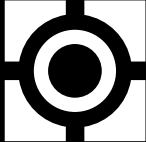


1.5 AMP POSITIVE ADJUSTABLE VOLTAGE  
REGULATOR APPROVED TO DESC DRAWING 7703407



Please see mechanical  
outlines herein

Three Terminal, Precision Adjustable  
Positive Voltage Regulator In Hermetic  
Style Packages (LM117AHV)

FEATURES

- Similar To Industry Standard LM117AHV
- Approved To DESC Standardized Military Drawing Number 7703407
- Built In Thermal Overload Protection
- Short Circuit Current Limiting
- Available In Six Package Styles
- Maximum Output Voltage Tolerance Is Guaranteed to  $\pm 1\%$

DESCRIPTION

These three terminal positive regulators are supplied in hermetically sealed packages. All protective features are designed into the circuit, including thermal shutdown, current-limiting, and safe-area control. With heat sinking, these devices can deliver up to 1.5 amps of output current. The LCC-20 device is limited to .5 amps. The unit also features output voltages that can be fixed from 1.2 volts to 57 volts using external resistors.

ABSOLUTE MAXIMUM RATINGS  $T_c @ 25^{\circ}\text{C}$

|                                                |                   |
|------------------------------------------------|-------------------|
| Power Dissipation                              |                   |
| Case 2                                         | 1.1 W             |
| Case-All Others.                               | 20 W              |
| Input - Output Voltage Differential            | 60 V              |
| Operating Junction Temperature Range           | - 55°C to + 150°C |
| Storage Temperature Range                      | - 65°C to + 150°C |
| Lead Temperature (Soldering 10 seconds)        | 300°C             |
| Thermal Resistance, Junction to Case:          |                   |
| Case 2, LCC-20                                 | 17°C/W            |
| Case U & M, TO-257 (Isol) and SMD-3            | 4.2°C/W           |
| Case T&N, TO-257 (Non-Isol) and SMD-1          | 3.5°C/W           |
| Case Y, TO-3                                   | 3.0°C/W           |
| Maximum Output Current:                        |                   |
| Case 2                                         | .5 A              |
| Case-All Others.                               | 1.5A              |
| <u>Recommended Operating Conditions:</u>       |                   |
| Output Voltage Range                           | 1.2 to 57 VDC     |
| Ambient Operating Temperature Range ( $T_A$ ). | - 55°C to + 125°C |
| Input Voltage Range                            | 4.25 to 61.25 VDC |

3.5

**ELECTRICAL CHARACTERISTICS**  $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$ ,  $I_L = 8\text{mA}$  (unless otherwise specified)  
**OM1326NTM, OM1326STM, OM1326NKM, OM1326SMM, OM1326NMM**

| Parameter                        | Symbol           | Test Conditions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Min.                             | Max.                             | Unit          |
|----------------------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|----------------------------------|---------------|
| Reference Voltage                | $V_{REF}$        | $V_{DIFF} = 3.0\text{V}$ , $T_A = 25^{\circ}\text{C}$<br>$V_{DIFF} = 3.3\text{V}$<br>$V_{DIFF} = 40\text{V}$<br>$V_{DIFF} = 60\text{V}$                                                                                                                                                                                                                                                                                                                                                                                  | 1.238<br>1.225<br>1.225<br>1.225 | 1.262<br>1.270<br>1.270<br>1.270 | V             |
| Line Regulation<br>(Note 1)      | $R_{LINE}$       | $3.0\text{V} \leq V_{DIFF} \leq 40\text{V}$ , $V_{out} = V_{ref}$ , $T_A = 25^{\circ}\text{C}$<br>$3.3\text{V} \leq V_{DIFF} \leq 40\text{V}$ , $V_{out} = V_{ref}$<br>$40\text{V} \leq V_{DIFF} \leq 60\text{V}$ , $V_{out} = V_{ref}$ , $T_A = 25^{\circ}\text{C}$<br>$40\text{V} \leq V_{DIFF} \leq 60\text{V}$ , $V_{out} = V_{ref}$                                                                                                                                                                                 | -4.5<br>-9<br>-5<br>-10          | 4.5<br>-9<br>5<br>10             | mV            |
| Load Regulation<br>(Note 1)      | $R_{LOAD}$       | $V_{DIFF} = 3.0\text{V}$ , $10\text{mA} \leq I_L \leq 1.5\text{A}$ , $T_A = 25^{\circ}\text{C}$<br>$V_{DIFF} = 3.3\text{V}$ , $10\text{mA} \leq I_L \leq 1.5\text{A}$<br>$V_{DIFF} = 40\text{V}$ , $10\text{mA} \leq I_L \leq 300\text{mA}$ , $T_A = 25^{\circ}\text{C}$<br>$V_{DIFF} = 40\text{V}$ , $10\text{mA} \leq I_L \leq 195\text{mA}$<br>$V_{DIFF} = 60\text{V}$ , $10\text{mA} \leq I_L \leq 30\text{mA}$                                                                                                      | -15<br>-15<br>-15<br>-15<br>-15  | 15<br>15<br>15<br>15<br>15       | mV            |
| Thermal Regulation               | $V_{RTH}$        | $V_{in} = 14.6\text{V}$ , $I_L = 1.5\text{A}$<br>$P_d = 20\text{ Watts}$ , $t = 20\text{ ms}$ , $T_A = 25^{\circ}\text{C}$                                                                                                                                                                                                                                                                                                                                                                                               | -5                               | 5                                | mV            |
| Ripple Rejection<br>(Note 2)     | $R_N$            | $f = 120\text{ Hz}$ , $V_{out} = V_{ref}$<br>$C_{Adj} = 10\text{ }\mu\text{F}$ , $I_{out} = 100\text{ mA}$                                                                                                                                                                                                                                                                                                                                                                                                               | 66                               |                                  | dB            |
| Adjustment Pin Current           | $I_{Adj}$        | $V_{DIFF} = 3.0\text{V}$ , $T_A = 25^{\circ}\text{C}$<br>$V_{DIFF} = 3.3\text{V}$<br>$V_{DIFF} = 40\text{V}$<br>$V_{DIFF} = 60\text{V}$                                                                                                                                                                                                                                                                                                                                                                                  |                                  | 100<br>100<br>100<br>100         | $\mu\text{A}$ |
| Adjustment Pin<br>Current Change | $\Delta I_{Adj}$ | $V_{DIFF} = 3.0\text{V}$ , $10\text{mA} \leq I_L \leq 1.5\text{A}$ , $T_A = 25^{\circ}\text{C}$<br>$V_{DIFF} = 3.3\text{V}$ , $10\text{mA} \leq I_L \leq 1.5\text{A}$<br>$V_{DIFF} = 40\text{V}$ , $10\text{mA} \leq I_L \leq 300\text{mA}$ , $T_A = 25^{\circ}\text{C}$<br>$V_{DIFF} = 40\text{V}$ , $10\text{mA} \leq I_L \leq 195\text{mA}$<br>$3.0\text{V} \leq V_{DIFF} \leq 40\text{V}$ , $T_A = 25^{\circ}\text{C}$<br>$3.3\text{V} \leq V_{DIFF} \leq 40\text{V}$<br>$3.3\text{V} \leq V_{DIFF} \leq 60\text{V}$ | -5<br>-5<br>-5<br>-5<br>-5<br>-5 | 5<br>5<br>5<br>5<br>5<br>5       | $\mu\text{A}$ |
| Minimum Load Current             | $I_{Lmin}$       | $V_{DIFF} = 3.0\text{V}$ , $V_{out} = 1.4\text{V}$ (forced)<br>$V_{DIFF} = 3.3\text{V}$ , $V_{out} = 1.4\text{V}$ (forced)<br>$V_{DIFF} = 40\text{V}$ , $V_{out} = 1.4\text{V}$ (forced)<br>$V_{DIFF} = 60\text{V}$ , $V_{out} = 1.4\text{V}$ (forced)                                                                                                                                                                                                                                                                   |                                  | 5.0<br>5.0<br>5.0<br>7.0         | mA            |
| Current Limit<br>(Note 2)        | $I_{CL}$         | $V_{DIFF} = 5\text{V}$<br>$V_{DIFF} = 40\text{V}$ , $T_A = 25^{\circ}\text{C}$<br>$V_{DIFF} = 60\text{V}$ , $T_A = 25^{\circ}\text{C}$                                                                                                                                                                                                                                                                                                                                                                                   | 1.5<br>0.3<br>0.05               | 3.5<br>1.5<br>0.50               | A             |

**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.
- If not tested, shall be guaranteed to the specified limits.
- The • denotes the specifications which apply over the full operating temperature range.

## 3.5

| PART NUMBER DESIGNATOR                                               |                                                                            |                                                                                |
|----------------------------------------------------------------------|----------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Standard Military Drawing Number                                     | Omnirel Part Number                                                        | Omnirel Package Designation                                                    |
| 7703407M<br>7703407U<br>7703407T<br>7703407Y<br>7703407N<br>77034072 | OM1326SMM<br>OM1326STM<br>OM1326NTM<br>OM1326NKM<br>OM1326NMM<br>OM1326N2M | SMD-3<br>TO-257 (Isolated)<br>TO-257 (non-Isolated)<br>TO-3<br>SMD-1<br>LCC-20 |

**ELECTRICAL CHARACTERISTICS**  $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$ ,  $I_L = 8\text{mA}$  (unless otherwise specified)

**OM1326N2M**

| Parameter                        | Symbol                  | Test Conditions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Min.                                   | Max.                             | Unit          |
|----------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|----------------------------------|---------------|
| Reference Voltage                | $V_{\text{REF}}$        | $V_{\text{DIFF}} = 3.0\text{V}$ , $T_A = 25^{\circ}\text{C}$<br>$V_{\text{DIFF}} = 3.3\text{V}$<br>$V_{\text{DIFF}} = 40\text{V}$<br>$V_{\text{DIFF}} = 60\text{V}$                                                                                                                                                                                                                                                                                                                                                                                                         | 1.238<br>1.225<br>1.225<br>1.225       | 1.262<br>1.270<br>1.270<br>1.270 | V             |
| Line Regulation<br>(Note 1)      | $R_{\text{LINE}}$       | $3.0\text{V} \leq V_{\text{DIFF}} \leq 40\text{V}$ , $V_{\text{out}} = V_{\text{ref}}$ , $T_A = 25^{\circ}\text{C}$<br>$3.3\text{V} \leq V_{\text{DIFF}} \leq 40\text{V}$ , $V_{\text{out}} = V_{\text{ref}}$<br>$40\text{V} \leq V_{\text{DIFF}} \leq 60\text{V}$ , $V_{\text{out}} = V_{\text{ref}}$ , $T_A = 25^{\circ}\text{C}$<br>$40\text{V} \leq V_{\text{DIFF}} \leq 60\text{V}$ , $V_{\text{out}} = V_{\text{ref}}$                                                                                                                                                | -4.5<br>-9<br>-5<br>-10                | 4.5<br>-9<br>5<br>10             | mV            |
| Load Regulation<br>(Note 1)      | $R_{\text{LOAD}}$       | $V_{\text{DIFF}} = 3.0\text{V}$ , $10\text{mA} \leq I_L \leq 500\text{mA}$ , $T_A = 25^{\circ}\text{C}$<br>$V_{\text{DIFF}} = 3.3\text{V}$ , $10\text{mA} \leq I_L \leq 500\text{mA}$<br>$V_{\text{DIFF}} = 40\text{V}$ , $10\text{mA} \leq I_L \leq 150\text{mA}$ , $T_A = 25^{\circ}\text{C}$<br>$V_{\text{DIFF}} = 40\text{V}$ , $10\text{mA} \leq I_L \leq 100\text{mA}$<br>$V_{\text{DIFF}} = 60\text{V}$ , $10\text{mA} \leq I_L \leq 20\text{mA}$                                                                                                                    | -15<br>-15<br>-15<br>-15<br>-15        | 15<br>15<br>15<br>15<br>15       | mV            |
| Thermal Regulation               | $V_{\text{RTH}}$        | $V_{\text{in}} = 14.6\text{V}$ , $I_L = 300\text{mA}$<br>$P_d = 4.0\text{ Watts}$ , $t = 20\text{ ms}$ , $T_A = 25^{\circ}\text{C}$                                                                                                                                                                                                                                                                                                                                                                                                                                         | -2                                     | 2                                | mV            |
| Ripple Rejection<br>(Note 2)     | $R_N$                   | $f = 120\text{ Hz}$ , $V_{\text{out}} = V_{\text{ref}}$<br>$C_{\text{Adj}} = 10\text{ }\mu\text{F}$ , $I_{\text{out}} = 100\text{ mA}$                                                                                                                                                                                                                                                                                                                                                                                                                                      | 66                                     |                                  | dB            |
| Adjustment Pin Current           | $I_{\text{Adj}}$        | $V_{\text{DIFF}} = 3.0\text{V}$ , $T_A = 25^{\circ}\text{C}$<br>$V_{\text{DIFF}} = 3.3\text{V}$<br>$V_{\text{DIFF}} = 40\text{V}$<br>$V_{\text{DIFF}} = 60\text{V}$                                                                                                                                                                                                                                                                                                                                                                                                         |                                        | 100<br>100<br>100<br>100         | $\mu\text{A}$ |
| Adjustment Pin<br>Current Change | $\Delta I_{\text{Adj}}$ | $V_{\text{DIFF}} = 3.0\text{V}$ , $10\text{mA} \leq I_L \leq 500\text{mA}$ , $T_A = 25^{\circ}\text{C}$<br>$V_{\text{DIFF}} = 3.3\text{V}$ , $10\text{mA} \leq I_L \leq 500\text{mA}$<br>$V_{\text{DIFF}} = 40\text{V}$ , $10\text{mA} \leq I_L \leq 150\text{mA}$ , $T_A = 25^{\circ}\text{C}$<br>$V_{\text{DIFF}} = 40\text{V}$ , $10\text{mA} \leq I_L \leq 100\text{mA}$<br>$3.0\text{V} \leq V_{\text{DIFF}} \leq 40\text{V}$ , $T_A = 25^{\circ}\text{C}$<br>$3.3\text{V} \leq V_{\text{DIFF}} \leq 40\text{V}$<br>$3.3\text{V} \leq V_{\text{DIFF}} \leq 60\text{V}$ | -5<br>-5<br>-5<br>-5<br>-5<br>-5<br>-5 | 5<br>5<br>5<br>5<br>5<br>5<br>5  | $\mu\text{A}$ |
| Minimum Load Current             | $I_{\text{Lmin}}$       | $V_{\text{DIFF}} = 3.0\text{V}$ , $V_{\text{out}} = 1.4\text{V}$ (forced)<br>$V_{\text{DIFF}} = 3.3\text{V}$ , $V_{\text{out}} = 1.4\text{V}$ (forced)<br>$V_{\text{DIFF}} = 40\text{V}$ , $V_{\text{out}} = 1.4\text{V}$ (forced)<br>$V_{\text{DIFF}} = 60\text{V}$ , $V_{\text{out}} = 1.4\text{V}$ (forced)                                                                                                                                                                                                                                                              |                                        | 5.0<br>5.0<br>5.0<br>7.0         | mA            |
| Current Limit<br>(Note 2)        | $I_{\text{CL}}$         | $V_{\text{DIFF}} = 5\text{V}$<br>$V_{\text{DIFF}} = 40\text{V}$ , $T_A = 25^{\circ}\text{C}$<br>$V_{\text{DIFF}} = 60\text{V}$ , $T_A = 25^{\circ}\text{C}$                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.5<br>0.15<br>0.02                    | 1.65<br>0.65<br>0.28             | A             |

Notes: Please see page 34.

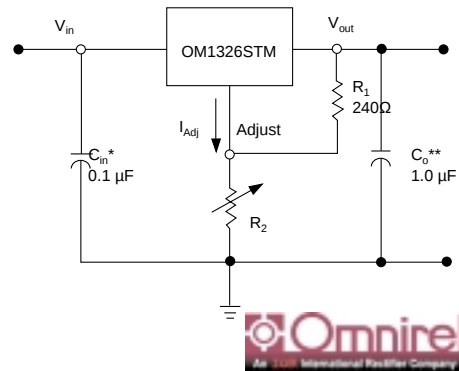
**STANDARD APPLICATION**

\*  $C_{\text{in}}$  is required if regulator is located an appreciable distance from power supply filter.

\*\*  $C_o$  is not needed for stability, however it does improve transient response.

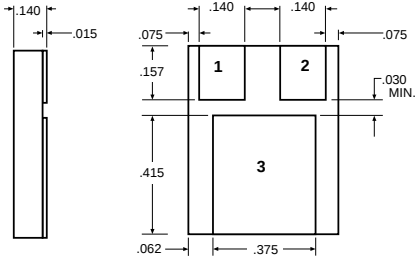
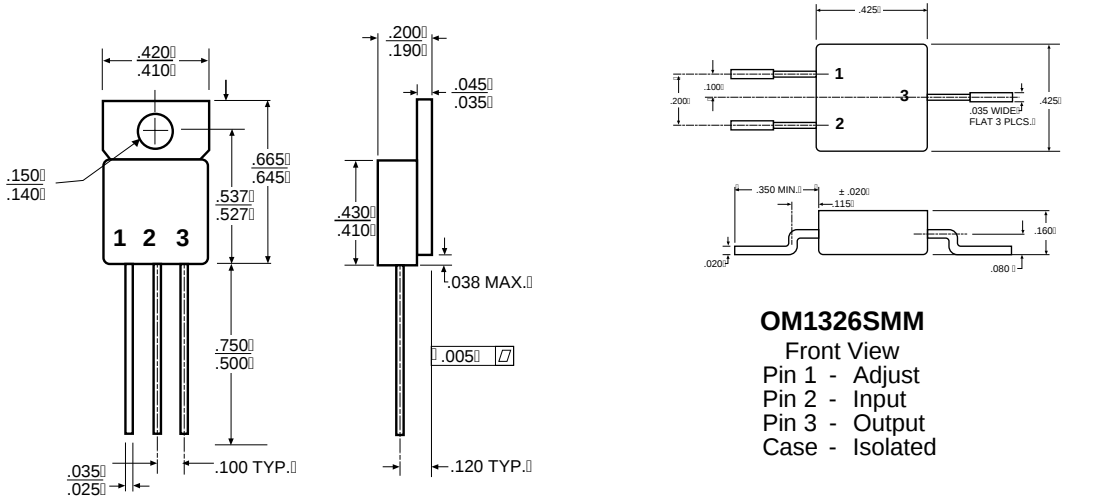
$$V_{\text{out}} = 1.25\text{ V} \left(1 + \frac{R_2}{R_1}\right) + I_{\text{Adj}} R_2$$

Since  $I_{\text{Adj}}$  is controlled to less than  $100\text{ }\mu\text{A}$ , the error associated with this term is negligible in most applications.



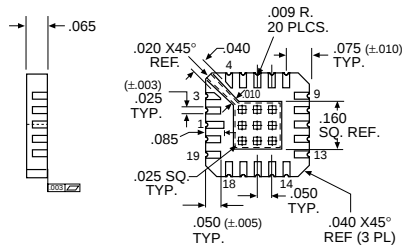
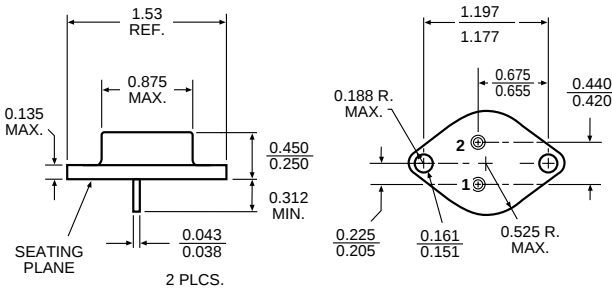
3.5

MECHANICAL OUTLINE



OM1326NMM

Pin 1 - Adjust  
Pin 2 - Input  
Pin 3 - Output



OM1326N2M

|        |    |        |                          |
|--------|----|--------|--------------------------|
| Pin 1  | NC | Pin 11 | V <sub>IN</sub>          |
| Pin 2  | NC | Pin 12 | V <sub>OUT</sub>         |
| Pin 3  | NC | Pin 13 | V <sub>OUT</sub>         |
| Pin 4  | NC | Pin 14 | V <sub>OUT</sub> (Sense) |
| Pin 5  | NC | Pin 15 | NC                       |
| Pin 6  | NC | Pin 16 | NC                       |
| Pin 7  | NC | Pin 17 | NC                       |
| Pin 8  | NC | Pin 18 | ADJUST                   |
| Pin 9  | NC | Pin 19 | NC                       |
| Pin 10 | NC | Pin 20 | V <sub>IN</sub>          |

OM1326NKM

Pin 1 - Adjust  
Pin 2 - Input  
Case - Output