

1.5 AMP NEGATIVE ADJUSTABLE VOLTAGE REGULATOR APPROVED TO DESC DRAWING 7703404



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

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 25 A
Case-All Others.	1.5A
<u>Recommended Operating Conditions:</u>	
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

3.3

OM1323NTM, OM1323STM, OM1323NKM, OM1323SMM, OM1323NMM, OM1323N2M

ELECTRICAL CHARACTERISTICS -55°C T_A 125°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}	$V_{DIFF} \text{ } \ominus = 3.0\text{V}, T_A = 25^\circ\text{C}$	-1.275	-1.225	V
		$V_{DIFF} \text{ } \ominus = 3.0\text{V}$ •	-1.30	-1.20	
		$V_{DIFF} \text{ } \ominus = 50\text{V}, T_A = 25^\circ\text{C}$	-1.275	-1.225	
		$V_{DIFF} \text{ } \ominus = 50\text{V}$ •	-1.30	-1.20	
Line Regulation (Note 1)	R_{LINE}	3.0 V $V_{DIFF} \text{ } \ominus = 40\text{V}, T_A = 25^\circ\text{C}$	-10 • -25	10 25	mV
Load Regulation (Note 1)	R_{LOAD}	$V_{DIFF} \text{ } \ominus = 5.0\text{V}, 8\text{mA}$ $I_L = 110\text{mA}$ $T_A = 25^\circ\text{C}$ $V_{DIFF} \text{ } \ominus = 5\text{V}, 8\text{mA}$ $I_L = 1.5\text{A}, T_A = 25^\circ\text{C}$	-25 • -25 -45	25 25 45	mV
Thermal Regulation	V_{RTH}	$V_{in} = -14.6\text{V}, I_L = 1.5\text{A}$ $P_d = 20\text{ Watts}, t = 10\text{ ms}, T_A = 25^\circ\text{C}$	-5	5	mV
Ripple Rejection (Note 2)	R_N	$f = 120\text{ Hz}, V_{out} = V_{ref}$ $C_{Adj} = 10\text{ }\mu\text{F}$	• 66		dB
Adjustment Pin Current	I_{Adj}	$V_{DIFF} \text{ } \ominus = 3.0\text{V}$ $V_{DIFF} \text{ } \ominus = 40\text{V}$ $V_{DIFF} \text{ } \ominus = 50\text{V}$	• • •	100 100 100	μA μA μA
Adjustment Pin Current Change	$^3I_{Adj}$	$V_{DIFF} \text{ } \ominus = 5\text{V}, 8\text{mA}$ $I_L = 1.5\text{A}$ 3 V $V_{DIFF} \text{ } \ominus = 50\text{V}$	• • -5 -6	5 6	μA μA
Minimum Load Current	I_{Lmin}	$V_{DIFF} \text{ } \ominus = 3.0\text{V}, V_{out} = -1.4\text{V}$ (forced) $V_{DIFF} \text{ } \ominus = 10\text{V}, V_{out} = -1.4\text{V}$ (forced) $V_{DIFF} \text{ } \ominus = 40\text{V}, V_{out} = -1.4\text{V}$ (forced) $V_{DIFF} \text{ } \ominus = 50\text{V}, V_{out} = -1.4\text{V}$ (forced)	• • • •	3.0 3.0 5.0 5.0	mA
Current Limit (Note 2)	I_{CL}	$V_{DIFF} \text{ } \ominus = 5\text{V}$ $V_{DIFF} \text{ } \ominus = 50\text{V}, T_A = 25^\circ\text{C}$	• 1.5 0.2	3.5 1.0	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.

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

OM1323NTM, OM1323STM, OM1323NKM, OM1323SMM, OM1323NMM, OM1323N2M

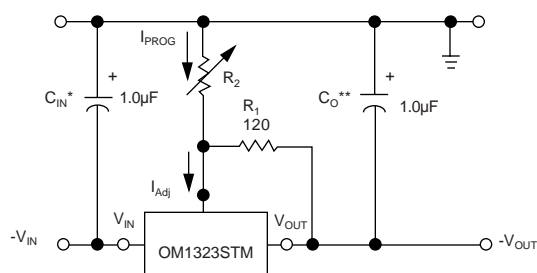
ELECTRICAL CHARACTERISTICS -55°C T_A 125°C, $I_L = 8\text{mA}$ (unless otherwise specified)
OM1323N2M

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

Notes: Please see previous page.

TYPICAL APPLICATIONS

3.3



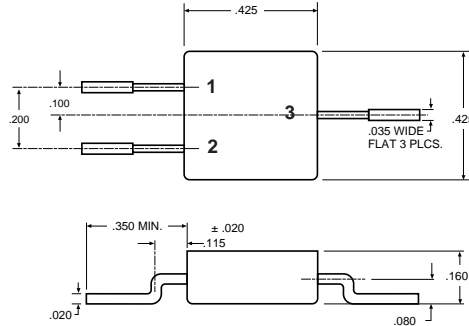
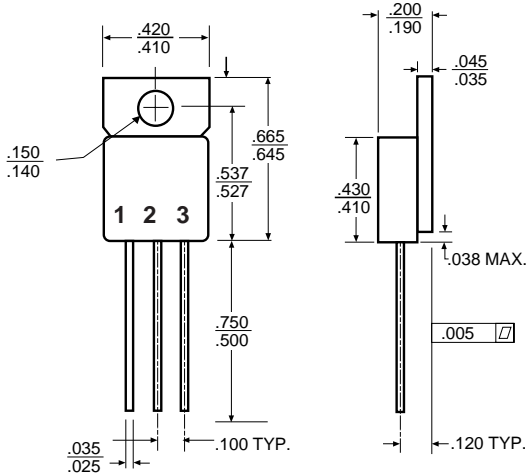
* C_{in} is required if regulator is located more than 4 inches from power supply filter. A 1 μF solid tantalum or 10 μF aluminum electrolytic is recommended.

** C_o is necessary for stability. A 1 μF solid tantalum or 10 μF aluminum electrolytic is recommended.

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

OM1323NTM, OM1323STM, OM1323NKM, OM1323SMM, OM1323NMM, OM1323N2M

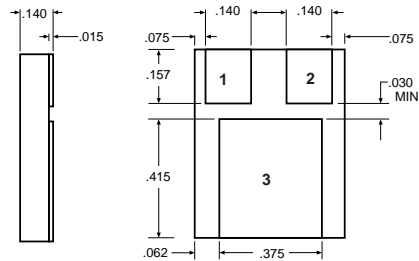
MECHANICAL OUTLINE



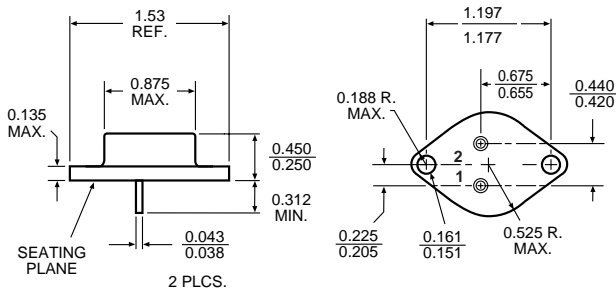
OM1323SMM
 Front View
 Pin 1 - Adjust
 Pin 2 - Output
 Pin 3 - Input
 Case - Isolated

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

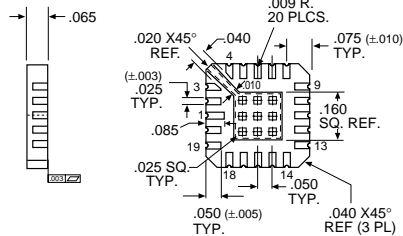
OM1323NTM
 Non-Isolated
 Front View
 Pin 1 - Adjust
 Pin 2 - Input
 Pin 3 - Output
 Tab - Input



OM1323NMM
 Pin 1 - Adjust
 Pin 2 - Output
 Pin 3 - Input



OM1323NKM
 Pin 1 - Adjust
 Pin 2 - Output
 Case - 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.