*Surface Mount*

# Directional Coupler

# ADC-20-132+

50Ω 100 to 1300 MHz

CASE STYLE: CD542

## The Big Deal

- Useable to 1500 MHz
- Low mainline loss, 0.4 dB
- High directivity, 22 dB
- High-Power, 4W

## Product Overview

Mini-Circuits' ADC-20-132+ is a surface-mount directional coupler providing 20 dB coupling from 100 to 1300 MHz. This model, provides good coupling flatness, low mainline loss, high directivity and RF input power handling up to 4W. The unit comes housed in a miniature 6-lead plastic package (0.27 x 0.31 x 0.11"), saving space in dense PCB layouts.

## Key Features

| Feature | Advantages |
|---|---|
| Usable to 1500 MHz | The ADC-20-132+ supports a variety of applications. |
| Good coupling flatness, ±1.5 dB | Provides consistent coupling performance across frequency. |
| High power handling:<br>• 4W to 700 MHz<br>• 2W to 1300 Mhz | Usable in systems with a wide range of high-power requirements. |
| Low mainline loss, 0.4 dB | Provides excellent through-path signal power transmission. |
| High directivity, 22 dB | High directivity allows accurate signal sampling through the coupled port with minimal measurement error. |
| Small size, 0.27 x 0.31 x 0.11" | Provides high power capability while saving space in systems with tight layouts. |

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# ADC-20-132+

## 50Ω 100 to 1300 MHz

CASE STYLE: CD542

*+RoHS Compliant*

*The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications*

*Available Tape and Reel at no extra cost*

| Reel Size | Devices/Reel |
|---|---|
| 7" | 10, 20, 50, 100, 200, 500 |
| 13" | 500, 1000 |

## Maximum Ratings

| | |
|---|---|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |

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

## Pin Connections

| | |
|---|---|
| INPUT | 1 |
| OUTPUT | 6 |
| COUPLED | 3 |
| GROUND | 2 |
| 50Ω TERM EXTERNAL | 4 |
| ISOLATE (DO NOT USE) | 5 |

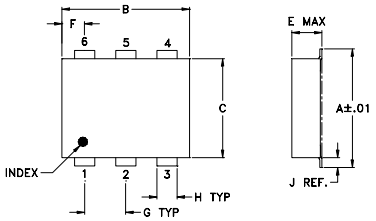
## Features

- useable to 1500 MHz
- low mainline loss, 0.4 dB typ.
- high directivity, 22 dB typ.
- aqueous washable
- protected by U.S Patents 6,133,525 & 6,140,887

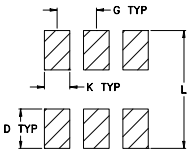
## Applications

- cable tv

## Outline Drawing




PCB Land Pattern



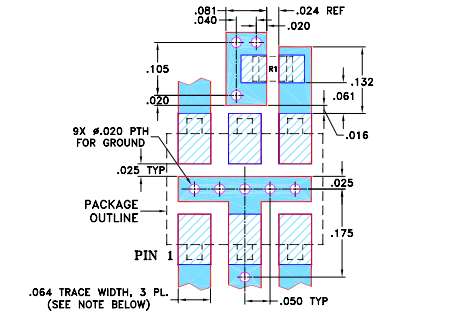

Suggested Layout,
Tolerance to be within ±.002

## Outline Dimensions (inch / mm)

| A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|
| .272 | .310 | .220 | .100 | .112 | .055 | .100 |
| 6.91 | 7.87 | 5.59 | 2.54 | 2.84 | 1.40 | 2.54 |

| H | J | K | L | wt |
|---|---|---|---|---|
| .030 | .026 | .065 | .300 | grams |
| 0.76 | 0.66 | 1.65 | 7.62 | 0.20 |

***Demo Board MCL P/N: TB-05***
***Suggested PCB Layout (PL-095)***




RESISTOR R1: 49.9 Ohm, 0805 SIZE.

NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

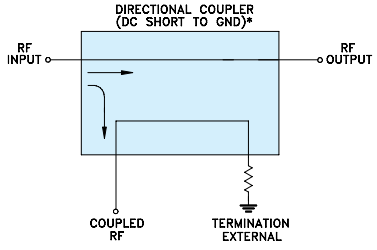
DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

## Electrical Specifications at 25°C

| Parameter | Condition (MHz) | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| **Frequency Range** | | 100 | — | 1300 | MHz |
| **Mainline Loss**[1] | 100 | — | 0.3 | 0.6 | dB |
| | 500 | — | 0.2 | 0.4 | |
| | 1000 | — | 0.3 | 0.5 | |
| | 1300 | — | 0.4 | 0.7 | |
| **Coupling** | 100-1300 | — | 20 | — | dB |
| **Coupling Flatness(±)** | 100-1000 | — | 1.0 | 1.6 | dB |
| | 100-1300 | — | 1.5 | 2.5 | |
| **Directivity** | 100 | 20 | 25 | — | dB |
| | 500 | 18 | 23 | — | |
| | 1000 | 14 | 18 | — | |
| | 1300 | 10 | 15 | — | |
| **Return Loss (Input)** | 200-1000 | | 19 | — | dB |
| | 100-1300 | | 15 | — | |
| **Return Loss (Output)** | 200-1000 | | 20 | — | dB |
| | 100-1300 | | 15 | — | |
| **Return Loss (Coupling)** | 200-1000 | | 17 | — | dB |
| | 100-1300 | | 15 | — | |
| **Input Power** | 200-700 | — | — | 4 | W |
| | 100-1300 | — | — | 2 | |

1. Mainline loss includes theorectical power loss at coupled port.

## Electrical Schematic




* ELECTRICAL SCHEMATIC IS FOR DIRECTIONAL COUPLER WITH INTERNAL TRANSFORMER(S) AND EXTERNAL TERMINATION.

Notes

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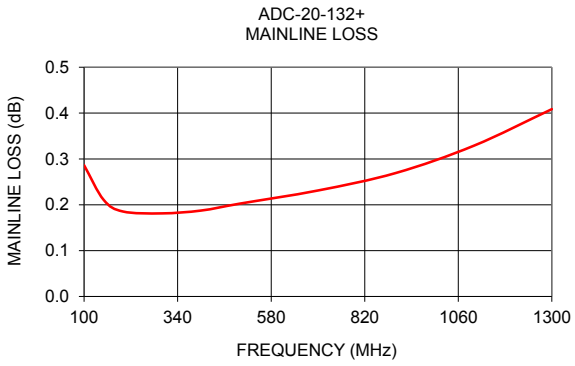
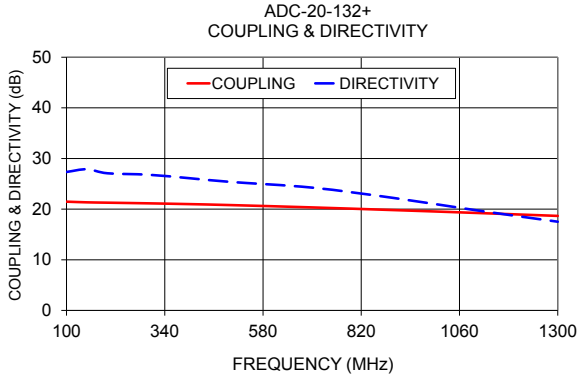
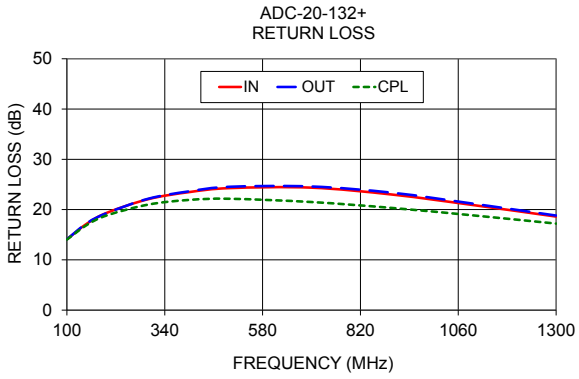
## Typical Performance Data

| Frequency (MHz) | Mainline Loss (dB) In-Out | Coupling (dB) In-Cpl | Directivity (dB) | Return Loss (dB) In | Return Loss (dB) Out | Return Loss (dB) Cpl |
|---|---|---|---|---|---|---|
| 100 | 0.29 | 21.48 | 27.34 | 14.11 | 14.11 | 14.04 |
| 150 | 0.21 | 21.34 | 27.88 | 17.26 | 17.36 | 17.00 |
| 200 | 0.19 | 21.28 | 27.08 | 19.43 | 19.37 | 18.90 |
| 300 | 0.18 | 21.15 | 26.79 | 22.08 | 22.17 | 21.00 |
| 400 | 0.19 | 20.99 | 26.11 | 23.48 | 23.63 | 21.92 |
| 500 | 0.20 | 20.80 | 25.38 | 24.27 | 24.54 | 22.15 |
| 700 | 0.23 | 20.34 | 24.25 | 24.36 | 24.59 | 21.50 |
| 900 | 0.27 | 19.81 | 22.20 | 22.97 | 23.33 | 20.31 |
| 1100 | 0.33 | 19.25 | 19.78 | 20.86 | 21.14 | 18.82 |
| 1300 | 0.41 | 18.66 | 17.52 | 18.61 | 18.81 | 17.21 |

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