

# Surface Mount RF Transformer

75Ω

10 to 1800 MHz

TRS1-182-75-7+

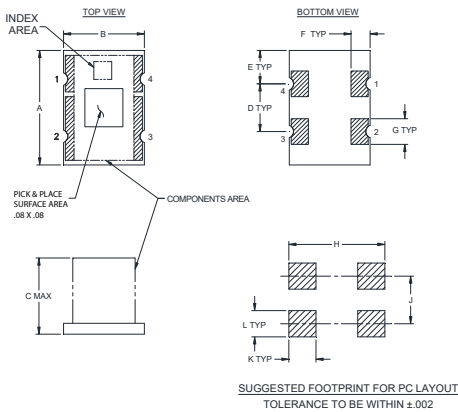
## Maximum Ratings

|                                                                 |                |
|-----------------------------------------------------------------|----------------|
| Operating Temperature                                           | -40°C to 100°C |
| Storage Temperature                                             | -55°C to 125°C |
| RF Power                                                        | 1W             |
| DC Current                                                      | 30mA           |
| Permanent damage may occur if any of these limits are exceeded. |                |

## Pin Connections

|               |   |
|---------------|---|
| PRIMARY DOT   | 1 |
| PRIMARY       | 2 |
| SECONDARY DOT | 3 |
| SECONDARY     | 4 |

## Outline Drawing

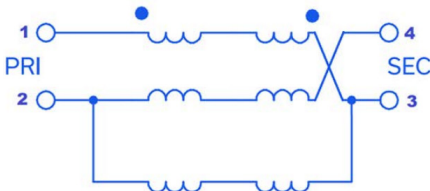


## Outline Dimensions (inch/mm)

|      |      |      |      |      |       |
|------|------|------|------|------|-------|
| A    | B    | C    | D    | E    | F     |
| .240 | .170 | .160 | .100 | .070 | .040  |
| 6.10 | 4.32 | 4.06 | 2.54 | 1.78 | 1.02  |
| G    | H    | J    | K    | L    | wt.   |
| .054 | .202 | .100 | .057 | .055 | grams |
| 1.37 | 5.13 | 2.54 | 1.45 | 1.40 | 2.8   |

Test board for TRS1-182-75-7+ is TB-875+

## Electrical Schematic



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

## Features

- suitable for tin/lead and RoHS solder systems
- wideband, 10 to 1800 MHz
- balanced transmission line
- good return loss, 20 dB typ. at 1 dB band
- excellent amplitude unbalance, 0.3 dB typ.
- aqueous washable
- excellent intermod suppression



Generic photo used for illustration purposes only

CASE STYLE: TT1618-2

+RoHS Compliant

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

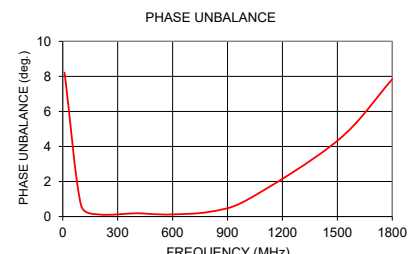
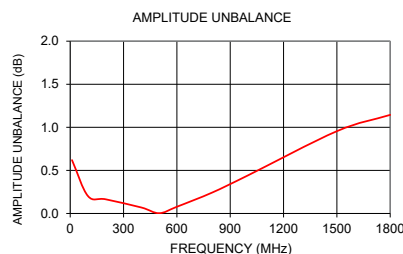
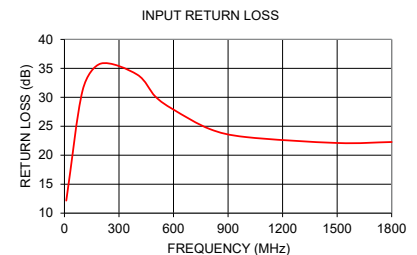
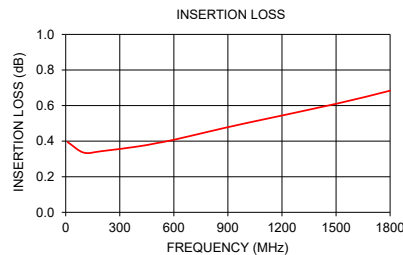
## Electrical Specifications at 25°C

| Parameter                   | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|-----------------------------|-----------------|------|------|------|------|
| Impedance Ratio             |                 |      | 1    |      | :1   |
| Frequency Range             |                 | 10   |      | 1800 | MHz  |
| Insertion Loss <sup>1</sup> | 50 - 1200       |      | 0.6  | 1    | dB   |
|                             | 10 - 1800       |      | 0.9  | 2    |      |
| Amplitude Unbalance         | 50 - 1000       |      | 0.3  | 0.7  | dB   |
|                             | 1000 - 1200     |      | 0.5  | 1.1  |      |
|                             | 10 - 1800       |      | 0.7  | 1.5  |      |
| Phase Unbalance             | 50 - 1000       |      | 2    | 4    | Deg. |
|                             | 1000 - 1200     |      | 3    | 6    |      |
|                             | 10 - 1800       |      | 7.5  | 15   |      |
| Primary Return Loss         | 50 - 500        | 16   | 22   |      | dB   |
|                             | 500 - 1000      | 13   | 20   |      |      |
|                             | 1000 - 1200     | 12   | 20   |      |      |
|                             | 10 - 1800       | 8    | 12.5 |      |      |

1. Insertion Loss is referenced to mid-band loss, 0.25 dB typ.

## Typical Performance Data

| FREQUENCY (MHz) | INSERTION LOSS (dB) | INPUT R. LOSS (dB) | AMPLITUDE UNBALANCE (dB) | PHASE UNBALANCE (Deg.) |
|-----------------|---------------------|--------------------|--------------------------|------------------------|
| 10              | 0.40                | 12.17              | 0.62                     | 8.22                   |
| 50              | 0.33                | 26.38              | 0.21                     | 1.41                   |
| 100             | 0.34                | 31.22              | 0.20                     | 0.64                   |
| 200             | 0.34                | 35.82              | 0.16                     | 0.12                   |
| 400             | 0.37                | 33.92              | 0.07                     | 0.19                   |
| 500             | 0.39                | 30.13              | 0.00                     | 0.14                   |
| 600             | 0.41                | 27.88              | 0.08                     | 0.12                   |
| 1000            | 0.50                | 23.13              | 0.44                     | 0.91                   |
| 1200            | 0.55                | 22.28              | 0.66                     | 1.87                   |
| 1800            | 0.68                | 22.28              | 1.14                     | 7.84                   |



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REV. B  
ECO-018460  
TRS1-182-75-3+  
MCL NY  
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Page 1 of 1

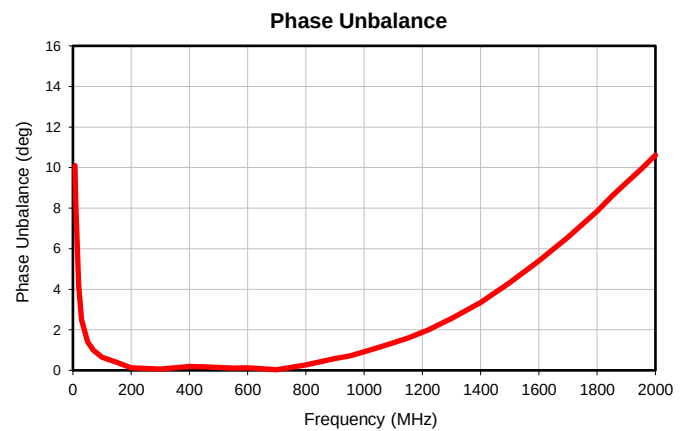
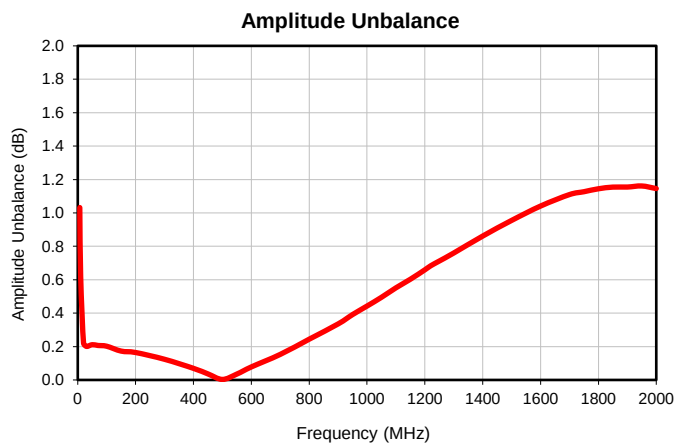
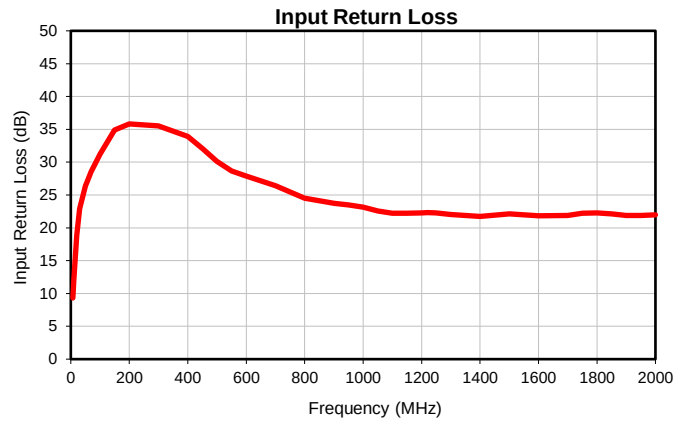
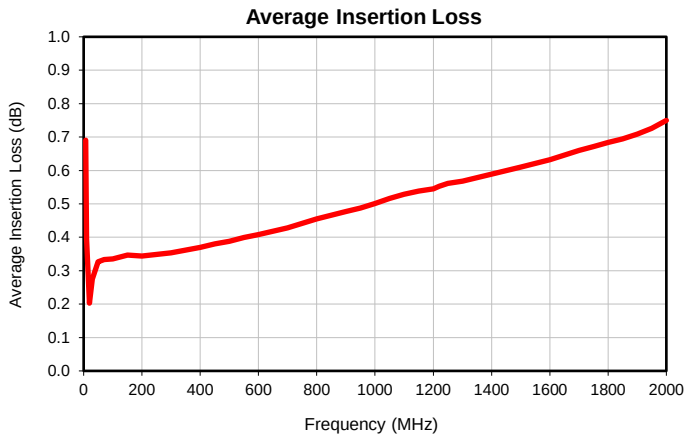
# RF Transformer

# TRS1-182-75-7+

## Typical Performance Data

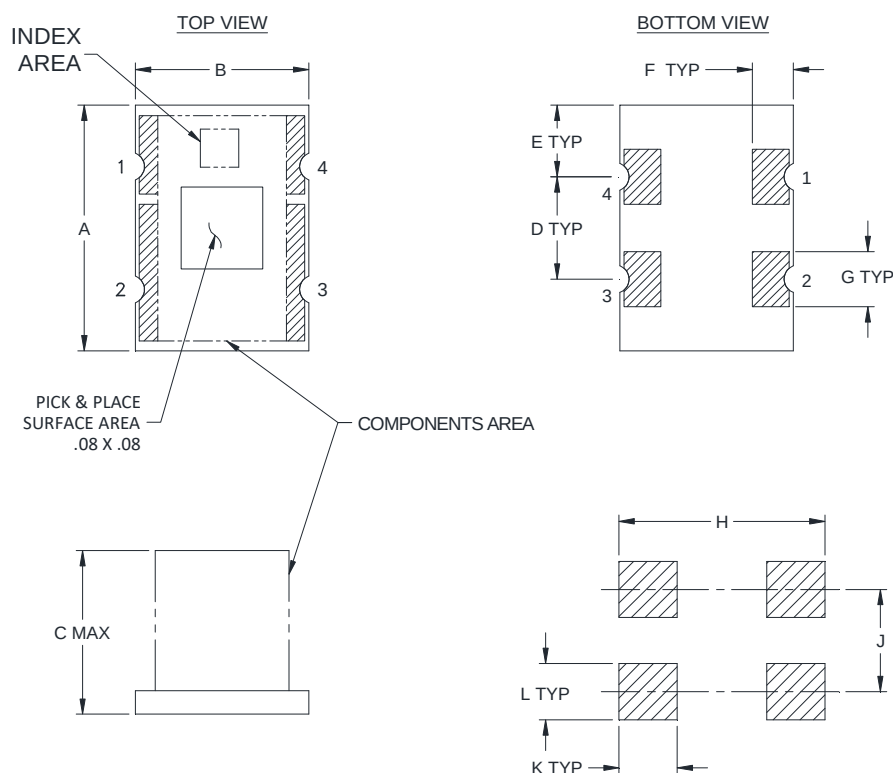
| FREQUENCY<br>MHz | AVERAGE<br>INSERTION<br>LOSS<br>(dB) | INPUT<br>RETURN<br>LOSS<br>(dB) | AMPLITUDE<br>UNBALANCE<br>(dB) | PHASE<br>UNBALANCE<br>(deg.) |
|------------------|--------------------------------------|---------------------------------|--------------------------------|------------------------------|
| 7                | 0.69                                 | 9.31                            | 1.03                           | 10.09                        |
| 10               | 0.40                                 | 12.17                           | 0.62                           | 8.22                         |
| 20               | 0.20                                 | 18.88                           | 0.22                           | 4.20                         |
| 30               | 0.27                                 | 22.90                           | 0.20                           | 2.50                         |
| 50               | 0.33                                 | 26.38                           | 0.21                           | 1.41                         |
| 70               | 0.33                                 | 28.58                           | 0.21                           | 0.99                         |
| 100              | 0.34                                 | 31.22                           | 0.20                           | 0.64                         |
| 150              | 0.35                                 | 34.88                           | 0.17                           | 0.39                         |
| 200              | 0.34                                 | 35.82                           | 0.16                           | 0.12                         |
| 300              | 0.35                                 | 35.53                           | 0.12                           | 0.07                         |
| 400              | 0.37                                 | 33.92                           | 0.07                           | 0.19                         |
| 450              | 0.38                                 | 32.08                           | 0.04                           | 0.17                         |
| 500              | 0.39                                 | 30.13                           | 0.00                           | 0.14                         |
| 550              | 0.40                                 | 28.64                           | 0.04                           | 0.12                         |
| 600              | 0.41                                 | 27.88                           | 0.08                           | 0.12                         |
| 700              | 0.43                                 | 26.41                           | 0.15                           | 0.03                         |
| 800              | 0.46                                 | 24.52                           | 0.24                           | 0.27                         |
| 900              | 0.48                                 | 23.74                           | 0.34                           | 0.58                         |
| 950              | 0.49                                 | 23.50                           | 0.39                           | 0.71                         |
| 1000             | 0.50                                 | 23.13                           | 0.44                           | 0.91                         |
| 1050             | 0.52                                 | 22.56                           | 0.49                           | 1.14                         |
| 1100             | 0.53                                 | 22.22                           | 0.55                           | 1.36                         |
| 1150             | 0.54                                 | 22.21                           | 0.60                           | 1.59                         |
| 1200             | 0.55                                 | 22.28                           | 0.66                           | 1.87                         |
| 1220             | 0.55                                 | 22.30                           | 0.68                           | 1.99                         |
| 1250             | 0.56                                 | 22.27                           | 0.71                           | 2.22                         |
| 1300             | 0.57                                 | 22.03                           | 0.76                           | 2.56                         |
| 1400             | 0.59                                 | 21.75                           | 0.86                           | 3.34                         |
| 1500             | 0.61                                 | 22.12                           | 0.96                           | 4.32                         |
| 1600             | 0.63                                 | 21.85                           | 1.04                           | 5.39                         |
| 1700             | 0.66                                 | 21.90                           | 1.11                           | 6.57                         |
| 1750             | 0.67                                 | 22.24                           | 1.13                           | 7.22                         |
| 1800             | 0.68                                 | 22.28                           | 1.14                           | 7.84                         |
| 1850             | 0.69                                 | 22.11                           | 1.15                           | 8.59                         |
| 1900             | 0.71                                 | 21.88                           | 1.15                           | 9.24                         |
| 1950             | 0.73                                 | 21.86                           | 1.16                           | 9.90                         |
| 2000             | 0.75                                 | 21.96                           | 1.15                           | 10.61                        |

## Typical Performance Data



## Outline Dimensions

TT1618-2



SUGGESTED FOOTPRINT FOR PC LAYOUT

TOLERANCE TO BE WITHIN  $\pm .002$

| CASE #   | A              | B              | C              | D              | E              | F              | G              | H              | J              | K              | L              | WT GRAMS |
|----------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------|
| TT1618-2 | .240<br>(6.10) | .170<br>(4.32) | .160<br>(4.06) | .100<br>(2.54) | .070<br>(1.78) | .040<br>(1.02) | .054<br>(1.37) | .202<br>(5.13) | .100<br>(2.54) | .057<br>(1.45) | .055<br>(1.40) | 2.80     |

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

### Notes:

- Open style, Base material: Printed wiring laminate.
- Termination finish: 3-5  $\mu$  inch (.08-.13 microns) Gold over 120-240  $\mu$  inch (3.05-6.10 microns) Nickel plate.  
All models, (+) suffix.
- Orientation Dot on Unit corresponds to Pin #1.



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RF/IF MICROWAVE COMPONENTS



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            | -55° to 100° C<br>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<br>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, 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                                                                 |
| Marking Resistance to Solvents | Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C;<br>distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C | MIL-STD-202, Method 215                                                                              |