

M62222L/FP

2.7V FIXED OUTPUT VOLTAGE DC-DC CONVERTER

GENERAL DESCRIPTION

M62222 is a general purpose DC-DC converter which provides a 2.7V fixed output voltage.

It is possible to simplify the peripheral circuit and to design compact and low cost sets because this IC, housed in a small 5- or 8-pin package includes necessary peripheral components.

Especially this is most suitable for CD-ROM, Disk Drive sets and PDA as a converter from 5V to 2.7V .

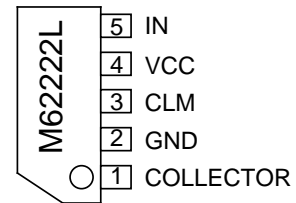
FEATURES

- Wide operation supply voltage range 4 to 15 V
- Low power consumption 900 μ A(max.)
- Built-in oscillator without external components (110KHz typ.)
- Built-in over current protection circuit
- Small 5-pin SIP and 8-pin SOP packages

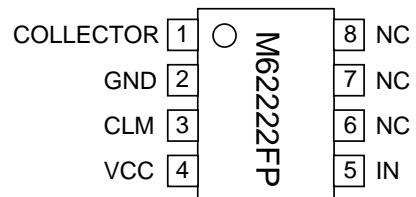
APPLICATIONS

CD-ROM, PDA, general purpose electric products

PIN CONFIGURATION (TOP VIEW)



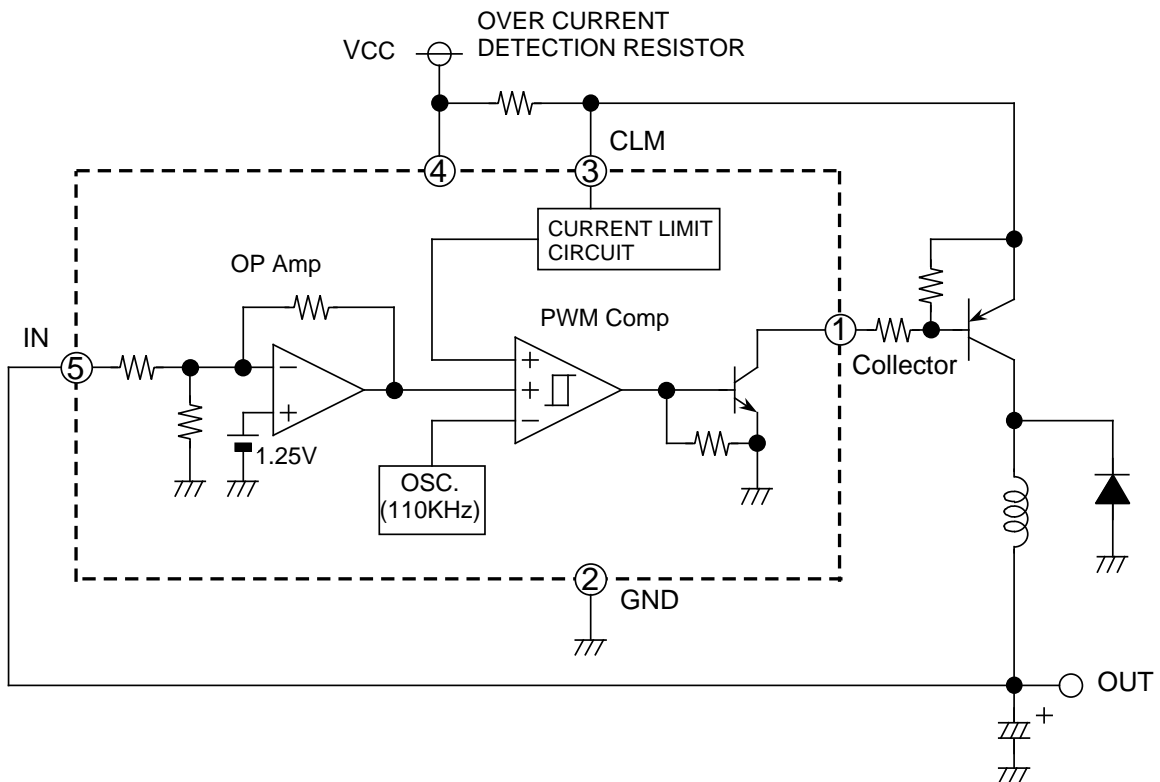
Outline 5P5T



Outline 8P2S-A

NC: NO CONNECTION

BLOCK DIAGRAM



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ABSOLUTE MAXIMUM RATINGS (Ta=25°C, unless otherwise noted)

| Symbol | Parameter | Conditions | | Ratings | Unit |
|--------------------|-----------------------|------------|-----------|------------|--------|
| Vcc | Supply voltage | | | 16 | V |
| Io | Output current | | | 100 | mA |
| Pd | Power dissipation | Ta=25°C | 5-pin SIP | 450 | mW |
| | | | 8-pin SOP | 440 | mW |
| K _{THETA} | Thermal derating | Ta>25°C | 5-pin SIP | 4.5 | mW/ °C |
| | | | 8-pin SOP | 4.4 | mW/ °C |
| Topr | Operating temperature | | | -20 - +85 | °C |
| Tstg | Storage temperature | | | -40 - +125 | °C |

ELECTRICAL CHARACTERISTICS (Ta=25°C, Vcc=5V, unless otherwise noted)

| Block | Symbol | Parameter | Test conditions | Limits | | | Unit |
|------------|--------|---------------------------|---------------------|--------|------|------|------|
| | | | | Min. | Typ. | Max. | |
| All block | Vcc | Supply voltage | | 4.0 | | 15 | V |
| | Icc | Supply current | Whthout load | — | 660 | 900 | µA |
| Error Amp. | Vo | Output voltage | | 2.57 | 2.70 | 2.83 | V |
| | Vreg-L | REF line regulation | Vcc= 4 to 12V | | 5 | 15 | mV |
| | Iin | IN input current | | — | 100 | 300 | µA |
| Oscillator | fosc | Oscillator frequency | | 65 | 110 | 155 | kHz |
| | TDUTY | Maximum on duty | | | 90 | | % |
| CLM | VTHCLM | Current limit voltage | Vcc - CLM | 120 | 150 | 180 | mV |
| Output | ICL | Output leakage current | Vcc = 12V, Vc = 12V | -1 | — | 1 | µA |
| | Vsat | Output saturation voltage | Io = 100mA | — | 0.4 | 0.7 | V |

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Application Circuit (2.7V Output DC-DC Converter)

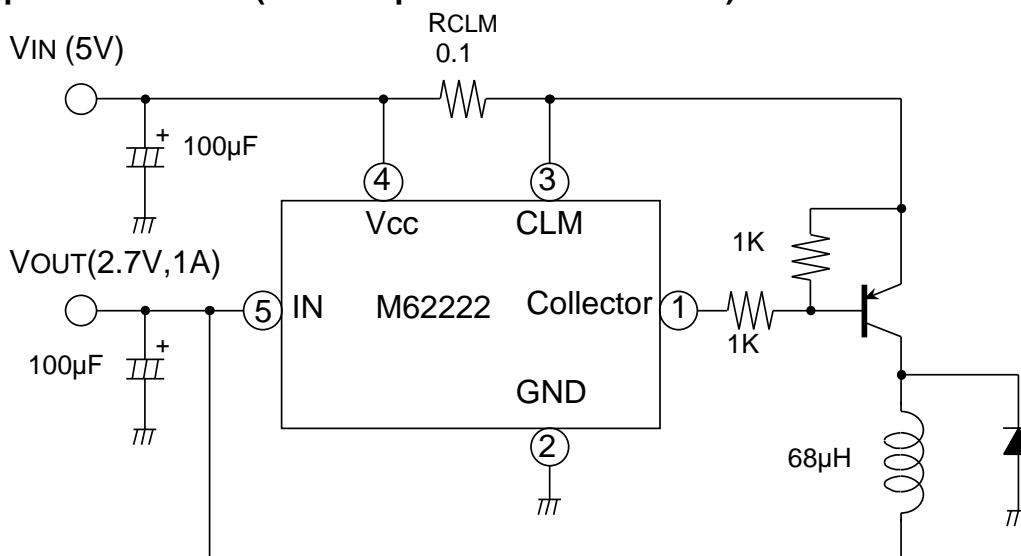


Fig.1 Example of the M62222L/FP application circuit

- Current Limit Detection:
When the voltage drop between pin 3 and pin 4 becomes more than 150mV, the Current Limit Detection circuit begins operating. The peak switch current "Ipk" is limited to $150\text{mV} / \text{RCLM}$. In the example of application (fig.1), the current is limited to 1.5A.

THE EXPRESSION OF CIRCUIT CONSTANTS

| CONSTANTS | EXPRESSIONS |
|----------------------------------|---|
| $\frac{\text{TON}}{\text{TOFF}}$ | $\frac{\text{VO} + \text{VF}}{\text{VIN} - \text{VCE}(\text{sat}) - \text{VO}}$ |
| (TON+TOFF)MAX | $\frac{1}{f_{\text{osc}}}$ fosc:110KHz(Vcc=5V) |
| TOFF(MIN) | $(\text{TON} + \text{TOFF}) / (1 + \frac{\text{TON}}{\text{TOFF}})$ |
| TON(MAX) | $\frac{1}{f_{\text{osc}}} - \text{TOFF}$ |
| L(MIN) | $\frac{(\text{VIN} - \text{VCE}(\text{sat}) - \text{VO}) \times \text{TON}(\text{MAX})}{I_o}$ |
| Ipk | $I_o + \frac{1}{2} I_o$ |
| RCLM | $\frac{0.15}{I_{\text{pk}}}$ VCLM:150mV(Vcc=5V) |

- VF : Forward voltage drop of an external diode.
- Vsat : Output saturation voltage of an external switching transistor.
- Io : It should be set between 1/3 and 1/5 of maximum output current.
- An external transistor, diode and inductor should have a peak current capability of greater than "Ipk".