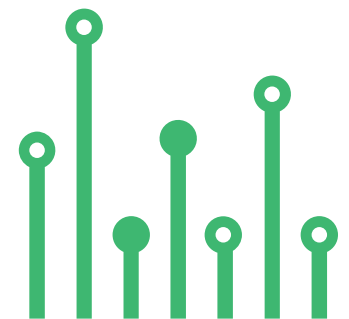


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AUDIO



# Voltage Controlled Amplifier, VCA



SKU: EL148503

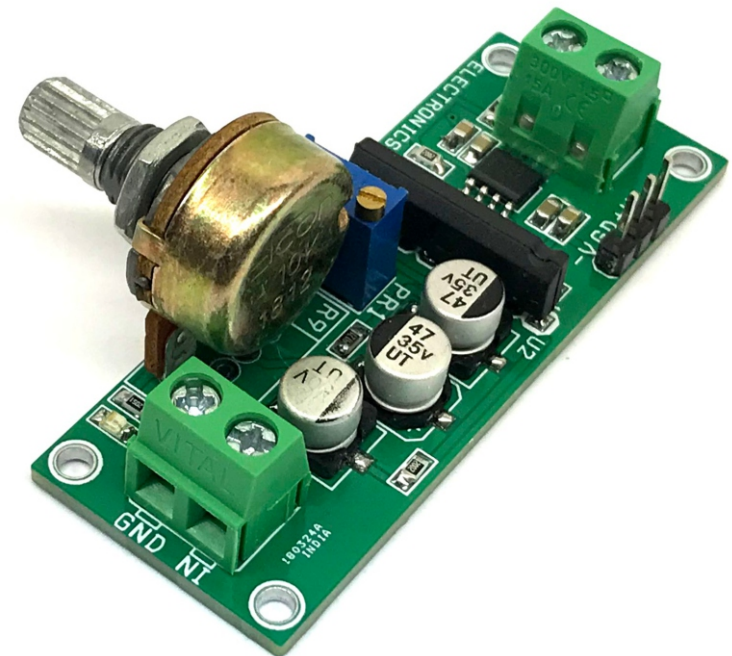
# Voltage Controlled Amplifier , VCA



The project presented here is a Voltage Controlled Amplifier (VCA). A VCA board helps users control the Audio Level from a remote potentiometer. It requires a single-ended audio signal in the input. Gain control voltage can be adjusted through an on-board potentiometer or use an external potentiometer connected to CN4. The project works with a dual  $\pm 15V$  power supply. Screw terminal connectors are provided for signal input and signal output. The project is built using THAT2181LA chip, a VCA that is designed for high-performance audio-frequency applications requiring exponential gain control, low distortion, wide dynamic range, and low control-voltage feedthrough.

## FEATURES

- Power Supply  $\pm 15V$  DC @ 40mA
- Gain Range -100Min-+20dB Maximum
- Total Harmonic Distortion 1V 0dB Gain 0.0025%
- Screw Terminal for Single Ended Audio Input
- Input Impedance, Audio 20K Ohms
- Screw Terminal for Audio Output
- On Board Power LED
- 4X2.5MM Mounting Holes
- PCB DIMENSIONS 60.96X23.50MM



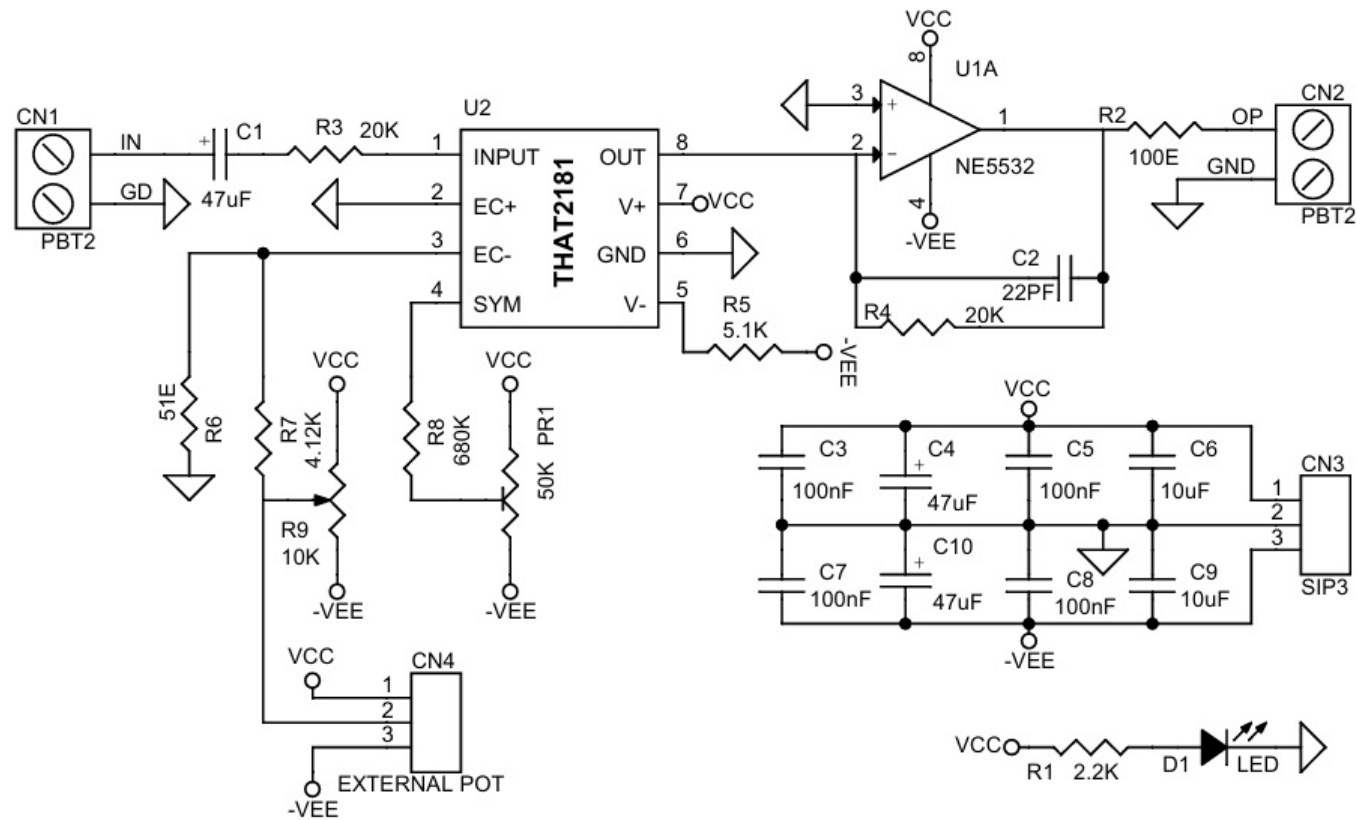
These parts control gain by converting an input current signal to a bipolar logged voltage, adding a DC control voltage, and re-converting the summed voltage back to a current through a bipolar antilog circuit. Stereo control of VCA with a single potentiometer is possible.

THAT 2181-series trimmable Blackmer voltage-controlled amplifier (VCAs) ICs are very high-performance current-in/current-out devices with two opposing-polarity, voltage-sensitive control ports. They offer wide-range exponential control of gain and attenuation with low signal distortion.

#### TRIMMING

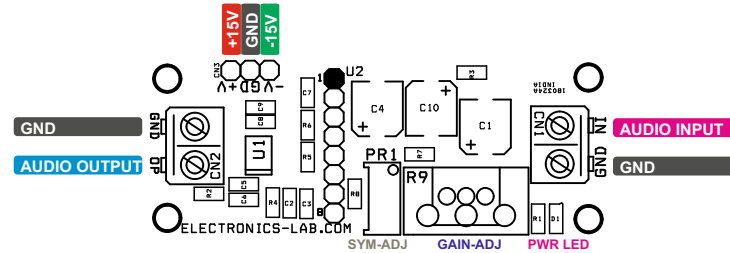
The trim should be adjusted for minimum harmonic distortion using PR1. This is usually done by applying a middle-level, middle-frequency signal (e.g. 1 kHz at 1V) to the audio input, setting the VCA to 0 dB gain, and adjusting the SYM trim while observing THD at the output. In THAT2181LA, this adjustment coincides closely with the setting which produces minimum control-voltage feedthrough, though the two settings are not always identical.

# Schematic



# Connections

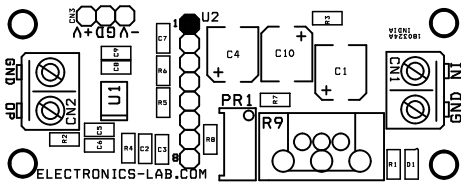
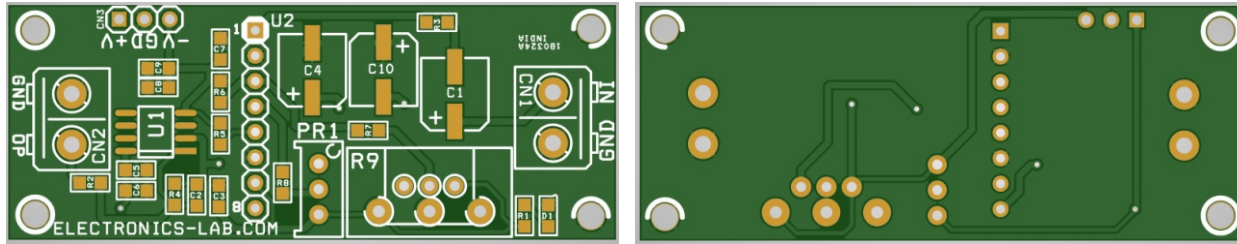
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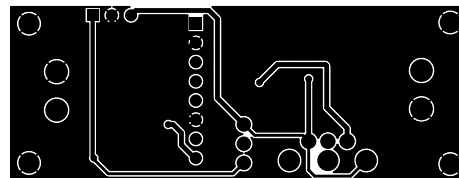
## Connection

- CN1: Pin 1 = Audio Signal Input, Pin 2 = GND
- CN2: Pin 1 = Audio Output, Pin 2 = GND
- CN3: Pin 1 = +15V DC, Pin 2 = GND, Pin 3 = -15V DC
- R9: Gain Adjust Potentiometer
- CN4: Optional External Gain Adjust Potentiometer
- D1: Power LED

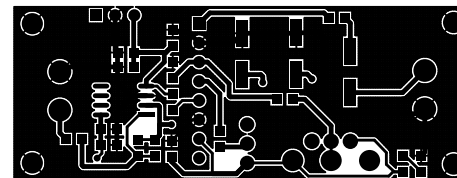
# PCB



SILK SCREEN TOP



BOTTOM LAYER



TOP LAYER

PCB DIMENSIONS 60.96X23.50MM

# Parts List

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BOM						
NO.	QNTY.	REF.	DESC.	MANUFACTURER	SUPPLIER	SUPPLIER PART NO
1	2	CN1,CN2	2 PIN SCREW TERMINAL PITCH 5.08MM	PHOENIX	DIGIKEY	277-1247-ND
2	1	CN3	3 MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5316-ND
3	1	CN4	3 PIN MALE HEADER - OPTIONAL	WURTH	DIGIKEY	732-5316-ND
4	3	C1,C4,C10	47uF/35V ELECTROLYTIC SMD 6.6MM	WURTH	DIGIKEY	732-8508-6-ND
5	1	C2	22PF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
6	4	C3,C5,C7,C8	100nF/50V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
7	2	C6,C9	10uF/16V CERAMIC SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
8	1	D1	LED RED SMD SIZE 0805	OSRAM	DIGIKEY	475-1278-1-ND
9	1	PR1	50K TRIMMER POT	BOURNS INC	DIGIKEY	3296W-503LF-ND
10	1	R1	2.2K 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
11	1	R2	100E 5% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
12	2	R3,R4	20K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
13	1	R5	5.1K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
14	1	R6	51E 0.1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
15	1	R7	4.12K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
16	1	R8	680K 1% SMD SIZE 0805	YAGEO/MURATA	DIGIKEY	
17	1	R9	10K POTENTIOMETER	BOURNS INC	DIGIKEY	PDB181-K420K-103B-ND
18	1	U1	NE5532 SOIC8	ONSEMI	DIGIKEY	NE5532D8R2GOSCT-ND
19	1	U2	THAT2181LA SIP8	THAT CORP	MOUSER	887-2181AL08-U



# Notes

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## APP

### Android App

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