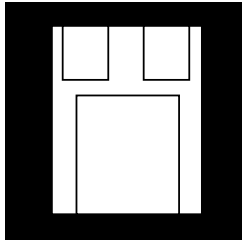


# HERMETIC SURFACE MOUNT FIXED VOLTAGE POSITIVE REGULATORS



**Three Terminal, Fixed Voltage, 1.5 Amp  
Precision Positive Regulators In Hermetic  
Surface Mount Package**

## FEATURES

- Hermetic Surface Mount Package
- Output Voltages: +5V, +12V, +15V
- Output Voltages Set Internally To  $\pm 1\%$
- Built-In Thermal Overload Protection
- Short Circuit Current Limiting
- Product Is Available Hi-Rel Screened

## DESCRIPTION

These three terminal positive regulators are supplied in a hermetically sealed surface mount 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  $\pm 1\%$  of nominal voltage. Standard voltages are +5V, +12V, and +15V. These units are ideally suited for Military applications where a hermetic surface mount package is required.

## ABSOLUTE MAXIMUM RATINGS

Input to Output Voltage Differential	.....	+35 V
Operating Junction Temperature Range	.....	- 55°C to + 150°C
Storage Temperature Range	.....	- 55°C to + 150°C
Typical Power/Thermal Characteristics:		
Rated Power @ 25°C		
$T_C$	.....	17.5W
$T_A$	.....	3W
Thermal Resistance:		
$\theta_{JC}$	.....	3.5°C/W
$\theta_{JA}$	.....	42°C/W
Lead Temperature at Case (5 sec)	.....	225°C

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**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
		$V_{IN} = 8.0V$ to 12V	•	12	mV
Load Regulation (Note 1)	$V_{RLOAD}$	$I_O = 5mA$ to 1.5 Amp	•	4	mV
		$I_O = 250mA$ to 750 mA	•	10	mV
Standby Current Drain	$I_{SCD}$		•	12	mV
			•	25	mV
Standby Current Drain Change With Line	$\Delta I_{SCD}$ (Line)	$V_{IN} = 7.5V$ to 20V	•	6	mV
			•	15	mV
Standby Current Drain Change With Load	$\Delta I_{SCD}$ (Load)	$I_O = 5mA$ to 1000mA	•	6.5	mA
			•	0.8	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	$\frac{\Delta V_{IN}}{\Delta V_{OUT}}$	$f = 120Hz, \Delta V_{IN} = 10V$	•	66	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	•	18	mV
		$V_{IN} = 16V$ to 22V	•	50	mV
Load Regulation (Note 1)	$V_{RLOAD}$	$I_O = 5mA$ to 1.5 Amp	•	9	mV
		$I_O = 250mA$ to 750 mA	•	30	mV
Standby Current Drain	$I_{SCD}$		•	32	mV
			•	60	mV
Standby Current Drain Change With Line	$\Delta I_{SCD}$ (Line)	$V_{IN} = 15V$ to 30V	•	20	mV
			•	40	mV
Standby Current Drain Change With Load	$\Delta I_{SCD}$ (Load)	$I_O = 5mA$ to 1000mA	•	6.0	mA
			•	6.5	mA
Dropout Voltage	$V_{DO}$	$\Delta V_{OUT} = 100mV, I_O = 1.0A$	•	0.8	mA
Peak Output Current	$I_{O(pk)}$	$T_A = 25^{\circ}C$	1.5	3.3	A
Short Circuit Current (Note 2)	$I_{DS}$	$V_{IN} = 35V$	•	1.2	A
			•	2.8	A
Ripple Rejection	$\frac{\Delta V_{IN}}{\Delta V_{OUT}}$	$f = 120Hz, \Delta V_{IN} = 10V$	•	61	dB
		(Note 3)	•	54	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:**

- 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.

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

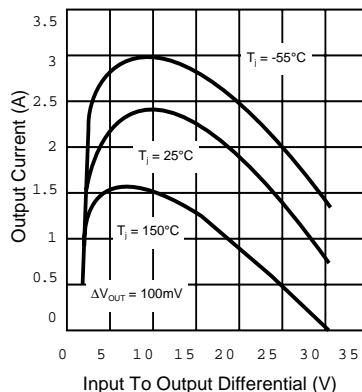
Parameter	Symbol	Test Conditions	Min.	Max.	Unit
Output Voltage	$V_{OUT}$	$T_A = 25^{\circ}C$	14.8	15.2	V
		$V_{IN} = 18.5V$ to $30V$	• 14.6	15.4	V
Line Regulation (Note 1)	$V_{RLINE}$	$V_{IN} = 17.5V$ to $30V$	•	20	mV
		$V_{IN} = 20V$ to $26V$	•	50	mV
			•	15	mV
Load Regulation (Note 1)	$V_{RLOAD}$	$I_O = 5mA$ 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	$\Delta I_{SCD}$ (Line)	$V_{IN} = 18.5V$ to $30V$	•	0.8	mA
Standby Current Drain Change With Load	$\Delta I_{SCD}$ (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	$\Delta V_{IN}$ $\Delta V_{OUT}$	$f = 120$ Hz, $\Delta V_{IN} = 10V$	•	54	dB
		(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)	$\Delta V_{OUT}$ $\Delta t$	$T_A = 25^{\circ}C, t = 1000$ hrs.		150	mV

**Notes:**

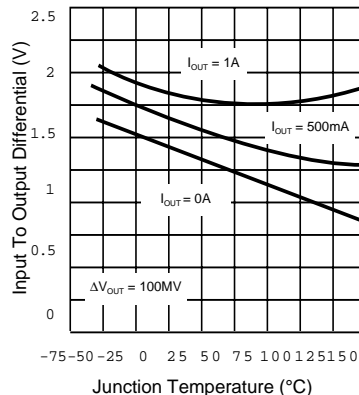
1. Load and Line Regulation are specified at a constant junction temperature. Pulse testing with low duty cycle is used. Changes in output voltage due to heating effects must be taken into account separately.
2. Short Circuit protection is only assured up to  $V_{IN} = 35V$ .
3. If not tested, shall be guaranteed to the specified limits.  
The • denotes the specifications which apply over the full operating temperature range.

**TYPICAL PERFORMANCE CHARACTERISTICS**

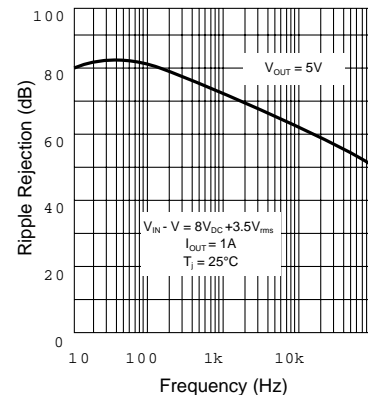
PEAK OUTPUT CURRENT



DROPOUT VOLTAGE



RIPPLE REJECTION

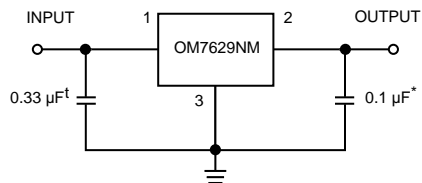


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## TYPICAL APPLICATIONS

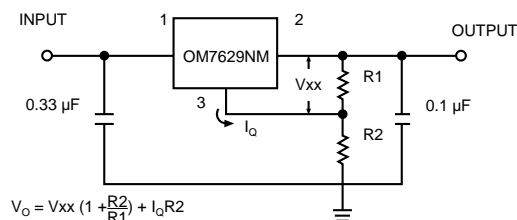
### FIXED OUTPUT REGULATOR



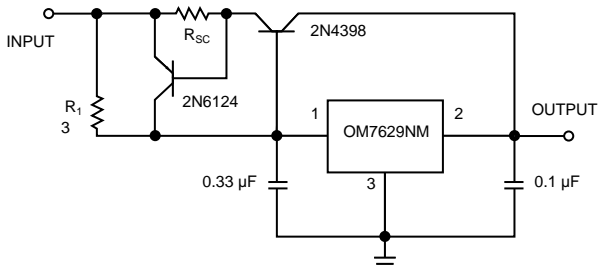
\* Increasing value of output capacitor improves system transient response

t Required only if regulator is located an appreciable distance from power supply filter.

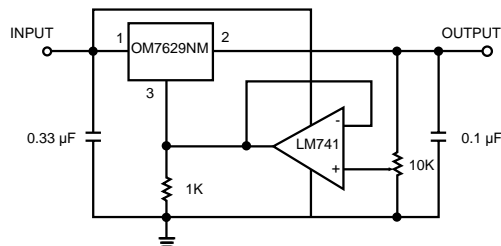
### CIRCUIT FOR INCREASING OUTPUT VOLTAGE



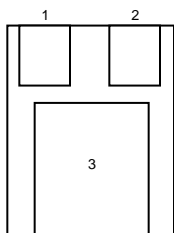
### HIGH OUTPUT CURRENT, SHORT CIRCUIT PROTECTED



### ADJUSTABLE OUTPUT REGULATOR, 7 TO 30 VOLTS



### PIN CONNECTION



Pin 1: In  
Pin 2: Out  
Pin 3: Ground

### MECHANICAL OUTLINE

