Claims

1. A contacting module (1) for the successive contacting of optoelectronic chips (2) for the purpose of transmitting electrical and optical signals (S_e, S_o) between in each case at least one of the optoelectronic chips (2) and the contacting module (1), wherein the successively contacted optoelectronic chips (2) and the contacting module (1) are arranged in different adjustment positions relative to one another due to tolerances,

   with electrical and optical signal lines (1.1.1.1, 1.2.1.1) arranged in the contacting module (1), which each have an electrical or optical input or output, which as electrical or optical inputs or outputs (E_{eK}, E_{oK}, A_{eK}, A_{oK}) on the contacting module (1) are each assigned to an electrical or optical input or output (E_{eC}, E_{oC}, A_{eC}, A_{oC}) of the at least one optoelectronic chip (2),

   wherein the electrical inputs and outputs (E_{eK}, $A_{eK)}$ on the contacting module (1) are each formed by contact pins (1.1.2) which, for transmitting the electrical signals (S_e), are each in mechanical contact, in each of the adjustment positions, with one of the electrical inputs or outputs (E_{eC}, A_{eC}) of the at least one optoelectronic chip (2), which are each formed by an electrical contact plate (2.1), and

   the optical inputs and outputs (E_{oK}, A_{oK}) on the contacting module (1) and the optical inputs and outputs (E_{oC}, A_{oC}) of the at least one optoelectronic chip (2) together delimit, in respective pairs, an optical free beam region for the transmission of the optical signals (S_o),

   characterized in that

   the optical signals (S_o) transmitted from the contacting module (1) to the at least one optoelectronic chip (2) irradiate the optical inputs (E_{oC}) of the at least one optoelectronic chip (2) in each of the adjustment positions, and

   the contacting module (1) includes an electronic module (1.1) with the contact pins (1.1.2) and a printed circuit board (1.1.1), in which the electrical signal lines (1.1.1.1) are guided, and an optical module (1.2) with an optical block (1.2.1), in which the optical and/or electrical signal lines (1.2.1.1, 1.1.1.1) are guided, which lead to the optical inputs and outputs (E_{oK}, A_{oK}) on the contacting module (1), with the printed circuit board (1.1.1) and the optical block (1.2.1) being fixedly arranged in a mutually adjusted manner,

the optical signal lines (1.2.1.1) are waveguides integrated in the optical block (1.2.1), and

due to the length of the respective free beam region formed and an at least slightly divergent emission of the optical signal (S_o), the optical signals (S_o) each illuminate an area of one of the optical inputs (E_{oC}) on the at least one chip (2) larger than an opening of the respective optical input (E_{oC}) of the at least one chip (2), so that in each of the adjustment positions the optical inputs (E_{oC}) of the at least one chip (2) are irradiated.

2. The contacting module (1) according to claim 1, characterized in that
the printed circuit board (1.1.1) and the optical block (1.2.1) are made of different materials and the electrical and optical signal lines (1.1.1.1, 1.2.1.1) were manufactured independently of each other by different technologies.

3. The contacting module (1) according to claim 1, characterized in that
an intensity distribution in a beam cross-section of the optical signal (S_o) corresponds to a Gaussian distribution.

4. The contacting module (1) according to claim 1, characterized in that
an intensity distribution in a beam cross-section of the optical signal (S_o) corresponds to a top-hat distribution.

5. The contacting module (1) according to claim 1, characterized in that
the optical block (1.2.1) is embodied in its dimension and geometry, including breakthroughs and/or openings, in such a way that all contact pins (1.1.2) present on the electronic module (1.1) are in contact with the chip (2) past the optical block (1.2.1), around it and/or if necessary through openings formed therein.

6. The contacting module (1) according to claim 1, characterized in that
there is at least one beam shaping element in the free beam region by which the optical signal (S_o) is shaped geometrically and/or in its intensity distribution.

7. The contacting module (1) according to claim 6, characterized in that

the at least one beam shaping element is a structured gray grad filter that homogenizes the intensity distribution of the optical signal (S_o).

8. The contacting module (1) according to claim 1, characterized in that
the inputs or outputs of the waveguides, which form the optical inputs or outputs (E_{oK}, A_{oK}) on the contacting module (1), are located inside the optical block (1.2.1) and each of the inputs or outputs (E_{oK}, A_{oK}) is preceded by an integrated mirror (1.2.1.2) which deflects the optical signals (S_o) coming from the waveguide in a direction required for coupling into the at least one chip (2).

9. The contacting module (1) according to claim 1, characterized in that
the optical signals (S_o) transmitted by the at least one optoelectronic chip (2) are completely coupled into the optical inputs (E_{oK}) on the contacting module (1) in each of the adjustment positions.

10. The contacting module (1) according to claim 9, characterized in that
the waveguides each end in a taper (5.1), which has a cross-section adapted to a waveguide cross-section at the entrance of the waveguide and directs the entire radiation intensity of the optical signal (S_o) completely into the waveguide in each of the adjustment positions, the beam cross-section of the optical signal (S_o) incident into the taper (5.1) being smaller than an entrance opening (5.1.1) of the taper (5.1).

11. The contacting module (1) according to claim 10, characterized in that
the mirror (1.2.1.2) is designed as a concave mirror.

12. The contacting module (1) according to claim 9, characterized in that
the waveguides each end in an upstream waveguide group, whose ends together form one of the optical inputs (E_{oK}), which is completely irradiated in each adjustment position, so that a larger proportion of the signal intensity is coupled in than into just one waveguide.