TCD-17-282X+

 $50\Omega$  5 to 2850 MHz

# The Big Deal

- Wideband, 5 to 2850 MHz
- Low mainline loss, 0.7–1.9 dB
- Flat coupling, ±1.2 dB
- RF power handling up to 1W





CASE STYLE: DB1627

## **Product Overview**

Mini-Circuits' TCD-17-282X+ surface mount directional coupler provides 17 dB nominal coupling with excellent flatness from 5 to 2850 MHz, supporting a wide variety of applications including VHF/UHF, CATV, cellular, SatCom and more. This model provides low mainline loss, high directivity and excellent return loss. The coupler is built with core and wire construction mounted on a 6-lead plastic base (0.16 x 0.15 x 0.16") and includes Mini-Circuits' TopHat® feature for faster, more accurate pick-and-place assembly.

# **Key Features**

Feature	Advantages
Low mainline loss • 0.7 dB to 950 MHz • 1.9 dB to 2850 MHz	Provides good through-path signal power transmission.
High directivity, 10 – 25 dB	High directivity allows accurate signal sampling through the coupled port with minimal measurement error.
Excellent return loss, 14 – 22 dB (input/output/coupling)	Provides excellent matching for $50\Omega$ systems and minimal signal reflection.
Good power handling  • 1W, 100 to 2850 MHz  • 0.5W, 5 to 100 MHz	Usable in systems with a variety of high-power requirements.
Top Hat® feature	Improves speed and accuracy of pick and place assembly and provides clear device marking for visual inspection.



# TCD-17-282X+

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#### **Features**

- wideband, 5 to 2850 MHz
- low mainline loss,1.9 dB typ. up to 2850 MHz
- aqueous washable
- leads for excellent solderability
- protected by US Patent 6,140,887

#### **Applications**

- VHF/UHF
- PCS
- ISM
- PCN
- cellular
- UMTS
- GPS

## Electrical Specifications at 25°C





CASE STYLE: DB1627

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

	Available Tape and Reel at no extra cost
Reel Size	Devices/Reel
7"	20, 50, 100, 200, 500
13"	1000 2000

Parameter	Condition (MHz)	Min.	Тур.	Max.	Unit	
Frequency Range		5		2850	MHz	
	5	_	0.7	1.3		
Mainline Loss <sup>1</sup> (above theoretical 0.1 dB)	950	_	0.7	1.1	dB	
,	2850	_	1.9	2.4		
Nominal Coupling	5-2850	_	17 ±1	_	dB	
Occupies Flateress(s)	5-950	_	0.3	0.6	dB	
Coupling Flatness(±)	950-2850	_	1.2	1.5	ub	
	5-100	18	25	_		
Directivity	100-950	13	20	<u> </u>	dB	
	950-2850	6	10	_		
	5	_	20	_		
Return Loss (Input)	950	_	17	_	dB	
	2850	<del>_</del>	14	<del>_</del>		
Return Loss (Output)	5 950	_	22 18	_	dB	
Return Loss (Output)	2850		14		αв	
Return Loss (Coupling)	5	_	20	_		
	950	_	16	_	dB	
	2850	_	15	_		
Input Power	5-100	_	_	0.5	W	
	100-2850	_	_	1.0		

Mainline loss includes theoretical power loss 0.1dB at coupled port.

#### **Maximum Ratings**

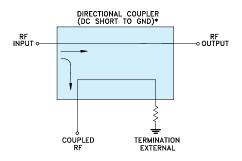
Parameter	Ratings
Operating Temperature	-40°C to 85°C*
Storage Temperature	-55°C to 100°C

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

#### **Pin Connections**

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

#### **Electrical Schematic**

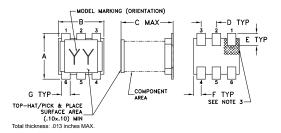


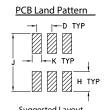
\* ELECTRICAL SCHEMATIC IS FOR DIRECTIONAL COUPLER WITH INTERNAL TRANSFORMER(S) AND EXTERNAL TERMINATION.



<sup>\*</sup> Case temperature is defined as temperature on ground leads.

## **Outline Drawing**

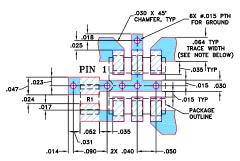




## Outline Dimensions (inch )

F	E	D	С	В	Α
.025	.040	.050	.160	.150	.160
0.64	1.02	1.27	4.06	3.81	4.06
wt		к	J	н	G
***		- 1			u
grams		.030	.190	.065	.028
0.15		0.76	4.83	1.65	0.71

#### Demo Board MCL P/N: TB-71 Suggested PCB Layout (PL-009)



RESISTOR R1: 49.9 ± 1% Ohm. 0805 SIZE

NOTES: 1. 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.

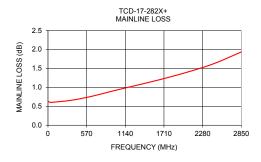
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

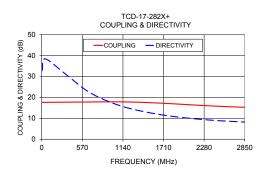
DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

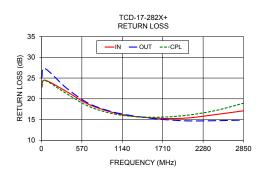
DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

## **Typical Performance Data**

Frequency (MHz)	Mainline Loss (dB)	Coupling (dB)	Directivity (dB)	Return Loss (dB)		
(	In-Out	In-Cpl	(/	In	Out	Cpl
5	0.62	17.63	32.71	22.72	25.10	22.92
50	0.60	17.61	38.38	24.47	27.28	24.42
350	0.66	17.71	30.67	21.79	22.63	21.28
650	0.77	17.79	22.79	18.79	19.05	18.33
950	0.90	17.87	17.87	16.99	17.11	16.63
1250	1.03	17.77	14.58	15.90	16.01	15.81
1650	1.20	17.28	11.83	15.31	15.14	15.57
2050	1.40	16.52	10.09	15.38	14.70	16.04
2450	1.63	15.79	8.93	16.19	14.74	17.16
2850	1.93	15.27	8.21	17.12	14.89	18.94







### **Additional 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.

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