## General Description

XC6201Pxx2MR-G series are a set of Low Dropout Linear Regulator ICs implemented in CMOS technology. They can withstand voltage 12V. And they are available with lowvoltage drop and low quiescent current,widely used in audio, video and communication appliances.

## Features

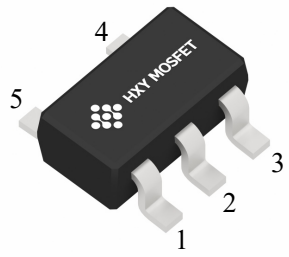
- Low Power Consumption
- Low Voltage Drop
- Low Temperature Coefficient
- Withstanding Voltage 12V
- Quiescent Current 2.0μA
- Output Voltage Accuracy: tolerance ±2%
- High output current: 300mA

## Application

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

## Pin Configuration And Descriptions

SOT-23-5L




| PIN No. SOT-23-5L | Name | Functions Description |
|---|---|---|
| 1 | $V_{IN}$ | Input |
| 2 | GND | Ground |
| 3 | NC | No Connect |
| 4 | NC | No Connect |
| 5 | $V_{OUT}$ | Output |

## Order Information

| Orderable Device | Package | Output Voltage | Packing Option |
|---|---|---|---|
| XC6201P302MR-G | SOT-23-5L | 3.0V | 3000/Reel |
| XC6201P332MR-G | SOT-23-5L | 3.3V | 3000/Reel |
| XC6201P502MR-G | SOT-23-5L | 5.0V | 3000/Reel |

## Absolute Maximum Ratings

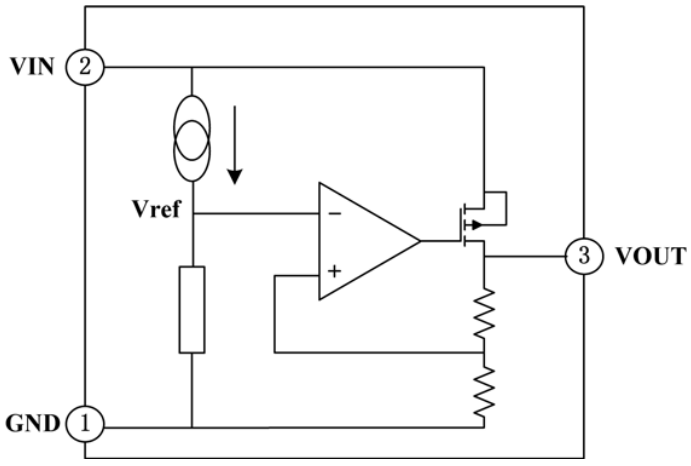
| Description | Symbol | Value Range | Unit |
|---|---|---|---|
| Limit Power Voltage | $V_{IN}$ | -0.3～+15 | V |
| Storage Temperature Range | $T_{STG}$ | -50～+125 | °C |
| Operating Free-air Temperature Range | $T_A$ | -40～+85 | °C |

Note:Stresses greater than those listed under "Absolute Maximum Ratingsmay" 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 Conditionsis" not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

## Heat Dissipation

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

## Block Diagram



## DC Characteristics (unless otherwise noted $T_A$= 25°C)

($V_{IN}$= $V_{OUT}$+2.0V，$C_{IN}$=$C_L$=10uF，Ta=25°C, unless otherwise noted)

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 | 3.00 | 3.06 | V |
| Output Current | $I_{OUT}$ | $V_{IN}$=$V_{OUT}$+2.0V | 300 | | | mA |
| Load Regulation | △$V_{OUT}$ | $V_{IN}$=$V_{OUT}$+2.0V 1mA≤$I_{OUT}$≤50mA | | 37 | 100 | mV |
| Voltage Drop | $V_{DIF}$ | $I_{OUT}$=1mA，△$V_{OUT}$=2% | | 210 | 300 | mV |
| Quiescent Current | $I_{SS}$ | No Load | | 2.0 | 3.0 | uA |
| Line Regulation | △$V_{OUT}$/$V_{OUT}$* △$V_{IN}$ | $V_{OUT}$+1.0V≤$V_{IN}$≤30V，$I_{OUT}$=1mA | | | 0.2 | %/V |
| Input Voltage | $V_{IN}$ | | | | 12 | V |
| Temperature Coefficient | △$V_{OUT}$/ △$T_A$*$V_{OUT}$ | $V_{IN}$=$V_{OUT}$+2.0V，$I_{OUT}$=10mA，-40℃≤$T_A$≤85℃ | | 100 | | ppm/°C |
| Output Short Circuit Current | Ilim | $V_{OUT}$=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 | 3.234 | 3.30 | 3.366 | V |
| Output Current | $I_{OUT}$ | $V_{IN}$=$V_{OUT}$+2.0V | | 150 | | mA |
| Load Regulation | △$V_{OUT}$ | $V_{IN}$=$V_{OUT}$+2.0V 1mA≤$I_{OUT}$≤50mA | | 37 | 100 | mV |
| Voltage Drop | $V_{DIF}$ | $I_{OUT}$=1mA，△$V_{OUT}$=2% | | 195 | 300 | mV |
| Quiescent Current | $I_{SS}$ | No Load | | 2.0 | 3.0 | uA |
| Line Regulation | △$V_{OUT}$/$V_{OUT}$* △$V_{IN}$ | $V_{OUT}$+1.0V≤$V_{IN}$≤30V，$I_{OUT}$=1mA | | | 0.2 | %/V |
| Input Voltage | $V_{IN}$ | | | | 12 | V |
| Temperature Coefficient | △$V_{OUT}$/ △$T_A$*$V_{OUT}$ | $V_{IN}$=$V_{OUT}$+2.0V，$I_{OUT}$=10mA，-40℃≤$T_A$≤85℃ | | 100 | | ppm/°C |
| Output Short Circuit Current | Ilim | $V_{OUT}$=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 +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 | $\triangle V_{OUT}$ | $V_{IN}=V_{OUT}+2.0V$ $1mA \leqslant I_{OUT} \leqslant 50mA$ | | 37 | 100 | mV |
| Voltage Drop | $V_{DIF}$ | $I_{OUT}=1mA$, $\triangle V_{OUT}=2\%$ | | 170 | 300 | mV |
| Quiescent Current | $I_{SS}$ | No Load | | 2.0 | 3.0 | uA |
| Line Regulation | $\triangle V_{OUT}/V_{OUT}* \triangle V_{IN}$ | $V_{OUT}+1.0V \leqslant V_{IN} \leqslant 30V$, $I_{OUT}=1mA$ | | | 0.2 | %/V |
| Input Voltage | $V_{IN}$ | | | | 12 | V |
| Temperature Coefficient | $\triangle V_{OUT}/ \triangle T_A*V_{OUT}$ | $V_{IN}=V_{OUT}+2.0V$, $I_{OUT}=10mA$, $-40℃ \leqslant T_A \leqslant 85℃$ | | 100 | | ppm/°C |
| Output Short Circuit Current | Ilim | $V_{OUT}=0V$ | | 400 | | mA |

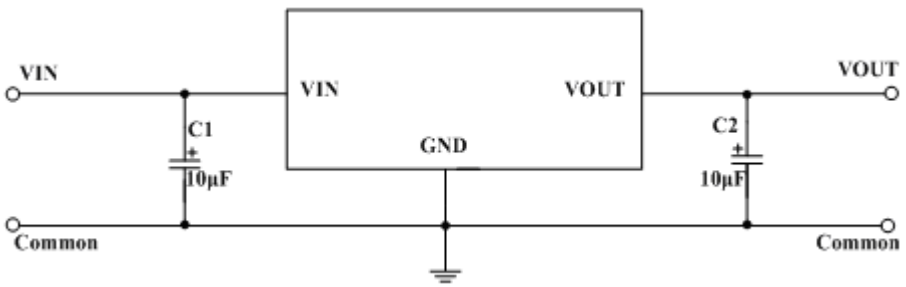
Note:When $V_{IN}=V_{OUT}+2.0V$,as the output voltage declined 2%,the $V_{DIF}=V_{IN}-V_{OUT}$.

## Function Description

XC6201P502MR-G series are linear voltage regulator ICs with standing 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 wheb the output current or input voltage reaches limit level.

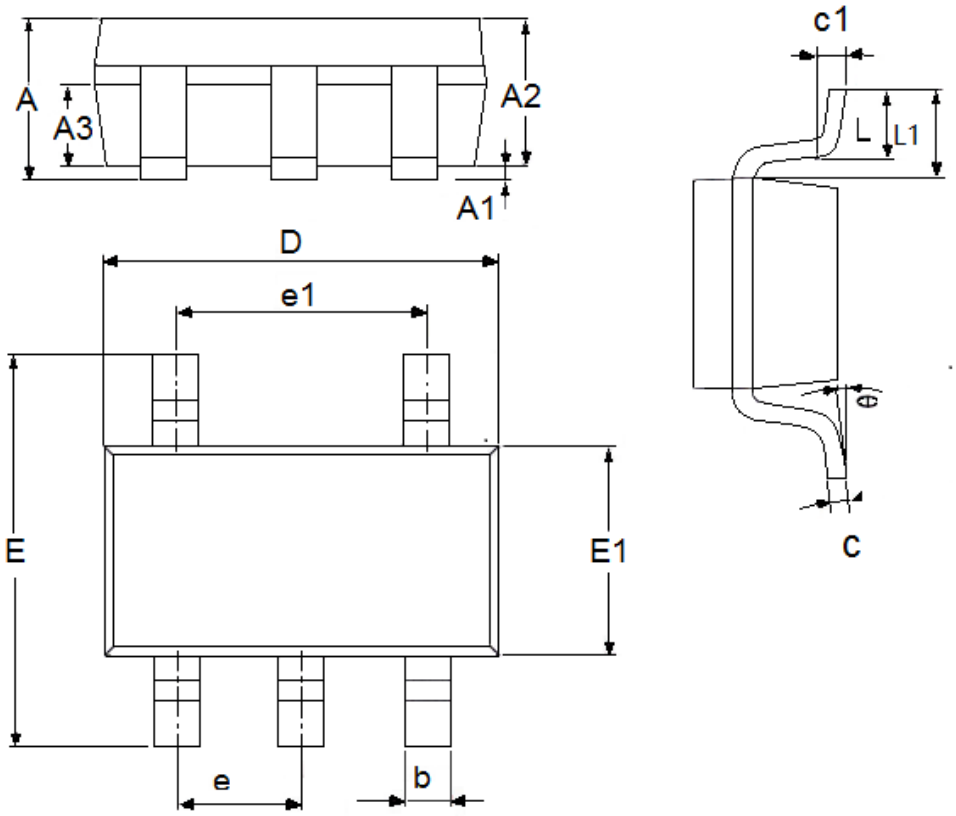
## Application Circuit

Basic Circuits



## Package Outline Dimensions

SOT-23-5L




| Symbol | Dimensions in Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 1.05 | 1.45 | 0.0413 | 0.0571 |
| A1 | 0 | 0.15 | 0.0000 | 0.0059 |
| A2 | 0.9 | 1.3 | 0.0354 | 0.0512 |
| A3 | 0.6 | 0.7 | 0.0236 | 0.0276 |
| b | 0.25 | 0.5 | 0.0098 | 0.0197 |
| c | 0.1 | 0.23 | 0.0039 | 0.0091 |
| D | 2.82 | 3.05 | 0.1110 | 0.1201 |
| e1 | 1.9(TYP) | | 0.0748(TYP) | |
| E | 2.6 | 3.05 | 0.1024 | 0.1201 |
| E1 | 1.5 | 1.75 | 0.0512 | 0.0689 |
| e | 0.95(TYP) | | 0.0374(TYP) | |
| L | 0.25 | 0.6 | 0.0098 | 0.0236 |
| L1 | 0.59(TYP) | | 0.0232(TYP) | |
| θ | 0 | 8° | 0.0000 | 8° |
| c1 | 0.2(TYP) | | 0.0079(TYP) | |

## 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.



■ 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.