

PV4003_080 Data Sheet

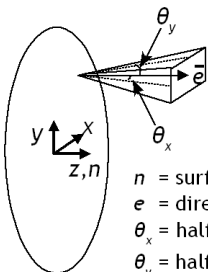
Technology Overview

PhotonVacuum™ technology is an advanced optical illumination technology for LED based projection displays. It makes it possible to collect all the light from the LED die, which leads to the best possible lm/W ratio. By integrating several optical functions into one etendue preserving component the technology enables the superior performance in the smallest size.

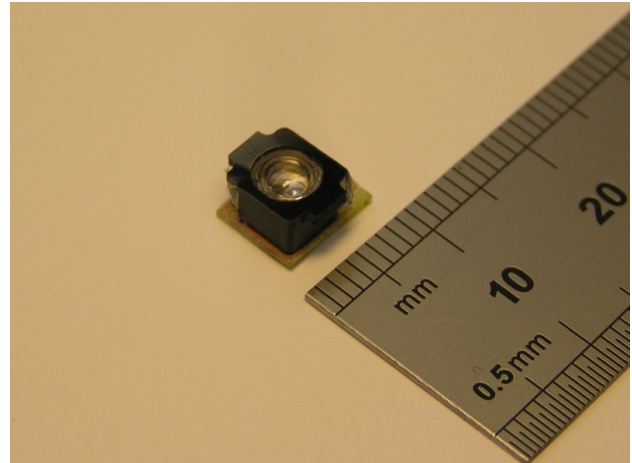
The technology provides all-in-one illuminator including light collection, beam forming and homogenization functions, and resulting uniform and rectangular illumination. Each point at the output of the PhotonVacuum™ component emits light with a rectangular cone. The output is telecentric with solid beam in both spatial and angular space.

Applications

- Picoprojectors, 10-20 lumens
- Embedded projectors
- Head-up displays
- Military displays
- Suitable for DMD, LCoS and LCD projectors
- Suitable microdisplay sizes from 0.17" to 0.5"



n = surface normal vector of PV output
 e = direction vector of rectangular cone of light
 θ_x = half angle in x-direction
 θ_y = half angle in y-direction



Features

Compatible with the most common HB LED chips

- LED chip sizes from 0.6mm to 1mm

Superior lm/W Ratio: Collects All the Light

- Collects the light emitted from the LED die to the whole hemisphere ($\pm 83^\circ$)

Ultra Small Size: All-in-One Illuminator

- Integrates light collection, beam forming and homogenization functions into one component (Size 3x6x6mm³)

Preserved Etendue

- The etendue of the output beam is equal to the etendue of the source
- The output beam is spatially and angularly solid

High Collection and Guiding Efficiency

- Provides up to 80% efficiency from the LED die to the microdisplay imager

Good Uniformity

- Provides uniformity better than 85% inside the illuminated rectangular

Contact Information

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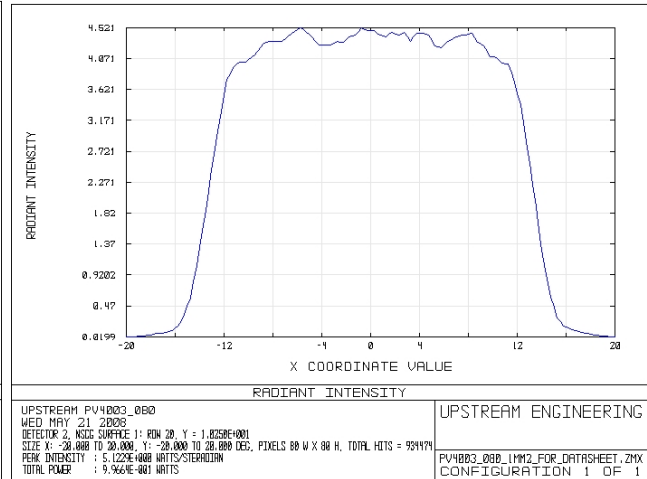
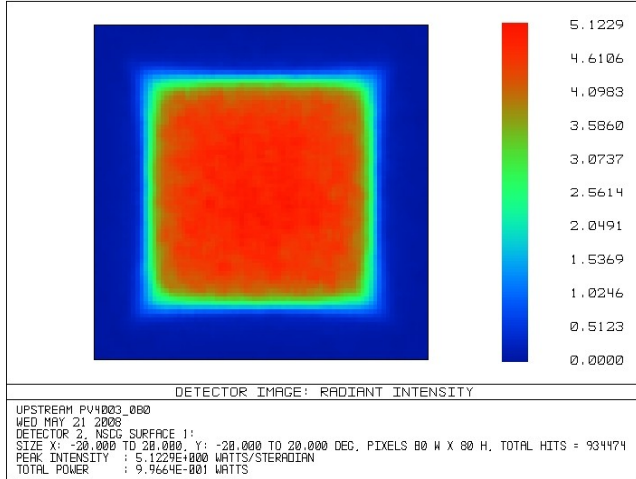
Web: www.upstream.fi

Important Notice

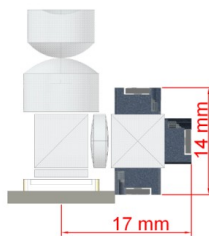
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Output Beam Characteristics

Angular distribution at PV output plane:

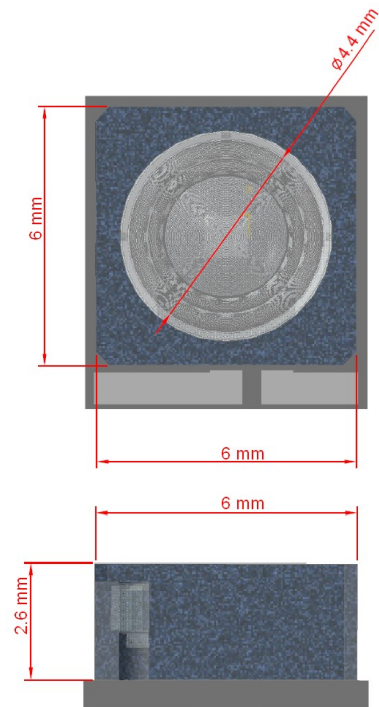


Illumination example



Optical engine with
PhotonVacuum™ RGB illuminator
(Scale 1:1)

Mechanical dimensions



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