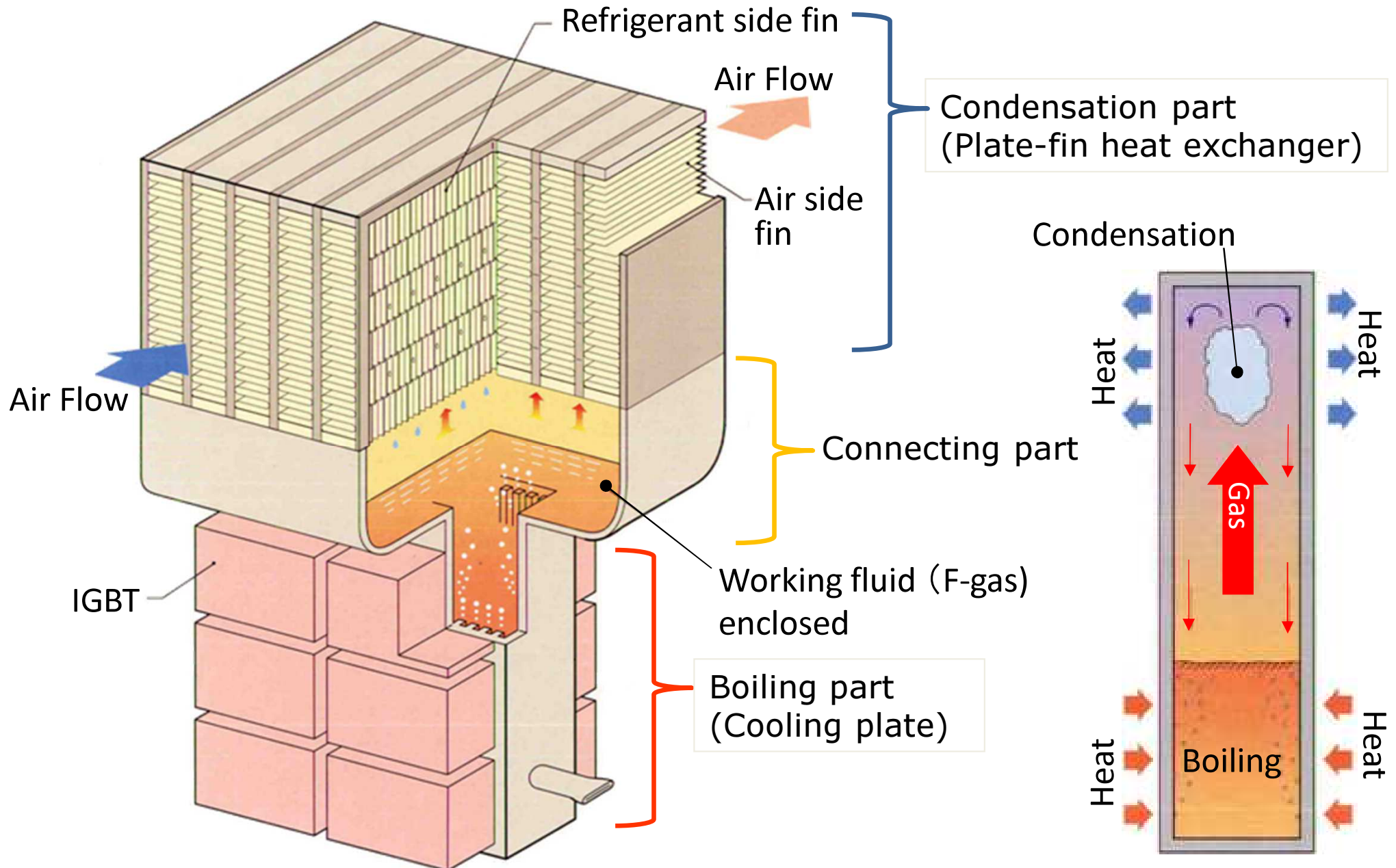
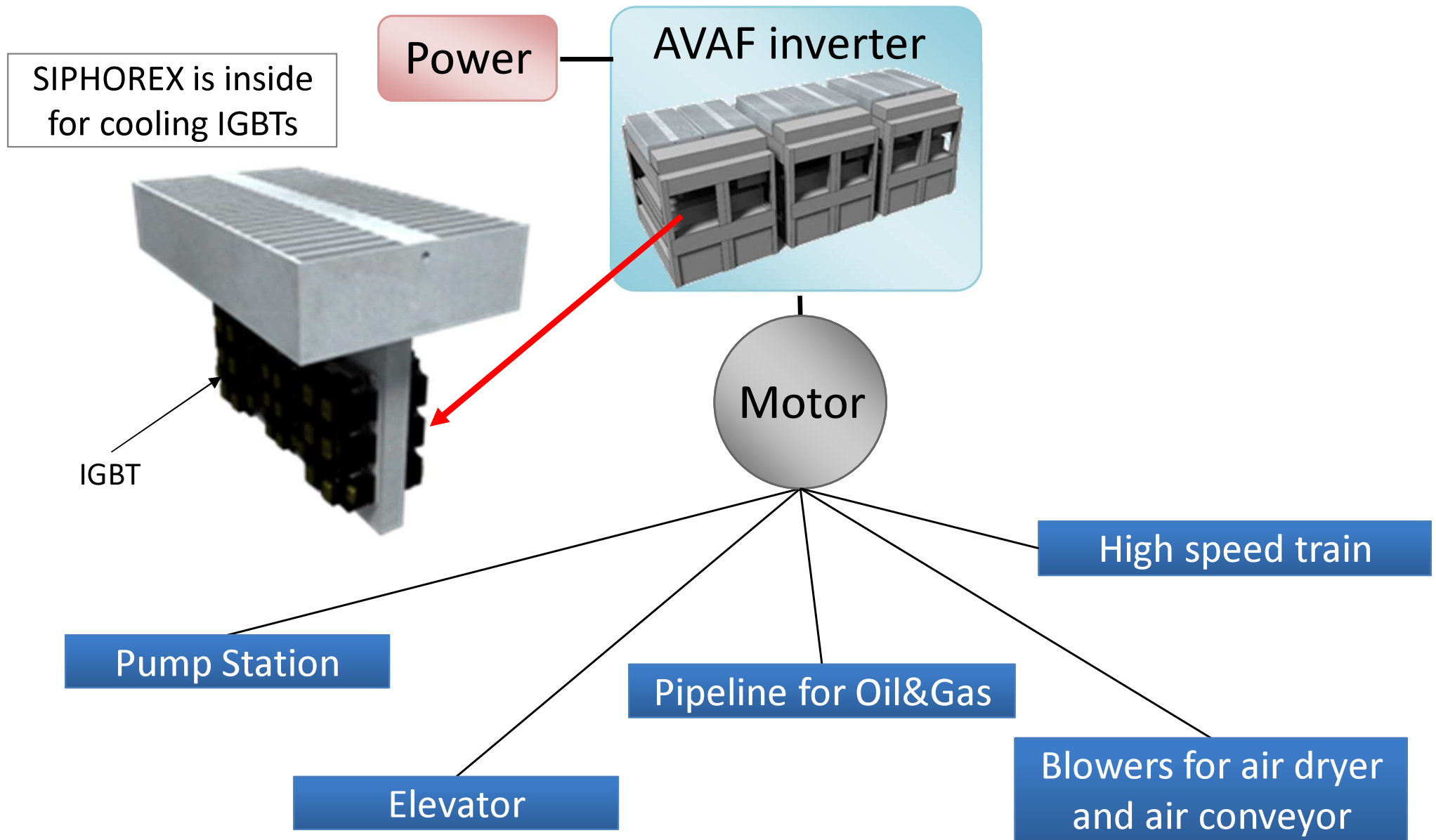


Basic structure of "SIPHOREX"

"SIPHOREX" is our product name of 2phase (boiling & condensation) cooling system.



Applications for IGBT cooling



Other features of "SIPHOREX"

◆ High Reliability

Form our experience of 25 years, SIPHOREX has experienced no failure, besides external reason (e.g. corrosive environment, external force)

◆ Uniform cooling surface temperature

Since temperature of contained liquid inside becomes uniform with saturation temperature, cooling surface also becomes almost uniform.

◆ Sub-zero ambient temperature OK.

Since freezing point of refrigerant is very low, SIPHOREX does work in sub-zero ambient. (more than -40degC possible)

Suggestions for high-performance CPU cooler

- Hope to increase the processing capacity and speed of equipment. (increasing CPU heat value)
- Hope to reduce the power consumption of air conditioning. (raising the room temperature setting value)
- However, you do not want to use the water cooling method. (leakage, maintenance, power consumption).

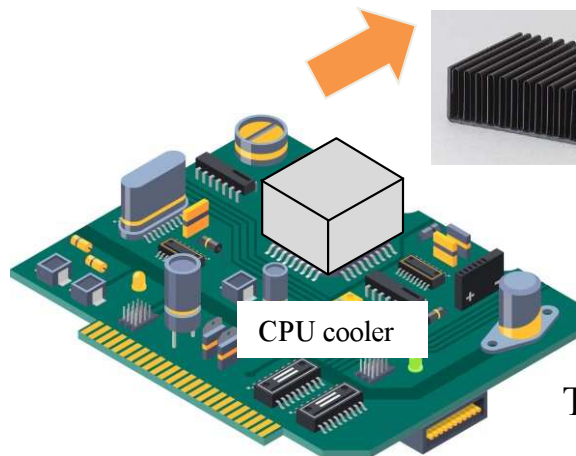
I wish a high-performance air-cooled cooler...



The performance of the cooler is low,

Acceptable CPU temp.: 70°C
Temperature rise value ΔT : 45°C

↓
Need to keep the room temperature low

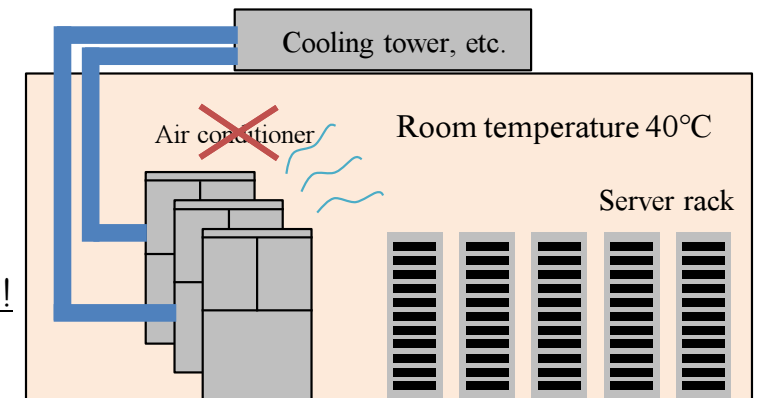
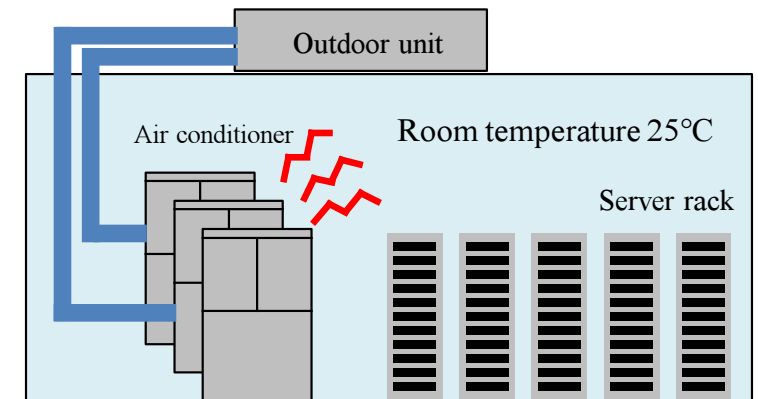
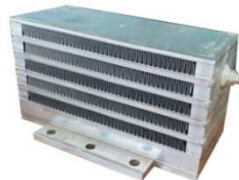


CPU cooler

The performance of the cooler is good,

Acceptable CPU temp.: 70°C
Temperature rise value ΔT : 30°C

↓
The room temperature can be kept high!!



Suggestions for high-performance CPU cooler

Cooling method comparison

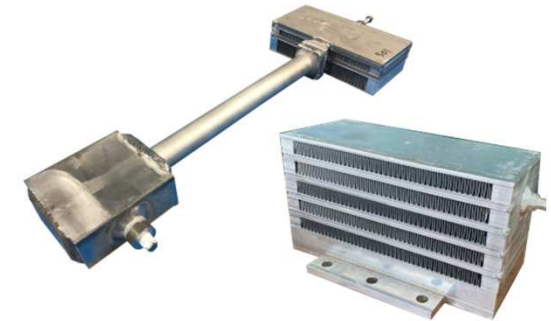
- Heat sink
 - Low cost
 - △ Low cooling performance
- Liquid cooling
 - High cooling performance
 - △ Need piping, Maintenance
- Liquid immersion
 - Cooling performance High
 - × Large space, High cost



Air cooling with phase change Siphorex for CPU/GPU

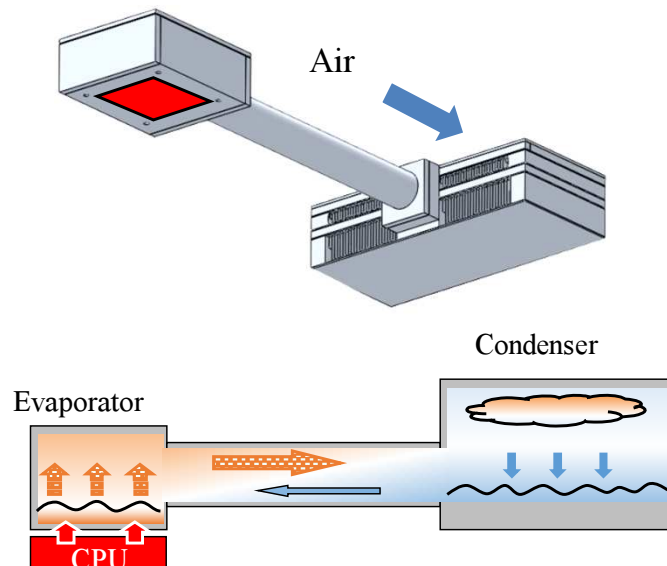
- Cooling performance similar to liquid cooling
- Smaller space than liquid cooling / immersion
- △ Higher cost than heatsink

Possible for 1000W



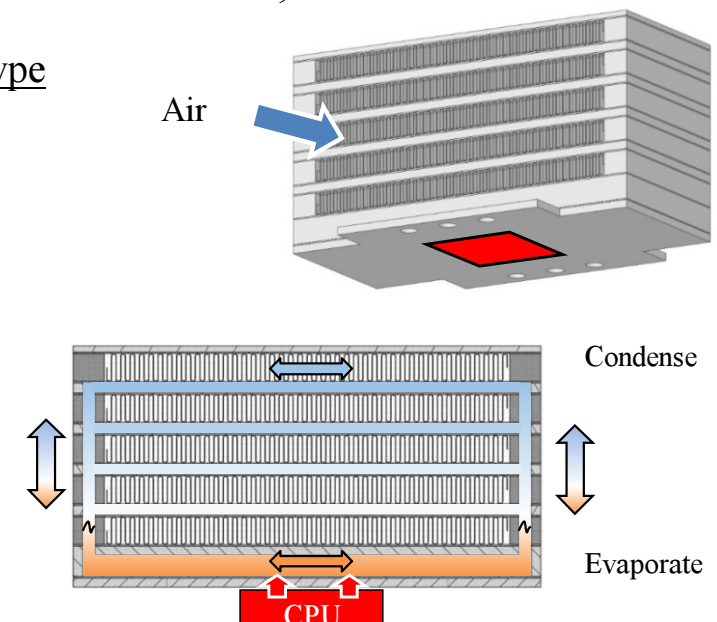
If height of cooler need to be low,

Separate type

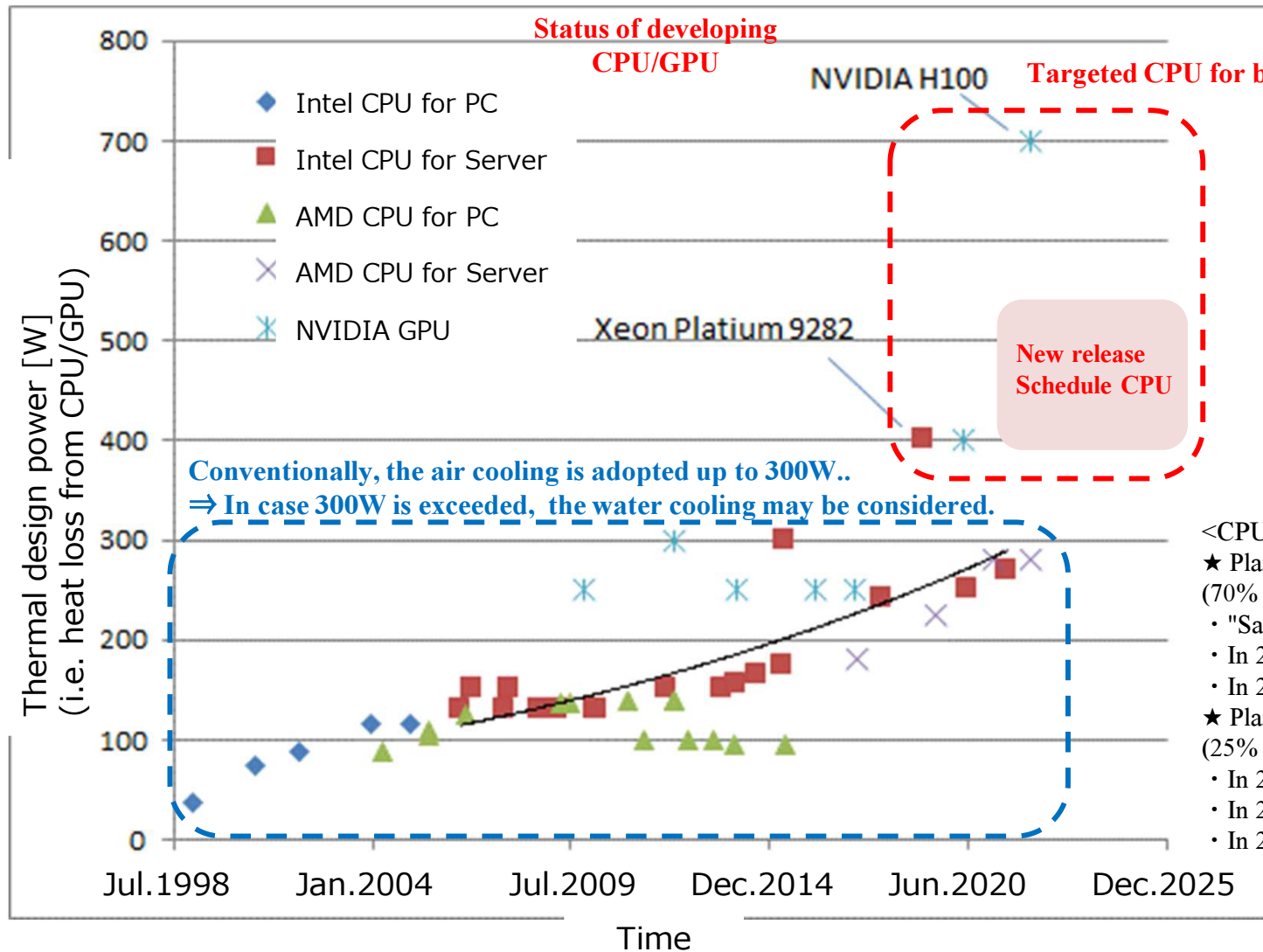


If cooler needs to be on CPU,

Integrated type



Status of developing CPU • GPU



<CPU status>

- ★ Planned release of newly developed CPU made by Intel (70% share)
 - "Sapphire Rapids" by the second quarter of 2022
 - In 2023, "Emerald Rapids"
 - In 2024, "Granite Rapids" and "Sierra Forest"
- ★ Planned release of newly developed CPU made by AMD (25% share)
 - In 2022, "Genoa"
 - In 2023, "Bergamo"
 - In 2024, "Turin"

Summary of appeal points

<Compare with Other Cooling Specifications>

	Air-cooled heat sink	Air cool SIPHOREX	Water cooling
CAPEX	Heat sink + fan	SIPHOREX + fan	Cooler + piping + pump + radiator
OPEX	• Electricity cost/year • Maintenance costs	> Power cost/year ≒ Maintenance cost	• Electricity cost/year • Maintenance costs

Heat value

300W

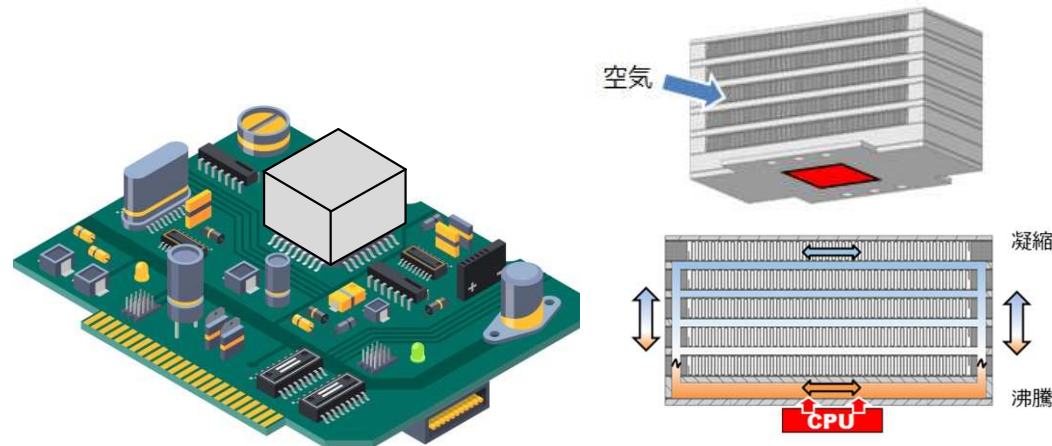
700W

According to the specifications

CPU spec image

<Appeal Points>

- ★ For air-cooled specifications
 - High load heat can be removed
 - Reduce power consumption and noise by reducing fan air volume
- ★ Against the water cooling specifications
 - No need for pumps and piping
 - No risk of damage to electronic equipment due to fluid leaks
 - Easy maintenance



Motherboard in the server

Compact, high-performance phase-change CPU cooler (SIPHOREX) developed for CPU cooling applications in datacenter servers