

# 6.5 GHz WiFi 6E Coexistence BAW Filter

# A10165

## Description

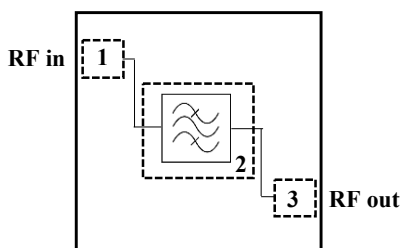
Akoustis’ A10165 is a high performance, ultra-wide bandwidth BAW RF Filter for use in WiFi 6E applications covering U-NII-5 thru U-NII-8 bands. A10165 utilizes Akoustis’ patented, XBAW technology which provides leading RF filter performance. This BAW RF filter provides low insertion loss and meets the 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 WiFi 6E standards. A10165 is a fully integrated, 50 ohm module using standard laminate packaging and is compatible with high volume, lead-free SMT soldering processes.

- Small form factor 3.5mm x 3.5mm x 1.73mm
- Single ended Tx/Rx ports.
- Ultra-wide passband covering 1180MHz
- High rejection enables coexistence with adjacent WiFi UNII bands
- High power rating, maximum +27dBm
- Low insertion loss band pass filter
- Performance over -40 C to +85C
- RoHS compliant, Pb-free package

## Applications

- WiFi 6E tri band routers, integrated cable modem
- WiFi 6E tri band access points
- LTE/LAA small cells

## Functional Block Diagram



Pin #	Description
1	RF Input
2	Ground
3	RF Output

## Ordering Information

Part Number	Description
A10165EVB	Evaluation board
A10165SP	(5) Loose pcs
A10165SR	(100) Short Reel
A10165TR1	(1000) Tape & Reel
A10165TR2	(2500) Tape & Reel

## Absolute Maximum Ratings

Parameter	Rating
Storage Temperature	-40 to 125 °C
Input Power	+29 dBm

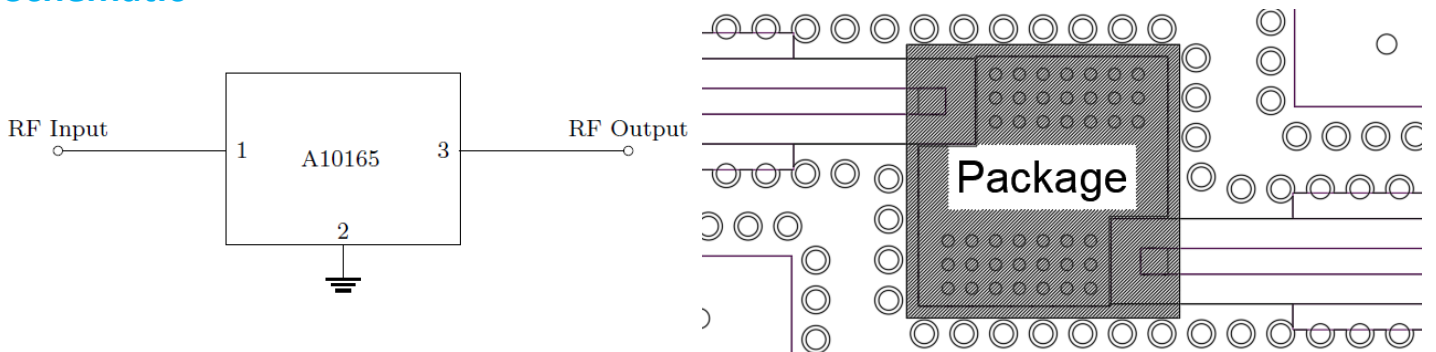
## Nominal Operating Parameters (Simulations)

Parameter	Units	Min.	Typ.	Max.
Center Frequency (Fc)	MHz		6535	
Pass bandwidth	MHz		5945 - 7125	
Insertion Loss				
5945 – 7125 MHz	dB		1.8 <sup>(1)</sup>	3.5
Amplitude Variation				
5945 – 7125 MHz	dB		1.5	1.8
Attenuation				
30 – 1000 MHz	dB	44	45	
1000 - 3300 MHz	dB	21	22	
3300 – 4000 MHz	dB	13	14	
5170 – 5815 MHz	dB	45	46	
5815 – 5835 MHz	dB	43	44	
8500 - 12000 MHz	dB	13	14	
Return Loss				
5945 – 7125 MHz		10	15 <sup>(1)</sup>	
Operating Temperature	C	-40		85
Load Impedance	Ohm		50	
Power Handling: 802.11ax MCS10, 80 MHz BW, PAR 11dB	dBm			27

Note:

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

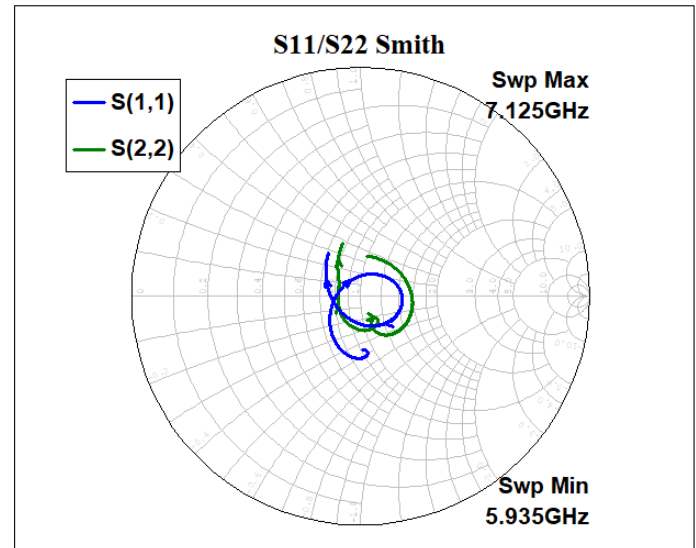
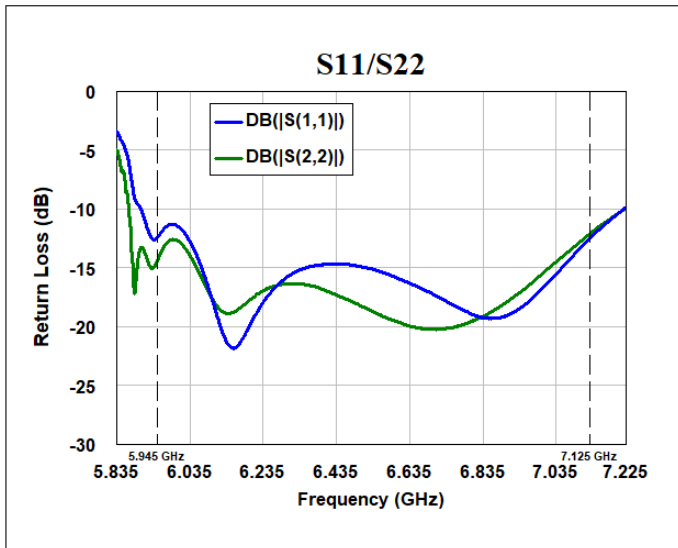
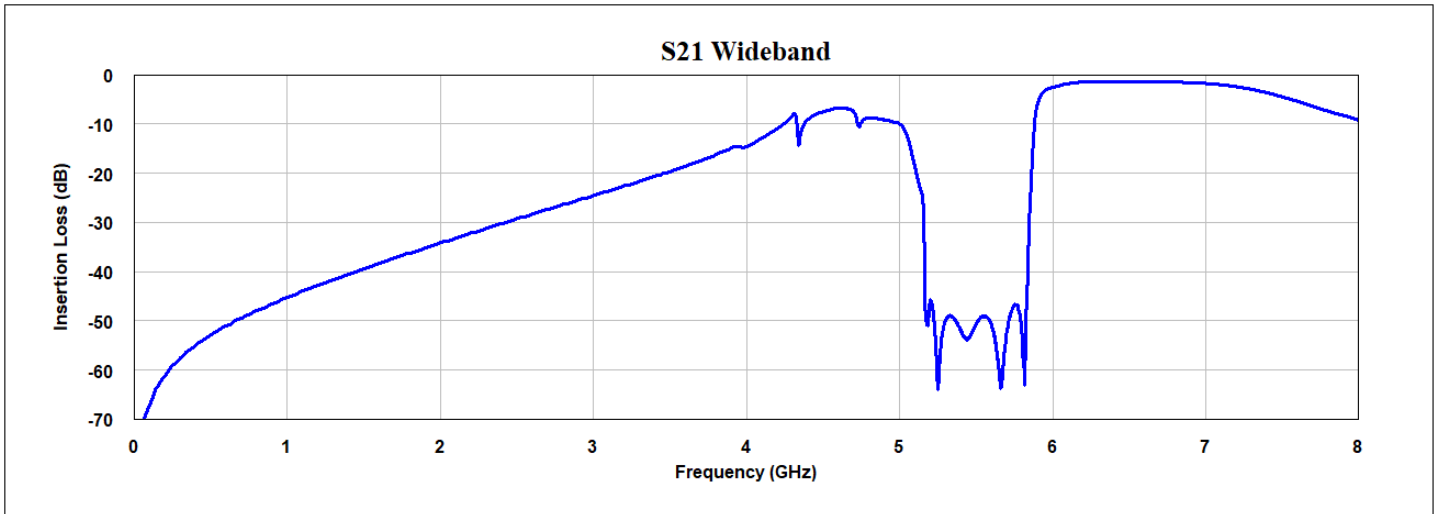
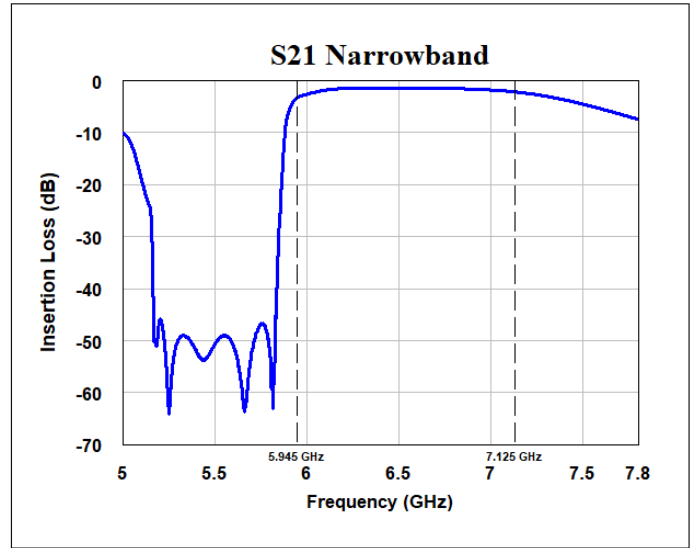
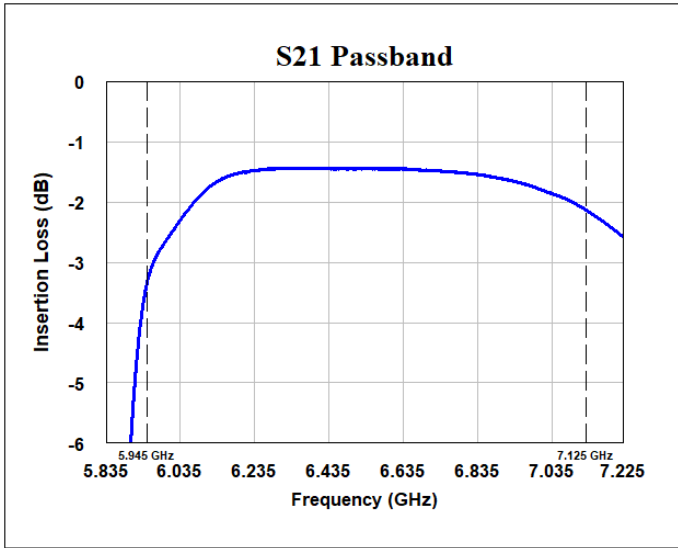
## Schematic



## Bill of Materials

Reference Des.	Value	Description	Manufacturer	Part Number
PCB	N/A	4 layer	Multiple	
U1	N/A	6.53 GHz BAW Filter	Akoustis	A10165

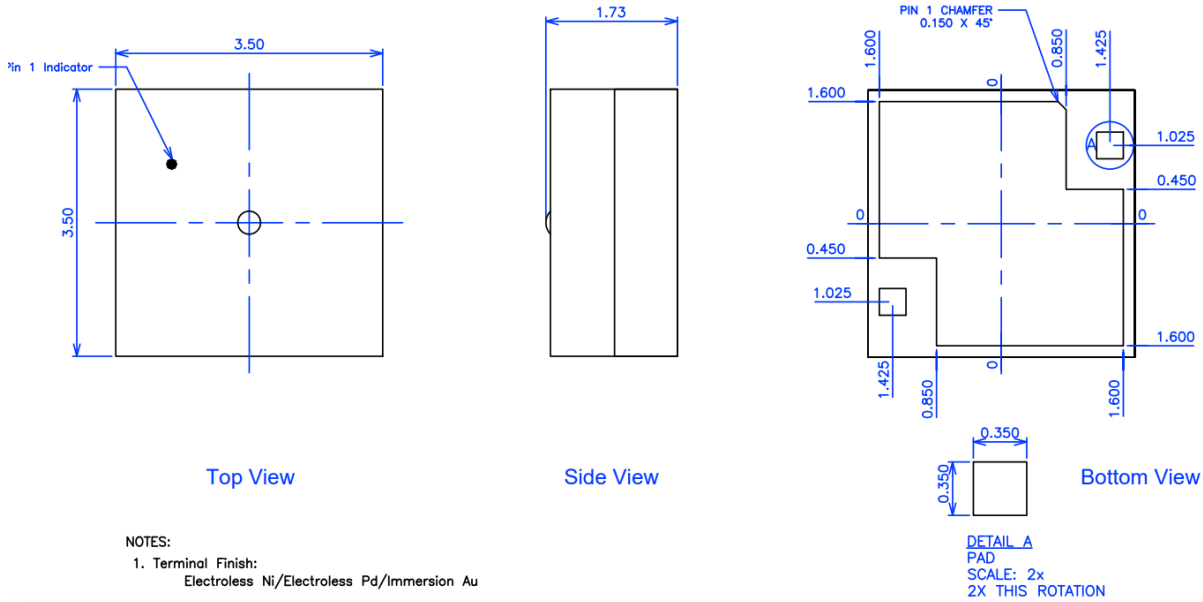
### Performance Plots



# PRELIMINARY A10165

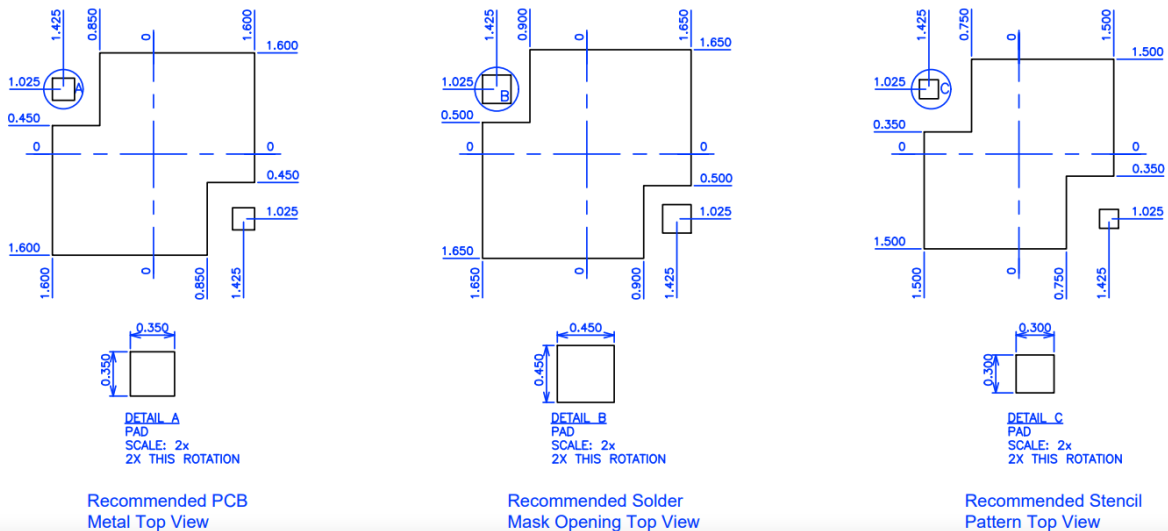
## Package Drawing & Pin Description

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

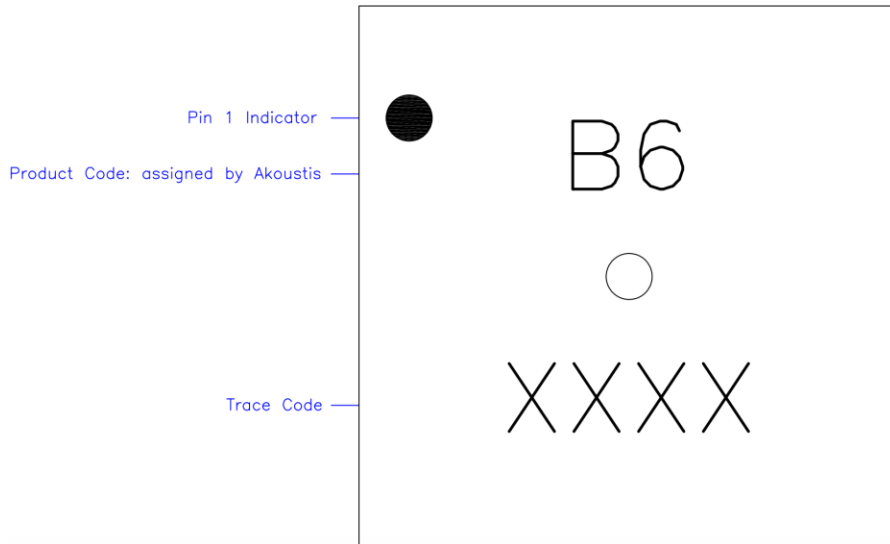


## PCB Mounting Pattern

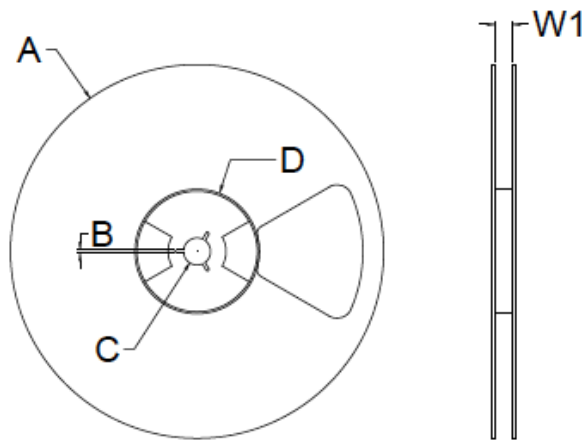
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- All Units are in mm unless otherwise stated
  - General Tolerance:
    - Linear X.XXX =  $\pm 0.050\text{mm}$
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## Typical Part Marking

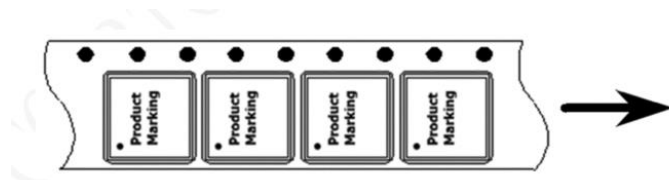
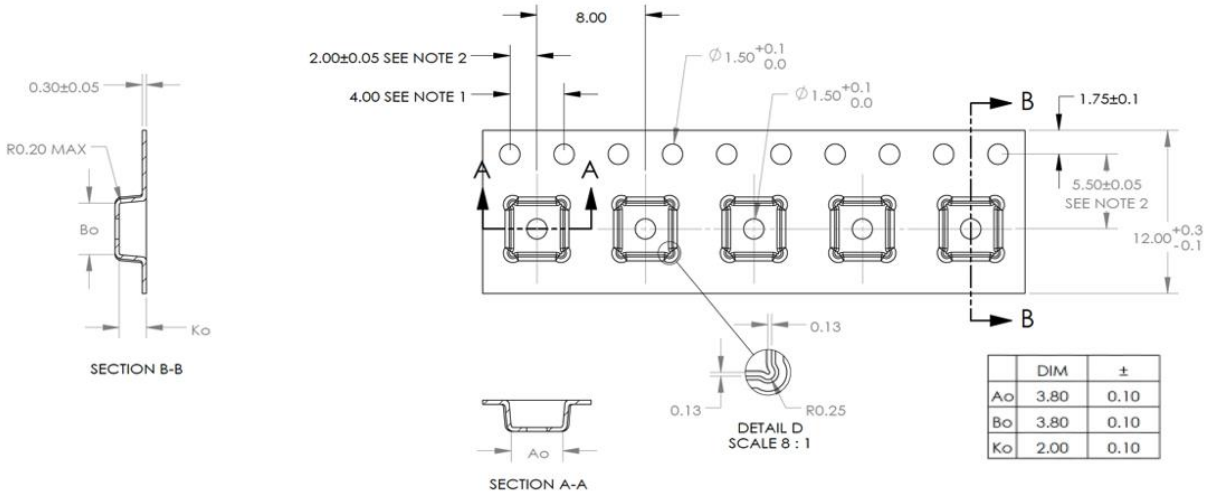


## Reel Dimension For 12mm Tape Width



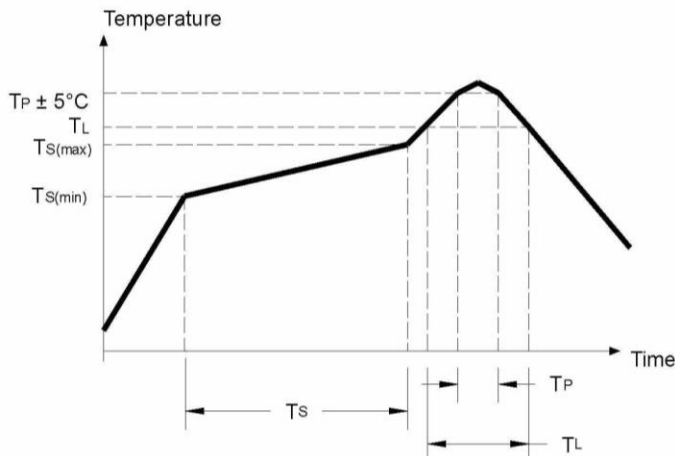
Reel Dimensions					
Tape Width	A	B	C	D	W1 *measured at hub
8 mm	180 +0/-2.0 mm	1.5mm Min	13.0 + 0.5 / -0 mm	60.0 mm	8.40 + 1.5 / -0 mm
12 mm	180 +0/-2.0 mm	1.5mm Min	13.0 + 0.5 / -0 mm	60.0 mm	12.40 + 2.0 / -0 mm
16 mm	180 +0/-2.0 mm	1.5mm Min	13.0 + 0.5 / -0 mm	60.0 mm	16.40 + 2.0 / -0 mm

## Tape Dimension



## 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: TBD

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

Charged Device Model (CDM)

Rating: TBD

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

### MSL Rating

TBD

### 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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