Low-Power High-Voltage Voltage Regulator

1.Overview

The FLD75XX series are low-power, high-voltage voltage regulators manufactured using CMOS technology. They deliver an output current of 100 mA and accept a maximum input voltage of up to 30 V, with an output voltage range of 2.1 V to 5.0 V. Features include low dropout voltage and low quiescent current.

2.Features

- Low power consumption
- Low dropout voltage
- Low temperature coefficient
- High output current capability
- High output voltage accuracy: tolerance ±2%
- Available packages: TO-92, SOT-89-3L, SOT-23-3L

3.Applications

- Battery-powered equipment
- Power supplies for various communication devices
- Audio/Video equipment

4.Typical Application Circuit

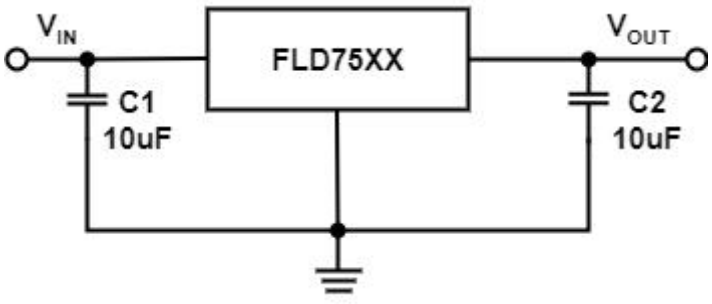
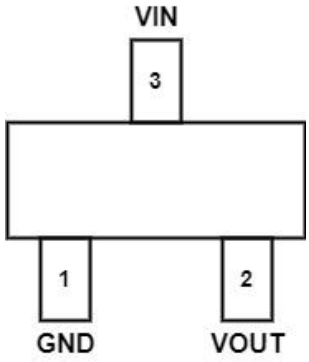


Figure 1 Basic Circuit

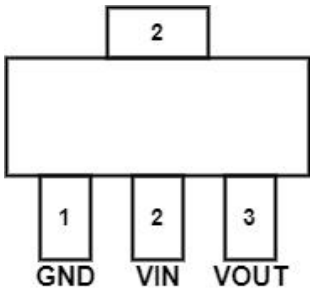
5.Ordering Information

Model	Output Voltage	Package	Ordering Code	Packing
FLD7521	2.1V	SOT23-3L	FLD7521-SBA21CT	Tape and Reel,3000
		SOT-89-3L	FLD7521-SEA21CT	Tape and Reel,1000
		TO-92	FLD7521-TOA21CA	Bag,1000
FLD7523	2.3V	SOT23-3L	FLD7523-SBA23CT	Tape and Reel,3000
		SOT-89-3L	FLD7523-SEA23CT	Tape and Reel,1000
		TO-92	FLD7523-TOA23CA	Bag,1000
FLD7525	2.5V	SOT23-3L	FLD7525-SBA25CT	Tape and Reel,3000
		SOT-89-3L	FLD7525-SEA25CT	Tape and Reel,1000
		TO-92	FLD7525-TOA25CA	Bag,1000
FLD7527	2.7V	SOT23-3L	FLD7527-SBA27CT	Tape and Reel,3000
		SOT-89-3L	FLD7527-SEA27CT	Tape and Reel,1000
		TO-92	FLD7527-TOA27CA	Bag,1000
FLD7530	3.0V	SOT23-3L	FLD7530-SBA30CT	Tape and Reel,3000
		SOT-89-3L	FLD7530-SEA30CT	Tape and Reel,1000
		TO-92	FLD7530-TOA30CA	Bag,1000
FLD7533	3.3V	SOT23-3L	FLD7533-SBA33CT	Tape and Reel,3000
		SOT-89-3L	FLD7533-SEA33CT	Tape and Reel,1000
		TO-92	FLD7533-TOA33CA	Bag,1000
FLD7536	3.6V	SOT23-3L	FLD7536-SBA36CT	Tape and Reel,3000
		SOT-89-3L	FLD7536-SEA36CT	Tape and Reel,1000
		TO-92	FLD7536-TOA36CA	Bag,1000
FLD7540	4.0V	SOT23-3L	FLD7540-SBA40CT	Tape and Reel,3000
		SOT-89-3L	FLD7540-SEA40CT	Tape and Reel,1000
		TO-92	FLD7540-TOA40CA	Bag,1000
FLD7544	4.4V	SOT23-3L	FLD7544-SBA44CT	Tape and Reel,3000
		SOT-89-3L	FLD7544-SEA44CT	Tape and Reel,1000
		TO-92	FLD7544-TOA44CA	Bag,1000
FLD7550	5.0V	SOT23-3L	FLD7550-SBA50CT	Tape and Reel,3000
		SOT-89-3L	FLD7550-SEA50CT	Tape and Reel,1000
		TO-92	FLD7550-TOA50CA	Bag,1000

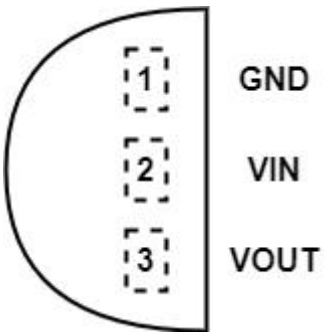
6.Pin Configuration and Functions



SOT23-3L



SOT-89-3L



TO-92

Pin Number			Name	Description
SOT23-3L	SOT-89-3L	TO-92		
1	1	1	GND	Ground
3	2	2	VIN	Power supply input
2	3	3	VOUT	Output pin

7.Absolute Maximum Ratings

(TA = 25 °C unless otherwise noted)

Parameter	Symbol	Range	Unit
Input Voltage	V_{IN}	-0.3 ~ +33	V
Power Dissipation	P_D	200	mW
Operating Temperature	T_{OPR}	-20 ~ + 125	℃
Storage Temperature	T_{STG}	-65 ~ + 150	℃

8.Electrical Characteristics

FLD7521

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{OUT}	Output voltage	V_{IN} =V_{OUT}+2V, I_{OUT} =10mA	2.037	2.100	2.163	V
I_{OUT}	Output current	V_{IN}=V_{OUT}+2V	60	100	-	mA
ΔV_{OUT}	Load Regulation	V_{IN} =V_{OUT}+2V , 1mA≤I_{OUT} ≤50mA	-	60	100	mV
V_{DIF}	Dropout Voltage	I_{OUT} = 1mA	-	100	-	mV
I_Q	Quiescent current	No load , V_{IN}=V_{OUT}+2V	-	2	5	uA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line regulation	V_{OUT}+1V≤V_{IN}≤30V , I_{OUT} =1mA	-	0.2	-	%/V
V_{IN}	Input Voltage	-	-	-	30	V
$\frac{\Delta V_{OUT}}{\Delta Ta}$	Temperature coefficient	I_{OUT} =10mA , -20℃<Ta<125℃	-	±0.45	-	mV/℃

FLD7523

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{OUT}	Output voltage	V_{IN} =V_{OUT}+2V, I_{OUT} =10mA	2.231	2.300	2.369	V
I_{OUT}	Output current	V_{IN}=V_{OUT}+2V	60	100	-	mA
ΔV_{OUT}	Load Regulation	V_{IN} =V_{OUT}+2V , 1mA≤I_{OUT} ≤50mA	-	60	100	mV
V_{DIF}	Dropout Voltage	I_{OUT} = 1mA	-	100	-	mV
I_Q	Quiescent current	No load , V_{IN}=V_{OUT}+2V	-	2	5	uA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line regulation	V_{OUT}+1V≤V_{IN}≤30V I_{OUT} =1mA	-	0.2	-	%/V
V_{IN}	Input Voltage	-	-	-	30	V
$\frac{\Delta V_{OUT}}{\Delta Ta}$	Temperature coefficient	I_{OUT} =10mA -20℃<Ta<125℃	-	±0.45	-	mV/℃

FLD7525

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{OUT}	Output voltage	V_{IN} =V_{OUT}+2V, I_{OUT} =10mA	2.425	2.500	2.575	V
I_{OUT}	Output current	V_{IN}=V_{OUT}+2V	60	100	-	mA
ΔV_{OUT}	Load Regulation	V_{IN} =V_{OUT}+2V , 1mA≤I_{OUT} ≤50mA	-	60	100	mV
V_{DIF}	Dropout Voltage	I_{OUT} = 1mA	-	100	-	mV
I_Q	Quiescent current	No load , V_{IN}=V_{OUT}+2V	-	2	5	uA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line regulation	V_{OUT}+1V≤V_{IN}≤30V I_{OUT} =1mA	-	0.2	-	%/V
V_{IN}	Input Voltage	-	-	-	30	V
$\frac{\Delta V_{OUT}}{\Delta Ta}$	Temperature coefficient	I_{OUT} =10mA -20℃<Ta<125℃	-	±0.45	-	mV/℃

FLD7527

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{OUT}	Output voltage	V_{IN} =V_{OUT}+2V, I_{OUT} =10mA	2.619	2.700	2.781	V
I_{OUT}	Output current	V_{IN}=V_{OUT}+2V	60	100	-	mA
ΔV_{OUT}	Load Regulation	V_{IN} =V_{OUT}+2V , 1mA≤I_{OUT} ≤50mA	-	60	100	mV
V_{DIF}	Dropout Voltage	I_{OUT} = 1mA	-	100	-	mV
I_Q	Quiescent current	No load , V_{IN}=V_{OUT}+2V	-	2	5	uA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line regulation	V_{OUT}+1V≤V_{IN}≤30V I_{OUT} =1mA	-	0.2	-	%/V
V_{IN}	Input Voltage	-	-	-	30	V
$\frac{\Delta V_{OUT}}{\Delta Ta}$	Temperature coefficient	I_{OUT} =10mA -20℃<Ta<125℃	-	±0.45	-	mV/℃

FLD7530

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{OUT}	Output voltage	V_{IN} =V_{OUT}+2V, I_{OUT} =10mA	2.910	3.000	3.090	V
I_{OUT}	Output current	V_{IN}=V_{OUT}+2V	60	100	-	mA
ΔV_{OUT}	Load Regulation	V_{IN} =V_{OUT}+2V , 1mA≤I_{OUT} ≤50mA	-	60	100	mV
V_{DIF}	Dropout Voltage	I_{OUT} = 1mA	-	100	-	mV
I_Q	Quiescent current	No load , V_{IN}=V_{OUT}+2V	-	2	5	uA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line regulation	V_{OUT}+1V≤V_{IN}≤30V I_{OUT} =1mA	-	0.2	-	%/V
V_{IN}	Input Voltage	-	-	-	30	V
$\frac{\Delta V_{OUT}}{\Delta Ta}$	Temperature coefficient	I_{OUT} =10mA -20℃<Ta<125℃	-	±0.45	-	mV/℃

FLD7533

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{OUT}	Output voltage	V_{IN} =V_{OUT}+2V, I_{OUT} =10mA	3.201	3.300	3.399	V
I_{OUT}	Output current	V_{IN}=V_{OUT}+2V	60	100	-	mA
ΔV_{OUT}	Load Regulation	V_{IN} =V_{OUT}+2V , 1mA≤I_{OUT} ≤50mA	-	60	100	mV
V_{DIF}	Dropout Voltage	I_{OUT} = 1mA	-	100	-	mV
I_Q	Quiescent current	No load , V_{IN}=V_{OUT}+2V	-	2	5	uA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line regulation	V_{OUT}+1V≤V_{IN}≤30V I_{OUT} =1mA	-	0.2	-	%/V
V_{IN}	Input Voltage	-	-	-	30	V
$\frac{\Delta V_{OUT}}{\Delta Ta}$	Temperature coefficient	I_{OUT} =10mA -20℃<Ta<125℃	-	±0.5	-	mV/℃

FLD7536

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{OUT}	Output voltage	V_{IN} =V_{OUT}+2V, I_{OUT} =10mA	3.492	3.600	3.708	V
I_{OUT}	Output current	V_{IN}=V_{OUT}+2V	60	100	-	mA
ΔV_{OUT}	Load Regulation	V_{IN} =V_{OUT}+2V , 1mA≤I_{OUT} ≤50mA	-	60	100	mV
V_{DIF}	Dropout Voltage	I_{OUT} = 1mA	-	100	-	mV
I_Q	Quiescent current	No load , V_{IN}=V_{OUT}+2V	-	2	5	uA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line regulation	V_{OUT}+1V≤V_{IN}≤30V I_{OUT} =1mA	-	0.2	-	%/V
V_{IN}	Input Voltage	-	-	-	30	V
$\frac{\Delta V_{OUT}}{\Delta Ta}$	Temperature coefficient	I_{OUT} =10mA -20℃<Ta<125℃	-	±0.6	-	mV/℃

FLD7540

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{OUT}	Output voltage	V_{IN} =V_{OUT}+2V, I_{OUT} =10mA	3.880	4.000	4.120	V
I_{OUT}	Output current	V_{IN}=V_{OUT}+2V	60	100	-	mA
ΔV_{OUT}	Load Regulation	V_{IN} =V_{OUT}+2V , 1mA≤I_{OUT} ≤50mA	-	60	100	mV
V_{DIF}	Dropout Voltage	I_{OUT} = 1mA	-	100	-	mV
I_Q	Quiescent current	No load , V_{IN}=V_{OUT}+2V	-	2	5	uA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line regulation	V_{OUT}+1V≤V_{IN}≤30V I_{OUT} =1mA	-	0.2	-	%/V
V_{IN}	Input Voltage	-	-	-	30	V
$\frac{\Delta V_{OUT}}{\Delta Ta}$	Temperature coefficient	I_{OUT} =10mA -20℃<Ta<125℃	-	±0.45	-	mV/℃

FLD7544

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{OUT}	Output voltage	V_{IN} =V_{OUT}+2V, I_{OUT} =10mA	4.268	4.400	4.532	V
I_{OUT}	Output current	V_{IN}=V_{OUT}+2V	60	100	-	mA
ΔV_{OUT}	Load Regulation	V_{IN} =V_{OUT}+2V , 1mA≤I_{OUT} ≤50mA	-	60	100	mV
V_{DIF}	Dropout Voltage	I_{OUT} = 1mA	-	100	-	mV
I_Q	Quiescent current	No load , V_{IN}=V_{OUT}+2V	-	2	5	uA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line regulation	V_{OUT}+1V≤V_{IN}≤30V I_{OUT} =1mA	-	0.2	-	%/V
V_{IN}	Input Voltage	-	-	-	30	V
$\frac{\Delta V_{OUT}}{\Delta Ta}$	Temperature coefficient	I_{OUT} =10mA -20℃<Ta<125℃	-	±0.7	-	mV/℃

FLD7550

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
V_{OUT}	Output voltage	V_{IN} =V_{OUT}+2V, I_{OUT} =10mA	4.850	5.000	5.150	V
I_{OUT}	Output current	V_{IN}=V_{OUT}+2V	60	100	-	mA
ΔV_{OUT}	Load Regulation	V_{IN} =V_{OUT}+2V , 1mA≤I_{OUT} ≤50mA	-	60	100	mV
V_{DIF}	Dropout Voltage	I_{OUT} = 1mA	-	100	-	mV
I_Q	Quiescent current	No load , V_{IN}=V_{OUT}+2V	-	2	5	uA
$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	Line regulation	V_{OUT}+1V≤V_{IN}≤30V I_{OUT} =1mA	-	0.2	-	%/V
V_{IN}	Input Voltage	-	-	-	30	V
$\frac{\Delta V_{OUT}}{\Delta Ta}$	Temperature coefficient	I_{OUT} =10mA -20℃<Ta<125℃	-	±0.75	-	mV/℃

9.Schematic Diagram

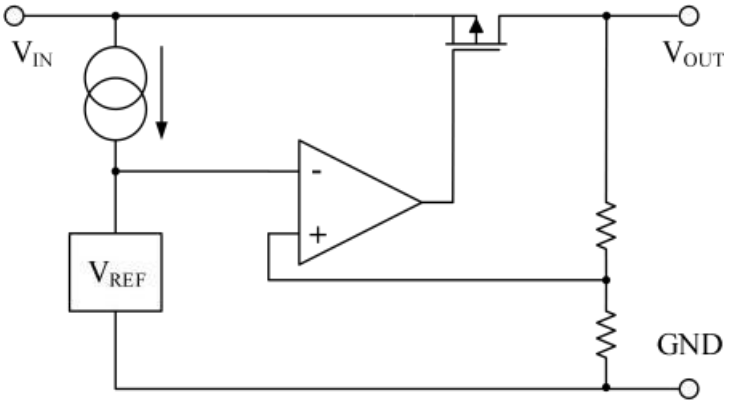


Figure 3 FLD75XX Schematic Diagram

10.Typical Application Circuits

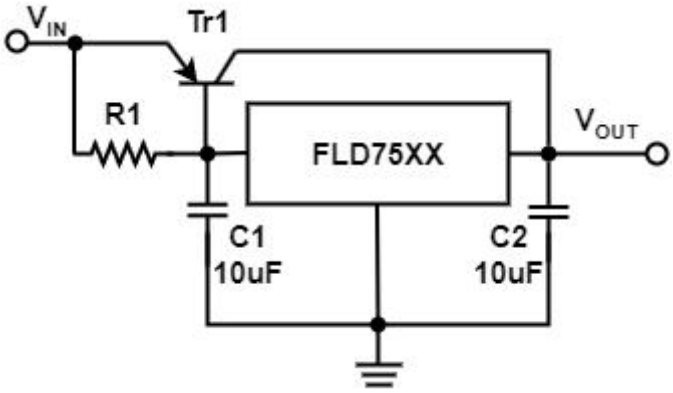


Figure 4 High Output Current Regulator Circuit

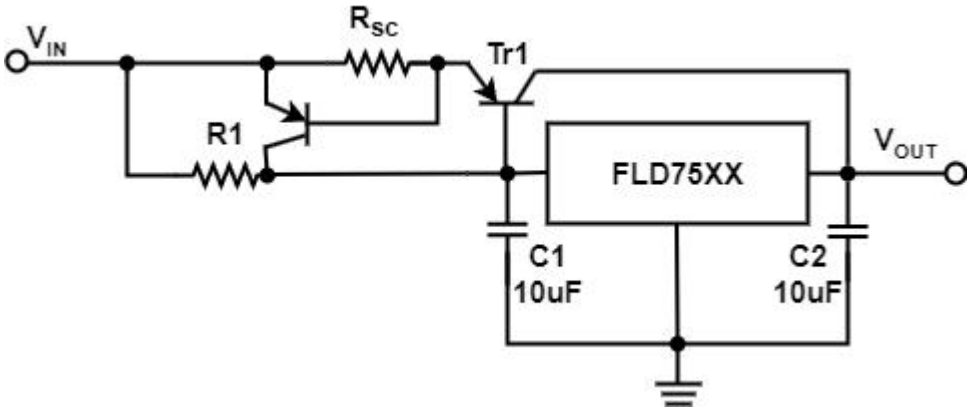


Figure 5 Short- Circuit Protection Circuit

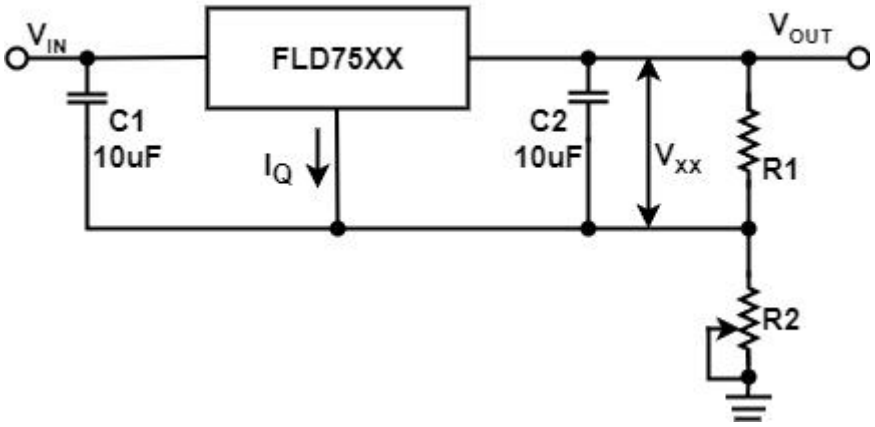


Figure 6 Output Voltage Boosting Circuit 1

$V_{OUT} = V_{XX}(1 + R2 / R1) + I_Q \times R2$

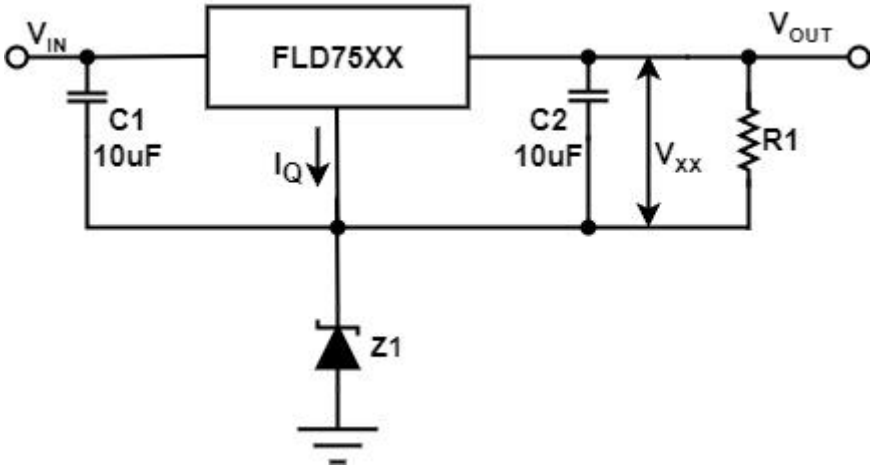


Figure 7 Output Voltage Boosting Circuit 2

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

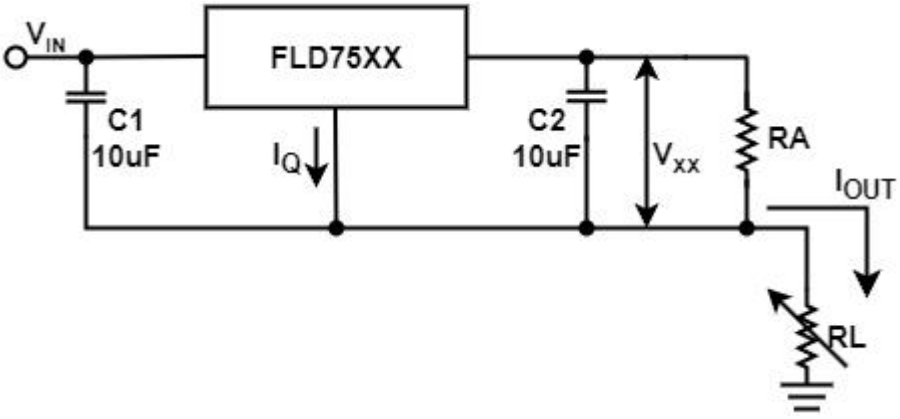


Figure 8 Current Adjustment Circuit

$I_{OUT} = V_{XX} / RX + I_Q$

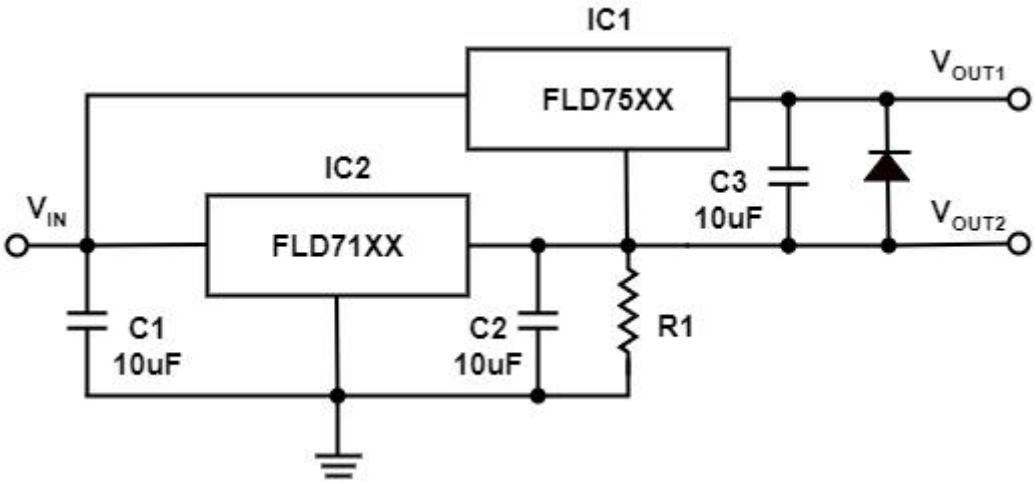


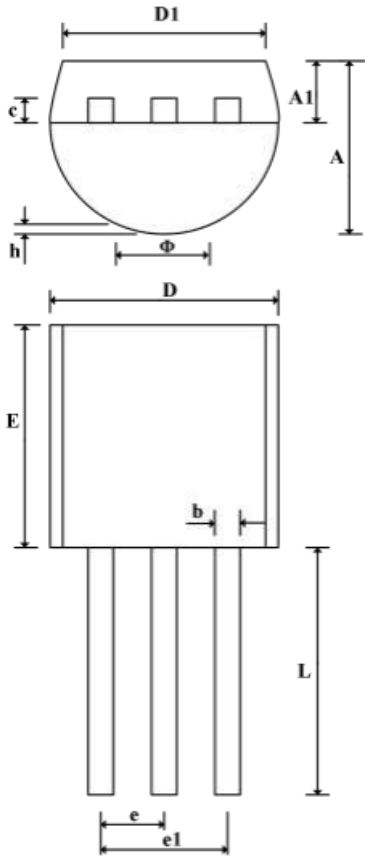
Figure 9 Dual Output Circuit

Note:

"XX" in the above formulas denotes the nominal output voltage

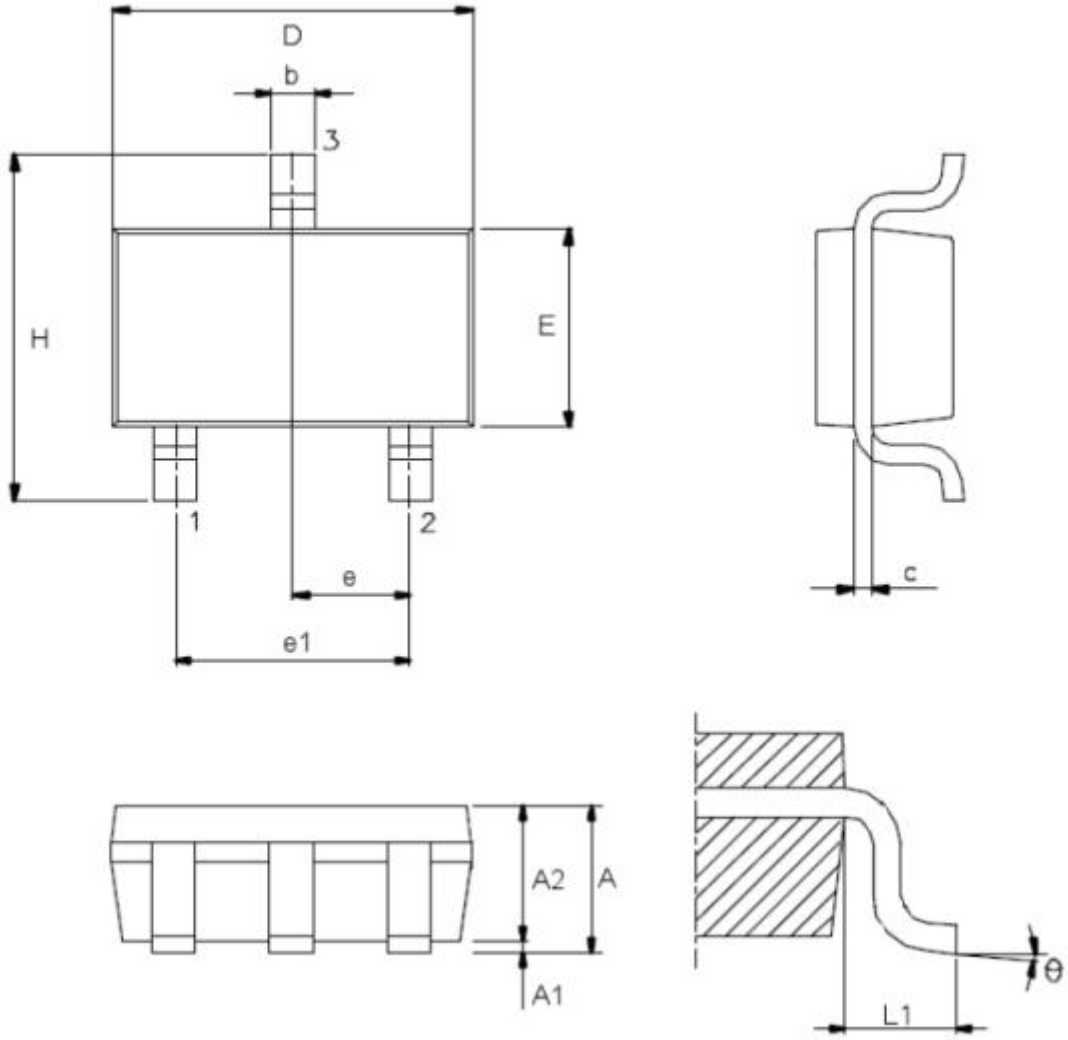
11.Package Dimensions

(1)TO-92：



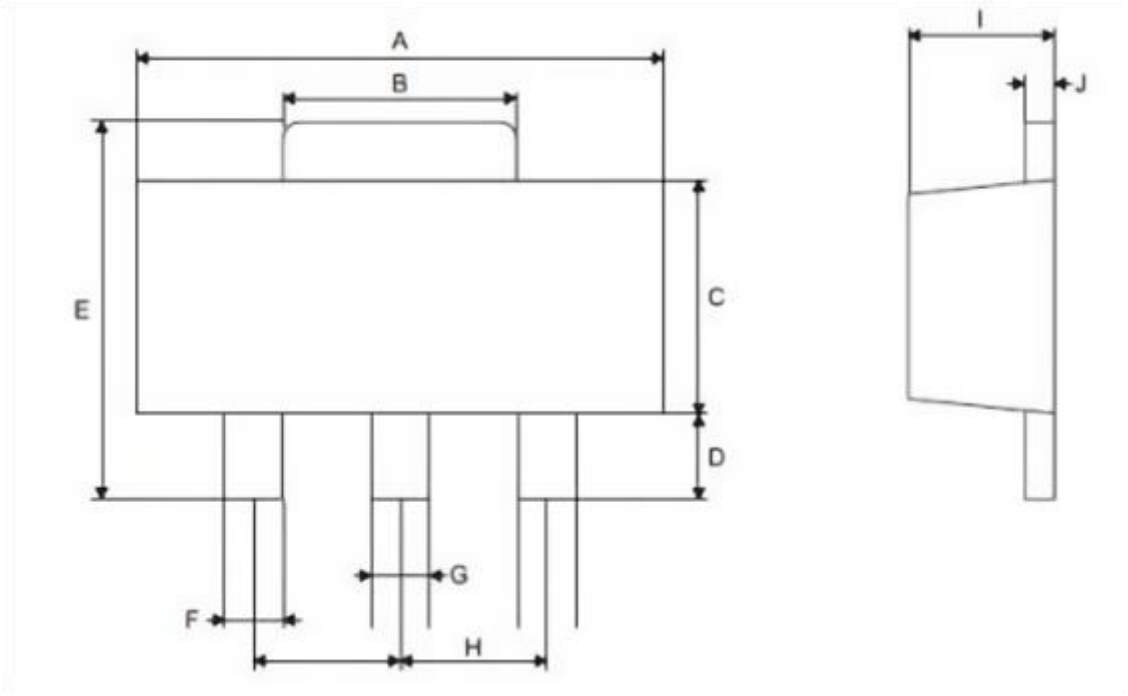
Symbol	Dimensions(mm)		Symbol	Dimensions(mm)	
	Min	Max		Min	Max
A	3.300	3.700	E	4.300	4.700
A1	1.100	1.400	e	1.270 (TYP)	
b	0.360	0.560	e1	2.440	2.640
c	0.280	0.510	L	14.100	14.500
D	4.300	4.700	Φ		1.600
D1	3.430		h	0.000	0.380

(2)SOT23-3L：



Symbol	Dimensions (mm)		
	Min	Typ	Max
A	—	—	1.45
A1	—	—	0.15
A2	0.90	1.15	1.30
b	0.30	—	0.50
C	0.08	—	0.22
D	—	2.90	—
E	—	1.60	—
e	—	0.95	—
e1	—	1.90	—
H	—	2.80	—
L1	—	0.60	
θ	0°	—	9°

(3)SOT-89-3L：



Symbol	Dimensions (mm)		
	Min	Typ	Max
A	4.40	—	4.60
B	1.35	—	1.83
C	2.29	—	2.60
D	0.89	—	1.20
E	3.94	—	4.25
F	0.36	—	0.48
G	0.44	—	0.56
H	—	1.50	—
I	1.40	—	1.60
J	0.35	—	0.44

12.Important Notice And Disclaimer

- We reserve the right to change the instruction manual without prior notice.
- Any semiconductor product has a certain possibility of failure or malfunction under specific conditions. The buyer is responsible for complying with safety standards and taking safety measures when using our products for system design and overall manufacturing to avoid potential failure risks that may cause personal injury or property damage.
- The improvement of product quality is endless, our company will be dedicated to provide customers with better products.