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

SURFACE MOUNT top hat

RF Transformer

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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

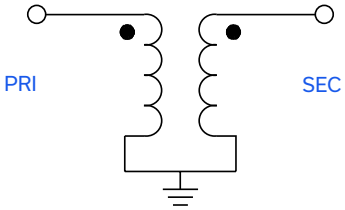
* For the frequency range from 450 to 512MHz, the Return loss may go up to the Min. spec.

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.

CONFIGURATION D



SURFACE MOUNT top hat

RF Transformer SCTX4-52HP-20W+

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

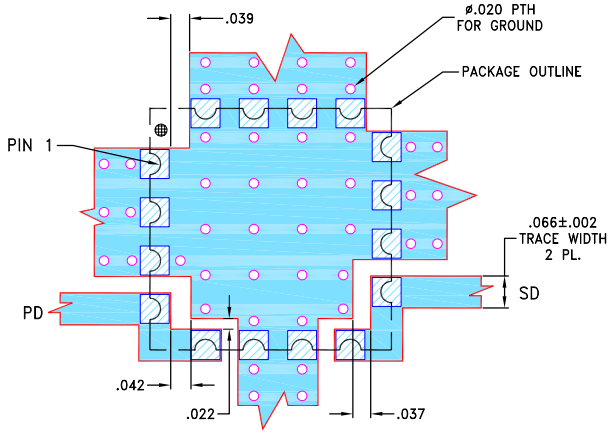
PAD CONNECTIONS

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

PRODUCT MARKING: VN

DEMO BOARD MCL P/N: TB-SCTX452HP20W

SUGGESTED PCB LAYOUT: (PL-698)



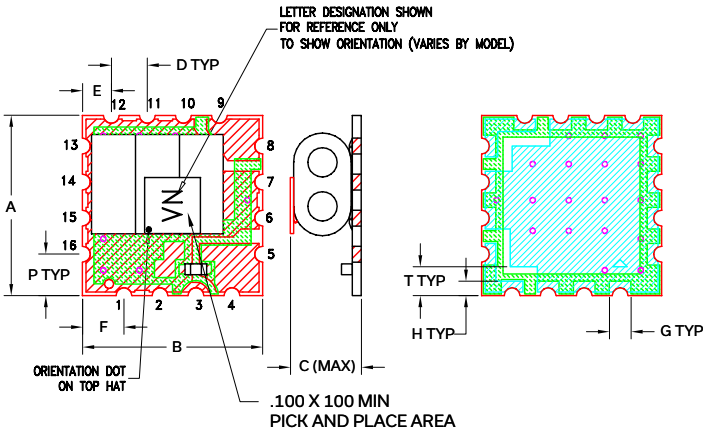
NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B, 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

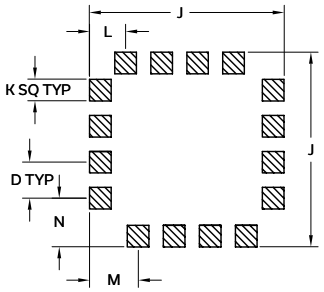
OUTLINE DRAWING



DENOTES METALLIZATION.

DENOTES SOLDER MASK.

PCB Land Pattern



Suggested Layout
Tolerance to be within ±.002

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

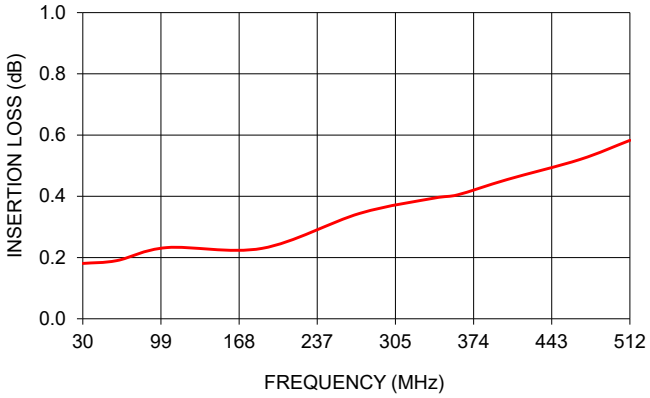
RF Transformer SCTX4-52HP-20W+

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

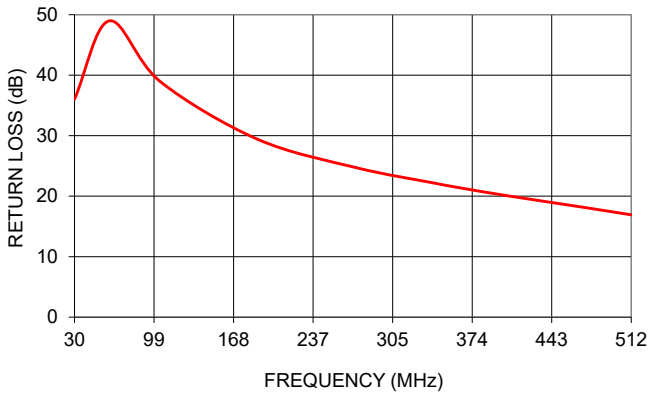
TYPICAL PERFORMANCE DATA

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

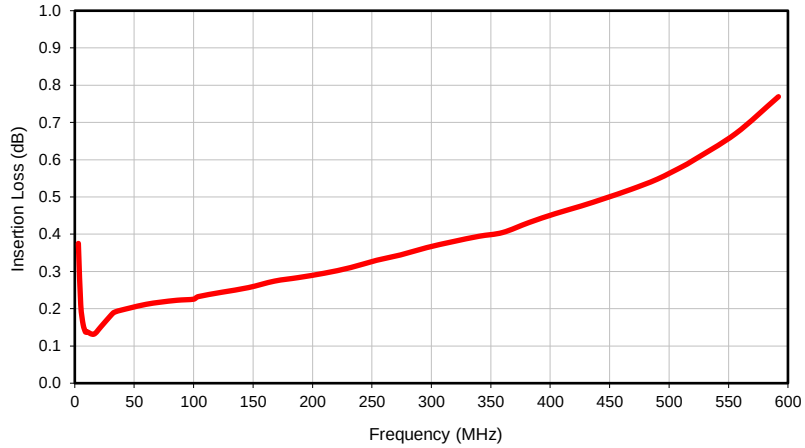
RF Transformer SCTX4-52HP-20W+

Typical Performance Data

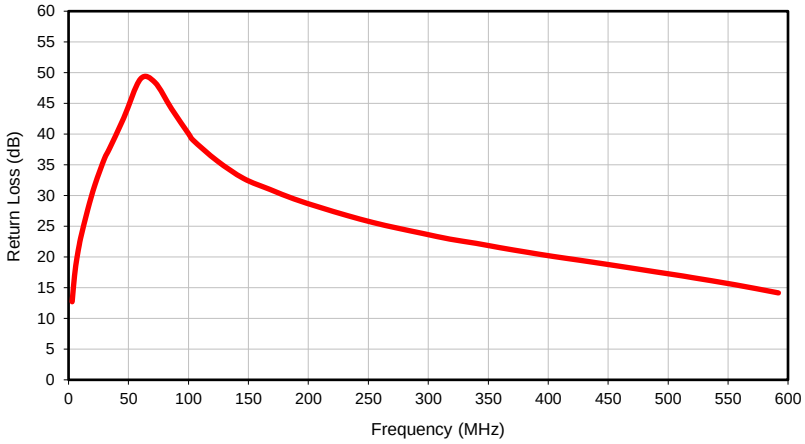
FREQUENCY (MHz)	INSERTION LOSS (dB)	RETURN LOSS (dB)
3	0.38	12.71
5	0.21	16.98
7	0.16	19.85
9	0.14	22.03
10	0.14	23.03
16	0.13	27.72
22	0.15	31.75
30	0.18	36.03
34	0.19	37.58
46	0.20	42.61
60	0.21	48.98
72	0.22	48.42
86	0.22	44.08
100	0.23	40.07
104	0.23	38.98
124	0.24	35.63
146	0.26	32.77
168	0.27	30.98
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

Insertion Loss



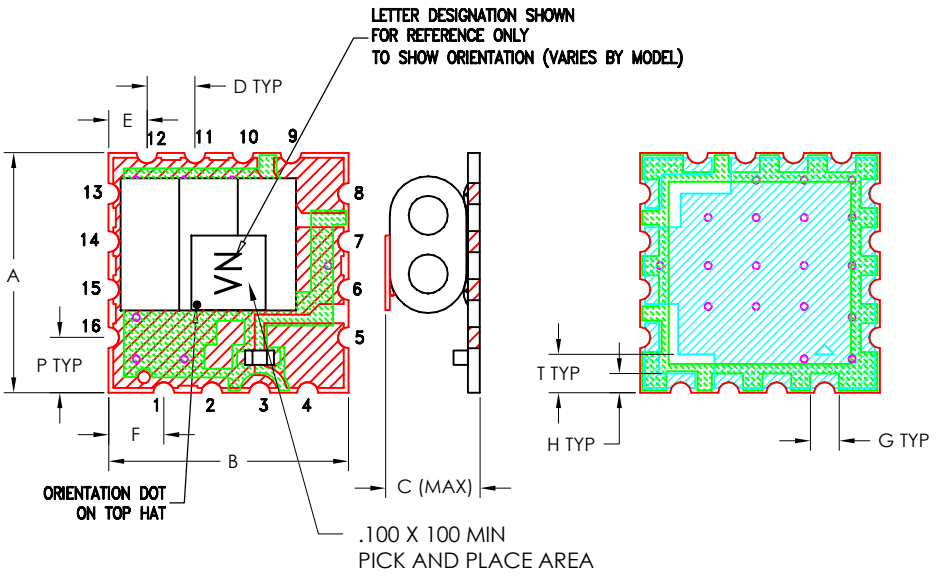
Return Loss



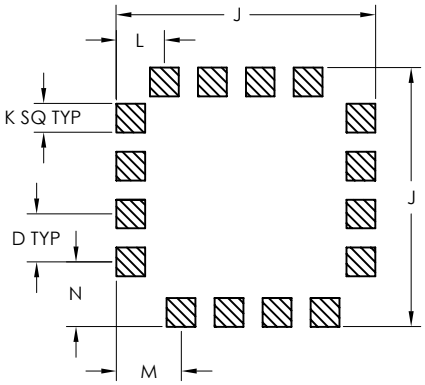
Case Style CK

Outline Dimensions

CK2335-1



PCB Land Pattern



Suggested Layout
Tolerance to be within ±.002

DENOTES METALLIZATION.

DENOTES SOLDER MASK.

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

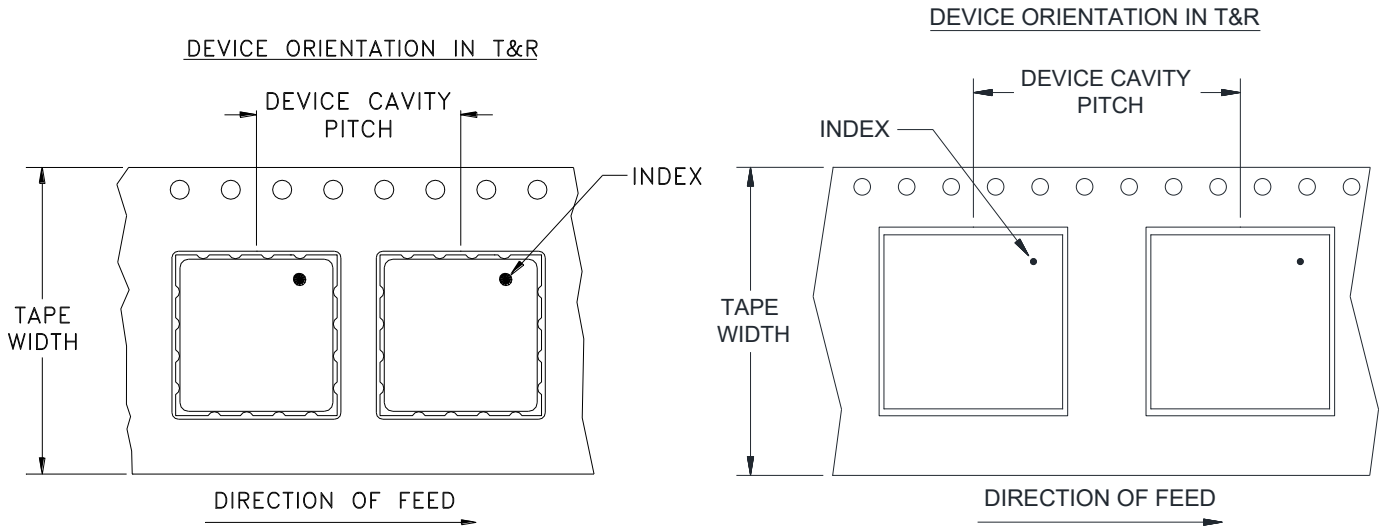
Dimensions are in inches (mm). Tolerances: 2 Pl.±.03; 3 Pl. ±.015

Notes:
1. Case material: Nickel-Silver alloy.
2. Base: Printed wiring laminate.
3. 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.

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RF/IF MICROWAVE COMPONENTS

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Tape & Reel Packaging TR-F37



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
24	16	7	Small quantity standards (see note)	10
				20
				50
				100
		13	Standard	200
				500

Note: Please consult individual model data sheet to determine device per reel availability.

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf

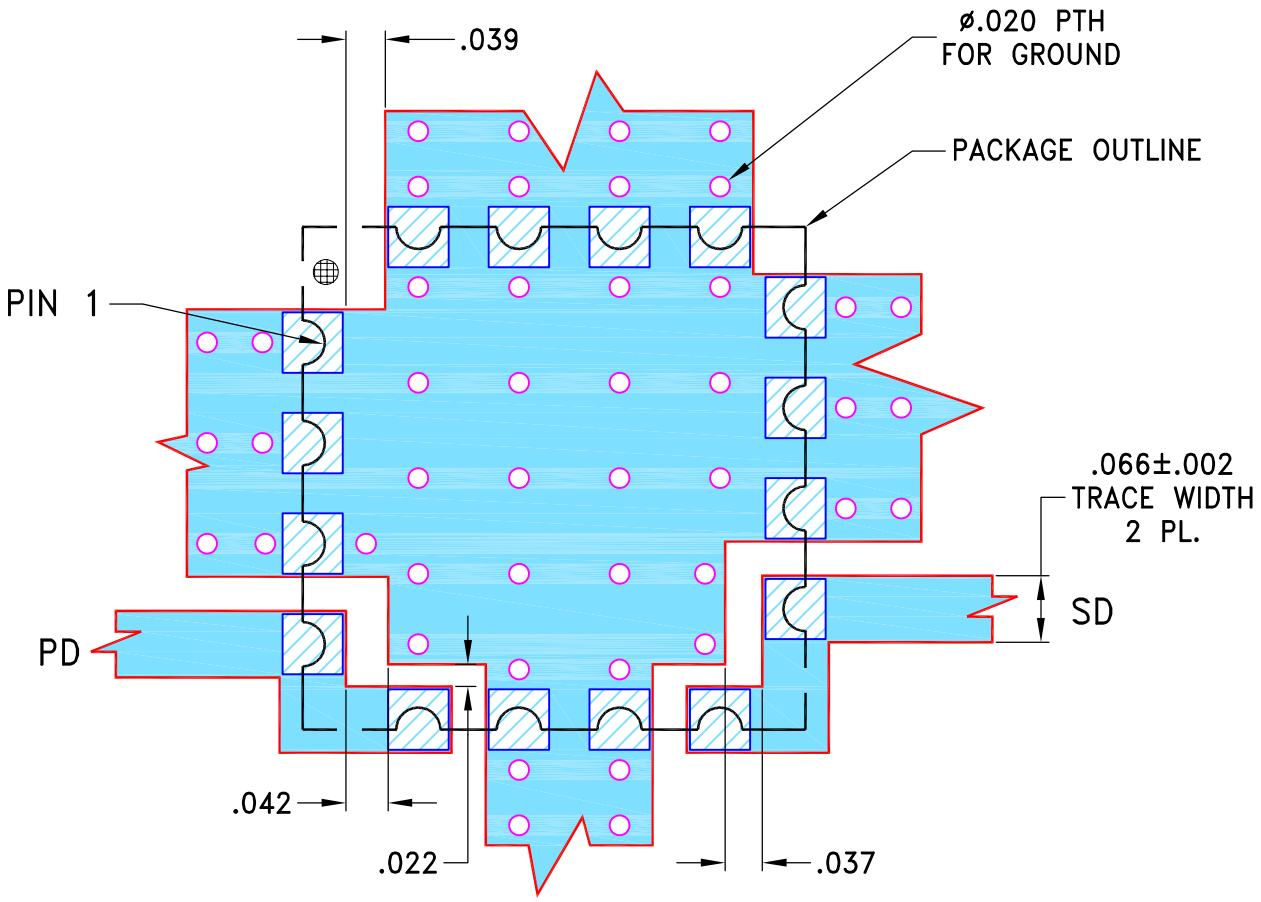
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THIRD ANGLE PROJECTION

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:

1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B, 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

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

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

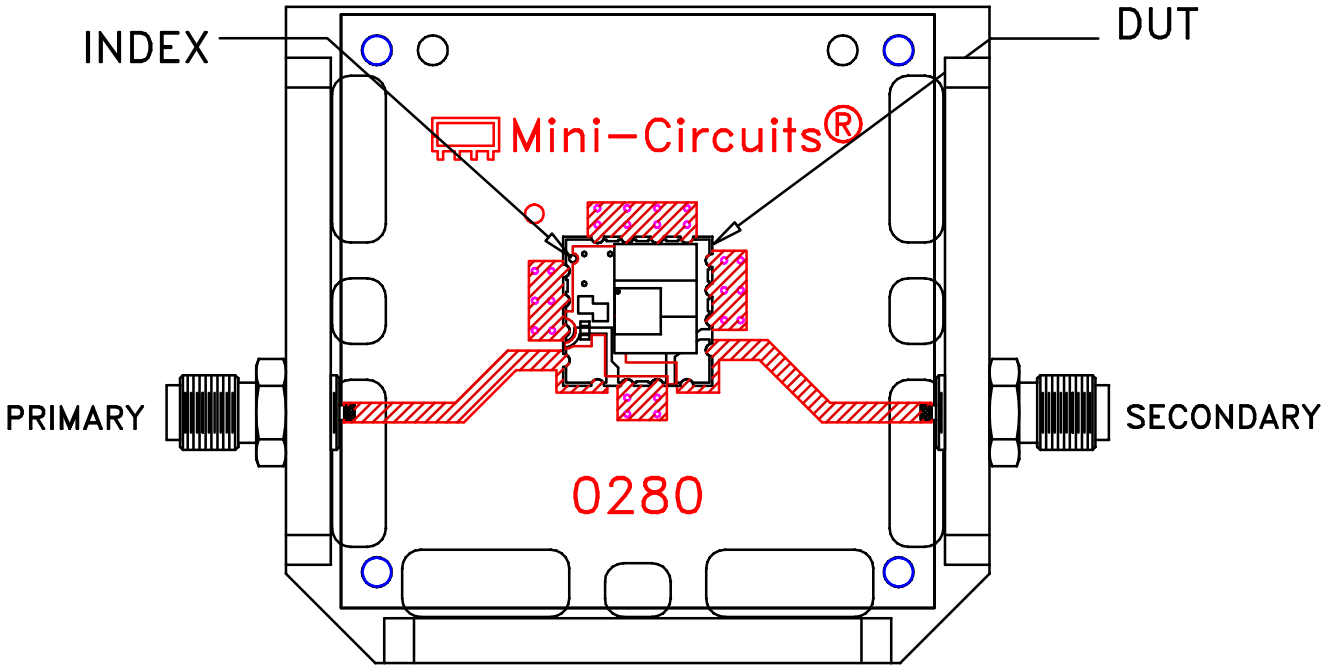
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, CK2335-1, TB-1184

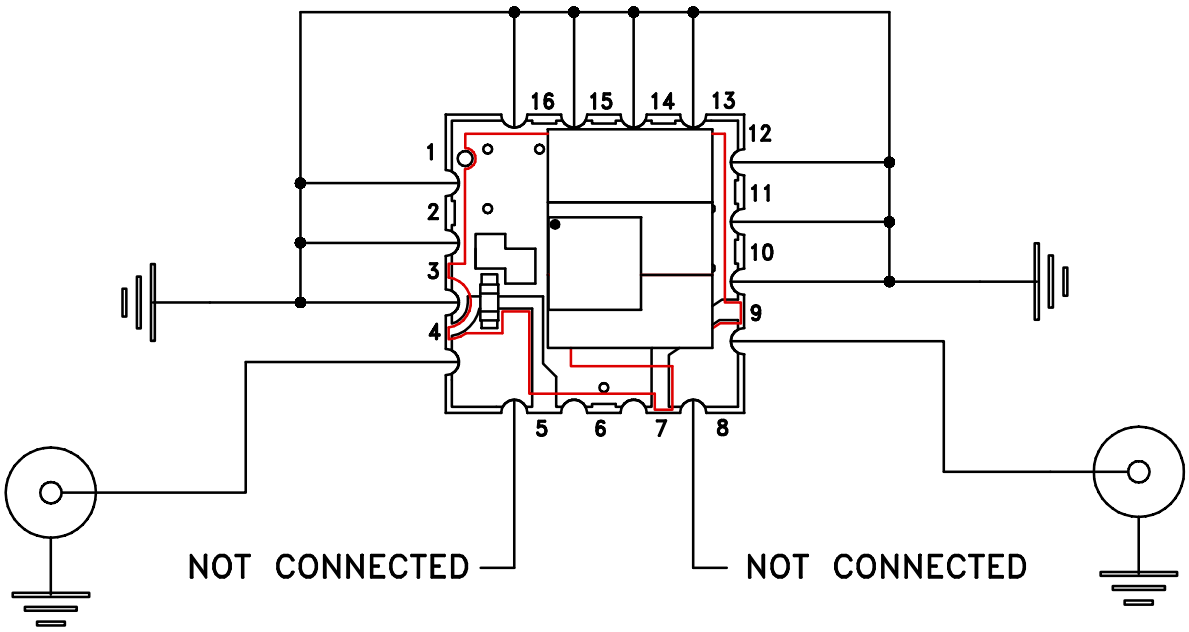
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-698	OR

FILE:	SCALE:	SHEET:
98PL698	5:1	1 OF 1

Evaluation Board and Circuit



TB-1184



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: RO4350 or equivalent.
   Dielectric Constant=3.5, Thickness=.030 inch.

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Environmental Specifications **ENV23T16**

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

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