

Adjustable attenuator for security applications with low loss



Overview

Optical Attenuators | Keysight Keysight attenuators offer low insertion loss, low polarization-dependent loss (PDL), and high resolution across a wide atten.

Key Takeaways

For security applications requiring low-loss signal control, digital step attenuators, chip attenuators, and adjustable coaxial attenuators provide precise, low-insertion-loss solutions across wide frequency ranges.

Types of Low-

Loss Adjustable Attenuators 1. Digital Step Attenuators (DSA) Digital step attenuators offer precise, programmable attenuation in small increments, often as low as 0.5 dB, with low insertion loss and high accuracy.

For example, a 6-bit DSA can provide up to 31.5 dB attenuation in 0.5 dB steps, with insertion loss better than 2.

54 dB and return loss better than -17 dB over 2–22 GHz, making them suitable for RF and radar security systems. These devices are available in GaAs or Silicon (SOI) processes and can be controlled via serial or parallel interfaces. 2.

Chip Attenuators Surface-mount chip attenuators are compact and designed for high-frequency applications up to 40 GHz. They provide ultra-flat attenuation (± 0.3 dB) and low VSWR (as low as 1).

1: 1), ensuring minimal reflection and low insertion loss. They are ideal for phased arrays, radar subsystems, and military electronics, with power handling up to 2 W and stable performance across -55°C to +150°C. 3.

Adjustable Coaxial Attenuators For simpler setups, adjustable coaxial attenuators with N-type male-to-female connectors offer low insertion loss and stable performance in the DC–3 GHz range. These attenuators typically feature a standing wave ratio below 1.20, 50-ohm impedance, and power ratings around 2 W, making them suitable for low-power security applications.

Their compact design allows easy integration into existing RF systems.

Key Considerations for Security Applications

Insertion Loss: Choose attenuators with minimal insertion loss to maintain signal integrity. Digital step and chip attenuators typically offer the lowest loss. **Frequency Range:** Ensure the attenuator covers the operational frequency of your system, from DC to tens of GHz for radar or communication systems.

Power Handling: Verify the attenuator can handle the expected RF power without distortion or damage.

VSWR

Return Loss: Low VSWR (

Article Content

Optical Attenuators | Keysight

Keysight attenuators offer low insertion loss, low polarization-dependent loss (PDL), and high resolution across a wide attenuation range. These features ensure accurate and stable signal control in both

84905M Programmable Step Attenuator, 50 GHz, 60 dB, 10 dB Steps

Offers a compact, rugged design with attenuator range of 0 to 60 dB in 10 dB steps and exceptionally low insertion loss.

RF Attenuators | Analog Devices

Analog Devices' RF attenuators are available in broad range of architectures and factors, giving designers the flexibility to select part that best aligns with their system requirements. The parts are

Low Loss N Type Male Female RF Coaxial Attenuator with Adjustable

- **Copper-plated Design**- The attenuator features a copper-plated ternary construction, enhancing its durability and longevity. It is designed for low-power applications, providing efficient signal

RF Attenuators & MIL-SPEC Attenuator Manufacturers

To enhance secure military communications, new attenuators are designed with ultra-low intermodulation distortion (IMD). This reduces unwanted

Digital Attenuators

These products exhibit low insertion loss and high attenuation accuracy and are offered both GaAs and Silicon (SOI) processes and are offered in both packaged and bare die form factors.

1310/1550nm Singlemode In-Line Variable Optical Attenuator (VOA)

This in-line variable optical attenuator features continuously adjustable attenuation, low insertion loss, and high return loss for stable, repeatable results.

24GHz Low-Loss Digital Attenuator

Our new, cutting-edge DAT60KUL Digital Programmable Microwave Attenuator is a stand-alone, USB, and Ethernet controlled digital attenuator with 0.5dB steps, 0

Push Button Attenuators

We offer a robust portfolio of in-stock, adjustable RF attenuators and phase shifters for multiple applications, including test instrumentation, cellular communication, wireless communications,

RF Attenuators

Over 400 coaxial, surface mount, and MMIC attenuator models for 50-Ohm & 75-Ohm system including fixed attenuators, high-power attenuators, digital step / programmable attenuators, voltage variable

RF Attenuators: Types, Benefits, and Advantages

Benefits and Advantages of RF Attenuators Here's why RF attenuators are essential in various applications: Signal Attenuation: The primary function - to reduce the

Low Loss N Type Male Female RF Coaxial Attenuator with Adjustable

It is designed for low-power applications, providing efficient signal attenuation while maintaining signal integrity. - **Easy Installation**- This attenuator is designed in a male-to-female N type connector

What Are Fiber Optic Attenuators | Amerifiber Guide

In short, attenuators prevent overload and help maintain a steady optical link across varying distances and power levels. Amerifiber's attenuators are built with tight power tolerances and

RF Variable Attenuators

Variable attenuators provide continuously or step-adjustable loss to set path gain or emulate fading while maintaining good return loss. They are used for AGC loops and test fixtures, specified by

RF Attenuators | DigiKey

A look at RF attenuators – their function, why they are used, and the different types available along with a guide of the key selection parameters to

An MSCL-Based Attenuator With Ultralow Insertion Loss

Request PDF | An MSCL-Based Attenuator With Ultralow Insertion Loss and Intrinsic ESD-Protection for Millimeter-Wave and Terahertz Applications | This article presents a new magnetically ...

Electronic Attenuator Types: Fixed, Variable, Digital – Selection Guide ...

Electronic attenuator guide: fixed, variable, and digital programmable types. Learn key specs (attenuation range, frequency response, power handling) and applications (RF, telecom, test).

Variable Optical Attenuators

Variable optical attenuators, used in fiber communications, vary light attenuation. The article discusses operation principles and various performance parameters.

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This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

