

# MSKSEMI 美森科

SEMICONDUCTOR



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## XC6202PXXXMR-MS

Product specification

## GENERAL DESCRIPTION

XC6202PXXXMR-MS series are a set of Low Dropout Linear Regulator ICs implemented in CMOS technology. They can withstand voltage 20V. And they are available with low voltage drop and low quiescent current, widely used in audio, video and communication appliances.

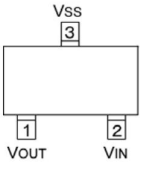
## FEATURES

- Low Power Consumption
- Low Voltage Drop
- Low Temperature Coefficient
- Withstanding Voltage 20V
- Quiescent Current 2.0μA
- Output Voltage Accuracy: tolerance ±2%
- High output current: 150mA

## TYPICAL APPLICATIONS

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

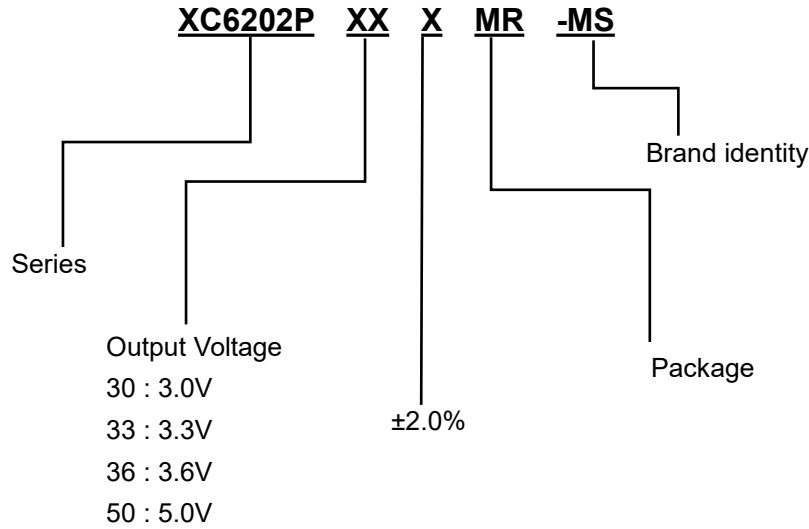
## PACKAGE/ORDER INFORMATION

Part Number	Package	Pin Configuration	Marking	QTY
XC6202P302MR-MS	SOT-23		<b>24ZX</b>	3000
XC6202P332MR-MS			<b>252A</b>	3000
XC6202P362MR-MS			<b>255B</b>	3000
XC6202P502MR-MS			<b>25MX</b>	3000

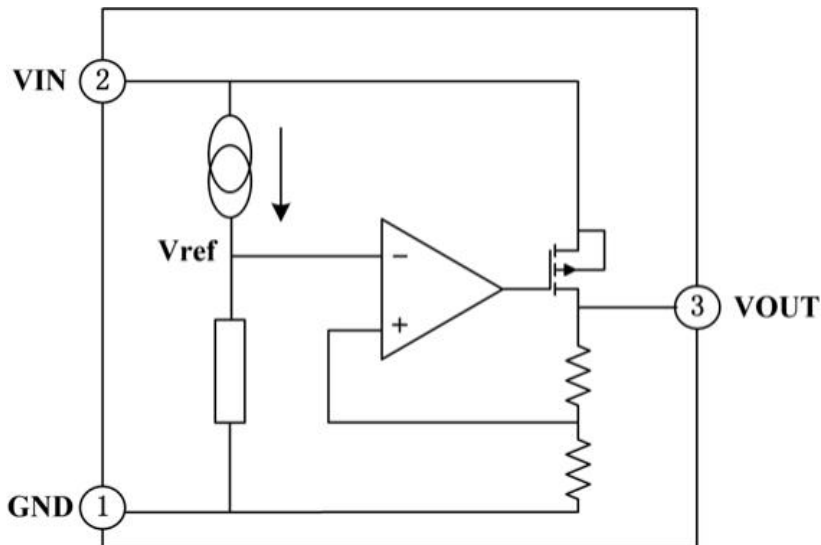
## PIN DESCRIPTION

PIN No.	Name	Functions Description
SOT-23-L		
3	GND	ground
2	V <sub>IN</sub>	input
1	V <sub>OUT</sub>	output

**PRODUCT NAMING**



**FUNCTIONAL BLOCK DIAGRAM**



**ABSOLUTE MAXIMUM RATINGS**

Description	Symbol	Value range	Unit
Limit Power Voltage	$V_{IN}$	-0.3 ~ +22	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.

## HEAT DISSIPATION

Description	Symbol	Package	Value range	Unit
Thermal resistance	$\theta_{JA}$	SOT-23	500	$^{\circ}\text{C}/\text{W}$
Power dissipation	PW	SOT-23	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 +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	$I_{OUT}$	$V_{IN} = V_{OUT} + 2.0\text{V}$	70	100	—	mA
Load Regulation	$\Delta V_{OUT}$	$V_{IN} = V_{OUT} + 2.0\text{V}$ $1\text{mA} \leq I_{OUT} \leq 50\text{mA}$	—	25	60	mV
Voltage Drop	$V_{DIF}$	$I_{OUT} = 1\text{mA}$ , $\Delta V_{OUT} = 2\%$	—	30	100	mV
Quiescent Current	$I_{SS}$	—	—	2.0	3.0	$\mu\text{A}$
Line Regulation	$\frac{\Delta V_{OUT}}{V_{OUT}} / \Delta V_{IN}$	$V_{OUT} + 1.0\text{V} \leq V_{IN} \leq 20\text{V}$ , $I_{OUT} = 1\text{mA}$	—	—	0.2	%/V
Input Voltage	$V_{IN}$	—	—	—	24	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/ $^{\circ}\text{C}$

**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	$V_{OUT}$	$V_{IN} = V_{OUT} + 2.0\text{V}$ , $I_{OUT} = 10\text{mA}$	3.23	3.3	3.36	V
Output Current	$I_{OUT}$	$V_{IN} = V_{OUT} + 2.0\text{V}$	70	100	—	mA
Load Regulation	$\Delta V_{OUT}$	$V_{IN} = V_{OUT} + 2.0\text{V}$ $1\text{mA} \leq I_{OUT} \leq 50\text{mA}$	—	25	60	mV
Voltage Drop	$V_{DIF}$	$I_{OUT} = 1\text{mA}$ , $\Delta V_{OUT} = 2\%$	—	25	55	mV
Quiescent Current	$I_{SS}$	—	—	2.0	3.0	$\mu\text{A}$
Line Regulation	$\frac{\Delta V_{OUT}}{V_{OUT}} / \Delta V_{IN}$	$V_{OUT} + 1.0\text{V} \leq V_{IN} \leq 20\text{V}$ , $I_{OUT} = 1\text{mA}$	—	—	0.2	%/V
Input Voltage	$V_{IN}$	—	—	—	24	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/ $^{\circ}\text{C}$

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

**Series +3.6V 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	$I_{OUT}$	$V_{IN}=V_{OUT}+2.0V$	70	100	—	mA
Load Regulation	$\Delta V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ $1mA \leq I_{OUT} \leq 50mA$	—	25	60	mV
Voltage Drop	$V_{DIF}$	$I_{OUT}=1mA, \Delta V_{OUT}=2\%$	—	25	55	mV
Quiescent Current	$I_{SS}$	—	—	2.0	3.0	$\mu A$
Line Regulation	$\frac{\Delta V_{OUT}}{V_{OUT}} * \Delta V_{IN}$	$V_{OUT}+1.0V \leq V_{IN} \leq 20V,$ $I_{OUT}=1mA$	—	—	0.2	%/V
Input Voltage	$V_{IN}$	—	—	—	24	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/ $^\circ C$

**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	$I_{OUT}$	$V_{IN}=V_{OUT}+2.0V$	100	150	—	mA
Load Regulation	$\Delta V_{OUT}$	$V_{IN}=V_{OUT}+2.0V$ $1mA \leq I_{OUT} \leq 70mA$	—	25	60	mV
Voltage Drop	$V_{DIF}$	$I_{OUT}=1mA, \Delta V_{OUT}=2\%$	—	25	55	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	$V_{IN}$	—	—	—	24	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/ $^\circ C$

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

## FUNCTIONAL DESCRIPTION

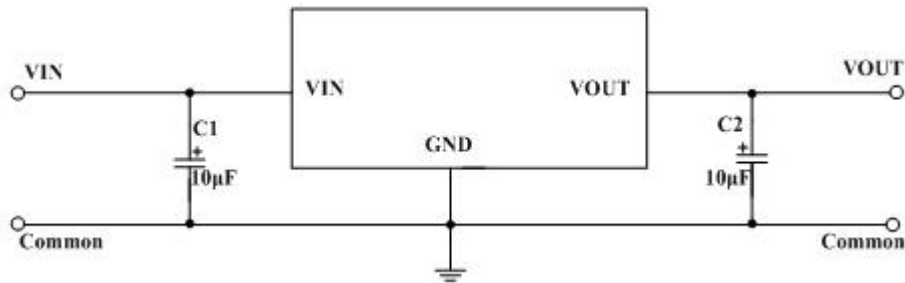
XC6202PXXXMR-MS series are linear voltage regulator ICs withstanding 20V voltage. The series IC consists of a voltage reference, an error amplifier, a current limiter and a phase compensation circuit plus a driver transistor. The output stabilization capacitor is also compatible with low ESR ceramic 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.

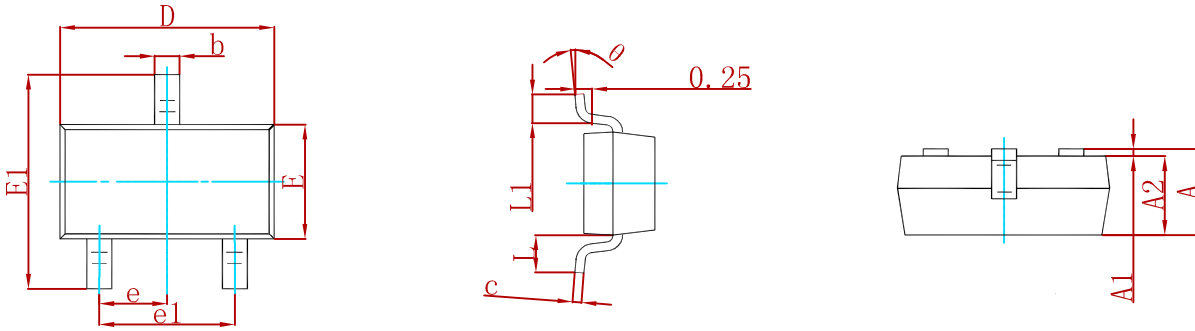
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## TYPICAL APPLICATION CIRCUIT

### Basic Circuit

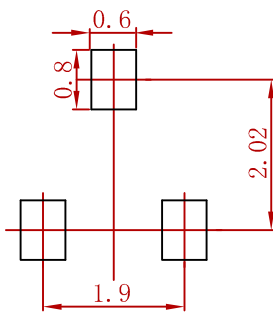


**PACKAGE MECHANICAL DATA**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

**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.

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