MICROWAVE PRECISION

Fixed Attenuator

YAT-20A+

50Ω 0.8 W 20 dB DC to 18 GHz

THE BIG DEAL

- Exceptional Power Handling
- Wide Bandwidth, DC to 18 GHz
- Miniature Package MCLP™ 2 x 2 mm
- Excellent Attenuation Accuracy & Flatness

Generic photo used for illustration purposes only

CASE STYLE: MC1630

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

APPLICATIONS

- Cellular
- PCS
- Communications
- Radar
- Defense

PRODUCT OVERVIEW

YAT-20A+ (RoHS compliant) is a fixed value, absorptive MMIC attenuator fabricated using highly repetitive IPD process technology with thin film resistors on GaAs substrates. This design incorporates through-wafer metallization vias to realize low thermal resistance and wideband operation with outstanding attenuation accuracy and flatness over its full operating bandwidth. YAT-A family attenuators are available with nominal attenuation values of 0 to 10 dB (in 1 dB steps), 12, 15, 20, and 30 dB. Packaged in a tiny 2 x 2 mm MCLP™ package, it's ideal for tight spaces in crowded board layouts. Also available in die form (YAT-20A-DG+).

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 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 0.8 W	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.

REV. C
ECO-024948
YAT-20A+
MCL NY
250319

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ELECTRICAL SPECIFICATIONS[1] AT +25°C, 50Ω (CPW)

Parameter	Frequency (GHz)	Min.	Typ.	Max.	Unit
Frequency Range		DC		18	GHz
Attenuation	DC - 5	19.7	20.05	20.4	dB
	5 - 15	19.7	20.15	21.0	
	15 - 18	19.7	20.31	21.0	
VSWR	DC - 5		1.11	1.5	:1
	5 - 15		1.10	2.0	
	15 - 18		1.21	2.25	

1. Tested on Mini-Circuits test board TB-YAT-20A+ using coplanar wave guide (CPW) input and output traces (see suggested PCB layout on page 3 of this data sheet).

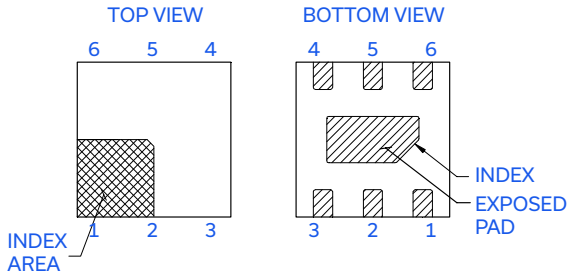
ABSOLUTE MAXIMUM RATINGS[2]

Parameter	Ratings
Operating Case Temperature[3]	-40°C to +85°C
Storage Temperature	-65°C to +150°C
RF Input Power[4]	0.8 W

2. Permanent damage may occur if any of these limits are exceeded.
3. Case is defined as ground lead.
4. RF Power at +25°C case temperature: 0.8 Watt. Derate linearly to 0.6 W at +85°C.

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



CHARACTERIZATION TEST CIRCUIT

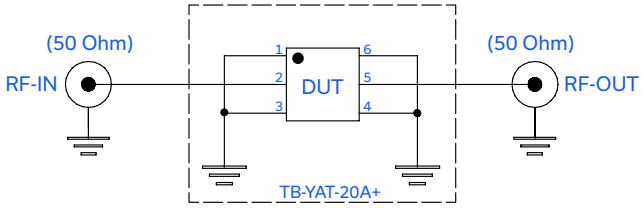


Fig 1. Block diagram of Test Circuit used for characterization, Test board TB-YAT-20A+
Conditions: Attenuation, VSWR: P_{IN}=-10 dBm

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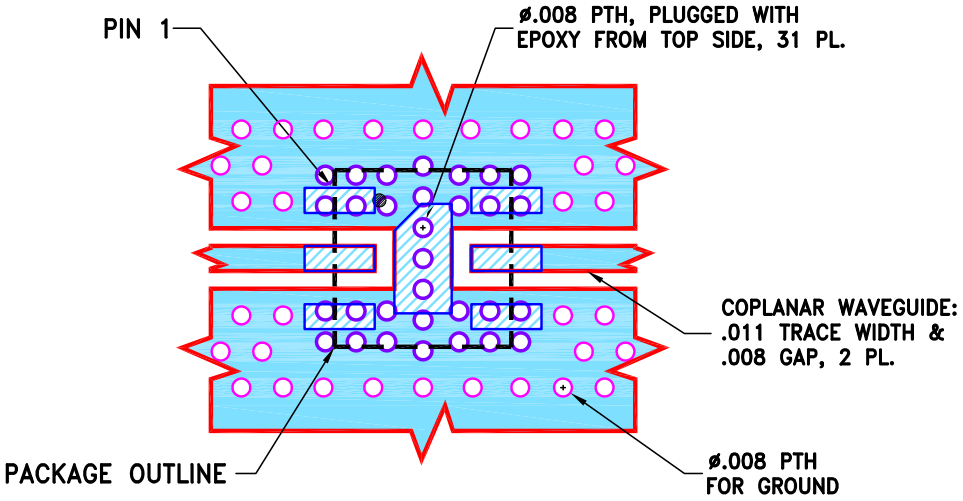
SUGGESTED PCB LAYOUT (PL-586)



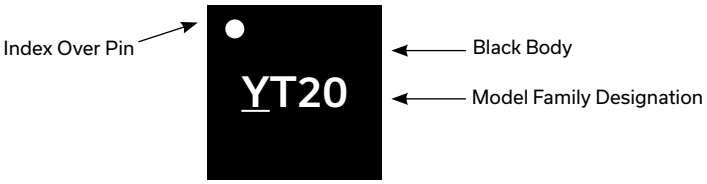
NOTES:

1. TRACE WIDTH & GAP PARAMETERS ARE SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .0066±.0007. COPPER: 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH & GAP 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 SOLDER MASK.

PRODUCT MARKING



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

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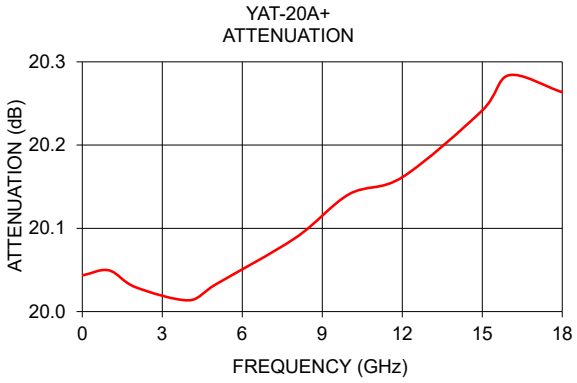
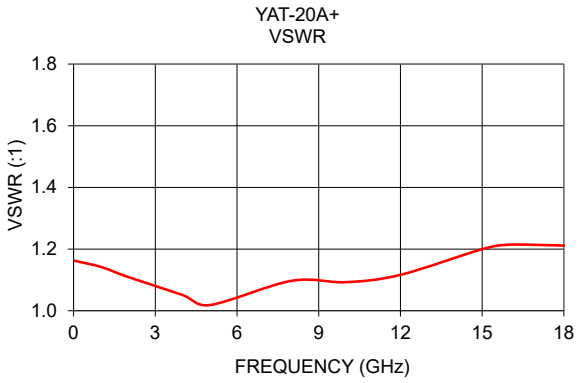
TYPICAL PERFORMANCE DATA AT +25°C

Frequency (GHz)	Attenuation (dB)	VSWR (:1)
0.01	20.04	1.16
1.0	20.05	1.14
2.0	20.03	1.11
4.0	20.01	1.05
5.0	20.03	1.02
8.0	20.09	1.10
10.0	20.14	1.09
12.0	20.16	1.12
15.0	20.24	1.20
16.0	20.28	1.21
18.0	20.26	1.21





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ADDITIONAL DETAILED TECHNICAL INFORMATION IS AVAILABLE ON OUR DASHBOARD. TO ACCESS CLICK HERE

Performance Data	Data Table Swept Graphs
Case Style	MC1630 Plastic package, Terminal finish: Matte Tin Plate
Tape & Reel **Standard Quantities Available on Reel**	F108 7" Reels with 20, 50, 100, 200, 500, 1K, 2K, or 3K devices
Suggested Layout for PCB Design	PL-586
Evaluation Board	TB-YAT-20A+
Environmental Ratings	ENV08T1

ESD RATING*

	Class	Voltage Range	Reference Standard
HBM	Class 2	>2000 V	ANSI/ESD STM 5.1-2001
CDM	Class C3	>1000 V	ANSI/ESDA/JEDEC JS-002-2022

* Tested in industry standard 2 x 2 mm, 6-lead MCLP package

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/terms/viewterm.html