

3.55 GHz 5G Coexistence BAW Filter

AKF-1335

Description

Akoustis' AKF-1335 is a high performance, ultra-small bandpass BAW RF Filter for use in 5G infrastructure applications covering 100 MHz of 5G n77 band. AKF-1335 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 4G LTE and 5G bands. This device exhibits high-power handling capabilities necessary for demanding power requirements of the latest 5G infrastructure requirements. AKF-1335 uses standard laminate packaging and is compatible with high volume, lead-free SMT soldering processes.

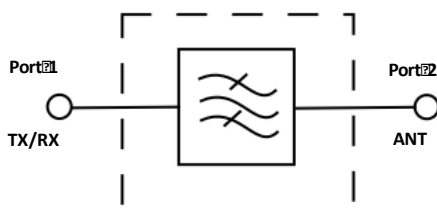
Features

- Small form factor 3mm x 3mm x 1mm
- Single ended Tx/Rx ports.
- High rejection enables coexistence with adjacent 4G LTE & 5G bands
- High power rating, maximum +33 dBm
- Low insertion loss passband filter
- Performance over -40 C to +85C
- RoHS compliant, Pb-free package

Applications

- 5G small cells
- 5G massive MIMO

Functional Block Diagram



Ordering Information

Part Number	Description
AKF-1335EVB	Evaluation board
AKF-1335SP	(5) Loose pcs
AKF-1335SR	(100) Short Reel
AKF-1335TR1	(1000) Tape & Reel
AKF-1335TR2	(2500) Tape & Reel

Absolute Maximum Ratings

Parameter	Rating
Storage Temperature	-40 to 125 °C
Input Power (CW)	+35 dBm

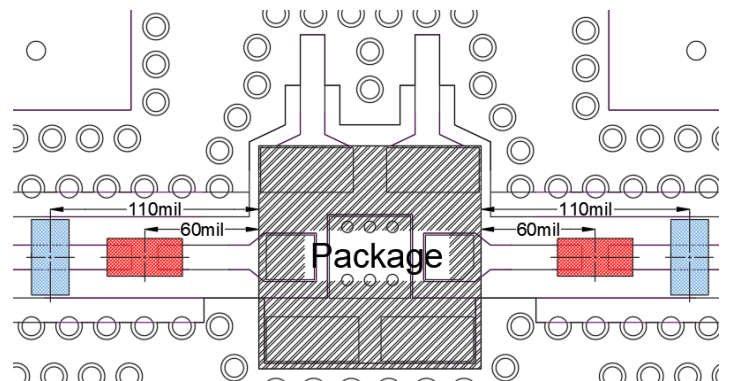
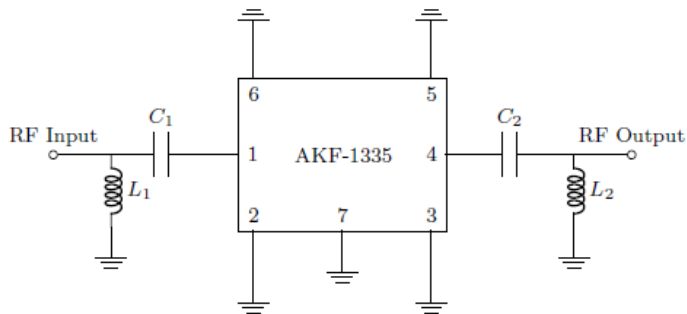
Nominal Operating Parameters

Parameter	Units	Min.	Typ.	Max.
Center Frequency (Fc)	MHz		3550	
Pass bandwidth	MHz		3500 - 3600	
Insertion Loss				
3500 – 3600 MHz	dB		1.7 ⁽¹⁾	TBD
Amplitude Variation				
3500 – 3600 MHz	dB		0.8	TBD
Attenuation				
10 – 2400 MHz	dB	TBD	50	
2400 - 3300 MHz	dB	TBD	45	
3460 - 3480 MHz	dB	TBD	11	
3620 - 3640 MHz	dB	TBD	15	
3640 - 6000 MHz	dB	TBD	25	
6000 - 10000 MHz	dB	TBD	12	
Return Loss				
3500 - 3600MHz		TBD	16 ⁽¹⁾	
Operating Temperature	C	-40		85
Load Impedance	Ohm		50	
Power Handling LTE Config 2, 5 MHz BW, 16 QAM, PAR 8.5dB	dBm			33

Note:

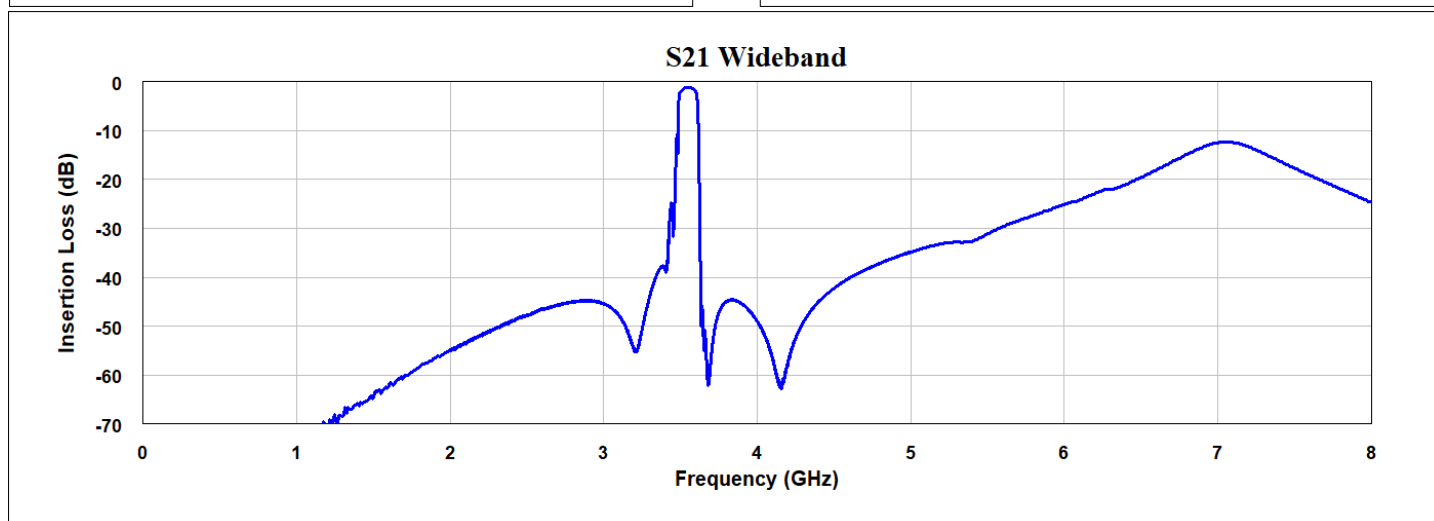
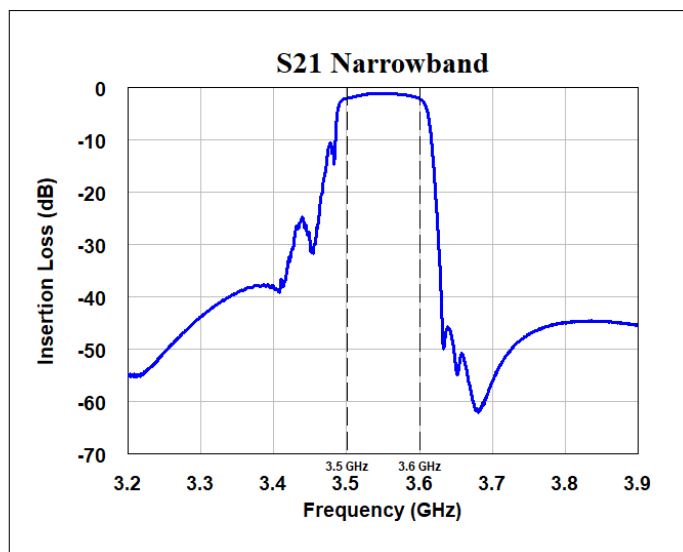
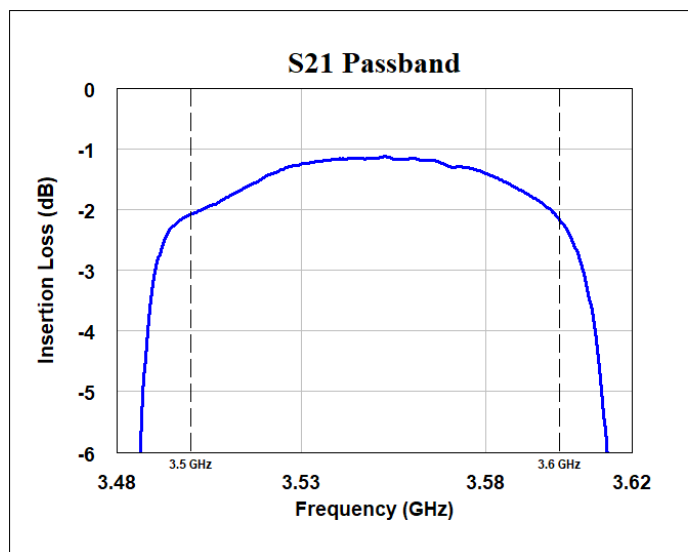
1. S-parameter averaged over specified pass band frequency at room

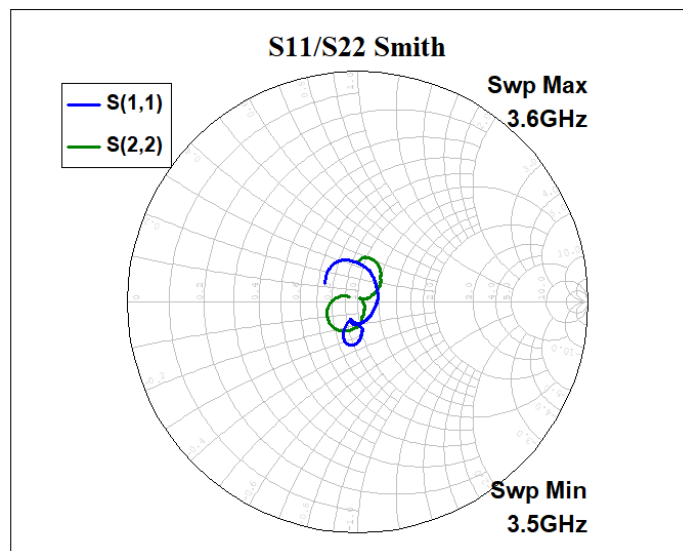
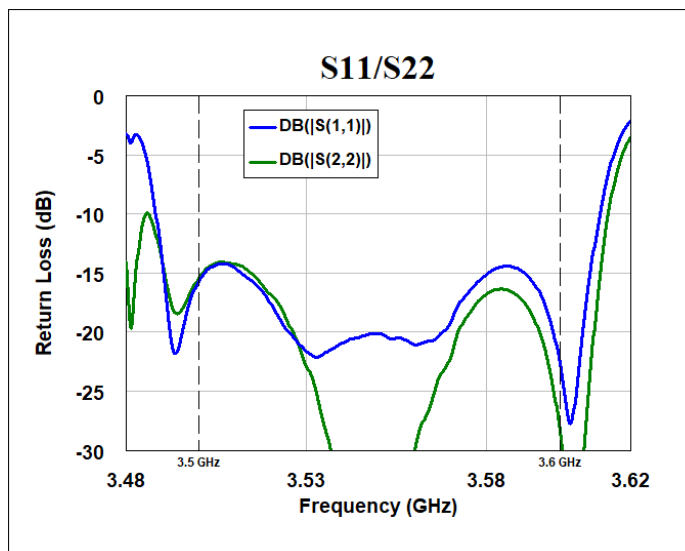
Schematic and EVB Bill of Materials



Reference Des.	Value	Description	Manufacturer	Part Number
PCB	N/A	4 layer	Multiple	
U1	N/A	3.55 GHz BAW Filter	Akoustis	AKF-1335
L1	2.2nH	Chip inductor, 0402, ± 0.1 nH	Murata	LQW15AN2N2B80D
L2	2.2nH	Chip inductor, 0402, ± 0.1 nH	Murata	LQW15AN2N2B80D
C1	1.3pF	Chip capacitor, 0402, ± 0.05 pF	Murata	GJM1555C1H1R3WB01D
C2	1.4pF	Chip capacitor, 0402, ± 0.05 pF	Murata	GJM1555C1H1R4WB01D

Performance Plots

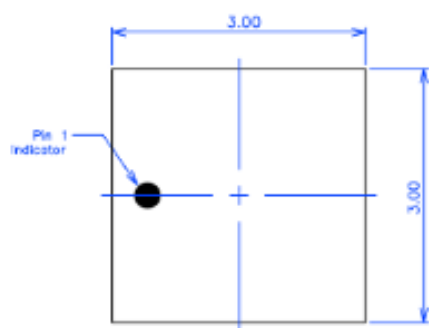




Package Drawing, Pin Description and PCB Mounting

Notes:

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

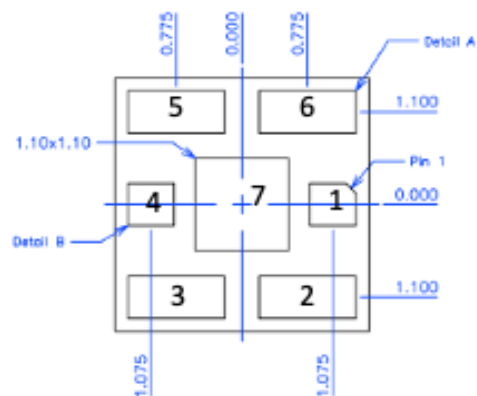


Pin-out:

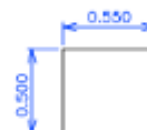
1: Input

2, 3, 5, 6, 7: Ground

4: Output



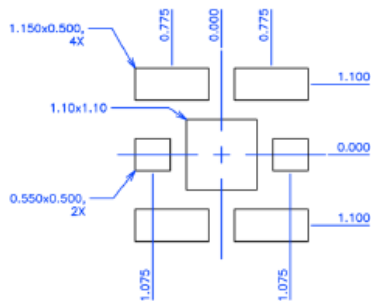
DETAIL A
PAD, 4X
SCALE: 2x



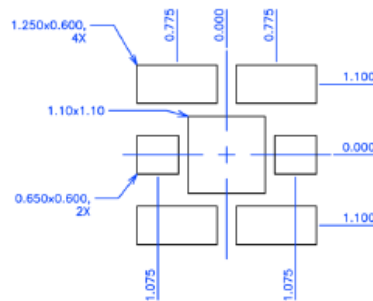
DETAIL B
PAD, 2X
SCALE: 2x
PIN 1 CHAMFER
0.150 X 45°

NOTES:

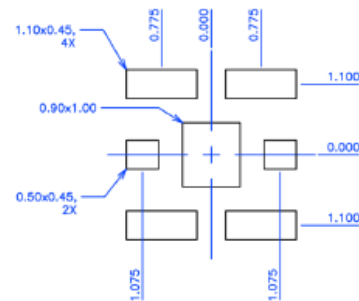
1. Terminal Finish:
Electroless Ni/Electroless Pd/Immersion Au



Recommended PCB
Metal Top View

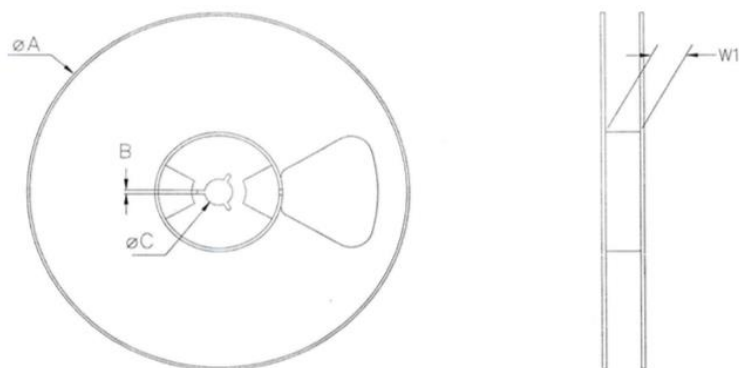


Recommended
Solder Mask Opening
Top View



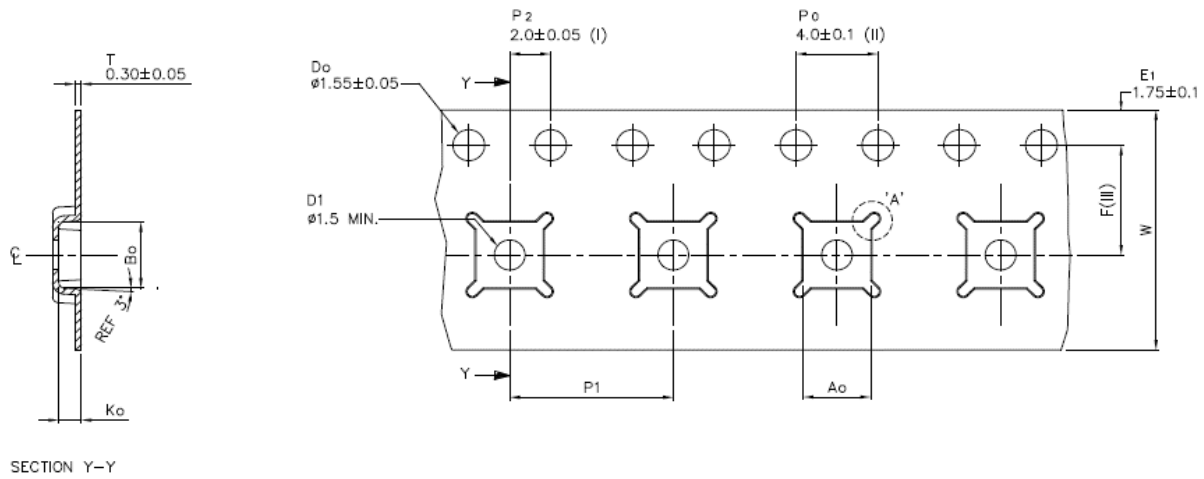
Recommended Stencil
Pattern Top View

Reel Dimension

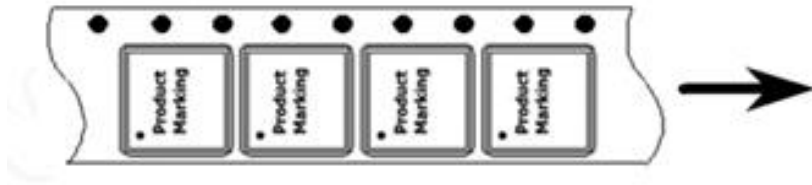


Item	Parameters	Method	Min	Max
1	ø A (180mm + 0 / - 2.0)	Caliper	178.96	179.00
2	B (1.5mm Min)	Caliper	2.33	2.36
3	ø C (13.0mm + 0.5 / - 0.2)	Caliper	13.26	13.29
4	W1 (8.40mm + 1.5 / - 0)	Caliper	9.24	9.27
5	Surface Resistivity (10 ¹¹ Max) ohms / sq	S.R meter	10 ⁹	10 ¹⁰
6	Visual		PASS	

Tape Dimension

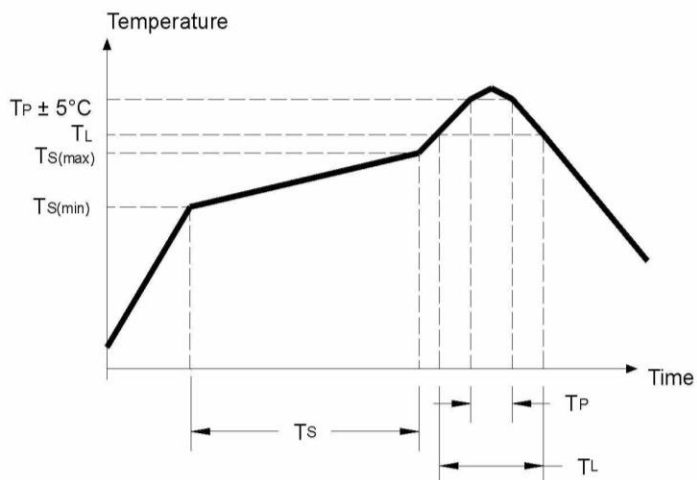


A_0	3.30 ± 0.1
B_0	3.30 ± 0.1
K_0	1.10 ± 0.1
F	5.50 ± 0.05
P_1	8.00 ± 0.1
W	12.00 ± 0.3



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



Product Compliance Information

ESD Sensitivity Ratings

Human Body Model (HBM) Test

Rating: TBD

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

Charged Device Model (CDM)

Rating: TBD

Standard: ANSI/ESDA/JEDEC JS-002-2018

MSL Rating

MSL3

RoHS

This part is compliant with 2011/65EU RoHS directive on the restrictions of the use of certain hazardous substances in electrical and electronics equipment as amended by Directive (EU) 2015/863

Contact Information

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

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