

Quarter Wave Plate

Up to 1.5 THz, circular polarization

DESCRIPTION

Anteral's Quarter Wave Plates (QWP) consist of a patterned Cu-Au micro grid array of strips in the topside and a continuous conductor in the backside. The micro grid array is patterned via photolithography process on very thin (135 μm), flexible and ultra-low loss substrate for THz frequencies with low dielectric constant. The QWP is designed to generate a reflected circularly polarized wave when a linearly polarized wave impinges over its surface.

QWP are mounted with protection layers made of a high-performance polymethacrylimide foam without degradation of the quality.

APPLICATIONS

The QWPs can be used from DC up to 1.5 THz systems for generation of circular polarization.

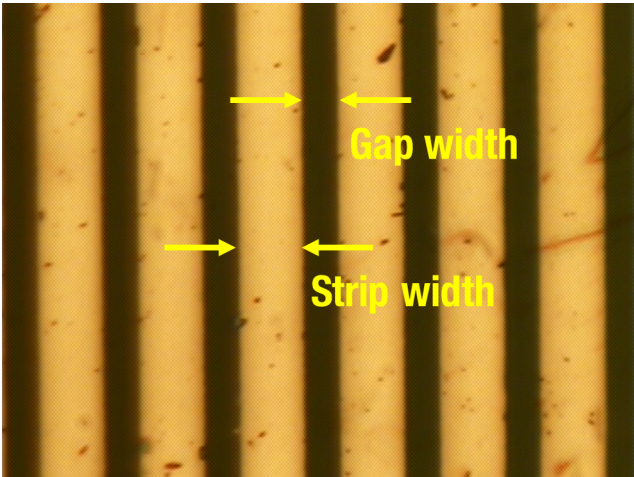
Anteral also offers their **Wire Grid Polarizers** for enhancement of the polarization sensitivity or beam splitting.



SPECIFICATIONS

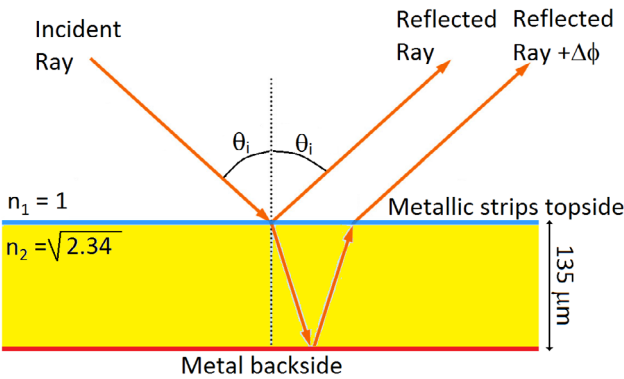
Model	Gap Width	Strip Width	Clear Aperture	Typical Transmission Loss*	Frequency Band
QWP-25	5 μm	10 μm	23.9 mm	< 1.0 dB	0 – 1.5 THz
QWP-50	5 μm	10 μm	48.3 mm	< 1.0 dB	0 – 1.5 THz

* Measured at the WR2.2 frequency band



Description

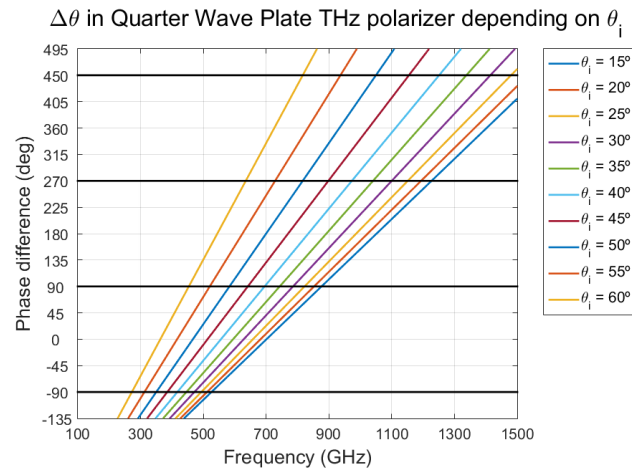
The quarter wave plate THz polarizer performance depends on the angle of incidence over its surface since the phase of the reflection of the transmitted wave depends on the travelling through the dielectric, see next figure.



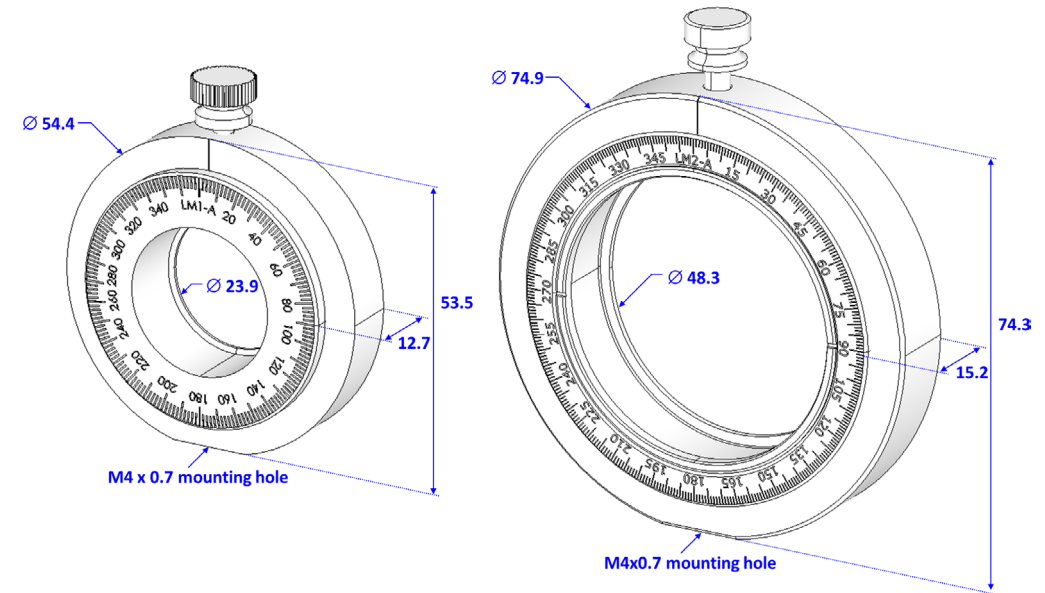
The metallic strips must be placed 45 degrees with respect to the plane of polarization of the incident wave, then half of the incident power will be reflected on the strips surface and the other half will be reflected by the metal backside surface.

The angle of incidence must be carefully selected to obtain -90 or 90 + n*180 (n is 0, 1, 2...) degrees phase difference between the waves reflected in the topside and the backside.

As a reference, in the next figure, several incidence angles for this quarter wave plate THz polarizer are given.



MECHANICAL OUTLINE



Additional notes

All quarter wave plates are mounted in rotating frames with angular scale of step equal to 1 degree, clear apertures of 50 mm and 25 mm approximately and with ISO M4x0.7 connection.

QWPs are mounted with protection layers made of high-performance polymethacrylimide foam without degradation of the quality.

The performance of all QWPs is checked before delivery.