Introduction to Component Identification for Electronics Assembly
SYLLABUS

Welcome to IPC's Component Identification program! In this course, you will learn how to identify and determine the value of the most common electronic components used in PCB assembly. You will also learn how to use component markings, assembly documentation, and manufacturer data sheets to verify that the specified components are correctly placed and oriented on an assembly.

LEARNING OBJECTIVES PER COURSE MODULE

- **Module 1: Introduction**
  - Distinguish between through-hole (TH) and surface mount (SMT) components
  - Distinguish between component packages and component packaging
- **Module 2: Component Verification**
  - Use component markings and component packaging to identify the origin and value of a component
  - Use a manufacturer data sheet to determine the characteristics of a component
  - Identify the markings used to indicate polarity
  - Explain how component reference designators, bills of materials, and assembly drawings are used to verify correct component placement
  - Use component and PCA markings, CRDS, BOMs, assembly drawings, and sample boards to verify that the right components have been correctly placed and oriented on an assembly
- **Module 3: Resistors**
  - Explain the function of a resistor
  - Visually identify the most common types of TH and SMT resistors
  - Interpret component markings and code tables to determine a resistor's value,
- **Module 4: Capacitors**
  - Explain the function of a capacitor
  - Explain capacitance and voltage
  - Visually identify the most common types of TH and SMT capacitors
  - Convert units of capacitance (microfarad, nanofarad, picofarad)
  - Interpret component markings to determine capacitance, voltage, and tolerance
  - Use polarity markings to verify correct orientation on a PCB
- **Module 5: Inductors**
  - Explain the function of an inductor
  - Explain inductance
  - Visually identify the most common types of TH and SMT inductors
  - Convert units of inductance (millihenries, microhenries, nanohenries)
  - Interpret inductor color bands and alphanumeric codes to determine inductance and tolerance

- Module 6: Diodes
  - Explain the function of a diode
  - Explain voltage (volts) and current (amperes)
  - Identify the most common types of diodes
  - Determine the polarity of a diode
  - Use markings and assembly documentation to ensure correct installation
- Module 7: Transistors
  - Explain the functions of transistors
  - Identify the most common types of transistors and transistor packages
  - Describe key units used to indicate the value of a transistor
  - Use assembly documentation and manufacturer data sheets to verify the identity, value, and characteristics of a transistor
  - Use component and PCA markings, assembly documentation, and data sheets to correctly orient transistors on a PCB
- Module 8: Integrated Circuits
  - Explain the function of the most common types of integrated circuits
  - Identify the component packages used to house common integrated circuits
  - Use assembly documentation and manufacturer data sheets to verify the identity value, and characteristics of an integrated circuit
  - Use component and PCA markings, assembly documentation, and data sheets to correctly orient integrated circuits on a PCB

FINAL EXAM

You must complete the Final Exam with a passing score of 80% to access and download your Component Identification Certificate of Completion. You may attempt the exam up to three (3) times. Please note that you must wait 24 hours after completing your second attempt to commence a third and final attempt.

COURSE RESOURCES

Everything you need to complete this Component Identification course is included and available on the IPC EDGE Learning Management System.

IPC EDGE LEARNING MANAGEMENT SYSTEM

Upon accessing the course for the first time, make sure to take a moment to update your personal profile. IPC EDGE supports the most recent versions of Google Chrome, Firefox, Safari, Internet Explorer, and Microsoft Edge. Courses can be accessed on desktops, laptops, tablets, and mobile phones. Please refer to Browser Settings under the Start Here! Tab on your dashboard to make sure your browser is set to function seamlessly with the IPC Edge Learning Management System. If you need further technical assistance, please send an email to certification@ipc.org or call IPC Member Support at +1 847-597-2862.