METHOD OF THIN FILM ADHESION PRETREATMENT

KANSAS CITY NSC National Security Campus

MANAGED BY HONEYWELL

This technology improves adhesion between a PCB/ceramic/glass substrate and its circuit trace by changing the surface composition and morphology of the PCB/ceramic/glass substrate.

Background

Delamination is a common problem in Printed Circuit Boards (PCB) and thin film metallized ceramics/glass substrates. Humidity buildup in the production process can cause circuit traces to separate from the PCB substrate, hindering circuit performance. In ceramic metal systems, the adhesion of metals were modeled to show that some metals adhere better to certain ceramic/glass phases than other phases. This technology improves adhesion between a PCB/ceramic/glass substrate and its circuit trace by changing the surface composition and morphology of the PCB/ceramic/glass substrate.

PCBs are used to create complex circuits by mechanically supporting and electrically connecting electronic components. Circuit paths comprised of a thin conductive film are designed and deposited on PCB substrates to form circuit traces. Electronic components are then soldered onto specific locations of the circuit traces to form a circuit component. This technology prevents delamination of PCBs by pretreating its substrate surface for circuit trace adhesion.

Description

This process uses ion mill etching on the PCB/ceramic/glass substrate to increase its surface roughness. The ion mill preferentially removes a portion of the substrate's glass phase, while all or most of its alumina phase remains. The substrate surface can be ion milled for up to 60 minutes in a vacuum or in a reduced pressure environment before the circuit trace is adhered to the substrate. Figure 1 shows a perspective view of a circuit board following ion milling. Figure 2 presents a cross-section of Figure 1.

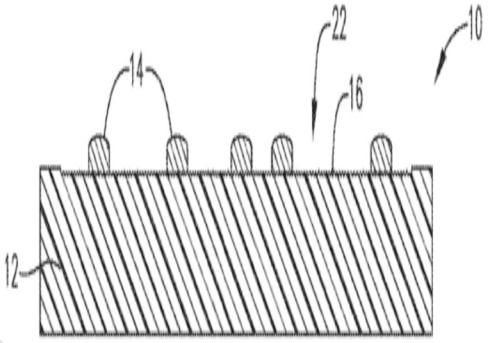

Figure 1: Perspective view of a circuit board following ion milling.

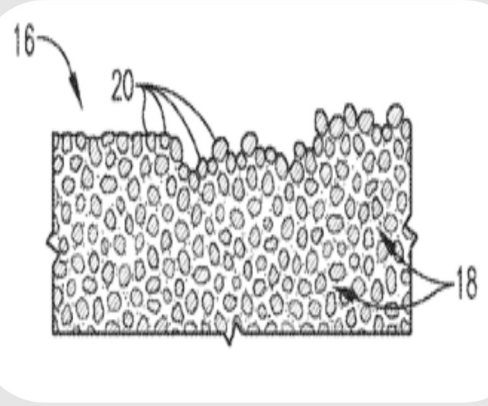

Figure 2: Cross-section of circuit board following ion milling.

Advantage

This method for pretreating a PCB/ceramic/glass substrate is advantageous over existing methods because it produces a PCB/ceramic/glass that does not peel or delaminate. Increasing the surface roughness of the PCB/ceramic/glass substrate provides stronger adhesion between PCB components.

Applications

This technology has applications in any fields that require PCBs in their electronic components. Examples include consumer electronics such as tablets and smartphones, medical imaging systems used in the healthcare industry, and electronic components used in the aerospace and defense industries.

Intellectual Property Status

This technology is protected under US Patent US 10426034.

Keyword List

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Contact

Andrew Myers
816-488-4432
techtransfer@kcnsc.doe.gov