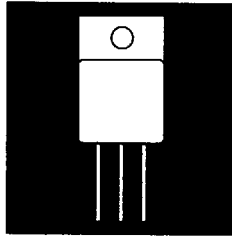


# ISOLATED HERMETIC TO-254AA FIXED VOLTAGE REGULATORS WITH INTERNAL CAPACITOR COMPENSATION



Three Terminal, Fixed Voltage, 1.5 Amp  
Internally Compensated, Precision Positive  
Regulators In Hermetic TO-254AA Package

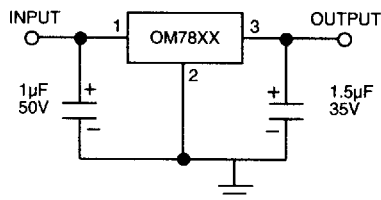
## FEATURES

- Isolated Hermetic Package, TO-254
- Output Voltages: 5V, 12V, 15V
- Output Voltages Set Internally To 1%
- Built-In Thermal Overload Protection
- Internally Compensated
- Product Is Available Screened To MIL-STD-883

## DESCRIPTION

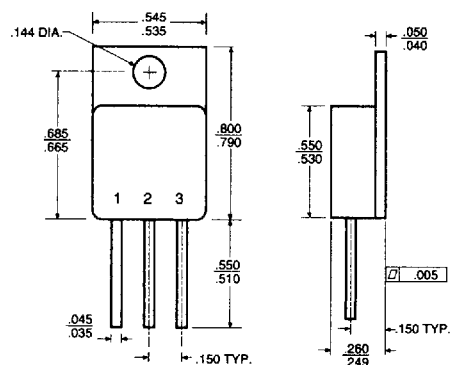
These three (3) terminal positive regulators are supplied in a hermetically sealed TO-254 metal package. All protective features are designed into the circuit, including thermal shutdown, current limiting and safe-area control. These units are internally compensated, thus improving stability and transient response of the regulator. External capacitors are not required in most applications. These units are highly desirable for use in a high density design where space is a major consideration. Standard voltages are 5V, 12V, and 15V. These units are trimmed to 1% of nominal voltage.

## SCHEMATIC



| Omnirel<br>Part Number | Output<br>Voltage |
|------------------------|-------------------|
| OM7805EA               | 5 V               |
| OM7812EA               | 12 V              |
| OM7815EA               | 15 V              |

## MECHANICAL OUTLINE



Pin 1: Input  
Pin 2: Ground  
Pin 3: Output

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## ABSOLUTE MAXIMUM RATINGS

Input Voltage ..... +35 V\*

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     $T_C$ ..... 15W

$$T_A \dots\dots\dots 3W$$

Thermal Resistance  $\theta_{JC}$  ..... 3.5°C/W

 $\theta_{JA} \dots\dots\dots 42^{\circ}\text{C/W}$ 

\* Derated to 30V above 85°C due to derating of the input capacitor.

### OM7805EA 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 <sub>OUT</sub>                  | T <sub>A</sub> = 25°C                                                   |   | 4.92 | 5.08 | V           |
|                                           |                                   | V <sub>IN</sub> = 7.5V to 20V                                           | • | 4.85 | 5.15 | V           |
| Line Regulation<br>(Note 1)               | V <sub>RLINE</sub>                | V <sub>IN</sub> = 7.5V to 20V                                           | • |      | 5    | mV          |
|                                           |                                   |                                                                         | • |      | 12   | mV          |
|                                           |                                   | V <sub>IN</sub> = 8.0V to 12V                                           | • |      | 4    | mV          |
|                                           |                                   |                                                                         | • |      | 10   | mV          |
| Load Regulation<br>(Note 1)               | V <sub>RLOAD</sub>                | I <sub>O</sub> = 5mA to 1.5A                                            | • |      | 12   | mV          |
|                                           |                                   |                                                                         | • |      | 25   | mV          |
|                                           |                                   | I <sub>O</sub> = 250mA to 750mA                                         | • |      | 15   | mV          |
| Standby Current Drain                     | I <sub>SCD</sub>                  |                                                                         | • |      | 6    | mA          |
|                                           |                                   |                                                                         | • |      | 6.5  | mA          |
| Standby Current Drain<br>Change With Line | ΔI <sub>SCD</sub><br>(Line)       | V <sub>IN</sub> = 7.5V to 20V                                           | • |      | 0.8  | mA          |
| Standby Current Drain<br>Change With Load | ΔI <sub>SCD</sub><br>(Load)       | I <sub>O</sub> = 5mA to 1000mA                                          | • |      | 0.5  | mA          |
| Dropout Voltage                           | V <sub>DO</sub>                   | T <sub>A</sub> = 25°C, ΔV <sub>OUT</sub> = 100mV, I <sub>O</sub> = 1.0A |   |      | 2.5  | V           |
| Peak Output Current                       | I <sub>O (PK)</sub>               | T <sub>A</sub> = 25°C                                                   |   | 1.5  | 3.3  | A           |
| Short Circuit Current<br>(Note 2)         | I <sub>DS</sub>                   | V <sub>IN</sub> = 35V                                                   |   |      | 1.2  | A           |
|                                           |                                   |                                                                         | • |      | 2.8  | A           |
| Ripple Rejection                          | ΔV <sub>IN</sub>                  | f = 120 Hz, ΔV <sub>IN</sub> = 10V                                      |   | 66   |      | dB          |
|                                           | ΔV <sub>OUT</sub>                 | (Note 3)                                                                | • | 60   |      | dB          |
| Output Noise Voltage<br>(Note 3)          | N <sub>O</sub>                    | T <sub>A</sub> = 25°C, f = 10 Hz to 100KHz                              |   |      | 40   | μV/V<br>RMS |
| Long Term Stability<br>(Note 3)           | $\frac{\Delta V_{OUT}}{\Delta t}$ | T <sub>A</sub> = 25°C, t = 1000 hrs.                                    |   |      | 75   | 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 guaranteed from -55 °C to +85°C. Above +85°C,  $V_{IN} = 30V$ .
  3. If not tested, shall be guaranteed to the specified limits.
- The • denotes the specifications which apply over the full operating temperature range.

**OM7812EA 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<br>(Note 1)               | $V_{RLINE}$                            | $V_{IN} = 14.5V$ to $27V$                     | •       | 18    | mV               |
|                                           |                                        |                                               | •       | 50    | mV               |
|                                           |                                        | $V_{IN} = 16V$ to $22V$                       | •       | 9     | mV               |
|                                           |                                        |                                               | •       | 30    | mV               |
| Load Regulation<br>(Note 1)               | $V_{RLOAD}$                            | $I_O = 5mA$ to $1.5A$                         | •       | 32    | mV               |
|                                           |                                        |                                               | •       | 60    | mV               |
|                                           |                                        | $I_O = 250mA$ to $750mA$                      | •       | 20    | mV               |
|                                           |                                        |                                               | •       | 40    | mV               |
| Standby Current Drain                     | $I_{SCD}$                              |                                               | •       | 6.0   | mA               |
|                                           |                                        |                                               | •       | 6.5   | mA               |
| Standby Current Drain<br>Change With Line | $\Delta I_{SCD}$<br>(Line)             | $V_{IN} = 15V$ to $30V$                       | •       | 0.8   | mA               |
| Standby Current Drain<br>Change With Load | $\Delta I_{SCD}$<br>(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<br>(Note 2)         | $I_{DS}$                               | $V_{IN} = 35V$                                |         | 1.2   | A                |
|                                           |                                        |                                               |         | 2.8   | A                |
| Ripple Rejection                          | $\frac{\Delta V_{IN}}{\Delta V_{OUT}}$ | $f = 120 Hz$ , $\Delta V_{IN} = 10V$          | 59      |       | dB               |
|                                           |                                        | (Note 3)                                      | • 54    |       | dB               |
| Output Noise Voltage<br>(Note 3)          | $N_O$                                  | $T_A = 25^{\circ}C$ , $f = 10 Hz$ to $100KHz$ |         | 40    | $\mu V/V$<br>RMS |
| Long Term Stability<br>(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 guaranteed from  $-55^{\circ}C$  to  $+85^{\circ}C$ . Above  $+85^{\circ}C$ ,  $V_{IN} = 30V$ .
3. If not tested, shall be guaranteed to the specified limits.  
The • denotes the specifications which apply over the full operating temperature range.

OM7815EA 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                            | $V_{OUT}$                              | $T_A = 25^{\circ}C$                                           | 14.8   | 15.2 | V                |
|                                           |                                        | $V_{IN} = 18V$ to $30V$                                       | • 14.6 | 15.4 | V                |
| Line Regulation<br>(Note 1)               | $V_{RLINE}$                            | $V_{IN} = 17.5V$ to $30V$                                     | •      | 20   | mV               |
|                                           |                                        |                                                               | •      | 50   | mV               |
|                                           |                                        | $V_{IN} = 20V$ to $26V$                                       | •      | 15   | mV               |
| Load Regulation<br>(Note 1)               | $V_{RLOAD}$                            | $I_O = 5mA$ to $1.5A$                                         |        | 35   | mV               |
|                                           |                                        | $I_O = 5mA$ to $1.0A$                                         | •      | 75   | mV               |
|                                           |                                        | $I_O = 250mA$ to $750mA$                                      | •      | 21   | mV               |
|                                           |                                        |                                                               | •      | 45   | mV               |
| Standby Current Drain                     | $I_{SCD}$                              |                                                               | •      | 6.0  | mA               |
|                                           |                                        |                                                               | •      | 6.5  | mA               |
| Standby Current Drain<br>Change With Line | $\Delta I_{SCD}$<br>(Line)             | $V_{IN} = 18.5V$ to $30V$                                     | •      | 0.8  | mA               |
| Standby Current Drain<br>Change With Load | $\Delta I_{SCD}$<br>(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<br>(Note 2)         | $I_{DS}$                               | $V_{IN} = 35V$                                                | •      | 1.2  | A                |
|                                           |                                        |                                                               | •      | 2.8  | A                |
| Ripple Rejection                          | $\frac{\Delta V_{IN}}{\Delta V_{OUT}}$ | $f = 120 Hz$ , $\Delta V_{IN} = 10V$                          | 54     |      | dB               |
|                                           |                                        | (Note 3)                                                      | • 52   |      | dB               |
| Output Noise Voltage<br>(Note 3)          | $N_O$                                  | $T_A = 25^{\circ}C$ , $f = 10 Hz$ to $100KHz$                 |        | 40   | $\mu V/V$<br>RMS |
| Long Term Stability<br>(Note 3)           | $\frac{\Delta V_{OUT}}{\Delta t}$      | $T_A = 25^{\circ}C$ , $t = 1000 hrs.$                         |        | 150  | 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 guaranteed from  $-55^{\circ}C$  to  $+85^{\circ}C$ . Above  $+85^{\circ}C$ ,  $V_{IN} = 30V$ .
  3. 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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TYPICAL PERFORMANCE CHARACTERISTICS

