

Graphic Memory

Product Guide

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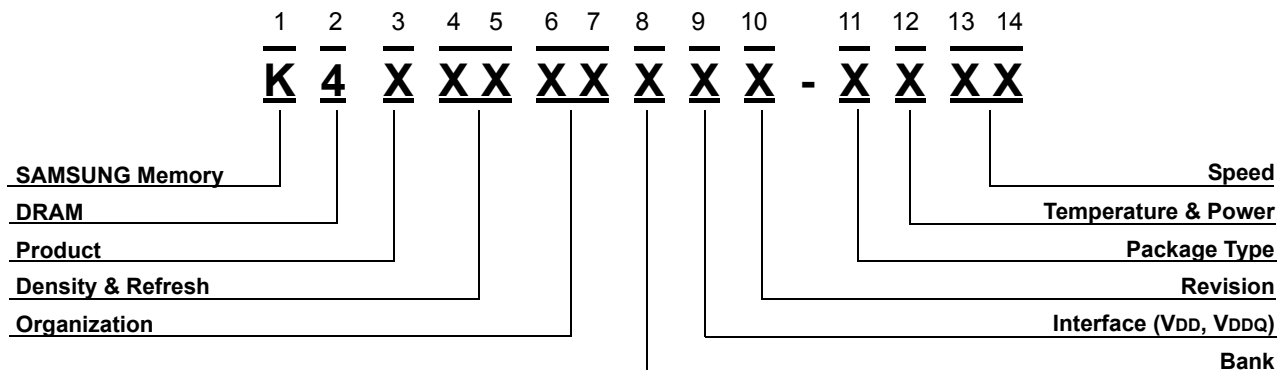
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1. GRAPHIC MEMORY ORDERING INFORMATION



1. SAMSUNG Memory

2. DRAM

3. Product

N : gDDR2 SDRAM
 W : gDDR3 SDRAM
 J : GDDR3 SGRAM
 G : GDDR5 SGRAM

4~5. Density & Refresh

51 : 512M, 8K/64ms
 52 : 512M, 8K/32ms
 10 : 1G, 8K/32ms
 1G : 1G, 8K/64ms
 2G : 2G, 8K/64ms
 4G : 4G, 8K/64ms

6~7. Organization

16 : x16
 32 : x32

8. Bank

3 : 4Banks
 4 : 8Banks

9. Interface (VDD, VDDQ)

Q : SSTL_2 (1.8V, 1.8V)
 5 : SSTL_2 (1.8V, 1.8V, LP)
 6 : SSTL_15 (1.5V, 1.5V)
 F : POD_15 (1.5V, 1.5V)
 K : POD_18 (1.8V, 1.8V)

10. Revision

M : 1st Gen. A : 2nd Gen.
 B : 3rd Gen. C : 4th Gen.
 D : 5th Gen. E : 6th Gen.
 F : 7th Gen. G : 8th Gen.
 H : 9th Gen. I : 10th Gen.
 Q : 17th Gen. Z : 26th Gen.

11. Package Type

gDDR2
 H : 84FBGA(Halogen Free & Lead Free)
 B : 84FBGA(Halogen Free & Lead Free & Flip Chip)

gDDR3
 E : 100FBGA(Halogen Free & Lead Free)
 H : 96FBGA(Halogen Free & Lead Free)

GDDR3
 B : 136FBGA(Lead Free)
 H : 136FBGA(Halogen Free & Lead Free)

GDDR5
 H : 170FBGA(Halogen Free & Lead Free)

12. Temperature & Power(VDD)

C : Commercial Normal
 J : Commercial High
 L : Commercial Low

13~14. Speed

1A ¹⁾ : 0.935ns (2.1Gbps)	28 : 0.28ns (7.0Gbps)
11 ²⁾ : 1.07ns (1.8Gbps)	03 : 0.33ns (6.0Gbps)
12 : 1.25ns (1.6Gbps)	04 : 0.40ns (5.0Gbps)
14 : 1.4ns (1.4Gbps)	05 : 0.50ns (4.0Gbps)
15 : 1.5ns (1.3Gbps)	5C : 0.56ns (3.6Gbps)
16 : 1.6ns (1.2Gbps)	06 : 0.62ns (3.2Gbps)
18 : 1.8ns (1.1Gbps)	6A : 0.66ns (3.0Gbps)
19 : 1.875ns (1.06Gbps)	07 : 0.71ns (2.8Gbps)
20 : 2.0ns (1.0Gbps)	7A : 0.77ns (2.6Gbps)
22 : 2.2ns (0.9Gbps)	08 : 0.8ns (2.4Gbps)
25 : 2.5ns (0.8Gbps)	09 : 0.9ns (2.2Gbps)

NOTE :

1)Graphic high speed binning was unified to EDP binning(2000Mbps→2133Mbps)
 2)Graphic high speed binning was unified to EDP binning(1800Mbps→1866Mbps)

2. GRAPHIC MEMORY COMPONENT PRODUCT GUIDES

Product	Density	Banks	Part Num.	PKG & Speed	Org.	Interf.	Ref.	Voltage(V)	PKG.	PKG Type	Status
gDDR2 SDRAM	512Mb G-die	4Banks	K4N51163QG	HC20/25	32Mx16	SSTL_18	8K/64ms	1.8V ± 0.1V	84ball FBGA	Halogen-Free & Lead-Free	Mass Production
	512Mb Z-die		K4N51163QZ	HC20/25							
	1Gb E-die	8Banks	K4N1G164QE	HC20/25	64Mx16					Halogen-Free, Lead-Free & Flip-Chip	CS May. '10
	1Gb F-die		K4N1G164QF	BC20/25							
gDDR3 SDRAM	1Gb E-die	8Banks	K4W1G1646E	HC1A/11 12/15	64Mx16	SSTL_15	8K/64ms	1.5V ± 0.075V	96ball FBGA	Halogen-Free & Lead-Free	Mass Production
	2Gb B-die		K4W2G1646B	HC12/15	128Mx16						
	2Gb C-die		K4W2G1646C	HC1A/11 12/15	128Mx16					CS May. '10	
GDDR3 SGRAM	512Mb I-die	8Banks	K4J52324KI	HC7A/08 1A/12/14	16Mx32	Pseudo Open_ Drain	8K/32ms	1.8V ± 0.1V	136ball FBGA		Halogen-Free & Lead-Free
	1Gb E-die		K4J10324KE	HC7A/08 1A/12/14	32Mx32					Mass Production	
GDDR5 SGRAM	1Gb E-die	8Banks	K4G10325FE	HC04/05 5C	32Mx32	POD_15	8K/32ms	1.5V ± 0.045V	170ball FBGA		Halogen-Free & Lead-Free
	2Gb C-die	16Banks	K4G20325FC	TBD	64Mx32	POD_15	16K/32ms	1.5V ± 0.045V	170ball FBGA	Halogen-Free & Lead-Free	CS May. '10