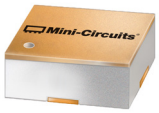
Microwave Precision

Fixed Attenuator

RCAT-SERIES

50Ω 2W DC to 20 GHz

The Big Deal



- Exceptional power handling of 2W
- Wide band width DC to 20 GHz
- Miniature size 2.25 mm x 2.25 mm x 1.1 mm Ceramic package
- Highly reliable and repeatable performance

Product Overview

RCAT attenuators are fixed value absorptive attenuators. The highly precision and repeatable monolithic attenuator chip is processed using the most advanced semiconductor processing techniques. The Cu filled through-die via's and Cu metallization on the backside provides a very low thermal resistance path to dissipate the attenuated power. The attenuator chip is packaged in an LTCC hermetic package utilizing fully automated and highly reliable manufacturing processes.

Key Features

Feature	Advantages
Max power input 2W	Thermally optimized design can operate reliably at much higher input power as compared to similar devices
Band width 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.

Notes
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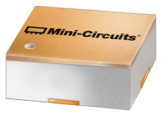
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty 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

Microwave Precision

Fixed Attenuator

RCAT-05+

50Ω 2W 5dB DC to 20 GHz



CASE STYLE: LZ1737

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

Product Features

- fixed value, absorptive device
- wide bandwidth, DC-20 GHz
- excellent attenuation accuracy & flatness
- miniature size 2.25 mm x 2.25 mm x 1.1 mm
- ceramic, hermetic, nitrogen filled
- aqueous washable

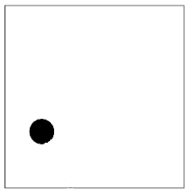
Typical Applications

- cellular
- PCS
- communications
- radar
- wideband military
- test and measurement equipment

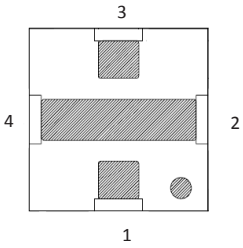
General Description

RCAT-05+ (RoHS compliant) is a wideband fixed attenuator with excellent attenuation accuracy and flatness. It can handle up to 2W. 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 have been tested to MIL requirements for gross leak, fine leak, thermal shock, vibration, acceleration, mechanical shock, and HTOL.

Top View



Bottom View



Pad Description

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

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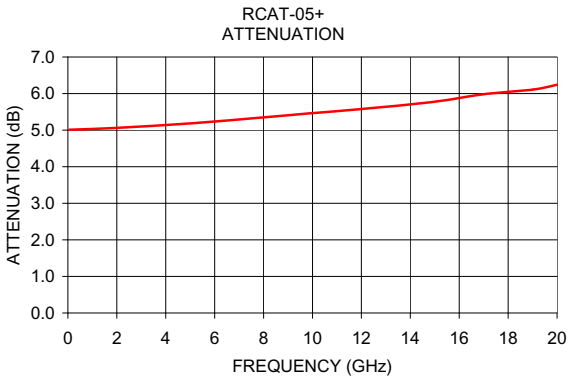
Electrical Specifications[1] at 25°C, 50Ω

Parameter	Condition (GHz)	Min.	Typ.	Max.	Unit
Frequency Range		DC	—	20	GHz
Attenuation	1	4.5	5.03	5.5	dB
	10	5.0	5.47	6.0	
	20	5.4	6.24	7.0	
Return Loss	1	—	30	—	dB
	10	—	20	—	
	20	—	16	—	

Typical Performance Data at 25°C

Frequency (GHz)	Attenuation (dB)	Return Loss (dB)
0.05	5.01	37.22
2.00	5.06	28.90
5.00	5.18	21.66
8.00	5.35	19.49
10.00	5.47	19.67
12.00	5.58	20.11
15.00	5.78	19.77
17.00	5.98	18.11
19.00	6.11	16.05
20.00	6.24	15.59





Absolute Maximum Ratings[2]

Operating Case Temperature[3]	-55°C to 125°C
Storage Temperature	-65°C to 150°C
RF Input Power[4]	2W at 25°C

1. Tested using characterization test circuit as defined in Figure 1. See graphs and data above for performances at all other frequencies.
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: 2W. Derate linearly to 0.33W at 125°C.

Characterization Test Circuit

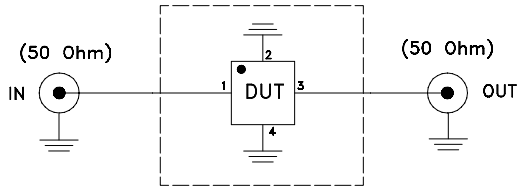


Fig 1. Block diagram of Test Circuit used for characterization. Characterization was performed by Modelithics®, conditions test board details are available at: http://www.modelithics.com/datasheet2/606.pdf

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Product Marking



Additional Detailed Technical Information *additional information is available on our dash board. To access this information click here*	
Performance Data	Data Table
	Swept Graphs
Case Style	LZ1737 *Ceramic package, Terminal finish: Ni-Pd-Au*
Tape & Reel **Standard quantities available on reel**	F108 *7" reels with 20, 50, 100, 200, 500, 1K or 2K devices.*
Suggested Layout for PCB Design	*click here*
Evaluation Board	TB-668-05+
Environmental Ratings	ENV-71

ESD Rating

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

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

MSL Rating

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

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