

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:	
θ_{JC} (Isolated)	4.2°C/W
θ_{JA}	42°C/W
Maximum Output Current.	1.3 A

3.5

ELECTRICAL CHARACTERISTICS, P/N OM7648SM (5 Volts)

-55°C ≤ T_A ≤ 125°C; V_{IN} = 20 V, I_O = 1 A, C_{OUT} = 22 µF (unless otherwise specified).

Parameter	Symbol	Test Conditions	Notes	Min.	Max.	Unit
Output Voltage	V _{OUT}	V _N = 10 V, I _{OUT} = 5 mA	1	4.85	5.15	V
			2	4.75	5.25	
		V _N = 6 V, I _{OUT} = 5 mA	1	4.85	5.15	
			2	4.75	5.25	
		V _N = 7 V, I _{OUT} = 5 mA	1	4.85	5.15	
			2	4.75	5.25	
		V _N = 26 V, I _{OUT} = 5 mA	1	4.85	5.15	
			2	4.75	5.25	
		V _N = 10 V, I _{OUT} = 1 A	1	4.85	5.15	
			2	4.75	5.25	
		V _N = 6 V, I _{OUT} = 1 A	1	4.85	5.15	
			2	4.75	5.25	
		V _N = 6 V, I _{OUT} = 50 mA	1	4.85	5.15	
			2	4.75	5.25	
		V _N = 10 V, I _{OUT} = 50 mA	1	4.85	5.15	
			2	4.75	5.25	
		V _O ≤ 6 V, R _O = 100 Ω, t = 20 ms	1, 2	40		
		R _O = 100 Ω	1, 2	-15		
		R _O = 100 Ω, t = 20 ms	1, 2	-45		V
		V _N = 10 V, I _{OUT} = 5 mA	1		15	
			2		20	
		V _N = 7 V, I _{OUT} = 5 mA	1		15	
			2		20	
		V _N = 26 V, I _{OUT} = 5 mA	1		15	
			2		20	
		V _N = 10 V, I _{OUT} = 1 A	1		50	
			2		100	
Line Regulation	V _{RIN}	7 V ≤ V _{IN} ≤ 26 V, I _{OUT} = 5 mA	1		±40	mV
			2		±50	
		V _N = 10 V, 50 mA ≤ I _{OUT} ≤ 1 A	1		±50	
			2		±100	
		I _{OUT} = 1 A	1		.7	
			2		1	
		I _{OUT} = 100 mA	1		150	
			2		200	
		V _N = 10 V, I _O = 5 mA, 10 Hz - 100 Hz	1, 2		700	
Output Impedance	R _O	V _N = 10 V, I _{OUT} = 100 mA dc and 20 mA ac, f _O = 120 Hz	1, 2		1	Ω
		V _N = 10 V	1	1.5		
			2	1.3		
		V _N = 10 V + 1 V rms, I _{OUT} = 5 mA, f = 1 kHz	1	60		
			2	50		
Ripple Rejection	R _R					dB

Notes: 1. T_A = 25°C.
2. Over full operating temperature range.

ELECTRICAL CHARACTERISTICS, P/N OM7649SM (12 Volts)

-55°C ≤ T_A ≤ 125°C; V_{IN} = 20 V, I_O = 1 A, C_{OUT} = 22 µF (unless otherwise specified).

Parameter	Symbol	Test Conditions	Notes	Min.	Max.	Unit
Output Voltage	V _{OUT}	V _N = 17 V, I _{OUT} = 5 mA	1	11.64	12.36	V
			2	11.40	12.60	
		V _N = 13.6 V, I _{OUT} = 5 mA	1	11.64	12.36	
			2	11.40	12.60	
		V _N = 14 V, I _{OUT} = 5 mA	1	11.64	12.36	
			2	11.40	12.60	
		V _N = 26 V, I _{OUT} = 5 mA	1	11.64	12.36	
			2	11.40	12.60	
		V _N = 17 V, I _{OUT} = 1 A	1	11.64	12.36	
			2	11.40	12.60	
		V _N = 13.6 V, I _{OUT} = 1 A	1	11.64	12.36	
			2	11.40	12.60	
		V _N = 13.6 V, I _{OUT} = 50 mA	1	11.64	12.36	
			2	11.40	12.60	
		V _N = 17 V, I _{OUT} = 50 mA	1	11.64	12.36	
			2	11.40	12.60	
		V _O ≤ 13 V, R _O = 100 Ω, t = 20 ms	1, 2	40		
		R _O = 100 Ω	1, 2	-15		
		R _O = 100 Ω, t = 20 ms	1, 2	-45		V
		V _N = 17 V, I _{OUT} = 5 mA	1		15	
			2		20	
		V _N = 14 V, I _{OUT} = 5 mA	1		15	
			2		20	
		V _N = 26 V, I _{OUT} = 5 mA	1		15	
			2		20	
		V _N = 17 V, I _{OUT} = 1 A	1		5	
			2		60	
Line Regulation	V _{RIN}	14 V ≤ V _{IN} ≤ 26 V, I _{OUT} = 5 mA	1		±75	mV
			2		±120	
		V _N = 17 V, 50 mA ≤ I _{OUT} ≤ 1 A	1		±120	
			2		±190	
		I _{OUT} = 1 A	1		.7	
			2		1	
		I _{OUT} = 100 mA	1		150	
			2		200	
		V _N = 17 V, I _O = 5 mA, 10 Hz - 100 Hz	1		1000	
Output Impedance	R _O	V _N = 17 V, I _{OUT} = 100 mA dc and 20 mA ac, f _O = 120 Hz	1, 2		1	Ω
		V _N = 17 V	1	1.6		
			2	1.3		
		V _N = 17 V + 1 V rms, I _{OUT} = 5 mA, f = 1 kHz	1	45		
			2	42		

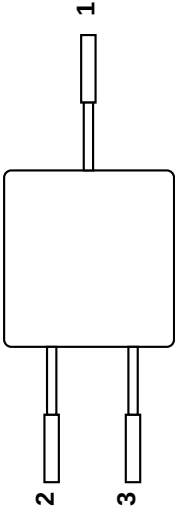
Notes: 1. T_A = 25°C.
2. Over full operating temperature range.

ELECTRICAL CHARACTERISTICS, P/N OM7650SM (15 Volts)
-55°C ≤ T_A ≤ 125°C, V_{IN} = 20 V, I_O = 1 A, C_{OUT} = 22 μF (unless otherwise specified).

Parameter	Symbol	Test Conditions	Notes	Min.	Max.	Unit
Output Voltage	V _{OUT}	V _{IN} = 20 V, I _{OUT} = 5 mA	1	14.55	15.45	V
			2	14.25	15.75	
		V _{IN} = 16.75 V, I _{OUT} = 5 mA	1	14.55	15.45	
			2	14.25	15.75	
		V _{IN} = 17 V, I _{OUT} = 5 mA	1	14.55	15.45	
			2	14.25	15.75	
		V _{IN} = 26 V, I _{OUT} = 5 mA	1	14.55	15.45	
			2	14.25	15.75	
		V _{IN} = 20 V, I _{OUT} = 1 A	1	14.55	15.45	
			2	14.25	15.75	
		V _{IN} = 16.75 V, I _{OUT} = 1 A	1	14.55	15.45	
			2	14.25	15.75	
		V _{IN} = 20 V, I _{OUT} = 50 mA	1	14.55	15.45	
			2	14.25	15.75	
		V _{IN} = 16 V, R _O = 100 Ω, t = 20 ms	1, 2	40		
Maximum Line Transient	V _{LT}		1, 2	40		V
Reverse Polarity Input Voltage DC	V _{RIN}	R _O = 100 Ω	1, 2	-15		V
Reverse Polarity Input Voltage Transient	V _{RIT}	R _O = 100 Ω, t = 20 ms	1, 2	-45		V
Quiescent Current	I _Q	V _{IN} = 20 V, I _{OUT} = 5 mA	1		15	mA
			2		20	
		V _{IN} = 17 V, I _{OUT} = 5 mA	1		15	
			2		20	
		V _{IN} = 26 V, I _{OUT} = 5 mA	1		15	
			2		20	
		V _{IN} = 20 V, I _{OUT} = 1 A	1		50	
			2		60	
Line Regulation	V _{RLIN}	17 V ≤ V _{IN} ≤ 26 V, I _{OUT} = 5 mA	1		±95	mV
			2		±150	
Load Regulation	V _{RLD}	V _{IN} = 20 V, 50 mA ≤ I _{OUT} ≤ 1 A	1		±150	mV
			2		±240	
Dropout Voltage	V _{DO}	I _{OUT} = 1 A	1		.7	V
			2		1	
Output Noise Voltage	V _{ON}	I _{OUT} = 100 mA	1		150	mV
			2		200	
Output Impedance	R _O	V _{IN} = 20 V, I _O = 5 mA, 10 Hz - 100 Hz	1		1000	μV rms
		V _{IN} = 20 V, I _{OUT} = 100 mA ac and 20 mA dc, f _o = 120 Hz	1, 2			
Short Circuit Current	I _{OS}	V _{IN} = 20 V	1	1.6		Ω
			2	1.3		
Ripple Rejection	R _R	V _{IN} = 20 V + 1 V rms, I _{OUT} = 5 mA, f = 1 kHz	1	48		dB
			2	42		

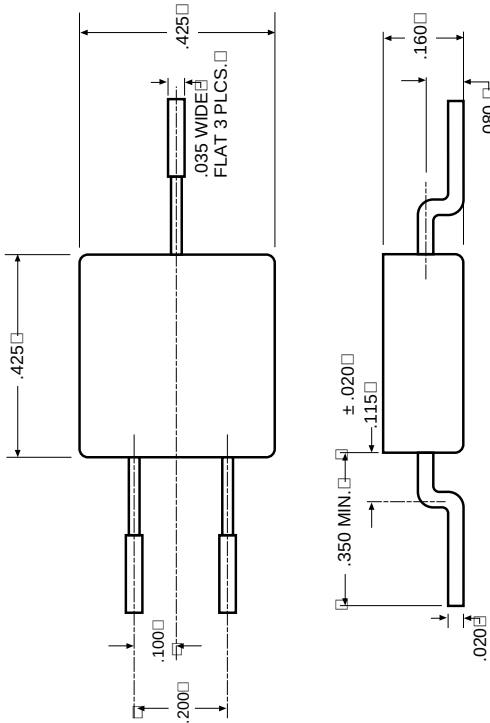
Notes: 1. T_A = 25°C.
2. Over full operating temperature range.

PIN CONNECTION



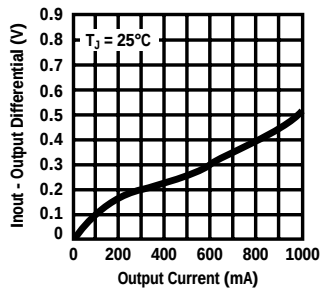
Pin 1: V_{OUT}
Pin 2: Adjust
Pin 3: V_{IN}
Case: Isolated

MECHANICAL OUTLINE

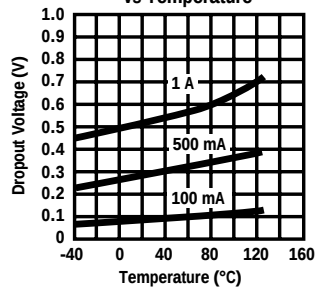


TYPICAL APPLICATIONS

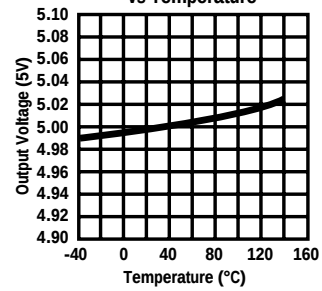
Dropout Voltage



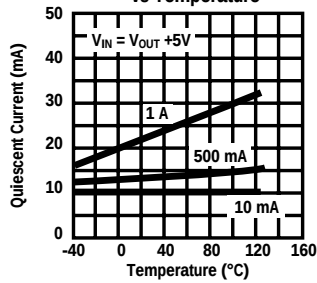
Dropout Voltage vs Temperature



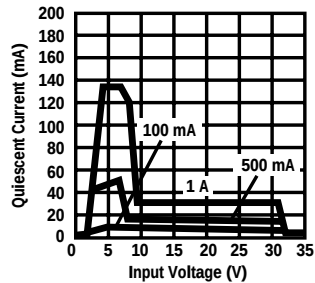
Output Voltage vs Temperature



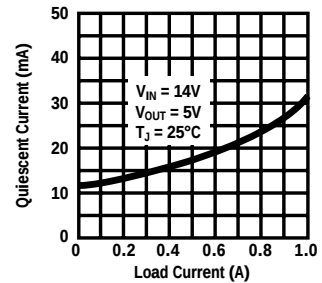
Quiescent Current vs Temperature



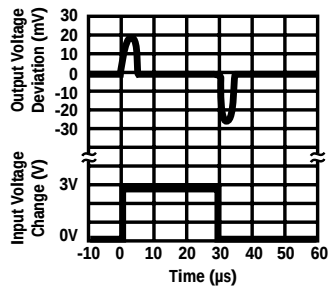
Quiescent Current



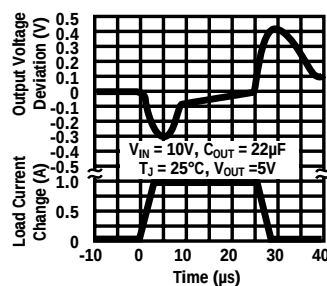
Quiescent Current



Line Transient Response



Load Transient Response



Ripple Rejection

