

Surface Mount

# Bandpass Filter

BPF-BC300+

50Ω      290 to 310 MHz



## The Big Deal

- Narrow bandwidth
- High Rejection
- Miniature shielded package

*Generic photo used for illustration purposes only*

CASE STYLE: TS2825

## Product Overview

BPF-BC300+ is a 50Ω bandpass filter in a shielded package fabricated using SMT technology. This bandpass filter covers from 290 to 310 MHz. This filter build with high Q capacitors and wire welded inductors for high reliability. This filter offers sharp rejection and low insertion loss for use in Test and measurement system applications.

## Key Features

| Feature            | Advantages   |
|--------------------|--|
| Low insertion loss | Can be used in Transmitters/Receivers application  |
| Good rejection     | This enables the filter attenuate spurious signals and reject harmonics for broad frequency band |
| Shielded package   | The small surface mount package enables the BPF-BC300+ to be used in compact design              |

### 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/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp)



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Surface Mount

# Bandpass Filter

50Ω

290 to 310 MHz

BPF-BC300+

## Features

- Narrow bandwidth
- High rejection
- Miniature shielded package

## Applications

- Test and measurement
- Harmonic rejection
- Transmitters / Receivers



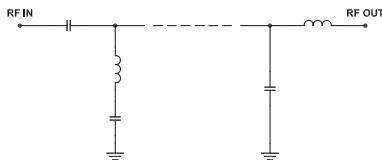
Generic photo used for illustration purposes only

CASE STYLE: TS2825

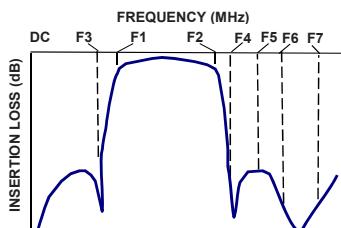
## Electrical Specifications at 25°C

| Parameter        | F#               | Frequency (MHz) | Min.        | Typ. | Max. | Unit |
|------------------|------------------|-----------------|-------------|------|------|------|
| Pass Band        | Center Frequency | —               | —           | 300  | —    | MHz  |
|                  | Insertion Loss   | F1-F2           | 290 - 310   | —    | 2.2  | dB   |
|                  | VSWR             | F1-F2           | 290 - 310   | —    | 1.4  | :1   |
| Stop Band, Lower | Insertion Loss   | DC-F3           | DC - 240    | 40   | 50   | —    |
|                  | VSWR             | DC-F3           | DC - 240    | —    | 20   | —    |
|                  | Insertion Loss   | F4-F5           | 350 - 1000  | 40   | 45   | —    |
| Stop Band, Upper | Insertion Loss   | F5-F6           | 1000 - 3000 | 30   | 40   | —    |
|                  | VSWR             | F6-F7           | 3000 - 4000 | 20   | 25   | —    |
|                  | Insertion Loss   | F4-F7           | 350 - 4000  | —    | 20   | —    |
|                  | VSWR             | —               | —           | —    | —    | :1   |

## Functional Schematic



## Typical Frequency Response

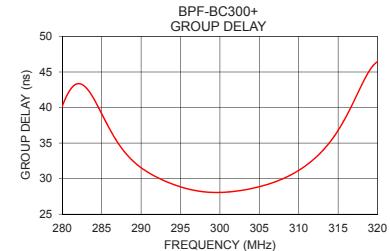
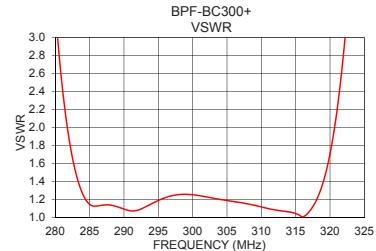
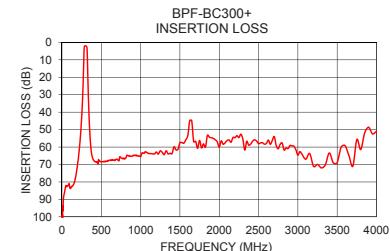
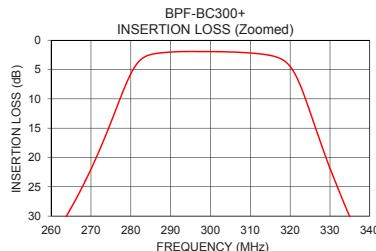


| Maximum Ratings       |                |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C  |
| Storage Temperature   | -55°C to 100°C |
| RF Power Input        | 0.5 W          |

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

## Typical Performance Data at 25°C

| Frequency (MHz) | Insertion Loss (dB) | VSWR (:1) | Frequency (MHz) | Group Delay (nsec) |
|-----------------|---------------------|-----------|-----------------|--------------------|
| 1               | 106.97              | 353.00    | 290             | 31.52              |
| 10              | 96.68               | 347.32    | 291             | 30.80              |
| 100             | 83.47               | 183.51    | 292             | 30.19              |
| 240             | 50.46               | 68.80     | 293             | 29.67              |
| 264             | 29.82               | 35.32     | 294             | 29.22              |
| 270             | 22.00               | 23.10     | 295             | 28.85              |
| 282             | 3.65                | 1.88      | 296             | 28.53              |
| 290             | 2.02                | 1.09      | 297             | 28.30              |
| 300             | 1.95                | 1.25      | 298             | 28.14              |
| 310             | 2.18                | 1.12      | 299             | 28.07              |
| 318             | 3.29                | 1.19      | 300             | 28.06              |
| 325             | 12.24               | 6.08      | 301             | 28.11              |
| 335             | 30.14               | 21.35     | 302             | 28.23              |
| 350             | 48.25               | 41.49     | 303             | 28.39              |
| 500             | 68.44               | 98.08     | 304             | 28.60              |
| 1000            | 65.53               | 154.18    | 305             | 28.86              |
| 1650            | 44.89               | 118.38    | 306             | 29.17              |
| 1700            | 56.67               | 275.53    | 307             | 29.54              |
| 3000            | 64.64               | 149.24    | 308             | 29.99              |
| 4000            | 51.06               | 73.35     | 310             | 31.16              |



## +RoHS Compliant

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

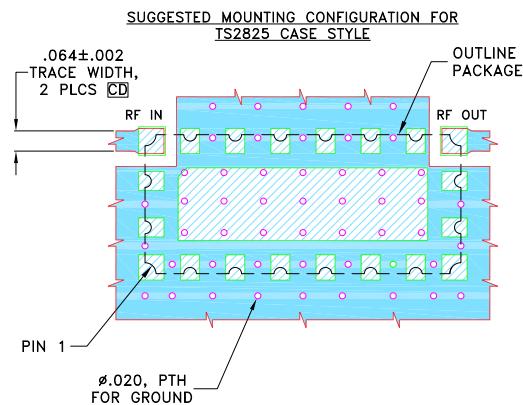
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**Pad Connections**

|        |                   |
|--------|-------------------|
| INPUT  | 18                |
| OUTPUT | 11                |
| GROUND | 1-10, 12-17,19,20 |

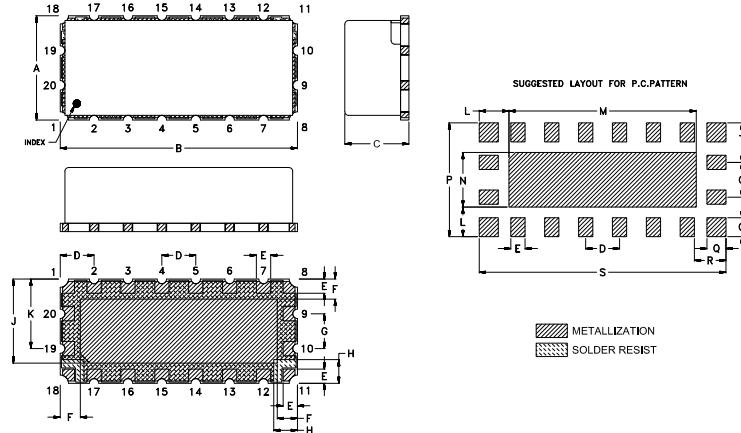
**Demo Board MCL P/N: TB-1097+  
Suggested PCB Layout (PL-639)**

**NOTES:**

1. TRACE WIDTH IS SHOWN FOR ROGERS (R04350B) WITH DIELECTRIC THICKNESS .030"±.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

**Outline Drawing****Outline Dimensions ( inch mm )**

| A     | B     | C    | D     | E    | F     | G     | H    | J     | K    |
|-------|-------|------|-------|------|-------|-------|------|-------|------|
| .440  | 1.000 | .270 | .143  | .060 | .085  | .147  | .100 | .355  | .293 |
| 11.18 | 25.40 | 6.86 | 3.63  | 1.52 | 2.16  | 3.73  | 2.54 | 9.02  | 7.45 |
| L     | M     | N    | P     | Q    | R     | S     | T    | Wt.   |      |
| .125  | .790  | .230 | .480  | .080 | .0133 | 1.040 | .167 | grams |      |
| 3.18  | 20.07 | 5.84 | 12.19 | 2.03 | 3.37  | 26.42 | 4.23 |       | 2    |

*Note: Please refer to case style drawing for details*

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# Band Pass Filter

# BPF-BC300+

## Typical Performance Data

| FREQ.<br>(MHz) | INSERTION LOSS<br>(dB) |        |        | INPUT RETURN LOSS<br>(dB) |        |        | OUTPUT RETURN LOSS<br>(dB) |        |        |
|----------------|------------------------|--------|--------|---------------------------|--------|--------|----------------------------|--------|--------|
|                | @-40°C                 | @+25°C | @+85°C | @-40°C                    | @+25°C | @+85°C | @-40°C                     | @+25°C | @+85°C |
|                | 1                      | 98.75  | 106.97 | 108.94                    | 0.05   | 0.05   | 0.05                       | 0.05   | 0.05   |
| 10             | 94.74                  | 96.68  | 93.51  | 0.05                      | 0.05   | 0.05   | 0.05                       | 0.05   | 0.05   |
| 50             | 82.77                  | 82.09  | 82.57  | 0.03                      | 0.06   | 0.05   | 0.04                       | 0.06   | 0.05   |
| 100            | 82.31                  | 83.47  | 82.51  | 0.05                      | 0.09   | 0.07   | 0.06                       | 0.10   | 0.08   |
| 110            | 82.64                  | 83.72  | 81.77  | 0.06                      | 0.11   | 0.09   | 0.07                       | 0.11   | 0.10   |
| 120            | 82.20                  | 82.60  | 82.04  | 0.07                      | 0.12   | 0.10   | 0.08                       | 0.12   | 0.11   |
| 130            | 82.56                  | 82.59  | 82.32  | 0.08                      | 0.13   | 0.11   | 0.08                       | 0.13   | 0.12   |
| 140            | 81.62                  | 81.95  | 81.95  | 0.08                      | 0.13   | 0.12   | 0.09                       | 0.14   | 0.13   |
| 150            | 81.56                  | 81.21  | 80.65  | 0.09                      | 0.14   | 0.12   | 0.10                       | 0.14   | 0.14   |
| 160            | 79.52                  | 79.87  | 78.88  | 0.10                      | 0.15   | 0.13   | 0.10                       | 0.15   | 0.14   |
| 170            | 77.55                  | 77.94  | 78.23  | 0.10                      | 0.15   | 0.13   | 0.11                       | 0.16   | 0.15   |
| 180            | 75.67                  | 75.65  | 75.57  | 0.11                      | 0.16   | 0.14   | 0.12                       | 0.17   | 0.16   |
| 190            | 72.59                  | 72.59  | 72.79  | 0.12                      | 0.17   | 0.15   | 0.13                       | 0.17   | 0.17   |
| 200            | 69.52                  | 69.32  | 69.44  | 0.13                      | 0.18   | 0.16   | 0.13                       | 0.18   | 0.17   |
| 220            | 61.44                  | 61.47  | 61.37  | 0.16                      | 0.20   | 0.19   | 0.16                       | 0.20   | 0.20   |
| 240            | 50.51                  | 50.46  | 50.36  | 0.20                      | 0.25   | 0.24   | 0.21                       | 0.26   | 0.26   |
| 250            | 43.39                  | 43.27  | 43.11  | 0.25                      | 0.30   | 0.30   | 0.26                       | 0.32   | 0.33   |
| 260            | 34.40                  | 34.22  | 34.01  | 0.34                      | 0.41   | 0.42   | 0.37                       | 0.44   | 0.46   |
| 264            | 30.03                  | 29.82  | 29.58  | 0.42                      | 0.49   | 0.51   | 0.46                       | 0.54   | 0.57   |
| 270            | 22.28                  | 22.00  | 21.70  | 0.64                      | 0.75   | 0.81   | 0.71                       | 0.84   | 0.90   |
| 272            | 19.28                  | 18.98  | 18.66  | 0.80                      | 0.93   | 1.01   | 0.88                       | 1.03   | 1.13   |
| 275            | 14.34                  | 14.02  | 13.68  | 1.25                      | 1.47   | 1.62   | 1.38                       | 1.62   | 1.79   |
| 280            | 5.83                   | 5.73   | 5.57   | 4.66                      | 5.39   | 6.03   | 4.96                       | 5.76   | 6.47   |
| 282            | 3.56                   | 3.65   | 3.66   | 9.14                      | 10.30  | 11.35  | 9.69                       | 11.00  | 12.23  |
| 286            | 2.06                   | 2.30   | 2.44   | 25.09                     | 24.59  | 24.00  | 27.97                      | 26.93  | 25.76  |
| 290            | 1.79                   | 2.02   | 2.15   | 26.20                     | 27.18  | 27.80  | 27.40                      | 28.99  | 29.68  |
| 295            | 1.69                   | 1.93   | 2.07   | 22.30                     | 21.33  | 20.69  | 23.35                      | 22.43  | 21.83  |
| 300            | 1.71                   | 1.95   | 2.08   | 19.14                     | 19.04  | 18.96  | 20.72                      | 20.96  | 21.09  |
| 305            | 1.76                   | 2.01   | 2.15   | 21.26                     | 21.35  | 21.51  | 23.36                      | 23.86  | 24.13  |
| 310            | 1.91                   | 2.18   | 2.35   | 24.64                     | 25.25  | 26.01  | 21.98                      | 22.23  | 22.34  |
| 315            | 2.25                   | 2.60   | 2.82   | 31.07                     | 33.74  | 37.72  | 22.50                      | 22.27  | 22.23  |
| 320            | 3.85                   | 4.49   | 4.99   | 12.37                     | 11.66  | 10.97  | 10.27                      | 9.61   | 8.99   |
| 325            | 11.32                  | 12.24  | 12.95  | 2.78                      | 2.88   | 2.87   | 2.33                       | 2.38   | 2.37   |
| 328            | 17.29                  | 18.13  | 18.77  | 1.52                      | 1.66   | 1.69   | 1.27                       | 1.38   | 1.41   |
| 330            | 21.07                  | 21.85  | 22.44  | 1.14                      | 1.28   | 1.31   | 0.97                       | 1.08   | 1.11   |
| 335            | 29.48                  | 30.14  | 30.63  | 0.69                      | 0.81   | 0.83   | 0.61                       | 0.71   | 0.73   |
| 340            | 36.58                  | 37.14  | 37.56  | 0.50                      | 0.61   | 0.61   | 0.45                       | 0.54   | 0.55   |
| 350            | 47.70                  | 48.25  | 48.47  | 0.33                      | 0.42   | 0.41   | 0.31                       | 0.38   | 0.38   |
| 400            | 67.36                  | 67.38  | 67.51  | 0.17                      | 0.23   | 0.22   | 0.15                       | 0.21   | 0.21   |
| 450            | 68.79                  | 68.81  | 68.70  | 0.13                      | 0.19   | 0.19   | 0.12                       | 0.18   | 0.18   |
| 500            | 68.24                  | 68.44  | 68.23  | 0.12                      | 0.18   | 0.18   | 0.11                       | 0.17   | 0.17   |
| 600            | 67.42                  | 67.69  | 67.75  | 0.09                      | 0.16   | 0.17   | 0.08                       | 0.16   | 0.15   |
| 800            | 66.62                  | 66.76  | 66.37  | 0.04                      | 0.14   | 0.13   | 0.05                       | 0.13   | 0.12   |
| 1000           | 65.73                  | 65.53  | 65.06  | 0.00                      | 0.11   | 0.10   | 0.00                       | 0.10   | 0.11   |
| 1200           | 62.21                  | 62.86  | 62.75  | 0.05                      | 0.07   | 0.07   | 0.03                       | 0.07   | 0.08   |
| 1400           | 64.05                  | 63.76  | 64.13  | 0.09                      | 0.04   | 0.05   | 0.06                       | 0.06   | 0.06   |
| 1600           | 53.57                  | 53.52  | 53.30  | 0.09                      | 0.05   | 0.07   | 0.05                       | 0.09   | 0.11   |
| 1650           | 44.42                  | 44.89  | 45.38  | 0.02                      | 0.15   | 0.18   | 0.16                       | 0.34   | 0.39   |
| 1700           | 56.50                  | 56.67  | 57.72  | 0.08                      | 0.06   | 0.07   | 0.05                       | 0.09   | 0.10   |
| 2000           | 60.60                  | 60.04  | 63.40  | 0.10                      | 0.06   | 0.07   | 0.09                       | 0.06   | 0.09   |
| 2400           | 57.54                  | 58.33  | 56.75  | 0.08                      | 0.09   | 0.11   | 0.07                       | 0.10   | 0.12   |
| 2600           | 58.60                  | 57.95  | 57.80  | 0.06                      | 0.12   | 0.13   | 0.02                       | 0.14   | 0.16   |
| 2800           | 56.41                  | 57.69  | 57.20  | 0.06                      | 0.12   | 0.12   | 0.02                       | 0.15   | 0.16   |
| 3000           | 64.00                  | 64.64  | 64.60  | 0.06                      | 0.12   | 0.13   | 0.02                       | 0.19   | 0.20   |
| 3200           | 71.16                  | 71.06  | 69.23  | 0.07                      | 0.11   | 0.11   | 0.04                       | 0.23   | 0.25   |
| 3400           | 66.46                  | 63.40  | 67.12  | 0.07                      | 0.12   | 0.12   | 0.17                       | 0.39   | 0.43   |
| 3500           | 72.43                  | 68.97  | 69.87  | 0.05                      | 0.15   | 0.15   | 0.29                       | 0.56   | 0.63   |
| 3600           | 63.23                  | 59.18  | 54.06  | 0.01                      | 0.20   | 0.22   | 0.75                       | 1.14   | 1.34   |
| 3800           | 61.05                  | 61.43  | 55.50  | 0.65                      | 0.83   | 0.83   | 3.98                       | 4.48   | 4.78   |
| 4000           | 47.62                  | 51.06  | 68.17  | 0.02                      | 0.24   | 0.27   | 0.93                       | 1.12   | 1.17   |



ISO 9001 ISO 14001 AS 9100 CERTIFIED

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IF/RF MICROWAVE COMPONENTS



*Typical Performance Data*

| FREQ.<br>(MHz) | GROUP DELAY |        |        |
|----------------|-------------|--------|--------|
|                | (nsec)      |        |        |
|                | @-40°C      | @+25°C | @+85°C |
| 280            | 39.62       | 40.20  | 40.69  |
| 281            | 42.39       | 42.49  | 42.57  |
| 282            | 43.74       | 43.36  | 43.04  |
| 283            | 43.55       | 42.80  | 42.21  |
| 284            | 42.14       | 41.22  | 40.49  |
| 285            | 40.01       | 39.12  | 38.41  |
| 286            | 37.74       | 36.99  | 36.38  |
| 287            | 35.71       | 35.13  | 34.65  |
| 288            | 34.05       | 33.62  | 33.26  |
| 289            | 32.76       | 32.45  | 32.18  |
| 290            | 31.77       | 31.52  | 31.33  |
| 291            | 30.99       | 30.80  | 30.63  |
| 292            | 30.35       | 30.19  | 30.05  |
| 293            | 29.81       | 29.67  | 29.55  |
| 294            | 29.35       | 29.22  | 29.12  |
| 295            | 28.95       | 28.85  | 28.76  |
| 296            | 28.61       | 28.53  | 28.47  |
| 297            | 28.35       | 28.30  | 28.25  |
| 298            | 28.17       | 28.14  | 28.12  |
| 299            | 28.07       | 28.07  | 28.06  |
| 300            | 28.03       | 28.06  | 28.08  |
| 301            | 28.07       | 28.11  | 28.15  |
| 302            | 28.17       | 28.23  | 28.28  |
| 303            | 28.31       | 28.39  | 28.46  |
| 304            | 28.51       | 28.60  | 28.68  |
| 305            | 28.76       | 28.86  | 28.96  |
| 306            | 29.05       | 29.17  | 29.28  |
| 307            | 29.40       | 29.54  | 29.67  |
| 308            | 29.82       | 29.99  | 30.14  |
| 309            | 30.33       | 30.51  | 30.69  |
| 310            | 30.94       | 31.16  | 31.37  |
| 311            | 31.65       | 31.91  | 32.15  |
| 312            | 32.50       | 32.81  | 33.09  |
| 313            | 33.53       | 33.89  | 34.22  |
| 314            | 34.77       | 35.19  | 35.58  |
| 315            | 36.29       | 36.78  | 37.22  |
| 316            | 38.15       | 38.69  | 39.16  |
| 317            | 40.35       | 40.88  | 41.32  |
| 318            | 42.75       | 43.19  | 43.49  |
| 319            | 45.06       | 45.22  | 45.25  |
| 320            | 46.71       | 46.45  | 46.08  |



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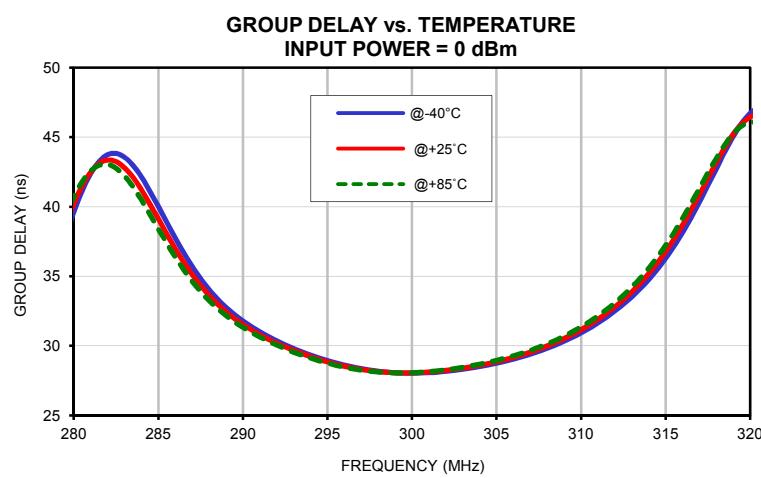
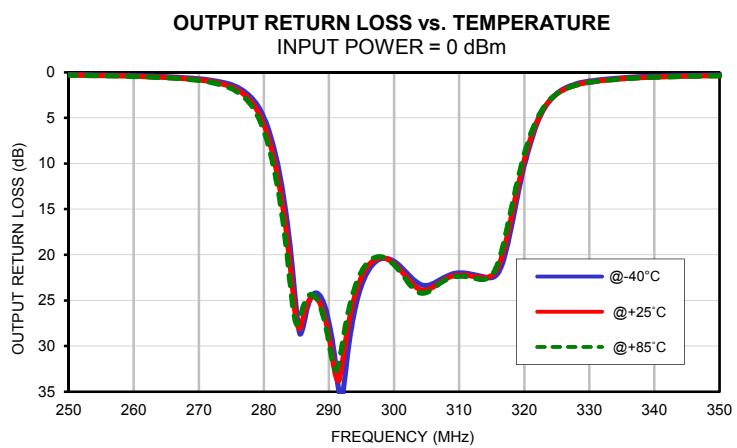
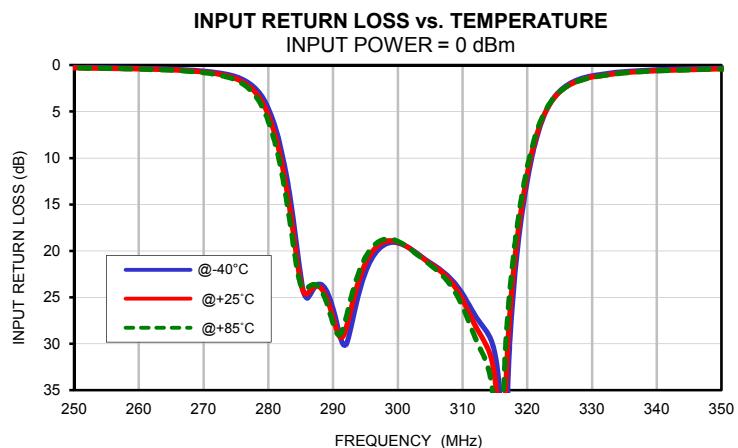
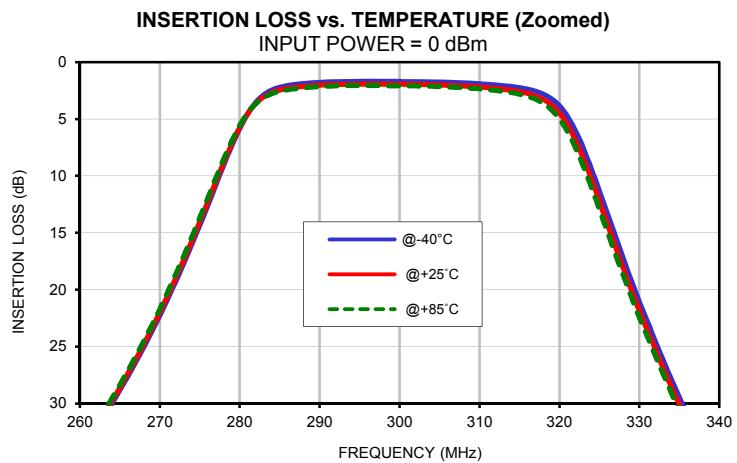
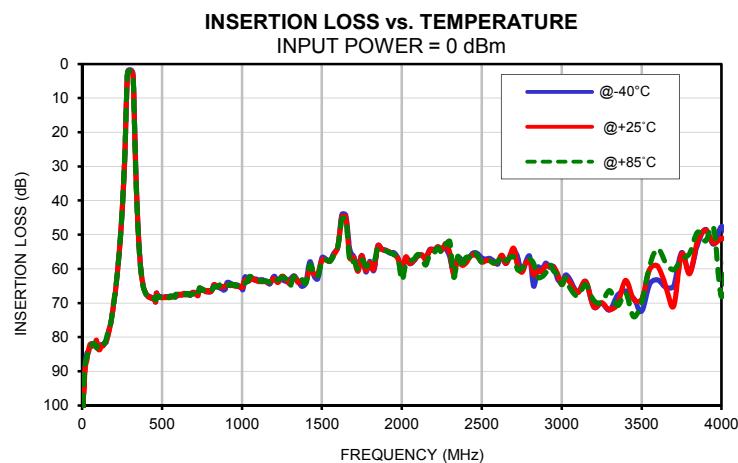
IF/RF MICROWAVE COMPONENTS



REV. OR  
BPF-BC300+  
190607

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## Typical Performance Curves

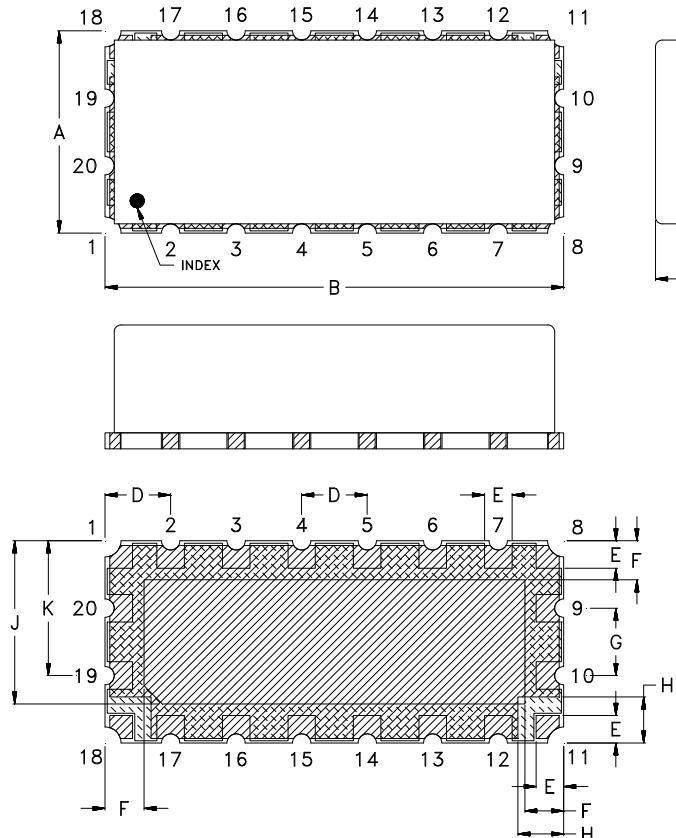


# Case Style

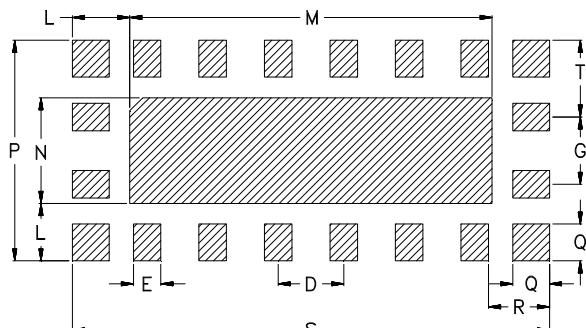
TS

TS2825

## Outline Dimensions



SUGGESTED LAYOUT FOR P.C.PATTERN



METALLIZATION  
 SOLDER RESIST

| CASE#  | A               | B                | C              | D              | E              | F              | G              | H              | J              | K              | L              | M               |
|--------|-----------------|------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|
| TS2825 | .440<br>(11.18) | 1.000<br>(25.40) | .270<br>(6.86) | .143<br>(3.63) | .060<br>(1.52) | .085<br>(2.16) | .147<br>(3.73) | .100<br>(2.54) | .355<br>(9.02) | .293<br>(7.45) | .125<br>(3.18) | .790<br>(20.07) |

| CASE#  | N              | P               | Q              | R              | S                | T              | WT. GRAMS |
|--------|----------------|-----------------|----------------|----------------|------------------|----------------|-----------|
| TS2825 | .230<br>(5.84) | .480<br>(12.19) | .080<br>(2.03) | .133<br>(3.37) | 1.040<br>(26.42) | .167<br>(4.23) | 2         |

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

1. Case material: Nickel-Silver alloy.
2. Base: Printed wiring laminate.
3. Termination finish:  
For RoHS Case Styles: 3-5  $\mu$  inch Gold over 120-240  $\mu$  inch Nickel plate.  
For RoHS-5 Case Styles: Tin-Lead plate.

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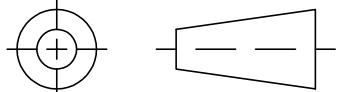
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



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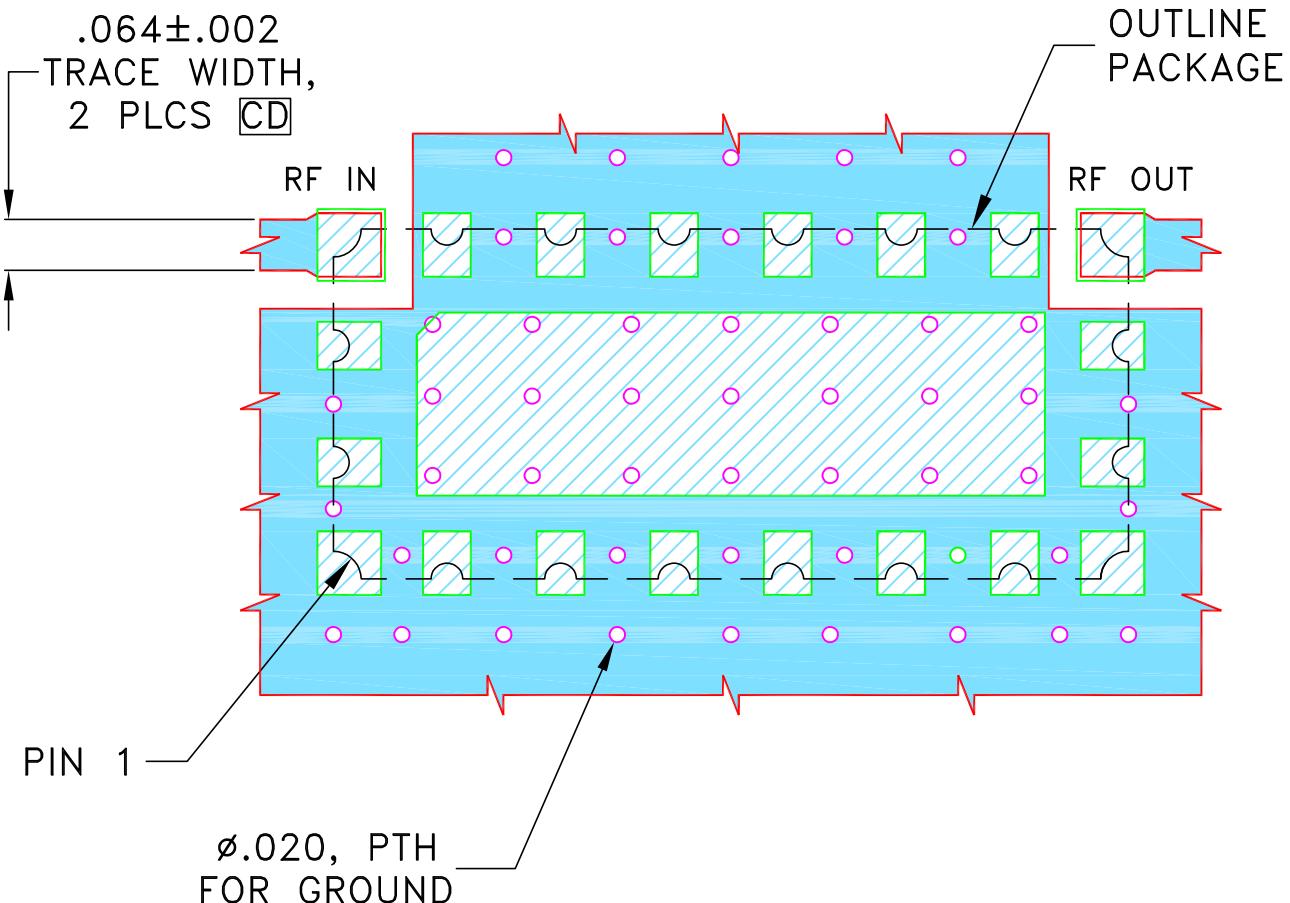
RF/IF MICROWAVE COMPONENTS

## THIRD ANGLE PROJECTION



## REVIEWS

| REV OR | ECN No. M174597 | DESCRIPTION NEW RELEASE | DATE JUN 19 | DR ES | AUTH VC |
|--------|-----------------|-------------------------|-------------|-------|---------|
|        |                 |                         |             |       |         |
|        |                 |                         |             |       |         |
|        |                 |                         |             |       |         |
|        |                 |                         |             |       |         |

SUGGESTED MOUNTING CONFIGURATION FOR  
TS2825 CASE STYLE

## NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS (R04350B) WITH DIELECTRIC THICKNESS  $.030'' \pm .002''$ . 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  
TOLERANCES ON:  
2 PL DECIMALS  $\pm$   
3 PL DECIMALS  $\pm .005$   
ANGLES  $\pm$   
FRACTIONS  $\pm$

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



Mini-Circuits®

13 Neptune Avenue  
Brooklyn NY 11235

PL, TS2825, BPF, TB-1097+, 50 0hm

| SIZE A        | CODE IDENT 15542 | DRAWING NO: 98-PL-639 | REV: OR |
|---------------|------------------|-----------------------|---------|
| FILE: 98PL639 | SCALE: 3.5:1     | SHEET: 1 OF 1         |         |



## Environmental Specifications

ENV12

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<br>Ambient Environment  | Individual Model Data Sheet                   |
| Storage Temperature           | -65° to 150° C<br>Ambient Environment   | Individual Model Data Sheet                   |
| Autoclave                     | 15 psig, 100% RH, 121°C, 96 hours   | JESD22-A102-C, Condition C                    |
| Temperature Cycling           | -65° to 150°C, 100 cycles   | JESD22-A104                                   |
| Temperature Humidity          | 85°C/ 85% RH, 168 hours   | JESD22-113                                    |
| Solder Reflow Heat            | Sn-Pb Eutetic Process: 240°C peak<br>Pb-Free Process: 260°C peak  | J-STD-020, Table 4-1, 4-2 and 5-2; Figure 5-1 |
| Moisture Sensitivity: Level 1 | Bake at 125°C for 24 hours<br>Soak at 85°C/85% RH for 168 hours, Reflow 3 cycles at 240°C peak (Non-RoHS) or 260°C (RoHS) | J-STD-020                                     |
| Solderability                 | 10X magnification, 95% coverage   | JESD22-B102, Method 1: Dip and Look Test      |
| Mechanical Shock              | 50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes   | MIL-STD-202, Method 213, Condition A          |
| 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          |