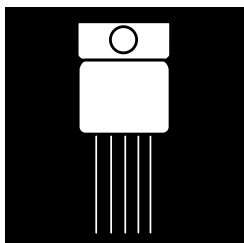


DUAL POSITIVE AND NEGATIVE FIXED VOLTAGE REGULATORS



Dual 5V, 12V and 15V, 1.5 Amp Fixed Voltage Regulators In Single Hermetic MO-078AA Package

FEATURES

- Positive And Negative Regulators In One Package
- Hermetic 5-Pin Metal Package, JEDEC MO-078AA
- Isolated Case
- Output Voltages 5V, 12V and 15V; Other Voltages Available
- Output Voltages Set Internally To $\pm 2.0\%$
- Built-In Thermal Overload Protection
- Short Circuit Current Limiting
- Product Is Available Screened To MIL-S-19500, TX, TXV And S Levels

DESCRIPTION

This series of products offers a positive and a negative fixed voltage regulator in one hermetically sealed, 5 PIN package whose outline is similar to the industry standard TO-247 package. With heat sinking, they can regulate over 1.5 Amp of output current per device. Standard voltages are + or - 5V, 12V and 15V. Other voltages are available upon request. Output voltages are internally trimmed to $\pm 2.0\%$ of nominal voltage. These devices are ideally suited for Military applications where small size and high reliability are required.

To order, use the following Omnirel part numbers to determine the required output voltage of each regulator within one package.

| Omnirel Part Number | Output Voltages | |
|---------------------|-----------------|----------|
| | Positive | Negative |
| OM7501SC | +5V | -5V |
| OM7502SC | +5V | -12V |
| OM7503SC | +5V | -15V |
| OM7504SC | +12V | -5V |
| OM7505SC | +12V | -12V |
| OM7506SC | +12V | -15V |
| OM7507SC | +15V | -5V |
| OM7508SC | +15V | -12V |
| OM7509SC | +15V | -15V |

PIN CONNECTION



Pin 1: + Input
 Pin 2: + Output
 Pin 3: Common
 Pin 4: - Input
 Pin 5: - Output

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INDIVIDUAL POSITIVE REGULATORS

ELECTRICAL CHARACTERISTICS +5 Volt $V_{IN} = 10V, I_o = 500mA, -55^{\circ}C \leq T_A \leq 125^{\circ}C$ (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 |
| | | $V_{IN} = 8.0V$ to 12V | • | 12 | mV |
| Load Regulation (Note 1) | V_{RLOAD} | $I_o = 5mA$ to 1.5 Amp | • | 4 | mV |
| | | $I_o = 250mA$ to 750 mA | • | 10 | mV |
| Standby Current Drain | I_{SCD} | | • | 12 | mV |
| | | | • | 25 | mV |
| Standby Current Drain Change With Line | $D I_{SCD}$ (Line) | $V_{IN} = 7.5V$ to 20V | • | 6 | mA |
| | | | • | 6.5 | mA |
| Standby Current Drain Change With Load | $D I_{SCD}$ (Load) | $I_o = 5mA$ to 1000mA | • | 0.8 | mA |
| | | | • | 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 $V_{IN} = 19V, I_o = 500mA, -55^{\circ}C \leq T_A \leq 125^{\circ}C$ (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 |
| | | $V_{IN} = 16V$ to 22V | • | 50 | mV |
| Load Regulation (Note 1) | V_{RLOAD} | $I_o = 5mA$ to 1.5 Amp | • | 9 | mV |
| | | $I_o = 250mA$ to 750 mA | • | 30 | mV |
| Standby Current Drain | I_{SCD} | | • | 32 | mV |
| | | | • | 60 | mV |
| Standby Current Drain Change With Line | $D I_{SCD}$ (Line) | $V_{IN} = 15V$ to 30V | • | 20 | mV |
| | | | • | 40 | mV |
| Standby Current Drain Change With Load | $D I_{SCD}$ (Load) | $I_o = 5mA$ to 1000mA | • | 6.0 | mA |
| | | | • | 6.5 | mA |
| Dropout Voltage | V_{DO} | $\Delta V_{OUT} = 100mV, I_o = 1.0A$ | • | 0.8 | mA |
| 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:

1. 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.
2. Short Circuit protection is only assured up to $V_{IN} = 35V$.
3. If not tested, shall be guaranteed to the specified limits.
The • denotes the specifications which apply over the full operating temperature range.

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 |
| | | | • | | 50 | mV |
| | | $V_{IN} = 20V$ to 26V | • | | 15 | 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 | $D I_{SCD}$ (Line) | $V_{IN} = 18.5V$ to 30V | • | | 0.8 | mA |
| Standby Current Drain Change With Load | $D I_{SCD}$ (Load) | $I_O = 5mA$ to 1000mA | • | | 0.5 | mA |
| Dropout Voltage | V_{DO} | $T_A = 25^{\circ}C, DV_{OUT} = 100mV, I_O = 1.0A$ | | | 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 | $\frac{DV_{IN}}{DV_{OUT}}$ | $f = 120 \text{ Hz}, DV_{IN} = 10V$ | | 54 | | dB |
| | | (Note 3) | • | 52 | | dB |
| Output Noise Voltage (Note 3) | N_O | $T_A = 25^{\circ}C, f = 10 \text{ Hz to } 100KHz$ | | | 40 | $\mu V/V$ RMS |
| Long Term Stability (Note 3) | $\frac{DV_{OUT}}{Dt}$ | $T_A = 25^{\circ}C, t = 1000 \text{ hrs.}$ | | | 150 | mV |

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

| Parameter | Symbol | Test Conditions | Min. | Max. | Unit | |
|---|----------------------------|---|------|-------|-------|------------------|
| Output Voltage | V_{OUT} | $T_A = 25^{\circ}C$ | | -4.95 | -5.05 | V |
| | | $V_{IN} = -7.5V$ to -20V | • | -4.85 | -5.15 | V |
| Line Regulation (Note 1) | V_{RLINE} | $V_{IN} = -7.5V$ to -20V | • | | 12 | mV |
| | | | • | | 25 | mV |
| | | $V_{IN} = -8.0V$ to -12V | • | | 5 | mV |
| Load Regulation (Note 1) | V_{RLOAD} | $I_O = 5mA$ to 1.5 Amp | • | | 20 | mV |
| | | | • | | 25 | mV |
| | | $I_O = 250mA$ to 750 mA | • | | 15 | mV |
| Standby Current Drain | I_{SCD} | | • | | 2.5 | mA |
| | | | • | | 3.0 | mA |
| Standby Current Drain Change With Line | $D I_{SCD}$ (Line) | $V_{IN} = -7.0V$ to -20V | • | | 0.4 | mA |
| Standby Current Drain Change With Load | $D I_{SCD}$ (Load) | $I_O = 5mA$ to 1000mA | • | | 0.4 | mA |
| Dropout Voltage | V_{DO} | $DV_{OUT} = 100mV, I_O = 1.0A$ | • | | 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 | $\frac{DV_{IN}}{DV_{OUT}}$ | $f = 120 \text{ Hz}, DV_{IN} = -10V$ | | 63 | | dB |
| | | (Note 3) | • | 60 | | dB |
| Output Noise Voltage (Note 3) | N_O | $T_A = 25^{\circ}C, f = 10 \text{ Hz to } 100KHz$ | | | 40 | $\mu V/V$ RMS |
| Long Term Stability (Note 3) | $\frac{DV_{OUT}}{Dt}$ | $T_A = 25^{\circ}C, t = 1000 \text{ hrs.}$ | | | 75 | mV |

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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 $V_{IN} = +35V$, positive regulator; $V_{IN} = -35V$, negative regulator.
- If not tested, shall be guaranteed to the specified limits.
The • denotes the specifications which apply over the full operating temperature range.

ELECTRICAL CHARACTERISTICS -12 Volt $V_{IN} = -19V, I_O = 500mA, -55^{\circ}C \leq T_A \leq 125^{\circ}C$ (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 $-27V$ | • | 20 | mV |
| | | $V_{IN} = -16V$ to $-22V$ | • | 50 | mV |
| Load Regulation (Note 1) | V_{RLOAD} | $I_O = 5mA$ to $1.5A$ | • | 10 | mV |
| | | $I_O = 250mA$ to $750mA$ | • | 30 | mV |
| | | | • | 32 | mV |
| Standby Current Drain | I_{SCD} | | • | 60 | mV |
| | | | • | 16 | mV |
| Standby Current Drain Change With Line | DI_{SCD} (Line) | $V_{IN} = -14.5V$ to $-27V$ | • | 30 | mV |
| Standby Current Drain Change With Load | DI_{SCD} (Load) | $I_O = 5mA$ to $1000mA$ | • | 4.0 | mA |
| Dropout Voltage | V_{DO} | $DI_{OUT} = 100mV, I_O = 1.0A$ | • | 0.8 | mA |
| Peak Output Current | $I_{O(PK)}$ | $T_A = 25^{\circ}C, I_O = 5mA$ to $1A$ | • | 1.8 | V |
| Short Circuit Current (Note 2) | I_{DS} | $V_{IN} = -35V$ | • | 1.5 | A |
| Ripple Rejection | $\frac{DV_{IN}}{DV_{OUT}}$ | $f = 120Hz, DV_{IN} = -10V$ | • | 1.2 | A |
| | | (Note 3) | • | 2.8 | A |
| Output Noise Voltage (Note 3) | N_O | $T_A = 25^{\circ}C, f = 10Hz$ to $100KHz$ | | 56 | dB |
| Long Term Stability (Note 3) | $\frac{DV_{OUT}}{DT}$ | $T_A = 25^{\circ}C, t = 1000hrs.$ | | 53 | dB |
| | | | | 40 | $\mu V/V$ RMS |

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

| Parameter | Symbol | Test Conditions | Min. | Max. | Unit |
|---|----------------------------|---|----------|--------|------------------|
| Output Voltage | V_{OUT} | $T_A = 25^{\circ}C$ | -14.85 | -15.15 | V |
| | | $V_{IN} = -17.5V$ to $-30V$ | • -14.55 | -15.45 | V |
| Line Regulation (Note 1) | V_{RLINE} | $V_{IN} = -17.5V$ to $-30V$ | • | 25 | mV |
| | | $V_{IN} = -20V$ to $-26V$ | • | 50 | mV |
| Load Regulation (Note 1) | V_{RLOAD} | $I_O = 5mA$ to $1.5A$ | • | 15 | mV |
| | | $I_O = 250mA$ to $750mA$ | • | 25 | mV |
| | | | • | 35 | mV |
| Standby Current Drain | I_{SCD} | | • | 75 | mV |
| | | | • | 45 | mV |
| Standby Current Drain Change With Line | DI_{SCD} (Line) | $V_{IN} = -17.5V$ to $-30V$ | • | 6.0 | mA |
| Standby Current Drain Change With Load | DI_{SCD} (Load) | $I_O = 5mA$ to $1000mA$ | • | 6.5 | mA |
| Dropout Voltage | V_{DO} | $DI_{OUT} = 100mV, I_O = 1.0A$ | • | 0.5 | mA |
| Peak Output Current | $I_{O(PK)}$ | $T_A = 25^{\circ}C$ | • | 0.8 | mA |
| Short Circuit Current (Note 2) | I_{DS} | $V_{IN} = -35V$ | • | 1.5 | A |
| Ripple Rejection | $\frac{DV_{IN}}{DV_{OUT}}$ | $f = 120Hz, DV_{IN} = -10V$ | • | 1.2 | A |
| | | (Note 3) | • | 2.8 | A |
| Output Noise Voltage (Note 3) | N_O | $T_A = 25^{\circ}C, f = 10Hz$ to $100KHz$ | | 53 | dB |
| Long Term Stability (Note 3) | $\frac{DV_{OUT}}{DT}$ | $T_A = 25^{\circ}C, t = 1000hrs.$ | | 50 | dB |
| | | | | 40 | $\mu V/V$ RMS |

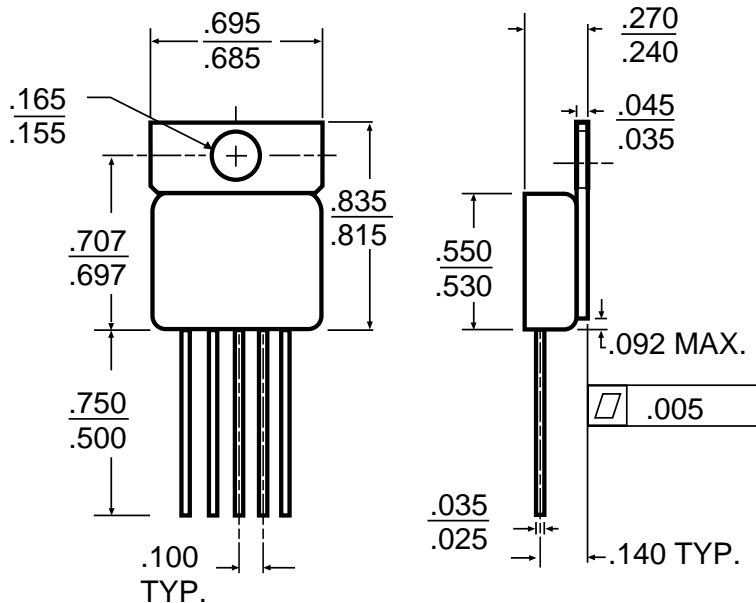
Notes:

1. 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.
2. Short Circuit protection is only assured up to $V_{IN} = -35V$.
3. If not tested, shall be guaranteed to the specified limits.
The • denotes the specifications which apply over the full operating temperature range.

ABSOLUTE MAXIMUM RATINGS (Per Regulator)

| | |
|--|--|
| Input Voltage | Positive Regulator = 35V, Negative Regulator = - 35V |
| Operating Junction Temperature Range | -55°C to +150°C |
| Storage Temperature Range | -65°C to +150°C |
| Typical Power/Thermal Characteristics | |
| Rated Power @ 25°C | |
| T_C | 17.5W |
| T_A | 3W |
| Thermal Resistance | |
| θ_{JC} | 4.2°C/W |
| θ_{JA} | 42°C/W |
| Thermal Shutdown, $I_O = 5mA$, V_{IN} @ Voltage | 175°C |

MECHANICAL OUTLINE



NOTES:

- Case is metal/hermetically sealed
- Isolated Tab

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