CLAIMS

1. A vertical probe for testing electrical devices, the probe comprising:

an alternating sequence of capacitive sections and inductive sections along a length of the probe;

wherein the probe includes a signal conductor and one or more ground conductors insulated from the signal conductor;

wherein the capacitive sections include a dielectric material configured to hold the signal conductor at fixed separations from the one or more ground conductors by occupying space between the signal conductor and the one or more ground conductors;

wherein the inductive sections are air bridge structures having the signal conductor separated from the one or more ground conductors by air gaps;

wherein impedances of the capacitive sections and impedances of the inductive sections effectively provide a uniform transmission line impedance of the probe;

wherein the probe is configured to flex in the inductive sections in operation.

2. The vertical probe of claim 1, wherein the alternating sequence of capacitive sections and inductive sections is periodic along the length of the probe.

3. The vertical probe of claim 1, wherein the uniform transmission line impedance of the probe is substantially 50 Ohms.

4. The vertical probe of claim 1, wherein the vertical probe has a ground-signal-ground configuration.

5. The vertical probe of claim 4, wherein the grounds of the ground-signal-ground configuration are electrically connected within the vertical probe.

6. The vertical probe of claim 1, wherein the capacitive sections are configured as layered posts including:

a conductive core connecting a top ground layer to a bottom ground layer;

an insulating shell disposed around the conductive core; and

the signal conductor disposed around the insulating shell;

wherein the signal conductor is separated from the conductive core by the insulating shell;

wherein the insulating shell defines a top separation between the signal conductor and the top ground layer;

wherein the insulating shell defines a bottom separation between the signal conductor and the bottom ground layer.

7. The vertical probe of claim 1, wherein lengths and/or widths of one or more of the inductive sections are modulated along the length of the probe to determine a mechanical resilience of the probe.

8. The vertical probe of claim 1, wherein capacitances of one or more of the capacitive sections are modulated along the length of the probe.

9. A probe head comprising a probe array including two or more of the vertical probes of claim 1.

10. The probe head of claim 9, wherein the probe array further comprises one or more vertical probes.