ORIGAMI MODULE B20
module with extreme connectivity.

► Overview
The Origami B20 Module is a production module with extreme connectivity and processing power.

With its business card size and its dedicated Z-Ray connector, the B20 can easily be integrated onto standard or custom carrier boards that perfectly fit every application.

The B20 is organized on a Xilinx Kintex Ultrascale 060 FPGA. The B20 features 2 banks of high bandwidth DDR4 memories. It incorporates on-board DC-DC.

The B20 offers special provision for security. It allows to secure IP-Cores, Firmware and processed content with strong encryption, key management and physical security enclosure. It includes a battery powered real time clock and tamper detection circuitry.

The B20 is particularly convenient for advanced video applications. It is capable of handling multiple video codecs and of interfacing and processing video streams up to 8K UHD-2 video stream in uncompressed & TICO and up to 4K UHD-1 in uncompressed, TICO, JPEG 2000, HEVC IP, AVC and MPEG 2.

► Features

<table>
<thead>
<tr>
<th>Interfaces</th>
<th>Interposer connector - 2 unit Module (Z2-50)</th>
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<tbody>
<tr>
<td></td>
<td>• 23 x 50 pins</td>
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<tr>
<td></td>
<td>• 28x Gigabit Transceivers</td>
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<td></td>
<td>• JTAG</td>
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<td>• HPIO / HRIO</td>
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<td></td>
<td>• I²C &amp; ISP control bus</td>
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<td></td>
<td>• 12V &amp; 3.3V Power lines</td>
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<td></td>
<td>LEDs for debug</td>
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| Security   | RTC with battery back-up                      |

<table>
<thead>
<tr>
<th>On board Clock</th>
<th>200 Mhz Oscillator +/- 30ppm</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>300 MHz Oscillator +/- 10ppm</td>
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<tr>
<th>FPGA</th>
<th>Xilinx Kintex UltraScale:</th>
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<tbody>
<tr>
<td></td>
<td>XCKU060 -2 speed grade in FFVA1156 package</td>
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<tr>
<th>Memory</th>
<th>4GByte DDR4 SDRAM: 16Gbits per bank</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>(4 chips x 256Mbits depth x 16 width) x 2 banks</td>
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<tr>
<th>Flash memory</th>
<th>512 Mbit Configurable flash</th>
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</table>

| Dimension     | 2 Unit Origami Module 99.15 x 53.38 x 20 mm |

► Hardware View

► Function Block Diagram

► Reference Designs & Development Kits

A set of development kits is available (under license) to help you develop your own hardware application:

**Hardware Development Kit (HDK)**
- Interposer schematics, PCB layout

**Software Development Kit (SDK)**
- API

**Firmware Development Kit (FDK)**
- Pre-validated IP-cores and pre-build firmwares
- QuickPlay© tool to develop firmwares in HLS

Ordering Number:
OM-B20-Z2-KU-060

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ORIGAMI CARRIER B21
flexible PCIe platform for high-end video applications.

► Overview
The Origami B21 Carrier offers a flexible PCIe platform to experiment and deploy high-end video applications using the extreme power and connectivity of the Origami B20 Module. With its half-height half-length low profile PCIe size, the B21 can easily be integrated into any PC based systems. Featuring a PCIe GEN3 x8/x16 bus, the B21 can reach throughput supporting up to uncompressed 8K-60p video streams simultaneously as input and output. With its 3 SFP cages, the B21 allows interfacing through 12G-SDI, HDMI, 10 Gb Ethernet, in copper or fiber version. Coupled with the Origami B20 Module, the B21 is particularly convenient for advanced video applications. It is capable of handling multiple video codecs and of interfacing and processing video streams up to 8K UHD-2 video stream in uncompressed & TICO and up to 4K UHD-1 in uncompressed, TICO, JPEG 2000, HEVC IP, AVC and MPEG 2.

► Features

**Interfaces**
- 3x SFP Cages - MSA and non-MSA compliant PCIe Gen3 up to x16
- Interposer connector for 1 or 2 unit Origami Module
  - 6x Gigabit Transceivers toward the 3 SFP Cages
  - 16 Gigabit Transceivers toward the PCIe bus
  - 2x JTAG
  - HPIO / HRIO
  - I²C & ISP control bus
  - 12V & 3,3V Power lines
- USB and JTAG connectors for module programming
- Reset buttons and LEDs for debug

**Clock**
- 2x Clock Generators based on 48MHz oscillators
- 1x Clock Generator based on 25MHz oscillator

**Dimension**
- Low Profile - Half length - PCIe card
- 68.90 x 167.65 mm

► Reference Designs & Development Kits
A set of development kits is available (under license) to help you develop your own carrierboard:
- **Hardware Development Kit (HDK)**
  - Interposer schematics, PCB layout
  - Interposer reference design and pinout
  - Reference design, Bill of Materials

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