



LTCC SURFACE MOUNT

Directional Coupler

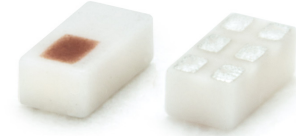
DCW-20-722+

Mini-Circuits

50Ω 6.35 to 7.20 GHz 20 dB

THE BIG DEAL

- Wideband, 6350 to 7200 MHz
- Low mainline loss, 0.17 dB typical
- High-power handling 8 W maximum
- 0603 Surface Mount Footprint

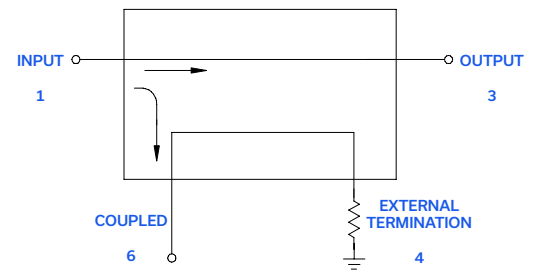


Generic photo used for illustration purposes only

APPLICATIONS

- Telecommunications
- Satellite Communications
- 5G

FUNCTIONAL DIAGRAM



PRODUCT OVERVIEW

Mini-Circuits' DCW-20-722+ is a miniature low temperature co-fired ceramic (LTCC) directional coupler operating from 6.35 to 7.20 GHz. This model exhibits low typical mainline loss of 0.17 dB, due to its rugged monolithic construction. 0603 surface mountable form factor, the DCW-20-722+ offers an industry leading combination of high-power handling and miniature size. The low mainline loss makes this component a versatile building block for use in various systems, including subsystem designs in 5G New Radio, among others. The LTCC fabrication process ensures minimal RF performance variation while delivering a product well-suited for environmental extremes, including high humidity and temperature.

KEY FEATURES

Features	Advantages
High Power Handling Capability	Able to handle up to 8 Watts CW.
Small, 0603 Surface Mount Footprint	Saves space in dense circuit board layouts and minimizes the effects of parasitics.
Low Mainline Losses	Enables minimal impact to main signal while sampling.
LTCC Construction	Provides repeatable performance in a rugged, ceramic package, well suited for tough environments with high humidity and temperature extremes.

REV. OR
ECO-026018
DCW-20-722+
MCL NY
250627





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ELECTRICAL SPECIFICATIONS^{1,2} AT +25°C

Parameter	Frequency (GHz)	Min.	Typ.	Max.	Units
Frequency Range		6.35		7.20	GHz
Mainline Loss	6.35 – 7.20		0.17	0.30	dB
Coupling Nominal	6.35 – 7.20	18.2	19.7	21.5	dB
Directivity	6.35 – 7.20		16		dB
Return Loss (Input)	6.35 – 7.20	14.3	16.3		dB
Return Loss (Output)	6.35 – 7.20	14.3	16.3		dB
Return Loss (Coupled)	6.35 – 7.20	12.3	14.3		dB

1. Tested on Evaluation Board TB-DCW-20-722+. Fixture losses de-embedded using TRL.
2. Symmetrical, all ports are interchangeable. See Pad Configuration Table and S-Parameters for actual performance.

ABSOLUTE MAXIMUM RATINGS³

Parameter	Ratings
Operating Temperature	-55 °C to +125 °C
Storage Temperature	-55 °C to +125 °C
Input Power ⁴	8 W at +25 °C

3. Permanent damage may occur if any of these limits are exceeded.
4. Derate linearly to 3.2 W at +125 °C.





LTCC SURFACE MOUNT

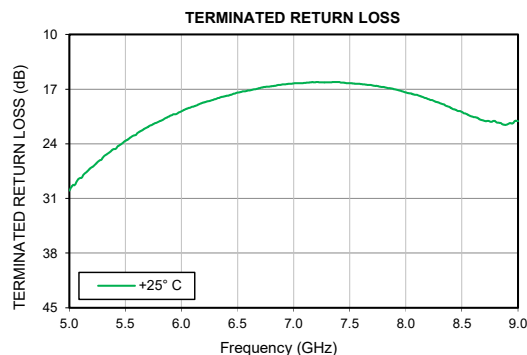
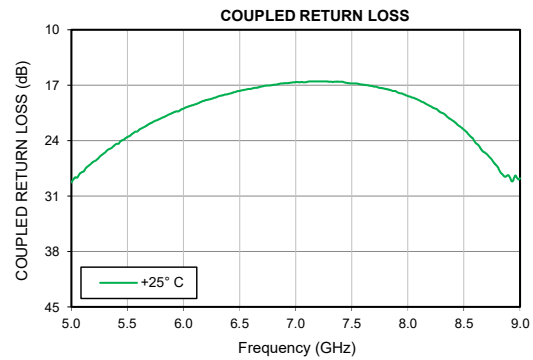
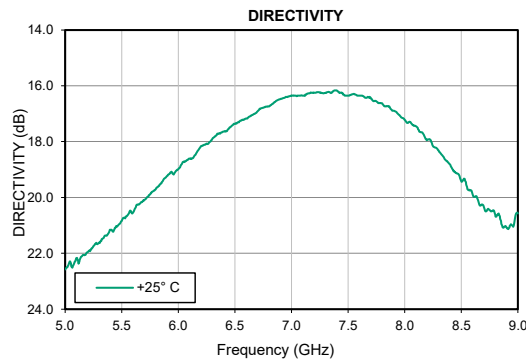
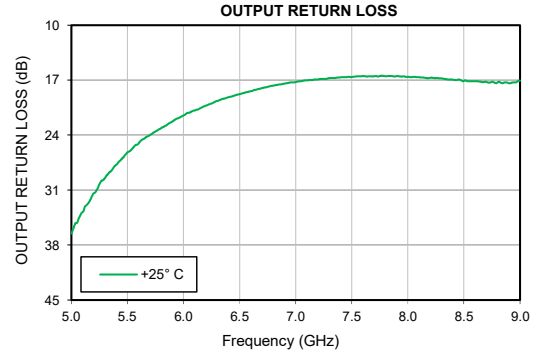
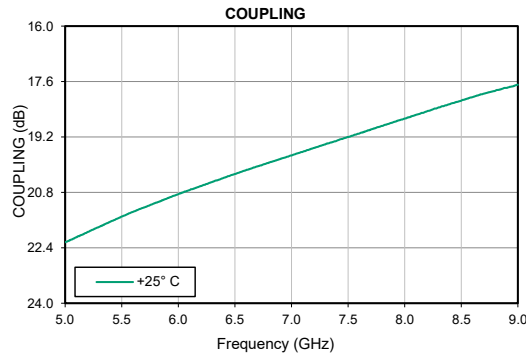
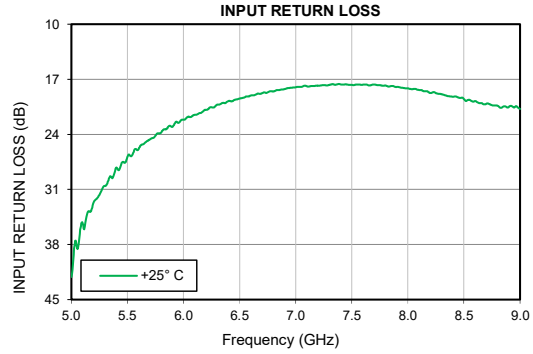
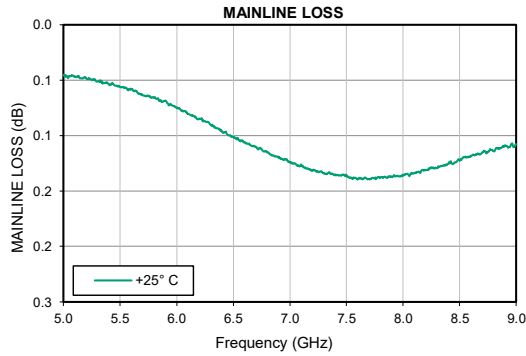
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TYPICAL PERFORMANCE GRAPHS





FUNCTIONAL DIAGRAM

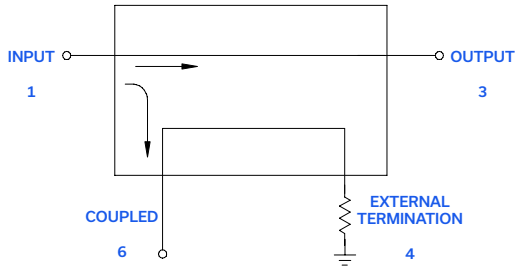
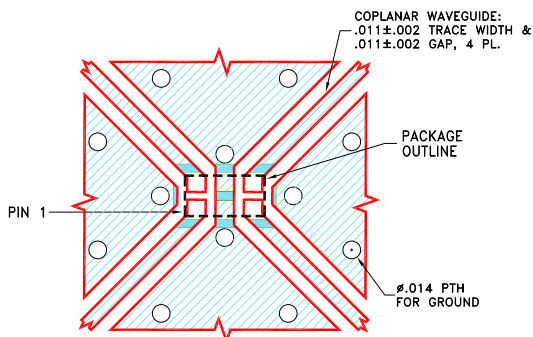


Figure 1. DCW-20-722+ Functional Diagram

PAD DESCRIPTION/CONFIGURATION²

Function	Pad Number	Description
Input	1	Connects to RF Input Port
Output	3	Connects to RF Output Port
Termination	4	Connects to EXTERNAL TERMINATION
Coupled	6	Connects to COUPLED
Ground	2, 5	Connects to GROUND

SUGGESTED PCB LAYOUT (PL-823)

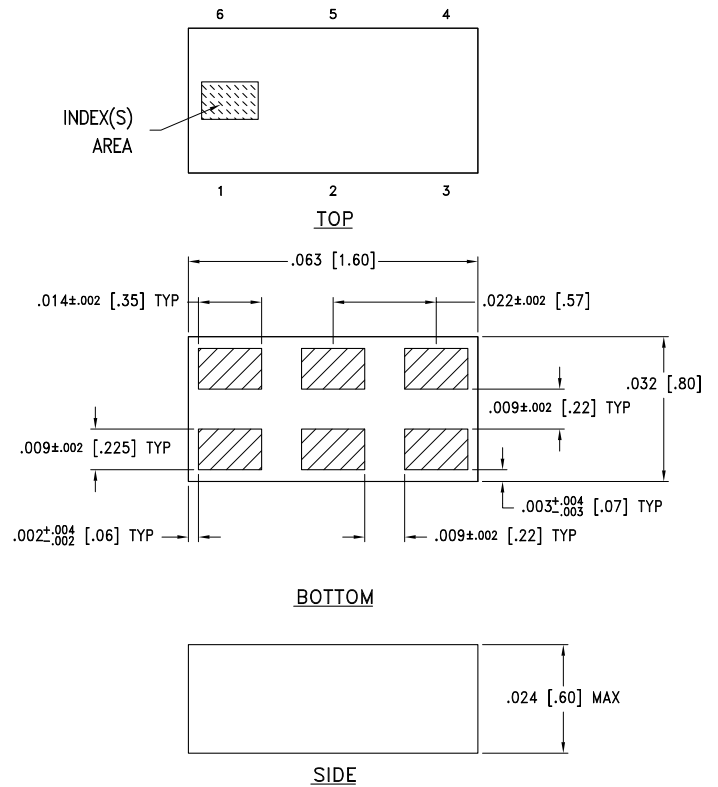


- NOTES:
- PCB IS MULTILAYER PCB, SEE STACK-UP DIAGRAM.
 - TRACE WIDTH & GAP ARE SHOWN FOR 0.006 FR4 IT-180A, COPPER: 1/2 OZ. EACH LAYER. FOR OTHER MATERIALS TRACE WIDTH & GAP MAY NEED TO BE MODIFIED.

- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).
- DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

Figure 2. Suggested PCB Layout PL-823

CASE STYLE DRAWING



Weight:.002 grams
Dimensions are in inches [mm]. Tolerances: ±0.005 Inches

PRODUCT MARKING*: N/A

*Marking may contain other features or characters for internal lot control.



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ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASHBOARD.

[CLICK HERE](#)

Performance Data & Graphs	Data Graphs S-Parameter (S4P Files) Data Set (.zip file) De-embedded to device pads
Case Style	JC0603C-9 Lead Finish: Tin Plate over Nickel Plate
RoHS Status	Compliant
Tape and Reel	F74
Suggested Layout for PCB Design	PL-823
Evaluation Board	TB-DCW-20-722+ Gerber File
Environmental Rating	ENV06T10

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-Circuits' 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

