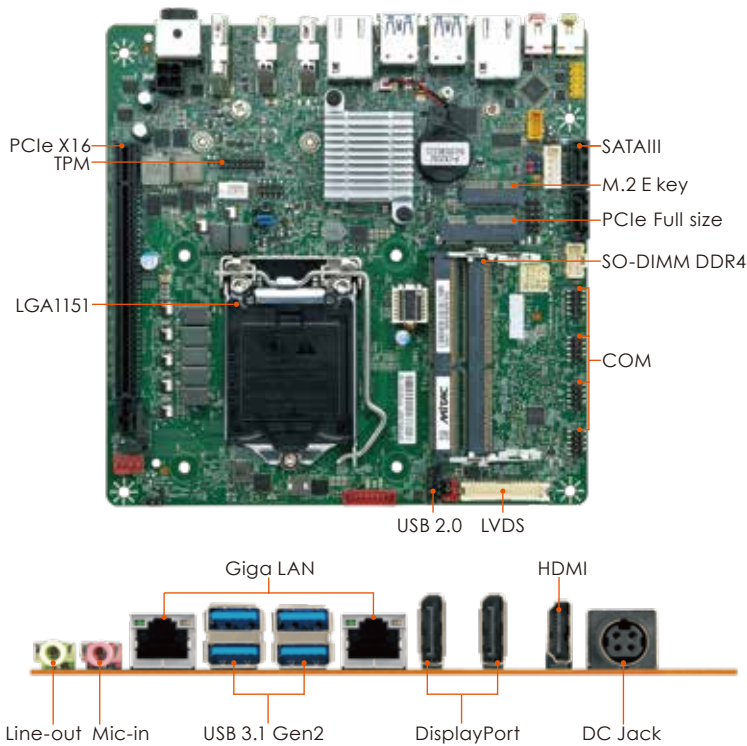


# PH14FEI

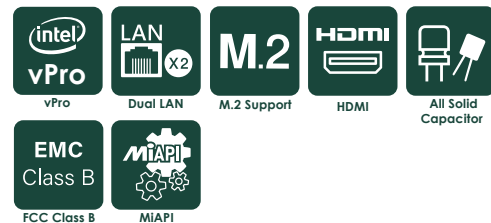
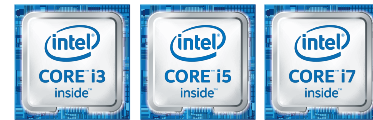
Mini-ITX Form Factor

Intel® Coffee Lake 9th & 8th Processor with Q370 / H310 Chipset

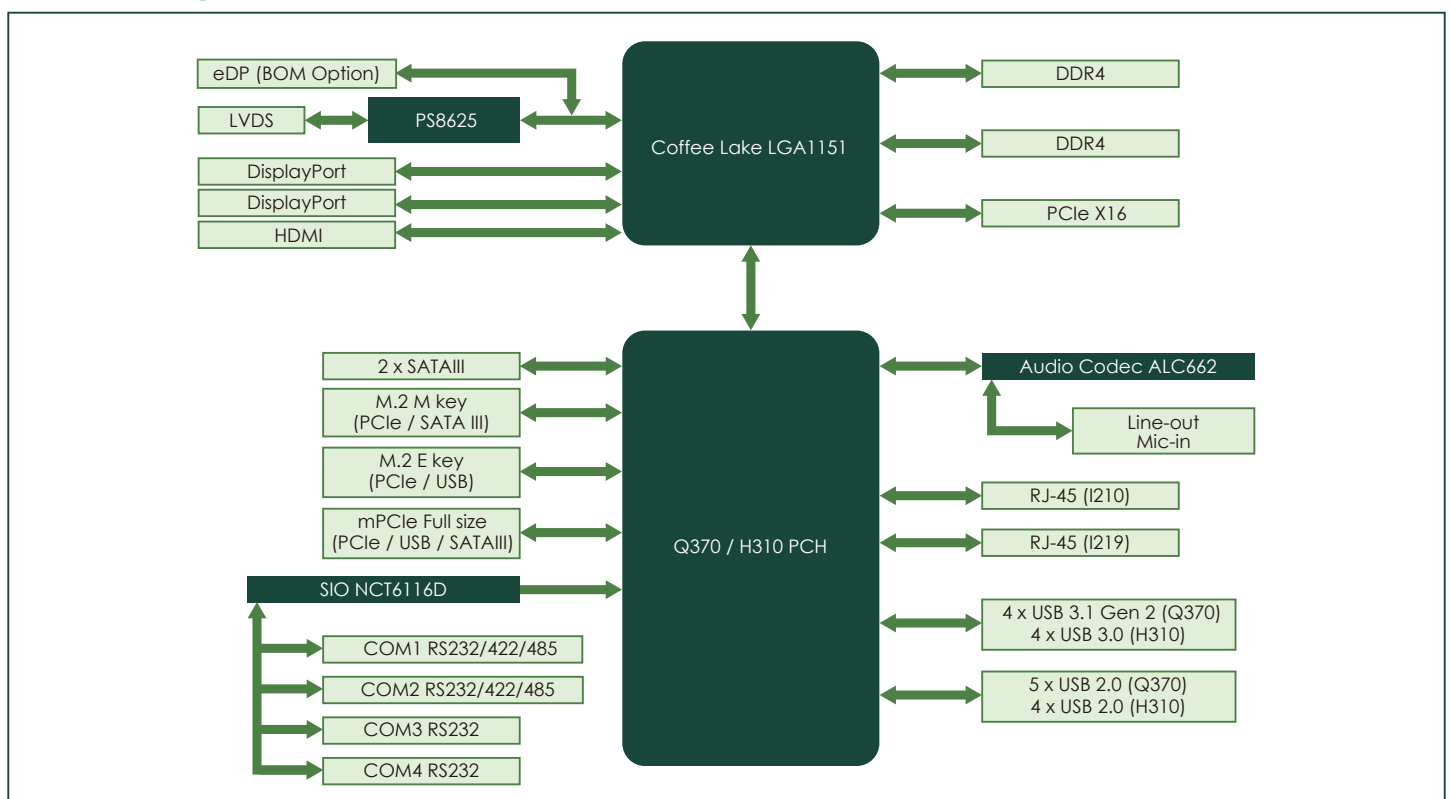


## Features

- Up to Intel® Coffee Lake-R 9th i9 35W & 8th i7 95W(6cores) LGA process
- Intel® H310/Q370 Chipset
- Intel® vPro technology support (Q370)
- 2 x DDR4 SO-DIMM up to 32GB
- 5 phase power design
- Support triple display for HDMI, DisplayPort and LVDS/eDP
- 1 x M.2 M 2280, 1 x M.2 E 2230, 1 x mPCIe Full size, 1 x PCIe X16
- 2 x Intel® Gigabit Ethernet
- DC-in 12V (Optional: 12~24V)



## Block Diagram



# PH14FEI

## Mini-ITX

# Industrial Motherboard

### MECHANICAL

Form Factor Mini-ITX: 6.7" x 6.7" (170mm x 170mm)

### SYSTEM

Processor	9th & 8th Gen Intel® Coffee Lake LGA1151 Socket Processor, 6-core TDP Max. 95W, 8-core TDP Max 35W
Chipset	Intel® Q370 (Support RAID 0 / 1) support vPro / 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	TPM Header
Expansion Slot	1 x PCIe X16 slot 1 x Mini PCIe Full size (SATA, USB, PCIe) 1 x M.2 2260 / 2280 M key (PCIe, SATA) * H310 only supports M.2 SATA SSD 1 x M.2 2230 E key (PCIe, USB 2.0)
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
2nd 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 (10Gb/S)(Q370) / 4 x USB 3.0 (H310)
Display I/O	1 x HDMI 1.4, 2 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	1 x DIN 4-pin DC Jack

### INTERNAL CONNECTORS

Storage	2 x SATAIII
USB	5 x USB 2.0 (Q370) , 4 x USB 2.0 (H310)
Display I/O	1 x LVDS (Optional eDP SKU available) 1 x Backlight Connector
Audio I/O	1 x Speaker 2W
Serial Port	4 x RS232 (two supports RS232/422/485 select by BIOS)
PS/2 Port	—
Parallel Port	—
GPIO	1 x MiAPI Header (Programmable)
Fan	1 x 4-pin CPU Fan Connector, 1 x 4-pin System Fan Connector
Power	1 x ATX 4-pin Power Connector, 1 x AT / ATX Mode Select Jumper
Others	1 x Front Audio Header (Mic-in / Line-out), 1 x CMOS Jumper, 1 x panel power select header, 1 x backlight power select header, 1x buzzer header

### POWER REQUIREMENT

Power Input	DC-in 12V DIN 4-pin connector / ATX 4pin 12V *optional 12V-24V via DC to DC power board
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### ENVIRONMENTAL

Operating Temperature	0 ~ 60°C (32 ~140°F)
Storage Temperature	-40 ~ 85°C (-40 ~185°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)
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## 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	mPCIe Full size	PCIe X16	Power
PH14FEI-H310-12V	Intel® H310	1 / 1	1 / 0	4 / 4	1 / 1	4	2	1 / 1	1	1	DC-in 12V
PH14FEI-Q370-12V	Intel® Q370	2 / 1	1 / 0	4 / 5	1 / 1	4	2	1 / 1	1	1	DC-in 12V

## Packing List

### Packing

- 1 x Motherboard
- 1 x 50cm SATA Cable
- 1 x Driver CD
- 2 x I/O Bracket (Half and Full Height)
- 1 x Quick Guide