Design to Cost

Cost-optimized products - „Design to cost" in the electronics field

Just imagine the following situation:

You assign an engineering office the task of developing an electronic product and after the development phase is finished, you receive a prototype which is, in terms of functionality, flawless. At production start-up however, it is found that the production of the product in larger quantities is more time-consuming and expensive than you had originally planned. Unless you redesign the product, you will not succeed with it in the market. Your product launch gets pushed further and further behind, and your competitors are not sleeping.

If you have experienced situations like this, then the answer to your problem is "design to cost".

"Design to Cost" is a process of product development in which the lowest-cost alternative is consistently sought for each individual component throughout the development process. This leads to direct cost savings for you.

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„These days everyone is talking about cutting costs.
We engineers at dataschalt have been helping our customers develop cost-optimized products for years"

Cost-saving with "design to cost" - A look in an engineer's box of tricks with a printed circuit board example

Our engineers at dataschalt have been working with "design to cost" practices for several years, and many projects have been successfully realized as a result. In addition to using components which cost the least while still having an equal or higher level of quality and functionality, we make sure that through clever detailed solutions, components or even complete modules can be saved. Cost-saving does not just mean using the fewest and cheapest parts possible. Much more, it means laying a foundation during development so that production is carried out in a minimized number of processes in as optimal a manner as possible.

A good example is the printed circuit board (PCB), which serves as a holder for components connected by PCB track. During the development

of PCBs, the engineer already has the necessary production steps in mind. The rule is, the smaller the surface of a PCB, the lower the price. By using surface mount components (SMD components) circuits can be placed on the circuit board in a very compact way. SMD components are sometimes more expensive than Pin-through-hole (PTH) components, which have the same function, but are placed very quickly by an automated assembly machine so that the time saved more than compensates for the price difference. An optimal PCB, when possible, only has SMD components on one side and is soldered in a reflow oven. However, the necessary components available do not always allow for this. In those cases, isolated PTH components are used and placed by hand, then wave soldered together with the SMD components. The size and shape of the SMD pads are different for reflow and wave soldering. When laying out the board, it is important to be aware of which process will be later applied in order to minimize the time needed for visual inspection and follow-up. Control times are also positively affected when the components on a board are as well aligned as possible. In general, circuit boards should only be constructed as complicatedly as absolutely necessary. Seemingly unimportant details such as using the smallest drill diameter or lowest PCB track width have a decisive influence on the price.

Design to cost - development and production at dataschalt from a single source

In their work, developers at dataschalt have significant influence on the production yield and can help prevent potential errors in advance, avoiding subsequent troubleshooting and rework on populated boards. While a compact design saves PCB area, in extreme cases it leads to the formation of solder bridges, and in other cases to shadowing effects on components that are not to be soldered. The modules then need to be reworked manually. At dataschalt, small PCBs are manufactured on larger panels. In the process, the PCB layout is superimposed several times onto a larger board, and 20 to 30 circuits are assembled during one single production step. After the soldering process, the PCBs are separated using a depaneling machine. This procedure reduces the total duration of product assembly, thereby reducing the production costs. We dataschalt developers have the advantage of being at our production lines daily, dealing with the products being manufactured on behalf of our customers. We help our customers revise and adapt the PCB design and components cost-effectively. We constantly use our extensive acquired knowledge for our own and our customers' developments.

Before products leave our facility, they are inspected for functionality. These necessary inspection steps must already be considered during development. In addition to including the circuit parts necessary for the product's functionality, the design can be broadened so that the finished product is able to quickly undergo a full automated inspection. The costs for the hardware, thus, although slightly higher, pay off later in saved testing and increased reliability of the product. The PCB is just one example of cost-effective product development. Equally important is production optimized housing, in which board, buttons or switches can be mounted in as few steps as possible. We design custom injection housing, keyboard, decals and create LCDs, all of which are coordinated and thus can be assembled at low cost. Devices "off the shelf" always have the problem that they do not fit together in an optimal way mechanically, or can only be adapted to each other with additional effort.

Design to Cost

Cost-optimized design also improves your product

We can not say whether or not the above situation has ever happened to you, but we can assure you that it will definitely not happen with us. With the product development process “design to cost”, along with our extensive experience in the implementation of projects in the electronics field, we can create your product to be cost-optimized in addition to being functional.

Contact us; we look forward to seeing your ideas realized. dataschalt

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