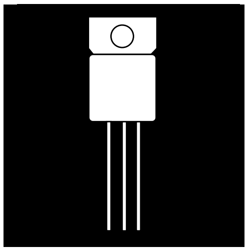
3 AMP NEGATIVE ADJUSTABLE REGULATOR APPROVED TO DESC DRAWING 5962-87741



Three Terminal, Negative Adjustable Voltage Regulator In Hermetic Packages

FEATURES

- Similar To Industry Standard LT1033
- Approved To DESC Standardized Military Drawing Number 5962-8774101
- Adjustable Output Voltage
- Built In Thermal Overload Protection
- Short Circuit Current Limiting
- Maximum Output Voltage Tolerance is Guaranteed To ±1%
- Guaranteed Dropout Voltage At Multiple Current Levels
- TO-257 Available in Isolated and Non-Isolated Packages

DESCRIPTION

This three terminal negative adjustable voltage regulator is designed to provide 3A with higher efficiency than conventional voltage regulators. This device is designed to operate down to 1 Volt input to output differential and the dropout voltage is fully specified as a function of load current. Supplied in easy-to-use hermetic TO-257 and TO-3, this device is ideally suited for Military applications where small size and high reliability is required.

ABSOLUTE MAXIMUM RATINGS @ 25°C

Power Dissipation (P_d) . . . . Internally Limited
Input - Output Voltage Differential . . . . 35 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:
(TO-257, Isolated) . . . . 3.5°C/W
(TO-257, Non-Isolated) . . . . 2.3°C/W
(TO-3) . . . . 3.0°C/W
Recommended Operating Conditions:
Output Voltage Range . . . . -3V to -15 V
Ambient Operating Temperature Range (T_A) . . . . - 55°C to + 125°C
Input Voltage Range . . . . - 5V to -35 V

3.3

ELECTRICAL CHARACTERISTICS $-55°C \leq T_A \leq +125°C$ (unless otherwise specified)

Parameter	Symbol	Test Conditions		Min.	Max.	Unit
Reference Voltage	V_{REF}	$\lvert V_{IN} - V_{OUT} \rvert = 5$ V, $I_{OUT} = 5$ mA, $T_A = 25°$ C		-1.238	-1.262	V
		$3\ V \leq \lvert V_{IN} - V_{OUT} \rvert \leq 35$ V	•	-1.215	-1.285	
Line Regulation (Note 1)	$\frac{\Delta V_{OUT}}{\Delta V_{IN}}$	$3\ V \leq \lvert V_{IN} - V_{OUT} \rvert \leq 35$ V			0.015	%/V
			•		0.04	
Load Regulation (Note 1)	$\frac{\Delta V_{OUT}}{\Delta I_{OUT}}$	$\lvert V_{OUT} \rvert \leq 5$ V, $T_A = 25°$ C $10\ mA \leq I_{OUT} \leq I_{MAX.}$			50	mV
			•		75	
		$\lvert V_{OUT} \rvert \geq 5.0$ V $10\ mA \leq I_{OUT} \leq I_{MAX.}$			1.0	%
			•		1.5	
Thermal Regulation	-	30 ms pulse, $T_A = 25°$ C			0.02	%/W
Ripple Rejection (Note 2)	$\frac{\Delta V_{IN}}{\Delta V_{REF}}$	$\lvert V_{OUT} \rvert = -10$ V, f = 120 Hz, $C_{Adj} = 0$		56		dB
			•	53		
		$\lvert V_{OUT} \rvert = -10$ V, f = 120 Hz, $C_{Adj} = 10\ \mu F$		70		dB
			•	60		
Adjust Pin Current	I_{Adj}	$V_{DIFF} = 35$ V, $I_L = 10$ mA	•		100	μA
Adjust Pin Current Change	ΔI_{Adj}	$10\ mA \leq I_{OUT} \leq I_{MAX.}$	•		2.0	μA
		$3\ V \leq \lvert V_{IN} - V_{OUT} \rvert \leq 35$ V	•		5.0	
Minimum Load Current	I_{Min}	$\lvert V_{IN} - V_{OUT} \rvert \leq 35$ V	•		5.0	mA
		$\lvert V_{IN} - V_{OUT} \rvert \leq 10$ V	•		3.0	
Current Limit	I_{Lim}	$\lvert V_{IN} - V_{OUT} \rvert \leq 10$ V		3.0	6.0	A
			•	3.0		
		$\lvert V_{IN} - V_{OUT} \rvert = 35$ V		0.5	2.5	A
			•	0.5		
Temperature Stability (Note 2)	$\frac{\Delta V_{OUT}}{\Delta T}$	$-55°\ C \leq T_J \leq +125°$ C	•		1.5	%
Long Term Stability (Note 2)	$\frac{\Delta V_{OUT}}{\Delta T}$	$T_A = +125°$ C, t = 1000 hrs			1.0	%

Notes:

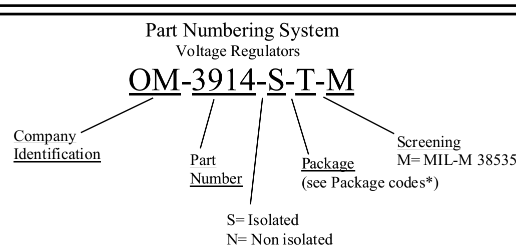
1. Line and Load Regulation are measured at a constant junction temperature using a low duty cycle pulse technique. Although power dissipation is internally limited, regulation is guaranteed up to the maximum power dissipation of 30 W. Power dissipation is determined by the input/output differential voltage and the output current. Guaranteed maximum power dissipation will not be available over the full input/output voltage range.
2. Guaranteed by design, characterization or correlation to other tested parameters.
3. The • denotes the specifications which apply over the full operating temperature range.

3.3

PART NUMBER DESIGNATOR

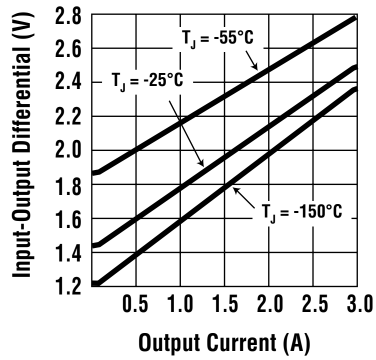
Standard Military Drawing Number	Omnirel Part Number
5962-8774101U	OM3914STM
5962-8774101T	OM3914NTM
5962-8774101X	OM3914NKM

"U" = Isolated
"T" = Non-Isolated

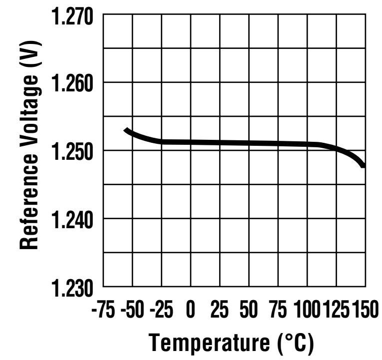


TYPICAL PERFORMANCE CHARACTERISTICS

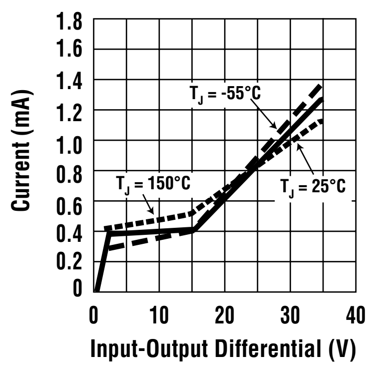
DROPOUT VOLTAGE



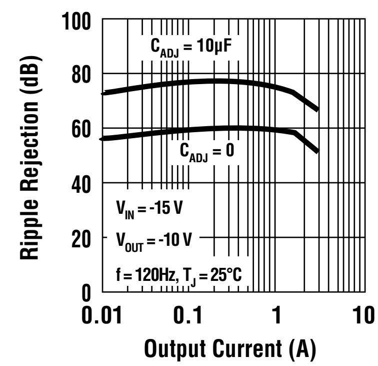
TEMPERATURE STABILITY



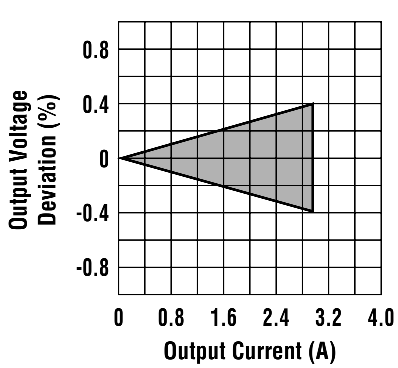
MINIMUM LOAD CURRENT



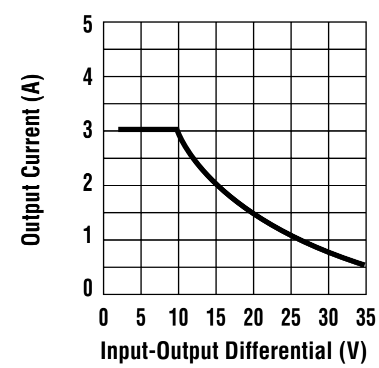
RIPPLE REJECTION



LOAD REGULATION

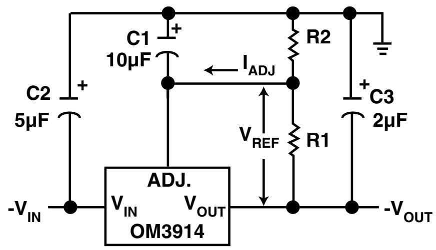


GUARANTEED MINIMUM OUTPUT CURRENT



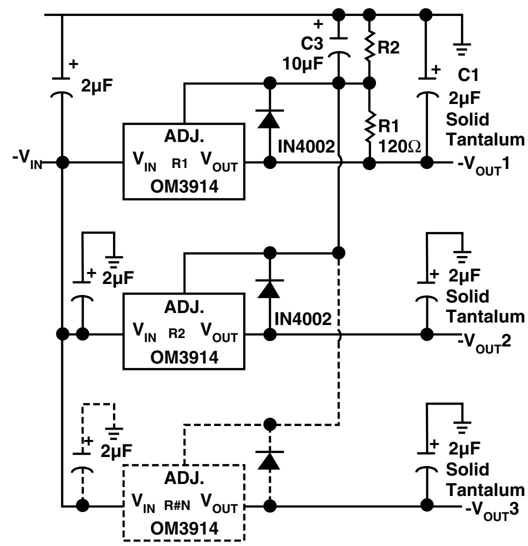
3.3

TYPICAL APPLICATIONS

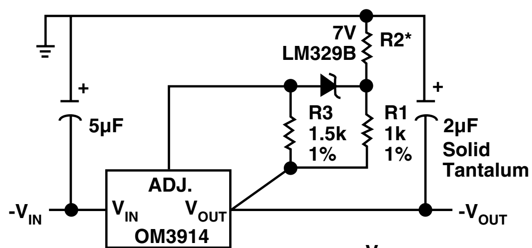


$$V_{OUT} = V_{REF}\left(1 + \frac{R2}{R1}\right) + I_{ADJ}\,(R2)$$

MULTIPLE TRACKING REGULATORS

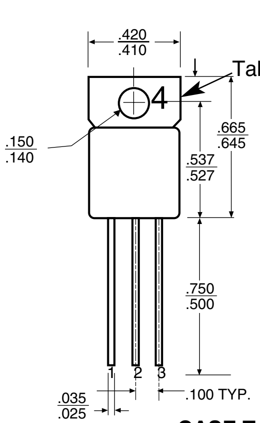


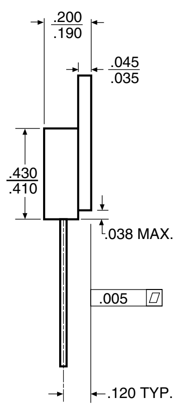
HIGH STABILITY REGULATOR



$$^{*}R2 = \frac{V_{OUT}}{9.08 \times 10^{-3}} - 908\Omega$$

MECHANICAL OUTLINES





Front View

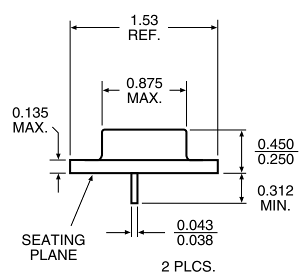
CASE T

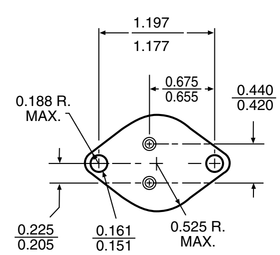
Pin 1 - Adjust
Pin 2 - VIN
Pin 3 - VOUT
Tab - VIN

CASE U

Pin 1 - Adjust
Pin 2 - VIN
Pin 3 - VOUT
Tab - No Connection

TO-3





OM3914NKM

Pin 1 – Adjust
Pin 2 – Vout
Case – Vin

NOTES:

- Case is metal/hermetically sealed
- Isolated Tab