

Power over Ethernet: New Applications Every Day



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Tom Brady just threw his 400th touchdown pass in 13 NFL seasons. Similarly, I just completed my 400th Power over Ethernet (PoE) power supply reference design, the first of which I designed 13 years ago.

Okay, the two records are not exactly comparable, but it is a major milestone for a power supply designer nonetheless. It is amazing all of the applications customers can imagine: IP phones, security cameras, wireless access points, home automation, point-of-sale terminals - the list goes on.

The original IEEE802.3af specification limited sourced power to 15W. This was sufficient for a while, but customers demanded more power, so the 802.3at specification increased the sourced power to 30W. There are also customers who go the other way and want less power and minimum size. Some customers want isolation, some don't. Cost is important to some, while efficiency is important to others. You can begin to see why I have done so many PoE power supply designs! A few of my most recent designs include:

- [Class 1 Non-Isolated Buck Converter \(5V/560mA\) for PoE PD Applications](#). Low cost and small size.
- [Isolated Fly-Buck Power Module for PoE Application](#). Primary-side regulation in a System-in-Package (SiP) module format.
- [Class 4 High-Efficiency Driven Flyback Converter \(5V/5A\) for PoE PD](#). Synchronous flyback converter with 90% efficiency.
- [Class 4 PoE High Efficiency Active Clamp Forward Converter \(3.3V\)](#). Active clamp forward converter with 90% efficiency.
- [UPOE High-Efficiency Flyback Converter \(19V/2.3A\) for Forced 4-Pair PoE PD Apps](#). Universal Power Over Ethernet (UPOE) synchronous flyback converter with 19.5V/2.3A/45W output.
- [Non-Standard \(>25.5W\) PoE – High Efficiency Forward Converter \(12V@5A\)](#). Link Layer Discovery Protocol (LLDP) active clamp forward converter with 12V/5A/60W output.

If one of these designs isn't what you need, you can find any PoE TI design optimized for cost, size or performance. My colleagues developed a widget to make it easy to search for the most popular and useful designs in the [TI Designs reference design library](#) by inputting common PoE criteria such as class, converter topology, output voltage, output current and isolation requirements. You can narrow down or broaden your search by including or omitting certain criteria. The results of your search will yield a list of reference designs geared toward your power requirements and links to the product pages of each reference design. The product pages contain all of the technical information you need for your design, such as schematics; BOMs; Gerber files; and a test report that showcases the performance of the design, like efficiency and transient response. This will reduce your design cycle and get you to market faster.

For some time now, I have provided non-standard designs that exceed the 30W sourced power limit. The IEEE802.3bt standard will be released soon and will provide standard power levels up to 90W sourced. Texas Instruments has been on the Institute of Electrical and Electronics Engineers committee developing this new standard (as well as the previous .af and .at standards), so we will be ready with new products and reference designs that comply with the standard when released.

Tools & Software for Power Over Ethernet (PoE)/LAN Solutions

- ✘ [Class 3 5V/2.3A High Efficiency Synchronous Flyback Converter for PoE Application](#)
- ✘ [Class 3 - Low Cost 12V/1A Flyback Converter for PoE Applications](#)
- ✘ [Class 4, Efficiency-Optimized, Flyback Converter for PoE Applications](#)
- ✘ [Non-Standard \(>25.5W\) PoE - High Efficiency Forward Converter \(12V@5A\)](#)



PoE Power Reference Designs

Select your design requirements to get your results

Select a class

Select a topology

Output Voltage V

Output Current A

Isolated Non-isolated

Get Results

Additional Resources

- [Discover PoE power-supply designs](#)
- [May the forced UPOE be with you](#)

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