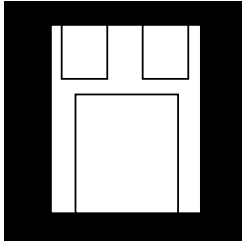


HERMETIC SURFACE MOUNT FIXED VOLTAGE POSITIVE REGULATORS



**Three Terminal, Fixed Voltage, 1.5 Amp
Precision Positive Regulators In Hermetic
Surface Mount Package**

FEATURES

- Hermetic Surface Mount Package
- Output Voltages: +5V, +12V, +15V
- Output Voltages Set Internally To $\pm 1\%$
- Built-In Thermal Overload Protection
- Short Circuit Current Limiting
- Product Is Available Hi-Rel Screened

DESCRIPTION

These three terminal positive regulators are supplied in a hermetically sealed surface mount package. All protective features are designed into the circuit including thermal shutdown, current limiting and safe-area control. With heat sinking, they can deliver over 1.5 amps of output current. These units feature internally trimmed output voltages to $\pm 1\%$ of nominal voltage. Standard voltages are +5V, +12V, and +15V. These units are ideally suited for Military applications where a hermetic surface mount package is required.

ABSOLUTE MAXIMUM RATINGS

| | |
|---|-------------------|
| Input to Output Voltage Differential. | +35 V |
| Operating Junction Temperature Range. | - 55°C to + 150°C |
| Storage Temperature Range | - 55°C to + 150°C |
| Typical Power/Thermal Characteristics: | |
| Rated Power @ 25°C | |
| T_C | 17.5W |
| T_A | 3W |
| Thermal Resistance: | |
| θ_{JC} | 3.5°C/W |
| θ_{JA} | 42°C/W |
| Lead Temperature at Case (5 sec). | 225°C |

3.5



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ELECTRICAL CHARACTERISTICS 5 Volt $V_{IN} = 10V, I_O = 500mA, -55^{\circ}C$ T_A 125°C (unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min. | Max. | Unit |
|--|--|---|--------|------|------------------|
| Output Voltage | V_{OUT} | $T_A = 25^{\circ}C$ | 4.92 | 5.08 | V |
| | | $V_{IN} = 7.5V$ to 20V | • 4.85 | 5.15 | V |
| Line Regulation (Note 1) | V_{RLINE} | $V_{IN} = 7.5V$ to 20V | • | 5 | mV |
| | | | • | 12 | mV |
| | | $V_{IN} = 8.0V$ to 12V | • | 4 | mV |
| Load Regulation (Note 1) | V_{RLOAD} | $I_O = 5mA$ to 1.5 Amp | • | 12 | mV |
| | | | • | 25 | mV |
| | | $I_O = 250mA$ to 750 mA | • | 6 | mV |
| Standby Current Drain | I_{SCD} | | • | 6 | mA |
| | | | • | 6.5 | mA |
| Standby Current Drain Change With Line | ΔI_{SCD} (Line) | $V_{IN} = 7.5V$ to 20V | • | 0.8 | mA |
| Standby Current Drain Change With Load | ΔI_{SCD} (Load) | $I_O = 5mA$ to 1000mA | • | 0.5 | mA |
| Dropout Voltage | V_{DO} | $T_A = 25^{\circ}C, \Delta V_{OUT} = 100mV, I_O = 1.0A$ | | 2.5 | V |
| Peak Output Current | $I_{O(pk)}$ | $T_A = 25^{\circ}C$ | 1.5 | 3.3 | A |
| Short Circuit Current (Note 2) | I_{DS} | $V_{IN} = 35V$ | | 1.2 | A |
| | | | • | 2.8 | A |
| Ripple Rejection | $\frac{\Delta V_{IN}}{\Delta V_{OUT}}$ | $f = 120$ Hz, $\Delta V_{IN} = 10V$ | • | 66 | dB |
| | | (Note 3) | • | 60 | dB |
| Output Noise Voltage (Note 3) | N_O | $T_A = 25^{\circ}C, f = 10$ Hz to 100KHz | | 40 | $\mu V/V$ RMS |
| Long Term Stability (Note 3) | $\frac{\Delta V_{OUT}}{\Delta t}$ | $T_A = 25^{\circ}C, t = 1000$ hrs. | | 75 | mV |

ELECTRICAL CHARACTERISTICS 12 Volt $V_{IN} = 19V, I_O = 500mA, -55^{\circ}C$ T_A 125°C (unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min. | Max. | Unit |
|--|--|--|---------|-------|------------------|
| Output Voltage | V_{OUT} | $T_A = 25^{\circ}C$ | 11.88 | 12.12 | V |
| | | $V_{IN} = 14.5V$ to 27V | • 11.64 | 12.36 | V |
| Line Regulation (Note 1) | V_{RLINE} | $V_{IN} = 14.5V$ to 27V | • | 18 | mV |
| | | | • | 50 | mV |
| | | $V_{IN} = 16V$ to 22V | • | 9 | mV |
| Load Regulation (Note 1) | V_{RLOAD} | $I_O = 5mA$ to 1.5 Amp | • | 32 | mV |
| | | | • | 60 | mV |
| | | $I_O = 250mA$ to 750 mA | • | 20 | mV |
| Standby Current Drain | I_{SCD} | | • | 6.0 | mA |
| | | | • | 6.5 | mA |
| Standby Current Drain Change With Line | ΔI_{SCD} (Line) | $V_{IN} = 15V$ to 30V | • | 0.8 | mA |
| Standby Current Drain Change With Load | ΔI_{SCD} (Load) | $I_O = 5mA$ to 1000mA | • | 0.5 | mA |
| Dropout Voltage | V_{DO} | $\Delta V_{OUT} = 100mV, I_O = 1.0A$ | • | 2.5 | V |
| Peak Output Current | $I_{O(pk)}$ | $T_A = 25^{\circ}C$ | 1.5 | 3.3 | A |
| Short Circuit Current (Note 2) | I_{DS} | $V_{IN} = 35V$ | | 1.2 | A |
| | | | • | 2.8 | A |
| Ripple Rejection | $\frac{\Delta V_{IN}}{\Delta V_{OUT}}$ | $f = 120$ Hz, $\Delta V_{IN} = 10V$ | • | 61 | dB |
| | | (Note 3) | • | 54 | dB |
| Output Noise Voltage (Note 3) | N_O | $T_A = 25^{\circ}C, f = 10$ Hz to 100KHz | | 40 | $\mu V/V$ RMS |
| Long Term Stability (Note 3) | $\frac{\Delta V_{OUT}}{\Delta t}$ | $T_A = 25^{\circ}C, t = 1000$ hrs. | | 120 | mV |

Notes:

- Load and Line Regulation are specified at a constant junction temperature. Pulse testing with low duty cycle is used. Changes in output voltage due to heating effects must be taken into account separately.
- Short Circuit protection is only assured up to $V_{IN} = 35V$.
- If not tested, shall be guaranteed to the specified limits.
The • denotes the specifications which apply over the full operating temperature range.

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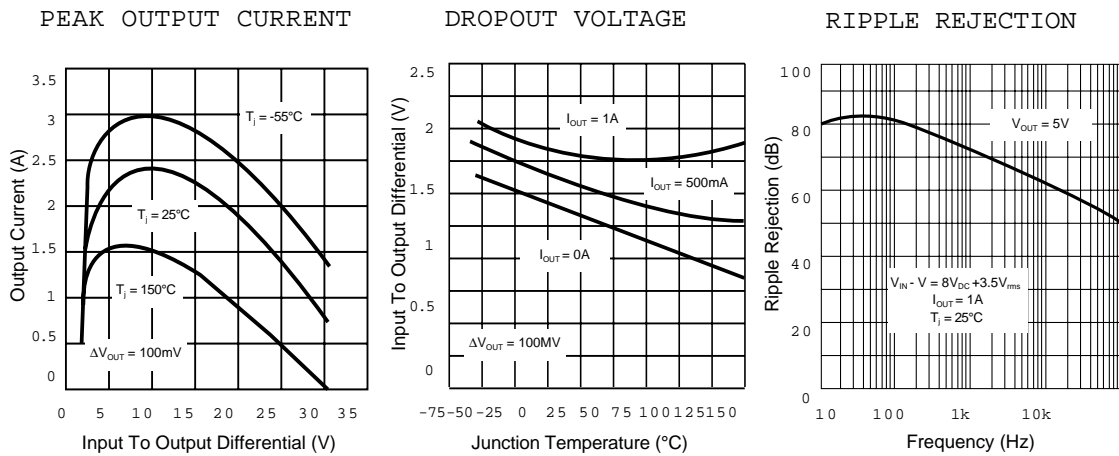
ELECTRICAL CHARACTERISTICS 15 Volt $V_{IN} = 23V, I_o = 500mA, -55^{\circ}C$ $T_A = 125^{\circ}C$ (unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min. | Max. | Unit |
|---|-------------------------------------|---|--------|------|------------------|
| Output Voltage | V_{OUT} | $T_A = 25^{\circ}C$ | 14.8 | 15.2 | V |
| | | $V_{IN} = 18.5V$ to $30V$ | • 14.6 | 15.4 | V |
| Line Regulation (Note 1) | V_{RLINE} | $V_{IN} = 17.5V$ to $30V$ | • | 20 | mV |
| | | $V_{IN} = 20V$ to $26V$ | • | 50 | mV |
| Load Regulation (Note 1) | V_{RLOAD} | $I_o = 5mA$ to 1.5 Amp | • | 35 | mV |
| | | $I_o = 5mA$ to 1.0 Amp | • | 75 | mV |
| | | $I_o = 250mA$ to 750 mA | • | 21 | mV |
| Standby Current Drain | I_{SCD} | | • | 6.0 | mA |
| | | | • | 6.5 | mA |
| Standby Current Drain Change With Line | ΔI_{SCD} (Line) | $V_{IN} = 18.5V$ to $30V$ | • | 0.8 | mA |
| Standby Current Drain Change With Load | ΔI_{SCD} (Load) | $I_o = 5mA$ to $1000mA$ | • | 0.5 | mA |
| Dropout Voltage | V_{DO} | $T_A = 25^{\circ}C, \Delta V_{OUT} = 100mV, I_o = 1.0A$ | | 2.5 | V |
| Peak Output Current | $I_{O(pk)}$ | $T_A = 25^{\circ}C$ | 1.5 | 3.3 | A |
| Short Circuit Current (Note 2) | I_{DS} | $V_{IN} = 35V$ | • | 1.2 | A |
| | | | • | 2.8 | A |
| Ripple Rejection | ΔV_{IN} ΔV_{OUT} | $f = 120$ Hz, $\Delta V_{IN} = 10V$ | • | 54 | dB |
| | | (Note 3) | • | 52 | dB |
| Output Noise Voltage (Note 3) | N_O | $T_A = 25^{\circ}C, f = 10$ Hz to $100kHz$ | | 40 | $\mu V/V$ RMS |
| Long Term Stability (Note 3) | ΔV_{OUT} Δt | $T_A = 25^{\circ}C, t = 1000$ hrs. | | 150 | mV |

Notes:

- Load and Line Regulation are specified at a constant junction temperature. Pulse testing with low duty cycle is used. Changes in output voltage due to heating effects must be taken into account separately.
- Short Circuit protection is only assured up to $V_{IN} = 35V$.
- If not tested, shall be guaranteed to the specified limits.
The • denotes the specifications which apply over the full operating temperature range.

TYPICAL PERFORMANCE CHARACTERISTICS



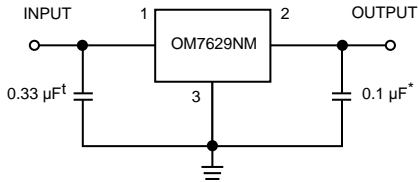
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TYPICAL APPLICATIONS

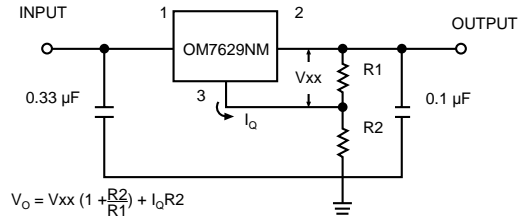
FIXED OUTPUT REGULATOR



* Increasing value of output capacitor improves system transient response

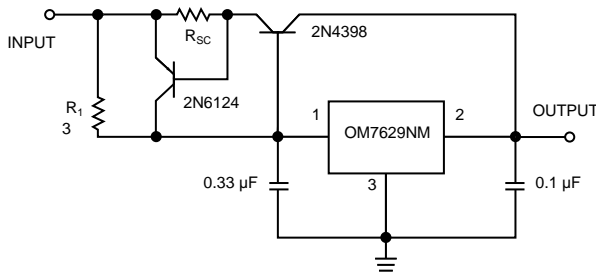
t Required only if regulator is located an appreciable distance from power supply filter.

CIRCUIT FOR INCREASING OUTPUT VOLTAGE

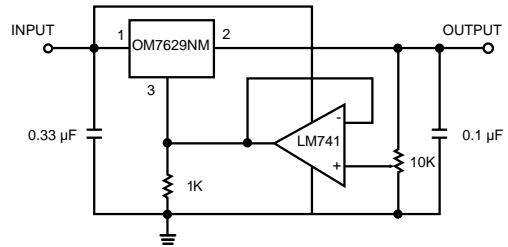


$$V_o = V_{xx} \left(1 + \frac{R_2}{R_1}\right) + I_o R_2$$

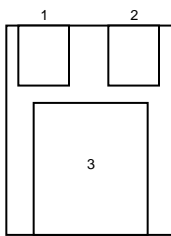
HIGH OUTPUT CURRENT, SHORT CIRCUIT PROTECTED



ADJUSTABLE OUTPUT REGULATOR, 7 TO 30 VOLTS



PIN CONNECTION



Pin 1: In
Pin 2: Out
Pin 3: Ground

MECHANICAL OUTLINE

