

Application of FloTHERM XT to Networks Products

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2016 / 11 / 11

Outline



- Company Introduction
- Products
- Why Do Simulation
- Case Study
- Why Choose FloTHERM XT

CornerStone 成基應用科技

Outline



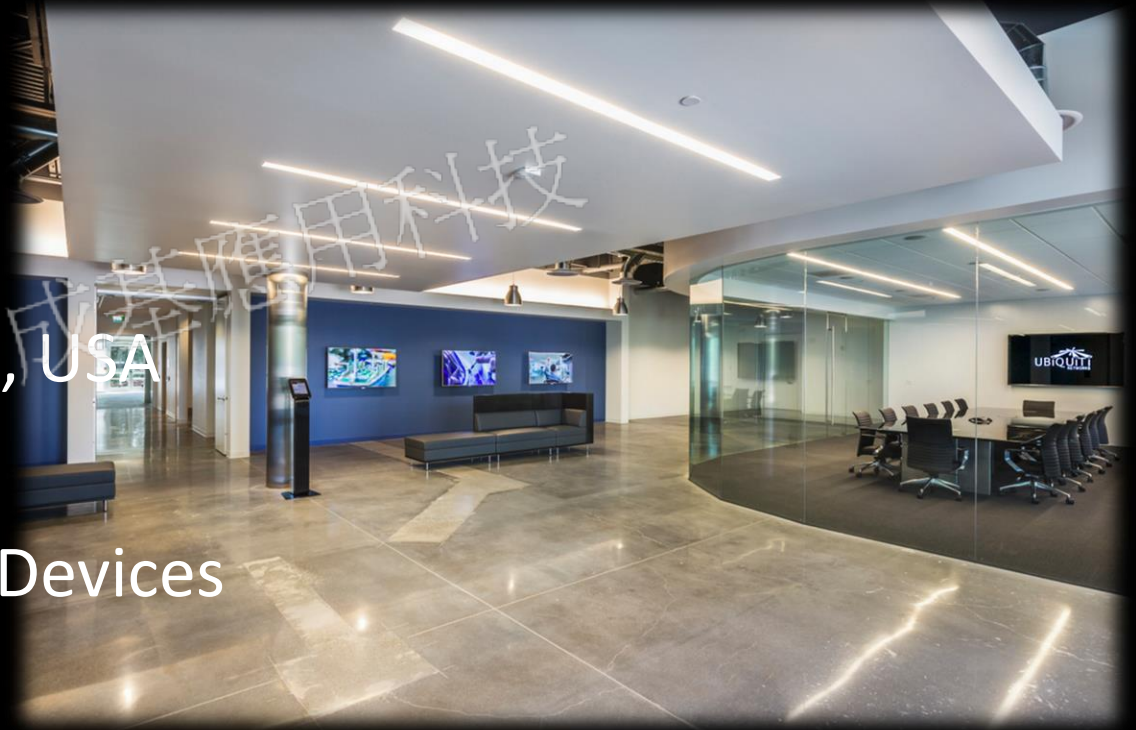
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Company Introduction



- Ubiquiti Networks
- Founder: Robert J. Pera, CEO
- Founded: June 2005
- Headquarter: San Jose, California, USA
- Trade: NASDAQ UBNT
- Products: Computer Networking Devices



Robert J. Pera



- Born: 1978
- Nationality: American
- Alma mater: University of California
- Occupation: CEO of Ubiquiti Networks
Owner of Memphis Grizzlies
- Career: Apple



Motivation



- After graduation, he secured a job at Apple, where he tested the company's Wi-Fi devices to ensure compliance with Federal Communications Commission standards.
- He noticed that the power sources Apple's WiFi devices used to throw signals were far below FCC limits.
- Boosting the power could increase the transmission range to over dozens of miles.
- His bosses ignored his idea, so he decided to build his own low-cost, high performance WiFi module.

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Products



- airFiber – Wireless Backhaul
- airMAX – Fixed Outdoor Wireless
- EdgeMAX – Carrier Routing
- UniFi – Enterprise Wifi
- UniFi VIDEO – Video Surveillance
- UniFi VoIP – Scalable Internet Telephony Network
- AmpliFi – High Density Wi-Fi System



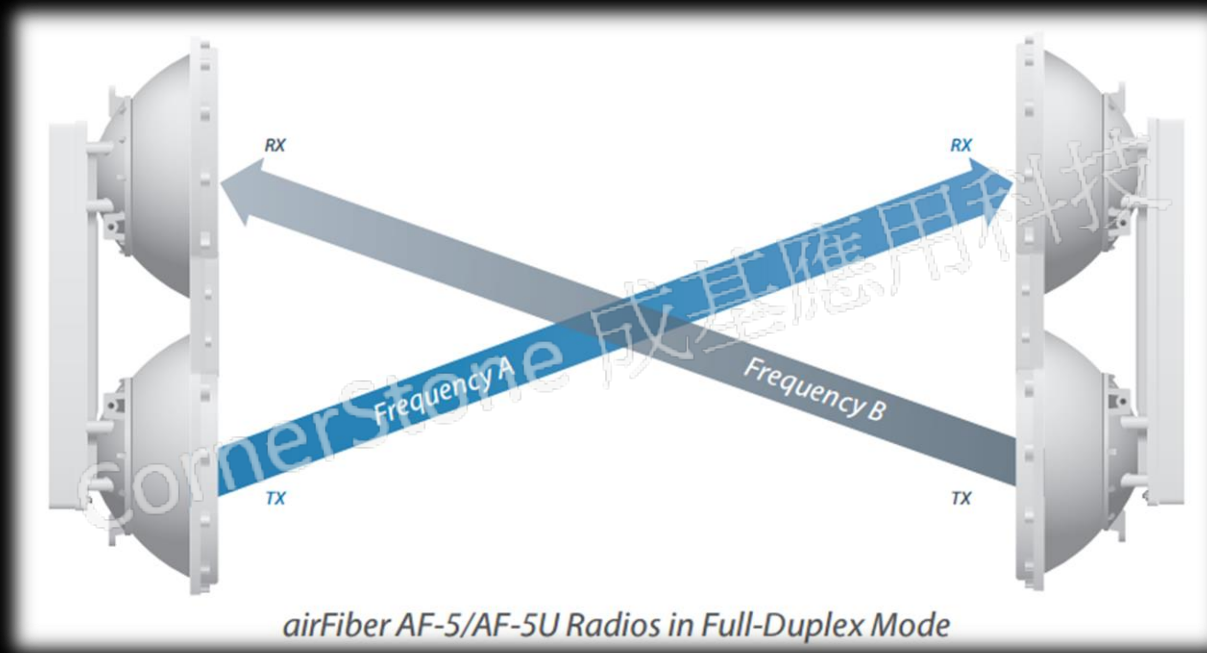
airFiber – Wireless Backhaul



- Performance: 1.2 Gbps+
- Band: 5 GHz, 24 GHz
- Range: 100 Km+
- Latency: < 1 ms
- -40° C to 70° C

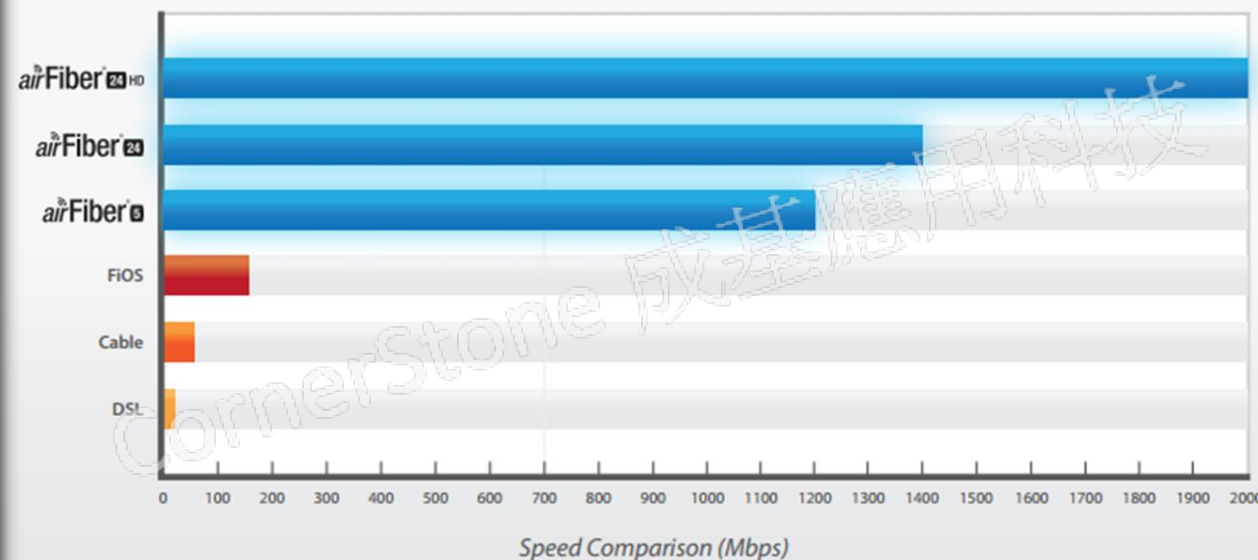


airFiber – Wireless Backhaul



- Hybrid Division Duplex (HDD)
Synchronous data transmission and reception

airFiber – Wireless Backhaul



- Built for Speed and Range
airFiber can transmit a 100 MB file in less than a second

airFiber – Wireless Backhaul



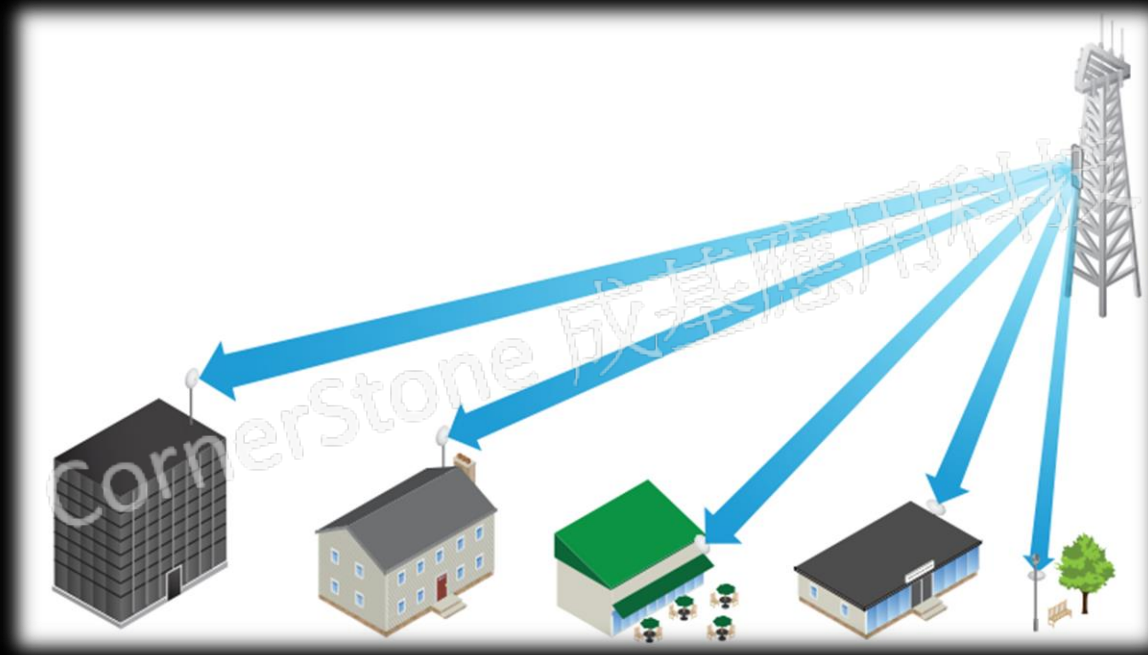
airMAX – Fixed Outdoor Wireless



- Performance: 450 Mbps+
- Band: 5 GHz
- Range: 25 Km+
- Latency: < 1 ms
- -40° C to 70° C

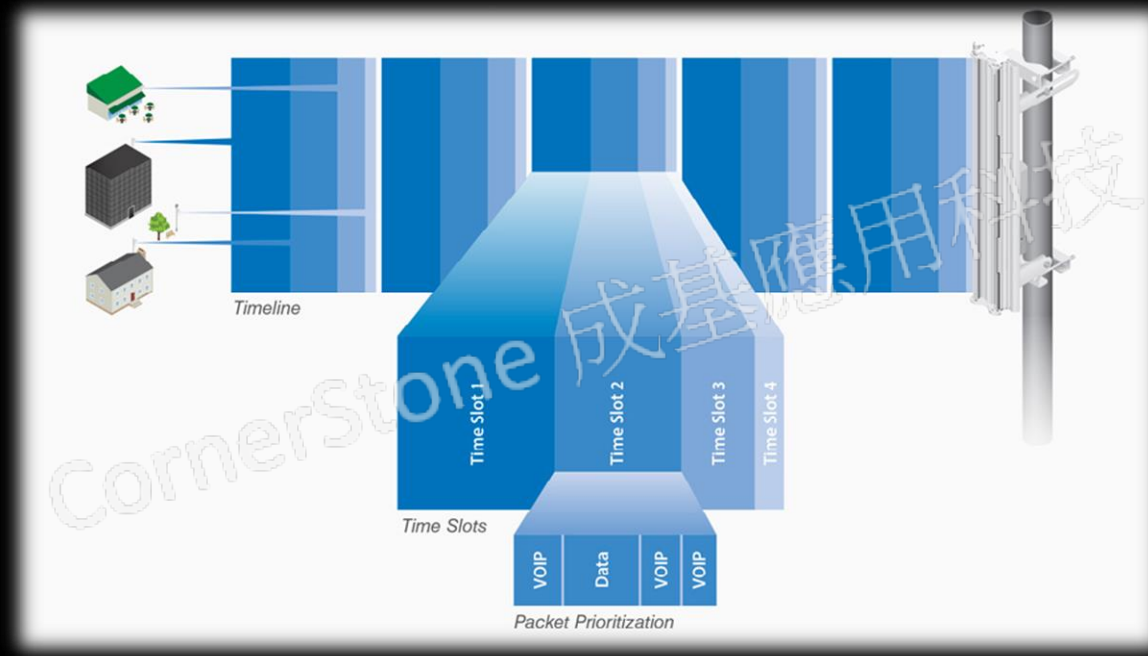


airMAX – Fixed Outdoor Wireless



- airMAX are powerful wireless client
Each client can send and receive data at same time

airMAX – Fixed Outdoor Wireless



- Time Division Multiple Access (TDMA) Technology
Allows each client to send and receive data using pre-designated timeslots

EdgeMAX – Carrier Routing



- Non-Blocking Throughput: 70 Gbps
- Switching Capacity: 140 Gbps
- Enterprise-Class Features
 - Supports Layer-2 switching features
 - Provides Layer-3 routing capability
- Optical Fiber Backhaul
 - Includes two SFP+ ports for uplinks of up to 10 Gbps
- PoE+ Support: up to 750 W



EdgeMAX – Carrier Routing



- Features an intuitive, easy-to-use graphical user interface
Makes it simple to configure and monitor your devices

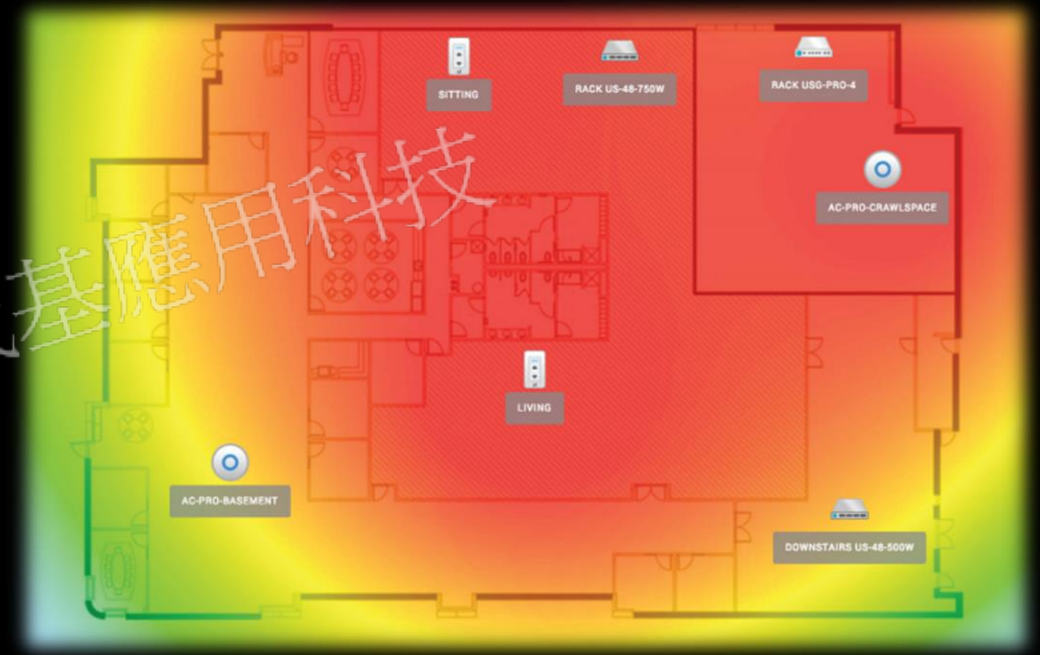
UniFi – Enterprise Wifi



- Performance: up to 1.3 Gbps
- Band: 2.4 GHz, 5 GHz
- Range: up to 183 m
- Latency: < 1 ms
- -10° C to 70° C
- Weather Resistant



UniFi – Enterprise Wifi



- Expandable unlimited scalability
Build wireless networks as big or small as needed

UniFi VIDEO – Video Surveillance



- FHD Image Quality
- 1 / 3" 4-Megapixel HDR Sensor
- 10 / 100 Ethernet Port
- Weather Resistant
- -30° C to 70° C



UniFi VIDEO – Video Surveillance

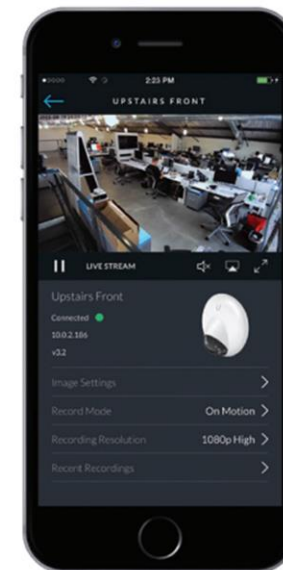
A screenshot of the UniFi Video web interface showing a list of event recordings. The interface includes a sidebar with camera thumbnails and a main table of recordings. A large, semi-transparent watermark 'CornerStone 應用科技' is overlaid on the table.

Camera	Event	Time
New Office	Motion	Apr 3 2015 09:08
June and Paul Office	Motion	Apr 3 2015 09:08
Kitchenette	Motion	Apr 3 2015 09:08
New Office	Motion	Apr 3 2015 09:08
Open Office 2	Motion	Apr 3 2015 09:08
Open Office	Motion	Apr 3 2015 09:08
Entry 1	Motion	Apr 3 2015 09:08
Open Office	Motion	Apr 3 2015 09:08
Open Office 2	Motion	Apr 3 2015 09:08
Open Office	Motion	Apr 3 2015 09:08
Entry 2	Motion	Apr 3 2015 09:08
Entrance Hallway	Motion	Apr 3 2015 09:08
Office Entry	Motion	Apr 3 2015 09:07
New Suite Entry	Motion	Apr 3 2015 09:07
Photo Studio	Motion	Apr 3 2015 09:07
Photo Studio	Motion	Apr 3 2015 09:07



- Event Recordings
The UniFi Video cameras feature motion detection

UniFi VIDEO – Video Surveillance



- Mobile App

UniFi Video may be accessed from iOS and Android™ using the mobile app

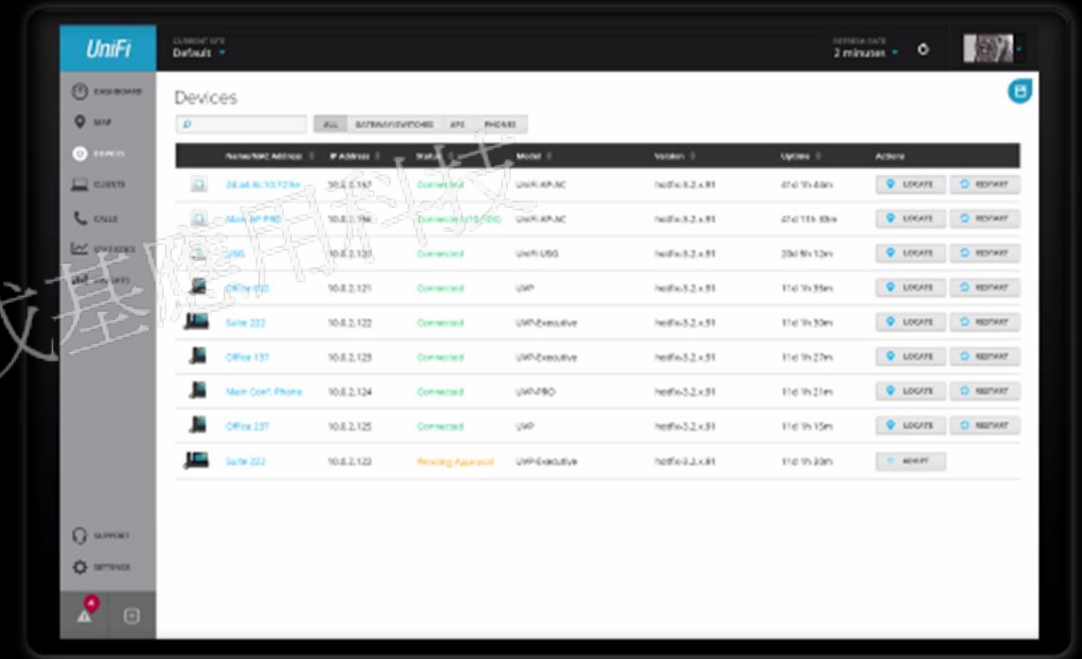
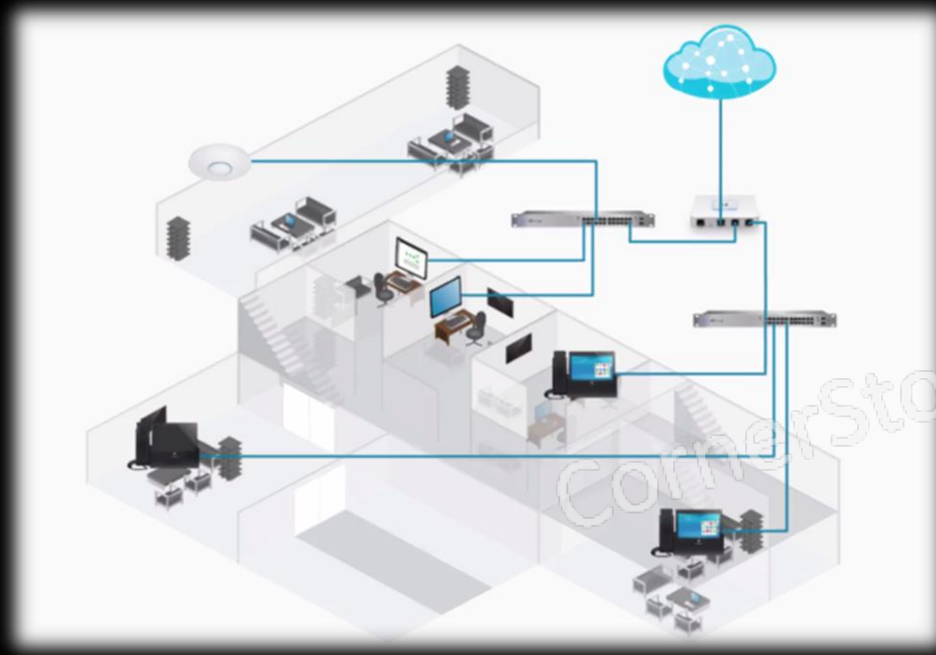
UniFi VoIP – Internet Telephony Network



- 7-Inch Multi-Touch Display
- Powered by Android
- High-Definition Camera
- Premium Stereo Sound
- Bluetooth Support



UniFi VoIP – Internet Telephony Network



- Plug and Play Deployment
Includes SIP support and automatic provisioning

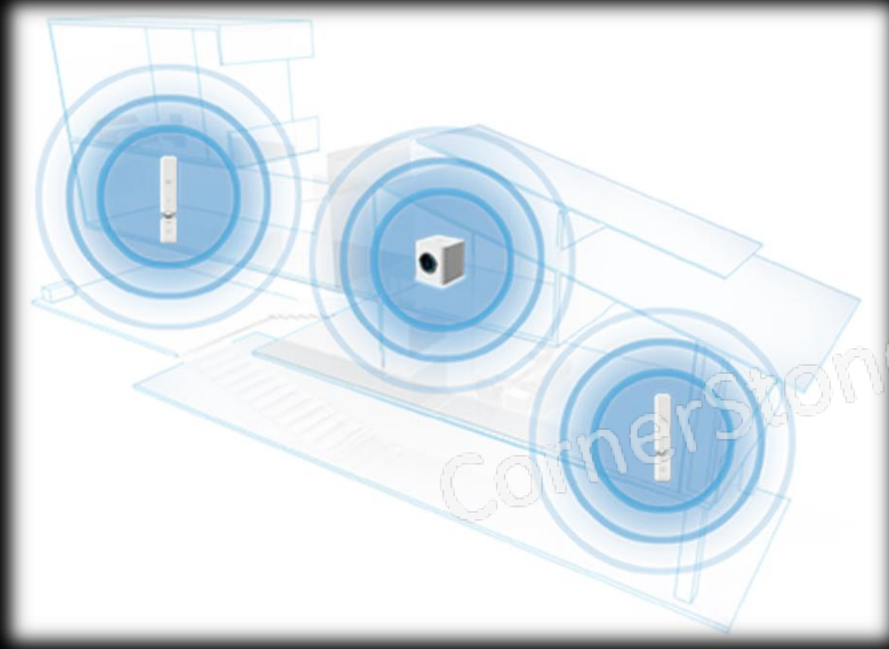
AmpliFi – High Density Wi-Fi System



- Performance: up to 1300 Mbps
- Band: 802.11b / g / a / n / ac
- Display: 212 ppi Touch Screen
- Interface: Gigabit Ethernet
- Range: 1800 m²
- Latency: < 1 ms
- -10° C to 55° C



AmpliFi – High Density Wi-Fi System



- Mesh Points
Extends wifi coverage for best performance

Outline



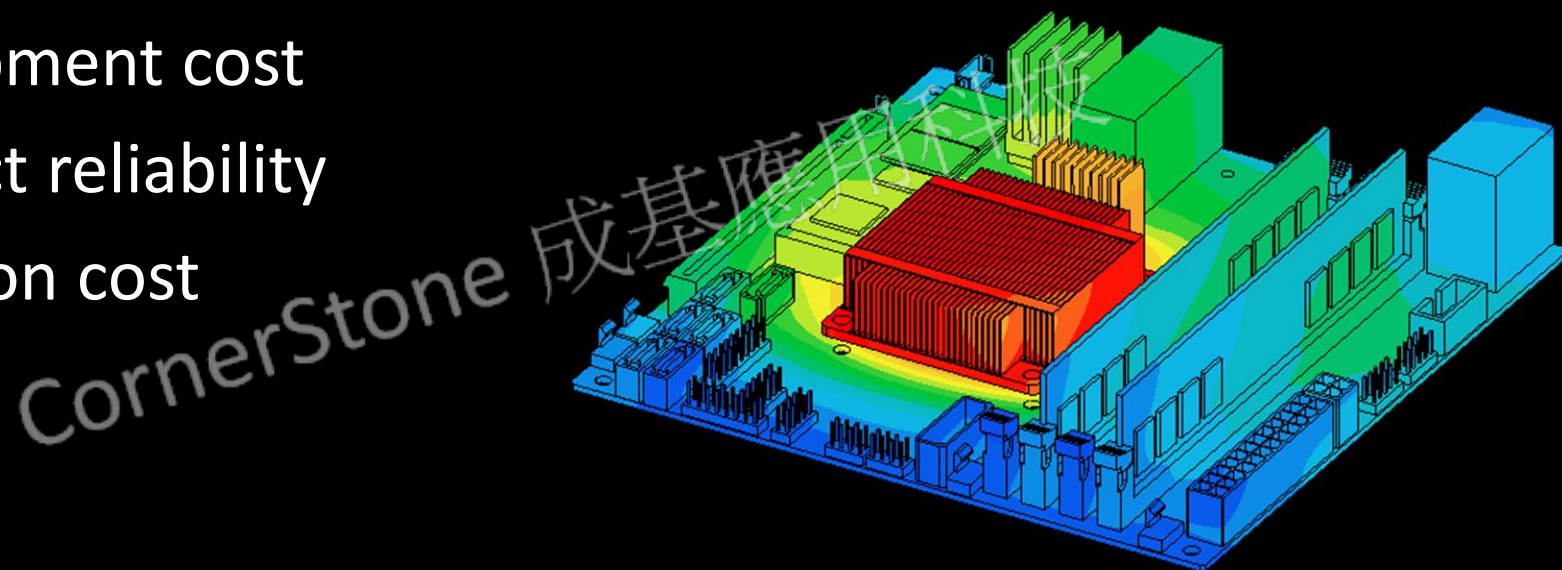
- Company Introduction
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- **Why Do Simulation**
- Case Study
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Why Do Simulation



- Shorten the development cycle
- Reduce development cost
- Improve product reliability
- Lower production cost



Why Do Simulation



Outline



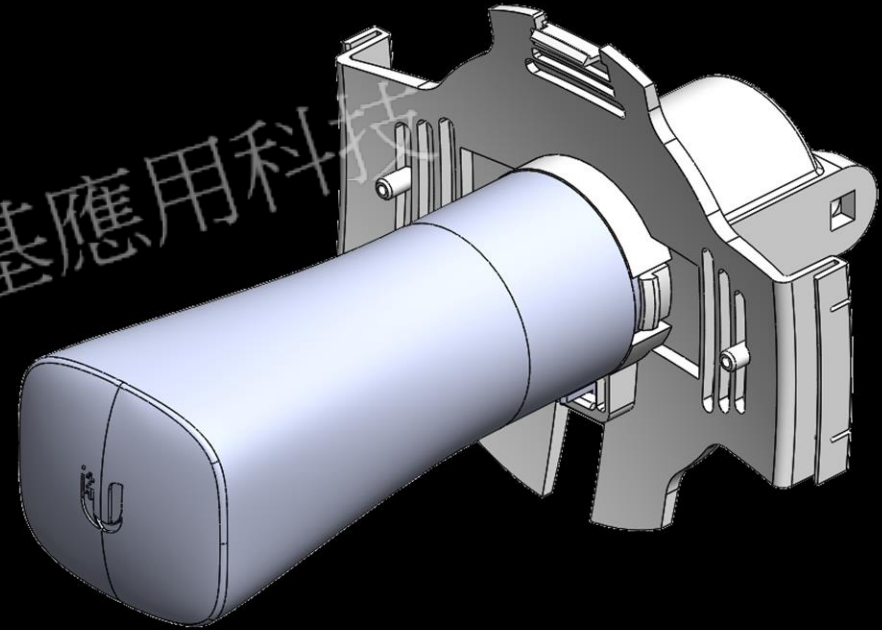
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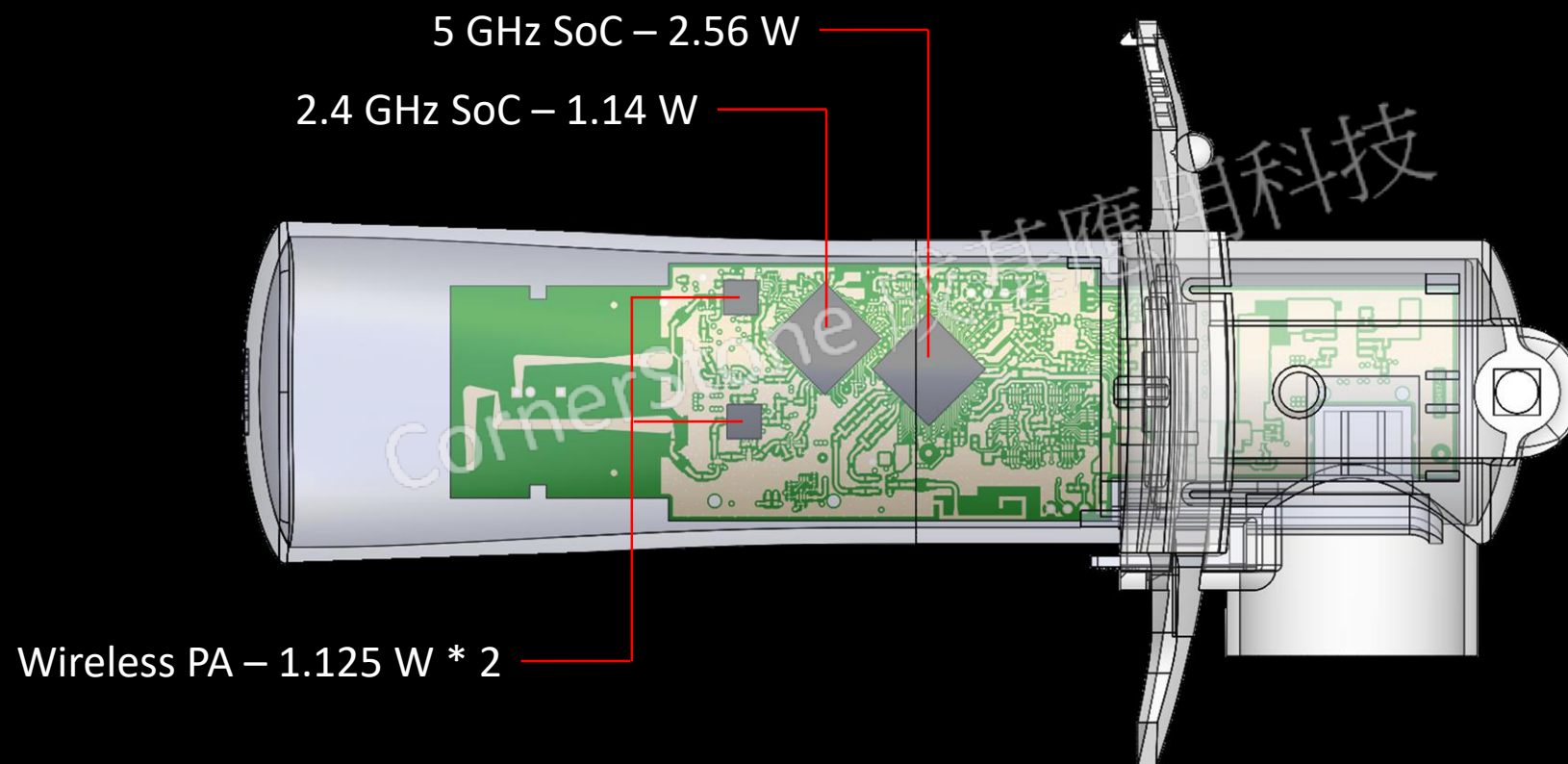
Case Study A



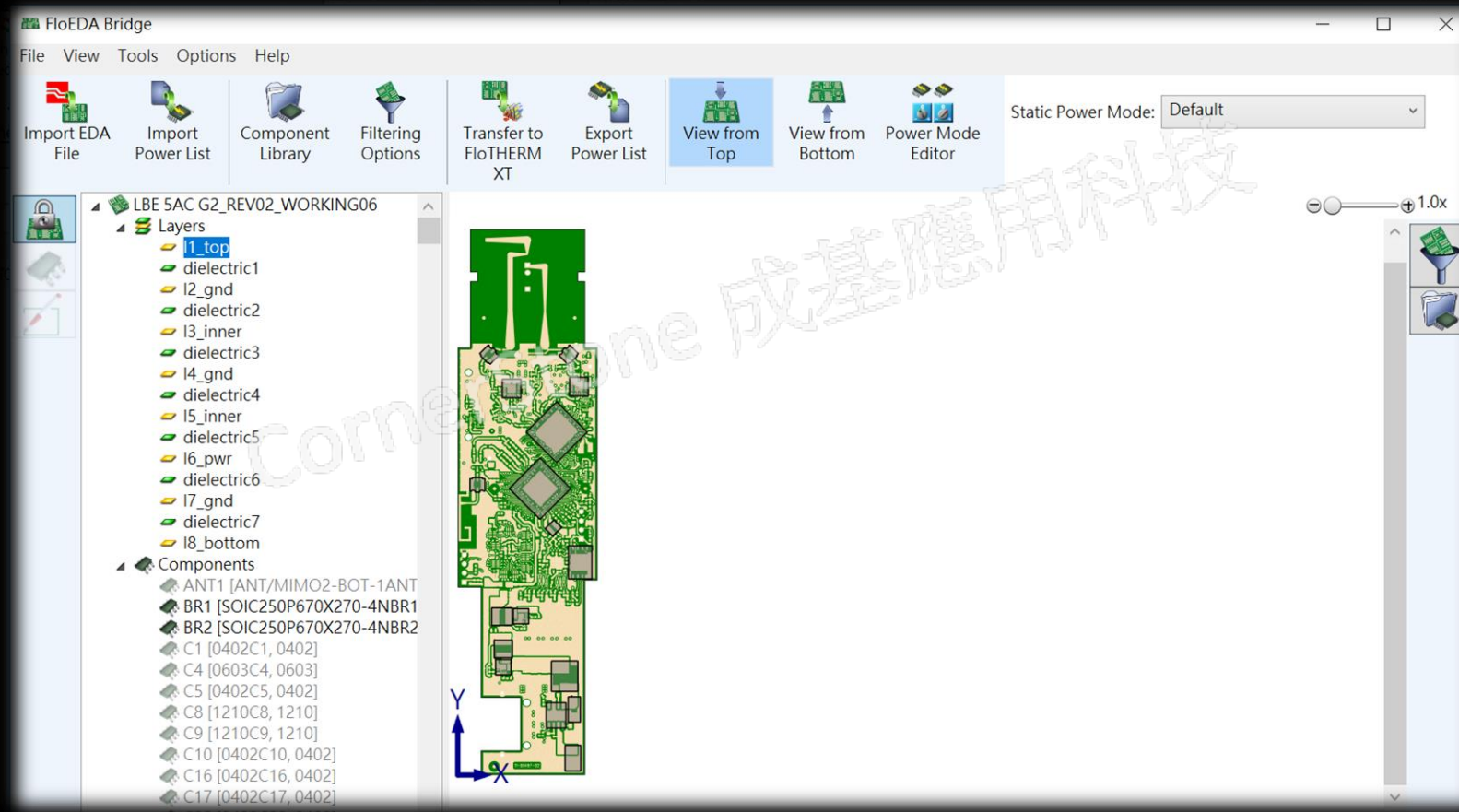
- Fixed outdoor wireless
- Under full load
- Ambient temperature 70° C
- Wind velocity 0 m/s
- Free convection



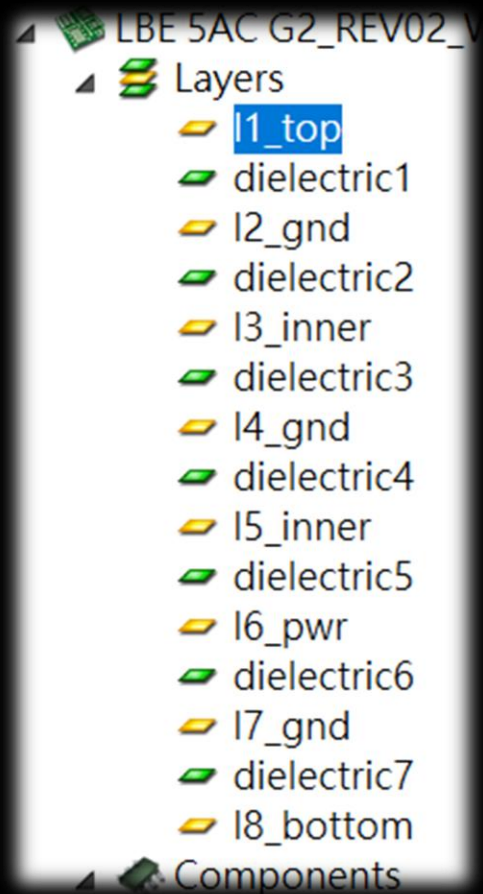
Model



FloEDA Bridge – ODB++



FloEDA Bridge – ODB++



Layer Details

Name l1_top

Thickness 0.50385 Oz

Dielectric Material

FR4

Conductor Details

Conducting Material

Copper

% Cover

52.06078

FloEDA Bridge – ODB++



TP21 [TP1TP21, TP1]

U1 [QFN-DR-149-EPU1, C

U4 [QFN50P400X400-21

U7 [QFN40P500X500X80

U8 [QFN50P400X400-21

U11 [QFN40P1200X1200

U12 [SOIC127P680X239-

U13 [US8U13, US8]

U14 [US8U14, US8]

U15 [US8U15, US8]

U22 [QFN50P150X150X5

U23 [SOT65P210X110-5

U24 [QFN50P150X150X5

U25 [SOT65P210X110-5

U27 [SOT65P210X110-5

U28 [SOT65P210X110-5

A top-down view of a PCB layout. A central component, U1, is highlighted with a red square. The board is populated with various other components, including microprocessors, memory chips, and connectors. A coordinate system with X and Y axes is shown at the bottom left.

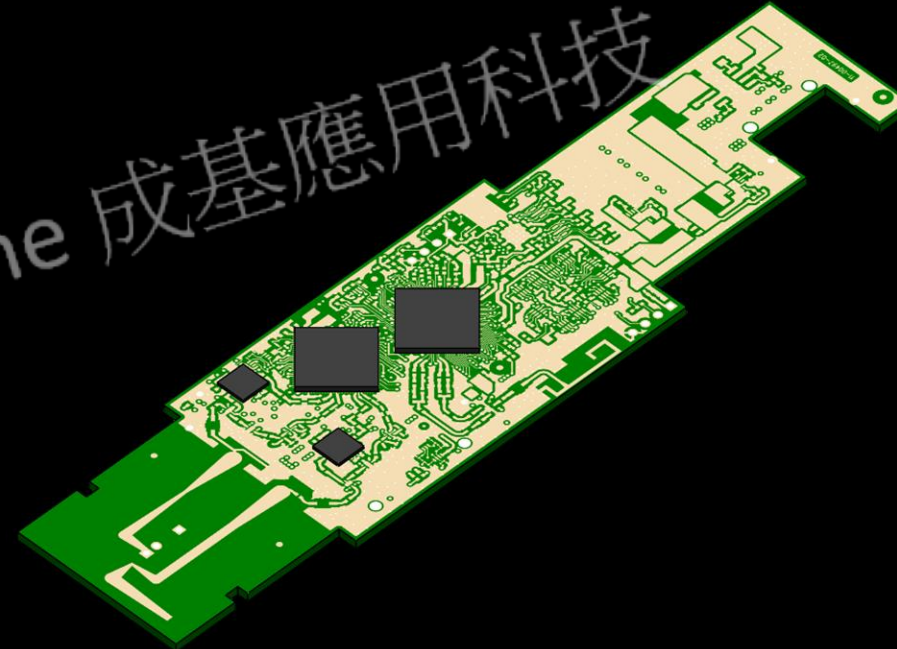
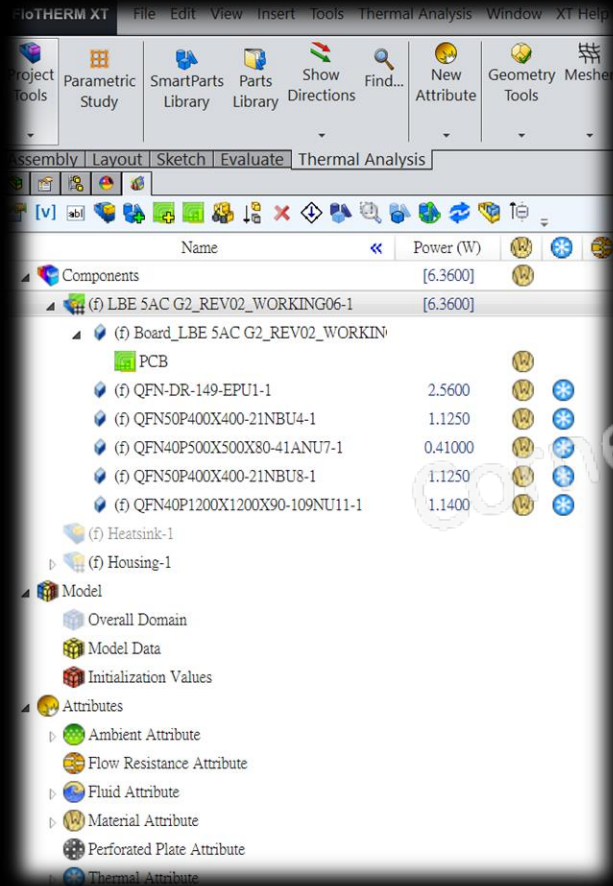
Component Details

Reference Designator	U1
Package Name	QFN-DR-149-EPU1
Part Number	QFN-DR-149-EP
Board side	Top
X Location	22.94738 mm
Y Location	79.92011 mm
Z Offset	0 mm
Rotation	45 deg
Length	12.1206 mm
Width	12.1206 mm
Height	2 mm

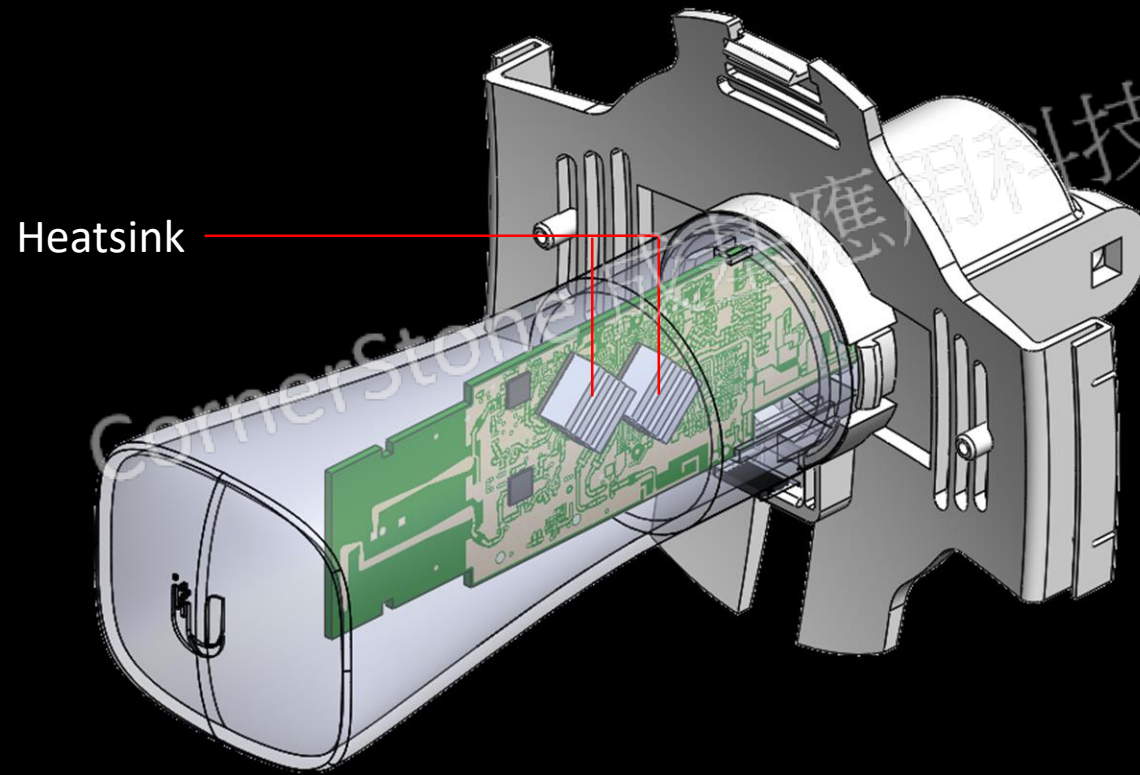
Thermal Details

Model Type	Simple
Power	0 W
Max. T Junction	90 degC
Max. T Case	75 degC
Material	Typical Plastic Package

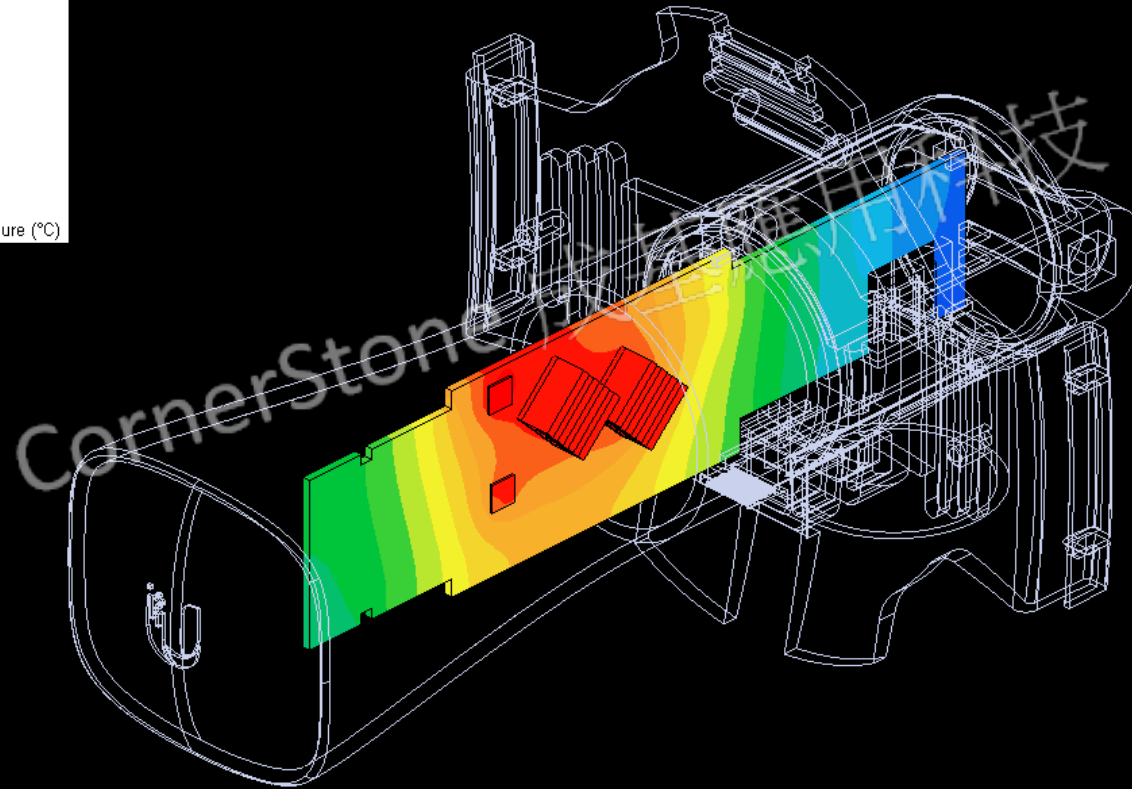
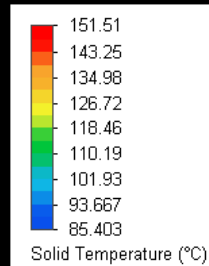
FloEDA Bridge – ODB++



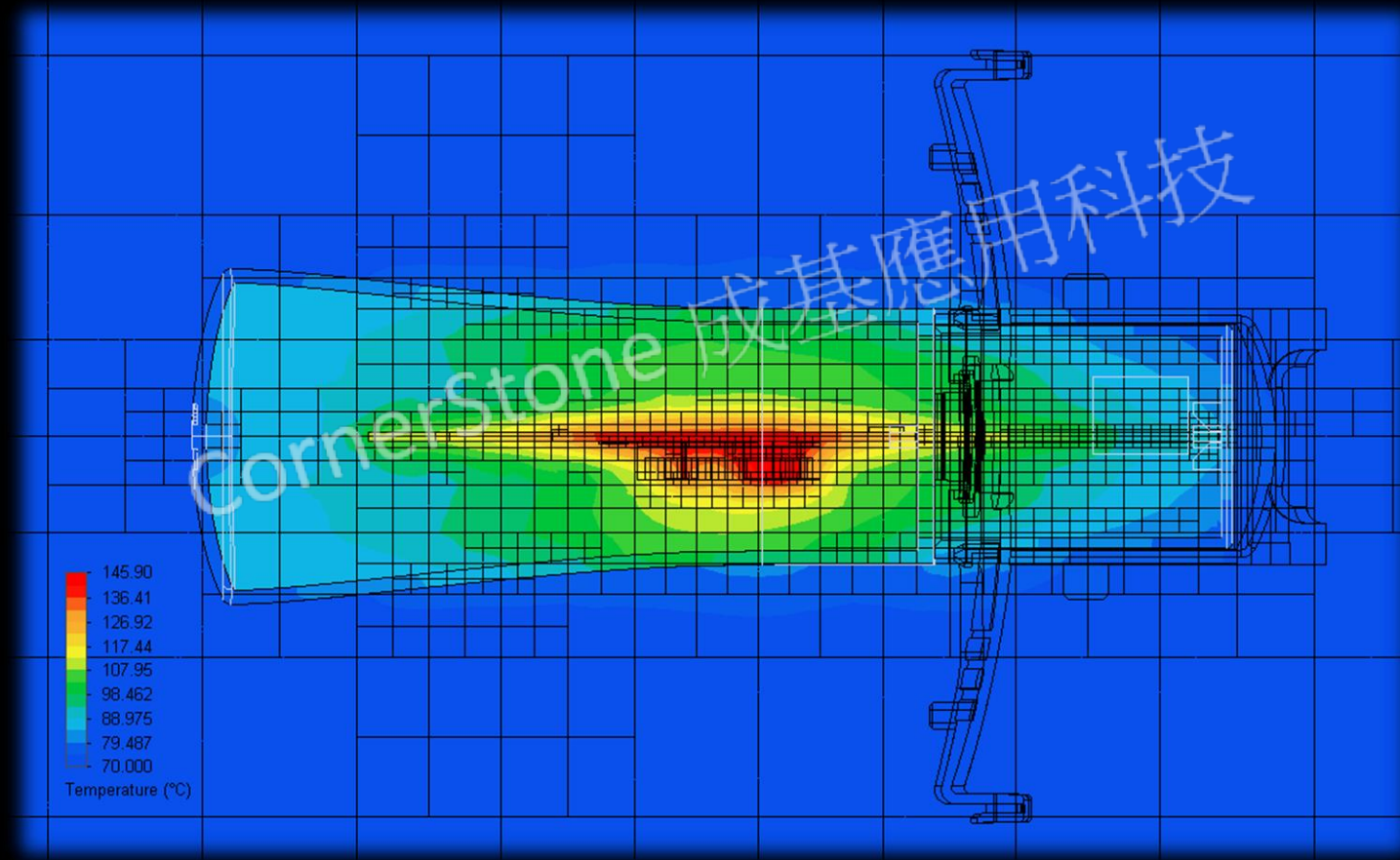
Preliminary Design



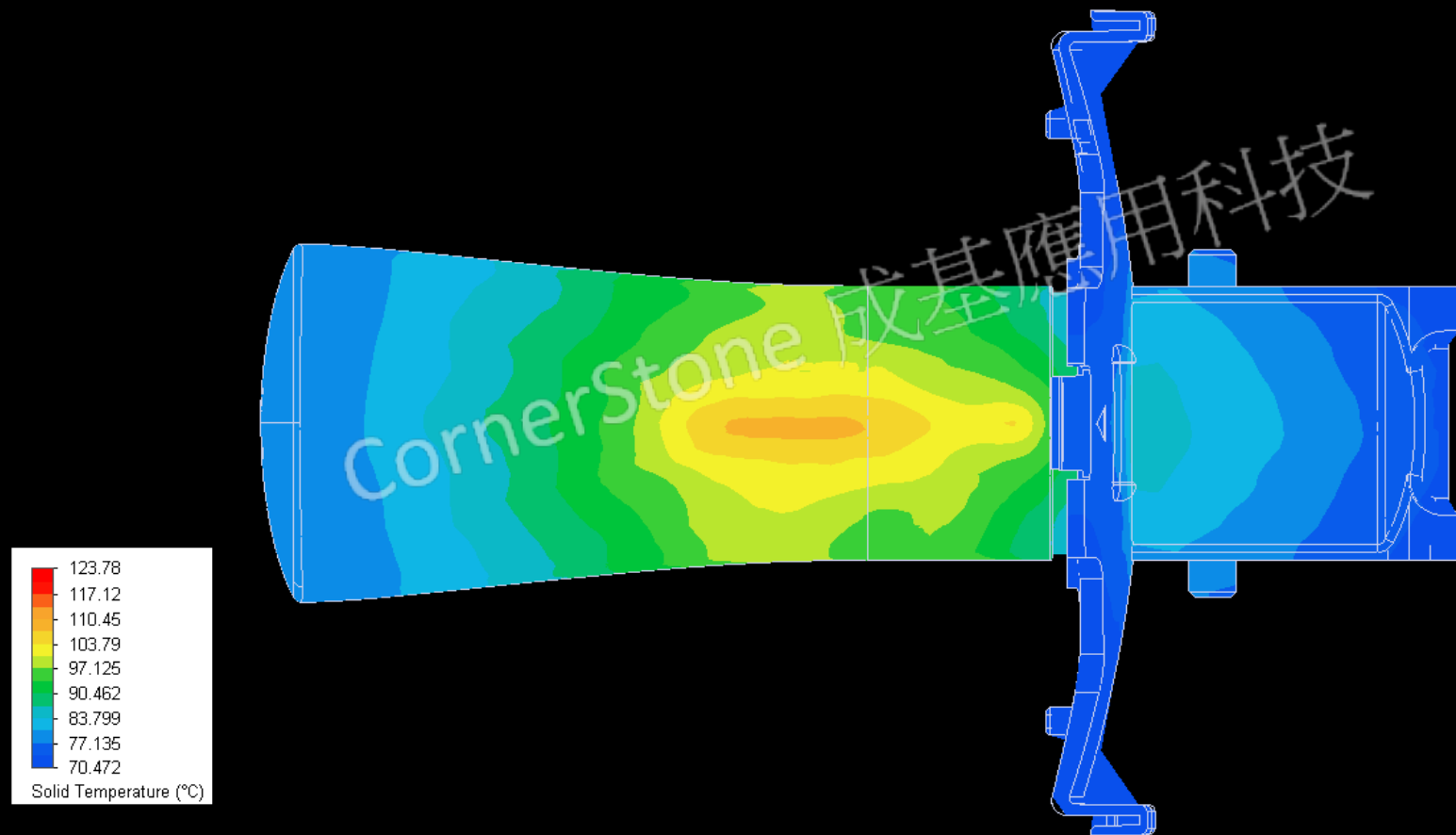
Preliminary Result



Preliminary Result



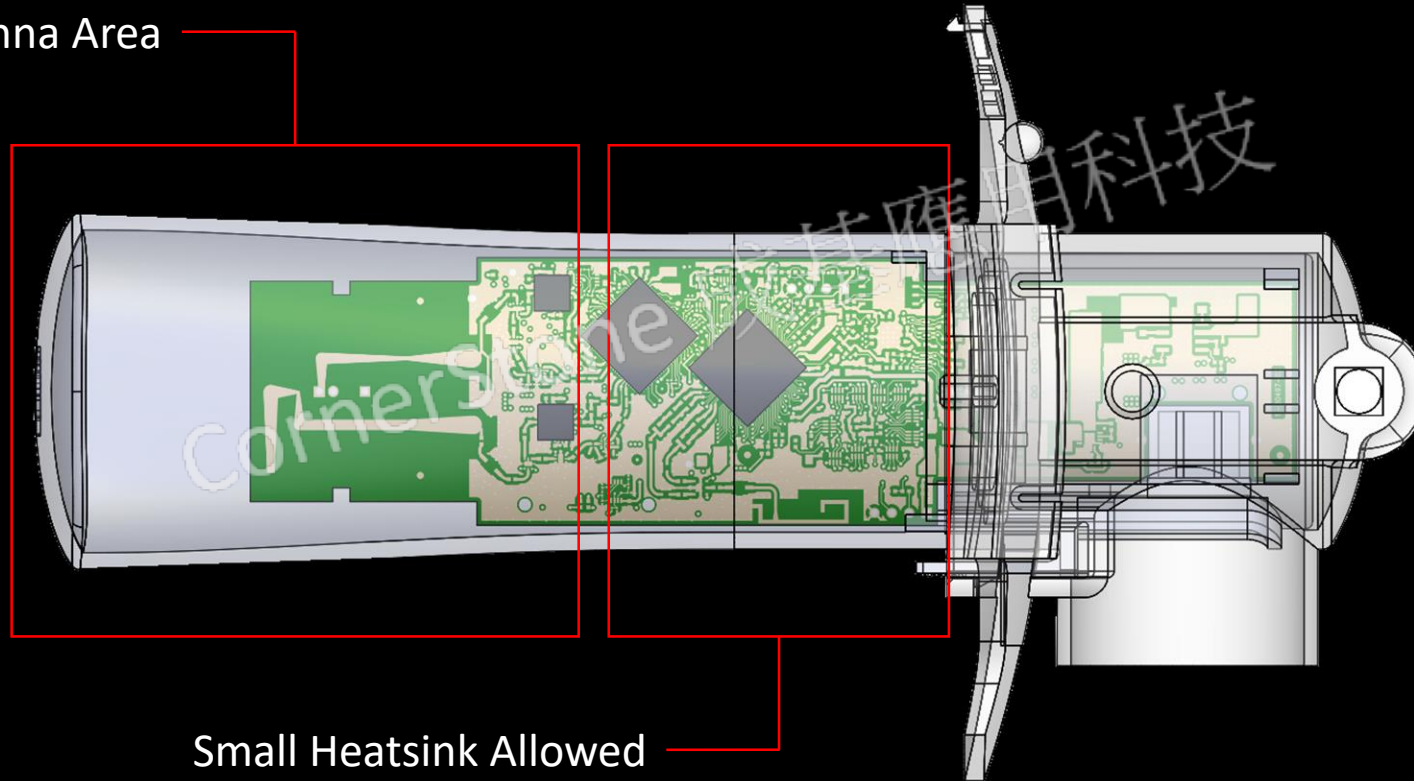
Preliminary Result



Design Limitation



Wifi Antenna Area

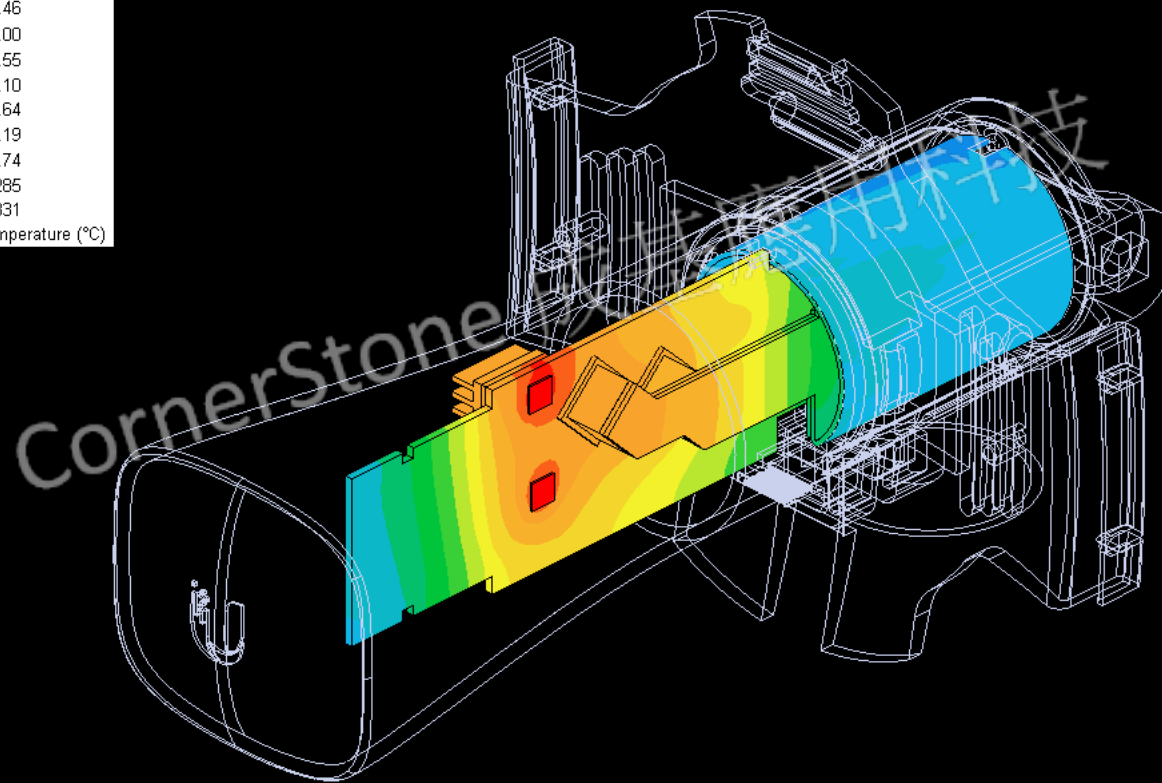
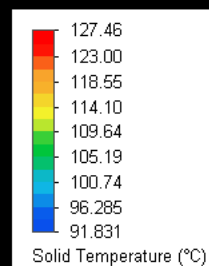


Small Heatsink Allowed

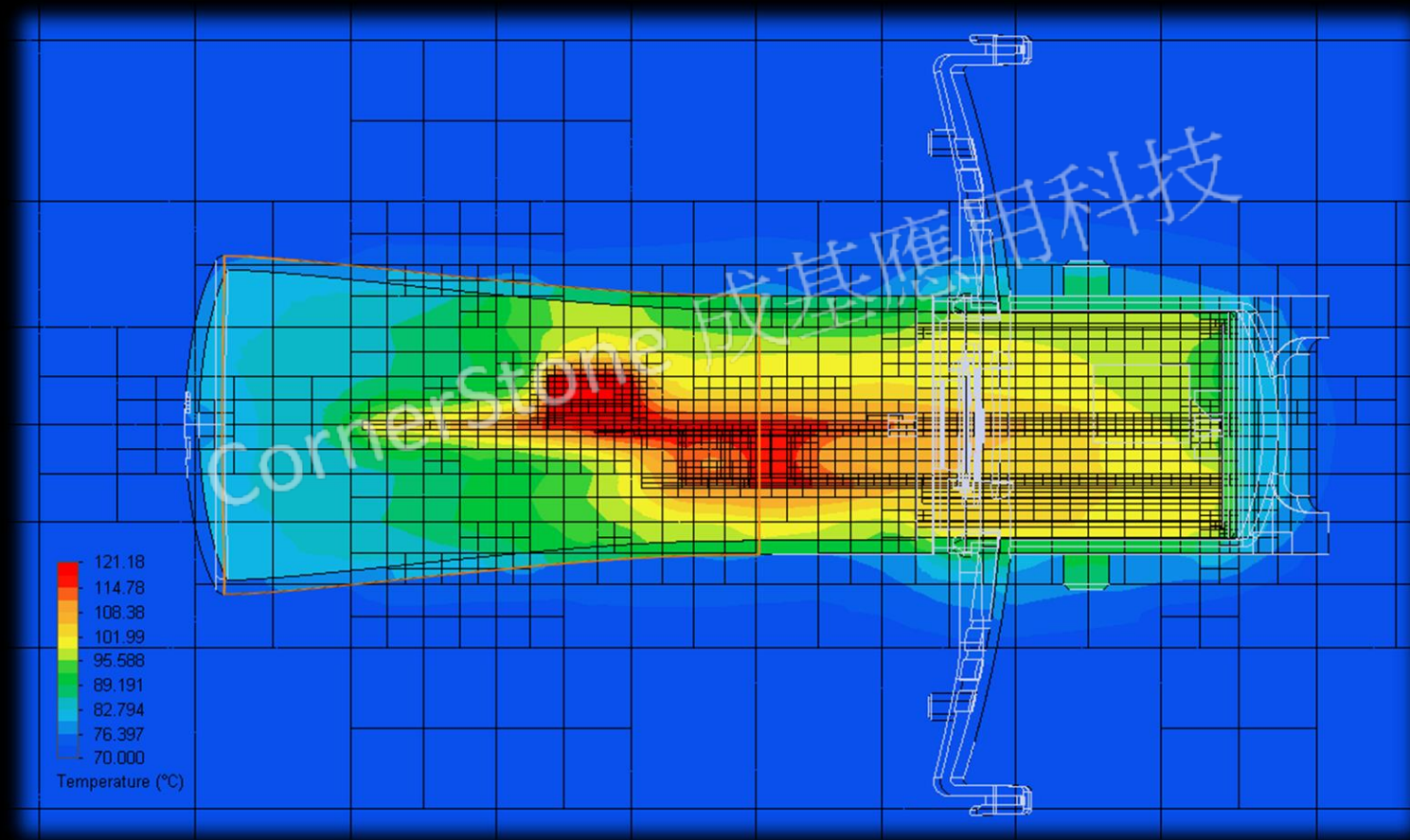
Improved Design



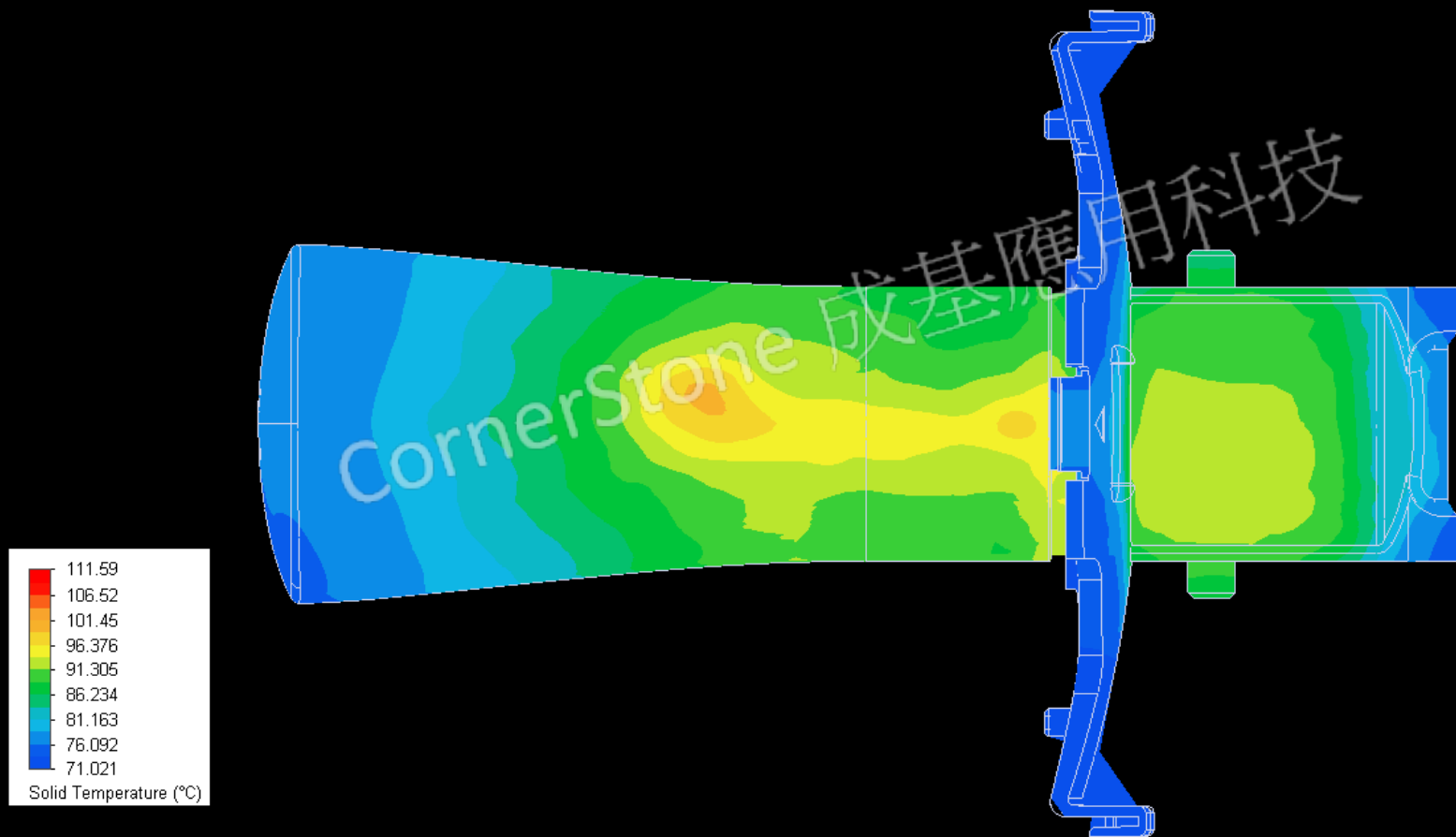
Improved Result



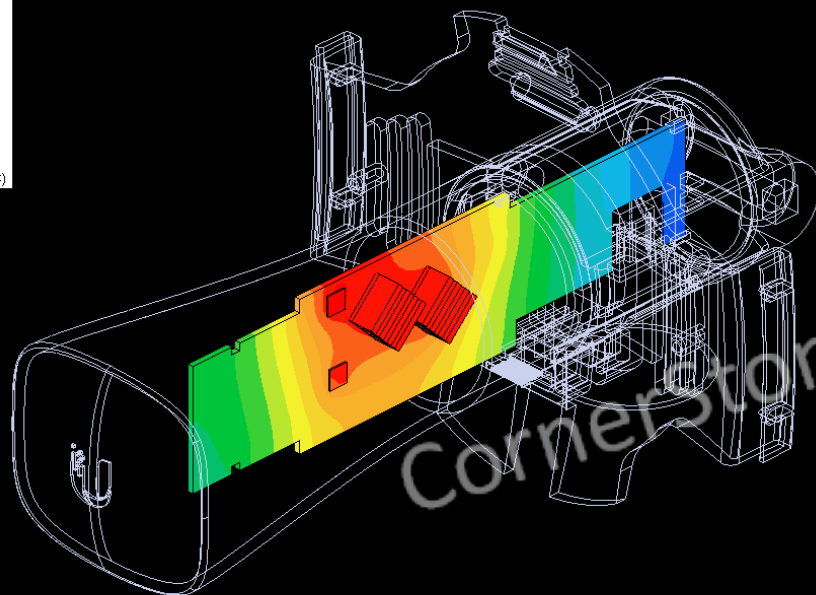
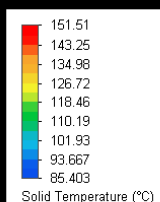
Improved Result



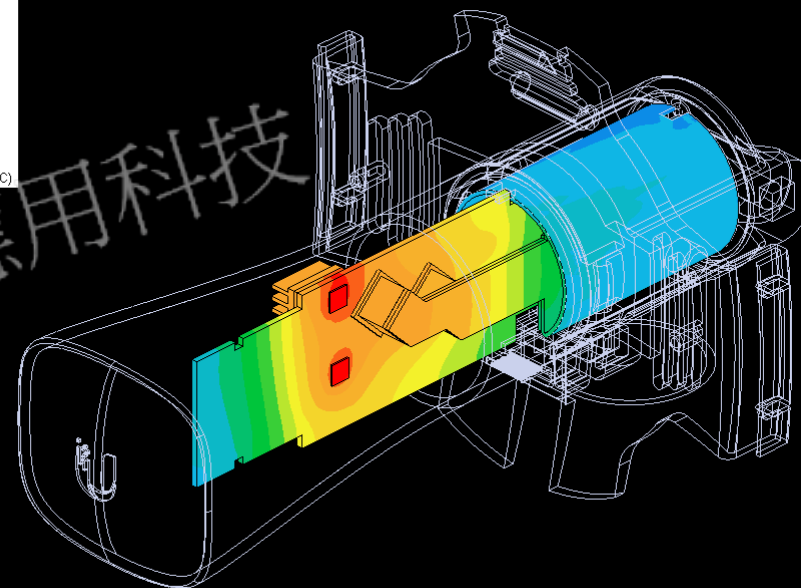
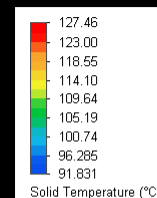
Improved Result



Comparison

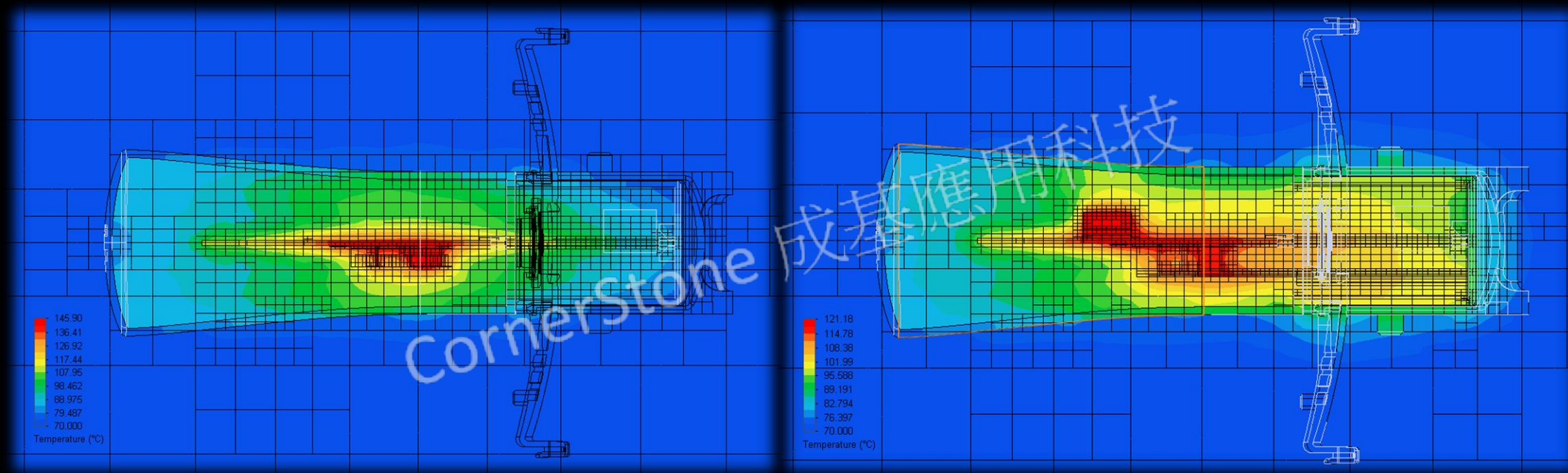


Preliminary



Improved

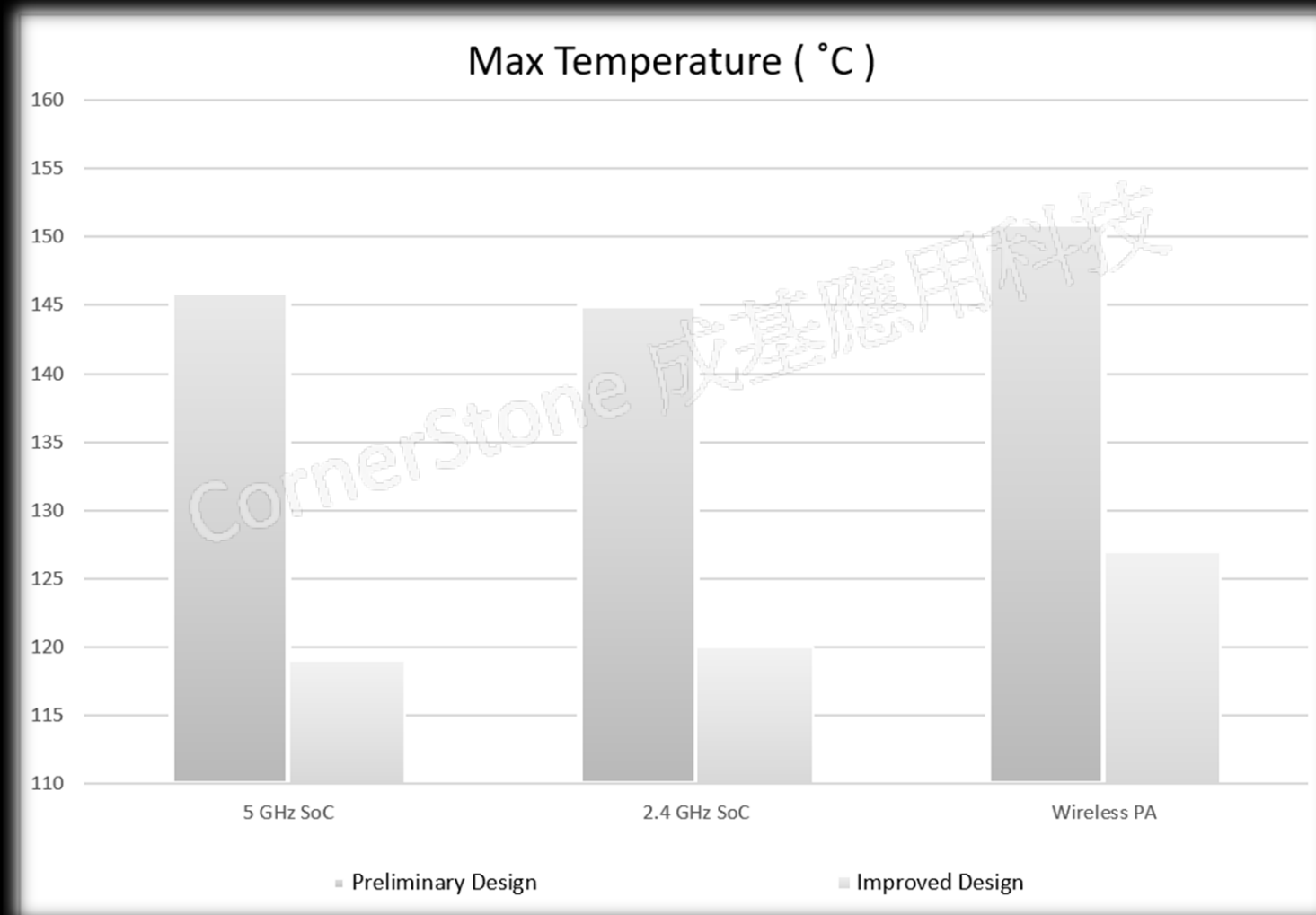
Comparison



Preliminary

Improved

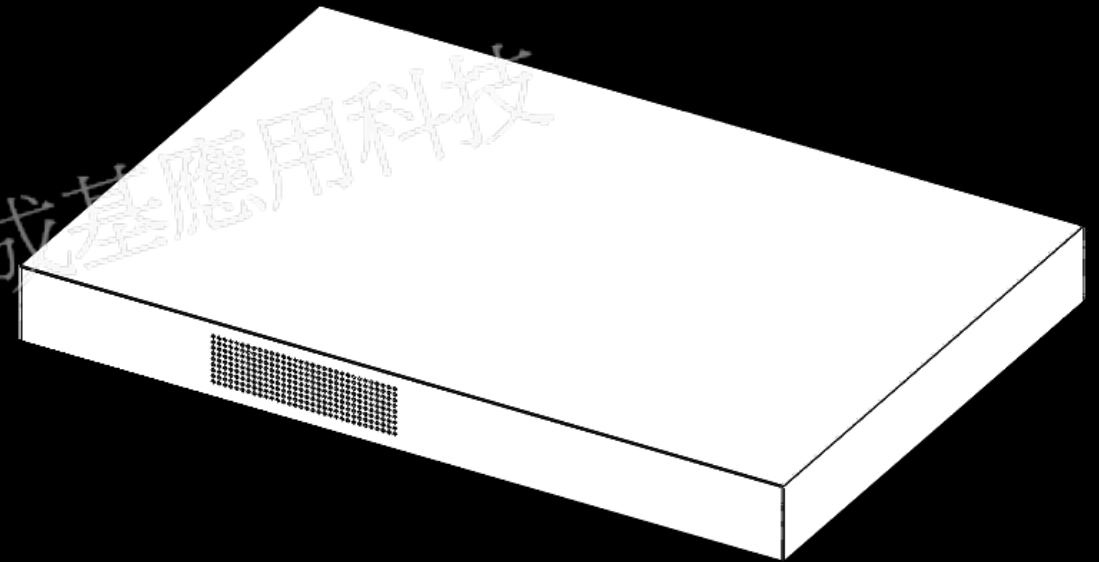
Comparison



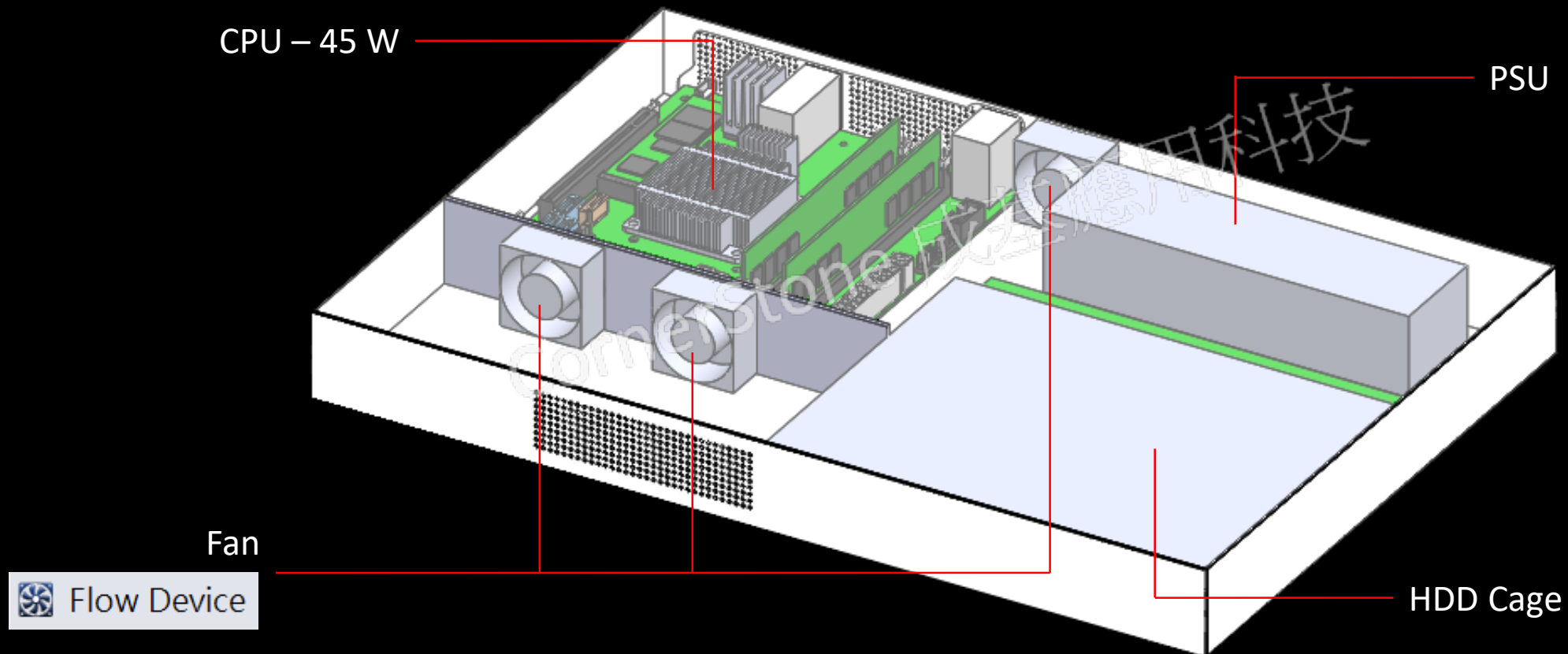
Case Study B



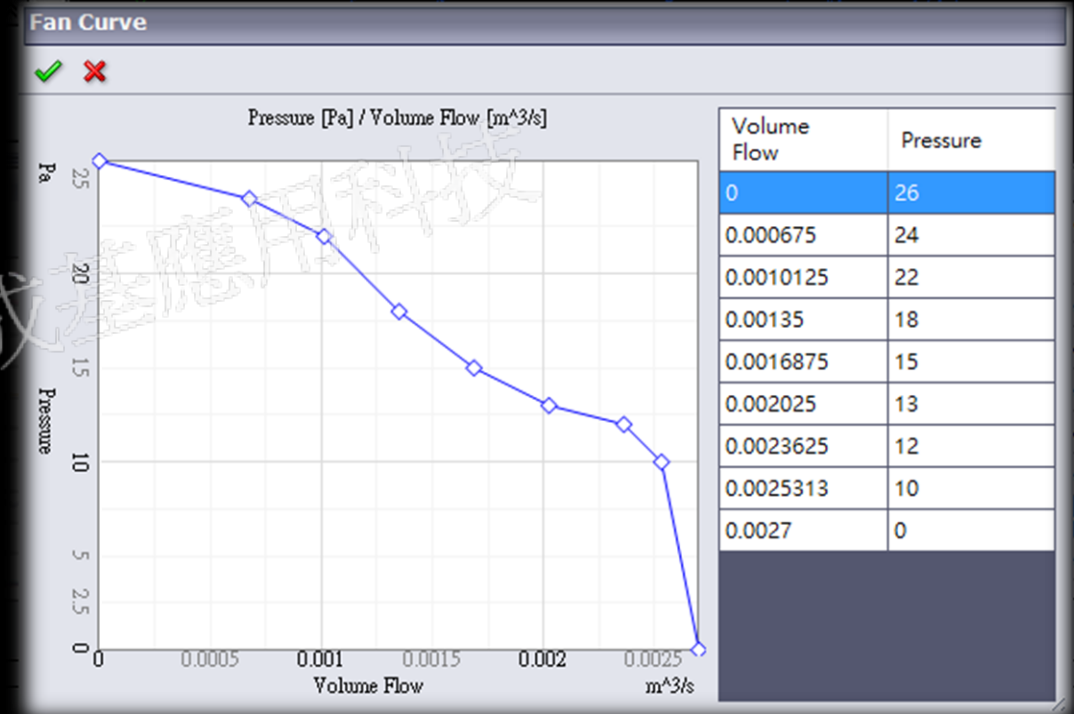
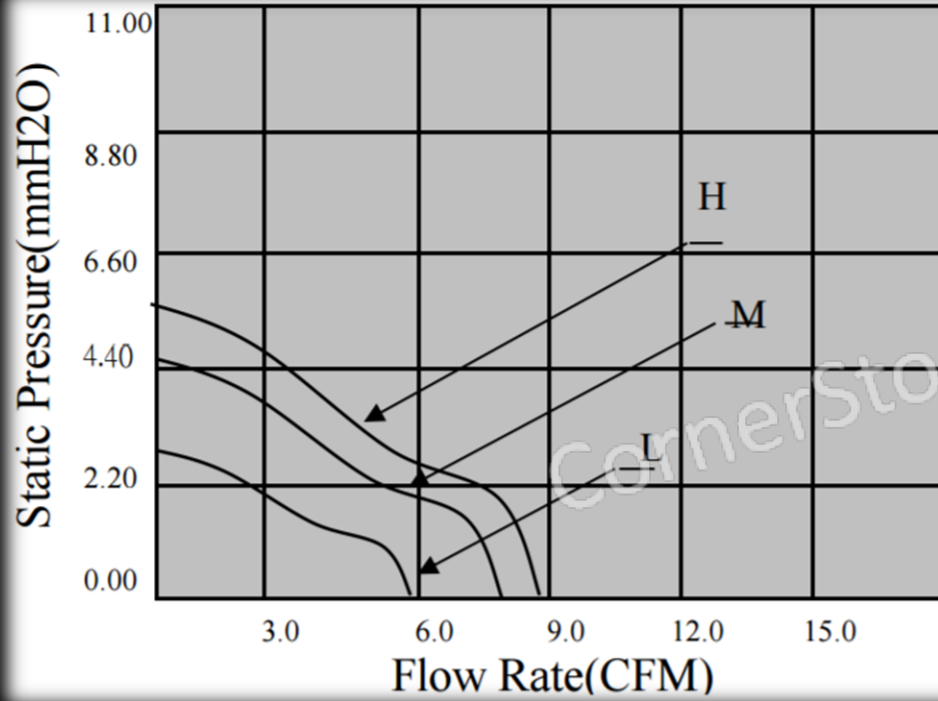
- 1U rack server system
- Under full load
- Ambient temperature 35° C
- Wind velocity 0 m/s
- Forced convection



Model




Fan P-Q Curve
















SmartParts



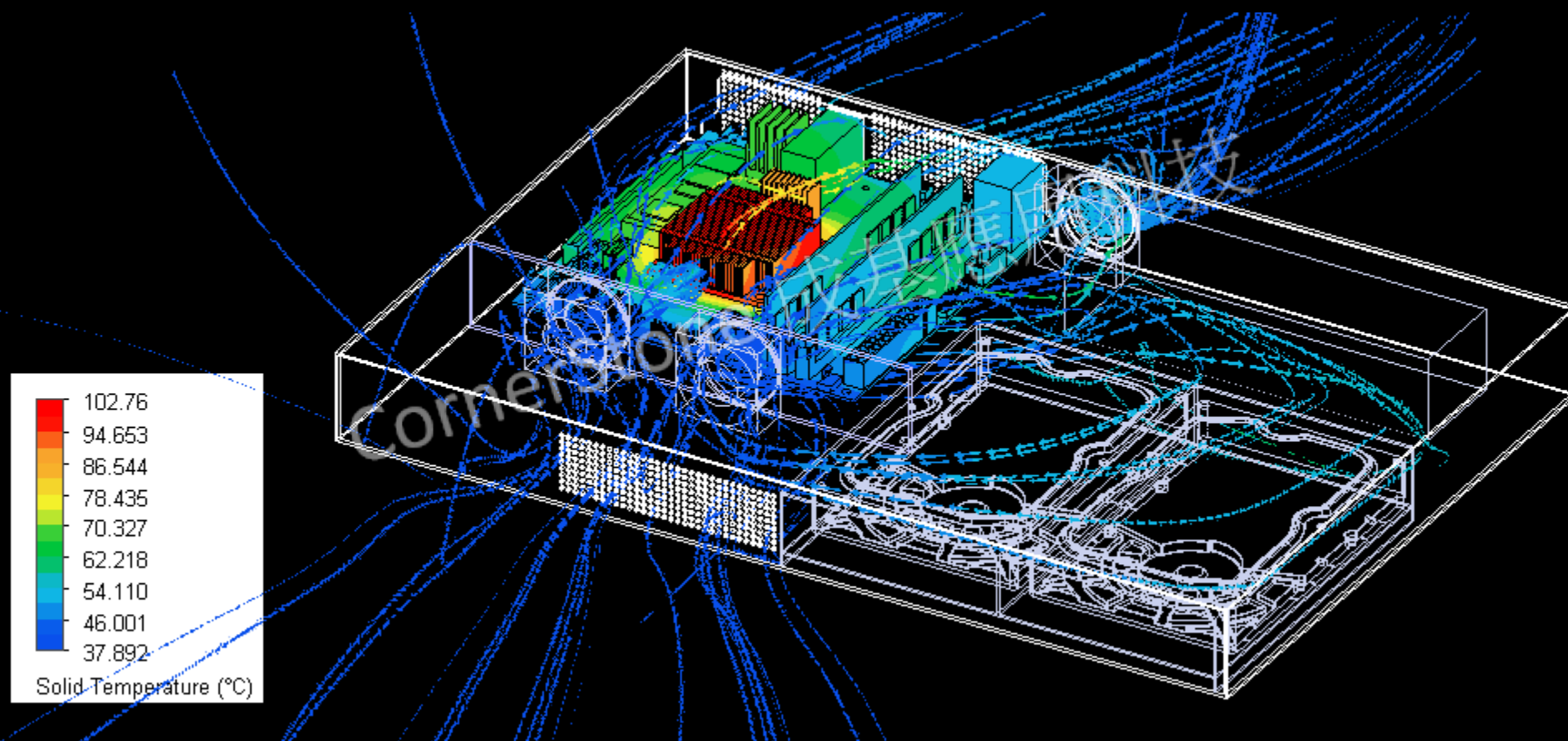
Geometric

-  Cuboid
-  Cylinder
-  Enclosure
-  Fan
-  Heat Sink - Circ InLine
-  Heat Sink - Circ Staggered
-  Heat Sink - Plate Fin
-  Heat Sink - Rect InLine
-  Heat Sink - Rect Staggered
-  Prism
-  Region
-  Thermo Electric Cooler

Non-Geometric

-  Contact Resistance
-  Electrical Condition
-  External Wall
-  Fixed Flow
-  Flow Device
-  Fluid Subdomain
-  Heat Pipe
-  Network Assembly
-  PCB
-  Planar Thermal Source
-  Pressure
-  Radiation Surfaces
-  Surface Exchange

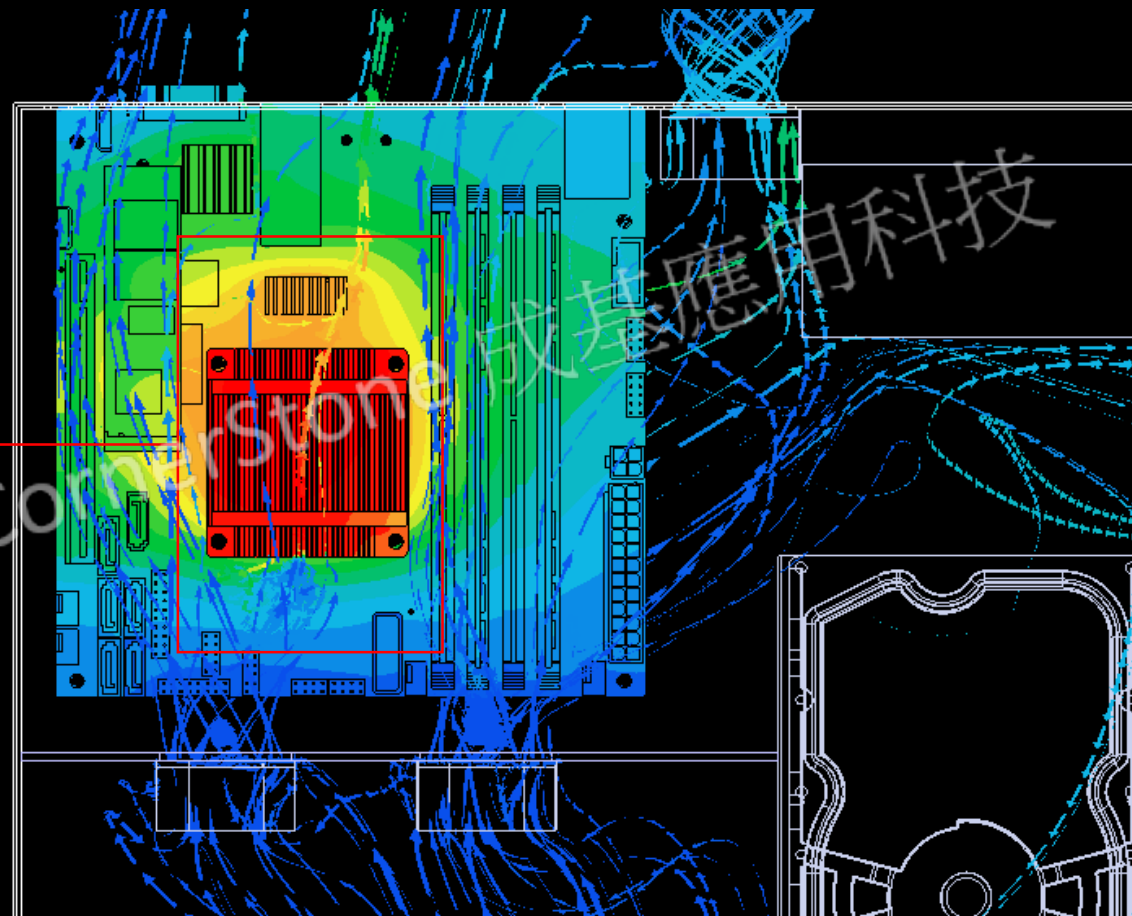
Preliminary Result



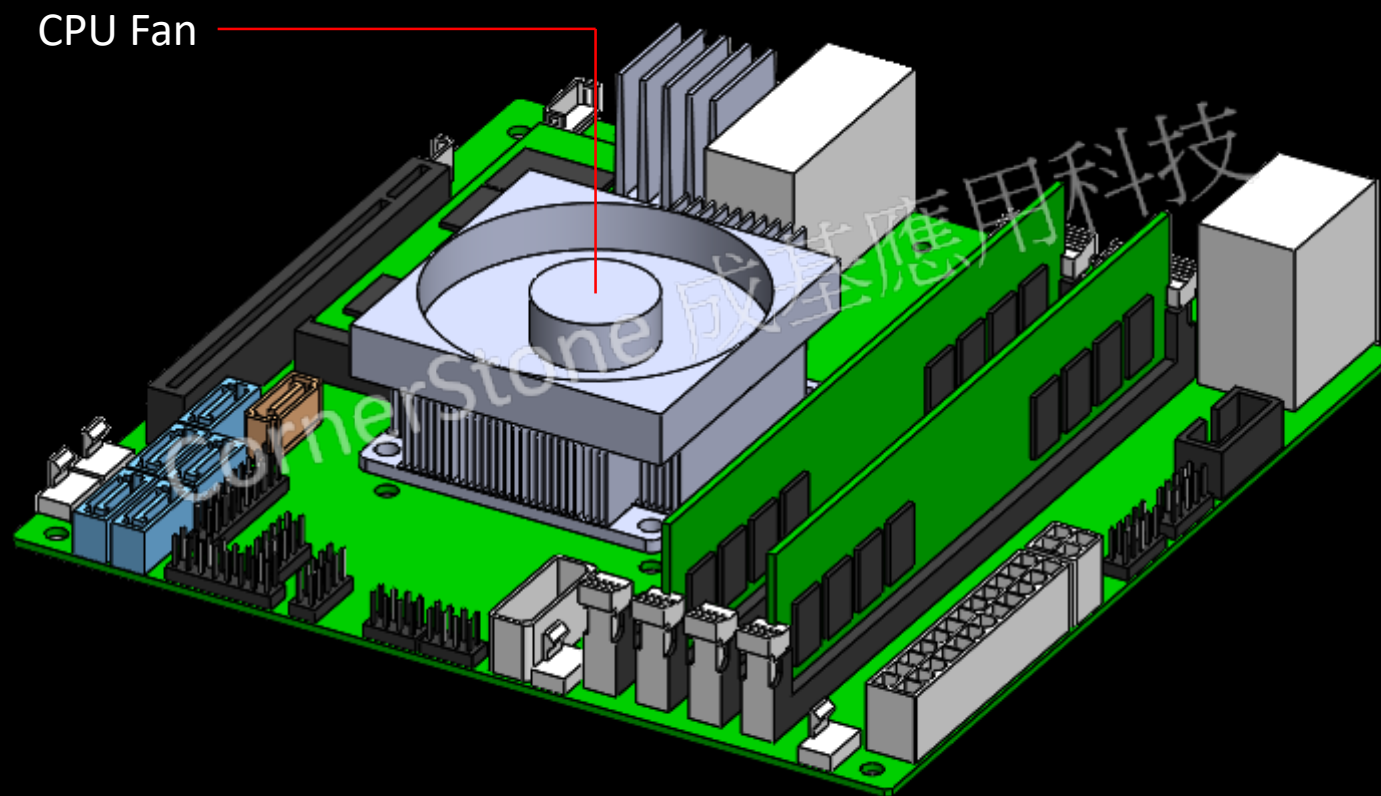
Preliminary Result



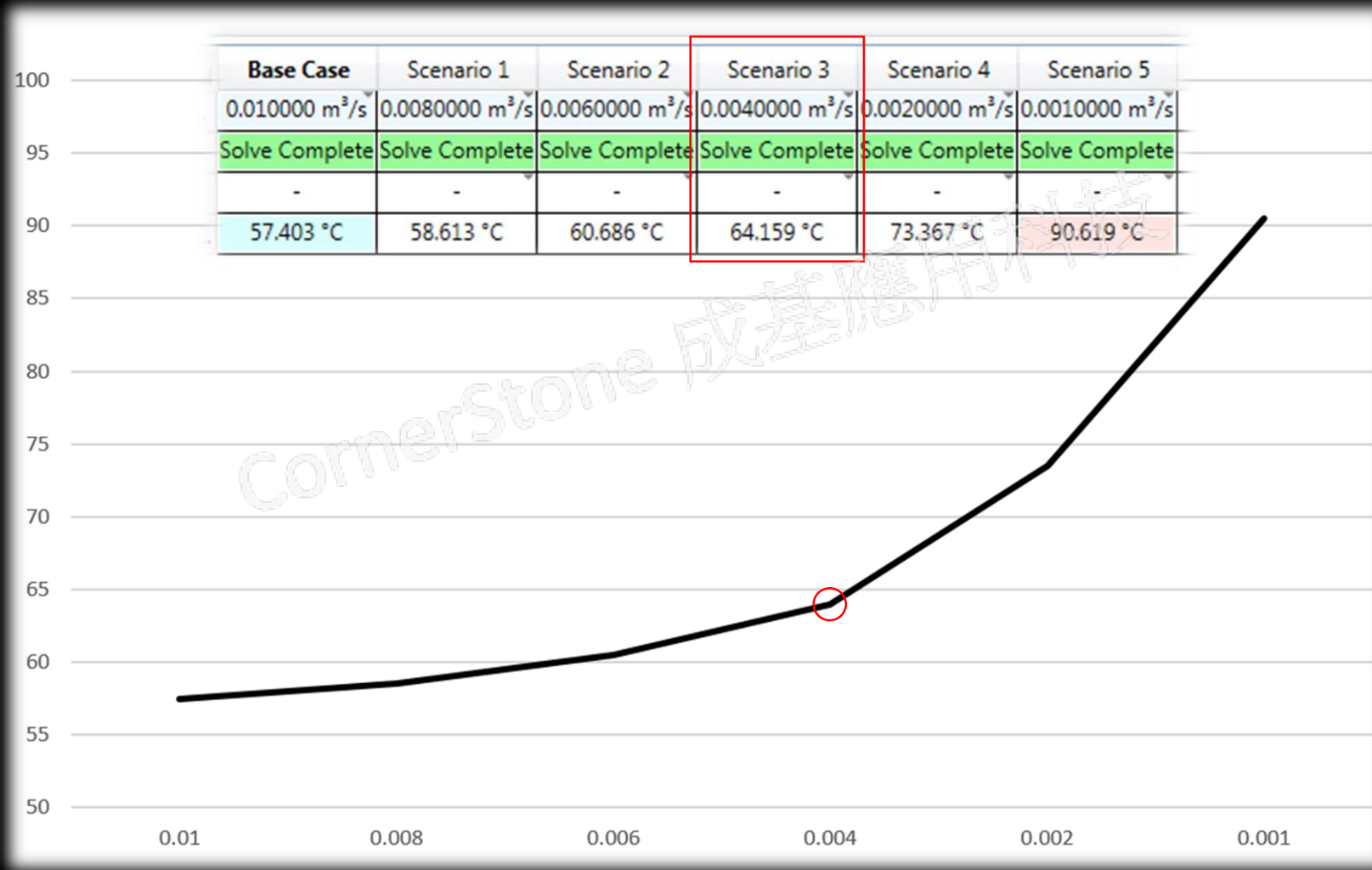
High Flow Resistance



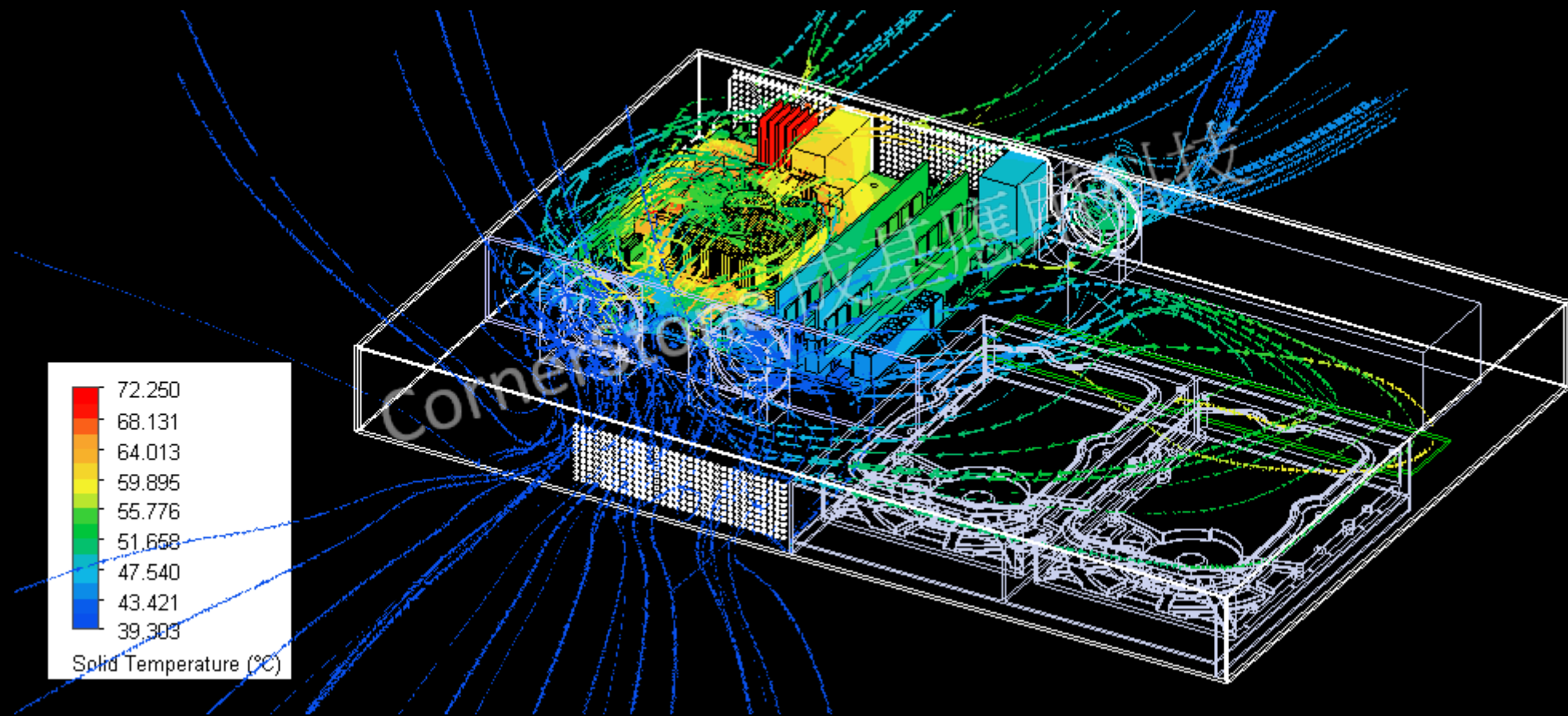
Improved Design



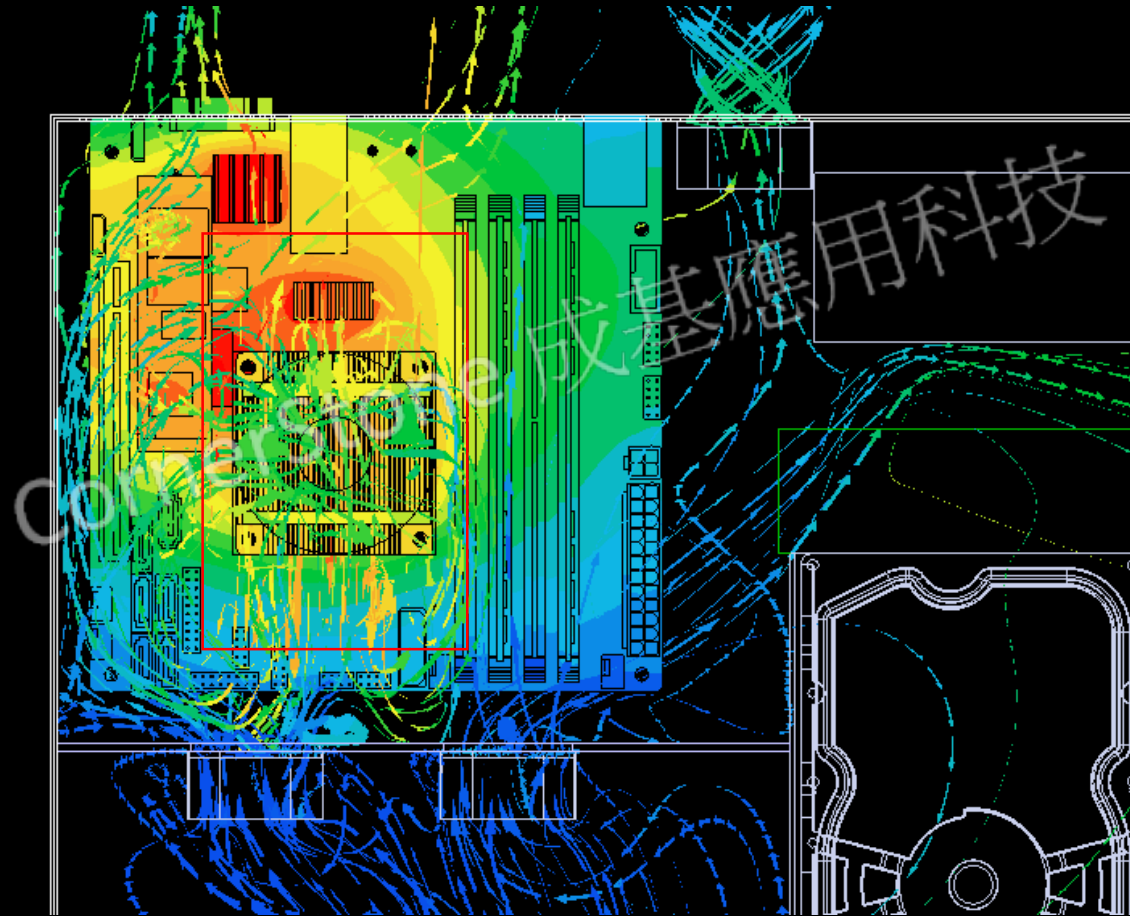
Parametric Study



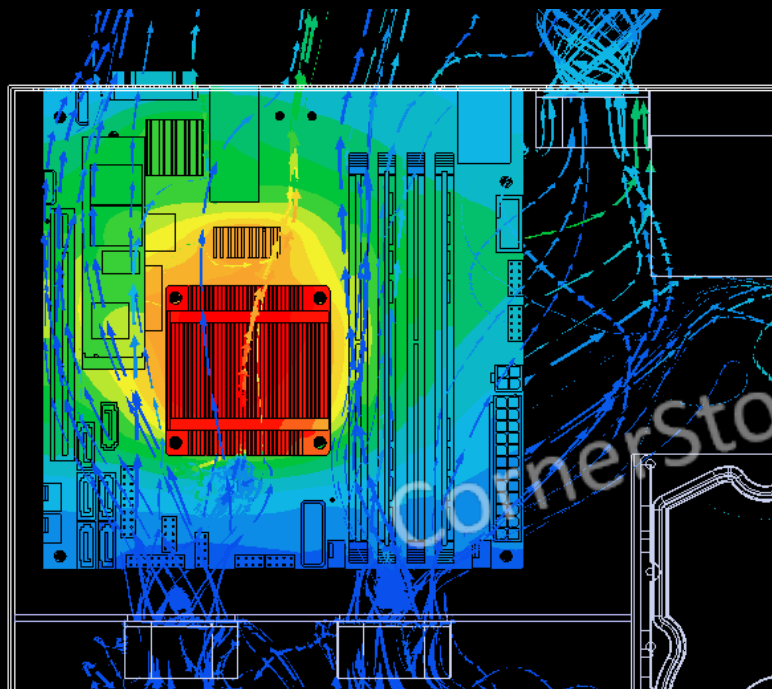
Improved Result



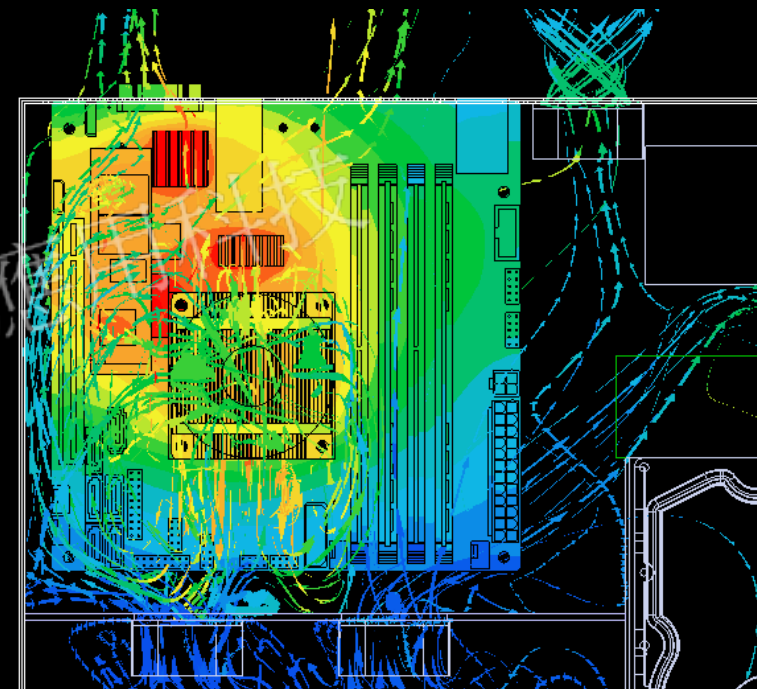
Improved Result



Comparison

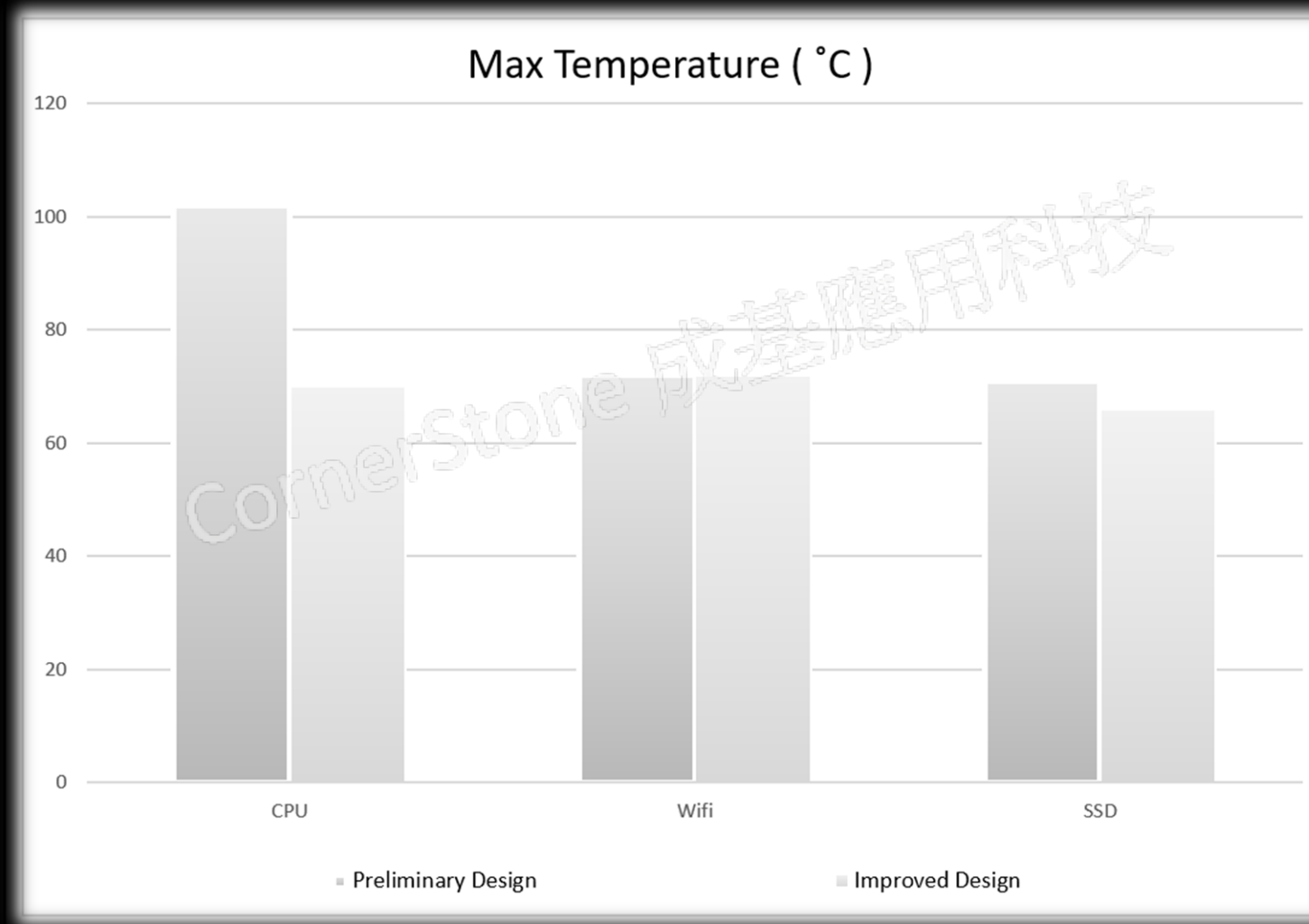


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Why Choose FloTHERM XT



- CAD-centric user interface
- Geometric and non-geometric SmartParts
- Components library
- Powerful mesher and solver
- Advanced FloEDA bridge
- Parametric studies for optimized designs

CornerStone 成基應用科技

q u e s t i o n & a n s w e r

cornerStone 成基應用科技

thank you

CornerStone 威基應用科技