

DDR2 SDRAM Memory

Product Guide

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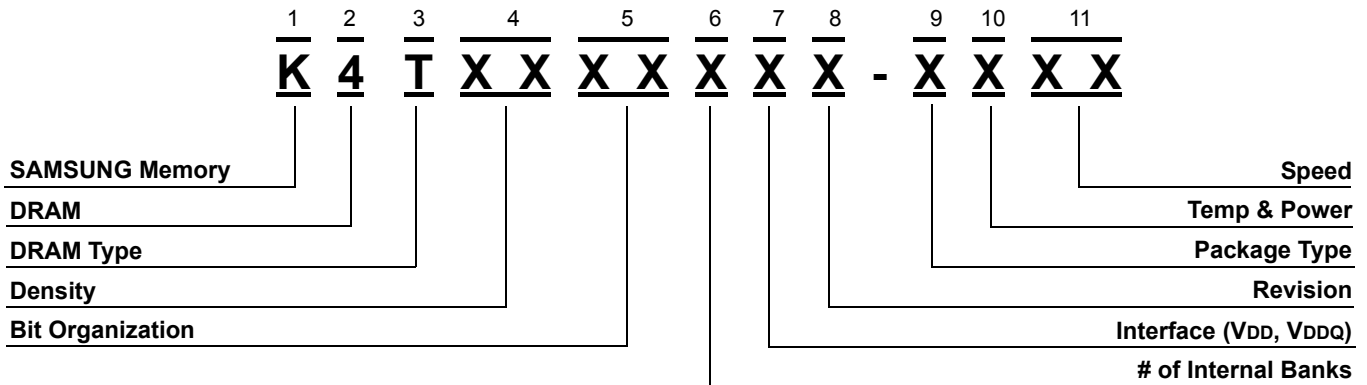
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1. DDR2 SDRAM MEMORY ORDERING INFORMATION



1. SAMSUNG Memory : K

2. DRAM : 4

3. DRAM Type

T : DDR2 SDRAM

4. Density

- 56 : 256Mb
- 51 : 512Mb
- 1G : 1Gb
- 2G : 2Gb
- 4G : 4Gb

5. Bit Organization

- 04 : x 4
- 06 : x 4 Stack
- 07 : x 8 Stack
- 08 : x 8
- 16 : x16
- 26 : x 4 Stack (JEDEC Standard)
- 27 : x 8 Stack (JEDEC Standard)

6. # of Internal Banks

- 3 : 4 Banks
- 4 : 8 Banks

7. Interface (VDD, VDDQ)

Q : SSTL_18 (1.8V, 1.8V)

8. Revision

- M : 1st Gen.
- A : 2nd Gen.
- B : 3rd Gen.
- C : 4th Gen.
- D : 5th Gen.
- E : 6th Gen.
- F : 7th Gen.
- G : 8th Gen.
- H : 9th Gen.
- I : 10th Gen.
- Q : 17th Gen.
- R : 18th Gen.

9. Package Type

- Z : FBGA (Lead-free)
- J : FBGA DDP (Lead-free)
- H : FBGA (Lead-free & Halogen-free)
- M : FBGA DDP (Lead-free & Halogen-free)
- T : FBGA DSP (Lead-free & Halogen-free, Thin)
- B : FBGA (Lead-free & Halogen-free, Flip Chip)

10. Temp & Power

- C : Commercial Temp.(0°C ~ 95°C) & Normal Power
- L : Commercial Temp.(0°C ~ 95°C) & Low Power
- Y : Commercial Temp.(0°C ~ 95°C) & Low Voltage

11. Speed

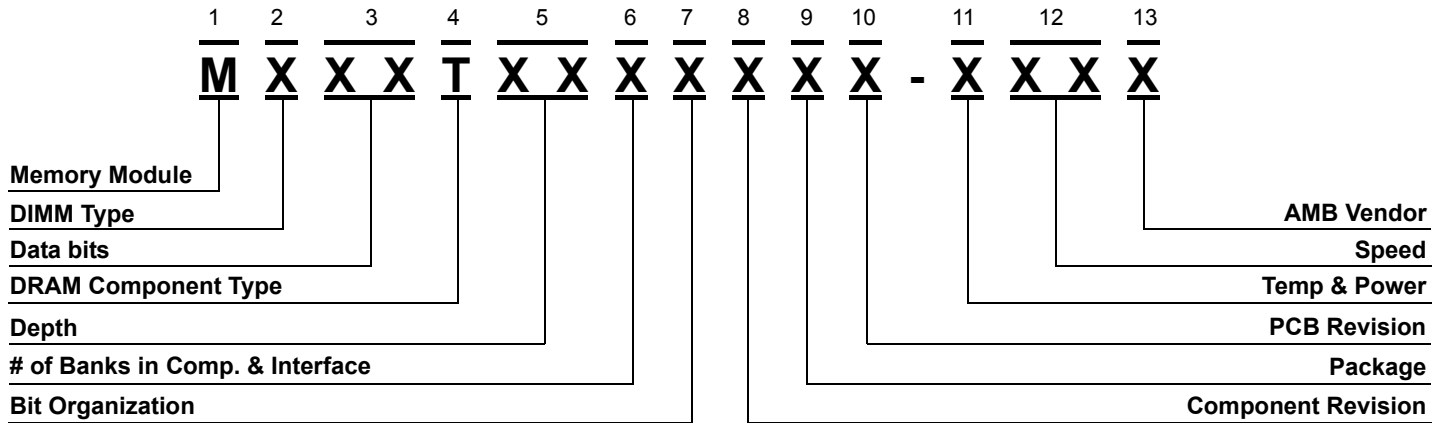
- CC : DDR2-400 (200MHz @ CL=3, tRCD=3, tRP=3)
- D5 : DDR2-533 (266MHz @ CL=4, tRCD=4, tRP=4)
- E6 : DDR2-667 (333MHz @ CL=5, tRCD=5, tRP=5)
- F7 : DDR2-800 (400MHz @ CL=6, tRCD=6, tRP=6)
- E7 : DDR2-800 (400MHz @ CL=5, tRCD=5, tRP=5)

2. DDR2 SDRAM Component Product Guide

2.1 SDRAM

Density	Banks	Part Number	Package & Power, Temp. (-C/-L) & Speed	Org.	PKG	Avail.
512Mb I-die	4Banks	K4T51043QI	HCE7/F7/E6	128M x 4	60 ball FBGA	Now
		K4T51083QI	HCE7/F7/E6	64M x 8		
		K4T51163QI	HCF8/E7/F7/E6	32M x 16	84 ball FBGA	
1Gb Q-die	8Banks	K4T1G044QQ	HC(L)E7/F7/E6	256M x 4	60 ball FBGA	Now
		K4T1G084QQ	HC(L)E7/F7/E6	128M x 8		
		K4T1G164QQ	HC(L)E7/F7/E6	64M x 16	84 ball FBGA	
1Gb E-die	8Banks	K4T1G044QE	HC(L)E7/F7/E6	256M x 4	60 ball FBGA	Now
		K4T1G084QE	HC(L)E7/F7/E6	128M x 8		
		K4T1G164QE	HC(L)E7/F7/E6	64M x 16	84 ball FBGA	
1Gb F-die	8Banks	K4T1G044QF	BCE7/F7/E6	256M x 4	60 ball FBGA	Jun. '10
		K4T1G084QF	BCE7/F7/E6	128M x 8		
		K4T1G164QF	BCE7/F7/E6	64M x 16	84 ball FBGA	
2Gb A-die	8Banks	K4T2G044QA	HC(L)F7/E6	512M x 4	68 ball FBGA	Now
		K4T2G084QA	HC(L)F7/E6	256M x 8		

3. DDR2 SDRAM Module Ordering Information



1. Memory Module : M

2. DIMM Type

- 3 : DIMM
- 4 : SODIMM

3. Data Bits

- 78 : **x64** 240pin Unbuffered DIMM
- 91 : **x72** 240pin ECC unbuffered DIMM
- 92 : **x72** 240pin VLP Registered DIMM
- 93 : **x72** 240pin Registered DIMM
- 95 : **x72** 240pin Fully Buffered DIMM
- 70 : **x64** 200pin Unbuffered SODIMM

4. DRAM Component Type

- T : DDR2 SDRAM

5. Depth

- 32 : 32M
- 64 : 64M
- 28 : 128M
- 56 : 256M
- 51 : 512M
- 1G : 1G
- 33 : 32M (for 128Mb/512Mb)
- 65 : 64M (for 128Mb/512Mb)
- 29 : 128M (for 128Mb/512Mb)
- 57 : 256M (for 512Mb/2Gb)
- 52 : 512M (for 512Mb/2Gb)
- 1K : 1G (for 2Gb)

6. # of Banks in comp. & Interface

- 5 : 4Banks & SSTL-1.8V
- 6 : 8Banks & SSTL-1.8V

7. Bit Organization

- 0 : x 4
- 3 : x 8
- 4 : x16
- 6 : x 4 Stack (JEDEC Standard)
- 7 : x 8 Stack (JEDEC Standard)
- 8 : x 4 Stack
- 9 : x 8 Stack

8. Component Revision

- M : 1st Gen.
- B : 3rd Gen.
- D : 5th Gen.
- F : 7th Gen.
- I : 10th Gen.
- R : 18th Gen.
- A : 2nd Gen.
- C : 4th Gen.
- E : 6th Gen.
- G : 8th Gen.
- Q : 17th Gen.

9. Package

- Z : FBGA(Lead-free)
- J : FBGA DDP (Lead-free)
- Q : FBGA QDP (Lead-free)
- H : FBGA (Lead-free & Halogen-free)
- M : FBGA DDP (Lead-free & Halogen-free)
- E : FBGA QDP (Lead-free & Halogen-free)
- B : FBGA (Lead-free & Halogen-free, Flip Chip)

10. PCB Revision

- 0 : Mother PCB
- 2 : 2nd Rev.
- 4 : 4th Rev.
- 1 : 1st Rev.
- 3 : 3rd Rev.
- A : Parity DIMM
- S : Reduced PCB

11. Temp & Power

- C : Commercial Temp.(0°C ~ 95°C) & Normal Power
- L : Commercial Temp.(0°C ~ 95°C) & Low Power
- Y : Commercial Temp.(0°C ~ 95°C) & Low Voltage

12. Speed

- CC : DDR2-400 (200MHz @ CL=3, tRCD=3, tRP=3)
- D5 : DDR2-533 (266MHz @ CL=4, tRCD=4, tRP=4)
- E6 : DDR2-667 (333MHz @ CL=5, tRCD=5, tRP=5)
- F7 : DDR2-800 (400MHz @ CL=6, tRCD=6, tRP=6)
- E7 : DDR2-800 (400MHz @ CL=5, tRCD=5, tRP=5)

13. AMB Vendor For FBDIMM

- 5 : Intel
- 6, 8 : IDT
- 3, 4 : Montage

NOTE : PC2-6400(DDR2-800), PC2-5300(DDR2-667)
PC2-4200(DDR2-533), PC2-3200(DDR2-400)

4. DDR2 SDRAM Module Product Guide

240Pin DDR2 Unbuffered DIMM												
Org.	Density	Part Number	Speed	Composition	Comp. Version	Internal Banks	Rank	PKG	Height	Avail.		
64Mx 64	512MB	M378T6464QZ(H)3	CE7/F7/E6	64M x 16 * 4pcs	1Gb Q-die	8	1	84 ball FBGA	30mm	Now		
		M378T6464EHS	CE7/F7/E6	64M x 16 * 4pcs	1Gb E-die		1					
128Mx 64	1GB	M378T2863QZ(H)S	CE7/F7/E6	128M x 8 * 8pcs	1Gb Q-die	8	1	60 ball FBGA	30mm	Now		
		M378T2863EHS	CE7/F7/E6		1Gb E-die					Jun. '10		
		M378T2863FBS	CE7/F7/E6		1Gb F-die					Now		
128Mx 72		M391T2863QZ(H)3	CE7/F7/E6	128M x 8 * 9pcs	1Gb Q-die	8	1			Now		
		M391T2863EH3	CE7/F7/E6		1Gb E-die					Jun. '10		
		M391T2863FB3	CE7/F7/E6		1Gb F-die					Now		
256Mx 64	2GB	M378T5663QZ(H)3	CE7/F7/E6	128M x 8 * 16pcs	1Gb Q-die	8	2	60 ball FBGA	30mm	Now		
		M378T5663EH3	CE7/F7/E6		1Gb E-die					Jun. '10		
		M378T5663FB3	CE7/F7/E6		1Gb F-die					Now		
256Mx 72		M391T5663QZ(H)3	CE7/F7/E6	128M x 8 * 18pcs	1Gb Q-die					8	2	Now
		M391T5663EH3	CE7/F7/E6		1Gb E-die							Jun. '10
		M391T5663FB3	CE7/F7/E6		1Gb F-die							Now
512Mx 64	4GB	M378T5263AZ(H)3	CF7/E6	256M x 8 * 16pcs	2Gb A-die	8	2	68 ball FBGA	30mm	Now		
512Mx 72		M391T5263AZ(H)3	CF7/E6	256M x 8 * 18pcs	2Gb A-die							

200Pin DDR2 SODIMM										
Org.	Density	Part Number	Speed	Composition	Comp. Version	Internal Banks	Rank	PKG	Height	Avail.
64Mx 64	512MB	M470T6464QZ(H)3	C(L)E7/F7/E6	64M x 16 * 4pcs	1Gb Q-die	8	1	84 ball FBGA	30mm	Now
		M470T6464EHS	C(L)E7/F7/E6		1Gb E-die					
		M470T6554IH3	CE6	32M x 16 * 8pcs	512Mb I-die	4	2			
128Mx 64	1GB	M470T2864QZ(H)3	C(L)E7/F7/E6	64M x 16 * 8pcs	1Gb Q-die	8	2	84 ball FBGA	30mm	Now
		M470T2864EH3	C(L)E7/F7/E6		1Gb E-die					
		M470T2863EH3	C(L)E7/F7/E6	128M x 8 * 8pcs	1Gb F-die		1			60 ball FBGA
		M470T2863FB3	CE7/F7/E6							
256Mx 64	2GB	M470T5663QZ(H)3	C(L)E7/F7/E6	128M x 8 * 16pcs	1Gb Q-die	8	2	60 ball FBGA	30mm	Now
		M470T5663EH3	C(L)E7/F7/E6		1Gb E-die					
		M470T5663FB3	CE7/F7/E6		1Gb F-die					May. '10
512Mx 64	4GB	M470T5267AZ(H)3	C(L)F7/E6	st.512M x 8 * 8pcs	2Gb A-die	8	2	83 ball FBGA	30mm	Now

240Pin DDR2 Registered DIMM														
Org.	Density	Part Number	Speed	Composition	Comp. Version	Internal Banks	Rank	PKG	Height	Avail.				
128Mx 72	1GB	M393T2863QZ(H)3	CD5/CC	128M x 8 * 9pcs	1Gb Q-die	8	1	60 ball FBGA	30mm	Now				
		M393T2863QZ(H)A	CE7/F7/E6		1Gb F-die					8	1	Jun. '10		
		M393T2863FB3	CE7/F7/E6											
256Mx 72	2GB	M393T5663QZ3	CD5/CC	128M x 8 * 18pcs	1Gb Q-die	8	2	60 ball FBGA	30mm	Now				
		M393T5663QZ(H)A	CE7/F7/E6								256M x 4 * 18pcs	1Gb F-die	1	Jun. '10
		M393T5660QZ3	CD5/CC											
		M393T5660QZ(H)A	CE7/F7/E6											
		M393T5660FB3	CE7/F7/E6											
512Mx 72	4GB	M393T5160QZ3	CD5/CC	256M x 4 * 36pcs	1Gb Q-die	8	2	60 ball FBGA	30mm	Now				
		M393T5160QZ(H)A	CE7/F7/E6		1Gb F-die					1	Jun. '10			
		M393T5160FB3	CE7/F7/E6											
		M393T5260AZ(H)A	CF7/E6	512M x 4 * 18pcs	2Gb A-die		1			68 ball FBGA	Now			
1Gx 72	8GB	M393T1G60QJ(M)A	CE6/D5	DDP 512M x 4 * 36pcs	1Gb Q-die	8	4	63 ball FBGA	30mm	Now				
		M393T1K66AZ(H)A	CF7/E6	st.1G x 4 * 18pcs	2Gb A-die		2	83 ball FBGA						

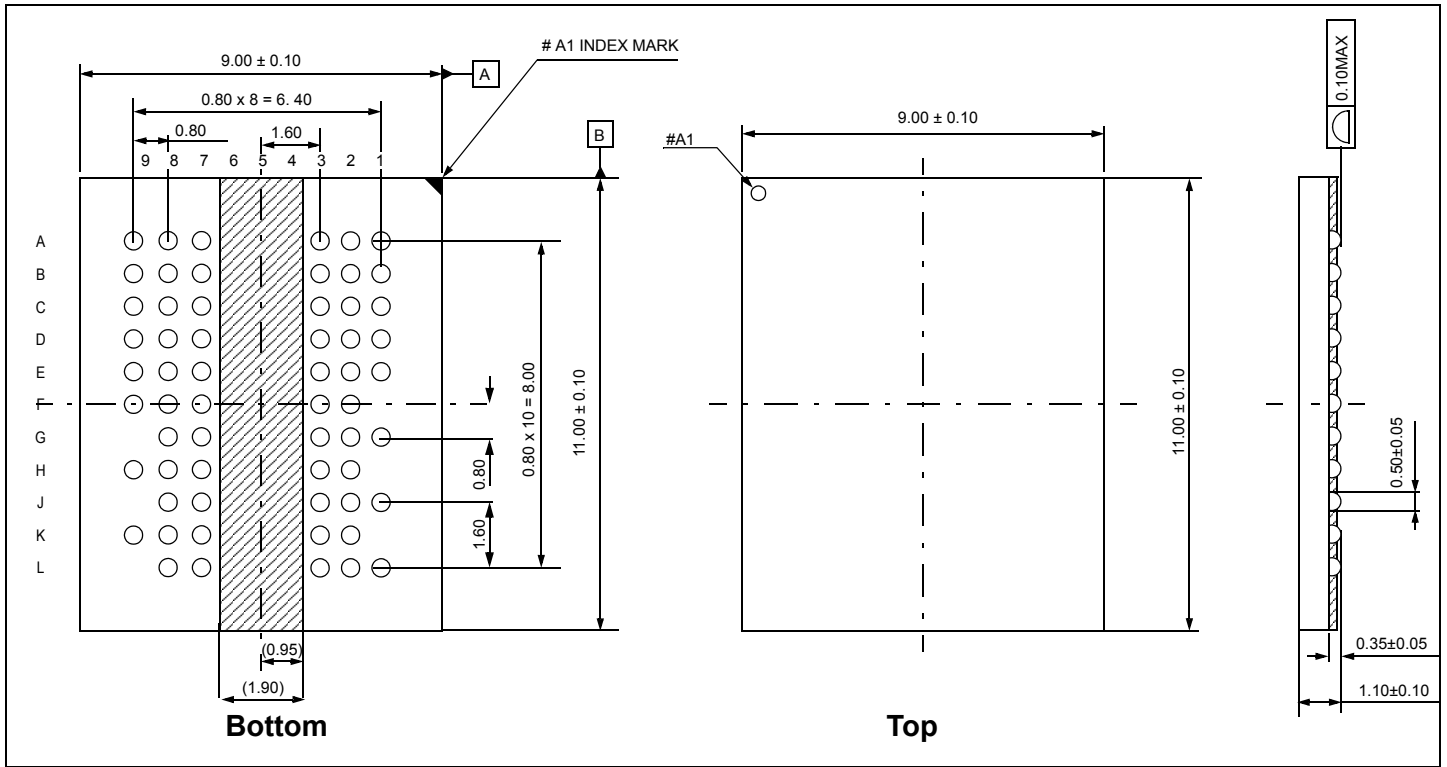
240Pin DDR2 VLP Registered DIMM											
Org.	Density	Part Number	Speed	Composition	Comp. Version	Internal Banks	Rank	PKG	Height	Avail.	
64Mx 72	512MB	M392T6553GZA	CF7/E6	64M x 8 * 9pcs	512Mb G-die	4	1	60 ball FBGA	18.3mm	Now	
128Mx 72	1GB	M392T2863QZ(H)A	CF7/E6	128M x 8 * 9pcs	1Gb Q-die	8	1	60 ball FBGA	18.3mm	Now	
		M392T2863FBA	CE7/F7/E6		1Gb F-die					Jun. '10	
256Mx 72	2GB	M392T5660QZ(H)A	CF7/E6	256M x 4 * 18pcs	1Gb Q-die	8	1	60 ball FBGA	18.3mm	Now	
		M392T5660FBA	CE7/F7/E6		1Gb F-die					Jun. '10	
		M392T5663QZ(H)A	CF7/E6	128M x 8 * 18pcs	1Gb Q-die		2			Now	
		M392T5663FBA	CE7/F7/E6		1Gb F-die					Jun. '10	
512Mx 72	4GB	M392T5160QJ(M)A	CF7/E6	DDP 512M x 4 * 18pcs	1Gb Q-die	8	2	63 ball FBGA	18.3mm	Now	
1Gx 72	8GB	M392T1G60QQ(E)A	CE6/D5	QDP 1G x 4 * 18pcs	1Gb Q-die	8	4	65 ball FBGA	18.3mm	Now	

240Pin DDR2 Fully Buffered DIMM(1.8V)													
Org.	Density	Part Number	Speed	AMB	Composition	Comp. Version	Internal Banks	Rank	PKG	Height	Avail.		
64Mx 72	512MB	M395T6553GZ4	CE7/F7/E6	6 : IDT C1	64M x 8 * 9pcs	512Mb G-die	4	1	60 ball FBGA	30.35mm	Now		
			CE6	5 : Intel D1									
128Mx 72	1GB	M395T2863QZ(H)4	CE7/F7/E6	6 : IDT C1	128M x 8 * 9pcs	1Gb Q-die	8	1	60 ball FBGA	30.35mm	Now		
			CE6	8 : IDT L4									
		M395T2863FB4	CE7/F7/E6	6 : IDT C1		1Gb F-die					Jun. '10		
			CE6	8 : IDT L4									
256Mx 72	2GB	M395T5663QZ(H)4	CE7/F7/E6	6 : IDT C1	128M x 8 * 18pcs	1Gb Q-die	8	2	60 ball FBGA	30.35mm	Now		
			CE6	8 : IDT L4									
		M395T5663FB4	CE7/F7/E6	5 : Intel D1 3: Montage D3		1Gb F-die					Jun. '10		
			CE6	6 : IDT C1 8 : IDT L4									
512Mx 72	4GB	M395T5160QZ(H)4	CE7/F7/E6	6 : IDT C1	256M x 4 * 36pcs	1Gb Q-die	8	2	60 ball FBGA	30.35mm	Now		
			CE6	8 : IDT L4									
		M395T5160FB4	CE7/F7/E6	5 : Intel D1 3: Montage D3		1Gb F-die					Jun. '10		
			CE6	6 : IDT C1 8 : IDT L4									
		M395T5163QZ(H)4	CE7/F7/E6	8 : IDT L4	1Gb Q-die	Now							
			M395T5163FB4	CE7/F7/E6				6 : IDT C1 8 : IDT L4			1Gb F-die	Jun. '10	
		M395T5263AZ(H)4		CF7/E6	6 : IDT C1	256M x 8 * 18pcs		2Gb A-die					2
			CF7/E6	8 : IDT L4									
1Gx 72	8GB	M395T1G60QJ(M)4	CE6/F7	8 : IDT L4	DDP 512M x 4 * 36pcs	1Gb Q-die	8	4	63 ball FBGA	30.35mm	Now		
		M395T1K66AZ(H)4	CF7/E6/D5	6 : IDT C1	st.1G x 4 * 18pcs	2Gb A-die						2	83 ball FBGA
			CF7/E6	8 : IDT L4									

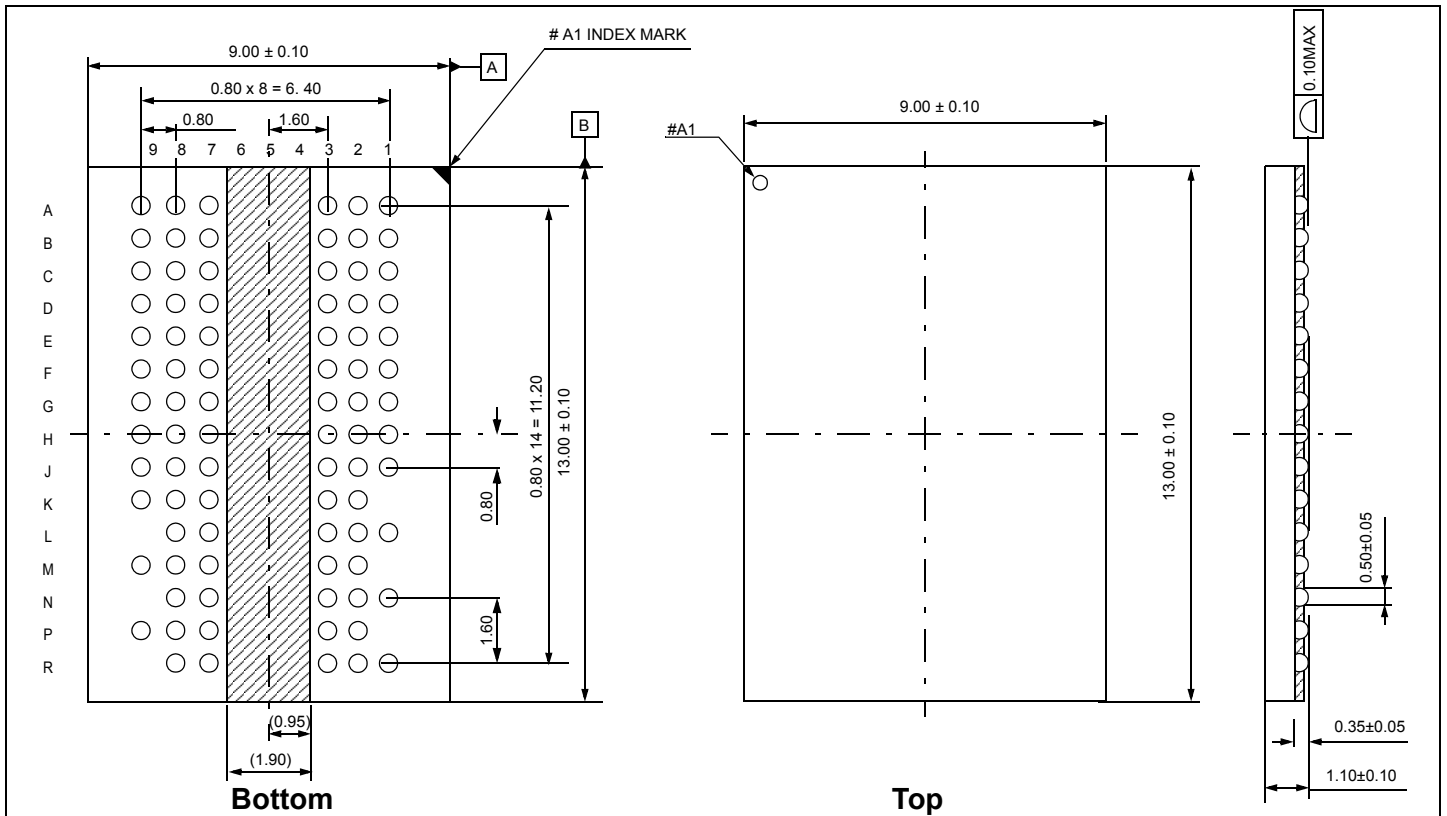
240Pin DDR2 Fully Buffered DIMM(1.55V)											
Org.	Density	Part Number	Speed	AMB	Composition	Comp. Version	Internal Banks	Rank	PKG	Height	Avail.
128Mx 72	1GB	M395T2863QZ(H)4	YE6	8: IDT L4	64M x 8 * 18pcs	1Gb Q-die	8	1	60 ball FBGA	30.35mm	Now
256Mx 72	2GB	M395T5663QZ(H)4	YE6	8: IDT L4	128M x 8 * 18pcs	1Gb Q-die	8	2	60 ball FBGA	30.35mm	Now
512Mx 72	4GB	M395T5160QZ(H)4	YE6	8: IDT L4	256M x 4 * 36pcs	1Gb Q-die	8	2	60 ball	30.35mm	Now
		M395T5163QZ(H)4	YE6	8: IDT L4	128M x 8 * 36pcs			4	FBGA		
		M395T5263AZ(H)4	YE6	8: IDT L4	256M x 8 * 18pcs	2Gb A-die		2	68 ball FBGA		
1Gx 72	8GB	M395T1K66AZ(H)4	YE6	8: IDT L4	st.1G x 4 * 18pcs	2Gb A-die	8	2	83 ball FBGA	30.35mm	Now

5. Package Dimension

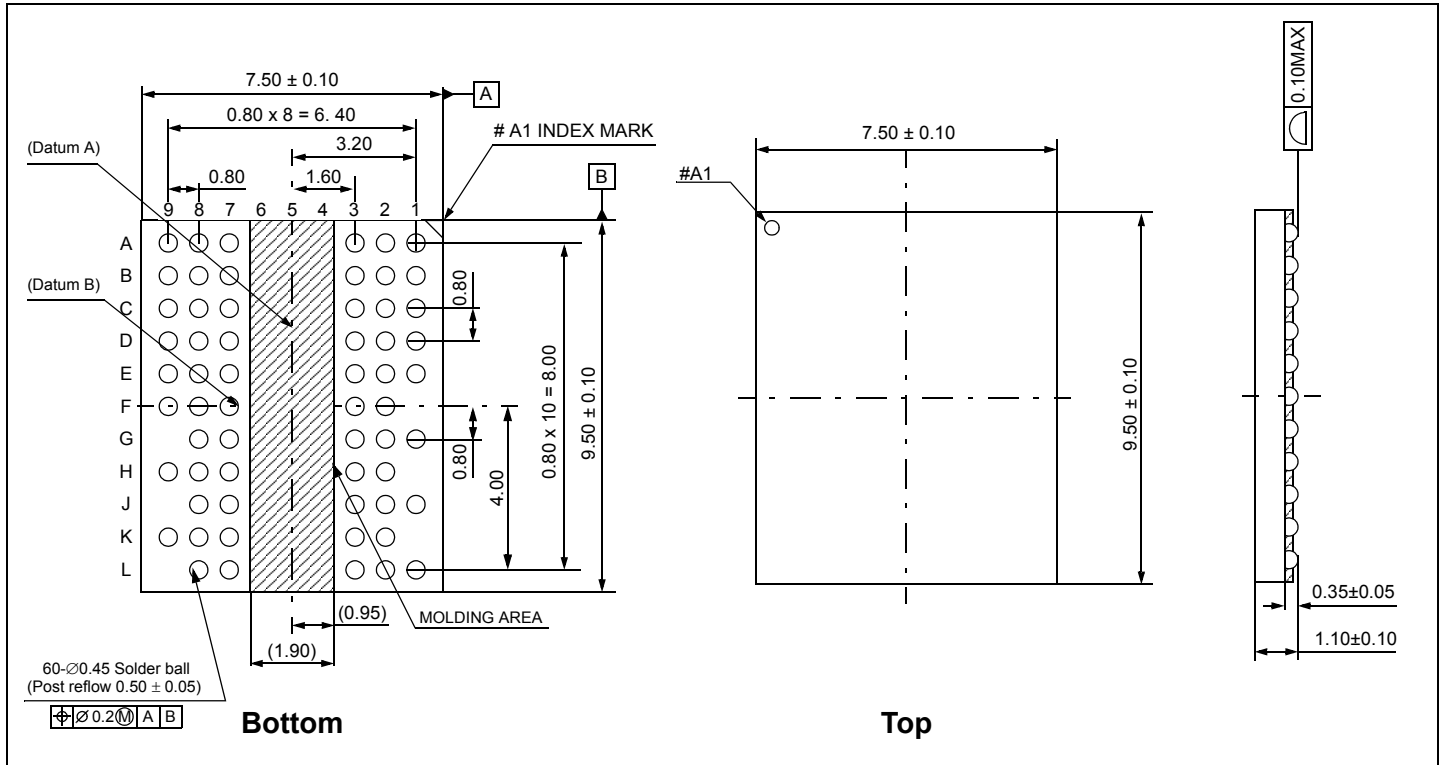
60Ball FBGA for 1Gb Q-die (x4/x8)



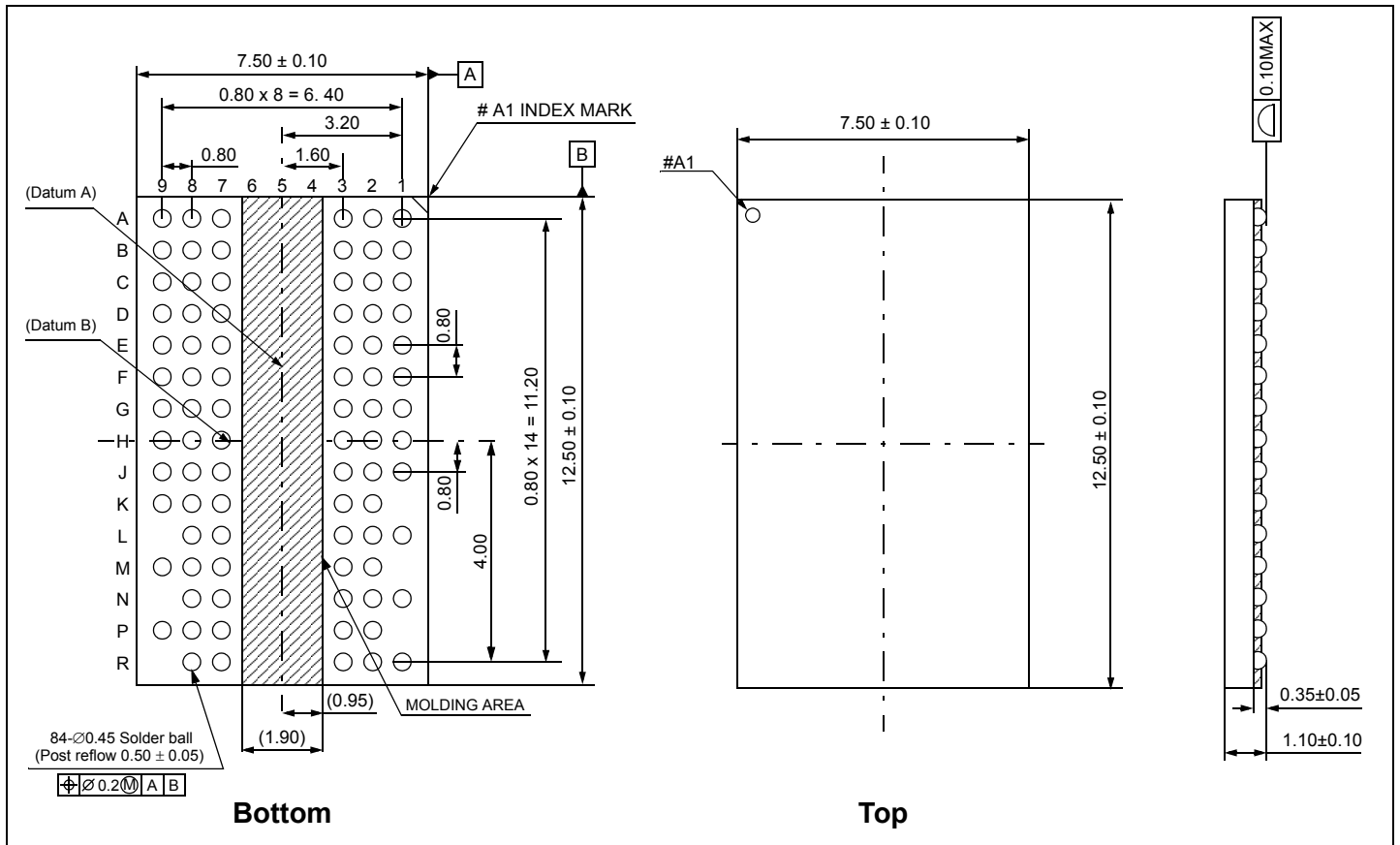
84Ball FBGA for 1Gb Q-die (x16)



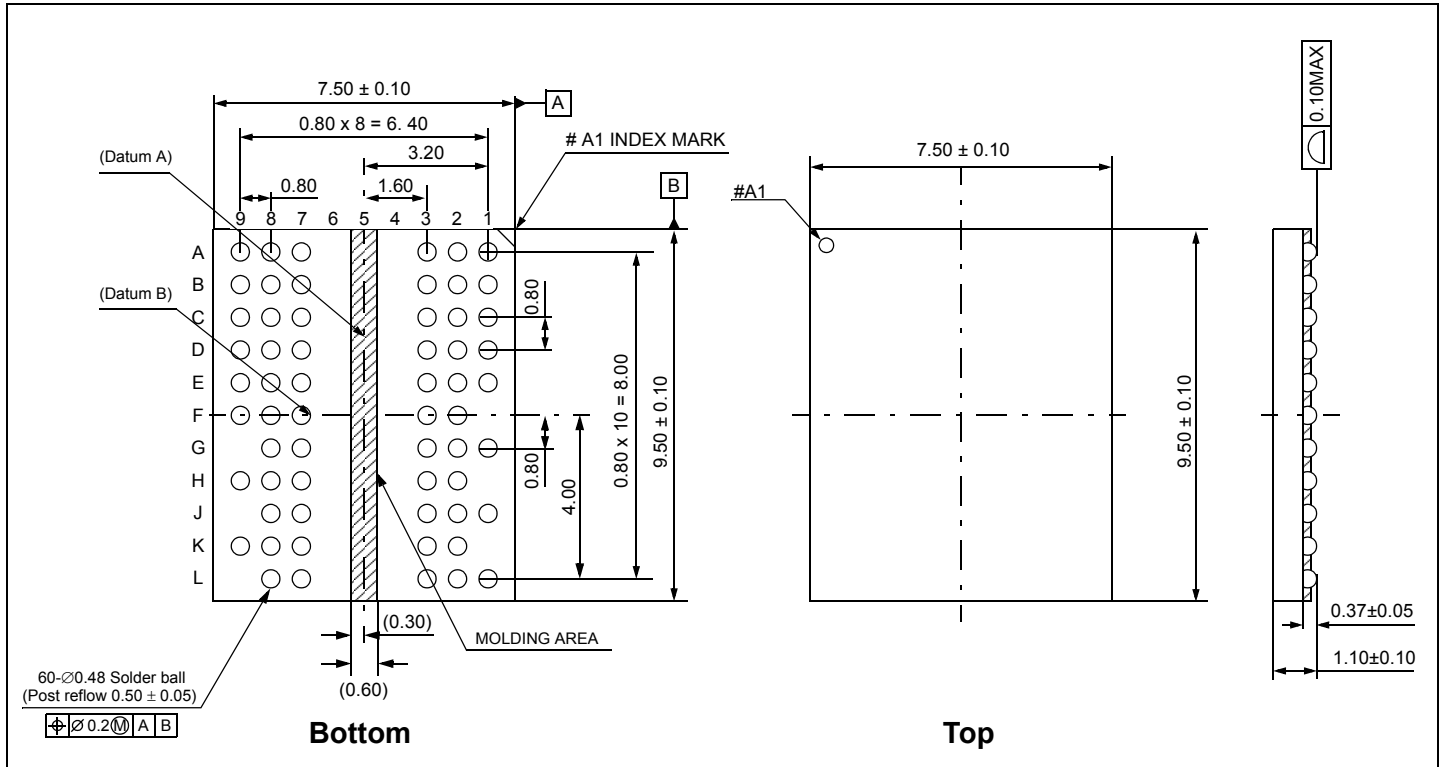
60Ball FBGA for 1Gb E-die (x4/x8)



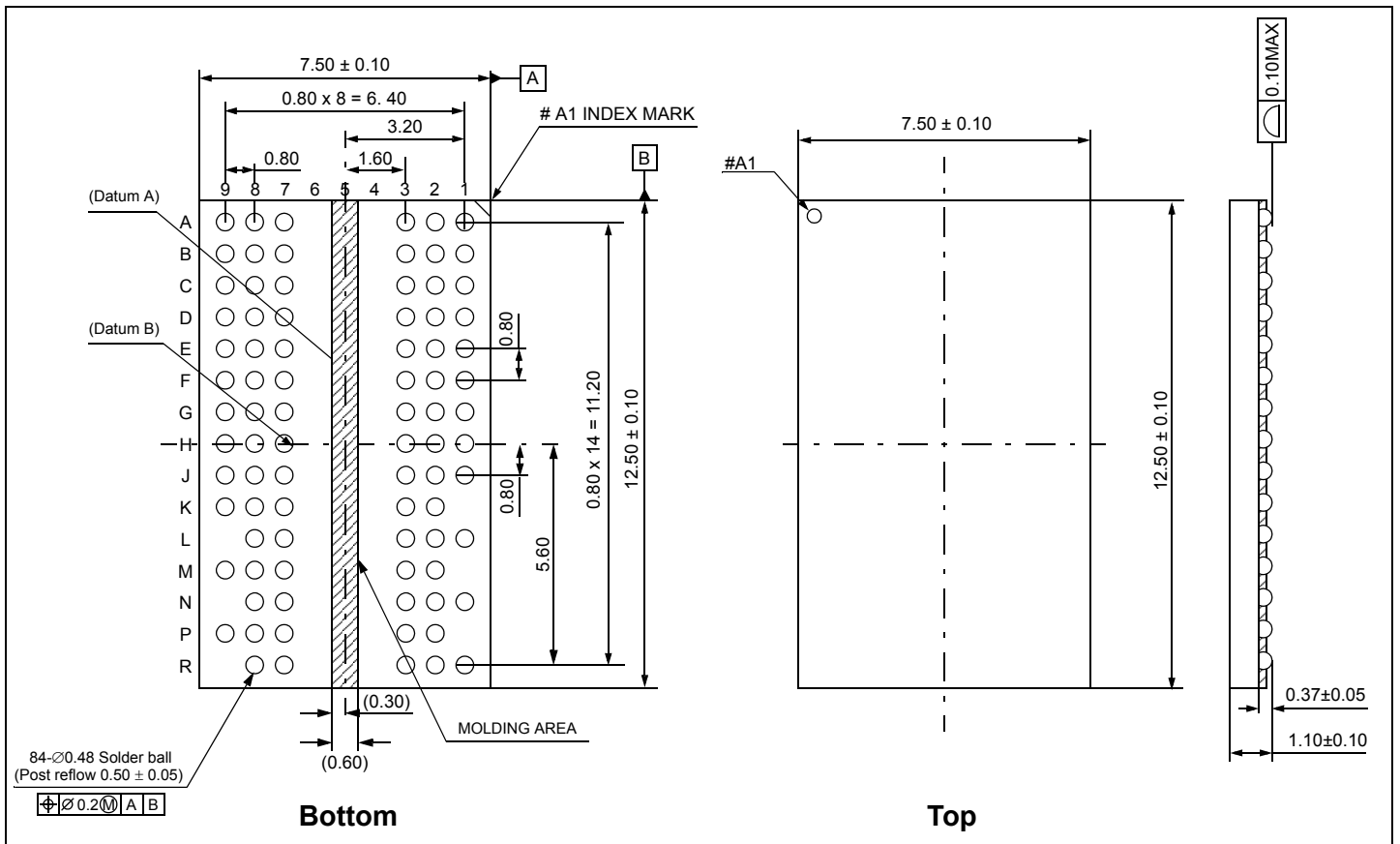
84Ball FBGA for 1Gb E-die (x16)



60Ball FBGA for 1Gb F-die (x4/x8)



84Ball FBGA for 1Gb F-die (x16)



68Ball FBGA for 2Gb A-die (x4/x8)

