



Mini-Circuits

SURFACE MOUNT ^{top hat}

Directional Coupler

RDC-20-252-5WX+

50Ω 20dB 30 to 2500 MHz

THE BIG DEAL

- Wideband 30-2500 MHz
- Low mainline loss, 0.6 dB typ. at 2000 MHz
- Good Directivity, 16 dB typ.
- Good Return Loss, 22 dB typ.



Generic photo used for illustration purposes only

CASE STYLE: TT2315

APPLICATIONS

- VHF/UHF
- Cable tv
- Cellular
- Defense / Military
- Military / Radio Application

PRODUCT OVERVIEW

Mini-Circuits RDC-20-252-5WX+ surface-mount directional coupler provides 20 dB coupling with high directivity, low mainline loss, and good return loss for 50Ω applications from 30 to 2500 MHz, supporting a variety of broadband applications including VHF/UHF, CATV, 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 2500 MHz	Supports bandwidth requirements.
Low mainline loss, 0.6 dB at 2000 MHz	Provides excellent through-path signal transmission and maintains low heat dissipation, avoiding the need for special heat sinking methods.
Power handling, up to 5W	Usable in systems with a variety of signal power requirements.
Good return loss, 22 dB typ.	Provides excellent matching for 50Ω systems.
Top Hat® feature	Improves speed and accuracy of pick and place assembly.

REV. OR
ECO-011662
RDC-20-252-5WX+
YL/CP/AM
221006





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ELECTRICAL SPECIFICATIONS AT 25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		30		2500	MHz
Mainline Loss ¹	30-1000	—	0.4	0.8	dB
	1000-2000	—	0.6	1.1	
	2000-2500	—	1.1	1.6	
Nominal Coupling	30-2500	—	±20.5	—	dB
Coupling Flatness(±)	30-2500	—	1.2	2.0	dB
Directivity	30-1000	—	20	—	dB
	1000-2000	—	16	—	
	2000-2500	—	14	—	
Return Loss (Input)	30-1000	17	22	—	dB
	1000-2000	16	20	—	
	2000-2500	14	18	—	
Return Loss (Output)	30-1000	17	22	—	dB
	1000-2000	14	20	—	
	2000-2500	11	15	—	
Return Loss (Coupled)	30-1000	13	18	—	dB
	1000-2000	11	14	—	
	2000-2500	10	13	—	
Input Power	30-2500	—	—	5	W

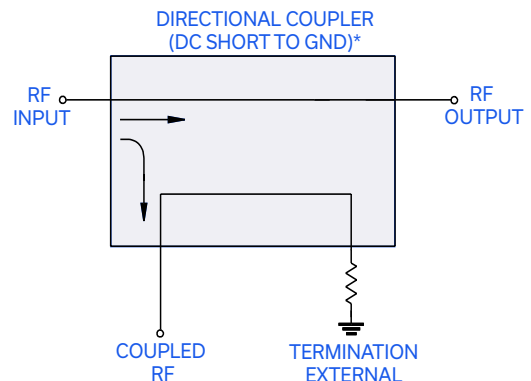
1. Mainline loss includes theoretical power loss at coupled port.

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



*Electrical schematic is for Directional coupler with internal transformer(s) and external termination

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SURFACE MOUNT top hat

Directional Coupler

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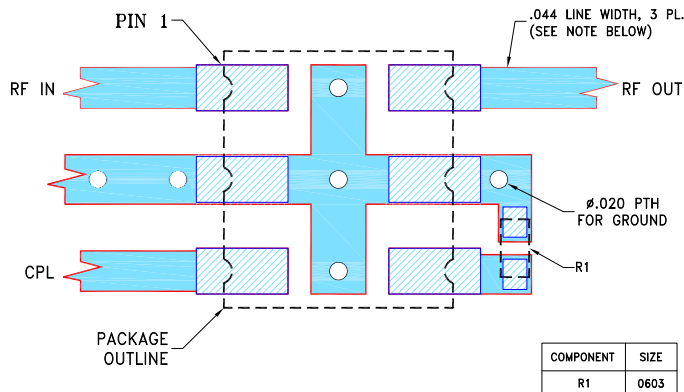
50Ω 20dB 30 to 2500 MHz

PAD CONNECTIONS

Function	Pad Number
INPUT	1
OUTPUT	6
COUPLED	3
GROUND	2
50Ω TERM EXTERNAL	4
ISOLATE (DO NOT USE)	5

PRODUCT MARKING: YK

DEMO BOARD MCL P/N: TB-RDC202525WX+
SUGGESTED PCB LAYOUT (PL-710)

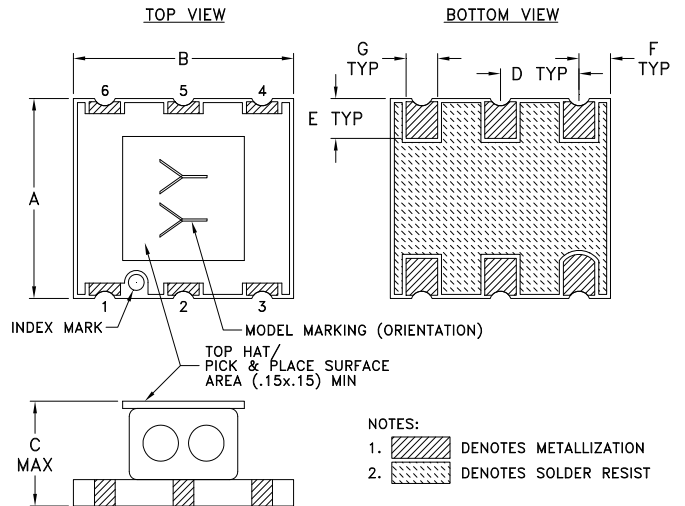


NOTES:

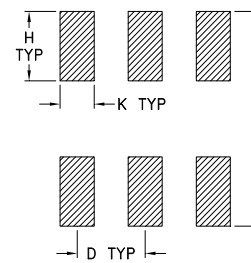
1. TRACE WIDTH AND GAP ARE SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .020±.0015"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS LINE WIDTH MAY NEED TO BE MODIFIED.
2. CHIP COMPONENT FOOT PRINTS SHOWN FOR REFERENCE. FOR COMPONENT VALUES REFER TO TB-1178+.
3. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

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

OUTLINE DRAWING



PCB Land Pattern



Suggested Layout,
Tolerance to be within±.002

OUTLINE DIMENSIONS (Inches mm)

A	B	C	D	E	F	G	H	J	K
.250	.280	.140	.100	.050	.040	.040	.100	.310	.050
6.35	7.11	3.56	2.54	1.27	1.02	1.02	2.54	7.87	1.27

Weight: 0.35 grams

TAPE & REEL INFORMATION: F34



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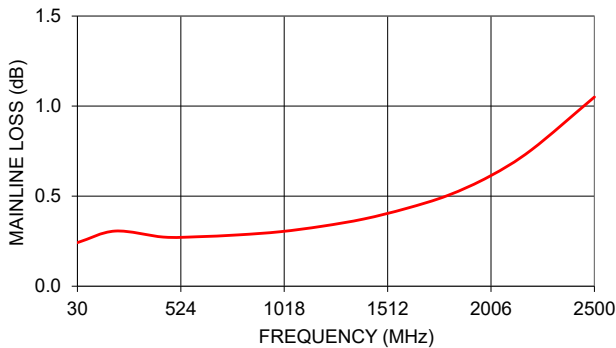
RDC-20-252-5WX+

50Ω 20dB 30 to 2500 MHz

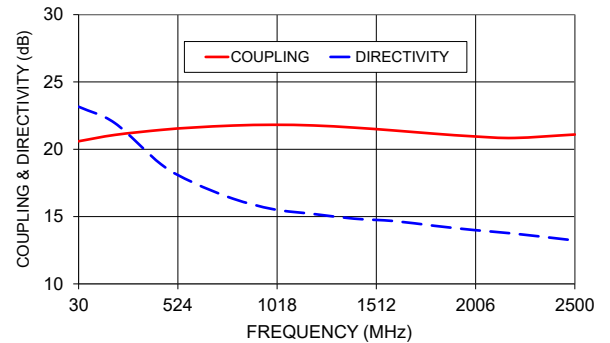
TYPICAL PERFORMANCE DATA

Frequency (MHz)	Mainline Loss (dB) In-Out	Coupling (dB) In-Cpl	Directivity (dB)	Return Loss(dB)		
				In	Out	Cpl
30	0.24	20.60	23.16	21.57	21.55	21.69
210	0.31	21.07	21.95	28.12	29.18	25.99
440	0.27	21.44	18.89	28.07	29.04	22.96
600	0.27	21.61	17.53	27.37	28.22	21.07
800	0.29	21.76	16.32	26.56	27.50	19.11
1000	0.30	21.82	15.54	25.53	25.95	17.68
1200	0.33	21.77	15.19	24.39	24.07	16.68
1400	0.37	21.61	14.85	23.24	22.15	16.00
1600	0.43	21.40	14.67	22.00	20.46	15.59
1800	0.50	21.16	14.32	21.01	18.95	15.31
2000	0.61	20.95	14.00	20.26	17.47	14.84
2200	0.76	20.84	13.73	19.96	15.98	14.10
2500	1.05	21.10	13.22	20.03	13.89	12.65

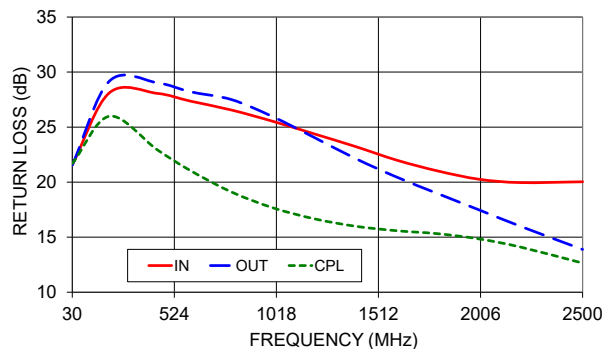
RDC-20-252-5WX+
MAINLINE LOSS



RDC-20-252-5WX+
COUPLING & DIRECTIVITY



RDC-20-252-5WX+
RETURN LOSS



NOTES

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
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