Chapter 15: Quality Control of Assembly and Mounting

V.L. Lanin[1],

V. A. Emel'yanov[1],

I. B. Petukhov

2024

[1]Belarusian State University of Informatics and Radioelectronics, 6 P. Brovki Street, Minsk, 220013, Belarus.

Keywords: assembly, mounting, connections, quality control, connection defects.

Abstract: This chapter delineates detailed methods and tools for the visual inspection of soldered joints. It enumerates the primary types of defects and the capabilities of automatic visual and electrical inspection for their detection and highlights the use of automatic equipment for thermographic, acoustic, and X-ray inspection of soldered and microsoldered joints. The methodology for monitoring transient electrical resistance in contact connections is also examined. For automatic electrical inspection of connections, systems equipped with flying probes are used. These systems supply power and receive signals from the inspected connection on the board or component, automatically verifying functionality. The criteria for assessing the strength of soldered joints include the magnitude of the pull-off force, the durability of the joints under alternating loads, and vibration resistance. Destructive testing is employed to ascertain the mechanical and physico-mechanical properties of soldered joints. In metallographic inspection, the diffusion zone between the solder and the base metal is identified, and the quality of the soldered joint is assessed based on its width. Typical defects of soldered joints and their causes are considered.

Publication source:

Lanin, V. L. Chapter 15: Quality Control of Assembly and Mounting / V. L. Lanin, V. A. Emel'yanov, I. B. Petukhov // Surface Engineering and Applied Electrochemistry. – 2024. – Vol. 60, No. 3. – P. 572–598. – DOI: https://doi.org/10.3103/S1068375524700157.