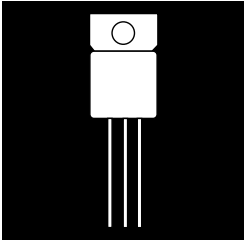


ISOLATED HERMETIC TO-257AA FIXED VOLTAGE NEGATIVE REGULATORS



Three Terminal, Fixed Voltage, 1.5 Amp
Precision Negative Regulators In Hermetic
JEDEC TO-257AA Package and D² Pac

FEATURES

- Isolated Hermetic Package, JEDEC TO-257AA Outline
- Output Voltages: -5V, -12V, -15V (Other Voltages Available)
- Output Voltages Set Internally To $\pm 1\%$ or $\pm 2\%$
- Built-In Thermal Overload Protection
- Short Circuit Current Limiting
- Product Is Available Screened To MIL-STD-883

DESCRIPTION

These three terminal negative regulators are 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, they can deliver over 1.5 amps of output current. These units feature internally trimmed output voltages to $\pm 1\%$ or 2% of nominal voltage. Standard voltages are -5V, -12V, and -15V. However, other voltages are available up to -24 volts. These units are ideally suited for Military applications where a hermetically sealed package is required.

ABSOLUTE MAXIMUM RATINGS @ 25°C

Input Voltage	-35 V
Operating Junction Temperature Range	- 55°C to + 150°C
Storage Temperature Range	- 65°C to + 150°C
Typical Power/Thermal Characteristics:	
Rated Power @ 25° C	T_C 17.5W
	T_A 3W
Thermal Resistance	θ_{JC} 4.2°C/W
	θ_{JA} 42°C/W

3.3

Notes: Product also available in Non-Isolated construction. To order this version, delete "I" from part number.
Example: Isolated Non-Isolated
 OM79XXIH OM79XXH

Use letter "A" after part number to designate $\pm 1\%$ output voltage tolerance.
Example: OM7905AIH

OM7900IH
OM7900SR

ELECTRICAL CHARACTERISTICS -5 Volt $V_{IN} = -10V, I_O = 500mA, -55^{\circ}C \leq T_A \leq 125^{\circ}C$ (unless otherwise specified)

Parameter	Symbol	Test Conditions	Min.	Max.	Unit
Output Voltage	V_{OUT}	$T_A = 25^{\circ}C$	-4.95	-5.05	V
		$V_{IN} = -7.5V$ to $-20V$	• -4.85	-5.15	V
Line Regulation (Note 1)	V_{RLINE}	$V_{IN} = -7.5V$ to $-20V$	•	12	mV
				25	mV
		$V_{IN} = -8.0V$ to $-12V$	•	5	mV
Load Regulation (Note 1)	V_{RLOAD}	$I_O = 5mA$ to 1.5 Amp	•	20	mV
				25	mV
		$I_O = 250mA$ to 750 mA	•	15	mV
Standby Current Drain	I_{SCD}		•	30	mV
				2.5	mA
Standby Current Drain Change With Line	ΔI_{SCD} (Line)	$V_{IN} = -7.0V$ to $-20V$	•	3.0	mA
Standby Current Drain Change With Load	ΔI_{SCD} (Load)	$I_O = 5mA$ to 1000mA	•	0.4	mA
Dropout Voltage	V_{DO}	$\Delta V_{OUT} = 100mV, I_O = 1.0A$	•	2.5	V
Peak Output Current	$I_{O(pk)}$	$T_A = 25^{\circ}C$	1.5	3.3	A
Short Circuit Current (Note 2)	I_{DS}	$V_{IN} = -35V$		1.2	A
			•	2.8	A
Ripple Rejection	$\frac{\Delta V_{IN}}{\Delta V_{OUT}}$	$f = 120Hz, \Delta V_{IN} = -10V$	63		dB
		(Note 3)	• 60		dB
Output Noise Voltage (Note 3)	N_O	$T_A = 25^{\circ}C, f = 10Hz$ to 100KHz		40	$\mu V/V$ RMS
Long Term Stability (Note 3)	$\frac{\Delta V_{OUT}}{\Delta t}$	$T_A = 25^{\circ}C, t = 1000$ hrs.		75	mV

ELECTRICAL CHARACTERISTICS -12 Volt $V_{IN} = -19V, I_O = 500mA, -55^{\circ}C \leq T_A \leq 125^{\circ}C$ (unless otherwise specified)

Parameter	Symbol	Test Conditions	Min.	Max.	Unit
Output Voltage	V_{OUT}	$T_A = 25^{\circ}C$	-11.88	-12.12	V
		$V_{IN} = -14.5V$ to $-27V$	• -11.64	-12.36	V
Line Regulation (Note 1)	V_{RLINE}	$V_{IN} = -14.5V$ to $-27V$	•	20	mV
				50	mV
		$V_{IN} = -16V$ to $-22V$	•	10	mV
Load Regulation (Note 1)	V_{RLOAD}	$I_O = 5mA$ to 1.5 Amp	•	30	mV
				32	mV
		$I_O = 250mA$ to 750 mA	•	60	mV
Standby Current Drain	I_{SCD}		•	16	mV
				30	mV
Standby Current Drain Change With Line	ΔI_{SCD} (Line)	$V_{IN} = -14.5V$ to $-27V$	•	3.5	mA
Standby Current Drain Change With Load	ΔI_{SCD} (Load)	$I_O = 5mA$ to 1000mA	•	4.0	mA
Dropout Voltage	V_{DO}	$\Delta V_{OUT} = 100mV, I_O = 1.0A$	•	0.8	mA
Peak Output Current	$I_{O(pk)}$	$T_A = 25^{\circ}C, I_O = 5mA$ to 1A	1.5	3.3	V
Short Circuit Current (Note 2)	I_{DS}	$V_{IN} = -35V$		1.8	A
			•	2.8	A
Ripple Rejection	$\frac{\Delta V_{IN}}{\Delta V_{OUT}}$	$f = 120Hz, \Delta V_{IN} = -10V$	56		dB
		(Note 3)	• 53		dB
Output Noise Voltage (Note 3)	N_O	$T_A = 25^{\circ}C, f = 10Hz$ to 100KHz		40	$\mu V/V$ RMS
Long Term Stability (Note 3)	$\frac{\Delta V_{OUT}}{\Delta t}$	$T_A = 25^{\circ}C, t = 1000$ hrs.		120	mV

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. Short Circuit protection is only assured up to $V_{IN} = -35V$.
3. If not tested, shall be guaranteed to the specified limits.
The • denotes the specifications which apply over the full operating temperature range.

ELECTRICAL CHARACTERISTICS -15 Volt $V_{IN} = -23V$, $I_O = 500mA$, $-55^{\circ}C \leq T_A \leq 125^{\circ}C$ (unless otherwise specified)

Parameter	Symbol	Test Conditions	Min.	Max.	Unit
Output Voltage	V_{OUT}	$T_A = 25^{\circ}C$	-14.85	-15.15	V
		$V_{IN} = -17.5V$ to $-30V$	• -14.55	-15.45	V
Line Regulation (Note 1)	V_{RLINE}	$V_{IN} = -17.5V$ to $-30V$	•	25	mV
			•	50	mV
		$V_{IN} = -20V$ to $-26V$	•	15	mV
Load Regulation (Note 1)	V_{RLOAD}	$I_O = 5mA$ to $1.5A$	•	35	mV
			•	75	mV
		$I_O = 250mA$ to $750mA$	•	21	mV
Standby Current Drain	I_{SCD}		•	45	mV
			•	6.0	mA
Standby Current Drain Change With Line	ΔI_{SCD} (Line)	$V_{IN} = -17.5V$ to $-30V$	•	6.5	mA
Standby Current Drain Change With Load	ΔI_{SCD} (Load)	$I_O = 5mA$ to $1000mA$	•	0.8	mA
Dropout Voltage	V_{DO}	$\Delta V_{OUT} = 100mV$, $I_O = 1.0A$	•	0.5	V
Peak Output Current	I_O (pk)	$T_A = 25^{\circ}C$		2.5	A
Short Circuit Current (Note 2)	I_{OS}	$V_{IN} = -35V$	•	3.3	A
			•	1.2	A
Ripple Rejection	$\frac{\Delta V_{IN}}{\Delta V_{OUT}}$	$f = 120Hz$, $\Delta V_{IN} = -10V$		2.8	A
		(Note 3)	•	50	dB
Output Noise Voltage (Note 3)	N_O	$T_A = 25^{\circ}C$, $f = 10Hz$ to $100KHz$			dB
Long Term Stability (Note 3)	$\frac{\Delta V_{OUT}}{\Delta t}$	$T_A = 25^{\circ}C$, $t = 1000hrs.$		40	$\mu V/V$ RMS
				150	mV

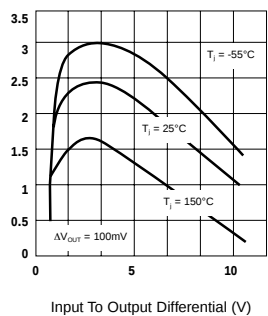
Notes:

- 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.
- Short Circuit protection is only assured up to $V_{IN} = -35V$.
- If not tested, shall be guaranteed to the specified limits.

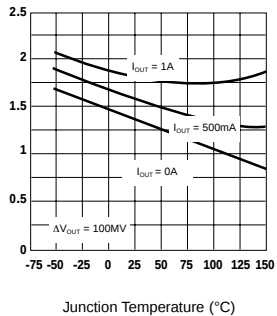
The • denotes the specifications which apply over the full operating temperature range.

TYPICAL PERFORMANCE CHARACTERISTICS

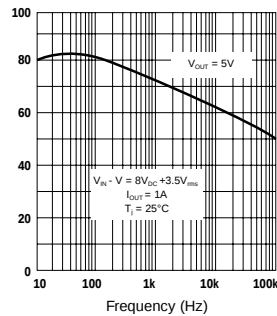
PEAK OUTPUT CURRENT



DROPOUT VOLTAGE



RIPPLE REJECTION

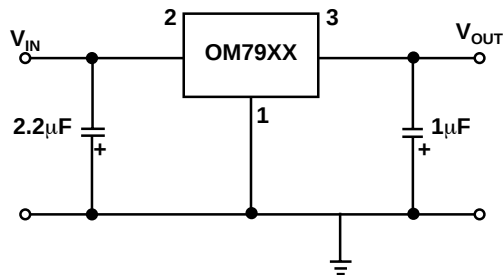


TYPICAL APPLICATIONS

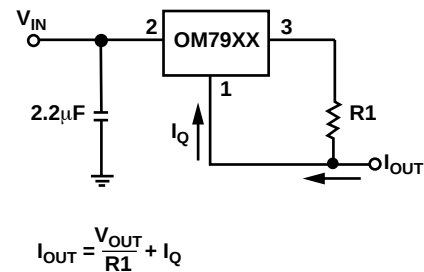
Input bypass capacitors are recommended for stable operation of the OM7900 series of regulators over the input voltage and output current ranges. Output bypass capacitors will improve the transient response of the regulator.

The bypass capacitors, (2.2μF on the input, 1μF on the output) should be ceramic or solid tantalum which have good high frequency characteristics. If aluminum electrolytics are used, their values should be 10μF or larger. The bypass capacitors should be mounted with the shortest leads, and if possible, directly across the regulator terminals.

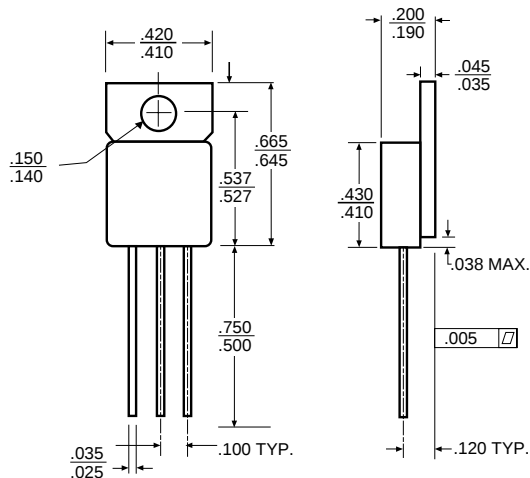
Fixed Output Regulator



Basic Current Regulator



MECHANICAL OUTLINE

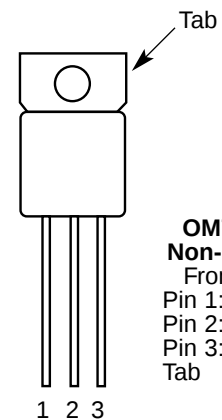


Note:

- Case is metal/hermetically sealed
- Isolated Tab
- Outline similar to JEDEC TO-220 outline

PIN CONNECTION

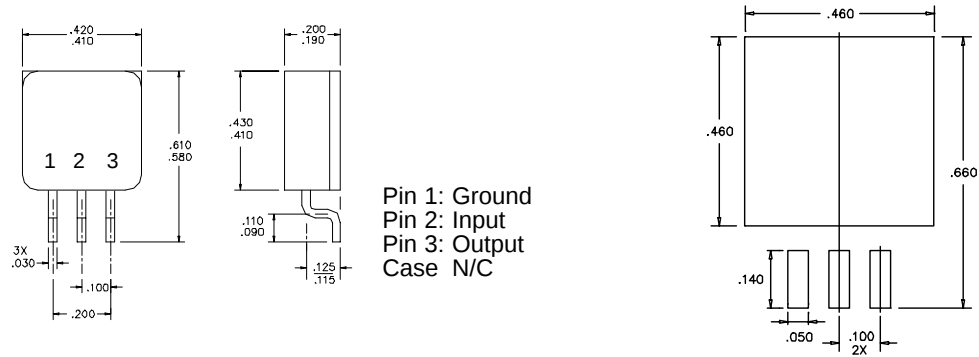
OM79XXIH
Isolated
Front View
Pin 1: Ground
Pin 2: Input
Pin 3: Output
Tab: Isolated



OM79XXH
Non-Isolated
Front View
Pin 1: Ground
Pin 2: Input
Pin 3: Output
Tab: Input

MECHANICAL OUTLINE

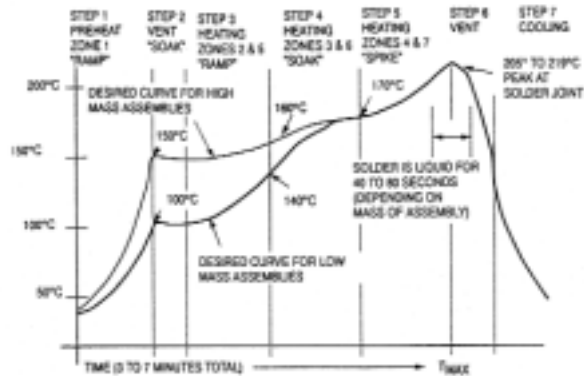
SOLDERING FOOTPRINT



TYPICAL SOLDERING PROFILE

Figure 1 shows a typical soldering profile for the D² and D³ Packages when soldering a to a printed circuit board. The profile will vary from system to system and solders to solders. Factors that can affect the profile include the type of soldering system used, density and type of components on the board or substrate material being used. This profile shows temperature versus time. The two profiles described are based on a high density and a low density board. The type solder used was 62/36/2 Tin Lead Silver with a melting point between 177-189°C. An convection/infrared soldering reflow system was used. The circuit and solder joints heat up first due to their mass followed by the components which typically run 30 degrees cooler than the solder joints.

TYPICAL HEATING PROFILE



Typical Soldering Heating Profile
Fig 1.

PART NUMBER DESIGNATOR

OM 7900 S R M
↑ ↑ ↑ ↑ ↑
Omnirel Device Isolated Package Hi-Rel Screening
Type Package Style Level