ELECTRONIC DEVICE

[0001] The subject matter herein relates generally to electronic devices and methods of manufacturing electronic devices.

[0002] Electronic devices typically include conductors that electrically connect components of the electronic device. Some electronic devices have circuit boards with conductive traces deposited on the substrate as a conductive layer in a predefined pattern or layout. Contacts or wires may be terminated to the traces, such as by spring contact, soldering or the like. Conventional circuit boards have good wear properties and are not readily damaged during mating or unmating of the contacts.

[0003] However, some electronic devices have been proposed that are manufactured by printing conductive ink on the substrate and then possibly plating the conductive ink to increase the current carrying capacity of the conductive circuits. Circuit traces manufactured as such are susceptible to wear or damage from scraping by the contacts when mated to or unmated from such traces. Additionally, some electronic devices have been proposed that provide circuit traces without the use of traditional circuit boards by printing the conductive ink traces directly onto another substrate, such as a case or housing of the electronic device, which may reduce the overall size of the electronic devices.

[0004] The problem ~~is~~ can be solved by embodiments of an electronic device as described herein. According to an aspect, the electronic device ~~that~~ includes a dielectric substrate having a first surface, ~~a conductive circuit deposited on the first surface and having a printed conductive ink trace on the first surface, and~~ a conductive interposer mechanically coupled to the substrate and a conductive circuit deposited on the first surface of the substrate and deposited on the arm of the conductive interposer with the conductive circuit spanning between the first surface of the substrate and the arm of the conductive interposer. The conductive interposer has a post extending into the dielectric substrate and an arm positioned proximate to the first surface. The conductive interposer has a contact interface configured to be mechanically and electrically connected to a contact~~is electrically coupled to the conductive circuit. The conductive interposer has a separable contact~~

~~interface configured to be mechanically and electrically connected to a removable contact.~~ The conductive circuit includes a printed conductive ink trace, wherein the printed conductive ink trace of the conductive circuit is applied on the arm of the conductive interposer in addition to the first surface of the substrate such that the conductive interposer is electrically coupled to the conductive circuit, with the conductive interposer providing the electrical connection between the contact and the conductive circuit.

[0005] The invention will now be described by way of example with reference to the accompanying drawings in which:

WHAT IS CLAIMED IS:

1. An electronic device comprising:

a dielectric substrate having a first surface;

~~a conductive circuit deposited on the first surface, the conductive circuit comprising a printed conductive ink trace on the first surface; and~~

a conductive interposer mechanically coupled to the substrate, the conductive interposer having a post extending into the dielectric substrate and an arm positioned proximate to the first surface, the conductive interposer having a contact interface configured to be mechanically and electrically connected to a contact; and

a conductive circuit deposited on the first surface of the substrate and deposited on the arm of the conductive interposer with the conductive circuit spanning between the first surface of the substrate and the arm of the conductive interposer, the conductive circuit comprising a printed conductive ink trace, wherein the printed conductive ink trace of the conductive circuit is applied on the arm of the conductive interposer in addition to the first surface of the substrate such that the conductive interposer ~~being~~ is electrically coupled to the conductive circuit, with the conductive interposer providing the electrical connection between the contact and the conductive circuit ~~the conductive interposer having a separable contact interface configured to be mechanically and electrically connected to a removable contact~~.

2. The electronic device of claim 1, wherein the ~~conductive interposer comprises a~~ post ~~extending~~ extends through ~~the conductive circuit into~~ the substrate to a position at or beyond a second surface of the substrate opposite the first surface of the substrate, the post fixing the relative position between the conductive interposer and the substrate.

3. The electronic device of claim ~~2~~1, wherein the ~~conductive interposer comprises an~~ arm ~~extending~~ extends from the post along the first surface such that the arm is generally coplanar with the first surface, the conductive circuit

spanning across the interface ~~being positioned~~ between the arm and the first surface, the arm defining the ~~separable~~ contact interface.

4. The electronic device of claim 1, wherein the conductive interposer comprises a main body including the post and the arm ~~and a flexible element extending between the main body and the conductive circuit, the flexible element electrically connecting the conductive circuit with the main body~~, the main body defining the ~~separable~~ contact interface with the removable contact, such contact interface being a separable contact interface allowing the contact to be removed from the conductive interposer, the conductive circuit being provided on a portion of the arm remote from the contact interface.

5. The electronic device of claim 1, wherein the conductive interposer comprises a flexible, conductive gasket directly engaging and being electrically connected to the conductive circuit.

6. The electronic device of claim 1, wherein the conductive interposer comprises a flexible spring beam directly engaging and being electrically connected to the conductive circuit.

7. The electronic device of claim 1, wherein the conductive interposer is connected to the conductive circuit at an interface remote from the contact interface where contact wiping occurs creating a ~~along a wiping contact surface, the conductive interposer allowing~~ non-damaging electrical connection between the contact and ~~wiping to occur between the conductive interposer and~~ the conductive circuit via the conductive interposer.

8. The electronic device of claim 1, wherein the printed conductive ink trace is applied to the first surface and to the conductive interposer after the conductive interposer is mechanically coupled to the substrate such that the printed conductive ink trace spans an interface between the conductive interposer and the substrate.

9. The electronic device of claim 1, wherein the conductive circuit comprises an antenna, the contact comprises a feed line attached to the antenna by the conductive interposer.

10. The electronic device of claim 1, wherein the substrate comprises a case of the electronic device, the conductive circuit being applied directly to the case, the case being configured to hold electronic components therein.