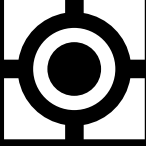


1.5 AMP POSITIVE ADJUSTABLE VOLTAGE REGULATOR APPROVED TO DESC DRAWING 7703401



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

Please see mechanical outlines herein

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°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 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°C

Input Voltage Range 4.25 to 41.25 VDC

3.5

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.

3.5

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

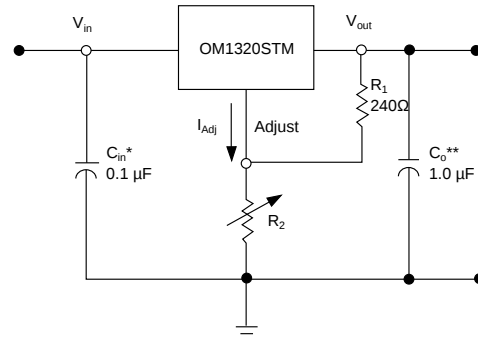
STANDARD APPLICATION

* 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.

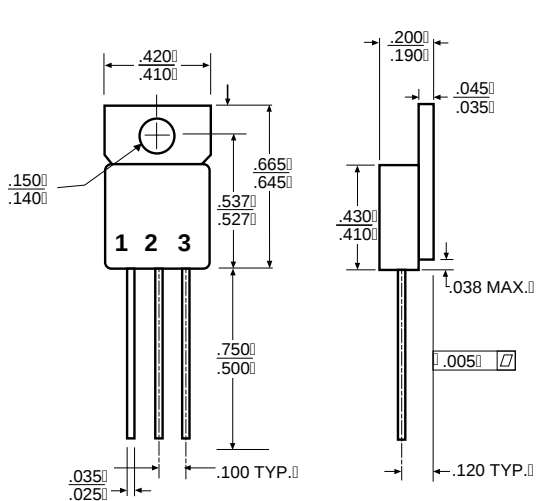
$$V_{out} = 1.25\text{ V} \left(1 + \frac{R_2}{R_1}\right) + I_{Adj} R_2$$

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



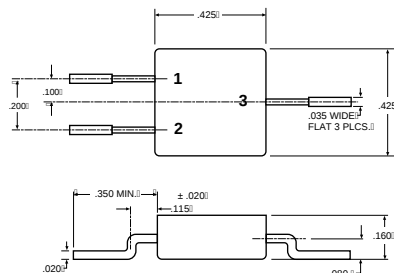
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MECHANICAL OUTLINE



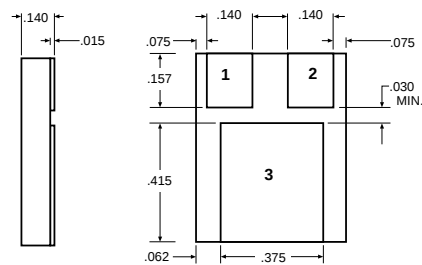
OM1320STM
Isolated
Front View
Pin 1 - Adjust
Pin 2 - Output
Pin 3 - Input
Tab - Isolated

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



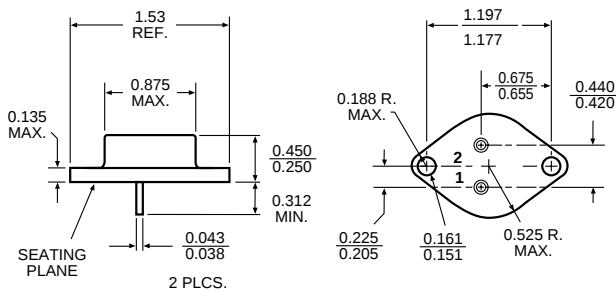
OM1320SMM

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



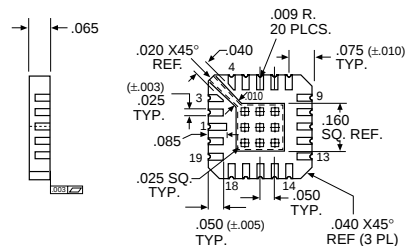
OM1320NMM

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}