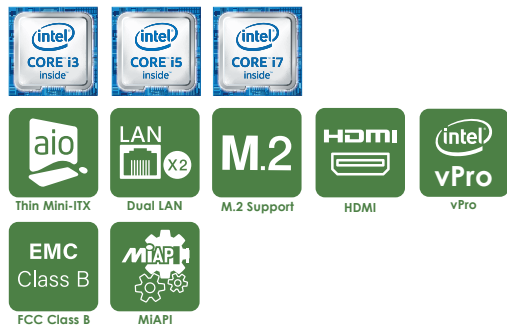
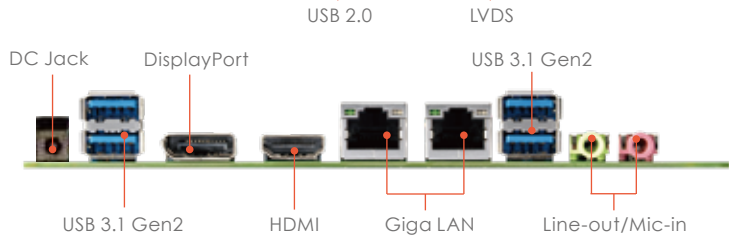
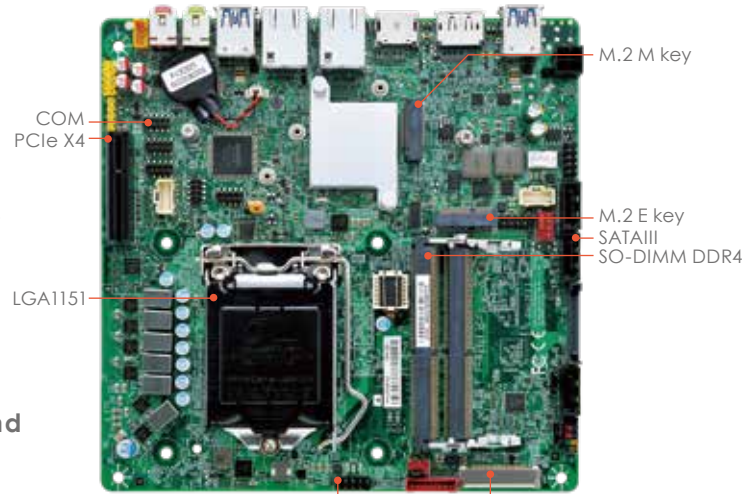


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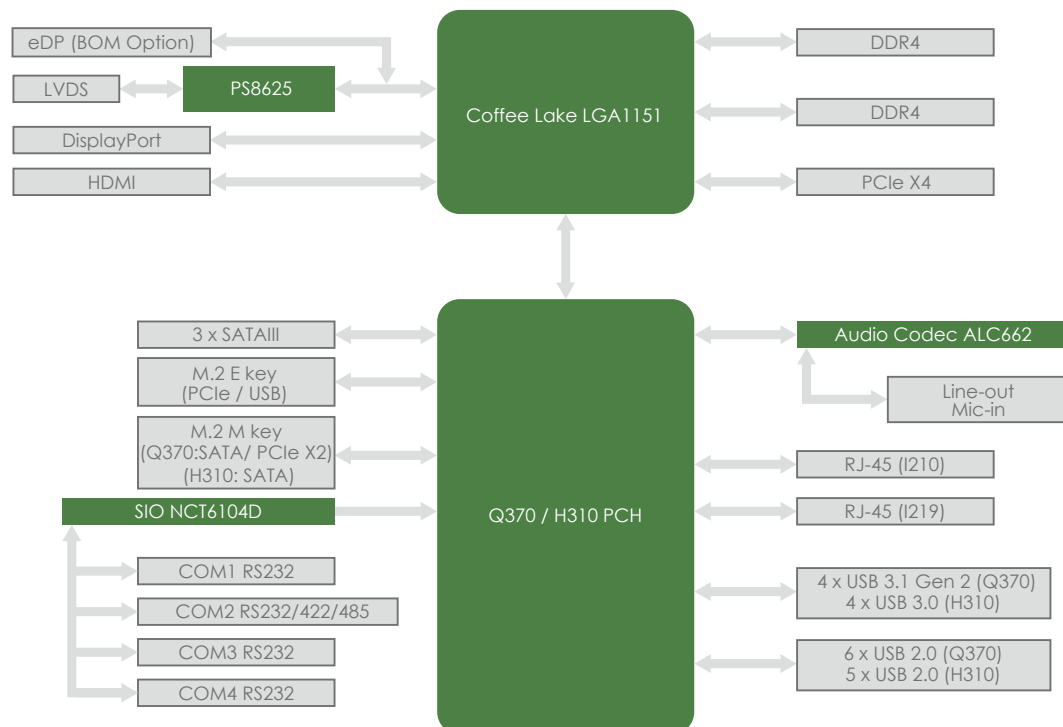
Thin Mini-ITX Form Factor
Intel® Coffee Lake Processor with Q370 / H310 Chipset

Features

- Intel® Coffee Lake Core i7/i5/i3 / Pentium / Celeron LGA1151 processors
- Intel® H310/Q370 Chipset
- Intel® vPro technology support (Q370)
- 2 x DDR4 SO-DIMM, support up to 32GB
- Support triple display for HDMI, DisplayPort and LVDS/eDP
- Support PCIe X4 (Gen 3) slot and M.2 slot
- 3 x SATA III support RAID 0, 1, 5
- 2 x Intel® Gigabit Ethernet
- 6 x USB 2.0, 4 x USB 3.1 (Gen 2), 4 x COM and 1 x MiAPI (configurable digital I/O)
- DC-in 12/19V power input



Block Diagram



PH12FEI Thin Mini-ITX

MECHANICAL	
Form Factor	Mini-ITX: 6.7" x 6.7" (170mm x 170mm)
SYSTEM	
Processor	9th & 8th Gen Intel® Coffee Lake LGA1151 Socket Processor, Core i7/i5/i3 6-core TDP Max. 65W, Core i9 8-core TDP Max 35W
Chipset	Intel® Q370 / Intel® H310
Memory	DDR4 2666MHz, 2 x 260-pin SO-DIMM, Max. 32GB (Non-ECC)
Graphics	Intel® HD Graphics
Ethernet	Intel® I219-LM Giga LAN + Intel® I210-AT Giga LAN
Audio	Realtek® ALC662
I/O Chipset	Nuvoton NCT6116D
TPM	Nuvoton NPCT750AAAYX TPM2.0 (Optional)
Expansion Slot	1 x PCIe 3.0 X4 slot 1 x M.2 2260 / 2280 M key (PCIe X2, SATA) **H310 only supports SATA SSD 1 x M.2 2230 E key (PCIe, USB 2.0) *not support Intel CNVi wifi module
BIOS	AMI BIOS, 256 Mbit SPI
H / W Monitor	Temperature Monitor, Voltage Monitor, Fan Monitor
Watchdog Timer	1~255 Steps by Software Program
Smart Fan Control	CPU Fan / System Fan
GRAPHICS	
VGA	—
DVI	—
HDMI	Up to 4K (4096 x 2160) @30 Hz
DisplayPort	Up to 4K (4096 x 2304) @60 Hz
LVDS	Up to 1920 x 1200 @60 Hz
eDP (Option)	Up to 4K (4096 x 2304) @60 Hz
REAR I/O	
USB	4 x USB 3.1 Gen. 2 (10 Gb/S)
Display I/O	1 x HDMI 1.4, 1 x DisplayPort 1.2
Audio I/O	1 x Mic-in ,1 x Line-out
LAN I/O	2 x RJ-45
Serial Port	—
PS/2 Port	—
Others	DC-in 12V(DIN 4-pin power cable) / DC-in 19V (5.1 mm / ID, 7.4 mm / OD)
INTERNAL CONNECTORS	
Storage	3 x SATAIII 6 x USB 2.0 (Q370) , 5 x USB 2.0 (H310)
Display I/O	1 x LVDS(Optional eDP SKU available) 1 x Backlight Connector
Audio I/O	1 x Line-out
Serial Port	4 x RS232(one supports RS232/422/485 select by BIOS)
PS/2 Port	—
Parallel Port	—
GPIO	1 x MiAPI Header (Programmable) support 8 x GPIO
Fan	1 x 4-pin CPU Fan Connector, 1 x 4-pin System Fan Connector
Power	1 x ATX Power Connector, 1 x AT/ATX Mode Select Jumper
Others	1 x Front Audio Header (Mic-in/Line-out), 1 x Chassis Intrusion, 1 x CMOS Jumper
POWER REQUIREMENT	
Power Input	DC-in 19V(5.1mm / ID, 7.4mm/ OD) / ATX 2-pin 19V DC-in 12V(DIN 4-pin power cable) / ATX 4-pin 12V
ENVIRONMENTAL	
Operating Temperature	0 ~ 60°C (32 ~140°F)
Storage Temperature	-20 ~ 80°C (-4 ~158°F)
Operating Humidity	10% ~ 95% R/H, non-condensing
Certification	CE & FCC Class B
OS	
OS Support	Windows® 10 64-bit Linux (support by request)

Ordering Information

Model Number	Chipset	DisplayPort	HDMI	LVDS / eDP	USB 3.1 / 2.0	Line-out / Mic-in	RS-232	LAN	M.2 2230 E key / M.2 2280 M key	PCIe X4	Power
PH12FEI-H310-19V	Intel® H310	1	1	1 / 0	4 / 5	1 / 1	4	2	1 / 1	1	DC-in 19V
PH12FEI-H310-12VC	Intel® H310	1	1	1 / 0	4 / 5	1 / 1	4	2	1 / 1	1	DC-in 12V
PH12FEI-Q370-19V	Intel® Q370	1	1	1 / 0	4 / 6	1 / 1	2	2	1 / 1	1	DC-in 19V
PH12FEI-Q370-12V	Intel® Q370	1	1	1 / 0	4 / 6	1 / 1	4	2	1 / 1	1	DC-in 12V

*Option: TPM, eDP

Packing List

Packing		
• 1 x Motherboard	• 1 x 50cm SATA Cable	• 1 x 45cm SATA Power Cable
• 1 x ATX 4-pin to DIN 4-pin Cable (12V SKU Only)	• 2 x I/O Bracket (Half and Full Height)	