
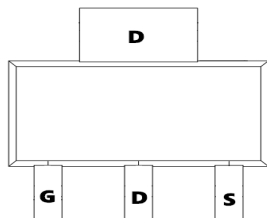




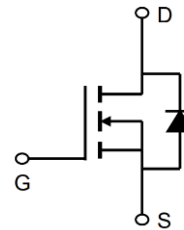
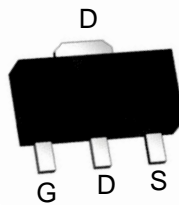
## TM15N10SI

## N-Channel Enhancement Mosfet

<p><b>General Description</b></p> <ul style="list-style-type: none"> <li>• Low <math>R_{DS(ON)}</math></li> <li>• RoHS and Halogen-Free Compliant</li> </ul> <p><b>Applications</b></p> <ul style="list-style-type: none"> <li>• Load switch</li> <li>• PWM</li> </ul>	<p><b>General Features</b></p> <p><math>V_{DS}=100V</math> <math>I_D=15A</math>  <math>R_{DS(ON)} = 80m\Omega(\text{typ.}) @ V_{GS} = 10V</math></p> <p>100% UIS Tested  100% <math>R_g</math> Tested</p> 
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SI:SOT-89-3L



Marking: 15N10 OR 9968

**Absolute Maximum Ratings** ( $T_A = 25^\circ\text{C}$  Unless Otherwise Noted)

Symbol	Parameter	Rating	Unit	
<b>Common Ratings</b>				
$V_{DSS}$	Drain-Source Voltage	100	V	
$V_{GSS}$	Gate-Source Voltage	$\pm 20$		
$T_J$	Maximum Junction Temperature	150	$^\circ\text{C}$	
$T_{STG}$	Storage Temperature Range	-55 to 150		
$I_S$	Diode Continuous Forward Current	$T_A=25^\circ$	A	
$I_D$	Continuous Drain Current	$T_C=25^\circ\text{C}$	15	A
		$T_C=70^\circ\text{C}$	13	
$I_{DM}^a$	Pulsed Drain Current	$T_C=25^\circ\text{C}$	26	A
$P_D$	Maximum Power Dissipation	$T_A=25^\circ\text{C}$	3.5	W
		$T_A=70^\circ\text{C}$	2.2	
$R_{\theta JA}^c$	Thermal Resistance-Junction to Ambient	$t \leq 10s$	35	$^\circ\text{C/W}$
		Steady State	70	$^\circ\text{C/W}$
$I_{AS}^b$	Avalanche Current, Single pulse (L=0.5mH)	7	A	
$E_{AS}^b$	Avalanche Energy, Single pulse (L=0.5mH)	12	mJ	

Note a : Pulse width limited by max. junction temperature.

Note b : UIS tested and pulse width limited by maximum junction temperature  $150^\circ\text{C}$  (initial temperature  $T_J=25^\circ\text{C}$ ).Note c : Surface Mounted on  $1\text{in}^2$  pad area.

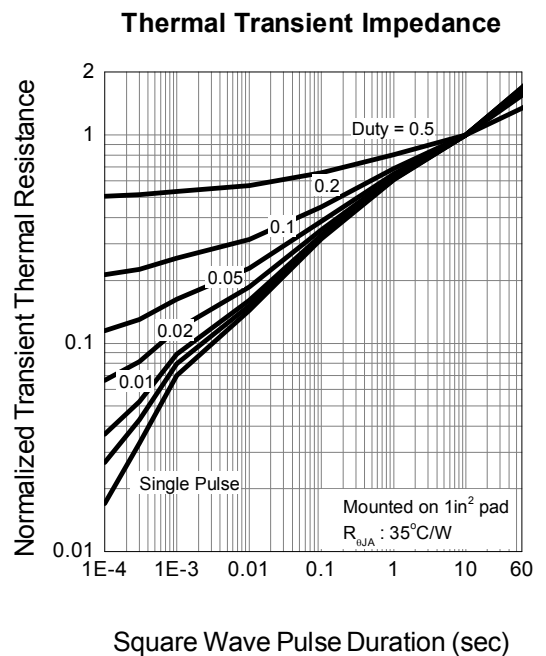
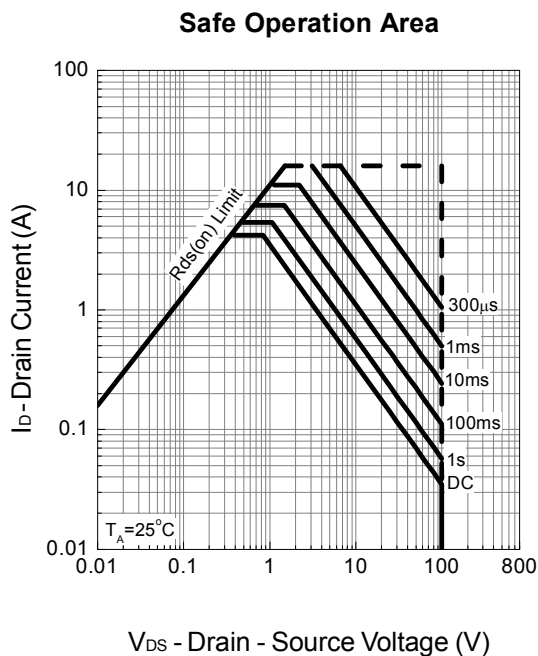
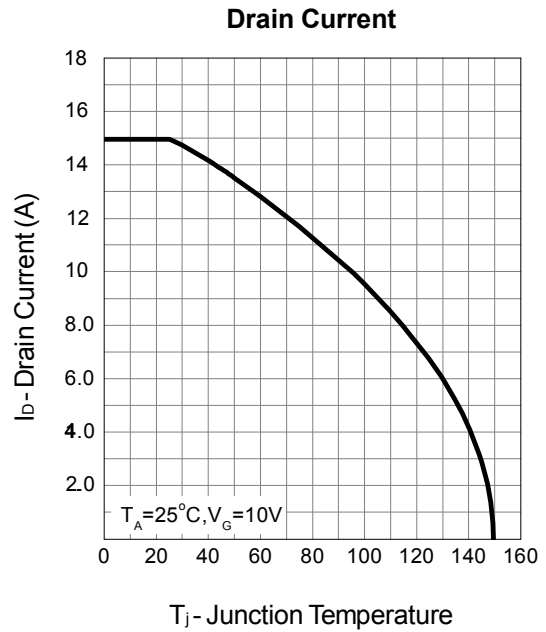
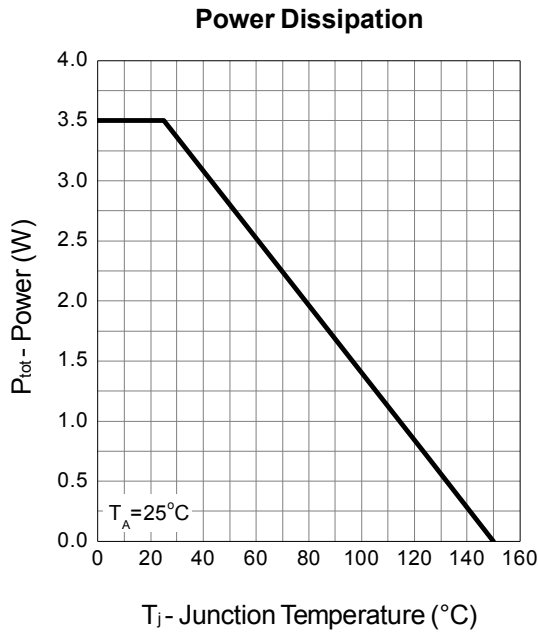
**Electrical Characteristics** ( $T_A = 25^\circ\text{C}$  Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	100	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=80V, V_{GS}=0V$ $T_J=85^\circ\text{C}$	-	-	1	$\mu A$
			-	-	30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	1	2	3	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
$R_{DS(ON)}^d$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=4A$	-	80	100	$m\Omega$
		$V_{GS}=4.5V, I_{DS}=3.5A$	-	85	110	$m\Omega$
<b>Diode Characteristics</b>						
$V_{SD}^d$	Diode Forward Voltage	$I_{SD}=3A, V_{GS}=0V$	-	0.8	1.3	V
$t_{rr}$	Reverse Recovery Time	$I_{SD}=3A, dI_{SD}/dt=100A/\mu s$	-	27	-	ns
$Q_{rr}$	Reverse Recovery Charge		-	36	-	nC
<b>Dynamic Characteristics<sup>e</sup></b>						
$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, f=1\text{MHz}$	-	2.5	-	$\Omega$
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=30V,$ Frequency=1.0MHz	-	740	960	$\mu F$
$C_{oss}$	Output Capacitance		-	45	-	
$C_{rss}$	Reverse Transfer Capacitance		-	24	-	
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=30V, R_L=30\Omega,$ $I_{DS}=1A, V_{GEN}=10V,$ $R_G=6\Omega$	-	11	20	ns
$t_r$	Turn-on Rise Time		-	6	11	
$t_{d(OFF)}$	Turn-off Delay Time		-	27	49	
$t_f$	Turn-off Fall Time		-	5	10	
<b>Gate Charge Characteristics<sup>e</sup></b>						
$Q_g$	Total Gate Charge	$V_{DS}=30V, V_{GS}=4.5V,$ $I_{DS}=4A$	-	7.7	-	nC
$Q_g$	Total Gate Charge	$V_{DS}=30V, V_{GS}=10V,$ $I_{DS}=4A$	-	16	23	
$Q_{gs}$	Gate-Source Charge		-	2.5	-	
$Q_{gd}$	Gate-Drain Charge		-	3	-	

Note d : Pulse test ; pulse width $\leq 300\mu s$ , duty cycle $\leq 2\%$ .

Note e : Guaranteed by design, not subject to production testing.

**Typical Operating Characteristics**

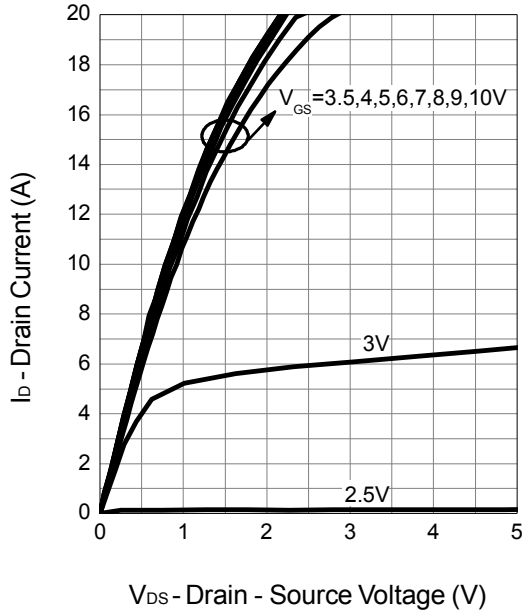




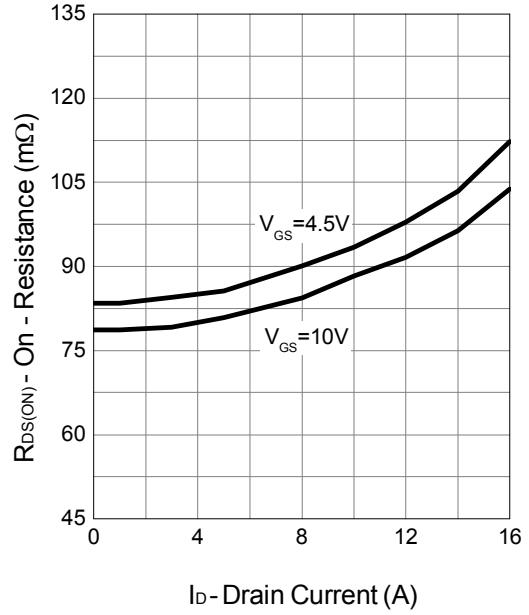
# TM15N10SI

# N-Channel Enhancement Mosfet

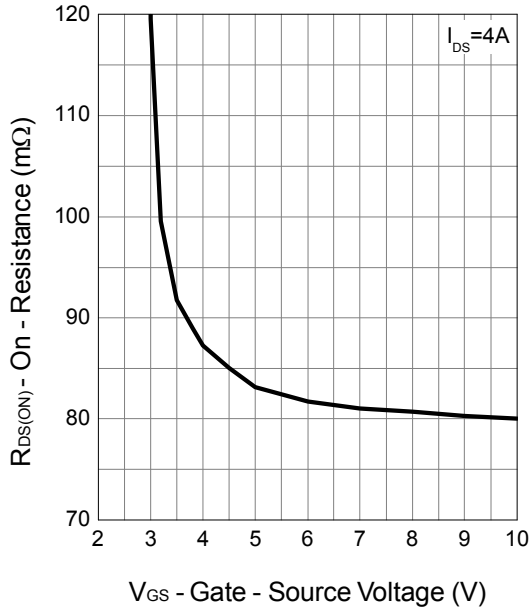
### Output Characteristics



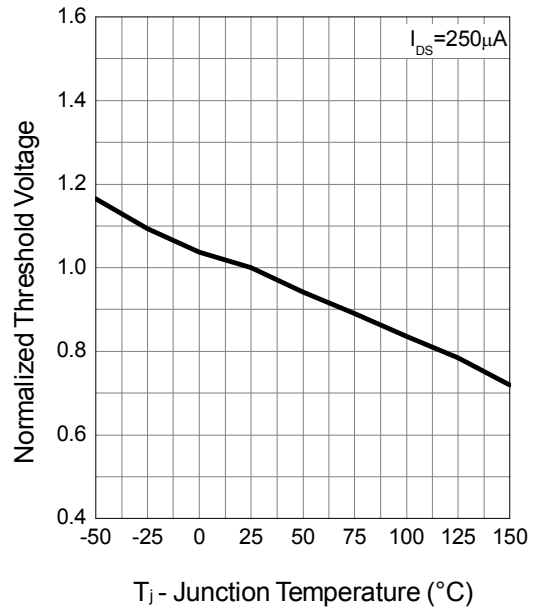
### Drain-Source On Resistance



### Gate-Source On Resistance

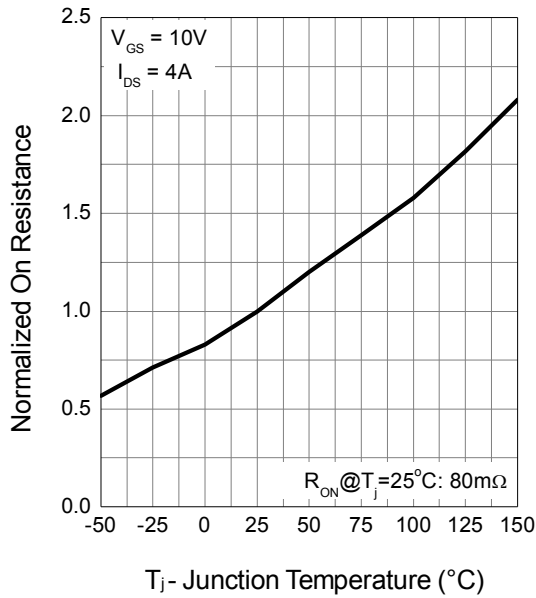


### Gate Threshold Voltage

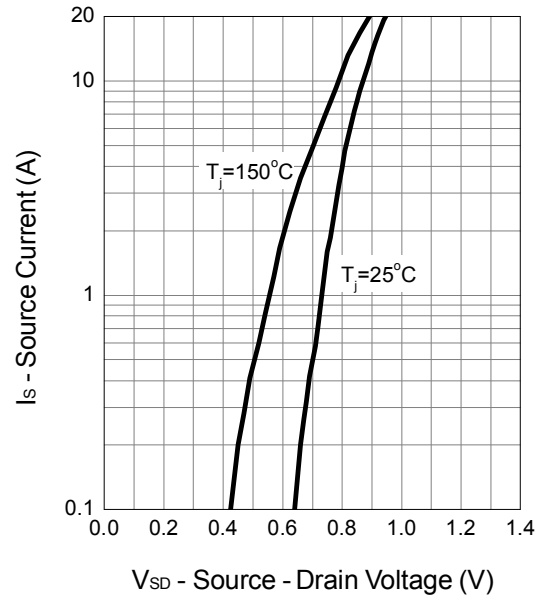




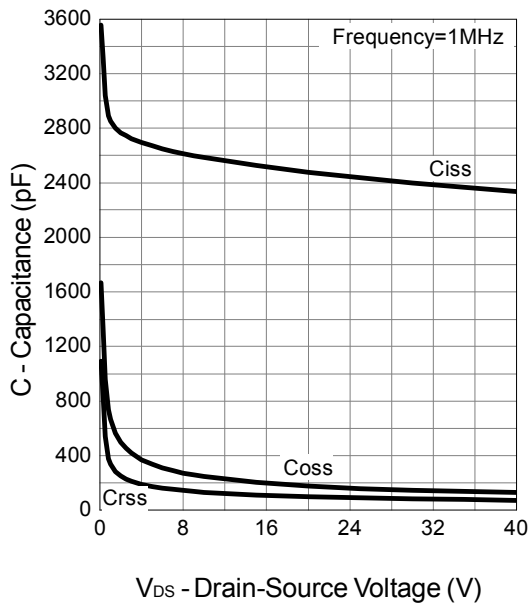
Drain-Source On Resistance



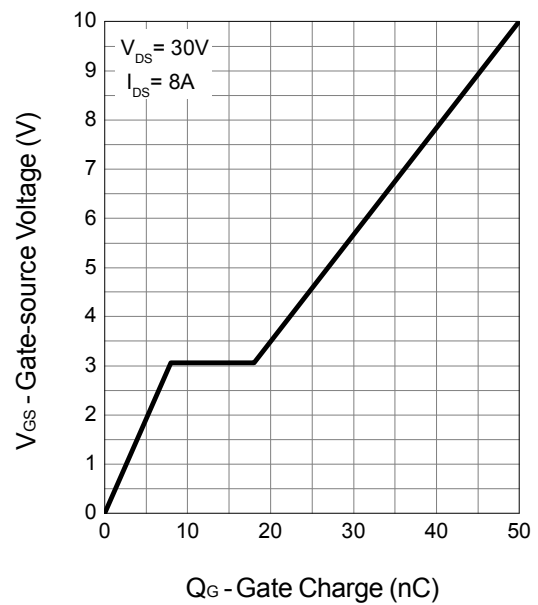
Source-Drain Diode Forward



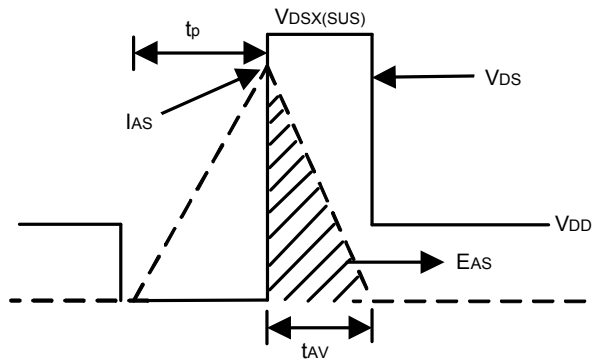
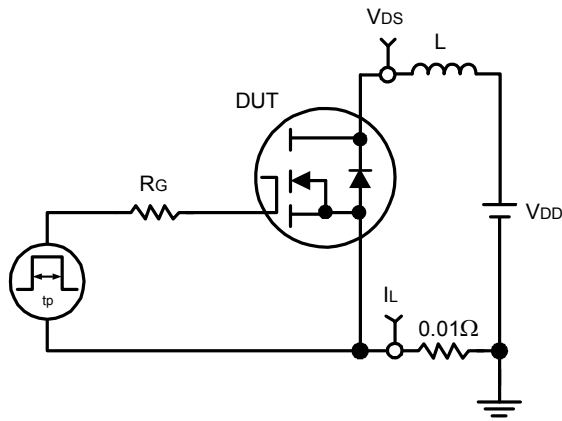
Capacitance



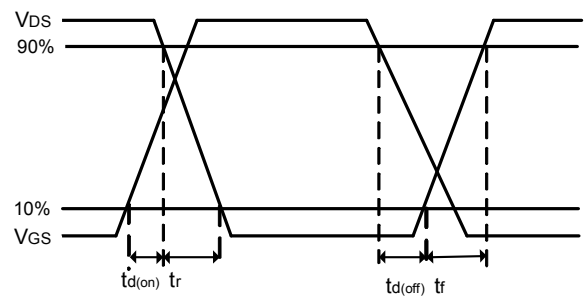
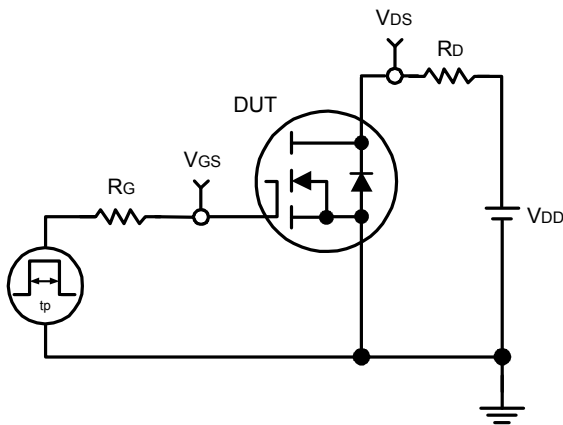
Gate Charge



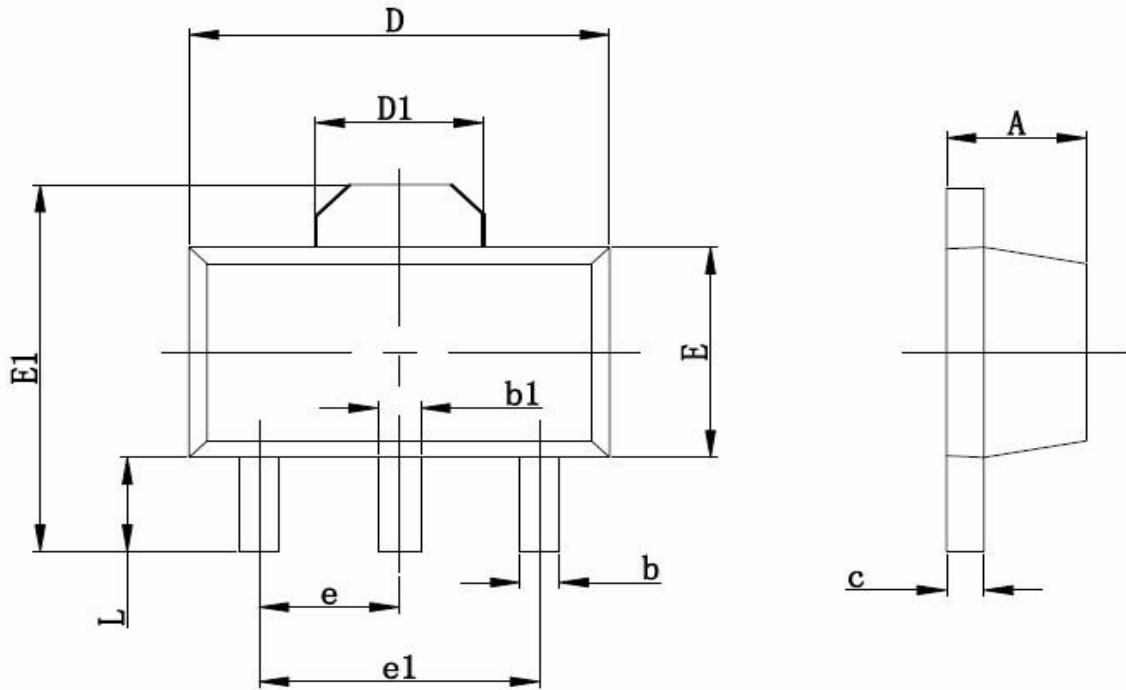
### Avalanche Test Circuit and Waveforms



### Switching Time Test Circuit and Waveforms



## Package Mechanical Data:SOT-89-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.350	0.520	0.013	0.197
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.350	2.550	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.060TYP	
e1	3.000 TYP		0.118TYP	
L	0.900	1.100	0.035	0.047