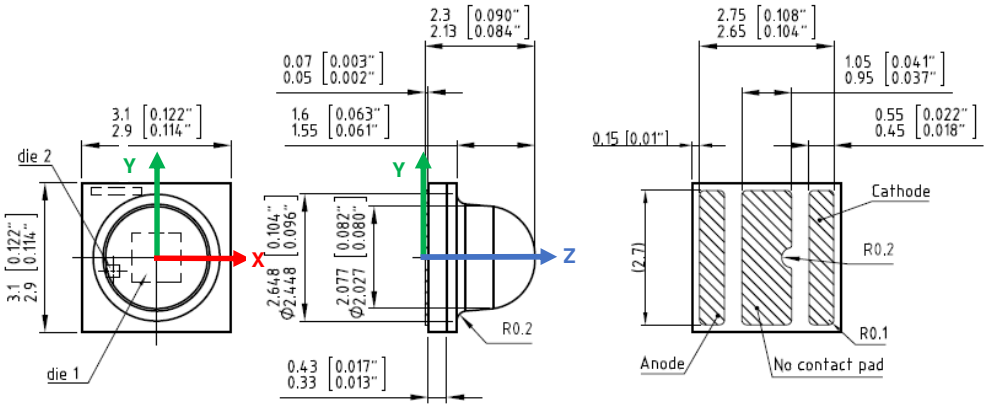
Information for OSRAM rayfile data

GW_CS8PM1pm, OSLON SSL 80 - Warm White Power Champ

1. *Position of global coordinate origin vs. package*



The global coordinate origin is at the center of the package at bottom surface. The CAD model provided with this rayfile package has the same global orientation as the rayfile.

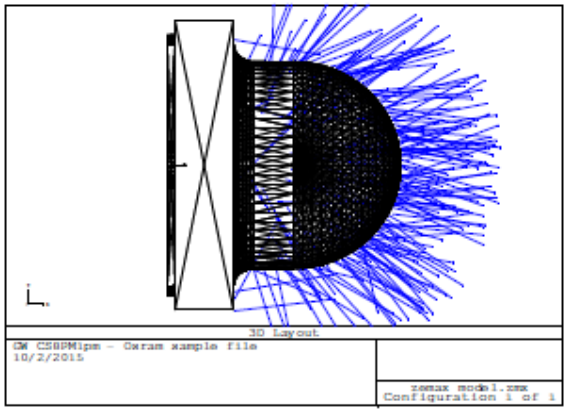
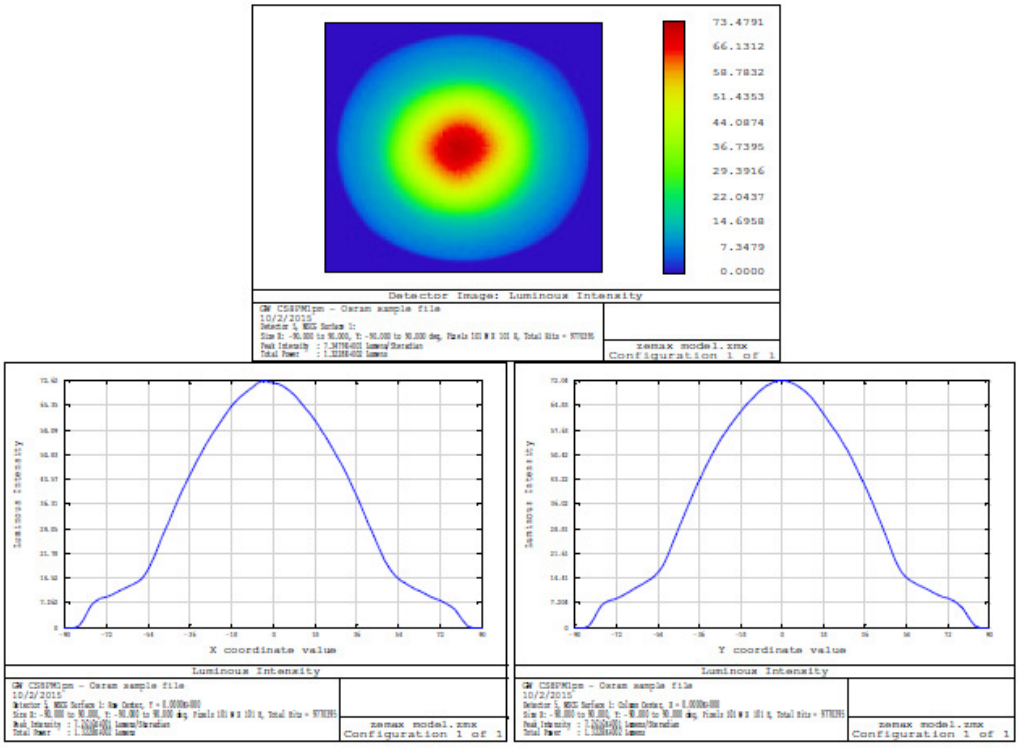


Fig. 1: Orientation of LED

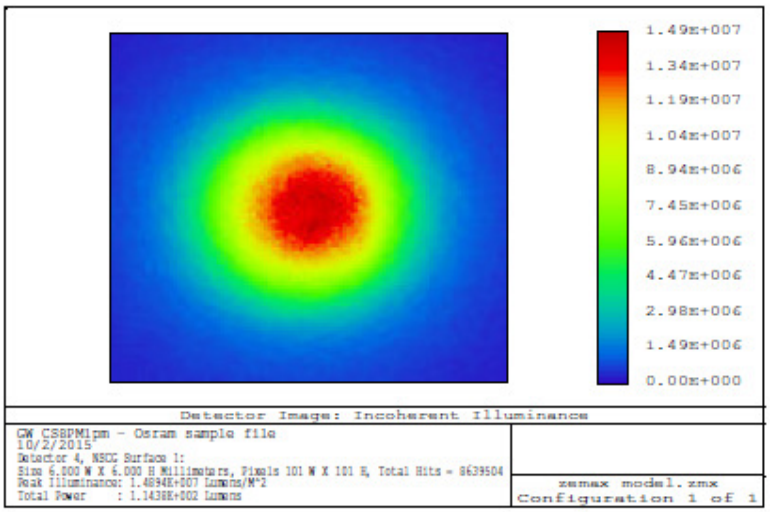
2. General Properties of the Rayfile

- the starting points of the rays need to be in air
- the rays are randomly ordered in the rayfile
- the CAD model provided with this rayfile package is intended for the design of mechanical components and not valid for optical raytracing calculations
- the units used for the coordinates in the rayfile and for the CAD model are mm
- the virtual focus of this rayfile (10M rays) with respect to the above coordinate origin is:
  x = 0.012 mm
  y = -0.010 mm
  z = 0.774 mm

3. Luminous intensity *(units: cd, LED Luminous flux Φ_V=136 **lm**)*



4. ***Near field illuminance*** *(units: lx, LED Luminous flux Φ_V=136* ***lm****, z=2.5* ***mm****)*



5. ***Using white LED OSRAM rayfile data***

The spectrum of the LED represented in this rayfile package has two local maxima due to the specific generation principle of white light used for this LED type. The slope in the blue wavelength range has narrow width and a peak wavelength around 440 nm, the slope in the yellow wavelength range has a wide distribution with a peak wavelength around 540-590 nm depending on the LED type.

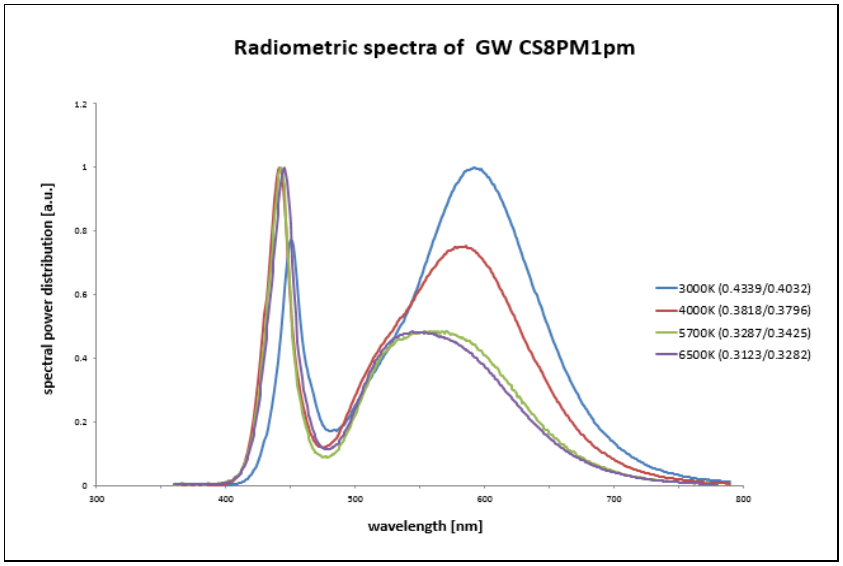


Fig. 2: exemplary radiometric spectra for four chromaticity coordinate groups

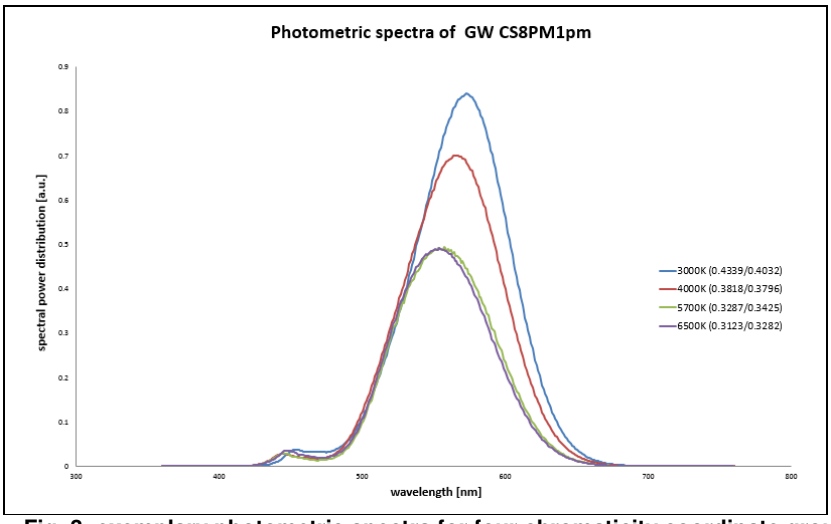


Fig. 3: exemplary photometric spectra for four chromaticity coordinate groups

Due to the different angular characteristics of the rays referring to the blue and yellow parts of the spectrum a separation of the ray model in two parts is recommended. Therefore, two rayfiles have been delivered with this rayfile package. One rayfile for the blue and one rayfile for the yellow part of the spectrum. Both rayfiles have the same global coordinate origin and must be placed in a simulation at exactly the same x-,y-,z-coordinates. To use the rayfiles in a simulation the user has to consider the following points:

- "blue" and "yellow" rayfile must be placed at the same x-,y-,z-coordinates
- simulation to be done simultaneously for the two raysets, like two overlapping sources
- Luminous flux contributions of both rayfiles must be chosen, e.g. by integration of the slope of the spectrum for the referring LED color bin.

The luminous flux ratio between yellow and blue depends on the spectrum and is therefore slightly different for the different chromaticity coordinate groups. The table below summarizes typical ratios resulting from the integration of the blue and yellow part of the spectra (separation of both parts at 510 nm):

	photometric		radiometric	
	yellow	blue	yellow	blue
3000K*	0.967	0.033	0.847	0.153
4000K	0.9574	0.0426	0.7633	0.2368
5700K	0.9410	0.0591	0.6715	0.3285
6500K	0.9316	0.0684	0.6324	0.3676

*(default setting for Speos, Lighttools and Zemax)

These relationships have to be used with the referring spectra, if the software allows the usage of complete spectra.
Some optical design software packages do not support the simulation of the complete color spectrum, but only some single wavelengths. In that case it is recommended for the simulation of the white LED to use two monochromatic sources with the peak wavelengths of the blue and yellow part of the LED-spectrum and with the above shown Luminous flux ratio.

6. Software Related Information

ASAP

The provided rayfiles for ASAP are in binary format. Flux is set to a default of 1; the user has to adapt the flux setting in the software. Wavelength is set to peak emission wavelength.
The typical radiometric spectrum in ASCII format *.txt is included in the package.
Units for wavelength are nm.

IES TM25

The provided rayfiles for IES TM25 contain the typical spectrum and the typical flux; the user has to adapt the flux setting in the software.
In addition the spectrum is included in the package as *.txt file in ASCII format. Units for wavelength are nm.

Lighttools

This rayfile package contains additionally the LED as a Lighttools library element. This provides the following information:

- link to rayfile with 100k rays, the rayfile should be placed in the same folder as the Lighttools file
- CAD model
- rayfile and CAD model are grouped. In case the grouping is resolved, the correct positioning of rayfile vs. CAD model must be ensured
- typical spectrum of the LED

For importing the library element into an existing Lighttools project, please consider the following:

- File → Restore Library… → select path and file
- indicate scaling factor: “1”
- indicate position: e.g. “XYZ 0,0,0”
- indicate z axis direction: e.g. “XYZ 0,0,1”
- indicate y axis direction: e.g. “XYZ 0,1,0”

The typical radiometric spectrum in ASCII format *.sre is included in the package.
Units for wavelength are nm.

Lucidshape

The provided rayfiles for Lucidshape are in binary format. Flux is set to a default of 1; the user has to adapt the flux setting in the software.
The typical radiometric spectrum in ASCII format *.txt is included in the package.
Units for wavelength are nm.

Simulux

The provided rayfiles for Simulux are in binary format. The rayfiles contain as wavelength information the peak emission wavelength of the LED. Flux is set to a default of 1; the user has to adapt the flux setting in the software.
The typical radiometric spectrum in ASCII format *.txt is included in the package.
Units for wavelength are nm.

Speos/Optis

The provided rayfiles for Speos/Optis are in binary format. The rayfile contains the typical color spectrum and the typical Luminous flux. In addition the spectrum is included in the package as *.spectrum file in ASCII format.

TracePro, Photopia

The provided rayfiles for TracePro and Photopia are in binary format. The rayfiles contain as wavelength information the peak emission wavelength of the LED. Flux is set to a default of 1; the user has to adapt the flux setting in the software.
The typical radiometric spectrum in ASCII format *.txt is included in the package.
Units for wavelength are nm.

Zemax

The provided rayfiles for Zemax are in binary format. In addition a sample file is included in the package showing the recommended settings and placement of rayfiles and CAD model. The sample file contains the typical Luminous flux of the LED and the typical spectrum (see “sources” tab in the object properties dialog box). Additionally, the radiometric color spectrum is included as *.spc file in the package.

7. Provided files

file type	file name
rayfile (blue part of spectrum)	rayfile_GW_CS8PM1pm_blue_[number of rays]_[YYYYMMDD]_[data format].[extension]
rayfile (yellow part of spectrum)	rayfile_GW_CS8PM1pm_yellow_[number of rays]_[YYYYMMDD]_[data format].[extension]
CAD geometry	GW_CS8PM1_[YYYYMMDD]_geometry.IGS GW_CS8PM1_[YYYYMMDD]_geometry.STEP GW_CS8PM1_[YYYYMMDD]_geometry.SLDPRT
library elements	GW_CS8PM1pm_[YYYYMMDD]_sample_[data format].[extension]
spectrum	GW_CS8PM1pm _[YYYYMMDD]_spectrum.[extension]
information (this file)	GW_CS8PM1pm _[YYYYMMDD]_info.pdf

8. Disclaimer and User Agreement

OSRAM assumes neither warranty, nor guarantee nor any other liability of any kind for the contents and correctness of the provided rayfile data. The rayfile data has been generated with highest diligence but the provided data may in reality not represent the complete possible variation range of all component parameters. Therefore, in certain cases a deviation between the real emission characteristic and the emission characteristic which is encoded in the provided rayfile data could occur.

OSRAM reserves the right to undertake technical changes of the component without further notification which could lead to changes in the provided rayfile data.

OSRAM assumes no liability of any kind for the loss of data or any other damage resulting from the usage of the provided rayfile data.

The user agrees to this disclaimer and user agreement with the download or usage of the provided files.

9. Revision History

Date	Type	code
20151002	rayfiles generated	JL
2018-05-17	updated spectrum 4000K & 5700K CCT	BZ
2019-04-04	updated spectrum for 6500K CCT	BZ