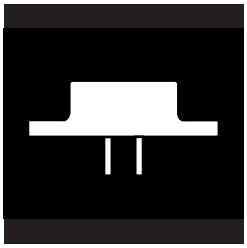
HERMETIC TO-3 FIXED VOLTAGE REGULATORS APPROVED TO DESC DRAWINGS



Three Terminal, Fixed Voltage, 1.5 Amp Precision Positive Regulators In Hermetic JEDEC TO-3 Package

FEATURES

- Output Voltages: 5V, 12V, 15V
- Output Voltages Set Internally to ±1%
- Built-In Thermal Overload Protection
- Short Circuit Current Limiting
- Similar To Industry Standards 7805, 7812, 7815
- Hi-Rel Screening Available

DESCRIPTION

These three terminal positive regulators are supplied in a hermetically sealed metal TO-3 package. All protective features are designed into the circuit, including thermal shutdown, current limiting and safe-area control. With heat sinking, they can deliver over 1.5 amps of output current. These units feature internally trimmed output voltages ±1% of nominal voltage. These units are ideally suited for Military applications where a hermetically sealed package is required.

PART NUMBER DESIGNATOR

Standard Military Drawing Number	Omnirel Part Number
5962-8778201 YX	OM1805NKM
5962-8777601 YX	OM1812NKM
5962-8855301 YX	OM1815NKM

ABSOLUTE MAXIMUM RATINGS @ 25°C

Input Voltage . . . . . +35 V
Operating Junction Temperature Range . . . . . - 55°C to + 150°C
Storage Temperature Range . . . . . - 65°C to + 150°C
Typical Power/Thermal Charateristics:
Rated Power @ 25° C T_C 20W
T_A 4.3W
Thermal Resistance q_{JC} . . . . . 3°C/W
q_{JA} . . . . . 29°C/W

ELECTRICAL CHARACTERISTICS 5 Volt

V_{IN} = 10V, I_o = 500mA, -55°C T_A 125°C (unless otherwise specified)

Parameter	Symbol	Test Conditions		Min.	Max.	Unit
Output Voltage	V_{OUT}	T_A = 25°C		4.92	5.08	V
		V_{IN} = 7.5V to 20V	•	4.85	5.15	V
		I_O = 5mA to 1.0A, P ≤ 20 W				
Line Regulation	V_{RLINE}	V_{IN} = 7.5V to 20V			5	mV
(Note 1)			•		12	mV
(Note 4)		V_{IN} = 8.0V to 12V			4	mV
			•		10	mV
Load Regulation	V_{RLOAD}	I_O = 5mA to 1.5 Amp			12	mV
(Note 1)		I_O = 5mA to 1.0Amp	•		25	mV
		I_O = 250mA to 750 mA			6	mV
			•		15	mV
Standby Current Drain	I_{SCD}				6	mA
			•		6.5	mA
Standby Current Drain	DI_{SCD}	V_{IN} = 7.5V to 20V	•		0.8	mA
Change With Line	(Line)					
Standby Current Drain	DI_{SCD}	I_O = 5mA to 1000mA	•		0.5	mA
Change With Load	(Load)					
Dropout Voltage	V_{DO}	T_A = 25°C, DV_{OUT} = 100mV, I_O = 1.0A			2.5	V
Peak Output Current	$I_{O\ (pk)}$	T_A = 25°C		1.5	3.3	A
Short Circuit Current	I_{DS}	V_{IN} = 35V			1.2	A
(Note 2)			•		2.8	A
Ripple Rejection	$\frac{DV_{IN}}{DV_{OUT}}$	f =120 Hz, DV_{IN} = 10V		66		dB
		(Note 3)	•	60		dB
Output Noise Voltage	N_O	T_A = 25°C, f =10 Hz to 100KHz			40	µV/V
(Note 3)						RMS
Long Term Stability	$\frac{DV_{OUT}}{Dt}$	T_A = 25°C, t = 1000 hrs.			75	mV
(Note 3)						

Notes:

1. Load and Line Regulation are specified at a constant junction temperature. Pulse testing with low duty cycle is used. Changes in output voltage due to heating effects must be taken into account separately.
2. Short Circuit protection is only assured up to V_{IN} = 35V.
3. If not tested, shall be guaranteed to the specified limits.
   The • denotes the specifications which apply over the full operating temperature range.
4. Minimum load current for full line regulation = 5.0 mA.

ELECTRICAL CHARACTERISTICS 12 Volt V_{IN} = 19V, I_o = 500mA, -55°C T_A 125°C (unless otherwise specified)

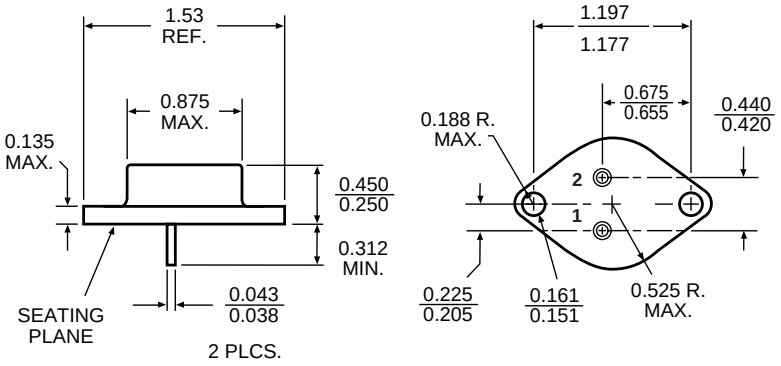
Parameter	Symbol	Test Conditions		Min.	Max.	Unit
Output Voltage	V_{OUT}	T_A = 25°C		11.88	12.12	V
		V_{IN} = 14.5V to 27V I_O = 5mA to 1.0 A, P ≤ 20W	•	11.64	12.36	V
Line Regulation	V_{RLINE}	V_{IN} = 14.5V to 27V			18	mV
(Note 1)			•		50	mV
(Note 4)		V_{IN} = 16V to 22V			9	mV
			•		30	mV
Load Regulation	V_{RLOAD}	I_O = 5mA to 1.5 Amp			32	mV
(Note 1)		I_O = 5mA to 1.0 Amp	•		60	mV
		I_O = 250mA to 750 mA			20	mV
			•		40	mV
Standby Current Drain	I_{SCD}				6.0	mA
			•		6.5	mA
Standby Current Drain Change With Line	DI_{SCD} (Line)	V_{IN} = 15V to 30V	•		0.8	mA
Standby Current Drain Change With Load	DI_{SCD} (Load)	I_O = 5mA to 1000mA	•		0.5	mA
Dropout Voltage	V_{DO}	DV_{OUT} = 100mV, I_O = 1.0A	•		2.5	V
Peak Output Current	$I_{O(pk)}$	T_A = 25°C		1.5	3.3	A
Short Circuit Current	I_{DS}	V_{IN} = 35V			1.2	A
(Note 2)			•		2.8	A
Ripple Rejection	$\frac{DV_{IN}}{DV_{OUT}}$	f =120 Hz, DV_{IN} = 10V		61		dB
		(Note 3)	•	54		dB
Output Noise Voltage	N_O	T_A = 25°C, f =10 Hz to 100KHz			40	µV/V
(Note 3)						RMS
Long Term Stability	$\frac{DV_{OUT}}{Dt}$	T_A = 25°C, t = 1000 hrs.			120	mV
(Note 3)						

Notes:

1. Load and Line Regulation are specified at a constant junction temperature. Pulse testing with low duty cycle is used. Changes in output voltage due to heating effects must be taken into account separately.
2. Short Circuit protection is only assured up to V_{IN} = 35V.
3. If not tested, shall be guaranteed to the specified limits.
   The • denotes the specifications which apply over the full operating temperature range.
4. Minimum load current for full line regulation = 5.0 mA.

3.3

MECHANICAL OUTLINE



Pin Connection

Pin 1: Input

Pin 2: Output

Case: Ground

Omnirel

ELECTRICAL CHARACTERISTICS 15 Volt V_{IN} = 23V, I_o = 500mA, -55°C T_A 125°C (unless otherwise specified)

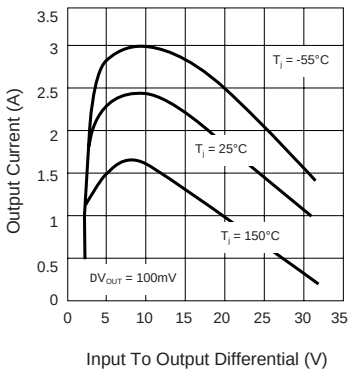
Parameter	Symbol	Test Conditions		Min.	Max.	Unit
Output Voltage	V_{OUT}	T_A = 25°C		14.8	15.2	V
		V_{IN} = 18.5V to 30V	•	14.6	15.4	V
		I_O = 5mA to 1.0 A, P ≤ 20W				
Line Regulation	V_{RLINE}	V_{IN} = 17.5V to 30V			20	mV
(Note 1)			•		50	mV
(Note 4)		V_{IN} = 20V to 26V			15	mV
			•		25	mV
Load Regulation	V_{RLOAD}	I_O = 5mA to 1.5 Amp			35	mV
(Note 1)		I_O = 5mA to 1.0 Amp	•		75	mV
		I_O = 250mA to 750 mA			21	mV
			•		45	mV
Standby Current Drain	I_{SCD}				6.0	mA
			•		6.5	mA
Standby Current Drain Change With Line	DI_{SCD} (Line)	V_{IN} = 18.5V to 30V	•		0.8	mA
Standby Current Drain Change With Load	DI_{SCD} (Load)	I_O = 5mA to 1000mA	•		0.5	mA
Dropout Voltage	V_{DO}	T_A = 25°C, DV_{OUT} = 100mV, I_O = 1.0A			2.5	V
Peak Output Current	$I_{O(pk)}$	T_A = 25°C		1.5	3.3	A
Short Circuit Current	I_{DS}	V_{IN} = 35V			1.2	A
(Note 2)			•		2.8	A
Ripple Rejection	$\frac{DV_{IN}}{DV_{OUT}}$	f =120 Hz, DV_{IN} = 10V		54		dB
		(Note 3)	•	52		dB
Output Noise Voltage (Note 3)	N_O	T_A = 25°C, f =10 Hz to 100KHz			40	µV/V RMS
Long Term Stability (Note 3)	$\frac{DV_{OUT}}{Dt}$	T_A = 25°C, t = 1000 hrs.			150	mV

Notes:
1. Load and Line Regulation are specified at a constant junction temperature. Pulse testing with low duty cycle is used. Changes in output voltage due to heating effects must be taken into account separately.
2. Short Circuit protection is only assured up to V_{IN} = 35V.
3. If not tested, shall be guaranteed to the specified limits.
   The • denotes the specifications which apply over the full operating temperature range.
4. Minimum load current for full line regulation = 5.0 mA.

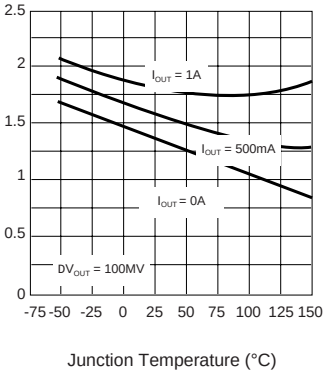
TYPICAL PERFORMANCE CHARACTERISTICS

3.3

PEAK OUTPUT



DROPOUT VOLTAGE



RIPPLE REJECTION