Engineering Development Model

Directional Coupler TCD-ED12623/2

Important Note

This model has been designed, built and tested in our engineering department. Performance data represents model capability.
At present it is a non-catalog model. On request, we can supply a final specification sheet, part number and price/delivery information.

Please click "Back", and then click "Contact Us" for Applications support.

CASE STYLE : AT224-1

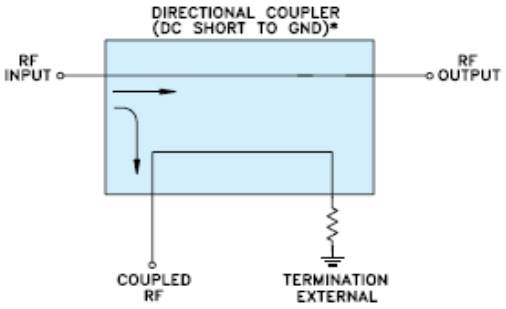
ELECTRICAL SPECIFICATIONS 50Ω @ +25°C					
Parameter		**Min.**	**Typ.**	**Max.**	**Units**
Frequency		5		1000	MHz
Coupling	**Nominal**		10.00		dB
	Flatness		± 0.215		dB
Mainline Loss **	**5-50 MHz**		1.00		dB
	50-500 MHz		1.10		dB
	500-1000 MHz		1.30		dB
Directivity	**5-50 MHz**		23		dB
	50-500 MHz		20		dB
	500-1000 MHz		14		dB
VSWR	**5-1000 MHz**		1.25		(:1)
RF Power Input	**5-1000 MHz**			0.5	W

Note: ** Mainline loss includes theoretical coupled power loss of 0.458dB at 10dB coupling.

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

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

Electrical Schematic



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

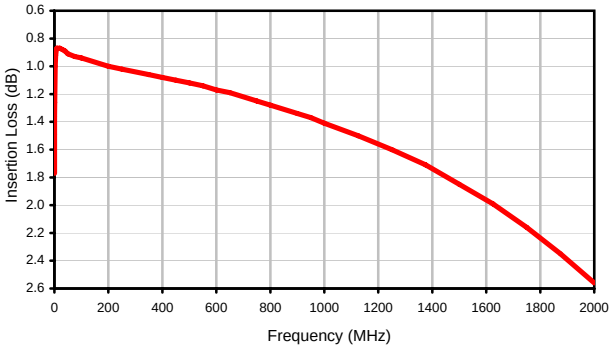
Directional Coupler TCD-ED12623/2.XLS

Typical Performance Data

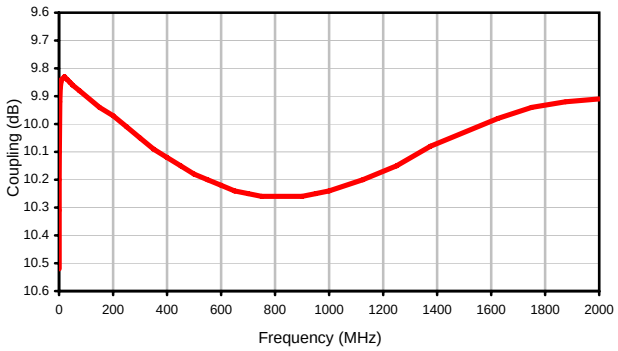
FREQUENCY (MHz)	INSERTION LOSS (dB)	COUPLING (dB)	DIRECTIVITY (dB)	RETURN LOSS (dB)		
				IN	OUT	CPL
0.3	1.77	10.52	17.06	10.84	11.30	9.75
0.5	1.49	10.31	19.12	13.40	14.71	12.25
0.7	1.36	10.20	19.98	14.78	16.83	13.71
1.0	1.26	10.10	20.60	15.98	18.93	15.13
3.0	1.00	9.92	22.19	19.06	25.12	18.66
5.0	0.92	9.87	22.83	20.19	28.11	19.91
7.0	0.88	9.85	23.09	20.74	30.03	20.56
9.0	0.87	9.84	23.21	21.05	31.29	20.93
10.0	0.87	9.84	23.25	21.14	31.75	21.04
20.0	0.87	9.83	23.14	21.52	34.24	21.46
30.0	0.88	9.84	23.01	21.52	35.04	21.51
40.0	0.89	9.85	22.85	21.48	35.18	21.50
50.0	0.91	9.86	22.76	21.44	35.03	21.48
75.0	0.93	9.88	22.58	21.42	34.08	21.38
100.0	0.94	9.90	22.42	21.35	32.59	21.27
150.0	0.97	9.94	22.04	21.00	29.92	21.09
200.0	1.00	9.97	21.57	20.71	27.99	20.79
250.0	1.02	10.01	21.12	20.31	26.27	20.50
300.0	1.04	10.05	20.53	19.91	24.89	20.14
350.0	1.06	10.09	20.04	19.53	23.89	19.86
400.0	1.08	10.12	19.43	19.10	22.87	19.52
450.0	1.10	10.15	18.88	18.74	22.07	19.21
500.0	1.12	10.18	18.30	18.31	21.33	18.91
550.0	1.14	10.20	17.72	17.99	20.72	18.57
600.0	1.17	10.22	17.15	17.65	20.14	18.41
650.0	1.19	10.24	16.63	17.34	19.64	18.05
700.0	1.22	10.25	16.13	17.08	19.22	17.89
750.0	1.25	10.26	15.62	16.82	18.79	17.64
800.0	1.28	10.26	15.15	16.60	18.44	17.45
850.0	1.31	10.26	14.70	16.39	18.12	17.32
900.0	1.34	10.26	14.26	16.22	17.82	17.14
950.0	1.37	10.25	13.83	16.02	17.52	17.06
1000.0	1.41	10.24	13.42	15.88	17.30	16.96
1125.0	1.50	10.20	12.49	15.59	16.80	16.83
1250.0	1.60	10.15	11.65	15.32	16.36	16.84
1375.0	1.71	10.08	10.89	15.11	15.97	16.95
1500.0	1.85	10.03	10.20	14.95	15.61	17.13
1625.0	1.99	9.98	9.57	14.77	15.24	17.48
1750.0	2.16	9.94	9.01	14.71	14.92	17.95
1875.0	2.35	9.92	8.51	14.59	14.62	18.57
2000.0	2.56	9.91	8.08	14.50	14.39	19.38

Typical Performance Curves

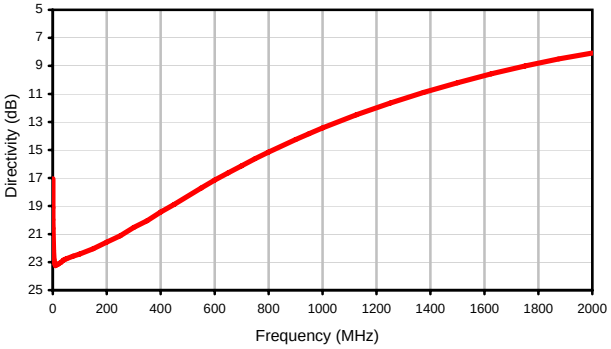
Insertion Loss



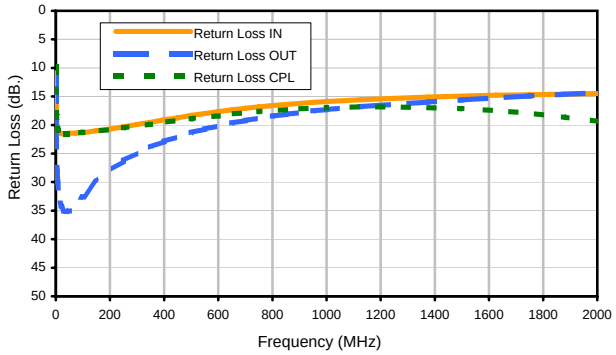
Coupling



Directivity



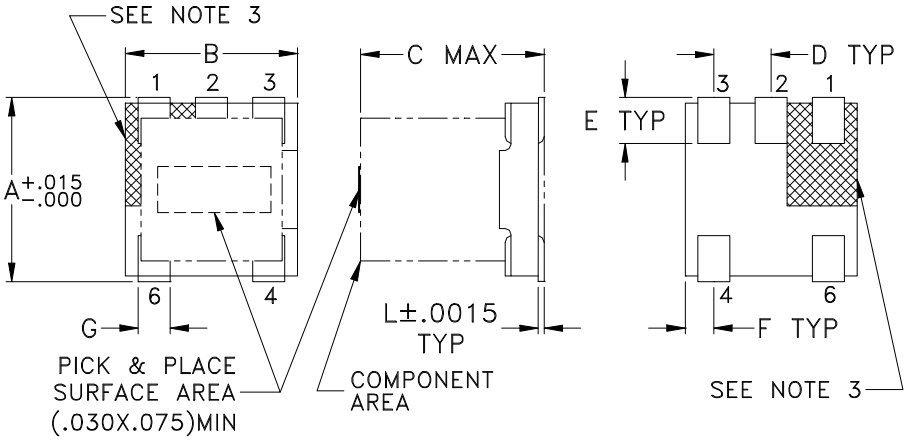
Return Loss



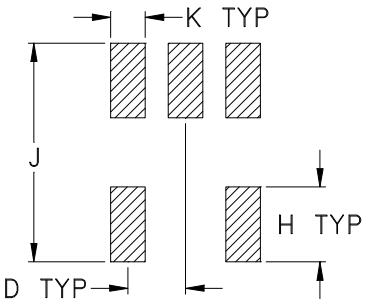
Case Style AT

Outline Dimensions

AT224-1



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

CASE #	A	B	C	D	E	F	G	H	J	K	L	WT. GRAMS
AT224-1	.150 (3.81)	.150 (3.81)	.160 (4.06)	.050 (1.27)	.040 (1.02)	.025 (0.64)	.028 (0.71)	.065 (1.65)	.190 (4.83)	.030 (0.76)	.007 (0.18)	.15

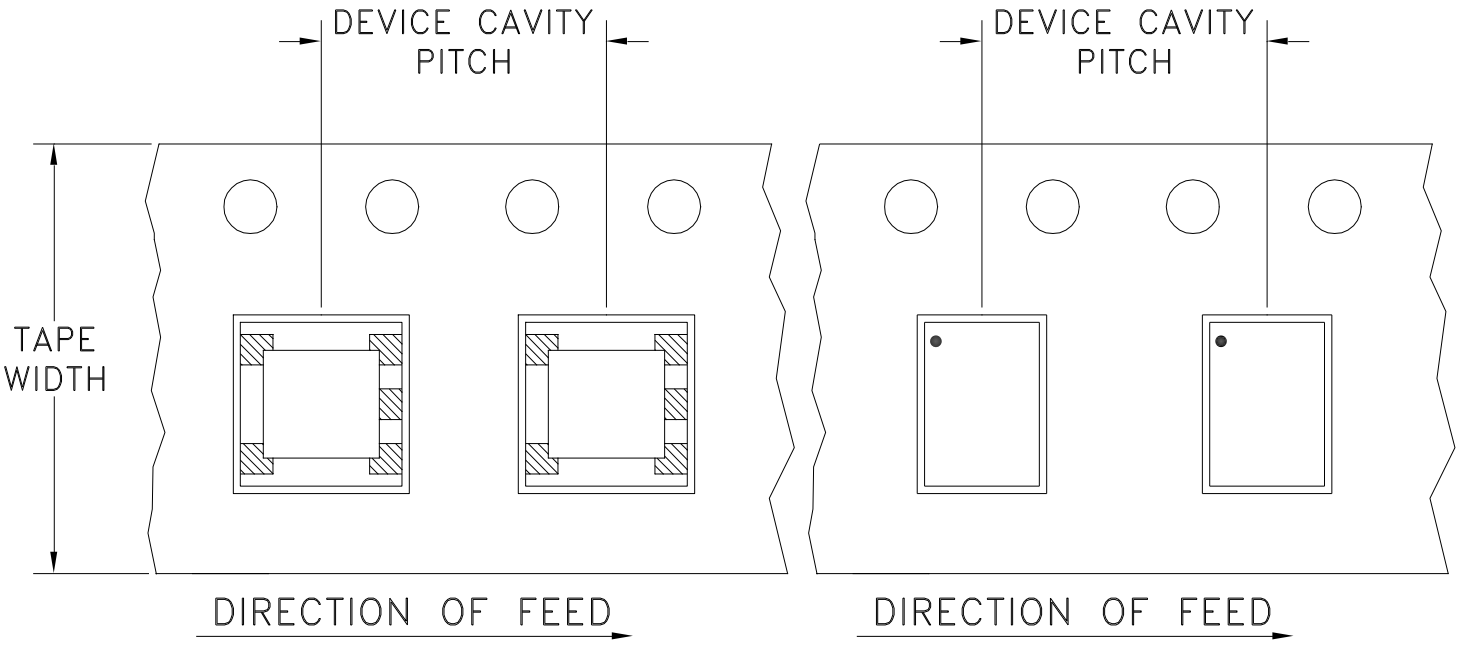
Dimensions are in inches (mm). Tolerances: 2 Pl. ± .01; 3 Pl. ± .005

Notes:

1. Case material: Plastic.
2. Termination finish: Tin plate over Nickel plate.
3. Lead #1 identifier shall be located in the cross-hatched area shown. Identifier may be either a molded or marked feature.

Tape & Reel Packaging TR-F17

DEVICE ORIENTATION IN T&R



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
12	8	7	Small quantity standards (see note)	20
				50
				100
				200
				500
		13	Standard	1000
				2000

Note: Please Consult individual model data sheet to determine device per reel availability.

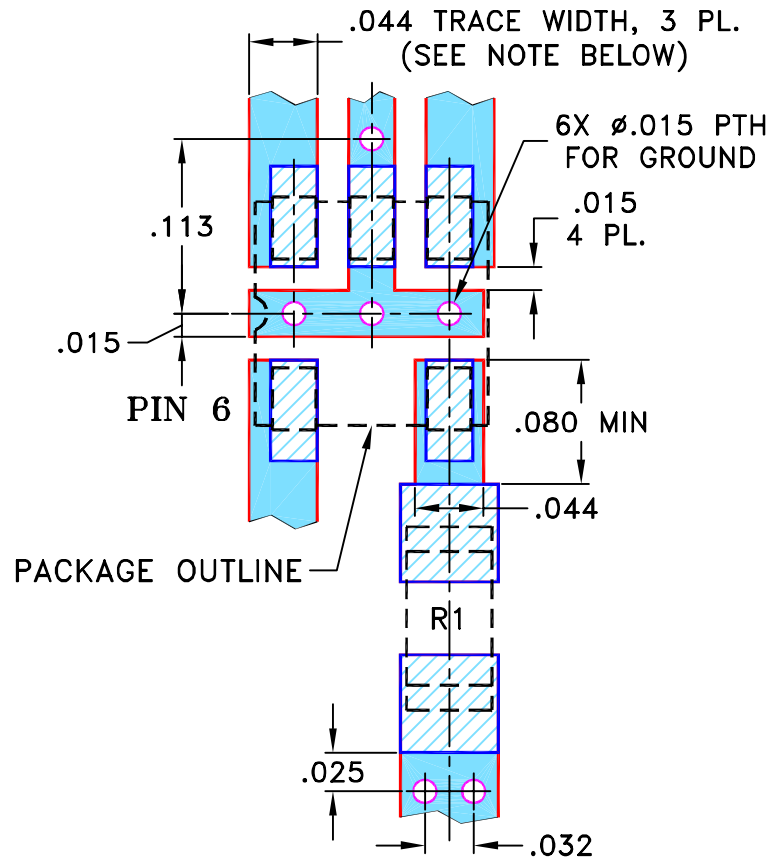
Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf

THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M105423	NEW RELEASE	09/15/06	MMG	DY

SUGGESTED MOUNTING CONFIGURATION FOR AT224-1 CASE STYLE, "kd" PIN CONNECTION



RESISTOR R1: 49.9 Ohm, 1206 SIZE

NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020 ± .0015; 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

UNLESS OTHERWISE SPECIFIED		INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN	MMG	09/12/06
TOLERANCES ON:	CHECKED	AV	09/15/06
2 PL DECIMALS ±	APPROVED	DY	09/15/06
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

ASHEETA1.DWG REV:A DATE:01/12/95

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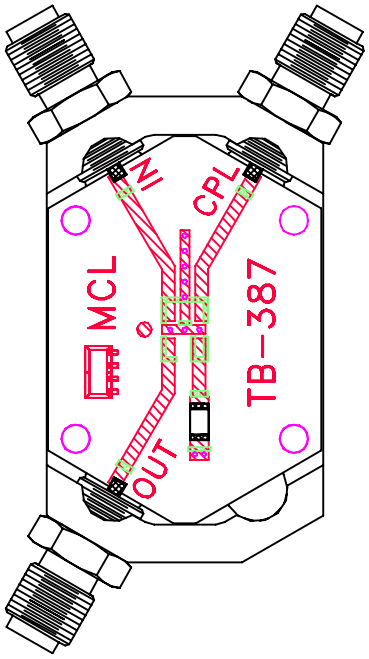
PL, kd, AT224-1, TCD, TB-387

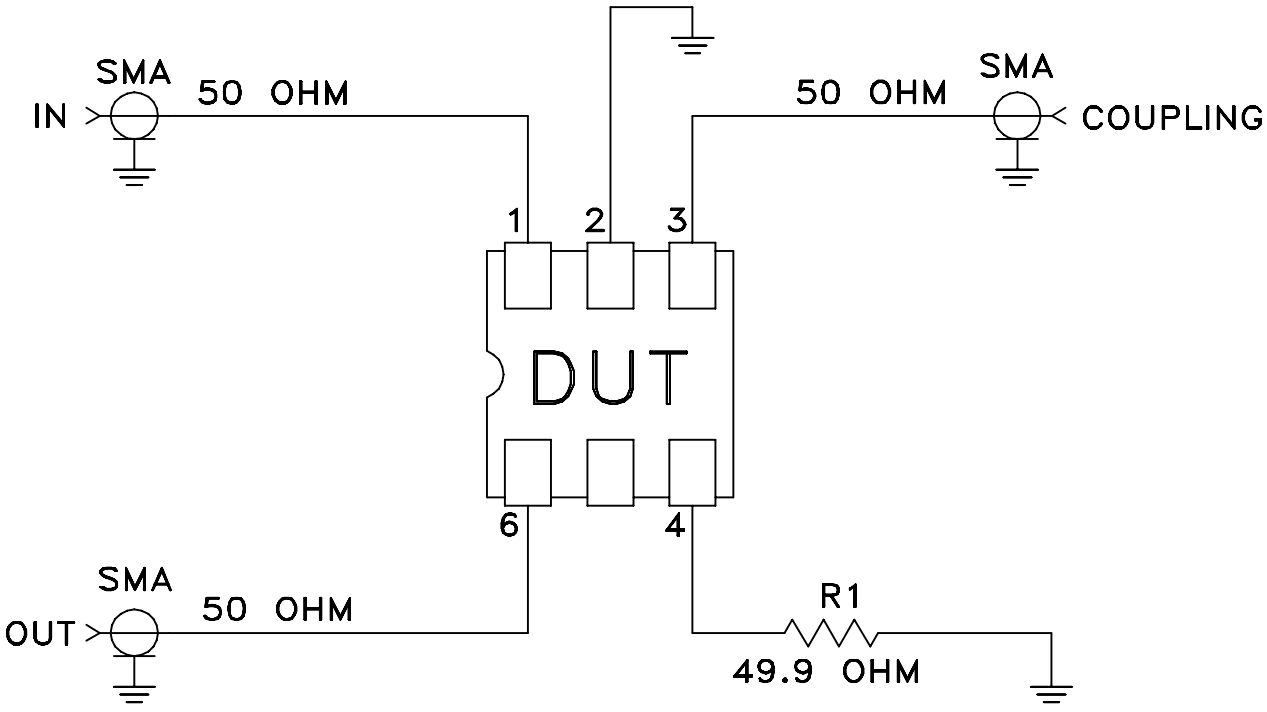
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-245	OR

FILE:	SCALE:	SHEET:
98PL245	8:1	1 OF 1

Evaluation Board and Circuit



TB-387



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: Rogers RO4350 or its equivalent, Dielectric Constant=3.5, Thickness=.020"

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Environmental Specifications ENV02T1

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-40° to 85°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Humidity	90 to 95% RH, 240 hours, 50°C	MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutetic Process: 225°C peak Pb-Free Process 245° - 250°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, 95% Coverage
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A
Marking Resistance to Solvents	Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215