

# “Best DRAM Partner For Smart World”



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# Content

About Nanya	P2
Global Footprint	P2
Consumer DRAM	P3
KGD	P4
Mobile DRAM	P5~6
Server Module	P7
PC Module	P7~8
Authorized Distributors	P9
Sales Representatives	P10

# About Nanya

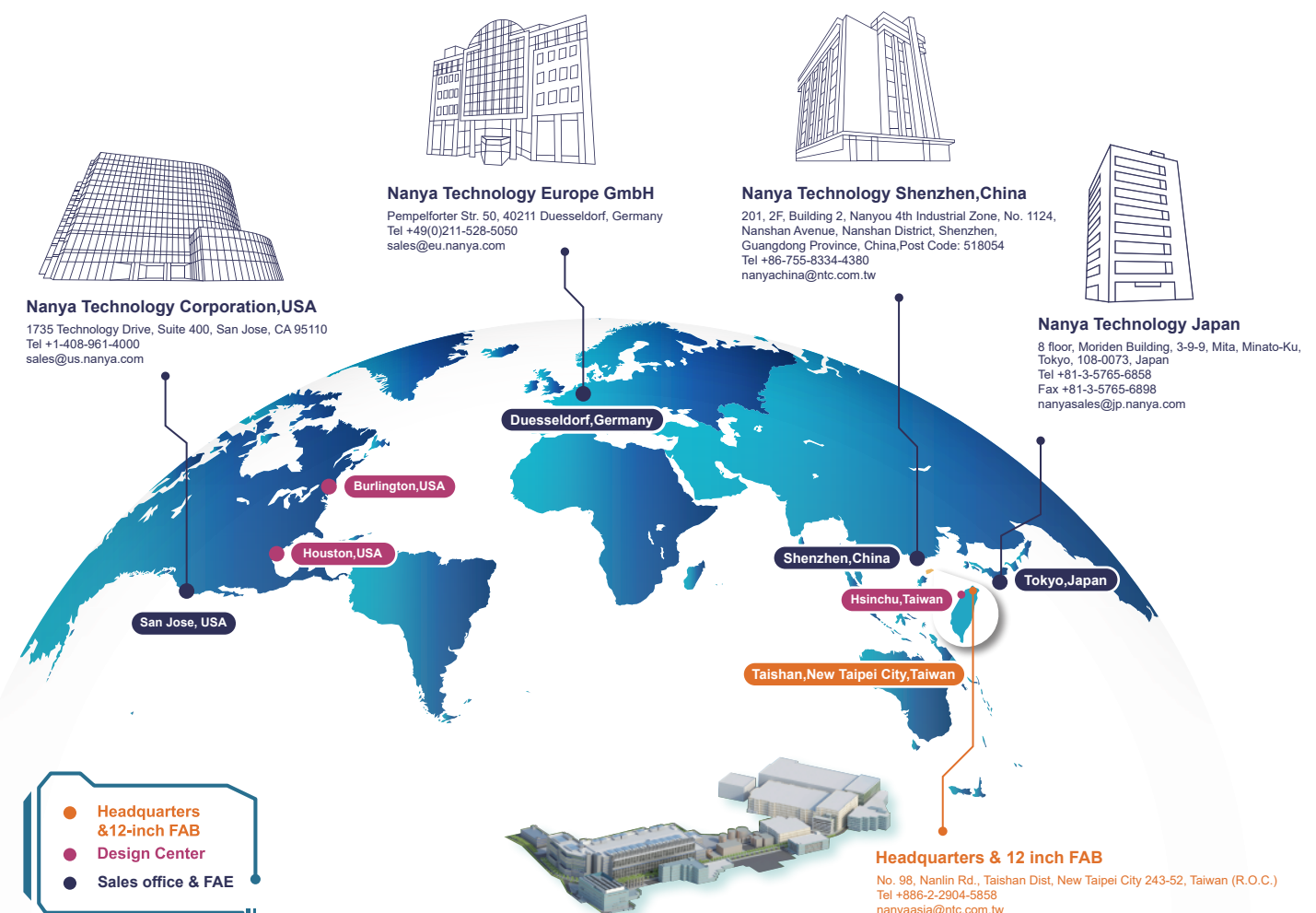
## Focusing on DRAM

Nanya Technology holds innovation as our core value which is realized in the company's dedication to research and develop, design, manufacture, marketing, and sales of Dynamic Random Access Memory (DRAM). Nanya's commitment to research and development has enabled the company to accumulate extensive DRAM expertise and intellectual property. A true leader in corporate citizenship, Nanya has proactively implemented green manufacturing technology. Nanya has harnessed the power of artificial intelligence (AI) to significantly upgrade production capacity and efficiency. The result is a company that provides industry leading DRAM solutions in a way that is environmentally friendly to our planet.

## Being the Best DRAM Partner for Smart World

DRAM is a critical component of the smart world. Smartphones and servers used in data centers have been the primary drivers of DRAM development and demand. In the 5G and AI era, demand will continue to grow as the applications of DRAM use further diversify with the boom of various smart-connected devices. Providing value added products and services to customers is paramount at Nanya. Nanya's focus on innovation has resulted in the successful development of 10nm class DRAM process technology which will enable the next three generations of DRAM solutions including DDR5 and LPDDR5 products. Nanya also planned to invest NT\$360 billion for a FAB upgrade and a new FAB. The first-generation 10nm class process technology (1Anm), 8Gb DDR4 chip has begun pilot production, and expect small-scale production by the end of 2022. Meanwhile, the second product DDR5 will be ready for pilot runs. The development of the second-generation 10nm class process technology (1Bnm) and products are on schedule, and expect to begin a small-scale production in year 2023. Combined, Nanya will provide customers with a complete product lineup to meet the rising needs of the 5G era and smart world.

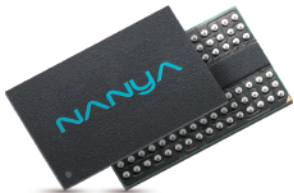
# Global Footprint



# Consumer DRAM



Available Generation   DDR5 | DDR4 | DDR3 | DDR2  
Available Densities   512Mb | 1Gb | 2Gb | 4Gb | 8Gb | 16Gb



## DDR5 SDRAM

Density	Org	Voltage	Package	Speed	Commercial	IT	Automotive	
							G2	G3
8Gb	x8	1.1V	78-ball BGA	4400/4800	Q1'23	-	-	-
16Gb	x4/x8 x16	1.1V	82-ball BGA 106-ball BGA	5600	Q1'24	Q2'24	-	-

## DDR4 SDRAM

Density	Org	Voltage	Package	Speed	Commercial	IT	Automotive	
							G2	G3
4Gb	x4/x8 x16	1.2V	78-ball BGA 96-ball BGA	2666/3200	Now	Now	-	-
8Gb	x4/x8 x16	1.2V	78-ball BGA 96-ball BGA	2666/3200	Now	Now	-	-
16Gb	x4/x8 x16	1.2V	78-ball BGA 96-ball BGA	2666/3200	Q3'23	Q4'23	-	-

## DDR3 SDRAM

Density	Org	Voltage	Package	Speed	Commercial	IT	Automotive	
							G2	G3
1Gb	x8 x16	1.5V 1.35V	78-ball BGA 96-ball BGA	1600/1866/2133	Now	Now	Now	Now
2Gb	x8 x16	1.5V 1.35V	78-ball BGA 96-ball BGA	1600/1866/2133	Now	Now	Now	Now
4Gb	x8 x16	1.5V 1.35V	78-ball BGA 96-ball BGA	1600/1866/2133	Now	Now	Now	Now

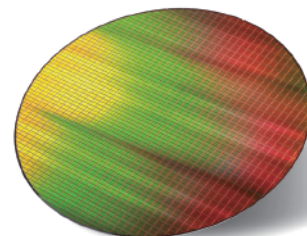
## DDR2 SDRAM

Density	Org	Voltage	Package	Speed	Commercial	IT	Automotive	
							G2	G3
512Mb	x8 x16	1.8V	60-ball BGA 84-ball BGA	800/1066/1333	Now	Now	Now	Now
1Gb	x8 x16	1.8V	60-ball BGA 84-ball BGA	800/1066	Now	Now	Now	Now



**Available Generation** LPDDR4 | LPDDR3 | LPDDR2 | DDR4 | DDR3 | DDR2

**Available Densities** 512Mb | 1Gb | 2Gb | 4Gb | 8Gb | 16Gb



Density	Org	Voltage	Generation	Speed	Commercial
2Gb	x16	1.1V (VDDQ=0.6V)	LPDDR4X	3733/4267	Now
4Gb					Now
8Gb					Now
16Gb					Q1'25
2Gb	x16	1.1V	LPDDR4	3733/4267	Now
4Gb					Now
8Gb				3733	Now
4Gb	x16/x32	1.2V	LPDDR3	1866/2133	Now
8Gb					Now
2Gb	x32	1.2V	LPDDR2	1066	Now
4Gb					Now
4Gb	x8/x16	1.2V	DDR4	3200	Now
8Gb				2933/3200	Now/Q4'23
1Gb	x8/x16	1.35V/1.5V	DDR3	2133	Now
2Gb					Now
4Gb					Now
512Mb	x8/x16	1.8V	DDR2	1333	Now

# Mobile DRAM



**Available Generation** LPDDR4X | LPDDR4 | LPDDR3 | LPDDR2

**Available Densities** 1Gb | 2Gb | 4Gb | 8Gb | 16Gb | 32Gb



## LPDDR4X

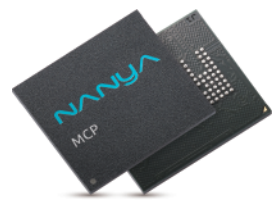
Density	Org	Voltage	Package	Speed	Commercial	IT	Automotive	
							G2	G3
2Gb	x16	1.1V (VDDQ=0.6V)	200-FBGA SDP	3733/4267	Now	-	-	-
4Gb	x16	1.1V (VDDQ=0.6V)	200-FBGA SDP	3733/4267	Now	-	-	-
	x32		200-FBGA DDP			Now	Q1'23	
8Gb	x16	1.1V (VDDQ=0.6V)	200-FBGA SDP	3733/4267	Now	-	-	-
	x32		200-FBGA DDP		Now	Now	-	-
16Gb	x32	1.1V (VDDQ=0.6V)	200-FBGA DDP	3733/4267	Now	Now	Q1'23	
	x64		376-PoP QDP	3733	Now	-	-	-
32Gb	x32	1.1V (VDDQ=0.6V)	200-FBGA QDP	3733/4267	Q4'22	Q1'23	Q2'23	
			200-FBGA DDP		Q1'25	-	-	-
	x64		376-PoP QDP	3733	Q1'23	-	-	-

## LPDDR4

Density	Org	Voltage	Package	Speed	Commercial	IT	Automotive	
							G2	G3
2Gb	x16	1.1V	200-FBGA SDP	3733/4267	Now	-	-	-
4Gb	x16	1.1V	200-FBGA SDP	3733/4267	Now	Now	-	-
	x32		200-FBGA DDP			Now	Q1'23	
8Gb	x16	1.1V	200-FBGA SDP	3733/4267	Now	Now	-	-
	x32		200-FBGA DDP		Now	Now	Now	
16Gb	x32	1.1V	200-FBGA DDP	3733/4267	Now	Now	Now	Now
32Gb	x32	1.1V	200-FBGA QDP	3733	Now	Now	Now	Now

## LPDDR3

Density	Org	Voltage	Package	Speed	Commercial	IT	Automotive	
							G2	G3
4Gb	x32/x16	1.2V	178-FBGA	1866/2133	Now	-	-	-
8Gb	x32	1.2V	178-FBGA SDP	1866/2133	Now	-	-	-
	x64		216-PoP DDP		Now	-	-	-
			256-PoP DDP		Now	-	-	-
16Gb	x32	1.2V	178-FBGA DDP	1866/2133	Now	-	-	-
			168-PoP DDP	1866	Now	-	-	-
	x64		256-PoP DDP		Now	-	-	-
			216-PoP DDP		Now	-	-	-
			253-PoP DDP		Now	-	-	-
32Gb	x32	1.2V	178-FBGA DDP	1866/2133	Now	-	-	-
	x64		256-PoP QDP	1866	Now	-	-	-
			216-PoP QDP		Now	-	-	-
			253-PoP QDP		Now	-	-	-



## LPDDR2

Density	Org	Voltage	Package	Speed	Commercial	IT	Automotive	
							G2	G3
1Gb	x32	1.2V	168-PoP	1066	Now	-	Now	-
			134-FBGA			-	Now	Now
2Gb	x32	1.2V	134-FBGA	1066	Now	Now	Now	Now
			168-PoP			-	-	-
			134-FBGA DDP			-	Now	-
4Gb	x32	1.2V	134-FBGA	1066	Now	Now	Now	Now
			168-PoP			-	-	-
	x64		216-PoP DDP			-	-	-
			220-PoP DDP			-	-	-
8Gb	x32	1.2V	168-PoP DDP	1066	Now	-	-	-
			134-FBGA DDP			Now	-	-
	x64		216-PoP DDP			-	-	-
			220-PoP DDP			-	-	-

## MCP

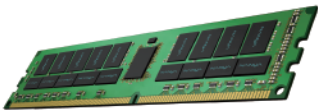
Type	SLC NAND		Gen	DRAM		Package	Commercial	WT	IT	Automotive	
	Density	Org		Density	Org					G2	G3
2+1	2Gb	x8	LPDDR2	1Gb	x32	162b	Now	Now	-	-	-
2+2	2Gb	x8		2Gb	x32	162b	Now	Now	-	-	-
4+2	4Gb	x8		2Gb	x32	162b	Now	Now	Now	-	-
4+4	4Gb	x8		4Gb	x32	162b	Now	Now	-	-	-
4+2	4Gb	x8	LPDDR4X	2Gb	x16	149b	Now	Now	Now	-	-
4+4	4Gb	x8		4Gb	x16	149b	Now	Now	Now	-	-
8+8	8Gb	x8		8Gb	x16	149b	Now	-	Now	-	-
8+8	8Gb	x8		8Gb	x32	254b	Now	-	Now	-	-

## eMCP

Type	MLC NAND		Gen	DRAM		Package	Commercial	WT	IT	Automotive	
	Density	Org		Density	Org					G2	G3
4+4	4GB	x8	LPDDR3	8Gb	x32	221b	Now	-	-	-	-
8+8	8GB	x8		4Gb	x32	221b	Now	-	-	-	-
16+8	16GB	x8		8Gb	x32	221b	Now	-	-	-	-
16+16	16GB	x8		16Gb	x32	221b	Now	-	-	-	-
8+8	8GB	x8	LPDDR4X	8Gb	x32	254b	Q4'22	-	-	-	-
16+8	16GB	x8		8Gb	x32	254b	Q4'22	-	-	-	-
16+16	16GB	x8		16Gb	x32	254b	Q3'22	-	-	-	-

# Server Module

Available Generation   DDR5 | DDR4  
Available Densities     8GB | 16GB | 32GB | 64GB



## DDR5 RDIMM

Density	Org	Voltage	DRAM	Speed	Availability
32GB	1Rx4	1.1V	16Gb SDP	5600	Q2'24
	2Rx8				
64GB	2Rx4	1.1V	16Gb SDP	5600	Q2'24

## DDR4 RDIMM

Density	Org	Voltage	DRAM	Speed	Availability
8GB	1Rx8	1.2V	8Gb SDP	3200	Now
16GB	1Rx4	1.2V	8Gb SDP	3200	Now
	2Rx8				
32GB	2Rx4	1.2V	8Gb SDP	3200	Now
	1Rx4	1.2V	16Gb SDP	3200	Q4'23
	2Rx8				
64GB	2Rx4	1.2V	16Gb SDP	3200	Q4'23

# PC Module

Available Generation   DDR5 | DDR4  
Available Densities     4GB | 8GB | 16GB | 32GB

## DDR5 SODIMM

Density	Org	Voltage	DRAM	Speed	Availability
8GB	1Rx8	1.1V	8Gb SDP	4400/4800	Q1'23
	1Rx16	1.1V	16Gb SDP	5600	Q1'24
16GB	1Rx8	1.1V	16Gb SDP	5600	Q1'24
32GB	2Rx8	1.1V	16Gb SDP	5600	Q1'24

### DDR5 UDIMM

Density	Org	Voltage	DRAM	Speed	Availability
8GB	1Rx8	1.1V	8Gb SDP	4400/4800	Q1'23
	1Rx16	1.1V	16Gb SDP	5600	Q1'24
16GB	1Rx8	1.1V	16Gb SDP	5600	Q1'24
32GB	2Rx8	1.1V	16Gb SDP	5600	Q1'24

### DDR4 SODIMM

Density	Org	Voltage	DRAM	Speed	Availability
4GB	1Rx16	1.2V	8Gb SDP	2666/3200	Now
8GB	1Rx8	1.2V	8Gb SDP	2666/3200	Now
	1Rx16	1.2V	16Gb SDP	2666/3200	Q3'23
16GB	2Rx8	1.2V	8Gb SDP	2666/3200	Q4'22
	1Rx8	1.2V	16Gb SDP	2666/3200	Q3'23
32GB	2Rx8	1.2V	16Gb SDP	2666/3200	Q3'23

### DDR4 ECC-SODIMM

Density	Org	Voltage	DRAM	Speed	Availability
8GB	1Rx8	1.2V	8Gb SDP	2666	Now

### DDR4 UDIMM

Density	Org	Voltage	DRAM	Speed	Availability
4GB	1Rx16	1.2V	8Gb SDP	2666/3200	Now
8GB	1Rx8	1.2V	8Gb SDP	2666/3200	Now
	1Rx16	1.2V	16Gb SDP	2666/3200	Q3'23
16GB	2Rx8	1.2V	8Gb SDP	2666/3200	Now
	1Rx8	1.2V	16Gb SDP	2666/3200	Q3'23
32GB	2Rx8	1.2V	16Gb SDP	2666/3200	Q3'23

### DDR4 ECC-UDIMM

Density	Org	Voltage	DRAM	Speed	Availability
8GB	1Rx8	1.2V	8Gb SDP	2666	Now

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www.smart-core.com.hk

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