

# Surface Mount Directional Coupler

50Ω 5 to 500 MHz

LRDC-10-1+



Generic photo used for illustration purposes only

CASE STYLE: QQQ130

+RoHS Compliant

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

## Maximum Ratings

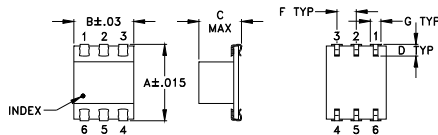
Operating Temperature	-40°C to 85 °C
Storage Temperature	-55°C to 100°C

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

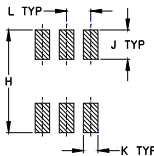
## Pin Connections

INPUT	6
OUTPUT	1
COUPLED	4
GROUND	2,5
ISOLATE (DO NOT USE)	3

## Outline Drawing



### PCB Land Pattern

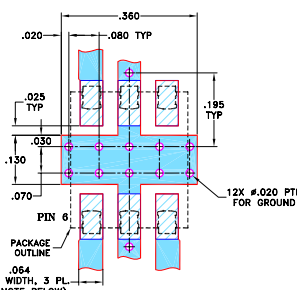


Suggested Layout,  
Tolerance to be within ±.002

## Outline Dimensions (inch/mm)

A	B	C	D	E	F	G
.390	.31	.225	.060	--	.100	.045
9.91	7.87	5.72	1.52	--	2.54	1.14
H	J	K	L	M	wt	
.420	.120	.060	.100	--	grams	
10.67	3.05	1.52	2.54	--	0.50	

## Demo Board MCL P/N: TB-31 Suggested PCB Layout (PL-087)



- NOTES:
- TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS 0.030" ± 0.002". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
  - 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

### 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.
- 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/WCLStore/terms.jsp](http://www.minicircuits.com/WCLStore/terms.jsp)

## Features

- low mainline loss, 0.9 dB typ.
- high directivity, 30 dB typ.

## Applications

- VHF/UHF
- reflective power measurements
- communications
- signal sampling

## Directional Coupler Electrical Specifications

FREQ. (MHz)	COUPLING (dB)		MAINLINE LOSS <sup>1</sup> (dB)						DIRECTIVITY (dB)						VSWR (:1)	POWER INPUT, W		
	Nom.	Flatness	L		M		U		L		M		U			Typ.	Max.	Max.
f <sub>L</sub> -f <sub>U</sub>			Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Min.	Typ.	Min.	Typ.	Min.	Typ.			
5-500	10.7±0.5	±0.5	0.9	1.4	0.9	1.4	1.2	1.9	31	25	30	20	25	16	1.2	1.0	1.0	

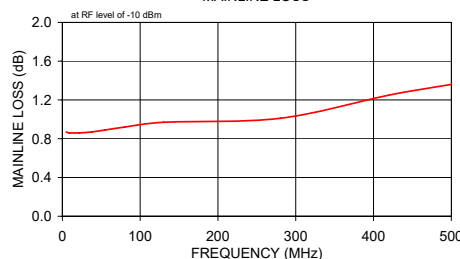
L = low range [f<sub>L</sub> to 10 f<sub>L</sub>] M = mid range [10 f<sub>L</sub> to f<sub>U</sub>/2] U = upper range [f<sub>U</sub>/2 to f<sub>U</sub>]

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

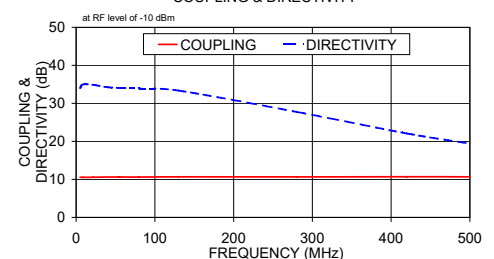
## Typical Performance Data

Frequency (MHz)	Mainline Loss (dB) In-Out	Coupling (dB) In-Cpl	Directivity (dB)	Return Loss (dB)		
				In	Out	Cpl
5.00	0.87	10.56	34.05	32.58	21.08	21.19
9.00	0.86	10.55	34.98	34.24	21.38	21.44
22.00	0.86	10.57	34.87	34.86	21.43	21.53
38.00	0.87	10.61	34.30	33.52	21.31	21.52
55.00	0.89	10.62	34.06	31.49	21.16	21.52
80.00	0.92	10.61	33.94	28.84	20.90	21.53
130.00	0.97	10.68	33.37	25.10	20.17	21.41
280.00	1.01	10.66	27.76	19.24	17.58	20.72
420.00	1.25	10.69	22.09	16.25	15.45	19.95
500.00	1.36	10.67	19.44	15.06	14.47	19.60

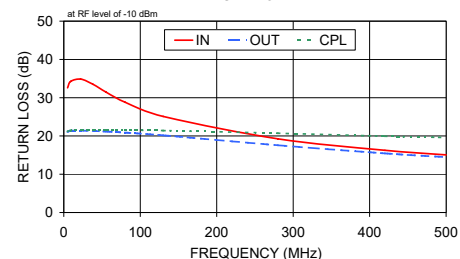
### MAINLINE LOSS



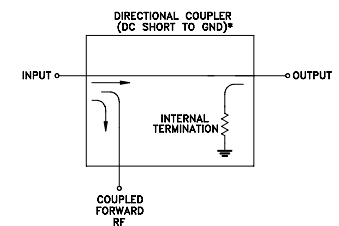
### COUPLING & DIRECTIVITY



### RETURN LOSS



## Electrical Schematic



\* ELECTRICAL SCHEMATIC IS FOR DIRECTIONAL COUPLER WITH INTERNAL TRANSFORMER(S) THAT ROUTES DC FROM RF PORTS TO GROUND.



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