Synchronous DC-DC Boost Converter

■ General Description

XT1861 series is a high efficiency, low ripple , high frequency PFM control DC-DC boost converter.

XT1861 series requires only three external components, the device can change the low voltage input of battery step-up into output voltages for electronic devices.

■ Applications

- 1 to 3 batteries of electronic equipment
- Electronic dictionaries, digital cameras
- LED flashlights, LED Light,
- Blood pressure monitors, MP3, remote control toys,
- Wireless headsets,wireless mouse, keyboard
- Medical devices, anti-lost alarm,
- Car alarm,charger,VCR,PDA and other handheld electronic devices

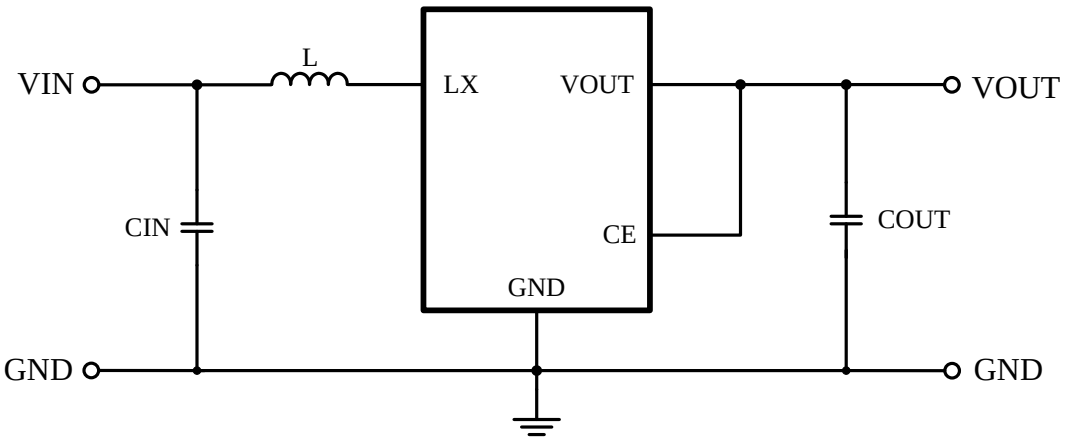
■ Features

- Maximum efficiency: 94%
- Maximum operating frequency: 300KHz
- Low Quiescent Current: 15μA
- Output Voltage: 1.8V ~ 5.0V (step 0.1V)
- Output Accuracy: ± 2.5%
- Input voltage: 0.9V ~ 6.5V
- low ripple and low noise
- Small volume

■ Package

- SOT-23-3L
- SOT-23-3B
- SOT-23-5L
- SOT-89-3L
- TO-92S
- TO-92

■ Typical Application Circuit



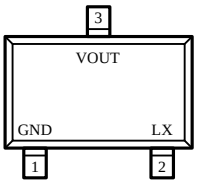
Note: CIN=10μF, COUT=22 μF, L=10uH.

■ Ordering Information

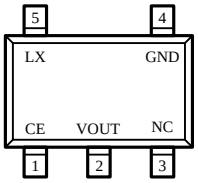
XT1861 B①②③④⑤

Designator	Symbol	Description
①②	18-50	Output Voltage: e.g. 33= 3.3V etc.
③	2	Precision：2%
④	M	Package Types: SOT-23-3L
	V	Package Types: SOT-23-3B
	S	Package Types: SOT-23-5L
	P	Package Types: SOT89-3L
	T	Package Types: TO-92S
	L	Package Types: TO-92
⑤	R	Embossed Tape :Standard Feed
	L	Embossed Tape :Reverse Feed

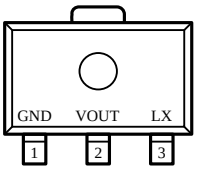
■ Pin Assignment



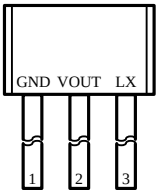
SOT-23-3L
(TOP VIEW)



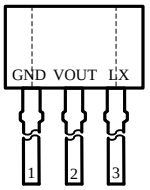
SOT-23-5L
(TOP VIEW)



SOT-89-3L
(TOP VIEW)



TO-92
(FRONT VIEW)



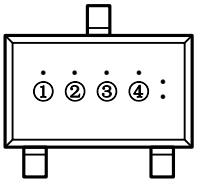
TO-92S
(FRONT VIEW)

■ Functional Pin Description

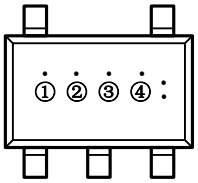
Pin Number					Pin Name	Function Description
SOT-23-3L	SOT-23-5L	SOT-89-3L	TO-92S	TO-92		
2	5	3	3	3	LX	Switch pin
3	2	2	2	2	VOUT	Output pin
—	1	—	—	—	CE	Chip enable pin
1	4	1	1	1	GND	Ground
—	3	—	—	—	NC	NC

■ Marking Rule

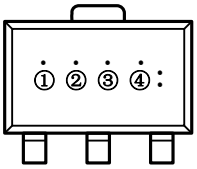
- **SOT-89-3L ,SOT-23-3L/B,SOT-23-5L,SOT89-3L,TO-92S,TO-92**



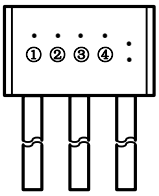
SOT-23-3L
(TOP VIEW)



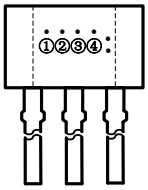
SOT-23-5L
(TOP VIEW)



SOT-89-3L
(TOP VIEW)



TO-92
(FRONT VIEW)



TO-92S
(FRONT VIEW)

① Represents the product name

Symbol	Product Name
A	XT1861B*****

② Represents the output voltage range

Output Voltage(V)	0.1～3.0	3.1～6.0
300KHz	T	X
180KHz	U	Y
100KHz	V	Z

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	-	4.2	-	V	2.7	5.7	-
C	-	4.3	-	X	2.8	5.8	-
D	-	4.4	-	Y	2.9	5.9	-
E	1.5	4.5	-	Z	3	6.0	-

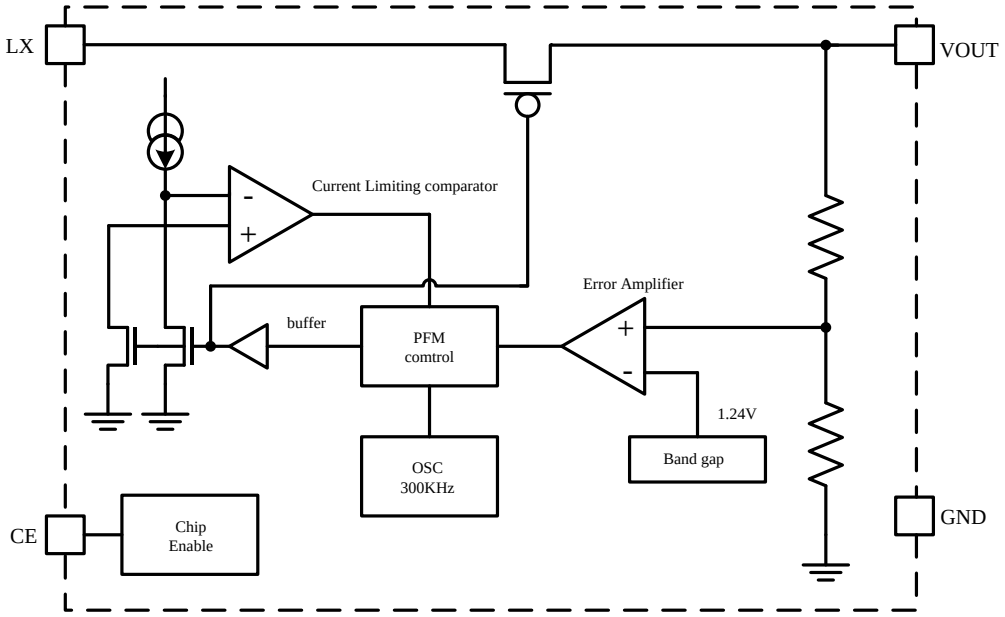
④ Represents the assembly lot No.

0-9，A-Z; 0-9，A-Z mirror writing，repeated（G，I，J，O，Q，W exception）

For example:A6TX, represents the output voltage of XT1861B552*R 5.5V。

Notes: "• "represents the batch number. "• "says" 1 ", dot not said "0"; For example: dot on the top of the "③", and the top right of the "④", said "010010", used to track the product batch.

■ Function Block Diagram



■ Absolute Maximum Ratings

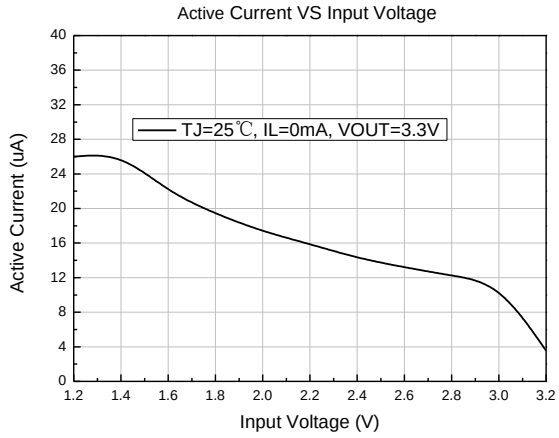
Parameter	Symbol	Description	Typical	Unit
Input voltage	V_{max}	Maximum voltage supply for V_{OUT} and V_{LX} pin	6.5	V
Current	ILXmax	Maximum current in LX pin	1000	mA
Power dissipation	P_D	SOT-23-3L maximum power dissipation	350	mW
		SOT-23-3Bmaximum power dissipation	250	mW
		SOT-23-5L maximum power dissipation	350	mW
		SOT89-3L maximum power dissipation	500	mW
		TO-92S maximum power dissipation	500	mW
Temperature	Tmin-max	Operating Ambient Temperature	-40—85	°C
	Tstorage	Storage Temperature	-40—165	
ESD	V_{ESD}	Body static pressure values	2000	V

■ Electrical Characteristics

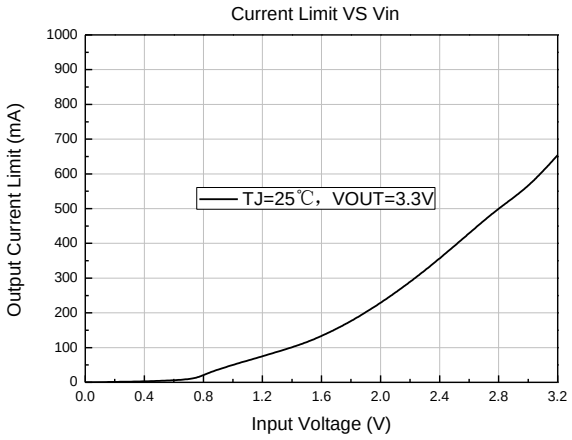
Parameter	Symbol	Test condition	Min	Typ	Max	Units
Output voltage accuracy	$\triangle V_{OUT}$	-	-2.5	-	2.5	%
Maximum input voltage	VIN_{MAX}	-	0.9	-	6.5	V
Start voltage	V_{START}	I_{LOAD}=1mA,V_{IN}:0→2V	-	-	0.8	V
Hold voltage	V_{HOLD}	I_{LOAD}=1mA,V_{IN}:2→0V	0.6	-	-	V
Oscillation signal duty cycle	DC_{OSC}	-	-	-	78	%
Efficiency	η	-	-	90	94	%
Limit current	I_{LIMIT}	-	600	800	1000	mA
Input current (No load)	L_{INO}	V_{IN}=1.8V,V_{OUT}=3.0V	-	15	-	μA

■ Typical Performance Characteristics

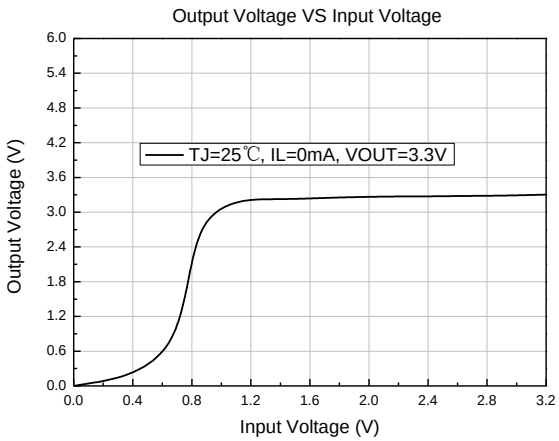
1. Active Current VS Input Voltage



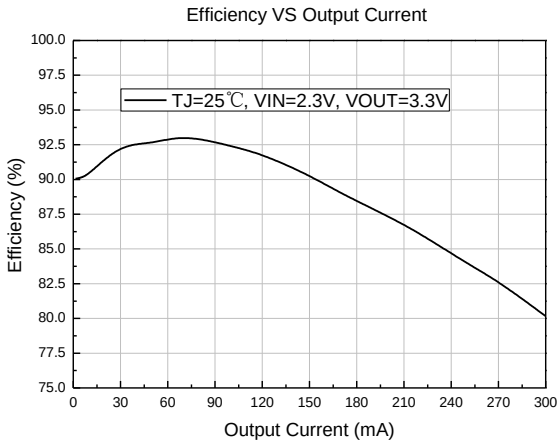
2. Output Current Limit VS Vin



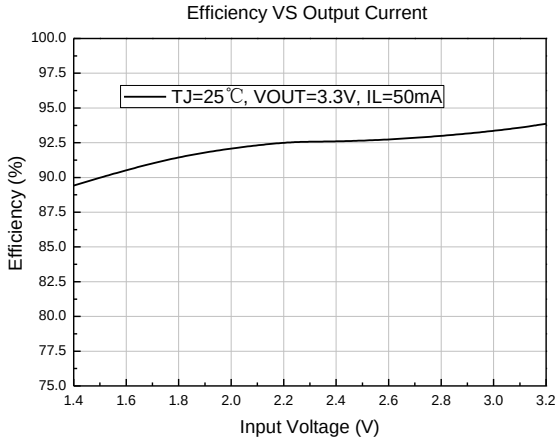
3. Output Voltage VS Input Voltage



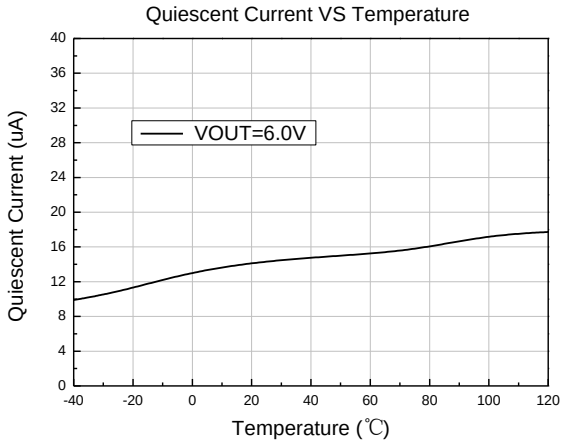
4. Efficiency VS Output Current



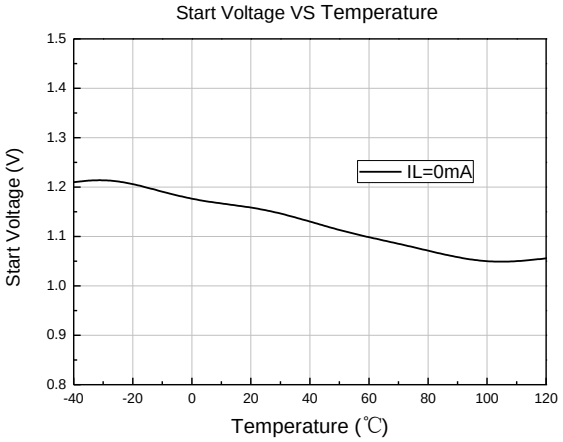
5. Efficiency VS Output Current



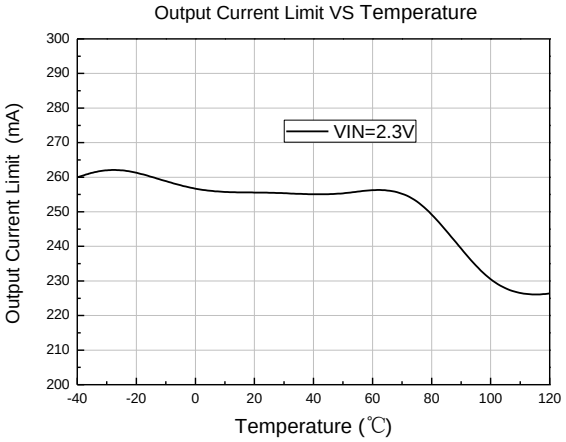
6. Quiescent Current VS Temperature



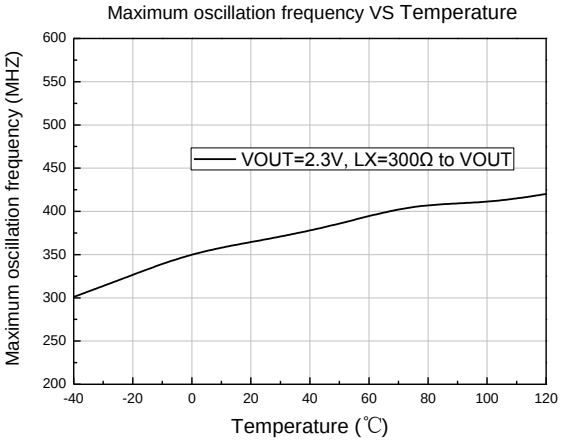
7. Start Voltage VS Temperature



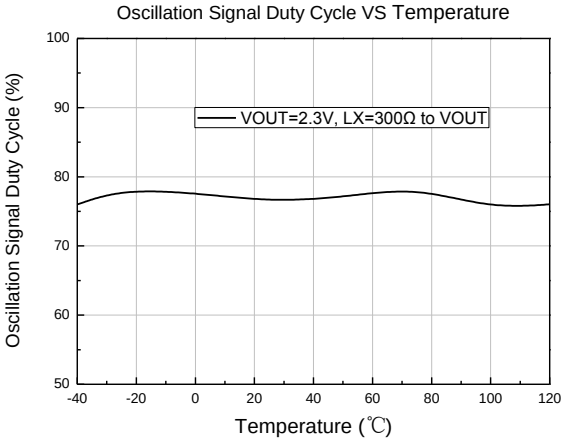
8. Output Current Limit VS Temperature



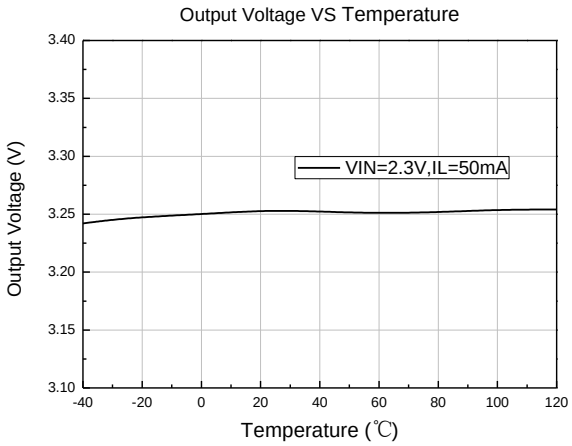
9. Maximum oscillation frequency VS Temperature



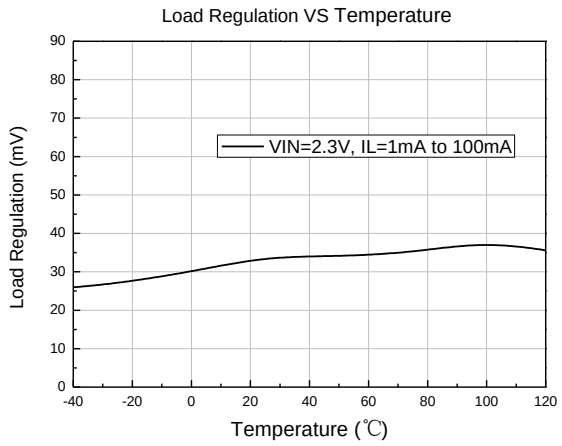
10. Oscillation Signal Duty Cycle VS Temperature



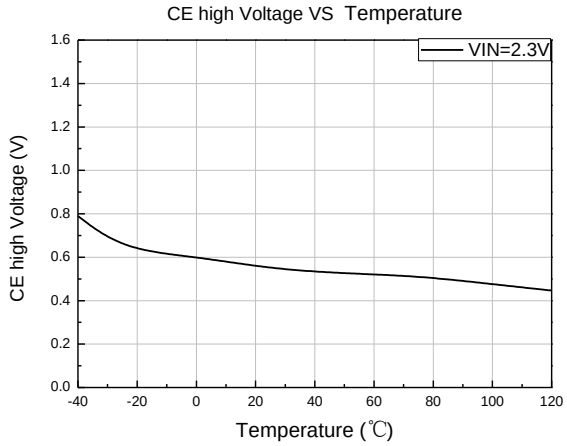
11. Output Voltage VS Temperature



12. Load Regulation VS Temperature

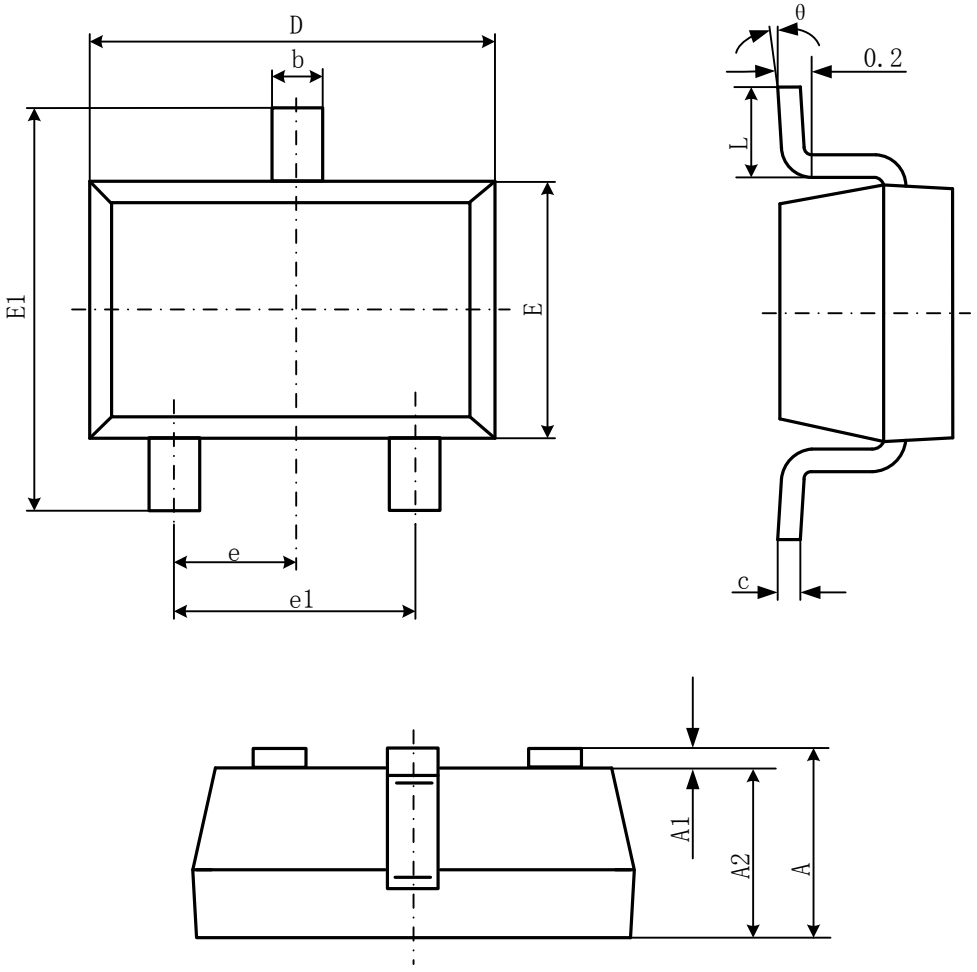


13. CE high Voltage VS Temperature



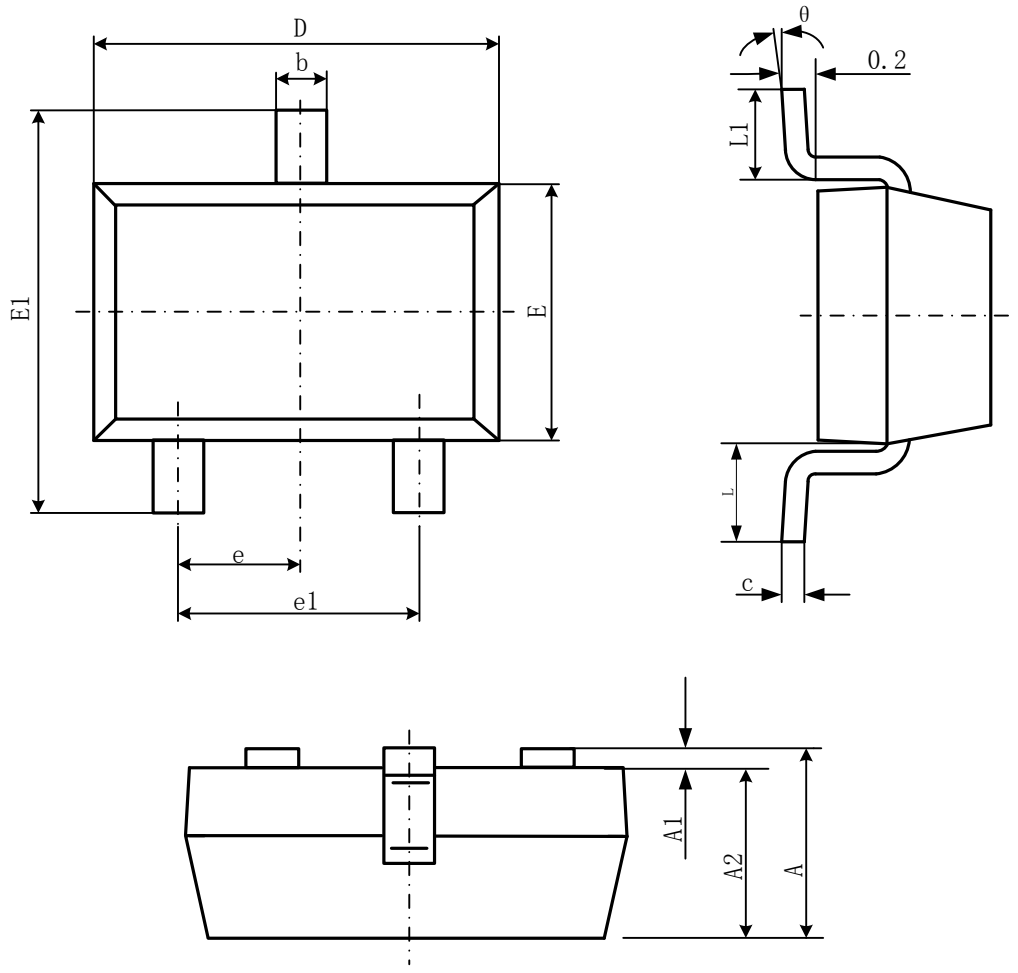
■ Package Information

- **SOT-23-3L**



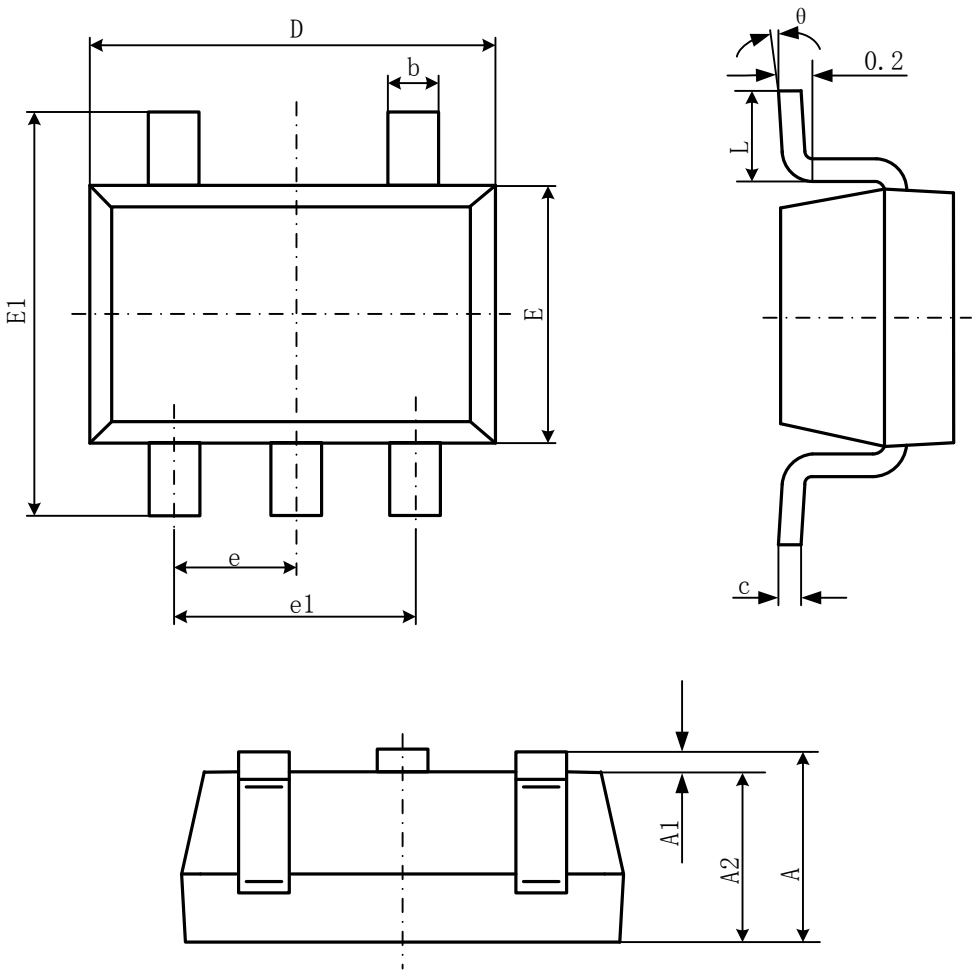
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
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**



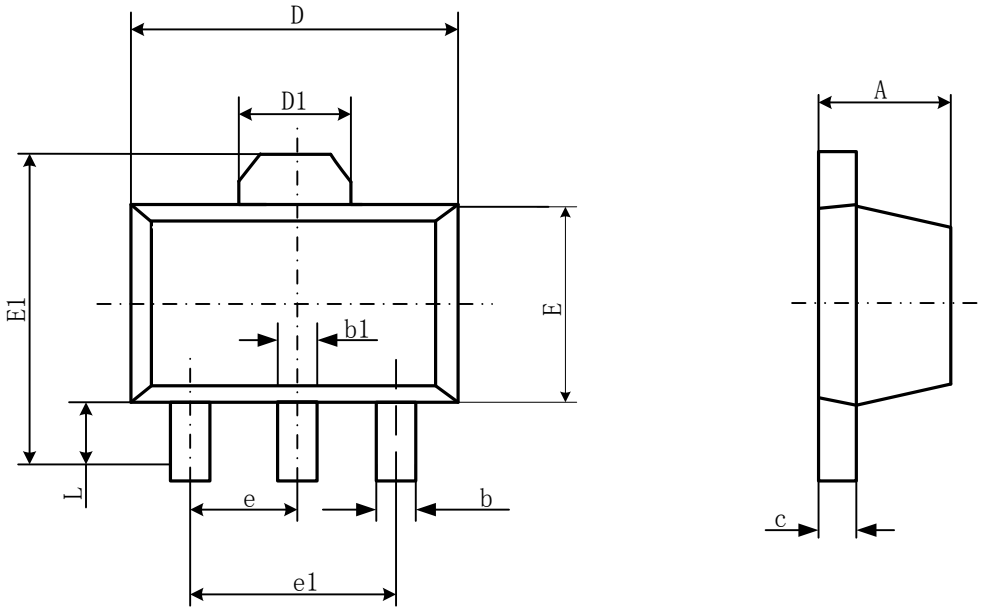
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)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

- **SOT-23-5L**



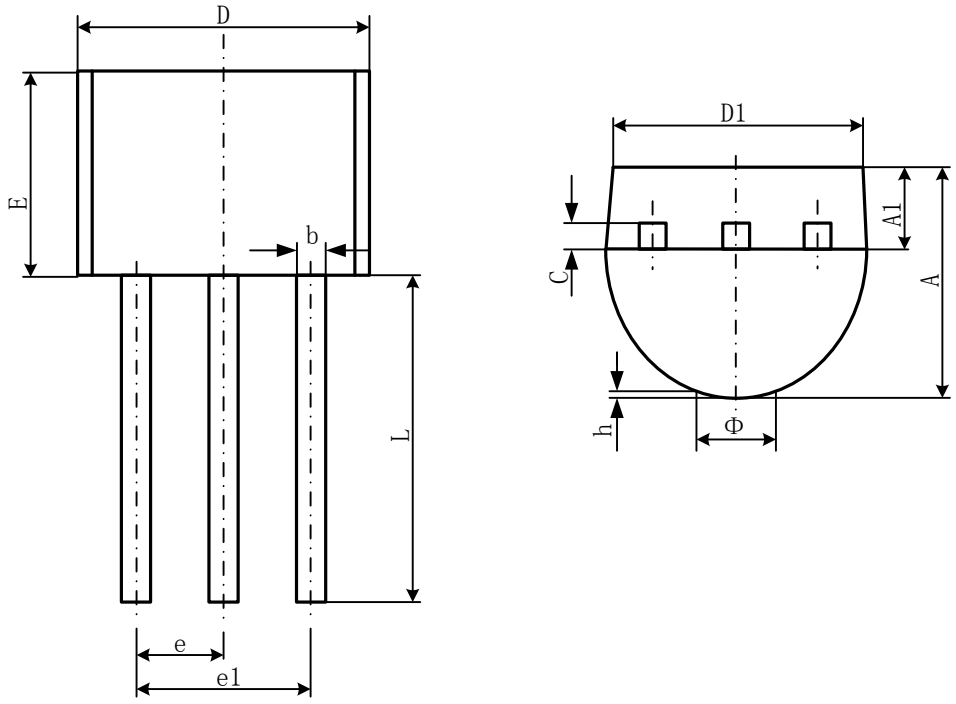
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)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

- **SOT-89-3L**



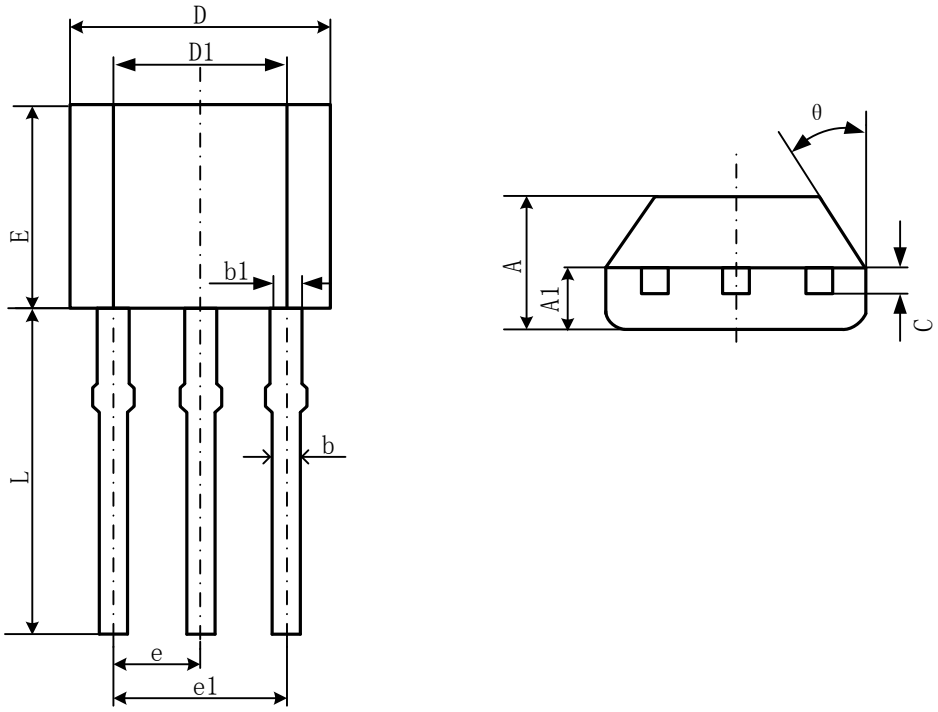
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.400	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550REF.		0.061REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500TYP		0.060TYP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

- **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	1.270TYP		0.050TYP	
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

- **TO-92S**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.420	1.620	0.056	0.064
A1	0.660	0.860	0.026	0.034
b	0.350	0.480	0.014	0.019
b1	0.400	0.550	0.016	0.022
c	0.360	0.510	0.014	0.020
D	3.900	4.100	0.154	0.161
D1	2.280	2.680	0.090	0.106
E	3.050	3.250	0.120	0.128
e	1.270TYP		0.050TYP	
e1	2.440	2.640	0.096	0.104
L	15.100	15.500	0.594	0.610
θ	45° TYP		45° TYP	