



STRIPLINE SURFACE MOUNT

Bi-Directional Coupler MBDA-30-451HP+

50Ω 225 to 450 MHz 30 dB 200W

KEY FEATURES

- High power handling, up to 200W
- Excellent return loss, 30 dB
- Low insertion loss, 0.15 dB
- High directivity, 24 dB

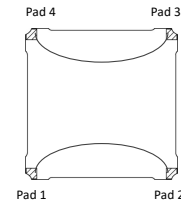
APPLICATIONS

- Power amplifiers
- Antenna feeds
- VHF/UHF radios
- Defense and military



Generic photo used for illustration purposes only

FUNCTIONAL DIAGRAM



PRODUCT OVERVIEW

Mini-Circuits' MBDA-30-451HP+ is a high-power bi-directional coupler providing high power handling up to 200 W and mainline loss of 0.15 dB. High directivity of 24 dB provides accurate sampling from the coupled port, and 30 dB return loss provides excellent matching over full frequency range. Covering frequencies from 225 to 450 MHz, the model supports a wide variety of applications from power amplifiers and antenna feeds to various digital communications and more. The coupler is designed into an open printed laminate (1.00" x 1.00" x 0.051") with wrap-around terminations for good solderability and easy visual inspection.

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

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Units
Frequency Range		225		450	MHz
Insertion Loss ³	225-450	-	0.15	0.25	dB
Coupling Nominal	225-450	-	30.5±1.5	-	dB
Coupling Flatness (±)	225-450	-	±0.85	±1.00	dB
Directivity	225-450	18	24	-	dB
Return Loss (Input/Output)	225-450	20	30	-	dB
Return Loss (Coupled Forward/Reverse)	225-450	20	30	-	dB
Thermal Resistance ⁴	225-450	-	0.4	-	°C/W

1. Tested on Evaluation Board TB-MBDA30451HP+. De-embedded to the device reference plane.

2. Model is symmetrical and all ports are interchangeable, see Port Function Description/Configuration table for details and S-Parameters for actual performance.

3. Does not include theoretical loss due to coupling. Nominal theoretical loss is 0.01 dB.

4. Thermal Resistance is defined as, example (θ)_{jc} = (Hot Spot Temperature on DUT - Base Plate Temperature)/Input Power)

ABSOLUTE MAXIMUM RATINGS⁵

Operating Case Temperature ⁶	-55 °C to +105 °C	
Storage Temperature	-55 °C to +105 °C	
Power Input	+85 °C case	200 W
	+95 °C case	180 W
	+105 °C case	150 W
DC Current	2 A	

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

6. Case temperature is defined as temperature on base plate.





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Bi-Directional Coupler

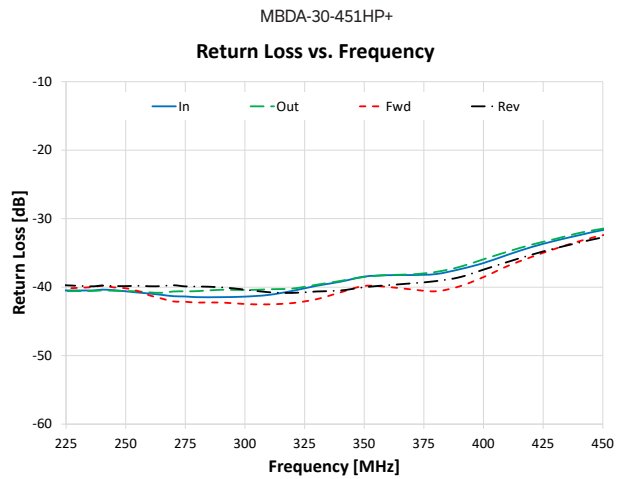
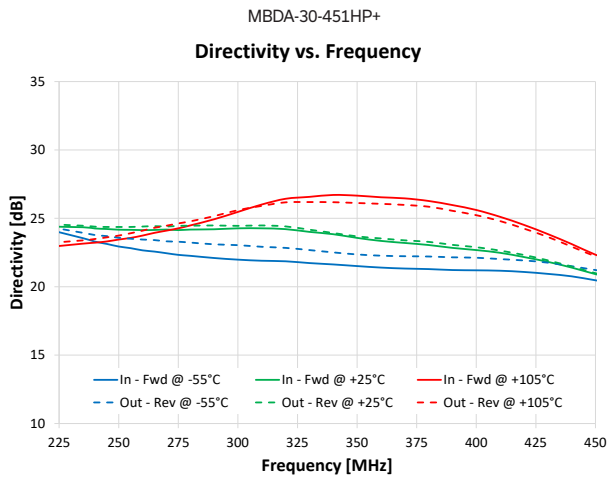
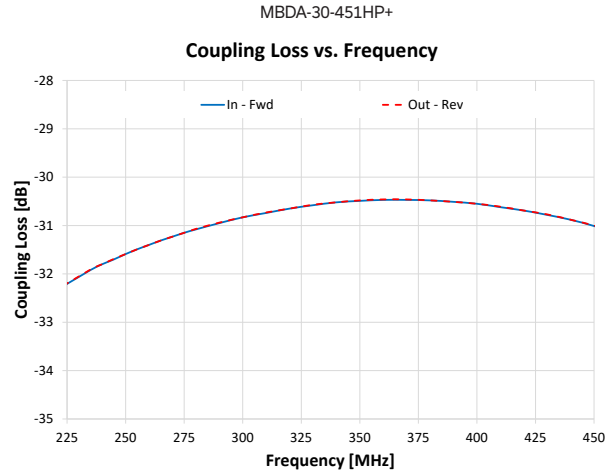
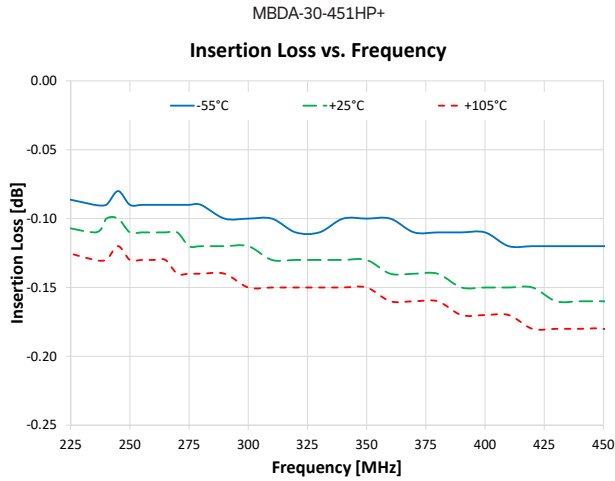
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TYPICAL PERFORMANCE GRAPHS

Note: Data corresponds to Configuration A at +25°C unless specified otherwise.





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FUNCTIONAL DIAGRAM

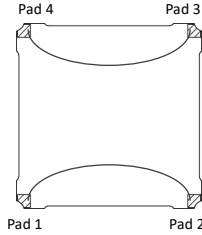


Figure 1. MBDA-30-451HP+ Functional Diagram

PAD DESCRIPTION/CONFIGURATION ⁷

Function	Pad Number	Description
Input	1	Connects to RF Input Port
Output	2	Connects to RF Output Port
Coupled Forward	4	Connects to Coupled Forward Port
Coupled Reverse	3	Connects to Coupled Reverse Port
Ground	5	Connects to Ground

Configuration	Input	Output	Coupled Forward	Coupled Reverse
A	1	2	4	3
B	2	1	3	4
C	3	4	2	1
D	4	3	1	2

7. Model is symmetrical and all ports are interchangeable, see Port Function Description/Configuration table for details and S-Parameters for actual performance.

SUGGESTED PCB LAYOUT (PL-468)

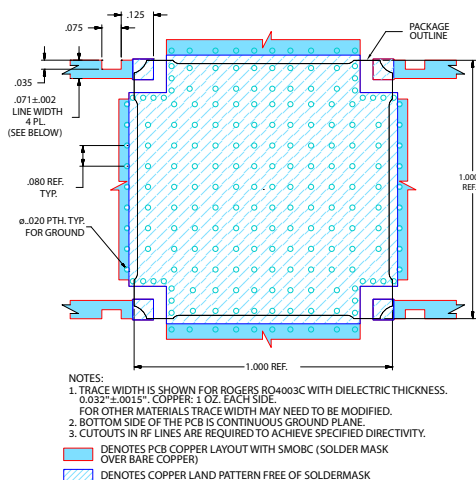
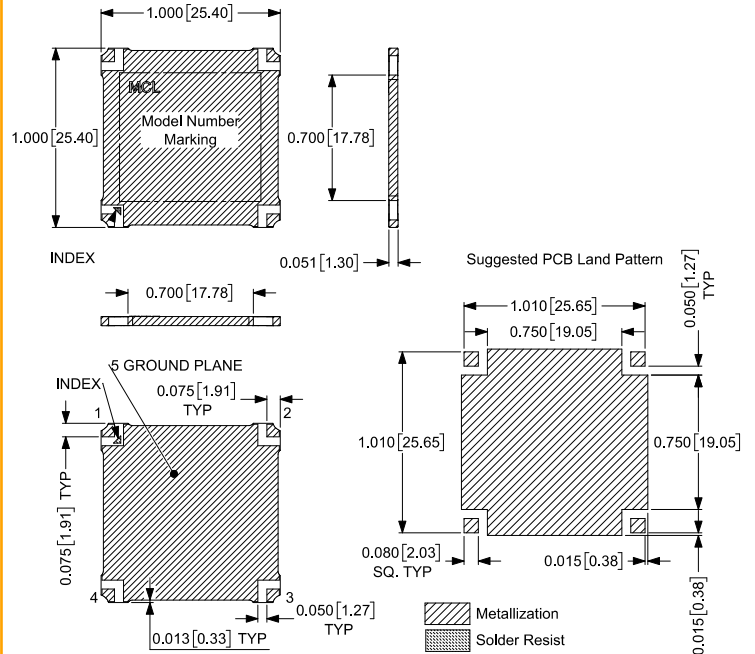


Figure 2. Suggested PCB Layout PL-468

CASE STYLE DRAWING (PQ2074)



NOTES:

1. Base material: Printed wiring laminate.
2. Termination finish: 2-5 μinch (.05-.13 microns) Immersion Gold.
3. Dimensions: Inches [mm]. Tolerances 2 Pl. ±.03 inch; 3 Pl. ±.015 inch.
4. Weight: 4.0 grams
5. Marking may contain other features or characters for internal lot control.

PRODUCT MARKING*: MBDA-30-451HP+

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ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASH BOARD.

[CLICK HERE](#)

Performance Data & Graphs	Data
	Graphs
	S-Parameter (S4P Files) Data Set (.zip file) De-embedded to device pads
Case Style	PQ2074 Lead Finish: 2-5 μinch (0.05-0.13 microns) Immersion Gold.
RoHS Status	Compliant
Tape and Reel	F117
Suggested Layout for PCB Design	PL-468
Evaluation Board	TB-MBDA30451HP+
	Gerber File
Environmental Rating	ENV02T8

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

