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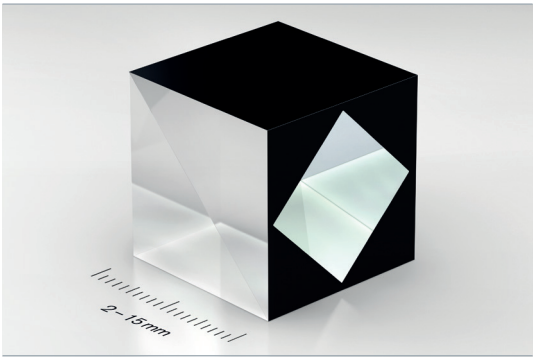
Polarizing Beamsplitter for Wearable Devices

Miniature PBS with high light throughput

Materion Balzers Optics understands the tight budget of lumens, weight and size, when it comes to optical systems for wearable devices. Therefore, we have developed technologies to miniaturize the Polarizing Beamsplitter (PBS) without compromising its excellent light throughput characteristics. Chamfer-free manufacturing and our edge-to-edge coating procedure reduce the non-functional area to zero. And this improved utilization of substrate surface enables smaller component design. As option, patterned or uniform black chrome coating may be added to eliminate unwanted straylight.



Benefits

- Small size and weight
- High lumens throughput
- Tight surface form and angular tolerances
- Minimum dead area
- Flexibility in substrate material, shape and size
- High volume fabrication

Applications

- Augmented reality
- Wearable devices
- Near-Eye displays
- Pico projectors
- Laser projector
- Gesture recognition
- Solid state lighting

Technical Data

Dimensions
From 2 mm to 15 mm cubic or cuboid
Tolerances ± 0.005 mm
Angular tolerances ± 3’
Bond line thickness < 0.01 mm
Flatness
< 0.5 fringes per 5 mm
Defects
Scratch/Dig 40/20 (MIL)
Edge chips < 0.05 mm
Glass Index range
from 1.50 to 1.85
Spectral performance for a broad spectrum
Tp (avg) > 90% VIS
Rs (avg) > 95% VIS
Contrast > 300:1
AOI = 45° ± 10° (in glass)
Spectral performance for a narrow spectrum (40 nm)
Tp (avg) > 95%
Rs (avg) > 99%
AOI = 45° ± 20° (in glass)
Other possible features
OD4 Black chrome coating, patterned or uniform
Index matching layer on optical surfaces
PBS coating for NIR wavelengths
Assembly of wave-plates

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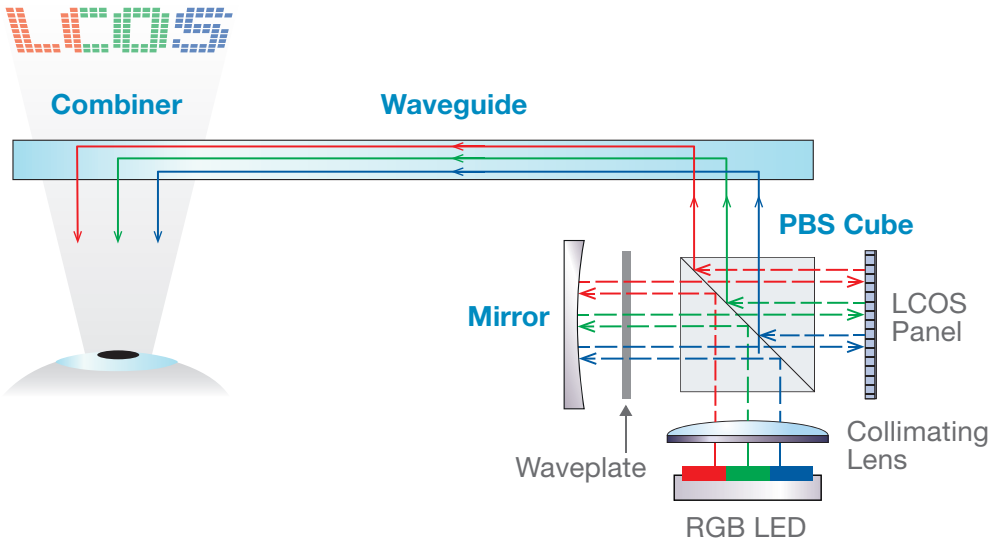
PBS application in a LCOS projection system for near-eye displays



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