

500mA Low Dropout Linear Regulator

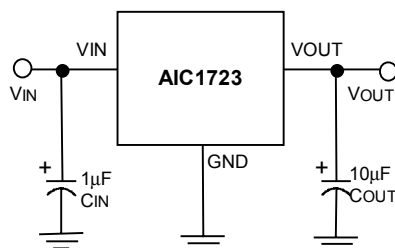
■ FEATURES

- Low Dropout Voltage of 750mV at 500mA Output Current (5.0V Output Version).
- Guaranteed 500mA Output Current.
- Internal 1.5Ω P-MOSFET Draws no Base Current.
- Low Ground Current at 65μA.
- 2% Accuracy Output Voltage of 3.3V/ 3.5V/ 3.7V/ 3.8V/ 5.0V/ 5.2V.
- Input Voltage Range up to 12V (5.0V Output Version).
- Needs only 4.7μF for Stability.
- Current and Thermal Limiting.

■ APPLICATIONS

- Voltage Regulator for CD-ROM Drivers.
- Voltage Regulator for LAN Cards.
- Voltage Regulator for Monitor Microprocessor.
- Voltage Regulator for RAM Module.
- Wireless Communication Systems.
- Battery Powered Systems.

■ TYPICAL APPLICATION CIRCUIT



Low Dropout Linear Regulator

■ DESCRIPTION

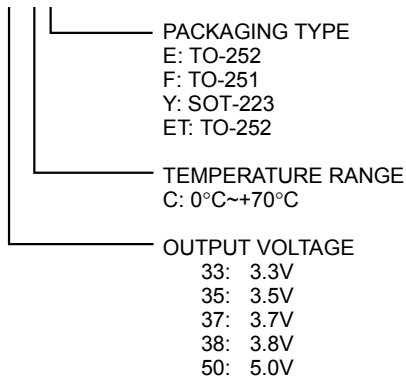
The AIC1723 is a 3-pin low dropout linear regulator. The superior characteristics of the AIC1723 include zero base current loss, very low dropout voltage, and 2% accuracy output voltage. Typical ground current remains approximately

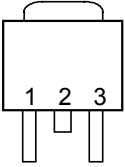
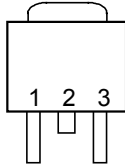
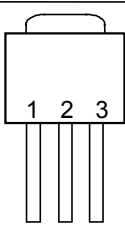
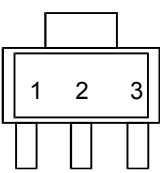
65μA, from no load to maximum loading conditions. Dropout voltage at 500mA output current is exceptionally low: 750mV for the AIC1723-50 and AIC1723-52, 900mV for the AIC1723-38, AIC1723-37, AIC1723-35, and the AIC1723-33. Output current limiting and thermal limiting are built in to provide maximal protection to the AIC1723 against fault conditions.

The AIC1723 comes in the popular SOT-223, TO-251 and TO-252 packages.

ORDERING INFORMATION

AIC1723-XXXX



| ORDER NUMBER | PIN CONFIGURATION |
|--|--|
| AIC1723-33CE AIC1723-35CE AIC1723-37CE AIC1723-38CE AIC1723-50CE AIC1723-52CE (TO-252) | FRONT VIEW 1: VOUT 2: GND 3: VIN  |
| AIC1723-33CET AIC1723-35CET AIC1723-37CET AIC1723-38CET AIC1723-50CET AIC1723-52CET (TO-252) | FRONT VIEW 1: VIN 2: GND 3: VOUT  |
| AIC1723-33CF AIC1723-35CF AIC1723-37CF AIC1723-38CF AIC1723-50CF AIC1723-52CF (TO-251) | FRONT VIEW 1: VOUT 2: GND 3: VIN  |
| AIC1723-33CY AIC1723-35CY AIC1723-37CY AIC1723-38CY AIC1723-50CY AIC1723-52CY (SOT-223) | FRONT VIEW 1: VOUT 2: GND 3: VIN  |

ABSOLUTE MAXIMUM RATINGS

| | |
|--|--------------|
| Input Supply Voltage | -0.3~12V |
| Operating Junction Temperature Range | -40°C~ 125°C |
| Storage Temperature Range | -65°C~150°C |
| Power Dissipation..... | 0.85W |
| Thermal Resistance θ_{JC} TO-251, TO-252 Package..... | 12.5°C/W |
| SOT-223 Package | 15°C/W |

TEST CIRCUIT

Refer to the TYPICAL APPLICATION CIRCUIT

■ **ELECTRICAL CHARACTERISTICS** (Ta=25°C, C_{IN}=1μF, C_{OUT}=10μF, unless otherwise specified.)

| PARAMETER | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT | |
|---|--------------------------|--|-------|-------|--------|----|
| Output Voltage | No Load | | | | | |
| | AIC1723-52 | V _{IN} =5.5~12V | 5.100 | 5.2 | 5.300 | V |
| | AIC1723-50 | V _{IN} =5.5~12V | 4.900 | 5.0 | 5.100 | |
| | AIC1723-38 | V _{IN} =4.7~12V | 3.725 | 3.8 | 3.875 | |
| | AIC1723-37 | V _{IN} =4.7~12V | 3.625 | 3.7 | 3.775 | |
| | AIC1723-35 | V _{IN} =4.7~12V | 3.430 | 3.5 | 3.570 | |
| AIC1723-33 | V _{IN} =3.6~12V | 3.234 | 3.3 | 3.366 | | |
| Output Voltage Temperature Coefficiency | (Note 1) | | 50 | | PPM/°C | |
| Line Regulation | I _L =1mA | | | | | |
| | AIC1723-52 | V _{IN} =5.5~12V | | 3 | 10 | mV |
| | AIC1723-50 | V _{IN} =5.5~12V | | 3 | 10 | |
| | AIC1723-38 | V _{IN} =4.7~12V | | 3 | 10 | |
| | AIC1723-37 | V _{IN} =4.7~12V | | 3 | 10 | |
| | AIC1723-35 | V _{IN} =4.7~12V | | 3 | 10 | |
| AIC1723-33 | V _{IN} =4.7~12V | | 3 | 10 | | |
| Load Regulation (Note 2) | AIC1723-52 | V _{IN} =7V, I _L =0.1~500mA | | 20 | 50 | mV |
| | AIC1723-50 | V _{IN} =7V, I _L =0.1~500mA | | 20 | 50 | |
| | AIC1723-38 | V _{IN} =5V, I _L =0.1~500mA | | 20 | 50 | |
| | AIC1723-37 | V _{IN} =5V, I _L =0.1~500mA | | 20 | 50 | |
| | AIC1723-35 | V _{IN} =5V, I _L =0.1~500mA | | 20 | 50 | |
| | AIC1723-33 | V _{IN} =5V, I _L =0.1~500mA | | 20 | 50 | |
| Current Limit (Note 3) | AIC1723-52 | V _{IN} =7V, V _{OUT} =0V | | 650 | | mA |
| | AIC1723-50 | V _{IN} =7V, V _{OUT} =0V | | 650 | | |
| | AIC1723-38 | V _{IN} =5V, V _{OUT} =0V | | 650 | | |
| | AIC1723-37 | V _{IN} =5V, V _{OUT} =0V | | 650 | | |
| | AIC1723-35 | V _{IN} =5V, V _{OUT} =0V | | 650 | | |
| | AIC1723-33 | V _{IN} =5V, V _{OUT} =0V | | 650 | | |

ELECTRICAL CHARACTERISTICS (Continued)

| PARAMETER | TEST CONDITIONS | | MIN. | TYP. | MAX. | UNIT |
|-----------------------------|--------------------------------|-----------------------------|------|------|------|---------------|
| Dropout Voltage (Note 4) | AIC1723s | $I_L=0.1\text{mA}$ | | 0.2 | 10 | mV |
| | AIC1723-52 | $I_L=500\text{mA}$ | | 750 | 850 | |
| | AIC1723-50 | $I_L=500\text{mA}$ | | 750 | 850 | |
| | AIC1723-38 | $I_L=500\text{mA}$ | | 900 | 1050 | |
| | AIC1723-37 | $I_L=500\text{mA}$ | | 900 | 1050 | |
| | AIC1723-35 | $I_L=500\text{mA}$ | | 900 | 1050 | |
| | AIC1723-33 | $I_L=500\text{mA}$ | | 900 | 1050 | |
| Ground Current | $I_O=0.1\text{mA}\sim I_{MAX}$ | | | | | μA |
| | AIC1723-52 | $V_{IN}=5.5\sim 12\text{V}$ | | 65 | 90 | |
| | AIC1723-50 | $V_{IN}=5.5\sim 12\text{V}$ | | 65 | 90 | |
| | AIC1723-38 | $V_{IN}=4.7\sim 12\text{V}$ | | 65 | 90 | |
| | AIC1723-37 | $V_{IN}=4.7\sim 12\text{V}$ | | 65 | 90 | |
| | AIC1723-35 | $V_{IN}=4.7\sim 12\text{V}$ | | 65 | 90 | |
| | AIC1723-33 | $V_{IN}=4\sim 12\text{V}$ | | 65 | 90 | |

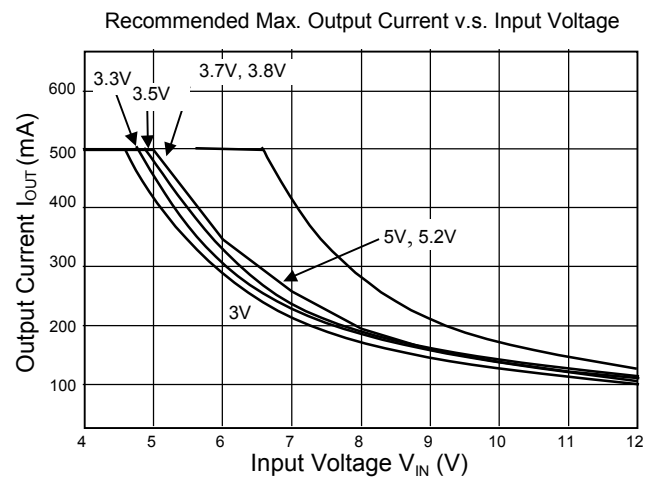
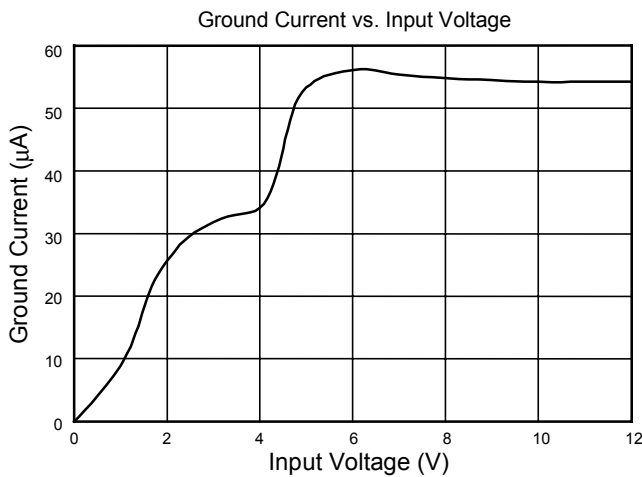
Note 1: Guaranteed by design.

Note 2: Regulation is measured at constant junction temperature, using pulse testing with a low ON time.

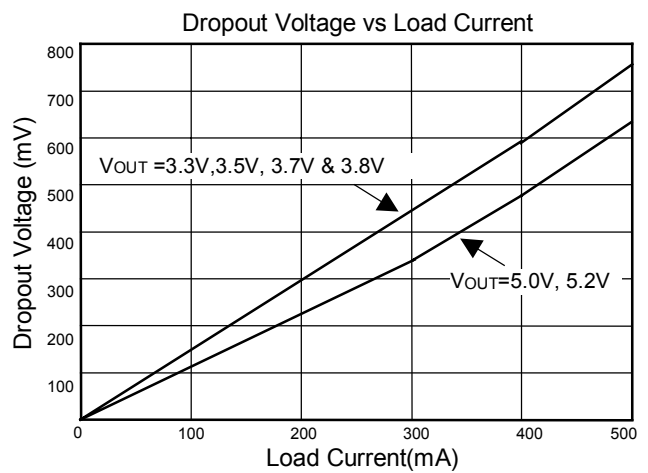
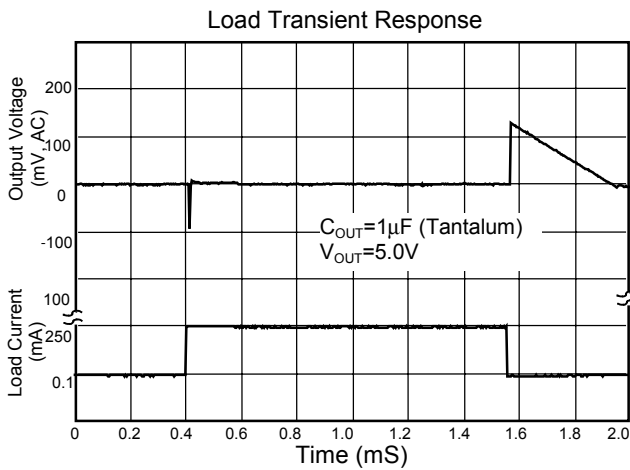
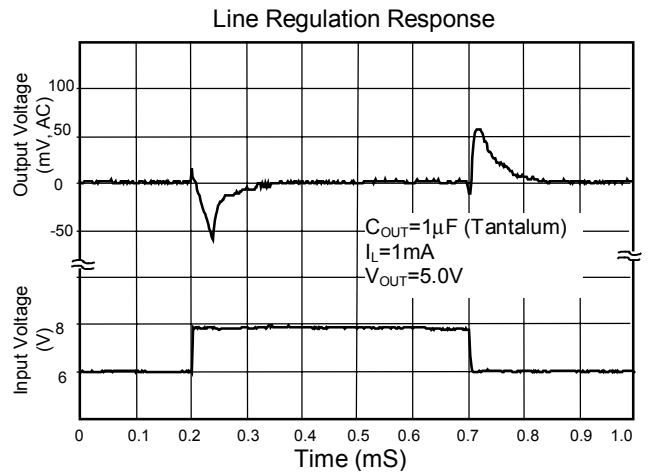
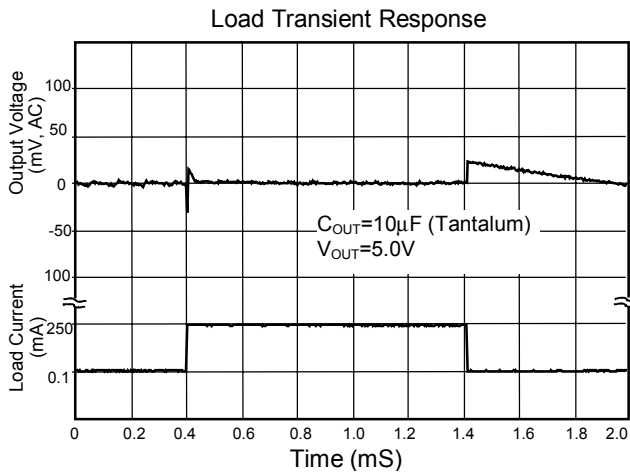
Note 3: Current limit is measured by pulsing a short time.

Note 4: Dropout voltage is defined as the input to output differential at which the output voltage drops 100mV below the value measured with a 1V differential.

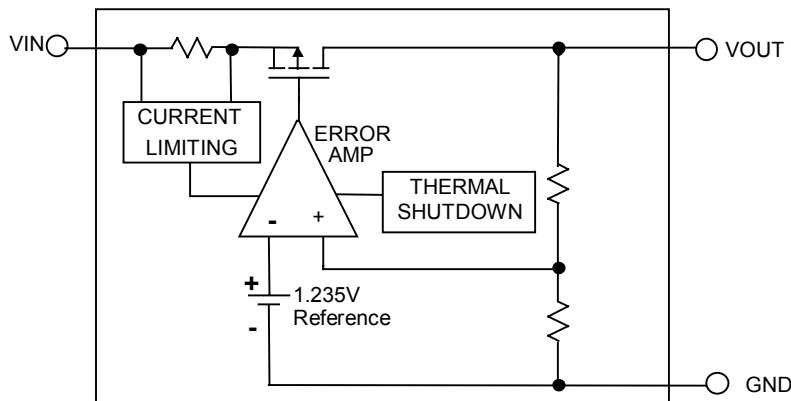
TYPICAL PERFORMANCE CHARACTERISTICS



TYPICAL PERFORMANCE CHARACTERISTICS (Continued)



BLOCK DIAGRAM



■ PIN DESCRIPTION

VOUT PIN - Output pin.

GND PIN - Power GND.

VIN PIN - Power Supply Input.

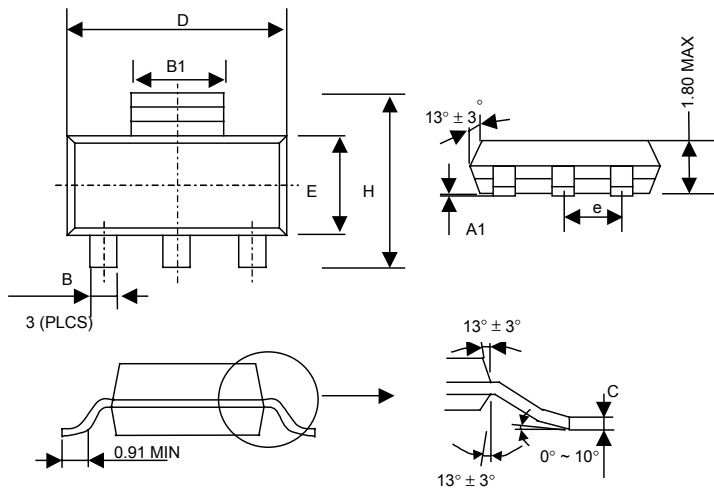
■ APPLICATION INFORMATIONS

A 4.7 μ F (or greater) capacitor is required between the AIC1723 output and ground for stability. Without this capacitor the part will oscillate. Even though most types of capacitor may work, the equivalent series resistance (ESR) should be held to 5 Ω or less if Aluminum electrolytic type is used. Many Aluminum electrolytics have electrolytes that freeze at about -30°C, so solid tantalums are recommended for operation below -25°C. The value of this capacitor may be increased without limit.

A 0.1 μ F capacitor (or greater) should be placed from the AIC1723 input to ground if the lead inductance between the input and power source exceeds 500nH (approximately 10 inches of trace).

■ PHYSICAL DIMENSIONS

● SOT-223 (unit: mm)

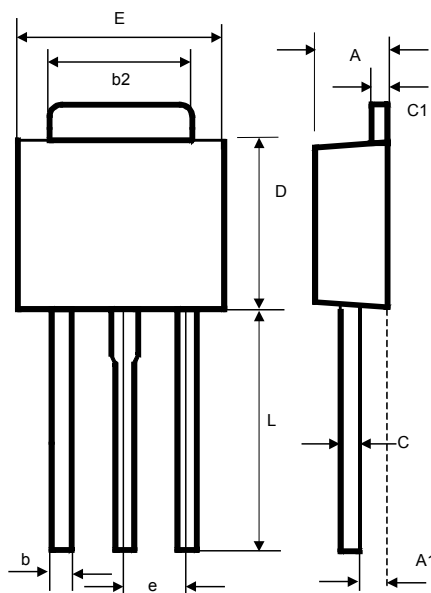


| SYMBOL | MIN | MAX |
|--------|-------------|------|
| A1 | 0.02 | 0.12 |
| B | 0.60 | 0.80 |
| B1 | 2.90 | 3.15 |
| C | 0.24 | 0.35 |
| D | 6.30 | 6.80 |
| E | 3.30 | 3.70 |
| e | 2.30 (TYP.) | |
| H | 6.70 | 7.30 |

● SOT-223 MARKING

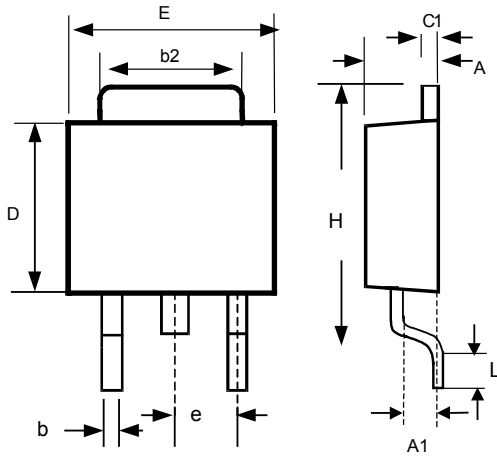
| Part No. | Marking | Part No. | Marking |
|------------|---------|------------|---------|
| AIC1723-33 | AJ33 | AIC1723-38 | AJ38 |
| AIC1723-35 | AJ35 | AIC1723-50 | AJ50 |
| AIC1723-37 | AJ37 | AIC1723-52 | AJ52 |

● TO-251 (unit: mm)



| SYMBOL | MIN | MAX |
|--------|-------------|------|
| A | 2.19 | 2.38 |
| A1 | 1.02 | 1.27 |
| b | 0.55 | 0.89 |
| b2 | 5.21 | 5.46 |
| C | 0.46 | 0.58 |
| C1 | 0.46 | 0.58 |
| D | 5.33 | 5.59 |
| E | 6.35 | 6.73 |
| e | 2.28 (TYP.) | |
| L | 7.62 (TYP.) | |

● TO-252 (unit: mm)



| SYMBOL | MIN | MAX |
|--------|-------------|-------|
| A | 2.19 | 2.38 |
| A1 | 1.02 | 1.27 |
| b | 0.64 | 0.88 |
| b2 | 5.21 | 5.46 |
| C1 | 0.46 | 0.58 |
| D | 5.33 | 5.59 |
| E | 6.35 | 6.73 |
| e | 2.28 (TYP.) | |
| H | 9.40 | 10.42 |
| L | 0.51 | - |