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## XC6201PXXXXX-MS

### Product specification

## GENERAL DESCRIPTION

XC6201PXXXX-MS series are a set of Low Dropout LinearRegulator ICs implemented in CMOS technology. They can withstand voltage 10V. And they areavailable with low voltage drop and low quiescentcurrent,widely used in audio,video and communication appliances.

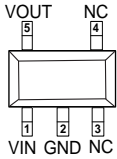
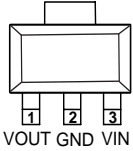
## FEATURES

- 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

## TYPICALAPPLICATIONS

- Battery-poweredEquipments
- CommunicationEquipments
- Audio/VideoEquipments
- SmartBattery Packs
- Smoke Detectors
- CO2 DETECTORS

## PACKAGE/ORDERINFORMATION

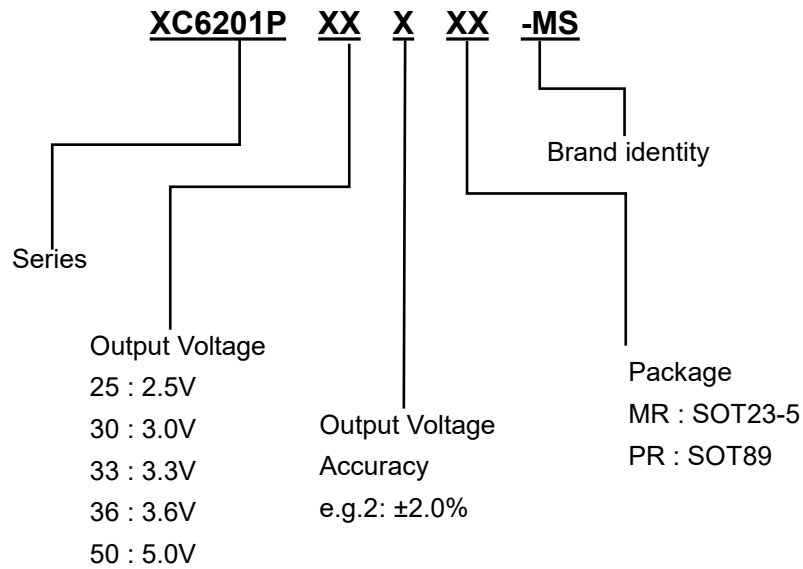
Part Number	Package	Pin Configuration	Marking	QTY
XC6201P252MR-MS	SOT-23-5L		15T*	3000
XC6201P302MR-MS			15Z*	3000
XC6201P332MR-MS			162*	3000
XC6201P362MR-MS			165*	3000
XC6201P502MR-MS			16M*	3000
XC6201P252PR-MS	SOT-89-3		15 T*	1000
XC6201P302PR-MS			15 Z*	1000
XC6201P332PR-MS			16 2*	1000
XC6201P362PR-MS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

Notes:\*Representing internal production number.

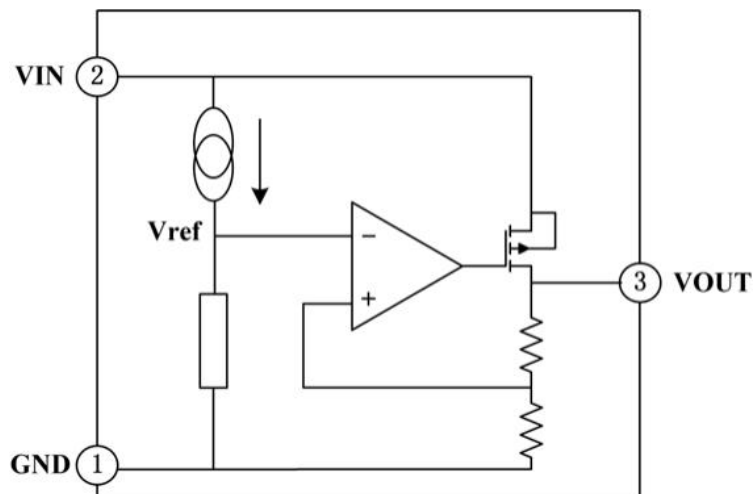
**PIN DESCRIPTION**

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	$\frac{\Delta V_{OUT}}{V_{OUT}} \cdot \Delta V_{IN}$	$V_{OUT}+1.0V \leq V_{IN} \leq 12V,$ $I_{OUT}=1mA$	—	—	0.2	%/V
Input Voltage	$V_{IN}$	—	—	—	12	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_A} \cdot V_{OUT}$	$V_{IN}=V_{OUT}+2.0V, I_{OUT}=10mA,$ $-40^\circ C \leq T_A \leq 85^\circ C$	—	$\pm 100$	—	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	$\frac{\Delta V_{OUT}}{V_{OUT}} \cdot \Delta V_{IN}$	$V_{OUT}+1.0V \leq V_{IN} \leq 12V,$ $I_{OUT}=1mA$	—	—	0.2	%/V
Input Voltage	$V_{IN}$	—	—	—	12	V
Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T_A} \cdot V_{OUT}$	$V_{IN}=V_{OUT}+2.0V, I_{OUT}=10mA,$ $-40^\circ C \leq T_A \leq 85^\circ C$	—	$\pm 100$	—	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  $V_{DIF}=V_{IN}-V_{OUT}$ .

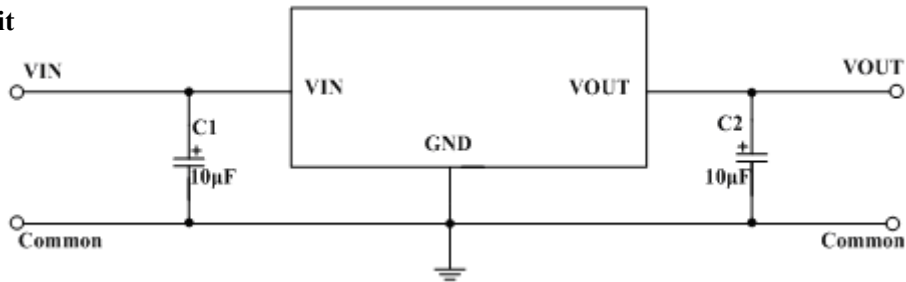
## FUNCTIONALDESCRIPTION

XC6201PXXXX-MS 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.

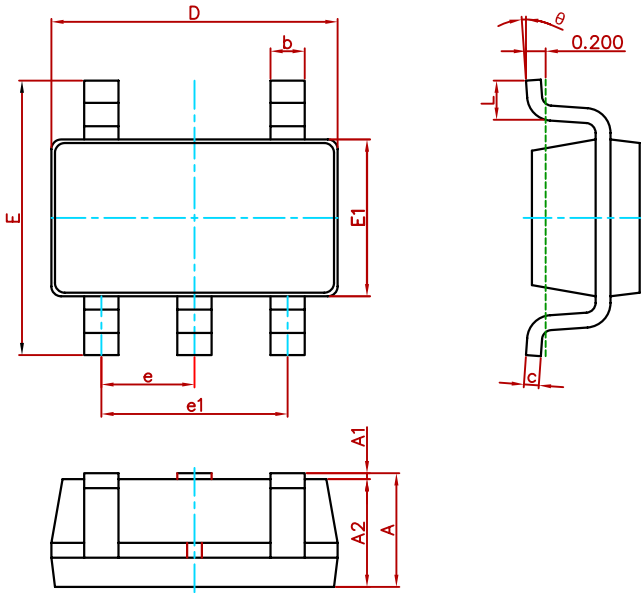
The over current protection circuit and the over voltage protection circuit are built-in. The protection circuit will operate when the output current or input voltage reaches limit level.

## TYPICALAPPLICATIONCIRCUIT

Basic Circuit

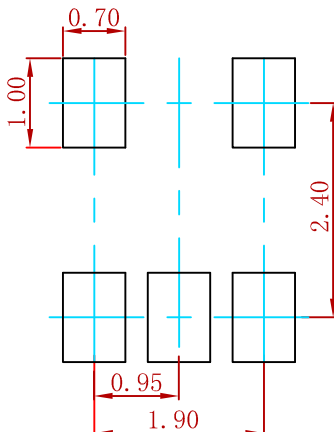


**SOT-23-5L Package Outline Dimensions**



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°

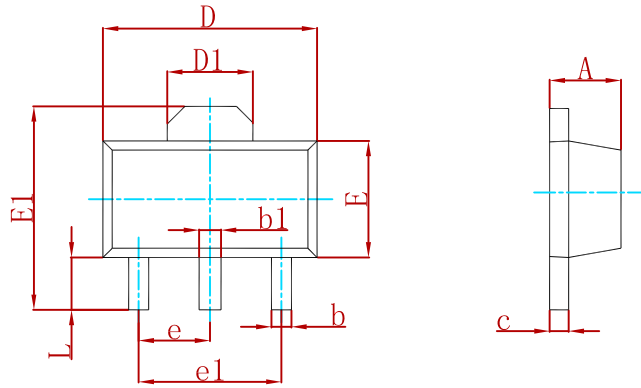
**SOT-23-5L Suggested Pad Layout**



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

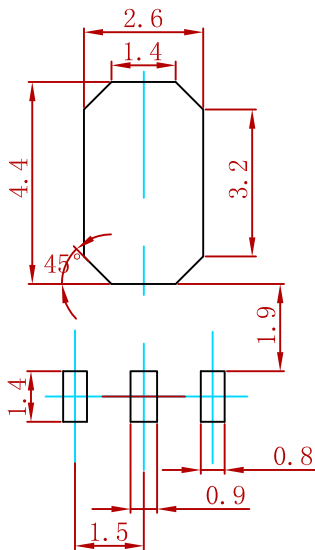


**SOT-89-3 PACKAGE MECHANICAL DATA**



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:  $\pm 0.05$  mm.
  3. The pad layout is for reference purposes only.

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