interface between the thin layer and the growth substrate. The ablation capacity of the laser for the thin layer, however, largely depends on the frequency, so that an optimum choice of the frequency, which on the one hand permits a high transmissivity in respect of the substrate, and on the other hand permits a high ablation capacity, is very difficult. Furthermore, especially in the case of lasers, only electromagnetic radiation with a well-defined frequency is available, which cannot be arbitrarily varied or adjusted.

Nowadays, therefore, thin layers, such as for example GaN LEDs (GaN light emitting diodes), are produced or generated on small and expensive sapphire substrates. The latter permit an LLO process through the sapphire substrate from the rear side by means of UV laser radiation. For economic reasons, the generation of such thin layers (for example GaN layers) would make sense on more favourable silicon. Since silicon is however non-transparent in the UV wavelength region, UV lasers cannot be used to perform the GaN ablation. A detachment of a generated thin layer, in particular a GaN layer or a GaN structure, from a substrate by means of electromagnetic radiation is therefore complex.

In addition, there are limits on the selection of the material of the substrate and of the thin layer to be generated, since the separation of the thin layer is dependent on the degree of transmissivity of the material for electromagnetic radiation. A separation process by means of electromagnetic radiation that can be performed selectively is especially desired for the production of electronic components. The prior art is limited to specific materials for the growth substrates, which permit a separation of the structures by radiation through the growth substrate itself by means of electromagnetic radiation.

Embodiments of the present invention provide a method and a device which at least partially remove, in particular completely remove, the drawbacks listed in the prior art. In particular, embodiments of the present invention provide an improved method and a device for separating structures from a substrate.

Furthermore, embodiments of the present invention provide an alternative method and an alternative device for separating structures from a substrate. Furthermore, embodiments of the present invention provide a method and a device which improve the transfer of structures from a transferring substrate to a receiving substrate.

All combinations of at least two features specified in the description, in the claims and/or the drawings also fall within the scope of the invention. In stated value ranges, values lying within the stated limits should also be deemed to be disclosed as limiting values and can be claimed in any combination.

According to a first aspect of the present invention, there is provided a method for separating structures from a substrate, including at least the following steps, in particular in the following sequence,

i) provision of at least one structure on a first substrate,

ii) irradiation of a boundary area between the first substrate and the at least one structure with electromagnetic radiation,

iii) separation of the at least one structure from the first substrate, wherein the electromagnetic radiation first penetrates the at least one structure and then strikes the boundary area.

The beam path of the electromagnetic radiation thus runs from the source first to be substrates to be separated and only then strikes the boundary area. The boundary area or the interface lies in the region between the structures and the first substrate. If a further layer for the detachment (detachment layer) is arranged between the first substrate and the structures, the boundary area is, so to speak, formed by said detachment layer.

The thin layer is provided on the first substrate, especially a substrate surface. The thin layer can be generated on the first substrate. The thin layer is split up to form structures in optional further steps. The structures split up

into single units are then in particular electronic components with a function. However, a structure can also be formed by a thin layer, so that, instead of a structure split up into single units, the entire thin layer can be separated. The thin layer thus also represents a structure.

In the method for the separation or the detachment of the structures, the electromagnetic radiation is not irradiated through the first substrate. On the contrary, the electromagnetic radiation is directed onto the at least one structure, wherein the at least one structure is at least partially permeable for the electromagnetic radiation. The at least one structure can thus advantageously be separated from the first substrate, without the radiation having to be passed through the first substrate to the boundary area. The method for the separation is thus more efficient, since no energy loss arises due to passing the electromagnetic radiation through the first substrate. Furthermore, the structures can be detached by the method from a first substrate which is made of a material which is impermeable for electromagnetic radiation. Furthermore, the first substrate can advantageously be preserved, since the electromagnetic radiation is absorbed only in the boundary area of the first substrate and is not irradiated through the first substrate. In this way, electromagnetic radiation in the UV region can advantageously be used. Furthermore, the at least one substrate to be separated is also preserved, since the latter is constituted essentially permeable for electromagnetic radiation. The separation can thus be carried out particularly free from defects. In addition, the electromagnetic radiation can advantageously take place from the side of the first substrate on which the structures are provided.

According to a second aspect of the present invention, there is provided a device for separating structures from a substrate, at least including:

- a first substrate with the least one structure which can be provided on the first substrate,