

Mini-Circuits' Surface Mount Thin-Film filters offer low insertion loss and high

rejection realized via Thin-Film on Alumina substrate, using a sputtering process

that can guarantee an enhanced Q and repeatable performance. Low pass, high pass, and bandpass surface mount thin-film designs can be realized with this technology up to 40GHz in a small form factor helping customers achieve their SWaP objectives. Using our high quality thin-film manufacturing process we can

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26.5 to 29.5 GHz

#### **KEY FEATURES**

- Low Mid band Insertion Loss of 1.6 dB Typ.
- High Rejection of 60 dB Typ.
- Good Return Loss of 15 dB Typ.
- Small Size, 3.05 x 11.43 x 2.54 mm

500

#### **APPLICATIONS**

- n257
- 5G Telecommunication

**PRODUCT OVERVIEW** 



**ABF-28G+** 

#### **FUNCTIONAL DIAGRAM**



#### ELECTRICAL SPECIFICATIONS<sup>1,2,3</sup> AT +25°C

guarantee repeatability on large batches of filters.

Parameter		F#	Frequency (GHz)	Min.	Тур.	Max.	Units
Passband	Center Frequency <sup>4</sup>	Fc	28	_	1.6	3.0	
	Insertion Loss	F1-F2	26.5 - 29.5	—	3.5	_	dB
	Return Loss	F1-F2	26.5 - 29.5	—	15	_	
Stopband, Lower	Rejection	DC-F3	DC - 23	30	45	_	٩D
		F3-F4	23 - 24.5	25	45	_	uв
Stopband ,Upper	Rejection	F5-F6	31.5 - 32.5	25	55	_	
		F6-F7	32.5 - 36	40	60	_	dB
		F7-F8	36 - 40	_	40	_	

1. Tested on Evaluation Board P/N TB-ABF-28G+.

2. This filter is bi-directional RF1 and RF2 ports may be interchanged, see S-Parameters for actual performance.

3. This component is not intended for use as a DC-blocking circuit element. In applications where DC voltage and/or current is present at either the input or output ports, external DC blocking capacitors are required.

4. Typical variation ±3%.

#### **ABSOLUTE MAXIMUM RATINGS<sup>5</sup>**

Parameter	Ratings
Operating Temperature	-55 °C to +125 °C
Storage Temperature	-55 °C to +125 °C
Input Power <sup>6</sup>	1W Max. at 25°C

5. Permanent damage may occur if any of these limits are exceeded.

6. Power rating applies only to signals within the passband.

#### **TYPICAL FREQUENCY RESPONSE AT +25°C**







### THIN FILM SURFACE MOUNT

### **Bandpass Filter**



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#### **TYPICAL PERFORMANCE GRAPHS AT +25°C**











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#### **FUNCTIONAL DIAGRAM**

50Ω



Figure 1. ABF-28G+ Functional Diagram

#### **PAD DESCRIPTION**

Function	Pad Number	Description
RF1 <sup>2</sup>	1	Connects to RF Input Port
RF2 <sup>2</sup>	2	Connects to RF Output Port
GROUND	3	Connects to Ground on PCB, (See drawing PL-713)
NC	_	No connection, not used internally. See drawing PL-713 for connection to PCB

#### SUGGESTED PCB LAYOUT (PL-713)



Figure 2. Suggested PCB Layout PL-713

#### **CASE STYLE DRAWING**



#### PRODUCT MARKING\*: ABF-28G

\*Marking may contain other features or characters for internal lot control.



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#### **RECOMMENDED PCB LAYOUT PATTERN FOR FILTER**



**PCB Pattern Recommendations** 



- 1) Customer PCB's ground pattern length (dimension A) can be similar to filter length.
- 2) Customer PCB's ground pattern width (dimension B) can be similar to filter width.
- 3) Dimensions C and D on Filter RF I/O detail and Customer PCB pattern can be closely match. The dimensions of C and D on the Customer PCB pattern can be slightly larger to account for component alignment tolerance (ground metal can be pulled back from RF I/O trace).
- 4) Recommend to use solder mask at Customer PCB at outer area of filter pattern/footprint without any clearance.
- 5) Recommended to use Solder mask at I/O of Customer PCB with 5 mil clearance from filter I/O edge (dimension E)

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#### COMMENTS ON COMPONENT HANDLING AND SOLDER ATTACH

- 1) Avoid using soldering iron directly to the ceramic filter. This would lead to development of crack in the component due to thermal shock.
- 2) Vacuum pick-up tool or plastic tweezers are recommended for handling the components. Extra care should be taken not to scratch the filter or metal area.
- 3) Use 2-3 mil thickness stencil plate and screen print the solder. Refer below picture for recommended stencil pattern to get the best solder attachment.



- 4) Plugged ground vias in the PWB will improve attachment consistency.
- 5) Recommended to have a similar or closer test board material and thickness (refer Mini-Circuits evaluation board for details) to minimize the CTE over the temperature range.





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#### ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASH BOARD.

**CLICK HERE** 

	Data		
Performance Data and Graphs	Graphs		
	S-Parameter (S2P Files) Data Set (.zip file) De-embedded to device pads		
Case Style	VG3044 Lead Finish: Gold over Nickel Plate		
RoHS Status	Compliant		
Tape and Reel	TR-F004		
Suggested Layout for PCB Design	PL-713		
Evaluation Poord	TB-ABF-28G+		
	Gerber File		
Environmental Rating	ENV120		

NOTES

A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.

B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuits' applicable established test performance criteria and measurement instructions.

C. The parts covered by this specification document are subject to Mini-Circuits' standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/terms/viewterm.html

