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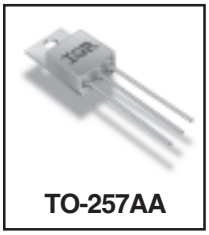
International
IOR Rectifier

Adjustable Positive Linear Regulator Thru-Hole (TO-257AA)

OM7602ST
OM7602NT
1.5A

Product Summary

Part Number	Input Voltage Range	Adjustable Output Voltage	Package
OM7602ST	4.25V to 41.25V	1.2V to 37V	TO-257 (Isolated)
OM7602NT	4.25V to 41.25V	1.2V to 37V	TO-257 (Non-Isolated)



TO-257AA

Description

This three terminal positive regulator is supplied in a hermetically sealed metal 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. This unit also features output voltages that can be trimmed from 1.2 volt to 37 volts using external resistors.

Features:

- Adjustable Output Voltage
- Eliminates Stocking Fixed Voltages
- Built-In Thermal Oveload Protection
- Short Circuit Current Limiting
- Isolated / Non-Isolated Hermetic TO-257AA Package ensures High Reliability

Absolute Maximum Ratings @ Tc = 25°C

Parameter	Symbol	Value	Units
Input-Output Voltage Differential	V_{I-O}	40	V
Input Voltage Range	V_{IN}	4.25 to 41.25	
Output Voltage Range	V_{OUT}	1.2 to 37	
Output Current	I_{OUT}	1.5	A
Power Dissipation @ T_C = 86°C	P_{DC}	17.5	W
Power Dissipation @ T_A = 25°C	P_{DA}	3.0	
Thermal Resistance, Junction to Case	$R_{\theta JC}$	3.5	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	42	
Operating Junction Temperature Range	T_J	-55 to +150	°C
Storage Temperature Range	T_{STG}	-65 to +150	
Lead Temperature Soldering (10 seconds maximum)	T_L	300	

Electrical Characteristics -55°C ≤ T_A ≤ 125°C, I_L = 8.0mA (Unless Otherwise Specified)

Parameter	Symbol	Test Conditions	Min.	Max.	Units
Reference Voltage	V_{REF}	V_{DIFF} = 3.0V, T_A = 25°C	1.2	1.3	V
		V_{DIFF} = 3.3V ③	1.2	1.3	
		V_{DIFF} = 40V ③	1.2	1.3	
Line Regulation ①	R_{LINE}	3.0V ≤ V_{DIFF} ≤ 40V, V_{OUT} = V_{REF}, T_A = 25°C	-9.0	9.0	mV
		3.3V ≤ V_{DIFF} ≤ 40V, V_{OUT} = V_{REF} ③	-23	23	
Load Regulation ①	R_{LOAD}	V_{DIFF} = 3.0V, 10mA ≤ I_L ≤ 1.5A, T_A = 25°C	-15	15	
		V_{DIFF} = 3.3V, 10mA ≤ I_L ≤ 1.5A ③	-15	15	
		V_{DIFF} = 40V, 10mA ≤ I_L ≤ 300mA, T_A = 25°C	-15	15	
		V_{DIFF} = 40V, 10mA ≤ I_L ≤ 195mA ③	-15	15	
Thermal Regulation	V_{RTH}	V_{IN} = 14.6V, I_L =1.5A, P_D = 20W, t = 20ms, T_A = 25°C	-16	16	
Ripple Rejection ②	R_N	f = 120Hz, V_{OUT} = V_{REF}, C_{ADJ} = 10μF ③	66	-	dB
Adjustment Pin Current	I_{ADJ}	V_{DIFF} = 3.0V, T_A = 25°C	-	100	μA
		V_{DIFF} = 3.3V ③	-	100	
		V_{DIFF} = 40V ③	-	100	
Adjustment Pin Current Change	ΔI_{ADJ}	V_{DIFF} = 3.0V, 10mA ≤ I_L ≤ 1.5A, T_A = 25°C	-5.0	5.0	
		V_{DIFF} = 3.3V, 10mA ≤ I_L ≤ 1.5A ③	-5.0	5.0	
		V_{DIFF} = 40V, 10mA ≤ I_L ≤ 300mA, T_A = 25°C	-5.0	5.0	
		V_{DIFF} = 40V, 10mA ≤ I_L ≤ 195mA ③	-5.0	5.0	
		3.0V ≤ V_{DIFF} ≤ 40V, T_A = 25°C	-5.0	5.0	
		3.3V ≤ V_{DIFF} ≤ 40V ③	-5.0	5.0	
Minimum Load Current	I_{LMIN}	V_{DIFF} = 3.0V, V_{OUT} =1.4V (forced), T_A = 25°C	-	5.0	mA
		V_{DIFF} = 3.3V, V_{OUT} =1.4V (forced) ③	-	5.0	
		V_{DIFF} = 40V, V_{OUT} =1.4V (forced) ③	-	5.0	
Current Limit ②	I_{CL}	V_{DIFF} = 15V ③	1.5	3.5	A
		V_{DIFF} = 40V, T_A = 25°C	0.18	1.5	

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 specific limits.

③ The specifications are applied over the full operating temperature range.

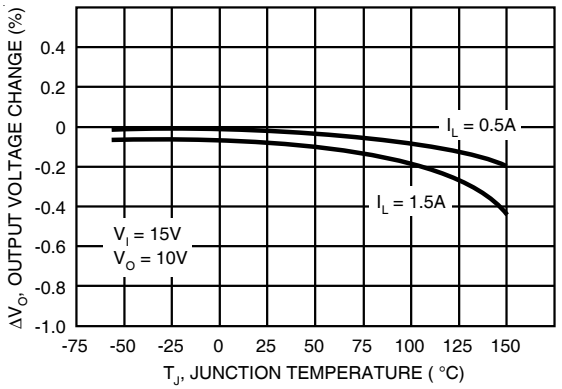


Fig. 1 Load Regulation

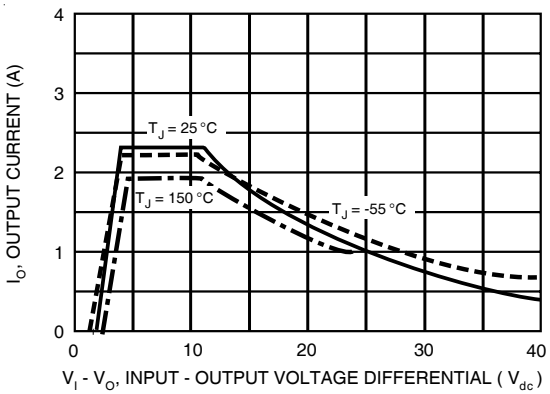


Fig. 2 Current Limit

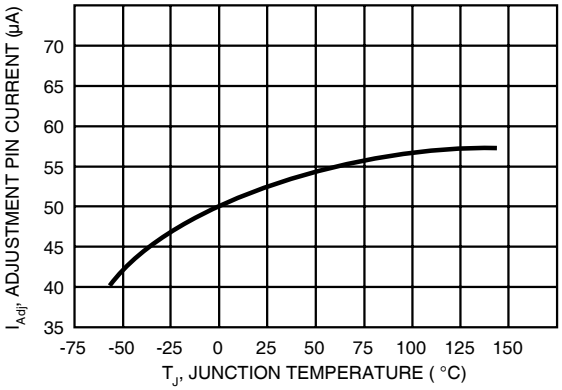


Fig. 3 Adjustment Pin Current

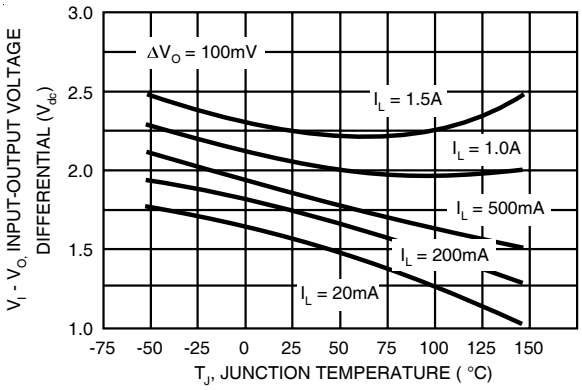


Fig. 4 Dropout Voltage

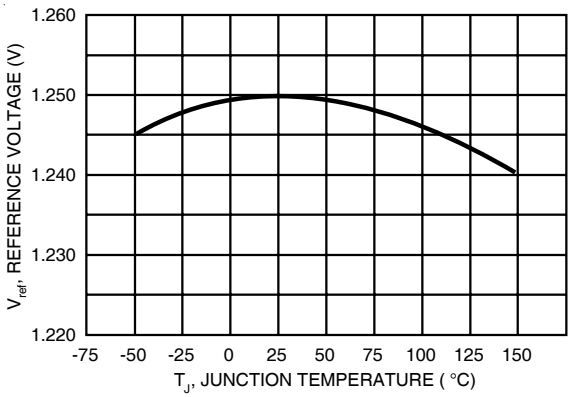


Fig. 5 Temperature Stability

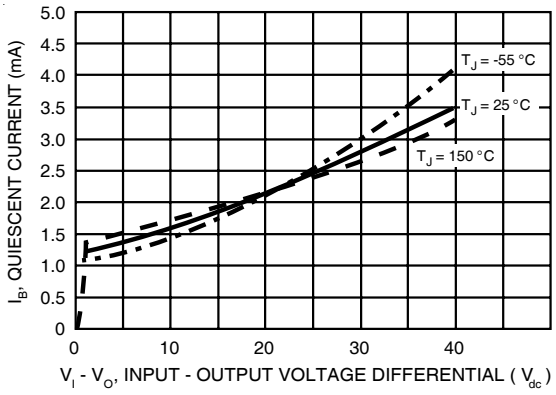
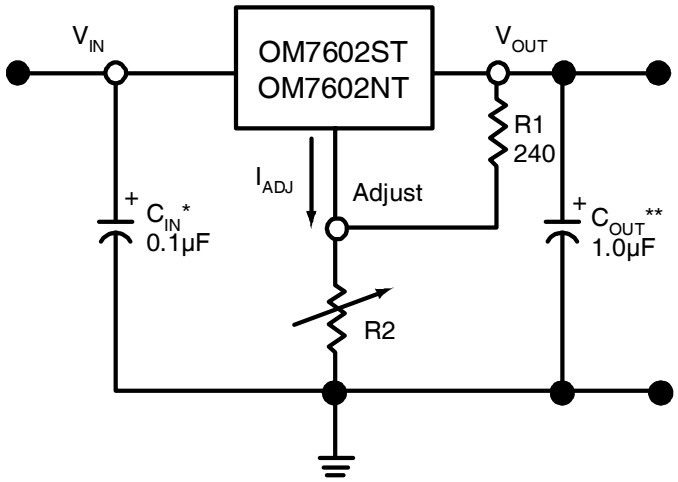


Fig. 6 Minimum Operating Current

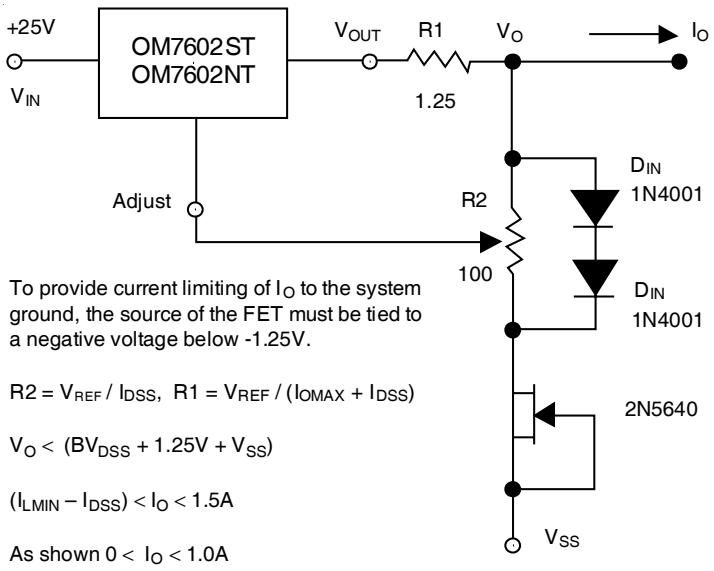
Fig. 7 - Standard Application



* C_{IN} is required if regulator is located an appreciable distance from power supply filter.
** C_{OUT} is not needed for stability, however it does improve transient response.
$V_{OUT} = 1.25V(1 + (R2/R1)) + I_{ADJ}(R2)$
Since I_{ADJ} is not controlled to less than 100µA, the error associated with this term is negligible in most applications.

Typical Applications

Fig. 8 Adjustable Current Limiter



To provide current limiting of I_O to the system ground, the source of the FET must be tied to a negative voltage below -1.25V.

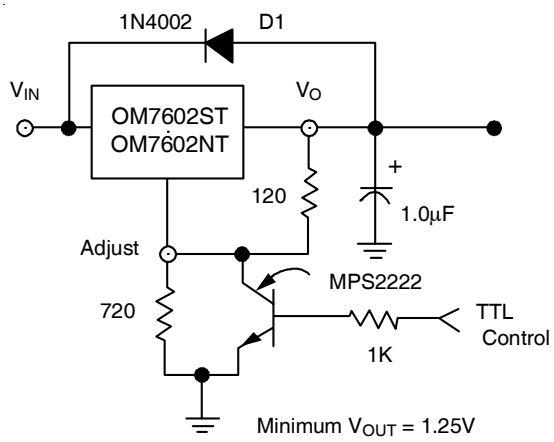
$R2 = V_{REF} / I_{DSS}$, $R1 = V_{REF} / (I_{OMAX} + I_{DSS})$

$V_O < (BV_{DSS} + 1.25V + V_{SS})$

$(I_{LMIN} - I_{DSS}) < I_O < 1.5A$

As shown $0 < I_O < 1.0A$

Fig. 9 5V Electronic Shut Down Regulator



D1 protects the device during an input short circuit

Fig. 10 Slow Turn-On Regulator

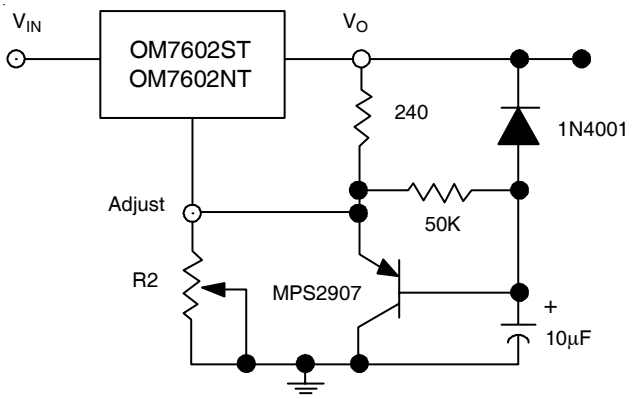
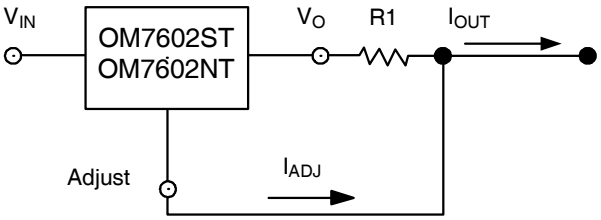


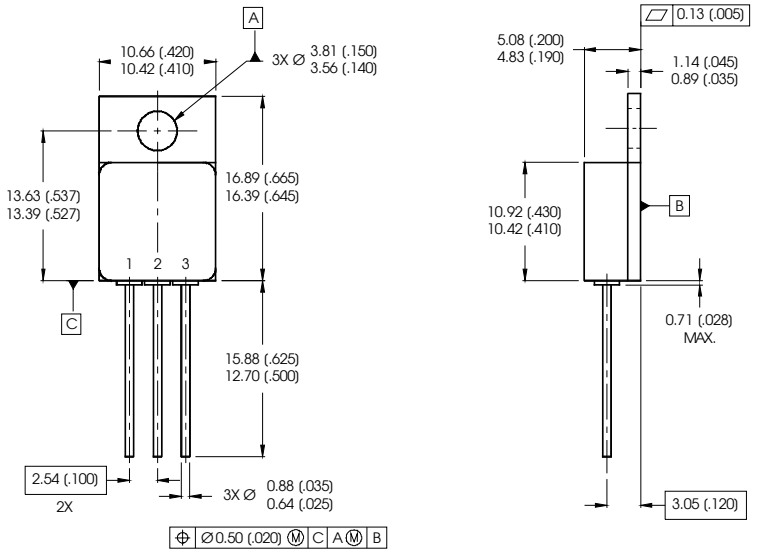
Fig. 11 Current Regulator



$I_{OUT} = (V_{REF} / R1) + I_{ADJ} = (1.25V / R1) + I_{ADJ}$

$10mA < I_{OUT} < 1.5A$

Case Outline and Dimensions — TO-257AA



NOTES:

1. DIMENSIONING & TOLERANCING PER ANSI Y14.5M-1994.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).
4. OUTLINE CONFORMS TO JEDEC OUTLINE TO-257AA.

PIN ASSIGNMENTS

ISOLATED		NON-ISOLATED	
Front View		Front View	
Pin #	Description	Pin #	Description
1	ADJUST	1	ADJUST
2	OUTPUT	2	OUTPUT
3	INPUT	3	INPUT
Tab	ISOLATED	Tab	OUTPUT

Part Numbering Nomenclature

OM 7602 S/N T M

Device Number

Screening
M = MIL-PRF-38535
P = Minimal Screening

Package Code
T = TO-257AA

Isolated / Non-Isolated
S = Isolated
N = Non-Isolated

International
IOR Rectifier

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Data and specifications subject to change without notice.10/2006