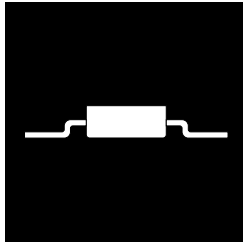


# SURFACE MOUNT POSITIVE 0.5 VOLT, LOW DROPOUT VOLTAGE REGULATOR



**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 @  $I_O = 1$  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>IN</sub> = 10 V, I <sub>OUT</sub> = 5 mA	1	4.85	5.15	V
			2	4.75	5.25	
		V <sub>IN</sub> = 6 V, I <sub>OUT</sub> = 5 mA	1	4.85	5.15	
			2	4.75	5.25	
		V <sub>IN</sub> = 7 V, I <sub>OUT</sub> = 5 mA	1	4.85	5.15	
			2	4.75	5.25	
		V <sub>IN</sub> = 26 V, I <sub>OUT</sub> = 5 mA	1	4.85	5.15	
			2	4.75	5.25	
		V <sub>IN</sub> = 10 V, I <sub>OUT</sub> = 1 A	1	4.85	5.15	
			2	4.75	5.25	
Maximum Line Transient Reverse Polarity Input Voltage DC	V <sub>RIN</sub>	V <sub>IN</sub> = 6 V, I <sub>OUT</sub> = 1 A	1	4.85	5.15	V
			2	4.75	5.25	
		V <sub>IN</sub> = 6 V, I <sub>OUT</sub> = 50 mA	1	4.85	5.15	
			2	4.75	5.25	
		V <sub>IN</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		
			1, 2	-15		
			1, 2	-45		
		Quiescent Current	I <sub>Q</sub>	V <sub>IN</sub> = 10 V, I <sub>OUT</sub> = 5 mA	1	
	2			15	20	
V <sub>IN</sub> = 7 V, I <sub>OUT</sub> = 5 mA	1			15	20	
	2			15	20	
V <sub>IN</sub> = 26 V, I <sub>OUT</sub> = 5 mA	1			15	20	
	2			15	20	
V <sub>IN</sub> = 10 V, I <sub>OUT</sub> = 1 A	1			50	100	
	2			40	100	
V <sub>IN</sub> 7 V, V <sub>IN</sub> 26 V, I <sub>OUT</sub> = 5 mA	1			±40	±50	
	2			±50	±100	
Line Regulation	V <sub>RUN</sub>	V <sub>IN</sub> = 10 V, I <sub>OUT</sub> = 1 A	1	.7	1	V
			2	1	1	
Load Regulation	V <sub>RLD</sub>	V <sub>IN</sub> = 10 V, I <sub>OUT</sub> = 1 A	1	±50	±100	mV
			2	±50	±100	
Dropout Voltage	V <sub>DO</sub>	I <sub>OUT</sub> = 1 A	1	.7	1	V
			2	1	1	
Output Noise Voltage	V <sub>ON</sub>	I <sub>OUT</sub> = 100 mA	1	150	200	mV
			2	150	200	
Output Impedance	R <sub>O</sub>	V <sub>IN</sub> = 10 V, I <sub>O</sub> = 5 mA, 10 Hz - 100 Hz	1, 2	700		μV rms
		V <sub>IN</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>IN</sub> = 10 V	1	1.5		A
			2	1.3		
Ripple Rejection	R <sub>R</sub>	V <sub>IN</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>IN</sub> = 17 V, I <sub>OUT</sub> = 5 mA	1	11.64	12.36	V
			2	11.40	12.60	
		V <sub>IN</sub> = 13.6 V, I <sub>OUT</sub> = 5 mA	1	11.64	12.36	
			2	11.40	12.60	
		V <sub>IN</sub> = 14 V, I <sub>OUT</sub> = 5 mA	1	11.64	12.36	
			2	11.40	12.60	
		V <sub>IN</sub> = 26 V, I <sub>OUT</sub> = 5 mA	1	11.64	12.36	
			2	11.40	12.60	
		V <sub>IN</sub> = 17 V, I <sub>OUT</sub> = 1 A	1	11.64	12.36	
			2	11.40	12.60	
Maximum Line Transient Reverse Polarity Input Voltage DC	V <sub>RIN</sub>	V <sub>IN</sub> = 13.6 V, I <sub>OUT</sub> = 1 A	1	11.64	12.36	V
			2	11.40	12.60	
		V <sub>IN</sub> = 13.6 V, I <sub>OUT</sub> = 50 mA	1	11.64	12.36	
			2	11.40	12.60	
		V <sub>IN</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		
			1, 2	-15		
			1, 2	-45		
		Quiescent Current	I <sub>Q</sub>	V <sub>IN</sub> = 17 V, I <sub>OUT</sub> = 5 mA	1	
	2			15	20	
V <sub>IN</sub> = 14 V, I <sub>OUT</sub> = 5 mA	1			15	20	
	2			15	20	
V <sub>IN</sub> = 26 V, I <sub>OUT</sub> = 5 mA	1			15	20	
	2			15	20	
V <sub>IN</sub> = 17 V, I <sub>OUT</sub> = 1 A	1			5	60	
	2			5	60	
V <sub>IN</sub> 14 V, V <sub>IN</sub> 26 V, I <sub>OUT</sub> = 5 mA	1			±75	±120	
	2			±120	±190	
Dropout Voltage	V <sub>DO</sub>	I <sub>OUT</sub> = 1 A	1	.7	1	V
			2	1	1	
Output Noise Voltage	V <sub>ON</sub>	I <sub>OUT</sub> = 100 mA	1	150	200	mV
			2	150	200	
Output Impedance	R <sub>O</sub>	V <sub>IN</sub> = 17 V, I <sub>O</sub> = 5 mA, 10 Hz - 100 Hz	1	1000		μV rms
		V <sub>IN</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>IN</sub> = 17 V	1	1.6		A
			2	1.3		
Ripple Rejection	R <sub>R</sub>	V <sub>IN</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.



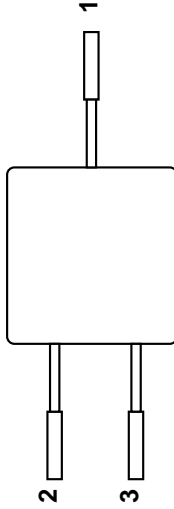
**ELECTRICAL CHARACTERISTICS, P/N OM7650SM (15 Volts)**

-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	
			2	14.25	15.75	
Maximum Line Transient Reverse Polarity Input Voltage DC	V <sub>RT</sub>	V <sub>IN</sub> = 20 V, I <sub>OUT</sub> = 1 A	1	14.55	15.45	V
			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	
			2	14.25	15.75	
Maximum Line Transient Reverse Polarity Input Voltage DC	V <sub>RT</sub>	V <sub>O</sub> = 16 V, R <sub>O</sub> = 100 Ω, t = 20 ms	1, 2	40		V
Reverse Polarity Input Voltage Transient	V <sub>RIN</sub>	R <sub>O</sub> = 100 Ω	1, 2	-15		V
Reverse Polarity Input Voltage Transient	V <sub>RIT</sub>	R <sub>O</sub> = 100 Ω, 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	15	mA
			2	20	20	
		V <sub>IN</sub> = 17 V, I <sub>OUT</sub> = 5 mA	1	15	15	
			2	20	20	
		V <sub>IN</sub> = 26 V, I <sub>OUT</sub> = 5 mA	1	15	15	
			2	20	20	
		V <sub>IN</sub> = 20 V, I <sub>OUT</sub> = 1 A	1	50	50	
			2	60	60	
Line Regulation	V <sub>RLN</sub>	17 V V <sub>IN</sub> 26 V, I <sub>OUT</sub> = 5 mA	1	±95	mV	
	2			±150		
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	
		I <sub>OUT</sub> = 1 A	2	1		
Output Noise Voltage	V <sub>ON</sub>	I <sub>OUT</sub> = 100 mA	1	150	mV	
		V <sub>IN</sub> = 20 V, I <sub>O</sub> = 5 mA, 10 Hz - 100 Hz	2	200		
Output Impedance	R <sub>O</sub>	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	1000	μV/rms	
Short Circuit Current	I <sub>OS</sub>	V <sub>IN</sub> = 20 V	1	1.6	A	
		V <sub>IN</sub> = 20 V + 1 V rms, I <sub>OUT</sub> = 5 mA, f = 1 kHz	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		

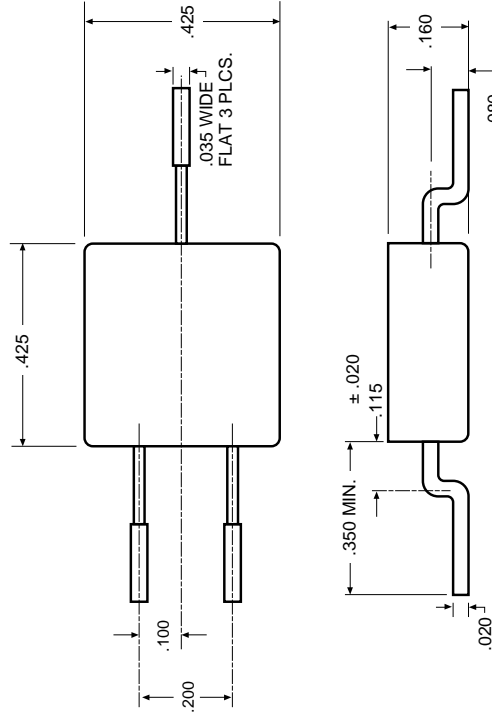
Notes: 1. T<sub>A</sub> = 25°C.  
2. Over full operating temperature range.

**PIN CONNECTION**



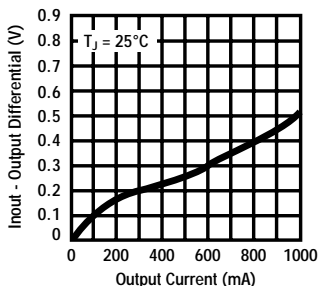
Pin 1: V<sub>OUT</sub>  
Pin 2: Adjust  
Pin 3: V<sub>IN</sub>  
Case: Isolated

**MECHANICAL OUTLINE**

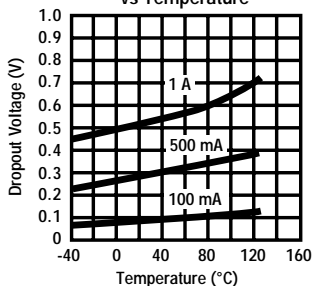


# TYPICAL APPLICATIONS

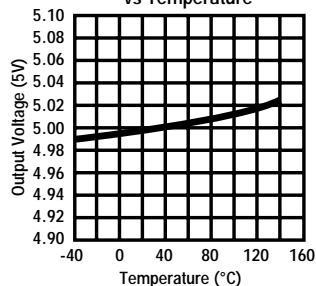
Dropout Voltage



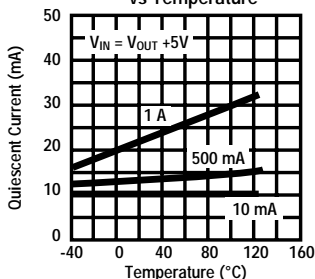
Dropout Voltage vs Temperature



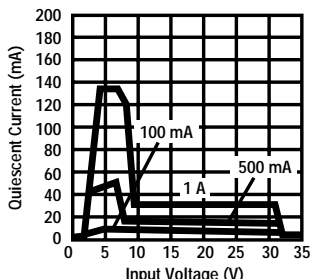
Output Voltage vs Temperature



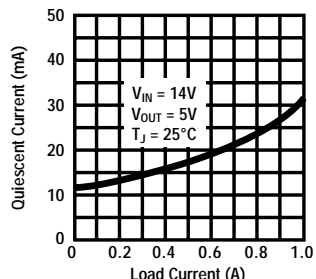
Quiescent Current vs Temperature



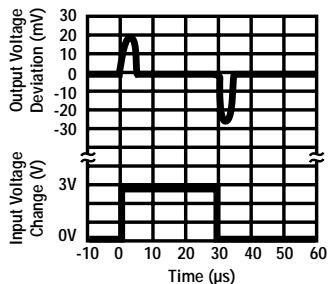
Quiescent Current



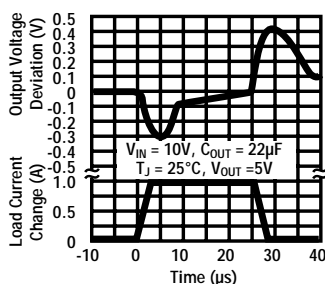
Quiescent Current



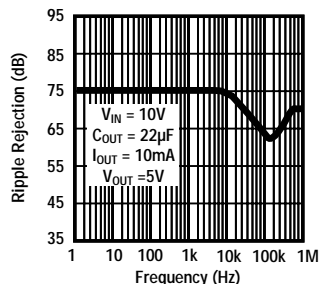
Line Transient Response



Load Transient Response



Ripple Rejection



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