LUMPED LC SURFACE MOUNT top hat

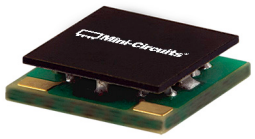
# Low Pass Filter

# ULP-470+

50Ω DC to 470 MHz

## KEY FEATURES

- Low Insertion Loss, 1.5 dB Typ.
- High Rejection, 37 dB Typ.
- Sharp Insertion Loss Roll-off
- Ultra Miniature Surface Mount Package



*Generic photo used for illustration purposes only*

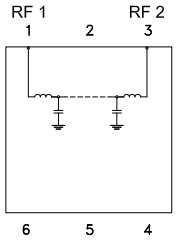
## APPLICATIONS

- Wireless Communications
- Receivers / Transformers
- Lab Use

## PRODUCT OVERVIEW

The ULP-470+ is a low pass filter in a top hat package (size of 0.25" x 0.25") fabricated using SMT technology. Covering DC to 470 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.

## FUNCTIONAL DIAGRAM




## ELECTRICAL SPECIFICATIONS[1,2,3] AT +25°C

| Parameter | | F# | Frequency (MHz) | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|---|
| Passband | Insertion Loss | DC-F1 | DC - 470 | — | 1.5 | 2.0 | dB |
| | Freq. Cut-Off | Fc | 510 | — | 3.0 | — | dB |
| | Return Loss | DC-F1 | DC - 470 | — | 13.9 | — | dB |
| Stopband | Rejection | F2-F3 | 650 - 780 | 20 | 27 | — | dB |
| | | F3-F4 | 780 - 2000 | 30 | 37 | — | |

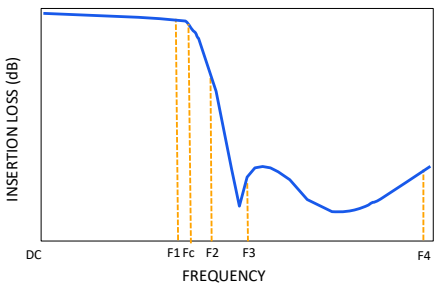
1. Tested in Evaluation Board P/N TB-ULP-470+
2. This filter is bi-directional RF1 and RF2 ports may be interchanged, see S-Parameters for actual performance.
3. In applications where DC voltage and/or current is present at either the input or output ports, external DC blocking capacitors are required.

## ABSOLUTE MAXIMUM RATINGS[4]

| Parameter | Ratings |
|---|---|
| Operating Temperature | -40°C to + 85°C |
| Storage Temperature | -55°C to +100°C |
| Input Power[5] | 2 W max. |

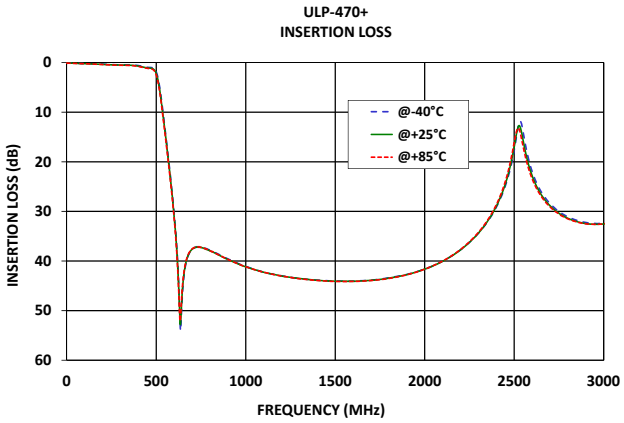
4. Permanent damage may occur if any of these limits are exceeded.
5. Power rating applies only to signals within the passband.

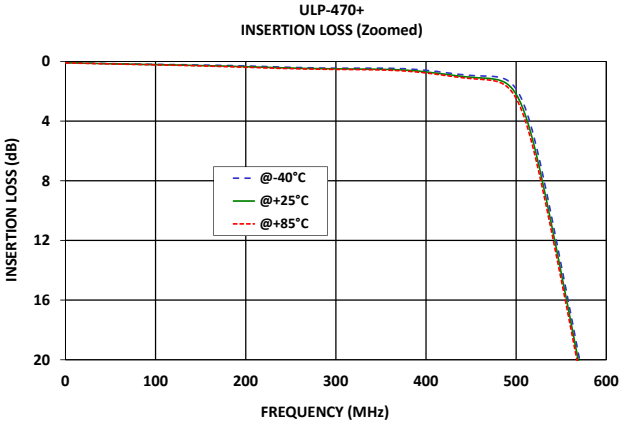
## TYPICAL FREQUENCY RESPONSE AT +25°C

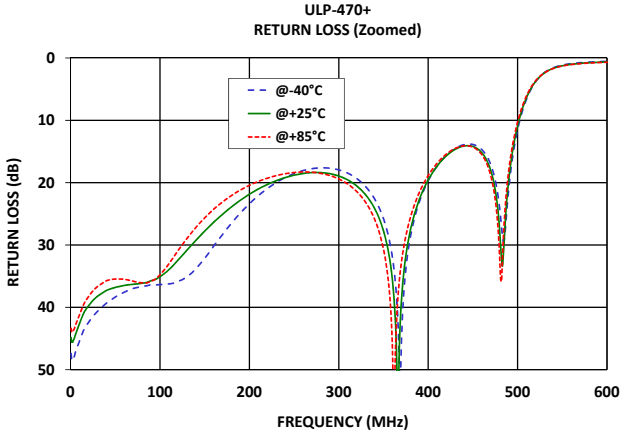


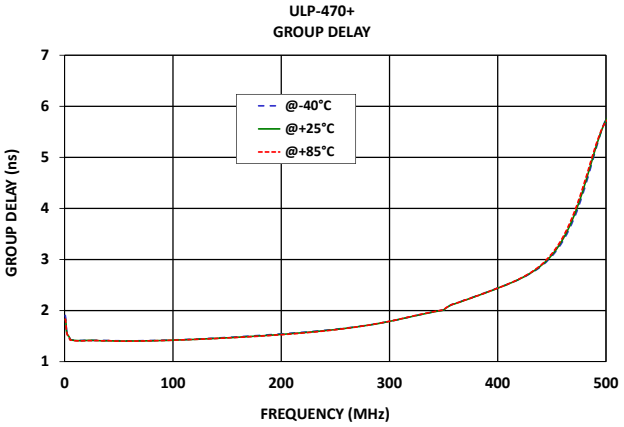

REV. B
ECO-025420
ULP-470+
EDU2397
URJ
250519

## TYPICAL PERFORMANCE GRAPHS



## FUNCTIONAL DIAGRAM

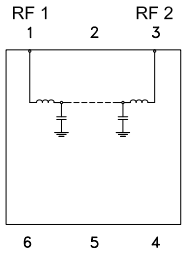
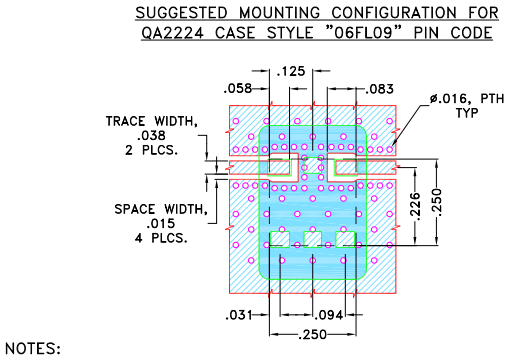



Figure 1. ULP-470+ Functional Diagram

## PAD DESCRIPTION

| Function | Pad Number | Description |
|---|---|---|
| RF1 (Note 2) | 1 | Connects to RF Input Port |
| RF2 (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)




NOTES:

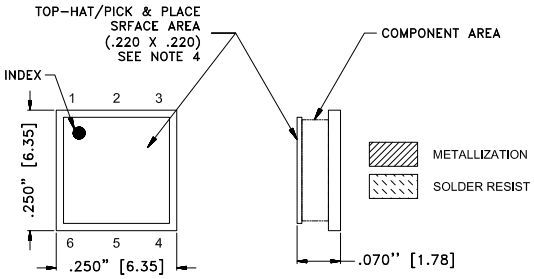
1. TRACE WIDTH IS SHOWN FOR ROGERS (RO4350B) WITH DIELECTRIC THICKNESS .020"±.0015". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

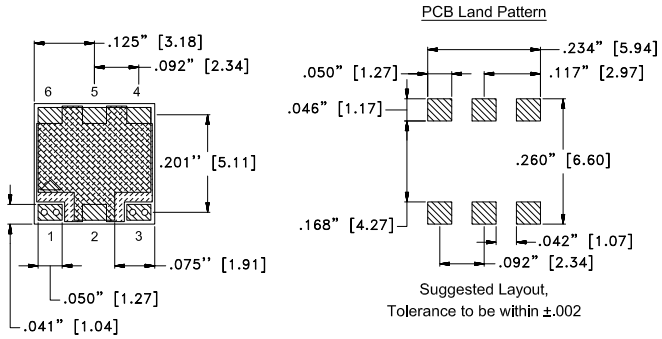
DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

Figure 2. Suggested PCB Layout PL-484

## CASE STYLE DRAWING




**Weight: .25 gram**

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

## PRODUCT MARKING*: ULP-470

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

**ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASH BOARD.** CLICK HERE

| | |
|---|---|
| **Performance Data and Graphs** | Data<br>Graphs<br>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-470+ |
| | 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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