

High Input Voltage & Low Power CMOS Voltage Regulators

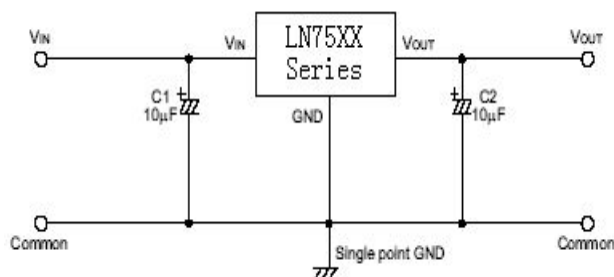
General Description

The LN75XX series is a set of three-terminal middle current low voltage regulator implemented in CMOS technology. They can deliver 120mA output current and allow an input voltage as high as 18V. They are available with several fixed output voltages ranging from 3.0V to 8.0V. CMOS technology ensures low voltage drop and low quiescent current. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain variable voltages and currents.

Applications

- Battery-powered equipment
- Communication equipment
- Audio/Video equipment

Typical Application Circuit



Features

- Low power : 2µA (typ.)
- Low voltage drop: 100mV @ Iout=1mA
- Low temperature coefficient : <±100ppm/°C
- High input voltage : 18V
- Maximum output current : 100mA
- Tiny packages : TO-92, SOT89-3 etc.

Package

- SOT-89-3L
- TO-92
- SOT23-3L
- SOT23-5L

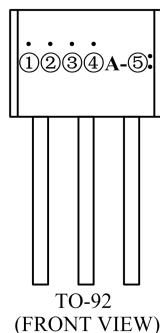
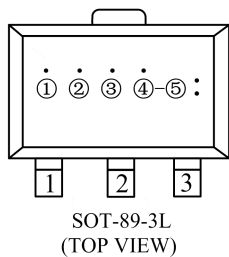
Ordering Information

LN75 ①②③④

Item	Symbol	Description
①②	30-80	Output voltage: Eg: ②=3, ③=0 represents 3.0V
③		Package type
	T	TO-92
	M	SOT23-3L
	F	SOT23-5L
④	P	SOT-89-3
		Device orientation
	R	Embossed Tape: Standard Feed
	L	Embossed Tape: Reverse Feed

■ Marking Rule

● SOT-89-3、TO-92



① ② Represents the product name

Symbol	Product Name
75	LN75◆◆◆◆

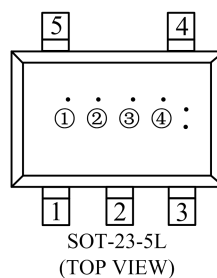
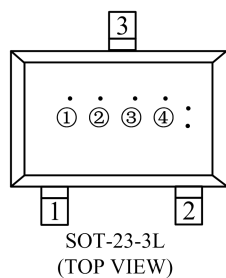
③ ④ Represents the output voltage

Symbol	Product Name
③	④
Output volatge: Eg: ②=3, ③=0 represents 3.0V	

⑤ Represents the assembly lot no.

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

● SOT23-3L、SOT23-5L



① Represents the product name

Symbol	Product Name
5	LN75◆◆◆◆

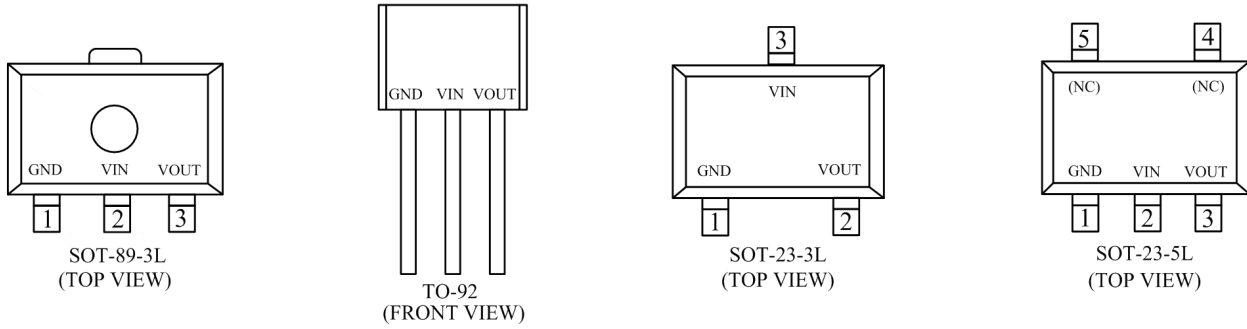
② ③ Represents the output voltage

Symbol	Product Name
②	③
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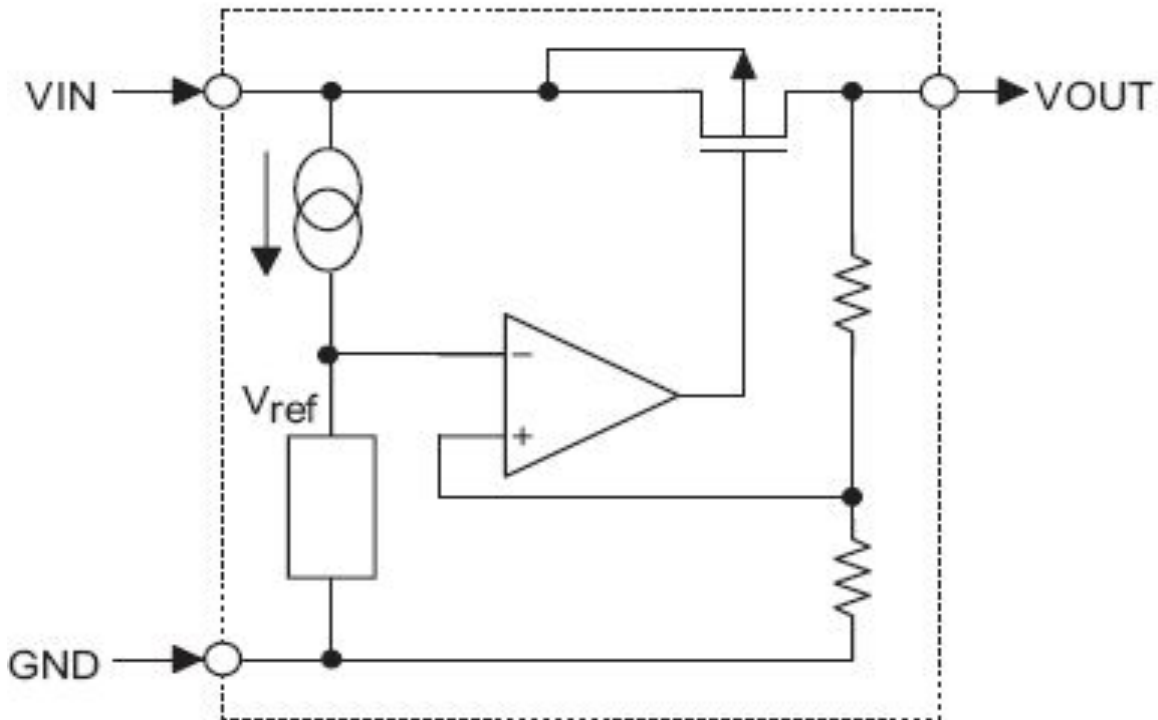
Pin Configuration



Pin Assignment

Pin Number				Pin Name	Function Description
TO-92	SOT23-5L	SOT23-3L	SOT-89-3		
1	1	1	1	GND	Ground
2	2	3	2	VIN	Power Input
3	3	2	3	VOUT	Output
-	4,5	-	-	NC	No Connected

Function Block Diagram



■ Absolute Maximum Ratings

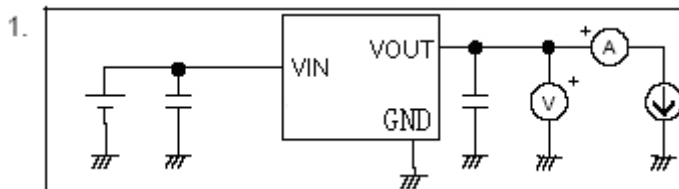
Parameter		Symbol	Maximum Rating	Unit
Input Voltage		V _{in}	-0.3~22	V
Power Dissipation	SOT-89-3	P _d	500	mW
	SOT23-3L/SOT23-5L		250	
	TO-92		300	
Operating Ambient Temperature		T _{opr}	-40~+85	°C
Storage Temperature		T _{stg}	-40~+125	°C

■ Electrical Characteristics

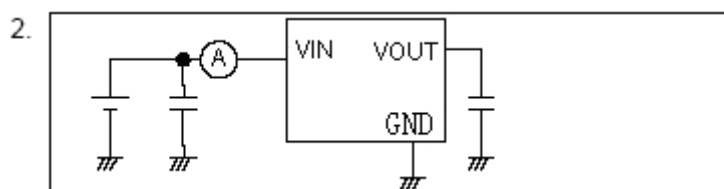
T_a=25°C

Symbol	Parameters	Test Conditions		Min.	Typ.	Max.	Unit	Testing Circuit
		V _{IN}	Conditions					
V _{OUT}	Output Voltage Tolerance	V _{OUT} +2V	I _{OUT} =10mA	0.98×V _{OUT}	V _{OUT}	1.02×V _{OUT}	V	1
I _{OUT}	Output Current	V _{OUT} +2V	-	80	100	120	mA	3
ΔV _{OUT}	Load Regulation	V _{OUT} +2V	1mA≤I _{OUT} ≤50mA	-	60	150	mV	1
V _{DIF}	Voltage Drop	-	I _{OUT} =1mA	-	100	-	mV	1
I _{SS}	Current Consumption	V _{OUT} +2V	No Load	-	2	4	μA	2
I _{short}	Output Shorted Current	V _{OUT} +2V	V _{out} Connected to ground	20	-	80	mA	2
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line Regulation	-	V _{OUT} +2V≤V _{IN} ≤18 I _{OUT} =1mA	-	0.2	-	%/V	1
V _{IN}	Input Voltage	-	-	-	-	22	V	-
$\frac{\Delta V_{OUT}}{\Delta T_a}$	Temperature Coefficient	V _{OUT} +2V	I _{OUT} =10mA -40°C≤T _a ≤85°C	-	$\pm 0.45 \times \frac{V_{OUT}}{3}$	-	$\frac{mV}{°C}$	1

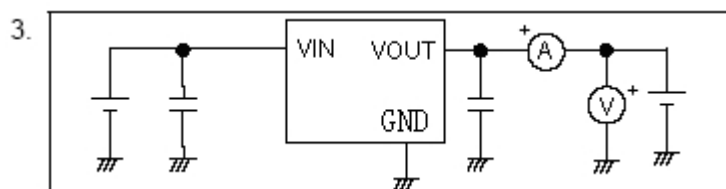
■ Testing Circuits



电路 1



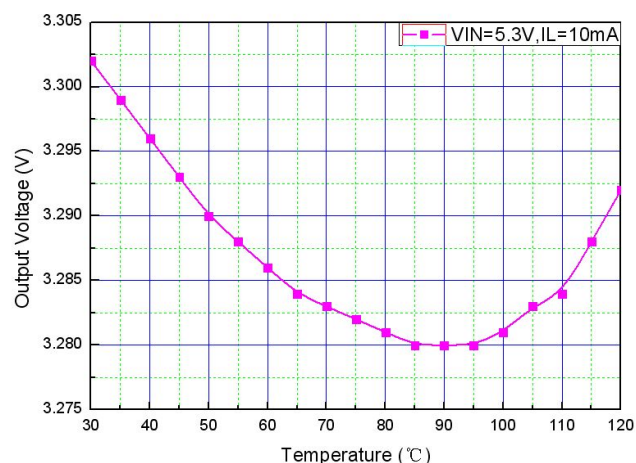
电路 2



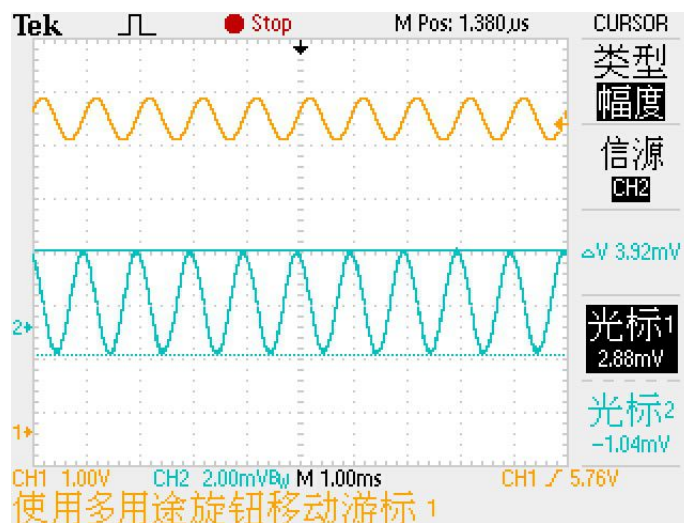
电路 3

■ Typical Performance Characteristics

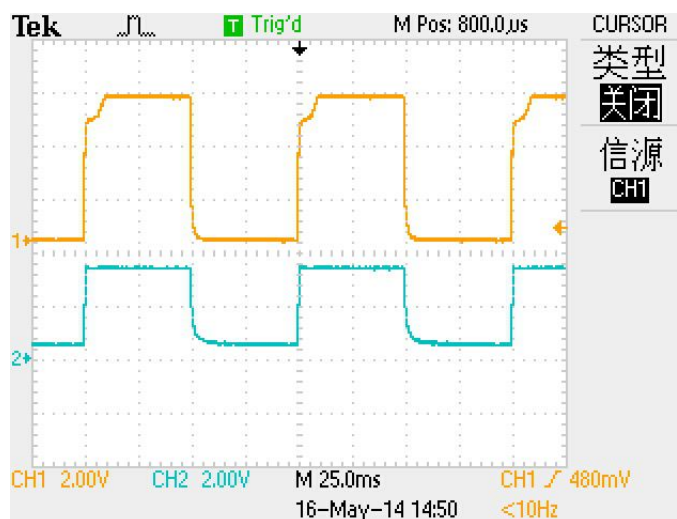
1. Output Voltage VS Temperature ($V_{IN}=5.3V$, $C_{IN}=C_{OUT}=10\mu F$, $I_{OUT}=30mA$)



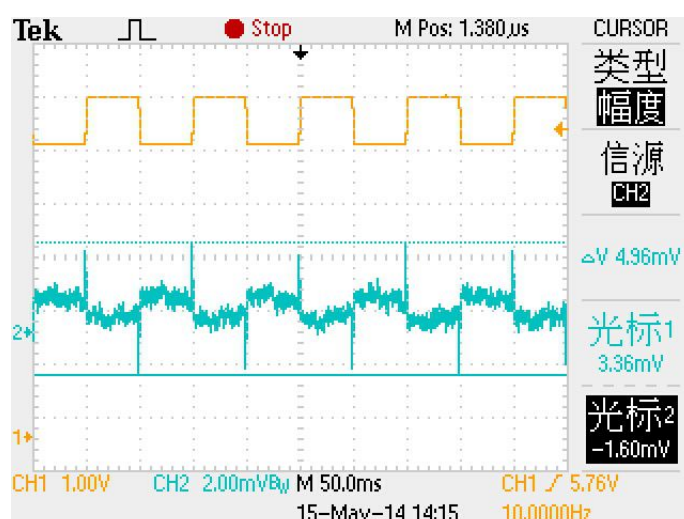
2. Power Supply Rejection Ratio ($V_{IN}=5.3V-6.3V$, $I_{OUT}=10mA$, $C_{IN}=C_{OUT}=10\mu F$, $V_{PP}=0.5V$, $F=1KHz$)



3. Overshoot Voltage (VIN=0-5.3V, CIN=COU=10uF)



4. Line Regulation (VIN=5.3V-6.3V, Iout=10mA, CIN=COU=10uF)



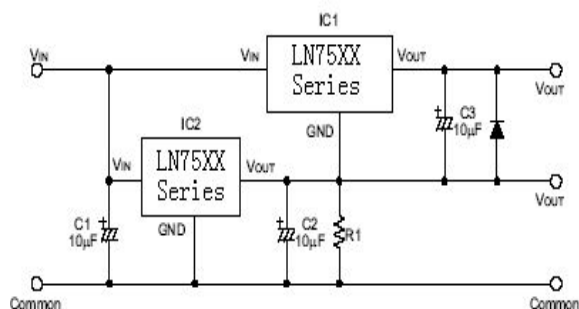
5. Load Regulation (VIN=5.3V, CIN=COU=10uF, Iout=10-70-10mA)



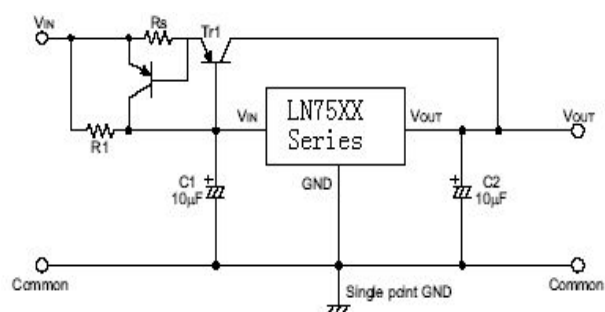
使用多用途旋钮移动游标 1

Typical Application

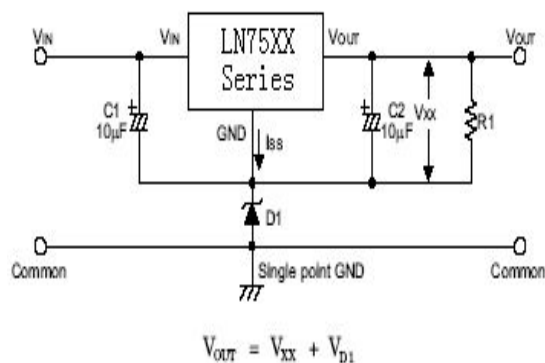
1、Dual Output



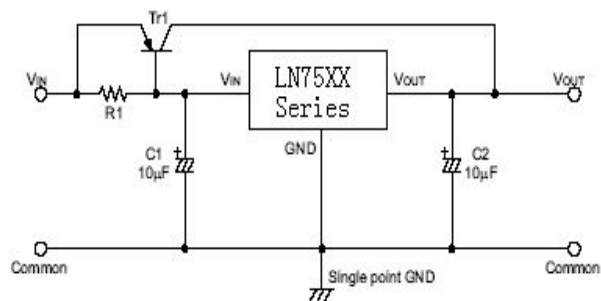
3、Short-circuit protection for Tr1



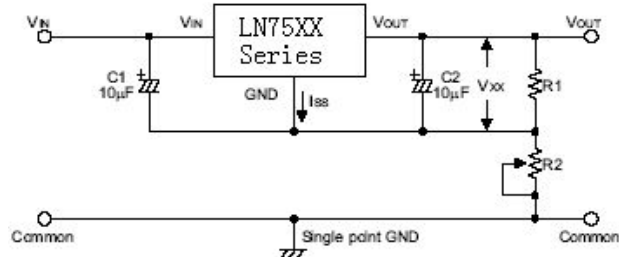
5、Circuit B for increasing output voltage



2、High output current positive voltage regulator

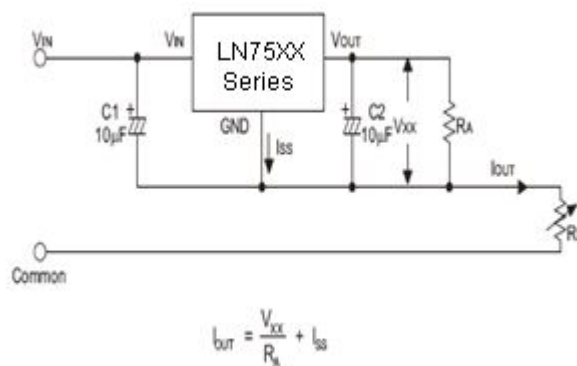


4、Circuit A for increasing output voltage



$$V_{OUT} = V_{XX} \left(1 + \frac{R_2}{R_1} \right) + I_{SS} R_2$$

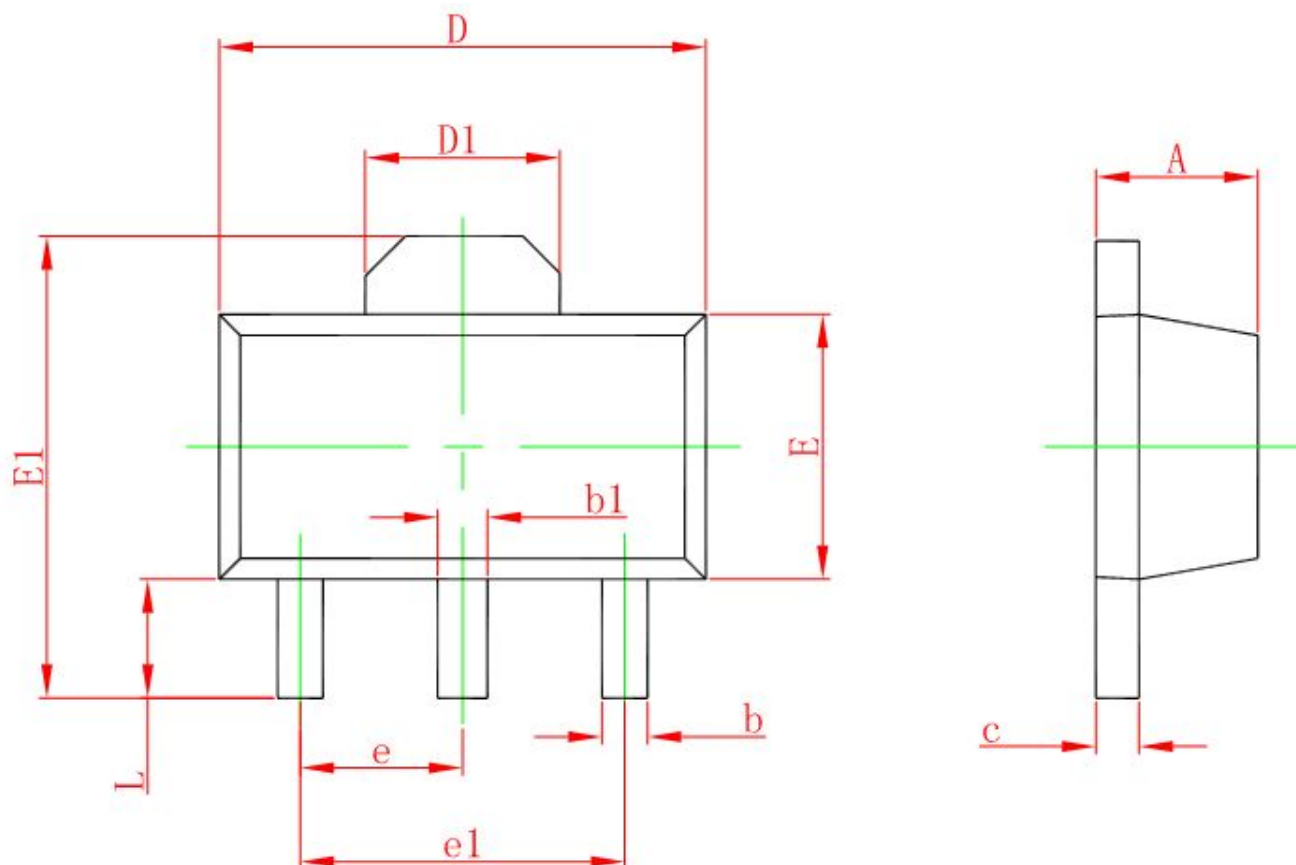
6、Constant Current Regulator



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

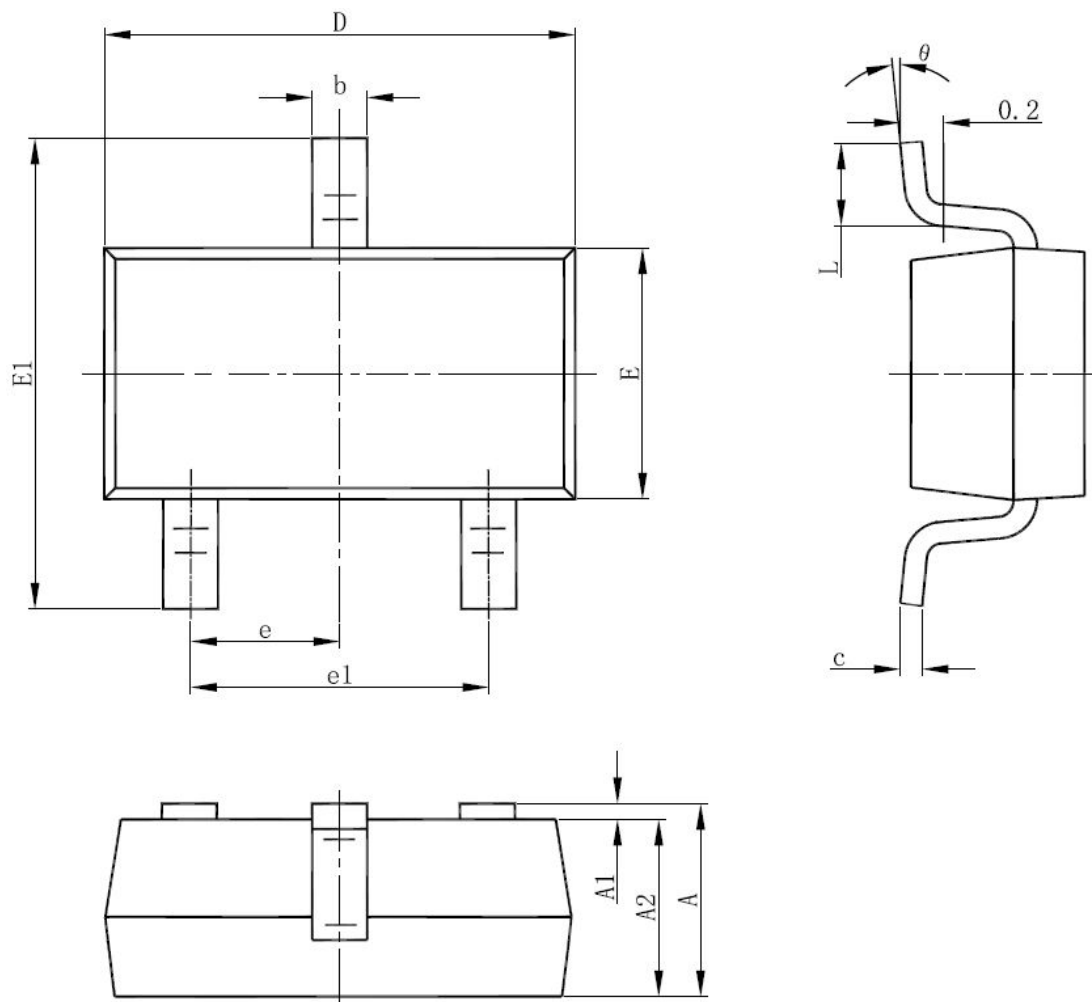
Package Information

- SOT-89-3L



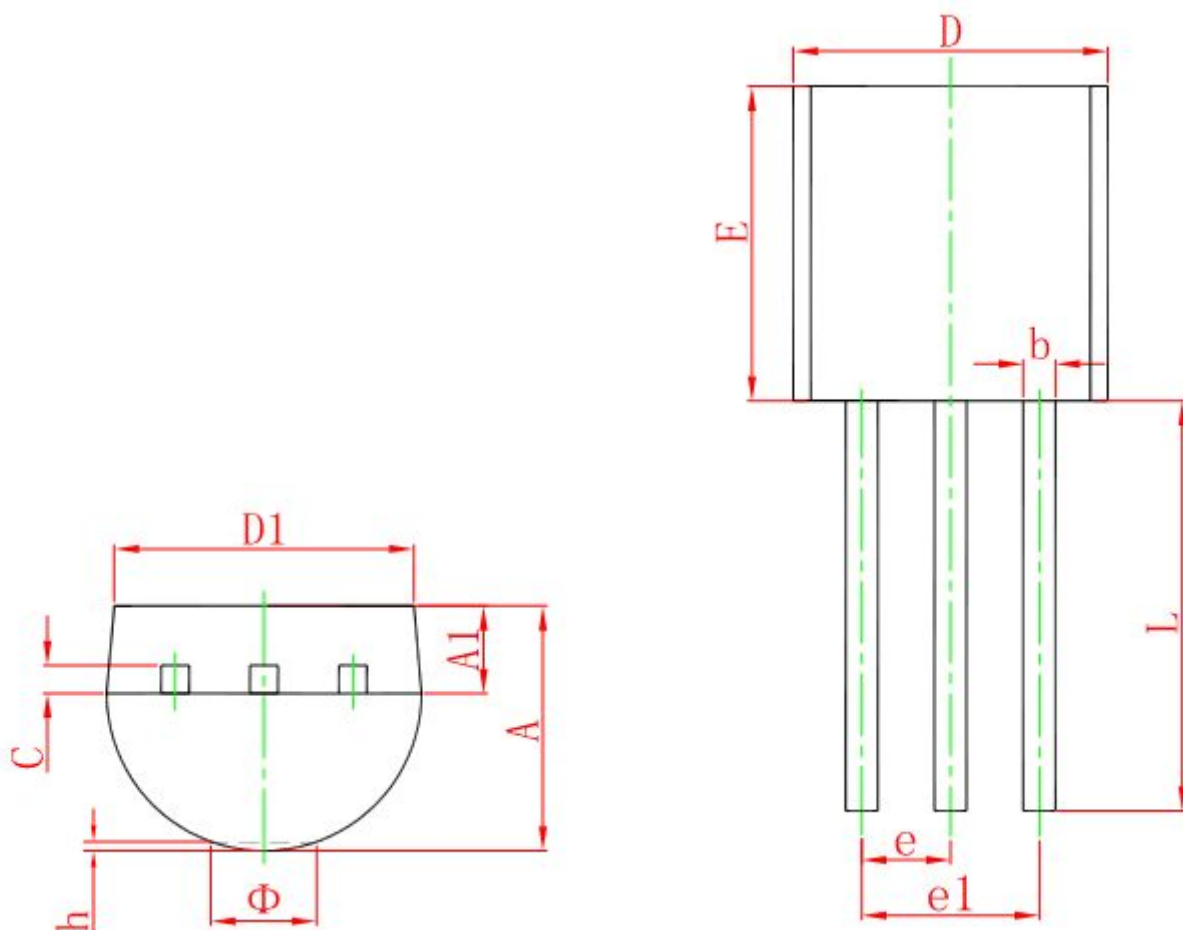
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP.		0.118 TYP.	
L	0.900	1.200	0.035	0.047

● SOT23-3L



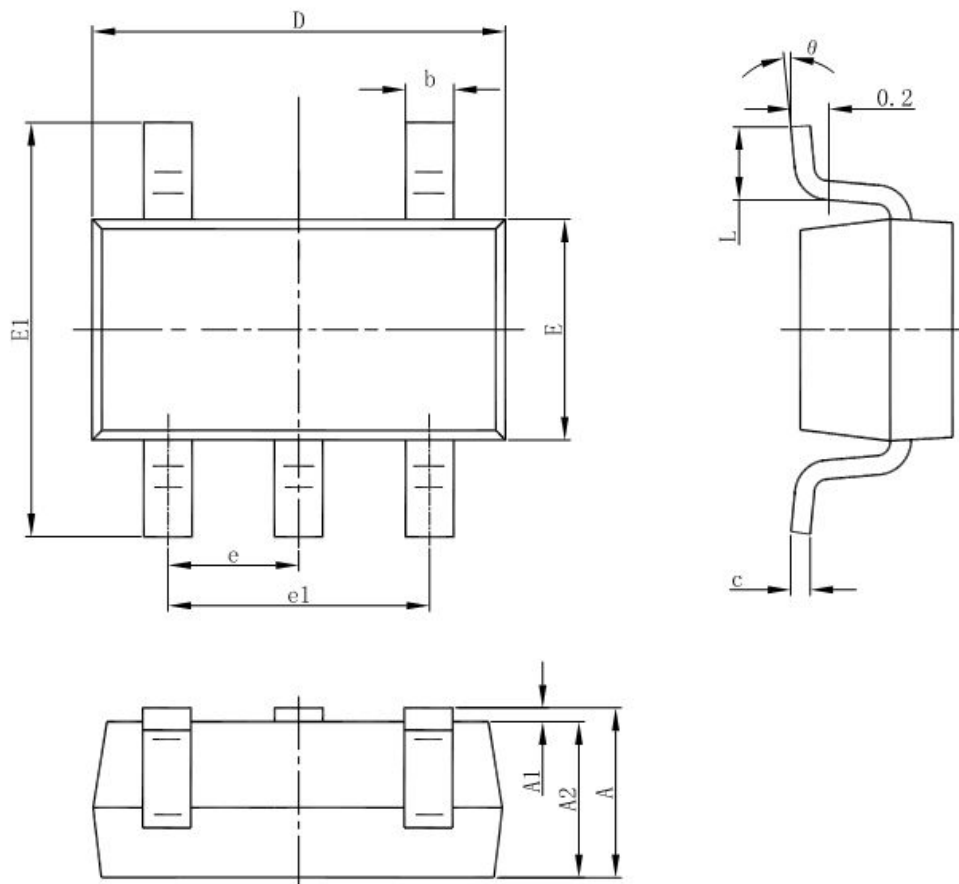
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)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

● TO-92



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.300	3.700	0.130	0.146
A1	1.100	1.400	0.043	0.055
b	0.380	0.550	0.015	0.022
c	0.360	0.510	0.014	0.020
D	4.400	4.700	0.173	0.185
D1	3.430		0.135	
E	4.300	4.700	0.169	0.185
e	1.270 TYP		0.050 TYP	
e1	2.440	2.640	0.096	0.104
L	14.100	14.500	0.555	0.571
Φ		1.600		0.063
h	0.000	0.380	0.000	0.015

● SOT23-5L



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°