

COFAN USA



Professional Thermal Management Since 1994

COFAN USA

A COMPLETE SOLUTION

For over twenty years, COFAN USA has provided advanced, customized solutions to serve our partners' unique needs and allow them to succeed in their markets. While we started out as a company dedicated to cooling solutions for electronic and industrial applications, over time we have expanded to provide innovative solutions in the PCB and LED industries as well. We strive to deliver quick, customized, and professional solutions to our clients by adhering to the highest standards of quality and service. In everything we do, we believe in going the extra mile to make the impossible possible by providing custom thermal and mechanical solutions. Our focus on one-stop solutions is critical for providing absolute minimal lead-time and complete pricing.



Technology

We provide custom fan and heat sink design solutions to meet the most particular design requirements.



Quality

We strive to meet our customers' expectations in all areas of design, support and manufacture.



Cost

We provide innovative products for the most complicated thermal challenges using state-of-the-art fan and heat sink technology utilizing various alloys at very competitive prices.



Customer Services

Our customer and their customer satisfaction are our ultimate goals.



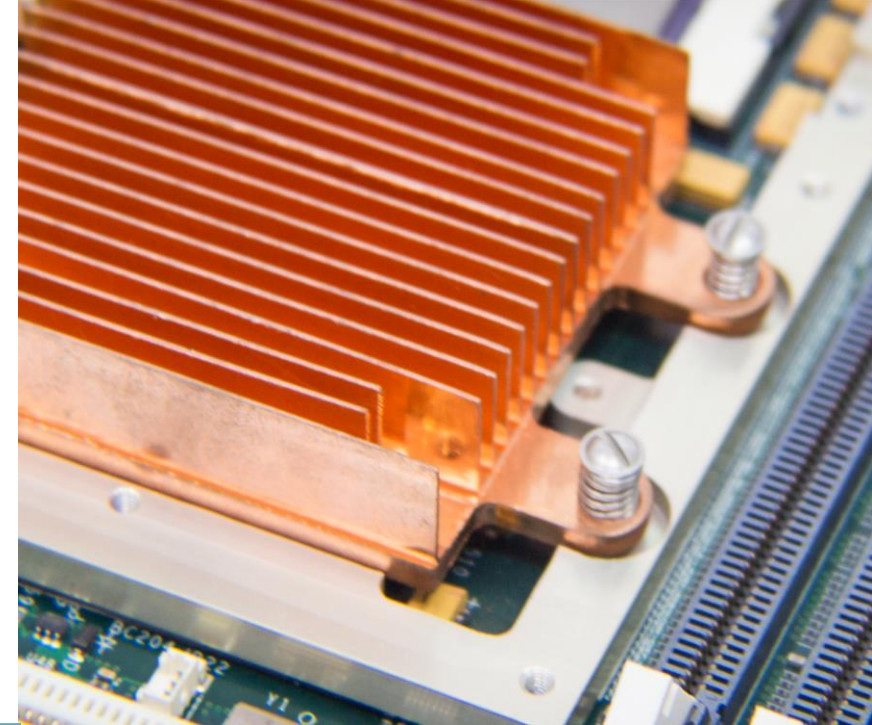
Delivery

We provide short lead-time and long-term production needs with a stock to ship, just in time delivery program.



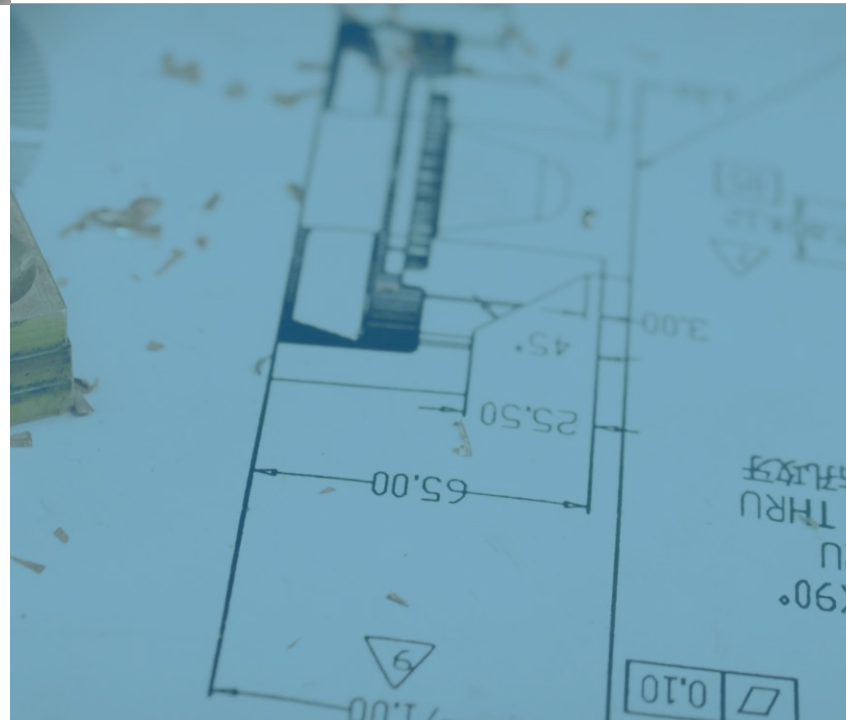
Vision

To be a world leading one-stop shop for all of our customers' engineering, manufacturing, and consulting needs.



Mission

To provide quick, customized, and professional services in cooling, PCB, and LED applications.



Core Values

- Go the extra mile
- Make the impossible possible
- Personal leadership is essential to excellent teamwork
- Take action
- There is always room for improvement

Company History

1990

1994

COFAN USA was established in Fremont, CA to serve the Bay Area as a fan manufacturer and distributor.

1995

COFAN USA introduces its first Heatsink/Fan CPU cooler to positive reviews and high demand.

1999

COFAN USA, using its growing manufacturing expertise, introduces its Asia manufacturing staff and uses its program management skills to solve customers needs for low cost off-shore production for both high and low quantity needs.

2000

2000

COFAN USA begins offering design and offshore manufacturing services for custom sheet metal, die cast, extrusion and machined products.

2001

COFAN USA introduces state-of-the art CFD thermal analysis to enable a quick turnaround, all-in-one analysis of its customers' thermal needs.

2003

COFAN USA establishes a factory in China and starts providing turnkey assembly for its customers.

2005

COFAN USA enters the LED lighting business with the introduction of metal core PCB (MCPCB).

2009

COFAN USA establishes the Taiwan MCPCB facility, and Canadian Sales, Marketing and engineering office.

2010

2010

COFAN USA introduced revolutionary patented Super Pilar technology.

2011

COFAN USA establishes an R&D team in Taipei, Taiwan that allows us to provide around the clock engineering services. COFAN China was relocated to expand production capacity.

2012

COFAN USA expended R&D team in Taipei, Taiwan with introduction of COB technology.

2014

COFAN USA establishes the China PCB team.

2017

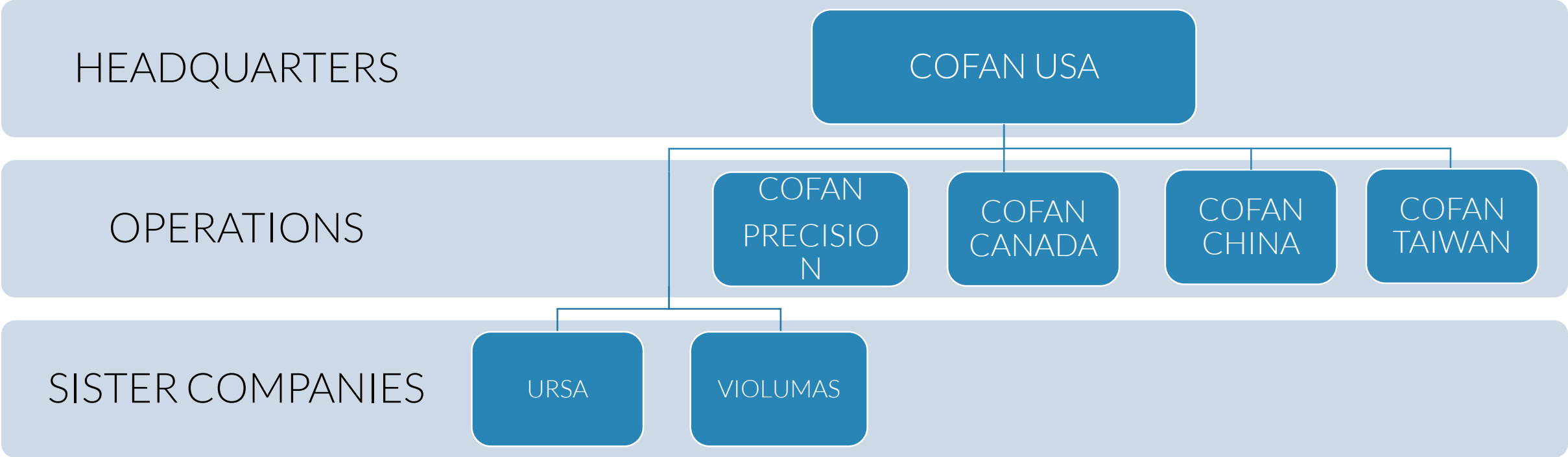
COFAN Taiwan expanded production capacity.

2018

COFAN USA acquired A&M Machining and established COFAN Precision

2020

Company Corporate Structure



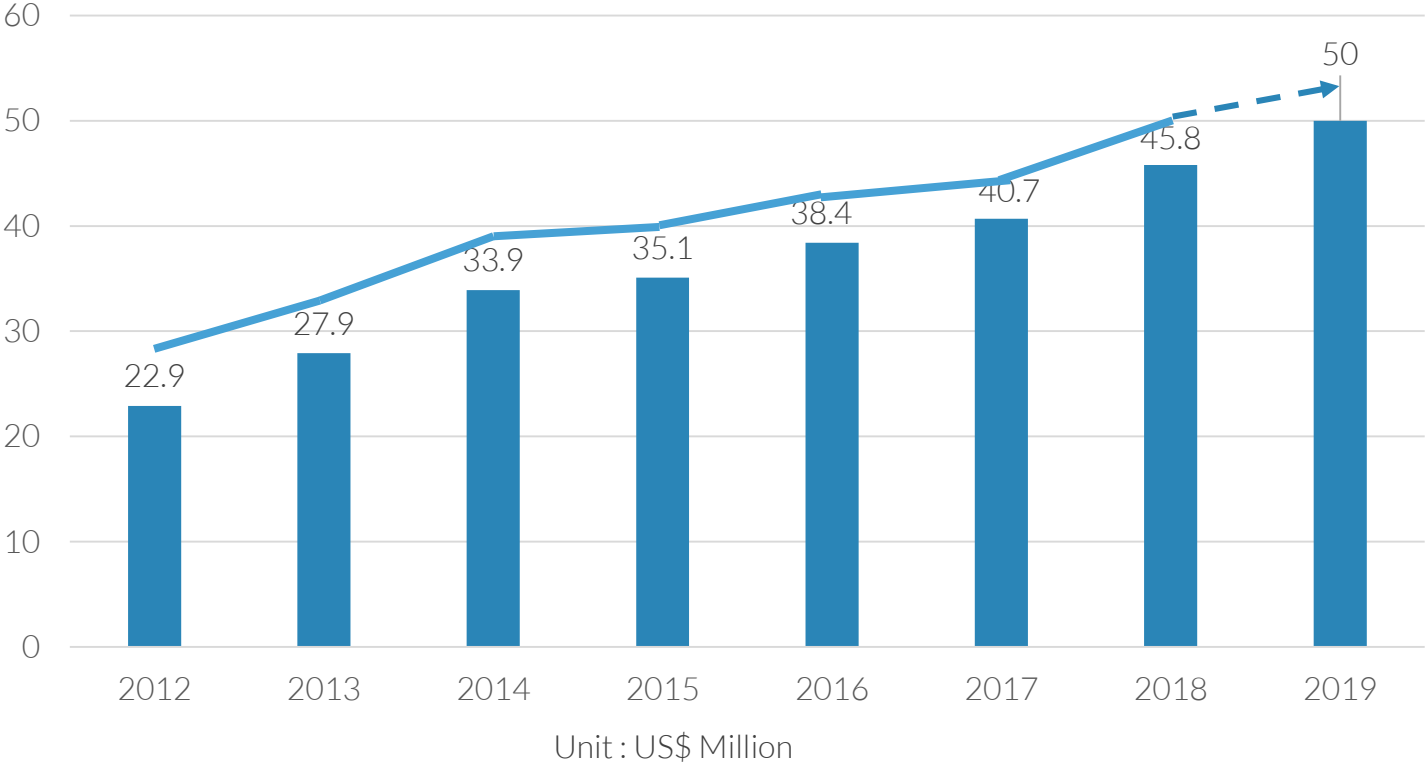
COFAN Portfolio



violumas
High Power UV LED Solutions

ursa

COFAN Revenue



Projected 2019 Revenue:
\$46 Million

Quality Standards



At COFAN, we stand behind every product we ship out. Everything we ship undergoes rigorous testing before it leaves our shipping dock. Testing and inspection begins with the components and concludes with system level testing of the final product for every turnkey solution project. As an organization, we are dedicated to quality. We build it into our process, employee training, and every product we touch.

Quality Assurance Standards

Cofan complies with industry standards

- ISO 9001:2015
- ISO14001:2015
- OHSAS18001:2011
- UL/CSA
- IPC-6011
- IPC-6012B
- ANSI/IPC-A-600
- IPC-4101B



Our Expertise

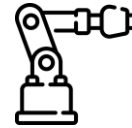
A COMPLETE SOLUTION

Our strength lies in the offering of comprehensive thermal and mechanical solutions, with seamless integration of analysis, design, prototyping, and production.



Design & Engineering

Our in-house engineering team provides engineering expertise in mechanical design and thermal simulation. Our design process decreases prototyping costs and accelerates time to market.



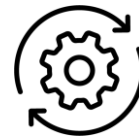
Manufacturing

With over 300,000 square feet of manufacturing spaces, COFAN is able to provide a diverse range of solutions from our ISO 9000 series certified factories.



Thermal Simulation

COFAN offers the latest software to handle complex CFD simulations and CAD modeling. We are also able to offer root cause analysis and provide redesign services for thermal related challenges.



Turnkey Solutions

Our established supply chain and buying power make COFAN's turnkey solutions an invaluable service.



Prototyping

We offer speedy prototype turn-around so you can validate the performance of your design early on.



Hardware Testing

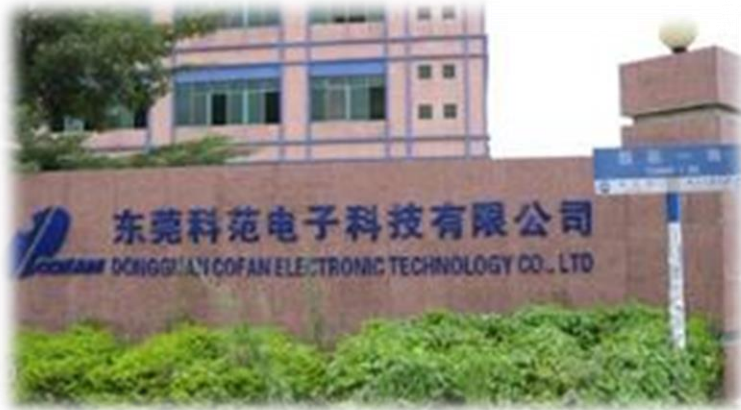
Our hardware testing services help validate products prior to deployment and assess the performance of every product being introduced to the market.

Factory Information

At the turn of the century, COFAN realized the need to have our own factory to control the production process to better serve our customers. As a result, we established our own factory in 2003 in the industrial area of Dongguan, China. Later, we established a MCPCB facility in Taiwan. This allows us to provide high quality, low cost machining and PCB fabrication to support our customers low volume production needs.

Production Capability

PRODUCTION BASED (CHINA)



Location: Changping, Dongguan, China

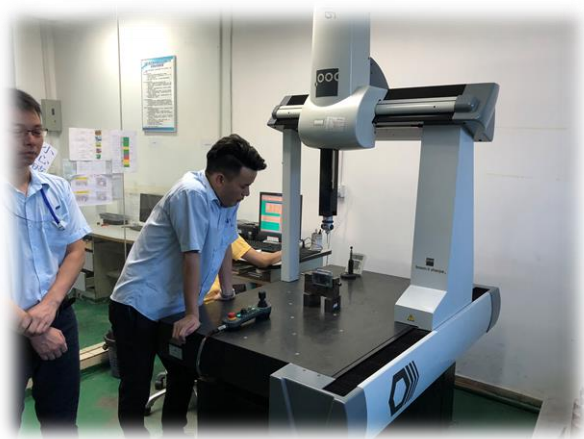
Total Area: 11,000 Square Meters

Production Lines

- Assembly Lines x 6
- Reflow Oven x 1 (SMTA)
- CNC Plant x 9
- Lathing, Milling, Drilling & etc.

Product	Capacity/Month
Heat Sink (<100mm)	100K/Month
Heat Sink (>100mm)	50K/Month
Cooler Assembly	500K/Month
Panel (Sheet Metal)	30K/Month
LED Fixture	20K/Month

Production Capability – CNC Machine Shop



Skiving Machine



CNC Milling Machine 850mm



CNC Lathe



AI-Cutting Machine



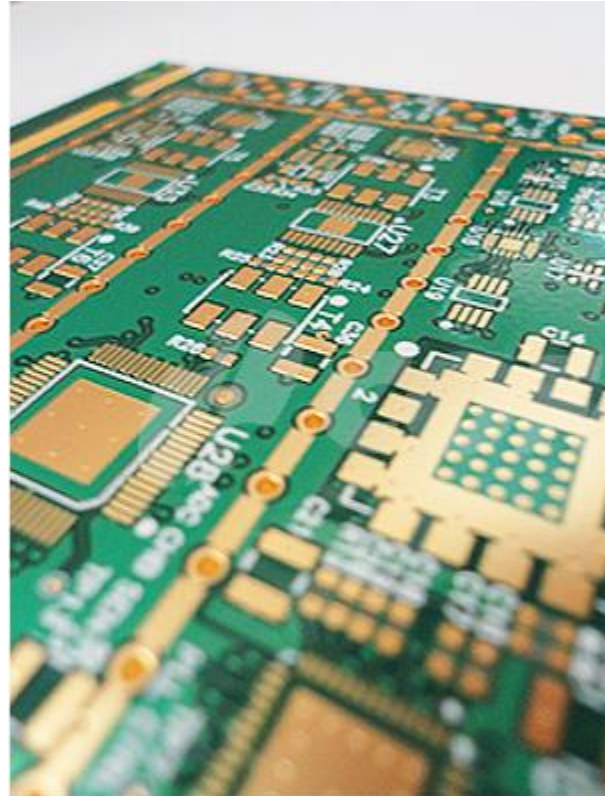
Milling Machine



Plastic Injection Molding Machine

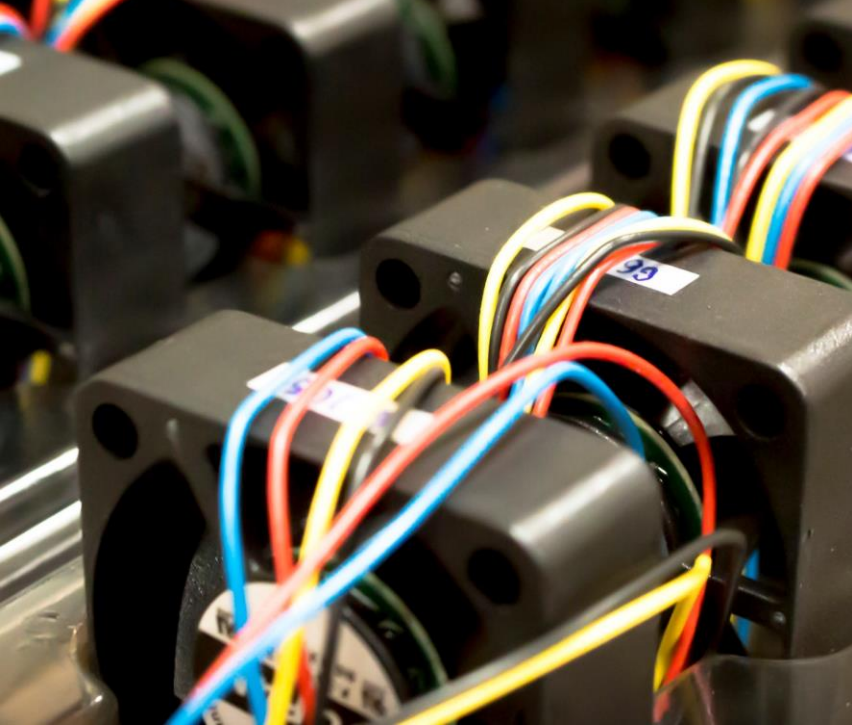
PCB Manufacturing Capability

- MCPCB (Metal Core PCB)
- Super Pillar MCPCB
- Bendable MCPCB
- FR4
- Flip Chip
- COB



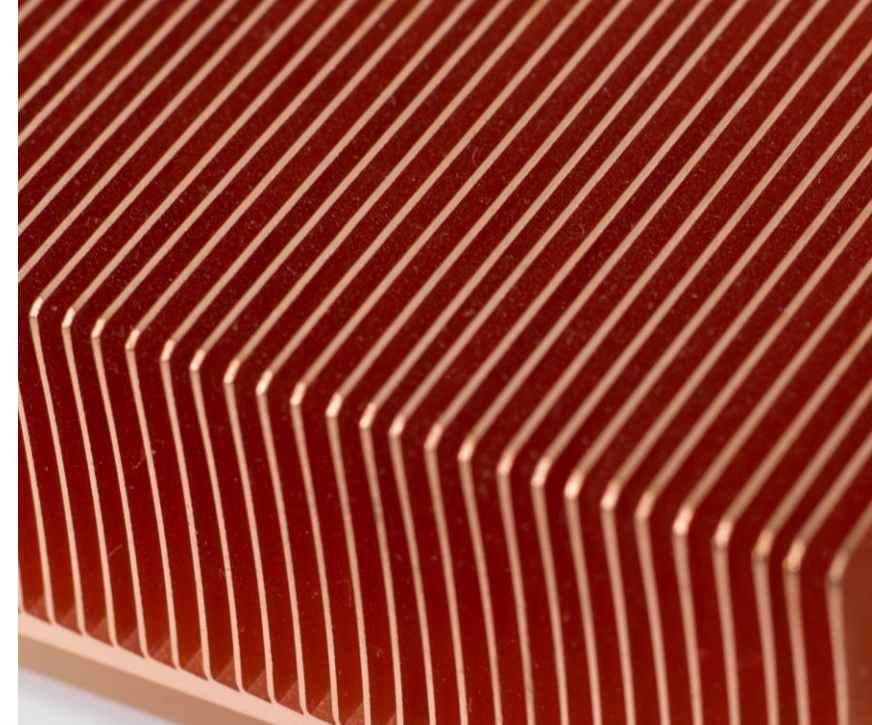
Products & Solutions

At the turn of the century, COFAN realized the need to have our own factory to control the production process to better serve our customers. As a result, we established our own factory in 2003 in the industrial area of Dongguan, China. Later, we established a MCPCB facility in Taiwan. This allows us to provide high quality, low cost machining and PCB fabrication to support our customers low volume production needs



Thermal Modeling

- Board & System Level CFD Modeling & Analysis
- Custom Fan and Heatsink Design & Selection
- Mock-up Thermal Test
- Actual System Simulation at 40°C

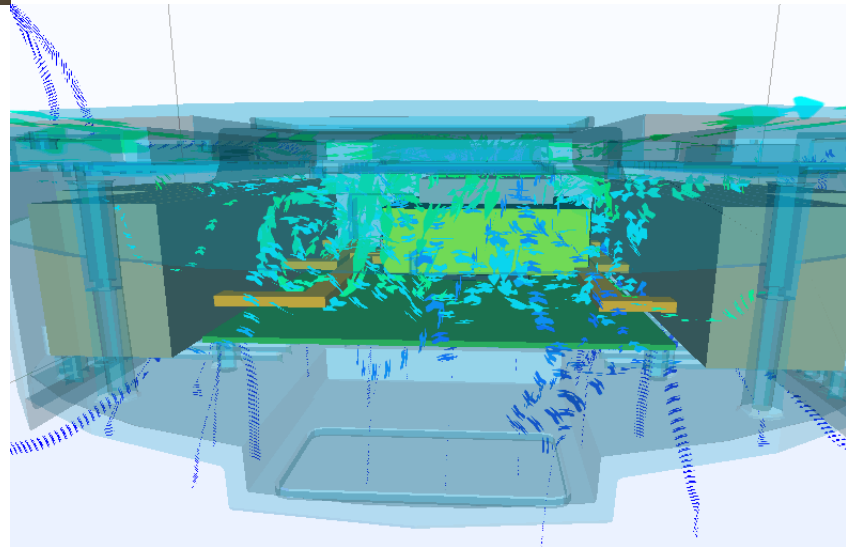


DC Fans

- Axial : 25mm-170mm
- Blower
- Custom Speed & Wire
- High Temperature Fan

CPU Coolers

- Intel LGA 2011/2066/Narrow
- Intel LGA 2011/2066/Square
- Intel LGA 775/115x/1356/1366/1974/G34
- AMD AM2/AM3/FM1/FM2/FM2+/TR4



Heatsinks

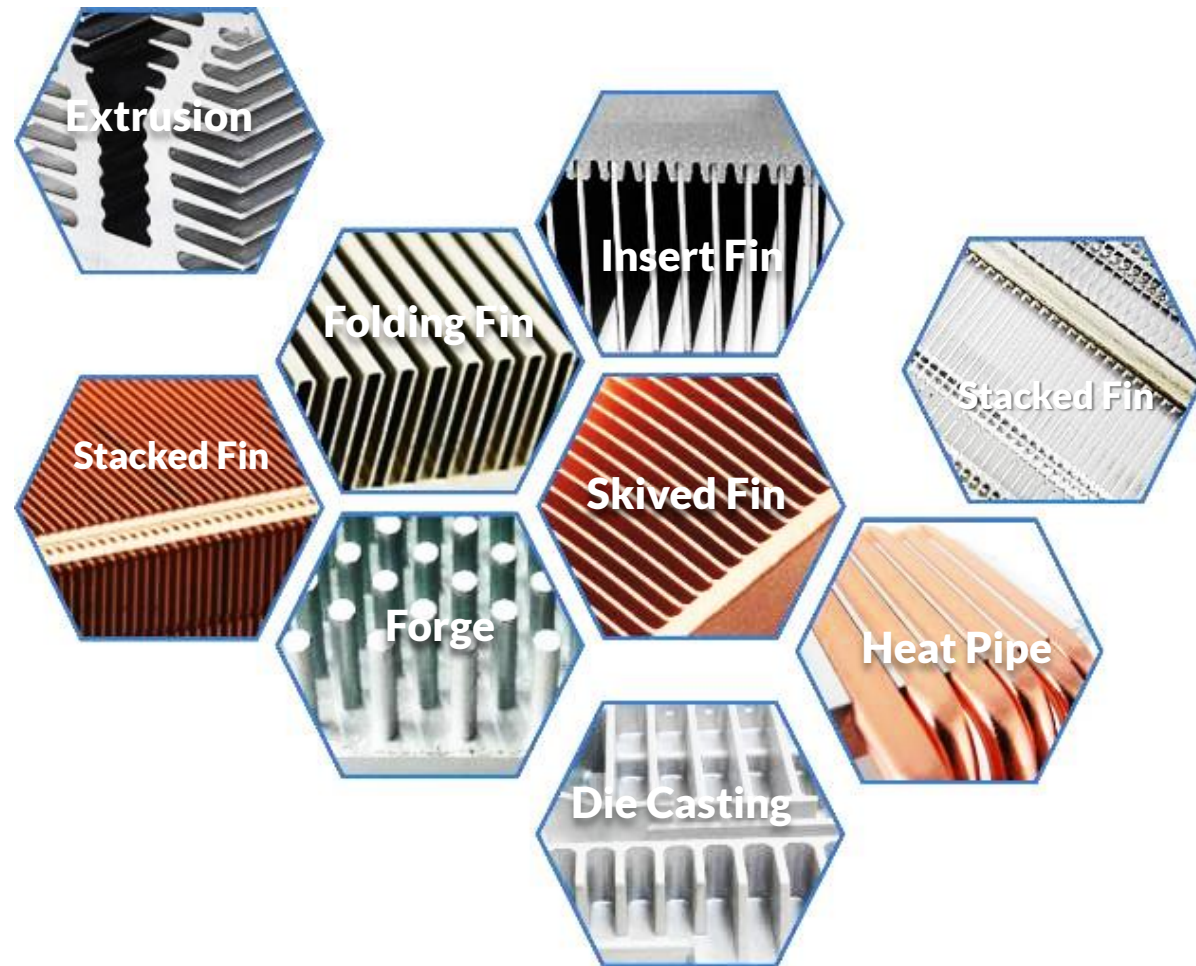
- Extruded
- Die Cast
- Skived
- Machined
- Integrated Heat Pipe
- Folded, inserted, and stacked fin
- Custom BGA
- Standard & Custom Mounting Hardware

TEC

- Thermoelectric Cooling (Peltier effect)

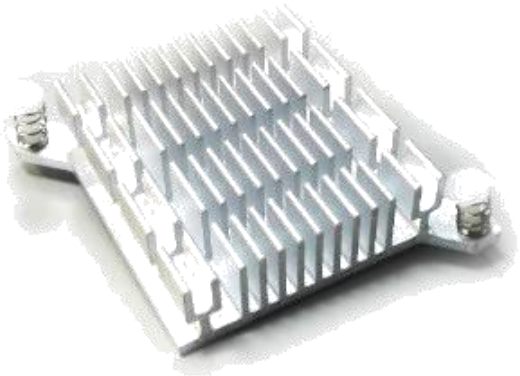
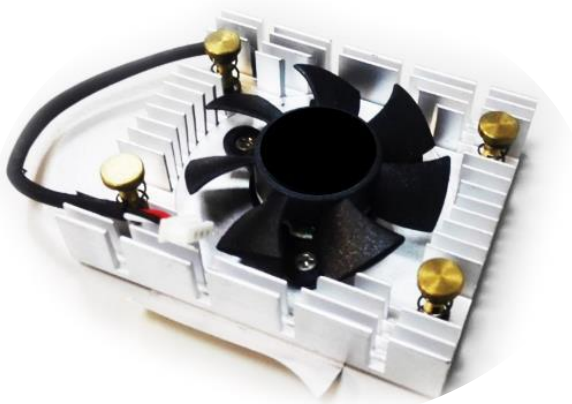
Metal Fabrication Capability

- Extrusions
- Stacked Fin
- Folded Fins
- Inserted Fins
- Cold Forging
- CNC Machining
- Die Cast
- Skived Fins
- Heat Pipes
- Copper Cold Plate



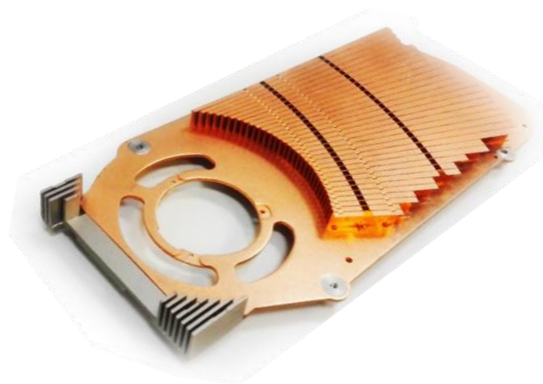
Metal Fabrication Capability

- Cutting
- Drilling
- Deburring
- CNC Processing

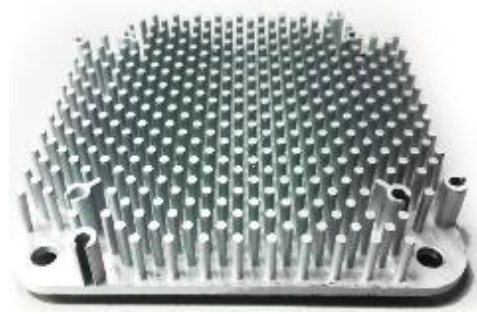


Dimension(W * L * H)		
9 x 9 x 12	27 x 27 x 10	47.5 x 35 x 13.5
11.1 x 11.1 x 3.8	28 x 28 x 10.5	48 x 40 x 10
15 x 15 x 11	30 x 30 x 10	50 x 50 x 20
17 x 17 x 10	31 x 31 x 37	53 x 43 x 17.5
18 x 18 x 10	35 x 35 x 10	57.9 x 61 x 11.5
19 x 19 x 10.5	35 x 35 x 10	58.2 x 40.2 x 16
20 x 20 x 10	38 x 38 x 16.5	59 x 35 x 15
21.6 x 21.6 x 12	40 x 40 x 25	60 x 60 x 28
23.1 x 23.1 x 9	42.5 x 42.5 x 18	65 x 55.4 x 17.5
25 x 25 x 12	45 x 45 x 20	78.4 x 18.2 x 12.6
26 x 22 x 7	45.7 x 42.5 x 29.3	100 x 101.6 x 32

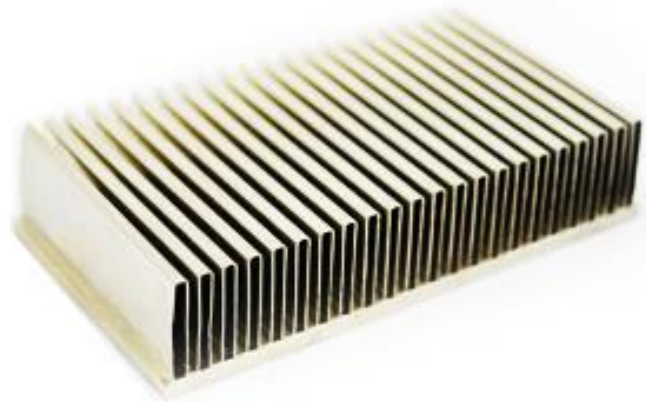
Metal Fabrication Capability – Various Fins



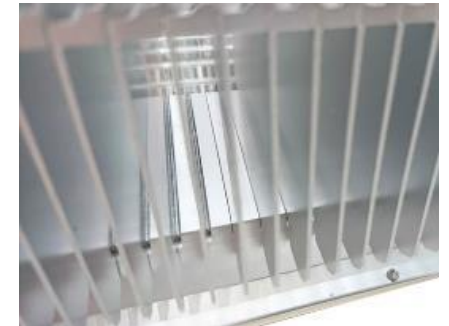
Stacked Fin



Inserted Fins



Folded Fins



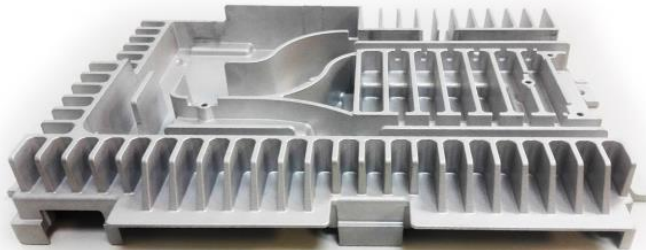
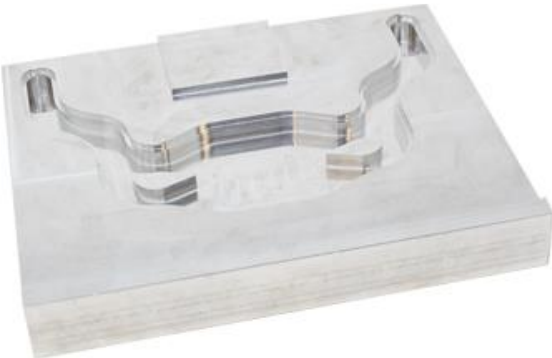
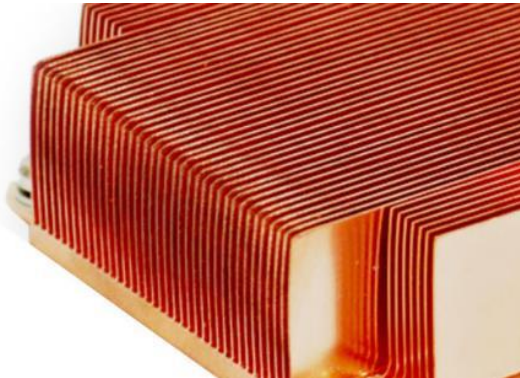
Cold Forging

Metal Fabrication Capability

Die Cast



Skived Fin

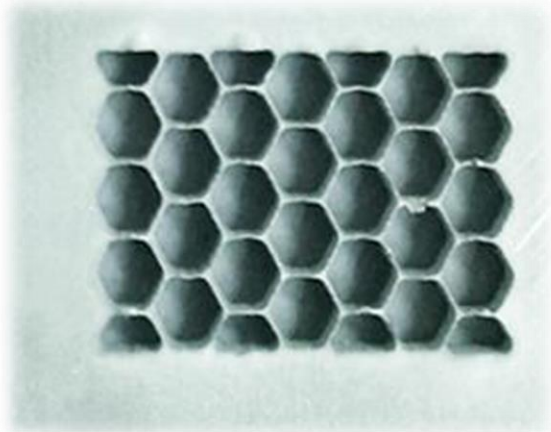


Die Cast (CNC Processing)



Heat Pipes

Customized Machining



Water Jet machining (3mm thick plate with 0.3mm wall thickness honeycomb)



Ultra thin (0.3mm) AL extrusion

Surface Finish & Assembly

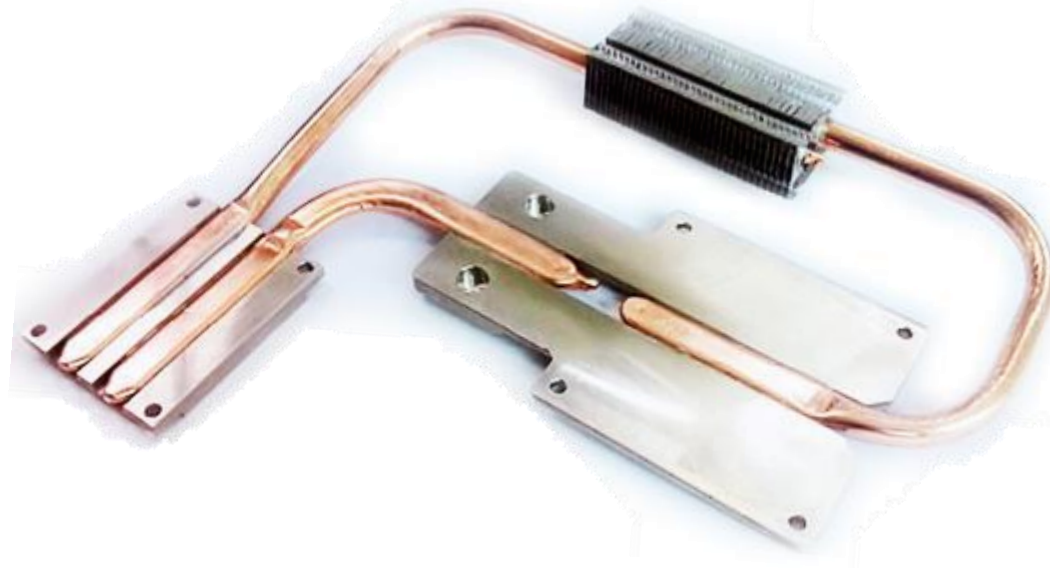
Finishes

- Anodized
- Nickle Plating
- Sand Blasting
- Electroless Plating



Assembly

- Soldering
- Press-fit
- Laminated
- Friction Stir Welding



Hardware & Thermal Interface Material

Miscellaneous Hardware

- Screws / Springs
- Push Pin Fasteners
- Brackets
- Clips
- Washers / O-rings
- Plastic Injection Molded Parts



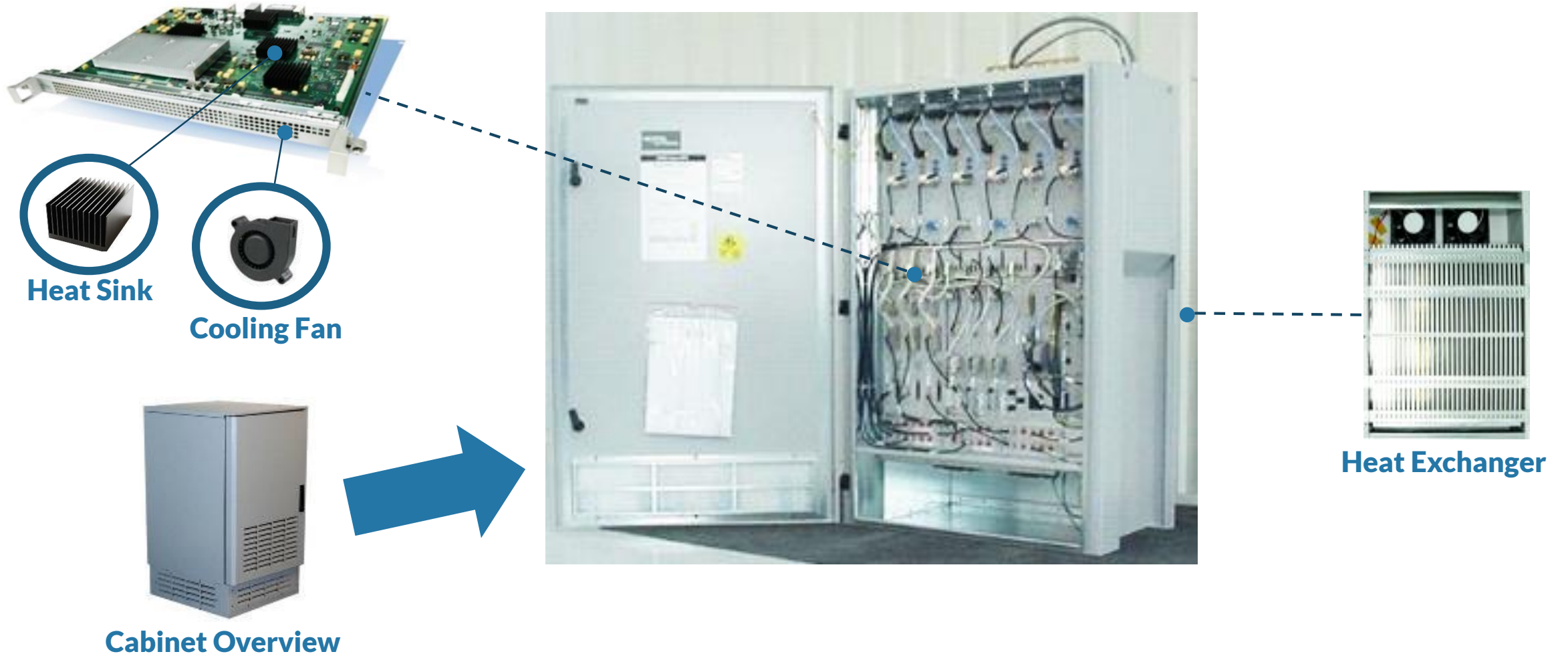
Thermal Interface Material

(Grease / Pads)

- Own brand (FCO)
Thermal Grease
 - TG40
 - TG20



Thermal Solutions - Telecommunication Base Station



Thermal Solutions - Products for Server Applications



Chipset Heat Sink



CPU Heat Sink

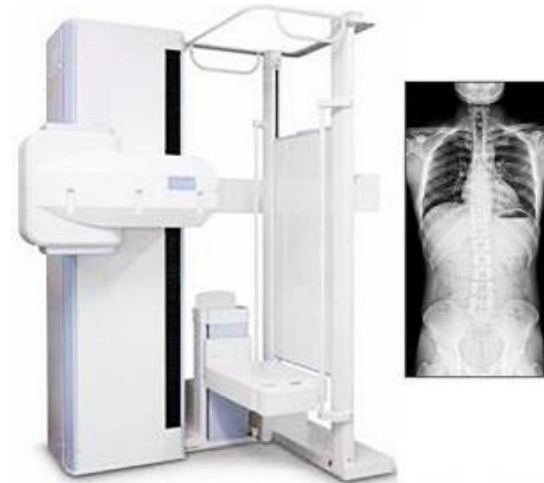
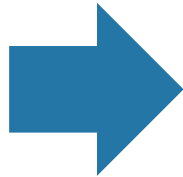
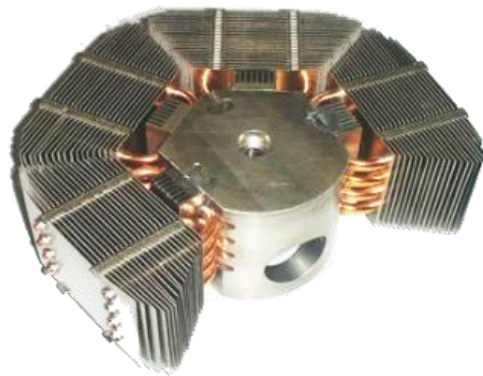
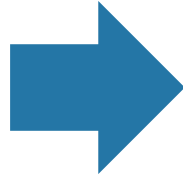


Chassis

Thermal Solutions - Industrial Applications

Heat Sink for Inverter

212K Watt. With 192 heat pipes

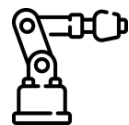


Heat Sink for X-ray scanner 1250 Watt.

Services



Design & Engineering



Manufacturing



Thermal Simulation



Turnkey Solutions

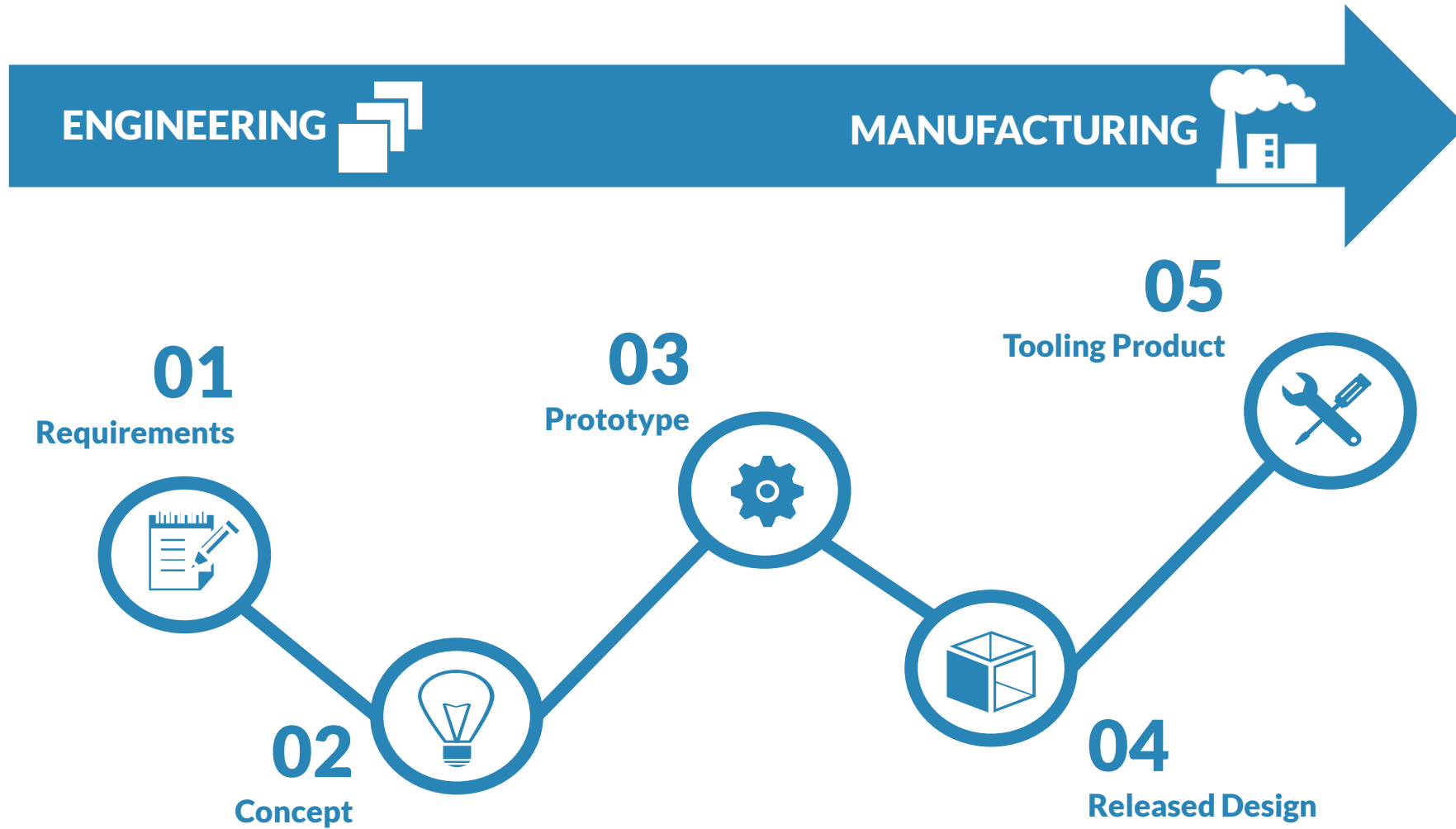


Prototyping



Hardware Testing

Design Processes



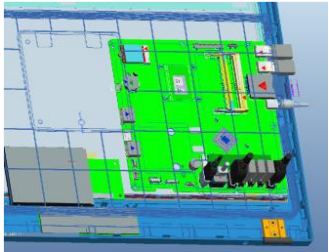
Design Case Study – Thermal Module for AIO System (25W)

Requirements

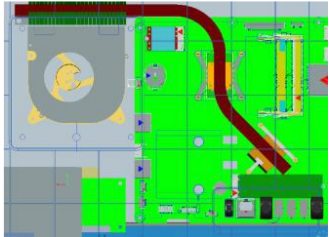
Concept

Prototype

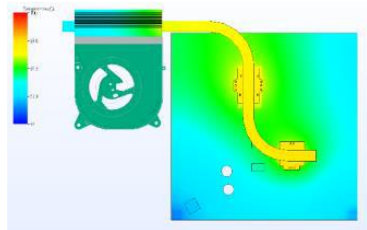
Released Design to MP



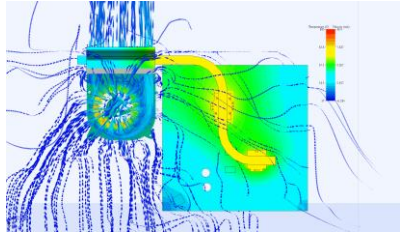
System



Thermal Module



Temperature field
(Tc= 45C @ Tair = 25C)



Flow field

序号	CPU Cubase厚度	CPU 壓力值(kg)	GPU 壓力值(kg)	壓機 (CPU)	壓機 (VGA)
1	1.5mm	6.648	2.028		
2	1.5mm	6.514	1.956		

Pressure Test

Item	Temp	Pressure	Flow	Power	Temp	Pressure	Flow	Power
1	45.00	6.648	2.028	25.00	45.00	6.648	2.028	25.00
2	45.00	6.514	1.956	25.00	45.00	6.514	1.956	25.00
3	45.00	6.648	2.028	25.00	45.00	6.648	2.028	25.00
4	45.00	6.514	1.956	25.00	45.00	6.514	1.956	25.00
5	45.00	6.648	2.028	25.00	45.00	6.648	2.028	25.00
6	45.00	6.514	1.956	25.00	45.00	6.514	1.956	25.00
7	45.00	6.648	2.028	25.00	45.00	6.648	2.028	25.00
8	45.00	6.514	1.956	25.00	45.00	6.514	1.956	25.00
9	45.00	6.648	2.028	25.00	45.00	6.648	2.028	25.00
10	45.00	6.514	1.956	25.00	45.00	6.514	1.956	25.00

Thermal Resistance Test
Tc = 42C @ Ta 25C (Module)



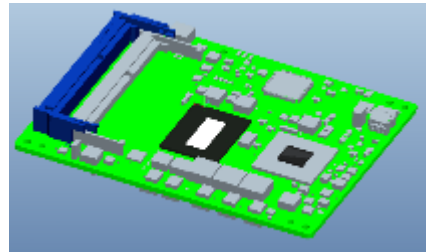
Design Case Study – Thermal Module for IPC (35W)

Requirements

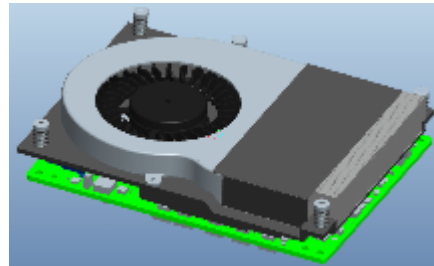
Concept

Prototype

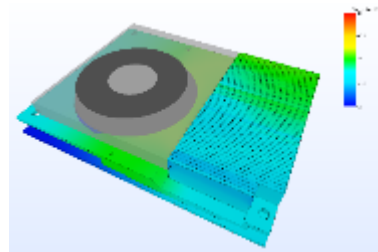
Released
Design to MP



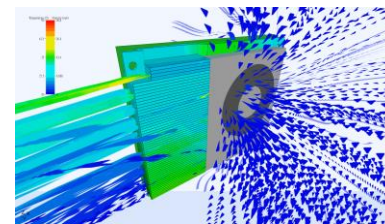
PCB



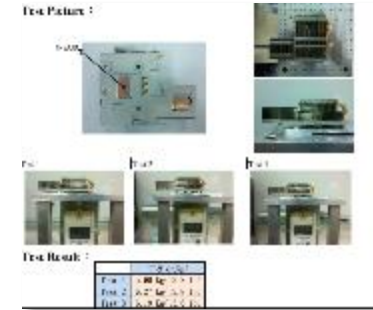
Thermal Module



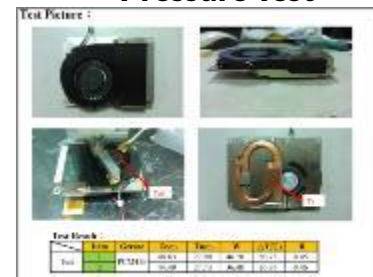
Temperature Field



Flow Field
 $T_c = 70C, T_{air} = 45C$



Pressure Test



Thermal Resistance Test
($T_c = 48.6C @ T_a 25C$)

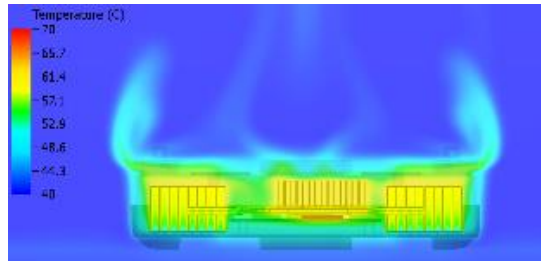


Design Case Study - Thermal Module for AIO System (25W)

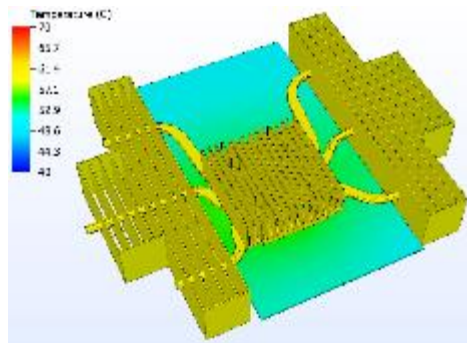
Concept

Prototype

Released Design to MP



Temperature field



Temperature field
($T_c = 63.3C @ T_{air} = 40C$)

TEST PICTURE -



Test Results:

Sample	V	I	W	T _{chip}	T _{case}	T _{amb}	R _θ
Sample 1	12.0	1.75	21.00	49.50	54.00	34.00	0.90
Sample 2	22.2	1.25	27.75	32.40	40.00	24.00	0.90
Sample 3	12.0	1.75	21.00	31.60	40.00	34.00	0.90
Sample 4	22.2	1.25	27.75	37.40	44.00	23.00	0.91
Sample 5	12.0	1.25	15.00	33.20	40.00	24.00	0.90

Offset Ta=40:

Sample	V	I	W	T _{chip}	T _{case}	T _{amb}	R _θ
Sample 1	22.2	1.25	27.75	40.00	51.00	23.00	0.90
Sample 2	12.0	1.25	15.00	42.00	50.00	24.00	0.90
Sample 3	22.2	1.25	27.75	40.00	50.00	23.00	0.90
Sample 4	22.2	1.25	27.75	40.00	50.00	23.00	0.91
Sample 5	12.0	1.25	15.00	40.00	50.00	23.00	0.90

Thermal Resistance Test
 $T_c = 54.0C @ T_a 40C$



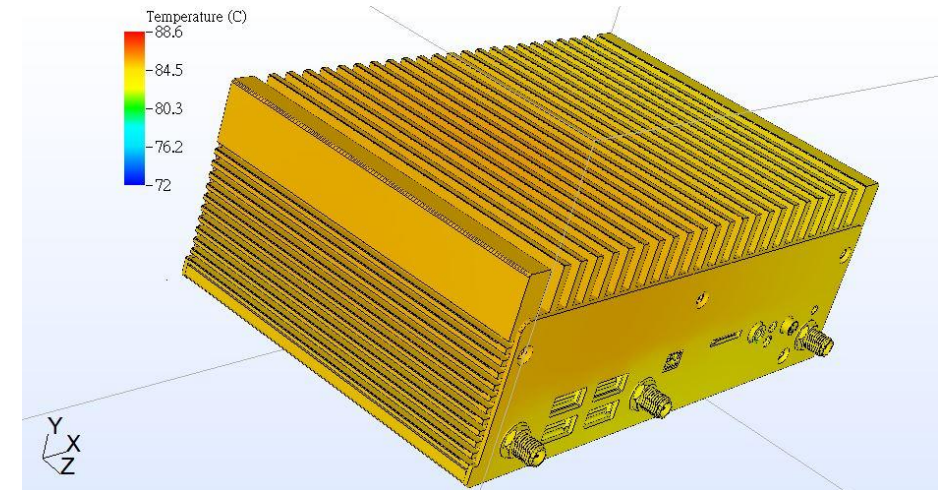
Thermal Analysis

Electronic Component Computational Fluid Dynamics

With more than 20 years of experience in thermal management solutions, we offer the best thermal simulation services in Taiwan and USA to help reduce the costs of product development for our customers. We offer CFD analysis and consultation for the best possible arrangements and recommendations in thermal solutions.

Simulation Service Pricing Schedule

Project	Price	Service Content
Standard Computational Fluid Dynamic (CFD) services	1200 - 2,400 (\$60/hour)	Simulation without design suggestion
Advanced Computational Fluid Dynamic (CFD) services	1,600 - 4,000 (80/hour)	Simulation with design suggestion and optimization
Standard Specialized Application Computational Fluid Dynamic (CFD) services Simulation	1,800 - 5,500 (100/hour)	Water Cooling simulation without design suggestion
Advanced Specialized Application Computational Fluid Dynamic (CFD) services Simulation	2,000 - 6,600 (120/hour)	Water Cooling simulation with design suggestion and optimization



Prototyping

Computer Numerical Control Machining

We use advanced equipment to offer a variety of CNC machining services including milling, turning, EDM, wire EDM, surface grinding and much more. Using our 3,4 and 5-axis CNC machining Centers, our skilled machinist can make turned and milled parts using a wide range of plastic and metal material.

What Is CNC Machining?

CNC machining is a subtractive manufacturing process where raw material is removed with a variety of precision cutting tools to make a part or product.

Advantage of CNC Machining

- Highly accurate and repeatable
- Suitable for many different kind of substrates
- High Production and Scalability : 1 to 100,000
- Less Labor and economical
- Fast turnaround
- Low investment in tooling and preparation costs.



Turnkey Solution

Single Source Responsibility

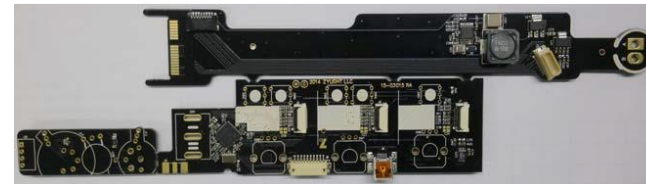
Our established supply chain and buying power make COFAN's turnkey solutions an invaluable service. We have earned partnerships from some of the well-known companies and worked hand-in-hand for decades. We diligently work along with the drawings that are provided by the customer's engineers. We can review in determining the design for manufacturability (DFM) and finding the low-cost solutions to meet our customers' goals. We have resources in providing the best possible solutions for customized parts for respective OEMs.



Studio Lightings



LED Light & Fixture

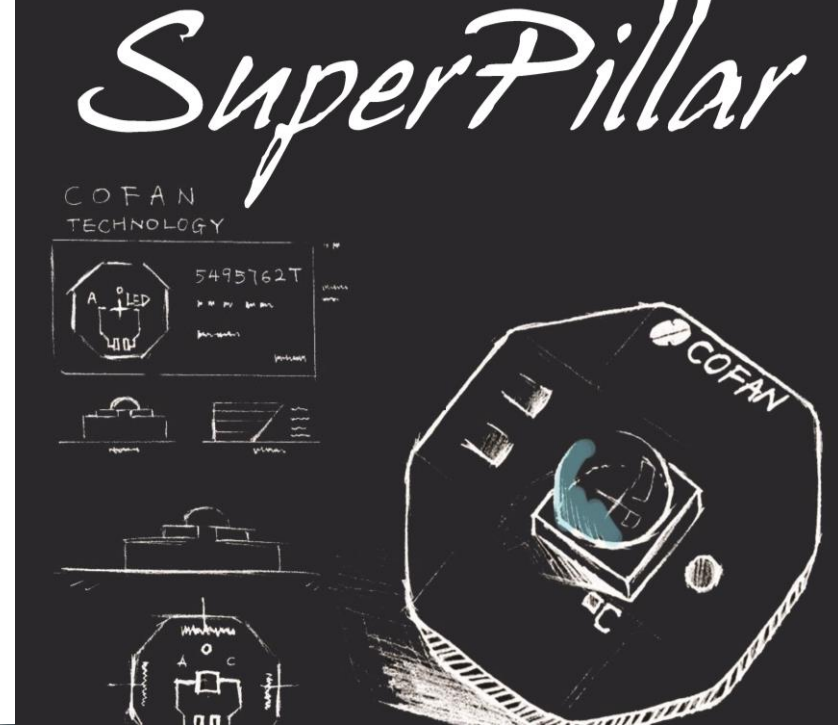


Light Controller



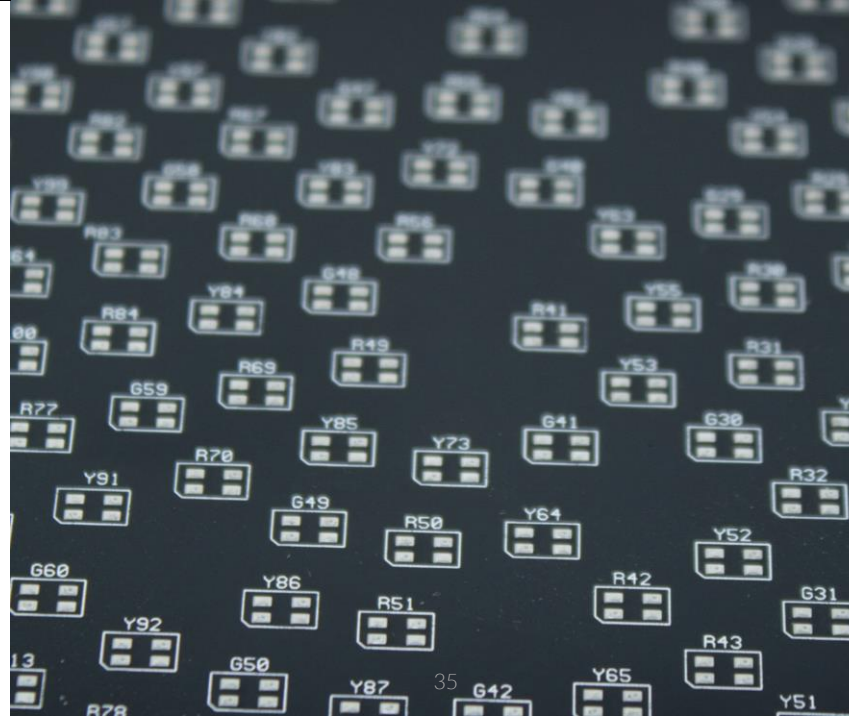
Printed Circuit Board

- Metal Core PCB
- Chip on Board (COB)
- FR4
- Super Pillar



LED Lights

- Horticulture
- High Bay
- Sports Facilities
- Ruggedized



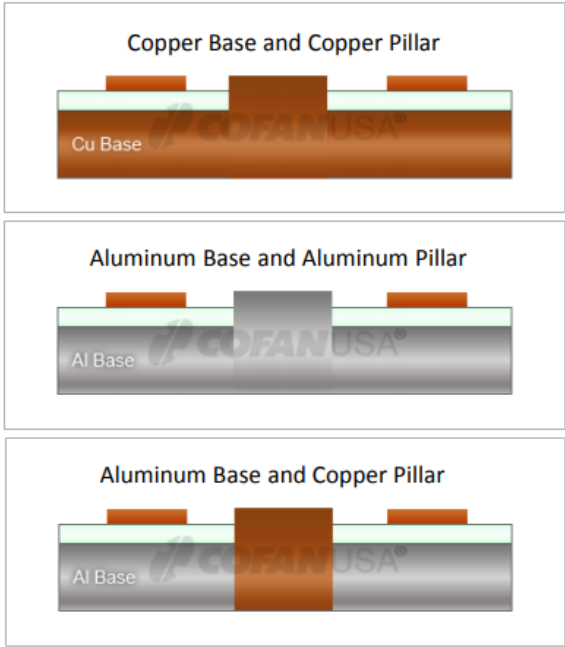
UV Light

- UVA
- UVB
- UVC
- Wafers
- Chips
- SMDs

Patented Technology

SUPER PILLAR™

- Enable designers to bypass the dielectric prepreg
- Move heat faster than conventional MCPCBs



- Layer 4 – Cu Pillar
- Layer 3 – Cu Foil/Circuit
- Layer 2 – Pre-preg
- Layer 1 – Al or Cu Base



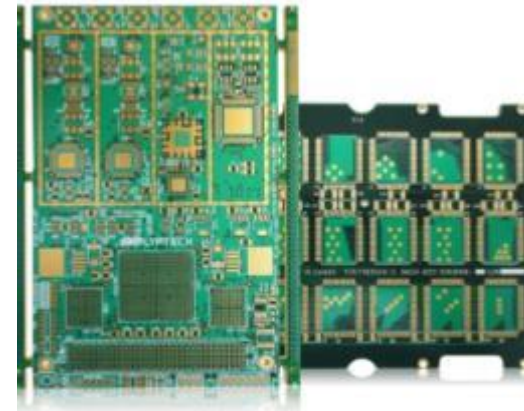
XML 160W



LZP up to 960W

MCPCB Product Details

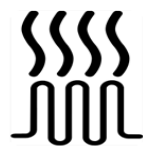
- Single sided, double sided and multi-layer PCB's
- Metal core printed circuit boards (MCPCB's)
- Heavy copper PCB's (up to 8oz)
- Blind and Buried via construction
- Epoxy filled vias (Via-in-pad)
- Mixed laminate construction (FR4+Rogers)
- Fine pitch BGA's
- Fully RoHS compliant



New Products & Services



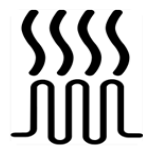
Thermal Simulation



Graphene Coated
Heat Sink

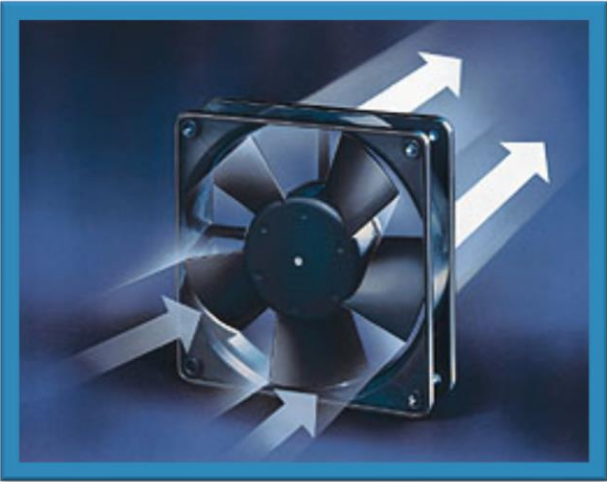


High Temperature Fan

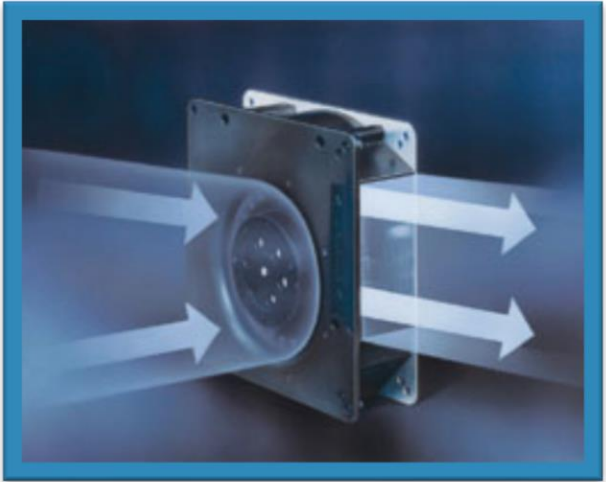


Copper Cold Plate

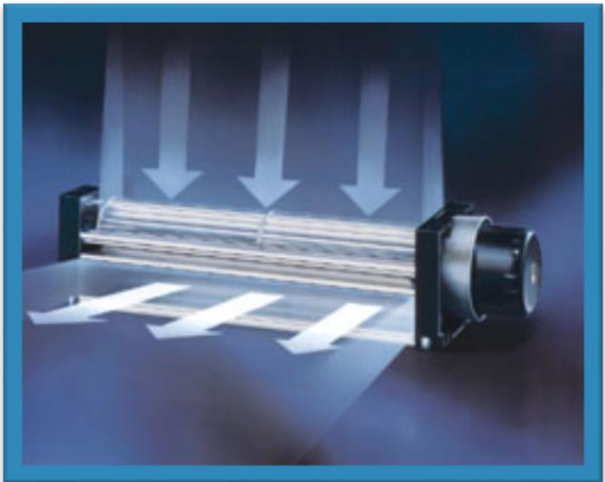
High Temperature Fan



Axial Fan
(Air flows axially)



Centrifugal Fan / Blower
(Air flows radially)



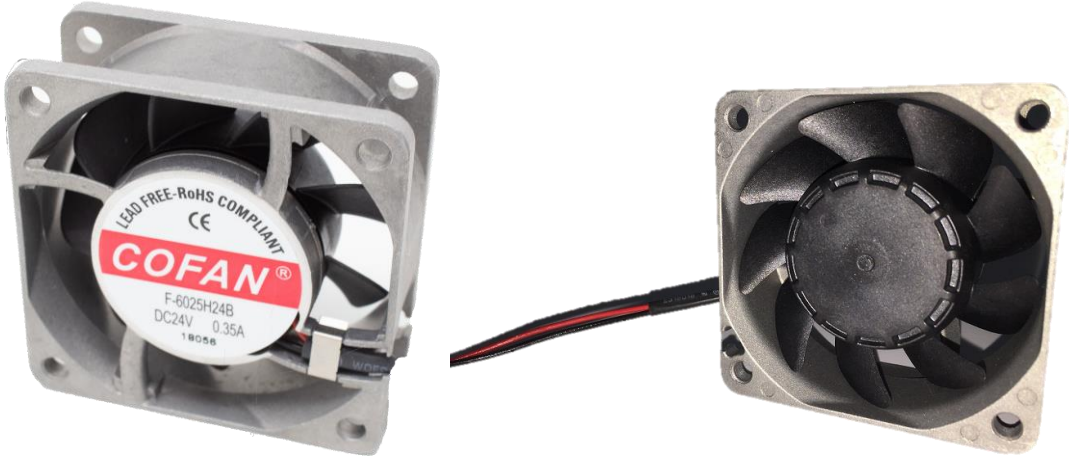
Cross Fan
(Air flows across the axis)

High Temperature Fan- Specs

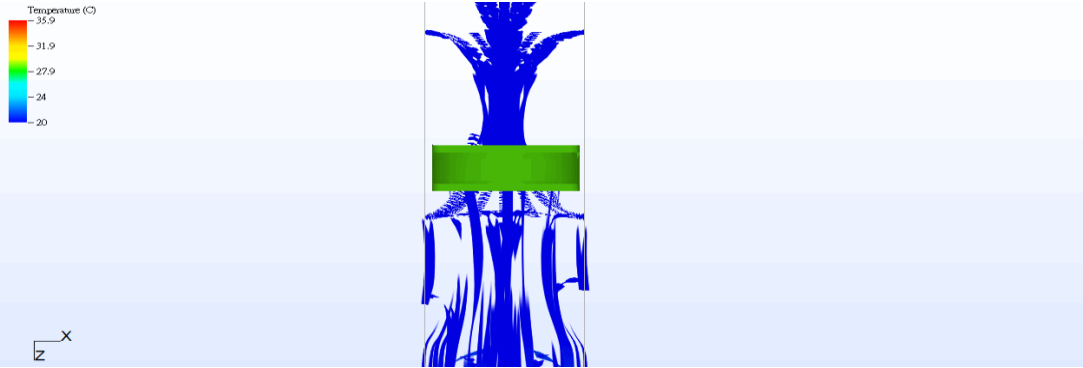
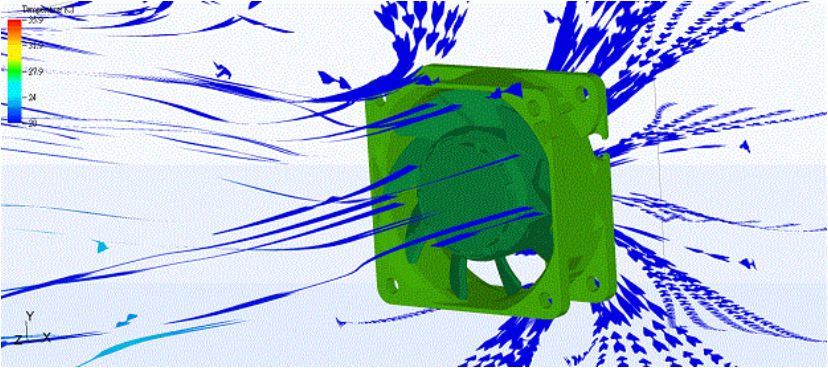
	F-6025H24B(High Temp Fan)	6025H24B(Regular Fan)
Size	60 X 60 X 25	60 X 60 X 25
Operating Temp	-40°C~ 100°C	-40°C ~ 70°C
Burning Test Temp	105°C – 130°C	70°C
Max. Test Temp	130°C	80°C
70°C Live Time (MTTFL10)	40000 hrs	12000 hrs
90°C Live Time (MTTFL10)	30000 hrs	N/A
100°C Live Time (MTTFL10)	12000 hrs	N/A
Fan Impeller Material	PPS	PBT 85% + Fiber 15%
Fan Frame Material	Aluminum ADC 12	PBT 85% + Fiber 15%
Bearing / Max. Temp	Two Ball Bearing / 230°C	Two Ball Bearing/ 180°C
PWM Function	Option	Option
Rated Voltage DC	5V. 12V. 24V. 48V.	5V. 12V. 24V. 48V.
Rated Current	0.34 A	
Max. Static Air Pressure(24V)	1.34 inch-H ₂ O / 34	0.43 inch - H ₂ O / 11.5
Max. Air Flow (24V)	1.36 / 49.4 CFM	1.10 / 38.99 CFM
R.P.M.	11000	6600
Noise Level (dBm)	53	

Key Components

- Blade : PPS /185°C
- Frame Housing : ADC12
- Ball Bearing : 180-230°C
- Driver IC : 105°C



Design - Simulation

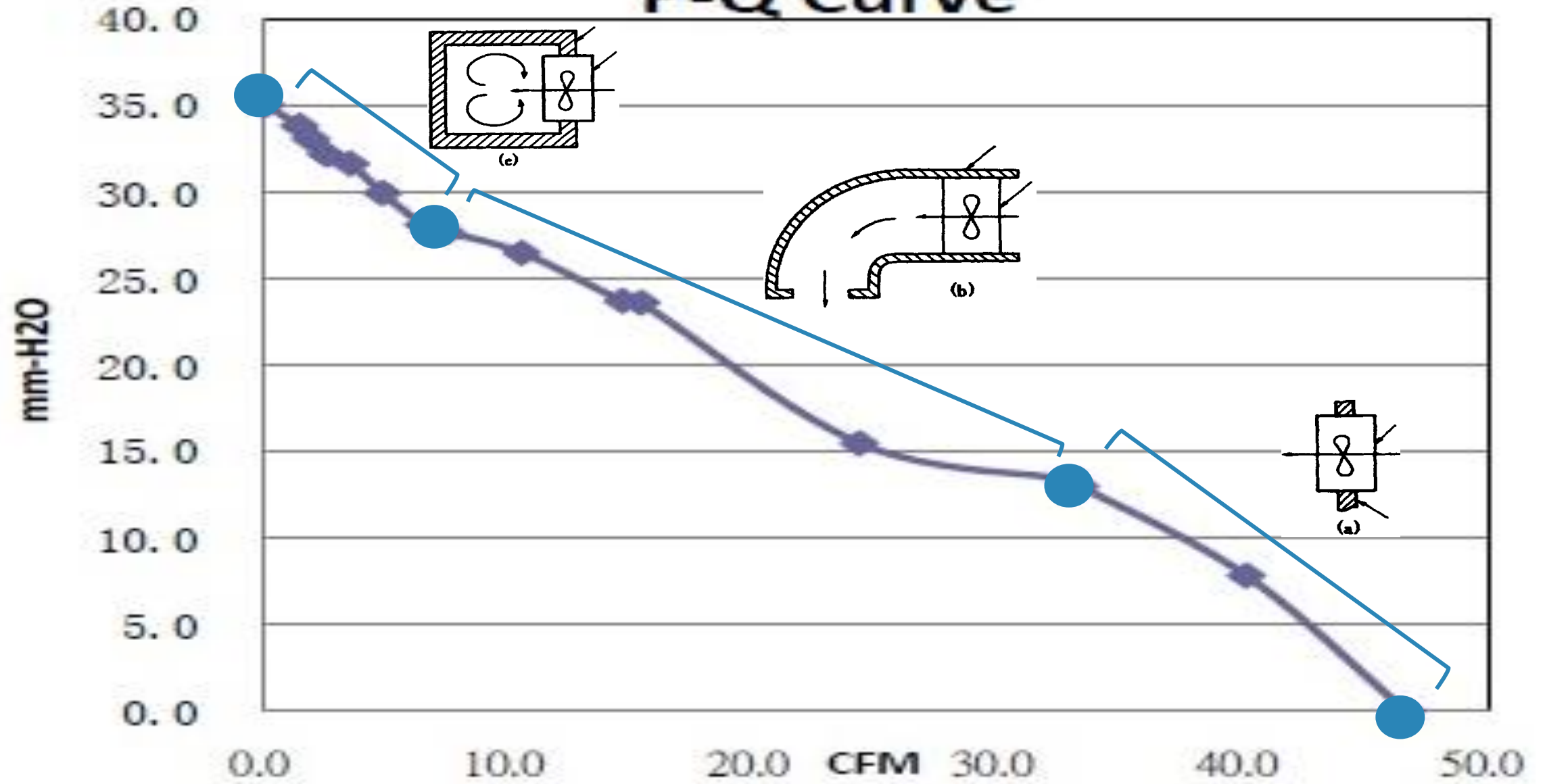


Design

Engineering Anatomy

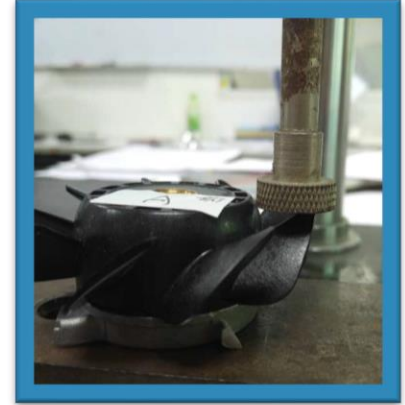
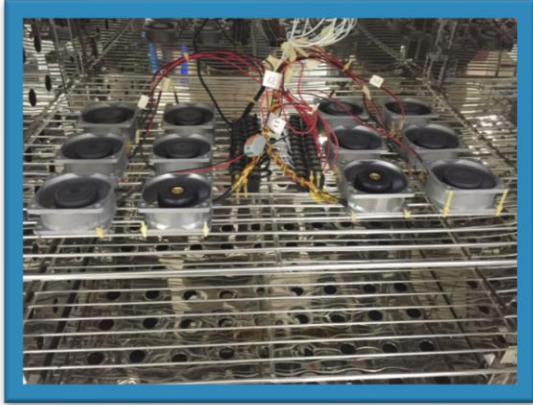


P-Q Curve



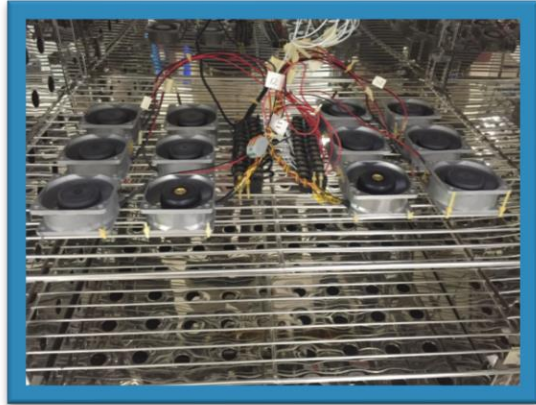
High Temperature Fan – Stress Tests

Stress Test



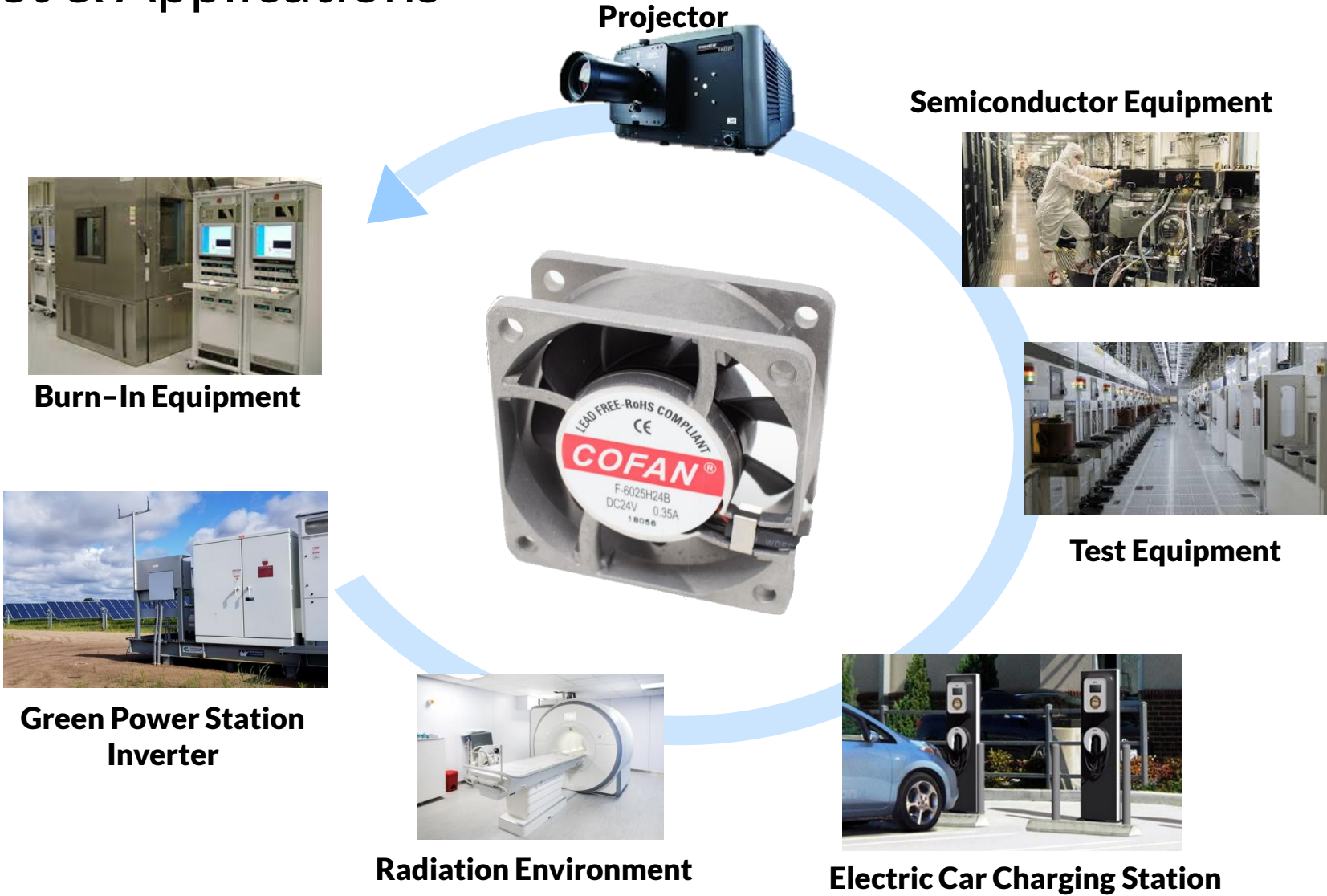
Sample Description	Sample Material	Test 1	Test 2	Test 3	Test 4	AVR
A. Competitor Blade	PPE + PS + GF20	4.5 KG	5.0 KG	5.0 KG	5.0 KG	4.875 KG
B. Competitor Blade Failed after 7900 Hr in 105°C	PPE + PS + GF20	3.5 KG	3.5 KG	3.0 KG	3.5 KG	3.375 KG
C. COFAN New Blade	PPS	5.0 KG	5.0 KG	5.5 KG	5.0 KG	5.125 KG
D. COFAN Blade Run 10,000 Hours in 105°C	PPS	PPS	5.0 KG	5.0 KG	5.0 KG	5.0 KG

High Temperature Fan – Temperature Test



Sample Description	Sample Material	105° C	125° C	130° C
A. Competitor Blade	PPE + PS + GF20	Fail after 7080 Hours	Fail after 1000 Hours	Fail After 1.5 Hours
B. Competitor Blade	PPE + PS + GF20	Fail after 7900 Hours	Fail after 1000 Hours	Fail After 1.5 Hours
C. COFAN New Blade	PPS	Continue Running After 10K hours	Running After 1000 Hours	Running After 528 Hours
D. COFAN Blade Run 10,000 Hours in 105° C	PPS	Continue Running After 10K Hours	Running After 1000 Hours	Running After 528 Hours

Market & Applications



Copper Cold Plate

The liquid cooling system uses a pressure pump to circulate the cooling liquid in the heat pipe and dissipate heat.

Cooling system consists of :

- Liquid-cooled panels
 - Made of copper or Aluminum plate
 - Channel/Cavity is CNC process
 - Fit with aluminum In contacts with the heat source
- Channel is fit with copper pipes
- Filled with liquid (ionized water or 50% Ethylene Glycol Mixture)
- Circulation achieved by pumps
- Liquid is cooled in a external tank or heat Exchanger

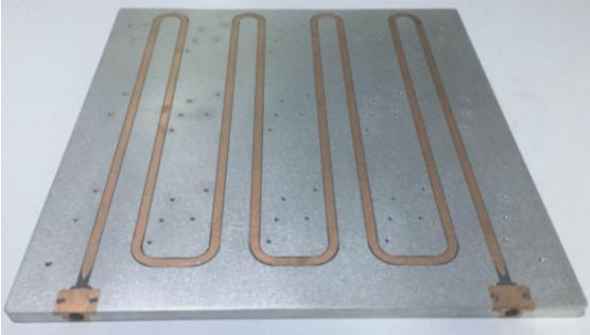


Benefits of Copper Cold Plate

- Low Cost (No tooling requirements, no limits to volume)
- High Performance
- Highly reliable
 - Seamless copper pipe is set in the channels
 - No risk of leakage (as long as with reasonable control of dimensions)
 - Sustain up to 100 PSI ($\sim 7\text{kg/cm}^2$) of pressure
 - Heating Element on both sides to achieve miniaturization
 - Direct contact of the copper pipe and heating element provide high heat transfer
 - Customized connector dimension (metrics or
 - Customized dimensions (Maximum dimension to 1200 x 700 x 20mm)

Benefits of Liquid Copper Tube System

Dimension	Power	Weight
740 x 200 x 28 mm	100 kW	11.27 kg
540 x 200 x 28 mm	30 kW	8.22 kg
410 x 400 x 13 mm	1200 W	5.8 kg
320 x 280 X 13 mm	800 W	3.16 kg





COFAN USA is the leading provider of thermal management solutions, trusted by more than 500 companies worldwide.

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