

1.5 AMP NEGATIVE ADJUSTABLE VOLTAGE REGULATOR APPROVED TO DESC DRAWING 7703404



**Three Terminal, Precision Adjustable
Negative Voltage Regulator In Hermetic
Style Packages (LM137HV)**

Please see mechanical outlines herein

FEATURES

- Similar To Industry Standard LM137HV
- Approved To DESC Standardized Military Drawing Number 7703404
- Built In Thermal Overload Protection
- Short Circuit Current Limiting
- Available In Six Package Styles

DESCRIPTION

These three terminal negative 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 -47 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 50 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 -47 VDC
Ambient Operating Temperature Range (T_A).	- 55°C to + 125°C
Input Voltage Range	-4.25 to -51.25 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)

OM1323NTM, OM1323STM, OM1323NKM, OM1323SMM, OM1323NMM

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}} = 3.0\text{V}$ $ V_{\text{DIFF}} = 50\text{V}$, $T_A = 25^{\circ}\text{C}$ $ V_{\text{DIFF}} = 50\text{V}$	-1.275 -1.30 -1.275 -1.30	-1.225 -1.20 -1.225 -1.20	V
Line Regulation (Note 1)	R_{LINE}	$3.0\text{V} \leq V_{\text{DIFF}} \leq 40\text{V}$, $T_A = 25^{\circ}\text{C}$	-10 -25	10 25	mV
Load Regulation (Note 1)	R_{LOAD}	$ V_{\text{DIFF}} = 5.0\text{V}$, $8\text{mA} \leq I_L \leq 110\text{mA}$ $T_A = 25^{\circ}\text{C}$ $ V_{\text{DIFF}} = 5\text{V}$, $8\text{mA} \leq I_L \leq 1.5\text{A}$, $T_A = 25^{\circ}\text{C}$	-25 -25 -45	25 25 45	mV
Thermal Regulation	V_{RTH}	$V_{\text{in}} = -14.6\text{V}$, $I_L = 1.5\text{A}$ $P_d = 20\text{ Watts}$, $t = 10\text{ ms}$, $T_A = 25^{\circ}\text{C}$	-5	5	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}$ $ V_{\text{DIFF}} = 40\text{V}$ $ V_{\text{DIFF}} \leq 50\text{V}$		100 100 100	 μA μA
Adjustment Pin Current Change	ΔI_{Adj}	$ V_{\text{DIFF}} = 5\text{V}$, $8\text{mA} \leq I_L \leq 1.5\text{A}$ $3\text{V} \leq V_{\text{DIFF}} \leq 50\text{V}$	-5 -6	5 6	 μA
Minimum Load Current	I_{Lmin}	$ V_{\text{DIFF}} = 3.0\text{V}$, $V_{\text{out}} = -1.4\text{V}$ (forced) $ V_{\text{DIFF}} = 10\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}} = 50\text{V}$, $V_{\text{out}} = -1.4\text{V}$ (forced)		3.0 3.0 5.0 5.0	 mA
Current Limit (Note 2)	I_{CL}	$ V_{\text{DIFF}} \leq 5\text{V}$ $ V_{\text{DIFF}} = 50\text{V}$, $T_A = 25^{\circ}\text{C}$	1.5 0.2	3.5 1.0	 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.

PART NUMBER DESIGNATOR

Standard Military Drawing Number	Omnirel Part Number	Omnirel Package Designation
7703404M 7703404U 7703404T 7703404Y 7703404N 77034042	OM1323SMM OM1323STM OM1323NTM OM1323NKM OM1323NMM OM1323N2M	SMD-3 TO-257 (Isolated) TO-257 (non-Isolated) TO-3 SMD-1 LCC-20

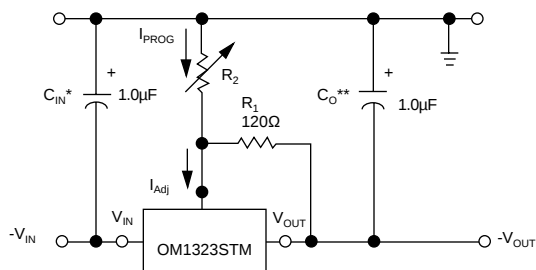
ELECTRICAL CHARACTERISTICS $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$, $I_L = 8\text{mA}$ (unless otherwise specified)

OM1323N2M

Parameter	Symbol	Test Conditions	Min.	Max.	Unit
Reference Voltage	V_{REF}	$ V_{\text{DIFF}} = 3.0\text{V}$, $T_A = 25^{\circ}\text{C}$	-1.275	-1.225	V
		$ V_{\text{DIFF}} = 3.0\text{V}$	-1.30	-1.20	
		$ V_{\text{DIFF}} = 40\text{V}$, $T_A = 25^{\circ}\text{C}$	-1.275	-1.225	
		$ V_{\text{DIFF}} = 40\text{V}$	-1.30	-1.20	V
		$ V_{\text{DIFF}} = 50\text{V}$, $T_A = 25^{\circ}\text{C}$	-1.275	-1.225	
		$ V_{\text{DIFF}} = 50\text{V}$	-1.30	-1.20	
Line Regulation (Note 1)	R_{LINE}	$3.0\text{V} \leq V_{\text{DIFF}} \leq 40\text{V}$, $T_A = 25^{\circ}\text{C}$	-10 -25	10 25	mV
Load Regulation (Note 1)	R_{LOAD}	$ V_{\text{DIFF}} = 5.0\text{V}$, $8\text{mA} \leq I_L \leq 100\text{mA}$ $T_A = 25^{\circ}\text{C}$ $ V_{\text{DIFF}} = 5\text{V}$, $8\text{mA} \leq I_L \leq 500\text{mA}$, $T_A = 25^{\circ}\text{C}$	-25 -31 -50	25 31 50	mV
Thermal Regulation	V_{RTH}	$V_{\text{in}} = -16.25\text{V}$, $I_L = 330\text{mA}$ $P_d = 5\text{ Watts}$, $t = 10\text{ ms}$, $T_A = 25^{\circ}\text{C}$	-2	2	mV
Ripple Rejection (Note 2)	R_N	$f = 120\text{ Hz}$, $V_{\text{out}} = V_{\text{ref}}$ $C_{\text{Adj}} = 10\text{ }\mu\text{F}$	66		dB
Adjustment Pin Current	I_{Adj}	$ V_{\text{DIFF}} = 3.0\text{V}$ $ V_{\text{DIFF}} = 40\text{V}$ $ V_{\text{DIFF}} \leq 50\text{V}$		100 100 100	μA μA μA
Adjustment Pin Current Change	ΔI_{Adj}	$ V_{\text{DIFF}} = 5\text{V}$, $8\text{mA} \leq I_L \leq 200\text{ mA}$ $3\text{ V} \leq V_{\text{DIFF}} \leq 50\text{V}$	-5 -6	5 6	μA
Mimumum Load Current	I_{Lmin}	$ V_{\text{DIFF}} = 3.0\text{V}$, $V_{\text{out}} = -1.4\text{V}$ (forced) $ V_{\text{DIFF}} = 10\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}} = 50\text{V}$, $V_{\text{out}} = -1.4\text{V}$ (forced)		3.0 3.0 5.0 5.0	mA
Current Limit (Note 2)	I_{CL}	$ V_{\text{DIFF}} \leq 5\text{V}$ $ V_{\text{DIFF}} = 50\text{V}$, $T_A = 25^{\circ}\text{C}$	0.5 0.1	1.8 0.65	A

Notes: Please see previous page.

TYPICAL APPLICATIONS



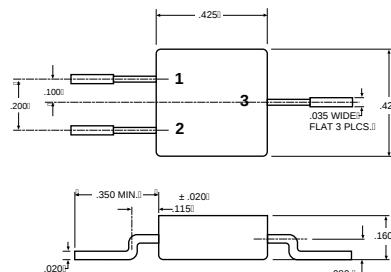
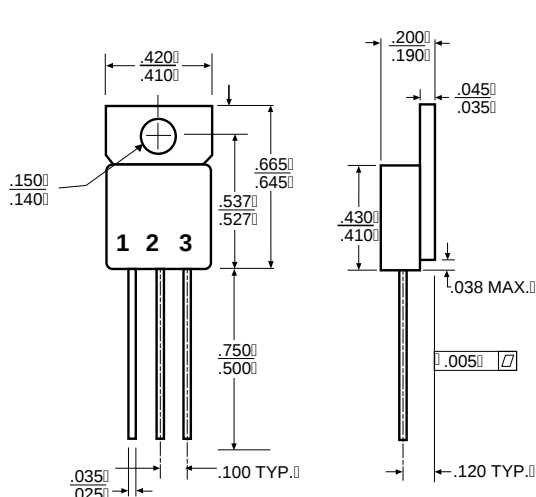
* C_{in} is required if regulator is located more than 4 inches from power supply filter. A $1\text{ }\mu\text{F}$ solid tantalum or $10\text{ }\mu\text{F}$ aluminum electrolytic is recommended.

** C_o is necessary for stability. A $1\text{ }\mu\text{F}$ solid tantalum or $10\text{ }\mu\text{F}$ aluminum electrolytic is recommended.

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

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MECHANICAL OUTLINE

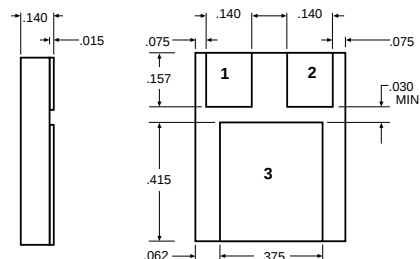


OM1323SMM

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

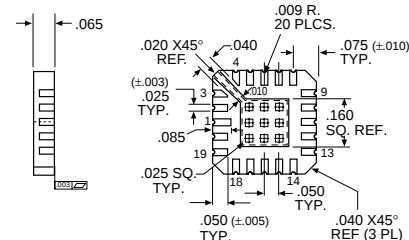
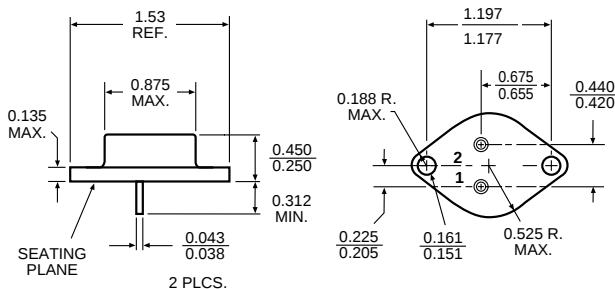
OM1323STM
Isolated
Front View
Pin 1 - Adjust
Pin 2 - Input
Pin 3 - Output
Tab - Isolated

OM1323NTM
Non-Isolated
Front View
Pin 1 - Adjust
Pin 2 - Input
Pin 3 - Output
Tab - Input



OM1323NMM

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



OM1323N2M

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

For additional information please see the mechanical outline section.