

P-Channel Enhancement Mode Field Effect Transistor

General Description

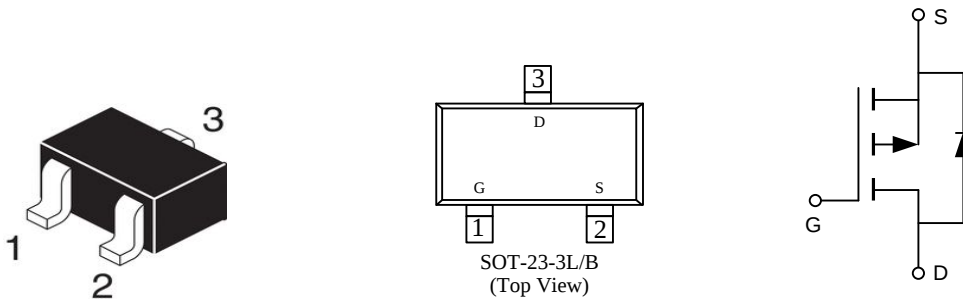
Product Summary		
V_{DSS}	I_D	$R_{DS(ON)}(m\Omega)TYP$
-20V	-0.45A	135 @ $V_{GS}=-4.5V$
	-0.35A	180 @ $V_{GS}=-2.5V$

Features

- Super high dense cell design for low $R_{DS(ON)}$
- Rugged and reliable
- Simple drive requirement
- SOT-23-3L/B package

Package

- SOT-23-3L/B



Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
LN2305	-55°C to +150°C	SOT-23-3L/B	3000

Absolute Maximum Ratings

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

parameter		symbol	limit	unit
Drain-source voltage		V_{DSS}	-20	V
Gate-source voltage		V_{GSS}	± 12	V
Coutinuous drain current ($T_J=150^\circ\text{C}$)	$T_A=25^\circ\text{C}$	I_D	-0.8	A
	$T_A=80^\circ\text{C}$		-0.7	A
Pulsed drain current		I_{DM}	-1.8	A
Drain-source Diode forward current		I_S	-0.58	A
Power dissipation	$T_A=25^\circ\text{C}$	P_D	0.27	W
	$T_A=70^\circ\text{C}$		0.16	
Operating junction Temperature range		T_J	-55—150	$^\circ\text{C}$

■ Electrical Characteristics

(TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Static						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20			V
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.35		-0.8	V
Gate leakage current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 12V$			± 100	nA
Zero gate voltage drain current	I_{DSS}	$V_{DS}=-20V, V_{GS}=0V$			-1	μA
		$V_{DS}=-20V, V_{GS}=0V$ $T_j=55^\circ C$			-5	
On-state drain current	$I_{D(ON)}$	$V_{DS} \leq -4.5V, V_{GS}=-5V$	-0.7			A
Drain-source on-state resistance	$R_{DS(ON)}$	$V_{GS}=-4.5V, I_D=-0.45A$		0.135	0.19	Ω
		$V_{GS}=-2.5V, I_D=-0.35A$		0.18	0.22	
		$V_{GS}=-1.8V, I_D=-0.25A$		0.26	0.30	
Forward transconductance	g_{fs}	$V_{DS}=-10V, I_D=-0.25A$		0.4		S
Diode forward voltage	V_{SD}	$I_S=-0.15A, V_{GS}=0V$		-0.8	-1.2	V
Dynamic						
Total gate charge	Q_g	$V_{DS}=-10V$ $I_D=-0.6A$ $V_{GS}=-4.5V$		1.5	2.0	nC
Gate-source charge	Q_{gs}			0.3		
Gate-drain charge	Q_{gd}			0.35		
Turn-on delay time	$t_{d(ON)}$	$V_{DD}=-10V$ $V_{GEN}=-4.5V$ $I_D=-0.4A$ $R_L=10\Omega$ $R_G=6\Omega$		5	10	ns
Rise time	t_r			15	25	
Turn-off delay time	$t_{d(OFF)}$			8	15	
Fall time	t_f			1.4	1.8	

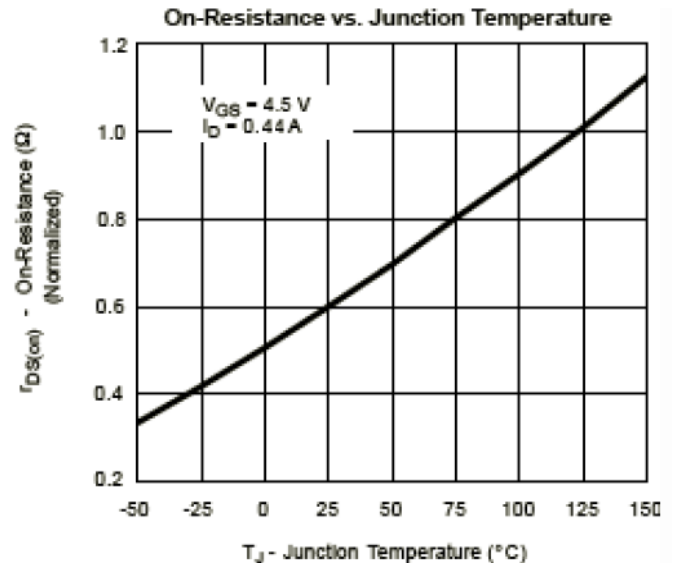
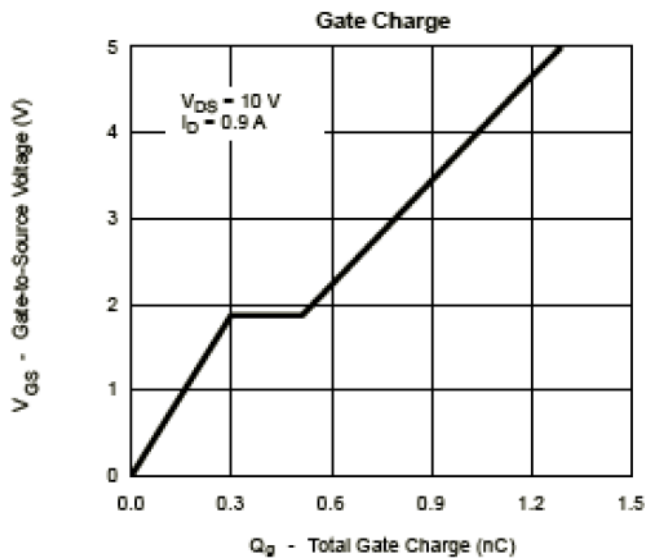
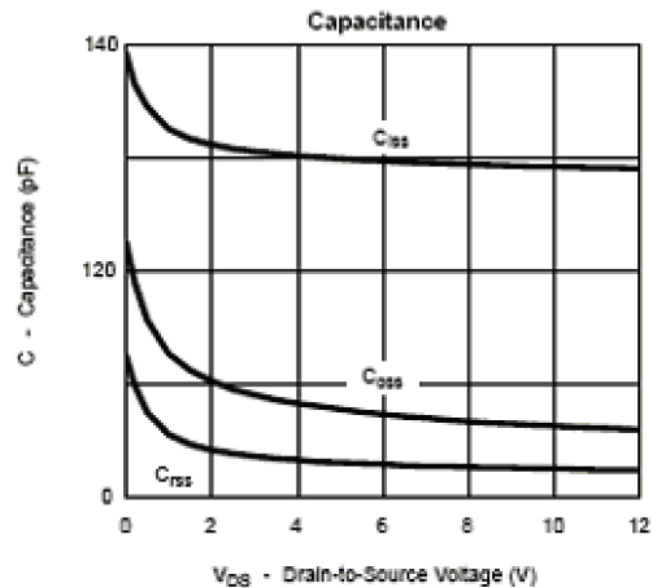
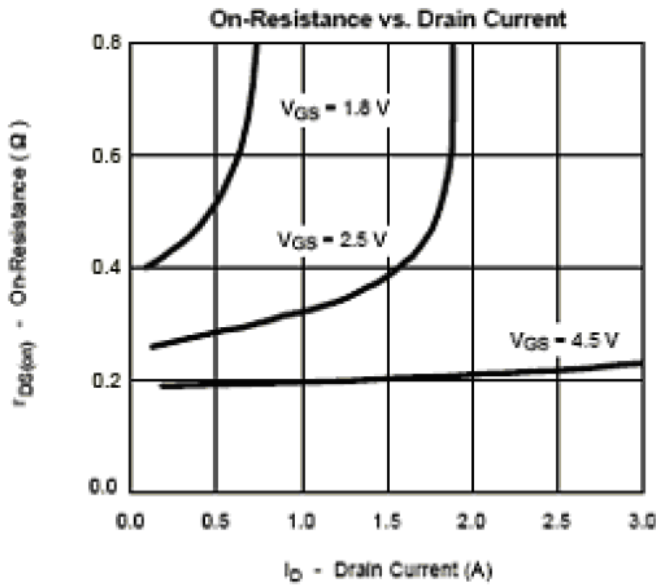
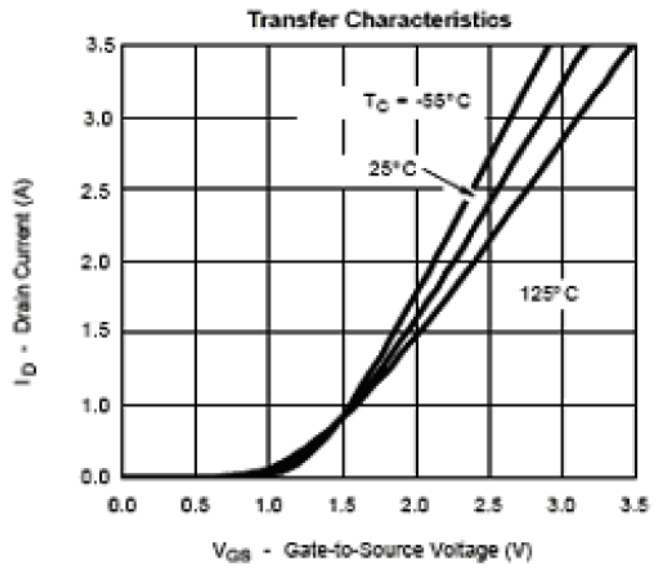
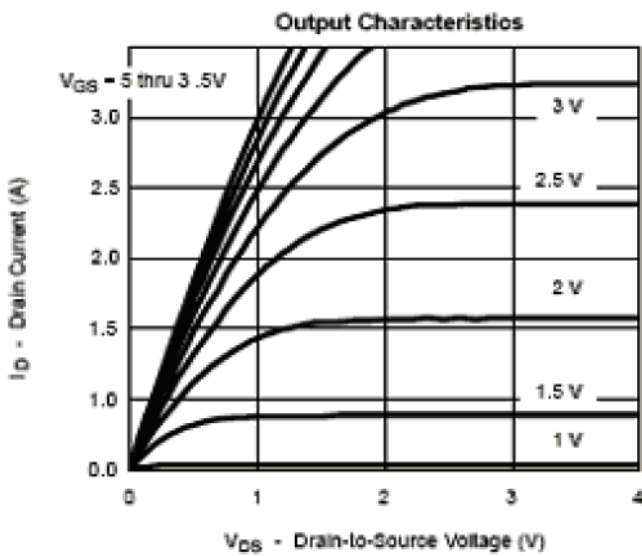
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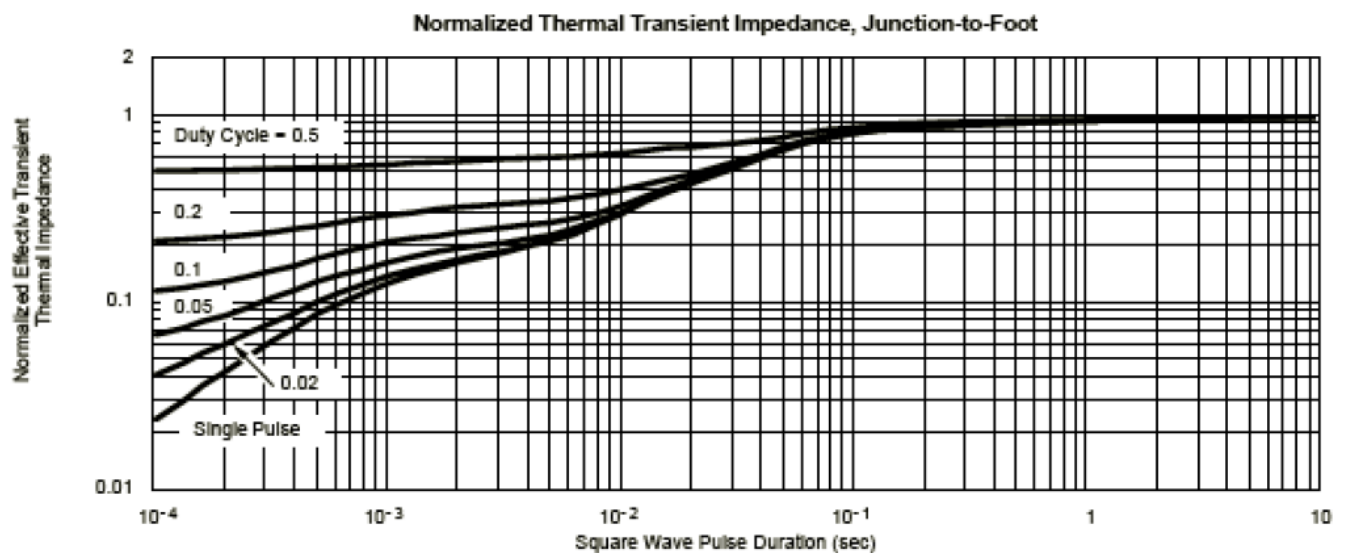
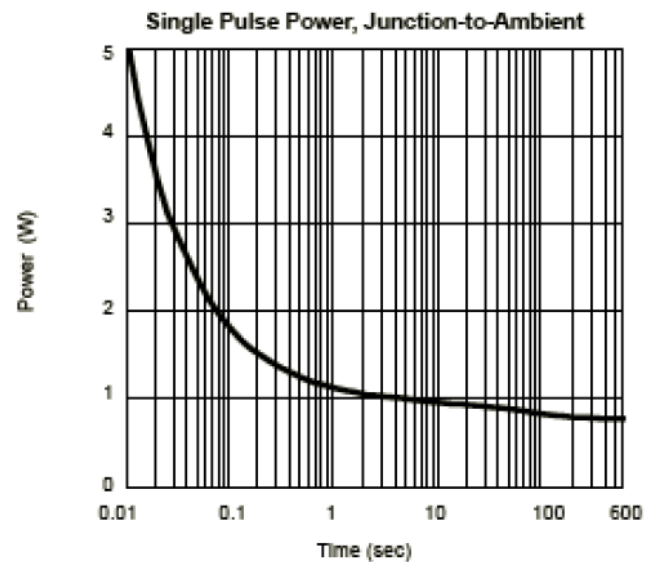
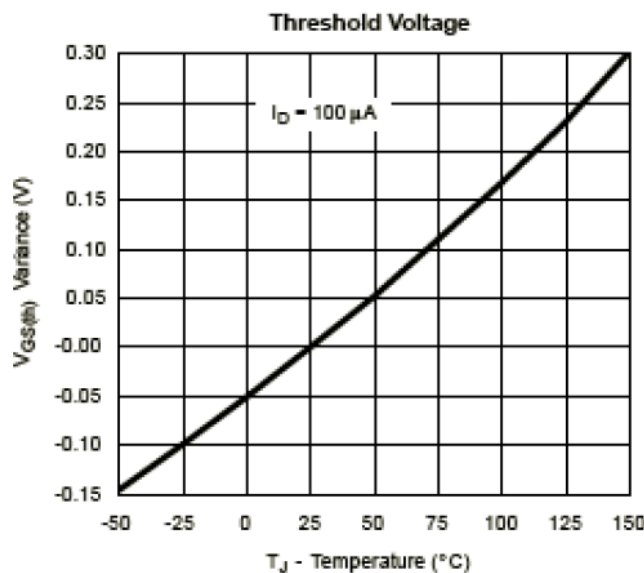
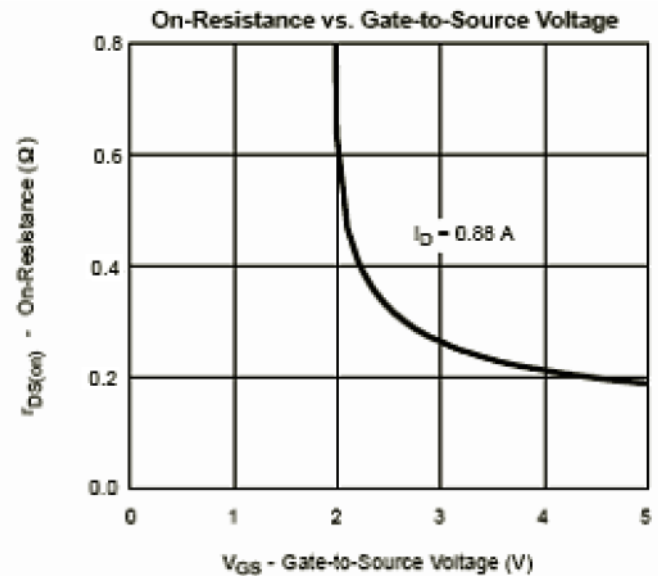
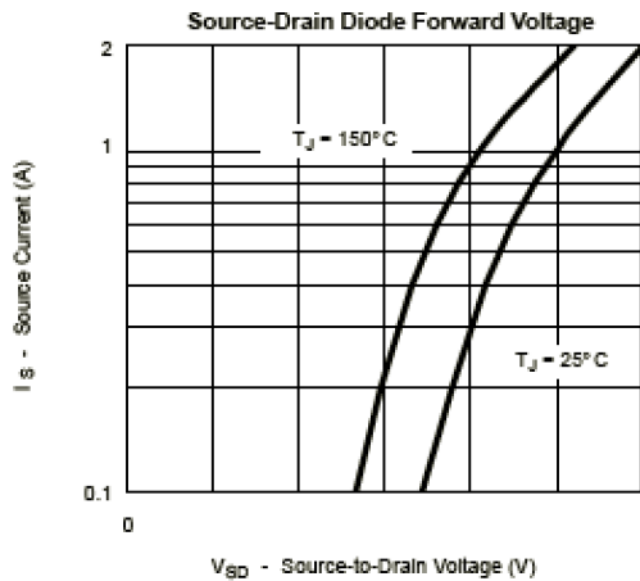
- surface mounted on FR4 board, $t \leq 10\text{sec}$
- pulse test: pulse width $\leq 300\mu s$, duty $\leq 2\%$
- guaranteed by design, not subject to production testing

■ Thermal Characteristics

Thermal Resistance junction-to ambient	$R_{th JA}$	100	$^\circ C/W$
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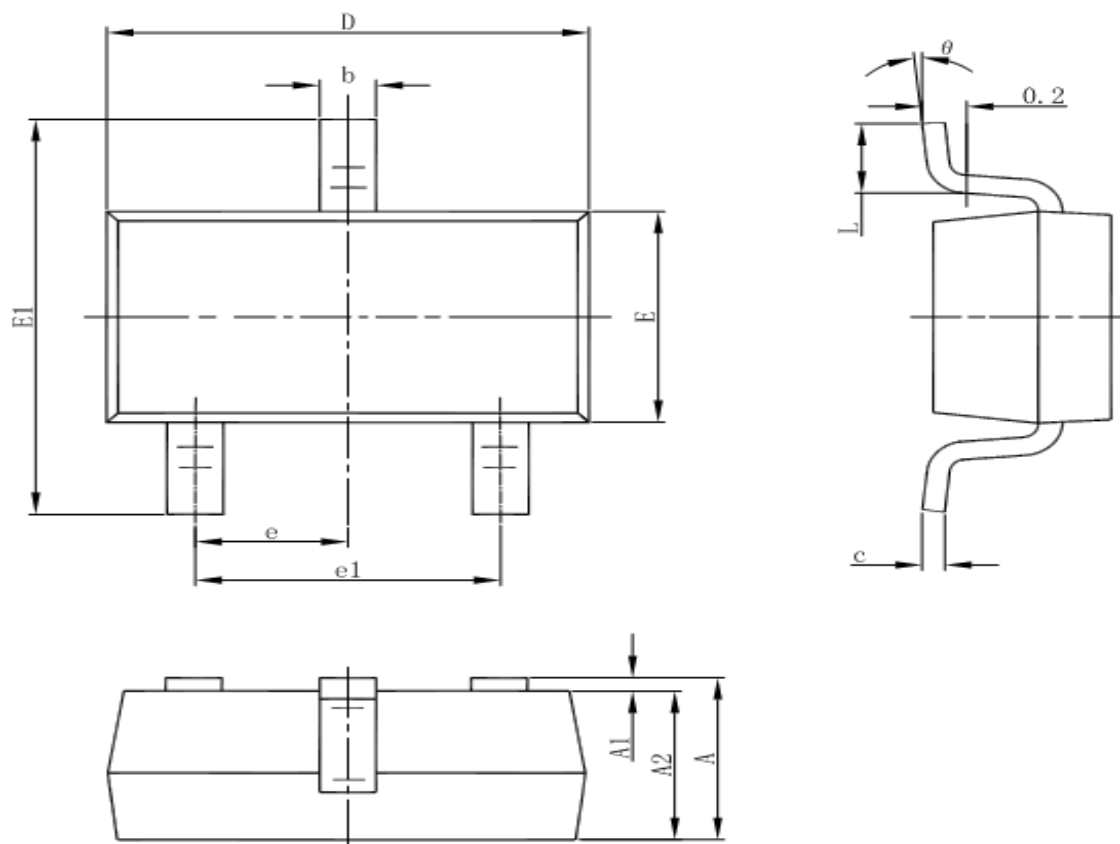
Typical Performance Characteristics





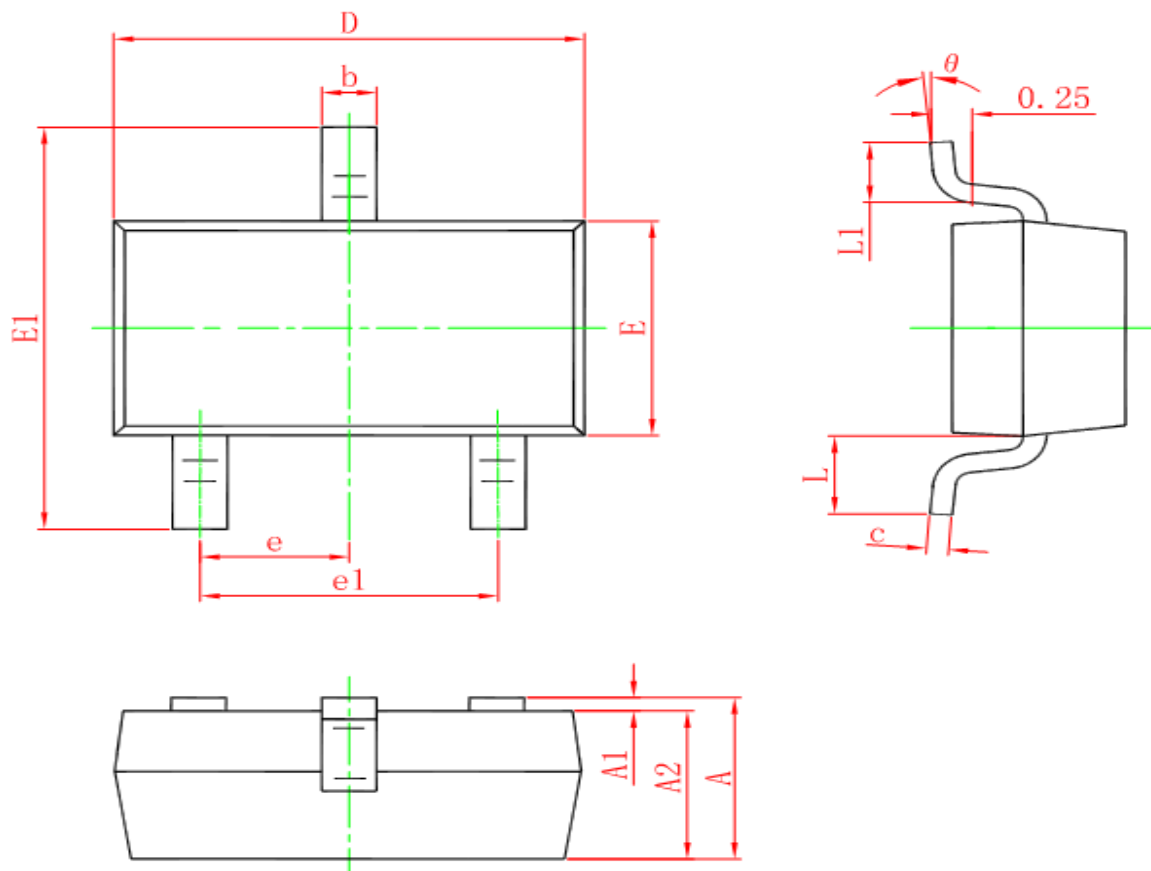
Package Information

- SOT-23-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

● SOT-23-3B



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°