

Surface Mount

# RF Transformer

**SYTX2-52HP-20W+**

50Ω 20 Watt 30 to 520 MHz

## The Big Deal

- High power handling, 20W
- Low insertion loss, 0.8 dB typ.
- Small size, 0.43 x 0.69 x 0.42"



CASE STYLE: AH1647

## Product Overview

Mini-Circuits' SYTX2-52HP-20W+ is a high-power, surface-mount transformer with a secondary/primary impedance ratio of 1:2, covering the 30 to 520 MHz band. With proper heat sinking, the transformer is capable of handling RF input power up to 20W. It provides low insertion loss (0.8 dB) as well as good matching VSWR1.25:1. Featuring core and wire construction mounted on a printed laminate base, the unit comes enclosed in a miniature, shielded package measuring just 0.43 x 0.69 x 0.42", 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, 0.8 dB	Provides excellent transmission of signal power from input to output.
Good Return Loss, 18 dB typ	Provide good in to output impedance matching.
Small footprint, 0.43 x 0.69 x 0.42"	Accommodates tight space requirements for dense PCB layouts.

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



# Surface Mount RF Transformer

## SYTX2-52HP-20W+

25/50Ω      30 to 520 MHz      20 Watt

### Maximum Ratings

Operating Temperature	-40°C to 65°C case*
Storage Temperature	-55°C to 100°C
RF Power	20W

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

### Pin Connections

PRIMARY (50 ohm)	4
SECONDARY (25 ohm)	1
GROUND	5
NOT USE	8
CASE GROUND	all others

### Features

- high power input, 20 Watt max.
- low insertion loss, 08 dB typ.
- small size, 0.43 x 0.69 x 0.42

### Applications

- military mobile
- PCS
- BALUN
- diode matching



Generic photo used for illustration purposes only

CASE STYLE: AH1647

### +RoHS Compliant

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

Available Tape and Reel at no extra cost

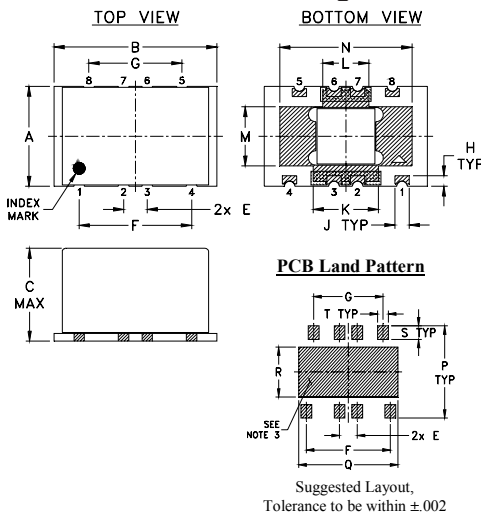
Reel Size	Devices/Reel
13"	200

### Electrical Specifications at 25°C

Parameter	Frequency (MHz)	Min.	Typ.	Max.	Unit
Impedance Ratio (Primary / Secondary)			2		
Frequency Range		30	—	520	MHz
Insertion Loss	30-520	—	0.8	1.5	dB
Return Loss at 50 ohm	30-520	13	20	—	dB
Power Handling at primary <sup>1</sup>	30-520	—	—	20	Watt

1. The user must provide adequate means of heat removal to limit the temperature of ground connections under the PCB to +65°C, in order to ensure proper performance. At 25°C ambient temperature this requires thermal resistance of the user's PC board heat sink to be 2°C/W.

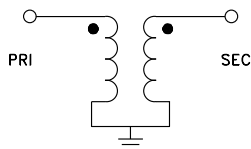
### Outline Drawing



### Outline Dimensions (inch)

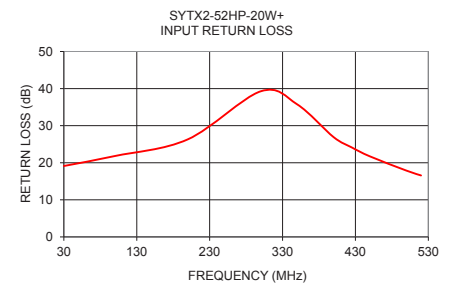
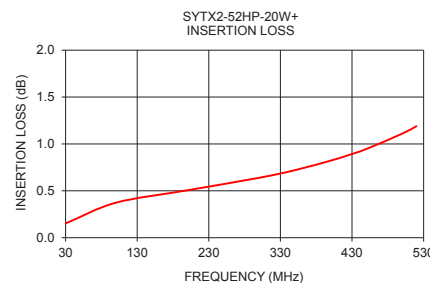
A	B	C	E	F	G	H	J	K
.433	.690	.415	.100	.476	.394	.045	.060	.276
11.00	17.53	10.54	2.54	12.09	10.01	1.14	1.52	7.01
L	M	N	P	Q	R	S	T	wt
.194	.257	.560	.475	.561	.258	.069	.061	grams
4.93	6.53	14.22	12.07	14.25	6.55	1.75	1.55	2.80

### Config. D



### Typical Performance Data

FREQUENCY (MHz)	INSERTION LOSS (dB)	PRIMARY R. LOSS (dB)
30	0.15	19.13
100	0.37	21.81
200	0.51	26.31
300	0.64	39.26
350	0.72	35.76
400	0.82	26.92
425	0.88	24.12
450	0.95	21.71
500	1.11	17.88
520	1.19	16.58



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M164707  
SYTX2-52HP-20W+  
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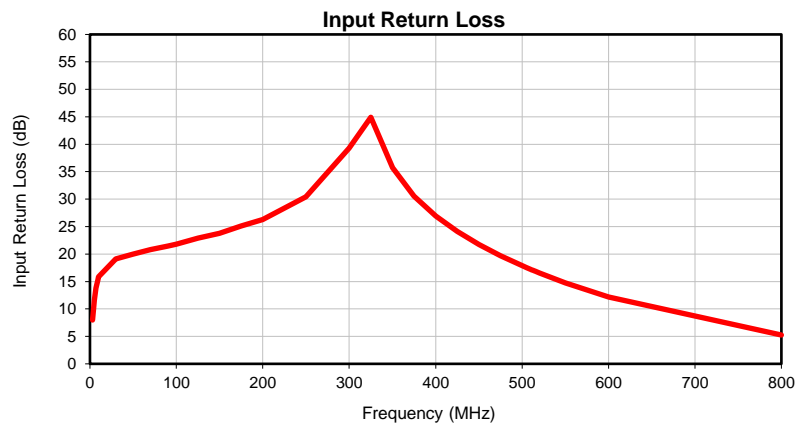
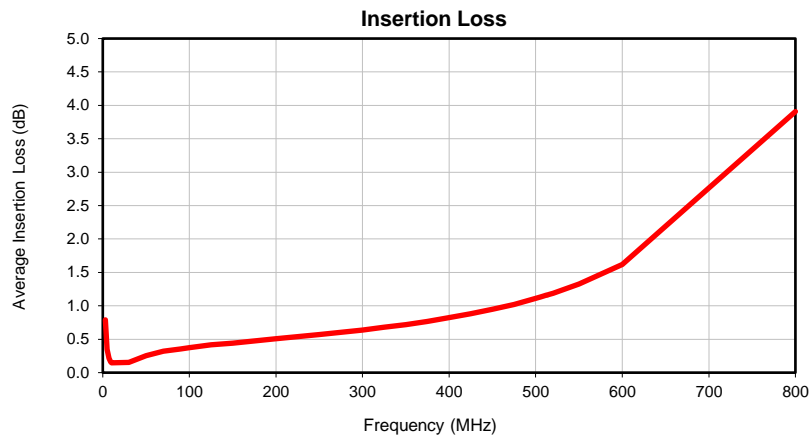
# RF Transformer

# SYTX2-52HP-20W+

## Typical Performance Data

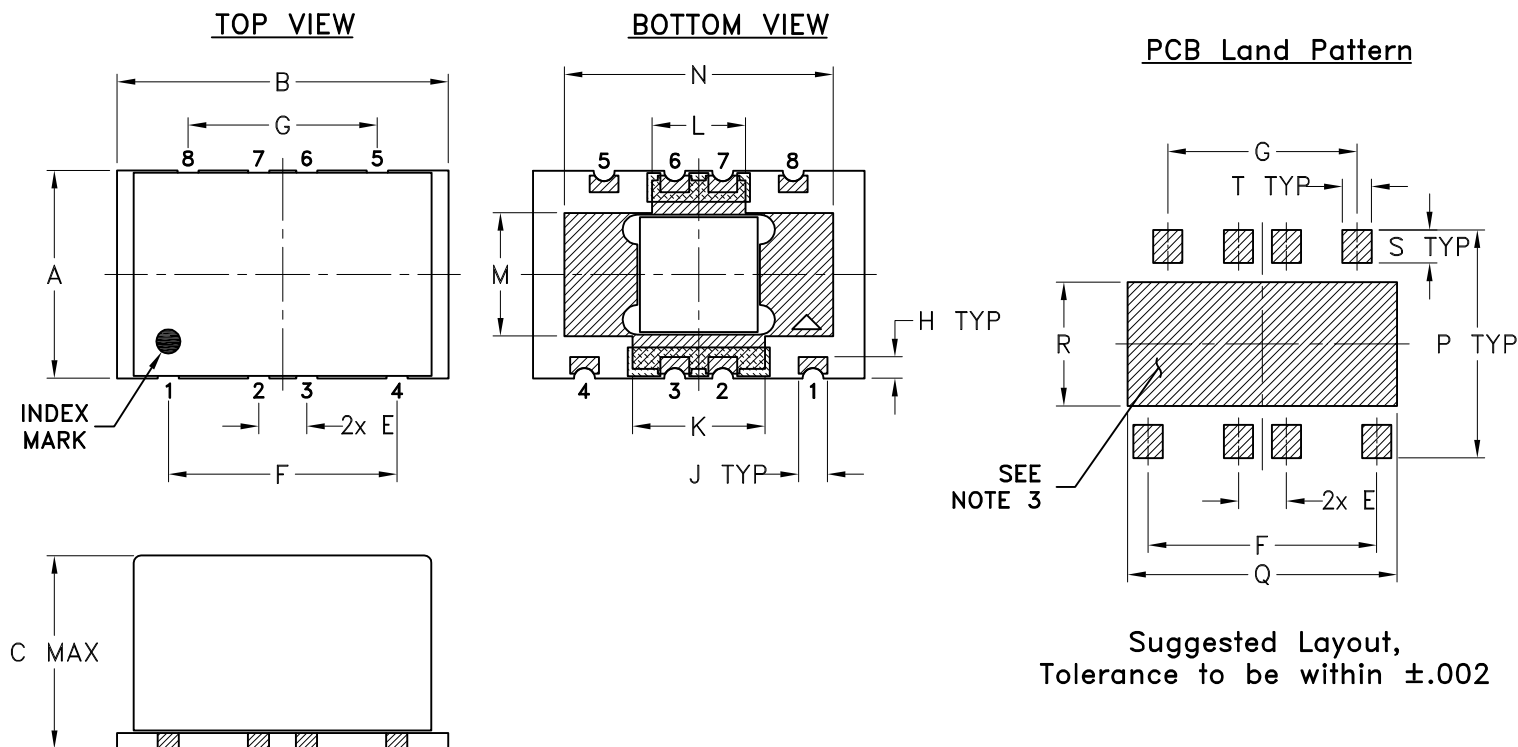
FREQUENCY (MHz)	INSERTION LOSS (dB)	INPUT RETURN LOSS (dB)
3	0.79	8.01
5	0.35	11.57
7	0.22	13.80
9	0.16	15.29
10	0.15	15.86
30	0.15	19.13
50	0.25	19.97
70	0.32	20.80
90	0.36	21.45
100	0.37	21.81
125	0.41	22.89
150	0.44	23.76
175	0.48	25.09
200	0.51	26.31
250	0.57	30.43
300	0.64	39.26
325	0.68	44.92
350	0.72	35.76
375	0.77	30.52
400	0.82	26.92
425	0.88	24.12
450	0.95	21.71
475	1.02	19.68
500	1.11	17.88
505	1.13	17.55
510	1.15	17.21
511	1.15	17.16
512	1.16	17.09
513	1.16	17.03
514	1.17	16.96
515	1.17	16.89
520	1.19	16.58
550	1.33	14.77
600	1.62	12.15
800	3.91	5.25

## Typical Performance Data



## Outline Dimensions

AH1647



Suggested Layout,  
Tolerance to be within  $\pm 0.002$

CASE#	A	B	C	D	E	F	G	H	J	K	L	M	N
AH164 7	.433 (11.00)	.690 (17.53)	.415 (10.54)	- -	.100 (2.54)	.476 (12.09)	.394 (10.01)	.045 (1.14)	.060 (1.52)	.276 (7.01)	.194 (4.93)	.257 (6.53)	.560 (14.22)
CASE #	P	Q	R	S	T	WT, GRAM							
AH1647	.475 (12.07)	.561 (14.25)	.258 (6.55)	.069 (1.75)	.061 (1.55)	2.80							

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm 0.01$ ; 3 Pl.  $\pm 0.005$

### Notes:

- Case material: Nickel Silver alloy.
- Base material: Printed wiring laminate.
- Termination finish: Tin copper solder alloy up to 0.07% Nickel. All models, (+) suffix.

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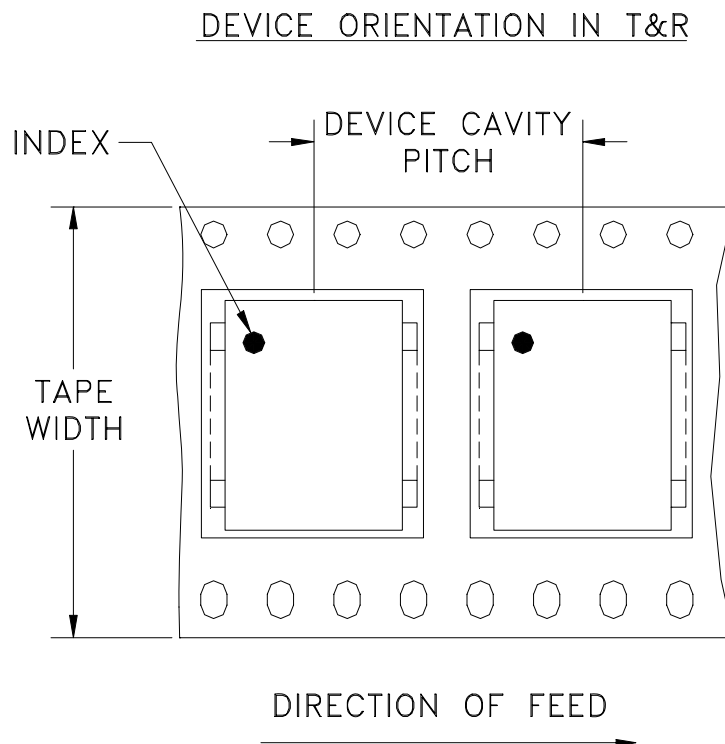
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: [www.minicircuits.com](http://www.minicircuits.com)

RF/IF MICROWAVE COMPONENTS

# Tape & Reel Packaging TR-F109



Tape Width, mm	Device Cavity Pitch, mm	Reel Size, inches	Devices per Reel
32	16	13	200

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](http://www.minicircuits.com/pages/pdfs/tape.pdf)



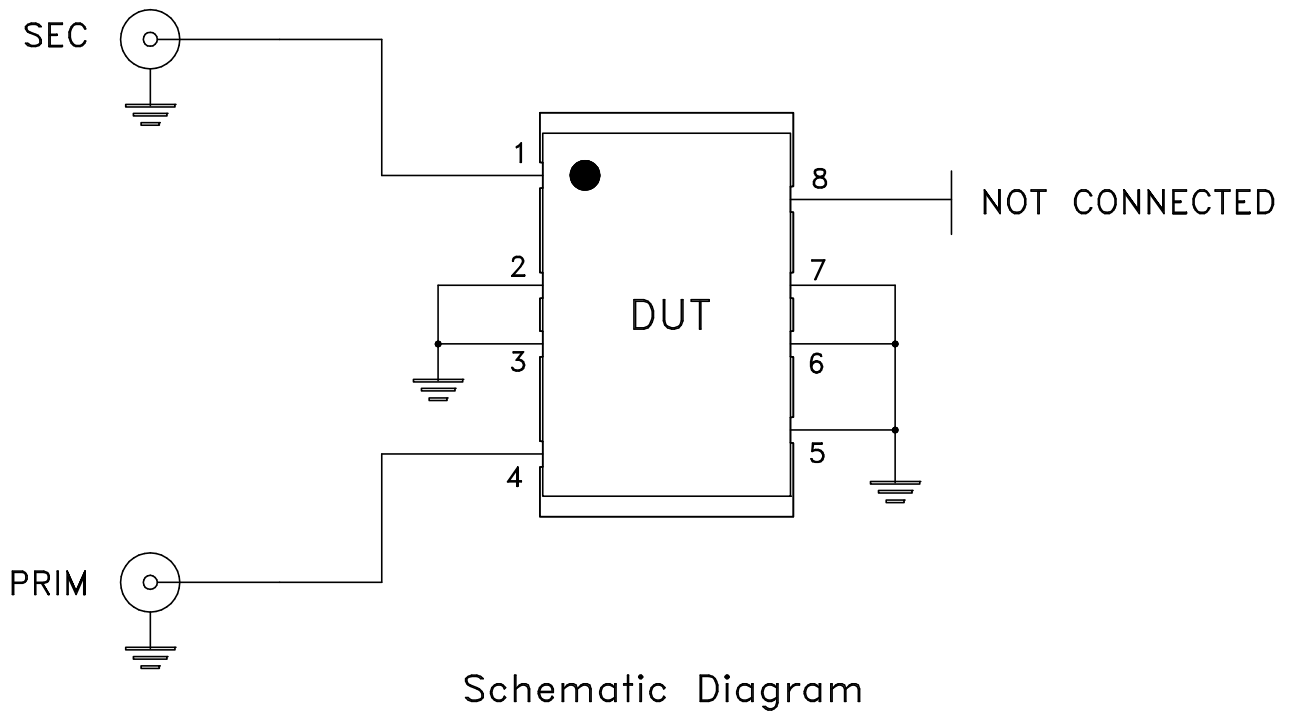
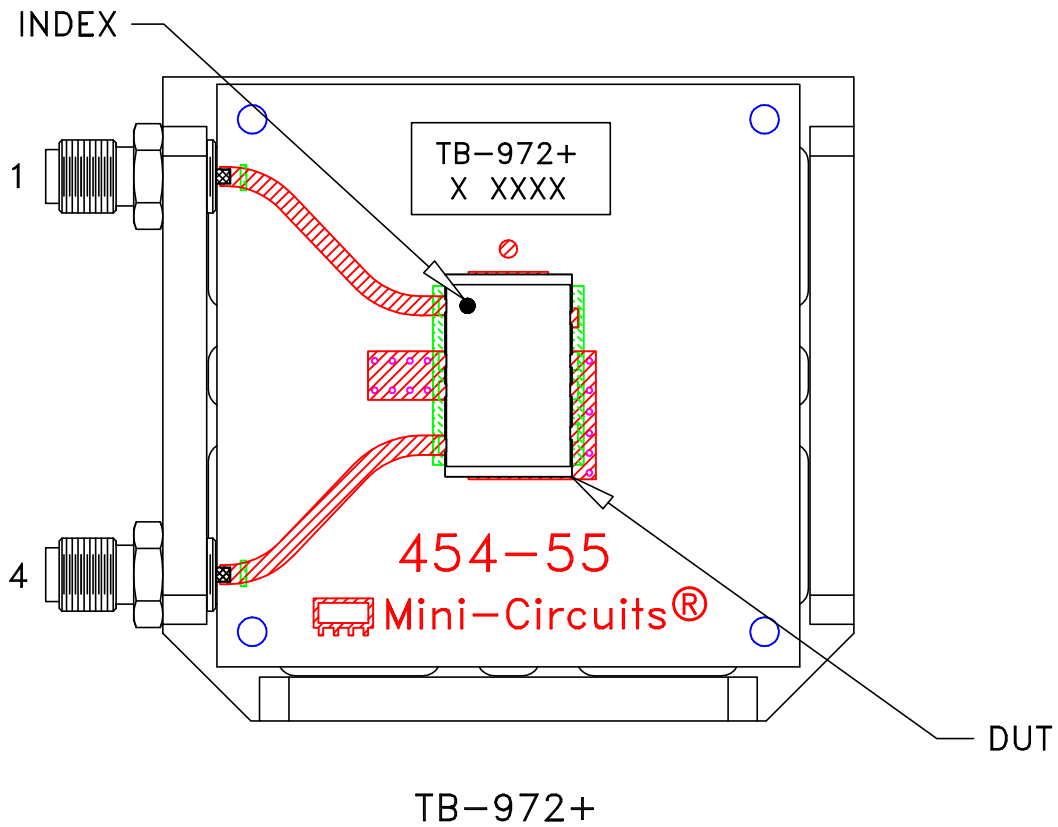
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# Evaluation Board and Circuit



## 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.

<b>Specification</b>	<b>Test/Inspection Condition</b>	<b>Reference/Spec</b>
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