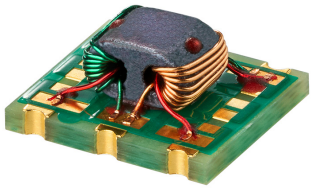
SURFACE MOUNT

Bi-Directional Coupler RDC-20-52-10W+

50Ω 20dB 30 to 520 MHz 10 Watt

THE BIG DEAL

- Wideband 30 to 520 MHz
- Low Mainline Loss, 0.3 dB typ. at 520 MHz
- Flat Coupling, ±0.5 dB
- Good Return Loss, 22 dB typ.



Generic photo used for illustration purposes only

CASE STYLE: TT1491-7

+RoHS Compliant
The +Suffix identifies RoHS Compliance.
See our website for methodologies and qualifications

APPLICATIONS

- VHF/UHF
- Cable TV
- Defense / Military
- Military / Radio Application

PRODUCT OVERVIEW

Mini-Circuits' RDC-20-52-10W+ surface-mount directional coupler provides 20 dB coupling with high directivity, low mainline loss, and good return loss for 50Ω applications from 30 to 520 MHz, supporting a variety of broadband applications including VHF/UHF, cellular and more. This model features core and wire construction with wrap-around terminations for good solderability and easy visual inspection.

KEY FEATURES

Feature	Advantages
Broadband, 30 to 520 MHz	Supports bandwidth requirements.
Low Mainline Loss, 0.3 dB at 520 MHz	Provides excellent through-path signal transmission and maintains low heat dissipation, avoiding the need for special heat sinking methods.
Power Handling, up to 10 W	Usable in systems with a variety of signal power requirements.
Good Return Loss, 22 dB typ.	Provides excellent matching for 50Ω systems.

REV. A
ECO-021586
RDC-20-52-10W+
MCL NY
240430

SURFACE MOUNT

Bi-Directional Coupler RDC-20-52-10W+

50Ω 20dB 30 to 520 MHz 10 Watt

ELECTRICAL SPECIFICATIONS AT 25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		30		520	MHz
Mainline Loss[1]	30-520	—	0.3	0.4	dB
Nominal Coupling	30-520	—	19.0 ± 0.5	—	dB
Coupling Flatness(±)	30-520	—	0.3	0.5	dB
Directivity	30-520	14	20	—	dB
Return Loss (Input)	30-520	18	28	—	dB
Return Loss (Output)	30-520	18	28	—	dB
Return Loss (Coupled)	30-520	18	28	—	dB
Input Power	30-520	—	—	10	W

1. Mainline loss includes theoretical power loss at coupled port.

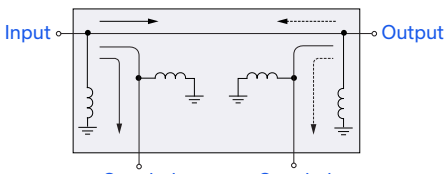
ABSOLUTE MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C

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

ELECTRICAL SCHEMATIC

BI-DIRECTIONAL COUPLER*



*Electrical schematic is for Bi-Directional coupler with internal transformer(s) that routes DC from all ports to ground

SURFACE MOUNT

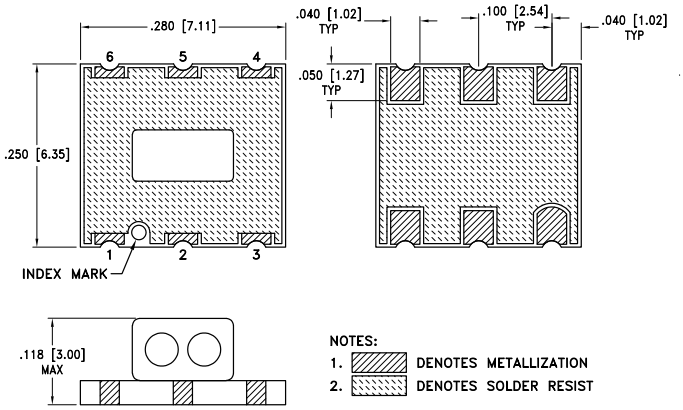
Bi-Directional Coupler RDC-20-52-10W+

50Ω 20dB 30 to 520 MHz 10 Watt

PAD CONNECTIONS

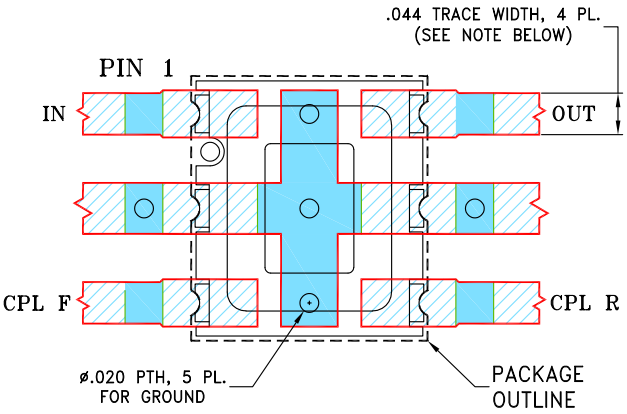
Function	Pad Number
INPUT	1
OUTPUT	6
COUPLED (Fwd)	3
GROUND	2
COUPLED (Rev)	4
ISOLATE (DO NOT USE)	5

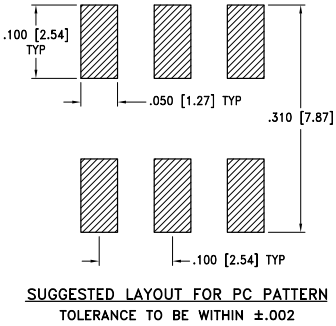
OUTLINE DRAWING



DEMO BOARD MCL P/N: TB-RDC205210W+

SUGGESTED PCB LAYOUT (PL-759)





NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH 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

OUTLINE DIMENSIONS (Inches / mm)

A	B	C	D	E	F	G	H	J	K
.250	.280	0.118	.100	.050	.040	.040	.100	.310	.050
6.35	7.11	3.00	2.54	1.27	1.02	1.02	2.54	7.87	1.27

Weight: 0.35 grams

TAPE & REEL INFORMATION: F2

SURFACE MOUNT

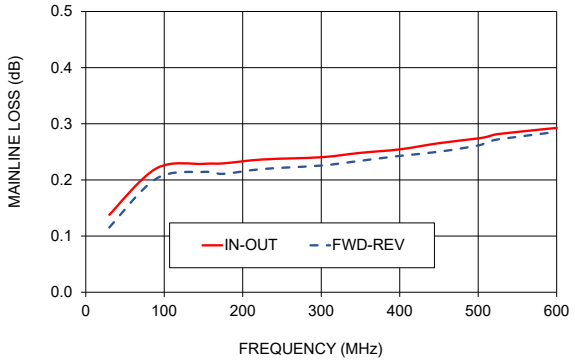
Bi-Directional Coupler RDC-20-52-10W+

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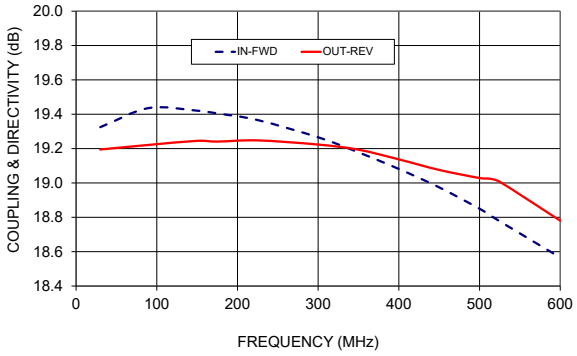
TYPICAL PERFORMANCE DATA

Frequency (Mhz)	Insertion Loss (Db)		Coupling (Db)		Directivity (Db)		Return Loss (Db)			
	In-Out	Fwd-Rev	In-Fwd	Out-Rev	In-Fwd	Out-Rev	In	Out	Fwd	Rev
30	0.14	0.12	19.32	19.19	41.64	39.17	27.24	27.59	26.80	27.28
90	0.22	0.20	19.44	19.22	33.77	39.32	31.80	34.16	31.06	33.23
150	0.23	0.21	19.42	19.25	27.83	32.03	32.71	35.14	31.77	34.41
175	0.23	0.21	19.40	19.24	26.96	30.36	32.88	34.94	31.79	33.82
225	0.24	0.22	19.37	19.25	24.70	27.35	32.89	34.19	31.27	33.21
300	0.24	0.23	19.27	19.22	21.99	24.13	33.43	33.47	30.73	31.75
350	0.25	0.23	19.18	19.19	20.69	22.30	33.25	33.31	30.42	31.20
400	0.25	0.24	19.08	19.14	19.49	20.73	33.54	32.84	30.01	30.54
450	0.27	0.25	18.97	19.08	18.37	19.36	33.58	32.76	29.59	29.66
500	0.27	0.26	18.85	19.03	17.61	18.12	33.19	32.50	29.14	29.33
512	0.28	0.27	18.82	19.02	17.43	17.80	33.13	32.41	28.96	29.17
525	0.28	0.27	18.78	19.01	17.16	17.41	33.17	32.14	28.70	28.91
600	0.29	0.29	18.57	18.78	15.87	15.84	33.27	31.29	28.01	27.56

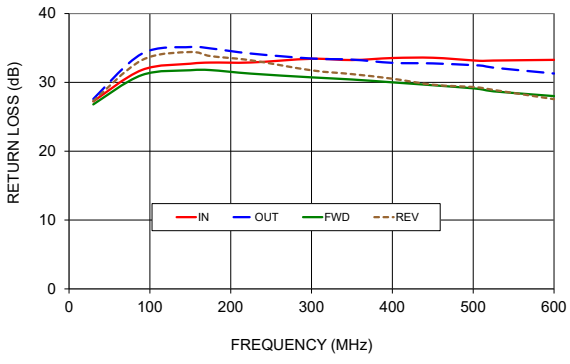
MAINLINE LOSS



COUPLING & DIRECTIVITY



RETURN LOSS



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.

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/MCLStore/terms.jsp