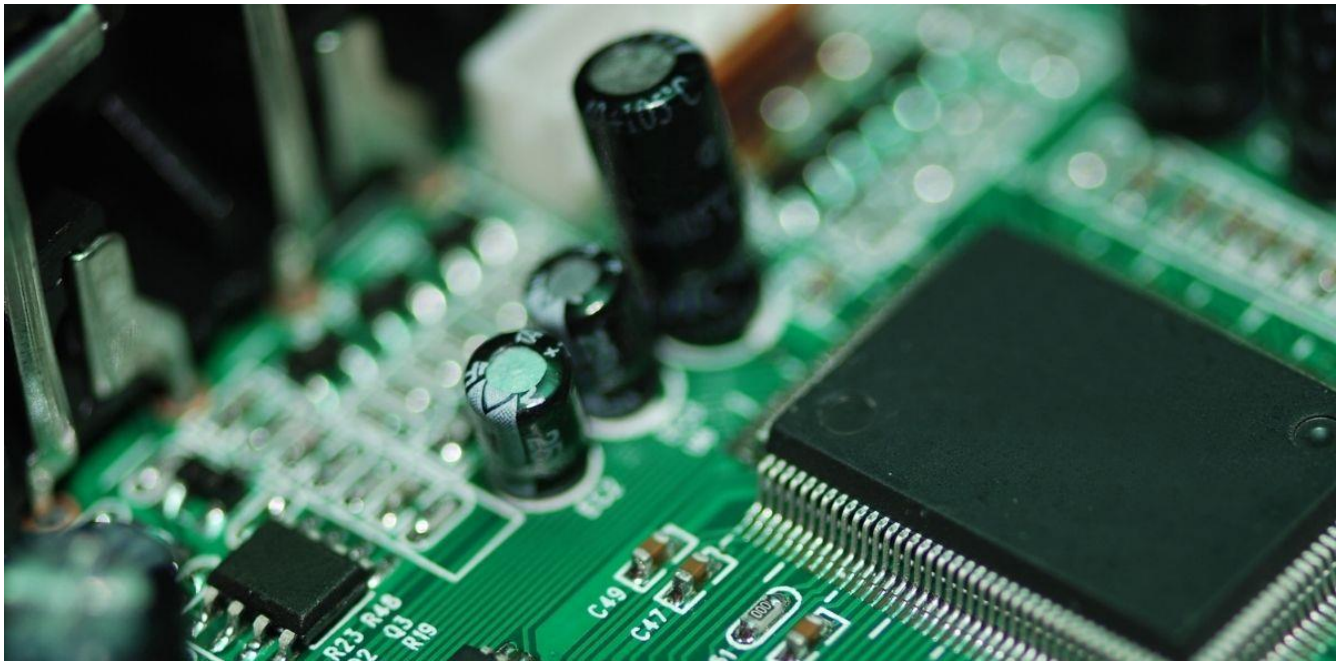
What is a Circuit Card Assembly (CCA)?



A Circuit Card Assembly (commonly referred to as a CCA) is a flat board with connected electronic components placed on it.

CCA Manufacturing usually employs the use of machines (SMT and Through-hole) to automate the process of creating CCAs.

Real-world Uses

From household items (TVs, microwaves, laptops, cell phones, smoke detector, security cameras) to industrial uses (medical imaging systems and monitors, automotive displays, power supplies, navigation systems), you can find CCAs throughout many different industries.

Resources & Links:

https://emsginc.com/resources/10-common-pcb-applications/

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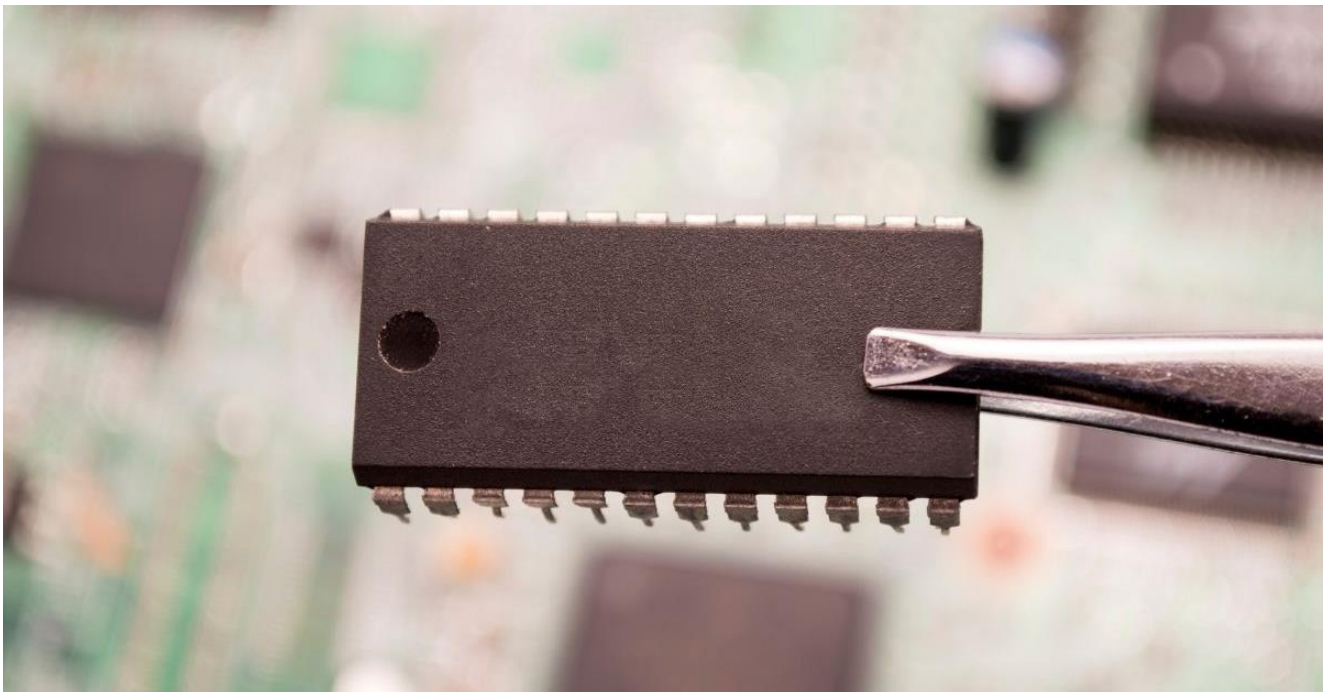
What are the Different Components of a CCA?



There is a myriad of different CCA designs, types, and capabilities. However, PCBAs are largely comprised of 4 basic elements.

1. Substrate
2. Copper
3. Solder mask
4. Silkscreen

Substrate

The material supporting all the electrical components together. Substrates can vary greatly depending on the type of PCBA. For example, you can have flexible, ridged, and metal core boards.

Copper

A thin layer of copper is laminated to the substrate of the PCBA connecting the electrical components with conductive tracks or traces. The number of copper layers depends of the type of PCBA, and can range from single-sided, double-sided, and multi-layer boards.

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Solder Mask

Solder masks are applied as a coating to prevent corrosion, reducing the possibility of solder shorts.

Silkscreen

A silkscreen may be printed on circuit boards to display a legend identifying the components and test points.

Resources & Links:

https://www.pcbcart.com/article/content/pcb-assembly-process.html

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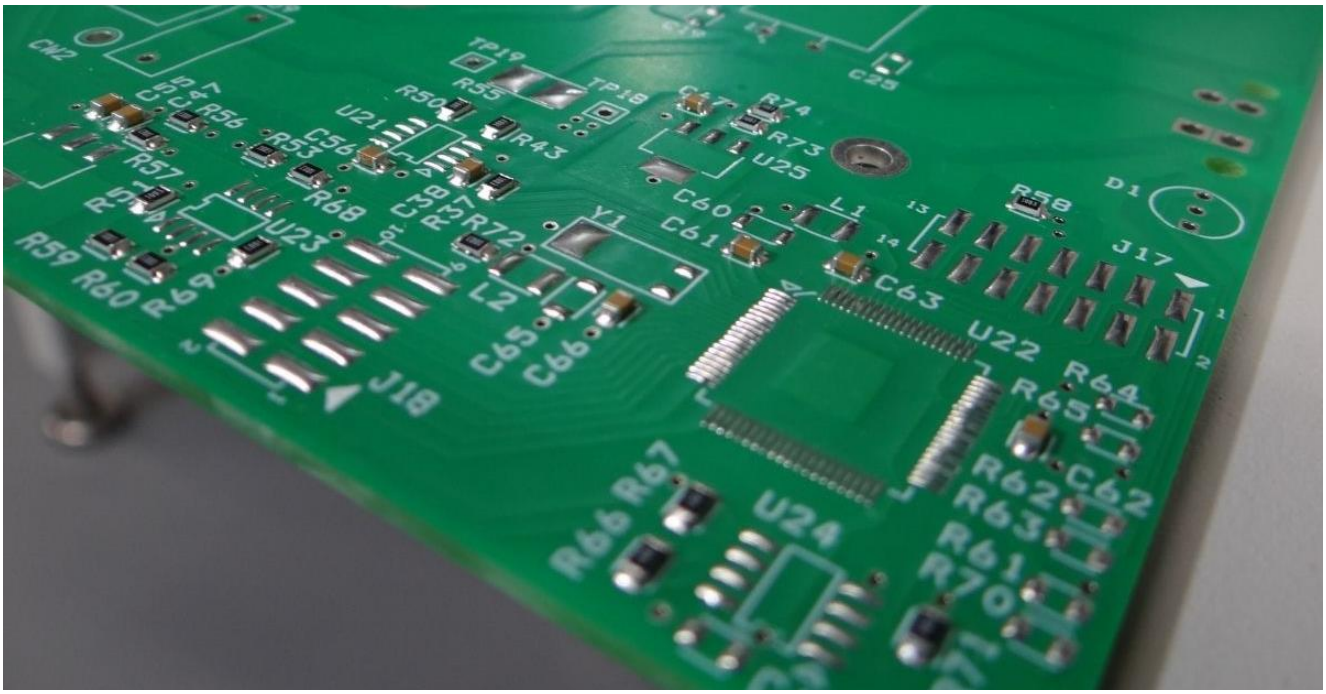
CCA vs. PCBA



Is There a Difference Between CCA and PCBA?

- Circuit Card Assembly (CCA) and Printed Circuit Board Assembly (PCBA) or Printed Circuit Assembly (PCA) both refer to the same thing: bare and assembled circuit boards.

PCBA and PCA are both more informal terms that are commonly used in the industry, however the Intellectual Property Constituency (IPC) uses the term CCA instead.

CME can help you with your CCA/PCBA Needs

Choose a fully integrated, turnkey facility for your CCA & PCBA needs.

- Custom Design or Build to Print & Specification
- Prototypes or High Mix to Rate Production

Resources & Links:

http://www.58pcba.com/index.php?id=318#:~:text=PCBA%2C%20printed%20circuit%20board%20assembly,subassembly%20of%20small%20circuit%20boards.

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What is a SMT Line?

SMT stands for Surface-mount Technology, and it is comprised on 3 primary machines: Stencil Printer, Pick and Place Machine, and a Reflow Oven. All these machines work one after the other to automate printing CCAs, reducing labor costs and increasing production rates.

Stencil Printing Machine

A stencil machine spreads solder evenly on the board through a customized stencil. After spreading the solder on the board, the machine cleans off the excess solder paste.

Automation Advantage:

- Dual squeegee for clean application
- Double-sided board capable
- Print rigid & flex circuits

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Pick and Place Machine

Electronic components are placed on circuit boards by a Pick and Place (PnP) Machine.

Automation Advantage:

- Placement rate ≤ 4800 cph
- Placement accuracy +/-0.001”
- Improved quality with Error Recognition System

Reflow Oven Machine

The solder material is heated up and melted in a Reflow Oven to make electro-mechanical connections with the electronic components.

Automation Advantage:

- 4 vertical heating zones plus cooling zone
- 18” wide conveyor and 50” heated tunnel length

Resources & Links:

www.ddmnovastar.com/smt-equipment

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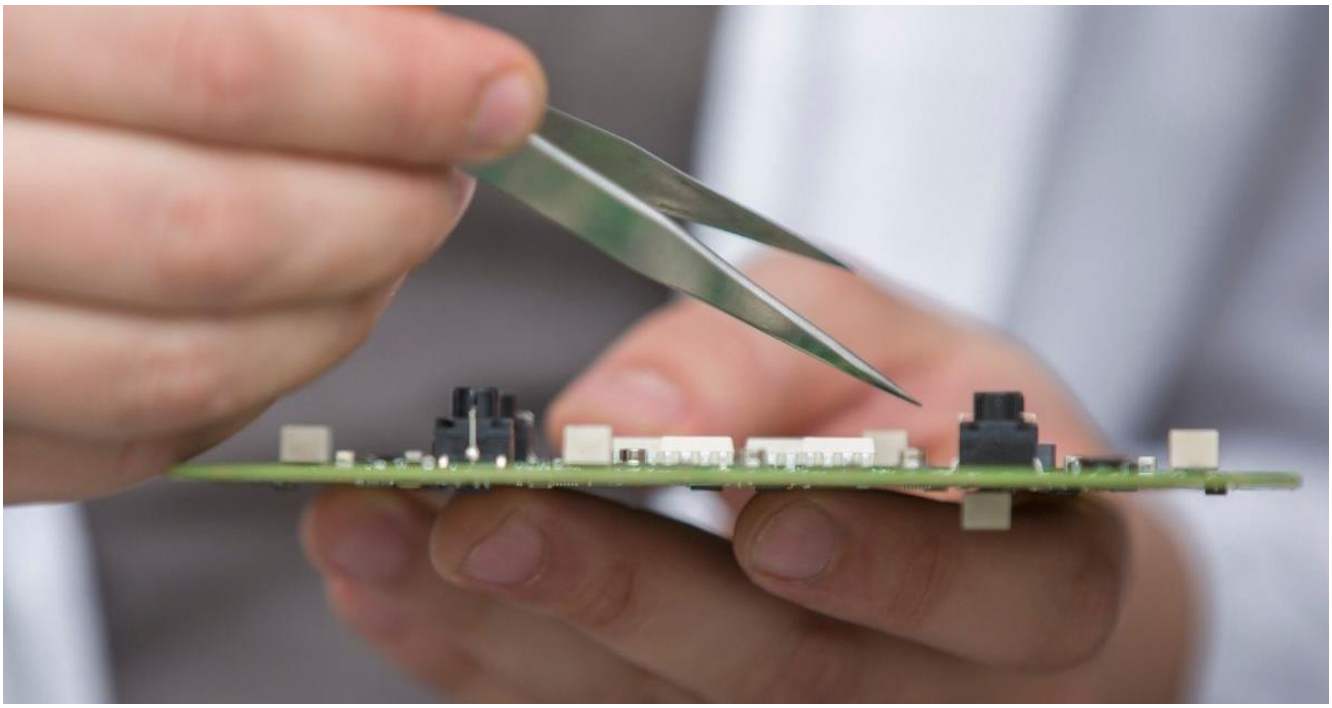
Can Circuit Cards be Repaired?



Circuit Cards condition can worsen depending on humidity, duration of use, and wear and tear that affect performance. Before you recycle your CCA consider the possibility of repairing the board.

A team of engineers will need to find out why your board is not functioning properly before you can proceed with a repair.

Possibilities of Why Your PCBA is Failing

Is your Circuit Card Assembly (CCA) failing you? Before you throw it out, try to determine why it's failing in the first place. Depending on the cause of the failure, you may be able to salvage your CCA and have it repaired by experts.

- Physical Damage
- Component Failure
- Trace Damage
- Poor Design
- Power Failure

You research these root causes in more depth in this article on CCA repair.

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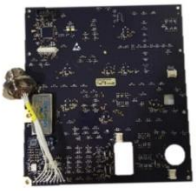
Get a Quote for Your CCA Repair

Contact us for a quote on your CCA repair and have the help of our experienced engineers to diagnose and repair your board.



Resources and Links:

https://emsginc.com/resources/5-most-common-pcb-repairs/#:~:text=Over%20time%2C%20they%20experience%20a,make%20them%20like%20new%20again

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