



Mini-Circuits

COAXIAL

## Medium Power Amplifier

ZHL-6A+

50Ω 0.0025 to 500 MHz

## FEATURES

- Wideband, 0.0025 to 500 MHz
- High IP3, +34 dBm typ.
- Protected by US Patent, 6,943,629



BNC version shown  
Generic photo used for illustration purposes only

CASE STYLE: S32

| Connectors | Model     |
|------------|-----------|
| BNC        | ZHL-6A+   |
| SMA        | ZHL-6A-S+ |
| N-TYPE     | ZHL-6A-N+ |

**+RoHS Compliant**

The +Suffix identifies RoHS Compliance.  
See our website for methodologies and qualifications

## APPLICATIONS

- HF/VHF
- Communication Systems
- UHF TV
- Lab use

## ELECTRICAL SPECIFICATIONS

| Parameter                          | Frequency (MHz) | Min.   | Typ. | Max.  | Units |
|------------------------------------|-----------------|--------|------|-------|-------|
| Frequency Range                    |                 | 0.0025 |      | 500   | MHz   |
| Gain                               | 0.0025 - 500    | 21     | 25   |       | dB    |
| Gain Flatness                      | 0.0025 - 500    |        |      | ±1.2  | dB    |
| Output Power at 1 dB Compression   | 0.0025 - 500    | +22    |      |       | dBm   |
| Output third order intercept point | 0.0025 - 500    |        | +34  |       | dBm   |
| Noise Figure <sup>1</sup>          | 0.0025 - 500    |        | 9.5  |       | dB    |
| Input VSWR                         | 0.0025 - 500    |        | 1.8  |       | :1    |
| Output VSWR <sup>1</sup>           | 0.0025 - 500    |        | 2.0  |       | :1    |
| DC Supply Voltage                  |                 |        | +24  |       | V     |
| Supply Current                     |                 |        |      | 0.350 | A     |

Caution! Transient voltage occurring at RF output upon turn-on is approximately 50% of the applied DC power supply voltage. User should protect equipment fed by this amplifier.

1. Noise Figure continually increases from 70 MHz to 10 MHz by approximately 4 dB; output VSWR 2.8:1 below 30 MHz

Open load is not recommended, potentially can cause damage. With no load derate max input power by 20 dB

## ABSOLUTE MAXIMUM RATINGS

| Parameter                  | Ratings         |
|----------------------------|-----------------|
| Operating Temperature      | -20°C to +65°C  |
| Storage Temperature        | -55°C to +100°C |
| DC Voltage                 | +24.5 V Max.    |
| Input RF Power (no damage) | +10 dBm         |

Permanent damage may occur if any of these limits are exceeded.

REV. J  
ECO-018143  
ZHL-6A+  
MCL NY  
230605





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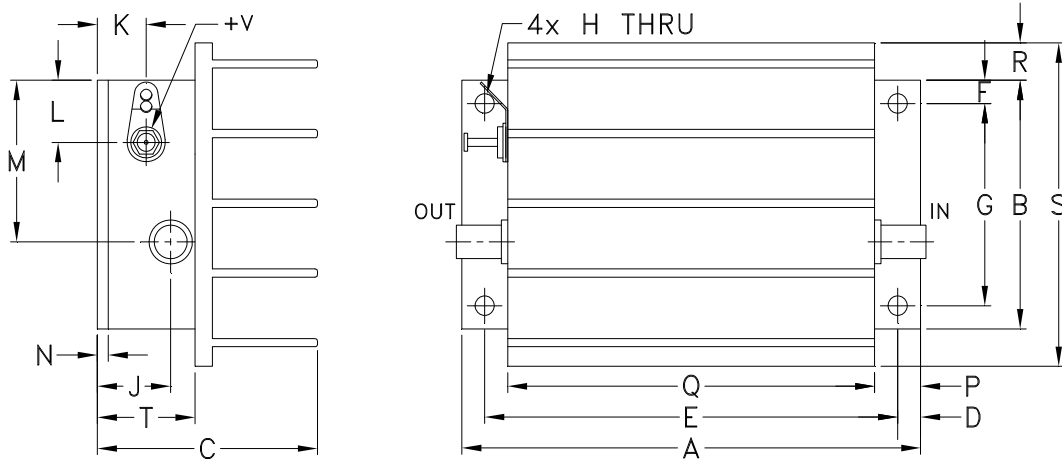
# Medium Power Amplifier

**ZHL-6A+**

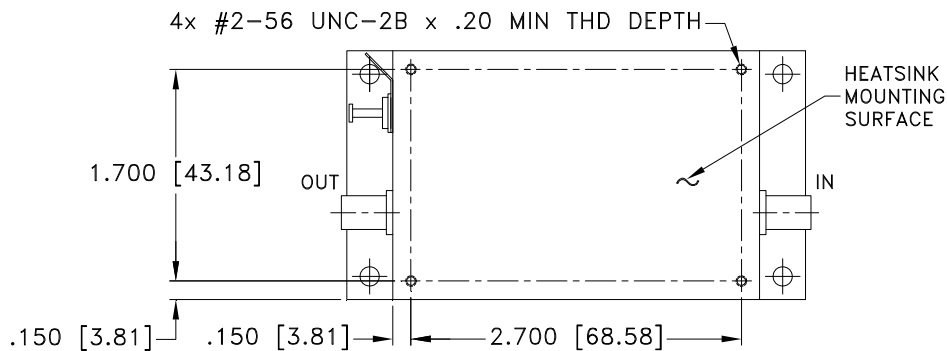
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50Ω 0.0025 to 500 MHz

## OUTLINE DRAWING



## MOUNTING INFORMATION FOR MODELS WITHOUT HEATSINK



## OUTLINE DIMENSIONS (Inch/mm)

| A                 | B     | C     | D    | E     | F    | G     | H    | J     | K     | L     | M     | N    | P    | Q     | R    | S     | T     | wt    |
|-------------------|-------|-------|------|-------|------|-------|------|-------|-------|-------|-------|------|------|-------|------|-------|-------|-------|
| 3.75              | 2.00  | 1.80  | .19  | 3.375 | .19  | 1.625 | .144 | .50   | .40   | .50   | 1.30  | .10  | .38  | 3.00  | .30  | 2.60  | .80   | grams |
| 95.25             | 50.80 | 45.72 | 4.83 | 85.73 | 4.83 | 41.28 | 3.66 | 12.70 | 10.16 | 12.70 | 33.02 | 2.54 | 9.65 | 76.20 | 7.62 | 66.04 | 20.32 | 220.0 |
| wt. w/o heat sink |       |       |      |       |      |       |      |       |       |       |       |      |      |       |      |       |       | 150   |



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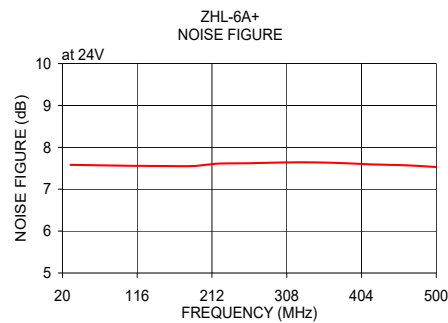
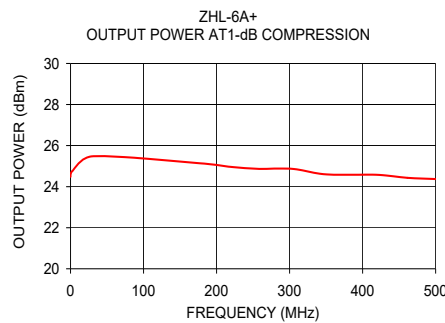
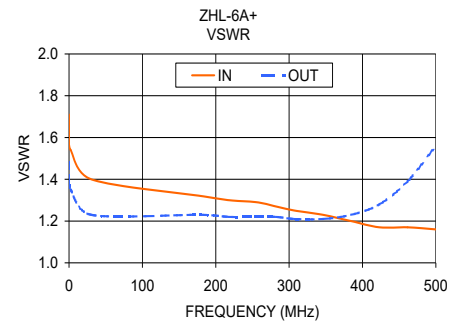
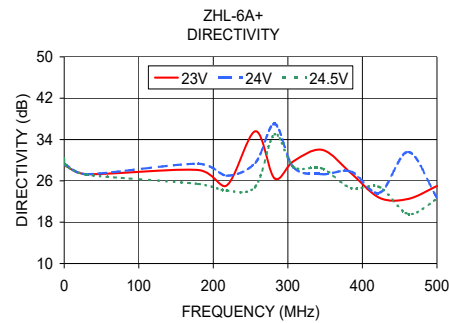
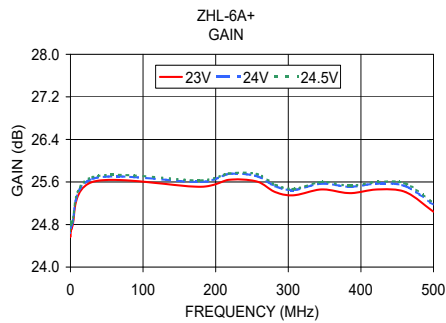
## Medium Power Amplifier

ZHL-6A+

50Ω 0.0025 to 500 MHz

## TYPICAL PERFORMANCE DATA/CURVES

| FREQ.<br>(MHz) | GAIN<br>(dB) |       |       | DIRECTIVITY<br>(dB) |       |       | VSWR<br>(:1) |      | NOISE<br>FIGURE<br>(dB) | POUT<br>at 1 dB<br>COMPR.<br>(dBm) |
|----------------|--------------|-------|-------|---------------------|-------|-------|--------------|------|-------------------------|------------------------------------|
|                | 23V          | 24V   | 24.5V | 23V                 | 24V   | 24.5V | IN           | OUT  | 24V                     | 24V                                |
| 0.0025         | 24.57        | 24.64 | 24.69 | 30.40               | 30.50 | 30.40 | 1.71         | 1.48 | —                       | 24.48                              |
| 0.01           | 24.73        | 24.82 | 24.86 | 29.80               | 29.80 | 29.70 | 1.57         | 1.38 | —                       | 24.62                              |
| 0.18           | 24.67        | 24.75 | 24.79 | 29.30               | 29.20 | 29.20 | 1.56         | 1.37 | —                       | 24.65                              |
| 2.30           | 24.75        | 24.81 | 24.85 | 28.90               | 29.10 | 28.90 | 1.54         | 1.35 | —                       | 24.75                              |
| 30.20          | 25.60        | 25.66 | 25.69 | 27.30               | 27.30 | 27.20 | 1.40         | 1.23 | 7.58                    | 25.48                              |
| 179.50         | 25.51        | 25.60 | 25.63 | 28.10               | 29.30 | 25.40 | 1.32         | 1.23 | 7.55                    | 25.13                              |
| 217.90         | 25.64        | 25.75 | 25.76 | 25.10               | 27.00 | 24.10 | 1.30         | 1.22 | 7.61                    | 24.97                              |
| 256.40         | 25.61        | 25.71 | 25.75 | 35.60               | 29.50 | 24.90 | 1.29         | 1.22 | 7.62                    | 24.87                              |
| 282.10         | 25.41        | 25.52 | 25.55 | 26.50               | 37.00 | 35.00 | 1.27         | 1.22 | 7.63                    | 24.88                              |
| 307.70         | 25.35        | 25.45 | 25.47 | 29.80               | 28.60 | 28.70 | 1.25         | 1.21 | 7.64                    | 24.85                              |
| 346.10         | 25.46        | 25.57 | 25.60 | 32.00               | 27.30 | 28.40 | 1.23         | 1.21 | 7.64                    | 24.61                              |
| 384.60         | 25.39        | 25.51 | 25.53 | 27.50               | 27.80 | 24.60 | 1.20         | 1.23 | 7.62                    | 24.58                              |
| 423.10         | 25.46        | 25.57 | 25.60 | 22.70               | 23.70 | 24.80 | 1.17         | 1.28 | 7.59                    | 24.57                              |
| 461.50         | 25.41        | 25.52 | 25.57 | 22.50               | 31.60 | 19.60 | 1.17         | 1.39 | 7.57                    | 24.43                              |
| 500.00         | 25.04        | 25.17 | 25.21 | 25.00               | 22.70 | 22.50 | 1.16         | 1.56 | 7.53                    | 24.37                              |



## NOTES

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/terms/viewterm.html](http://www.minicircuits.com/terms/viewterm.html)



# Amplifier

# ZHL-6A+

## Typical Performance Data

| FREQUENCY<br>(MHz) | GAIN<br>(dB) |       |       | DIRECTIVITY<br>(dB) |       |       | VSWR<br>IN<br>(:1)<br>24V | VSWR OUT<br>(:1)<br>24V | NOISE<br>FIGURE<br>(dB)<br>24V | Pout at<br>1dB Comp.<br>(dBm)<br>24V |
|--------------------|--------------|-------|-------|---------------------|-------|-------|---------------------------|-------------------------|--------------------------------|--------------------------------------|
|                    | 23V          | 24V   | 24.5V | 23V                 | 24V   | 24.5V |                           |                         |                                |                                      |
| 0.0025             | 24.57        | 24.64 | 24.69 | 30.40               | 30.50 | 30.40 | 1.71                      | 1.48                    | -                              | 24.48                                |
| 0.01               | 24.73        | 24.82 | 24.86 | 29.80               | 29.80 | 29.70 | 1.57                      | 1.38                    | -                              | 24.62                                |
| 0.18               | 24.67        | 24.75 | 24.79 | 29.30               | 29.20 | 29.20 | 1.56                      | 1.37                    | -                              | 24.65                                |
| 2.30               | 24.75        | 24.81 | 24.85 | 28.90               | 29.10 | 28.90 | 1.54                      | 1.35                    | -                              | 24.75                                |
| 30.20              | 25.60        | 25.66 | 25.69 | 27.30               | 27.30 | 27.20 | 1.40                      | 1.23                    | 7.58                           | 25.48                                |
| 179.50             | 25.51        | 25.60 | 25.63 | 28.10               | 29.30 | 25.40 | 1.32                      | 1.23                    | 7.55                           | 25.13                                |
| 217.90             | 25.64        | 25.75 | 25.76 | 25.10               | 27.00 | 24.10 | 1.30                      | 1.22                    | 7.61                           | 24.97                                |
| 256.40             | 25.61        | 25.71 | 25.75 | 35.60               | 29.50 | 24.90 | 1.29                      | 1.22                    | 7.62                           | 24.87                                |
| 282.10             | 25.41        | 25.52 | 25.55 | 26.50               | 37.00 | 35.00 | 1.27                      | 1.22                    | 7.63                           | 24.88                                |
| 307.70             | 25.35        | 25.45 | 25.47 | 29.80               | 28.60 | 28.70 | 1.25                      | 1.21                    | 7.64                           | 24.85                                |
| 346.10             | 25.46        | 25.57 | 25.60 | 32.00               | 27.30 | 28.40 | 1.23                      | 1.21                    | 7.64                           | 24.61                                |
| 384.60             | 25.39        | 25.51 | 25.53 | 27.50               | 27.80 | 24.60 | 1.20                      | 1.23                    | 7.62                           | 24.58                                |
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| 500.00             | 25.04        | 25.17 | 25.21 | 25.00               | 22.70 | 22.50 | 1.16                      | 1.56                    | 7.53                           | 24.37                                |

REV. X1

ZHL-6A+

070115

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IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS 9100 CERTIFIED RoHS compliant

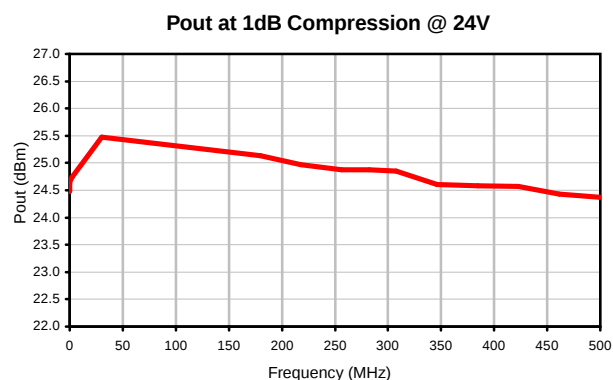
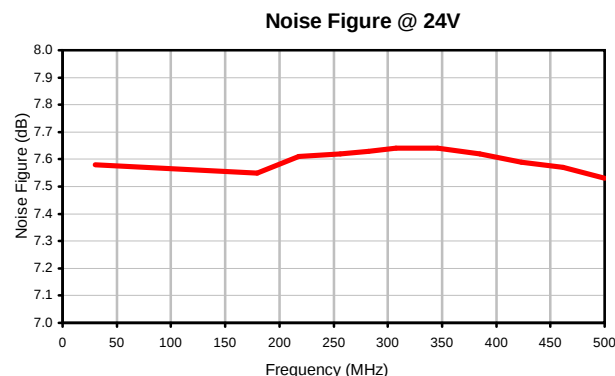
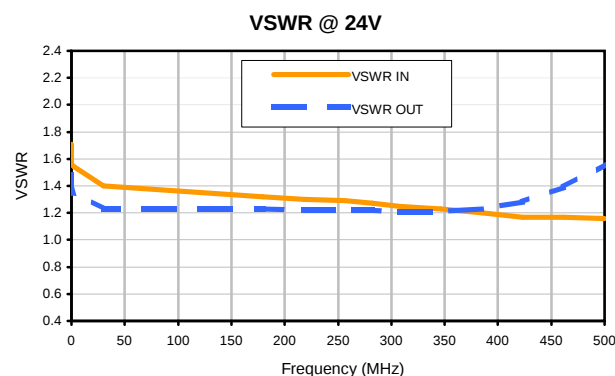
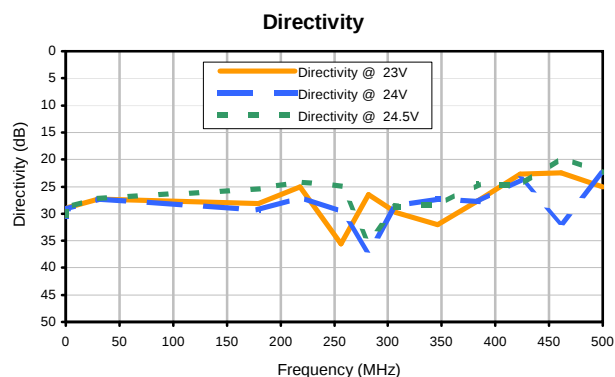
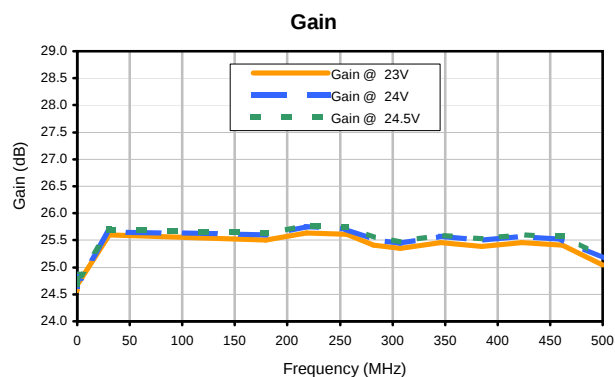
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661



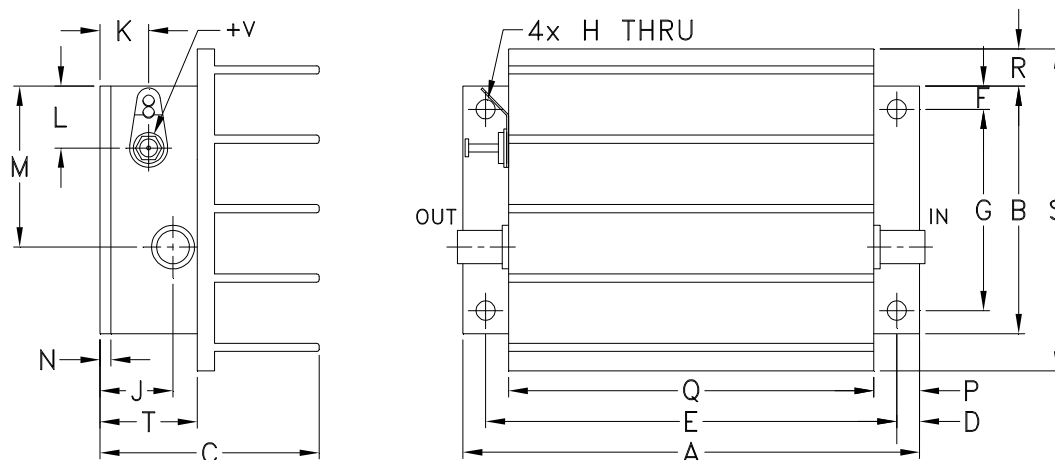
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see



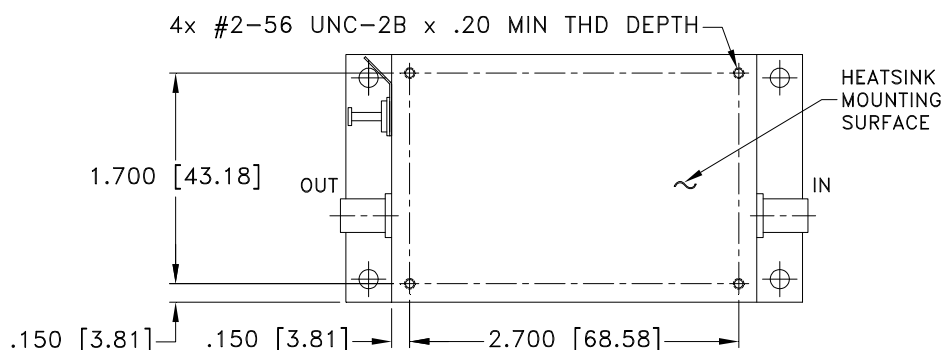
## Typical Performance Curves



### Outline Dimensions



### MOUNTING INFORMATION FOR MODELS WITHOUT HEATSINK



| CASE# | A               | B               | C               | D             | E                | F             | G                | H              | J              | K              | L              | M               | N             |
|-------|-----------------|-----------------|-----------------|---------------|------------------|---------------|------------------|----------------|----------------|----------------|----------------|-----------------|---------------|
| S32   | 3.75<br>(95.25) | 2.00<br>(50.80) | 1.80<br>(45.72) | .19<br>(4.83) | 3.375<br>(85.73) | .19<br>(4.83) | 1.625<br>(41.28) | .144<br>(3.66) | .50<br>(12.70) | .40<br>(10.16) | .50<br>(12.70) | 1.30<br>(33.02) | .10<br>(2.54) |

| CASE# | P             | Q               | R             | S               | T              | WT. GRAMS | WT. WITHOUT HEATSINK GRAMS |
|-------|---------------|-----------------|---------------|-----------------|----------------|-----------|----------------------------|
| S32   | .38<br>(9.65) | 3.00<br>(76.20) | .30<br>(7.62) | 2.60<br>(66.04) | .80<br>(20.32) | 220.0     | 150.0                      |

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm .03$ ; 3 Pl.  $\pm .015$

### Notes:

- Case material: Aluminum alloy.
- Case finish:  
For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.
- Heat sink finish: Black anodize.



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: [www.minicircuits.com](http://www.minicircuits.com)

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