

# GEMINAX PRO ULP

ADSL2+ Central Office Chip Set  
PEF 55016 / PEF 55304



GEMINAX PRO ULP (Ultra Low Power) is the latest member of Infineon's GEMINAX ADSL/2/2+ product family. Setting new industry benchmarks with respect to port density and power consumption GEMINAX PRO ULP features a 16-channel data pump, GEMINAX D-16 PRO, and a unique integrated analog front end (AFE) and line driver, the AL4. It supports data rates up to 24 Mbit/s targeting CO, DLC, DSLAM and Multi-Service-Access applications.

GEMINAX PRO ULP enables Broadband Access equipment vendors to design ultra dense, ultra low power, lowest cost line cards that feature industry leading performance and interoperability with lowest BOM cost. This is realized by the revolutionary Class D line driver technology that reduces the power consumption of traditional linear line drivers by 35%. GEMINAX PRO ULP's two-chip architecture provides a purely digital interface between both devices, eliminating sensitive analog signals in layout critical areas of application boards. Per-channel foot print is further reduced by up to 30% making the GEMINAX PRO ULP the most cost efficient ADSL/2/2+ solution available.

Together with Infineon's VINETIC Codec/SLIC solution, GEMINAX PRO ULP facilitates migration towards integrated Voice/Data (IVD) solutions.

## Applications

- Multi-standard ADSL/2/2+ and IVD line cards for Central Office DSLAM, DLC and Remote Terminals

## Features

- 16-channel ADSL / ADSL2 / ADSL2+ data-pump
- 4-channel ADSL / ADSL2 / ADSL2+ integrated AFE and Line Driver
- Software upgradeable
- On-chip ATM TC Layer
- Support of Dual Latency
- Pseudo-STM mode via UTOPIA
- High performance 14-bit AD and DA converter
- On-chip tuned analog filter
- Power down and sleep mode support

- All memory on-chip, no external memory required
- CVoDSL support of 4 voice channels per ADSL port
- Integrated hybrid and passive components
- Automatic gain control (-2 dB, +38 dB)
- Differential analog output
- High speed serial data interface between AL4 and GEMINAX D16 PRO ULP
- Extended Temperature range -40 to +85°C

## Interfaces

- UTOPIA level 2 interface, 8 bit or 16 bit / up to 50 MHz, back-to-back cell transmission
- PCM Highway interface
- JTAG Interface
- HDLC-based Serial Control Interface (SCI) for serial communication with other devices
- Parallel host interface for connection to  $\mu$ C

## Power Requirements

- < 600 mW power dissipation ADSL mode
- < 640 mW power dissipation in ADSL2+ mode
- Power supplies:
  - DFE 3.3 V 1.5 V
  - AFE 3.3 V 1.5 V
  - LD 15 V

## Supported Standards

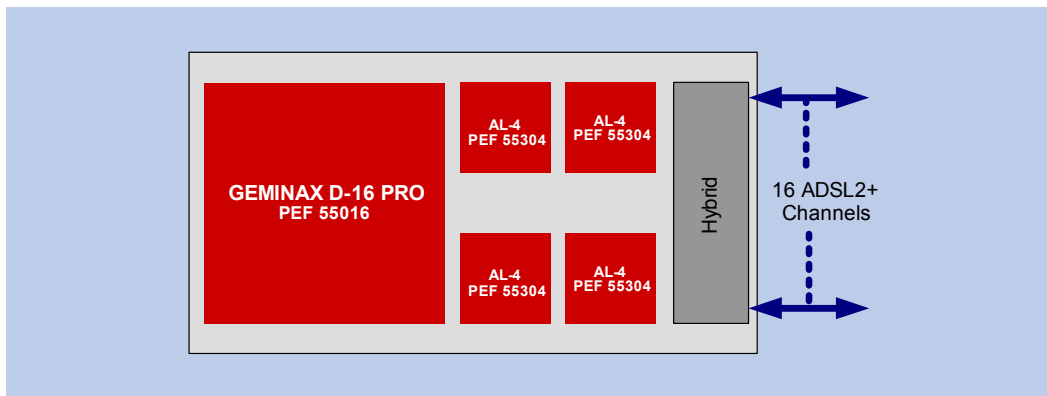
- ADSL2+ (G992.5), ADSL2 (G992.3), ADSL full-rate (G992.1), ADSL-lite (G992.2), T1.413
- Mixed mode operation supported
- DELT, G.SELT and READSL
- Optimized for TR-67 performance requirements
- Inband Management
- Enhanced framing parameters supported

[www.infineon.com/dsl](http://www.infineon.com/dsl)

# COMMUNICATION



Never stop thinking.

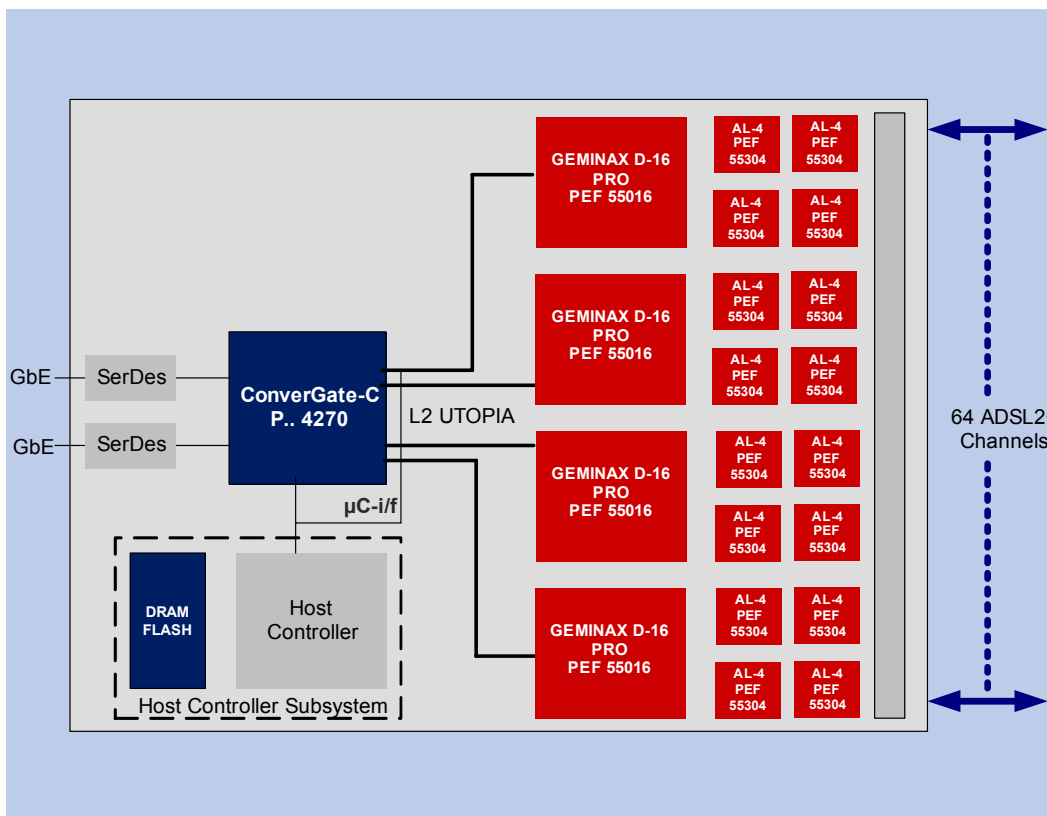


**GEMINAX  
PRO ULP**

**16-Channel  
ADSL2+ PHY**

## Product Summary

| Type            | Sales Code | Description                                        | Package       |
|-----------------|------------|----------------------------------------------------|---------------|
| GEMINAX-D16 PRO | PEF 55016  | 16-channel ADSL/2/2+ data pump                     | PG-LBGA-484   |
| GEMINAX-AL4 PRO | PEF 55304  | 4-channel ADSL/2/2+ integrated AFE and line driver | PG-LBGA-192-3 |



**Application  
Example**

**64-Channel  
Line Card for  
IP-DSLAMs**

How to reach us:

<http://www.infineon.com>

Published by  
Infineon Technologies AG  
St.-Martin-Strasse 53  
81669 München

© Infineon Technologies AG 2004.  
All Rights Reserved.

Template: pb\_tmplt.fm/4

### Attention please!

The information herein is given to describe certain components and shall not be considered as a guarantee of characteristics. Terms of delivery and rights to technical change reserved.

We hereby disclaim any and all warranties, including but not limited to warranties of non-infringement, regarding circuits, descriptions and charts stated herein.

### Information

For further information on technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies Office.

### Warnings

Due to technical requirements components may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies Office.

Infineon Technologies Components may only be used in life-support devices or systems with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system, or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body, or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.

Ordering No. B115-H8604-X-X-7600  
Printed in Germany  
PS 0505