



Mini-Circuits

WIDEBAND, DC PASS

# Directional Coupler ZUDC6-5R23-S+

50Ω 6dB Up to 50W 0.5 to 2 GHz

## THE BIG DEAL

- Wide frequency range, 0.5 to 2 GHz
- Good coupling flatness,  $\pm 0.6$  dB typ.
- Excellent directivity, 24 dB typ. up to 2 GHz
- Excellent return loss, 24 dB typ. up to 2 GHz
- DC current pass through input to output

## APPLICATIONS

- Mobile
- Fixed satellite
- Lab use
- GPS
- Radar
- Radio



Generic photo used for illustration purposes only

|            |               |
|------------|---------------|
| Model No.  | ZUDC6-5R23-S+ |
| Case Style | HT2446-2      |
| Connectors | SMA           |

### +RoHS Compliant

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

## PRODUCT OVERVIEW

The Mini-Circuits ZUDC6-5R23-S+ wideband directional coupler offers exceptional performance operating over 0.5 to 2 GHz. This coupler has excellent coupling flatness, good directivity, and power handling. It is ideal for lab testing applications as well as for power monitoring over wide bands, among other applications.

## KEY FEATURES

| Feature                                                      | Advantages                                                                                                                                                                      |
|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wide bandwidth                                               | With a bandwidth spanning 0.5 to 2 GHz, ZUDC6-5R23-S+ coupler is ideal for most lab testing applications, avoiding the need to switch components for different frequency bands. |
| Excellent Directivity<br>• 24 dB typ. up to 2 GHz            | High directivity allows sampling of input powers with minimal detrimental effects due to output mismatches.                                                                     |
| Excellent Return Loss (In & Out)<br>• 24 dB typ. up to 2 GHz | Good return loss over 0.5 to 2 GHz minimizes undesired reflections and resulting amplitude ripple.                                                                              |

REV. C  
ECO-016429  
ZUDC6-5R23-S+  
CM/CP/AM  
230119





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## ELECTRICAL SPECIFICATIONS AT 25°C

| Parameter                              | Frequency (GHz) | Min. | Typ.     | Max.  | Units |
|----------------------------------------|-----------------|------|----------|-------|-------|
| Operating Frequency                    |                 | 0.5  |          | 2     | GHz   |
| Coupling                               | 0.5 - 2         | —    | 6.5 ±1.0 | —     | dB    |
| Coupling Flatness (±)                  | 0.5 - 2         | —    | ±0.6     | ±1.25 | dB    |
| Mainline Loss <sup>1</sup>             | 0.5 - 2         | —    | 1.3      | 2.0   | dB    |
| Directivity                            | 0.5 - 2         | 18   | 28       | —     | dB    |
| Return Loss (In & Out)                 | 0.5 - 2         | 20.8 | 29       | —     | dB    |
| Return Loss (Coupling)                 | 0.5 - 2         | 20.8 | 29       | —     | dB    |
| Forward Power (In to Out) <sup>2</sup> | 0.5 - 2         | —    | —        | 50    | dB    |
| Reverse Power (Out to In)              | 0.5 - 2         | —    | —        | 3     | W     |

1. Mainline loss includes coupling loss

2. Up to 25°C, derates linearly to 5W at 100°C.

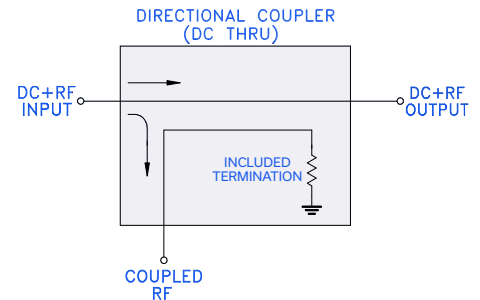
## MAXIMUM RATINGS

| Parameter             | Ratings        |
|-----------------------|----------------|
| Operating Temperature | -55°C to 85°C  |
| Storage Temperature   | -55°C to 100°C |
| Supplied Termination* | 1W             |
| DC Current            | 1A             |

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

\* up to 25°C, derates linearly to 325mW at 100°C.

## ELECTRICAL SCHEMATIC





WIDEBAND, DC PASS

# Directional Coupler **ZUDC6-5R23-S+**

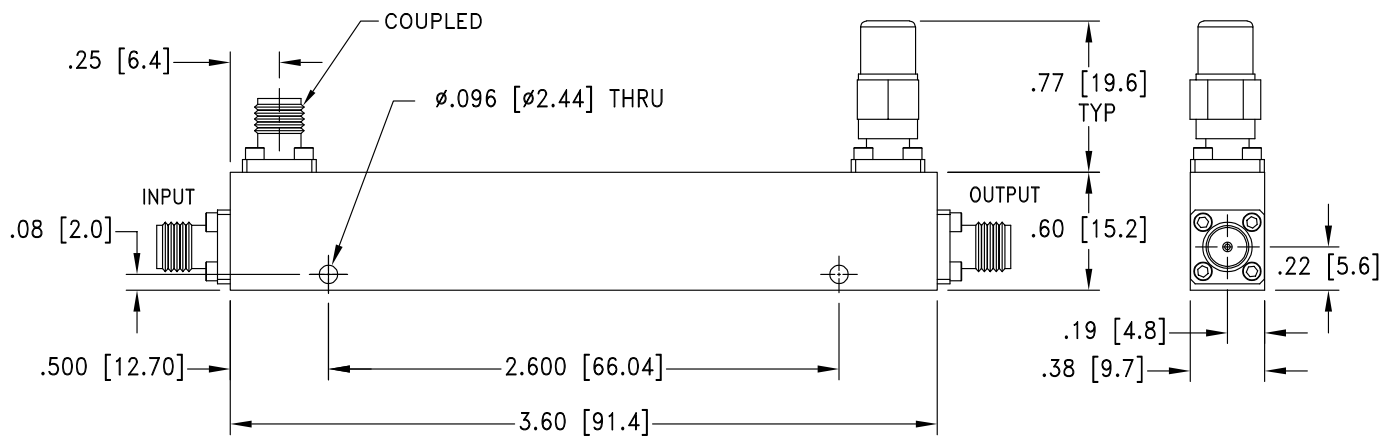
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## COAXIAL CONNECTIONS

|                            |     |
|----------------------------|-----|
| INPUT                      | IN  |
| OUTPUT                     | OUT |
| COUPLED                    | CPL |
| TERMINATION (50Ω) INCLUDED | —   |

## OUTLINE DRAWING



Weight: 45.4 grams;

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





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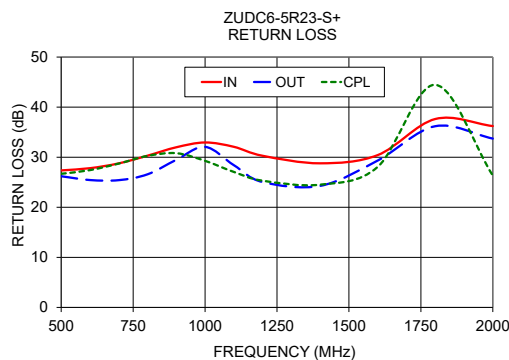
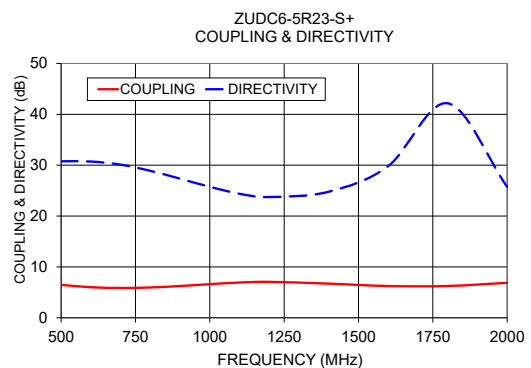
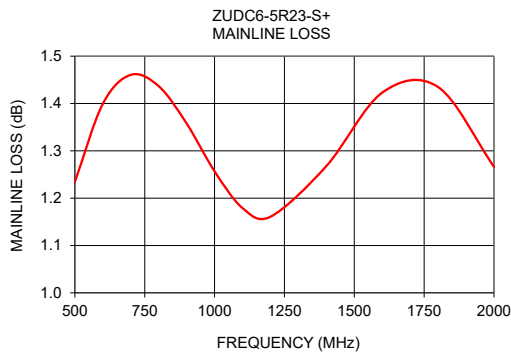
# Directional Coupler ZUDC6-5R23-S+

50Ω 6dB Up to 50W 0.5 to 2 GHz

## TYPICAL PERFORMANCE DATA

| Freq.<br>(MHz) | Mainline Loss <sup>1</sup><br>(dB) | Coupling<br>(dB)<br>In-Cpl | Directivity<br>(dB) | Return Loss<br>(dB) |       |       |
|----------------|------------------------------------|----------------------------|---------------------|---------------------|-------|-------|
|                | In-Out                             |                            |                     | In                  | Out   | Cpl   |
| 500            | 1.23                               | 6.48                       | 30.77               | 27.37               | 26.20 | 26.69 |
| 600            | 1.40                               | 6.01                       | 30.72               | 27.81               | 25.44 | 27.42 |
| 700            | 1.46                               | 5.86                       | 30.11               | 28.77               | 25.42 | 28.73 |
| 800            | 1.44                               | 5.96                       | 28.89               | 30.31               | 26.58 | 30.26 |
| 900            | 1.36                               | 6.25                       | 27.34               | 31.99               | 29.48 | 30.80 |
| 1000           | 1.26                               | 6.62                       | 25.75               | 32.94               | 32.07 | 29.28 |
| 1100           | 1.18                               | 6.93                       | 24.38               | 32.08               | 28.41 | 27.06 |
| 1200           | 1.16                               | 7.06                       | 23.74               | 30.28               | 25.03 | 25.31 |
| 1400           | 1.27                               | 6.72                       | 24.79               | 28.78               | 24.27 | 24.52 |
| 1600           | 1.42                               | 6.24                       | 29.82               | 30.42               | 29.34 | 28.07 |
| 1800           | 1.43                               | 6.25                       | 42.17               | 37.63               | 36.19 | 44.46 |
| 2000           | 1.27                               | 6.88                       | 25.73               | 36.21               | 33.72 | 26.33 |

1. Mainline loss includes coupling loss



### NOTES

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- 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)

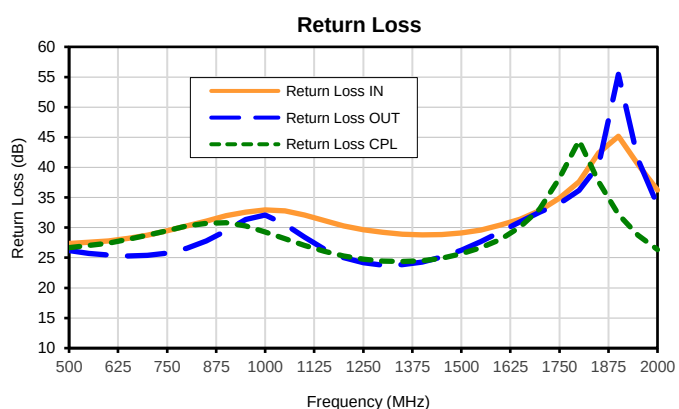
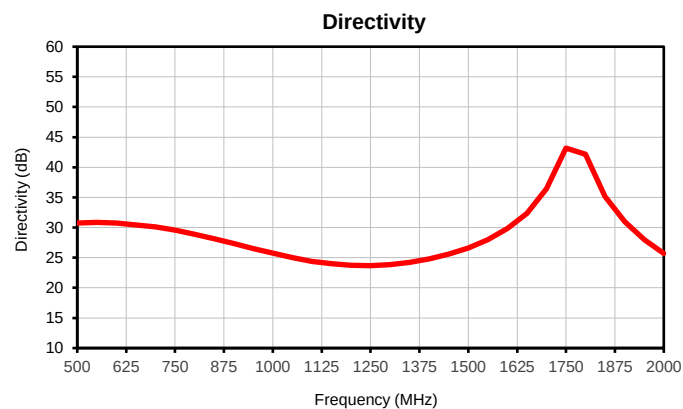
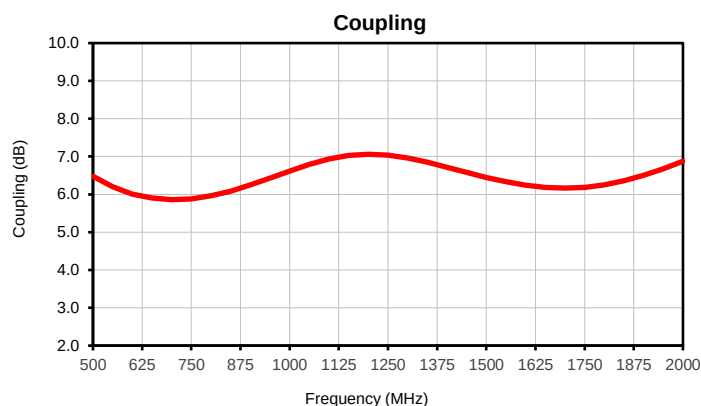
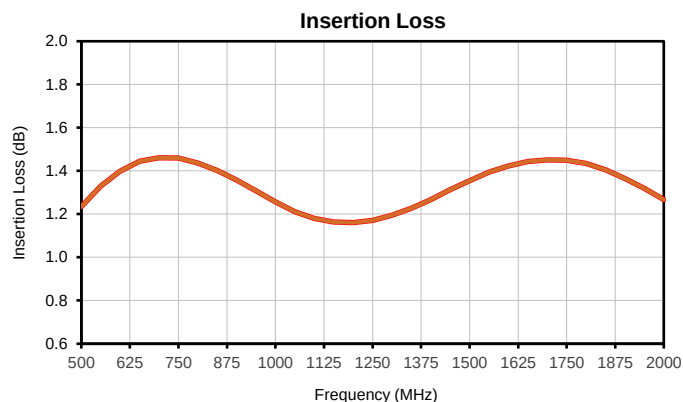


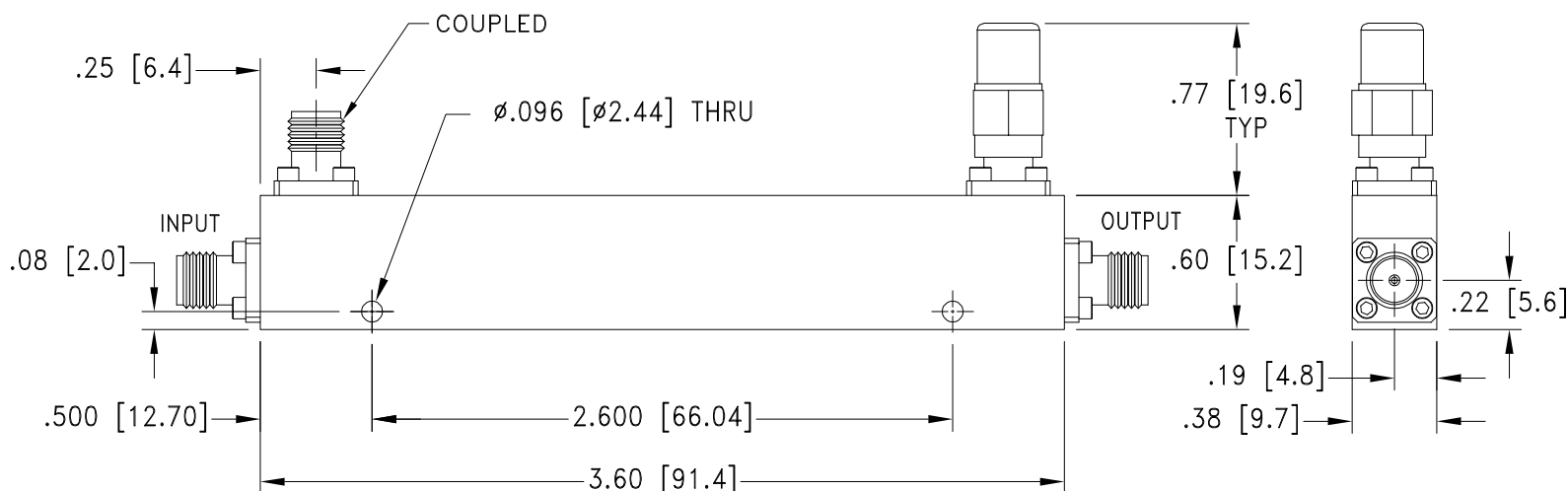
## Typical Performance Data

| FREQUENCY<br>(MHz) | INSERTION LOSS <sup>(1)</sup><br>(dB) | COUPLING<br>(dB) | DIRECTIVITY<br>(dB) | RETURN LOSS |             |       |
|--------------------|---------------------------------------|------------------|---------------------|-------------|-------------|-------|
|                    |                                       |                  |                     | IN          | (dB)<br>OUT | CPL   |
| 500                | 1.23                                  | 6.48             | 30.77               | 27.37       | 26.20       | 26.69 |
| 550                | 1.33                                  | 6.20             | 30.84               | 27.58       | 25.72       | 27.04 |
| 600                | 1.40                                  | 6.01             | 30.72               | 27.81       | 25.44       | 27.42 |
| 650                | 1.44                                  | 5.90             | 30.45               | 28.23       | 25.30       | 28.04 |
| 700                | 1.46                                  | 5.86             | 30.11               | 28.77       | 25.42       | 28.73 |
| 750                | 1.46                                  | 5.88             | 29.57               | 29.51       | 25.77       | 29.47 |
| 800                | 1.44                                  | 5.96             | 28.89               | 30.31       | 26.58       | 30.26 |
| 850                | 1.40                                  | 6.08             | 28.17               | 31.10       | 27.76       | 30.73 |
| 900                | 1.36                                  | 6.25             | 27.34               | 31.99       | 29.48       | 30.80 |
| 950                | 1.31                                  | 6.43             | 26.49               | 32.57       | 31.32       | 30.28 |
| 1000               | 1.26                                  | 6.62             | 25.75               | 32.94       | 32.07       | 29.28 |
| 1050               | 1.21                                  | 6.79             | 25.02               | 32.80       | 30.56       | 28.16 |
| 1100               | 1.18                                  | 6.93             | 24.38               | 32.08       | 28.41       | 27.06 |
| 1150               | 1.16                                  | 7.03             | 24.01               | 31.16       | 26.44       | 26.08 |
| 1200               | 1.16                                  | 7.06             | 23.74               | 30.28       | 25.03       | 25.31 |
| 1250               | 1.17                                  | 7.04             | 23.67               | 29.65       | 24.20       | 24.78 |
| 1300               | 1.20                                  | 6.96             | 23.86               | 29.22       | 23.76       | 24.46 |
| 1350               | 1.23                                  | 6.85             | 24.22               | 28.89       | 23.84       | 24.38 |
| 1400               | 1.27                                  | 6.72             | 24.79               | 28.78       | 24.27       | 24.52 |
| 1450               | 1.31                                  | 6.58             | 25.57               | 28.84       | 25.11       | 24.93 |
| 1500               | 1.36                                  | 6.45             | 26.59               | 29.10       | 26.26       | 25.65 |
| 1550               | 1.40                                  | 6.34             | 27.97               | 29.58       | 27.70       | 26.65 |
| 1600               | 1.42                                  | 6.24             | 29.82               | 30.42       | 29.34       | 28.07 |
| 1650               | 1.44                                  | 6.18             | 32.34               | 31.39       | 30.97       | 30.12 |
| 1700               | 1.45                                  | 6.16             | 36.43               | 32.86       | 32.57       | 33.11 |
| 1750               | 1.45                                  | 6.19             | 43.18               | 34.91       | 34.02       | 38.22 |
| 1800               | 1.43                                  | 6.25             | 42.17               | 37.63       | 36.19       | 44.46 |
| 1850               | 1.40                                  | 6.36             | 35.17               | 42.37       | 40.39       | 37.60 |
| 1900               | 1.36                                  | 6.50             | 30.98               | 45.16       | 55.45       | 32.17 |
| 1950               | 1.32                                  | 6.68             | 28.00               | 40.47       | 41.32       | 28.73 |
| 2000               | 1.27                                  | 6.88             | 25.73               | 36.21       | 33.72       | 26.33 |

<sup>(1)</sup>Mainline loss includes coupling loss

## Typical Performance Curves





Weight: 45.4 grams;

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

### Notes:

1. Case Material: Aluminum Alloy
2. Case Finish: Blue Painting, Pantone 286



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



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RF/IF MICROWAVE COMPONENTS



All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

| Specification         | Test/Inspection Condition             | Reference/Spec                                        |
|-----------------------|---------------------------------------|-------------------------------------------------------|
| Operating Temperature | -55° to +85 °C<br>Ambient Environment | Individual Model Data Sheet                           |
| Storage Temperature   | -55° to 100° C<br>Ambient Environment | Individual Model Data Sheet                           |
| Thermal Shock         | -55° to 100°C, 100 cycles             | MIL-STD-202, Method 107, Condition A-3, except +100°C |