Surface Mount top hat®

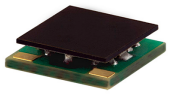
Low Pass Filter

ULP-120+

50Ω DC to 120 MHz

The Big Deal

- Low Insertion loss, 1.5dB Typ.
- High rejection, > 40dB
- Sharp insertion loss roll-off
- Good VSWR
- Ultra miniature surface mount package



CASE STYLE: QA2224

Product Overview

The ULP-120+ is a lowpass filter in a top hat package (size of 0.25" x 0.25") fabricated using SMT technology. Covering DC to 120 MHz band width, these units offer good matching within the passband and high rejection. This model uses a miniature high Q capacitors and chip inductors for high reliability. In addition it has repeatable performance across production lots and consistent performance across temperature.

Key Features

Feature	Advantages
Low passband insertion loss	Passband insertion loss 1.5dB typical ensures low signal loss throughout the passband
Excellent stopband rejection	Rejection of 40 dB ensures unwanted spurious are eliminated
Excellent return loss at DC-120 MHz	This makes signal transmission with very less reflections and well-matched with the adjacent component used in the system
Small size, 0.25" x 0.25"	The Ultra miniature surface mount package enables the ULP-120+ to be used in compact designs.

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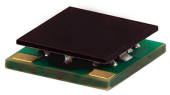


CASE STYLE: QA2224

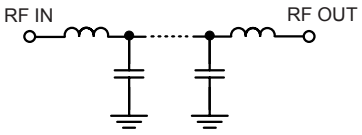
Features

- High rejection
- Sharp insertion loss roll-off
- Good VSWR, 1.1:1 typ at passband
- Ultra miniature surface mount package

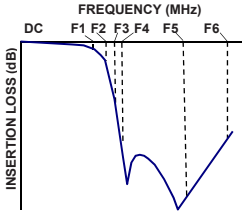
Applications

- Wireless communications
- Receivers / Transformers
- Lab use

Functional Schematic



Typical Frequency Response



Electrical Specifications at 25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	DC-F1	DC-120	—	1.5	2.0	dB
	Freq. Cut-Off	F2	132	—	3.0	—	dB
	VSWR	DC-F1	DC-120	—	1.1	—	:1
Stop Band	Rejection Loss	F3-F4	170-205	20	27	—	dB
		F4-F5	205-1000	40	47	—	dB
		F5-F6	1000-3000	—	20	—	dB
	VSWR	F3-F5	170-1000	—	20	—	:1

Maximum Ratings	
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	0.15W max.

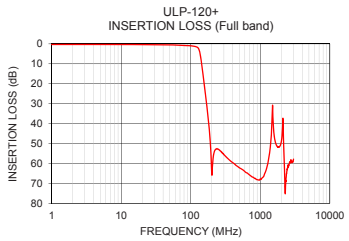
Permanent damage may occur if any of these limits are exceeded.

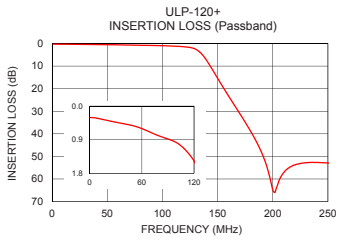
Typical Performance Data at 25°C

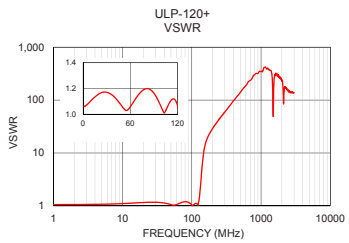
Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
1	0.31	1.06	1	5.93
50	0.53	1.06	5	5.85
120	1.47	1.07	10	5.82
132	3.09	2.01	20	5.82
145	11.35	8.09	30	5.89
156	20.22	14.36	40	6.04
169	30.23	19.59	50	6.23
170	31.00	19.93	60	6.46
190	48.46	26.09	65	6.59
205	61.69	30.49	70	6.73
210	57.19	32.06	75	6.91
250	52.92	44.04	80	7.13
500	62.21	138.91	85	7.40
1000	67.77	343.35	90	7.75
1500	30.92	50.20	95	8.16
1750	51.42	283.13	100	8.63
2000	49.28	229.17	105	9.18
2500	61.21	146.43	110	9.85
2750	58.13	136.89	115	10.76
3000	57.89	137.15	120	12.17

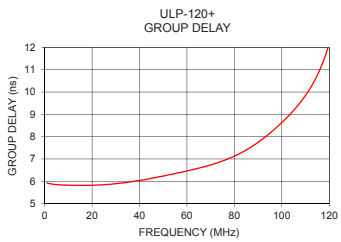
+RoHS Compliant

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









Notes

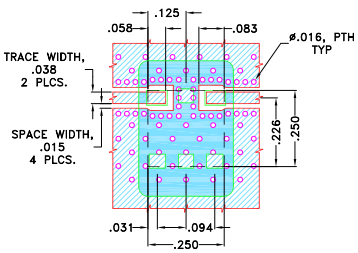
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's 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	1
OUTPUT	3
GROUND	2,4,5,6

Demo Board MCL P/N: TB-894+
Suggested PCB Layout (PL-484)

SUGGESTED MOUNTING CONFIGURATION FOR
QA2224 CASE STYLE "06FL09" PIN CODE



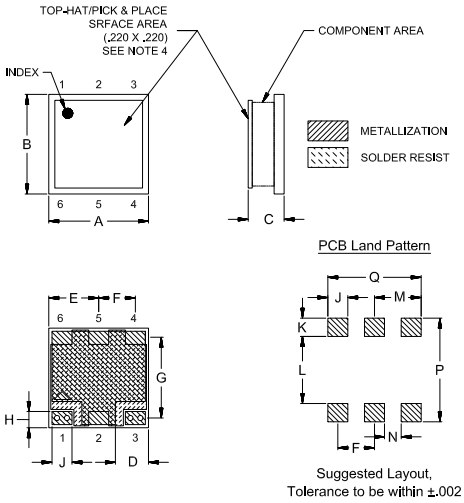
NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS (RO4350B) WITH DIELECTRIC THICKNESS .020"±.0015". 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



Outline Dimensions (inch / mm)

A	B	C		D	E	F	G	H	J	K
-	-	Min	Max	-	-	-	-	-	-	-
.250	**.250**	**.075**	**.100**	**.075**	**.125**	**.092**	**.201**	**.041**	**.050**	**.046**
6.35	6.35	1.91	2.54	1.91	3.18	2.34	5.11	1.04	1.27	1.17

L	M	N	P	Q	Wt.
-	-	-	-	-	grams
.168	**.117**	**.042**	**.260**	**.234**	0.25
4.27	2.97	1.07	6.60	5.94	