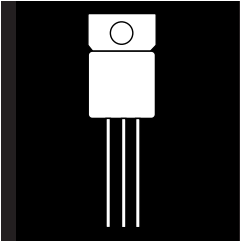# 1.5 AMP HIGH VOLTAGE NEGATIVE ADJUSTABLE REGULATOR

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 ±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

3.3

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:
    q_{JC} (Isolated) . . . . 4.2°C/W
    q_{JC} (Non-Isolated) . . . . 3.5°C/W
    q_{JA} . . . . 42°C/W
Maximum Output Current. . . . . 1.5 A

Omnirel

ELECTRICAL CHARACTERISTICS -55°C $\leq$ T$_A$ $\leq$ 125°C, I$_L$ = 8mA (unless otherwise specified)

| 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 $\leq$ V$_{DIFF}$ $\leq$ 50V, T$_A$ = 25°C		-6	6	
(Note 1)			•	-20	20	mV
Load Regulation	R$_{LOAD}$	V$_{DIFF}$ $\leq$ 50V, 8mA $\leq$ I$_L$ $\leq$ 110mA, T$_A$ = 25°C		-25	25	
(Note 1)		V$_{DIFF}$ = 5V, 8mA $\leq$ I$_L$ $\leq$ 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, I$_{OUT}$ = 100 mA				
Adjustment Pin Current	I$_{Adj}$	V$_{DIFF}$ = 3.0V	•		100	
		V$_{DIFF}$ = 40V	•		100	µA
		V$_{DIFF}$ = 50V	•		100	
Adjustment Pin	[3]I$_{Adj}$	V$_{DIFF}$ = 5V, 8mA $\leq$ I$_{OUT}$ $\leq$ 1.5A	•	-5	5	µA
Current Change		3V $\leq$ V$_{DIFF}$ $\leq$ 50V, I$_L$ $\leq$ 8mA	•	-6	6	
Miminum Load Current	I$_{Lmin}$	V$_{DIFF}$ = 3.0V, V$_{OUT}$ = -1.4V (forced)	•		3	
		V$_{DIFF}$ = 10V, V$_{OUT}$ = -1.4V (forced)	•		3	mA
		V$_{DIFF}$ = 40V, V$_{OUT}$ = -1.4V (forced)	•		5	
		V$_{DIFF}$ = 50V, V$_{OUT}$ = -1.4V (forced)	•		5	
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.
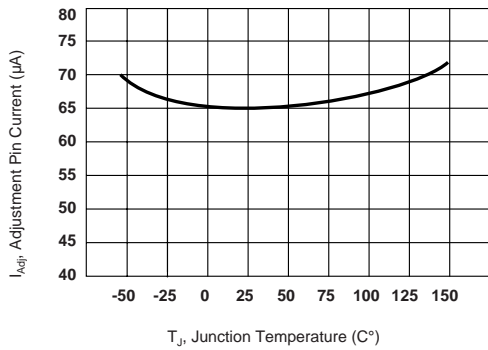
3.3

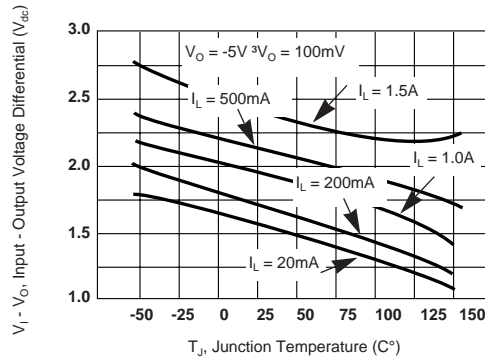# TYPICAL PERFORMANCE CHARACTERISTICS
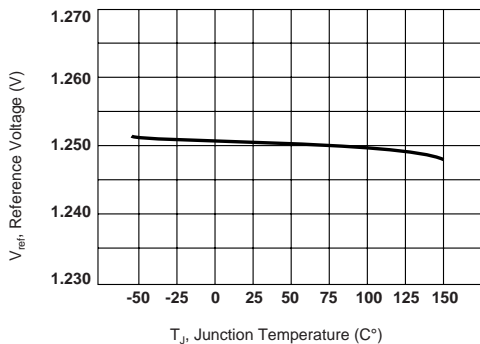
LOAD REGULATION
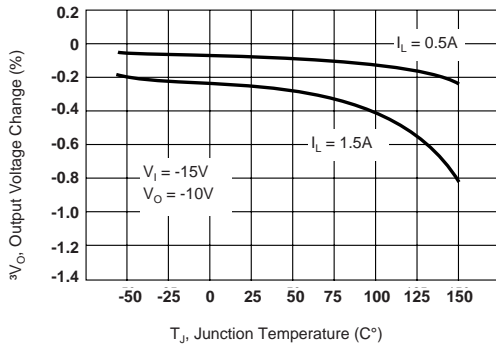
CURRENT LIMIT
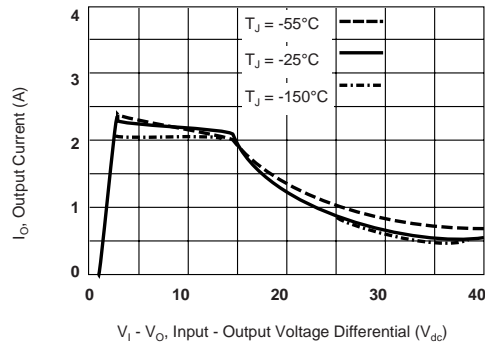
ADJUSTMENT PIN CURRENT

DROPOUT VOLTAGE

TEMPERATURE STABILITY

MINIMUM OPERATING CURRENT

3.3

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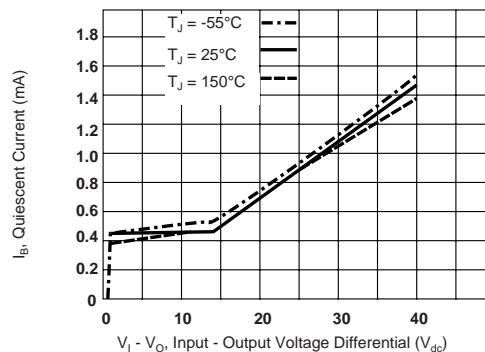
TYPICAL APPLICATIONS

HIGH STABILITY REGULATOR

7V
LM329B
R₂*

⁺1µF
Solid
Tantalum

R₃
1.5K
1%

R₁
1k
1%

⁺1µF
Solid
Tantalum

-V_IN

Adj

V_IN   V_OUT

OM7612ST

-V_OUT

$$*R2 = \frac{(V_{OUT})}{9.08 \times 10^{-3}} - 908$$
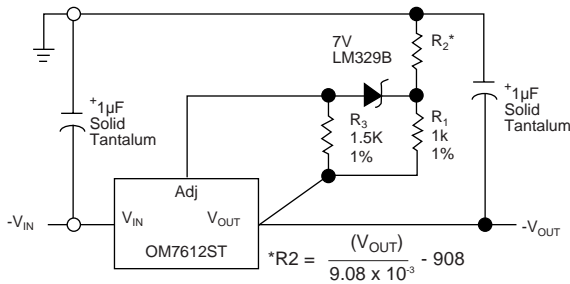
DUAL TRACKING SUPPLY ±1.25V TO ±20V

+V_IN

OM7620ST
V_IN   V_OUT
Adj

+V_OUT

1µF*

R1**
100
1%

2.2*
µF

D1
IN4002

R2
5K
1%

R3
5K

⁺
10µF

R4
5k
1%

⁺
10µF

R5**
100
1%

2.2*
µF

D2
IN4002

1µF*

-V_IN

Adj
V_IN   V_OUT
OM7612ST

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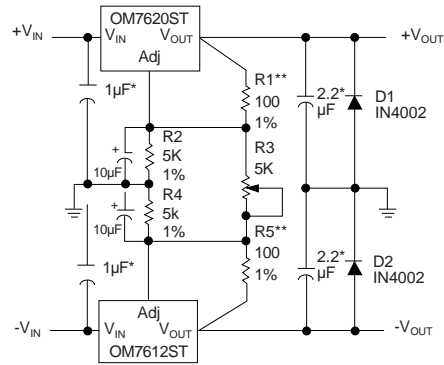
* Solid Tantalum
** R1 or R2 may be trimmed slightly to improve tracking.

I_PROG

R₂

C_IN*   ⁺ 1.0µF

R₁
120

C_O**   ⁺ 1.0µF

I_Adj
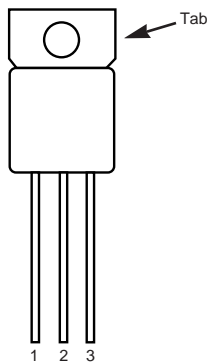
-V_IN   V_IN   OM7612ST   V_OUT   -V_OUT
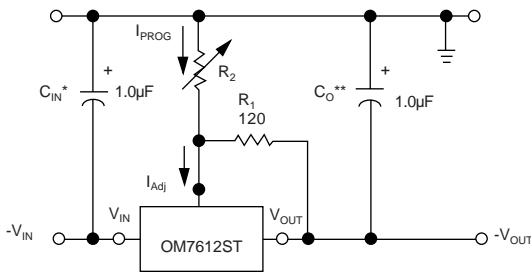
* C_{IN} is required if regulator is located more than 4 inches from power supply filter. A 1 µF solid tantalum or 10 µF aluminum electrolytic is recommended.

** C_O is necessary for stability. A 1 µF solid tantalum or 10 µF aluminum electrolytic is recommended.
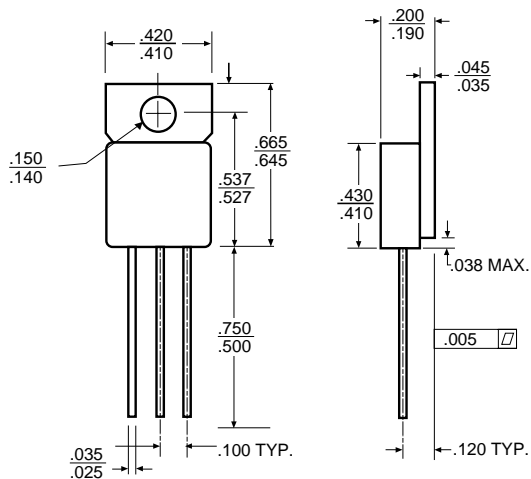
$$V_{OUT} = -1.25 \ V \ (1 + \frac{R_2}{R_1})$$

CONNECTION DIAGRAM

Tab

1   2   3

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

3.3

MECHANICAL OUTLINE

.420
.410

.200
.190

.045
.035

.150
.140

.665
.645

.537
.527

.430
.410

.038 MAX.

.750
.500

.005

.035
.025

.100 TYP.

.120 TYP.

NOTES
• Case is metal/hermetically sealed
• Isolated Tab