

Jade 5585 and 5586

3U VPX Virtex UltraScale+ HBM FPGA modules



Jade 5585 and 5586 modules

The Model 5585 features eight 250 MHz A/D converters suitable for connection to HF or IF ports of a communications or radar system through SOSA aligned backplane coaxial connectors. Installed IP includes eight programmable digital downconverters and synchronous acquisition circuitry support a wide range of bandwidths for phased-array applications.

The Model 5586, without data converters, serves as an ideal stand-alone processor or as a co-processor for distributed, FPGA processing tasks.

FAQ

What are the 5585 and 5586?

The 5585 and 5586 are SOSA aligned 3U VPX FPGA processor boards.

What is the difference between the 5585 and 5586?

Both boards share similar architectures based on the Xilinx Virtex® UltraScale+™ HBM FPGA. The key difference is the 5585 includes eight A/D converter channels, making it a powerful data acquisition and processing board. The 5586 does not include the A/D converters and is ideal as a coprocessor utilizing its multiple gigabit serial interfaces for data movement on and off the board.

What is SOSA and why is it important?

SOSA has been created to improve subsystem re-configurability, upgradability and reuse—and to shorten cycle times to counter emerging threats in SIGINT, radar, EW and communications applications. By employing SOSA specified products, users can expect to find a very well defined and reliable platform for both development and deployment.

What FPGA is used on the 5585 and 5586?

Both boards feature a Xilinx Virtex UltraScale+ HBM XCVU37P.

What is HBM and why is it important?

High-bandwidth memory, or HBM, is 8 gigabytes of on-chip SDRAM, which allows much higher speed access to the memory. It supports memory bandwidths of up to 460 GB/sec., representing more than a 20x throughput increase over traditional, external DDR4 SDRAM. This increased throughput is critical for high data bandwidth and high-computational applications.

In addition to the HBM, what other resources are available on the XCVU37P?

System Logic Cells: 2.8 million
 DSP slices: 9,024
 UltraRAM: 279 Mb

Do the boards support optical interfaces and, if so, at what speeds?

Yes. Both boards offer an option 8-lane optical interface running at 25 Gbps per lane that appear on the VITA 67.3C connector. Users can install their own protocol or use the 100 GigE UDP IP core supplied with the Navigator FPGA design kit to instantiate a single or dual 100 GigE interface.

How quickly can I get up and running with the 5585 or 5586?

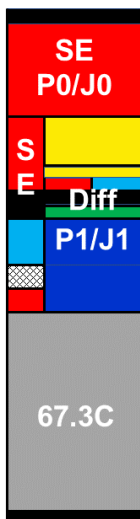
Both boards are shipped with factory-installed IP that loads the FPGA from on-board FLASH on power up. The IP-based functions are specific and appropriate to match the hardware features of each board. Software libraries to support the built-in functions and precompiled examples allow the board to be used right out of the box.

Can the built-in IP be changed?

Yes. While the built-in IP might satisfy some applications, most users look to the high-performance processing available in the FPGA for custom processing. The Mercury Navigator FPGA design kit works with Xilinx Vivado® and includes all installed IP cores as well as a library of additional functions for users to add to, modify or completely replace the factory-installed IP. The Mercury Navigator board support package (BSP) is the complementary product providing software support for all IP and hardware functions.

What VPX profile do the boards conform to?

Per the SOSA specification, the 5585 and 5586 follow the SLT3-PAY-1F1U1S1U2F1H-14.6.11-12 profile.



5585 QUESTIONS

Which A/Ds are used on the 5585?

There are 4 dual channel Texas Instruments ADS42LB69 250 MHz, 16-bit A/D converters on the 5585.

Can the 8 channels be synchronized?

Yes. The 5585 is designed to support accurate single sample synchronization across all channels on the board. For higher channel count systems, the model 5503 High-Speed System Synchronizer, a SOSA Aligned 3U VPX board, can be employed to extend synchronization across multiple 5585s.

What factory-installed IP is included with the 5585?

The factory-installed functions include eight A/D acquisition IP modules for performing data capture and transfer to the boards' 10 GigE, 40 GigE and PCIe interfaces. Each acquisition module includes a programmable digital downconverter as well as data tagging features for processing and marking the incoming data.

What applications can the 5585 be used for?

The 5585 can be used in a range of military, electronic warfare, instrumentation and communications applications. Some specifically are:

- **Communications, signals and electronics intelligence:** The 5585's A/D converters offer excellent fidelity including SFDR at -80 dBFS, making it ideal for applications that detect and capture very small signals positioned next to larger ones.
- **Low-latency applications:** The 5585's A/Ds are tightly coupled to the FPGA for data processing through a high-speed parallel interface, eliminating the latency typically found in serial-interfaced A/Ds. This, along with the HBM memory speed, make it an excellent match for applications that can't tolerate delays in processing results.

5586 QUESTIONS

What factory-installed IP is included with the 5586?

Because the processing tasks performed on the 5586 will be different for every application, the built-in IP is more generic, providing support for the board's 10 GigE, 40 GigE and PCIe interfaces. In addition, the Navigator FPGA design kit IP core library contains many functions like the 100 GigE UDP Ethernet interface, which can be installed by the user as needed.

What applications can the 5586 be used for?

Like the 5585, the 5586 can be deployed in a wide range of applications including systems that require high-performance processing and memory and I/O bandwidth:

- The 5586 is an ideal coprocessor when paired with the Mercury 5550 or 5553 RFSoc-based boards. The 5586's data paths, including 40 GigE and dual 100 GigE, provide a high-speed interface for exchanging data with the RFSoc boards.
- The 5586 is an excellent match for high-data-processing applications like data analytics, adaptable artificial intelligence, image processing and target identification.

Learn more

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