

TOSHIBA

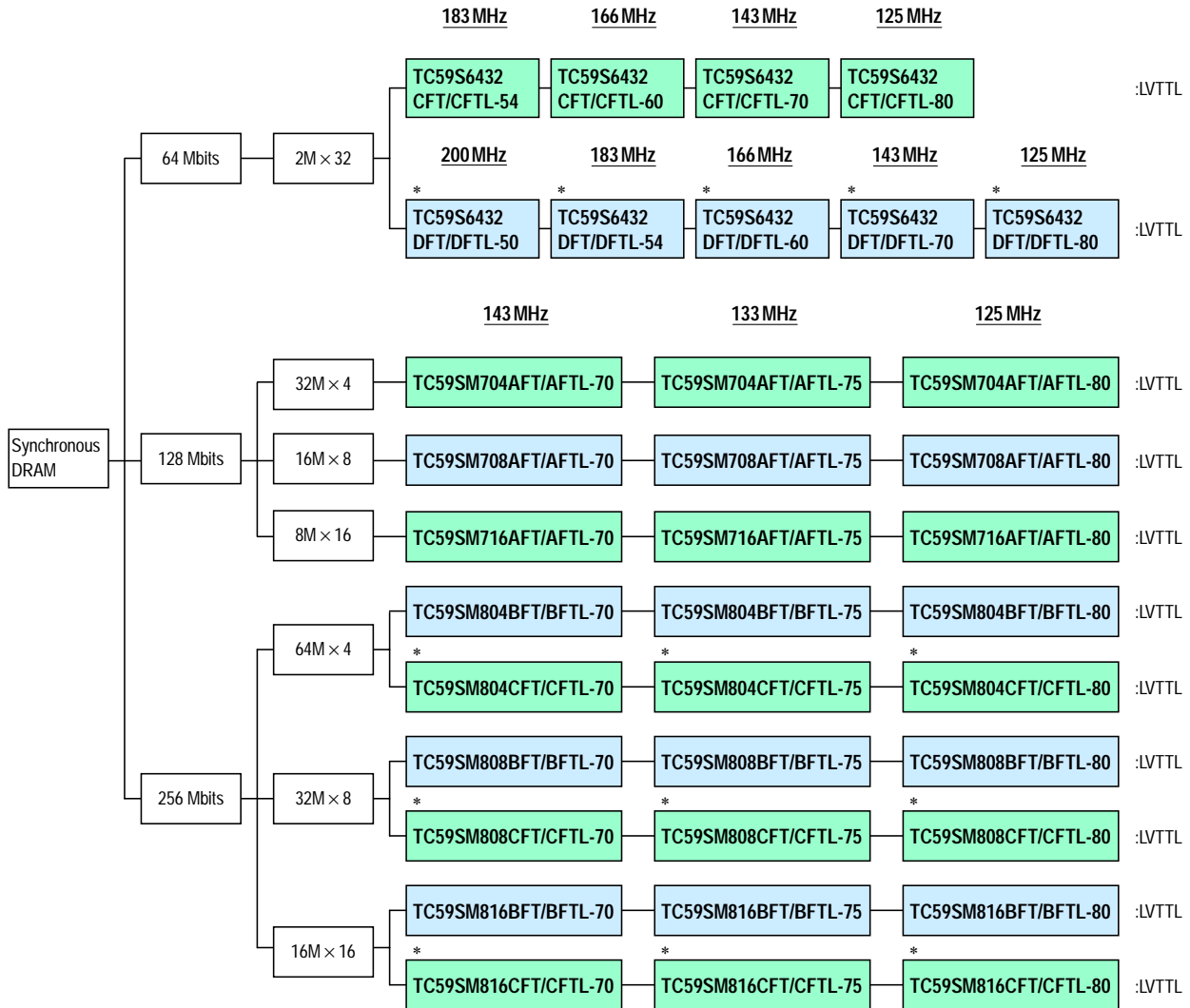
MOS Memory

GENERAL CATALOG

1. Selection Guide

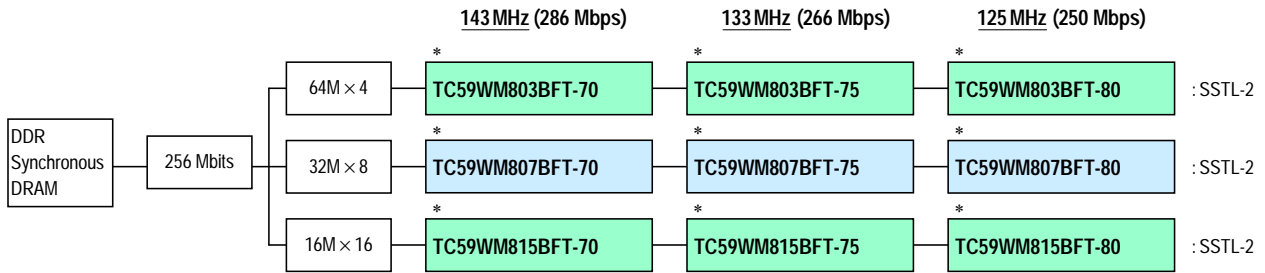
Dynamic RAMs

Synchronous DRAMs



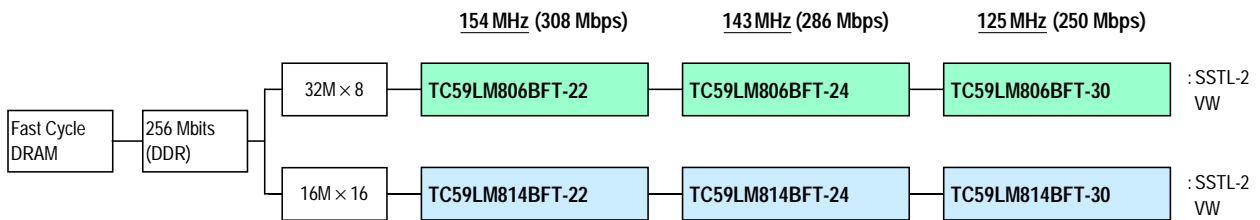
*: New product

DDR Synchronous DRAMs

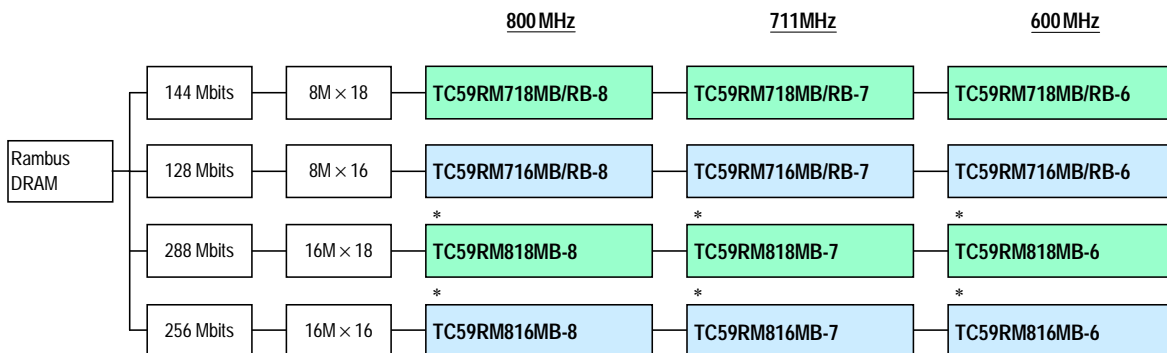


*: New product

Fast Cycle RAM (FCRAM®) (DDR)



Rambus DRAMs (RDRAM®)

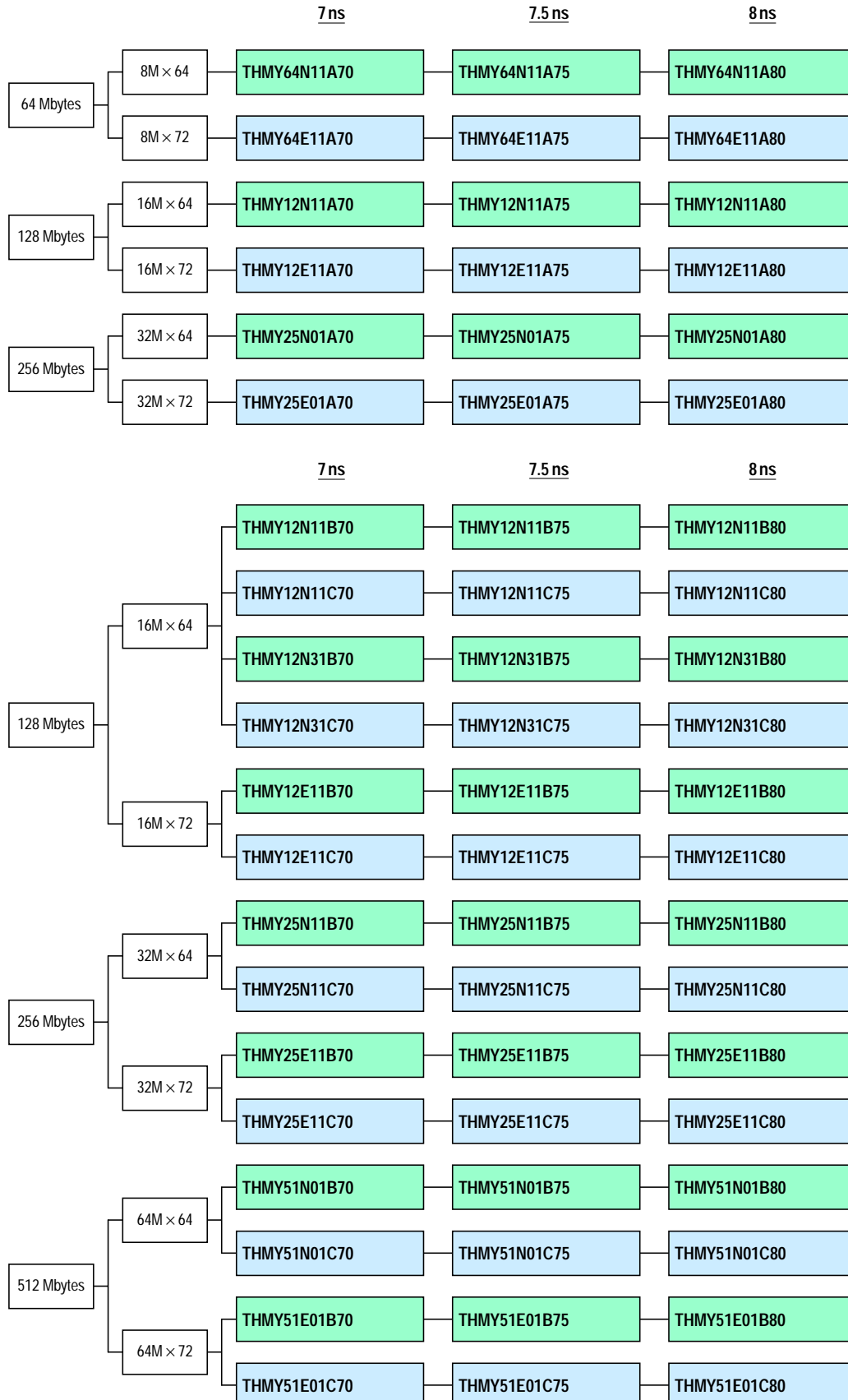


*: New product

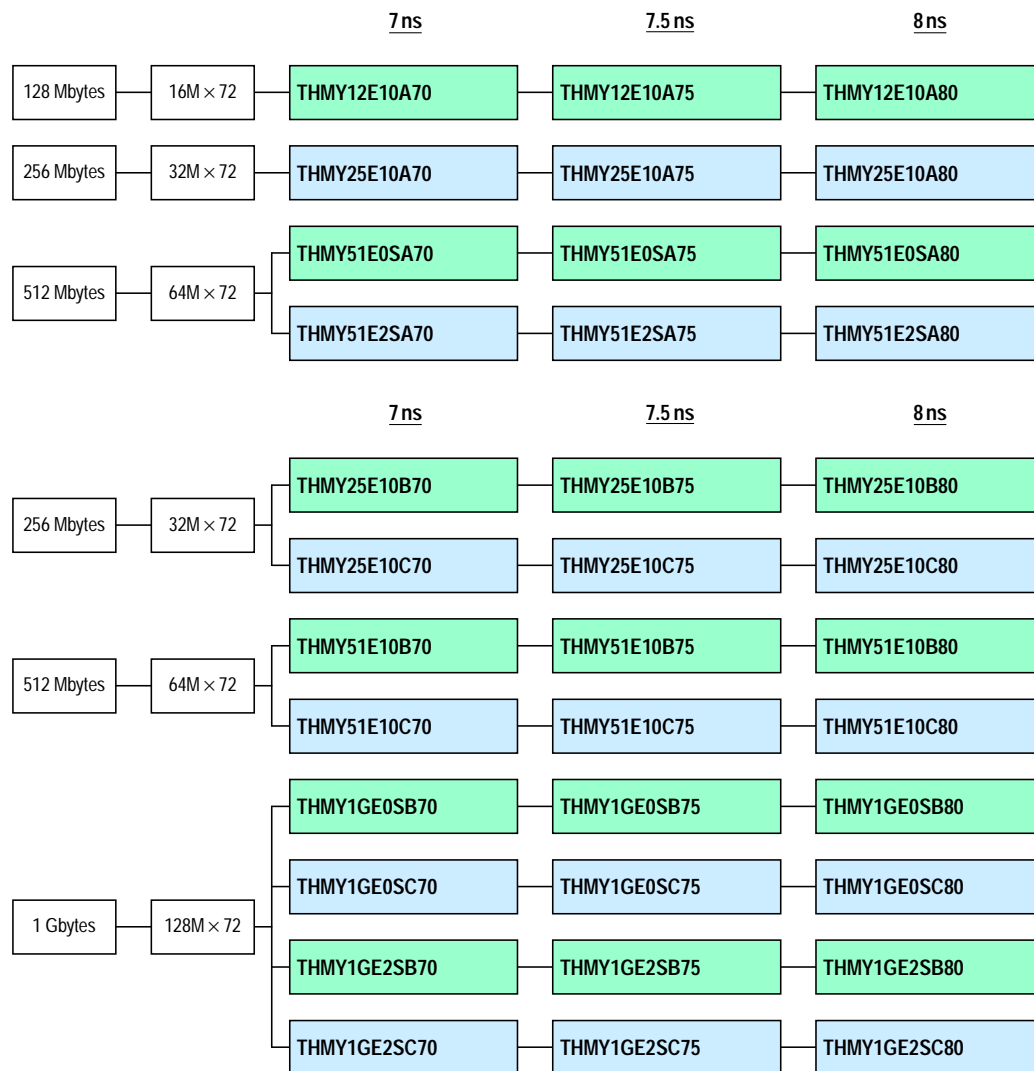
Selection Guide

DRAM Modules

8-Byte Unbuffered DIMMs (SDRAM) for 133-MHz bus and 100-MHz bus

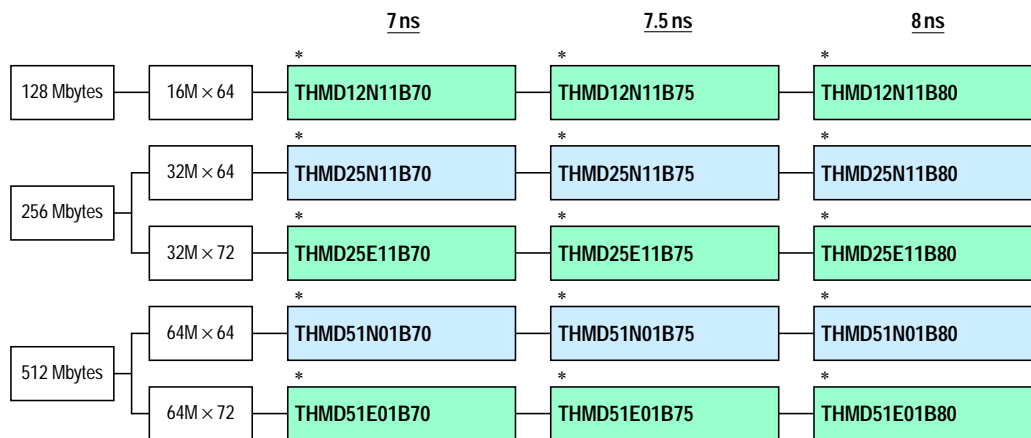


8-Byte Registered DIMMs (SDRAM) for 133-MHz bus and 100-MHz bus



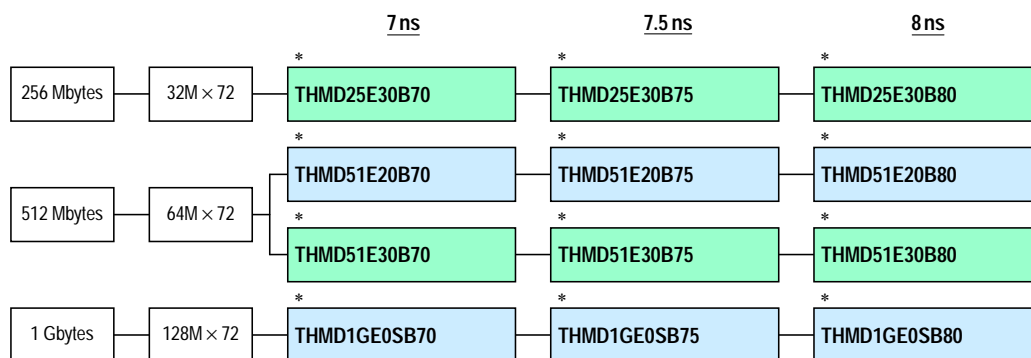
Selection Guide

8-Byte Unbuffered DIMMs (DDR SDRAM) for 266-MHz bus and 200-MHz bus



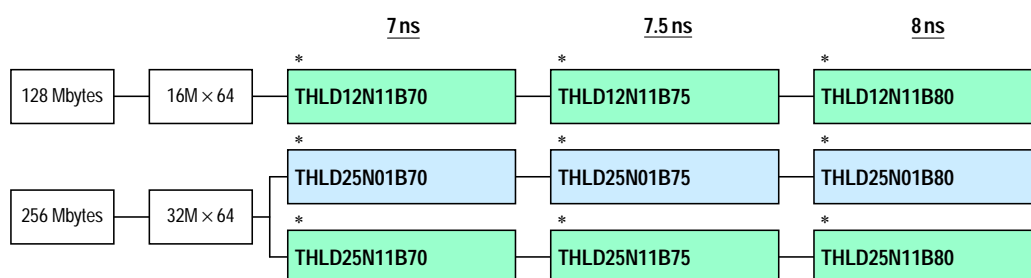
*: New product

8-Byte Registered DIMMs (DDR SDRAM) for 266-MHz bus and 200-MHz bus



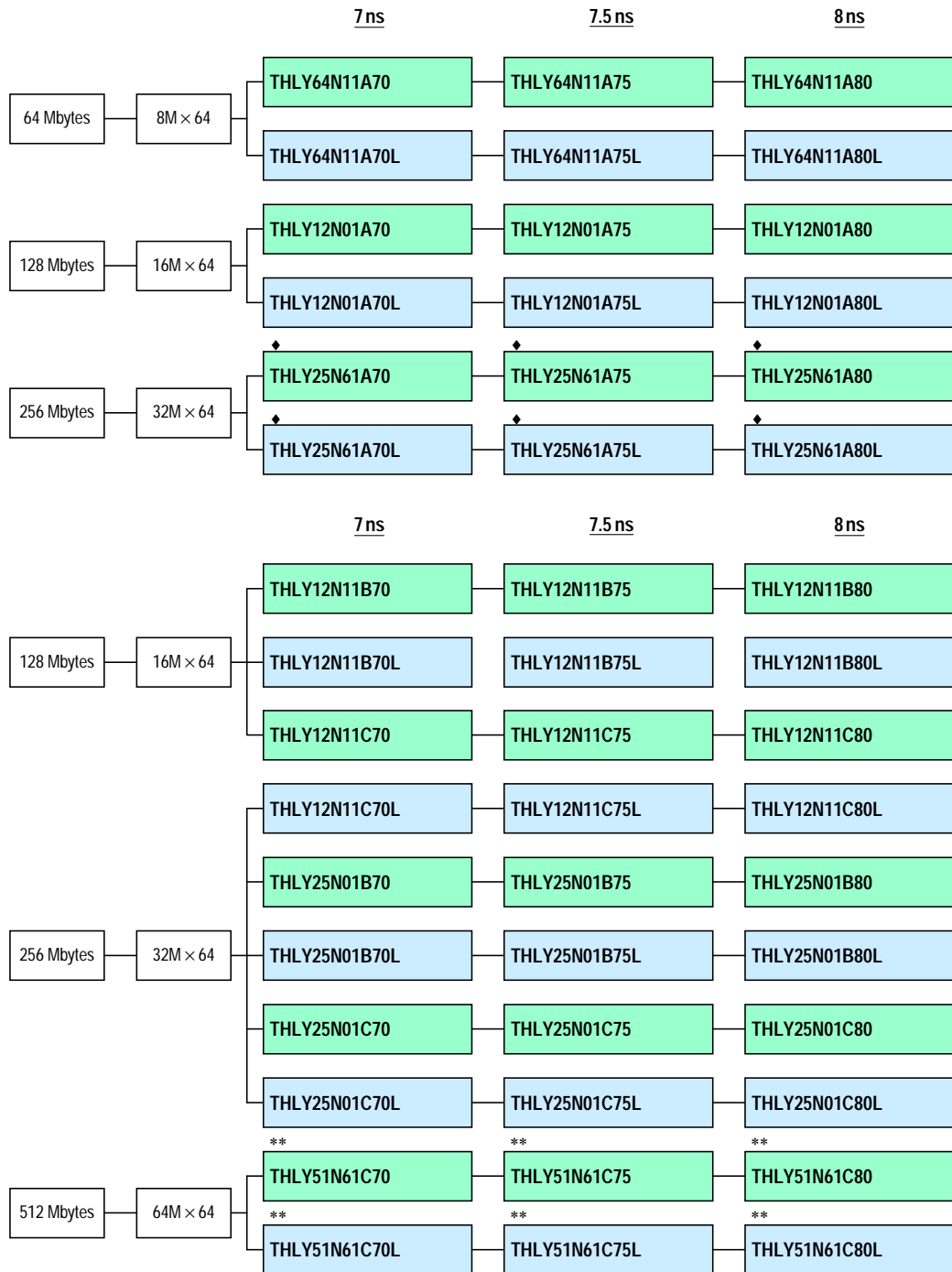
*: New product

8-Byte Unbuffered SO-DIMMs (DDR SDRAM) for 266-MHz bus and 200-MHz bus



*: New product

8-Byte Unbuffered SO-DIMMs (SDRAM) for 133-MHz bus and 100-MHz bus



◆ : Component STSOP PKG
 **: Under development
 (Component CSP PKG)

Selection Guide

RIMM™ (RDRAM)

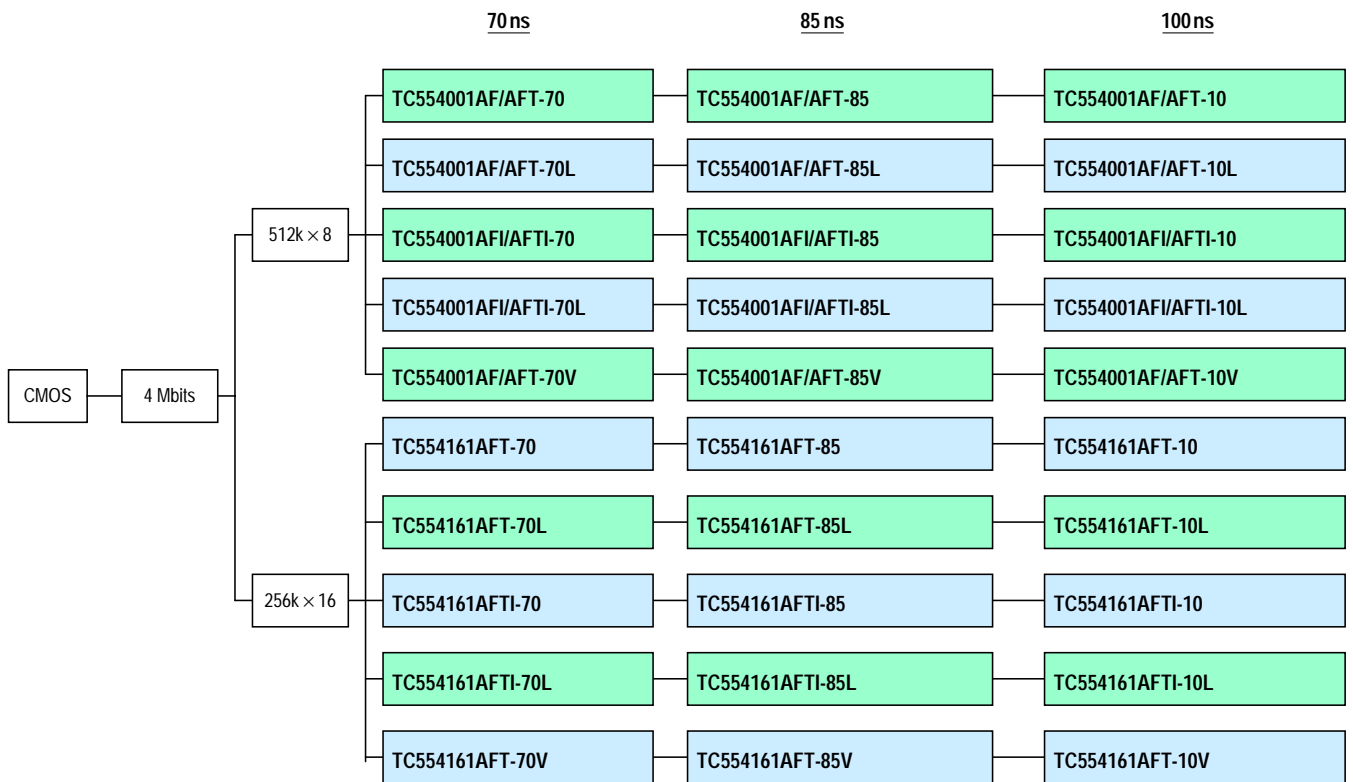
| | | 800MHz | 711MHz | 600MHz |
|------------|---------------|--------------|--------------|--------------|
| 64 Mbytes | 8M × 16 × 4 | THMR1N4E-8 | THMR1N4E-7 | THMR1N4E-6 |
| | 8M × 18 × 4 | THMR1E4E-8 | THMR1E4E-7 | THMR1E4E-6 |
| | 16M × 16 × 2 | * THMR2N2Z-8 | * THMR2N2Z-7 | * THMR2N2Z-6 |
| | 16M × 18 × 2 | THMR2E2Z-8 | THMR2E2Z-7 | THMR2E2Z-6 |
| 128 Mbytes | 8M × 16 × 8 | THMR1N8E-8 | THMR1N8E-7 | THMR1N8E-6 |
| | 8M × 18 × 8 | THMR1E8E-8 | THMR1E8E-7 | THMR1E8E-6 |
| | 16M × 16 × 4 | * THMR2N4Z-8 | * THMR2N4Z-7 | * THMR2N4Z-6 |
| | 16M × 18 × 4 | THMR2E4Z-8 | THMR2E4Z-7 | THMR2E4Z-6 |
| 256 Mbytes | 8M × 16 × 16 | THMR1N16E-8 | THMR1N16E-7 | THMR1N16E-6 |
| | 8M × 18 × 16 | THMR1E16E-8 | THMR1E16E-7 | THMR1E16E-6 |
| | 16M × 16 × 8 | * THMR2N8Z-8 | * THMR2N8Z-7 | * THMR2N8Z-6 |
| | 16M × 18 × 8 | THMR2E8Z-8 | THMR2E8Z-7 | THMR2E8Z-6 |
| 512 Mbytes | 16M × 16 × 16 | * THMR2N16-8 | * THMR2N16-7 | * THMR2N16-6 |
| | 16M × 18 × 16 | THMR2E16-8 | THMR2E16-7 | THMR2E16-6 |

*: New product

Notes: RIMM is the registered trademark of the Rambus company in the United States.

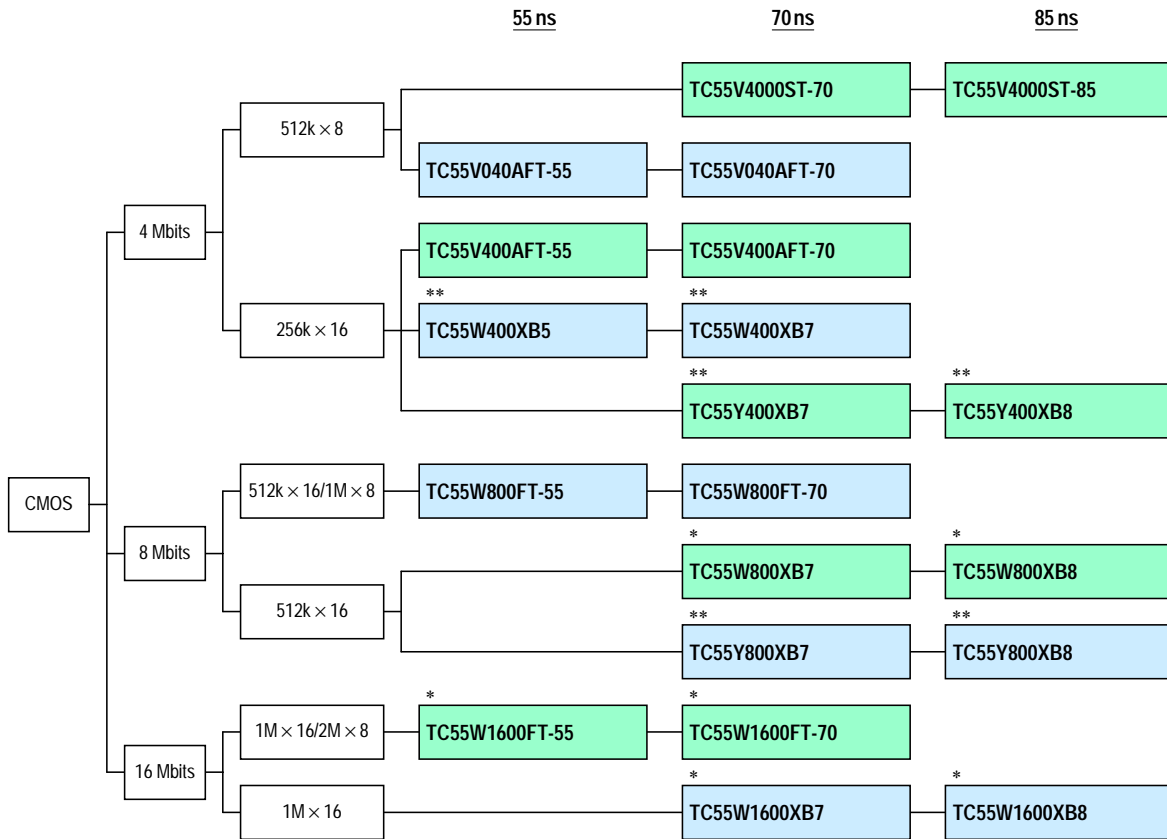
Static RAMs

Low-Power Static RAMs (E/R type)



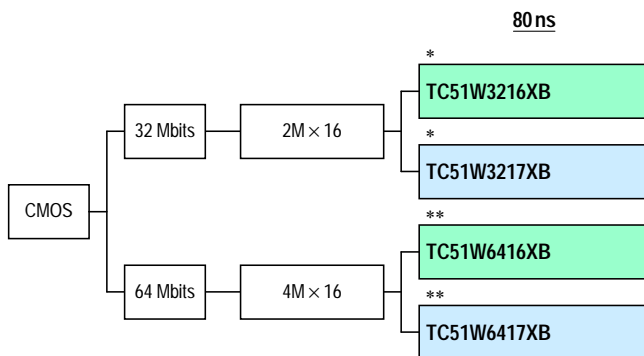
Selection Guide

Low-Power Static RAMs (Full-CMOS type)



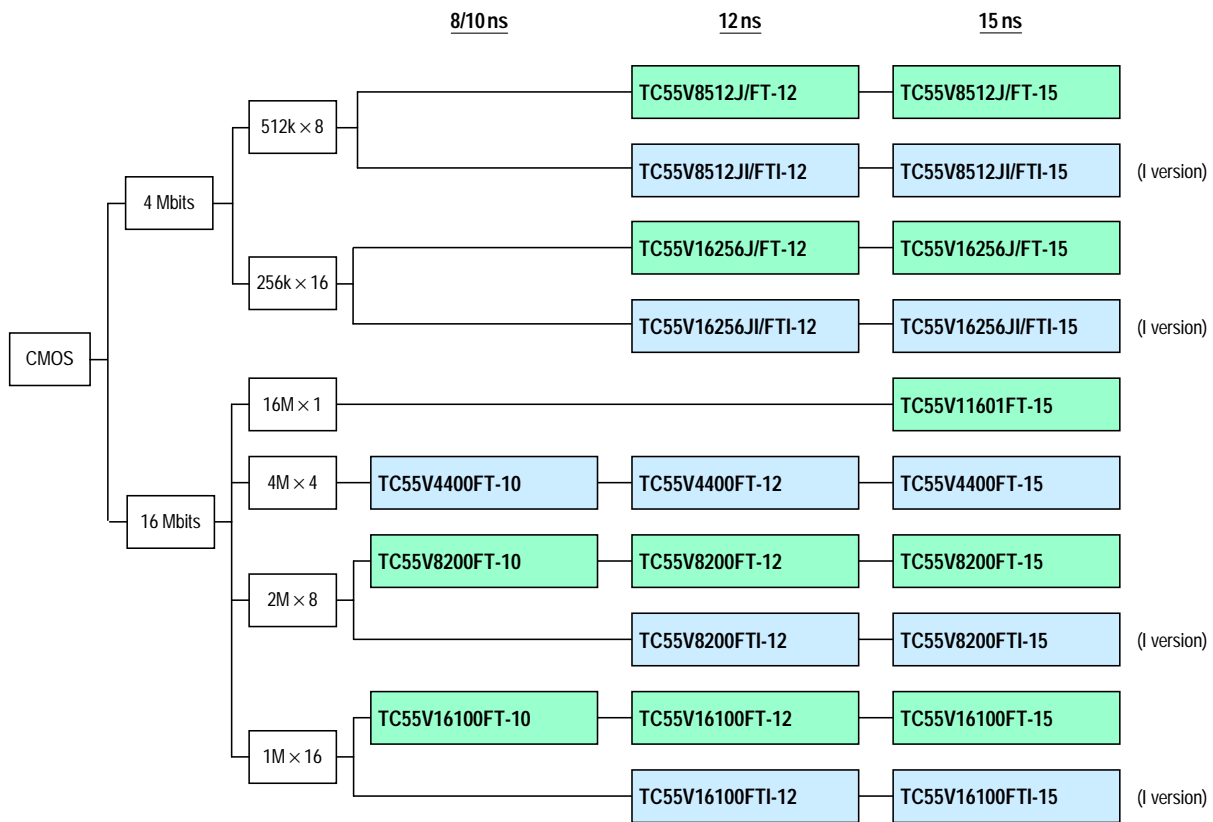
*: New product
 **: Under development

Pseudo Static RAMs



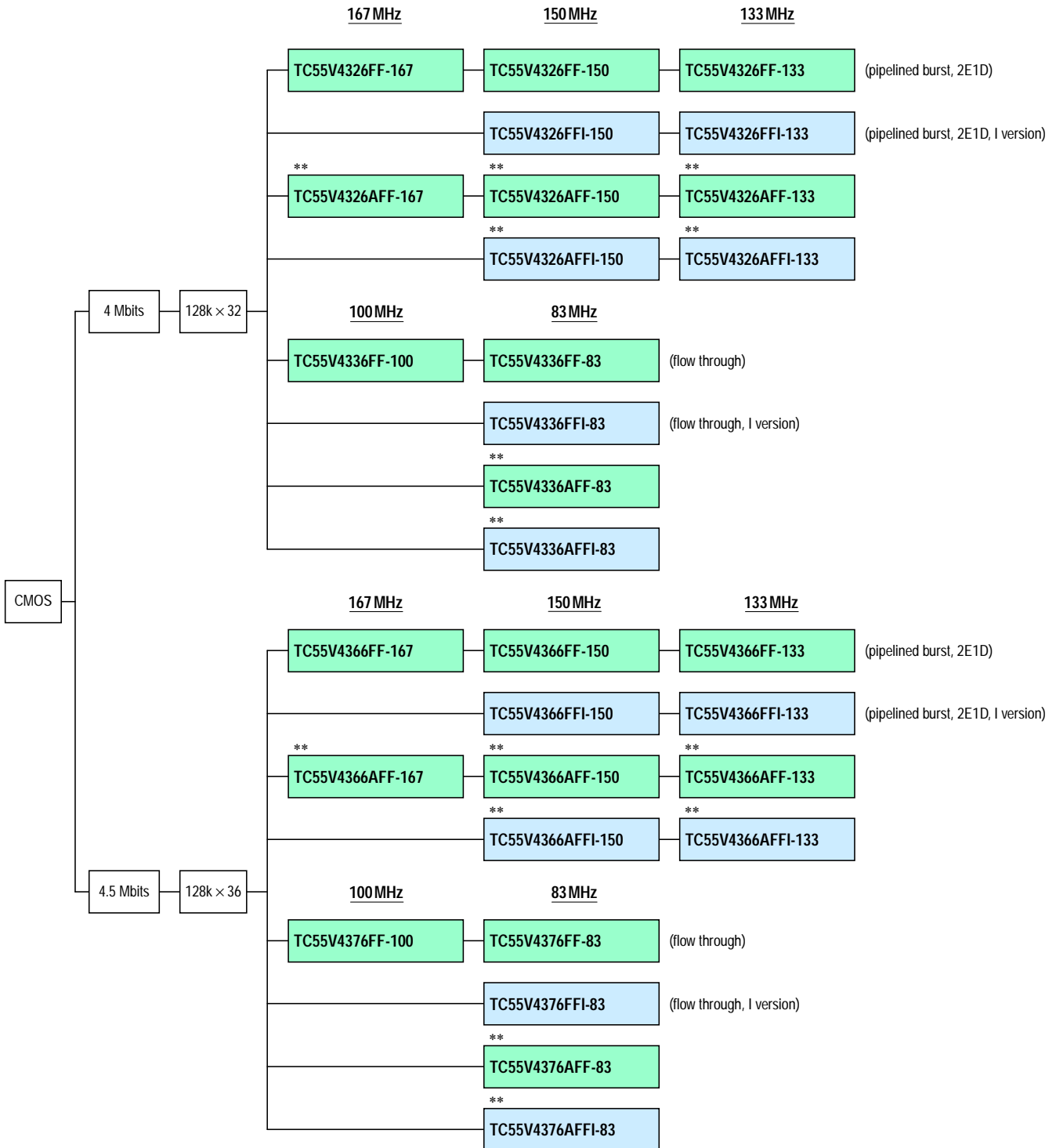
*: New product
 **: Under development

High-Speed Static RAMs (Asynchronous)



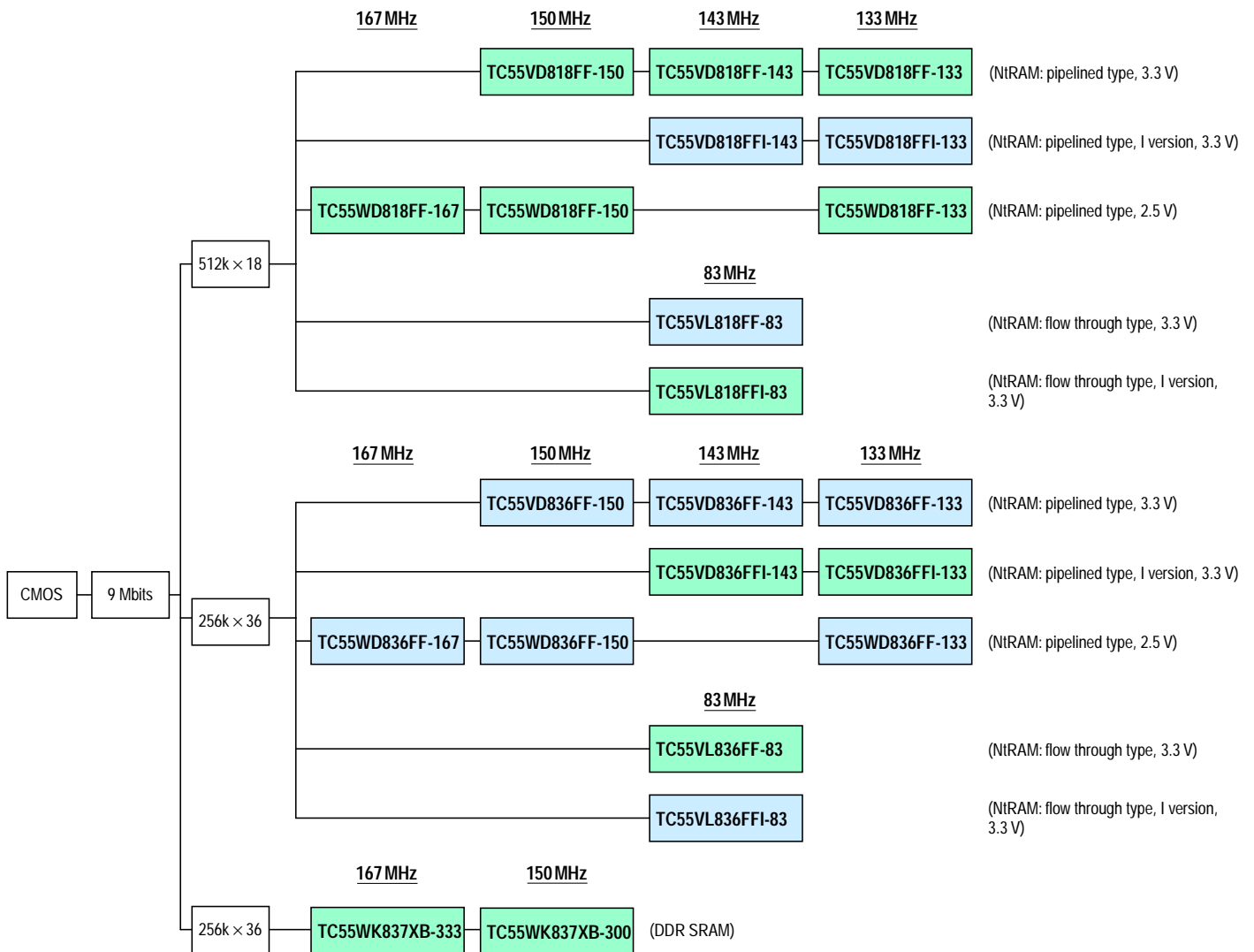
Selection Guide

High-Speed Static RAMs (Synchronous)



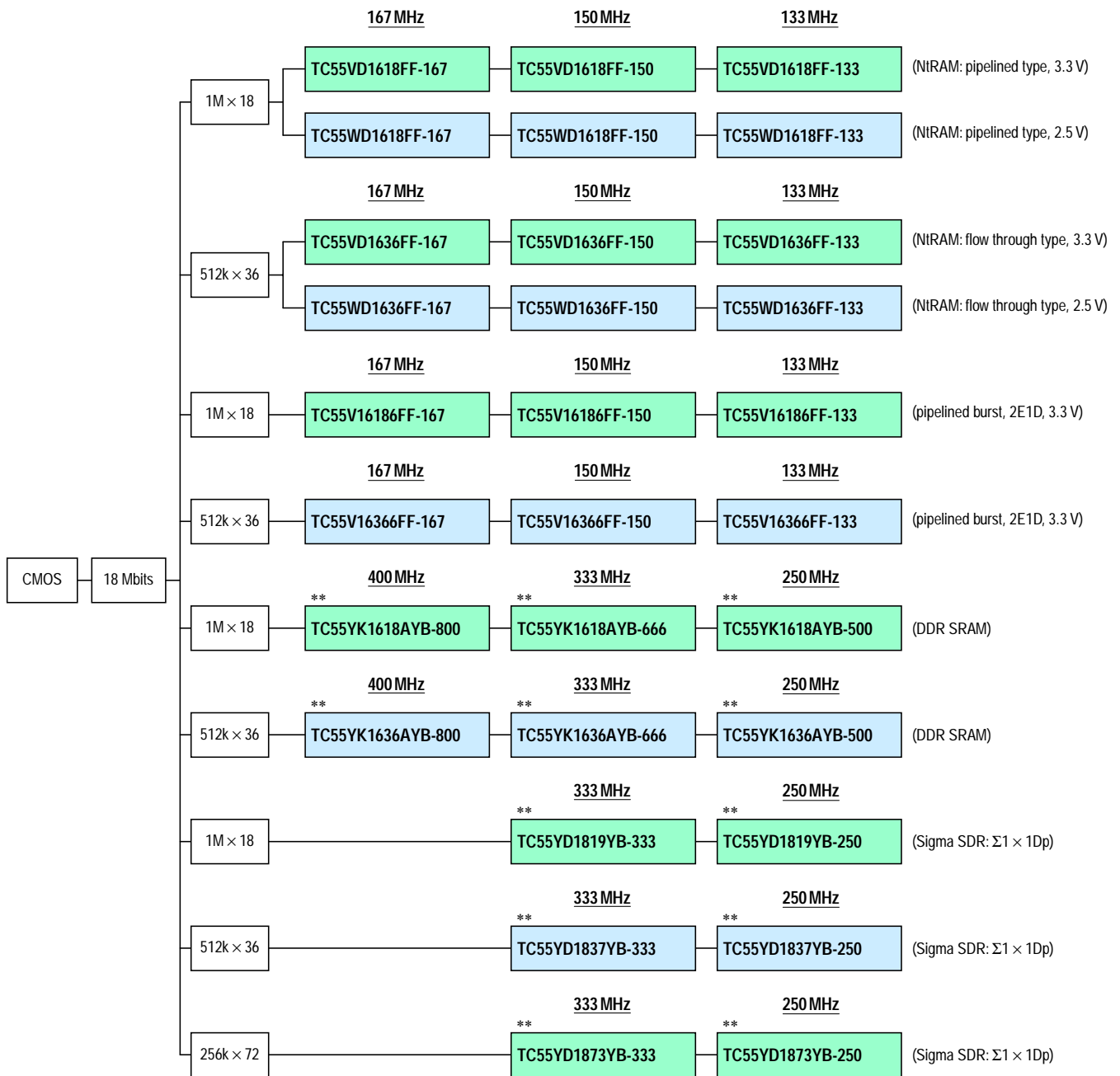
** : Under development

High-Speed Static RAMs (Synchronous) continued



Selection Guide

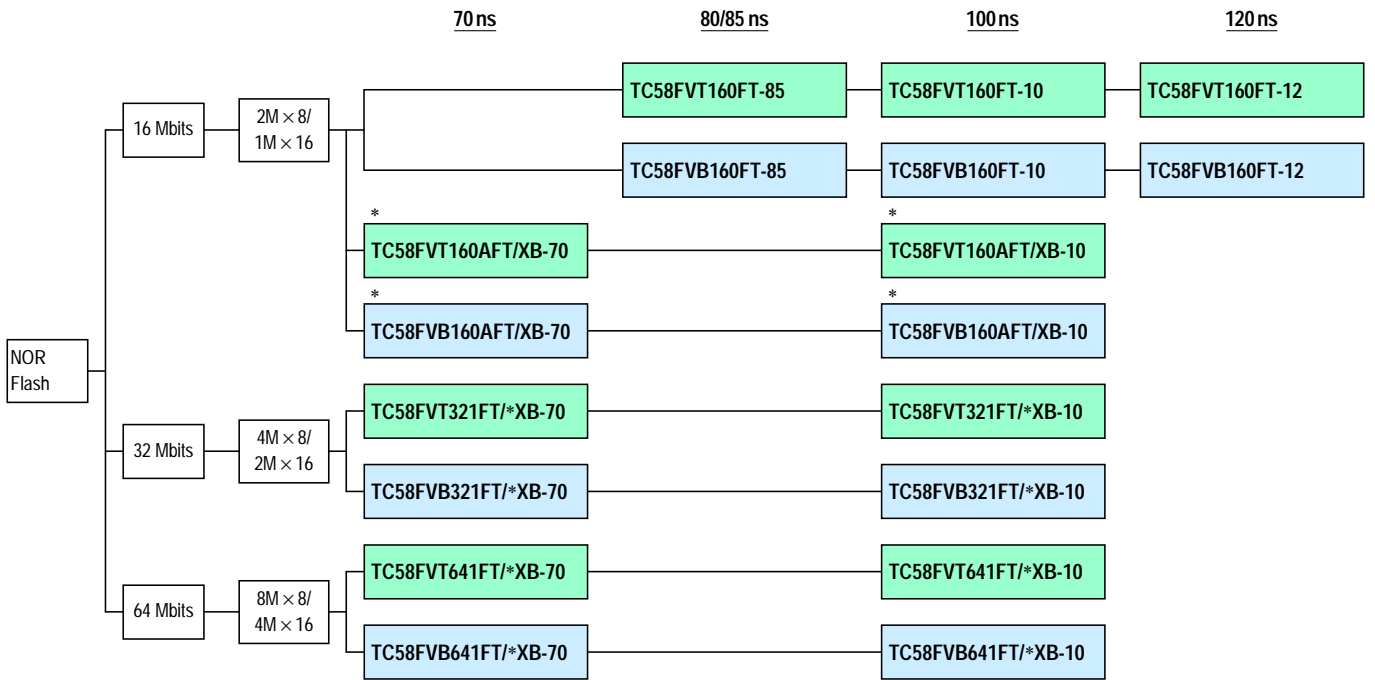
High-Speed Static RAMs (Synchronous) continued



** : Under development

NOR Flash Memories/NAND E²PROMs/SmartMedia™

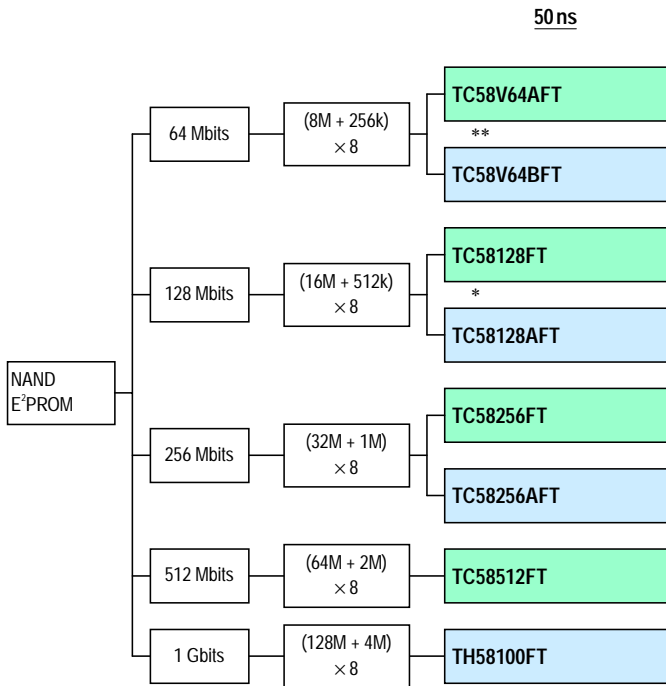
NOR Flash Memories



*: New product

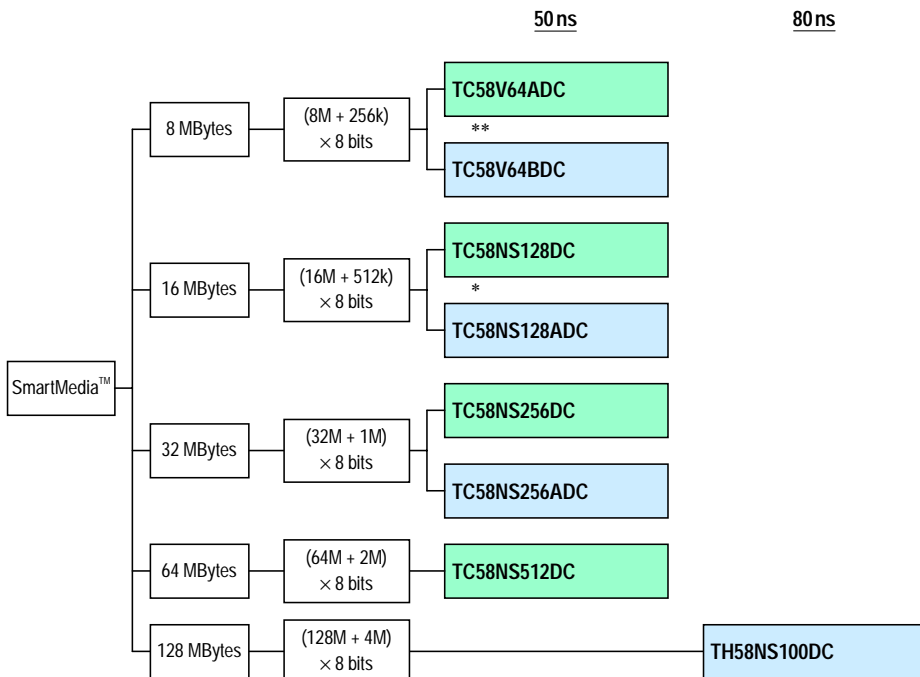
Selection Guide

NAND E²PROM



: 1st Access Time 25 μs Max
 *: New product
 **: Under development

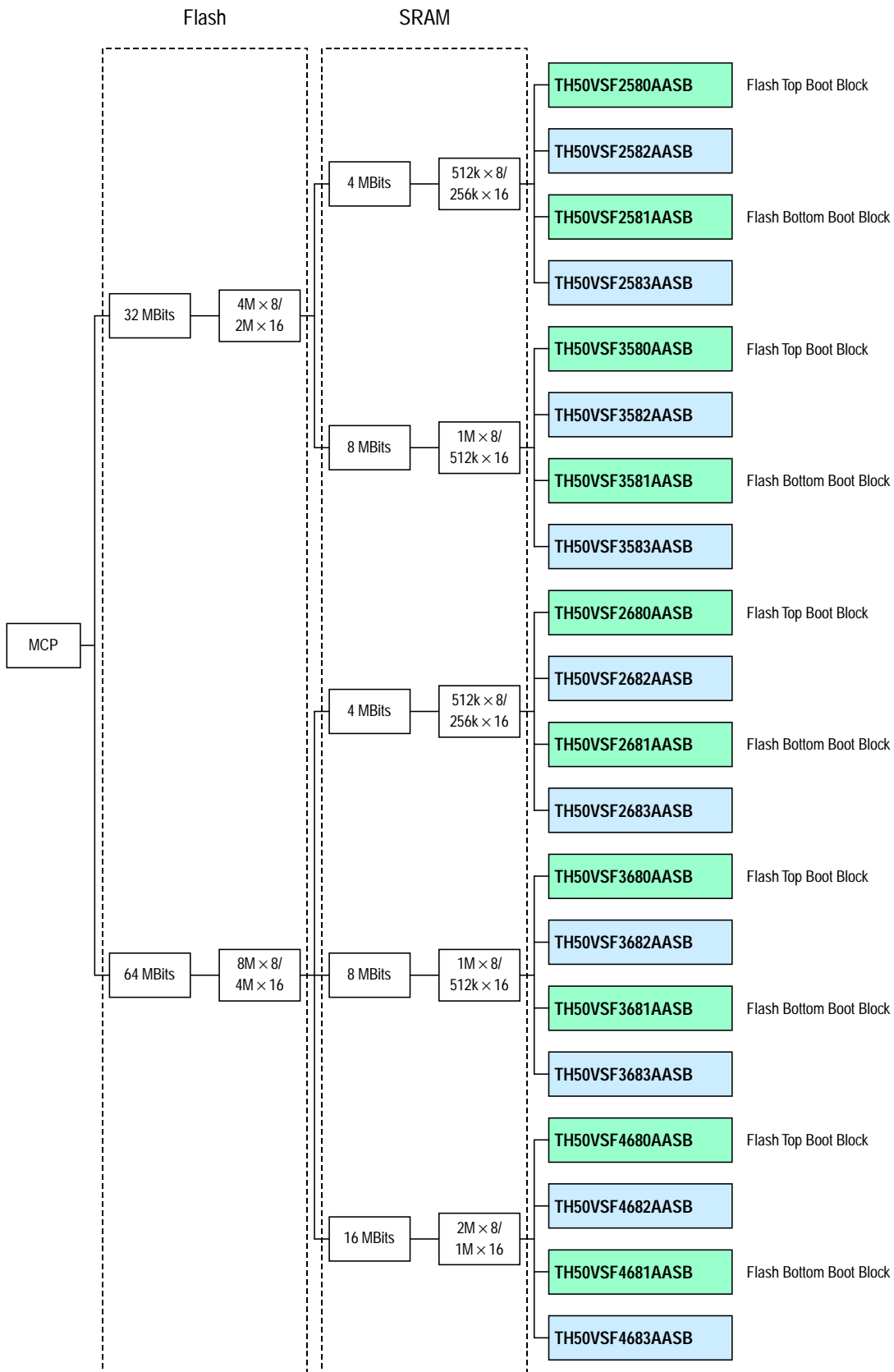
SmartMedia™



: 1st Access Time 25 μs Max
 *: New product
 **: Under development

MCPs (multichip packages)

MCPs (NOR Flash Memory/SRAM)



2. Characteristics

Dynamic RAMs

Synchronous DRAMs

| Capacity | Product No. | Organization (bits) | Max Clock Access Time (ns) | Min Clock Cycle Time (ns) | Power Supply (V) | Power Dissipation (mW) | | No. of Pins | Package Width (inches) |
|-----------------------|-------------------------|------------------------------|-----------------------------|---------------------------|-----------------------|------------------------|---------|-------------|----------------------------------|
| | | | | | | Active | Standby | | |
| 64 Mbits | TC59S6432CFT/CF TL-54 | 2,097,152 × 32 (4 Banks) | 5.4 | 5.4 | 3.3 ± 0.3 (LVTTTL) | 576 | 3.6 | 86 (86) | TSOP (II): 0.4 (0.5 mm pitch) |
| | TC59S6432CFT/CF TL-60 | | 5.4 | 6 | | 558 | 3.6 | | |
| | TC59S6432CFT/CF TL-70 | | 5.4 | 7 | | 522 | 3.6 | | |
| | TC59S6432CFT/CF TL-80 | | 6 | 8 | | 450 | 3.6 | | |
| | * TC59S6432DFT/DF TL-50 | 2,097,152 × 32 (4 Banks) | 4.4 (note) | 5 | 3.3 ± 0.3 (LVTTTL) | 648 | 3.6 | 86 (86) | TSOP (II): 0.4 (0.5 mm pitch) |
| | * TC59S6432DFT/DF TL-54 | | 4.4 (note) | 5.4 | | 468 | 3.6 | | |
| | * TC59S6432DFT/DF TL-60 | | 4.4 (note) | 6 | | 432 | 3.6 | | |
| | * TC59S6432DFT/DF TL-70 | | 4.4 (note) | 7 | | 396 | 3.6 | | |
| | * TC59S6432DFT/DF TL-80 | | 5 (note) | 8 | | 360 | 3.6 | | |
| | 128 Mbits | TC59SM704AFT/AF TL-70 | 33,554,432 × 4 (4 Banks) | 5.4 | 7 | 3.3 ± 0.3 (LVTTTL) | 360 | 7.2 | 54 (54) |
| TC59SM704AFT/AF TL-75 | | 5.4 | | 7.5 | 342 | | 7.2 | | |
| TC59SM704AFT/AF TL-80 | | 6 | | 8 | 324 | | 7.2 | | |
| TC59SM708AFT/AF TL-70 | | 16,777,216 × 8 (4 Banks) | 5.4 | 7 | 3.3 ± 0.3 (LVTTTL) | 360 | 7.2 | 54 (54) | TSOP (II): 0.4 (0.8 mm pitch) |
| TC59SM708AFT/AF TL-75 | | | 5.4 | 7.5 | | 342 | 7.2 | | |
| TC59SM708AFT/AF TL-80 | | | 6 | 8 | | 324 | 7.2 | | |
| TC59SM716AFT/AF TL-70 | | 8,388,608 × 16 (4 Banks) | 5.4 | 7 | 3.3 ± 0.3 (LVTTTL) | 360 | 7.2 | 54 (54) | TSOP (II): 0.4 (0.8 mm pitch) |
| TC59SM716AFT/AF TL-75 | | | 5.4 | 7.5 | | 342 | 7.2 | | |
| TC59SM716AFT/AF TL-80 | | | 6 | 8 | | 324 | 7.2 | | |
| 256 Mbits | TC59SM804BFT/BF TL-70 | 67,108,864 × 4 (4 Banks) | 5.4 | 7 | 3.3 ± 0.3 (LVTTTL) | 360 | 10.8 | 54 (54) | TSOP (II): 0.4 (0.8 mm pitch) |
| | TC59SM804BFT/BF TL-75 | | 5.4 | 7.5 | | 342 | 10.8 | | |
| | TC59SM804BFT/BF TL-80 | | 6 | 8 | | 324 | 10.8 | | |
| | TC59SM808BFT/BF TL-70 | 33,554,432 × 8 (4 Banks) | 5.4 | 7 | 3.3 ± 0.3 (LVTTTL) | 360 | 10.8 | 54 (54) | TSOP (II): 0.4 (0.8 mm pitch) |
| | TC59SM808BFT/BF TL-75 | | 5.4 | 7.5 | | 342 | 10.8 | | |
| | TC59SM808BFT/BF TL-80 | | 6 | 8 | | 324 | 10.8 | | |
| | TC59SM816BFT/BF TL-70 | 16,777,216 × 16 (4 Banks) | 5.4 | 7 | 3.3 ± 0.3 (LVTTTL) | 360 | 10.8 | 54 (54) | TSOP (II): 0.4 (0.8 mm pitch) |
| | TC59SM816BFT/BF TL-75 | | 5.4 | 7.5 | | 342 | 10.8 | | |
| | TC59SM816BFT/BF TL-80 | | 6 | 8 | | 324 | 10.8 | | |
| | * TC59SM804CFT/CF TL-70 | 67,108,864 × 4 (4 Banks) | 5.4 | 7 | 3.3 ± 0.3 (LVTTTL) | 360 | 10.8 | 54 (54) | TSOP (II): 0.4 (0.8 mm pitch) |
| | * TC59SM804CFT/CF TL-75 | | 5.4 | 7.5 | | 342 | 10.8 | | |
| | * TC59SM804CFT/CF TL-80 | | 6 | 8 | | 324 | 10.8 | | |
| | * TC59SM808CFT/CF TL-70 | 33,554,432 × 8 (4 Banks) | 5.4 | 7 | 3.3 ± 0.3 (LVTTTL) | 360 | 10.8 | 54 (54) | TSOP (II): 0.4 (0.8 mm pitch) |
| | * TC59SM808CFT/CF TL-75 | | 5.4 | 7.5 | | 342 | 10.8 | | |
| | * TC59SM808CFT/CF TL-80 | | 6 | 8 | | 324 | 10.8 | | |
| | * TC59SM816CFT/CF TL-70 | 16,777,216 × 16 (4 Banks) | 5.4 | 7 | 3.3 ± 0.3 (LVTTTL) | 360 | 10.8 | 54 (54) | TSOP (II): 0.4 (0.8 mm pitch) |
| | * TC59SM816CFT/CF TL-75 | | 5.4 | 7.5 | | 342 | 10.8 | | |
| | * TC59SM816CFT/CF TL-80 | | 6 | 8 | | 324 | 10.8 | | |

Notes: Load = 30pF

*: New product

DDR-Synchronous DRAMs

| Capacity | Product No. | Organization (bits) | Max Clock Access Time (ns) | Min Clock Cycle Time (ns) | Power Supply (V) | Power Dissipation (mW) | | No. of Pins | Package Width (inches) |
|-----------------|-----------------|------------------------------|----------------------------|---------------------------|-----------------------|------------------------|---------|-------------|-----------------------------------|
| | | | | | | Active | Standby | | |
| 256 Mbits | TC59WM803BFT-70 | 67,108,864 × 4 (4 Banks) | 0.75 | 7 | 2.5 ± 0.2 (SSTL-2) | 446 | 8.1 | 66 (66) | TSOP (II): 0.4 (0.65 mm pitch) |
| | TC59WM803BFT-75 | | 0.75 | 7.5 | | 419 | 8.1 | | |
| | TC59WM803BFT-80 | | 0.8 | 8 | | 405 | 8.1 | | |
| | TC59WM807BFT-70 | 33,554,432 × 8 (4 Banks) | 0.75 | 7 | | 446 | 8.1 | | |
| | TC59WM807BFT-75 | | 0.75 | 7.5 | | 419 | 8.1 | | |
| | TC59WM807BFT-80 | | 0.8 | 8 | | 405 | 8.1 | | |
| | TC59WM815BFT-70 | 16,777,216 × 16 (4 Banks) | 0.75 | 7 | | 446 | 8.1 | | |
| | TC59WM815BFT-75 | | 0.75 | 7.5 | | 419 | 8.1 | | |
| TC59WM815BFT-80 | 0.8 | | 8 | 405 | 8.1 | | | | |

Fast Cycle RAM (FCRAM[®]) (DDR)

| Capacity | Product No. | Organization (bits) | Max Clock Access Time (ns) | Min Clock Cycle Time (ns) | Power Supply (V) | Power Dissipation (mW) | | No. of Pins | Package Width (inches) |
|-----------|-----------------|------------------------------|----------------------------|---------------------------|-----------------------|------------------------|---------|-------------|--|
| | | | | | | Active | Standby | | |
| 256 Mbits | TC59LM806BFT-22 | 33,554,432 × 8 (4 Banks) | 0.85 | 6.5 | 2.5 ± 0.2 (SSTL-2) | 459 | 8.1 | 66 (66) | TSOP (II): 0.4 (0.65 mm pitch) (VW Function) |
| | TC59LM806BFT-24 | | 0.9 | 7 | | 446 | 8.1 | | |
| | TC59LM806BFT-30 | | 1 | 8 | | 405 | 8.1 | | |
| | TC59LM814BFT-22 | 16,777,216 × 16 (4 Banks) | 0.85 | 6.5 | | 459 | 8.1 | | |
| | TC59LM814BFT-24 | | 0.9 | 7 | | 446 | 8.1 | | |
| | TC59LM814BFT-30 | | 1 | 8 | | 405 | 8.1 | | |

Notes: FCRAM and Fast Cycle RAM are registered trademarks of Fujitsu Limited, Japan.

Rambus DRAMs (RDRAM[®])

| Capacity | Product No. | Organization (bits) | Min Clock Cycle Time (ns) | Power Supply (V) | Power Dissipation (mW) | | No. of Pins | Package Width (inches) |
|-----------|------------------|---------------------|---------------------------|------------------|------------------------|---------|-------------|------------------------|
| | | | | | Active | Standby | | |
| 144 Mbits | TC59RM718MB/RB-8 | 8,388,608 × 18 | 2.50 | 2.5 ± 5% | 1670 | 266 | 62 | BGA |
| | TC59RM718MB/RB-7 | | 2.80 | | | | | |
| | TC59RM718MB/RB-6 | | 3.33 | | | | | |
| 128 Mbits | TC59RM716MB/RB-8 | 8,388,608 × 16 | 2.50 | 2.5 ± 5% | 1512 | 266 | 62 | BGA |
| | TC59RM716MB/RB-7 | | 2.80 | | | | | |
| | TC59RM716MB/RB-6 | | 3.33 | | | | | |
| 288 Mbits | * TC59RM818MB-8 | 16,777,216 × 18 | 2.50 | 2.5 ± 5% | 1670 | 266 | 92 | BGA |
| | * TC59RM818MB-7 | | 2.80 | | | | | |
| | * TC59RM818MB-6 | | 3.33 | | | | | |
| 256 Mbits | * TC59RM816MB-8 | 16,777,216 × 16 | 2.50 | 2.5 ± 5% | 1512 | 266 | 92 | BGA |
| | * TC59RM816MB-7 | | 2.80 | | | | | |
| | * TC59RM816MB-6 | | 3.33 | | | | | |

Notes: RDRAM is a registered trademark of Rambus Inc.

*: New product

Characteristics

DRAM Modules

8-Byte DIMMs (SDRAM) Unbuffered

| Capacity | Product No. | Organization (bits) | Cycle Time tck (ns) | No. of Pins | Dimensions (mm) | | | Comment | | | | | |
|------------|--------------------|---------------------|----------------------------|-------------|-----------------|--------|-------|---|----------|-------|--------|------|---|
| | | | | | Height | Length | Width | | | | | | |
| 64 Mbytes | THMY64N11A70,75,80 | 8M × 64 | 70:7.0 75:7.5 80:8.0 | 168 | 25.40 | 133.35 | 2.80 | 70, 75 : PC133 Rev 0.4 80 : PC100 Rev 1.0 | | | | | |
| | THMY64E11A70,75,80 | 8M × 72 | | | | | | | | | | | |
| 128 Mbytes | THMY12N11A70,75,80 | 16M × 64 | | | 35.052 | | | | | | | | |
| | THMY12E11A70,75,80 | 16M × 72 | | | | | | | | | | | |
| 256 Mbytes | THMY25N01A70,75,80 | 32M × 64 | | | 35.052 | | | | 168 | 25.40 | 133.35 | 2.80 | 70, 75 : PC133 Rev 0.4 80 : PC100 Rev 1.0 THMYxxxxBxx : 0.175 um THMYxxxxCxx : 0.175 Dum |
| | THMY25E01A70,75,80 | 32M × 72 | | | | | | | | | | | |
| 128 Mbytes | THMY12N11B70,75,80 | 16M × 64 | 70:7.0 75:7.5 80:8.0 | 168 | 25.40 | 133.35 | 2.80 | 70, 75 : PC133 Rev 0.4 80 : PC100 Rev 1.0 THMYxxxxBxx : 0.175 um THMYxxxxCxx : 0.175 Dum | | | | | |
| | THMY12N11C70,75,80 | | | | | | | | | | | | |
| | THMY12N31B70,75,80 | | | | | | | | | | | | |
| | THMY12N31C70,75,80 | | | | | | | | | | | | |
| 256 Mbytes | THMY12E11B70,75,80 | 16M × 72 | 70:7.0 75:7.5 80:8.0 | 168 | 35.052 | 133.35 | 4.00 | 70, 75 : PC133 Rev 0.4 80 : PC100 Rev 1.0 THMYxxxxBxx : 0.175 um THMYxxxxCxx : 0.175 Dum | | | | | |
| | THMY12E11C70,75,80 | | | | | | | | | | | | |
| | THMY25N11B70,75,80 | | | | | | | | 32M × 64 | | | | |
| | THMY25N11C70,75,80 | | | | | | | | 32M × 72 | | | | |
| 512 Mbytes | THMY25E11B70,75,80 | 64M × 64 | 70:7.0 75:7.5 80:8.0 | 168 | 35.052 | 133.35 | 4.00 | 70, 75 : PC133 Rev 0.4 80 : PC100 Rev 1.0 THMYxxxxBxx : 0.175 um THMYxxxxCxx : 0.175 Dum | | | | | |
| | THMY25E11C70,75,80 | | | | | | | | | | | | |
| | THMY51N01B70,75,80 | | | | | | | | 64M × 64 | | | | |
| | THMY51N01C70,75,80 | | | | | | | | 64M × 72 | | | | |
| 512 Mbytes | THMY51E01B70,75,80 | 64M × 72 | 70:7.0 75:7.5 80:8.0 | 168 | 35.052 | 133.35 | 4.00 | 70, 75 : PC133 Rev 0.4 80 : PC100 Rev 1.0 THMYxxxxBxx : 0.175 um THMYxxxxCxx : 0.175 Dum | | | | | |
| | THMY51E01C70,75,80 | | | | | | | | | | | | |

8-Byte DIMMs (SDRAM) Registered

| Capacity | Product No. | Organization (bits) | Cycle Time tck (ns) | No. of Pins | Dimensions (mm) | | | Comment | | | | | |
|------------|--------------------|---------------------|----------------------------|-------------|----------------------------|--------|--------|--|-----|---|--------|------|---|
| | | | | | Height | Length | Width | | | | | | |
| 128 Mbytes | THMY12E10A70,75,80 | 16M × 72 | 70:7.0 75:7.5 80:8.0 | 168 | 38.10 | 133.35 | 4.00 | 70, 75 : PC133 Rev 1.0 80 : PC100 Rev 1.2 | | | | | |
| 256 Mbytes | THMY25E10A70,75,80 | 32M × 72 | | | | | | | | | | | |
| 512 Mbytes | THMY51E0SA70,75,80 | 64M × 72 | | | 43.18 | | | | | | | | |
| | THMY51E2SA70,75,80 | | | | | | | | | | | | |
| 256 Mbytes | THMY25E10B70,75,80 | 32M × 72 | | | 70:7.0 75:7.5 80:8.0 | | | | 168 | 38.10 | 133.35 | 4.00 | 70, 75 : PC133 Rev 1.0 80 : PC100 Rev 1.2 THMYxxxxBxx : 0.175 um THMYxxxxCxx : 0.175 Dum |
| 512 Mbytes | THMY25E10C70,75,80 | 32M × 72 | | | | | | | | | | | |
| 512 Mbytes | THMY51E10B70,75,80 | 64M × 72 | 43.18 | | | | | | | | | | |
| | THMY51E10C70,75,80 | | | | | | | | | | | | |
| 1 Gbytes | THMY1GE0SB70,75,80 | 128M × 72 | 70:7.0 75:7.5 80:8.0 | 168 | | 43.18 | 133.35 | 6.35 | | 70, 75 : PC133 Rev 1.0 80 : PC100 Rev 1.2 THMYxxxxBxx : 0.175 um THMYxxxxCxx : 0.175 Dum | | | |
| | THMY1GE0SC70,75,80 | | | | | | | | | | | | |
| | THMY1GE2SB70,75,80 | | | | | | | | | | | | |
| | THMY1GE2SC70,75,80 | | | | | | | | | | | | |

Note: L, S: Stack type

8-Byte DIMMs (DDR SDRAM) Unbuffered

| Capacity | Product No. | Organization (bits) | Cycle Time tck (ns) | No. of Pins | Dimensions (mm) | | | Comment |
|------------|----------------------|---------------------|----------------------------|-------------|-----------------|--------|----------|--|
| | | | | | Height | Length | Width | |
| 128 Mbytes | * THMD12N11B70,75,80 | 16M × 64 | 70:7.0 75:7.5 80:8.0 | 184 | 31.75 | 133.35 | 3.18 | 70 : PC2100 (CL = 2) 75 : PC2100 (CL = 2.5) 80 : PC1600 (CL = 2) |
| 256 Mbytes | * THMD25N11B70,75,80 | 32M × 64 | | | | | | |
| | * THMD25E11B70,75,80 | 32M × 72 | | | | | | |
| 512 Mbytes | * THMD51N01B70,75,80 | 64M × 64 | | | | | 64M × 72 | |
| | * THMD51E01B70,75,80 | | | | | | | |

*: New product

8-Byte DIMMs (DDR SDRAM) Registered

| Capacity | Product No. | Organization (bits) | Cycle Time tck (ns) | No. of Pins | Dimensions (mm) | | | Comment |
|------------|----------------------|---------------------|----------------------------|-------------|-----------------|--------|-------|--|
| | | | | | Height | Length | Width | |
| 256 Mbytes | * THMD25E30B70,75,80 | 32M × 72 | 70:7.0 75:7.5 80:8.0 | 184 | 43.18 | 133.35 | 3.99 | 70 : PC2100 (CL = 2) 75 : PC2100 (CL = 2.5) 80 : PC1600 (CL = 2) |
| 512 Mbytes | * THMD51E20B70,75,80 | 64M × 72 | | | | | | |
| | * THMD51E30B70,75,80 | | | | | | | |
| 1 Gbyte | * THMD1GE0SB70,75,80 | 128M × 72 | | | | | 6.81 | |

Note: S: Stack type

*: New product

8-Byte SO-DIMMs (DDR SDRAM) Unbuffered

| Capacity | Product No. | Organization (bits) | Cycle Time tck (ns) | No. of Pins | Dimensions (mm) | | | Comment |
|------------|----------------------|---------------------|---------------------|-------------|-----------------|--------|-------|--|
| | | | | | Height | Length | Width | |
| 128 Mbytes | * THLD12N11B70,75,80 | 16M × 64 | 70:7.0 | 200 | 31.75 | 67.60 | 3.80 | 70 : PC2100 (CL = 2) 75 : PC2100 (CL = 2.5) 80 : PC1600 (CL = 2) |
| | * THLD25N01B70,75,80 | 32M × 64 | 75:7.5 | | | | | |
| 256 Mbytes | * THLD25N11B70,75,80 | | 80:8.0 | | | | | |

*: New product

8-Byte SO-DIMMs (SDRAM) Unbuffered

| Capacity | Product No. | Organization (bits) | Cycle Time tck (ns) | No. of Pins | Dimensions (mm) | | | Comment |
|------------|--------------------------|---------------------|---------------------|-------------|-----------------|--------|-------|---|
| | | | | | Height | Length | Width | |
| 64 Mbytes | THLY64N11A70,75,80 | 8M × 64 | 70:7.0 | 144 | 25.40 | 67.60 | 3.80 | 70, 75 : PC133 Rev 1.0 80 : PC100 Rev 1.0 L : Low Power Version |
| | THLY64N11A70L,75L,80L | | | | | | | |
| 128 Mbytes | THLY12N01A70,75,80 | 16M × 64 | 75:7.5 | | | | | |
| | THLY12N01A70L,75L,80L | | 80:8.0 | | | | | |
| 256 Mbytes | ◆ THLY25N61A70,75,80 | 32M × 64 | 70:7.0 | 144 | 25.40 | 67.60 | 3.80 | 70, 75 : PC133 Rev 1.0 80 : PC100 Rev 1.0 L : Low Power Version |
| | ◆ THLY25N61A70L,75L,80L | | | | | | | |
| 128 Mbytes | THLY12N11B70,75,80 | 16M × 64 | 70:7.0 | 144 | 25.40 | 67.60 | 3.80 | 70, 75 : PC133 Rev 1.0 80 : PC100 Rev 1.0 L : Low Power Version |
| | THLY12N11B70L,75L,80L | | | | | | | |
| | THLY12N11C70,75,80 | | | | | | | |
| | THLY12N11C70L,75L,80L | | | | | | | |
| 256 Mbytes | THLY25N01B70,75,80 | 32M × 64 | 75:7.5 | | | | | THLYxxxxBxx : 0.175 um THLYxxxxCxx : 0.175 Dum |
| | THLY25N01B70L,75L,80L | | 80:8.0 | | | | | |
| | THLY25N01C70,75,80 | | | | | | | |
| | THLY25N01C70L,75L,80L | | | | | | | |
| 512 Mbytes | ** THLY51N61C70,75,80 | 64M × 64 | 70:7.0 | 144 | 25.40 | 67.60 | 3.80 | 70, 75 : PC133 Rev 1.0 80 : PC100 Rev 1.0 L : Low Power Version |
| | ** THLY51N61C70L,75L,80L | | | | | | | |

◆: Component STSOP PKG

** : Under development (Component CSP PKG)

RIMM™ (RDRAM)

| Capacity | Product No. | Organization (bits) | Operating Frequency (MHz) | No. of Pins | Dimensions (mm) | | | Comment |
|------------|--------------------|---------------------|----------------------------|-------------|-----------------|--------|-------|----------------------|
| | | | | | Height | Length | Width | |
| 64 Mbytes | THMR1N4E-8,-7,-6 | 8M × 16 × 4 | -8:800 -7:711 -6:600 | 184 | 31.75 | 133.35 | 4.8 | Used 128 Mbits RDRAM |
| | THMR1E4E-8,-7,-6 | 8M × 18 × 4 | | | | | | Used 144 Mbits RDRAM |
| 128 Mbytes | THMR1N8E-8,-7,-6 | 8M × 16 × 8 | | | | | | Used 128 Mbits RDRAM |
| | THMR1E8E-8,-7,-6 | 8M × 18 × 8 | | | | | | Used 144 Mbits RDRAM |
| 256 Mbytes | THMR1N16E-8,-7,-6 | 8M × 16 × 16 | | | | | 8.0 | Used 128 Mbits RDRAM |
| | THMR1E16E-8,-7,-6 | 8M × 18 × 16 | | | | | | Used 144 Mbits RDRAM |
| 64 Mbytes | * THMR2N2Z-8,-7,-6 | 16M × 16 × 2 | -8:800 -7:711 -6:600 | 184 | 34.29 | 133.35 | 4.8 | Used 256 Mbits RDRAM |
| | THMR2E2Z-8,-7,-6 | 16M × 18 × 2 | | | | | | Used 288 Mbits RDRAM |
| 128 Mbytes | * THMR2N4Z-8,-7,-6 | 16M × 16 × 4 | | | | | | Used 256 Mbits RDRAM |
| | THMR2E4Z-8,-7,-6 | 16M × 18 × 4 | | | | | | Used 288 Mbits RDRAM |
| 256 Mbytes | * THMR2N8Z-8,-7,-6 | 16M × 16 × 8 | | | | | | Used 256 Mbits RDRAM |
| | THMR2E8Z-8,-7,-6 | 16M × 18 × 8 | | | | | | Used 288 Mbits RDRAM |
| 512 Mbytes | * THMR2N16-8,-7,-6 | 16M × 16 × 16 | | | | | 8.0 | Used 256 Mbits RDRAM |
| | THMR2E16-8,-7,-6 | 16M × 18 × 16 | | | | | | Used 288 Mbits RDRAM |

Note: RIMM is a trademark of Rambus Inc.

*: New product

Characteristics

Static RAMs

Low-Power Static RAMs

| Capacity | Product No. | Organization (bits) | Max Access Time (ns) | Min Cycle Time (ns) | Power Supply (V) | Max Power Dissipation (mW) | | No. of Pins | Package Width (inch) | | | |
|------------------|----------------------|---------------------|------------------------|--|--|--|--|-------------|---|--------------------------|---------------------------------------|---|
| | | | | | | Active | Standby | | | | | |
| 4 Mbits | TC554001AF/AFT-70 | 524,288 × 8 | 70 | 70 | 5.0 ± 10% | 330 | 0.55 | 32 | SOP 0.525 (F) TSOP-II 0.4 (FT) | | | |
| | TC554001AF/AFT-85 | | 85 | 85 | | | | | | | | |
| | TC554001AF/AFT-10 | | 100 | 100 | | | | | | | | |
| | TC554001AF/AFT-70L | | 70 | 70 | | | | | | | | |
| | TC554001AF/AFT-85L | | 85 | 85 | | | | | | | | |
| | TC554001AF/AFT-10L | | 100 | 100 | | | | | | | | |
| | TC554001AFI/AFTI-70 | | 70 | 70 | | | | | | | | |
| | TC554001AFI/AFTI-85 | | 85 | 85 | | | | | | | | |
| | TC554001AFI/AFTI-10 | | 100 | 100 | | | | | | | | |
| | TC554001AFI/AFTI-70L | | 70 | 70 | | | | | | | | |
| | TC554001AFI/AFTI-85L | | 85 | 85 | | | | | | | | |
| | TC554001AFI/AFTI-10L | | 100 | 100 | | | | | | | | |
| | TC554001AF/AFT-70V | | 120 (70) | 120 (70) | | | | | | 2.7–5.5 (5.0 V ± 10%) | 99 (3.0 V ± 10%) 330 (5.0 V ± 10%) | 0.0924 (3.0 V ± 10%) 0.275 (5.0 V ± 10%) |
| | TC554001AF/AFT-85V | | 150 (85) | 150 (85) | | | | | | | | |
| | TC554001AF/AFT-10V | 150 (100) | 150 (100) | | | | | | | | | |
| | TC55V040AFT-55 | 262,144 × 16 | 55 [70] | 55 [70] | 5.0 ± 10% | 181.5 (3.0 V ± 10%) 148.5 (3.0 V ± 10%) | 0.0198 (3.0 V ± 10%) 0.0252 (3.3 V ± 0.3 V) | 40 | TSOP-I 10 × 14 mm | | | |
| | TC55V040AFT-70 | | 70 [85] | 70 [85] | | | | | | | | |
| | TC55V4000ST-70 | | 70 [85] | 70 [85] | | | | | | | | |
| | TC55V4000ST-85 | | 85 [100] | 85 [100] | | | | | | | | |
| | TC554161AFT-70 | | 70 | 70 | | | | | | | | |
| | TC554161AFT-85 | | 85 | 85 | | | | | | | | |
| | TC554161AFT-10 | | 100 | 100 | | | | | | | | |
| | TC554161AFT-70L | | 70 | 70 | | | | | | | | |
| | TC554161AFT-85L | | 85 | 85 | | | | | | | | |
| | TC554161AFT-10L | | 100 | 100 | | | | | | | | |
| | TC554161AFTI-70 | | 70 | 70 | | | | | | | | |
| | TC554161AFTI-85 | | 85 | 85 | | | | | | | | |
| | TC554161AFTI-10 | | 100 | 100 | | | | | | | | |
| TC554161AFTI-70L | 70 | | 70 | | | | | | | | | |
| TC554161AFTI-85L | 85 | 85 | | | | | | | | | | |
| TC554161AFTI-10L | 100 | 100 | | | | | | | | | | |
| TC554161AFT-70V | 150 (70) | 150 (70) | 2.7–5.5 (5.0 ± 10%) | 99 (3.0 V ± 10%) 550 (5.0 V ± 10%) | 0.0924 (3.0 V ± 10%) 0.275 (5.0 V ± 10%) | | | | | | | |
| TC554161AFT-85V | 150 (85) | 150 (85) | | | | | | | | | | |
| TC554161AFT-10V | 150 (100) | 150 (100) | | | | | | | | | | |
| TC55V400AFT-55 | 55 [70] | 55 [70] | 2.7–3.6 [2.3–3.6] | 214.5 (3.0 V ± 10%) 181.5 (3.0 V ± 10%) | 0.0198 (3.0 V ± 10%) 0.0252 (3.3 V ± 0.3 V) | | | | | | | |
| TC55V400AFT-70 | 70 [85] | 70 [85] | | | | | | | | | | |
| ** TC55W400XB5 | 55 [70] | 55 [70] | 2.5–3.3 | 148.5 | 0.033 (2.3 V–3.3 V) 0.015 (2.3 V–3.0 V) | | | | | | | |
| ** TC55W400XB7 | 70 [85] | 70 [85] | [2.3–3.3] | | | | | | | | | |
| ** TC55Y400XB7 | 70 [85] | 70 [85] | 1.8–2.2 | 55 | 0.011 | | | | | | | |
| ** TC55Y400XB8 | 85 [100] | 85 [100] | [1.65–2.2] | | | | | | | | | |
| 8 Mbits | TC55W800FT-55 | 524,288 × 16/ | 55 [70] | 55 [70] | 2.7–3.3 [2.3–3.3] | 181.5 | 0.033 (2.3 V–3.3 V) 0.015 (2.3 V–3.0 V) | 48 | TSOP-I 12 × 20 mm | | | |
| | TC55W800FT-70 | 1,048,576 × 8 | 70 [85] | 70 [85] | | | | | | | | |
| | * TC55W800XB7 | 524,288 × 16 | 70 [85] | 70 [85] | | | | | | | | |
| | * TC55W800XB8 | | 85 [100] | 85 [100] | | | | | | | | |
| | ** TC55Y800XB7 | | 70 [85] | 70 [85] | | | | | | | | |
| | ** TC55Y800XB8 | | 85 [100] | 85 [100] | | | | | | | | |
| 16 Mbits | * TC55W1600FT-55 | 1,048,576 × 16/ | 55 [70] | 55 [70] | 2.7–3.1 [2.3–3.1] | 170.5 | 0.031 (2.3 V–3.1 V) 0.015 (2.3 V–3.0 V) | 12 × 20 mm | | | | |
| | * TC55W1600FT-70 | 2,097,152 × 8 | 70 [85] | 70 [85] | | | | | | | | |
| | * TC55W1600XB7 | 1,048,576 × 16 | 70 [85] | 70 [85] | | | | | | | | |
| | * TC55W1600XB8 | | 85 [100] | 85 [100] | | | | | | | | |

*: New product
**: Under development

Pseudo Static RAMs

| Capacity | Product No. | Organization (bits) | Max Access Time (ns) | Min Cycle Time (ns) | Power Supply (V) | Max Power Dissipation (mW) | | No. of Pins | Package Width (inch) |
|----------|----------------|---------------------|----------------------|---------------------|------------------|----------------------------|---------|-------------|----------------------|
| | | | | | | Active | Standby | | |
| 32 MBits | * TC51W3216XB | 2,097,152 × 16 | 80 | 100 | 2.5~3.1 | 124 | 0.217 | 48 | FBGA 9 × 6 mm |
| | * TC51W3217XB | | | | | | | | |
| 64 MBits | ** TC51W6416XB | 4,194,304 × 16 | | | | | 0.31 | | |
| | ** TC51W6417XB | | | | | | | | |

*: New product
 **: Under development

High-Speed Static RAMs (Asynchronous)

| Capacity | Product No. | Organization (bits) | Max Access Time (ns) | Min Cycle Time (ns) | Power Supply (V) | Max Power Dissipation (mW) | | No. of Pins | Package Width (inches) |
|----------|---------------------|---------------------|----------------------|---------------------|------------------|----------------------------|---------|-------------|---|
| | | | | | | Active | Standby | | |
| 4 MBit | TC55V8512J-12 | 524,288 × 8 | 12 | 12 | 3.3 ± 0.3 | 612 | 14.4 | 36 | SOJ 0.4 |
| | TC55V8512J-15 | | 15 | 15 | | 504 | | | |
| | TC55V8512JI-12 | | 12 | 12 | | 648 | 36.0 | | |
| | TC55V8512JI-15 | | 15 | 15 | | 540 | | | |
| | TC55V8512FT-12 | | 12 | 12 | | 612 | 14.4 | | |
| | TC55V8512FT-15 | | 15 | 15 | | 504 | | | |
| | TC55V8512FTI-12 | 12 | 12 | 648 | | 36.0 | | | |
| | TC55V8512FTI-15 | 15 | 15 | 540 | | | | | |
| | TC55V16256J/FT-12 | 262,144 × 16 | 12 | 12 | | 792 | 14.4 | 44 | SOJ 0.4(J/JI)/ TSOP-II 11.8 × 18.8 mm (FT/FTI) |
| | TC55V16256J/FT-15 | | 15 | 15 | | 684 | | | |
| | TC55V16256JI/FTI-12 | | 12 | 12 | | 828 | 36.0 | | |
| | TC55V16256JI/FTI-15 | | 15 | 15 | | 720 | | | |
| 16 MBits | TC55V11601FT-15 | 16,777,216 × 1 | 15 | 15 | | 612 | 14.4 | 54 | TSOP-II 11.8 × 22.6 mm |
| | TC55V4400FT-10 | 4,194,304 × 4 | 10 | 10 | 3.3 ± 5% | 1421 | 13.86 | | |
| | TC55V4400FT-12 | | 12 | 12 | 3.3 ± 0.3 | 1368 | 14.4 | | |
| | TC55V4400FT-15 | | 15 | 15 | | 1296 | | | |
| | TC55V8200FT-10 | 2,097,152 × 8 | 10 | 10 | 3.3 ± 5% | 1490 | 13.68 | | |
| | TC55V8200FT-12 | | 12 | 12 | 3.3 ± 0.3 | 1440 | 14.4 | | |
| | TC55V8200FT-15 | | 15 | 15 | | 1332 | | | |
| | TC55V8200FTI-12 | | 12 | 12 | | 1440 | | | |
| | TC55V8200FTI-15 | 15 | 15 | 1332 | | | | | |
| | TC55V16100FT-10 | 1,048,576 × 16 | 10 | 10 | 3.3 ± 5% | 1560 | 13.68 | | |
| | TC55V16100FT-12 | | 12 | 12 | 3.3 ± 0.3 | 1512 | 14.4 | | |
| | TC55V16100FT-15 | | 15 | 15 | | 1368 | | | |
| | TC55V16100FTI-12 | | 12 | 12 | | 1512 | | | |
| | TC55V16100FTI-15 | | 15 | 15 | | 1368 | | | |

Notes: J = SOJ; FT = TSOP

Characteristics

High-Speed Static RAMs (Synchronous)

| Capacity | Product No. | Organization (bits) | Max Access Time (ns) | Min Cycle Time (ns) | Power Supply (V) | Max Power Dissipation (mW) | | No. of Pins | Package Width (inches) |
|---------------------|----------------------|---------------------|----------------------|---------------------|------------------|----------------------------|---------|-------------|------------------------|
| | | | | | | Active | Standby | | |
| 4 Mbits | TC55V4326FF-167 | 131,072 × 32 | 3.5 | 6 (167 MHz) | 3.1~3.6 | 1332 | 10.8 | 100 | LQFP 16.0 × 22.0 mm |
| | TC55V4326FF-150 | | 3.8 | 6.6 (150 MHz) | | | | | |
| | TC55V4326FF-133 | | 4 | 7.5 (133 MHz) | | | | | |
| | TC55V4326FFI-150 | | 4.4 | 6.6 (150 MHz) | | | | | |
| | TC55V4326FFI-133 | | 5 | 7.5 (133 MHz) | | | | | |
| | TC55V4336FF-100 | | 8.5 | 10 (100 MHz) | | | | | |
| | TC55V4336FF-83 | | 9 | 12 (83 MHz) | | | | | |
| | TC55V4336FFI-83 | | 9 | 12 (83 MHz) | | | | | |
| | ** TC55V4326AFF-167 | | 3.5 | 6 (167 MHz) | | | | | |
| | ** TC55V4326AFF-150 | | 3.8 | 6.6 (150 MHz) | | | | | |
| | ** TC55V4326AFF-133 | | 4 | 7.5 (133 MHz) | | | | | |
| | ** TC55V4326AFFI-150 | | 4.4 | 6.6 (150 MHz) | | | | | |
| | ** TC55V4326AFFI-133 | | 5 | 7.5 (133 MHz) | | | | | |
| | ** TC55V4336AFF-83 | | 9 | 12 (83 MHz) | | | | | |
| ** TC55V4336AFFI-83 | 9 | 12 (83 MHz) | | | | | | | |
| 4.5 Mbits | TC55V4366FF-167 | 131,072 × 36 | 3.5 | 6 (167 MHz) | 3.1~3.6 | 1332 | 10.8 | 100 | LQFP 16.0 × 22.0 mm |
| | TC55V4366FF-150 | | 3.8 | 6.6 (150 MHz) | | | | | |
| | TC55V4366FF-133 | | 4 | 7.5 (133 MHz) | | | | | |
| | TC55V4366FFI-150 | | 4.4 | 6.6 (150 MHz) | | | | | |
| | TC55V4366FFI-133 | | 5 | 7.5 (133 MHz) | | | | | |
| | TC55V4376FF-100 | | 8.5 | 10 (100 MHz) | | | | | |
| | TC55V4376FF-83 | | 9 | 12 (83 MHz) | | | | | |
| | TC55V4376FFI-83 | | 9 | 12 (83 MHz) | | | | | |
| | ** TC55V4366AFF-167 | | 3.5 | 6 (167 MHz) | | | | | |
| | ** TC55V4366AFF-150 | | 3.8 | 6.6 (150 MHz) | | | | | |
| | ** TC55V4366AFF-133 | | 4 | 7.5 (133 MHz) | | | | | |
| | ** TC55V4366AFFI-150 | | 4.4 | 6.6 (150 MHz) | | | | | |
| | ** TC55V4366AFFI-133 | | 5 | 7.5 (133 MHz) | | | | | |
| | ** TC55V4376AFF-83 | | 9 | 12 (83 MHz) | | | | | |
| ** TC55V4376AFFI-83 | 9 | 12 (83 MHz) | | | | | | | |
| 18 Mbits | TC55V16186FF-167 | 1,048,576 × 18 | 3.6 | 6 (167 MHz) | 3.3 ± 5% | 1455.3 | 34.65 | 100 | LQFP 16.0 × 22.0 mm |
| | TC55V16186FF-150 | 3.8 | 6.6 (150 MHz) | 1403.3 | | | | | |
| | TC55V16186FF-133 | 4.2 | 7.5 (133 MHz) | 1316.7 | | | | | |
| | TC55V16366FF-167 | 524,288 × 36 | 3.6 | 6 (167 MHz) | | 1524.6 | | | |
| | TC55V16366FF-150 | 3.8 | 6.6 (150 MHz) | 1472.6 | | | | | |
| | TC55V16366FF-133 | 4.2 | 7.5 (133 MHz) | 1386 | | | | | |

Notes: FF: LQFP

** : Under development

TC55V4326FF, TC55V4366FF, TC55V16186FF, TC55V16366FF: synchronous SRAM (pipelined-burst SRAM, 2 cycle enable 1 cycle disable)

TC55V4336FF, TC55V4376FF: synchronous SRAM (flow-through SRAM)

High-Speed Static RAMs (N/RAM™)

| Capacity | Product No. | Organization (bits) | Max Access Time (ns) | Min Cycle Time (ns) | Power Supply (V) | Max Power Dissipation (mW) | | No. of Pins | Package Width (inches) | | | | | | | |
|------------------|------------------|---------------------|----------------------|---------------------|------------------|----------------------------|---------|-------------|------------------------|------------------------|-------|-----|------------------------|-------|-----|------------------------|
| | | | | | | Active | Standby | | | | | | | | | |
| 9 Mbits | TC55VD818FF-150 | 524,288 × 18 | 3.8 | 6.6 (150 MHz) | 3.3 ± 5% | 1455.3 | 34.65 | 100 | LQFP 16.0 × 22.0 mm | | | | | | | |
| | TC55VD818FF-143 | | 4 | 7 (143 MHz) | | 1386 | | | | | | | | | | |
| | TC55VD818FF-133 | | 4.2 | 7.5 (133 MHz) | | 1316.7 | | | | | | | | | | |
| | TC55VL818FF-83 | | 9 | 12 (83 MHz) | | 831.6 | | | | | | | | | | |
| | TC55VD818FFI-143 | | 4 | 7 (143 MHz) | | 1386 | | | | | | | | | | |
| | TC55VD818FFI-133 | | 4.2 | 7.5 (133 MHz) | | 1316.7 | | | | | | | | | | |
| | TC55VL818FFI-83 | 9 | 12 (83 MHz) | 831.6 | | | | | | | | | | | | |
| | TC55VD836FF-150 | 262,144 × 36 | 3.8 | 6.6 (150 MHz) | | 1524.6 | | | | | | | | | | |
| | TC55VD836FF-143 | | 4 | 7 (143 MHz) | | 1455.3 | | | | | | | | | | |
| | TC55VD836FF-133 | | 4.2 | 7.5 (133 MHz) | | 1386 | | | | | | | | | | |
| | TC55VL836FF-83 | | 9 | 12 (83 MHz) | | 900.9 | | | | | | | | | | |
| | TC55VD836FFI-143 | | 4 | 7 (143 MHz) | | 1455.3 | | | | | | | | | | |
| | TC55VD836FFI-133 | | 4.2 | 7.5 (133 MHz) | | 1386 | | | | | | | | | | |
| | TC55VL836FFI-83 | 9 | 12 (83 MHz) | 900.9 | | | | | | | | | | | | |
| | TC55WD818FF-167 | 524,288 × 18 | 3.5 | 6 (167 MHz) | | 2.5 ± 5% | | | | 918.75 | 26.25 | 100 | LQFP 16.0 × 22.0 mm | | | |
| | TC55WD818FF-150 | | 3.8 | 6.6 (150 MHz) | | | | | | 866.25 | | | | | | |
| TC55WD818FF-133 | 4.2 | | 7.5 (133 MHz) | 813.75 | | | | | | | | | | | | |
| TC55WD836FF-167 | 262,144 × 36 | 3.5 | 6 (167 MHz) | 945 | | | | | | | | | | | | |
| TC55WD836FF-150 | | 3.8 | 6.6 (150 MHz) | 892.5 | | | | | | | | | | | | |
| TC55WD836FF-133 | | 4.2 | 7.5 (133 MHz) | 840 | | | | | | | | | | | | |
| TC55VD1618FF-167 | | 1,048,576 × 18 | 3.6 | 6 (167 MHz) | 3.3 ± 5% | | 1420.65 | 34.65 | 100 | LQFP 16.0 × 22.0 mm | | | | | | |
| TC55VD1618FF-150 | 3.8 | | 6.6 (150 MHz) | 1351.3 | | | | | | | | | | | | |
| TC55VD1618FF-133 | 4.2 | | 7.5 (133 MHz) | 1282 | | | | | | | | | | | | |
| TC55VD1636FF-167 | 524,288 × 36 | 3.6 | 6 (167 MHz) | 1524.6 | | | | | | | | | | | | |
| TC55VD1636FF-150 | | 3.8 | 6.6 (150 MHz) | 1455.3 | | | | | | | | | | | | |
| TC55VD1636FF-133 | | 4.2 | 7.5 (133 MHz) | 1386 | | | | | | | | | | | | |
| TC55WD1618FF-167 | 1,048,576 × 18 | 3.6 | 6 (167 MHz) | 2.5 ± 5% | | | 1076.25 | | | | | | | 26.25 | 100 | LQFP 16.0 × 22.0 mm |
| TC55WD1618FF-150 | | 3.8 | 6.6 (150 MHz) | | | | 1023.75 | | | | | | | | | |
| TC55WD1618FF-133 | | 4.2 | 7.5 (133 MHz) | | | | 971.25 | | | | | | | | | |
| TC55WD1636FF-167 | 524,288 × 36 | 3.6 | 6.0 (167 MHz) | | | | 1155 | | | | | | | | | |
| TC55WD1636FF-150 | | 3.8 | 6.6 (150 MHz) | | | 1102.5 | | | | | | | | | | |
| TC55WD1636FF-133 | | 4.2 | 7.5 (133 MHz) | | | 1050 | | | | | | | | | | |

Notes: FF: LQFP

TC55VD818FF, TC55VD836FF, TC55WD818FF, TC55WD836FF, TC55VD1618FF, TC55VD1636FF, TC55WD1618FF, TC55WD1636FF: N/RAM(no-turnaround RAM, pipelined type)

TC55VL818FF, TC55VL836FF: N/RAM(no-turnaround RAM, flow-through type)

N/RAM is a trademark of Samsung Electronics Co., Ltd.

High-Speed Static RAMs (Sigma SDR : Σ1 × 1DP)

| Capacity | Product No. | Organization (bits) | Max Access Time (ns) | Min Cycle Time (ns) | Power Supply (V) | Max Power Dissipation (mW) | | No. of Pins | Package Width (inches) |
|----------|---------------------|---------------------|----------------------|---------------------|------------------|----------------------------|---------|-------------|------------------------|
| | | | | | | Active | Standby | | |
| 18 Mbits | ** TC55YD1819YB-250 | 1,048,576 × 18 | 2.1 | 4 (250 MHz) | 1.7-1.95 | TBD | TBD | 209 | BGA 14.0 × 22.0 mm |
| | ** TC55YD1819YB-333 | | 1.6 | 3 (333 MHz) | | | | | |
| | ** TC55YD1837YB-250 | 524,288 × 36 | 2.1 | 4 (250 MHz) | | | | | |
| | ** TC55YD1837YB-333 | | 1.6 | 3 (333 MHz) | | | | | |
| | ** TC55YD1873YB-250 | 262,144 × 72 | 2.1 | 4 (250 MHz) | | | | | |
| | ** TC55YD1873YB-333 | | 1.6 | 3 (333 MHz) | | | | | |

** : Under development

Characteristics

High-Speed Static RAMs (DDR)

| Capacity | Product No. | Organization (bits) | Max Access Time (ns) | Min Cycle Time (ns) | Power Supply (V) | Max Power Dissipation (mW) | | No. of Pins | Package Width (inches) |
|----------|-----------------------------|---------------------|----------------------|---------------------|----------------------------|----------------------------|---------|-------------|------------------------|
| | | | | | | Active | Standby | | |
| 9 MBits | TC55WK837XB-333 | 262,144 × 36 | 4.0 | 6.0 (167 MHz) | 2.5 ± 5%(V _{DD}) | 1444 | 210 | 153 | BGA 14.0 × 22.0 mm |
| | TC55WK837XB-300 | | 4.5 | 6.6 (150 MHz) | 1.4~1.6(V _{DDQ}) | | | | |
| 18 MBits | ** TC55YK1636AYB-800 | 524,288 × 36 | 1.8 | 2.5 (400 MHz) | 1.8 ± 5%(V _{DD}) | TBD | TBD | 153 | BGA 14.0 × 22.0 mm |
| | ** TC55YK1636AYB-666 | | 1.9 | 3 (333 MHz) | 1.8 ± 5% or | | | | |
| | ** TC55YK1636AYB-500 | | 2.3 | 4 (250 MHz) | 1.4~1.6(V _{DDQ}) | | | | |
| | ** TC55YK1618AYB-800 | 1,048,576 × 18 | 1.8 | 2.5 (400 MHz) | 1.8 ± 5%(V _{DD}) | TBD | TBD | 153 | BGA 14.0 × 22.0 mm |
| | ** TC55YK1618AYB-666 | | 1.9 | 3 (333 MHz) | 1.8 ± 5% or | | | | |
| | ** TC55YK1618AYB-500 | | 2.3 | 4 (250 MHz) | 1.4~1.6(V _{DDQ}) | | | | |

Notes: XB: BGA

TC55WK837XB: DDR SRAM (double data rate SRAM)

** : Under development

NOR Flash Memories/NAND E²PROMs/SmartMedia™

NOR Flash Memories

| Capacity | Product No. | Organization (bits) | Max Access Time (ns) | Power Supply (V) | Max Power Dissipation (mW) | | | Write/Erase Method | Operating Temperature (°C) | Package (inches) | No. of Pins |
|-----------------------|-----------------------|----------------------------------|----------------------|------------------|----------------------------|-------------|---------|------------------------|----------------------------|---------------------|-------------|
| | | | | | Read | Write/Erase | Standby | | | | |
| 16 Mbits | TC58FVT160FT-10,12 | 1,048,576 × 16/ 2,097,152 × 8 | 100/120 | 2.7~3.6 | 108 | 144 | 0.018 | Command Control Method | -40~85 | 12 × 20 TSOP TYPE I | 48 |
| | TC58FVB160FT-10,12 | | 85 | 3.3 ± 0.3 | 108 | 144 | 0.018 | | | | |
| | TC58FVT160FT-85 | | | | | | | | | | |
| | TC58FVB160FT-85 | | 70/100 | 2.7~3.6 | 72 | 54 | 0.036 | | | | |
| | * TC58FVT160AFT-70/10 | | | | | | | | | | |
| | * TC58FVB160AFT-70/10 | | | | | | | | | | |
| | * TC58FVT160AXB-70/10 | | | | | | | | | | |
| * TC58FVB160AXB-70/10 | | | | | | | | | | | |
| 32 Mbits | TC58FVT321FT-70/10 | 2,097,152 × 16/ 4,194,304 × 8 | 70/100 | 2.7~3.6 | 72 | 54 | 0.036 | Command Control Method | -40~85 | 12 × 20 TSOP TYPE I | 48 |
| | TC58FVB321FT-70/10 | | | | | | | | | | |
| | * TC58FVT321XB-70/10 | | | | | | | | | FBGA48-0608 | 48 |
| | * TC58FVB321XB-70/10 | | | | | | | | | 12 × 20 TSOP TYPE I | 48 |
| 64 Mbits | TC58FVT641FT-70/10 | 4,194,304 × 16/ 8,388,608 × 8 | 70/100 | 2.7~3.6 | 72 | 54 | 0.036 | Command Control Method | -40~85 | 12 × 20 TSOP TYPE I | 48 |
| | TC58FVB641FT-70/10 | | | | | | | | | | |
| | * TC58FVT641XB-70/10 | | | | | | | | | FBGA56-0710 | 56 |
| | * TC58FVB641XB-70/10 | | | | | | | | | 12 × 20 TSOP TYPE I | 48 |
| | | | | | | | | | | FBGA63-0911 | 63 |

*: New Product

NAND E²PROMs

| Capacity | Product No. | Organization (bits) | Max Access Time | | Power Supply (V) | Max Power Dissipation (mW) | | | Operating Temperature (°C) | Package | No. of Pins |
|-----------|---------------|---------------------|-------------------|-----------------|------------------|----------------------------|-------------|---------|----------------------------|----------------------|-------------|
| | | | Serial cycle (ns) | 1st access (μs) | | Read | Write/Erase | Standby | | | |
| 64 Mbits | TC58V64AFT | 8,650,752 × 8 | 50 | 25 | 3.3 ± 0.3 | 108 | 108 | 0.36 | 0~70 | 400 mil TSOP TYPE II | 44 (40) |
| | ** TC58V64BFT | | 50 | 25 | 2.7~3.6 | 108 | 108 | 0.36 | | | |
| 128 Mbits | TC58128FT | 17,301,504 × 8 | 50 | 25 | 3.3 ± 0.3 | 108 | 108 | 0.36 | 0~70 | 12 × 20 TSOP TYPE I | 48 |
| | * TC58128AFT | | 50 | 25 | 2.7~3.6 | 108 | 108 | 0.36 | | | |
| 256 Mbits | TC58256FT | 34,603,008 × 8 | 50 | 25 | 3.3 ± 0.3 | 108 | 108 | 0.36 | 0~70 | 12 × 20 TSOP TYPE I | 48 |
| | TC58256AFT | | 50 | 25 | 2.7~3.6 | 108 | 108 | 0.36 | | | |
| 512 Mbits | TC58512FT | 69,206,016 × 8 | 50 | 25 | 2.7~3.6 | 108 | 108 | 0.36 | 0~70 | 12 × 20 TSOP TYPE I | 48 |
| 1 Gbits | TH58100FT | 138,412,032 × 8 | 50 | 25 | 2.7~3.6 | 108 | 108 | 0.36 | 0~70 | 12 × 20 TSOP TYPE I | 48 |

*: New Product

** : Under Development

SmartMedia™

| Capacity | Product No. | Organization (bits) | Max Access Time | | Power Supply (V) | Max Power Dissipation (mW) | | | Operating Temperature (°C) | Package | No. of Pins |
|------------|----------------|---------------------|-------------------|-----------------|------------------|----------------------------|-------------|---------|----------------------------|---------|-------------|
| | | | Serial cycle (ns) | 1st access (μs) | | Read | Write/Erase | Standby | | | |
| 8 MBytes | TC58V64ADC | 8,650,752 × 8 | 50 | 25 | 3.3 ± 0.3 | 108 | 108 | 0.36 | 0~55 | FDC22A | 22 |
| | ** TC58V64BDC | | 50 | 25 | 3.3 ± 0.3 | 108 | 108 | 0.36 | | | |
| 16 MBytes | TC58NS128DC | 17,301,504 × 8 | 50 | 25 | 3.3 ± 0.3 | 108 | 108 | 0.36 | 0~55 | FDC22A | 22 |
| | * TC58NS128ADC | | 50 | 25 | 3.3 ± 0.3 | 108 | 108 | 0.36 | | | |
| 32 MBytes | TC58NS256DC | 34,603,008 × 8 | 50 | 25 | 3.3 ± 0.3 | 108 | 108 | 0.36 | 0~55 | FDC22A | 22 |
| | TC58NS256ADC | | 50 | 25 | 3.3 ± 0.3 | 108 | 108 | 0.36 | | | |
| 64 MBytes | TC58NS512DC | 69,206,016 × 8 | 50 | 25 | 3.3 ± 0.3 | 108 | 108 | 0.36 | 0~55 | FDC22A | 22 |
| 128 MBytes | TH58NS100DC | 138,412,032 × 8 | 80 | 25 | 3.3 ± 0.3 | 108 | 108 | 0.36 | 0~55 | FDC22C | 22 |

Note: Package = FDC22A, FDC22C: Floppy Disk Card
SmartMedia is a trademark of Toshiba Corporation.

*: New Product

** : Under Development

Characteristics

MCPs (multi-chip packages)

MCPs (NOR Flash Memory / SRAM)

| Capacity Flash/ SRAM | Product No. | Organization (bits) | | Max Access Time (ns) | Power Supply (V) | SRAM Power Dissipation (mW) | | Flash Power Dissipation (mW) | | | No. of Pins | Package Width |
|----------------------------|-------------------|----------------------------------|----------------------------------|------------------------------|---------------------|--------------------------------|---------|---------------------------------|-----------------------|---------|-------------|------------------|
| | | Flash memory | SRAM | | | Active | Standby | Active | Write/Erase method | Standby | | |
| 32M/4M | TH50VSF2580AASB | 4,194,304 × 8/ 2,097,152 × 16 | 524,288 × 8/ 262,144 × 16 | 90 | 2.7~3.6 | 162 | 0.025 | 72 | 54 | 0.036 | 56 | 9 × 12 P-BGA |
| | * TH50VSF2581AASB | | | 70 | | | | | | | | |
| | * TH50VSF2582AASB | | | | | | | | | | | |
| | * TH50VSF2583AASB | | | | | | | | | | | |
| 32M/8M | TH50VSF3580AASB | | 1,048,576 × 8/ 524,288 × 16 | 90 | 2.7~3.3 | 148.5 | 0.033 | | | | | |
| | TH50VSF3581AASB | | | 70 | | | | | | | | |
| | * TH50VSF3582AASB | | | | | | | | | | | |
| * TH50VSF3583AASB | | | | | | | | | | | | |
| 64M/8M | TH50VSF3680AASB | 8,388,608 × 8/ 4,194,304 × 16 | | 524,288 × 8/ 262,144 × 16 | | | | 90 | 2.7~3.6 | 162 | 0.025 | |
| | TH50VSF3681AASB | | | | | | | 70 | | | | |
| | * TH50VSF3682AASB | | | | | | | | | | | |
| | * TH50VSF3683AASB | | | | | | | | | | | |
| 64M/4M | * TH50VSF2680AASB | | 2,097,152 × 8/ 1,048,576 × 16 | 524,288 × 8/ 262,144 × 16 | 90 | 2.7~3.1 | 148.5 | 0.033 | | | | |
| | * TH50VSF2681AASB | | | | 70 | | | | | | | |
| | * TH50VSF2682AASB | | | | | | | | | | | |
| | * TH50VSF2683AASB | | | | | | | | | | | |
| 64M/16M | * TH50VSF4680AASB | 2,097,152 × 8/ 1,048,576 × 16 | | 524,288 × 8/ 262,144 × 16 | 90 | | | | 2.7~3.1 | 148.5 | 0.033 | 10 × 12 P-BGA |
| | * TH50VSF4681AASB | | | | | | | | | | | |
| | * TH50VSF4682AASB | | | | | | | | | | | |
| | * TH50VSF4683AASB | | | | | | | | | | | |

*: New product

**Toshiba America
Electronic Components, Inc.**

Headquarters-Irvine, CA
9775 Toledo Way, Irvine, CA 92618, U.S.A.
Tel: (949)455-2000 Fax: (949)859-3963

Boulder, CO (Denver)
3100 Araphahoe Avenue, Ste. 500,
Boulder, CO 80303, U.S.A.
Tel: (303)442-3801 Fax: (303)442-7216

Boynton Beach, FL (Orlando)
11924 W. Forest Hill Blvd., Ste. 22-337,
Wellington, FL 33414, U.S.A.
Tel: (561)733-4949 Fax: (561)733-4949

Deerfield, IL (Chicago)
One Pkwy., North, Suite 500, Deerfield,
IL 60015, U.S.A.
Tel: (847)945-1500 Fax: (847)945-1044

Duluth, GA (Atlanta)
3700 Crestwood Parkway, Ste. 460,
Duluth, GA 30196, U.S.A.
Tel: (770)931-3363 Fax: (770)931-7602

Edison, NJ
2035 Lincoln Hwy. #3000, Edison,
NJ 08817, U.S.A.
Tel: (732)248-8070 Fax: (732)248-8030

Orange County, CA
2 Venture Plaza, #500 Irvine, CA 92618, U.S.A.
Tel: (949)453-0224 Fax: (949)453-0125

Portland, OR
1700 NW 167th Place, #240,
Beaverton, OR 97006, U.S.A.
Tel: (503)629-0818 Fax: (503)629-0827

Raleigh, NC
5511 Capitol Center Dr., #114,
Raleigh, NC 27606, U.S.A.
Tel: (919)859-2800 Fax: (919)859-2898

Richardson, TX (Dallas)
777 East Campbell Rd., #650, Richardson,
TX 75081, U.S.A.
Tel: (972)480-0470 Fax: (972)235-4114

San Jose Engineering Center, CA
1060 Rincon Circle, San Jose, CA 95131, U.S.A.
Tel: (408)526-2400 Fax: (408)526-2410

Wakefield, MA (Boston)
401 Edgewater Place, #360, Wakefield,
MA 01880, U.S.A.
Tel: (781)224-0074 Fax: (781)224-1095

Toshiba Do Brasil, S.A.

Electronic Component Div.
Estrada Dos Alvarengas 5500,
09850-550, Brasil São Bernardo do campo, S.P.
Tel: (011)4358-7144 Fax: (011)4358-7179

Toshiba Electronics Europe GmbH

Düsseldorf Head Office
Hansaallee 181, D-40549 Düsseldorf,
Germany
Tel: (0211)5296-0 Fax: (0211)5296-400

München Office
Büro München Hofmannstrasse 52,
D-81379, München, Germany
Tel: (089)748595-0 Fax: (089)748595-42

Toshiba Electronics France S.A.R.L.
Immeuble Robert Schuman 3 Rue de Rome
F-93561, Rosny-Sous-Bois, Cédex, France
Tel: (1)48-12-48-12 Fax: (1)48-94-51-15

Toshiba Electronics Italiana S.R.L.
Centro Direzionale Colleoni,
Palazzo Perseo 3,
1-20041 Agrate Brianza, (Milan), Italy
Tel: (039)68701 Fax: (039)6870205

Toshiba Electronics España, S.A.
Parque Empresarial, San Fernando, Edificio Europa,
1ª Planta, E-28831 Madrid, Spain
Tel: (91)660-6798 Fax: (91)660-6799

Toshiba Electronics (UK) Ltd.
Riverside Way, Camberley Surrey,
GU15 3YA, U.K.
Tel: (01276)69-4600 Fax: (01276)69-4800

Toshiba Electronics Scandinavia A.B.
Gustavslundsvägen 12, 2nd Floor,
S-161 15 Bromma, Sweden
Tel: (08)704-0900 Fax: (08)80-8459

**Toshiba Electronics Asia
(Singapore) Pte. Ltd.**

Singapore Head Office
438B Alexandra Road, #06-08/12 Alexandra
Technopark, Singapore 119968
Tel: (278)5252 Fax: (271)5155

Bangkok Office
135 Moo 5, Bangkadi Industrial Park, Tivanon Rd.,
Bangkadi, Amphur Muang, Pathumthai, Bangkok 12000,
Thailand
Tel: (02)501-1635 Fax: (02)501-1638

**Toshiba Electronics Trading
(Malaysia) Sdn. Bhd.**

Kuala Lumpur Head Office
Suite W1203, Wisma Conspant, No.2,
Jalan SS 16/4, Subang Jaya, 47500 Petaling Jaya,
Selangor Darul Ehsan, Malaysia
Tel: (03)731-6311 Fax: (03)731-6307

Penang Office
Suite 13-1, 13th Floor, Menara Penang Garden,
42-A, Jalan Sultan Ahmad Shah,
100 50 Penang, Malaysia
Tel: (04)226-8523 Fax: (04)226-8515

Toshiba Electronics Philippines, Inc.

26th Floor, Citibank Tower, Valero Street, Makati,
Manila, Philippines
Tel: (02)750-5510 Fax: (02)750-5511

Toshiba Electronics Asia, Ltd.

Hong Kong Head Office
Level 11, Tower 2, Grand Century
Place, No.193, Prince Edward Road West,
Mong Kok, Kowloon, Hong Kong
Tel: 2375-6111 Fax: 2375-0969

Beijing Office
Rm 714, Beijing Fortune Building,
No.5 Dong San Huan Bei-Lu, Chao Yang District,
Beijing, 100004, China
Tel: (010)6590-8796 Fax: (010)6590-8791

Chengdu Office
Suite 403A, Holiday Inn Crown Plaza 31, Zongfu Street,
Chengdu, 610016, China
Tel: (028)675-1773 Fax: (028)675-1065

Shenzhen Office
Rm 3010-3013, Office Tower Shun Hing Square,
Di Wang Commercial Centre, 5002 ShenNan
East Road, Shenzhen, 518008, China
Tel: (0755)246-3218 Fax: (0755)246-1581

Toshiba Electronics Korea Corporation

Seoul Head Office
14/F, KEC B/D, 275-7 Yangjae-dong,
Seocho-ku, Seoul, Korea
Tel: (02)589-4300 Fax: (02)589-4302

Gumi Office
6/F, Good morning Securities B/D,
56 Songjung-dong, Gumi-shi,
Kyeongbuk, Korea
Tel: (0546)456-7613 Fax: (0546)456-7617

**Toshiba Technology Development
(Shanghai) Co., Ltd.**

23/F, HSBC Tower, 101
Yin Cheng East Road, Pudong New Area, Shanghai,
200120, China
Tel: (021)6841-0666 Fax: (021)6841-5002

**Tsurong Xiamen Xiangyu Trading
Co., Ltd.**

8N, Xiamen SEZ Bonded Goods Market Building,
Xiamen, Fujian, 361006, China
Tel: (0592)562-3798 Fax: (0592)562-3799

**Toshiba Electronics Taiwan
Corporation**

Taipei Head Office
17F, Union Enterprise Plaza Bldg. 109
Min Sheng East Rd., Section 3, 10446 Taipei,
Taiwan
Tel: (02)2514-9988 Fax: (02)2514-7892

Kaohsiung Office
16F-A, Chung-Cheng Bldg.2, Chung-Cheng 3Rd.,
Kaohsiung, 80027, Taiwan
Tel: (07)222-0826 Fax: (07)223-0046

(As of August, 2001)

The information contained herein is subject to change without notice.

The information contained herein is presented only as a guide for the applications of our products.
No responsibility is assumed by TOSHIBA for any infringements of patents or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of TOSHIBA or others.

TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the "Handling Guide for Semiconductor Devices," or "TOSHIBA Semiconductor Reliability Handbook" etc..

The Toshiba products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These Toshiba products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of Toshiba products listed in this document shall be made at the customer's own risk.

The products described in this document are subject to the foreign exchange and foreign trade laws.

Website: <http://www.semicon.toshiba.co.jp/eng/index.html>

0000C-0000 PC DQ

In Touch with Tomorrow
TOSHIBA

TOSHIBA CORPORATION

Electronic Devices Sales & Marketing Division
1-1, Shibaura 1-chome, Minato-ku, Tokyo, 105-8001, Japan
Tel: +81-3-3457-3405 Fax: +81-3-5444-9431