Mustang™ 300

Expanding the company's end-to-end fiber-to-the-home (FTTH) semiconductor portfolio, the Mustang™ 300 ASSP is a fully integrated, single chip, mixed-signal protocol processing solution for gigabit Ethernet Passive Optical Network (EPON) ONU applications. This highly-integrated and low power FTTH solution is ideal for service providers deploying EPON in customer premise equipment (CPE), enabling the delivery of premium Triple Play services such as bandwidth-intensive IPTV.

Raising the bar on performance, Mustang 300 supports traffic management, classification and filtering for up to 256 multicast groups, and up to eight different service types, the highest in the industry. These features enable new capabilities for television entertainment including interactivity, integration with voice and data communications, personalization and value-added services while maintaining the highest quality of service.

Mustang 300 has achieved the highest level of integration available by integrating all packet buffer and program memories in a compact package, reducing the ONU bill of materials (BOM) to just five components: optical transceiver, Gigabit PHY, FLASH, power supply, and Mustang 300. Furthermore, the chip is accompanied with a robust software package with API and reference design that can be used 'right out of the box' to build a full-fledged ONU. This alleviates the need for systems vendors to develop customized hardware or software, leading to a significantly lower development cost and an accelerated time to market.

The Mustang 300 simplifies service provider deployments by being fully interoperable with a variety of vendor solutions and supporting a full range of protocols and relevant standards including IEEE 802.3ah to ensure error-free, low latency, bandwidth efficient data transmissions over EPON networks.

Mustang 300, combined with Centillium's Colt™ Optical Line Terminal (OLT) SoC and Zeus 2™ burst-mode transceiver, strengthens the company's market position as the only silicon vendor with complete, end-to-end EPON solutions for the 'last mile'. Furthermore, the integration of these optical SoCs with Centillium's award-winning Arion™ VDSL2 and Atlanta™ VoIP technologies provides systems vendors and service providers with comprehensive fiber-to-the-node (FTTN) and fiber-to-the-building (FTTB) solutions, enabling reduced costs and operational complexities and rapid time to value.

the edge in broadband™

Features

- Full compliance with the IEEE 802.3ah specification
- Single-chip, mixed-signal solution for ONU
- Components integrated:
  - EPON protocol processor
  - CDR and SERDES on PON interface
  - 1 Mbyte internal packet RAM
  - 192 kbytes of integrated L2 Cache memory
  - MIPS CPU core with 16 kbytes D-cache and 8 kbytes I-cache

Part Ordering Information

Product	Part Number	Package
Mustang 300	CT-TPIMN04-PJ	256-pin LBGA

UNI Ports

- Two 10/100/1000 Base-T ports with GMII
- Gigabit Ethernet full duplex mode
- 10/100 Ethernet full-duplex and half-duplex modes
- Auto-negotiation
- Support for both optical and copper interfaces

Bridge

- Supports IEEE 802.1d compliant bridge connecting the PON interface to the two UNI ports
- VLAN support including tagging, stacking, and IPv4 and IPv6 TOS/COS conversions
- 32 VLAN tag filters
- Support of up to eight upstream and eight downstream priority queues with classification based on VLAN tag or IP TOS or COS
- Support for up to 64 MAC addresses (static and dynamic) at the UNI with learning and filtering
- IPv4 and IPv6 support
- Configurable broadcast and multicast frame filtering, with filtering of up to 256 multicast groups
- Queue-based flow control at the UNI as specified in IEEE 802.3x, including PAUSE messages with configurable buffer threshold

CENTILLIUM COMMUNICATIONS

Mustang™ 300

EPON Protocol

- Full compliance to IEEE 802.3ah including clauses 64 and 65
- Supports SCB (single-copy broadcast)
- Complete processing and generation of the EFM (Ethernet in the first mile) specific messages (MPCP messages)
- Configurable support for upstream and downstream encryption and decryption based on AES-128 CTR mode FIPS PUB 197
- Wire-speed (1.25 Gbps) encryption and decryption
- Encryption key handshake
- Key change on-the-fly with no loss of frame
- Supports IEEE802.3ah P-to-P (point-to-point) emulation

Authentication

- Supports IEEE 802.1X authentication scheme

PMD

- Integrated SERDES and CDR for PON interface

Management

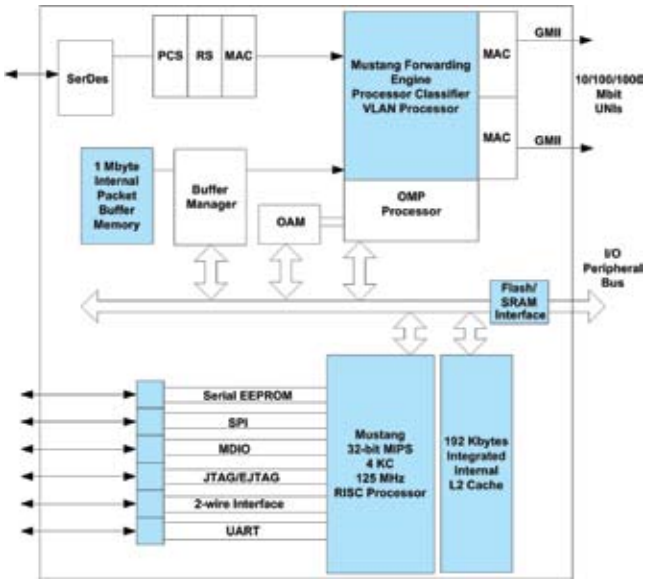
- Full compliance to IEEE 802.3ah clause 57
- Supports IEEE 802.3 and 802.3ah annex 30A management elements and enhanced elements using organization-specific OAM messages
- Remote management including:
  - Alarm detection
  - Configuration and monitoring
  - Pattern generation and detection for loop testing
  - Remote firmware download
  - Soft-reset control

Supported Interfaces

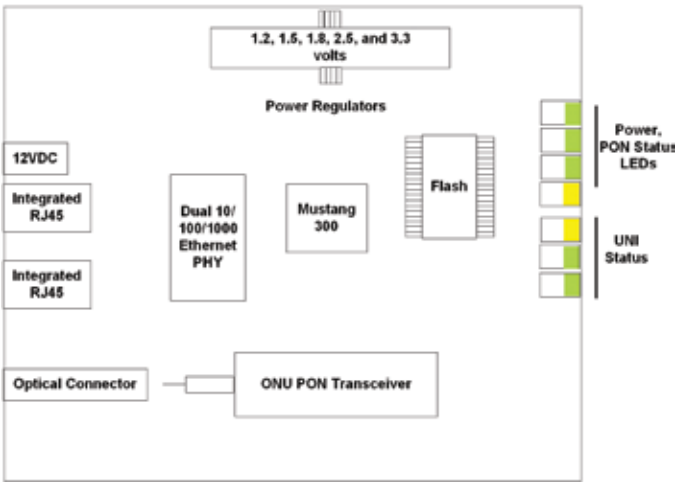
- Serial differential interface to the PON
- Two UNI interfaces capable of interfacing to 10/100/1000 Mbps Ethernet PHYs
- I/O peripheral interface
- EEPROM SPI
- GPIO and LED
- JTAG
- UART interface
- MDIO
- Two-wire interface

Application Block Diagram

The application block diagram illustrates the Mustang 300 and its interfaces. In this application, the Mustang interfaces with a bidirectional (PON) transceiver on the PON side.



System Blocks of the Mustang-Based ONU Board



The Express Logic ThreadX real time operating system is integrated into the ME300 software package.

CENTILLIUM COMMUNICATIONS

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