



# ARG3001

## 33W ADJUSTABLE DC/DC CONVERTER

$18V_{IN}$  to  $36V_{IN}$   
 $100V_{OUT} (\pm 50)$  to  $220V_{OUT} (\pm 110)$

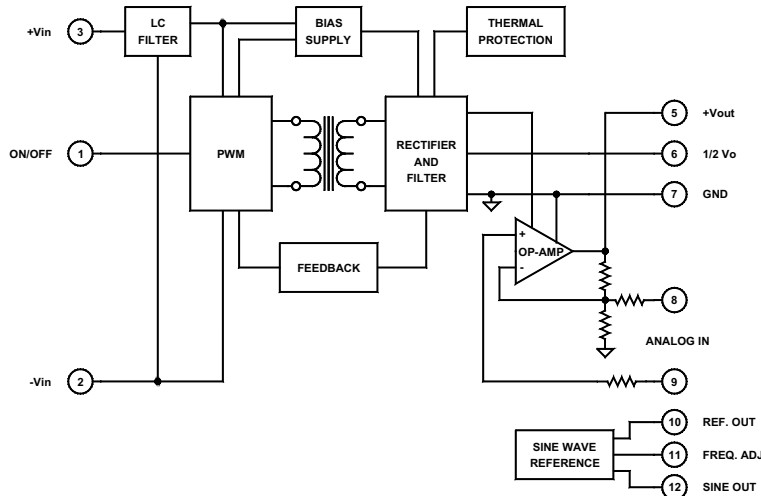
### Key Features

- Wide input voltage range (18–36Vdc)
- External  $V_o$  adjustment selection from  $100V_{dc}(\pm 50)$  to  $220V_{dc}(\pm 110)$
- Onboard 5Vdc reference
- Remote ON/OFF control
- 300 $\mu$ A off state current
- Isolated output
- Over/under input voltage protection
- Short circuit protection
- Over temperature protection
- Six-sided shielding



### Functional Description

The ARG3001 is an isolated, adjustable output DC/DC converter with an input voltage range of  $18V_{IN}$  to  $36V_{IN}$  and an adjustable output voltage from  $100V_{OUT}(\pm 50)$  to  $220V_{OUT}(\pm 110)$  and a maximum output power of 33 watts.



Typical Block Diagram

## DC/DC Converter

### INPUT SPECIFICATIONS (See Application Note RG-001.)

Unless otherwise specified, all parameters are given under typical +25°C with nominal input voltage and under full output load conditions.

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Supply Voltage Range		18		36	Vdc
Input Current, No Load			4		mA
Input Current, Full Load	$V_O = 100\text{Vdc}$ , $R_L = 333\text{K}$		1700		mA
Short Circuit Current	Input Current Limit	$I_{IN\ FL}$			
Input Reflected Ripple <sup>1</sup>			250		$\text{mA}_{PP}$
Switching Frequency	PWM frequencies		250		kHz
Start Up Threshold		0.7			V
Under Voltage Shutdown			10		Vdc
Input Filter Type	$\pi$ Filter				
Off State Input Current			300		$\mu\text{A}$
Remote ON/OFF Control, ON	Pin open, 10Vdc@100 $\mu\text{A}$ , internal pullup				
Remote ON/OFF Control, OFF	Jumper pin to $-V_{IN}$				
Case Connection	$-V_{IN}$ pin for 24V				

### OUTPUT SPECIFICATIONS

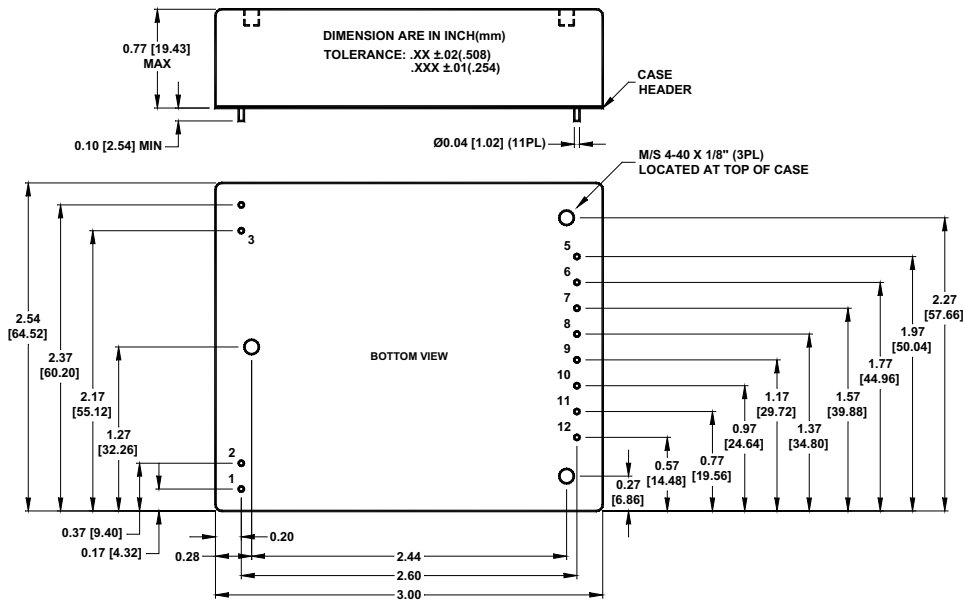
PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Voltage, Single Output	Pin 7 = GND, Pin 5 = $V_{OUT}$		100	220	Vdc
Voltage, Dual Output	Pin 6 = GND		$\pm 50$	$\pm 110$	Vdc
Voltage Imbalance			1		%
Output Current	$V_O = 100\text{Vdc}$		330		mA
	$V_O = 220\text{Vdc}$			150	mA
Short Circuit Protection	Indefinite				
Turn On Delay			8		mS
Output Ripple & Noise	20MHz bandwidth (See App. Note RG-001)		1		% of $V_{OUT}$
Load Regulation	Minimum to Full Load		1		% of $V_O$
Line Regulation	Minimum to maximum input voltage		$\pm 0.5$		%
Temperature Coefficient	Nominal line, Full Load		$\pm 0.01$	$\pm 0.02$	%/°C
Efficiency	$V_O = 100\text{Vdc}$ , $R_L = 333\text{K}$		74		%
Derating	No derating $-40^\circ$ to $+75^\circ\text{C}$				
Transient Response	50% FL to FL to 50% FL to within 1% of $V_{OUT}$ (See App. Note RG-003)		250		$\mu\text{S}$
Isolation			1500		Vdc

### PHYSICAL CHARACTERISTICS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Dimensions (L×W×H)	3.00×2.54×0.77 in. (76.20×64.52×19.43mm)				
Weight	7.48 oz. (212g)				
Case Material	Coated metal				
Shielding Connection, 12, 24V <sub>IN</sub>	$-V_{IN}$ (Pin 2)				
Shielding Connection, 48V <sub>IN</sub>	$+V_{IN}$ (Pin 3)				

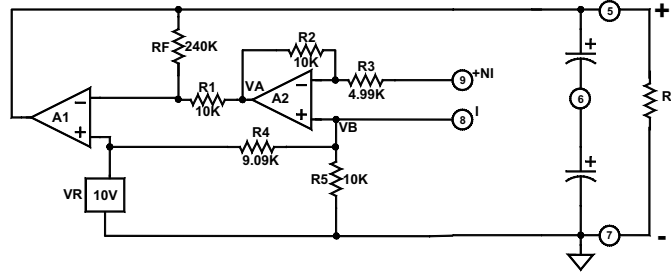
<sup>1</sup> Measured with  $C_{IN} = 100\mu\text{F}$ .

### MECHANICAL SPECIFICATIONS



1	ON/OFF
2	-V <sub>IN</sub>
3	+V <sub>IN</sub>
4	No Pin
5	+V <sub>OUT</sub>
6	GND
7	-V <sub>OUT</sub>
8	INV INPUT
9	NON-INV INPUT
10	REF. OUT
11	FREQ. ADJ
12	SINE OUT

ALL RESISTORS TOL: ±1%



$$V_o = V_R \left(1 + \frac{R_F}{R_1}\right) - \frac{R_F}{R_1} V_A$$

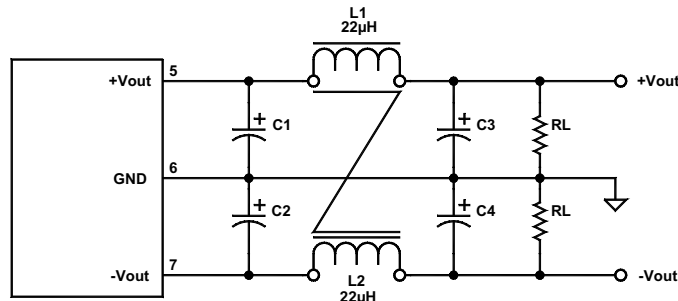
$$V_A = V_B \left(1 + \frac{R_2}{R_3}\right) - \frac{R_2}{R_3} V(I)$$

Pin 8 open

$$V_A = \left(1 + \frac{R_2}{R_3}\right) V_B$$

Pin 9 shorted to Pin 7

FIGURE 1. Output stage



C1 C2 C3 C4 = 33-68µF @200V

$$C_1, C_2 = 33 \text{ to } 68\mu\text{F @ } 200\text{V}$$

$$C_3, C_4 = 33 \text{ to } 68\mu\text{F @ } 200\text{V}$$

$$L_1, L_2 = 22\mu\text{H}$$

$$I_{L\text{Sat}} \geq 1.5I_o$$

FIGURE 2. Output filter for Bipolar Adjustable DC/DC Converter

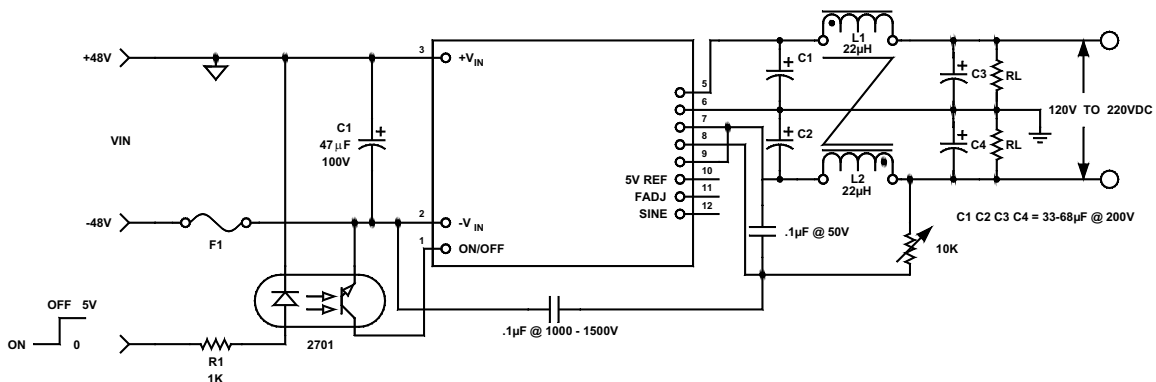


FIGURE 3. Unipolar 120V to 220V, bipolar ±2.5V to ±110V DC/DC Converter

V <sub>IN</sub>	F1
12V	8A
24V	4A
48V	2A