

FORESEE[®]
More than Foresee

BRAND INTRODUCTION

Shenzhen Longsys Electronics Co., Ltd.

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1.

**BRAND
INTRODUCTION**



Focusing on Industry Applications

The industry storage brand FORESEE was founded in 2011. Powered by technology, focused on customers, and driven by innovation, FORESEE has been engaged in the memory and storage industry for many years.

It owns four product lines: embedded storage, mobile memory, solid-state drive, and memory module, offering memory and storage solutions for commercial, industrial, automotive and enterprise grade applications.

FORESEE has made continuous efforts in independent R&D as well as comprehensive quality control. It develops new products based on industry trends and market demands to optimize performance, expand storage capacity, reduce power consumption, and improve overall quality. FORESEE also provides professional and prompt technical support and market services. With the capability to deliver industry-grade storage product solutions and extensive delivery experience, FORESEE serves customers with high-quality, high-performance, and innovative storage products and solutions, establishing long-term, stable, and deep cooperation relationships with multiple high-end customers across various industries.

As a brand with industry-oriented values and a strong sense of responsibility, FORESEE will continue to strengthen its competitiveness edge in the storage industry and empower storage development and innovation across the various industries with cutting-edge technology, excellent quality and superior services.





Brand Milestone

2011

Established FORESEE brand
Established Embedded storage product line and solid-state drive product line
Released eMMC

2012

Released high-speed TSOP SD
Longsys opens up a new world in the field of protocol memory chips

2014

Released eMCP
eMMC and LPDDR3 packaged together

2018

Released the World's first 1TB UFS product and 1TB PCIe BGA SSD

2019

Established memory module product line

2020

Released automotive eMMC
Released pSLC microSD card

2021

Released DDR5 memory module

2022

Released automotive UFS
Released the first in-house chip 512Mb SPI NAND Flash

2023

Released LPDDR5
Released DDR5 RDIMM
Released enterprise SSD
Released the first in-house PCIe Gen4 BGA SSD

2024

Released LPCAMM2
Released CXL2.0 Memory Expansion Modules

Brand Advantages



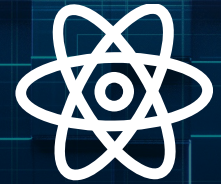
PROFESSION

High-quality independent firmware



EFFICIENCY

Local service and mass
production capabilities



INNOVATION/ CUSTOMIZATION

Application customization product
innovation

Brand Advantages

FORESEE focuses on high-quality tech-based brands, and spares no effort in developing and innovating industry-level storage products under the brand values of “open cooperation, excellent quality, leading technology, and permanent pioneering”

VALUE OF CUSTOMER

- Compensation ability
- Quality and service assurance
- Difference and innovation
- Full product solution support

VALUE OF PARTNER

- Group cooperation in high growth
- Specialization of the industrial chain
- Massive and long-term market development opportunities
- Mutual respect and equality
- Teamwork
- Integrity and cultural identity



02.

**PRODUCT
INTRODUCTION**



Production Classification

	Embedded Storage	Mobile Memory	Solid-State Drive	Memory Module
Commercial	eMMC/UFS/LPDDR/DDR4/ eMCP/uMCP/ePOP	SD/micro SD	2.5inch/M.2/mSATA/BGA SSD (SATA&PCIe)	DDR4 SODIMM/DDR4 UDIMM/ DDR5 SODIMM/DDR5 UDIMM LPCAMM2
Small Capacity	SPI NAND Flash(SLC&MLC)/ DDR3L/Parallel NAND Flash/nMCP			
Industrial	eMMC/DDR3L	SD/micro SD	2.5inch/M.2/mSATA SSD (SATA)	DDR4 SODIMM/ DDR4 VLP-UDIMM
Automotive	eMMC/UFS SPI NAND Flash			
Enterprise			2.5inch eSSD (SATA&PCIe)	DDR4 RDIMM/DDR5 RDIMM/ CXL2.0 Memory Expansion Modules

Embedded Storage

Industrial/Industrial Wide-temperature/Automotive eMMC

eMMC

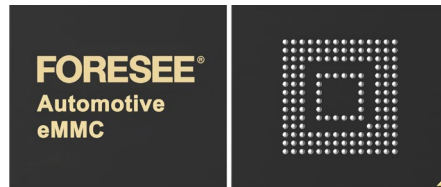


NAND Flash: QLC / MLC / TLC

Capacity: 4GB / 8GB / 16GB / 32GB / 64GB / 128GB / 256GB / 512GB

Interface: eMMC5.1

Size: 11.5*13*0.8/1.0 mm;
9*10/7.5*0.8 mm(Subsize)

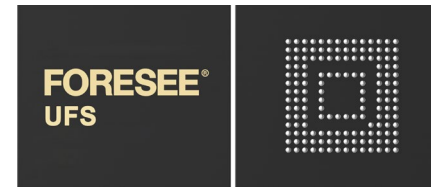


NAND Flash: pSLC / MLC / 3D NAND

Operating Temperature: -40°C~85°C
-40°C~105°C

Capacity: 4GB / 8GB / 16GB / 32GB / 64GB / 128GB / 256GB / 512GB

UFS



Capacity: 64GB / 128GB / 256GB / 512GB

Interface: UFS 2.2

Size: 11.5*13*1.0 mm

Automotive UFS



Operating Temperature: -40°C~105°C

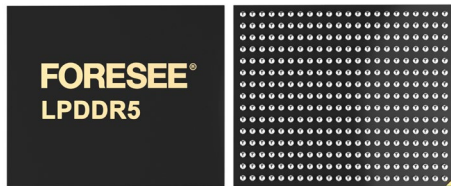
Capacity: 64GB / 128GB / 256GB

Interface: UFS 2.1 / UFS 3.1



Embedded Storage

LPDDR



Capacity: 16Gb / 24Gb / 32Gb / 48Gb / 64Gb

Interface: LPDDR4: 3733Mbps / 4266Mbps
LPDDR4x: 4266Mbps
LPDDR5: 5500Mbps

Size: LPDDR4&4x: 10 x 14.5 x 1.0 mm
LPDDR5: 12.4 x 15 x 1.0/1.1 mm

eMCP

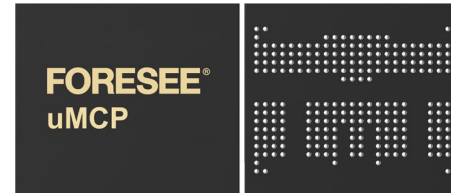


Capacity: 16GB+8Gb / 64GB+32Gb / 128GB+32Gb

Interface: eMMC5.1 + LPDDR3/LPDDR4x

Package: 221ball / 254ball

uMCP



Capacity: 64GB+32Gb / 128GB+32Gb

Interface: UFS 2.2 + LPDDR4x

Package: 254ball

ePOP



Capacity: 8GB+8Gb / 32GB+8Gb / 32GB+16Gb / 64GB+8Gb / 64GB+16Gb

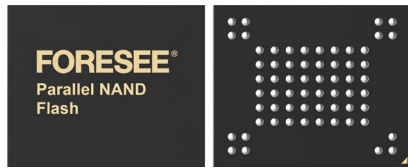
Capacity: eMMC 5.1 + LPDDR3/LPDDR4x

Package: 136ball / 144ball



Embedded Storage

Parallel NAND Flash



Package: TSOP 48L / BGA 63 / BGA 48

Capacity: 1Gb / 4Gb / 8Gb

Bit wide: x8

SPI NAND Flash



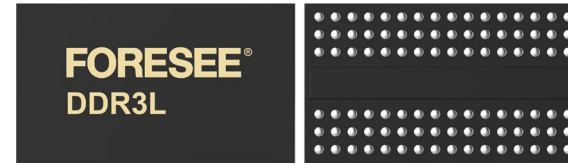
Package: WSON8

Capacity: 512Mb / 1Gb / 2Gb / 4Gb

Size: 8*6 mm / 6*5 mm

Operating Temperature: -40°C~85°C
-40°C ~105°C
(Automotive Grade 2)

DDR3L



Package: BGA 96

Capacity: 2Gb / 4Gb

Data Rate: 1866Mbps

Operating Temperature: -0°C~95°C
-40°C ~95°C(Industrial)

NAND-based MCP



Package: TFBGA 162 / WFBGA 149

Capacity: 1Gb+1Gb / 2Gb+1Gb / 2Gb+2Gb / 4Gb+2Gb / 4Gb+6Gb / 4Gb+8Gb / 8Gb+6Gb / 8Gb+8Gb

Interface: NAND Flash + LPDDR2 / LPDDR4x

EMBEDDED STORAGE

QLC eMMC

Advanced process, higher density



512GB

Take the lead in releasing high-capacity QLC eMMC

QLC

QLC has higher density, larger capacity and better performance than MLC and TLC

In-house Main Controller & Packaging and Testing

Adopt Longsys in-house main controller chip WM6000 and package in Longforce

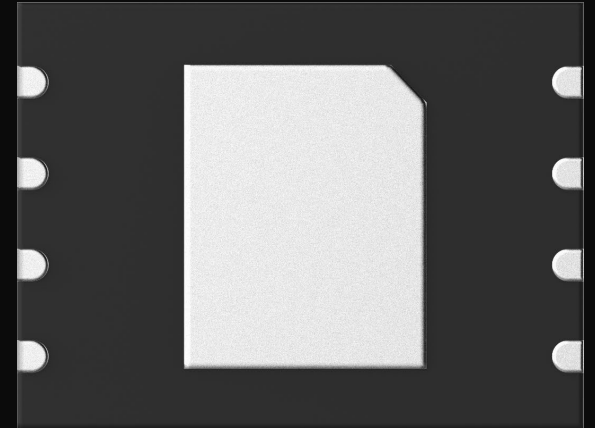
Up to 340MB/s / 300MB/s*

With Longsys in-house firmware algorithms to achieve stable performance, empowering the high-capacity mobile phone market

EMBEDDED STORAGE

SPI NAND Flash

Differentiated design, both cost reduction and efficiency



512Mb

The first 512Mb SPI NAND Flash product in mainland China

WSON

Small size, and reduced PCB space
Size : 8*6* mm / 6*5 mm

-40°C ~85°C

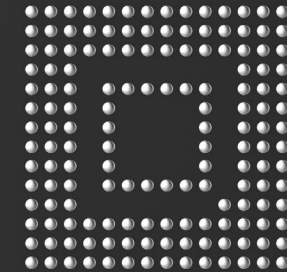
It has passed rigorous industrial-grade testing with over 50 major items and a total of 80 sub-items.

Multi-industry Applications

Smart watches, wearable devices, communication CPE, communication modules, security monitoring, smart homes, smart locks, etc.

EMBEDDED STORAGE

FORESEE®
Automotive
UFS



Automotive UFS

Powers Automotive Storage Upgrades

64GB~256GB

The first automotive UFS product in mainland China

Read Speed Increased Six-fold

Have more than 6x higher read performance and more than 4x higher write performance than eMMC products

-40°C~105°C

Have all undergone rigorous reliability standard qualification tests to ensure their long-term, stable and reliable operation

AEC-Q100

Adopt manufacturers' automotive resources and high-quality components along with Longsys's in-house firmware algorithms

Mobile Memory

EPLUS V10 microSD

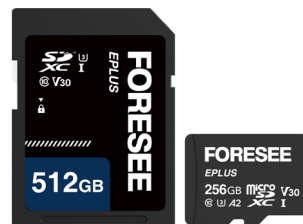


Capacity: 8GB / 16GB / 32GB

Operating Temp.: -25°C~85°C

Transmission Speed: Up to 100MB/s

EPLUS V30 microSD/SD



Capacity: 32GB / 64GB / 128GB / 256GB / 512GB

Operating Temp.: -25°C~85°C

Transmission Speed: Up to 100MB/s

Industrial SD/ microSD

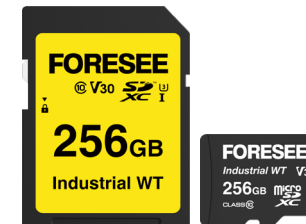


Capacity: 32GB / 64GB / 128GB / 256GB / 512GB

Operating Temp.: -25°C~85°C

Durability: < 500 PPM

Industrial WT SD/microSD



Capacity: 8GB / 16GB / 32GB / 64GB / 128GB / 256GB

Operating Temp.: -40°C~85°C

Durability: 5000/3000 P/E

Industrial pSLC microSD



Capacity: 8GB / 16GB / 32GB / 64GB / 128GB

Operating Temp.: -40°C~85°C

Durability: 3000 P/E

MOBILE MEMORY

Industrial pSLC microSD Card

High stability, durability, compatibility, and performance



pSLC

pSLC storage chips of high reliability

30,000 P/E

High durability of 30,000 P/E

-40°C ~ 85°C

Industrial wide-temperature of
-40°C ~ 85°C

Write/Read

Stable order and random
read/write

Long Service Life

Service life of over 5 years

Pre-exchange

Pre-exchange, ECC error correction,
balanced wear

3 Types of Protection

Anti-static, anti-vibration,
moisture-proof

Health Assessment

Smart health monitoring

2.7V ~ 3.6V

Operating voltage: 2.7V~3.6V

Power Failure Protection

Data protection in case of
unexpected power failure

Solid-State Drive

ORCA 4836 Series Enterprise NVMe SSD



NAND Flash:	128 layer 3D eTLC
Type:	U.2 2.5inch
Interface:	PCIe Gen4*4
Capacity:	1.6TB / 1.92TB / 3.2TB / 3.84TB / 6.4TB / 7.68TB
Sequential Read & Write:	Up to 6800MB/s / 4600MB/s
Random Read & Write IOPS:	Up to 1000K / 380K
Power Consumption:	Active:<=14W Idle:<=5W
Endurance (DWPD) :	1.0./2.6/3.0

UNCIA 3836 Series Enterprise SATA SSD



NAND Flash:	128 layer 3D eTLC
Type:	U.2 2.5inch
Interface:	SATA III
Capacity:	480GB / 960GB / 1.92TB / 3.84TB
Sequential Read & Write:	Up to 560MB/s / 520MB/s
Random Read & Write IOPS:	Up to 95K / 50K
Power Consumption:	Active:<=4W Idle:<=2W
Endurance (DWPD) :	1.0

Solid-State Drive

XP2200 PCIe SSD



Type:	M.2 2280
Interface:	PCIe Gen4*4
Capacity:	512GB / 1TB / 2TB
Sequential Read & Write:	Up to 7100MB/s / 6700MB/s
Random Read & Write IOPS:	Up to 1190K / 1100K

XP2200 PCIe SSD



Type:	BGA(11.5*13mm)
Interface:	PCIe Gen4*2
Capacity:	128GB / 256GB / 512GB / 1TB
Sequential Read & Write:	Up to 3500MB/s / 3450MB/s
Random Read & Write IOPS:	Up to 260K / 220K

XP2000 PCIe SSD



Type:	PCIe Gen4*4
Interface:	M.2 2280/2242/2230
Capacity:	128GB / 256GB / 512GB / 1TB
Sequential Read & Write:	Up to 5200MB/s / 4700MB/s
Random Read & Write IOPS:	Up to 810K / 940K

XP1000 PCIe SSD



Type:	M.2 2280
Interface:	PCIe Gen3*4
Capacity:	128GB / 256GB / 512GB / 1TB / 2TB
Sequential Read & Write:	Up to 3500MB/s / 3200MB/s
Random Read & Write IOPS:	Up to 366K / 286K

Solid-State Drive

Industrial SSD



Type:	M.2 2280/2242, mSATA, 2.5inch
Interface:	SATA III
Capacity:	8GB / 16GB / 32GB / 64GB / 128GB / 256GB / 512GB / 1TB
Operating Temperature:	-40°C~85°C
Random Read & Write IOPS:	Up to 559MB/s

S435 SATA SSD



Type:	2.5inch
Interface:	SATA III
Capacity:	512GB / 1TB / 2TB
Sequential Read & Write:	Up to 540MB/s / 510MB/s
Random Read & Write IOPS:	Up to 46K / 55K

S423 SATA SSD



Type:	M.2 2280, mSATA, 2.5inch
Interface:	SATA III
Capacity:	128GB / 256GB / 512GB / 1TB / 2TB
Sequential Read & Write:	Up to 540MB/s / 510MB/s
Random Read & Write IOPS:	Up to 52K / 57K

S326 SATA SSD



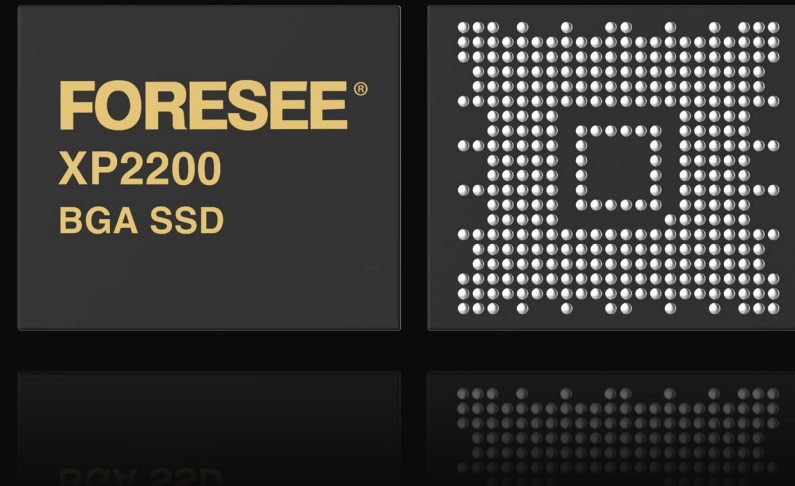
Type:	M.2 2280, mSATA, 2.5inch
Interface:	SATA III
Capacity:	64GB / 128GB / 256GB / 512GB / 1TB
Sequential Read & Write:	Up to 540MB/s / 480MB/s
Random Read & Write IOPS:	Up to 52K / 57K



SOLID-STATE DRIVE

XP2200 PCIe Gen4 SSD

More lightweight mobile smart terminal storage



3500MB/s*

Read/write performance is up to 3,500MB/s and 3,450MB/s*

260K*

Random read/write performance is up to 260K IOPS and 220K IOPS*

PCIe 4.0

Support PCIe Gen4*2 DRAM-less standard

11.5*13 mm

The thickness of the 1TB capacity option is no more than 1.35mm



SOLID-STATE DRIVE

ORCA 4836 Series Enterprise NVMe SSD

Stable and Steady



6,800MB/s*

Sequential read speeds of up to 6,800 MB/s and sequential write speeds of up to 4,600 MB/s*

1000K*

It delivers reach 1000K Random Read IOPS and 380K Random Write IOPS*

7.68TB

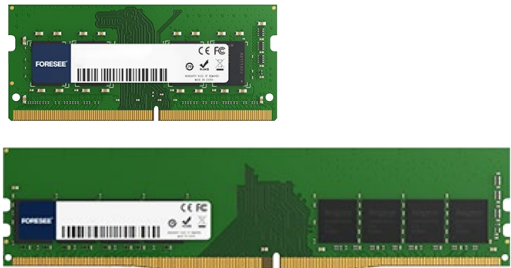
Support the capacity of 1.92TB, 3.84TB, 7.68TB, 1.6TB, 3.2TB and 6.4TB

PCIe Gen 4*4

PCIe Gen4 U.2 SSD supports NVME1.4

Memory Module

Commercial Memory Module



Type: SODIMM, UDIMM

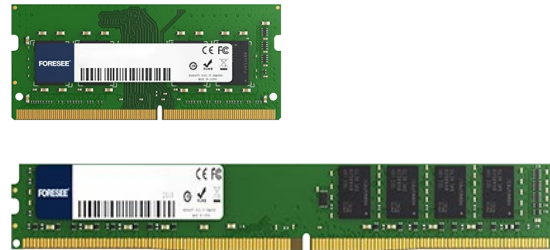
Data Rate: 3200Mbps / 5600 Mbps

DDR: DDR4 / DDR5

Capacity: 8GB / 16GB

Architecture: 1Rx8

Industrial Memory Module



Type: SODIMM

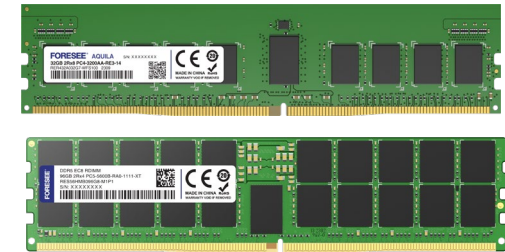
Data Rate: 3200Mbps

DDR: DDR4

Capacity: 4GB / 8GB / 16GB / 32GB

Architecture: 1R×8 / 2R×8 / 1R×16

Enterprise Memory Module



Type: RDIMM

Data Rate: 3200Mbps / 5600 Mbps

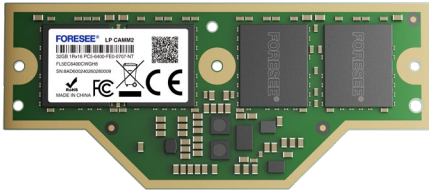
DDR: DDR4 / DDR5

Capacity: 16GB / 32GB / 64GB / 96GB

Architecture: 2R×4 / 2R×8

Memory Module

LPCAMM2



DRAM: LPDDR5/LPDDR5x

Frequency: 6400MT/s+

Capacity: 16GB /32GB / 64GB

Operating Voltage: VIN BULK 4.25V~5.5V

Bit Width: 2DPC

CXL2.0 Memory Expansion Modules



Form Factor: EDSFF (E3.S 2T)

Protocol: CXL 1.1/2.0

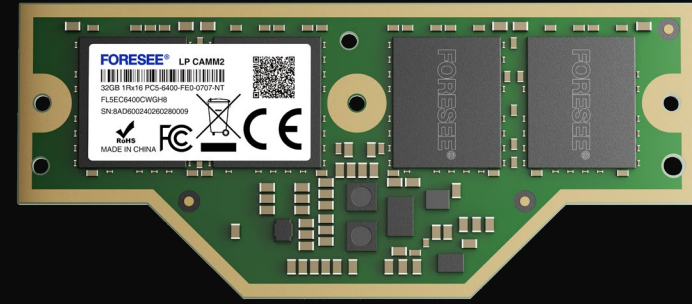
DDR: DDR5

Interface: Support PCIe 5.0X8 lanes

Bandwidth: 32GB/s

Capacity: 64GB / 128GB / 192GB / 512GB*

MEMORY MODULE



LPCAMM2

Accelerating on-device AI landing and leading the new shape of memory

Higher Speed

LPDDR5/5X based, speeds up to 6,400MT/s* and above

Lower Power Consumption

Large area of contact with PCB to improve heat dissipation performance;
Reduce power consumption by more than 50% compared to SODIMMs

Higher Capacity

Available in capacities from 16GB to 64GB

Lighter & Thinner

More than 60% space savings compared to SODIMMs

Easier maintenance

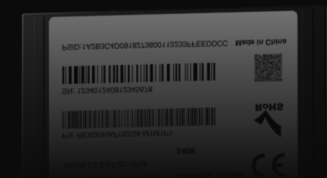
High-speed connector contacts to reduce damage and ESD;
Support upgrades and low maintenance costs

*Data is sourced from internal testing of Longsys. The actual performance may vary between different devices

MEMORY MODULE

CXL2.0 Memory Expansion Modules

Empowering cloud AI to achieve better performance



Large-capacity

Support multiple capacity options, available in 64GB, 128GB, 192GB and 512GB

High-speed

Gen 5.0 32GT/s*

Low latency

240ns

Innovative Stack Technology

Achieves 2x the industry mainstream capacity

Wide range of adaptations

Open source API, compatible with CXL 1.1/2.0

Low Cost, High Expansion

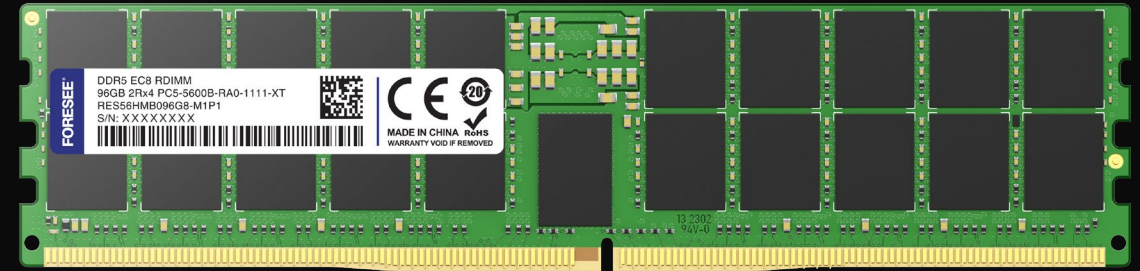
Improve storage ROI

*Data is sourced from internal testing of Longsys. The actual performance may vary between different devices

MEMORY MODULE

AQUILA Series Enterprise DDR5 RDIMM

The DDR5 RDIMMs are based on the JEDEC Raw Card. They have undergone meticulous optimization and simulation to achieve a design with independent intellectual property. In addition, the hardware is made from materials with excellent high-frequency performance, including reliable and temperature-resistant components, and featuring DDR5 chips produced using original mature processes. They support an 80-bit width and ECC error correction and their reliability and stability meet the requirements of data center products.



**32GB / 64GB
96GB**

Multiple capacity options, up to 96GB

5600MT/s*

The speed meets the requirements of mainstream servers

In-house PCBs

Enhance signal quality and reduce noise from the power supply

On die ECC

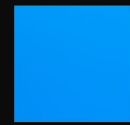
Improve reliability and reduces failure rates through internal DRAM error correction

32-bit sub-channel design

Reduce latency and enhances channel performance

03.

APPLICATIONS



Main Applications

Serving more than 100 market segments and industry applications



Smart phone



Tablet



Smart TV



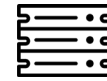
Smart watch



Dash cam



AR/VR device



Server



Smart earphone



Data Center



TV box



Smart projector



Smart speaker



Smart band



Laptop



Financial payment



Smart cam



Commercial display device



3/4/5G Module



STB



Industrial Motherboard



In-vehicle DVR



Billboard



Security monitoring



Switch



Player



Multi-media central control



T-Box



streaming rear-view mirror



Medical equipment



Industrial Control



communication base stations



Children toy



Learning machine



Educational machine



GoPro



Cloud terminal



Industrial black box



Industrial PC



Smart power grid

.....

FORESEE® More than
Foresee

**Broaden the Scope of Industry
Empower the Future of Storage**

THANK YOU

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