oxide and/or alkali metal oxide fractions, is preferred. In tests, the evaporation-coating glass 8329 produced by Schott has proven particularly suitable.

The copy-protect layer, i.e. in particular glass, is preferably applied by evaporation coating. The evaporation coating advantageously gives rise to very secure bonding to the substrate without, for example, adhesives being required.

In this respect, reference is also made to the applications

DE 202 05 830.1, filed on Apr. 15, 2002,

DE 102 22 964.3, filed on May 23, 2002;

DE 102 22 609.1, filed on May 23, 2002;

DE 102 22 958.9, filed on May 23, 2002;

DE 102 52 787.3, filed on Nov. 13, 2002;

DE 103 01 559.0, filed on Jan. 16, 2003

in the name of the same Applicant, the content of disclosure of which is hereby expressly incorporated by reference.

The following process parameters are advantageous for the application of a continuous layer of glass as copy-protect layer:

Surface roughness of the substrate:	<50 μm
BIAS temperature during the evaporation:	≈100° C.
Pressure during the evaporation:	10^{-4} mbar

It is advantageous for the deposition or application by evaporation coating of the copy-protect layer to be carried out by means of plasma ion assisted deposition (PIAD). In this case, an ion beam is additionally directed onto the substrate that is to be coated. The ion beam can be generated by means of a plasma source, for example by ionization of a suitable gas. The plasma produces additional densification of the layer and removes loosely attached particles from the substrate surface. This leads to particularly dense, low-defect deposited layers.

The copy-protect layer is either transparent, which is advantageous for opto-electronic components, or opaque, non-transparent, shaded, colored, cloudy, matted or with similar vision-impeding properties.

Silicon as the main component of wafer and protective layer can substantially only be removed by means of the same etching chemicals, which virtually rules out the possibility of selective etching. Even when dry-etching processes are used, a combination of materials of silicon substrate or wafer and silicon glass is protected against selective etching, since information about the etching stop can only be obtained on the basis of the elements of the semiconductor layer or the glass layer. Only once this information has been acquired, i.e. once the semiconductor layers have been damaged, can the etching process be stopped.

However, glass can also be used for substrates other than silicon, including organic and inorganic semiconductors, by using suitably adapted evaporation-coating glasses.

It is preferable for the surface roughness of the substrate to be at most 50 μm, 10 μm or 5 μm and/or for the coefficient of thermal expansion of the substrate and the material of the copy-protect layer, in particular the evaporation-coating glass, to coincide.

According to a preferred embodiment, the copy-protect layer comprises an at least binary system, preferably a multi-component system. An at least binary system is to be understood as meaning a material which represents a synthesis of at least two chemical compounds.

Thermal evaporation and electron beam evaporation have proven particularly effective evaporation-coating processes for the copy-protect layer. High evaporation-coating rates of at least 0.01 μm/min, 0.1 μm/min, 1 μm/min, 2 μm/min and/or up to 10 μm/min, 8 μm/min, 6 μm/min or 4 μm/min are advantageously achieved. This exceeds known sputtering rates by a multiple and makes the use of the process according to the invention of considerable interest for the production of copy protection. This allows layer thicknesses of from 0.01 μm to 1000 μm, preferably from 10 μm to 100 μm, to be applied to the substrate quickly and effectively. Sputtered layers comprising single-component systems (typically SiO_2) which have been applied hitherto have sputtering rates of just a few nanometers per minute.

It is preferable for the coating of the substrate with the copy-protect layer to be carried out at a bias temperature of below 300° C., in particular below 150° C., and particularly preferably in the region of 100° C. A background pressure of from 10^{-3} mbar to 10^{-7} mbar, in particular in the region of 10^{-5} mbar, has proven suitable for coating the substrate with the copy-protect layer, in particular for the application of the glass layer by evaporation coating.

According to a preferred refinement of the invention, at least one further layer, e.g. a glass, ceramic, metal or plastics layer, is applied, in particular as an optical and X-ray optical protection layer and/or as a protection layer preventing capacitive and inductive spying, this protective layer being substantially impermeable to electromagnetic waves, in particular to X-rays, or comprising capacitive and/or inductive shielding. This layer may cover either the entire area or, in the most favorable situation, a partial area of the regions of the substrate which are to be protected. However, the protective layer may also be applied in such a manner that signals can nevertheless be introduced or emitted contactlessly, in particular inductively or capacitively.

According to a preferred embodiment, at least some of the passive components and/or interconnects required for the functioning of the circuits are incorporated in the protective layer sequence, so that when the protective layers are removed the circuit logic can no longer be understood or at least is more difficult to understand.

According to a preferred refinement of the invention, at least one further layer, e.g. a glass or plastics layer, is applied, in particular as a passivation layer and/or as mechanical strengthening, to a second side of the substrate, which is on the opposite side from the first side. A combination of a glass layer with a passivation function and a mechanically strengthening plastics layer applied to it is particularly advantageous.

According to a preferred embodiment, the process according to the invention is combined with a process for housing semiconductor components, in which the substrate is thinned, etching pits with connection structure regions are produced on the first side of the substrate, a plastics layer is applied to a second side of the substrate, which is on the opposite side from the first side, by means of plastics lithography, with the connection structure regions remaining open, contacts are produced on the second side by coating, in particular sputtering, with a conductive layer, a ball grid array is applied and/or finally the substrate is diced into individual chips. If desired, the plastics layer on the second side is removed again prior to the dicing operation and/or the etching pits are filled with conductive material.

According to a further preferred embodiment, a second side of the substrate, which is on the opposite side from the first side, is covered by evaporation coating with a 0.01 μm to