

Smoothing the Migration to the PD64012

Introduction

More companies are making the switchover from the PD64008 integrated circuit to the new PD64012 PoE Power Manager during the coming year, as PowerDsine™ introduces a family of new products. To ease the migration, PowerDsine offers a number of tools and resources, from customer support and training, to reference materials and guides.

Coverage

The new PD64012 is mounted directly on motherboards or is part of pluggable DIMMs. Either way, the new device provides a simpler and more cost-effective method of integration, since most functionality is built-in, requiring a minimal number of external components. Along with the PD64012, PowerDsine supplies a micro-controller unit, the PD63000. These two new devices form a Chip Set.

Concepts

The migration to the new devices is channeled in one of two directions:

1. As part of a overall design for the switches motherboard
2. As easily-integrated modules (DIMMs), that include almost all PoE required components, on-board.

In both cases the interfacing with the switch, remains identical to that previously used with the PD64008 IC and PD66000 Micro-controller Unit (MCU). The designer only has to deal with the new chip layout and match it to the overall circuitry. Once the physical integration has been completed, the same software is used as for the PD64008.

Customer Care

PowerDsine maintains a capable staff of support engineers, extremely knowledgeable in the technical ins and outs of the devices manufactured. Coverage is worldwide. Support includes, as applicable, and is not limited to:

- In-house training, both at PowerDsine's headquarters and at the customer's location
- Close assistance during the design and integration phase
- Verification of the design
- Technical support after fabrication to resolve both hardware and software difficulties.

Reference Materials and Guides

A number of documents are made available to the designer in order to facilitate his tasks. These are in the form of application notes and technical notes. The documents address specific subjects, related to the Chip Set (PD64012/PD63000) or to the DIMM family (PD670xx).

Chip Set Material

- *12-channel PoE Manager, PD64012 data sheet:* contains a description and configuration; overall and specific characteristics; pin description and block diagram explanation; package information and applications.
- *PoE Micro-controller Unit, PD63000 data sheet:* this MCU is a Motorola unit, [pre-programmed by PowerDsine](#), to operate in a PoE environment. The document provides specific data useful to the integration of the MCU in a PoE system.
- *Layout Design Guidelines for PoE Systems, AN-128:* this application note includes familiar material on isolation and termination. Specific layout guidelines on location within a switch, ground and power planes layout, conductor details and routing are defined in great details. Since the PD64012 is outfitted with a thermal pad for cooling, full instructions are given for the design of the PCB matching pad.
- *Designing a 48-port Enhanced PoE System:* for this effort, two documents have been released: one for UART (RS-232) interface and one for I²C interface. Aside the interface differences which are fully detailed in the respective application

notes, both documents are similar. Note that AN-129 (UART) and AN-130 (I²C), both provide general and detailed circuit explanations, down to component level, complete schematics for the entire 48-port design and a complete parts list to ease the acquisition task. The designer should note that the circuits provided have been checked and approved for direct integration into a switch.

- *Designing a 48-port PoE System*: for compact systems, requiring 48 or less channels, only a single PD64012 device is necessary. AN-131 includes similar information as that provided in other application notes: circuit description, detailed analysis, electrical schematics and parts list. All data essential to integrate a PoE system into a moderate-size switch.

DIMM Material

- *12/24-channel PoE DIMM, PD670xx data sheet*: contains a description and configuration; overall and specific characteristics; operating conditions and temperature graphs; pin designation and

description, and block diagram explanation; package information for the device.

- *Layout Design Guidelines for PoE DIMMs, AN-132*: the efforts here are simplified, by having almost all components on the module. Guidelines for interfacing and isolation and termination of the modules to the rest of the switch. Conductor routing and requirements, as well as grounds separation and structure are explained here.
- *Designing with PoE DIMMs, AN-133*: this document covers the functional analysis of the DIMMs, in order to understand its internal operation, both in enhanced and in auto modes. Detailed descriptions of the important pins are given as typical connection examples. Detailed and complete schematics can be used on a one-to-one basis. Finally, complete parts listing ties up the package.

Comparison of Features

The next table illustrates the features of the previous generation (PD64008) with the newer PD64012.

	PD64008	PD64012 Enhanced mode	PD64012 Auto mode
Port Count	8 ports	12 ports	12 ports
Package	44 pins TQFP	64 pins LQFP	64 pins LQFP
Footprint	12 x 12 mm	10 x 10 mm	10 x 10 mm
Detection Methods	<ul style="list-style-type: none"> • 802.3af • Legacy • Cisco PDs 	<ul style="list-style-type: none"> • 802.3af • Legacy • Cisco PDs 	<ul style="list-style-type: none"> • 802.3af only
Supply Voltages	5 V, 3.3 V	48 V	
Technology	CMOS 0.35 μm	SMARTMOS 8 0.25 μm	
Port Count	Up to 48 ports		
External Component Count (48-port solution)	About 1000	Less than 350	
48-port space	30.7 in ²	10.2 in ²	Less than 10.2 in ²
FET switches	External	Internal	Internal
Host Interface	I ² C or UART		I ² C
API	Command-based	Command-based (compatible with PD64008)	Register map-based
Power Management	Power limit-based	<ul style="list-style-type: none"> • Power limit-based • Classification-based • Power limit & classification-based 	Power limit-based
Power Banks	Up to 7 budgets		Single budget
Thermal Protection	None	Two-level temperature disconnect and temperature monitoring and reporting	
Features	<ul style="list-style-type: none"> • 802.3af • Legacy detection • Port matrix • LED support • Power banks • Power management 	<ul style="list-style-type: none"> • 802.3af • Legacy detection • Port matrix • LED support • Power banks • Advanced power management • Thermal protection 	<ul style="list-style-type: none"> • 802.3af • Power management • Thermal protection



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Revision History

Revision Level / Date	Para. Affected	Description
1.1 / 27 May 04	Introduction	Formatting only
	Table of Comparisons	Deleted 48 V from the PD64008 supply voltages
1.2 / 23 June 04	Various	Minor corrections

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