P-Flex®

Flexible Printed Circuit Board (Flex PCB) Prototype Inspection Specifications

Ver. 2.0.0

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1. OVERVIEW

P-Flex® is a flexible Printed Circuit Board (Flex PCB) that is manufactured using inkjet printing and electroless copper plating processes. Elephantech offers one-stop prototyping service that includes artwork design, manufacturing of P-Flex® PWBs, and mounting of components onto their surfaces. This document defines the inspection specifications that will be used in the P-Flex® manufacturing process and the One-stop Prototype Making Service.

The inspection specifications are separately defined for the inspections to be performed after the P-Flex® manufacturing process and the surface mounting process. While Elephantech usually does not perform any other inspections besides those that are stated in this document for regular prototyping projects, customers who desire other types of inspections for mass production projects or prototype projects that require special inspection specifications, can contact our sales staff for consultation.

2. POST-MANUFACTURING P-Flex® INSPECTION SPECIFICATIONS

The following table shows whether all parts are inspected or not, by inspection type.

Inspection type	All parts inspection
Opens/shorts test	Yes
Film thickness inspection	Yes
Dimensional deviation rate inspection	Yes
Visual inspection	Yes

AOI (automated optical inspection)	No
Length gauge inspection	No

The following is a description of each type of inspection.

2.1. OPENS/SHORTS TEST

This is the test performed for the conductance of all circuit patterns on the products as well as for short-circuits, using a flying probe tester. As the probe must contact the product surface during this test, small marks may be left in some cases.

2.2. COPPER THICKNESS INSPECTION

This inspection confirms whether a specified minimum copper thickness is achieved or not, by calculating the thickness of the copper film from the electrical resistance value measured on the test pattern being placed on the same artwork. For the purpose of this calculation, the volume resistance of the electroless copper film is assumed to be $2.0*10^{-8}\Omega m$.

2.3. DIMENSIONAL DEVIATION RATE INSPECTION

This inspection confirms whether the dimensional deviation rate does not exceed ±0.3%, both vertically and horizontally, based on the test pattern being placed on the same artwork. However, the measurements are taken from the test pattern, so the actual product dimensions are not physically measured using a length gauge.

2.4. VISUAL INSPECTION

During this inspection, all product units are visually checked to make sure that there is no scratch, dust, etc. on them.

3. POST-SURFACE-MOUNTING INSPECTION SPECIFICATIONS

The following table shows whether all parts are inspected or not, by inspection type.
As it is usually impossible to perform any functional inspection (i.e., operation test) on prototypes after components have been mounted onto them, it is difficult to offer any warranty that they would operate properly as finished products. Therefore, it must be noted that Elephantech will only be responsible for performing opens/shorts tests to check the conductance and short circuits before the surface mounting process and also for performing visual inspection on the mounted components, etc. after the surface mounting process.

Inspection type	All parts inspection
Visual inspection of mounted components	Yes
AOI	No
Functional inspection	No

While X-ray inspection is usually not performed, Elephantech may be able to offer it through a cooperating company. Any customer interested can inquire regarding this to our sales staff.

3.1. VISUAL INSPECTION OF MOUNTED COMPONENTS, ETC.

During this inspection, all product units are visually checked as to their mounted components, etc. for any short circuit, offset component placement, and other types of defects in the soldered areas.

4. REVISION HISTORY

Ver.	Revision date	Revision details
1.0	August 2nd, 2018	New
2.0	September 20th, 2020	• Document name changed to "P-Flex Prototype Inspection Specifications" • Changed P-Flex™ to P-Flex®