

CLAIMS

1. A vertical probe head (20) comprising a plate-shaped support (22) and a plurality of vertical contact probes (21A, 21B, 21C) being housed in respective pluralities of guide holes (25A, 27A, 29A, 36A; 25B, 27B, 29B, 36B; 28C, 29C, 36C) being realized in said plate-shaped support (22), said plurality of vertical contact probes (21A, 21B, 21C) sliding within said pluralities of guide holes (25A, 27A, 29A, 36A; 25B, 27B, 29B, 36B; 28C, 29C, 36C) on occasion of their movement during testing operations performed by means of said vertical probe head (20), said plurality of vertical contact probes (21A, 21B, 21C) comprising at least a first group of vertical contact probes (21A, 21B) being apt to carry only one type of signal chosen between ground and power supply signals (GND, PWR), said vertical probe head (20) comprising at least one filtering capacitor (30) and at least a first and a second conductive portion (22A, 27A; 22B, 26A) realized on said plate-shaped support (22) and including a plurality of said guide holes (25A, 29A; 25B, 28B) slidably housing said vertical contact probes (21A, 21B) of said first group, said conductive portion (22A, 27A; 22B, 26A) electrically connecting said vertical contact probes (21A, 21B) of said first group, said vertical probe head (20) being characterized in that said plate-shaped support (22) comprises at least a seat (33) housing said filtering capacitor (30), said first and second conductive portions (22A, 22B) extending also in correspondence of said capacitor housing seat (33) to realize a connection with said filtering capacitor (30) having a first capacitor plate (31) connected to said first conductive portion (22A) and a second capacitor plate (32) connected to said second conductive portion (22B), said first and second conductive portions (22A, 22B) being apt to be connected to respective distinct voltage references, chosen between a power supply reference and a ground reference (PWR, GND) and in that said plate-shaped support (22) is a lower support of a pair of supports housing said vertical contact probes (21A, 21B, 21C), lower meaning closer to a device under test (23) integrated on a wafer, said filtering capacitor (30) being in this way positioned in proximity of contact tips of said vertical contact probes (21A, 21B, 21C) adapted to abut onto contact pads (23A, 23B) of said device under test (23).
2. The vertical probe head (20) according to claim 1, characterized in that said first and second conductive portions (22A, 27A; 22B, 26A) comprise orthogonal portions (22Aw, 27Aw; 22Bw, 26Aw) which extend at least partially within said guide holes (25A, 29A; 25B, 28B) of said vertical contact probes (21A, 21B) of said first group.
3. The vertical probe head (20) according to claim 1, characterized in that it comprises distinct conductive portions including distinct pluralities of said guide holes

(25A, 27A, 29A, 36A; 25B, 27B, 29B, 36B; 28C, 29C, 36C) and being each apt to be connected to distinct voltage references, chosen between a power supply reference and a ground reference (PWR, GND).

4. The vertical probe head (20) according to claim 1, characterized in that said capacitor housing seat (33) of said at least one filtering capacitor (30) extends into said support (22) with a dimension (H1, H2) equal to a corresponding height of said filtering capacitor (30).

5. The vertical probe head (20) according to claim 1, characterized in that said plate-shaped support (22) comprises at least one pair of guides (27, 26), being plate-shaped and parallel to each other, separated by an air gap (34), each of said guides (27, 26) being provided with a plurality of said guide holes (29A, 28B) slidably housing said vertical contact probes (21A, 21B) of said first group and a corresponding plurality of passing through guide holes (29B, 28A) of said vertical contact probes (21B, 21A), each of said guides (27, 26) having at least one of said first and second conductive portions (27A, 26A) each including at least a guide hole (29A, 28B) of said plurality of housing guide holes (29A; 28B) slidably housing a vertical contact probe (21A, 21B) of said first group.

6. The vertical probe head (20) according to claim 5, characterized in that said first and second conductive portions (27A, 26A) of said guides (27, 26) are separated from said passing through guide holes (29B, 28A) of said vertical contact probes (21B, 21A) by areas (Dfa1, Dfa2, Dfb1, Dfb2) being portions of said guides (27, 26) not covered by said conductive portions (27A, 26A).

7. The vertical probe head (20) according to claim 5, characterized in that said first and second conductive portions (27A, 26A) are formed on corresponding faces of said guides (27, 26).

8. The vertical probe head (20) according to claim 5, characterized in that a first guide (27) of said guides (27, 26) comprises said housing seat (33A; 33B) housing said filtering capacitor (30A, 30B), said first conductive portion (27A) of said first guide (27) extending also in correspondence of said capacitor housing seat (33A; 33B), said filtering capacitor (30A, 30B) being inserted in said capacitor housing seat (33A; 33B) and rests on said second conductive portion (26A) of a second guide (26) of said guides (27, 26).

9. The vertical probe head (20) according to claim 5, characterized in that said first and second guides (27, 26) further comprise a plurality of said housing guide holes (29C, 28C) slidably housing vertical contact probes (21C) of a second group of

vertical contact probes apt to carry working signals, said first and second conductive portions (27A, 26A) of said guides (27, 26) being separated from said guide holes (29C, 28C) of vertical contact probes (21C) of said second group by suitable areas (Dfc1, Dfc2) being portion of said first and second guides (27, 26) not covered by said first and second conductive portions (27A, 26A).

10. The vertical probe head (20) according to claim 9, characterized in that said vertical contact probes (21C) of said second group are partially coated by an insulating material in a portion in correspondence of said housing guide holes (29C, 28C).

11. The vertical probe head (20) according to claim 5, characterized in that said vertical contact probes (21A, 21B) of said first group are partially coated by an insulating material in a portion in correspondence of said passing through guide holes (29B, 28A).

12. The vertical probe head (20) according to claim 5, characterized in that said plate-shaped support (22) further comprises an intermediate guide (35) inserted between said pair of guides (27, 26) occupying said air zone (34), said intermediate guide (35) being provided with a plurality of said housing guide holes (36C) slidably housing vertical contact probes (21C) of a second group of vertical contact probes apt to carry working signals and a corresponding plurality of passing through guide holes (36A, 36B) of vertical contact probes (21A, 21B) of said first group, said intermediate guide (35) slidably contacting only said vertical contact probes (21C) of said second group.

13. The vertical probe head (20) according to claim 12, characterized in that said intermediate guide (35) comprises a further housing seat (37A, 37B) housing said filtering capacitor (30A, 30B), having similar size and being positioned in correspondence of said housing seat (33A, 33B) formed in said first guide (27) of said pair of guides (27, 26).

14. The vertical probe head (20) according to claim 1, characterized in that it comprises a plurality of filtering capacitors (30, 30A, 30B).

15. The vertical probe head (20) according to claim 7, characterized in that said first conductive portion (22A) or said second conductive portion (22B) extends on all said support (22) and covers one of the faces (Fa, Fb) thereof, including and connecting a first group of said guide holes (25A, 25B) slidably housing vertical contact probes (21A, 21B) of said first group, said first conductive portion (22A) or said second conductive portion (22B) further comprising respective non-conductive areas (A1, A2, A3, B1, B2) in correspondence with the guide holes slidably housing vertical contact probes (21A, 21B, 21C) not belonging to said first group.

16. The vertical probe head (20) according to claim 1, characterized in that it comprises vertical contact probes (21A, 21B, 21C) partially coated by an insulating material, preferably in a portion in correspondence of guide holes included in conductive portions to which said vertical contact probes (21A, 21B, 21C) are not to be electrically connected.

5