General Description

The ECL1121 series are precise, low power consumption, high voltage; positive voltage regulators manufactured using CMOS and laser trimming technologies. The series provides large currents with a significantly small dropout voltage. The ECL1121 consists of a current limiter circuit, a driver transistor, a precision reference voltage and an error correction circuit. The series is compatible with low ESR ceramic capacitors. The current limiter's feedback circuit also operates as a short protect for the output current limiter and the output pin. Output voltage can be set internally by laser trimming technologies. It is selectable in 100mV increments within a range of 1.2V to 5.0V. SOT89, SOT23-3L, SOT-353 and SOT23-3B packages are available.

Features

◆Output Voltage Range: 1.2V to 5.0V(selectable in 100mV steps)
◆Highly Accurate: 2%
◆Dropout Voltage: 160mV @ 100mA (3.0V type)
◆Low Power Consumption: 1μA (TYP.)
◆Maximum Output Current : 250mA (Vin≥Vout+1V)
◆Internal protector: current limiter and short protector
◆Small packages

Applications

◆Battery powered equipment
◆Reference voltage sources
◆Cameras, Video cameras
◆Mobile phones
◆Communication tools

Package

◆SOT89
◆SOT353/SC70-5
◆SOT23-3L,SOT23-3B

Ordering/Marking Information

ECL1121 <u>XX</u> <u>XX</u>　<u>R</u>

R：Tape & Reel

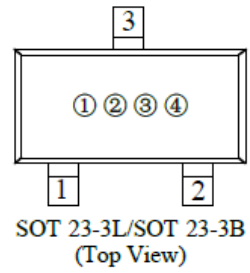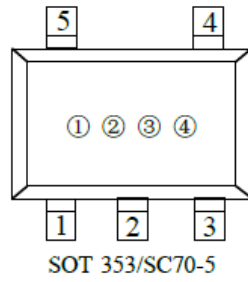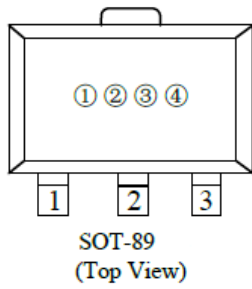Output Voltage：
12=1.2V
13=1.3V
14=1.4V
：
：
50=5.0V

Package Type：
B1：SOT23-3L
BF：SOT23-3B
B6：SOT89
B8：SOT353
C5：SC70-5

SOT-89
(Top View)

SOT 353/SC70-5

SOT 23-3L/SOT 23-3B
(Top View)

① Represents the product name

Symbol	Product Name
6/9/S	ECL1121◆◆◆◆◆

② Represents the   range of output voltage

Output Voltage Range（V）	0.1～3.0	3.1～6.0	6.1～9.0
Symbol	5	6	7

③ Represents the Output Voltage

Symbol	Output Voltage（V）			Symbol	Output Voltage（V）		
0	-	3.1	-	F	1.6	4.6	-
1	-	3.2	-	H	1.7	4.7	-
2	-	3.3	-	K	1.8	4.8	-
3	-	3.4	-	L	1.9	4.9	-
4	-	3.5	-	M	2	5.0	-
5	-	3.6	-	N	2.1	5.1	-
6	-	3.7	-	P	2.2	5.2	-
7	-	3.8	-	R	2.3	5.3	-
8	-	3.9	-	S	2.4	5.4	-
9	-	4	-	T	2.5	5.5	-
A	-	4.1	-	U	2.6	5.6	-
B	1.2	4.2	-	V	2.7	5.7	-
C	1.3	4.3	-	X	2.8	5.8	-
D	1.4	4.4		Y	2.9	5.9	
E	1.5	4.5		Z	3	6.0	

④ Represents the assembly lot no.

0~9, A~Z repeated (G, I, J, O, Q, W excepted)

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Pin Configuration

SOT 89
(Top View)

SOT 23-3L/SOT-23-3B
(Top View)
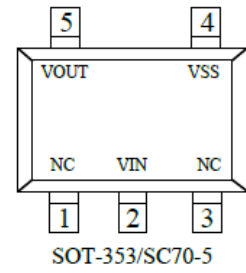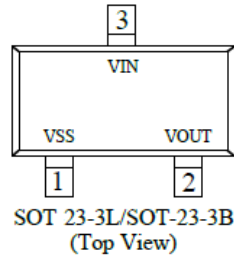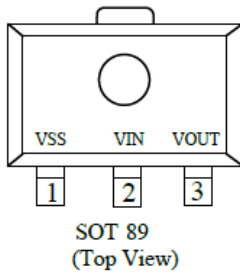
SOT-353/SC70-5

Pin Assignment

Pin Number			Pin Name	Function
SOT353/SC70-5	SOT23-3L/B	SOT89		
2	3	2	VIN	Supply Power
4	1	1	VSS	Ground
1,3	-	-	NC	No Connection
5	2	3	VOUT	Voltage Output

Function Block Diagram
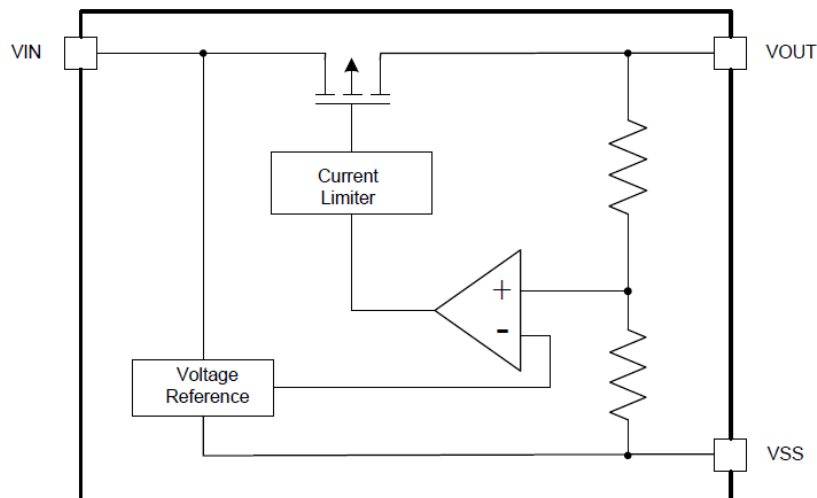
Absolute Maximum Ratings

Parameter	Symbol	Maximum Rating		Unit
Input Voltage	VIN	VSS-0.3～VSS+6		V
Output Current	VOUT	VSS-0.3～VIN+0.3		
Power Dissipation	PD	SOT23-3L, SOT23-3LB	250	mW
		SOT353	250	
		SOT89	500	
Operating Ambient Temperature	Topr	-40～+85		°C
Storage Temperature	Tstg	-40～+125		

Caution:

The absolute maximum ratings are rated values exceeding which the product could suffer physical damage.
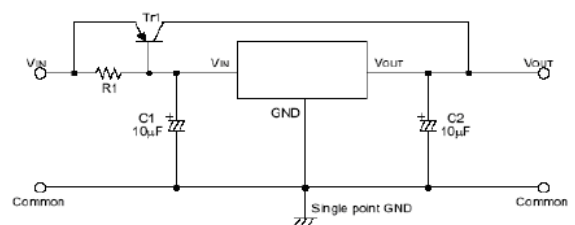
These values must therefore not be exceeded under any conditions.
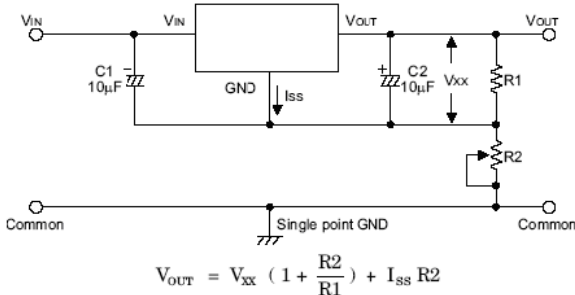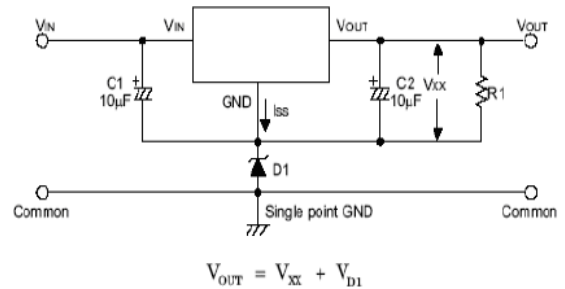
Typical Application Circuit

1、**Basic circuit**
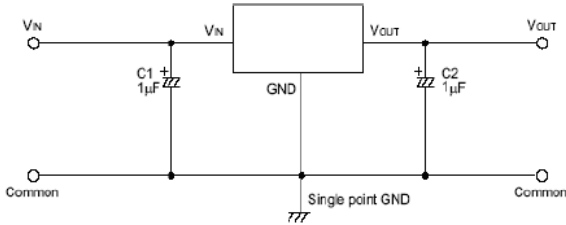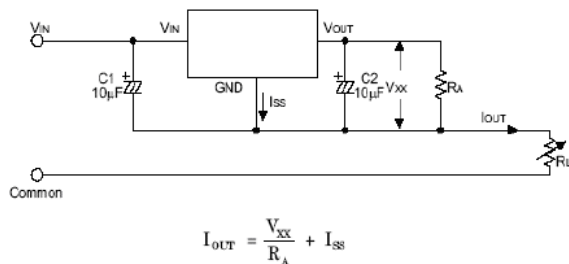

2、**High output current positive voltage regulator**

3、**Circuit for increasing output voltage**

$$V_{OUT} = V_{XX}\left(1 + \frac{R2}{R1}\right) + I_{SS}R2$$

4、**Circuit for increasing output voltage**

$$V_{OUT} = V_{XX} + V_{D1}$$

5、**Constant current regulator**

$$I_{OUT} = \frac{V_{XX}}{R_A} + I_{SS}$$

6、**Dual supply**

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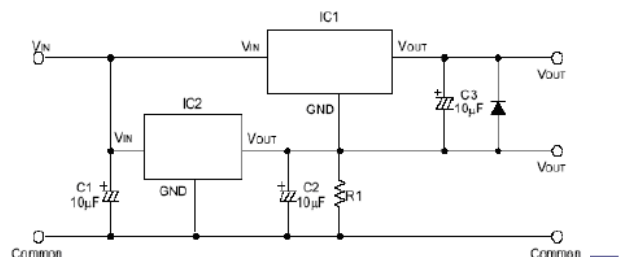
Caution ：
The above connection diagram and constant will not guarantee successful operation. Perform thorough evaluation using the actual application to set the constant.
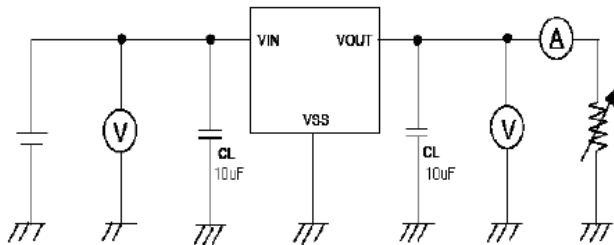
Application Conditions

◆Input capacitor (CIN): 1.0μF or more
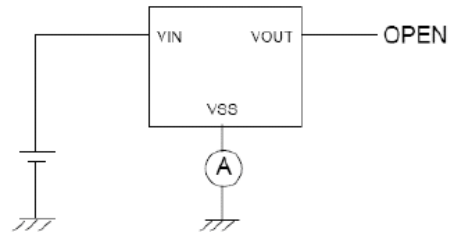◆Output capacitor (CL): .01μF or more (tantalum capacitor)
Caution A general series regulator may oscillate, depending on the external components selected. Check that no oscillation occurs with the application using the above capacitor.

Test Circuits

Electrical Characteristics

| Item	Symbol	Condition		Min	Typ	Max	Unit	Circuit
Output Voltage	VOUT(E)1	VIN =VOUT(S)+1.0 V, IOUT=10 mA		VOUT(S) ×0.98	VOUT(S)	VOUT(S) ×1.02	V	1
Output Current	IOUT	VIN≥VOUT(S)+1.0 V		280*1	—	—	mA	1
Dropout Voltage	Vdrop	IOUT=40mA	1.5 V ≤VOUT(S)≤2.5V	—	0.18	0.24	V	1
			2.6 V ≤VOUT(S)≤3.3V	—	0.12	0.20		
			3.4 V ≤VOUT(S)≤5.0V	—	0.08	0.16		
Line Regulations	VOUT1 △VIN*VOUT	VOUT(S)+0.5 V ≤VIN≤5.5 V IOUT=10 mA		—	0.05	0.2	%/V	
Input Voltage	VOUT 2	VIN=VOUT(S)+1.0 V 1.0 mA ≤IOUT ≤50 mA		—	20	40	mV	
Output Voltage Temperature Characteristics	VOUT △Ta*VOUT	VIN=VOUT(S)+1.0 V, IOUT=10 mA -40°C ≤Ta ≤85°C		—	±100	—	ppm/℃	
Supply Current	ISS1	VIN=VOUT(S)+1.0 V		0.8	1	2	μA	2
Input Voltage	VIN	——		1.8	—	6	V	—
Ripple-Rejection	|RR|	VIN=VOUT(S)+1.0 V，f=1.0 kHz Vrip=0.5 Vrms, IOUT=30 mA		—	40	—	dB	1
Short current	Ishort	VIN=VOUT(S)+1.5 V,		—	15	—	mA	1
Current Limiter	Ilim	VIN=VOUT(S)+1.5 V,		—	380	—	mA	1

Note1:

Lower input voltage and the output voltage, maximum output current will decrease. Example:
IOUT (max)=150mA @(VIN=2.5V,VOUT=1.5V)
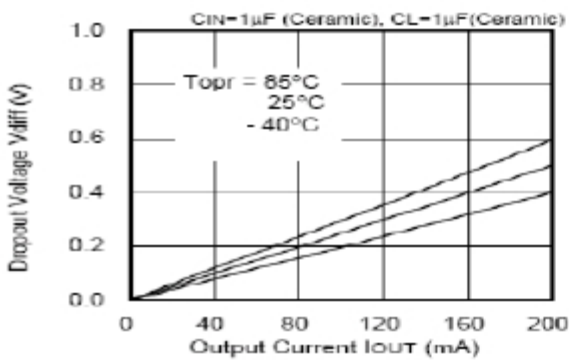
Typical Performance Characteristics（3.0V output）
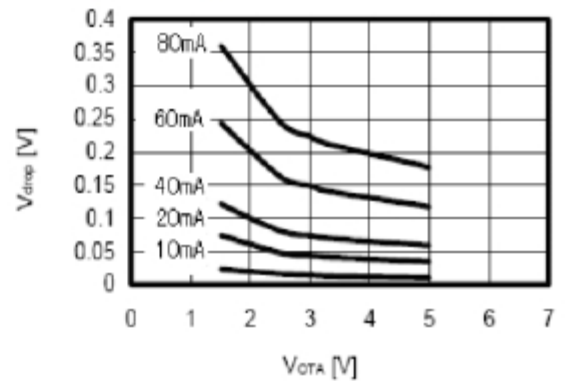
1、Output Voltage vs. Output Current
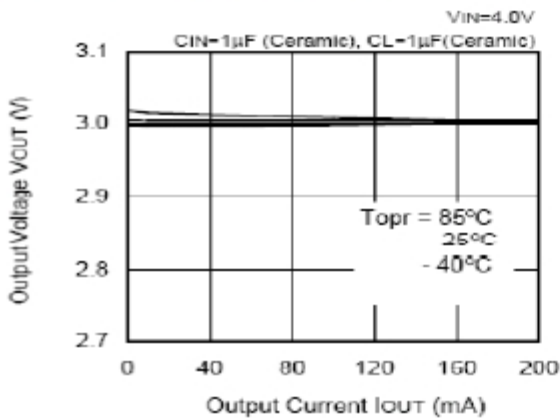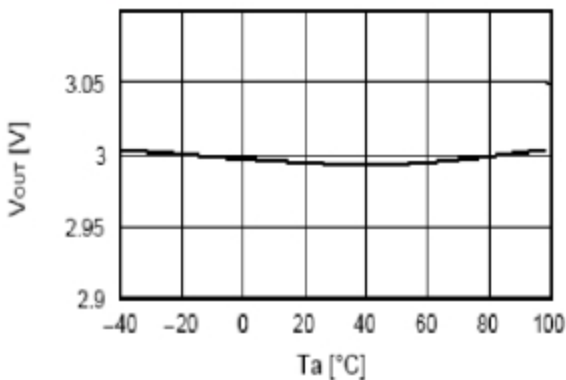

2、Output Voltage vs. Input Voltage
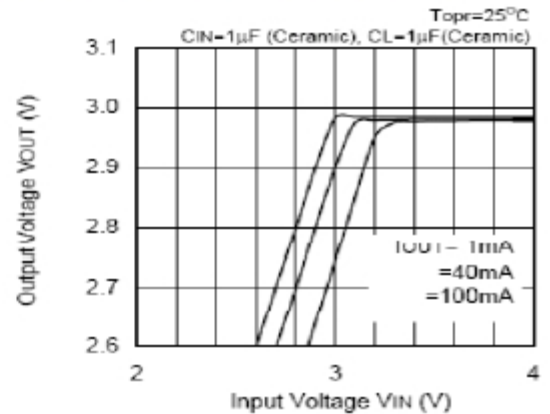
3、Dropout Voltage vs. Output Current
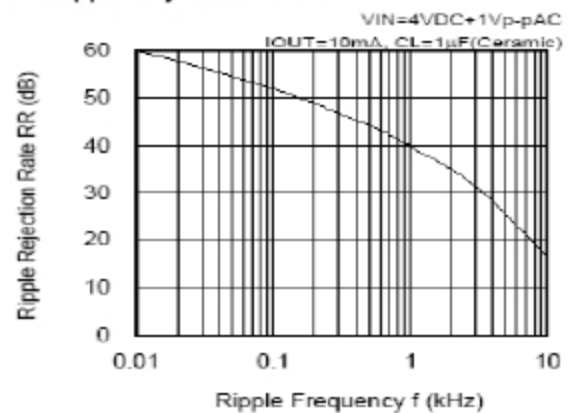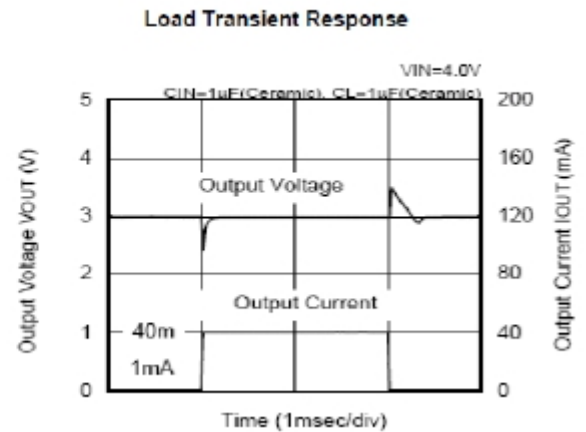

4、Dropout Voltage vs. Output Voltage

5、Output Voltage vs. Ambient Temperature

6、Ripple Rejection Rate

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7、Transient Response

Input Transient Response

Load Transient Response
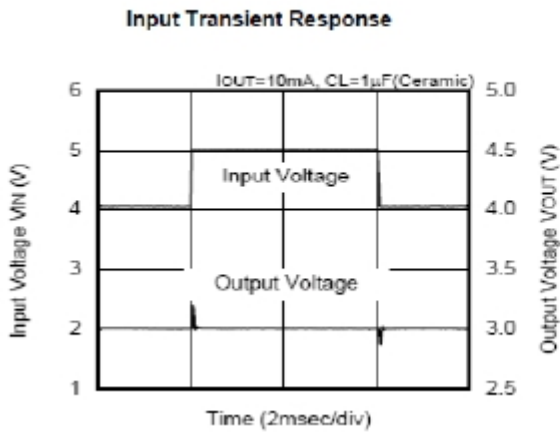
Package Information
SOT-89
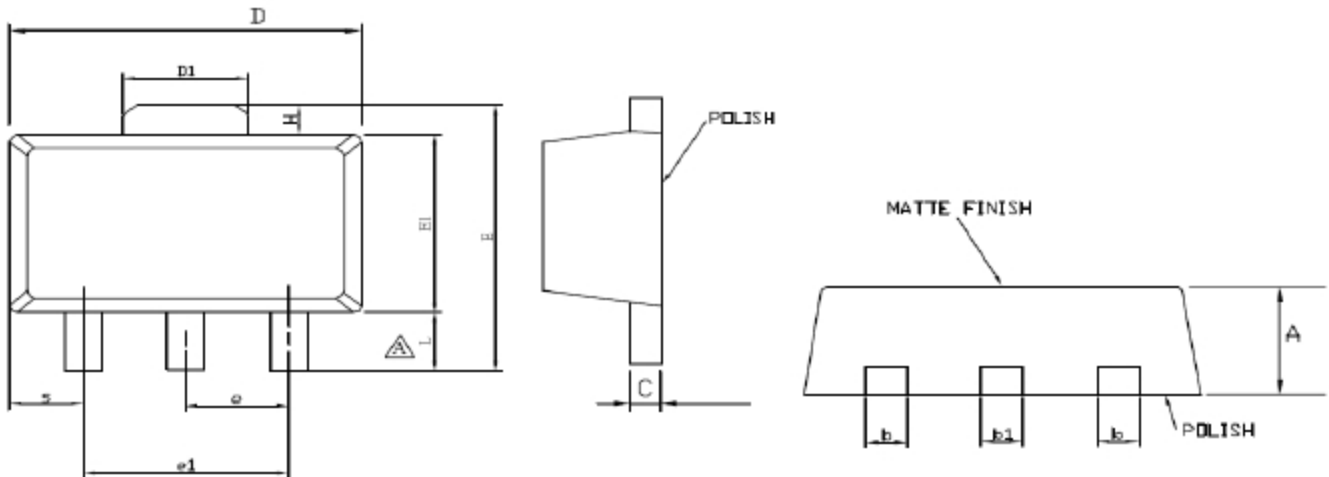
Symbol	Dimensions in millimeters			Dimensions in inches		
	Min	Nom	Max	Min	Nom	Max
A	1.40	1.50	1.60	0.055	0.059	0.063
L	0.89	1.04	1.20	0.0350	0.041	0.047
b	0.36	0.42	0.48	0.014	0.016	0.018
b1	0.41	0.47	0.53	0.016	0.018	0.020
C	0.38	0.40	0.43	0.014	0.015	0.017
D	4.40	4.50	4.60	0.173	0.177	0.181
D1	1.40	1.60	1.75	0.055	0.062	0.069
E	3.64	---	4.25	0.143	---	0.167
E1	2.40	2.50	2.60	0.094	0.098	0.102
e1	2.90	3.00	3.10	0.114	0.118	0.122
H	0.35	0.40	0.45	0.014	0.0169	0.018
S	0.65	0.75	0.85	0.026	0.030	0.034
e	1.40	1.50	1.60	0.054	0.059	0.063

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SOT353/SC70-5
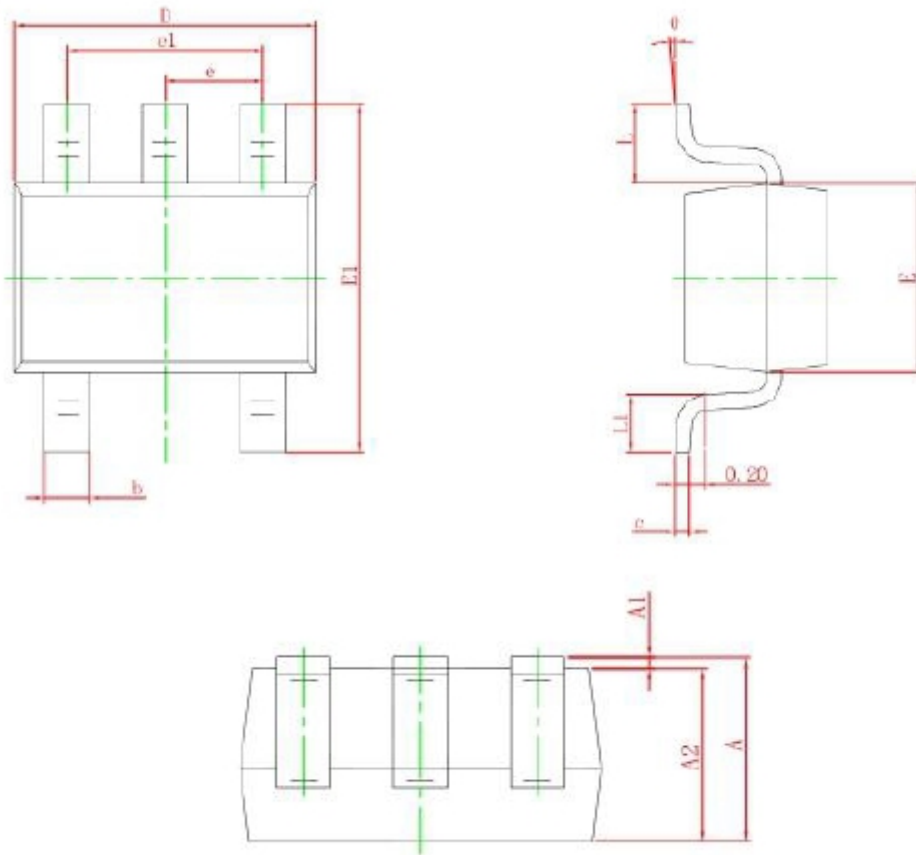
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

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SOT23-3L
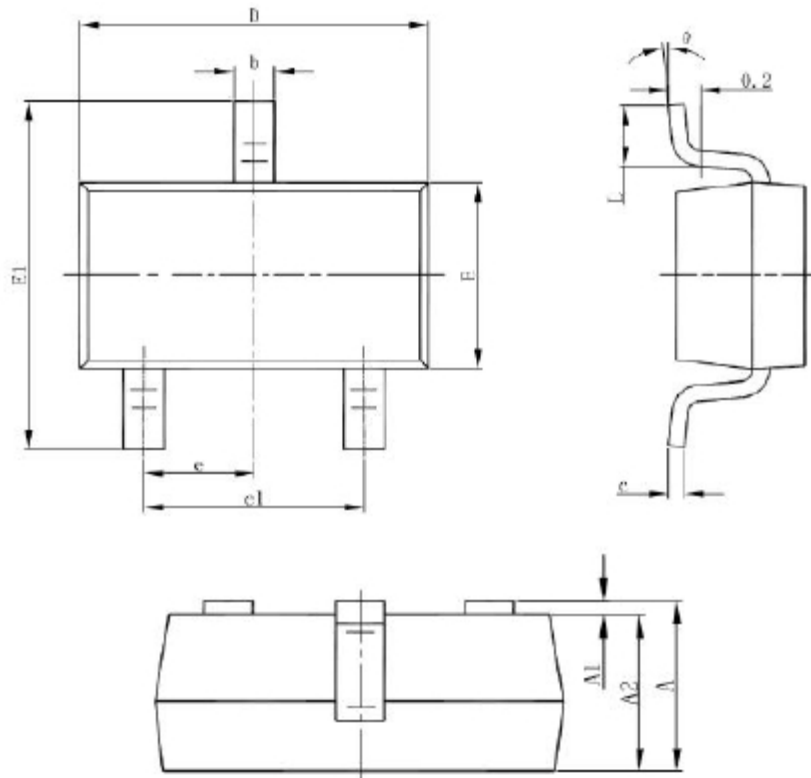
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

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SOT23-3B
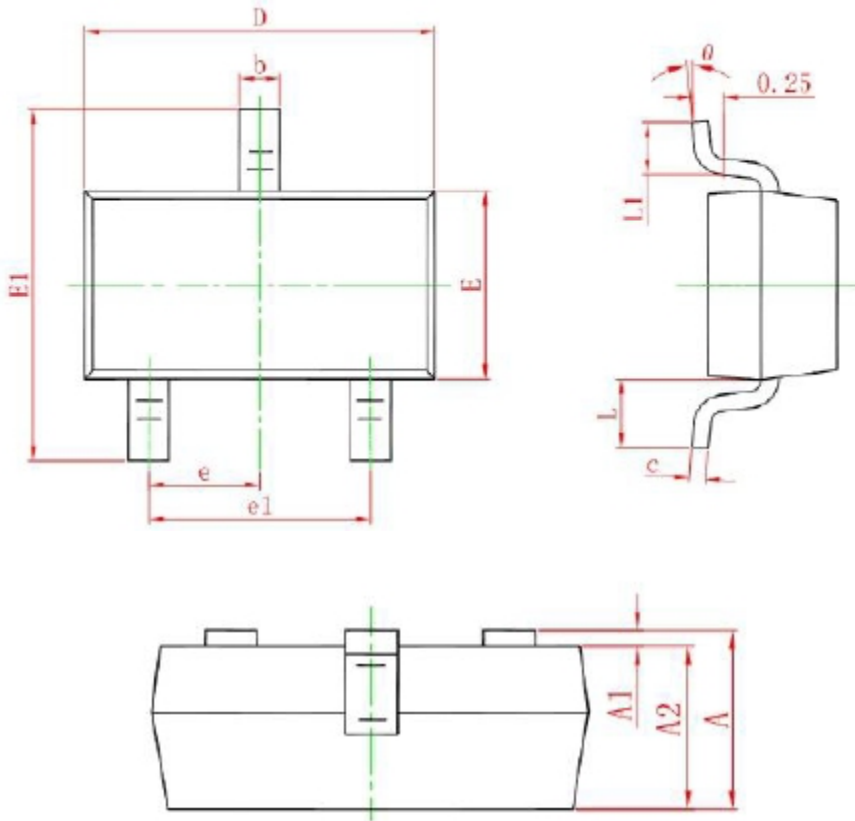
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		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°

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