5.7 GHz Wi-Fi 6E & 7 Coexistence BAW Filter A10157

Description

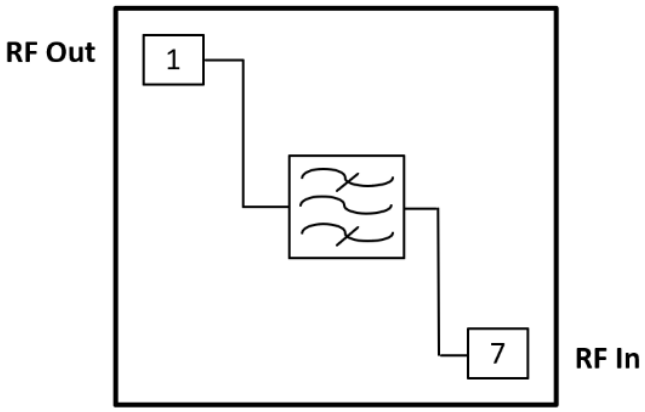
Akoustis' A10157 is a high-performance, BAW RF Filter for use in Wi-Fi 6E & 7 applications covering U-NII-2C thru U-NII-4 bands. A10157 utilizes Akoustis' patented, XBAW® technology which provides leading RF filter performance. This BAW RF filter provides low insertion loss and meets the stringent rejection requirements enabling coexistence with U-NII-1 thru 2A and 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. A10157 uses standard laminate packaging and is compatible with high volume, lead-free SMT soldering processes.

- Small form factor 1.6mm x 1.8mm x 0.63mm
- Single-ended Tx/Rx ports
- Passband covering 405 MHz
- High rejection enables coexistence with adjacent Wi-Fi UNII bands
- Low insertion loss bandpass filter
- Temperature range -20C 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

Block Diagram



Ordering Information

Part Number	Description
A10157EVB	Evaluation board
A10157SP	(5) Loose pcs
A10157SR	(100) Short Reel (7" Reel)
A10157TR1	(1000) Tape & Reel (7" Reel)
A10157TR2	(2500) Tape & Reel (7" Reel)

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Datasheet: Rev 06282024
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	31
Max Temperature		-40 to 105°C

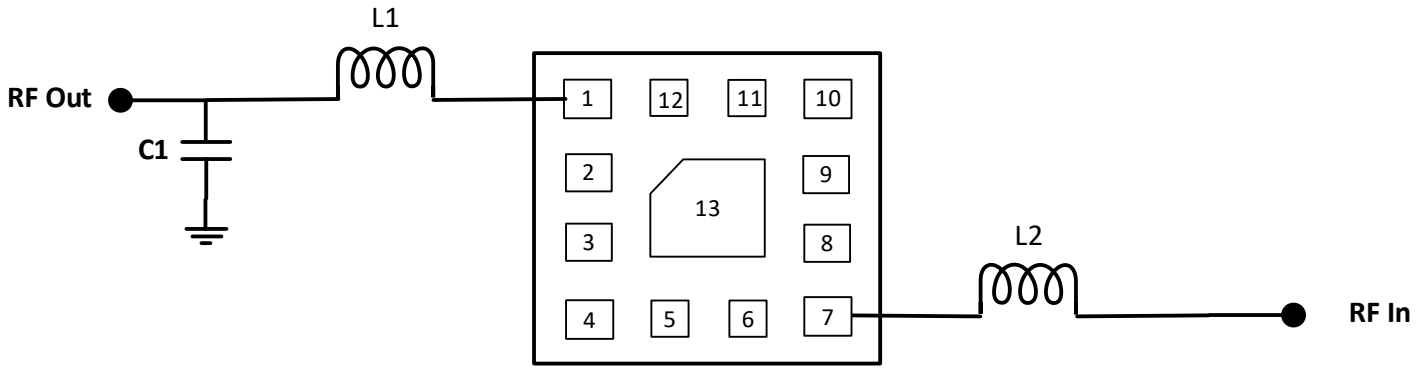
Exceeding any one limit or a combination of AMR conditions may result in damage to the device.

Operating Parameters[6] (Temp = -20°C to +95°C unless otherwise noted)

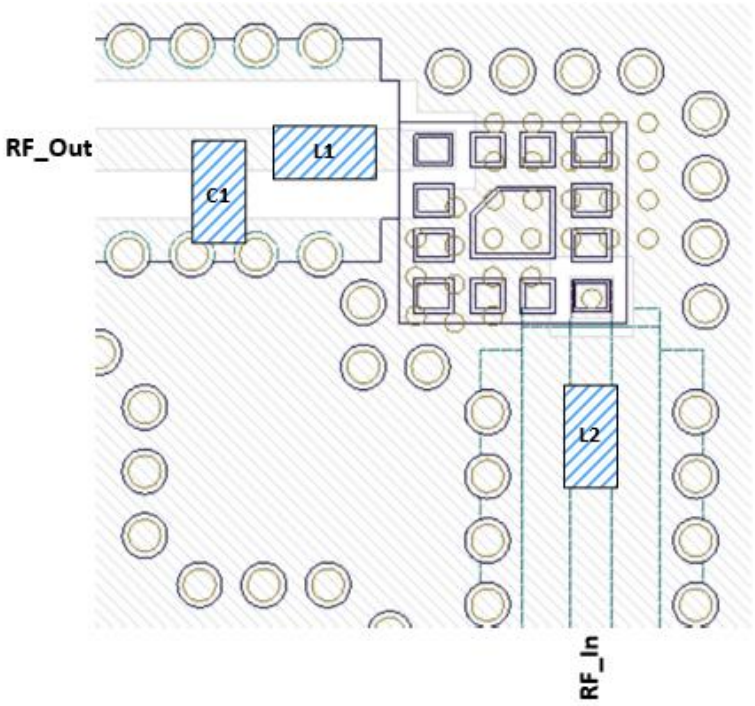
Parameter	Conditions	Units	Min.	Typ.	Max.
Passband		MHz	5490	5700	5895
Insertion Loss	5490 – 5895 MHz	dB		2.0[1]	2.7[3]
	5875 – 5895 MHz	dB		3.8[1]	6.3[2]
Amplitude Variation	5490 – 5895 MHz	dB		2.2[2]	
Attenuation	30 – 1000 MHz	dB	37	45	
	1000 – 4200 MHz	dB	32	35	
	4200 – 5000 MHz	dB	33	45	
	5170 – 5330 MHz	dB	50	55	
	5945 – 6065 MHz[4]	dB	40	60	
	5945 – 6065 MHz[5] @27dBm	dB	56	60	
	5945 – 6065 MHz @50C & 15dBm	dB	50	60	
	5945 – 6065 MHz @27dBm	dB	40	45	
	6065 – 6125 MHz	dB	54	62	
	6125 – 6425 MHz	dB	50	56	
	6425 – 6525 MHz	dB	52	58	
	6525 – 6905 MHz	dB	50	55	
	6905 – 7065 MHz	dB	49	57	
	7065 – 7125 MHz	dB	45	57	
	10980 – 11790 MHz	dB	35	40	
	16470 – 17865 MHz	dB	35	40	
Return Loss	5490 – 5895 MHz	dB	10[3]	15[1]	
Load Impedance		Ω		50	
Power Handling:	OFDM MCS0, 160 MHz, PAR 10dB	dBm			29

Notes: 1) Averaged frequency range at 25C; 2) Average over 20MHz; 3) Average over 160MHz; 4) For temperature > 25C; 5) For temperature > 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 (P2) 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

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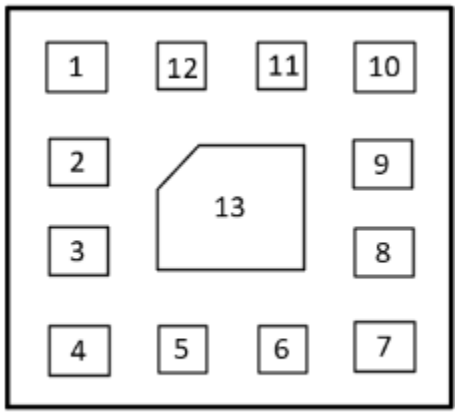
Bill of Materials

Reference Des.	Value	Description	Manufacturer	Part Number
PCB	N/A	Multi-layer	Multiple	AA4 1816-412-A10-1-1
U1	N/A	5.5 GHz BAW Filter	Akoustis	A10157
C1	0.4pF	Chip capacitor, 0201, 0.05pF	Murata	GJM0335C1ER40BB01D
L1	1.6nH	Chip inductor, 0201, ±0.05nH	Murata	LQP03HQ1N6W02
L2	1.1nH	Chip inductor, 0201, ±0.05nH	Murata	LQP03HQ1N1W02

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

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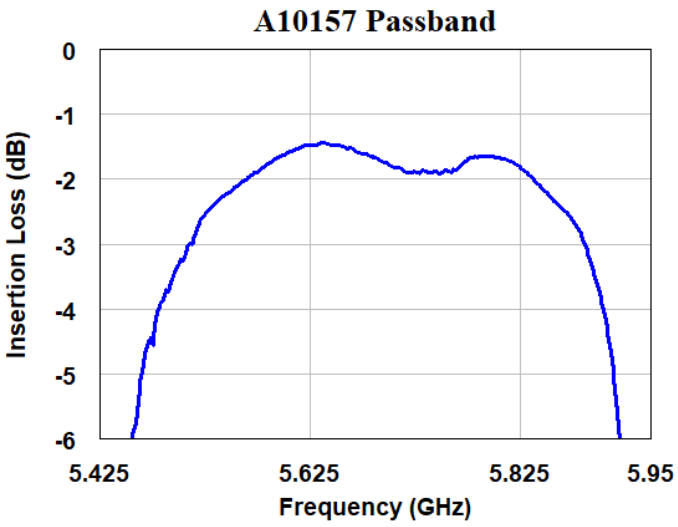
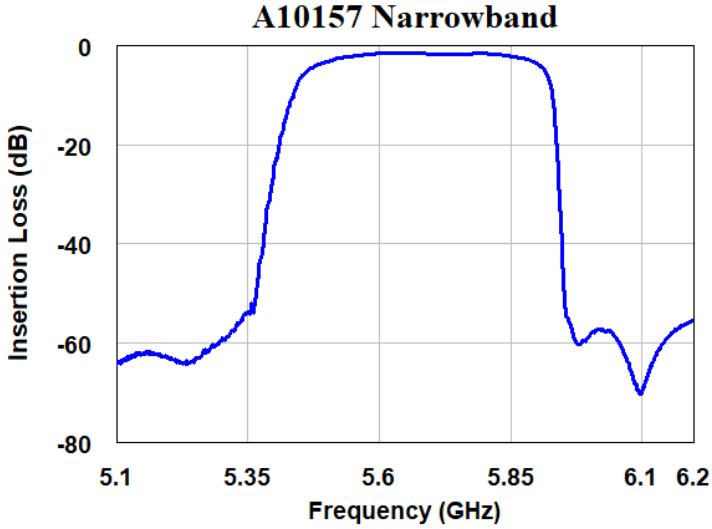
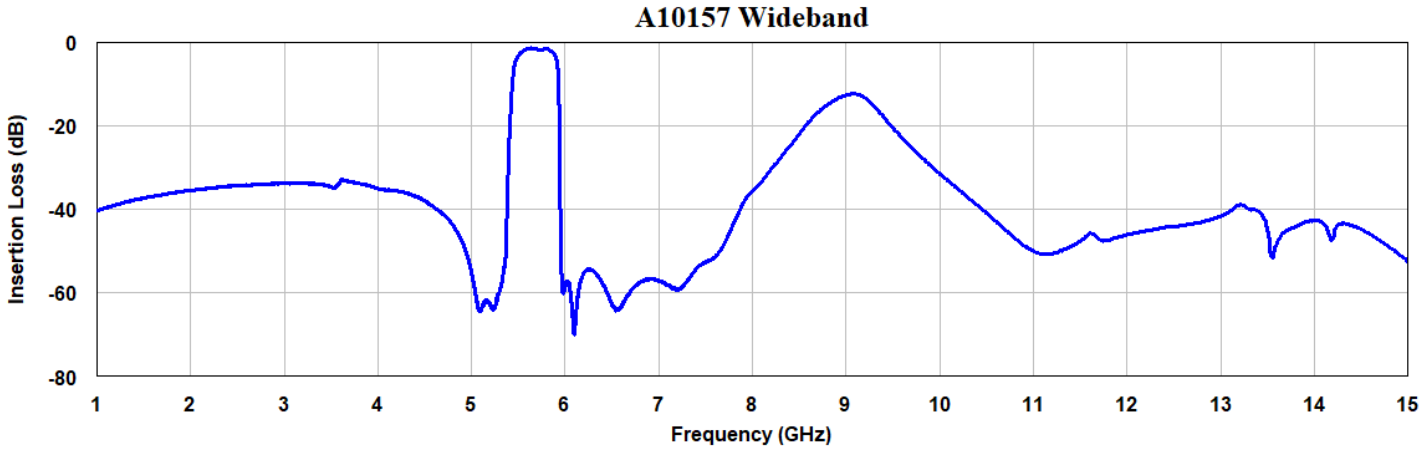
Measured Performance Plots (Temp = 25°C unless otherwise noted)







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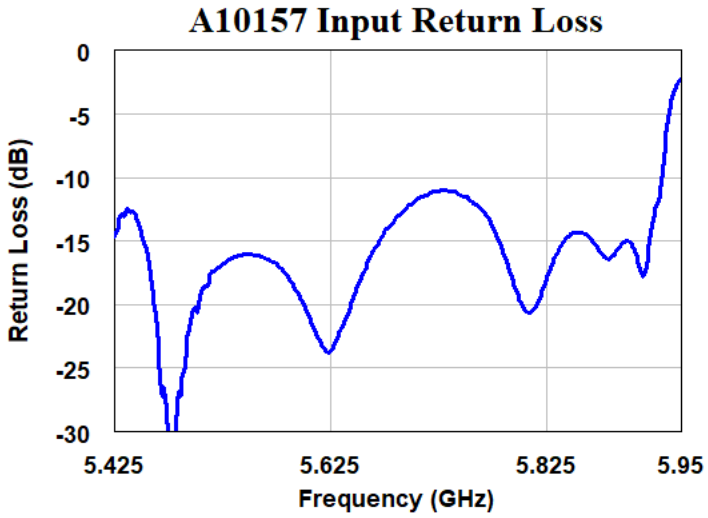
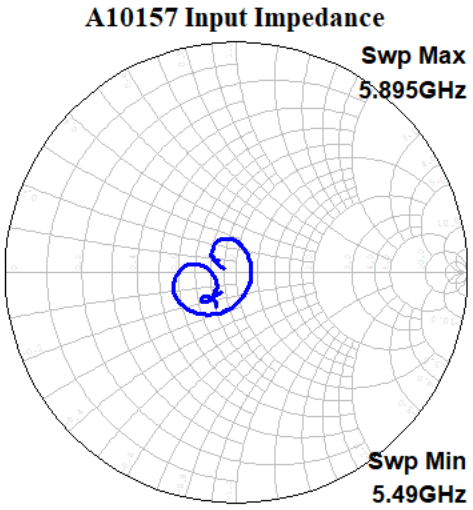
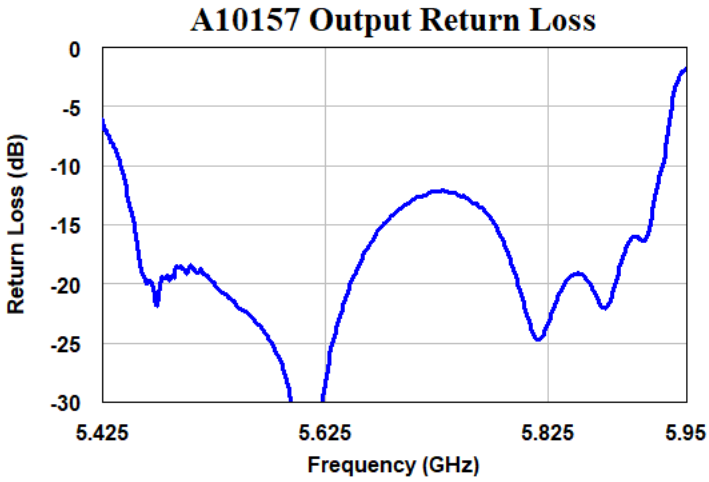
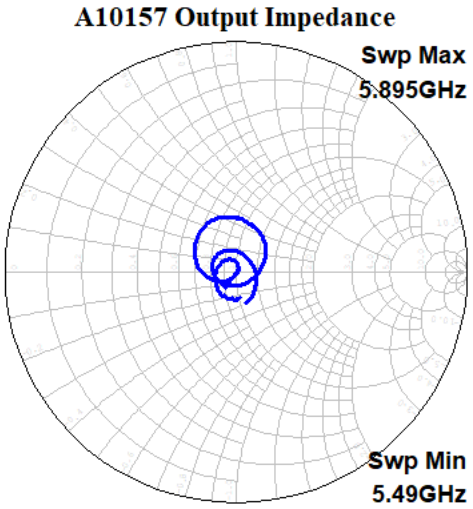
Measured Performance Plots …continued (Temp = 25°C unless otherwise noted)









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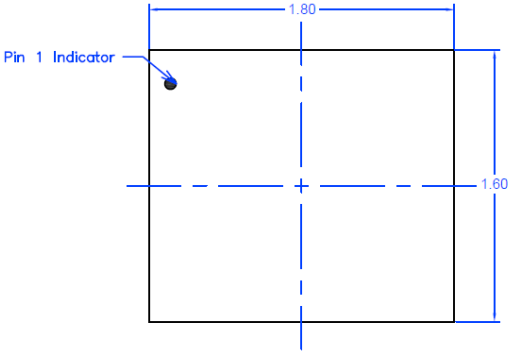
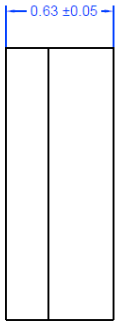
Package Outline Drawing (POD)

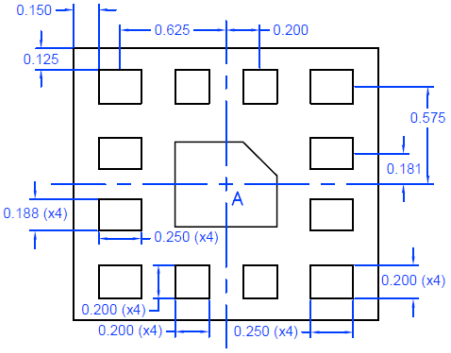
- All units in mm

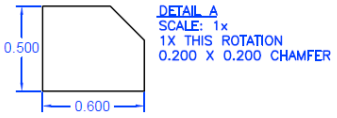


Top View



Side View



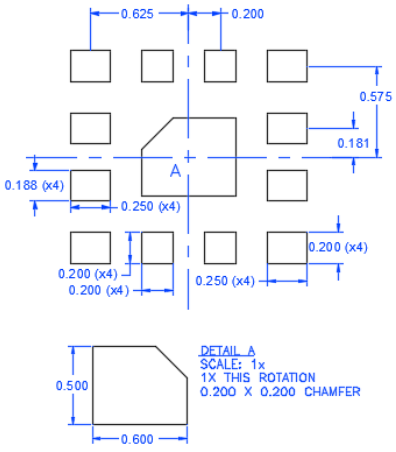


Bottom View

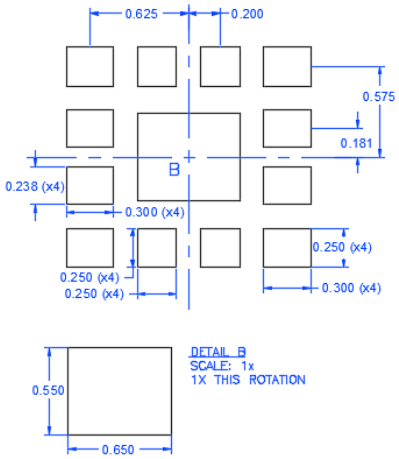
NOTES:

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

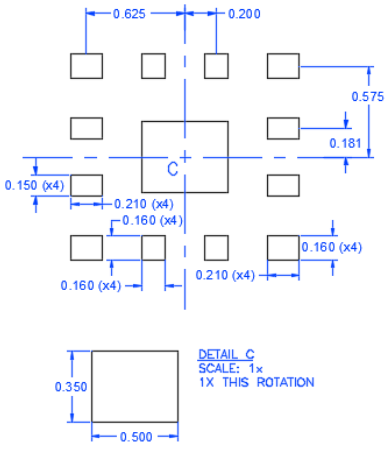
PCB Mounting Pattern



Recommended PCB Metal Top View



Recommended Solder Mask Opening Top View



Recommended Stencil Pattern Top View

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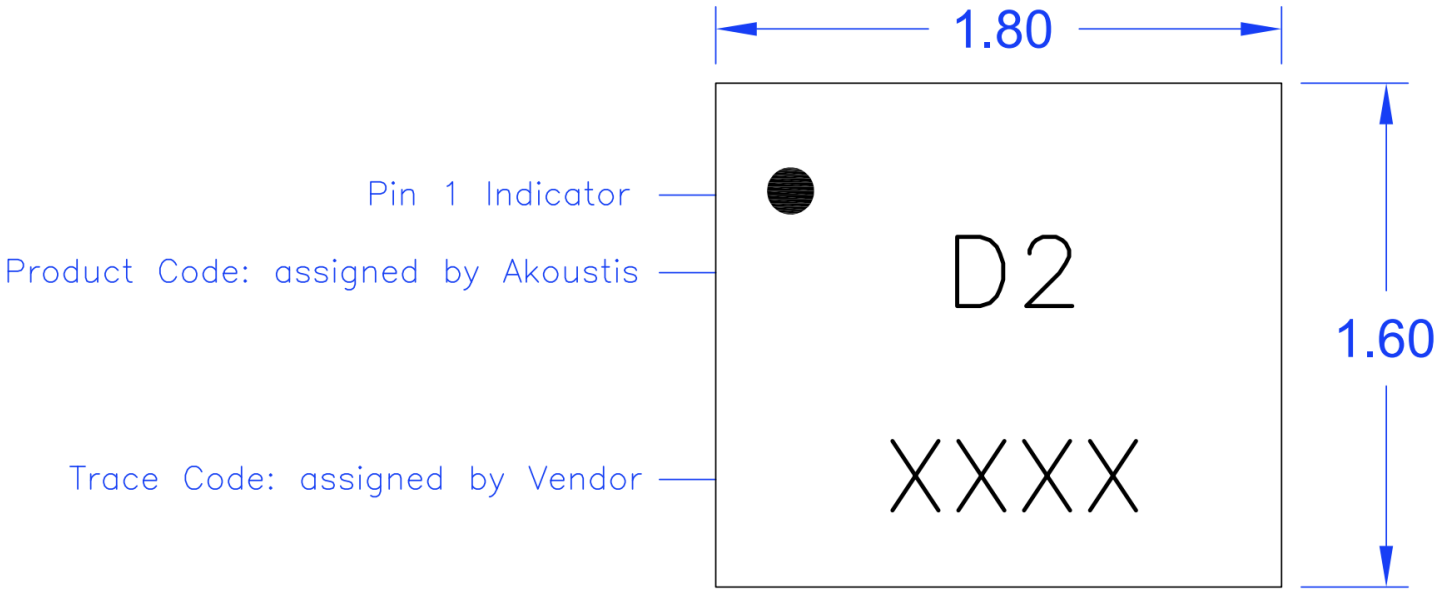
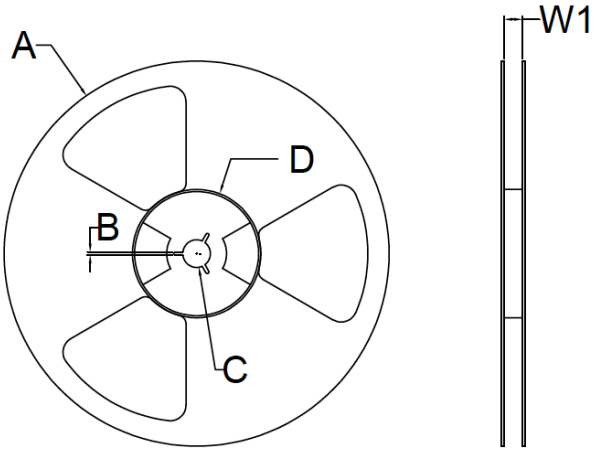
Typical Part Marking



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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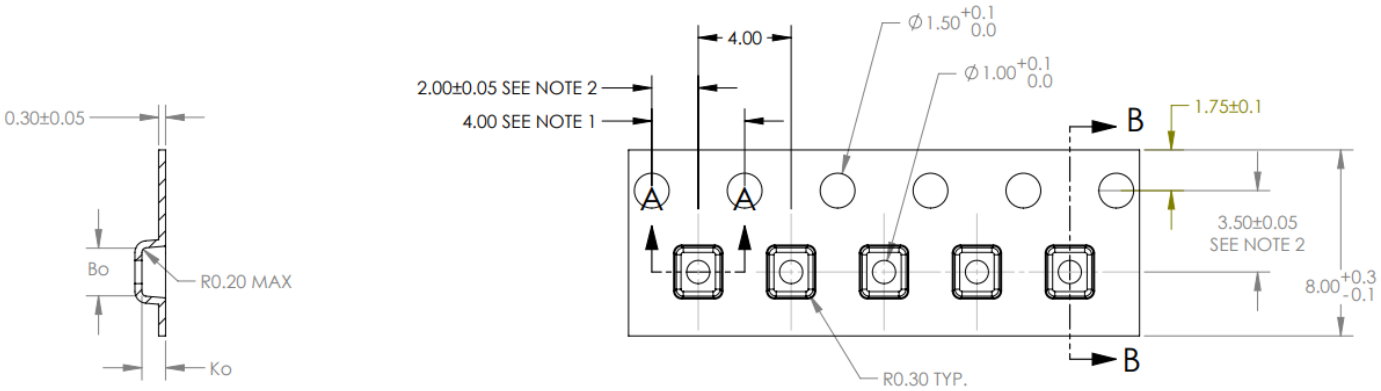
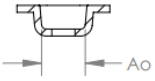
Tape Dimension

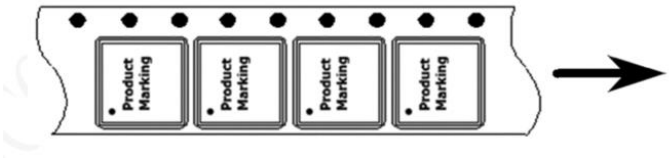


SCALE 1:1



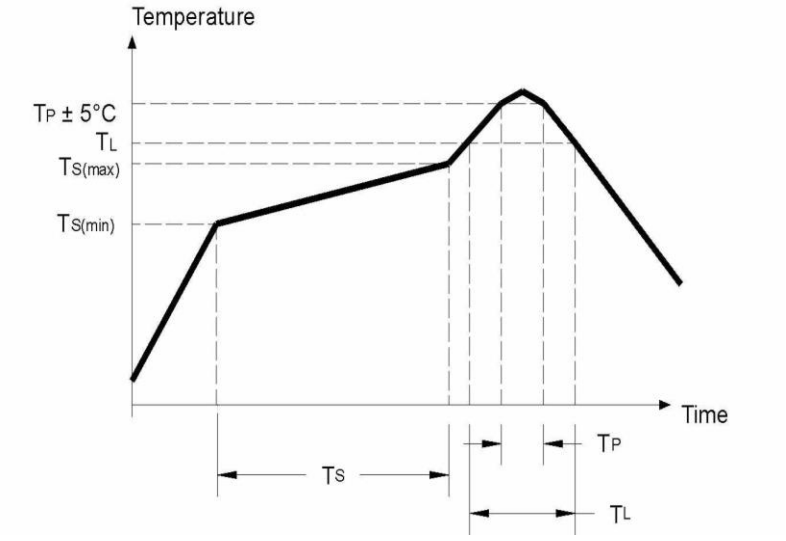
SECTION A-A

	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



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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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