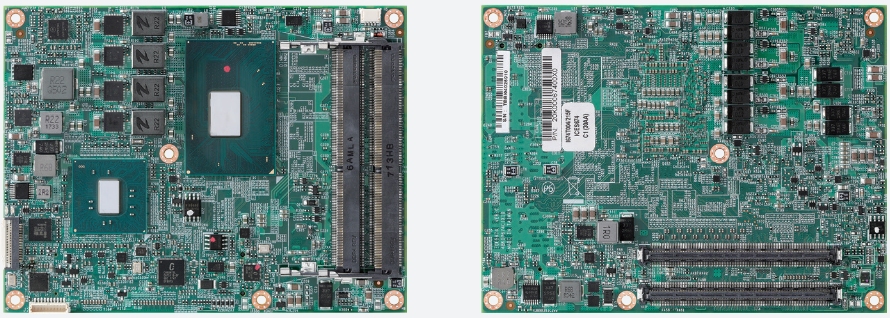
ICES 674

COM Express Basic Type 6
6/7th Gen. Intel® Core™/Xeon® Processors



Main Features

- Onboard 6/7th Gen Intel® Core™ i7/i5/i3/Xeon® + PCH QM175/ CM238 (optional)
- 2 channel DDR4 with non-ECC/SO-DIMM 2133MHZ up to 32GB
- Support display LVDS/VGA/DDI 1/DDI 2
- PCIe x16/8 PCIe x1, 4 x USB 3.0, 8 x USB 2.0, 4 x SATA 3.0 and GBE

Product Overview

The ICES 674 is a COM express type 6-pinouts basic module which featuring Intel® 100 series PCH chipset supports Intel® 6th and 7th generation Intel® Core™ with Dual DDR4 SO-DIMM socket up to 32GB DDR4 2400MHz SDRAM. The ICES 674 integrated Intel® HD graphics engines support or expands via PCI express graphic 1 x 16 lanes and support three DDI (Digital Display Interface) to follow the standard of PICMG COM2.0 specification. It allows type 6-pinout carrier board to implement DDI and legacy VGA interface. With the 125 x 95mm type 6 COM express modules, the boards are offered with numerous processor variants: Intel® Core™ i7/i5 with quad-core or dual core. The high performance ICES 674 COM express basic module supports 4 x USB 3.0/8 x USB 2.0, 4 x SATA 3.0 and 8 x PCIe x 1 lanes through our NEXCOM designed ICEB 8060 as well as customized solution for your embedded projects.

Specifications

CPU/Chipset

- Intel® mobile QM175 (default SKU)
  - Intel® i7-7820EQ Core™ i7, 4x 3.0 GHz (3.7 GHz), GT2, 45/35 W
  - Intel® i5-6440EQ Core™ i5, 4x 2.7 GHz (3.4 GHz), 45 W
  - Intel® Celeron® G3900E 2 x 2.40GHz, 25 W

Main Memory

- Dual channel DDR4 SO-DIMM memory socket with non-ECC support, up to 32 GB 2133/2400MHZ

Display

- Integrated Intel® Gen 9 graphics graphic engine
- 1 x VGA connector (resolution up to 1920 x 1080 @ 60Hz)
- 1 x LVDS connector (resolution up to 1920 x1080 @ 60Hz)
- DDI 1/2 port configurable to HDMI 1.4/DVI/DisplayPort
- 1.2 HDMI up to 4096 x 2160 @ 30/24Hz, DVI up to 1920 x1200 @ 60Hz, DP up to 4096 x 2304 @ 60Hz)

BIOS

- Up to 1 x 8MB (128Mb) SPI flash ROMs
- AMI (UEFI)

COM Express Connector

- AB :
  LVDS, VGA (VGA/eDP co-lay), 1 x Gbe LAN, 6 x PCIe x1, HD Audio, 4 x SATA III, 8 x USB 2.0, LPC Bus, SM Bus/I2C, 2 x COM, GPIO 8-bit
- CD :
  eDP (VGA/eDP co-lay), DDI1, DDI2, 1 x PCIe x16, 2 x PCIe x1, 4 x USB 3.0

Power Requirement

- +12VDC, +5Vsb
- Support both AT and ATX power supply mode

Dimensions

- 125mm (W) x 95mm (L)

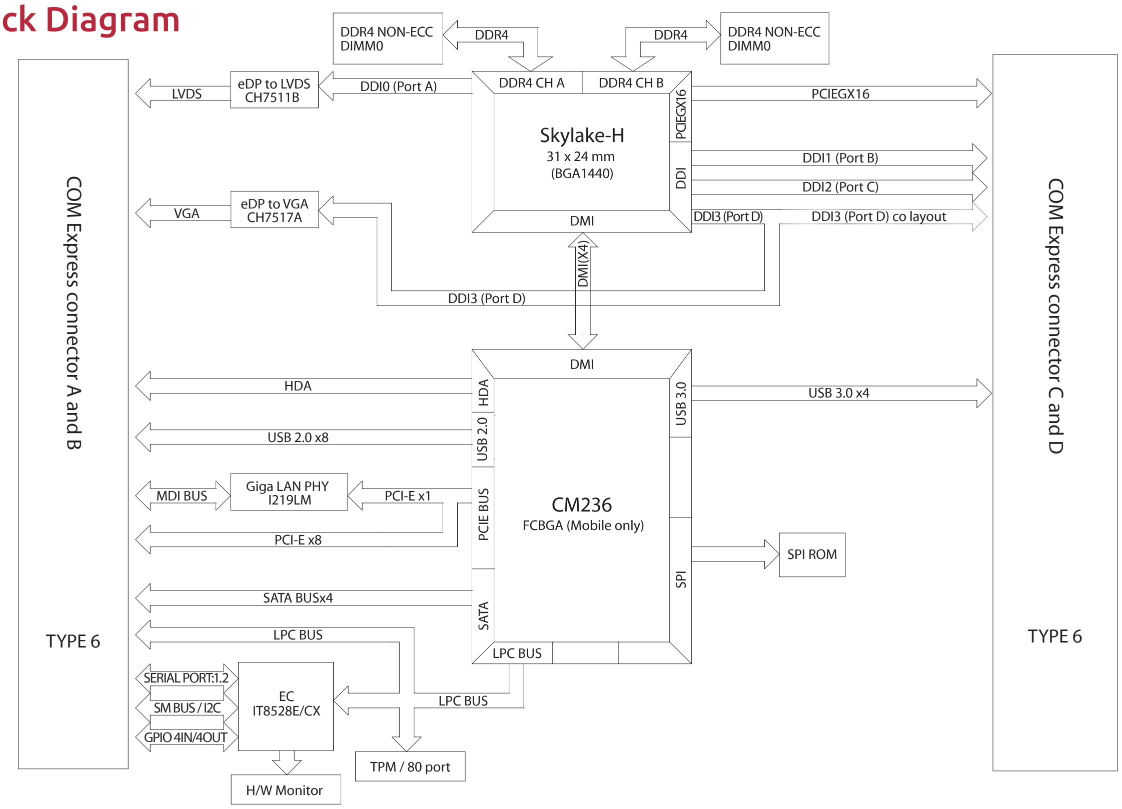
Environment

- Board level operation temperture : -15°C to 60°C
- Storage temperture : -20˚C to 85˚C
- Relative humidty:
  - 10% to 95% (operating, non-condensing)
  - 5% to 95% (non-operating, non-condensing)

Certifications

- Meet CE/FCC Class A

Block Diagram



Ordering Information

Barebone

- **ICES 674 (P/N: 10K00067400X0)**
  Onboard Intel® 7th i7-7820E processor, w/ DDR4 SO-DIMM, support multiple display from VGA/LVDSD/DDI1/2, 4 x SATA III, 1x GbE LAN, 2 x COM, 4 x USB 3.0, 8 x USB 2.0, HD audio, 8bit GPIO
- **ICE 674-6640EQ (P/N: 10K00067401X0)**
  Onboard Intel® 6th ICES 674-6440EQ processor, w/ DDR4 SO-DIMM, support multiple display from VGA/LVDSD/DDI1/2, 4 x SATA III, 1 x GbE LAN, 2 x COM, 4 x USB 3.0, 8 x USB 2.0, HD audio, 8-bit GPIO

Optional Accessories

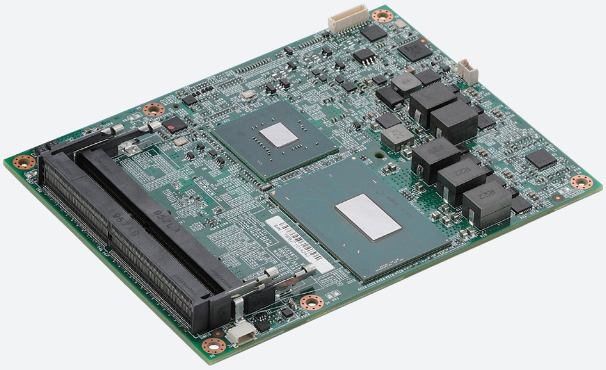
- **ICES 674 heat spreader thermal pad screw**
  (P/N: 5050200148X00)
- **ICES 674 cpu cooler fan heat sink screw**
  (P/N: 5050300920X00)

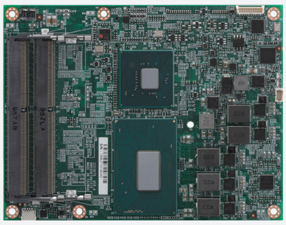
* Notice
Heat spreader: The heat spreader acts as a thermal coupling device to the module and is thermally coupled to the CPU via a thermal gap filler. On some modules, it may also be thermally coupled to other heat generating components with the use of additional thermal gap fillers. Although the heatspreader is the thermal interface where most of the heat generated by the module is dissipated, it is not to be considered as a heatsink. It has been designed as a thermal interface between the module and the application specific thermal solution.

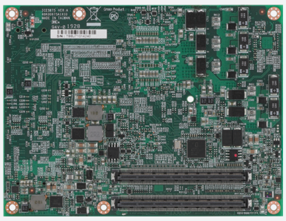
ICES 675

COM Express Basic Type 6

8th Gen Intel® Core™/Xeon® Processors







Main Features

- 8th Gen Intel® Core™ processors, BGA 1440, PCH CM246
- 2 channel DDR4 with ECC or non-ECC SO-DIMM 2666MHz up to 32GB
- Support triple display VGA, 2 x DP, eDP/LVDS 24-bit dual channel
- PCI express lane x16 (configurable: “1 x 16”;“2 x 8”;“1 x 8 + 2 x 4”)
- PCI express lane x1 (Gen 3), 8 x (can be configured x 1, x 4)
- IO: 2 x UART (RX/TX), 8-bit DIO, WDT, TPM (optional)

Product Overview

The ICES 675 is a COM express type 6-pinouts basic module which featuring Intel® C240 series PCH chipset supports Intel® 8th and Intel® Xeon® and Intel® Core™ processors 2 channel DDR4 with ECC or non-ECC SO-DIMM 2666MHz up to 32GB. The ICES 675 integrated Intel® HD graphics engines support or expands via PCI express graphic 1 x16 lanes and support three DDI (Digital Display Interface) to follow the standard of PICMG COM2.0 specification. It allows type 6-pinout carrier board to implement DDI and legacy VGA interface.

With the 125 x 95mm type 6 COM express modules, the boards are offered with numerous processor variants: Intel® Xeon® E-2176M processor (support ECC), Intel® Core™ i7-8850H processor (non-ECC) and Intel® Core™ i5-8400H processor (non-ECC).

The high performance ICES 675 COM express basic module supports 1 x GbE LAN, 4 x USB 3.1 GEN1, 8 x USB 2.0, 4 x SATA 3.0, 2 x UART (TX/RX), HD audio, 8-bit DIO, TPM (optional) ICEB 8060 as well as customized solution for your embedded projects.

Specifications

CPU Support

- 8th Gen Intel® Core™ processors, BGA 1440
- Intel® Xeon® E-2176M processor, 6 Cores, 12M Cache, 2.7GHz (4.4GHz), 45W (support ECC)
- Intel® Core™ i7-8850H processor, 6 Cores, 12M Cache, 2.6GHz (4.3GHz), 45W
- Intel® Core™ i5-8400H processor, 4 cores, 8M Cache, 2.5GHz (4.2GHz), 45W
- Intel® Mobile CM246

Main Memory

- Dual channel DDR4 SO-DIMM memory socket with non-ECC support, up to 32 GB 2666MHZ, ECC support as option with Intel® Xeon® E-2176M processor

Display

- Integrated Intel® Gen9 graphics engine
- 1 x VGA connector (resolution up to 1920 x 1080@60Hz)
- 1 x LVDS connector(resolution up to 1920 x 1080@60Hz)
- DDI 1/2 port configurable to HDMI 1.4/DVI/display port 1.4 HDMI up to 4096 x 2160@30Hz/24bpp, DVI up to 1920 x 1200@60Hz, DP up to 4096 x 2304@60Hz

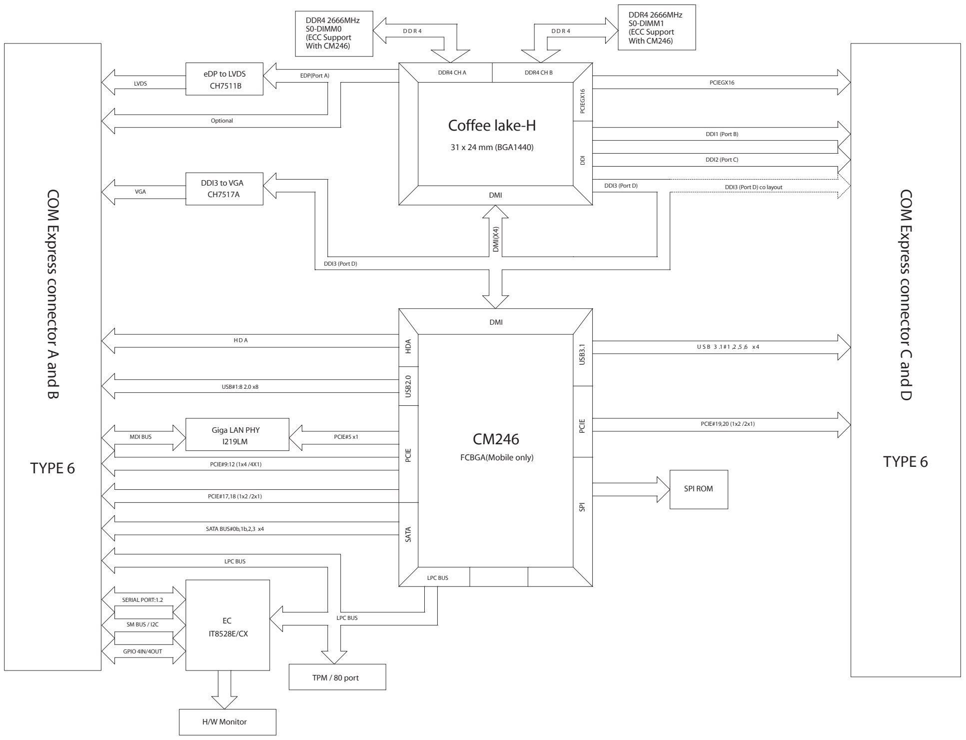
BIOS

- AMI (UEFI)

COM Express Connector

- AB: LVDS: (LVDS/eDP co-lay), VGA: (VGA/DDI port3 co-lay), 1 x GbE LAN, 6 x PCIe x1, HD audio, 4 x SATA 3.0, 8 x USB 2.0, LPC Bus, SM Bus/I2C, 2 x COM, GPIO 8-bit
- CD: DDI1, DDI2, 1 x PCIe x16, 2 x PCIe x1, 4 x USB 3.0

Block Diagram



Power Requirement

- +12VDC, +5Vsb
- Support both AT and ATX power supply mode

Dimensions

- 125 mm x 95 mm

Environment

- Board level operation temperture: -0°C to 60°C
- Storage temperture: -20˚C to 85˚C
- Relative humidty:
  10% to 95% (operating, non-condensing)
  5% to 95% (non-operating, non-condensing)

Certifications

- Meet CE/FCC Class B

Ordering Information

Barebone

- **ICES 675 (P/N: 10K00067500X0)**
  Onboard Intel® 8th Intel® Xeon® E-2176M processorr, 2 x DDR4 SO-DIMM (support ECC), support multiple display from VGA/LVDSD/ DDI1/2, 4 x SATA 3.0, 1 x GbE LAN, 2 x COM, 4 x USB 3.0, 8 x USB 2.0, HD audio, 8-bit GPIO

- **ICES 675-8850H (P/N: 10K00067502X0)**
  Onboard Intel® 8th Intel® Core™ i7-8850H processor, 2 x DDR4 SO-DIMM (non-ECC), support multiple display from VGA/LVDSD/ DDI1/2, 4 x SATA 3.0, 1 x GbE LAN, 2 x COM, 4 x USB 3.0, 8 x USB 2.0, HD audio, 8-bit GPIO

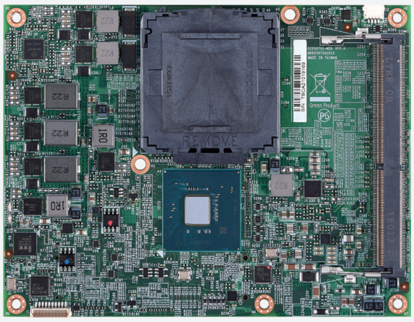
- **ICES 675-8400H (P/N: 10K00067501X0)**
  Onboard Intel® 8th Intel® Core™ i5-8400H processor, 2 x DDR4 SO-DIMM (non-ECC), support multiple display from VGA/LVDSD/ DDI1/2, 4 x SATA 3.0, 1 x GbE LAN, 2 x COM, 4 x USB 3.0, 8 x USB 2.0, HD audio, 8-bit GPIO

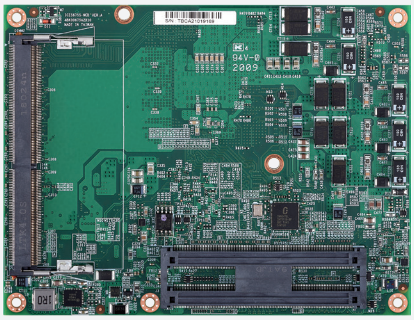
Optional Accessories

- **CPU cooler (P/N: TBD)**
- **Heat spreader (P/N: TBD)**
- **TPM 2.0 module kit (P/N: 5050300994X00)**

ICES 675S

COM Express Basic Type 6
8/9th Gen Intel® Core™/Xeon® Processors





Main Features

- 8/9th Gen Intel® Core™ processors, socket 1151, PCH C246
- 2-Channel DDR4 with ECC or non-ECC SO-DIMM 2666MHZ up to 32GB
- Support triple display VGA, 2 x DP, eDP/LVDS 24bit dual channel
- PCI express lane x16 (configurable: “1 x 16” ; “2 x 8” ; “1 x 8 + 2 x 4”)
- PCI express lane x1 (Gen 3), 8 x (can be configured x1, x 4)
- IO: 2 x UART (RX/TX), 8 Bit DIO, WDT, TPM (optional)

Product Overview

The ICES 675S series is a COM express type 6-pinouts basic module which featuring Intel® C240 series PCH chipset supports Intel® 8/9th Generation Intel® Core™ processors, socket 1151, DDR4 with ECC or non-ECC SO-DIMM 2666MHZ up to 32GB. The ICES 675S-NCB integrated Intel® HD graphics engines support or expands via PCI express graphic 1 x16 lanes and support three DDI (Digital Display Interface) to follow the standard of PICMG COM 2.0 specification. It allows type 6-pinout carrier board to implement DDI and legacy VGA interface.

The high performance ICES 675 COM express basic module supports 1 x GBE LAN, 4 x USB 3.1 GEN1, 8 x USB 2.0, 4 x SATA 3.0, 2 x UART (TX/RX), HD audio, 8 bit DIO, TPM (optional) ICEB 8060 as well as customized solution for your embedded projects.

Specifications

CPU Support

- 8/9th Intel® (Coffee Lake-S) Xeon® and Core™ i7/ i5 /i3 processor and LGA1151 socket, TDP max 65W
- CPU support list
  - 35W: Xeon® E-2278GEL (8C) (with ECC)
  - 65W: i7-8700 (6c)/i5-8500 (6c)/i3-8100 (4c) (with ECC)
  - 35W: i7-8700T (6c)/i5-8500T (6c)/i3-8100T (4c) (with ECC)
  - 35W: i7-9700TE (8c)/i5-9500TE (6c)/i3-9100TE (4c) (with ECC)
- PCH C246

Main Memory

- Dual channel DDR4 SO-DIMM memory socket with non-ECC support, up to 32GB 2666MHZ, ECC support as option with Intel® i3-8100, i3-8100T, i3-9100TE

Display

- Integrated Intel® Gen9 Graphics graphic engine
- 1 x VGA connector (resolution up to 1920 x 1080 @60Hz)
- 1 x LVDS connector (resolution up to 1920 x 1080 @60Hz)
- DDI 1/2 port configurable to HDMI 1.4/DVI/Display port 1.4 HDMI up to 4096 x 2160@30Hz/24bpp, DVI up to 1920 x 1200 @60Hz, DP up to 4096 x 2304@60Hz

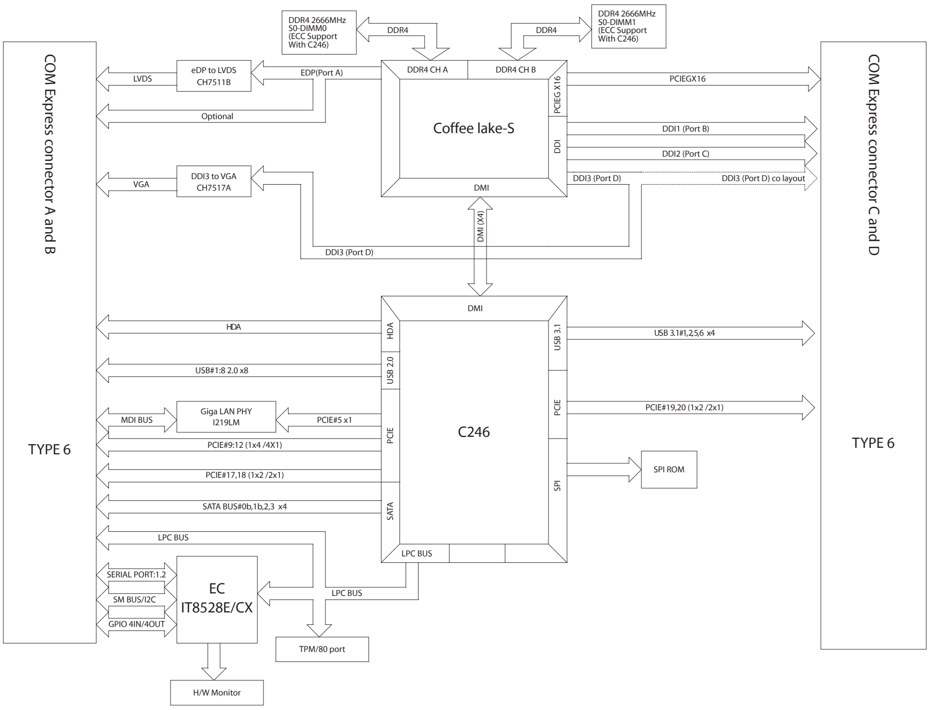
BIOS

- AMI (UEFI)

COM Express Connector

- AB: LVDS: (LVDS/eDP co-lay), VGA: (VGA/DDI port3 co-lay), 1 x GbE LAN, 6 x PCIex1, HD Audio, 4 x SATA III, 8 x USB 2.0, LPC Bus, SM Bus/I2C, 2 x COM, GPIO 8-bit
- CD: DDI1, DDI2, 1 x PCIe x16, 2 x PCIe x1, 4 x USB 3.0

Block Diagram



Power Requirement

- +12VDC, +5Vsb
- Support both AT and ATX power supply mode

Dimensions

- 125 mm x 95 mm

Environment

- Board level operation temperture: -0°C to 60°C
- Storage temperture: -20˚C to 85˚C
- Relative humidty
  - 10% to 95% (operating, non-condensing)
  - 5% to 95% (non-operating, non-condensing)

Certifications

- Meet CE/FCC Class B

Ordering Information

Barebone

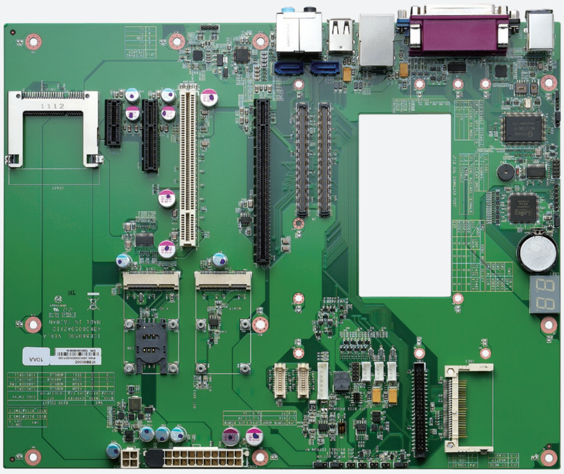
- **ICES 675S (P/N: 10K00067508X0)**
  COM express type 6, basic module, 8/9th Generation Intel® Core™ LGA1151 processor,C246 PCH with 6 core support, support dual channel DDR4 with ECC and non-ECC SO-DIMM 2666MHZ up to 32 GB, support 1 PCIe x16/8 PCIe x1/4 x USB 3.1/8 x USB 2.0/4 SATA 3.0 and GBE, LVDS (eDP optional)/VGA (DDI3 optional)/DDI 1/DDI 2

Optional Accessories

- **CPU cooler (P/N: 5050200161X00)**
- **TPM 2.0 module kit (P/N: 79E00TPM01X00)**
- **Heat spreader (P/N : 5050301052X00)**

ICEB 8050C

COM Express Carrier Board, Type 2 pin-out, PICMG COM.0 Rev. 2.0
Bootable from CFAST/mini-SATA/SATA and CF/Shared IDE



Main Features

- COM express COM.0, Rev2.0 evaluation carrier, ATX form-factor
- Support type 2 pin-outs, COMe extended/basic/compact module
- Display: VGA & dual channels 18/24-bit LVDS
- Bootable CFAST or mini-SATA, CF and shared IDE
- PCIe x16, PCIe x4, PCIe x1, PCI x1 and mini-PCIe for Wi-Fi
- PS2/KB/mouse, LPT/RS232/422/485, VGA/GbE/4USB/5.1, S/PDIF

Product Overview

NEXCOM ICEB 8050C is a COM Express Type 2, pin-out defined by PICMG, COM.0 Rev. 2.0 specification with ATX form-factor. In-house designed features with bootable CFAST/SATA or mini-SATA/SATA via mini-PCIe slot (half-/full-size slot) as well as legacy SATA and CF/shared IDE-HDD interfaces. ICEB 8050C support added-on card slots of 1 x PCIe x16, 1 x PCIe x4, 1 x PCIe x1 and 1 x PCI (32/33Mhz) slots. Onboard Super I/O W83627DHG-PT maybe backward compatible of legacy BIOS.

- Faster system time-to-market
  ICEB 8050C new type 2 carrier MB may help your system design customer to reduce total development cycle time from our proof-of-concept and design-assistance support for your own customized carrier board.
- CPU support from Atom™ to Core™ i7/i5/i3, Celeron® M
  It is ready and easy to adapt with our various CPU/SKU from Intel® Atom to 2nd generation Intel® Core™ i7/i5/i3, Celeron® M-based COM express core module from compact size (95 x 95mm) like ICES 251/ICES 253/ICES 254 to Basic-size (125 x 95mm) like ICES 270/ICES 267/ICES 267S.
- Longevity for your multi-generation durable equipment
  Once you designed common I/O carrier solution board, you may adapt multiple COMe modules with different CPU and upgradable by follow 440pos type-2 pin-outs board-to-board connectors of PICMG COM.0 Rev. 2.0 specification.

Specifications

Form factor

- ATX carrier MB, dimension: 305mm x 244mm (12" x 9.9")
- COM express evaluation CRB: PICMB COM express board-to-board interconnectors, type 2 pin-puts, female, 8mm stack-up height, COM.0 Rev. 2.0

NEXCOM Computer-On-Modules Support List

- Compact size (95 x 95mm) : ICES 251/ICES 251X, ICES 253, ICES 254
- Basic size (125 x 95mm) : ICES 270, ICES 267/ICES 267S

Expansion

- 1 x PCIe x16 slot, support PEG interfaces
- 1 x PCIe x4 slot, optional 4 x PCIe x1 signals
- 1 x PCIe x1 slot and 1 x PCI (v2.3) slot
- 1 x mini-PCIe slot for Wi-Fi with SIM tray

Graphic Interfaces

- Graphic chip: from type 2 pin-out, COM express module
- CRT: support analog VGA with DB15 connector on the I/O edge
- LVDS: dual channels 18/24-bit LVDS connector (dual DF-13-20P)
- PCIex16: optional EBK-A2HDMI (ICES 254 only) riser card for HDMI or DP

Super I/O

- Winbond W83627DHG-PT

I/O Interface

- Serial COM: 2 ports
- 1 x Edge DB9 connector to support RS232/422/485 (+5/+12V by Ring)
- 1 x Internal box-header 2.0 pitch to support RS232
- USB 2.0: 8 ports
- 4 x USB2.0 ports by stack type A on edge
- 3 x USB2.0 by 4-pins JST 2.0mm JST connector
- 1 x Internal USB 2.0 to mini-PCIe slot for external Wi-Fi module
- SATA 2.0: 4 ports