

## GENERAL DESCRIPTION

XC6201 series are a set of Low Dropout Linear Regulator ICs implemented in CMOS technology. They can withstand voltage 10V. And they are available with low voltage drop and low quiescent current, widely used in audio, video and communication appliances.

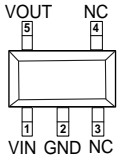
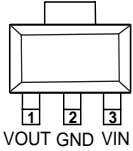
## FEATURES

- Low Power Consumption
- Low Voltage Drop
- Low Temperature Coefficient
- Withstanding Voltage 12V
- Quiescent Current 2.0μA
- Output Voltage Accuracy: tolerance ±2%
- High output current: 300mA

## TYPICAL APPLICATIONS

- Battery-powered Equipments
- Communication Equipments
- Audio/Video Equipments
- Smart Battery Packs
- Smoke Detectors
- CO2 DETECTORS

## PACKAGE/ORDER INFORMATION

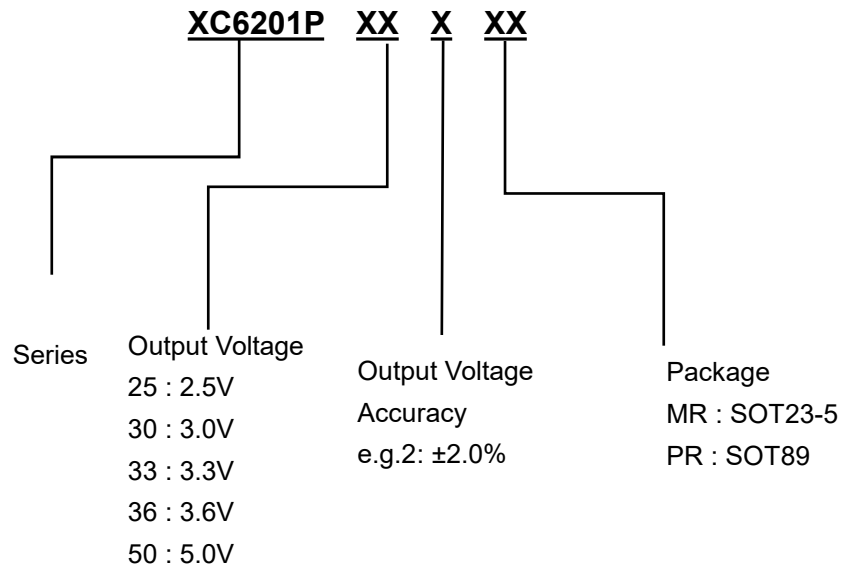
Part Number	Package	Pin Configuration	Marking	QTY
XC6201P252MR	SOT-23-5L		15T*	3000
XC6201P302MR			15Z*	3000
XC6201P332MR			162*	3000
XC6201P362MR			165*	3000
XC6201P502MR			16M*	3000
XC6201P252PR	SOT-89-3		15 T*	1000
XC6201P302PR			15 Z*	1000
XC6201P332PR			16 2*	1000
XC6201P362PR			16 5*	1000
XC6201P502PR			16 M*	1000

Notes: \*Representing internal production number.

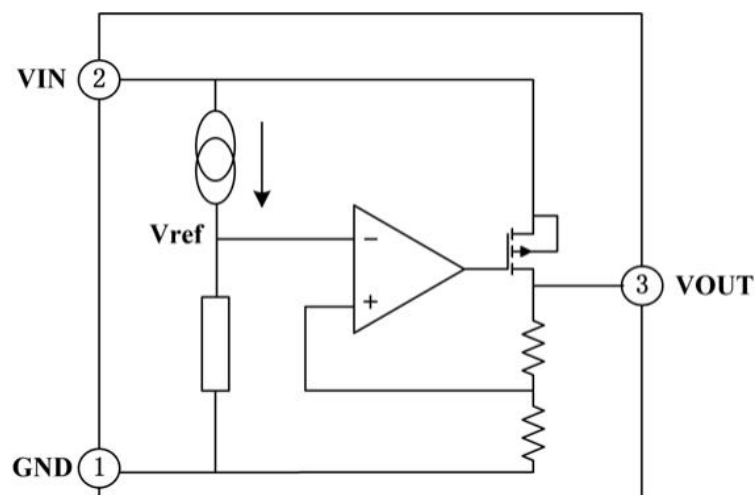
## PIN DESCRIPTION

PIN No.		Name	Functions Description
SOT-23-5	SOT-89-3		
2	2	GND	ground
1	3	VIN	input
5	1	VOUT	output
3		NC	No Connect
4		NC	No Connect

## PRODUCT NAMING



## FUNCTIONAL BLOCK DIAGRAM



## ABSOLUTEMAXIMUMRATINGS

Description	Symbol	Value range	Unit
Limit Power Voltage	$V_{IN}$	-0.3~+15	V
Storage Temperature Range	$T_{STG}$	-50~+125	°C
Operating Free-air Temperature Range	$T_A$	-40~+85	°C

**Note :** Stresses greater than those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “Recommended Operating Conditions” is not implied. Exposure to “Absolute Maximum Ratings” for extended periods may affect device reliability.

## HEATDISSIPATION

Description	Symbol	Package	Value range	Unit
Thermal resistance	$\theta_{JA}$	SOT-89-3	200	°C/W
		SOT-23-5L	500	°C/W
Power dissipation	$P_W$	SOT-89-3	500	mW
		SOT-23-5L	200	mW

## DCCHARACTERISTICS(unless otherwise noted $T_A = +25^\circ\text{C}$ )( $V_{IN} = V_{OUT} + 2.0\text{V}$ , $C_{IN} =$

$C_L = 10\mu\text{F}$ ,  $T_a = 25^\circ\text{C}$ , unless otherwise noted)

### Series +2.5V OUTPUT

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Output Voltage	$V_{OUT}$	$V_{IN} = V_{OUT} + 2.0\text{V}$ , $I_{OUT} = 10\text{mA}$	2.450	2.500	2.550	V
Output Current	$I_{OUT}$	$V_{IN} = V_{OUT} + 2.0\text{V}$	300	—	—	mA
Load Regulation	$\Delta V_{OUT}$	$V_{IN} = V_{OUT} + 2.0\text{V}$ $1\text{mA} \leq I_{OUT} \leq 300\text{mA}$	—	37	100	mV
Voltage Drop	$V_{DIF}$	$I_{OUT} = 10\text{mA}$ , $\Delta V_{OUT} = 2\%$	—	35	55	mV
Quiescent Current	$I_{SS}$	—	—	2.0	3.0	$\mu\text{A}$
Line Regulation	$\frac{\Delta V_{OUT}}{V_{OUT}} \cdot \Delta V_{IN}$	$V_{OUT} + 1.0\text{V} \leq V_{IN} \leq 12\text{V}$ , $I_{OUT} = 1\text{mA}$	—	—	0.2	%/V
Input Voltage	$V_{IN}$	—	—	—	12	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_A} \cdot V_{OUT}$	$V_{IN} = V_{OUT} + 2.0\text{V}$ , $I_{OUT} = 10\text{mA}$ , $-40^\circ\text{C} \leq T_A \leq 85^\circ\text{C}$	—	$\pm 100$	—	ppm/ °C
Output Short Circuit Current	$I_{lim}$	$V_{OUT} = 0\text{V}$	—	400	—	

**Note :** When  $V_{IN} = V_{OUT} + 2.0\text{V}$ , as the output voltage declined 2%, the  $V_{DIF} = V_{IN} - V_{OUT}$ .

## Series +3.0V OUTPUT

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Output Voltage	$V_{OUT}$	$V_{IN}=V_{OUT}+2.0V, I_{OUT}=10mA$	2.94	3.0	3.06	V
Output Current	$I_{OUT}$	$V_{IN}=V_{OUT}+2.0V$	300	—	—	mA
Load Regulation	$\Delta V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ $1mA \leq I_{OUT} \leq 300mA$	—	37	100	mV
Voltage Drop	$V_{DIF}$	$I_{OUT}=100mA, \Delta V_{OUT}=2\%$	—	210	300	mV
Quiescent Current	$I_{SS}$	—	—	2.0	3.0	$\mu A$
Line Regulation	$\frac{\Delta V_{OUT}}{V_{OUT}} * \Delta V_{IN}$	$V_{OUT}+1.0V \leq V_{IN} \leq 12V,$ $I_{OUT}=1mA$	—	—	0.2	%/V
Input Voltage	$V_{IN}$	—	—	—	12	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_A} * V_{OUT}$	$V_{IN}=V_{OUT}+2.0V, I_{OUT}=10mA,$ $-40^\circ C \leq T_A \leq 85^\circ C$	—	$\pm 100$	—	ppm/ $^\circ C$
Output Short Circuit Current	$I_{lim}$	$V_{OUT}=0V$	—	400	—	mA

**Note :** When  $V_{IN}=V_{OUT}+2.0V$ , as the output voltage declined 2%, the  $V_{DIF}=V_{IN}-V_{OUT}$ .

## Series +3.3V OUTPUT

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Output Voltage	$V_{OUT}$	$V_{IN}=V_{OUT}+2.0V, I_{OUT}=10mA$	2.23	3.3	3.36	V
Output Current	$I_{OUT}$	$V_{IN}=V_{OUT}+2.0V$	300	—	—	mA
Load Regulation	$\Delta V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ $1mA \leq I_{OUT} \leq 300mA$	—	37	100	mV
Voltage Drop	$V_{DIF}$	$I_{OUT}=100mA, \Delta V_{OUT}=2\%$	—	195	300	mV
Quiescent Current	$I_{SS}$	—	—	2.0	3.0	$\mu A$
Line Regulation	$\frac{\Delta V_{OUT}}{V_{OUT}} * \Delta V_{IN}$	$V_{OUT}+1.0V \leq V_{IN} \leq 12V,$ $I_{OUT}=1mA$	—	—	0.2	%/V
Input Voltage	$V_{IN}$	—	—	—	12	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_A} * V_{OUT}$	$V_{IN}=V_{OUT}+2.0V, I_{OUT}=10mA,$ $-40^\circ C \leq T_A \leq 85^\circ C$	—	$\pm 100$	—	ppm/ $^\circ C$
Output Short Circuit Current	$I_{lim}$	$V_{OUT}=0V$	—	400	—	mA

**Note :** When  $V_{IN}=V_{OUT}+2.0V$ , as the output voltage declined 2%, the  $V_{DIF}=V_{IN}-V_{OUT}$ .

## Series +3.6V OUTPUT

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Output Voltage	$V_{OUT}$	$V_{IN}=V_{OUT}+2.0V, I_{OUT}=10mA$	3.52	3.6	3.67	V
Output Current	$I_{OUT}$	$V_{IN}=V_{OUT}+2.0V$	300	—	—	mA
Load Regulation	$\Delta V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ $1mA \leq I_{OUT} \leq 300mA$	—	37	100	mV
Voltage Drop	$V_{DIF}$	$I_{OUT}=100mA, \Delta V_{OUT}=2\%$	—	180	300	mV
Quiescent Current	$I_{SS}$	—	—	2.0	3.0	$\mu A$
Line Regulation	$\frac{\Delta V_{OUT}}{V_{OUT}} * \Delta V_{IN}$	$V_{OUT}+1.0V \leq V_{IN} \leq 12V,$ $I_{OUT}=1mA$	—	—	0.2	%/V
Input Voltage	$V_{IN}$	—	—	—	12	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_A} * V_{OUT}$	$V_{IN}=V_{OUT}+2.0V, I_{OUT}=10mA,$ $-40^\circ C \leq T_A \leq 85^\circ C$	—	$\pm 100$	—	ppm/ $^\circ C$
Output Short Circuit Current	$I_{lim}$	$V_{OUT}=0V$	—	400	—	

**Note :** When  $V_{IN}=V_{OUT}+2.0V$ , as the output voltage declined 2%, the  $V_{DIF}=V_{IN}-V_{OUT}$ .

## Series +5.0V OUTPUT

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Output Voltage	$V_{OUT}$	$V_{IN}=V_{OUT}+2.0V, I_{OUT}=10mA$	4.9	5.0	5.1	V
Output Current	$I_{OUT}$	$V_{IN}=V_{OUT}+2.0V$	300	—	—	mA
Load Regulation	$\Delta V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ $1mA \leq I_{OUT} \leq 300mA$	—	37	100	mV
Voltage Drop	$V_{DIF}$	$I_{OUT}=100mA, \Delta V_{OUT}=2\%$	—	170	300	mV
Quiescent Current	$I_{SS}$	—	—	2.0	3.0	$\mu A$
Line Regulation	$\frac{\Delta V_{OUT}}{V_{OUT}} * \Delta V_{IN}$	$V_{OUT}+1.0V \leq V_{IN} \leq 12V,$ $I_{OUT}=1mA$	—	—	0.2	%/V
Input Voltage	$V_{IN}$	—	—	—	12	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_A} * V_{OUT}$	$V_{IN}=V_{OUT}+2.0V, I_{OUT}=10mA,$ $-40^\circ C \leq T_A \leq 85^\circ C$	—	$\pm 100$	—	ppm/ $^\circ C$
Output Short Circuit Current	$I_{lim}$	$V_{OUT}=0V$	—	400	—	mA

**Note :** When  $V_{IN}=V_{OUT}+2.0V$ , as the output voltage declined 2%, the  $V_{DIF}=V_{IN}-V_{OUT}$ .

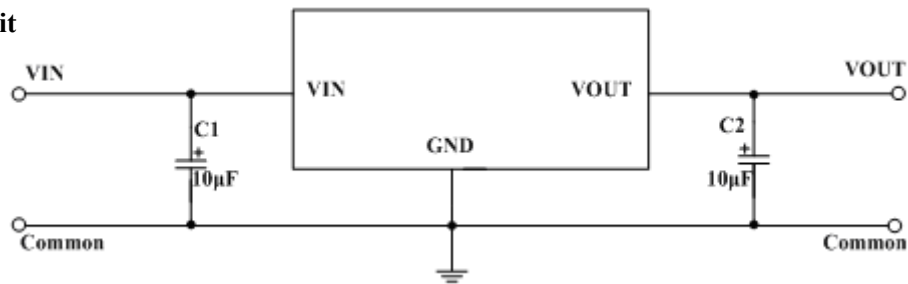
## FUNCTIONAL DESCRIPTION

XC6201 series are linear voltage regulator ICs withstanding 12V voltage. The series IC consists of a voltage reference, an error amplifier, a current limiter and a phase compensation circuit plus a driver transistor. The output stabilization capacitor is also compatible with low ESR ceramic capacitors.

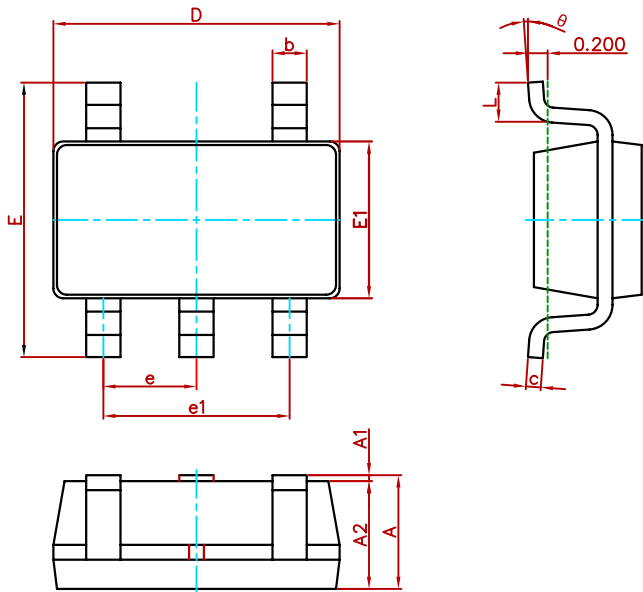
The over current protection circuit and the over voltage protection circuit are built-in. The protection circuit will operate when the output current or input voltage reaches limit level.

## TYPICAL APPLICATION CIRCUIT

Basic Circuit

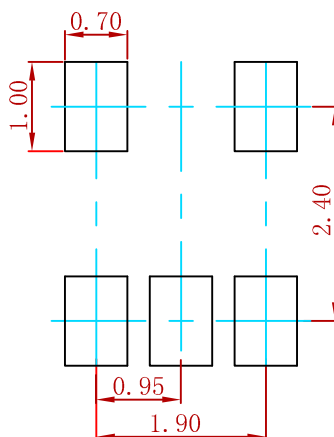


## SOT-23-5L Package Outline Dimensions



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	2.650	2.950	0.104	0.116
E1	1.500	1.700	0.059	0.067
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

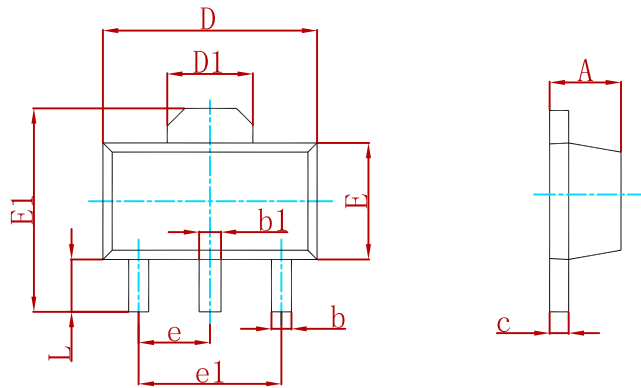
## SOT-23-5L Suggested Pad Layout



**Note:**

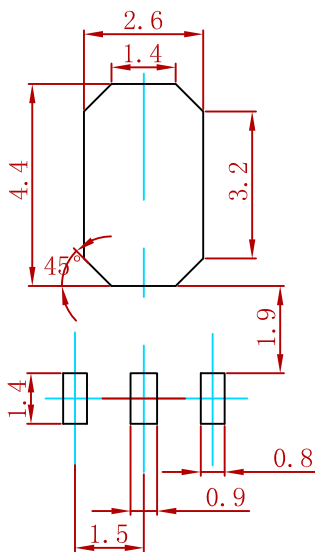
1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.

## SOT-89-3 PACKAGE MECHANICAL DATA



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

## SOT-89-3 Suggested Pad Layout



- Note:
1. Controlling dimension: in millimeters.
  2. General tolerance:  $\pm 0.05\text{mm}$ .
  3. The pad layout is for reference purposes only.