



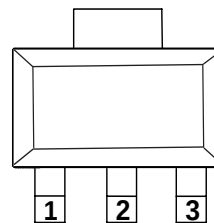
GENERAL DESCRIPTION

XC6201P 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.

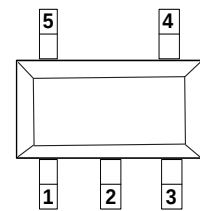
FEATURES

- Low Power Consumption
- Low Voltage Drop
- Low Temperature Coefficient
- Withstanding Voltage 12V
- Quiescent Current 2.0 μ A
- Output Voltage Accuracy: tolerance $\pm 2\%$
- High output current: 300mA

PIN CONFIGURATION



SOT-89



SOT-23-5L
(SOT-25/SOT-25-5)

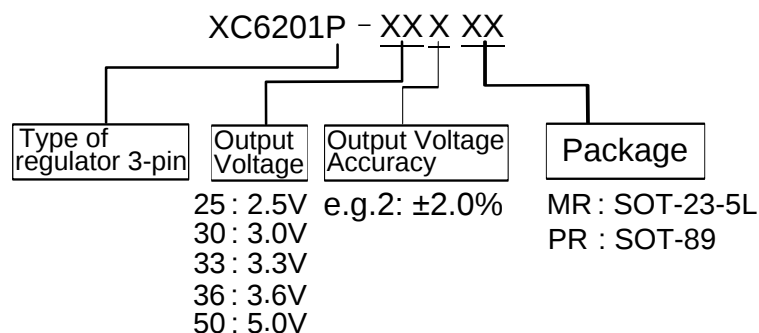
TYPICAL APPLICATIONS

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

PIN DESCRIPTION

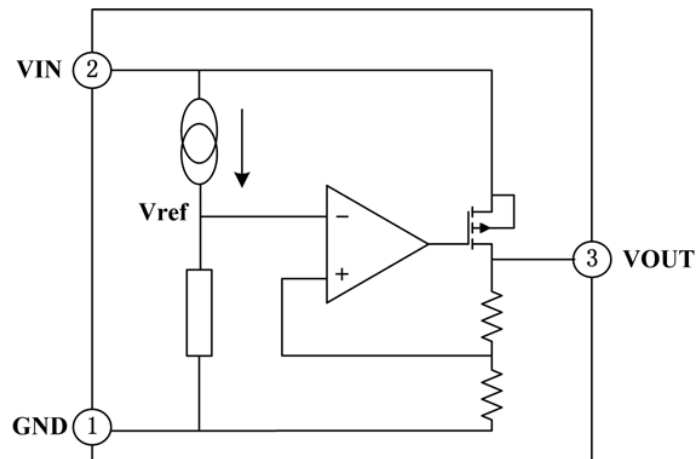
PIN No.		Name	Functions Description
SOT-23-5L SOT-25 SOT-25-5	SOT-89		
2	2	GND	ground
1	3	V _{IN}	input
5	1	V _{OUT}	output
3		NC	No Connect
4		NC	No Connect

OUTPUT





FUNCTIONAL BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

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

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.

HEAT DISSIPATION

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



DC CHARACTERISTICS (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	ΔV_{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	μA
Line Regulation	$\Delta V_{OUT} / V_{OUT} * \Delta V_{IN}$	$V_{OUT} + 1.0\text{V} \leq V_{IN} \leq 12\text{V}$, $I_{OUT} = 1\text{mA}$	—	—	0.2	%/V
Input Voltage	V_{IN}	—	—	—	12	V
Temperature Coefficient	$\Delta V_{OUT} / \Delta T_A * V_{OUT}$	$V_{IN} = V_{OUT} + 2.0\text{V}$, $I_{OUT} = 10\text{mA}$, $-40^{\circ}\text{C} \leq T_A \leq 85^{\circ}\text{C}$	—	± 100	—	ppm/ $^{\circ}\text{C}$
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}	$V_{IN} = V_{OUT} + 2.0\text{V}$, $I_{OUT} = 10\text{mA}$	2.94	3.0	3.06	V
Output Current	I_{OUT}	$V_{IN} = V_{OUT} + 2.0\text{V}$	300	—	—	mA
Load Regulation	ΔV_{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}	$I_{OUT} = 100\text{mA}$, $\Delta V_{OUT} = 2\%$	—	210	300	mV
Quiescent Current	I_{SS}	—	—	2.0	3.0	μA
Line Regulation	$\Delta V_{OUT} / V_{OUT} * \Delta V_{IN}$	$V_{OUT} + 1.0\text{V} \leq V_{IN} \leq 12\text{V}$, $I_{OUT} = 1\text{mA}$	—	—	0.2	%/V
Input Voltage	V_{IN}	—	—	—	12	V
Temperature Coefficient	$\Delta V_{OUT} / \Delta T_A * V_{OUT}$	$V_{IN} = V_{OUT} + 2.0\text{V}$, $I_{OUT} = 10\text{mA}$, $-40^{\circ}\text{C} \leq T_A \leq 85^{\circ}\text{C}$	—	± 100	—	ppm/ $^{\circ}\text{C}$
Output Short Circuit Current	I_{lim}	$V_{OUT} = 0\text{V}$	—	400	—	mA

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



Series +3.3V 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	ΔV_{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	μA
Line Regulation	$\frac{\Delta V_{OUT}}{V_{OUT}} \cdot \Delta V_{IN}$	$V_{OUT}+1.0V \leq V_{IN} \leq 12V$, $I_{OUT}=1mA$	—	—	0.2	%/V
Input Voltage	V_{IN}	—	—	—	12	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_A} \cdot V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$, $I_{OUT}=10mA$, $-40^{\circ}C \leq T_A \leq 85^{\circ}C$	—	± 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	ΔV_{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	μA
Line Regulation	$\frac{\Delta V_{OUT}}{V_{OUT}} \cdot \Delta V_{IN}$	$V_{OUT}+1.0V \leq V_{IN} \leq 12V$, $I_{OUT}=1mA$	—	—	0.2	%/V
Input Voltage	V_{IN}	—	—	—	12	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_A} \cdot V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$, $I_{OUT}=10mA$, $-40^{\circ}C \leq T_A \leq 85^{\circ}C$	—	± 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	ΔV_{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	μA
Line Regulation	$\frac{\Delta V_{OUT}}{V_{OUT}} \cdot \Delta V_{IN}$	$V_{OUT}+1.0V \leq V_{IN} \leq 12V$, $I_{OUT}=1mA$	—	—	0.2	%/V
Input Voltage	V_{IN}	—	—	—	12	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_A} \cdot V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$, $I_{OUT}=10mA$, $-40^{\circ}C \leq T_A \leq 85^{\circ}C$	—	± 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 $V_{DIF}=V_{IN}-V_{OUT}$.

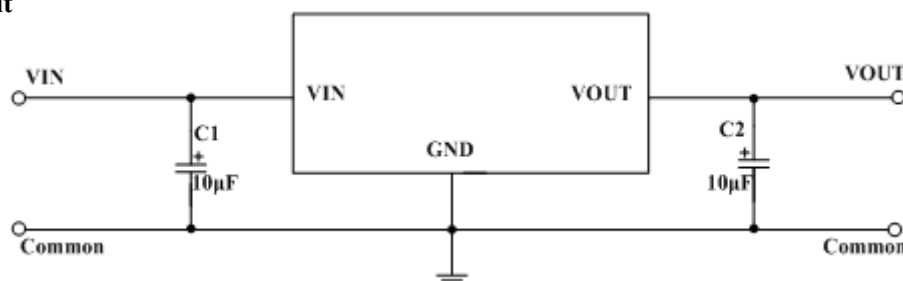
FUNCTIONAL DESCRIPTION

XC6201P 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

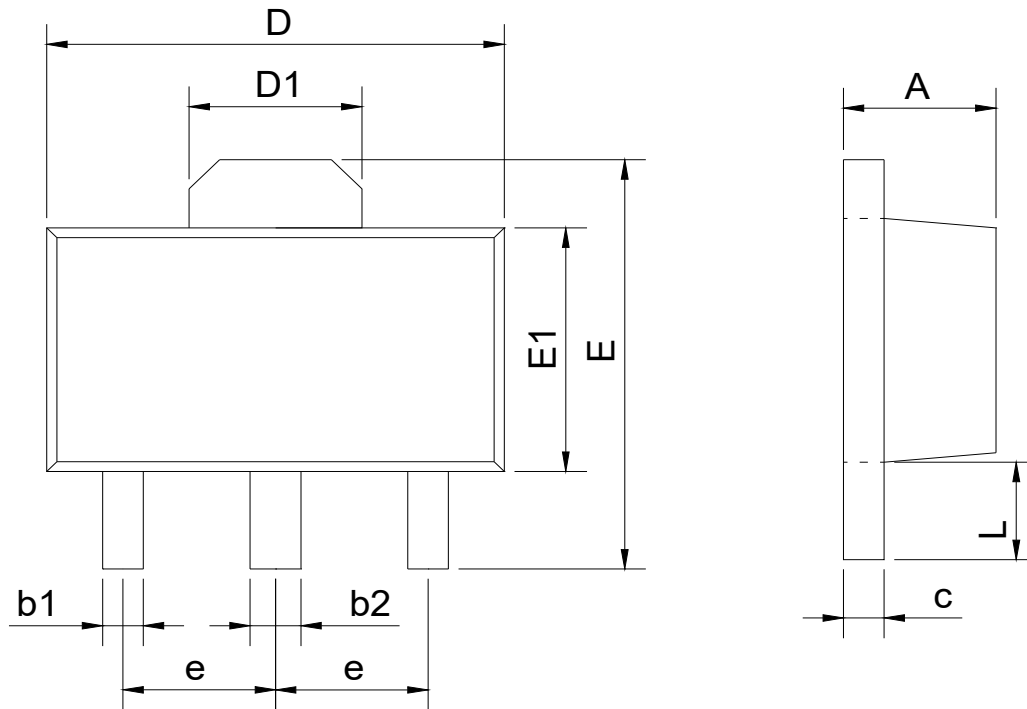
Basic Circuit





PACKAGE INFORMATION

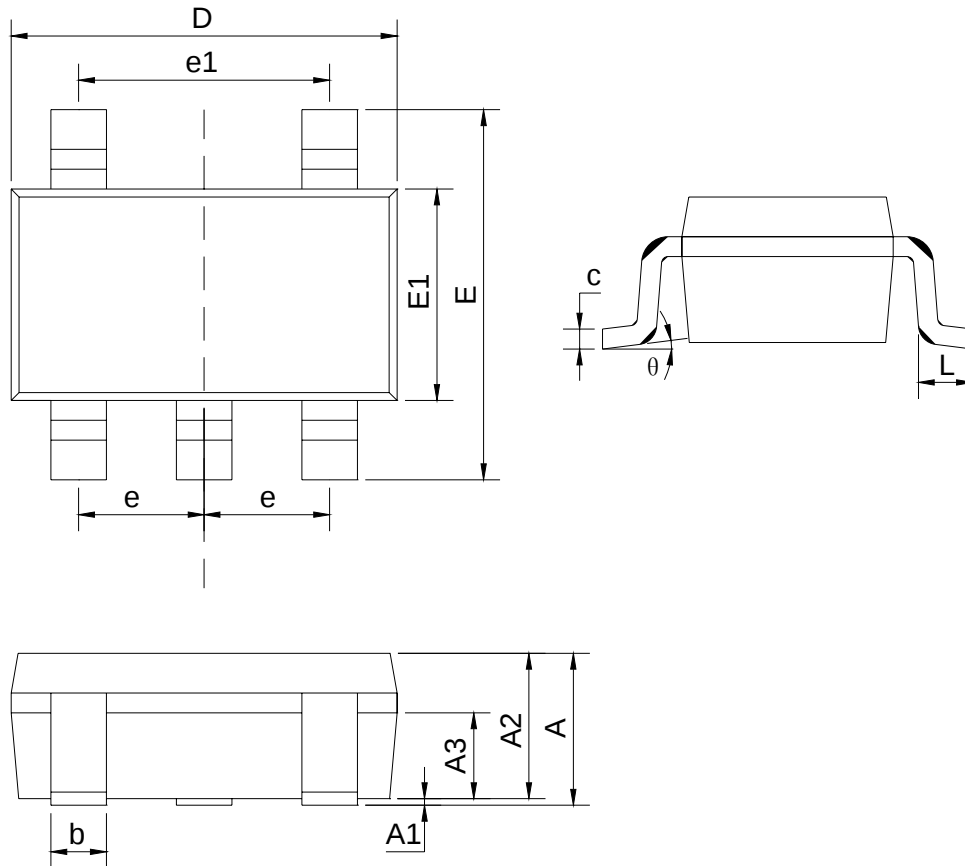
SOT-89



SYMBOL	mm	
	min	max
A	1.40	1.60
b1	0.35	0.50
b2	0.45	0.60
c	0.36	0.46
D	4.30	4.70
D1	1.40	1.80
E	4.00	4.40
E1	2.30	2.70
e	1.50BSC	
L	0.80	1.20



SOT-23-5(SOT-25SOT-25-5)



SYMBOL	mm	
	min	max
A		1.35
A1	0.04	0.15
A2	1.00	1.20
A3	0.55	0.75
b	0.38	0.48
c	0.10	0.25
D	2.72	3.12
E	2.60	3.00
E1	1.40	1.80
e	0.95BSC	
e1	1.90BSC	
L	0.30	0.60
θ	0	8°



Attention

- Any and all HUA XUAN YANG ELECTRONICS products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your HUA XUAN YANG ELECTRONICS representative nearest you before using any HUA XUAN YANG ELECTRONICS products described or contained herein in such applications.
- HUA XUAN YANG ELECTRONICS assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all HUA XUAN YANG ELECTRONICS products described or contained herein.
- Specifications of any and all HUA XUAN YANG ELECTRONICS products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.
- HUA XUAN YANG ELECTRONICS CO.,LTD. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.
- In the event that any or all HUA XUAN YANG ELECTRONICS products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.
- No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of HUA XUAN YANG ELECTRONICS CO.,LTD.
- Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. HUA XUAN YANG ELECTRONICS believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.
- Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the HUA XUAN YANG ELECTRONICS product that you intend to use.