



Mini-Circuits

SURFACE MOUNT ^{top hat} RF Transformer

SCTX4-52HP-20W+

12.5/50Ω 30 to 512 MHz 20 Watt 1:4 Ratio

THE BIG DEAL

- High Power Input, 20 Watt max.
- Low Insertion Loss, 0.3 dB typ.
- Small size, 0.50 x 0.50 x 0.20"
- Excellent Return Loss, 23 dB typ.



Generic photo used for illustration purposes only

CASE STYLE: CK2335-1

+RoHS Compliant

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

APPLICATIONS

- VHF/UHF Radios & Aircraft Communications
- BALUN
- Diode matching

PRODUCT OVERVIEW

Mini-Circuits' SCTX4-52HP-20W+ is a high-power, surface-mount transformer with a primary/secondary impedance ratio of 1:4, covering the 30 to 512 MHz band. The transformer is capable of handling RF input power up to 20W across entire bandwidth. It provides low insertion loss (0.3 dB) as well as good matching VSWR 1.10:1. Featuring core and wire construction mounted on PCB, the unit comes enclosed in a miniature, shielded package measuring just 0.50 x 0.50 x 0.20", ideal for dense circuit board layouts.

KEY FEATURES

| Feature | Advantages |
|--------------------------------------|---|
| High RF Power Handling (20W) | Supports systems with high power requirements in small device size. |
| Low Insertion Loss, 0.3 dB | Provides excellent transmission of signal power from input to output. |
| Good Return Loss, 20 dB typ | Provide good in to output impedance matching. |
| Small Footprint, 0.50 x 0.50 x 0.20" | Accommodates tight space requirements for dense PCB layouts. |

REV. E
ECO-020468
SCTX4-52HP-20W+
MCL NY
240104





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ELECTRICAL SPECIFICATIONS AT 25°C

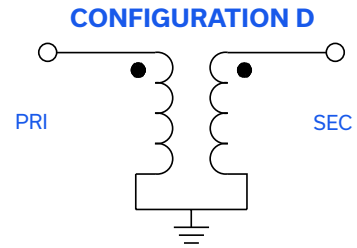
| Parameter | Frequency (MHz) | Min. | Typ. | Max. | Unit |
|-------------------------------------|-----------------|------|------|------|------|
| Impedance Ratio (secondary/primary) | | | 4 | | |
| Frequency Range | | 30 | — | 512 | MHz |
| Insertion Loss | 30 - 100 | — | 0.3 | 0.5 | dB |
| | 30 - 512 | — | 0.5 | 0.9 | |
| Return Loss* (Primary) | 30 - 100 | 20 | 30 | — | dB |
| | 30 - 512 | 12 | 20 | — | |
| Input Power | 30 - 512 | — | — | 20 | Watt |

* For the frequency range from 450 to 512MHz, the Return loss may go up to the Min. spec.

ABSOLUTE MAXIMUM RATINGS

| Parameter | Ratings |
|-----------------------|---------------------|
| Operating Temperature | -40°C to 85°C case* |
| Storage Temperature | -55°C to 100°C |

*Case temperature is defined as temperature on ground leads.
 Permanent damage may occur if any of these limits are exceeded.





SURFACE MOUNT top hat
RF Transformer

SCTX4-52HP-20W+

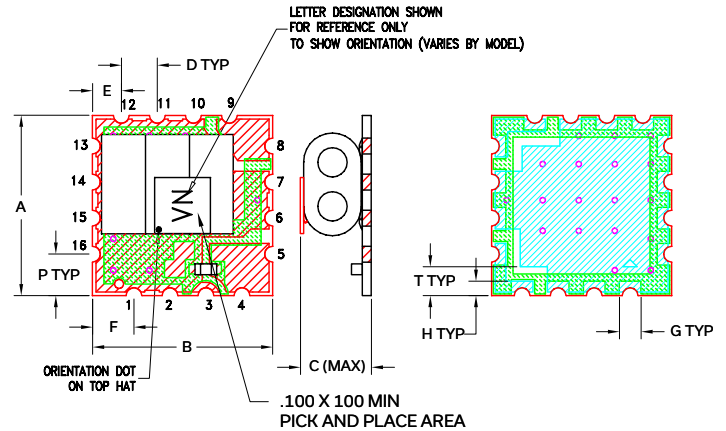
Mini-Circuits

12.5/50Ω 30 to 512 MHz 20 Watt 1:4 Ratio

PAD CONNECTIONS

| | |
|--------------------|------------|
| PRIMARY (12.5 ohm) | 4,5 |
| SECONDARY (50 ohm) | 8,9 |
| GND | all others |

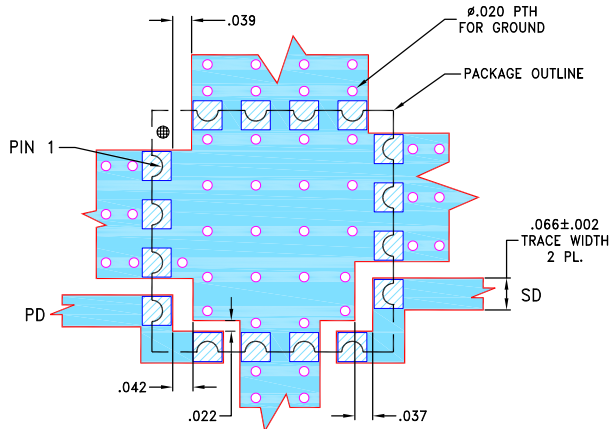
OUTLINE DRAWING



DENOTES METALLIZATION.
 DENOTES SOLDER MASK.

PRODUCT MARKING: VN

DEMO BOARD MCL P/N: TB-SCTX452HP20W
SUGGESTED PCB LAYOUT: (PL-698)

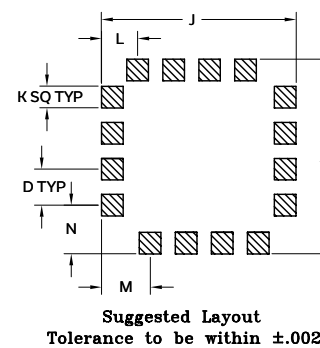


NOTES:

- 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.
- 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

PCB Land Pattern



OUTLINE DIMENSIONS (Inch mm)

| | | | | | | | |
|-------|-------|------|------|------|------|------|-------|
| A | B | C | D | E | F | G | H |
| .500 | .500 | .209 | .100 | .080 | .115 | .060 | .040 |
| 12.70 | 12.70 | 5.31 | 2.54 | 2.03 | 2.92 | 1.52 | 1.02 |
| J | K | L | M | N | P | T | wt. |
| .540 | .060 | .100 | .135 | .135 | .115 | .080 | grams |
| 13.72 | 1.52 | 2.54 | 3.43 | 3.43 | 2.92 | 2.03 | 1.0 |

TAPE & REEL INFORMATION: F37





SURFACE MOUNT top hat
RF Transformer

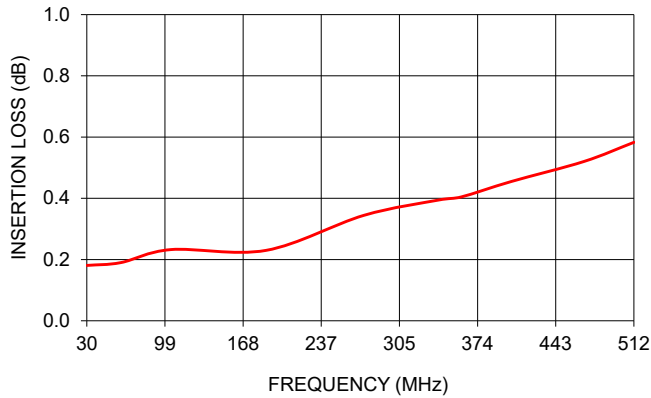
SCTX4-52HP-20W+

12.5/50Ω 30 to 512 MHz 20 Watt 1:4 Ratio

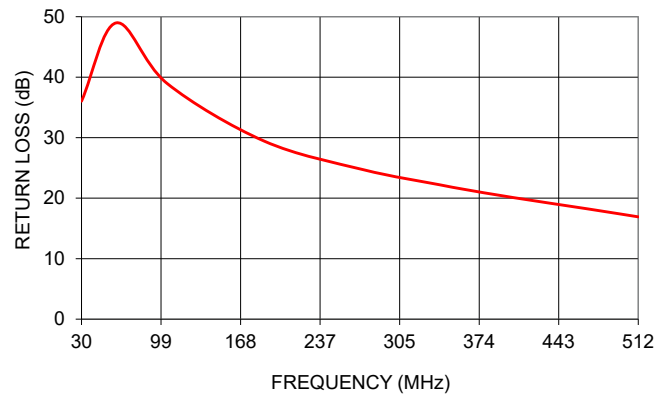
TYPICAL PERFORMANCE DATA

| Frequency (MHz) | Insertion Loss (dB) | Primary Return Loss (dB) |
|-----------------|---------------------|--------------------------|
| 30 | 0.18 | 36.03 |
| 60 | 0.19 | 48.98 |
| 104 | 0.23 | 38.98 |
| 188 | 0.23 | 29.44 |
| 274 | 0.34 | 24.71 |
| 340 | 0.39 | 22.22 |
| 360 | 0.40 | 21.50 |
| 404 | 0.45 | 20.09 |
| 468 | 0.52 | 18.23 |
| 512 | 0.58 | 16.91 |

SCTX4-52HP-20W+
INSERTION LOSS



SCTX4-52HP-20W+
INPUT RETURN LOSS



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/terms/viewterm.html



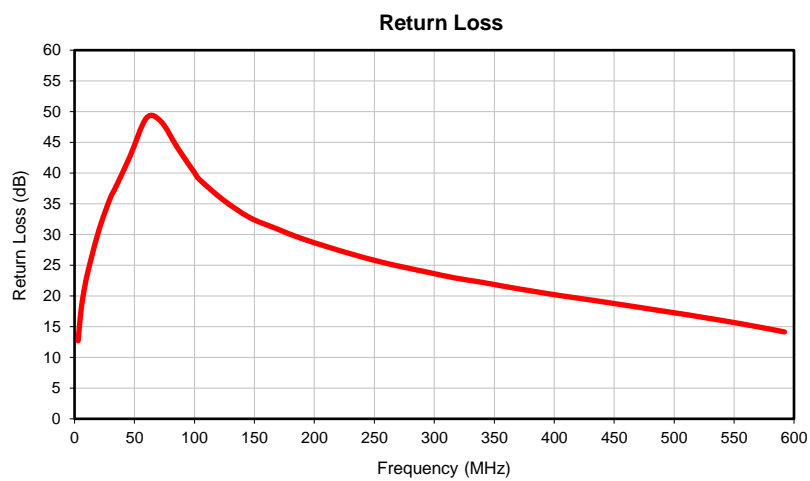
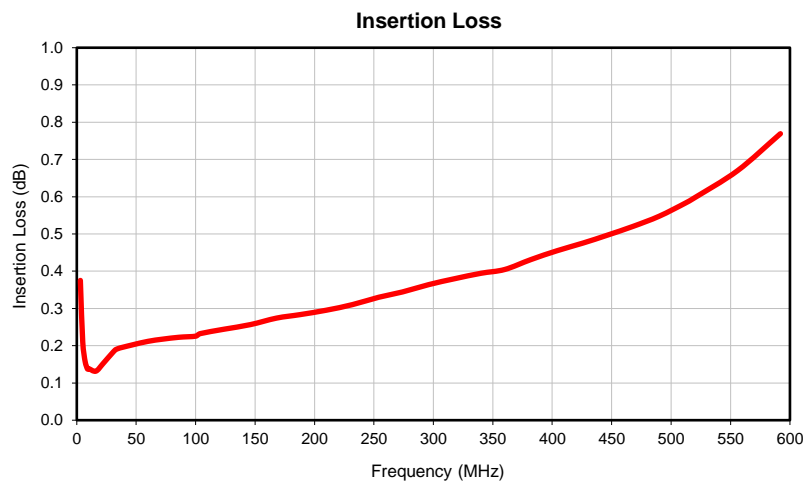
RF Transformer

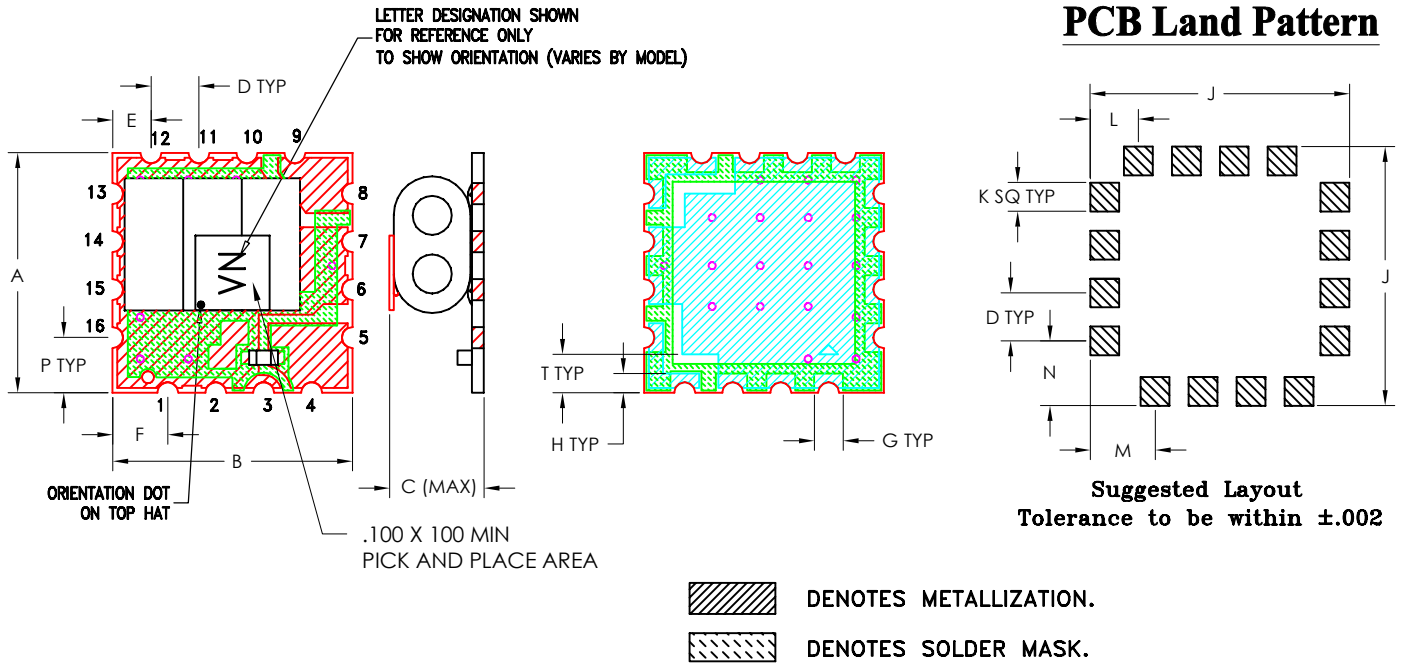
SCTX4-52HP-20W+

Typical Performance Data

| FREQUENCY (MHz) | INSERTION LOSS (dB) | RETURN LOSS (dB) |
|--------------------|------------------------|---------------------|
| 3 | 0.38 | 12.71 |
| 5 | 0.21 | 16.98 |
| 7 | 0.16 | 19.85 |
| 9 | 0.14 | 22.03 |
| 10 | 0.14 | 23.03 |
| 16 | 0.13 | 27.72 |
| 22 | 0.15 | 31.75 |
| 30 | 0.18 | 36.03 |
| 34 | 0.19 | 37.58 |
| 46 | 0.20 | 42.61 |
| 60 | 0.21 | 48.98 |
| 72 | 0.22 | 48.42 |
| 86 | 0.22 | 44.08 |
| 100 | 0.23 | 40.07 |
| 104 | 0.23 | 38.98 |
| 124 | 0.24 | 35.63 |
| 146 | 0.26 | 32.77 |
| 168 | 0.27 | 30.98 |
| 188 | 0.28 | 29.44 |
| 210 | 0.30 | 28.05 |
| 232 | 0.31 | 26.76 |
| 254 | 0.33 | 25.60 |
| 274 | 0.34 | 24.71 |
| 296 | 0.36 | 23.80 |
| 318 | 0.38 | 22.90 |
| 340 | 0.39 | 22.22 |
| 360 | 0.40 | 21.50 |
| 382 | 0.43 | 20.78 |
| 404 | 0.45 | 20.09 |
| 426 | 0.48 | 19.47 |
| 446 | 0.50 | 18.89 |
| 468 | 0.52 | 18.23 |
| 490 | 0.55 | 17.56 |
| 512 | 0.58 | 16.91 |
| 520 | 0.60 | 16.65 |
| 556 | 0.67 | 15.47 |
| 592 | 0.77 | 14.15 |

Typical Performance Data





| CASE # | A | B | C | D | E | F | G | H | J | K | L | M | N | P |
|----------|-----------------|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|----------------|----------------|----------------|----------------|----------------|
| CK2335-1 | .500 (12.70) | .500 (12.70) | .209 (5.31) | .100 (2.54) | .080 (2.03) | .115 (2.92) | .060 (1.52) | .040 (1.02) | .540 (13.72) | .060 (1.52) | .100 (2.54) | .135 (3.43) | .135 (3.43) | .115 (2.92) |

| CASE # | Q | R | S | T | WT, GRAM |
|----------|---|---|---|----------------|----------|
| CK2335-1 | - | - | - | .080 (2.03) | 1.0 |

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

Notes:

- Case material: Nickel-Silver alloy.
- Base: Printed wiring laminate.
- Termination finish:
 For RoHS Case Styles: 3-5 μ inch (.08-.13 microns) Gold over 120-240 μ inch (3.05-6.10 microns) Nickel plate. All models, (+) suffix.



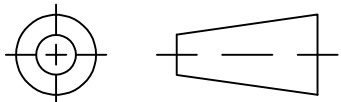
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



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

RF/IF MICROWAVE COMPONENTS

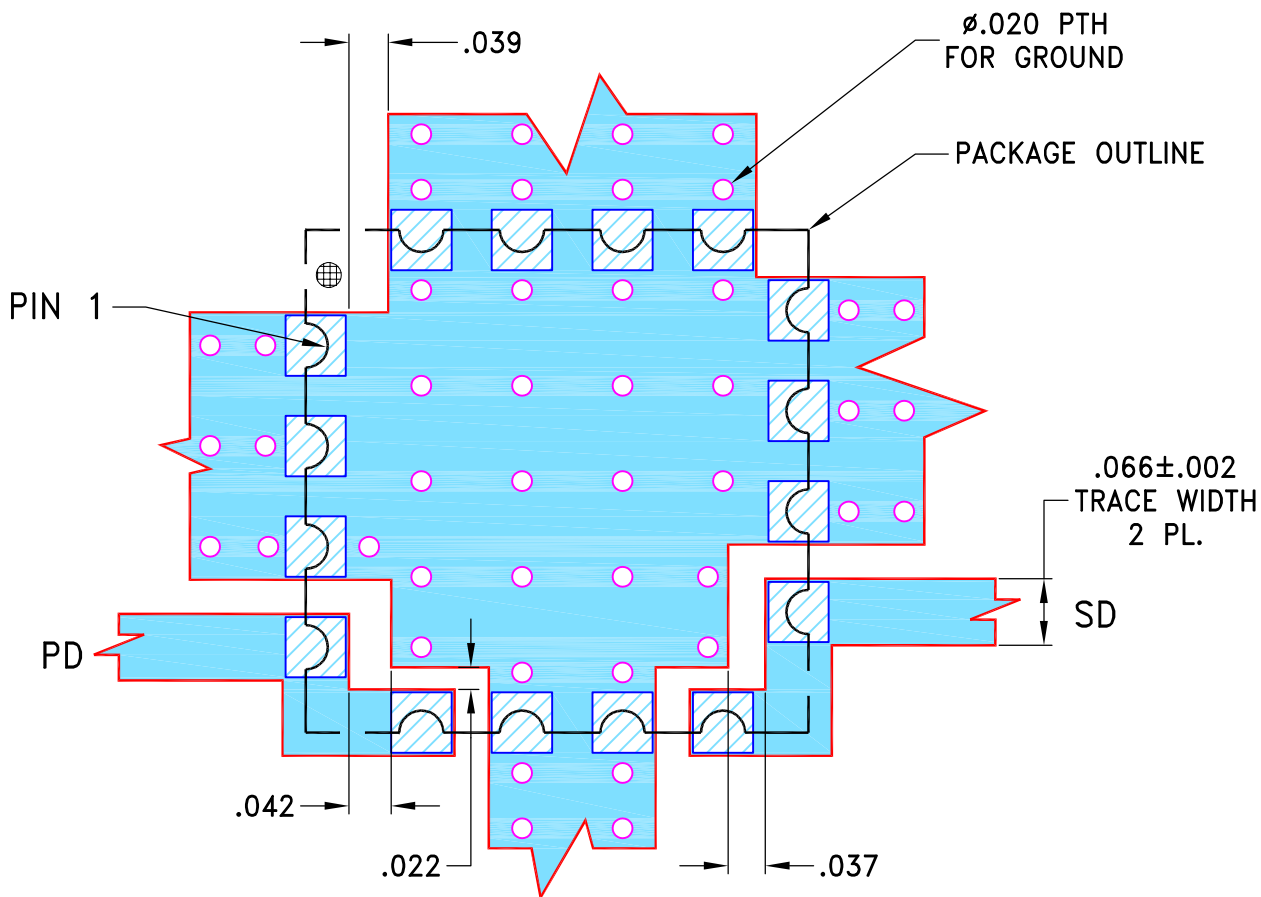
THIRD ANGLE PROJECTION



REVISIONS


| REV | ECN No. | DESCRIPTION | DATE | DR | AUTH |
|-----|------------|-------------|----------|-----|------|
| OR | ECO-005116 | NEW RELEASE | 03/15/21 | ITG | RonS |
| | | | | | |
| | | | | | |


SUGGESTED MOUNTING CONFIGURATION FOR CK2335-1 CASE STYLE



NOTES:

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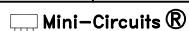
 DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

 DENOTES COPPER LAND PATTERN FREE OF SOLDERMASK

| UNLESS OTHERWISE SPECIFIED | INITIALS | | DATE |
|----------------------------|----------|------|----------|
| DIMENSIONS ARE IN INCHES | DRAWN | ITG | 03/15/21 |
| TOLERANCES ON: | CHECKED | GF | 03/15/21 |
| 2 PL DECIMALS ± | APPROVED | RonS | 03/15/21 |
| 3 PL DECIMALS ± .005" | | | |
| ANGLES ± | | | |
| FRACTIONS ± | | | |

 **Mini-Circuits®** 13 Neptune Avenue
Brooklyn NY 11235

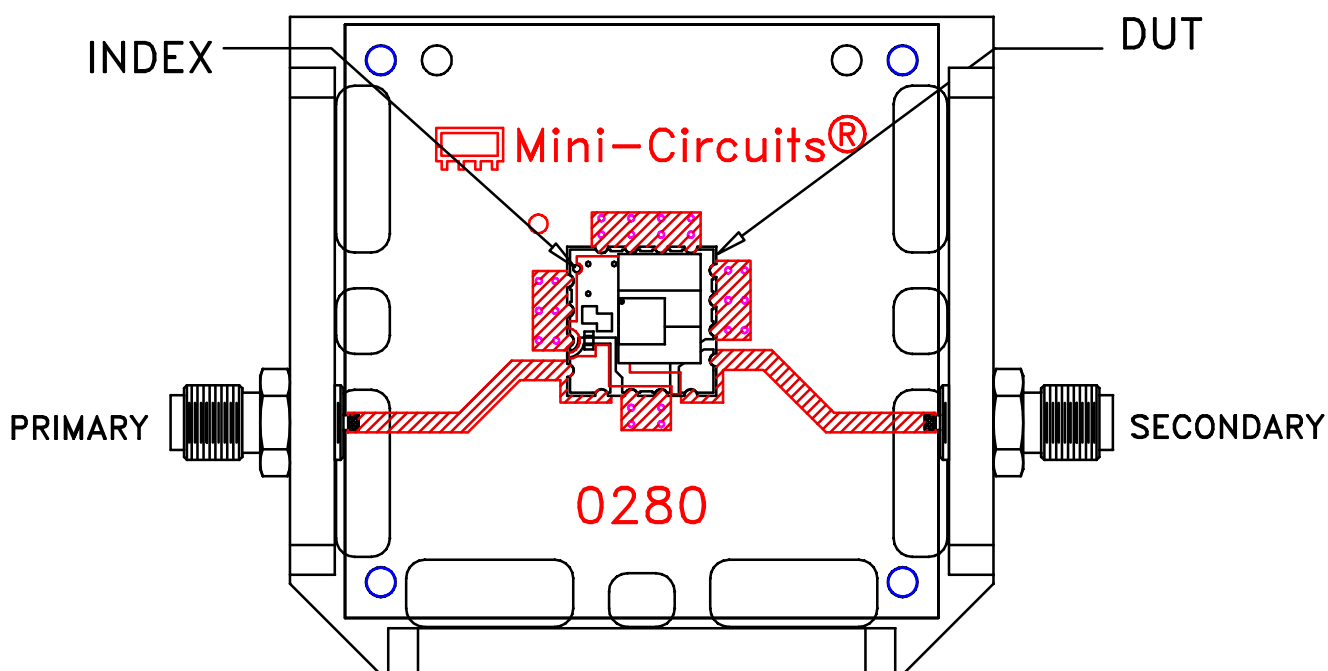
PL, CK2335-1, TB-1184

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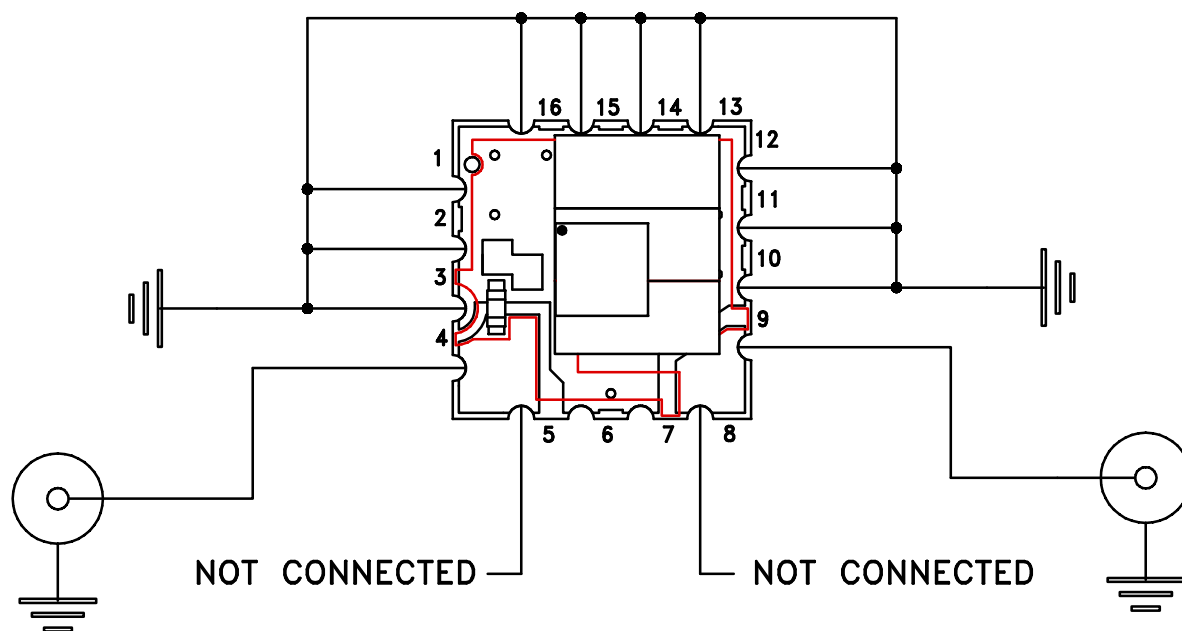
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| SIZE | CODE IDENT | DRAWING NO: | REV: |
|----------------------------------|------------|-------------|--------|
| A | 15542 | 98-PL-698 | OR |
| FILE: | 98PL698 | SCALE: | SHEET: |
| ASHEETA1.DWG REV:A DATE:01/12/95 | 5:1 | 1 | OF 1 |

Evaluation Board and Circuit



TB-1184



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: R04350 or equivalent.
Dielectric Constant=3.5, Thickness=.030 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 | -40° to 65° C Ambient Environment | Individual Model Data Sheet |
| Storage Temperature | -55° to 100° C Ambient Environment | Individual Model Data Sheet |
| Stabilization Bake | (non-operating) 125°C, 24 hours | - - - |
| Burn-in at Elevated Temp. | (DC on) 160 hours at 85° C | MIL-STD-202, Method 108 |
| Thermal Shock | -55° to 100°C, 5 cycles | MIL-STD-202, Method 107, Condition A, except 100°C |