

New Product Announcement!

Ceramic

Dual Low Pass Filter

DLFCV-1000+

50Ω DC to 1000 MHz



CASE STYLE: JV1210C-1

The Big Deal

- Low insertion loss
- Fast roll off
- Small size
- Dual filter in 1210 package

Product Overview

DLFCV-1000+ is a dual low pass filter which can also operate as a balanced input /output low pass filter in LTCC package. This filter has faster roll and offers low insertion loss, low VSWR and high power handling.

Key Features

Feature	Advantages
Faster roll off	DLFCV-1000+ is a dual low pass filter in LTCC package with 7 sections hence the roll off is faster.
Power handling	Each filter can handle 8.5W power.
Dual filter	Dual Filter in 1210 package, LTCC construction.

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/MCLStore/terms.jsp



50Ω DC to 1000 MHz

Maximum Ratings

Operating Temperature	-40° to 85°C
Storage Temperature	-55°C to 100°C
RF Power Input*	8.5W Max. at 25°C

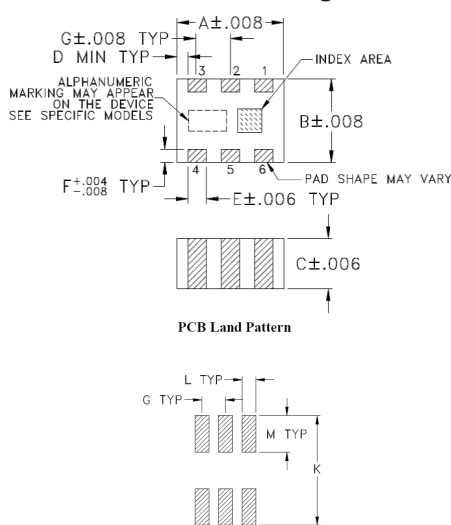
* Passband rating, derate linearly to 3.5W at 100°C ambient. Permanent damage may occur if any of these limits are exceeded.

Pin Connections

RF IN1, RF IN2	1, 6
RF OUT1, RF OUT2	3, 4
GROUND	2, 5

Product Marking: HB

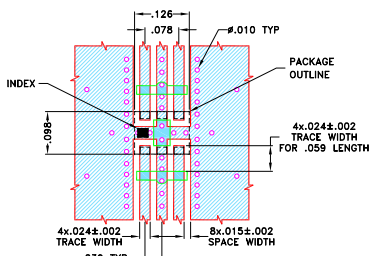
Outline Drawing



Outline Dimensions (inch/mm)

A	B	C	D	E	F	G
.126	.098	.059	.004	.022	.016	.039
3.2	2.5	1.50	.1	.56	.4	1.0
H	J	K	L	M	WT.GRAMS	
-	-	.177	.024	.059	.03	
-	-	4.5	.6	1.5		

Demo Board MCL P/N: TB-867+
Suggested PCB Layout (PL-483)



NOTES:

1. TRACE WIDTH IS GIVEN FOR ROGERS (RO4350B) WITH DIELECTRIC THICKNESS
 $0.100 \pm .001$ ". 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 LAYER PATTERN FREE OF SOLDERMASK

Features

- Low insertion loss
- Small size
- Excellent return loss
- High rejection

Applications

- Military Applications
- VHF/UHF transmitters/receivers
- Harmonic rejection
- Output of the A/D convertor
- Test and Measurement



CASE STYLE: JV1210C-1

+RoHS Compliant

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

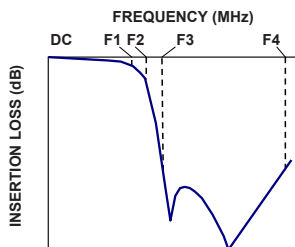
Electrical Specifications^(1,2) at 25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Unit
Pass Band	Insertion Loss	DC-F1	DC-1000	—	1.2	2.2	dB
	Freq. Cut-Off	F2	1280	—	3.0	—	dB
	Amp Unbalance	DC-F1	DC-1000	—	0.1	—	dB
	Pha Unbalance	DC-F1	DC-1000	—	3	—	deg
	VSWR	DC-F1	DC-1000	—	1.4	—	:1
Stop Band	Insertion Loss	F3-F4	1700-5000	24	27	—	dB
	Cross Over Isolation	F3-F4	1700-5000	—	27	—	dB
	VSWR	F3-F4	1700-5000	—	20	—	:1

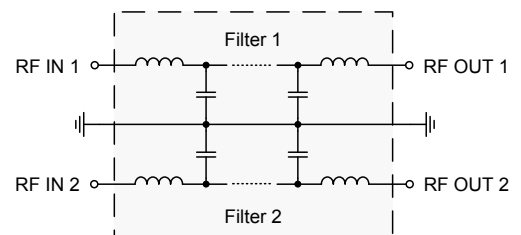
(1) In Application where DC voltage is present at either input or output ports, coupling capacitors are required

(2) Measured on Mini-Circuits Characterization Test Board TB-867+.

Typical Frequency Response



Functional Schematic

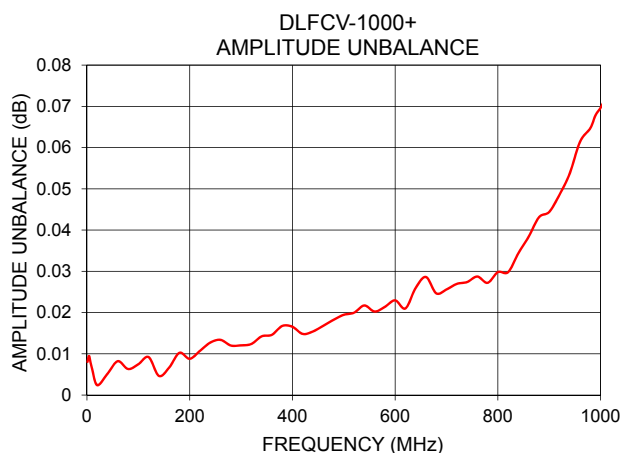
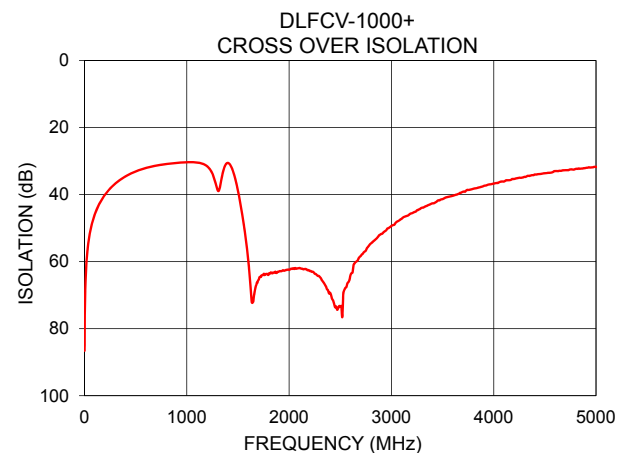
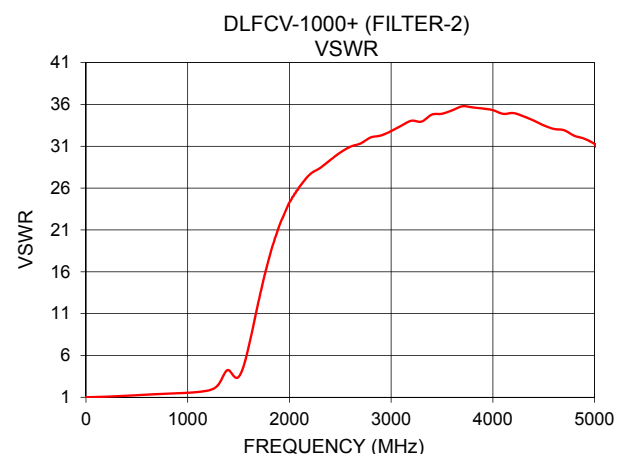
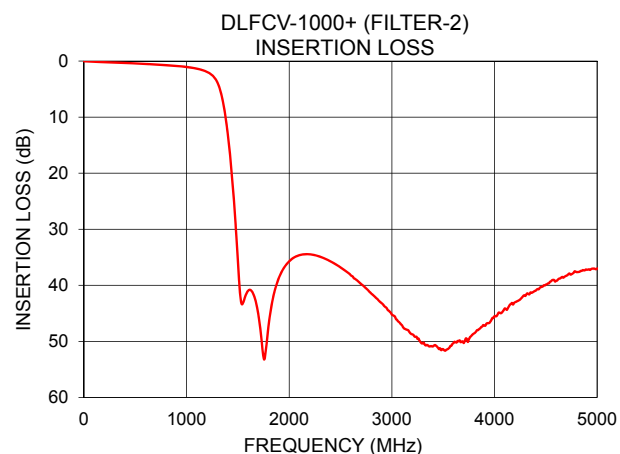
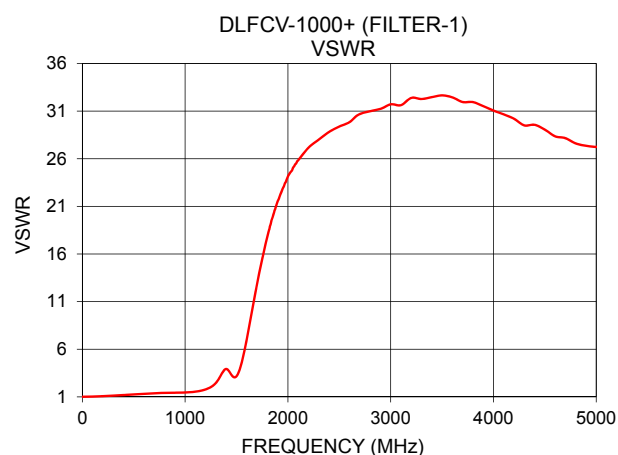
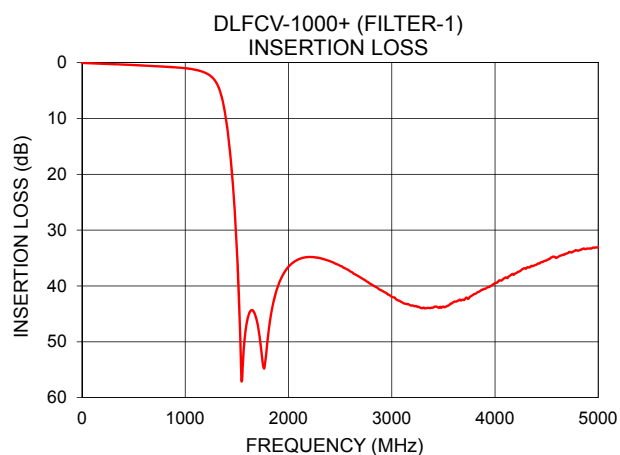


Typical Performance Data at 25°C

VSWR						Group Delay				
Freq.	Insertion Loss		Cross Over	VSWR		Freq.	Amp Unbal.	Phase Unbal.	Filter1	Filter2
	Filter1	Filter2	Isolation	Filter1	Filter2					
(MHz)	(dB)	(dB)	(dB)	(:1)	(:1)	(MHz)	(dB)	(deg)	(ns)	(ns)
1.0	0.03	0.03	86.58	1.01	1.01	1.0	0.01	0.01	0.56	0.57
30.0	0.07	0.07	56.46	1.01	1.01	40.0	0.01	0.02	0.58	0.58
100.0	0.13	0.12	45.96	1.04	1.03	60.0	0.01	0.05	0.58	0.58
250.0	0.24	0.23	38.21	1.10	1.10	100.0	0.01	0.09	0.58	0.58
500.0	0.43	0.42	33.11	1.25	1.25	140.0	0.00	0.16	0.58	0.58
1000.0	1.00	1.05	30.36	1.46	1.54	200.0	0.01	0.24	0.58	0.58
1280.0	3.02	3.16	36.44	2.26	2.24	260.0	0.01	0.34	0.58	0.58
1400.0	10.79	12.85	30.56	3.93	4.25	300.0	0.01	0.38	0.59	0.59
1450.0	19.29	22.21	32.88	3.32	3.57	340.0	0.01	0.44	0.59	0.59
1500.0	33.50	35.73	38.85	3.17	3.43	460.0	0.02	0.64	0.61	0.61
1600.0	46.20	40.97	59.38	7.08	7.08	480.0	0.02	0.69	0.61	0.61
1700.0	46.78	45.32	65.50	12.88	12.65	500.0	0.02	0.73	0.61	0.62
1760.0	54.70	53.12	64.01	15.97	15.76	540.0	0.02	0.82	0.62	0.63
1800.0	49.27	47.00	63.58	17.81	17.63	600.0	0.02	0.93	0.64	0.64
1900.0	39.91	38.63	62.98	21.53	21.49	660.0	0.03	1.06	0.66	0.66
2000.0	36.56	35.71	62.46	24.14	24.28	700.0	0.03	1.20	0.67	0.68
2100.0	35.21	34.62	61.91	25.84	26.18	740.0	0.03	1.31	0.69	0.70
2500.0	36.38	36.82	73.40	29.38	30.26	800.0	0.03	1.55	0.72	0.73
3000.0	41.95	45.22	49.35	31.71	32.81	840.0	0.03	1.77	0.75	0.76
3400.0	43.88	50.90	42.63	32.46	34.79	900.0	0.04	2.11	0.80	0.81
4000.0	39.49	45.49	36.75	31.05	35.32	960.0	0.06	2.48	0.86	0.87
5000.0	33.10	37.01	31.76	27.23	31.28	1000.0	0.07	2.81	0.90	0.91

Notes

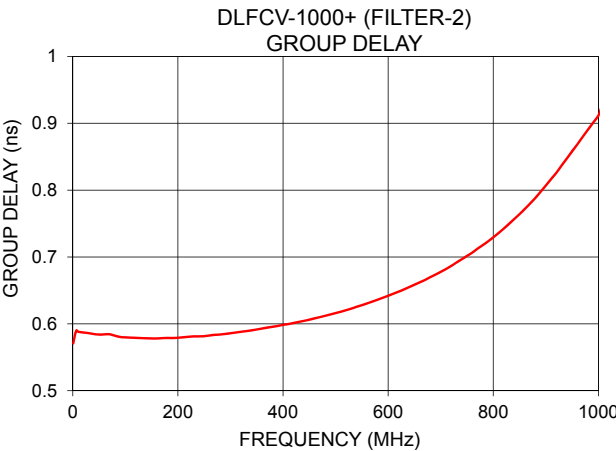
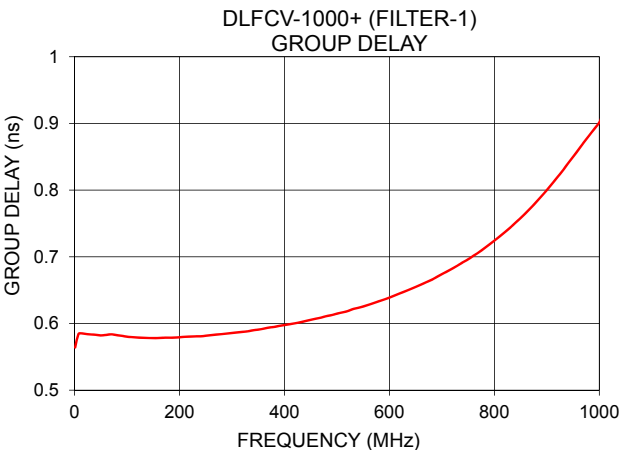
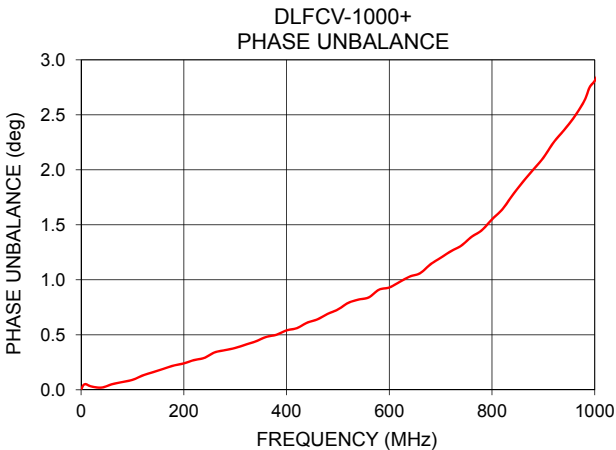
- NOTES**
- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- B. Technical specification information contained in this specification document is limited in scope to Mini-Circuits' policies, established test procedures, performance criteria and manufacturing 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/MCJStore/terms



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





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/MCStore/terms.jsp



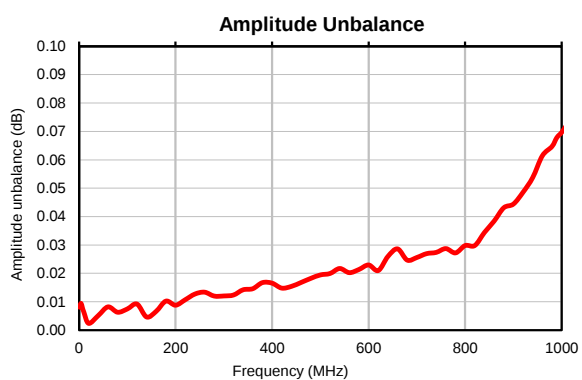
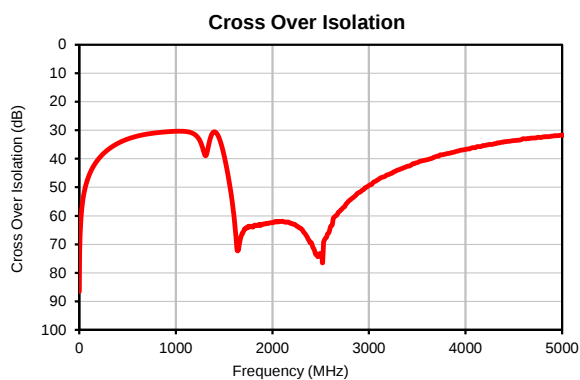
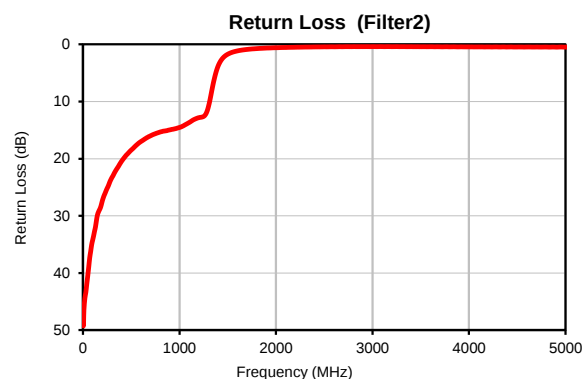
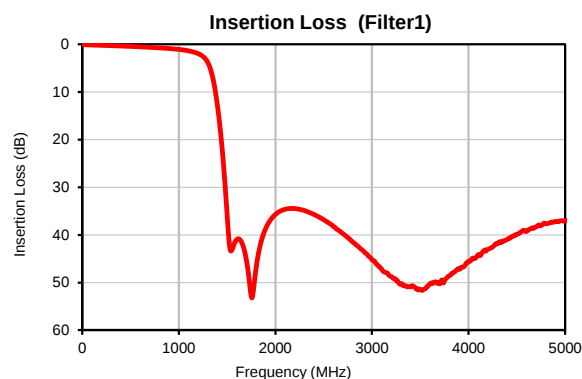
Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)		Cross Over Isolation (dB)	RETURN LOSS (dB)	
	Filter1	Filter2		Filter1	Filter2
1	0.03	0.03	86.58	44.69	46.66
10	0.05	0.04	66.06	44.50	46.44
50	0.09	0.09	51.97	38.20	40.44
100	0.13	0.12	45.96	32.92	34.28
370	0.32	0.32	35.16	20.55	21.28
510	0.44	0.43	32.98	17.80	18.34
730	0.65	0.65	31.21	15.69	15.75
1000	1.00	1.05	30.36	15.97	14.53
1190	1.79	1.85	31.36	12.89	12.87
1215	2.02	2.08	32.02	12.33	12.77
1280	3.02	3.16	36.44	10.81	11.94
1310	3.89	4.22	38.94	9.72	10.20
1435	16.28	19.01	31.74	3.29	2.70
1440	17.23	20.03	32.07	3.14	2.59
1445	18.24	21.10	32.45	3.00	2.48
1450	19.29	22.21	32.88	2.88	2.38
1455	20.40	23.36	33.32	2.76	2.29
1490	30.01	32.73	37.41	2.13	1.82
1500	33.50	35.73	38.85	2.00	1.72
1525	44.74	42.20	42.90	1.74	1.52
1530	47.66	42.87	43.78	1.69	1.48
1545	57.08	43.33	46.59	1.57	1.39
1550	56.86	43.15	47.55	1.53	1.36
1635	44.40	41.04	72.13	1.11	1.03
1645	44.34	41.34	72.12	1.08	1.00
1700	46.78	45.32	65.50	0.93	0.88
1750	53.83	52.89	63.74	0.84	0.79
1765	54.78	52.64	63.83	0.82	0.78
1840	44.13	42.43	63.45	0.72	0.69
1865	42.03	40.53	63.01	0.69	0.67
1900	39.91	38.63	62.98	0.66	0.64
1920	38.98	37.81	62.88	0.65	0.63
2110	35.13	34.57	61.99	0.55	0.53
2150	34.92	34.46	62.22	0.53	0.51
2300	34.99	34.88	64.59	0.48	0.46
2500	36.38	36.82	73.40	0.44	0.42
2590	37.28	38.00	65.44	0.43	0.41
2700	38.51	39.76	58.32	0.41	0.40
2850	40.22	42.32	53.23	0.41	0.39
3000	41.95	45.22	49.35	0.41	0.38
3250	43.76	49.57	44.69	0.40	0.38
3300	43.96	50.35	43.92	0.41	0.39
3500	43.70	51.40	41.37	0.41	0.40
3750	42.10	49.65	38.62	0.44	0.41
3980	39.73	45.82	36.88	0.45	0.43
4000	39.49	45.49	36.75	0.45	0.43
4050	39.00	44.89	36.39	0.46	0.44
4150	38.09	43.46	35.74	0.46	0.44
4260	37.07	42.32	34.99	0.47	0.44
4400	36.21	40.97	34.02	0.48	0.45
4560	34.76	39.10	33.48	0.48	0.46
4600	34.91	39.19	32.99	0.48	0.45
4650	34.47	38.61	32.91	0.48	0.46
4700	34.15	38.28	32.73	0.49	0.46
4800	33.68	37.64	32.35	0.49	0.46
4850	33.37	37.41	32.26	0.50	0.47
4900	33.31	37.22	32.05	0.49	0.48
4950	33.12	37.04	31.92	0.48	0.45
4960	33.16	37.03	31.89	0.48	0.45
5000	33.10	37.01	31.76	0.49	0.47

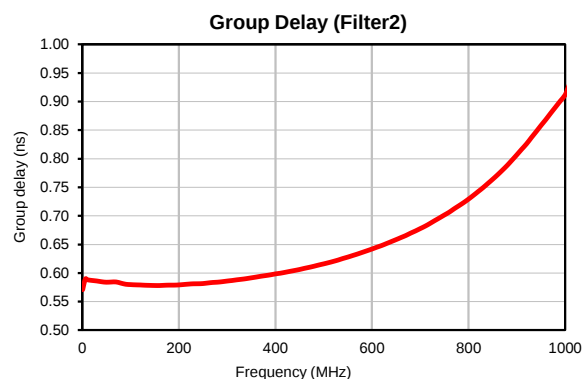
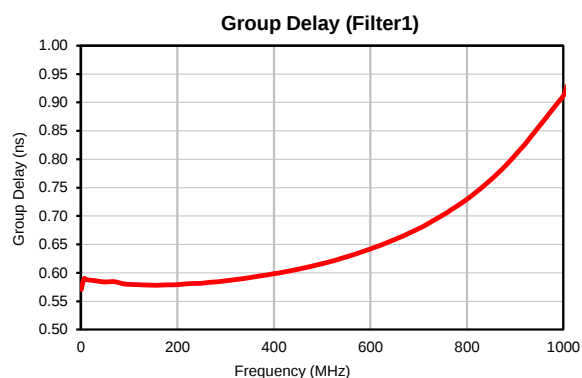
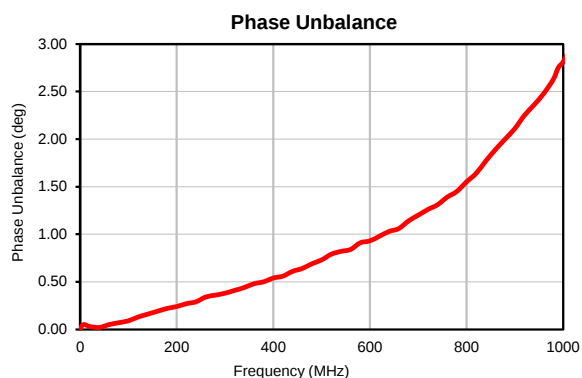
Typical Performance Data

FREQUENCY (MHz)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (deg)	GROUP DELAY (ns)	
			Filter1	Filter2
1	0.01	0.01	0.56	0.57
10	0.01	0.05	0.59	0.59
20	0.00	0.03	0.58	0.59
40	0.01	0.02	0.58	0.58
60	0.01	0.05	0.58	0.58
80	0.01	0.07	0.58	0.58
100	0.01	0.09	0.58	0.58
120	0.01	0.13	0.58	0.58
140	0.00	0.16	0.58	0.58
160	0.01	0.19	0.58	0.58
180	0.01	0.22	0.58	0.58
200	0.01	0.24	0.58	0.58
220	0.01	0.27	0.58	0.58
240	0.01	0.29	0.58	0.58
260	0.01	0.34	0.58	0.58
280	0.01	0.36	0.58	0.58
300	0.01	0.38	0.59	0.59
320	0.01	0.41	0.59	0.59
340	0.01	0.44	0.59	0.59
360	0.01	0.48	0.59	0.59
380	0.02	0.50	0.59	0.60
400	0.02	0.54	0.60	0.60
420	0.01	0.56	0.60	0.60
440	0.02	0.61	0.60	0.60
460	0.02	0.64	0.61	0.61
480	0.02	0.69	0.61	0.61
500	0.02	0.73	0.61	0.62
520	0.02	0.79	0.62	0.62
540	0.02	0.82	0.62	0.63
560	0.02	0.84	0.63	0.63
580	0.02	0.91	0.63	0.64
600	0.02	0.93	0.64	0.64
620	0.02	0.98	0.65	0.65
640	0.03	1.03	0.65	0.66
660	0.03	1.06	0.66	0.66
680	0.02	1.14	0.67	0.67
700	0.03	1.20	0.67	0.68
720	0.03	1.26	0.68	0.69
740	0.03	1.31	0.69	0.70
760	0.03	1.39	0.70	0.71
780	0.03	1.45	0.71	0.72
800	0.03	1.55	0.72	0.73
820	0.03	1.64	0.74	0.74
840	0.03	1.77	0.75	0.76
860	0.04	1.89	0.77	0.77
880	0.04	2.00	0.78	0.79
900	0.04	2.11	0.80	0.81
920	0.05	2.25	0.82	0.83
940	0.05	2.36	0.84	0.85
960	0.06	2.48	0.86	0.87
980	0.06	2.63	0.88	0.89
1000	0.07	2.81	0.90	0.91

Typical Performance Curves



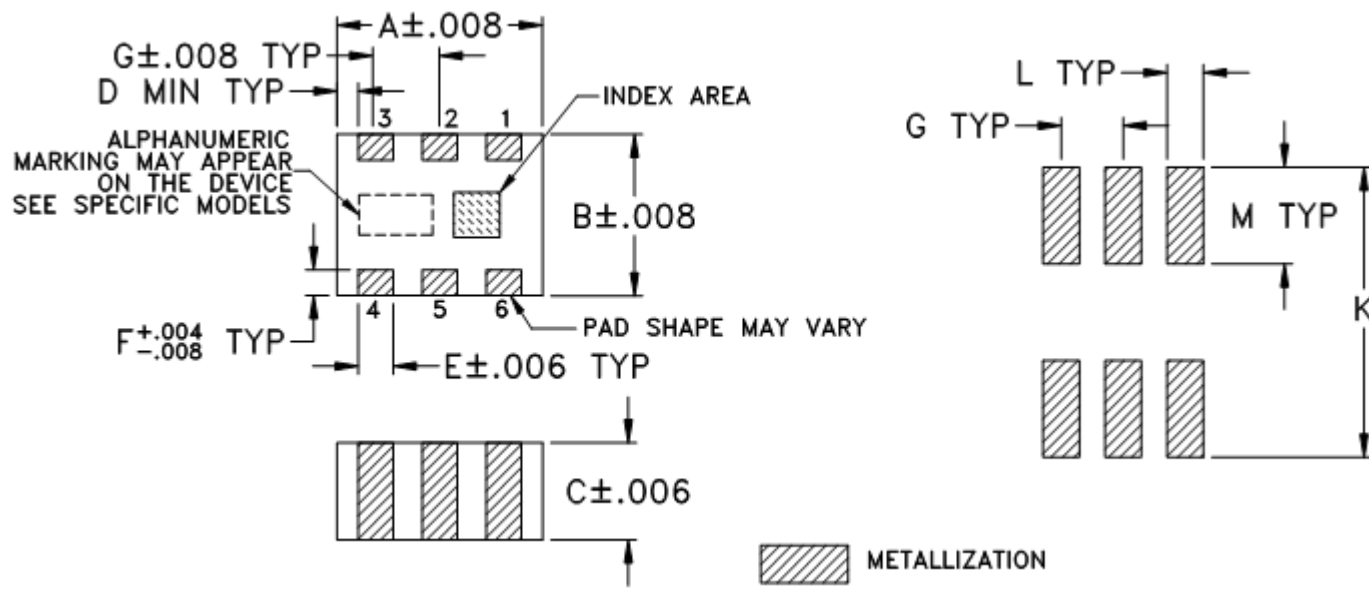
Typical Performance Curves



Outline Dimensions

JV1210C-1

PCB Land Pattern



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

CASE #	A	B	C	D	E	F	G	H	J	K	L	M	WT. GRAM
JV1210C-1	.126 (3.2)	.098 (2.5)	.059 (1.50)	.004 (.1)	.022 (.56)	.016 (.4)	.039 (1.0)	- -	- -	.177 (4.5)	.024 (.6)	.059 (1.5)	.03

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

Notes:

- Open style, ceramic base.
- 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.
- Pad tolerance is non-cumulative. Minimum spacing between each pad is .004.

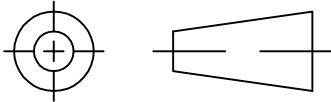


P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site

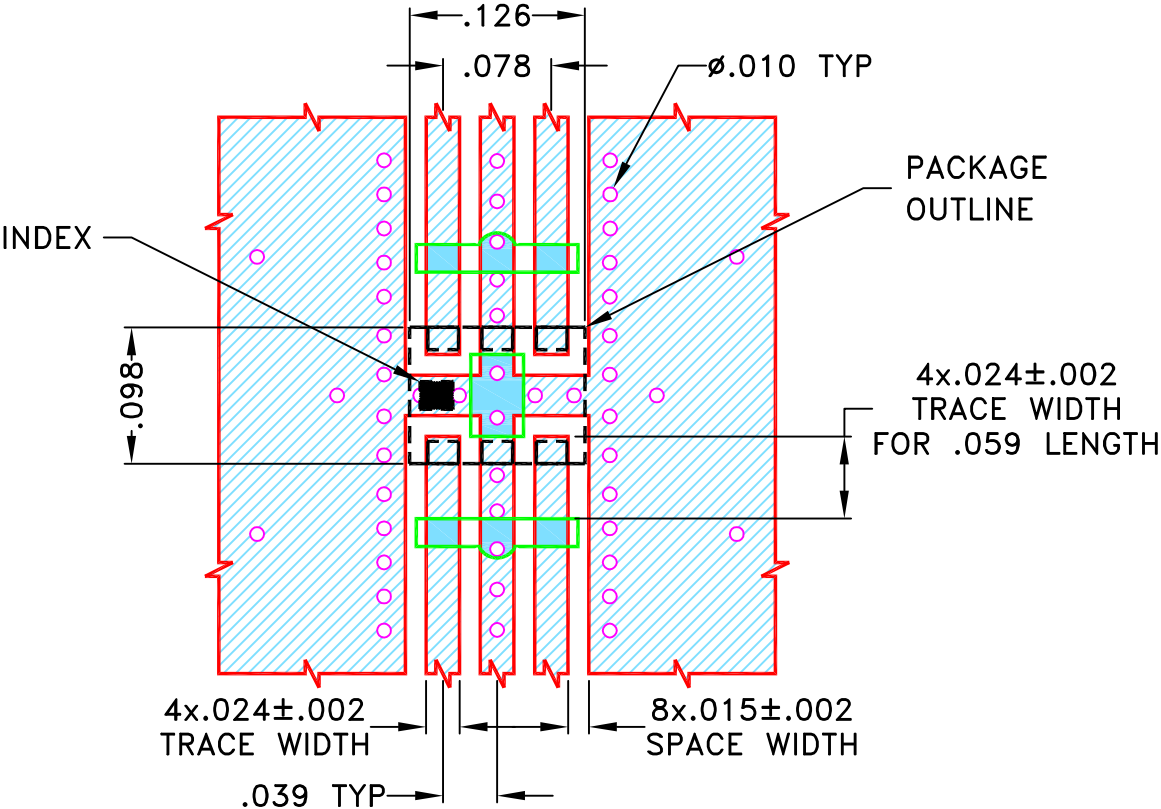


The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

RF/IF MICROWAVE COMPONENTS

THIRD ANGLE PROJECTION		REVISIONS					
		REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
		OR	M156223	NEW RELEASE	MAY 16	DDR	MD

SUGGESTED MOUNTING CONFIGURATION FOR
JV1210C-1 CASE STYLE "06FL08" PIN CODE



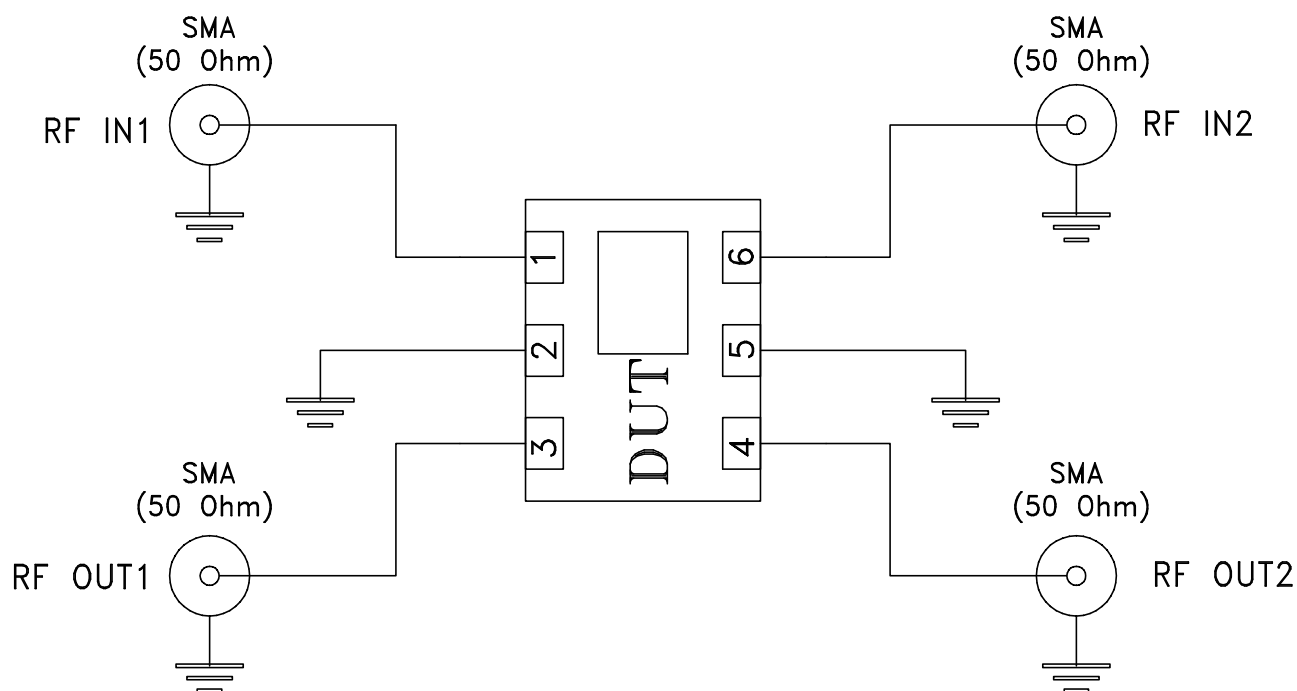
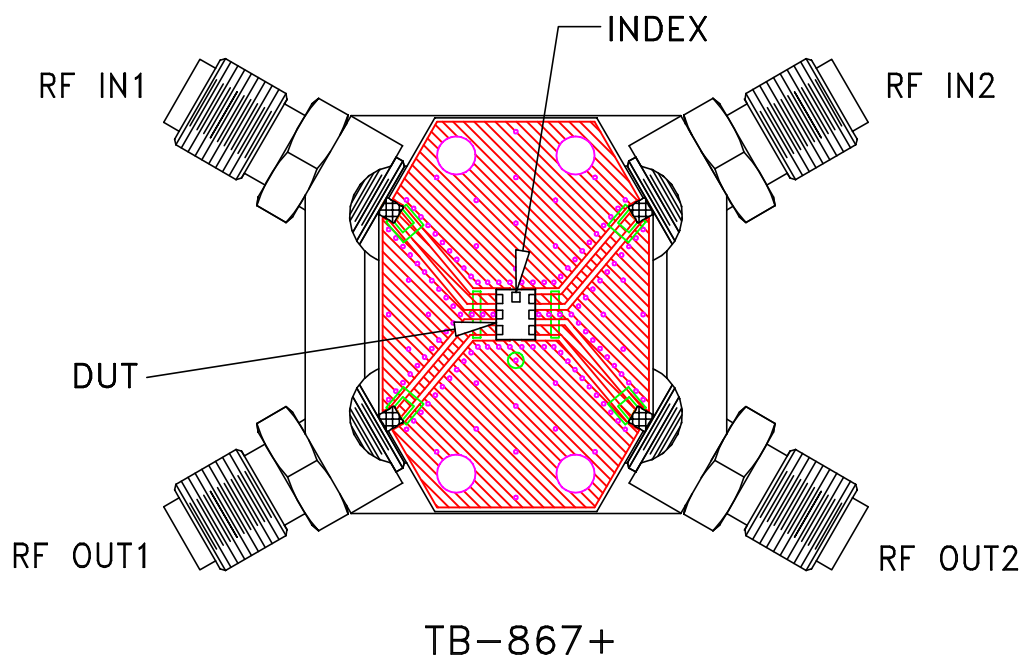
NOTES:

- TRACE WIDTH IS SHOWN FOR ROGERS (R04350B) WITH DIELECTRIC THICKNESS $.010 \pm .001$ ". COPPER: 1/2 OZ. EACH SIDE.
FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
- 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 SOLDERMASK

UNLESS OTHERWISE SPECIFIED		INITIALS		DATE		Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235							
DIMENSIONS ARE IN INCHES TOLERANCES ON: 2 PL DECIMALS ± 3 PL DECIMALS ± .005" ANGLES ± FRACTIONS ±		DRAWN	DDR	26 MAY 16		PL, 06FL08, JV1210C-1 LFCV, TB-867+, 50 OHM							
		CHECKED	MD	26 MAY 16									
		APPROVED	RV	26 MAY 16									
Mini-Circuits® 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.						SIZE A		CODE IDENT 15542		DRAWING NO: 98-PL-483		REV: OR	
ASHEETA1.DWG REV:A DATE:01/12/95						FILE: 98PL483		SCALE: 7:1		SHEET: 1 OF 1			

Evaluation Board and Circuit



Schematic Diagram

Notes:

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

 **Mini-Circuits®**



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 100° 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
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