

WHAT IS CLAIMED IS:

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

a back grinding step of grinding a back side of said wafer in a condition where a protective tape is attached to the front side of said wafer, thereby reducing a thickness of said wafer to a predetermined thickness;

a reinforcing insulation seal mounting step of peeling said protective tape attached to the front side of said wafer and mounting a reinforcing insulation seal capable of transmitting infrared light on the back side of said wafer after performing said back grinding step;

a reinforcing insulation seal hardening step of heating said reinforcing insulation seal mounted on the back side of said wafer to thereby harden said reinforcing insulation seal after performing said reinforcing insulation seal mounting step;

a wafer supporting step of attaching a dicing tape to said reinforcing insulation seal mounted on the back side of said wafer and supporting a peripheral portion of said dicing tape to an annular frame after performing said reinforcing insulation seal hardening step;

a modified layer forming step of setting a focal point of a laser beam inside said wafer in an area corresponding to each division line, said laser beam having an infrared wavelength transmissive to said wafer, and then applying said laser beam along each division line from the back side of said wafer through said dicing tape and said reinforcing insulation seal, thereby forming a modified layer inside said wafer along each division line after performing said wafer supporting step; and

a wafer dividing step of applying an external force to said wafer to thereby divide said wafer into said individual device chips along each division line where said modified layer is formed, after performing said modified layer forming step.

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

a laser processed groove forming step of applying a laser beam having an absorption wavelength to said wafer from the front side of said wafer along each division line to thereby form a laser processed groove along each division line after performing said reinforcing insulation seal hardening step and before performing said modified layer forming step.

3. The wafer processing method according to claim 1, wherein the reinforcing insulation seal is mounted to the devices and the division lines during the reinforcing insulation seal mounting step.

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

a marking step of applying a laser beam having an absorption wavelength to said reinforcing insulation seal, to a target area of said reinforcing insulation seal corresponding to each device, thereby marking device information in said target area corresponding to each device.

5. The wafer processing method according to claim 1, wherein said mounting of the reinforcing insulation seal on the back side of the wafer of the reinforcing insulation seal mounting step is performed before said attaching the dicing tape to said reinforcing insulation seal of the wafer supporting step.

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

a back grinding step of grinding a back side of said wafer in a condition where a protective tape is attached to the front side of said wafer, thereby reducing a thickness of said wafer to a predetermined thickness;

a reinforcing insulation seal mounting step of peeling said protective tape attached to the front side of said wafer and mounting a reinforcing insulation seal

capable of transmitting infrared light on the back side of said wafer after performing said hack grinding step;

a reinforcing insulation seal hardening step of heating said reinforcing insulation seal mounted on the back side of said wafer to thereby harden said reinforcing insulation seal after performing said reinforcing insulation seal mounting step;

a wafer supporting step of attaching a dicing tape to said reinforcing insulation seal mounted on the back side of said wafer and supporting a peripheral portion of said dicing tape to an annular frame after performing said reinforcing insulation seal hardening step;

a modified layer forming step of setting a focal point of a laser beam inside said wafer in an area corresponding to each division line, said laser beam having an infrared wavelength transmissive to said wafer and then applying said laser beam along each division line from the back side of said wafer through said dicing tape and said reinforcing insulation seal, thereby forming a modified layer inside said wafer along each division line after performing said wafer supporting step; and

a wafer dividing step of applying an external force to said wafer to thereby divide said wafer into said individual device chips along each division line where said modified layer is formed, after performing said modified layer forming step; and

wherein the wafer processing method further comprises:

a marking step of applying a laser beam having an absorption wavelength to said reinforcing insulation seal, to a target area of said reinforcing insulation seal corresponding to each device, thereby marking device information in said target area corresponding to each device after performing said reinforcing insulation seal hardening step and before performing said wafer supporting step.

7. The wafer processing method according to claim 6, further comprising:

a laser processed groove forming step of applying a laser beam having an absorption wavelength to said wafer from the front side of said wafer along each division line to thereby form a laser processed groove along each division line after performing said reinforcing insulation seal hardening step and before performing said modified layer forming step.

8. The wafer processing method according to claim 6, wherein the reinforcing insulation seal is mounted to the devices and the division lines during the reinforcing insulation seal mounting step.

9. The wafer processing method according to claim 6, wherein said mounting of the reinforcing insulation seal on the back side of the wafer of the reinforcing insulation seal mounting step is performed before said attaching the dicing tape to said reinforcing insulation seal of the wafer supporting step.