1.5 AMP POSITIVE ADJUSTABLE VOLTAGE REGULATOR APPROVED TO DESC DRAWING 7703405

Three Terminal, Precision Adjustable Positive Voltage Regulator In Hermetic Style Packages (LM117A)

FEATURES

- Similar To Industry Standard LM117A
- Approved To DESC Standardized Military Drawing Number 7703405
- Built In Thermal Overload Protection
- Short Circuit Current Limiting
- Available In Six Package Styles
- Maximum Output Voltage Tolerance Is Guaranteed to ± 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 37 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 . . . . . 40 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

Recommended Operating Conditions:
- Output Voltage Range . . . . . .1.2 to 37 VDC
- Ambient Operating Temperature Range (T_A). . . . . - 55°C to + 125°C
- Input Voltage Range . . . . . 4.25 to 41.25 VDC

ELECTRICAL CHARACTERISTICS -55°C T_A 125°C, I_L = 8mA (unless otherwise specified)

OM1324NTM, OM1324STM, OM1324NKM, OM1324SMM, OM1324NMM

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	
Line Regulation	R_{LINE}	3.0V V_{DIFF} 40V, V_{out} = V_{ref}, T_A = 25°C		-4.5	4.5	mV
(Note 1)		3.3V V_{DIFF} 40V, V_{out} = V_{ref}	•	-9	9	
Load Regulation	R_{LOAD}	V_{DIFF} = 3.0V, 10mA I_L 1.5A, T_A = 25°C		-15	15	
(Note 1)		V_{DIFF} = 3.3V, 10mA I_L 1.5A	•	-15	15	mV
		V_{DIFF} = 40V, 10mA I_L 300mA, T_A = 25°C		-15	15	
		V_{DIFF} = 40V, 10mA I_L 195mA	•	-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				
Adjustment Pin Current	I_{Adj}	V_{DIFF} = 3.0V, T_A = 25°C			100	
		V_{DIFF} = 3.3V	•		100	µA
		V_{DIFF} = 40V	•		100	
Adjustment Pin	$^3I_{Adj}$	V_{DIFF} = 3.0V, 10mA I_L 1.5A, T_A = 25°C		-5	5	
Current Change		V_{DIFF} = 3.3V, 10mA I_L 1.5A	•	-5	5	
		V_{DIFF} = 40V, 10mA I_L 300mA, T_A = 25°C		-5	5	
		V_{DIFF} = 40V, 10mA I_L 195mA	•	-5	5	µA
		3.0V V_{DIFF} 40V, T_A = 25°C		-5	5	
		3.3V V_{DIFF} 40V	•	-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	
Current Limit	I_{CL}	V_{DIFF} = 15V	•	1.5	3.5	
(Note 2)		V_{DIFF} = 40V, T_A = 25°C		0.18	1.5	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.

3.3

PART NUMBER DESIGNATOR		
Standard Military Drawing Number	**Omnirel Part Number**	**Omnirel Package Designation**
7703405M	**OM1324SMM**	**SMD-3**
7703405U	**OM1324STM**	**TO-257 (Isolated)**
7703405T	**OM1324NTM**	**TO-257 (non-Isolated)**
7703405Y	**OM1324 NKM**	**TO-3**
7703405N	**OM1324NMM**	**SMD-1**
77034052	**OM1324N2M**	**LCC-20**

ELECTRICAL CHARACTERISTICS -55°C T_A 125°C, I_L = 8mA (unless otherwise specified)

OM1324N2M

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	
Line Regulation	R_{LINE}	3.0V V_{DIFF} 40V, V_{out} = V_{ref}, T_A = 25°C		-4.5	4.5	mV
(Note 1)		3.3V V_{DIFF} 40V, V_{out} = V_{ref}	•	-9	9	
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	
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				
Adjustment Pin Current	I_{Adj}	V_{DIFF} = 3.0V, T_A = 25°C			100	
		V_{DIFF} = 3.3V	•		100	µA
		V_{DIFF} = 40V	•		100	
Adjustment Pin	$^3I_{Adj}$	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 150mA, T_A = 25°C		-5	5	
		V_{DIFF} = 40V, 10mA I_L 100mA	•	-5	5	µA
		3.0V V_{DIFF} 40V, T_A = 25°C		-5	5	
		3.3V V_{DIFF} 40V	•	-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	
Current Limit	I_{CL}	V_{DIFF} = 15V	•	0.5	1.65	
(Note 2)		V_{DIFF} = 40V, T_A = 25°C		0.15	0.65	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.

3.3

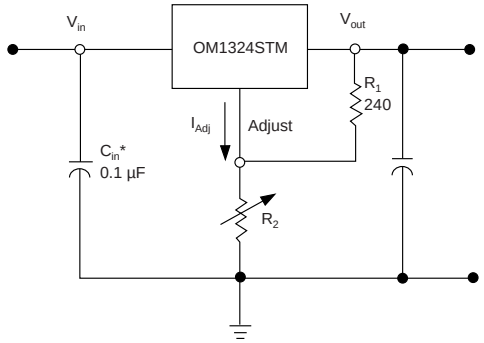
APPLICATION

* 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.

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

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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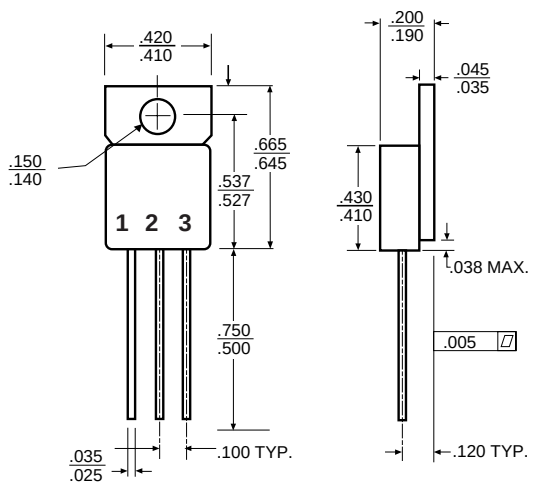
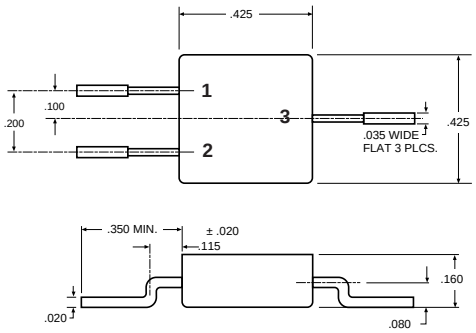
OM1324NTM, OM1324STM, OM1324NKM, OM1324SMM, OM1324NMM, OM1324N2M

MECHANICAL OUTLINE

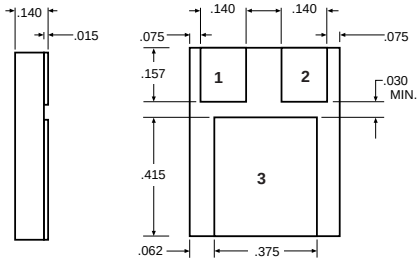




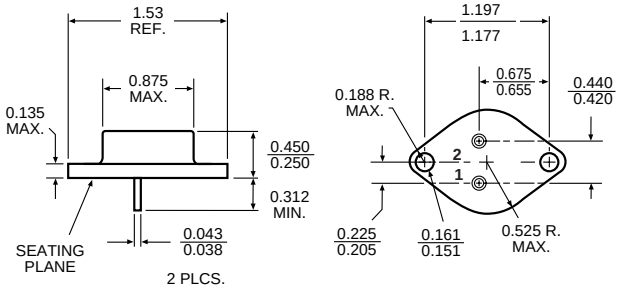
OM1324SMM
Front View
Pin 1 - Adjust
Pin 2 - Input
Pin 3 - Output
Case - Isolated

OM1324STM
Isolated
Front View
Pin 1 - Adjust
Pin 2 - Output
Pin 3 - Input
Tab - Isolated

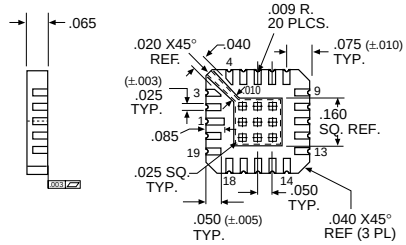
OM1324NTM
Non-Isolated
Front View
Pin 1 - Adjust
Pin 2 - Output
Pin 3 - Input
Tab - Output



OM1324NMM
Pin 1 - Adjust
Pin 2 - Input
Pin 3 - Output



OM1324NKM
Pin 1 - Adjust
Pin 2 - Input
Case - Output



OM1324N2M

Pin 1	V_{OUT}(Sense)	Pin 11	NC
Pin 2	NC	Pin 12	NC
Pin 3	NC	Pin 13	NC
Pin 4	NC	Pin 14	NC
Pin 5	V_{IN}	Pin 15	NC
Pin 6	NC	Pin 16	NC
Pin 7	NC	Pin 17	NC
Pin 8	NC	Pin 18	NC
Pin 9	NC	Pin 19	NC
Pin 10	ADJUST	Pin 20	V_{OUT}

For additional information please see the mechanical outline section.

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