

# ONYX HPEC+GPGPU+SWaP-C

## Multi-mission Rugged Computer



### ► Out-of-the-box SWaP-C platform ready to application

The slim profile of the ONYX allows the unit to fit easily into available nooks on any platform making it ideal for space constrained applications such as UAVs, ground vehicles, military and civilian aircrafts, shipboards, submarines or any other robots in harsh environment requiring rock-solid reliability.



ONYX is based on modular mezzanines concept that offers customer a large flexibility and Long Life Management. It employs leading edge dual and quad-core Intel® Core™ i7 (2<sup>nd</sup>, 3<sup>rd</sup> & 4<sup>th</sup> GEN) processing capabilities to meet a wide variety of mission requirements. Very-compact, ONYX is ideal for high performance harsh environment/space constrained applications, and features flexible I/O which can be tailored to customer requirements, without NRE or any additional development allowing customer to accelerate Time-to-Market. ONYX is ready to perform with your program software for vetronics and avionics applications, acting as a Mission or Display Computer, or as a Processor for Crew Station, Command and Control, or Situational Awareness applications.

Particularly attention has been made on Embedded Video Graphic features thanks to optional module that specifically targets, via a 500 pins rugged connector offering PCIe x16 lanes at 10Gbps signaling, high-end video analog, digital and broadcast SMPTE inputs and outputs, overlay, H.264 AVC compression and EAS-NI encryption. On other way, long life AMD Radeon E6760 GP-GPU offers its 480 Stream Processors matrix and up to 576 GFLOPs computing engine.

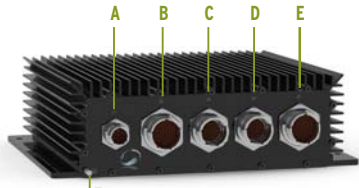
Internal I/O routing from the backplane to the front panel MIL-DTL-38999 connectors is by means of solid-state transition module. It provides cable-free higher reliability and improved signal integrity than harnessing at lower price.

- > Small Form Factor: 88mm (2U) x 270mm x 250mm
- > Flexible configuration based on Extreme Rugged COMe modules
- > AMD Radeon™ E6760 Discrete GPU option offering 576 GFLOPs compute engine
- > One PMC slot for I/O extension
- > Several storage Flash drive options (cFast, SSDs)
- > Wireless Wi-Fi/3G/LTE/GPS/BT ready
- > No fan, cable free
- > External convection with radiation by fins and/or conduction cooled through cold plate
- > IP-67 protection
- > -40°C / +71°C operating environment
- > MIL-STD-810, DO-160 qualified
- > MIL-STD-461 qualified & MIL-STD-1275 ready
- > ITAR free
- > Long Life Management
- > BIT and Fast BIT at cold start for dependability
- > Continuous BIT on request

## System specifications

Processor	Core i7 2 <sup>nd</sup> , 3 <sup>rd</sup> and 4 <sup>th</sup> on COM Express 2.1 Type 6 module - Core i5-4400E @ 2.7GHz, 2C/4T, 4MB L3 cache, 37W TDP - Core i7-3612QE @ 2.1GHz, 4C/8T, 6MB L3 cache, 35W TDP - Core i7-3555LE @ 2.5GHz, 2C/4T, 4MB L3 cache, 25W TDP - Core i7-3517UE @ 1.7 GHz, 2C/4T, 4MB L3 cache, 17W TDP	
Chipset	Intel mobile QM67/QM77/QM87 Express chipset supporting PCI Express 2.0 & 3.0	
Memory	Up to 16GB DDR3 1333 ECC memory	
Video	1 x DVI-D + 1x VGA from Intel HD Graphics	
Optional Video	AMD Radeon™ E6760 Discrete GPU with 128-bit memory interface with 1GB GDDR5 Video Outputs: 1 x DVI-D + 1 x DP (factory options to DVI-D, STANAG-3350...) Video Inputs: 4 x RS-170/NTSC/PAL/SECAM, CCIR-601; 2 x H.264/HD-SDI	
Ethernet ports	3 x Gb Ethernet (10/100/1000 Base T) 1 x Gb Ethernet port internally connected to MXC slot for the H.264 streaming	
Audio	Intel® High Def Audio: In and Out Lines	
Storage	- One 2"5 SSD Flash drive slot - Or Two 1"8 SSD Flash drive slots (Intel® Rapid Storage Technology 1,0 supports RAID 1, 0) - One cFast slot	
Serial ports	4 x RS232/422/485 (software programmable) 4 x USB 2.0	
I/O extension	1 x PMC slot (conduction cooled) 1 x miniPCIe slot Support for Ethernet, MIL-STD-1553, ARINC 429, FPGA, Serial ports, CAN... I/O from PMC on dedicated MIL-DTL-38999 connector J5	
Discretes I/O	On MIL-STD-38999 connector Reset, Power Button, Power Led, HDD Led, Fast Erase, 8 x GPIO (TTL)	
Hardware monitor	Supply voltages, CPU, GPU, carrier board temperatures	
Watchdog timer	Programmable timer range to generate RESET	

## Chassis specifications

Material	Aluminum 6061	 A: Power supply B: USB, Serial, GPIO, DVI-D + VGA C: Ethernet, Audio D: GPGPU: DVI-D + DP + Video In E: PMC I/O's F: Ground
Internal cooling type	Conduction cooled with wedge locks to withstand severe vibrations and shocks	
External protection	Aircraft Grade anodized Aluminum	
Internal treatment	Surtec 650 chromiAL®	
Size (HxWxD)	88mm (2U) x 270mm x 250mm	
Weight	6.8kg	
Connectors	5 x MIL-DTL-38999 Serie III circular connectors	
Power supply	+28VDC (+18VDC up to +36VDC) / MIL-STD-1275 / DO-160 / MIL-STD-461	
Power consumption	< 90 Watts (Core i7 + GPU E6760 + 2 x SSD) < 50 Watts (Core i7)	

## Environmental conditions

Cooling type	Convection & radiation by fins, conduction by cold plate
Ingress Protection Rating	IP67
Temperature	Operating: -40°C / +71°C (depending of the processor version and cooling methods) • Storage: -40°C / +85°C
Decompression	8000 to 50 000 feet
Altitude	Up to 15000 feet
Humidity	0%-95% relative humidity
Salt fog	50% salt spray / 96h
Fine dust	Wind and fine dust particles
Shock & Vibration	MIL-STD-810 / DO-160*
EMI / RFI	MIL-STD-461 / DO-160 (Fully sealed Faraday cage and complete EMI/RFI filtering)
CE certification	EMC: UE 2004/108/CE ; EN 61000-6-2, EN55022, EN 55024 SAFETY: UE 2006/95 CE

## Software

Operating system	Linux / Windows 7 Windows Embedded Standard 7 / ElinOS Embedded Linux
Graphic features & framework	DirectX 11, Open GL 4.1, AMD Eyefinity Technology, Open CL 1.2
Dependability	BIT, Fast BIT

\* Consult ECRIN Systems for levels and sections qualification passed.

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