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SURFACE MOUNT

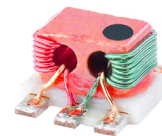
Bi-Directional Coupler

TCD-20-23BD+

50Ω 500 to 2000 MHz 20 dB 2 W

KEY FEATURES

- Wideband 500 to 2000 MHz, Multi-Octave
- Low Mainline Loss, 0.2 dB typ.
- Power Handling, 2 Watts
- Robust and Reliable

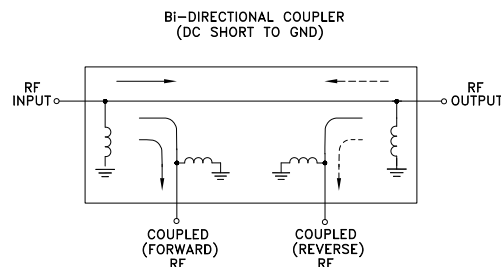


Generic photo used for illustration purposes only

APPLICATIONS

- UHF, GSM,
- ISM, GPS & PCN
- Cellular

ELECTRICAL SCHEMATIC



PRODUCT OVERVIEW

Mini-Circuits' TCD-20-23BD+ surface mount bi-directional coupler provides 20 dB nominal coupling with low mainline loss from 500 to 2000 MHz, supporting a wide variety of applications including UHF, GSM, ISM, GPS & PCN, Cellular and more. This coupler is built with core and wire construction mounted on a 5-lead base (0.162 x 0.150 x 0.022").

ELECTRICAL SPECIFICATIONS AT +25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Units
Frequency Range	-	500		2000	MHz
Mainline Loss (In -Out) ¹	500 - 1200	-	0.25	0.45	dB
	1200 - 2000	-	0.15	0.50	
Coupling Nominal	500 - 1200	-	22 ± 1.0	-	dB
	1200 - 2000	-	19 ± 1.0	-	
Coupling Flatness (±)	500 - 1200	-	±1.2	±1.9	dB
	1200 - 2000	-	±1.3	±1.9	
Directivity	500-800	13	17	-	dB
	800 - 1200	12	16	-	
	1200 - 2000	10	14	-	
Return Loss (Input)	500 - 2000	-	17	-	dB
Return Loss (Output)	500 - 2000	-	17	-	dB
Return Loss (Coupled)	500 - 2000	-	17	-	dB

1. Mainline Loss includes coupling loss.

ABSOLUTE MAXIMUM RATINGS²

Operating Case Temperature	-40°C to +85°C
Storage Temperature	-55°C to +100°C
Input Power	2 W

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

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REV. OR
ECO-025921
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MCL NY
250619

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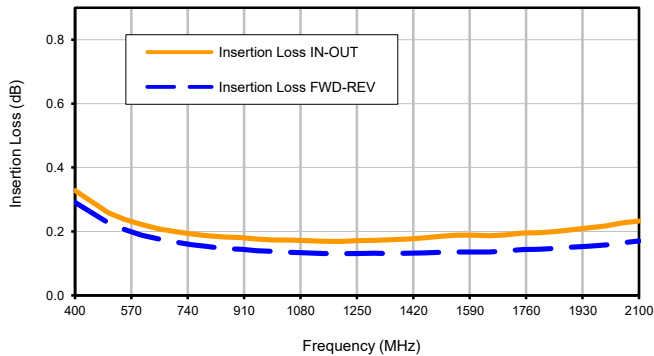
TCD-20-23BD+

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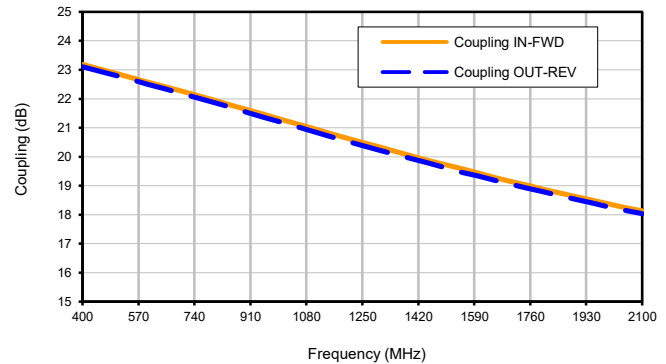
50Ω 500 to 2000 MHz 20 dB 2 W

TYPICAL PERFORMANCE GRAPHS

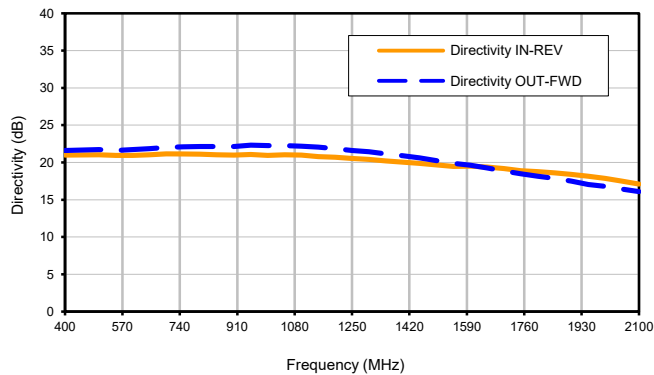
Insertion Loss



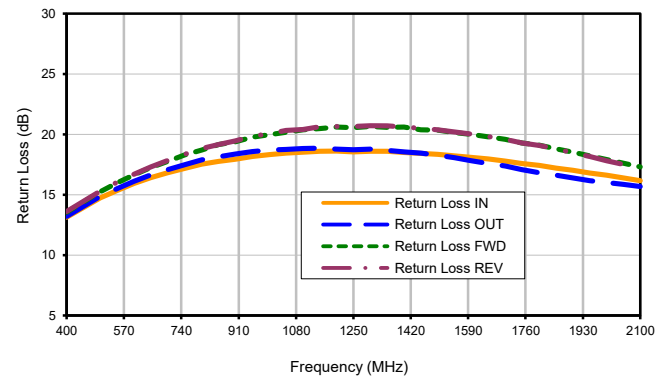
Coupling



Directivity



Return Loss



ELECTRICAL SCHEMATIC

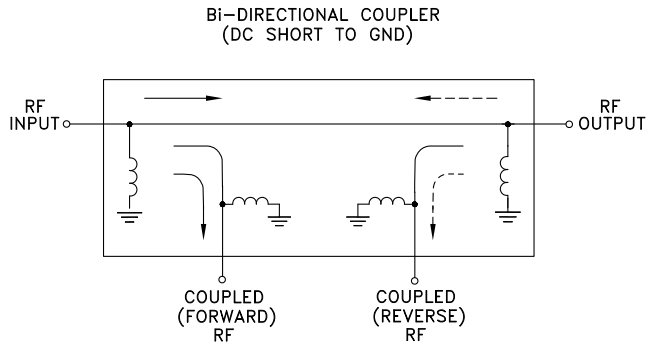
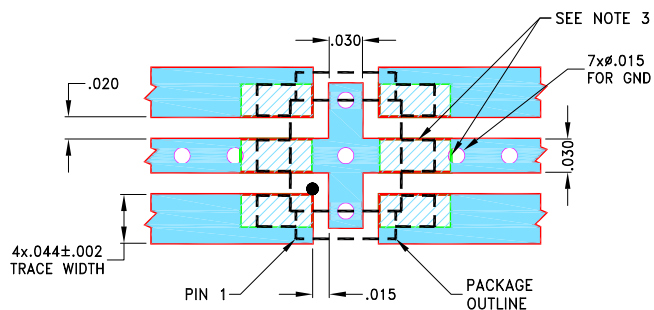


Figure 1. TCD-20-23BD+ Functional Diagram

PAD DESCRIPTION/CONFIGURATION

Function	Pad Number	Description
Input	1	Connects to RF Input Port
Output	6	Connects to RF Output Port
Coupled Forward	3	Connects to Coupled Forward Port
Coupled Reverse	4	Connects to Coupled Reverse Port
Ground	2	Connects to Ground

SUGGESTED PCB LAYOUT (PL-821)



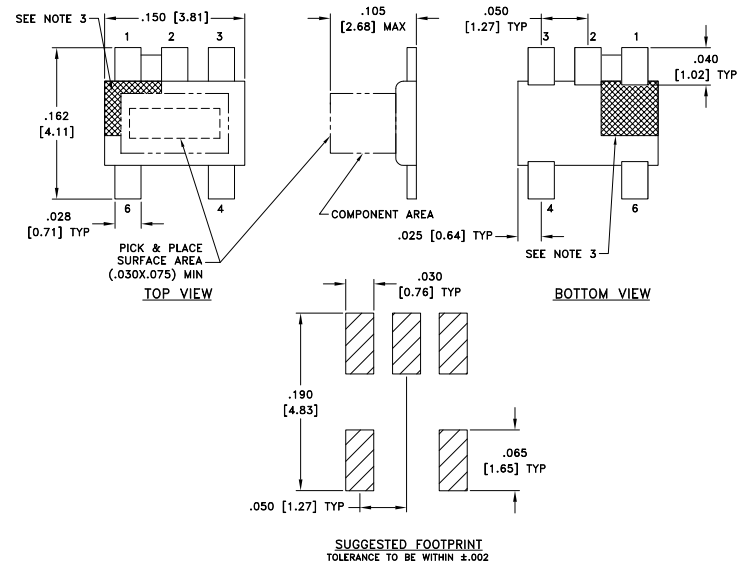
NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS (RO4350B) WITH DIELECTRIC THICKNESS .020±.0015 COPPER: 1/2 Oz ON EACH SIDE.
FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
3. THIS PAD/PIN IS NOT AVAILABLE/REQUIRED FOR FIVE PIN CASE STYLES (AT SERIES).

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

 DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK.

CASE STYLE DRAWING



Weight: 0.11 grams

Dimensions are in inches [mm]. Tolerances: 2 Pl. $\pm .01$; 3 Pl. $\pm .005$

PRODUCT MARKING*: N/A

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

Figure 2. Suggested PCB Layout PL-821



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ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASHBOARD.

[CLICK HERE](#)

Performance Data & Graphs	Data Graphs S-Parameter (SXP Files) Data Set (.zip file) De-embedded to device pads
Case Style	AT224-5
RoHS Status	Compliant
Tape and Reel	F17
Suggested Layout for PCB Design	PL-821
Evaluation Board	TB-TCD-20-23BD+ Gerber File
Environmental Rating	ENV02T1

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.
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