

B48 CBRS 3.6GHz Bandpass BAW Filter

AKF-1336

Description

Akoustis' AKF-1336 is a high performance, ultra-small bandpass BAW Filter targeting 5G B48 Citizen Broadcast Radio Solutions (CBRS) infrastructure applications. AKF-1336 utilizes Akoustis' XBAW™ technology which provides leading RF filter performance. This BAW filter provides 150 MHz bandwidth, low insertion loss at 3.6 GHz and high out of band attenuation. AKF-1336 uses standard ceramic packaging and is compatible with high volume, lead-free SMT soldering processes.

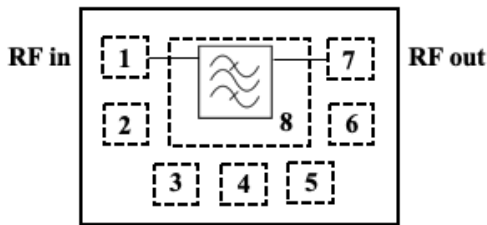
Features

- Ultra small form factor 2.5mm x 2.0mm x 0.8mm
- Single-ended 50Ω Ant, Tx/Rx ports
- High out of band attenuation
- High power handling, maximum +30dBm
- Low insertion loss 150 MHz passband filter
- Performance -40 C to +85°C
- RoHS Compliant

Applications

- 5G Infrastructure
- B48 CBRS
- 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
AKF-1336EVB	Evaluation board
AKF-1336SP	(5) Loose pcs
AKF-1336SR	(100) Short Reel (7" Reel)
AKF-1336TR1	(1000) Tape & Reel (7" Reel)
AKF-1336TR2	(2500) Tape & Reel (7" Reel)

Absolute Maximum Rating

Parameter		Rating
Storage Temperature		-40 to 125 °C
Input Power	Signal: 5G NR, 100 MHz, PAR 7.8dB Temp: 85°C	+32 dBm

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

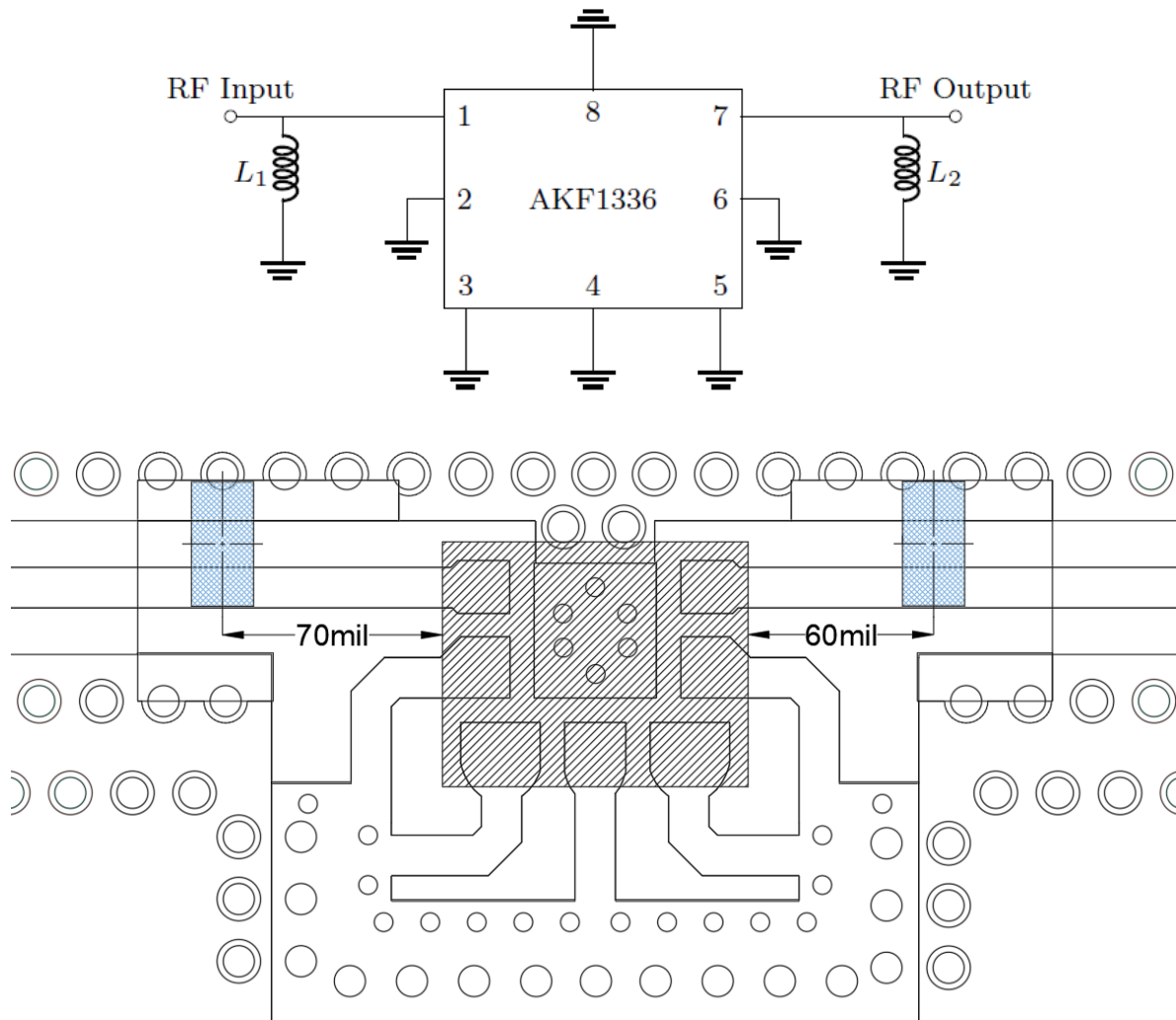
Operating Parameters (Temp=-40°C to +85°C unless otherwise noted)

Parameter	Conditions	Units	Min.	Typ.	Max.
Passband		MHz	3550	3625	3700
Insertion Loss	3550 – 3700 MHz	dB		1.5 ⁽¹⁾	2.7
Amplitude Variation	3550 – 3700 MHz	dB		1	1.5
Attenuation	10 – 1000 MHz	dB	50	55	
	1700 - 2690 MHz	dB	22	25	
	2690 - 3450 MHz	dB	22	25	
	3450 - 3530 MHz ⁽²⁾	dB	10	15	
	3720 – 3800 MHz ⁽²⁾	dB	9	15	
	3800 - 6000 MHz	dB	14	25	
	6000 - 8000 MHz	dB	15	18	
Return Loss	3550 - 3700MHz	dB	10	16 ⁽¹⁾	
Load Impedence		Ω		50	
Power Handling	5G NR, 100MHz, PAR 7.8dB	dBm			30
2 nd Harmonic	Po=27dBm (25°C)	dBm/MHz		-28	
3 rd Harmonic	Po=27dBm (25°C)	dBm/MHz		-73	

Note:

1. Averaged over specified frequency at room temperature
2. S-parameter averaged over 5MHz

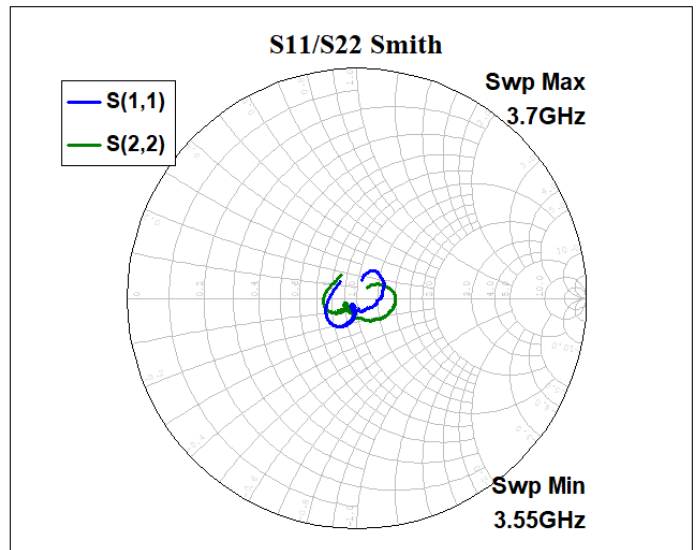
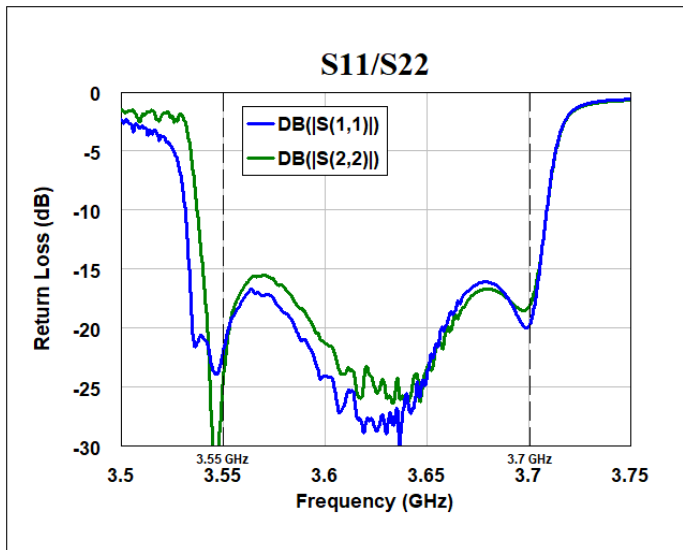
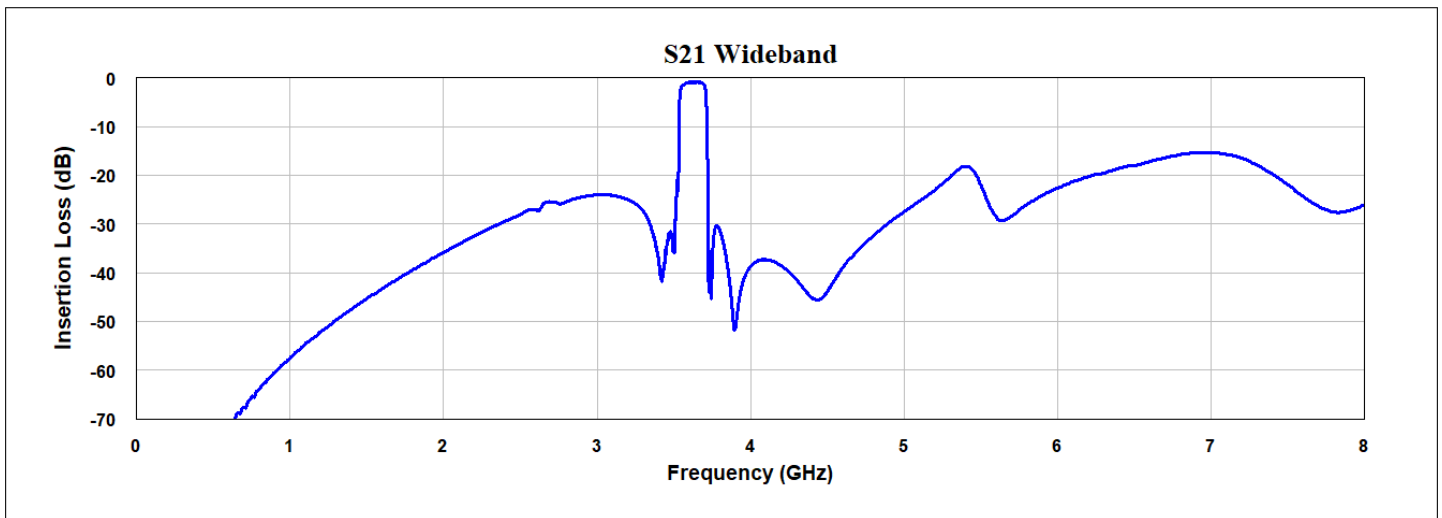
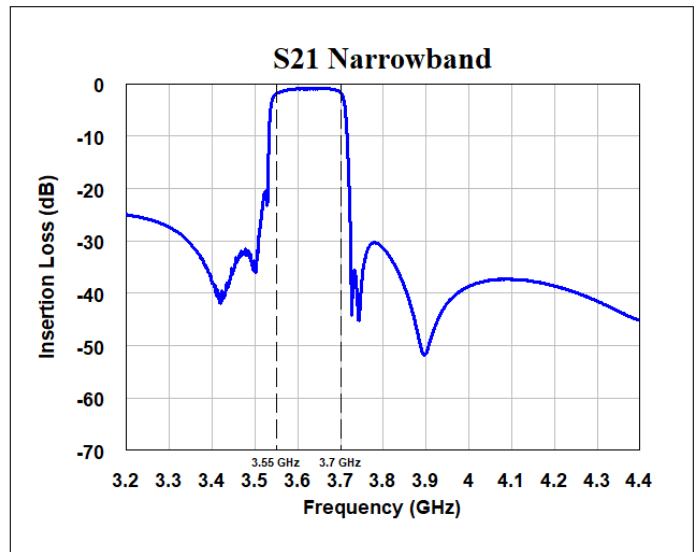
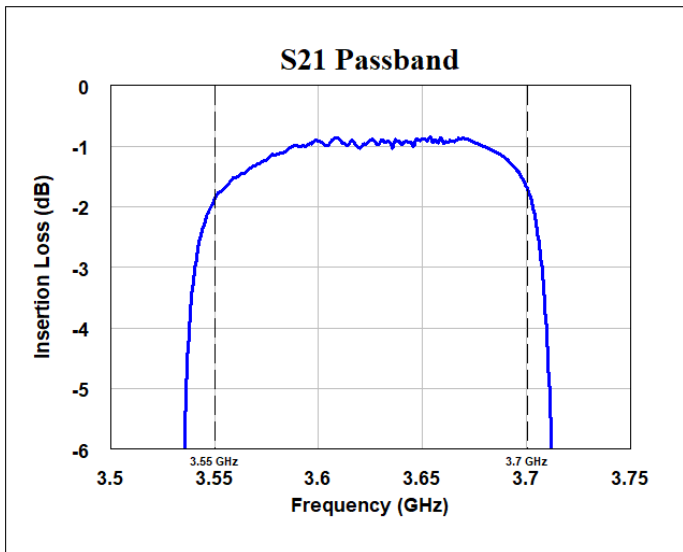
EVB Schematic & Layout



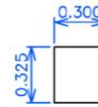
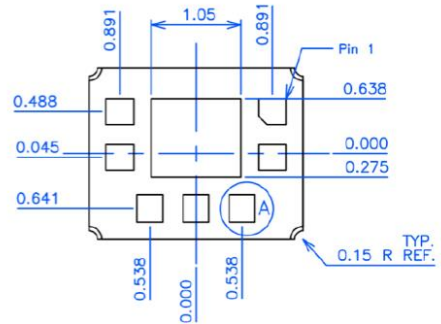
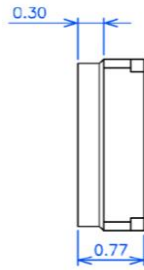
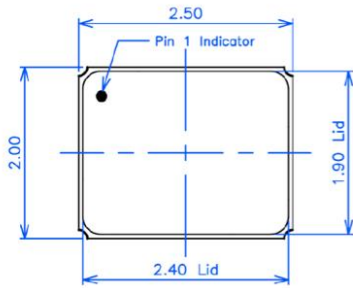
Bill of Materials

Reference Des.	Value	Description	Manufacturer	Part Number
PCB	N/A	2 layer	Multiple	
U1	N/A	3.6 GHz BAW Filter	Akoustis	AKF-1336
L1	2.6nH	Chip inductor, 0402, $\pm 0.1\text{nH}$	Murata	LQW15AN2N6G8ZD
L2	3.0nH	Chip inductor, 0402, $\pm 0.1\text{nH}$	Murata	LQW15AN3N0C10D

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



Package Dimensions & Pin Descriptions



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

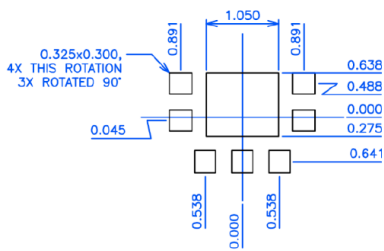
NOTES:

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

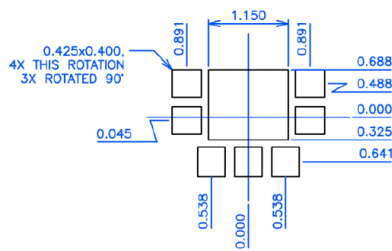
Notes:

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

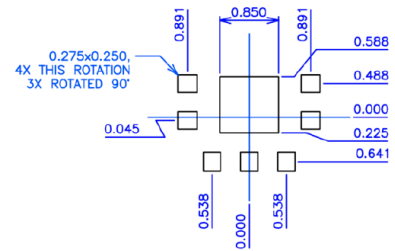
PCB Mounting Pattern



Recommended PCB
Metal Top View

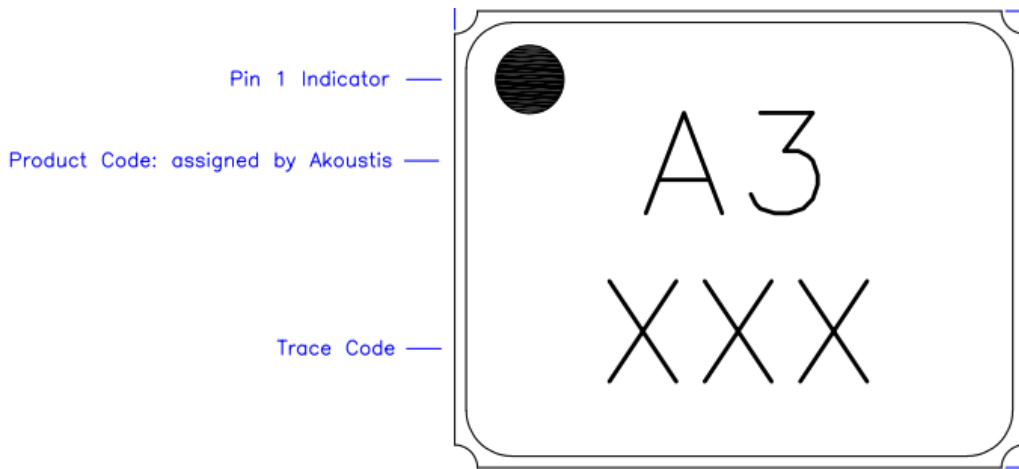


Recommended
Solder Mask Opening
Top View

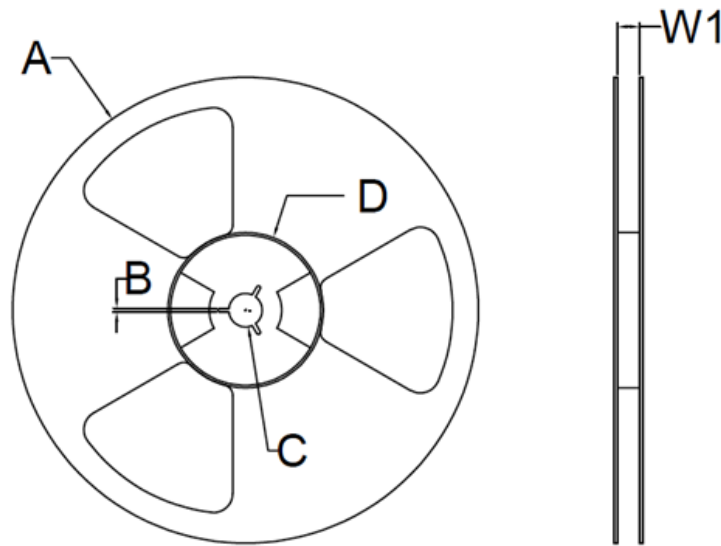


Recommended Stencil
Pattern Top View

Typical Part Marking



Reel Dimensions

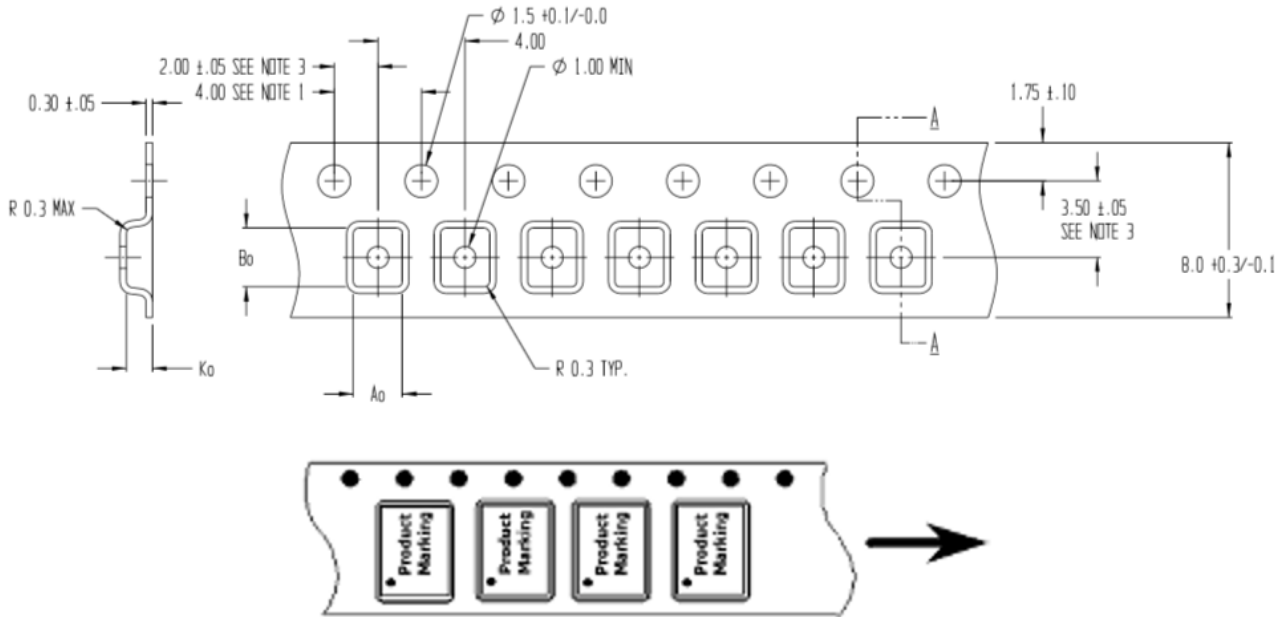


Reel Dimensions						
Reel Size	Tape Width	A	B	C	D	W1 *measured at hub
7 Inch	8 mm	180 +/- 2.0 mm	2.0mm +/- 0.5	13.0 + 0.5 / - 0 mm	60.0 +/- 2.0 mm	8.40 + 1.5 / - 0 mm
	12 mm	180 +/- 2.0 mm	2.0mm +/- 0.5	13.0 + 0.5 / - 0 mm	60.0 +/- 2.0 mm	12.40 + 2.0 / - 0 mm
	16 mm	180 +/- 2.0 mm	2.0mm +/- 0.5	13.0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

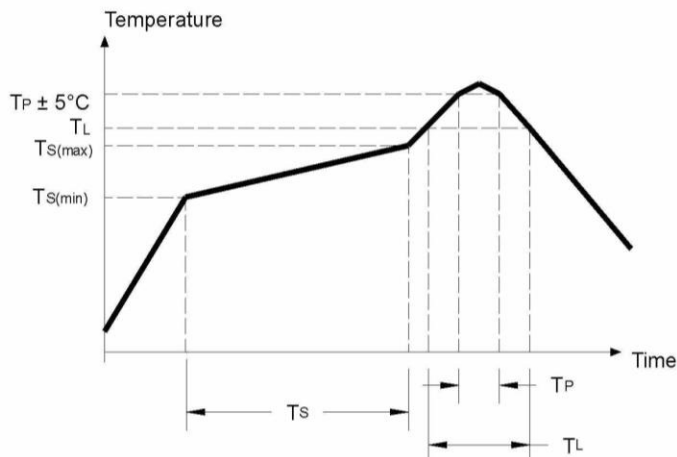
Tape Dimension

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



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



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

TBD

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.

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