

## 5.2 GHz WiFi Coexistence BAW Filter

## A10252

### Description

Akoustis’ A10252 is a high performance, ultra-small bandpass BAW RF Filter for use in 5.2GHz WiFi applications covering U-NII 1 plus 2A bands. A10252 utilizes Akoustis’ patented, XBAW technology which provides leading RF filter performance. This BAW RF filter provides low insertion loss and meets the stringent rejection requirements enabling coexistence with U-NII 2C and 3. This device exhibits high-power handling capabilities necessary for demanding power requirements of the latest WiFi standards. A10252 uses standard laminate packaging and is compatible with high volume, lead-free SMT soldering processes.

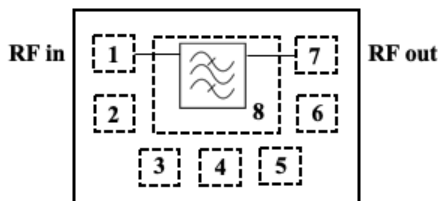
### Features

- Ultra small form factor 2.5mm x 2.0mm x 1.0mm
- Single ended Tx/Rx ports.
- High rejection enables coexistence with adjacent WiFi UNII bands
- High power rating, maximum +28dBm
- Low insertion loss passband filter
- Performance over -40 C to +85C
- RoHS compliant, Pb-free package

### Applications

- WiFi tri band routers, integrated cable modem
- WiFi tri band access points
- LTE/LAA small cells

### Functional Block Diagram



Pin #	Description
1	RF Input
2	Ground
3	Ground
4	Ground
5	Ground
6	Ground
7	RF Output
8	Ground

### Ordering Information

Part Number	Description
A10252EVB	Evaluation board
A10252SP	(5) Loose pcs
A10252SR	(100) Short Reel
A10252TR1	(1000) Tape & Reel
A10252TR2	(2500) Tape & Reel

## Absolute Maximum Ratings

Parameter	Rating
Storage Temperature	-40 to 125 °C
Input Power (CW)	+30 dBm

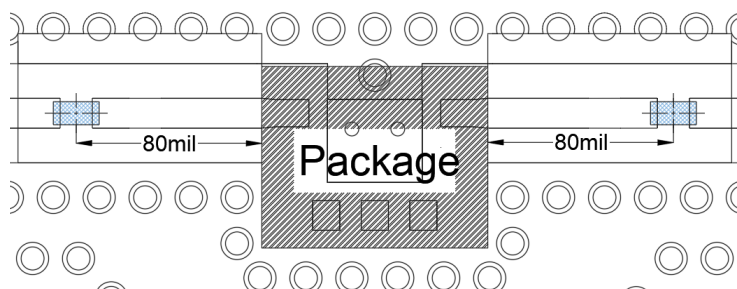
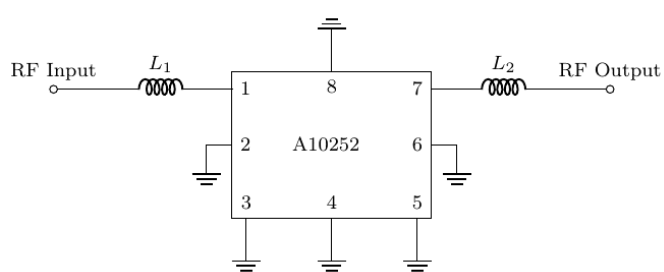
## Nominal Operating Parameters

Parameter	Units	Min.	Typ.	Max.
Center Frequency (Fc)	MHz		5250	
Pass bandwidth	MHz		5170 - 5330	
Insertion Loss				
5170 – 5330 MHz	dB		1.5 <sup>(1)</sup>	2.1
Amplitude Variation				
5170 – 5330 MHz	dB		0.6	0.7
Attenuation				
30 – 2700 MHz	dB	35	36	
3300 - 3700 MHz	dB	37	38	
5490 - 5835 MHz	dB	54	55	
5900 - 11000 MHz	dB	27	29	
Return Loss				
5170 – 5330MHz		12	16 <sup>(1)</sup>	
Operating Temperature	C	-40		85
Load Impedance	Ohm		50	
Power Handling: 802.11ax MCS10, 80 MHz BW, PAR 11dB	dBm			28

Note:

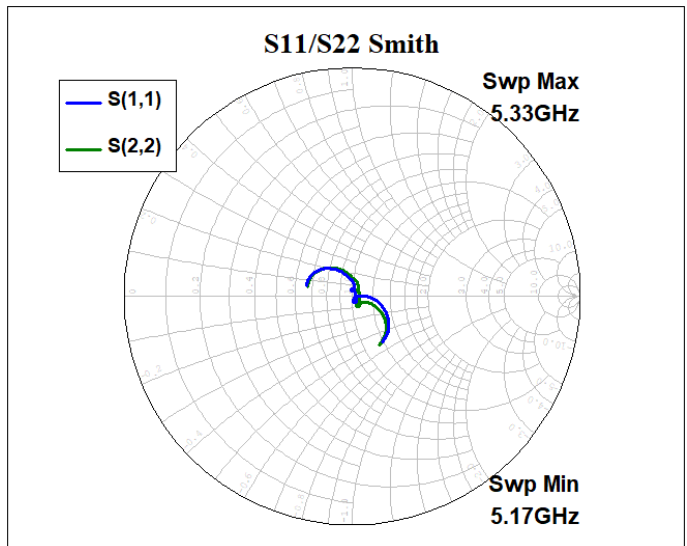
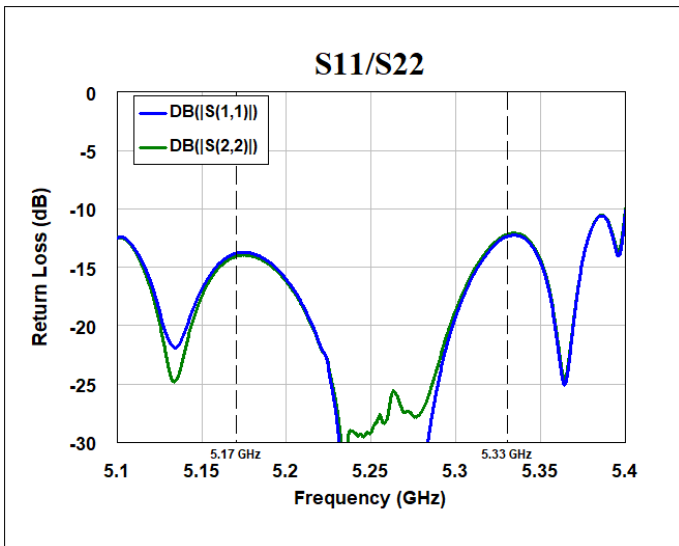
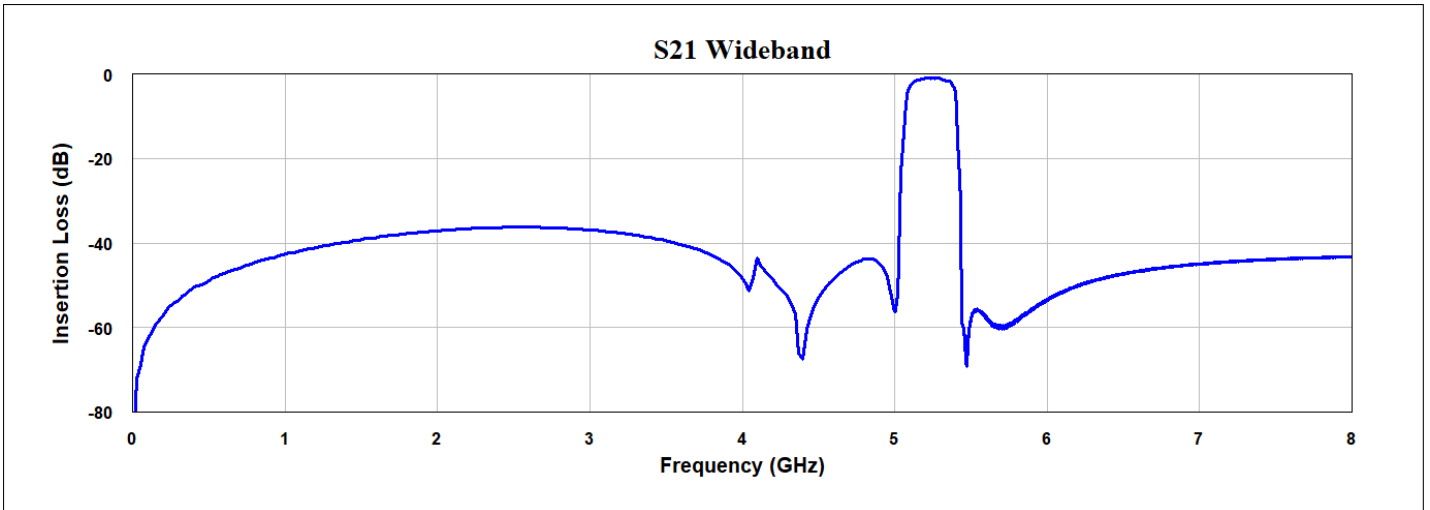
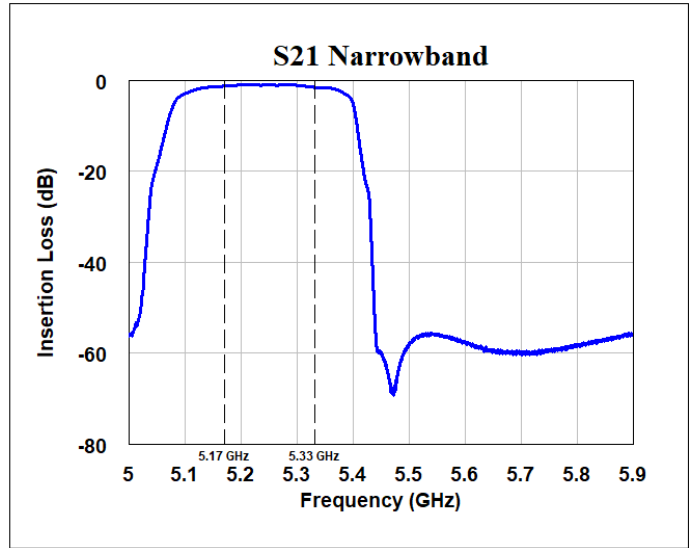
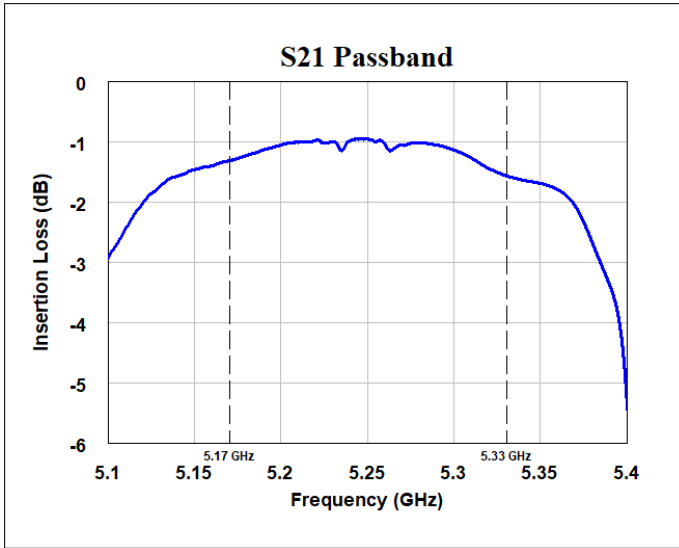
1. S-parameter averaged over specified pass band frequency at room temperature

## Schematic & Bill of Materials



Reference Des.	Value	Description	Manufacturer	Part Number
PCB	N/A	4 layer	Multiple	
U1	N/A	5.2GHz BAW Filter	Akoustis	A10252
L1	1.4nH	Chip inductor, 0201, ±0.05nH	Murata	LQP03HQ1N4W02
L2	1.4nH	Chip inductor, 0201, ±0.05nH	Murata	LQP03HQ1N4W02

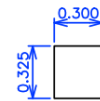
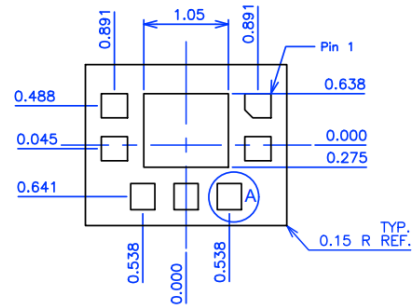
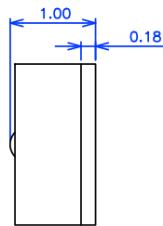
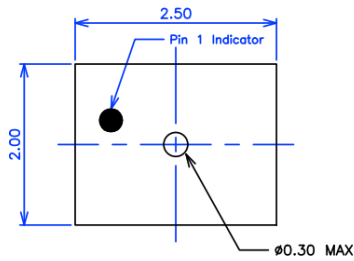
### Performance Plots



# Preliminary A10252

## Package Outline Drawing

- Notes:
- All Units are in mm unless otherwise stated
  - General Tolerance:  
 Linear X.XXX =  $\pm 0.050\text{mm}$   
 X.XX =  $\pm 0.10\text{mm}$

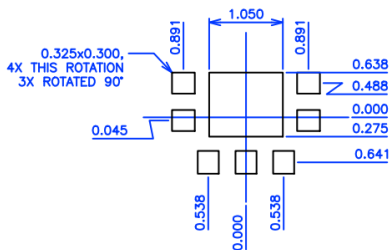


DETAIL A  
 PAD  
 SCALE: 2x  
 3X THIS ROTATION  
 4X ROTATED 90°  
 PIN 1 CHAMFER 0.150 X 45°

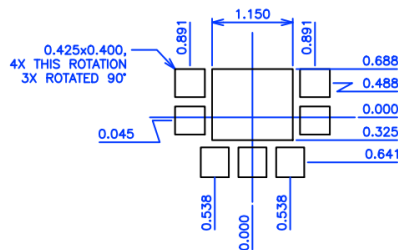
- NOTES:
1. Terminal Finish:  
 Electroless Ni/Electroless Pd/Immersion Au

## PCB Mounting Pattern

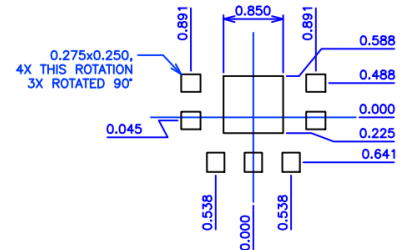
- Notes:
- All Units are in mm unless otherwise stated
  - General Tolerance:  
 Linear X.XXX =  $\pm 0.050\text{mm}$   
 X.XX =  $\pm 0.10\text{mm}$



Recommended PCB  
 Metal Top View

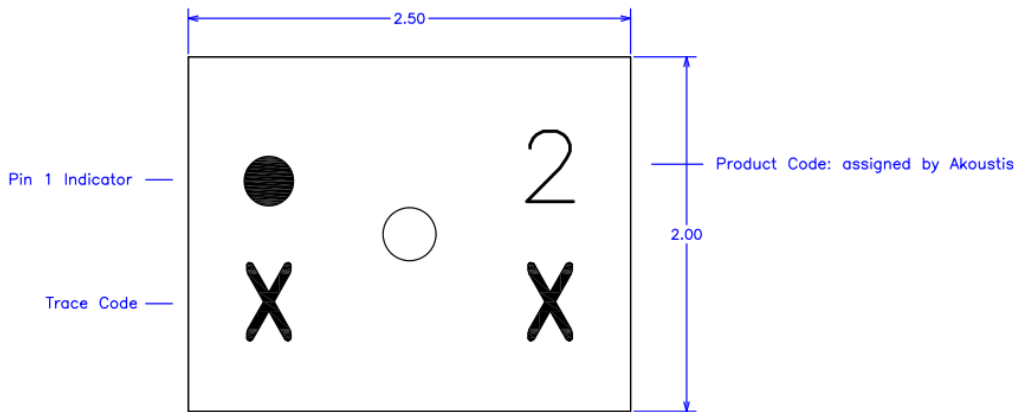


Recommended  
 Solder Mask Opening  
 Top View

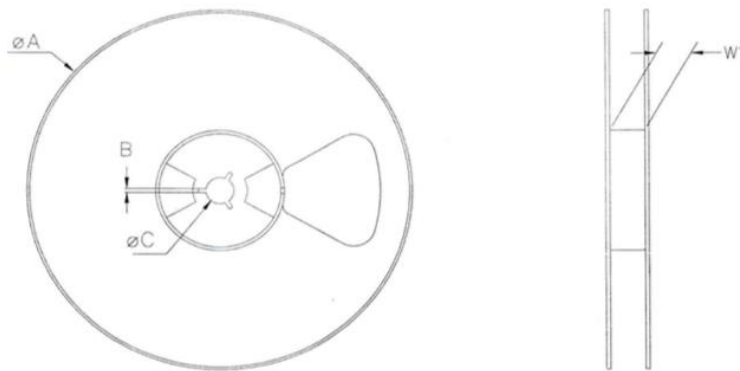


Recommended Stencil  
 Pattern Top View

### Typical Part Marking



### Reel Dimension

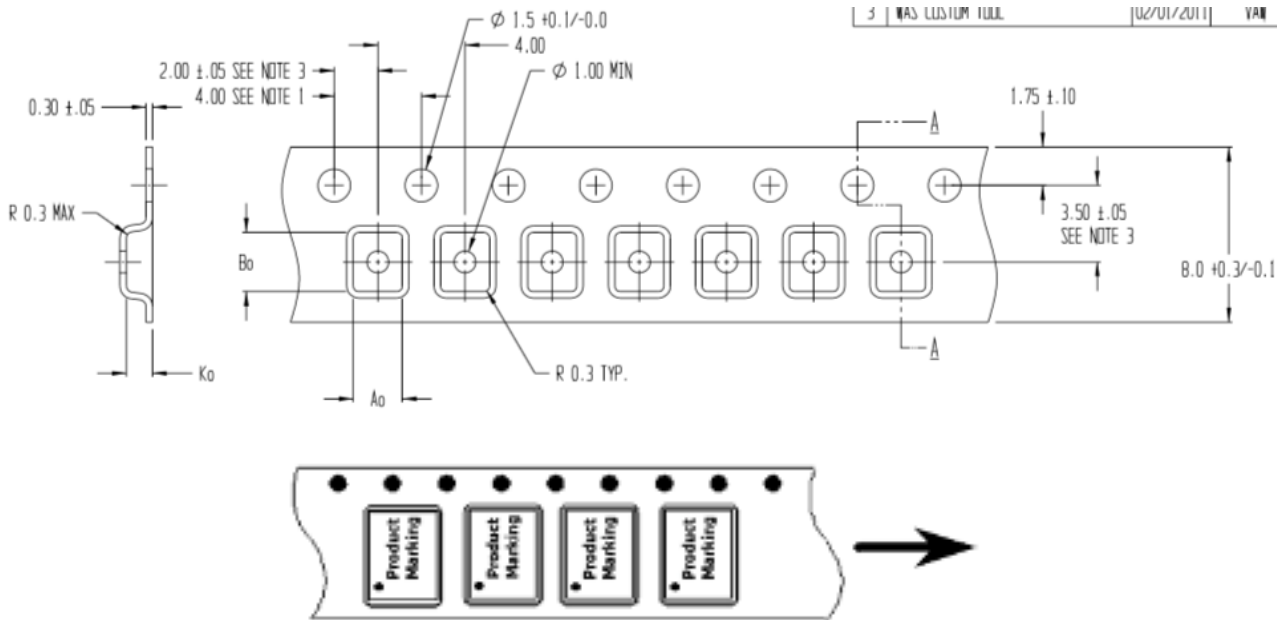


Item	Parameters	Method	Min	Max
1	$\phi A$ (180mm + 0 / - 2.0)	Caliper	178.96	179.00
2	B (1.5mm Min)	Caliper	2.33	2.36
3	$\phi C$ (13.0mm + 0.5 / - 0.2)	Caliper	13.26	13.29
4	W1 (8.40mm + 1.5 / - 0)	Caliper	9.24	9.27
5	Surface Resistivity ( $10^{11}$ Max) ohms / sq	S.R meter	$10^9$	$10^{10}$
6	Visual		PASS	

# Preliminary A10252

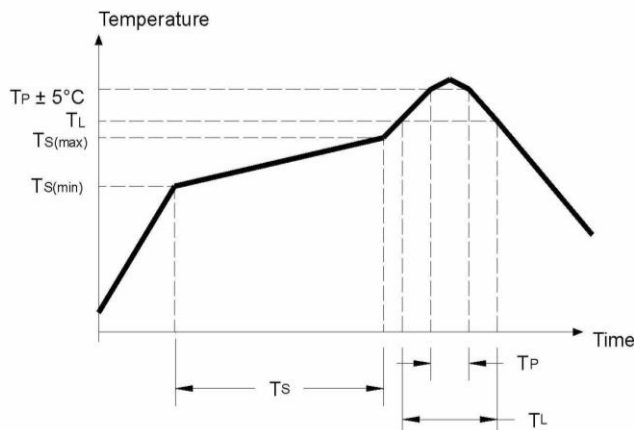
## Tape Dimension

$A_0 = 2.25$   
 $B_0 = 2.70$   
 $K_0 = 1.20$



## Recommended Solder Profile

Parameter	Eutectic Sn/Pb	Pb Free
Max Ramp Up Rate	6 Deg C/Second	6 Deg C/Second
Soak Temp Time $T_s$ (min) - $T_s$ (max)	135 - 155 Deg C	150-200 Deg C
Max Soak Time $T_s$	2 minutes	3 minutes
Liquidous Temp $T_L$	183 Deg C	220 Deg C
Max Time Above $T_L$	150 Seconds	150 Seconds
Max Peak Temperature $T_P$	225 Deg C	260 Deg C
Max Time at Peak $T_P$	30 Seconds	30 Seconds
Max Ramp Down Rate	10 Deg C/Second	10 Deg C/Second



## Product Compliance Information

### ESD Sensitivity Ratings

Human Body Model (HBM) Test

Rating: TBD

Standard: ANSI/ESDA/JEDEC JS-001-2017

Charged Device Model (CDM)

Rating: TBD

Standard: ANSI/ESDA/JEDEC JS-002-2018

### MSL Rating

TBD

### RoHS

This part is compliant with 2011/65EU RoHS directive on the restrictions of the use of certain hazardous substances in electrical and electronics equipment as amended by Directive (EU) 2015/863

## Contact Information

All contents specified in datasheet are subject to change. Please contact Akoustis for the latest on our products and company information.

Email: [sales@akoustis.com](mailto:sales@akoustis.com)

Website: [www.akoustis.com](http://www.akoustis.com)

Telephone: +1 704.997.5735

Fax: +1 704.997.5734