5.7 GHz Wi-Fi 6E & 7 Coexistence BAW Filter A10257

Description

Akoustis' A10257 is a high-performance, wideband BAW RF Filter for use in Wi-Fi 6E & 7 applications covering U-NII-2C thru U-NII-3 bands. A10257 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 Wi-Fi 6E & 7 standards. A10257 uses standard laminate packaging and is compatible with high volume, lead-free SMT soldering processes.

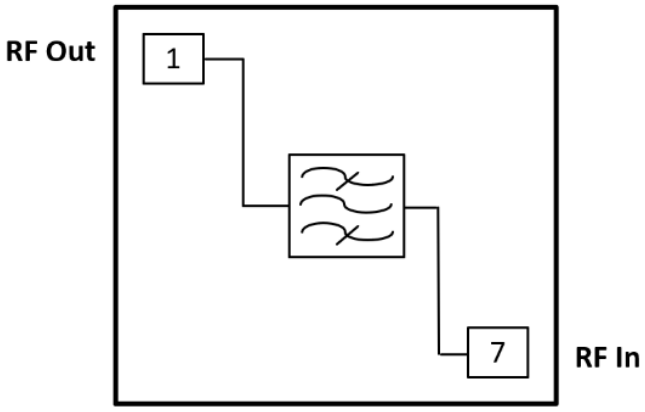
Features

- Small form factor 1.6mm x 1.8mm x 0.63mm
- Single-ended Tx/Rx ports.
- Wide passband covering 345 MHz
- High rejection enables coexistence with adjacent Wi-Fi UNII bands
- High power rating, maximum +30dBm
- Low insertion loss
- Temperature range -40C to +95C
- RoHS-compliant, Pb-free package

Applications

- Wi-Fi 6E & 7 tri-band routers, integrated cable modem
- Wi-Fi 6E & 7 tri-band access points

Functional Block Diagram



Ordering Information

Part Number	Description
A10257EVB	Evaluation board
A10257SP	(5) Loose pcs
A10257SR	(100) Short Reel (7" Reel)
A10257TR1	(1000) Tape & Reel (7" Reel)
A10257TR2	(2500) Tape & Reel (7" Reel)

Akoustis, Inc.
9805-A Northcross Center Court, Huntersville, NC 28078
Limited Release Datasheet: Rev 08132024
Pat. 10,256,786

Absolute Maximum Ratings

Parameter	Conditions	Rating
Storage Temperature		-40 to 125°C
Max Input Power	Signal: OFDM MCS0, 20 MHz, PAR 10dB	31dBm
Max Temperature		-40 to 105°C

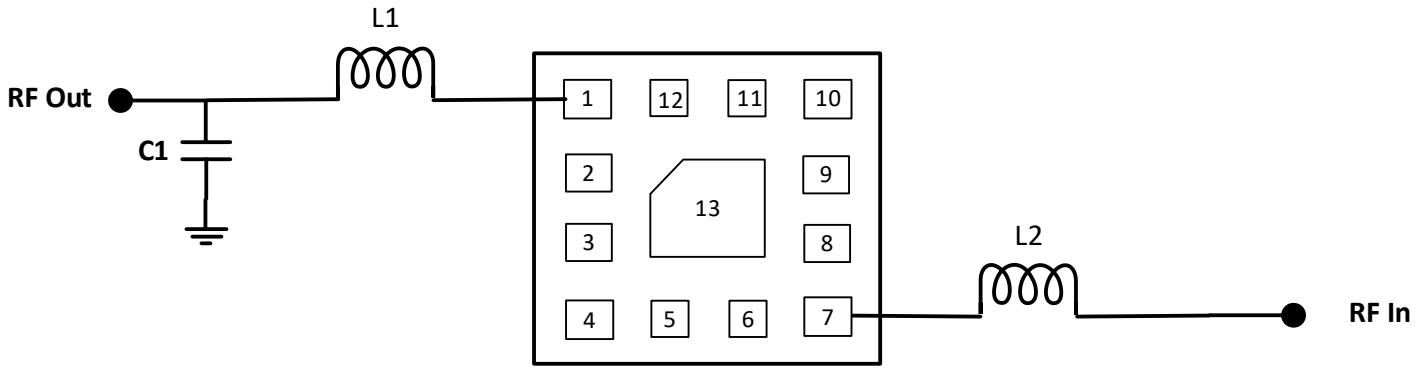
Exceeding any one limit or a combination of AMR conditions may result in damage to the device.

Operating Parameters(6) (Temp = -40°C to +95°C unless otherwise noted)

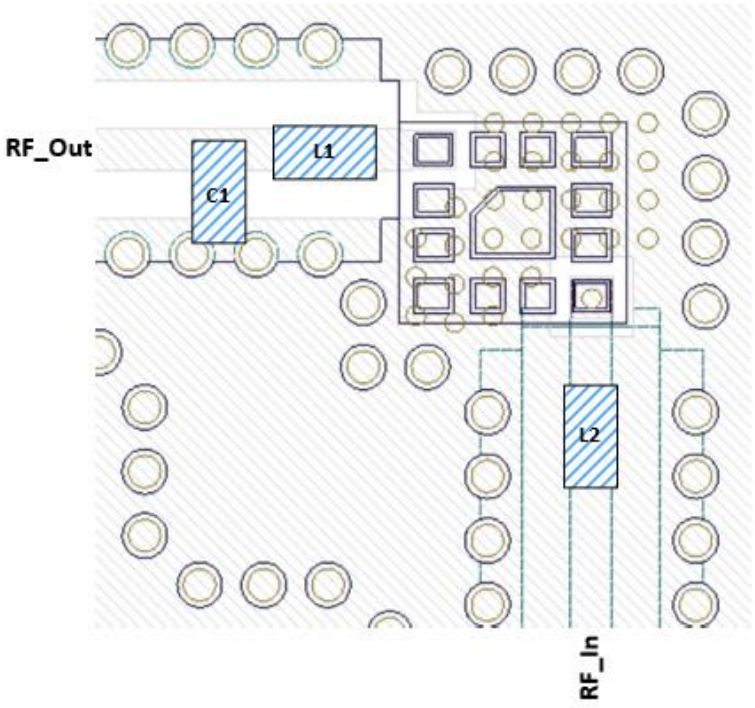
Parameter	Conditions	Units	Min.	Typ.	Max.
Passband		MHz	5490	5662.5	5835
Insertion Loss	5490 – 5815 MHz	dB		1.9(1)	2.7(3)
	5815 – 5835 MHz	dB		2.1(1)	2.9(2)
Amplitude Variation	5490 – 5835 MHz	dB		1.8(1)	
Attenuation	30 – 1000 MHz	dB	40	60	
	1000 – 4200 MHz	dB	33	40	
	4200 – 5000 MHz	dB	33	45	
	5170 – 5330 MHz	dB	54(3)	58(3)	
	5945 – 6105 MHz(4)	dB	50(2)	58(2)	
	5945 – 6105 MHz	dB	47(3)	60(3)	
	6105 – 6425 MHz	dB	51(3)	56(3)	
	6425 – 7065 MHz	dB	53(3)	58(3)	
	7065 – 7125 MHz	dB	52(2)	57(2)	
	10980 – 11790 MHz	dB	35	40	
	16470 – 17865 MHz	dB	35	40	
Return Loss	5490 – 5835 MHz	dB	10(3)	15(1)	
Load Impedance		Ω		50	
Power Handling:	OFDM MCS0, 160 MHz, PAR 10dB	dBm			30
	OFDM MCS0, 20 MHz, PAR 10dB CH165	dBm			28

Notes: 1) Averaged frequency range at 25C; 2) Average over 20MHz; 3) Average over 160MHz;
4) For temperatures > 25C; 5) For temperatures > 65C; 6) Performance based on Akoustis EVB

EVB Schematic & Layout



(GND: 2,3,4,5,6,8,9,10,11,12,13)



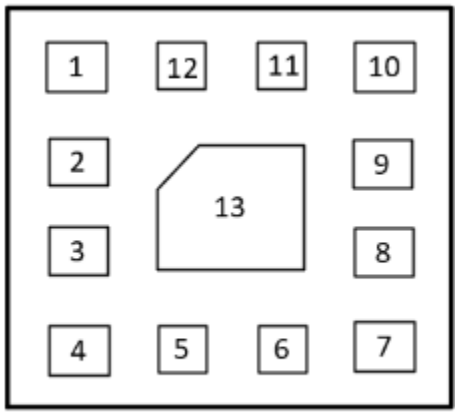
Notes:

1) Center ground pad via: 6mil; outer via: 10mil
2) “RF in” trace located on bottom layer
3) Place tuning components as close as possible to filter package
4) Emulate Akoustis EVB as close as possible, particularly the via ground patttern

Bill of Materials

Reference Des.	Value	Description	Manufacturer	Part Number
PCB	N/A	Multi-layer	Multiple	AA4 1816-412-A10-1-1
U1	N/A	5.7 GHz BAW Filter	Akoustis	A10257
C1	0.4pF	Chip capacitor, 0201, 0.05pF	Murata	GJM0335C1ER40BB01D
L1	1.6nH	Chip inductor, 0201, ±0.05nH	Murata	LQP03HQ1N6B02D
L2	1.1nH	Chip inductor, 0201, ±0.05nH	Murata	LQP03HQ1N1B02D

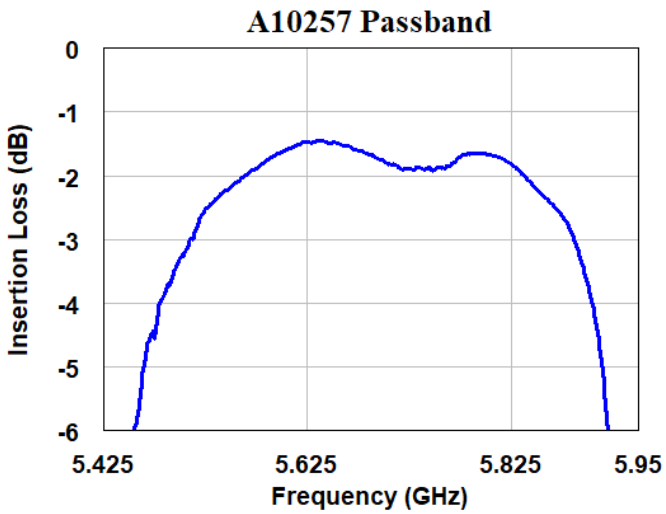
Pin Description

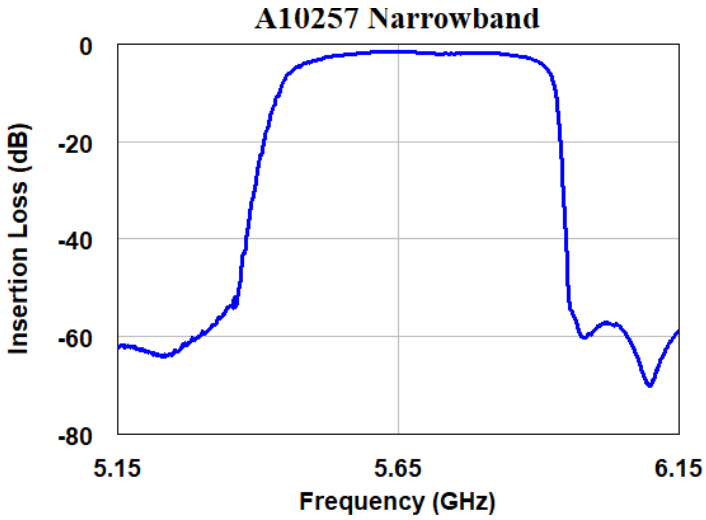


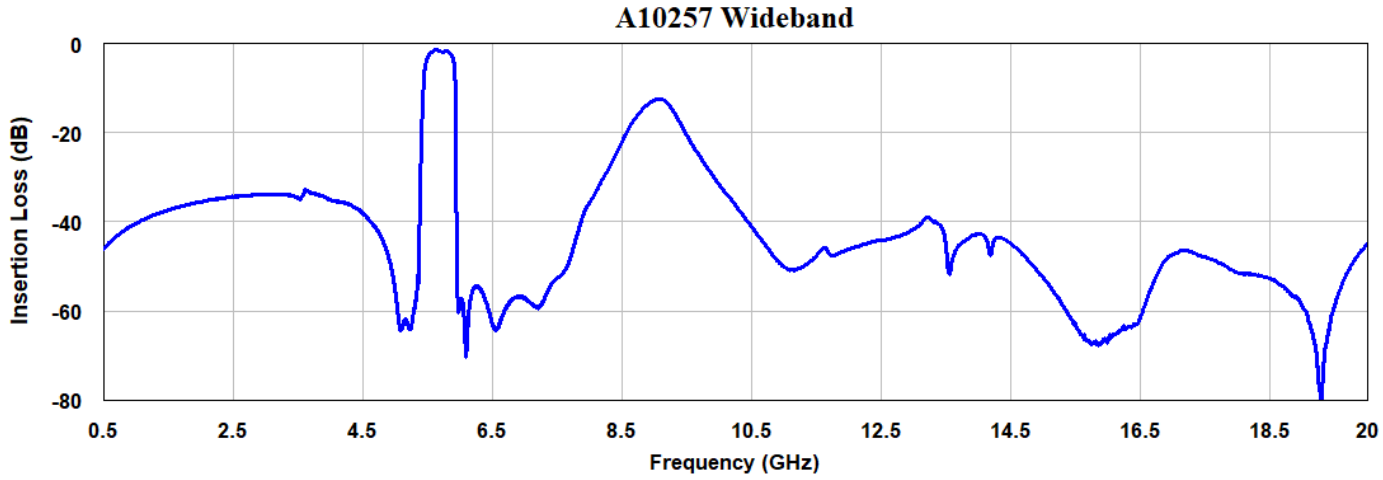
Top View

Pin	Name	Description
1	RF Out	Antenna
7	RF In	TX (high power input)
2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13	GND	Ground

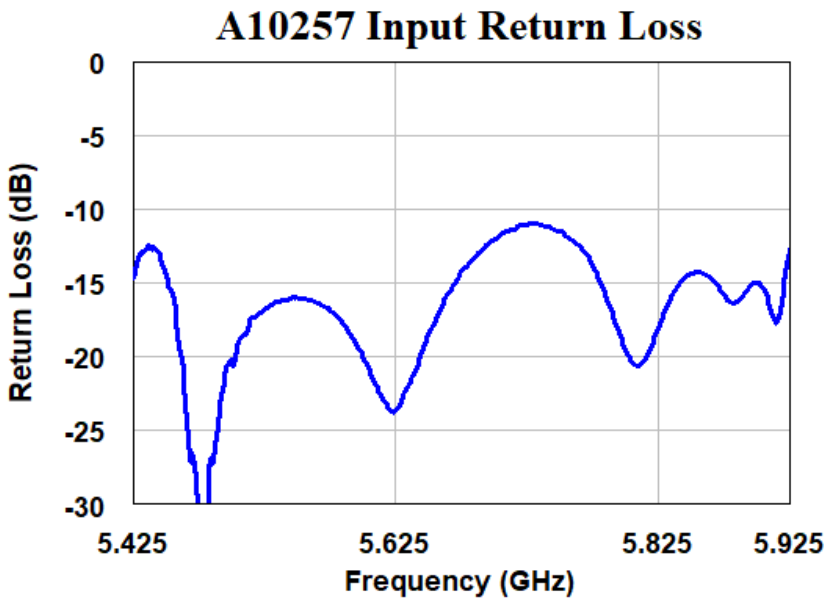
Performance Plots (Temp = 25°C unless otherwise noted)

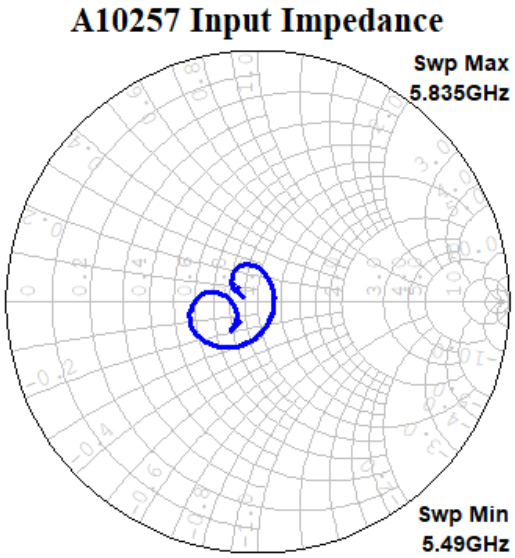


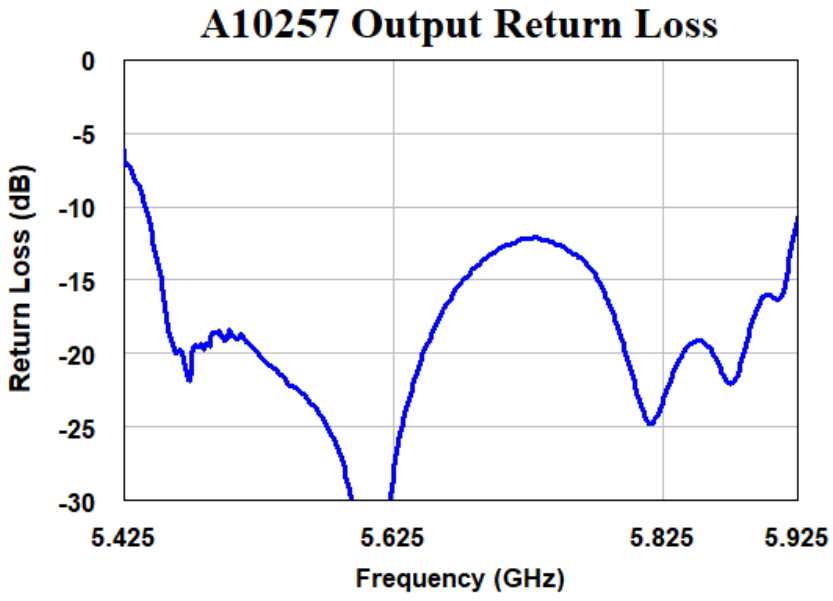


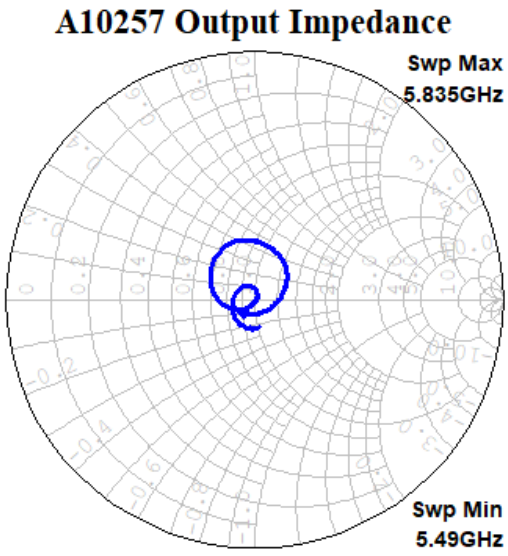


Performance Plots…continued (Temp = 25°C unless otherwise noted)



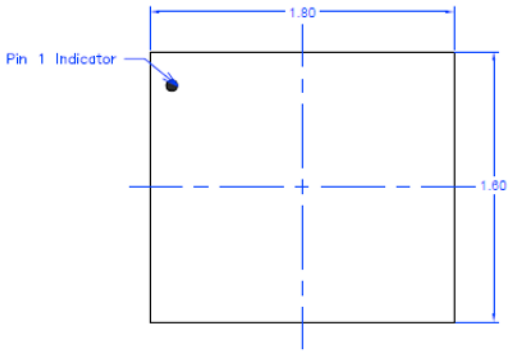




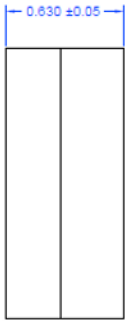


Package Outline Drawing (POD)

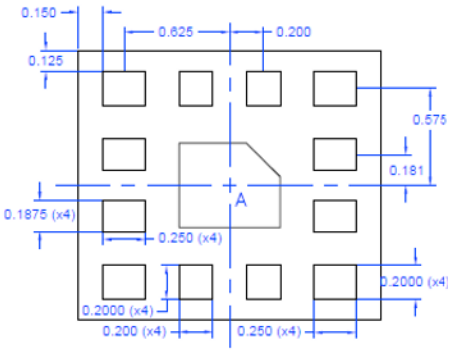
Unless Otherwise Specified:
- All units in mm

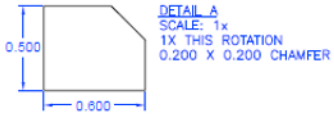


Top View



Side View

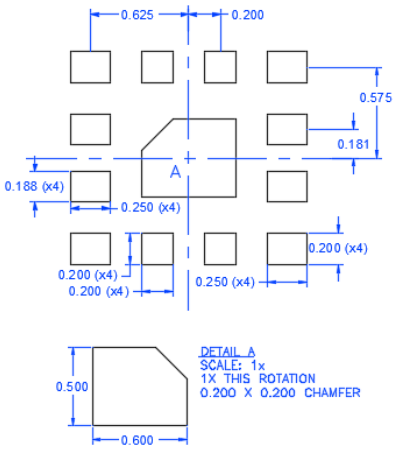




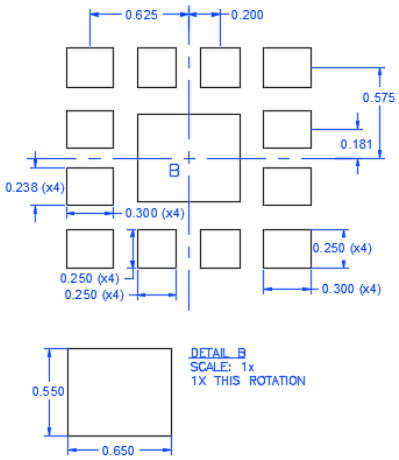
Bottom View

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

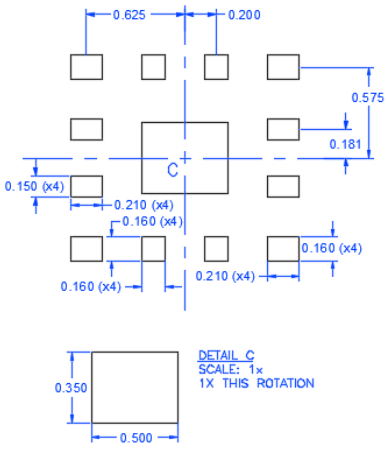
PCB Patterns



Recommended PCB Metal Top View

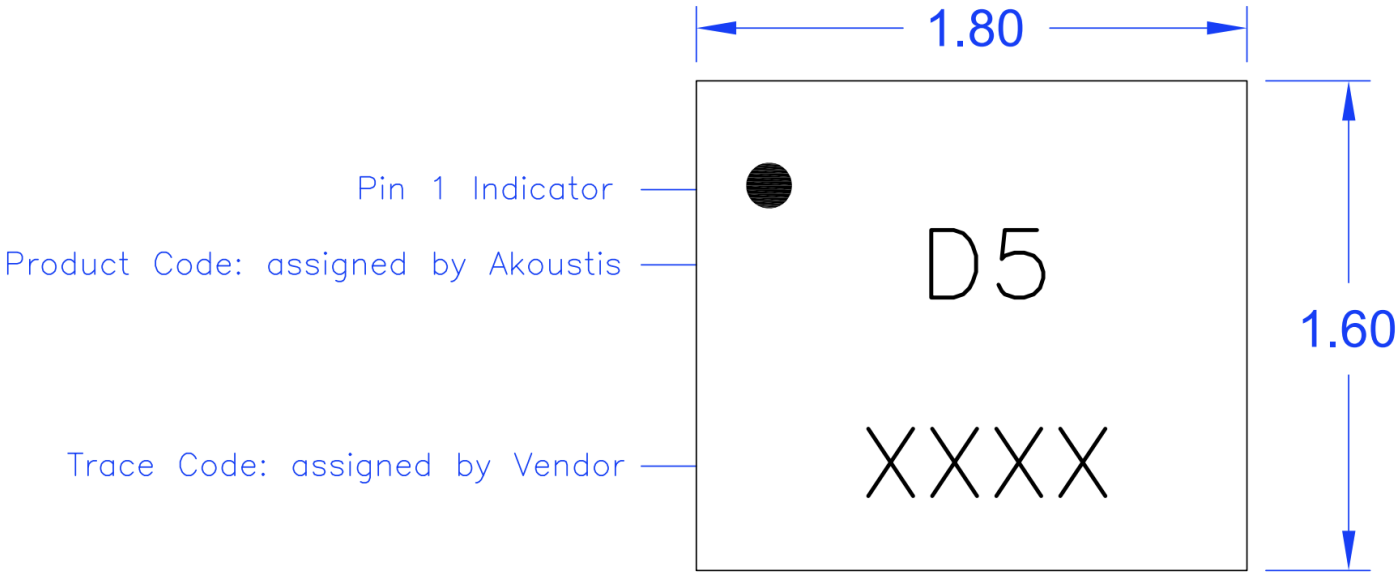


Recommended Solder Mask Opening Top View

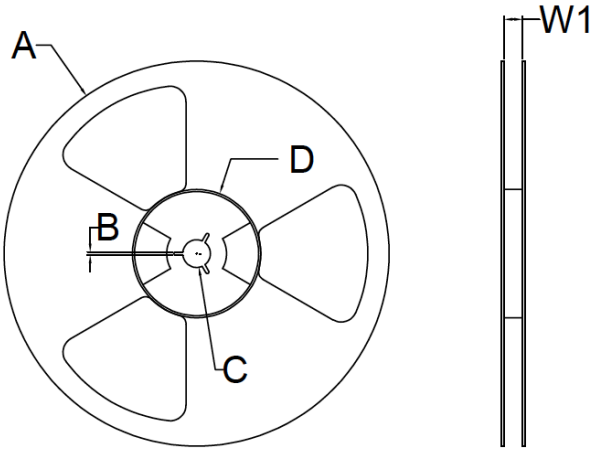


Recommended Stencil Pattern Top View

Typical Part Marking



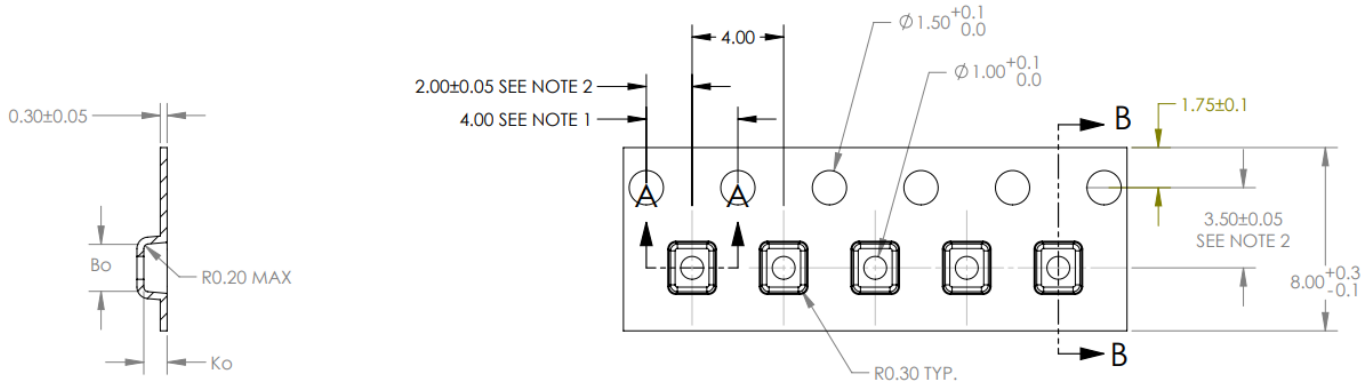
Reel Dimensions



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

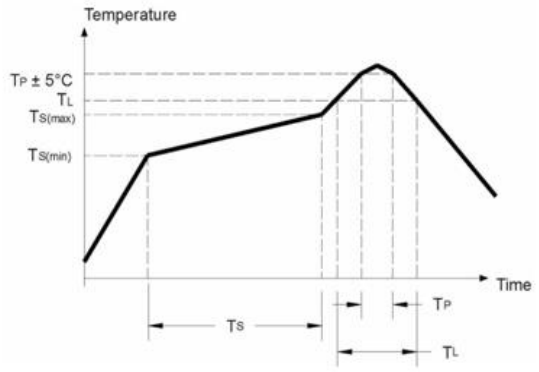
Tape Dimension



	DIM	±
Ao	1.85	0.1
Bo	2.05	0.1
Ko	1.02	0.1

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.
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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 C3
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 without notice. Please contact Akoustis for the latest on our products and company information.

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