MICROWAVE PRECISION

Fixed Attenuator

QAT-1+

50Ω 2W 1dB DC to 50 GHz

THE BIG DEAL

- Small package, 2x2 MCLP™
- Super Wide bandwidth, DC-50 GHz
- Excellent VSWR, 1.35:1 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 website for methodologies and qualifications

APPLICATIONS

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

PRODUCT OVERVIEW

QAT-1+ 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.

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 - Integrated Passive Device.

REV. A
ECO-014672
QAT-1+
MCL NY
221003

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ELECTRICAL SPECIFICATIONS[1] AT 25°C, 50Ω , UNLESS NOTED OTHERWISE

Parameter	Condition (GHz)	Min.	Typ.	Max.	Unit
Frequency Range		DC	—	50	GHz
Attenuation	0.01 - 5	0.6	1.0	1.4	dB
	5 - 10	0.6	1.1	1.5	
	10 - 20	0.6	1.1	1.6	
	20 - 30	0.7	1.3	1.7	
	30 - 40	—	1.5	—	
	40 - 50	—	1.8	—	
VSWR	0.01 - 5	—	1.08	1.3	:1
	5 - 10	—	1.19	1.6	
	10 - 20	—	1.11	1.5	
	20 - 30	—	1.16	—	
	30 - 40	—	1.36	—	
	40 - 50	—	1.60	—	

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

MAXIMUM RATINGS[2,3]

Parameter	Ratings
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.

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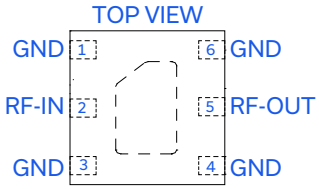
QAT-1+

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



CHARACTERIZATION TEST CIRCUIT

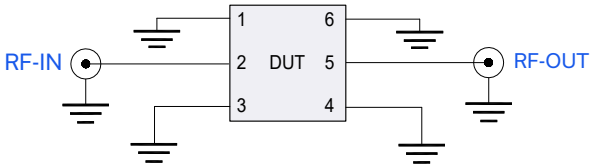
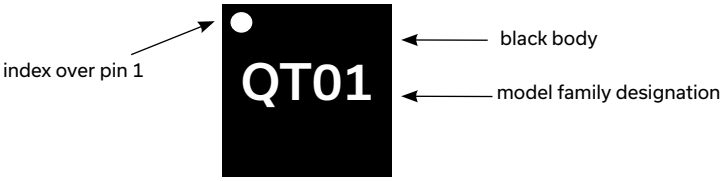


Fig 1. Block diagram of Test Circuit used for characterization, Test board TB-QAT-1C+
Conditions: Attenuation, VSWR: Pin=0 dBm

PRODUCT MARKING



Marking may contain other features or characters for internal lot control

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

Performance Data	Data Table Swept Graphs S-Parameter (S2P Files) Data Set (.zip file)
Case Style	MC3000 Plastic package, Terminal finish: Matte Tin
Tape & Reel **Standard quantities available on reel**	F66 7" reels with 20, 50, 100, 200, 500 or 2K devices
Suggested Layout for PCB Design	PL-676
Evaluation Board	TB-QAT-1+ (without connectors) TB-QAT-1C+ (with connectors)
Environmental Ratings	ENV08T1

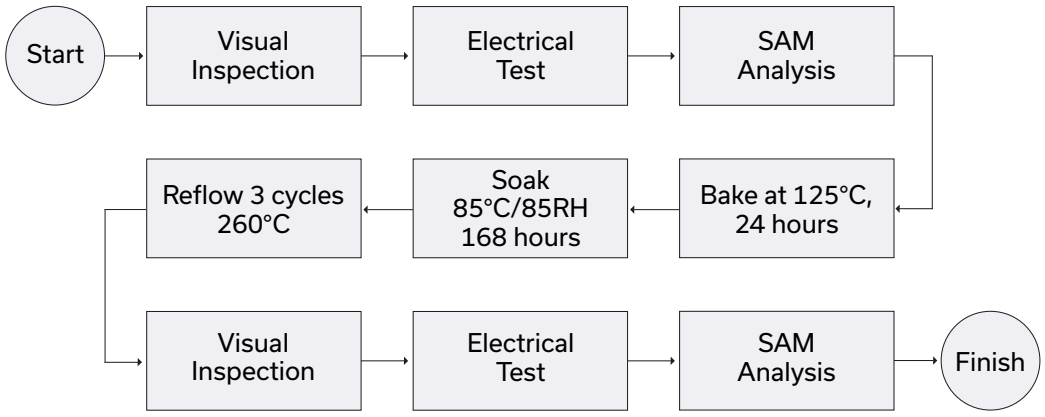
ESD RATING

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

MSL RATING

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

MSL TEST FLOW CHART



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