



Mini-Circuits®

SURFACE MOUNT

Directional Coupler

TCD-20-4+

50Ω

5 to 1000 MHz

FEATURES

- Wideband, 5 to 1000 MHz
- Low mainline loss, 0.4 dB typ.
- Aqueous washable
- Leads for excellent solderability
- Protected by US Patent 6,140,887

APPLICATIONS

- VHF/UHF
- Communications
- Cellular
- Signal processing



Generic photo used for illustration purposes only

CASE STYLE: DB714

+RoHS Compliant

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

ELECTRICAL SPECIFICATIONS AT 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range	—	5	—	1000	MHz
Mainline Loss ¹	5-50	—	0.3	0.9	dB
	50-500	—	0.4	0.8	
	500-1000	—	0.7	1.1	
Coupling	5-1000	—	20±0.5	—	dB
Coupling Flatness (±)	5-1000	—	±0.8	—	dB
Directivity	5-50	11	20	—	dB
	50-500	15	21	—	
	500-1000	—	15	—	
VSWR	5-1000	—	1.2	—	:1
Input Power	5-1000	—	—	1.0	W

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

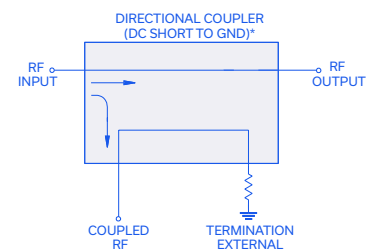
MAXIMUM RATINGS

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.

* Case temperature is defined as temperature on ground leads.

ELECTRICAL SCHEMATIC



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

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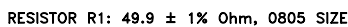
Directional Coupler

TCD-20-4+

5 to 1000 MHz

INPUT	3
OUTPUT	4
COUPLED	1
GROUND	2
50Ω TERM EXTERNAL	6
NOT USED	5

DEMO BOARD MCL P/N: TB-71
SUGGESTED PCB LAYOUT (PL-009)



2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

-
- Lead #1 identifier shall be located in the cross-hatched area shown. Identifier may be either a molded or marked feature.
- COMPONENT AREA
- PICK & PLACE SURFACE AREA (.03X.075)MIN.
- PLASTIC SHAPE ADJACENT TO LEADS MAY VARY
- Dimensions: A, B, C MAX, D TYP, E $\begin{matrix} +.005 \\ -.009 \end{matrix}$ TYP, F TYP
- Tolerances: .000, .008

Suggested Layout,
Tolerance to be within $\pm .002$

OUTLINE DIMENSIONS (Inches)

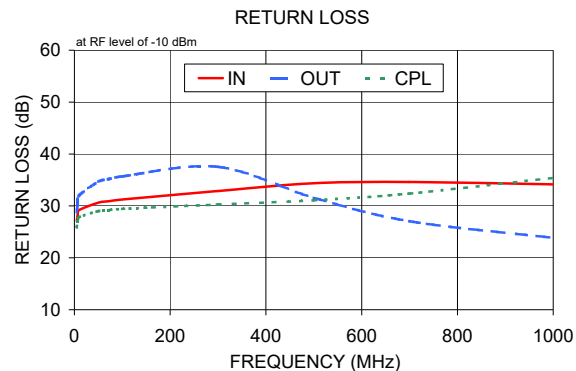
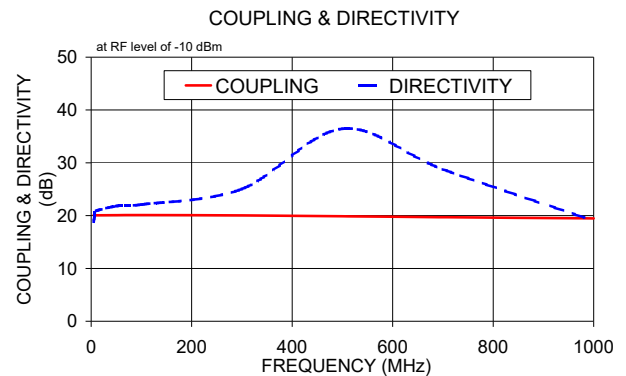
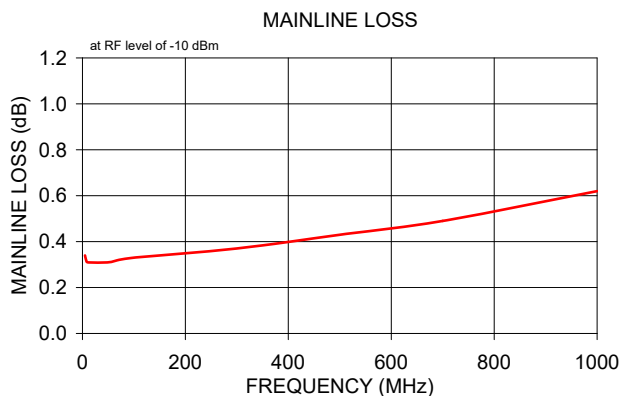
A	B	C	D	E	F
.160	.150	.160	.050	.040	.025
4.06	3.81	4.06	1.27	1.02	0.64
G	H	J	K		wt
.028	.065	.190	.030		grams
0.71	1.65	4.83	0.76		0.15

TAPE & REEL INFORMATION: F47



TYPICAL PERFORMANCE DATA

Frequency (MHz)	Mainline Loss (dB)	Coupling (dB)	Directivity (dB)	Return Loss (dB)		
	In-Out			In	Out	Cpl
5.00	0.34	20.10	18.84	27.09	28.80	25.84
7.00	0.32	20.07	20.01	28.28	30.52	26.99
10.00	0.31	20.06	20.88	29.20	32.01	27.84
50.00	0.31	20.09	21.80	30.62	34.67	28.98
70.00	0.32	20.10	21.88	30.88	35.14	29.17
100.00	0.33	20.10	22.10	31.23	35.70	29.43
300.00	0.37	20.04	25.05	32.86	37.54	30.26
500.00	0.43	19.88	36.45	34.37	31.56	31.08
700.00	0.49	19.70	28.77	34.61	27.04	32.38
1000.00	0.62	19.48	19.03	34.14	23.85	35.39



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/terms/viewterm.html

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