901B61401204

PRELIMINARY

Product description

- 3 Year Warranty
- CE certified
- Multiple White CCT's Available
- Mid-power LEDs
- Uniform distribution of light
- UL-recognized components
- ANSI compliant 1/6th color binning

Applied standards

- EN62031: LED modules for general lightning - safety specifications
- Zhaga compatible

Technical Notes

PCB (FR4)size	280x20mm
Weight	25 gr.
Source Type	28 LUXEON® 3535L Mid power LEDs

Ordering Data

See *part numbering* and *order information* table

Electrical Characteristics

	Min	Typ	Max
Current (mA) ②③	-	-	700
Voltage@ 700mA (V) ①④	11.2	12.2	13.6
Power @ 700mA (W) ①	7.84	8.54	9.52
Connector Type	WAGO 2060 Series (2060-401)		

Optical Characteristics

Color temperature ⑤	Min CCT	Max CCT	Min CRI	Min Flux (lm) ①⑥	Typ Flux (lm) ①⑥
3000K	2850K	3200K	80	896	1092
			90	672	868
3500K	3200K	3750K	80	896	1120
			85	672	924
4000K	3750K	4250K	70	1008	1260
			80	896	1176
			85	672	952

① The LEDs are tested and binned at 100mA.

② Safe operation only possible by the use of external constant current sources.
The current source used for operation, must ensure the following protection
- Short-circuit protection
- Overload protection
- Over-temperature protection

③ Proper current derating must be observed to maintain junction temperature below the maximum.

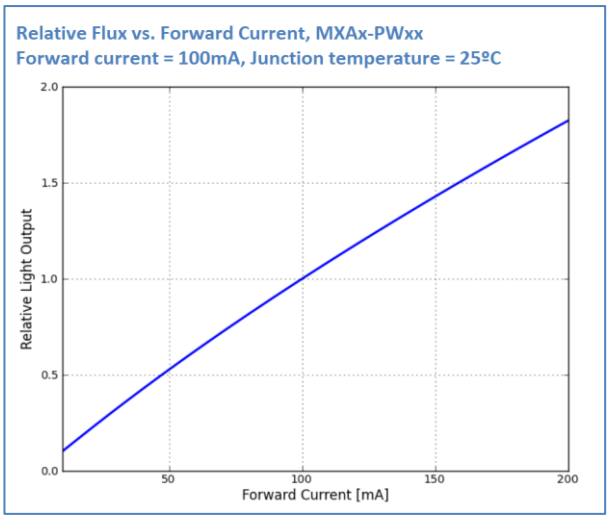
④ Philips Lumileds maintains a tolerance of ± 0.10V on forward voltage measurements.

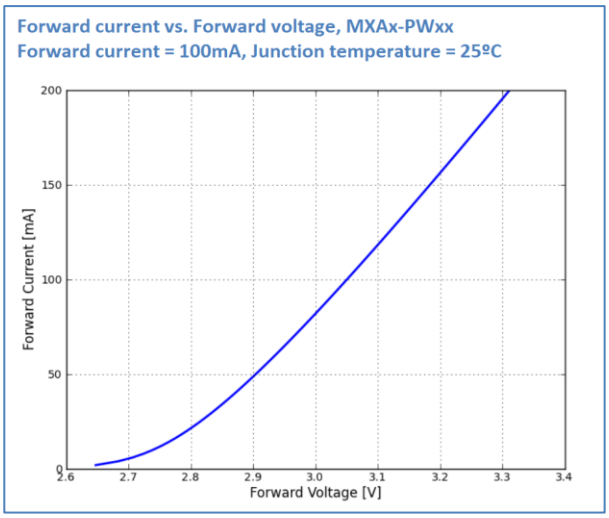
⑤ Different CCT available upon request. Contact your local sales representative.

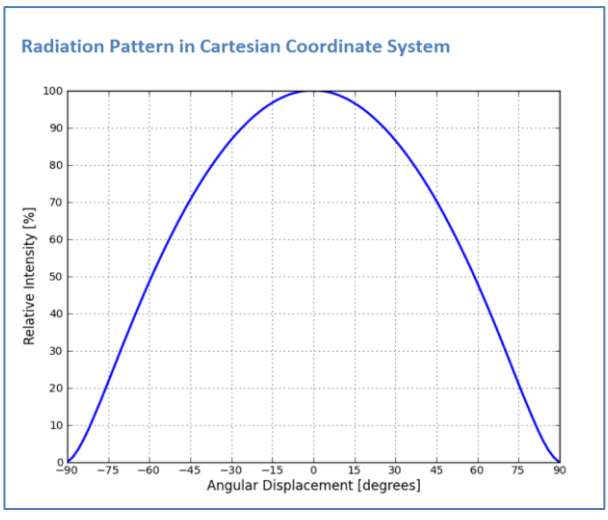
⑥ Typical lumen output according to datasheet at Ts: 25°C
and test current single LED: 100mA,
use for reference only since application temperature and LED driver current have influence on the lumen output.

Typical characteristics Graphs

These graphs show the typical values





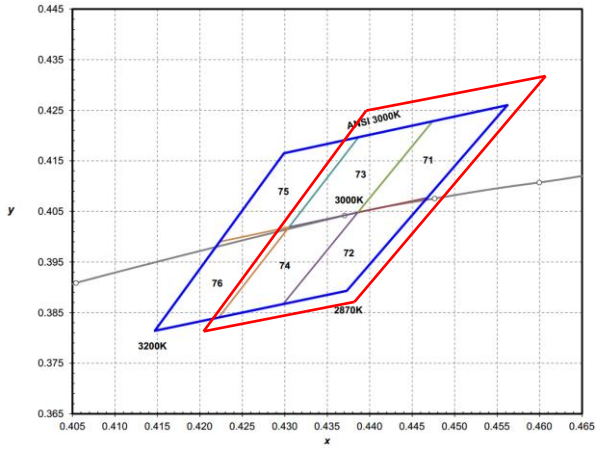


Bins

The standard shipping format includes all chromaticity coordinate groups.
The concrete delivered group is marked on each product.

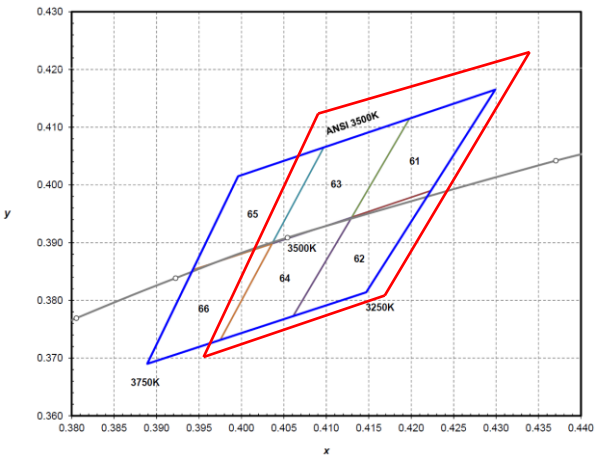
Specified Bins for the MXA8-PW30 (3000K)

Flux	L (32lm – 36lm) min
Color	71 or 72 or 73 or 74
Forward Voltage	V (2.9V – 3.0V) or W (3.0V – 3.1V)



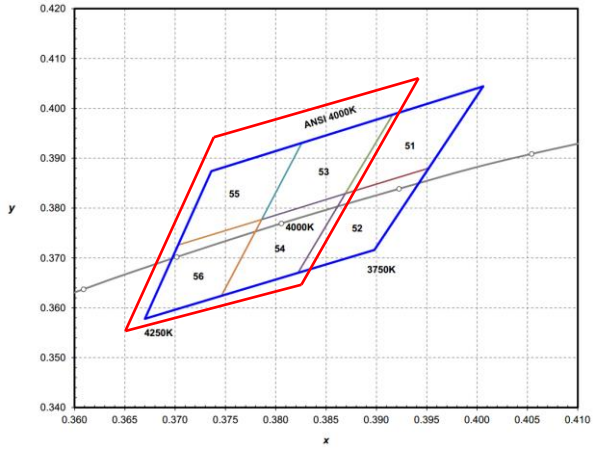
Specified Bins for the MXA8-PW35 (3500K)

Flux	M (36lm – 40lm) min
Color	61 or 62 or 63 or 64
Forward Voltage	V (2.9V – 3.0V) or W (3.0V – 3.1V)



Specified Bins for the MXA8-PW40 (4000K)

Flux	M (36lm – 40lm) min
Color	53 or 54 or 55 or 56
Forward Voltage	V (2.9V – 3.0V) or W (3.0V – 3.1V)



Product Labeling

Every PCB is laser-marked with specific numbers.
Each laser-marking consists of the following items (example):

Part ID RENA:
901B61401204.L8---80032C

Order number – Follow number:
50030796-125

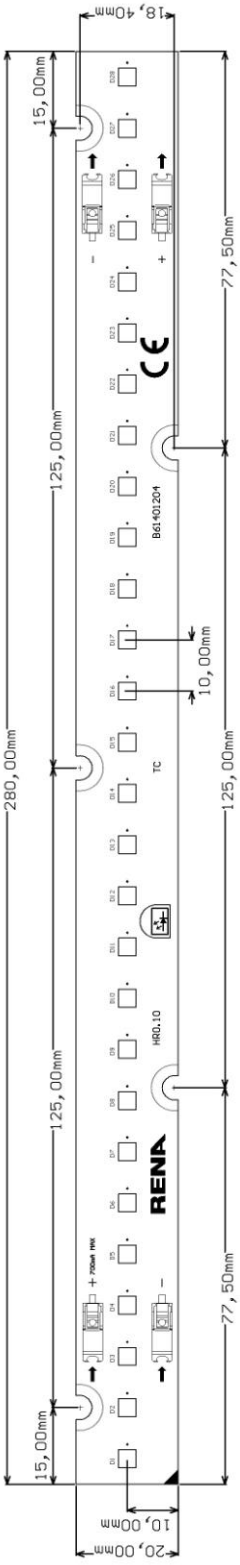
MPN LED – BIN code:
MXA8-PW30-0000-L72V

The font size used for laser-marking is 1.5.

Mechanical Dimensions

Overall dimensions 280x20x1.6mm (PCB thickness),
280x20x6.1mm (highest component included).
The PCB has holes for fixing it to the mounting plate with M4 bolts.
Use M4 bolts with a maximum head diameter of 9mm. The M4 bolts need to be tightened with a torque of 0.6 – 1.0N.

Symbol	Description	Quantity
	Main LEDs	28



Thermal Characteristics

The light engines must operate under proper environmental conditions and the operating ambient air temperature must NOT exceed a certain maximum which cause the LEDs to exceed the maximum junction temperature as stated in the Philips Lumileds datasheet.

A heat sink can be used when operating the light engines. The objective is to maintain the junction temperature below the maximum ratings according to the Philips Lumileds datasheet while also not exceeding the maximum PCB temperature.

If the light engine is mounted on a heat sink the following advice must be followed:

- The surface where the light engine will be mounted on must be flat.
- Avoid bending of the PCB to avoid damaging the LEDs and the solder connections
- Use a thermal interface material in between the PCB and heat sink. This is available as 840B613xxxx

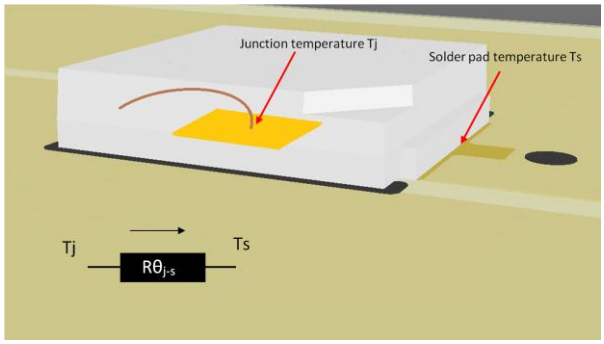
For an optimal lifetime performance the light engine must be placed in an environment where the air should be able to flow freely around the luminary. The heat transport is done by conduction to the heat sink and by radiation to the air. It's not recommended to expose the module to direct sunlight or any other heat source.

Environmental characteristics

Storage temperature	-20 – 80 °C
PCB temperature (Tc)	-20 – 85 °C
Ts temperature (max)	85 °C
IP classification	IP00

Thermal measurement

There are several reference points surrounding a LED to determine the junction temperature (Tj). Between these points there is always some resistance.



The maximum ratings for the junction temperature can be maintained from the Lumileds datasheet; however the limiting factor is the solder joint temperature (Ts). In order to have a reliable solder joint the maximum is set at Ts 85˚C. The solder pad temperature Ts must never exceed 85 degrees Celsius. The recommended temperature measure point for Ts is located right next to the cathode of the LUXEON emitter on the PCB. To ensure accurate readings the thermocouple must make direct contact with the copper of the PCB onto which the LUXEON emitter pads are soldered.

The typical thermal resistance between junction and sensor pad $R\theta_{j\text{-}s}$ is around 28-32 K/W. The junction temperature can be calculated according to the following equation:

$$T_j = T_s + R\theta_{j-s} * P_{electrical}$$

Detailed information can be found in the Application Brief AB203 of the Philips Lumileds website.

Interconnectivity Options
Board-to-Board wiring options and drawings.
The last board, or when a single board is used the single board, always must have the jumper wire installed as shown below.

A maximum of 8 boards can be connected in series.

Module interconnection: Series

Module interconnection: Parallel

Assembly and Safety Information

Installations must be carried out under observation of the relevant regulations and standards. The following guidelines must be followed:

- Installations must be carried out in a voltage-free state.
- The device / module contains components that are sensitive to electrostatic discharge and may only be installed in the factory and on site if appropriate EOS/ESD protection measures have been taken.
- Before installing on to a heat sink, the PCB needs to be connected with thermal interface material and fixed with screws. Do not use heat conducting paste to maintain PCB clearances. The fixing/cooling surface must be cleaned before installing the PCB to remove all dirt, dust and grease. The light engine must not be bent to avoid damaging the LEDs. Use all screw holes to attach the light engine to the heat sink in order to provide proper heat transfer.
- The TIM material can be ordered separately. Contact your local sales representative.
- Use wire size AWG 24-18 for connecting the PCB to the current source power supply.
- Conductors must be inserted at a 0° angle with respect to the PCB.
- Wires must be stripped to a length of 6-7mm (solid & stranded).

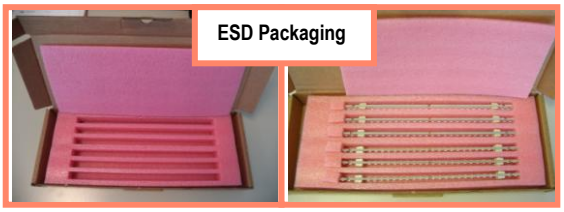
1) Insert solid conductors via push-in termination.
2) Inserting/ removing fine-stranded conductors by lightly pressing on the push-button

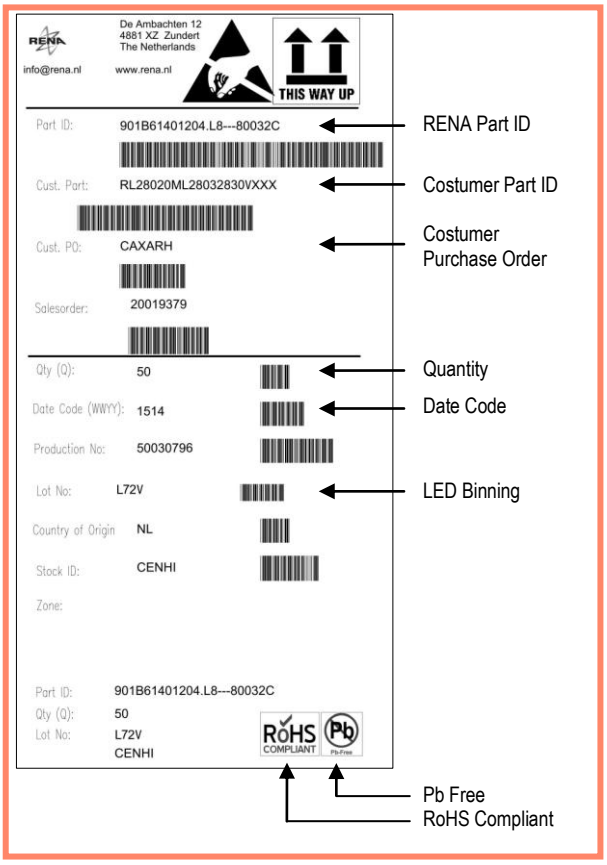
- Applying pressure on the LEDs will influence the reliability of the LEDs. Precautions should be taken to avoid pressure on the LEDs.
- Do not stack the PCBs on top of each other. Since the LED materials are soft this can cause LED catastrophic failures.
- It is recommended to avoid using chemicals in the LED system. Gas molecules from chemicals, even in small amounts, may damage the LEDs. The list of commonly used chemicals that will damage the LEDs can be viewed in the application brief AB203 at http://philipslumileds.com/
- Using corrugated boxes as packaging is only allowed if the sulfur concentration used in the corrugated box is less than 850ppm.
- Please ensure the correct polarity of the leads. Reverse polarity connection may damage the LEDs.
- For outdoor or damp locations, care must be taken to protect the LED PCB against moisture. There is the possibility for coating please contact your local sales representative.

All above specifications must be met in order to qualify for the 3 year warranty.
There is the possibility to extend to a 5 year warranty. Please contact your local sales representative.

Packaging and Package Marking

Box size (mm)	405x155x35
Quantity each box	12
Quantity each layer	12
Layer each box	1
Weight each box (kg)	0,386





Part Numbering & Ordering Information

1. Min. Flux* (AAA)

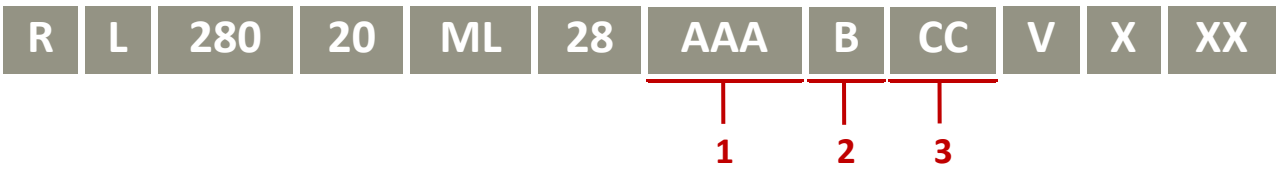
024 = Min. 24
026 = Min. 26
028 = Min. 28
032 = Min. 32
036 = Min. 36

2. Min. CRI* (B)

7 = Min. 70
8 = Min. 80
A = Min. 85
9 = Min. 90

3. LED Color* (CC)

22 = 2200K
25 = 2500K
27 = 2700K
30 = 3000K
35 = 3500K
40 = 4000K
50 = 5000K
57 = 5700K
65 = 6500K



For example:
When ordering a PCB where LUXEON 3535L LEDs have a CCT of 3000K,
a minimum flux of 32 lm and a minimum CRI of 80, the generated part number will be:

Part number:

RL28020ML28032830VXXX

*Based on the Philips Lumileds LUXEON 3535L datasheet of 1 LED
Special configurations available upon request
Contact your local sales representative