

# μONYX

## The design advantages of rugged SFF mission computers

208 x 163 x 107 mm



### ► Higher availability, without hot spots in SWaP-C environment

Small Form Factor (SFF) embedded computing, such as COM Express architecture, is growing in importance for many aerospace and defense applications, such as UAS, fixed and rotary wings (un)manned aircraft, tactical ground vehicles and underwater robots. In the near future, they will dominate mobile computing for aerospace and defense.

Small-Form-Factor embedded computing offers small size, weight, power consumption and cost (SWaP-C), as well as the ability to distribute high-performance computing and avoid single-points of failure and thermal hot spots.

Qualified μONYX profiles slash design risk, lower costs and speed deployment thanks to risk-lowering of proven technology, stress tests passed for maximum loads, saving up to \$60,000 and 2 months EQT campaign.

μONYX profile is based on modular mezzanines concept that offers customer a large flexibility and Long Life Management with revision control. It employs cutting edge technology based on new Compact COM Express type 6 Intel® dual-core Skylake U System-on-Chip plus embedded proven PMC and miniPCI Express mezzanines, that will allow tailoring the configuration to exact customer's I/O requirements, no more, no less.

> Supports Dual-Core INTEL Core i7 6<sup>th</sup> Gen, SoC, with only 15W TDP and incredible 7.5W cTDP

> Up to 32GB dual-channel non-ECC DDR4 memory

> Up to two internal/removable SSD behind sealed door panel

> 1x DVI-D Single Link

> 1x PMC and 2x mini PCI Express sites for flexible avionics and industrial I/O expansion

> 4x RS-232 + 2x RS-422 and 4x USB 2.0

> 1x USB 3.0 Full Specs with circular USB-Field connector

> SFF: 3 liters, 3 kilos, 30 Watts

> Cable-free, Fan less, MIL-DTL-38999 circular connectors

> -40°C up to +71°C operating temp (depend on configuration and cooling system)

> Standard BOM Qualified DO-160F and MIL-STD-810G/461F/1275D/704

> High flexibility to Modified COTS services

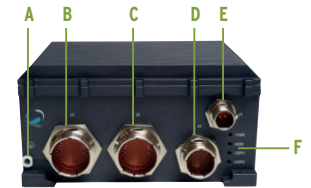
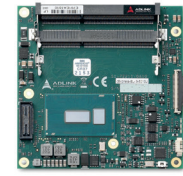
> BIT functions

> ITAR free without export control

> Long Life Management with revision control

## System specifications

<b>Processor Module</b>	COM-Express Compact Size (95x95 mm)
Processor 6 <sup>th</sup> Generation Intel	Intel Core 6 <sup>th</sup> Gen Mobile 14nm process ("Skylake-U") Core™ i7-6600U 2.6/3.4GHz (Turbo), 4M, 15W (7.5W cTDP) (2C/GT2) Core™ i5-6300U 2.4/3.0GHz (Turbo), 3M, 15W (7.5W cTDP) (2C/GT2)
Memory	Dual channel 1867/2133 MHz non-ECC DDR4 memory up to 32GB
Video outputs (Intel HD Graphic)	1x DVI-D Single Link
Other Video inputs / outputs	Use of miniPCIe board
Ethernet	2x 10/100/1000 BaseT
Serial	2x RS-232 (Tx, Rx) + 2x RS-232 (Tx, Rx, RTS, CTS) 2x RS422
USB 2.0	4x USB2.0 High / Full / Low speed
USB 3.0 (38999 USB Field)	Full USB3.0 specifications (on rear panel)
Audio	Intel® High Def Audio: 1x In and 1x Out Lines
Discret I/O	8x Isolated Inputs 8x Isolated Outputs Reset, Power Button, Power Led, HDD Led, Fast Erase, 2x user's LEDs
I/O expansion slots	1x PMC slot 1x miniPCIe + 1x miniPCIe/AcroPack slots
Solid state disk (SSD) (internal)	1x mSATA
Solid State Disk (SSD) (Removable)	2x SSD 2.5" sites (on rear panel)
Hardware monitoring	Voltages, CPU, GPU, and carrier board temperatures
Watchdog timer	Programmable timer range to generate RESET



A: Mechanical ground      D: miniPCIe Slots I/O  
B: CPU I/O                      E: Power Supply  
C: PMC & isolated GPI/GPO      F: 2x Monitoring & 2x User's LEDs



Removable SSD tray and USB 3.0 connector

## Power supply

Power Input	+28VDC (+10VDC up to +36VDC) MIL-STD-1275D / DO-160F / MIL-STD-461F / MIL-STD-704
Power consumption	Less than 40W

## SWaP-C constraints

Size (WxDxH)	208mm x 163mm x 107mm (8.19" x 6.41" x 4.21")
Weight	3kg (6.6 lbs.)
Cooling type	Convection & radiation by fins, conduction by cold plate (conduction cooled inside)
Connectors	Military circular IP67 locking connectors (MIL-DTL-38999) Front panel customizable for specific application

## Environmental Qualification Tests

Operating temperature	-40°C / +71°C (depend on configuration and cooling system)	Salt fog	50% salt spray / 96h (DO-160F)
Storage temperature	Storage: -40°C / +85°C	Dust	Wind and fine dust particles (DO-160F)
Ingress protection rating	IP65	Operating shock & vibration	MIL-STD-810G / DO-160F
Altitude	Up to 15000 feet (DO-160F)	EMI / RFI	MIL-STD-461F / DO-160F
Humidity	0%-95% relative humidity (DO-160F)	CE certification	EMC: 2014/30/UE ; EN 61000-6-2, EN55032, EN 55024 - SAFETY: 2014/35/UE ; EN60950-1 : 2006 2 <sup>nd</sup> edition A11 : 2009 + A1 : 2010 + A12 : 2011 + A2 : 2014

## Software corner

Operating system	Windows 10 32/64-bit, Linux 32/64-bit, ElinOS. For other requirements, contact ECRIN Systems
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## Security &amp; dependability

Trusted platform module	Atmel AT97SC3204; TPM 1.2
Built-In-Test	BIT, monitoring functions library, maintenance L2 with SEMA library

## Export control classification

	ITAR Free - No export control (ECCN 4A003)
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## Other specifications

Reliability	Designed and manufactured using ISO 9001:2015 Certified Quality Program
MTBF	Calculated per MIL-HDBK-217F, available upon request
Regulatory compliance	European CE Mark, REACH, RoHS, WEEE
Warranty	1 year return to depot warranty (extended warranty available with service contract)
Starter cable set	Optional starter breakout cable set mates with MIL-DTL-38999 connectors to break out standard CPU I/O and power signals to traditional PC style interfaces for lab or bench testing purposes

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