

# 1.5 AMP POSITIVE ADJUSTABLE VOLTAGE REGULATOR APPROVED TO DESC DRAWING 7703407



**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

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**ELECTRICAL CHARACTERISTICS** -55°C T<sub>A</sub> 125°C, I<sub>L</sub> = 8mA (unless otherwise specified)  
**OM1326NTM, OM1326STM, OM1326NKM, OM1326SMM, OM1326NMM**

Parameter	Symbol	Test Conditions	Min.	Max.	Unit
Reference Voltage	V <sub>REF</sub>	V <sub>DIFF</sub> = 3.0V, T <sub>A</sub> = 25°C V <sub>DIFF</sub> = 3.3V V <sub>DIFF</sub> = 40V V <sub>DIFF</sub> = 60V	1.238 1.225 1.225 1.225	1.262 1.270 1.270 1.270	V
Line Regulation (Note 1)	R <sub>LINE</sub>	3.0V V <sub>DIFF</sub> 40V, V <sub>out</sub> = V <sub>ref</sub> , T <sub>A</sub> = 25°C 3.3V V <sub>DIFF</sub> 40V, V <sub>out</sub> = V <sub>ref</sub> 40V V <sub>DIFF</sub> 60V, V <sub>out</sub> = V <sub>ref</sub> , T <sub>A</sub> = 25°C 40V V <sub>DIFF</sub> 60V, V <sub>out</sub> = V <sub>ref</sub>	-4.5 -9 -5 -10	4.5 -9 5 10	mV
Load Regulation (Note 1)	R <sub>LOAD</sub>	V <sub>DIFF</sub> = 3.0V, 10mA I <sub>L</sub> 1.5A, T <sub>A</sub> = 25°C V <sub>DIFF</sub> = 3.3V, 10mA I <sub>L</sub> 1.5A V <sub>DIFF</sub> = 40V, 10mA I <sub>L</sub> 300mA, T <sub>A</sub> = 25°C V <sub>DIFF</sub> = 40V, 10mA I <sub>L</sub> 195mA V <sub>DIFF</sub> = 60V, 10mA I <sub>L</sub> 30mA	-15 -15 -15 -15 -15	15 15 15 15 15	mV
Thermal Regulation	V <sub>RTH</sub>	V <sub>in</sub> = 14.6V, I <sub>L</sub> = 1.5A P <sub>d</sub> = 20 Watts, t = 20 ms, T <sub>A</sub> = 25°C	-5	5	mV
Ripple Rejection (Note 2)	R <sub>N</sub>	f = 120 Hz, V <sub>out</sub> = V <sub>ref</sub> C <sub>Adj</sub> = 10 μF, I <sub>out</sub> = 100 mA	66		dB
Adjustment Pin Current	I <sub>Adj</sub>	V <sub>DIFF</sub> = 3.0V, T <sub>A</sub> = 25°C V <sub>DIFF</sub> = 3.3V V <sub>DIFF</sub> = 40V V <sub>DIFF</sub> = 60V		100 100 100 100	μA
Adjustment Pin Current Change	I <sub>Adj</sub>	V <sub>DIFF</sub> = 3.0V, 10mA I <sub>L</sub> 1.5A, T <sub>A</sub> = 25°C V <sub>DIFF</sub> = 3.3V, 10mA I <sub>L</sub> 1.5A V <sub>DIFF</sub> = 40V, 10mA I <sub>L</sub> 300mA, T <sub>A</sub> = 25°C V <sub>DIFF</sub> = 40V, 10mA I <sub>L</sub> 195mA 3.0V V <sub>DIFF</sub> 40V, T <sub>A</sub> = 25°C 3.3V V <sub>DIFF</sub> 40V 3.3V V <sub>DIFF</sub> 60V	-5 -5 -5 -5 -5 -5 -5	5 5 5 5 5 5 5	μA
Minimum Load Current	I <sub>Lmin</sub>	V <sub>DIFF</sub> = 3.0V, V <sub>out</sub> = 1.4V (forced) V <sub>DIFF</sub> = 3.3V, V <sub>out</sub> = 1.4V (forced) V <sub>DIFF</sub> = 40V, V <sub>out</sub> = 1.4V (forced) V <sub>DIFF</sub> = 60V, V <sub>out</sub> = 1.4V (forced)		5.0 5.0 5.0 7.0	mA
Current Limit (Note 2)	I <sub>CL</sub>	V <sub>DIFF</sub> = 5V V <sub>DIFF</sub> = 40V, T <sub>A</sub> = 25°C V <sub>DIFF</sub> = 60V, T <sub>A</sub> = 25°C	1.5 0.3 0.05	3.5 1.5 0.50	A

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

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



**ELECTRICAL CHARACTERISTICS** -55°C T<sub>A</sub> 125°C, I<sub>L</sub> = 8mA (unless otherwise specified)

**OM1326N2M**

Parameter	Symbol	Test Conditions	Min.	Max.	Unit
Reference Voltage	V <sub>REF</sub>	V <sub>DIFF</sub> = 3.0V, T <sub>A</sub> = 25°C V <sub>DIFF</sub> = 3.3V V <sub>DIFF</sub> = 40V V <sub>DIFF</sub> = 60V	1.238 1.225 1.225 1.225	1.262 1.270 1.270 1.270	V
Line Regulation (Note 1)	R <sub>LINE</sub>	3.0V V <sub>DIFF</sub> 40V, V <sub>out</sub> = V <sub>ref</sub> , T <sub>A</sub> = 25°C 3.3V V <sub>DIFF</sub> 40V, V <sub>out</sub> = V <sub>ref</sub> 40V V <sub>DIFF</sub> 60V, V <sub>out</sub> = V <sub>ref</sub> , T <sub>A</sub> = 25°C 40V V <sub>DIFF</sub> 60V, V <sub>out</sub> = V <sub>ref</sub>	-4.5 -9 -5 -10	4.5 -9 5 10	mV
Load Regulation (Note 1)	R <sub>LOAD</sub>	V <sub>DIFF</sub> = 3.0V, 10mA I <sub>L</sub> 500 mA, T <sub>A</sub> = 25°C V <sub>DIFF</sub> = 3.3V, 10mA I <sub>L</sub> 500 mA V <sub>DIFF</sub> = 40V, 10mA I <sub>L</sub> 150 mA, T <sub>A</sub> = 25°C V <sub>DIFF</sub> = 40V, 10mA I <sub>L</sub> 100 mA V <sub>DIFF</sub> = 60V, 10mA I <sub>L</sub> 20 mA	-15 -15 -15 -15 -15	15 15 15 15 15	mV
Thermal Regulation	V <sub>RTH</sub>	V <sub>in</sub> = 14.6V, I <sub>L</sub> = 300 mA P <sub>d</sub> = 4.0 Watts, t = 20 ms, T <sub>A</sub> = 25°C	-2	2	mV
Ripple Rejection (Note 2)	R <sub>N</sub>	f = 120 Hz, V <sub>out</sub> = V <sub>ref</sub> C <sub>Adj</sub> = 10 μF, I <sub>out</sub> = 100 mA	66		dB
Adjustment Pin Current	I <sub>Adj</sub>	V <sub>DIFF</sub> = 3.0V, T <sub>A</sub> = 25°C V <sub>DIFF</sub> = 3.3V V <sub>DIFF</sub> = 40V V <sub>DIFF</sub> = 60V		100 100 100 100	μA
Adjustment Pin Current Change	I <sub>Adj</sub>	V <sub>DIFF</sub> = 3.0V, 10mA I <sub>L</sub> 500 mA, T <sub>A</sub> = 25°C V <sub>DIFF</sub> = 3.3V, 10mA I <sub>L</sub> 500 mA V <sub>DIFF</sub> = 40V, 10mA I <sub>L</sub> 150 mA, T <sub>A</sub> = 25°C V <sub>DIFF</sub> = 40V, 10mA I <sub>L</sub> 100 mA 3.0V V <sub>DIFF</sub> 40V, T <sub>A</sub> = 25°C 3.3V V <sub>DIFF</sub> 40V 3.3V V <sub>DIFF</sub> 60V	-5 -5 -5 -5 -5 -5	5 5 5 5 5 5	μA
Minimum Load Current	I <sub>Lmin</sub>	V <sub>DIFF</sub> = 3.0V, V <sub>out</sub> = 1.4V (forced) V <sub>DIFF</sub> = 3.3V, V <sub>out</sub> = 1.4V (forced) V <sub>DIFF</sub> = 40V, V <sub>out</sub> = 1.4V (forced) V <sub>DIFF</sub> = 60V, V <sub>out</sub> = 1.4V (forced)		5.0 5.0 5.0 7.0	mA
Current Limit (Note 2)	I <sub>CL</sub>	V <sub>DIFF</sub> = 5V V <sub>DIFF</sub> = 40V, T <sub>A</sub> = 25°C V <sub>DIFF</sub> = 60V, T <sub>A</sub> = 25°C	0.5 0.15 0.02	1.65 0.65 0.28	A

Notes: Please see page 34.

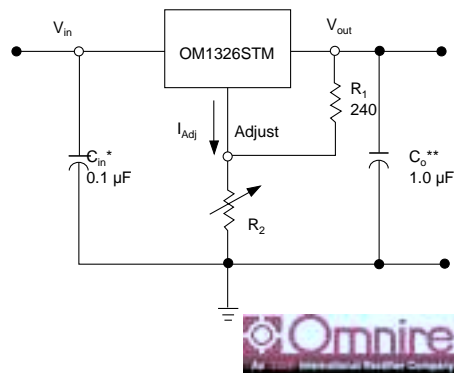
**STANDARD APPLICATION**

\* C<sub>in</sub> is required if regulator is located an appreciable distance from power supply filter.

\*\* C<sub>o</sub> is not needed for stability, however it does improve transient response.

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

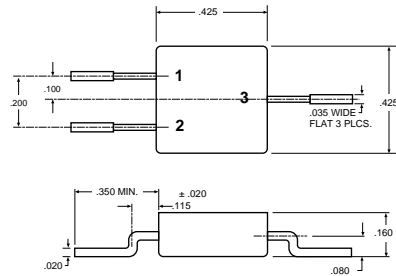
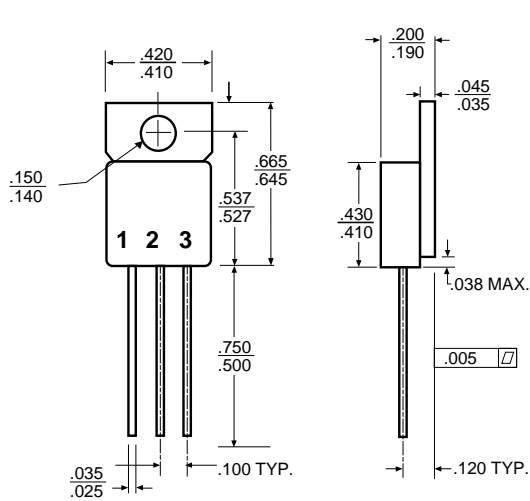
Since I<sub>Adj</sub> is controlled to less than 100 μA, the error associated with this term is negligible in most applications.



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**MECHANICAL OUTLINE**

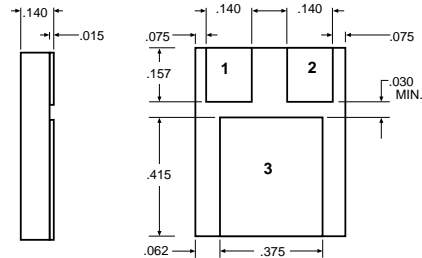


**OM1326SMM**

Front View  
 Pin 1 - Adjust  
 Pin 2 - Input  
 Pin 3 - Output  
 Case - Isolated

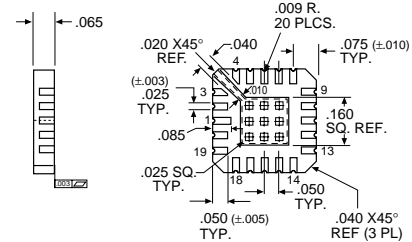
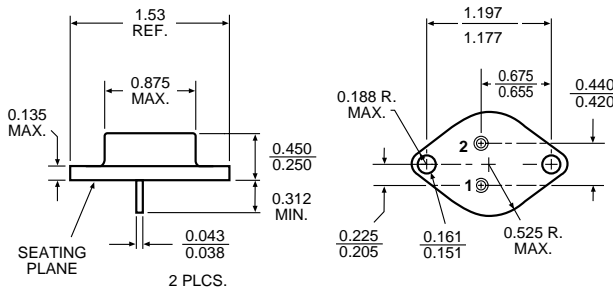
**OM1326STM**  
 Isolated  
 Front View  
 Pin 1 - Adjust  
 Pin 2 - Output  
 Pin 3 - Input  
 Tab - Isolated

**OM1326NTM**  
 Non-Isolated  
 Front View  
 Pin 1 - Adjust  
 Pin 2 - Output  
 Pin 3 - Input  
 Tab - Output



**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

For additional information please see the mechanical outline section.

