

Ceramic

# Directional Coupler

DCW-9-432+

50Ω    2300 to 4300 MHz    9dB Coupling

## The Big Deal

- High Power handling
- Industry leading combination of size/ bandwidth



CASE STYLE: JC0603C

## Product Overview

Mini-Circuits new directional coupler DCW-9-432+ offers an industry leading combination of operating bandwidth and size. The low insertion loss makes this component a versatile building block for use in a variety of systems and sub-system designs.

## Key Features

| Feature             | Advantages                                                                                                                                                                                                                                 |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Small Size          | Offered in the JC0603C package size, the DCW-9-432+ offers an industry leading combination of size, bandwidth and frequency. The small footprint allows for reduced parasitics in systems with improved performance and simplified layout. |
| High Power handling | Capable of operating up to 2W, the LTCC construction of the DCW-9-432+ makes this directional coupler a robust, rugged product that can be used effectively in either the transmit or receive paths.                                       |

### 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/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp)



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50Ω 2300 to 4300 MHz 9dB Coupling

DCW-9-432+



Generic photo used for illustration purposes only

CASE STYLE: JC0603C

**+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"        | 20, 50, 100, 200, 500, 1000, 4000 |

## Maximum Ratings

Operating Temperature -55°C to 125°C

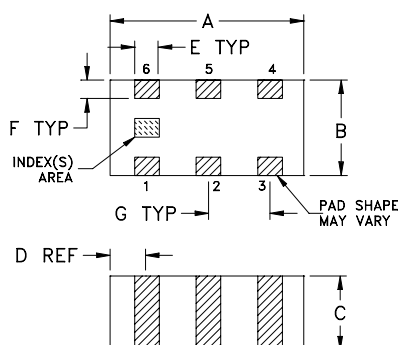
Storage Temperature\* -55°C to 125°C

\*Refer to product storage temperature after installation.  
Suggestion for T&R unused product storage condition: +5--+35°C,  
Humidity 45-75%RH, 12 Month max.  
Permanent damage may occur if any of these limits are exceeded.

## Pad Connections

|             |   |
|-------------|---|
| Input       | 1 |
| GND         | 2 |
| Coupled     | 3 |
| Termination | 4 |
| GND         | 5 |
| Output      | 6 |

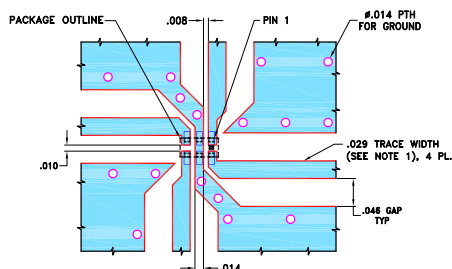
## Outline Drawing



## Outline Dimensions (inch/mm)

| A    | B    | C    | D    | E    | F    | G    | wt    |
|------|------|------|------|------|------|------|-------|
| .063 | .031 | .024 | .012 | .008 | .006 | .020 | grams |
| 1.60 | 0.79 | 0.61 | 0.30 | 0.20 | 0.15 | 0.51 | 0.005 |

## Evaluation Board MCL P/N: TB-DCW-9-432+ Suggested PCB Layout (PL-572)



### NOTES:

1. TRACE WIDTH & GAP ARE SHOWN FOR FR4, GRADE IT-180TC (ITEQ CORP.) WITH DIELECTRIC THICKNESS .016±.0015. COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH & GAP MAY NEED TO BE MODIFIED.
  2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
  3. REFER TO MODEL DATASHEET FOR PIN OUTS.
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).
- DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

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## Features

- miniature size 0603
- low cost
- aqueous washable

## Applications

- ISM Band
- Cellular
- Bluetooth
- Zigbee

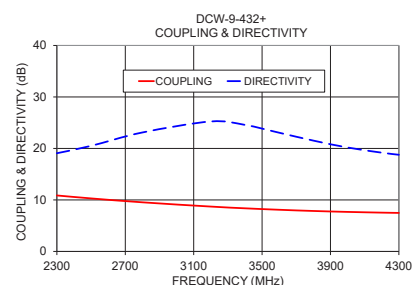
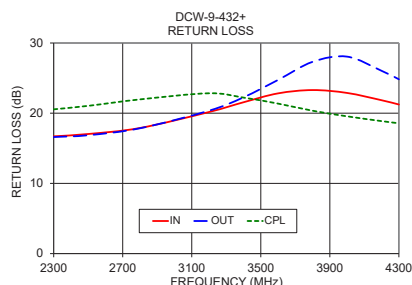
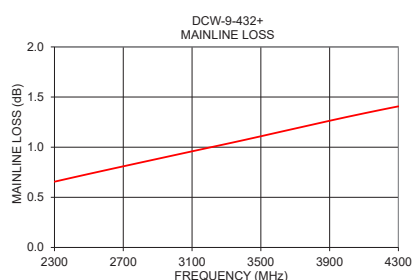
## Electrical Specifications at 25°C

| Parameter                | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|--------------------------|-----------------|------|------|------|------|
| Frequency Range          |                 | 2300 |      | 4300 | MHz  |
| Mainline Loss            | 2300 - 4300     | —    | 1.3  | 1.7  | dB   |
| Coupling                 | 2300 - 4300     | —    | 9±2  | —    | dB   |
| Directivity              | 2300 - 4300     | 14   | 17   | —    | dB   |
| Return Loss (Input)      | 2300 - 4300     | 11   | —    | —    | dB   |
| Return Loss (Output)     | 2300 - 4300     | 11   | —    | —    | dB   |
| Input Power <sup>1</sup> | 2300 - 4300     | —    | —    | 2    | W    |

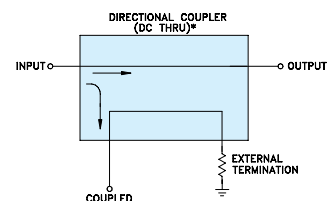
1. Derate linearly to 0.5W at 125°C.

## Typical Performance Data

| Frequency (MHz) | Mainline Loss (dB) In-Out | Coupling (dB) In-Cpl | Directivity (dB) | Return Loss (dB) |       |       |
|-----------------|---------------------------|----------------------|------------------|------------------|-------|-------|
|                 |                           |                      |                  | In               | Out   | Cpl   |
| 2300            | 0.66                      | 10.87                | 19.07            | 16.71            | 16.60 | 20.55 |
| 2500            | 0.73                      | 10.30                | 20.50            | 17.04            | 16.86 | 21.05 |
| 2800            | 0.85                      | 9.54                 | 23.10            | 17.89            | 17.86 | 21.97 |
| 3200            | 1.00                      | 8.71                 | 25.24            | 20.17            | 20.36 | 22.84 |
| 3400            | 1.07                      | 8.38                 | 24.57            | 21.56            | 22.26 | 22.22 |
| 3600            | 1.15                      | 8.09                 | 23.05            | 22.83            | 24.74 | 21.37 |
| 3800            | 1.23                      | 7.86                 | 21.52            | 23.30            | 27.32 | 20.35 |
| 4000            | 1.30                      | 7.68                 | 20.18            | 22.89            | 28.06 | 19.55 |
| 4200            | 1.37                      | 7.54                 | 19.18            | 21.85            | 26.04 | 18.87 |
| 4300            | 1.41                      | 7.48                 | 18.77            | 21.24            | 24.83 | 18.57 |



## Electrical Schematic



\* ELECTRICAL SCHEMATIC FOR DIRECTIONAL COUPLERS REQUIRING EXTERNAL TERMINATION THAT IS DESIGNED WITHOUT INTERNAL TRANSFORMERS.



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