

## Miniaturize your FPGA!

In today's digital world, more and more data gets generated and consumed. Companies that provide NextGen products are looking to significantly reduce the circuit size of their products and lower their power consumption.

Bare Die Technology is a packaging method to place an FPGA Bare Die on a Printed Circuit Board (PCB) in order to shrink the total solution size much further than what is possible with standard packaged Ball Grid Arrays (BGAs).

AimValley uses this technology to place FPGAs that normally feature 23x23mm in commercial packaged BGAs inside a 10mm width SFP. This technology can be used in any instance where size matters. Other similar space constraint applications could be sensors, camera's and SFPs.

Bare Die applications can be found in most industries, for example; Aerospace, Healthcare, Automotive and Industry 4.0.

### Functionality

AimValley makes use of the Artix and the Kintex series in Bare Die from AMD. AimValley is a selected AMD partner to process AMD Bare Dies, we can therefore, also provide any other AMD product of interest to be designed on a small module. The used technology ranges from wire-bonding to flipchip.

The modules are robust and tested according to the JESD22 requirements, which are also used for standard IC packaging tests. Being a design center for high-speed Telecom applications, AimValley supports 10Gb/s links and higher from our modules.

### Benefits of Bare Die use

The benefits of using Bare Die in embedded designs can be substantial and result in optimized integration and improved performance.

- Smaller size and weight
- Operating temperature size
- Ruggedness
- Reliability
- Shorter time-to-market
- Use of patented power reduction algorithm

## AimValley's Bare Die Technology Expertise

One of the key aspects of Bare Die technology is the use of a large-sized FPGA, that will only be available in maybe 5 years time from now in the same size but then packaged.

The latest FPGA technology is first deployed in high cost, large scale devices, before the smaller devices become available to the market.

Having the solution in bare die 5 years ahead of a package device, is a unique way to differentiate your product from the competition. When using Bare Die technology, you can have your product up & running in a short(er) period of time, while your competition is waiting for the right sized FPGA to fit the solution.

Smaller modules usually have stringent requirements in the power consumption. Our design experts are highly experienced in reducing the power consumption footprint in the FPGA code as well as in the Hardware itself.

Co-development can also be a way to develop applications. AimValley provides the base platform and the customer provides an encrypted FPGA solution. This way the IP of both parties is protected.

## AimValley proven track record

Unlike packaged semiconductors, working with Bare Die Technology creates additional complexity across multiple disciplines. AimValley has the required expertise to work with Bare Die:

- Electrical engineering (Hardware)
- Mechanical engineering
- Quality Management
- Component Selection

AimValley provides the design service and facilitates the production of the Hardware, FPGA code and software needed to operate the devices.

**Bare Die example:** these two products have the same functionality.

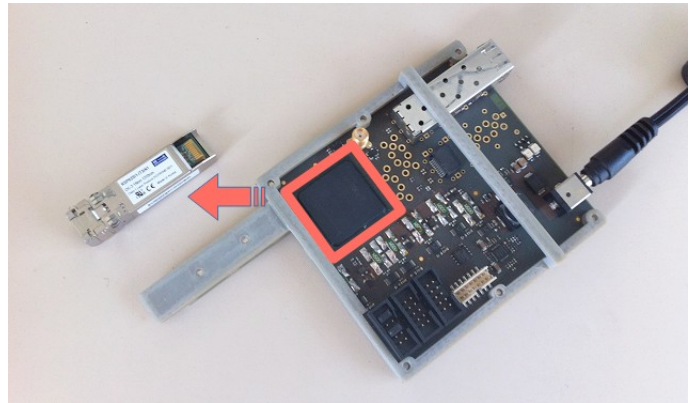


Figure 1: Size comparison Bare Die versus packaged solution

On the left side you see the SFP with the Artix Bare Die integrated in a 622Mb/s SDH to Ethernet converter and on the right side, the same solution in a commercially available package.

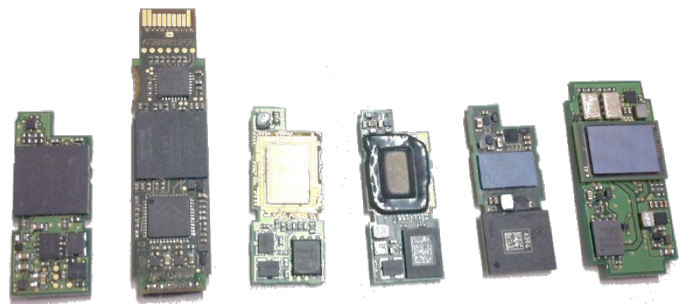


Figure 2: Overview of AimValley Bare Die Solutions

## Why AimValley?

AimValley is a reliable provider of Bare Die Technology since 2003, delivering solutions for:

- High speed data processing applications
- Complex FPGA-based accelerated systems
- High speed, low power hardware equipment
- Robust embedded software
- Early adopter of Acceleration Technology

AimValley understands the full complexities as well as the subtle nuances of designing great edge solutions. We excel in building complex systems that are part of your product in the fields of Industry 4.0, Big Data, Healthcare and Transportation markets.