

WHAT IS CLAIMED IS:

1. A wafer processing method for dividing a wafer into a plurality of individual device chips along a plurality of crossing division lines formed on a front side of said wafer, the front side of said wafer being partitioned by said division lines to define a plurality of separate regions where a plurality of devices are formed, said individual device chips corresponding to said respective devices, said wafer processing method comprising:

a frame supporting step of attaching said wafer to an adhesive tape fixed at its peripheral portion to an annular frame, thereby supporting said wafer through said adhesive tape to said annular frame;

a laser processing step of applying a laser beam to each division line to thereby form a strength reduced portion along each division line; and

a dividing step of applying a radial tension to said adhesive tape and next applying an external force to said wafer in the condition where said radial tension is kept acting on said adhesive tape, thereby dividing said wafer into said individual device chips along said division lines,

wherein said external force is applied by a metal wedge.

2. The wafer processing method according to claim 1, wherein a back side of said wafer is attached to said adhesive tape in said frame supporting step.
3. The wafer processing method according to claim 1, wherein said dividing step includes the steps of setting a first

ring having a cylindrical inner surface on one side of said adhesive tape, setting a second ring having a cylindrical outer surface on the other side of said adhesive tape, said cylindrical outer surface of said second ring corresponding to said cylindrical inner surface of said first ring, and next sandwiching said adhesive tape between said cylindrical inner surface of said first ring and said cylindrical outer surface of said second ring, thereby applying said radial tension to said adhesive tape.

4. The wafer processing method according to claim 1, wherein said laser processing step includes the steps of setting the focal point of said laser beam inside said wafer, said laser beam having a transmission wavelength to said wafer, and next applying said laser beam along each division line, thereby forming a modified layer as said strength reduced portion inside said wafer along each division line.
5. The wafer processing method according to claim 1, wherein said laser processing step includes the steps of setting the focal point of said laser beam inside said wafer, said laser beam having a transmission wavelength to said wafer, and next applying said laser beam along each division line, thereby forming shield tunnels as said strength reduced portion along each division line.
6. The wafer processing method according to claim 1, wherein said laser processing step includes the steps of setting the focal point of said laser beam on the upper surface of said wafer, said laser beam having an absorption wavelength to said wafer, and next applying said laser beam along each division line, thereby forming a laser

processed groove as the strength reduced portion on the upper surface of said wafer along each division line.