

1.5A Low Dropout Positive Adjustable Regulator

FEATURES

- Dropout Voltage 1.3V at 1.5A Output Current.
- Fast Transient Response.
- Line Regulation typically at 0.015%.
- Load Regulation typically at 0.1%.
- Internal Thermal and Current Limiting.
- Adjustable Output Voltage or Fixed 2.85V, 3.3V, 5V.
- Standard 3-Pin Power Packages.

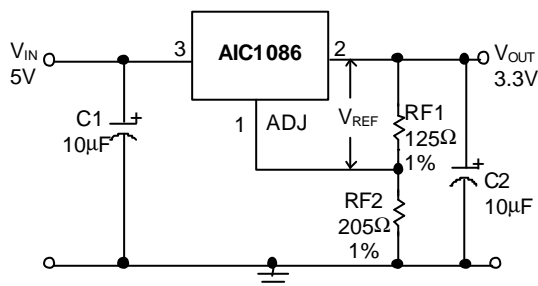
APPLICATIONS

- Post Regulator for Switching Supply.
- Battery Chargers.
- Constant-Current Regulators.
- PC Add-On Card.

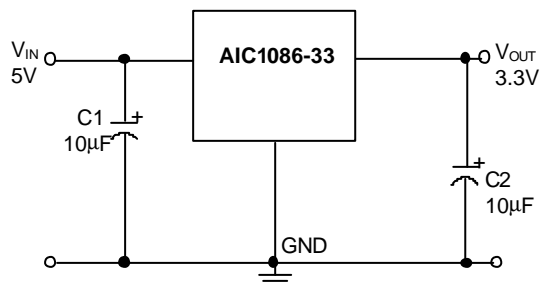
DESCRIPTION

The AIC1086 is a low dropout three terminal regulator with 1.5A output current capability. The output voltage is adjustable with the use of a resistor divider or fixed 2.85V, 3.3V, 5V. Dropout is guaranteed at a maximum of 1.5V at maximum output current. Its low dropout voltage and fast transient response make it ideal for low voltage microprocessor applications. Internal current and thermal limiting provides protection against any overload condition that would create excessive junction temperatures.

TYPICAL APPLICATION CIRCUIT



Adjustable Voltage Regulator



Fixed Voltage Regulator

$$V_{REF} = V_{OUT} - V_{ADJ} = 1.25V \text{ (typ.)}$$

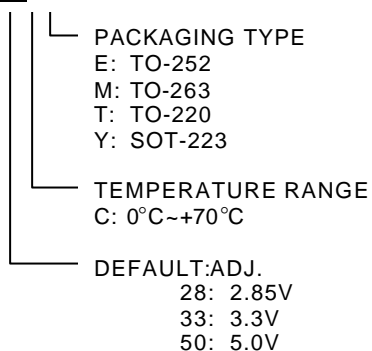
$$V_{OUT} = V_{REF} \times (1 + RF2/RF1) + I_{ADJ} \times RF2$$

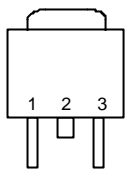
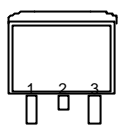
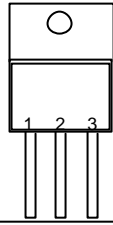
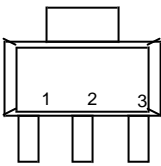
$$I_{ADJ} = 55\mu A \text{ (typ.)}$$

- (1) C1 needed if device is far away from filter capacitors.
- (2) C2 required for stability.

ORDERING INFORMATION

AIC1086-XXXX



| ORDER NUMBER | PIN CONFIGURATION |
|------------------------|--|
| AIC1086CE (TO-252) | FRONT VIEW 1: ADJ 2: VOUT (TAB) 3: VIN  |
| AIC1086CM (TO-263) | FRONT VIEW 1: ADJ 2: VOUT (TAB) 3: VIN  |
| AIC1086CT (TO-220) | FRONT VIEW 1: ADJ 2: VOUT (TAB) 3: VIN  |
| AIC1086CY (SOT-223) | FRONT VIEW 1: ADJ 2: VOUT (TAB) 3: VIN  |

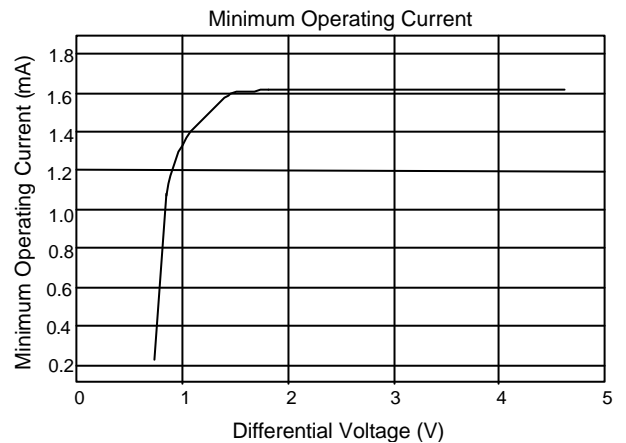
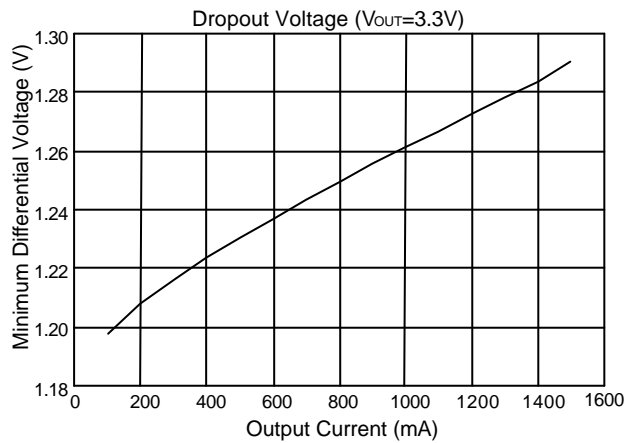
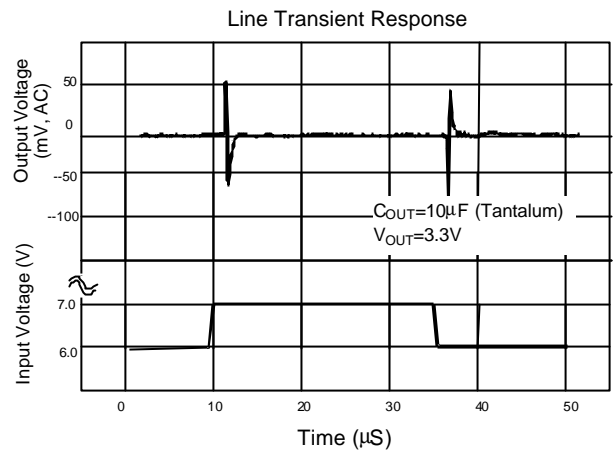
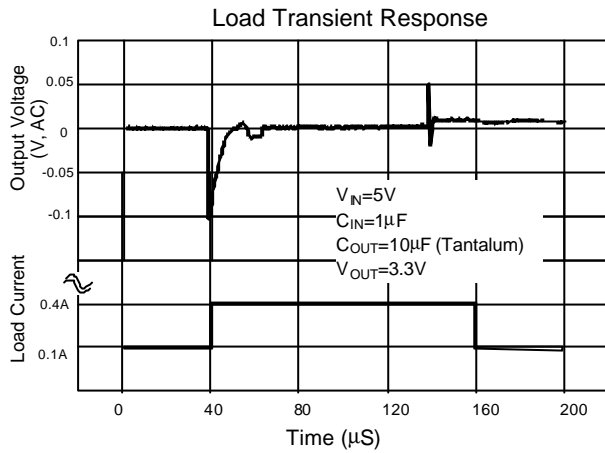
ABSOLUTE MAXIMUM RATINGS

| | | |
|---------------------------------------|---------|----------------|
| VIN pin to ADJ/GND pin | | 7V |
| Operating Junction Temperature Range | | 0°C ~ 125°C |
| Storage Temperature Range | | - 65°C ~ 150°C |
| Thermal Resistance (Junction to Case) | TO-220 | 3°C /W |
| | TO-263 |3°C /W |
| | SOT-223 |15°C /W |
| Lead Temperature (Soldering) 10 sec. | | 260°C |

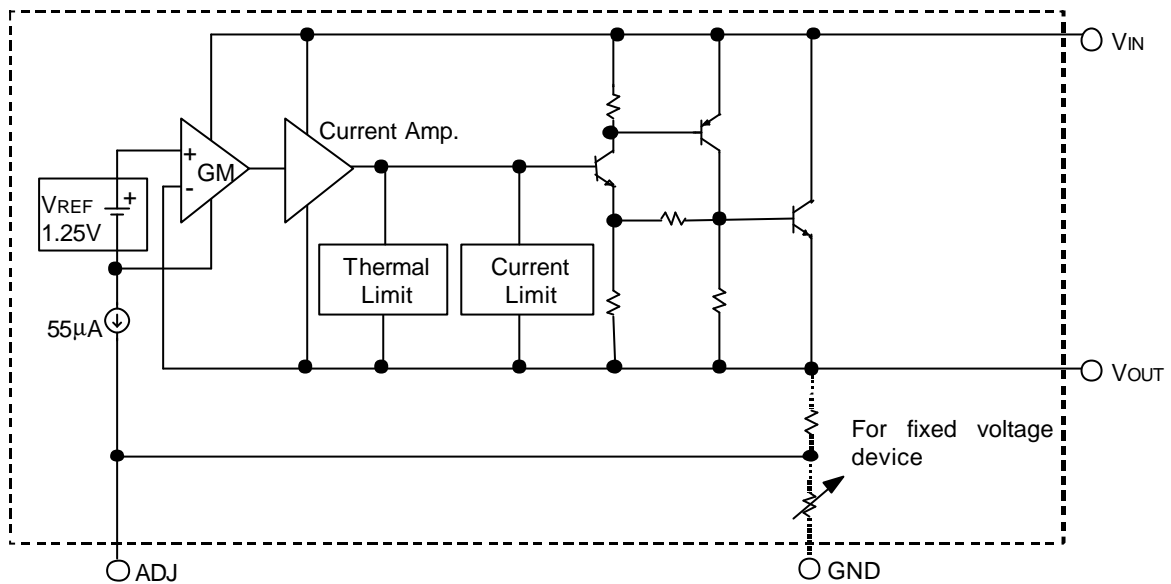
ELECTRICAL CHARACTERISTICS ($V_{IN}=5V$, $T_J=25^\circ C$, $I_O=10mA$, Unless otherwise specified)

| PARAMETER | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|--|--|----------------------|----------------------|----------------------|---------|
| Reference Voltage | AIC1086 (Adj.) $T_J=25^\circ C$ $0^\circ C \leq T_J \leq 125^\circ C$ | 1.238 1.225 | 1.25 1.25 | 1.262 1.275 | V |
| Output Voltage | AIC1086-28, $V_{IN}=5V$ AIC1086-33, $V_{IN}=5V$ AIC1086-50, $V_{IN}=7V$ | 2.82 3.26 4.95 | 2.85 3.30 5.00 | 2.88 3.33 5.05 | V |
| Line Regulation | $2.65 \leq V_{IN} \leq 7V$ $T_J=25^\circ C$ $0^\circ C \leq T_J \leq 125^\circ C$ | | 0.015 0.035 | 0.2 0.2 | % |
| Load Regulation | $T_J=25^\circ C$, $I_O=10mA \sim 1.5A$ $0^\circ C \leq T_J \leq 125^\circ C$ | | 0.1 0.2 | 0.3 0.4 | % |
| Dropout Voltage | $\Delta V_{OUT}, \Delta V_{REF}=1\%$ $I_O=1.5A$ $0^\circ C \leq T_J \leq 125^\circ C$ | | 1.3 | 1.5 | V |
| Current Limit | $0^\circ C \leq T_J \leq 125^\circ C$ | 1.5 | 2.0 | | A |
| Adjusted Pin Current (I_{ADJ}) | $2.65 \leq V_{IN} \leq 7V$ $10mA \leq I_O \leq 1.5A$ $0^\circ C \leq T_J \leq 125^\circ C$ | | 55 | 120 | μA |
| Adjusted Pin Current Change (ΔI_{ADJ}) | $2.65 \leq V_{IN} \leq 7V$ $10mA \leq I_O \leq 1.5A$ $0^\circ C \leq T_J \leq 125^\circ C$ | | 0.2 | 5 | μA |
| Temperature Stability | $I_O=0.5A$ $0^\circ C \leq T_J \leq 125^\circ C$ | | 0.5 | | % |
| Minimum Load Current | $0^\circ C \leq T_J \leq 125^\circ C$ | | 5 | 10 | mA |
| RMS Output Noise (% of V_{OUT}) | $10Hz \leq f \leq 10KHz$ | | 0.003 | | % |
| Ripple Rejection Ratio | 120Hz input ripple $C_{OUT}=25\mu F$ | 60 | 72 | | dB |

TYPICAL PERFORMANCE CHARACTERISTICS

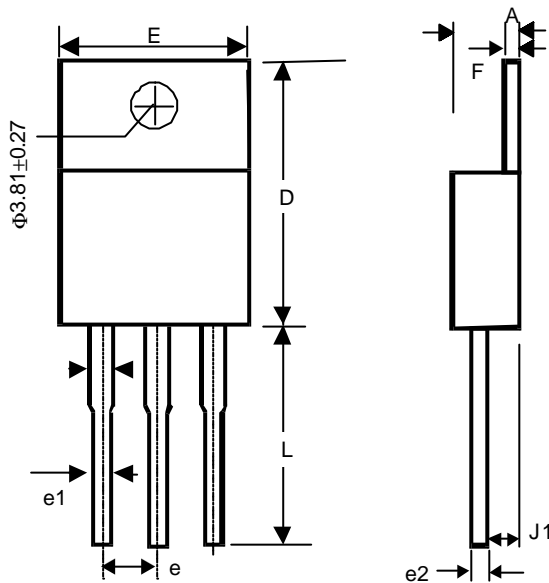


■ BLOCK DIAGRAM

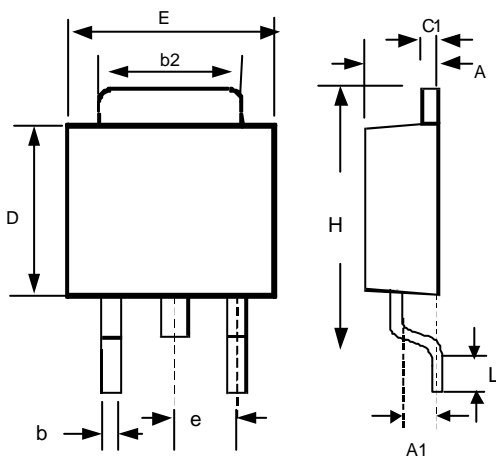


■ PIN DESCRIPTIONS

- ADJ PIN - Providing $V_{REF}=1.25V$ (typ.) for adjustable V_{OUT} . $V_{REF}=V_{OUT}-V_{ADJ}$ and $I_{ADJ}=55\mu A$ (typ.)
- (GND PIN - Power ground.)
- VOU PIN - Adjustable output voltage.
- VIN PIN - Power Input.

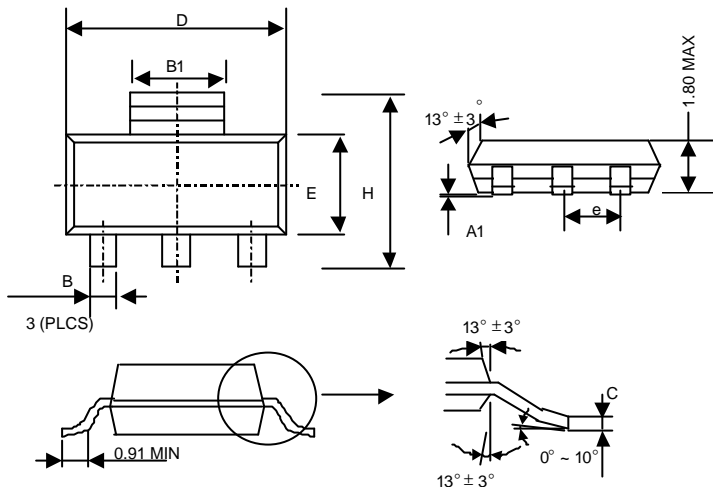
PHYSICAL DIMENSIONS
TO-220 (unit: mm)


| SYMBOL | MIN | MAX |
|--------|-------|-------|
| A | 3.56 | 4.82 |
| D | 14.23 | 16.51 |
| E | 9.66 | 10.66 |
| e | 2.29 | 2.79 |
| e1 | 0.50 | 1.15 |
| e2 | - | 1.10 |
| F | 0.51 | 1.39 |
| J1 | 2.04 | 2.92 |
| L | 12.70 | 14.73 |

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 | - |

● SOT-223

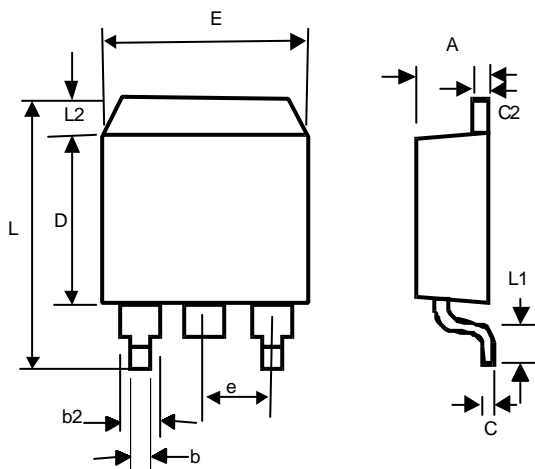


| SYMBOL | MIN | MAX |
|--------|-------------|------|
| A1 | 0.02 | 0.12 |
| B | 0.60 | 0.80 |
| B1 | 2.90 | 3.15 |
| C | 0.24 | 0.35 |
| D | 6.30 | 6.80 |
| E | 3.30 | 3.70 |
| e | 2.30 (TYP.) | |
| H | 6.70 | 7.30 |

● SOT-223 Marking

| Part No. | Marking |
|--------------|---------|
| AIC1086CY | 1086 |
| AIC1086-28CY | AX28 |
| AIC1086-33CY | AX33 |
| AIC1086-50CY | AX50 |

● TO-263 (unit: mm)



| SYMBOL | MIN | MAX |
|--------|-------------|-------|
| A | 4.06 | 4.83 |
| b | 0.50 | 1.00 |
| b2 | 1.14 | 1.40 |
| C | - | 0.7 |
| c2 | 1.14 | 1.40 |
| D | 8.63 | 9.66 |
| E | 9.65 | 10.29 |
| e | 2.54 (TYP.) | |
| L | 14.60 | 15.88 |
| L1 | 2.28 | 2.80 |
| L2 | - | 1.40 |