

Ceramic High Pass Filter

50Ω 1900 to 2700 MHz

Maximum Ratings

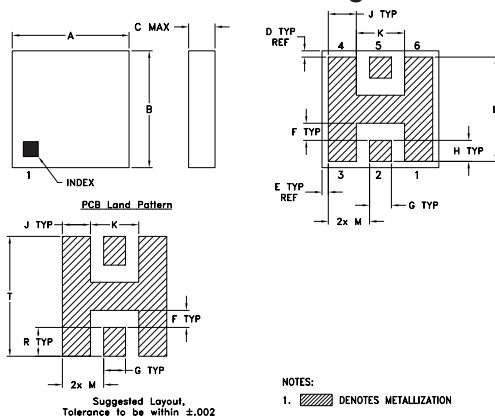
Operating Temperature	-55°C to 100°C
Storage Temperature	-55°C to 125°C
Permanent damage may occur if any of these limits are exceeded.	

Pin Connections

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

Product Marking: HF2

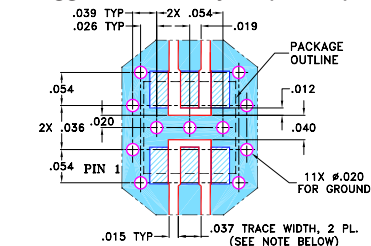
Outline Drawing



Outline Dimensions (inch/mm)

A	B	C	D	E	F	G	H
.150	.150	.034	.008	.008	.022	.028	.027
3.81	3.81	0.864	0.203	0.203	0.559	0.711	0.686
J	K	L	M	R	T	wt	
.036	.062	.134	.053	.037	.154	grams	
0.914	1.575	3.404	1.346	0.940	3.912	0.15	

Demo Board MCL P/N: TB-233 Suggested PCB Layout (PL-112)



Notes

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- 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/MCLStore/terms.jsp

Features

- miniature size, 0.15"X0.15"X0.034"
- low profile, 0.034" height
- low pass-band insertion loss, 1.0 dB typ.
- excellent input power handling, 14W
- hermetically sealed

Applications

- sub-harmonic rejection
- transmitters/receivers
- dc blocking

HFTC-16+



Generic photo used for illustration purposes only

CASE STYLE: FR933

+RoHS Compliant

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

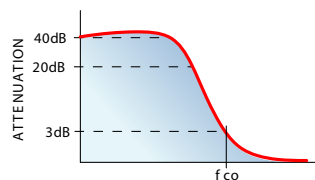
Reel Size	Devices/Reel
7"	20, 50, 100, 200, 500, 1000
13"	2000, 3000, 4000

Electrical Specifications (T_{AMB}=25°C)

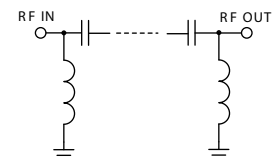
STOP BAND (MHz)	f _{co} , MHz Nom.	PASSBAND (MHz)	VSWR (:1)	POWER INPUT* (W)	MARKING	NO. OF SECTIONS
(loss > 40 dB) (loss > 20 dB)	(loss 3 dB) Typ.	(loss < 1.3 dB)	Stopband Passband Typ. Typ.			
DC-1030 1300	1580	1900-2700	18 1.3	14	HF2	7

* Derate linearly to 6W at 100°C ambient.

typical frequency response

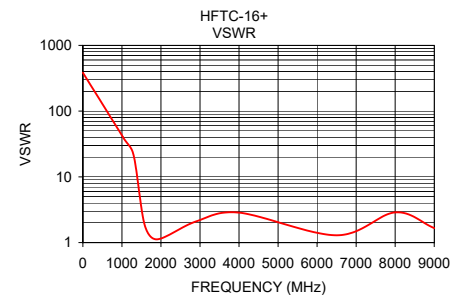
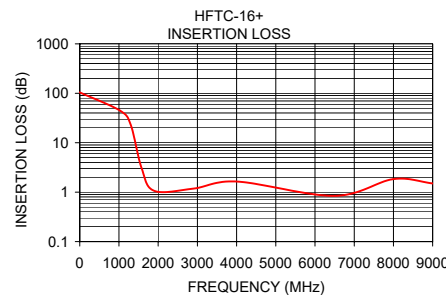


electrical schematic



Typical Performance Data at 25°C

Frequency (MHz)	Insertion Loss (dB)	VSWR (:1)
1.00	104.25	384.41
1030.00	44.43	40.06
1300.00	23.10	21.36
1580.00	3.03	1.89
1900.00	1.06	1.12
2900.00	1.18	2.10
4000.00	1.64	2.86
6500.00	0.84	1.29
8000.00	1.84	2.88
9000.00	1.50	1.66



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REV. P
ECO-006050
HFTC-16+
EDB-020517
AD/YB/CP/AM
210216

Ceramic High Pass Filter

HFTC-16+

Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS @ +25° C (dB)	INPUT RETURN LOSS @ +25° C (dB)	OUTPUT RETURNLOSS @ +25° C (dB)
1	104.25	0.05	0.05
50	85.22	0.15	0.10
100	86.84	0.18	0.13
245	77.69	0.24	0.19
470	69.64	0.30	0.26
690	59.77	0.36	0.32
890	49.73	0.45	0.38
1030	41.53	0.54	0.45
1135	34.68	0.60	0.52
1210	29.55	0.69	0.60
1275	24.84	0.81	0.71
1300	23.00	0.87	0.76
1345	19.55	1.01	0.90
1410	14.41	1.45	1.30
1470	9.66	2.42	2.19
1545	4.69	6.01	5.43
1580	3.23	9.62	8.46
1590	2.92	11.00	9.55
1810	1.28	21.27	22.07
1900	1.11	26.75	33.42
1985	1.01	24.56	26.75
2000	1.00	23.67	25.33
2300	0.81	21.96	21.80
2500	0.72	30.59	26.44
2700	0.79	15.59	15.41
2850	0.96	11.61	11.48
3000	1.19	9.23	9.14
3500	1.91	5.99	5.95
4000	2.12	5.46	5.53
5000	1.30	8.93	8.99
6000	0.75	21.51	21.69
7000	1.93	6.80	6.63
7880	3.12	4.26	4.13
8500	3.23	4.10	4.05
9000	2.42	6.38	6.44
9790	14.82	1.77	1.78
10000	26.62	1.24	1.24
10290	37.02	1.29	1.23
10480	18.83	1.92	1.79
10620	10.21	3.81	3.53
12000	4.18	3.49	3.25

REV. X1

HFTC-16+

071007

Page 1 of 1



IF/RF MICROWAVE COMPONENTS • ISO 9001 ISO 14001 AS9100 CERTIFIED • RoHS compliant

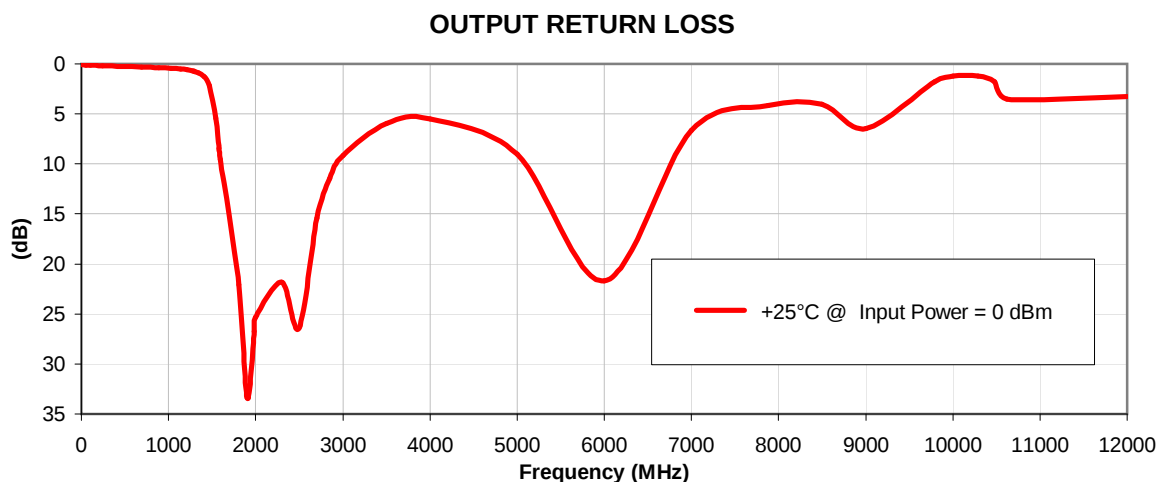
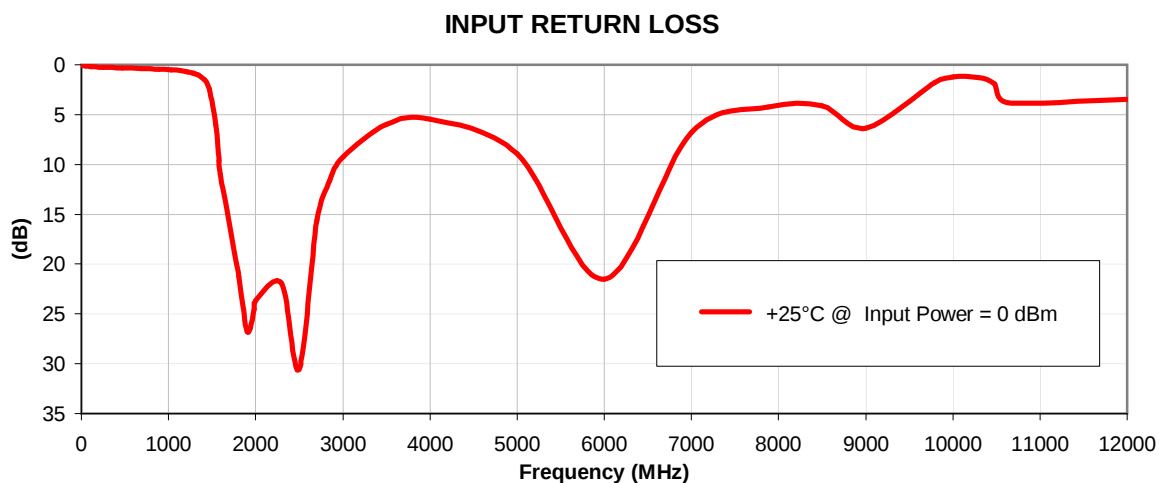
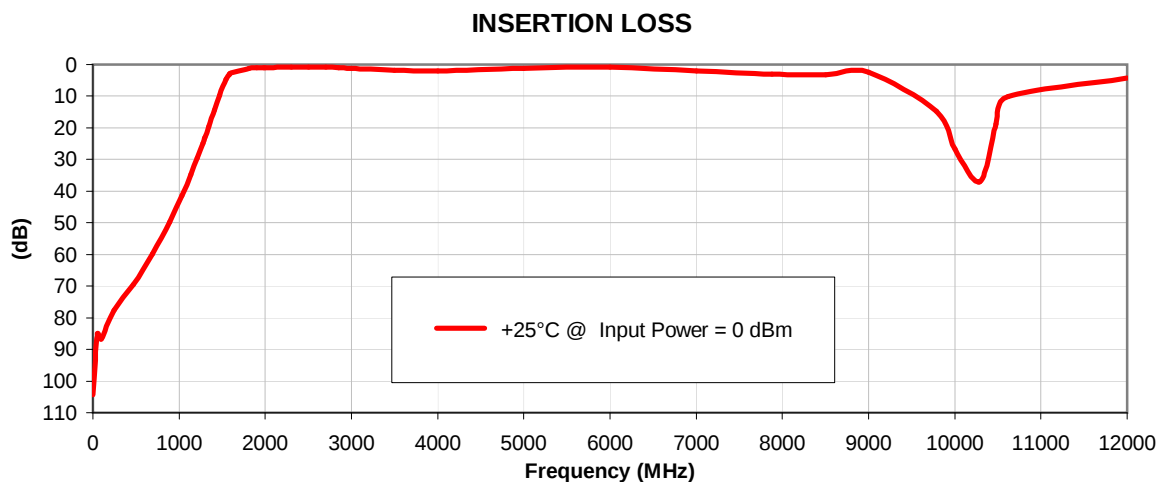
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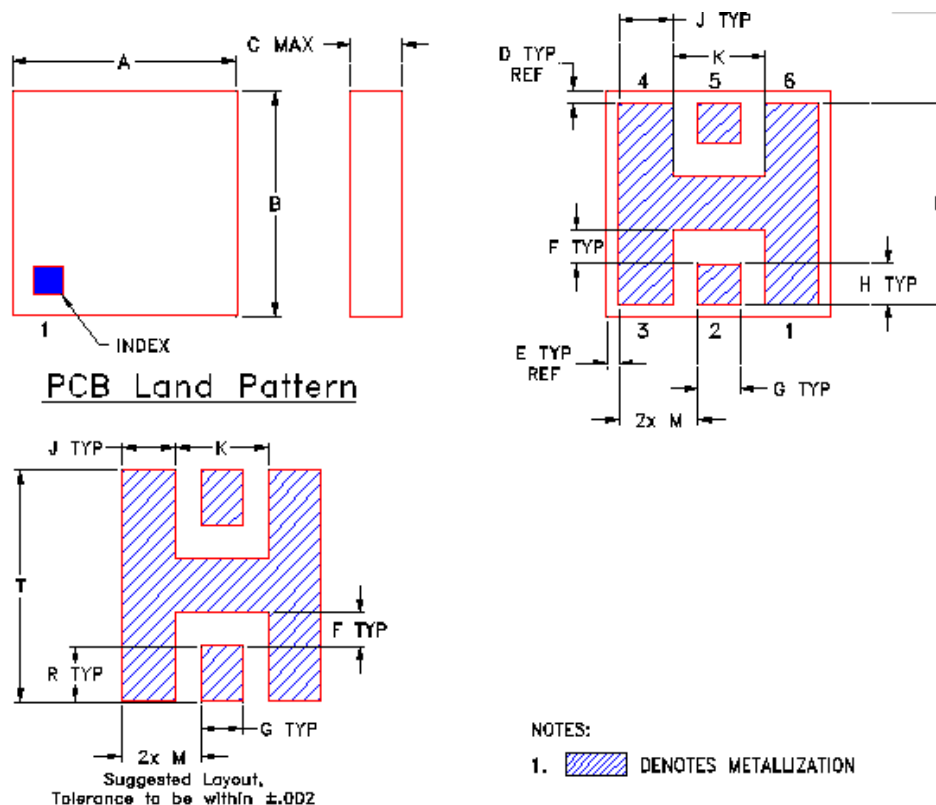
The Design Engineers Search Engine finds the model you need, Instantly • For detailed performance specs & shopping online see



Typical Performance Curves



Outline Dimensions



CASE #	A	B	C	D	E	F	G	H	J	K	L	M	R
FR933	.150 (3.81)	.150 (3.81)	.034 (.864)	.008 (.203)	.008 (.203)	.022 (.559)	.028 (.711)	.027 (.686)	.036 (.914)	.062 (1.575)	.134 (3.404)	.053 (1.346)	.037 (.940)

CASE #	T	WT. GRAM
FR933	.154 (3.912)	0.15

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

Notes:

1. Open style, Ceramic Base.
2. Termination finish: Palladium Silver.



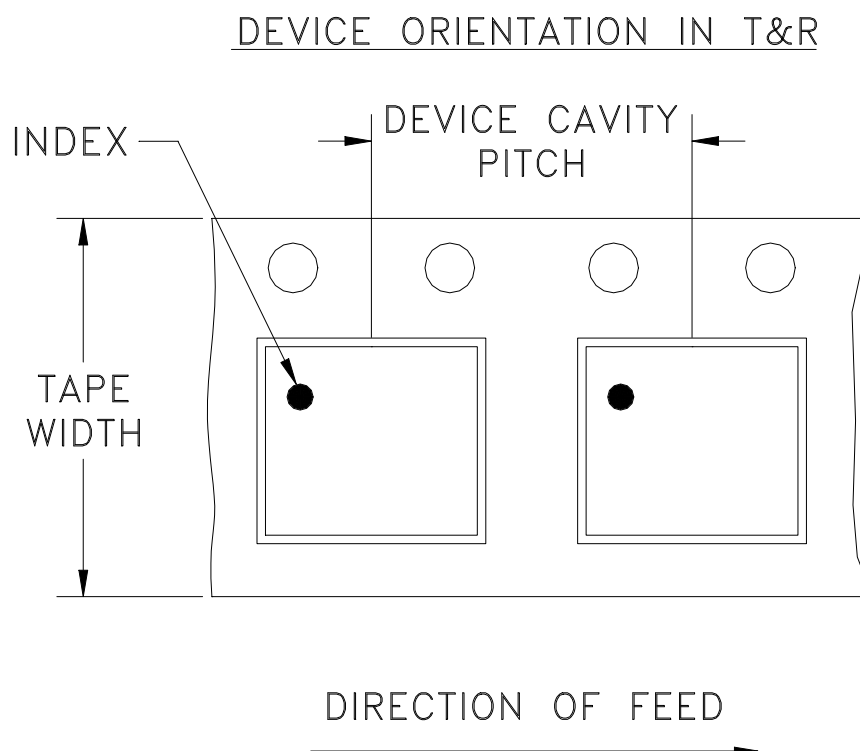
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Tape & Reel Packaging TR-F68



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel see note	
12	8	7	Small quantity standard	20
				50
				100
				200
				500
		7	Standard	1000
		13	Standard	2000
				3000
				4000

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.

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REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M83007	NEW RELEASE	09/04/02	MMG	LER
A	M83501	CNG LAYOUT AS PER B14-TB-233	10/01/02	MMG	ABD
B	M102713	ADDED "...WITH SMOBC"	01/14/06	GF	IL
C	M164713	ADDED "933-1 & 06FL03"	11/15/17	CA	IL

Figure 1 is a top view of the package showing dimensions and features. The package is octagonal with a central rectangular area. Dimensions include: .039 TYP, .026 TYP, 2X .054, .019, .054, .012, .040, 2X .036, .020, .054 PIN 1, .015 TYP, .037 TRACE WIDTH, 2 PL. (SEE NOTE BELOW), 11X ϕ .020 FOR GROUND, and PACKAGE OUTLINE.

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

 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

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Brooklyn NY 11235

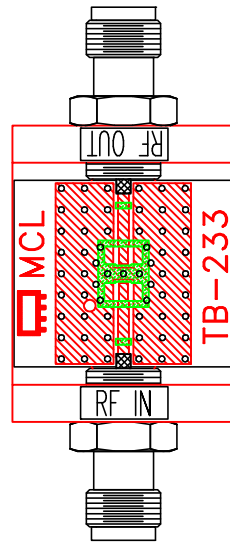
PL, 06FL03, FR932/933/933-1, TB-233

SIZE A	CODE IDENT 15542	DRAWING NO: 98-PL-112		REV: C
FILE: 98PL112		SCALE: 10:1	SHEET: 1 OF 1	

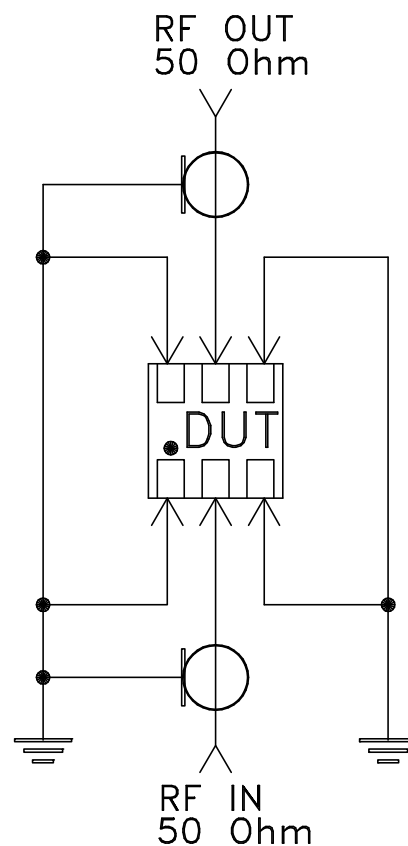
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ASHEETA1.DWG REV:A DATE:01/12/95

Evaluation Board and Circuit



TB-233



Schematic Diagram

Notes:

1. SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,
Dielectric Constant=3.5, Thickness=.020 inch.

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All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	-55° to 100°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 125° C Ambient Environment	Individual Model Data Sheet
Humidity	90 to 95% RH, 240 hours, 50°C	MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutetic Process: 225°C peak Pb-Free Process 245° - 250°C peak	J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1
Solderability	10X Magnification	J-STD-002, Para 4.2.5, Test S, 95% Coverage
Vibration (High Frequency)	20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36)	MIL-STD-202, Method 204, Condition D
Mechanical Shock	50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes	MIL-STD-202, Method 213, Condition A