

5.6GHz WiFi Coexistence BAW Filter

AKF-1256

Description

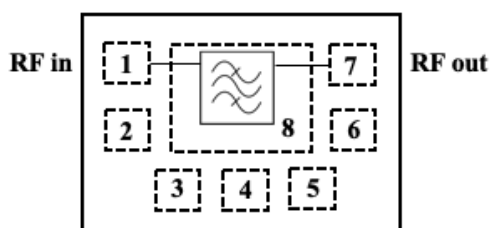
Akoustis' AKF-1256 is a high-performance, ultra-wide bandwidth BAW RF Filter for use in 5.6GHz WiFi applications covering U-NII-2C plus U-NII-3 bands. AKF-1256 utilizes Akoustis' patented, XBAW™ technology which provides leading RF filter performance. This BAW RF filter provides low insertion loss and meets the stringent rejection requirements enabling coexistence with U-NII-1 and 2A. This device exhibits high-power handling capabilities necessary for demanding power requirements of the latest WiFi standards. AKF-1256 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 1.0mm
- 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
2	Ground
3	Ground
4	Ground
5	Ground
6	Ground
7	RF Output
8	Ground

Ordering Information

Part Number	Description
AKF-1256EVB	Evaluation board
AKF-1256SP	(5) Loose pcs
AKF-1256SR	(100) Short Reel (7" Reel)
AKF-1256TR1	(1000) Tape & Reel (7" Reel)
AKF-1256TR2	(2500) Tape & Reel (7" Reel)

Absolute Maximum Ratings

Parameter	Conditions	Rating
Storage Temperature		-40 to 125 °C
Input Power	Singal: OFDM MCS0, 20 MHz, PAR 10dB Temp: 85°C	+31dBm

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

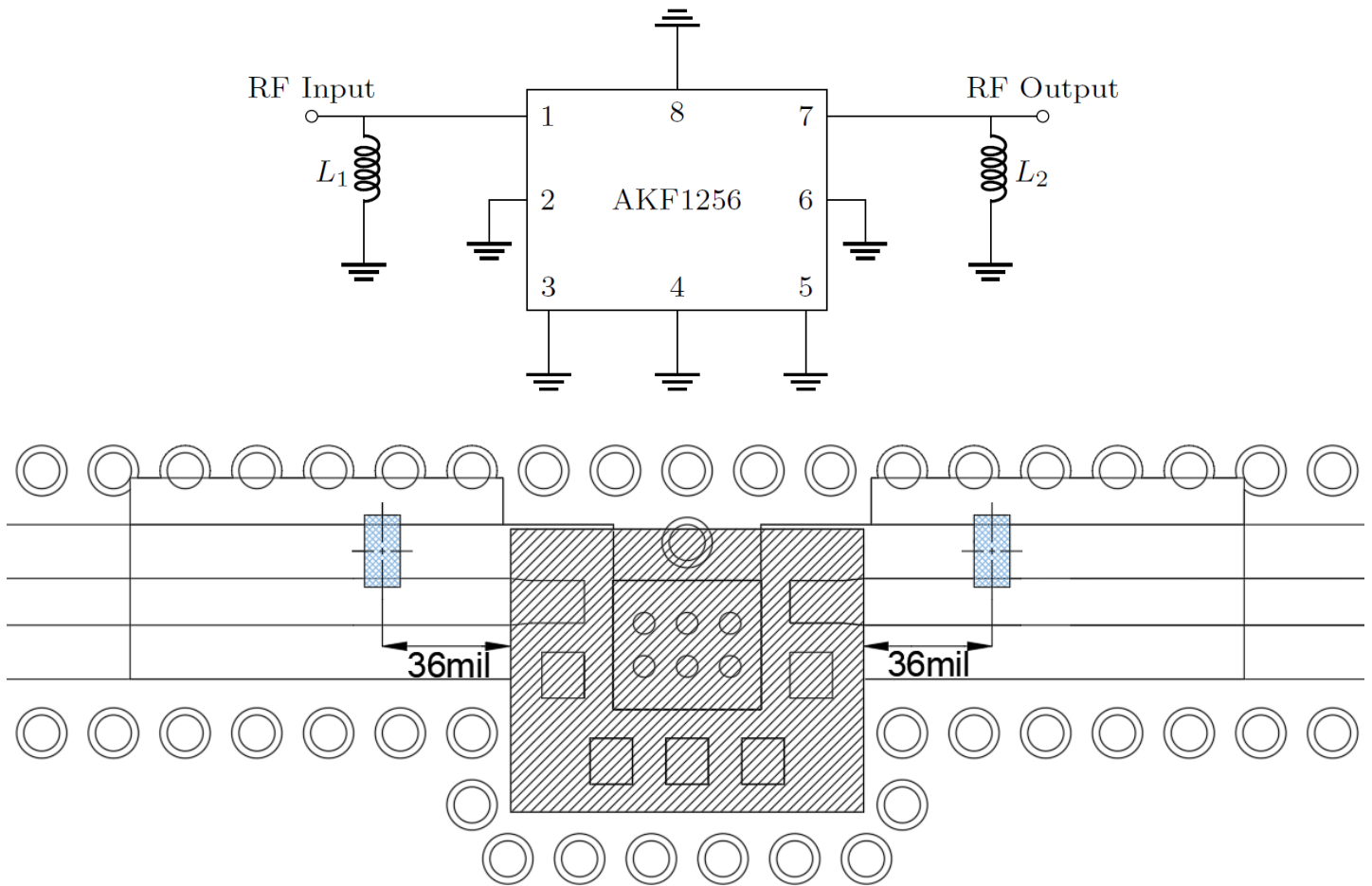
Operating Parameters (Temp = -40°C to +85°C unless otherwise noted)

Parameter	Conditions	Units	Min.	Typ.	Max.
Passband		MHz	5490	5665	5835
Insertion Loss	5490 – 5835 MHz	dB		1.9 ⁽¹⁾	2.7
Amplitude Variation	5490 – 5835 MHz	dB		1	1.5
Attenuation	30 – 2700 MHz	dB	43	47	
	3300 – 5000 MHz	dB	30	35	
	5170 – 5330 MHz ⁽²⁾	dB	50	51	
	5975 – 10000 MHz	dB	30	32	
	10000 – 12000 MHz	dB	15	20	
Return Loss	5490 – 5835 MHz		12	15 ⁽¹⁾	
Load Impedance		Ω		50	
Power Handling	OFDM MCS0, 20 MHz, PAR 10dB	dBm			30
2 nd Harmonic	Po=28dBm (25°C)	dBm/MHz		-40	

Note:

1. Averaged over specified frequency at room temperature
2. Only for room temperature

EVB Schematic & Layout



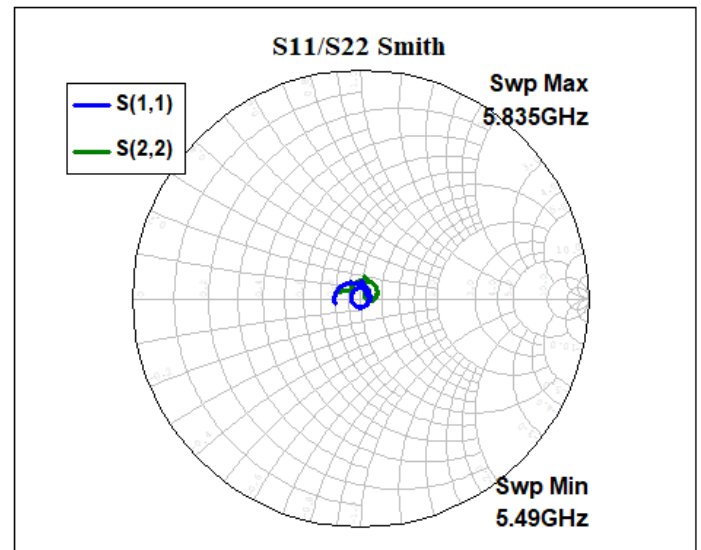
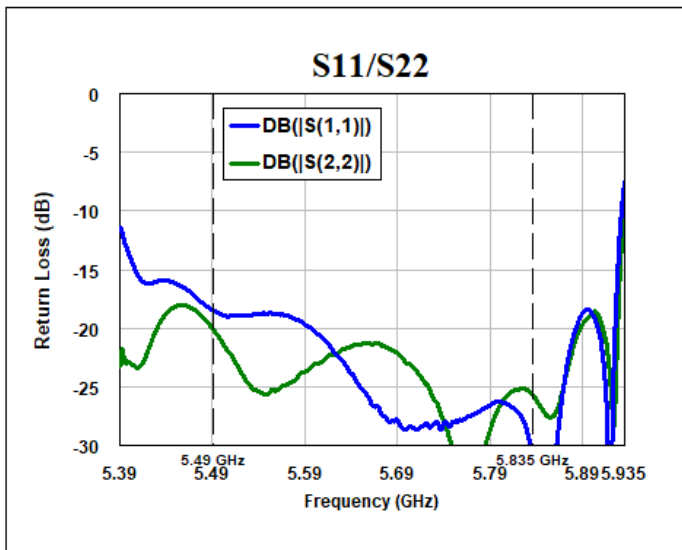
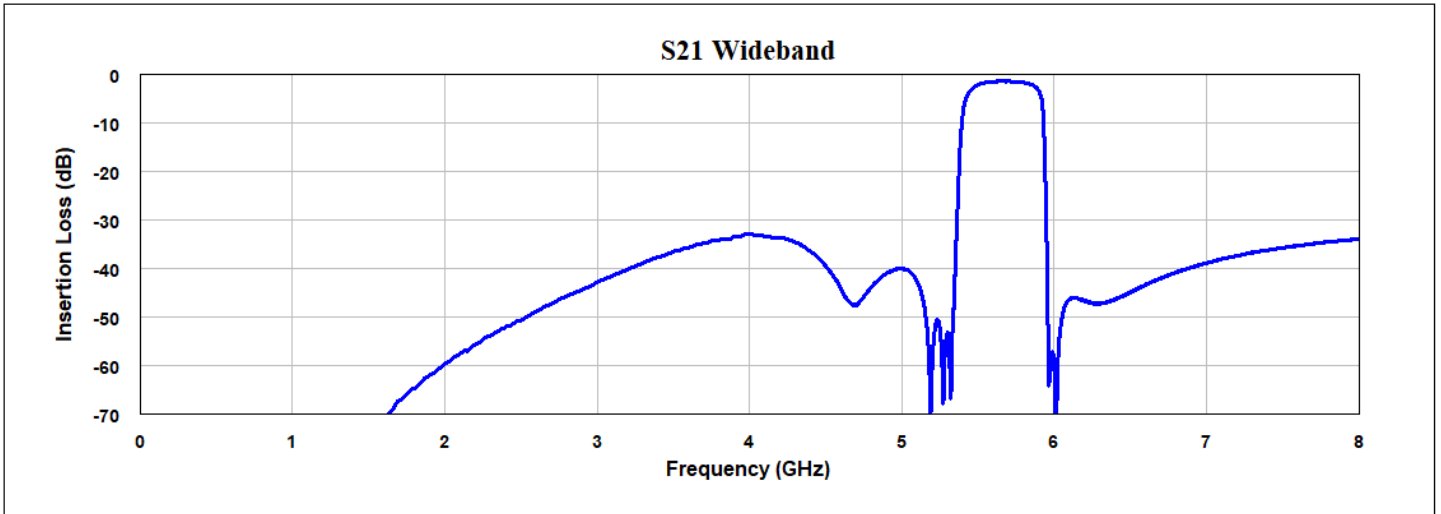
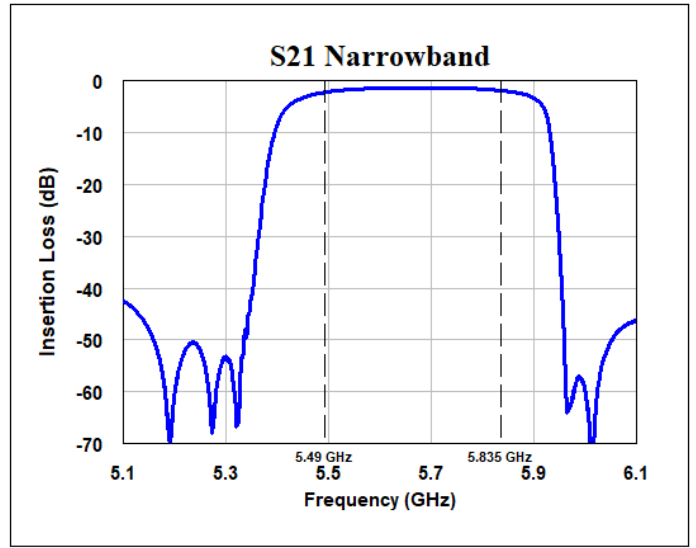
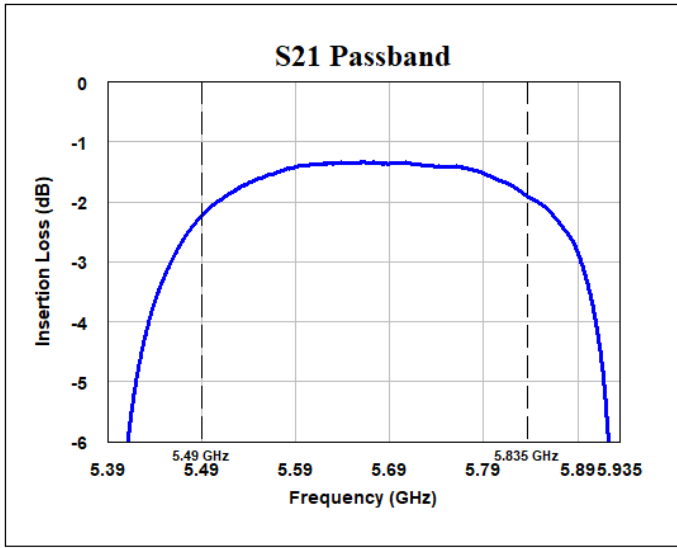
Note:

- 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	4 layer	Multiple	
U1	N/A	5.66 GHz BAW Filter	Akoustis	AKF-1256
L1	1.7 nH	Chip inductor, 0201, $\pm 0.05\text{nH}$	Murata	LQP03HQ1N7B02#
L2	1.7 nH	Chip inductor, 0201, $\pm 0.05\text{nH}$	Murata	LQP03HQ1N7B02#

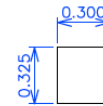
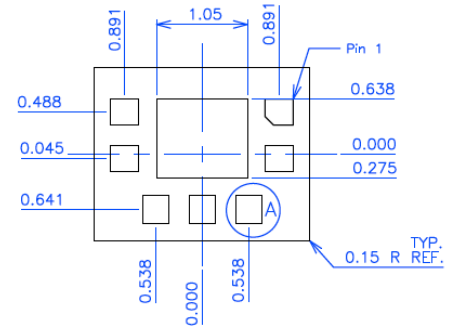
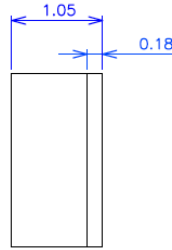
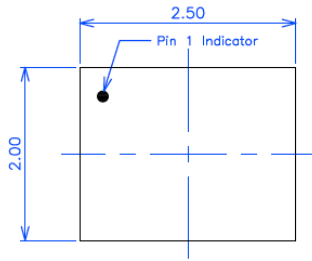
Performance Plots (Temp = 25°C unless otherwise noted)



AKF-1256

Package Drawing & Pin Description

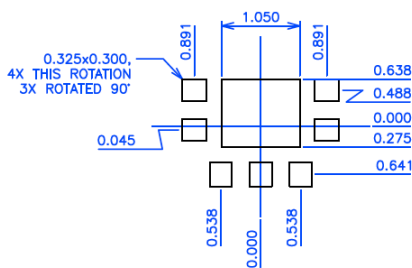
- Notes:
- All Units are in mm unless otherwise stated
 - General Tolerance:
 - Linear X.XXX = $\pm 0.050\text{mm}$
 - X.XX = $\pm 0.10\text{mm}$



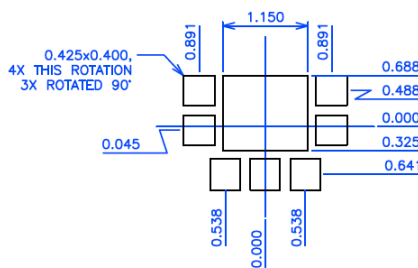
DETAIL A
 PAD
 SCALE: 2x
 3X THIS ROTATION
 4X ROTATED 90°
 PIN 1 CHAMFER 0.100 X 45°

- NOTES:
- Terminal Finish:
 Electroless Ni/Electroless Pd/Immersion Au

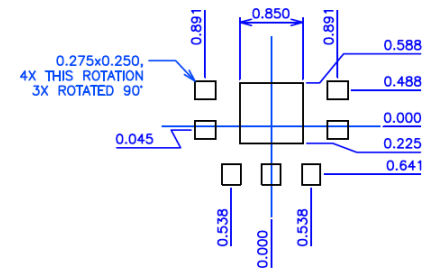
PCB Mounting Pattern



Recommended PCB
 Metal Top View

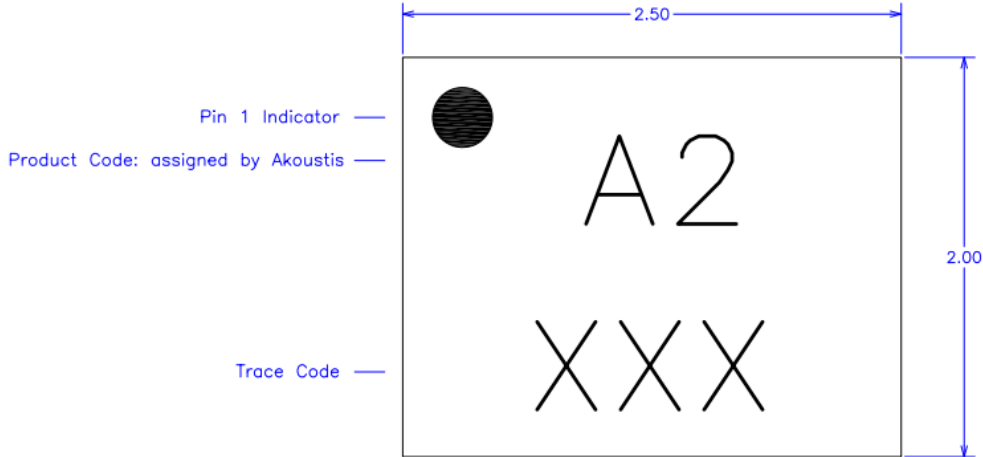


Recommended
 Solder Mask Opening
 Top View

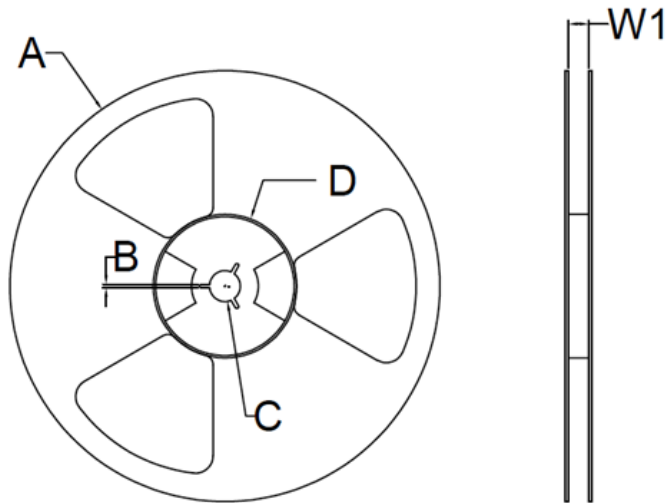


Recommended Stencil
 Pattern Top View

Typical Part Marking



Reel Dimensions

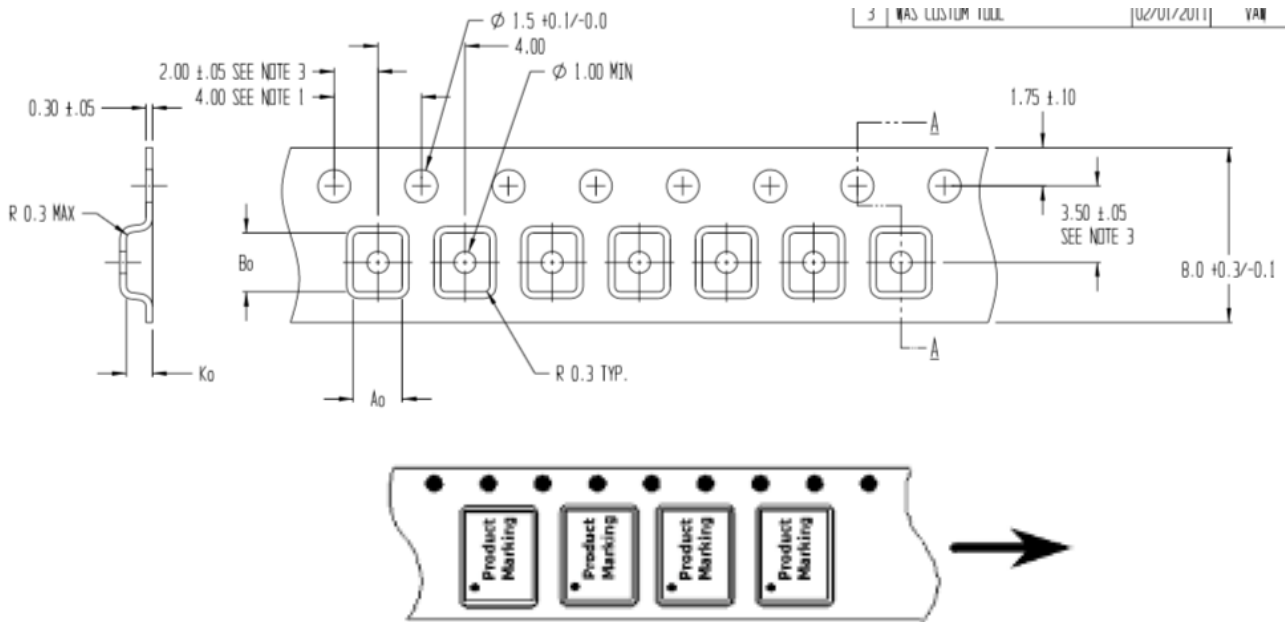


Reel Dimensions						
Reel Size	Tape Width	A	B	C	D	W1 *measured at hub
7 Inch	8 mm	180 +0/-2.0 mm	2.0mm +/-0.5	13.0+0.5 / -0 mm	60.0 +/- 2.0 mm	8.40 + 1.5 / -0 mm
	12 mm	180 +0/-2.0 mm	2.0mm +/-0.5	13.0+0.5 / -0 mm	60.0 +/- 2.0 mm	12.40 + 2.0 / -0 mm
	16 mm	180 +0/-2.0 mm	2.0mm +/-0.5	13.0+0.5 / -0 mm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

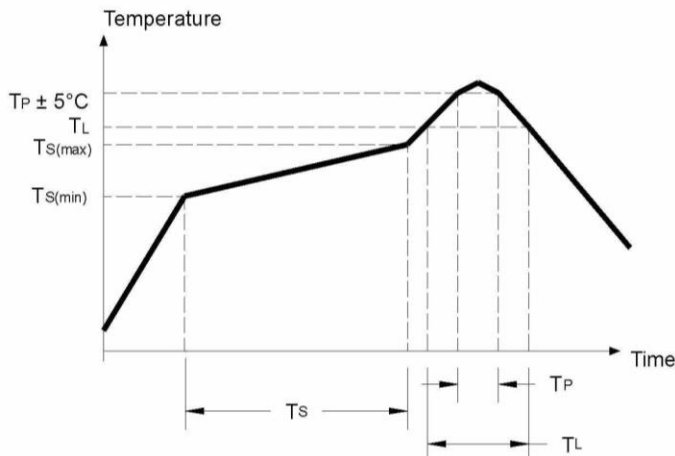
Tape Dimension

A₀ = 2.25
 B₀ = 2.70
 K₀ = 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 (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



AKF-1256

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 the datasheet are subject to change. Please contact Akoustis for the latest on our products and company information.

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