1.5 AMP NEGATIVE ADJUSTABLE VOLTAGE REGULATOR APPROVED TO DESC DRAWING 7703408

Please see mechanical outlines herein

Three Terminal, Precision Adjustable Negative Voltage Regulator In Hermetic Style Packages (LM137AHV)

FEATURES

- Similar To Industry Standard LM137AHV
- Approved To DESC Standardized Military Drawing Number 7703408
- Built In Thermal Overload Protection
- Short Circuit Current Limiting
- Available In Six Package Styles
- Maximum Output Voltage Tolerance Is Guaranteed to ± 1%

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°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

3.5

ELECTRICAL CHARACTERISTICS -55°C ≤ T_A ≤ 125°C, I_L = 8mA (unless otherwise specified)

OM1327NTM, OM1327STM, OM1327NKM, OM1327SMM, OM1327NMM

Parameter	Symbol	Test Conditions		Min.	Max.	Unit
Reference Voltage	V_{REF}	$\|V_{DIFF}\|$ = 3.0V, T_A = 25°C		-1.262	-1.238	
		$\|V_{DIFF}\|$ = 3.0V	•	-1.28	-1.22	V
		$\|V_{DIFF}\|$ = 50V, T_A = 25°C		-1.28	-1.22	
		$\|V_{DIFF}\|$ = 50V	•	-1.28	-1.22	
Line Regulation	R_{LINE}	3.0 V ≤ $\|V_{DIFF}\|$ ≤ 50V, T_A = 25°C		-6	6	
(Note 1)			•	-20	20	mV
Load Regulation	R_{LOAD}	$\|V_{DIFF}\|$ 50V, 8mA ≤ I_L ≤ 110mA, T_A = 25°C		-25	25	
(Note 1)		$\|V_{DIFF}\|$ = 5V, 8mA ≤ I_L ≤ 1.5A, T_A = 25°C		-25	25	mV
			•	-50	50	
Thermal Regulation	V_{RTH}	V_{in} = -14.6V, I_L = 1.5A		-5	5	mV
		P_d = 20 Watts, t = 10 ms, T_A = 25°C				
Ripple Rejection	R_N	f = 120 Hz, V_{out} = V_{ref}	•	66		dB
(Note 2)		C_{Adj} = 10 µF				
Adjustment Pin Current	I_{Adj}	$\|V_{DIFF}\|$ = 3.0V	•		100	
		$\|V_{DIFF}\|$ = 40V	•		100	µA
		$\|V_{DIFF}\|$ = 50V	•		100	
Adjustment Pin	ΔI_{Adj}	$\|V_{DIFF}\|$ = 5V, 8mA ≤ I_{out} ≤ 1.5A	•	-5	5	µA
Current Change		3V ≤ $\|V_{DIFF}\|$ ≤ 50V, I_L ≤ 8mA	•	-6	6	
Miminum Load Current	I_{Lmin}	$\|V_{DIFF}\|$ = 3.0V, V_{out} = -1.4V (forced)	•		3.0	
		$\|V_{DIFF}\|$ = 10V, V_{out} = -1.4V (forced)	•		3.0	mA
		$\|V_{DIFF}\|$ = 40V, V_{out} = -1.4V (forced)	•		5.0	
		$\|V_{DIFF}\|$ = 50V, V_{out} = -1.4V (forced)	•		5.0	
Current Limit	I_{CL}	$\|V_{DIFF}\|$ = 5V	•	1.5	3.5	
(Note 2)		$\|V_{DIFF}\|$ = 50V, T_A = 25°C		0.2	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**
7703408M	**OM1327SMM**	**SMD-3**
7703408U	**OM1327STM**	**TO-257 (Isolated)**
7703408T	**OM1327NTM**	**TO-257 (non-Isolated)**
7703408Y	**OM1327NKM**	**TO-3**
7703408N	**OM1327NMM**	**SMD-1**
77034082	**OM1327N2M**	**LCC-20**

ELECTRICAL CHARACTERISTICS -55°C ≤ T_A ≤ 125°C, I_L = 8mA (unless otherwise specified)

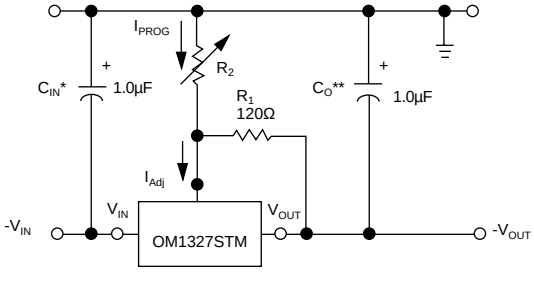
OM1327N2M

Parameter	Symbol	Test Conditions		Min.	Max.	Unit
Reference Voltage	V_{REF}	$\|V_{DIFF}\|$ = 3.0V, T_A = 25°C		-1.262	-1.235	
		$\|V_{DIFF}\|$ = 3.0V	•	-1.28	-1.22	V
		$\|V_{DIFF}\|$ = 40V, T_A = 25°C		-1.28	-1.22	
		$\|V_{DIFF}\|$ = 40V	•	-1.28	-1.22	
		$\|V_{DIFF}\|$ = 50V, T_A = 25°C		-1.28	-1.22	
		$\|V_{DIFF}\|$ = 50V	•	-1.28	-1.22	
Line Regulation	R_{LINE}	3.0 V ≤ $\|V_{DIFF}\|$ ≤ 50V, T_A = 25°C		-10	10	
(Note 1)			•	-25	25	mV
Load Regulation	R_{LOAD}	$\|V_{DIFF}\|$ 50V, 8mA ≤ I_L ≤ 100 mA, T_A = 25°C		-25	25	
(Note 1)		$\|V_{DIFF}\|$ = 5V, 8mA ≤ I_L ≤ 500 mA, T_A = 25°C		-31	31	mV
			•	-50	50	
Thermal Regulation	V_{RTH}	V_{in} = -16.25V, I_L = 330 mA		-2	2	mV
		P_d = 5 Watts, t = 10 ms, T_A = 25°C				
Ripple Rejection	R_N	f = 120 Hz, V_{out} = V_{ref}	•	66		dB
(Note 2)		C_{Adj} = 10 µF				
Adjustment Pin Current	I_{Adj}	$\|V_{DIFF}\|$ = 3.0V	•		100	
		$\|V_{DIFF}\|$ = 40V	•		100	µA
		$\|V_{DIFF}\|$ = 50V	•		100	
Adjustment Pin	ΔI_{Adj}	$\|V_{DIFF}\|$ = 5V, 8mA ≤ I_{out} ≤ 200 mA	•	-5	5	µA
Current Change		3V ≤ $\|V_{DIFF}\|$ ≤ 50V, I_L ≤ 8mA	•	-6	6	
Miminum Load Current	I_{Lmin}	$\|V_{DIFF}\|$ = 3.0V, V_{out} = -1.4V (forced)	•		3.0	
		$\|V_{DIFF}\|$ = 10V, V_{out} = -1.4V (forced)	•		3.0	mA
		$\|V_{DIFF}\|$ = 40V, V_{out} = -1.4V (forced)	•		5.0	
		$\|V_{DIFF}\|$ = 50V, V_{out} = -1.4V (forced)	•		5.0	
Current Limit	I_{CL}	$\|V_{DIFF}\|$ = 5V	•	0.5	1.8	
(Note 2)		$\|V_{DIFF}\|$ = 50V, T_A = 25°C		0.1	0.65	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.

TYPICAL APPLICATION



* 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.

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

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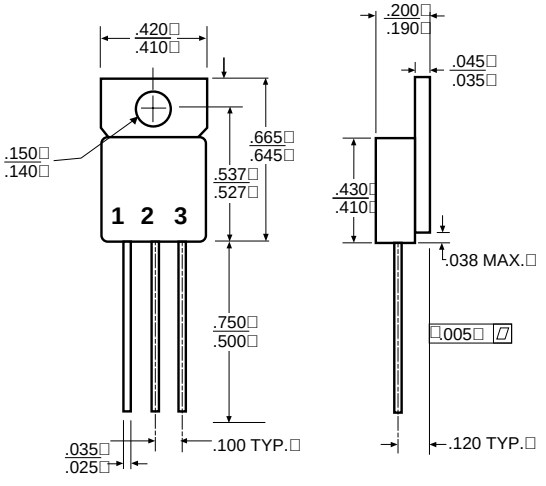
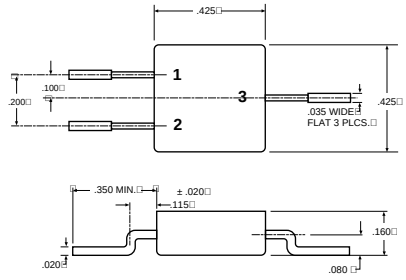
MECHANICAL OUTLINE

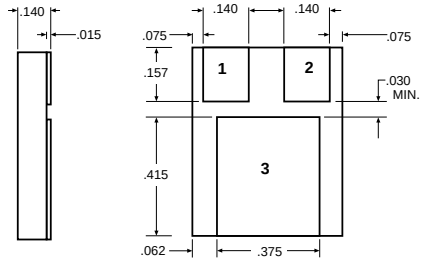


OM1327STM
Isolated
Front View
Pin 1 - Adjust
Pin 2 - Input
Pin 3 - Output
Tab - Isolated

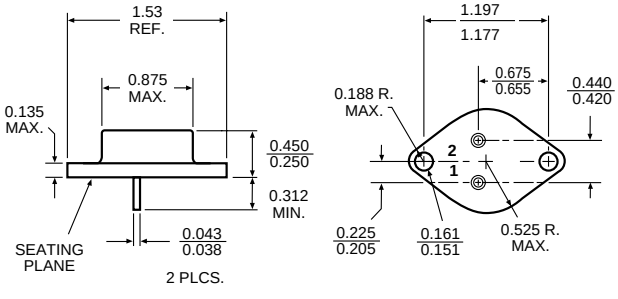
OM1327NTM
Non-Isolated
Front View
Pin 1 - Adjust
Pin 2 - Input
Pin 3 - Output
Tab - Input



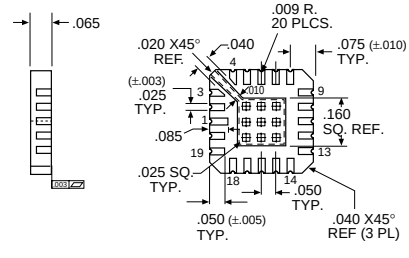
OM1327SMM
Front View
Pin 1 - Adjust
Pin 2 - Output
Pin 3 - Input
Case - Isolated



OM1327NMM
Pin 1 - Adjust
Pin 2 - Output
Pin 3 - Input



OM1327NKM
Pin 1 - Adjust
Pin 2 - Output
Case - Input



OM1327N2M

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.