1.5 AMP NEGATIVE ADJUSTABLE VOLTAGE REGULATOR APPROVED TO DESC DRAWING 7703406

Three Terminal, Precision Adjustable Negative Voltage Regulator In Hermetic Style Packages (LM137A)

FEATURES

- Similar To Industry Standard LM137A
- Approved To DESC Standardized Military Drawing Number 7703406
- 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 -37 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 . . . . . 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

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

OM1325NTM, OM1325STM, OM1325NKM, OM1325SMM, OM1325NMM

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	•	-1.280	-1.220	V
		V_{DIFF} = 40V	•	-1.280	-1.220	
Line Regulation	R_{LINE}	3.0 V V_{DIFF} 40V, T_A = 25°C		-4.5	4.5	
(Note 1)		3.0V V_{DIFF} 40V	•	-13.8	13.8	mV
Load Regulation	R_{LOAD}	V_{DIFF} = 5V, 8mA I_L 1.5A	•	-25	25	
(Note 1)		V_{DIFF} = 12V, 8mA I_L 1.5A, T_A = 25°C		-25	25	mV
		V_{DIFF} 40V, 8mA I_L 1.5A, T_A = 25°C		-25	25	
		V_{DIFF} = 40V, 8mA I_L 1.5A	•	-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
Adjustment Pin	$^3I_{Adj}$					
Current Change	(line)	3V V_{DIFF} 40V	•	-5	5	µA
	$^3I_{Adj}$					
	(load)	V_{DIFF} = 5V, 8mA I_L 1.5A	•	-5	5	µA
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	
Current Limit	I_{CL}	V_{DIFF} 5V	•	1.5	3.5	
(Note 2)		V_{DIFF} = 40V, T_A = 25°C		0.24	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.

3.3

PART NUMBER DESIGNATOR		
Standard Military Drawing Number	**Omnirel Part Number**	**Omnirel Package Designation**
7703406M	**OM1325SMM**	**SMD-3**
7703406U	**OM1325STM**	**TO-257 (Isolated)**
7703406T	**OM1325NTM**	**TO-257 (non-Isolated)**
7703406Y	**OM1325NKM**	**TO-3**
7703406N	**OM1325NMM**	**SMD-1**
77034062	**OM1325N2M**	**LCC-20**

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

OM1325N2M

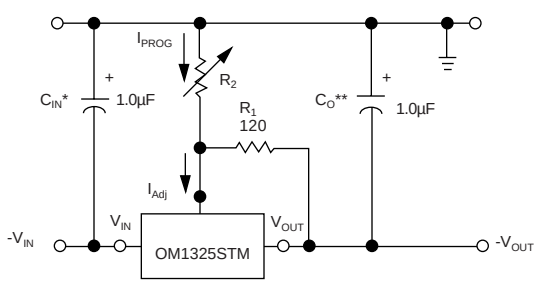
Parameter	Symbol	Test Conditions		Min.	Max.	Unit
Reference Voltage	V_{REF}	V_{DIFF} = 3.0V, T_A = 25°C		-1.262	-1.238	
		V_{DIFF} = 3.0V	•	-1.280	-1.220	V
		V_{DIFF} = 40V	•	-1.280	-1.220	
Line Regulation	R_{LINE}	3.0 V V_{DIFF} 40V, T_A = 25°C		-4.5	4.5	
(Note 1)		3.0V V_{DIFF} 40V	•	-13.8	13.8	mV
Load Regulation	R_{LOAD}	V_{DIFF} = 5V, 8mA I_L 200 mA	•	-25	25	
(Note 1)		V_{DIFF} = 15V, 8mA I_L 200m, AT_A = 25°C		-25	25	mV
		V_{DIFF} 40V, 8mA I_L 150 mA, AT_A = 25°C		-25	25	
		V_{DIFF} = 40V, 8mA I_L 50 mA	•	-50	50	
Thermal Regulation	V_{RTH}	V_{in} = -16.25V, I_L =330 mA		-5	5	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
Adjustment Pin	$^3I_{Adj}$					
Current Change	(line)	3V V_{DIFF} 40V	•	-5	5	µA
	$^3I_{Adj}$					
	(load)	V_{DIFF} = 5V, 8mA I_L 500 mA	•	-5	5	µA
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	
Current Limit	I_{CL}	V_{DIFF} 5V	•	0.5	1.8	
(Note 2)		V_{DIFF} = 40V, T_A = 25°C		0.15	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.
2. If not tested, shall be guaranteed to the specified limits.
3. The • denotes the specifications which apply over the full operating temperature range.

3.3

TYPICAL APPLICATION



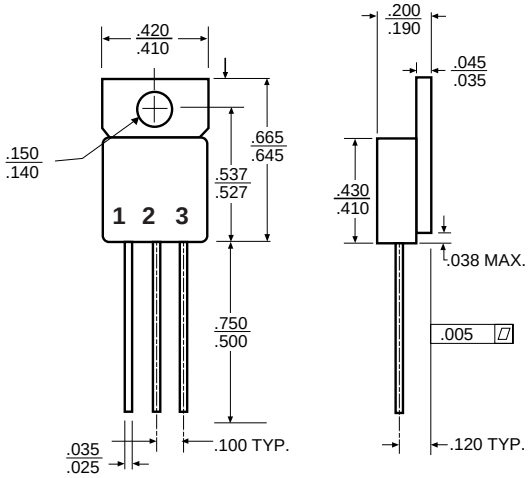
* C_{in} is required if regulator is located more than 4 inches from power supply filter. A 1 µF solid tantalum or 10 µF aluminum electrolytic is recommended.

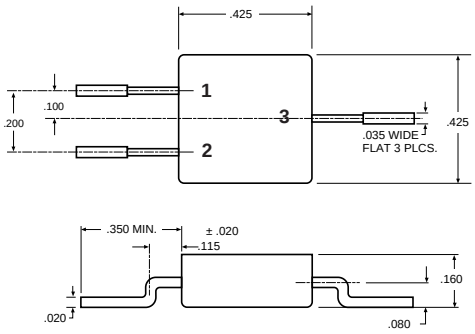
** C_o is necessary for stability. A 1 µF solid tantalum or 10 µF aluminum electrolytic is recommended.

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

OM1325NTM, OM1325STM, OM1325NKM, OM1325SMM, OM1325NMM, OM1325N2M

MECHANICAL OUTLINE

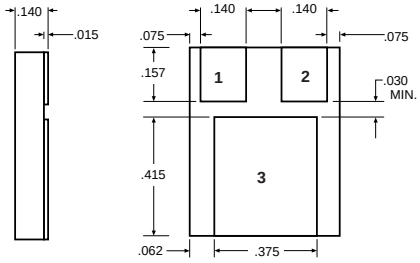




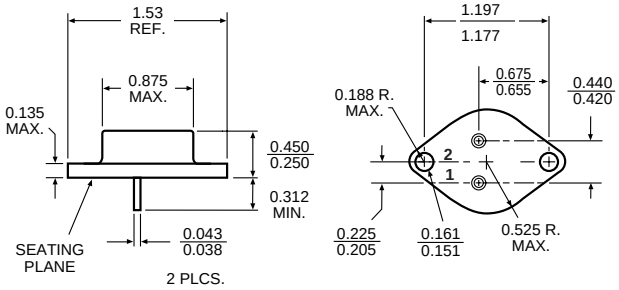
OM1325SMM
Front View
Pin 1 - Adjust
Pin 2 - Output
Pin 3 - Input
Case - Isolated

OM1325STM
Isolated
Front View
Pin 1 - Adjust
Pin 2 - Input
Pin 3 - Output
Tab - Isolated

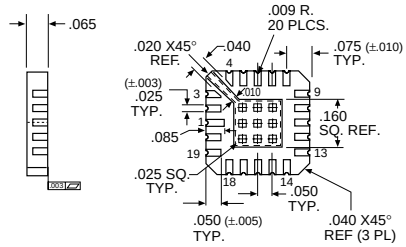
OM1325NTM
Non-Isolated
Front View
Pin 1 - Adjust
Pin 2 - Input
Pin 3 - Output
Tab - Input



OM1325NMM
Pin 1 - Adjust
Pin 2 - Output
Pin 3 - Input



OM1325NKM
Pin 1 - Adjust
Pin 2 - Output
Case - Input



OM1325N2M

Pin 1	V_{OUT}	Pin 11	VIN
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

For additional information please see the mechanical outline section.

Omnirel *205 Crawford Street, Leominster, MA 01453 USA (508) 534-5776 FAX (508) 537-4246*