SURFACE MOUNT top hat

Bi-Directional Coupler TCD-10-23BDX+

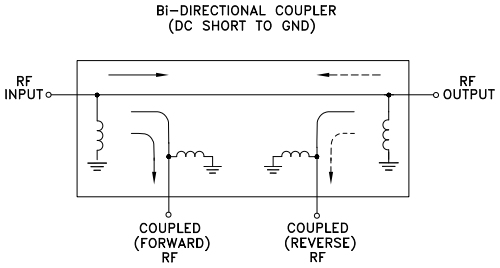
50Ω 5 to 2250 MHz 10 dB Coupling

KEY FEATURES

- Wideband, 5 to 2250 MHz
- Low Mainline Loss, 2.0 dB typ.
- Excellent Return Loss; 18 dB typ.
- Aqueous Washable
- Leads for excellent solderability

Generic photo used for illustration purposes only

FUNCTIONAL DIAGRAM



APPLICATIONS

- VHF/UHF
- CATV
- Cellular

PRODUCT OVERVIEW

Mini-Circuits' TCD-10-23BDX+ surface mount bi-directional coupler provides 10 dB nominal coupling with excellent flatness from 5 to 2250 MHz, supporting a wide variety of applications including VHF/UHF, CATV, Cellular and more. This model provides low mainline loss, high directivity and excellent return loss. The coupler is built with core and wire construction mounted on a 6-leadplastic base (0.16 x 0.15 x 0.22'') and includes Mini-Circuits' Tophat® feature for faster, and more accurate pick-and-place assembly.

ELECTRICAL SPECIFICATIONS AT +25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Units
Frequency Range		5		2250	MHz
Mainline Loss[1]	5 – 950		1.3	1.8	dB
	950 - 2250		2.2	2.6	
Coupling Nominal	5 – 2250		10 ±0.8	-	dB
Coupling Flatness (±)	5 - 2250		0.6	1.0	dB
Directivity	5 – 400	17	21		dB
	400 – 950	15	18		
	950 - 2250	9	14		
Return Loss (Input)	5 – 950		18		dB
	950 - 2250		16		
Return Loss (Output)	5 - 950		24		dB
	950 - 2250		20		
Return Loss (Coupled)	5 – 950		18		dB
	950 - 2250		16		

1. Mainline Loss includes coupling loss.

ABSOLUTE MAXIMUM RATINGS[2]

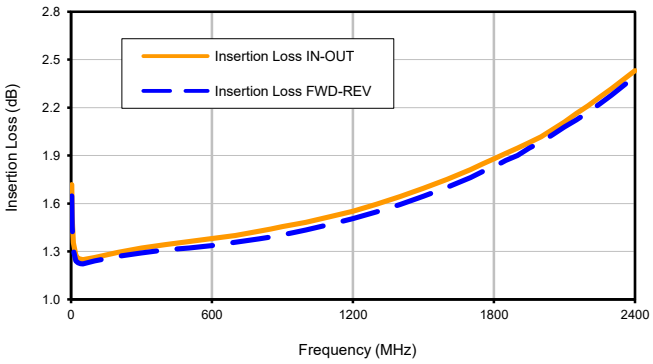
Operating Case Temperature	-40°C to +85°C
Storage Temperature	-55°C to +100°C
Input Power	0.5 W

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

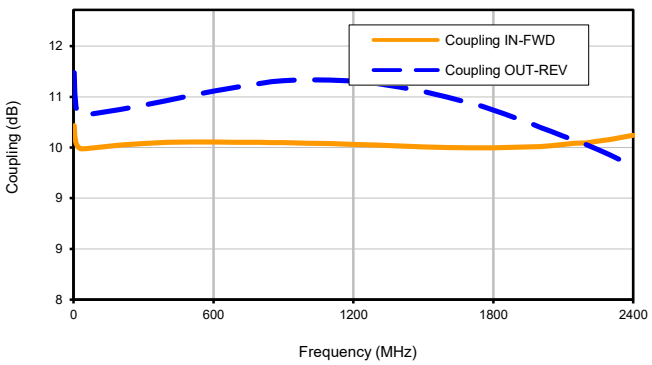
REV. OR
ECO-025837
TCD-10-23BDX+
MCL NY
250611

TYPICAL PERFORMANCE GRAPHS

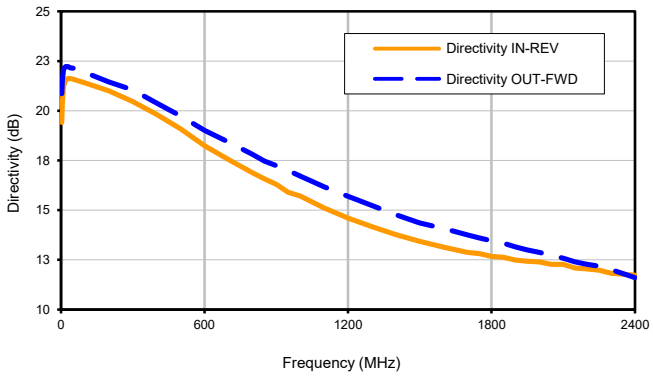
Insertion Loss



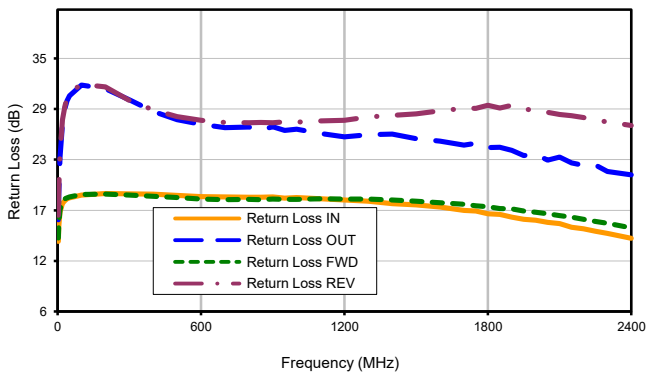
Coupling



Directivity



Return Loss



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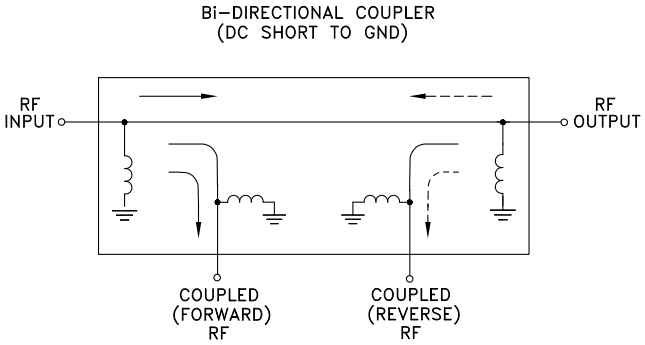
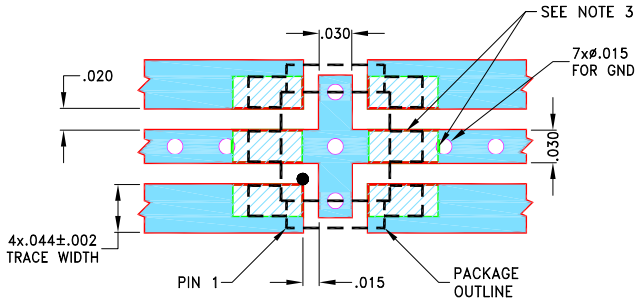


Figure 1. TCD-10-23BDX+ Functional Diagram

PAD DESCRIPTION/CONFIGURATION

Function	Pad Number	Description
Input	3	Connects to RF Input Port
Output	4	Connects to RF Output Port
Coupled FWD	1	Connects to Coupled FWD Port
Coupled REV	6	Connects to Coupled REV Port
Ground	2	Connects to Ground
Not Used	5	Not Used

SUGGESTED PCB LAYOUT (PL-821)



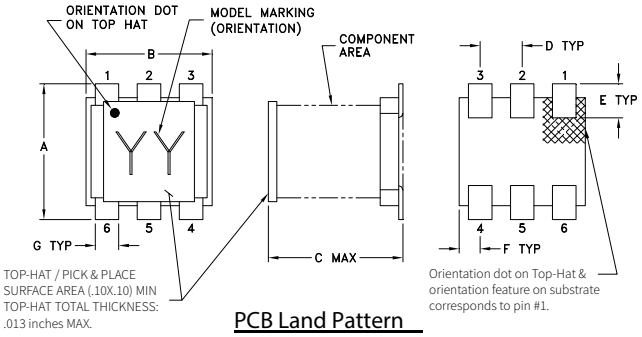
NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS (RO4350B) WITH DIELECTRIC THICKNESS .020±.0015
   COPPER: 1/2 Oz ON EACH SIDE.
   FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
3. THIS PAD/PIN IS NOT AVAILABLE/REQUIRED FOR FIVE PIN CASE STYLES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

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

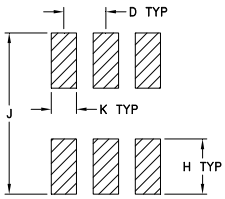
DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK.

Figure 2. Suggested PCB Layout PL-821

CASE STYLE DRAWING



PCB Land Pattern



SUGGESTED LAYOUT
TOLERANCE TO BE WITHIN ±.002

OUTLINE DIMENSIONS (inches / mm)

A	B	C	D	E	F
.160	.150	.160	.050	.040	.025
4.06	3.81	4.06	1.27	1.02	0.64

G	H	J	K		wt
.028	.065	.190	.030		grams
0.71	1.65	4.83	0.76		0.15

PRODUCT MARKING*: BN

*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	DB1627
RoHS Status	Compliant
Tape and Reel	F47
Suggested Layout for PCB Design	PL-821
Evaluation Board	TB-TCD-1023BDX+ 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.
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