Low dropout linear regulators

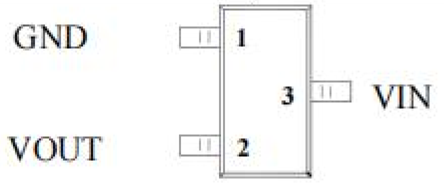
Product Overview
The SL75XX-3 is a low dropout linear regulator with CMOS technology. The maximum working voltage can reach 24V, there are several fixed output voltage values, the output range is 2.8V~9.0V, with low static power consumption, widely used in all kinds of audio, video equipment and communication equipment power supply.

Key Features
- Low power consumption
- The input-output voltage difference is low.
- The temperature drift coefficient is small.
- The maximum operating voltage can reach 24V.
- Quiescent current:1.5μA
- Output voltage accuracy: ±2%
- High output current:100mA

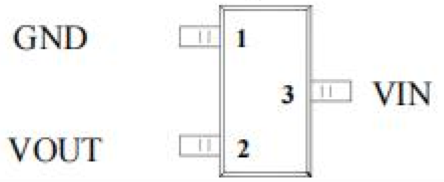
Typical Applications
- All kinds of power supply equipment
- Communication equipment
- Audio, video equipment

Pinouts

	SOT23



	SOT23-3L



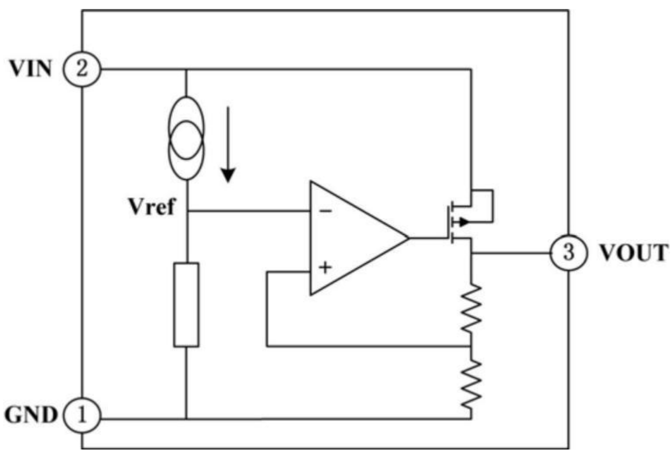
Output voltage selection

Model	Output voltage	Package type
SL7528-3	2.8V	SOT23 SOT23-3L
SL7530-3	3.0V	
SL7533-3	3.3V	
SL7536-3	3.6V	
SL7540-3	4.0V	
SL7544-3	4.4V	
SL7550-3	5.0V	
SL7590-3	9.0V	

Pin function

Ordinal	Symbol	Description of the function
1	GND	ground
3	VIN	input
2	VOUT	output

Block diagram of the circuit function



Maximum ratings

Parameter description	Symbol	Numeric range	Unit
operating voltage	V_{IN}	-0.3～+26	V
storage temperature	T_{STG}	-50～+125	℃
operating temperature	T_A	-40～+85	℃

Note:
If the device operates under conditions exceeding the maximum rated values listed above, it may cause permanent damage to the device. The above parameters are the maximum values for operating conditions; we do not recommend operating the device outside of these specifications. If the device operates continuously under absolute maximum limit conditions, its stability may be affected.

Parameter description	Symbol	Package type	Value range	Unit
thermal resistance	θ_{JA}	SOT23	500	℃/W
		SOT23-3L	400	℃/W
power consumption	P_D	SOT23	200	mW
		SOT23-3L	250	mW

DC Electrical characteristics (unless otherwise specified, T_A = +25°C)

Output Model **SL7528-3**

Parameter Description	Symbol	Test Conditions	Min	Typical	Max	Unit
output voltage	V_{OUT}	$V_{IN}=V_{OUT}+2.0V$，$I_{OUT}=10mA$	2.744	2.80	2.856	V
output current	I_{OUT}	$V_{IN}=V_{OUT}+2.0V$	70	100	—	mA
load regulation	$\triangle V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ $1mA \le I_{OUT} \le 50mA$	—	25	60	mV
low voltage difference	V_{DIF}	$I_{OUT}=1mA$， $\triangle V_{OUT}=2\%$	—	30	100	mV
static current	I_{SS}	no load	—	1.5	3.0	μA
linear regulation	$\triangle V_{OUT}/ V_{OUT}{*}\ \triangle V_{IN}$	$V_{OUT}+1.0V \le V_{IN} \le 24V$，$I_{OUT}=1mA$	—	—	0.2	%/V
input voltage	V_{IN}	—	—	—	24	V
temperature coefficient	$\triangle V_{OUT}/ \triangle T_A{*}V_{OUT}$	$V_{OUT}+2.0V$，$I_{OUT}=10mA$， $-40℃ \le T_A \le 85℃$	—	100	—	ppm/℃

Note:

When $V_{IN} = V_{OUT} + 2.0V$, under fixed load conditions, the output voltage decreases by 2%. At this point, the difference between the input and output voltages is the low voltage difference (V_{DIF}).

Output Model SL7530-3

Parameter Description	Symbol	Test Conditions	Min	Typical	Max	Unit
output voltage	V_{OUT}	$V_{IN}=V_{OUT}+2.0V$，$I_{OUT}=10mA$	2.94	3.0	3.06	V
output current	I_{OUT}	$V_{IN}=V_{OUT}+2.0V$	70	100	—	mA
load regulation	$\triangle V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ $1mA\leq I_{OUT}\leq 50mA$	—	25	60	mV
low voltage difference	V_{DIF}	$I_{OUT}=1mA$，$\triangle V_{OUT}=2\%$	—	30	100	mV
static current	I_{SS}	no load	—	1.5	3.0	μA
linear regulation	$\triangle V_{OUT}/ V_{OUT}{*}\triangle V_{IN}$	$V_{OUT}+1.0V\leq V_{IN}\leq 24V$，$I_{OUT}=1mA$	—	—	0.2	%/V
input voltage	V_{IN}	—	—	—	24	V
temperature coefficient	$\triangle V_{OUT}/ \triangle T_A{*}V_{OUT}$	$V_{OUT}+2.0V$，$I_{OUT}=10mA$，-40℃$\leq T_A\leq$85℃	—	100	—	ppm/℃

Note:
When $V_{IN} = V_{OUT} + 2.0V$, under fixed load conditions, the output voltage decreases by 2%. At this point, the difference between the input and output voltages is the low voltage difference (V_{DIF}).

Output Model SL7533-3

Parameter Description	Symbol	Test Conditions	Min	Typical	Max	Unit
output voltage	V_{OUT}	$V_{IN}=V_{OUT}+2.0V$，$I_{OUT}=10mA$	3.234	3.30	3.366	V
output current	I_{OUT}	$V_{IN}=V_{OUT}+2.0V$	70	100	—	mA
load regulation	$\triangle V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ $1mA\leq I_{OUT}\leq 50mA$	—	25	60	mV
low voltage difference	V_{DIF}	$I_{OUT}=1mA$，$\triangle V_{OUT}=2\%$	—	25	55	mV
static current	I_{SS}	no load	—	1.5	3.0	μA
linear regulation	$\triangle V_{OUT}/ V_{OUT}{*}\triangle V_{IN}$	$V_{OUT}+1.0V\leq V_{IN}\leq 24V$，$I_{OUT}=1mA$	—	—	0.2	%/V
input voltage	V_{IN}	—	—	—	24	V
temperature coefficient	$\triangle V_{OUT}/ \triangle T_A{*}V_{OUT}$	$V_{OUT}+2.0V$，$I_{OUT}=10mA$，-40℃$\leq T_A\leq$85℃	—	100	—	ppm/℃

Note:
When $V_{IN} = V_{OUT} + 2.0V$, under fixed load conditions, the output voltage decreases by 2%. At this point, the difference between the input and output voltages is the low voltage difference (V_{DIF}).

Output Model SL7536-3

Parameter Description	Symbol	Test Conditions	Min	Typical	Max	Unit
output voltage	V_{OUT}	$V_{IN}=V_{OUT}+2.0V$，$I_{OUT}=10mA$	3.528	3.60	3.672	V
output current	I_{OUT}	$V_{IN}=V_{OUT}+2.0V$	70	100	—	mA
load regulation	$\triangle V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ $1mA\le I_{OUT}\le 50mA$	—	25	60	mV
low voltage difference	V_{DIF}	$I_{OUT}=1mA$， $\triangle V_{OUT}=2\%$	—	25	55	mV
static current	I_{SS}	no load	—	1.5	3.0	μA
linear regulation	$\triangle V_{OUT}/V_{OUT}{}^{*}\triangle V_{IN}$	$V_{OUT}+1.0V\le V_{IN}\le 24V$，$I_{OUT}=1mA$	—	—	0.2	%/V
input voltage	V_{IN}	—	—	—	24	V
temperature coefficient	$\triangle V_{OUT}/\triangle T_A{}^{*}V_{OUT}$	$V_{OUT}+2.0V$，$I_{OUT}=10mA$， $-40℃\le T_A\le 85℃$	—	100	—	ppm/℃

Note:
When $V_{IN} = V_{OUT} + 2.0V$, under fixed load conditions, the output voltage decreases by 2%. At this point, the difference between the input and output voltages is the low voltage difference (V_{DIF}).

Output Model SL7540-3

Parameter Description	Symbol	Test Conditions	Min	Typical	Max	Unit
output voltage	V_{OUT}	$V_{IN}=V_{OUT}+2.0V$，$I_{OUT}=10mA$	3.92	4.0	4.08	V
output current	I_{OUT}	$V_{IN}=V_{OUT}+2.0V$	70	100	—	mA
load regulation	$\triangle V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ $1mA\le I_{OUT}\le 50mA$	—	25	60	mV
low voltage difference	V_{DIF}	$I_{OUT}=1mA$， $\triangle V_{OUT}=2\%$	—	25	55	mV
static current	I_{SS}	no load	—	1.5	3.0	μA
linear regulation	$\triangle V_{OUT}/V_{OUT}{}^{*}\triangle V_{IN}$	$V_{OUT}+1.0V\le V_{IN}\le 24V$，$I_{OUT}=1mA$	—	—	0.2	%/V
input voltage	V_{IN}	—	—	—	24	V
temperature coefficient	$\triangle V_{OUT}/\triangle T_A{}^{*}V_{OUT}$	$V_{OUT}+2.0V$，$I_{OUT}=10mA$， $-40℃\le T_A\le 85℃$	—	100	—	ppm/℃

Note:
When $V_{IN} = V_{OUT} + 2.0V$, under fixed load conditions, the output voltage decreases by 2%. At this point, the difference between the input and output voltages is the low voltage difference (V_{DIF}).

Output Model SL7544-3

Parameter Description	Symbol	Test Conditions	Min	Typical	Max	Unit
output voltage	V_{OUT}	$V_{IN}=V_{OUT}+2.0V$，$I_{OUT}=10mA$	4.312	4.4	4.488	V
output current	I_{OUT}	$V_{IN}=V_{OUT}+2.0V$	70	100	—	mA
load regulation	$\triangle V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ $1mA\leq I_{OUT}\leq 50mA$	—	25	60	mV
low voltage difference	V_{DIF}	$I_{OUT}=1mA$，$\triangle V_{OUT}=2\%$	—	25	55	mV
static current	I_{SS}	no load	—	1.5	3.0	μA
linear regulation	$\triangle V_{OUT}/ V_{OUT}{}^{*}\triangle V_{IN}$	$V_{OUT}+1.0V\leq V_{IN}\leq 24V$，$I_{OUT}=1mA$	—	—	0.2	%/V
input voltage	V_{IN}	—	—	—	24	V
temperature coefficient	$\triangle V_{OUT}/ \triangle T_A{}^{*}V_{OUT}$	$V_{OUT}+2.0V$，$I_{OUT}=10mA$, $-40℃\leq T_A\leq 85℃$	—	100	—	ppm/℃

Note:
When $V_{IN} = V_{OUT} + 2.0V$, under fixed load conditions, the output voltage decreases by 2%. At this point, the difference between the input and output voltages is the low voltage difference (V_{DIF}).

Output Model SL7550-3

Parameter Description	Symbol	Test Conditions	Min	Typical	Max	Unit
output voltage	V_{OUT}	$V_{IN}=V_{OUT}+2.0V$，$I_{OUT}=10mA$	4.9	5.0	5.1	V
output current	I_{OUT}	$V_{IN}=V_{OUT}+2.0V$	100	150	—	mA
load regulation	$\triangle V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ $1mA\leq I_{OUT}\leq 50mA$	—	25	60	mV
low voltage difference	V_{DIF}	$I_{OUT}=1mA$，$\triangle V_{OUT}=2\%$	—	25	55	mV
static current	I_{SS}	no load	—	1.5	3.0	μA
linear regulation	$\triangle V_{OUT}/ V_{OUT}{}^{*}\triangle V_{IN}$	$V_{OUT}+1.0V\leq V_{IN}\leq 24V$，$I_{OUT}=1mA$	—	—	0.2	%/V
input voltage	V_{IN}	—	—	—	24	V
temperature coefficient	$\triangle V_{OUT}/ \triangle T_A{}^{*}V_{OUT}$	$V_{OUT}+2.0V$，$I_{OUT}=10mA$, $-40℃\leq T_A\leq 85℃$	—	100	—	ppm/℃

Note:
When $V_{IN} = V_{OUT} + 2.0V$, under fixed load conditions, the output voltage decreases by 2%. At this point, the difference between the input and output voltages is the low voltage difference (V_{DIF}).

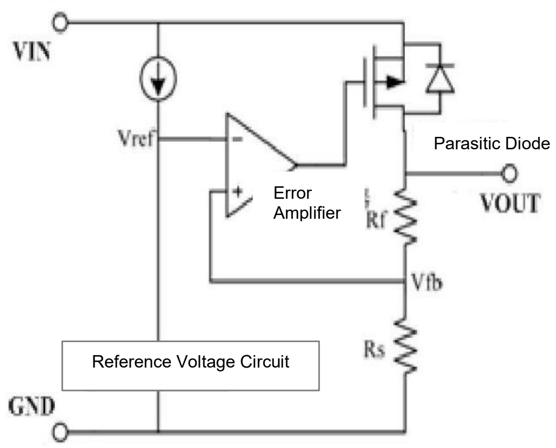
Output Model SL7590-3

Parameter Description	Symbol	Test Conditions	Min	Typical	Max	Unit
output voltage	V_{OUT}	$V_{IN}=V_{OUT}+2.0V$, $I_{OUT}=10mA$	8.82	9.0	9.18	V
output current	I_{OUT}	$V_{IN}=V_{OUT}+2.0V$	100	150	—	mA
load regulation	$\triangle V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ $1mA\leq I_{OUT}\leq 50mA$	—	25	60	mV
low voltage difference	V_{DIF}	$I_{OUT}=1mA$, $\triangle V_{OUT}=2\%$	—	25	55	mV
static current	I_{SS}	no load	—	1.5	3.0	μA
linear regulation	$\triangle V_{OUT}/V_{OUT}{}^{*}\triangle V_{IN}$	$V_{OUT}+1.0V\leq V_{IN}\leq 24V$, $I_{OUT}=1mA$	—	—	0.2	%/V
input voltage	V_{IN}	—	—	—	24	V
temperature coefficient	$\triangle V_{OUT}/\triangle T_A{}^{*}V_{OUT}$	$V_{OUT}+2.0V$, $I_{OUT}=10mA$, $-40℃\leq T_A\leq 85℃$	—	100	—	ppm/℃

Note:
When $V_{IN} = V_{OUT} + 2.0V$, under fixed load conditions, the output voltage decreases by 2%. At this point, the difference between the input and output voltages is the low voltage difference (V_{DIF}).

Function Description

The error amplifier compares the input voltage V_{fb} , which is formed by the voltage divider resistors Rs and Rf , with the reference voltage V_{ref}. Through this error amplifier, the necessary gate voltage is provided to the output transistor, ensuring that the output voltage remains stable and unaffected by changes in input voltage or temperature.



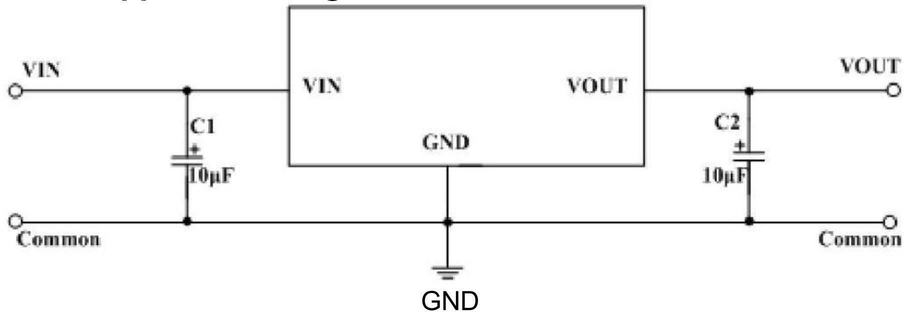
1.When applying, try to place the capacitor near the VIN and VOUT pins.

2.The circuit internally uses a phase compensation circuit and utilizes the ESR (Equivalent Series Resistance) of the output capacitor for compensation. Therefore, a capacitor greater than 2.2μF must be connected from the output to ground. It is recommended to use a tantalum capacitor.

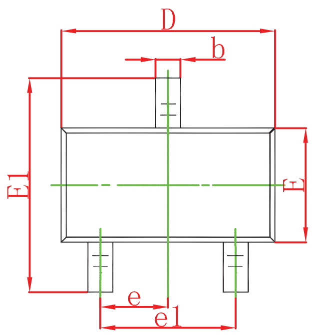
3.Pay attention to the input/output voltage and load current usage conditions to avoid the internal power consumption of the IC exceeding the maximum power dissipation allowed by the package.

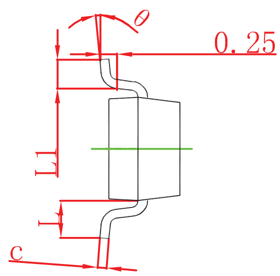
Typical Application Circuit

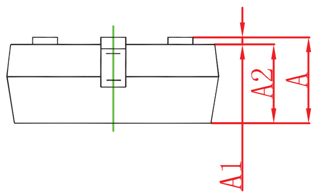
1.Basic Application Diagram



SOT-23 Package Outline Dimensions

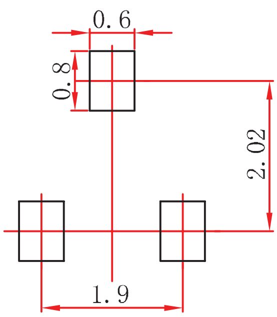






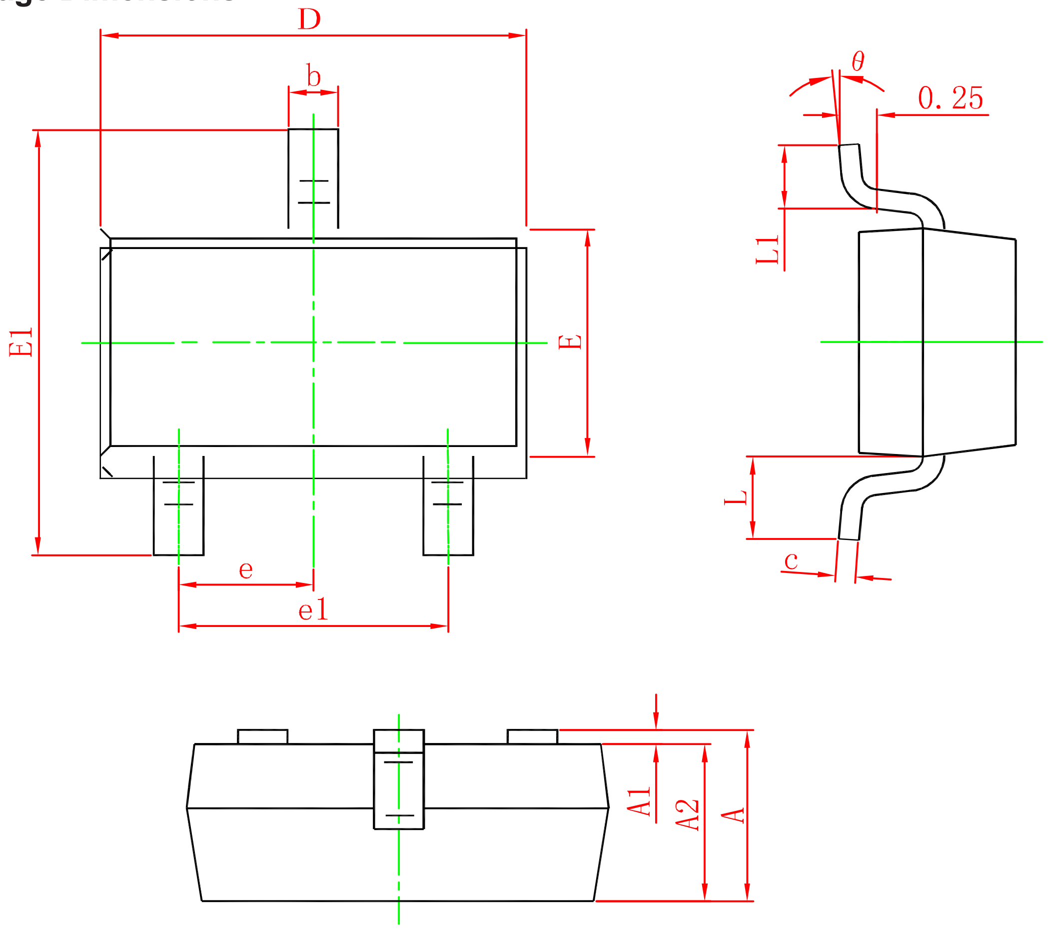
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

SOT-23 Suggested Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.

SOT23-3 Package Dimensions



Symbol	Size(Unit:Inch)		Size(Unit:Inch)	
	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 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°