

3.5 GHz 5G Coexistence BAW Filter

A10235

Description

Akoustis' A10235 is a high-performance, ultra-small bandpass BAW RF Filter for use in 5G and 4G LTE infrastructure applications covering 200 MHz of 5G n78/77 band and 4G B42. A10235 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 4G LTE and 5G bands. This device exhibits high-power handling capabilities necessary for demanding power requirements of the latest 5G infrastructure requirements. A10235 uses standard ceramic packaging and is compatible with high volume, lead-free SMT soldering processes.

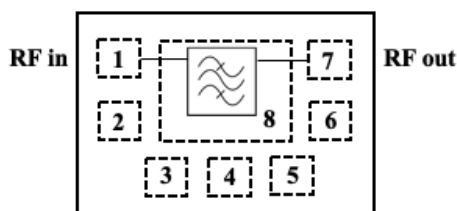
Features

- Small form factor 2.5mm x 2.0mm x 0.8mm
- Single-ended Tx/Rx ports.
- High rejection enables coexistence with adjacent 4G LTE & 5G bands
- High power rating, maximum +32 dBm
- Low insertion loss passband filter
- Performance over -40 C to +95 C
- RoHS compliant

Applications

- 5G Infrastructure
- LTE B42 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
A10235EVB	Evaluation board
A10235SP	(5) Loose pcs
A10235SR	(100) Short Reel (7" Reel)
A10235TR1	(1000) Tape & Reel (7" Reel)
A10235TR2	(2500) Tape & Reel (7" Reel)

Absolute Maximum Ratings

Parameter		Rating
Storage Temperature		-40 to 125 °C
Input Power	Signal: 5G NR, 100 MHz, PAR 7.8dB Temp: 85°C	+33 dBm

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

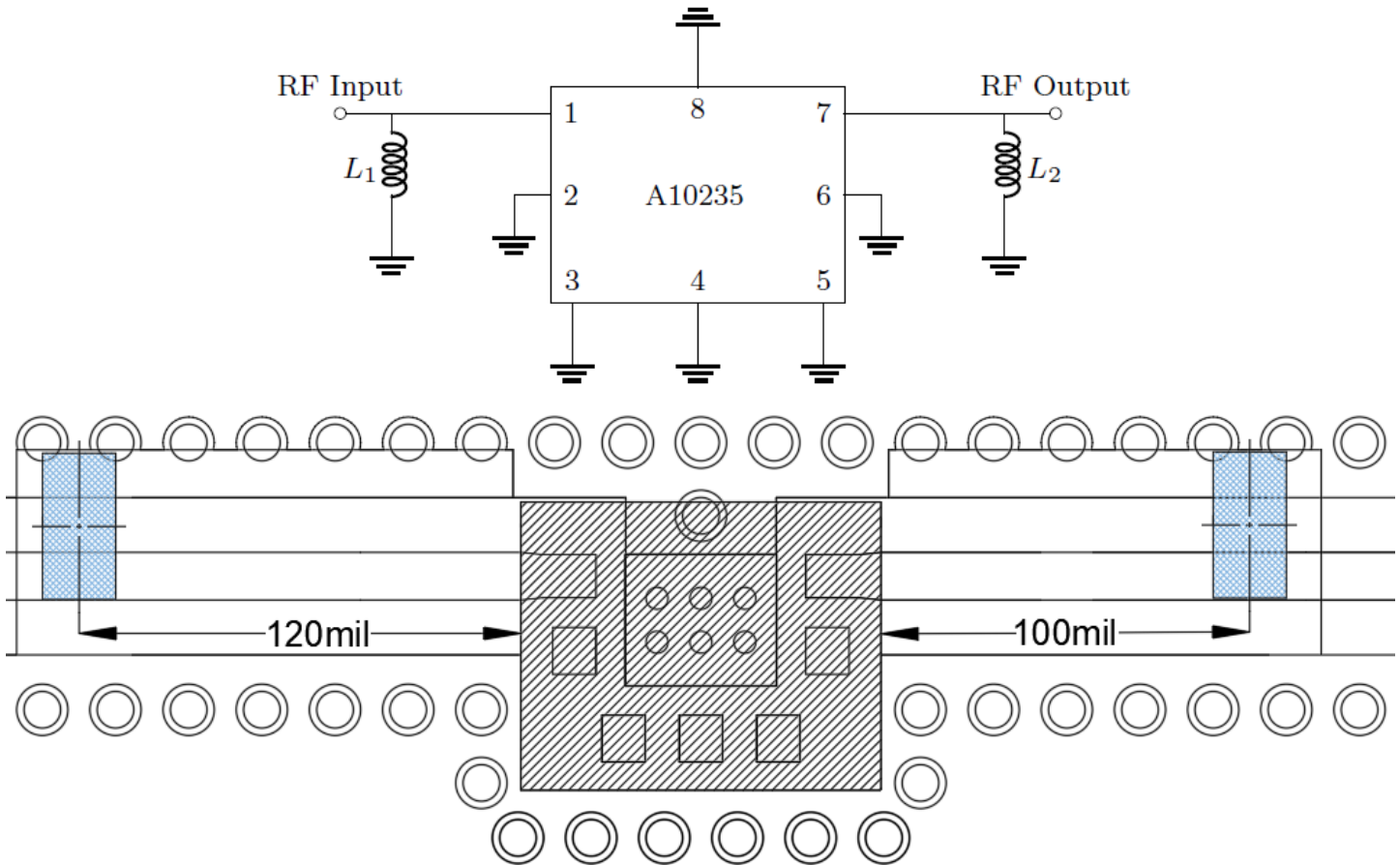
Operating Parameters (Temp = -40°C to +85°C unless otherwise noted)

Parameter	Conditions	Units	Min.	Typ.	Max.
Passband		MHz	3400	3500	3600
Insertion Loss	3400 – 3600 MHz	dB		1.3 ⁽¹⁾	2.4
Amplitude Variation	3400 – 3600 MHz	dB		1.3	1.6
Attenuation	10 – 960 MHz	dB	48	50	
	960 - 1880 MHz	dB	28	30	
	1880 – 2483 MHz	dB	21	23	
	2500 – 3150 MHz	dB	21	23	
	3300 – 3360 MHz	dB	18	20	
	3645 – 4000 MHz	dB	20	25	
	4000 – 5925 MHz	dB	28	30	
	6000 – 10000 MHz	dB	15	17	
Return Loss	3400 – 3600 MHz		10	15 ⁽¹⁾	
Load Impedance		Ω		50	
Power Handling	5G NR, 100 MHz, PAR 7.8dB	dBm			32

Note:

1. Averaged over specified frequency at room temperature

EVB Schematic & Layout



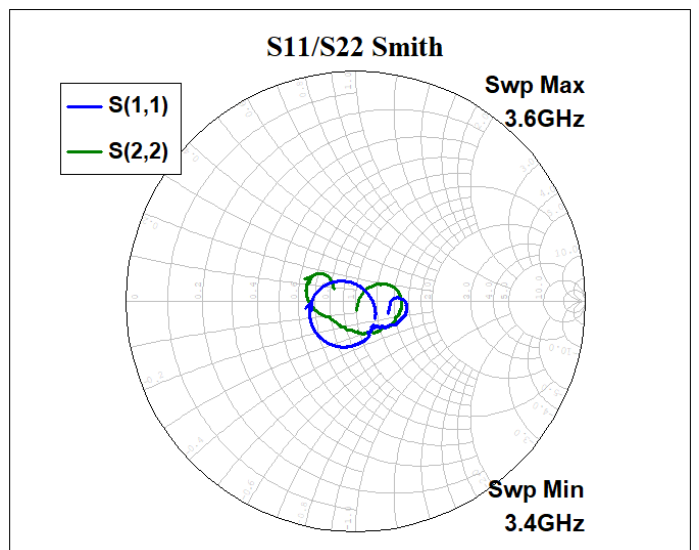
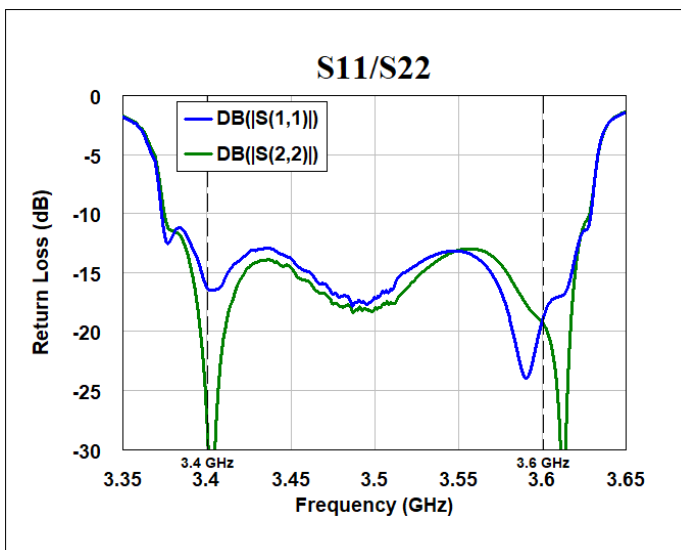
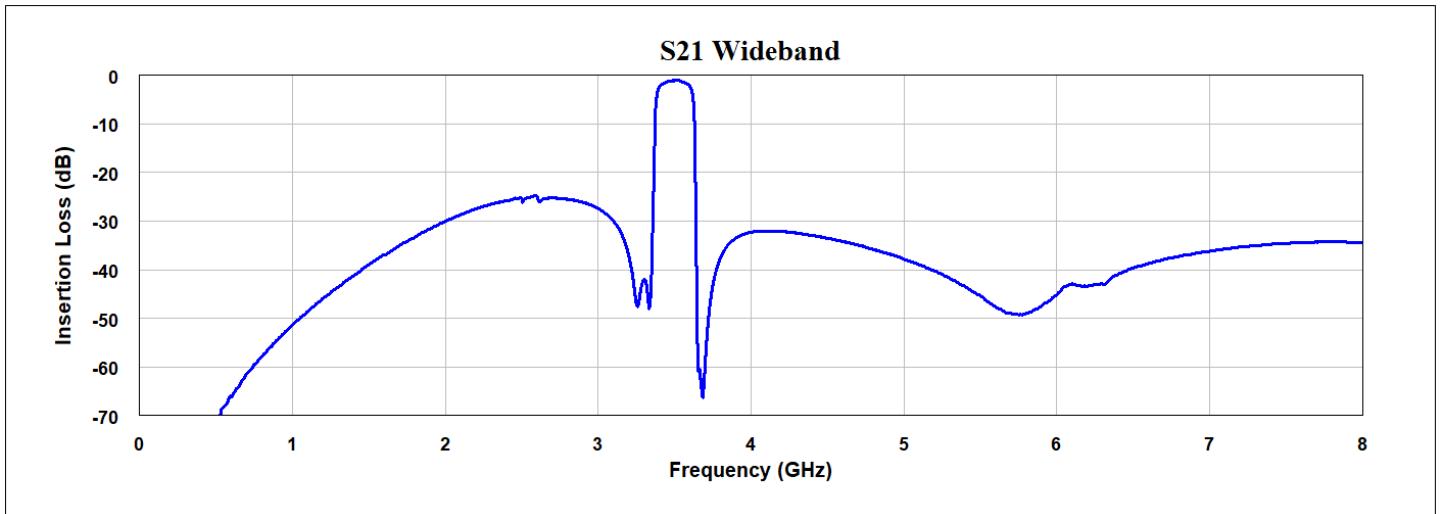
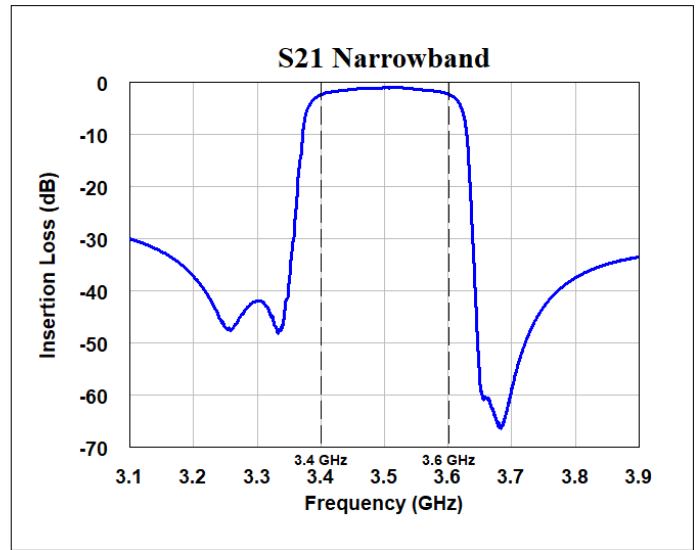
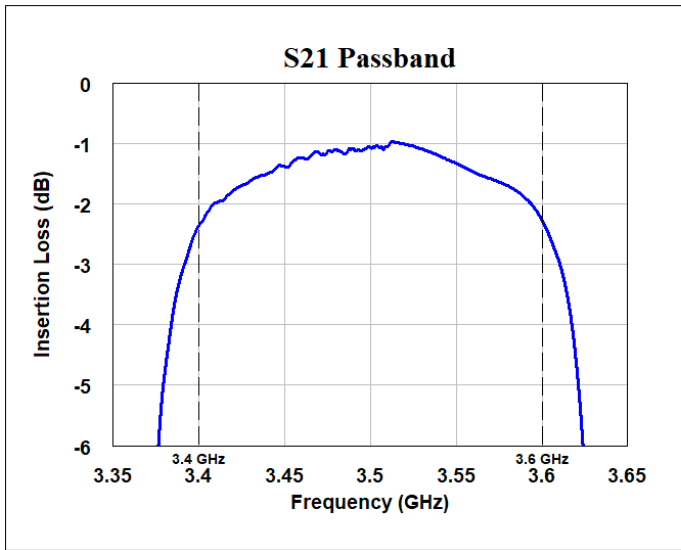
Note:

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

Bill of Materials

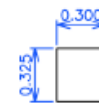
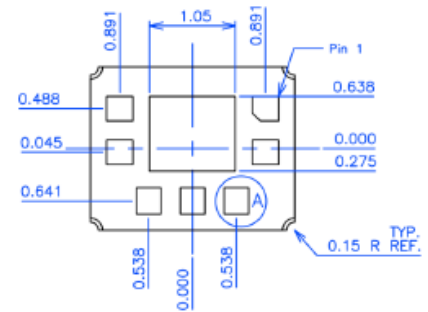
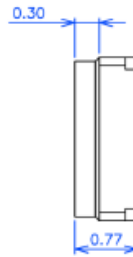
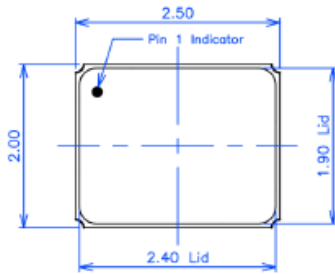
Reference Des.	Value	Description	Manufacturer	Part Number
PCB	N/A	4 layer	Multiple	
U1	N/A	3.5 GHz BAW Filter	Akoustis	A10235
L1	3.2nH	Chip inductor, 0402, ± 0.1 nH	Murata	LQW15AN3N2D00D
L2	4.0nH	Chip inductor, 0402, ± 0.1 nH	Murata	LQW15AN4N0B80D

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



Package Drawing & Pin Description

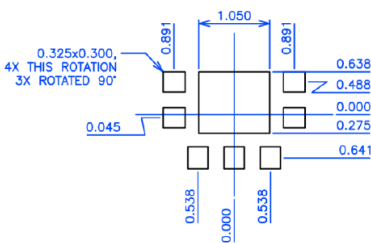
- Notes:
- All Units are in mm unless otherwise stated
 - General Tolerance:
 - Linear X.XXX = $\pm 0.050\text{mm}$
 - X.XX = $\pm 0.10\text{mm}$



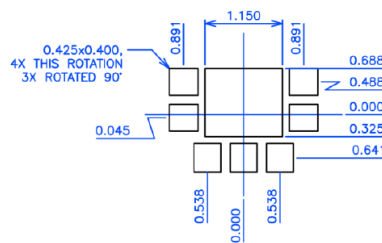
DETAIL A
PAD
SCALE: 2x
3X THIS ROTATION
4X ROTATED 90°
PIN 1 CHAMFER 0.150 X 45°

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

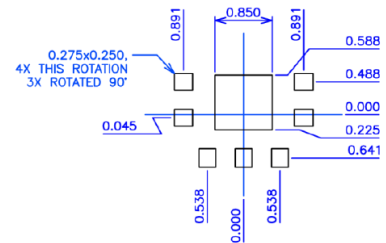
PCB Mounting Pattern



Recommended PCB
Metal Top View

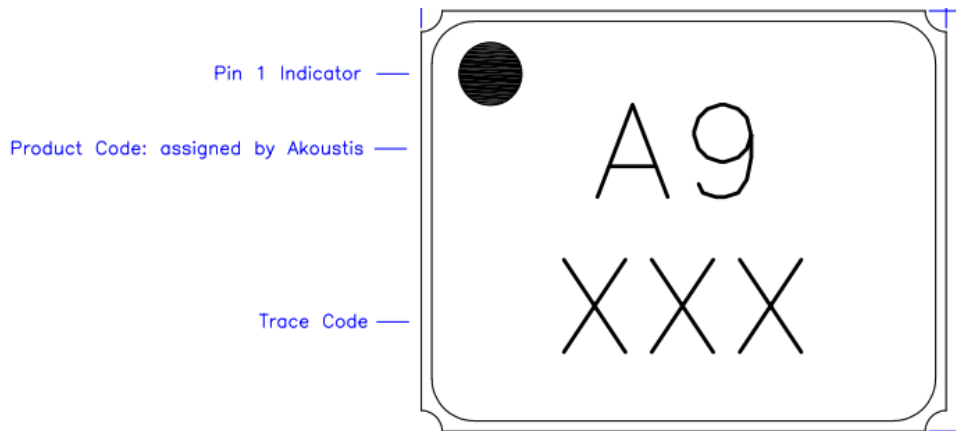


Recommended
Solder Mask Opening
Top View

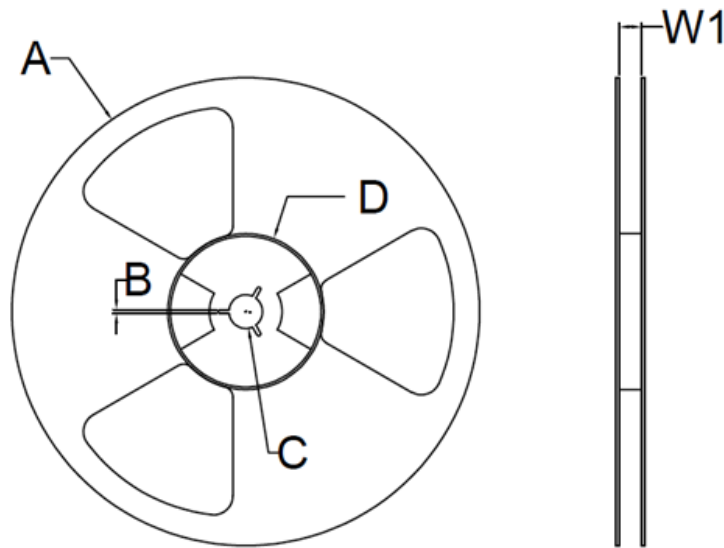


Recommended Stencil
Pattern Top View

Typical Part Marking



Reel Dimensions

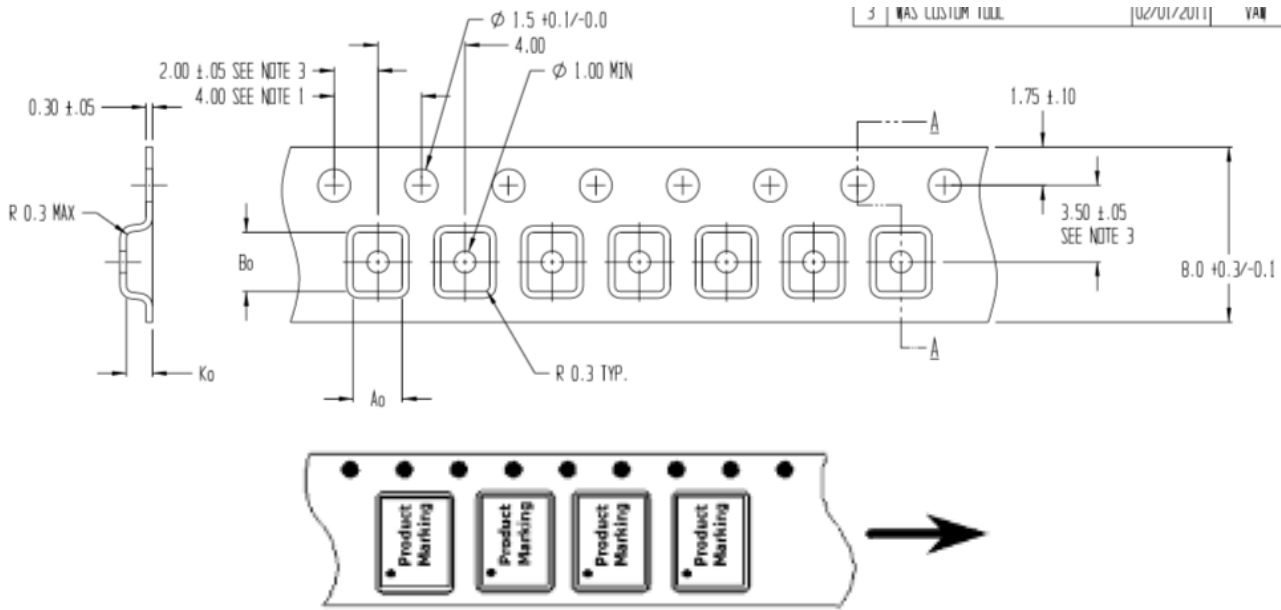


Reel Dimensiones						
Reel Size	Tape Width	A	B	C	D	W1 *measured at hub
7 Inch	8 mm	180 +0/-2.0 mm	2.0mm +/-0.5	13.0+0.5 / -0 mm	60.0 +/- 2.0 mm	8.40 + 1.5 / -0 mm
	12 mm	180 +0/-2.0 mm	2.0mm +/-0.5	13.0+0.5 / -0 mm	60.0 +/- 2.0 mm	12.40 + 2.0 / -0 mm
	16 mm	180 +0/-2.0 mm	2.0mm +/-0.5	13.0+0.5 / -0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

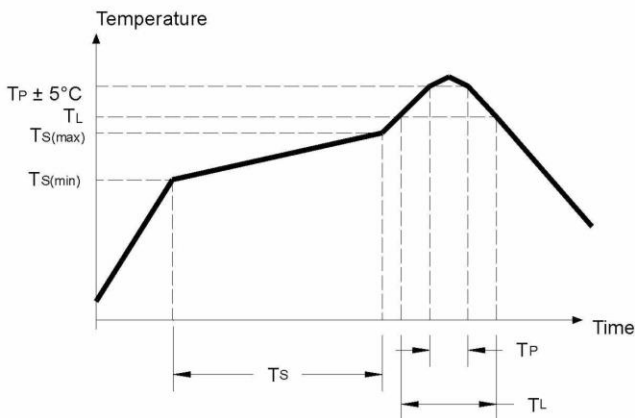
Tape Dimension

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



Recommended Solder Profile

Parameter	Eutectic Sn/Pb	Pb Free
Max Ramp Up Rate	6 Deg C/Second	6 Deg C/Second
Soak Temp Time $T_S(\text{min}) - T_S(\text{max})$	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



A10235

Product Compliance Information

ESD Sensitivity Ratings

Human Body Model (HBM) Test

Rating: Class 1C 1000V

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

Charged Device Model (CDM)

Rating: Class C3 1000V

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 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