AXXC6

(300mA Low Power Consumption LDO)

■ Overview

The AxxC6 is a low dropout linear regulator (LDO) based on CMOS technology.
It supports an output current of up to 300mA and allows a maximum input voltage of 60V.
The output voltage covers a wide range, with common values from 2.1V to 5.0V, while custom voltages can be selected between 1V and 12V.
Leveraging CMOS technology, it features low dropout voltage and low quiescent current.

■ Features and Functions

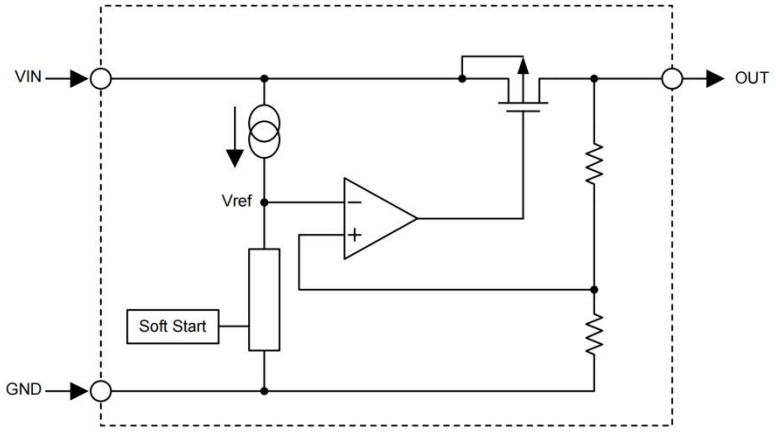
Low Power Consumption
Low Dropout Voltage
Maximum Input Voltage: 60V
Typical Quiescent Current: 2μA
Output Current: 300mA
Output Voltage Accuracy: ±2%
Package Types: SOT23-3, TO92, SOT89, 5SOT23

■ Selection Table

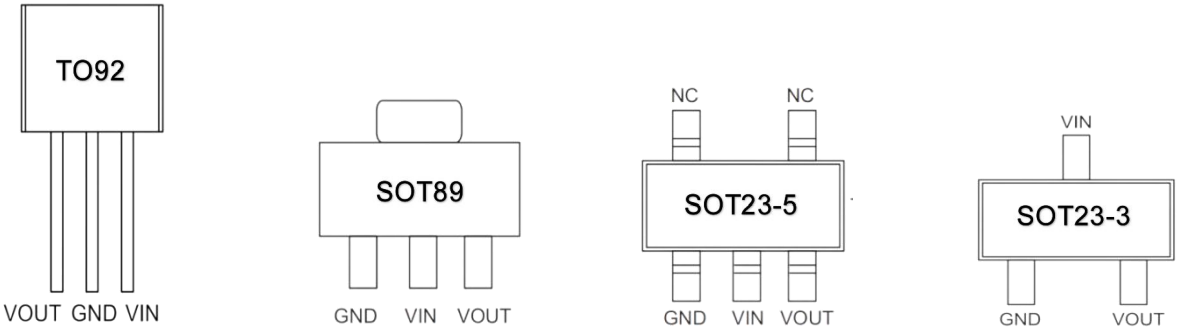
Model Number	Output Voltage	Package Type	Label Mark
A21C6	2.1V	TO92 SOT23-3 SOT23-5 SOT89	75XX-1 or AXXC6*
A23C6	2.3V		
A25C6	2.5V		
A27C6	2.7V		
A30C6	3.0V		
A33C6	3.3V		
A36C6	3.6V		
A40C6	4.0V		
A44C6	4.4V		
A50C6	5.0V		

*XX represents the output voltage.

■ Circuit Block Diagram



■ Pin Diagram



■ Pin Description

NO.	Symbol	Functional Description
1	GND	Ground
2	VIN	Input Pin
3	VOUT	Output Pin

■ Absolute Maximum Rating

Description	Symbol	Value Range
Operating Voltage	V_{IN}	-0.3V~+60V
Storage Temperature	T_{STG}	-50℃~+125℃
Operating Temperature	T_A	-45℃~+85℃

Note: The above parameters represent the maximum values for operating conditions. If the device operates continuously under these extreme conditions, its stability may be affected, and it could potentially cause permanent damage to the device.

■ Thermal Information

Symbol	Description	Package Type	Maximum Value	Unit
θJA	Thermal Resistance	SOT23-3/SOT23-5	500	℃/W
		SOT89	200	℃/W
		TO92	200	℃/W
P_D	Power Consumption	SOT23-3/SOT23-5	0.2	W
		SOT89	0.5	W
		TO92	0.5	W

Note:The P_D value is measured at Ta = 25°C.

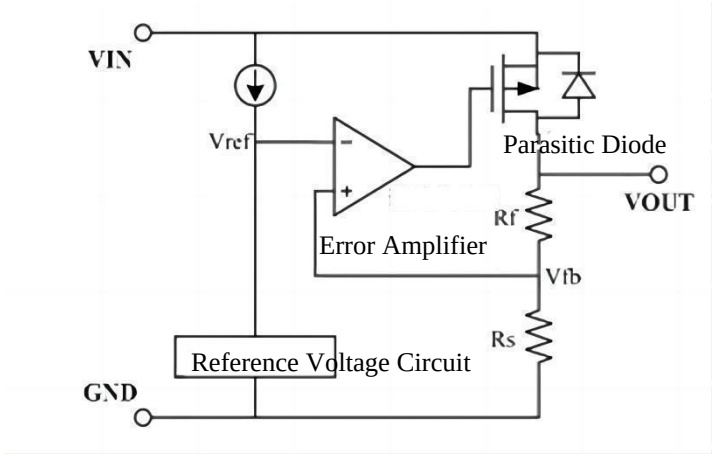
■ Electrical Characteristics (Ta=+25℃)

Parameter	Symbol	Test Conditions	Min	Ty	Max	Unit
Input Voltage	V_{IN}	—	—	—	60	V
Output Voltage	V_{OUT}	$V_{IN} = V_{OUT}+1V$ $I_{OUT} = 40mA$	$V_{OUT} * 0.98$	—	$V_{OUT} * 1.02$	V
Output Current	I_{OUT}	$V_{IN}=V_{OUT} + 1V$ $V_{OUT}\geq 2.7V$	—	—	300	mA
Load Regulation	$\triangle V_{OUT}$	$V_{IN} = V_{OUT} + 1V$ $1mA \leq I_{OUT} \leq 80mA$	—	25	40	mV
Low Dropout	V_{DIF}	I_{OUT} =10mA △Vo = 2%	—	550	--	mV
Quiescent Current	I_{SS}	No Load	—	2.0	3.0	μA
Input Voltage Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	$Vo+1V \leq V_{IN} \leq 21V$ $I_{OUT} = 40mA$	—	0.2	0.3	%/V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_A}$	$V_{IN} = V_{OUT}+1V$ $I_{OUT} = 40mA$ -40℃<Ta<85℃	—	0.7	—	ppm/℃

Note: Under the condition of $V_{IN} = V_{OUT} + 1V$ and a fixed load, when the output voltage decreases by 2%, the difference between the input voltage and the output voltage at this point is the Low Dropout Voltage (VDIF).

■ Functional Description

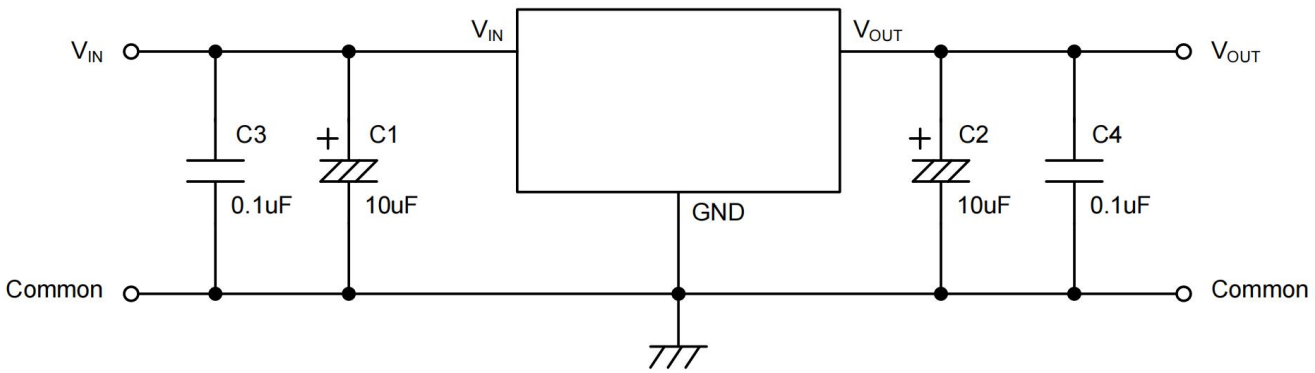
The error amplifier compares the input voltage Vfb, which is derived from the voltage divider formed by the feedback resistors Rs and Rf, with the reference voltage Vref. Based on this comparison, the error amplifier provides the necessary gate voltage to the output transistor, ensuring that the output voltage remains stable and unaffected by variations in input voltage or temperature.



Caution:

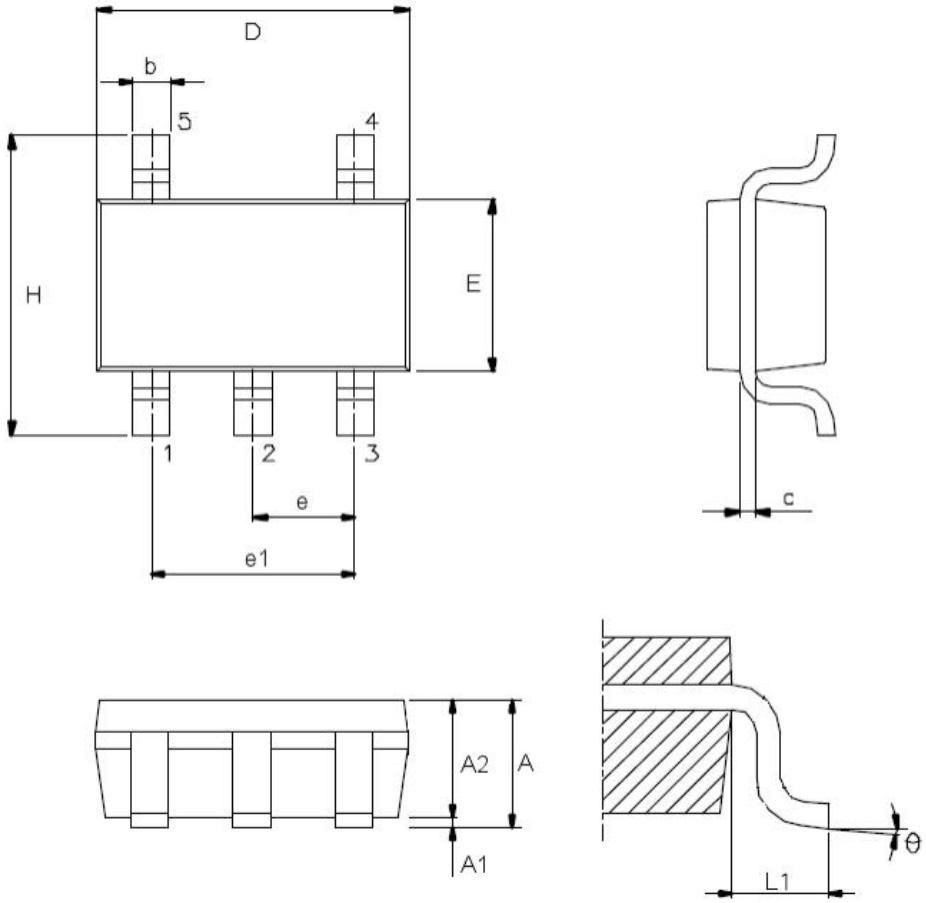
1)The circuit includes a phase compensation circuit and utilizes the output capacitor's ESR for compensation. Therefore, a capacitor greater than 2.2μF must be connected from the output to ground.
2) It is recommended to use a 10μF polarized capacitor for both the input and output, and to place the capacitor as close as possible to the LDO's V_{IN} and V_{OUT} pins.
3)In cases where a polarized capacitor cannot be used (such as no capacitor at the input or only a small capacitor), and the input voltage is relatively high, the instantaneous voltage at V may exceed the IC's maximum voltage rating during power-up, potentially damaging the IC. To prevent this, a small resistor can be placed in series with the input.
4)Pay attention to the input and output voltage and load current conditions to avoid exceeding the maximum allowable power dissipation (P_D) for the package, which could lead to IC damage.

■ Typical Application Circuit



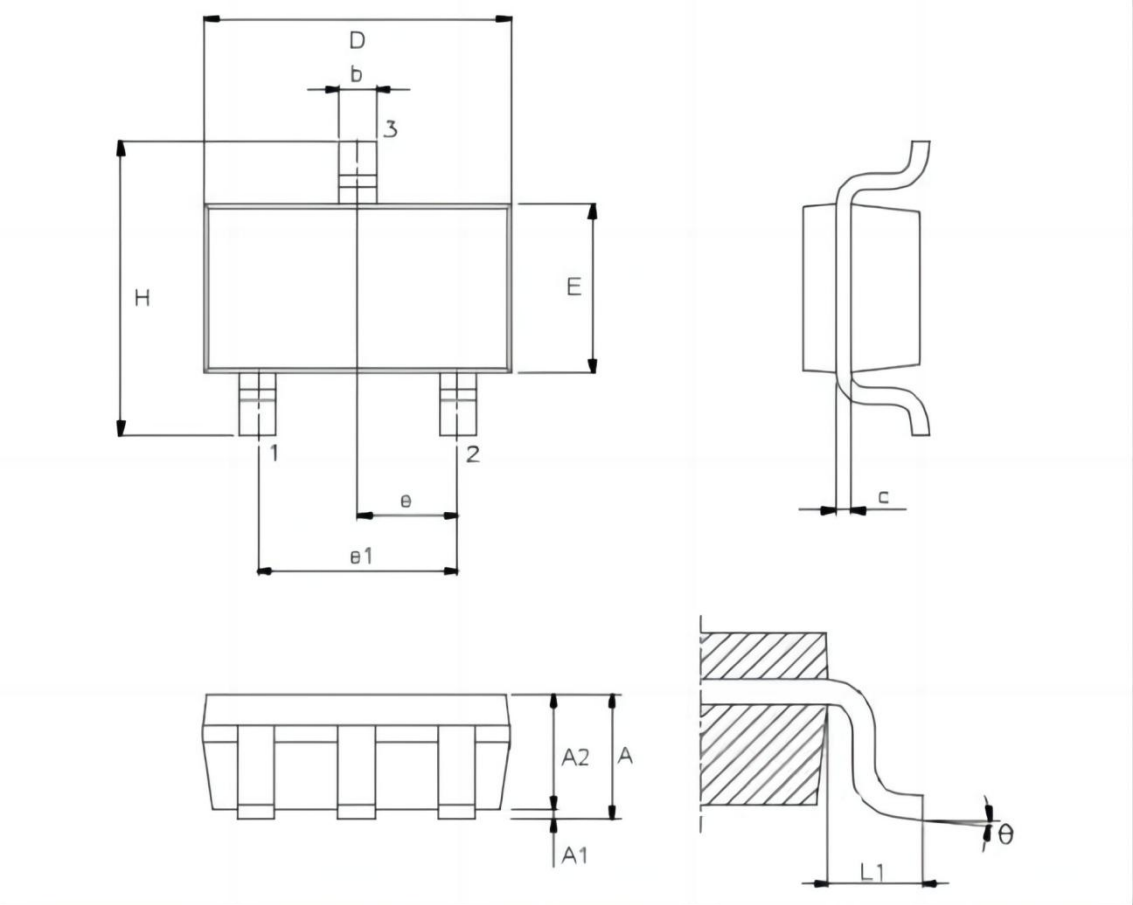
■ Package Information

SOT23-5 Package Dimensions



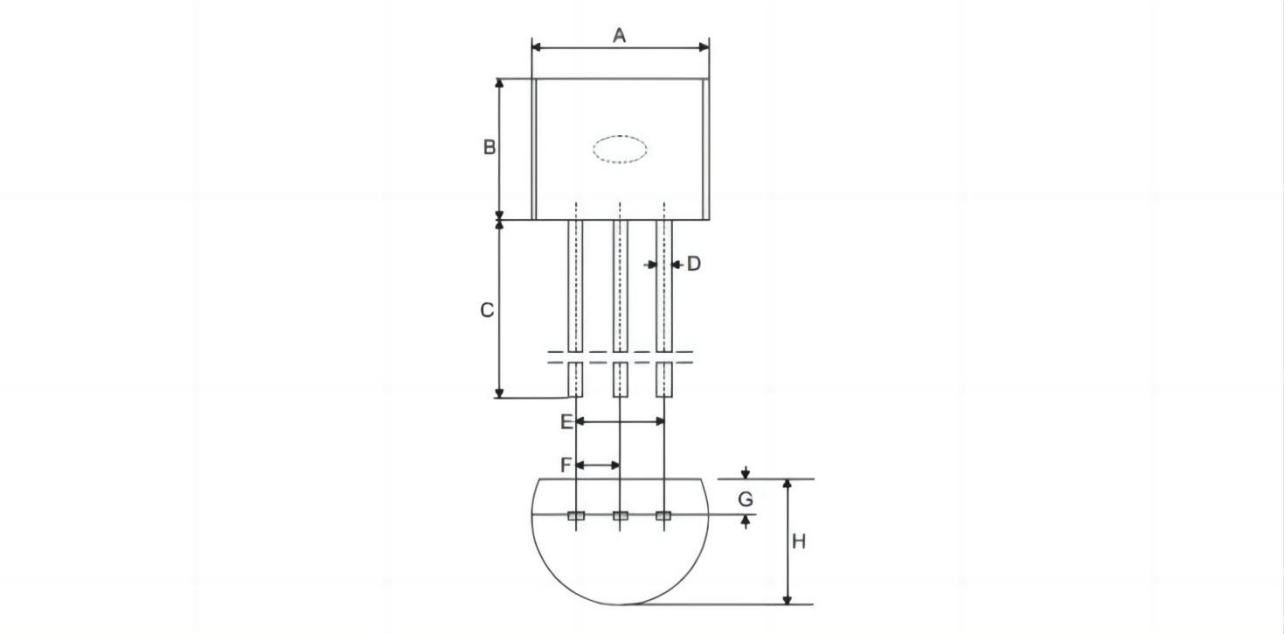
Symbol	Dimensions (Unit: mm)		
	Minimum	Typical	Maximum
A	—	—	1.45
A1	—	—	0.15
A2	0.90	1.15	1.30
b	0.30	—	0.50
C	0.08	—	0.22
D	—	2.90	—
E	—	1.60	—
e	—	0.95	—
e1	—	1.90	—
H	—	2.80	—
L1	—	0.60	
θ	0°	—	8°

SOT23-3 Package Dimensions



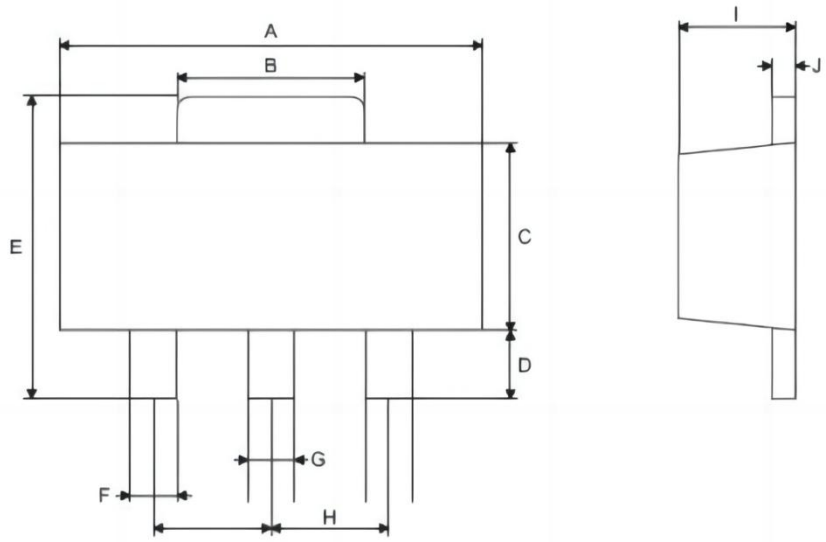
Symbol	Dimensions (Unit: mm)		
	Minimum	Typical	Maximum
A	—	—	1.45
A1	—	—	0.15
A2	0.90	1.15	1.3
b	0.30	—	0.50
C	0.08	—	0.22
D	—	2.90	—
E	—	1.60	—
e	—	0.95	—
e1	—	1.90	—
H	—	2.80	—
L1	—	0.60	
θ	0°	—	9°

TO92 Package Dimensions



Symbol	Dimensions (Unit: mm)		
	Minimum	Typical	Maximum
A	4.39	4.57	5.21
B	4.32	—	5.33
C	12.70	14.73	—
D	—	0.38	—
E	—	2.54	—
F	—	1.27	—
G	—	0.89	—
H	3.18	3.61	4.19

SOT89 Package Dimensions



Symbol	Dimensions (Unit: mm)		
	Minimum	Typical	Maximum
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