

Method for handling miniaturized components

Disclosed is a method for handling miniaturized components. Benefits include improved functionality, improved performance, and improved cost effectiveness.

Background

Miniaturized components, such as resistors, capacitors, and inductors, can be displaced when loaded in standard waffle packs during assembly pickup and placement. Components can shift out of position or out of the pocket. These displacements/dislodgements can occur from any slight jarring of the waffle pack that occurs during handling. Examples include loading the waffle pack, transporting the loaded waffle pack from the load station to the pick-and-place tool, or moving the loaded waffle pack onto the tool's feeder mount.

Conventionally, no economical, commercially available solution exists. Of the assortment of component handling media currently available on the market, the use of chip trays provides the most cost-effective option. However, off-the-shelf waffle packs are not always dimensioned correctly to properly fit the components. Oversized waffle pack pockets make component orientation difficult due to an increased opportunity for skewing and/or misorientation. Alternatively, obtaining the correct waffle-pack dimensions requires custom-sized packs, which are cost prohibitive.

Gel packs are not conducive to accurate alignment during manual loading. Additionally, the manual loading of miniaturized components is an extremely nonergonomic condition due the requirement for controlled finger pressure over an extended length of time to avoid damaging the parts. The difficulty is emphasized by the fact that a single 2-inch x 2-inch waffle pack can accommodate more than five hundred 02016-sized components (see Figure 1).

Description

The disclosed method is the handling of miniaturized components. The method combines the use of a mask designed for miniaturized components with a standard gel pack. The mask is manufactured of a static dissipative or conductive material and a low-tack gel pack (see Figure 2).

A mask of static dissipative or conductive material is designed and manufactured to accommodate miniaturized components. The design takes into account component dimensions, required aperture dimensions, and pitch. The apertures are manufactured using electrical discharge machining. The template outer dimensions are such that it can be inserted into a standard gel-pack chip tray.

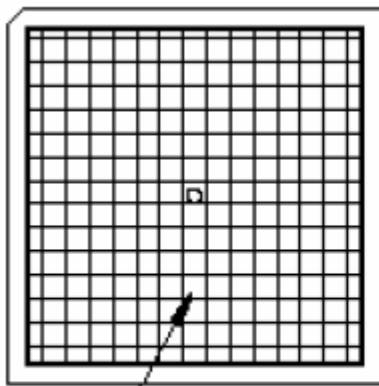
The disclosed method combines the tacky surface of a gel pack that immobilizes components with the individually fitted compartments/cavities of a waffle pack to prevent part rotation and

enable automated loading. As a result, lateral displacement and dislodgement of parts are eliminated and part alignment is greatly improved.

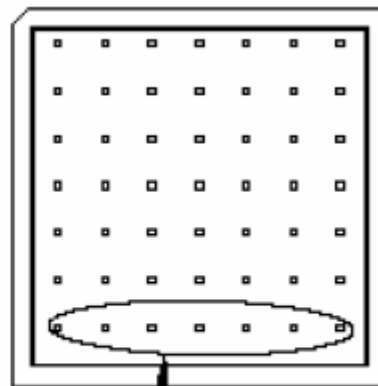
Advantages

The disclosed method provides advantages, including:

- Improved functionality due to providing the handling of miniaturized components
- Improved functionality due to providing a mask of static dissipative or conductive material that can be inserted into a standard gel-pack chip tray
- Improved performance due to eliminating the lateral displacement and dislodgement of parts
- Improved performance due to improving part alignment
- Improved cost effectiveness due to using conventional gel packs and interchangeable masks

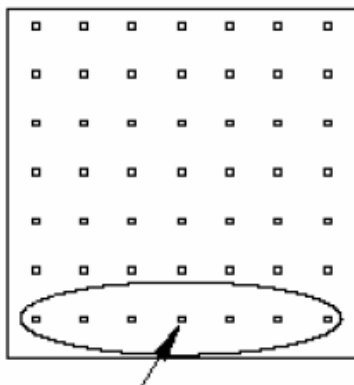


Membrane over mesh



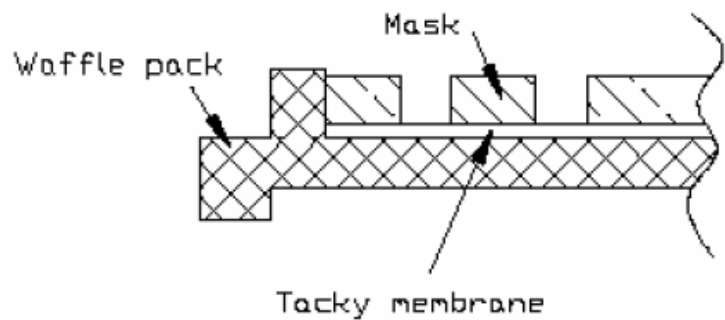
Individual cavities

Fig. 1



Thru-hole apertures

Fig. 2



Disclosed anonymously