

SURFACE MOUNT POSITIVE VOLTAGE REGULATOR, 3-TERMINAL, FIXED VOLTAGE



Isolated Hermetic Surface Mount Package
1.5 Amp, +5V, +12V, +15V Positive Voltage
Regulators

FEATURES

- Small Hermetic Surface Mount Package
- Chip Isolated From 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 hermetic metal 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 output voltage. Standard voltages are 5V, 12V, and 15V. These units are ideally suited for Military applications where a hermetically sealed surface mount package is required.

ABSOLUTE MAXIMUM RATINGS @ 25°C

Input to Output Voltage Differential	+35V
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:	
θ_{JC}	4.2°C/W
θ_{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
			•	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}		•	15	mV
			•	6	mA
Standby Current Drain Change With Line	ΔI_{SCD} (Line)	$V_{IN} = 7.5V$ to 20V	•	6.5	mA
Standby Current Drain Change With Load	ΔI_{SCD} (Load)	$I_O = 5mA$ to 1000mA	•	0.8	mA
Dropout Voltage	V_{DO}	$T_A = 25^{\circ}C, \Delta V_{OUT} = 100mV, I_O = 1.0A$		0.5	mA
Peak Output Current	$I_{O(pk)}$	$T_A = 25^{\circ}C$	1.5	2.5	V
Short Circuit Current (Note 2)	I_{DS}	$V_{IN} = 35V$	•	3.3	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)	$\frac{\Delta V_{OUT}}{\Delta t}$	$T_A = 25^{\circ}C, t = 1000hrs.$		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	•	30	mV
			•	32	mV
		$I_O = 250mA$ to 750 mA	•	60	mV
Standby Current Drain	I_{SCD}		•	20	mV
			•	40	mV
Standby Current Drain Change With Line	ΔI_{SCD} (Line)	$V_{IN} = 15V$ to 30V	•	6.0	mA
Standby Current Drain Change With Load	ΔI_{SCD} (Load)	$I_O = 5mA$ to 1000mA	•	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	2.5	V
Short Circuit Current (Note 2)	I_{DS}	$V_{IN} = 35V$	•	3.3	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)	$\frac{\Delta V_{OUT}}{\Delta t}$	$T_A = 25^{\circ}C, t = 1000hrs.$		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.

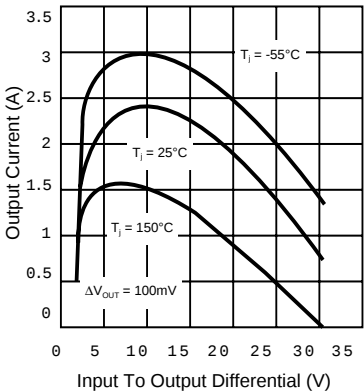
ELECTRICAL CHARACTERISTICS 15 Volt $V_{IN} = 23V, I_O = 500mA, -55^{\circ}C \leq T_A \leq 125^{\circ}C$ (unless otherwise specified)

Parameter	Symbol	Test Conditions	Min.	Max.	Unit
Output Voltage	V_{OUT}	$T_A = 25^{\circ}C$	14.8	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 (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, $\Delta V_{IN} = 10V$	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

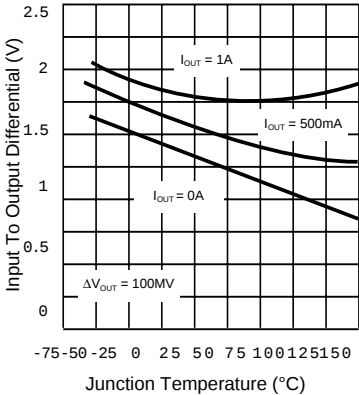
- Notes:
- 1. Load and Line Regulation are specified at a constant junction temperature. Pulse testing with low duty cycle is used. Changes in output voltage due to heating effects must be taken into account separately.
 - 2. Short Circuit protection is only assured up to $V_{IN} = 35V$.
 - 3. If not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

TYPICAL PERFORMANCE CHARACTERISTICS

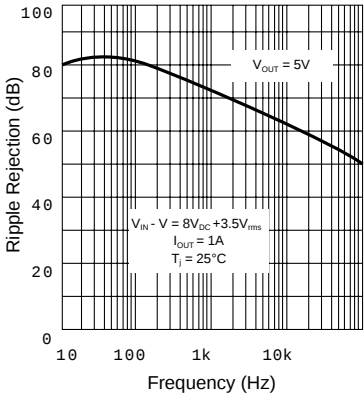
PEAK OUTPUT CURRENT



DROPOUT VOLTAGE



RIPPLE REJECTION

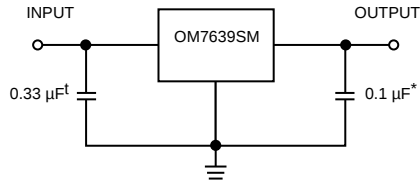


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TYPICAL APPLICATIONS

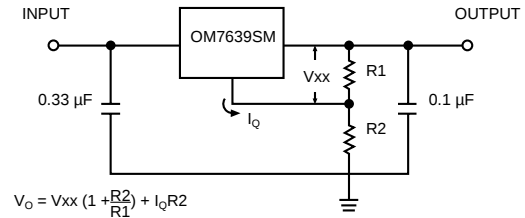
FIXED OUTPUT REGULATOR



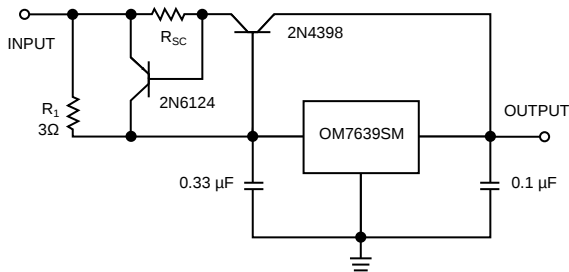
* Increasing value of output capacitor improves system transient response

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

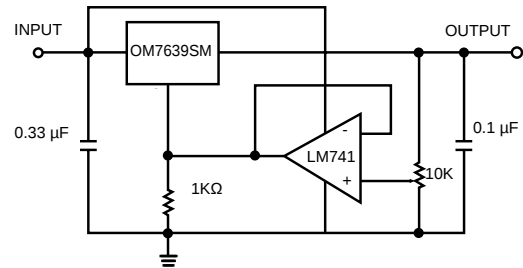
CIRCUIT FOR INCREASING OUTPUT VOLTAGE



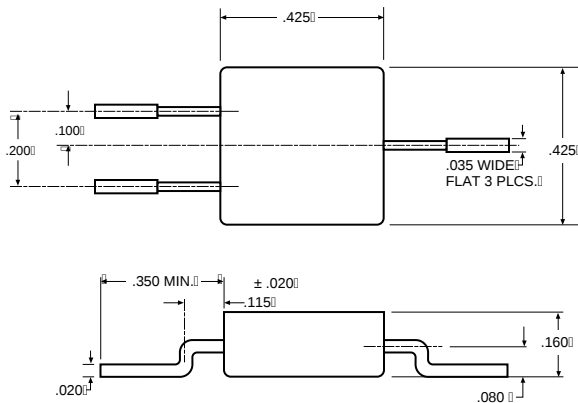
HIGH OUTPUT CURRENT, SHORT CIRCUIT PROTECTED



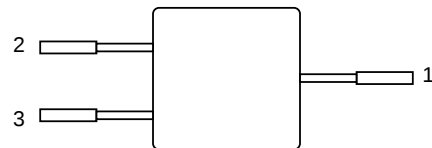
ADJUSTABLE OUTPUT REGULATOR, 7 TO 30 VOLTS



MECHANICAL OUTLINE



PIN CONNECTION



Pin 1: Ground
Pin 2: V_{IN}
Pin 3: V_{OUT}
Case: Isolated