

# SNE2301 300mA, Ultra Low Consumption, Low Dropout, CMOS LDO

## Features

- Input voltage: 2.5V~6.5V
- Output range: 1.8V~3.6V (customized by every 0.1V step)
- Output current: 300mA @ $V_{IN} - V_{OUT} = 0.5V$
- Dropout voltage: 180mV@ $I_{OUT} = 100mA$
- Quiescent current: 1 $\mu A$  Typ.
- Recommend capacitor: 1 $\mu F$

## Applications

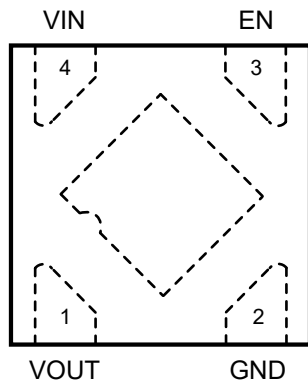
- Reference voltage source
- Toys
- Bluetooth, wireless handsets
- Low Consumption Device
- Others portable electronic device

## General Description

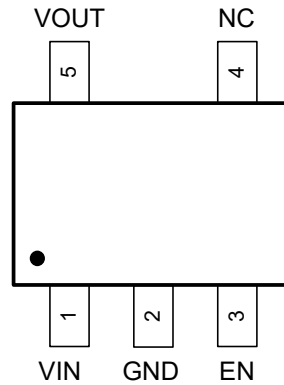
The SNE2301 series are low dropout linear regulators and optimized to provide a high performance solution for battery power system to delivery low quiescent current. The device offer a new level of cost effective performance in cellular phones, laptop and notebook computers, and other portable devices. SNE2301 can provide output value in the range of 1.8V~3.6V by every 0.1V step.

The SNE2301 series are designed to make use of low cost ceramic capacitors which ensure the stability of the output current, and enhance the efficiency in order to prolong the battery life of those portable devices.

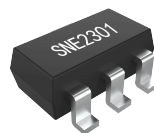
The SNE2301 regulators are available in UTDFN-1x1-4L, SOT23-5 packages. Standard products are Pb-free and Halogen-free.



UTDFN- 1x1-4L (Top View)



SOT-23-5 (Top View)

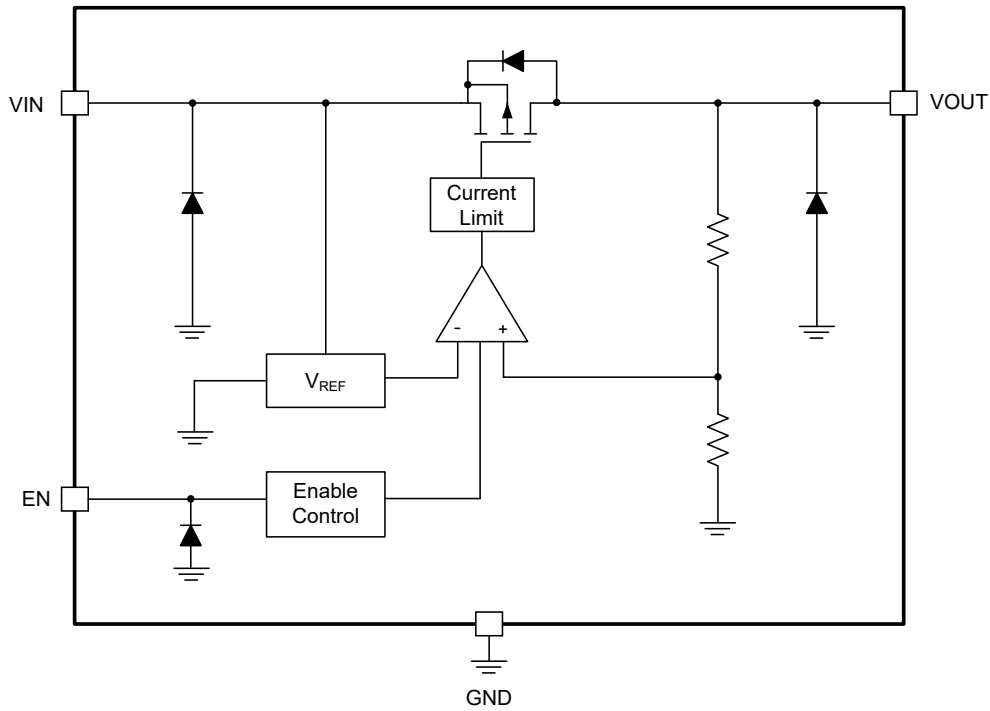


### Ordering Information

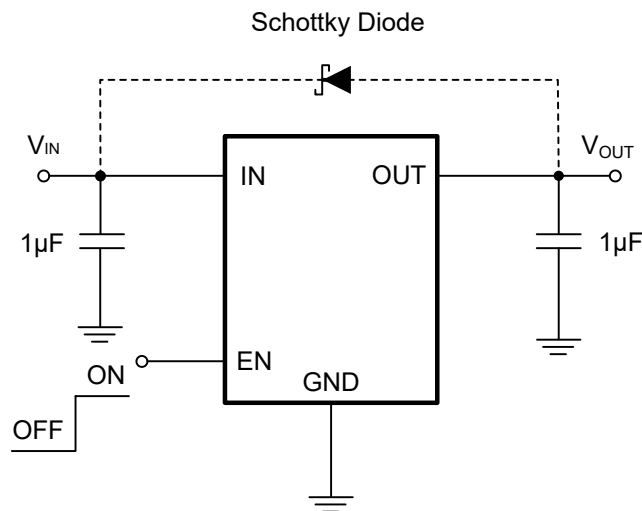
Part Number	V <sub>OUT</sub> (V)	Accuracy	Temperature	Package	Ordering Number	Packing Option
SNE2301	XX	2%	-40 ~ +85°C	UTDFN- 1x1-4L	SNE2301 XXAK4	Tape and Real, 10000
SNE2301	XX	2%	-40 ~ +85°C	SOT23-5	SNE2301 XXAB5	Tape and Real, 10000

**Note:** XX indicates 1.8V~3.6V by 0.1V step. For example, 33 means product outputs 3.3V.

### Simplified Block Diagram



### Application Circuit



## Contents

<b>1</b>	<b>Specifications.....</b>	<b>4</b>
1.1	Absolute Maximum Ratings.....	4
1.2	Recommanded Operating Range.....	4
1.3	Electrical Characteristics.....	4
<b>2</b>	<b>Performance Characteristics.....</b>	<b>5</b>
<b>3</b>	<b>Performance Characteristics(Continued).....</b>	<b>6</b>
<b>4</b>	<b>Package Outline.....</b>	<b>7</b>
<b>5</b>	<b>Revision History.....</b>	<b>9</b>

# 1 Specifications

## 1.1 Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Input Voltage	$V_{IN}$	-0.3~8	V
Output Current	$I_{OUT}$	350	mA
Power Dissipation	$P_{DMAX}$	0.6	W
Thermal Resistance	$R_{\theta JA}$	250	°C/W
Junction Temperature	$T_J$	-40~125	°C
Ambient Temperature	$T_A$	-40~85	°C
Storage Temperature	$T_{STG}$	-55~150	°C
Package Lead Soldering Temperature (10s)	$T_{SOLDER}$	260	°C

**Note:** Exceed these limits to damage to the device. Exposure to absolute maximum rating conditions may affect device reliability.

## 1.2 Recommended Operating Range

Parameter	Symbol	Value	Unit
Supply Voltage	$V_{IN}$	2.5~6.5	V
Operating Temperature	$T_{OPT}$	-40~85	°C

## 1.3 Electrical Characteristics

The following specifications apply for  $V_{OUT} = 3.3V$ ,  $T_A = 25^\circ C$ , unless otherwise noted.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input Voltage	$V_{IN}$				6.5	V
Output Voltage	$V_{OUT}$	$I_{OUT} = 1mA$	-2	$V_{OUT}$	2	%
Quiescent Current	$I_Q$	$V_{OUT} = 3.3V, I_{OUT} = 0V$		1	2	$\mu A$
Current Limit	$I_{LIMIT}$	$V_{IN} - V_{OUT} = 0.5V$		350		mA
Dropout Voltage	$V_{DROP}$	$V_{OUT} = 3.3V, I_{OUT} = 100mA$		0.18		V
		$V_{OUT} = 3.3V, I_{OUT} = 200mA$		0.36		V
Line Regulation	$\Delta V_{LINE}$	$V_{IN} = 2.7\sim 5.5V, I_{OUT} = 1mA$		0.01		%/V
Load Regulation	$\Delta V_{LOAD}$	$V_{OUT} = 3.3V, I_{OUT} = 1\sim 300mA$		100		mV
Short Current	$I_{SHORT}$	$V_{EN} = V_{IN},$ $V_{OUT}$ Short to GND with $1\Omega$		70		mA
Shutdown Current	$I_{SHDN}$	$V_{EN} = 0V$		0.1	1	$\mu A$
EN Logic High Voltage	$V_{ENH}$	$V_{IN} = 5.5V, I_{OUT} = 1mA$	1.2		$V_{IN}$	V
EN Logic Low Voltage	$V_{ENL}$	$V_{IN} = 5.5V, V_{OUT} = 0V$			0.4	V
EN Input Current	$I_{EN}$	$V_{EN} = 0$ to $5.5V$			1.0	$\mu A$

## 2 Performance Characteristics

$C_{IN}=1\mu F, C_{OUT}=1\mu F, T_A=25^\circ C, V_{IN}=3.8V, V_{OUT}=3.3V$ , unless otherwise noted.

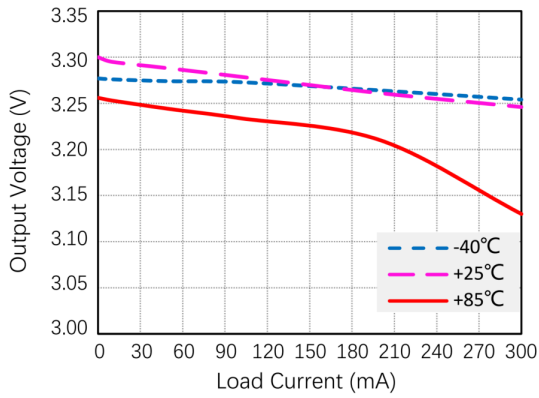


Figure 2-1 Output Voltage VS Temperature

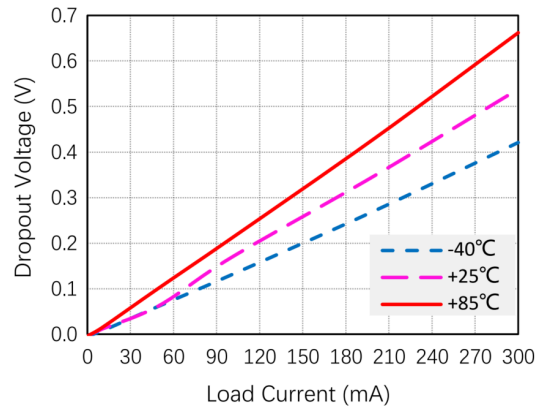


Figure 2-2 Dropout Voltage VS Temperature

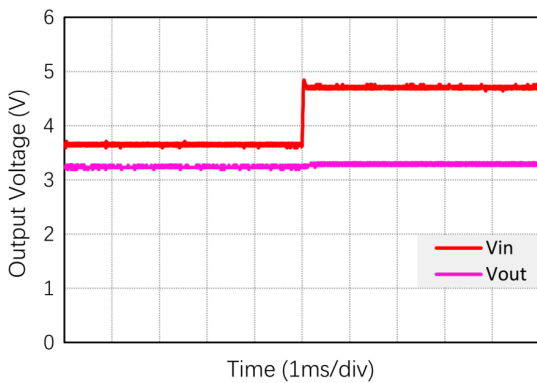


Figure 2-3 Line Transient Response

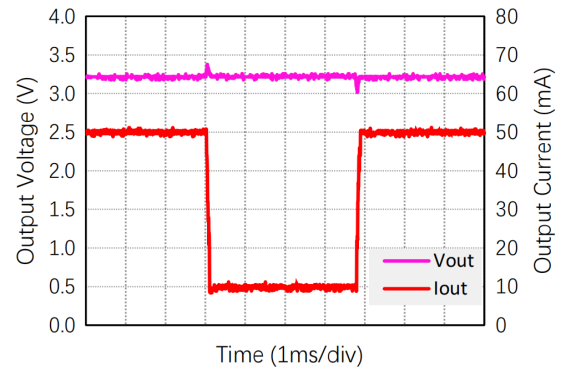


Figure 2-4 Load Transient Response (10mA-50mA)

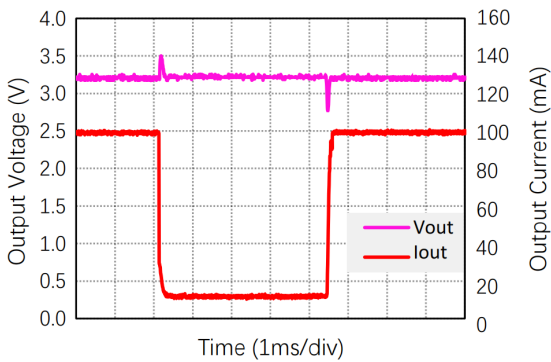


Figure 2-5 Load Transient Response (10mA-100mA)

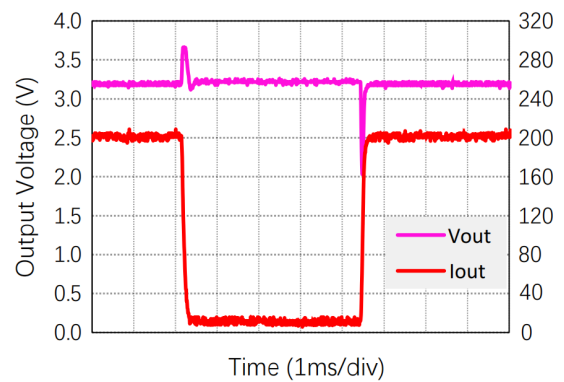
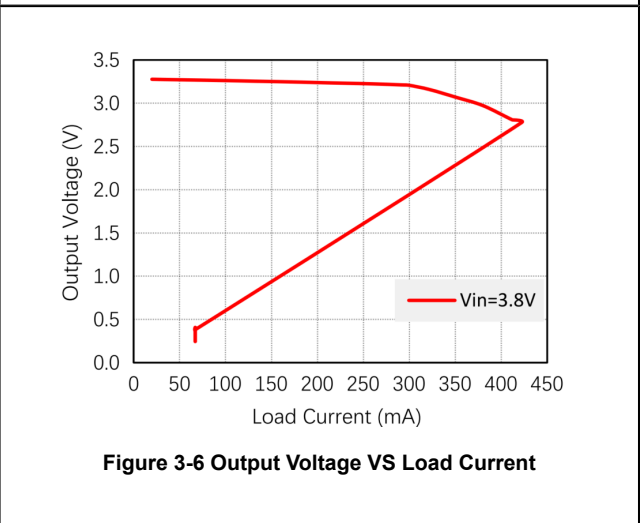
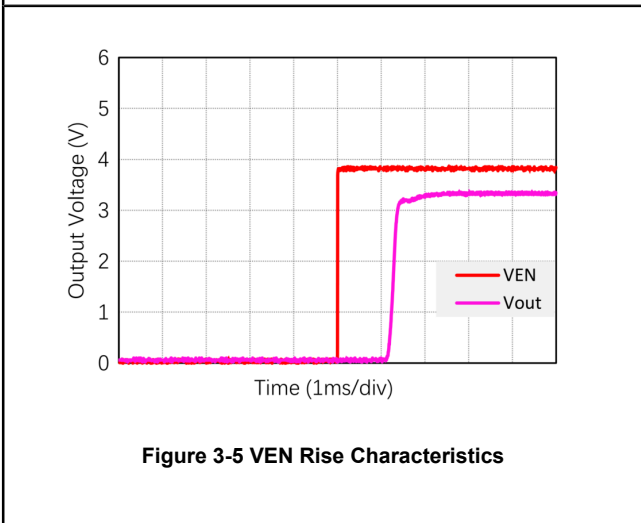
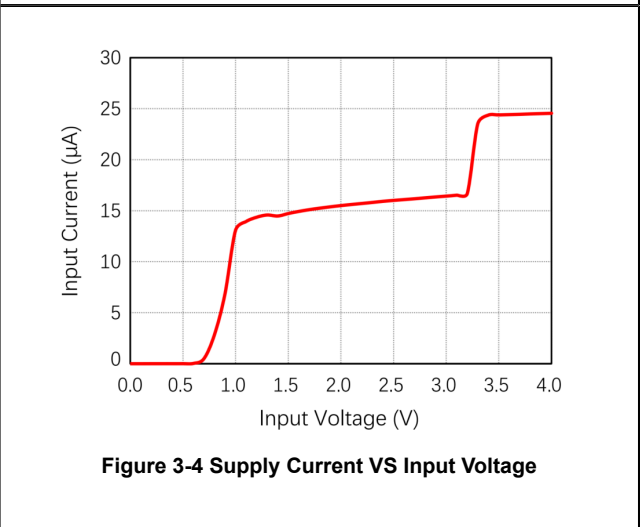
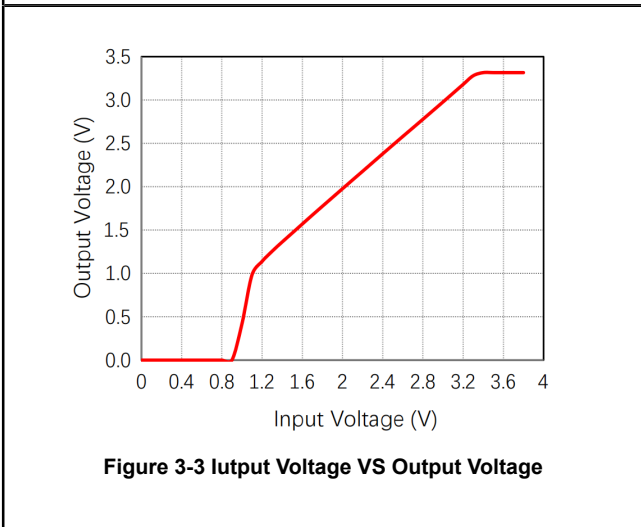
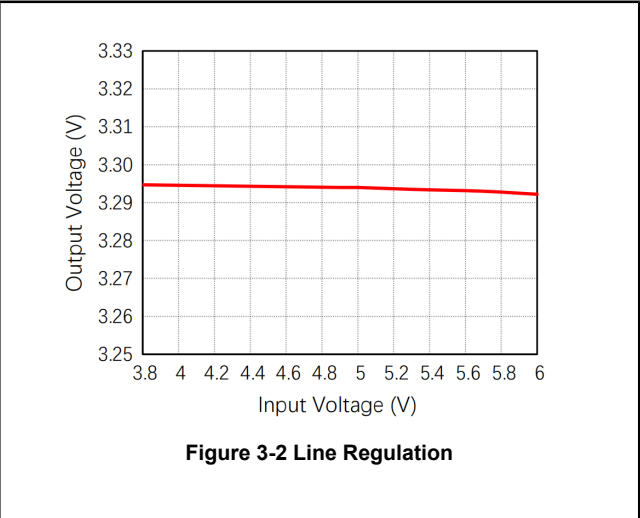
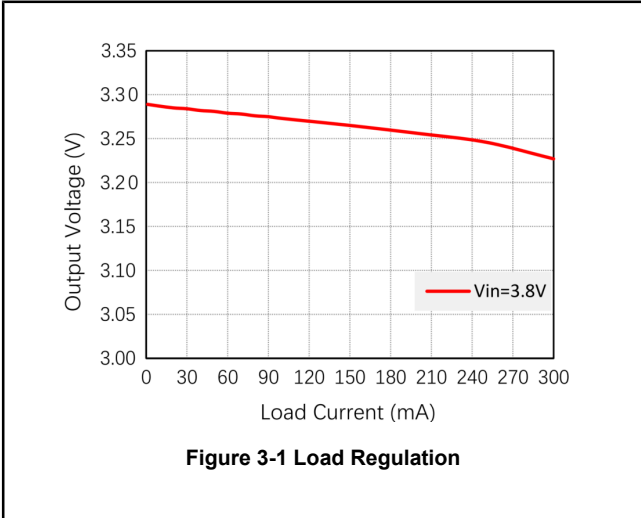


Figure 2-6 Load Transient Response (10mA-200mA)

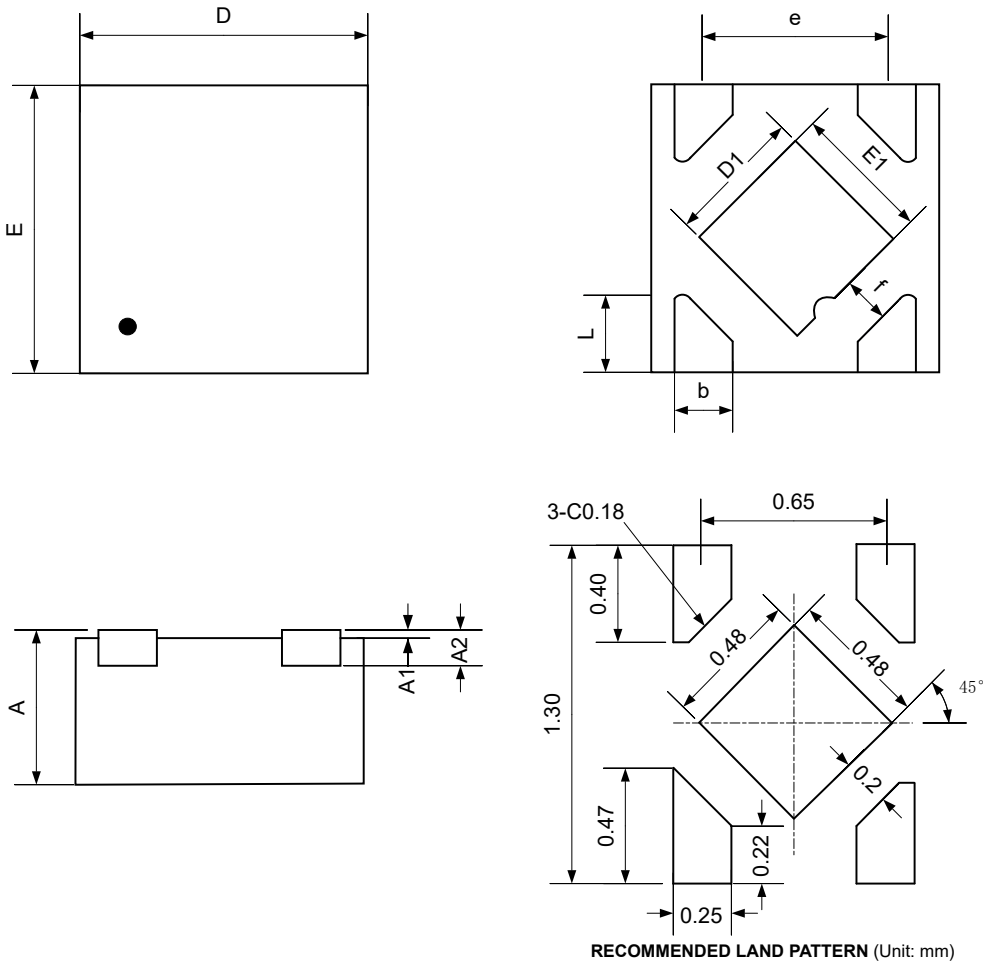
### 3 Performance Characteristics(Continued)

$C_{IN}=1\mu F, C_{OUT}=1\mu F, T_A=25^\circ C, V_{IN}=3.8V, V_{OUT}=3.3V$ , unless otherwise noted.



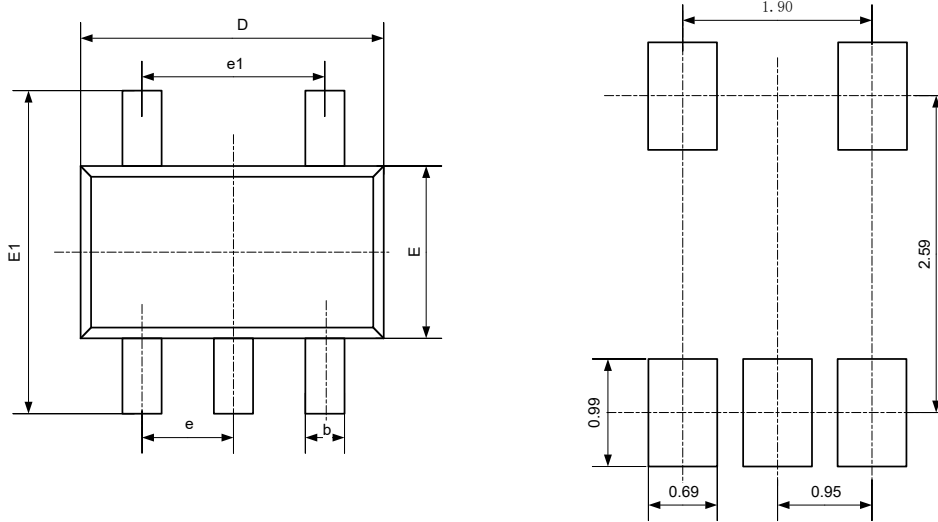
## 4 Package Outline

### UTDFN-1x1-4L

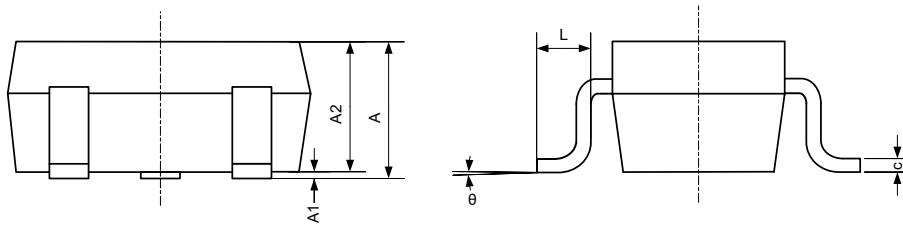


Symbol	Dimensions in Millimeters		
	Min	Nominal	Max
A	0.500	0.550	0.600
A1	0.000		0.050
A2	0.152 REF		
D	0.950	1.000	1.050
D1	0.450	0.500	0.550
E	0.950	1.000	1.050
E1	0.450	0.500	0.550
b	0.175	0.225	0.275
e	0.625 BSC		
f	0.195 REF		
L	0.200	0.250	0.300

SOT23-5



RECOMMENDED LAND PATTERN (Unit: mm)



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	1.900 BSC		0.075 BSC	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°




## 5 Revision History

Version	Date	Description
0.1	2022/03/31	Initial release
0.2	2022/07/11	Fix some error
0.3	2022/09/16	Add Package Information: SOT23-5 Modify Chapter 2 Performance Characteristics
0.4	2022/10/08	Modify Chapter 2/3 Performance Characteristics

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