SURFACE MOUNT

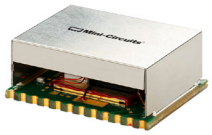
RF Transformer

SYTX3-41-80W+

16.7/50Ω 5 to 40 MHz 80 Watt 1:3 Ratio

KEY FEATURES

- High Power Input, up to 80 W
- Low Insertion Loss , 0.2 dB Typ.
- DC Isolated from IN to Out

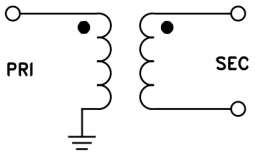


Generic photo used for illustration purposes only

APPLICATIONS

- Aerospace & Defense
- Industrial

CONFIGURATION E1



PRODUCT OVERVIEW

Mini-Circuits' SYTX3-41-80W+ is a high-power, surface-mount transformer with a secondary/primary impedance ratio of 1:3, covering the 5 to 40 MHz band. DC current isolated IN to OUT, the transformer is capable of handling RF input power up to 80W. It provides low insertion loss (0.2 dB) as well as good matching VSWR 1.57:1. Featuring core and wire construction mounted on PCB, the unit comes enclosed in a miniature, shielded package measuring just 1.22 x 0.93 x 0.47", ideal for dense circuit board layouts.

ELECTRICAL SPECIFICATIONS[1,2,3,4] AT +25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Units
Impedance Ratio			1:3		
Frequency Range		5		40	MHz
Insertion Loss (Avg.)	5 - 7.28	—	0.2	0.65	dB
	7.28 - 40	—	0.4	1.0	
Amplitude Unbalance	5 - 7.28	—	—	0.5	dB
	7.28 - 40	—	—	1.5	
Phase Unbalance	5 - 7.28	—	4.0	—	Degree
	7.28 - 40	—	17.0	—	
Primary Return Loss (Input)	5 - 7.28	13	—	—	dB
	7.28 - 40	13	—	—	

1. Nominal test impedances, Primary 50Ω to Secondary 16.7Ω.
2. Tested in Mini-Circuits Evaluation Board TB-SYTX3-4180W+. (Tested using Z conversion ON and Port extension ON)
3. The user must provide adequate means of heat removal to limit the temperature of ground connections under the PCB to +85°C, in order to ensure proper performance.
4. At 25°C ambient temperature this requires thermal resistance of the users PC board heat sink to be 8°C/W.

ABSOLUTE MAXIMUM RATINGS[5]

Operating Temperature	0°C to +40°C
Storage Temperature	-55°C to +100°C
Input Power[6]	80 W

5. Permanent damage may occur if any of these limits are exceeded.
6. Power rating applies only to signals within the passband.

REV. OR
ECO-027031
STYX3-41-80W+
EDU5190
URJ
250923

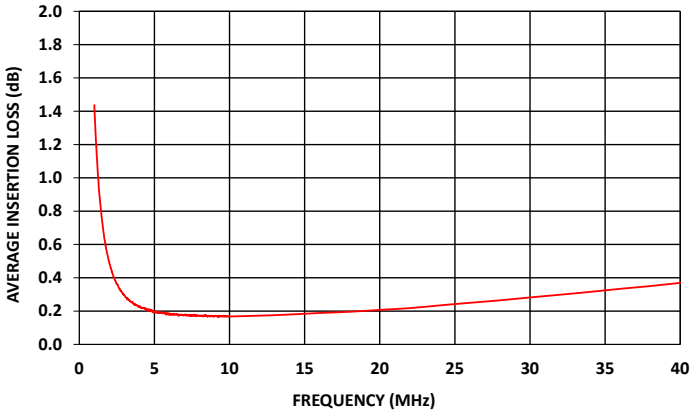
RF Transformer

SYTX3-41-80W+

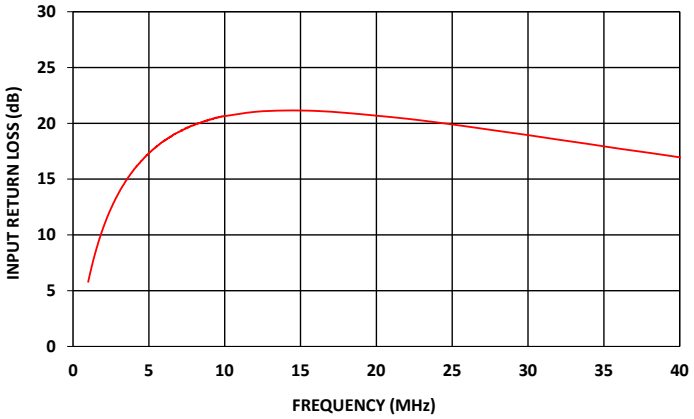
16.7/50Ω 5 to 40 MHz 80 Watt 1:3 Ratio

TYPICAL PERFORMANCE GRAPHS AT +25°C

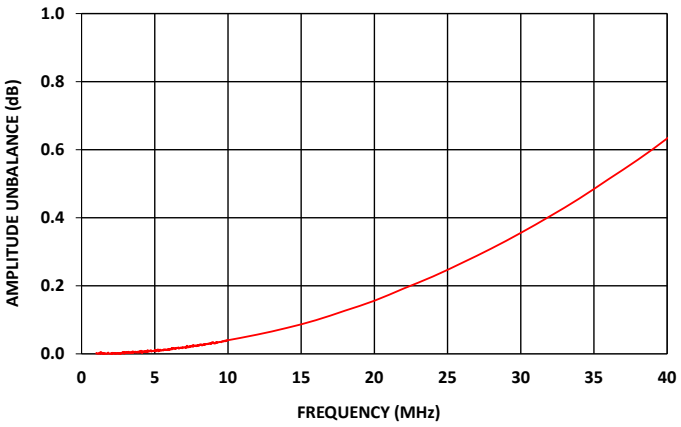
AVERAGE INSERTION LOSS



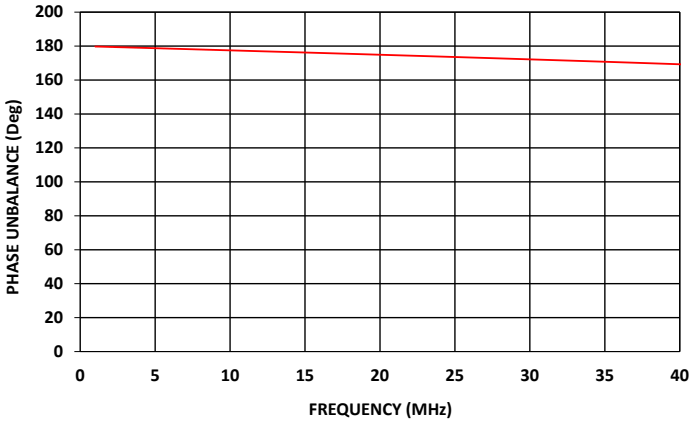
INPUT RETURN LOSS



AMPLITUDE UNBALANCE



PHASE UNBALANCE



SURFACE MOUNT

RF Transformer

SYTX3-41-80W+

16.7/50Ω 5 to 40 MHz 80 Watt 1:3 Ratio

CONFIGURATION E1

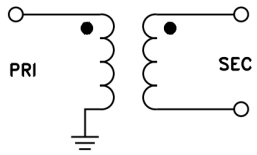


Figure 1. SYTX3-41-80W+ Configuration

PAD DESCRIPTION

Function	Pad Number	Description
Primary Dot	10	Connects to Input
Secondary Dot	15	Connects to Output 1
Secondary	24	Connects to Output 2
GND	All others	Connects to Ground on PCB, (See drawing PL-437)

SUGGESTED PCB LAYOUT (PL-437)

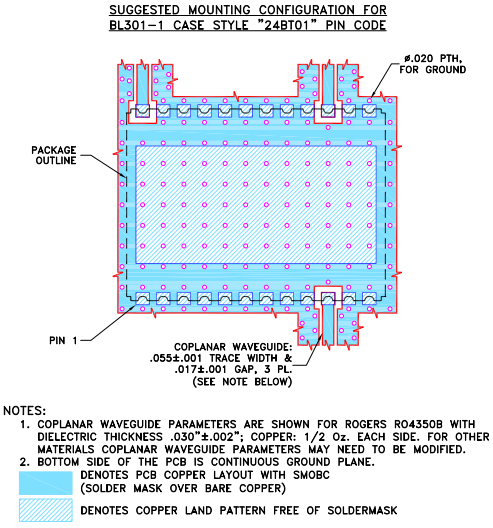
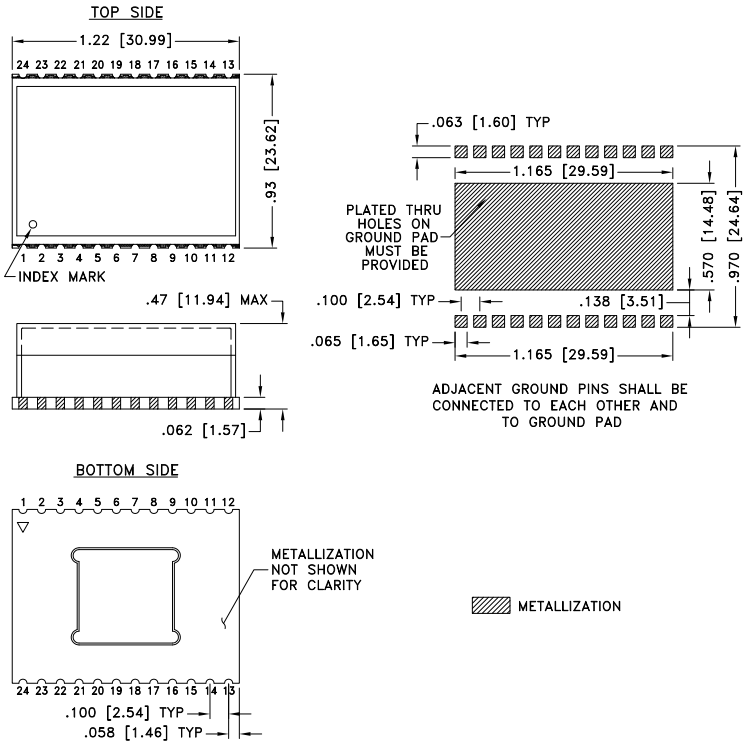


Figure 2. Suggested PCB Layout PL-437

CASE STYLE DRAWING



Weight: 12.4 grams

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

PRODUCT MARKING*: SYTX3-41-80W

*Marking may contain other features or characters for internal lot control.

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ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASHBOARD CLICK HERE

Performance Data & Graphs	Data Graphs S-Parameter (S3P Files) Data Set (.zip file) De-embedded to device pads
Case Style	BL301-3 Lead Finish: Gold over Nickel Plate
RoHS Status	Compliant
Tape and Reel	N/A
Suggested Layout for PCB Design	PL-437
Evaluation Board	TB-SYTX3-4180W+ Gerber File
Environmental Rating	ENV02T4

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/terms/viewterm.html

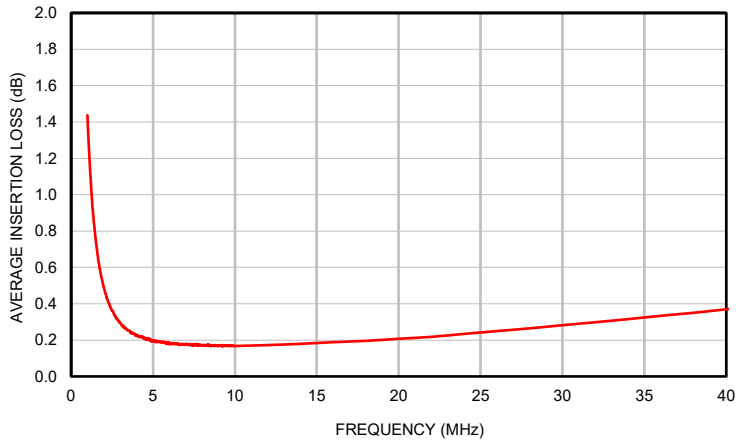
RF Transformer SYTX3-41-80W+

Typical Performance Data

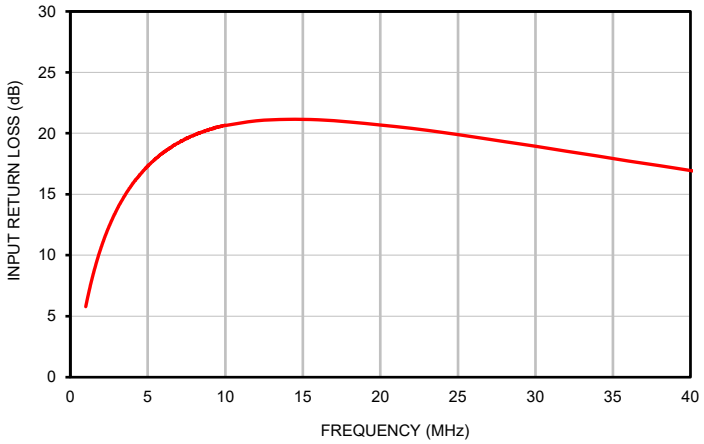
FREQUENCY (MHz)	AVERAGE INSERTION LOSS (dB)	INPUT RETURN LOSS (dB)	AMPLITUDE UNBALANCE (dB)	PHASE UNBALANCE (deg.)
1.00	1.44	5.78	0.00	179.76
2.00	0.49	10.69	0.00	179.51
3.00	0.29	13.73	0.00	179.27
4.00	0.23	15.82	0.01	179.02
5.00	0.20	17.28	0.01	178.75
6.28	0.18	18.66	0.02	178.43
6.30	0.18	18.69	0.02	178.44
6.40	0.18	18.76	0.01	178.39
6.52	0.18	18.87	0.02	178.37
7.00	0.18	19.24	0.02	178.25
7.12	0.17	19.36	0.02	178.23
7.20	0.18	19.36	0.02	178.21
7.28	0.17	19.43	0.02	178.18
7.80	0.17	19.77	0.02	178.06
8.00	0.17	19.89	0.03	178.00
8.40	0.17	20.06	0.03	177.89
8.86	0.17	20.27	0.03	177.77
8.50	0.17	20.12	0.03	177.88
9.00	0.17	20.33	0.03	177.74
9.50	0.17	20.50	0.04	177.61
10.00	0.17	20.64	0.04	177.49
12.00	0.17	21.03	0.06	176.97
14.00	0.18	21.15	0.08	176.47
10.00	0.17	20.64	0.04	177.49
12.00	0.17	21.03	0.06	176.97
14.00	0.18	21.15	0.08	176.47
16.00	0.19	21.11	0.10	175.96
18.00	0.20	20.93	0.13	175.43
20.00	0.21	20.68	0.16	174.90
22.00	0.22	20.41	0.19	174.37
24.00	0.23	20.08	0.23	173.83
26.00	0.25	19.71	0.27	173.29
28.00	0.26	19.32	0.31	172.74
30.00	0.28	18.94	0.36	172.18
32.00	0.30	18.53	0.40	171.62
34.00	0.32	18.14	0.46	171.06
36.00	0.33	17.73	0.51	170.47
38.00	0.35	17.35	0.57	169.89
40.00	0.37	16.95	0.63	169.28

Typical Performance Curves

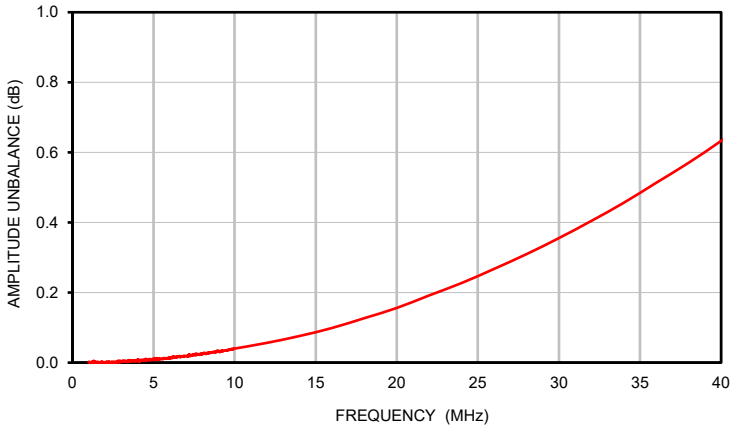
AVERAGE INSERTION LOSS



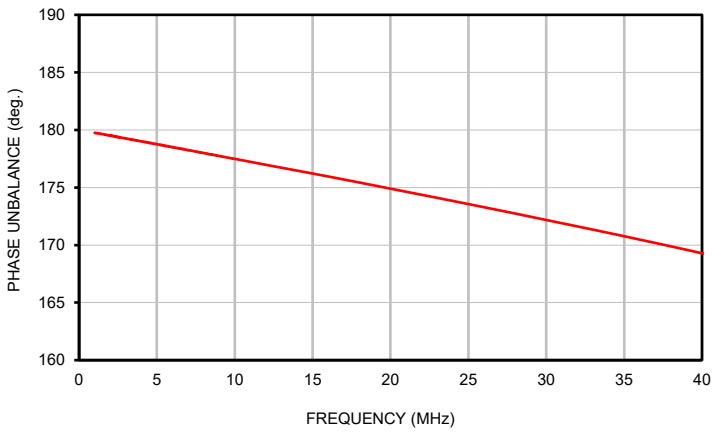
INPUT RETURN LOSS



AMPLITUDE UNBALANCE



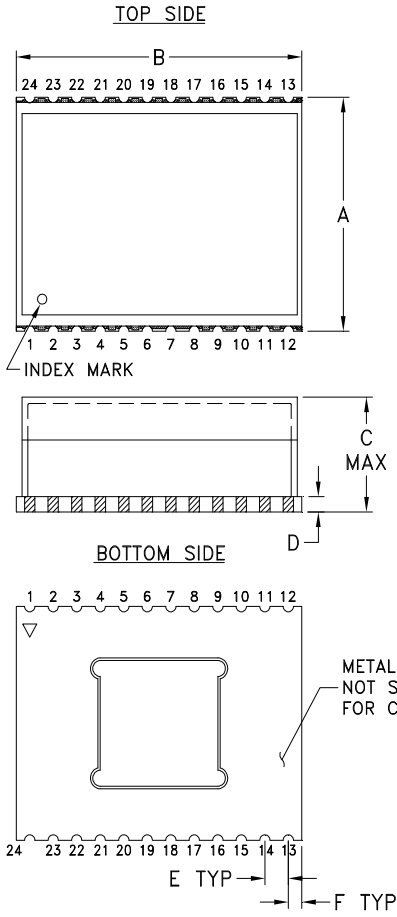
PHASE UNBALANCE



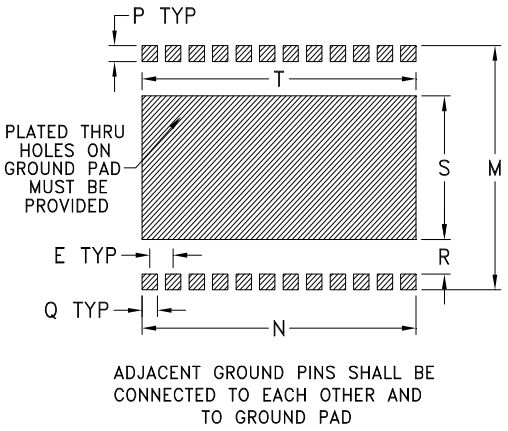
Case Style BL

Outline Dimensions

BL301-3



PCB Land Pattern



Suggested Layout,
Tolerance to be within ±.002

METALLIZATION

CASE #	A	B	C	D	E	F	G	H	J	K	L
BL301-3	.93 (23.62)	1.22 (30.99)	.47 (11.94)	.062 (1.57)	.100 (2.54)	.058 (1.46)	-- --	-- --	-- --	-- --	-- --

CASE#	M	N	P	Q	R	S	T	U	WT. GRAM*	
									MIN	MAX
BL301-3	.970 (24.64)	1.165 (29.59)	.063 (1.60)	.065 (1.65)	.138 (3.51)	.570 (14.48)	1.165 (29.59)	-- --	6.5	13

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

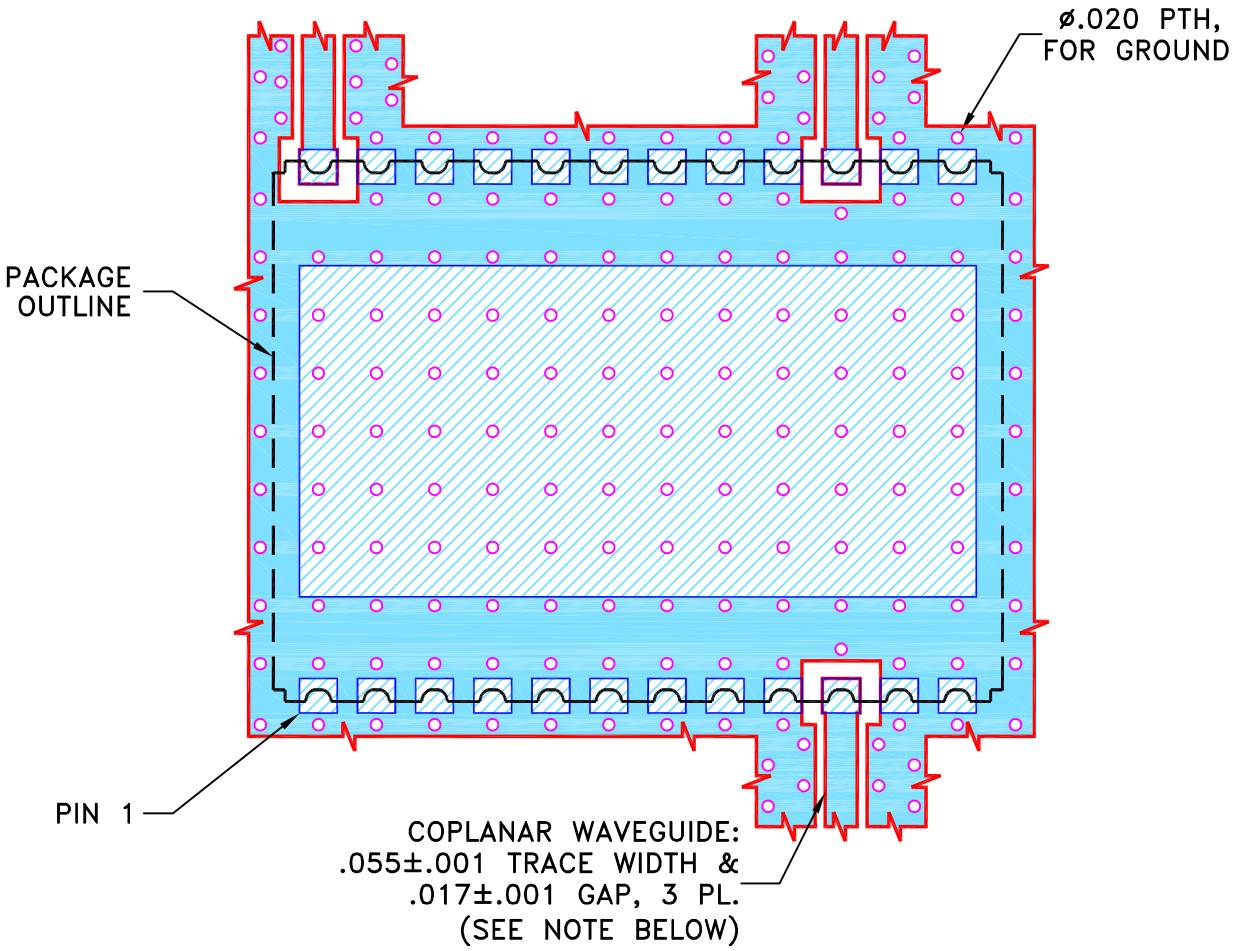
Notes:

1. Case material: Copper-Nickel alloy.
2. Base material: Printed wiring laminate.
3. Termination finish:
   For RoHS Case Styles: 3-5 µinch Gold over 120-240 µinch Nickel plate. All models, (+) suffix.
   For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.
4. *Refer to the individual model datasheet for exact unit weight details.

THIRD ANGLE PROJECTION

REVISIONS					
REV	ECN No.	DESCRIPTION	DATE	DR	AUTH
OR	M148377	NEW RELEASE	12/30/14	ITG	DJ

SUGGESTED MOUNTING CONFIGURATION FOR BL301-1 CASE STYLE "24BT01" PIN CODE



NOTES:

1. COPLANAR WAVEGUIDE PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030"±.002"; COPPER: 1/2 Oz. EACH SIDE. FOR OTHER MATERIALS COPLANAR WAVEGUIDE PARAMETERS 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	12/17/14
TOLERANCES ON:	CHECKED	GF	12/30/14
2 PL DECIMALS ±	APPROVED	DJ	12/30/14
3 PL DECIMALS ± .005"			
ANGLES ±			
FRACTIONS ±			

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

Mini-Circuits®
13 Neptune Avenue
Brooklyn NY 11235

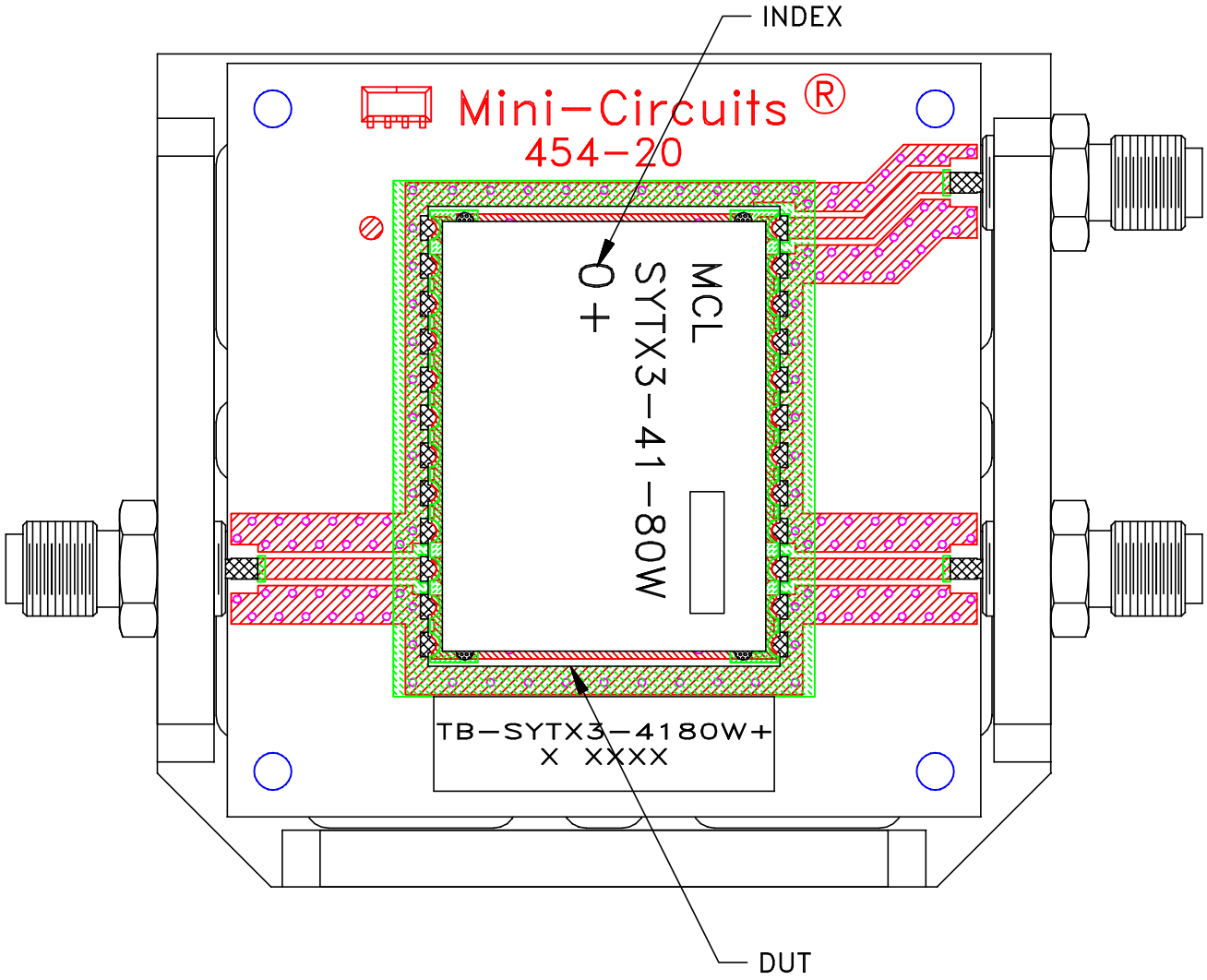
PL, 24BT01, BL301-1, TB-605+

SIZE	CODE IDENT	DRAWING NO:	REV:
A	15542	98-PL-437	OR

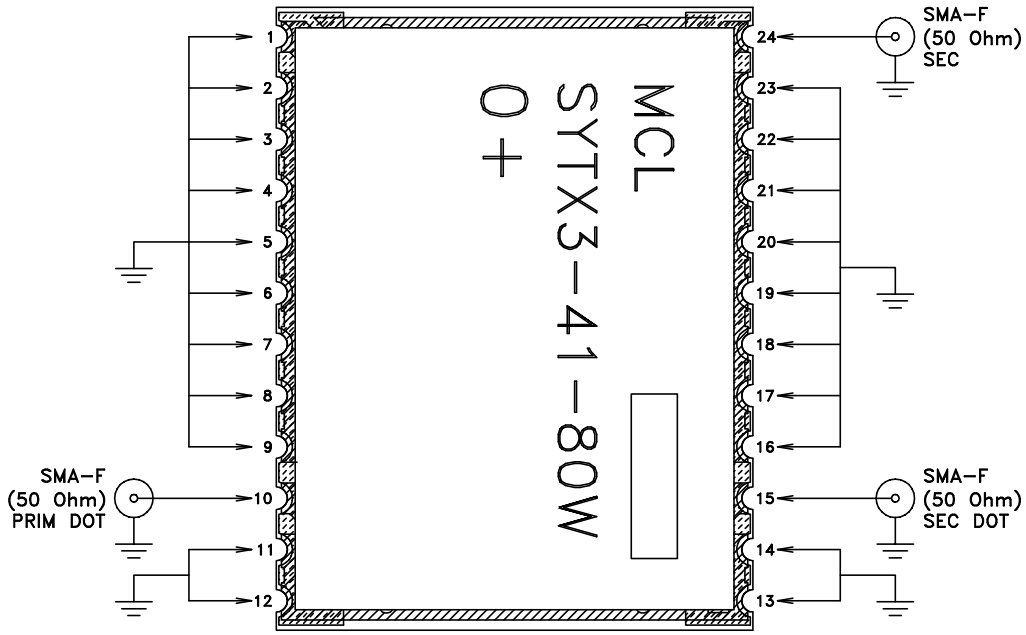
FILE:	SCALE:	SHEET:
98PL437	3:1	1 OF 1

Evaluation Board and Circuit

TB-SYTX3-4180W+



Schematic diagram



Notes:

1. PCB Material: ROGERS (RO4350B) OR Equivalent, Dielectric Constant=3.48±.05
Dielectric Thickness: .030±.002 inch
2. 50 Ohm SMA Female Connectors.

Mini-Circuits®

Mini-Circuits

Environmental Specifications **ENV02T4**

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 Case 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, Para 4.2.5, Test S, 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