

# Ikanos Velocity™ A/VDSL Access Chipsets

World's Lowest Power, Highest Performance Chipset for DSLAMS, ONUs, OLTs and Broadband Concentrators

## Target Markets

- Central Office, Multi-Tenant and Multi-Dwelling units (MxU)

## Applications

- DSLAMs, ONUs, OLTs and Broadband Concentrators

## Features

- Industry leading power profile that meets or exceeds European Code of Conduct requirements
- Symmetrical performance up to 100/100 Mbps; Asymmetrical performance up to 100/50 Mbps
- Ikanos iQV™ technology for increased stability and performance supports 8, 12, 17 and 30 MHz Profiles
- Supports VDSL/ADSL2+/ADSL2/ADSL standards
- Integrated QoS capabilities
- Firmware and OS-independent APIs

## Development Tools

- Reference Designs
- Application Notes
- Complete Software Suite
- Bill of materials (BOM)



The Ikanos Velocity™ family of low-power, full-featured A/VDSL access chipsets provide up to 100 Mbps symmetric bandwidth and operate at an unprecedented sub 1 Watt (W) per port power consumption. Both the symmetric 100/100 (FX100100-6) and the asymmetric 100/50 (FX10050-6) chipsets support 8a/b/c/d, 12a/b, 17a and 30a VDSL2 profiles as well as ADSL2+, ADSL2 and ADSL standards.

Compliant with European Code of Conduct (CoC) power consumption standards, the Velocity chipsets utilize up to 30 MHz of spectrum and are IPTV-optimized to provide the ideal viewing experience for both standard and high-definition television.

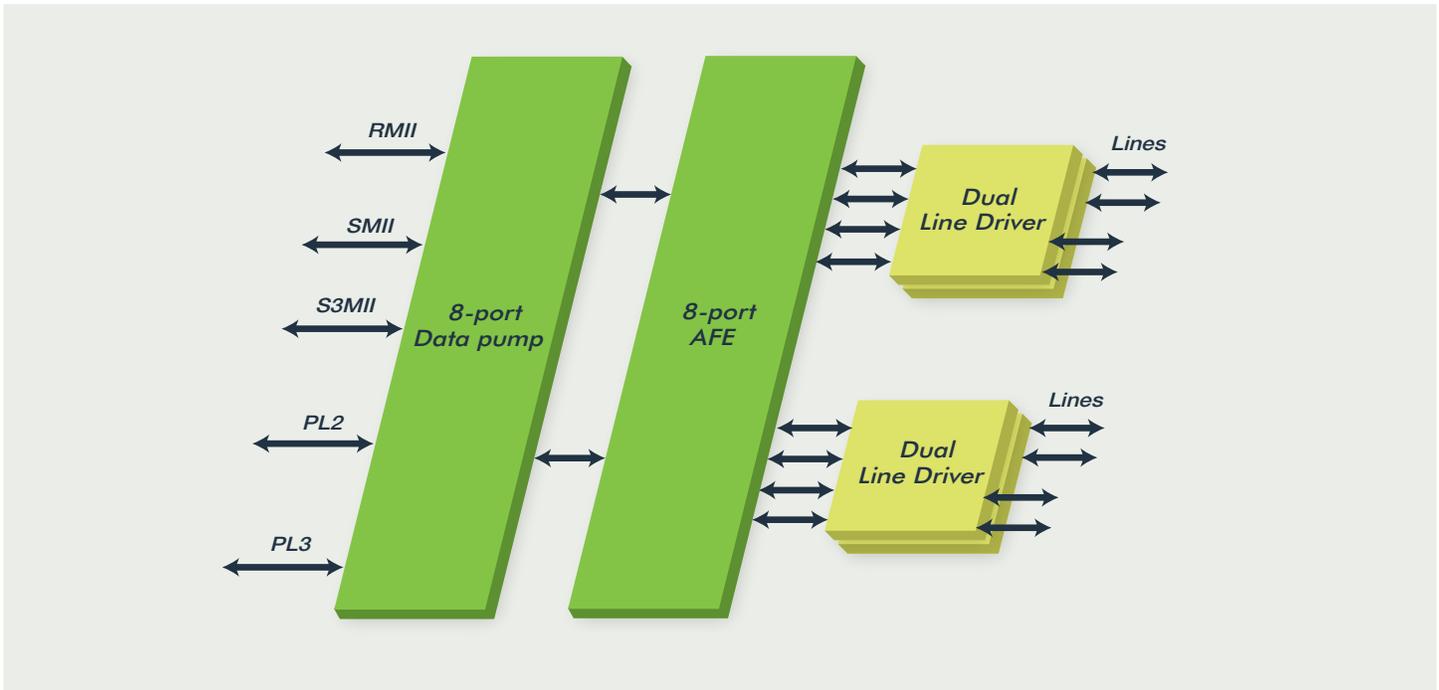
A powerful complement to fiber technology, the Velocity chipsets' highly-integrated architectures enable the design of smaller, simpler, and denser systems with fewer components.

**Industry's Lowest Power xDSL Chipsets:** Ikanos' latest generation of products have a dramatically lower power profile than previous generations. Their sub 1 Watt per port performance reduces power consumption by over 500 mw per port over previous generations of products.

**Ikanos iQV™ Technology:** Velocity chipsets include Ikanos Quality Video (iQV) technology which enables exceptional delivery of data-

intensive triple play applications, including multi-channel high-definition IPTV, high-speed data transmission, video on demand (VoD) and voice over Internet (VoIP). Ikanos iQV protects against all noise types including dynamic, impulse, repetitive impulse noise (REIN) by employing retransmission, Rapid Rate Adaptation (RRA™) and other innovative technologies. Additionally RRA technology, a combination of enhanced standard-based SOS, SRA, and Bitswap, is an automated and intelligent solution allowing service providers to enhance link robustness, reliability and availability under severe and time-varying noise environments.

**Best-in-Class Performance:** The Velocity chipsets improve ADSL and VDSL long range performance by providing additional hardware support to enhance the time domain equalization (TEQ) and also include a dedicated hardware engine for echo cancellation.



The stability and performance enhancements build upon Ikanos' industry leading central office (CO) capabilities offering on-chip classification, queuing and scheduling for enhanced QoS in IPv4 and IPv6 networks. Common attributes of both chipsets include: universal line card supporting both VDSLx and ADSLx, plug-and-play per-port multi-mode operation, VDSL long range capability with programmable upstream zero (US0), integrated adaptive hybrid for best line impedance matching, full band plan configurability for worldwide applications, and interoperability with deployed customer premises equipment (CPE). The Ikanos Velocity chipsets are software compatible to Ikanos' prior generation of CO chipsets, enabling system vendors to seamlessly migrate and take advantage of the performance and stability of the Ikanos Velocity devices.

### Key Features

Supports mandatory and optional features of the VDSL2 standard.

- Supports VDSL2 profiles
  - Fx100100-6 supports 8a/8b/8c/8d, 12a/12b, 17a and 30a
  - Fx10050-6 100/50 supports 8a/8b/8c/8d, 12a/12b and 17a
- Plug-and-play multi-mode (VDSL2, VDSL, ADSL2+, ADSL2 and ADSL) operation per port
- Full support of ITU-T G.993.2 Amendments 1-4, ITU-T G.997.1 G.Ploam and ITU-T G.994 G.hs
- Feature set optimized for triple play and IPTV including:
  - Ikanos iQV for enhanced stability and performance
    - Erasure decoding providing twice the impulse protection without increasing the delay
    - Retransmission technology (G.inp) for protection from random impulse noise, REIN, SHINE, and PEIN sources.
- Improved ADSL performance through hardware accelerated echo cancellation
  - Improved rejection of side lobes
  - Provides increased reduction in inter-symbol interference (ISI)
- Faster swapping of bits with noise margin changes
- Enhanced long-range performance through improved TEQ hardware and accelerated echo-canceller
- Low power enables sub 1W/port 17a design for significant mw/port reduction in data pump (DSP engine) power over prior generation products
- Available on-chip classification, queuing and scheduling for enhanced QoS
- QoS for IPv4 and IPv6 networks
- Support for dual latency, dual interleaving over xMII, PL2 and PL3 interfaces for interworking with low cost 10/100 Ethernet switch chips as well as high-performance network processors

- Backward interoperable with deployed CPE

## Key Features continued

- Highly-integrated chipset consists of the following:
  - Eight-port data pump (DSP engine) – a single chip data pump that integrates a framer, deframer, FFT/IFFT engines, interleaver/ de-interleaver memory and network interfaces
  - An embedded 200 MIPS processor performs control-plane and management functions for all ports. The data pump is available in different versions to support different levels of QoS.
  - Eight-port analog front end (AFE) with Integrated Front End (IFE) with variable gain amplifier (VGA), programmable gain amplifier (PGA) and filters. The eight-port AFE integrates high performance converters (DAC and ADC)
  - Two-port line driver (HLD) with integrated low noise amplifier (LNA) enables adaptive hybrid for best line-impedance matching and supports programmable drive levels from 8.5 – 20.5 dBm
  - iPOS consists of firmware and OS-independent APIs that enable easy integration into existing management software
- Enhanced power savings modes: software can turn off quad ports in data pump, and individual ports in the AFE and HLD for maximum power savings
- Standards-compliant discrete multi-tone (DMT) line coding ensures spectral compatibility with POTS, ISDN, and DSL services per T1.417 standard
- Region-specific radio frequency interference (RFI) notching
- Industrial temperature range (-40 °C to +85 °C)

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For more information, contact Ikanos.

Ikanos Communications, Inc.  
47669 Fremont Boulevard  
Fremont, California 94538

[www.ikanos.com](http://www.ikanos.com)

P +1 510.979.0400

F +1 510.979.0500

E [sales@ikanos.com](mailto:sales@ikanos.com)

