



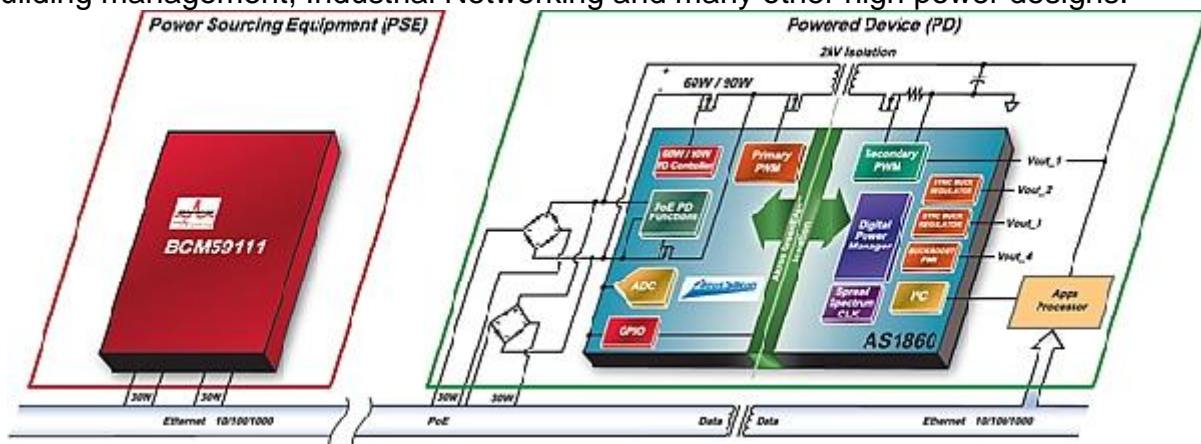
# Akros silicon SoC supports 60W and 90W PoE applications

Steve Taranovich - April 3, 2013

***Next-generation AS1860 with GreenEdge™ digital isolation technology offers the industry's first single-package solution for higher power PoE Powered Devices.***

EDN met with Akros vice president of marketing, James Ashe at APEC 2013. We discussed this digital isolation technology which ranges from 2kV to 4 kV and enables SoC integration in bulk CMOS. I was quite intrigued with this feisty, creative and innovative company. Keep a close eye on them, there is some good talent there, led by some really good board member leadership with proven electronics and semiconductor track records.

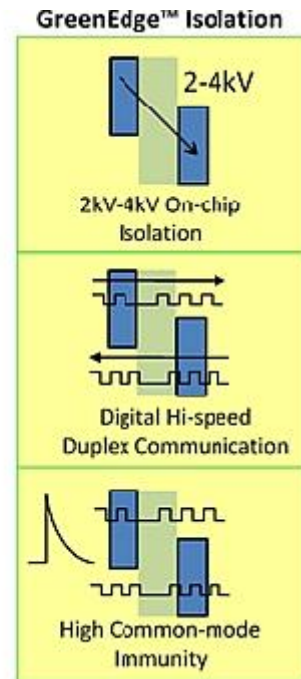
**Akros Silicon Inc.** developed the AS1860, the newest member of the company's **GreenEdge™** family of system-on-a-chip (SoC) energy management ICs. The IC is equipped with Akros' proprietary GreenEdge digital isolation technology and is suited to support deployments of 60W and above Power over Ethernet (PoE) Powered Device (PD) applications such as thin clients, monitors, industrial Ethernet, IPTV, building management, Industrial Networking and many other high power designs.



## A block diagram of the system with AS1860

### GreenEdge™ technology

- **On-Chip Digital Isolation (2kV-4kV)**
  - Enables SoC integration in bulk CMOS
  - System design optimization, elimination of Optos
- **High-Speed Duplex Communication**
  - Breaks architectural barrier in power-system designs
  - Enables architecture that has better efficiency, lower EMI/noise, lower cost and enables platform level value added features
- **High Common-mode Immunity**
  - Error-free communication under severe FMC/UII stress
- Learn more at GreenEdge Technology & Benefits
  - <http://www.akrossilicor.com/content/greenedge>



This single-package solution offers high efficiency and reliability as well as low system costs and board real estate.



Traditional Designs



Board Area  
~ 6700mm<sup>2</sup>



- Efficient
- Small
- Simple

AS18x4 based design  
Board area ~ 1620mm<sup>2</sup>  
75% size reduction

Significant board footprint reductions are achieved by the Akros SoC

The solution SoC offers the following features:

- Dynamic power-level adjustment (to 60W and above) without using opto-couplers and their associated complex compensation networks
- Higher power conversion efficiency due to communication across the isolation barrier
- More accurate output-voltage sensing using a resistor-divider sensor on the secondary side



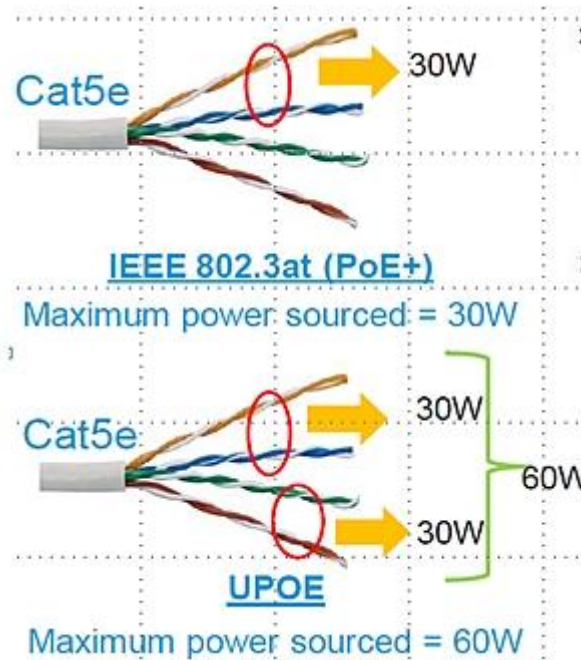
**A high level of integration of the full PoE solution is achieved by the Akros architecture on SoC**

Other existing approaches to higher power (60W and above) PoE deployments require multiple components, such as two or three power management ICs, several opto-couplers and custom transformers. In addition to adding component cost, consuming board space and increasing design complexity, these approaches are vulnerable to shoot-through issues and losses due to rectifier diode and reverse recovery. Akros' approach can accommodate 60W and above PoE applications using just two components: one AS1860 SoC and one external FET. Moreover, by integrating GreenEdge digital isolation, the AS1860 enables the implementation of many advanced diagnostic and high-voltage telemetry features that allow operators to remotely manage power, which in turn enhances reliability and energy efficiency.



60W and above PoE deployments are coming soon and are expected to transform next-generation enterprise workspaces.

### Why 60W PoE?



$$\text{Cable Loss} = I^2 \times 12.5\Omega \text{ per pair}$$

For the same current, R is halved using 2 pairs, so power loss in the cable reduced by a factor of 2

**60W PoE advantages are obvious**

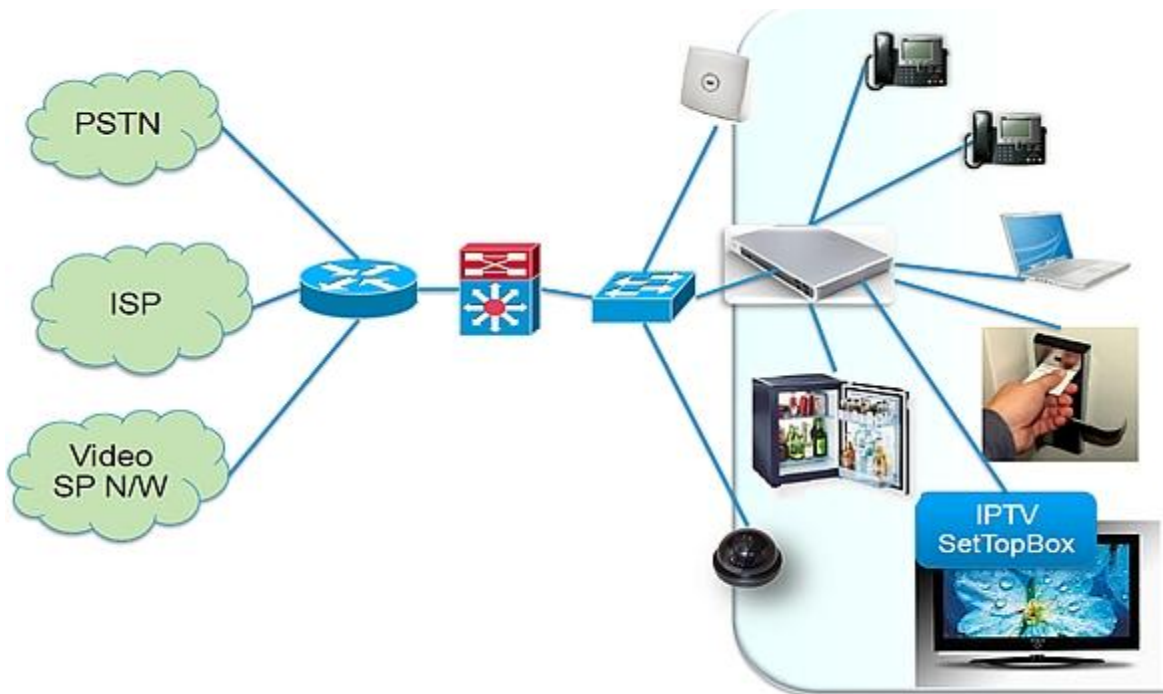
### How much power can a 4-pair system save?

Parameter	Value
Nominal Voltage	48 V
Average PD Power	10 Watts
Link nominal Resistance	12.5 Ohms (over nominal length)
Link nominal Length	100 meters
Average Link length	50 meters
Hours in a Year	8760 Hours
Cable loss/PD	0.271 Watts
Cable loss/PD/Year	2376 Watt-Hour

Assuming 100 million PD's deployed, 2 pair system – 237 Million kW-hr wasted

4-pair system will save 120 Million kW-hr

**Power savings by implementing a 4-pair system are significant**

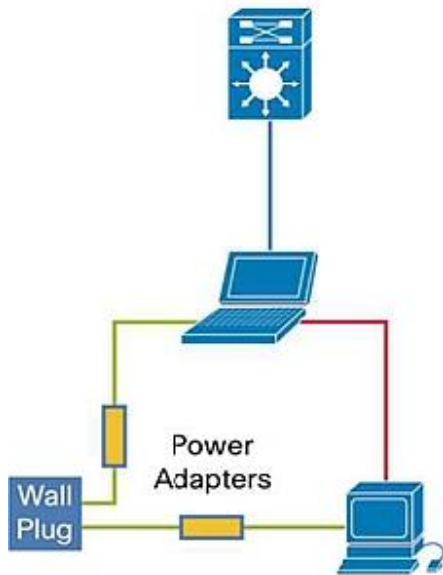


**60W PoE Eliminates need for Power at each Connected Appliance**

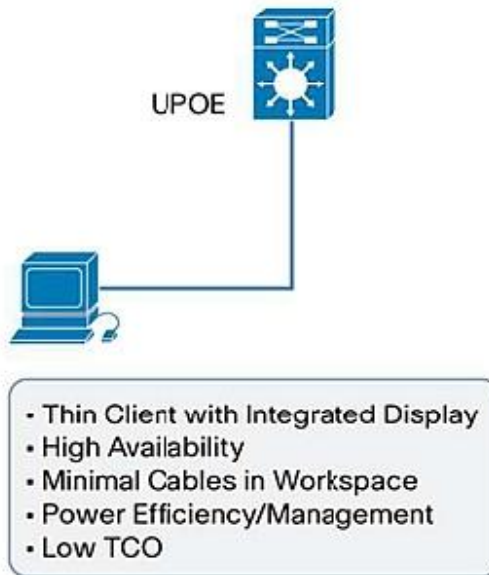
**60W PoE applications**

**The thin client**

Current Workspace Architecture



Next Generation Workspace Architecture



**A thin client approach is now easily achievable**

The AS1860 SoC is offered in a RoHS-compliant, 64-pin 9x9 QFN package. It is priced starting at \$4.69 per unit in 3K quantities.

For more information go to the Akros [website](#)