Type Designation System
Visible LED
Overview

OS LED MK PRM | September 2013
Visible LED
OSRAM OSTAR: Type designation system (single colour)

Emission Color
A: amber (617 nm)
B: blue (465 nm)
CG: converted green
UW: ultra white

Optics
A: silicone encapsulation
R: planar molded silicon (120°); conversion platelet
W: window on top

Number of Chips / Power class / Multicolor
1: 1 chip
2: 2 chips
3: 3 chips
4: 4 chips
5: 5 chips
M: low – power class
N: standard – power class
P: high – power class

Packaging (1-9)
1: OSRAM OSTAR Headlamp => one row with x chips
2: 2x2 chips
3: 2x3 chips
4: 1x2 chips
8: 1x1 chip

Board Design
H: OSRAM OSTAR Projection Cube
Q: OSRAM OSTAR Projection Compact
P: OSRAM OSTAR Projection Power
S: OSRAM OSTAR Stage
U: OSRAM OSTAR Headlamp Pro

Headlamp Design Versions
01: standard version
04: connector version
05: connector version – each chip can be controlled separately

Brightness Intensity Groups
For details see next page after type designation systems

Color Tolerance Range
For exact definition: please check datasheet

for exact definition: please check datasheet

Type designation system OS LED MK PRM
September 2013
Visible LED

OSRAM OSTAR: Type designation system (multi colour)

Emission Color
A: amber (617 nm)
B: blue (465 nm)
CG: converted green
CW: warm white
d: deep blue
R: red
T: true green
UW: ultra white
v: verde green

Optics
W: window on top

Number of Chips / Power class / Multicolor
M: low – power class

Package Type (1-9)
2: 2x2 chips
6: 1x2 chips

Board Design
Q: OSRAM OSTAR Projection Compact
S: OSRAM OSTAR Stage or OSRAM OSTAR Medical
Visible LED
Standard products: Type designation system

Wavelength | Emission Color | Color coordinates according to CIE 1931/Emission color:
--- | --- | ---
D: 460 nm | deep blue | W: white
B: 470 nm | blue | UW: ultra white
V: 505 nm | verde green | CW: warm white
T: 528 nm | true green | MW: multiphosphor white
P: 560 nm | pure green | CW: color on demand yellow
G: 570 nm | green | CB: color on demand blue
Y: 587 nm | yellow | V: verd green
O: 606 nm | orange | MW: multiphosphor white
A: 617 nm | amber | P: point LED
R: 625 nm | red | T: TOPLED
S: 633 nm | super red | W: DRAGON
H: 645 nm | hyper red | Y: Micro SIDELED

Package Type:
A: SIDELED
E: E:
M: Mini TOPLED
P: PointLED
T: TOPLED
W: DRAGON
Y: Micro SIDELED

Color Tolerance Range: For exact definition and detailed description of white binning, please check datasheet.

Forward Voltage:
0: total forward voltage range
-1: total forward voltage range, delivery in single groups

Brightness Intensity Groups: For details see next page after type designation systems.

Chip Technology / Power Class:
3: standard InGaN
5: high-optical power (HOP)
6: standard InGaAP
B: HOP 2000
C: standard InGaN enhanced brightness
D: ThinGaN Thinfilm: low brightness performance
F: ThinFilm (InGaAP): standard high brightness
G: ThinGaN
K: InGaAP low current
L: low cost performance
M: standard performance
N: high performance
P: power performance
S: standard InGaN low current
## Visible LED
OSLON and Ceramos: Type designation system

### Wavelength, Emission Color, and Color Coordinates

<table>
<thead>
<tr>
<th>Wavelength (nm)</th>
<th>Emission Color</th>
<th>Color Coordinates according to CIE 1931/Emission Color:</th>
</tr>
</thead>
<tbody>
<tr>
<td>465</td>
<td>deep blue</td>
<td>LNW: ultra white</td>
</tr>
<tr>
<td>470</td>
<td>blue</td>
<td>CW: warm white</td>
</tr>
<tr>
<td>505</td>
<td>verdigris green</td>
<td>CG: converted green</td>
</tr>
<tr>
<td>528</td>
<td>true green</td>
<td>CV: converted yellow</td>
</tr>
<tr>
<td>587</td>
<td>yellow</td>
<td></td>
</tr>
<tr>
<td>617</td>
<td>amber</td>
<td></td>
</tr>
<tr>
<td>625</td>
<td>red</td>
<td></td>
</tr>
<tr>
<td>633</td>
<td>super red</td>
<td></td>
</tr>
<tr>
<td>460</td>
<td>deep blue</td>
<td>D: deep blue</td>
</tr>
<tr>
<td>470</td>
<td>blue</td>
<td></td>
</tr>
<tr>
<td>505</td>
<td>verdigris green</td>
<td></td>
</tr>
<tr>
<td>528</td>
<td>true green</td>
<td></td>
</tr>
<tr>
<td>587</td>
<td>yellow</td>
<td></td>
</tr>
<tr>
<td>617</td>
<td>amber</td>
<td></td>
</tr>
<tr>
<td>625</td>
<td>red</td>
<td></td>
</tr>
<tr>
<td>633</td>
<td>super red</td>
<td></td>
</tr>
<tr>
<td>470</td>
<td>blue</td>
<td>U: ultra white</td>
</tr>
<tr>
<td>505</td>
<td>verdigris green</td>
<td></td>
</tr>
<tr>
<td>528</td>
<td>true green</td>
<td></td>
</tr>
<tr>
<td>587</td>
<td>yellow</td>
<td></td>
</tr>
<tr>
<td>617</td>
<td>amber</td>
<td></td>
</tr>
<tr>
<td>625</td>
<td>red</td>
<td></td>
</tr>
<tr>
<td>633</td>
<td>super red</td>
<td></td>
</tr>
</tbody>
</table>

### Package Type
- C: CERAMOS or ceramic OSLON
- H: OSLON Black or OSRAM OSTAR Projection Cube

### Encapsulant Type / Lens Properties
- 5: outcoupling lens 60°
- 7: outcoupling lens 80°
- B: outcoupling lens 120°
- D: outcoupling lens 150°
- E: whitish appearance
- G: outcoupling lens 90°
- R: silicone encapsulation
- S: diffused or clear silicon
- Q: planar molded silicone
- P: planar molded silicone enhanced \( R_{th} \) LED type

### Forward Voltage
- 0: total forward voltage range
- 1: total forward voltage range, delivery in single groups

### Lead / Package Properties
- 9: leadless
- A: overmolded and leadless
- E: OSLON Compact
- H: standard CERAMOS reflector
- N: ceramic material aluminumoxide
- KL: ceramic material aluminaoxide
- W: enhanced 8th LED type

### Chip Technology / Power Class
- M: standard performance
- N: high performance
- P: power performance

### Brightness Intensity Groups
For details see next page after type designation systems.

### Color Tolerance Range
For exact definition and detailed description of white binning: please check datasheet

### Type designation system | OS LED MK PRM
September 2013
## Visible LED

### Miniature packages: Type designation system

<table>
<thead>
<tr>
<th>Wavelength</th>
<th>Emission Color</th>
<th>Package Type</th>
<th>Color Tolerance Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>D: 460 nm</td>
<td>deep blue</td>
<td>SmartLED</td>
<td>-1: total color tolerance range</td>
</tr>
<tr>
<td>B: 470 nm</td>
<td>blue</td>
<td>CHIPLED 5056 / CHIPLED with lens</td>
<td></td>
</tr>
<tr>
<td>V: 535 nm</td>
<td>verde green</td>
<td>CHIPLED 0603 / 0402</td>
<td></td>
</tr>
<tr>
<td>T: 528 nm</td>
<td>true green</td>
<td>FIREFLY</td>
<td></td>
</tr>
<tr>
<td>F: 560 nm</td>
<td>pure green</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G: 570 nm</td>
<td>green</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y: 587 nm</td>
<td>yellow</td>
<td></td>
<td></td>
</tr>
<tr>
<td>O: 606 nm</td>
<td>orange</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A: 617 nm</td>
<td>amber</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R: 625 nm</td>
<td>red</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S: 633 nm</td>
<td>super-red</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H: 646 nm</td>
<td>hyper-red</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Color coordinates according to CIE 1931**

### Luminous Intensity Groups

- **L** (Light emitting diode)
- **W** (white)
- **Q** (warm white)
- **H** (color on demand blue)

### Lead / Package Properties

<table>
<thead>
<tr>
<th>Package Properties</th>
<th>Luminous Intensity Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: footprint 0603 / height: 0.6 mm</td>
<td>delivery in single groups</td>
</tr>
<tr>
<td>2: footprint 0603 / height: 0.6 mm</td>
<td></td>
</tr>
<tr>
<td>3: footprint 0603 / height: 0.35 mm</td>
<td></td>
</tr>
<tr>
<td>4: footprint 0603 / height: 0.25 mm</td>
<td></td>
</tr>
<tr>
<td>5: footprint 0603 / height: 0.1 mm</td>
<td></td>
</tr>
<tr>
<td>6: standard</td>
<td></td>
</tr>
<tr>
<td>7: standard</td>
<td></td>
</tr>
<tr>
<td>8: footprint 0402 / height: 0.35 mm</td>
<td></td>
</tr>
</tbody>
</table>

### Encapsulant Type / Lens Properties

<table>
<thead>
<tr>
<th>Encapsulant Type / Lens Properties</th>
<th>Luminous Intensity Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: focusing lens (=&lt;20°)</td>
<td></td>
</tr>
<tr>
<td>7: clear resin / white volume conversion</td>
<td></td>
</tr>
<tr>
<td>8: white volume conversion</td>
<td></td>
</tr>
<tr>
<td>9: clear resin</td>
<td></td>
</tr>
</tbody>
</table>

### Chip Technology / Power Class

<table>
<thead>
<tr>
<th>Chip Technology / Power Class</th>
<th>Luminous Intensity Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: TSN</td>
<td></td>
</tr>
<tr>
<td>3: standard InGaN</td>
<td></td>
</tr>
<tr>
<td>4: AlGaAs</td>
<td></td>
</tr>
<tr>
<td>5: HOP 2000</td>
<td></td>
</tr>
<tr>
<td>6: standard InGaP</td>
<td></td>
</tr>
<tr>
<td>7: standard InGaN enhanced brightness</td>
<td></td>
</tr>
<tr>
<td>8: ThinGaN &amp; package with 8 kV ESD stability</td>
<td></td>
</tr>
<tr>
<td>9: ThinGaN</td>
<td></td>
</tr>
<tr>
<td>10: NOTA, PowerFlip, ThinGaN</td>
<td></td>
</tr>
<tr>
<td>N: InAlGaP low current</td>
<td></td>
</tr>
</tbody>
</table>

For details see next page after type designation systems.

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**Type designation system | OS LED MK PRM**

September 2013
Visible LED
Multi chip packages: Type designation system

<table>
<thead>
<tr>
<th>Wavelength</th>
<th>Emission Color</th>
<th>Package Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>D: 460 nm</td>
<td>deep blue</td>
<td>C: Multi CERAMOS</td>
</tr>
<tr>
<td>B: 470 nm</td>
<td>blue</td>
<td>G: MULTILED/DISPLIX</td>
</tr>
<tr>
<td>T: 520 nm</td>
<td>true green</td>
<td>R: Multi CHIPLED</td>
</tr>
<tr>
<td>Y: 570 nm</td>
<td>yellowish green</td>
<td>T: Multi TOPLED</td>
</tr>
<tr>
<td>O: 590 nm</td>
<td>yellow</td>
<td></td>
</tr>
<tr>
<td>A: 617 nm</td>
<td>amber</td>
<td></td>
</tr>
<tr>
<td>R: 625 nm</td>
<td>red</td>
<td></td>
</tr>
<tr>
<td>S: 633 nm</td>
<td>super-red</td>
<td></td>
</tr>
</tbody>
</table>

**Lead / Package Properties**
- 4: 4-lead, common anode
- 6: folded leads
- 7: reverse gullwing leads
- 8: 8-lead, triangle
- 9: 6-lead
- F: 6-lead, inline chip configuration

**Encapsulant Type / Lens Properties**
- 7: colorless clear
- B: epoxy resin / high contrast
- S: silicone, white package
- T: silicone, black surface
- U: silicone, black package

**Color Tolerance Range**
For exact definition and detailed description of white binning: please check datasheet

**Brightness Intensity Groups**
For details see next page after type designation systems.
Visible LED
New Type designation system

Package concept
C: TOPlooker, ceramic package, without reflector
D: TOPlooker; lead frame based, white reflector package
H: TOPlooker, lead frame based, black reflector package

Radiation characteristics/ Lens properties
L: No lens
V: Oval lens (120° / 60°)

Technology concept/ Encapsulation type
3: Silicone casting (QFN package)
A: Silicone molding (QFN package)
M: Silicone Molding (single layer ceramic)
S: Silicone casting (Premold package)

Package Outlines/ Foot print
TOPlooker
A: 2.6 x 2.2 mm²
B: 2.0 x 1.6 mm²
C: 3.0 x 1.4 mm²
P: 4.0 x 1.4 mm²
U: 3.8 x 3.8 mm²
2: 3.75 x 3.1 mm²
3: 3.75 x 4.2 mm²
4: 3.75 x 5.3 mm²
5: 3.75 x 6.4 mm²

Power/ Chip class
Single chip
M: Standard performance
P: High performance
S: Power performance

Multi chip (not individually addressable)
5: High performance

Product version

Power/ Chip class

Spectral characteristics & Binning information
First letter: Spectral characteristic
Second letter: Binning information

White and other unsaturated colors
First letter:
E: CRI80
P: CRI70
S: Cold white
T: Greenish color white

Second letter:
B: General BLU binning
C: ANSI fine binning
E: IEC 62707 binning (ECE white binning)

Saturated colors
First letter:
1: InGAN saturated
2: InGaAlP saturated

Second letter:
2: Luminous intensity Iv [mcd]
3: Luminous flux Phiv [lm]
4: Radiant intensity Ie [mW/sr]
5: Illuminance Ev [lx]