

Surface Mount

Bandpass Filter

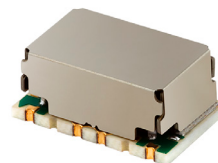
BPF-AS1600-75+

75Ω

950 to 2250 MHz

The Big Deal

- Wide bandwidth
- Low insertion loss
- Miniature shielded package



Generic photo used for illustration purposes only

CASE STYLE: TK2678

Product Overview

The BPF-AS1600-75+ is a 75Ω band pass filter fabricated using SMT technology centered at 1600 MHz. The band-pass filter is designed in a very small (0.433" x 0.276" x 0.197") shielded package that covers 1600 MHz ± 650 MHz bandwidth. They use high Q capacitors and inductors for low insertion loss and has consistent performance across temperature & repeatable performance across lots.

Key Features

Feature	Advantages
Low insertion loss	Can be used in high performance applications like L-band satellite communication systems.
Small form factor	This filter can be used in dense layout applications.
Shielded case	Reduced interference with and from the surrounding components.

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.

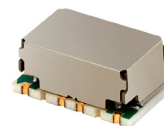
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp



Surface Mount Bandpass Filter

75Ω 950 to 2250 MHz

BPF-AS1600-75+



Features

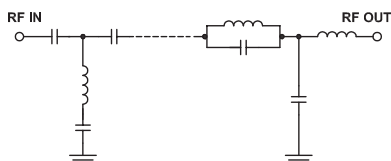
- Wide bandwidth
- Low passband IL
- Miniature shielded package

Generic photo used for illustration purposes only
CASE STYLE:TK2678

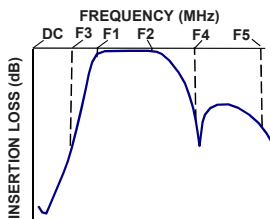
Applications

- L-Band satellite applications
- Telecommunication & broadband wireless system
- Base station controllers
- Weather instruments / Radar networks

Functional Schematic



Typical Frequency Response



Electrical Specifications at 25°C

Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Center Frequency	—	—	1600	—	MHz
	Insertion Loss	F1-F2	—	1.0	1.6	dB
	VSWR	F1-F2	—	1.6	2.0	:1
Stop Band, Lower	Insertion Loss	DC-F3	20	30	—	dB
	VSWR	DC-F3	—	30	—	:1
Stop Band, Upper	Insertion Loss	F4-F5	16	20	—	dB
	VSWR	F4-F5	—	10	—	:1

Maximum Ratings

Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	1 W

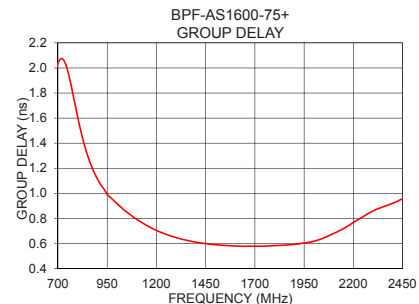
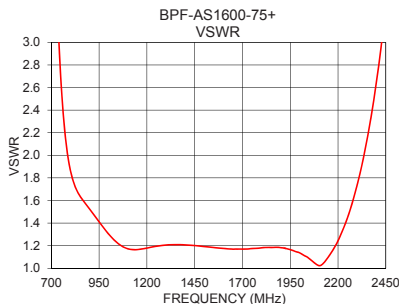
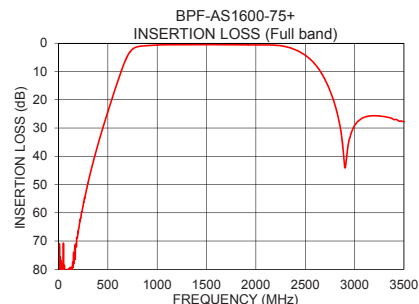
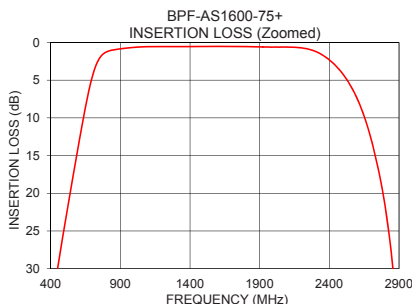
Permanent damage may occur if any of these limits are exceeded.

Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
10	70.96	354.40	950	0.99
250	57.52	356.60	1000	0.92
448	30.12	83.21	1050	0.85
480	26.49	66.98	1100	0.79
538	20.14	44.08	1150	0.74
650	8.53	12.06	1200	0.70
724	3.07	3.69	1250	0.67
950	0.74	1.41	1300	0.65
1600	0.53	1.18	1350	0.63
2250	0.89	1.45	1450	0.60
2445	3.07	3.25	1450	0.60
2650	9.81	8.71	1500	0.59
2700	12.85	9.80	1550	0.58
2790	20.57	10.75	1600	0.58
2840	27.14	10.94	1700	0.58
2860	30.80	11.14	1800	0.58
3000	29.14	14.13	1900	0.59
3200	25.64	23.45	2000	0.62
3400	27.04	27.90	2100	0.68
3500	27.85	26.90	2250	0.81

+RoHS Compliant

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



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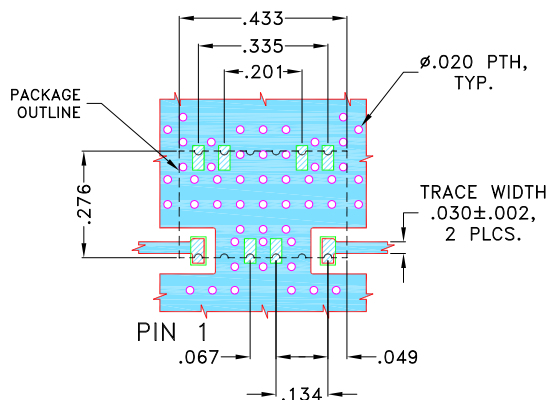


Pad Connections

RF IN	1
RF OUT	6
GROUND	3,4,7,8,11,12
NOT CONNECTED	2,5,9,10

Demo Board MCL P/N: TB-1072+
Suggested PCB Layout (PL-599)

SUGGESTED MOUNTING CONFIGURATION FOR
TK2678 CASE STYLE "12FL04" PIN CODE

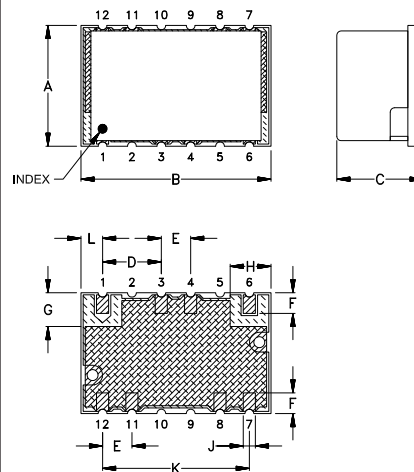


NOTES:

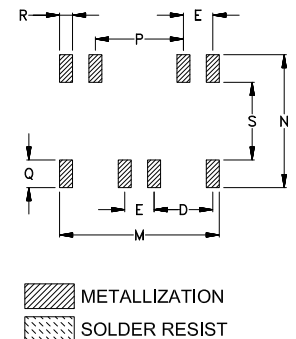
1. TRACE WIDTH IS SHOWN FOR ROGERS(R04350B) WITH DIELECTRIC THICKNESS .030"±.002". COPPER: 1/2 Oz EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

-  DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)
-  DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

Outline Drawing



PCB LAND PATTERN



-  METALLIZATION
-  SOLDER RESIST

Outline Dimensions (inch mm)

A	B	C	D	E	F	G	H	J	K
.276	.433	.197	.134	.067	.047	.077	.093	.028	.335
7.01	11.00	5.00	3.40	1.70	1.19	1.96	2.36	0.71	8.51
L	M	N	P	Q	R	S			Wt.
.049	.364	.303	.201	.063	.030	.177			grams
1.24	9.25	7.67	5.11	1.60	0.76	4.50			0.6

Note: Please refer to case style drawing for details

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Band Pass Filter

BPF-AS1600-75+

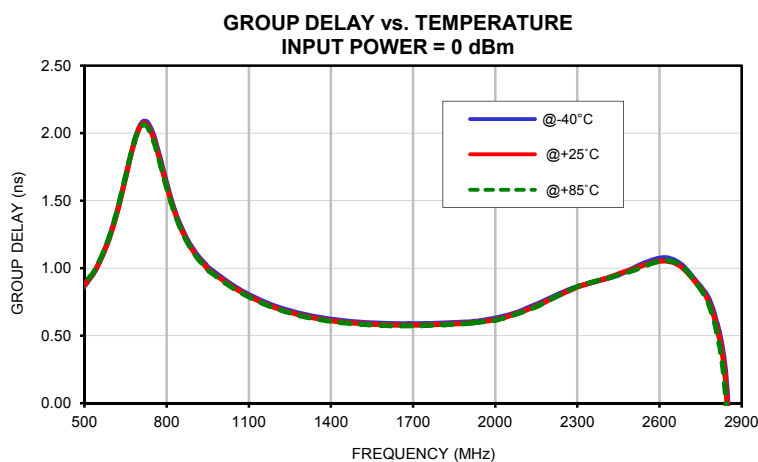
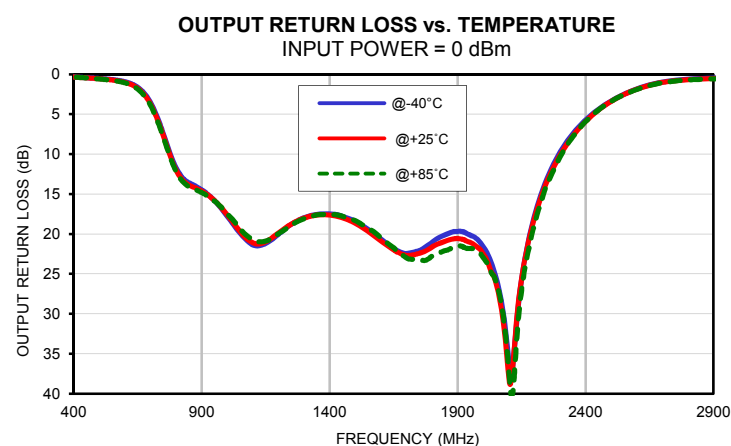
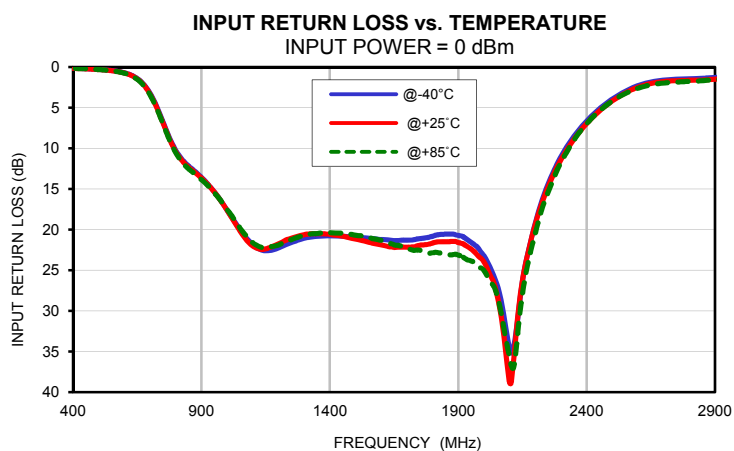
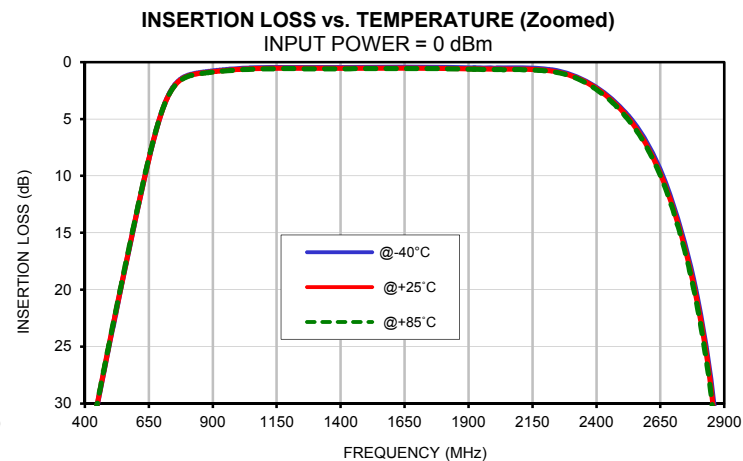
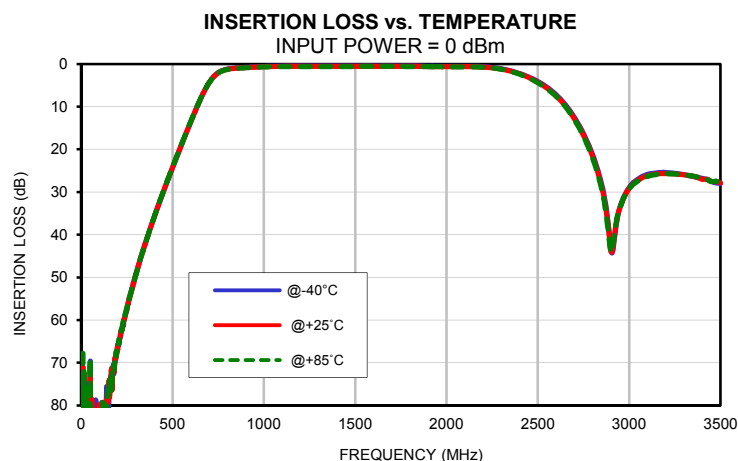
Typical Performance Data

FREQ.	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
(MHz)	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
10	73.81	70.96	67.79	0.05	0.05	0.06	0.05	0.05	0.05
50	69.99	70.92	69.41	0.04	0.04	0.04	0.04	0.05	0.05
100	80.27	80.30	92.98	0.03	0.03	0.04	0.03	0.04	0.04
150	83.26	77.86	75.51	0.02	0.03	0.03	0.03	0.04	0.04
200	65.75	67.03	66.58	0.02	0.04	0.04	0.06	0.06	0.07
250	57.78	57.52	57.25	0.03	0.05	0.05	0.12	0.11	0.12
300	49.06	49.46	49.27	0.05	0.07	0.07	0.18	0.18	0.18
350	42.06	42.30	42.31	0.08	0.11	0.10	0.26	0.26	0.25
400	35.85	35.83	35.84	0.13	0.15	0.14	0.34	0.35	0.35
450	29.98	29.91	29.84	0.19	0.21	0.20	0.43	0.45	0.46
480	26.58	26.49	26.42	0.23	0.26	0.26	0.48	0.52	0.54
500	24.37	24.27	24.19	0.27	0.30	0.29	0.53	0.56	0.59
540	19.99	19.92	19.82	0.38	0.40	0.40	0.63	0.69	0.72
550	18.91	18.85	18.75	0.41	0.44	0.44	0.67	0.72	0.76
600	13.58	13.55	13.45	0.69	0.72	0.74	0.93	1.01	1.07
720	3.24	3.27	3.27	4.44	4.55	4.68	4.84	5.08	5.25
800	1.19	1.25	1.29	10.25	10.40	10.53	11.71	11.98	12.14
850	0.92	0.98	1.02	12.16	12.32	12.51	13.58	13.87	14.09
900	0.78	0.85	0.88	13.56	13.65	13.84	14.46	14.62	14.82
950	0.67	0.74	0.77	15.35	15.36	15.45	15.82	15.80	15.87
1000	0.58	0.65	0.69	17.60	17.64	17.51	17.76	17.61	17.48
1050	0.52	0.59	0.63	19.96	20.15	19.79	19.89	19.70	19.35
1100	0.49	0.56	0.60	21.84	22.01	21.61	21.37	21.11	20.74
1200	0.48	0.55	0.58	22.23	21.74	21.89	20.03	19.89	19.97
1300	0.48	0.55	0.59	21.07	20.61	20.71	17.97	18.00	18.10
1400	0.48	0.55	0.59	20.74	20.58	20.37	17.49	17.63	17.55
1500	0.47	0.54	0.58	20.92	21.16	20.68	18.40	18.66	18.33
1600	0.46	0.53	0.57	21.19	21.86	21.30	20.63	20.85	20.46
1700	0.46	0.53	0.57	21.30	22.14	22.24	22.44	22.67	22.98
1800	0.48	0.55	0.59	20.80	21.64	22.84	21.07	21.64	22.78
1900	0.51	0.59	0.63	20.69	21.58	23.13	19.68	20.59	21.51
2000	0.53	0.61	0.66	23.21	23.96	25.04	21.56	22.46	22.93
2100	0.52	0.61	0.66	34.69	38.85	35.78	36.04	37.95	37.10
2200	0.62	0.72	0.76	19.15	19.30	20.44	17.80	18.02	18.84
2250	0.79	0.89	0.93	14.38	14.73	15.38	13.04	13.38	13.79
2400	2.23	2.32	2.41	6.63	6.93	6.95	5.71	5.91	5.92
2450	3.06	3.17	3.29	5.12	5.39	5.37	4.40	4.49	4.48
2500	4.10	4.26	4.41	3.93	4.16	4.16	3.35	3.40	3.40
2550	5.43	5.66	5.81	2.99	3.18	3.25	2.52	2.54	2.55
2600	7.18	7.46	7.61	2.28	2.47	2.59	1.84	1.88	1.90
2700	12.52	12.85	13.05	1.60	1.78	1.97	0.98	1.03	1.06
2800	21.27	21.72	22.14	1.43	1.61	1.75	0.62	0.68	0.72
2850	28.30	28.93	29.54	1.37	1.58	1.67	0.53	0.60	0.63
2860	30.15	30.80	31.52	1.35	1.56	1.65	0.52	0.58	0.62
2890	39.16	40.19	41.12	1.30	1.51	1.57	0.48	0.54	0.59
2900	43.23	43.90	44.12	1.27	1.49	1.55	0.47	0.53	0.57
2950	33.40	33.67	33.52	1.16	1.38	1.42	0.42	0.49	0.54
3000	28.93	29.14	29.28	1.02	1.23	1.27	0.37	0.44	0.48
3050	26.94	27.23	27.37	0.89	1.10	1.14	0.33	0.41	0.46
3100	25.89	26.19	26.34	0.77	0.96	1.01	0.30	0.38	0.43
3150	25.52	25.76	25.86	0.67	0.84	0.89	0.27	0.35	0.40
3200	25.40	25.64	25.69	0.59	0.74	0.81	0.25	0.34	0.39
3250	25.62	25.73	25.76	0.55	0.68	0.76	0.25	0.34	0.39
3300	25.86	25.94	25.92	0.51	0.63	0.72	0.24	0.33	0.38
3350	26.34	26.31	26.26	0.50	0.62	0.73	0.25	0.35	0.41
3400	26.81	27.04	26.96	0.52	0.62	0.73	0.26	0.36	0.42
3425	27.03	27.01	27.02	0.51	0.61	0.71	0.26	0.37	0.43
3450	27.51	27.55	27.56	0.51	0.61	0.71	0.27	0.38	0.43
3475	27.82	27.54	27.48	0.53	0.63	0.73	0.29	0.39	0.45
3500	28.04	27.85	27.86	0.53	0.65	0.76	0.29	0.39	0.46

Typical Performance Data

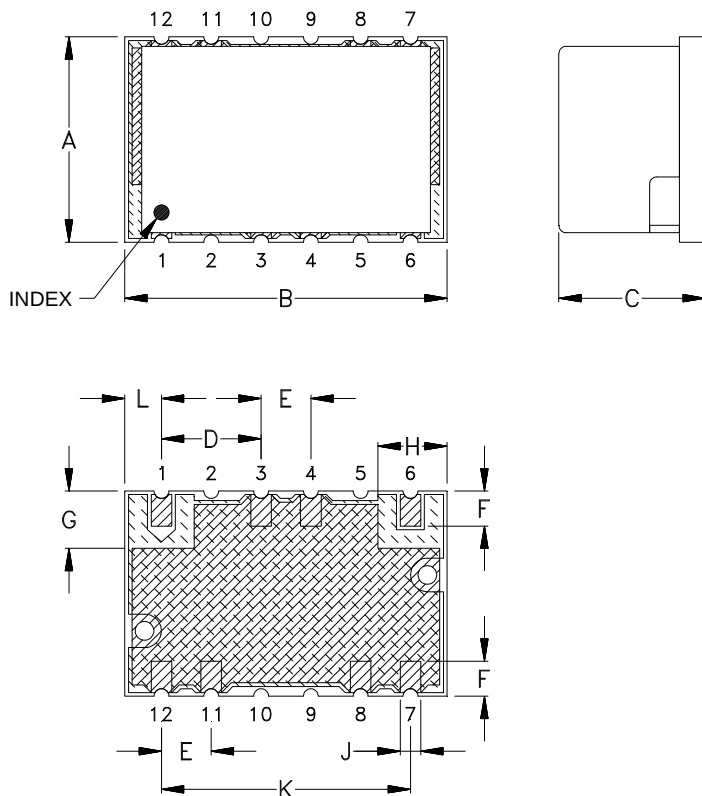
FREQ.	GROUP DELAY		
(MHz)	(nsec)		
	@-40°C	@+25°C	@+85°C
950	1.01	0.99	0.98
975	0.97	0.95	0.95
1000	0.93	0.92	0.91
1025	0.89	0.88	0.87
1050	0.86	0.85	0.84
1075	0.83	0.82	0.81
1100	0.80	0.79	0.79
1125	0.78	0.77	0.76
1150	0.76	0.74	0.74
1175	0.73	0.72	0.72
1200	0.72	0.70	0.70
1225	0.70	0.69	0.68
1250	0.68	0.67	0.67
1275	0.67	0.66	0.65
1300	0.66	0.65	0.64
1325	0.65	0.64	0.63
1350	0.64	0.63	0.62
1375	0.63	0.62	0.61
1400	0.62	0.61	0.61
1425	0.61	0.60	0.60
1450	0.61	0.60	0.59
1475	0.60	0.59	0.59
1500	0.60	0.59	0.58
1525	0.60	0.59	0.58
1550	0.59	0.58	0.58
1575	0.59	0.58	0.58
1600	0.59	0.58	0.57
1650	0.59	0.58	0.57
1700	0.59	0.58	0.57
1750	0.59	0.58	0.58
1800	0.59	0.58	0.58
1850	0.60	0.59	0.58
1900	0.60	0.59	0.59
1950	0.61	0.60	0.60
2000	0.63	0.62	0.61
2050	0.65	0.64	0.64
2100	0.69	0.68	0.68
2150	0.73	0.72	0.71
2200	0.78	0.77	0.77
2225	0.80	0.79	0.79
2250	0.82	0.81	0.82

Typical Performance Curves

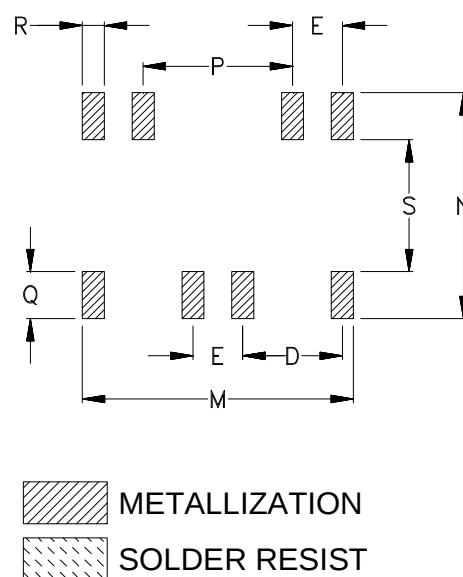


Outline Dimensions

TK2678



PCB LAND PATTERN



 METALLIZATION
 SOLDER RESIST

CASE#	A	B	C	D	E	F	G	H	J	K	L	M
TK2678	.276 (7.01)	.433 (11.00)	.197 (5.00)	.134 (3.40)	.067 (1.70)	.047 (1.19)	.077 (1.96)	.093 (2.36)	.028 (0.71)	.335 (8.51)	.049 (1.24)	.364 (9.25)

CASE#	N	P	Q	R	S	WT.GRAMS
TK2678	.303 (7.67)	.201 (5.11)	.063 (1.60)	.030 (0.76)	.177 (4.50)	0.6

Dimensions are in inches (mm). Tolerances: 2PL. $\pm .03$; 3PL. $\pm .015$

Notes:

1. Case material: Nickel-Silver alloy.
2. Base: Printed wiring laminate.
3. Termination finish:
 For RoHS Case Styles: 2-5 μ inch (.05-.13 microns) Gold over 120-240 μ inch (3.05-6.10 microns) Nickel plate.
 All models, (+) suffix.

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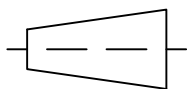
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RF/IF MICROWAVE COMPONENTS



REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M168517	NEW RELEASE	JUL 18	TM	VC

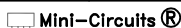
Top view of the PCB layout for the 16-pin package. The layout shows a central rectangular area with a grid of 16 pins (8x2). The pins are labeled PIN 1 through PIN 16. The package outline is indicated by a dashed line. Dimensions are provided for the overall package size (.433 x .276) and the pin pitch (.067). The pin diameter is specified as $\phi.020$ PTH, TYP. The trace width is specified as $.030 \pm .002$, 2 PLCS. The pin 1 location is marked with a green square.

1. TRACE WIDTH IS SHOWN FOR ROGERS(RO4350B) WITH DIELECTRIC THICKNESS .030"±.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 SOLDERMASK

17 JUL 18



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Mini-Circuits® 13 Neptune Avenue
Brooklyn NY 11235

PL, 12FL04, TK2678, BPF,
TB-1072+, 75 Ohm

SIZE
A

CODE IDENT
15542

DRAWING NO:
98-PL-599

REV: OR

FILE:

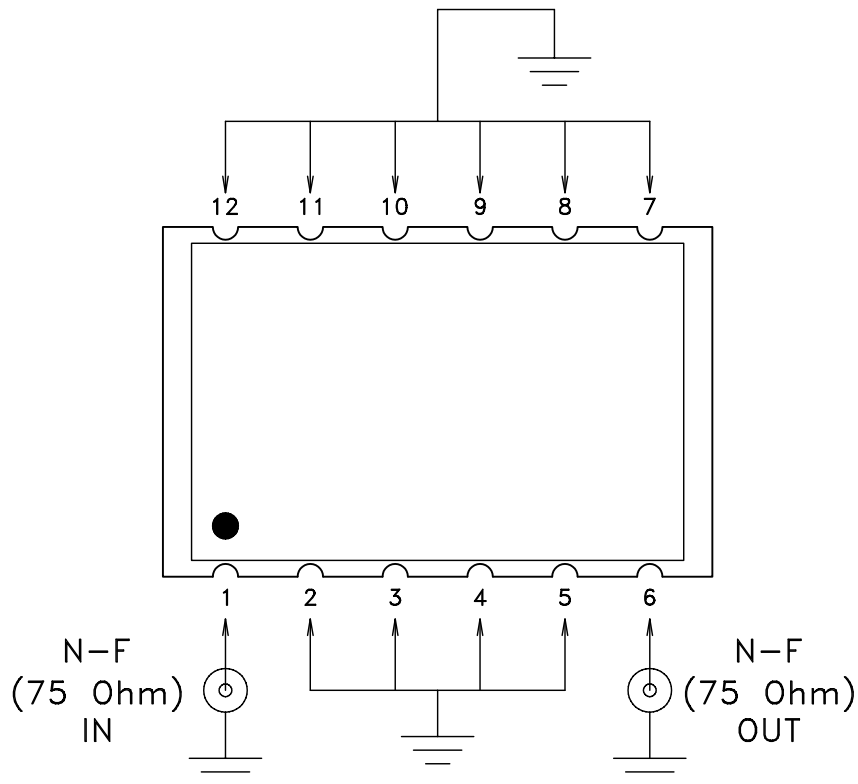
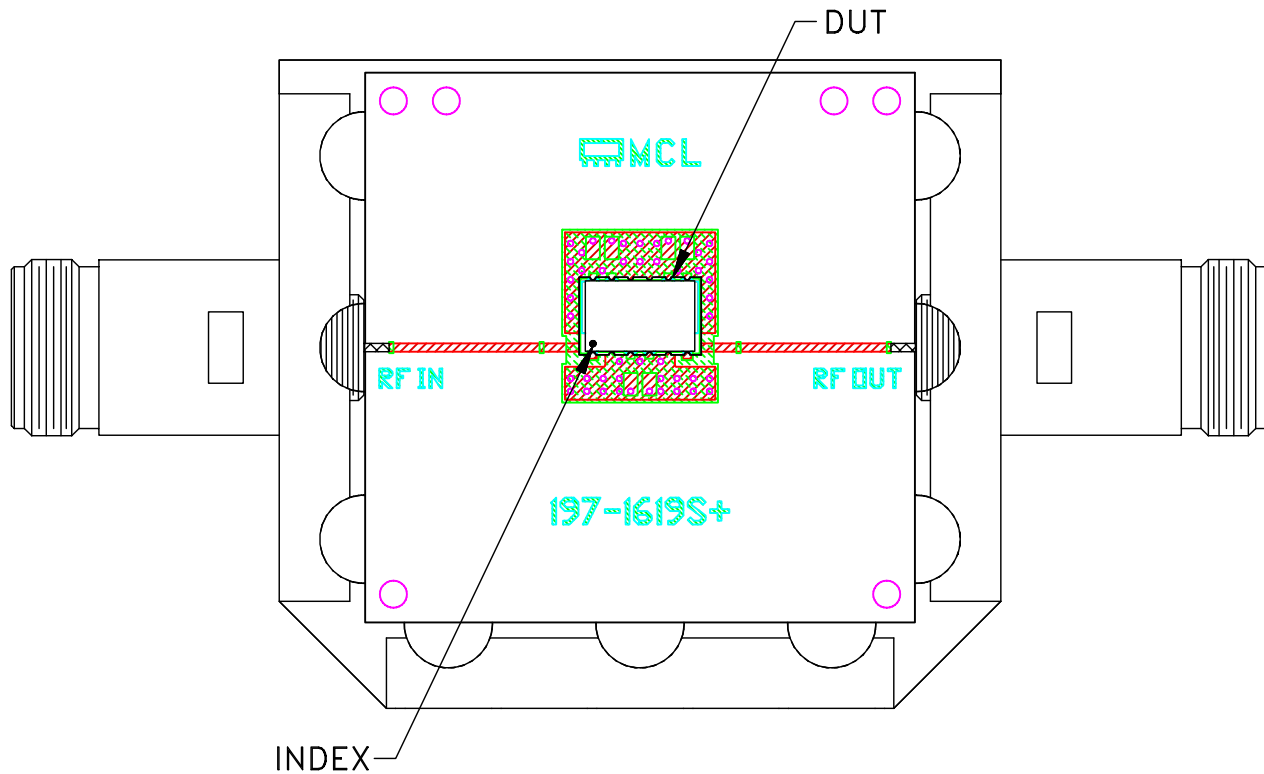
98PL599

SCALE: 3:1

SHEET:	1 OF 1
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Evaluation Board and Circuit

TB-1072+



Notes:

1. 75 Ohm N Female connectors.
2. PCB Material: Rogers (R04350) OR Equivalent
Dielectric Constant= $3.48 \pm .05$, 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