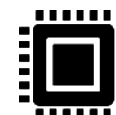


# HOPERF Matter Solution

Jan 20<sup>th</sup> 2025



RF IC



IoT Module



Signal Chain



## 1. Matter Overview

- Smart Home Pain Points
- Matter is Coming
- Matter Architecture and Features
- Matter Market Prediction

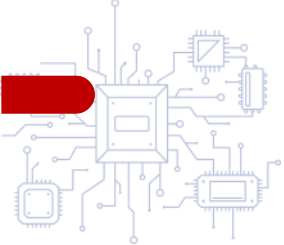
## 2. HOPERF Matter Solution

- HOPERF Matter Modules
- Customize Matter Development Service
- HOPERF Matter Certification Service
- HOPERF Matter Manufacture Tool

## 3. Why Choose HOPERF?

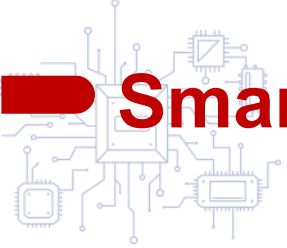
- How to cooperate with HOPERF
- Win-Win Cooperation





matter

## **Matter Overview**



# Smart Home Pain Point

HOPERF



○ Zigbee    ○ Z-Wave    ○ Bluetooth    ○ Wi-Fi

## • Current Situation of Smart Home

- Too many available ecosystems
- The devices are bound to an ecosystem
- The devices cannot communicate with each other

## • Manufacturer

- Forced to choose different eco-systems
- Multiple SKUs need to be stocked for different standards
- Different IoT technologies need to be developed to connect to different ecosystems

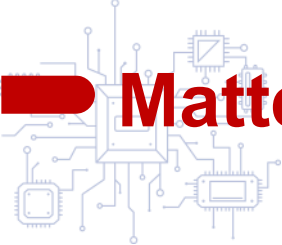
## • Retailer

- Duplicate products are placed on shelves
- It is difficult to provide good advice to consumers
- High return rate due to incompatibility

## • Consumer

- Confusion when buying products
- Difficulty mixing and matching the products they want
- Smart Home APPs are complex and diverse





# Matter is Coming

HOPERF

## Previous Situations

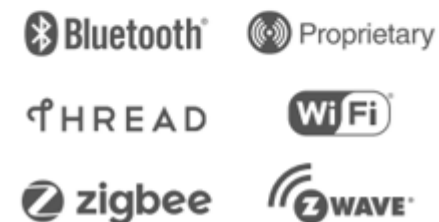
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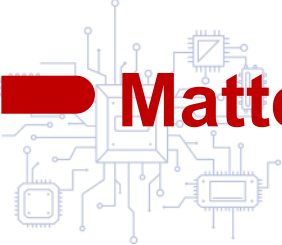

## Transforming Period

- Compatible with older smart home products
- Reduce ecosystem barrier
- Existing products can be upgraded to Matter devices in the future
- More smart home devices support Matter standard

## 2023 and Future

Connectivity





# Matter History



Dec 18<sup>th</sup> 2019

Amazon, Apple, Google, Samsung SmartThings, Silicon Labs, and the Zigbee Alliance launched the CHIP (Connected Home over IP) project

2019

2021

2022

2023

Oct

2024

Nov

Oct 04<sup>th</sup> 2022

Matter 1.0 released

Oct 23<sup>rd</sup> 2023

Matter 1.2 released

Nov 7<sup>th</sup> 2024

Matter 1.4 released

May 11<sup>th</sup> 2021

CHIP was renamed to Matter, and the Zigbee Alliance was renamed to CSA

May 18<sup>th</sup> 2023

Matter 1.1 released

May 08<sup>th</sup> 2024

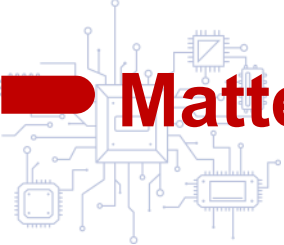
Matter 1.3 released

Fragmented

amazon		WiFi	Wave
		Bluetooth	zigbee
Apple		WiFi	Bluetooth
Google		WiFi	Bluetooth
		Bluetooth	Thread
COMCAST	works with XFINITY Home	zigbee	
SmartThings	Works with SmartThings	Wave	zigbee

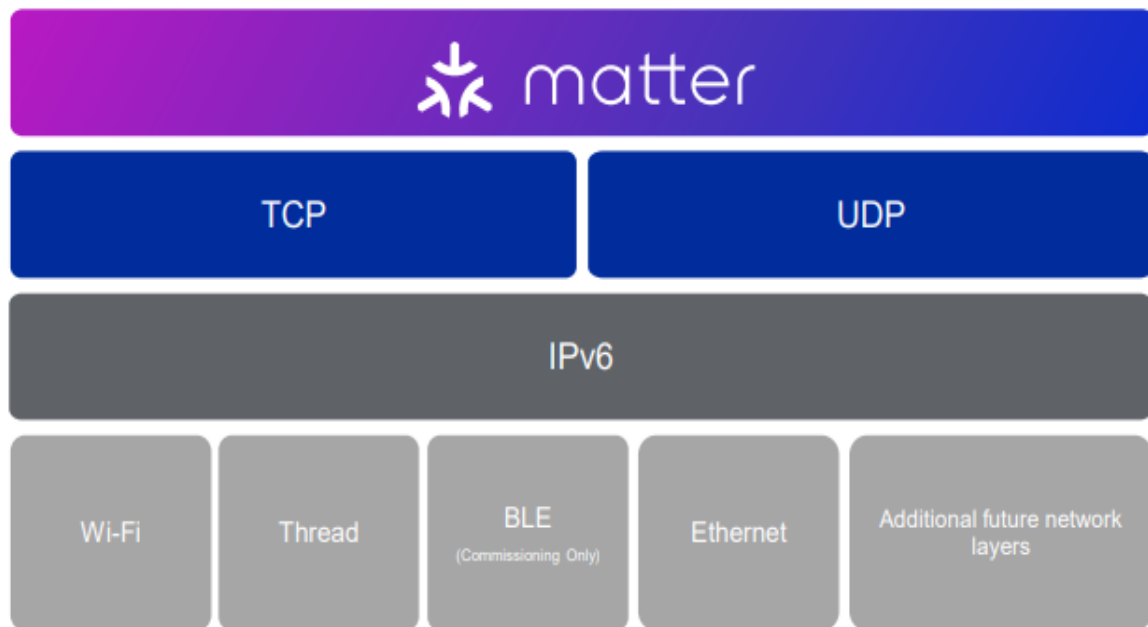
Over 400 companies joined the Matter Working Group





# Matter Architecture and Features

**HOPERF**



## Simply

Buying is easy and there are no compatibility issues to consider

Cross-ecological interoperability makes the use of smart devices simple

## Interoperability

Products with the Matter logo are interoperable

Consumers can freely choose different models of products and connect to different ecosystems

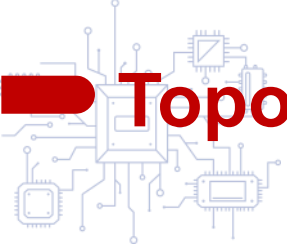
## Reliably

Consistent and low latency for local connections.

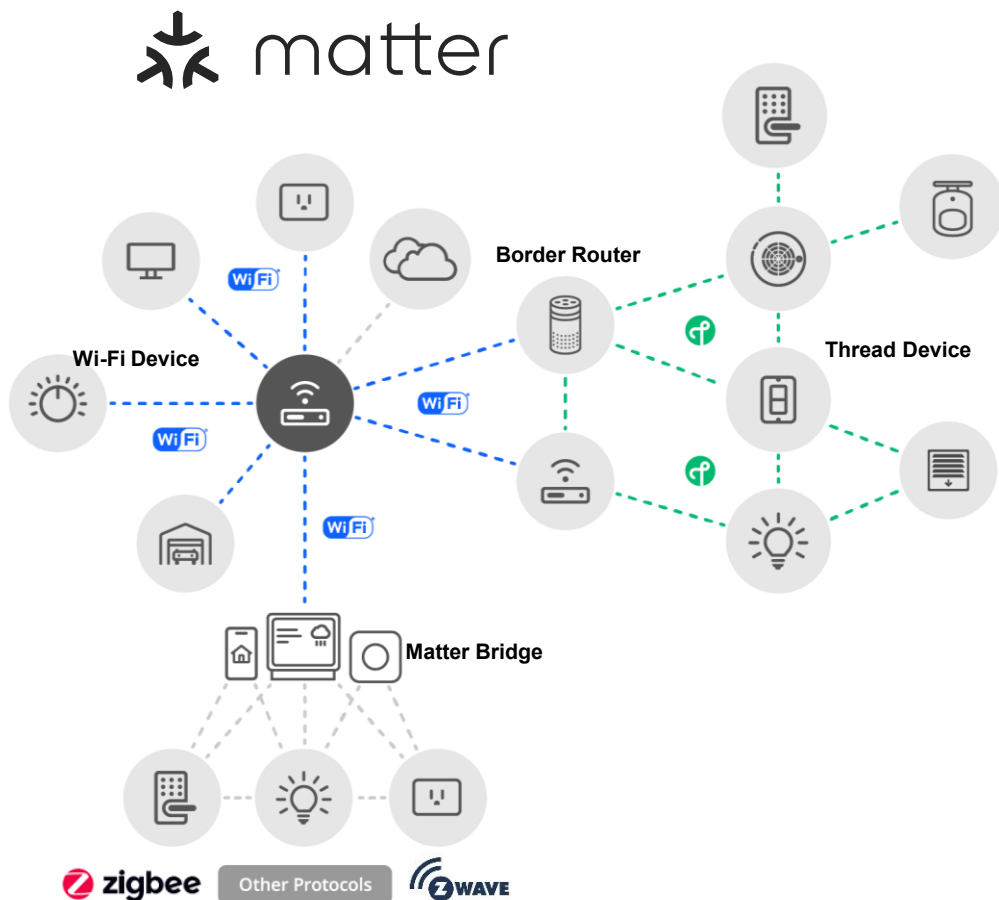
Still works when the internet is down.

## Securely

Devices must be authenticated before accessing the network, and all transmitted data must be encrypted.



# Topology for Matter Network



- **Wi-Fi Network**

- Wi-Fi Access Point
- Matter over Wi-Fi devices

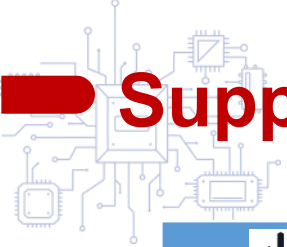
- **Thread Network**

- Open Thread Border Router
- Matter over Thread devices

- **Other networks: Zigbee, Zwave, BLE**





- Matter Bridge
- Zigbee, Zwave, BLE, etc. devices



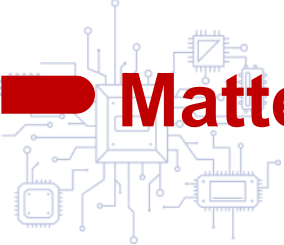


# Supported Matter Device Types

**HOPERF**



 Matter 1.0	 Matter 1.2	 Matter 1.3	 Matter 1.4
Lighting	Refrigerator	Water Leak Detector	Mounted On/Off Control
Plug-In	Air Conditioner	Rain Sensor	Mounted Dimmable Load Control
Switch	Dishwasher	Laundry Dryer	Water Heater
Door Lock	Laundry Washer	Cooktop	Energy Tariff Calendar
Window Covering	Robotic Vacuum Cleaner	Cook Surface	Solar Power
Thermostat	Co/Smoke Alarm	Oven	Battery Storage
Contact Sensor	Air Quality Sensor	Microwave Oven	Heat Pump
PIR	Air Purifier	Extractor Hood	Network Infrastructure Manager
T/H Sensor	FAN	EVSE	Thread Border Router

Note: no new device type was defined in Matter 1.1



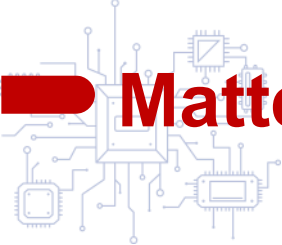
# Matter Devices on Market

HOPERF

Smart Light	 	Aqara sengled 生迪 tp-link nanoleaf YEELIGHT Govee Schneider Electric
Smart Plugs	 	Aqara sengled 生迪 tp-link eve. onvis nanoleaf
Smart Switch	 	Aqara tp-link eve. nanoleaf LEVITON
Door Lock	 	Aqara Yale LOCKLY
PIR T/H Sensor	 	Aqara eve. tp-link Netatmo Heiman 海曼
HVAC	 	G Nest eve. ecobee
Window Covering		Aqara eve. SwitchBot Heiman 海曼

Note: Only the brands whose Matter products have been launched in markets are counted as of June 2023

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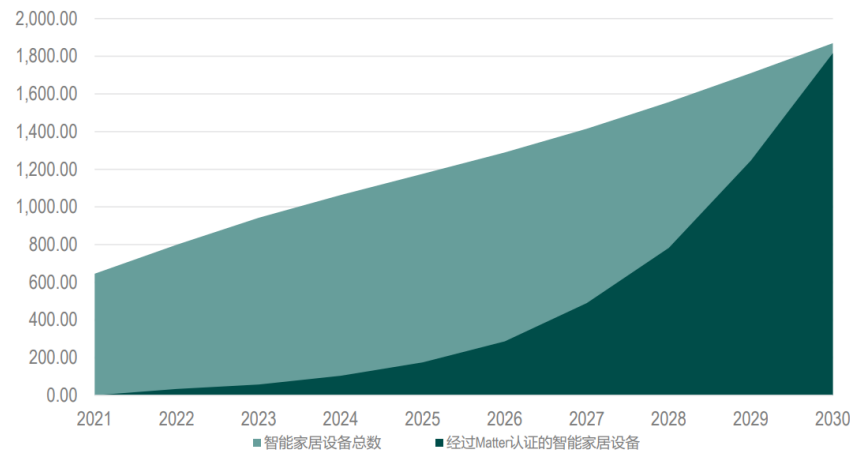


# Matter Market Prediction

HOPERF

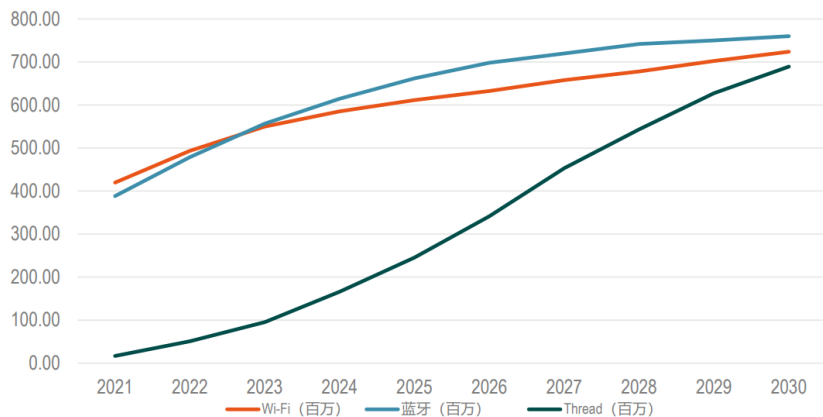
Matter兼容智能家居设备出货量 (按类型划分)  
全球市场: 2021至2030年

(资料来源: ABI Research)



智能家居设备出货量 (按协议划分)  
全球市场: 2021至2030年

(资料来源: ABI Research)



## • Matter Market Prediction

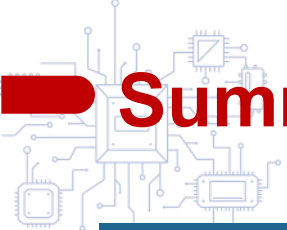
- According to ABI Research, there will be approximately 5.5 billion Matter device shipments from 2022 to 2030
- In 2030, smart home shipments will exceed 1.9 billion units, with Matter devices accounting for more than 95% of the market
- From 2023 to 2030, Matter devices will replace the original smart home devices at a huge growth rate
- In 2030, BLE/Wi-Fi/Thread protocols will dominate the world in smart homes, with Thread having the largest growth rate
- Newly released mobile phones from Apple and Google in 2023 already support Thread, which will promote the growth of Matter devices

最新款iPhone将成为首批支持Thread的智能手机, 这是苹果官方的消息。iPhone 15 Pro和iPhone 15 Pro Max (不包括iPhone 15) 将支持开源智能家居协议Thread, 以“为Home应用的未来整合提供更多机会”, 该公司在库比蒂诺的iPhone 15发布活动上宣布。



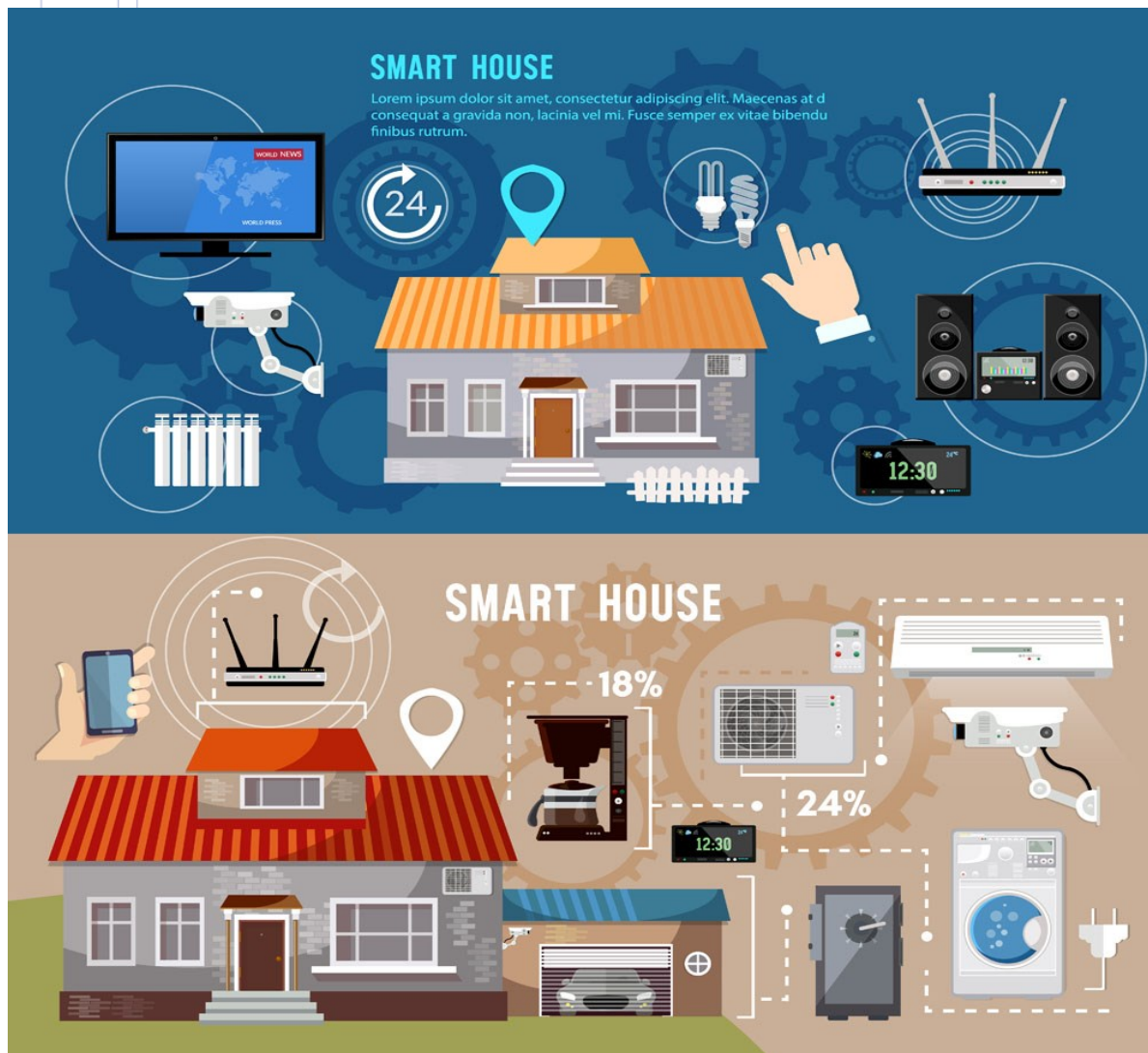
THREAD





# Summary

HOPERF



- **Global smart home market**

- The global smart home market size could reach hundreds of billions of dollars in the next few years
- By 2030, it will grow rapidly at a compound annual growth rate of 15% to 20%
- The main markets are North America, Europe, and China

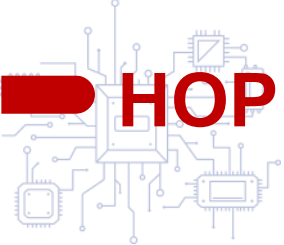
- **Big changes in the smart home**

- The emergence of the Matter standard has changed the landscape of smart homes and reshuffled the smart home market, the media call Matter a Game Changer
- The Matter standard is likely to become a unified standard for smart homes
- Matter supports wireless transmission technologies such as Wi-Fi and Thread, and has a good market prospect



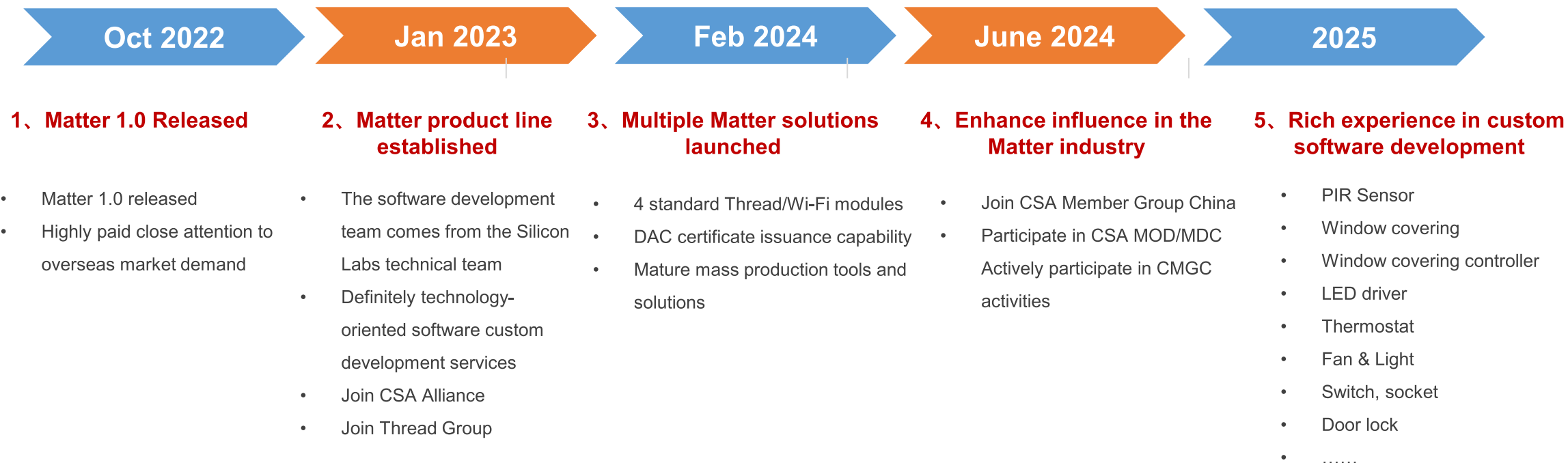
## **HOPERF's Matter Solution**

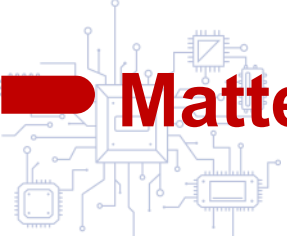




# HOPERF Matter Product Line Overview

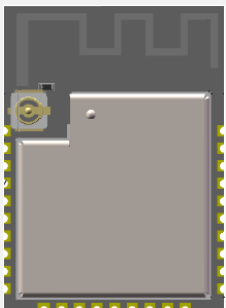
**HOPERF**





# Matter Product Development Process

HOPERF



## Hardware Module

- RF design and verification of hardware modules
- Experienced RF hardware engineers required
- Expensive RF test equipment is required
- Passed FCC/CE certifications



## Software Development

- Involving multiple wireless protocols such as Matter/Thread/BLE/Wi-Fi, development difficulty increases sharply
- Setting up a development environment is complex and time-consuming
- It is difficult to debug technical problems



## Matter Certification

- Comprehensive planning and product Matter certification are required
- Don't understand the Matter certification and testing process
- Matter certification pre-testing and failure analysis is difficult



## Manufacturing

- The requirements for Matter security are unclear
- The management of DAC certificates and private keys is complex
- The process of burning DAC certificate is cumbersome
- QR code management is complex



# HOPERF Matter Module

HOPERF



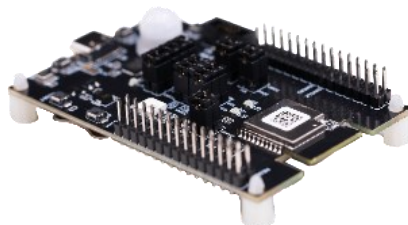
HM-MT2401



HM-MT2401B



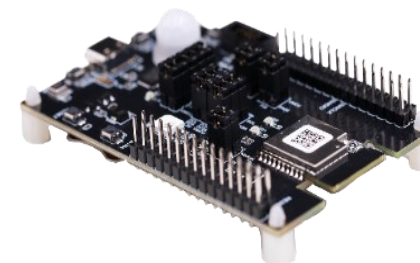
HM-MT2401C



HM-MT2401 EVB Kit



HM-MT5801



HM-MT5801 EVB Kit



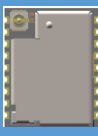

- Silicon Labs MG24
- Mesh networking has good stability
- Battery-powered
- Products with good profits pursue performance and quality
- High-end market

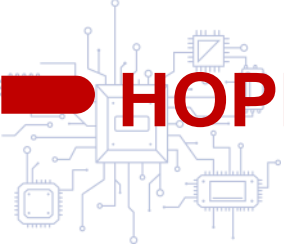
- ASR 5822 Soc
- Star network
- Power supply
- Cost-sensitive products
- Mid and low-end markets



# HOPERF Matter Module

HOPERF

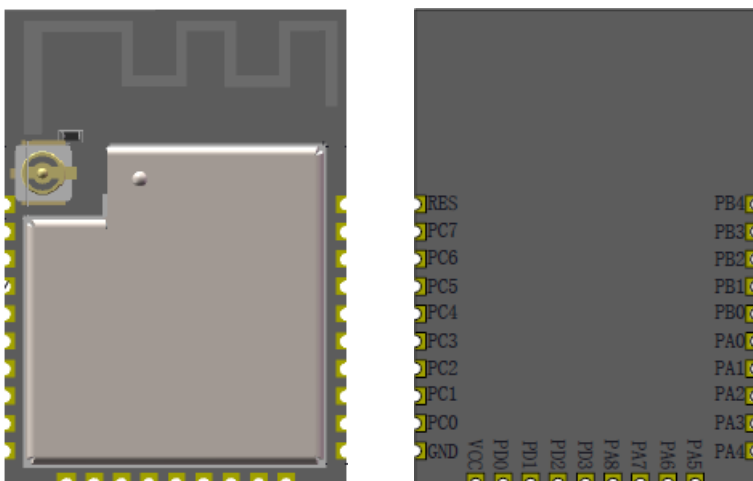
Module	HM-MT2401	HM-MT2401B	HM-MT2401C	HM-MT5801
				
Protocol type	Matter over Thread	Matter over TThread	Matter over Thread	Matter over Wi-Fi
Chip type	MG24	MG24	MG24	ASR582x
Security Level (Optional)	Secure High	Secure High	Secure High	-
Antenna type	PCB/external antenna	PCB/external antenna	external antenna	PCB/external antenna
Transmit power	19.5 dBm	10 dBm	10 dBm	20 dBm
Dimensions (mm)	15.8 x 22 x 2.6	15.8 x 22 x 2.6	10 x 12.7 x 2.6	15.8 x 20.3 x 2.6
Voltage	1.8-3.6V	1.8-3.6V	1.8-3.6V	3.0-3.6V
Flash size	1536KB	1536KB	1536KB	4MB
External Flash (Optional)	2/4/8 MB	2/4/8 MB	2/4/8 MB	-
RAM size	256KB	256KB	256KB	352KB
Product type applied	Electricians, lighting, Sensors, thermostats, Curtain motor, etc.	Electricians, lighting, Sensors, thermostats, Curtain motor, etc.	Electricians, lighting, Sensors, thermostats, Curtain motor, etc.	Electricians, lighting, Sensors, Curtain motor, etc



# HOPERF Matter Module Market Positioning

**HOPERF**

Matter over Thread module  
HM-MT2401



**HOPERF** | 华普微



matter



## • Important features of modules

- Based on Silicon Labs' latest MG24 Soc
- **Support low power consumption**
- **The maximum transmit power is 19.5 dBm**
- **Rich peripherals, including 26 GPIO**
- Internal Integrated 1.5 MB Flash and 256 KB RAM
- Support OTA upgrade using internal Flash
- Supports PCB antenna and external IPEX antenna interface

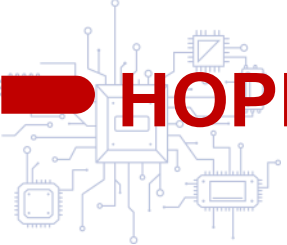
## • Potential target customers

- Long distance and strong stability
- The module integrates a rich set of peripherals and uses SoC mode to develop Matter products

## • Potential target market

- Electricians, lighting, thermostats, sensors, kitchen appliances, door locks, curtain motors, etc.

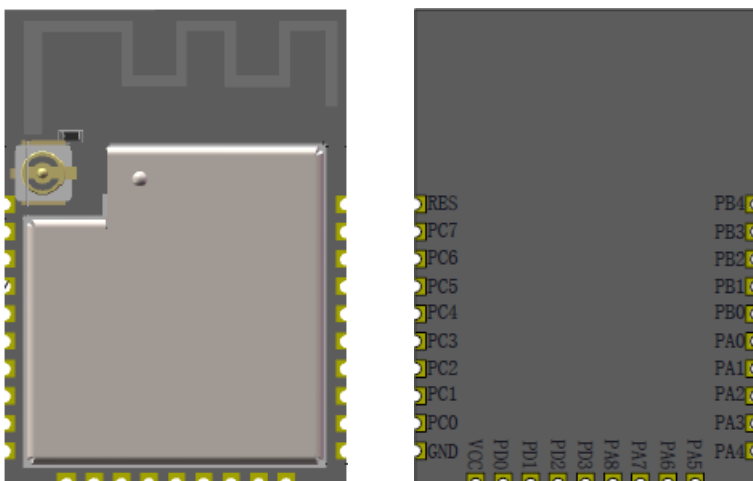




# HOPERF Matter Module Market Positioning

**HOPERF**

Matter over Thread module  
HM-MT2401B



**HOPERF** | 华普微



matter



- **Important features of modules**

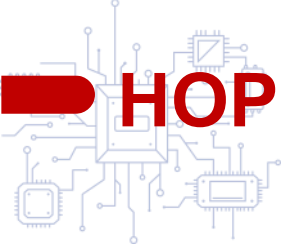
- Based on Silicon Labs' latest MG24 Soc
- **Ultra low power consumption**
- **The maximum transmit power is 10 dBm**
- **Rich peripherals, including 26 GPIO**
- Internal Integrated 1.5 MB Flash and 256 KB RAM
- Support OTA upgrade using internal Flash
- Supports PCB antenna and external IPEX antenna interface

- **Potential target customers**

- Long distance and strong stability
- The module integrates a rich set of peripherals and use SoC mode to develop Matter products

- **Potential target market**

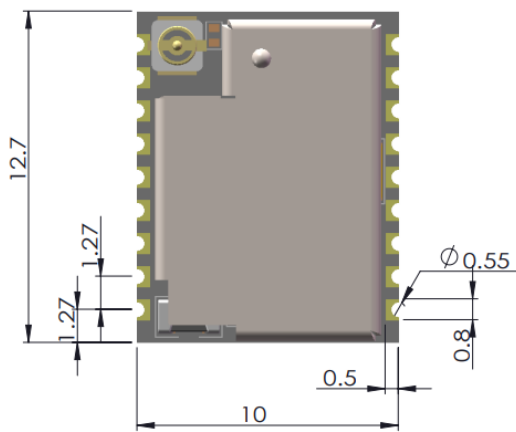
- Electricians, lighting, thermostats, sensors, kitchen appliances, door locks, curtain motors, etc.



# HOPERF Matter Module Market Positioning

**HOPERF**

Matter over Thread module  
HM-MT2401C



**HOPERF** | 华普微



matter



- **Important features of modules**

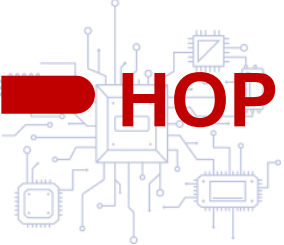
- Based on Silicon Labs' latest MG24 Soc
- **Ultra low power consumption**
- **Extra small size**
- The maximum transmit power is 10dBm
- Internal Integrated 1.5MB Flash and 256KB RAM
- Support OTA upgrade using internal Flash

- **Potential target customers**

- Battery powered, small size, pursuit of ultimate low power consumption
- Base this mode (module connected to other MCU by serial port) to develop Matter products

- **Potential target market**

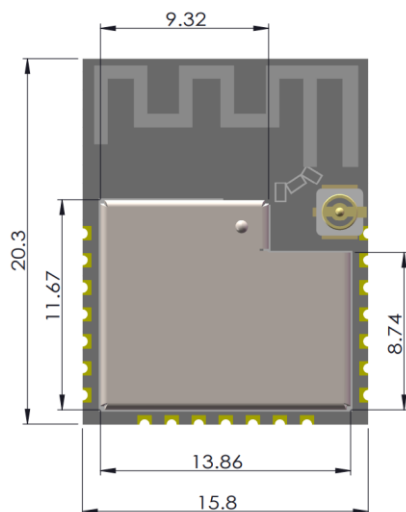
- Electricians, lighting, thermostats, sensors, kitchen appliances, door locks, curtain motors, etc.



# HOPERF Matter Module Market Positioning

**HOPERF**

Matter over Wi-Fi module  
HM-MT5801



**HOPERF** | 华普微



matter



- **Important features of modules**

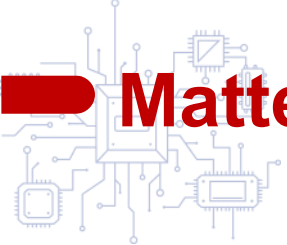
- Based on ASR582 Soc
- The maximum transmit power is 20 dBm
- Internal Integrated 4 MB Flash and 352 KB RAM
- Rich peripherals, including 15 GPIO
- Support OTA upgrade using internal Flash
- Supports PCB antenna and external IPEX antenna interface

- **Potential target customers**

- Conventional power supply equipment, pursuing the ultimate cost performance
- Base this mode (module connected to other MCU by serial port) to develop Matter products

- **Potential target market**

- Electricians, lighting, thermostats, sensors, kitchen appliances, door locks, curtain motors, etc.



# Matter Module Roadmap

**HOPERF**

2023

2024

2025

Matter  
over  
Thread  
Module



HM-MT2401



HM-MT2401B

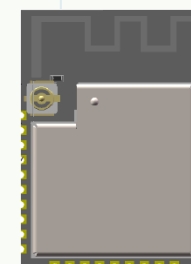


HM-MT2401C

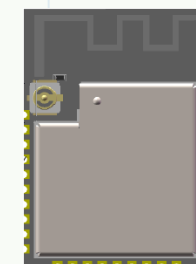
Matter  
over  
Wi-Fi  
Module



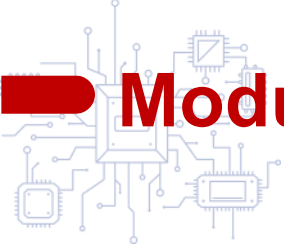
Wi-Fi 4 / BLE  
HM-MT5801



Wi-Fi 6 / BLE



Wi-Fi 6  
2.4 GHz & 5.8 GHz

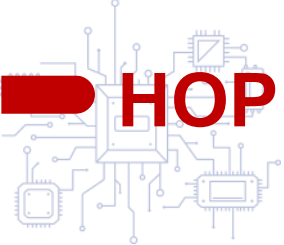


# Module Selection Guide

**HOPERF**

Module Model	Protocol	Standard (Default)	Enhanced Security (Optional)	External Flash (Optional)	Custom Hardware Module (Optional)
HM-MT2401	Thread/BLE	√	√	√	Module size, antenna type, chip model, special needs customization, etc.
HM-MT2401B	Thread/BLE	√	√	√	
HM-MT2401C	Thread/BLE	√	√	√	
HM-MT5801	Wi-Fi/BLE	√	-	-	





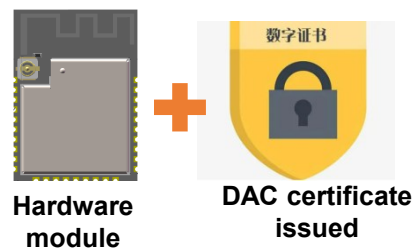
# HOPERF Matter Customer Service Model

**HOPERF**

**Service Model 1**



**Service Model 2**

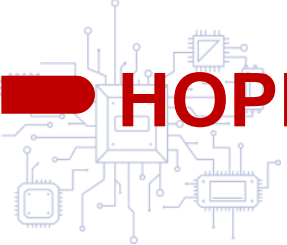


**Service Model 3**



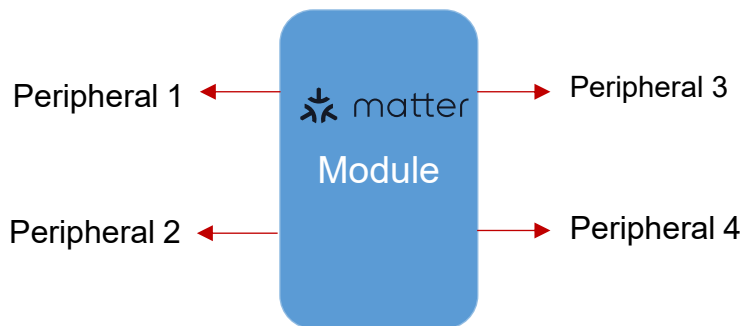
**Service Model 4**



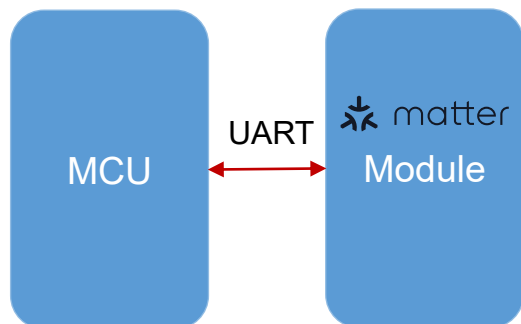


# HOPERF Matter Development Service

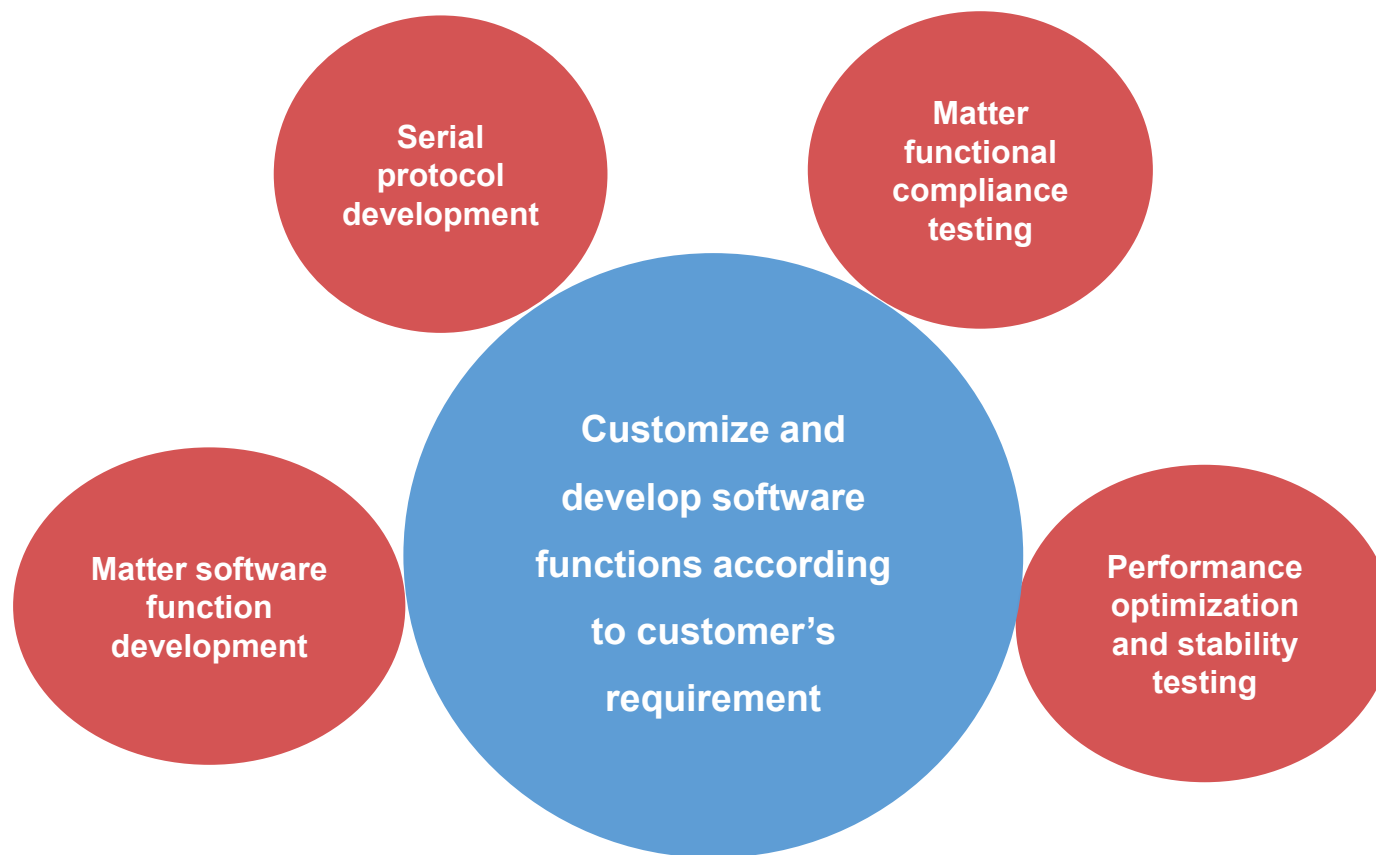
**HOPERF**

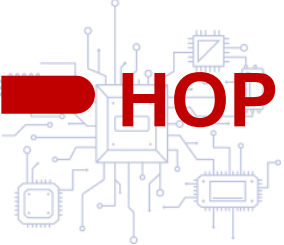


**Example : SoC Mode**



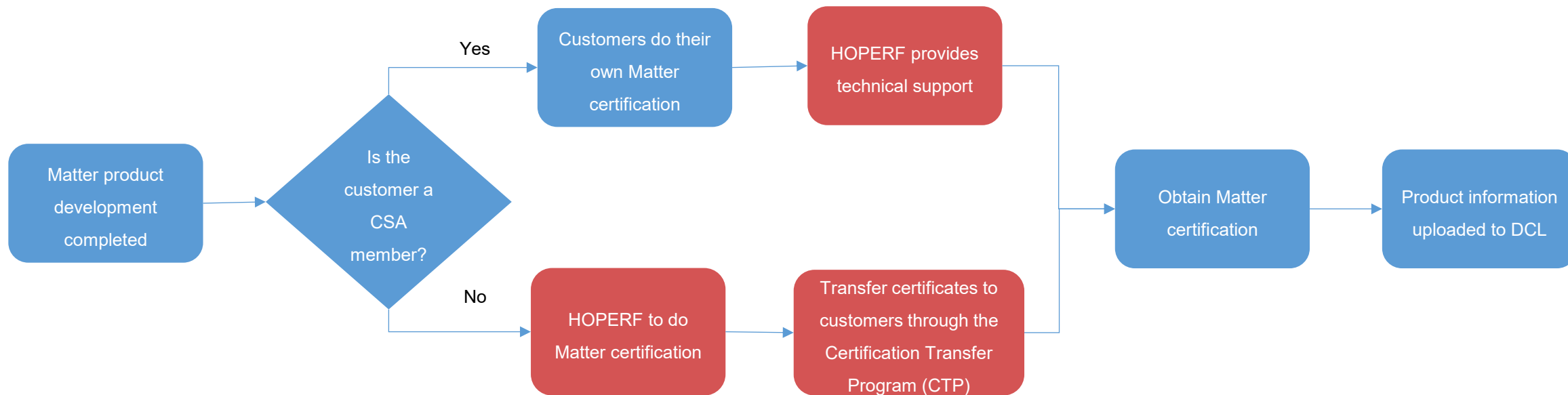
**Example : Serial communication mode**

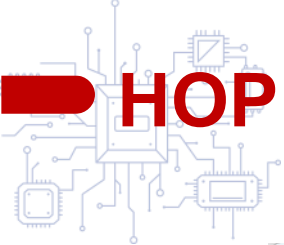




## Bring **Credibility** to Your Product

Certification shows interoperability with respective certified products.  
Show the market your commitment to quality.



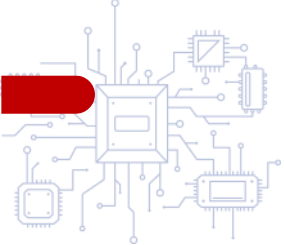


# HOPERF Matter Manufacturing Tool

HOPERF



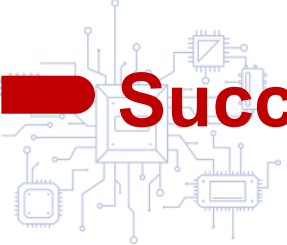
- Mature and stable Matter mass production solution
- Matter manufacturing tool
  - Designed by HOPERF
  - DAC certificate burning
  - CD certificate burning
  - Configure network parameter burning
  - Matter firmware burning
  - Bootloader burning
  - QR Code Print



matter

**Why Choose HOPERF?**



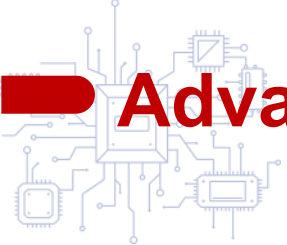


# Successful Case

**HOPERF**



- **Matter/Zigbee PIR Dual Protocol Product**
  - Customer is Fortune Global 500
  - Extremely complex function
  - Lots of customized functions
  - High safety requirements
  - High power consumption requirements
  - High test requirements
- **Achieve the project successfully**
  - Completed the project on time(nearly 8 months)
  - Customers highly recognize professional ability
  - Awarded "Technical Collaboration Award"



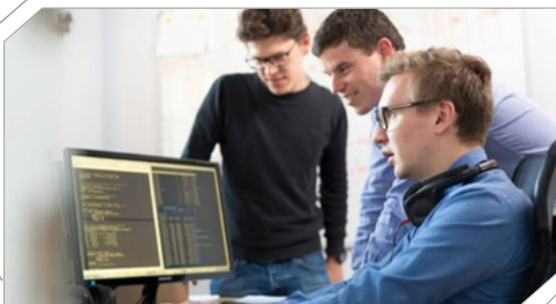
# Advantages of HOPERF Matter Solution

**HOPERF**

01

## Professional technical team

- In-depth understanding of Matter protocol
- Very familiar with the Silicon Labs platform
- Rich experience in Matter certification and mass production



02

## Keep up with Matter Standard

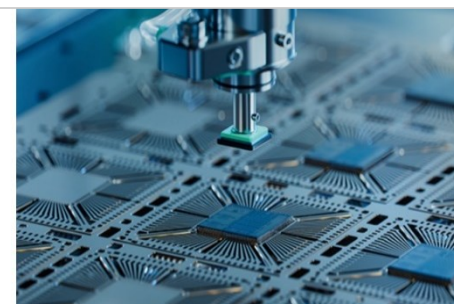
- Keep an eye on the evolution and iteration of Matter standards
- Early involved in hot technologies like Aliro/NFC
- Technology sharing in CMGC Matter interest group

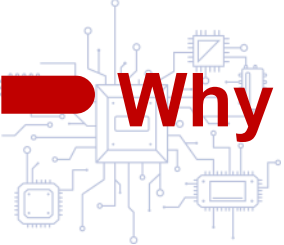


03

## Stable supply chain system

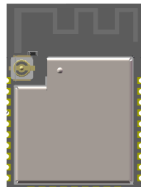
- More than ten years of stable cooperation with upstream chip manufacturers
- With the module production plant, the quality and effectiveness can be controlled
- Efficient modular automated production test pipeline





# Why Choose HOPERF Matter?

**HOPERF**



Hardware Module



Matter Software  
Development Service



**CERTIFICATION**

Matter Certification Pre-test



Factory Manufacturing



DAC certificate  
issuance



## Formidable R&D capabilities

HOPERF boasts a Matter R&D team composed of top experts in the industry, equipped with extensive experience and expertise in Matter software development and innovative technologies.



## Diverse collaboration models

HOPERF offers a tailored one-stop solution, including hardware modules, Matter software development, DAC certificates, and certification testing, to meet diverse customer needs.



## Agile production capabilities

HOPERF has an agile module mass production process, responding promptly to customer needs with efficient solutions. Comprehensive technical support is provided to ensure the smooth deployment of Matter products.

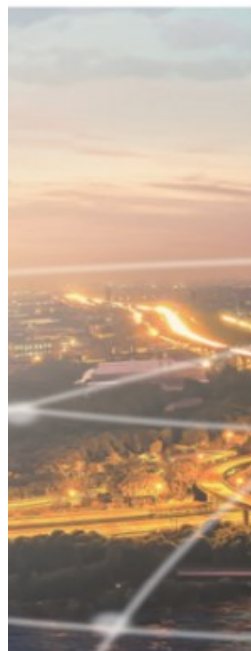


# Win-Win Cooperation

**HOPERF**



matter



**HOPERF**

## Our Mission:

Significantly shortening the development cycle,  
Enabling customers to achieve more with less effort,  
Easily seizing market opportunities!

HOPERF is a research-oriented high-tech enterprise in the semiconductor wireless communication field. Throughout its extensive research and development efforts, HOPERF has established a highly experienced, efficiently innovative team of technical talents, providing essential support for continually enhancing HOPERF's independent innovation capabilities and advancing technological expertise.

As of June 2023, HOPERF has accumulated numerous professional certifications, including 14 invention patents, 14 utility model patents, 5 design patents, and 103 software copyrights. This comprehensive set of patents, along with non-patent technologies, reflects HOPERF's rich research achievements.



## Collaborative Development for a Win-Win Future

As of March 2023, HOPERF has successfully provided efficient and high-quality chip products and services to over 3,000 customers in more than 50 countries, earning widespread recognition.

**HOPERF**

# THANKS



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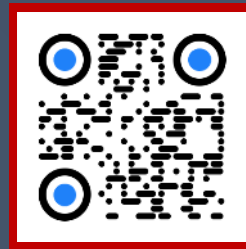
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