WIDEBAND, DC PASS

# Directional Coupler ZUDC30-06183-S+

50Ω 30dB Up to 50W 6 to 18 GHz SMA Female

## THE BIG DEAL

- Wide frequency range, 6 to 18 GHz
- Excellent coupling flatness, ±0.3 dB typ.
- Good directivity, 21 dB typ. at 12 GHz
- Excellent return loss, 24 dB typ. 6 to 18 GHz
- DC current pass through input to output

*Generic photo used for illustration purposes only*

| | |
|---|---|
| **Model No.** | ZUDC30-06183-S+ |
| **Case Style** | HT3059 |
| **Connectors** | SMA-Female |

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

## APPLICATIONS

- Satellite Communications
- Test and Measurement Equipment
- Radar, EW and ECM Defense Systems

## PRODUCT OVERVIEW

The ZUDC30-06183-S+ is part of Mini-Circuits ZUDC family of wide band directional couplers offers exceptional performance spanning frequencies from 6 to 18 GHz. This datasheet is for the 30 dB variant but Mini Circuits offers 10 and 20 dB coupling. These couplers provide excellent coupling flatness, good directivity, and power handling up to 50W. They are ideal for lab testing applications as well as for power monitoring over wide bands.

## KEY FEATURES

| Features | Advantages |
|---|---|
| Wide bandwidth | With a bandwidth spanning 6 to 18 GHz, ZUDC couplers are ideal for most lab testing applications, avoiding the need to switch components for different frequency bands. |
| Excellent Directivity<br>• 21 dB typ. at 12 GHz | High directivity allows sampling of input power with minimal detrimental effects due to mismatches. |
| Excellent coupling flatness<br>• +0.3 dB typ. at 12 GHz | Excellent coupling flatness over the entire frequency range eliminates the need for compensation circuits in most cases. |
| Excellent Return Loss (IN&OUT)<br>• 25 dB typ. 6 to 18 GHz | Good return loss over 6 to 18 GHz minimizes undesired reflections and resulting amplitude ripple. |

## ELECTRICAL SPECIFICATIONS AT 25°C

| Parameter | Frequency (GHz) | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|
| Operating Frequency | | 6 | | 18 | GHz |
| Nominal Coupling | 6 - 18 | 27.5 | 30.8 | 32.5 | dB |
| Coupling Flatness | 6 - 18 | - | ± 0.3 | ±1.5 | dB |
| Mainline Loss[1] | 6 - 18 | - | 0.3 | 0.7 | dB |
| Directivity | 6 - 18 | 10.0 | 21.8 | - | dB |
| Return Loss (In & Out) | 6 - 18 | 13.8 | 24.0 | - | dB |
| Return Loss (Coupling) | 6 - 18 | 12.5 | 23.0 | - | dB |
| Input Power[2] | 6 - 18 | - | - | 50 | W |

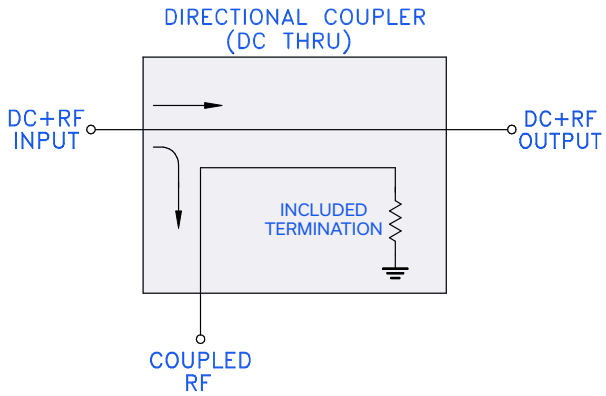
1. Mainline loss includes coupling loss.
2. Up to 25°C, derates linearly to 5W at 100°C

## MAXIMUM RATINGS

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

*DC current de-rates to 316mA at 100 Deg C

## FUNCTIONAL SCHEMATIC



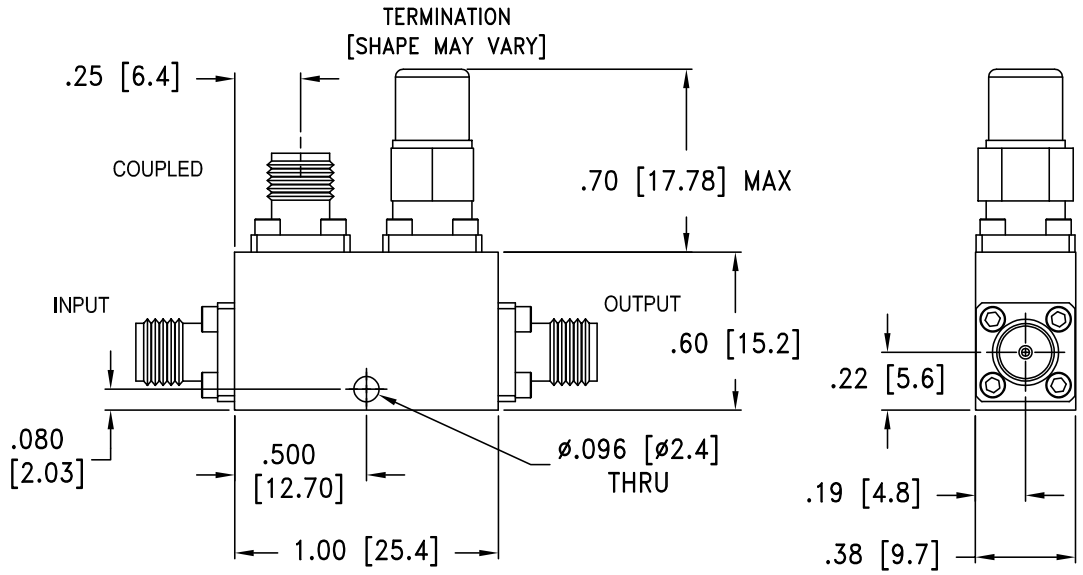
# Directional Coupler ZUDC30-06183-S+

50Ω 30dB Up to 50W 6 to 18 GHz SMA Female

## COAXIAL CONNECTIONS

| Ports | Marking |
|---|---|
| Input | IN |
| Output | OUT |
| Coupled | CPL |
| Termination (50Ω) Included | TERM |

## OUTLINE DRAWING




Weight: 22.7 grams
Dimensions are in inches [mm]. Tolerances: 2 Pl.±.03; 3 PL ±.015

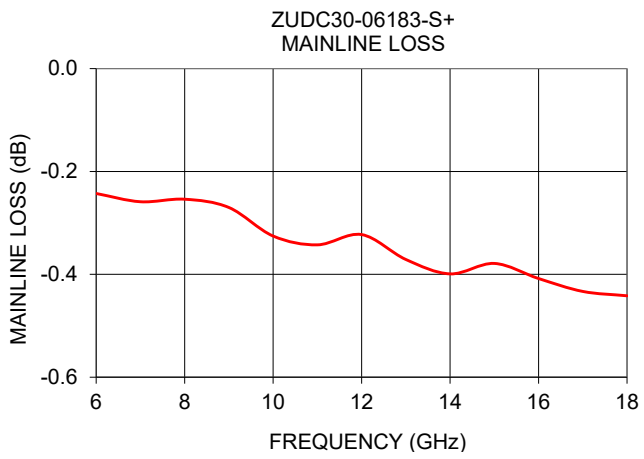
# Directional Coupler ZUDC30-06183-S+

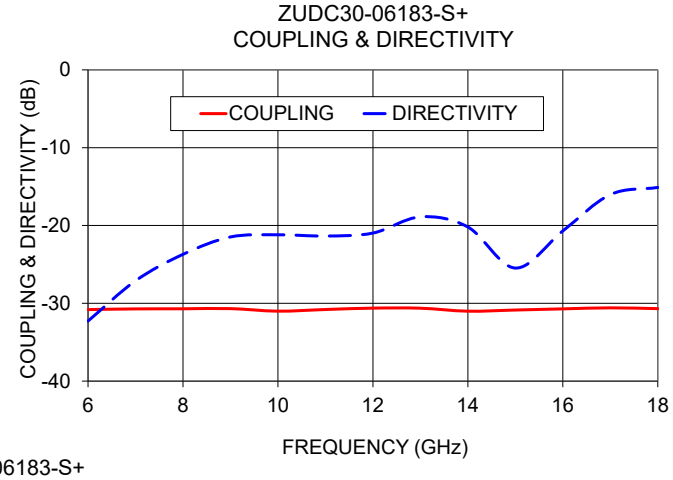
50Ω 30dB Up to 50W 6 to 18 GHz SMA Female

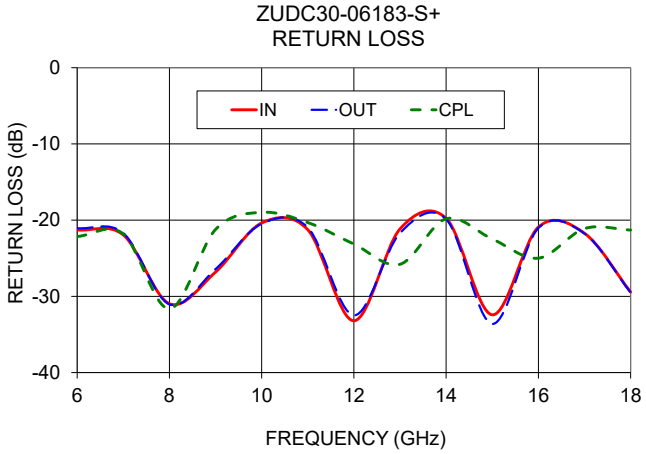
## TYPICAL PERFORMANCE DATA AND CHARTS

| Frequency (GHz) | Mainline Loss (dB) In-Out | Coupling (dB) In-Out | Directivity (dB) | Return Loss (dB) In | Return Loss (dB) Out | Return Loss (dB) Cpl |
|---|---|---|---|---|---|---|
| 6 | 0.2 | 30.8 | 32.3 | 21.3 | 21.0 | 22.1 |
| 7 | 0.3 | 30.7 | 27.1 | 21.9 | 21.7 | 21.8 |
| 8 | 0.3 | 30.7 | 23.7 | 31.0 | 31.1 | 31.6 |
| 9 | 0.3 | 30.7 | 21.5 | 26.8 | 26.4 | 21.2 |
| 10 | 0.3 | 31.0 | 21.2 | 20.4 | 20.5 | 19.0 |
| 11 | 0.3 | 30.8 | 21.4 | 21.3 | 21.0 | 20.3 |
| 12 | 0.3 | 30.6 | 21.0 | 33.2 | 32.5 | 23.1 |
| 13 | 0.4 | 30.6 | 18.9 | 21.2 | 21.7 | 25.8 |
| 14 | 0.4 | 31.0 | 20.2 | 19.8 | 19.9 | 19.8 |
| 15 | 0.4 | 30.9 | 25.5 | 32.4 | 33.6 | 22.5 |
| 16 | 0.4 | 30.7 | 20.7 | 20.9 | 21.0 | 25.0 |
| 17 | 0.4 | 30.6 | 16.0 | 21.7 | 21.8 | 21.1 |
| 18 | 0.4 | 30.7 | 15.1 | 29.4 | 29.5 | 21.3 |

1. Mainline loss includes coupling loss.




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.

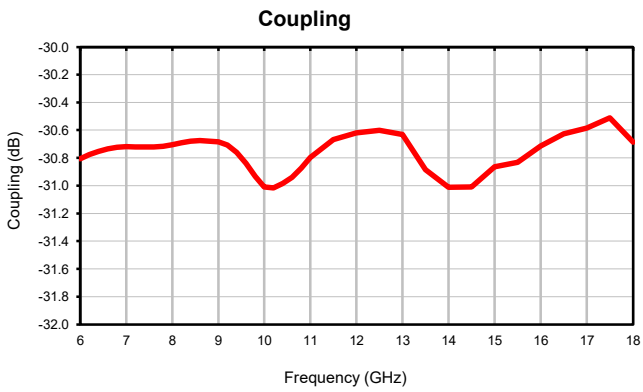
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/terms/viewterm.html

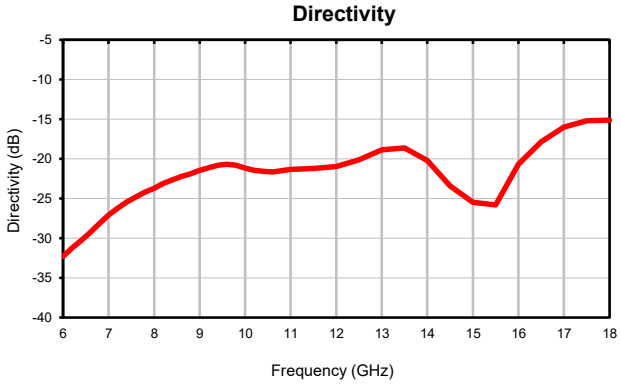
## *Typical Performance Data*

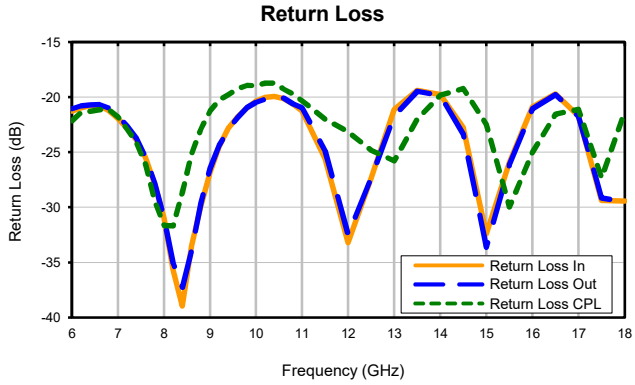
| FREQUENCY (GHz) | INSERTION LOSS [1] (dB) | COUPLING (dB) | DIRECTIVITY (dB) | RETURN LOSS (dB) IN | OUT | CPL |
|---|---|---|---|---|---|---|
| 6.0 | 0.2 | 30.8 | 32.3 | 21.3 | 21.0 | 22.1 |
| 6.2 | 0.2 | 30.8 | 31.2 | 21.0 | 20.8 | 21.4 |
| 6.4 | 0.3 | 30.8 | 30.3 | 20.8 | 20.7 | 21.3 |
| 6.6 | 0.3 | 30.7 | 29.3 | 20.8 | 20.7 | 21.1 |
| 6.8 | 0.3 | 30.7 | 28.1 | 21.2 | 21.0 | 21.1 |
| 7.0 | 0.3 | 30.7 | 27.1 | 21.9 | 21.7 | 21.8 |
| 7.2 | 0.3 | 30.7 | 26.2 | 22.8 | 22.6 | 22.9 |
| 7.4 | 0.3 | 30.7 | 25.4 | 23.9 | 23.7 | 24.1 |
| 7.6 | 0.3 | 30.7 | 24.8 | 25.5 | 25.5 | 26.1 |
| 7.8 | 0.3 | 30.7 | 24.2 | 27.9 | 27.8 | 29.5 |
| 8.0 | 0.3 | 30.7 | 23.7 | 31.0 | 31.1 | 31.6 |
| 8.2 | 0.3 | 30.7 | 23.1 | 35.7 | 35.1 | 31.7 |
| 8.4 | 0.3 | 30.7 | 22.7 | 38.9 | 37.2 | 28.6 |
| 8.6 | 0.3 | 30.7 | 22.2 | 33.5 | 33.8 | 25.1 |
| 8.8 | 0.3 | 30.7 | 21.9 | 29.9 | 29.6 | 22.9 |
| 9.0 | 0.3 | 30.7 | 21.5 | 26.8 | 26.4 | 21.2 |
| 9.2 | 0.3 | 30.7 | 21.1 | 24.5 | 24.4 | 20.2 |
| 9.4 | 0.3 | 30.8 | 20.8 | 22.8 | 22.9 | 19.8 |
| 9.6 | 0.3 | 30.8 | 20.7 | 21.8 | 21.8 | 19.2 |
| 9.8 | 0.3 | 30.9 | 20.8 | 21.0 | 20.9 | 18.9 |
| 10.0 | 0.3 | 31.0 | 21.2 | 20.4 | 20.5 | 19.0 |
| 10.2 | 0.3 | 31.0 | 21.4 | 20.0 | 20.2 | 18.7 |
| 10.4 | 0.3 | 31.0 | 21.6 | 19.9 | 19.8 | 18.7 |
| 10.6 | 0.3 | 30.9 | 21.6 | 20.2 | 20.1 | 19.3 |
| 10.8 | 0.3 | 30.9 | 21.5 | 20.7 | 20.6 | 19.7 |
| 11.0 | 0.3 | 30.8 | 21.4 | 21.3 | 21.0 | 20.3 |
| 11.5 | 0.3 | 30.7 | 21.2 | 25.6 | 24.9 | 22.0 |
| 12.0 | 0.3 | 30.6 | 21.0 | 33.2 | 32.5 | 23.1 |
| 12.5 | 0.3 | 30.6 | 20.1 | 27.4 | 27.3 | 24.8 |
| 13.0 | 0.4 | 30.6 | 18.9 | 21.2 | 21.7 | 25.8 |
| 13.5 | 0.4 | 30.9 | 18.6 | 19.4 | 19.5 | 22.0 |
| 14.0 | 0.4 | 31.0 | 20.2 | 19.8 | 19.9 | 19.8 |
| 14.5 | 0.4 | 31.0 | 23.4 | 22.8 | 23.4 | 19.2 |
| 15.0 | 0.4 | 30.9 | 25.5 | 32.4 | 33.6 | 22.5 |
| 15.5 | 0.4 | 30.8 | 25.8 | 26.0 | 26.1 | 30.0 |
| 16.0 | 0.4 | 30.7 | 20.7 | 20.9 | 21.0 | 25.0 |
| 16.5 | 0.4 | 30.6 | 17.9 | 19.7 | 19.8 | 21.5 |
| 17.0 | 0.4 | 30.6 | 16.0 | 21.7 | 21.8 | 21.1 |
| 17.5 | 0.4 | 30.5 | 15.2 | 29.4 | 29.1 | 27.3 |
| 18.0 | 0.4 | 30.7 | 15.1 | 29.4 | 29.5 | 21.3 |

[1] Mainline loss includes coupling loss.

## *Typical Performance Curves*



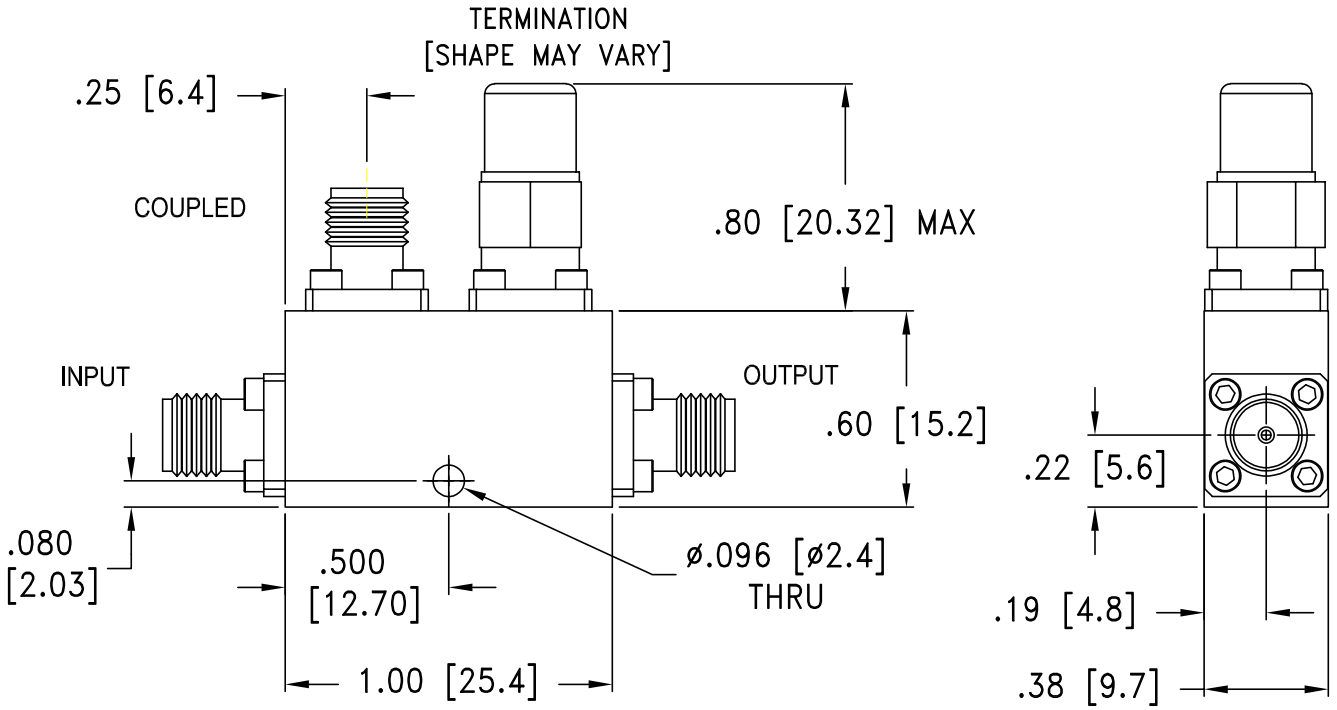



# Case Style HT

## Outline Dimensions

**HT3059**




Weight: 22.7 grams

Dimensions are in inches [mm]. Tolerances: 2 Pl.±.03; 3 Pl. ±.015

Notes:

1. Case material: Aluminum alloy.
2. Case finish: Pantone 286.



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Mini-Circuits

# Environmental Specifications ENV77

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 |


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