



Mini-Circuits

LUMPED LC SURFACE MOUNT <sup>top hat</sup>

## Low Pass Filter

ULP-40+

50Ω

DC to 40 MHz

## KEY FEATURES

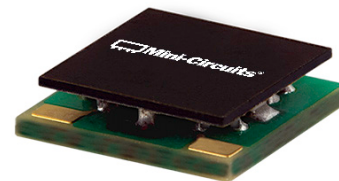
- Low Insertion Loss, 1.5 dB Typ.
- High Rejection, 47 dB Typ.
- Good Return Loss, 26 dB Typ.
- Sharp Insertion Loss Roll-off
- Ultra Miniature Surface Mount Package

## APPLICATIONS

- Wireless Communications
- Receivers / Transformers
- Lab Use

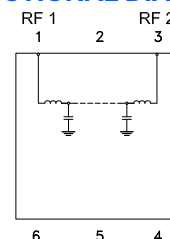
## PRODUCT OVERVIEW

The ULP-40+ is a low pass filter in a top hat package (size of 0.25" x 0.25") fabricated using SMT technology. Covering DC to 40 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.



Generic photo used for illustration purposes only

## FUNCTIONAL DIAGRAM

ELECTRICAL SPECIFICATIONS<sup>1,2,3</sup> AT +25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Units
Passband	Insertion Loss	DC-F1	DC - 40	—	1.5	2.0	dB
	Freq. Cut-Off	Fc	56	—	3.0	—	dB
	Return Loss	DC-F1	DC - 40	—	26	—	dB
Stopband	Rejection	F2-F3	70 - 80	20	27	—	dB
		F3-F4	80 - 600	40	47	—	
		F4-F5	600 - 3000	—	20	—	

1. Tested in Evaluation Board P/N TB-ULP-40+.

2. This filter is bi-directional RF1 and RF2 ports may be interchanged, see S-Parameters for actual performance.

3. In applications where DC voltage and/or current is present at either the input or output ports, external DC blocking capacitors are required.

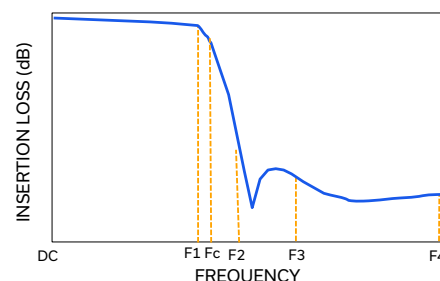
ABSOLUTE MAXIMUM RATINGS<sup>4</sup>

Parameter	Ratings
Operating Temperature	-40°C to + 85°C
Storage Temperature	-55°C to +100°C
Input Power <sup>5</sup>	0.1 W max.

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

5. Power rating applies only to signals within the passband.

## TYPICAL FREQUENCY RESPONSE AT +25°C



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www.minicircuits.com P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com

 REV. B  
 ECO-025420  
 ULP-40+  
 EDU2381  
 URJ  
 250519

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LUMPED LC SURFACE MOUNT top hat

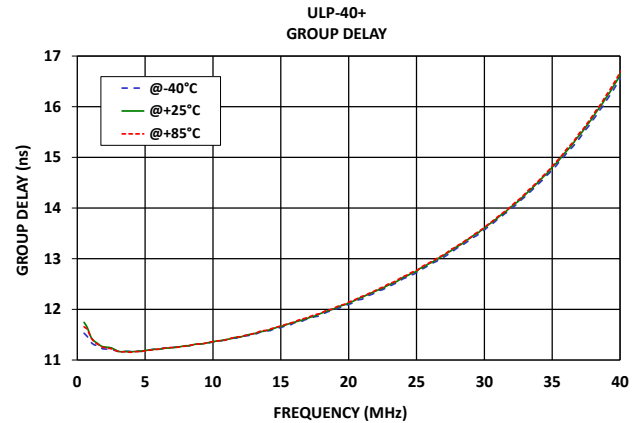
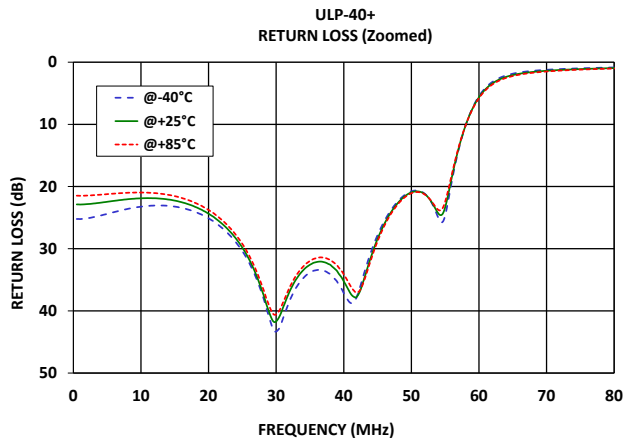
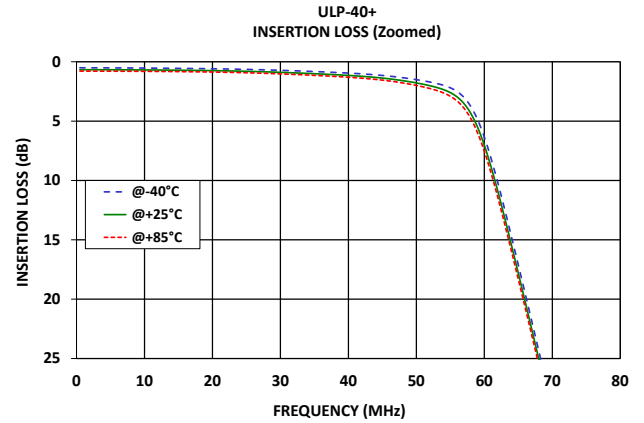
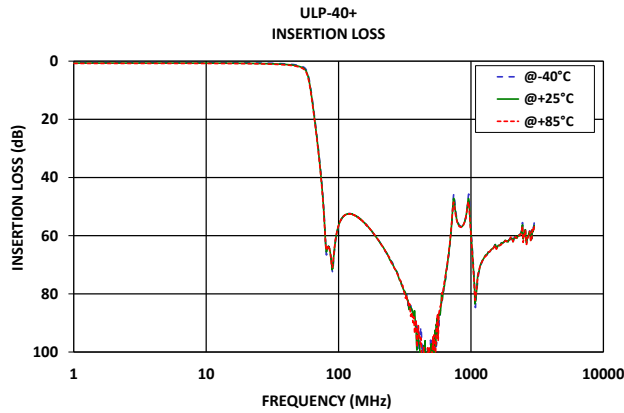
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ULP-40+

50 $\Omega$

DC to 40 MHz

## TYPICAL PERFORMANCE GRAPHS





## FUNCTIONAL DIAGRAM

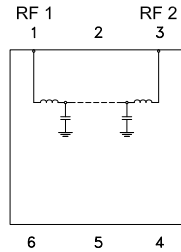


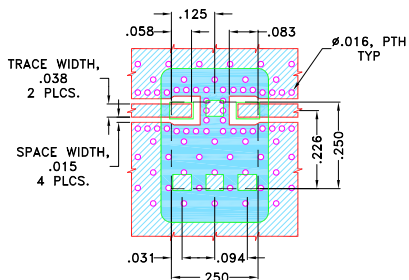
Figure 1. ULP-40+ Functional Diagram

## PAD DESCRIPTION

Function	Pad Number	Description
RF <sub>1</sub> (Note 2)	1	Connects to RF Input Port
RF <sub>2</sub> (Note 2)	3	Connects to RF Output Port
GROUND	2,4,5,6	Connects to Ground on PCB, (See drawing PL-484)
NC	—	No connection, not used internally. See drawing PL-484 for connection to PCB

## SUGGESTED PCB LAYOUT (PL-484)

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



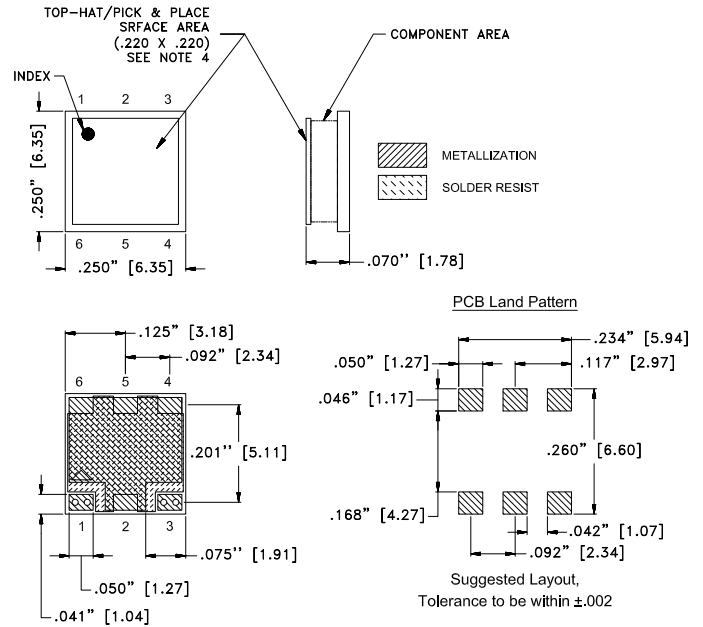
## NOTES:

- 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

Figure 2. Suggested PCB Layout PL-484

## CASE STYLE DRAWING



Weight: .25 gram

Dimensions are in inches (mm). Tolerances: 2PI. ± .03; 3PI. ± .015

## PRODUCT MARKING\*: ULP-40

\*Marking may contain other features or characters for internal lot control.



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50Ω

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ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASH BOARD.

[CLICK HERE](#)

Performance Data and Graphs	Data
	Graphs
	S-Parameter (S2P Files) Data Set (.zip file) De-embedded to device pads
Case Style	QA2224    Lead Finish: Gold over Nickel Plate
RoHS Status	Compliant
Tape and Reel	TR-F34
Suggested Layout for PCB Design	PL-484
Evaluation Board	TB-ULP-40+
	Gerber File
Environmental Rating	ENV03T2

## 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-Circuits' applicable established test performance criteria and measurement instructions.
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