



**SURFACE MOUNT**

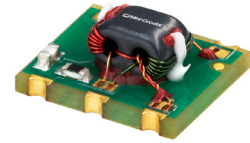
# Directional Coupler

# RDC17-182-75+

75Ω 5 to 1800 MHz 17 dB Coupling High Isolation

### KEY FEATURES

- Low Mainline Loss 0.7 dB typ.
- High Isolation, above 38 dB up to 850 MHz
- Great Coupling Flatness, ±0.6 dB typ.

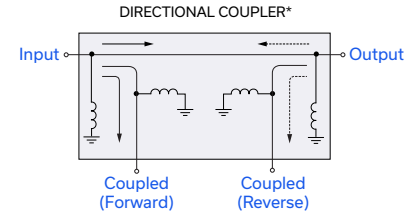


Generic photo used for illustration purposes only

### APPLICATIONS

- DOCSIS® 4.0
- CATV /Broadband

### FUNCTIONAL DIAGRAM



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

### PRODUCT OVERVIEW

Mini-Circuits' RDC17-182-75+ surface mount directional coupler provides 17.5 dB coupling with great flatness, low mainline loss, high isolation for 75Ω applications from 5 to 1800 MHz; This model features core and wire construction and good solderability and easy visual inspection.

### ELECTRICAL SPECIFICATIONS AT +25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Units
Frequency Range		5		1800	MHz
Mainline Loss <sup>1</sup> (In-Out)	5 - 1800		0.7	1.3	dB
Coupling Nominal (In-CPLF)	5 - 850		17.5 ± 1		dB
	5 - 1800		17.5 ± 1.5		
Coupling Flatness (±) (In-CPLF)	5 - 850		±0.5	±0.8	dB
	5 - 1800		±0.8	±1.2	
Isolation (Out-CPLF)	5 - 850	38	41		dB
	850 - 1800	24	31		
Return Loss (Input)	5 - 50	19	21		dB
	50 - 850	20	22		
	850 - 1800	12	17		
Return Loss (Output)	5 - 50	21	25		dB
	50 - 850	22	28		
	850 - 1800	14	20		
Return Loss (CPLF)	5 - 50	20	25		dB
	50 - 850	11	17		
	850 - 1800	10	14		

1. Mainline Loss includes coupling loss.

### ABSOLUTE MAXIMUM RATINGS<sup>2</sup>

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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# Directional Coupler

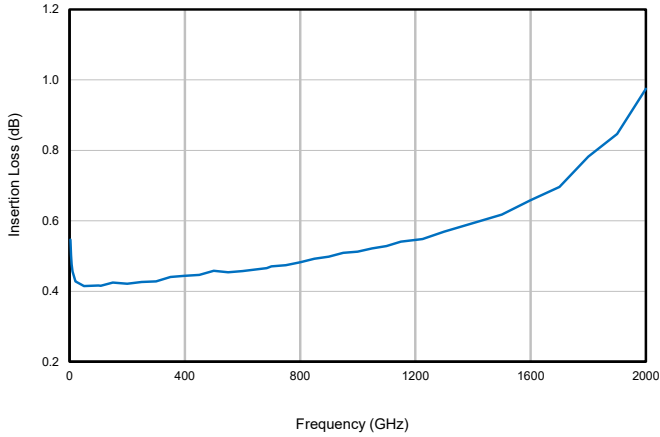
## RDC17-182-75+

Mini-Circuits

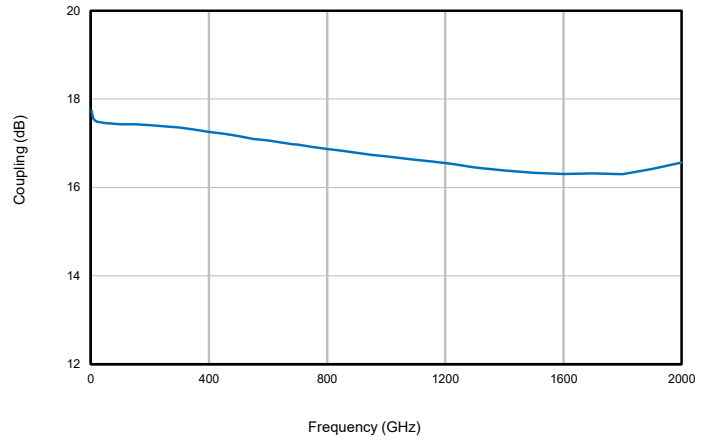
75Ω 5 to 1800 MHz 17 dB Coupling High Isolation

### TYPICAL PERFORMANCE GRAPHS

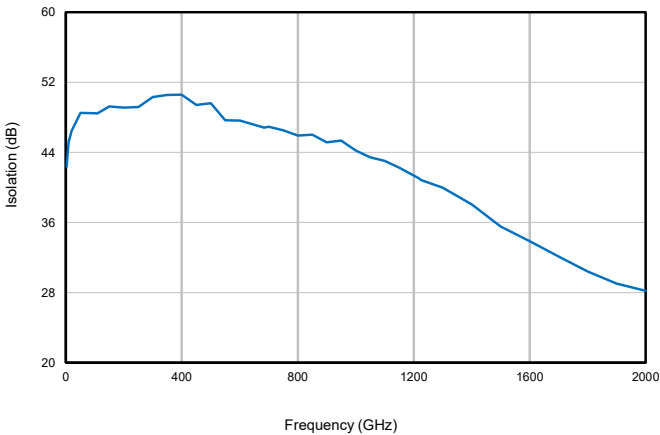
INSERTION LOSS



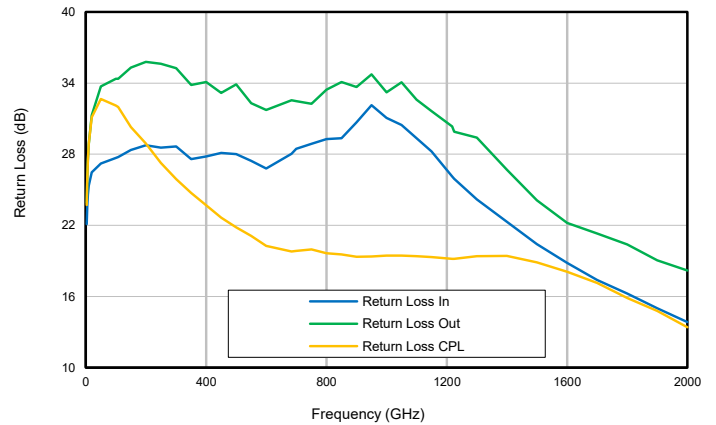
COUPLING



ISOLATION

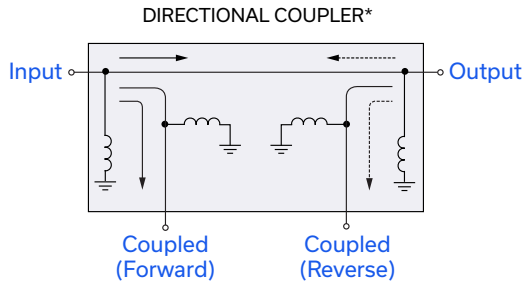


RETURN LOSS





### FUNCTIONAL DIAGRAM



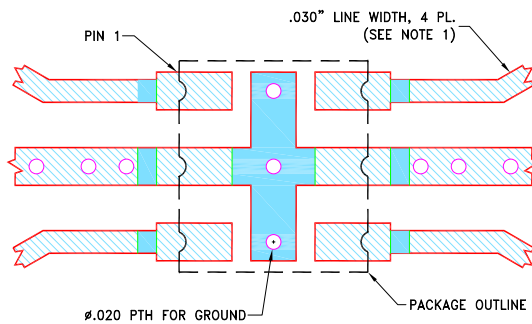
\*Electrical schematic is for Directional coupler with internal transformer(s) that routes DC from all ports to ground

Figure 1. RDC17-182-75+ Electrical Schematic

### PAD DESCRIPTION/CONFIGURATION

Function	Pad Number	Description
Input	1	Connects to Input Port
Output	6	Connects to RF Output Port
CPL F	3	Connect to CPLF Port
Ground	2,5	Connects to Ground
CPL R	4	75 Ohm External Termination

### SUGGESTED PCB LAYOUT (PL-795)

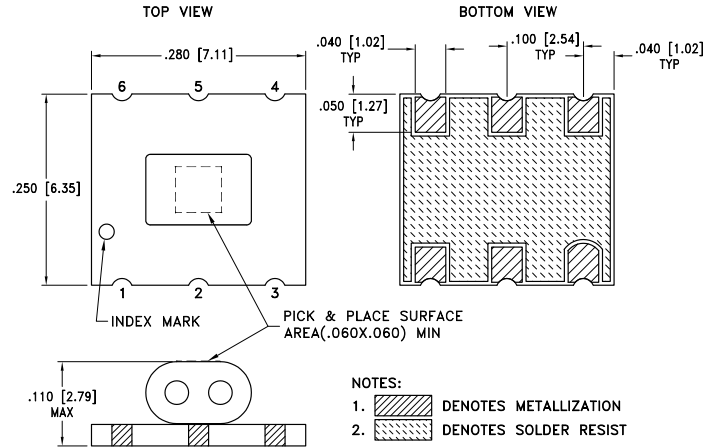


- NOTES:
1. LINE WIDTH IS SHOWN FOR ROGERS R04350B, DIELECTRIC THICKNESS: .030±.002"; COPPER: 1/2 Oz EACH SIDE. FOR OTHER MATERIALS LINE WIDTH MAY NEED TO BE MODIFIED.
  2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

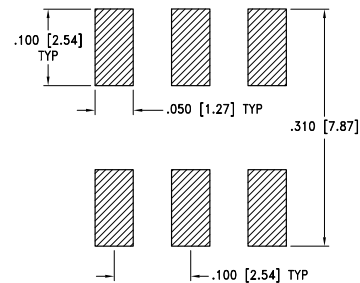
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).
- DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

Figure 2. Suggested PCB Layout PL-795

### CASE STYLE DRAWING



### PCB Land Pattern



SUGGESTED LAYOUT FOR PC PATTERN  
TOLERANCE TO BE WITHIN ±.002

Weight: .361 grams

Dimensions are in inches [mm]. Tolerances: 2 Pl. ±.01; 3 Pl. ±.005 Inch

### PRODUCT MARKING\*: N/A

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



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# Directional Coupler

## RDC17-182-75+

75Ω 5 to 1800 MHz 17 dB Coupling High Isolation

**ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASHBOARD.**

**CLICK HERE**

<b>Performance Data &amp; Graphs</b>	Data Graphs S-Parameter (S4P Files) Data Set (.zip file) De-embedded to device pads
<b>Case Style</b>	TT1491-8
<b>RoHS Status</b>	Compliant
<b>Tape and Reel</b>	F34
<b>Suggested Layout for PCB Design</b>	PL-795
<b>Evaluation Board</b>	TB-RDC17-18275+ Gerber File
<b>Environmental Rating</b>	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](http://www.minicircuits.com/terms/viewterm.html)



# Directional Coupler

# RDC17-182-75+

## Typical Performance Data

FREQUENCY (GHz)	INSERTION LOSS <sup>(1)</sup> (dB)	COUPLING (dB)	ISOLATION (dB)	RETURN LOSS (dB)		
				IN	OUT	CPL
3	0.55	17.74	42.36	22.11	23.92	23.73
5	0.50	17.66	43.25	23.70	26.23	26.10
7	0.48	17.61	44.06	24.58	27.59	27.51
10	0.46	17.55	45.21	25.35	28.89	28.91
20	0.43	17.49	46.47	26.48	31.29	31.12
50	0.41	17.45	48.51	27.21	33.72	32.66
100	0.42	17.43	48.46	27.69	34.37	32.12
108	0.42	17.43	48.46	27.78	34.36	31.99
150	0.42	17.43	49.25	28.36	35.30	30.29
200	0.42	17.41	49.10	28.75	35.79	28.91
250	0.43	17.38	49.19	28.55	35.63	27.27
300	0.43	17.36	50.33	28.66	35.27	25.90
350	0.44	17.31	50.54	27.58	33.84	24.75
400	0.44	17.26	50.59	27.82	34.08	23.70
450	0.45	17.21	49.43	28.11	33.18	22.66
500	0.46	17.16	49.61	28.00	33.88	21.83
550	0.45	17.10	47.66	27.45	32.31	21.11
600	0.46	17.06	47.63	26.79	31.73	20.27
684	0.47	16.98	46.83	28.03	32.55	19.80
700	0.47	16.97	46.93	28.46	32.47	19.85
750	0.47	16.91	46.54	28.88	32.25	19.97
800	0.48	16.87	45.93	29.28	33.46	19.66
850	0.49	16.83	46.03	29.36	34.10	19.56
900	0.50	16.78	45.14	30.70	33.66	19.36
950	0.51	16.74	45.34	32.14	34.74	19.38
1000	0.51	16.70	44.22	31.08	33.23	19.46
1050	0.52	16.66	43.45	30.47	34.06	19.45
1100	0.53	16.62	43.05	29.34	32.60	19.41
1150	0.54	16.59	42.24	28.23	31.63	19.33
1218	0.55	16.54	41.05	26.13	30.35	19.18
1225	0.55	16.53	40.84	25.92	29.90	19.17
1300	0.57	16.45	39.99	24.19	29.41	19.39
1400	0.59	16.38	38.06	22.31	26.69	19.44
1500	0.62	16.33	35.53	20.42	24.10	18.87
1600	0.66	16.31	33.86	18.83	22.21	18.08
1700	0.70	16.32	32.13	17.39	21.32	17.14
1800	0.78	16.30	30.41	16.24	20.39	15.87
1900	0.85	16.42	29.03	15.01	19.05	14.80
2000	0.97	16.57	28.20	13.85	18.20	13.41

<sup>(1)</sup>Mainline loss includes coupling loss.



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 The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

IF/RF MICROWAVE COMPONENTS

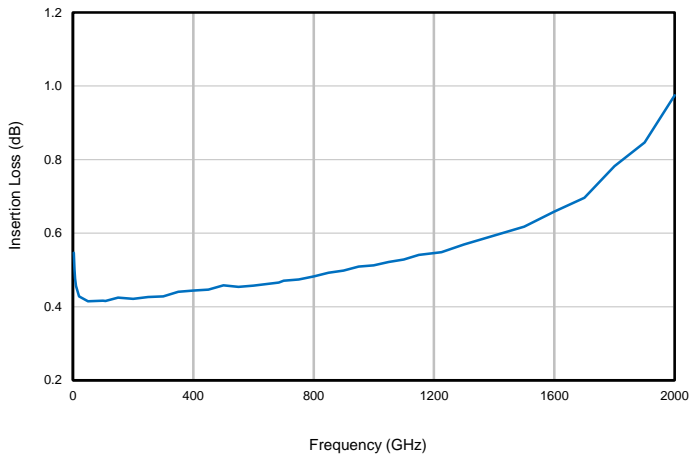
REV. OR  
 RDC17-182-75+  
 2/26/2025  
 Page 1 of 1

# Directional Coupler

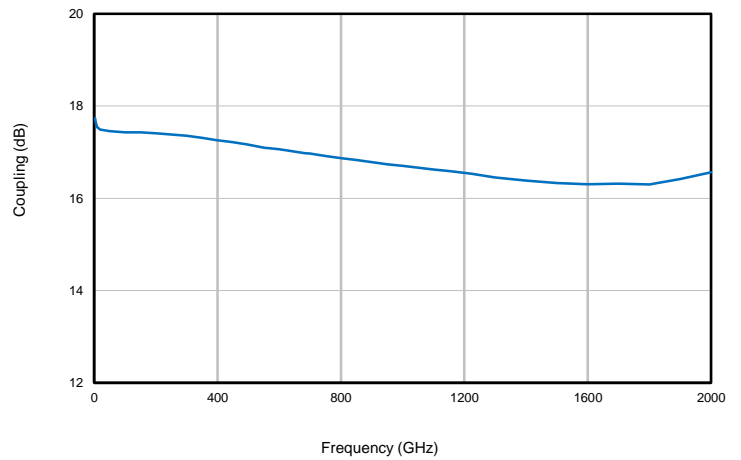
## Typical Performance Curves

RDC17-182-75+

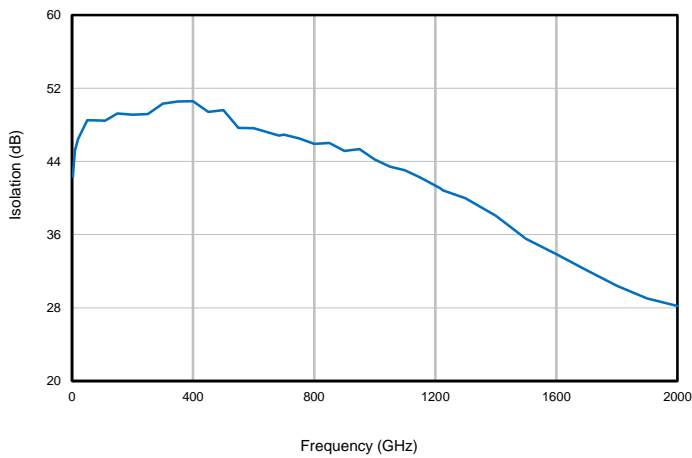
INSERTION LOSS



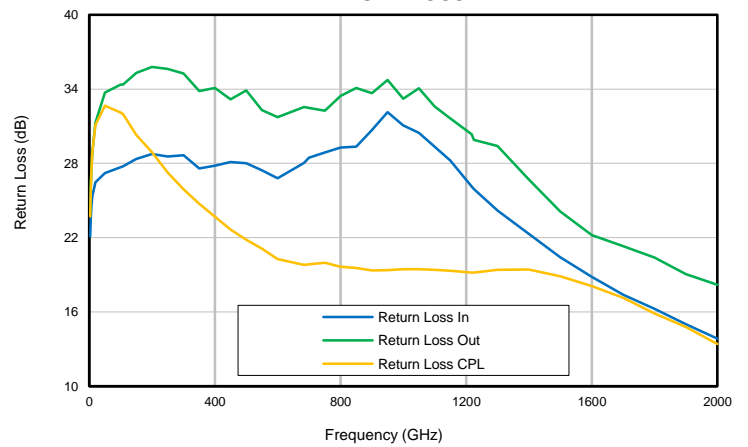
COUPLING

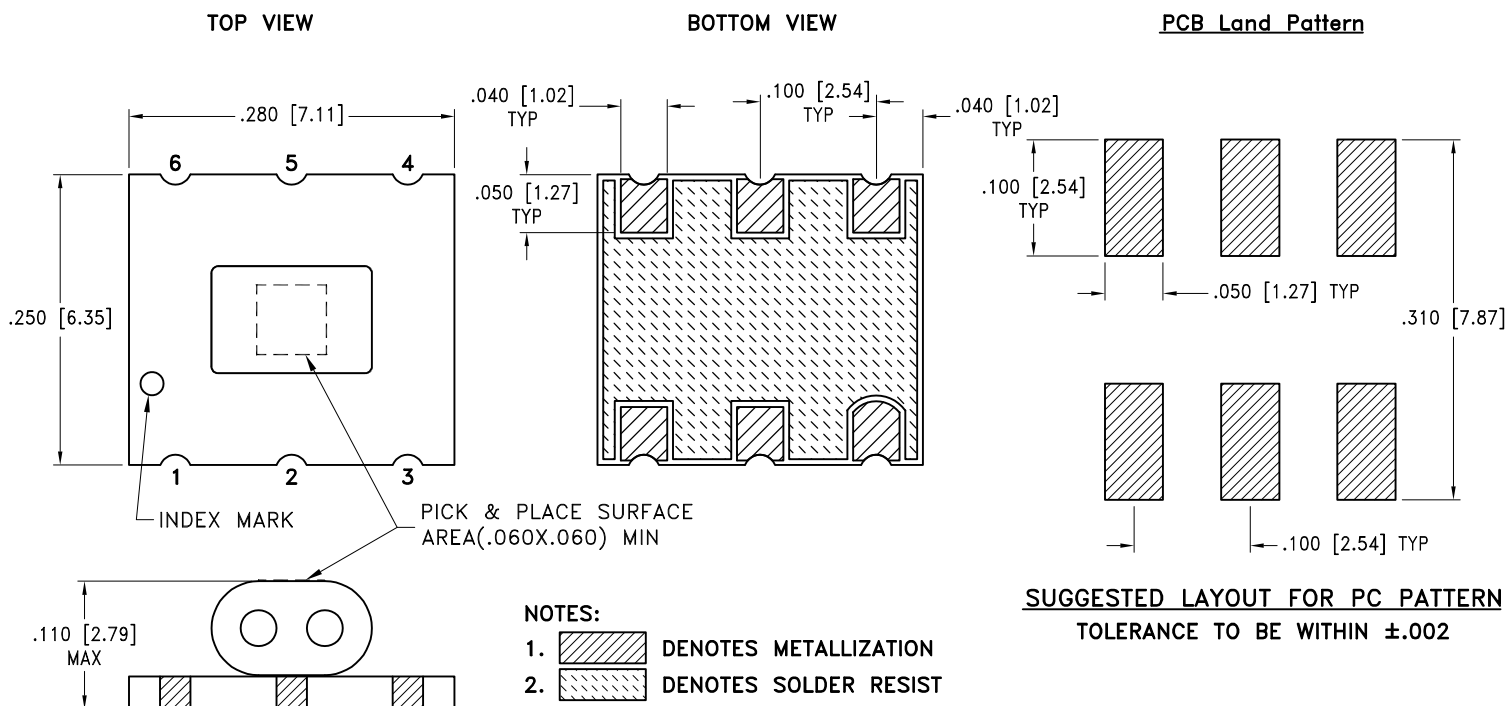


ISOLATION



RETURN LOSS





Weight: .361 grams

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

**Notes:**

1. Open style, Base material: Printed wiring laminate.
2. Termination finish: 3-5  $\mu$  inch (.08-.13 microns) Gold over 120-240  $\mu$  inch (3.05-6.10 microns) Nickel plate  
All models, (+) suffix.



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RF/IF MICROWAVE COMPONENTS

# Tape & Reel Packaging TR-F34



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel see note	
16	12	7	Small quantity standard (see note)	20
				50
				100
				200
		13	Standard	500
				1000

Note: Availability of small reel quantity varies by model.  
Refer to pricing and availability on individual model dashboard.

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: [www.minicircuits.com/pages/pdfs/tape.pdf](http://www.minicircuits.com/pages/pdfs/tape.pdf)



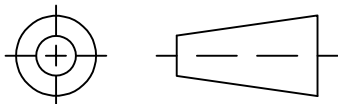
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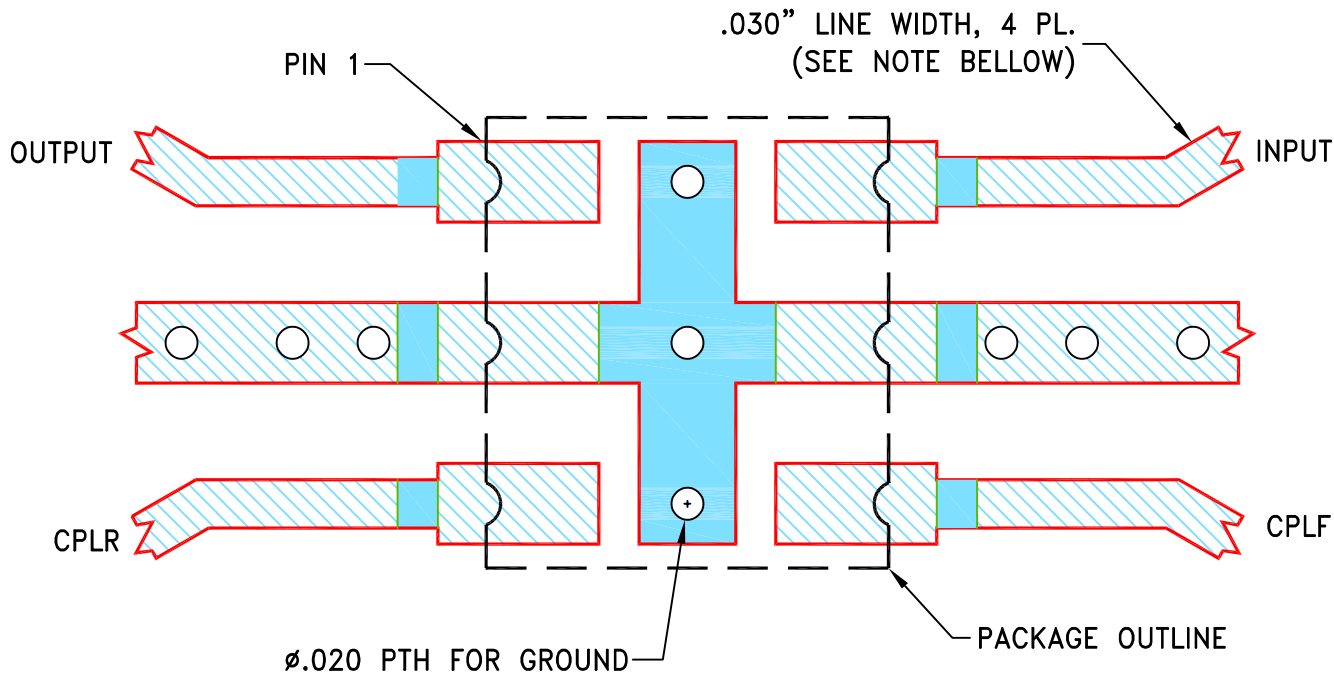
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	ECO-023000	NEW RELEASE	09/16/24	ITG	IL

SUGGESTED MOUNTING CONFIGURATION  
FOR TT1491-8 CASE STYLE

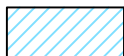


**NOTES:**

1. LINE WIDTH IS SHOWN FOR ROGERS RO4350B, DIELECTRIC THICKNESS:  $.030 \pm .002$ ";  
COPPER: 1/2 Oz EACH SIDE. FOR OTHER MATERIALS LINE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.



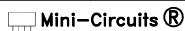
DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER).



DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK.

UNLESS OTHERWISE SPECIFIED	INITIALS	DATE
DRAWN	ITG	09/10/24
CHECKED	GF	09/10/24
APPROVED	IL	09/10/24

DIMENSIONS ARE IN INCHES  
TOLERANCES ON:  
2 PL DECIMALS  $\pm$   
3 PL DECIMALS  $\pm$  .005  
ANGLES  $\pm$   
FRACTIONS  $\pm$



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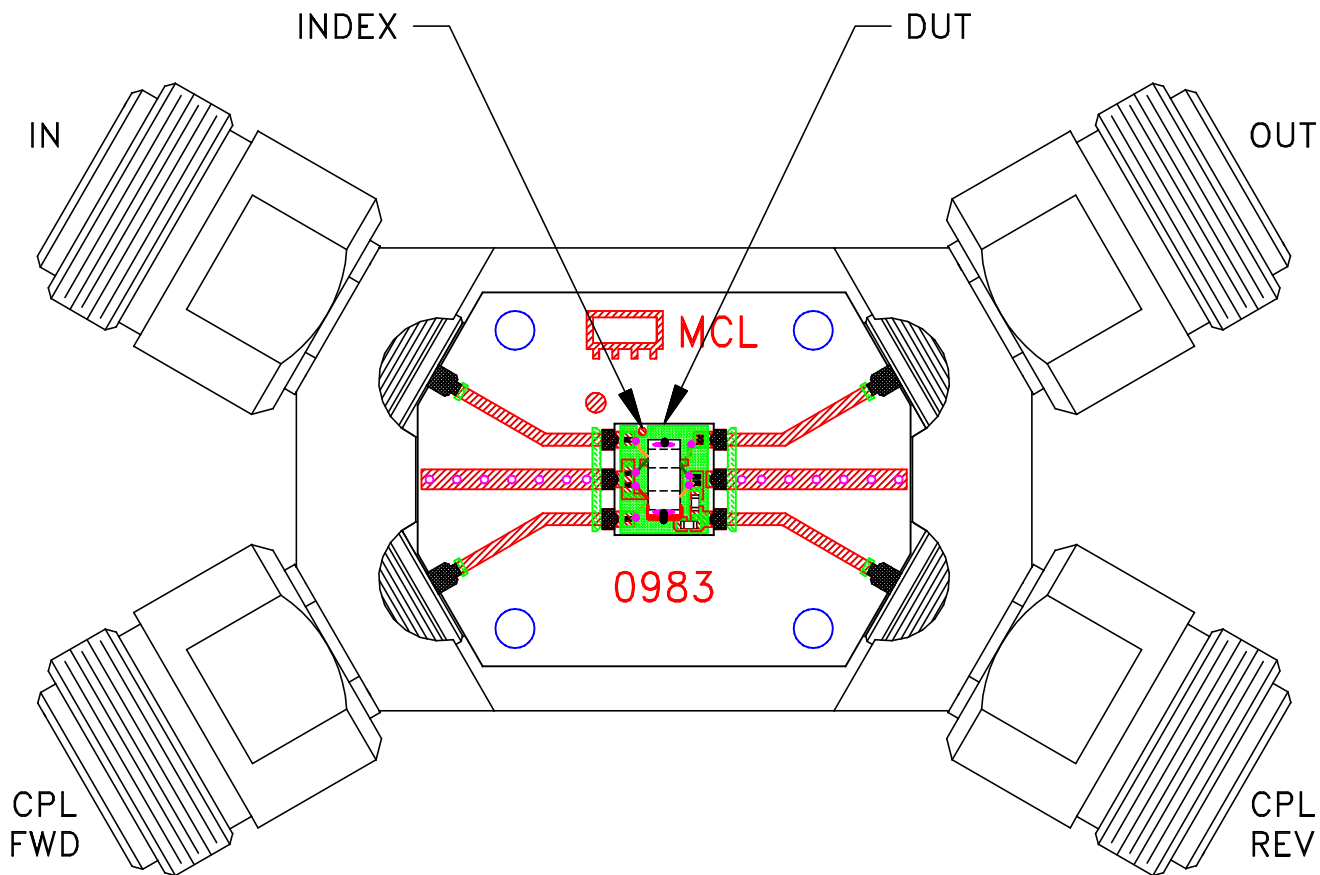
13 Neptune Avenue  
Brooklyn NY 11235

PL, TT1491-8, TB-RBDC918275X+

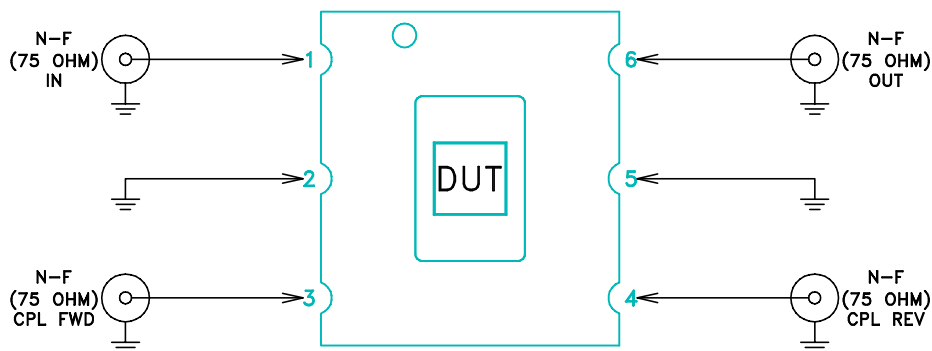
SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-795	REV: OR
FILE: 98PL795	SCALE: 8:1	SHEET: 1 OF 1	

# Evaluation Board and Circuit

TB-RDC17-18275+




## Schematic Diagram



### Notes:

1. PCB Material: ROGERS (R04350B) OR Equivalent, Dielectric Constant=3.48  
Thickness=.030±.002 inch
2. 75 Ohm N Female Connector.

 **Mini-Circuits®**