



**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

#### +RoHS Compliant

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

### 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  
220224





### ELECTRICAL SPECIFICATIONS AT 25°C

Parameter	Condition (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		30		2500	MHz
Mainline Loss <sup>1</sup>	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

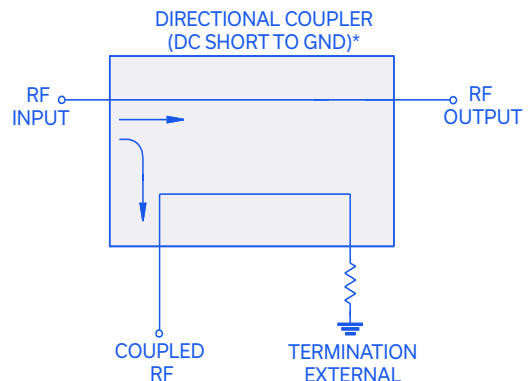
1. Mainline loss includes theoretical power loss at coupled port.

### 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

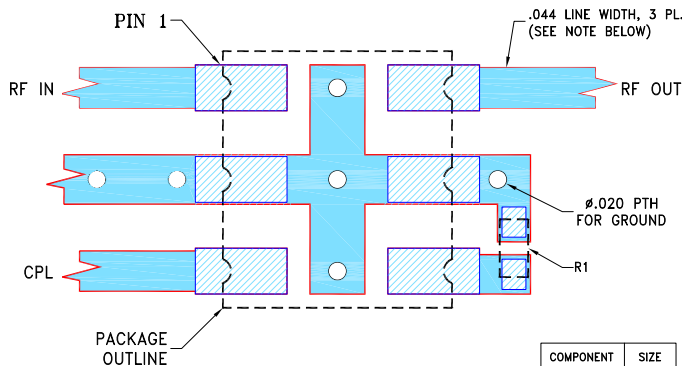


### PAD CONNECTIONS

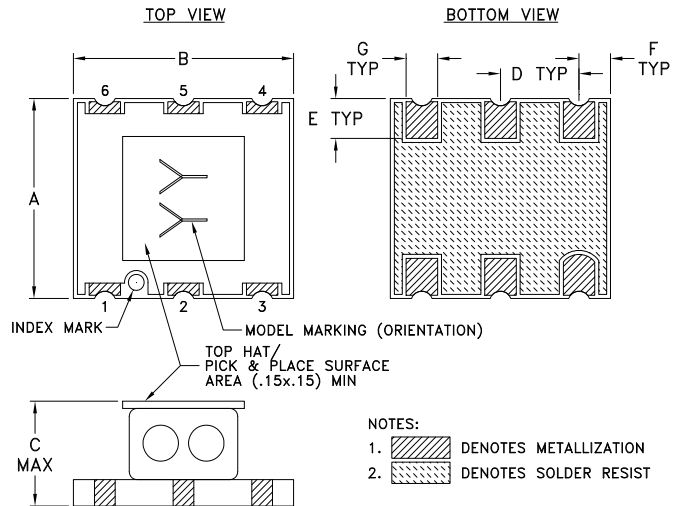
Function	Pad Number
INPUT	1
OUTPUT	6
COUPLED	3
GROUND	2
50Ω TERM EXTERNAL	4
ISOLATE (DO NOT USE)	5

### PRODUCT MARKING: YK

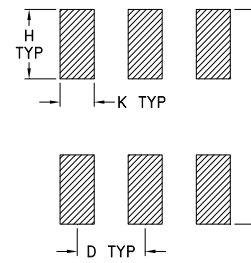
### DEMO BOARD MCL P/N: TB-RDC202525WX+ SUGGESTED PCB LAYOUT (PL-710)



### 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



Mini-Circuits

SURFACE MOUNT <sup>top hat</sup>

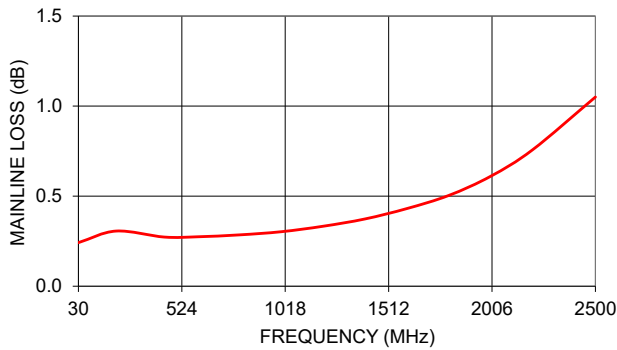
# Directional Coupler

# RDC-20-252-5WX+

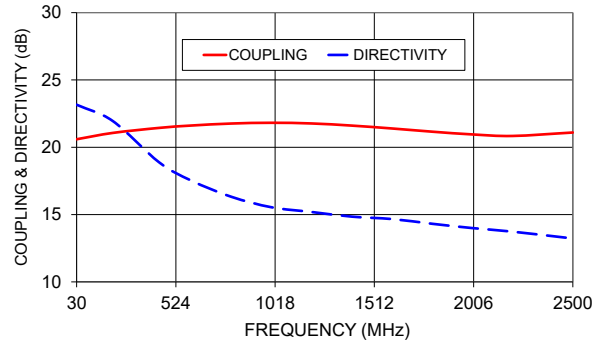
### TYPICAL PERFORMANCE DATA

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

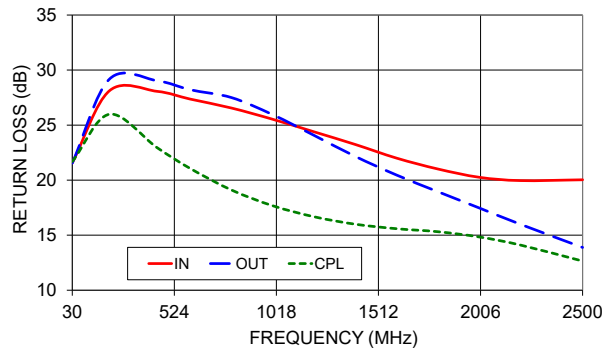
RDC-20-252-5WX+  
MAINLINE LOSS



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



RDC-20-252-5WX+  
RETURN LOSS



- NOTES**
- 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](http://www.minicircuits.com/MCLStore/terms.jsp)

