

TX72XXM Series

0.5A Low Power LDO

Features

- Low voltage drop: 0.17V@100mA
- High input voltage: 15V
- Low temperature coefficient
- Large Output Current: >0.5A
- Low Quiescent Current: 1.0uA
- Output voltage accuracy: tolerance $\pm 2\%$
- Built-in current limiter
- SOT89,SOT89-5,SOT23-3 and SOT23-5 packages

Applications

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

General Description

The TX72XXM 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 TX72XXM 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, SOT89-5,SOT23-3 and SOT23-5 packages are available.

Selection Table

| Part No. | Output Voltage | Package | Marking |
|----------|----------------|--|-----------------------|
| TX7218xx | 1.8V | SOT89 SOT89-5 SOT23 SOT23-5 SOT23-5B | Refer to Marking rule |
| TX7228xx | 2.8V | | |
| TX7230xx | 3.0V | | |
| TX7233xx | 3.3V | | |
| TX7236xx | 3.6V | | |
| TX7240xx | 4.0V | | |
| TX7245xx | 4.5V | | |
| TX7250xx | 5.0V | | |

Order Information

TX72①②③④

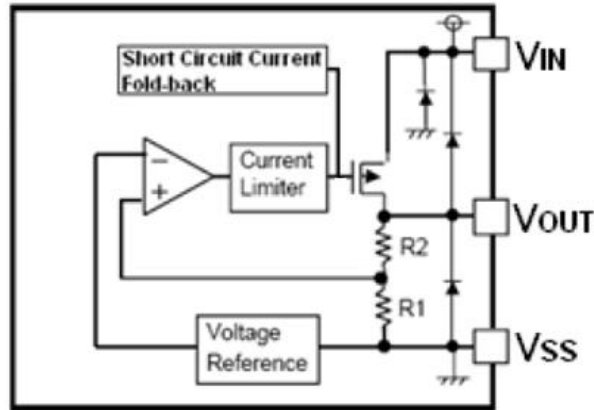
| Designator | Symbol | Description |
|------------|---------|--------------------------|
| ① ② | Integer | Output Voltage(1.8~5.0V) |
| ③ | P | Package:SOT89 |
| | P5 | Package:SOT89-5 |
| | M | Package:SOT23-3 |
| | M5 | Package:SOT23-5 |
| | M5B | Package:SOT23-5B |
| ④ | R | RoHS / Pb Free |
| | G | Halogen Free |

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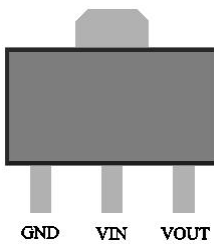
Note: "①②" stands for output voltages. Other voltages can be specially customized

Block Diagram

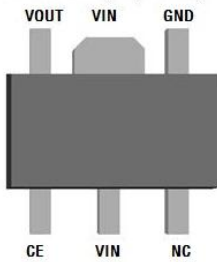


Pin Assignment

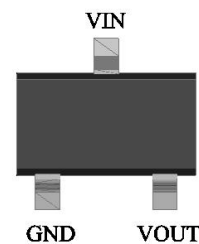
SOT89 (Top view)



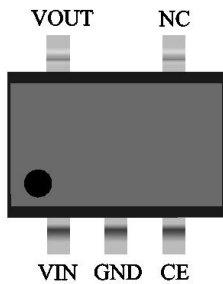
SOT89-5 (Top view)



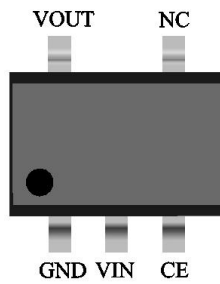
SOT23-3 (Top view)



SOT23-5 (Top view)



SOT23-5B (Top view)



Absolute Maximum Ratings

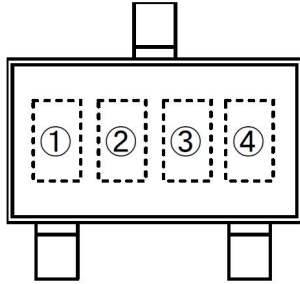
| | | | |
|-----------------------------|---------------|---------------------------|----------------|
| Supply Voltage | 3.5V to 18V | Storage Temperature | -40°C to 125°C |
| Operating Temperature | -40°C to 85°C | | |

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.

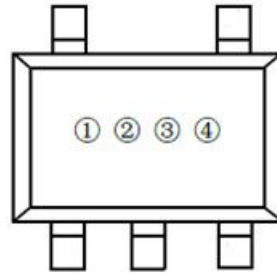
TX72XXM Series 0.5A Low Power LDO

Marking Rule

(1) SOT23-3 and SOT23-5



SOT-23
(TOP VIEW)



SOT23-5
(TOP VIEW)

List of Product Name vs. Product Code

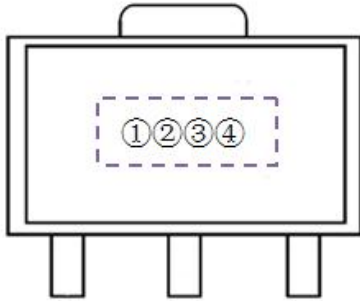
| Product Name | Product Code | | |
|--------------|--------------|-----|-----|
| | (1) | (2) | (3) |
| TX7212 | S | A | A |
| TX7213 | S | A | B |
| TX7214 | S | A | C |
| TX7215 | S | A | D |
| TX7216 | S | A | E |
| TX7217 | S | A | F |
| TX7218 | S | A | G |
| TX7219 | S | A | I |
| TX7220 | S | A | J |
| TX7221 | S | A | K |
| TX7222 | S | A | L |
| TX7223 | S | A | M |
| TX7224 | S | A | N |
| TX7225 | S | A | O |
| TX7226 | S | A | P |
| TX7227 | S | A | Q |
| TX7228 | S | A | R |
| TX7229 | S | A | T |
| TX7230 | S | A | U |
| TX7231 | S | A | V |

| Product Name | Product Code | | |
|--------------|--------------|-----|-----|
| | (1) | (2) | (3) |
| TX7232 | S | A | W |
| TX7233 | S | A | X |
| TX7234 | S | A | Y |
| TX7235 | S | A | Z |
| TX7236 | S | B | A |
| TX7237 | S | B | B |
| TX7238 | S | B | C |
| TX7239 | S | B | D |
| TX7240 | S | B | E |
| TX7241 | S | B | F |
| TX7242 | S | B | J |
| TX7243 | S | B | H |
| TX7244 | S | B | I |
| TX7245 | S | B | J |
| TX7246 | S | B | K |
| TX7247 | S | B | L |
| TX7248 | S | B | M |
| TX7249 | S | B | N |
| TX7250 | S | B | O |

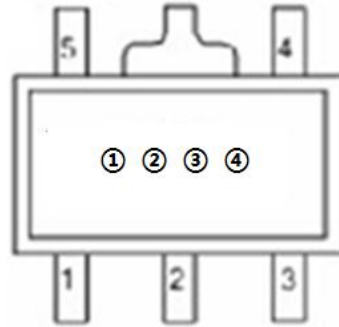
NOTE: SOT23-5, the last is Z
SOT23-5B, the last is Y

TX72XXM Series 0.5A Low Power LDO

(2) SOT89 and SOT89-5



SOT-89
(TOP VIEW)



SOT89-5
(TOP VIEW)

| Product Code: E | | | | | |
|---------------------|------|------|------|------|------|
| Output Voltage Code | | | | | |
| Vout | Code | Vout | Code | Vout | Code |
| 1.5V | 1 | 2.7V | C | 3.9V | O |
| 1.6V | 2 | 2.8V | D | 4.0V | P |
| 1.7V | 3 | 2.9V | E | 4.1V | Q |
| 1.8V | 4 | 3.0V | F | 4.2V | R |
| 1.9V | 5 | 3.1V | G | 4.3V | S |
| 2.0V | 6 | 3.2V | H | 4.4V | T |
| 2.1V | 7 | 3.3V | I | 4.5V | U |
| 2.2V | 8 | 3.4V | J | 4.6V | V |
| 2.3V | 9 | 3.5V | K | 4.7V | W |
| 2.4V | 0 | 3.6V | L | 4.8V | X |
| 2.5V | A | 3.7V | M | 4.9V | Y |
| 2.6V | B | 3.8V | N | 5.0V | Z |
| Data Code: XX | | | | | |

Note: The last two of them are based on the time of this product which is the first time into production, and the third is the launch of this product ,it can be in 1 ~ 9 , which is expressed in "0" in October, in November with an "A", in December with "B"; the fourth is of the launch of the product, such as expressed in "0" in 2010, in "3" in 2013. For example: EZ81 represents TX7250PR product is first put into production in August in 2011.

TX72XXM Series 0.5A Low Power LDO

Electrical Characteristics

TX72XXM for any output voltage

(Ta=25°C)

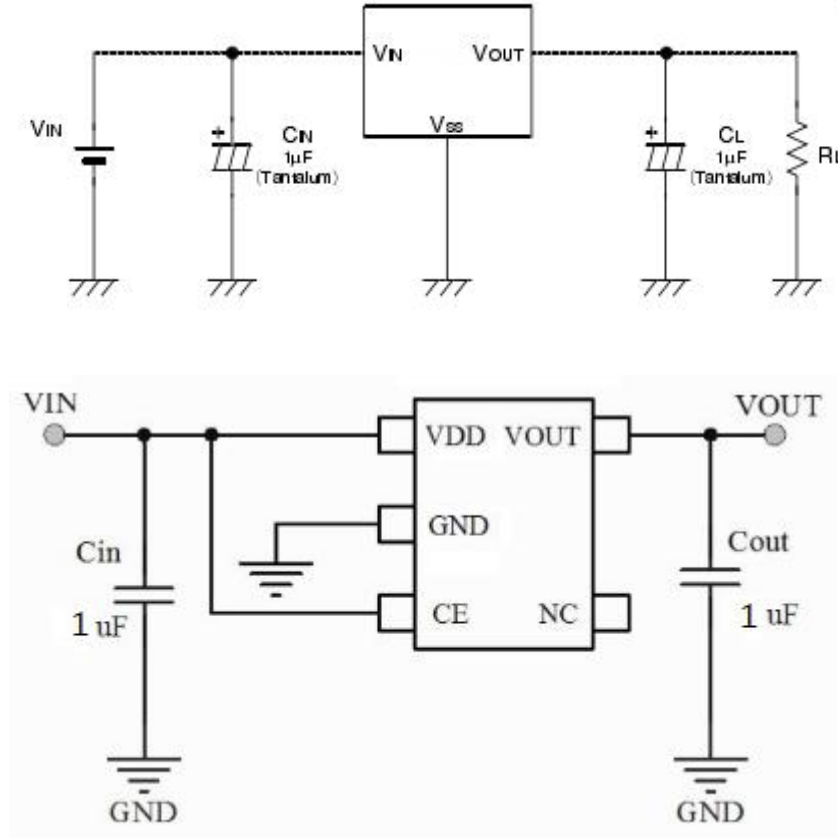
| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|----------------------------------|-----------|------|-----------|--------|
| Output Voltage | Vout | Vin=Vout+1V 1.0mA≤Iout≤30mA | Vout×0.98 | -- | Vout×1.02 | V |
| Output Current*1 | Iout | Vin-Vout=1V | 500 | -- | -- | mA |
| 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 |
| PSRR | PSRR | F=1KHz Vin=Vout+1V | -- | 40 | -- | dB |
| Supply Current | Iss1 | -- | -- | 1 | 2 | uA |
| Input Voltage | Vin | -- | 3.5 | -- | 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 ≤ 6.0 | | 0.20 | 0.22 |
| 3.0 < Vout ≤ 4.0 | Iout=500 mA | 0.8 | 0.85 |
| 4.0 < Vout ≤ 6.0 | | 0.75 | 0.80 |

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Typical Application



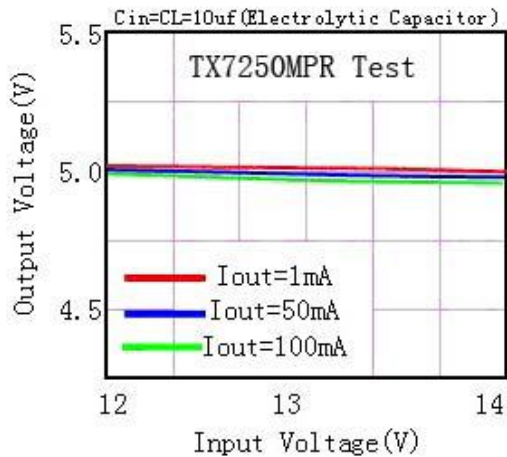
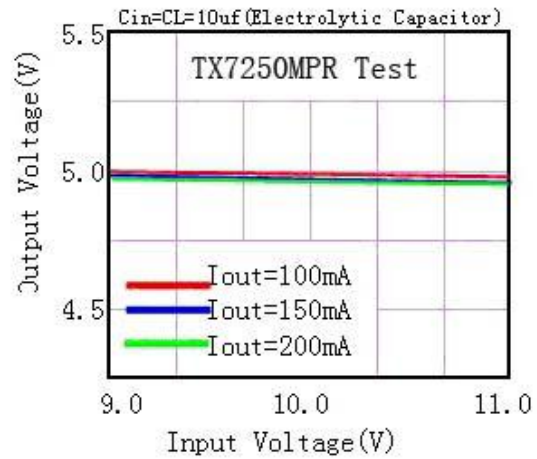
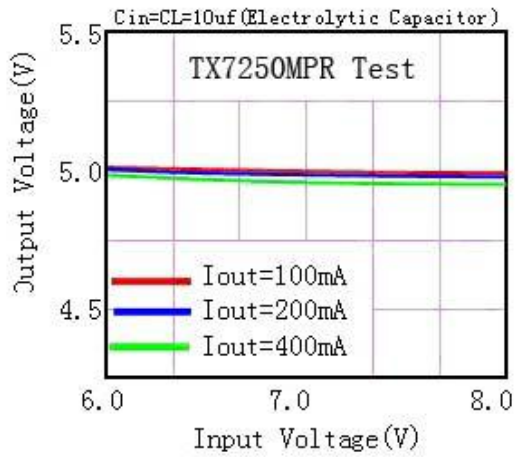
Note1: Input capacitor $C_{IN}=1\mu F$.

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

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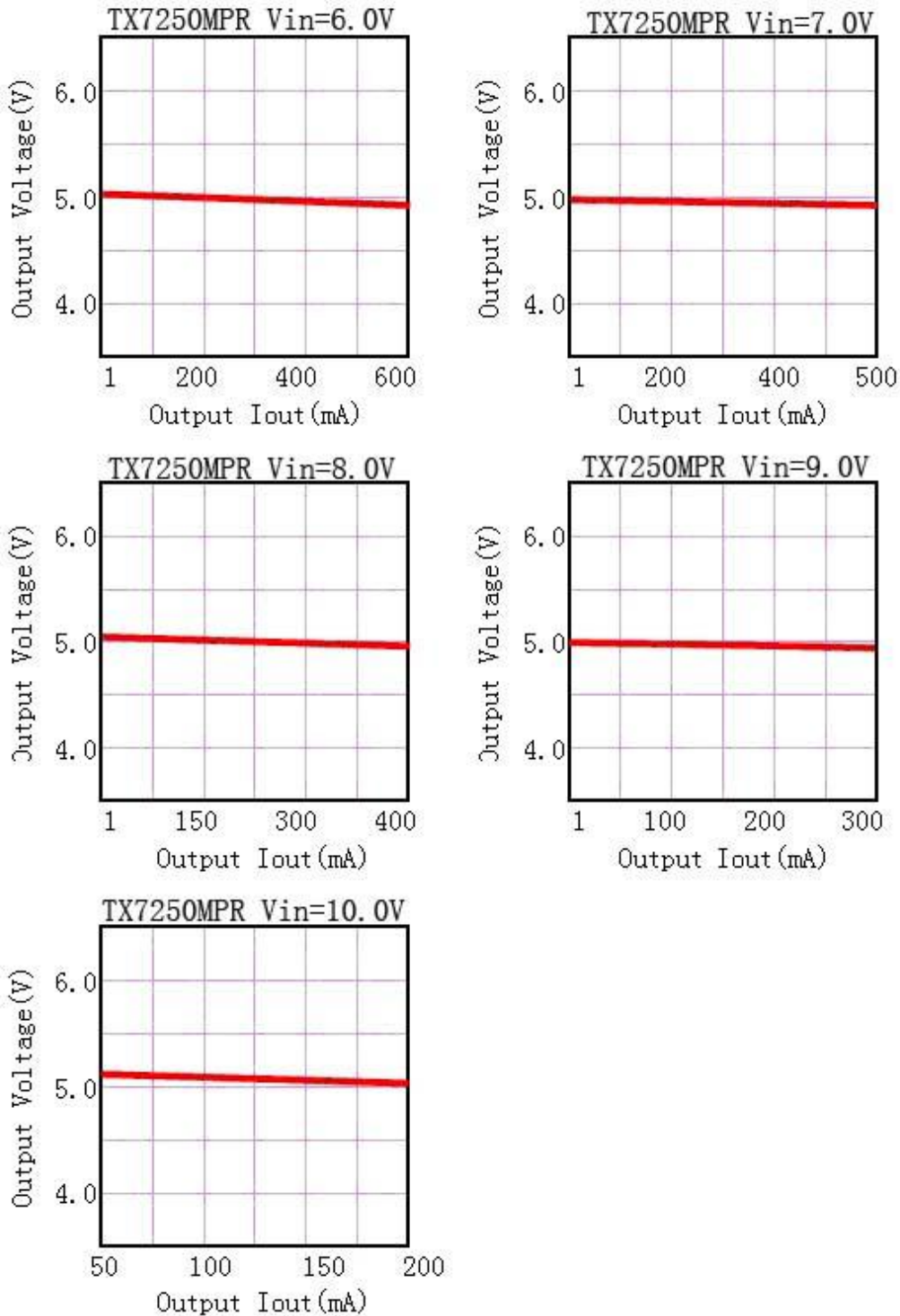
Typical Performance Characteristics

(1) Output Voltage vs Input voltage



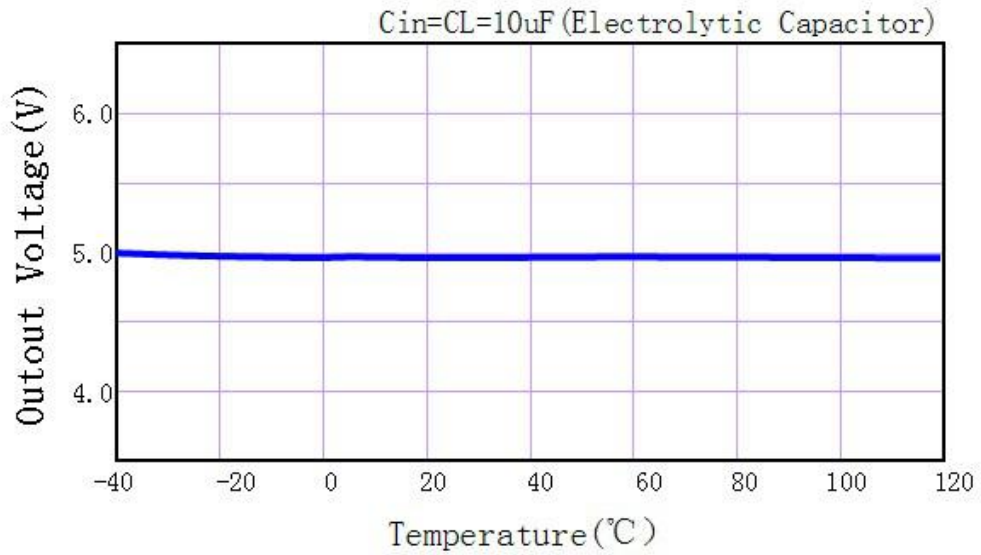
TX72XXM Series 0.5A Low Power LDO

(2) Output Voltage vs. Output Current



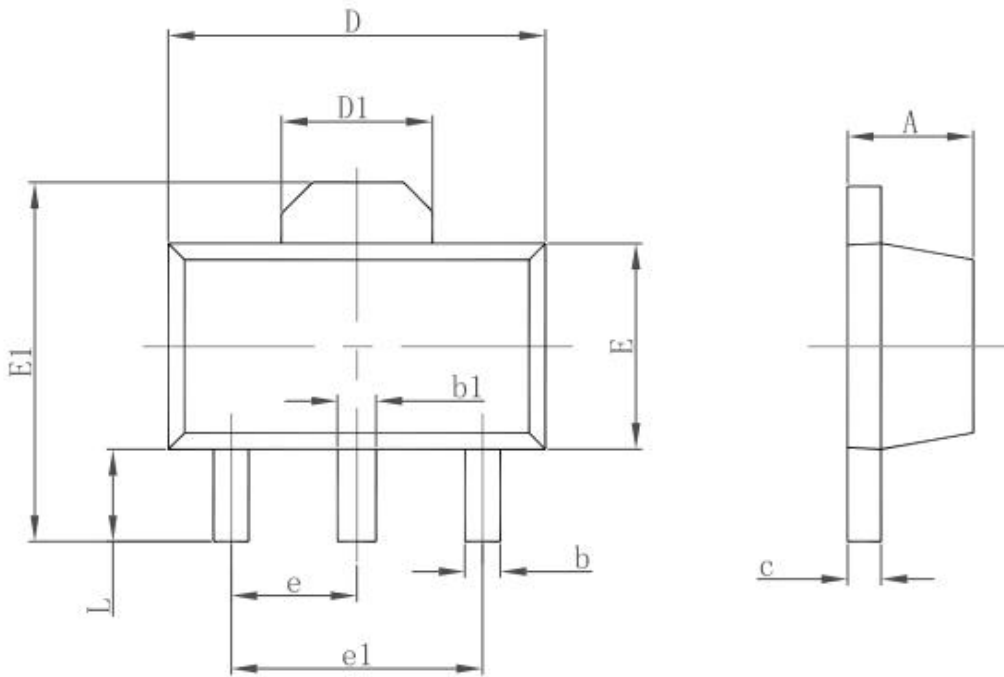
TX72XXM Series 0.5A Low Power LDO

(3) Output Voltage vs. Ambient Temperature



TX72XXM Series 0.5A Low Power LDO

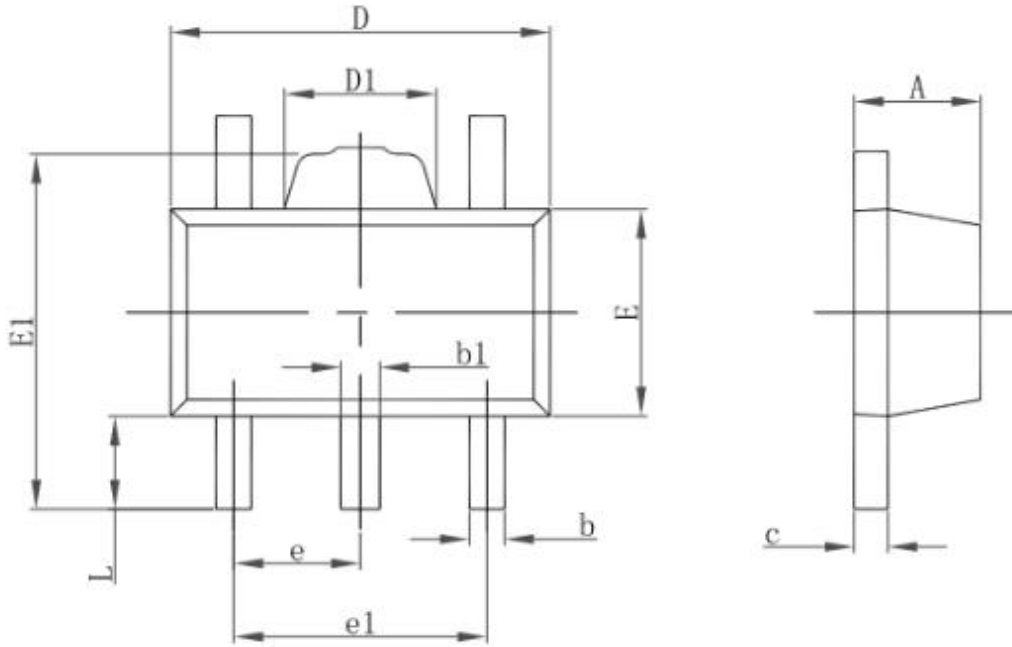
Package Information 3-pin SOT89 Outline Dimensions



| 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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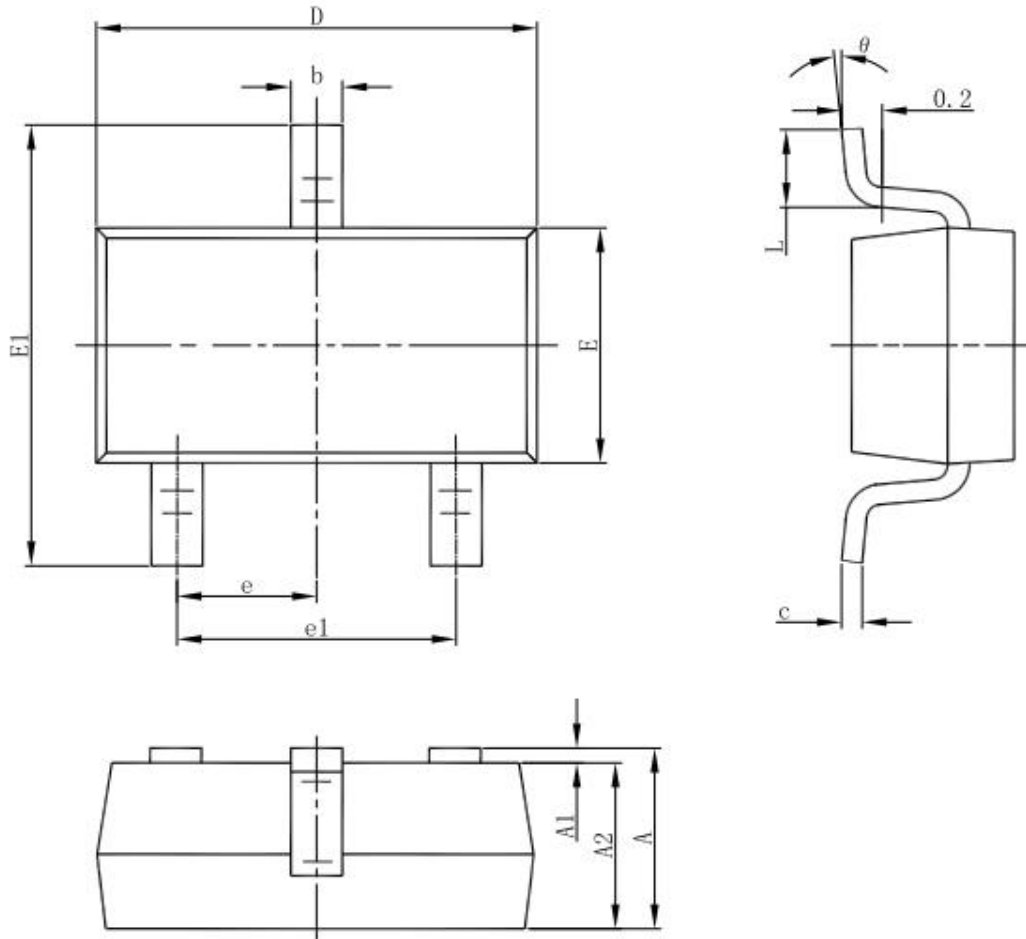
SOT89-5 Outline Dimensions



| 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 | 0.360 | 0.560 | 0.014 | 0.022 |
| c | 0.350 | 0.440 | 0.014 | 0.017 |
| D | 4.400 | 4.600 | 0.173 | 0.181 |
| D1 | 1.400 | 1.800 | 0.055 | 0.071 |
| E | 2.300 | 2.600 | 0.091 | 0.102 |
| E1 | 3.940 | 4.250 | 0.155 | 0.167 |
| e | 1.500TYP. | | 0.060TYP. | |
| e1 | 2.900 | 3.100 | 0.114 | 0.122 |
| L | 0.900 | 1.100 | 0.035 | 0.043 |

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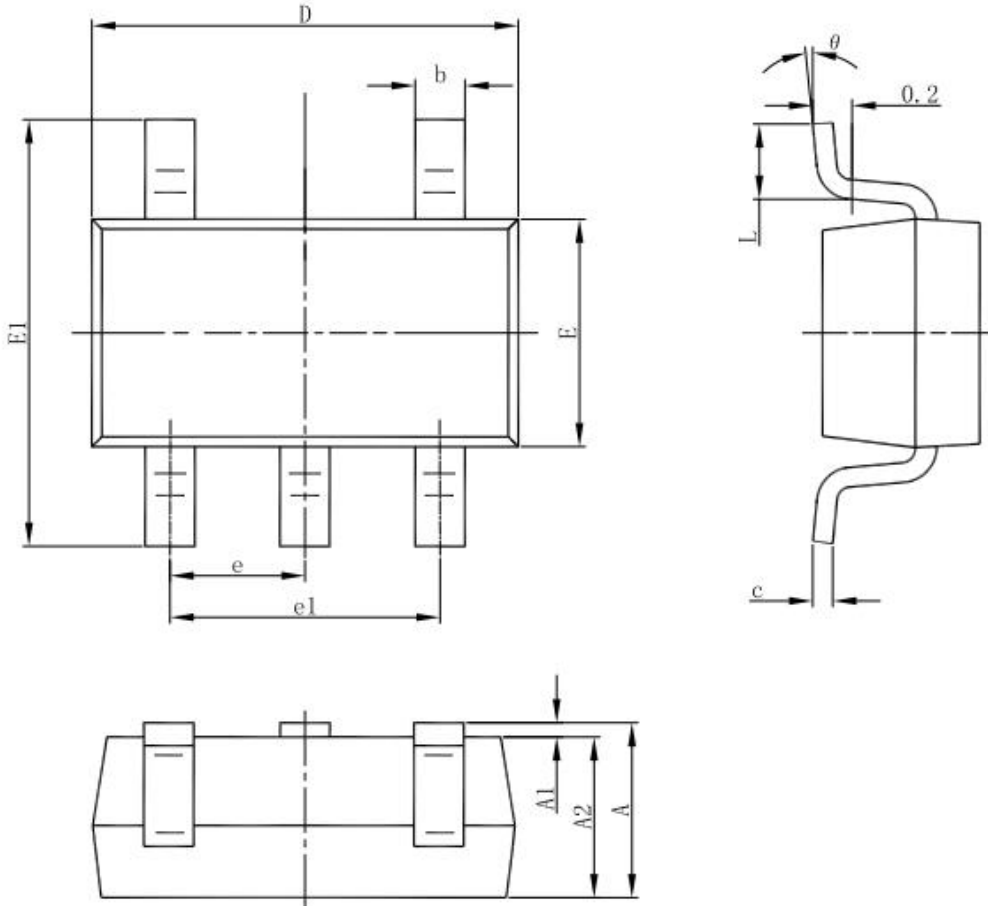
3-pin SOT23-3 Outline Dimensions



| 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° |

TX72XXM Series 0.5A Low Power LDO

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° |