CLAIMS

1. A semiconductor structure, comprising:

a bottom oxide insulating layer;

a silicon layer disposed on the bottom oxide insulating layer;

a deep trench isolation (DTI) material passes vertically through the silicon layer to the bottom oxide insulating layer, the deep trench isolation material having a lower permittivity than the permittivity of the silicon layer; and

a coaxial transmission line having an inner electrical conductor and an outer electrically conductive shield structure disposed around the inner electrical conductor passing vertically through the deep trench isolation material to electrically connect electrical conductors disposed over the bottom oxide insulating layer to electrical conductors disposed under the bottom oxide insulating layer.

2. A semiconductor structure, comprising:

a bottom oxide insulating layer;

a silicon layer having disposed on an upper surface of the bottom oxide insulating layer;

wherein the silicon layer a deep trench isolation material passing vertically through the silicon layer to the bottom oxide insulating layer;

a dielectric structure disposed over the silicon layer;

a plurality of electrical contacts disposed on the dielectric structure, a first portion of the electrical contacts passing vertically through the dielectric structure, and a second portion of the electrical contacts being connected to electrical contacts disposed on a bottom surface of the bottom oxide insulating layer by a plurality of spaced electrically conductive vias passing vertically through the dielectric structure, the deep trench isolation material, and the bottom oxide insulating layer; and

wherein the plurality of spaced electrically conductive vias connected to the second portion of the electrical contacts are arranged to provide a coaxial connector between the second portion of the electrical contacts and the electrical contacts disposed on the bottom surface of the bottom oxide insulating layer.

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3. A semiconductor, silicon-on-oxide (SOI) structure, comprising:

a bottom oxide (BOX) insulating layer;

a silicon layer disposed on the bottom oxide (BOX) insulating layer;

a deep trench isolation (DTI) material passing vertically through the silicon layer to the bottom oxide insulating layer, the deep trench isolation material having a lower permittivity than the permittivity of the silicon layer;

wherein the silicon layer has formed therein a pair of complementary metal oxide semiconductor (CMOS) transistors, the transistor being electrically isolated one from the other by the deep trench isolation (DTI) material; and

a coaxial transmission line having an inner electrical conductor and an outer electrically conductive shield structure disposed around the inner electrical conductor passing vertically through the deep trench isolation material to electrically connect electrical conductors disposed over the bottom oxide insulating layer to electrical conductors disposed under the bottom oxide insulating layer.

4. The structure recited in claim 3 wherein the inner conductor and the outer conductor shield structure are chemically vapor deposited (CVD) tungsten.

5. The structure recited in claim 3 wherein the outer conductor shield structure comprises a plurality of spaced electrical conductors separated one from another by less than one-quarter wavelength of the operating wavelength of the coaxial transmission line and thus provides an electrically continuous conductor for the outer conductor shield structure.

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