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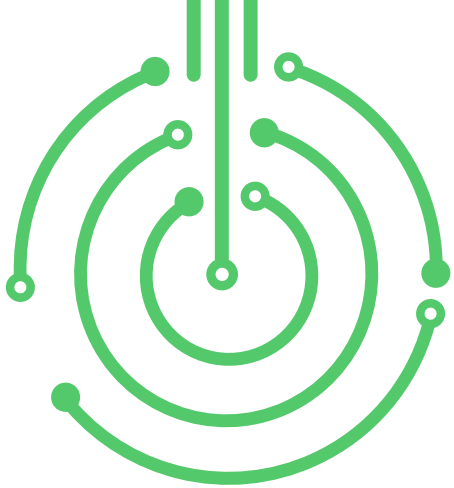


# Dual 2A Power Amplifier Module for TEC

SKU: EL134865

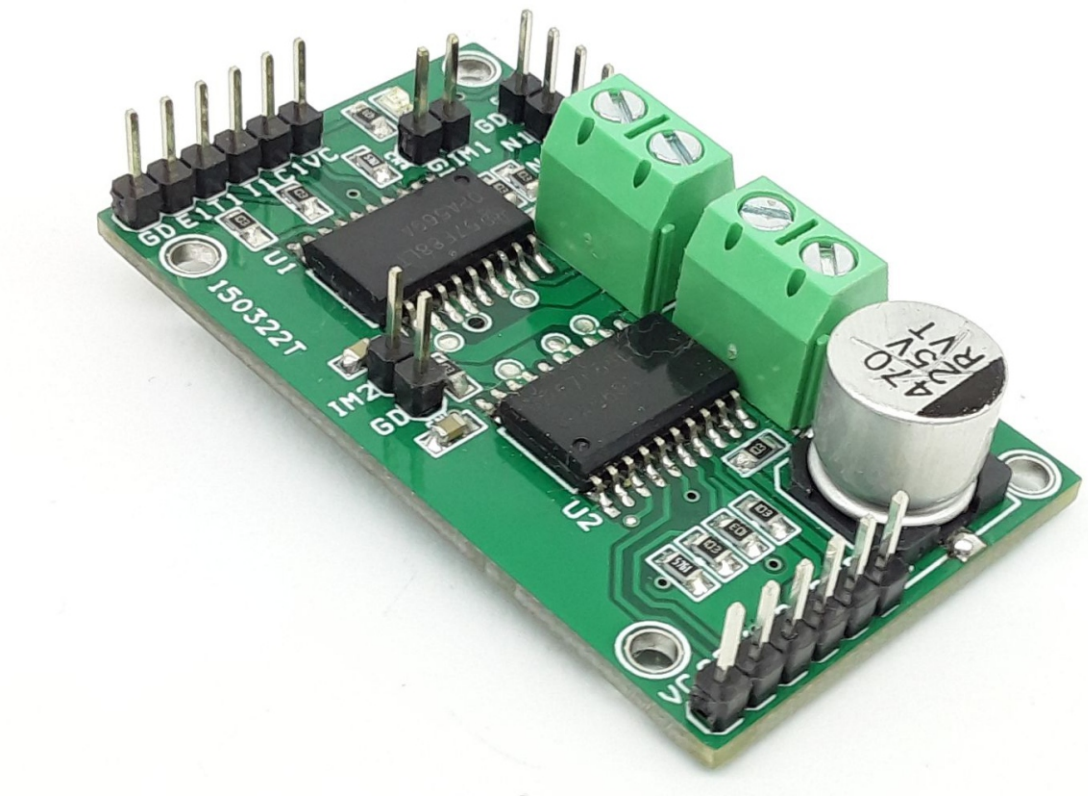
POWER SUPPLY

# Dual 2A Power Amplifier Module for TEC

This Dual 2A Power Amplifier module is a low-cost operational amplifier designed for driving a wide variety of loads while operating on low-voltage supplies. The dual amplifier can drive high output loads with a current of up to 2A. This Dual 2A Power Amplifier has been designed as a TEC (thermoelectric cooler) driver but it can also be used for other applications such as valve driver, servo driver, transducer excitation, linear power booster, laser diode pump driver, and TEC driver. Please refer to the datasheet of OPA569 for more info. A complete temperature control loop can be created using this board and additional PID (proportional, integral, differential) control circuits and temperature amplifier modules such as the INA330. The module also can be controlled using analog voltage or DAC.

## FEATURES

- Low Supply Voltage Operation: 2.7V to 5.5V
- High Output Current: 2A
- Output Swings : 150mV of Rails with IO =2A
- Thermal Protection
- Adjustable Current Limit
- Two Flags: Current Limit and Temperature Warning
- Shutdown Function with Output Disable
- PCB Dimensions 54.77 X 31.91mm
- PCB Mounting: 2.5mm X 4 Holes




## APPLICATIONS

- Thermoelectric Cooler Driver
- Laser Diode Pump Driver
- Valve, Actuator Driver
- Synchro, Servo Driver
- Transducer Excitation
- General Linear Power Booster For Op Amps
- Paralleling Option For Higher Current Applications

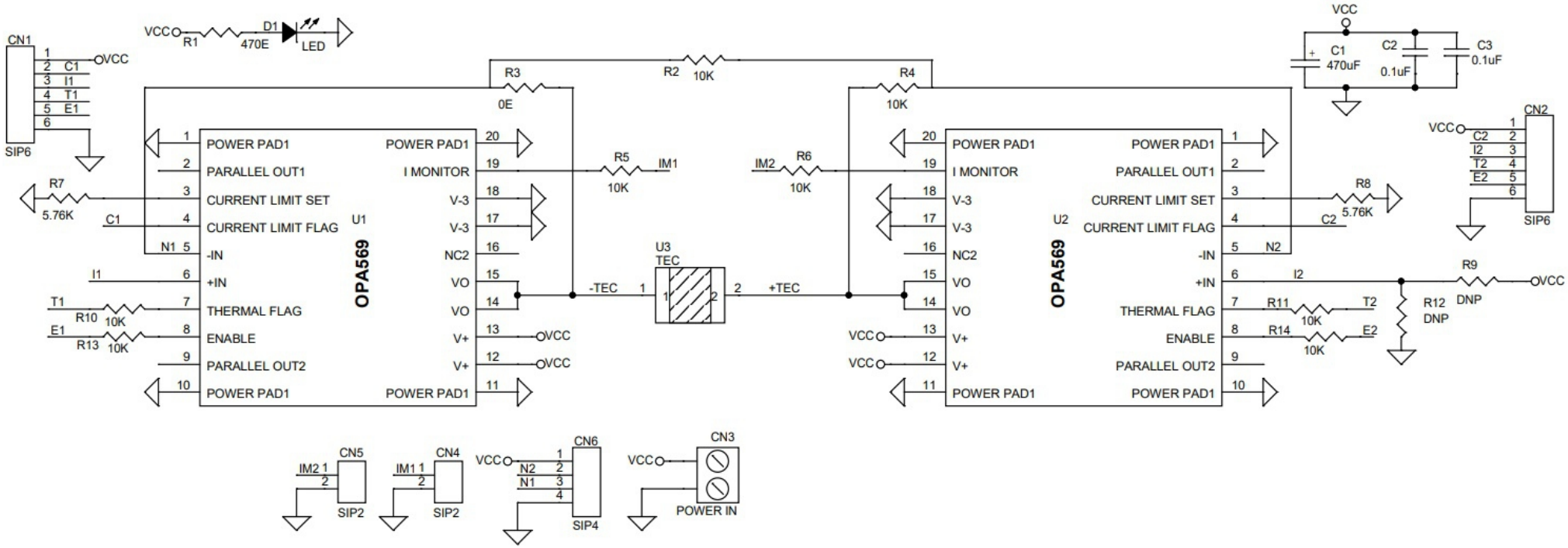
The OPA569 is a low-cost, high-current, operational amplifier designed for driving a wide variety of loads while operating on low-voltage supplies. It operates from either single or dual supplies for design flexibility and has rail-to-rail swing on the input and output. Typical output swing is within 150mV of the supply rails, with output current of 2A. Output swing closer to the rails is achievable with lighter loads. The OPA569 is unity gain stable, has low dc errors, is easy to use, and free from the phase inversion problems found in some power amplifiers. High performance is maintained at voltage swings near the output rails.

The OPA569 provides an accurate user-selected current limit that is set with an external resistor, or digitally adjusted via a Digital-to-Analog Converter. The OPA569 output can be independently disabled using the Enable pin, saving power and protecting the load. The IMONITOR pin provides a 1:475 bidirectional copy of the output current. This eliminates the need for a series current shunt resistor, allowing more voltage to be applied to the load. This pin can be used for simple monitoring, or feedback control to establish constant output current. Two flags are provided: one for warning of thermal over-stress, and one for current limit condition. The Thermal Flag pin can be connected to the Enable pin to provide a thermal shutdown solution.

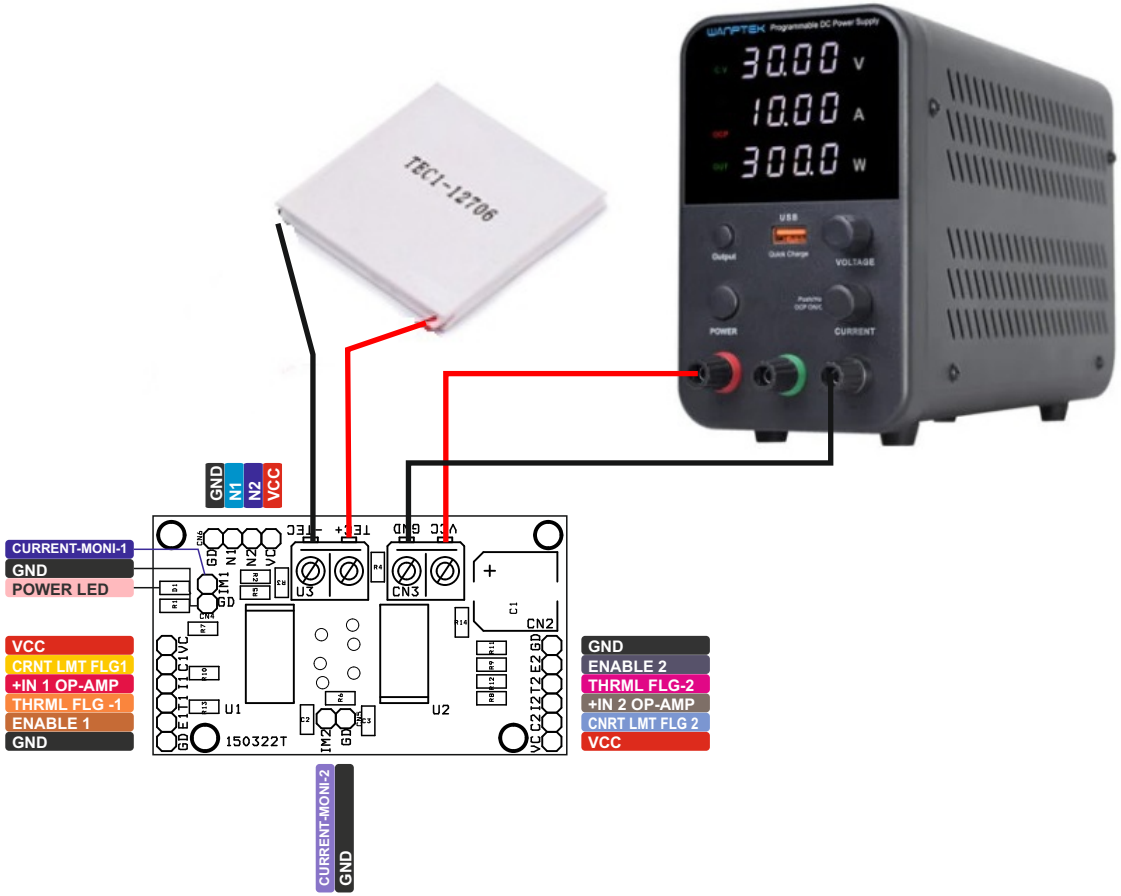
## Connections and Other Details

- CN1: Pin 1 = VCC, Pin 2 = Current Limit Flag 1, Pin 3 = +IN 1 Op-Amp, Pin 4 = Thermal Flag 1, Pin 5 = Enable 1, Pin 6 = GND
- CN2: Pin 1 = VCC, Pin 2 = Current Limit Flag 2, Pin 3 = +IN 2 Op-Amp, Pin 4 = Thermal Flag 2, Pin 5 = Enable 2, Pin 6 = GND
- CN3: Pin 1 = VCC, Pin 2 = GND
- CN4: Pin 1 = Current Monitor 1, Pin 2 = GND
- CN5: Pin 1 = Current Monitor 2, Pin 2 = GND
- CN6: Pin 1 = VCC, Pin 2 = N2 -IN 2 Op-Amp, Pin 3 = N1 -IN 1 Op-Amp
- D1: Power LED
- U3: Pin 1 = -TEC, Pin 2 = +TEC

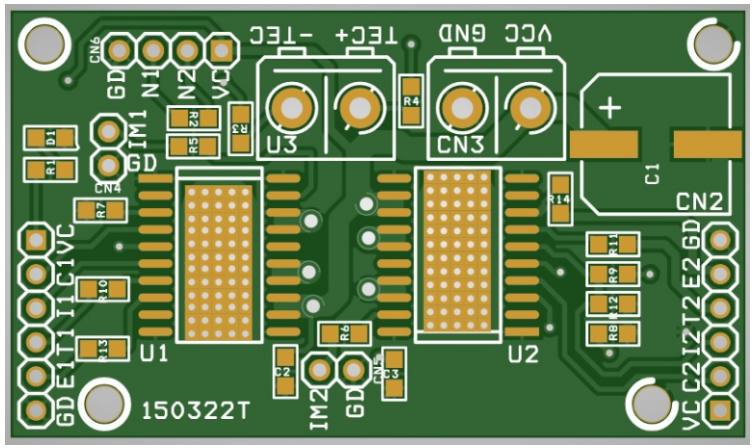
# Schematic

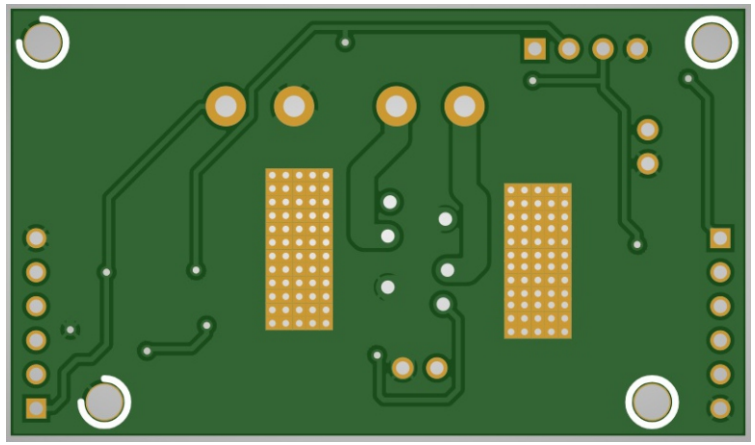

CN1
SIP6
VCC
C1
I1
T1
E1
R1
470E
D1
LED
R3
0E
R2
10K
R4
10K
C1
470uF
C2
0.1uF
C3
0.1uF
CN2
SIP6
U1
OPA569
POWER PAD1
PARALLEL OUT1
CURRENT LIMIT SET
CURRENT LIMIT FLAG
-IN
+IN
THERMAL FLAG
ENABLE
PARALLEL OUT2
POWER PAD1
I MONITOR
V-3
V-3
NC2
VO
VO
V+
V+
POWER PAD1
R5
10K
IM1
R6
10K
IM2
R7
5.76K
R8
5.76K
C2
R9
DNP
R10
10K
R11
10K
R12
DNP
R13
10K
R14
10K
T2
E2
N1
N2
I2
U3
TEC
-TEC
+TEC
U2
CN5
SIP2
CN4
SIP2
CN6
SIP4
CN3
POWER IN

# Connections

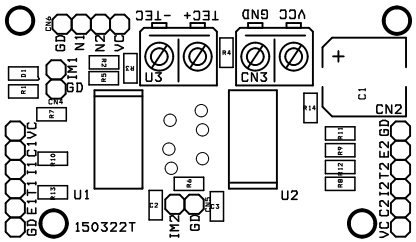


# PCB

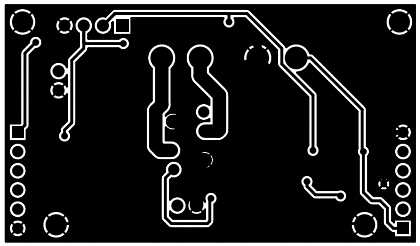


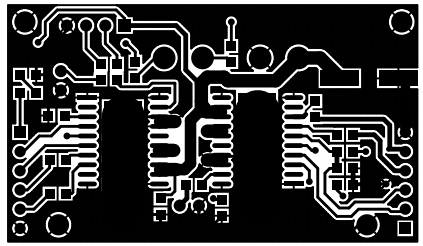
PCB GERBER FILES AVAILABLE




SILK SCREEN TOP



BOTTOM LAYER



TOP LAYER

**PCB DIMENSIONS 54.77 X 31.91MM**

# Parts List

| BOM | | | | | | |
|---|---|---|---|---|---|---|
| NO | QNTY | REF | DESC | MANUFACTURER | SUPPLIER | SUPPLIER'S PART NO |
| 1 | 2 | CN1,CN2 | 6 PIN MALE HEADER PITCH 2.54MM | WURTH | | 732-5319-ND |
| 2 | 1 | CN3 | 2 PIN SCREW TERMINAL PITCH 5.08MM | PHOENIX | | 277-1247-ND |
| 3 | 2 | CN4,CN5 | 2 PIN MALE HEADER PITCH 2.54MM | WURTH | | 732-5315-ND |
| 4 | 1 | CN6 | 4 PIN MALE HEADER PITCH 2.54MM | WURTH | | 732-5317-ND |
| 5 | 1 | C1 | 470uF/25V ELECTROLYTIC SMD | PANASONIC | | PCE4605CT-ND |
| 6 | 2 | C2,C3 | 0.1uF/50V CERAMIC SMD SIZE 0805 | YAGEO/MURATA | | |
| 7 | 1 | D1 | LED RED SMD SIZE 0805 | OSRAM | | 475-1278-1-ND |
| 8 | 1 | R1 | 470E 1% SMD SIZE 0805 | YAGEO/MURATA | | |
| 9 | 8 | R2,R4,R5,R6,R10,R11,R13,R14 | 10K 1% SMD SIZE 0805 | YAGEO/MURATA | | |
| 10 | 1 | R3 | 0E SMD SIZE 0805 | YAGEO/MURATA | | |
| 11 | 2 | R7,R8 | 5.76K 1% SMD SIZE 0805 | YAGEO/MURATA | | |
| 12 | 2 | R9,R12 | DNP | | | |
| 13 | 2 | U1,U2 | OPA569 SOIC | TI | | 296-14174-5-ND |
| 14 | 1 | U3 | 2 PIN SCREW TERMINAL PITCH 5.08MM | PHOENIX | | 277-1247-ND |

# Notes

# APP

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