

Tips for Choosing the Right Power Supply

Fit, Form, & Function

The guidelines for choosing a power supply can be summarized in three major terms. These are fit, form and function.

The basic definitions are as follows:

- *Fit* - Fit is the ability to physically interface, interconnect or become an integral component of another item.
- *Form* - Form is the size, mass, weight, shape and any other dimension that uniquely identifies a power supply.
- *Function* - Function is simply the action or actions a power supply is designed to perform.

Prioritize Needs

Every power supply has a data sheet which identifies fit, form and function. The designer must consult the manufacturer's data sheet to make sure that the supply meets the requirements of his/her application. While all criteria should be considered, different applications may find certain parameters more crucial than others.

For example: In some designs, space may be a critical issue (form), while others may have a requirement for a special connector or interface (fit). Still others may need a specific electrical requirement (function). It is best to prioritize what you need the most, start there and fill in the rest of the requirements as you move along.

Understanding Data Sheets

When consulting the data sheet, remember that a manufacturer's definition of fit, form and function may differ from other interpretations of the same information. This is caused by differences in terminology or different ways of characterizing the same thing. For example, one manufacturer publishes the rated operational current as "full load" while another uses "max load". You may call it something else entirely, so confusion can occur rather easily.

Keep in mind that space does not allow for all data to be published but some information can be extrapolated from curves or other data in the specification. If you don't see the information or have any questions, a call should be placed into applications engineering for assistance. When looking for replacement supplies, competitor part numbers and/or data sheets are helpful aids for discussion.

Interchangeability

The manufacturer is only responsible for the published data, which may be subject to change without notice. If the end user must have incontrovertible adherence to their specifications, then it is suggested they present their written specifications to the manufacturer. This is often done for military applications where the designer will submit a procurement document. The procurement document guarantees that the manufacturer will comply with all requirements. Changes to the part are allowed if it still fulfills the requirements of the procurement document.

Design Review

Advances in power supplies have led to a myriad of different forms, with various connection options, and electrical characteristics for every market.

With so many choices, it may be a good time to make a quick review of your requirements. If you have used the same supplies for years, it is possible that there are newer technologies that will provide a more efficient design. You may consider using a higher density supply with a smaller footprint to gain space for additional build out. Observe any changes that may have occurred to operating ambients, supplies with better thermal profiles will enhance your design.

Review your power budget to make sure you are getting the right power for your design. Requirements for special connectors or feature sets may have changed or been eliminated. Cost savings may be realized through standardization where possible. Be cognizant of the necessary safety approvals for your market and any updates to those approvals.

Once your review is complete, you are ready to make your selection. At present time, Astrodyne has over 15000 SKU's in our portfolio, which makes it likely that designers will be able to fill their requirements with an off-the-shelf power supply. In the event that you need a modified standard or custom design, Astrodyne engineers are ready to work with you throughout the process.

Selecting a power supply is a very important step in the design cycle, by following a few simple steps it can be a very successful one.