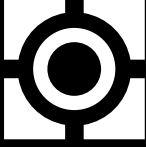


1.5 AMP POSITIVE ADJUSTABLE VOLTAGE REGULATOR APPROVED TO DESC DRAWING 7703401



Please see mechanical outlines herein

Three Terminal, Precision Adjustable Positive Voltage Regulator In Hermetic Style Packages (LM117)

FEATURES

- Similar To Industry Standard LM117
- Approved To DESC Standardized Military Drawing Number 7703401
- Built In Thermal Overload Protection
- Short Circuit Current Limiting
- Available In Six Package Styles

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 $T_c @ 25^{\circ}\text{C}$

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 $+150^{\circ}\text{C}$

Storage Temperature Range -65°C to $+150^{\circ}\text{C}$

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 25 A

Case-All Others. 1.5 A

Recommended Operating Conditions:

Output Voltage Range 1.2 to 37 VDC

Ambient Operating Temperature Range (T_A). -55°C to $+125^{\circ}\text{C}$

Input Voltage Range 4.25 to 41.25 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)**OM1320NTM, OM1320STM, OM1320NKM, OM1320SMM, OM1320NMM**

Parameter	Symbol	Test Conditions	Min.	Max.	Unit
Reference Voltage	V_{REF}	$V_{\text{DIFF}} = 3.0\text{V}$, $T_A = 25^{\circ}\text{C}$ $V_{\text{DIFF}} = 3.3\text{V}$ • $V_{\text{DIFF}} = 40\text{V}$ •	1.20 1.20 1.20	1.30 1.30 1.30	V
Line Regulation (Note 1)	R_{LINE}	$3.0\text{V} \leq V_{\text{DIFF}} \leq 40\text{V}$, $V_{\text{out}} = V_{\text{ref}}$, $T_A = 25^{\circ}\text{C}$ $3.3\text{V} \leq V_{\text{DIFF}} \leq 40\text{V}$, $V_{\text{out}} = V_{\text{ref}}$ •	-9 -23	9 23	mV
Load Regulation (Note 1)	R_{LOAD}	$V_{\text{DIFF}} = 3.0\text{V}$, $10\text{mA} \leq I_L \leq 1.5\text{A}$, $T_A = 25^{\circ}\text{C}$ $V_{\text{DIFF}} = 3.3\text{V}$, $10\text{mA} \leq I_L \leq 1.5\text{A}$ • $V_{\text{DIFF}} = 40\text{V}$, $10\text{mA} \leq I_L \leq 300\text{mA}$, $T_A = 25^{\circ}\text{C}$ $V_{\text{DIFF}} = 40\text{V}$, $10\text{mA} \leq I_L \leq 195\text{mA}$ •	-15 -15 -15 -15	15 15 15 15	mV
Thermal Regulation	V_{RTH}	$V_{\text{in}} = 14.6\text{V}$, $I_L = 1.5\text{A}$ $P_d = 20\text{ Watts}$, $t = 20\text{ ms}$, $T_A = 25^{\circ}\text{C}$	-16	16	mV
Ripple Rejection (Note 2)	R_N	$f = 120\text{ Hz}$, $V_{\text{out}} = V_{\text{ref}}$ • $C_{\text{Adj}} = 10\text{ }\mu\text{F}$	66		dB
Adjustment Pin Current	I_{Adj}	$V_{\text{DIFF}} = 3.0\text{V}$, $T_A = 25^{\circ}\text{C}$ $V_{\text{DIFF}} = 3.3\text{V}$ • $V_{\text{DIFF}} = 40\text{V}$ •		100 100 100	μA
Adjustment Pin Current Change	ΔI_{Adj}	$V_{\text{DIFF}} = 3.0\text{V}$, $10\text{mA} \leq I_L \leq 1.5\text{A}$, $T_A = 25^{\circ}\text{C}$ $V_{\text{DIFF}} = 3.3\text{V}$, $10\text{mA} \leq I_L \leq 1.5\text{A}$ • $V_{\text{DIFF}} = 40\text{V}$, $10\text{mA} \leq I_L \leq 300\text{mA}$, $T_A = 25^{\circ}\text{C}$ • $V_{\text{DIFF}} = 40\text{V}$, $10\text{mA} \leq I_L \leq 195\text{mA}$ • $3.0\text{V} \leq V_{\text{DIFF}} \leq 40\text{V}$, $T_A = 25^{\circ}\text{C}$ $3.3\text{V} \leq V_{\text{DIFF}} \leq 40\text{V}$ •	-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) •		5.0 5.0 5.0	mA
Current Limit (Note 2)	I_{CL}	$V_{\text{DIFF}} = 15\text{V}$ • $V_{\text{DIFF}} = 40\text{V}$, $T_A = 25^{\circ}\text{C}$	1.5 0.18	3.5 1.5	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.

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PART NUMBER DESIGNATOR		
Standard Military Drawing Number	Omnirel Part Number	Omnirel Package Designation
7703401M 7703401U 7703401T 7703401Y 7703401N 77034012	OM1320SMM OM1320STM OM1320NTM OM1320 NKM OM1320NMM OM1320N2M	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)

OM1320N2M

Parameter	Symbol	Test Conditions	Min.	Max.	Unit
Reference Voltage	V_{REF}	$V_{\text{DIFF}} = 3.0\text{V}$, $T_A = 25^{\circ}\text{C}$ $V_{\text{DIFF}} = 3.3\text{V}$ $V_{\text{DIFF}} = 40\text{V}$	1.20 • 1.20 • 1.20	1.30 1.30 1.30	V
Line Regulation (Note 1)	R_{LINE}	$3.0\text{V} \leq V_{\text{DIFF}} \leq 40\text{V}$, $V_{\text{out}} = V_{\text{ref}}$, $T_A = 25^{\circ}\text{C}$ $3.3\text{V} \leq V_{\text{DIFF}} \leq 40\text{V}$, $V_{\text{out}} = V_{\text{ref}}$	-9 • -23	9 23	mV
Load Regulation (Note 1)	R_{LOAD}	$V_{\text{DIFF}} = 3.0\text{V}$, $10\text{mA} \leq I_L \leq .5\text{A}$, $T_A = 25^{\circ}\text{C}$ $V_{\text{DIFF}} = 3.3\text{V}$, $10\text{mA} \leq I_L \leq .5\text{A}$ $V_{\text{DIFF}} = 40\text{V}$, $10\text{mA} \leq I_L \leq 150\text{mA}$, $T_A = 25^{\circ}\text{C}$ $V_{\text{DIFF}} = 40\text{V}$, $10\text{mA} \leq I_L \leq 100\text{mA}$	-15 • -15 -15 • -15	15 15 15 15	mV
Thermal Regulation	V_{RTH}	$V_{\text{in}} = 14.6\text{V}$, $I_L = 300\text{mA}$ $P_d = 4\text{ Watts}$, $t = 20\text{ ms}$, $T_A = 25^{\circ}\text{C}$	-16	16	mV
Ripple Rejection (Note 2)	R_N	$f = 120\text{ Hz}$, $V_{\text{out}} = V_{\text{ref}}$ $C_{\text{Adj}} = 10\text{ }\mu\text{F}$	• 66		dB
Adjustment Pin Current	I_{Adj}	$V_{\text{DIFF}} = 3.0\text{V}$, $T_A = 25^{\circ}\text{C}$ $V_{\text{DIFF}} = 3.3\text{V}$ $V_{\text{DIFF}} = 40\text{V}$	• •	100 100 100	μA
Adjustment Pin Current Change	ΔI_{Adj}	$V_{\text{DIFF}} = 3.0\text{V}$, $10\text{mA} \leq I_L \leq .5\text{A}$, $T_A = 25^{\circ}\text{C}$ $V_{\text{DIFF}} = 3.3\text{V}$, $10\text{mA} \leq I_L \leq .5\text{A}$ $V_{\text{DIFF}} = 40\text{V}$, $10\text{mA} \leq I_L \leq 150\text{mA}$, $T_A = 25^{\circ}\text{C}$ $V_{\text{DIFF}} = 40\text{V}$, $10\text{mA} \leq I_L \leq 100\text{mA}$ $3.0\text{V} \leq V_{\text{DIFF}} \leq 40\text{V}$, $T_A = 25^{\circ}\text{C}$ $3.3\text{V} \leq V_{\text{DIFF}} \leq 40\text{V}$	-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)	• •	5.0 5.0 5.0	mA
Current Limit (Note 2)	I_{CL}	$V_{\text{DIFF}} = 15\text{V}$ $V_{\text{DIFF}} = 40\text{V}$, $T_A = 25^{\circ}\text{C}$	• 0.15	1.65 .065	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.

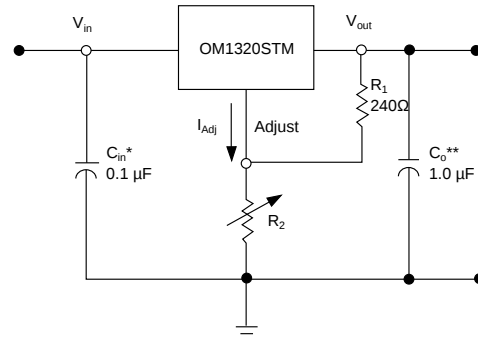
STANDARD APPLICATION

* 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.

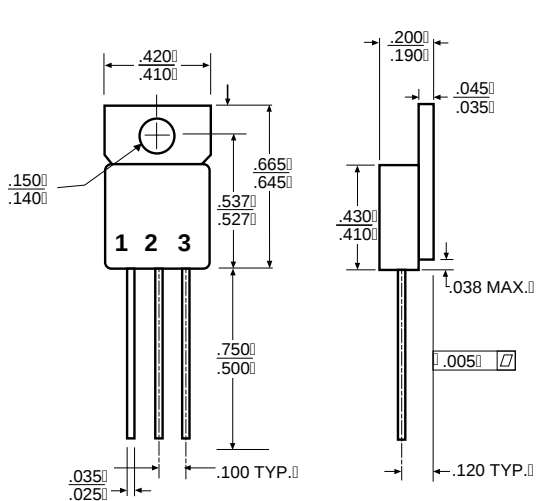
$$V_{\text{out}} = 1.25\text{ V} \left(1 + \frac{R_2}{R_1} \right) + I_{\text{Adj}} R_2$$

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



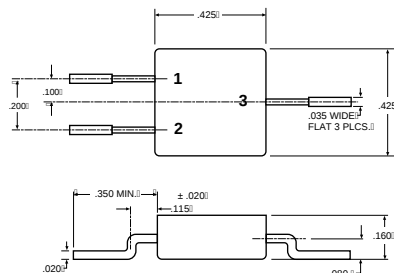
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MECHANICAL OUTLINE



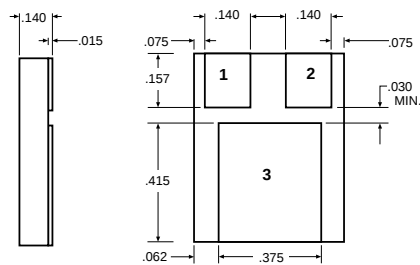
OM1320STM
Isolated
Front View
Pin 1 - Adjust
Pin 2 - Output
Pin 3 - Input
Tab - Isolated

OM1320NTM
Non-Isolated
Front View
Pin 1 - Adjust
Pin 2 - Output
Pin 3 - Input
Tab - Output



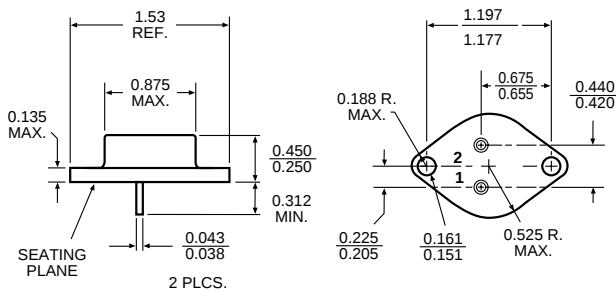
OM1320SMM

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



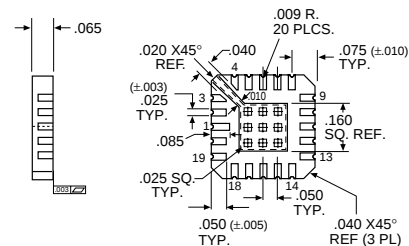
OM1320NMM

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



OM1320NKM

Pin 1 - Adjust
Pin 2 - Input
Case - Output



OM1320N2M

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}