

ISOLATED HERMETIC TO-254AA FIXED VOLTAGE REGULATORS WITH INTERNAL CAPACITOR COMPENSATION



Three Terminal, Fixed Voltage, 1.5 Amp Internally Compensated, Precision Positive Regulators In Hermetic TO-254AA Package

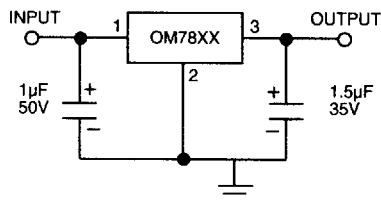
FEATURES

- Isolated Hermetic Package, TO-254
- Output Voltages: 5V, 12V, 15V
- Output Voltages Set Internally To 1%
- Built-In Thermal Overload Protection
- Internally Compensated
- Product Is Available Screened To MIL-STD-883

DESCRIPTION

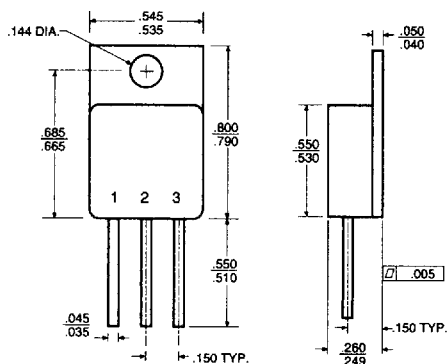
These three (3) terminal positive regulators are supplied in a hermetically sealed TO-254 metal package. All protective features are designed into the circuit, including thermal shutdown, current limiting and safe-area control. These units are internally compensated, thus improving stability and transient response of the regulator. External capacitors are not required in most applications. These units are highly desirable for use in a high density design where space is a major consideration. Standard voltages are 5V, 12V, and 15V. These units are trimmed to 1% of nominal voltage.

SCHEMATIC



Omnirel Part Number	Output Voltage
OM7805EA	5 V
OM7812EA	12 V
OM7815EA	15 V

MECHANICAL OUTLINE



Pin 1: Input
Pin 2: Ground
Pin 3: Output

3.3

ABSOLUTE MAXIMUM RATINGS

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	15W
T_A	3W
Thermal Resistance θ_{JC}	3.5°C/W
θ_{JA}	42°C/W

* Derated to 30V above 85°C due to derating of the input capacitor.

OM7805EA 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 1.5A	•	12	mV
			•	25	mV
		$I_O = 250mA$ to 750mA	•	15	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	$\frac{\Delta V_{IN}}{\Delta V_{OUT}}$	$f = 120 Hz, \Delta V_{IN} = 10V$		66	dB
		(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

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 guaranteed from -55 °C to +85°C. Above +85°C, $V_{IN} = 30V$.
3. If not tested, shall be guaranteed to the specified limits.
The • denotes the specifications which apply over the full operating temperature range.

3.3

OM7812EA 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 1.5A	•	32	mV
			•	60	mV
		$I_O = 250mA$ to 750mA	•	20	mV
Standby Current Drain	I_{SCD}		•	6.0	mA
			•	6.5	mA
Standby Current Drain Change With Line	ΔI_{SCD} (Line)	$V_{IN} = 15V$ 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}	$\Delta V_{OUT} = 100mV, I_O = 1.0A$	•	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	$\frac{\Delta V_{IN}}{\Delta V_{OUT}}$	$f = 120 Hz, \Delta V_{IN} = 10V$	59		dB
		(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:

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 guaranteed from $-55^{\circ}C$ to $+85^{\circ}C$. Above $+85^{\circ}C, V_{IN} = 30V$.
3. If not tested, shall be guaranteed to the specified limits.
The • denotes the specifications which apply over the full operating temperature range.

OM7815EA ELECTRICAL CHARACTERISTICS: 15 Volt

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

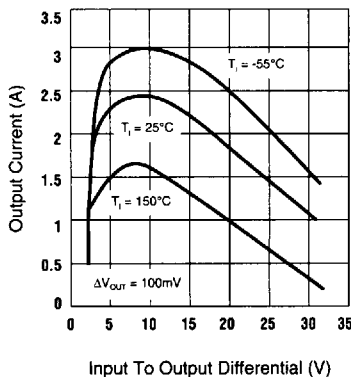
Parameter	Symbol	Test Conditions	Min.	Max.	Unit	
Output Voltage	V_{OUT}	$T_A = 25^{\circ}C$		14.8	15.2	V
		$V_{IN} = 18V$ to $30V$	•	14.6	15.4	V
Line Regulation (Note 1)	V_{RLINE}	$V_{IN} = 17.5V$ to $30V$	•		20	mV
			•		50	mV
		$V_{IN} = 20V$ to $26V$	•		15	mV
Load Regulation (Note 1)	V_{RLOAD}	$I_O = 5mA$ to $1.5A$			35	mV
		$I_O = 5mA$ to $1.0A$	•		75	mV
		$I_O = 250mA$ to $750mA$	•		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	$I_{O(pk)}$	$T_A = 25^{\circ}C$		1.5	3.3	A
Short Circuit Current (Note 2)	I_{DS}	$V_{IN} = 35V$	•		1.2	A
			•		2.8	A
Ripple Rejection	$\frac{\Delta V_{IN}}{\Delta V_{OUT}}$	$f = 120$ Hz, $\Delta V_{IN} = 10V$ (Note 3)	•	54		dB
			•	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)	$\frac{\Delta V_{OUT}}{\Delta t}$	$T_A = 25^{\circ}C$, $t = 1000$ hrs.			150	mV

Notes:

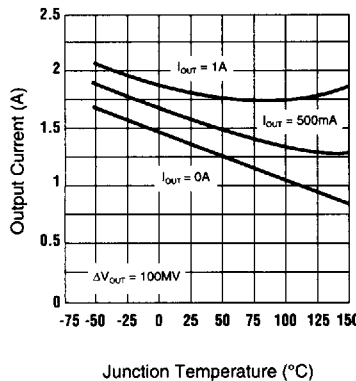
- Load and Line Regulation are specified at a constant junction temperature. Pulse testing with low duty cycle is used. Changes in output voltage due to heating effects must be taken into account separately.
 - Short Circuit protection is guaranteed from $-55^{\circ}C$ to $+85^{\circ}C$. Above $+85^{\circ}C$, $V_{IN} = 30V$.
 - 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

