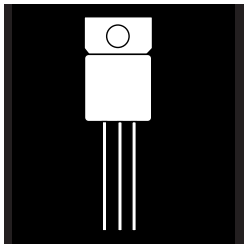
0.5 VOLT LOW DROPOUT POSITIVE FIXED VOLTAGE REGULATOR APPROVED TO DESC DRAWING



Three Terminal, Fixed Voltage, 1 Amp Low Dropout Voltage Regulator In Hermetic JEDEC TO-257AA Package

FEATURES

- Similar To Industry Standard LM2940
- Approved To DESC Standardized Military Drawing
- Dropout Voltage Typically 0.5 V @ I_O = 1 A
- Output Current in Excess of 1 A
- Reverse Battery Protection
- Internal Short Circuit Protection
- Isolated Hermetic 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 the hermetic TO-257 package and is ideally suited for Military applications where small size and high reliability is required.

ABSOLUTE MAXIMUM RATINGS

Input Voltage 26Vdc
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:
q_{JC} (Isolated) . . . . . 4.2°C/W
q_{JA} . . . . . 42°C/W
Maximum Output Current . . . . . 1.3 A

3.3

PART NUMBER DESIGNATOR	
Standard Military Drawing Number	**Omnirel Part Number**
5962-8958710MUX	**OM2940-5STM**
5962-9088401MUX	**OM2940-12STM**
5962-9088501MUX	**OM2940-15STM**

ELECTRICAL CHARACTERISTICS, P/N OM2940-5 (5 Volt)

Test Conditions are -55°C T_A 125°C, V_{IN} = 10 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} = 10 V, I_{OUT} = 5 mA	1	4.85	5.15	V
			2	4.75	5.25	
		V_{IN} = 6 V, I_{OUT} = 5 mA	1	4.85	5.15	
			2	4.75	5.25	
		V_{IN} = 7 V, I_{OUT} = 5 mA	1	4.85	5.15	
			2	4.75	5.25	
		V_{IN} = 26 V, I_{OUT} = 5 mA	1	4.85	5.15	
			2	4.75	5.25	
		V_{IN} = 10 V, I_{OUT} = 1 A	1	4.85	5.15	
			2	4.75	5.25	
		V_{IN} = 6 V, I_{OUT} = 1 A	1	4.85	5.15	
			2	4.75	5.25	
		V_{IN} = 6 V, I_{OUT} = 50 mA	1	4.85	5.15	
			2	4.75	5.25	
		V_{IN} = 10 V, I_{OUT} = 50 mA	1	4.85	5.15	
			2	4.75	5.25	
Maximum Line Transient	V_{LT}	V_O 6 V, R_O = 100 , t = 20 ms	1, 2	40		V
Reverse Polarity Input Voltage DC	V_{RIN}	R_O = 100	1, 2	-15		V
Reverse Polarity Input Voltage Transient	V_{RIT}	R_O = 100 , t =20 ms	1, 2	-45		V
Quiescent Current	I_Q	V_{IN} = 10 V, I_{OUT} = 5 mA	1		15	mA
			2		20	
		V_{IN} = 7 V, I_{OUT} = 5 mA	1		15	
			2		20	
		V_{IN} = 26 V, I_{OUT} = 5 mA	1		15	
				2		20
		V_{IN} = 10 V, I_{OUT} = 1 A	1		50	
				2		100
Line Regulation	V_{RLN}	7 V V_{IN} 26 V, I_{OUT} = 5 mA	1		±40	mV
			2		±50	
Load Regulation	V_{RLD}	V_{IN} = 10 V, 50 mA I_{OUT} 1 A	1		±50	mV
			2		±100	
Dropout Voltage	V_{DO}	I_{OUT} = 1 A	1		.7	V
			2		1	
		I_{OUT} = 100 mA	1		150	mV
			2		200	
Output Noise Voltage	V_{ON}	V_{IN} = 10 V, I_O = 5 mA, 10 Hz - 100 Hz	1, 2		700	µV rms
Output Impedance	R_O	V_{IN} = 10 V, I_{OUT} = 100 mA dc and 20 mA ac, f_O = 120 Hz	1, 2		1	
Short Circuit Current	I_{OS}	V_{IN} = 10 V	1	1.5		A
			2	1.3		
Ripple Rejection	R_R	V_{IN} = 10 V + 1 V rms, I_{OUT} = 5 mA, f = 1 kHz	1	60		dB
			2	50		

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

ELECTRICAL CHARACTERISTICS, P/N OM2940-12 (12 Volt)

Test Conditions are -55°C T_A 125°C, V_{IN} = 17 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} = 17 V, I_{OUT} = 5 mA	1	11.64	12.36	V
			2	11.40	12.60	
		V_{IN} = 13.6 V, I_{OUT} = 5 mA	1	11.64	12.36	
			2	11.40	12.60	
		V_{IN} = 14 V, I_{OUT} = 5 mA	1	11.64	12.36	
			2	11.40	12.60	
		V_{IN} = 26 V, I_{OUT} = 5 mA	1	11.64	12.36	
			2	11.40	12.60	
		V_{IN} = 17 V, I_{OUT} = 1 A	1	11.64	12.36	
			2	11.40	12.60	
		V_{IN} = 13.6 V, I_{OUT} = 1 A	1	11.64	12.36	
			2	11.40	12.60	
		V_{IN} = 13.6 V, I_{OUT} = 50 mA	1	11.64	12.36	
			2	11.40	12.60	
		V_{IN} = 17 V, I_{OUT} = 50 mA	1	11.64	12.36	
			2	11.40	12.60	
Maximum Line Transient	V_{LT}	V_O 13 V, R_O = 100 , t = 20 ms	1, 2	40		V
Reverse Polarity Input Voltage DC	V_{RIN}	R_O = 100	1, 2	-15		V
Reverse Polarity Input Voltage Transient	V_{RIT}	R_O = 100 , t =20 ms	1, 2	-45		V
Quiescent Current	I_Q	V_{IN} = 17 V, I_{OUT} = 5 mA	1		15	mA
			2		20	
		V_{IN} = 14 V, I_{OUT} = 5 mA	1		15	
			2		20	
		V_{IN} = 26 V, I_{OUT} = 5 mA	1		15	
				2		20
		V_{IN} = 17 V, I_{OUT} = 1 A	1		50	
				2		60
Line Regulation	V_{RLN}	14 V V_{IN} 26 V, I_{OUT} = 5 mA	1		±75	mV
			2		±120	
Load Regulation	V_{RLD}	V_{IN} = 17 V, 50 mA I_{OUT} 1 A	1		±120	mV
			2		±190	
Dropout Voltage	V_{DO}	I_{OUT} = 1 A	1		.7	V
			2		1	
		I_{OUT} = 100 mA	1		150	mV
			2		200	
Output Noise Voltage	V_{ON}	V_{IN} = 17 V, I_O = 5 mA, 10 Hz - 100 Hz	1		1000	µV rms
Output Impedance	R_O	V_{IN} = 17 V, I_{OUT} = 100 mA dc and 20 mA ac, f_O = 120 Hz	1, 2		1	
Short Circuit Current	I_{OS}	V_{IN} = 17 V	1	1.6		A
			2	1.3		
Ripple Rejection	R_R	V_{IN} = 17 V + 1 V rms, I_{OUT} = 5 mA, f = 1 kHz	1	52		dB
			2	46		

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

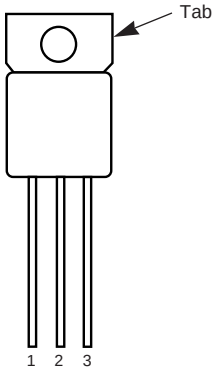
ELECTRICAL CHARACTERISTICS, P/N OM2940-15 (15Volt)

Test Conditions are -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} = 16.75 V, I_{OUT} = 50 mA	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	
Maximum Line Transient	V_{LT}	V_O 16 V, R_O = 100 , t = 20 ms	1, 2	40		V
Reverse Polarity Input Voltage DC	V_{RIN}	R_O = 100	1, 2	-15		V
Reverse Polarity Input Voltage Transient	V_{RIT}	R_O = 100 , 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_{RLN}	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	
		I_{OUT} = 100 mA	1		150	mV
			2		200	
Output Noise Voltage	V_{ON}	V_{IN} = 20 V, I_O = 5 mA, 10 Hz - 100 Hz	1		1000	µV rms
Output Impedance	R_O	V_{IN} = 20 V, I_{OUT} = 100 mA ac and 20 mA dc, f_O = 120 Hz	1, 2		1	
Short Circuit Current	I_{OS}	V_{IN} = 20 V	1	1.6		A
			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.

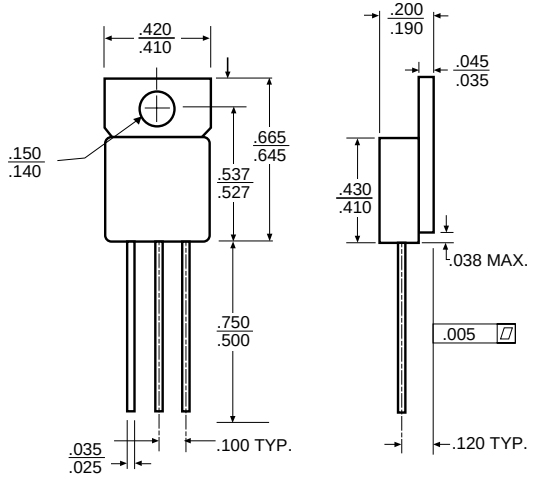
PIN CONNECTION



Front View

Pin 1: V_{IN} Pin 3: V_{OUT}
Pin 2: Gnd Tab: Isolated

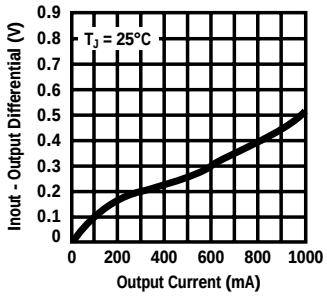
MECHANICAL OUTLINE



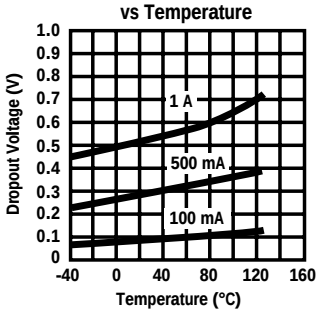
NOTES
- Case is metal/hermetically sealed
- Isolated Tab

TYPICAL APPLICATIONS

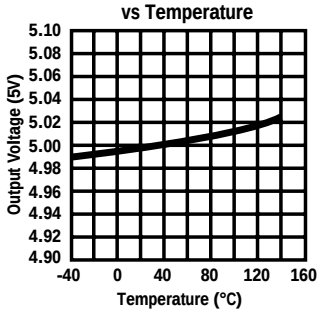
Dropout Voltage



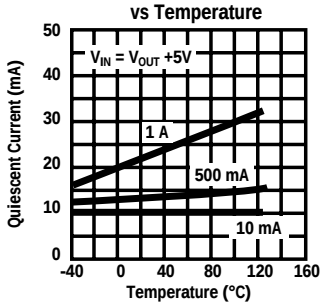
Dropout Voltage vs Temperature



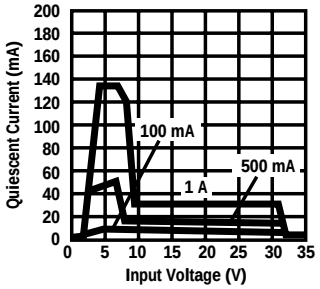
Output Voltage vs Temperature



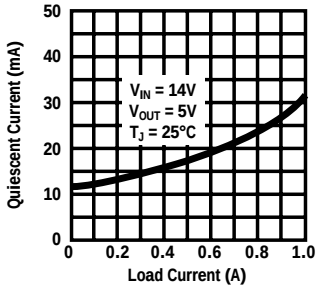
Quiescent Current vs Temperature



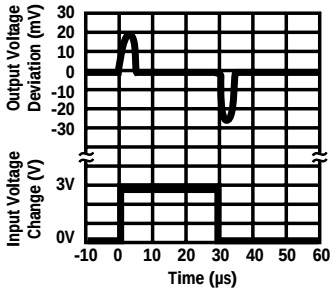
Quiescent Current



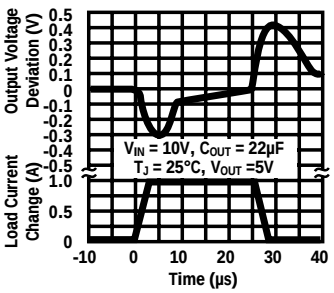
Quiescent Current



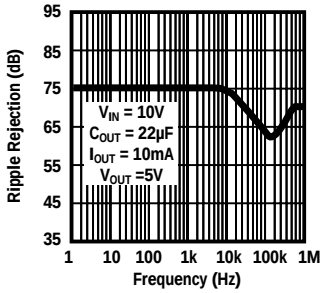
Line Transient Response



Load Transient Response



Ripple Rejection



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