

**Comments on Draft 1 Version 2.0 EPS Specifications for Energy Star
from Delta Electronics, Inc.**

Draft 1 version 2.0 of Energy Star Specifications for external power supplies requires a true power factor of 0.9 or greater when measured at 100% of rated output power for power supplies with a nameplate output power greater than or equal to 75 W.

Currently, the manufacturers of universal-range external power supplies follow European regulation EN 61000-3-2, which only specifies the line-current-harmonic limits. The majority of today's external power supplies that meet the EN61000-3-2 specifications are designed by employing an active PFC technique and exhibit typically a power factor of 0.85 or greater across the entire line range when measured at 100% of rated output power. Generally, external power supplies that employ simple and cost-effective active PFC techniques exhibit slightly lower power factors compared to more sophisticated and expensive active PFC techniques. Both techniques show a better power factor at 115-V line than at 230-V line at a given output power level.

In fact, the proposed power-factor requirement would eliminate simple and cost-effective active PFC technologies from being employed in a vast number of external power supplies because these simple active PFC techniques are typically applied in external power supplies with a rated power below 120-150 W. In addition, the migration to more complex active PFC circuits capable of meeting the proposed power-factor specification would significantly increase the cost. Furthermore, it is also unclear what would be the energy savings from mandating the power factor of 0.9 or greater at 100% load because external power supplies that meet the EN61000-3-2 specifications already have a power factor that is typically greater than 0.85. In addition, external power supplies such as notebook and printer adapters rarely work at or even close to full power, i.e., most of the time they operate at a partial load well below the full load.

Finally, a harmonization with other international specifications as the rationale for including the power-factor specification does not seem plausible. To the best of our knowledge, none of the international specifications for external power supplies define the power factor. Generally, the power factor is specified for high-power power supplies such as desktop, workstation, and server power supplies that operate at significantly higher power levels than the external power supplies.

Therefore, Delta Electronics, Inc. is **against** the proposed power factor requirement in the EPA 2.0 Energy Star specifications. In fact, Delta's position is that:

1. Power factor **not to be specified** for external power supplies at any power level since external power supplies meeting the EN61000-3-2 line-current-harmonic limits already exhibit a high power factor; or

2. **Change** the proposed power factor specification from 0.9 or greater to 0.8 or greater when measured at 100% of rated output power to exclude external power supplies with a particularly low power factor (typically, those with no PFC circuit and/or those with a passive PFC circuit) without affecting external power supplies that use active PFC techniques.

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