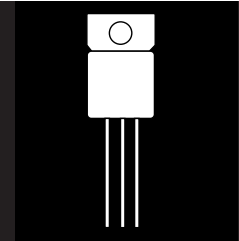


# 1.5 AMP HIGH VOLTAGE NEGATIVE ADJUSTABLE REGULATOR



**Three Terminal, High Voltage, Precision Adjustable Negative Voltage Regulator In Hermetic JEDEC TO-257AA Package**

## FEATURES

- Similar To Industry Standard LT137AHV
- Adjustable Output Voltage
- Built In Thermal Overload Protection
- Short Circuit Current Limiting
- Available In Isolated and Non-Isolated Package
- Maximum Output Voltage Tolerance Is Guaranteed To  $\pm 1\%$
- Available Hi-Rel Screened

## DESCRIPTION

This three terminal negative regulator is supplied in a hermetically sealed metal package whose outline is similar to the industry standard TO-220 plastic package. 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 unit also features output voltages that can be fixed from -1.2 volts to -47 volts.

## ABSOLUTE MAXIMUM RATINGS @ 25°C

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Power Dissipation ( $P_D$ ) (Internally Limited).....	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:	
$\theta_{JC}$ (Isolated) .....	4.2°C/W
$\theta_{JC}$ (Non-Isolated).....	3.5°C/W
$\theta_{JA}$ .....	42°C/W
Maximum Output Current.....	1.5 A

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

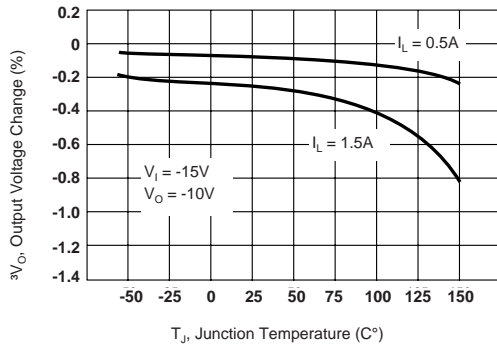
Parameter	Symbol	Test Conditions	Min.	Max.	Unit
Reference Voltage	$V_{REF}$	$V_{DIFF} = 3.0\text{V}$ , $T_A = 25^\circ\text{C}$	-1.262	-1.238	V
		$V_{DIFF} = 3.0\text{V}$ •	-1.28	-1.22	
		$V_{DIFF} = 50\text{V}$ , $T_A = 25^\circ\text{C}$	-1.28	-1.22	
		$V_{DIFF} = 50\text{V}$ •	-1.28	-1.22	
Line Regulation (Note 1)	$R_{LINE}$	3.0 V $V_{DIFF}$ 50V, $T_A = 25^\circ\text{C}$ •	-6 -20	6 20	mV
Load Regulation (Note 1)	$R_{LOAD}$	$V_{DIFF}$ 50V, 8mA $I_L$ 110mA, $T_A = 25^\circ\text{C}$ • $V_{DIFF} = 5\text{V}$ , 8mA $I_L$ 1.5A, $T_A = 25^\circ\text{C}$ •	-25 -25 -50	25 25 50	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)	$R_N$	$f = 120\text{ Hz}$ , $V_{OUT} = V_{ref}$ • $C_{Adj} = 10\text{ }\mu\text{F}$ , $I_{OUT} = 100\text{ mA}$	66		dB
Adjustment Pin Current	$I_{Adj}$	$V_{DIFF} = 3.0\text{V}$ • $V_{DIFF} = 40\text{V}$ • $V_{DIFF} = 50\text{V}$ •		100 100 100	$\mu\text{A}$
Adjustment Pin Current Change	$^3I_{Adj}$	$V_{DIFF} = 5\text{V}$ , 8mA $I_{OUT}$ 1.5A • 3V $V_{DIFF}$ 50V, $I_L$ 8mA •	-5 -6	5 6	$\mu\text{A}$
Minimum 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) • $V_{DIFF} = 50\text{V}$ , $V_{OUT} = -1.4\text{V}$ (forced) •		3 3 5 5	mA
Current Limit (Note 2)	$I_{CL}$	$V_{DIFF} = 5\text{V}$ • $V_{DIFF} = 50\text{V}$ , $T_A = 25^\circ\text{C}$	1.5 0.2	3.5 1.0	A

**Notes:**

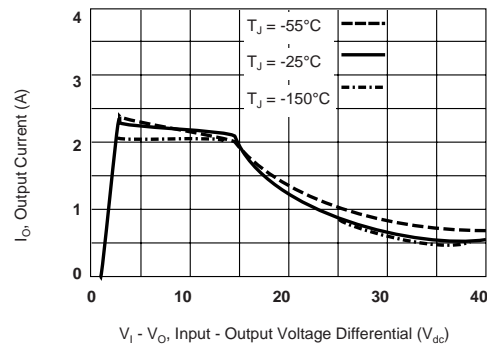
- Load and Line Regulation are specified at a constant junction temperature. Pulse testing with low duty cycle is used. Changes in output voltage due to heating effects must be taken into account separately.
- If not tested, shall be guaranteed to the specified limits.
- The • denotes the specifications which apply over the full operating temperature range.

## TYPICAL PERFORMANCE CHARACTERISTICS

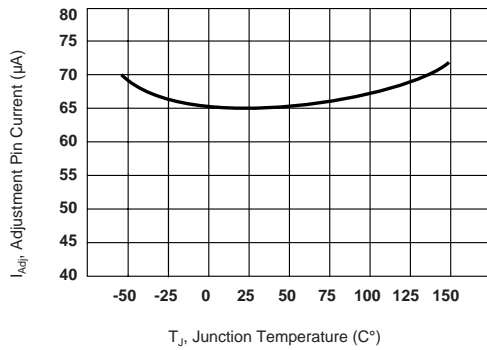
**LOAD REGULATION**



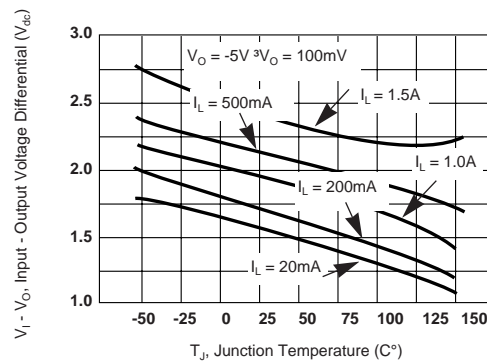
**CURRENT LIMIT**



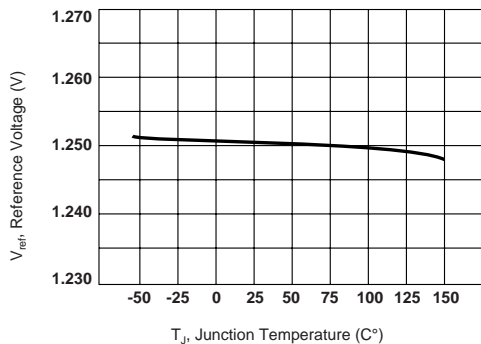
**ADJUSTMENT PIN CURRENT**



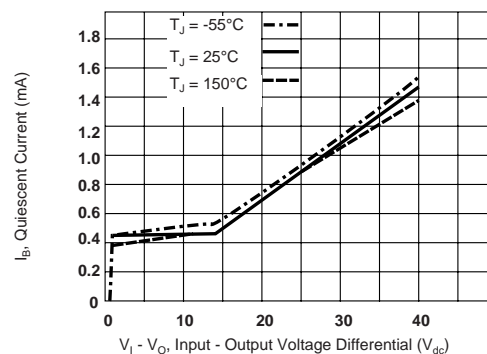
**DROPOUT VOLTAGE**



**TEMPERATURE STABILITY**



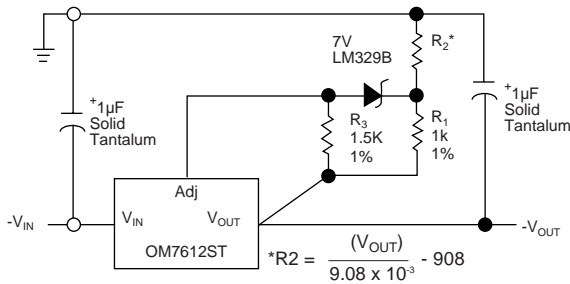
**MINIMUM OPERATING CURRENT**



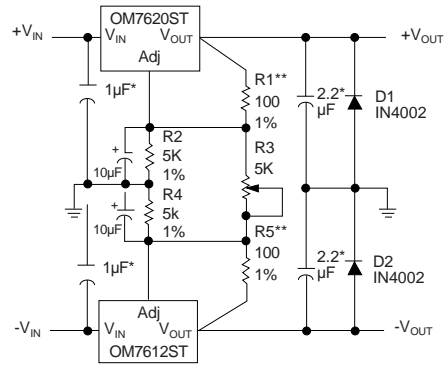
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## TYPICAL APPLICATIONS

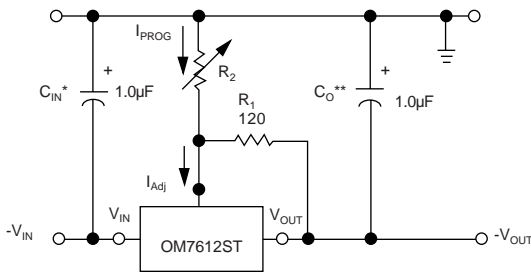
### HIGH STABILITY REGULATOR



### DUAL TRACKING SUPPLY ±1.25V TO ±20V



- \* Solid Tantalum
- \*\* R1 or R2 may be trimmed slightly to improve tracking.

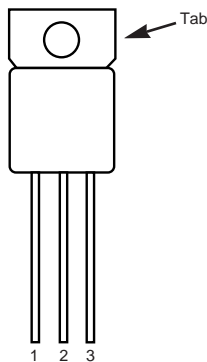


- \*  $C_{IN}$  is required if regulator is located more than 4 inches from power supply filter. A 1 µF solid tantalum or 10 µF aluminum electrolytic is recommended.

- \*\*  $C_O$  is necessary for stability. A 1 µF solid tantalum or 10 µF aluminum electrolytic is recommended.

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

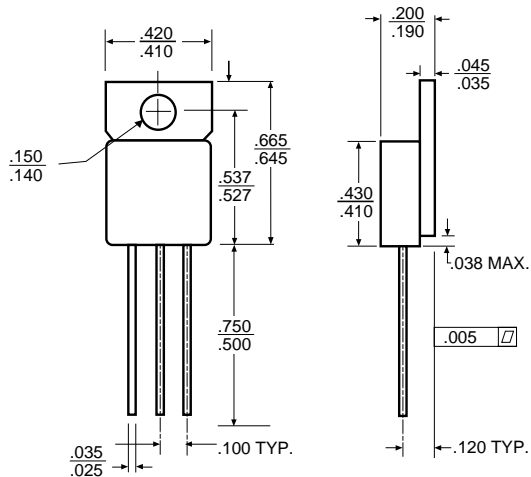
### CONNECTION DIAGRAM



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

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

### MECHANICAL OUTLINE



### NOTES

- Case is metal/hermetically sealed
- Isolated Tab