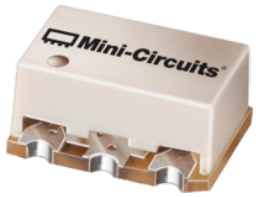
Surface Mount

Bandpass Filter

SYBP-675+

50Ω 500 to 850 MHz



Generic photo used for illustration purposes only

CASE STYLE: TT1423

The Big Deal

- Small size (0.25" X 0.31" X 0.15")
- High power handling, 4 W
- Low insertion loss, 1.8 dB typ.

Product Overview

SYBP-675+ is a 50Ω bandpass filter fabricated using SMT technology. The bandpass filter covers from 500 to 850 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

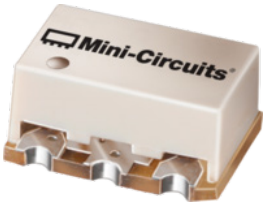
Feature	Advantages
Small size (0.25" X 0.31" X 0.15")	Saves space in dense circuit board layouts.
High power handling, 4 W	Supports a wide range of system power requirements.
Low insertion loss, 1.8 dB typ.	Low insertion loss enables usage in military radio transmitters.

Surface Mount

Bandpass Filter

50Ω 500 to 850 MHz

SYBP-675+



Generic photo used for illustration purposes only
CASE STYLE: TT1423

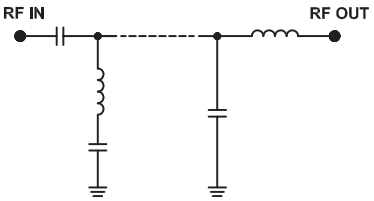
Features

- High power handling
- Small size
- Temperature stable

Applications

- Military radio
- Lab use
- Television broadcast

Functional Schematic



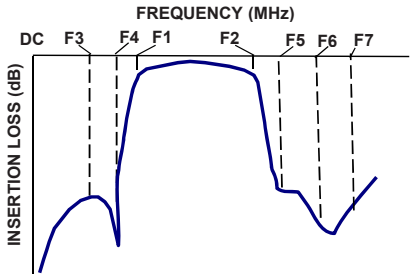
Electrical Specifications at 25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	-	-	-	675	-	MHz
	Insertion Loss	F1-F2	500 - 850	-	1.8	2.8	dB
	VSWR	F1-F2	500 - 850	-	1.7	-	:1
Stop Band, Lower	Insertion Loss	DC-F3	DC - 230	40	52	-	dB
		F3-F4	230 - 340	20	28	-	dB
	VSWR	DC-F4	DC - 340	-	16	-	:1
Stop Band, Upper	Insertion Loss	F5-F6	1275 - 1350	20	35	-	dB
		F6-F7	1350 - 4500	-	22	-	dB
	VSWR	F5-F7	1275 - 4500	-	14	-	:1

Maximum Ratings	
Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 100°C
RF Power Input*	4 W max. at 25°C

*Passband rating, derate linearly to 1.5 W at 100°C ambient.
Permanent damage may occur if any of these limits are exceeded.

Typical Frequency Response

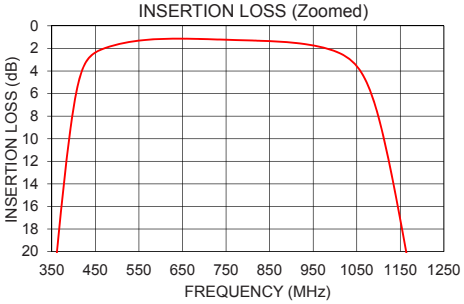


+RoHS Compliant
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

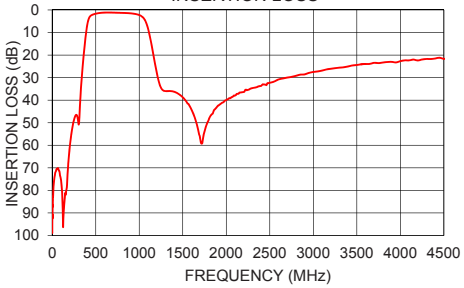
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
10	82.87	327.07
100	75.08	258.89
230	52.50	58.98
340	29.70	19.33
360	20.76	14.03
430	3.11	1.82
500	1.65	1.38
675	1.15	1.28
850	1.35	1.27
1040	3.16	1.53
1165	20.33	10.76
1215	30.22	14.88
1275	35.67	17.20
1350	35.93	17.57
1400	36.24	16.63
2000	39.94	24.39
2700	29.98	90.27
3000	27.50	111.35
4000	22.71	17.93
4500	21.67	54.04

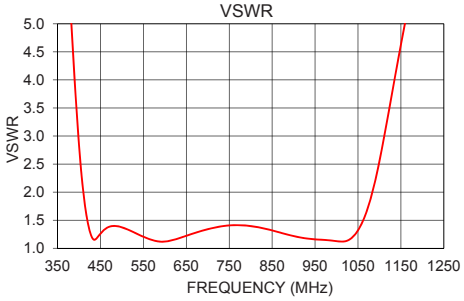
SYBP-675+
INSERTION LOSS (Zoomed)



SYBP-675+
INSERTION LOSS



SYBP-675+
VSWR



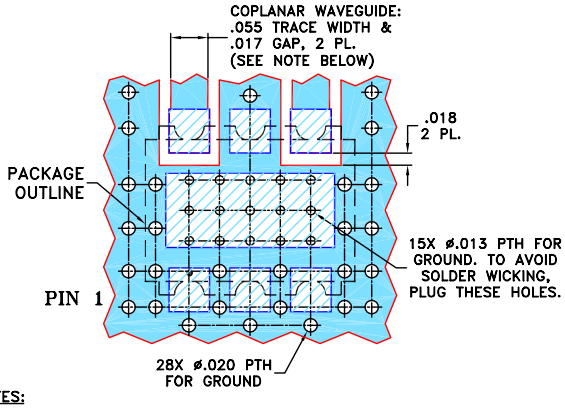
Notes
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's 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

Pad Connections

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

Demo Board MCL P/N: TB-1122+
Suggested PCB Layout (PL-308)

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

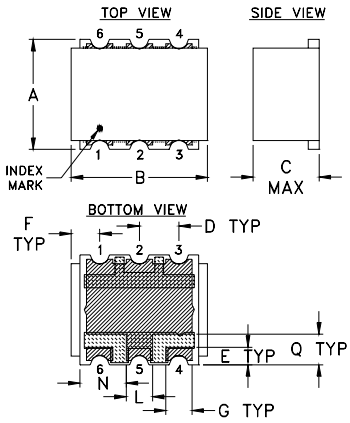


NOTES:
1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH THICKNESS .030" ± .002"; COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH AND GAP MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

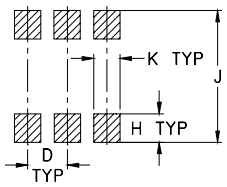
DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

Outline Drawing



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

METALLIZATION
SOLDER RESIST

Outline Dimensions (inch / mm)

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

Surface Mount Band Pass Filter SYBP-675+

Typical Performance Data

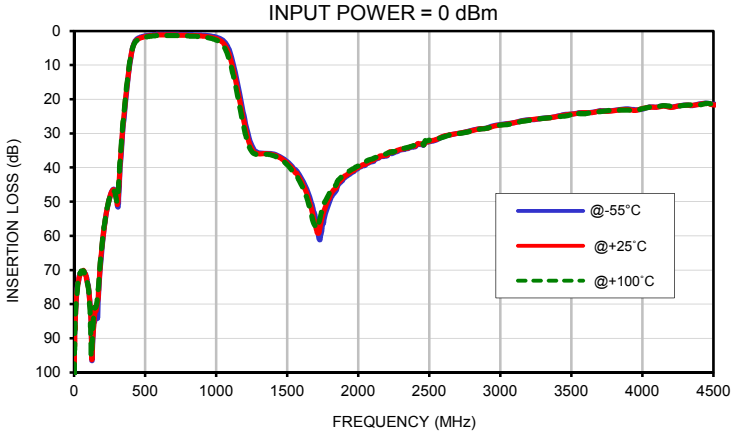
FREQ.	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
(MHz)	(dB)			(dB)			(dB)		
	@-55°C	@+25°C	@+100°C	@-55°C	@+25°C	@+100°C	@-55°C	@+25°C	@+100°C
10	82.30	82.87	81.74	0.05	0.05	0.05	0.05	0.05	0.05
40	71.32	71.68	70.97	0.05	0.06	0.06	0.04	0.05	0.05
50	70.59	70.54	70.33	0.06	0.07	0.08	0.04	0.05	0.05
60	70.46	70.49	70.41	0.07	0.08	0.09	0.04	0.05	0.05
70	70.43	70.40	70.65	0.08	0.10	0.11	0.04	0.05	0.06
80	71.15	71.27	71.76	0.10	0.12	0.14	0.04	0.05	0.06
100	74.45	75.08	75.32	0.14	0.18	0.21	0.05	0.07	0.07
110	78.72	79.24	80.83	0.17	0.22	0.25	0.06	0.08	0.09
120	84.74	87.02	95.16	0.21	0.26	0.30	0.06	0.09	0.10
150	82.64	81.12	81.08	0.33	0.40	0.45	0.09	0.12	0.14
160	84.03	80.36	79.54	0.38	0.45	0.51	0.10	0.14	0.16
200	61.92	61.44	61.07	0.58	0.68	0.75	0.17	0.22	0.25
230	52.68	52.50	52.38	0.74	0.87	0.96	0.23	0.29	0.33
250	48.82	48.78	48.73	0.85	1.00	1.11	0.29	0.36	0.41
280	46.35	46.56	46.80	1.00	1.22	1.38	0.39	0.48	0.54
300	49.46	49.83	49.88	1.12	1.37	1.57	0.48	0.58	0.65
340	30.85	29.70	28.73	1.45	1.81	2.13	0.73	0.90	1.03
360	21.61	20.76	20.01	1.81	2.25	2.67	0.99	1.24	1.44
400	7.48	7.24	7.04	5.18	6.36	7.45	3.46	4.22	4.88
430	2.86	3.11	3.28	17.48	20.89	24.16	10.04	10.76	11.33
450	2.08	2.36	2.55	18.41	18.80	19.21	12.62	12.89	13.25
480	1.62	1.87	2.04	15.26	15.61	16.07	13.93	14.31	14.81
500	1.42	1.65	1.82	15.68	16.06	16.51	15.37	15.92	16.57
600	0.96	1.16	1.32	25.71	25.06	24.10	33.02	31.20	28.85
650	0.93	1.13	1.30	20.50	20.02	19.07	21.08	20.48	19.53
675	0.94	1.15	1.32	18.44	18.09	17.29	18.71	18.33	17.58
700	0.96	1.17	1.34	17.04	16.78	16.11	17.23	16.98	16.39
750	1.01	1.23	1.40	15.59	15.45	15.12	15.81	15.77	15.56
800	1.06	1.28	1.46	15.63	15.65	15.73	16.00	16.22	16.52
850	1.11	1.35	1.54	17.11	17.26	17.80	17.91	18.48	19.53
900	1.20	1.48	1.70	20.17	20.19	20.95	22.44	23.44	25.66
950	1.39	1.74	2.03	23.02	22.65	23.11	25.48	25.26	24.77
1000	1.79	2.24	2.66	23.75	24.53	26.01	20.19	19.45	18.49
1040	2.49	3.16	3.83	20.22	20.17	18.70	14.51	13.53	12.27
1080	4.47	5.67	6.89	10.79	10.18	9.58	7.55	6.86	6.16
1165	18.38	20.33	22.17	3.03	3.37	3.65	1.48	1.62	1.72
1200	25.70	27.53	29.22	2.31	2.67	2.93	1.08	1.25	1.39
1215	28.55	30.22	31.72	2.10	2.44	2.69	0.99	1.17	1.31
1250	33.48	34.51	35.31	1.71	2.02	2.22	0.86	1.05	1.20
1275	35.15	35.67	36.07	1.49	1.78	1.96	0.82	1.01	1.17
1350	35.78	35.93	36.08	1.06	1.28	1.43	0.76	0.99	1.17
1400	36.01	36.24	36.46	0.87	1.06	1.19	0.79	1.05	1.25
1500	38.25	38.72	39.21	0.64	0.79	0.89	0.91	1.23	1.46
1600	43.19	44.12	45.07	0.49	0.61	0.69	1.02	1.39	1.61
1700	55.20	57.07	57.66	0.39	0.50	0.57	1.01	1.34	1.54
1800	49.81	48.49	47.24	0.32	0.42	0.49	0.88	1.14	1.31
1900	43.17	42.62	42.09	0.24	0.34	0.41	0.69	0.91	1.04
2000	40.15	39.94	39.52	0.20	0.30	0.37	0.53	0.71	0.83
2100	38.20	37.94	37.49	0.16	0.27	0.33	0.39	0.56	0.66
2200	36.62	36.36	35.88	0.11	0.22	0.30	0.29	0.45	0.53
2300	34.86	34.64	34.60	0.08	0.20	0.28	0.20	0.35	0.44
2400	33.92	33.67	33.42	0.06	0.18	0.26	0.15	0.30	0.38
2500	32.47	32.28	31.95	0.04	0.17	0.26	0.14	0.29	0.35
3000	27.42	27.50	27.57	0.04	0.17	0.27	0.00	0.16	0.25
3100	26.80	26.89	26.90	0.04	0.18	0.27	0.00	0.16	0.25
3500	24.33	24.41	24.52	0.09	0.23	0.30	0.02	0.18	0.27
4000	22.92	22.71	22.74	0.13	0.25	0.30	1.40	0.97	0.78
4200	22.32	22.38	22.04	0.14	0.27	0.34	0.12	0.27	0.37
4300	21.69	21.72	21.78	0.12	0.26	0.32	0.09	0.27	0.35
4500	21.50	21.67	21.54	0.14	0.27	0.35	0.16	0.32	0.41

Typical Performance Data

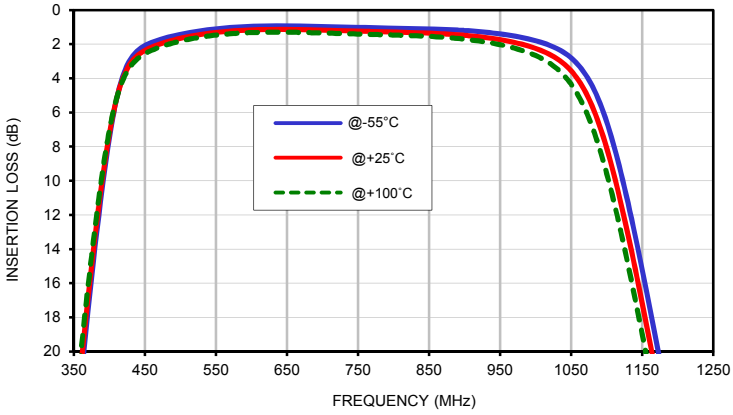
FREQ. (MHz)	GROUP DELAY (nsec)		
	@-55°C	@+25°C	@+100°C
500	2.74	2.69	2.65
508	2.63	2.58	2.54
516	2.53	2.48	2.45
524	2.43	2.40	2.36
532	2.35	2.32	2.29
540	2.27	2.24	2.21
548	2.20	2.17	2.14
556	2.14	2.11	2.09
564	2.08	2.05	2.03
572	2.03	2.01	1.99
580	1.98	1.96	1.94
588	1.93	1.91	1.89
596	1.89	1.87	1.85
604	1.85	1.83	1.81
612	1.81	1.80	1.78
620	1.79	1.77	1.76
628	1.76	1.74	1.73
636	1.72	1.71	1.70
644	1.70	1.68	1.67
652	1.67	1.65	1.64
660	1.65	1.64	1.63
668	1.63	1.62	1.61
675	1.62	1.61	1.60
684	1.60	1.59	1.58
692	1.58	1.57	1.56
700	1.56	1.55	1.54
708	1.55	1.54	1.54
716	1.55	1.54	1.53
724	1.54	1.53	1.52
732	1.53	1.52	1.52
740	1.52	1.52	1.51
748	1.52	1.51	1.51
756	1.51	1.51	1.51
764	1.52	1.52	1.52
772	1.52	1.52	1.52
780	1.52	1.52	1.52
788	1.52	1.52	1.53
796	1.52	1.53	1.53
804	1.53	1.54	1.54
812	1.55	1.55	1.56
850	1.61	1.62	1.64

Typical Performance Curves

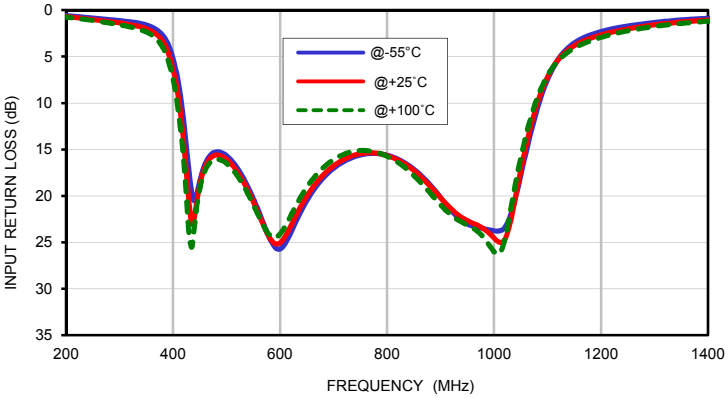
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



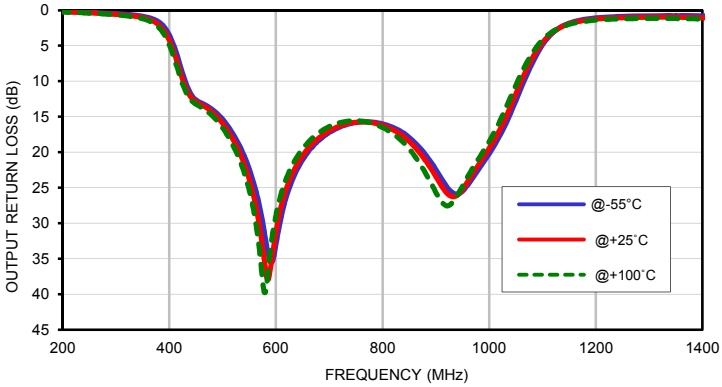
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



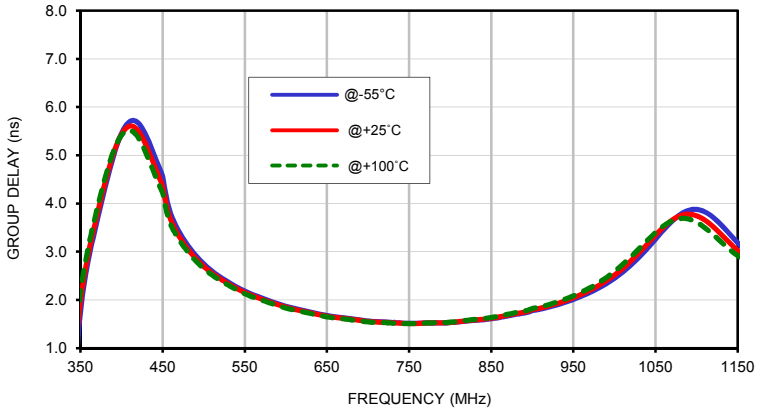
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



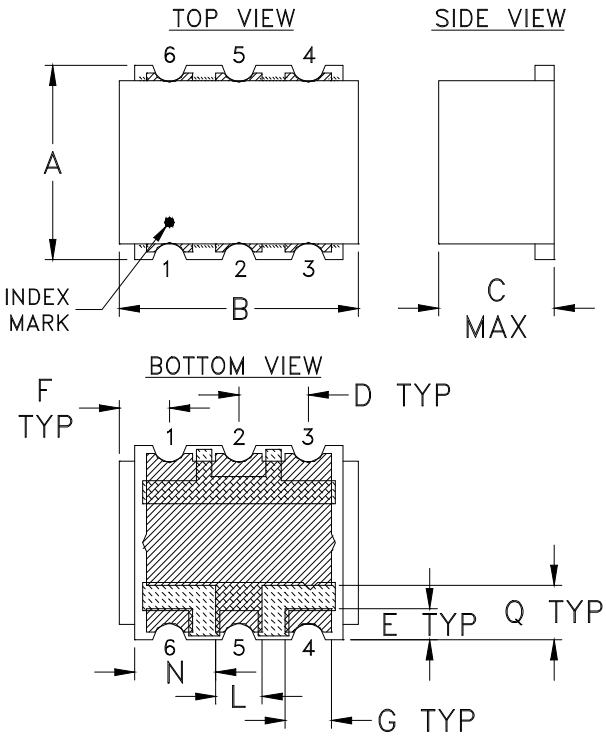
GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm



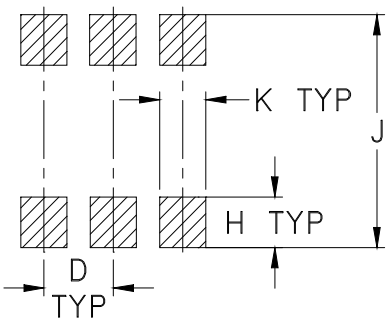
Case Style TT

TT1423

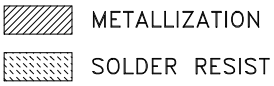
Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.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)	- -

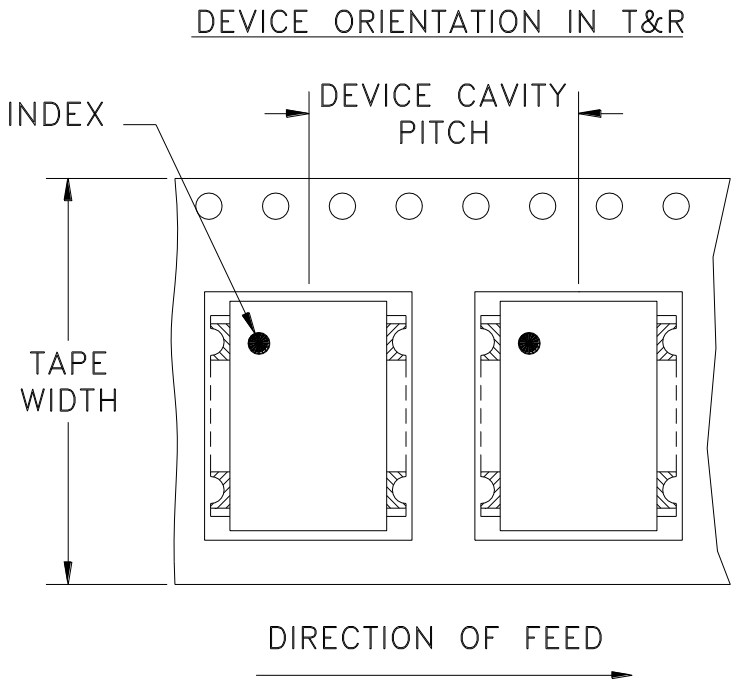
CASE #	N	P	Q	WT. GRAM
TT1423	.105 (2.67)	- -	.070 (1.78)	.50

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

Notes:

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

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

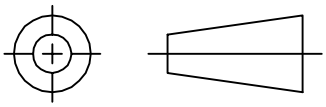
Note: Please consult individual model data sheet to determine device per reel availability

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

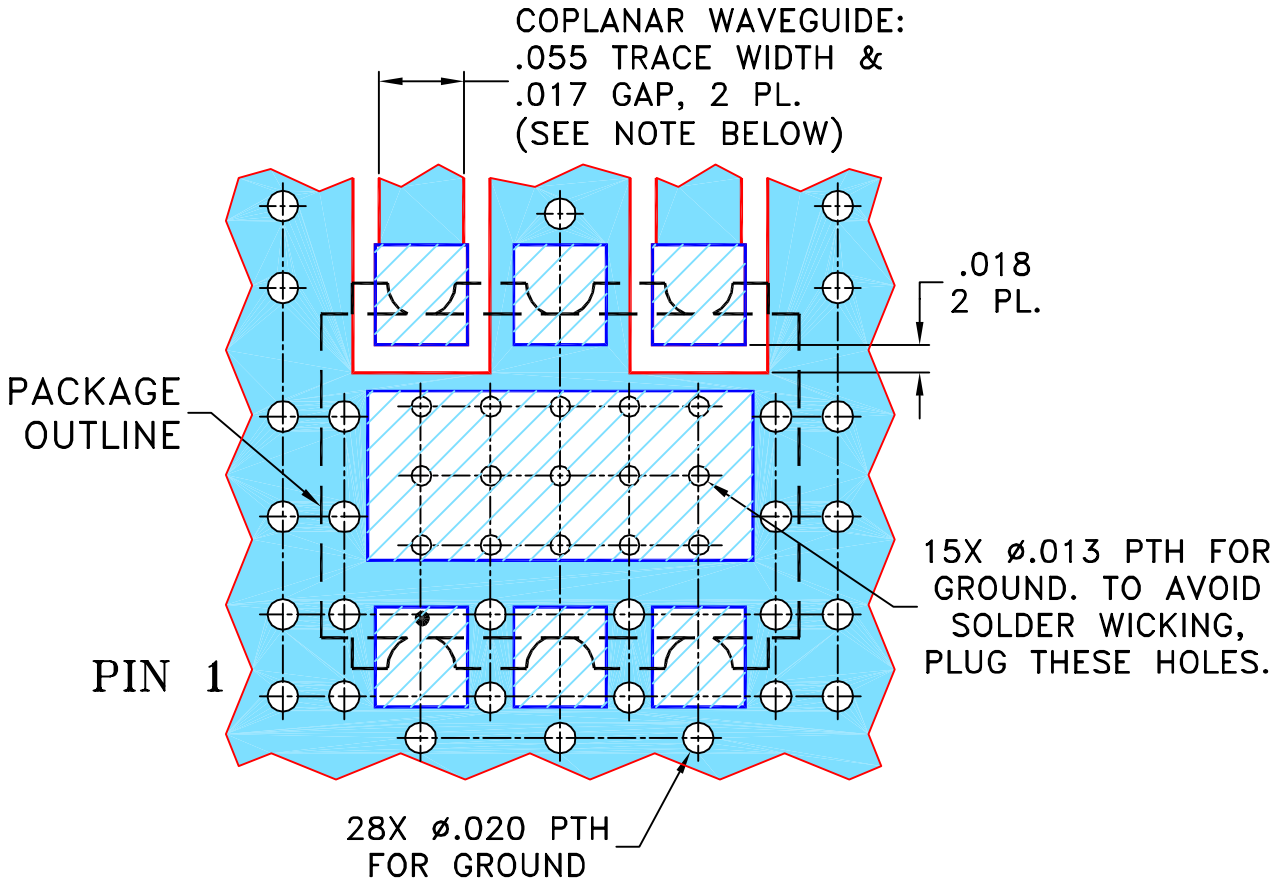
Mini-Circuits®
INTERNET http://www.minicircuits.com
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661
Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010
Mini-Circuits ISO 9001 & ISO 14001 Certified

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" ± .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	DRAWN	AV	06/22/09
TOLERANCES ON:	CHECKED	IL	07/10/09
2 PL DECIMALS ±	APPROVED	DY	07/10/09
3 PL DECIMALS ± .005			
ANGLES ±			
FRACTIONS ±			

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

Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

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

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-308	OR
FILE: 98PL308	SCALE: 8:1	SHEET: 1 OF 1	

Mini-Circuits

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