

DP83016AUG - Falcon Switch 16-port Gigabit Ethernet Switch Engine

General Description

The DP83016 (Falcon switch) is a wirespeed, full featured 16-port Gigabit Ethernet Switch-On-a-Chip with several integrated management interfaces, which supports both, copper and optical PHYs.

The DP83016 provides non-blocking, wire-speed Gigabit performance on all ports and supports both managed and unmanaged operation.

The DP83016 minimizes total system cost. It offers the most cost effective 16 port Gigabit switch solution in the market by removing the need for external memory. Furthermore, it eliminates the requirement for a configuration EEPROM.

An on-chip 256kB frame buffer allows for an extremely simple system design.

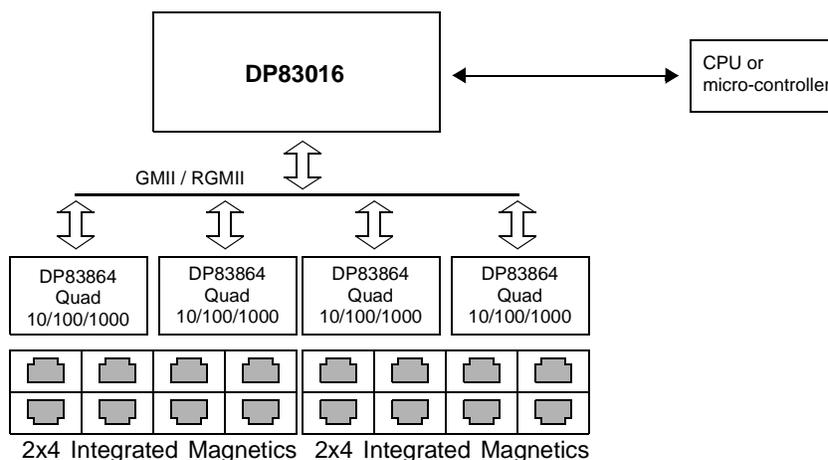
Using only two DP83016 devices, 24-port Gigabit Switch designs are possible.

The DP83016 forwards frames at layer 2 based on information from layer 2 through layer 4. It supports programmable classification and prioritization to enable enhanced Quality of Service (QoS) support for real time applications such as Voice-over-IP (VoIP).

Features

- 16 10/100/1000 Mb/s Ethernet ports with non-blocking wire-speed performance
- 32 Gbit/s internal switching bandwidth, 24 Mpps forwarding rate
- MII / GMII / RGMII operation for copper PHYs, TBI / RTBI interface for fiber / SerDes
- 4-wire serial CPU interface for low cost unmanaged systems
- 16-bit CPU interface for SNMP and Web based management
- 256 kB on-chip frame buffer
- Programmable classifier for QoS (Layer-4/Multi-media)
- 4k VLAN (IEEE802.1Q) and 4k MAC address support
- Full duplex flow control (IEEE802.3x) and half duplex back pressure
- Flexible link aggregation based on IEEE802.3ad
- Spanning Tree Protocol support (IEEE802.1D)
- GARP, GMRP and GVRP support
- IGMP Snooping supported
- Extended statistics for RMON IEEE 802.3z TBI
- JTAG (IEEE 1149,1-1994) support

System Diagram



Targeted at desktop/workgroup LAN connectivity, the DP83016 offers new levels of integration and performance for Gigabit Ethernet switch applications.

The DP83016 maintains the ability to provide non-blocking wire-speed Gigabit performance on all ports. The internal switching engine can process 32 Gbit/s and forward 24 million packets per second (Mpps).

The scalable and modular design makes it possible to build a 16-port or 24-port Gigabit switch using only 1 or 2 devices, respectively. Each port can be configured as tri-speed port for copper PHYs using (R)GMII or for optical transceivers using (R)TBI.

The on-chip switching engine with filtering/forwarding functions and queueing capabilities eliminates any requirements for external memory devices in the system design.

The DP83016 makes unmanaged designs possible by utilizing a low cost micro-controller for configuration and monitoring purposes - this is accomplished using a simple serial interface.

Additionally, the DP83016 delivers the ability to make managed designs with a 16-bit parallel CPU interface. This enables web based or SNMP management. With enhanced support for routing protocols such as GARP, GMRP, GVRP and IGMP snooping the DP83016 is an ideal choice for future switch applications.

The Layer-2 switching engine provides full wire-speed automatic MAC address learning. The chip also supports programmable higher layer classification and prioritization to enable enhanced Quality of Service (QoS) support for real time applications such as VoIP.

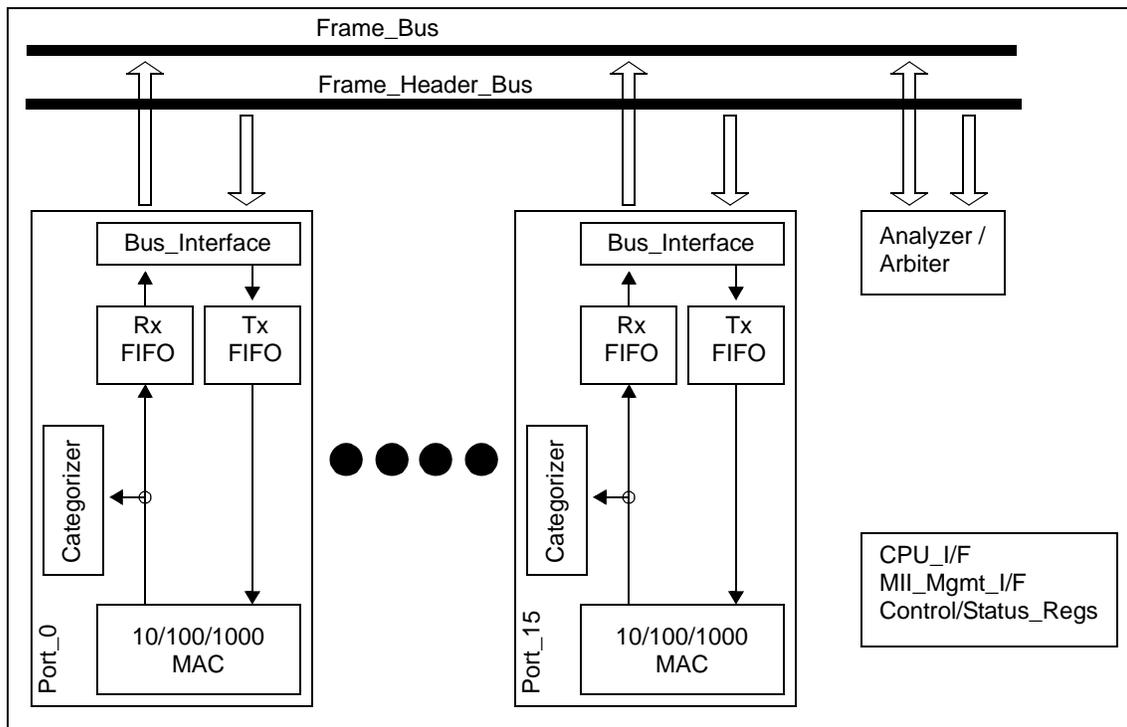
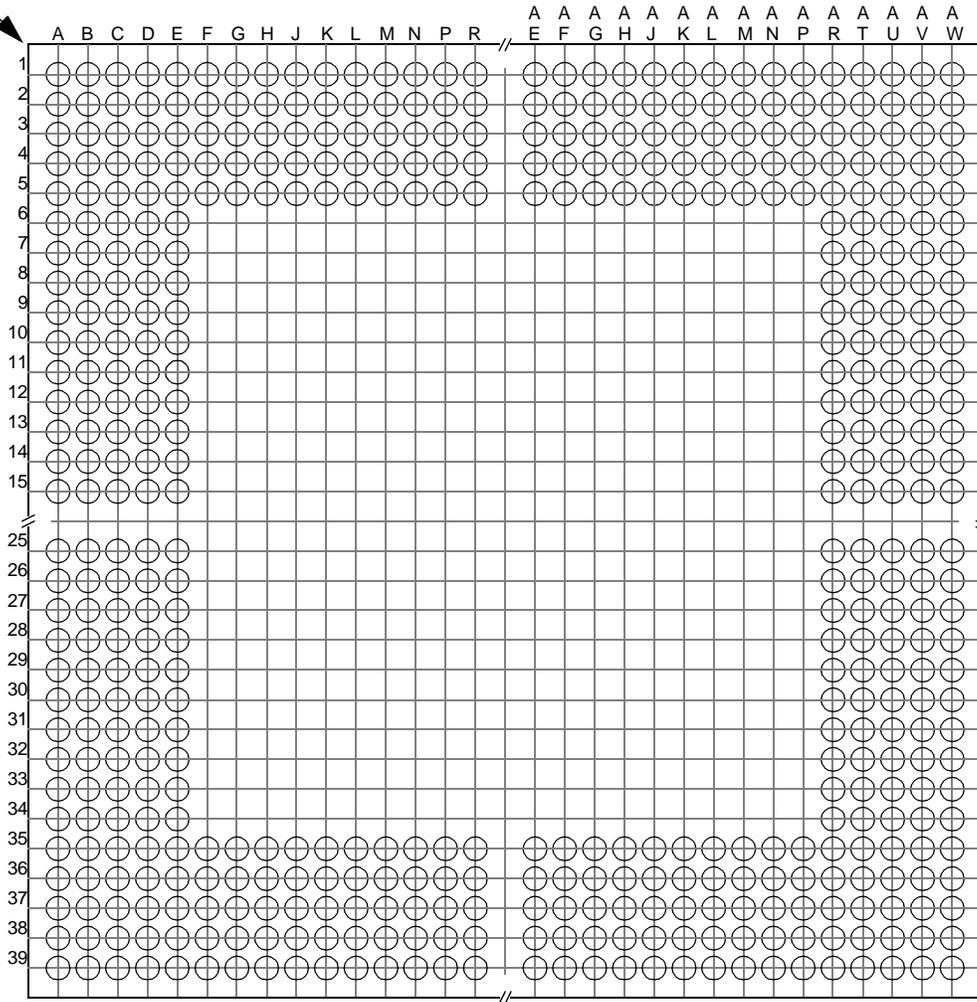


Figure 1. DP83016 Block Diagram

1.0 Pin-out

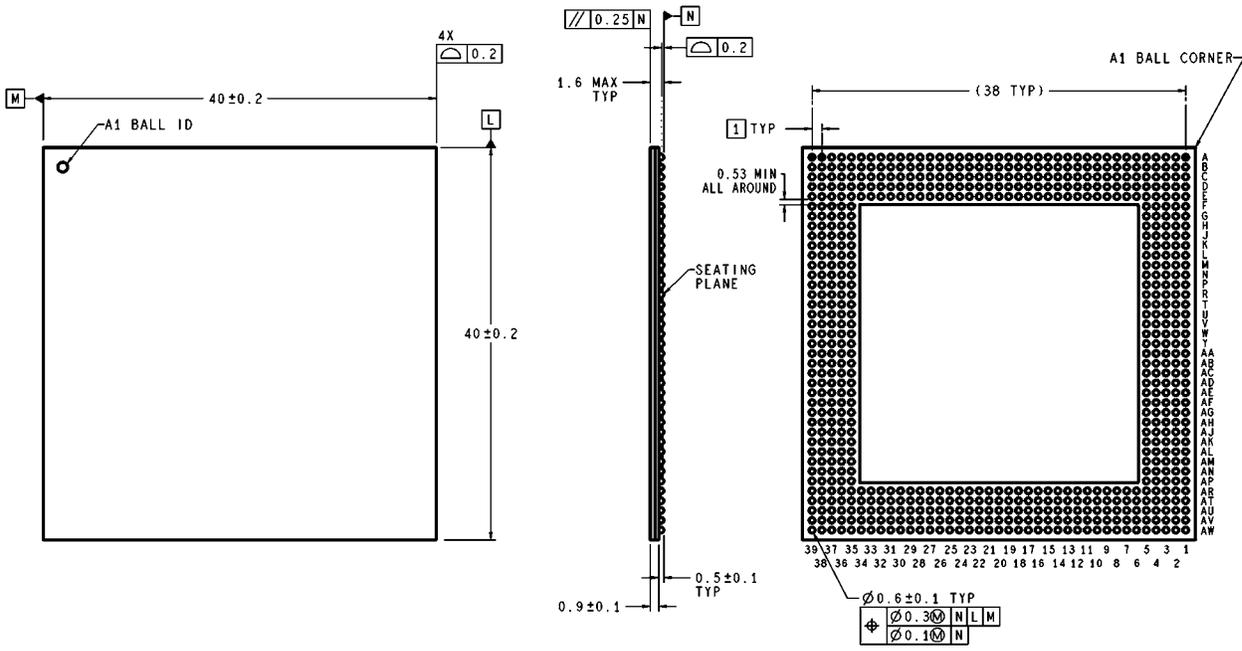
1.1 680 pin BGA Pin Layout

Alignment mark



DP83016
(Bottom view)

Physical Dimensions inches (millimeters) unless otherwise noted



DIMENSIONS ARE IN MILLIMETERS

UGC680A (Rev A)

TSBGA Package
Order Number DP83016AUG
NS Package Number PUGC680A

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National Semiconductor Corporation
 Americas
 Tel: 1-800-272-9959
 Fax: 1-800-737-7018
 Email: support@nsc.com

National Semiconductor Europe
 Fax: +49 (0) 180-530 85 86
 Email: europe.support@nsc.com
 Deutsch Tel: +49 (0) 69 9508 6208
 English Tel: +44 (0) 870 24 0 2171
 Francais Tel: +33 (0) 1 41 91 8790

National Semiconductor Asia Pacific Customer Response Group
 Tel: 65-2544466
 Fax: 65-2504466
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 Tel: 81-3-5639-7560
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