## HFCN-672AT+

#### THE BIG DEAL

- Small size (0.12 x 0.06 X .04")
- Temperature stable
- Excellent power handling, 7W
- · Hermetically sealed
- Low cost
- LTCC construction
- Protected by US Patent 7,760,485
- AEC-Q200 qualified component family



Generic photo used for illustration purposes only

CASE STYLE: FV1206-1

## +RoHS Compliant

The +Suffix identifies RoHS Compliance. See our website for methodologies and qualifications

## **APPLICATIONS**

Automotive

## **PRODUCT OVERVIEW**

The HFCN-672AT+ is an LTCC high pass filter with a wide passband from the 6700 to 13000 MHz. This model provides 2.0 dB passband insertion loss and 27 dB stopband rejection, and is capable of handling up to 7W RF input power. Utilizing LTCC multi-layer construction, the filter achieves excellent repeatability of performance and comes in a tiny 1206 ceramic package with wraparound terminations, minimizing performance variations due to parasitics and saving space in dense PCB layouts. The unit has an operating temperature range from -40 to +105°C, and its rugged, ceramic construction provides makes it an excellent candidate for harsh operating environments.

#### **KEY FEATURES**

Feature	Advantages
LTCC Construction	Provides repeatable performance in a rugged, ceramic package well suited for tough environments such as high humidity and temperature extremes.
Tiny size (0.12 x 0.06 x .04")	Saves space in dense circuit board layouts and minimizes the effects of parasitics.
Wrap-around terminations	Provides excellent solderability and easy visual inspection
Wide operating temperature range, -40 to +105°C	Enables reliable performance in extreme environments

REV. OR NPO-005308 HFCN-672AT+ MCL NY 250606



# **CERAMIC** ligh Pass Filter

## HFCN-672AT+

50Ω 6700 to 13000 MHz

## **ELECTRICAL SPECIFICATIONS 1,2 AT +25°C**

	Parameter		Frequency (MHz)	Min.	Тур.	Max.	Units
Stop Band	Dejection Loss	DC-F1	DC-4435	27	32	_	٩D
	Rejection Loss	F1-F2	4435-5500	16	27	_	dB
	Freq. Cut-Off	F3	6275	_	3.0	_	dB
	VSWR	DC-F2	DC-5500	_	30	_	:1
	Insertion Loss³	F4-F7	6700-13000	_	2.0	4.0	dB
Pass Band		F5-F6	6900-12770	_	2.0	3.5	dB
	VSWR	F4-F7	6700-13000	_	1.9	_	:1

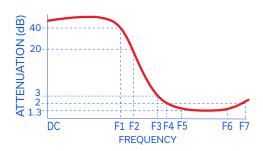
In Application where DC voltage is present at either input or output ports, coupling capacitors are required.
 Electrical performance measured on TB-270 using HFCN-672+.

## **ABSOLUTE MAXIMUM RATINGS**

Parameter	Ratings
Operating Temperature	-40°C to +105°C
Storage Temperature	-40°C to +105°C
RF Power Input⁴	7 W max. at +25°C

<sup>4.</sup> Passband rating, derate linearly to 3 W at +105°C ambient. Permanent damage may occur if any of these limits are exceeded.

## **TYPICAL FREQUENCY RESPONSE**



## **FUNCTIONAL SCHEMATIC**

<sup>3.</sup> Referenced to mid-band insertion loss, 0.5 dB typ.



# **CERAMIC** igh Pass Filter

HFCN-672AT+

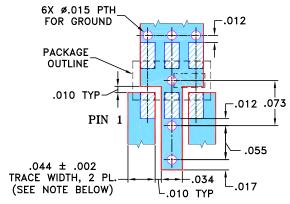
6700 to 13000 MHz 50Ω

### **PIN CONNECTIONS**

RF IN	1
RF OUT	3
GROUND	2,4,5,6

**PRODUCT MARKING: XP** 

## **DEMO BOARD MCL P/N: TB-285+ SUGGESTED PCB LAYOUT (PL-158)**



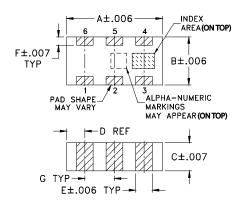
NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350 WITH DIELECTRIC THICKNESS: .020 ± .0015; COPPER: 1/2 OZ. EACH SIDE.
FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.

2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

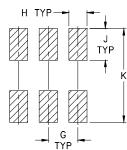
DENOTES PCB COPPER LAYOUT

DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

### **OUTLINE DRAWING**



#### **PCB Land Pattern**



Suggested Layout, Tolerance to be within ±.002

## OUTLINE DIMENSIONS (Inches)

F	E	D	С	В	Α
.011	.022	.024	.035	.063	.126
0.28	0.56	0.61	0.89	1.60	3.20
wt		K	J	н	G
VVL			-	• • •	-
grams		.123	.042	.024	.039
.020		3 12	1.07	0.61	0.99
.020		0.12	1.07	0.01	0.55

**TAPE & REEL INFORMATION: F75** 



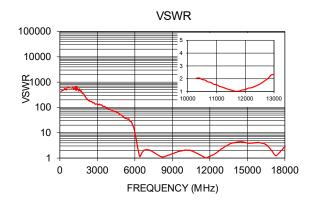
# High Pass Filter

## HFCN-672AT+

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

Frequency (MHz)	Insertion Loss (dB)	VSWR :1
100	56.76	435.00
500	42.89	487.79
1000	37.15	591.02
2700	31.94	156.03
3000	32.72	134.81
4400	35.68	69.56
5500	29.76	35.88
6000	11.10	10.02
6700	2.14	1.97
7550	1.41	1.65
9100	1.07	1.53
9700	1.11	1.89
11500	0.43	1.13
13000	1.76	2.36
15000	4.35	3.90
16500	2.73	3.34
17000	1.77	1.81
17100	1.77	1.52





#### NOTES

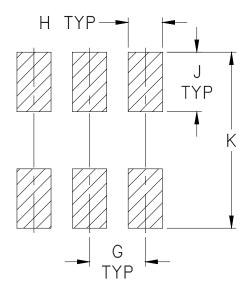
- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's 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

FV1206-1

## **Outline Dimensions**

## $A \pm .006$ INDEX AREA (ON TOP) F±.007 B±.006 TYP PAD SHAPE ALPHA-NUMERIC MAY VARY MARKINGS MAY APPEAR (ON TOP) -D REF C±.007 G TYP→ F±.006

## **PCB Land Pattern**



Suggested Layout, Tolerance to be within  $\pm .002$ 

CASE #	A	В	С	D	Е	F	G	Н	J	K	L	M	N	P	WT. GRAM
FV1206-1	.126 (3.20)	.063 (1.60)	.035 (0.89)	.024 (0.61)	.022 (0.56)	.011 (0.28)	.039 (0.99)	.024 (0.61)	.042 (1.07)	.123 (3.12)	1 1	1 1			.020

Dimensions are in inches (mm). Tolerances: 2 Pl. + .01; 3 Pl. + .005

### **Notes:**

- 1. Open style, ceramic base.
- 2. Termination finish: as shown below or indicated on Data Sheet.

For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.

For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.





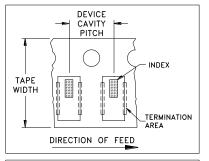
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

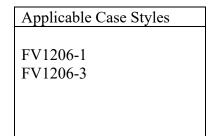
RF/IF MICROWAVE COMPONENTS

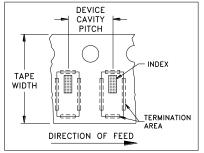
# Tape & Reel Packaging

## TR-F75

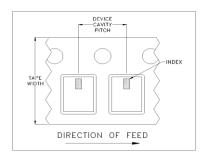
## DEVICE ORIENTATION IN T&R







Applicable Case Styles
FV1206-4
FV1206-5
FV1206-6
FV1206-7
FV1206-9



Applicable Case Styles
FV1206-11
FV1206-12
GE0805C-18
NL1008C-6
NL1008C-7
NL1008C-9
NL1008C-10

## **ILLUSTRATION 3**

ILLUSTRATION 1

**ILLUSTRATION 2** 

Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices 1	er Reel
8	4	7	Small quantity standards (see note)	20 50 100 200 500 1000
			Standard	3000

Note: Please consult individual model data sheet to determine device per reel availability.

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf



INTERNET http://www.minicircuits.com

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

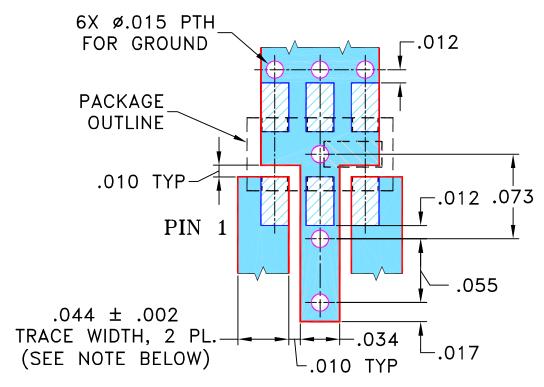
Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010

Mini-Circuits ISO 9001 & ISO 14001 Certified

THIRD AN	IGLE PROJECTION	
(h)		

		REVISIONS			
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M92199	NEW RELEASE	05/24/04	AV	ABD
A	M99247	ADD GROUND PTH	06/05	RZ	RZ
A	R60782	ADD GROUND PTH	06/05	RZ	RZ
В	M102713	ADDED "WITH SMOBC"	01/12/06	GF	IL

# SUGGESTED MOUNTING CONFIGURATION FOR FV1206-1 CASE STYLE, "pr" PIN CONNECTION.



NOTE: 1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .020" ± .0015". COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.

2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.



DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)



DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

UNLESS OTHERWISE SPECIFIED	D INITIALS		DATE								
DIMENSIONS ARE IN INCHES	DRAWN	AV	05/03/04	Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235							
TOLERANCES ON: 2 PL DECIMALS ± 3 PL DECIMALS ± 4 NOLES ± FRACTIONS ±	CHECKED	IL	05/24/04		Brooklyn NI 11235						
	APPROVED	ABD	05/24/04	]	PL, pr, FV1206-1, HFCN, TB-285						
				] PI							
∏ Mini-		, ,									
THIS DOCUMENT AND ITS CONTENTS ARE THE PROPERTY OF MINI-CIRCUITS.  EXCEPT FOR USE EXPRESSLY GRANTED, IN WRITING, TO ITS VENDORS, VENDEE  AND THE UNITED STATES GOVERNMENT, MINI-CIRCUITS RESERVES ALL PROPRIETARY  DESIGN, USE, MANUFACTURING AND REPRODUCTION RIGHTS THERETO.  THESE CONTENTS SHALL NOT BE USED, DUPLICATED OR DISCLOSED TO ANY OUTSIDE  PARTY, IN WHOLE OR IN PART, WITHOUT WRITTEN PERMISSION OF MINI-CIRCUITS.  ASHEETA1.DWG REV:A DATE:01/12/95				SIZE A	code ident 15542	DRAWING NO: 98-PL-158			REV:		
				FILE:	98PL158	SCALE:	12:1	SHEET:	1	OF 1	