Photonics On Crystals

POC-OC-120217-Phase Modulator Datasheet

Key Features

- Utilizes the electro-optic effect for precise light phase modulation.
- Capable of both broadband and resonant modulation up to GHz range.
- Adjustable center frequency within a wide range.
- High precision with low drive voltage requirements.
- Customizable configurations for diverse applications.

General Description

The **Phase Modulators (EOPMs)** offered by Photonics of Crystals (POC) are advanced devices leveraging the electro-optic effect to modulate the phase of light beams with high precision. These modulators are categorized into broadband and resonant types to cater to diverse operational requirements.

Broadband EOPMs operate with drive frequencies ranging from DC to 100 MHz, offering flexibility for dynamic applications. On the other hand, resonant EOPMs are engineered for single-frequency operation, significantly reducing drive voltage by utilizing resonant circuits or microwave cavities. This design achieves frequencies exceeding 500 MHz, with certain models operating in the GHz range for ultra-high-frequency applications.

These modulators are optimized to achieve maximum efficiency with minimal distortion, ensuring reliable performance for demanding applications such as laser frequency stabilization, quantum state control, and spectroscopy.

Applications

1. **Laser Frequency Stabilization**
   EOPMs are vital in stabilizing laser frequencies for precision measurements in interferometry and metrology.
2. **Quantum State Control**
   These devices are extensively used in controlling quantum states for advanced quantum computing and communication technologies.

3. **Atom Trapping and Laser Cooling**
   Phase modulation enhances the trapping efficiency of atoms, enabling advanced research in atomic physics and laser cooling.

4. **Spectroscopy**
   Precision phase modulation aids in achieving higher resolution and accuracy in spectroscopic analysis across multiple industries.

Standard Product and Model Numbers

Material (m)	Modulation (d)	Aperture (a)	Center Frequency (f)	Modulation Wavelength (w)
M (MLN)	C (Conventional Modulation Volume)	1 (1 × 1 mm²)	1500 MHz	532 nm
	H (High Modulation Volume)	3 (3 × 3 mm²)	1750 MHz	633 nm

Typical Specifications

Material	Center Frequency	Aperture	Modulation
MLN	1500 MHz	2 × 2 mm²	π rad
MLN	1750 MHz	1 × 1 mm²	π rad

The center frequency is adjustable within a specified range, ensuring compatibility with varying application requirements.

Housing Dimensions

- **Model**: BPMR-MC2
  - **Dimensions**:
    - Length: 52.9 mm
    - Width: 46.3 mm
    - Height: 30.9 mm

Refer to the attached diagrams for a detailed view of the housing dimensions.

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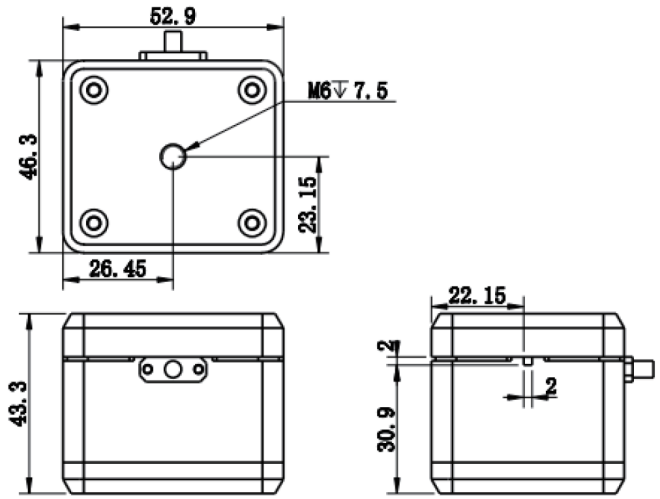
BPMR-MC2



POC Strength and Capabilities

Photonics of Crystals (POC) is committed to delivering state-of-the-art photonics solutions. With cutting-edge manufacturing techniques and rigorous quality control, POC offers a range of customizable phase modulators tailored to meet client-specific requirements. Our team of experts ensures precise calibration and reliable performance for demanding applications in scientific research, industrial operations, and advanced quantum technologies.