5.6GHz WiFi Coexistence BAW Filter A10256

Description

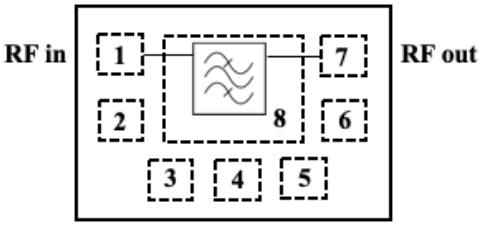
Akoustis' A10256 is a high-performance, ultra-wide bandwidth BAW RF Filter for use in 5.6GHz WiFi applications covering U-NII-2C plus U-NII-3 bands. A10256 utilizes Akoustis' patented, XBAW® technology to deliver differentiated filter performance. This BAW RF filter provides very low insertion loss and meets the stringent rejection requirements enabling coexistence with U-NII-1 and 2A. This device exhibits high-power handling capabilities necessary for demanding power requirements of the latest WiFi standards. A10256 uses standard laminate packaging and is compatible with high volume, lead-free SMT soldering processes.

- Ultra small form factor 2.5mm x 2.0mm x 1.1mm
- Single-ended Tx/Rx ports.
- Ultra-wide passband covering 345MHz
- High rejection enables coexistence with adjacent WiFi UNII bands
- High power rating, maximum +30dBm
- 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
7	RF Output
2, 3, 4, 5, 6, 8	Ground

Ordering Information

Part Number	Description
A10256EVB	Evaluation board
A10256SP	(5) Loose pcs
A10256SR	(100) Short Reel (7" Reel)
A10256TR1	(1000) Tape & Reel (7" Reel)
A10256TR2	(2500) Tape & Reel (7" Reel)

Akoustis, Inc.
9805-A Northcross Center Court, Huntersville, NC 28078
Prelim Datasheet: Rev 01162023
Pat. 10,256,786

Absolute Maximum Ratings

Parameter		Rating
Storage Temperature		-40 to 125 °C
Max Input Power	Signal: 802.11ax MCS10, 80 MHz, PAR 11dB	+31 dBm
Max Temperature		-40 to 105°C

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

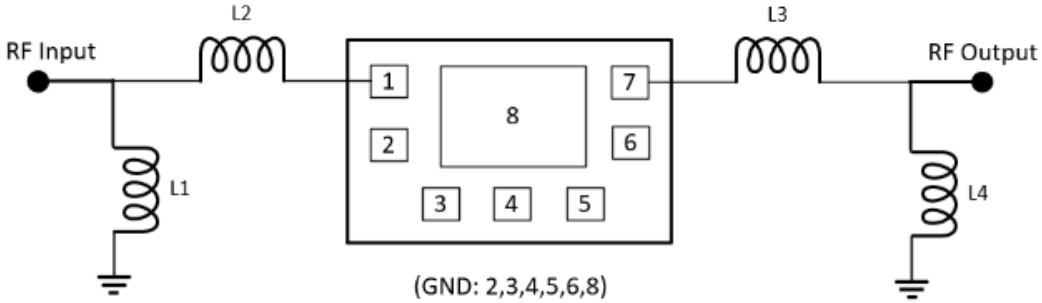
Operating Parameters (Temp = -40°C to +85°C unless otherwise noted)

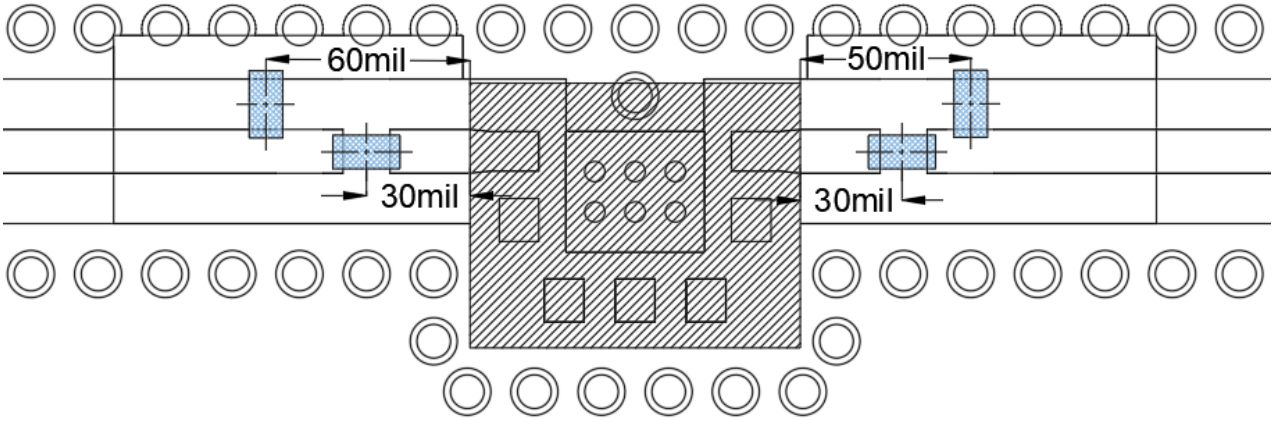
Parameter	Conditions	Units	Min.	Typ.	Max.
Pass bandwidth		MHz	5490	5665	5835
Insertion Loss	5490 – 5835 MHz	dB		1.6 (1)	2.3
Amplitude Variation	5490 – 5835 MHz (80MHz BW Channel)	dB		1.0	1.2
Attenuation	30 – 2100 MHz	dB	45	47	
	2400 – 2500 MHz	dB	38	40	
	3300 - 5000 MHz	dB	10	11	
	5170 – 5330 MHz	dB	50(2)	52(2)	
	5950 - 10000 MHz	dB	22	24	
	10000 - 12000 MHz	dB	40	41	
Return Loss	5490 – 5835 MHz		10	17(1)	
Load Impedance		Ω		50	
Power Handling	802.11ax MCS10, 80 MHz, PAR 11dB	dBm			30
2nd Harmonic	Po=28dBm **(25°C)**	dBm/MHz		-50	
3rd Harmonic	Po=28dBm **(25°C)**	dBm/MHz		-92	

Note:

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

EVB Schematic & Layout





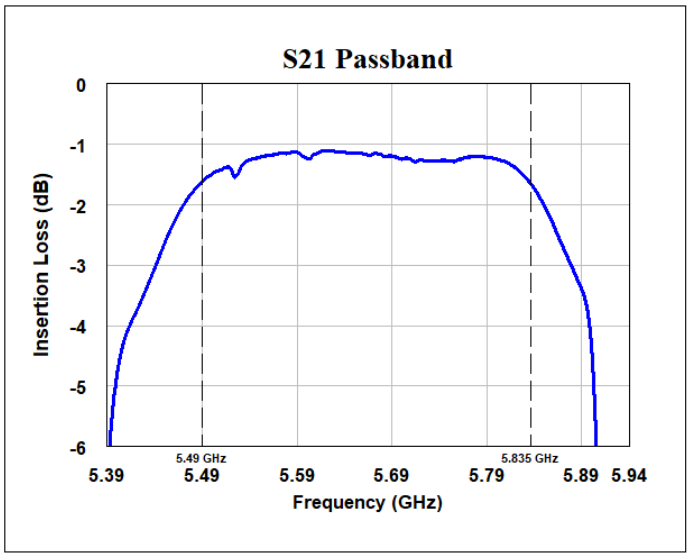
Note:

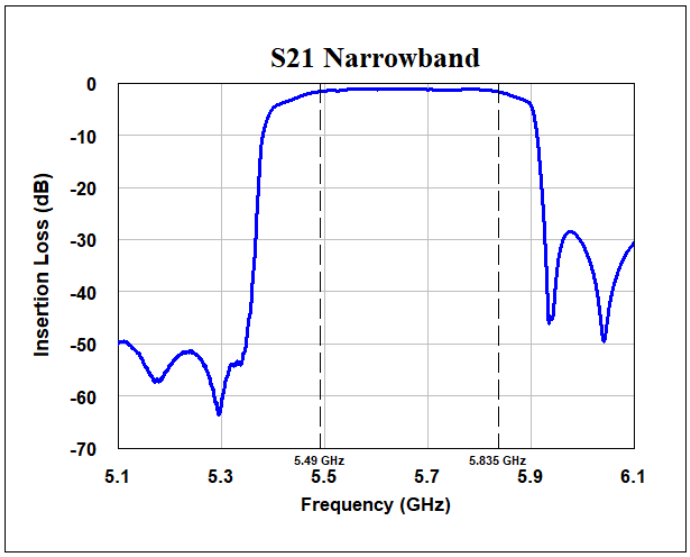
1) Center ground pad vias 6mil diameter
2) RF ground vias 10mil diameter

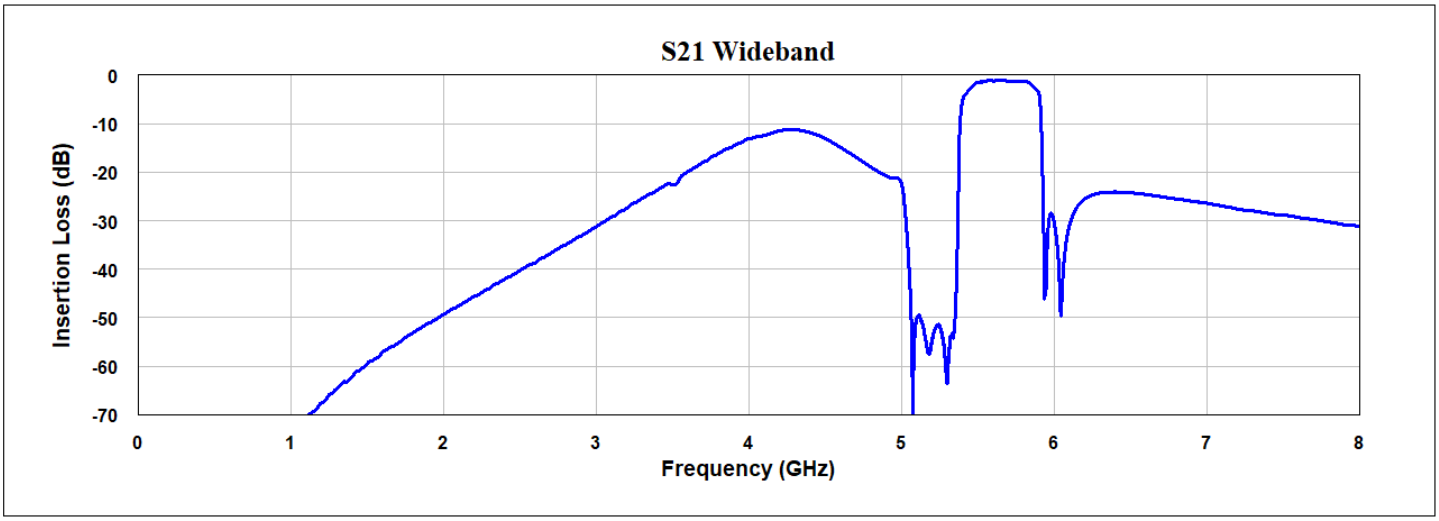
Bill of Materials

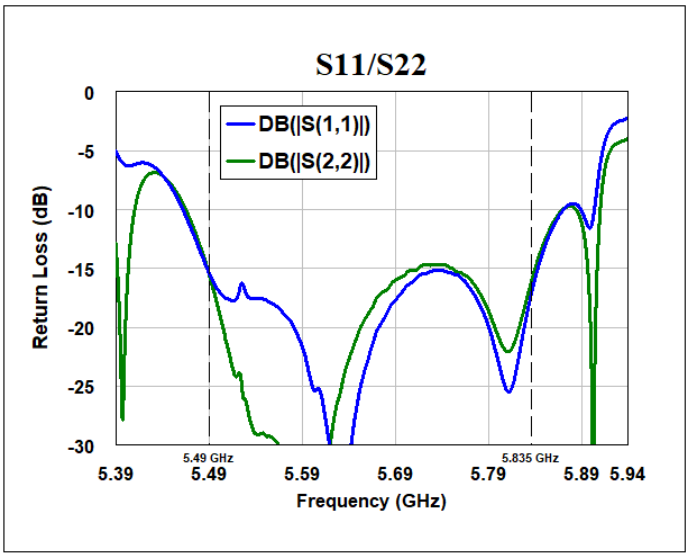
Reference Des.	Value	Description	Manufacturer	Part Number
PCB	N/A	3 layer	Multiple	
U1	N/A	5.6GHz Wi-Fi Filter	Akoustis	A10256
L1	1.1nH	Chip inductor, 0201, ±0.05nH	Murata	LQP03HQ1N1B02D
L2	0.3nH	Chip inductor, 0201, ±0.05nH	Murata	LQP03TG0N3B02D
L3	0.8nH	Chip inductor, 0201, ±0.05nH	Murata	LQP03HQ0N8B02D
L4	1.6nH	Chip inductor, 0201, ±0.05nH	Murata	LQP03HQ1N6B02D

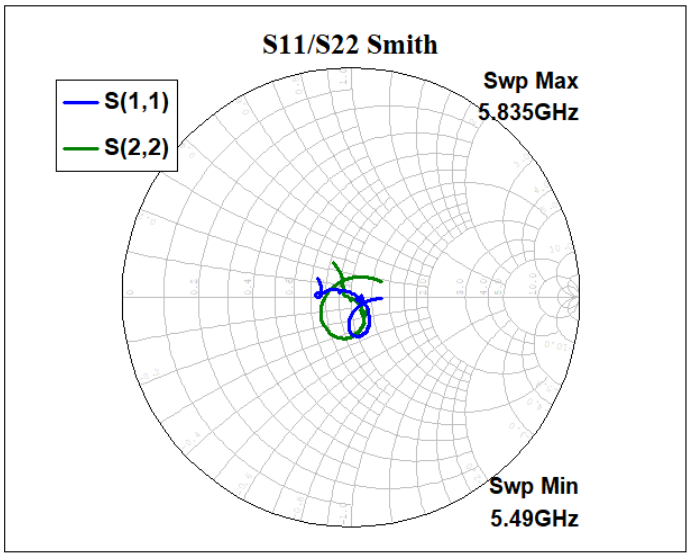
Performance Plots (Temp = 25°C unless otherwise noted)











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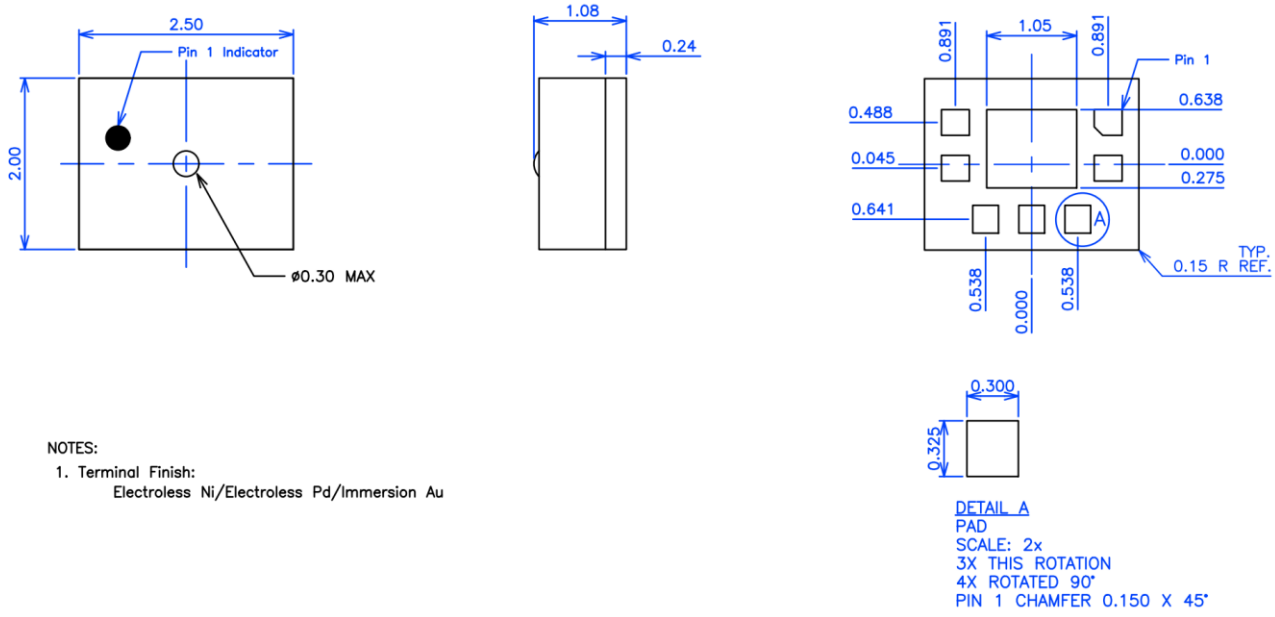
Package Drawing & Pin Indicator

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

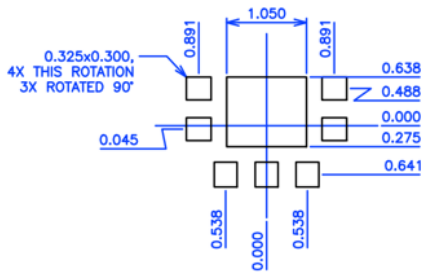


NOTES:
1. Terminal Finish:
Electroless Ni/Electroless Pd/Immersion Au

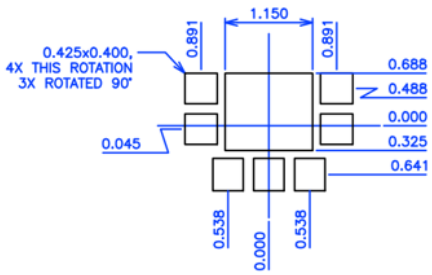
DETAIL A
PAD
SCALE: 2x
3X THIS ROTATION
4X ROTATED 90°
PIN 1 CHAMFER 0.150 X 45°

Recommended PCB Patterns

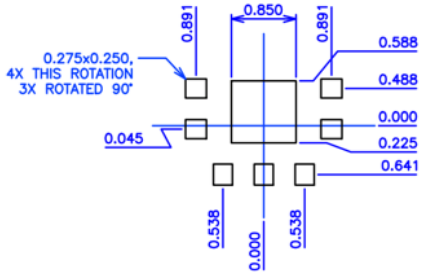
Notes:
– All Units are in mm unless otherwise stated
– General Tolerance:
Linear X.XXX = ±0.050mm
X.XX = ±0.10mm



Recommended PCB
Metal Top View



Recommended
Solder Mask Opening
Top View



Recommended Stencil
Pattern Top View

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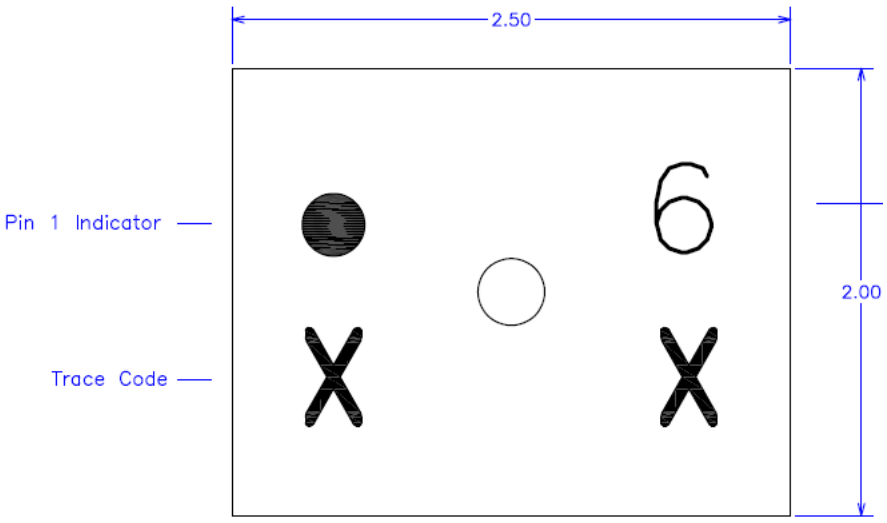
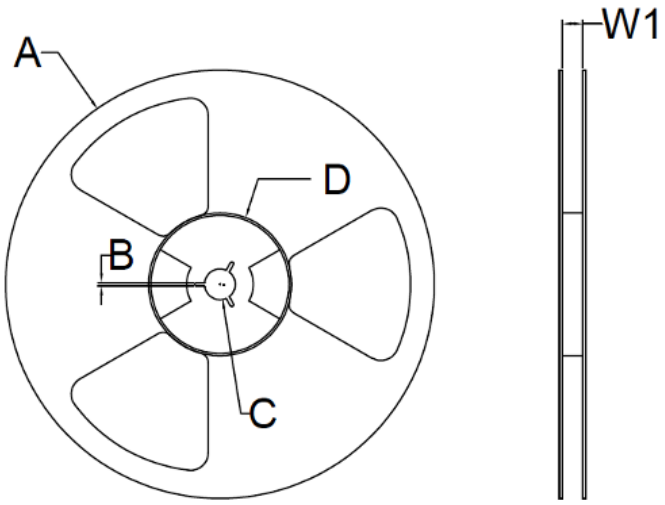
Typical Part Marking



Product Code: assigned by Akoustis

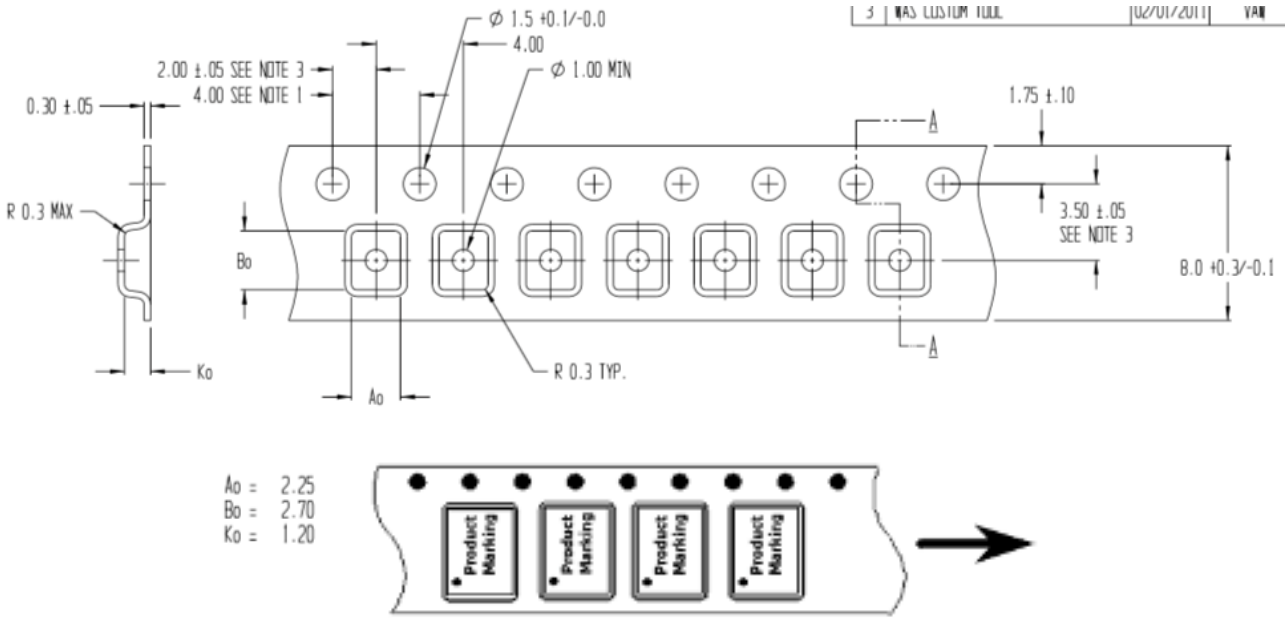
Reel Dimensions



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

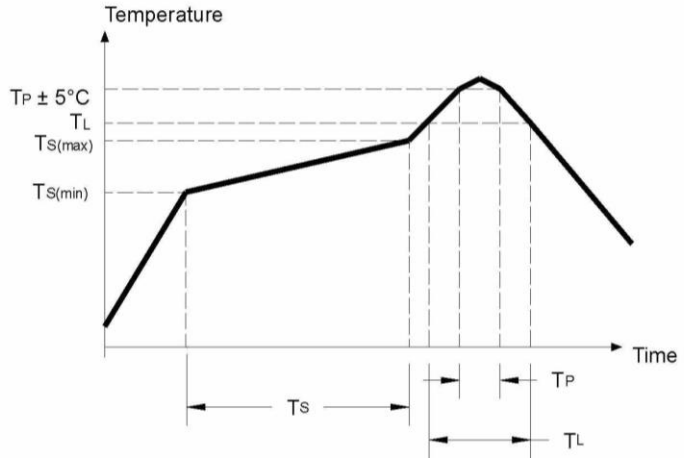
Note: 7 Inch Reel Only Has One Opening

Tape Dimension



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: 500V
Standard: ANSI/ESDA/JEDEC JS-001-2017

Charged Device Model (CDM)
Rating: 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 datasheet are subject to change. Please contact Akoustis for the latest on our products and company information.

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