

2 Way-0° 50/75Ω 50 to 1000 MHz

### Features

- 50 ohm input, 75 ohm output
- excellent isolation, 20 dB typ.
- very good phase unbalance, 1.0 deg. typ.
- small size, 0.15"x0.15"x0.15"
- temperature stable LTCC base
- small size
- low cost
- aqueous washable
- protected by US patent 6,963,255

### Applications

- cable
- 50-75 ohm amplifier splitter



Generic photo used for illustration purposes only

CASE STYLE: AT790

#### +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
13"	500, 1000, 2000

### Electrical Specifications

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Frequency Range		50		1000	MHz
Insertion Loss Above 3.0 dB	50 - 500	—	0.7	1.2	dB
	500 - 1000	—	1.0	1.6	
Isolation	50 - 500	16	25	—	dB
	500 - 1000	15	20	—	
Phase Unbalance	50 - 500	—	—	3	Degree
	500 - 1000	—	—	5	
Amplitude Unbalance	50 - 500	—	—	0.6	dB
	500 - 1000	—	—	0.5	

### Maximum Ratings

Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
Power Input (as a splitter)	0.5W max.
Internal Dissipation	0.125W max

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

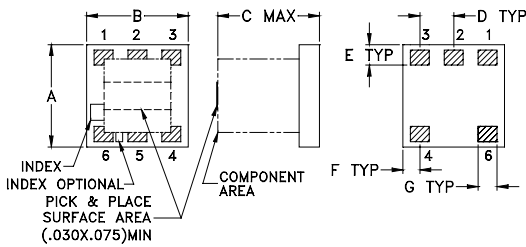
### Pin Connections

Function	Pin Number
SUM PORT	6 (50 ohms)
PORT 1	3 (75 ohms)
PORT 2	4 (75 ohms)
GROUND	1,2
NOT USED	5

### Electrical Schematic



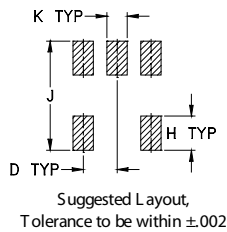
## Outline Drawing



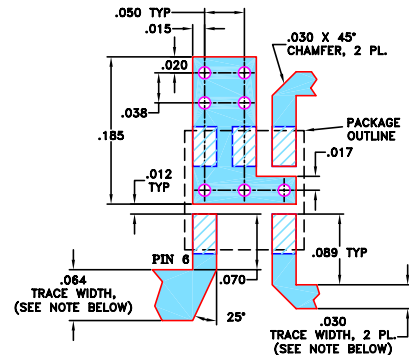
### Outline Dimensions (inch mm)

A	B	C	D	E	F
.150	.150	.150	.050	.030	.025
3.81	3.81	3.81	1.27	0.76	0.64
G	H	J	K	wt	
.028	.050	.160	.030	grams	
0.71	1.27	4.06	0.76	0.10	

### PCB Land Pattern



### Demo Board MCL P/N: TB-146 Suggested PCB Layout (PL-093)



NOTE: TRACE WIDTH IS SHOWN FOR ROGERS RO4350 WITH DIELECTRIC THICKNESS 0.030" ± 0.002", COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.

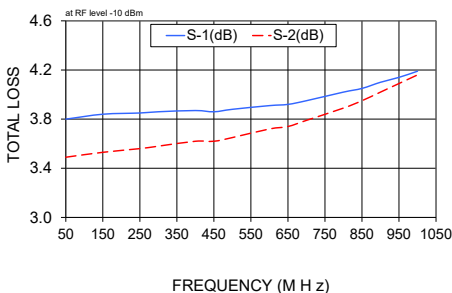
- DENOTES PCB COPPER LAYOUT
- DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

## Typical Performance Data

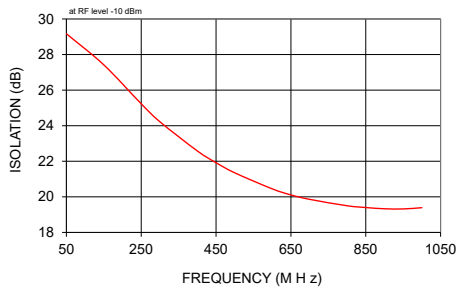
Frequency (MHz)	Total Loss <sup>1</sup> (dB)		Amplitude Unbalance (dB)	Isolation (dB)	Phase Unbalance (deg.)	VSWR S	VSWR 1	VSWR 2
	S-1	S-2						
50.00	3.80	3.49	0.31	29.17	0.08	1.20	1.38	1.30
150.00	3.84	3.53	0.30	27.42	0.28	1.20	1.34	1.27
250.00	3.85	3.56	0.29	25.23	0.57	1.18	1.29	1.25
300.00	3.86	3.58	0.28	24.22	0.67	1.17	1.26	1.23
400.00	3.87	3.62	0.25	22.58	0.95	1.14	1.19	1.20
450.00	3.86	3.62	0.24	21.92	1.08	1.12	1.17	1.19
500.00	3.88	3.65	0.23	21.35	1.21	1.10	1.14	1.18
600.00	3.91	3.72	0.19	20.45	1.47	1.06	1.13	1.18
650.00	3.92	3.74	0.18	20.11	1.53	1.04	1.14	1.19
700.00	3.95	3.79	0.16	19.86	1.66	1.03	1.17	1.21
800.00	4.02	3.89	0.13	19.50	1.80	1.05	1.24	1.25
850.00	4.05	3.95	0.10	19.40	1.84	1.07	1.27	1.27
900.00	4.10	4.02	0.09	19.33	1.93	1.09	1.30	1.29
950.00	4.14	4.09	0.05	19.32	2.00	1.10	1.32	1.30
1000.00	4.19	4.16	0.03	19.39	1.99	1.12	1.34	1.30

1. Total Loss = Insertion Loss + 3dB splitter loss.

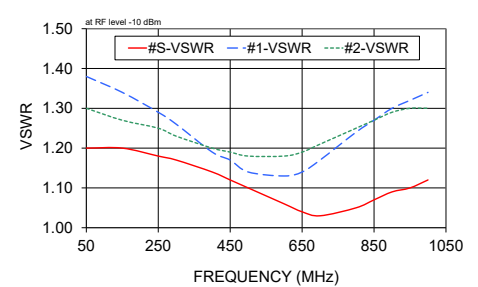
TOTAL LOSS



ISOLATION



VSWR

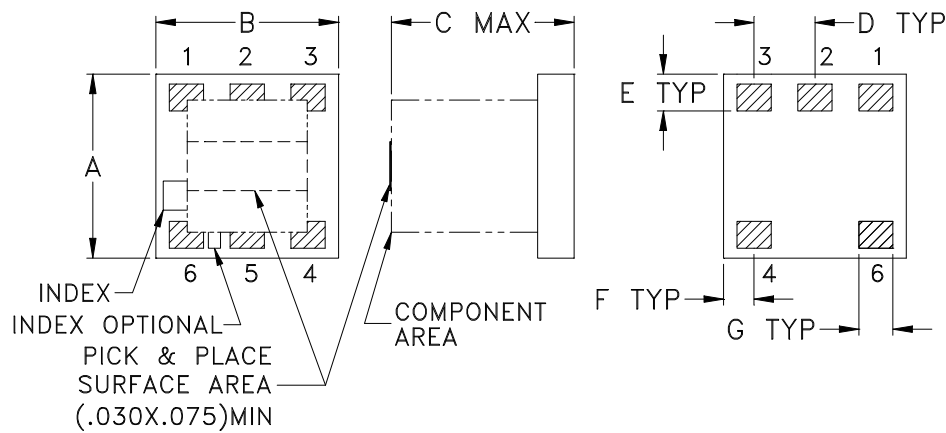


### Additional Notes

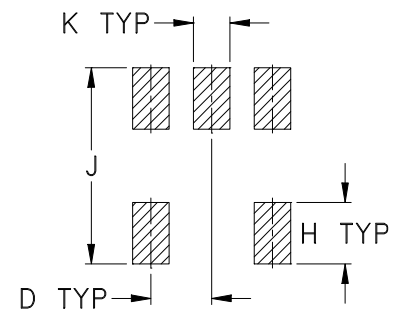
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## Outline Dimensions

AT790



## PCB Land Pattern



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

CASE #	A	B	C	D	E	F	G	H	J	K	L	WT. GRAMS
AT790	.150 (3.81)	.150 (3.81)	.150 (3.81)	.050 (1.27)	.030 (0.76)	.025 (0.64)	.028 (0.71)	.050 (1.27)	.160 (4.06)	.030 (0.76)	-- --	.10

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

### Notes:

1. Open style, Ceramic base.
2. Termination finish: Silver palladium or gold over nickel based on stock availability.



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site

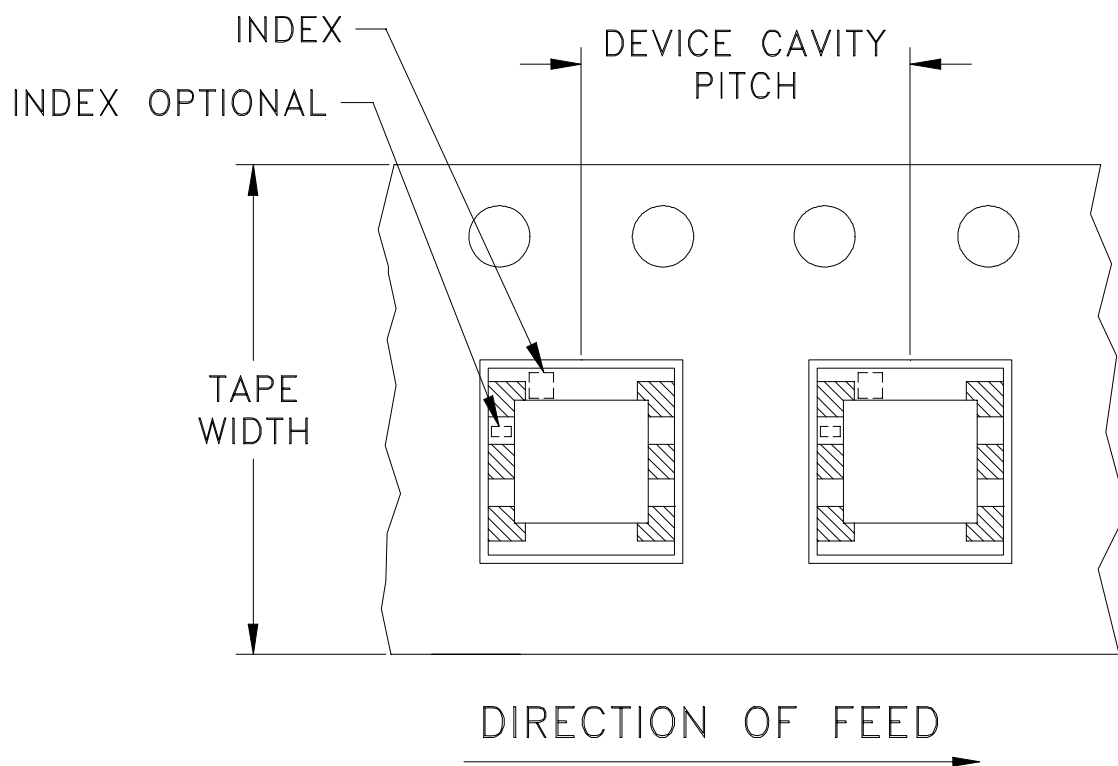


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RF/IF MICROWAVE COMPONENTS

# Tape & Reel Packaging TR-F15

## DEVICE ORIENTATION IN T&R



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
12	8	7	20
			50
			100
		13	200
			500
			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](http://www.minicircuits.com/pages/pdfs/tape.pdf)



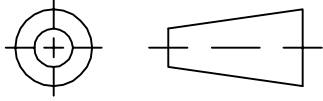
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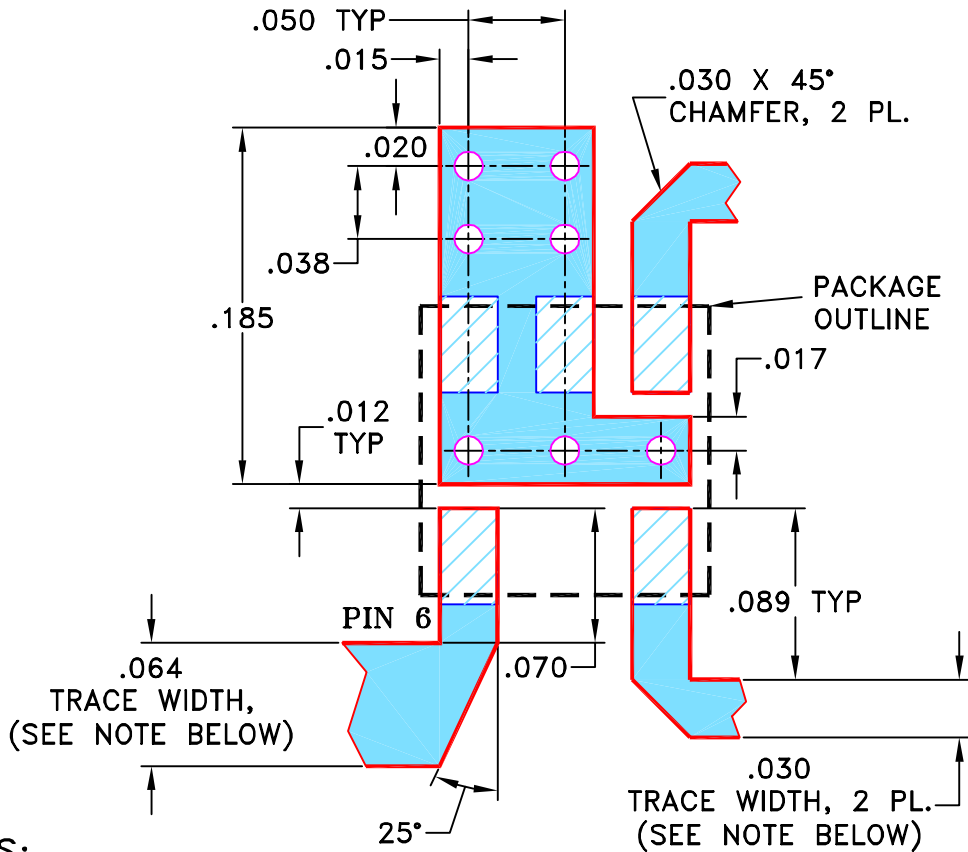
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M82272	NEW RELEASE	08/05/02	GF	DJ
A	M102713	UPDATED NOTES, ADDED "...WITH SMOBC"	01/16/06	GT	IL

SUGGESTED MOUNTING CONFIGURATION FOR AT790 CASE STYLE, "nc" PIN CONNECTION



NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B 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

UNLESS OTHERWISE SPECIFIED

INITIALS

DATE

DIMENSIONS ARE IN INCHES

DRAWN

GF

07/23/02

TOLERANCES ON:

CHECKED

HY

08/01/02

2 PL DECIMALS ±

APPROVED

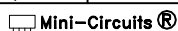
DJ

08/05/02

3 PL DECIMALS ± .005

ANGLES ±

FRACTIONS ±



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



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PL, nc, 5075, AT790, SBTC, TB-146

SIZE

CODE IDENT

DRAWING NO:

REV:

A

15542

98-PL-093

A

FILE: 98PL093

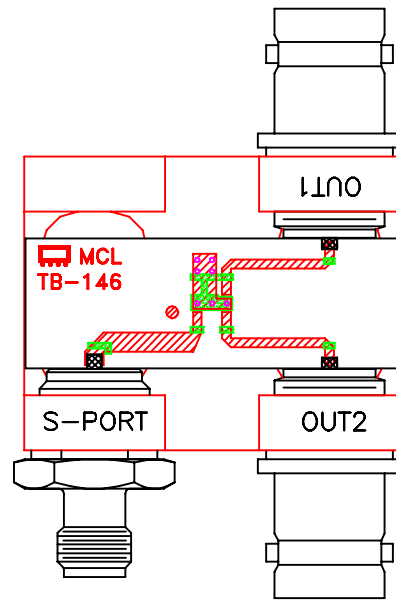
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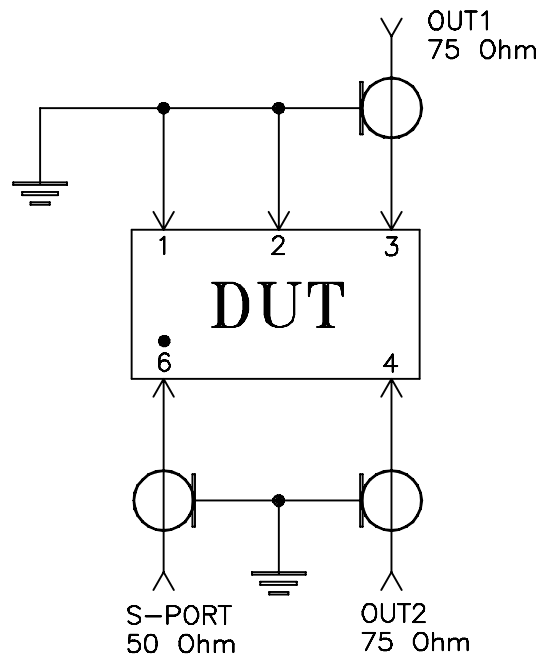
SHEET:

1 OF 1

# Evaluation Board and Circuit




TB-146



Schematic Diagram

## Notes:

1. 50 Ohm SMA AND 75 Ohm BNC Female connectors.
2. PCB Material: Rogers R04350 or equivalent,  
Dielectric Constant=3.5, Thickness=.030 inch.

 Mini-Circuits®

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