

## SNE2401 40V $\mu$ A-power LDO Regulator

### Features

- Maximum Operating Voltage: 40V
- Output Voltage: 1.8V, 2.5V, 3.0V, 3.3V, 3.6V, 4.0V, 4.2V and 5.0V
- Output Accuracy:  $\pm 1\%$
- Low Power Consumption: 1.5 $\mu$ A
- <0.1 $\mu$ A Standby Current When Shutdown
- Low Temperature Coefficient
- Current Limiting, Thermal Shutdown
- Available in SOT89-3, SOT23-5, SOT23/ SOT23-3L and SOT223 Packages

### Applications

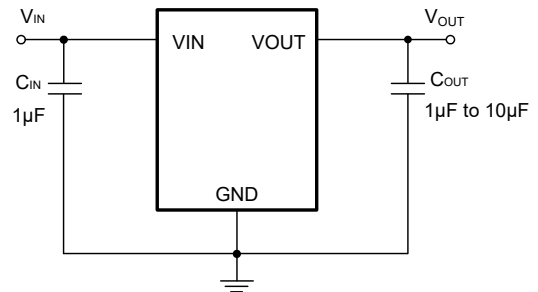
- Battery Supplied Systems
- Telecom Systems
- Audio & Video Devices
- Automotive Electronics
- Industrial Electronics

### General Description

The SNE2401 is a 40V  $\mu$ A-power high accuracy LDO regulator. The 1 $\mu$ A power consumption makes it ideal for most HV power-saving systems. The maximum operating voltage can be as high as 40V. The output accuracy is as excellent as  $\pm 1\%$ .

The other features include low dropout voltage, current limiting protection and thermal shutdown protection.

### Typical Application Circuit

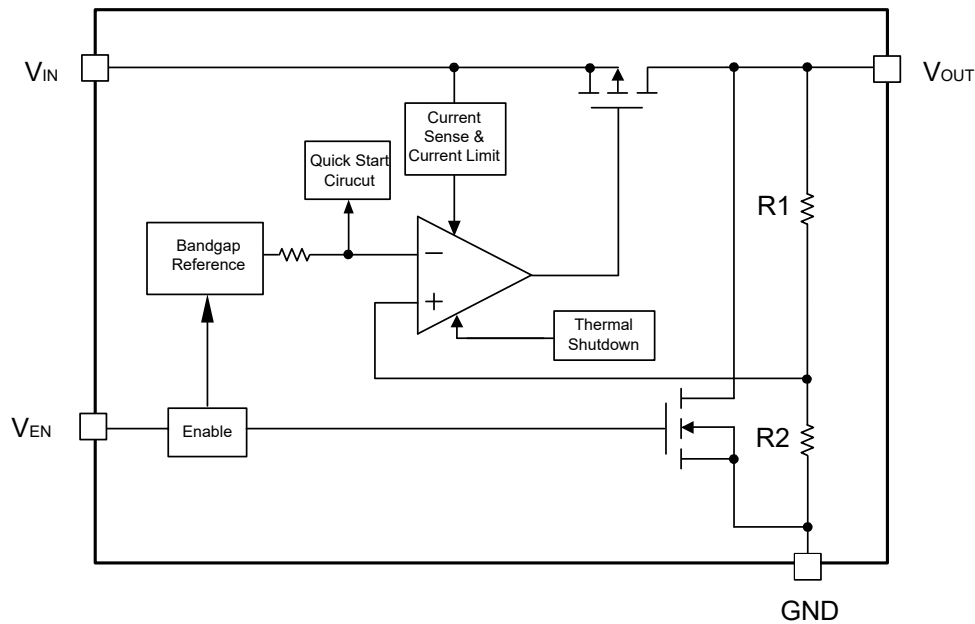


### Order Information

Model	PIN-PACKAGE	Ordering Number	Packing Option
SNE2401	SOT23/SOT23-3L	SNE2401XXAB3	3000pcs/Reel
	SOT23-5A	SNE2401XXAAB5	3000pcs/Reel
	SOT23-5B	SNE2401XXBAB5	3000pcs/Reel
	SOT89-3A	SNE2401XXAAY3	3000pcs/Reel
	SOT89-3B	SNE2401XXBAY3	3000pcs/Reel
	SOT-223	SNE2401XXAS3	3000pcs/Reel

**Note:** XX indicates 1.8V~5V by 0.1V step. For example, 33 means product outputs 3.3V.

## Block Diagram



## Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Supply Voltage	$V_{IN}$	-0.3~44	V
EN pin to GND Voltage	$V_{EN}$	-0.3~44	V
VOUT pin to GND Voltage	$V_{IO}$	-0.3~6	V
VOUT pin to VIN Voltage	$V_{IO2}$	-46~0.3	V
Maximum Power Dissipation, SOT89-3	$P_D$	1.2	W
Maximum Power Dissipation, SOT23-3		0.4	W
Junction Temperature Range	$T_J$	-40~150	°C
Storage Temperature Range	$T_{STG}$	-50~150	°C
Operating Temperature Range	$T_{OP}$	-45~80	°C
Lead Temperature (Soldering)	$T_{SOLDER}$	260°C, 10s	

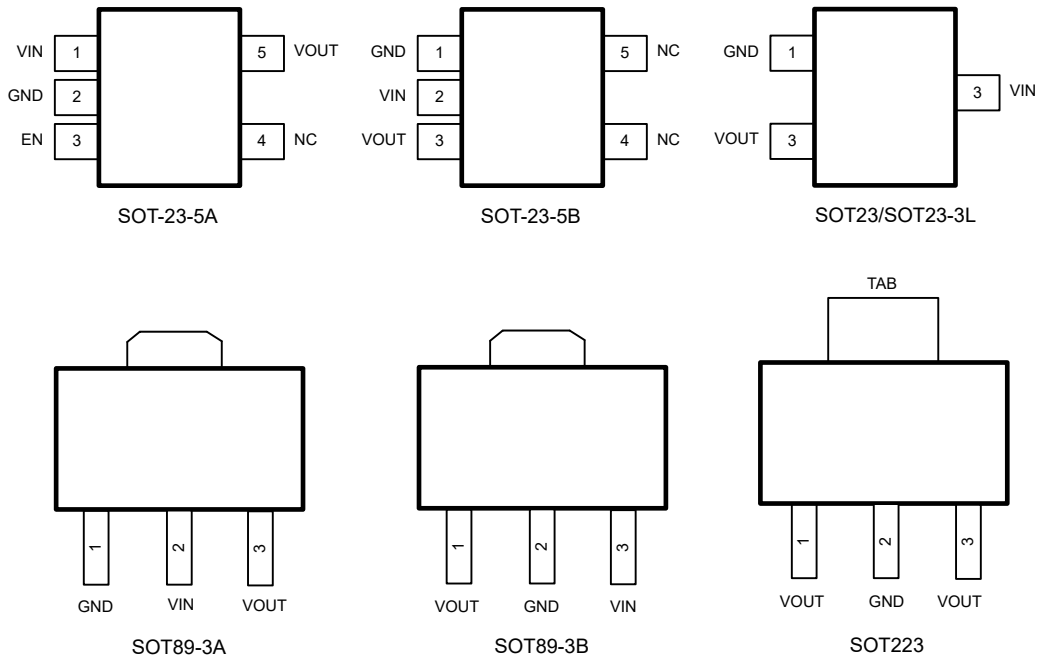
**Note:** Absolute Maximum Ratings are threshold limit values that must not be exceeded even for an instant under any condition. Moreover, such values for any two items must not be reached simultaneously. Operation above these absolute maximum ratings may cause degradation or permanent damage to the device. These are stress ratings only and do not necessarily imply functional operation below these limits.

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# 1 Pin Description



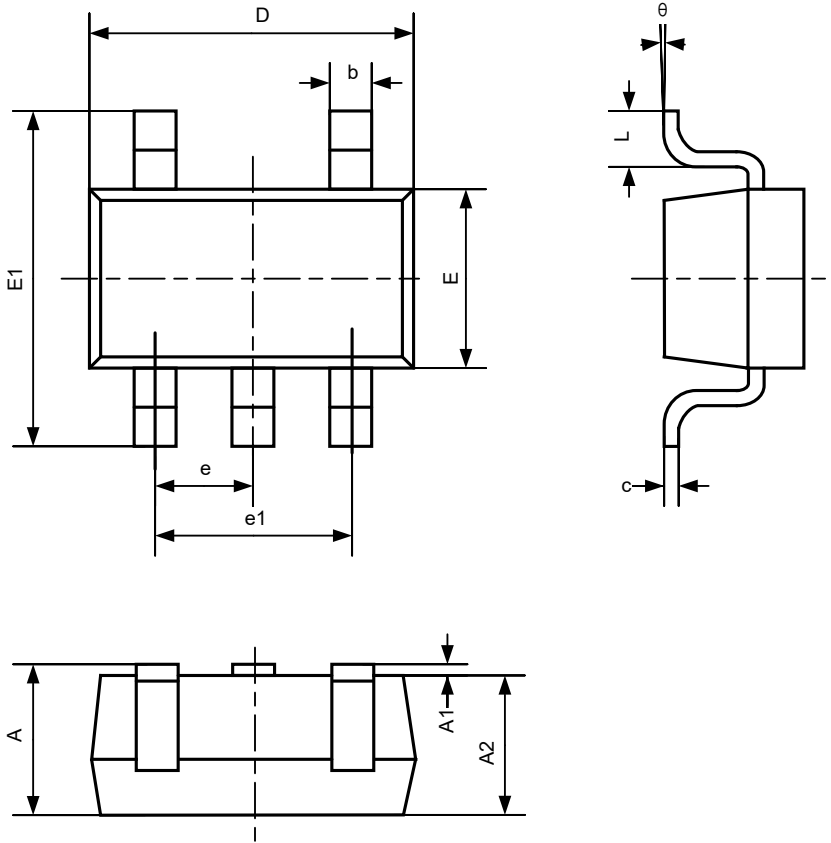
PIN					NAME	FUNCTION
SOT23/SOT23-3L	SOT89-3A/SOT223	SOT89-3B	SOT23-5A	SOT23-5B		
1	1	2	2	1	GND	Ground
2	3	1	5	3	VOUT	Output
3	2	3	1	2	VIN	Power Supply Input
			3		EN	Chip Enable
			4	4,5	NC	Not Connected

## 2 Electrical Characteristics

( $V_{IN} = V_{OUT} + 1V$ ,  $C_L = 1\mu F$ ,  $T_A = +25^\circ C$ , unless otherwise noted.)

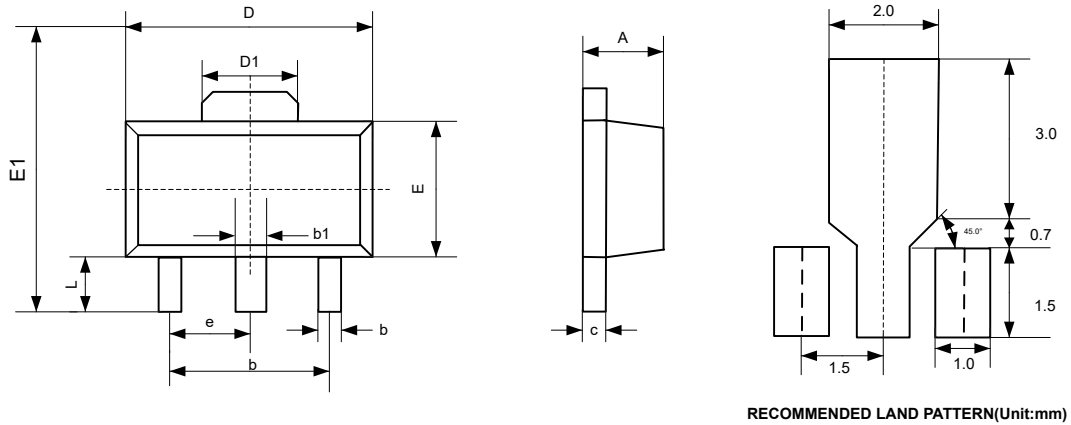
Parameter	Symbol	Values			Unit	Note/Test Condition
		Min.	Typ.	Max.		
Input Voltage	$V_{IN}$	2.5		40	V	
Output Voltage	$V_{OUT}$	-1%		+1%	V	$I_{OUT}=40mA$
Maxim Output Current	$I_{OUT\_max}$	150			mA	SOT89-3, SOT223
		100			mA	SOT23-3
Load Regulation	$\Delta V_{OUT}$		25	50	mV	$1mA < I_{OUT} < 60mA$
Dropout Voltage	$V_{Drop}$		260		mV	$I_{OUT}=40mA$ , $V_{OUT}=5V$
			700		mV	$I_{OUT}=100mA$ , $V_{OUT}=1.8V$
Quiescent Current	$I_{QC}$		1.3	2	$\mu A$	$V_{IN}=V_{OUT}+1V$ , $I_{OUT}=0mA$
Short Current	$I_{Short}$		70		mA	$V_{OUT}=0V$
Line Regulation	$R_{EGI}$		0.2	0.3	%/V	$V_{IN}=V_{OUT}+1V$ to 24V, $I_{OUT}=40mA$
Power Supply Rejection Ratio	$P_{SRR}$		85		dB	Freq=200Hz, $I_{OUT}=50mA$
			80			Freq=1KHz, $I_{OUT}=50mA$
Temperature Coefficient	$T_C$		$\pm 0.7$		mV/ $^\circ C$	$I_{OUT}=40mA$ , $-40^\circ C \sim +85^\circ C$
Thermal Shutdown	$T_{SD}$		180		$^\circ C$	Shutdown, Temp increasing
Thermal Hysteresis	$T_{HYST}$		20		$^\circ C$	

### 3 Package Outline(SOT23-5)



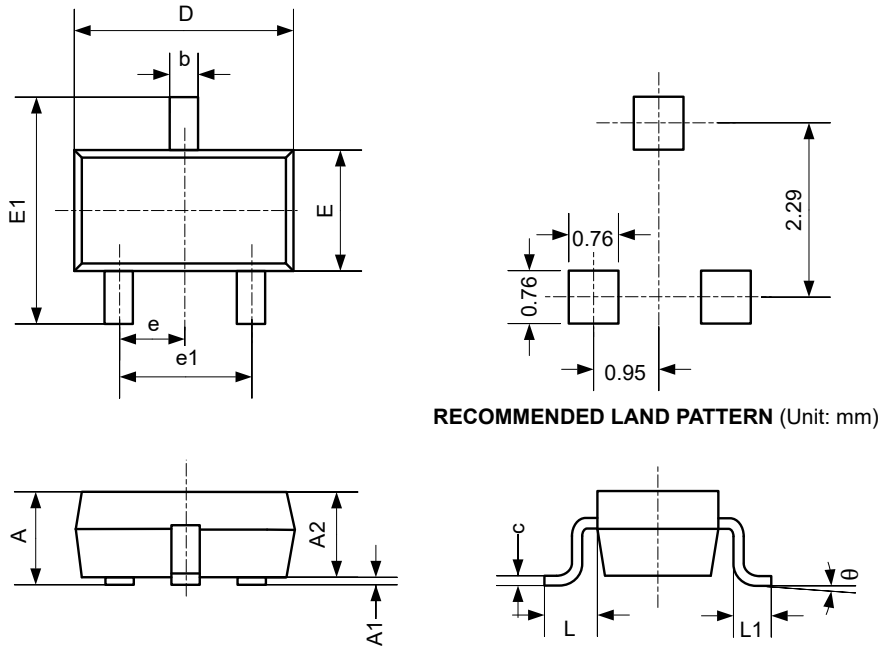
Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 BSC		0.037 BSC	
e1	1.900 BSC		0.075 BSC	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

### 4 Package Outline(SOT89-3)



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

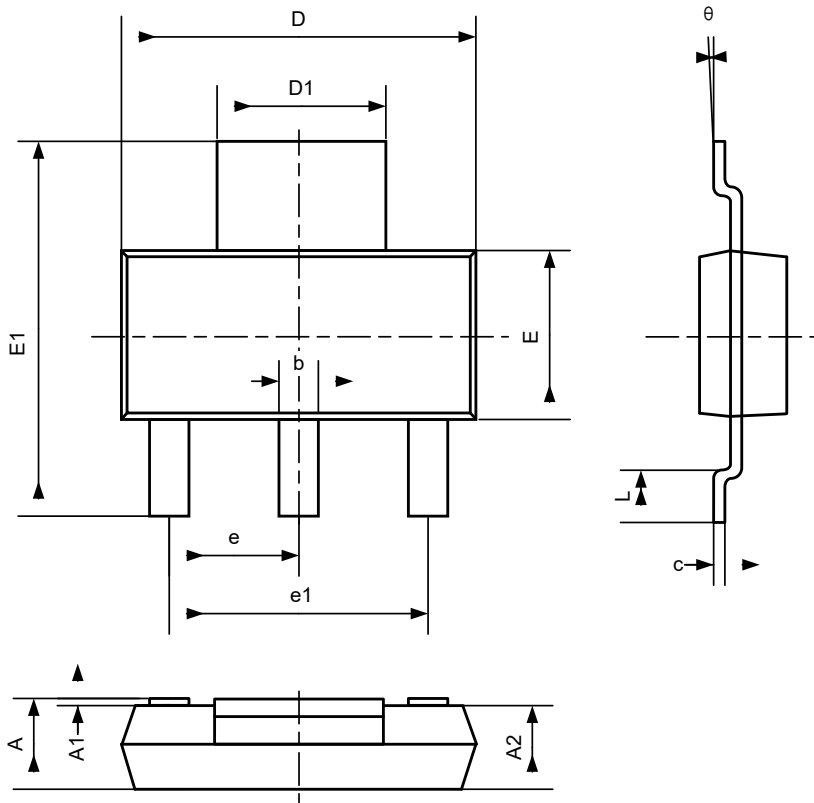
## 5 Package Outline(SOT23)



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 BSC		0.037 BSC	
e1	1.900 BSC		0.075 BSC	
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
$\theta$	0°	8°	0°	8°



## 6 Package Outline(SOT223)




Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	1.520	1.800	0.060	0.071
A1	0.000	0.100	0.000	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.820	0.026	0.032
c	0.250	0.350	0.010	0.014
D	6.200	6.400	0.244	0.252
D1	2.900	3.100	0.114	0.122
E	3.300	3.700	0.130	0.146
E1	6.830	7.070	0.269	0.278
e	2.300 BSC		0.091 BSC	
e1	4.500	4.700	0.177	0.185
L	0.900	1.150	0.035	0.045
θ	0°	10°	0°	10°

## 7 Revision History

VERSION	DATE	NOTE
1.0	2022/07/08	Initial version
1.1	2022/11/24	Add SOT223 Package
1.2	2023/10/26	Modify ordering number

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