aetina


# Small Form Factor Modules

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Aetina provides a variety of small form factor (SFF) modules with compact architecture, targeting applications that usually require high performance computing in limited space. SFF modules include M.2 Module, Mini PCIe (mPCIe) Module, Mobile PCIe Module (MXM), expansion kit, and one-stop thermal service.

M.2 Module and Mini PCIe Module are AI accelerator Modules for AI applications, delivering unprecedented AI performance for edge devices. They both can be quickly plugged into existing edge devices to execute in real-time. With low-power deep neural network inference, M.2 Module and Mini PCIe Module are suitable for a broad range of market segments. Metion to Mobile PCI Express Module (MXM), it features compact commercial off-the-shelf (COTS) solution. It leverages parallel processing performance, delivering unmatched power efficiency. With high-level compute capability, MXM is ideal for embedded system that is demanding performance, size, weight and power (SWaP) constrained.

In the early stages of AI deep learning project development, developers spend lots of cost and time building a test system to confirm performance specifications and related peripheral devices. To solve the problem, Aetina expansion kits provide onboard high-performance computing modules with various applications of deep learning for computer vision.

### Longevity Product Life Cycle

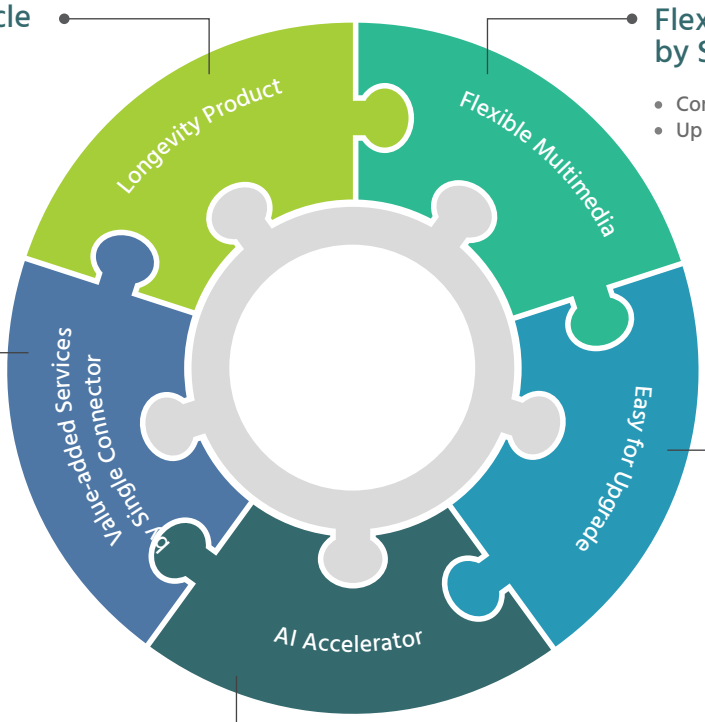
- Five-year product longevity
- Dedicated technical supporting
- Save total cost of ownership (TCO)

### Flexible Multimedia by Single Connector

- Consistent with 16-lane PCI express
- Up to 4 independent displays

### Value-added Services

- Wide operating temperature
- Conformal coating providing
- Firmware customization
- Evaluation kit of carriers and thermals



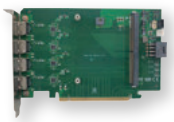

### Easy for Upgrade

- Modular design
- Ready-to-use drivers

### AI Accelerator

- Available with latest AI chipsets

AIB-SQ37-A1



DEV-MXM-4H

M3T5000-WN

M3T3000-QN

M3T1000-PN

# Key Features

## Slim and Space-saving

- Small footprint and light weight
- Mounted flat to save mecha-nism space


## Golden Finger 30μ"

- Extra protection from scratch and damage
- Ensure stable and quality signals


## Extended Temperature

- Option temperature support : -20~70°C, -40~85°C
- Individual validation before shipping

## Conformal Coating

- Protection against dust, mois-ture and corrosion
- Improve MTBF

## CUDA Computing

- Up to thousands of CUDA cores
- Optimized parallel computing

## Visual Computing

- Dedicated for AI acceleration
- Real-time image processing


## Multi Displays

- 3840x2160 resolution
- DP++, HDMI, eDP outputs

## Configurable TDP

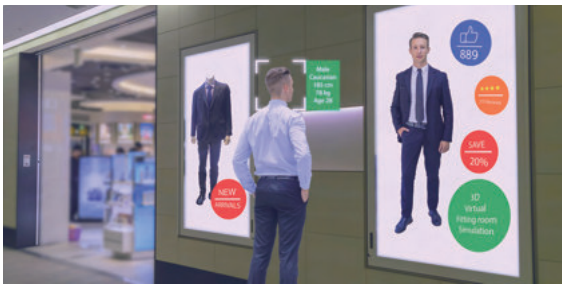
- Power cap customization
- Meet specific usage scenario

# Vertical Applications

Medical

Defense

Logistics




Retail

Transportation

Factory

Security

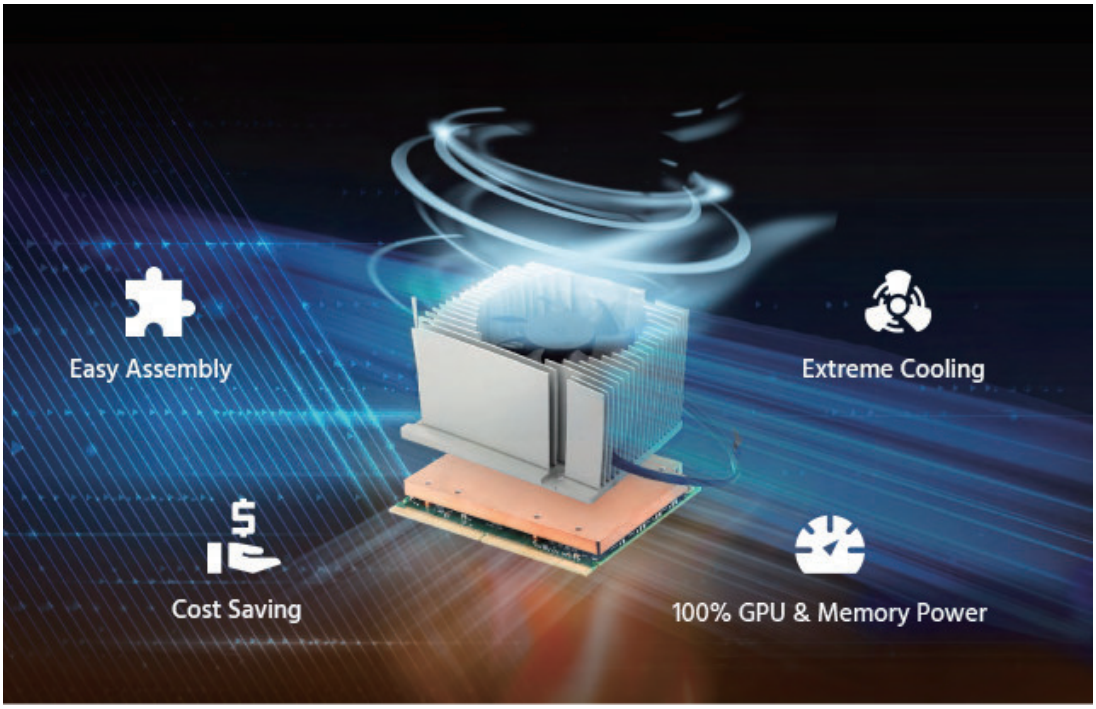

Telecommunication

Gaming

City

# Aetina One-Stop Thermal Service

## Advanced Full-Scale Cooling Design
## Ensure Superlative Computing Performance




As the dimensions of small form factor modules are inconsistent in the market, it's inconvenient for users to customize heat dissipation design to avoid the occurrence of high temperature failure especially when developing high computing performance applications in smart medical, factory automation, and so on. To improve the situation, Aetina decide to roll out one-stop thermal service, including standard heat spreaders, optional semi sink, and customized cooler.

- Increase the area of dissipation for each IC component
- Handle temperature overheat issue not merely for GPU but memory as well
- High-watt heat spreader is made of copper, and low-watt one is aluminum
- Easy assembly

# Product Selection




| Model Number | | M3P1000-LN | M3T1000-PN | M3T3000-QN | M3T5000-WN |
|---|---|---|---|---|---|
| Form Factor | | MXM 3.1 Type A | MXM 3.1 Type A | MXM 3.1 Type B | MXM 3.1 Type B+ |
| Engine | Engine Core | NVIDIA Quadro P1000 | NVIDIA Quadro T1000 | NVIDIA Quadro RTX3000 | NVIDIA Quadro RTX5000 |
| | GPU Architecture | NVIDIA Pascal | NVIDIA Turing | NVIDIA Turing | NVIDIA Turing |
| | NVIDIA CUDA Cores | 512 | 896 | 1920 | 3072 |
| | Graphics Clock | 1354/1392 MHz | 1395/1455 MHz | 945/1380 MHz | 1035/1530 MHz |
| | Performance | 1.8 TFLOPS | 2.6 TFLOPS SP Peak | 5.3 TFLOPS SP Peak | 9.4 TFLOPS SP Peak |
| Memory | Memory Size | 4GB GDDR5 | 4GB GDDR6 | 6GB GDDR6 | 16GB GDDR6 |
| | Memory Clock | 6.0 Gbps | 12.0 Gbps | 14.0 Gbps | 14.0 Gbps |
| | Memory Interface Width | 128-bit | 128-bit | 192-bit | 256-bit |
| | Memory Bandwidth | 96 GB/sec | 192 GB/sec | 336 GB/sec | 448 GB/sec |
| API | DirectX | 12 | 12 | 12 | 12 |
| | OpenGL | 4.5 | 4.6 | 4.6 | 4.6 |
| | OpenCL | 1.2 | 1.2 | 1.2 | 1.2 |
| | CUDA Compute Capability | 6.1 | 7.5 | 7.5 | 7.5 |
| Software | Operation System | Windows® 7-10 Linux | Windows 10 64-bit Linux 64-bit | Windows 10 64-bit Linux 64-bit | Windows 10 64-bit Linux 64-bit |
| Display | Max. Displays per Board | 4 | | | |
| | Max. Digital Display | up to 7680x4320 | | | |
| | Max. Analog Display | Not Support | | | |
| | Outputs | DisplayPort 1.4 | | | |
| Power | Max. Board Power Consumption | 47 W | 50 W | 80 W | 110 W |
| Mechanical | Dimensions | 82 x 70 mm | 82 x 70 mm | 82 x 105 mm | 82 x 110 mm |
| Temperature | Operation (Standard) | 0°C to +55°C | | | |
| Environment | Standard Temp. (0 ~ 55°C ) | M3P1000-LN | M3T1000-PN | M3T3000-QN | M3T5000-WN |
| | Wide Temp. (-40 ~ 85°C ) | M3P1000-LN-A | M3T1000-PN-A | N/A | N/A |
| | Extended Temp. (-40 ~ 70°C ) | N/A | N/A | M3T3000-QN-H | N/A |
| | Coating | M3Nxxxx-xx-xC (C=with conformal coating service) | | | |

# Product Selection

DEV-MXM-6DP

DEV-MXM-4H

| Model Number | | DEV-MXM-6DP | DEV-MXM-4H |
|---|---|---|---|
| Bus Type | | PCI Express 3.0 Slot to Host MXM 3.1 Slot to Device | PCI Express 4.0 Slot to Host MXM 3.1 Slot to Device |
| Display | Max. Displays per Board | 6 | 4 |
| | Outputs | 6x Display Ports | 4x HDMI |
| Power | Supplementary Power Connectors | 1x 8-pin connector | 1x 8-pin connector |
| Mechanical & Environment | Dimensions | 236 mm x 164.8 mm | 169 mm x 111.15 mm |
| | Operation Temperature (Standard) | 0°C to +55°C | |

AIB-SQ37-A1

| Model Number | | AIB-SQ37-A1 |
|---|---|---|
| Processor | CPU | Support Intel 8th Gen. processor |
| | Socket | LGA1151 |
| | TDP | 95W |
| Motherboard | Chipset | Intel® Q370 |
| Motherboard-Memory | Technology | 2x DDR4 SO-DIMM 2666 MHz |
| | Max. Capacity | 32GB |
| | Socket | 2 x 260-pin DIMM |
| Graphics | Controller | Intel® Integrated Graphics or discrete GPU |
| Ethernet | Interface | 10/100/1000 Mbps |
| | Controller | Intel i219LN & i211 |
| | Connector | 2 x RJ45 |
| Storage | Max Data Transfer Rate | 6GB/s |
| | M.2 | 1 x M.2 M key slot, support PCIe *4+ SATA interface for NVMe, Size 2280 |
| | SATA III SSD | 2x 2.5" SATAIII SSD/HDD |
| | RAID | RAID 0 / RAID 1 |
| | Display Port | 2 Ports (1 for CPU, 1 for GPU) |
| | Ethernet | 2x RJ45 LAN connector |
| | USB | 6x USB3.0 / 2x USB 2.0 |
| | Audio | 2 x Audio jacks, support Line out/Mic |
| | CAN | 2 x CAN Bus DB-9(Connecter) |
| | COM | 2x COM(RS232) |
| | DIO | 1x DIO |
| Power Requirement | Internal | 1 sec.~255 min. and 1 sec. or 1 min. /step |
| | Power ON mode | 1x DC-In power jack |
| | Vollage | DC 19V |
| Physical Characteristics | Operating Temperature | 0°C to +60°C |
| | Humidity | 5% to 90% (non-condensing) |
| | Dimension | 170 x 188 x 1.5 mm |
| Expansion Slot | MXM | 1 x MXM 3.1 slot |
| | M.2 | M.2 M key 2280 slot, M.2 B key 3042/3052 slot |

# Application Story


**Virtual Reality (VR)** brings an immersive visual experience, widely applied to various fields, such as entertainment, science, healthcare, arts, marketing, education and training.The trend to optimize VR experience is seeking higher mobility and best comfort.

## Challenges

One of our Chinese customers created a mobile VR device to remove connection with large traditional computer bulks. To run VR device smoothly, it's essential to have powerful performance, high energy efficiency and quick response.

## Solution

To operate in the customer's embedded system with a portable battery pack, Aetina provides a tailor-made MXM footprint and custom firmware, based on M3T5000-WN. It's compatible to the industry MXM 3.1 standard. The compact module leverages the NVIDIA GPU, driving the fastest performance and intensive graphics boost aiming for VR. With 16GB GDDR6 256-bit, M3T5000-WN features high-speed data transfer, realistic image for simulation and visualization.

## Conclusion

Aetina MXM solution effectively meets the customer requirements to solve the issues of performance, size and power-efficiency. It makes mobile VR device stable and competitive in the market.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