

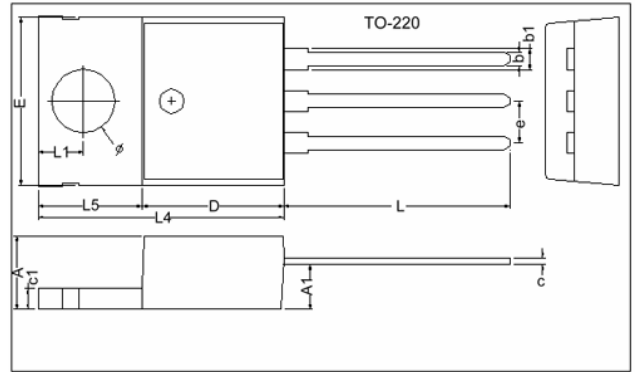
RoHS Compliant Product

Description

The SELM317 is an adjustable 3-terminal positive voltage regulator, designed to supply more than 1.5A of output current with voltage adjustable from 1.3 to 37V.

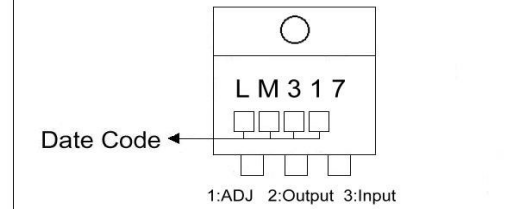
Features

- * Safe-Area Compensation For Output Transistor
- * Internal Short Circuit Protection
- * Internal Over Temperature Protection
- * Output Current Up To 1.5A
- * Output Voltage Adjustable From 1.3 to 37V

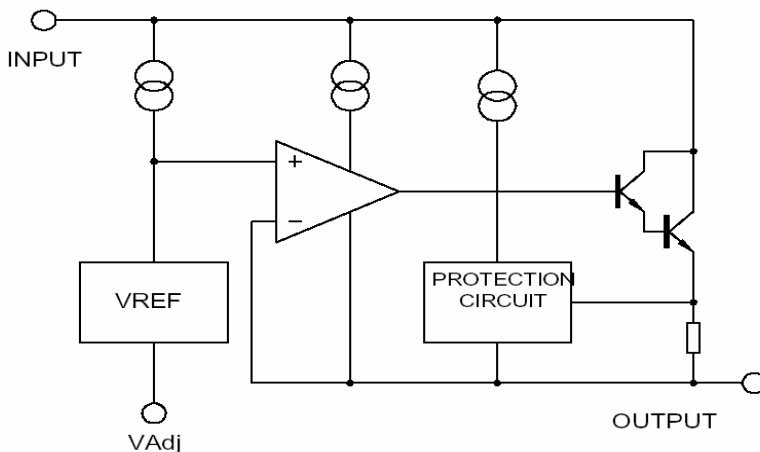


| REF. | Millimeter | | REF. | Millimeter | |
|------|------------|------|------|------------|-------|
| | Min. | Max. | | Min. | Max. |
| A | 4.40 | 4.80 | c1 | 1.25 | 1.45 |
| b | 0.76 | 1.00 | b1 | 1.17 | 1.47 |
| c | 0.36 | 0.50 | L | 13.25 | 14.25 |
| D | 8.60 | 9.00 | e | 2.54 REF. | |
| E | 9.80 | 10.4 | L1 | 2.60 | 2.89 |
| L4 | 14.7 | 15.3 | ∅ | 3.71 | 3.96 |
| L5 | 6.20 | 6.60 | A1 | 2.60 | 2.80 |

Marking :



Block Diagram



Absolute Maximum Ratings at Ta=25°C

| Parameter | Symbol | Ratings | Unit |
|---------------------------------|-----------------------------------|------------------|------|
| Input-Output Voltage Difference | V _{IN} -V _{OUT} | 40 | V |
| Load Temperature | T _{LEAD} | 230 | °C |
| Power Dissipation | P _D | Internal Limited | |
| Storage Temperature Range | T _{STG} | -65~+150 | °C |
| Operating Junction Temperature | T _{OPR} | 0~125 | °C |

Electrical Characteristics (Vi-Vo=5V, 0°C < Tj < 125°C, Io=500mA, IMax=1.5A, PMax=20W, unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min | TYP | Max | Unit | |
|-------------------------------------|---------|--|---------|-------|-------|------|------|
| Line Regulation | ΔVo | Ta=25°C, 3V ≤ Vi-Vo ≤ 40V | - | 0.01 | 0.04 | %/V | |
| | | Ta=0~125°C, 3V ≤ Vi-Vo ≤ 40V | - | 0.02 | 0.07 | %/V | |
| Load Regulation | ΔVo | Ta=25°C, Vo ≤ 6V | - | 18 | 25 | mV | |
| | | 10mA ≤ Io ≤ IMax, Vo ≥ 5V | - | 0.4 | 0.5 | %/Vo | |
| | | 10mA ≤ Io ≤ IMax | Vo ≤ 5V | - | 40 | 70 | mV |
| | | | Vo ≥ 6V | - | 0.8 | 1.5 | %/Vo |
| Adjustable Pin Current | IADJ | | - | 46 | 100 | μA | |
| Adjustable Pin Current Change | ΔIADJ | 2.5V ≤ Vi-Vo ≤ 40V, 10mA ≤ Io ≤ IMax, PD ≤ PMax | - | 2.0 | 5 | μA | |
| Reference Voltage | VREF | 3V ≤ Vi-Vo ≤ 40V, 10mA ≤ Io ≤ IMax, PD ≤ PMax | 1.225 | 1.25 | 1.275 | V | |
| Temperature Stability | STT | | - | 0.7 | - | %/Vo | |
| Minimum Load Current for Regulation | IL(Min) | Vi-Vo=40V | - | 3.5 | 10 | mA | |
| Maximum Output Current | Io(Max) | Vi-Vo ≤ 15V, PD ≤ PMax | 1.5 | 2.2 | - | A | |
| | | Vi-Vo ≤ 15V, PD ≤ PMax Ta=25°C | 0.15 | 0.4 | - | | |
| RMS Noise v.s. % of Vout | eN | Ta=25°C, 10Hz ≤ f ≤ 10KHz | - | 0.003 | 0.01 | %/Vo | |
| Ripple Rejection | RR | Vo=10V, f=120Hz | - | 60 | - | dB | |
| | | Vo=10V, f=120Hz, Cadj=10μF | 66 | 75 | - | | |
| Long-term Stability, Tj=Thigh | ST | Ta=25°C, 1000hr | - | 0.3 | 1 | % | |
| Junction to Case Thermal Resistance | Rθjc | - | - | 5 | - | °C/W | |

*Note: Testing with low duty pulse should be used to avoid heating effect.

Characteristics Curve

Fig.1. Load Regulation vs temperature

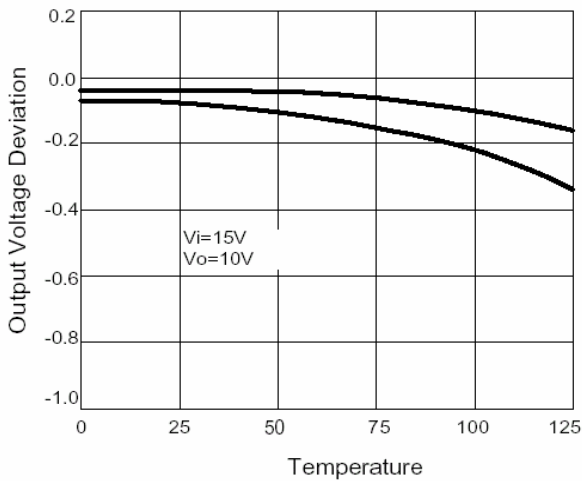


Fig.2 Adjustment Current vs Temperature

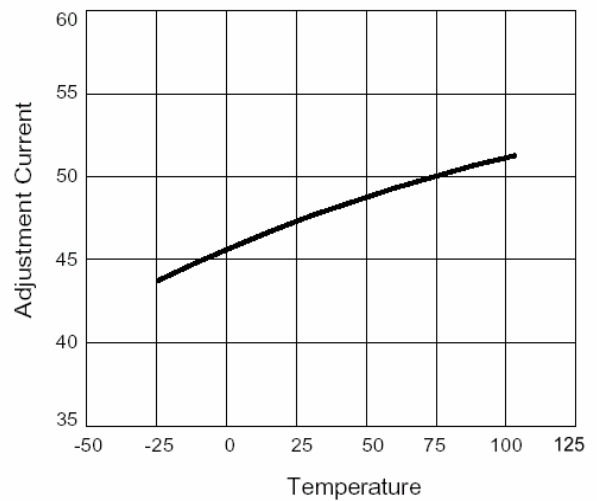


Fig.3. Dropout Voltage vs Input-Output Voltage Difference

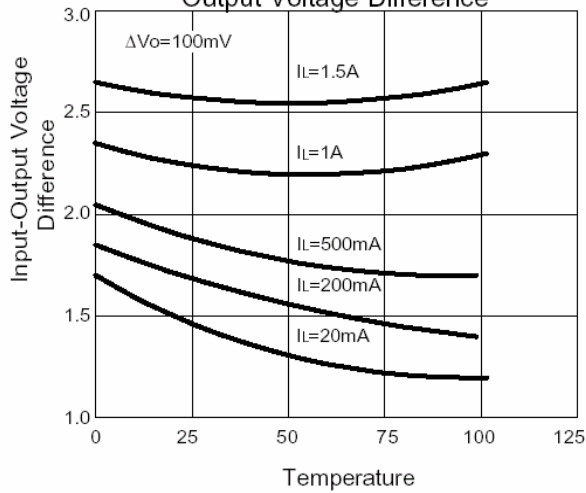
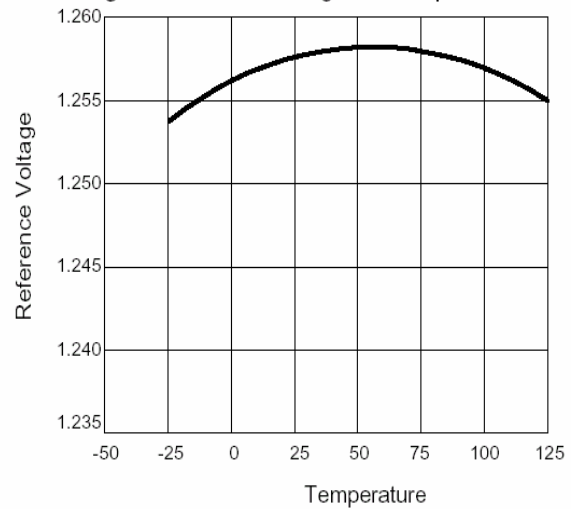


Fig.4 Reference Voltage vs Temperature



Application Circuit

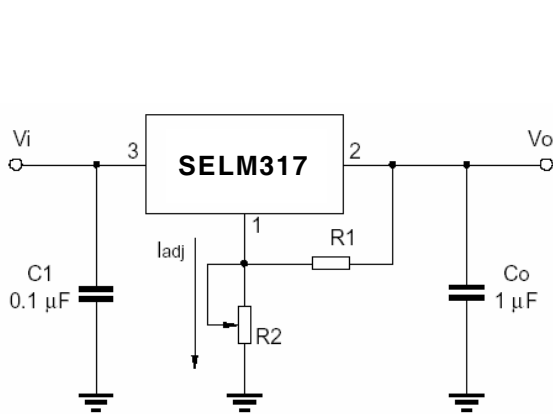


Fig.5 Programmable voltage regulator

$$V_o = 1.25V \cdot (1 + R_2/R_1) + I_{adj} \cdot R_2$$

C1 is required when regulator is located an appreciated distance from power supply. Co is needed to improve transient response.

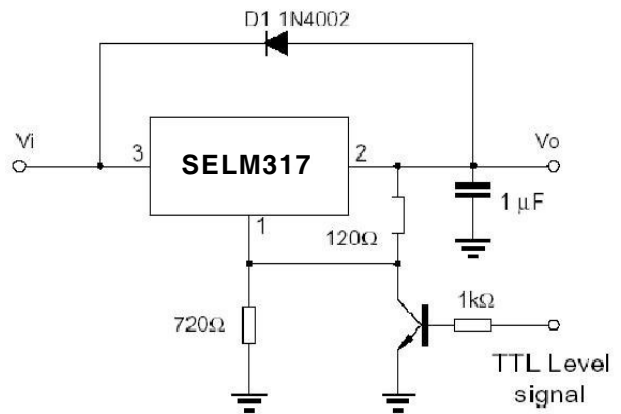


Fig.6 Regulator with On-off control

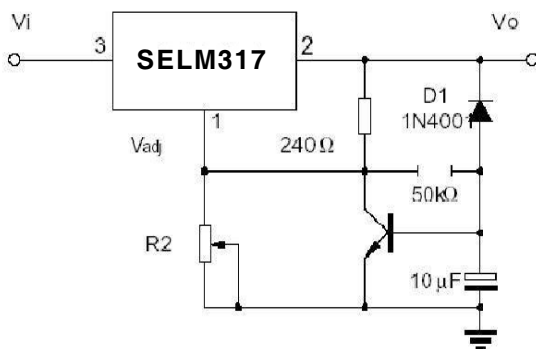
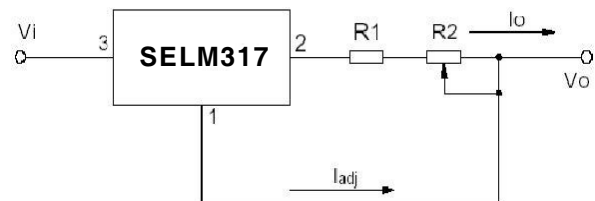


Fig.7 Soft start application



$$I_{o\max} = \left(\frac{V_{ref}}{R_1}\right) + I_{adj} = \frac{1.25V}{R_1}$$

$$I_{o\min} = \left(\frac{V_{ref}}{R_1 + R_2}\right) + I_{adj} = \frac{1.25V}{R_1 + R_2}$$

$$5\text{mA} < I_o < 100\text{mA}$$

Fig.8 Constant current application