

# LTCC Coupler

50Ω 2400 to 2500 MHz 21dB Coupling

## CPJC-21-252R+



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 100°C |
| Storage Temperature*  | -55°C to 100°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 Out | 3 |
| Termination | 4 |
| GND         | 5 |
| Main Out    | 6 |

### Features

- miniature size 0603 (0.063"[1.6mm]) x 0.031"[0.8mm] x 0.024"[0.6mm])
- low cost
- aqueous washable

### Applications

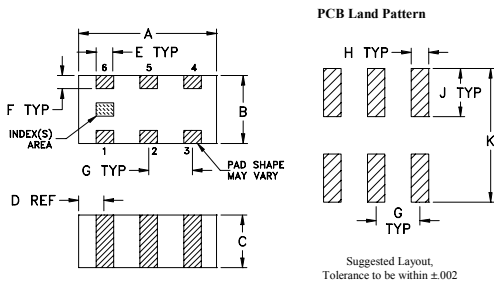
- ISM Band
- WLAN
- Bluetooth
- Zigbee

### Electrical Specifications at 25°C

| Parameter                      | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|--------------------------------|-----------------|------|------|------|------|
| <b>Frequency Range</b>         |                 | 2400 |      | 2500 | MHz  |
| <b>Mainline Loss</b>           | 2400 - 2500     | —    | 0.3  | 0.4  | dB   |
| <b>Coupling</b>                | 2400 - 2500     | 19.5 | 21   | 22.5 | dB   |
| <b>Directivity</b>             | 2400 - 2500     | 12.5 | 19   | —    | dB   |
| <b>Return Loss (Input)</b>     | 2400 - 2500     | 14.7 | 26   | —    | dB   |
| <b>Return Loss (Output)</b>    | 2400 - 2500     | 14.7 | 27   | —    | dB   |
| <b>Input Power<sup>1</sup></b> | 2400 - 2500     | —    | —    | 2    | W    |

1. Derate linearly to 1W at 100°C

### Outline Drawing

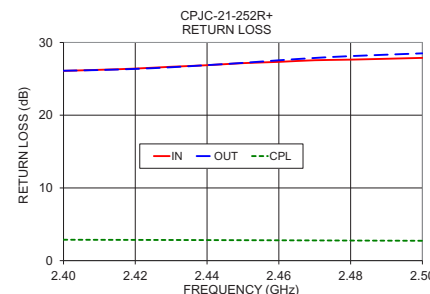
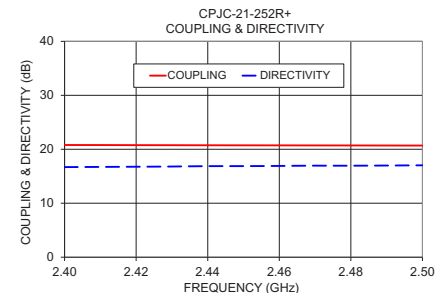
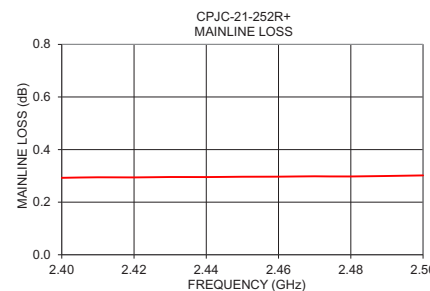


### Outline Dimensions (inch/mm)

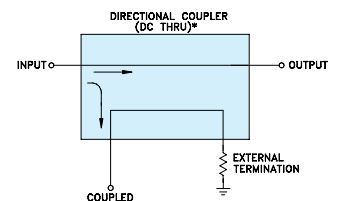
|      |      |      |      |      |      |       |
|------|------|------|------|------|------|-------|
| A    | B    | C    | D    | E    | F    |       |
| .063 | .031 | .024 | .012 | .008 | .006 |       |
| 1.60 | 0.79 | 0.61 | 0.30 | 0.20 | 0.15 |       |
| G    | H    | J    | K    |      |      | wt    |
| .020 | .010 | .022 | .053 |      |      | grams |
| 0.51 | 0.25 | 0.56 | 1.35 |      |      | 0.005 |

### Typical Performance Data

| Frequency (GHz) | Mainline Loss (dB) In-Out | Coupling (dB) In-Cpl | Directivity (dB) | Return Loss (dB) |       |      |
|-----------------|---------------------------|----------------------|------------------|------------------|-------|------|
|                 |                           |                      |                  | In               | Out   | Cpl  |
| 2.40            | 0.29                      | 20.79                | 16.70            | 26.10            | 26.11 | 2.87 |
| 2.41            | 0.29                      | 20.78                | 16.73            | 26.24            | 26.21 | 2.86 |
| 2.42            | 0.29                      | 20.77                | 16.77            | 26.41            | 26.37 | 2.85 |
| 2.43            | 0.30                      | 20.76                | 16.80            | 26.66            | 26.59 | 2.84 |
| 2.44            | 0.30                      | 20.74                | 16.88            | 26.87            | 26.89 | 2.83 |
| 2.45            | 0.30                      | 20.73                | 16.88            | 27.16            | 27.19 | 2.81 |
| 2.46            | 0.30                      | 20.72                | 16.91            | 27.33            | 27.55 | 2.80 |
| 2.47            | 0.30                      | 20.71                | 16.96            | 27.56            | 27.87 | 2.78 |
| 2.48            | 0.30                      | 20.71                | 16.95            | 27.64            | 28.13 | 2.76 |
| 2.49            | 0.30                      | 20.70                | 16.99            | 27.77            | 28.33 | 2.75 |
| 2.50            | 0.30                      | 20.69                | 17.03            | 27.88            | 28.51 | 2.73 |

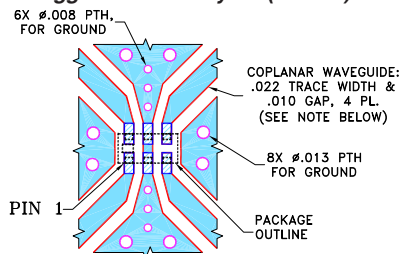


### Electrical Schematic



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

### Evaluation Board MCL P/N: TB-CPJC21-252R+ Suggested PCB Layout (PL-440)



#### NOTES:

1. COPLANAR WAVEGUIDE IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .010" ± .001". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP 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.

#### 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.
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