Intel® C246 Express Chipset and
Intel® Xeon®/Intel® 8th/9th Gen Core™ i3/i5/i7/i9 Processors

- cTDP – Easy & flexible reduction of CPU TDP
- Supporting Intel® AMT 12.0/vPro
- Dual LAN, 4x COM, GPIO
- M.2 SSD & M.2 WLAN slots onboard
- Powerful USB 3.1 Gen2
D3641-S µATX
Industrial Series

The Industrial Motherboard D3641-S µATX is equipped with the highly performant Intel® C246 Express Chipset. It also offers a multitude of supporting processors such as the Intel® Xeon® E-21xx/E-22xx processor series, as well as Intel® Core™ i9/i7/i5/i3 (8th/9th Gen) and the Intel® Pentium®/Intel® Celeron® processor series. Designed and approved for 24/7 continuous operation and an enhanced temperature range up to 60 °C the D3641-S µATX provides high functionality and fits perfect with special requirements of certain markets. It offers extended manageability with the latest Intel® AMT 12.0 and vPro.

PRODUCT HIGHLIGHTS

- Intel® 8th/9th Gen Core™ & Intel® Xeon® Processor Series
- DDR4 2666 SDRAM, max. 64 GByte
- cTDP – Easy & flexible reduction of CPU TDP
- Supporting Intel® AMT 12.0/vPro
- PCI Express® x16 (Gen.3)
- 2x Intel® GbE LAN (incl. Teaming)
- Intel® UHD Graphics (DX12); 1x DVI-D, 2x DP V1.2
- Intel® High Definition 5.1 Audio; Infineon TPM V2.0
- 8 Bit GPIO; 4 x COM ports
- 6x USB 2.0, 4x USB 3.1 Gen1, 2x USB 3.1 Gen2,
  1x USB 3.1 Gen2 stick socket
- 6x SATA 6G incl. RAID support, parallel port (internal pin header)
- M.2 2280 (PCIe-based SSD modules)
- M.2 2230 (WLAN/Bluetooth modules)
- BIOS-POST/-Boot & OS – HW Watchdog onboard

TECHNICAL INFORMATION

SYSTEM

- PROCESSOR
  - Intel® Xeon® E-21xx/E-22xx processor series
  - Intel® Core™ i9/i7/i5/i3 (8th/9th Gen) processor series
  - Intel® Pentium®/Intel® Celeron® processor series
  - Socket LGA1151, max. 95 W TDP
  - (For details on supported processors please refer to Kontron FTP Server)

- CHIPSET
  - Intel® C246 Express Chipset

- MEMORY
  - 4 DIMM Sockets DDR4-2666 (1.2 V), max. 64 GByte, Dual Channel
  - DDR4 -2666 (CL19)/-2400 (CL17)/-2133 (CL15) SDRAM,
    unbuffered, ECC/non-ECC
  - Note: 128 GByte memory configuration (4x 32 GByte modules) not supported
  - Effective memory speed depends on installed processor

VIDEO

- GRAPHICS
  - Intel® UHD Graphics (depends on installed processor), DX12
  - 2x DP V1.2
  - 1x DVI-D
  - VGA output possible via optional VGA extension card D3653-A

AUDIO

- AUDIO INTERFACE
  - Realtek ALC671
  - 5.1- channel, High Definition Audio Codec

NETWORK CONNECTION

- ETHERNET
  - Intel i219LM & i210AT with 10/100/1000 MBit/s, AMT 12.0/vPro Support,
    Wake-on-LAN (WoL) by interesting Packets, Link Status Change and
    Magic Packet™, PXE Support, BIOS MAC Address Display, Teaming Support

PERIPHERAL CONNECTION

- USB
  - 6x USB 2.0, 4x USB 3.1 Gen1, 2x USB 3.1 Gen2, 1x USB 3.1 Gen2 stick socket
  - 1x RS232 (by header)
  - 1x 8-Bit GPIO

- SERIAL PORT
  - 6x Serial ATA III 600 Interface (up to 6Gbps), NCQ, AHCI, RAID 0/1/5/10,
    1x M.2 PCIe (2280), 1x M.2 Key-E (2230)
  - PCIe x16: 1x 16 lanes, Gen3/4x 4 lanes, Gen3
  - PCIe x1: 1x Gen3, “open”/1x Gen3, “closed”

- SATAC
  - 6x Serial ATA III 600 Interface (up to 6Gbps), NCQ, AHCI, RAID 0/1/5/10,
    1x M.2 PCIe (2280), 1x M.2 Key-E (2230)
  - PCIe x16: 1x 16 lanes, Gen3/4x 4 lanes, Gen3
  - PCIe x1: 1x Gen3, “open”/1x Gen3, “closed”

POWER

- CONNECTOR
  - Input/Output/WLAN LED support, WLAN enable/disable support
  - 3.3 V/5 V/12 V supply voltage output, SMBus controller PCA9554A

- INPUT VOLTAGE
  - 8 Bit GPIO (Input/Output); WLAN LED support, WLAN enable/disable support
  - 3.3 V/5 V/12 V supply voltage output, SMBus controller PCA9554A

- BIOM
  - AMI Aptio 5 x (UEFI) BIOS
  - modified and adapted by Kontron; Recovery BIOS, SM-BIOS (OMI), BIOS and
    CPU Microcode Update, Quick Boot, Logo Boot, Quiet Boot, Plug & Play,
    Automatic DRAM and PCIe Configuration, BIOS Support for S.M.A.R.T.,
    Advanced Power Management, ACPI S3/S4, Wake on time from S5.
    HW Watchdog support & BIOS integrated HW Diagnostic Tool.

- WATCHDOG
  - No legacy OS support, no MBR installation (UEFI only)
  - Recovery BIOS, System and BIOS Password, Boot Sequence Control
  - Integrated

- REAL TIME CLOCK
  - TPM V2.0 (Infineon SB9670; TCG compliant)

- TPM
  - AMT Aptio 5 x (UEFI) BIOS
  - modified and adapted by Kontron; Recovery BIOS, SM-BIOS (OMI), BIOS and
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- TPM V2.0 (Infineon SB9670; TCG compliant)
**TECHNICAL INFORMATION**

**SYSTEM CONTROL**
- FP HEADER
  - 1x Header for Reset button, HDD LED & External Speaker, Power button, Power LED
- SECURITY
  - Recovery BIOS, System and BIOS Password, Boot Sequence Control, Serial/USB - Port Access Protection, Write Protection for Flash BIOS, EraseDisk (BIOS Feature), Infineon Trusted Platform Module (TPM)

**SOFTWARE**
- OS SUPPORT
  - MS Windows 10
  - Linux 64

**MECHANICAL**
- DIMENSIONS (L x W)
  - µATX: 9.6” x 9.6” (243.8 x 243.8 mm)

**ENVIRONMENTAL**
- OPERATION TEMPERATURE
  - 0 °C - 60 °C

**CERTIFICATION**
- EMC & SAFETY
  - cTÜVus acc. IEC62368-1, CE Class B Industrial Immunity, FCC-B verified

**POWER SUPPLY REQUIREMENTS**

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>VOLTAGE</th>
<th>MIN. PS LOAD</th>
<th>MAX. VOLTAGE TOLERANCE</th>
<th>MOTHERBOARD CAPACITIVE LOAD</th>
<th>MOTHERBOARD MAX. CURRENT (continuous)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Power Supply</td>
<td>+ 12 V</td>
<td>0.05 A</td>
<td>± 5 %</td>
<td>5.000 µF</td>
<td>10 A / 18 A*</td>
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<tr>
<td></td>
<td>- 12 V</td>
<td>0 A</td>
<td>± 10 %</td>
<td>470 µF</td>
<td>0.3 A</td>
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<tr>
<td></td>
<td>+ 5 V</td>
<td>0.2 A</td>
<td>± 5 %</td>
<td>3.000 µF</td>
<td>6.0 A</td>
</tr>
<tr>
<td></td>
<td>+ 3.3 V</td>
<td>0 A</td>
<td>± 5 %</td>
<td>3.000 µF</td>
<td>0.5 A</td>
</tr>
<tr>
<td>Aux</td>
<td>+ 5 Vaux</td>
<td>0 A</td>
<td>+ 5 % / - 3 %</td>
<td>3.000 µF</td>
<td>2.5 A</td>
</tr>
</tbody>
</table>

* Processor 95 W TDP: Max. Cont. Current = 10 A; max. Surge Current = 18 A (< 100ms) / 18 A (< 10ms)
* Processor 65 W TDP: Max. Cont. Current = 7 A; max. Surge Current = 14 A (< 100ms) / 18 A (< 10ms)
* Processor 35 W TDP: Max. Cont. Current = 4 A; max. Surge Current = 10 A (< 100ms) / 14 A (< 10ms)

**CONNECTOR / SOCKET DIAGRAM**

[Diagram showing various connections and components such as PCIe, DDR4, USB, IO, etc. with dimensions 243.8 mm x 243.8 mm]
## TECHNICAL INFORMATION

### FEATURES

<table>
<thead>
<tr>
<th>Board Size / Chipset</th>
<th>µATX / IC246</th>
</tr>
</thead>
<tbody>
<tr>
<td>VGA® / DVI-I / DVI-D / DP-V1.2 / 2nd DP-V1.2 / LVDS</td>
<td>µATX / IC246</td>
</tr>
</tbody>
</table>

### SPECIAL FEATURES

- Silent Fan / System Guard / cTPM
- Recovery BIOS / Desk Update / Multi Boot
- HDD Password / EraseDisk / TPM V2.0
- BIOS POST Watchdog / BIOS Boot Watchdog / OS HW Watchdog
- Logo Boot Option
- High Efficiency Core Voltage Regulator Design
- Operating Mode 24/7 - 8-5 (hrs per day - days per week)
- Motherboard operating temperature range (chassis inside)*** 0°C – 60°C

### INTERNAL CONNECTORS

- D1mm Sockets (DDR4 2666MHz)
- PCI Express® x16: 16lanes-gen3 / PCI Express® x16: 4lanes-gen3
- PCI Express® x1: gen3-“open” / PCI Express® x1: gen3-1lane-“closed”
- PCI Slots (32 Bit, 33 MHz, Rev. 2.3) / Mini-PCIe
- SATA-600 / mSATA / M.2 SSD 2280 (Key-M, PCIe/NVME)
- M.2 2230 (Key-E, PCIe & USB2.0 for WLAN/Bluetooth)
- S/PDIF (digital Audio) OUT / IN
- Front Panel Audio (9-Pin, HD Audio)
- USB 2.0 / USB 3.1 (Gen1) / USB 3.1 (Gen2) / USB 3.1 (Gen2) Stick****
- Fan PSU / CPU / AUX1 / AUX2 / Aux3
- Intrusion (Case Open) / GPIO (8Bit) / 5M-Bus (Case Temp.)
- Serial (COM, RS-232) / Parallel Port Pin Header*****
- Front Panel (Power Switch, Reset Switch, LEDs, Intel 10 pin compatible)
- ATX Power Supply (24 pin + 4 pin) / 12V-only Power Supply

### EXTERNAL CONNECTORS

- VGA Sub D® / DVI-I / DVI-D / DisplayPort V1.2
- Audio Mic. In / Line in / Line out (or driver configuration)
- LAN (RJ-45)
- PS/2 Mouse / Keyboard
- USB 2.0 / USB 3.1 (Gen1) / USB 3.1 (Gen2)
- Serial (COM1, RS-232)
- Parallel (EPP/ECP)****

* VGA possible via optional Extension Card D3653-A or DP-VGA-converter (dongle)
** Not supported by standard Power Supplies
*** Forced cooling required, see technical documentation for details
**** Each internal USB connector (pin header) provides two USB ports (except for USB stick socket)
***** External parallel port possible via optional connector cable

### ORDERING INFORMATION

<table>
<thead>
<tr>
<th>ARTICLE</th>
<th>ART NO.</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>D3641-S µATX</td>
<td>F5110-V63</td>
<td>Intel® 8th/9th Gen Core™ &amp; Intel® Xeon® Processor Series, Intel® C246 Chipset</td>
</tr>
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</table>

### ACCESSORIES

<table>
<thead>
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<th>ARTICLE</th>
<th>PART NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>VGA EXTENSION CARD</td>
<td>F5000-R009</td>
<td>D3653-A</td>
</tr>
<tr>
<td>SERIAL PORT CABLE</td>
<td>F5000-K010</td>
<td>400 mm, fullsize slot bracket</td>
</tr>
<tr>
<td>M.2 CARRIER BOARD</td>
<td>F5000-M001</td>
<td>D3352-A1</td>
</tr>
</tbody>
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### GLOBAL HEADQUARTERS

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