



CM52

Data Sheet

Rugged COM Express Module with Intel Atom Processor x7000RE Series

COM Express Mini, Type 10

- **Intel Atom Processor x7000RE series (Amston Lake)**
- **Up to 8 cores**
- **Up to 16 GB LPDDR5 RAM with in-band error-correction**
- **Integrated GPU, up to 32 EU**
- **Onboard storage, up to 128 GB eMMC**
- **Trusted Platform Module (TPM 2.0)**

Product Description

Rugged COM Express Module

The CM52 is an ultra-rugged COM Express module with Type 10 pin-out for rolling stock, public transportation, industry or medical applications. It is operable in an extended temperature range of -40 °C up to +85 °C (Tcase). The use of soldered components makes the board resistant to shock and vibration.

Scalable Performance

The Intel Atom Processor x7000RE series (Amston Lake) provides a scalable performance with up to 8 cores, up to 16 GB LPDDR5 RAM with in-band error-correction and integrated quality graphics. The module also provides up to 128 GB eMMC onboard storage. Due to the low power dissipation (depending on the CPU), no active cooling is necessary and very small designs are feasible.

Safety, Security and Connectivity

A versatile board management controller provides intelligent monitoring and supervision of all vital signals including supply and on-board voltages, temperatures and a watchdog for the OS. The Trusted Platform Module (TPM 2.0) supports features like secure/measured booting and fast cryptographic execution. The CM52 comes with a large variety of interfaces, including, e.g., DisplayPort or USB-C, HD Audio, PCI Express 3.0 and 2.5 Gigabit Ethernet. This enables implementing many functions on a very small form factor.

Versions for Extremely Harsh Environments

The CM52 offers protective coating as a standard feature. For applications that need reliable operation even under the harshest environmental conditions, a special version equipped with a closed aluminum frame that ensures optimum EMC protection, efficient conduction cooling and extended resistance to vibration and shock can be provided on request.

Preliminary

www.duagon.com

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Technical Data

CPU

- The following CPU types are supported:
 - Intel Atom x7835RE, 8 cores, 1.3 GHz, 32 EU, 12 W, -40 °C to +105 °C
 - Intel Atom x7433RE, 4 cores, 1.5 GHz, 32 EU, 9 W, -40 °C to +105 °C
 - Intel Atom x7213RE, 2 cores, 2.0 GHz, 16 EU, 9 W, -40 °C to +105 °C
 - Intel Atom x7211RE, 2 cores, 1.0 GHz, 16 EU, 6 W, -40 °C to +105 °C
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Memory

- System RAM
 - Soldered LPDDR5, IBECC, 4800 MT/s
 - 16 GB max.
 - Non-volatile RAM (NVRAM): 64 kbit (8 K × 8) FRAM
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Mass Storage

- eMMC (soldered); 128 GB max.
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Graphics

- Processor graphics, up to 32 EU
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Interfaces

- This product includes interface options
 - SATA
 - 2 × SATA Revision 3.2, board to board
 - Video
 - 1 × DP1.4a, board to board (optional, instead of USB-C)
 - 1 × eDP 1.4, board to board
 - Audio
 - 1 × board to board
 - HD Audio
 - USB
 - 2 × USB 3.2 Gen 2x1, board to board
 - 6 × USB 2.0, board to board
 - 1 × USB-C, board to board (optional, instead of DP1.4a)
 - Ethernet
 - 1 × 10/100/1000/2500BASE-T, board to board
 - PCI Express
 - 4 × PCIe 3.0, x1, board to board
 - Serial
 - 2 × UART, board to board
 - I2C
 - 1 × board to board
 - SMBus
 - 1 × board to board
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Supervision and Management

- Board management controller
- Voltage supervision
- Temperature measurement
- System watchdog (BMC)
- Real-time clock
- Trusted Platform Module 2.0

Electrical Specifications

- Supply voltage
 - +12 V (4.75 V to 17 V)
 - 3 V RTC (2 V to 3.4 V)

Mechanical Specifications

- Dimensions: COM Express Mini: (W) 84 mm, (D) 55 mm

Product Standard

- Mini, Type 10, PICMG COM.0 COM Express Module Base Specification

Product Compliance: Rail - Rolling Stock

- Operating temperature: -40 °C to +85 °C (measured inside the housing of a host system)
- Storage temperature: -40 °C (EN 50155:2021) to +85 °C (EN 60068-2-2, Bb)
- Altitude: +3000 m max. (EN 50125-1:2014, class AX)
- Protective coatings: EN 50155:2021, class PC2 (Any PCB protected on both sides)
- Useful life: 20 years (EN 50155:2021, class L4)

Product Compliance: Rail - Wayside Non-Safety Related

- Operating temperature: -40 °C to +85 °C (measured inside the housing of a host system)
- Storage temperature: -40 °C (EN 60068-2-1:2007, Ab) to +85 °C (EN 60068-2-2:2007, Bb)
- Altitude: +3000 m max. (EN 50125-3:2003, class AX)

Product Compliance: Information Technology Equipment

- Operating temperature: -40 °C to +85 °C (measured inside the housing of a host system)
- Storage temperature: -40 °C (EN 60068-2-1:2007, Ab) to +85 °C (EN 60068-2-2:2007, Bb)
- Altitude: +3000 m max. (EN 62368-1:2014 + AC:2015)
- Flammability (PCBs): UL 94 V-0

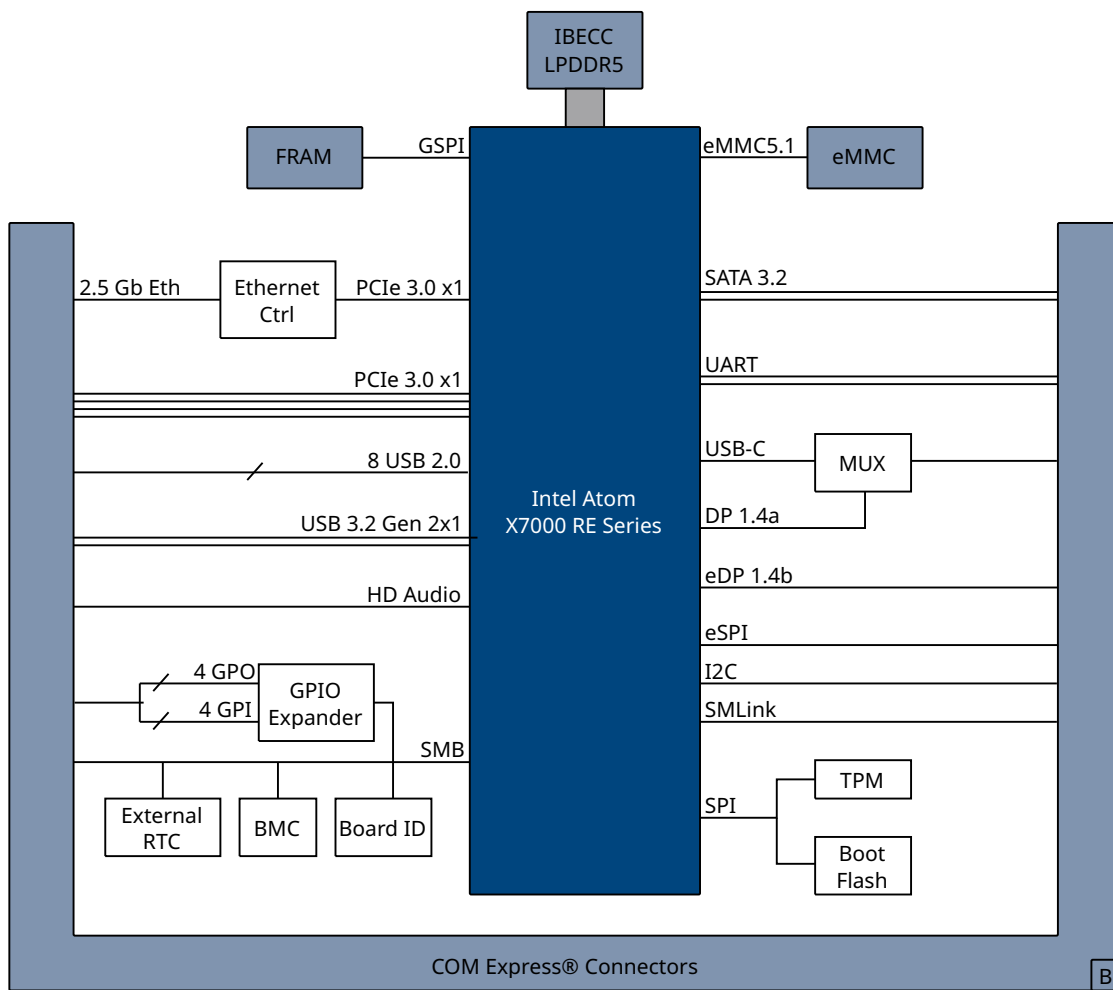
BIOS/Boot Loader

- AMI Aptio UEFI Firmware

Software Support

- Linux: Certified for Red Hat Enterprise Linux 9.6 - 9.x and 10.1 - 10.x
- See the Linux-related documentation for details on Linux support:
www.duagon.com/products/cm52/#doc
- See also Application Note *Recommendations for a Robust Software Setup*

Functional Diagram



B Onboard

Ordering Information

Standard Models

15CM52-00

COM Express Mini, type 10, Intel Atom x7835RE, 8 cores, 1.3 GHz, 16 GB LPDDR5, 64 GB eMMC, -40 °C to +85 °C, conformal coated

15CM52-01

COM Express Mini, type 10, Intel Atom x7433RE, 4 cores, 1.5 Hz, 8 GB LPDDR5, 64 GB eMMC, -40 °C to +85 °C, conformal coated

15CM52-02

COM Express Mini, type 10, Intel Atom x7211RE, 2 cores, 1.0 GHz, 4 GB LPDDR5, 64 GB eMMC, -40 °C to +85 °C, conformal coated

► **Contact duagon** for availability and lead times for product models not listed above.