

CLAIMS

1. An electronic module (20) for a chip card comprising at least one first dielectric substrate (4) that is provided, on one of its faces, with at least one first microelectronic chip (8) the input/output terminals (9) of which are connected to first connection pads (2a) that are arranged around said first microelectronic chip (8), and at least one second dielectric substrate (6) that is placed directly opposite the first dielectric substrate (4) and provided, on one of its faces, with at least one second microelectronic chip (7) the input/output terminals of which are connected to second connection pads (2b) that are arranged around said second microelectronic chip (7), the first and second microelectronic chips (7, 8) being arranged on the faces of the first and second dielectric substrates (~~6, 4, 6~~) that are turned toward the inside of the electronic module, characterized in that it comprises a dielectric spacer (3) of calibrated thickness separating the first and second dielectric substrates (4, 6), said spacer (3) comprising through-holes (22, 22') ~~or vias (24)~~ opening either side onto the inner face of said first and second dielectric substrates (4, 6) and in which electrically conductive materials (1a, 1b, 1c) are arranged that are able to connect some of the first connection pads (2a) to some of the second connection pads (2b) or conductive vias the ends of which are connected to first and second electrical connection pads by means of an anisotropic conductive adhesive that conducts current only in a direction that is perpendicular to the first and second dielectric substrates (4, 6).
2. The electronic module (20) as claimed in claim 1, characterized in that the spacer (3) has as many holes (22) as there are interconnections to make between the first and second electronic chips (8, 7), each of these holes having a cross-sectional area that is at least equal to the cross-sectional area of the connection pads (2a, 2b) and being filled by a dot (1b) of conductive material.
3. The electronic module (20) as claimed in either one of the preceding claims, characterized in that said conductive material is a conductive resin, a conductive ink, a conductive fluid, a conductive adhesive or fatty substance.
4. The electronic module (20) as claimed in any one of the preceding claims, characterized in that said conductive material is a resin or adhesive that solidifies under the effect of heat or ultraviolet rays being applied.

5. The electronic module (20) as claimed in claim 1, characterized in that the spacer (3) has holes (22') in the shape of an arc the cross-sectional area of which is larger than the cross-sectional area of a plurality of adjacent connection pads (2a, 2b), said holes (22') being filled by an anisotropic ferromagnetic adhesive or resin that is able to make, under the effect of a magnetic field, a plurality of parallel electrical connections on an axis (Z) that is perpendicular to the dielectric substrates (4, 6).
6. The electronic module (20) as claimed in claim 5, characterized in that the electrical connections become permanent after a predefined magnetic field and temperature are applied.
7. The electronic module (20) as claimed in claim 5, characterized in that said electrical connections are temporary and last only as long as a magnetic field is applied.
8. The electronic module (20) as claimed in claim 1, characterized in that said spacer (3) comprises conductive vias (24) the ends of which are connected to first and second electrical connection pads (2a, 2b) by means of an anisotropic conductive adhesive (1c) that conducts electricity only in a direction that is perpendicular to the first and second dielectric substrates (4, 6).
9. The electronic module (20) as claimed in one of the preceding claims, characterized in that said first dielectric substrate (4) comprises, on its outer face, which is turned toward the outside of the module, a contact terminal block (10), in particular according to ISO standard 7816, the contacts terminal block (10) being connected to the first connection pads (2a) by conductive tracks that are integrated into the first dielectric substrate (4).
10. The electronic module (20) as claimed in any one of the preceding claims, characterized in that said first dielectric substrate (4) comprises, on its inner face, which is turned toward the inside of the module, an antenna (~~12~~ 11) the ends of which are connected to the connection pads of a radiofrequency interface of the first microelectronic chip (8).
11. The electronic module (20) as claimed in any one of the preceding claims, characterized in that said second dielectric substrate (6) comprises, on its outer face, a display screen (25) and in that said second microelectronic chip (7) is a controller that is able to control said display screen.

12. The electronic module (20) as claimed in any one of the preceding claims, characterized in that said second dielectric substrate (6) comprises a sensor, in particular a biometric sensor, and in that said second microelectronic chip (7) is a controller that is able to control said sensor.
13. A chip card, characterized in that it comprises a card body that is provided with a through-cavity, and an electronic module (20) as claimed in any one of the preceding claims, which is fastened in said cavity so as to exhibit, on one of the faces of the chip card, a face of the first dielectric substrate (4) and, on the other face of the chip card, a face of the second dielectric substrate (6).
14. A chip card, characterized in that it comprises a card body that is provided with a blind cavity (27) exhibiting a transparent bottom (26), and an electronic module (20) as claimed in any one of ~~the preceding claims~~ 1 to 12, which is fastened in said cavity so as to exhibit, on one of the faces of the chip card, a face of the first dielectric substrate (4) and, on the other face of the chip card, a face of the second dielectric substrate (6) that is visible through the transparent bottom (26).