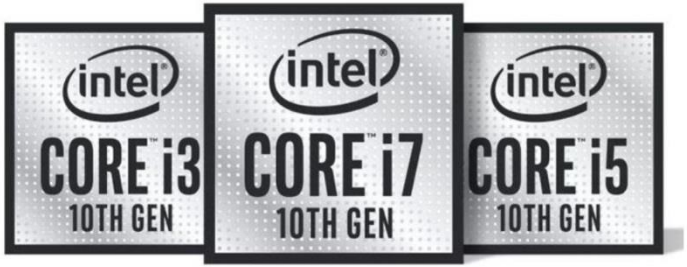
ASRock Industrial

intel IoT Solutions Alliance

SUPPORTS intel CORE 10TH GEN

10th GEN INTEL® CORE™ PROCESSORS
FULL RANGE OF INDUSTRIAL MOTHERBOARDS

The 10th Gen is coming



CML-S / Xeon Processors

- Up to 10 Cores
- Up to DDR4-2933
- Increased multi-threaded performance

	9th Gen Coffee Lake	10th Gen Comet Lake	Advantage of CML-S
LGA	Socket 1151	Socket 1200	Improve power delivery
CPU	Up to **8 Cores**	Up to **10 Cores**	**Performance enhance**
Multi-Thread	Only **Core i9** support	Core **i9/i7/i5/i3/Pentium/Xeon** support	
DRAM	Up to **DDR4-2666**	Up to **DDR4-2933**	

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Performance Comparison – i7 v.s i5

Spec / Benchmark	Coffee Lake Core i7 i7-9700	Comet Lake Core i5 i5-10500	Performance Increase (%)
Official **CPU Price** (USD)	**$323 ~ $335**	**$192 ~ $202**	**Saving $13X**
Base Frequency	3.0 GHz	3.1 GHz	
Max Turbo Frequency	4.7 GHz	4.5 GHz	
CPU Cores / Threads	**8 / 8**	**6 / 12**	
Cinebench R15 CPU Score	**1,221**	**1,355**	**11%** ▲
3DMark Sky Diver Physics	**14,040**	**16,006**	**14%** ▲
3DMark Fire Strike Physics	**15,125**	**17,421**	**15.2%** ▲

◆ **Advantage of CML-S CPU**

Performance: CML i5 is better than CFL i7 CPU (Up to 15%)

Cost: Saving $130 at least

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Performance Comparison Core i3

Spec / Benchmark	Coffee Lake Core i3 i3-9100	Comet Lake Core i3 i3-10100	Performance Increase (%)
Official CPU Price (USD)	$122	$122	
Base Frequency	3.6 GHz	3.6 GHz	
Max Turbo Frequency	4.2 GHz	4.3 GHz	
CPU Cores / Threads	**4 / 4**	**4 / 8**	
Sandra CPU GOPs Score	**100**	**139.48**	**39.5%** ▲
Cinebench R15 CPU Score	**643**	**881**	**37%** ▲
3DMark Sky Diver Physics	**8,264**	**11,352**	**37.4%** ▲
3DMark Fire Strike Physics	**8,720**	**12,436**	**42.6%** ▲

◆ **Choosing CML-S CPU, the performance can increase 40%**

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400 Series M/B Product Lineup

	Mini-ITX (High-Rise I/O)	Mini-ITX (Thin I/O)	Micro ATX	ATX
W480E	IMB-X1220-L	IMB-X1222-WV	IMB-X1313	IMB-X1711
Q470E	IMB-1220-D	IMB-1222	IMB-1313	IMB-1711
	IMB-1220-L	IMB-1222-WV		
H420E	IMB-1221-D	IMB-1223		
	IMB-1221-L	IMB-1223-WV		

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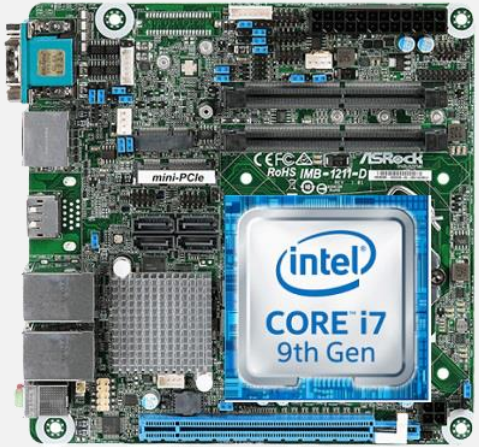
CML/CFL PC Price-Performance Ratio

CML

CFL



IMB-1220-D + i5-10500 VS **IMB-1211-D + i7-9700**

Cost Saving **$1XX**

Win10 License Saving [~~High-end~~ Value]

Performance increase **15%**

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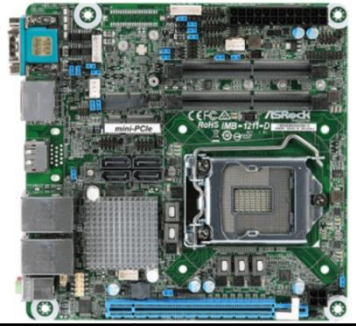
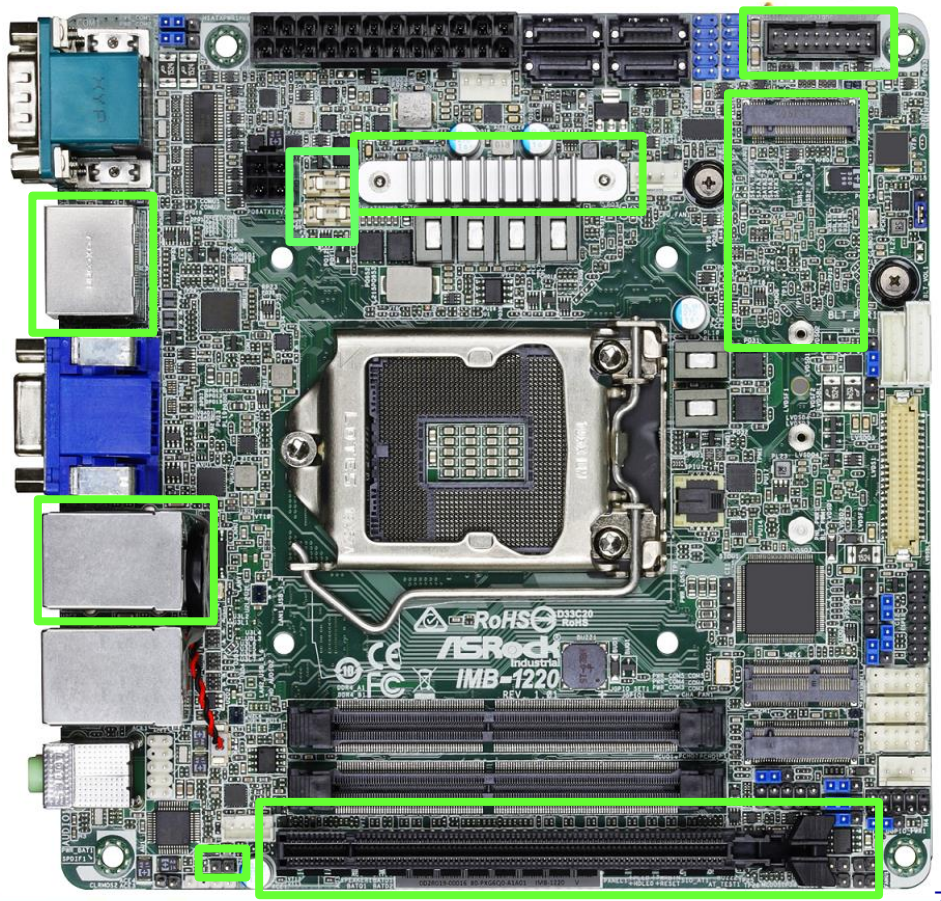
Spec Comparison – IMB-1211 / IMB-1220





	IMB-1211-D (Q370)	IMB-1220-D (Q470E)
Aircraft tail PCI-E slot	No	Yes
MOSFET Heatsink	No	Yes
Replaceable DC-in Fuse	No	Yes
CMOS Battery Charge	No	Yes
M.2 Key B with SIM	No	Yes
HDMI2.0a	No	Yes
Intel 2.5G LAN	No	Yes
USB 3.2 Gen1 Header	No	Yes (2 Ports)
ATX/DC_IN Co-design	No	BOM Option

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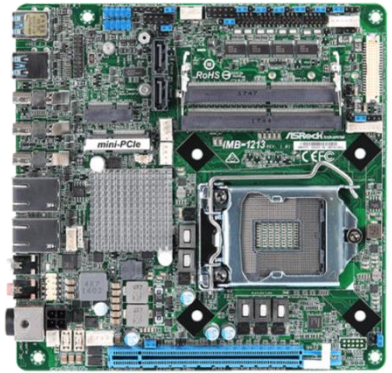
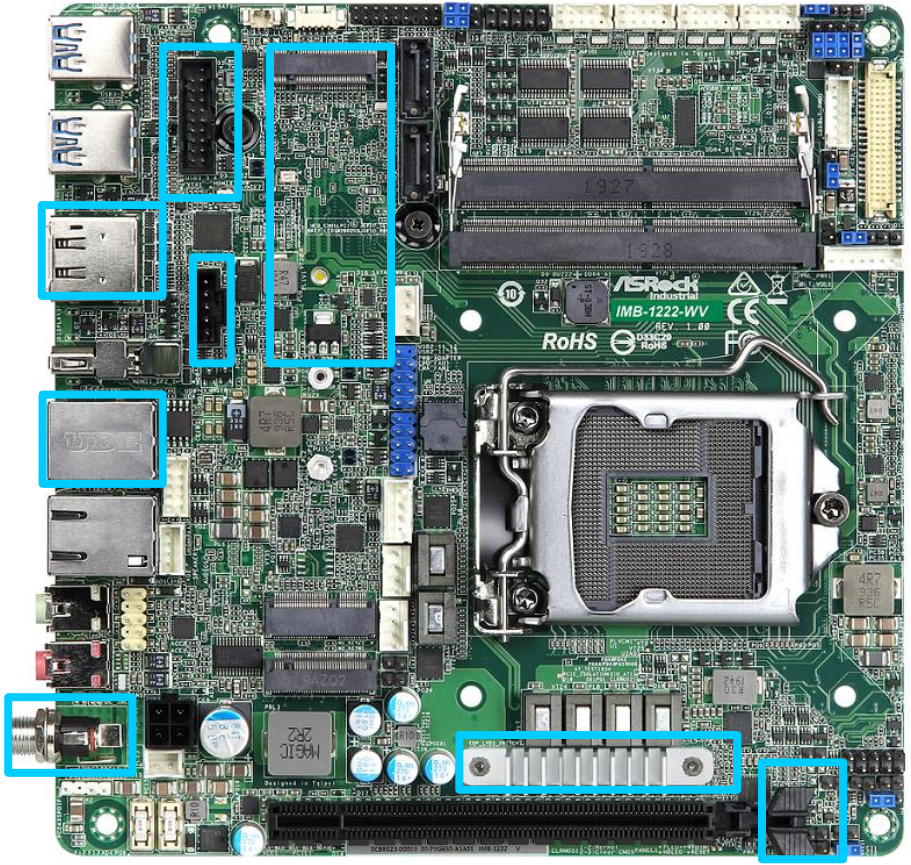
Spec Comparison – IMB-1213 / IMB-1222-WV





	IMB-1213 (Q370)	IMB-1222-WV (Q470E)
Wide Range DC-in	12V/19~28V	**12~28V**
Thunderbolt Header	No	**Yes**
MOSFET Heatsink	No	**Yes**
Aircraft tail PCI-E slot	No	**Yes**
M.2 Key B with SIM	No	**Yes**
HDMI2.0a	No	**Yes**
Intel 2.5G LAN	No	**Yes**
USB 3.2 Gen1 Header	No	**Yes (2 Ports)**

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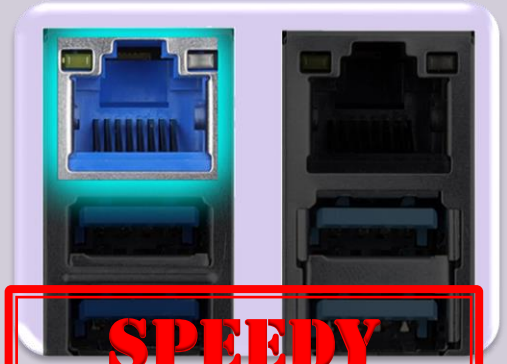
Key Feature for Mino



SPEEDY

Intel® 2.5G LAN

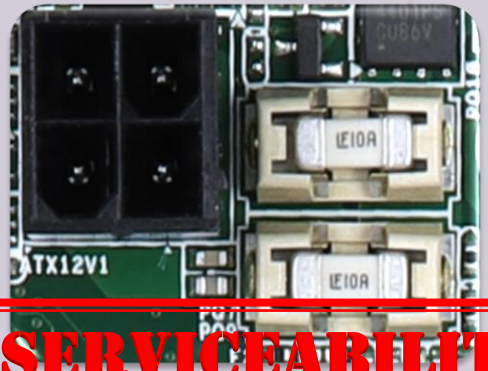
- Intel **i225** LAN adopt
- Boost networking performance up to **2.5X**
- Faster file transfers, smoother high quality video streaming

STABILITY

MOSFET Heatsink

- Dissipate heat efficiently
- Bring down MOSFET temperature
- Enhance the utilized efficiency of MOSFET
- Suitable for Fanless system

*Only for Mini-ITX models



SERVICEABILITY

Replaceable Fuse

- Design 20A Fuse for Input Power protection
- Enhance serviceability

*Only for Mini-ITX models

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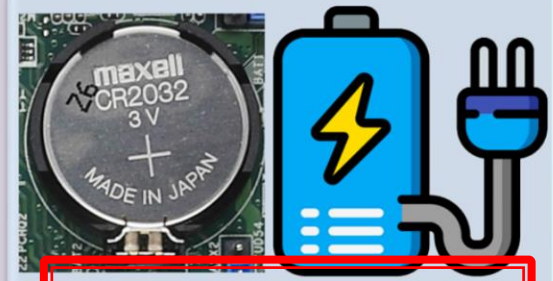
Key Feature

PERFORMANCE

HDMI 2.0a

- 4096x2160@60Hz
- High Dynamic Range (HDR) support
- Fully enjoy Premium 4K UHD content



DURABILITY

CMOS Battery Charge

- Design **PWR_BAT1** header for Long-Life RTC battery application
- Choose **chargeable battery** by customer to support this function

*IMB-1222/IMB-1223/IMB-X1222 Series M/B don't support it

SECURITY

Onboard TPM2.0

- Integrated Infineon TPM2.0 SLB9670
- Provide hardware-based security for Industrial data protection

*Q470E/W480E M/B Support

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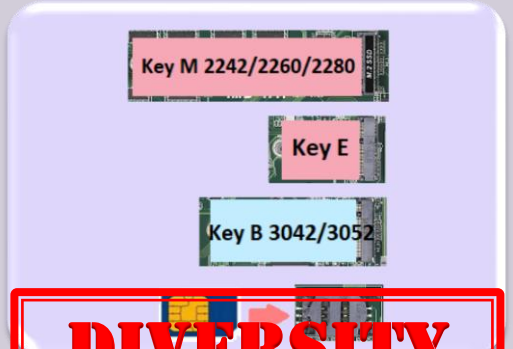
Key Feature



DIVERSITY

Multi-M.2 Slots

- **Key M** 2280 with PCIex4
- **Key E** 2230
  PCIe/USB2.0/CNVi for WiFi/BT
- **Key B** 3042/3052
  PCIe/USB3.0/USB2.0 and SIM socket for 4G/5G

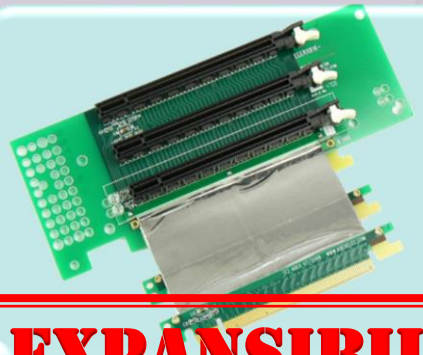
*Key M: PCIex4 for Q470E/W480E, PCIex2 for H420E
Key B: Only 3042 for IMB-1220/1221

FLEXIBILITY

Wide Range DC-in

- 12~28V DC-in design
- Flexible acceptance of inconsistent power input
- OVP/UVP for Protection

*Only IMB-X1222-WV/IMB-1222-WV/IMB-1223-WV support 12~28V



EXPANSIBILITY

PCI-E Riser Card

- PCIe x16 slot support
- PCIe x16 to **x8/x8** or **x8/x4/x4** Riser Card
- Without PCIe Clock buffer to support extension slots

*IMB-1711 and IMB-X1711 don't support it

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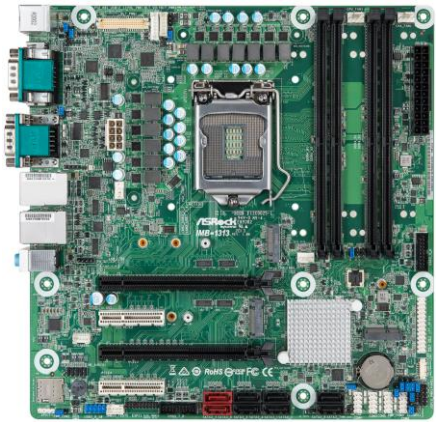
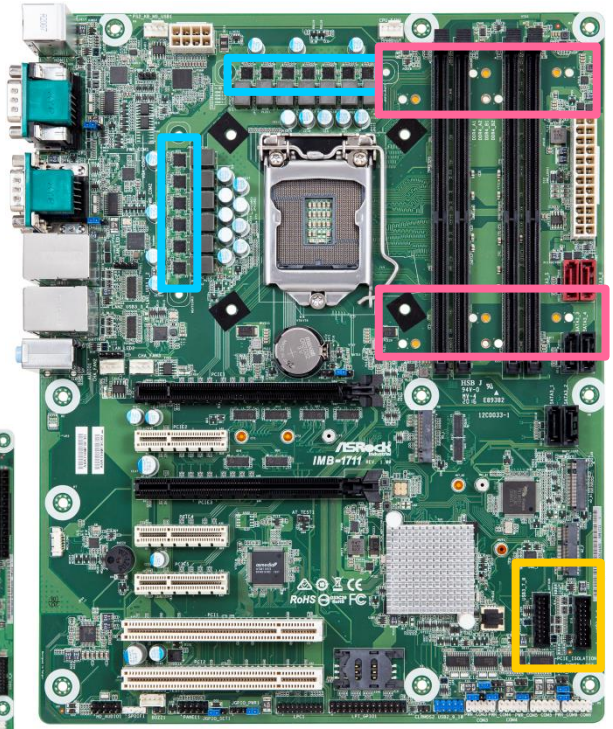
IMB-1313 & IMB-1711 Feature

Power Design	**Dr. MOS** with Digital PWM Support CPU up to **125W**
DIMM Bracket	**Design Retention bracket for Memory Modules**
USB Ports	Rear: **4*USB3.2** Gen2 + 2*USB2.0 Internal: **4*USB3.2** Gen1 (2*Header) + 2*USB2.0
SATA Ports	IMB-1313: **8*SATA3** IMB-1711: **6*SATA3** 1*M.2 Key M (Shared with SATA3_5/6)
Other	**MCU Mini58 Support** HDMI2.0a/Intel 2.5G LAN/ TPM Onboard CMOS Battery Charge (PWR_BAT1) M.2 Key B with SIM socket for 5G M.2 Key M with SATA/PCIe x4 M.2 Key E with PCIe x1/USB2.0/CNVi *** PCIE1 Riser card support for IMB-1313** *** 2x PCI Slot for IMB-1711**



IMB-1313



IMB-1711

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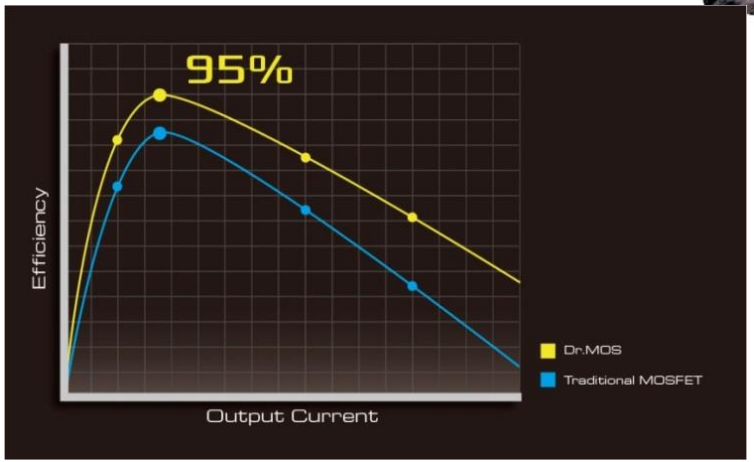
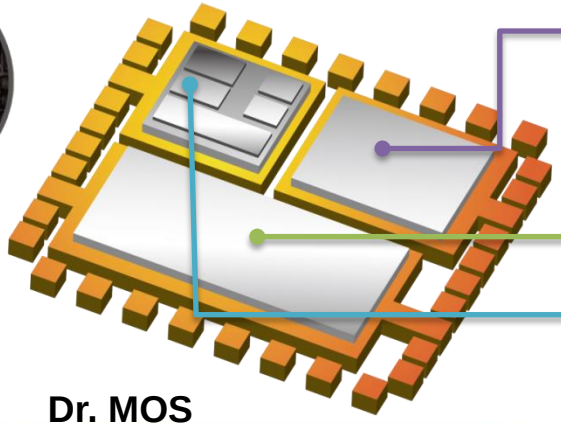
Key Feature – Dr. MOS

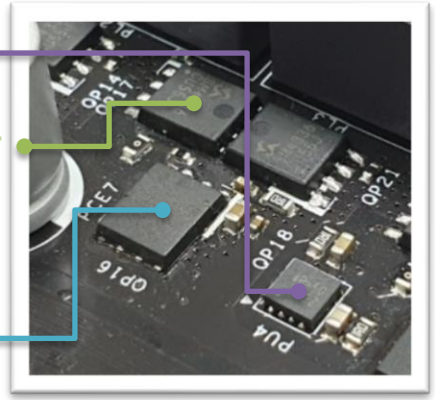
Dr. MOS

With **efficiency up to 95%**, Dr. MOS is more efficient during normal operation.
Dr. MOS is able to give **less power losses** to maintain lower temperature under heavy Loading, thus providing improved thermal result and **superior performance**





Dr. MOS



Traditional Design

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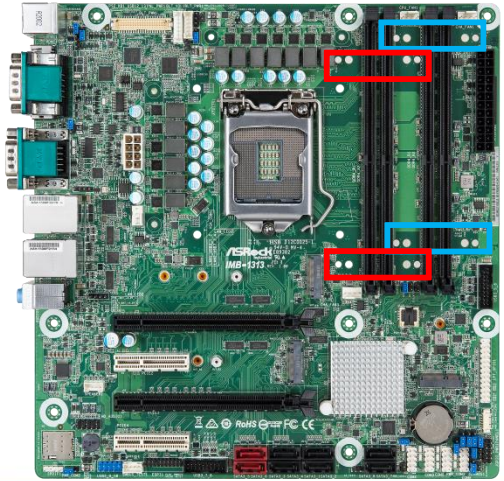
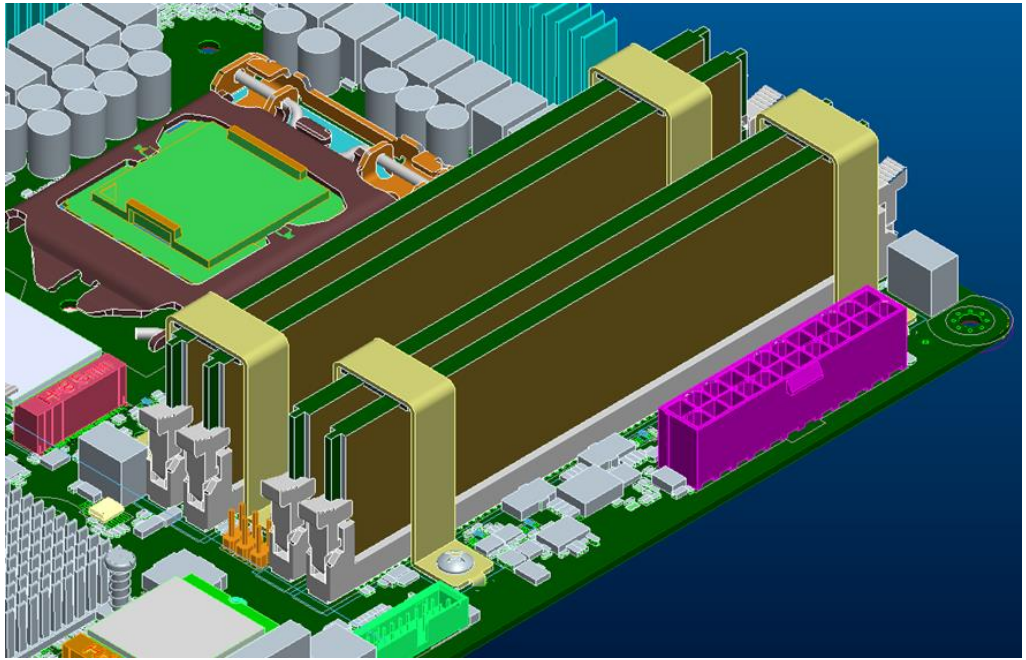
Key Feature – DIMM Bracket

DIMM Bracket

Design **Retention bracket** for Memory Modules.
Memory operation will be under stronger fixture and **reduce Vibration/Shock** from external environment, thus providing **durability** and **stability** for Industrial application.





*DIMM Bracket is optional

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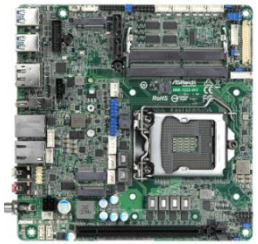
W480E Product Lineup & Feature

- **Full Product-line for W480E Chipset**
- **Support Xeon W-1200 Series CPU and ECC memory**

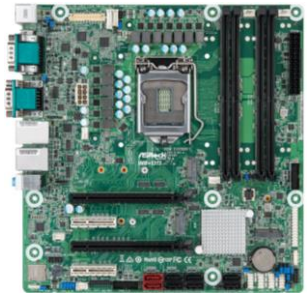
CPU	TDP	Core/Threads	ECC Support
W-1290E/W-1290TE	95W/35W	10/20	Yes
W-1270E/W-1270TE	80W/35W	8/16	Yes
W-1250E/W-1250TE	80W/35W	6/12	Yes
i3-10100E/i3-10100TE	65W/35W	4/8	Yes

*About the detailed CPU support for each M/B, please refer to the CPU support list

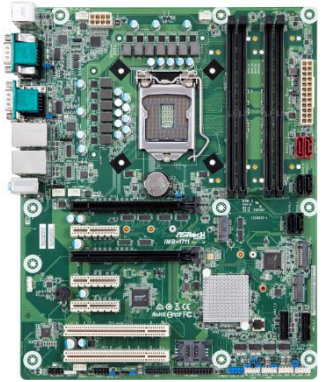
IMB-X1220-L



IMB-X1222-WV



IMB-X1313



IMB-X1711

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Generation Table – Intel Q Series Chipset

	Mini-ITX (High-Rise I/O)	Mini-ITX (Thin I/O)	Micro ATX	ATX
Haswell (Q87)*	IMB-181	IMB-184	IMB-380	IMB-780 IMB-781
Skylake/Kabylake (Q170)	IMB-194	IMB-190	IMB-390	IMB-790
Coffee Lake (Q370)	IMB-1211	IMB-1213 IMB-1215	IMB-1311 IMB-1312	IMB-1710
Comet Lake (Q470E)	**IMB-1220-D** **IMB-1220-L**	**IMB-1222** **IMB-1222-WV**	**IMB-1313**	**IMB-1711**

***Q87 Chipset will EOL in 2021**

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Generation Table – Intel H Series Chipset

	Mini-ITX (High-Rise I/O)	Mini-ITX (Thin I/O)	Micro ATX	ATX
Haswell (H81)*	IMB-185	IMB-183	IMB-385	IMB-785
Skylake/Kabylake (H110)	IMB-195	IMB-191 IMB-192 IMB-193	IMB-391	IMB-791 IMB-792
Coffee Lake (H310)	IMB-1210	IMB-1212 IMB-1214	IMB-1310	
Comet Lake (H420E)	**IMB-1221-D** **IMB-1221-L**	**IMB-1223** **IMB-1223-WV**		

***H81 Chipset will EOL in 2021**

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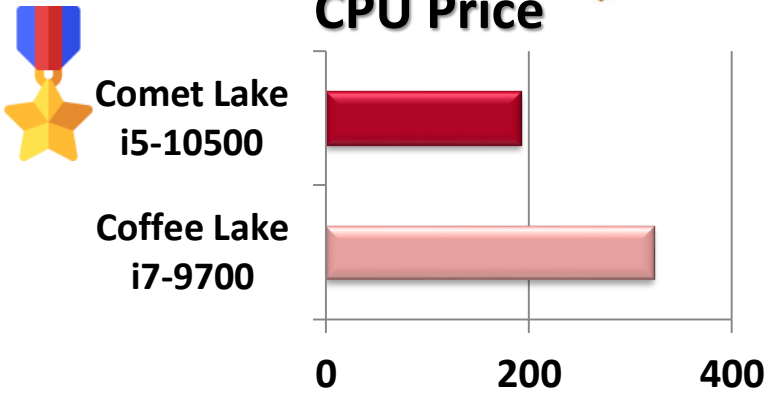
Summary

ASRock Industrial CML-S

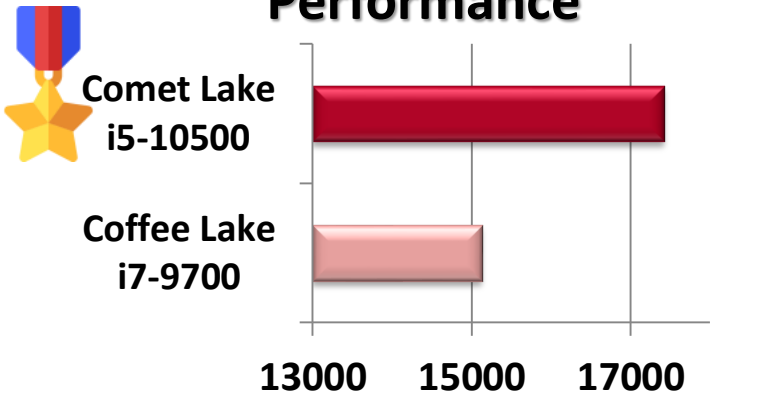
- Cost reduce
- Performance increase
- Specification enrich

Professional Support Team

CPU Price



Performance



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