

4.9 GHz 5G Coexistence BAW Filter

A10149

Description

Akoustis' A10149 is a high performance, ultra-small bandpass BAW RF Filter for use in 4.9 GHz 5G applications covering 100 MHz of 5G n79 band. A10149 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 5G n77 and WiFi U-NII 1-3 bands. This device exhibits high-power handling capabilities necessary for demanding power requirements of the latest small cell requirements. A10149 uses standard hermetic sealed ceramic packaging and is compatible with high volume, lead-free SMT soldering processes.

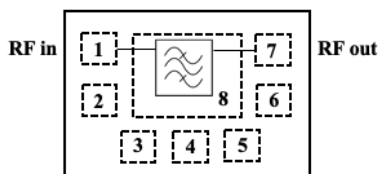
Features

- Ultra small form factor 2.5mm x 2.0mm x 0.8mm
- Single ended Tx/Rx ports.
- High rejection enables coexistence with adjacent 5G n77 and WiFi UNII bands
- High power rating, maximum +30dBm
- Low insertion loss passband filter
- Performance over -40 C to +85 C
- RoHS compliant

Applications

- 5G Infrastructure
- General Purpose Wireless

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
A10149EVB	Evaluation board
A10149SP	(5) Loose pcs
A10149SR	(100) Short Reel
A10149TR1	(1000) Tape & Reel
A10149TR2	(2500) Tape & Reel

Absolute Maximum Ratings

Parameter	Rating
Storage Temperature	-40 to 125 °C
Input Power (CW)	+31 dBm

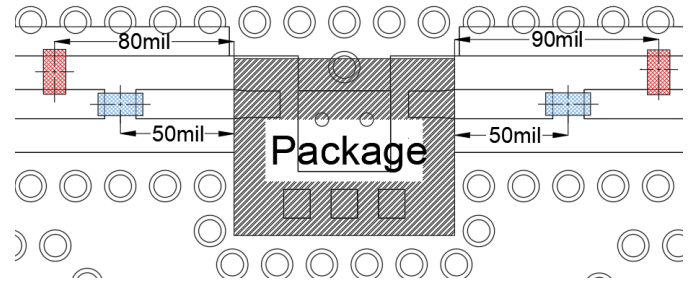
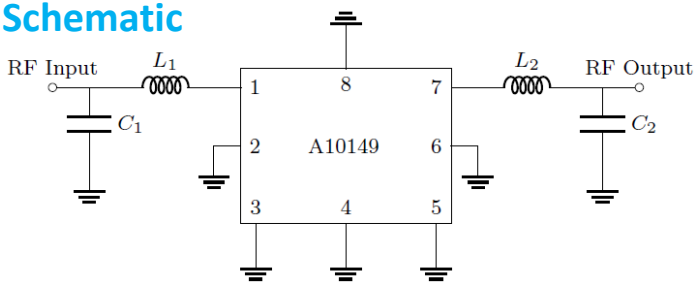
Nominal Operating Parameters

Parameter	Units	Min.	Typ.	Max.
Center Frequency (Fc)	MHz		4850	
Pass bandwidth	MHz		4800 - 4900	
Insertion Loss				
4800 – 4900 MHz	dB		1.8 ⁽¹⁾	2.2
Amplitude Variation				
4800 – 4900 MHz	dB		0.6	0.8
Attenuation				
10 – 2370 MHz	dB	40	43	
2400 - 3800 MHz	dB	37	40	
3900 - 4650 MHz	dB	38	40	
5150 - 5350 MHz	dB	40	43	
5725 - 5850 MHz	dB	52	55	
6000 - 10000 MHz	dB	44	46	
Return Loss				
4800 - 4900MHz		14	20 ⁽¹⁾	
Operating Temperature	C	-40		85
Load Impedence	Ohm		50	
Power Handling: 5G 100 MHz BW 7.8dB PAR	dBm			30

Note:

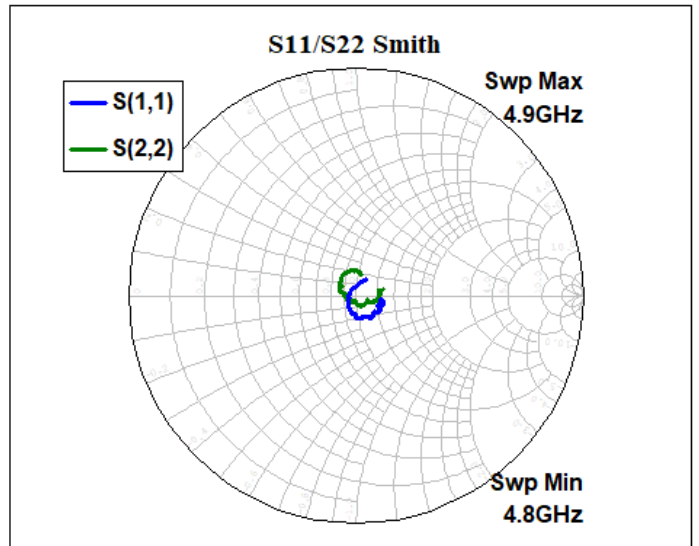
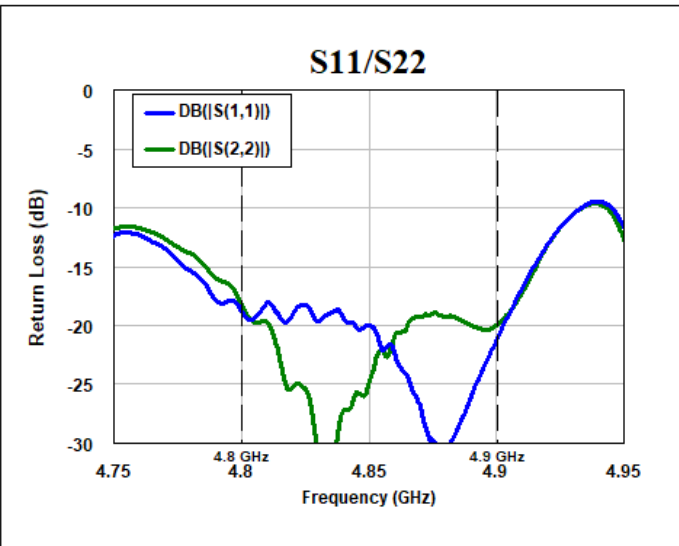
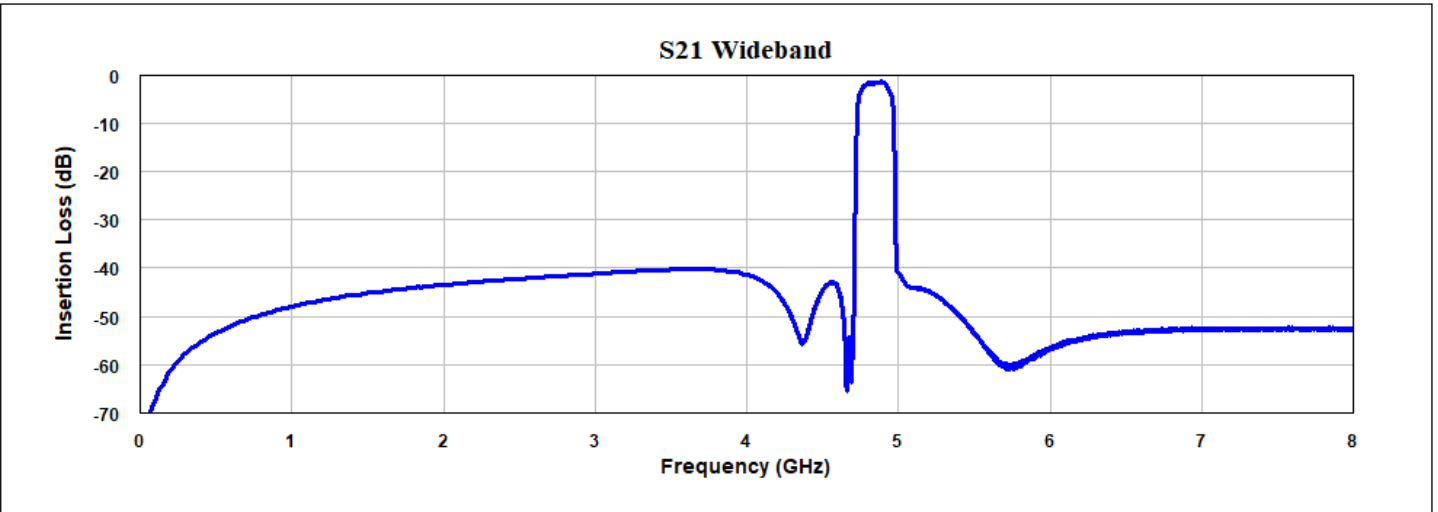
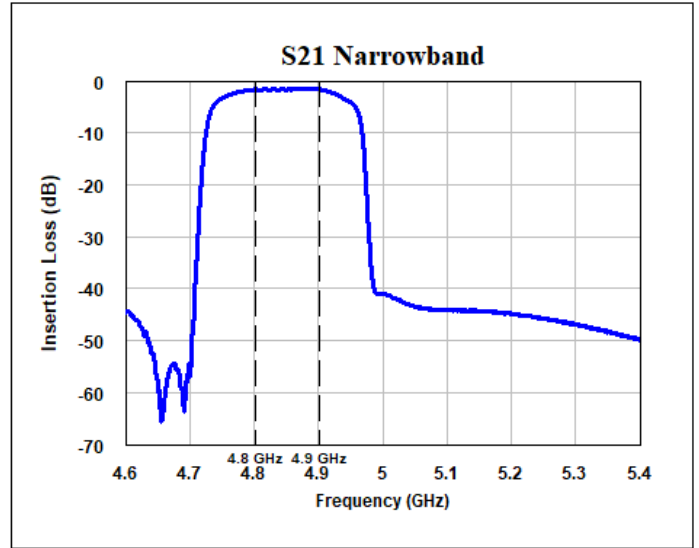
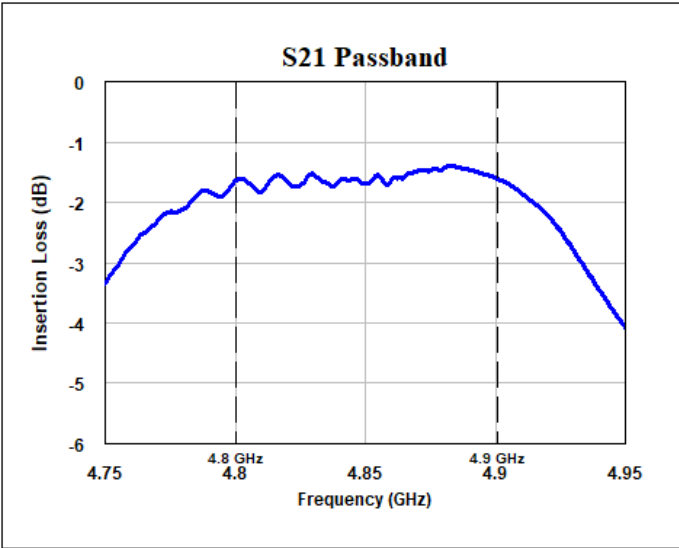
1. S-parameter averaged over specified pass band frequency at room

Schematic



Reference Des.	Value	Description	Manufacturer	Part Number
PCB	N/A	4 layer	Multiple	
U1	N/A	4.85 GHz BAW Filter	Akoustis	A10149
L1	2.0nH	Chip inductor, 0201, ±0.05nH	Murata	LQP03HQ2N0B02
L2	2.0nH	Chip inductor, 0201, ±0.05nH	Murata	LQP03HQ2N0B02
C1	0.4pF	Chip capacitor, 0201, ±0.05pF	Murata	GJM0335C1HR40WB01D
C2	0.4pF	Chip capacitor, 0201, ±0.05pF	Murata	GJM0335C1HR40WB01D

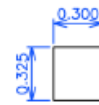
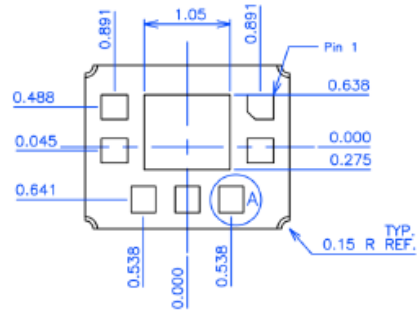
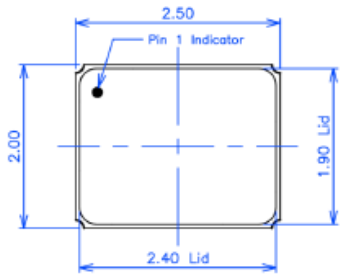
Performance Plots



A10149

Package Drawing

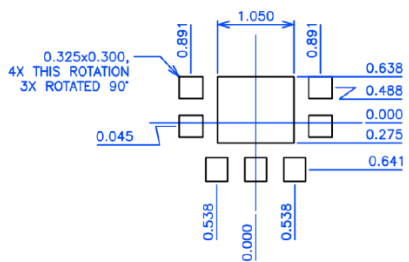
- Notes:
- All Units are in mm unless otherwise stated
 - General Tolerance:
Linear X.XXX = $\pm 0.050\text{mm}$
X.XX = $\pm 0.10\text{mm}$



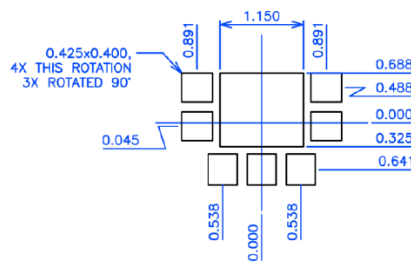
DETAIL A
PAD
SCALE: 2x
3X THIS ROTATION
4X ROTATED 90°
PIN 1 CHAMFER 0.150 X 45°

- NOTES:
1. PLATING THICKNESS
ELECTRO Ni : 1.27~8.89 μm (S/P)
ELECTRO Au : 0.30~1.00 μm (S/P)

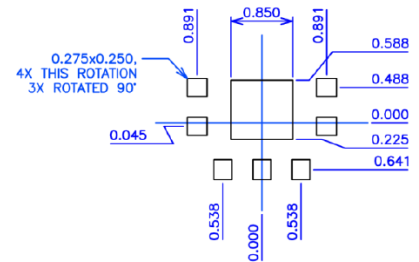
PCB Mounting Pattern



Recommended PCB
Metal Top View

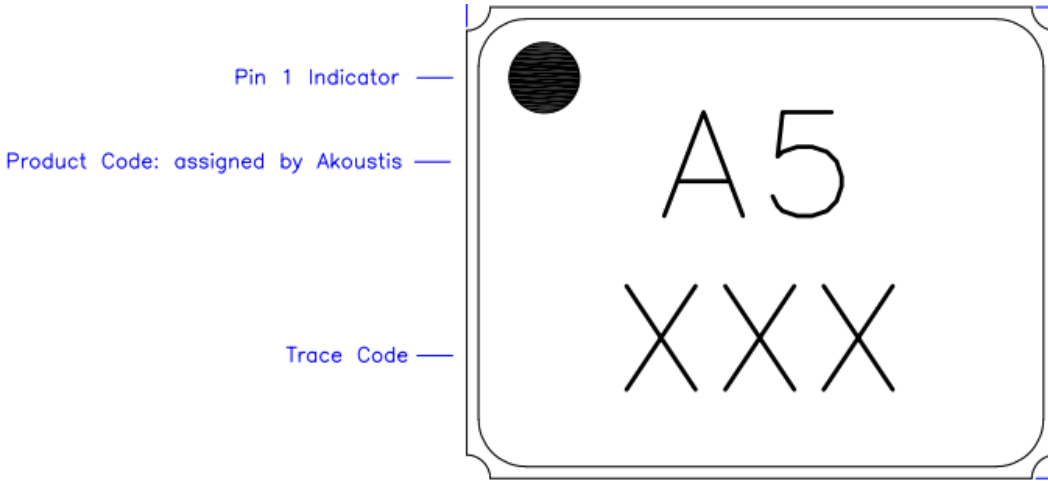


Recommended
Solder Mask Opening
Top View

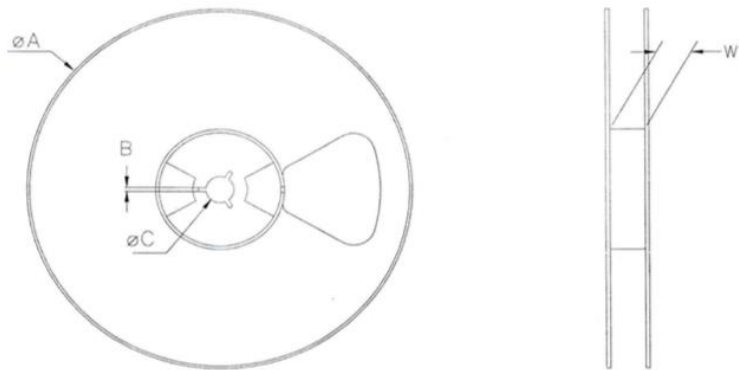


Recommended Stencil
Pattern Top View

Typical Part Marking



Reel Dimension

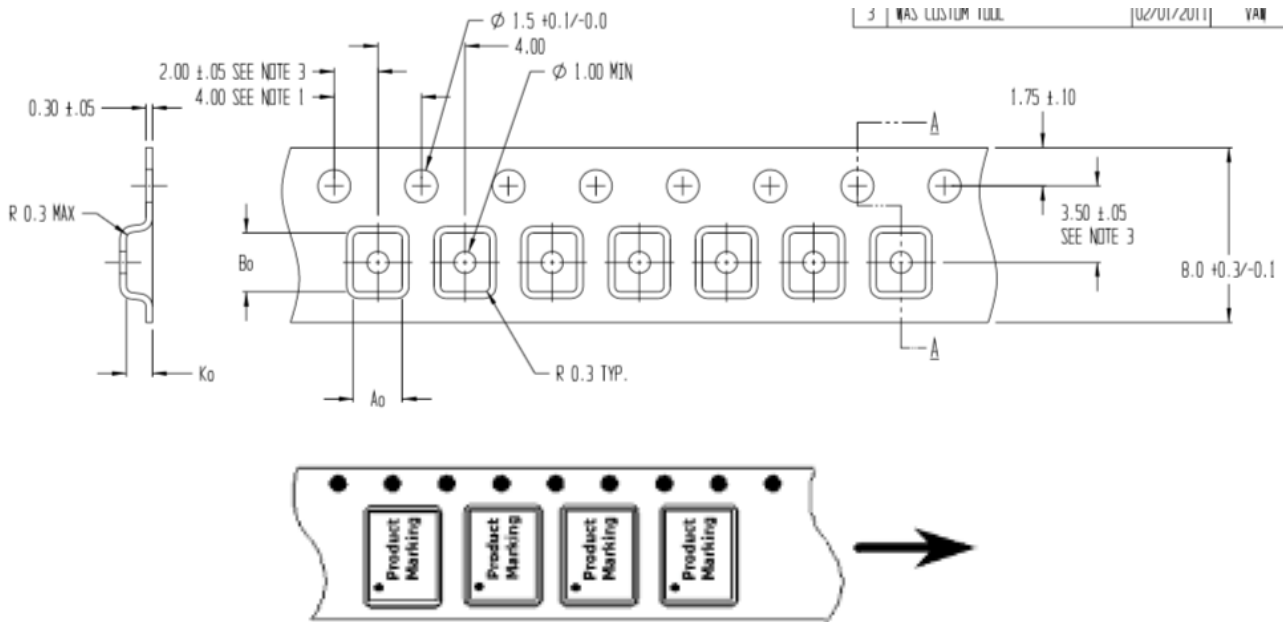


Item	Parameters	Method	Min	Max
1	$\varnothing A$ (180mm + 0 / - 2.0)	Caliper	178.96	179.00
2	B (1.5mm Min)	Caliper	2.33	2.36
3	$\varnothing C$ (13.0mm + 0.5 / - 0.2)	Caliper	13.26	13.29
4	W1 (8.40mm + 1.5 / - 0)	Caliper	9.24	9.27
5	Surface Resistivity (10^{11} Max) ohms / sq	S.R meter	10^9	10^{10}
6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

A10149

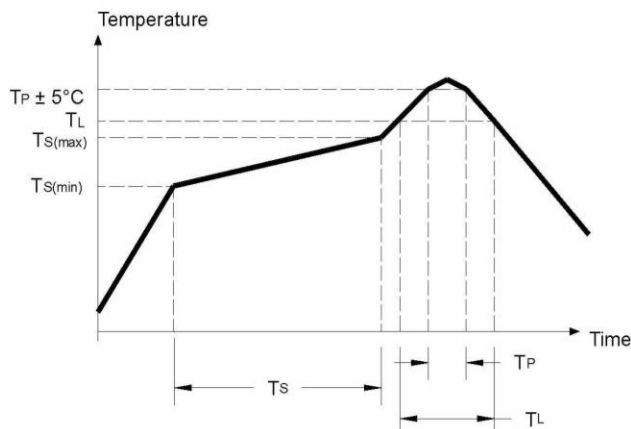
Tape Dimension

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



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



A10149

Product Compliance Information

ESD Sensitivity Ratings

Human Body Model (HBM) Test

Rating: 500 V

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

Charged Device Model (CDM)

Rating: 1000 V

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

MSL Rating

N/A – Hermetic Package

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.

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