

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

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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}	$V_{DIFF} = 3.0\text{V}$, $T_A = 25^{\circ}\text{C}$ $V_{DIFF} = 3.3\text{V}$ $V_{DIFF} = 40\text{V}$ $V_{DIFF} = 60\text{V}$	1.238 1.225 1.225 1.225	1.262 1.270 1.270 1.270	V
Line Regulation (Note 1)	R_{LINE}	$3.0\text{V} \leq V_{DIFF} \leq 40\text{V}$, $V_{out} = V_{ref}$, $T_A = 25^{\circ}\text{C}$ $3.3\text{V} \leq V_{DIFF} \leq 40\text{V}$, $V_{out} = V_{ref}$ $40\text{V} \leq V_{DIFF} \leq 60\text{V}$, $V_{out} = V_{ref}$, $T_A = 25^{\circ}\text{C}$ $40\text{V} \leq V_{DIFF} \leq 60\text{V}$, $V_{out} = V_{ref}$	-4.5 -9 -5 -10	4.5 -9 5 10	mV
Load Regulation (Note 1)	R_{LOAD}	$V_{DIFF} = 3.0\text{V}$, $10\text{mA} \leq I_L \leq 1.5\text{A}$, $T_A = 25^{\circ}\text{C}$ $V_{DIFF} = 3.3\text{V}$, $10\text{mA} \leq I_L \leq 1.5\text{A}$ $V_{DIFF} = 40\text{V}$, $10\text{mA} \leq I_L \leq 300\text{mA}$, $T_A = 25^{\circ}\text{C}$ $V_{DIFF} = 40\text{V}$, $10\text{mA} \leq I_L \leq 195\text{mA}$ $V_{DIFF} = 60\text{V}$, $10\text{mA} \leq I_L \leq 30\text{mA}$	-15 -15 -15 -15 -15	15 15 15 15 15	mV
Thermal Regulation	V_{RTH}	$V_{in} = 14.6\text{V}$, $I_L = 1.5\text{A}$ $P_d = 20\text{ Watts}$, $t = 20\text{ ms}$, $T_A = 25^{\circ}\text{C}$	-5	5	mV
Ripple Rejection (Note 2)	R_N	$f = 120\text{ Hz}$, $V_{out} = V_{ref}$ $C_{Adj} = 10\text{ }\mu\text{F}$, $I_{out} = 100\text{ mA}$	66		dB
Adjustment Pin Current	I_{Adj}	$V_{DIFF} = 3.0\text{V}$, $T_A = 25^{\circ}\text{C}$ $V_{DIFF} = 3.3\text{V}$ $V_{DIFF} = 40\text{V}$ $V_{DIFF} = 60\text{V}$		100 100 100 100	μA
Adjustment Pin Current Change	ΔI_{Adj}	$V_{DIFF} = 3.0\text{V}$, $10\text{mA} \leq I_L \leq 1.5\text{A}$, $T_A = 25^{\circ}\text{C}$ $V_{DIFF} = 3.3\text{V}$, $10\text{mA} \leq I_L \leq 1.5\text{A}$ $V_{DIFF} = 40\text{V}$, $10\text{mA} \leq I_L \leq 300\text{mA}$, $T_A = 25^{\circ}\text{C}$ $V_{DIFF} = 40\text{V}$, $10\text{mA} \leq I_L \leq 195\text{mA}$ $3.0\text{V} \leq V_{DIFF} \leq 40\text{V}$, $T_A = 25^{\circ}\text{C}$ $3.3\text{V} \leq V_{DIFF} \leq 40\text{V}$ $3.3\text{V} \leq V_{DIFF} \leq 60\text{V}$	-5 -5 -5 -5 -5 -5	5 5 5 5 5 5	μA
Minimum Load Current	I_{Lmin}	$V_{DIFF} = 3.0\text{V}$, $V_{out} = 1.4\text{V}$ (forced) $V_{DIFF} = 3.3\text{V}$, $V_{out} = 1.4\text{V}$ (forced) $V_{DIFF} = 40\text{V}$, $V_{out} = 1.4\text{V}$ (forced) $V_{DIFF} = 60\text{V}$, $V_{out} = 1.4\text{V}$ (forced)		5.0 5.0 5.0 7.0	mA
Current Limit (Note 2)	I_{CL}	$V_{DIFF} = 5\text{V}$ $V_{DIFF} = 40\text{V}$, $T_A = 25^{\circ}\text{C}$ $V_{DIFF} = 60\text{V}$, $T_A = 25^{\circ}\text{C}$	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 $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$, $I_L = 8\text{mA}$ (unless otherwise specified)

OM1326N2M

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

Notes: Please see page 34.

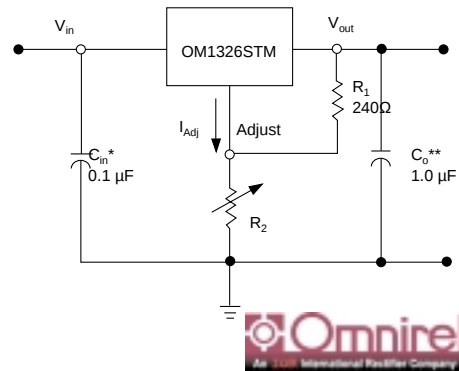
STANDARD APPLICATION

* C_{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.

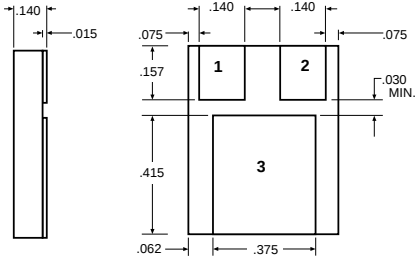
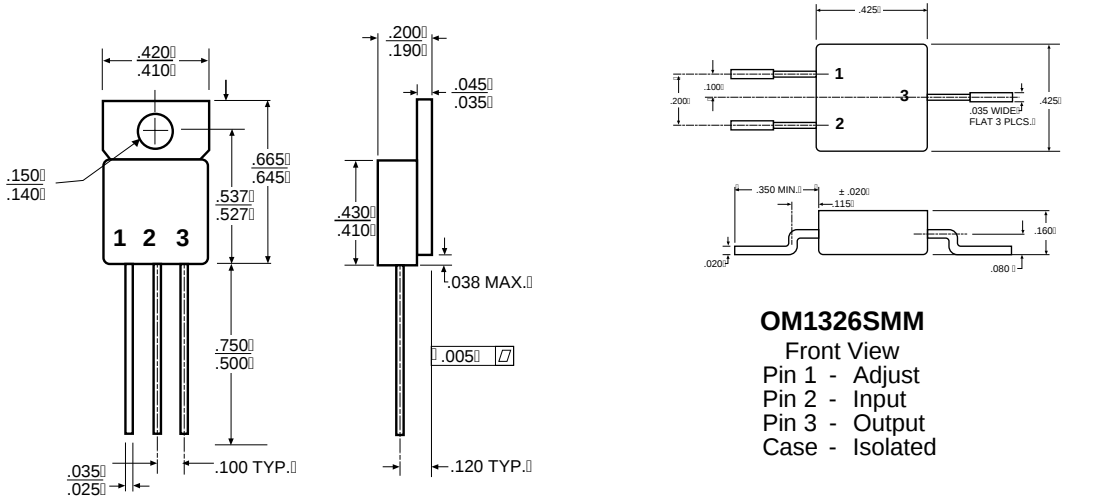
$$V_{\text{out}} = 1.25\text{ V} \left(1 + \frac{R_2}{R_1}\right) + I_{\text{Adj}} R_2$$

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



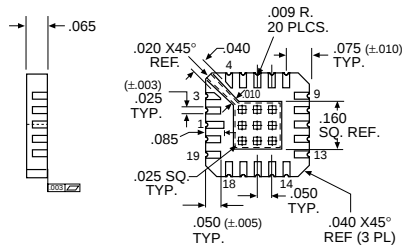
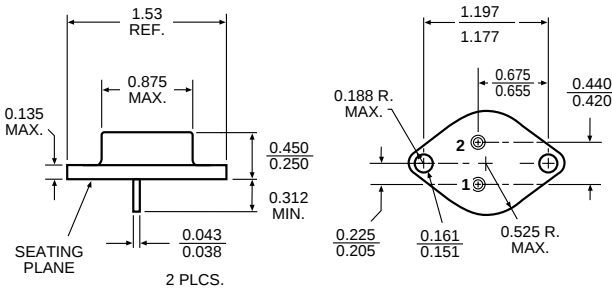
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MECHANICAL OUTLINE



OM1326NMM

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



OM1326N2M

Pin 1	NC	Pin 11	V _{IN}
Pin 2	NC	Pin 12	V _{OUT}
Pin 3	NC	Pin 13	V _{OUT}
Pin 4	NC	Pin 14	V _{OUT} (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 _{IN}

OM1326NKM

Pin 1 - Adjust
Pin 2 - Input
Case - Output