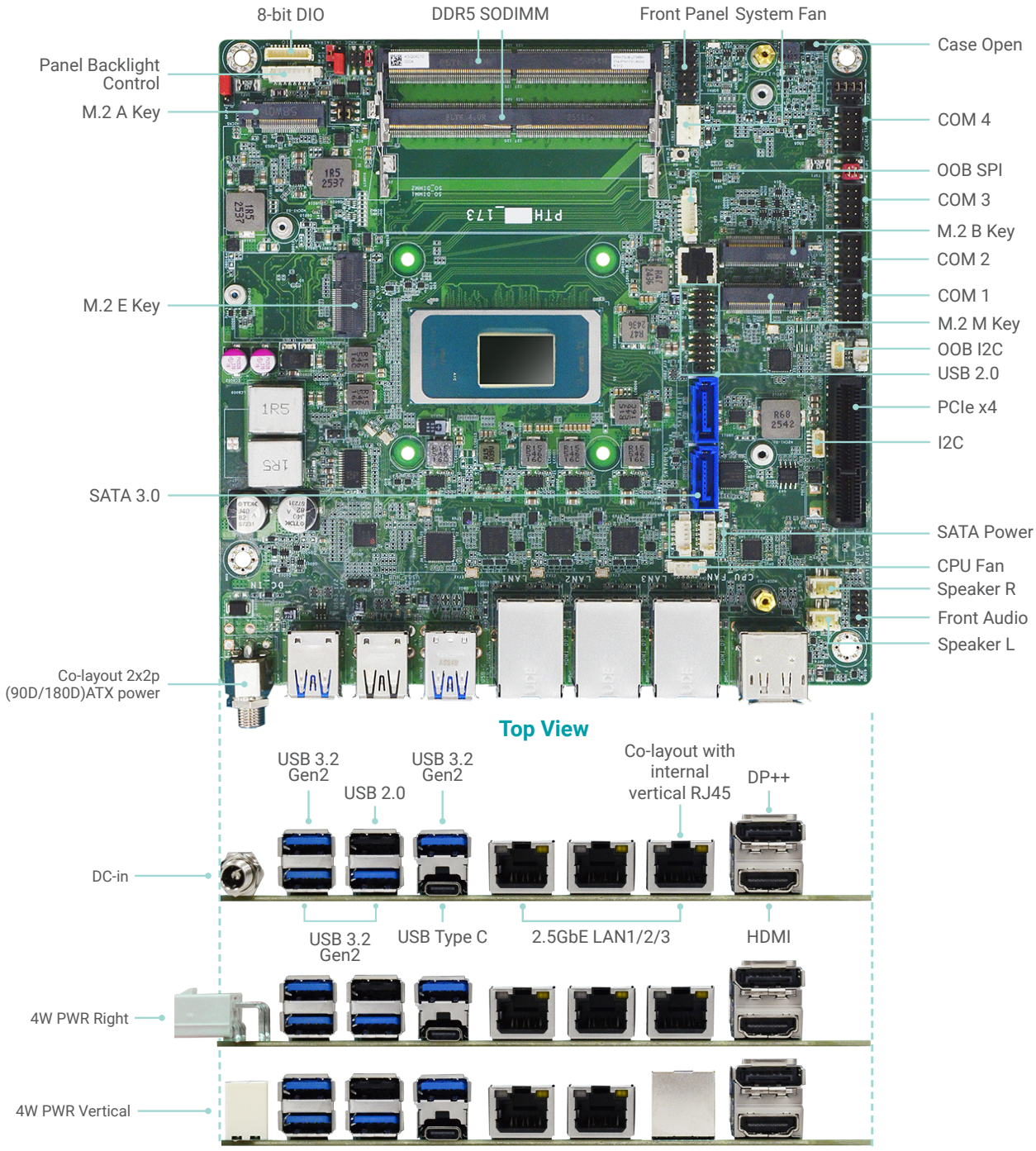
# PTH171/PTH173

**Intel® Core™ Ultra processor (Series 3)**
Mini-ITX

intel IoT Solutions Alliance




## KEY FEATURES

### DDR5

2 DDR5 6400/7200MHz SODIMM up to 128GB

### 4K High Resolution

Supports 4K/ 2K resolution

### Quad Displays

HDMI, DP,
USB Type C
(DP alt-mode/USB3.2 Gen2 /PD 15W),
M2A-Display (optional)

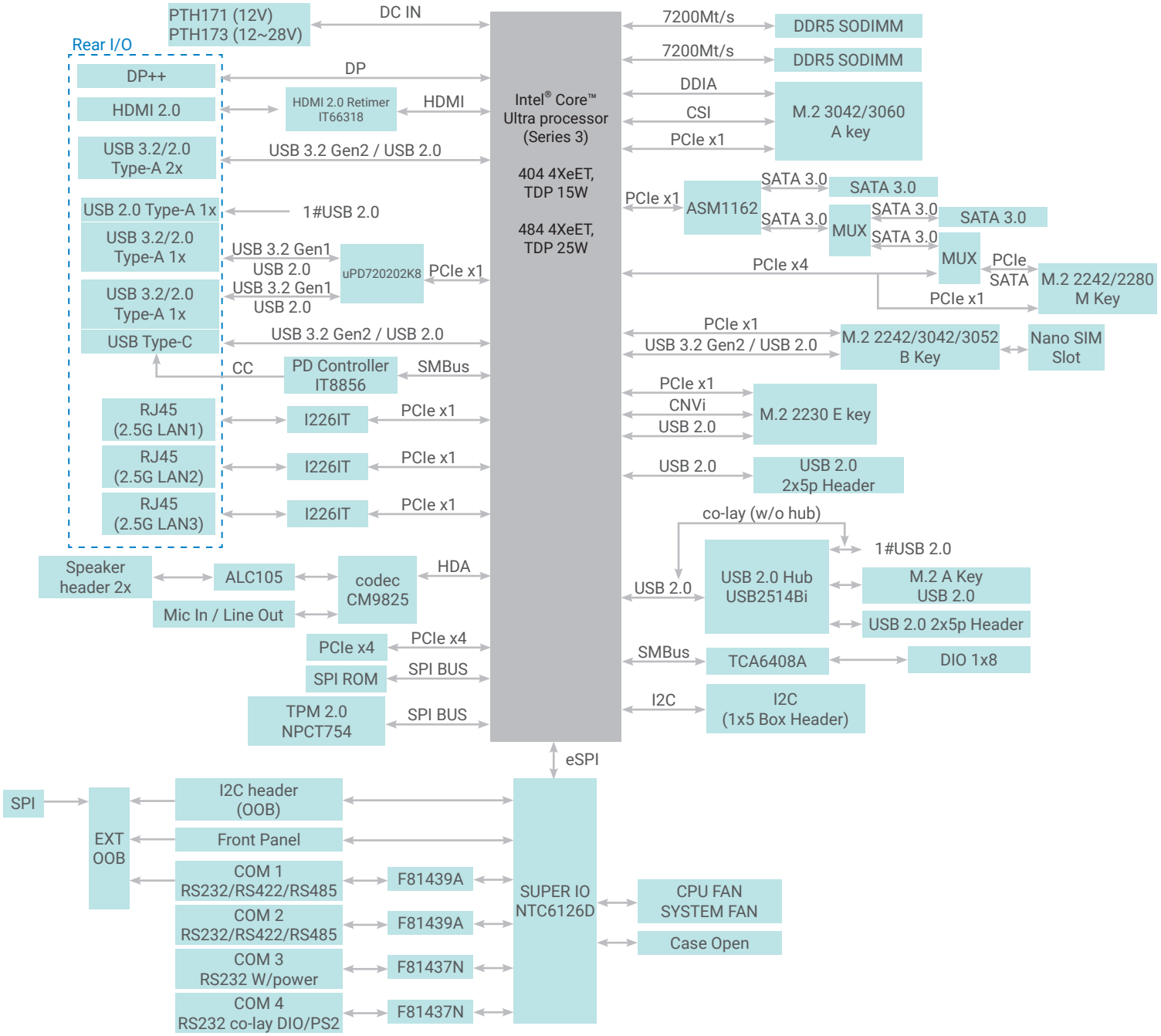
### Multiple Expansion

1 PCIe Gen5 x4,
1 M.2 M Key Gen5 x4,
1 M.2 B Key Gen4 x1,
1 M.2 E Key Gen4 x1,
1 M.2 A Key Gen4 x1

### Rich I/O

Up to 3 2.5GbE LAN,
4 USB 3.2, 1 USB Type C,
5 USB 2.0, 2 SATA 3.0,
4 COM

## BLOCK DIAGRAM



## SPECIFICATION

| Model Name | | PTH171 | PTH173 |
|---|---|---|---|
| SYSTEM | Processor | **Intel® Core™ Ultra processor (Series 3), TDP up to 25W**<br>Intel® Core™ Ultra 9 388H (H484-12XeCT, vPro)<br>Intel® Core™ Ultra X7 358HR (H484-12XeCT, vPro)<br>Intel® Core™ Ultra 7 366HRE (484-4XeET, vPro)<br>Intel® Core™ Ultra 7 365RE (404-4XeET, vPro)<br>Intel® Core™ Ultra 5 336HRE (444-4XeET, vPro)<br>Intel® Core™ Ultra 5 335RE (404-4XeET, vPro) | |
| | Memory | 2x 262-pin SODIMM up to 128GB<br>Dual-channel SODIMM DDR5 up to 6400 MHz (H404)/7200 MHz (H484) | 2x 262-pin SODIMM up to 128GB<br>Dual-channel SODIMM DDR5 up to 6400 MHz (H404)/7200 MHz (H484) |
| | BIOS | AMI SPI 256Mbit | AMI SPI 256Mbit |
| GRAPHICS | Controller | Intel® Arc Xe3 | Intel® Arc Xe3 |
| | Display | 1 x HDMI<br>1 x DP++<br>**HDMI:** resolution up to 4096x2160 @60Hz<br>**DP:** resolution up to 4096x2304 @60Hz<br>**USB Type C (DP alt-mode/USB3.2 Gen2/PD 15W):** resolution up to 4096x2304 @60Hz (HBR2) | 1 x HDMI<br>1 x DP++<br>**HDMI:** resolution up to 4096x2160 @60Hz<br>**DP:** resolution up to 4096x2304 @60Hz<br>**USB Type C (DP alt-mode/USB3.2 Gen2/PD 15W):** resolution up to 4096x2304 @60Hz (HBR2) |
| | Quad Displays | HDMI + DP + USB Type C (DP alt-mode/USB3.2 Gen2/PD 15W) + M2A-Display (optional) | HDMI + DP + USB Type C (DP alt-mode/USB3.2 Gen2/PD 15W) + M2A-Display (optional) |
| EXPANSION | Interface | 1 x PCIe Gen 5 x4 slot | 1 x PCIe Gen 5 x4 slot |
| | | 1 x M.2 2242/2280 M Key (PCIE Gen5x4, SATA3 opt. selected by BIOS, support NVMe ) | 1 x M.2 2242/2280 M Key (PCIE Gen5x4, SATA3 opt. selected by BIOS, support NVMe ) |
| | | 1 x M.2 2242/3042/3052 B Key<br>(PCIE Gen4x1 shared with M.2 A key by request, USB3.2 Gen2, USB2.0, SIM) | 1 x M.2 2242/3042/3052 B Key<br>(PCIE Gen4x1 shared with M.2 A key by request, USB3.2 Gen2, USB2.0, SIM) |
| | | 1 x M.2 2230 E Key<br>(PCIE Gen4x1 and USB2.0, support Intel® CNVi,WIFI7) | 1 x M.2 2230 E Key<br>(PCIE Gen4x1 and USB2.0, support Intel® CNVi,WIFI7) |
| | | 1 x M.2 3042/3060 A Key (Standoff 3030)<br>Support M2A Display solution<br>(eDP/LVDS/VGA/DP/HDMI or DVI via optional cable)<br>Support M2A-M21 expansion solution<br>(PCIEx1,USB3/USB2,SIM) | 1 x M.2 3042/3060 A Key (Standoff 3030)<br>Support M2A Display solution<br>(eDP/LVDS/VGA/DP/HDMI or DVI via optional cable)<br>Support M2A-M21 expansion solution<br>(PCIEx1,USB3/USB2,SIM) |
| AUDIO | Audio Codec | Realtek ALC888S | Realtek ALC888S |
| ETHERNET | Controller | **LAN1/2:** i226V/IT (10/100/1000/2.5G speeds)<br>**LAN3(vPro):** i226LM/IT (10/100/1000/2.5G speeds) | **LAN1/2:** i226V/IT (10/100/1000/2.5G speeds)<br>**LAN3(vPro):** i226LM/IT (10/100/1000/2.5G speeds) |
| REAR I/O | Ethernet | Up to 3 x 2.5GHz RJ45<br>(LAN 3 colayout with internal vertical RJ45 by option) | Up to 3 x 2.5GHz RJ45<br>(LAN 3 colayout with internal vertical RJ45 by option) |
| | USB | 2 x USB 3.2 Gen2 Type A<br>2 x USB 3.2 Gen1 Type A<br>1 x USB 2.0 Type A<br>1 x USB 3.2 Gen2 Type C<br>(DP alt-mode/USB3.2 Gen 2/PD 15W) | 2 x USB 3.2 Gen2 Type A<br>2 x USB 3.2 Gen1 Type A<br>1 x USB 2.0 Type A<br>1 x USB 3.2 Gen2 Type C<br>(DP alt-mode/USB3.2 Gen 2/PD 15W) |
| | Display | 1 x HDMI 2.0<br>1 x DP++ | 1 x HDMI 2.0<br>1 x DP++ |
| INTERNAL I/O | Serial | 2 x RS-232/422/485 (2.0mm pitch)<br>1 x RS-232 with power (2.0mm pitch)<br>1 x RS-232 (2.0mm pitch) colay with DIO-4bit or PS/2 (Option) | 2 x RS-232/422/485 (2.0mm pitch)<br>1 x RS-232 with power (2.0mm pitch)<br>1 x RS-232 (2.0mm pitch) colay with DIO-4bit or PS/2 (Option) |
| | USB | 4 x USB 2.0 (2.0mm pitch)<br>1 x M.2 A key with M2A-M21 supports up to 2 USB3 Gen1 and 4 USB2.0 (Option) | 4 x USB 2.0 (2.0mm pitch)<br>1 x M.2 A key with M2A-M21 supports up to 2 USB3 Gen1 and 4 USB2.0 (Option) |
| | Display | 1 x M.2 A key, support M2A-Display ( eDP / LVDS / VGA / DP / HDMI or DVI via optional cable) | 1 x M.2 A key, support M2A-Display ( eDP / LVDS / VGA / DP / HDMI or DVI via optional cable) |
| | Audio | 1 x Line-out/Mic-in<br>2 x 3W speaker header (L/R) | 1 x Line-out/Mic-in<br>2 x 3W speaker header (L/R) |
| | SATA | 2 x SATA 3.0<br>H484 RAID 0,1,5 supported by Intel VMD<br>H404 RAID 0,1 (shared with M.2 M key) | 2 x SATA 3.0<br>H484 RAID 0,1,5 supported by Intel VMD<br>H404 RAID 0,1 (shared with M.2 M key) |
| | DIO | 1 x 8-bit DIO | 1 x 8-bit DIO |
| | Case open | 1 x case open header | 1 x case open header |
| | SMBus | 1 x SMBus | 1 x SMBus |
| WATCHDOG TIMER | Output & Interval | System Reset, Programmable via Software from 1 to 255 Seconds | System Reset, Programmable via Software from 1 to 255 Seconds |
| SECURITY | TPM | dTPM (default)<br>fTPM (option) | dTPM (default)<br>fTPM (option) |

## SPECIFICATION

| Model Name | | PTH171 | PTH173 |
|---|---|---|---|
| POWER | Type | Single 12VDC | Wide Range 12~28VDC |
| | Connector | DC-in Jack<br>Right Angle Connector (4-pin) (Option)<br>Straightl Type Connector (4-pin) (Option) | DC-in Jack<br>Right Angle Connector (4-pin) (Option)<br>Straightl Type Connector (4-pin) (Option) |
| | Consumption | **Idle:** TBD<br>**Max:** TBD | **Idle:** TBD<br>**Max:** TBD |
| | RTC Battery | CR2032 Coin Cell | CR2032 Coin Cell |
| OS SUPPORT | Microsoft | Windows 11 24H2 LTSC 64-bit | Windows 11 24H2 LTSC 64-bit |
| | Linux | Ubuntu 24.04 | Ubuntu 24.04 |
| ENVIRONMENT | Temperature | **Operating:** -5 to 65°C, -20 to 70°C<br>**Storage:** -40 to 85°C | **Operating:** -5 to 65°C, -20 to 70°C<br>**Storage:** -40 to 85°C |
| | Humidity | **Operating:** 5 to 95% RH<br>**Storage:** 5 to 95% RH | **Operating:** 5 to 95% RH<br>**Storage:** 5 to 95% RH |
| ENVIRONMENT | MTBF | TBD | TBD |
| MECHANISM | Dimensions | Mini-ITX Form Factor<br>170mm (6.7") x 170mm (6.7") | Mini-ITX Form Factor<br>170mm (6.7") x 170mm (6.7") |
| | Height | **PCB:** TBDmm<br>**Top Side:** TBDmm<br>**Bottom Side:** TBDmm | **PCB:** TBDmm<br>**Top Side:** TBDmm<br>**Bottom Side:** TBDmm |
| STANDARDS AND CERTIFICATION | Certifications | CE, FCC, RoHS, UKCA | CE, FCC, RoHS, UKCA |

## ORDERING INFORMATION

| Model Name | P/N | CPU | Memory | Rear I/O | | | Internal I/O | | | Power | Operating Temp. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Display | LAN | USB | Expansion | USB | TPM | | |
| PTH171-IB-UX7358HR | 770-PTH171X-000G | Ultra X7 358HR | 2 DDR5 | 1 DP++, 1 HDMI20 | 3 | 2 USB 3.2 Gen2 Type A<br>2 USB 3.2 Gen1 Type A<br>1 USB 2.0 Type A<br>1 USB 3.2 Gen2 Type C | w/o PCIE slot, M.2 M/B/E/A Key | 5 USB 2.0 | Yes | 12VDC | -5 to 65°C |
| PTH171-IE-U7366HRE | 770-PTH171X-100G | Ultra 7 366HRE | | | | | M.2 M/B/E/A Key | | | 12VDC | -20 to 70°C |
| PTH171-IE-U7365RE | 770-PTH171X-200G | Ultra 7 365RE | | | | | M.2 M/B/E/A Key | | | 12VDC | -20 to 70°C |
| PTH171-IE-U5336HRE | 770-PTH171X-300G | Ultra 5 336HRE | | | | | M.2 M/B/E/A Key | | | 12VDC | -20 to 70°C |
| PTH171-IE-U5335RE | 770-PTH171X-400G | Ultra 5 335RE | | | | | M.2 M/B/E/A Key | | | 12VDC | -20 to 70°C |
| PTH171-IB-U9388H | 770-PTH171X-500G | Ultra 9 388H | | | | | w/o PCIE slot, M.2 M/B/E/A Key | | | 12VDC | -5 to 65°C |
| PTH173-IB- UX7358HR | 770-PTH173X-000G | Ultra X7 358HR | | | | | w/o PCIE slot, M.2 M/B/E/A Key | | | 12~28VDC | -5 to 65°C |
| PTH173-IE-U7366HRE | 770-PTH173X-100G | Ultra 7 366HRE | | | | | M.2 M/B/E/A Key | | | 12~28VDC | -20 to 70°C |
| PTH173-IE-U7365RE | 770-PTH173X-200G | Ultra 7 365RE | | | | | M.2 M/B/E/A Key | | | 12~28VDC | -20 to 70°C |
| PTH173-IE-U5336HRE | 770-PTH173X-300G | Ultra 5 336HRE | | | | | M.2 M/B/E/A Key | | | 12~28VDC | -20 to 70°C |
| PTH173-IE-U5335RE | 770-PTH173X-400G | Ultra 5 335RE | | | | | M.2 M/B/E/A Key | | | 12~28VDC | -20 to 70°C |
| PTH173-IB-U9388H | 770-PTH173X-500G | Ultra 9 388H | | | | | w/o PCIE slot, M.2 M/B/E/A Key | | | 12~28VDC | -5 to 65°C |

## OPTIONAL ITEMS

| Model Name | P/N | CPU |
|---|---|---|
| WM130 Chassis | | CASE, mini-ITX, 200x210.6x153.8mm, for 6.7"x6.7" |
| Power adapter-230W/24V | 671-123001-000G | POWER ADAPTER,230W,HA-1231-24LC,Input:100~240V,Output:24V/9.6A,155x75x25.4mm,L=1500mm,DC Cord 5.5*2.5mm,LV6,62368-1,HA-1231-24LC-D1(LITEON)RoHS |
| Power adapter-150W/24V | 671-115004-000G | POWER ADAPTER,150W,PA-1151-08EA,Input:100~240V,Output:24V/6.25A,138x66x22mm,L=1500mm,DC PLUG 5.5*2.5*10mm(10A),LV6,62368-1,PA-1151-08EA(LITEON)RoHS |
| Power adapter-120W/24V | 671-112005-100G | POWERADAPTER,120W,GST120A24,Input:100~240V,Output:24V/5A,167x67x35mm,L=1200mm,DC Cord 5.5*2.5*17mm(Lockable),LV6,62368-1,W/DFI JP PSE,GST120A24-DFI(MEAN WELL)RoHS |
| Power adapter-150W/12V | 671-115003-000G | POWER ADAPTER,150W,EA11701E-1200,Input:100~240V,Output:12V/12.5A,179x65x40mm,L=1500mm,DC PLUG 5.5*2.5*10mm(10A),LV6,62368-1,EA11701E(T02)(EDAC)RoHS |
| Power adapter-60W/12V | 671-106012-000G | POWER ADAPTER,60W,EA10681N-120,Input:100~240V,Output:12V/5A,113x49x35mm,L=1500mm,DC PLUG 5.5*2.5*10mm(Lockable),LV6,62368-1,EA10681N(183)(EDAC)RoHS |
| M2A-LVDS | 770-M2ALVD-000G | M.2 A/E key DP-to-LVDS Display Module |
| M2A-EDP | 770-M2AEDP-000G | M.2 A/E key DP-to-EDP Display Module |
| M2A-HDMI (HDMI/DVI) | 770-M2AHDM-000G | M.2 A/E key DP-to-HDMI 2.0 Internal Module |
| | A81-026014-004G | HDMI Extend CABLE (90D M, L=300mm) |
| | A81-013010-017G | DVI CABLE, DVI-I 24+5P W/SCREW to HDMI, L=300mm |
| M2A-DP | 770-M2ADP1-000G | M.2 A/E key DP-to-Internal DP Module w/re-driver |
| | A81-020081-023G | DISPLAYPORT Extend CABLE (90D M, L=300mm) |
| M2A-VGA | 770-M2AVGA-000G | M.2 A/E key DP-to-VGA Internal Module |
| | A81-012004-001G | VGA CABLE;PITCH:2.54mm;L=350mm |
| M2A-M21 (to B key w/I SIM slot) | 770-M2AM21-000G | M.2 A/E key-to-M.2 M/B key(PCIE) (3060) adapter wi SIM slot, 4 USB2.0 |
| M2A-M21 (to B key w/I SIM slot) | 770-M2AM21-100G | M.2 A/E key-to-M.2 M/B key(USB3/2) (3060) adapter wi SIM slot, 4 USB2.0 |
| M2A-M21 (2xUSB3/ 4xUSB2) | 770-M2AM21-200G | M.2 A/E key to USB module (3060) with 2 USB3.2 Gen1, 4 USB2.0 |
| M2A-M21 (4xUSB2) | 770-M2AM21-300G | M.2 A/E key-to-USB adapter with 4 USB2.0 |
| M2A-MIPI (MIPI-CST) | 770-M2AMIP-000G | M.2 A key-to-MIPI CSI Adapter |
| SMBUS cable | A81-009716-018G | WIRE CABLE, SMBus, WL1010 1*5P/1mm to KB931 2*3P/2mm, L=200mm, UL1571, 28AWG, CYT23050202BAA(GREAT IDEAL)RoHS |
| COM Port Cable | A81-015115-018G | COM PORT CABLE, D-SUB 9P M to KB931 2*5P/2mm, L=250mm, UL2651, 28AWG |
| PS/2 cable | A81-023005-009G | PS2 CABLE, MD 6P F x2 (GREEN & PURPLE) W/BRACKET to 2032H 2*5P/2mm, L=400mm, UL2725, 28AWG |
| SATA cable w/lock | A81-002013-000G | Serial ATA data & power cable w/lock (Length: 300mm) |
| SATA PWR adapter cable | A81-009794-018G | SATA Power 5P/1.25mm to4P/2.5mm,Length: 100mm |
| USB 2.0 cable | A81-000060-054G | USB 2.0 1-port cable (Length: 200mm) NO Bracket |
| USB 2.0 cable | A81-001032-016G | USB 2.0 2-port cable (Length: 200mm) NO Bracket |
| DIO cable | A81-009715-018G | WIRE CABLE, DIO, WL1010 1*10P/1mm to PH-8Y 1*8P/2mm and PH-4Y 1*4P/2mm, L=200mm, UL1571, 28AWG |
| Fan cable | A81-009771-018G | CPU/System 3P/4P Fan 1.25p-to2.54p adatper cable, Length: 150mm |
| Front Panel cable | A81-009615-016G | WIRE CABLE, Front panel, HSG 2*6P/2.54mm to 3φ LED*2 (orange/green) & SW Button, L=270mm, |
| Front Audio, w/bracket, 300mm | A81-022034-016G | AUDIO CABLE, HSG 2*5P/2.0mm to 3.5 audio jack green*1 and pink *1, w/ STD bracket, L=300mm, UL2651, 28AWG |
| Front Audio, 110m | A81-022036-016G | AUDIO CABLE, HSG 2*5/2mm TO RED Earphone Jack and Green Earphone Jack, L=110mm, UL1517, 28AWG |
| WIFI7 BE211 | TBD | TBD |
| KS-AUD2 | 770-KSAUD2-000G | Audio Amplifiers Mono/Stereo High-Power Class D Amplifier |
| SPEAKER 3W,150mm | 293-130020-010G | SPEAKER 3W,150mm |
| SPEAKER 5W, 350mm | 293-050001-100G | SPEAKER 5W,8Ω,w/CABLE 350mm |

## PACKING LIST

| | |
|---|---|
| • 1 PTH171/PTH173 motherboard | |
| • 1 COM port cable with bracket (Length: 250mm, 1 x COM ports) | A81-015115-018G |
| • 1 Serial ATA data with power cable (Length: 300mm) | A81-002144-018G |
| • 4 M.2 screw/standoff | |
| • 1 I/O Shield<br>- (2 LAN, Regular type)(For Sample)<br>- (3 LAN, Regular type)(For Sample)<br>- (2 LAN, Thin type)(For Sample)<br>- (3 LAN, Thin type)(For Sample) | <br>TBD<br>TBD<br>TBD<br>TBD |
| • 1 Cooler<br>- (Wide/Normal Temp. -Cooler for 25W) | <br>A71-108160-030G |



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