*Microwave Precision*

# Fixed Attenuator

## QAT-SERIES

50Ω Up to 2W DC to 50 GHz

## The Big Deal

- Super bandwidth, Up to 50 GHz
- Exceptional Power Handling, from 0.8W to 2W
- Small Size, 2 mm x 2 mm



CASE STYLE: MC3000

## Product Overview

QAT models are a series of absorptive fixed attenuators fabricated using highly reliable and repeatable GaAs MMIC IPD* process. The models operate from DC up to 50 GHz. They have outstanding attenuation accuracy and flatness while maintaining excellent VSWR throughout the entire band. The models can also handle input power up to around 2W, depending on each value, which makes this model series an ideal choice for a wide range of applications.

## Key Features

| Feature | Advantages |
|---|---|
| Wideband operation, From DC to 50 GHz | Supports a wide array of applications including 5G, wireless infrastructure, 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 QAT series occupies less board space than a lumped element approach, minimizes component count and ensures repeatable performance over wide frequency range. |
| Wide range of nominal attenuation values (0,1,2,3,4,5,6,7,8,9,10,12,15,20 & 30) | Small increment offering enables circuit designer to change attenuation values without motherboard redesign making the QAT series ideal for select at test application. |
| MCLP™ Package | Low Inductance, repeatable transitions, excellent thermal path make the QAT series an ideal solution as an alternative to “do it yourself” lumped element-based approach. |

* IPD - Integraded Passive Device.

*Microwave Precision*

# Fixed Attenuator

## QAT-3+

50Ω 2W 3dB DC to 50 GHz

### Product Features

- Small package, 2x2 MCLP™
- Super Wide bandwidth, DC-50 GHz
- Excellent VSWR, 1.19:1 typ. at 25 GHz
- High Power Handling, 2W
- Patent pending



*Generic photo used for illustration purposes only*

CASE STYLE: MC3000

***+RoHS Compliant***

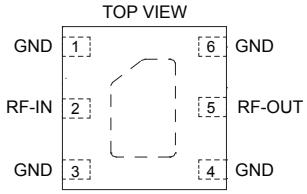
*The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications*

### Typical Applications

- 5G
- Test and Measurement
- Radar
- Communication
- Defense
- Satellite

### General Description

QAT-3+ is an absorptive fixed attenuator fabricated using highly reliable and repeatable GaAs MMIC IPD process. The model operates from DC to 50 GHz. It achieves outstanding attenuation accuracy and flatness while maintains excellent VSWR throughout the entire band. The model can also handle input power up to 2W, which makes this model an ideal choice for a wide range of applications.




### Pad Description

| Function | Pad Number | Description |
|---|---|---|
| RF-IN | 2 | RF input pad |
| RF-OUT | 5 | RF output pad |
| GND | 1,3,4,6 & Paddle | Ground |

## Electrical Specifications[1] at 25°C, 50Ω , unless noted

| Parameter | Condition (GHz) | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| **Frequency Range** | | DC | — | 50 | GHz |
| **Attenuation** | 0.01 - 5 | 2.6 | 3.0 | 3.3 | dB |
| | 5 - 10 | 2.5 | 3.1 | 3.4 | |
| | 10 - 20 | 2.5 | 3.1 | 3.8 | |
| | 20 - 30 | 2.5 | 3.3 | 3.8 | |
| | 30 - 40 | | 3.1 | | |
| | 40 - 50 | | 3.0 | | |
| **VSWR** | 0.01 - 5 | | 1.15 | 1.4 | :1 |
| | 5 - 10 | | 1.16 | 1.4 | |
| | 10 - 20 | | 1.17 | 1.6 | |
| | 20 - 30 | | 1.21 | | |
| | 30 - 40 | | 1.22 | | |
| | 40 - 50 | | 1.37 | | |

1. Tested on Mini-Circuits test board TB-QAT-3C+. See Characterization/Application Circuit in Fig. 1

## Absolute Maximum Ratings[2]

| | |
|---|---|
| Operating Case Temperature[3] | -55°C to 105°C |
| Storage Temperature | -65°C to 150°C |
| RF Input Power | 2W[3] |

2. Permanent damage may occur if any of these limits are exceeded.
3. Power rating derated to 1W at 85°C and 0.6W at 105°C.

## Characterization Test Circuit

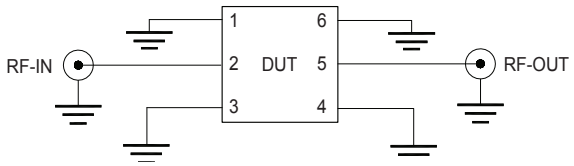
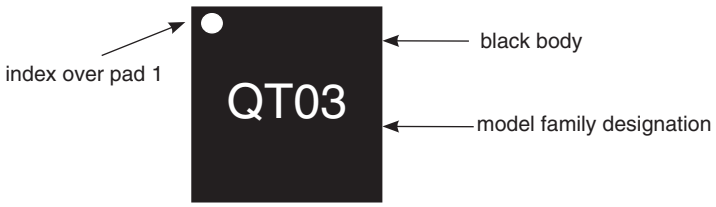



**Fig 1**. Block diagram of Test Circuit used for characterization, Test board TB-QAT-3C+
Conditions: Attenuation, VSWR: Pin=0 dBm

## Product Marking




Marking may contain other features or characters for internal lot control

| **Additional Detailed Technical Information**<br>*additional information is available on our dash board. To access this information click here* | |
|---|---|
| **Performance Data** | Data Table |
| | Swept Graphs |
| **Case Style** | MC3000 *Plastic package, Terminal finish: Matte Tin* |
| **Tape & Reel**<br>**Standard quantities available on reel** | F66<br>*7" reels with 20, 50, 100, 200, 500, 1K, 2K devices.* |
| **Suggested Layout for PCB Design** | PL-676 |
| **Evaluation Board** | TB-QAT-3+ (without connectors)<br>TB-QAT-3C+ (with connectors) |
| **Environmental Ratings** | ENV08T1 |

## ESD Rating

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

## Additional 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