

Industry's First Broadband Passive Optical Networking System-On-Chip

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AUSTIN, Texas – June 21, 2004 – Freescale Semiconductor, Inc., a wholly owned subsidiary of Motorola, Inc., has unveiled the industry's first system-on-chip (SoC) solution for broadband passive optical networking (B-PON). Freescale's advanced SoC device—the MPC8340BPON—integrates Freescale's e300 core (a PowerPC® processor core design), a B-PON media access controller (MAC), Ethernet MACs, and a clock and data recovery (CDR) unit on the same chip.

The MPC8340BPON provides an integrated solution for internet protocol (IP) services designed to minimize system-level cost through silicon integration and reduction of the number of discrete memories required by optical network termination (ONT) systems. Freescale's standards-based approach also supports end-to-end interoperability for applications such as mass deployment of fiber to the premises (FTTx) networks in Japan and other countries deploying IP-based services.

According to the research and consulting firm RHK, Inc., FTTx networks passed approximately 894,000 homes worldwide by the end of 2003. PON systems comprised about 40 percent of those network deployments, and 26 percent were B-PON deployments. FTTx deployment remains especially strong in Japan where the cumulative number of FTTx subscribers recently topped one million, with 80,000 new subscribers a month signing up for the service, according to Japan's Ministry of Public Management, Home Affairs, Posts and Telecommunications.

“We currently use Freescale’s MC92701 B-PON device with a PowerQUICC II™ processor. Combining B-PON functionality from the MC92701 with Ethernet MACs and a processor platform is ideal for today’s cost-sensitive market,” said Motoyuki Nakamura, General Manager of the Communication Networks Center at Mitsubishi Electric Corporation. “Using a single-chip B-PON SoC reduces silicon cost, and therefore the bill of materials, for optical network termination at the subscriber’s premises. Ultimately, Freescale’s integrated approach to B-PON silicon will help original equipment manufacturers and service providers broadly deploy fiber to the home in the Japan market at an attractive cost structure.”

The MPC8340BPON device is based on Freescale’s e300 SoC platform, which provides the foundation for the company’s recently announced MPC8349E PowerQUICC II Pro communications processor family. The MPC8340BPON device’s e300 core operates at 266 MHz and includes a 32KB instruction cache and a 32KB data cache. The processor platform integrates a double data rate (DDR) SDRAM memory controller, three 10/100 Ethernet controllers, dual universal asynchronous receiver/transmitter (DUART), Inter-IC (I2C) bus support, serial peripheral interface (SPI), an interrupt controller, general-purpose input output (GPIO), ATM adaptation layer 5 (AAL5) support, and UTOPIA interfaces.

The PON subsystem is based on Freescale’s discrete MC92701 interface device. The B-PON interface fully complies with the ITU-T G.983 specification, which is critical for PON system interoperability used in FTTx network deployments. The PON subsystem supports dynamic bandwidth assignment (DBA), a capability designed to enhance quality of service (QoS) in fiber-based broadband services and to enable additional services that require bandwidth peaks beyond traditional fixed-bandwidth allocations.

Freescale's B-PON SoC features integrated clock and data recovery (CDR). Integration of CDR logic provides system developers with the flexibility to use economical 2R triplexer optical modules, which helps to reduce bill of material and optical module costs. The PON subsystem also leverages Freescale's broad expertise in asynchronous transfer mode (ATM) cell processing and mixed-signal technology.

Key features of the MPC8340BPON SoC device include:

- e300 platform based on PowerPC core operating at 266 MHz
- DDR SDRAM memory controller
- Three Ethernet controllers
- 155/622Mbps downstream and 155Mbps upstream performance
- B-PON layer termination
- DBA for enhanced QoS control and peak bandwidth allocation
- Integrated phase-locked loop (PLL) and CDR
- ATM cell processing with full operation, administration and maintenance (OAM) support
- Four classes of QoS buffers, all five types of traffic containers (T-CONTs)
- IEEE 1149.1 compliant JTAG.

Leveraging Freescale's advanced process technology and manufacturing capabilities, the MPC8340BPON device is offered in the same compact, 27mm x 27mm package size as the discrete MC92701 BPON layer termination device.

The original press release can be found [here](#).

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