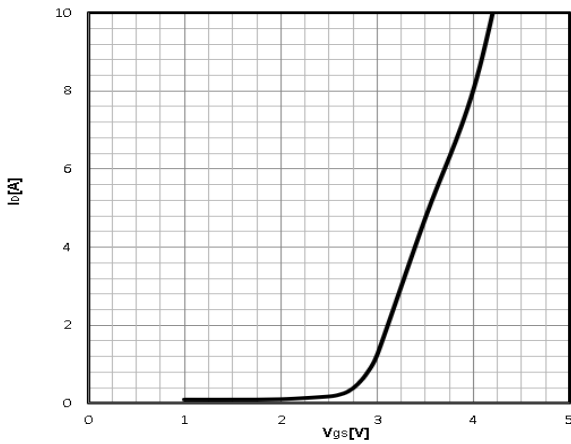


Figure 2. transfer characteristics  
 $I_D=f(V_{GS})$

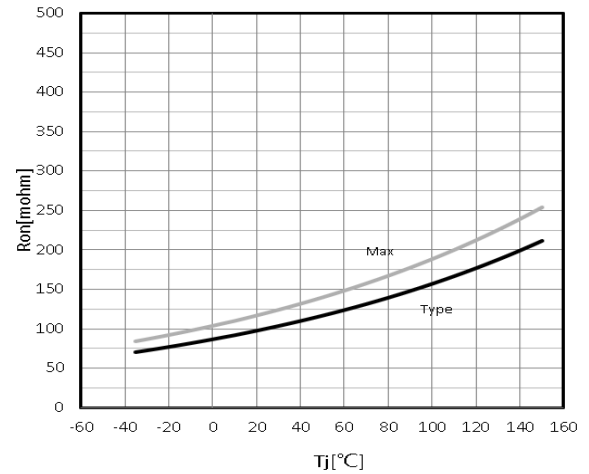


Figure 5. Drain-source on-state resistance  
 $R_{DS(on)}=f(T_j); I_D=4A; V_{GS}=10V$

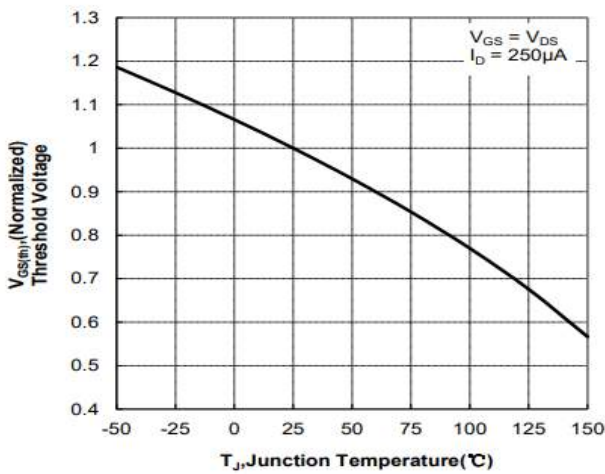


Figure 3. Gate Threshold Voltage  
 $V_{TH}=f(T_j); I_D=250\mu A$

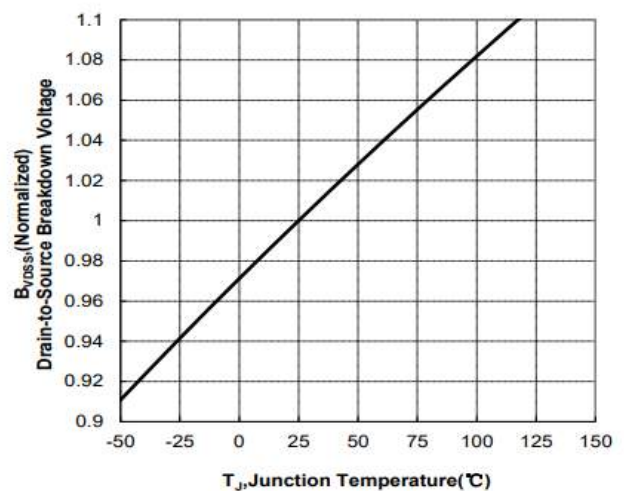
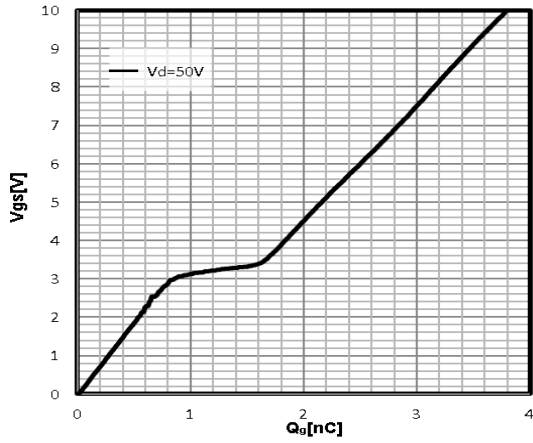
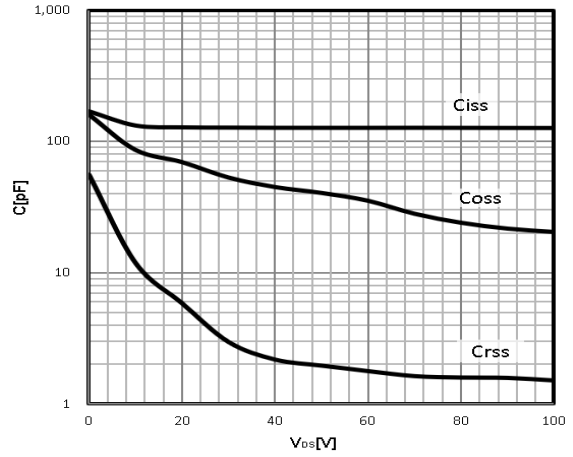


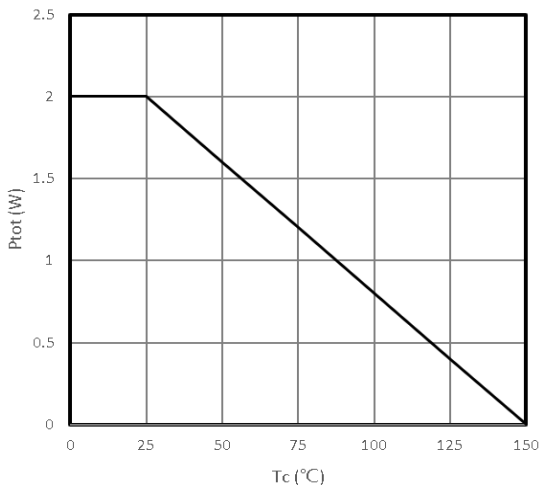
Figure 6. Drain-source breakdown voltage  
 $V_{BR(DSS)}=f(T_j); I_D=250\mu A$



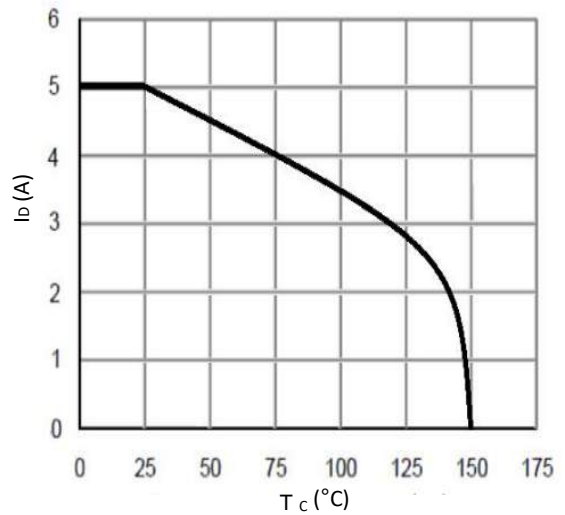
**Figure 7. gate charge**  
 $V_{GS}=f(Q_g)$ ;  $I_D=2A$



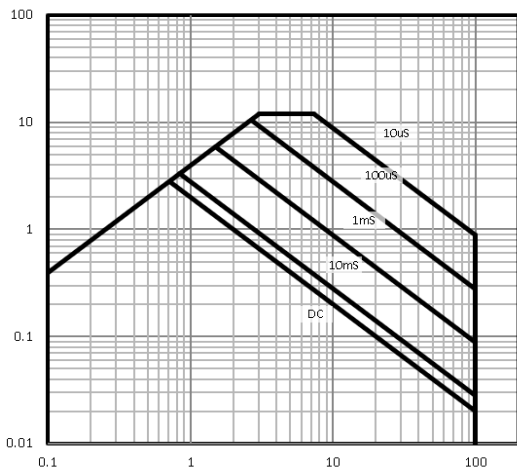
**Figure 10. capacitances**  
 $C=f(V_{DS})$ ;  $V_{GS}=0V$ ;  $f=1MHz$



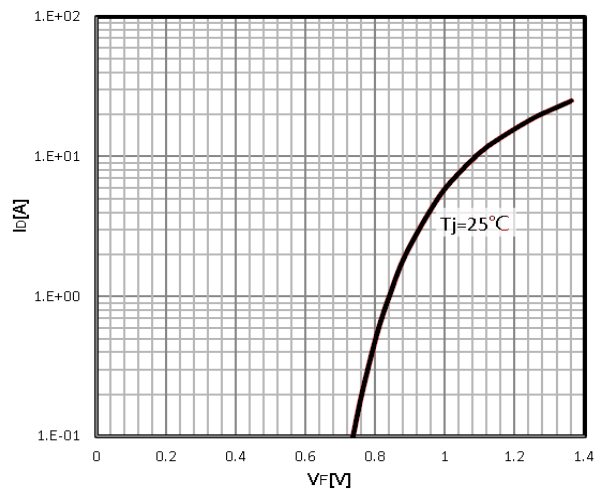
**Figure 8. Power Dissipation**  
 $P_{tot}=f(T_C)$



**Figure 11. Maximum Drain Current**  
 $I_D=f(T_C)$



**Figure 9. Safe operating area**  
 $I_D=f(V_{DS})$



**Figure 12. Body Diode Forward Voltage Variation**  
 $I_F=f(V_{GS})$

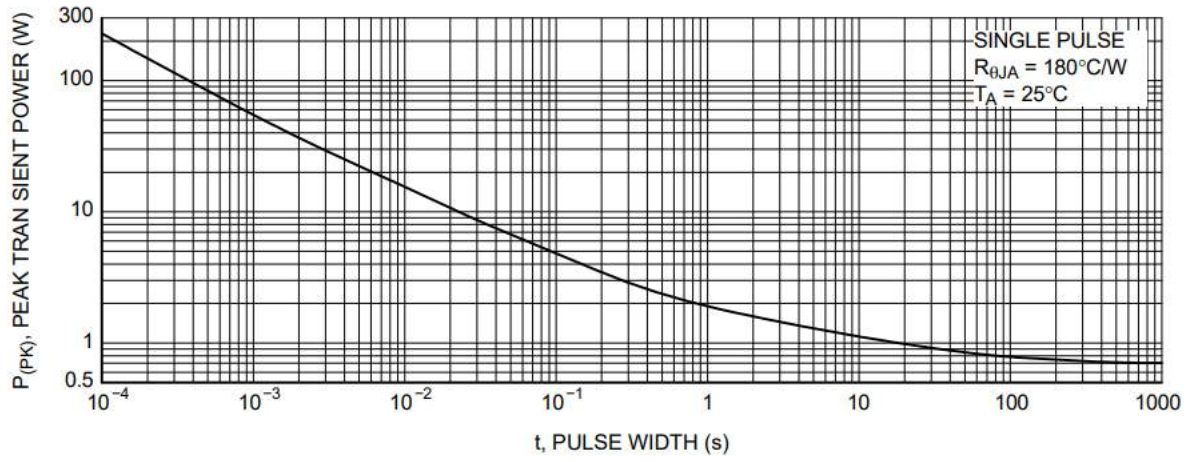
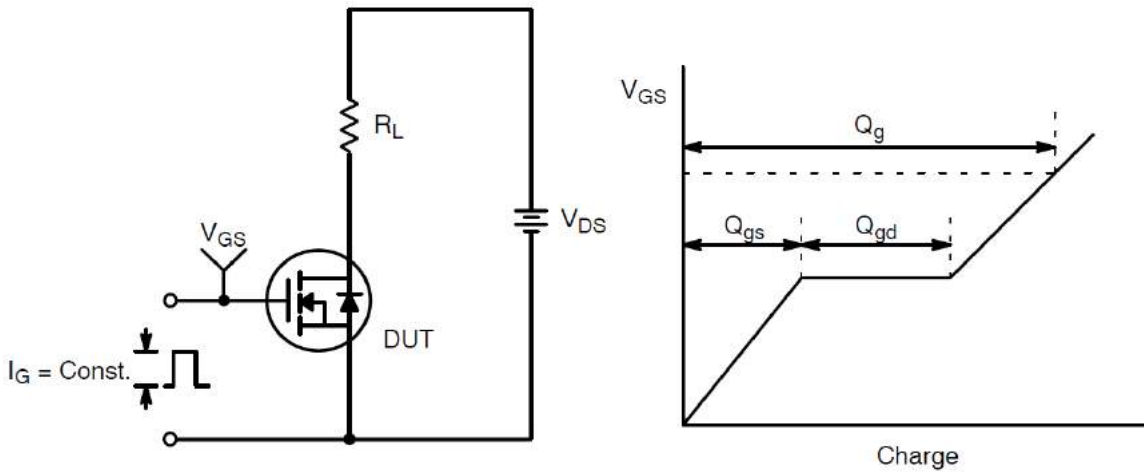


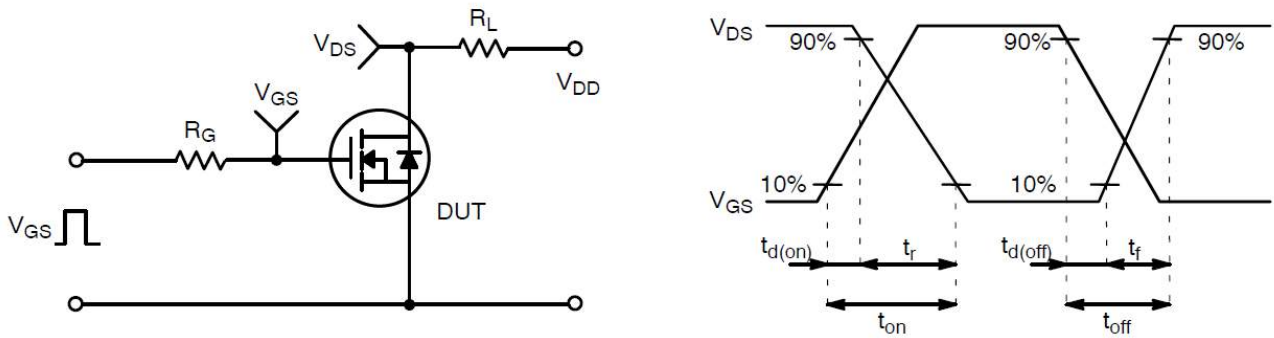
Figure 13. Max. transient thermal impedance

$$Z_{thJC} = f(t_p)$$

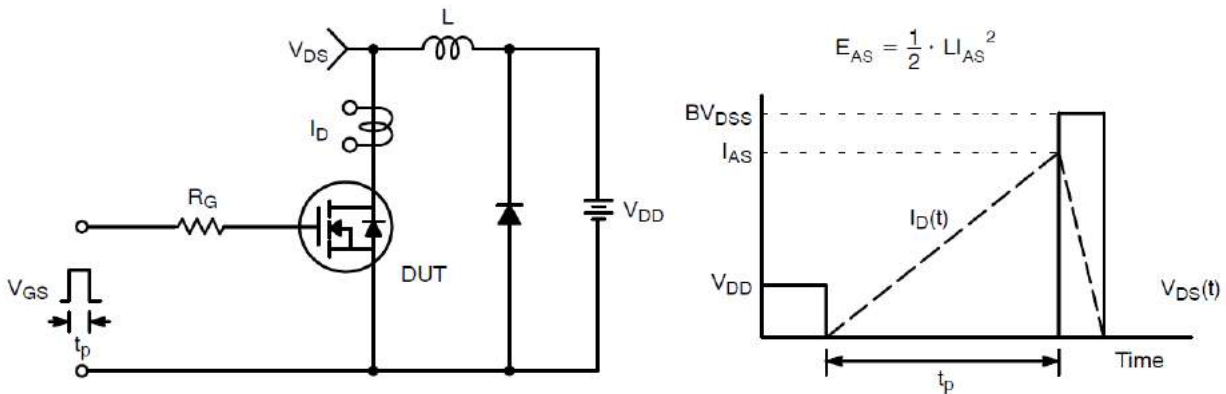
**Test Circuit and Waveform:**



**Gate Charge Test Circuit & Waveform**

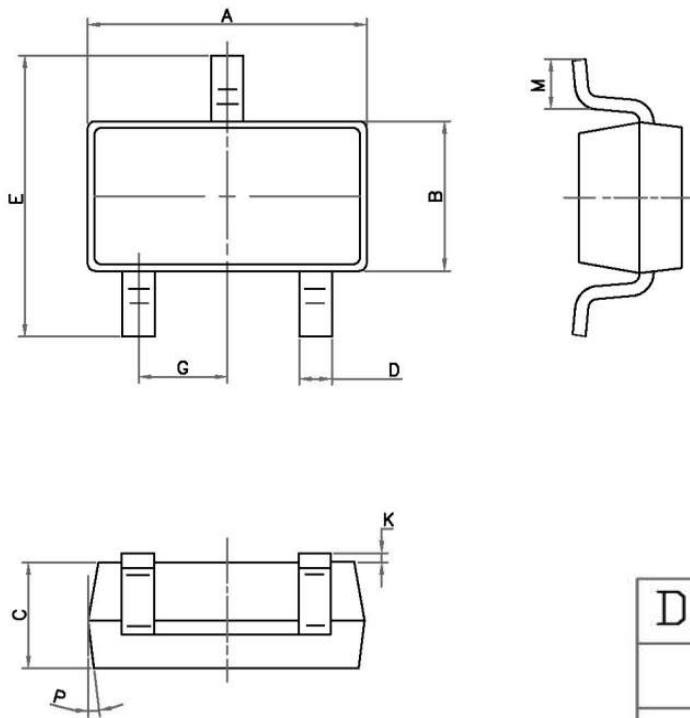


**Resistive Switching Test Circuit & Waveforms**



**Unclamped Inductive Switching Test Circuit & Waveforms**

## SOT-23-3L Package Information



DIM	MILLIMETERS
A	2.82~3.02
B	1.60 ± 0.10
C	1.10 ± 0.05
D	0.40 ± 0.10
E	2.65~2.95
G	0.95typ
K	0.00~0.10
M	0.20MIN
P	9 ± 2°

## Customer Service

Sales and Service:

[zj@ztasemi.com](mailto:zj@ztasemi.com)