


# SURFACE MOUNT POSITIVE 0.5 VOLT, LOW DROPOUT VOLTAGE REGULATOR



Isolated Hermetic Surface Mount Package  
Three Terminal, Fixed Voltage, 1 Amp,  
Low Dropout Voltage Regulator

## FEATURES

- Isolated Hermetic Surface Mount Package
- Similar To Industry Standard LM2940
- Dropout Voltage Typically 0.5 V @  $I_O = 1\text{ A}$
- Output Current In Excess Of 1 A
- Reverse Battery Protection
- Internal Short Circuit Protection
- Available Hi-Rel Screened

## DESCRIPTION

These three terminal fixed voltage regulators are designed to provide 1.0A with high efficiency. It has the ability to source 1A of output current with a typical dropout voltage of .5V and a maximum of 1V over the entire temperature range. It is supplied in a hermetic surface mount package and is ideally suited for Hi-Rel applications where small size and high reliability are required.

## ABSOLUTE MAXIMUM RATINGS @ 25°C

Input Voltage . . . . .	26 Vdc
Output Voltage . . . . .	+5V, +12V, +15Vdc
Operating Junction Temperature Range . . . . .	- 55°C to + 125°C
Storage Temperature Range . . . . .	- 65°C to + 150°C
Lead Temperature (Soldering 10 Seconds) . . . . .	300°C
Thermal Resistance:	
$\theta_{JC}$ (Isolated) . . . . .	4.2°C/W
$\theta_{JA}$ . . . . .	42°C/W
Maximum Output Current. . . . .	1.3 A

3.5



ELECTRICAL CHARACTERISTICS, P/N OM7648SM (5 Volts)  
-55°C T<sub>A</sub> 125°C, V<sub>IN</sub> = 20 V, I<sub>O</sub> = 1 A, C<sub>OUT</sub> = 22 µF (unless otherwise specified).

Parameter	Symbol	Test Conditions	Notes	Min.	Max.	Unit
Output Voltage	V <sub>OUT</sub>	V <sub>N</sub> = 10 V, I <sub>OUT</sub> = 5 mA	1	4.85	5.15	V
			2	4.75	5.25	
		V <sub>N</sub> = 6 V, I <sub>OUT</sub> = 5 mA	1	4.85	5.15	
			2	4.75	5.25	
		V <sub>N</sub> = 7 V, I <sub>OUT</sub> = 5 mA	1	4.85	5.15	
			2	4.75	5.25	
		V <sub>N</sub> = 26 V, I <sub>OUT</sub> = 5 mA	1	4.85	5.15	
			2	4.75	5.25	
		V <sub>N</sub> = 10 V, I <sub>OUT</sub> = 1 A	1	4.85	5.15	
			2	4.75	5.25	
		V <sub>N</sub> = 6 V, I <sub>OUT</sub> = 1 A	1	4.85	5.15	
			2	4.75	5.25	
		V <sub>N</sub> = 6 V, I <sub>OUT</sub> = 50 mA	1	4.85	5.15	
			2	4.75	5.25	
		V <sub>N</sub> = 10 V, I <sub>OUT</sub> = 50 mA	1	4.85	5.15	
			2	4.75	5.25	
		V <sub>O</sub> 6 V, R <sub>O</sub> = 100 , t = 20 ms	1, 2	40		
		V <sub>LT</sub>				
Maximum Line Transient Reverse Polarity	V <sub>LT</sub>					V
Input Voltage DC	V <sub>RIN</sub>	R <sub>O</sub> = 100	1, 2	-15		V
Reverse Polarity						
Input Voltage Transient	V <sub>RIT</sub>	R <sub>O</sub> = 100 , t = 20 ms	1, 2	-45		V
Quiescent Current	I <sub>Q</sub>	V <sub>N</sub> = 10 V, I <sub>OUT</sub> = 5 mA	1		15	mA
			2		20	
		V <sub>N</sub> = 7 V, I <sub>OUT</sub> = 5 mA	1		15	
			2		20	
		V <sub>N</sub> = 26 V, I <sub>OUT</sub> = 5 mA	1		15	
			2		20	
		V <sub>N</sub> = 10 V, I <sub>OUT</sub> = 1 A	1		50	
			2		100	
Line Regulation	V <sub>RLN</sub>	7 V V <sub>IN</sub> 26 V, I <sub>OUT</sub> = 5 mA	1		±40	mV
			2		±50	
Load Regulation	V <sub>RLD</sub>	V <sub>N</sub> = 10 V, 50 mA I <sub>OUT</sub> 1 A	1		±50	mV
			2		±100	
Dropout Voltage	V <sub>DO</sub>	I <sub>OUT</sub> = 1 A	1		.7	V
			2		1	
						mV
		I <sub>OUT</sub> = 100 mA	1		150	
			2		200	µV rms
Output Noise Voltage	V <sub>ON</sub>	V <sub>N</sub> = 10 V, I <sub>O</sub> = 5 mA, 10 Hz - 100 Hz	1, 2		700	
Output Impedance	R <sub>O</sub>	V <sub>N</sub> = 10 V, I <sub>OUT</sub> = 100 mA dc and 20 mA ac, f <sub>O</sub> = 120 Hz	1, 2		1	
Short Circuit Current	I <sub>OS</sub>	V <sub>N</sub> = 10 V	1	1.5		A
			2	1.3		
Ripple Rejection	R <sub>R</sub>	V <sub>N</sub> = 10 V + 1 V rms, I <sub>OUT</sub> = 5 mA, f = 1 kHz	1	60		dB
			2	50		

Notes: 1. T<sub>A</sub> = 25°C.  
2. Over full operating temperature range.

ELECTRICAL CHARACTERISTICS, P/N OM7649SM (12 Volts)  
-55°C T<sub>A</sub> 125°C, V<sub>IN</sub> = 20 V, I<sub>O</sub> = 1 A, C<sub>OUT</sub> = 22 µF (unless otherwise specified).

Parameter	Symbol	Test Conditions	Notes	Min.	Max.	Unit
Output Voltage	V <sub>OUT</sub>	V <sub>N</sub> = 17 V, I <sub>OUT</sub> = 5 mA	1	11.64	12.36	V
			2	11.40	12.60	
		V <sub>N</sub> = 13.6 V, I <sub>OUT</sub> = 5 mA	1	11.64	12.36	
			2	11.40	12.60	
		V <sub>N</sub> = 14 V, I <sub>OUT</sub> = 5 mA	1	11.64	12.36	
			2	11.40	12.60	
		V <sub>N</sub> = 26 V, I <sub>OUT</sub> = 5 mA	1	11.64	12.36	
			2	11.40	12.60	
		V <sub>N</sub> = 17 V, I <sub>OUT</sub> = 1 A	1	11.64	12.36	
			2	11.40	12.60	
		V <sub>N</sub> = 13.6 V, I <sub>OUT</sub> = 1 A	1	11.64	12.36	
			2	11.40	12.60	
		V <sub>N</sub> = 13.6 V, I <sub>OUT</sub> = 50 mA	1	11.64	12.36	
			2	11.40	12.60	
		V <sub>N</sub> = 17 V, I <sub>OUT</sub> = 50 mA	1	11.64	12.36	
			2	11.40	12.60	
		V <sub>O</sub> 13 V, R <sub>O</sub> = 100 , t = 20 ms	1, 2	40		
		V <sub>LT</sub>				
Maximum Line Transient Reverse Polarity	V <sub>LT</sub>					V
Input Voltage DC	V <sub>RIN</sub>	R <sub>O</sub> = 100	1, 2	-15		V
Reverse Polarity						
Input Voltage Transient	V <sub>RIT</sub>	R <sub>O</sub> = 100 , t = 20 ms	1, 2	-45		V
Quiescent Current	I <sub>Q</sub>	V <sub>N</sub> = 17 V, I <sub>OUT</sub> = 5 mA	1		15	mA
			2		20	
		V <sub>N</sub> = 14 V, I <sub>OUT</sub> = 5 mA	1		15	
			2		20	
		V <sub>N</sub> = 26 V, I <sub>OUT</sub> = 5 mA	1		15	
			2		20	
		V <sub>N</sub> = 17 V, I <sub>OUT</sub> = 1 A	1		5	
			2		60	
Line Regulation	V <sub>RLN</sub>	14 V V <sub>IN</sub> 26 V, I <sub>OUT</sub> = 5 mA	1		±75	mV
			2		±120	
Load Regulation	V <sub>RLD</sub>	V <sub>N</sub> = 17 V, 50 mA I <sub>OUT</sub> 1 A	1		±120	mV
			2		±190	
Dropout Voltage	V <sub>DO</sub>	I <sub>OUT</sub> = 1 A	1		.7	V
			2		1	
						mV
		I <sub>OUT</sub> = 100 mA	1		150	
			2		200	µV rms
Output Noise Voltage	V <sub>ON</sub>	V <sub>N</sub> = 17 V, I <sub>O</sub> = 5 mA, 10 Hz - 100 Hz	1		1000	
Output Impedance	R <sub>O</sub>	V <sub>N</sub> = 17 V, I <sub>OUT</sub> = 100 mA dc and 20 mA ac, f <sub>O</sub> = 120 Hz	1, 2		1	
Short Circuit Current	I <sub>OS</sub>	V <sub>N</sub> = 17 V	1	1.6		A
			2	1.3		
Ripple Rejection	R <sub>R</sub>	V <sub>N</sub> = 17 V + 1 V rms, I <sub>OUT</sub> = 5 mA, f = 1 kHz	1	45		dB
			2	42		

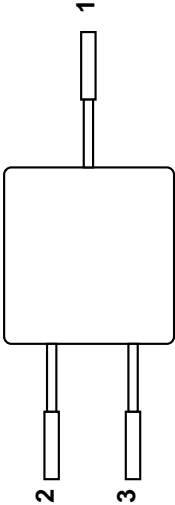
Notes: 1. T<sub>A</sub> = 25°C.  
2. Over full operating temperature range.

ELECTRICAL CHARACTERISTICS, P/N OM7650SM (15 Volts)  
-55°C T<sub>A</sub> 125°C, V<sub>IN</sub> = 20 V, I<sub>O</sub> = 1 A, C<sub>OUT</sub> = 22 µF (unless otherwise specified).

Parameter	Symbol	Test Conditions	Notes	Min.	Max.	Unit
Output Voltage	V <sub>OUT</sub>	V <sub>IN</sub> = 20 V, I <sub>OUT</sub> = 5 mA	1	14.55	15.45	V
			2	14.25	15.75	
		V <sub>IN</sub> = 16.75 V, I <sub>OUT</sub> = 5 mA	1	14.55	15.45	
			2	14.25	15.75	
		V <sub>IN</sub> = 17 V, I <sub>OUT</sub> = 5 mA	1	14.55	15.45	
			2	14.25	15.75	
		V <sub>IN</sub> = 26 V, I <sub>OUT</sub> = 5 mA	1	14.55	15.45	
		V <sub>IN</sub> = 20 V, I <sub>OUT</sub> = 1 A	1	14.55	15.45	
			2	14.25	15.75	
		V <sub>IN</sub> = 16.75 V, I <sub>OUT</sub> = 1 A	1	14.55	15.45	
			2	14.25	15.75	
		V <sub>IN</sub> = 16.75 V, I <sub>OUT</sub> = 50 mA	1	14.55	15.45	
			2	14.25	15.75	
		V <sub>IN</sub> = 20 V, I <sub>OUT</sub> = 50 mA	1	14.55	15.45	
Maximum Line Transient	V <sub>LT</sub>	V <sub>O</sub> 16 V, R <sub>O</sub> = 100 , t = 20 ms	1, 2	40		V
Reverse Polarity Input Voltage DC	V <sub>RN</sub>	R <sub>O</sub> = 100	1, 2	-15		V
Reverse Polarity Input Voltage Transient	V <sub>RT</sub>	R <sub>O</sub> = 100 , t = 20 ms	1, 2	-45		V
Quiescent Current	I <sub>Q</sub>	V <sub>IN</sub> = 20 V, I <sub>OUT</sub> = 5 mA	1		15	mA
			2		20	
		V <sub>IN</sub> = 17 V, I <sub>OUT</sub> = 5 mA	1		15	
			2		20	
		V <sub>IN</sub> = 26 V, I <sub>OUT</sub> = 5 mA	1		15	
			2		20	
Line Regulation	V <sub>RLN</sub>	V <sub>IN</sub> = 20 V, I <sub>OUT</sub> = 1 A	1		50	mV
		17 V V <sub>IN</sub> 26 V, I <sub>OUT</sub> = 5 mA	1		±95	
Load Regulation	V <sub>RLD</sub>	V <sub>IN</sub> = 20 V, 50 mA I <sub>OUT</sub> 1 A	1		±150	mV
			2		±240	
Dropout Voltage	V <sub>DO</sub>	I <sub>OUT</sub> = 1 A	1		.7	V
			2		1	
Output Noise Voltage	V <sub>ON</sub>	I <sub>OUT</sub> = 100 mA	1		150	mV
			2		200	
Output Impedance	R <sub>O</sub>	V <sub>IN</sub> = 20 V, I <sub>O</sub> = 5 mA, 10 Hz - 100 Hz	1		1000	µV rms
		V <sub>IN</sub> = 20 V, I <sub>OUT</sub> = 100 mA ac and 20 mA dc, f <sub>o</sub> = 120 Hz	1, 2		1	
Short Circuit Current	I <sub>OS</sub>	V <sub>IN</sub> = 20 V	1	1.6		A
			2	1.3		
Ripple Rejection	R <sub>R</sub>	V <sub>IN</sub> = 20 V + 1 V rms, I <sub>OUT</sub> = 5 mA, f = 1 kHz	1	48		dB
			2	42		

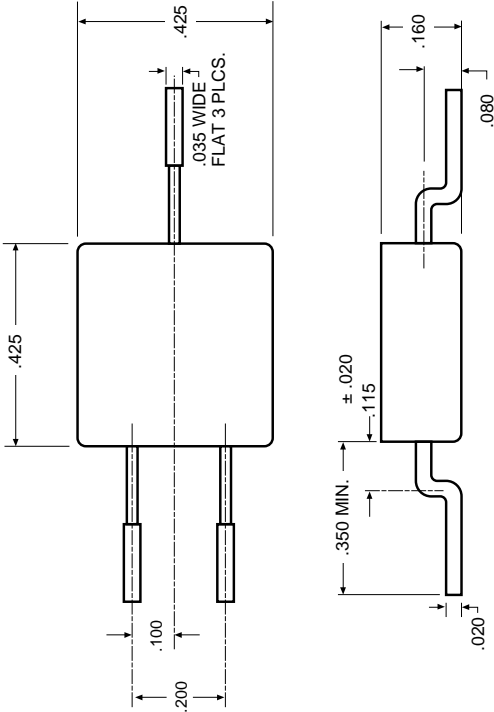
Notes: 1. T<sub>A</sub> = 25°C.  
2. Over full operating temperature range.

PIN CONNECTION



Pin 1: V<sub>OUT</sub>  
Pin 2: Adjust  
Pin 3: V<sub>IN</sub>  
Case: Isolated

MECHANICAL OUTLINE



TYPICAL APPLICATIONS

