

Surface Mount High Pass Filter

RHPF-500+

50Ω 500 to 6500 MHz

The Big Deal

- High rejection
- Good VSWR
- Wide passband
- Miniature shielded package



Generic photo used for illustration purposes only
CASE STYLE: CK605-5

Product Overview

RHPF-500+ is a 50Ω high pass filter in a shielded package (size of 0.500" x 0.500" x 0.197") fabricated using SMT technology. Covering 500 to 6500 MHz band width, these units offer good matching within the passband and high rejection. In addition it has repeatable performance across production lots and consistent performance across temperature.

Key Features

Feature	Advantages
Fast roll-off	Fast roll-off, this will attenuate frequencies closer to the passband with good rejection.
Good VSWR for broad band	This enables the filter to provide good matching over broad band frequency.
Small size, 0.500" x 0.500" x 0.197"	The small surface mount package enables the RHPF-500+ to be used in compact designs.

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



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50Ω 500 to 6500 MHz

RHPF-500+



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CASE STYLE: CK605-5

Features

- High Rejection
- Good VSWR
- Wide passband
- Miniature shielded package

Applications

- Defence systems
- Aeronautical mobile

Electrical Specifications at 25°C

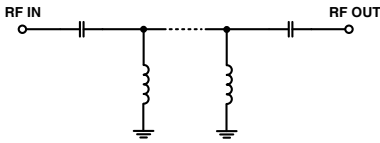
Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Stop Band	Rejection Loss	DC-F1	DC-400	45	50	-	dB
		F1-F2	400-430	20	30	-	dB
	VSWR	DC-F1	DC-430	-	20	-	:1
Pass Band	Insertion Loss	F3-F4	500-3000	-	1.4	2.0	dB
		F4-F5	3000-6500	-	1.7	3.0	dB
	VSWR	F3-F4	500-3000	-	1.4	1.6	:1
		F4-F5	3000-6500	-	2.0	-	:1

Maximum Ratings

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

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

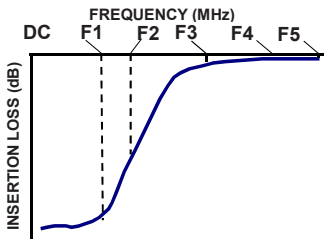
Functional Schematic



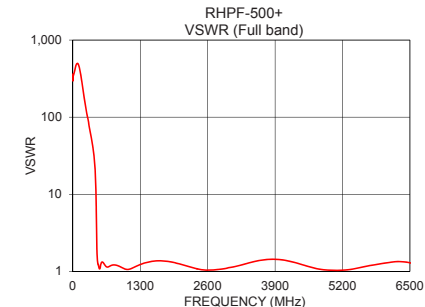
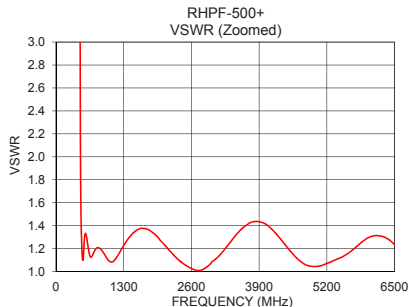
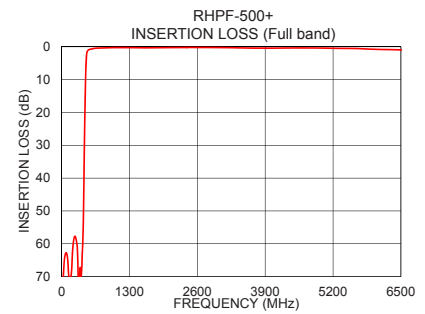
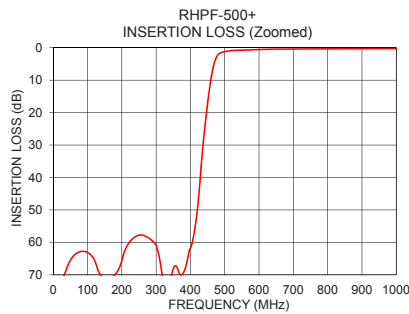
Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
0.3	105.68	362.24
1.2	96.47	354.06
5.0	77.74	399.57
10.0	76.29	408.07
100.0	63.09	410.66
250.0	57.78	81.66
400.0	61.81	31.41
430.0	38.16	22.63
432.0	35.52	21.76
436.0	30.81	19.77
442.0	24.56	15.97
446.0	20.72	12.86
450.0	17.11	9.60
460.0	9.49	3.82
474.0	3.30	1.74
480.0	2.18	1.50
500.0	1.18	1.16
3000.0	0.22	1.09
5000.0	0.39	1.04
6500.0	0.93	1.23

Typical Frequency Response



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



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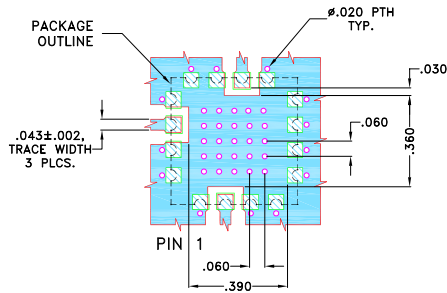
REV.B
M176011
RHPF-500+
EDU2926
URJ
190903
Page 2 of 3

Pad Connections

INPUT	2
OUTPUT	10
NOT CONNECTED	14
GROUND	1,3, 4, 5, 6,7,8,9,11,12,13,15,16

Demo Board MCL P/N: TB-1000+
Suggested PCB Layout (PL-580)

SUGGESTED MOUNTING CONFIGURATION FOR
 CK605-5 CASE STYLE "16FL05" PIN CODE

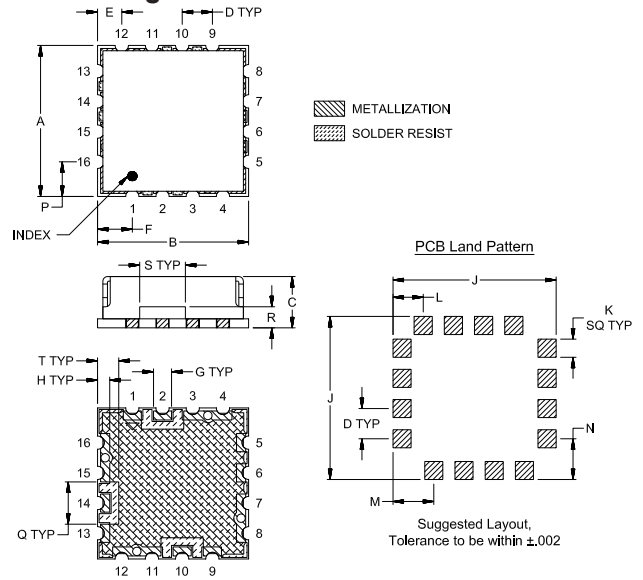


NOTES:

- TRACE WIDTH IS SHOWN FOR ROGERS(R04350B) WITH DIELECTRIC THICKNESS .020"±.0015". COPPER: 1/2 Oz EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
- 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



Outline Dimensions (inch)

A	B	C	D	E	F	G	H	J	K
-	-	Min	Max	-	-	-	-	-	-
.500	.500	.177	.197	.100	.080	.115	.060	.040	.540
12.70	12.70	4.5	5.00	2.54	2.03	2.92	1.52	1.02	13.72
L	M	N	P	Q	R	S	T		Wt.
.100	.135	.135	.115	.140	.070	.150	.070		grams
2.54	3.43	3.43	2.92	3.56	1.78	3.81	1.78		1.0

Note: Please refer to case style drawing for details

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Surface Mount High Pass Filter

RHPF-500+

Typical Performance Data

FREQ.	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
0.3	90.52	105.68	98.56	0.05	0.05	0.05	0.05	0.05	0.05
20	73.63	73.38	73.78	0.04	0.04	0.04	0.05	0.05	0.05
50	65.48	65.48	65.51	0.03	0.04	0.04	0.04	0.04	0.04
100	63.24	63.09	63.09	0.03	0.04	0.04	0.03	0.04	0.03
150	71.34	71.05	71.10	0.06	0.08	0.07	0.04	0.05	0.05
200	66.00	65.63	65.45	0.11	0.13	0.13	0.06	0.08	0.08
225	59.59	59.59	59.52	0.14	0.17	0.17	0.09	0.10	0.11
250	57.68	57.78	57.78	0.18	0.21	0.21	0.11	0.13	0.14
275	58.26	58.41	58.49	0.22	0.26	0.26	0.14	0.16	0.17
300	60.61	60.82	60.94	0.26	0.29	0.30	0.17	0.19	0.20
310	64.73	65.01	65.23	0.28	0.32	0.33	0.19	0.22	0.23
320	71.31	71.12	71.48	0.30	0.35	0.35	0.21	0.24	0.25
330	73.78	73.43	73.74	0.32	0.37	0.38	0.23	0.26	0.27
340	72.84	72.39	72.58	0.33	0.39	0.40	0.25	0.28	0.29
350	68.14	68.13	68.21	0.35	0.41	0.42	0.27	0.30	0.32
360	67.30	67.48	67.73	0.37	0.43	0.45	0.29	0.33	0.35
370	70.05	69.94	70.01	0.39	0.46	0.48	0.32	0.36	0.38
380	69.66	69.28	69.15	0.41	0.48	0.51	0.35	0.40	0.42
390	66.54	65.97	65.59	0.43	0.52	0.55	0.38	0.44	0.47
400	62.27	61.81	61.51	0.46	0.55	0.60	0.43	0.50	0.53
410	58.19	57.58	57.17	0.50	0.60	0.65	0.49	0.57	0.61
420	50.82	50.09	49.62	0.55	0.66	0.73	0.57	0.67	0.73
430	38.91	38.16	37.66	0.64	0.77	0.85	0.71	0.84	0.92
432	36.18	35.52	35.07	0.67	0.80	0.88	0.75	0.89	0.97
436	31.36	30.81	30.42	0.74	0.88	0.98	0.85	1.01	1.12
438	29.16	28.65	28.27	0.78	0.93	1.04	0.92	1.09	1.21
440	27.05	26.57	26.20	0.84	1.00	1.12	1.01	1.19	1.32
442	25.01	24.56	24.20	0.91	1.09	1.21	1.11	1.32	1.47
446	21.12	20.72	20.39	1.15	1.35	1.51	1.42	1.68	1.89
448	19.25	18.88	18.58	1.32	1.55	1.73	1.66	1.95	2.19
450	17.44	17.11	16.83	1.56	1.82	2.01	1.97	2.31	2.59
460	9.62	9.49	9.35	4.30	4.66	4.94	5.93	6.70	7.38
470	4.45	4.52	4.52	9.18	9.45	9.65	12.89	13.57	13.97
474	3.18	3.30	3.35	11.10	11.35	11.55	14.87	15.50	15.87
480	2.01	2.18	2.28	13.83	14.04	14.27	17.47	18.02	18.33
490	1.30	1.47	1.57	17.57	17.78	18.24	19.95	20.12	20.22
500	1.03	1.18	1.26	21.97	22.43	23.82	23.17	23.35	23.48
750	0.29	0.36	0.39	21.22	21.32	20.97	20.77	20.80	20.50
1000	0.18	0.24	0.26	26.24	26.55	27.22	28.74	28.85	29.61
1250	0.17	0.24	0.26	22.21	21.30	21.12	22.31	21.35	21.19
1500	0.22	0.29	0.30	16.75	16.68	17.20	16.80	16.76	17.32
1750	0.22	0.29	0.30	16.07	16.15	16.70	16.13	16.23	16.79
2000	0.16	0.24	0.27	18.17	18.45	18.59	18.09	18.36	18.49
2250	0.12	0.21	0.24	22.85	23.25	22.65	23.05	23.25	22.60
2500	0.10	0.19	0.22	32.24	32.00	30.80	34.81	32.59	30.70
2750	0.10	0.20	0.23	45.18	46.76	44.75	32.49	32.18	32.19
3000	0.12	0.22	0.25	27.18	27.49	28.41	24.69	25.27	26.23
3250	0.16	0.27	0.30	20.42	20.81	21.55	20.00	20.42	21.16
3500	0.21	0.34	0.37	16.85	16.71	17.03	16.90	16.72	16.97
3750	0.26	0.40	0.44	15.07	15.05	15.05	15.15	15.07	15.00
4000	0.26	0.41	0.46	15.13	15.21	15.10	15.22	15.20	14.99
4250	0.22	0.38	0.43	17.34	17.29	17.25	17.38	17.23	17.11
4500	0.19	0.35	0.40	21.41	21.78	22.15	21.41	21.73	22.14
4750	0.19	0.35	0.40	27.24	29.41	31.46	27.10	29.49	32.64
5000	0.21	0.39	0.44	29.95	33.34	35.20	30.92	35.73	40.87
5250	0.27	0.45	0.52	27.38	28.41	28.42	30.60	33.76	36.23
5500	0.29	0.48	0.55	25.03	24.35	23.82	27.04	25.92	25.43
5750	0.37	0.58	0.66	21.31	20.45	19.74	22.27	20.93	20.00
6000	0.53	0.75	0.83	18.10	17.79	17.47	18.96	18.31	17.69
6500	0.72	0.93	1.01	17.16	19.65	21.50	16.18	17.91	19.00



Surface Mount High Pass Filter

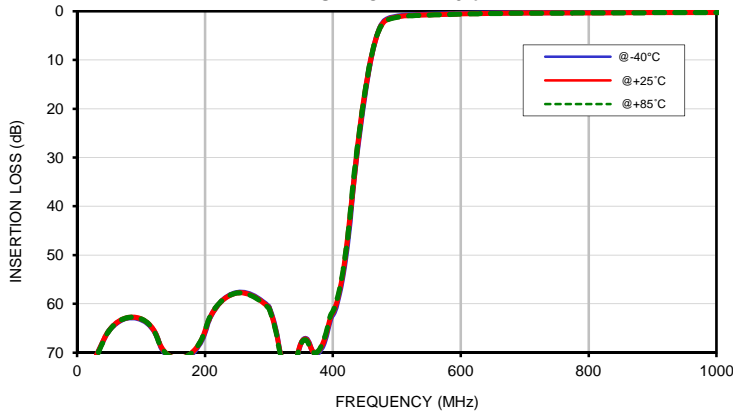
RHPF-500+

Typical Performance Data

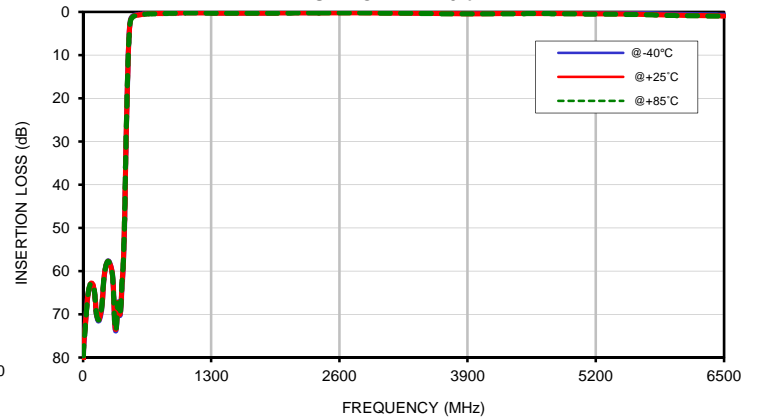
FREQ. (MHz)	GROUP DELAY		
	(nsec)		
	@-40°C	@+25°C	@+85°C
500	6.56	6.46	6.40
600	2.13	2.12	2.11
700	1.26	1.24	1.23
800	0.86	0.85	0.84
900	0.66	0.65	0.65
1000	0.53	0.52	0.51
1100	0.46	0.45	0.44
1200	0.39	0.38	0.37
1300	0.35	0.33	0.33
1400	0.31	0.30	0.29
1500	0.28	0.27	0.26
1600	0.26	0.24	0.24
1700	0.24	0.23	0.23
1800	0.23	0.22	0.21
1900	0.22	0.21	0.20
2000	0.21	0.20	0.19
2100	0.20	0.19	0.19
2200	0.20	0.19	0.18
2300	0.19	0.18	0.17
2400	0.19	0.18	0.17
2500	0.18	0.17	0.16
2600	0.18	0.17	0.16
2700	0.18	0.17	0.16
2800	0.17	0.16	0.16
2900	0.17	0.16	0.15
3000	0.17	0.16	0.15
3200	0.16	0.16	0.15
3400	0.16	0.15	0.14
3600	0.16	0.15	0.14
3800	0.16	0.15	0.14
4000	0.16	0.14	0.13
4250	0.16	0.15	0.14
4500	0.17	0.16	0.15
4750	0.17	0.16	0.16
5000	0.18	0.17	0.16
5250	0.18	0.17	0.17
5500	0.20	0.19	0.18
5750	0.21	0.20	0.20
6000	0.22	0.21	0.20
6250	0.25	0.24	0.24
6500	0.29	0.29	0.28

Typical Performance Curves

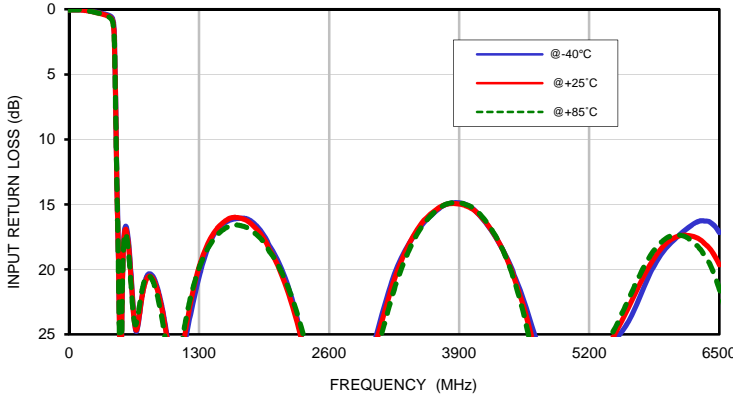
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



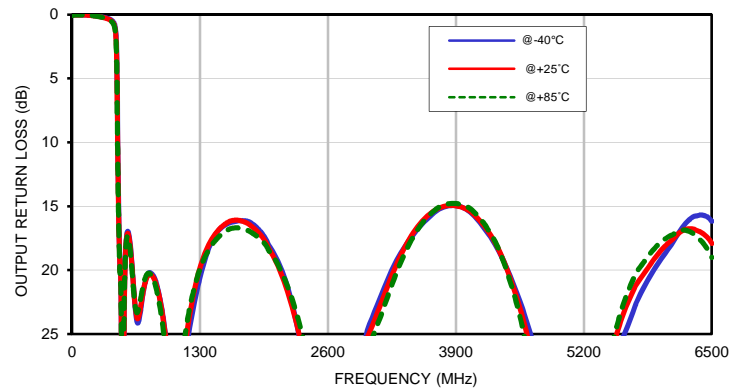
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



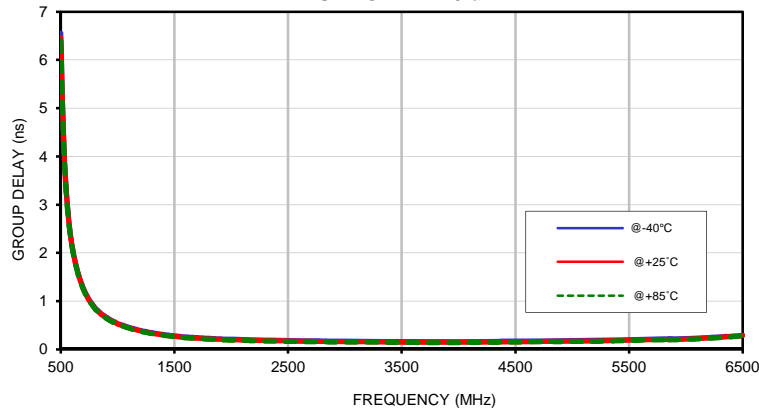
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm

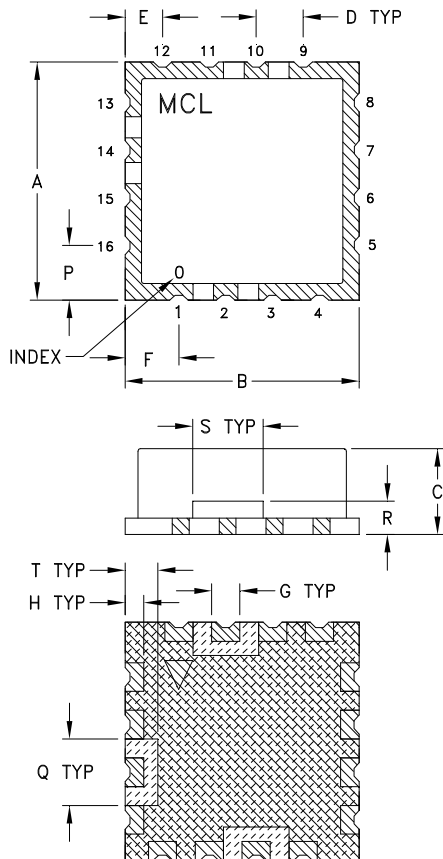


GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm

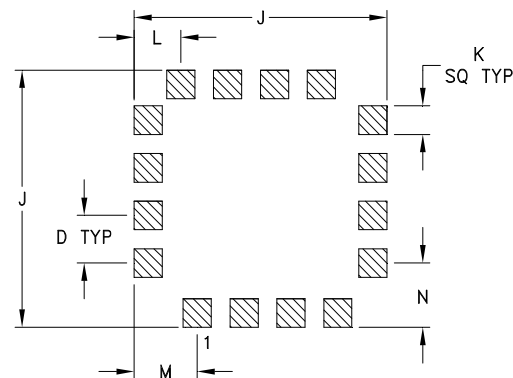


CK605-5

Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within ± 0.002

METALLIZATION
 SOLDER RESIST

CASE #	A	B	C MIN	C MAX	D	E	F	G	H	J	K
CK605-5	.500 (12.70)	.500 (12.70)	.177 (4.5)	.197 (5.00)	.100 (2.54)	.080 (2.03)	.115 (2.92)	.060 (1.52)	.040 (1.02)	.540 (13.72)	.060 (1.52)

CASE #	L	M	N	P	Q	R	S	T	WT. GRAM
CK605-5	.100 (2.54)	.135 (3.43)	.135 (3.43)	.115 (2.92)	.140 (3.56)	.070 (1.78)	.150 (3.81)	.070 (1.78)	1.0

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

Notes:

- Case material: Nickel-Silver alloy.
- Base: Printed wiring laminate.
- Termination finish:
For RoHS Case Styles: 3-5 μ inch (.08-.13 microns) Gold over 120-240 μ inch (3.05-6.10 microns) Nickel plate.
All models, (+) suffix.

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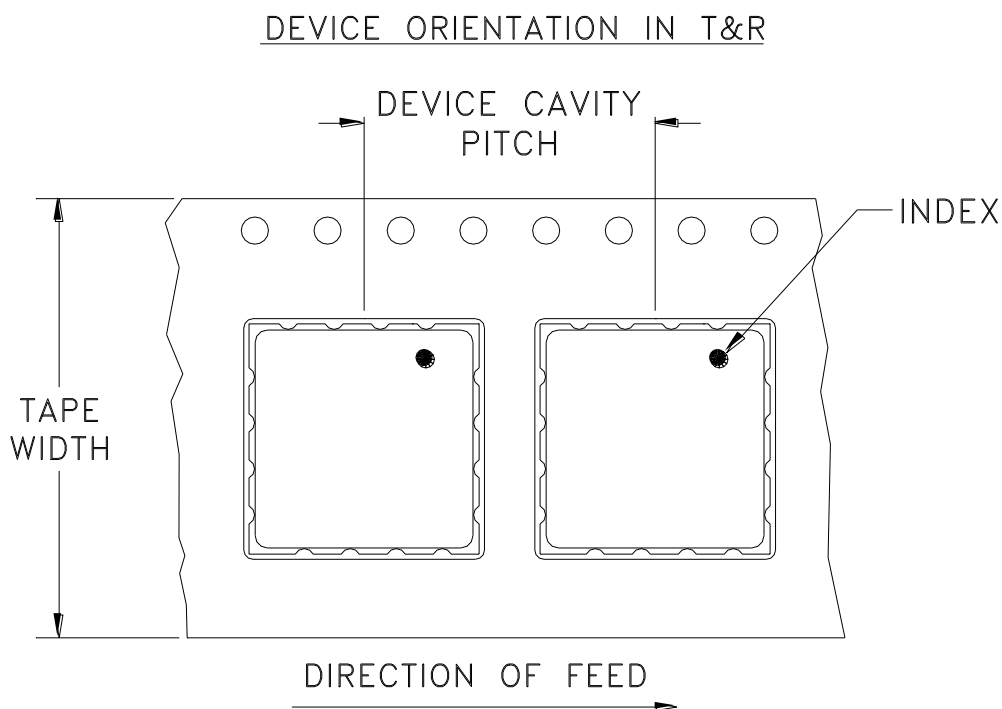
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS

Tape & Reel Packaging TR-F37



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
24	16	7	Small quantity standards (see note)	10
				20
				50
				100
		13	Standard	200
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



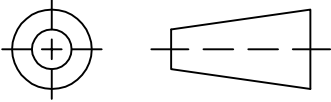
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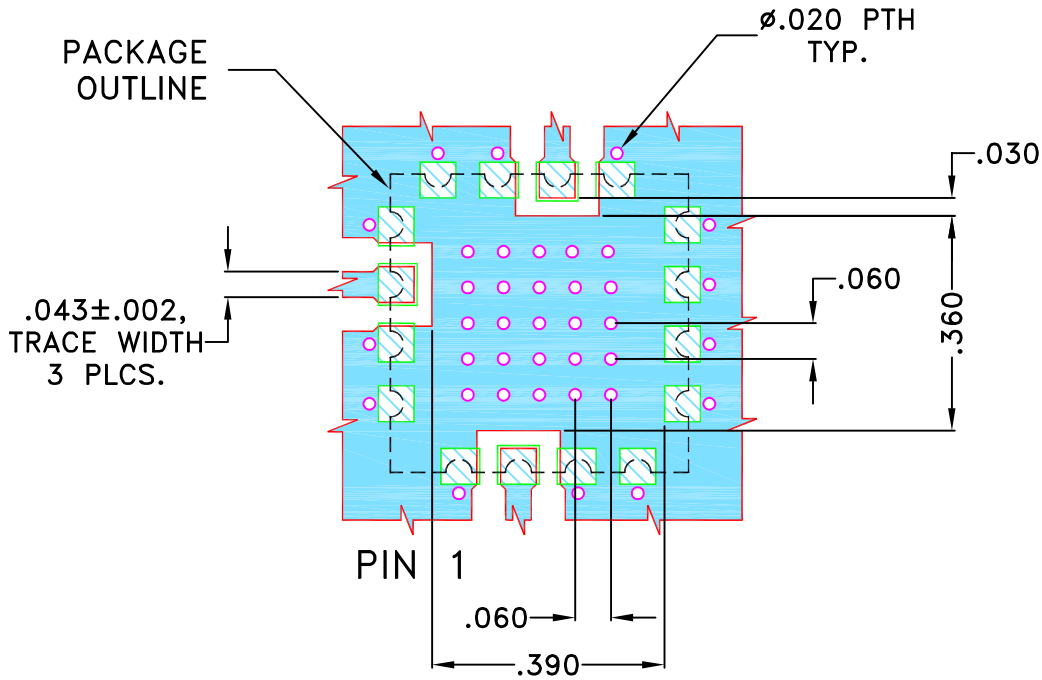
THIRD ANGLE PROJECTION



REVISIONS

REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M166989	NEW RELEASE	MAR 18	TM	VC
A	M171827	DRAWING UPDATED	JAN 19	TM	VC

SUGGESTED MOUNTING CONFIGURATION FOR CK605-5 CASE STYLE "16FL05" PIN CODE



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FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
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DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)



DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

UNLESS OTHERWISE SPECIFIED	INITIALS		DATE
DIMENSIONS ARE IN INCHES	DRAWN	TM	26 MAR 18
TOLERANCES ON:	CHECKED	MD	26 MAR 18
2 PL DECIMALS ±	APPROVED	VC	26 MAR 18
3 PL DECIMALS ± .005"			
ANGLES ±			
FRACTIONS ±			



Mini-Circuits®

13 Neptune Avenue
Brooklyn NY 11235

PL, 16FL05, CK605-5, RHPF,
TB-1000+, 50 Ohm

Mini-Circuits®

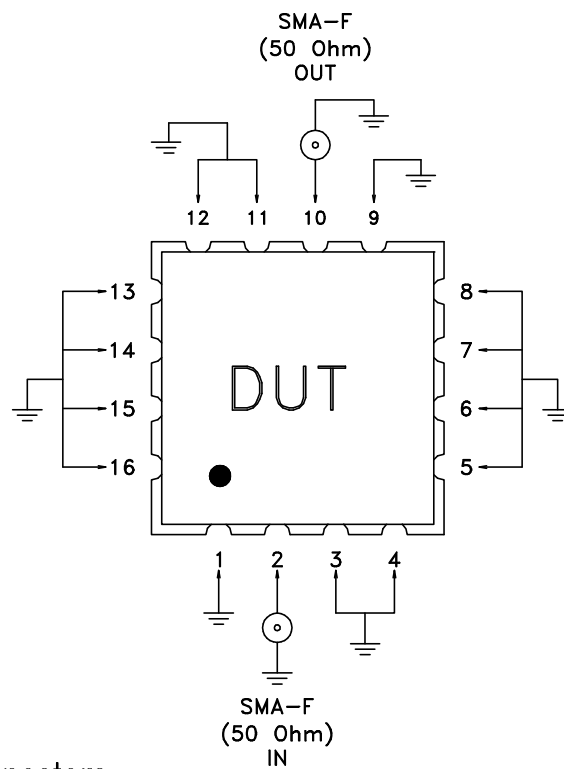
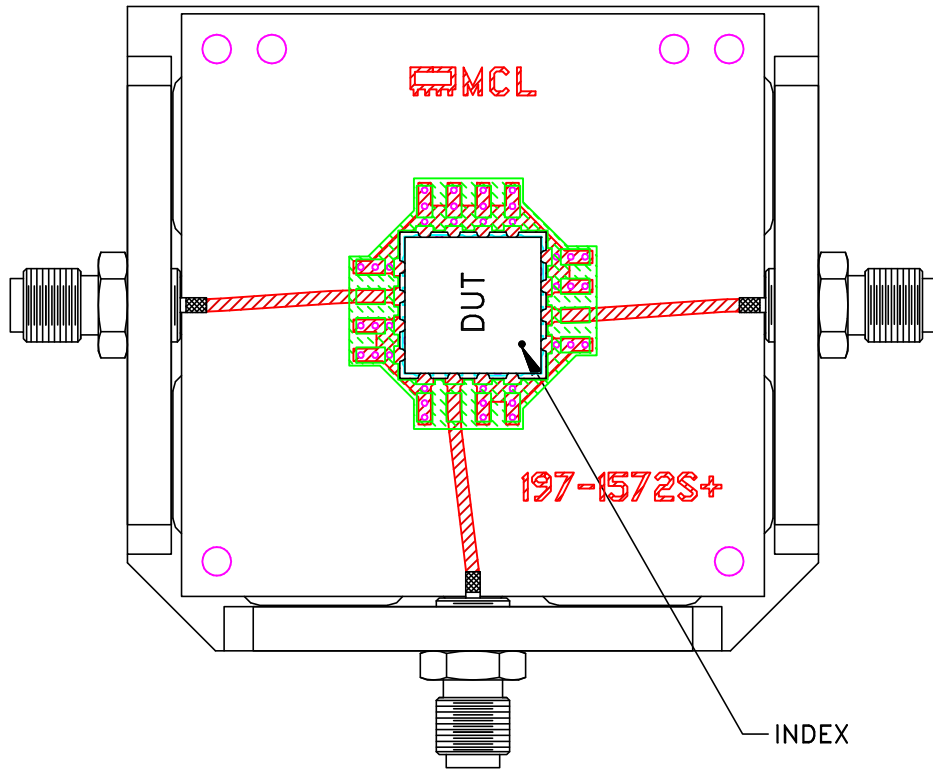
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SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-580	A
FILE:	98PL580	SCALE:	SHEET:
		3:1	1 OF 1

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


Evaluation Board and Circuit

TB-1000+



Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: R04350B, ROGERS OR Equivalent
Dielectric Constant=3.48, Thickness=.020inch.

 **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
HAST	130°C, 85% RH, 96 hours	JESD22-A110
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 Eutectic Process: 225°C peak Pb-Free Process, 245°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 95% Coverage
Vibration (High Frequency)	20g peak, 20-2000 Hz, 4 times in each of three axes (total 12)	MIL-STD-883, Method 2007.3, Condition A
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