



# PRODUCTION

## Understanding Component Library Management

By Paul B. Taubman, Paul B. Taubman Engineering

Component library management may not be the topic of greatest interest to design engineers, but it is certainly important to developers and users of electronic-design-automation (EDA) tools in the electronics industry. In performing test-and-measurement engineering for a large defense company, it became clear that the efficiency of an engineering design flow depends a great deal on a good component library. An effective component library should have good schematic symbols and footprints, but the management of the component library's intelligent data is critical as well.

Intelligent data refers to the data that accompanies a component library symbol and essentially represents that component. This information is not only pertinent to the engineer who needs to understand the characteristics the component being sought, but is needed to create a bill of materials (BOM) when a design is being produced. Unfortunately, many engineers still create their BOMs by hand using a Microsoft® Excel spreadsheet. This approach may work well for smaller projects that require quick manipulation, but may not be the best solution for an engineer constantly making changes and trying to manage a larger BOM by hand. The use of Excel in a manual or semi-automatic fashion may be an indication that there is a hole in the design flow. A possible culprit is the lack of intelligent data in the component libraries.

### Automating the BOM

A component library should have the data necessary to allow the schematic tool to automatically create a BOM by the mere placement of the component on the schematic sheet. While this may be something desired by most engineers, the challenge is in creating a component library that can support the automatic creation of a BOM for a given design. There are several facets to consider when building a component library, such as what intelligent data should be included for a given component, which type of format should be used for the intelligent data, which format should be used for the general description that should accompany each component, which unique identification (ID) should be given to each component, which naming conventions should be used for the component symbol and of the footprint graphics, how the library files should be divided, and so on. In creating a component library, these are matters that should be addressed up front, not once the component library has been established and making changes and/or additions becomes more difficult.

Effective management of a component library involves personnel willing to take on responsibility for maintaining and upgrading the library. At one time, this task may have fallen to a technician. But as component libraries have grown

in scope and complexity, more and more this responsibility falls to a design engineer, typically as something added to what is already a full schedule of responsibilities. An engineer who understands the need for a good component library and how it can benefit the company and the design group might be best equipped to handle the added responsibilities of managing a component library.

Just what are the benefits of a good component library?

There are at least three important points to note:

- Having the intelligent data necessary to automatically create a BOM for a design, eliminating the need to manually create a BOM.
- Knowing that the footprint being used has been vetted, to avoid costly manufacturing mistakes.
- Avoiding waste of time and the cost of unneeded parts—duplicate parts add to the cost of inventory, not only with

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the vetting process of the component during the design and prototype stages, but during production purchasing and inventory management.

Of course, component library management is viewed by a company's management as part of the firm's infrastructure, which is a cost to the design group, and management must understand the value of an improved component library to the company. A properly managed component library can lead to a reduction of administrative work but also smarter engineering with an improved and more efficient design flow.

For companies with an existing or inherited component library, a time may come when it is necessary to salvage or repair the library for use under changing conditions. This usually occurs when a company or design group decides to make a change to a new EDA tool. Often, bits and pieces of the old component library can be salvaged for use with the new EDA tool, but some of the intelligent data may be missing or incomplete and needs to be assembled for the component library to be effective with the new EDA tools.

Contact: Paul B. Taubman Engineering, Greater San Diego Area, CA, E-mail: [Taubman\\_engineering@yahoo.com](mailto:Taubman_engineering@yahoo.com) □