

DESC APPROVED LOW DROPOUT NEGATIVE



Three Terminal, Fixed Voltage,
Low Dropout Negative Voltage Regulator
In Hermetic Packages

FEATURES

- Approved To DESC Standardized Military Drawings
- Low Dropout Voltage, $0.6\text{ V @ } I_o = 1\text{ A}$
- Output Current in Excess of 1 A [LOC 20 (N2) package limited to 0.3A]
- Reverse Battery Protection
- Internal Short Circuit Protection
- Isolated and Non-Isolated Hermetic Package Types
- Output Voltages: - 5V, -5.2V, -12V, & -15V

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DESCRIPTION

The OM2990 series of fixed voltage regulators are designed to provide up to 1.5A with high efficiency. It has the ability to source 1A of output current with a typical dropout voltage of 0.6V and a maximum of 1V over the entire operating temperature range. It is supplied in hermetic packages and is ideally suited for all applications where small size and high reliability are required.

ABSOLUTE MAXIMUM RATINGS, $T_C = 25^\circ\text{C}$

Input Voltage	-26 V to +0.3V
Output Voltage	-5V, -5.2 V, -12 V, -15 V dc
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: Junction to Case	
Case 2, LOC20	15.5°C/W
Case U&M, TO-257 (isolated) & SMD-3	3.8°C/W
Case T&N, TO-257 (non-isolated) & SMD-1	3.0°C/W
Case Y, TO-3	2.7°C/W
Maximum Output Current	
Case 2	0.3A
Case U&M	1.2A
Case T, N & Y	1.5A

APPROVED DESC DRAWING	OMNIREL P/N
5962-9571101MUA	OM2990 - 5 STM
5962-9571002MUA	OM2990 - 5.2 STM
5962-9571001MUA	OM2990 - 12 STM

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Notes: 1. $T_A = 25^\circ\text{C}$.
2. Over full operating temperature range.
3. Guaranteed, not tested

Test Conditions are -55°C T_A 125°C , $V_{BI} = -17\text{V}$, $C_{OUT} = 47\text{ }\mu\text{F}$ (unless otherwise specified).

Notes:

1. $T_A = 25^{\circ}\text{C}$.
2. Over full operating temperature range.
3. Guaranteed, not tested
4. The short circuit current is less than the maximum output current due to internal foldback current limiting. The -5V and -5.2V versions do not reach the foldback current limit and therefore conducts a higher short

Test Conditions are -55°C T_A 125°C , $V_{IN} = -20\text{V}$, $C_{OUT} = 47\mu\text{F}$ (unless otherwise specified).

Notes:

1. $T_A = 25^\circ\text{C}$.
2. Over full operating temperature range.
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Quiescent Current	I_Q	$I_Q \leq 300 \text{ mA}$	1	-12.60	-11.40
			2	14	
		$I_Q = 300 \text{ mA}, V_{IN} = -12 \text{ V}$	1,2	60	
Line Regulation	V_{RLN}	$-13 \text{ V} \quad V_{IN} = -26 \text{ V}$	1	± 75	
		$I_{OUT} = 5 \text{ mA}$	2	± 110	
Load Regulation	V_{RLD}	$50 \text{ mA} \quad I_{OUT} \quad 300 \text{ mA}$	1	± 120	
			2	± 190	
Dropout Voltage	V_{DO}	$I_Q = 100 \text{ mA}$	1		
		$DV_{DO} \quad 100 \text{ mV}$	2	3	
		$I_Q = 300 \text{ mA}$	1		
		$DV_{DO} \quad 100 \text{ mV}$	2	1	
Output Noise Voltage	V_{ON}	$I_Q = 5 \text{ mA}$	3	1650	μV
		$10 \text{ Hz} - 100 \text{ kHz}$			
Short Circuit Current	I_{OS}	$R_L = 1$	1	200	mA
			2	175	
Maximum Output Current	I_{MAX}		1	280	mA
			4		
Ripple Rejection	R_R	$V_{ripple} = 1 \text{ V}_{rms}$	1	42	dB
		$I_{OUT} = 5 \text{ mA}, f = 1 \text{ kHz}$			

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The -9V and -5.2V versions do not reach the foldback current limit and therefore conducts a higher short

Quiescent Current	I_Q	$I_Q \leq 300 \text{ mA}$	1	-15,75	-14,25	m
			2		25	
		$I_Q = 300 \text{ mA}, V_{IN} = -15 \text{ V}$	1,2		60	
Line Regulation	V_{RLN}	-16 V V_{IN} -26 V,	1		± 85	m
		$I_{OUT} = 5 \text{ mA}$	2		± 130	
Load Regulation	V_{RLD}	50 mA I_{OUT} 300 mA	1		± 135	m
			2		± 205	
Dropout Voltage	V_{DO}	$I_Q = 100 \text{ mA}$	1			V
		$DV_{DO} 100 \text{ mV}$	2		3	
		$I_Q = 300 \text{ mA}$	1		1	
		$DV_{DO} 100 \text{ mV}$	2			
Output Noise Voltage	V_{ON}	$I_Q = 5 \text{ mA}$, 10 Hz - 100 kHz	3		1900	μV
Short Circuit Current	I_{BS}	$R_L = 1$	1	150		m
			2	140		
Maximum Output Current	I_{MAX}		1	280		m
			4			
Ripple Rejection	R_R	$V_{ripple} = 1 \text{ V}_{MS}$ $I_{OUT} = 5 \text{ mA}, f = 1 \text{ kHz}$	1	42		dB

Notes: 1. $T_A = 25^\circ\text{C}$.
2. Over full operating temperature range.
3. Guaranteed, not tested
4. The short circuit current is less than the maximum output current due to internal foldback current limiting.
The -5V and -5.2V versions do not reach the foldback current limit and therefore conducts a higher short circuit level.

ELECTRICAL CHARACTERISTICS, OM2990-5.2NK, NM, NT (-5.2 VOLTS)

Test Conditions are -55°C, T_A 125°C, $V_{IN} = -10.2V$, $C_{OUT} = 47\mu F$ (unless otherwise specified).

Parameter	Symbol	Test Conditions	Notes	Min.	Max.	Unit
Output Voltage	V_{OUT}	$5\text{ mA} \leq I_L \leq 1.0\text{ A}$	1 2	-5.30 -5.46	-5.10 -4.94	V
Quiescent Current	I_Q	$I_Q \leq 1.0\text{ A}$	1 2		5 12	mA
		$I_Q = 1.0\text{ A}$, $V_{IN} = -5.2\text{ V}$	1,2		50	
Line Regulation	V_{RLN}	-6.2 V $V_{IN} = -26\text{ V}$, $I_{OUT} = 5\text{ mA}$	1 2		± 40 ± 50	mV
Load Regulation	V_{RLD}	50 mA $I_{OUT} = 1.0\text{ A}$	1 2		± 50 ± 100	mV
Dropout Voltage	V_{DO}	$I_Q = 0.1\text{ A}$	1			V
		$DV_{DO} = 100\text{ mV}$	2		3	
		$I_Q = 1.0\text{ A}$	1		1	
		$DV_{DO} = 100\text{ mV}$	2			
Output Noise Voltage	V_{ON}	$I_Q = 5\text{ mA}$, 10 Hz - 100 kHz	3		750	μV
Short Circuit Current	I_{SC}	$R_L = 1$	1 2	1.5 1.3		A
Maximum Output Current	I_{MAX}		1	1.5		A
Ripple Rejection	R_R	$V_{ripple} = 1\text{ V}_{rms}$, $I_{OUT} = 5\text{ mA}$, $f = 1\text{ kHz}$	1	50		dB

Notes: 1. $T_A = 25^\circ\text{C}$.
2. Over full operating temperature range.
3. Guaranteed, not tested.

ELECTRICAL CHARACTERISTICS, OM2990-5.2SM, ST (-5.2 VOLTS)

Test Conditions are -55°C, T_A 125°C, $V_{IN} = -10.2V$, $C_{OUT} = 47\mu F$ (unless otherwise specified).

Parameter	Symbol	Test Conditions	Notes	Min.	Max.	Unit
Output Voltage	V_{OUT}	$5\text{ mA} \leq I_L \leq 1.0\text{ A}$	1 2	-5.30 -5.46	-5.10 -4.94	V
Quiescent Current	I_Q	$I_Q \leq 1.0\text{ A}$	1 2		5 12	mA
		$I_Q = 1.0\text{ A}$, $V_{IN} = -5.2\text{ V}$	1,2		50	
Line Regulation	V_{RLN}	-6.2 V $V_{IN} = -26\text{ V}$, $I_{OUT} = 5\text{ mA}$	1 2		± 45 ± 55	mV
Load Regulation	V_{RLD}	50 mA $I_{OUT} = 1.0\text{ A}$	1 2		± 70 ± 110	mV
Dropout Voltage	V_{DO}	$I_Q = 0.1\text{ A}$	1			V
		$DV_{DO} = 100\text{ mV}$	2		3	
		$I_Q = 1.0\text{ A}$	1		1	
		$DV_{DO} = 100\text{ mV}$	2			
Output Noise Voltage	V_{ON}	$I_Q = 5\text{ mA}$, 10 Hz - 100 kHz	3		750	μV
Short Circuit Current	I_{SC}	$R_L = 1$	1,2	1.27		A
Maximum Output Current	I_{MAX}		1	1.27		A
Ripple Rejection	R_R	$V_{ripple} = 1\text{ V}_{rms}$, $I_{OUT} = 5\text{ mA}$, $f = 1\text{ kHz}$	1	50		dB

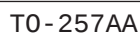
Notes: 1. $T_A = 25^\circ\text{C}$.
2. Over full operating temperature range.
3. Guaranteed, not tested.

ELECTRICAL CHARACTERISTICS, OM2990-5.2N2 (-5.2 VOLTS)

Test Conditions are -55°C, T_A 125°C, $V_{IN} = -10.2V$, $C_{OUT} = 47\mu F$ (unless otherwise specified).

Parameter	Symbol	Test Conditions	Notes	Min.	Max.	Unit
Output Voltage	V_{OUT}	$5\text{ mA} \leq I_L \leq 300\text{ mA}$	1 2	-5.30 -5.46	-5.10 -4.94	V
Quiescent Current	I_Q	$I_Q \leq 300\text{ mA}$	1 2		7 14	mA
		$I_Q = 300\text{ mA}$, $V_{IN} = -5.2\text{ V}$	1,2		55	
Line Regulation	V_{RLN}	-6.2 V $V_{IN} = -26\text{ V}$, $I_{OUT} = 5\text{ mA}$	1 2		± 45 ± 60	mV
Load Regulation	V_{RLD}	50 mA $I_{OUT} = 300\text{ mA}$	1 2		± 80 ± 120	mV
Dropout Voltage	V_{DO}	$I_Q = 100\text{ mA}$	1			V
		$DV_{DO} = 100\text{ mV}$	2		3	
		$I_Q = 300\text{ mA}$	1		1	
		$DV_{DO} = 100\text{ mV}$	2			
Output Noise Voltage	V_{ON}	$I_Q = 5\text{ mA}$, 10 Hz - 100 kHz	3		800	μV
Short Circuit Current	I_{SC}	$R_L = 1$	1 2	300 250		mA
Maximum Output Current	I_{MAX}		1	300		mA
Ripple Rejection	R_R	$V_{ripple} = 1\text{ V}_{rms}$, $I_{OUT} = 5\text{ mA}$, $f = 1\text{ kHz}$	1	50		dB

Notes: 1. $T_A = 25^\circ\text{C}$.
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3. Guaranteed, not tested.



Pin 1 - Ground
Pin 2 - Input
Pin 3 - Output
Tab - Isolated

Pin 1 - Ground
Pin 2 - Input
Pin 3 - Output
Tab - Input



0M2990NKM
Pin 1 - Ground
Pin 2 - Output

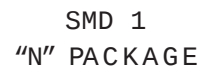


Front View

Pin 2 - Output

Pin 3 - Input

Case - Isolated



Pin 1 - Ground

Pin 2 - Output

Pin 3 - Input



OM2990N2M

Pin 1	NC	Pin 11	V_{OUT}
Pin 2	NC	Pin 12	V_{OUT}
Pin 3	NC	Pin 13	NC
Pin 4	NC	Pin 14	NC
Pin 5	NC	Pin 15	V_{IN}
Pin 6	Ground	Pin 16	V_{IN}
Pin 7	NC	Pin 17	V_{IN}
Pin 8	NC	Pin 18	NC
Pin 9	$V_{OUT}(\text{Sense})$	Pin 19	NC