

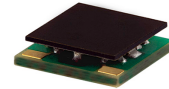
# Surface Mount <sup>top hat®</sup> Low Pass Filter

## ULP-137+

50Ω DC to 137 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-137+ is a lowpass filter in a top hat package (size of 0.25" x 0.25") fabricated using SMT technology. Covering DC to 137 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-137 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-137+ to be used in compact designs.

#### Notes

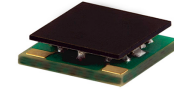
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CASE STYLE: QA2224

### Features

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

### Applications

- Wireless communications
- Receivers / Transformers
- Lab use

### Electrical Specifications at 25°C

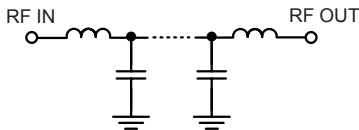
Parameter	F#	Frequency (MHz)	Min.	Typ.	Max.	Unit	
Pass Band	Insertion Loss	DC-F1	DC-137	—	1.5	2.0	dB
	Freq. Cut-Off	F2	150	—	3.0	—	dB
	VSWR	DC-F1	DC-137	—	1.2	—	:1
Stop Band	Rejection Loss	F3-F4	190-215	20	27	—	dB
		F4-F5	215-1000	40	47	—	dB
	VSWR	F5-F6	1000-3000	—	20	—	dB
		F3-F5	190-1000	—	20	—	:1

### Maximum Ratings

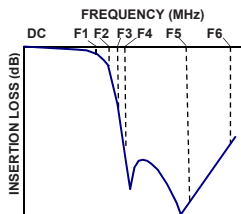
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input	0.8W max.

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

### Functional Schematic



### Typical Frequency Response

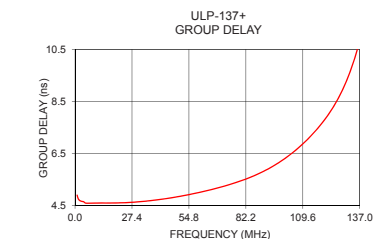
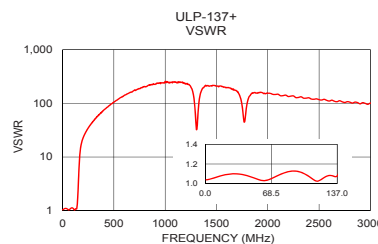
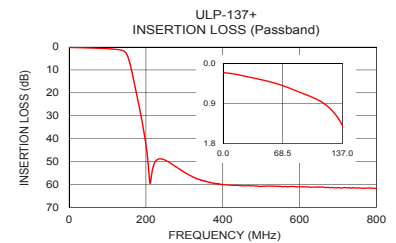
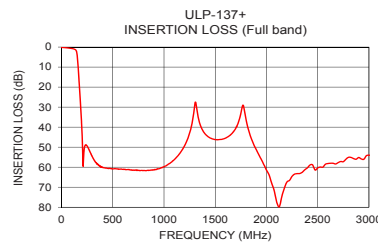


### Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)	Frequency (MHz)	Group Delay (nsec)
1	0.21	1.04	1	4.90
10	0.23	1.06	5	4.60
75	0.55	1.08	10	4.60
137	1.39	1.08	20	4.60
150	3.10	2.16	30	4.64
160	8.33	6.00	40	4.73
170	15.99	11.96	50	4.85
175	19.99	14.51	60	5.01
176	20.80	14.97	70	5.21
180	24.04	16.62	80	5.46
188	30.73	19.35	90	5.79
190	32.49	19.97	100	6.26
200	42.64	22.71	105	6.55
215	55.47	26.42	110	6.90
250	49.48	34.69	115	7.31
300	54.73	46.72	120	7.79
500	60.86	104.94	125	8.39
1000	59.80	257.07	130	9.18
2000	61.52	154.70	135	10.28
3000	54.05	101.04	137	10.83

### +RoHS Compliant

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



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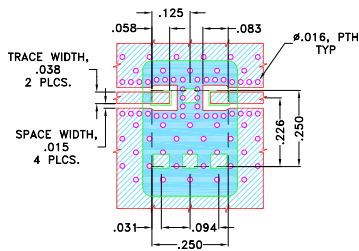
REV.A  
M161927  
ULP-137+  
EDU2386  
URJ  
170512  
Page 2 of 3

## 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

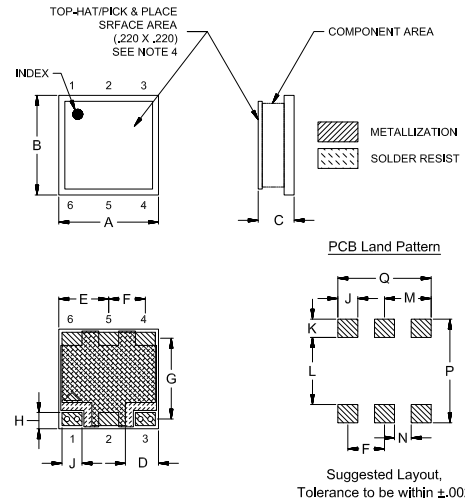


**NOTES:**

- 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



## Outline Dimensions ( Inch )

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

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