5.4 GHz WiFi 6E Coexistence BAW Filter A10154

Description

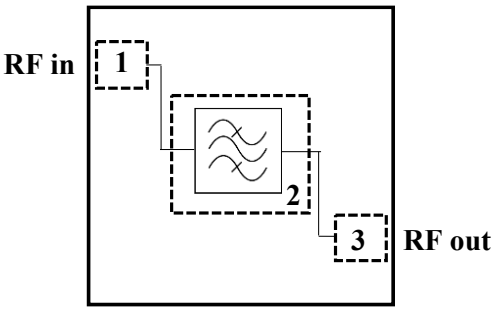
Akoustis' A10154 is a high-performance, ultra-wide bandwidth BAW RF Filter for use in WiFi 6E applications covering U-NII-1 thru U-NII-2C bands. A10154 utilizes Akoustis' patented XBAW® technology which provides leading RF filter performance. This BAW RF filter provides low insertion loss and meets the stringent rejection requirements enabling coexistence with U-NII-5 thru 8. This device exhibits high-power handling capabilities necessary for demanding power requirements of the latest WiFi 6E standards. A10154 is a fully integrated, 50Ω module using standard laminate packaging and is compatible with high volume, lead-free SMT soldering processes.

- Small form factor 3.5mm x 3.5mm x 1.4mm
- Single-ended Tx/Rx ports.
- Ultra-wide passband covering 560 MHz
- High rejection enables coexistence with adjacent WiFi UNII bands
- High power rating, maximum +27 dBm
- Low insertion loss bandpass filter
- Performance over -20 C to +95C
- RoHS compliant, Pb-free package

Applications

- WiFi 6E tri band routers, integrated cable modem
- WiFi 6E tri band access points
- LTE/LAA small cells

Functional Block Diagram



Pin #	Description
1	RF Input
2	Ground
3	RF Output

Ordering Information

Part Number	Description
A10154EVB	Evaluation board
A10154SP	(5) Loose pcs
A10154SR	(100) Short Reel (7" Reel)
A10154TR1	(1000) Tape & Reel (7" Reel)
A10154TR2	(2500) Tape & Reel (13" Reel)

Akoustis, Inc.
9805-A Northcross Center Court, Huntersville, NC 28078
Datasheet: Rev 06122024
Pat. 10,256,786

Absolute Maximum Ratings

Parameter	Conditions	Rating
Storage Temperature		-40 to 125 °C
Max Input Power	Signal: OFDM MCS0, 80MHz, PAR 10dB	+29 dBm
Max Temperature		-40 to 105°C

Exceeding any one limit or a combination of AMR conditions may result in damage to the device.

Operating Parameters (Temp = 25°C unless otherwise noted)

Parameter	Conditions	Units	Min.	Typ.	Max.
Passband		MHz	5170	5450	5730
Insertion Loss	5170 – 5730 MHz	dB		1.3(1)	2.5(2)
Amplitude Variation	5170 – 5730 MHz	dB		1.4(2)	1.6(2)
Attenuation	30 – 2700 MHz	dB	26	27	
	3300 – 4200 MHz	dB	25	26	
	4200 – 4900 MHz	dB	27	31	
	5945 – 6425 MHz	dB	46	49	
	6425 – 6525 MHz	dB	48	51	
	6525 – 7065 MHz	dB	47	50	
	7065 – 7125 MHz	dB	45	48	
	8500 – 12000 MHz	dB	2	3	
Return Loss	5170 – 5730 MHz		11	15(1)	
Load Impedance		Ω		50	
Power Handling	OFDM MCS0, 80MHz, PAR 10 dB	dBm			27

Note:

1. Averaged over specified frequency at room temperature
2. Averaged over 20MHz channel

Akoustis, Inc.
9805-A Northcross Center Court, Huntersville, NC 28078
Datasheet: Rev 06122024
Pat. 10,256,786

Operating Parameters (Temp = -20°C to +95°C unless otherwise noted)

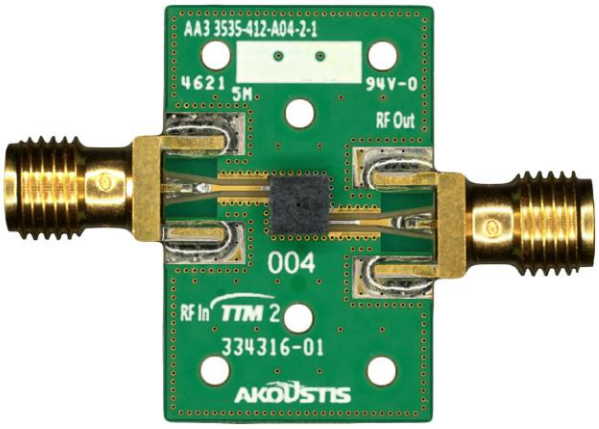
Parameter	Conditions	Units	Min.	Typ.	Max.
Passband		MHz	5170	5450	5730
Insertion Loss	5170 – 5730 MHz	dB		1.3(1)	2.7(2)
Amplitude Variation	5170 – 5730 MHz	dB		1.4(2)	1.7(2)
Attenuation	30 – 2700 MHz	dB	24	27	
	3300 – 4200 MHz	dB	23	26	
	4200 – 4900 MHz	dB	25	31	
	5945 – 6425 MHz	dB	45	49	
	6425 – 6525 MHz	dB	47	51	
	6525 – 7065 MHz	dB	45	50	
	7065 – 7125 MHz	dB	44	48	
	8500 – 12000 MHz	dB	2	3	
Return Loss	5170 – 5730 MHz		10	15(1)	
Load Impedance		Ω		50	
Power Handling:	OFDM MCS0, 80MHz, PAR 10dB	dBm			27

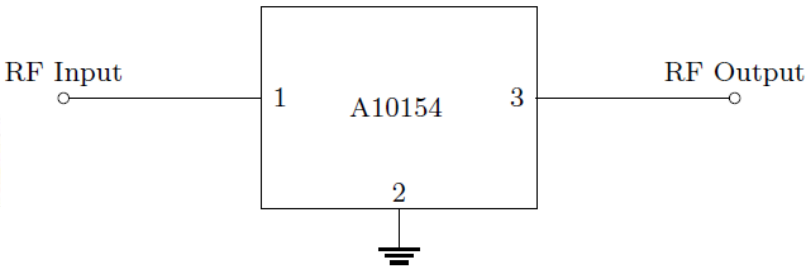
Note:

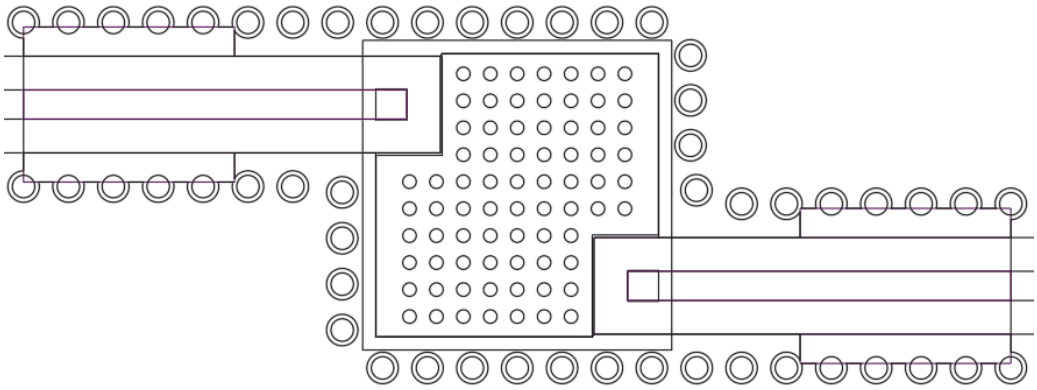
1. Averaged over specified frequency at room temperature
2. Averaged over 20MHz channel

Akoustis, Inc.
9805-A Northcross Center Court, Huntersville, NC 28078
Datasheet: Rev 06122024
Pat. 10,256,786

EVB Schematic







Note:

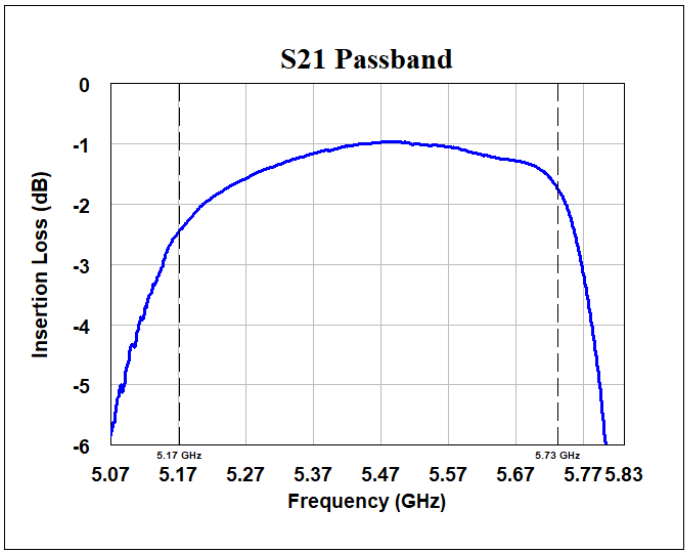
1) Center ground pad vias 6mil diameter
2) RF ground vias 10mil diameter

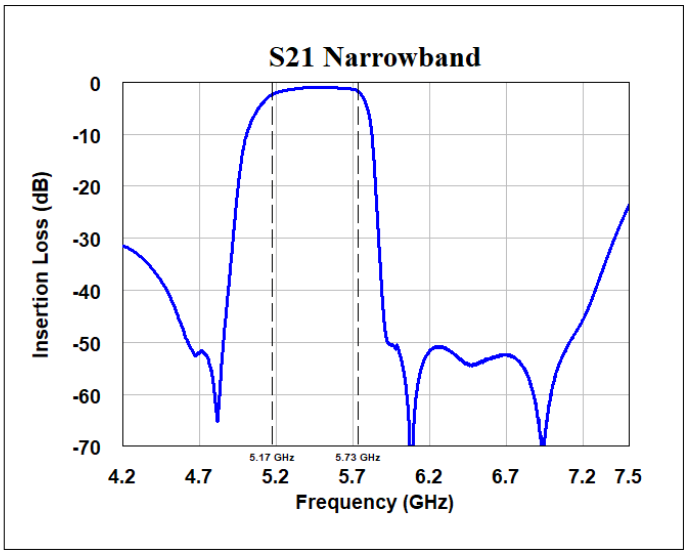
Bill of Materials

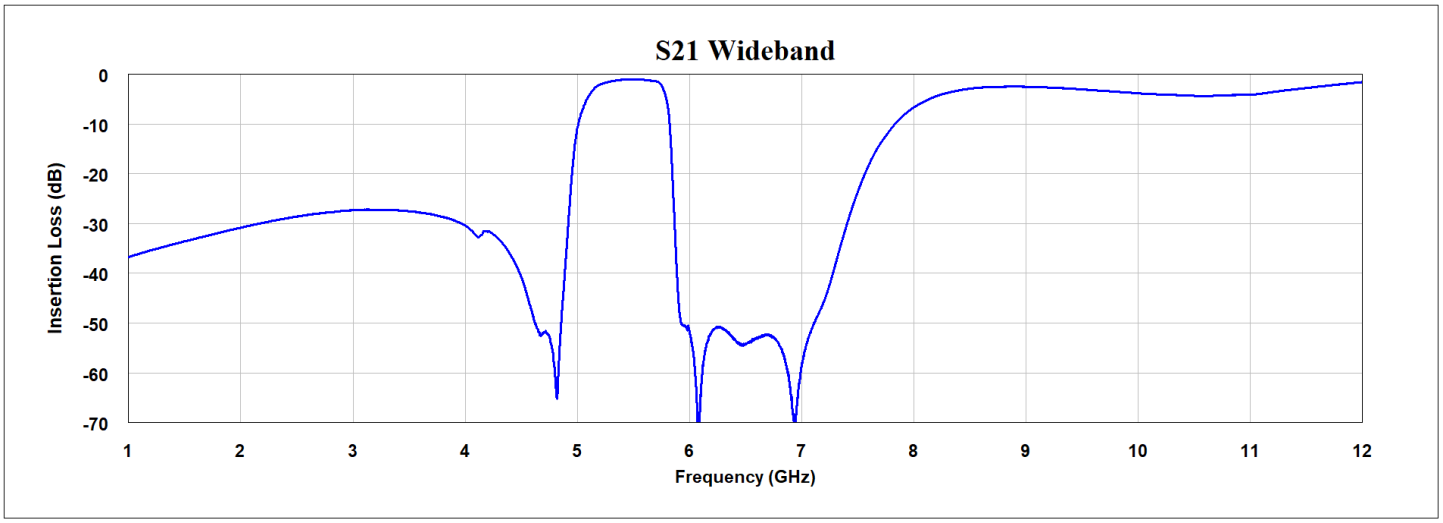
Reference Des.	Value	Description	Manufacturer	Part Number
PCB	N/A	Multi layer	Multiple	AA33535-412-A04-2-1
U1	N/A	5.4 GHz BAW Filter	Akoustis	A10154

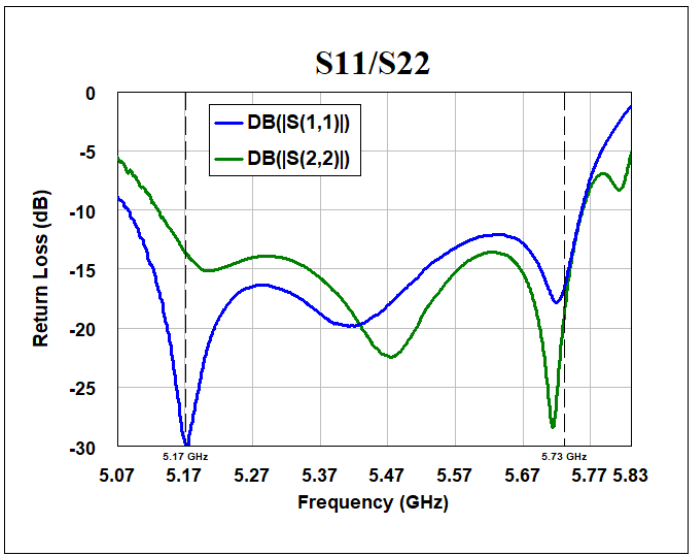
Akoustis, Inc.
9805-A Northcross Center Court, Huntersville, NC 28078
Datasheet: Rev 06122024
Pat. 10,256,786

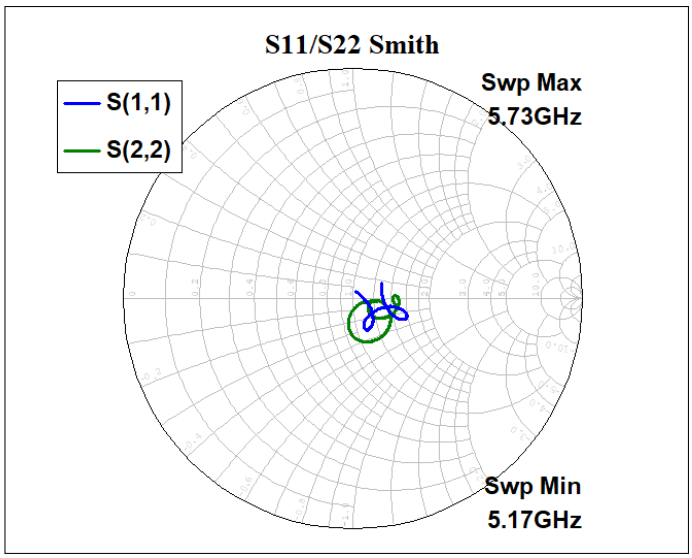
Performance Plots (Temp = 25°C unless otherwise noted)







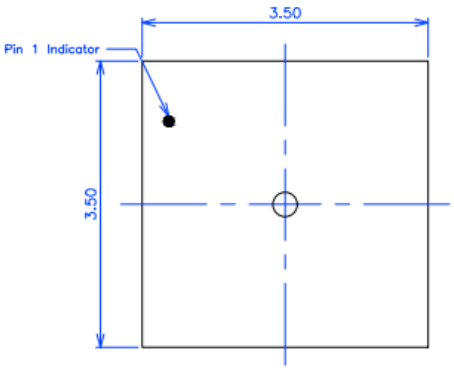




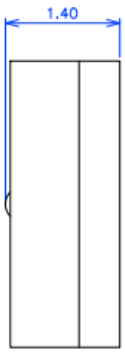
Akoustis, Inc.
9805-A Northcross Center Court, Huntersville, NC 28078
Datasheet: Rev 06122024
Pat. 10,256,786

Package Drawing & Pin Description

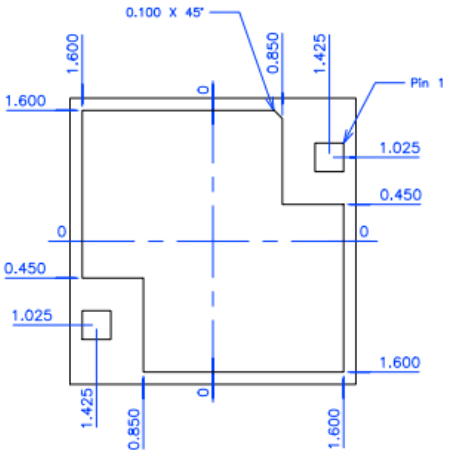
Notes:
- All Units are in mm unless otherwise stated
- General Tolerance:
  Linear X.XXX = ±0.050mm
  X.XX = ±0.10mm
- Terminal Finish:
  Electroless Ni/Electroless Pd/Immersion Au



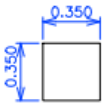
Top View



Side View

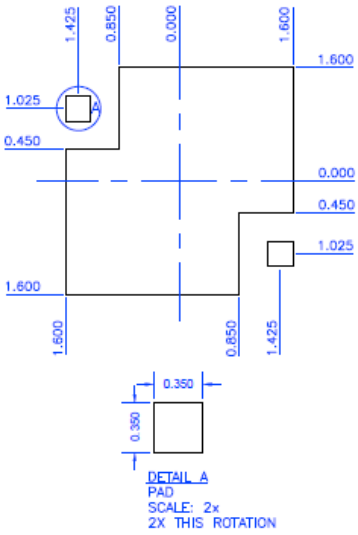


Bottom View

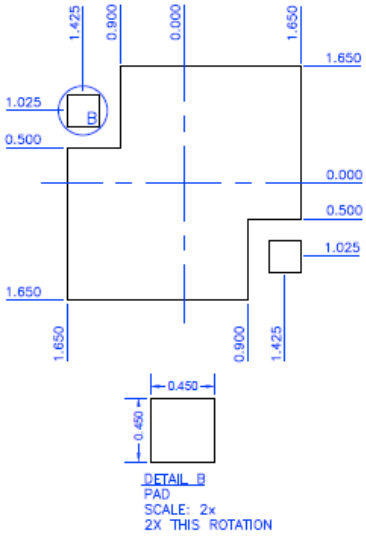


PAD: 2x
SCALE: 2x

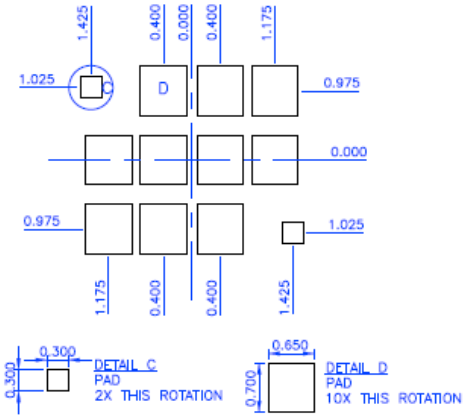
PCB Mounting Pattern



Recommended PCB Metal Top View



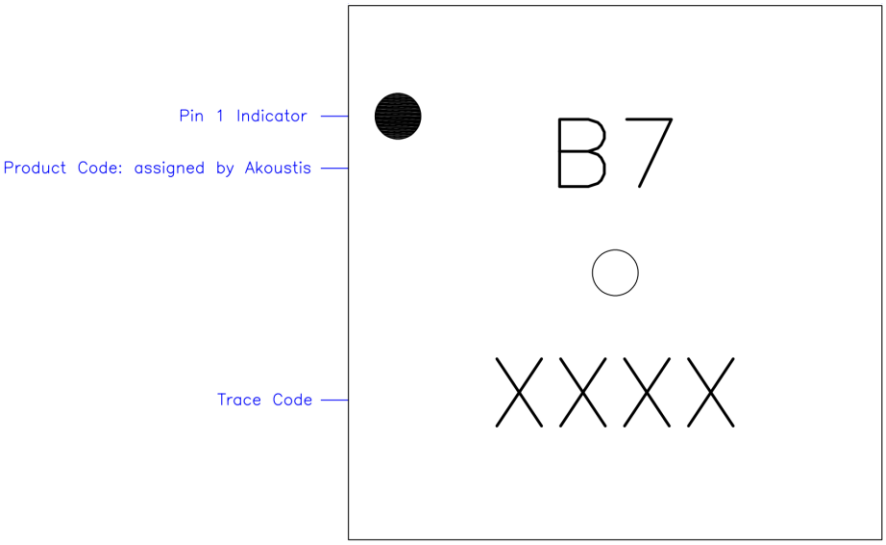
Recommended Solder Mask Opening Top View



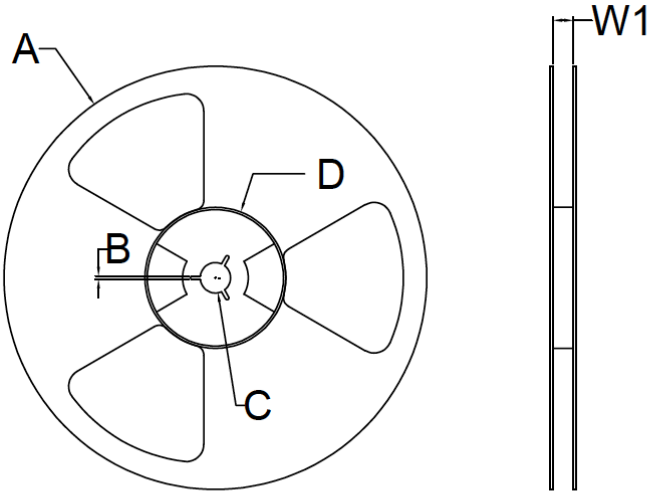
Recommended Stencil Pattern Top View

Akoustis, Inc.
9805-A Northcross Center Court, Huntersville, NC 28078

Typical Part Marking



Reel Dimensions

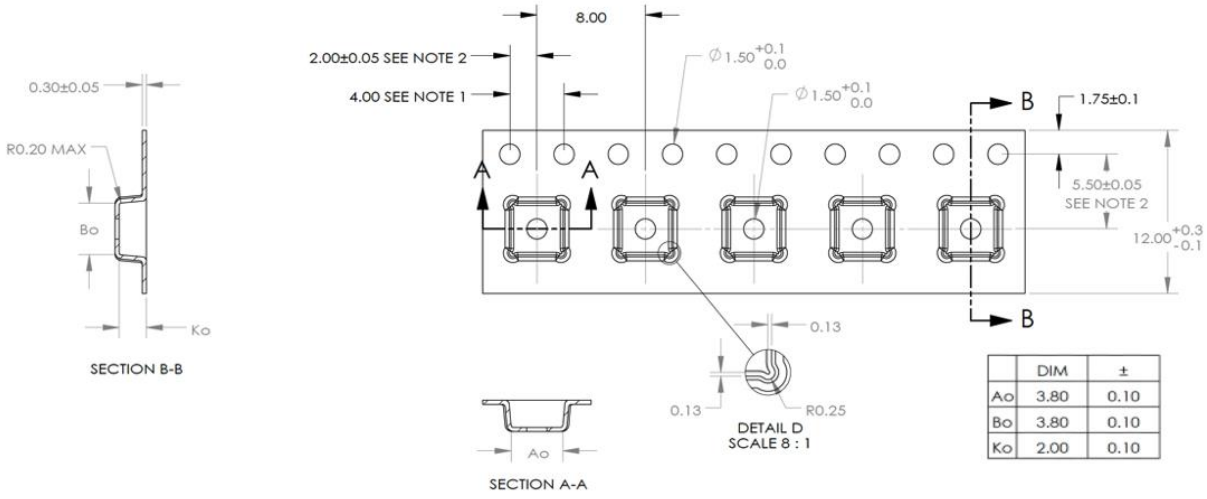


Reel Dimensiones						
Reel Size	**Tape Width**	**A**	**B**	**C**	**D**	**W1 *measured at hub**
7 Inch	8 mm	180 +0/-2.0 mm	2.0mm +/-0.5	13.0 + 0.5 / -0 mm	60.0 +/- 2.0 mm	8.40 + 1.5 / -0 mm
	12 mm	180 +0/-2.0 mm	2.0mm +/-0.5	13.0 + 0.5 / -0 mm	60.0 +/- 2.0 mm	12.40 + 2.0 / -0 mm
	16 mm	180 +0/-2.0 mm	2.0mm +/-0.5	13.0 + 0.5 / -0 mm	60.0 +/- 2.0 mm	16.40 + 2.0 / -0 mm
13 Inch	8 mm	330 +/- 2.0 mm	2.0mm +/-0.5	13.0 + 0.5 / -0.2 mm	102 +/- 2.0 mm	8.8 + 2.0 / -0 mm
	12 mm	330 +/- 2.0 mm	2.0mm +/-0.5	13.0 + 0.5 / -0.2 mm	102 +/- 2.0 mm	12.8 + 2.0 / -0 mm
	16 mm	330 +/- 2.0 mm	2.0mm +/-0.5	13.0 + 0.5 / -0.2 mm	102 +/- 2.0 mm	16.8 + 2.0 / -0 mm

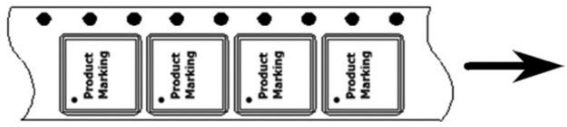
Note: 7 Inch Reel Only Has One Opening

Akoustis, Inc.
9805-A Northcross Center Court, Huntersville, NC 28078

Tape Dimension

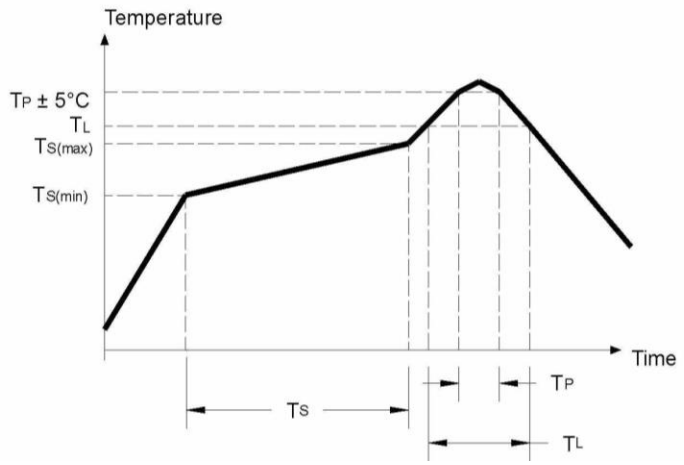


	DIM	±
Ao	3.80	0.10
Bo	3.80	0.10
Ko	2.00	0.10



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



Akoustis, Inc.
9805-A Northcross Center Court, Huntersville, NC 28078

Product Compliance Information

ESD Sensitivity Ratings

Human Body Model (HBM) Test
Rating: Class 1A
Standard: ANSI/ESDA/JEDEC JS-001-2017

Charged Device Model (CDM)
Rating: Class C2B
Standard: ANSI/ESDA/JEDEC JS-002-2018

MSL Rating

MSL3

RoHS

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

Contact Information

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

Email: sales@akoustis.com

Website: www.akoustis.com

Telephone: +1 704.997.5735

Fax: +1 704.997.5734