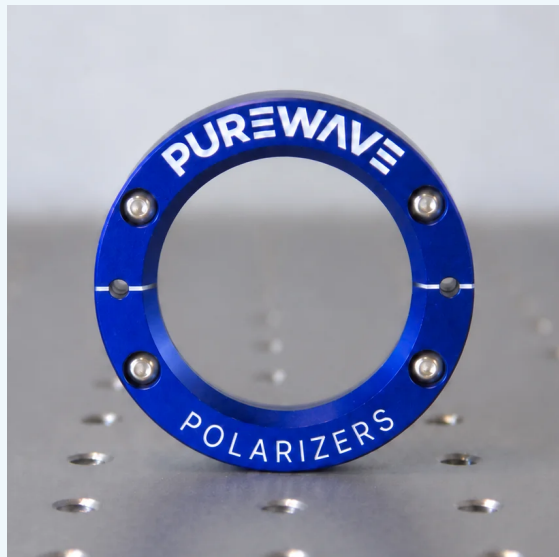


DATASHEET



Free-standing wire-grid polarizers

10 μm tungsten wire | PW010 series

The PW010 series comprises precision free-standing wire-grid polarizers for far-infrared and terahertz systems. The grids use 10 μm tungsten wire at 25, 30 or 40 μm periods, giving recommended ranges from 0.1 THz up to 4 THz, depending on period.

The substrate-free grid avoids absorption, dispersion and beam deviation from a support film. It transmits the electric field perpendicular to the wires and predominantly reflects the parallel field, enabling polarisation selection and attenuation.

Standard circular frames offer nominal clear apertures from 14 to 124 mm. Select a size for the beam diameter and mounting layout; consult the size-specific drawing.

Key features

- 10 μm tungsten wire for THz/FIR control
- Family range: approximately 0.1–4 THz
- 25 μm period extends recommended use to 4 THz
- Substrate-free design avoids loss and dispersion
- Up to six OD sizes and clear apertures
- Polarisation selection, reflection and attenuation
- Custom grids and frames available on request

Application areas

- **6G and Metamaterials**
Control polarisation in THz link and engineered-surface research.
- **Spectroscopy and Molecular Physics**
Probe anisotropic samples with selected incident and detected polarisation.
- **Instrumentation and Metrology**
Calibrate polarisation-sensitive instruments and suppress unwanted components.
- **Spintronics and Ultrafast Dynamics**
Analyse polarisation in time-resolved THz signals.
- **Space-Based Sensing and Astrophysics**
Select polarisation in submillimetre receiver and sensing research.

Selecting the wire period

Period sets a trade-off between pass transmission and extinction ratio. The 25 μm grid retains the strongest indicative extinction at higher frequencies; wider periods offer greater pass transmission. Select against the polarisation contrast your system needs.

25 μm

0.1–4 THz

30 μm

0.1–2.5 THz

40 μm

0.1–1.1 THz

Full part list and mounting details: page 2 • Performance guidance: page 3

Questions or custom requirements? info@purewavepolarizers.com

Configurations and integration

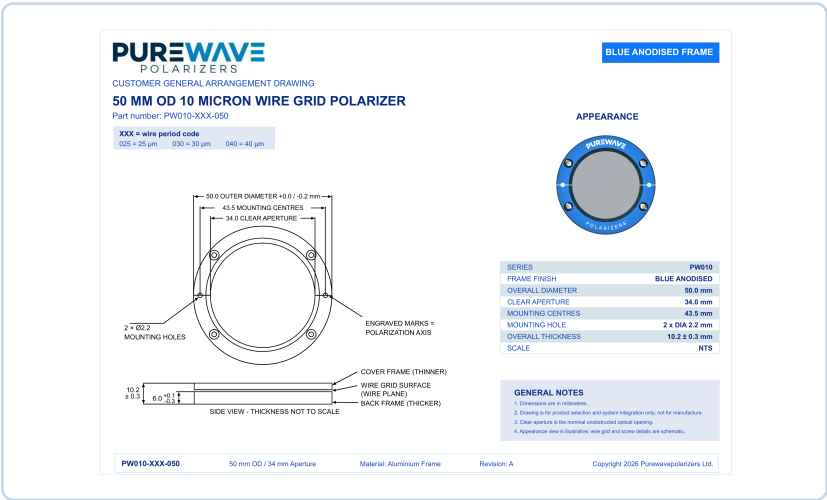
All listed parts use 10 µm tungsten wire in an anodised aluminium frame. Diameters below are nominal; use the size-specific general arrangement drawing for thickness and mounting dimensions.

Part number	Range (THz)	Period (µm)	OD (mm)	ID (mm)	Thickness (mm)
25 µm period					
PW010-025-025	0.1–4	25	25	14	7
PW010-025-050	0.1–4	25	50	34	10
PW010-025-075	0.1–4	25	75	56	10
PW010-025-100	0.1–4	25	100	80	10
PW010-025-125	0.1–4	25	125	100	12
PW010-025-150	0.1–4	25	150	124	12
30 µm period					
PW010-030-025	0.1–2.5	30	25	14	7
PW010-030-050	0.1–2.5	30	50	34	10
PW010-030-075	0.1–2.5	30	75	56	10
PW010-030-100	0.1–2.5	30	100	80	10
PW010-030-125	0.1–2.5	30	125	100	12
PW010-030-150	0.1–2.5	30	150	124	12
40 µm period					
PW010-040-025	0.1–1.1	40	25	14	7
PW010-040-050	0.1–1.1	40	50	34	10
PW010-040-075	0.1–1.1	40	75	56	10
PW010-040-100	0.1–1.1	40	100	80	10
PW010-040-125	0.1–1.1	40	125	100	12
PW010-040-150	0.1–1.1	40	150	124	12

Ranges depend on period and required extinction ratio. Thickness values are nominal, rounded to the nearest mm; use size-specific drawings for dimensions and tolerances.

General arrangement drawing — example only

50 mm OD example: PW010-XXX-050



For mounting and integration

The drawing gives OD, 34.0 mm clear aperture, 43.5 mm mounting centres, two Ø2.2 mm fixing holes and the frame side profile. Consult the full-size drawing before machining a mount.

Drawings and STEP files for all polarizers: see our website

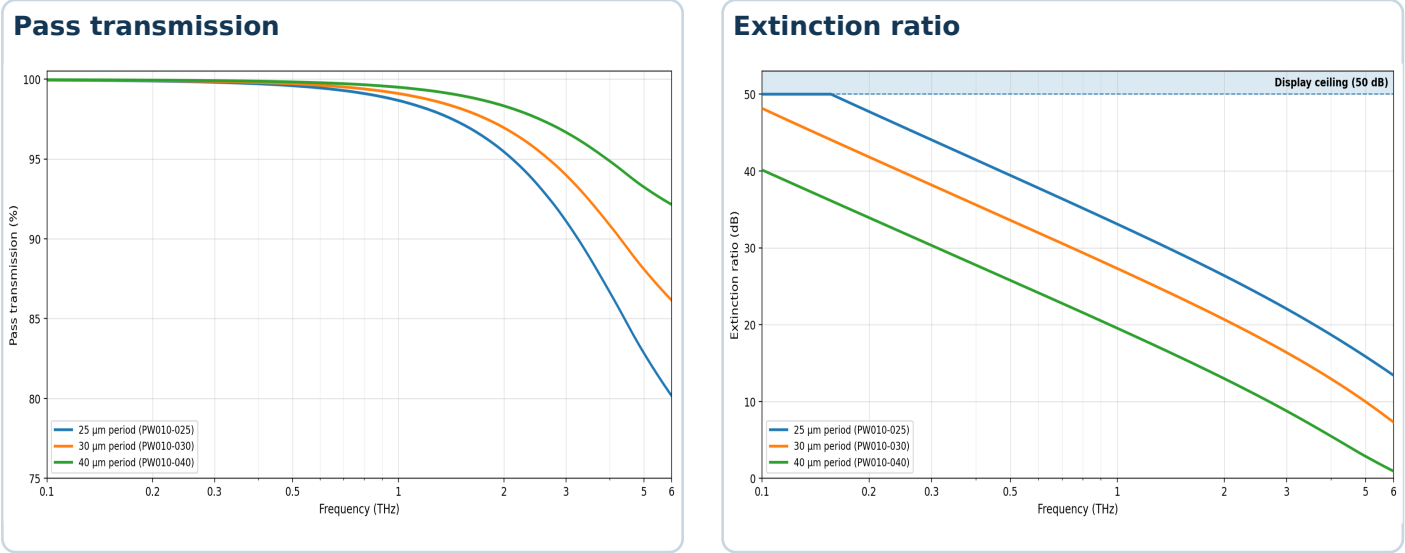
purewavepolarizers.com



Engraved marks identify the polarisation axis. STEP models show nominal geometry; use the size drawing for mounting.

Performance at normal incidence

These curves and selected values show expected normal-incidence pass transmission and extinction ratio for the three PW010 wire periods. Actual performance can vary with alignment, system configuration and component tolerances; the curves are not individual test certificates.



Graphs extend to 6 THz to show the trend. See page 2 for the recommended range of each period.

Selected performance values

Frequency		25 μm period		30 μm period		40 μm period	
THz		Pass Tp (%)	ER (dB)	Pass Tp (%)	ER (dB)	Pass Tp (%)	ER (dB)
0.1		>99.9	>50	>99.9	48	>99.9	40
0.3		99.8	44	99.9	38	99.9	30
0.5		99.6	39	99.7	34	99.8	26
1		98.7	33	99.1	27	99.5	20
3		91.0	22	94.0	16	97.0	9
6		80.0	13	86.0	7	92.0	1

Tp values are indicative; trailing zeros standardise formatting, not accuracy. ER = 10 log10(Tp/Ts).
ER above 50 dB is clipped at the graph ceiling; 6 THz values are reference only.

Recommended operating range

Recommended ranges are 0.1–4 THz (25 μm period), 0.1–2.5 THz (30 μm) and 0.1–1.1 THz (40 μm). Performance outside each range is shown for reference; the 6 THz values are outside every recommended range and are not a specification for standard use.

Handling

Handle the polarizer by its frame and avoid contact with the exposed wire grid during mounting and inspection.

Ordering and support

For custom parts, performance questions, regulatory declarations or qualified operating and storage limits, email info@purewavepolarizers.com.