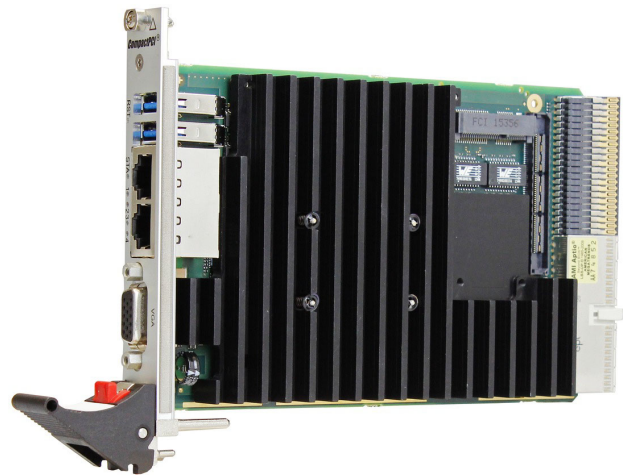


EMBEDDED SINGLE BOARD COMPUTER WITH INTEL ATOM E3900 SERIES PROCESSORS



- Intel Atom E3900 series CPU with up to four cores
- 6.5 W to 12 W CPU TDP
- Up to 8 GB soldered DDR3 ECC RAM
- For CompactPCI 2.0 systems or CompactPCI PlusIO 2.30 hybrid systems (2.0 and CPCI-S.0)
- Front I/O: 2× 1G Ethernet, 2× USB-A 5 Gbps, 1× VGA
- Rear I/O: 2× 1G Ethernet, 4× PCIe x1, 4× USB 2.0
- microSD card and mSATA slots
- Trusted Platform Module (TPM) 2.0
- Side card connector for high flexibility and interface extensions
- Up to -40 °C to +85 °C



INTEL ATOM LOW-POWER CPU

The F26L low-power CPU board is a member of the scalable family of Intel CPU boards which ensures future-safety and long-term availability. It is equipped with an Intel Atom Processor E3900 Series dual-core or quad-core System-on-a-Chip (SoC). The low power architecture on the Intel Atom processor enable a highly efficient total power consumption of max. 6.5 Watts to 12 Watts with a clock frequency of up to 1.6 GHz. Excellent graphics performance, thermal supervision of the processor and a watchdog for the operating system top off the functionality of the F26L. Furthermore, a Trusted Platform Module is assembled for security purposes.

DESIGNED FOR EXTREME TEMPERATURES

The CompactPCI PlusIO board has been designed for applications in extreme temperatures where high reliability and long-term availability are essential requirements, such as the rail market, industrial automation and the power and energy sector. The F26L is able to fulfill these extreme temperature requirements with a custom heat sink for efficient heat dissipation.

COMPACTPCI PLUSIO (PICMG 2.30)

The F26L supports the CompactPCI PlusIO (PICMG 2.30) specification, meaning it can be used in a hybrid system for control of both CompactPCI and CompactPCI Serial peripheral boards.

Compliant to the standard, four USB 2.0, four PCI Express x1 as well as two 1 Gbit Ethernet interfaces are accessible on the J2 rear I/O connector.

VERSATILE FRONT I/O

Standard I/O available at the front panel of the F26L includes VGA, two 1 Gbit Ethernet and two USB 3.2 Gen 1x1 (5 Gbps) ports. The F26L can be extended using different side cards to offer additional functions such as a variety of different UARTs or another four USBs, SATA and HD audio.

LINUX AND WINDOWS SUPPORT

The F26L supports Linux, Windows 10 and real-time operating systems. The AMI UEFI BIOS was specially designed for embedded system applications.

LONG-TERM AVAILABILITY

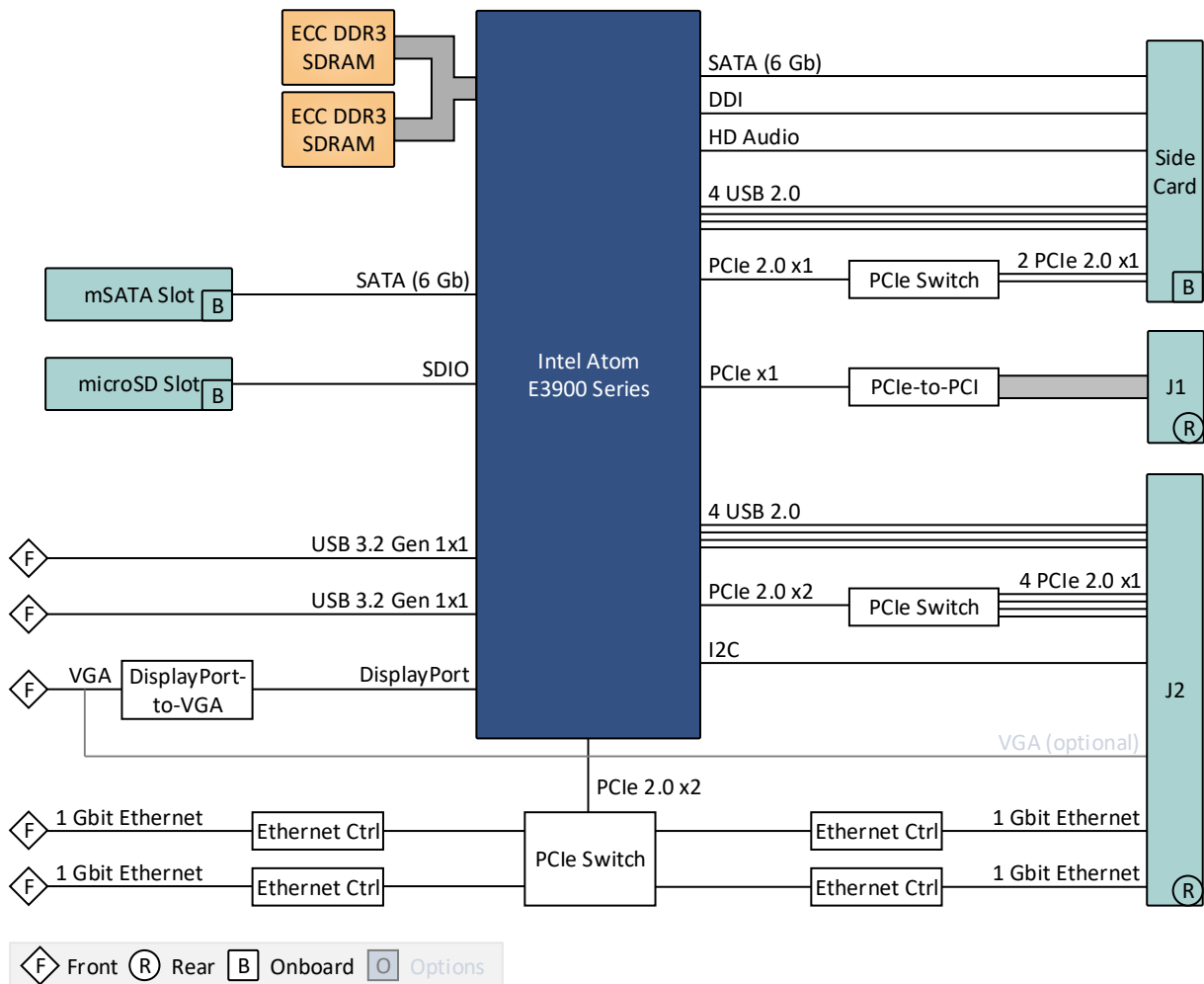
Long-term availability ensures an extended product life and future-safety.



www.duagon.com/products/f26l/

DATA SHEET

F26L | DIAGRAM



CPU

- The following CPU types are supported:
 - Intel Atom x5-E3930, 2 cores, 2 threads, 1.3 GHz, 1.8 GHz Turbo Boost, 6.5 W, 2 MB cache
 - Intel Atom x5-E3940, 4 cores, 4 threads, 1.6 GHz, 1.8 GHz Turbo Boost, 9.5 W, 2 MB cache
 - Intel Atom x7-E3950, 4 cores, 4 threads, 1.6 GHz, 2.0 GHz Turbo Boost, 12 W, 2 MB cache

MEMORY

- System RAM
 - Soldered DDR3, ECC
 - 8 GB max.

MASS STORAGE

- The following mass storage devices can be assembled:
 - mSATA
 - microSD card

GRAPHICS

- Processor graphics

INTERFACES

- This product includes interface options
 - Different front connectors
 - Front or rear connection for some interfaces (assembly option)
 - I/O expansion using a side card plugged via board-to-board connector



- SSD/HDD slot
 - 1 × mSATA; SATA Revision 3.x
- SD/microSD card slot
 - 1 × microSD card; UHS-I (104 MB/s (SDR104))
- SATA
 - 1 × SATA Revision 3.x, board to board
- Video
 - 1 × VGA
 - 1 × DDI, board to board
- Audio
 - 1 × board to board
 - HD Audio
- USB
 - 2 × USB 3.2 Gen 1x1, Type-A
 - 4 × USB 2.0, board to board
 - 4 × USB 2.0, backplane
- Ethernet
 - 2 × 10/100/1000BASE-T, RJ45
 - 2 × 10/100/1000BASE-T, M12, A-coded, receptacle
 - 2 × 10/100BASE-T, M12, D-coded, receptacle
 - 2 × 10/100/1000BASE-T, M12, X-coded, receptacle
 - 2 × 10/100/1000BASE-T, backplane
- PCI Express
 - 2 × PCIe 2.0, x1, board to board
 - 4 × PCIe 2.0, x1, backplane
- I2C
 - 1 × backplane
- Reset
 - Reset button
- LED
 - Status: board status (BMC)
 - Ethernet: activity, link

SUPERVISION AND MANAGEMENT

- Board management controller
- Temperature measurement
- System watchdog (BMC)
- Real-time clock, buffered by supercapacitor (3 days) or battery (1 year)

- Trusted Platform Module 2.0

ELECTRICAL SPECIFICATIONS

- Supply voltage
 - +5 V (-3 % / +5 %)
 - +3.3 V (-3 % / +5 %)
 - +12 V (-10 % / +10 %)
- Power consumption: 22 W max.

MECHANICAL SPECIFICATIONS

- Dimensions
 - 3U, 4 HP
 - 3U, 8 HP
 - 3U, 12 HP
 - 3U, 5 HP (8 HP with M12 connectors, up to 12 HP with side card, 5 HP with conduction cooling)
- Weight: 350 g (4 HP with RJ45 connectors)
- Cooling
 - Air cooling
 - Conduction cooling

PRODUCT COMPLIANCE: STANDARD

- CompactPCI: CompactPCI Core Specification PICMG 2.0 R3.0
- CompactPCI PlusIO: CompactPCI PlusIO Specification PICMG 2.30
- 1PCI33/4PCIE2.0/OSATA/4USB2/2ETH1G
- System slot
- 32-bit/33-MHz CompactPCI bus
- V(I/O): +3.3 V (+5 V tolerant)

PRODUCT COMPLIANCE: RAIL - ROLLING STOCK

- Operating temperature: -40 °C to +85 °C (EN 50155:2017, class OT6)
- Rapid temperature variations: EN 50155:2017, class H1, no requirements
- Storage temperature: -40 °C (EN 50155:2017) to +85 °C (EN 60068-2-2, Bb)
- Altitude: +3000 m max. (EN 50125-1:2014, class AX)
- Pollution degree: EN 50124-1:2017, class PD2
- Humidity: +55 °C and +25 °C, 100 % RH max. (EN 50155:2017)



- Shock: 30 ms @ 50 m/s² (EN 61373:2010/AC:2017-09, vehicle body, cat. 1, class B)
- Vibration: 10 min @ 1.01 m/s² (functional) and 5 h @ 5.72 m/s² (long-life) (EN 61373:2010/AC:2017-09, vehicle body, cat. 1, class B)
- Electrical safety
 - EN 50124-1:2017
 - EN 50153:2014 + A1:2017
 - EN 50155:2017
 - EN ISO 13732-1:2008
- Fire protection: EN 45545-2:2013 + A1:2015, HL3
- EMC emission
 - EN 50121-3-2:2016 + A1:2019
 - Regelung Nr. EMV 06 :2019-05-09 (2.0), Anhang E: Messung an Geräten
- EMC immunity: EN 50121-3-2:2016 + A1:2019
- Protective coatings: EN 50155:2017, class PC2 (Any PCB protected on both sides)
 - Third party products e.g. LTE modules are not coated, in compliance with EN 50155:2017 Class PC1
- Useful life: 20 years (EN 50155:2017, class L4)

PRODUCT COMPLIANCE: INFORMATION TECHNOLOGY EQUIPMENT

- Humidity - Condensation: Non-condensing
- Electrical safety: EN 62368-1:2014 + AC:2015
- Flammability (PCBs): UL 94 V-0

RELIABILITY

- MTBF: 365 000 h predicted @ 40 °C according to IEC/TR 62380 (RDF 2000)

BIOS/BOOT LOADER

- AMI Aptio UEFI Firmware

SOFTWARE SUPPORT

- Linux
 - duagon Yocto BSP
 - Tested with: duagon Yocto BSP (Kirkstone 4.0, Linux kernel 5.15)
- Windows
 - Windows 10 IoT Enterprise 64-bit
 - Not all functions are supported
- VxWorks
 - BSP on request
- QNX
 - BSP on request

FURTHER RESOURCES

- See the product User Manual for details on software support: www.duagon.com/products/f26l/#doc
- See section Software on the product web page for available packages: www.duagon.com/products/f26l/#downl
- See also Application Note *Recommendations for a Robust Software Setup*

F26L | ORDERING INFORMATION

STANDARD MODELS

- | | |
|------------------|--|
| 02F026L10 | 3U CompactPCI PlusIO, 4HP, Intel Atom x7-E3950, 4 cores, 4 threads, 1.6 GHz, 12 W TDP, 8 GB DDR3 (ECC) RAM, 2x 1G Ethernet RJ45, 2x USB-A 5 Gbps, 1x VGA, -40 °C to +70 °C (+85 °C) |
| 02F026L11 | 3U CompactPCI PlusIO, 8HP, Intel Atom x5-E3930, 2 cores, 2 threads, 1.3 GHz, 6.5 W TDP, 4 GB DDR3 (ECC) RAM, 2x 1G Ethernet M12, 2x USB-A 5 Gbps, 1x VGA, -40 °C to +70 °C (+85 °C), conformal coating |

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

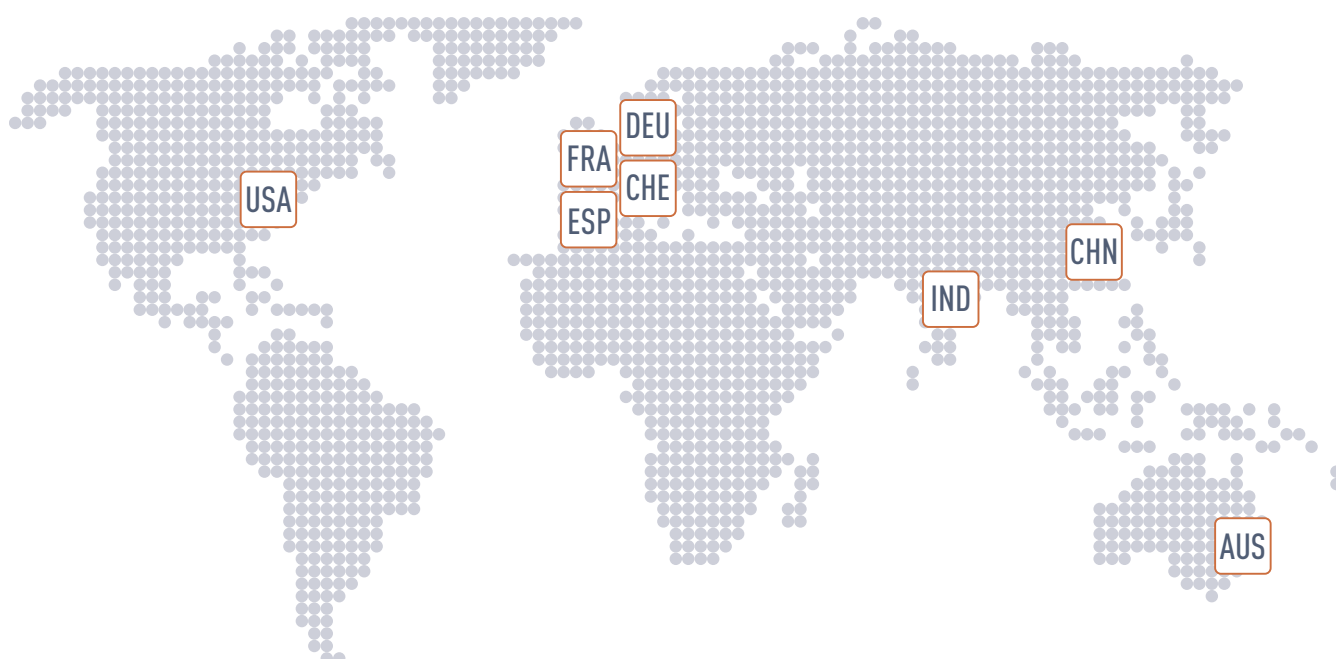
- ▶ F26L product page with an up-to-date list of standard models and available accessories: www.duagon.com/products/f26l/



LEADING THE EMBEDDED FUTURE

duagon WORLDWIDE

duagon has a global presence with support and sales representatives across eight countries. With three decentralized engineering and production sites, our customers take advantage of the added competence and flexibility.



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