

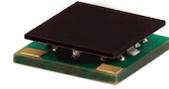
Surface Mount ^{top hat®} Low Pass Filter

ULP-176+

50Ω DC to 176 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-176+ is a lowpass filter in a top hat package (size of 0.25" x 0.25") fabricated using SMT technology. Covering DC to 176 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-176 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-176+ to be used in compact designs.

Notes

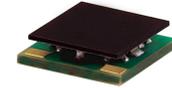
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Features

- High rejection
- Sharp insertion loss roll-off
- Good VSWR, 1.2:1 typ at passband
- Ultra miniature surface mount package

Applications

- Wireless communications
- Receivers / Transformers
- Lab use

Electrical Specifications at 25°C

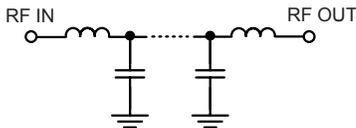
Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit	
Pass Band	Insertion Loss	DC-F1	DC-176	—	1.5	2.0	dB
	Freq. Cut-Off	F2	191	—	3.0	—	dB
	VSWR	DC-F1	DC-176	—	1.2	—	:1
Stop Band	Rejection Loss	F3-F4	245-285	20	27	—	dB
		F4-F5	285-1000	40	47	—	dB
	VSWR	F5-F6	1000-3000	—	20	—	dB
		F3-F5	245-1000	—	20	—	:1

Maximum Ratings

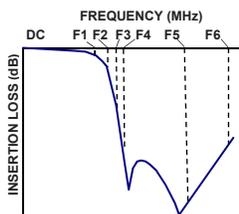
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	0.8W max.

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

Functional Schematic



Typical Frequency Response

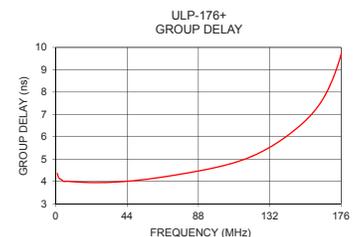
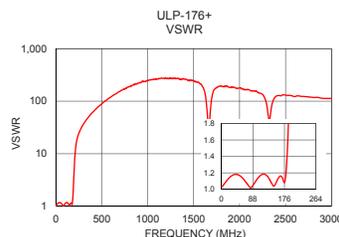
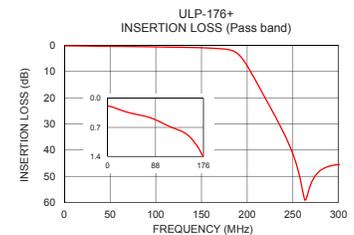
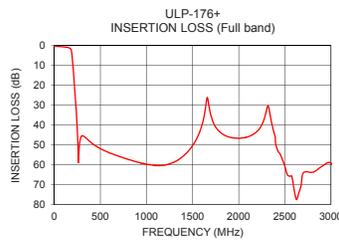


Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
1	0.18	1.03	1	4.35
50	0.38	1.17	5	4.00
176	1.45	1.08	10	3.99
185	2.20	1.56	20	3.95
191	3.63	2.50	40	3.98
200	7.80	5.61	50	4.05
210	13.94	10.70	80	4.36
220	20.30	15.31	90	4.49
235	29.98	20.49	100	4.64
245	37.20	23.23	110	4.83
250	41.50	24.55	120	5.09
285	46.78	33.12	130	5.44
300	45.55	36.55	140	5.89
500	51.87	89.41	150	6.45
750	56.51	171.43	155	6.79
1000	59.68	244.40	160	7.19
2000	46.72	176.95	165	7.71
2500	57.80	129.83	170	8.43
2800	64.12	117.68	175	9.42
3000	60.93	112.33	176	9.66

+RoHS Compliant

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



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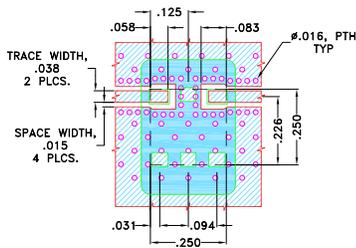
REV.A
M161927
ULP-176+
EDU2389
URJ
170512
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Pad Connections

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

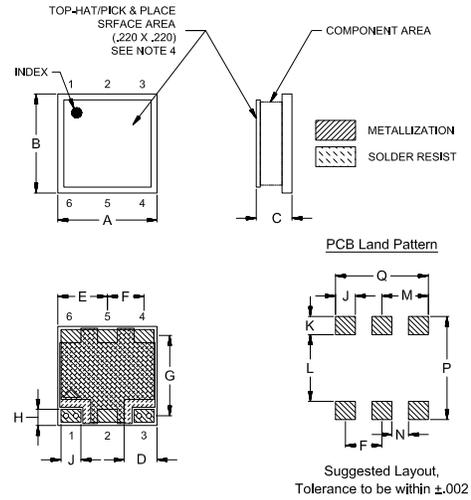


NOTES:

- TRACE WIDTH IS SHOWN FOR ROGERS (R04350B) WITH DIELECTRIC THICKNESS .020 \pm .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 / mm)

A	B	C	D	E	F	G	H	J	K
-	-	Min	Max	-	-	-	-	-	-
.250	.250	.075	.100	.075	.125	.092	.201	.041	.050
6.35	6.35	1.91	2.54	1.91	3.18	2.34	5.11	1.04	1.27
L	M	N	P	Q					Wt.
-	-	-	-	-					grams
.168	.117	.042	.260	.234					0.25
4.27	2.97	1.07	6.60	5.94					

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