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.

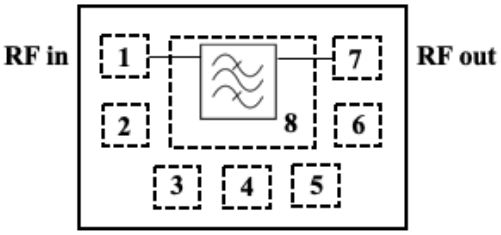
Features

- 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 (7" Reel)
A10252TR1	(1000) Tape & Reel (7" Reel)
A10252TR2	(2500) Tape & Reel (7" Reel)

Akoustis, Inc.
9805-A Northcross Center Court, Huntersville, NC 28078
Datasheet: Rev 05112022
Pat. 10,256,786

Absolute Maximum Ratings

Parameter		Rating
Storage Temperature		-40 to 125 °C
Input Power	Signal: 802.11ax MCS10, 80 MHz, PAR 11dB Temp: 85°C	+30 dBm

A combination of AMR conditions may result in damage to the device.

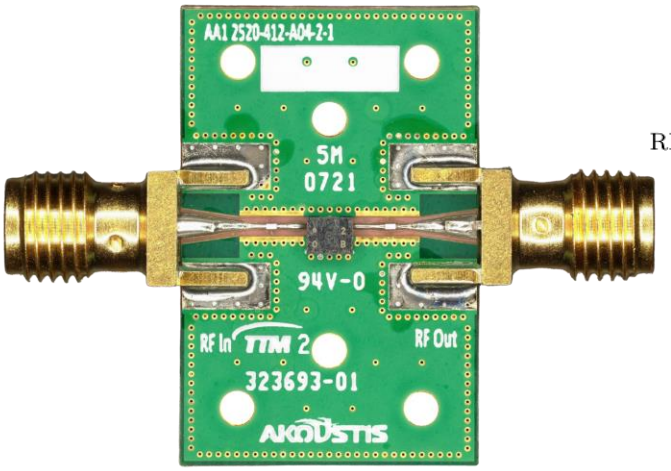
Operating Parameters (Temp = -40°C to +85°C unless otherwise noted)

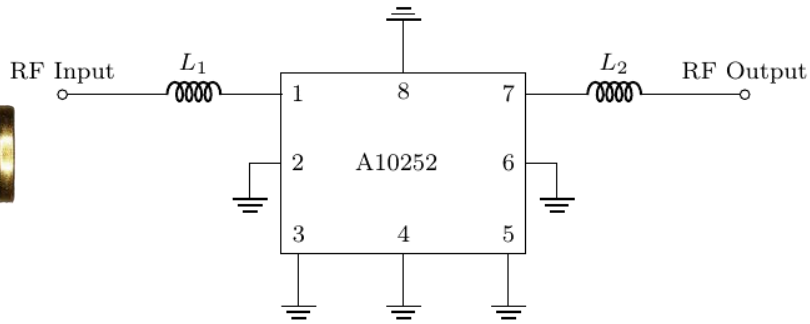
Parameter	Conditions	Units	Min.	Typ.	Max.
Passband		MHz	5170	5250	5330
Insertion Loss	5170 – 5330 MHz	dB		1.3(1)	2.0
Amplitude Variation	5170 – 5330 MHz	dB		0.6	0.7
Attenuation	30 – 2700 MHz	dB	35	36	
	3300 – 3700 MHz	dB	37	38	
	5490 – 5835 MHz	dB	55	57	
	5945 – 6425 MHz	dB	48	50	
	6525 – 7125 MHz	dB	44	46	
	7500 – 11000 MHz	dB	30	32	
Return Loss	5170 – 5330MHz		12	20(1)	
Load Impedance		Ω		50	
Power Handling	802.11ax MCS10, 80 MHz, PAR 11dB	dBm			28
2nd Harmonic	Po=28dBm **(25°C)**	dBm/MHz		-43	
3rd Harmonic	Po=28dBm **(25°C)**	dBm/MHz		-91	

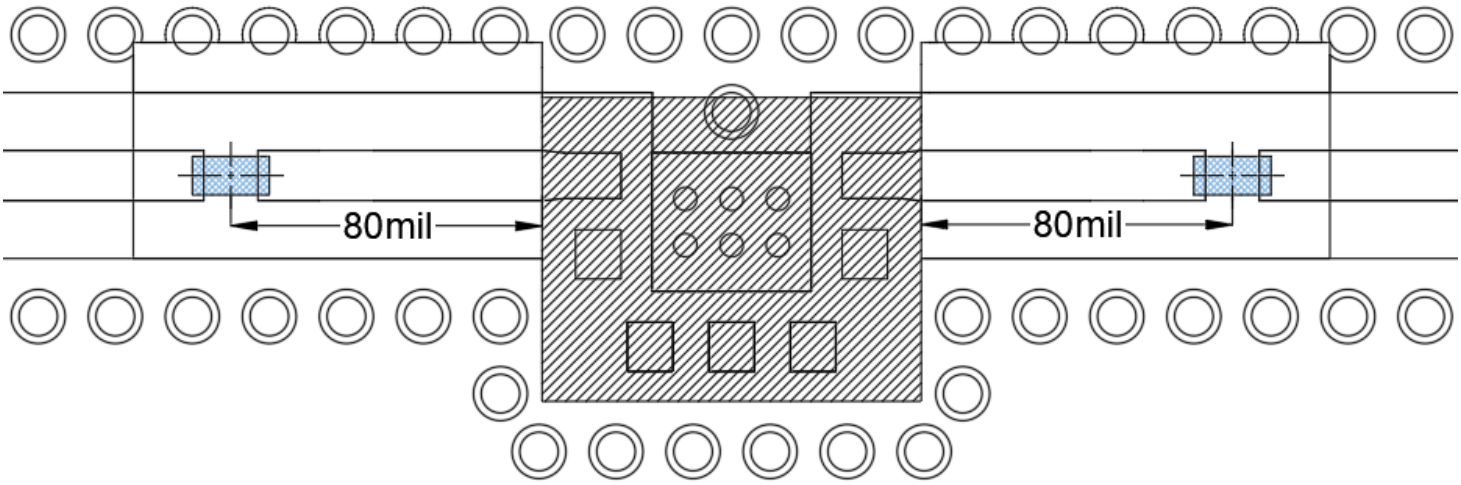
Note:

1. Averaged over specified frequency at room temperature

EVB Schematic & Layout







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	4 layer	Multiple	AA1 2520-412-A04-2-1
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

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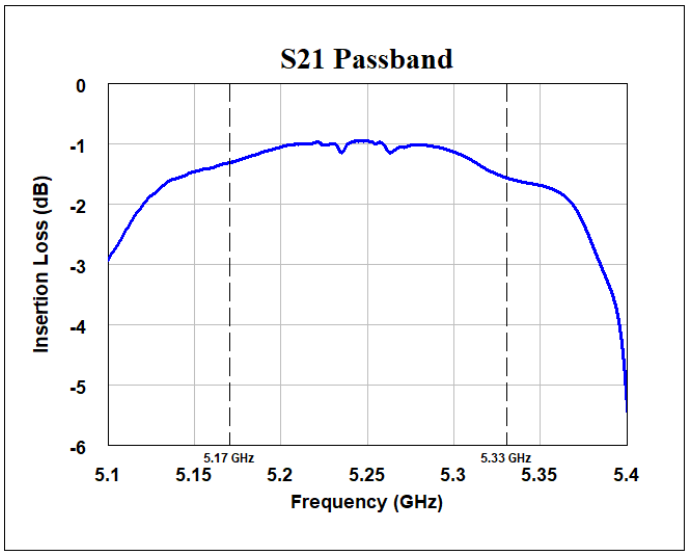
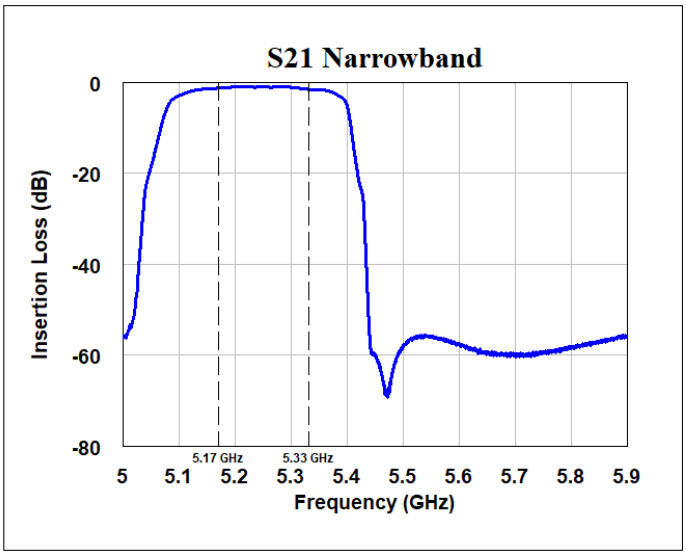
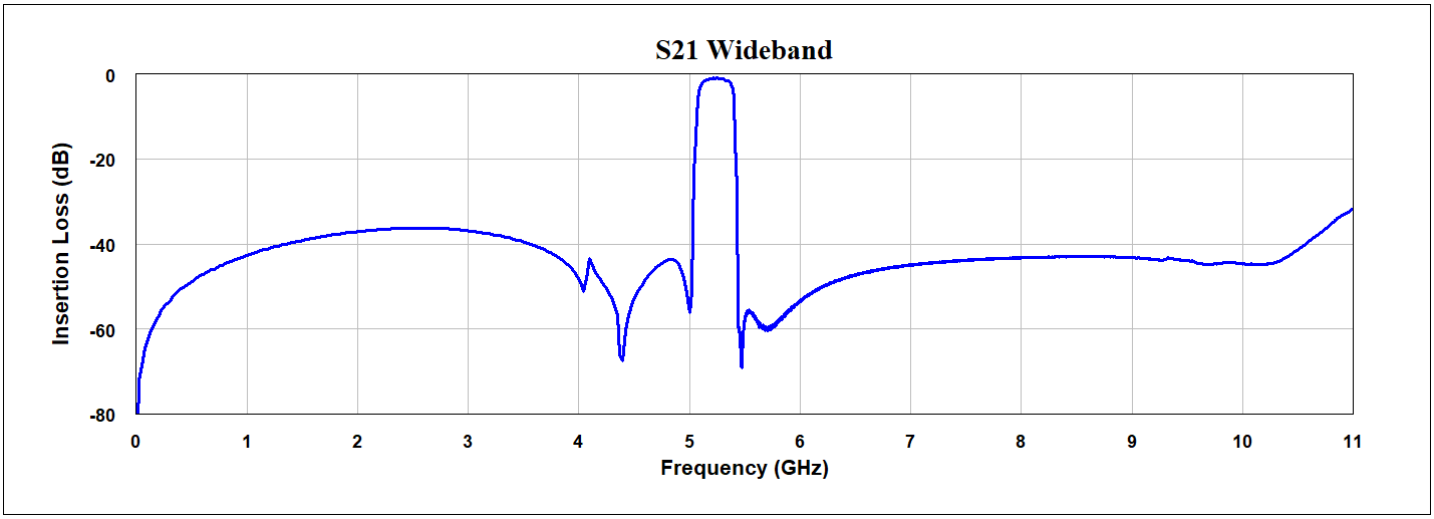
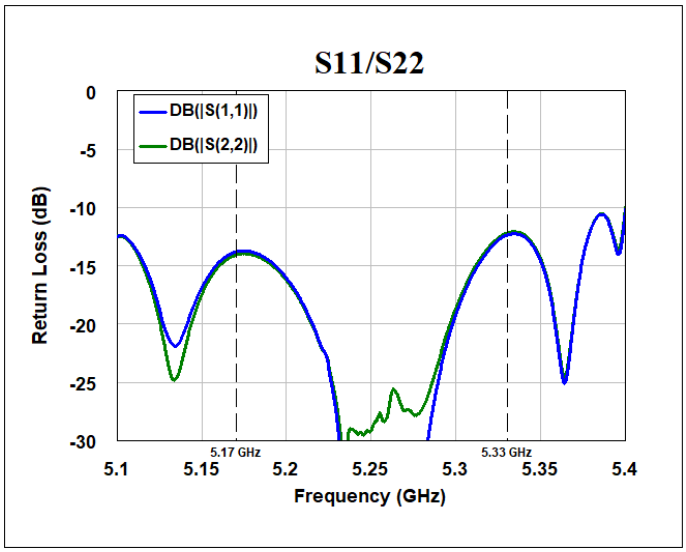
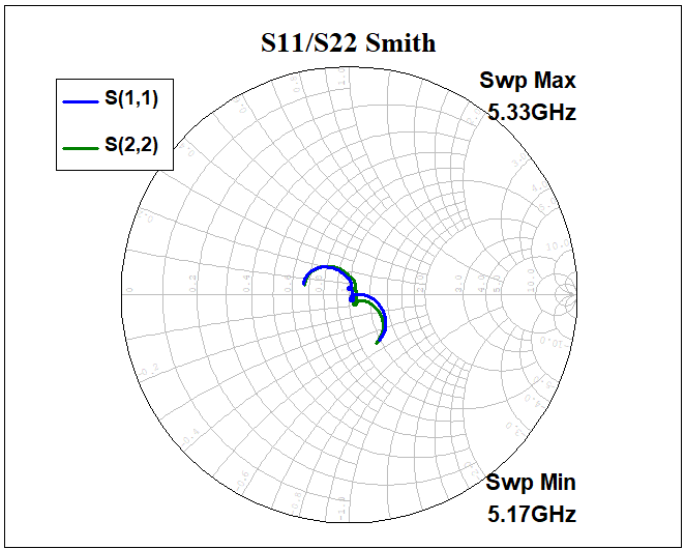
Performance Plots (Temp = 25°C unless otherwise noted)











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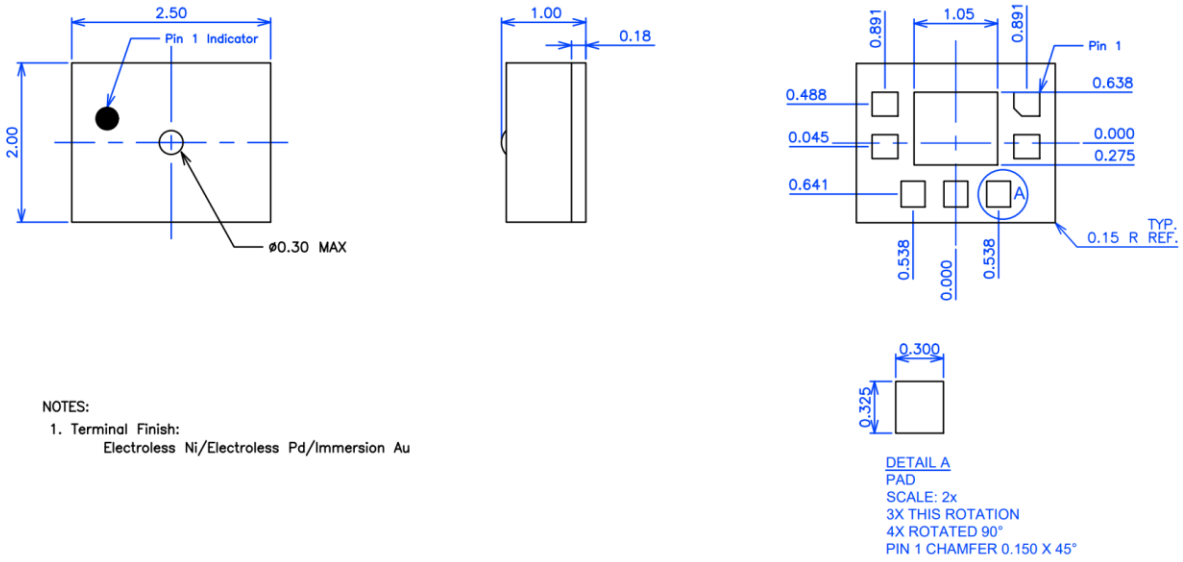
Package Outline Drawing

Notes:
– All Units are in mm unless otherwise stated
– General Tolerance:
Linear X.XXX = ±0.050mm
X.XX = ±0.10mm

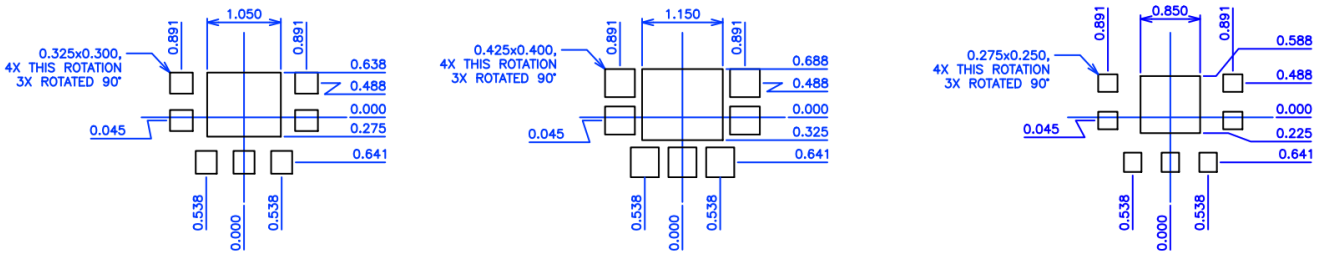


NOTES:
1. Terminal Finish:
Electroless Ni/Electroless Pd/Immersion Au

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

PCB Mounting Pattern

Notes:
– All Units are in mm unless otherwise stated
– General Tolerance:
Linear X.XXX = ±0.050mm
X.XX = ±0.10mm



Recommended PCB Metal Top View

Recommended Solder Mask Opening Top View

Recommended Stencil Pattern Top View

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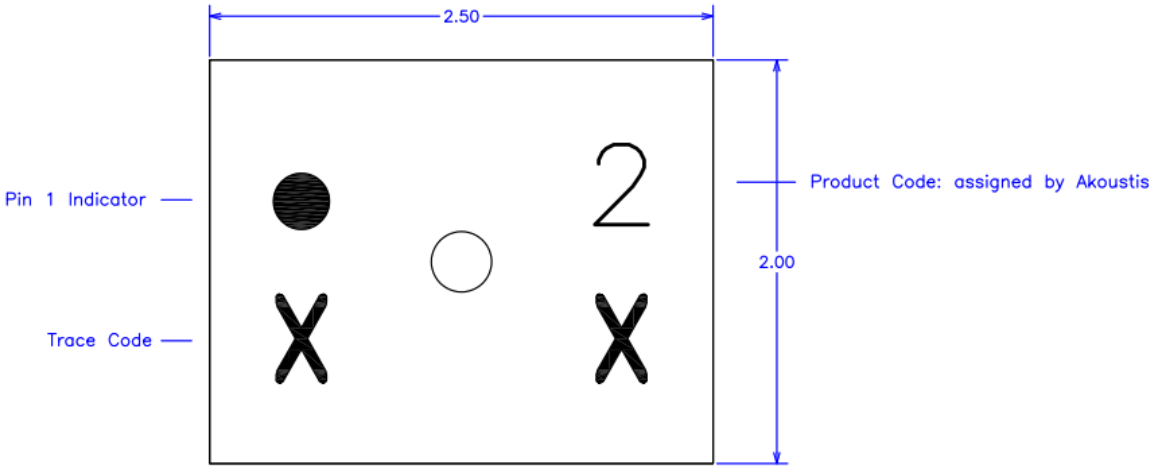
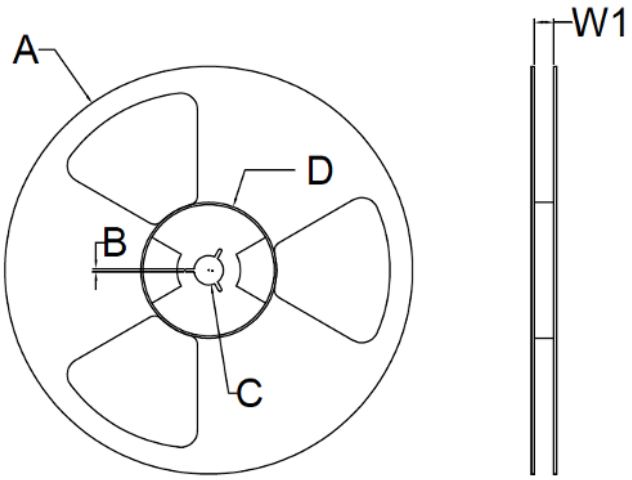
Typical Part Marking



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

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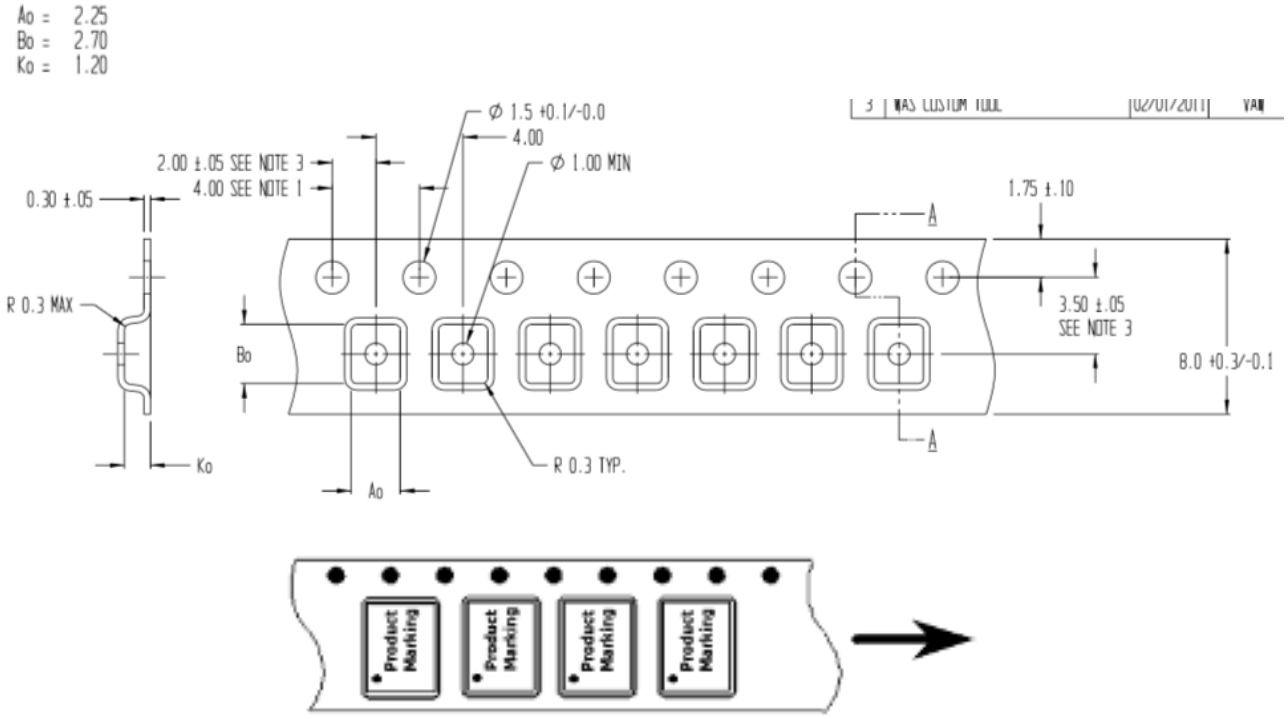
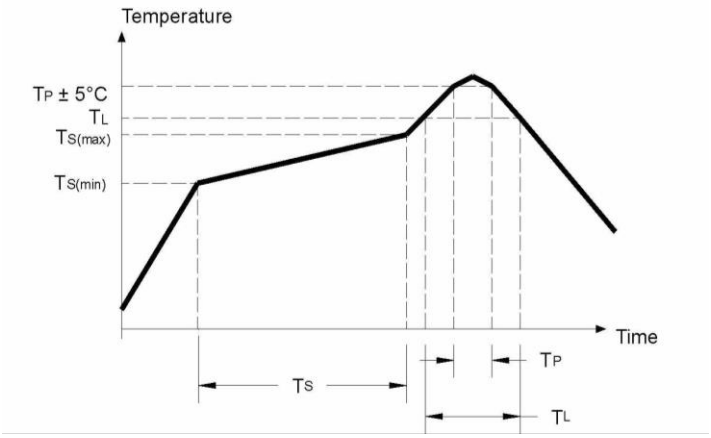
Tape Dimension



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



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Product Compliance Information

ESD Sensitivity Ratings

Human Body Model (HBM) Test
Rating: 500
Standard: ANSI/ESDA/JEDEC JS-001-2017

Charged Device Model (CDM)
Rating: 1000
Standard: ANSI/ESDA/JEDEC JS-002-2018

MSL Rating

MSL1

RoHS

This part is compliant with the 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 the datasheet are subject to change. Please contact Akoustis for the latest on our products and company information.

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