

Surface Mount Bandpass Filter

SYBP-1950+

50Ω

1700 to 2200 MHz

The Big Deal

- Small size (0.25" X 0.31" X 0.15")
- Excellent power handling, 10 W
- Low insertion loss, 1.2 dB typ.



Generic photo used for illustration purposes only
CASE STYLE: TT1423

Product Overview

SYBP-1950+ is a 50Ω bandpass filter fabricated using SMT technology. The bandpass filter covers from 1700 to 2200 MHz offering low insertion loss and good matching within the passband. It is fabricated in a tiny housing with very good power handling capabilities.

Key Features

Feature	Advantages
Small size (0.25" X 0.31" X 0.15")	Saves space in dense circuit board layouts.
Excellent power handling, 10 W	Supports a wide range of system power requirements.
Low insertion loss, 1.2 dB typ.	Low insertion loss enables usage in satellite transmitters.

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/MCLStore/terms.jsp



Surface Mount Bandpass Filter

50Ω 1700 to 2200 MHz

SYBP-1950+



Generic photo used for illustration purposes only
CASE STYLE: TT1423

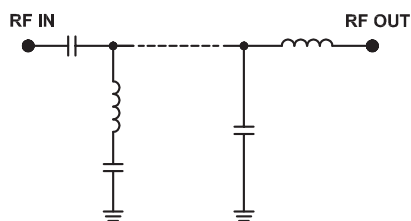
Features

- Excellent power handling
- Small size
- Temperature stable

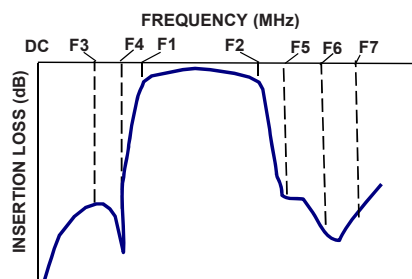
Applications

- Military radio
- Lab use
- Satellite communication

Functional Schematic



Typical Frequency Response



+RoHS Compliant

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

Electrical Specifications at 25°C

Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center frequency	-	-	1950	-	MHz
	Insertion Loss	F1-F2	-	1.2	2.2	dB
	VSWR	F1-F2	-	1.9	-	:1
Stop Band, Lower	Insertion Loss	DC-F3	30	39	-	dB
		F3-F4	20	26	-	dB
	VSWR	DC-F4	-	29	-	:1
Stop Band, Upper	Insertion Loss	F5-F6	20	28	-	dB
		F6-F7	-	20	-	dB
	VSWR	F5-F7	-	23	-	:1

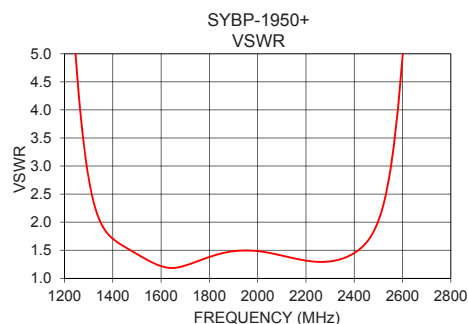
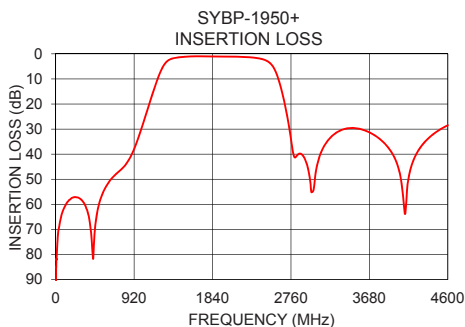
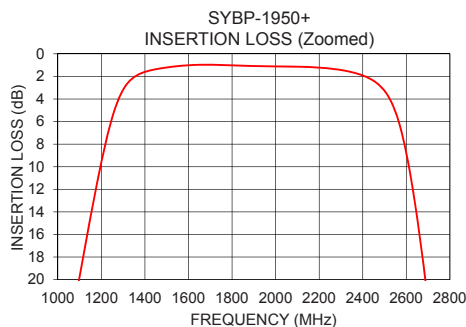
Maximum Ratings

Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power Input*	10 W max. at 25°C

*Passband rating, derate linearly to 3.75 W at 100°C ambient.
Permanent damage may occur if any of these limits are exceeded.

Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
10	81.78	386.31
100	61.33	626.21
200	57.33	686.16
250	57.20	552.76
800	45.00	64.90
880	40.90	51.78
1000	30.40	35.57
1030	27.25	31.55
1090	20.82	23.13
1300	3.18	2.39
1700	0.97	1.35
1950	1.10	1.54
2200	1.22	1.27
2490	3.04	1.50
2690	20.43	6.36
2750	31.68	8.77
2900	40.53	13.34
3000	55.15	14.52
4000	43.40	16.96
4600	28.46	26.27



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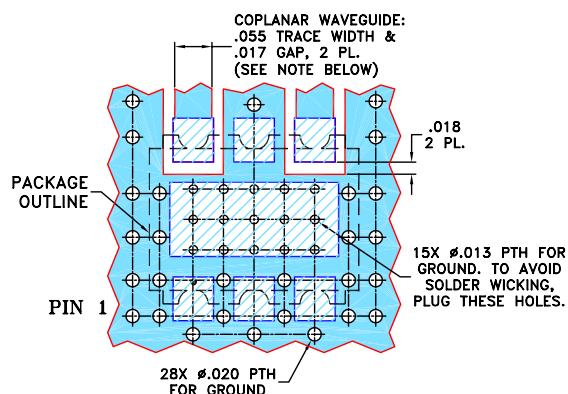


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REV. OR
M175559
SYBP-1950+
EDU3636
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191114
Page 2 of 3

INPUT	4
OUTPUT	6
GROUND	1,2,3,5

SUGGESTED MOUNTING CONFIGURATION
FOR TT1423 CASE STYLE "06FL04" PIN CONNECTION



1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS R04350B WITH THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP 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

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

 METALLIZATION
 SOLDER RESIST

A	B	C	D	E	F	G	H
.25	.31	.15	.090	.040	.065	.060	.065
6.35	7.87	3.81	2.29	1.02	1.65	1.52	1.65
J	K	L	N	Q			wt.
.300	.060	.060	.105	.070			grams
7.62	1.52	1.52	2.67	1.78			0.50

Note: Please refer to case style drawing for details

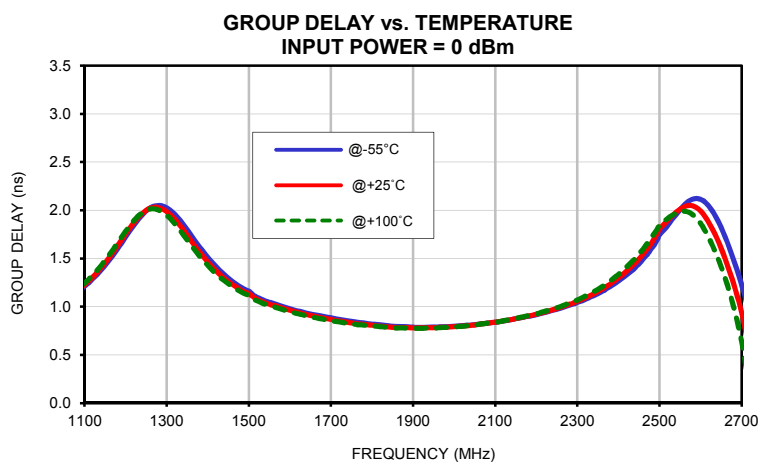
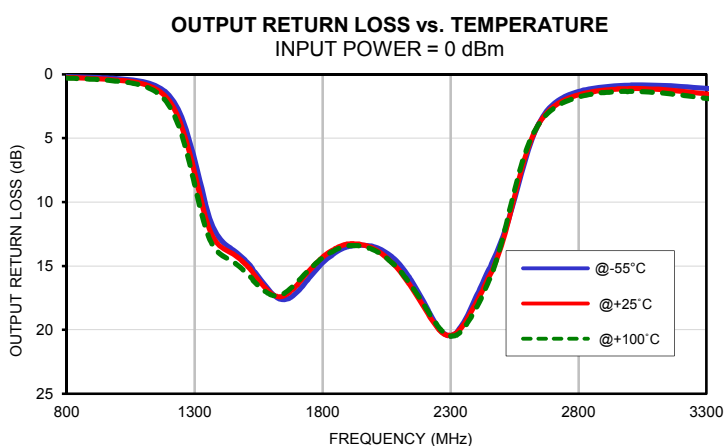
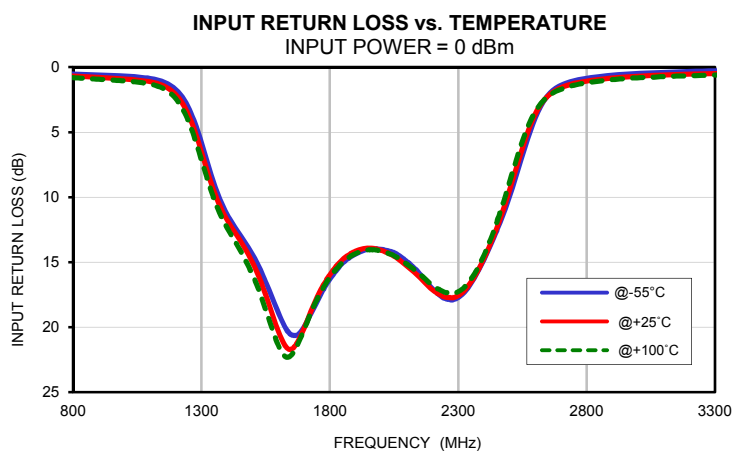
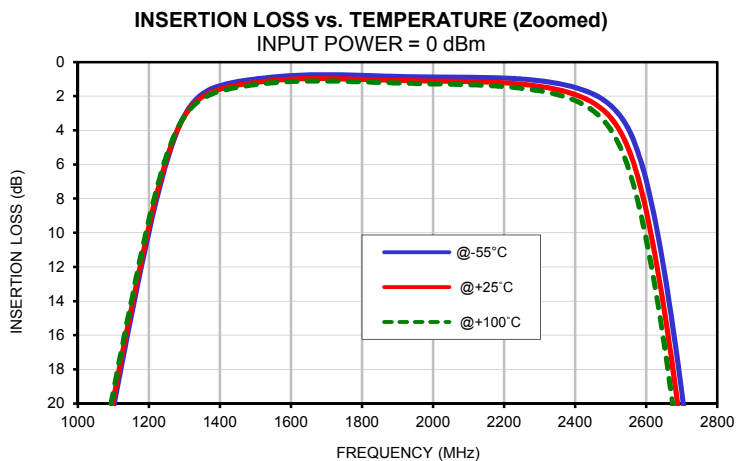
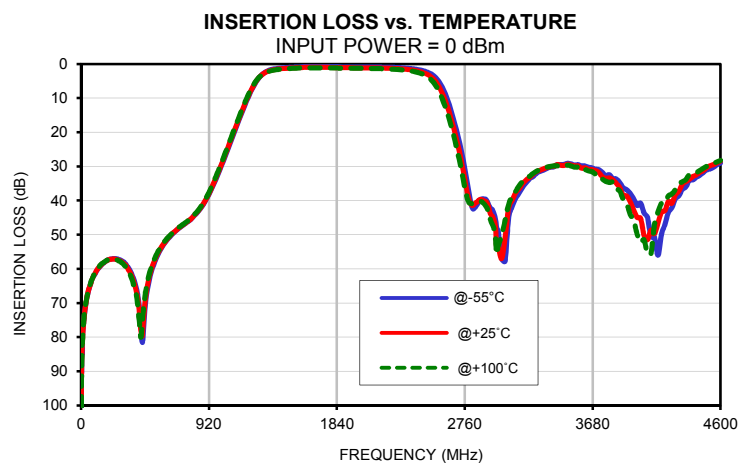
Typical Performance Data

FREQ.	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
(MHz)	(dB)			(dB)			(dB)		
	@-55°C	@+25°C	@+100°C	@-55°C	@+25°C	@+100°C	@-55°C	@+25°C	@+100°C
10	79.07	80.73	81.01	0.05	0.05	0.05	0.05	0.05	0.05
40	68.85	68.83	68.67	0.03	0.04	0.04	0.04	0.04	0.04
50	66.76	66.76	66.84	0.03	0.04	0.04	0.04	0.04	0.04
60	65.47	65.29	65.36	0.03	0.04	0.04	0.04	0.04	0.04
70	64.07	64.28	63.96	0.03	0.04	0.04	0.03	0.04	0.04
80	63.03	62.93	62.91	0.03	0.04	0.04	0.03	0.04	0.04
100	61.54	61.33	61.20	0.02	0.04	0.05	0.02	0.03	0.03
110	60.70	60.51	60.39	0.02	0.04	0.05	0.02	0.03	0.04
120	60.06	59.94	59.83	0.02	0.04	0.05	0.02	0.03	0.03
150	58.65	58.64	58.47	0.02	0.05	0.07	0.01	0.03	0.04
160	58.37	58.27	58.25	0.03	0.06	0.08	0.01	0.03	0.04
200	57.33	57.33	57.33	0.04	0.08	0.10	0.01	0.03	0.04
230	56.99	57.11	57.27	0.06	0.10	0.12	0.01	0.03	0.05
250	57.02	57.23	57.35	0.07	0.12	0.14	0.01	0.04	0.05
280	57.36	57.67	57.78	0.10	0.15	0.17	0.01	0.04	0.06
300	57.82	58.24	58.47	0.11	0.16	0.19	0.02	0.05	0.06
340	59.67	60.28	60.67	0.14	0.20	0.23	0.02	0.05	0.07
360	61.07	61.70	62.39	0.16	0.22	0.25	0.03	0.06	0.08
400	66.21	67.21	68.33	0.19	0.26	0.30	0.03	0.07	0.09
430	75.69	78.38	80.07	0.22	0.30	0.34	0.04	0.08	0.10
450	76.93	74.13	71.12	0.23	0.31	0.36	0.04	0.08	0.11
480	65.28	64.25	63.18	0.26	0.35	0.40	0.05	0.10	0.12
500	61.74	60.99	60.19	0.27	0.37	0.43	0.06	0.11	0.13
550	56.01	55.60	55.15	0.32	0.42	0.49	0.07	0.13	0.15
600	52.50	52.29	51.99	0.36	0.48	0.55	0.09	0.14	0.17
650	50.14	49.93	49.77	0.40	0.53	0.61	0.11	0.17	0.20
700	48.24	48.14	47.93	0.45	0.58	0.68	0.13	0.20	0.23
800	45.09	44.98	44.80	0.53	0.69	0.81	0.18	0.25	0.30
880	41.13	40.94	40.66	0.59	0.77	0.91	0.23	0.31	0.37
1000	30.79	30.39	29.97	0.68	0.90	1.06	0.35	0.46	0.55
1030	27.70	27.27	26.82	0.72	0.95	1.11	0.40	0.52	0.62
1090	21.29	20.85	20.39	0.84	1.09	1.26	0.55	0.71	0.85
1200	9.98	9.62	9.26	1.72	2.10	2.42	1.65	2.07	2.46
1300	3.13	3.17	3.18	5.82	6.52	7.13	6.69	7.74	8.62
1500	0.99	1.19	1.32	14.45	15.07	16.02	14.60	14.89	15.51
1520	0.94	1.14	1.27	15.18	15.92	16.95	15.03	15.32	15.90
1550	0.87	1.08	1.21	16.52	17.50	18.64	15.85	16.12	16.55
1600	0.79	1.00	1.14	18.90	20.32	21.42	17.11	17.17	17.27
1700	0.74	0.96	1.10	19.97	20.04	20.15	17.06	16.49	16.29
1710	0.74	0.96	1.11	19.63	19.57	19.67	16.85	16.26	16.08
1950	0.86	1.10	1.25	14.02	13.92	14.05	13.38	13.33	13.46
1750	0.75	0.98	1.13	18.05	17.70	17.86	15.89	15.31	15.23
1800	0.78	1.01	1.16	16.31	15.98	16.18	14.77	14.32	14.36
1875	0.82	1.06	1.21	14.67	14.42	14.62	13.68	13.41	13.54
1900	0.84	1.08	1.23	14.37	14.14	14.33	13.49	13.28	13.42
1950	0.86	1.10	1.25	14.02	13.92	14.05	13.38	13.33	13.46
2000	0.87	1.11	1.27	14.02	14.09	14.15	13.49	13.66	13.75
2200	0.93	1.21	1.43	17.06	17.14	16.79	18.01	18.37	18.18
2490	2.37	3.02	3.67	10.47	10.06	9.46	13.43	13.93	13.82
2600	6.93	8.72	10.38	3.89	3.61	3.42	6.22	5.96	5.72
2690	17.75	20.27	22.54	1.49	1.66	1.77	2.55	2.75	2.87
2750	28.41	31.49	34.14	1.05	1.26	1.40	1.71	1.96	2.12
2900	39.54	40.04	41.01	0.62	0.83	0.96	0.98	1.23	1.43
3000	48.86	53.48	53.37	0.48	0.69	0.82	0.85	1.12	1.35
3100	41.80	40.00	38.76	0.40	0.61	0.73	0.85	1.16	1.42
3700	30.85	31.18	32.25	0.19	0.41	0.55	1.01	1.44	1.72
4000	41.45	44.94	49.90	0.18	0.37	0.51	0.59	0.98	1.24
4200	46.96	42.94	40.56	0.19	0.39	0.49	0.49	0.84	1.12
4300	38.61	37.28	35.12	0.20	0.38	0.48	0.43	0.76	0.98
4600	29.05	28.41	28.27	0.16	0.36	0.42	0.36	0.67	0.85

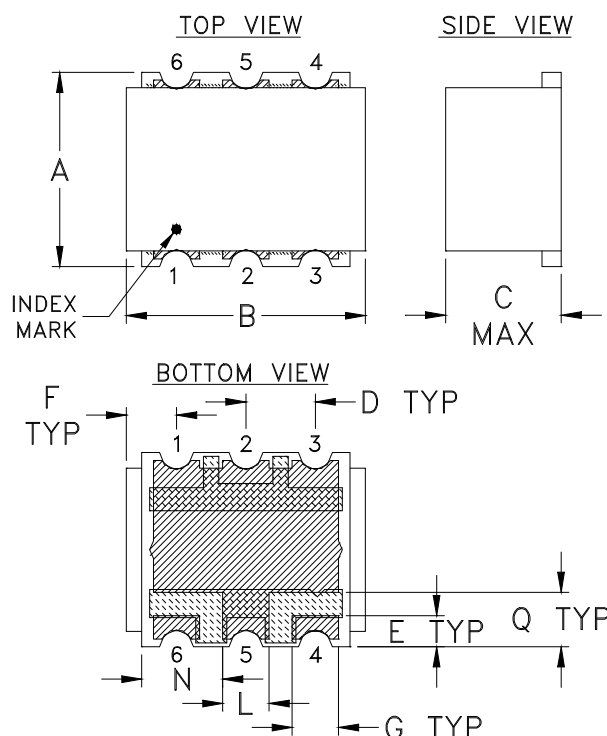
Typical Performance Data

FREQ.	GROUP DELAY		
(MHz)	(nsec)		
	@-55°C	@+25°C	@+100°C
1700	0.88	0.87	0.86
1710	0.87	0.86	0.85
1720	0.87	0.85	0.84
1730	0.86	0.85	0.83
1740	0.85	0.84	0.83
1750	0.85	0.83	0.82
1760	0.84	0.83	0.82
1770	0.84	0.82	0.81
1780	0.83	0.82	0.81
1790	0.82	0.81	0.80
1800	0.82	0.81	0.80
1810	0.82	0.80	0.80
1820	0.81	0.80	0.79
1830	0.81	0.79	0.79
1840	0.80	0.79	0.78
1850	0.80	0.78	0.78
1860	0.79	0.78	0.78
1870	0.80	0.78	0.78
1880	0.79	0.78	0.78
1890	0.79	0.78	0.78
1900	0.79	0.78	0.78
1910	0.79	0.78	0.78
1920	0.79	0.78	0.78
1930	0.79	0.78	0.78
1940	0.79	0.78	0.78
1950	0.79	0.78	0.78
1960	0.79	0.78	0.78
1970	0.79	0.79	0.78
1980	0.79	0.79	0.79
1990	0.79	0.79	0.79
2000	0.80	0.79	0.79
2010	0.80	0.79	0.79
2020	0.80	0.80	0.80
2030	0.81	0.80	0.80
2040	0.81	0.81	0.81
2050	0.81	0.81	0.81
2060	0.82	0.82	0.82
2070	0.82	0.82	0.82
2080	0.83	0.83	0.83
2100	0.84	0.84	0.84
2200	0.92	0.92	0.93

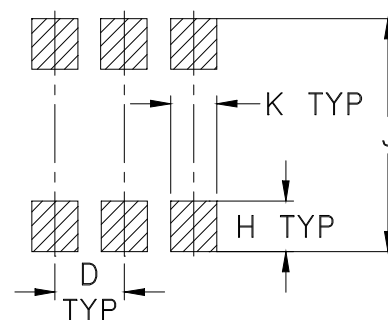
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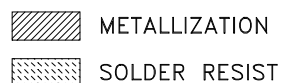
Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within ± 0.002



CASE #	A	B	C	D	E	F	G	H	J	K	L	M
TT1423	.25 (6.35)	.31 (7.87)	.15 (3.81)	.090 (2.29)	.040 (1.02)	.065 (1.65)	.060 (1.52)	.065 (1.65)	.300 (7.62)	.060 (1.52)	.060 (1.52)	- -

CASE #	N	P	Q	WT. GRAM
TT1423	.105 (2.67)	- -	.070 (1.78)	.50

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

Notes:

- Case material: Plastic.
- Terminations: 2-10 μ inch (.05-.25 microns) Gold over 100-300 μ inch (2.54-7.62 microns) Nickel plate.



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

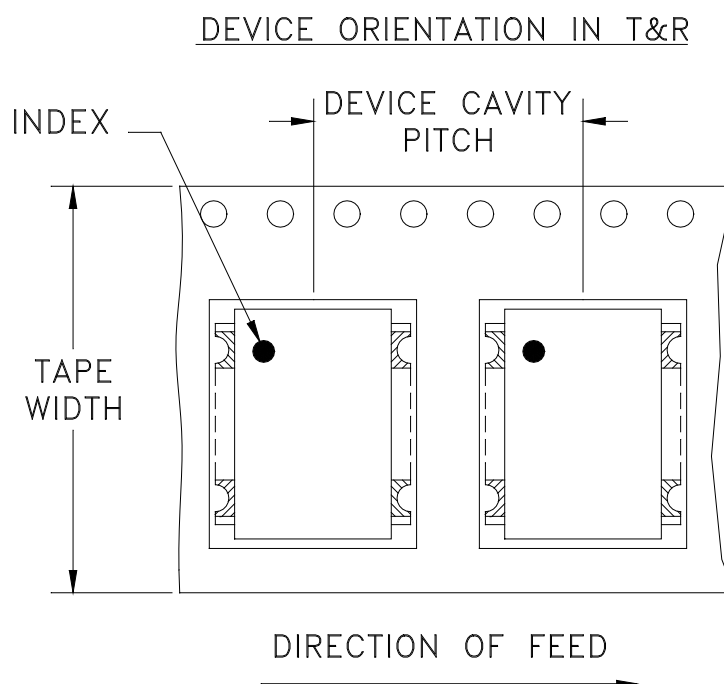


Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS



Tape & Reel Packaging TR-F2



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel See note
16	12	7	10
			20
			50
			100
			200
		13	500
			1000

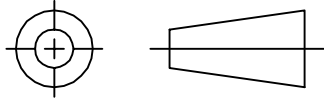
Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

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



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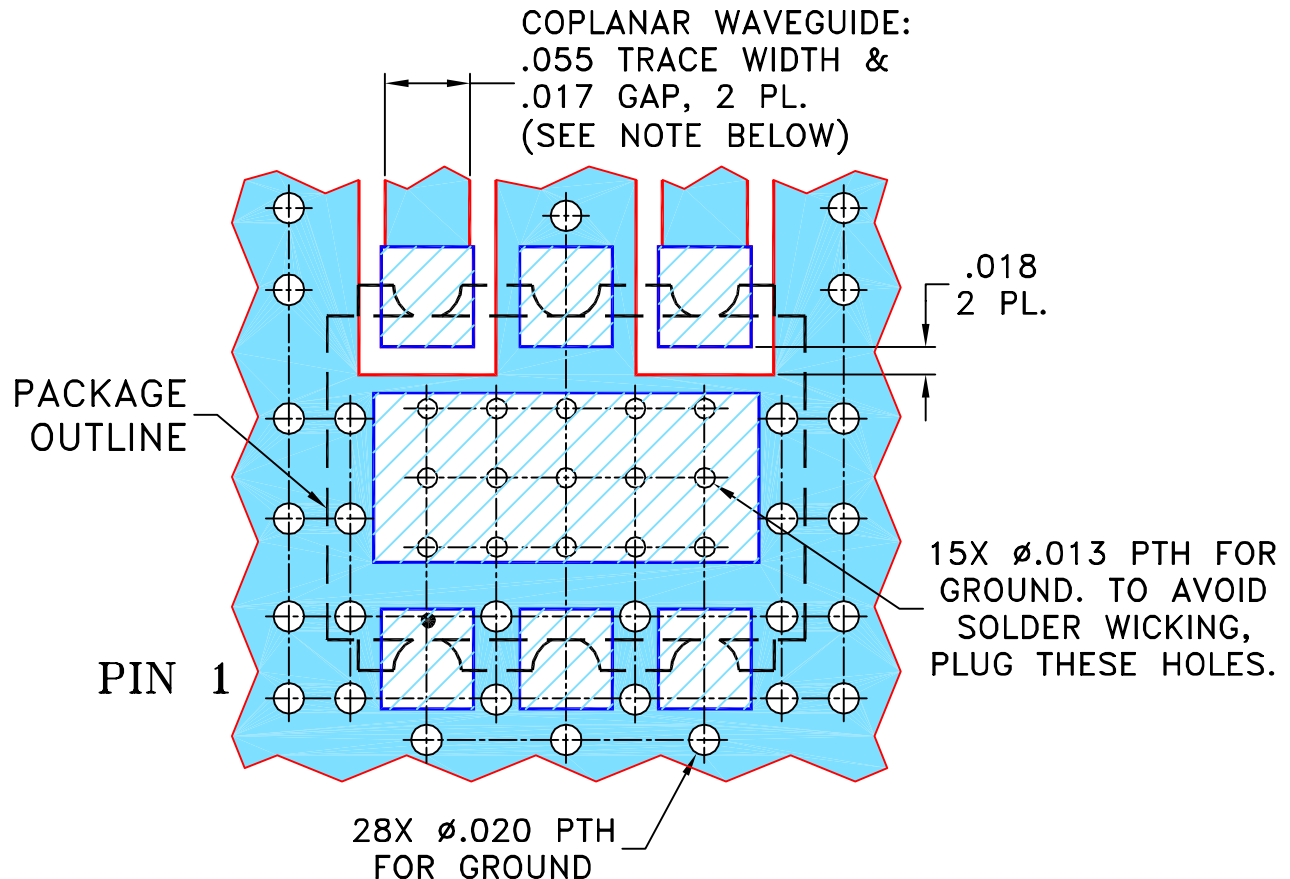
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M123346	NEW RELEASE	07/10/09	AV	DY

SUGGESTED MOUNTING CONFIGURATION FOR TT1423 CASE STYLE "06FL04" PIN CONNECTION

**NOTES:**

1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH THICKNESS .030" $\pm$.002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP 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

TOLERANCES ON:

2 PL DECIMALS $\pm$ 3 PL DECIMALS $\pm$.005ANGLES $\pm$ FRACTIONS $\pm$

DRAWN

AV

06/22/09

CHECKED

IL

07/10/09

APPROVED

DY

07/10/09

**Mini-Circuits®**13 Neptune Avenue
Brooklyn NY 11235

PL, 06FL04, TT1423, SYBP, TB-517+

SIZE
ACODE IDENT
15542

DRAWING NO:

98-PL-308

REV:

OR

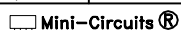
FILE: 98PL308

SCALE:

8:1

SHEET:

1 OF 1



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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