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TX6201 Series 250mA Low Power LDO

Features

- Low voltage drop: 0.17V@100mA
- High input voltage: 12V
- Low temperature coefficient
- Large Output Current: >0.5A
- Low Quiescent Current: 2.0uA
- Output voltage accuracy: tolerance $\pm 2\%$
- Built-in current limiter
- SOT89, SOT23-3 and SOT23-5 packages

Applications

- Battery-powered equipment
- Hand-Hold Equipment
- GRS Receivers
- Wireless LAN

General Description

The TX6201 series is a group of positive voltage output, three-pin regulators, that provide a high current even when the input/output voltage differential is small. Low power consumption and high accuracy is achieved through CMOS and laser trimming technologies.

The TX6201 consists of a high-precision voltage reference, an error amplification circuit, and a current limited output driver. Transient response to load variations have improved in comparison to the existing series. SOT89 and SOT23-3 packages are available.

Selection Table

| Part No. | Output Voltage | Package | Marking |
|-------------|----------------|---------------------------|---------|
| TX6201-30xx | 3.0V | SOT89 SOT23 SOT23-5 | 130N |
| TX6201-33xx | 3.3V | | 133N |
| TX6201-40xx | 4.0V | | 140N |
| TX6201-45xx | 4.5V | | 145N |
| TX6201-50xx | 5.0V | | 150N |

Order Information

TX6201-①②③④

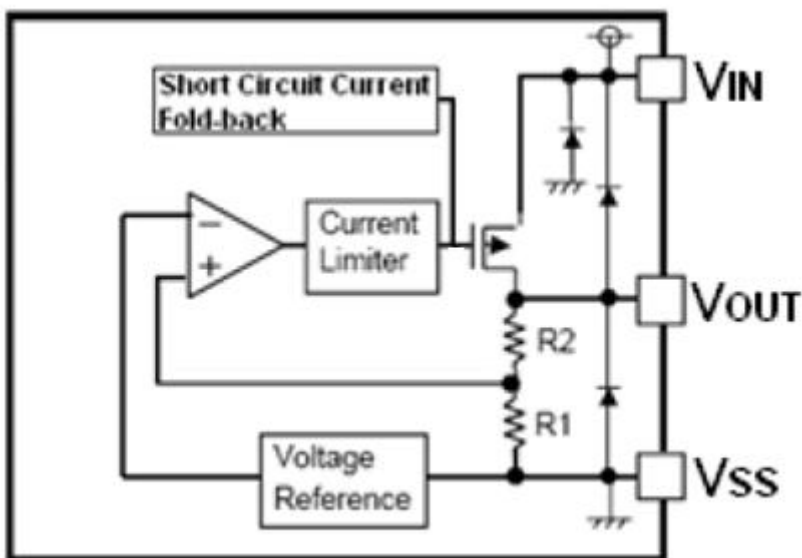
| Designator | Symbol | Description |
|------------|---------|--------------------------|
| ① ② | Integer | Output Voltage(1.5~5.0V) |
| ③ | P | Package:SOT89 |
| | M | Package:SOT23-3 |
| | M5 | Package:SOT23-5 |
| ④ | R | RoHS / Pb Free |
| | G | Halogen Free |

Note: "①②" stands for output voltages. Other voltages can be specially customized



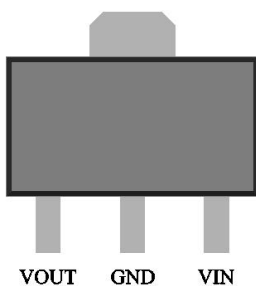
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Block Diagram

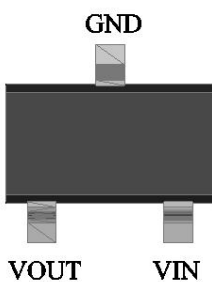


Pin Assignment

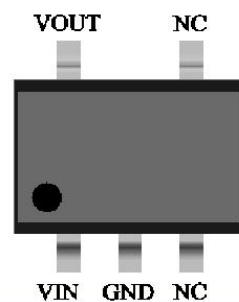
SOT89 (Top view)



SOT23-3 (Top view)



SOT23-5 (Top view)



Absolute Maximum Ratings

| | | | |
|-----------------------------|---------------|---------------------------|----------------|
| Supply Voltage | -0.3V to 15V | Storage Temperature | -40°C to 125°C |
| Operating Temperature | -40°C to 85°C | | |

Note: These are stress ratings only. Stresses exceeding the range specified under “Absolute Maximum Ratings” may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.



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Electrical Characteristics

TX6201 for any output voltage

(Ta=25°C)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|----------------------------------|-----------|------|-----------|--------|
| Output Voltage | Vout | Vin=Vout+1V 1.0mA≤Iout≤30mA | Vout×0.98 | -- | Vout×1.02 | V |
| Output Current*1 | Iout | Vin-Vout=1V | -- | 250 | -- | mA |
| Low dropout*2 | Vdrop | Refer to the next table | | | | |
| Line Regulation | $\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$ | 1.6V≤Vin≤8V Iout=100mA | -- | 0.05 | 0.2 | %/V |
| Load Regulation | ΔVout | Vin= Vout+1V 1.0mA≤Iout≤100mA | -- | 12 | 30 | mV |
| Output voltage Temperature Coefficiency | $\frac{\Delta V_{OUT}}{\Delta Ta}$ | Iout=30mA 0°C≤Ta≤70°C | -- | ±100 | -- | Ppm/°C |
| Supply Current | Iss1 | -- | -- | 2 | -- | uA |
| Input Voltage | Vin | -- | -- | -- | 15 | V |

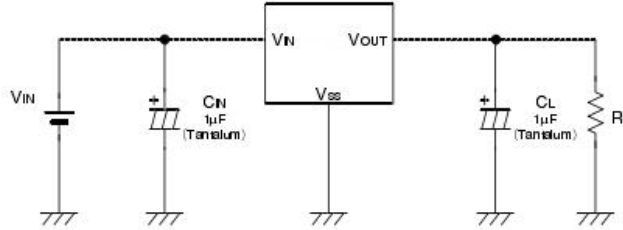
Electrical Characteristics by Output Voltage:

| Output Voltage Vout(V) | Dropout Voltage Vdif (V) | | |
|------------------------|--------------------------|------|------|
| | Conditions | Typ. | Max. |
| Vout ≤ 2.0V | Iout=60 mA | 0.1 | 0.12 |
| 2.0 < Vout ≤ 3.0 | Iout=80 mA | 0.12 | 0.14 |
| 3.0 < Vout ≤ 4.0 | Iout=100 mA | 0.16 | 0.18 |
| 4.0 < Vout ≤ 5.0 | | 0.17 | 0.18 |
| 3.0 < Vout ≤ 4.0 | Iout=200 mA | 0.21 | 0.24 |
| 4.0 < Vout ≤ 14.0 | | 0.20 | 0.22 |
| 3.0 < Vout ≤ 4.0 | Iout=500 mA | 0.7 | 0.75 |
| 4.0 < Vout ≤ 14.0 | | 0.72 | 0.76 |



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Typical Application

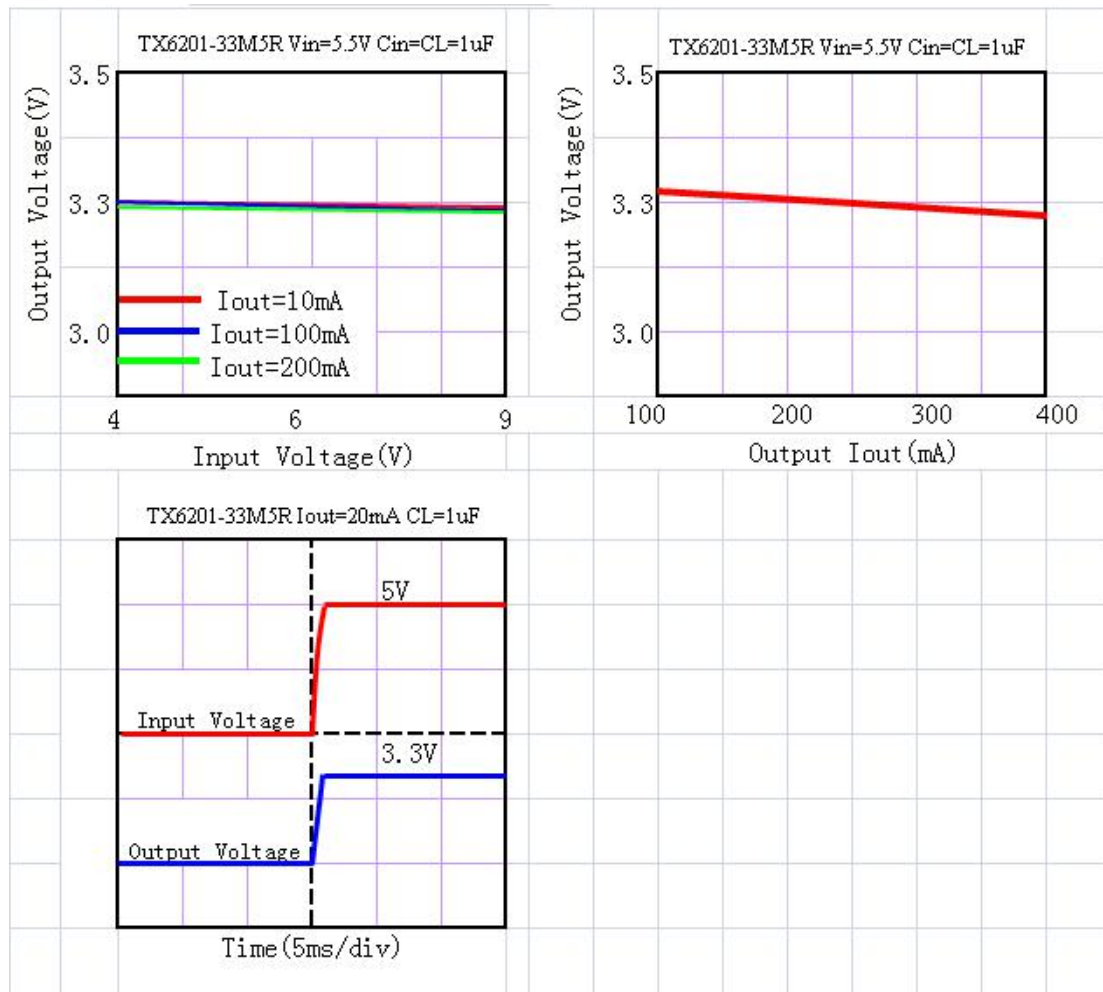


Note1: Input capacitor $C_{IN}=1\mu F$.

Note2: Output capacitor $C_{OUT}=1\mu F/6.8\mu F$ (1µF Tantalum capacitor or 6.8µF ceramic capacitor is recommended).

Typical Performance Characteristics

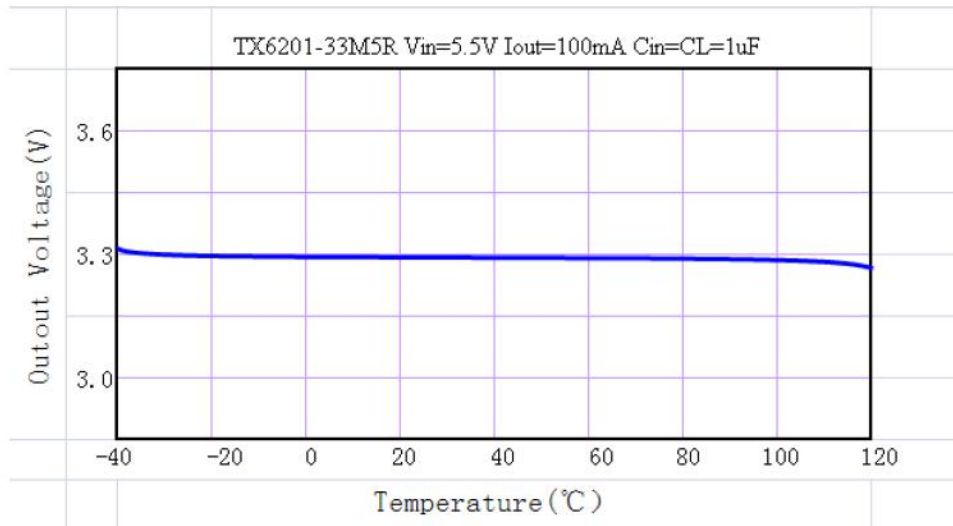
- (1) Output Voltage vs Input voltage and Output Voltage vs. Output Current and Input Transient Response





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(2) Output Voltage vs. Ambient Temperature





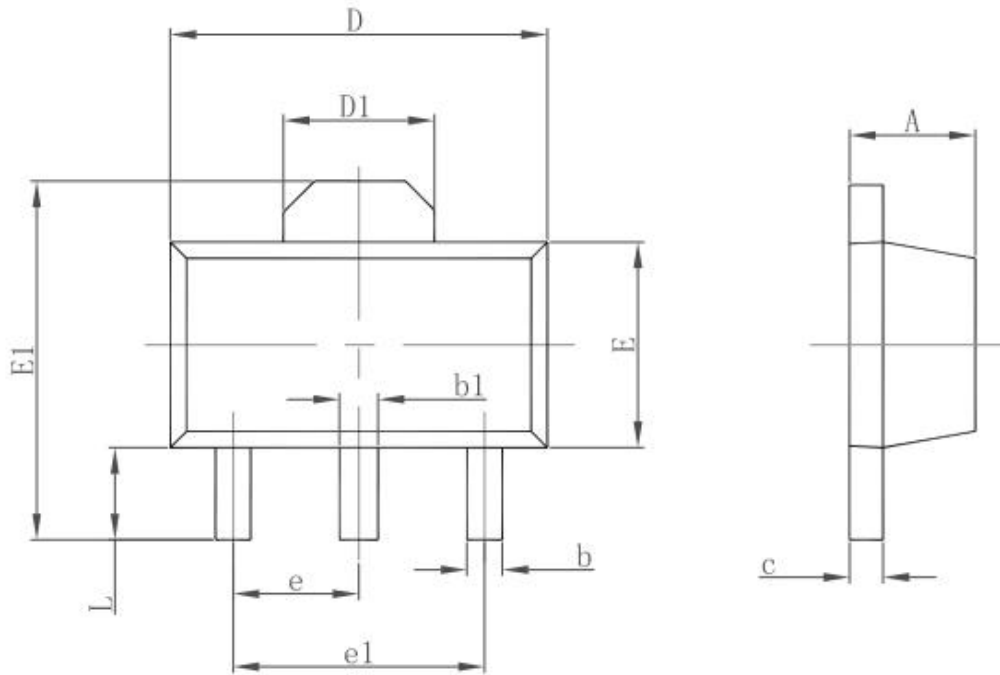
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Package Information

3-pin SOT89 Outline Dimensions



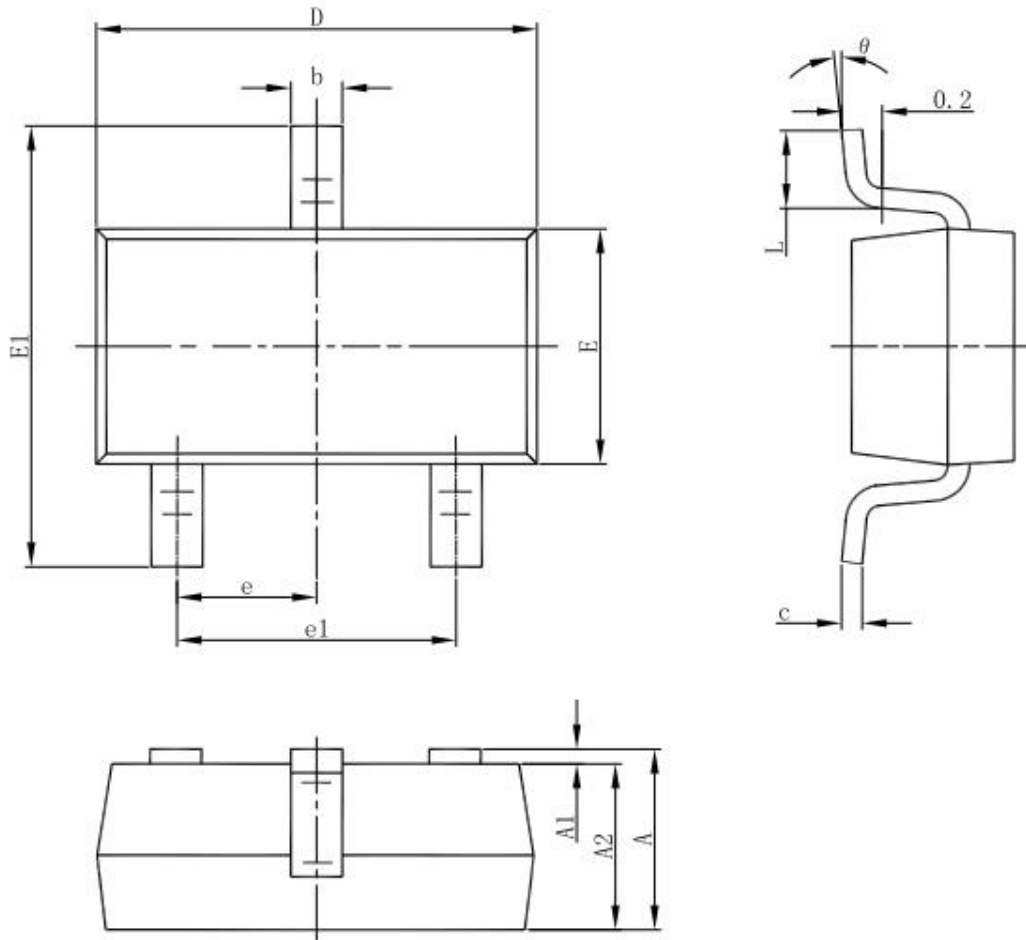
| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 1.400 | 1.600 | 0.055 | 0.063 |
| b | 0.320 | 0.520 | 0.013 | 0.020 |
| b1 | 0.400 | 0.580 | 0.016 | 0.023 |
| c | 0.350 | 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 |



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3-pin SOT23-3 Outline Dimensions



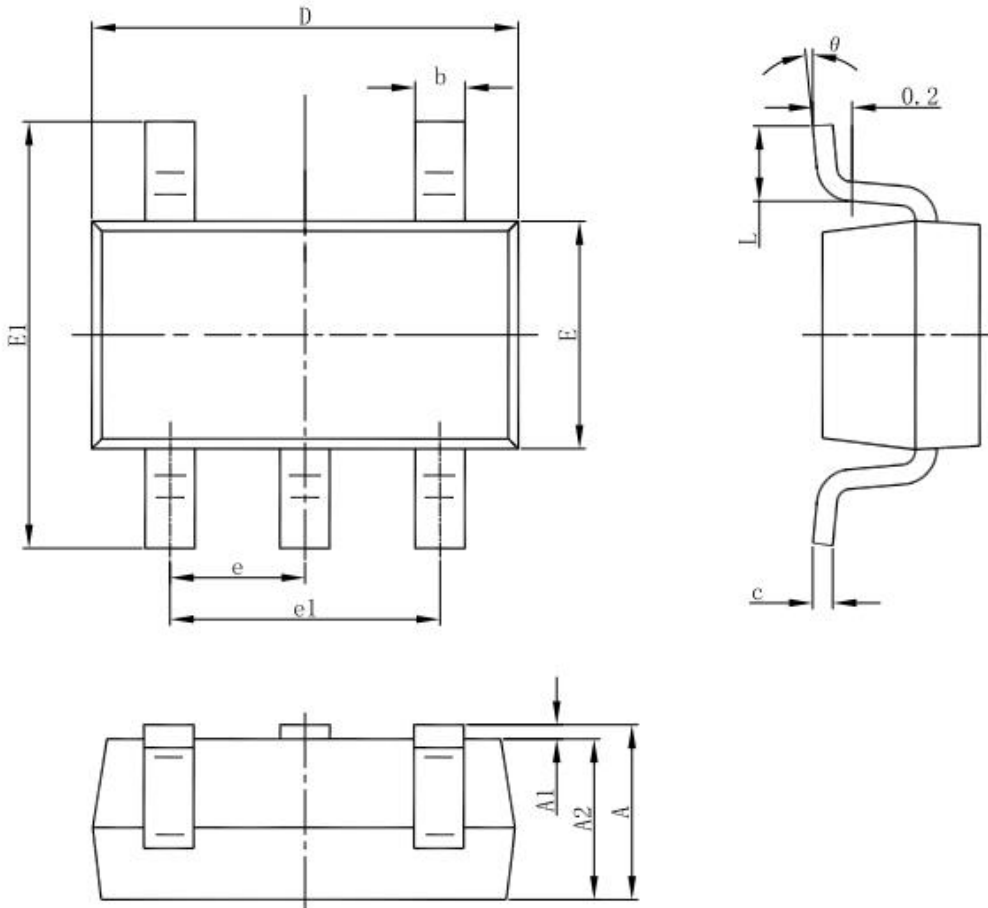
| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|----------|---------------------------|-------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 1.050 | 1.250 | 0.041 | 0.049 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 1.050 | 1.150 | 0.041 | 0.045 |
| b | 0.300 | 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 | 1.500 | 1.700 | 0.059 | 0.067 |
| E1 | 2.650 | 2.950 | 0.104 | 0.116 |
| 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° |



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SOT23-5 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 | 1.500 | 1.700 | 0.059 | 0.067 |
| E1 | 2.650 | 2.950 | 0.104 | 0.116 |
| 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° |



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