

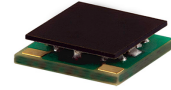
# Surface Mount <sup>top hat®</sup> Low Pass Filter

## ULP-105+

50Ω DC to 105 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-105+ is a lowpass filter in a top hat package (size of 0.25" x 0.25") fabricated using SMT technology. Covering DC to 105 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-105 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-105+ to be used in compact designs.

#### Notes

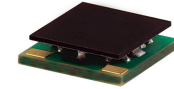
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CASE STYLE: QA2224

### 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

### Electrical Specifications at 25°C

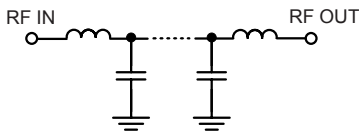
Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit	
Pass Band	Insertion Loss	DC-F1	DC-105	—	1.5	2.0	dB
	Freq. Cut-Off	F2	116	—	3.0	—	dB
	VSWR	DC-F1	DC-105	—	1.1	—	:1
Stop Band	Rejection Loss	F3-F4	145-165	20	27	—	dB
		F4-F5	165-1000	40	47	—	dB
	VSWR	F5-F6	1000-3000	—	20	—	dB
		F3-F5	145-1000	—	20	—	:1

### Maximum Ratings

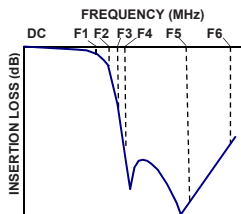
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	0.15W max.

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

### Functional Schematic



### Typical Frequency Response

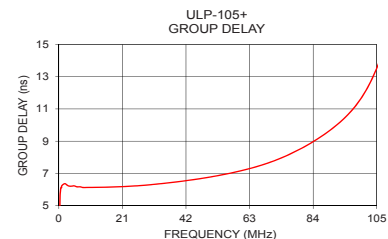
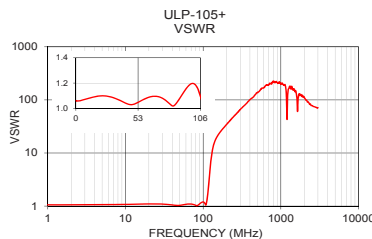
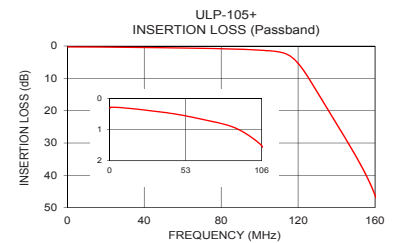
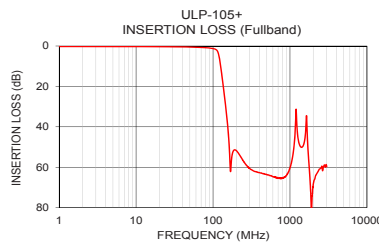


### Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
1	0.28	1.06	1	6.24
10	0.30	1.08	5	6.23
60	0.63	1.08	10	6.13
105	1.47	1.13	15	6.14
110	1.81	1.12	20	6.17
116	3.16	2.00	25	6.22
117	3.59	2.27	30	6.29
120	5.34	3.43	40	6.50
130	14.29	10.18	50	6.78
136	20.18	13.99	55	6.95
145	28.97	18.14	60	7.16
147	30.96	18.91	65	7.40
150	34.04	19.99	70	7.71
158	43.28	22.61	75	8.08
165	55.18	24.65	80	8.54
300	60.58	65.99	85	9.09
500	63.66	138.88	90	9.74
1000	60.23	201.46	95	10.55
2500	60.46	78.21	100	11.70
3000	59.66	71.50	105	13.52

### +RoHS Compliant

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



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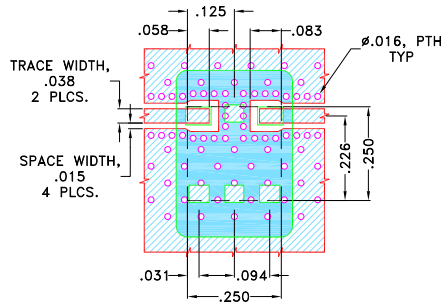
REV.A  
M161927  
ULP-105+  
EDU2368/2  
URJ  
170512  
Page 2 of 3

## 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



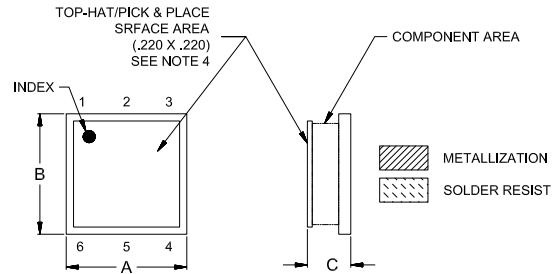
### NOTES:

- 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.

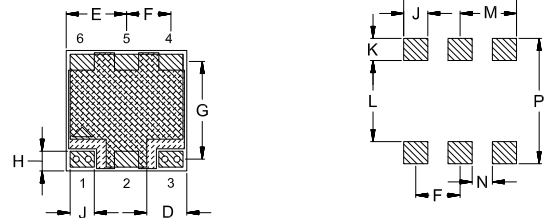
DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

## Outline Drawing



PCB Land Pattern



Suggested Layout,  
 Tolerance to be within ±.002

## 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	
										Wt.
.168	.117	.042	.260	.234						grams
4.27	2.97	1.07	6.60	5.94						0.25

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