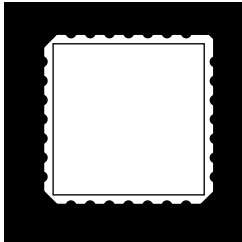


# SURFACE MOUNT 0.5 VOLT LOW DROPOUT POSITIVE REGULATOR



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

## FEATURES

- Similar To Industry Standard LM2940
- Dropout Voltage Typically 0.5V @  $I_o = 1A$
- Output Current Up To 1A
- Reverse Battery Protection
- Internal Short Circuit Protection
- Isolated Hermetic Surface Mount Package

## 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 Military applications where small size and high reliability are required.

## ABSOLUTE MAXIMUM RATINGS @ 25°C

Input Voltage . . . . .	26 Vdc
Output Voltage . . . . .	+5V, +12V, +15 Vdc
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). . . . .	15°C/W
Maximum Output Current . . . . .	1.0A

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**ELECTRICAL CHARACTERISTICS, P/N OM2940-5SM (5 Volts)**  
 -55°C T<sub>A</sub> 125°C, V<sub>IN</sub> = 10 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>LT</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	4.0		
			1, 2	-15		
		R <sub>O</sub> = 100	1, 2	-45		
		R <sub>O</sub> = 100, t = 20 ms	1, 2	-45		
Reverse Polarity Input Voltage Transient	V <sub>RIT</sub>	V <sub>IN</sub> = 10 V, I <sub>OUT</sub> = 5 mA	1		20	mV
			2		30	
		V <sub>IN</sub> = 7 V, I <sub>OUT</sub> = 5 mA	1		20	
			2		30	
		V <sub>IN</sub> = 26 V, I <sub>OUT</sub> = 5 mA	1		20	
			2		30	
		V <sub>IN</sub> = 10 V, I <sub>OUT</sub> = 1 A	1		70	
			2		120	
		7 V V <sub>IN</sub> 26 V, I <sub>OUT</sub> = 5 mA	1		±55	
			2		±80	
Line Regulation	V <sub>RLN</sub>	V <sub>IN</sub> = 10 V, 50 mA I <sub>OUT</sub> 1 A	1		±65	mV
			2		±120	
Load Regulation	V <sub>RLD</sub>	I <sub>OUT</sub> = 1 A	1		.7	V
			2		1	
Dropout Voltage	V <sub>DO</sub>	I <sub>OUT</sub> = 100 mA	1		150	mV
			2		200	
Output Noise Voltage	V <sub>ON</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	1.2		A
			2	1.0		
Ripple Rejection	R <sub>RR</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 OM2940-12SM (12 Volts)**  
 -55°C T<sub>A</sub> 125°C, V<sub>IN</sub> = 17 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>LT</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	4.0		
			1, 2	-15		
		R <sub>O</sub> = 100	1, 2	-45		
		R <sub>O</sub> = 100, t = 20 ms	1, 2	-45		
Reverse Polarity Input Voltage Transient	V <sub>RIT</sub>	V <sub>IN</sub> = 17 V, I <sub>OUT</sub> = 5 mA	1		20	mV
			2		30	
		V <sub>IN</sub> = 14 V, I <sub>OUT</sub> = 5 mA	1		20	
			2		30	
		V <sub>IN</sub> = 26 V, I <sub>OUT</sub> = 5 mA	1		20	
			2		30	
		V <sub>IN</sub> = 17 V, I <sub>OUT</sub> = 1 A	1		70	
			2		120	
		14 V V <sub>IN</sub> 26 V, I <sub>OUT</sub> = 5 mA	1		±110	
			2		±180	
Line Regulation	V <sub>RLN</sub>	V <sub>IN</sub> = 17 V, 50 mA I <sub>OUT</sub> 1 A	1		±160	mV
			2		±220	
Load Regulation	V <sub>RLD</sub>	I <sub>OUT</sub> = 1 A	1		.7	V
			2		1	
Dropout Voltage	V <sub>DO</sub>	I <sub>OUT</sub> = 100 mA	1		150	mV
			2		200	
Output Noise Voltage	V <sub>ON</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	1.2		A
			2	1.0		
Ripple Rejection	R <sub>RR</sub>	V <sub>IN</sub> = 17 V + 1 V rms, I <sub>OUT</sub> = 5 mA, f = 1 kHz	1	52		dB
			2	46		

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



**ELECTRICAL CHARACTERISTICS, P/N OM2940-15SM (15 Volts)**  
 -55°C, T<sub>A</sub> = 125°C, V<sub>IN</sub> = 20 V, I<sub>b</sub> = 1 A, C<sub>OUT</sub> = 22 μF (unless otherwise specified).

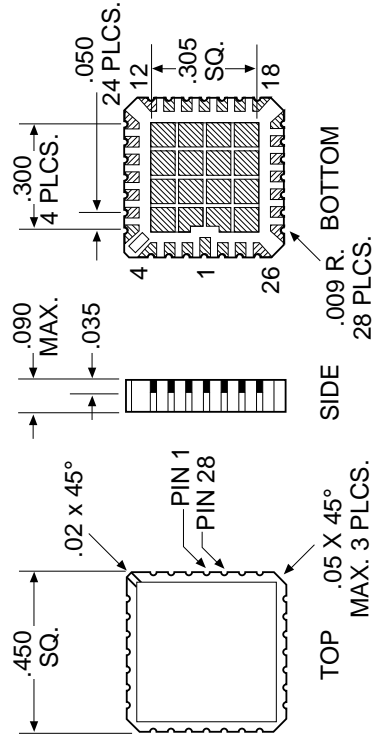
Parameter	Symbol	Test Conditions	Notes	Min.	Max.	Unit
Output Voltage	V <sub>OUT</sub>	V <sub>IN</sub> = 20 V, I <sub>OUT</sub> = 5 mA	1	14.55	15.45	V
			2	14.25	15.75	
		V <sub>IN</sub> = 16.75 V, I <sub>OUT</sub> = 5 mA	1	14.55	15.45	
			2	14.25	15.75	
		V <sub>IN</sub> = 17 V, I <sub>OUT</sub> = 5 mA	1	14.55	15.45	
			2	14.25	15.75	
Maximum Line Transient	V <sub>LT</sub>	V <sub>IN</sub> = 26 V, I <sub>OUT</sub> = 5 mA	1	14.55	15.45	V
			2	14.25	15.75	
		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	
Reverse Polarity Input Voltage DC	V <sub>RP</sub>	V <sub>IN</sub> = 16.75 V, I <sub>OUT</sub> = 50 mA	1	14.55	15.45	V
			2	14.25	15.75	
Reverse Polarity Input Voltage Transient	V <sub>RT</sub>	V <sub>IN</sub> = 20 V, R <sub>G</sub> = 100 Ω, t = 20 ms	1, 2	40		V
		R <sub>O</sub> = 100	1, 2	-15		
Quiescent Current	I <sub>Q</sub>	R <sub>O</sub> = 100	1, 2	-45		mA
		V <sub>IN</sub> = 20 V, I <sub>OUT</sub> = 5 mA	1	20		
			2	30		
		V <sub>IN</sub> = 17 V, I <sub>OUT</sub> = 5 mA	1	20		
			2	30		
		V <sub>IN</sub> = 26 V, I <sub>OUT</sub> = 5 mA	1	20		
Line Regulation	V <sub>RLN</sub>	V <sub>IN</sub> = 20 V, I <sub>OUT</sub> = 1 A	1	1	70	mV
			2	120		
		17 V V <sub>IN</sub> 26 V, I <sub>OUT</sub> = 5 mA	1	±125		
			2	±350		
		V <sub>IN</sub> = 20 V, 50 mA I <sub>OUT</sub> 1 A	1	±200		
			2	±400		
Load Regulation	V <sub>RLD</sub>	I <sub>OUT</sub> = 1 A	1	.7	V	
		I <sub>OUT</sub> = 5 mA	1	1		
Dropout Voltage	V <sub>DO</sub>	I <sub>OUT</sub> = 100 mA	1	150	mV	
		I <sub>OUT</sub> = 5 mA	1	200		
Output Noise Voltage	V <sub>ON</sub>	V <sub>IN</sub> = 20 V, I <sub>b</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>b</sub> = 120 Hz	1, 2	1		
Short Circuit Current	I <sub>OS</sub>	V <sub>IN</sub> = 20 V	1	1.2	A	
		V <sub>IN</sub> = 20 V + 1 V rms, I <sub>OUT</sub> = 5 mA, f = 1 kHz	2	1.0		
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**

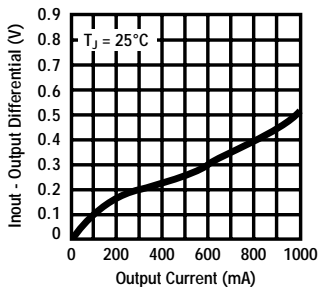
Pin 1, 15 thru 28: IN  
 Pin 2, 3, 13, and 14: GND  
 Pin 4 thru 12: OUT

**MECHANICAL OUTLINE**

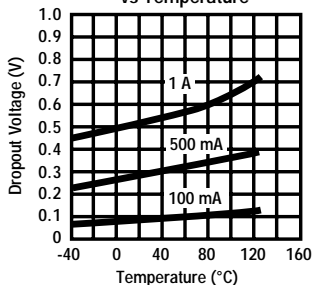


# TYPICAL APPLICATIONS

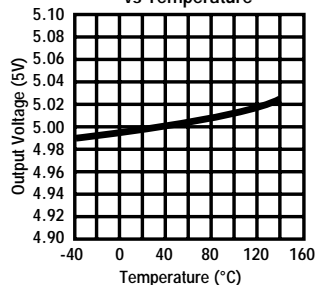
Dropout Voltage



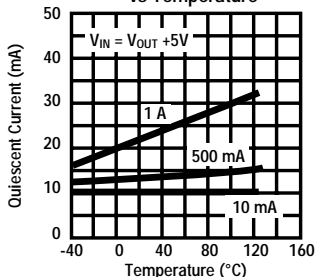
Dropout Voltage vs Temperature



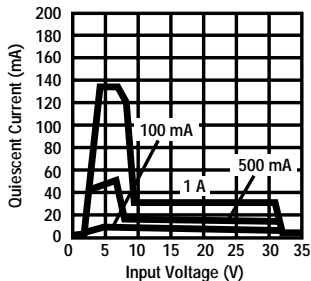
Output Voltage vs Temperature



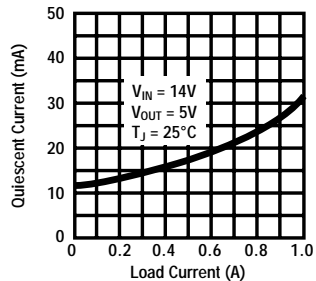
Quiescent Current vs Temperature



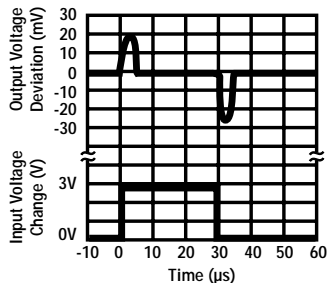
Quiescent Current



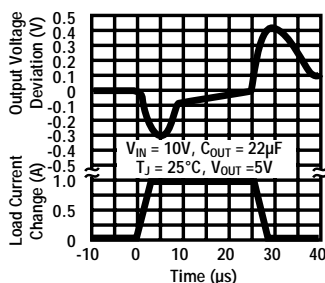
Quiescent Current



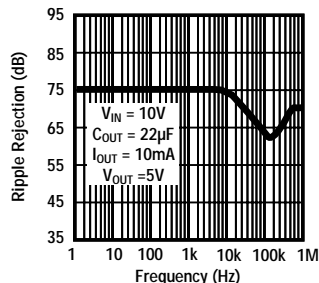
Line Transient Response



Load Transient Response



Ripple Rejection



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