# Reference Design for 40W and 80W Printer Power Supplies

ON Semiconductor unveiled a GreenPoint reference design for 40W power supplies used to power desktop printers. The design is a blueprint for engineers working on power adapters that provide both low active-mode and low standby-mode power consumption. Providing active-mode energy efficiency above 83 percent when delivering an output power between 5W and 40W, this reference design achieves a no-load power consumption of >150 mW. Typical 40 W printers in use today consume on average 450 mW in similar conditions. The frequency foldback technique implemented in the design, keeps the efficiency of the power supply very high under light load conditions. The combination of these characteristics makes this GreenPoint reference design compliant with stringent requirements from Energy Star to the Group for Energy Efficient Appliances (GEEA) via the US Executive Order "1-Watt Standby" Order and the Japanese Eco Mark program. The new 40W reference design enables a peak power of 80W to be transiently delivered. An over power protection below 100W has been implemented for the entire input voltage range (88V to 265V AC) to comply with the Limited Power Source (LPS) test. In addition, the design uses a smaller bulk capacitor than those typically utilized in 40W power adapter designs with similar performance, according to the company. The enabling device for the 40W reference design is the NCP1351, a current mode controller targeting low power off-line flyback switched mode power supplies (SMPS). Based on a fixed peak current technique (quasi fixed $T_{ON}$), the controller decreases its switching frequency as the load becomes lighter. As a result, a power supply using the NCP1351 naturally offers desirable no-load power consumption, while optimizing the efficiency in other loading conditions.
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