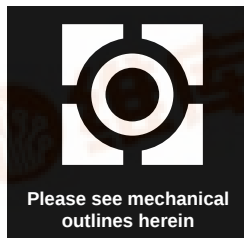


1.5 AMP NEGATIVE ADJUSTABLE VOLTAGE REGULATOR APPROVED TO DESC DRAWING 7703403



Three Terminal, Precision Adjustable Negative Voltage Regulator In Hermetic Style Packages (LM137)

FEATURES

- Similar To Industry Standard LM137
- Approved To DESC Standardized Military Drawing Number 7703403
- 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 -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 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

OM1322NTM, OM1322STM, OM1322NKM, OM1322SMM, OM1322NMM, OM1322N2M

ELECTRICAL CHARACTERISTICS $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$, $I_L = 8\text{mA}$ (unless otherwise specified)
OM1322NTM, OM1322STM, OM1322NKM, OM1322SMM, OM1322NMM

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} = 3.0\text{V}$ $ V_{DIFF} = 40\text{V}$, $T_A = 25^{\circ}\text{C}$ $ V_{DIFF} = 40\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}	$3.0\text{V} \leq V_{DIFF} \leq 40\text{V}$, $T_A = 25^{\circ}\text{C}$ $3.0\text{V} \leq V_{DIFF} \leq 40\text{V}$	•	-9 -23	9 23	mV
Load Regulation (Note 1)	R_{LOAD}	$ V_{DIFF} = 5.0\text{V}$, $8\text{mA} \leq I_L \leq 1.5\text{A}$ $ V_{DIFF} = 12\text{V}$, $8\text{mA} \leq I_L \leq 1.5\text{A}$, $T_A = 25^{\circ}\text{C}$ $ V_{DIFF} = 40\text{V}$, $8\text{mA} \leq I_L \leq 200\text{mA}$, $T_A = 25^{\circ}\text{C}$ $ V_{DIFF} = 40\text{V}$, $8\text{mA} \leq I_L \leq 100\text{mA}$	• •	-25 -25 -25 -25	25 25 25 25	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} = 3.0\text{V}$ $ V_{DIFF} = 40\text{V}$	• •		100 100	μA
Adjustment Pin Current Change	$\Delta I_{Adj}(\text{Line})$	$3.0\text{V} \leq V_{DIFF} \leq 40\text{V}$	•	-5	5	μA
	$\Delta I_{Adj}(\text{Load})$	$ V_{DIFF} = 5\text{V}$, $8\text{mA} \leq I_L \leq 1.5\text{A}$	•	-5	5	μA
Mimumum Load Current	I_{Lmin}	$ V_{DIFF} = 3.0\text{V}$, $V_{out} = -1.4\text{V}$ (forced) $ V_{DIFF} = 10\text{V}$, $V_{out} = -1.4\text{V}$ (forced) $ V_{DIFF} = 40\text{V}$, $V_{out} = -1.4\text{V}$ (forced)	• • •		3.0 3.0 5.0	mA
Current Limit (Note 2)	I_{CL}	$ V_{DIFF} \leq 5\text{V}$ $ V_{DIFF} = 40\text{V}$, $T_A = 25^{\circ}\text{C}$	•	1.5 0.24	3.5 1.2	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
7703403M 7703403U 7703403T 7703403Y 7703403N 77034032	OM1322SMM OM1322STM OM1322NTM OM1322 NKM OM1322NMM OM1322N2M	SMD-3 TO-257 (Isolated) TO-257 (non-Isolated) TO-3 SMD-1 LCC-20

OM1322NTM, OM1322STM, OM1322NKM, OM1322SMM, OM1322NMM, OM1322N2M

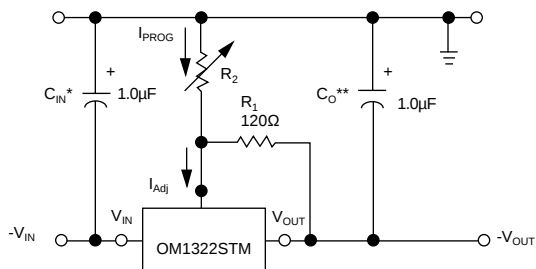
ELECTRICAL CHARACTERISTICS $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$, $I_L = 8\text{mA}$ (unless otherwise specified)

OM1322N2M

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} = 3.0\text{V}$ $ V_{DIFF} = 40\text{V}$, $T_A = 25^{\circ}\text{C}$ $ V_{DIFF} = 40\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}	$3.0\text{V} \leq V_{DIFF} \leq 40\text{V}$, $T_A = 25^{\circ}\text{C}$ $3.0\text{V} \leq V_{DIFF} \leq 40\text{V}$	-9 -23	9 23	mV
Load Regulation (Note 1)	R_{LOAD}	$ V_{DIFF} = 5.0\text{V}$, $8\text{mA} \leq I_L \leq 200\text{mA}$ $ V_{DIFF} = 15\text{V}$, $8\text{mA} \leq I_L \leq 200\text{mA}$, $T_A = 25^{\circ}\text{C}$ $ V_{DIFF} = 40\text{V}$, $8\text{mA} \leq I_L \leq 150\text{mA}$, $T_A = 25^{\circ}\text{C}$ $ V_{DIFF} = 40\text{V}$, $8\text{mA} \leq I_L \leq 50\text{mA}$	-25 -25 -25 -25	25 25 25 25	mV
Thermal Regulation	V_{RTH}	$V_{IN} = -16.25\text{V}$, $I_L = 330\text{mA}$ $P_d = 5\text{ Watts}$, $t = 10\text{ ms}$, $T_A = 25^{\circ}\text{C}$	-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} = 3.0\text{V}$ $ V_{DIFF} = 40\text{V}$		100 100	μA
Adjustment Pin Current Change	$\Delta I_{Adj}(\text{Line})$	$3.0\text{V} \leq V_{DIFF} \leq 40\text{V}$	-5	5	μA
	$\Delta I_{Adj}(\text{Load})$	$ V_{DIFF} = 5\text{V}$, $8\text{mA} \leq I_L \leq 500\text{ mA}$	-5	5	μA
Minimum Load Current	I_{Lmin}	$ V_{DIFF} = 3.0\text{V}$, $V_{out} = -1.4\text{V}$ (forced)		3.0	mA
		$ V_{DIFF} = 10\text{V}$, $V_{out} = -1.4\text{V}$ (forced)		3.0	
		$ V_{DIFF} = 40\text{V}$, $V_{out} = -1.4\text{V}$ (forced)		5.0	
Current Limit (Note 2)	I_{CL}	$ V_{DIFF} \leq 5\text{V}$	0.5	1.8	A
		$ V_{DIFF} = 40\text{V}$, $T_A = 25^{\circ}\text{C}$	0.15	0.65	

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.



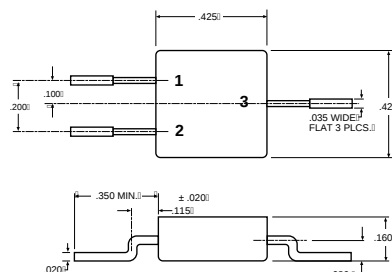
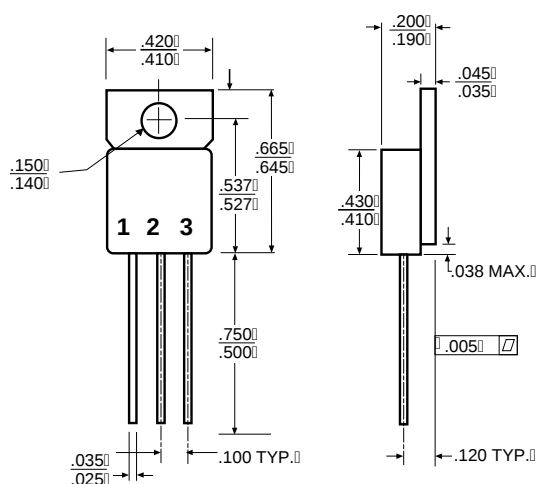
* C_{in} is required if regulator is located more than 4 inches from power supply filter. A $1\text{ }\mu\text{F}$ solid tantalum or $10\text{ }\mu\text{F}$ aluminum electrolytic is recommended.

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

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

OM1322NTM, OM1322STM, OM1322NKM, OM1322SMM, OM1322NMM, OM1322N2M

MECHANICAL OUTLINE



OM1322SMM

Front View

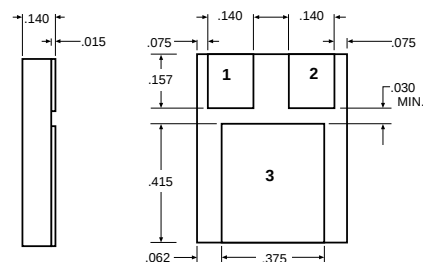
Pin 1	-	Adjust
Pin 2	-	Output
Pin 3	-	Input
Case	-	Isolated

OM1322STM

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

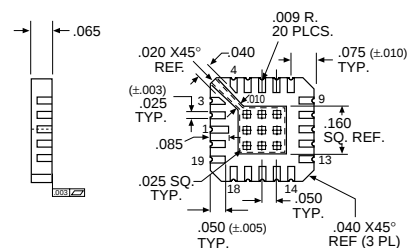
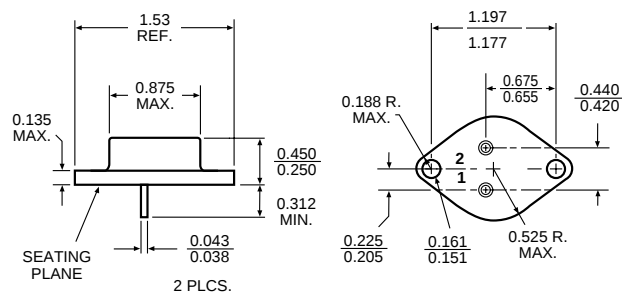
OM1322NTM

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



OM1322NMM

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



OM1322N2M

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

3.5

OM1322NKM

Pin 1 - Adjust
Pin 2 - Output
Case - Input

For additional information please see the mechanical outline section.