

Cost savings with high efficiency power supplies

Ensure the power supply is not being continually stressed By Mel Berman

When selecting a power supply for your next project, beware of the pitfalls in over- and under-specifying. For example, if your system requires 200 W of dc power, it would be unwise to select a power

BY PROPERLY DERATING YOUR ACTUAL POWER REQUIREMENTS, PAYBACK IS EXTENDED OPERATION

supply that is rated at exactly 200 W because the supply would be operating

at 100% capacity, thereby stressing the electronic components, and will likely fail prior to, or very shortly after, the warranty period.

A good rule is to derate your actual power requirements by 10% to 20% to ensure the power supply is not being continuously stressed. Your payback will come in the form of a trouble-free and extended period of operation. Moreover, in this example it would be wise to specify a power supply that is rated at about 250 W.

Another point to consider is to select a power supply vendor that employs conservative component deratings in the design of their power supplies. This means they design their power circuits so that components, such as semiconductors, capacitors,

inductors, etc., are never stressed to their maximum ratings. Sadly, many offshore power supply vendors that sell low-priced products often design their power supplies such that the internal components are working at their maximum ratings. These low-cost supplies are less expensive initially, but when the total cost of ownership is considered, the added cost of a single premature field failure can end up eroding what seemed like a cost-savings in the beginning.



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On the other side of the proposition, you don't want to over-specify by employing a 400 W supply when your system will need 200 W maximum. Yes, the over-sized supply will provide an extended lifetime, but the efficiency of your system's operation may suffer and your initial costs will be higher. As you know, operational efficiencies are very important these days for product promotions as being "green," earth-friendly, as well as to meet the ever evolving environmental standards. Most standard power supplies are not as efficient with a 30% (or less) load as they are with a 90% load.

For example, the efficiency of a typical 400 W ac-dc power supply might be only 78% with medium loads, but will increase to 85% when fully loaded. This efficiency improvement of 7% may not seem like much, but if it did not occur, there would 42 W of additional wasted power/heat developed within the power supply. In many instances, the heat generated by inefficiencies must be removed by means of fans, which require extra power to operate, and, because they are electromechanical devices, reduce the MTBF of the overall system.

Mel Berman is Product Marketing Manager, TDK-Lambda Americas. More information about the HFE series of rack mountable high-efficiency front-end power supplies is available at this web link: <http://ow.ly/a6CX3>.

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