

CLAIMS

1. A testing head (20) adapted to verify the operation of a device under test integrated on a semiconductor wafer, said testing head (20) comprising at least one guide (40, 41) provided with a plurality of guide holes (40h, 41h), and a plurality of contact elements (21', 21'', 21''') housed in said guide holes (40h, 41h), each of said contact elements (21', 21'', 21''') comprising a body (21pr, 21pp) that extends between a first end portion (24) and a second end portion (25), wherein said at least one guide (40, 41) comprises at least one first conductive portion (30') that includes holes of at least one first group (40', 41') of said guide holes (40h, 41h) and electrically connects a corresponding first group of said contact elements (21') housed in said at least one first group (40', 41') of said guide holes (40h, 41h), and at least one second conductive portion (30'') that includes holes of at least one second group (40'', 41'') of said guide holes (40h, 41h) and electrically connects a corresponding second group of said contact elements (21'') housed in said at least one second group (40'', 41'') of said guide holes (40h, 41h), wherein the contact elements of a same group are adapted to carry a same type of signal, wherein the contact elements of different groups are adapted to carry different types of respective signals, wherein the contact elements (21') housed in said first group (40', 41') of said guide holes (40h, 41h) are adapted to carry ground signals, and the contact elements (21'') housed in said second group (40'', 41'') of said guide holes (40h, 41h) are adapted to carry power signals, and wherein said guide including the conductive portions (30', 30'') is a lower guide (40) or an intermediate guide (41) of the testing head (20).
2. The testing head (20) according to claim 1, characterized in that one of said at least one first and at least one second conductive portion (30', 30'') is formed on a face (FA, FB; FC, FD) of said at least one guide (40, 41), and the other one of said first and second conductive portion (30'', 30') is formed on an opposite face (FB, FA; FD, FC) of said at least one guide (40, 41).
3. The testing head (20) according to claim 1 or 2, characterized in that said at least one first conductive portion (30',) is separated from said at least one second conductive portion and/or is locally interrupted by at least one non-conductive zone (31, 31', 31''), so as not to allow an electrical connection between contact elements

adapted to carry a different type of signal and/or contact elements which must not be short-circuited.

4. The testing head (20) according to claim 3, characterized in that said at least one guide (40, 41) comprises at least one coating dielectric portion that covers said at least
5 one non-conductive zone (31, 31', 31").

5. The testing head (20) according to any one of the preceding claims, characterized in that it comprises at least one lower guide (40), at least one intermediate guide (41), and at least one upper guide (42), said lower guide (40) and said intermediate guide (41) being separated from each other by a first gap (32'), said intermediate guide (41)
10 and said upper guide (42) being separated from each other by a second gap (32"), each of said guides (40, 41, 42) comprising respective guide holes (40h, 41h, 42h) for the housing of said contact elements (21', 21", 21""), and in that one of said at least one first and at least one second conductive portion (30', 30") is formed on a face (FA, FB) of said lower guide (40) and the other one of said first and second conductive portion
15 (30", 30') is formed on a face (FC, FD) of said intermediate guide (41).

6. The testing head (20) according to claim 1, characterized in that it comprises at least one lower guide (40), at least one intermediate guide (41), and at least one upper guide (42), said lower guide (40) and said intermediate guide (41) being separated from each other by a first gap (32'), said intermediate guide (41) and said upper guide (42)
20 being separated from each other by a second gap (32"), each of said guides (40, 41, 42) comprising respective guide holes (40h, 41h, 42h) for the housing of said contact elements (21', 21", 21""), and in that both said lower guide (40) and said intermediate guide (41) comprise both said at least one first conductive portion (30') and said at least one second conductive portion (30"), said first conductive portion (30') and said
25 second conductive portion (30") being physically and electrically separated from each other by a non-conductive zone (31, 31', 31") of said guides (40, 41).

7. The testing head (20) according to any one of the preceding claims, characterized in that it comprises at least one third conductive portion (30''') that includes holes of at least one third group (40''', 41''') of said guide holes and electrically connects the holes
30 of said third group (40''', 41''') of said guide holes (40h, 41h) to each other, said third group (40''', 41''') housing third contact elements (21''').

8. The testing head (20) according to claim 7, characterized in that the contact elements (21'') housed in said third group (40'', 41'') of said guide holes (40h, 41h) are adapted to carry input/output signals between the device under test and a test equipment.

5 9. The testing head (20) according to any one of the preceding claims, characterized in that at least one conductive portion (30', 30'', 30''') covers at least one portion (40'W, 40''W, 40'''W; 41'W, 41''W, 41'''W) of an inner surface of each guide hole of said group (40', 40'', 40'''; 41', 41'', 41''') of said guide holes (40h, 41h).

10 10. The testing head (20) according to any one of the preceding claims, characterized in that said contact elements (21', 21'', 21''') are contact probes wherein said body (21pr) has a deformation.

11. The testing head (20) according to any one of the claims from 1 to 4, characterized in that said contact elements (21', 21'', 21''') are pogo pins, said body (21pp) comprising a casing (33) and an elastic member (34) arranged in said casing (33), said
15 casing (33) defining a first surface (S1) and a second surface (S2), at least one of said surfaces (S1) being apt to abut onto said at least one guide (40), the electrical connection between said contact elements (21', 21'', 21''') and each of the at least one first conductive portions and the at least one second conductive portions (30', 30'',
20 30''') being a pressing contact through said surface (S1).

12. The testing head (20) according to any one of the preceding claims, characterized in that said at least one guide (40, 41) comprises at least one common pad (36', 36'', 36''') connected to each of the at least one first conductive portions and the at least one second conductive portions (30', 30'', 30''') by means of a conductive track (37',
25 37'', 37''').

13. The testing head (20) according to any one of the preceding claims, characterized in that each of the at least one first conductive portions and the at least one second conductive portions (30', 30'', 30''') is arranged on a face (FA, FB, FC, FD, FE) of said at least one guide (40, 41) and has a lower area than an area of said face (FA, FB, FC,
30 FD, FE) of said at least one guide (40, 41).

14. The testing head (20) according to any one of the claims from 1 to 12, characterized in that each of the at least one first conductive portions and the at least one second conductive portions (30', 30'', 30''') covers a face of said at least one guide (40, 41), each of the at least one first conductive portions and the at least one second
5 conductive portions (30', 30'', 30''') electrically connecting the holes of said at least one group (40', 41'; 40'', 41''; 40''', 41''') of said guide holes (40h, 41h) to each other, with the exception of areas where guide holes not belonging to said at least one group (40', 41'; 40'', 41''; 40''', 41''') are formed.
15. The testing head (20) according to any one of the preceding claims, characterized
10 in that said at least one guide (40, 41) comprises at least one further conductive portion (30bis), which includes one of said guide holes (40h, 41h) apt to house a single contact element, said at least one guide (40, 41) comprising a further common pad (36bis) connected to said at least one further conductive portion (30bis) by means of a further conductive track (37bis) and/or comprising a conductive track that connects
15 said at least one further conductive portion (30bis) to other conductive portions.
16. The testing head (20) according to claim 1, characterized in that each of the at least one first conductive portions and the at least one second conductive portions (30', 30'', 30''') is embedded in said at least one guide (40, 41).
17. The testing head (20) according to any one of the preceding claims, characterized
20 in that it comprises at least one conductive track (39) that electrically connects at least two conductive portions including and electrically connecting the holes of two respective groups of said guide holes (40h, 41h) to each other and being adapted to contact respective groups of said contact elements (21', 21'', 21''').
18. The testing head (20) according to any one of the preceding claims, characterized
25 in that it further comprises at least one circuit component (50), preferably a capacitor, which is electrically connected at least to said at least one first conductive portion and at least one second conductive portion of said at least one guide (40, 41).