6.5 GHz Wi-Fi 6E & 7 Coexistence BAW Filter A10765

Description

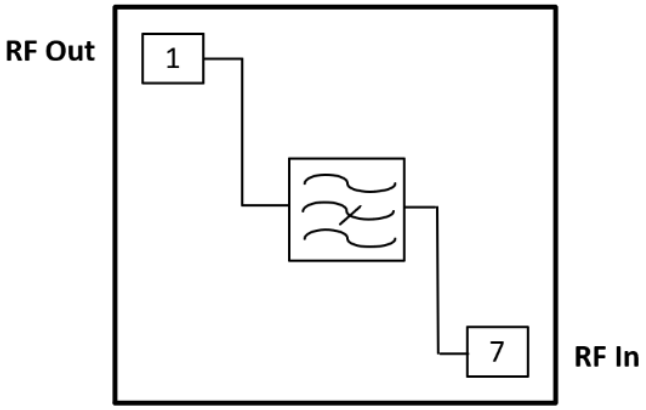
Akoustis' A10765 is a high-performance, ultra-wide bandwidth BAW RF Filter for use in Wi-Fi 6E & 7 applications covering U-NII-5 thru U-NII-8 bands. A10765 utilizes Akoustis' patented, XBAW® technology which provides leading RF filter performance. This BAW RF filter provides low insertion loss and meets the stringent rejection requirements enabling coexistence with U-NII-1 thru 3. This device exhibits high-power handling capabilities necessary for demanding power requirements of the latest Wi-Fi 6E & 7 standards. A10765 uses standard laminate packaging and is compatible with high volume, lead-free SMT soldering processes.

- Small form factor 1.6mm x 1.8mm x 0.62mm
- Single-ended 50Ω Tx/Rx ports (no external matching required)
- Ultra-wide passband covering 1180MHz
- High rejection enables coexistence with adjacent WiFi UNII bands
- High power rating, maximum +30 dBm
- Low insertion loss bandpass filter
- Performance over -30 C to +85C
- RoHS compliant, Pb-free package

Applications

- Wi-Fi 6E & 7 tri-band routers, integrated cable modem
- Wi-Fi 6E & 7 tri-band access points
- LTE/LAA small cells

Block Diagram



Ordering Information

Part Number	Description
A10765EVB	Evaluation board
A10765SP	(5) Loose pcs
A10765SR	(100) Short Reel (7" Reel)
A10765TR1	(1000) Tape & Reel (7" Reel)
A10765TR2	(2500) Tape & Reel (7" Reel)

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Prelim Datasheet: Rev 01262024
Pat. 10,256,786

Absolute Maximum Ratings

Parameter	Conditions	Rating
Storage Temperature		-40 to 125 °C
Input Power	Signal: OFDM MCS0, 20 MHz, PAR 10dB	+33 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[5] (Temp = -30°C to +85°C unless otherwise noted)

Parameter	Conditions	Units	Min.	Typ.	Max.
Pass bandwidth		MHz	5945	6535	7125
Insertion Loss	5945 – 7065 MHz	dB		1.9[1]	3.2[4]
	7065 – 7125 MHz	dB		1.9[1]	3.2[2]
Amplitude Variation	5945 – 7125 MHz	dB		2.0	2.5
Attenuation	30 – 1000 MHz	60	60	75	
	1000 – 2400 MHz	dB	25	35	
	2400 – 2500 MHz	dB	30[2]	35[1]	
	3300 – 4200 MHz	dB	3	8[1]	
	4400 – 5000 MHz	dB	2	10[1]	
	5170 – 5330 MHz	dB	50[4]	62[1]	
	5490 – 5650 MHz	dB	45[4]	50[1]	
	5650 – 5815 MHz	dB	47[3]	50[1]	
	5815 – 5835 MHz	dB	42[2]	52[1]	
	8500 – 11890 MHz	dB	10[4]	20[1]	
	11890 – 14250 MHz	dB	5[4]	7[1]	
Return Loss	5945 – 7125 MHz	dB	10	15[1]	
RF Port Impedance	5945 – 7125 MHz	Ω		50	
Power Handling	HE20 MCS0	dBm			30

Notes:

1. Averaged over specified frequency at room temperature.
2. Average over 20MHz Wi-Fi Channel.
3. Average over 80MHz Wi-Fi Channel.
4. Average over 160MHz Wi-Fi Channel.
5. Performance based on Akoustis EVB.

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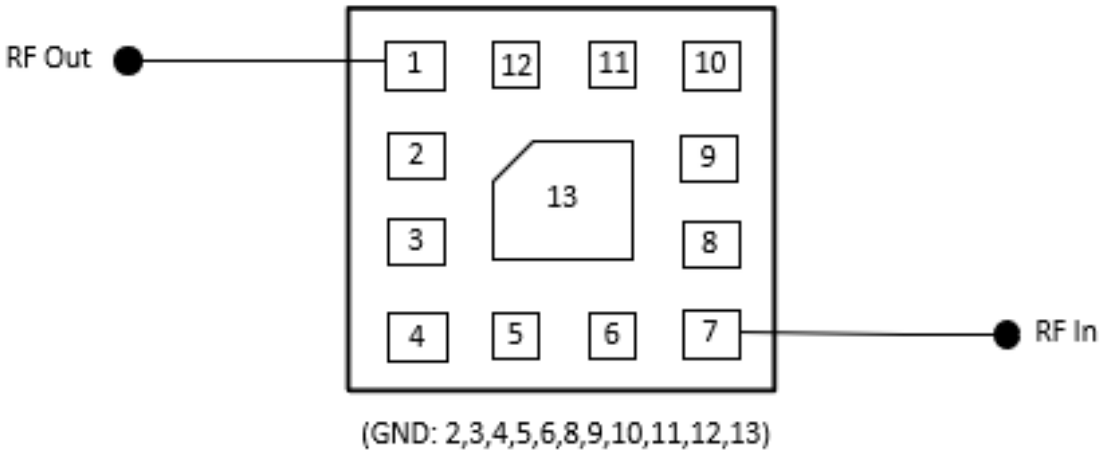
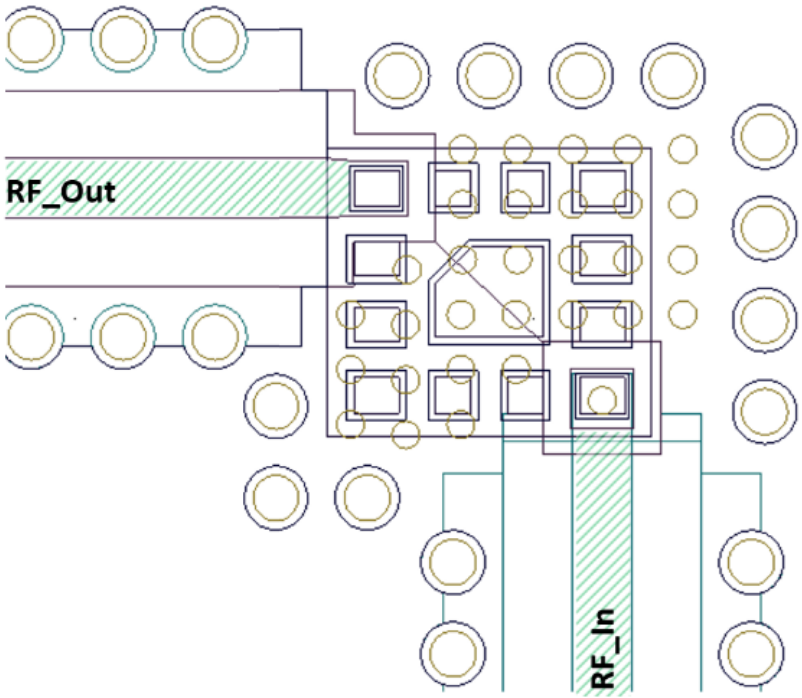
EVB Schematic & Layout





Notes:

1) Filter ground vias are 6mil. Other ground vias 10mil diameter.
2) Intput trace on bottom layer
3) Emulate Akoustis EVB as close as possible, particularly the via ground patttern.

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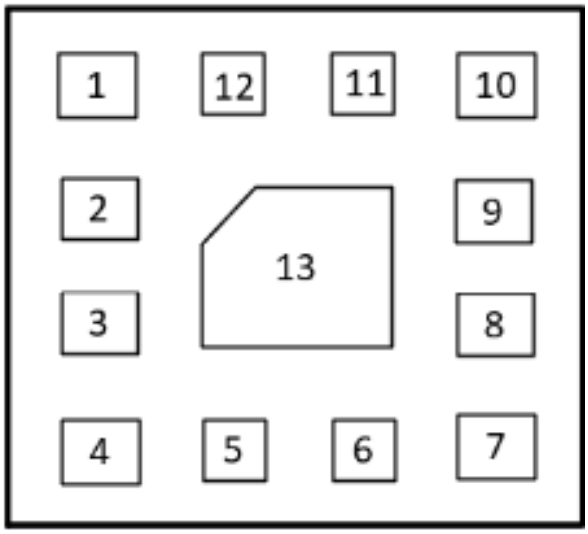
Bill of Materials

Reference Des.	Value	Description	Manufacturer	Part Number
PCB	N/A	4 layer	Multiple	AA4-1816-412-A04-4-1
U1	N/A	6.5 GHz BAW Filter	Akoustis	A10765

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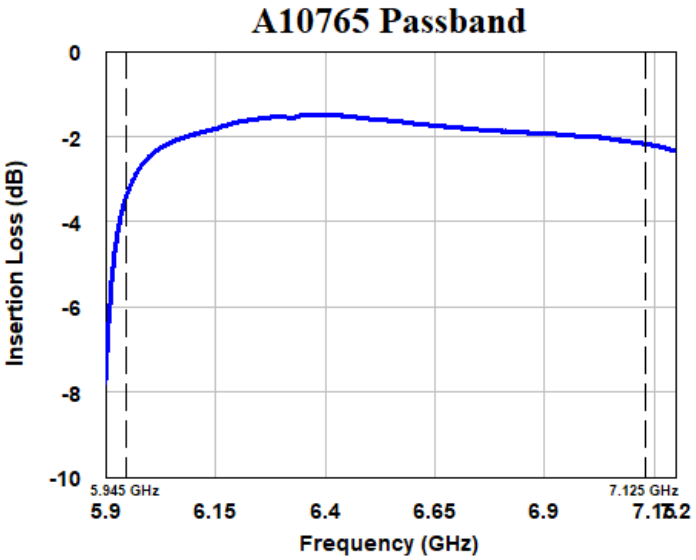
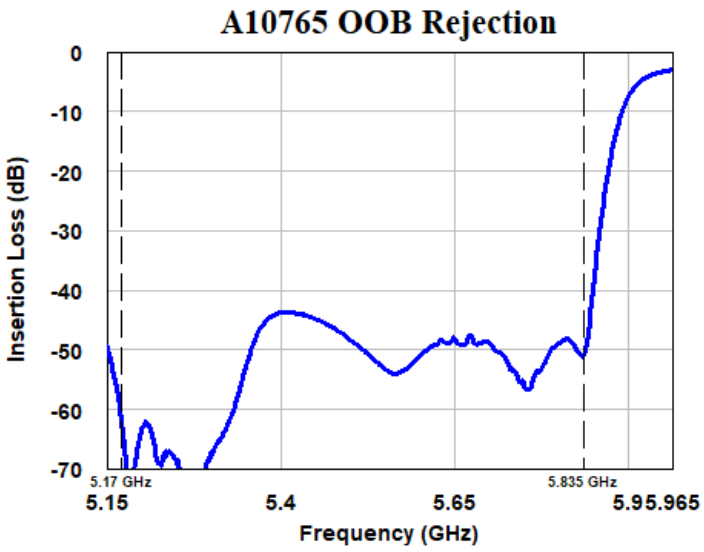
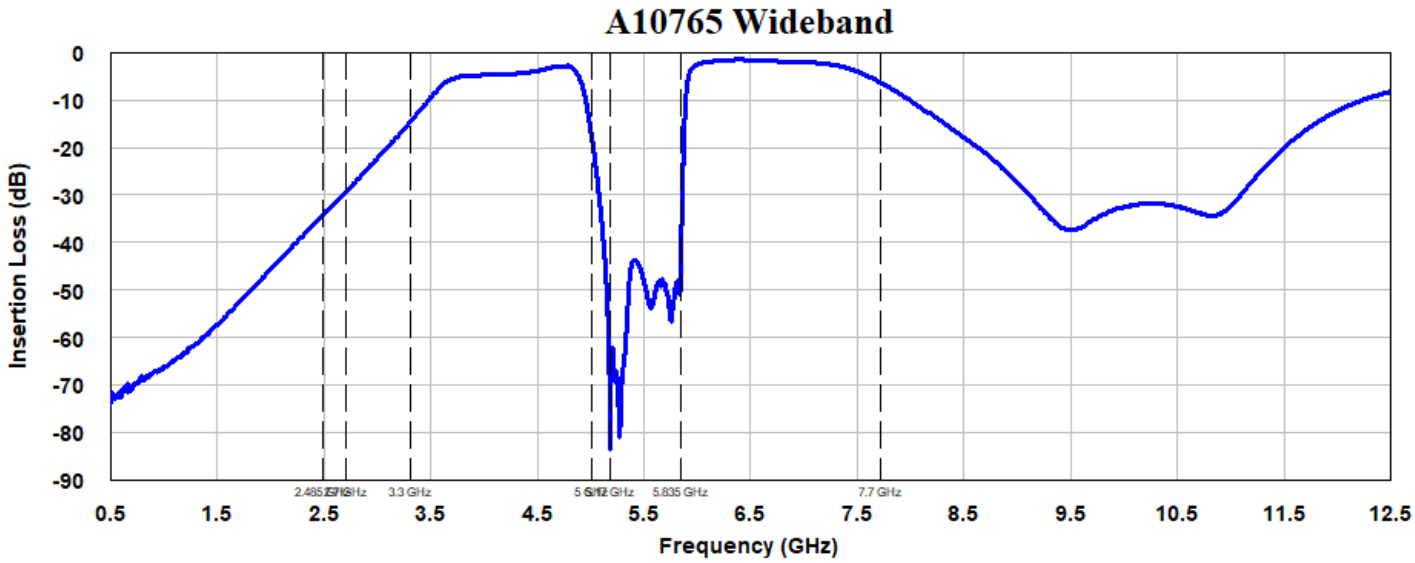
Performance Plots (Temp = +25°C unless otherwise noted)







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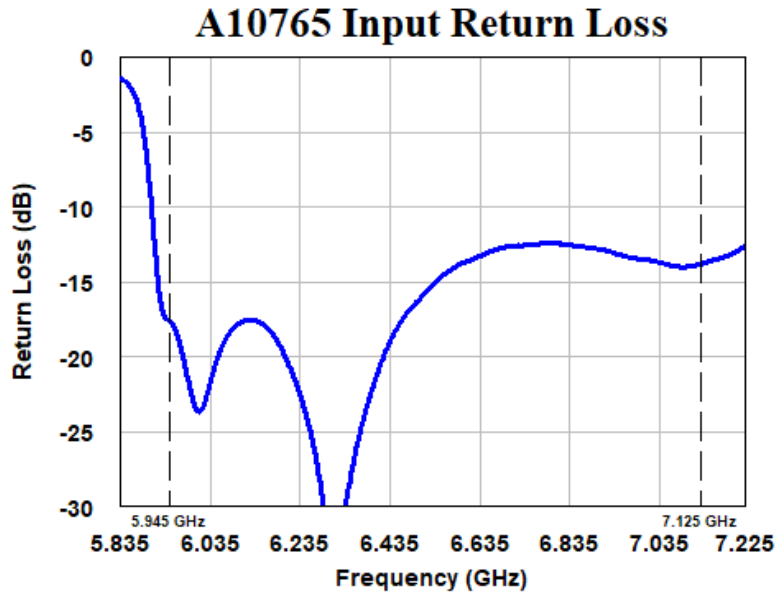
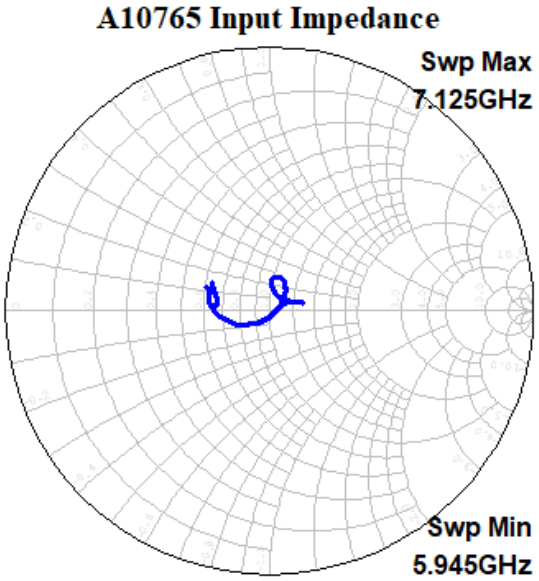
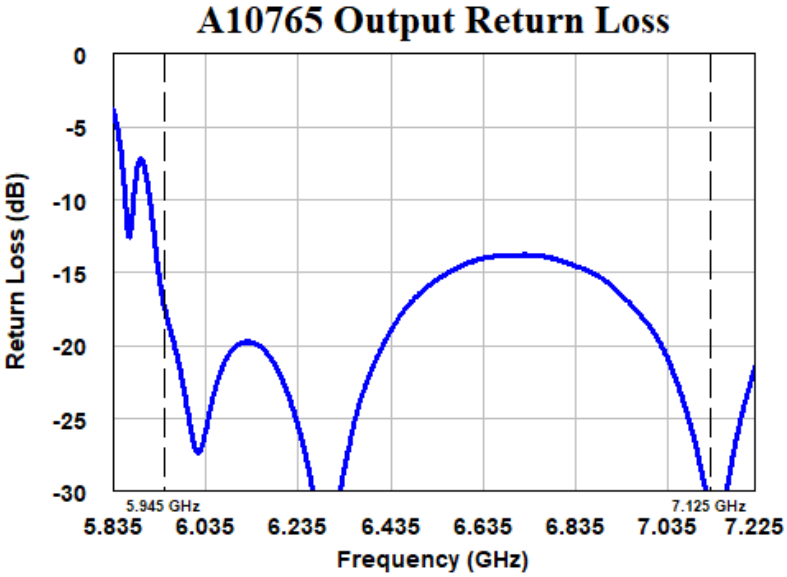
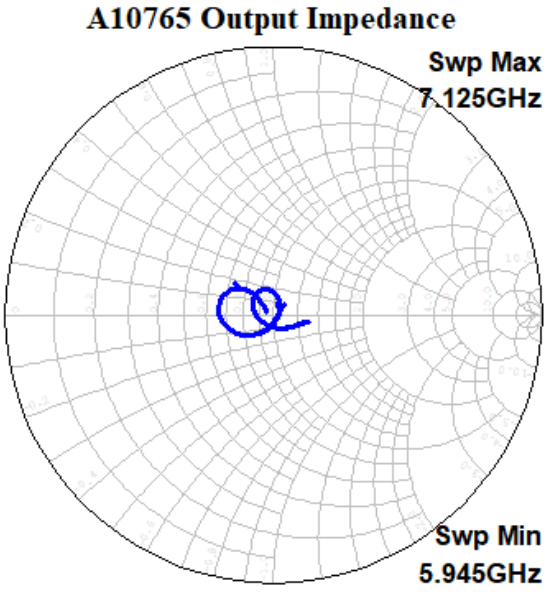
Performance Plots…continue (Temp = +25°C unless otherwise noted)









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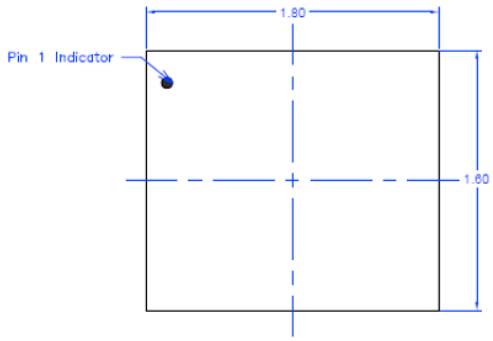
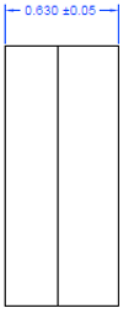
Package Outline Drawing (POD) & PCB Patterns

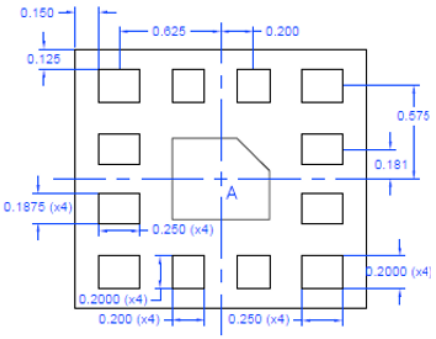
Unless Otherwise Specified:
- All units in mm

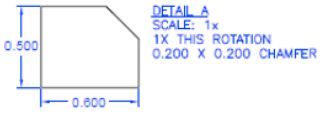


Top View



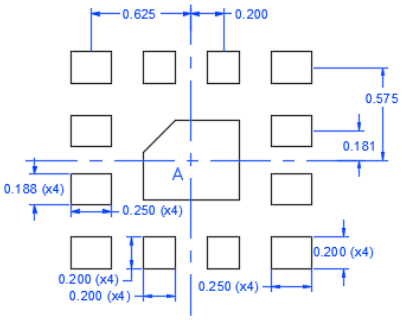
Side View

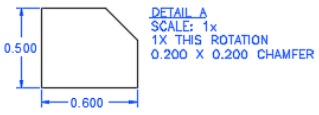




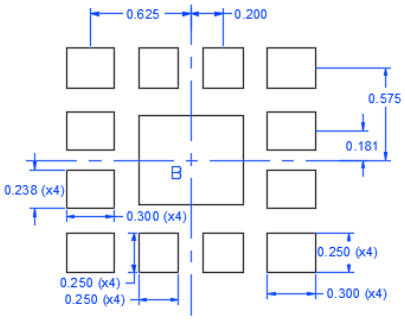
Bottom View

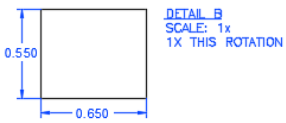
NOTES:
1. Terminal Finish:
   Electroless Ni/Electroless Pd/Immersion Au



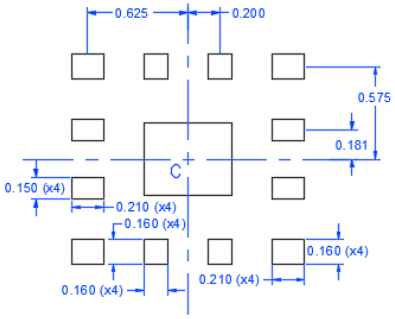


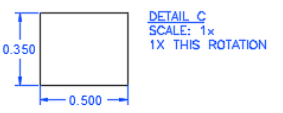
Recommended PCB Metal Top View





Recommended Solder Mask Opening Top View





Recommended Stencil Pattern Top View

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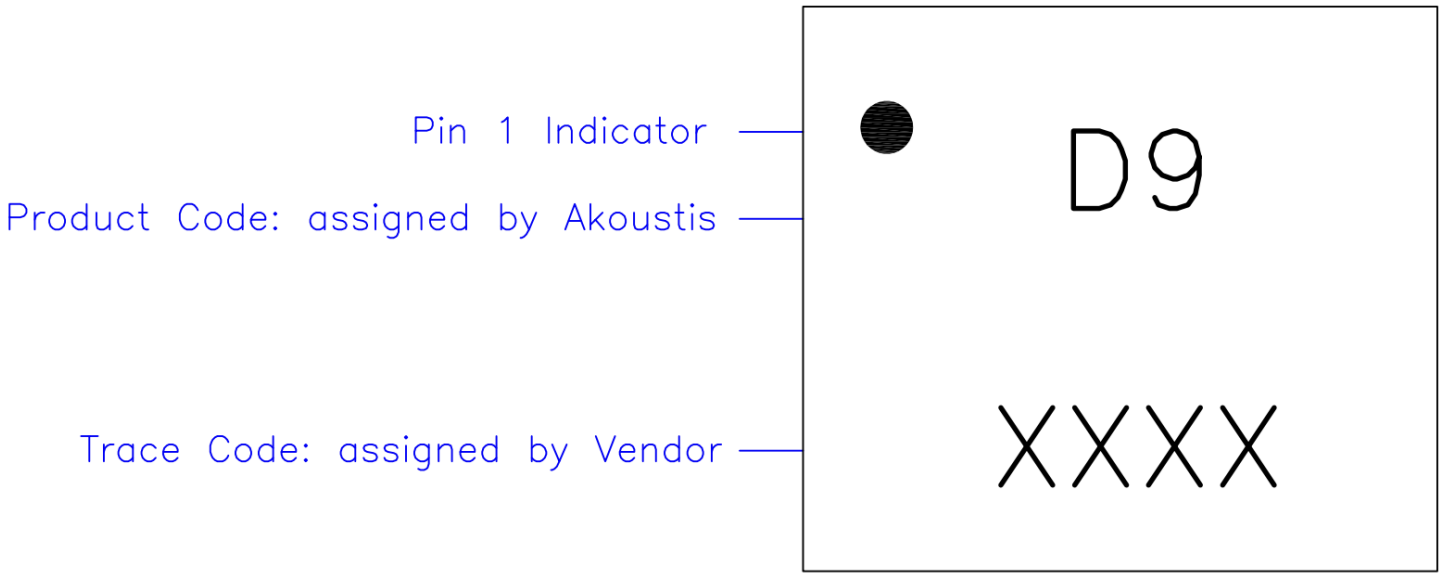
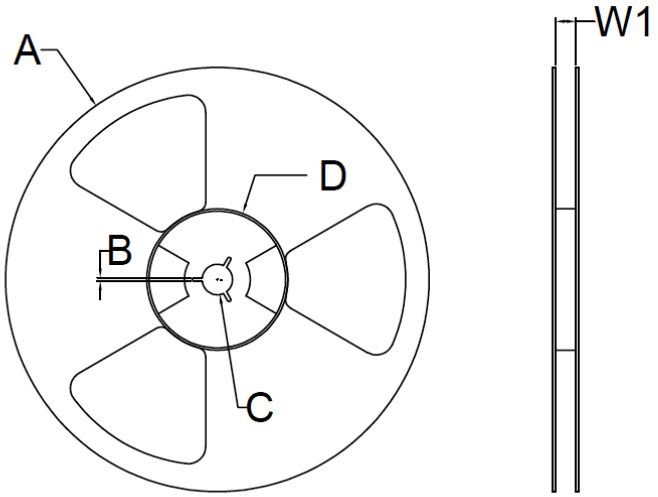
Typical Part Marking



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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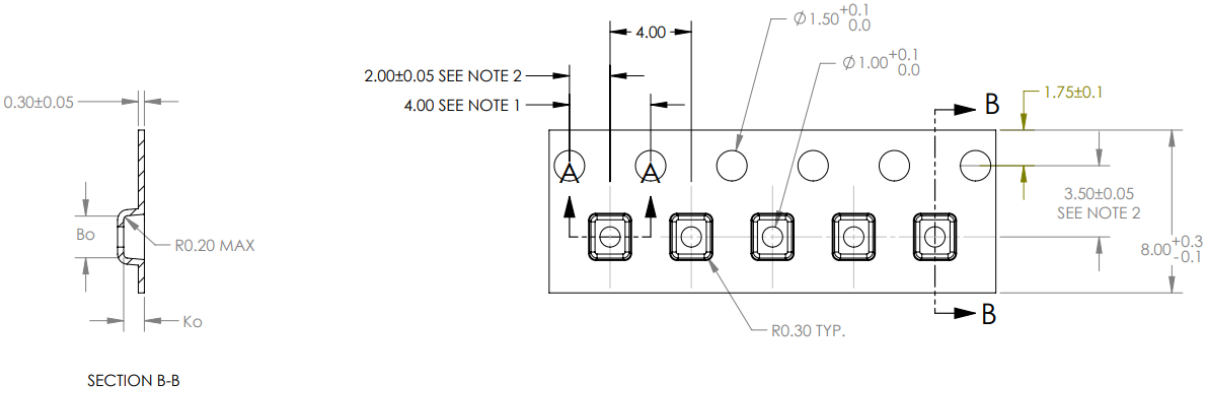
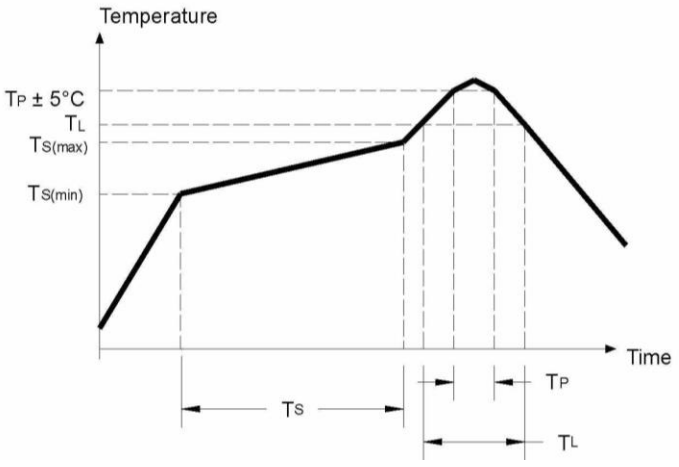
Tape Dimension



	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 0B
Standard: ANSI/ESDA/JEDEC JS-001-2017

Charged Device Model (CDM)
Rating: CLASS C2b
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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