

Microwave Precision

# Fixed Attenuator

YAT-A-SERIES

50Ω Up to 2W DC to 18 GHz

## The Big Deal

- Exceptional Power Handling, Up to 2W
- Wide bandwidth, DC - 18 GHz
- Small Size, 2 mm x 2 mm



CASE STYLE: MC1630

## Product Overview

YAT-A attenuators (ROHS compliant) are fixed value, absorptive attenuators fabricated using highly repetitive MMIC processing including thin film resistors on GaAs substrates. YAT-A attenuators contain through-wafer metallization vias to realize low thermal resistance and wideband operation. YAT-As are available with nominal attenuation values of 0 to 10 dB (in 1 dB steps), and 12, 15, 20, and 30 dB. Packaged in tiny 2 mm x 2 mm MCLP™ package fits into tiny spaces.

## Key Features

Feature	Advantages
Wideband operation, DC to 18 GHz	Supports a wide array of applications including wireless cellular, microwave Communications, satellite, Defense and aerospace, medical broadband and optic applications.
Small Size and simple to use (2 mm x 2 mm)	As a single chip solution, the YAT-A series occupies less board space than a “T” or “Pi” pad configuration, and ensures repeatable performance over wide frequency ranges.
High Power, Up to 2W	High power handling in a small size package.
Wide range of nominal attenuation values 0 to 10 dB (in 1 dB steps), and 12, 15, 20, and 30 dB	Small increment offering enables circuit designer to change attenuation values without motherboard redesign making the YAT-A series ideal for select at test application.
MCLP™ Package	Low Inductance, repeatable transitions, excellent thermal path make the YAT-A series an ideal solution as an alternative to “do it yourself” resistor based attenuators.

### 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)



# Microwave Precision Fixed Attenuator

## YAT-9A+

50Ω 1.1W 9 dB DC to 18 GHz

### Product Features

- Miniature package MCLP™ 2 x 2 mm
- Wide bandwidth, DC-18 GHz
- Excellent attenuation accuracy & flatness



Generic photo used for illustration purposes only  
CASE STYLE: MC1630

### +RoHS Compliant

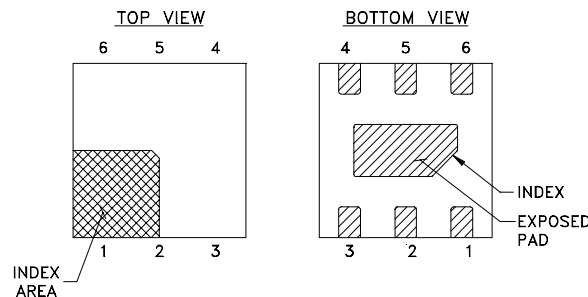
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

### Typical Applications

- Cellular
- PCS
- Communications
- Radar
- Defense

### General Description

YAT-9A+ is a 9-dB absorptive attenuator fabricated using highly repetitive MMIC process including thin film resistors on GaAs substrate. YAT-9A+ attenuator contains through-wafer metallization vias to realize low thermal resistance and wideband operation. Packaged in tiny 2 mm x 2 mm MCLP™ package fits into tiny spaces.



### Pad Description

Function	Pad Number	Description
RF IN	2	RF input pad
RF-OUT	5	RF output pad
GND	1,3,4,6 Bottom Exposed pad	Connected to ground externally

### 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)



**Electrical Specifications<sup>1</sup> at 25°C, 50Ω (CPW)**

Parameter	Condition (GHz)	Min.	Typ.	Max.	Unit
Frequency Range		DC	—	18	GHz
Attenuation	0.01	—	9	—	dB
	DC - 5	8.5	8.92	9.3	
	5 - 15	8.5	8.90	9.5	
VSWR	15 - 18	8.6	8.93	9.5	:1
	DC - 5	—	1.08	1.32	
	5 - 15	—	1.09	1.90	
Input Power <sup>2</sup>	15 - 18	—	1.21	1.96	W
	DC - 18	—	—	1.1	

1. Tested on Mini-Circuits test board TB-YAT-9A+ using coplanar wave guide (CPW) input and output traces (see suggested PCB layout on page 4 of this data sheet)  
 2. RF Power at 25°C case temperature: 1.1 Watt. Derate linearly to 0.8 W at 85°C.

**Absolute Maximum Ratings**

Operating Case Temperature <sup>3</sup>	-40°C to 85°C
Storage Temperature	-65°C to 150°C
RF Input Power <sup>2</sup>	1.1W

3. Case is defined as ground lead.  
 Permanent damage may occur if any of these limits are exceeded.

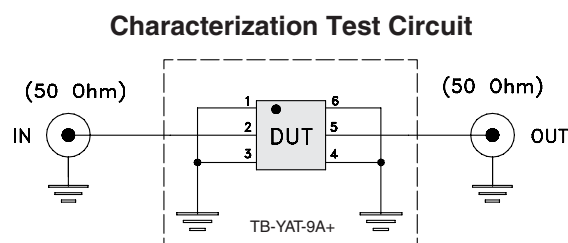
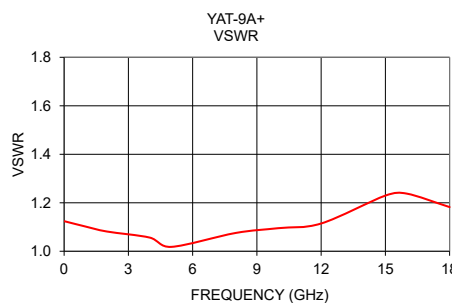
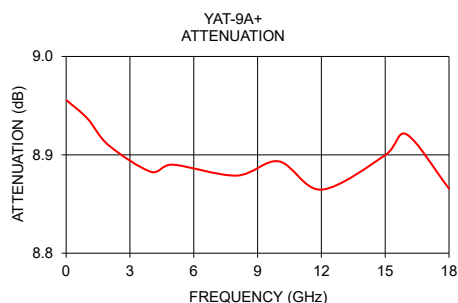


Fig 1. Block diagram of Test Circuit used for characterization, Test board TB-YAT-9A+ Conditions: Attenuation, VSWR: Pin=-10 dBm

**Typical Performance Data at 25°C**

Frequency (GHz)	Attenuation (dB)	VSWR (:1)
0.01	8.96	1.12
1.0	8.94	1.10
2.0	8.91	1.08
4.0	8.88	1.06
5.0	8.89	1.02
8.0	8.88	1.08
10.0	8.89	1.10
12.0	8.86	1.11
15.0	8.90	1.23
16.0	8.92	1.24
18.0	8.87	1.18

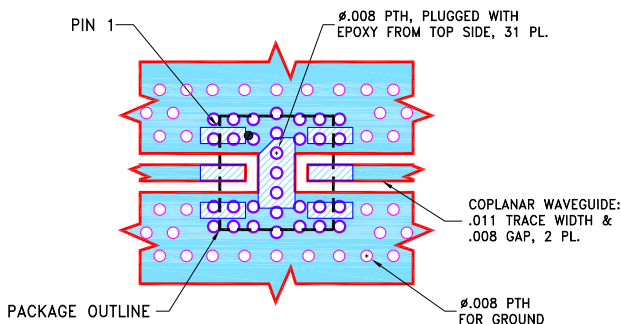


**Notes**

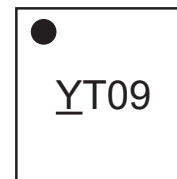
- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuits' 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/MCLStore/terms.jsp](http://www.minicircuits.com/MCLStore/terms.jsp)



Suggested PCB Layout (PL-586)



Product Marking



NOTES:

- TRACE WIDTH & GAP PARAMETERS ARE SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .0066±.0007, COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH & GAP 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 SOLDER MASK.

Additional Detailed Technical Information	
<i>additional information is available on our dash board. To access this information <a href="#">click here</a></i>	
<b>Performance Data</b>	Data Table
	Swept Graphs
<b>Case Style</b>	MC1630 <i>Plastic package, Terminal finish: Matte Tin Plate</i>
<b>Tape &amp; Reel</b> Standard quantities available on reel	F108 <i>7" reels with 20, 50, 100, 200, 500, 1K, 2K devices.</i>
<b>Suggested Layout for PCB Design</b>	PL-586
<b>Evaluation Board</b>	TB-YAT-9A+
<b>Environmental Ratings</b>	ENV08T1

ESD Rating

Human Body Model (HBM): Class 2 (Pass 2000 V) per ANSI/ESD STM 5.1-2001

MSL Rating

Moisture Sensitivity: MSL1 in accordance with IPC/JEDEC J-STD-020D

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)

