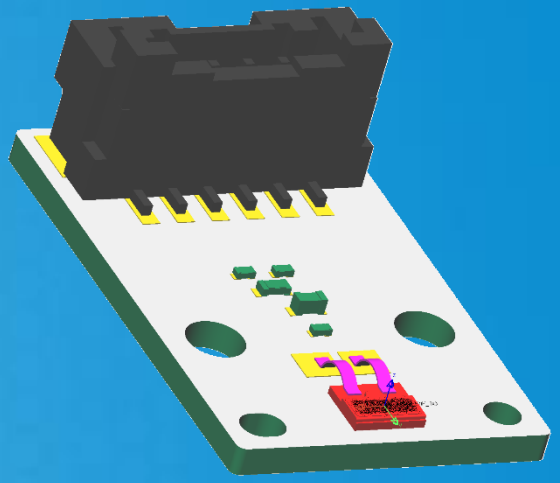
LUXEON Altilon TopContact PnP 1x3

Optical Rayset Readme

March, 5th, 2021



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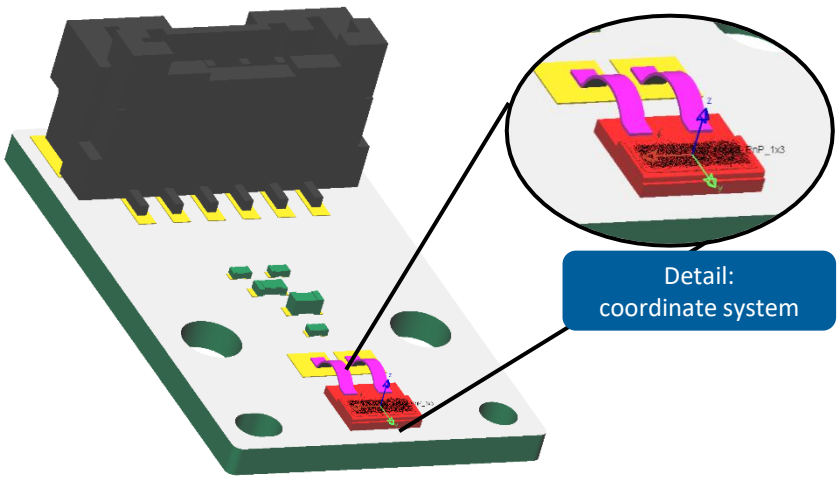
LUXEON Altilon TopContact PnP 1x3



TopContact PnP 1x3
Simulation model in LightTools

Coordinate System

- Rayfiles and CAD are defined in the same coordinate system
  - x-axis: red, y-axis: green, z-axis: blue
- xy center: center of light emitting area
- z=0 plane: top edge of light emitting area

- To use raydata and geometry together, you can follow these steps:
  - Import the CAD
  - Load the rayfile
  - The module geometry and rays are now oriented in the coordinate system as described above.
  - To re-align both, you can group both items and shift it to the desired coordinates and change the orientation of the group to match the desired orientation
- Alternative way:
  - Define a local coordinate system with correct origin and orientation
  - Import CAD and rayfile into this local coordinate system
- For optical design with the module we recommend to build a ray tracing model of the module from this CAD. Recommended model properties are described on the page: ‚Model for Ray-Tracing' in this documentation

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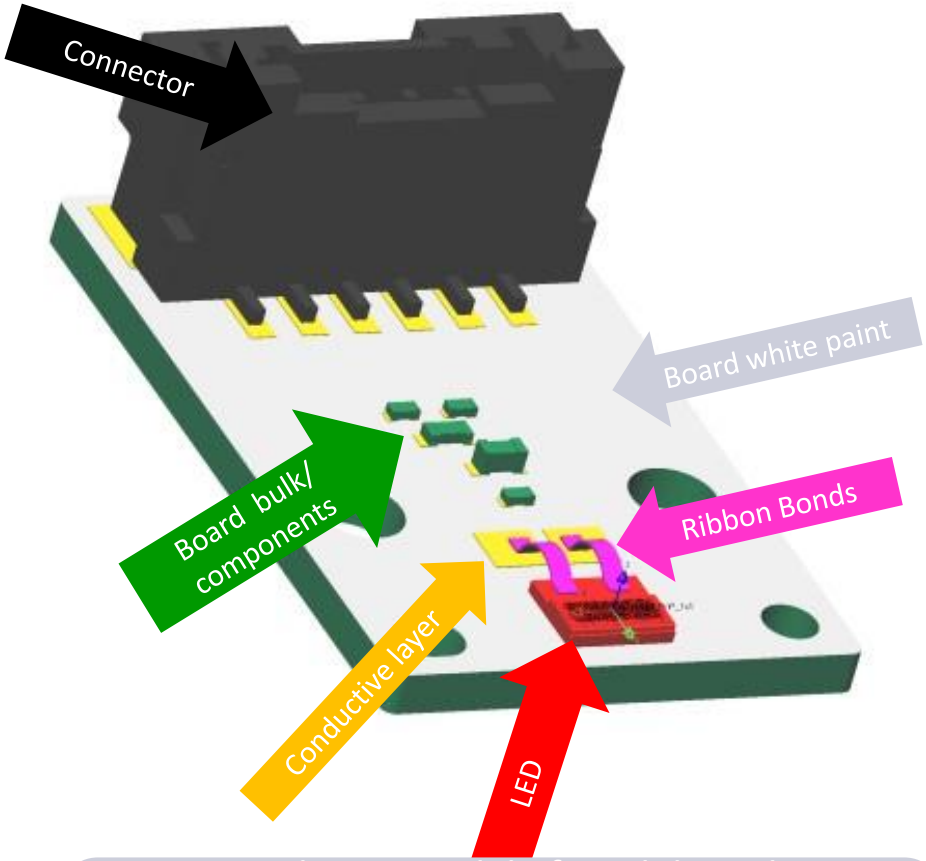


Simulation model of module with recommended optical surface properties shown in false colors
LUXEON Altilon TopContact PnP 1x3 as example

Model for Ray-Tracing

- We recommend to include the module geometry into ray-tracing when designing with LUXEON Altilon TopContact PnP. This provides consideration of any stray light paths in the system interfering with the module.
- The table indicates practical optical properties for simulation of the module components.
- The parameters of the models are based on estimated values, typical for the used materials.

Element	Property
LED	95% diffuse reflectance
Ribbon bonds	80% specular reflectance with Gaussian distribution, sigma 3°
Board white paint	85% reflectance. Hereof: 30% diffuse, 70% specular Gaussian 5° sigma
Board conductive layer	75% diffuse reflectance
Board bulk and components	80% diffuse reflectance
Connector	absorbing

LUXEON Altilon TopContact PnP 1x3 (Photometric Data)

photometric data taken from LUXEON Altilon TopContact 1x3

Link to download folder

https://raysets.lumileds.com/index.php/s/kKWobQb4KW7BMZB

Files available for download

Prosource

RS8	LUXEON_Altilon_TopContact_1x3_20200206_1249.rs8	378 MB	

LightTools

Spectral Projected	LUXEON_Altilon_TopContact_1x3_20200206_40MRays_proj_spectral_LT.ray	1.19 GB	40MRays
Y-Component Projected	LUXEON_Altilon_TopContact_1x3_20200206_20MRays_proj_Y_LT.ray	532 MB	20MRays
Z-Component Projected	LUXEON_Altilon_TopContact_1x3_20200206_20MRays_proj_Z_LT.ray	531 MB	20MRays

ASAP & LucidShape

Y-Component Projected	LUXEON_Altilon_TopContact_1x3_20200206_20MRays_proj_Y_ASAP.dis	532 MB	20MRays
Z-Component Projected	LUXEON_Altilon_TopContact_1x3_20200206_20MRays_proj_Z_ASAP.dis	531 MB	20MRays

OPTIS SPEOS

Y-Component Spectral Projected	LUXEON_Altilon_TopContact_1x3_20200206_20MRays_proj_Y_spectral_Speos.ray	608 MB	20MRays
Z-Component Spectral Projected	LUXEON_Altilon_TopContact_1x3_20200206_20MRays_proj_Z_spectral_Speos.ray	607 MB	20MRays

Zemax

Spectral Projected	LUXEON_Altilon_TopContact_1x3_20200206_40MRays_proj_spectral_zemax.dat	1.19 GB	40MRays

Far Field

IES	LUXEON_Altilon_TopContact_1x3_20200206_40MRays.ies	10.6 kB	

Spectrum

Spectrum	LUXEON_Altilon_TopContact_1x3_20200206_spectrum.txt	10.2 kB	

LUXEON Altilon TopContact PnP 1x3 (CAD Module)

Link to download folder

https://raysets.lumileds.com/index.php/s/K2kXHox2SPpmGR2

Files available for download

STEP module for raytracing

STEP	LUXEON_Altilon_TopContact_PnP_1x3_20210219_geometry.STEP	2 MB
IGS	LUXEON_Altilon_TopContact_PnP_1x3_20210219_geometry.IGS	3 MB

Additional Application Notes

Randomization

In some cases, reducing the number of rays in a rayset might be desirable. In order to facilitate the generation of reduced raysets, **all raysets mentioned in this readme file are randomized**. Hence, a rayset having 5 million rays (5M) can simply be generated by taking the first 5M rays from 20M rayset.

Projected Raysets: Propagated ray starting points

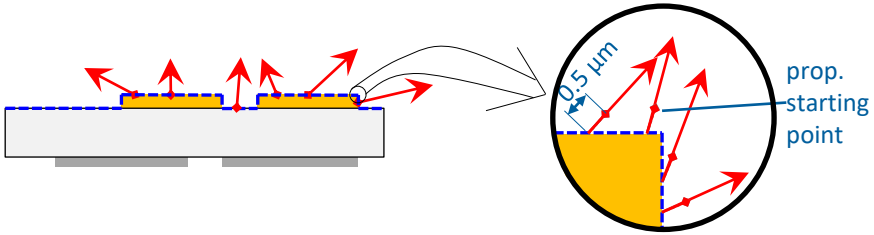
For projected raysets, the following procedure is applied for obtaining the starting points:

(1) Project rays on CAD surface (----) → ray starting points

(2) Propagate rays by 0.5 µm → propagated starting points (•)

All raysets mentioned in this readme file provide propagated starting points.

If raytracing includes the LED CAD, unpropagated rays are prone to be blocked at the surface. Rays with propagated starting points should not suffer from this problem.



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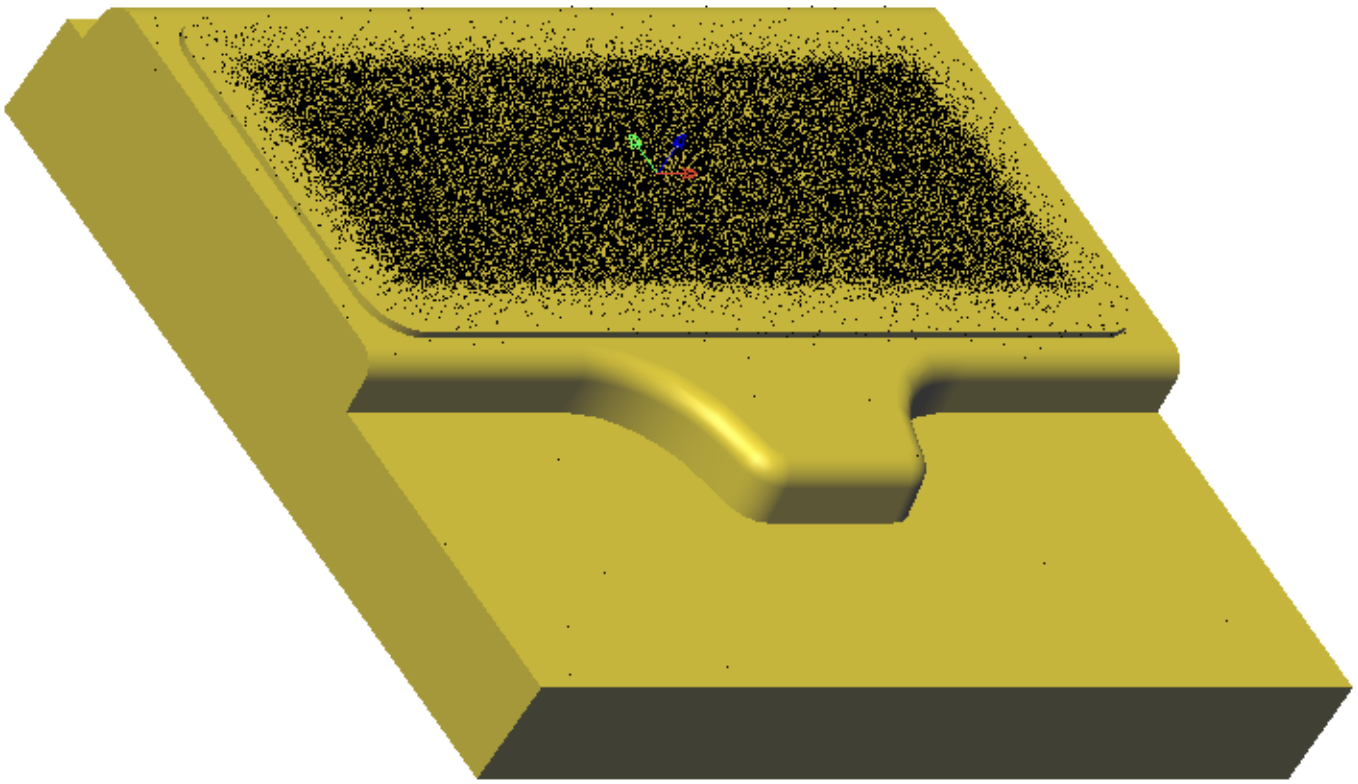
LUXEON Altilon TopContact PnP 1x3

Documentation of photometric data taken from measurement of LUXEON Altilon TopContact 1x3

LUXEON Altilon TopContact PnP 1x3

photometric data taken from LUXEON Altilon TopContact 1x3

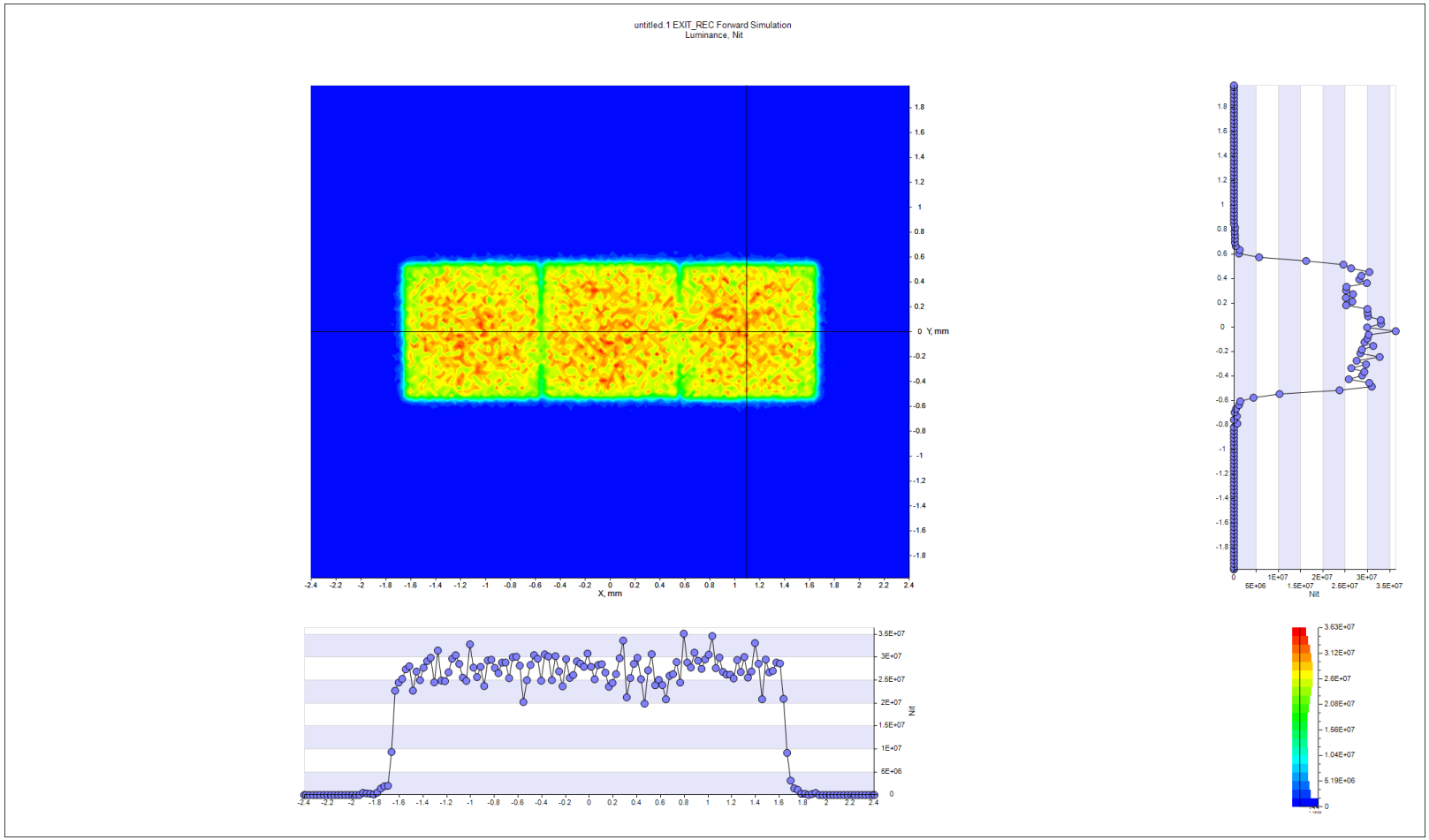
3D CAD view + ray starting points



LUXEON Altilon TopContact PnP 1x3

photometric data taken from LUXEON Altilon TopContact 1x3

Source Size



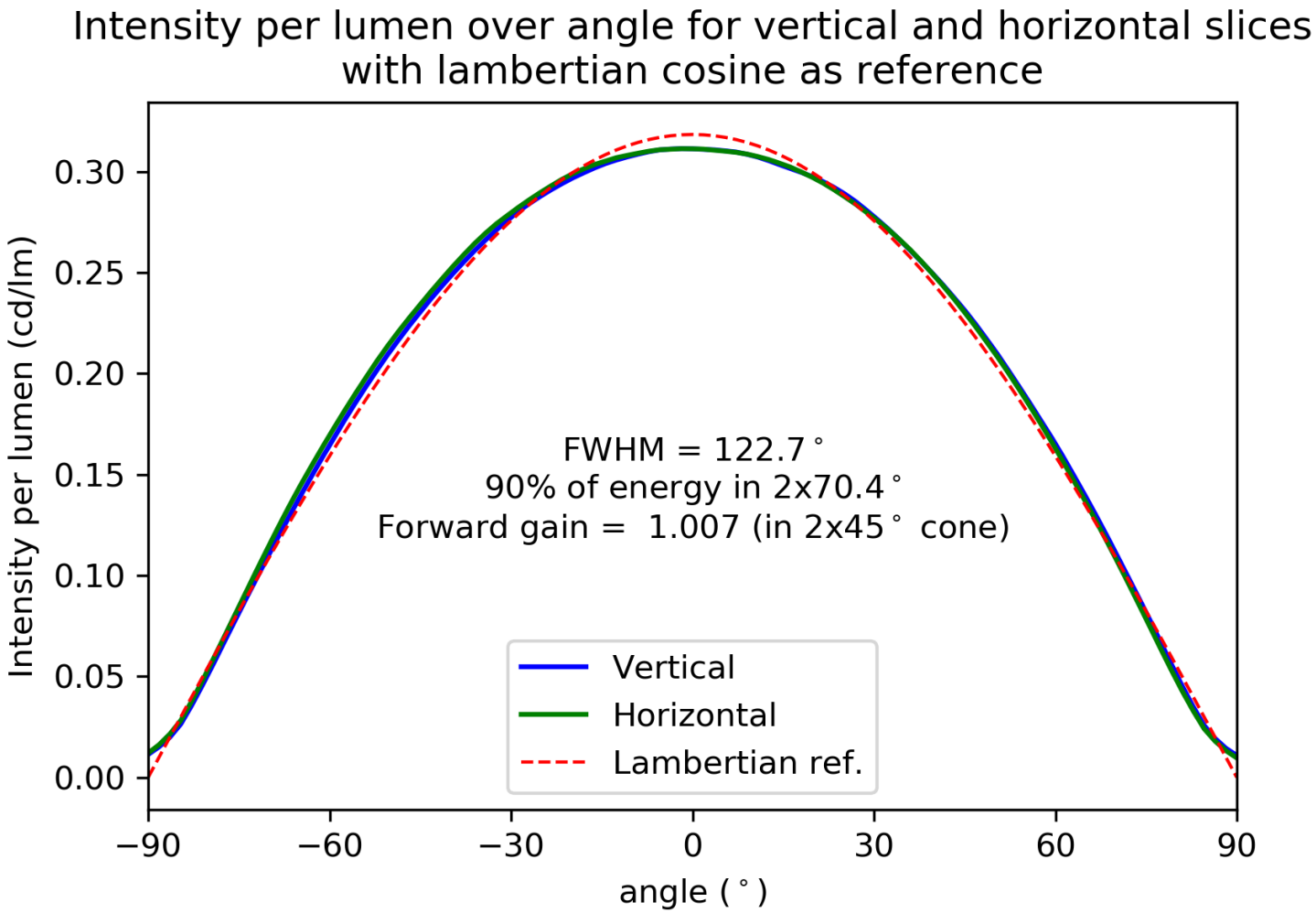
Source luminance (FWHM) = 3.31 x 1.06 mm²

The two orthogonal lines in the luminance image mark the reference planes of the two luminance cross sections.

LUXEON Altilon TopContact PnP 1x3

photometric data taken from LUXEON Altilon TopContact 1x3

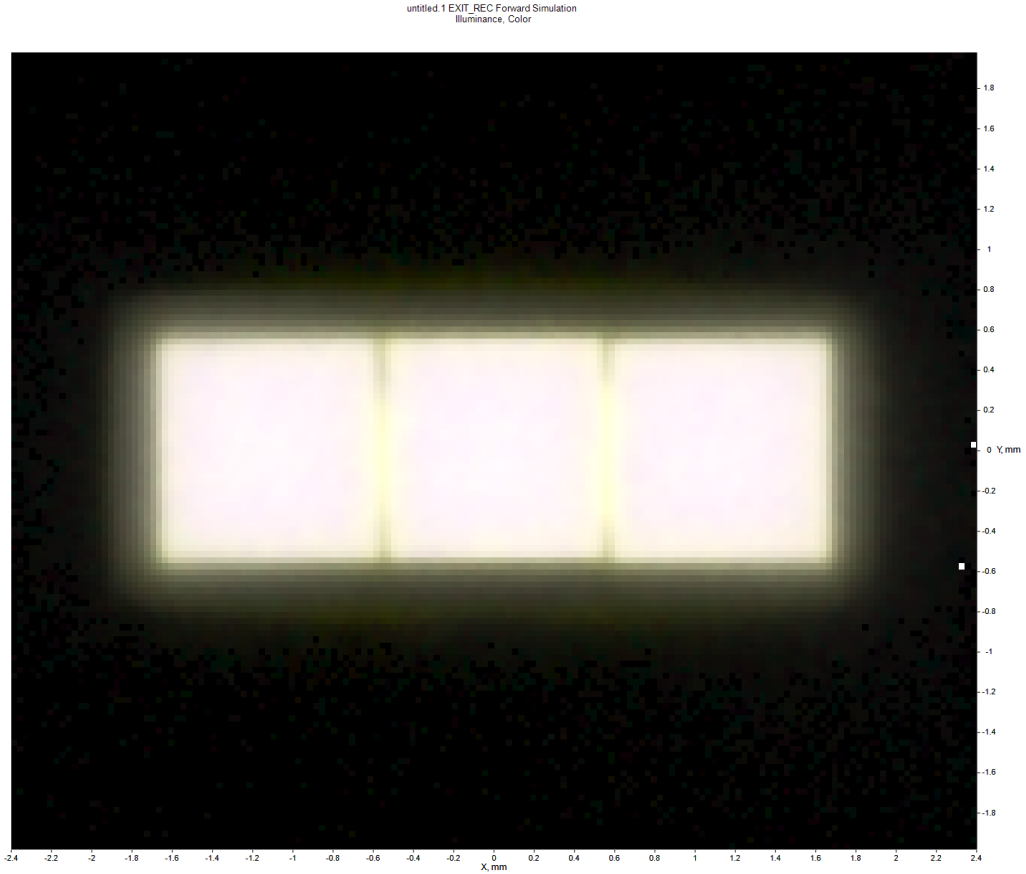
Luminous Intensity Distribution



LUXEON Altilon TopContact PnP 1x3

photometric data taken from LUXEON Altilon TopContact 1x3

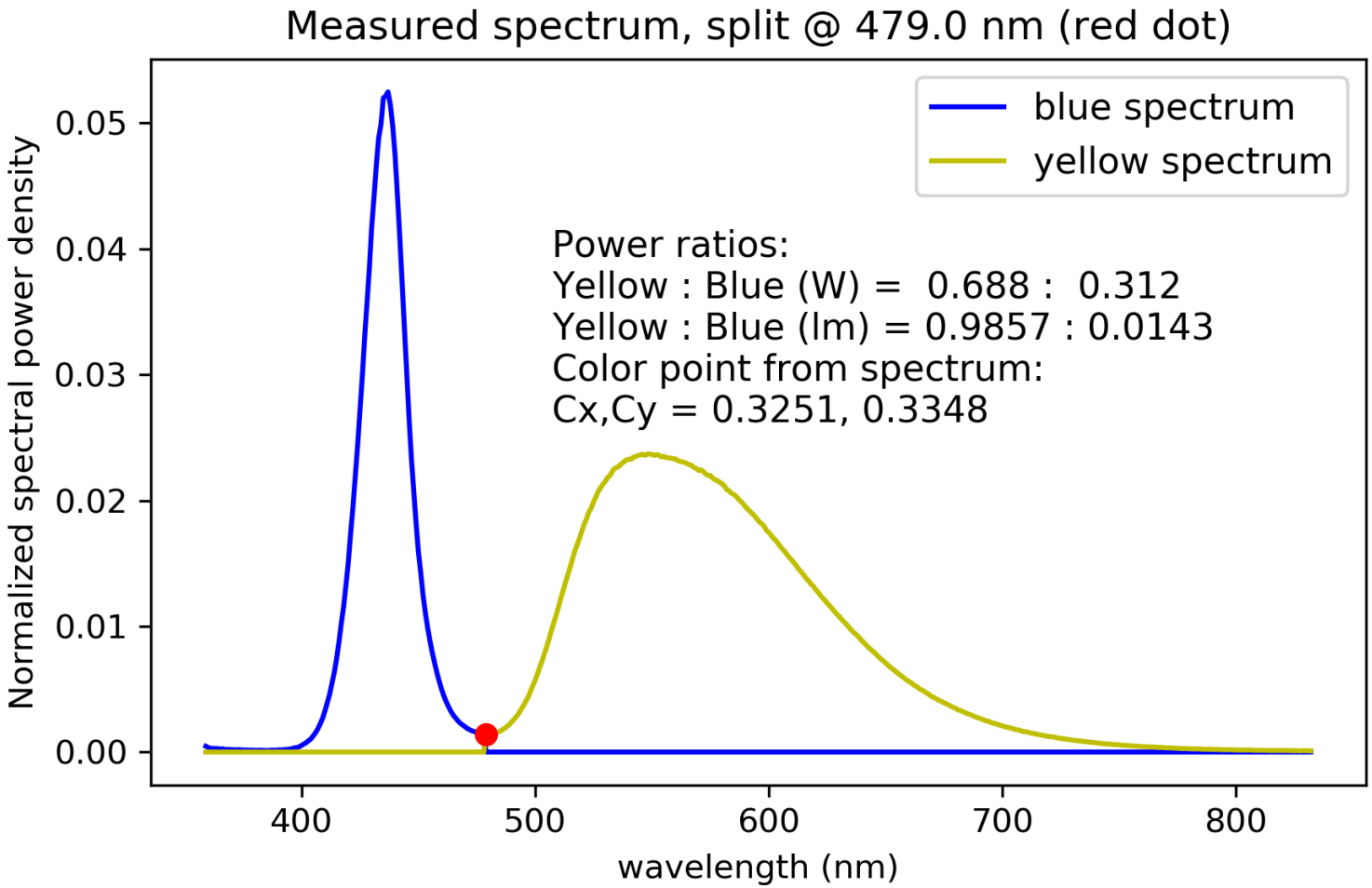
Illuminance color chart (color over position)



LUXEON Altilon TopContact PnP 1x3

photometric data taken from LUXEON Altilon TopContact 1x3

Measured spectrum split in blue (Z) and yellow (Y) components



LUXEON Altilon TopContact PnP 1x3

photometric data taken from LUXEON Altilon TopContact 1x3

Color data info

Parameter	Value
yellow : blue ratio (W) (from measured spectrum)	0.688 : 0.312
yellow : blue ratio (lm) (from measured spectrum)	0.9857 : 0.0143
Average color point Cx, Cy (from measured spectrum)	0.3251, 0.3348
Average color point Cx, Cy (from simulation)	0.3248, 0.3363
Color point Cx, Cy @ HV (from simulation)	0.323, 0.3273
Average CCT (K) (from simulation)	5.856e+03

Download File Nomenclature

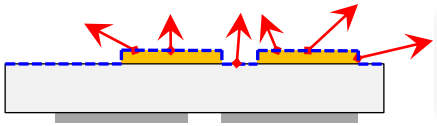
Example

LUXEON_Altilon_SMD2_1x4_gen4plus_20190206_20Mray_proj_Z_spectral_LT.ray

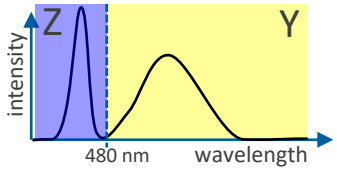
Product Name

Reference Date
helps identifying underlying dataset

Number of rays
e.g. 20 M = 20 · 10^6 rays



Ray starting points
'proj' indicates that ray starting points have been **projected** onto the CAD surface (---).



Spectral range

$$\begin{Bmatrix} \mathrm{Y} \\ \mathrm{Z} \\ - \end{Bmatrix} = \begin{Bmatrix} \text{only yellow} \\ \text{only blue} \\ \text{full} \end{Bmatrix} \text{ spectrum taken into account}$$

Spectral Information

$$\begin{Bmatrix} \text{spectral} \\ - \end{Bmatrix} = \text{individual rays } \begin{Bmatrix} \text{do} \\ \text{don't} \end{Bmatrix} \text{ carry wavelength information}$$

Target Software Package
LightTools (LT), ASAP, Zemax, …

File Extension

Lumileds ref.: C34_LUXEON Altilon TopContact PnP 1x3_20210305

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