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°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 $\leq$ T$_A$ $\leq$ 125°C, I$_L$ = 8mA (unless otherwise specified)
OM1326NTM, OM1326STM, OM1326NKM, OM1326SMM, OM1326NMM

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

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	OM1326SMM	SMD-3
7703407U	OM1326STM	TO-257 (Isolated)
7703407T	OM1326NTM	TO-257 (non-Isolated)
7703407Y	OM1326NKM	TO-3
7703407N	OM1326NMM	SMD-1
77034072	OM1326N2M	LCC-20

ELECTRICAL CHARACTERISTICS -55°C ≤ T$_A$ ≤ 125°C, I$_L$ = 8mA (unless otherwise specified)
OM1326N2M

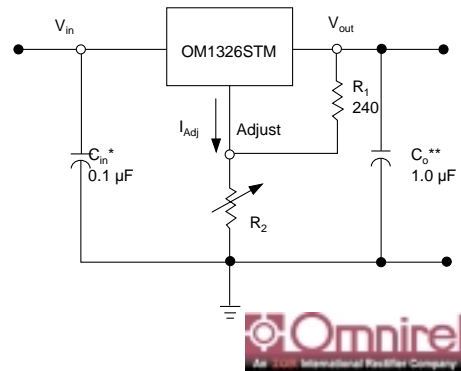| Parameter	Symbol	Test Conditions		Min.	Max.	Unit
Reference Voltage	V$_{REF}$	V$_{DIFF}$ = 3.0V, T$_A$ = 25°C		1.238	1.262	
		V$_{DIFF}$ = 3.3V	•	1.225	1.270	V
		V$_{DIFF}$ = 40V	•	1.225	1.270	
		V$_{DIFF}$ = 60V	•	1.225	1.270	
Line Regulation	R$_{LINE}$	3.0V ≤ V$_{DIFF}$ ≤ 40V, V$_{out}$ = V$_{ref}$,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

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.

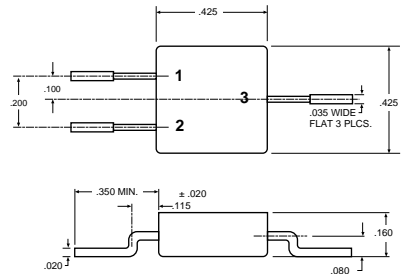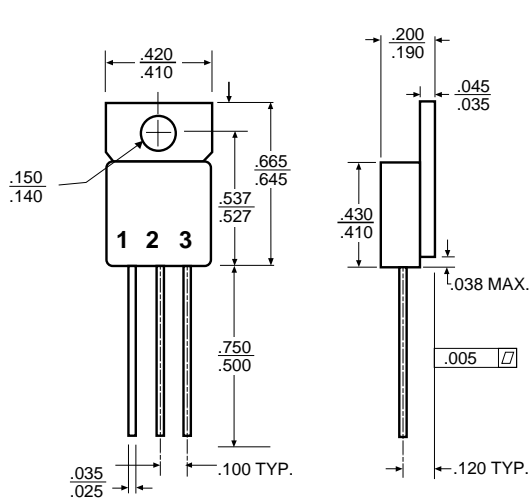$$V_{out} = 1.25 \text{ V } (1 + \frac{R_2}{R_1}) + I_{Adj} R_2$$

Since I$_{Adj}$ is controlled to less than 100 μA, the error associated with this term is negligible in most applications.
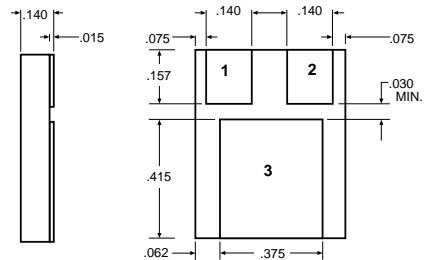

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MECHANICAL OUTLINE

OM1326SMM
Front View
Pin 1 - Adjust
Pin 2 - Input
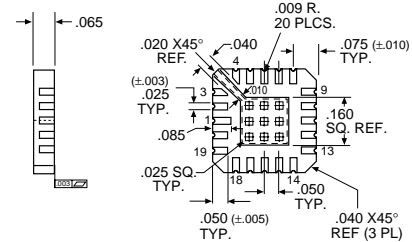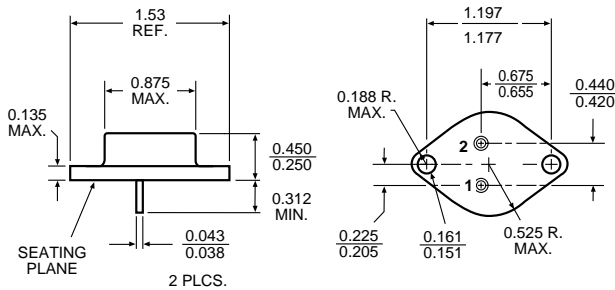Pin 3 - Output
Case - Isolated

OM1326STM   **OM1326NTM**
Isolated   **Non-Isolated**
Front View   Front View
Pin 1 - Adjust   Pin 1 - Adjust
Pin 2 - Output   Pin 2 - Output
Pin 3 - Input   Pin 3 - Input
Tab - Isolated   Tab - Output

OM1326NMM
Pin 1 - Adjust
Pin 2 - Input
Pin 3 - Output

SEATING PLANE
2 PLCS.

OM1326NKM
Pin 1 - Adjust
Pin 2 - Input
Case - 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}

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For additional information please see the mechanical outline section.

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