



Mini-Circuits

CERAMIC RESONATOR SURFACE MOUNT

Band Pass Filter

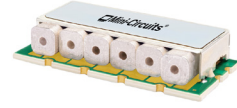
CBP4-4R3GBP+

50Ω

4230 to 4370 MHz

THE BIG DEAL

- Good Insertion Loss, 4.1 dB Typ.
- Excellent Rejection, 70 dB Typ.
- Good Return Loss, 12 dB Typ.
- Miniature Shielded Package

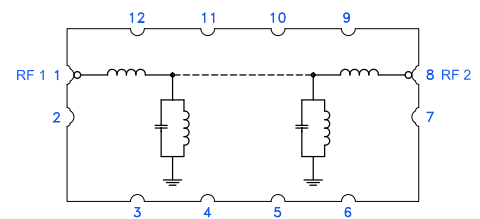


Generic photo used for illustration purposes only

APPLICATIONS

- Aerospace
- Defense and Government
- Telecom

FUNCTIONAL DIAGRAM



PRODUCT OVERVIEW

All our coaxial-ceramic resonator filters are built with rugged construction, qualified to withstand multiple demanding reflow cycles. Excellent repeatability across units is achieved through precise tuning and process control.

ELECTRICAL SPECIFICATIONS^{1,2} AT +25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Units
Passband	Center Frequency	—	—	—	4300	—	MHz
	Insertion Loss	F1-F2	4230 - 4370	—	4.1	4.8	dB
	Return Loss	F1-F2	4230 - 4370	10	12	—	dB
Stopband, Lower	Rejection	DC-F3	DC - 3000	60	70	—	dB
		F3-F4	3000 - 4000	40	50	—	
		F4-F5	4000 - 4160	30	40	—	
Stopband, Upper	Rejection	F6-F7	4460 - 4550	20	28	—	dB
		F7-F8	4550 - 5600	40	50	—	
		F8-F9	5600 - 8000	30	40	—	

1. Tested in Evaluation Board P/N TB-CBP4-4R3GBP+.

2. This component should not be used as a DC-block. In applications where DC voltage and/or current is present at either the input or output ports, external DC blocking capacitors are required.

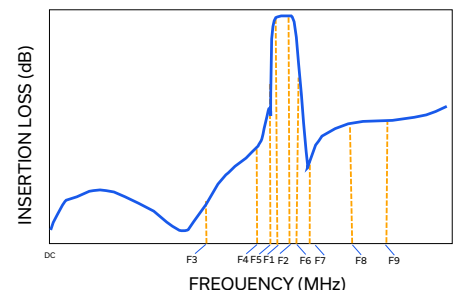
ABSOLUTE MAXIMUM RATINGS³

Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +100°C
Input Power ⁴	5 W at +25°C

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

4. Power rating applies only to signals within the passband. Power rating above +25°C operating temperature decreases linearly to 1 W at +85°C.

TYPICAL FREQUENCY RESPONSE



Mini-Circuits

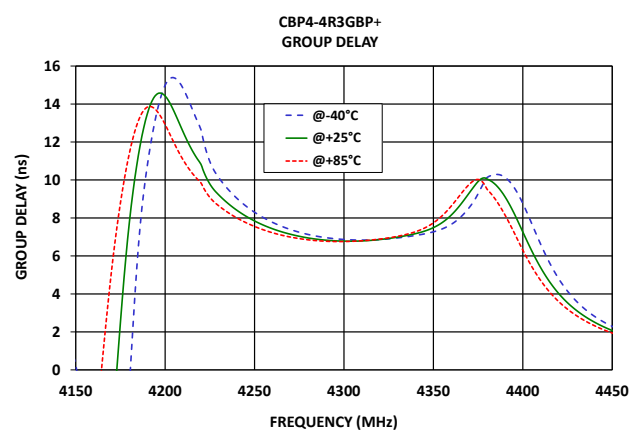
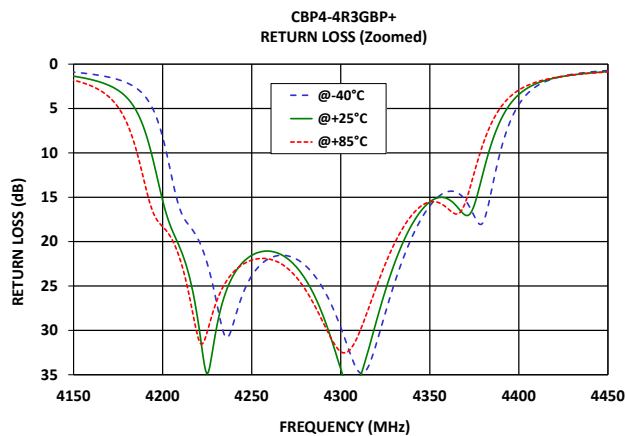
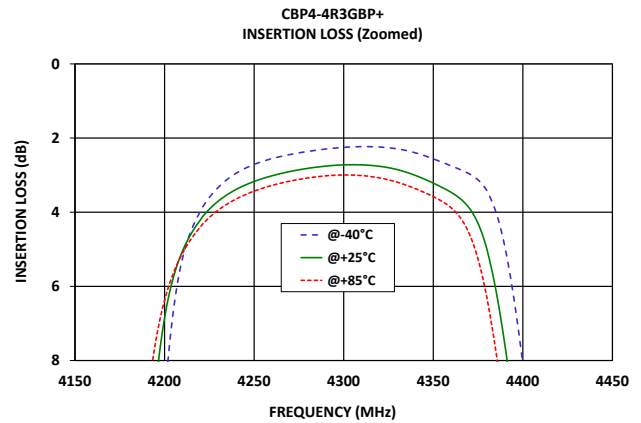
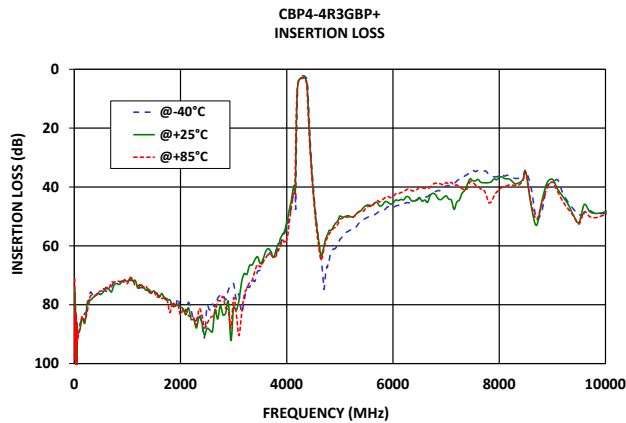
www.minicircuits.com P.O. Box 350166, Brooklyn, NY 11235-0003 (718) 934-4500 sales@minicircuits.com

REV. OR
ECO-030215
EDU5426
CBP4-4R3GBP+
MCINU
260626

PAGE 1 OF 4



TYPICAL PERFORMANCE GRAPHS



FUNCTIONAL DIAGRAM

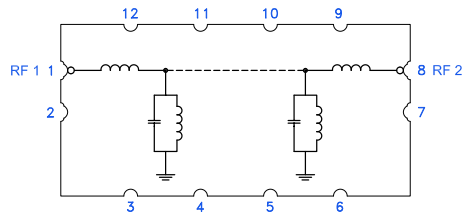


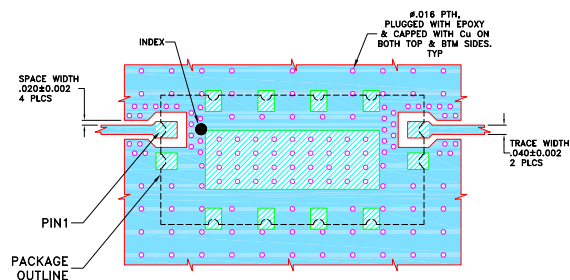
Figure 1. CBP4-4R3GBP+ Functional Diagram

PAD DESCRIPTION

Function	Pad Number	Description
RF1	1	Connects to RF Input Port
RF2	8	Connects to RF Output Port
GROUND	2-7,9-12	Connects to Ground on PCB, (See drawing PL-761)

SUGGESTED PCB LAYOUT

SUGGESTED MOUNTING CONFIGURATION FOR
BBZ3203-3 CASE STYLE



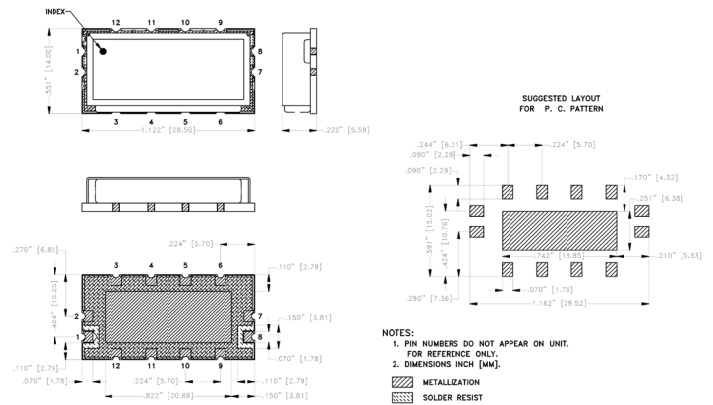
NOTES:

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 SOLDERMASK

Figure 2. Suggested PCB Layout

CASE STYLE DRAWING



Weight: 3.5g

Dimensions are in inches (mm). Tolerances: 2Pl. $\pm .03$; 3Pl. $\pm .015$

PRODUCT MARKING*: CBP4-4R3GBP

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



Mini-Circuits

CERAMIC RESONATOR SURFACE MOUNT

Band Pass Filter

CBP4-4R3GBP+

50Ω

4230 to 4370 MHz

ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASHBOARD

[CLICK HERE](#)

Performance Data & Graphs	Data Graphs S-Parameter (S2P Files) Data Set (.zip file) De-embedded to device pads
Case Style	BBZ3203-3 Lead Finish: Gold over Nickel Plate
RoHS/REACH Status	Compliant
Tape and Reel	F027
Suggested Layout for PCB Design	PL-865
Evaluation Board	TB-CBP4-4R3GBP+ Gerber File
Environmental Rating	ENV54
MSL Level	MSL1

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-Circuits' 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/terms/viewterm.html



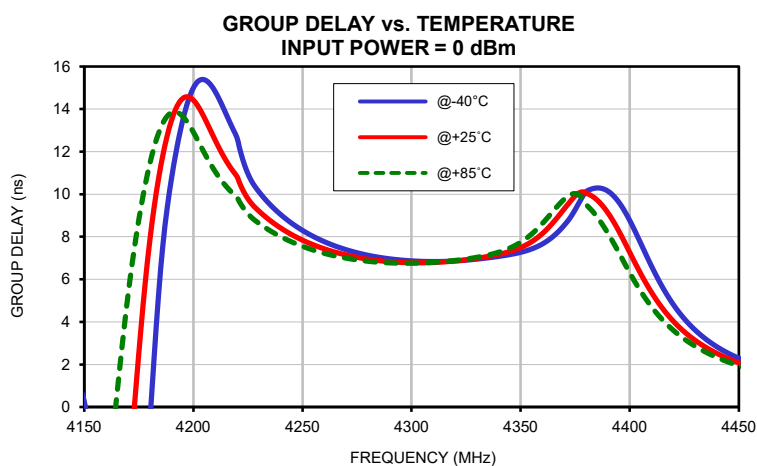
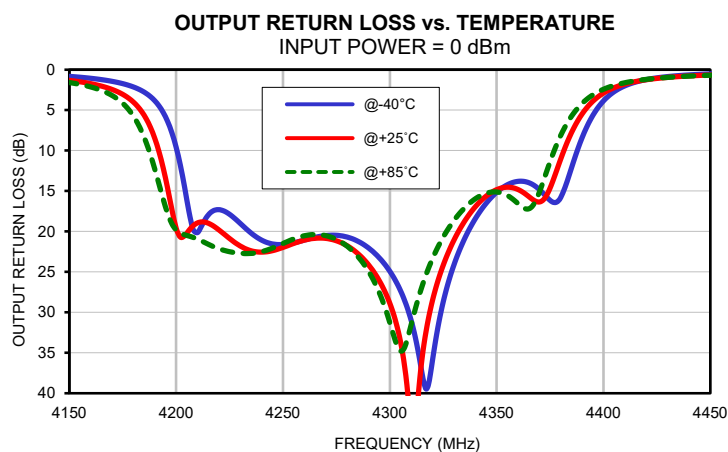
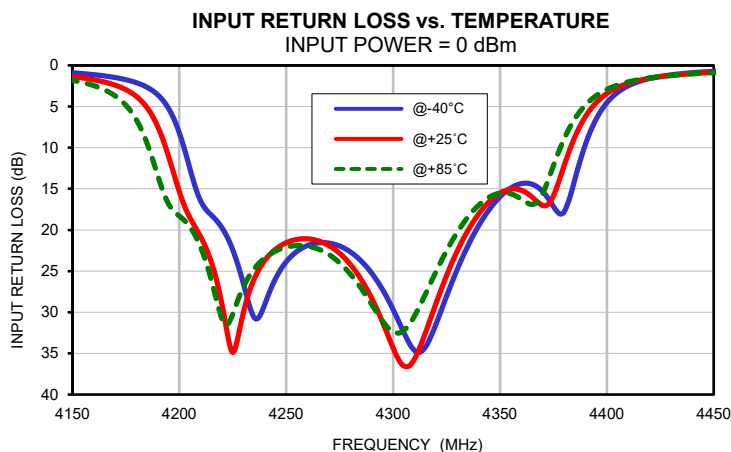
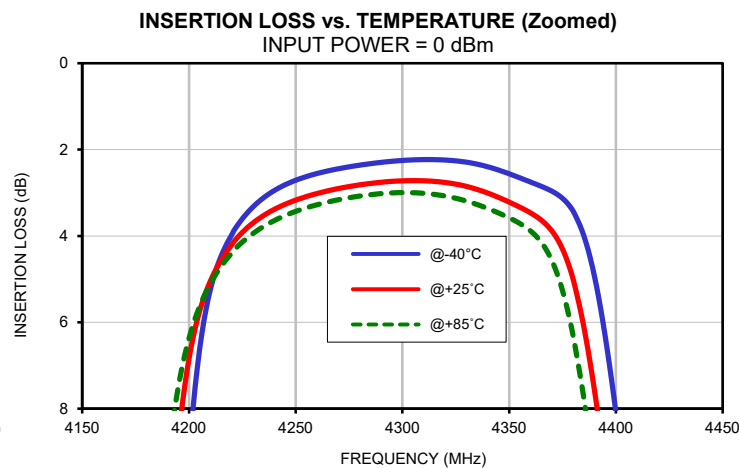
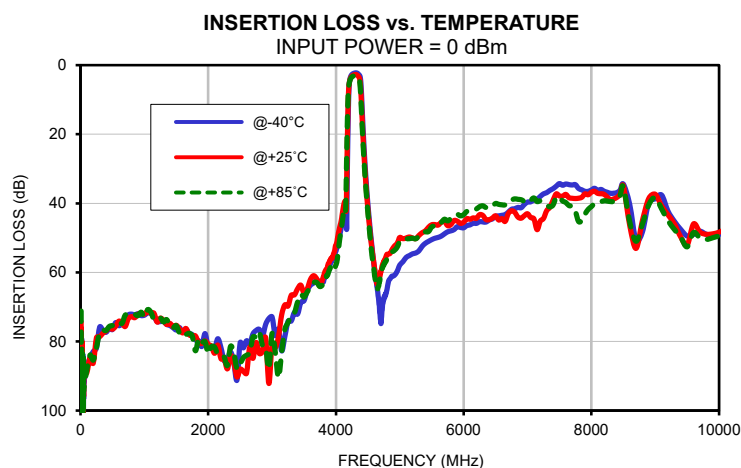
Typical Performance Data

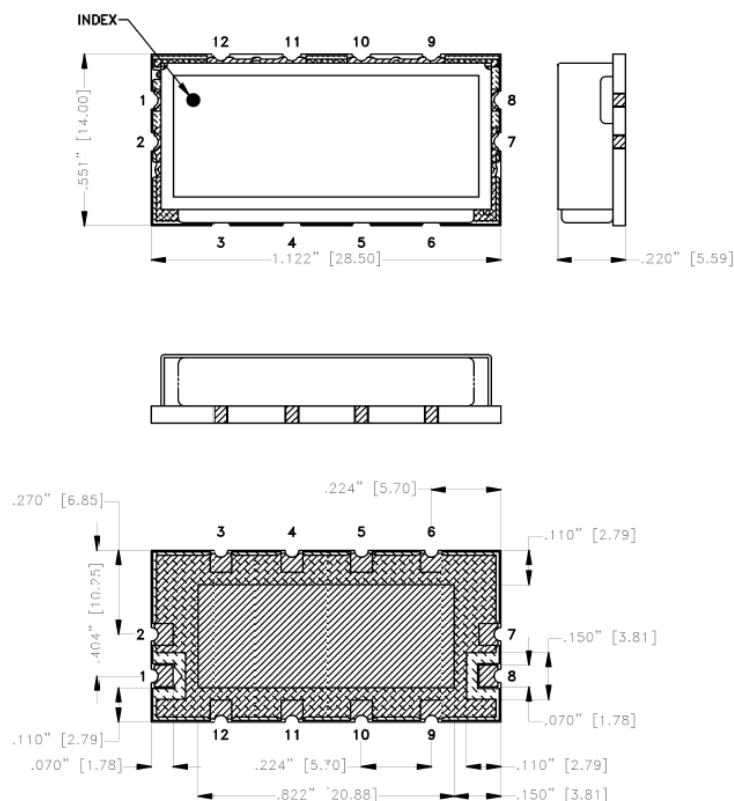
FREQ.	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
(MHz)	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
10	82.38	74.33	71.18	0.06	0.06	0.06	0.05	0.06	0.07
20	88.68	90.90	82.12	0.07	0.07	0.07	0.05	0.06	0.07
30	90.09	95.73	87.41	0.07	0.07	0.08	0.05	0.06	0.07
100	87.21	89.01	88.12	0.08	0.09	0.10	0.06	0.08	0.08
200	82.89	86.24	85.40	0.08	0.10	0.11	0.07	0.08	0.10
500	76.54	76.45	75.37	0.07	0.10	0.11	0.06	0.08	0.11
1000	72.39	72.07	72.83	0.03	0.08	0.10	0.02	0.06	0.09
1500	76.68	75.31	75.40	0.00	0.06	0.09	0.02	0.05	0.08
2000	81.74	80.76	83.48	0.00	0.06	0.10	0.04	0.03	0.07
3000	72.90	80.81	77.67	0.00	0.07	0.10	0.02	0.05	0.09
3500	68.21	66.00	67.16	0.01	0.08	0.12	0.01	0.06	0.10
4000	53.76	52.21	57.81	0.15	0.27	0.32	0.10	0.24	0.28
4160	42.52	42.37	35.26	1.13	1.75	2.46	1.06	1.72	2.13
4180	28.85	20.47	15.60	2.12	3.80	6.67	2.13	4.00	5.73
4200	9.10	6.85	6.38	8.22	15.36	18.31	9.58	19.59	19.81
4230	3.33	3.70	3.94	26.57	29.98	26.90	19.00	21.80	22.69
4238	3.01	3.44	3.69	30.26	24.46	23.84	20.76	22.53	22.62
4250	2.71	3.17	3.43	23.86	21.55	22.09	21.61	21.97	21.49
4280	2.36	2.82	3.08	22.68	24.19	25.37	20.69	21.76	21.81
4300	2.25	2.72	3.00	29.67	34.34	32.39	24.92	28.88	31.26
4320	2.24	2.76	3.08	31.48	28.97	25.11	35.89	28.49	23.34
4340	2.40	3.01	3.37	19.49	18.07	16.99	18.43	16.95	15.96
4350	2.56	3.22	3.58	15.97	15.53	15.53	15.15	14.83	15.12
4360	2.75	3.47	3.88	14.36	15.17	16.26	13.80	14.81	16.55
4370	2.96	3.88	4.57	15.34	17.02	15.55	14.81	16.35	15.14
4430	20.19	22.89	24.44	1.15	1.22	1.23	0.85	0.95	0.95
4460	30.00	32.07	33.25	0.61	0.74	0.78	0.42	0.56	0.60
4550	49.99	51.17	52.70	0.22	0.34	0.39	0.14	0.27	0.31
4600	58.39	58.18	59.84	0.16	0.27	0.32	0.09	0.21	0.26
4700	73.94	59.87	61.03	0.10	0.21	0.25	0.04	0.16	0.20
4800	64.94	54.73	55.95	0.08	0.19	0.23	0.03	0.14	0.19
4900	61.03	52.77	53.85	0.08	0.18	0.23	0.02	0.13	0.18
5000	57.85	49.85	50.94	0.07	0.19	0.23	0.02	0.13	0.18
5100	55.64	50.04	50.31	0.08	0.19	0.23	0.02	0.13	0.18
5200	54.62	50.05	50.10	0.08	0.19	0.24	0.03	0.13	0.18
5300	53.75	49.30	49.49	0.08	0.19	0.24	0.03	0.13	0.19
5400	51.58	47.99	48.27	0.09	0.20	0.24	0.03	0.14	0.19
5500	50.51	46.21	46.84	0.09	0.21	0.25	0.03	0.15	0.20
5600	49.87	46.31	46.63	0.10	0.21	0.26	0.03	0.15	0.21
5700	48.83	45.25	44.60	0.10	0.22	0.27	0.04	0.15	0.22
5800	47.97	46.15	44.36	0.10	0.22	0.27	0.04	0.16	0.22
5900	46.75	45.15	43.18	0.11	0.24	0.29	0.05	0.17	0.23
6000	47.08	45.49	43.29	0.11	0.23	0.28	0.06	0.18	0.24
6100	46.25	44.63	42.35	0.11	0.24	0.29	0.07	0.21	0.25
6200	45.81	44.36	41.64	0.10	0.24	0.29	0.07	0.23	0.26
6300	45.38	43.51	40.72	0.10	0.24	0.30	0.08	0.26	0.29
6400	44.82	44.74	41.32	0.10	0.26	0.31	0.08	0.27	0.31
6500	43.77	43.61	40.05	0.11	0.28	0.33	0.10	0.32	0.34
6600	43.47	44.41	40.43	0.13	0.29	0.36	0.11	0.33	0.36
6700	42.55	42.92	40.09	0.14	0.30	0.37	0.13	0.35	0.41
6800	41.57	42.60	38.71	0.15	0.30	0.37	0.14	0.39	0.45
6900	41.28	44.31	38.95	0.16	0.31	0.39	0.18	0.45	0.52
7000	39.65	43.01	38.52	0.17	0.34	0.40	0.23	0.47	0.56
7100	39.00	44.47	38.44	0.19	0.35	0.42	0.30	0.49	0.64
7200	38.00	45.15	39.28	0.22	0.41	0.47	0.36	0.52	0.68
7300	36.92	42.14	40.53	0.24	0.42	0.49	0.46	0.58	0.74
7400	35.76	39.09	40.49	0.29	0.45	0.53	0.54	0.67	0.81
7500	34.28	37.85	38.34	0.34	0.52	0.58	0.64	0.78	0.89
7800	35.71	38.52	45.27	0.43	0.62	0.65	0.84	1.00	1.05
8000	36.15	36.79	40.96	0.42	0.63	0.68	0.94	1.16	1.17

Typical Performance Data

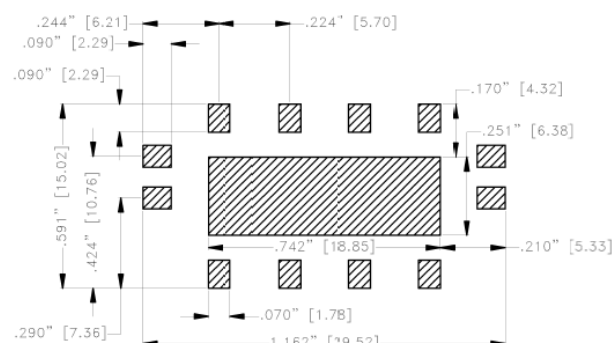
FREQ.	GROUP DELAY		
(MHz)	(nsec)		
	@-40°C	@+25°C	@+85°C
4230	10.12	9.21	8.64
4232	9.87	9.03	8.49
4234	9.64	8.86	8.36
4236	9.42	8.70	8.23
4238	9.23	8.55	8.12
4240	9.04	8.41	8.01
4242	8.87	8.28	7.90
4244	8.71	8.16	7.81
4246	8.57	8.05	7.72
4248	8.43	7.94	7.63
4250	8.30	7.84	7.55
4252	8.18	7.75	7.48
4254	8.07	7.66	7.41
4256	7.96	7.58	7.34
4258	7.86	7.50	7.28
4260	7.77	7.43	7.22
4265	7.56	7.27	7.10
4270	7.39	7.14	7.00
4275	7.25	7.03	6.91
4280	7.13	6.95	6.85
4285	7.04	6.88	6.80
4290	6.96	6.83	6.77
4300	6.87	6.78	6.76
4310	6.84	6.79	6.80
4320	6.86	6.86	6.89
4330	6.95	6.99	7.03
4340	7.08	7.17	7.28
4360	7.66	8.15	8.63
4370	8.54	9.31	9.77

Typical Performance Curves





SUGGESTED LAYOUT
FOR P. C. PATTERN



NOTES:

- PIN NUMBERS DO NOT APPEAR ON UNIT.
FOR REFERENCE ONLY.
- DIMENSIONS INCH [MM].

METALLIZATION

SOLDER RESIST

Dimensions are in inches [mm]. Tolerances: 2 Pl $\pm .030$ [.76]; 3 Pl $\pm .015$ [.38]

Notes:

- Case material: Nickel-silver alloy.
- Base: Printed wiring laminate.
- Unit weight: 3.5g
- Termination finish:

For RoHS Case styles: 2-5 μ inch (.05-.13 microns) Gold over 120-240 μ inch (3.05-6.10 microns) Nickel plate.

All models, (+) suffix.



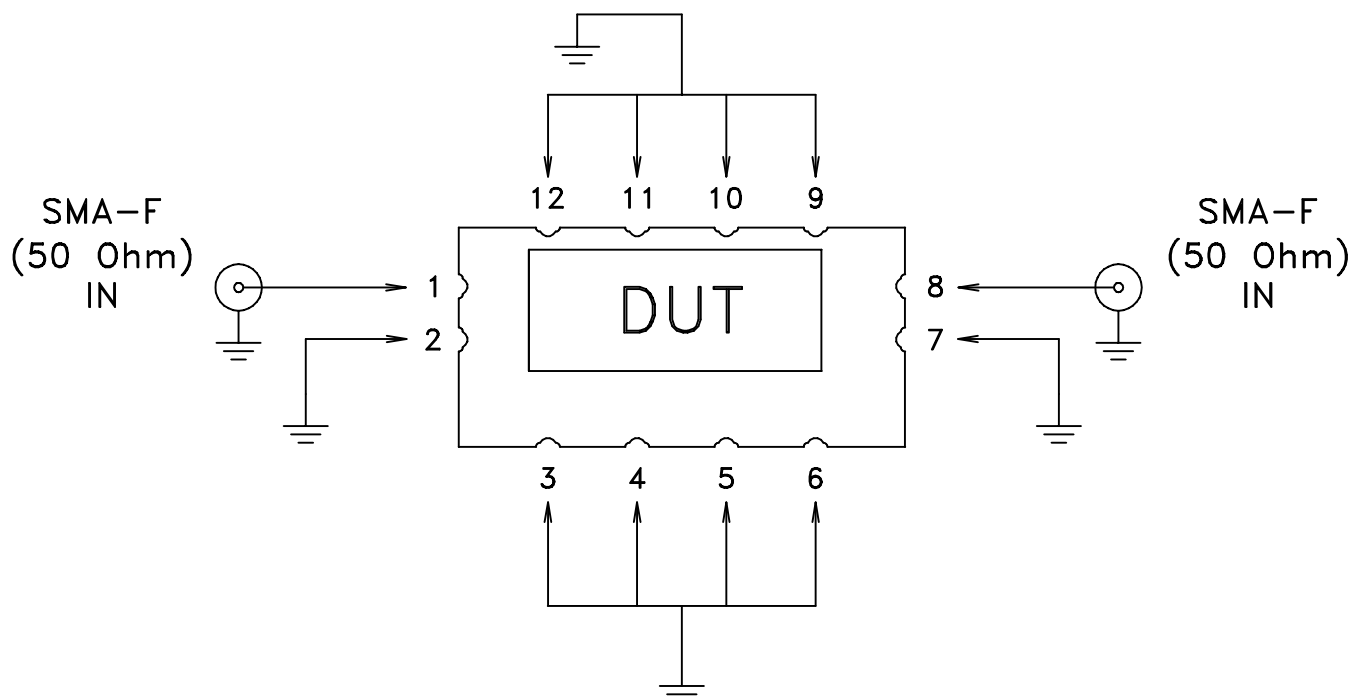
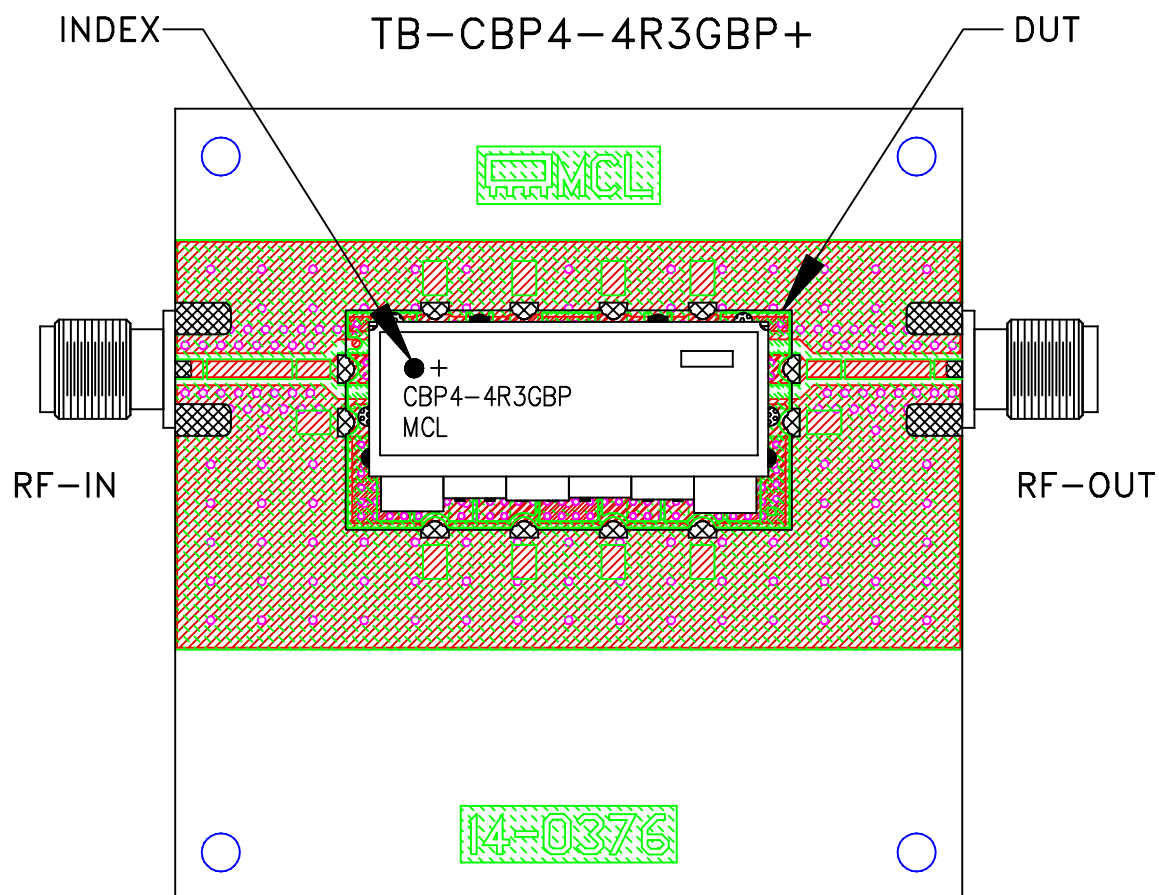
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



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

RF/IF MICROWAVE COMPONENTS

Evaluation Board and Circuit



Notes:

1. 50 Ohm SMA female connectors
2. PCB Material: ROGERS (R04350B) OR Equivalent
Dielectric Constant= 3.48 ± 0.05 , Thickness=.020 inch.

Schematic Diagram

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	-40° to 85°C Ambient Environment	Individual Model Data Sheet
Storage Temperature	-55° to 100° C Ambient Environment	Individual Model Data Sheet
Humidity	90 to 95% RH, 96 hours, 40°C	MIL-STD-202, Method 103B, Condition B, Except 50°C
Thermal Shock	-55° to 100°C, 100 cycles	MIL-STD-202, Method 107, Condition A-3, except +100°C
Solder Reflow Heat	Sn-Pb Eutectic Process: 225°C peak Pb-Free Process, 245°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, 4 times in each of three axes (total 12)	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