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A woman with dark hair pulled back, wearing a black jacket, a silver necklace, and a headset with a microphone, is smiling and looking towards the camera. She is holding a silver laptop with her right hand on the keyboard. The background is a wooden wall with vertical slats. A large, curved, semi-transparent teal graphic element is overlaid on the bottom right of the image, containing the title and date.

# Product Selection Guide

## Memory and Storage

April 2005

## MEMORY AND STORAGE

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## DDR2 DRAM COMPONENTS

Density	Org	Speed (Mbps)	Part Number
256Mb	x4	400/533	K4T56043QF-Z(CCC/CD5)
256Mb	x8	400/533	K4T56083QF-Z(CCC/CD5)
512Mb	x4	400/533/667	K4T51043QC-Z(CCC/CD5/CE6)
512Mb	x8	400/533/667	K4T51083QC-Z(CCC/CD5/CE6)
512Mb	x16	400/533/667	K4T51163QC-Z(CCC/CD5/CE6)
1Gb	x4	400/533/667	K4T1G044QA-Z(CCC/CD5/CE6)
1Gb	x8	400/533/667	K4T1G084QA-Z(CCC/CD5/CE6)

NOTES: CCC - DDR2 -400 (3-3-3)    CD5 - DDR2 -533 (4-4-4)    CE6 - DDR2 667 (5-5-5)    Voltage: 1.8V

## DDR2 SDRAM DIMM MODULES: UNBUFFERED

Density	Org	Speed (Mbps)	Part Number	Package	Components
256MB	32Mx64	400/533	M378T3253FZ0-(CCC/CD5)	Lead-free	256Mb
256MB	32Mx64	400/533/667	M378T3354CZ0-(CCC/CD5/CE6)	Lead-free	512Mb
512MB	64Mx64	400/533	M378T6453FZ0-(CCC/CD5)	Lead-free	256Mb
512MB	64Mx64	400/533/667	M378T6553CZ0-(CCC/CD5/CE6)	Lead-free	512Mb
512MB	64Mx64	400/533/667	M378T6464AZ0-(CCC/CD5/CE6)	Lead-free	1Gb
1GB	128Mx64	400/533/667	M378T2863AZ0-(CCC/CD5/CE6)	Lead-free	1Gb
1GB	128Mx64	400/533/667	M378T2953CZ0-(CCC/CD5/CE6)	Lead-free	512Mb
2GB	256Mx64	400/533/667	M378T5663AZ0-(CCC/CD5/CE6)	Lead-free	1Gb

NOTES: CC = 400Mbps    D5 = 533Mbps    E6 = 667Mbps    Voltage: 1.8V    Package: FBGA (11x13mm)

## DDR2 SDRAM 1U DIMM MODULES: REGISTERED

Density	Org	Speed (Mbps)	Part Number	Package	Components
256MB	32Mx72	400/533	M393T3253FZ0-(CCC/CD5)	Lead-free	256Mb
512MB	64Mx72	400/533	M393T6450FZ0-(CCC/CD5)	Lead-free	256Mb
512MB	64Mx72	400/533	M393T6453FZ0-(CCC/CD5)	Lead-free	256Mb
512MB	64Mx72	400/533/667	M393T6553CZ0-(CCC/CD5/CE6)	Lead-free	512Mb
1GB	128Mx72	400/533/667	M393T2950CZ0-(CCC/CD5/CE6)	Lead-free	512Mb
1GB	128Mx72	400/533/667	M393T2953CZ0-(CCC/CD5/CE6)	Lead-free	512Mb
1GB	128Mx72	400/533/667	M393T2863AZ0-(CCC/CD5/CE6)	Lead-free	1Gb
2GB	256Mx72	400/533/667	M393T5750CZ0-(CCC/CD5/CE6)	Lead-free	512Mb
2GB	256Mx72	400/533/667	M393T5660AZ0-(CCC/CD5/CE6)	Lead-free	1Gb
2GB	256Mx72	400/533/667	M393T5663AZ0-(CCC/CD5/CE6)	Lead-free	1Gb

NOTES: CC = 400Mbps    D5 = 533Mbps    C6 = 667Mbps    Voltage: 1.8V    Package: FBGA (11x13mm)

## DDR2 DRAM SODIMM MODULES

Density	Org	Speed (Mbps)	Part Number	Components
256MB	32Mx64	400/533/667	M470T3354CZ0-(CCC/CD5/CE6)	512Mb
512MB	64Mx64	400/533/667	M470T6554CZ0-(CCC/CD5/CE6)	512Mb
512MB	64Mx64	400/533/667	M470T6464AZ0-(CCC/CD5/CE6)	1Gb
1GB	128Mx64	400/533/667	M470T2953CS0-(CCC/CD5/CE6)	512Mb
1GB	128Mx64	400/533/667	M470T2864AZ0-(CCC/CD5/CE6)	1Gb

NOTES: CC = 400Mbps    D5 = 533Mbps    C6 = 667Mbps    Voltage: 1.8V    Package: FBGA (11x13mm)  
Height(in): 1.25

## DDR SDRAM COMPONENTS

Density	Org	Speed (Mbps)	Part Number	Package	Notes
256M	64Mx4	266/333/400	K4H560438E-TC(L)B0/B3/CCC	66 pin TSOP	Pb-free available
256M	64Mx4	333/400	K4H560438E-GC(L)B3/CCC	60 ball FBGA	Pb-free available
256M	32Mx8	266/333/400	K4H560838E-TC(L)B0/B3/CCC	66 pin TSOP	Pb-free available
256M	32Mx8	333/400	K4H560838E-GC(L)B3/CCC	60 ball FBGA	Pb-free available
256M	16Mx16	266/333/400	K4H561638F-TC(L)B0/B3/CCC	66 pin TSOP	Pb-free available
256M	16Mx16	333/400	K4H561638F-GC(L)B3/CCC	60 ball FBGA	Pb-free available
512M	128Mx4	266/333/400	K4H510438C-UC(L)B0/B3/CCC	66 pin TSOP	Pb-free available
512M	128Mx4	266/333/400	K4H510438C-ZC(L)B0/B3/CCC	60 ball FBGA	Pb-free
512M	64Mx8	266/333/400	K4H510838C-UC(L)B0/B3/CCC	66 pin TSOP	Pb-free
512M	64Mx8	266/333/400	K4H510838C-VC(L)B0/B3/CCC	54 pin Shrink TSOP	Pb-free
512M	64Mx8	266/333/400	K4H510838C-ZC(L)B0/B3/CCC	60 ball FBGA	Pb-free
512M	32Mx16	333/400	K4H511638C-UC(L)B3/CCC	66 pin TSOP	Pb-free
512M	32Mx16	333/400	K4H511638C-ZC(L)B3/CCC	60 ball FBGA	Pb-free
1Gb	256Mx4	266/333	K4H1G0438M-TC(L)B0/B3	66 pin TSOP	
1Gb	128Mx8	266/333	K4H1G0838M-TC(L)B0/B3	66 pin TSOP	

NOTES: B0 = DDR266 (133MHz @ CL=2.5)

A2 = DDR266 (133MHz @ CL=2)

B3 = DDR333 (166MHz @ CL=2.5)

CC = DDR400 (200MHz @ CL=3)

## DDR SDRAM DIMM MODULES: UNBUFFERED

Density	Org	Speed (Mbps)	Composition	Part Number	Notes
256MB	32Mx64	266/333	(32M x 8)*8	M368L3223ETN - CB0/B3	Pb-free available
256MB	32Mx64	400	(32M x 8)*8	M368L3223ETM - CCC00	Pb-free available
256MB	32Mx64	333/400	(32M x 8)*8	M368L3223FTN - CB3/CCC	Pb-free available
256MB	32Mx72	266/333/400	(32M x 8)*9	M381L3223ETM - CB0/B3/CCC	Pb-free available
256MB	32Mx72	333/400	(32M x 8)*9	M381L3223FTM - CB3/CCC	Pb-free available
512MB	64Mx64	266/333	(32M x 8)*16	M368L6423ETN - CB0/B3	Pb-free available
512MB	64Mx64	400	(32M x 8)*16	M368L6423ETM - CCC00	Pb-free available
512MB	64Mx64	333/400	(32M x 8)*16	M368L6423FTN - CB3/CCC	Pb-free available
512MB	64Mx72	266/333/400	(32M x 8)*18	M381L6423ETM - CB0/B3/CCC	Pb-free available
512MB	64Mx72	333/400	(32M x 8)*18	M381L6423FTM - CB3/CCC	Pb-free available
512MB	64MX64	266/333/400	(64M x 8)*8	M368L6523CUS - CB0/B3/CCC	Pb-free
512MB	64Mx72	266/333/400	(64M x 8)*9	M381L6523CUM - CB0/B3/CCC	Pb-free
1GB	128Mx64	266/333/400	(64M x 8)*16	M368L2923CUN - CB0/B3/CCC	Pb-free
1GB	128Mx72	266/333/400	(64M x 8)*18	M381L2923CUM - CB0/B3/CCC	Pb-free
2GB	256Mx64	266/333	(128M x 8)*16	M368L5623MTN - CB0/B3	
2GB	256Mx72	266/333	(128M x 8)*18	M381L5623MTM - CB0/B3	

NOTES: B0 = DDR266 (133MHz @ CL=2.5)  
Type: 184-pinA2 = DDR266 (133MHz @ CL=2)  
Package: TSOP componentsB3 = DDR333 (166MHz @ CL=2.5)  
Voltage: 2.5V

CC = DDR400 (200MHz @ CL=3)

## DDR SDRAM 1U DIMM MODULES: REGISTERED

Density	Org	Speed (Mbps)	Composition	Part Number	Component	# Banks	Notes
					Package	Module	
256MB	32Mx72	266	(32Mx8)*9	M312L3223ETS -C(L)B0	TSOP	1	
256MB	32Mx72	333/400	(32Mx8)*9	M312L3223EG0 - C(L)/B3/CCC	FBGA	1	
512MB	64Mx72	266	(32Mx8)*18	M312L6423ETS - C(L)B0	TSOP	2	
512MB	64Mx72	333/400	(32Mx8)*18	M312L6423EG0 - C(L)B3/CCC	FBGA	2	
512MB	64Mx72	333/400	(64Mx4)*18	M312L6420EG0- C(L)B3/CCC	FBGA	2	
512MB	64Mx72	266	(64Mx8)*9	M312L6523CUS - CB0	TSOP	1	Pb-free
512MB	64Mx72	333/400	(64Mx8)*9	M312L6523CZ0 - B3/CCC	FBGA	1	Pb-free
1GB	128Mx72	333/400	(128Mx4)*18	M312L2920CZ0 - B3/CCC	FBGA	1	Pb-free
2GB	256Mx72	266	(St. 256Mx4)*18	M312L5628CU0 - CB0	TSOP	2	Pb-free
2GB	256Mx72	333/400	(128Mx4)*36	M312L5720CZ0 - B3/CCC	FBGA	2	Pb-free
4GB	512Mx72	266/333	(St. 512Mx4)*18	M312L5128MT0 - CB0/B3	TSOP	2	

NOTES: B0 = DDR266 (133MHz @ CL=2.5)      A2 = DDR266 (133MHz @ CL=2)      B3 = DDR333 (166MHz @ CL=2.5)      CC = DDR400 (200MHz @ CL=3)  
Type: 184-pin

## DDR DRAM SODIMM MODULES

Density	Org	Speed (Mbps)	Composition	Part Number	Component	# Banks	Notes
					Package	Module	
128MB	16Mx64	333	(16M x 16)*4	M470L1624FT0 - C(L)B3	TSOP	1	
256MB	32Mx6	333	(16M x 16)*8	M470L3224FT0 - C(L)B3	TSOP	2	
512MB	32Mx64	333	(32M x 16)*4	M470L3224CU0 - C(L)B3	TSOP	1	Pb-free
1GB	64Mx64	333	(64M x 8)*16	M470L2923BN0 - C(L)B3	Shrink TSOP	2	

NOTES: B0 = DDR266 (133MHz @ CL=2.5)      A2 = DDR266 (133MHz @ CL=2)      B3 = DDR333 (166MHz @ CL=2.5)      CC = DDR400 (200MHz @ CL=3)  
Type: 200-pin, Double Sided      Height(in): 1.25

## SDRAM COMPONENTS

Density	Org	Speed (Mbps)	Part Number	Refresh	Pkg	Comments
					TSOP	
16Mb	1Mx16	125/143/166/183	K4S161622H-TC(L)(80/70/60/55)	2K	50	2 Banks
64Mb	16Mx4	133/143	K4S640432H-TC(L)(75/70)000	4K	54	
64Mb	8Mx8	133/143	K4S640832H-TC(L)(75/70)000	4K	54	
64Mb	4Mx16	133/143/166	K4S641632H-TC(L)(75/70/60)000	4K	54	
64Mb	2Mx32	143/166/183/209	K4S643232H-TC(L)(70/60/55/50)000	4K	86	
128Mb	32Mx4	133	K4S280432F-TC(L)(75)000	4K	54	
128Mb	16Mx8	133	K4S280832F-TC(L)(75)000	4K	54	
128Mb	8Mx16	133/166	K4S281632F-TC(L)(75/60)000	4K	54	
256Mb	64Mx4	133	K4S560432E-TC(L)(75)000	8K	54	
256Mb	32Mx8	133	K4S560832E-TC(L)(75)000	8K	54	
256Mb	16Mx16	133/166	K4S561632E-TC(L)(75/60)000	8K	54	
512Mb	128Mx4	133	K4S510632C-TC(L)(75)000	8K	54	stacked
512Mb	64Mx8	133	K4S510732C-TC(L)(75)000	8K	54	stacked
512Mb	128Mx4	133	K4S510432B-TC(L)(75)000	8K	54	
512Mb	64Mx8	133	K4S510832B-TC(L)(75)000	8K	54	
512Mb	32Mx16	133	K4S511632B-TC(L)(75)000	8K	54	
1Gb	256Mx4	133	K4S1G0632B-TC(L)(75)000	8K	54	stacked

NOTES: The "1H" in the part number signifies an Intel PC100 SDRAM spec compliant device at CAS latency of 2.

The "1L" in the part number signifies an Intel 100MHz SDRAM spec compliant device at CAS latency of 3.

The "7C" in the part number signifies an Intel 133MHz SDRAM spec compliant device at CAS latency of 2

L = Commercial Temp., Low Power

# Banks: 4

Package: TSOP

Voltage: 3.3V

Speed: PC133 (133MHz CL=3/PC100 CL2)

## SDRAM DIMM MODULES PC133 COMPLIANT: UNBUFFERED

Density	Org	Speed (Mbps)	Composition	Part Number	# Banks Module
128MB	16Mx64	PC133	128M: (16Mx8)*8	M366S1723FTS-C7A00	1
128MB	16Mx64	PC133	256M: (16Mx16)*4	M366S1654ETS-C7A00	1
128MB	16Mx72	PC133	128M: (16Mx8)*9	M374S1723FTS-C7A00	1
128MB	16Mx72	PC133	256M: (16Mx16)*5	M374S1654ETS-C7A00	1
256MB	32Mx64	PC133	128M: (16Mx8)*16	M366S3323FTS-C7A00	2
256MB	32Mx64	PC133	256M: (32Mx8)*8	M366S3253ETS-C7A00	1
256MB	32Mx64	PC133	256M: (16Mx16)*8	M366S3254ETS-C7A00	1
256MB	32Mx64	PC133	256M: (32Mx8)*8	M366S3253ETS-C7A00	1
256MB	32Mx72	PC133	128M: (16Mx8)*18	M374S3323FTS-C7A00	2
256MB	32Mx72	PC133	256M: (32Mx8)*9	M374S3253ETS-C7A00	1
512MB	64Mx64	PC133	256M: (32Mx8)*16	M366S6453ETS-C7A00	2
512MB	64Mx72	PC133	256M: (32Mx8)*18	M374S6453ETS-C7A00	2
1GB	128Mx64	PC133	512M: (64Mx8)*16	M366S2953BTS-C7A00	2
1GB	128Mx72	PC133	512M: (64Mx8)*18	M374S2953BTS-C7A00	2

NOTES: Type: 168-pin

Package: TSOP components

Voltage: 3.3V

## SDRAM DIMM MODULES PC133 COMPLIANT: REGISTERED

Density	Org	Speed (Mbps)	Composition	Part Number	# Banks Module	Refresh	Comments
128MB	16Mx72	PC133	(16Mx8)*9	M390S1723FT1-C7A00	1	4K	
256MB	32Mx72	PC133	(32Mx4)*18	M390S3320FT1-C7A00	2	4K	
256MB	32Mx72	PC133	(32Mx8)*9	M390S3253ET1-C7A00	1	4K	
512MB	64Mx72	PC133	(64Mx4)*18	M390S6450ET1-C7A00	2	8K	
512MB	64Mx72	PC133	(32Mx8)*18	M390S6453BT1-C7A00	2	8K	
1GB	128Mx72	PC133	(St.128Mx4)*18	M390S2858ET1-C7A00	2	8K	stacked
1GB	128Mx72	PC133	(128Mx4)*18	M390S2950BT1-C7A00	2	8K	
2GB	256Mx72	PC133	(St.256Mx4)*18	M390S5658BT1-C7A00	2	8K	stacked; avail Q204

NOTES: Type: 168-pin, double sided

Package: TSOP components

Voltage: 3.3V

## 1U SDRAM DIMM MODULES PC133 / PC100 COMPLIANT: REGISTERED

## LOW-PROFILE DIMMs (1.2 IN HEIGHT)

Density	Org	Speed	Composition	Part Number	# Banks Module	Refresh	Comments
128MB	16Mx72	PC133	(16x8)*9	M390S1723FTU - C7A00	1	4K	
256MB	32Mx72	PC133	(32Mx4)*18	M390S3320FTU - C7A00	2	4K	
256MB	32Mx72	PC133	(32Mx8)*9	M390S3253ETU - C7A00	1	8K	
512MB	64Mx72	PC133	(64Mx4)*18	M390S6450ETU - C7A00	2	8K	
1GB	128Mx72	PC133	(St.128Mx4)*18	M390S2858ETU - C7A00	2	8K	stacked
1GB	128Mx72	PC133	(128Mx4)*18	M390S2950BTU - C7A00	2	8K	
2GB	256Mx72	PC133	(St.128Mx4)*18	M390S5658BTU - C7A00	2	8K	stacked, avail Q204

NOTES: St. = Stacked components

Type: 168-pin, double sided

Package: TSOP Components

Voltage: 3.3V

## SDRAM SODIMM MODULES

Density	Org	Speed	Composition	Part Number	Height (in)	# Banks Module
64MB	8Mx64	PC133	(8Mx16)*4	M46450924FTS-L7A00	1.15	1
128MB	16Mx64	PC133	(8Mx16)*8	M46451724FTS-L7A00	1.15	1
256MB	32Mx64	PC133	(16Mx16)*8	M46453254ETS-L7A00	1.25	1
256MB	32Mx64	PC133	(32Mx16)*4	M46453354BTS-C(L)7A	1.25	1
512MB	64Mx64	PC133	(32Mx16)*8	M46456554BTS-C(L)7A	1.18	1
512MB	64Mx64	PC133	(64Mx8)*16	M46456453EN0-C75/L7500	1.25	2

NOTES: DS = Double-Sided

L = Commercial Temp., Low Power

Interface: SSTL-2

# Banks: 4

Latency: CL6

Refresh: 8K/32ms

## RDRAM COMPONENTS

Density	Org	Speed (Mbps)	Part Number	Refresh	Package
5576M	x18	1066	K4R761869A-GCT9	32K/32ms	92ball FBGA
288M	x18	800/1066	K4R881869E-GCM8/T9	16K/32ms	92ball FBGA
256M	x16	800/1066	K4R571669E-GCM8/T9	16K/32ms	92ball FBGA
128M	x16	800/1066	K4R271669F-SCK8/S8	16K/32ms	54ball FBGA

NOTES: Voltage: 2.5 v

## RIMM™ MODULES

Density	Org	Speed (Mbps)	# of Devices	Part Number	Component	Comments
128MB ECC	x18	800/1066Mbps	4	MR18R1624EG0-CM8/T9	288Mb	lead-free only
256MB ECC	x18	800/1066Mbps	8	MR18R1628EG0-CM8/T9	288Mb	lead-free only
512MB ECC	x18	800/1066Mbps	16	MR18R162GEG0-CM8/T9	288Mb	lead-free only
128MB NON-ECC	x16	800/1066Mbps	4	MR16R1624EG0-CM8/T9	256Mb	lead-free only
256MB NON-ECC	x16	800/1066Mbps	8	MR16R1628EG0-CM8/T9	256Mb	lead-free only
512MB NON-ECC	x16	800/1066Mbps	16	MR16R162GEG0-CM8/T9	512Mb	lead-free only
144MB NexMod	x18	800/1066Mbps	4	MN18R1624EF0-CT9	288Mb	lead-free only
288MB NexMod	x18	800/1066Mbps	8	MN18R1628EF0-CT9	288Mb	lead-free only
576MB NexMod	x18	800/1066Mbps	8	MN18R3268AEF0-CT9	576Mb	lead-free only

## NETWORK DRAM

Density	Org	Speed (Mbps)	Part Number	Package	Comments
288Mb	32Mx9	500/600/667	K4C89093AF-ACF5/FB/F6	60 ball BGA	MP Q4
288Mb	16Mx18	500/600/667	K4C89183AF-ACF5/FB/F6	60 ball BGA	MP Q4
288Mb	8Mx36	500/600/667	K4C89363AF-GCF5/FB/F6	144 ball BGA	MP Q4
256Mb	32x8	400	K4C560838F-TCD4	66-pin TSOP	MP Q4
256Mb	16x16	400	K4C561638F-TCD4	66-pin TSOP	MP Q4

NOTES: Interface: SSTL-2

# Banks: 4

Refresh: 8K/32ms

Latency: CL6

## MOBILE SDRAM COMPONENTS

Density	Org	Part Number	Refresh	Power	# Pins TSOP/BGA
64Mb	4Mx16	K4S641633H-(1)(2)(3)(4)	4K	3.0V	FBGA-54balls
64Mb	4Mx16	K4S64163LH-(1)(2)(3)(4)	4K	2.5V	FBGA-54balls
64Mb	4Mx16	K4M64163PH-(1)(2)(3)(4)	4K	1.8V	FBGA-54balls
64Mb	2MX32	K4S643233H-(1)(2)(3)(4)	4K	3.0V	FBGA-90balls
64Mb	2MX32	K4S64323LH-(1)(2)(3)(4)	4K	2.5V	FBGA-90balls
128Mb	8MX16	K4M281633F-(1)(2)(3)(4)	4K	3.0V	FBGA-54balls
128Mb	8MX16	K4M28163LF-(1)(2)(3)(4)	4K	2.5V	FBGA-54balls
128Mb	8MX16	K4M28163PF-(1)(2)(3)(4)	4K	1.8V	FBGA-54balls
128Mb	4MX32	K4S283233F-(1)(2)(3)(4)	4K	3.0V	FBGA-90balls
128Mb	4MX32	K4S28323LF-(1)(2)(3)(4)	4K	2.5V	FBGA-90balls
256Mb	16Mx16	K4S561633F-(1)(2)(3)(4)	8K	3.0V	54Balls BOC
256Mb	16Mx16	K4S56163LF-(1)(2)(3)(4)	8K	2.5V	54Balls BOC
256Mb	16Mx16	K4S56163PF-(1)(2)(3)(4)	4K	1.8V	FBGA-54balls
256Mb	8Mx32	K4S563233F-(1)(2)(3)(4)	4K	3.0V	FBGA-90balls
256Mb	8Mx32	K4S56323LF-(1)(2)(3)(4)	4K	2.5V	FBGA-90balls
256Mb	8Mx32	K4S56323PF-(1)(2)(3)(4)	4K	1.8V	FBGA-90balls
512Mb	32Mx16	K4S511533F-(1)(2)(3)(4)	8K	3.0V	FBGA-54balls
512Mb	32Mx16	K4S51153LF-(1)(2)(3)(4)	8K	2.5V	FBGA-54balls
512Mb	32Mx16	K4S511633F-(1)(2)(3)(4)	8K	3.0V	FBGA-54balls
512Mb	32Mx16	K4S51163LF-(1)(2)(3)(4)	8K	2.5V	FBGA-54balls
512Mb	32Mx16	K4S51163PF-(1)(2)(3)(4)	8K	1.8V	FBGA-54balls
512Mb	16Mx32	K4S513233F-(1)(2)(3)(4)	8K	3.0V	FBGA-90balls
512Mb	16Mx32	K4S51323LF-(1)(2)(3)(4)	8K	2.5V	FBGA-90balls
512Mb	16Mx32	K4S51323PF-(1)(2)(3)(4)	8K	1.8V	FBGA-54balls

NOTES:  
 Package:  
 Lead/Lead Free  
 G / A: 52balls FBGA Mono  
 R / B: 54balls FBGA Mono  
 X / Z: 54balls BOC Mono  
 J / V: 60(72)balls FBGA Mono  
 0.5pitch  
 L / F: 60balls FBGA Mono 0.8pitch

S / D: 90balls FBGA  
 Monolithic (11mm x 13mm)  
 F / H: Smaller 90balls FBGA Mono  
 Y / P: 54balls CSP DDP  
 M / E: 90balls FBGA DDP  
 Temp & Power:  
 C: Commercial(-25 ~ 70°C), Normal  
 L: Commercial, Low  
 F: Commercial, Low, PASR & TCSR

B: Commercial, Super Low  
 R: Commercial, Super Low,  
 PASR & TCSR  
 E: Extended(-25~85°C), Normal  
 N: Extended, Low  
 G: Extended, Low, PASR & TCSR  
 U: Extended, Super Low  
 S: Extended, Super Low,  
 PASR & TCSR  
 I: Industrial(-40~85°C), Normal

P: Industrial, Low  
 H: Industrial, Low, PASR & TCSR  
 D: Industrial, Super Low  
 T: Industrial, Super Low,  
 PASR & TCSR  
 Speed:  
 Mobile-SDRAM  
 60: 166MHz, CL 3  
 75: 133MHz, CL 3

80: 125MHz, CL 3  
 1H: 105MHz, CL 2  
 1L: 105MHz, CL 3  
 1S: 66MHz, CL 2 & 3  
 Mobile-DDR  
 C3: 133MHz, CL 3  
 C2: 100MHz, CL 3  
 C0: 66MHz, CL 3

## GRAPHICS DDR SDRAM COMPONENTS

Type	Density	Org	Die	Part Number	Package	VDD/VDDQ	Speed Bin (MHz)	Remarks					
GDDR3	512Mb	16Mx32	C	K4J52324Q	136 FBGA	1.8/1.8V	500/600						
						2.0/2.0V	700/800						
	256Mb	8Mx32	F	K4J55323Q	144 FBGA	2.0/2.0V	500/600/700/800	1.8V for GL20					
GDDR2	256Mb	16Mx16	F	K4N56163Q	84 FBGA	1.8/1.8V	266/333/400/450						
GDDR1	256Mb	8Mx32	F'	K4D553235	144 FBGA	1.8/1.8V	300/350						
						2.0/2.0V	400						
						2.5/2.5V	300/350/400/450						
			8Mx32	F'	K4D553238	144 FBGA	2.5/2.5V	300/350/400/450					
			16Mx16	F	K4D551638	66 TSOPII	2.5/2.5V	200/250					
							2.8 ± 0.1V	275					
							2.8 ~ 2.9V	300					
	128Mb	4Mx32	G	K4D26323Q	144 FBGA	1.8/1.8V	300/350/400						
								2.5/2.5V	300/350				
								2.5/2.5V	200				
							8Mx16	F	K4D261638	66 TSOPII	2.5/2.5V	200/250/275/300	CL-tRCD-tRP 3-4-4
								F	K4D261638F-TC5A		2.55/2.55V	200Mhz for STB	CL-tRCD-tRP 3-3-3

NOTES: \* clock cycle time

\*\* all products are 4 banks

Part No. Suffix	12	14	16	20	22	25	2A	33	36	37	40	50
Description	1.25ns (800MHz)	1.429ns (700MHz)	1.667ns (600MHz)	2.0 ns (500MHz)	2.2 ns (450MHz)	2.5 ns (400MHz)	2.86 NS (350MHz)	3.3 ns (300MHz)	3.6 ns (275MHz)	3.7 ns (266MHz)	4.0 ns (250MHz)	5.0 ns (200MHz)



DRAM ORDERING INFORMATION

K	4	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	

1. Memory (K)

64: 64M, 4K/64ms

R: SSTL-2, 2.8V, 2.8V

2. DRAM:4

66: 64M, 8K/64ms

S: SSTL-2, 2.2V, 1.8V

68: 768M, 8K/64ms

U: DRSL, 1.8V, 1.2V

72: 72M, 8K/32ms

Y: SSTL(LP), 2.5V, 2.5V

3. Small Classification

A: Advanced Dram Technology

B: DDR3 SDRAM

C: Network-DRAM

D: DDR SGRAM

E: EDO

F: FP

H: DDR SDRAM

J: GDDR3 SDRAM

K: Mobile SDRAM PEA

L: Mobile L2RAM

M: Mobile SDRAM

N: DDR SGRAM II

R: Direct RDRAM

S: SDRAM

T: DDR SDRAM IIJ

U: GDDR4 SDRAM

V: Mobile DDR SDRAM PEA

X: Mobile DDR SDRAM

Y: XDR DRAM

Z: Value Added DRAM

∞ PEA: Power Efficient Address

80: 8M, 2K/32ms

88: 288M, 16K/32ms

89: 288M, 8K/32ms

1G: 1G, 8K/64ms

2G: 2G, 8K/64ms

4G: 4G, 8K/64ms

2A: 128M, 4K/64ms with TCSR

5A: 256M, 8K/64ms with TCSR

6A: 64M, 4K/64ms with TCSR

6~7. Organization

01: x1            02: x2            03: x2  
(Including x1)

04: x4            05: x4 (2CS)

06: x4 Stack (Flexframe)

07: x8 Stack (Flexframe)

08: x8            09: x9            15: x16 (2CS)

16: x16            17: x16 (Including x8/ x4)

18: x18            30: x32 (2CS, 2CKE)

31: x32 (2CS)    32: x32 36: x36

A8: x8 Stack (70-mono)

8. Bank

1: 1Bank            2: 2Bank            3: 4Bank

4: 8Bank            5: 16Bank            6: 32Bank

9. Interface,VDD,VDDQ

0: NONE, NONE, NONE

1: TTL, 5.0V, 5.0V

2: LVTTTL, 3.3V, 3.3V

3: LVTTTL, 3.0V, 3.0V

4: LVTTTL, 2.5V, 2.5V

5: SSTL(LP), 1.8V, 1.8V

6: SSTL, 1.5V, 1.5V

7: SSTL-2, 3.3V, 2.5V

8: SSTL-2, 2.5V, 2.5V

9: RSL, 2.5V, 2.5V

A: SSTL, 2.5V, 1.8V

H: SSTL-2 DLL, 3.3V, 2.5V

J: LVTTTL, 3.0V, 1.8V

L: LVTTTL, 2.5V, 1.8V

M: LVTTTL, 1.8V, 1.5V

N: LVTTTL, 1.5V, 1.5V

P: LVTTTL, 1.8V, 1.8V

Q: SSTL, 1.8V, 1.8V

10. Generation

M: 1st Generation

A: 2nd Generation

B: 3rd Generation

C: 4th Generation

D: 5th Generation

E: 6th Generation

F: 7th Generation

G: 8th Generation

H: 9th Generation

I: 10th Generation

J: 11th Generation

K: 12th Generation

Y: Partial DRAM(2nd)

Z: Partial DRAM (for RAMOSTAK Product)

11. "-----"

12. Package

- Advanced DRAM Technology

G: WBGA

L: TSOP2-400F(LF)

T: TSOP2 Z: BOC(LF)

- DDR SDRAM

J: TSOP2-400(LF, DDP)

T: TSOP2-400

K: TSOP2-400(DDP)

U: TSOP2-400(LF)

G: BOC, WBGA

Z: BOC(LF)

P: BOC(DDP)

Q: ISM

N: STSOP2

V: STSOP2(LF)

S: POP(DDP)

X: POP(LF, DDP)

- DDR SDRAM II

G: BOC

Z: BOC(LF)

S: BOC(Smaller)

Y: BOC(Smaller, LF)

R: WLP

- DDR3 SDRAM

G: BOC

Z: BOC(LF)

- DDR SGRAM

E: FBGA(LF, DDP)

G : FBGA

J: FBGA(DDP)

V: FBGA(LF)

P: FBGA(LLDDP)

M: FBGA(1DQS)

N: FBGA(1DQS,LF)

H: BOC

L: TSOP2-400(LF)

T: TSOP2-400

Q: TQFP

U: TQFP(LF)

4~5. Density, Refresh

111: 1G, 64K/16ms

15: 16M, 1K/16ms

16: 16M, 2K/32ms

17: 16M, 4K/64ms

26: 128M, 4K/32ms

27: 128M, 16K/32ms

28: 128M, 4K/64ms

32: 32M, 2K/32ms

40: 4M, 512/8ms

41: 4M, 1K/16ms

44: 144M, 16K/32ms

50: 512M, 32K/16ms

51: 512M, 8K/64ms

52: 512M, 8K/32ms

54: 256M, 16K/16ms

55: 256M, 4K/32ms

56: 256M, 8K/64ms

57: 256M, 16K/32ms

58: 256M, 8K/32ms

62: 64M, 2K/16ms

## DRAM ORDERING INFORMATION

K	4	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18			
<b>- DDR SGRAM II</b>									<b>Mobile DDR SDRAM</b>											
G: FBGA, BOC			Z: BOC (LF)			1: MCP			6: MCP(LF)			E: Extended, Normal			N: Extended, Low					
<b>- GDDR3 SDRAM</b>																				
A: 136-FBGA, BOC			B: 136-FBGA, BOC(LF)			4: 96-FBGA			5: 96-FBGA(LF)			G: Extended, Low, PASR & TCSR								
G: FBGA, BOC			V: FBGA, BOC(LF)			7: 90-FBGA			8: 90-FBGA(LF)			U: Extended, Super Low								
<b>- Direct RDRAM</b>																				
F: WBGA			G: WBGA(LF)3			L: WBGA(0.8MM)			J: WBGA			S: Extended, Super Low, PASR & TCSR								
H: WBGA(LF, B/ L 320)			J: MWBGA(LF)			V: WBGA(LF)			Q: ISM			I: Industrial, Normal								
M: μBGA® packages <sup>1)</sup> (M) <sup>2)</sup>						S: POP			X: POP(LF, DDP)			P: Industrial, Low								
N: μBGA® packages						<b>Mobile DDR SDRAM PEA</b>						H: Industrial, Low, PASR & TCSR								
P: MWBGA			R: 54-WBGA			6: POP MONO(LF)			7: 90-FBGA			D: Industrial, Super Low								
S: 54-μBGA® packages			T: 54-WBGA(LF)			8: 90-FBGA(LF)			F: 60-FBGA(LF)			T: Industrial, Super Low, PASR & TCSR								
<b>- EDO</b>																				
B: SOJ-300			J: SOJ-400			L: 60-FBGA			Q: ISM			<b>- WAFER,CHIP BIZ Level Classification</b>								
N: STSOP2						S: POP(DDP)			X: POP(LF, DDP)			O: NONE, NONE								
T: TSOP2-400			U: TSOP2-400(LF)			<b>Network-DRAM</b>						1: DC test only								
F: TSOP2-300			H: TSOP2-300(LF)			A: 60-BOC			B: 60-BOC(LF)			2: DC test, WBI								
<b>- FP</b>						G: BOC			Z: BOC(LF)			3: DC, several AC test, WBI								
B: SOJ-300			J: SOJ-400			T: TSOP2			U: TSOP2(LF)											
F: TSOP2-300			H: TSOP2-300(LF)			<b>XDR DRAM</b>														
N: STSOP2						J: BOC(LF)			P: BOC											
T: TSOP2-400			U: TSOP2-400(LF)			<b>SDRAM</b>														
<b>- Mobile SDRAM</b>						1: MCP			2: 90-FBGA(DDP)											
1: MCP			6: MCP(LF)			3: 90-FBGA(DDP, LF)			4: 96-FBGA			A0: 10ns@CL2 A1: 8ns								
2: 90-FBGA(DDP)			3: 90-FBGA(DDP,LF)			5: 96-FBGA(LF)			A: 52-CSP(LF)			A2: 7.5ns@CL2								
4: 96-FBGA			5: 96-FBGA(LF)			G: CSP(except 54 Pin)			R: 54-CSP			AA :7.5ns@CL2,TRCD2,TRP2								
R: 54-CSP			B: 54-CSP(LF)			B: 54-CSP(LF)			D: 90-FBGA(LF)			B0: 7.5ns@CL2.5			B3: 6ns@CL2.5					
J: WBGA			V: WBGA(LF)			E: 90-FBGA (LF, MCP)			S: 90-FBGA			B4: 5ns@CL2.5			C3: 6ns@CL3					
M: FBGA(MCP)			E: FBGA(LF, MCP)			M: 90-FBGA(MCP)			F: Smaller 90FBGA			C4: 5ns@CL3			C5: 3.75ns@CL3					
F: Smaller 90 FBGA						H: Smaller 90FBGA(LF)			K: TSOP2-400(DDP)			CA: 5.5ns@CL3								
H: Smaller 90 FBGA(LF)						N: STSOP2			V: STSOP2(LF)			CC: 5ns@CL3,TRCD3,TRP3			CD: 4ns@CL3					
Y: 54-CSP(DDP)			P: 54-CSP(LF, DDP)			T: TSOP2-400			U: TSOP2-400(LF)			CE: 5ns@CL3, TRCD3, TRPS3(2.5V)			D4: 5ns@CL4			DS: Daisychain		
T: TSOP2-400			Q: ISM			Y: 54-CSP(DDP)			P: 54-CSP(LF, DDP)			M0: 10ns@CL1.5								
S: 90-FBGA			D: 90-FBGA(LF)			X: BOC			Z: BOC(LF)			<Only DDR SDRAM TPB code>								
<b>Mobile SDRAM PEA</b>						<b>DRAM COMMON</b>						S0: SH BIN(TPB) V0: SH 2/ 2/ 2 BIN								
F: Smaller 90-FBGA						C: CHIP BIZ			W: WAFER			W0: SH 3/ 3/ 3 BIN X0: Uniq. BIN								
H: Smaller 90-FBGA(LF)						(M): Mirror (LF): Lead Free						Y0: SH 3/ 4/ 4 BIN								
S: 90-FBGA			D: 90-FBGA(LF)									<b>- DDR SDRAM II</b>								
												C4: 5ns@CL3			C5: 3.75ns@CL3					
												CC: 5ns@CL3,TRCD3,TRP3								
												CF: 3.75ns@CL3(1.9V)								
												D4: 5ns@CL4			D5: 3.75ns@CL4					
												D6: 3.0ns@CL4			D7: 2.5ns@CL4					
												DH: 3ns@CL4(1.9V)								
												DS: Daisychain Sample			E4: 5ns@CL5					
												E5: 3.75ns@CL5			E6: 3.0ns@CL5					
												E7: 2.5ns@CL5			F6: 3.0ns@CL6					
												F7: 2.5ns@CL6								
												<b>- DDR3 SDRAM</b>								
												E7: 2.5ns@CL5			F6: 3.0ns@CL6					
												F7: 2.5ns@CL6								

## 13. Temp. Power

**- COMMON (Temp, Power)**

- O: NONE, NONE
- A: Automotive, Normal
- C: Commercial, Normal
- J: Commercial, Medium
- L: Commercial, Low
- F: Commercial, Low, PASR & TCSR
- B: Commercial, Super Low
- R: Commercial, Super Low, PASR & TCSR
- K: Commercial, Reduced

## 14~15. Speed (Wafer/Chip Biz/BGD: 00)

**- DDR SDRAM**

- A0: 10ns@CL2 A1: 8ns
- A2: 7.5ns@CL2
- AA :7.5ns@CL2,TRCD2,TRP2
- B0: 7.5ns@CL2.5
- B3: 6ns@CL2.5
- B4: 5ns@CL2.5
- C3: 6ns@CL3
- C4: 5ns@CL3
- C5: 3.75ns@CL3
- CA: 5.5ns@CL3
- CC: 5ns@CL3,TRCD3,TRP3
- CD: 4ns@CL3
- CE: 5ns@CL3, TRCD3, TRPS3(2.5V)
- D4: 5ns@CL4
- DS: Daisychain
- M0: 10ns@CL1.5
- <Only DDR SDRAM TPB code>
- S0: SH BIN(TPB) V0: SH 2/ 2/ 2 BIN
- W0: SH 3/ 3/ 3 BIN X0: Uniq. BIN
- Y0: SH 3/ 4/ 4 BIN

**- DDR SDRAM II**

- C4: 5ns@CL3
- C5: 3.75ns@CL3
- CC: 5ns@CL3,TRCD3,TRP3
- CF: 3.75ns@CL3(1.9V)
- D4: 5ns@CL4
- D5: 3.75ns@CL4
- D6: 3.0ns@CL4
- D7: 2.5ns@CL4
- DH: 3ns@CL4(1.9V)
- DS: Daisychain Sample
- E4: 5ns@CL5
- E5: 3.75ns@CL5
- E6: 3.0ns@CL5
- E7: 2.5ns@CL5
- F6: 3.0ns@CL6
- F7: 2.5ns@CL6
- DDR3 SDRAM**
- E7: 2.5ns@CL5
- F6: 3.0ns@CL6
- F7: 2.5ns@CL6

DRAM ORDERING INFORMATION

K	4	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	

- EDO & FP (tRAC)

40: 40ns

45: 45ns

50: 50ns

60: 60ns

- Direct RDRAM (tCC, tRAC)

C6: 300MHz, 53.3ns w/ consumer PKG

C8: 400MHz, 45ns w/ consumer PKG

C9: 533MHz, 32ns w/ consumer PKG

G6: 300MHz(3.3ns), 53.3ns

K7: 356MHz(2.8ns), 45ns

K8: 400MHz(2.5ns), 45ns

M8: 400MHz(2.5ns), 40ns

M9: 533MHz(1.9ns), 35ns

N1: 600MHz(1.667ns), 32ns

N9: 533MHz(1.9ns), 32ns

P3: 667MHz(1.5ns), 31ns

R6: 800MHz(1.25ns), 27ns

S8: 400MHz, 45ns SC

S9: 533MHz(1.9ns), 35ns SC

T9: 533MHz(1.9ns), 32ns, tDAC 3

DS: Daisychain Sample

\*SC (Short channel)

- Mobile SDRAM

15: 15ns@CL2

1H: 10ns@CL2

1L: 10ns@CL3

75: 7.5ns@CL3

80: 8ns@CL3

90: 9.0ns@CL3(12ns@CL2)

95: 9.5ns@CL3(12ns@CL2)

DP: Daisychain (PCB)

DS: Daisychain Sample

DY: Daisychain (Sanyo PCB)

- Mobile SDRAM PEA

1L: 10ns@CL3

60: 6ns@CL3

75: 7.5ns@CL3

90: 9.0ns@CL3(12ns@CL2)

- Mobile DDR SDRAM

C0: 15ns@CL3

C2: 10ns@CL3

C3: 7.5ns@CL3

C6: 6ns@CL3

CA: 9ns@CL3

DP: Daisychain (PCB)

DS: Daisychain

DY: Daisychain (Sanyo PCB)

- Mobile DDR SDRAM PEA

C3: 7.5ns@CL3

C6: 6ns@CL3

CA: 9ns@CL3

- Mobile L2RAM

L0: 100Mhz, CL3

L1: 133Mhz, CL3

L2: 166Mhz, CL4

- SDRAM (tCC: Default CL3)

10: 10ns, PC66

12: 12ns

15: 15ns

1H: 10ns@CL2, PC100

1L: 10ns, PC100

33: 3.3ns

40: 4ns

45: 4.5ns

50: 5ns

55: 5.5ns

56: 5.6ns

60: 6ns

67: 6.7ns

70: 7ns

74: 7.4ns

75: 7.5ns, PC133

7B: 7.5ns PC133, CL3, TRCD2, TRP2

7C: 7.5ns PC133, CL2, TRCD2, TRP2

80: 8ns

90: 9ns

96: 9.6ns

DP: Daisychain (PCB)

DS: Daisychain

DY: Daisychain (Sanyo PCB)

< Only SDRAM TPB Code >

S0: 7.0ns BIN

T0: 5.5ns BIN

U0: 6.0ns BIN

V0: 7.5ns BIN

W0: 8.0ns BIN

G0: 5.6ns BIN

- DDR SGRAM (tCC: Default CL3)

20: 2.0ns

21: 2.1ns(475MHz)

22: 2.2ns(450MHz)

25: 2.5ns

30: 3ns

33: 3.3ns

35: 3.5ns

36: 3.6ns

3N 3.32ns(301MHz)

40: 4ns

45: 4.5ns

50: 5ns

55: 5.5ns

60: 6ns

70: 7ns

2A: 2.86ns(350MHz)

2B: 2.94ns(340MHz)

2C: 2.66ns(375MHz)

5A: 5ns@CL3(TRCD3, TRP3)

< Only SDRAM TPB Code >

S0: 4.0ns BIN

- DDR SGRAM II

12: 1.25ns

14: 1.429ns

15: 1.5ns (667MHz)

16: 1.667ns

18: 1.818ns

1K: 1.996ns

2A: 2.86ns(350MHz)

20: 2ns

22: 2.2ns

25: 2.5ns

30: 3.0ns

33: 3.3ns

37: 3.75ns

- GDDR3 SDRAM

11: 1.1ns

12: 1.25ns

14: 1.429ns

15: 1.5ns(667MHz)

16: 1.667ns

18: 1.818ns

20: 2.0ns

22: 2.2ns

25: 2.5ns

30: 3.0ns

33: 3.3ns

36: 3.6ns

40: 4.0ns

1A: 1.0ns

2A: 2.86ns

- GDDR4 SDRAM

15: 1.5ns(667MHz)

Network-DRAM

D3: 6ns@CL4

D4: 5ns@CL4

DA: 5.5ns@CL4

F5: 4ns@CL6

F6: 3ns@CL6

FB: 3.33ns@CL6

FC: 3.0ns@CL6(6tCK tRC@CL4)

G7: 2.5ns@CL7

XDR DRAM

A2: 2.4Gbps, 36ns, 16Cycles

A3: 3.2Gbps, 27ns, 16Cycles

B3: 3.2Gbps, 35ns, 20Cycles

B4: 4.0Gbps, 28ns, 20Cycles

C3: 3.2Gbps, 35ns, 24Cycles

C4: 4.0Gbps, 28ns, 24Cycles

DS: Daisychain Sample

DRAM COMMON

00: NONE

16. Packing Type (16 digit)

Common to all products, except of Mask ROM  
 Divided into TAPE & REEL(In Mask ROM, divided into TRAY, AMMO Packing Separately)

Type	Packing Type	New Marking
Component	TAPE & REEL	T
	Other (Tray, Tube, Jar)	0 (Number)
	Stack	S
Component	TRAY	Y
(Mask ROM)	AMMO PACKING	A
Module	MODULE TAPE & REEL	P
	MODULE Other Packing	M

NOTES:

- 1) µgBGA® packages are registered trademarks of Tesser.
- 2) (M): Mirror
- 3) (LF): Lead Free

## NAND FLASH DISCRETE COMPONENTS

Density	Part Number	Organization	Speed (ns)	Voltage	Package
128Mb	K9F2808U0C-PCB	16Mx8	50	3.3V	TSOP48
256Mb	K9F5608U0C-PCB	32Mx8	50	3.3V	TSOP48
512Mb	K9F1208U0B-PCB	64Mx8	50	3.3V	TSOP48
1Gb	K9F1G08U0A-PCB	128Mx8	50	3.3V	TSOP48
2Gb	K9F2G08U0M-PCB	256Mx8	30	3.3V	TSOP48
4Gb	K9K4G08U0M-PCB	512Mx8	30	3.3V	TSOP48
8Gb	K9W8G08U1M-PCB	1024Mx8	30	3.3V	TSOP48

NOTE: All parts lead free

## OneNAND™ FLASH

Density	Part Number	Package	Organization	Voltage(V)	Temperature
128Mb	KFG2816Q1M-PEB0000	48 TSOP	X16	1.8v	Extended
	KFG2816D1M-PEB0000	<Pb free>	"	2.7v	Extended
	KFG2816U1M-PIB0000	"	"	3.3v	Industrial
256Mb	KFG5616Q1M-PEB0000	48 TSOP	X16	1.8v	Extended
	KFG5616D1M-PEB0000	<Pb free>	"	2.7v	Extended
	KFG5616U1M-PIB0000	"	"	3.3v	Industrial
	KFG5616Q1M-DEB0000	63 FBGA	X16	1.8v	Extended
	KFG5616D1M-DEB0000	<Pb free>	"	2.7v	Extended
	KFG5616U1M-DIB0000	"	"	3.3v	Industrial
512Mb	KFG1216Q2M-DEB0000	63 FBGA	X16	1.8v	Extended
	KFG1216D2M-DEB0000	<Pb free>	"	2.7v	Extended
	KFG1216U2M-DIB0000	"	"	3.3v	Industrial
1Gb	KFG1G16Q2M-DEB0000	63 FBGA	X16	1.8v	Extended
	KFG1G16D2M-DEB0000	<Pb free>	"	2.7v	Extended
	KFG1G16U2M-DIB0000	"	"	3.3v	Industrial

## NOR FLASH

Density	TSOP Part Number	FBGA Part Number	Block Architecture	Voltage
16Mb	K8D1716UTC-PI07	K8D1716UTC-FI07	Top	3.3V
	K801716UBC-PI07	K8D1716UBC-FI07	Bottom	3.3V
32Mb	K8D3216UTC-PI07	N/A	Top	3.3V
	K8D3216UBC-PI07	N/A	Bottom	3.3V
64Mb	K8D6316UTM-PI07	N/A	Top	3.3V
	K8D6316UBM-PI07	N/A	Bottom	3.3V

NOTE: All parts lead free

**NAND FLASH ORDERING INFORMATION**

K	4	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

**1. Memory (K)**

**2. NAND Flash: 9**

**3. Small Classification (SLC: Single Level Cell, MLC: Multi Level Cell, SM: SmartMedia, S/B: Small Block)**

- A: SLC + Muxed I/F Chip
- B: Muxed I/F Chip
- S: SLC Single SM
- D: SLC Dual SM
- Q: 4CHIP SM
- T: SLC SINGLE (S/B)
- E: SLC DUAL (S/B)
- R: SLC 4DIE STACK (S/B)
- F: SLC Normal
- G: MLC Normal
- K: SLC 2-Die Stack
- W: SLC 4-Die Stack
- J: Non-Muxed OneNAND
- U: 2 STACK MSP
- V: 4 STACK MSP

**4~5. Density**

- 12: 512M      16: 16M
- 28: 128M      32: 32M
- 40: 4M        56: 256M
- 64: 64M      80: 8M
- 1G: 1G        2G: 2G
- 4G: 4G        8G: 8G
- 00: NONE

**6~7. Organization**

- 00: NONE      08: x8
- 16: x16

**8. Vcc**

- C: 5.0V(4.5V~5.5V)
- D: 2.65V(2.4V~2.9V)
- E: 2.3V~3.6V
- Q: 1.8V(1.7V~1.95V)
- T: 2.4V~3.0V
- U: 2.7V~3.6V
- V: 3.3V(3.0V~3.6V)
- W: 2.7V~5.5V,3.0V~5.5V
- 0: NONE

**9. Mode**

- 0: Normal
- 1: Dual nCE & Dual Rn/B
- 4: Quad nCE & Single Rn/B
- A: Mask Option 1

**10. Generation**

- M: 1st Generation
- A: 2nd Generation
- B: 3rd Generation
- C: 4th Generation
- D: 5th Generation
- Y: Partial NAND(2nd)
- Z: Partial NAND(1st)
- M: 1st Generation
- A: 2nd Generation
- B: 3rd Generation
- C: 4th Generation
- D: 5th Generation
- Y: Partial NAND(2nd)
- Z: Partial NAND(1st)

**11. "--"**

**12. Package**

- A: COB                      B: TBGA
- C: CHIP BIZ                D: 63-TBGA
- E: TSOP1(LF,1217)        F: WSOP1(LF)
- G: FBGA                    H: TBGA(LF)
- J: FBGA(LF)                K: TSOP1(1217)
- L: LGA                      M: tLGA
- P: TSOP1(LF)              Q: TSOP2(LF)
- R: TSOP2-R                S: SMARTMEDIA
- T: TSOP2                  V: WSOP
- W: WAFER                 Y: TSOP1

**13. Temp**

- C: Commercial      I: Industrial
- 0: NONE

**14. Bad Block**

- B: Include Bad Block
- D: Daisychain Sample
- L: 1~5 Bad Block
- N: Ini. All Good, Add. 10 Blocks
- S: All Good Block
- 0: NONE

**15. NAND-Reserved**

- 0: Reserved

**16. Packing Type (16 digit)**

Common to all products, except of Mask ROM  
Divided into TAPE & REEL(In Mask ROM, divided into TRAY, AMMO Packing Separately)

Type	Packing Type	New Marking
<b>Component</b>	TAPE & REEL	T
	Other (Tray, Tube, Jar)	0 (Number)
	Stack	S
<b>Component</b>	TRAY	Y
<b>(Mask ROM)</b>	AMMO PACKING	A
<b>Module</b>	MODULE TAPE & REEL	P
	MODULE Other Packing	M

## LOW-POWER (5V) SRAM

Density	Part Number	Organization	Vcc (V)	Speed(ns)	Operating Temp	Operating Current (mA)	Standby Current (uA)	Package	Production Status
8Mbit	K6X8008C2B	1Mx8	4.5 - 5.5	55,70	C,I	50	50	TSOP2(44)	Mass Production
	K6X8016C3B	512x16	4.5 - 5.5	55,70	C,I	60	50	TSOP2(44)	Mass Production
4Mbit	K6X4016C3F	256x16	4.5 - 5.5	55,70	I,A	50	20,30	TSOP2(44)	Mass Production
	K6X4008C1F	512x8	4.5 - 5.5	55,70	I,A	40	20,30	32SOP,TSOP	Mass Production
1Mbit	K6T1008C2E	128x8	4.5 - 5.5	55,70	C,I	50	10	32DIP,32SOP,TSOP1(32)	EOL
	K6X1008C2D	128x8	4.5 - 5.5	55,70	I,A	35	15,25	32SOP,TSOP1(32)	Mass Production
256K bit	K6T0808C1D	32x8	4.5 - 5.5	55,70	C,I	60	5	28SOP,TSOP1(28)	EOL
	K6X0808C1D	32x8	4.5 - 5.5	55,70	C,I	35	25	28SOP	Mass Production

NOTE: Lead-free available upon request

## LOW-VOLTAGE & LOW-POWER SRAM

Density	Part Number	Organization	Vcc (V)	Speed (ns)	Operating Temp	Operating Current (mA)	Standby Current (uA)	Package	Production Status
8Mbit	K6X8008T2B	1024Kx8	2.7 - 3.6	55,70	C,I	40	40	TSOP2(44)	Mass Production
	K6X8016T3B	512Kx16	2.7 - 3.6	55,70	C,I	45	40	TSOP2(44)	Mass Production
4Mbit	K6X4008T1F	512x8	2.7 - 3.6	70,85	I,A	30	20,30	32SOP,TSOP2(32)	Mass Production
	K6X4016T3F	256x16	2.7 - 3.6	70,85	I,A	40	20,30	TSOP2(44)	Mass Production
1Mbit	K6F1008U2C	128x8	2.7 - 3.3	55,70	I	2	0.5	32TSOP1	Mass Production
	K6X1008T2D	128x8	2.7 - 3.6	70,85	I,A	25	10,20	32SOP,TSOP2(32)	Mass Production
	K6F1008V2C	128x8	3.0 - 3.6	55,70	I	3	0.5	25SOP1	Mass Production

## MICRO-POWER & LOW-VOLTAGE SRAM

Density	Part Number	Organization	Vcc (V)	Speed (ns)	Operating Temp	Operating Current (mA)	Standby Current (uA)	Package	Production Status
16Mbit	K6F1616U6C	1x16	2.7 - 3.3	55,70	I	3	1	48-FBGA	Mass Production
	K6F1616R6C	1x16	1.65 - 2.2	70	I	3	1	48-FBGA	Mass Production
8Mbit	K6F8016R6B	512x16	1.65 - 2.2	70,85	I	3	1	48-TBGA	EOL
	K6F8016U6B	512x16	2.7 - 3.3	55,70	I	4	1	48-TBGA	EOL
4Mbit	K6F4008R2G	512Kx8	1.65 - 2.20	70,85	I	2	0.5	36TBGA	Mass Production
	K6F4008U2G	512Kx8	2.7 - 3.3	45,55,70	I	2	0.5	36TBGA	Mass Production
	K6F4016R4E	256Kx16	1.65 - 2.20	70, 85	I	2	0.5	48TBGA	Mass Production
	K6F4016R6G	256Kx16	1.65 - 2.20	70,85	I	2	0.5	48TBGA	Mass Production
	K6F4016U4G	256Kx16	2.7 - 3.3	55,70	I	2	0.5	48TBGA	Mass Production
	K6F4016U6G	256Kx16	2.7 - 3.3	55,70	I	2	0.5	48TBGA	Mass Production
2Mbit	K6F2016U4E	128x16	2.7 - 3.3	55,70	I	2	0.5	48-TBGA	Mass Production
	K6F2016R4E	128x16	1.65 - 2.2	70,85	I	2	0.5	48-FBGA	Mass Production
	K6F2008U2E	256x8	2.7 - 3.3	55,70	I	2	0.5	32TSOP1	Mass Production
	K6F2008V2E	256x8	3.0 - 3.6	55,70	I	3	0.5	32TSOP1	Mass Production
1Mbit	K6F1016U4C	64x16	2.7 - 3.3	55,70	I	2	0.5	48-FBGA	Mass Production

## UtRAM (HIGH DENSITY & LOW POWER)

Density	Part Number	Organization	Vcc (V)	Speed (ns)	Operating Temp	Operating Current (mA)	Operating Current (uA)	Standby Current (uA)	Package	Production Status
32Mbit	K1S321615M	2Mx16	3	100	E	20	150		48-TBGA	EOL
	K1S321611C	2Mx17	3	70	I	35	100		48-FBGA	Mass Production
	K1S321615A	2Mx16	3	85	E	35	100		48-TBGA	Mass Production
16Mbit	K1S161615M	1Mx16	3	70	I	20	70		48-TBGA	Mass Production
	K1S1616B1M	1Mx16	1.8	70	I	35	60		48-TBGA	Mass Production

## HIGH-SPEED (4Mbit) ASYNCHRONOUS FAST SRAM

Density	Part Number	Organization	Vcc (V)	Speed (ns)	Operating Temp	Operating Current (mA)	Operating Current (uA)	Standby Current (uA)	Package	Production Status
4Mbit	4K6R4016C1D	256Kx16	5	10, 12	C,I	65, 55	20, 5		44SOJ, 44TSOP2, 48TBGA	Mass Production
	K6R4016V1D	256Kx16	3.3	8, 10	C,L,I,P	80, 65	20, 5(1.2)		44SOJ, 44TSOP2, 48TBGA	Mass Production
	K6R4004C1D	1Mx4	5	10, 12	C,I	65, 55	20, 5		32 SOJ	Mass Production
	K6R4004V1D	1Mx4	3.3	8, 10	C,I	80, 65	20, 5		32 SOJ	Mass Production
	K6R4008C1D	512Kx8	5	10, 12	C,I,P	65, 55	20, 5		36 SOJ, 44 TSOP2	Mass Production
	K6R4008V1D	512Kx8	3.3	8, 10	C,I	80, 65	20, 5		36 SOJ, 44 TSOP2	Mass Production
3Mbit	K6R3024V1D	128x24	3.3	9, 10, 12	C,I	170,150,130	40,15		119PBGA	Mass Production
1Mbit	K6R1008V1D	128x8	3.3	8, 10, 12	C,I	170,150,130	20,5		32SOJ,32TSOP2	Mass Production
	K6R1008C1D	128x8	5	10, 12, 15	C,I	170,150,130	20,5		32SOJ,32TSOP2	Mass Production
	K6R1004V1D	256x4	3.3	8, 10, 12	C,I	170,150,130	20,5		32SOJ	Mass Production
	K6R1004C1D	256x4	5	10, 12, 15	C,I	170,150,130	20,5		32SOJ	Mass Production
	K6R1016V1D	64x16	3.3	8, 10, 12	C,I	170,150,130	20,5		44SOJ,44TSOP2,48TBGA	Mass Production
	K6R1016C1D	64x16	5	10, 12, 15	C,I	170,150,130	20,5		44SOJ,44TSOP2,48TBGA	Mass Production

## SPB & FT (36Mbit) SRAM

Part Number	Organization	Operating Mode	Vdd (V)	Access Time tCD(ns)	Speed tCYC (MHz)	I/O Voltage (V)	Package	Production Status	Comments
K7A323600M	1Mx36	SPB	3.3	2.6, 3.1, 4.0	250, 200, 138	3.3, 2.5	100TQFP	Mass Production	2E1D
K7A321800M	2Mx18	SPB	3.3	2.6, 3.1, 4.0	250, 200, 138	3.3, 2.5	100TQFP	Mass Production	2E1D
K7B323625M	1Mx36	SB	3.3	6.5, 7.5	133, 118, 100	3.3, 2.5	100TQFP	Mass Production	-
K7B321825M	2Mx18	SB	3.3	6.5, 7.5	133, 118, 100	3.3, 2.5	100TQFP	Mass Production	-

NOTES: 2E1D = 2-cycle Enable and 1-cycle Disable

## SPB & FT (18Mbit) SRAM

Part Number	Organization	Operating Mode	Vdd (V)	Access Time tCD (ns)	Speed tCYC (MHz)	I/O Voltage (V)	Package	Production Status	Comments
K7A163600A	512Kx36	SPB	3.3	2.6, 3.5, 4.0	250, 167, 138	3.3, 2.5	100TQFP	EOL 2H'05	2E1D
K7A163601A	512Kx36	SPB	3.3	3.1, 3.5	200, 167	3.3, 2.5	100TQFP	EOL 2H'05	2E2D
K7A161800A	1Mx18	SPB	3.3	2.6, 3.5, 4.0	250, 167, 138	3.3, 2.5	100TQFP	EOL 2H'05	2E1D
K7A161801A	1Mx18	SPB	3.3	3.1, 3.5	200, 167	3.3, 2.5	100TQFP	EOL 2H'05	2E2D
K7B163625A	512Kx36	SB	3.3	7.5, 8.5	118, 100	3.3, 2.5	100TQFP	EOL 2H'05	-
K7B161825A	1Mx18	SB	3.3	7.5, 8.5	118, 100	3.3, 2.5	100TQFP	EOL 2H'05	-
K7A163630B	512Kx36	SPB	3.3, 2.5	2.6, 3.5	250, 167	3.3, 2.5	100TQFP	Mass Production 4Q'05	2E1D
K7A163631B	512Kx36	SPB	3.3, 2.5	3.1	200	3.3, 2.5	100TQFP	Mass Production 4Q'05	2E2D
K7A161830B	1Mx18	SPB	3.3, 2.5	2.6, 3.5	250, 167	3.3, 2.5	100TQFP	Mass Production 4Q'05	2E1D
K7A161831B	1Mx18	SPB	3.3, 2.5	3.1	200	3.3, 2.5	100TQFP	Mass Production 4Q'05	2E2D
K7B163635B	512Kx36	SB	3.3, 2.5	7.5	118	3.3, 2.5	100TQFP	Mass Production 4Q'05	-
K7B161835B	1Mx18	SB	3.3, 2.5	7.5	118	3.3, 2.5	100TQFP	Mass Production 4Q'05	-

NOTES: 2E1D = 2-cycle Enable and 1-cycle Disable    2E2D = 2-cycle Enable and 2-cycle Disable

### SPB & FT (8Mbit) SRAM

Part		Operating		Access Time		Speed		I/O		Production	
Number	Organization	Mode	Vdd (V)	tCD(ns)	tCYC (MHz)	tCYC (MHz)	tCYC (MHz)	Voltage (V)	Package	Status	Comments
K7A803600B	256x36	SPB	3.3	3.5,3.8	167,138	167,138	167,138	3.3,2.5	100TQFP	Mass Production	2E1D
K7A803609B	256x36	SPB	3.3	2.6	250	250	250	3.3,2.5	100TQFP	Mass Production	2E1D
K7A801800B	512x18	SPB	3.3	3.5,3.8	167,138	167,138	167,138	3.3,2.5	100TQFP	Mass Production	2E1D
K7A801809B	512x18	SPB	3.3	2.6	250	250	250	3.3,2.5	100TQFP	Mass Production	2E1D
K7B803625B	256x36	SB	3.3	6.5,7.5	133,117	133,117	133,117	3.3,2.5	100TQFP	Mass Production	-
K7B801825B	512x18	SB	3.3	6.5,7.5	133,117	133,117	133,117	3.3,2.5	100TQFP	Mass Production	-

NOTES: 2E1D = 2-cycle Enable and 1-cycle Disable  
2E2D = 2-cycle Enable and 2-cycle Disable

Recommended speed options for SPB are 250MHz and 167MHz.  
Recommended access speed option for SB is 6.5ns.

### SPB & FT (4Mbit) SRAM

Part		Operating		Access Time		Speed		I/O		Production	
Number	Organization	Mode	Vdd (V)	tCD(ns)	tCYC (MHz)	tCYC (MHz)	tCYC (MHz)	Voltage (V)	Package	Status	Comments
K7A403600B	128Kx36	SPB	3.3	3.5, 4.0	167, 138	167, 138	167, 138	3.3, 2.5	100 TQFP	Mass Production	2E1D
K7A401800B	256Kx18	SPB	3.3	3.5, 4.0	167, 138	167, 138	167, 138	3.3, 2.5	100 TQFP	Mass Production	2E1D
K7A403609B	128Kx36	SPB	3.3	2.4, 2.8	250, 200	250, 200	250, 200	3.3, 2.5	100 TQFP	Mass Production	2E1D
K7A401809B	256Kx18	SPB	3.3	2.4, 2.8	250, 200	250, 200	250, 200	3.3, 2.5	100 TQFP	Mass Production	2E1D
K7A403200B	128Kx32	SPB	3.3	3.5, 4.0	167, 138	167, 138	167, 138	3.3, 2.5	100 TQFP	Mass Production	2E1D
K7B403625B	128Kx36	SB	3.3	6.5, 7.5	133, 118	133, 118	133, 118	3.3, 2.5	100 TQFP	Mass Production	-
K7B401825B	256Kx18	SB	3.3	6.5, 7.5	133, 118	133, 118	133, 118	3.3, 2.5	100 TQFP	Mass Production	-

NOTES: 2E1D = 2-cycle Enable and 1-cycle Disable  
2E2D = 2-cycle Enable and 2-cycle Disable

Recommended speed options for SPB are 250MHz and 167MHz.  
Recommended access speed option for SB is 6.5ns.

### SPB & FT (2Mbit) SRAM

Part		Operating		Access Time		Speed		I/O		Production	
Number	Organization	Mode	Vdd (V)	tCD(ns)	tCYC (MHz)	tCYC (MHz)	tCYC (MHz)	Voltage (V)	Package	Status	Comments
K7A203600B	64Kx36	SPB	3.3	4	138	138	138	2.5, 3.3	100 TQFP	Mass Production	2E1D
K7A203200B	64Kx32	SPB	3.3	4	138	138	138	2.5, 3.3	100 TQFP	Mass Production	2E1D

NOTES: 2E1D = 2-cycle Enable and 1-cycle Disable

2E2D = 2-cycle Enable and 2-cycle Disable

### SPB & FT (36Mbit) NTRAM

Part		Operating		Access Time		Speed		I/O		Production	
Number	Organization	Mode	Vdd (V)	tCD(ns)	tCYC (MHz)	tCYC (MHz)	tCYC (MHz)	Voltage (V)	Package	Status	Comments
K7N323645M	1Mx36	SPB	2.5	2.6, 3.2, 3.5, 4.2	250, 200, 167, 133	250, 200, 167, 133	250, 200, 167, 133	2.5	100TQFP, 165FBGA	Mass Production	
K7N321845M	2Mx18	SPB	2.5	2.6, 3.2, 3.5, 4.2	250, 200, 167, 133	250, 200, 167, 133	250, 200, 167, 133	2.5	100TQFP, 165FBGA	Mass Production	
K7N323601M	1Mx36	SPB	3.3	2.6, 3.2, 3.5, 4.2	250, 200, 167, 133	250, 200, 167, 133	250, 200, 167, 133	3.3, 2.5	100TQFP, 165FBGA	Mass Production	
K7N321801M	2Mx18	SPB	3.3	2.6, 3.2, 3.5, 4.2	250, 200, 167, 133	250, 200, 167, 133	250, 200, 167, 133	3.3, 2.5	100TQFP, 165FBGA	Mass Production	
K7M323625M	1Mx36	FT	3.3	7.5	118	118	118	3.3, 2.5	100TQFP	Mass Production	
K7M321825M	2Mx18	FT	3.3	7.5	118	118	118	3.3, 2.5	100TQFP	Mass Production	

NOTES: Recommended speed options for SPB are 250MHz, 200MHz and 167MHz.

Recommended access speed option for SB is 7.5ns.

### SPB & FT (18Mbit) NTRAM

Part		Operating		Access Time		Speed		I/O		Production	
Number	Organization	Mode	Vdd (V)	tCD(ns)	tCYC (MHz)	tCYC (MHz)	tCYC (MHz)	Voltage (V)	Package	Status	Comments
K7N161801A	1Mx18	SPB	3.3	2.6, 3.2, 3.5, 4.2	250, 200, 167, 133	250, 200, 167, 133	250, 200, 167, 133	3.3, 2.5	100TQFP, 165FBGA	EOL 2H'05	
K7N163601A	512Kx36	SPB	3.3	2.6, 3.2, 3.5, 4.2	250, 200, 167, 133	250, 200, 167, 133	250, 200, 167, 133	3.3, 2.5	100TQFP, 165FBGA	EOL 2H'05	
K7N163645A	512Kx36	SPB	2.5	2.6, 3.2, 3.5, 4.2	250, 200, 167, 133	250, 200, 167, 133	250, 200, 167, 133	2.5	100TQFP, 165FBGA	EOL 2H'05	
K7N161845A	1Mx18	SPB	2.5	2.6, 3.2, 3.5, 4.2	250, 200, 167, 133	250, 200, 167, 133	250, 200, 167, 133	2.5	100TQFP, 165FBGA	EOL 2H'05	
K7M161825A	1Mx18	FT(SB)	3.3	6.5, 7.5	133, 117	133, 117	133, 117	3.3, 2.5	100TQFP	EOL 2H'05	
K7M163625A	512Kx36	FT(SB)	3.3	6.5, 7.5	133, 117	133, 117	133, 117	3.3, 2.5	100TQFP	EOL 2H'05	
K7N161831B	1Mx18	SPB	3.3, 2.5	2.6, 3.2, 3.5	250, 200, 167	250, 200, 167	250, 200, 167	3.3, 2.5	100TQFP, 165FBGA	Mass Production Q4'05	
K7N163631B	512Kx36	SPB	3.3, 2.5	2.6, 3.2, 3.5	250, 200, 167	250, 200, 167	250, 200, 167	3.3, 2.5	100TQFP, 165FBGA	Mass Production Q4'05	
K7M161835B	1Mx18	FT(SB)	3.3	6.5	133	133	133	3.3, 2.5	100TQFP	Mass Production Q4'05	
K7M163635B	512Kx36	FT(SB)	3.3	6.5	133	133	133	3.3, 2.5	100TQFP	Mass Production Q4'05	

NOTE: B-version samples are available now.



### SPB & FT (8Mbit) NtRAM

Part		Operating		Access Time		Speed		I/O		Production
Number	Organization	Mode	Vdd (V)	tCD(ns)	tCYC (MHz)	tCYC (MHz)	tCYC (MHz)	Voltage (V)	Package	Status
K7N803601B	256Kx36	SPB	3.3	3.5, 4.2	167,133	167,133	167,133	3.3,2.5	100TQFP	Mass Production
K7N801801B	512Kx18	SPB	3.3	3.5, 4.2	167,133	167,133	167,133	3.3,2.5	100TQFP	Mass Production
K7N803609B	256Kx36	SPB	3.3	2.6	250	250	250	3.3,2.5	100TQFP	Mass Production
K7N801809B	512Kx18	SPB	3.3	2.6	250	250	250	3.3,2.5	100TQFP	Mass Production
K7N803645B	256Kx36	SPB	2.5	3.5, 4.2	167,133	167,133	167,133	2.5	100TQFP	Mass Production
K7N801845B	512Kx18	SPB	2.5	3.5, 4.2	167,133	167,133	167,133	2.5	100TQFP	Mass Production
K7N803649B	256Kx36	SPB	2.5	2.6	250	250	250	2.5	100TQFP	Mass Production
K7N801849B	512Kx18	SPB	2.5	2.6	250	250	250	2.5	100TQFP	Mass Production
K7M801825B	512Kx18	FT	3.3	6.5,7.5	133,117	133,117	133,117	3.3, 2.5	100TQFP	Mass Production
K7M803625B	256Kx36	FT	3.3	6.5,7.5	133,117	133,117	133,117	3.3, 2.5	100TQFP	Mass Production

### SPB & FT (4Mbit) NtRAM

Part		Operating		Access Time		Speed		I/O		Production
Number	Organization	Mode	Vdd (V)	tCD(ns)	tCYC (MHz)	tCYC (MHz)	tCYC (MHz)	Voltage (V)	Package	Status
K7N403601B	128Kx36	SPB	3.3	3.5, 4.2	167,133	167,133	167,133	3.3,2.5	100 TQFP	Mass Production
K7N401801B	256Kx18	SPB	3.3	3.5, 4.2	167,133	167,133	167,133	3.3,2.5	100 TQFP	Mass Production
K7N403609B	128Kx36	SPB	3.3	2.6, 3.0	250,200	250,200	250,200	3.3,2.5	100 TQFP	Mass Production
K7N401809B	256Kx18	SPB	3.3	2.6, 3.0	250,200	250,200	250,200	3.3,2.5	100 TQFP	Mass Production

### LATE-WRITE R-R (18Mbit) SRAM

Part		Operating		Access Time		Speed		I/O		Production
Number	Organization	Mode	Vdd (V)	tCD(ns)	tCYC (MHz)	tCYC (MHz)	tCYC (MHz)	Voltage (V)	Package	Status
K7P161866A	1Mx18	SP	2.5	2	250	250	250	1.5 (Max.1.9)	119BGA	Mass Production
K7P163666A	512Kx36	SP	2.5	1.6	300,250	300,250	300,250	1.5 (Max.1.9)	119BGA	Mass Production

### LATE-WRITE R-R (8Mbit) SRAM

Part		Operating		Access Time		Speed		I/O		Production
Number	Organization	Mode	Vdd (V)	tCD(ns)	tCYC (MHz)	tCYC (MHz)	tCYC (MHz)	Voltage (V)	Package	Status
K7P801811B	512Kx18	SP	3.3	1.5,1.6,2.0	333,300,250	333,300,250	333,300,250	1.5 (Max.2.0)	119BGA	Mass Production
K7P801866B	512Kx18	SP	2.5	1.5,1.6,2.0	333,300,25	333,300,25	333,300,25	1.5 (Max.2.0)	119BGA	Mass Production
K7P803611B	256Kx36	SP	3.3	1.5,1.6,2.0	333,300,250	333,300,250	333,300,250	1.5 (Max.2.0)	119BGA	Mass Production
K7P803666B	256Kx36	SP	2.5	1.5, 1.6, 2.0	333, 300,250	333, 300,250	333, 300,250	1.5 (Max.2.0)	119BGA	Mass Production
K7P801822B	512Kx18	SP	3.3	1.5, 1.6, 2.0	333, 300,250	333, 300,250	333, 300,250	2.5/3.3	119BGA	Mass Production
K7P803622B	256Kx36	SP	3.3	3.3,2.5,2.0	250,200,166	250,200,166	250,200,166	2.5/3.3	119BGA	Mass Production

### LATE-WRITE R-R & R-L (4Mbit) SRAM

Part		Operating		Access Time		Speed		I/O		Production
Number	Organization	Mode	Vdd (V)	tCD(ns)	tCYC (MHz)	tCYC (MHz)	tCYC (MHz)	Voltage (V)	Package	Status
K7P401822B	256Kx18	SP	3.3	2.5,2.7,3.0	250,200,167	250,200,167	250,200,167	2.5/3.3	119BGA	Mass Production
K7P401823B	256Kx18	SP	3.3	6.5	167	167	167	2.5/3.3	119BGA	Mass Production
K7P403622B	128Kx36	SP	3.3	2.5,2.7,3.0	250,200,167	250,200,167	250,200,167	2.5/3.3	119BGA	Mass Production

### DDR1 (18Mbit) SRAM

Part		Operating		Access Time		Cycle Time		I/O		Production
Number	Organization	Mode	Vdd (V)	tCD (ns)	tCYC (MHz)	tCYC (MHz)	tCYC (MHz)	Voltage (V)	Package	Status
K7D161874B	1Mx18		1.8~2.5	2.3	330/300	330/300	330/300	1.5	153BGA	ES Samples
K7D163674B	512Kx36		1.8~2.5	2.3	330/300	330/300	330/300	1.5	153BGA	ES Samples

## DDR1 (8Mbit) SRAM

Part Number	Organization	Vdd (V)	Access Time tCD (ns)	Cycle Time (MHz)	I/O Voltage (V)	Package	Production Status
K7D803671B	256Kx36	2.5	1.7/1.9/2.1	333/330/250	1.5(Max 2.0)	153BGA	Mass Production
K7D801871B	512Kx18	2.5	1.7/1.9/2.1	333/330/250	1.5(Max 2.0)	153BGA	Mass Production

## DDR1 (16Mbit) CIO/SIO SRAM

Part Number	Organization	Vdd (V)	Access Time tCD (ns)	Cycle Time (MHz)	I/O Voltage (V)	Package	Production Status	Comments
K7I161882B	1Mx18	1.8	0.45,0.45,0.50	250,200,167	1.5,1.8	165FBGA	Mass Production	CIO-2B
K7I161884B	1Mx18	1.8	0.45,0.45,0.50	250,200,167	1.5,1.8	165FBGA	Mass Production	CIO-4B
K7J161882B	1Mx18	1.8	0.45,0.45,0.50	250,200,167	1.5,1.8	165FBGA	Mass Production	SIO-2B
K7J163682B	512Kx36	1.8	0.45,0.45,0.50	250,200,167	1.5,1.8	165FBGA	Mass Production	SIO-2B
K7I163682B	512Kx36	1.8	0.45,0.45,0.50	250,200,167	1.5,1.8	165FBGA	Mass Production	CIO-2B
K7I163684B	512Kx36	1.8	0.45,0.45,0.50	250,200,167	1.5,1.8	165FBGA	Mass Production	CIO-4B

NOTES: 2B = Burst of 2

4B = Burst of 4

SIO = Separate I/O

CIO = Common I/O

## QDR1,2 (16Mbit) SRAM

Part Number	Organization	Vdd (V)	Access Time tCD (ns)	Cycle Time (MHz)	I/O Voltage (V)	Package	Production Status	Comments
K7R160982B	2Mx9	1.8	0.45,0.50	200,167	1.5,1.8	165FBGA	Mass Production	QDR II - 2B
K7R161882B	1Mx18	1.8	0.45,0.50	200,167	1.5,1.8	165FBGA	Mass Production	QDR II - 2B
K7R161884B	1Mx18	1.8	0.45,0.45,0.50	250,200,167	1.5,1.8	165FBGA	Mass Production	QDR II - 4B
K7Q161852A	1Mx18	2.5	2.5,3.0	167,133	1.5,1.8	165FBGA	EOL 3Q'05	QDR I - 2B
K7Q161854A	1Mx18	2.5	2.5,3.0	167,133	1.5,1.8	165FBGA	EOL 3Q'05	QDR I - 4B
K7Q161882A	1Mx18	1.8	2.7,3.0	167,133	1.5,1.8	165FBGA	EOL 3Q'05	QDR I - 2B
K7Q161884A	1Mx18	1.8	2.5,3.0	167,133	1.5,1.8	169FBGA	EOL 3Q'05	QDR I - 4B
K7Q161862B	1Mx18	1.8v / 2.5v	2.5	167	1.5,1.8	165FBGA	Mass Production	QDR I - 2B
K7Q161864B	1Mx18	1.8v / 2.5v	2.5	167	1.5,1.8	165FBGA	Mass Production	QDR I - 4B
K7R163682B	512Kx36	1.8	0.45,0.50	200,167	1.5,1.8	165FBGA	Mass Production	QDR II - 2B
K7R163684B	512Kx36	1.8	0.45,0.45,0.50	250,200,167	1.5,1.8	165FBGA	Mass Production	QDR II - 4B
K7Q163652A	512Kx36	2.5	2.5,3.0	167,133	1.5,1.8	165FBGA	EOL 3Q'05	QDR I - 2B
K7Q163654A	512Kx36	2.5	2.5,3.0	167,133	1.5,1.8	165FBGA	EOL 3Q'05	QDR I - 4B
K7Q163682A	512Kx36	1.8	2.7,3.0	167,133	1.5,1.8	165FBGA	EOL 3Q'05	QDR I - 2B
K7Q163684A	512Kx36	1.8	2.5,3.0	167,133	1.5,1.8	165FBGA	EOL 3Q'05	QDR I - 4B
K7Q163662B	512Kx36	1.8v / 2.5v	2.5	167	1.5,1.8	165FBGA	Mass Production	QDR I - 2B
K7Q163664B	512Kx36	1.8v / 2.5v	2.5	167	1.5,1.8	165FBGA	Mass Production	QDR I - 4B

NOTES: 2B = Burst of 2

4B = Burst of 4

Accept A-version PO (Last-time buy chance at July) by July '05

## DDR2 CIO/SIO (36Mbit) SRAM

Part Number	Organization	Vdd (V)	Access Time tCD (ns)	Cycle Time (MHz)	I/O Voltage (V)	Production Package	Status	Comments
K7I321882M	2Mx18	1.8	0.45,0.45,0.50	250,200,167	1.5,1.8	165FBGA	Mass Production	CIO-2B
K7I321884M	2Mx18	1.8	0.45,0.45,0.50	250,200,167	1.5,1.8	165FBGA	Mass Production	CIO-4B
K7J321882M	2Mx18	1.8	0.45,0.45,0.50	250,200,167	1.5,1.8	165FBGA	Mass Production	SIO-2B
K7I323682M	1Mx36	1.8	0.45,0.45,0.50	250,200,167	1.5,1.8	165FBGA	Mass Production	CIO-2B
K7I323684M	1Mx36	1.8	0.45,0.45,0.50	250,200,167	1.5,1.8	165FBGA	Mass Production	CIO-4B
K7J323682M	1Mx36	1.8	0.45,0.45,0.50	250,200,167	1.5,1.8	165FBGA	Mass Production	SIO-2B

NOTES: 2B = Burst of 2

4B = Burst of 4

SIO = Separate I/O

CIO = Common I/O

## QDR 2 (36Mbit) SRAM

Part Number	Organization	Vdd (V)	Access Time tCD (ns)	Cycle Time (MHz)	I/O Voltage (V)	Production Package	Status	Comments
K7R320982M	4Mx9	1.8	0.45,0.50	200,167	1.5,1.8	165FBGA	Mass Production	QDR II-2B
K7R321882M	2Mx18	1.8	0.45,0.50	200,167	1.5,1.8	165FBGA	Mass Production	QDR II-2B
K7R321884M	2Mx18	1.8	0.45,0.45,0.50	250,200,167	1.5,1.8	165FBGA	Mass Production	QDR II-4B
K7R323682M	1Mx36	1.8	0.45,0.50	200,167	1.5,1.8	165FBGA	Mass Production	QDR II-2B
K7R323684M	1Mx36	1.8	0.45,0.45,0.50	250,200,167	1.5,1.8	165FBGA	Mass Production	QDR II-4B

NOTES: 2B = Burst of 2

4B = Burst of 4

## DDR2 CIO/SIO (72Mbit) SRAM

Part Number	Organization	Vdd (V)	Access Time tCD (ns)	Cycle Time (MHz)	I/O Voltage (V)	Production Package	Status	Comments
K7I641882M	4Mx18	1.8	0.45,0.45,0.45,0.50	300,250,200,167	1.5,1.8	165FBGA	Mass Production Q2'05	CIO-2B
K7I641884M	4Mx18	1.8	0.45,0.45,0.45,0.50	300,250,200,167	1.5,1.8	165FBGA	Mass Production Q2'05	CIO-4B
K7J641882M	4Mx18	1.8	0.45,0.45,0.45,0.50	300,250,200,167	1.5,1.8	165FBGA	Mass Production Q2'05	SIO-2B
K7I643682M	2Mx36	1.8	0.45,0.45,0.45,0.50	300,250,200,167	1.5,1.8	165FBGA	Mass Production Q2'05	CIO-2B
K7I643684M	2Mx36	1.8	0.45,0.45,0.45,0.50	300,250,200,167	1.5,1.8	165FBGA	Mass Production Q2'05	CIO-4B
K7J643682M	2Mx36	1.8	0.45,0.45,0.45,0.50	300,250,200,167	1.5,1.8	165FBGA	Mass Production Q2'05	SIO-2B

NOTES: 2B = Burst of 2

4B = Burst of 4

SIO = Separate I/O

CIO = Common I/O

## QDR 2 (72Mbit) SRAM

Part Number	Organization	Vdd (V)	Access Time tCD (ns)	Cycle Time (MHz)	I/O Voltage (V)	Production Package	Status	Comments
K7R640982M	8Mx9	1.8	0.45,0.45,0.50	250,200,167	1.5,1.8	165FBGA	Mass Production Q2'05	QDR II-2B
K7R641882M	4Mx18	1.8	0.45,0.45,0.50	250,200,167	1.5,1.8	165FBGA	Mass Production Q2'05	QDR II-2B
K7R641884M	4Mx18	1.8	0.45,0.45,0.45,0.50	300,250,200,167	1.5,1.8	165FBGA	Mass Production Q2'05	QDR II-4B
K7R643682M	2Mx36	1.8	0.45,0.45,0.50	250,200,167	1.5,1.8	165FBGA	Mass Production Q2'05	QDR II-2B
K7R643684M	2Mx36	1.8	0.45,0.45,0.45,0.50	300,250,200,167	1.5,1.8	165FBGA	Mass Production Q2'05	QDR II-4B

NOTES: 2B = Burst of 2

4B = Burst of 4

## ASYNCHRONOUS SRAM ORDERING INFORMATION

K	4	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X																				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18																					
<b>1. Memory (K)</b>			<b>10. Generation</b>									<b>14~15. Speed (t<sub>AA</sub>)</b>																										
<b>2. Async SRAM: 6</b>			M: 1st Generation A: 2nd Generation      B: 3rd Generation C: 4th Generation      D: 5th Generation E: 6th Generation      F: 7th Generation G: 8th Generation      H: 9th Generation									- fCMOS Cell + LPSRAM & Poly Load Cell + LPSRAM & TFT Cell + LPSRAM 10: 100ns 12: 120ns 15: 150ns 25: 25ns(only fCMOS Cell) 30: 300ns 35: 35ns(except Poly Load Cell) 45: 45ns(except fCMOS Cell) 55: 55ns 60: 60ns(only fCMOS Cell) 70: 70ns 85: 85ns 90: 90ns(only fCMOS Cell) DS: Daisychain Sample																										
<b>3. Small Classification</b>			E: Corner Vcc/Vss + Fast SRAM F: fCMOS Cell + LPSRAM H: High Speed(LPSRAM) X: High Voltage(LPSRAM) J: BICMOS L: Poly Load Cell + LPSRAM R: Center Vcc/Vss + Fast SRAM T: TFT Cell + LPSRAM									- High Speed (LPSRAM) 20: 20ns                                      25: 25ns - High Voltage (LPSRAM) 55: 55ns                                      70: 70ns                                      85: 85ns - Corner Vcc/Vss + Fast SRAM 10: 10ns                                      12: 12ns                                      13: 13ns 15: 15ns                                      17: 17ns                                      20: 20ns 25: 25ns                                      30: 30ns                                      35: 35ns 45: 45ns - BICMOS & Center Vcc/Vss + Fast SRAM 06: 6ns                                      08: 8ns                                      09: 9ns 10: 10ns                                      12: 12ns                                      13: 13ns 15: 15ns                                      17: 17ns                                      20: 20ns 25: 25ns 30: 30ns(only Center Vcc/Vss + Fast SRAM) 35: 35ns(only Center Vcc/Vss + Fast SRAM) 7A: 7.2ns(only BICMOS) 8A: 8.6ns(only BICMOS) DS: Daisychain Sample																										
<b>4~5. Density</b>			L: TSOP1-0813.4F(LF) P: TSOP1-0820F(LF) Q: TSOP2-400R(LF)                      R: TSOP-R T: TSOP                                      U: TSOP2-400(LF) W: WAFER                                      Z: UBGA									- Async SRAM COMMON 00: NONE (Containing Wafer, CHIP BIZ, Exception code)																										
<b>6~7. Organization</b>			* Exception - 1MFSRAM B-ver 32-SOJ-300 > S 28-SOJ-300 > S - 512K/1M/2M/4M LPSRAM 32-TSOP1-0813.4F > Y 32-TSOP1-0813.4 > Y 32-TSOP1-0813.4R > N - 4M LPSRAM 32-TSOP2-400F > V 32-TSOP2-400R > M									<b>16. Packing Type (16 digit)</b> - Common to all products, except of Mask ROM - Divided into TAPE & REEL(In Mask ROM, divided into TRAY, AMMO Packing Separately)																										
<b>8. Vcc</b>			- COMMON (Temp,Power) A: Automotive,Normal B: Commercial,Low Low C: Commercial,Normal D: Extended,Low Low E: Extended,Normal F: Industrial,Low Low I: Industrial,Normal L: Commercial,Low M: Military,Normal N: Extended,Low P: Industrial,Low Q: Automotive,Low R: Industrial,Super Low T: Extended,Super Low U: Commercial,Ultra Super Low 0: NONE,NONE - WAFER, CHIP BIZ Level Division 0: NONE,NONE 1: Hot DC sort 2: Hot DC,selected AC sort 3: Cold/Hot DC,selected AC sort									<b>Type                      Packing Type                      New Marking</b>																										
<b>9. Mode</b>			1: CS Low Active 2: CS1, CS2 - Dual Chip Select Signal 3: Single Chip Select with /LB,/UB(tOE) 4: Single Chip Select with /LB,/UB(tCS) 5: Dual Chip Select with /LB,/UB(tOE) 6: Dual Chip Select with /LB,/UB(tCS) 7: I/Os Control with /BYTE 8: CDMA Function 9: Multiplexed Address A: Mirror Chip Option									<table border="1"> <tbody> <tr> <td><b>Component</b></td> <td>TAPE &amp; REEL</td> <td>T</td> </tr> <tr> <td></td> <td>Other (Tray, Tube, Jar)</td> <td>0 (Number)</td> </tr> <tr> <td></td> <td>Stack</td> <td>S</td> </tr> <tr> <td><b>Component</b></td> <td>TRAY</td> <td>Y</td> </tr> <tr> <td><b>(Mask ROM)</b></td> <td>AMMO PACKING</td> <td>A</td> </tr> <tr> <td><b>Module</b></td> <td>MODULE TAPE &amp; REEL</td> <td>P</td> </tr> <tr> <td></td> <td>MODULE Other Packing</td> <td>M</td> </tr> </tbody> </table>						<b>Component</b>	TAPE & REEL	T		Other (Tray, Tube, Jar)	0 (Number)		Stack	S	<b>Component</b>	TRAY	Y	<b>(Mask ROM)</b>	AMMO PACKING	A	<b>Module</b>	MODULE TAPE & REEL	P		MODULE Other Packing	M
<b>Component</b>	TAPE & REEL	T																																				
	Other (Tray, Tube, Jar)	0 (Number)																																				
	Stack	S																																				
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<b>(Mask ROM)</b>	AMMO PACKING	A																																				
<b>Module</b>	MODULE TAPE & REEL	P																																				
	MODULE Other Packing	M																																				

SRAM ORDERING INFORMATION

K	4	X	X	X	X	X	X	X	X	-	X	X	X	X	X	X	X	X
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	

1. Memory (K)

- 45: 2.5V, LVTTTL, 2E2D
- 49: 2.5V, LVTTTL, Hi SPEED
- 52: 2.5V, 1.5/1.8V, HSTL, Burst2
- 54: 2.5V, 1.5/1.8V, HSTL, Burst4
- 62: 2.5V/1.8V, HSTL, Burst2
- 64: 2.5V/1.8V, HSTL, Burst4
- 66: 2.5V, HSTL, R-R
- 70: 2.5V, HSTL, 4-1-1-1
- 71: 2.5V, HSTL, 3-1-1-1
- 73: 1.5V, 1.8V, HSTL, All
- 74: 1.8V, 2.5V, HSTL, All
- 80: 1.8V, LVCMOS, 2E1D
- 82: 1.8V, HSTL, Burst2
- 84: 1.8V, HSTL, Burst4
- 85: 1.8V, LVCMOS, 2E2D, Hi SPEED
- 88: 1.8V, HSTL, R-R
- 91: 1.5V, HSTL, All
- 95: 1.0V, HSTL, All

2. Sync SRAM: 7

3. Small Classification

- A: Sync Pipelined Burst
- B: Sync Burst
- C: Custom Product
- D: Double Data Rate
- E: Double Data Rate 3-Clk Align
- H: Double Data Rate I-Common I/O
- I: Double Data Rate II-Common I/O
- J: Double Data Rate-Separate I/O
- L: Late Select
- M: Sync Burst + NtRAM
- N: Sync Pipelined Burst + NtRAM
- P: Sync Pipe
- Q: Quad Data Rate I
- R: Quad Data Rate II
- U: CSRAM
- Z: DLW RAM

4~5. Density

- 10: 1M
- 16: 16M
- 20: 2M
- 32: 32M
- 40: 4M
- 44: 144M
- 64: 64M
- 72: 72M
- 80: 8M

6~7. Organization

- 08: x8
- 09: x9
- 18: x18
- 32: x32
- 36: x36
- 44: x144
- 72: x72

8~9. Vcc, Interface, Mode

- 00: 3.3V, LVTTTL, 2E1D WIDE
- 01: 3.3V, LVTTTL, 2E2D WIDE
- 08: 3.3V, LVTTTL, 2E2D Hi SPEED
- 09: 3.3V, LVTTTL, Hi SPEED
- 11: 3.3V, HSTL, R-R
- 12: 3.3V, HSTL, R-L
- 14: 3.3V, HSTL, R-R Fixed ZQ
- 22: 3.3V, LVTTTL, R-R
- 23: 3.3V, LVTTTL, R-L
- 25: 3.3V, LVTTTL, SB-FT WIDE
- 30: 1.8/2.5/3.3V, LVTTTL, 2E1D
- 31: 1.8/2.5/3.3V, LVTTTL, 2E2D
- 35: 1.8/2.5/3.3V, LVTTTL, SB-FT
- 44: 2.5V, LVTTTL, 2E1D

10. Generation

- M: 1st Generation
- A: 2nd Generation
- B: 3rd Generation
- C: 4th Generation
- D: 5th Generation
- Z: TEMPORARY CODE

11. "--"

12. Package

- H: BGA, FCBGA, PBGA
- G: BGA, FCBGA, PBGA(LF)
- F: FBGA
- Q: (L)QFP
- C: CHIP BIZ
- W: WAFER

13. Temp. Power

- **COMMON (Temp, Power)**
- 0: NONE, NONE (Containing of Error handling code)
- A: Automotive, Normal
- B: Commercial, Low Low
- C: Commercial, Normal
- E: Extended, Normal
- I: Industrial, Normal
- **WAFER, CHIP BIZ Level Division**
- 0: NONE, NONE
- 1: Hot DC sort
- 2: Hot DC, selected AC sort

14~15. Speed

- **Sync Burst, Sync Burst + NtRAM & < Mode is R-L > (Clock Accesss Time)**
- 10: 10ns (Sync Burst, Sync Burst + NtRAM)
- 38: 3.8ns
- 43: 4.3ns
- 48: 4.8ns
- 50: 5ns (Only Sync Pipe)
- 55: 5.5ns
- 60: 6ns
- 65: 6.5ns
- 67: 6.7ns
- 70: 7ns
- 75: 7.5ns
- 80: 8ns
- 85: 8.5ns
- 90: 9ns

- **Other Small Classification (Clock Cycle Time)**

- 10: 100MHz
- 11: 117MHz
- 13: 133MHz
- 14: 138MHz
- 15: 150MHz
- 16: 166MHz
- 17: 175MHz
- 18: 183MHz
- 19: 143MHz
- 20: 200MHz
- 21: 200MHz(2.0ns)
- 22: 225MHz
- 25: 250MHz
- 26: 250MHz(1.75ns)
- 27: 275MHz
- 30: 300MHz
- 33: 333MHz
- 35: 350MHz
- 36: 366MHz(t-CYCLE)
- 37: 375MHz
- 40: 400MHz(t-CYCLE)
- 42: 425MHz
- 45: 450MHz
- 50: 500MHz(except Sync Pipe)
- 6A: 600MHz
- 6F: 650MHz(Only CSRAM)
- 7F: 750MHz

16. Packing Type (16 digit)

- Common to all products, except of Mask ROM
- Divided into TAPE & REEL(In Mask ROM, divided into TRAY, AMMO Packing Separately)

Type	Packing Type	New Marking
<b>Component</b>	TAPE & REEL	T
	Other (Tray, Tube, Jar)	0 (Number)
	Stack	S
<b>Component</b>	TRAY	Y
<b>(Mask ROM)</b>	AMMO PACKING	A
	<b>Module</b>	MODULE TAPE & REEL
MODULE Other Packing		M

## MCP: NAND/DRAM

DENSITY				PKG INFORMATION	
ROM	RAM	Family	Part No.	Size	Type
256	128	ND256128	K5D5629CCM-F(D)095000	10.5x13x1.4	107FBGA
			K5D5729CCM-F095000	10.5x13x1.4	107FBGA
			K5D5629ACB-D090(T)000	10.5x13x1.4	107FBGA
			K5D5729CCA-F(D)095000	10.5x13x1.4	127FBGA
256	256	ND256256	K5D5657ACM-F095T00	10.5x13x1.4	107FBGA
			K5D5657ACA-D090000	10.5x13x1.4	107FBGA
			K5D5657DCM-F095000	10.5x13x1.4	107FBGA
			K5D5757ACM-D090000	10.5x13x1.4	107FBGA
			K5D5658ACM-D090000	10.5x13x1.4	137FBGA
			K5D5658ECM-D075000	10.5x13x1.2	137FBGA
			K5E5658HCM-D060000	10.5x13x1.4	137FBGA
256	512	NDD256256256	KAL00B00CM-DG22000	10.5x13x1.4	107FBGA
			KAL00B00CA-DG22000	10.5x13x1.4	107FBGA
			KAL00Q00CM-DG55000	10.5x13x1.4	107FBGA
			KAL00B00EM-DG55000	10.5x13x1.4	107FBGA
512	256	NND565656	KAG00E007M-FGG2000	10.5x13x1.4	107FBGA
			KAG00J007M-F(D)GG2000	10.5x13x1.4	107FBGA
			KAG00H008M-FGG2000	10.5x13x1.4	107FBGA
			KAG00U00GM-FGG5000	10.5x13x1.4	107FBGA
			KAG00J00HM-FGG5000	10.5x13x1.4	137FBGA
		ND512256	K5D1257ACM-D090000	10.5x13x1.4	107FBGA
			K5D1257DCM-D090000	10.5x13x1.4	107FBGA
		K5D1258ACM-D090T00	11.5x13x1.2	137FBGA	
512	512	NNDD256256256256	KBE00M005M-D411000	10.5x13x1.4	137FBGA
			KBE00D004M-D411(3)000	10.5x13x1.4	137FBGA
			KBE00L007M-D415T00	10.5x13x1.4	137FBGA
			NDD512256256	KAL00R00KM-DG55000	11.5x13x1.2
1G	256	NND512512256	KAG00K007M-FGG2000	10.5x16x1.4	107FBGA
			KAG00K007A-DGG5000	10.5x13x1.4	107FBGA
			KAG00L008M-FGG2000(3)	10.5x16x1.4	107FBGA
			ND1G256	K5D1G58KCM-F(D)090000	14x14x1.1(POP)
1G	512	NNDD512512256256	KBE00F003M-F(D)411000	10.5x16x1.4	107FBGA
			KBE00F003A-D411000	10.5x13x1.4	107FBGA
			KBE00J006M-F411000	10.5x16x1.4	107FBGA
			KBE00F005M-F411000	10.5x16x1.4	137FBGA
			KBE00G005M-D411000	10.5x13x1.4	137FBGA
			NDD1G256256	KAL00T00KM-DG55T00	11.5x13x1.2
KAL00Z00LM-DA55000	11.5x13x1.4	137FBGA			
ND1G512	K5D1G13ACM-D090000	14x14x1.15(POP)		152FBGA	
2G	512	NNDD1G1G256256	KBE00S003M-D411000	12x14x1.4	107FBGA
			KBE00S005M-D411000		137FBGA
			KBE00H005M-F411000	11.5x13x1.4	137FBGA

NOTES: N=NAND D=DRAM

See sales rep for product details

## MCP: NOR/SRAM AND NOR/UtRAM

DENSITY		NOR			PKG INFORMATION		
ROM	RAM	Family	Org	Part No.	Size	Type	
32	4	RS3204	x8/x16	K5A3240YTC-T755000	8_11_1.2	69TBGA	
				K5A3240YBC-T755000			
				K5A3240CTM-F755000			
				K5A3240CBM-F755000			
32	8	RS3208	x8/x16	K5A3280YTC-T755000	8_11_1.2	69TBGA	
				K5A3280YBC-T755000			
				K5A3281CTM-F(D)755000			
				K5A3281CBM-F(D)755000			
64	16	RU6416	x16	K5J6316CTM-F770000	8_11.6_1.4	69FBGA	
				K5J6316CBM-F770000			
128	16	RRU646416	x8x16	KAD060J00M-FLLLO00	8_11.6_1.4	69FBGA	
				KAD070J00M-FLLLO00			
128	32	RRU646432	x8x16	KAD060300B-TLLLO00	8_11.6_1.4	69TBGA	
				KAD070300B-TLLLO00			
				KAD060300C-FLLLO00		8_11.6_1.4	69FBGA
				KAD070300C-FLLLO00			
256	128	RRU128128128	x16	KAD190F00M-DUUUT00	8x12x1.4	115FBGA	
		RU256128	x16	K5L5628JTM-DH18T00			
				K5L5628JBM-DH18000			
256	192	RUU25612864	x16	KAH170K00M-DUUUT00	8x12x1.4	115FBGA	
				KAH220K00M-DUUUT00			

NOTES: N=NAND R=NOR S=SRAM U=UtRAM  
See sales rep for product details

## MCP: OneNAND™/DRAM

DENSITY				PKG INFORMATION	
ROM	RAM	Family	Part No.	Size	Type
1G	512	ODD1G256256	KAT00W00EM-DU55000	11.5x13x1.4	167FBGA

NOTES: O=OneNAND D=DRAM  
See sales rep for product details

## MCP: NOR/DRAM

DENSITY				PKG INFORMATION	
ROM	RAM	Family	Part No.	Size	Type
32	128	RD32128	K5H3228CTM-D81H000	10x13x0.8	120FBGA
32	256	RDD32128128	KAN15000DA-DL22000	10.5x13x1.4	167FBGA
64	256	RD64256	K5H6358ETM-D775000	10x11x0.8(0.65)	145FBGA
256	128	RD256128	K5K5629ATA-DF90000	9x11x1.4	103FBGA
512	128	RRD256256128	KAS230009A-D445000	9x11x1.4	103FBGA

NOTES: R=NOR D=DRAM  
See sales rep for product details

## MCP: NOR/OneNAND/UtRAM

DENSITY				PKG INFORMATION	
ROM	RAM	Family	Part No.	Size	Type
192	32	RNU6412832	KAB02D100M-TLGP000	8_12_1.4	80TBGA
			KAB01D100M-TLGP000		
			KAB02D100A-FLGL000		
			KAB01D100A-FLGL000		
256	32	RRNU646412832	KBB06A300M-T402000	8_12_1.4	80TBGA
			KBB05A300M-T402000		
			KBB06A300A-D402000		
			KBB05A300A-D402000		
256	64	RRNU646412864	KBB06A500M-T402000	8_13_1.4	80TBGA
			KBB05A500M-T402000		
			KBB06A500A-D402000		
			KBB05A500A-D402000		
384	64	RRNU646425664	KBB06B400M-F(D)402000	8_13_1.4	80FBGA
			KBB05B400M-F(D)402000		
			KBB06B500A-D402000		
			KBB05B500A-D402000		
384	128	ROU256128128	KAP17YG00M-DUUU000	8_13_1.4	80FBGA
			KAP22YG00M-DUUU000		
512	128	ROU256256128	KAP20VH00A-DL8L000	8_13_1.4	80FBGA
			KAP21VH00A-DL8L000		
			KAP17VG00M-DUUU000		
			KAP22VG00M-DUUU000		
768	128	ROU256512128	KAP17SG00A-D4U4000	10.5x14x1.4	167FBGA
768	256	ROUU256512128128	KBH10EA00A-D414000	10.5x14x1.4	167FBGA
			KBH10ED00A-D414000		
1280	128	ROOU256512512128	KBJ16KC00A-D418000	10.5x14x1.4	167 FBGA
			KBJ17KC00A-D418000		
			KBJ10KB00A-D416000		
			KBJ11KB00A-D416000		
1280	256	ROUU2561G128128	KBH16PE00M-D421000(1C/S)	10.5x14x1.4	167 FBGA
			KBH17PE00M-D4210(T)00(1C/S)		
			KBH10PD00M-D414000(1C/S)		

NOTES: R=NOR O=OneNAND N=NAND U=UtRAM  
See sales rep for product details



**COMBO DRIVE****TS-H492A 52X 32X 52X CD-RW + 16X DVD-ROM**

Recording Capacity	Drive Type	Interface	Loading Type	Average Access Time	Dimensions (WxHxDmm)	Buffer Memory	Drive Mounting	Supported Disc
CD-RW Disc 700/650MB (Type 80/74) CDR Disc 800/700/650MB	Internal Type	EIDE/ATAPI	Motorized Tray Type	CD-RW, DVD: 130ms CD: 110ms	148.2 x 42 x 184	2MB	Horizontal/Vertical	DVD/RAM, DVD±R/RW, DVD-ROM, DVD-Video, CD-R, CD-RW, CD-DA, CD-ROM, CD-ROM/XA, VideoCD, CD-I, PhotoCD, CD-EXTRA, CD TEXT

**CR-RW DRIVE****TS-H292A 52X Write / 32X ReWrite / 52X Read**

Recording Capacity	Drive Type	Interface	Loading Type	Average Access Time	Dimensions (WxHxDmm)	Buffer Memory	Drive Mounting	Supported Disc
CD-RW Disc 700/650MB (Type 80/74) CDR Disc 800/700/650MB (Type 90/80/74)	Internal Type	EIDE/ATAPI	Motorized Tray Type	(SW-252F) 100ms	148.2 x 42 x 184	2MB	Horizontal/Vertical	CD-R/CD-RW, CD-DA, CD-ROM, CD-ROM/XA, VideoCD, CD-I, PhotoCD, CD-EXTRA, CD-TEXT

**DVD-MULTI RECORDER****TS-H552U DVD±R/RW + CD-R/CD-RW**

Drive Type	Interface	Average Seek Time	Dimensions (WxHxDmm)	Buffer Memory	Supported Disc
Internal Type	EIDE/ATAPI DVD-S	CD-ROM 130ms DVD-R/DVD-RW 150ms DVD-RAM 170ms	148 x 42 x 200	2MB	DVD-ROM, DVD±R/RW, DVD-Video, CD-R/RW, CD-DA, CD-ROM, CD-ROM-XA, Video-CD, CD-I, Photo CD, CD-EXTRA, CD-TEXT

**DVD-ROM DRIVE****TS-H352A 16X Multi-Read DVD-ROM Drive**

Drive Type	Interface	Loading Type	Average Access Time	Dimensions (WxHxDmm)	Buffer Memory	Drive Mounting	Supported Disc
Internal Type	EIDE/ATAPI	Motorized Tray Type	DVD 90ms CD 90ms	148.2 x 42 x 184	512KB	Horizontal/Vertical	DVD-RAM, DVD-R, DVD-RW, DVD-ROM, DVD-Video, CD-R/RW, CD-DA, CD-ROM, CD-ROM/XA, Video-CD, CD-I, Photo CD, CD-EXTRA, CD-TEXT

**CD-ROM DRIVE****SH-152A 52X Multi-Read CD-ROM Drive**

Drive Type	Interface	Disc Diameter	Loading Type	Average Access Time	Dimensions (WxHxDmm)	Buffer Memory	Drive Mounting	Supported Disc
Internal Type	EIDE/ATAPI	80mm / 120mm	Motorized Tray Type	80ms	(SC-152) 148.2 x 42 x 184	128KB	Horizontal/Vertical	CD-R/RW, CD-DA, CD-ROM, CD-ROM/XA, VideoCD, CD-I, Photo CD, CD-EXTRA, CD-TEXT

## HARD DISK DRIVES (HDD)

		Capacity	RPMs	Model	# of Heads	# of Disks	Interface	Buffer Size	Seek Time	MTBF	
SpinPoint V Series	V80 Series	80GB	5400 rpm	SV0802N	2	1	ATA-133	2MB / 8MB	8.9ms	500K hrs	
		120GB	5400 rpm	SV1203N	3	2	ATA-133	2MB / 8MB	8.9ms	500K hrs	
		160GB	5400 rpm	SV1604N	4	2	ATA-133	2MB / 8MB	8.9ms	500K hrs	
SpinPoint P Series	P80 Series	80GB	7200 rpm	SP0802N	2	1	ATA-133	2MB / 8MB	8.9ms	500K hrs	
		120GB	7200 rpm	SP1203N	3	2	ATA-133	2MB / 8MB	8.9ms	500K hrs	
		160GB	7200 rpm	SP1604N	4	2	ATA-133	2MB / 8MB	8.9ms	500K hrs	
		P40 Series	40GB	7200 rpm	SP0411N	1	1	ATA-133	2MB	10ms	500K hrs
		P80 Series SATA	80GB	7200 rpm	SP0812C	2	1	S-ATA	8MB	10ms	500K hrs
			120GB	7200 rpm	SP1213C	3	2	S-ATA	8MB	10ms	500K hrs
			160GB	7200 rpm	SP1614C	4	2	S-ATA	8MB	10ms	500K hrs
		P40 Series SATA	40GB	7200 rpm	SP0411C	1	1	S-ATA	2MB	10ms	500K hrs
		P120 Series	200GB	7200 rpm	SP2014N	4	2	ATA-133	8MB	8.9ms	500K hrs
			250GB	7200 rpm	SP2514N	4	2	ATA-133	8MB	8.9ms	500K hrs
		P120 Series SATA	200GB	7200 rpm	SP2004C	4	2	S-ATA	8MB	8.9ms	600K hrs
			250GB	7200 rpm	SP2504C	4	2	S-ATA	8MB	8.9ms	600K hrs

## 2.5" HARD DISK DRIVES (HDD)

		Capacity	Rotational Speed	P/N	# of Head	# of Disk	Interface	Buffer Size	
SpinPoint M Series	M40 Series	30GB	5400 rpm	MP0302H	1	1	ATA-6	8MB	
		40GB	5400 rpm	MP0402H	2	1	ATA-6	8MB	
		60GB	5400 rpm	MP0603H	3	2	ATA-6	8MB	
		80GB	5400 rpm	MP0804H	4	2	ATA-6	8MB	
		M40 Series SATA	40GB	5400 rpm	HM040HI	2	1	S-ATA	8MB
			60GB	5400 rpm	HM060HI	3	2	S-ATA	8MB
			80GB	5400 rpm	HM080HI	4	2	S-ATA	8MB

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