

GS2401C 40V μ 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 μ A
- <0.1 μ A Standby Current When Shutdown
- Low Temperature Coefficient
- Current Limiting, Thermal Shutdown
- Available in TO-92, SOT89-3, SOT23-3, SOT223-3 and SOT23-5 Packages

Applications

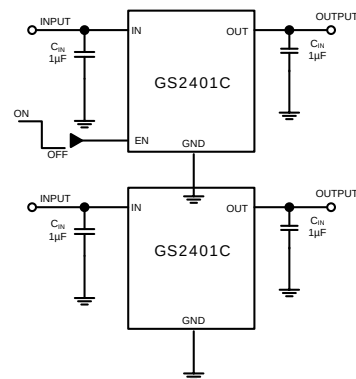
- Battery Supplied Systems
- Telecom Systems
- Audio & Video Devices

General Description

The GS2401C is a 40V μ A-power high accuracy LDO regulator. The 1 μ 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

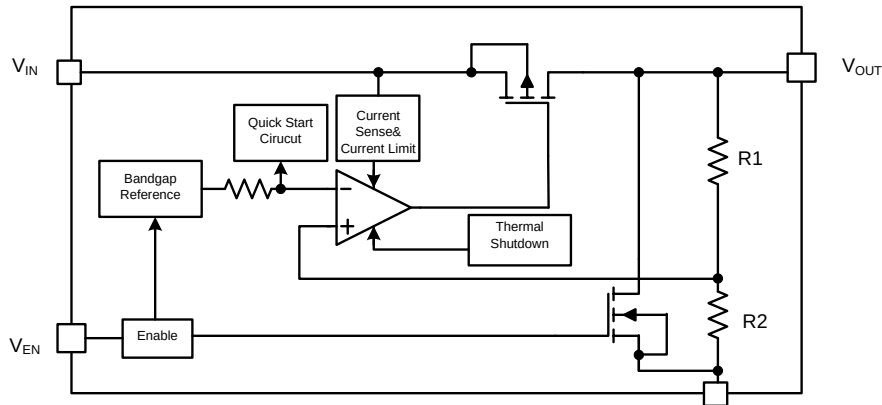


Order Information

Model	PIN-PACKAGE	Ordering Number	Packing Option
GS2401C	SOT23-3	GS2401C-XXTR3	3000pcs/Reel
	SOT23-5A	GS2401C-XXTR5	3000pcs/Reel
	SOT23-5B	GS2401CY-XXTR5	3000pcs/Reel
	SOT89-3A	GS2401C-XXSTR3	3000pcs/Reel
	SOT89-3B	GS2401CY-XXSTR3	3000pcs/Reel
	TO92	GS2401C-XXOTR2	3000pcs/Reel
	SOT223-3	GS2401C-XXCTR3	3000pcs/Reel

 **Note:** "XX" represents the type of voltage value.

Block Diagram



Absolute Maximum Ratings

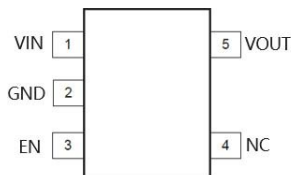
Parameter	Symbol	Rating	Unit
Supply Voltage	V_{IN}	-0.3~44	V
EN pin to GND Voltage	V_{EN}	-0.3~44	V
VOOUT pin to GND Voltage	V_{IO}	-0.3~6	V
VOOUT pin to VIN Voltage	V_{IO2}	-46~0.3	V
Maximum Power Dissipation, SOT89-3	P_D	1.2	W
Maximum Power Dissipation, SOT23-3		0.4	W
Maximum Power Dissipation, SOT23-5		0.4	W
Maximum Power Dissipation, SOT223-3		0.3	W
Maximum Power Dissipation, TO-92		-	W
Junction Temperature Range	T_J	-40~150	°C
Storage Temperature Range	T_{STG}	-50~150	°C
Operating Temperature Range	T_{OP}	-45~125	°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.

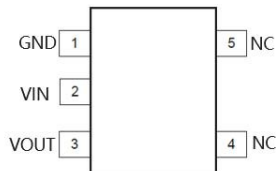
Thermal Information

Package Type	θ_{JA}	θ_{JC}	Unit
SOT89-3	65	10	°C/W
SOT23-3	275	60	°C/W
SOT23-5	275	60	°C/W
SOT223-3	65	39	°C/W
TO-92	200	-	°C/W

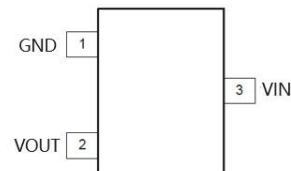
Pin Description



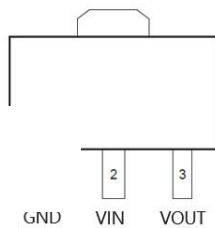
SOT23-5A



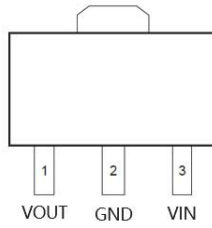
SOT23-5B



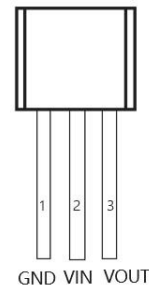
SOT23-3



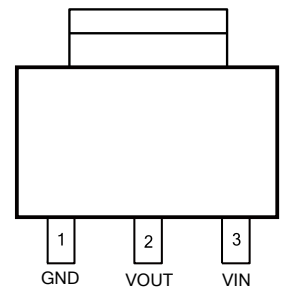
SOT89-3A



SOT89-3B



TO92



SOT223-3

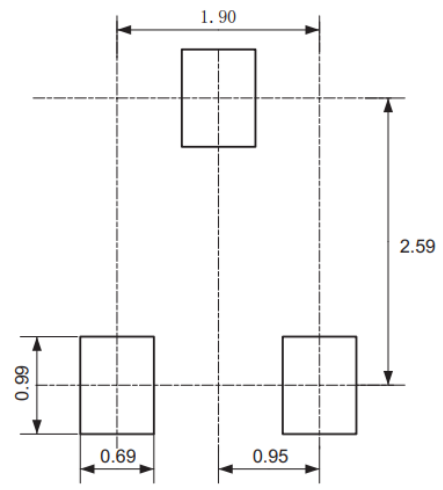
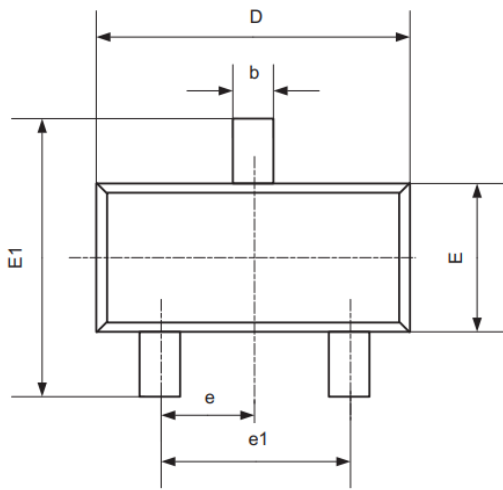
PIN					NAME	FUNCTION
SOT23-3 SOT223-3	SOT89-3A/ TO92	SOT89-3B	SOT23-5A	SOT23-5B		
1	1	2	2	1	GND	Ground
2	3	1	5	3	VOUT	Output
3	2	3	1	2	VIN	Power Supply Input
			3		EN	Chip Enable
			4	4,5	NC	Not Connected

Electrical Characteristics

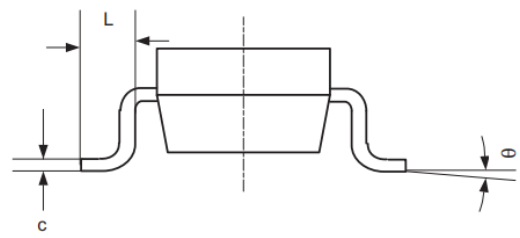
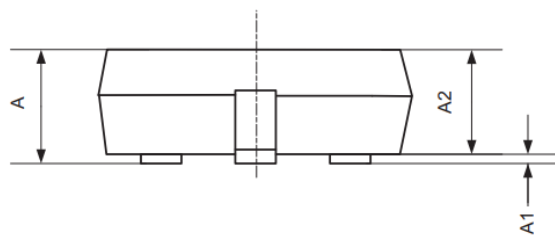
($V_{IN} = V_{OUT} + 1V$, $C_L = 1\mu F$, $T_A = +25^\circ C$, unless otherwise noted.)

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, TO92
		100			mA	SOT23-3
Load Regulation	ΔV_{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	μA	$V_{IN}=V_{OUT}+1V$, $I_{OUT}=0mA$
Short Current	I_{Short}		70		mA	$V_{OUT}=0V$
EN High Voltage	V_{ENH}	1.5			V	$V_{IN}=12V$, $I_{OUT}=1mA$
EN Low Voltage	V_{ENL}			0.4	V	
EN High Current	I_{ENH}		0	0.1	μA	$V_{IN}=12V$
EN Low Current	I_{ENL}		0	0.1	μA	$V_{IN}=12V$, $V_{EN}=0V$
Line Regulation	R_{EG}		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		± 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		$^\circ C$	

Package Outline (SOT23-3)

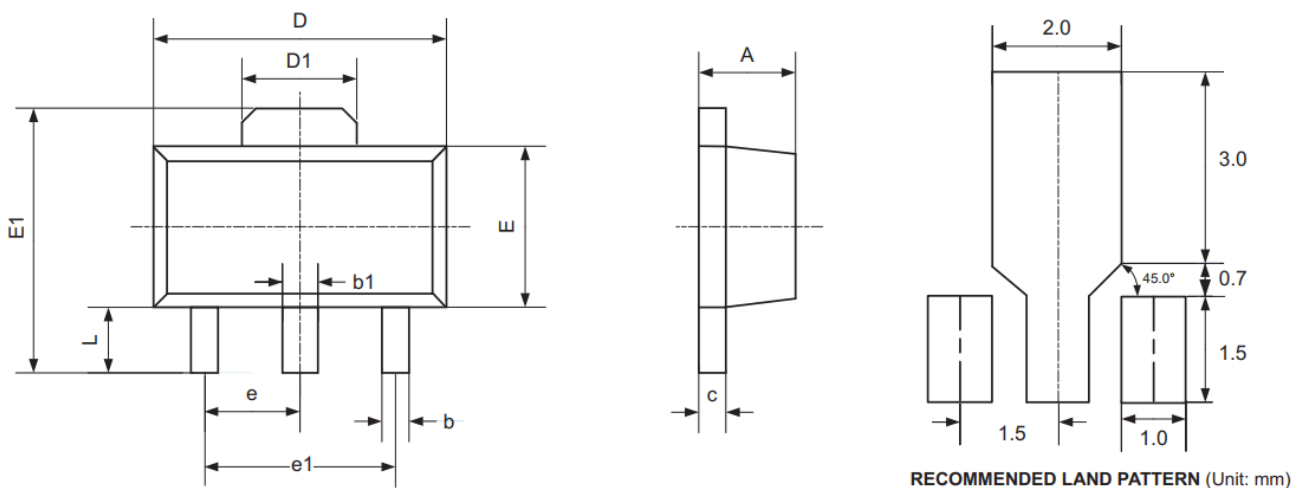


RECOMMENDED LAND PATTERN (Unit: mm)



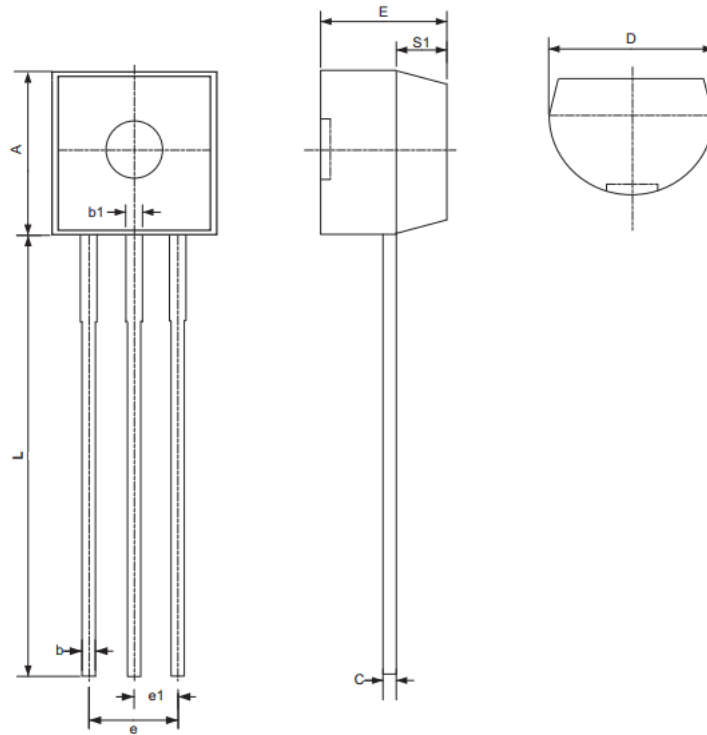
Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 BSC		0.037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

Package Outline (SOT89-3)



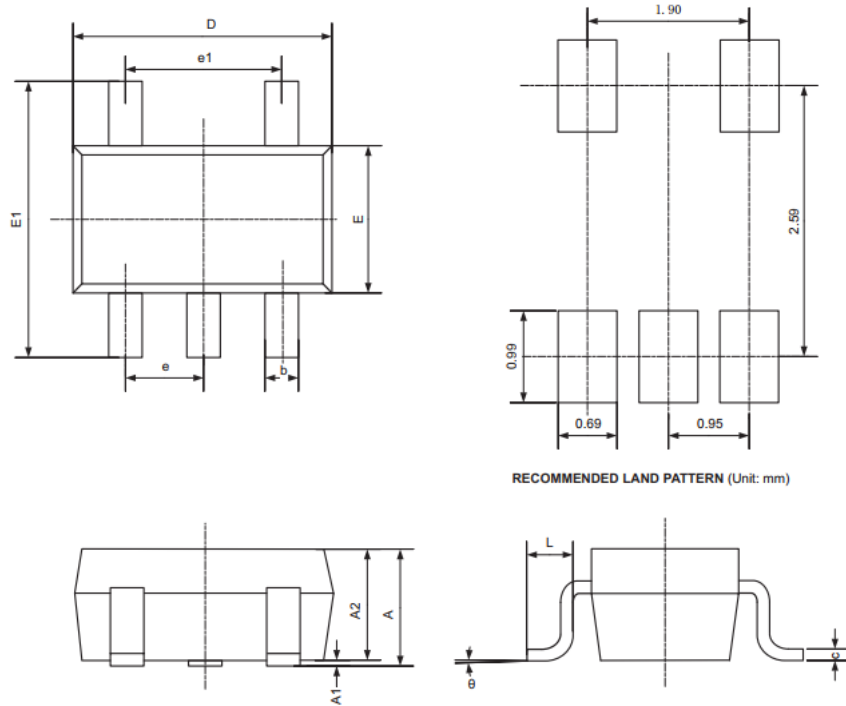
Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF		0.061 REF	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP		0.060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

Package Outline (TO92)



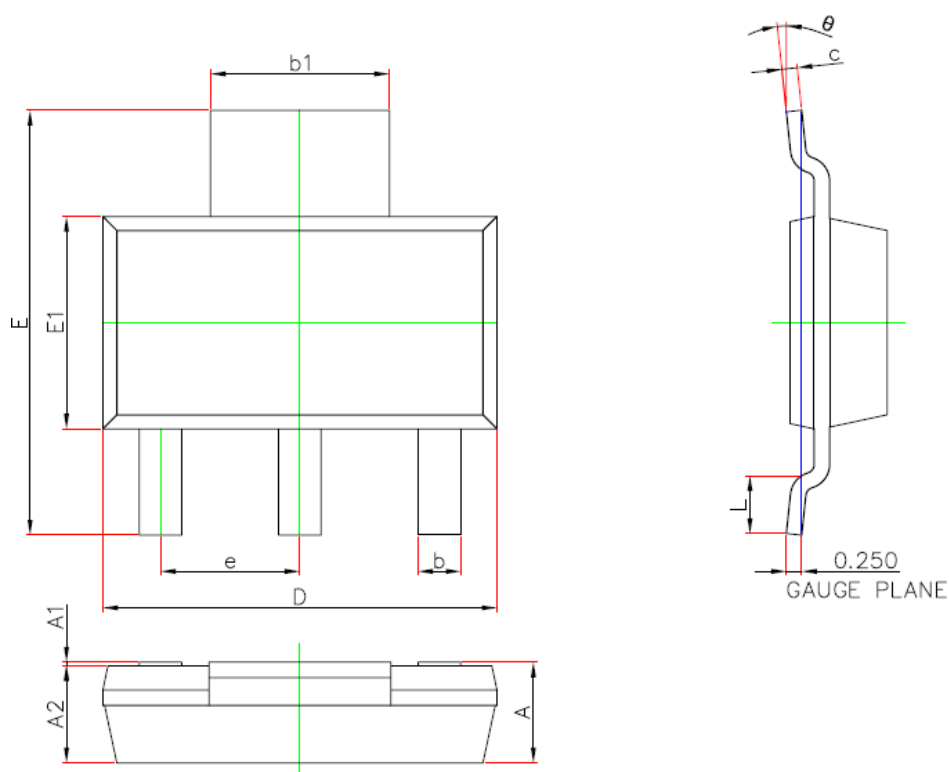
Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	4.450	4.700	0.177	0.185
b	0.360	0.510	0.014	0.020
b1	0.360	0.760	0.016	0.023
c	0.360	0.510	0.016	0.020
D	4.440	4.700	0.175	0.185
E	3.300	3.810	0.130	0.150
L	12.700		0.500	
e1	1.150	1.390	0.045	0.055
e	2.420	2.660	0.095	0.105
S1	1.020		0.040	

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°

Package Outline (SOT223-3)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	—	1.800	—	0.071
A1	0.020	0.100	0.001	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.840	0.026	0.033
b1	2.900	3.100	0.114	0.122
c	0.230	0.350	0.009	0.014
D	6.300	6.700	0.248	0.264
E	6.700	7.300	0.264	0.287
E1	3.300	3.700	0.130	0.146
e	2.300(BSC)		0.091(BSC)	
L	0.750	—	0.030	—
θ	0°	10°	0°	10°