BOSMA LED BULBS

LIGHT EMITTING DIODE

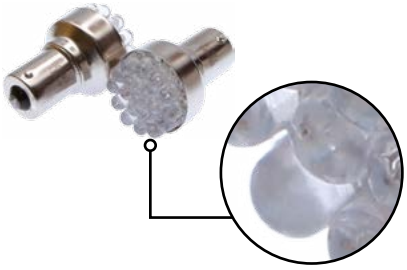
"LED bulbs" - is the common name of light sources built using electroluminescent diodes. Despite the absence of a filament as the light emitting element, but due to the fact that the name is the most commonly used, we at BOSMA also use it in describing our product range.

THE MAIN TYPES OF PRODUCT:

- **BOSMA LED SYSTEMS BULB STYLE COLLECTION** vehicle bulbs – counterparts of conventional automotive bulbs built using modern LED SMD and LED CREE diodes. The unique type of dome ensures a uniform structure and consistent light propagation. The entire collection is equipped with CANBUS (Computer Error Free) system - recommended for vehicles equipped with CAN bus diagnosing vehicle parameters.
- **BOSMA LED SYSTEMS** vehicle bulbs - counterparts of conventional automotive bulbs built using modern LED SMD, LED FLUX and LED COB diodes. Also available with CANBUS systems (Computer Error Free) - recommended for vehicles equipped with CAN bus diagnosing vehicle parameters.
- **BOSMA LED STANDARD** vehicle bulbs - counterparts of conventional automotive bulbs built using classic LEDs.

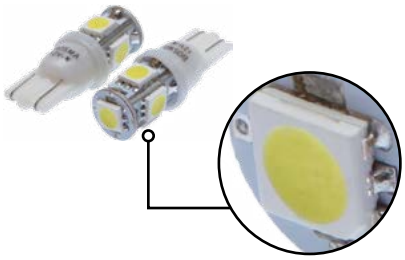
BOSMA LED bulbs are designed for electrical voltages of 12V or 24V and have a standard cap. For their production, we use only components of the highest quality: **EPISTAR** electroluminescent diodes and **SAMSUNG** control modules.

CHARACTERISTICS OF LEDS USED IN THE PRODUCTION OF BOSMA LED VEHICLE BULBS:



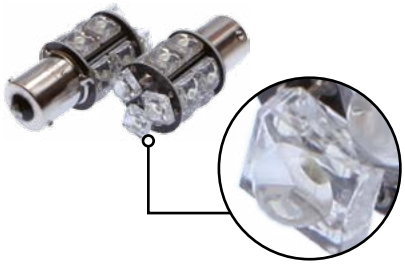
STANDARD

- Round shape
- Diameter of 3, 5, 8 or 10 mm
- Narrow beam angle (10-35^0)
- Lifespan up to 30 000 hours



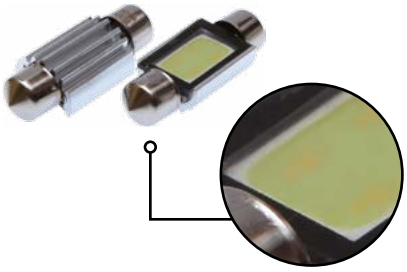
SMD

- The most popular type of LEDs
- Higher luminous efficacy compared with STANDARD LEDs
- Square or rectangular shape with different dimensions. The numbers after the SMD symbol indicate the LED size (e.g. SMD 3528, means using the SMD LED with dimensions of 3.5 mm x 2.8 mm)
- The wide beam angle (up to 180^0)
- Increased heat emitted during operation compared with STANDARD diodes
- Lifespan up to 50 000 hours



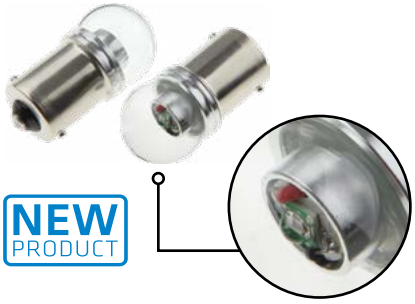
FLUX

- Greater luminous efficiency compared to STANDARD LEDs STANDARD and less compared to SMD LEDs
- Square in shape with side length of 7.6 mm
- A flat shape, or with a lens focusing the light
- Wide beam angle (110-140^0)
- Less heat emitted during operation compared with SMD diodes
- Lifespan up to 50 000 hours



COB

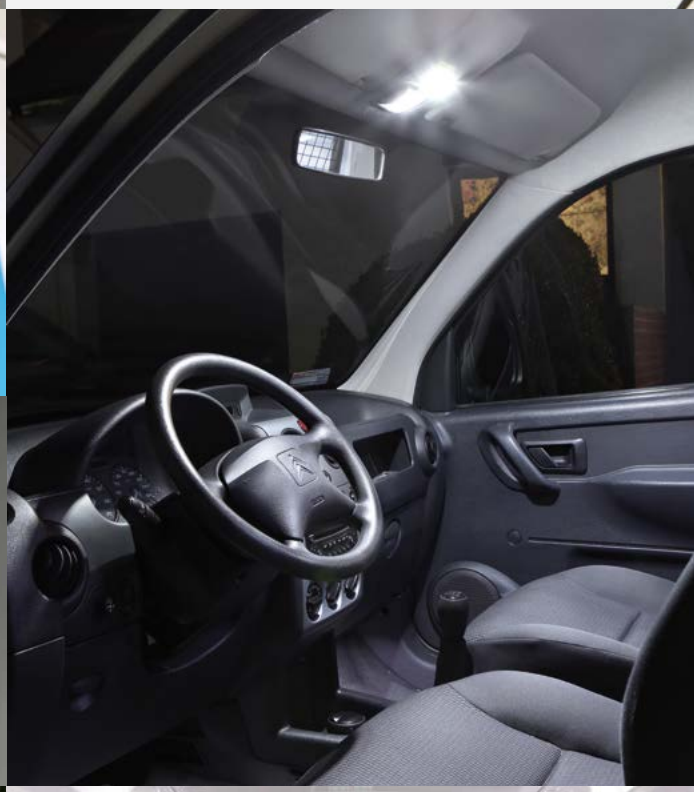
- The latest generation of electroluminescent diodes
- Very high luminous efficiency
- Any shape can be constructed, maintaining a uniform and bright light
- Wide beam angle which can be adjusted using a focusing lens
- High resistance to voltage fluctuations
- Negligible amount of emitted heat
- Lifespan up to 50 000 hours



CREE

- The latest American technology, guaranteeing high quality and reliability
- The highest luminous efficacy from what's currently available on the market
- Able to work at very high temperatures
- Square shape with different dimensions. The number after the CREE symbol indicates the diode size (e.g. CREE 3535 means using CREE diodes with dimensions of 3.5 mm x 3.5 mm)
- Wide beam angle (up to 180^0)
- Lifespan up to 60 000 hours

Modern SMD and COB LEDs allow for creating new forms of additional lighting for the automotive industry. The example of such products may be light plate, universal LED lights (both rigid and flexible). Examples of other products BOSMA LED SYSTEMS and their applications:



ADVANTAGES OF BOSMA LED VEHICLE BULBS:

1. **Very low power consumption** ("POWER" parameter - available in product tables for LED SYSTEMS).
   - small load on electrical wiring
   - noticeable reduction in fuel consumption

2. **High luminous efficacy** (conventional bulbs emit about 6-14 lm/W, halogen bulbs emit about 14-19 lm/W).
   - LED bulbs emit about 90 lm/W

3. **Very high durability**
   - up to 30 000 hours for bulbs BOSMA LED STANDARD
   - up to 50 000 hours for bulb BOSMA LED SYSTEMS

4. **No filament and glass bulb**
   - small amount of heat emitted
   - shock resistance
   - resistance to mechanical defects
   - resistance to action of water and moisture (there is no phenomenon of thermal shock)

5. **No UV radiation**
   - improves the lifespan of plastic components used in lamps and headlights

6. **Short response time to electric pulse**
   - a steady stream of light appears several times faster than for conventional bulbs

7. **A wide range of light colors**
   - useful e.g. for lighting vehicle interiors

8. **Light beam can be directed**

THE CHOICE OF LED COUNTERPART FOR A CONVENTIONAL BULB

PLEASE NOTE THAT THE USE OF LED COUNTERPARTS ON A VEHICLE MUST BE IN ACCORDANCE WITH THE PROVISIONS FOR APPROVAL IN FORCE IN A GIVEN COUNTRY.

To find the counterpart of a conventional automotive bulb using BOSMA LED technology, pay attention to the most important, fundamental aspects:

1. **Supply voltage**
   - the choice of nominal voltage of BOSMA LED bulb must be compatible with the voltage electrical system used in the vehicle
   - the range of BOSMA LED products is for voltages of 12 [V] or 24 [V]

2. **Cap**
   - after the rated voltage, this is the most important parameter which determines the choice of the counterpart, find the product with an identical mounting to the conventional bulb
   - we offer LED bulbs with caps: W2X4,6d (T05); W2,1X9,5d (T10, T13, T15); W3X16d (T20d); B8,5D; B8,7d; EBSR; BA9s; BA15s; BAY15d; BAU15s; SV8,5; (W2,5X16d) S25d; (W2,5X16q) S25q
   - the list of caps for conventional vehicle bulbs can be found on page 167

3. **Color of emitted light**
   - BOSMA LED bulbs, especially the STANDARD collection, make it possible to use light sources of different colors
   - most commonly, the counterpart used in vehicles is one which imitates the typical color of a light bulb, namely white

Other factors that affect the final choice of BOSMA LED counterpart depend on the individual needs of the user and the following indicators:

4. **The luminous flux** of the conventional bulb for which an LED counterpart is being sought
   - table of illustrative values of luminous flux for the basic power ratings of conventional bulbs

CONVENTIONAL BULB POWER RATING	LUMINOUS FLUX
3 [W]	20-30 [lm]
5 [W]	30-55 [lm]
10 [W]	100-150 [lm]
21 [W]	420-480 [lm]

   - BOSMA LED bulbs from the LED SYSTEMS collection have catalogued values of emitted luminous flux which can be a guide in choosing a suitable light source using LED technology

5. **Number and type of diodes**
   - the quantity and the nature of the light required is important when choosing the type of diode from which the LED bulb is built (STANDARD, SMD, FLUX, CREE)
   - the construction of lamp and reflector determines the choice of the LED bulb with the appropriate angle of light distribution
   - depending on the amount of free space in the lamp, the applicability of the LED bulb changes due to the shape and number of LEDs

6. **CANBUS**
   - in the case of modern vehicles it is recommended to use LED bulbs with the CANBUS system, because the replacement of conventional bulbs with LED bulbs can cause error signals on the dashboard resulting from low power consumption
   - BOSMA LED products with the CANBUS system are suitable for most vehicle models equipped with the CAN bus with a system monitoring the burnout of bulbs

The best light effect is achieved by using bulbs with SMD or COB LEDs, however, we cannot precisely and clearly define which LED bulb used in a particular lamp will give the light effect desired by the end-user.

LEDS REPLACEMENT FOR STANDARD CAR BULBS

Conventional bulbs from top to bottom:

- 12V 21W BA15s P21W
  NO REF. 501210
- 12V 21W BAU15s PY21W
  NO REF. 501292
- 12V 21W BA15s P21W
  NO REF. 501210
- 12V 21/5W BAY15d P21/5W
  NO REF. 501214

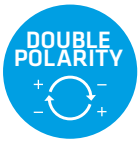
Counterparts of conventional bulbs from the BOSMA BULB STYLE COLLECTION series:

- 12V 9XSMD 2835 LED BA15s WHITE
  NO REF. 93534984
- 12V 9XSMD 2835 LED BAU15s ORANGE
  NO REF. 93535370
- 12V 9XSMD 2835 LED BA15s WHITE
  NO REF. 93534984
- 12V 9XSMD 2835 LED BAY15d WHITE
  NO REF. 93535066

PLEASE NOTE THAT THE USE OF LED COUNTERPARTS ON A VEHICLE MUST BE IN ACCORDANCE WITH THE PROVISIONS FOR APPROVAL IN FORCE IN A GIVEN COUNTRY.

PICTOGRAMS SPECIFYING IMPORTANT CHARACTERISTICS OF BOSMA LED BULBS

In modern cars, a CAN (**Controller Area Network**) bus is present, which is used to exchange data, and via which information about lighting failures can also be transmitted. The measurements of the correct operation of the light sources is done by comparing the resistance and current consumption, and any deviation in these parameters is treated as a fault. Vehicle LED bulbs used in such vehicles, due to their low power consumption, must be equipped with a CANBUS (Computer Error Free) system preventing the detection of reduced power consumption.
An alternative is using LED bulbs without a CANBUS system with special resistors, available in the BOSMA range on page 116.

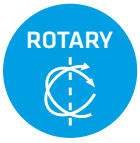


The electrical system of a vehicle is powered by direct current. This means that the positive and negative poles are assigned to specific points. For conventional light sources polarity is irrelevant, but in the case of semiconductor devices, which vehicle LED bulbs are, there is often a problem with correctly connecting them in T05, T10 or SV8,5 slots. BOSMA LED products, which have a DOUBLE POLARITY function, can be freely positioned in the slot, ensuring correct operation in any position.

BOSMA LED bulbs from the BULB STYLE COLLECTION are distinguished by a characteristic matte or clear cover. It provides a uniform structure and very good propagation of light across its entire surface.

Use of an internal tube, additionally diffusing the light, gives the impression of a brighter light source.

Thanks to the additional incisions on the cover, the size and number of lighting planes is increased, giving the impression of a brighter light source.



The variable geometry allows for individual adjustment of the position of the lighting elements to the mounting cap, to the extent provided for by the construction of the product.

Beam angle describes the direction of the beam inside the lamp. Products with an illumination angle of 360^0 are recommended when omnidirectional light emissions are needed. For other applications, products with an illumination angle of 180^0 are appropriate. In special cases, to obtain a spotlight, LED bulbs with an illumination angle below 180^0 can be used.

BOSMA FLEXIBLE LED products are very flexible. This feature enables their installation on rounded surfaces.