

DUAL POSITIVE AND NEGATIVE FIXED VOLTAGE REGULATORS



Dual 5V, 12V and 15V, 1.5 Amp Fixed Voltage Regulators In Single Hermetic MO-078AA Package

FEATURES

- Positive And Negative Regulators In One Package
- Hermetic 5-Pin Metal Package, JEDEC MO-078AA
- Isolated Case
- Output Voltages 5V, 12V and 15V; Other Voltages Available
- Output Voltages Set Internally To $\pm 2.0\%$
- Built-In Thermal Overload Protection
- Short Circuit Current Limiting
- Product Is Available Screened To MIL-S-19500, TX, TXV And S Levels

DESCRIPTION

This series of products offers a positive and a negative fixed voltage regulator in one hermetically sealed, 5 PIN package whose outline is similar to the industry standard TO-247 package. With heat sinking, they can regulate over 1.5 Amp of output current per device. Standard voltages are + or - 5V, 12V and 15V. Other voltages are available upon request. Output voltages are internally trimmed to $\pm 2.0\%$ of nominal voltage. These devices are ideally suited for Military applications where small size and high reliability are required.

To order, use the following Omnirel part numbers to determine the required output voltage of each regulator within one package.

Omnirel Part Number	Output Voltages	
	Positive	Negative
OM7501SC	+5V	-5V
OM7502SC	+5V	-12V
OM7503SC	+5V	-15V
OM7504SC	+12V	-5V
OM7505SC	+12V	-12V
OM7506SC	+12V	-15V
OM7507SC	+15V	-5V
OM7508SC	+15V	-12V
OM7509SC	+15V	-15V

PIN CONNECTION



Pin 1: + Input
Pin 2: + Output
Pin 3: Common
Pin 4: - Input
Pin 5: - Output

3.3

INDIVIDUAL POSITIVE REGULATORS

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}	$T_A = 25^{\circ}C$	4.92	5.08	V
		$V_{IN} = 7.5V$ to $20V$	• 4.85	5.15	V
Line Regulation (Note 1)	V_{RLINE}	$V_{IN} = 7.5V$ to $20V$	•	5	mV
			•	12	mV
		$V_{IN} = 8.0V$ to $12V$	•	4	mV
Load Regulation (Note 1)	V_{RLoad}	$I_O = 5mA$ to 1.5 Amp	•	12	mV
			•	25	mV
		$I_O = 250mA$ to 750 mA	•	6	mV
Standby Current Drain	I_{SCD}		•	6	mA
			•	6.5	mA
Standby Current Drain Change With Line	ΔI_{SCD} (Line)	$V_{IN} = 7.5V$ to $20V$	•	0.8	mA
Standby Current Drain Change With Load	ΔI_{SCD} (Load)	$I_O = 5mA$ to $1000mA$	•	0.5	mA
Dropout Voltage	V_{DO}	$T_A = 25^{\circ}C$, $\Delta V_{OUT} = 100mV$, $I_O = 1.0A$		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	ΔV_{IN}	$f = 120$ Hz, $\Delta V_{IN} = 10V$	66		dB
	ΔV_{OUT}	(Note 3)	• 60		dB
Output Noise Voltage (Note 3)	N_O	$T_A = 25^{\circ}C$, $f = 10$ Hz 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 $27V$	•	18	mV
			•	50	mV
		$V_{IN} = 16V$ to $22V$	•	9	mV
Load Regulation (Note 1)	V_{RLoad}	$I_O = 5mA$ to 1.5 Amp	•	32	mV
			•	60	mV
		$I_O = 250mA$ to 750 mA	•	20	mV
Standby Current Drain	I_{SCD}			40	mV
			•	6.0	mA
Standby Current Drain Change With Line	ΔI_{SCD} (Line)	$V_{IN} = 15V$ to $30V$	•	6.5	mA
				0.8	mA
Standby Current Drain Change With Load	ΔI_{SCD} (Load)	$I_O = 5mA$ to $1000mA$	•	0.5	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	ΔV_{IN}	$f = 120$ Hz, $\Delta V_{IN} = 10V$	61		dB
	ΔV_{OUT}	(Note 3)	• 54		dB
Output Noise Voltage (Note 3)	N_O	$T_A = 25^{\circ}C$, $f = 10$ Hz 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:

- 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.

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}	$T_A = 25^{\circ}C$	14.8	15.2	V
		$V_{IN} = 18.5V$ to $30V$	• 14.6	15.4	V
Line Regulation (Note 1)	V_{RLINE}	$V_{IN} = 17.5V$ to $30V$	•	20	mV
			•	50	mV
		$V_{IN} = 20V$ to $26V$	•	15	mV
Load Regulation (Note 1)	V_{RLOAD}	$I_O = 5mA$ to 1.5 Amp	•	35	mV
		$I_O = 5mA$ to 1.0 Amp	•	75	mV
		$I_O = 250mA$ to 750 mA	•	21	mV
Standby Current Drain	I_{SCD}		•	6.0	mA
			•	6.5	mA
Standby Current Drain Change With Line	ΔI_{SCD} (Line)	$V_{IN} = 18.5V$ to $30V$	•	0.8	mA
Standby Current Drain Change With Load	ΔI_{SCD} (Load)	$I_O = 5mA$ to $1000mA$	•	0.5	mA
Dropout Voltage	V_{DO}	$T_A = 25^{\circ}C$, $\Delta V_{OUT} = 100mV$, $I_O = 1.0A$		2.5	V
Peak Output Current	$I_{O(PEAK)}$	$T_A = 25^{\circ}C$	1.5	3.3	A
Short Circuit Current (Note 2)	I_{DS}	$V_{IN} = 35V$	•	1.2	A
			•	2.8	A
Ripple Rejection	ΔV_{IN}	$f = 120$ Hz, $\Delta V_{IN} = 10V$	54		dB
	ΔV_{OUT}	(Note 3)	• 52		dB
Output Noise Voltage (Note 3)	N_O	$T_A = 25^{\circ}C$, $f = 10$ Hz to $100KHz$		40	$\mu V/V$ RMS
Long Term Stability (Note 3)	ΔV_{OUT} Δt	$T_A = 25^{\circ}C$, $t = 1000$ hrs.		150	mV

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	$I_{O(PEAK)}$	$T_A = 25^{\circ}C$	1.5	3.3	A
Short Circuit Current (Note 2)	I_{DS}	$V_{IN} = -35V$	•	1.2	A
			•	2.8	A
Ripple Rejection	ΔV_{IN}	$f = 120$ Hz, $\Delta V_{IN} = -10V$	63		dB
	ΔV_{OUT}	(Note 3)	• 60		dB
Output Noise Voltage (Note 3)	N_O	$T_A = 25^{\circ}C$, $f = 10$ Hz to $100KHz$		40	$\mu V/V$ RMS
Long Term Stability (Note 3)	ΔV_{OUT} Δt	$T_A = 25^{\circ}C$, $t = 1000$ hrs.		75	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 $V_{IN} = +35V$, positive regulator; $V_{IN} = -35V$, negative regulator.
 - If not tested, shall be guaranteed to the specified limits.
- The • denotes the specifications which apply over the full operating temperature range.

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	•	32	mV
			•	60	mV
		$I_O = 250mA$ to 750 mA	•	16	mV
Standby Current Drain	I_{SCD}		•	30	mV
			•	3.5	mA
Standby Current Drain Change With Line	ΔI_{SCD} (Line)	$V_{IN} = -14.5V$ to $-27V$	•	4.0	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	$I_{O(pk)}$	$T_A = 25^{\circ}C$, $I_O = 5mA$ to 1A	•	1.8	A
Short Circuit Current (Note 2)	I_{DS}	$V_{IN} = -35V$		3.3	A
			•	2.8	A
Ripple Rejection	ΔV_{IN}	$f = 120$ Hz, $\Delta V_{IN} = -10V$	•	56	dB
	ΔV_{OUT}	(Note 3)	•	53	dB
Output Noise Voltage (Note 3)	N_O	$T_A = 25^{\circ}C$, $f = 10$ Hz 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

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 1.5 Amp	•	25	mV
			•	35	mV
		$I_O = 250mA$ to 750 mA	•	75	mV
Standby Current Drain	I_{SCD}		•	21	mV
			•	45	mV
Standby Current Drain Change With Line	ΔI_{SCD} (Line)	$V_{IN} = -17.5V$ to $-30V$	•	6.0	mA
			•	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	V
Short Circuit Current (Note 2)	I_{DS}	$V_{IN} = -35V$		1.5	A
			•	3.3	A
Ripple Rejection	ΔV_{IN}	$f = 120$ Hz, $\Delta V_{IN} = -10V$	•	1.2	A
	ΔV_{OUT}	(Note 3)	•	2.8	A
Output Noise Voltage (Note 3)	N_O	$T_A = 25^{\circ}C$, $f = 10$ Hz to 100KHz		53	dB
Long Term Stability (Note 3)	$\frac{\Delta V_{OUT}}{\Delta t}$	$T_A = 25^{\circ}C$, $t = 1000$ hrs.		50	dB
				40	$\mu V/V$ RMS
				150	mV

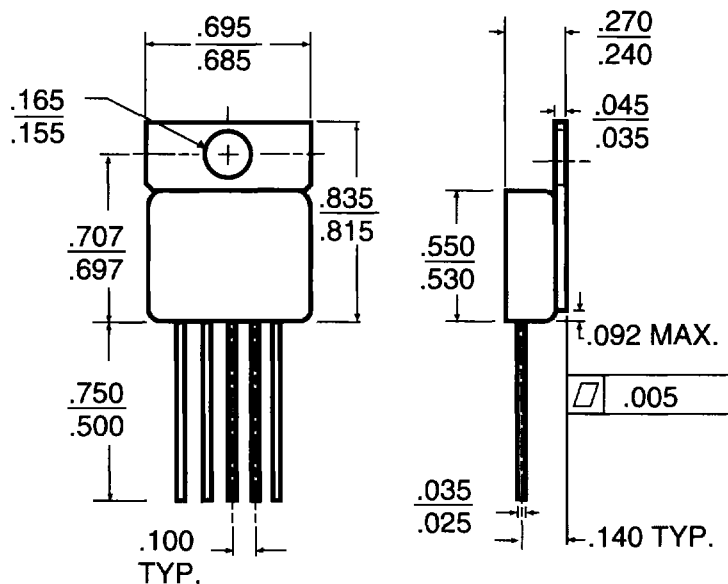
Notes:

- 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.

ABSOLUTE MAXIMUM RATINGS (Per Regulator)

Input Voltage	Positive Regulator = 35V, Negative Regulator = - 35V
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
Thermal Shutdown, $I_O = 5mA$, V_{IN} @ Voltage	175°C

MECHANICAL OUTLINE**NOTES:**

- Case is metal/hermetically sealed
- Isolated Tab