

A. Direct RDRAM Product Guide

Density	*1 Org.	Part Number	Speed *3	Power(V)	Refresh	Package Type	Avail.
128Mb (D-die)	256Kx16*32s	K4R271669D-R*2C	S8	2.5±0.13V	16K/32ms	54ball WBGA	EOL (4Q/02)
		K4R271669D-TC					
128Mb (E-die)	256Kx16*32s	K4R271669E-RC	S8	2.5±0.13V	16K/32ms	54ball WBGA	Now
		K4R271669E-TC					
256Mb (A-die)	512Kx16*32s	K4R571669A-FC	M8/K8	2.5±0.13V	16K/32ms	92ball WBGA	EOL (4Q/02)
288Mb (A-die)	512Kx18*32s	K4R881869A-FC	T9/N9/M9/S9 M8/K8	2.5±0.13V	16K/32ms	92ball WBGA	EOL (4Q/02)
256Mb (D-die)	512Kx16*32s	K4R571669D-FC	T9/N9/M9/S9 M8/K8	2.5±0.13V	16K/32ms	92ball WBGA	Now
288Mb (D-die)	512Kx18*32s	K4R881869D-FC	T9/N9/M9/S9 M8/K8	2.5±0.13V	16K/32ms	92ball WBGA	Now
512Mb (A-die)	1Mx16*32s	K4R521669A-FC	T9/N9/M9/S9 M8/K8	2.5±0.13V	32K/32ms	92ball WBGA	Q3 ' 03
576Mb (A-die)	1Mx18*32s	K4R761869A-FC	T9/N9/M9/S9 M8/K8	2.5±0.13V	32K/32ms	92ball WBGA	Q3 ' 03

*1 **Bank description**

- 32s :32 banks with a "spilt" architecture

*2 **Package Type**

Code	Description
F	92ball WBGA
G	92ball WBGA, Lead free
H	92ball WBGA, Lead free for SoRIMM
T	54ball WBGA
R	54ball WBGA, Lead free

*3 **Speed (Freq. & tRAC)**

Data frequency	Application	Code	Description (t _{CYCLE} , t _{RAC} , t _{RC})
1066MHz	Long channel	T9	533MHz (1.875ns), -32P, 28clks
		N9	533MHz (1.875ns), -32, 28clks
		M9	533MHz (1.875ns), -35, 32clks
800MHz	Short channel	S9	533MHz (1.875ns), -35, 32clks
		M8	400MHz (2.5ns), -40, 28clks
			K8
800MHz	Short channel	S8	400MHz (2.5ns), -45, 28clks

B. Direct Rambus RIMM Memory Module Product Guide

Den- sity	Part Number	Feature	Base Component				Avail.
			Base Component	*1Org.	Power		
Consumer RIMM based on 128Mb D-die							
128MB	MR16R0828DR*20-CM8*3	SS, 1250mil 184pin	128Mb D-die	K4R271669D-R*2CS8*3 x 8pcs	256Kx16*32s	2.5±0.13V	EOL (4Q' 02)
128MB	MR16R0828DT0-CM8	SS, 1250mil 184pin	128Mb D-die	K4R271669D-TCS8 x 8pcs	256Kx16*32s	2.5±0.13V	
Consumer RIMM based on 128Mb E-die							
128MB	MR16R0828ER0-CM8	SS, 1250mil 184pin	128Mb E-die	K4R271669E-RCS8 x 8pcs	256Kx16*32s	2.5±0.13V	Q4' 02
128MB	MR16R0828ET0-CM8	SS, 1250mil 184pin	128Mb E-die	K4R271669E-TCS8 x 8pcs	256Kx16*32s	2.5±0.13V	Q4' 02
x16 RIMM based on 256Mb A-die							
64MB	MR16R1622AF0-CM8/CK8	SS, 1250mil 184pin	256Mb A-die	K4R571669A-FCM8/FCK8 x 2pcs	512Kx16*32s	2.5±0.13V	EOL (4Q' 02)
128MB	MR16R1624AF0-CM8/CK8			K4R571669A-FCM8/FCK8 x 4pcs	512Kx16*32s	2.5±0.13V	
256MB	MR16R1628AF0-CM8/CK8			K4R571669A-FCM8/FCK8 x 8pcs	512Kx16*32s	2.5±0.13V	
512MB	MR16R162GAF0-CM8/CK8	DS, 1250mil 184pin	256Mb A-die	K4R571669A-FCM8/FCK8 x 16pcs	512Kx16*32s	2.5±0.13V	
x16 RIMM based on 288Mb A-die							
72MB	MR18R1622AF0-CM8/CK8	SS, 1375mil ECC, 184pin	288Mb A-die	K4R881869A-FCM8/FCK8 x 2pcs	512Kx18*32s	2.5±0.13V	EOL (4Q' 02)
144MB	MR18R1624AF0-CM8/CK8	SS, 1375mil ECC, 184pin	288Mb A-die	K4R881869A-FCM8/FCK8 x 4pcs	512Kx18*32s	2.5±0.13V	
	MR18R1624AF1-CT9/CN9			K4R881869A-FCT9/FCN9 x 4pcs			
288MB	MR18R1628AF0-CM8/CK8	SS, 1375mil ECC, 184pin	288Mb A-die	K4R881869A-FCM8/FCK8 x 8pcs	512Kx18*32s	2.5±0.13V	
	MR18R1628AF1-CT9/CN9			K4R881869A-FCT9/FCN9 x 8pcs			
576MB	MR18R162GAF0- CT9/CN9/CM8/CK8	DS, 1375mil ECC, 184pin	288Mb A-die	K4R881869A- FCT9/FCN9/FCM8/FCK8 x 16pcs	512Kx18*32s	2.5±0.13V	

General Information

Rambus DRAM

Density	Part Number	Feature	Base Component			Avail.	
			Base Component	*1Org.	Power		
x16 RIMM based on 256Mb D-die							
64MB	MR16R1622DF ^{*2} 0-CT9/CN9/CM9 ^{*3}	SS, 1375mil 184pin	256Mb D-die	K4R571669D-F ^{*2} CT9/FCN9/FCM9 ^{*3} x 2pcs	512Kx16*32s	2.5±0.13V	Now
	MR16R1622DF0-CM8/CK8	SS, 1250mil 184pin		K4R571669D-FCM8/FCK8 x 2pcs			
128MB	MR16R1624DF0-CT9/CN9/CM9	SS, 1375mil 184pin	256Mb D-die	K4R571669D-FCT9/FCN9/FCM9 x 4pcs	512Kx16*32s	2.5±0.13V	Now
	MR16R1624DF0-CM8/CK8	SS, 1250mil 184pin		K4R571669D-FCM8/FCK8 x 4pcs			
256MB	MR16R1628DF0-CT9/CN9/CM9	SS, 1375mil 184pin	256Mb D-die	K4R571669D-FCT9/FCN9/FCM9 x 8pcs	512Kx16*32s	2.5±0.13V	Now
	MR16R1628DF0-CM8/CK8	SS, 1250mil 184pin		K4R571669D-FCM8/FCK8 x 8pcs			
512MB	MR16R162GDF0-CT9/CN9/CM9	DS, 1375mil 184pin	256Mb D-die	K4R571669D-FCT9/FCN9/FCM9 x 16pcs	512Kx16*32s	2.5±0.13V	Now
	MR16R162GDF0-CM8/CK8	DS, 1250mil 184pin		K4R571669D-FCM8/FCK8 x 16pcs			
x16 RIMM based on 288Mb D-die							
72MB	MR18R1622DF0-CT9/CN9/CM9	SS, 1375mil 184pin	288Mb D-die	K4R881869D-FCT9/FCN9/FCM9 x 2pcs	512Kx18*32s	2.5±0.13V	Now
	MR18R1622DF0-CM8/CK8	SS, 1250mil 184pin		K4R881869D-FCM8/FCK8 x 2pcs			
144MB	MR18R1624DF0-CT9/CN9/CM9	SS, 1375mil 184pin	288Mb D-die	K4R881869D-FCT9/FCN9/FCM9 x 4pcs	512Kx18*32s	2.5±0.13V	Now
	MR18R1624DF0-CM8/CK8	SS, 1250mil 184pin		K4R881869D-FCM8/FCK8 x 4pcs			
288MB	MR18R1628DF0-CT9/CN9/CM9	SS, 1375mil 184pin	288Mb D-die	K4R881869D-FCT9/FCN9/FCM9 x 8pcs	512Kx18*32s	2.5±0.13V	Now
	MR18R1628DF0-CM8/CK8	SS, 1250mil 184pin		K4R881869D-FCM8/FCK8 x 8pcs			
576MB	MR18R162GDF0-CT9/CN9/CM9	DS, 1375mil 184pin	288Mb D-die	K4R881869D-FCT9/FCN9/FCM9 x 16pcs	512Kx18*32s	2.5±0.13V	Now
	MR18R162GDF0-CM8/CK8	DS, 1250mil 184pin		K4R881869D-FCM8/FCK8 x 16pcs			

General Information

Rambus DRAM

Density	Part Number	Feature	Base Component				Avail.
			Base Component	*1Org.	Power		
x32 RIMM based on 256Mb A-die							
128MB	MD16R1624AF*20-CM8*3	SS, 1375mil 232pin	256Mb A-die	K4R571669A-F*2CM8*3 x 4pcs	512Kx16*32s	2.5±0.13V	EOL (4Q/' 02)
256MB	MD16R1628AF0-CM8	SS, 1375mil 232pin	256Mb A-die	K4R571669A-FCM8 x 8pcs	512Kx16*32s	2.5±0.13V	
512MB	MD16R162GAF0-CM8	DS, 1375mil 232pin	256Mb A-die	K4R571669A-FCM8 x 16pcs	512Kx16*32s	2.5±0.13V	
x32 RIMM based on 288Mb A-die							
144MB	MD18R1624AF0-CN9/CM8	SS, 1375mil 232pin	288Mb A-die	K4R881869A- FCN9/FCM8 x 4pcs	512Kx18*32s	2.5±0.13V	EOL (4Q/' 02)
288MB	MD18R1628AF0-CN9/CM8	SS, 1375mil 232pin	288Mb A-die	K4R881869A- FCN9/FCM8 x 8pcs	512Kx18*32s	2.5±0.13V	
576MB	MD18R162GAF0-CN9/CM8	DS, 1375mil 232pin	288Mb A-die	K4R881869A- FCN9/FCM8 x 16pcs	512Kx18*32s	2.5±0.13V	
x32 RIMM based on 256Mb D-die							
128MB	MD16R1624DF0- CT9/CN9/CM9/CM8/CK8	SS, 1375mil 232pin	256Mb D-die	K4R571669D- FCT9/FCN9/FCM9/FCM8/FCK8 x 4pcs	512Kx16*32s	2.5±0.13V	Now
256MB	MD16R1628DF0- CT9/CN9/CM9/CM8/CK8	SS, 1375mil 232pin	256Mb D-die	K4R571669D- FCT9/FCN9/FCM9/FCM8/FCK8 x 8pcs	512Kx16*32s	2.5±0.13V	Now
512MB	MD16R162GDF0- CT9/CN9/CM9/CM8/CK8	DS, 1375mil 232pin	256Mb D-die	K4R571669D- FCT9/FCN9/FCM9/FCM8/FCK8 x 16pcs	512Kx16*32s	2.5±0.13V	Now
x32 RIMM based on 288Mb D-die							
144MB	MD18R1624DF0- CT9/CN9/CM9/CM8/CK8	SS, 1375mil 232pin	288Mb D-die	K4R881869D- FCT9/FCN9/FCM9/FCM8/FCK8 x 4pcs	512Kx18*32s	2.5±0.13V	Now
288MB	MD18R1628DF0- CT9/CN9/CM9/CM8/CK8	SS, 1375mil 232pin	288Mb D-die	K4R881869D- FCT9/FCN9/FCM9/FCM8/FCK8 x 8pcs	512Kx18*32s	2.5±0.13V	Now
576MB	MD18R162GDF0- CT9/CN9/CM9/CM8/CK8	DS, 1375mil 232pin	288Mb D-die	K4R881869D- FCT9/FCN9/FCM9/FCM8/FCK8 x 16pcs	512Kx18*32s	2.5±0.13V	Now

General Information

Rambus DRAM

Density	Part Number	Feature	Base Component				Avail.
			Base Component	*1Org.	Power		
SO-RIMM based on 288Mb A-die							
72MB	MS18R1622AH* ² 0-CM9/CM8/CK8* ³	SS, 1230mil ECC, 160pin	288Mb A-die	K4R881869A-H* ² CM9/HCM8/HCK8* ³ x 2pcs	512Kx18*32s	2.5±0.13V	EOL (4Q/ '02)
144MB	MS18R1624AH0-CM9/CM8/CK8	SS, 1230mil ECC, 160pin	288Mb A-die	K4R881869A-HCM9/HCM8/HCK8 x 4pcs	512Kx18*32s	2.5±0.13V	
288MB	MS18R1628AH0-CM9/CM8/CK8	DS, 1230mil ECC, 160pin	288Mb A-die	K4R881869A-HCM9/HCM8/HCK8 x 8pcs	512Kx18*32s	2.5±0.13V	
SO-RIMM based on 288Mb D-die							
72MB	MS18R1622DH0-CT9/CN9/CM9/CM8/CK8	SS, 1230mil ECC, 160pin	288Mb D-die	K4R881869D-HCT9/HCN9/HCM9/HCM8/HCK8 x 2pcs	512Kx18*32s	2.5±0.13V	Q4 '02
144MB	MS18R1624DH0-CT9/CN9/CM9/CM8/CK8	SS, 1230mil ECC, 160pin	288Mb D-die	K4R881869D-HCT9/HCN9/HCM9/HCM8/HCK8 x 4pcs	512Kx18*32s	2.5±0.13V	Q4 '02
288MB	MS18R1628DH0-CT9/CN9/CM9/CM8/CK8	DS, 1230mil ECC, 160pin	288Mb D-die	K4R881869D-HCT9/HCN9/HCM9/HCM8/HCK8 x 8pcs	512Kx18*32s	2.5±0.13V	Q4 '02
32d RIMM based on 288Mb A-die							
1152MB	MR18R162WAG0-CM8/CK8	DS, 2750mil ECC, 184pin	288Mb A-die	K4R881869A-GCM8/GCK8 x 32pcs	512Kx18*32s	2.5±0.13V	EOL (4Q/ '02)
32d RIMM based on 288Mb D-die							
1152MB	MR18R162WDG0-CM8/CK8	DS, 2750mil ECC, 184pin	288Mb D-die	K4R881869D-GCM8/GCK8 x 32pcs	512Kx18*32s	2.5±0.13V	Q4 '02

^{*1} **Bank description**

- 32s :32 banks with a "split" architecture

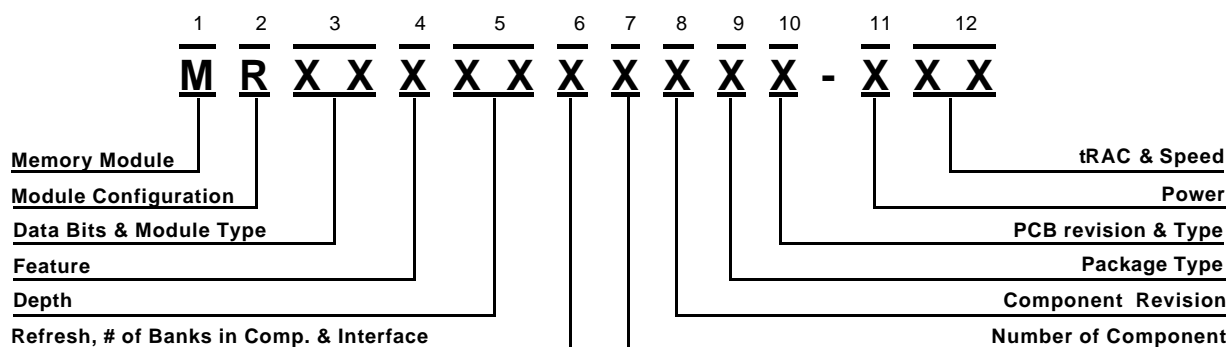
^{*2} **Package Type**

Code	Description
F	92ball WBGA
G	92ball WBGA, Lead free
H	92ball WBGA, Lead free for SoRIMM
T	54ball WBGA
R	54ball WBGA, Lead free

^{*3} **Speed (Freq. & tRAC)**

Data frequency	Application	Code	Description (t _{CYCLE} , t _{RAC} , t _{RC})
1066MHz	Long channel	T9	533MHz (1.875ns), -32P, 28clks
		N9	533MHz (1.875ns), -32, 28clks
		M9	533MHz (1.875ns), -35, 32clks
	Short channel	S9	533MHz (1.875ns), -35, 32clks
800MHz	Long channel	M8	400MHz (2.5ns), -40, 28clks
		K8	400MHz (2.5ns), -45, 28clks
	Short channel	S8	400MHz (2.5ns), -45, 28clks

E. Direct Rambus RIMM Memory Module Ordering Information



1. Memory Module : M

2. Module Configuration

- R : RIMM
- S : SO-RIMM
- D : X32 RIMM

3. Data Bits & Module Type

- 16 : X16 Non-ECC
- 18 : X18 ECC

4. Feature

- C : for Continuity Module
- R : Direct RAMBUS DRAM

5. Depth

- NT: for Continuity Module
- 04 : 4M
- 08 : 8M
- 16 : 16M
- 32 : 32M

6. Refresh, # of Banks in Comp.& Interface(VDD, VDDQ)

- Y : for Continuity Module
- 2 : 16K/32ms Ref. Dependent 2* 16 Banks & RSL(2.5V,2.5V)
- 6 : 32K/32ms Ref. Dependent 2* 16 Banks & RSL(2.5V,2.5V)

7. Number of Component

- M : for Continuity Module
- 2 : 2ea
- 4 : 4ea
- 8 : 8ea
- G : 16ea
- W : 32ea

8. Component Revision

- U : for Continuity Module
- M : 1st Generation
- A : 2nd Generation
- B : 3rd Generation
- C : 4th Generation
- D : 5th Generation
- E : 6th Generation

9. Package Type

- L : for Continuity Module
- M : uBGA for Mirrored Package
- N : uBGA for Normal Package
- S : uBGA for Consumer Package
- F : WBGA
- G : WBGA lead free
- H : WBGA lead free for SO-RIMM
- T : Consumer WBGA(54ball) & Lead free
- R : Consumer WBGA(54ball)

10. PCB Revision & Type

- 0 : Mother Ver.
- 1 : 1st Rev.
- 2 : 2nd Rev.
- 3 : 3rd Rev.

11. Power

- 0 : for Continuity Module
- C: Normal Power Self refresh

12. Speed (t_{CYCLE}, t_{RAC}, t_{RC})

- 00 : for Continuity Module
- T9 : -32P & 1066Mbps (533MHz)
- N9 : -32 & 1066Mbps (533MHz)
- M9 : -35 & 1066Mbps (533MHz)
- M8 : -40 & 800Mbps (400MHz)
- K8 : -45 & 800Mbps (400MHz)
- K7 : -45 & 711Mbps (356MHz)
- G6 : -53.3 & 600Mbps (300MHz)

