SURFACE MOUNT

RF Transformer

SCTX1.33-33-2W+

75Ω 10 to 3000 MHz 1:1.33 Ratio

THE BIG DEAL

- 75 ohm single-ended to 100 ohm differencial outputs
- Super Wideband, 10 to 3000 MHz
- Low Insertion Loss, 2.0 dB typ. up to 3 GHz
- Amplitude Unbalance, ±0.3 dB typ. up to 3 GHz
- Good Input Return Loss, 14 dB typ.
- Low Phase Unbalance, ±3˚ typ.
- Common Mode Rejection, 28 dB typ.

Generic photo used for illustration purposes only

CASE STYLE: SN2595

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

APPLICATIONS

- Defense Communication
- DOCSIS 3.1
- Line of sight links
- Cellular
- Wideband push-pull amplifiers
- CATV

PRODUCT OVERVIEW

Mini-Circuits' SCTX1.33-33-2W+ is a surface-mount transmission line transformer (core and Semi-Rigid cable) covering a very wide frequency range from 10 to 3000 MHz. The transformer provides low insertion loss with excellent phase and amplitude performance. Featuring core and cable construction on a 12-lead PCB unit measures 0.60 x 0.60 x 0.15" accommodating dense circuit board layouts.

KEY FEATURES

Feature	Advantages
Wideband, 10 to 3000 MHz	Super wide frequency range covers bandwidth requirements for many broadband applications.
Low insertion loss, 2.0 dB	SCTX1.33-33-2W+ provides excellent signal transmission from input to output with consistent performance across its entire frequency range.
Good Phase and Amplitude Unbalance	Provides good CMRR and IP2.
Small size (0.60 x 0.60 x 0.15")	Provide good solderability and tight layouts.

REV. B
ECO-020468
SCTX1.33-33-2W+
MCL NY
240410

RF Transformer

SCTX1.33-33-2W+

75Ω 10 to 3000 MHz 1:1.33 Ratio

ELECTRICAL SPECIFICATIONS AT 25°C

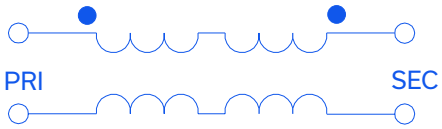
Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Impedance Ratio (secondary/primary)			1.33		
Frequency Range		10		3000	MHz
Insertion Loss (Average)	10-50 50-1250 1250-3000	— — —	1.8 1.9 2.1	2.4 2.5 2.8	dB
Amplitude Unbalance (±)	10-50 50-1250 1250-3000	— — —	0.05 0.1 0.3	0.2 0.3 0.7	dB
Phase Unbalance (±)	10-50 50-1250 1250-3000	— — —	2 1.5 3	5 3 6	Degree
Common mode rejection	10-3000	21	28	—	dB

ABSOLUTE MAXIMUM RATINGS

Parameter	Ratings
Operating Temperature	-40°C to 85°C
Storage Temperature	-55°C to 100°C
RF Power	2W

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

CONFIGURATION G



SURFACE MOUNT

RF Transformer

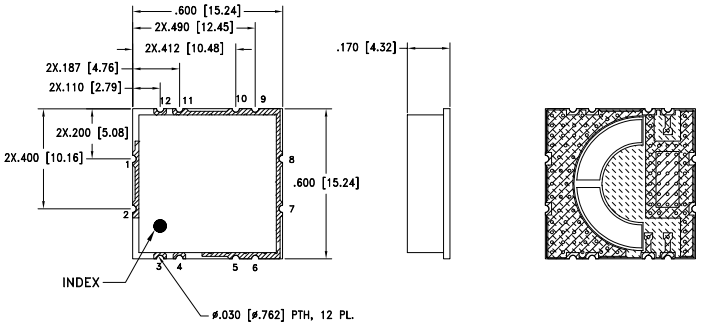
SCTX1.33-33-2W+

75Ω 10 to 3000 MHz 1:1.33 Ratio

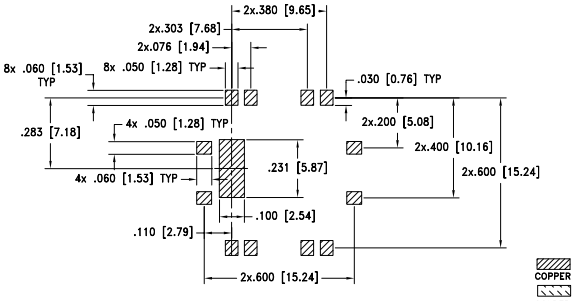
PIN CONNECTIONS

PRIMARY DOT	12
PRIMARY (GND)	11
SECONDARY DOT	3
SECONDARY	4
GROUND	1,2,5,6,7,8,9.10

OUTLINE DRAWING



TOP VIEW BOTTOM VIEW



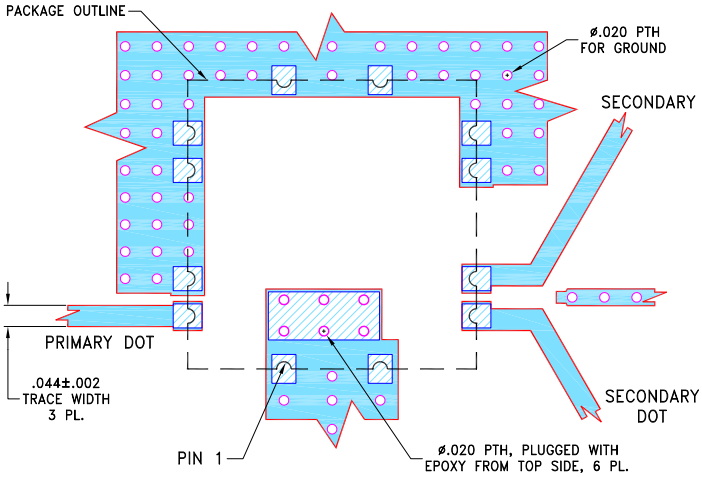
PCB LAND PATTERN
SUGGESTED LAYOUT
TOLERANCE TO BE WITHIN ±.002

Weight: 1.2 gram
Dimensions are in inches [mm]. Tolerances: 3 PL ±.005 Inch

PRODUCT MARKING: N/A

DEMO BOARD MCL P/N: TB-SCTX1.33-33-2W+

SUGGESTED PCB LAYOUT (PL-595)



NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B, WITH DIELECTRIC THICKNESS .020"±.0015". 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

TAPE & REEL INFORMATION: F95

SURFACE MOUNT

RF Transformer

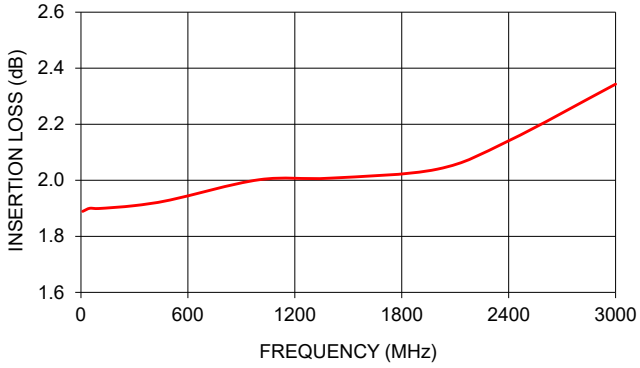
SCTX1.33-33-2W+

75Ω 10 to 3000 MHz 1:1.33 Ratio

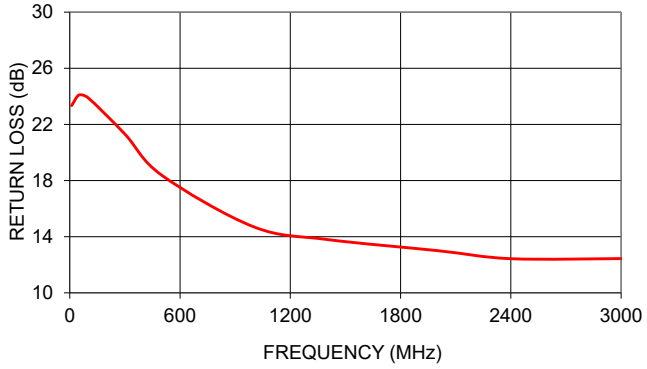
TYPICAL PERFORMANCE DATA

Frequency (MHz)	Insertion Loss (dB)	Input Return Loss (dB)	Amplitude Unbalance (dB)	Phase Unbalance (deg)
10	1.89	23.34	0.16	5.67
50	1.90	24.10	0.14	1.14
100	1.90	23.89	0.11	0.81
300	1.91	21.31	0.02	0.66
500	1.93	18.38	0.04	0.31
1000	2.00	14.71	0.07	0.07
1400	2.01	13.80	0.16	0.04
2000	2.04	13.01	0.38	0.86
2400	2.14	12.43	0.47	2.50
3000	2.34	12.44	0.28	5.78

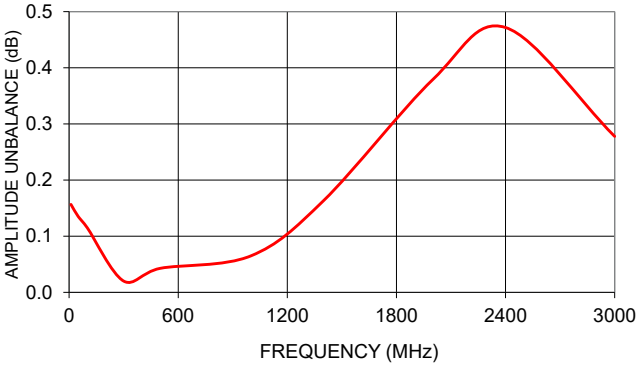
SCTX1.33-33-2W+
INSERTION LOSS



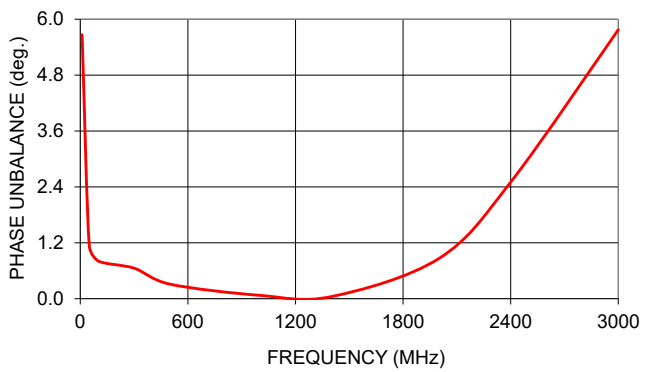
SCTX1.33-33-2W+
INPUT RETURN LOSS



SCTX1.33-33-2W+
AMPLITUDE UNBALANCE



SCTX1.33-33-2W+
PHASE UNBALANCE



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

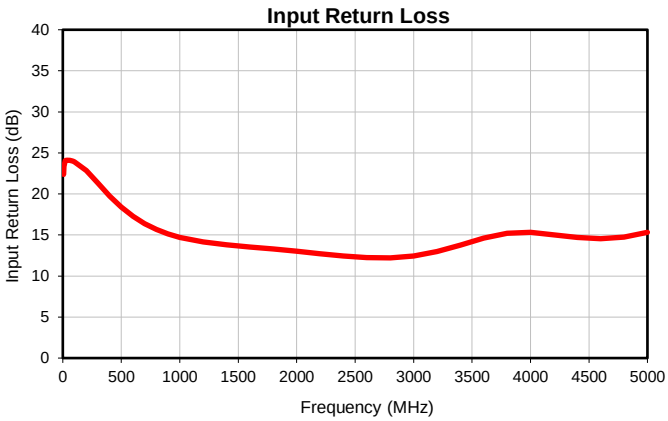
RF Transformer SCTX1.33-33-2W+

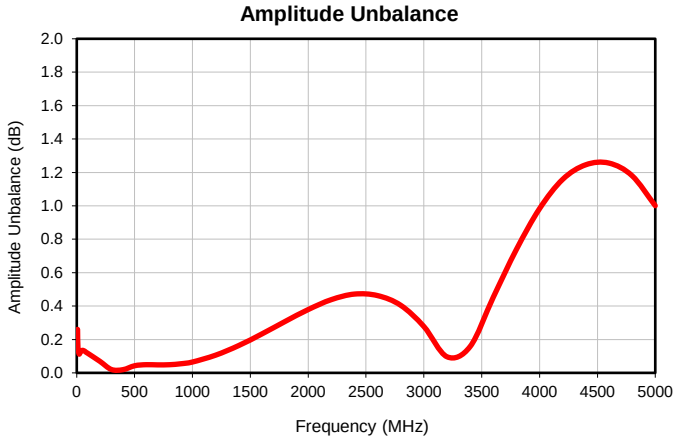
Typical Performance Data

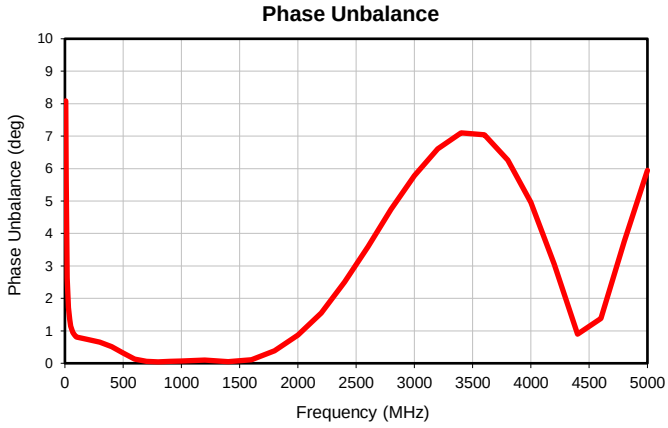
FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT RETURN LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE[1] (Deg)
7	1.90	22.39	0.26	8.09
10	1.89	23.34	0.16	5.67
20	1.89	24.06	0.11	2.64
30	1.89	24.10	0.12	1.72
40	1.90	24.10	0.13	1.35
50	1.90	24.10	0.14	1.14
60	1.90	24.09	0.13	1.02
70	1.90	24.06	0.13	0.95
80	1.90	24.02	0.12	0.89
90	1.90	23.97	0.12	0.84
100	1.90	23.89	0.11	0.81
200	1.91	22.84	0.07	0.73
300	1.91	21.31	0.02	0.66
400	1.92	19.75	0.02	0.51
500	1.93	18.38	0.04	0.31
600	1.95	17.28	0.05	0.13
700	1.96	16.39	0.05	0.06
800	1.98	15.69	0.05	0.04
900	1.99	15.15	0.05	0.06
1000	2.00	14.71	0.07	0.07
1200	2.01	14.14	0.11	0.10
1400	2.01	13.80	0.16	0.04
1600	2.01	13.54	0.23	0.11
1800	2.02	13.28	0.31	0.38
2000	2.04	13.01	0.38	0.86
2200	2.08	12.70	0.44	1.55
2400	2.14	12.43	0.47	2.50
2600	2.21	12.23	0.46	3.59
2800	2.28	12.21	0.40	4.74
3000	2.34	12.44	0.28	5.78
3200	2.39	12.98	0.10	6.61
3400	2.44	13.75	0.16	7.10
3600	2.49	14.61	0.45	7.04
3800	2.56	15.19	0.74	6.26
4000	2.64	15.30	0.98	4.96
4200	2.71	15.02	1.16	3.06
4400	2.75	14.69	1.25	0.89
4600	2.77	14.54	1.26	1.38
4800	2.75	14.74	1.18	3.76
5000	2.70	15.34	1.00	5.94

[1] Relative to 180°

Typical Performance Data



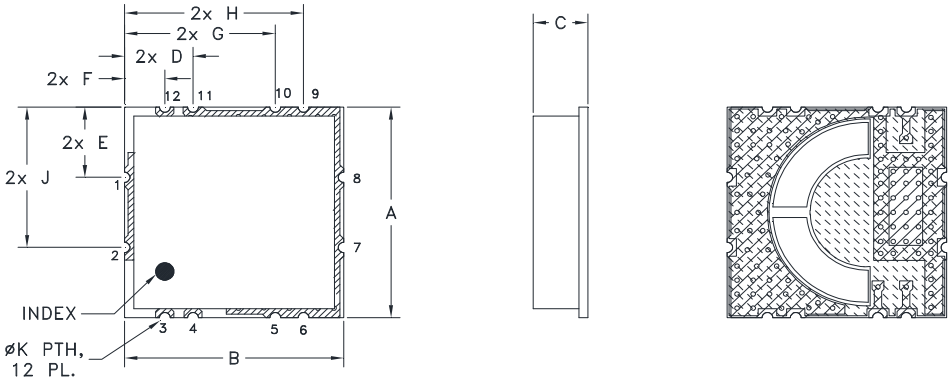




Case Style SN

Outline Dimensions

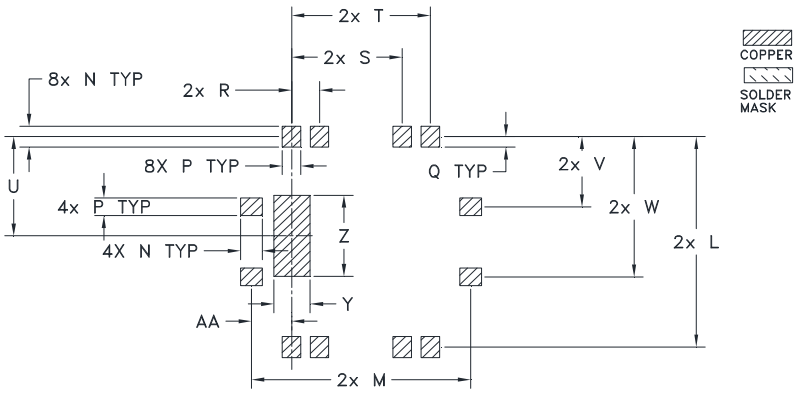
SN2595



TOP VIEW

BOTTOM VIEW

PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

CASE #	A	B	C	D	E	F	G	H	J	K
SN2595	.600 (15.24)	.600 (15.24)	.170 (3.81)	.187 (4.76)	.200 (5.08)	.110 (2.79)	.412 (10.48)	.490 (12.45)	.400 (10.16)	.030 (0.762)

CASE #	L	M	N	P	Q	R	S	T	U	V
SN2595	.600 (15.24)	.600 (15.24)	.060 (1.53)	.050 (1.28)	.030 (.76)	.076 (1.94)	.303 (7.68)	.380 (9.65)	.283 (7.18)	.200 (5.08)

CASE #	W	Y	Z	AA	WT. GRAM
SN2595	.400 (10.16)	.100 (2.54)	.231 (5.87)	.110 (2.79)	1.2

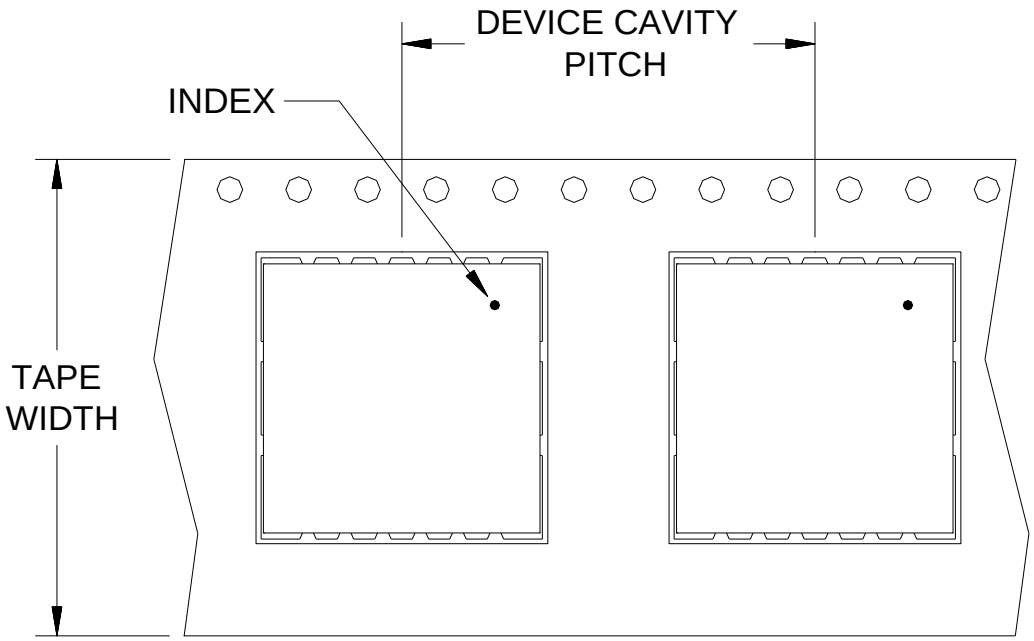
Dimensions are in inches (mm). Tolerances: 3Pl. ± .005

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.

Tape & Reel Packaging TR-F95

DEVICE ORIENTATION IN T&R



DIRECTION OF FEED

Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel	
24	24	13	Small quantity standards (see note)	20
				50
				100
				200
			Standard	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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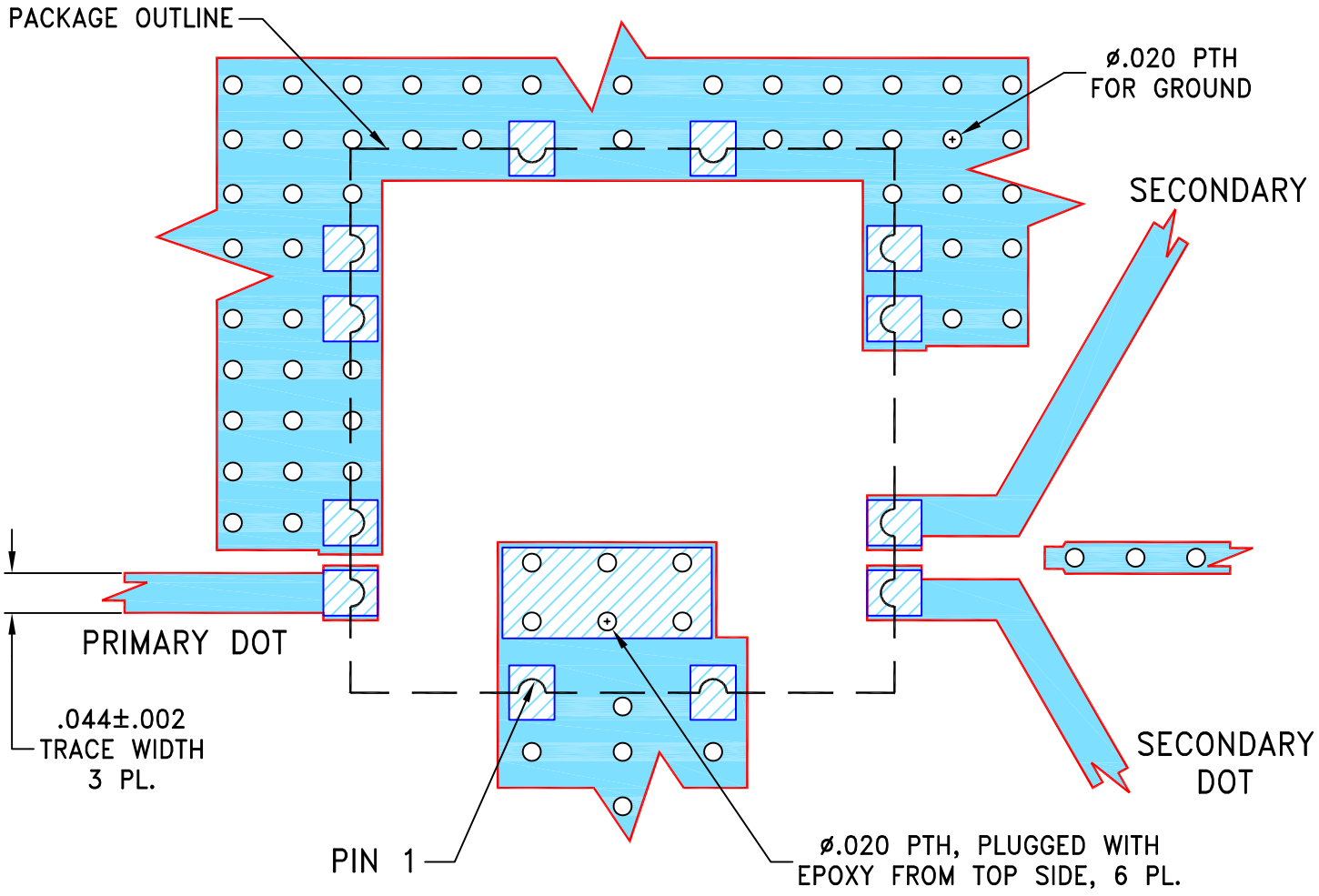
THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M168695	NEW RELEASE	06/28/18	ITG	WP
A	ECO-019969	CHANGED P/N OF TB, WAS TB-1005+	11/21/23	ITG	IL

SUGGESTED MOUNTING CONFIGURATION FOR SN2595 CASE STYLE



NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B, WITH DIELECTRIC THICKNESS .020±.0015". 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	06/28/18
TOLERANCES ON:	CHECKED	GF	06/28/18
2 PL DECIMALS ±	APPROVED	WP	06/28/18
3 PL DECIMALS ± .005"			
ANGLES ±			
FRACTIONS ±			

Mini-Circuits®

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

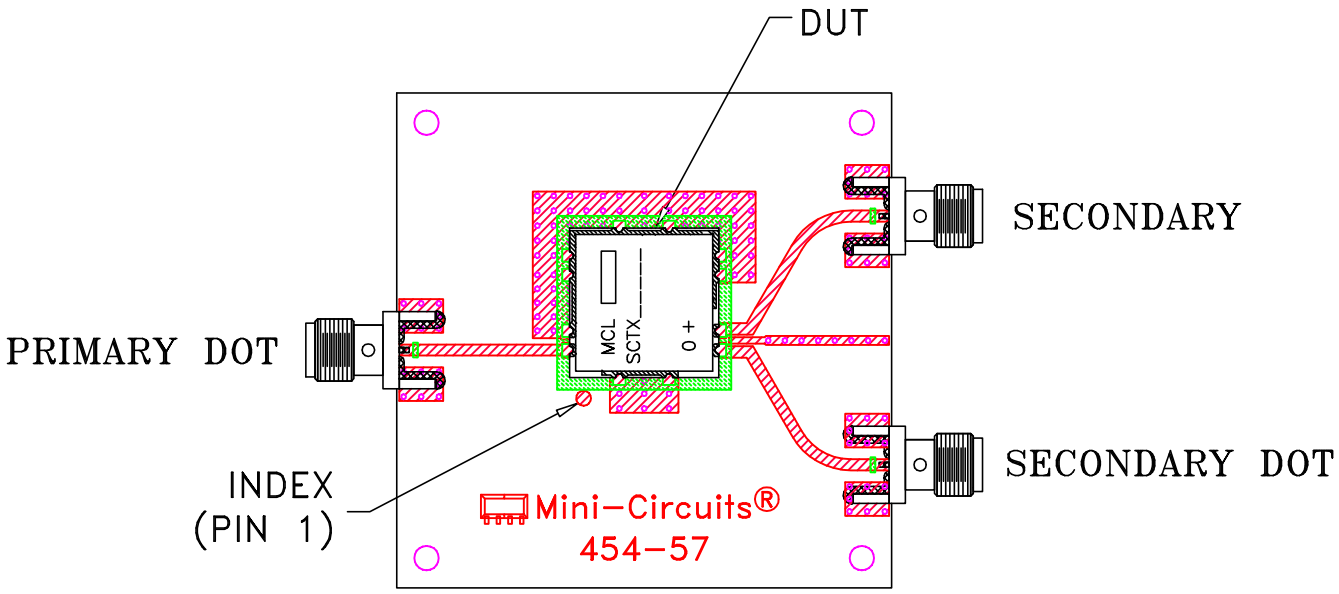
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

PL, SN2595,TB-SCTX2-93-2W+

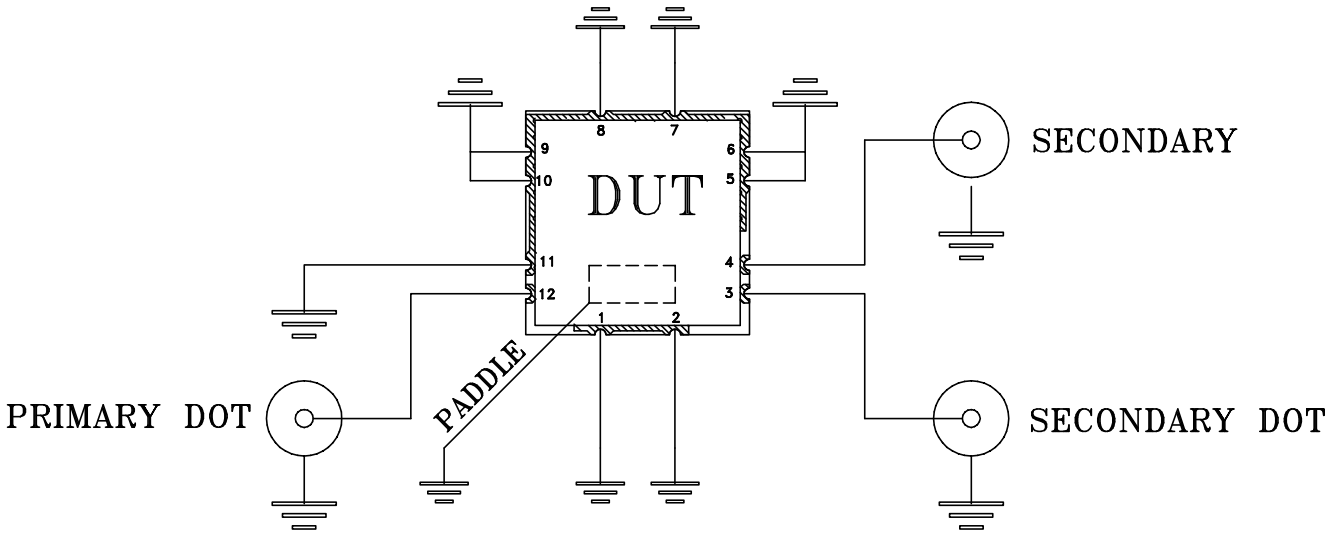
SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-595	A

FILE:	SCALE:	SHEET:
98PL595	5:1	1 OF 1

Evaluation Board and Circuit



TB-1005+



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: RO4350 or equivalent,
   Dielectric Constant=3.5, Thickness=.020 inch.

Mini-Circuits®

Mini-Circuits

Environmental Specifications ENV02T1

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, 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 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; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C	MIL-STD-202, Method 215