

# 1.5A LOW DROPOUT VOLTAGE REGULATOR (Adjustable & Fixed) LM1086

## FEATURES

- Low Dropout Voltage 500mV at 1.5A Output Current
- Fast Transient Response
- 0.015% Line Regulation
- 0.1% Load Regulation
- Internal Thermal and Current Limiting
- Adjustable or Fixed Output Voltage(1.5, 2.5, 2.85, 3.0, 3.3, 5.0V)
- Surface Mount Package SOT-223 & TO-263 (D2 Package)
- 100% Thermal Limit Burn-in

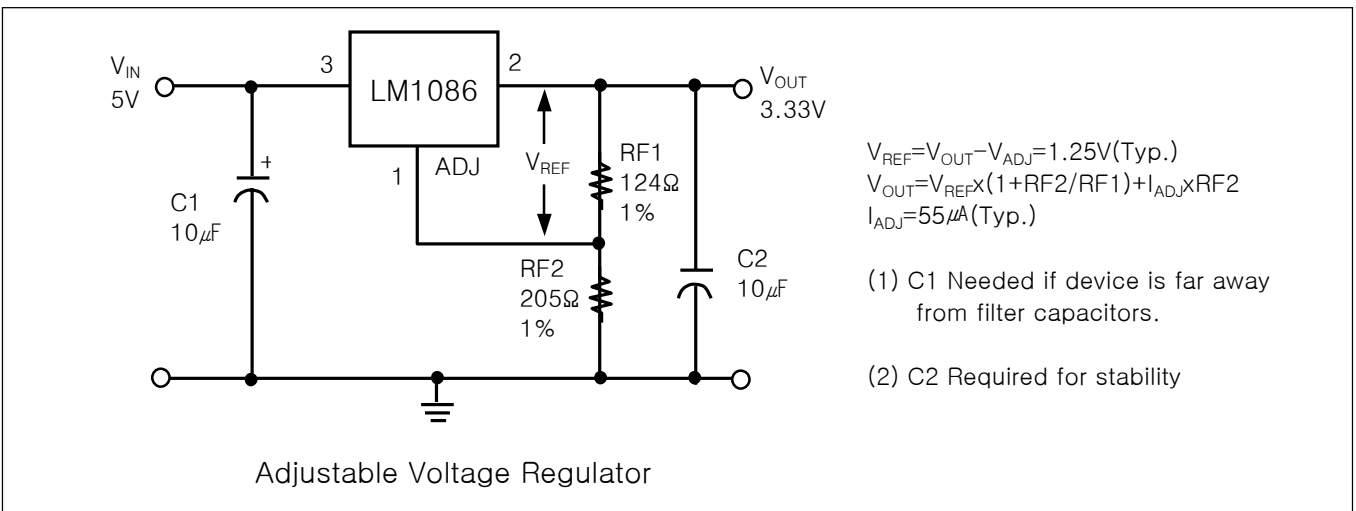
## APPLICATIONS

- Battery Charger
- Adjustable Power Supplies
- Constant Current Regulators
- Portable Instrumentation
- High Efficiency Linear Power Supplies
- High Efficiency "Green" Computer Systems
- SMPS Post-Regulator
- Power PC Supplies
- Powering VGA & Sound Card

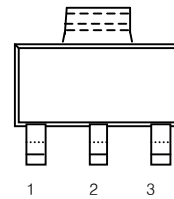
## DESCRIPTION

The LM1086 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. Dropout is guaranteed at a maximum of 500 mV at maximum output current. It's 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 temperature.

## TEST & TYPICAL APPLICATION CIRCUIT

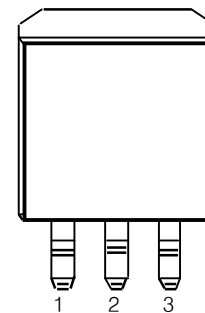


SOT-223 PKG (FRONT VIEW)



PIN FUNCTION  
 1. Adj/Gnd  
 2. Vout  
 3. Vin

TO-263 (D2 PKG, FRONT VIEW)



PIN FUNCTION  
 1. Adj/Gnd  
 2. Vout  
 3. Vin

## ORDERING INFORMATION

| Device & Marking | Package    |
|------------------|------------|
| LM1086S-XX       | SOT 223    |
| LM1086T-XX       | TO263 (D2) |

(XX=Vout=1.5V, 2.5V, 2.85V, 3.0V, 3.3V, 5.0V  
 Adjustable= AD)

## ABSOLUTE MAXIMUM RATINGS

| CHARACTERISTIC                                | SYMBOL           | VALUE   | UNIT |
|-----------------------------------------------|------------------|---------|------|
| Supply Voltage                                | V <sub>in</sub>  | 7       | V    |
| Operating Junction Temperature Range          | T <sub>opr</sub> | 0~125   | °C   |
| Storage Temperature Range                     | T <sub>stg</sub> | -65~150 | °C   |
| Thermal Resistance Junction to Case TO-263    | T <sub>jc</sub>  | 3       | C/W  |
| Thermal Resistance Junction to Ambient TO-263 | T <sub>ja</sub>  | 60      | C/W  |
| Lead Temperature (Soldering) 10 sec.          | T <sub>sol</sub> | 300     | °C   |
| Maximum Output Current                        | I <sub>max</sub> | 1.5     | A    |

ELECTRICAL CHARACTERISTICS I<sub>OUT</sub>=100mA, T<sub>A</sub>=25°C, unless otherwise specified

| PARAMETER                                               | TEST CONDITIONS                                                                            | MIN   | TYP   | MAX   | UNIT             |
|---------------------------------------------------------|--------------------------------------------------------------------------------------------|-------|-------|-------|------------------|
| <b>1.5V Version</b>                                     |                                                                                            |       |       |       |                  |
| Output Voltage                                          | 0<I <sub>OUT</sub> <1.5A, 2.75V<V <sub>IN</sub> <7V                                        | 1.485 | 1.5   | 1.515 | V                |
| <b>2.5V Version</b>                                     |                                                                                            |       |       |       |                  |
| Output Voltage                                          | 0<I <sub>OUT</sub> <1.5A, 3.5V<V <sub>IN</sub> <7V                                         | 2.475 | 2.5   | 2.525 | V                |
| <b>2.85V Version</b>                                    |                                                                                            |       |       |       |                  |
| Output Voltage                                          | 0<I <sub>OUT</sub> <1.5A, 4.35V<V <sub>IN</sub> <7V                                        | 2.822 | 2.85  | 2.879 | V                |
| <b>3.0V Version</b>                                     |                                                                                            |       |       |       |                  |
| Output Voltage                                          | 0<I <sub>OUT</sub> <1.5A, 4.5V<V <sub>IN</sub> <7V                                         | 2.97  | 3     | 3.03  | V                |
| <b>3.3V Version</b>                                     |                                                                                            |       |       |       |                  |
| Output Voltage                                          | 0<I <sub>OUT</sub> <1.5A, 4.75V<V <sub>IN</sub> <7V                                        | 3.27  | 3.3   | 3.33  | V                |
| <b>5.0V Version</b>                                     |                                                                                            |       |       |       |                  |
| Output Voltage                                          | 0≤I <sub>OUT</sub> ≤1.5A, 5.5V≤V <sub>IN</sub> <7V                                         | 4.95  | 5     | 5.05  | V                |
| <b>All Voltage Options</b>                              |                                                                                            |       |       |       |                  |
| Reference Voltage (V <sub>REF</sub> )                   | V <sub>IN</sub> ≤7V, P≤P <sub>MAX</sub>                                                    | 1.225 | 1.25  | 1.27  | V                |
|                                                         | 1.5V≤(V <sub>IN</sub> -V <sub>OUT</sub> )≤5.75V, 10mA≤I <sub>OUT</sub> ≤1.5A               | 1.225 | 1.25  | 1.27  |                  |
| Min. Load Current(Note 3)                               | 1.5V≤(V <sub>IN</sub> -V <sub>OUT</sub> )≤5.75V                                            |       | 5     | 10    | mA               |
| Line Regulation (ΔV <sub>REF</sub> (V <sub>IN</sub> ))  | 2.75V≤V <sub>IN</sub> ≤7V, I <sub>OUT</sub> =10mA, T <sub>J</sub> =25°C                    |       | 0.005 | 0.2   | %                |
| Load Regulation (ΔV <sub>REF</sub> (V <sub>OUT</sub> )) | 10mA≤I <sub>OUT</sub> ≤1.5A, (V <sub>IN</sub> -V <sub>OUT</sub> )=3V, T <sub>J</sub> =25°C |       | 0.05  | 0.3   | %                |
| Dropout Voltage                                         | ΔV <sub>REF</sub> =1% , I <sub>out</sub> =1.5A                                             |       | 1.1   | 1.2   | V                |
| Current Limit<br>I <sub>OUT</sub> (MAX)                 | V <sub>in</sub> -V <sub>out</sub> =3V                                                      | 1.7   | 2.5   |       | A                |
|                                                         | 1.4V≤(V <sub>IN</sub> -V <sub>OUT</sub> ) Adjustable Only                                  |       |       |       |                  |
| Long Term Stability                                     | T <sub>A</sub> =125°C, 1000Hrs                                                             |       | 0.3   | 1     | %                |
| Thermal Regulation<br>(ΔV <sub>OUT</sub> (Pwr))         | T <sub>A</sub> =25°C, 30ms pulse                                                           |       | 0.01  | 0.02  | %/W              |
| Output Noise, RMS                                       | 10Hz to 10KHz T <sub>A</sub> =25°C                                                         | 0.003 |       |       | %/V <sub>o</sub> |
| Thermal Resistance                                      | Junction to Tab                                                                            |       |       | 3     | °C/W             |
|                                                         | Junction to Ambient                                                                        |       |       | 60    |                  |