

Compact light-emitting diode arrangement

The present invention is directed to a compact light-emitting diode arrangement which can be used generically but, by reason of the compact design, is advantageous in particular for use in a vehicle. For instance, the compact light-emitting diode arrangement can be used e.g. as interior lighting in a car. The present invention is also directed to a vehicle component having the compact light-emitting diode arrangement. Furthermore, a method for producing the compact light-emitting diode arrangement is proposed as is a computer program product including control commands which implement the proposed method.

WO 2008/025625 shows a light module with at least one light emitting diode arranged on a substrate, wherein the Substrate is formed by silicium and the light emitting diode is arranged as a light emitting chip.

WO 2009/140947 A2 shows an opto-electronic module comprising a carrier substrate layer with different circuits being pre-constructed in or on the carrier substrate layer at wafer level stage in front end processes.

DE 10 2011 004 746 A1 shows a semiconductor light apparatus with a housing, at least one heat sink arranged within the housing, wherein the heat sink is thermally connected with at least one semiconductor light source and an active cooling unit arranged inside the housing.

Claims

1. A compact light-emitting diode arrangement for use in a vehicle, having a plurality of light-emitting diodes (LED), **characterised in that** the light-emitting diodes (LED) along with a control mechanism (StW), which is arranged to set the brightness intensity of the light-emitting diodes (LED) individually, are arranged in one piece in a common chip housing (P) and transparent or semi-transparent as well as partially opaque surfaces are provided within the housing (P) to provide window regions, through which the brightness intensity of the light-emitting diode (LED) is observable from outside the housing (P), and a lacquer layer is arranged such that the control mechanism (StW) is protected within the housing against the emission of the light-emitting diodes (LED).
2. The light-emitting diode arrangement as claimed in claim 1, **characterised in that** the control mechanism (StW) along with a communications unit (Com) and a light-emitting diode driver are installed in the chip housing (P).
3. The light-emitting diode arrangement as claimed in claim 1 or 2, **characterised in that** the light-emitting diodes (LED) are activated exclusively by the control mechanism (StW).
4. The light-emitting diode arrangement as claimed in any one of the preceding claims, **characterised in that** measuring units are provided in the chip housing (P).
5. The light-emitting diode arrangement as claimed in any one of the preceding claims, **characterised in that** the plurality of light-emitting diodes (LED) and the control mechanism (StW) are provided exclusively as active functional components in the chip housing (P).

6. The light-emitting diode arrangement as claimed in any one of the preceding claims, **characterised in that** the plurality of light-emitting diodes (LED) are provided as a red light-emitting diode (R), a green light-emitting diode (G), a blue light-emitting diode (B) and an optional white light-emitting diode.

7. A vehicle component comprising a compact light-emitting diode arrangement, having a plurality of light-emitting diodes (LED), **characterised in that** the light-emitting diodes (LED) along with a control mechanism (StW), which is arranged to set the brightness intensity of the light-emitting diodes (LED) individually, are arranged in one piece in a common chip housing (P) and transparent or semi-transparent as well as partially opaque surfaces are provided within the housing (P) to provide window regions, through which the brightness intensity of the light-emitting diode (LED) is observable from outside the housing (P), and a lacquer layer is arranged such that the control mechanism (StW) is protected within the housing against the emission of the light-emitting diodes (LED).

8. The vehicle component as claimed in claim 7, **characterised in that** the vehicle component is provided as a trim strip, an interior rear-view mirror, an exterior rear-view mirror, a warning light, an interior light and/or a vehicle light.

9. The vehicle component as claimed in claim 7 or 8, **characterised in that** a plurality of light-emitting diode arrangements are connected in series.

10. A method for producing a compact light-emitting diode arrangement for use in a vehicle, comprising providing (100) a plurality of light-emitting diodes (LED), **characterised in that** a control mechanism (StW) is provided (101) which is arranged to set the brightness intensity of the light-emitting diodes (LED) individually, and the provided plurality of light-emitting diodes (LED) and the provided control mechanism (StW) are arranged (102) in one piece in a common chip housing (P) and transparent or semi-transparent as well as partially opaque surfaces are provided within the housing (P) to provide window regions, through which the brightness

intensity of the light-emitting diode (LED) is observable from outside the housing (P), and a lacquer layer is arranged such that the control mechanism (StW) is protected within the housing against the emission of the light-emitting diodes (LED).

11. The method as claimed in claim 10, **characterised in that** the light-emitting diode arrangement is introduced (103) into a vehicle component.

12. The method as claimed in claim 11, **characterised in that** the the vehicle component is designed as a trim strip, an interior rear-view mirror, an exterior rear-view mirror, a warning light, an interior light and/or a vehicle light.

13. The method as claimed in any one of claims 10 to 12, **characterised in that** the step of arranging (102) the provided plurality of light-emitting diodes and the provided control mechanism (StW) in the chip housing (P) is performed in one working step.

14. A computer program product including control commands which implement the method as claimed in any one of claims 10 to 13.