FORCE2C Mission Computer

Open reference computing environment suitable for FACE applications

The rugged small form factor FORCE2C Mission Computer is powered by a QorIQ based SBC with extensive I/O capability, yet is targeted at rugged avionics applications specifically requiring DO-254 certification compliance. DO-254 artifacts packages are offered for the FORCE2C for this purpose.

The FORCE2C Mission Computer comprises COTS boards packaged in a proven chassis design with a high technology readiness level (TRL), allowing customers to focus on application design by reducing integration effort, thus lowering risk and time to market. Additionally, the FORCE2C Mission Computer is designed to be suitable for applications developed according to the principles of the FACE™ (Future Airborne Capability Environment) Consortium. The FACE Consortium is leading the development of open standards for avionics systems. The intention of this standard is to provide interoperability and portability, as well as ensuring a robust architecture and high quality software development.

At the heart of the FORCE2C Mission Computer is the SBC314C single board computer. The SBC314C, based on the Power Architecture T2081 CPU supports DO-254 certification compliance. This combined with extensive I/O, makes the FORCE2C ideal for a wide range of high performance, low power avionics applications where DO-254 certification compliance is required.

The comprehensive I/O capability in the FORCE2C Mission Computer is provided by the RAR15X 3U VPX avionics I/O card, the XMCS01C serial I/O module and the XCC924C carrier card.

The RAR15X certification compliant avionics card provides up to eight ARINC 429 TX ports, up to ten ARINC 429 RX ports, up to four MIL-STD-1553 (dual-redundant) and up to six logic level discrete I/O ports.

The XMCS01C certification compliant serial I/O module card provides eight RS422 ports with no flow control (4-wire) and four RS422 ports with flow control (8-wire).

The XCC924C certification compliant carrier card provides PCIe™ connectivity within the system and also an additional 1GbE port count to three (two GbE ports from the SBC314C).

Abaco Systems works with selected software partners to provide functional support for various DO-178 compliant safety-partitioned Operating Systems on the FORCE2C Mission Computer, including VxWorks653 (Wind River), LynxOS-178 (Lynx Software Technology), and DEOS (DDC-1).

The artifacts packages for FORCE2C are developed for use in systems requiring Design Assurance Level (DAL) D, up to DAL A. Some mitigation measure may need to be made for DAL-A and Dal-B to meet the necessary reliability levels. Services to assist with artifacts integration and particular program safety case compliance, with respect to Abaco artifacts, are also available.

FEATURES:

- QorIQ™ T2081 processor
- MIL-STD-1553 / ARINC 429 I/O
- Comprehensive RS422 serial I/O
- DO-254 artifacts
- Weight: 8.3 lbs (3.7 kg)
- MIL-STD-704F 28VDC PSU
- Qualified to MIL-STD-461G, DO-160G, MIL-STD-704F, MIL-STD-810G
- -40° C to +71° C operating temperature
- Conduction cooled
- Comprehensive software support, including safety -partitioned real-time operating systems

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Specifications

CPU
- 1.8 GHz QorIQ T2081 with eight virtual cores *
- 4 GB DDR3L SDRAM with ECC
- 256 MB NOR Flash
- x4 PCIe Gen 2
- On board 16 GB SSD

Avionics I/O
- 8x ARINC 429 TX
- 10x ARINC 429 RX
- 4x MIL-STD-1553 (Dual-redundant)
- 6x avionics discrete

General I/O
- 3x 1000BASE-T Gigabit Ethernet
- 2x USB 2.0
- 2x RS-232/RS-422 or 4x RS-232
- 8x RS422 with no flow control (4-wire)
- 4x RS422 with flow control (8-wire)

Safety OS Software support **
- VxWorks653™ (Wind River)
- LynxOS-178 (Lynx Software Technologies)
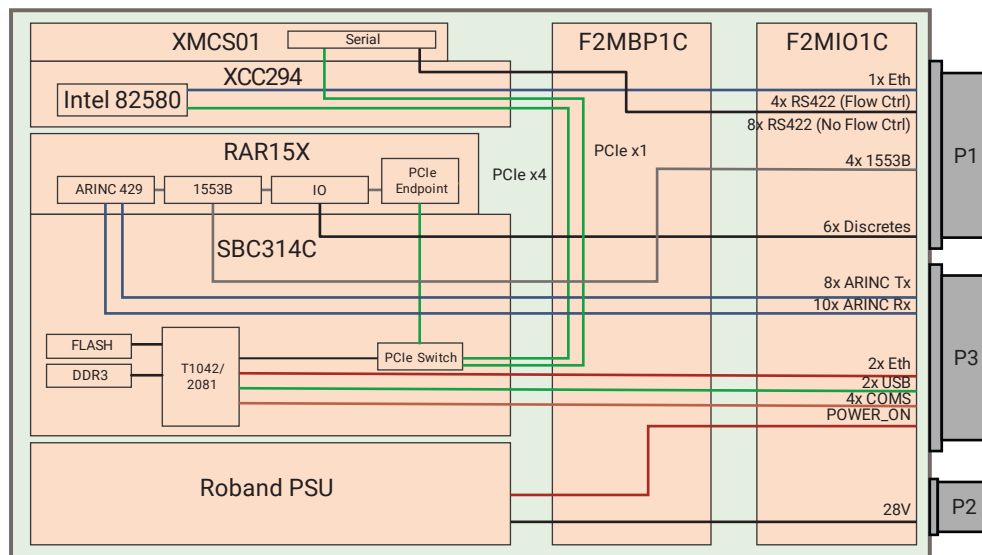- DEOS (DDC-I)

Environment and qualification
- Conduction cooled
- Operating temperature: -40º C to +71º C
- DO-160G
- MIL-STD-461G
- MIL-STD-704F
- MIL-STD-810G
- DO-254 artifacts

Dimensions and weight
- L: 9.56" / 24.3 cm
- H: 3.31" / 8.41 cm
- W: 6.56" / 16.66 cm
- 3.7 kgs / 8.3lbs

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* Only physical, not virtual, cores can be used in a DO-254 high DAL environment.
** VxWorks653 is currently the only operating system supported. LynxOS-178 and DEOS are planned options.

Block diagram