

NanoMind HP MK3

GOMSPACE



FLEXIBLE



RELIABLE



MODULAR

GomSpace NanoMind HP MK3 provides a High Performance, reliable, customizable and flexible onboard computer platform for Payload applications.

GomSpace NanoMind HP MK3 has been designed to support High Performance, yet efficient, on board processing and H/W acceleration functions, needed to meet the increasing demands of complex payloads.

Typical customer applications include data reduction using compression algorithms, and Artificial Intelligence (AI) and Machine Learning (ML) for Earth Observation and Synthetic Aperture Radar (SAR) data processing. If security and reliability are of concern, then the NanoMind HP MK3 is a perfect H/W acceleration platform for Encryption and Error Correction for Command and Data security.

With a wide range of interfaces, configurable I/O and support for in orbit updates, the NanoMind HP MK3 is a highly flexible and customisable platform. GomSpace comprehensive development kits are designed to speed up time to market for custom application development and can also be supplemented with training.

As you would expect from GomSpace, Quality and Reliability are evident from the component level, such as eMMC with Bit flip detection against SEU, PSU monitoring,

and redundant S/W images, right through to the comprehensive Qualification Certification. NanoMind HP MK3 is flight proven as part of SDR MK3.

The NanoMind HP MK3 is a high performance, versatile Space-graded compute platform based on Xilinx's Powerful Zynq®-7000 System on a Chip (SoC) family. The Zynq®-7030/45 parts integrate a dual-core ARM® Cortex™-A9 based processing system with a Xilinx FPGA in a single device. This combination allows rapid software prototyping and acceleration of custom programmable hardware development.



Technical Information

NANOMIND HP MK3	
SoC	Xilinx Zynq 7030/7045 Programmable SoC. <ul style="list-style-type: none"> Dual ARM Cortex A9 MPCore, clocked up to 800 MHz Powerful FPGA module - 1.25K / 350K logic cells
Volatile Memory	1024MB DDR3 (512MB with ECC enabled)
Non-volatile Memory	256 MB NOR flash 70GB eMMC (pSLC) and 233GB eMMC (MLC)
Mechanical dimensions	95 mm x 95 mm x 31.5 mm
Mass	240g
Radiation	20 kRad TID

KEY INTERFACES	
SpaceWire	x3, data link/network layer
USB	x1, host/device
Fully Configurable FPGA I/O	11 x LVDS pairs, 10 x I/O
Conditionally Configurable FPGA I/O	12 x LVDS pairs (or Spacewire), 8 x I/O (or RS-485)
Conditionally Configurable ARM I/O	6 x I/O (or eMMC#2)
Others	CAN/SPI/RS422/RS485/PPS

SUPPORT*	
Free Software Development Kit (SDK)	Development kit for the Zync 7000 Processing System (PS) <ul style="list-style-type: none"> Yocto environment centered around the bitbake/devtool utility (custom Linux BSP and distribution) Integrates GomSpace infrastructure SW components (parameter system, CSP etc.)
Free** Platform Development Kit (PDK)	Software Development kit for the Zync 7000 Processing System (PS) plus Xilinx Vivado tool for programmable logic (PL) design <ul style="list-style-type: none"> 7030 - Free licence for Vivado 7045 - **Requires Vivado licence, please contact Xilinx directly

Boots into a "low" power mode (PL disabled) and enables PL dynamically when required (by relevant interfaces)

* NanoMind HP MK3 includes development kits for getting started with software application and FPGA firmware development. The PL and PS stack is provided as fully customizable source code. The development kits are actively maintained against new BSP and tool releases from Xilinx, as well as new features introduced by various open source components within the Yocto Project. GomSpace also offers a training program to kick-start and support customer development process.

Available Services and Options

PDK and SDK training on request.

Contact

Please contact us if you want to know more about GomSpace NanoMind HP MK3.



FLEXIBLE

- CubeSat Space Protocol (CSP)
- Complex payload support
- Wide range of Interfaces



RELIABLE

- Flight Proven
- SEU bit flip detection
- PSU monitoring



MODULAR

- Customisable interfaces
- Development Kits for custom application design