



Mini-Circuits

MICROWAVE PRECISION

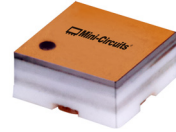
# Fixed Attenuator

RCAT-09+

50Ω 2 W 9 dB DC to 20 GHz

## THE BIG DEAL

- Wide Bandwidth, DC to 20 GHz
- Excellent Power Handling, 2 W
- Excellent Attenuation Accuracy & Flatness
- Miniature Size, 2.25 x 2.25 x 1.1 mm
- Ceramic, Hermetic, Nitrogen Filled
- Aqueous Washable



Generic photo used for illustration purposes only

CASE STYLE: LZ1737

## +RoHS Compliant

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

## APPLICATIONS

- Cellular
- PCS
- Communications
- Radar
- Wideband Military
- Test and Measurement Equipment

## PRODUCT OVERVIEW

RCAT-09+ (RoHS compliant) is a wideband fixed attenuator with excellent attenuation accuracy and flatness. It can handle up to 2 W. The integrated circuits comprising of thin film resistors is bonded in an optimized multi layer integrated LTCC substrate, and then hermetically sealed under a controlled nitrogen atmosphere with gold-plated covers and eutectic AuSn solder. These attenuators are capable of meeting MIL requirements for gross leak, fine leak, thermal shock, vibration, acceleration, mechanical shock, and HTOL. The testing can be done if requested.

## KEY FEATURES

Feature	Advantages
Max Power Input 2 W	Thermally optimized design can operate reliably at much higher input power as compared to similar devices
Wide Bandwidth, DC to 20 GHz	Supports a broad band of applications with predictable and repeatable performance, excellent choice to buffer cascaded reflective components.
Ceramic Hermetic Package	Highly reliable hermetic package provides predictable and repeatable performance in military applications including ground, air, and ship requirements
Very Small Size	Miniature 2.25 mm x 2.25 mm and very low profile of 1.1 mm.

REV. C  
ECO-024243  
RCAT-09+  
MCL NY  
250117



ELECTRICAL SPECIFICATIONS<sup>1</sup> AT +25°C, 50Ω

Parameter	Condition (GHz)	Min.	Typ.	Max.	Unit
Frequency Range		DC		20	GHz
Attenuation	1	8.5	9.03	9.5	dB
	10	9.2	9.67	10.2	
	20	10.3	11.06	11.9	
Return Loss	1		30		dB
	10		20		
	20		16		

1. Tested using characterization test circuit as defined in Figure 1. See data and graphs for performance at all other frequencies.

ABSOLUTE MAXIMUM RATINGS<sup>2</sup>

Parameter	Ratings
Operating Case Temperature <sup>3</sup>	-55°C to +125°C
Storage Temperature	-65°C to +150°C
RF Input Power <sup>4</sup>	2 W at +25°C

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: 2 W. Derate linearly to 0.33 W at +125°C.



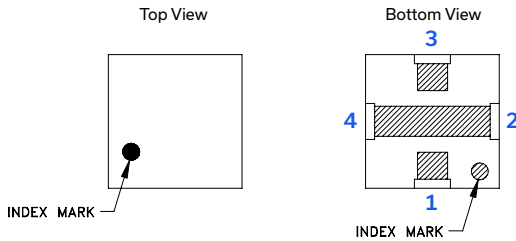
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## PAD DESCRIPTION

Function	Pad Number	Description
RF-IN / RF-OUT	1	RF input / output pad
RF-OUT / RF-IN	3	RF input / output pad
GND	2,4	Connected to circuit ground

## CHARACTERIZATION TEST CIRCUIT

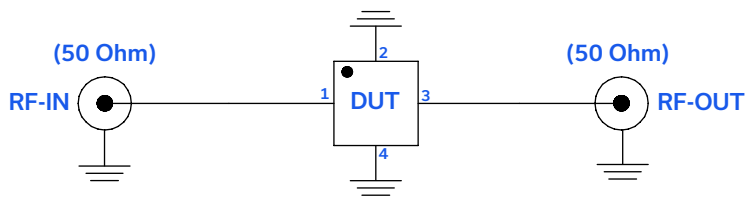
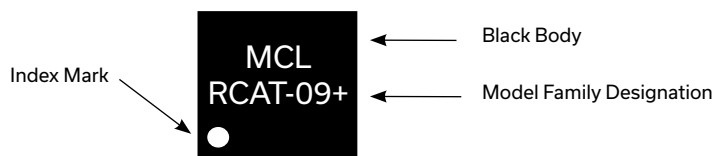


Fig 1. Block diagram of Test Circuit used for characterization. Characterization was performed by Modelithics, conditions test board details are available at: [www.modelithics.com/mvp/minicircuits](http://www.modelithics.com/mvp/minicircuits)

## PRODUCT MARKING



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





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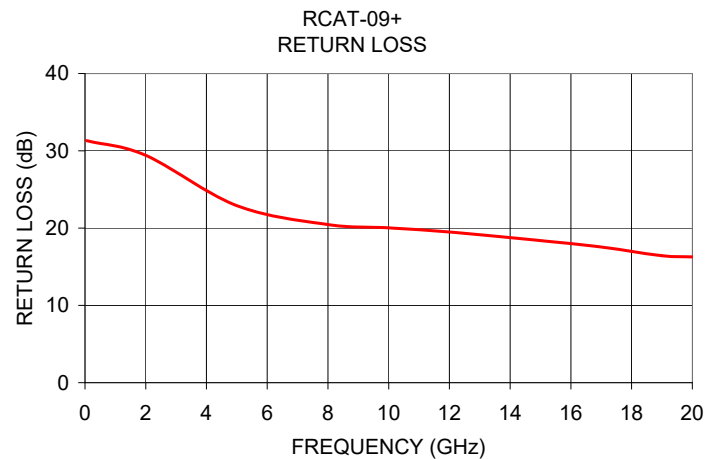
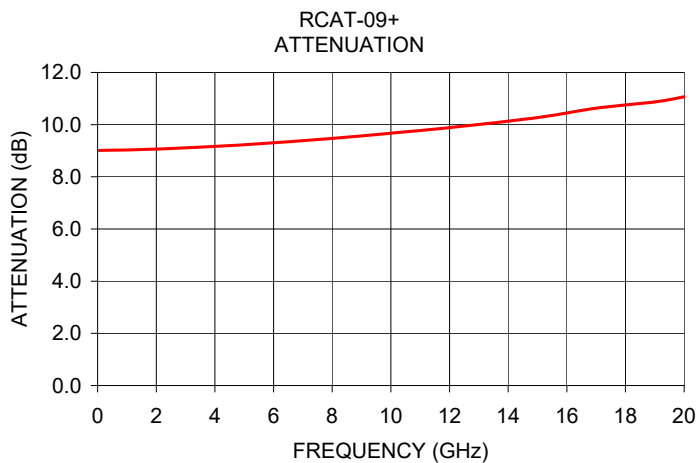
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TYPICAL PERFORMANCE DATA AT +25°C

Frequency (GHz)	Attenuation (dB)	VSWR (:1)
0.05	9.01	31.32
2.00	9.07	29.41
5.00	9.23	22.90
8.00	9.47	20.45
10.00	9.67	20.03
12.00	9.89	19.49
15.00	10.27	18.39
17.00	10.63	17.55
19.00	10.87	16.43
20.00	11.06	16.29





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ADDITIONAL DETAILED TECHNICAL INFORMATION IS AVAILABLE ON OUR DASHBOARD. [CLICK HERE](#)

Performance Data and Graphs	Data Table
	Swept Graphs
Case Style	LZ1737 Ceramic package, Terminal finish: Ni-Pd-Au
Tape & Reel	F66
Suggested Layout for PCB Design	PL-386
Evaluation Board	TB-668-09+
Environmental Ratings	ENV71

## ESD RATING

Human Body Model (HBM): Class 1A (Pass 250 V) (JESD22-A114)

Machine Model (MM): Class B (Pass 200 V) (JESD22-A115)

## MSL RATING

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

## NOTES

- 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.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- 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](http://www.minicircuits.com/terms/viewterm.html)

