WHAT IS CLAIMED IS:

1. A wafer processing method for dividing a wafer having a plurality of division lines in a grid pattern on a front side thereof and having a device in each of a plurality of regions partitioned by the division lines, along the division lines into individual device chips, the wafer processing method comprising:

   a protective film forming step of applying a liquid resin to the front side of the wafer to form a protective film followed by;

   a protective tape adhering step of adhering a protective tape to a surface of the protective film;

   a modified layer forming step of applying a laser beam having such a wavelength as to be transmitted through the wafer to the wafer along each of the division lines, with a focal point positioned inside the wafer, to form a modified layer inside the wafer along each of the division lines;

   and a back side grinding step of grinding a back side of the wafer while supplying grinding water to thin the wafer to a predetermined thickness and to crack the wafer along the division lines using the modified layers as crack starting points so as to divide the wafer into individual device chips, after the protective film forming step, the protective tape adhering step, and the modified layer forming step are carried out.

2. The wafer processing method according to claim 1, further comprising:

   a wafer supporting step of adhering an adhesive film to the back side of the wafer divided into the individual device chips and adhering to the adhesive film a dicing tape having a peripheral portion attached to an annular frame so as to support the wafer with the annular frame, after the back side grinding step is carried out;

   an adhesive film breaking step of expanding the dicing tape to break the adhesive film along the individual deice chips, after the wafer supporting step is carried out; and

   a protective film removing step of supplying a cleaning liquid to a front side of the individual device chips to remove the protective film, after the adhesive film breaking step is carried out.

3. The wafer processing method according to claim 2, wherein the liquid resin includes a water-soluble resin, and the cleaning liquid is cleaning water.