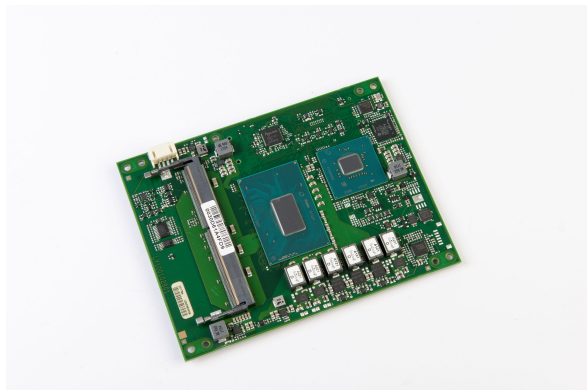




## MSC C6B-CFLH

Intel® Core™ 8th Generation



 125 x 95

 35 / 55 W

 0 +60



IoT Solutions  
Alliance

COM  Express

## Description

The MSC C6B-CFLH module is based on the 8th Generation Intel® Core™ Processor family. The Intel two-chip solution allows highest performance in graphics and computing on a COM Express module in basic form factor.

The new MSC C6B-CFLH offers triple independent display support with up to 4k x 2k resolution, highest level graphics acceleration and hardware based video en-/decoding. Fast DDR4 memory with optional error correction (ECC) and multiple USB 3.1/2.0 interfaces complete the compact and powerful module.

With choices of six and quad-core processor options the board is well positioned to address challenging performance demands. Besides an extensive set of interfaces and features, the MSC C6B-CFLH offers hardware based security compliant to the requirements of TCG (Trusted Computing Group).

The Type 6 pin-out allows direct access to the latest digital display interfaces like DisplayPort 1.4, DisplayPort 1.2, HDMI 1.4 and DVI as well as up to four USB 3.1 interfaces supporting the fastest peripherals currently available.

## Highlights

- Intel® Core™ i7-8850H (six-core, 2.6/4.3GHz, 45/35W cTDP),
- Intel® Core™ i5-8400H (quad-core, 2.5/4.2GHz, 45/35W cTDP)
- Intel® Core™ i3-8100H (quad-core, 3.0GHz, 45/35W cTDP)
- Intel® Xeon® E-2176M (six-core, 2.7/4.4GHz, 45/35W cTDP),
- Intel® UHD Graphics
- Intel® chipsets QM370 or CM246
- Up to 32GB DDR4-2666 SDRAM, dual channel (ECC optionally supported on models with Xeon E-2176M)
- Four SATA 6Gb/s mass storage interfaces
- Three DisplayPort/HDMI/DVI interfaces
- Embedded DisplayPort / LVDS (24 Bit, dual channel) interface
- Triple independent display support
- DirectX 12, OpenGL 4.5, OpenCL 2.x
- Resolution up to 4096 x 2304
- Eight PCI Express™ x1 lanes, configurable up to x4, Intel® Rapid Storage Technology support
- PEG configurable as 1x16 or 2x8 or 1x8 + 2x4
- Four USB 3.1/2.0 and four USB 2.0 interfaces
- Trusted Platform Module
- UEFI Firmware

## Technical Data - MSC C6B-CFLH

<b>Technology</b>	x86
<b>Formfactor</b>	COM Express Basic
<b>CPU</b>	<p>Intel® Core™ i7-8850H (six-core, 2.6/4.3GHz, 9M cache, 45/35W cTDP),  Intel® Core™ i5-8400H (quad-core, 2.5/4.2GHz, 8M cache, 45/35W cTDP),  Intel® Core™ i3-8100H (quad-core, 3.0GHz, 6M cache, 45/35W cTDP),  Intel® Xeon® E-2176M (six-core, 2.7/4.4GHz, 12M cache, 45/35W cTDP),</p> <p>Intel® Technologies: Intel® vPro, Intel® 64, Intel® Virtualization Technology (VT-x), Intel® Virtualization Technology for Directed I/O (VT-d), Intel® Trusted Execution Technology*, Intel® Adv. Encryption Standard AES-NI, Intel® Turbo Boost Technology 2.0  * not on all models</p>
<b>Chipset</b>	Intel® Platform Controller Hubs (PCH) QM370 or CM246
<b>RAM</b>	<p>2x 260-pin SO-DIMM socket for up to 2x 16GB DDR4 SDRAM (DDR4-2666<sup>1</sup>); dual channel operation; ECC option<sup>12</sup>  <sup>1</sup> Depending on SO-DIMM type  <sup>2</sup> ECC supported on models with Xeon E-2176M</p>
<b>Storage Interfaces</b>	4x SATA channels (up to 6Gb/s)
<b>USB</b>	4x USB 3.1 (Gen 1 & 2)/2.0, 4x USB 2.0
<b>Serial Interfaces</b>	2x high-speed serial ports from PCH
<b>Bus Interfaces</b>	8x PCI Express x1 Gen 3, 1x PCI Express Graphics (PEG) x 16 Gen. 3 LPC bus (Low Pin Count bus; no DMA support)
<b>Display Controller</b>	<p>Integrated Intel UHD graphics Gen. 9  3D Acceleration: DirectX® 11/12, OpenGL 4.3/4.4, OpenGL ES 2.0, OpenCL 2.x;  HW accelerated Video Decode: H.264/AVC, VP8, VP9, VP9 10 Bit, H.265/HEVC 8 bit, H.265/HEVC 10 Bit, MPEG2, MJPEG, VC-1  HW accelerated Video Encode: H.264/AVC, VP8, VP9, H.265/HEVC 8 bit, H.265/HEVC 10 Bit, MPEG2, MJPEG.</p> <p>Triple independent display support</p>
<b>Display Interfaces</b>	<p>Display Port and HDMI/DVI:  3x Digital Display Interface, usable as DisplayPort 1.2 (up to 4096 x 2304 @ 60Hz), also usable as HDMI 1.4b or DVI (up to 4096 x 2160 @ 30Hz)  1x Embedded DisplayPort 1.4 (on variants without LVDS only); 4096 x 2304 @ 60Hz</p> <p>LCD:  LVDS 24bit, dual-channel (not on all variants); 1920 x 1200 @ 60Hz</p>
<b>Network Interface</b>	10/100/1000Base-TX (integrated in PCH, Intel® i219LM PHY)
<b>Audio Interface</b>	High Definition Audio
<b>Security Device</b>	TPM 2.0

<b>Miscellaneous</b>	<p>Watchdog Timer: Initiates system reset, programmable</p> <p>Fan Supply: 4-pin header for 12V CPU fan, PWM speed controlled and PWM speed control for system fan supported</p> <p>RTC battery: External</p> <p>System Monitoring: Voltage, temperature, CPU fan, system fan</p>
<b>Firmware</b>	<p>UEFI Firmware: AMI Aptio<sup>®</sup> V</p> <p>Security: TPM 2.0 support, TCG compliant</p> <p>Power Management: ACPI Active fan control</p> <p>USB: USB legacy support (keyboard, mouse, storage)</p> <p>Monitoring: System Monitoring Health Monitoring</p> <p>MSC Adv. Boot Device Selection: Boot device priority setting based on physical interfaces</p>
<b>OS Support</b>	<p>Windows 10 IOT Enterprise BSP for Linux (Yocto) EAPI (HW Programming Interface)</p>
<b>Power Requirement</b>	<p>Voltage: +8.5V to +20V, +5V Stby optional</p> <p>Power Consumption: 35 W to 55 W (typ.)</p>
<b>Environment</b>	<p>Ambient Temperature: 0° ... 60°C (operating), -25° ... 85°C (storage)</p> <p>Humidity: 5 ... 95% (operating, non-condensing), 5 ... 95% (storage, non-condensing)</p>
<b>Dimensions</b>	<p>125mm x 95mm x 13mm* (*Measured from module PCB bottom side to heat spreader top side. Different heights apply, when using other cooling solutions.)</p>
<b>Certificates</b>	<p>UL / CE</p>

## Order Reference - MSC C6B-CFLH

Order Number	Description	Reference	Cat
73872	COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel Xeon E-2176M, six-core, 2.7/4.4GHz, 45W TDP; Chipset: CM246; Graphics: integrated Intel HD Gen 9 (GT2); Embedded DisplayPort (eDP); 3x DP/HDMI/DVI; Ethernet: Intel i219 Gbit; HD audio; 4x SATA; 4x USB3.1/2, 4x USB2; 8x PCIe x1 Gen 3; PEG x16 Gen 3; 2x socket for DDR4 or DDR4 ECC SO-DIMM; TPM 2.0.	MSC C6B-CFLH-2176M-NN1101C PCBFTX	OR
73874	COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel Xeon E-2176M, six-core, 2.7/4.4GHz, 45W TDP; Chipset: CM246; Graphics: integrated Intel HD Gen 9 (GT2); LVDS (24 Bit, dual channel); 3x DP/HDMI/DVI; Ethernet: Intel i219 Gbit; HD audio; 4x SATA; 4x USB3.1/2, 4x USB2; 8x PCIe x1 Gen 3; PEG x16 Gen 3; 2x socket for DDR4 or DDR4 ECC SO-DIMM; TPM 2.0.	MSC C6B-CFLH-2176M-NN1201C PCBFTX	OR
73848	COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel Core i7-8850H, six-core, 2.6/4.3GHz, 45W TDP; Chipset: QM370; Graphics: integrated Intel HD Gen 9 (GT2); Embedded DisplayPort (eDP); 3x DP/HDMI/DVI; Ethernet: Intel i219 Gbit; HD audio; 4x SATA; 4x USB3.1/2, 4x USB2; 8x PCIe x1 Gen 3; PEG x16 Gen 3; 2x socket for DDR4 SO-DIMM; TPM 2.0.	MSC C6B-CFLH-8850H-NN0101C PCBFTX	PV
73850	COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel Core i7-8850H, six-core, 2.6/4.3GHz, 45W TDP; Chipset: QM370; Graphics: integrated Intel HD Gen 9 (GT2); LVDS (24 Bit, dual channel); 3x DP/HDMI/DVI; Ethernet: Intel i219 Gbit; HD audio; 4x SATA; 4x USB3.1/2, 4x USB2; 8x PCIe x1 Gen 3; PEG x16 Gen 3; 2x socket for DDR4 SO-DIMM; TPM 2.0.	MSC C6B-CFLH-8850H-NN0201C PCBFTX	PV
73876	COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel Core i5-8400H, quad-core, 2.5/4.2GHz, 45W TDP; Chipset: QM370; Graphics: integrated Intel HD Gen 9 (GT2); Embedded DisplayPort (eDP); 3x DP/HDMI/DVI; Ethernet: Intel i219 Gbit; HD audio; 4x SATA; 4x USB3.1/2, 4x USB2; 8x PCIe x1 Gen 3; PEG x16 Gen 3; 2x socket for DDR4 SO-DIMM; TPM 2.0.	MSC C6B-CFLH-8400H-NN0101C PCBFTX	PV
73878	COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel Core i5-8400H, quad-core, 2.5/4.2GHz, 45W TDP; Chipset: QM370; Graphics: integrated Intel HD Gen 9 (GT2); LVDS (24 Bit, dual channel); 3x DP/HDMI/DVI; Ethernet: Intel i219 Gbit; HD audio; 4x SATA; 4x USB3.1/2, 4x USB2; 8x PCIe x1 Gen 3; PEG x16 Gen 3; 2x socket for DDR4 SO-DIMM; TPM 2.0.	MSC C6B-CFLH-8400H-NN0201C PCBFTX	PV

## Order Reference - MSC C6B-CFLH

Order Number	Description	Reference	Cat
76724	COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel Core i3-8100H, quad-core, 3.0GHz, 45W TDP; Chipset: QM370; Graphics: integrated Intel HD Gen 9 (GT2); Embedded DisplayPort (eDP); 3x DP/HDMI/DVI; Ethernet: Intel i219 Gbit; HD audio; 4x SATA; 4x USB3.1/2, 4x USB2; 8x PCIe x1 Gen 3; PEG x16 Gen 3; 2x socket for DDR4 SO-DIMM; TPM 2.0.	MSC C6B-CFLH-8100H-NN0101C PCBFTX	PV
76728	COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel Core i3-8100H, quad-core, 3.0GHz, 45W TDP; Chipset: CM246; Graphics: integrated Intel HD Gen 9 (GT2); Embedded DisplayPort (eDP); 3x DP/HDMI/DVI; Ethernet: Intel i219 Gbit; HD audio; 4x SATA; 4x USB3.1/2, 4x USB2; 8x PCIe x1 Gen 3; PEG x16 Gen 3; 2x socket for DDR4 or DDR4 ECC SO-DIMM; TPM 2.0.	MSC C6B-CFLH-8100H-NN1101C PCBFTX	OR
76726	COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel Core i3-8100H, quad-core, 3.0GHz, 45W TDP; Chipset: QM370; Graphics: integrated Intel HD Gen 9 (GT2); LVDS (24 Bit, dual channel); 3x DP/HDMI/DVI; Ethernet: Intel i219 Gbit; HD audio; 4x SATA; 4x USB3.1/2, 4x USB2; 8x PCIe x1 Gen 3; PEG x16 Gen 3; 2x socket for DDR4 SO-DIMM; TPM 2.0.	MSC C6B-CFLH-8100H-NN0201C PCBFTX	PV
76730	COM Express Type 6 Basic module (125mm x 95mm); CPU: Intel Core i3-8100H, quad-core, 3.0GHz, 45W TDP; Chipset: CM246; Graphics: integrated Intel HD Gen 9 (GT2); LVDS (24 Bit, dual channel); 3x DP/HDMI/DVI; Ethernet: Intel i219 Gbit; HD audio; 4x SATA; 4x USB3.1/2, 4x USB2; 8x PCIe x1 Gen 3; PEG x16 Gen 3; 2x socket for DDR4 or DDR4 ECC SO-DIMM; TPM 2.0.	MSC C6B-CFLH-8100H-NN1201C PCBFTX	OR

## Accessories

Order Number	Description	Reference
<b>Carrier Options</b>		
67295	COM Express Type 6 Evaluation Carrier Board with PCI Express x4/x16 slot, USB 3.0/2.0, GbE, SATA, DisplayPort, eDP/LVDS, VGA and HD audio interfaces; Mini PCI Express socket, SD card slot, ATX power connector and single 12V power jack. Dimensions: 170mm x 170mm (Mini-ITX form factor)	MSC C6-MB-EV-001 PCBFTX
41857	COM Express Type 6 Evaluation board with various PCI Express interfaces, SATA and mSATA, USB 2.0/3.0, Display Port and eDP, HDMI/DVI, HD-Audio, POST code display. ATX form factor	MSC C6-MB-EVA
<b>Cooling Options</b>		
1131080	Active Heatsink for C6B-SLH, C6B-KLH and C6B-CFLH, consisting of a single-piece aluminum profile with fins, pressed in standoffs without thread (2.7mm inner diameter), screws and thermopads for the thermal contact to CPU and chipset. PWM fan 80x80x15mm.	MSC C6B-SLH-01 HSF-001
1131081	Passive Heatsink for C6B-SLH, C6B-KLH and C6B-CFLH, consisting of a single-piece aluminum profile with fins, pressed in standoffs without thread (2.7mm inner diameter), screws and thermopads for the thermal contact to CPU and chipset.	MSC C6B-SLH-01 HSI-001
1131082	Heatspreader for C6B-SLH, C6B-KLH and C6B-CFLH. Single-piece aluminum profile, pressed in standoffs without thread (2.7mm inner diameter), screws and thermopads for the thermal contact to CPU and chipset. No fan, no SO-DIMM cutout.	MSC C6B-SLH-01 HSP-001
1131083	Heatspreader for C6B-SLH, C6B-KLH and C6B-CFLH. Single-piece aluminum profile, pressed in standoffs with M2.5 thread, screws and thermopads for the thermal contact to CPU and chipset. No fan, no SO-DIMM cutout.	MSC C6B-SLH-02 HSP-001
<b>Memory Options</b>		
1147001	4GB DDR4-2666 SO-DIMM, ECC	M4DI-4GSSPC0K-E
1147002	8GB DDR4-2666 SO-DIMM, ECC	M4DI-8GS1PC0K-C
1147003	16GB DDR4-2666 SO-DIMM, ECC	M4DI-AGS1QC0K-C
1147004	4GB DDR4-2666 SO-DIMM	M4SI-4GSSNC0K-E
1147005	8GB DDR4-2666 SO-DIMM	M4SI-8GS1NC0K-C
1147006	16GB DDR4-2666 SO-DIMM	M4SI-AGS1OC0K-C

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