

# Package ‘photobiologyLEDs’

January 14, 2018

**Type** Package

**Title** Spectral Data for Light-Emitting-Diodes

**Version** 0.4.3-1

**Date** 2018-01-03

**Maintainer** Pedro J. Aphalo <pedro.aphalo@helsinki.fi>

**Description** Spectral emission data for some frequently used light emitting diodes.

**License** GPL (>= 2)

**VignetteBuilder** knitr

**Depends** R (>= 3.3.0), photobiology (>= 0.9.17)

**Suggests** knitr (>= 1.17), photobiologyWavebands (>= 0.4.2), ggspectra (>= 0.2.2), ggplot2 (>= 2.2.1)

**LazyLoad** yes

**LazyData** yes

**ByteCompile** true

**Encoding** UTF-8

**URL** <http://www.r4photobiology.info>,  
<https://bitbucket.org/aphalo/photobiologyleds>

**BugReports** <https://bitbucket.org/aphalo/photobiologyleds/issues>

**RoxygenNote** 6.0.1

**NeedsCompilation** no

**Author** Pedro J. Aphalo [aut, cre] (<https://orcid.org/0000-0003-3385-972X>),  
Shafiuddin Ahmed [ctb]

**Repository** CRAN

**Date/Publication** 2018-01-14 15:47:06 UTC

**R topics documented:**

photobiologyLEDs-package . . . . .	2
hewlett_packard . . . . .	4
huey_jann . . . . .	5
leds.mspect . . . . .	5
leds_global . . . . .	7
led_engin . . . . .	8
lumitronix . . . . .	8
marktech . . . . .	9
nichia . . . . .	10
norlux . . . . .	11
osram . . . . .	11
quantum_devices . . . . .	12
roithner_laser . . . . .	13
seti . . . . .	14
tao_yuan . . . . .	15
unknown . . . . .	15
uv_leds . . . . .	16
<b>Index</b>	<b>18</b>

---

photobiologyLEDs-package

*photobiologyLEDs: Spectral Data for Light-Emitting-Diodes*

---

**Description**

Spectral emission data for some frequently used light emitting diodes.

**Details**

Data for emission spectra of different types of LEDs.

The package contains one collection of spectra for different LEDs all of them measured at room temperature and a series of vectors to be used as indexes to extract different subsets of spectra. In many cases spectral data are normalized to spectral energy irradiance equal to one at the wavelength of maximum spectral energy irradiance (strongest emission peak).

**Warning!**

None of the spectral data included in this package are based on supplier's specifications and are only for information. The exact emission spectrum depends to some extent on testing conditions, but more importantly among individual LED dies. Spectral specifications are usually given by typical and boundary values. Furthermore, most manufacturers classify LEDs of a given type into "bins" with slightly different optical and electrical characteristics. In other words, the data provided here are not a substitute for actual measurements of radiation emission and spectrum of the LEDs actually used in a given piece of scientific research. For less demanding situations the data are in most cases reliable enough but perfect agreement with measurements on other LEDs of the same exact type should not be expected.

**Author(s)**

**Maintainer:** Pedro J. Aphalo <pedro.aphalo@helsinki.fi> (<https://orcid.org/0000-0003-3385-972X>)

Other contributors:

- Shafuiddin Ahmed [contributor]

**See Also**

Useful links:

- <http://www.r4photobiology.info>
- <https://bitbucket.org/aphalo/photobiologyleds>
- Report bugs at <https://bitbucket.org/aphalo/photobiologyleds/issues>

**Examples**

```
library(photobiology)
library(photobiologyWavebands)
library(ggspectra)

names(leds.mspct)

q_ratio(leds.mspct$white, Blue(), Red())

peaks(leds.mspct$white, span = 101)

plot(leds.mspct$white)

q_ratio(leds.mspct$Q36_4000K, Blue(), Red())

## Not run:
plot(leds.mspct$Q36_4000K)

## End(Not run)

q_ratio(leds.mspct$NS6L183AT_H1, Blue(), Red())

## Not run:
plot(leds.mspct$NS6L183AT_H1)

## End(Not run)

## Not run:
plot(leds.mspct$NS6L183AT_H1, unit.out = "photon")

## End(Not run)

## Not run:
plot(leds.mspct$NS6L183AT_H1,
      range = VIS(),
```

```
w.band = VIS_bands(),  
span = 101)  
  
## End(Not run)
```

---

hewlett\_packard

*Spectral data for LEDs array supplied by Agilent/Hewlett Packard*

---

### Description

Names of datasets containing the wavelengths and tabulated values spectral emittance for light emitting diodes (LEDs) from Agilent/Hewlett Packard. Data are normalized to one at the wavelength of maximum emission.

### Usage

```
hewlett_packard
```

### Format

A vector of character strings.

### Note

The division of Hewlett Packard which supplied these LEDs became part of Agilent when this division spin-off the mother company. More recently the electronic components division of Agilent became Avago Technologies which still supplies some of these LEDs or similar improved types.

### References

<https://www.broadcom.com/products/leds-and-displays/>

### See Also

[leds.mspct](#)

Other manufacturers: [huey\\_jann](#), [led\\_engin](#), [leds\\_global](#), [lumitronix](#), [marktech](#), [nichia](#), [norlux](#), [osram](#), [quantum\\_devices](#), [roithner\\_laser](#), [seti](#), [tao\\_yuan](#), [unknown](#)

### Examples

```
hewlett_packard
```

---

`huey_jann`*Spectral data for LEDs array supplied by Huey Jann*

---

**Description**

Names of datasets containing the wavelengths and tabulated values spectral emittance for different light emitting diodes (LEDs) arrays from Huey Jann Electronics Industry Co., Ltd. (Taiwan). Absolute values are not meaningful as the measuring distances are variable, and in most cases unknown.

**Usage**`huey_jann`**Format**

A vector of character strings.

**Note**

Huey Jann was a Taiwanese supplier of LED array. It is no longer in business.

**See Also**

[leds.mspct](#)

Other manufacturers: [hewlett\\_packard](#), [led\\_engin](#), [leds\\_global](#), [lumitronix](#), [marktech](#), [nichia](#), [norlux](#), [osram](#), [quantum\\_devices](#), [roithner\\_laser](#), [seti](#), [tao\\_yuan](#), [unknown](#)

**Examples**`huey_jann`

---

`leds.mspct`*Spectral irradiance for diverse LEDs*

---

**Description**

A collection of emission spectra of light-emitting-diodes from different suppliers.

**Usage**`leds.mspct`

## Format

A "source\_mspct" object containing 51 "source\_spct" objects.

In each of the member spectra, the variables are as follows:

- w.length (nm)
- s.e.irrad (W m<sup>-2</sup> nm<sup>-1</sup>)

## Details

The "source\_mspct" object contains "source\_spct" objects with spectral emission data.

The variables in each member spectrum are as follows:

- w.length (nm)
- s.e.irrad (absolute or normalized).

When the exact distance from LED to cosine diffuser is not known precisely or when the driving current is unknown, the spectra have been normalized to spectral energy irradiance equal to 1 W m<sup>-2</sup> nm<sup>-1</sup> at the wavelength of maximum spectral irradiance. When the details of the measurement conditions are known, these are given and the data are expressed in absolute spectral irradiance units. In any case, it needs to be taken into account that even in these cases measurements have not been done in an optical bench, so values of spectral irradiance are subject to errors due to possible misalignment. The shape of the spectra, in contrast can be relied upon as measurements were done with well calibrated instruments.

## Note

Please see the metadata in each spectrum and the help pages corresponding to each supplier for contact information. The metadata is stored in attributes and can be accessed with functions [getWhatMeasured](#) and [getWhenMeasured](#). Some spectra also contain information on the measurement accessible with [getInstrDesc](#) and [getInstrSettings](#).

## See Also

[oo\\_maya\\_leds](#)

## Examples

```
library(photobiology)
library(ggspectra)

names(leds.mspct)

leds.mspct$white

cat(getWhatMeasured(leds.mspct$white))

peaks(leds.mspct$white, span = 100)

range(leds.mspct$white)
```

```
stepsize(leds.mspct$white)
plot(leds.mspct$white)
intersect(led_engin, blue_leds)
leds.mspct[intersect(led_engin, blue_leds)]
```

---

leds\_global

*Spectral data for LEDs array supplied by Shenzhen Weili Optical*

---

### Description

Names of datasets containing the wavelengths and tabulated values spectral emittance for different light emitting diodes (LEDs) arrays from Shenzhen Weili Optical Ltd. Data are normalized to one at the wavelength of maximum emission.

### Usage

```
leds_global
```

### Format

A vector of character strings.

### Note

Leds Global and Shenzhen Weili are trade names of the same supplier of LED arrays. They sell both standard types and also assemble customized arrays upon request. Customized arrays may have up to five independent channels.

### References

<http://www.leds-global.com/>

### See Also

[leds.mspct](#)

Other manufacturers: [hewlett\\_packard](#), [huey\\_jann](#), [led\\_engin](#), [lumitronix](#), [marktech](#), [nichia](#), [norlux](#), [osram](#), [quantum\\_devices](#), [roithner\\_laser](#), [seti](#), [tao\\_yuan](#), [unknown](#)

### Examples

```
shenzhen_weili
leds_global
```

---

`led_engin`*Spectral data for LEDs array supplied by Led Engin*

---

**Description**

Names of datasets containing the wavelengths and tabulated values spectral emittance for light emitting diodes (LEDs) and arrays from Led Engin (USA). Data are normalized to one at the wavelength of maximum emission.

**Usage**`led_engin`**Format**

A vector of character strings.

**Note**

Led Engin is a supplier of power LEDs of high efficiency.

**References**

<http://www.ledengin.com/>

**See Also**

[leds.mspct](#)

Other manufacturers: [hewlett\\_packard](#), [huey\\_jann](#), [leds\\_global](#), [lumitronix](#), [marktech](#), [nichia](#), [norlux](#), [osram](#), [quantum\\_devices](#), [roithner\\_laser](#), [seti](#), [tao\\_yuan](#), [unknown](#)

**Examples**`led_engin`

---

`lumitronix`*Spectral data for LED array from LUMITRONIX*

---

**Description**

Names of datasets containing the wavelengths and tabulated values spectral emittance for a high power light emitting diode (LED) array from LUMITRONIX based NICHIA's high efficiency natural white SMT LEDs. Specifications: LUMITRONIX SmartArray Q36 LED-Module, 4247 lm, 4000K, 39W electrical. Data are normalized to one at the wavelength of maximum emission.



**Usage**

lumitronix

**Format**

A vector of character strings.

**Note**

Lumitronix is a supplier of LED arrays, and a distributor of LEDs.

**References**

<http://www.leds.de/>

**See Also**

[leds.mspct](#)

Other manufacturers: [hewlett\\_packard](#), [huey\\_jann](#), [led\\_engin](#), [leds\\_global](#), [marktech](#), [nichia](#), [norlux](#), [osram](#), [quantum\\_devices](#), [roithner\\_laser](#), [seti](#), [tao\\_yuan](#), [unknown](#)

**Examples**

lumitronix

---

marktech

*Spectral data for LEDs array supplied by Marktech*

---

**Description**

Names of datasets containing the wavelengths and tabulated values spectral emittance for light emitting diodes (LEDs) from Marktech. Data are normalized to one at the wavelength of maximum emission.

**Usage**

marktech

**Format**

A vector of character strings.

**References**

<http://www.marktechopto.com/>

**See Also**

[leds.mspct](#)

Other manufacturers: [hewlett\\_packard](#), [huey\\_jann](#), [led\\_engin](#), [leds\\_global](#), [lumitronix](#), [nichia](#), [norlux](#), [osram](#), [quantum\\_devices](#), [roithner\\_laser](#), [seti](#), [tao\\_yuan](#), [unknown](#)

**Examples**

marktech

---

nichia

*Spectral data for LEDs array supplied by NICHIA*

---

**Description**

Names of datasets containing the wavelengths and tabulated values spectral emittance for light emitting diodes (LEDs) from NICHIA. Data are normalized to one at the wavelength of maximum emission.

**Usage**

nichia

**Format**

A vector of character strings.

**References**

<http://www.nichia.com/>

**See Also**

[leds.mspct](#)

Other manufacturers: [hewlett\\_packard](#), [huey\\_jann](#), [led\\_engin](#), [leds\\_global](#), [lumitronix](#), [marktech](#), [norlux](#), [osram](#), [quantum\\_devices](#), [roithner\\_laser](#), [seti](#), [tao\\_yuan](#), [unknown](#)

**Examples**

nichia

---

`norlux`*Spectral data for LEDs array supplied by Norlux*

---

**Description**

Names of datasets containing the wavelengths and tabulated values spectral emittance for the NHXRGB0905005 light emitting diode (LEDs) arrays from Norlux (USA). Data are normalized to one at the wavelength of maximum emission.

**Usage**`norlux`**Format**

A vector of character strings.

**Note**

Norlux is now part of Thomas Research Products.

**References**

<http://www.trpssl.com/>

**See Also**

[leds.mspct](#)

Other manufacturers: [hewlett\\_packard](#), [huey\\_jann](#), [led\\_engin](#), [leds\\_global](#), [lumitronix](#), [marktech](#), [nichia](#), [osram](#), [quantum\\_devices](#), [roithner\\_laser](#), [seti](#), [tao\\_yuan](#), [unknown](#)

**Examples**`norlux`

---

`osram`*Spectral data for LEDs array supplied by Osram*

---

**Description**

Names of datasets containing the wavelengths and tabulated values spectral emittance for light emitting diodes (LEDs) from Osram. Data are normalized to one at the wavelength of maximum emission.

**Usage**

osram

**Format**

A vector of character strings.

**Note**

Current trade name is Osram Opto Semiconductors

**References**

<http://www.osram-os.com/>

**See Also**

[leds.mspct](#)

Other manufacturers: [hewlett\\_packard](#), [huey\\_jann](#), [led\\_engin](#), [leds\\_global](#), [lumitronix](#), [marktech](#), [nichia](#), [norlux](#), [quantum\\_devices](#), [roithner\\_laser](#), [seti](#), [tao\\_yuan](#), [unknown](#)

**Examples**

osram

---

quantum\_devices

*Spectral data for LEDs array supplied by Quantum Devices*

---

**Description**

Names of datasets containing the wavelengths and tabulated values spectral emittance for light emitting diodes (LEDs) from Quantum Devices (USA). Data are normalized to one at the wavelength of maximum emission.

**Usage**

quantum\_devices

**Format**

A vector of character strings.

**Note**

Quantum Devices produces both individual LEDs and luminaires.

## References

<http://www.quantumdev.com/>

## See Also

[leds.mspct](#)

Other manufacturers: [hewlett\\_packard](#), [huey\\_jann](#), [led\\_engin](#), [leds\\_global](#), [lumitronix](#), [marktech](#), [nichia](#), [norlux](#), [osram](#), [roithner\\_laser](#), [seti](#), [tao\\_yuan](#), [unknown](#)

## Examples

```
quantum_devices
```

---

roithner\_laser

*Spectral data for LEDs supplied by Roithner Laser*

---

## Description

Names of datasets containing the wavelengths and tabulated values for spectral emittance for different light emitting diodes (LEDs) and LED arrays supplied by Roithner Laser (Austria). Data are normalized to one at the wavelength of maximum emission.

## Usage

```
roithner_laser
```

## Format

A vector of character strings.

## Note

Roithner LaserTechnik is a distributor and reseller of LEDs, LED arrays and lasers. They have a very extensive catalogue covering almost wavelengths for which LEDs are manufactured.

## References

<http://www.roithner-laser.com/>

## See Also

[leds.mspct](#)

Other manufacturers: [hewlett\\_packard](#), [huey\\_jann](#), [led\\_engin](#), [leds\\_global](#), [lumitronix](#), [marktech](#), [nichia](#), [norlux](#), [osram](#), [quantum\\_devices](#), [seti](#), [tao\\_yuan](#), [unknown](#)

**Examples**

roithner\_laser

---

seti

*Spectral data for LEDs array supplied by SETi*

---

**Description**

Names of datasets containing the wavelengths and tabulated values spectral emittance for light emitting diodes (LEDs) arrays from SETi. Data are normalized to one at the wavelength of maximum emission.

**Usage**

seti

**Format**

A vector of character strings.

**Note**

SETi (Sensor Electronic Technologies) is a supplier of high power ultraviolet LEDs emitting in the UVC, UVB and UVA regions of the spectrum. Many of these LEDs are also sold under different type denominations by Roithner LaserTechnik.

**References**

<http://www.s-et.com/>

**See Also**

[leds.mspct](#)

Other manufacturers: [hewlett\\_packard](#), [huey\\_jann](#), [led\\_engin](#), [leds\\_global](#), [lumitronix](#), [marktech](#), [nichia](#), [norlux](#), [osram](#), [quantum\\_devices](#), [roithner\\_laser](#), [tao\\_yuan](#), [unknown](#)

**Examples**

seti

---

tao\_yuan

*Spectral data for LEDs supplied by TaoYuan*

---

### Description

Names of datasets containing the wavelengths and tabulated values spectral emittance for different light emitting diodes (LEDs) from TaoYuan Electron (HK). Data are normalized to one at the wavelength of maximum emission.

### Usage

tao\_yuan

### Format

A vector of character strings.

### Note

TaoYuan Electron (HK) is a supplier of LEDs and LED arrays.

### References

<http://www.ledwv.com/en/>

### See Also

[leds.mspct](#)

Other manufacturers: [hewlett\\_packard](#), [huey\\_jann](#), [led\\_engin](#), [leds\\_global](#), [lumitronix](#), [marktech](#), [nichia](#), [norlux](#), [osram](#), [quantum\\_devices](#), [roithner\\_laser](#), [seti](#), [unknown](#)

### Examples

tao\_yuan

---

unknown

*Spectral data for LEDs array of unknown manufacturer*

---

### Description

Names of datasets containing the wavelengths and tabulated values spectral emittance for different "generic" light emitting diodes (LEDs) without type specifications. Bought from shops like Class Ohlson or hobby targeted electronic suppliers. Absolute values are not meaningful as the measuring distances are variable, and in most cases unknown.

**Usage**

unknown

**Format**

A vector of character strings.

**See Also**

Other manufacturers: [hewlett\\_packard](#), [huey\\_jann](#), [led\\_engin](#), [leds\\_global](#), [lumitronix](#), [marktech](#), [nichia](#), [norlux](#), [osram](#), [quantum\\_devices](#), [roithner\\_laser](#), [seti](#), [tao\\_yuan](#)

**Examples**

unknown

---

uv\_leds

*Spectral data for LEDs of different colors*

---

**Description**

Names of datasets containing the wavelengths and tabulated values spectral emittance for the light emitting diodes (LEDs) from various suppliers.

**Usage**

uv\_leds

**Format**

A vector of character strings.

**See Also**

[leds.mspct](#)

**Examples**

uv\_leds  
violet\_leds  
blue\_leds  
cyan\_leds  
green\_leds  
amber\_leds  
red\_leds  
white\_leds  
multichannel\_leds



```
# select LEDs emitting in the amber, yellow, orange region  
leds.mspect[amber_leds]
```

# Index

## \*Topic **datasets**

- hewlett\_packard, 4
  - huey\_jann, 5
  - led\_engin, 8
  - leds.mspct, 5
  - leds\_global, 7
  - lumitronix, 8
  - marktech, 9
  - nichia, 10
  - norlux, 11
  - osram, 11
  - quantum\_devices, 12
  - roithner\_laser, 13
  - seti, 14
  - tao\_yuan, 15
  - unknown, 15
  - uv\_leds, 16
- amber\_leds (uv\_leds), 16
- blue\_leds (uv\_leds), 16
- cyan\_leds (uv\_leds), 16
- getInstrDesc, 6
- getInstrSettings, 6
- getWhatMeasured, 6
- getWhenMeasured, 6
- green\_leds (uv\_leds), 16
- hewlett\_packard, 4, 5, 7–16
- huey\_jann, 4, 5, 7–16
- led\_engin, 4, 5, 7, 8, 9–16
- leds.mspct, 4, 5, 5, 7–16
- leds\_global, 4, 5, 7, 8–16
- lumitronix, 4, 5, 7, 8, 8, 10–16
- marktech, 4, 5, 7–9, 9, 10–16
- multichannel\_leds (uv\_leds), 16
- nichia, 4, 5, 7–10, 10, 11–16
- norlux, 4, 5, 7–10, 11, 12–16
- oo\_maya\_leds, 6
- osram, 4, 5, 7–11, 11, 13–16
- photobiologyLEDs  
(photobiologyLEDs-package), 2
- photobiologyLEDs-package, 2
- quantum\_devices, 4, 5, 7–12, 12, 13–16
- red\_leds (uv\_leds), 16
- roithner\_laser, 4, 5, 7–13, 13, 14–16
- seti, 4, 5, 7–13, 14, 15, 16
- shenzhen\_weili (leds\_global), 7
- tao\_yuan, 4, 5, 7–14, 15, 16
- unknown, 4, 5, 7–15, 15
- uv\_leds, 16
- violet\_leds (uv\_leds), 16
- white\_leds (uv\_leds), 16