(CERAMIC RESONATOR) SURFACE MOUNT

Bandpass Filter

CBP6-522R5BG+

50Ω 519 to 526 MHz

KEY FEATURES

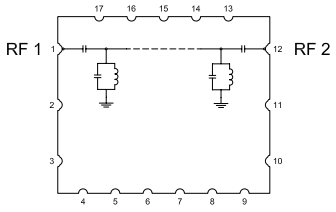
- Narrow Band Filter with 2% Bandwidth
- Good Insertion Loss 3.1 dB Typ.
- Excellent Rejection, 85 dB Typ.

Generic photo used for illustration purposes only

APPLICATIONS

- Radar Systems
- Television Broadcasting
- Industrial and Scientific Equipment
- Radio Astronomy
- Marine and Aviation Communication

FUNCTIONAL DIAGRAM



PRODUCT OVERVIEW

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

ELECTRICAL SPECIFICATIONS[1,2,3] AT +25°C

Parameter		F#	Frequency (MHz)	Min.	Typ.	Max.	Units
Passband	Center Frequency	—	—	—	522.5	—	MHz
	Insertion Loss	F1-F2	519 - 526	—	3.1	4	dB
	Return Loss	F1-F2	519 - 526	10	16	—	dB
Stop Band, Lower	Rejection	DC-F3	DC - 400	75	85	—	dB
		F3-F4	400 - 510	20	31	—	
Stop Band, Upper	Rejection	F5-F6	535 - 700	20	29	—	dB
		F6-F7	700 - 1100	60	70	—	

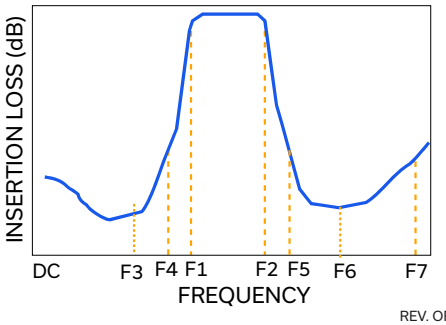
1. Tested in Evaluation Board P/N TB-CBP6522R5BG+.
2. This filter is bi-directional RF1 and RF2 ports may be interchanged, see S-Parameters for actual performance.
3. This component should not be used as a DC-block. In applications where DC voltage and/or current is present at either the input or output ports, external DC blocking capacitors are required.

ABSOLUTE MAXIMUM RATINGS[4]

Parameter	Ratings
Operating Temperature	-40°C to +85°C
Storage Temperature	-55°C to +100°C
Input Power[5]	5 W at 25°C

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



REV. OR
ECO-023082
EDU4943
CBP6-522R5BG+
URJ
240918

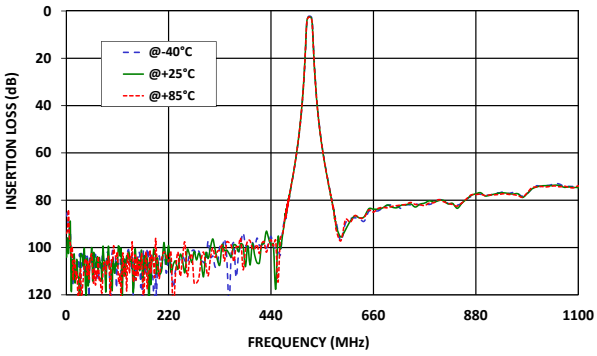
Bandpass Filter

CBP6-522R5BG+

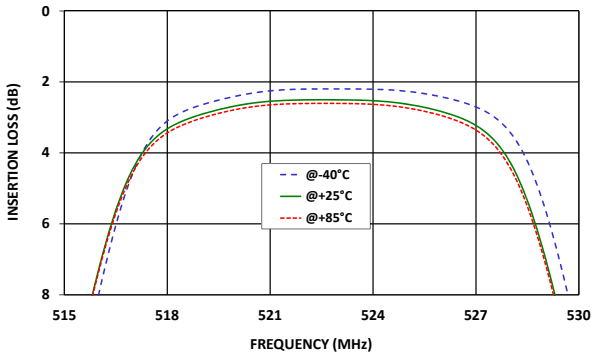
50Ω 519 to 526 MHz

TYPICAL PERFORMANCE GRAPHS

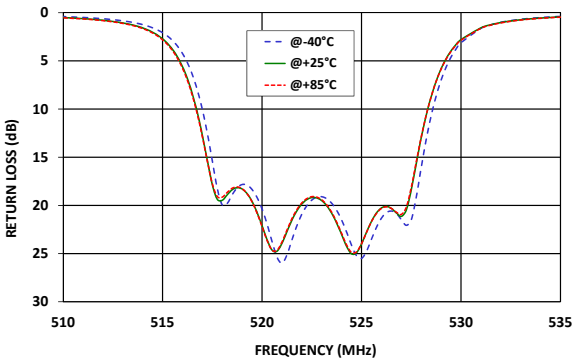
CBP6-522R5BG+
INSERTION LOSS



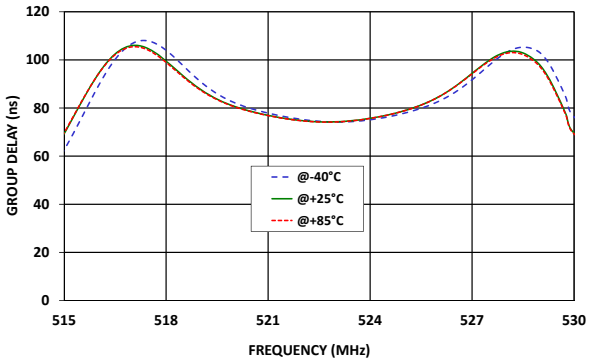
CBP6-522R5BG+
INSERTION LOSS (Zoomed)



CBP6-522R5BG+
RETURN LOSS (Zoomed)



CBP6-522R5BG+
GROUP DELAY



Bandpass Filter

CBP6-522R5BG+

50Ω 519 to 526 MHz

FUNCTIONAL DIAGRAM

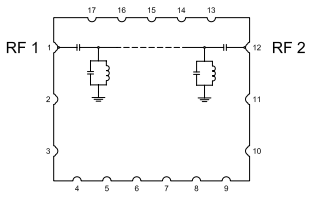
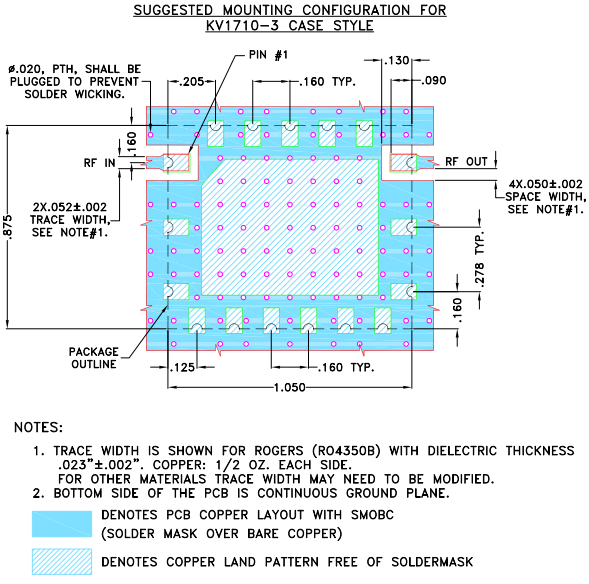


Figure 1. CBP6-522R5BG+ Functional Diagram

PAD DESCRIPTION

Function	Pad Number	Description
RF1 (Note 2)	1	Connects to RF Input Port
RF2 (Note 2)	12	Connects to RF Output Port
GROUND	2-11, 13-17	Connects to Ground on PCB, (See drawing PL-654)
NC	-	No connection, not used internally. See drawing PL-654 for connection to PCB

SUGGESTED PCB LAYOUT (PL-654)



NOTES:

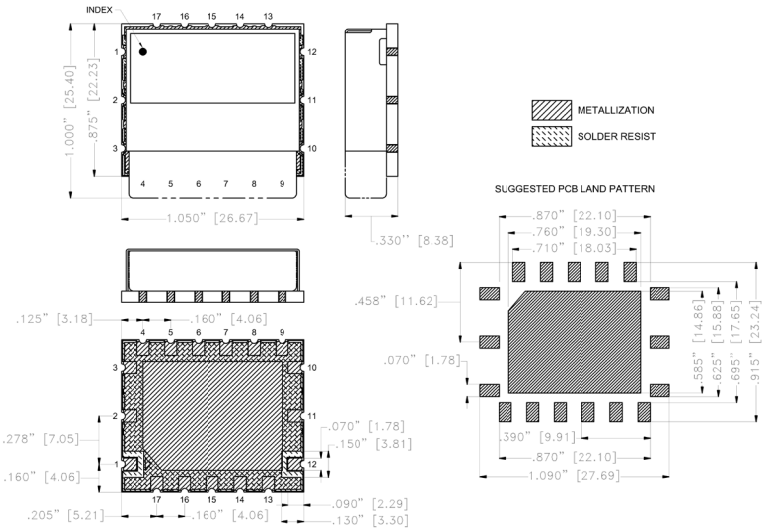
1. TRACE WIDTH IS SHOWN FOR ROGERS (RO4350B) WITH DIELECTRIC THICKNESS .023"±.002", COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

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

DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

Figure 2. Suggested PCB Layout PL-654

CASE STYLE DRAWING



Weight: 15 gram
Dimensions are in inches (mm). Tolerances: 2Pl. ± .03; 3Pl. ± .015

PRODUCT MARKING*: CBP6-522R5BG

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

(CERAMIC RESONATOR) SURFACE MOUNT

Bandpass Filter

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50Ω 519 to 526 MHz

ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASH BOARD. CLICK HERE

Performance Data and Graphs	Data Graphs S-Parameter (S2P Files) Data Set (.zip file) De-embedded to device pads
Case Style	KV1710-3 Lead Finish: Electroless Nickel Immersion Gold
RoHS Status	Compliant
Tape and Reel	-
Suggested Layout for PCB Design	PL-654
Evaluation Board	TB-CBP6522R5BG+
	Gerber File
Environmental Rating	ENV54

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

Surface Mount Bandpass Filter CBP6-522R5BG+

Typical Performance Data

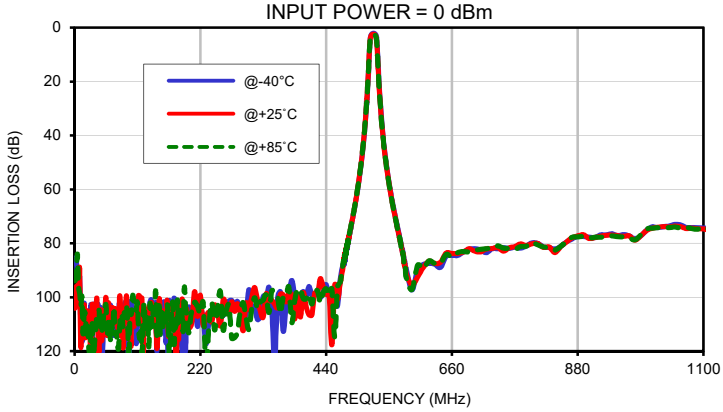
FREQ.	INSERTION LOSS			INPUT RETURN LOSS			OUTPUT RETURN LOSS		
(MHz)	(dB)			(dB)			(dB)		
	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C	@-40°C	@+25°C	@+85°C
1.0	86.62	104.04	93.90	0.05	0.05	0.05	0.05	0.05	0.05
3.0	85.38	95.97	92.48	0.05	0.05	0.05	0.05	0.05	0.05
9.0	92.22	89.31	98.75	0.05	0.05	0.05	0.04	0.05	0.04
19.0	111.56	114.87	106.44	0.04	0.04	0.04	0.04	0.04	0.04
25.0	106.03	111.80	119.12	0.04	0.04	0.04	0.04	0.04	0.04
35.0	103.44	103.61	117.12	0.04	0.04	0.04	0.04	0.04	0.04
45.0	103.79	104.58	111.64	0.03	0.04	0.04	0.03	0.03	0.03
55.0	104.21	100.27	102.74	0.03	0.03	0.03	0.03	0.03	0.03
100.0	101.29	105.18	104.64	0.02	0.03	0.03	0.02	0.02	0.02
120.0	115.37	122.29	108.84	0.01	0.02	0.03	0.01	0.02	0.02
140.0	108.72	104.96	104.48	0.01	0.02	0.03	0.01	0.02	0.02
160.0	116.81	105.67	108.93	0.01	0.02	0.02	0.01	0.02	0.02
180.0	110.37	106.28	101.01	0.00	0.02	0.02	0.00	0.02	0.02
200.0	103.52	111.52	113.05	0.00	0.02	0.02	0.00	0.02	0.02
220.0	104.06	99.22	105.96	0.00	0.02	0.03	0.00	0.02	0.02
240.0	108.29	109.21	101.87	0.00	0.02	0.03	0.00	0.02	0.02
260.0	106.81	100.92	112.19	0.00	0.02	0.03	0.00	0.02	0.03
280.0	102.84	105.21	114.99	0.00	0.02	0.03	0.00	0.02	0.03
300.0	106.77	102.25	107.58	0.00	0.02	0.02	0.00	0.02	0.02
320.0	108.25	101.02	104.14	0.00	0.02	0.03	0.00	0.02	0.03
340.0	96.29	101.30	105.68	0.00	0.02	0.03	0.00	0.02	0.03
360.0	97.99	98.90	105.99	0.00	0.02	0.03	0.00	0.03	0.03
400.0	97.86	98.31	100.49	0.00	0.03	0.04	0.01	0.03	0.04
420.0	99.03	98.51	98.37	0.01	0.03	0.04	0.01	0.04	0.04
510.0	31.35	30.62	30.62	0.40	0.50	0.53	0.40	0.50	0.53
519.0	2.65	2.91	3.02	17.83	18.29	18.27	17.84	18.51	18.42
520.0	2.40	2.67	2.78	20.37	22.10	22.20	20.60	23.00	22.82
521.0	2.25	2.54	2.65	25.99	23.95	23.80	26.93	25.29	24.70
522.5	2.20	2.50	2.60	19.45	19.18	19.09	19.62	19.42	19.26
523.0	2.20	2.50	2.61	19.10	19.50	19.42	19.29	19.73	19.58
524.0	2.21	2.53	2.63	21.51	23.04	22.91	22.10	23.65	23.36
525.0	2.27	2.63	2.73	25.50	24.00	23.97	27.75	24.92	24.66
526.0	2.42	2.84	2.95	21.33	20.27	20.32	21.83	20.40	20.37
530.0	9.34	10.91	11.04	3.12	2.79	2.85	3.11	2.77	2.83
533.0	21.89	23.09	23.16	0.68	0.73	0.76	0.69	0.74	0.77
535.0	28.56	29.54	29.60	0.38	0.44	0.46	0.40	0.45	0.47
538.0	36.60	37.37	37.42	0.21	0.26	0.28	0.22	0.27	0.29
600.0	89.71	92.46	88.18	0.00	0.03	0.05	0.01	0.04	0.06
620.0	87.44	86.60	86.49	0.00	0.03	0.05	0.01	0.04	0.05
640.0	88.89	87.03	87.34	0.01	0.04	0.05	0.01	0.05	0.06
660.0	84.48	83.78	85.03	0.00	0.04	0.05	0.01	0.05	0.06
680.0	83.25	83.24	83.04	0.01	0.04	0.06	0.02	0.05	0.06
700.0	81.97	82.93	82.60	0.01	0.04	0.06	0.02	0.05	0.06
720.0	83.48	82.08	81.99	0.01	0.04	0.06	0.02	0.05	0.07
740.0	81.98	81.56	80.94	0.00	0.04	0.06	0.02	0.05	0.07
760.0	81.91	81.67	81.92	0.01	0.05	0.06	0.02	0.06	0.07
780.0	81.79	80.23	81.19	0.01	0.05	0.07	0.03	0.06	0.08
800.0	79.82	80.18	79.76	0.02	0.06	0.07	0.03	0.07	0.08
820.0	81.33	81.54	81.32	0.02	0.06	0.08	0.03	0.07	0.09
840.0	82.09	83.41	82.50	0.02	0.06	0.08	0.03	0.07	0.09
860.0	79.49	79.59	79.42	0.02	0.06	0.08	0.03	0.07	0.09
880.0	77.40	77.28	77.61	0.02	0.07	0.08	0.04	0.08	0.09
900.0	77.70	78.22	78.03	0.02	0.07	0.09	0.04	0.08	0.09
920.0	76.89	77.40	77.72	0.03	0.07	0.09	0.04	0.09	0.10
940.0	76.45	76.86	77.26	0.03	0.08	0.09	0.05	0.09	0.11
960.0	76.77	77.39	77.62	0.04	0.08	0.10	0.05	0.10	0.11
980.0	78.33	78.84	78.71	0.04	0.08	0.10	0.05	0.10	0.11
1000.0	75.26	75.30	74.77	0.03	0.08	0.10	0.05	0.10	0.11
1050.0	72.94	73.61	73.96	0.05	0.09	0.11	0.07	0.11	0.13
1100.0	74.32	74.64	73.95	0.06	0.11	0.13	0.08	0.13	0.14

Typical Performance Data

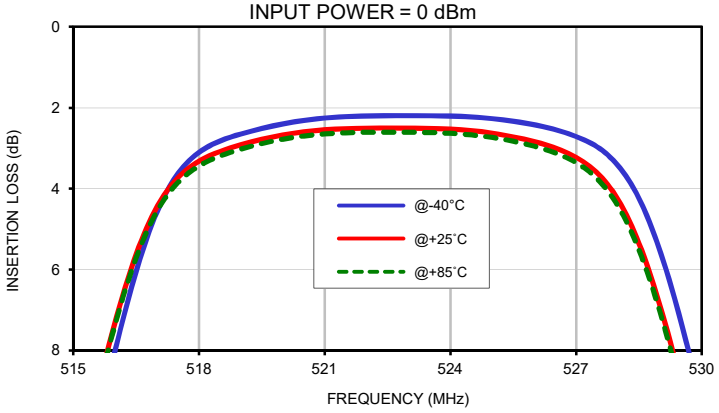
FREQ. (MHz)	GROUP DELAY (nsec)		
	@-40°C	@+25˚C	@+85˚C
519.00	91.09	87.84	87.53
519.25	88.31	85.58	85.32
519.50	85.92	83.67	83.46
519.75	83.92	82.06	81.88
520.00	82.27	80.72	80.56
520.25	80.90	79.58	79.44
520.50	79.74	78.59	78.46
520.75	78.75	77.71	77.60
521.00	77.87	76.94	76.85
521.25	77.09	76.26	76.17
521.50	76.39	75.66	75.58
521.75	75.77	75.15	75.07
522.00	75.24	74.74	74.66
522.25	74.81	74.44	74.38
522.50	74.48	74.26	74.20
522.75	74.26	74.19	74.14
523.00	74.18	74.26	74.21
523.25	74.22	74.45	74.40
523.50	74.39	74.76	74.71
523.75	74.69	75.18	75.14
524.00	75.11	75.71	75.68
524.25	75.64	76.33	76.30
524.50	76.26	77.05	77.02
524.75	76.99	77.88	77.86
525.00	77.83	78.84	78.83
525.25	78.79	79.95	79.93
525.50	79.88	81.22	81.21
525.75	81.16	82.73	82.71
526.00	82.68	84.51	84.49

Typical Performance Curves

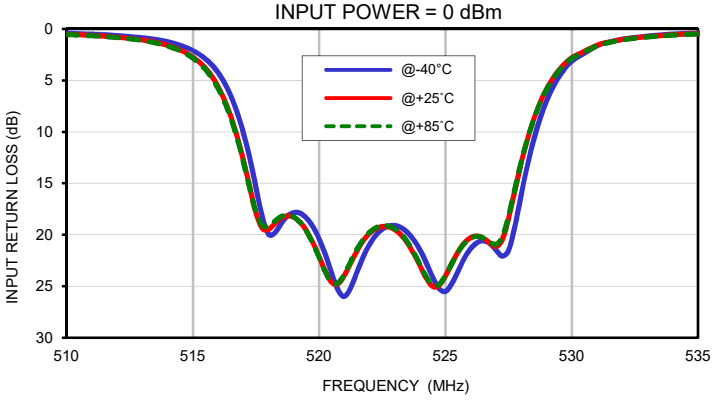
INSERTION LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



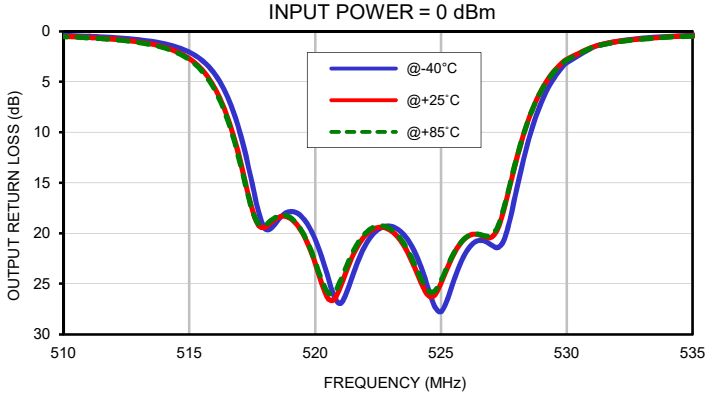
INSERTION LOSS vs. TEMPERATURE (Zoomed)
INPUT POWER = 0 dBm



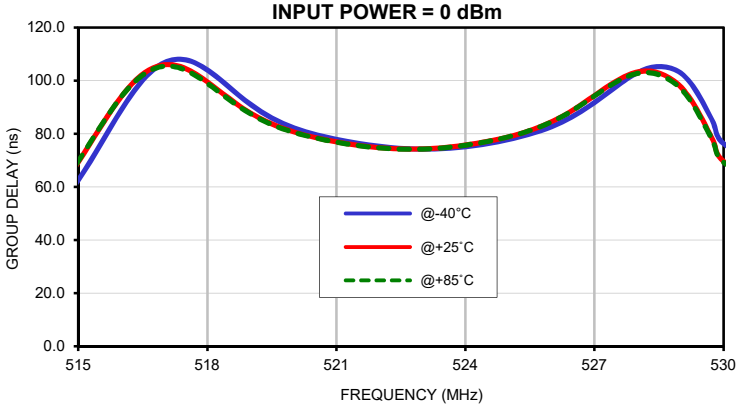
INPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



OUTPUT RETURN LOSS vs. TEMPERATURE
INPUT POWER = 0 dBm



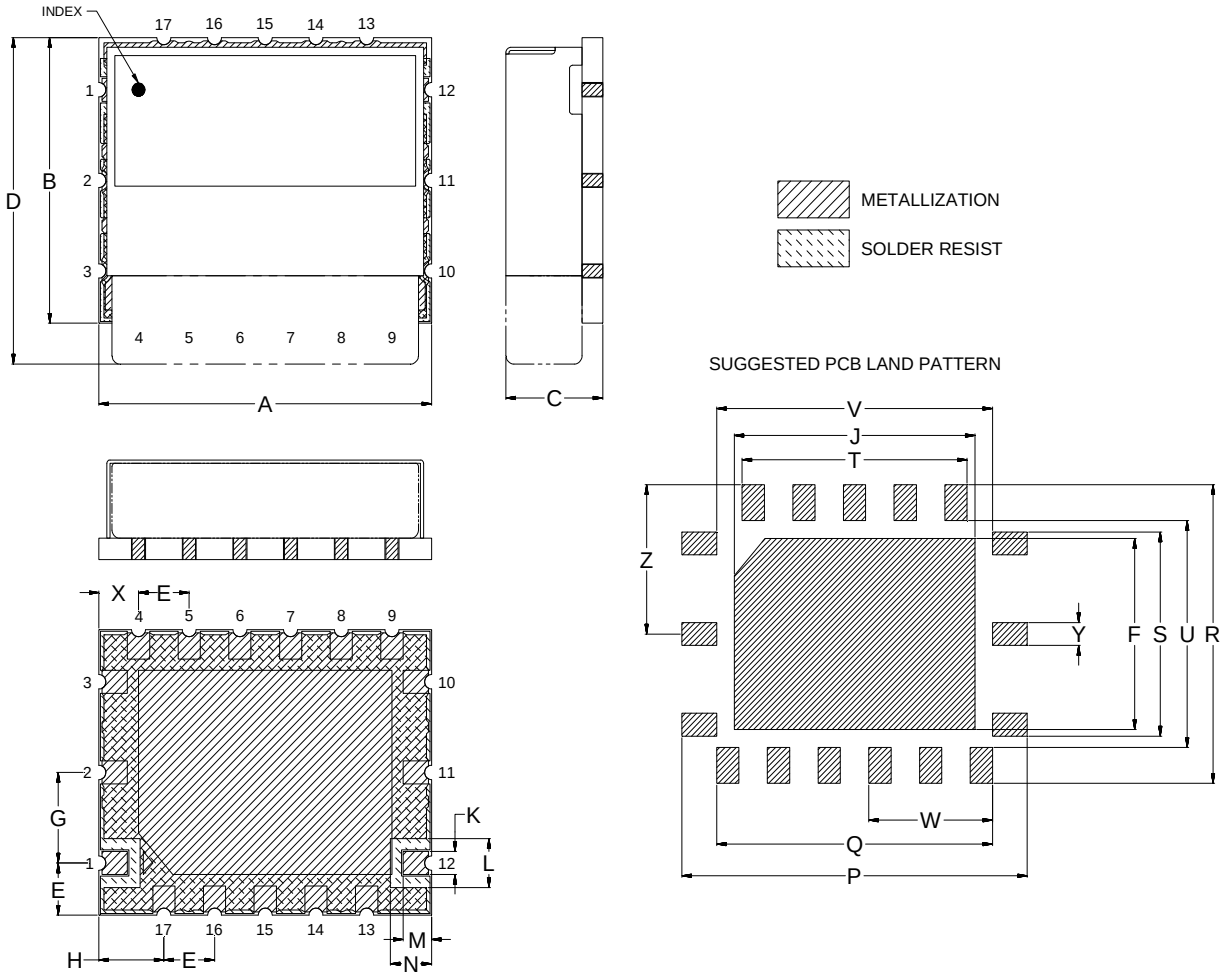
GROUP DELAY vs. TEMPERATURE
INPUT POWER = 0 dBm



Case Style KV

KV1710-3

Outline Dimensions



CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N
KV1710-3	1.050 (26.67)	.875 (22.23)	.330 (8.38)	1.000 (25.40)	.160 (4.06)	.585 (14.86)	.278 (7.05)	.205 (5.21)	.760 (19.30)	.070 (1.78)	.150 (3.81)	.090 (2.29)	.130 (3.30)

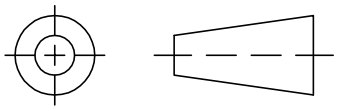
CASE#	P	Q	R	S	T	U	V	W	X	Y	Z	WT.GRAM
KV1710-3	1.090 (27.69)	.870 (22.10)	.915 (23.24)	.625 (15.88)	.710 (18.03)	.695 (17.65)	.870 (22.10)	.390 (9.91)	.125 (3.18)	.070 (1.78)	.458 (11.62)	15

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

Notes:

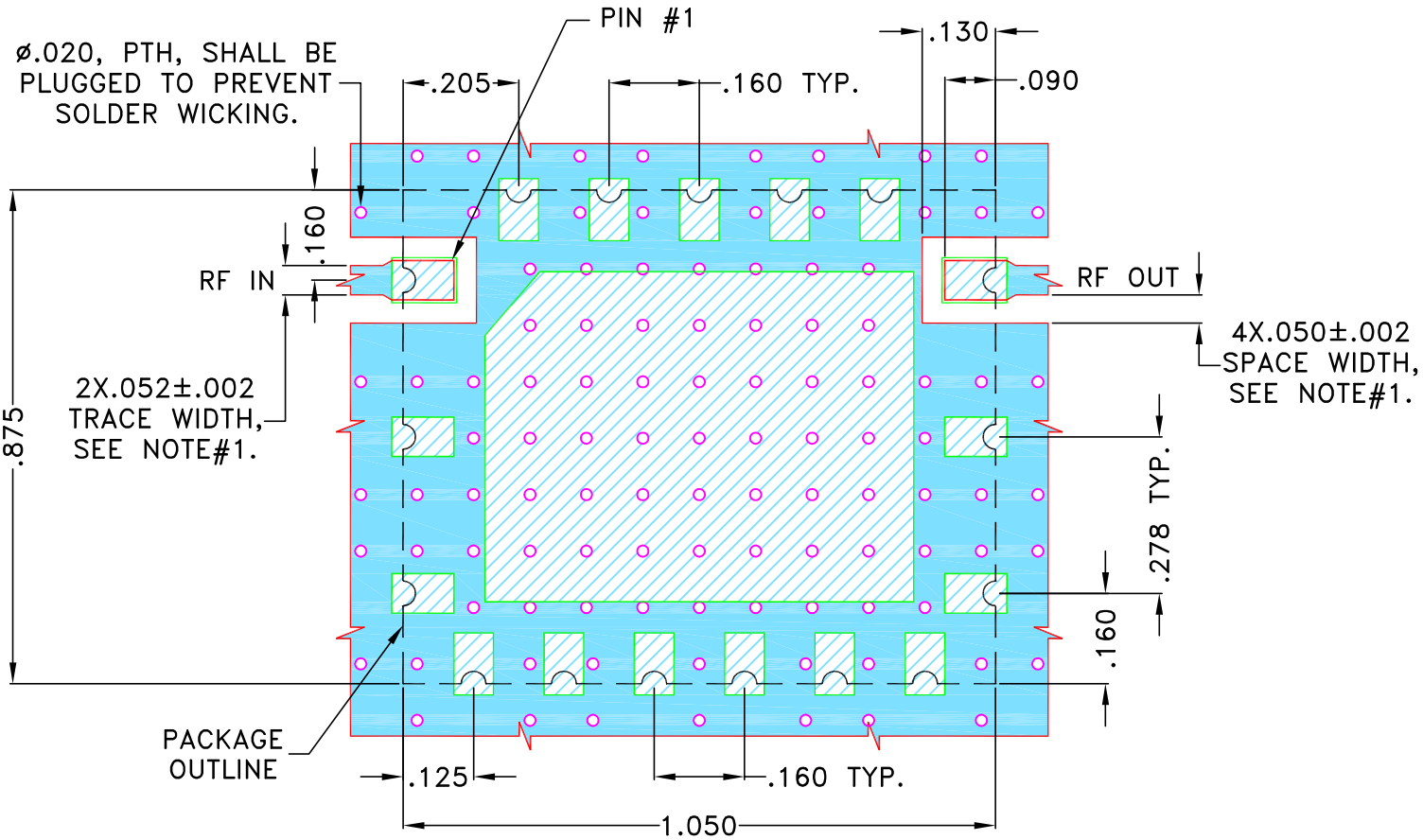
1. Case material: Nickel-Silver alloy.
2. Base: Printed wiring laminate.
3. Termination finish:
   For RoHS Case Styles: 2-5µinch (.05-.13microns) Gold over 120-240µinch (3.05-6.10microns) Nickel plate.
   For RoHS-5 Case Styles: Tin-Lead plate.

THIRD ANGLE PROJECTION



REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M176568	NEW RELEASE	OCT 19	AP	VC

SUGGESTED MOUNTING CONFIGURATION FOR KV1710-3 CASE STYLE



NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS (RO4350B) WITH DIELECTRIC THICKNESS .023"±.002". 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

UNLESS OTHERWISE SPECIFIED		INITIALS	DATE
DIMENSIONS ARE IN INCHES	DRAWN	AP	23 OCT 19
TOLERANCES ON:	CHECKED	MD	23 OCT 19
2 PL DECIMALS ±	APPROVED	KKK	23 OCT 19
3 PL DECIMALS ± .005"			
ANGLES ±			
FRACTIONS ±			

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

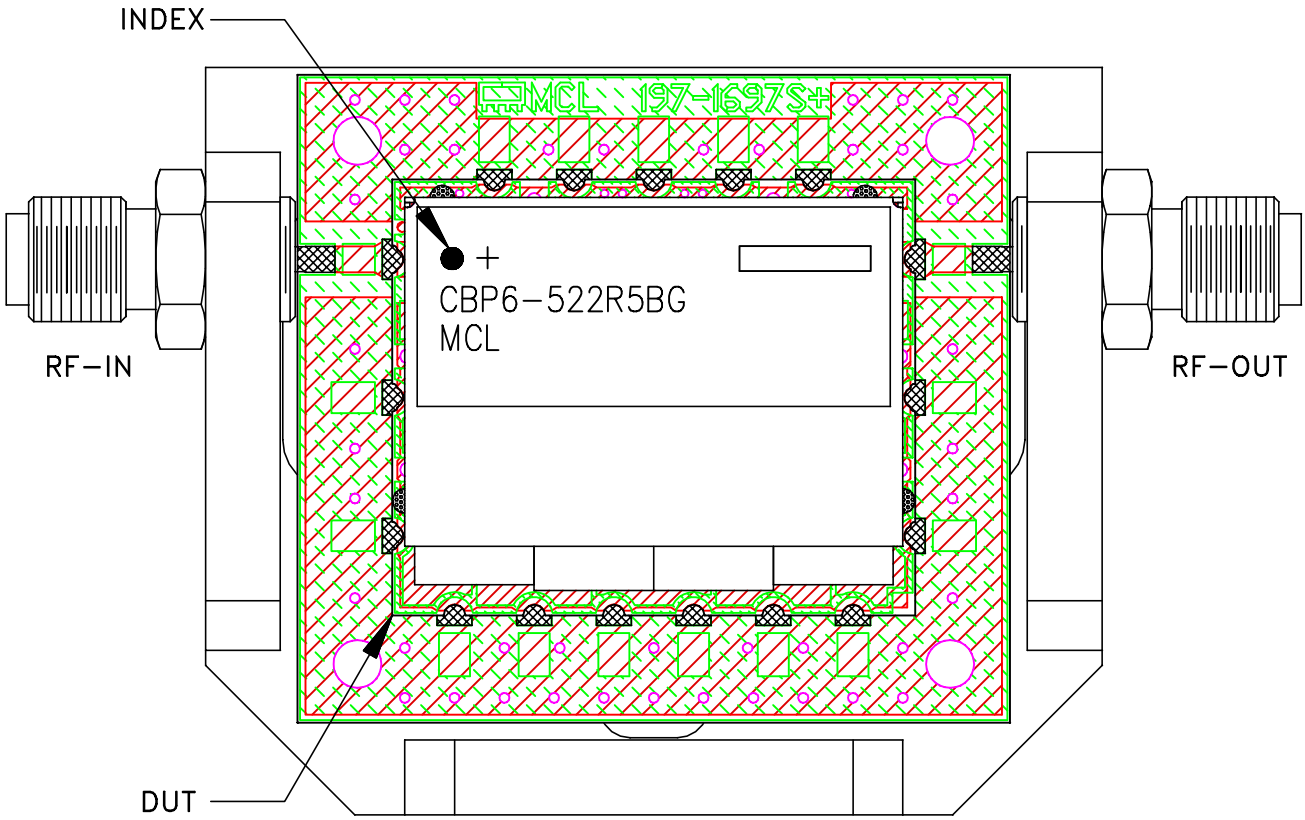
Mini-Circuits®
13 Neptune Avenue
Brooklyn NY 11235

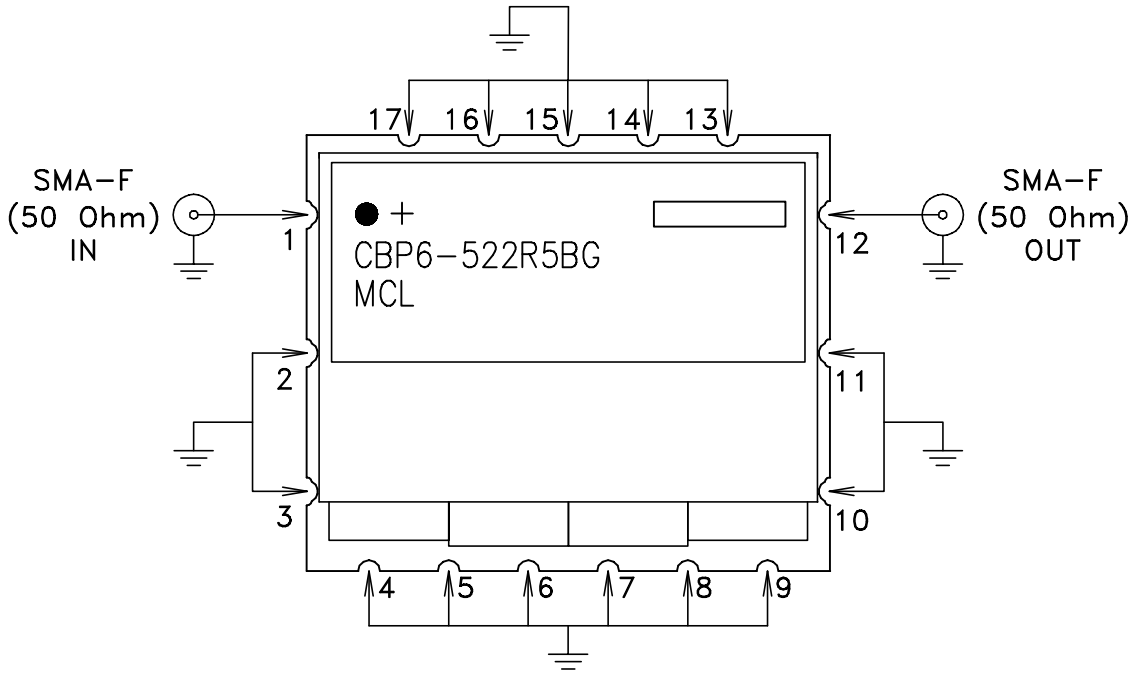
PL, KV1710-3, TB-1123+, 50 Ohm

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-654	OR
FILE: 98PL654		SCALE: 3:1	SHEET: 1 OF 1

Evaluation Board and Circuit

TB-CBP6522R5BG+





Schematic diagram

Notes:

1. 50 Ohm SMA female connectors.
2. PCB Material: ROGERS (RO4350B) OR Equivalent Dielectric Constant=3.48, Thickness=.023 inch.

Mini-Circuits®

Mini-Circuits

Environmental Specifications ENV54

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