

High input voltage LDO regulator

■ General description

The 75XX-1 series is a set of low-power high voltage regulators implemented in CMOS technology. The maximum input voltage can reach 30V, and the output voltage ranges from 1.5V to 12.0V. These devices feature high output voltage accuracy, low power consumption and low dropout voltage.

■ Features

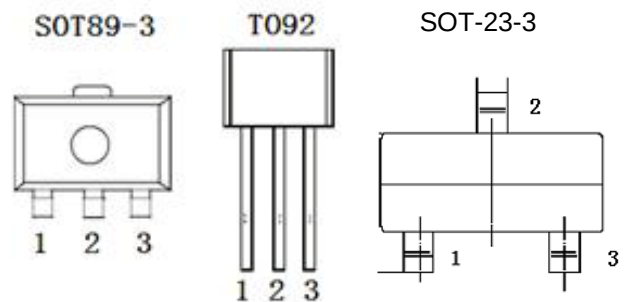
- Low drop voltage: 0.1V typical
- Low temperature drift: 50 ppm/°C typical
- High input voltage: up to 30V
- Output voltage accuracy: ±3%
- Packages: TO-92, SOT89-3, SOT23-3

■ Applications

- Battery-powered equipment
- Audio/Video equipment
- Communication equipment
- Security monitoring equipment

■ Pin Configuration and Functions

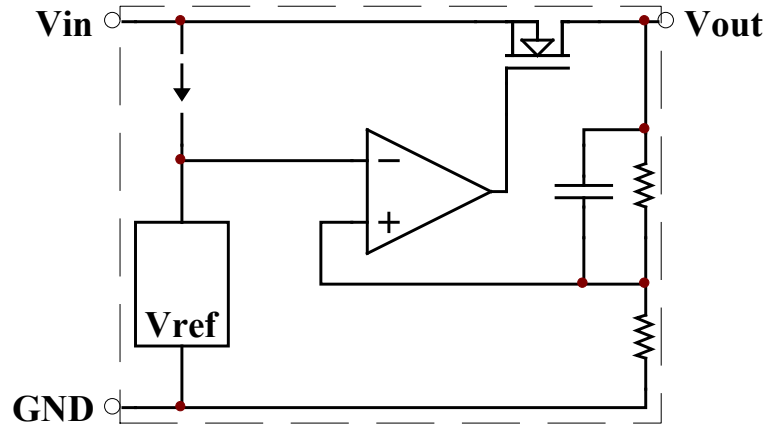
Pin number			Name	Function
TO-92	SOT89-3	SOT23-3		
1	1	1	GND	Ground
2	2	2	VIN	Input
3	3	3	VOUT	Output



■ Selection Table

Name	Part No.	Max input voltage (V)	Output voltage	Tolerance	Packages
75XX-1	7530-1	30	3.0	±3%	TO 92 SOT89-3 SOT-23-3
	7533-1	30	3.3	±3%	
	7536-1	30	3.6	±3%	
	7544-1	30	4.4	±3%	
	7550-1	30	5.0	±3%	

■ Block diagram



■ Limiting values

Characteristic	Symbol	Parameter	Value	Unit
Voltage	V _{IN}	Maximum input voltage	30	V
Power consumption	PD	Power consumption	400	mW
Temperature	T _w	Operating temperature	-25 ~ 70	°C
	T _c	Storage temperature	-50 ~ 125	°C
	T _h	Welding temperature	260	°C, 10s

■ Electrical characteristics

7530-1 (T_{OPT}=25°C)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V _{OUT}	Output voltage	V _{IN} = 5V, I _{OUT} = 10mA	2.91	3	3.09	V
I _{OUT}	Output current	V _{IN} = 5V	60	100	—	mA
ΔV _{OUT}	Load regulation	V _{IN} = 5V, 1mA ≤ I _{OUT} ≤ 20mA	—	100	150	mV
V _{DIF}	Voltage drop	I _{OUT} = 1mA	—	100	—	mV
I _{SS}	Current consumption	V _{IN} = 5V, no load	—	2	3	μA
ΔV _{OUT} / (ΔV _{IN} * V _{OUT})	Line regulation	4V ≤ V _{IN} ≤ 30V, I _{OUT} = 1mA	—	0.2	—	% /V
V _{IN}	Input voltage	—	—	—	30	V
ΔV _{OUT} / ΔT _a	Temperature coefficient	V _{IN} = 5V, I _{OUT} = 10mA 0°C ≤ T _a ≤ 70°C	—	±0.45	—	mV/°C

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 7533-1 (T_{OPT}=25°C)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V _{OUT}	Output voltage	V _{IN} = 5.5V, I _{OUT} = 10mA	3.201	3.3	3.399	V
I _{OUT}	Output current	V _{IN} = 5.5V	60	100	—	mA
ΔV _{OUT}	Load regulation	V _{IN} = 5.5V, 1mA ≤ I _{OUT} ≤ 30mA	—	100	150	mV
V _{DIF}	Voltage drop	I _{OUT} = 1mA	—	100	—	mV
I _{SS}	Current consumption	V _{IN} = 5.5V, no load	—	2	3	μA
ΔV _{OUT} / (ΔV _{IN} * V _{OUT})	Line regulation	4.5V ≤ V _{IN} ≤ 30V, I _{OUT} = 1mA	—	0.2	—	% /V
V _{IN}	Input voltage	—	—	—	30	V
ΔV _{OUT} / ΔT _a	Temperature coefficient	V _{IN} = 5.5V, I _{OUT} = 10mA 0°C ≤ T _a ≤ 70°C	—	±0.5	—	mV/°C

 7536-1 (T_{OPT}=25°C)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V _{OUT}	Output voltage	V _{IN} = 5.6V, I _{OUT} = 10mA	3.492	3.6	3.708	V
I _{OUT}	Output current	V _{IN} = 5.6V	60	100	—	mA
ΔV _{OUT}	Load regulation	V _{IN} = 5.6V, 1mA ≤ I _{OUT} ≤ 30mA	—	100	150	mV
V _{DIF}	Voltage drop	I _{OUT} = 1mA	—	100	—	mV
I _{SS}	Current consumption	V _{IN} = 5.6V, no load	—	2	3	μA
ΔV _{OUT} / (ΔV _{IN} * V _{OUT})	Line regulation	4.6V ≤ V _{IN} ≤ 30V, I _{OUT} = 1mA	—	0.2	—	% /V
V _{IN}	Input voltage	—	—	—	30	V
ΔV _{OUT} / ΔT _a	Temperature coefficient	V _{IN} = 5.6V, I _{OUT} = 10mA 0°C ≤ T _a ≤ 70°C	—	±0.6	—	mV/°C

 7544-1 (T_{OPT}=25°C)

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V _{OUT}	Output voltage	V _{IN} = 6.4V, I _{OUT} = 10mA	4.268	4.4	4.532	V
I _{OUT}	Output current	V _{IN} = 6.4V	60	100	—	mA
ΔV _{OUT}	Load regulation	V _{IN} = 6.4V, 1mA ≤ I _{OUT} ≤ 30mA	—	100	150	mV
V _{DIF}	Voltage drop	I _{OUT} = 1mA	—	100	—	mV
I _{SS}	Current consumption	V _{IN} = 6.4V, no load	—	2	3	μA
ΔV _{OUT} / (ΔV _{IN} * V _{OUT})	Line regulation	5.4V ≤ V _{IN} ≤ 30V, I _{OUT} = 1mA	—	0.2	—	% /V
V _{IN}	Input voltage	—	—	—	30	V
ΔV _{OUT} / ΔT _a	Temperature coefficient	V _{IN} = 6.4V, I _{OUT} = 10mA 0°C ≤ T _a ≤ 70°C	—	±0.7	—	mV/°C

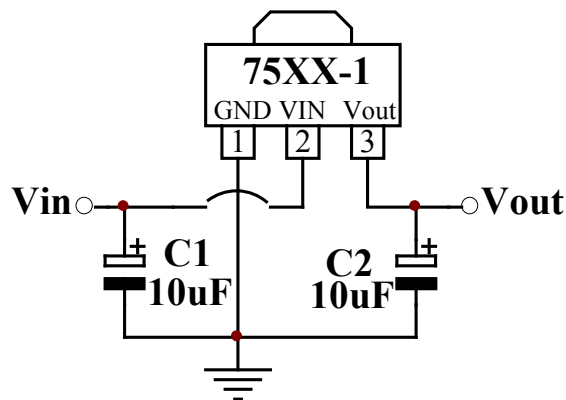
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7550-1 (T_{OPT}=25°C)

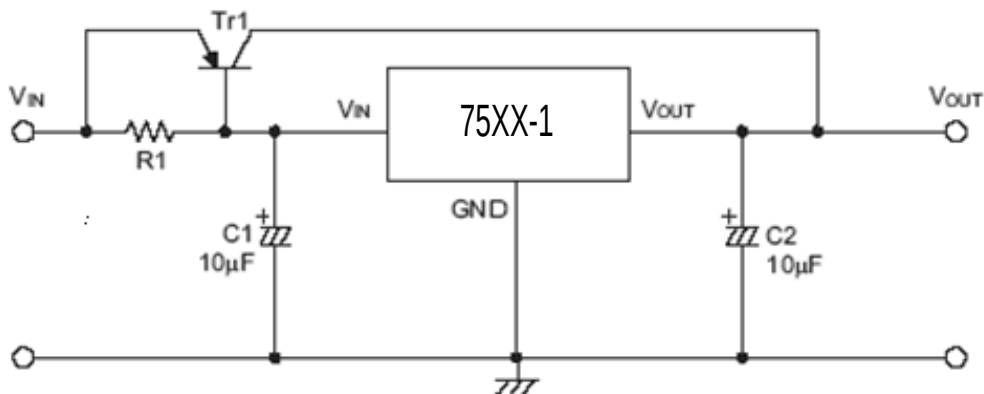
Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
V _{OUT}	Output voltage	V _{IN} = 7V, I _{OUT} = 10mA	4.85	5	5.15	V
I _{OUT}	Output current	V _{IN} = 7V	60	100	—	mA
ΔV _{OUT}	Load regulation	V _{IN} = 7V, 1mA ≤ I _{OUT} ≤ 20mA	—	100	150	mV
V _{DIF}	Voltage drop	I _{OUT} = 1mA	—	100	—	mV
I _{SS}	Current consumption	V _{IN} = 7V, no load	—	2	3	μA
ΔV _{OUT} / (ΔV _{IN} * V _{OUT})	Line regulation	6V ≤ V _{IN} ≤ 30V, I _{OUT} = 1mA	—	0.2	—	% /V
V _{IN}	Input voltage	—	—	—	30	V
ΔV _{OUT} / ΔT _a	Temperature coefficient	V _{IN} = 7V, I _{OUT} = 10mA 0°C ≤ T _a ≤ 70°C	—	±0.75	—	mV/°C

■ Application circuits

1. Basic circuit

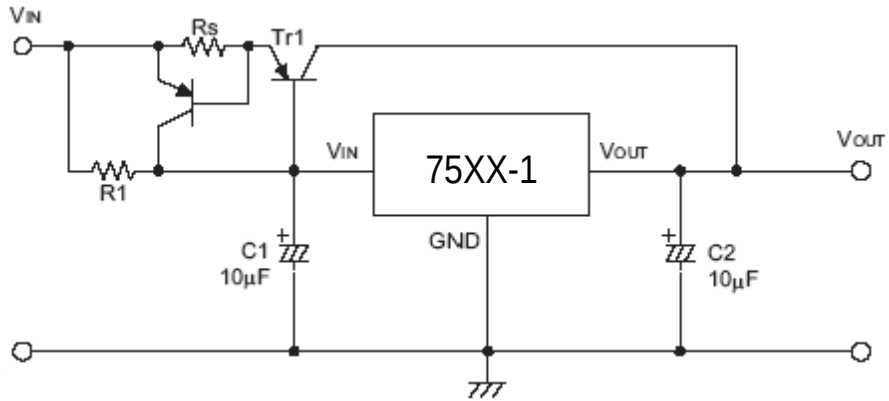


2. High Output Current Positive Voltage Regulator

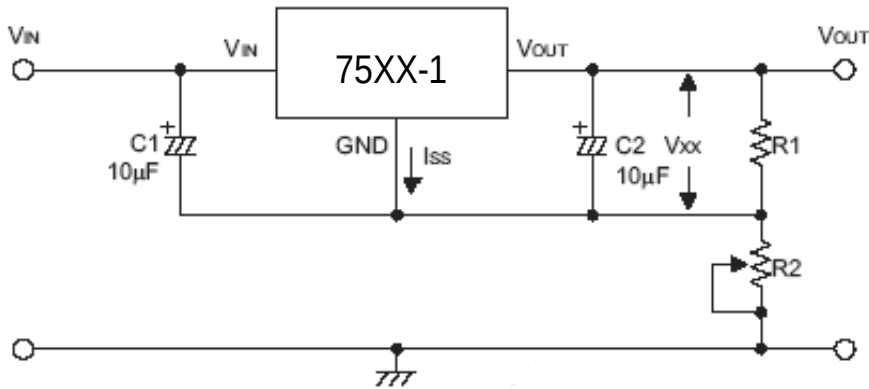


High input voltage LDO regulator

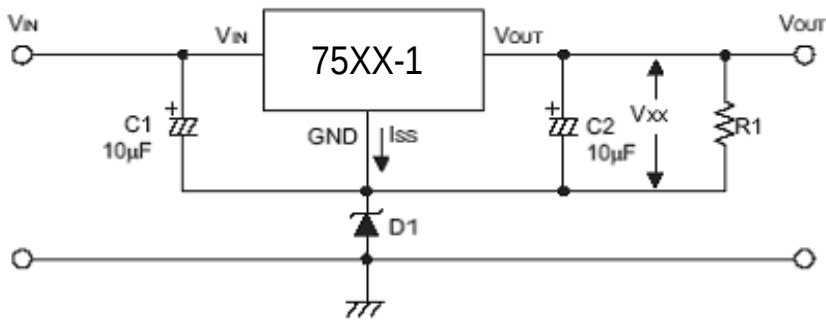
3. Short-Circuit Protection



4. Circuit for Increasing Output Voltage (1)



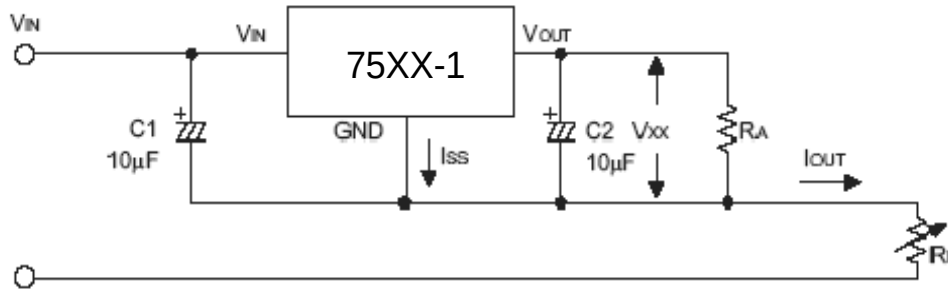
$$V_{OUT} = V_{xx} (1 + R2/R1) + I_{ss} * R2$$



$$V_{OUT} = V_{xx} + VD1$$

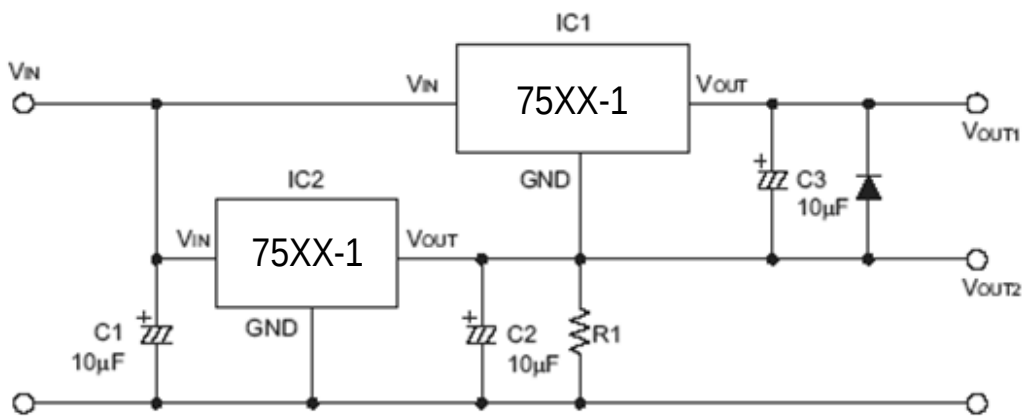
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6. Constant Current Regulator



$$I_{OUT} = V_{XX}/R_X + I_{SS}$$

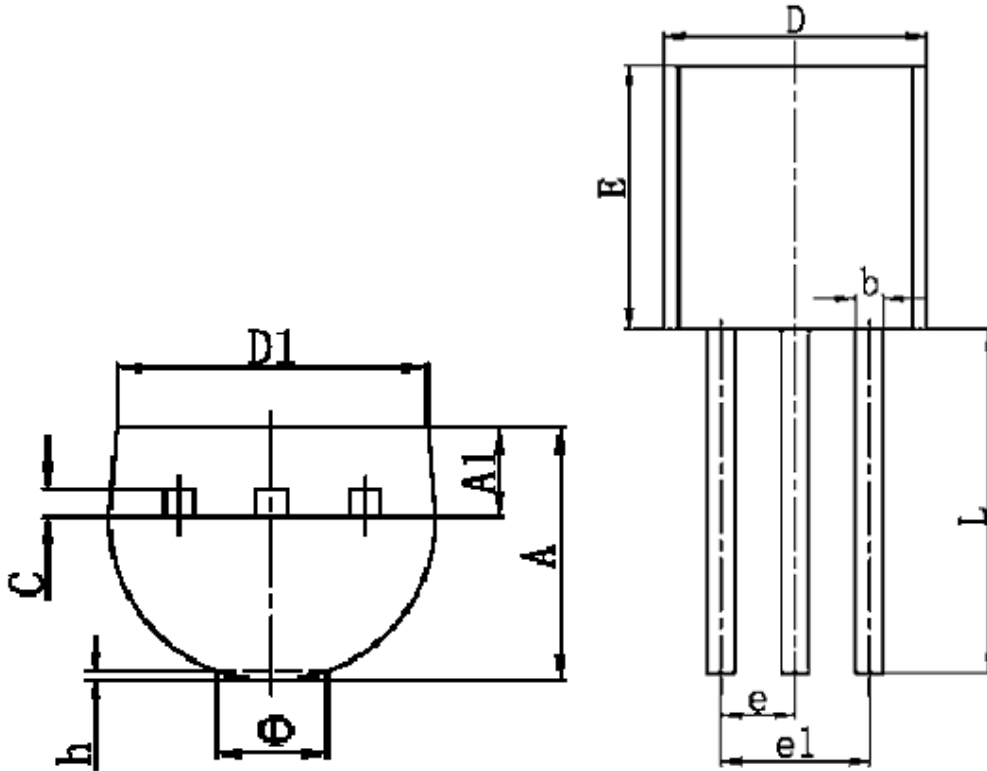
7 Dual Supply



Note: XX represents the output voltage

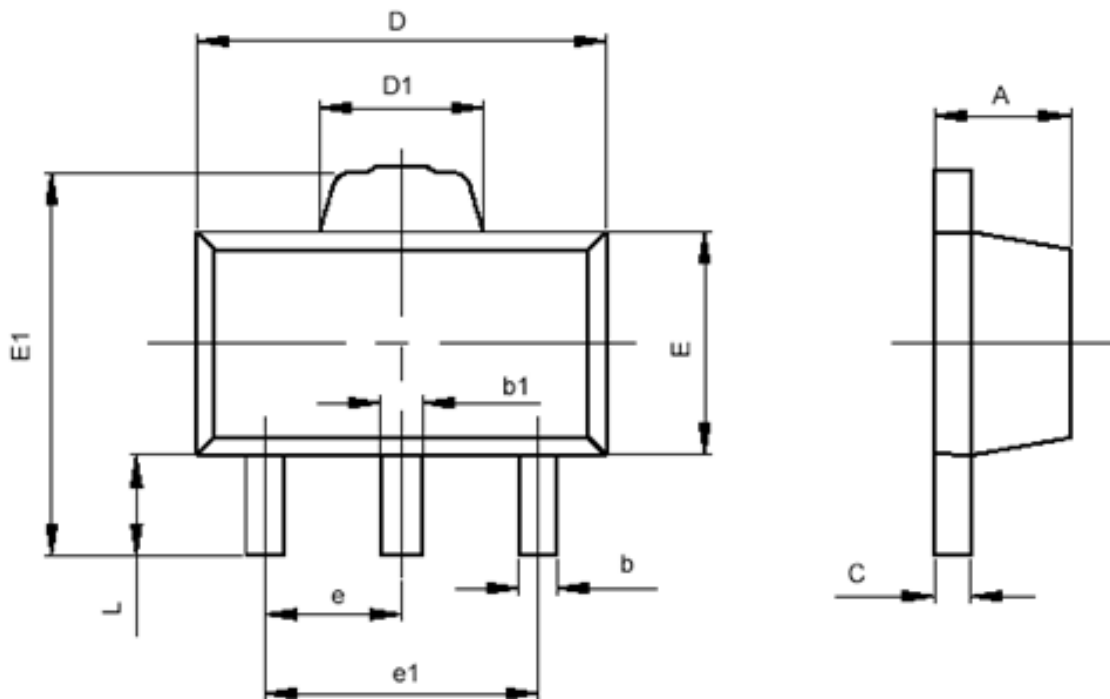
■ Package Information

T0-92



符号	最小值 (mm)	最大值 (mm)
A	3.300	3.700
A1	1.100	1.400
b	0.380	0.550
c	0.360	0.510
D	4.400	4.700
D1	3.430	
E	4.300	4.700
e	1.270 TYP	
e1	2.440	2.640
L	14.100	14.500
Φ		1.600
h	0.000	0.380

SOT-89-3



符号	最小值 (mm)	最大值 (mm)
A	1.400	1.600
b	0.320	0.520
b1	0.360	0.560
c	0.350	0.440
D	4.400	4.600
D1	1.400	1.800
E	2.300	2.600
E1	3.940	4.250
e	1.500TYP	
e1	2.900	3.100
L	0.900	1.100

SOT-23-3

