

**SAMSUNG**



# PRODUCT SELECTION GUIDE

DISPLAYS, MEMORY  
AND STORAGE

1H 2017

DRAM

FLASH - SSD

MCP

STORAGE

DISPLAYS














CONTACTS



# Samsung Semiconductor, Inc.

Samsung continues to lead the industry with the broadest portfolio of memory products and display technology. Its DRAM, flash, mobile and graphics memory are found in many computers — from ultrabooks to powerful servers — and in a wide range of handheld devices such as smartphones and tablets. Samsung is also a leader in display panels for smartphones, TVs and monitors and public information displays. In addition, Samsung provides the industry's widest line of storage products from the consumer to enterprise levels. These include flash storage, such as Solid State Drives, and a range of embedded flash storage products.

## Markets

	DRAM	SSD	FLASH	ASIC	LOGIC	LCD/OLED
						
 MOBILE/WIRELESS	●	N/A	●	●	●	●
 NOTEBOOK PCs/ ULTRABOOKS™	●	●	●	●	●	●
 DESKTOP PCs/ WORKSTATIONS	●	●	●	●	●	●
 SERVERS	●	●	●	●	●	●
 NETWORKING/ COMMUNICATIONS	●	●	●	●	●	N/A
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[samsung.com/semiconductor/sales-network](http://samsung.com/semiconductor/sales-network)

- Sales Representatives and Distributors

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## DDR4 SDRAM COMPONENTS

Density	Voltage	Organization	Part Number	# Pins-Package	Compliance	Speed (Mbps)	Dimensions	Production
4Gb	1.2V	1G x 4	K4A4G045WD-BCRC/PB	78 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	2400/2133	7.5x11mm	Now
			K4A4G085WD-BCRC/PB					
			256M x 16	96 Ball -FBGA				
			1G x 4	78 Ball -FBGA				
			512M x 8	96 Ball -FBGA				
8Gb	1.2V	1G x 8	K4A8G085WB-BCRC/PB	78 Ball FBGA	Lead Free & Halogen Free, Flip Chip	2400/2133	7.5x11mm	Now
			K4A8G165WB-BCRC/PB	96 Ball -FBGA				
16Gb (8Gb DDP)	1.2V	2Gx8	K4AAG085WB-MCPB/RC	78 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	2133/2400	7.5x13.3mm	Now
			K4AAG165WB-MCPB/RC					

## DDR4 SDRAM REGISTERED MODULES

Density	Voltage	Organization	Part Number	Composition	Compliance	Speed (Mbps)	Ranks	Production
4GB	1.2V	1G x 72	M393A5143DB0-CPB	4Gb (512M x8) * 9	Lead Free & Halogen Free, Flip Chip	2133	1	Now
			M393A5143DB0-CRC			2400		
8GB	1.2V	1G x 72	M393A1G40DB0-CPB	4Gb (1G x4) * 18	Lead Free & Halogen Free, Flip Chip	2133	1	Now
			M393A1G40DB1-CRC			2400		
			M393A1G43DB0-CPB	4Gb (512M x8) * 18		2133	2	
			M393A1G43DB1-CRC			2400		
			M393A1G40EB1-CPB	4Gb (1G x4) * 18		2133	1	
			M393A1G40EB1-CRC			2400		
			M393A1G43EB1-CPB	4Gb (512M x8) * 18		2133	2	
			M393A1G43EB1-CRC			2400		
16GB	1.2V	2G x 72	M393A2G40DB0-CPB	4Gb (1G x4) * 36	Lead Free & Halogen Free, Flip Chip	2133	2	Now
			M393A2G40DB1-CRC			2400		
			M393A2G40EB1-CPB			2133		
			M393A2G40EB1-CRC	8Gb (2G x4) * 18		2400	1	
			M393A2K40BB0-CPB			2133		
			M393A2K40BB1-CRC			2400		
			M393A2K43BB1-CPB/CRC			2133/2400		
32GB	1.2V	4G x 72	M393A4K40BB0-CPB	8Gb (2G x4) * 36	Lead Free & Halogen Free, Flip Chip	2133	2	Now
			M393A4K40BB1-CRC			2400		
64GB TSV	1.2V	8G x 72	M393A8G40D40-CRB	4Gb 4H TSV (4G x4) * 36	Lead Free & Halogen Free, 4High TSV	2133	8	Now
			M393A8K40B21-CRB	8Gb 2H TSV (4G x4) * 36	Lead Free & Halogen Free, 2High TSV	2133	4	
			M393A8K40B21-CTC			2400		
128GB TSV	1.2V	16G x 72	M393AAK40B41-CTC	8Gb 4H TSV (8G x4) * 36	Lead Free & Halogen Free, 4High TSV	2400	8	Now

Notes: DDR4 4Gb (D die) based 0 = IDT 2 = Montage 3 = Inphi PB = DDR4-2133(15-15-15)  
 0 = IDT 4 = Montage RC = DDR4-2400(17-17-17)  
 DDR4 4Gb (E die) based 0 = IDT 4 = Montage 3 = Inphi PB = DDR4-2133(15-15-15)  
 0 = IDT 4 = Montage 3 = Inphi RC = DDR4-2400(17-17-17)  
 DDR4 (B Die) 8Gb based 0 = IDT 4 = Montage PB = DDR4-2133(15-15-15)  
 0 = IDT 4 = Montage 3 = Inphi RC = DDR4-2400(17-17-17)

## DDR4 SDRAM Load Reduced REGISTERED MODULES

Density	Voltage	Organization	Part Number	Composition	Compliance	Speed (Mbps)	Ranks	Production
32GB	1.2V	4G x 72	M386A4G40DM0-CPB	4Gb DDP (2G x4) * 36	Lead Free & Halogen Free, DDP	2133	4	Now
			M386A4G40DM1-CRC			2400		
			M386A4K40BB0-CRC5	8G (2Gx4)*36			Lead Free & Halogen Free, Flip Chip	
64GB	1.2V	8G x 72	M386A8K40BM1-CPB/CRC	8Gb DDP (4G x4) * 36	Lead Free & Halogen Free, DDP	2133/2400	4	Now
128GB	1.2V	16G x 72	M386AAK40B40-CUC	8Gb 4H TSV (8G x4) * 36	Lead Free & Halogen Free, DDP	2400	8	Now

Notes: DDR4 4Gb (D die) based 0 = IDT 2 = Montage PB = DDR4-2133(15-15-15)  
 5 = IDT 4 = Montage RC = DDR4-2400(17-17-17)  
 DDR4 (B Die) 8Gb based 0 = IDT 4 = Montage PB = DDR4-2133(15-15-15)  
 5 = IDT 4 = Montage RC = DDR4-2400(17-17-17)

## DDR4 SDRAM VLP REGISTERED MODULES

Density	Voltage	Organization	Part Number	Composition	Compliance	Speed (Mbps)	Ranks	Production
16GB	1.2V	2G x 72	M392A4K40BM0-CPB/RC	4Gb DDP (2G x4) * 18	Lead Free & Halogen Free, DDP	2133	2	Now
			M392A2K43BB0-CPB/RC	8Gb (1G x8) * 18	Lead Free & Halogen Free, Flip Chip	2133/2400		
32GB	1.2V	4G x 72	M392A4K40BM0-CPB/RC	8Gb DDP (4G x4) * 18	Lead Free & Halogen Free, DDP	2133/2400	2	Now

## DDR4 SDRAM UNBUFFERED MODULES

Density	Voltage	Organization	Part Number	Composition	Compliance	Speed (Mbps)	Ranks	Production	
4GB	1.2V	512M x 64	M378A5143DB0-CPB	4Gb (512M x8) *8	Lead Free & Halogen Free	2133	1	Now	
			M378A5143EB1-CPB			2133			
			M378A5143EB2-CRC			2400			
			M378A5244CB0-CPB			2133			
			M378A5244CB0-CRC			2400			
8GB	1.2V	1G x 64	M378A1G43DB0-CPB	4Gb (512M x8) *16	Lead Free & Halogen Free	2133	2	Now	
			M378A1G43EB1-CRC			2400			
			M378A1K43BB1-CPB	8Gb (1G x8) *8		2133			1
			M378A1K43BB2-CRC			2400			
		1R x 8	M378A1K43CB2-CPB	2133					
			M378A1K43CB2-CRC	2400					
16GB	1.2V	2G x 64	M378A2K43BB1-CPB	8Gb (1G x8) * 16	Lead Free & Halogen Free	2133	2	Now	
			M378A2K43BB1-CRC			2400			
			M378A2K43CB1-CPB			2133			
			M378A2K43CB1-CRC			2400			

Notes: PB = DDR4-2133(15-15-15) RC = DD R4-2400(17-17-17)

## DDR4 SDRAM ECC UNBUFFERED MODULES

Density	Voltage	Organization	Part Number	Composition	Compliance	Speed (Mbps)	Ranks	Production
4GB	1.2V	512M x72	M391A5143EB1-CPB/CRC	M391A5143EB1-CPB/CRC	Lead Free & Halogen Free, Flip Chip	2133/2400	1	Now
8GB	1.2V	1G x72	M391A1G43DB0-CPB/CRC	M391A1G43DB0-CPB/CRC	Lead Free & Halogen Free, Flip Chip	2133/2400	2	Now
			M391A1K43BB1-CPB/CRC	M391A1K43BB1-CPB/CRC				
16GB	1.2V	2G x72	M391A2K43BB1-CPB/CRC	M391A2K43BB1-CPB/CRC	Lead Free & Halogen Free, Flip Chip	2133/2400	2	Now

Notes: PB = DDR4-2133(15-15-15) RC = DDR4-2400(17-17-17)

## DDR4 SDRAM SODIMM MODULES

Density	Voltage	Organization	Part Number	Composition	Compliance	Speed (Mbps)	Ranks	Production
4GB	1.2V	512M x 64	M471A5143DB0-CPB	4Gb (512M x8) * 8	Lead Free & Halogen Free	2133	1	Now
			M471A5143EB0-CPB/RC			2133/2400		
			M471A5244CB0-CPB/RC					
8GB	1.2V	1G x 64	M471A1G43DB0-CPB	4Gb (512M x8) * 16	Lead Free & Halogen Free	2133	2	Now
			M471A1G43EB1-CPB/CRC			2133/2400		
			M471A1K43BB1-CPB/CRC	8Gb (1Gx8)*8			1	
			M471A1K43CB1-CPB/CRC					
16GB	1.2V	2G x 64	M471A2K43BB1-CPB/RC	8Gb (1G x8) * 16	Lead Free & Halogen Free	2133/2400	2	Now
			M471A2K43CB1-CPB/RC					

Notes: PB = DDR4-2133(15-15-15) RC = DDR4-2400(17-17-17)

## DDR4 SDRAM ECC SODIMM MODULES

Density	Voltage	Organization	Part Number	Composition	Compliance	Speed (Mbps)	Ranks	Production
8GB	1.2V	1G x 72	M474A1G43DB0-CPB	4Gb (512M x8) * 18	Lead Free & Halogen Free, Flip Chip	2133	2	Now
			M474A1G43DB1-CRC			2400		
			M474A1G43EB1-CPB/CRC			2133/2400		
16GB	1.2V	2G x 72	M474A2K43BB1-CPB/RC	8Gb (1G x8) * 18	Lead Free & Halogen Free, Flip Chip	2133/2400	2	Now

## DDR3 SDRAM REGISTERED MODULES

Density	Voltage	Organization	Part Number	Composition	Compliance	Speed (Mbps)	Ranks	Production	
8GB	1.5V	1G x 72	M393B1G70EBO-CMA	4Gb (1G x4) * 18	Lead Free & Halogen Free, Flip Chip	1866	1	Now	
			M393B1G73EBO-CMA	4Gb (512M x8) * 18			2		
	1.35V		M393B1G70EBO-YKO	4Gb (1G x4) * 18		1600	1		
			M393B1G73EBO-YKO	4Gb (2R x8) * 18			2		
16GB	1.5V	2G x 72	M393B2G70DBO-CMA	4Gb (1G x4) * 36	Lead Free & Halogen Free, Flip Chip	1866	2	Now	
			M393B2G70EBO-CMA						
	1.35V		M393B2G70DBO-YKO						1600
			M393B2G70EBO-YKO						
32GB	1.35V	4G x 72	M393B4G70DMO-YH9	4Gb DDP (2G x4) * 36	Lead Free & Halogen Free, DDP	1333	4	Now	
Notes:		8 = IDT A1 Evergreen 9 = Inphi UVGS02	2 = IDT (E-die) 3 = Inphi (E-die)	YK = DDR3-1600 (11-11-11) MA = DDR3-1866 (13-13-13)					

## DDR3 SDRAM Load Reduced REGISTERED MODULES

Density	Voltage	Organization	Part Number	Composition	Compliance	Speed (Mbps)	Ranks	Production
32GB	1.35V	4G x 72	M386B4G70DMO-YKO	4Gb DDP (2G x4) * 36	Lead Free & Halogen Free, DDP	1600	4	Now
64GB	1.35V	8G x 72	M386B8G70DE0-YH9(4)	4Gb QDP (4G x4) * 36	Lead Free & Halogen Free, QDP	1333	8	Now
	1.5V		M386B8G70DE0-CK0(4)			1600		
Notes:		3 = Inphi iMB GS02B	4 = Montage C1					

## DDR3 SDRAM VLP REGISTERED MODULES

Density	Voltage	Organization	Part Number	Composition	Compliance	Speed (Mbps)	Ranks	Production
8GB	1.5V	1G x 72	M392B1G70DBO-CMA	4Gb (1Gx4) * 18	Lead Free & Halogen Free, Flip Chip	1866	1	Now
			M392B1G73DBO-CMA	4Gb (512M x8) * 18			2	
	1.35V		M392B1G70DBO-YKO	4Gb (1Gx4) * 18		1600	1	
			M392B1G73DBO-YKO	4Gb (512M x8) * 18			2	
16GB	1.5V	2G x 72	M392B2G70DMO-CMA	4Gb DDP (2G x4) * 18	Lead Free & Halogen Free, DDP	1866	2	Now
	1.35V		M392B2G70DMO-YKO			1600		
32GB	1.35V	4G x 72	M392B4G70DE0-YH9	4Gb QDP (4G x4) * 18	Lead Free & Halogen Free, QDP	1333	4	Now
Notes:		2 = IDT	3 = Inphi	YK = DDR3-1600	MA = DDR3-1866 (13-13-13)			

## DDR3 Non ECC UNBUFFERED MODULES

Density	Voltage	Organization	Part Number	Composition	Compliance	Speed (Mbps)	Ranks	Production
4GB	1.5V	512M x 64	M378B5173DBO-CK0/CMA	4Gb (512M x8) * 8	Lead Free & Halogen Free, Flip Chip	1600/1866	1	Now
			M378B5173EBO-CK0/CMA					
			M378B5173EBO-YKO/*CMA					
8GB	1.5V	1G x 64	M378B1G73DBO-CK0/MA	4Gb (512M x8) * 16	Lead Free & Halogen Free, Flip Chip	1600/1866	2	Now
			M378B1G73EBO-CK0/CMA					
	1.35V		M378B1G73EBO-YKO/*CMA					
Notes:		YK = DDR3-1600 (11-11-11)	MA = DDR3-1866 (13-13-13)	* 1.35V is compatible to 1.5V				

## DDR3 SDRAM UNBUFFERED MODULES (ECC)

Density	Voltage	Organization	Part Number	Composition	Compliance	Speed (Mbps)	Ranks	Production
4GB	1.5V	512Mx72	M391B5173EBO-CMA	4Gb (512M x8) * 9	Lead Free & Halogen Free	1866	1	Now
	1.35V		M391B5173EBO-YKO			1600		
8GB	1.5V	1G x 72	M391B1G73EBO-CMA	4Gb (512M x8) * 18	Lead Free & Halogen Free	1866	2	Now
	1.35V		M391B1G73EBO-YKO			1600		
Notes:		YKO = DDR3-1600 (11-11-11)	MA = DDR3-1866 (13-13-13)					

## DDR3 SDRAM SODIMM MODULES

Density	Voltage	Organization	Part Number	Composition	Compliance	Speed (Mbps)	Ranks	Production
4GB	1.35V	512M x 72	M474B5173EBO-YK0	4Gb (512M x8) * 9	Lead Free & Halogen Free, Flip Chip	1866	1	Now
8GB	1.5V	1G x 72	M474B1G73EBO-CMA	4Gb (512M x8) * 18	Lead Free & Halogen Free, Flip Chip	1866	2	Now
	1.35V		M474B1G73EBO-YK000			1600		

## DDR3 SDRAM COMPONENTS

Density	Voltage	Organization	Part Number	# Pins- Package	Compliance	Speed (Mbps)	Dimensions	Production
1Gb	1.5V	128M x 8	K4B1G0846I-BCK0/MA/NB	78 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	1600/1866/2133	7.5x11mm	Now
		128M x 16	K4B1G1646I-BCK0/MA/NB	96 Ball -FBGA			7.5x13.3mm	
	1.35V	128M x 8	K4B1G0846I-BYK0/MA	78 Ball -FBGA		1600/1800	7.5x11mm	
		128M x 16	K4B1G1646I-BYK0/MA	96 Ball -FBGA			7.5x13.3mm	
2Gb	1.5V	512M x 8	K4B2G0846F-BCK0/MA/NB	78 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	1600/1866/2133	7.5x11mm	Now
		256M x 16	K4B2G1646F-BCK0/MA/NB	96 Ball -FBGA			7.5x13.3mm	
	1.35V	256M x 8	K4B2G0846F-BK0/MA	78 Ball -FBGA		1600/1866	7.5x11mm	
		128M x 16	K4B2G1646F-BK0/MA	96 Ball -FBGA			7.5x13.3mm	
4Gb	1.5V	512M x 8	K4B4G0846D-BCK0/MA/NB	78 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	1600/1866/2133	7.5x11mm	Now
		256M x 16	K4B4G1646D-BCK0/MA/NB	96 Ball -FBGA			7.5x13.3mm	
		512M x 8	K4B4G0846E-BCK0/MA/NB	78 Ball -FBGA			7.5x11mm	
		256M x 16	K4B4G1646E-BCK0/MA/NB	96 Ball -FBGA			7.5x13.3mm	
	1.35V	1G x 4	K4B4G0446D-BYK0	78 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	1600	7.5x11mm	Now
		512M x 8	K4B4G0846D-BYK0	96 Ball -FBGA			7.5x11mm	
		256M x 16	K4B4G1646D-BYK0/MA	96 Ball -FBGA		1600/1866	7.5x13.3mm	
		1G x 4	K4B4G0446E-BYK0/MA	78 Ball -FBGA			7.5x11mm	
1.35V	512M x 8	K4B4G0846E-BYK0/MA	96 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	1600/1866	7.5x11mm	Now	
	256M x 16	K4B4G1646E-BYK0/MA	96 Ball -FBGA			7.5x13.3mm		
	1G x 4	K4B4G0446E-BYK0/MA	78 Ball -FBGA			1600/1866		7.5x11mm
	512M x 8	K4B4G0846E-BYK0/MA	96 Ball -FBGA					7.5x13.3mm
8Gb	1.5V	512M x 16	K4B8G1646Q-MCK0/MA	96 Ball -FBGA	Lead Free & Halogen Free	1600/1866	11x13.3mm	Now
			K4G8G1646D-MCK0/MA					
	1.35V	512M x 16	K4G8G1646D-MCK0/MA					
			K4G8G1646D-MYK0/ (MA)					

Notes: H9 = DDR3-1333 (9-9-9) K0 = DDR3-1600 (11-11-11) MA = DDR3-1866 (13-13-13) NB = DDR3-2133 (14-14-14)

## DDR2 SDRAM COMPONENTS

Density	Organization	Part Number	# Pins-Package	Dimensions	Package	Speed (Mbps)	Production
512Mb	64M x 8	K4T51083QN-BCE7	60-FBGA	7.5x9.5mm	Lead free & Halogen free , Flip chip	667/800/1066	Now
	32M x 16	K4T51163QN-BCE7	84-FBGA	7.5x12.5mm			
1Gb	128M x 8	K4T1G084QJ-BCE7	60-FBGA	7.5x9.5mm	Lead free & Halogen free , Flip chip	667/800/1066	Now
	64M x 16	K4T1G164QJ-BCE7	84-FBGA	7.5x12.5mm			

Notes: E6 = DDR2-667 (5-5-5) E7 = DDR2-800 (5-5-5) F7 = DDR2-800 (6-6-6) F8 = DDR2-1066 (7-7-7)

## GRAPHICS DRAM COMPONENTS

Type	Density	Organization	Part Number	Package	VDD/VDDQ	Speed Bin (MHz)	Production
GDDR5	8Gb	256M x 32	K4G80325FB-HC(03/28/25/22)	170-FCFBGA	1.5V/1.5V	6000/7000/8000*/9000*	Now
			K4G80325FB-HC(03/28/25/22)		1.35V/1.35V	5000/6000/6500/TBD	
	4Gb	128M x 32	K4G41325FE-HC2(03/28/25/22)		1.5V/1.5V	6000/7000/8000*/9000*	
			K4G41325FE-HC2(03/28/25/22)		1.35V/1.35V	5000/6000/6500/TBD	
gDDR3	4Gb	256M x 16	K4W4G1646E-BC(1A/1B)	96-FCFBGA	1.5V/1.5V	2133/2400	Now
			K4W4G1646E-BC(1A/1B)		1.35V/1.35V	1866/2133	

Notes: Package & Speed Bin Codes

H: FBGA (Halogen Free & Lead Free) (DDR3)  
 B: FCFBGA (Halogen Free & Lead Free) (DDR3)  
 H: FCFBGA (Halogen Free & Lead Free) (GDDR5)  
 F: FBGA (Halogen Free & Lead Free) (GDDR5)  
 22: 0.22ns (9000Mbps)  
 25: 0.25ns (8000Mbps)

28: 0.28ns (7000Mbps)  
 03: 0.3ns (6000Mbps)  
 04: 0.4ns (5000Mbps)  
 1B: 8.3ns (2400Mbps gDDR3)  
 1A: 1.0ns (2133Mbps gDDR3)  
 11: 1.1ns (1866Mbps)

## MOBILE DRAM COMPONENTS

Type	Density	Organization	Part Number	Package	Power	Production
LPDDR3	8Gb	1CH x 32	K4E8E324EB-EGCF	178-FBGA, 11x11.5, SDP, 1866Mbps	1.8V/1.2V/1.2V	Now
			K4E8E324EB-AGCF	168-FBGA, 12x12, SDP, 1866Mbps		
	12Gb	1CH x32	K4E2E304EA-AGCF	168-FBGA, 12x12, DDP, 1866Mbps		
			16Gb	1CH x 32		
	K4E6E304EB-AGCF	168-FBGA, 12x12, DDP, 1866Mbps				
	2CH x 32	K3QF2F20BM-AGCF		253-FBGA, 11x11.5, DDP, 1866Mbps		
		K3QF3F30BM-FGCF		256-FBGA, 14x14, DDP, 1866Mbps		
	24Gb	1CH x32	K4EHE304EA-AGCF	168-FBGA, 12x12, QDP, 1866Mbps		
			2CH x32	K3QF6F60AM-FGCF		
	32Gb	1CH x32	K4EBE304EB-EGCF	178-FBGA, 11x11.5, QDP, 1866Mbps		
2CH x32			K3QF4F40BM-AGCF	253-FBGA, 11x11.5, QDP, 1866Mbps		
			K3QF4F40BM-FGCF	256-FBGA, 14x14, QDP, 1866Mbps		
LPDDR4	8Gb	2CH x16	K4F8E304HB-MGCJ	200-FBGA, 10x15, SDP, 3733Mbps	1.8V/1.1V/1.1V	Now
	16Gb		K4F6E304HB-MGCJ	200-FBGA, 10x15, DDP, 3733Mbps		
	24Gb		K4FHE3D4HM-MFCJ	200-FBGA, 10x15, DDP, 3733Mbps		
			K3RG4G40MM-MGCJ	366-FBGA, 15x15, DDP, 3733Mbps		
	32Gb	4CH x16	K3RG2G20CA-MGCJ	366-FBGA, 15x15, QDP, 3733Mbps		
			K3RG2G20CM-FGCJ	432-FBGA, 15x15, QDP, 3733Mbps		
48Gb	4CH x16	K3RG6G60MM-MGCJ	366-FBGA, 15x15, QDP, 3733Mbps			
LPDDR4X	32Gb	4CH x16	K3UH5H50MM-NGCJ	366-FBGA, 12x12.7 DDP, 3733Mbps	1.8V/1.1V/1.1V	CS
	48Gb		K3UH6H60AM-NGCJ	366-FBGA, 12x12.7 QDP, 3733Mbps		



# COMPONENT DRAM ORDERING INFORMATION

	1	2	3	4	5	6	7	8	9	10	11
	K	4	T	XX	XX	X	X	X	X	X	XX
SAMSUNG Memory											Speed
DRAM											Temp & Power
DRAM Type											Package Type
Density											Generation
Bit Organization											Interface (VDD, VDDQ)
											Number of Internal Banks

## 1. Memory (K)

08: x 8

## 2. DRAM: 4

15: x 16 (2CS)

## 3. DRAM Type

B: DDR3 SDRAM  
 D: GDDR SDRAM  
 G: GDDR5 SDRAM  
 H: DDR SDRAM  
 J: GDDR3 SDRAM  
 M: Mobile SDRAM  
 N: SDDR2 SDRAM  
 S: SDRAM  
 T: DDR SDRAM  
 U: GDDR4 SDRAM  
 V: Mobile DDR SDRAM Power Efficient Address  
 W: SDDR3 SDRAM  
 X: Mobile DDR SDRAM  
 Y: XDR DRAM  
 Z: Value Added DRAM

16: x 16

26: x 4 Stack (JEDEC Standard)

27: x 8 Stack (JEDEC Standard)

30: x 32 (2CS, 2CKE)

31: x 32 (2CS)

32: x 32

## 9. Package Type

### DDR2 DRAM

L: TSOP II (Lead-free & Halogen-free)  
 H: FBGA (Lead-free & Halogen-free)  
 F: FBGA for 64Mb DDR (Lead-free & Halogen-free)  
 6: sTSOP II (Lead-free & Halogen-free)  
 T: TSOP II  
 N: sTSOP II  
 G: FBGA  
 U: TSOP II (Lead-free)  
 V: sTSOP II (Lead-free)  
 Z: FBGA (Lead-free)

## 6. # of Internal Banks

2: 2 Banks

3: 4 Banks

4: 8 Banks

5: 16 Banks

### DDR2 SDRAM

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)  
 T: FBGA DSP (Lead-free & Halogen-free, Thin)

## 7. Interface (VDD, VDDQ)

2: LVTTTL, 3.3V, 3.3V

4: LVTTTL, 2.5V, 2.5V

5: SSTL-2 1.8V, 1.8V

6: SSTL-15 1.5V, 1.5V

8: SSTL-2, 2.5V, 2.5V

A: SSTL, 2.5V, 1.8V

F: POD-15 (1.5V, 1.5V)

H: SSTL\_2 DLL, 3.3V, 2.5V

M: LVTTTL, 1.8V, 1.5V

N: LVTTTL, 1.5V, 1.5V

P: LVTTTL, 1.8V, 1.8V

Q: SSTL-2 1.8V, 1.8V

R: SSTL-2, 2.8V, 2.8V

U: DRSL, 1.8V, 1.2V

### DDR3 SDRAM

Z: FBGA (Lead-free)  
 H: FBGA (Halogen-free & Lead-free)

### Graphics Memory

Q: TQFP  
 U: TQFP (Lead Free)  
 G: 84/144 FBGA  
 V: 144 FBGA (Lead Free)  
 Z: 84 FBGA (Lead Free)  
 T: TSOP  
 L: TSOP (Lead Free)  
 A: 136 FBGA  
 B: 136 FBGA (Lead Free)  
 H: FBGA (Hologen Free & Lead Free)  
 E: 100 FBGA (Hologen Free & Lead Free)

## 4. Density

10: 1G, 8K/32ms  
 16: 16M, 4K/64ms  
 26: 128M, 4K/32ms  
 28: 128M, 4K/64ms  
 32: 32M, 2K/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  
 62: 64M, 2K/16ms  
 64: 64M, 4K/64ms  
 68: 768M, 8K/64ms  
 1G: 1G, 8K/64ms  
 2G: 2G, 8K/64ms  
 4G: 4G, 8K/64ms

## 5. Bit Organization

02: x 2  
 04: x 4  
 06: x 4 Stack (Flexframe)  
 07: x 8 Stack (Flexframe)

## 8. 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  
 M: 1st Generation  
 N: 14th Generation  
 Q: 17th Generation

## COMPONENT DRAM ORDERING INFORMATION

	1	2	3	4	5	6	7	8	9	10	11
	K	4	T	XX	XX	X	X	X	X	X	XX
SAMSUNG Memory											Speed
DRAM											Temp & Power
DRAM Type											Package Type
Density											Generation
Bit Organization											Interface (VDD, VDDQ)
											Number of Internal Banks

### XDR DRAM

J: BOC(LF) P: BOC

### Mobile DRAM

#### Leaded/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

## 10. Temp & Power - COMMON (Temp, Power)

C: Commercial, Normal (0°C – 95°C) & Normal Power

C: (Mobile Only) Commercial (-25 ~ 70°C), Normal Power

J: Commercial, Medium

L: Commercial, Low (0°C – 95°C) & Low Power

L: (Mobile Only) Commercial, Low, i-TCSR

F: Commercial, Low, i-TCSR & PASR & DS

E: Extended (-25~85°C), Normal

N: Extended, Low, i-TCSR

G: Extended, Low, i-TCSR & PASR & DS

I: Industrial, Normal (-40°C – 85°C) & Normal Power

P: Industrial, Low (-40°C – 85°C) & Low Power

H: Industrial, Low, i-TCSR & PASR & DS

## 11. Speed (Wafer/Chip Biz/BGD: 00)

### DDR SDRAM

CC: DDR400 (200MHz @ CL=3, tRCD=3, tRP=3)

B3: DDR333 (166MHz @ CL=2.5, tRCD=3, tRP=3) \*1

A2: DDR266 (133MHz @ CL=2, tRCD=3, tRP=3)

B0: DDR266 (133MHz @ CL=2.5, tRCD=3, tRP=3)

Note 1: "B3" has compatibility with "A2" and "B0"

### DDR2 SDRAM

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)

### DDR3 SDRAM

F7: DDR3-800 (400MHz @ CL=6, tRCD=6, tRP=6)

F8: DDR3-1066 (533MHz @ CL=7, tRCD=7, tRP=7)

G8: DDR3-1066 (533MHz @ CL=8, tRCD=8, tRP=8)

H9: DDR3-1333 (667MHz @ CL=9, tRCD=9, tRP=9)

K0: DDR3-1600 (800MHz @ CL=11, tRCD=11, tRP=11)

MA: DDR3-1866 (933MHz @ CL=13, tRCD=13, tRP=13)

NB: DDR3-2133 (1067MHz @ CL=14, tRCD=14, tRP=14)

### Graphics Memory

18: 1.8ns (550MHz)

04: 0.4ns (2500MHz)

20: 2.0ns (500MHz)

05: 0.5ns (2000MHz)

22: 2.2ns (450MHz)

5C: 0.56ns (1800MHz)

25: 2.5ns (400MHz)

06: 0.62ns (1600MHz)

2C: 2.66ns (375MHz)

6A: 0.66ns (1500MHz)

2A: 2.86ns (350MHz)

07: 0.71ns (1400MHz)

33: 3.3ns (300MHz)

7A: 0.77ns (1300MHz)

36: 3.6ns (275MHz)

08: 0.8ns (1200MHz)

40: 4.0ns (250MHz)

09: 0.9ns (1100MHz)

45: 4.5ns (222MHz)

1 : 1.0ns (1000MHz)

50/5A: 5.0ns (200MHz)

1 : 1.1ns (900MHz)

55: 5.5ns (183MHz)

12: 1.25ns (800MHz)

60: 6.0ns (166MHz)

14: 1.4ns (700MHz)

16: 1.6ns (600MHz)

### SDRAM (Default CL=3)

50: 5.0ns (200MHz CL=3)

60: 6.0ns (166MHz CL=3)

67: 6.7ns

75: 7.5ns PC133 (133MHz CL=3)

### XDR DRAM

A2: 2.4Gbps, 36ns, 16Cycles

B3: 3.2Gbps, 35ns, 20Cycles

C3: 3.2Gbps, 35ns, 24Cycles

C4: 4.0Gbps, 28ns, 24Cycles

DS: Daisychain Sample

### Mobile-SDRAM

60: 166MHz, CL 3

75: 133MHz, CL 3

80: 125MHz, CL 3

1H: 105MHz, CL 2

1L: 105MHz, CL 3

15: 66MHz, CL 2 & 3

### Mobile-DDR

C3: 133MHz, CL 3

C2: 100MHz, CL 3

C0: 66MHz, CL 3

Note: All Lead-free and Halogen-free products are in compliance with RoHS

# MODULE DRAM ORDERING INFORMATION

	1	2	3	4	5	6	7	8	9	10	11	12	13
	M	X	XX	T	XX	X	X	X	X	X	X	XX	X
SAMSUNG Memory												AMB Vendor	
DIMM												Speed	
Data bits												Temp & Power	
DRAM Component Type												PCB Revision	
Depth												Package	
Number of Banks												Generation	
Bit Organization													

## 1. Memory Module: M

### 2. DIMM Type

- 3: DIMM
- 4: SODIMM

### 3. Data bits

- 12: x 72 184pin Low Profile Registered DIMM
- 63: x 63 PC100/PC133 μSODIMM with SPD for 144pin
- 64: x 64 PC100/PC133 SODIMM with SPD for 144pin (Intel/JEDEC)
- 66: x 64 Unbuffered DIMM with SPD for 144pin/168pin (Intel/JEDEC)
- 68: x 64 184pin Unbuffered DIMM
- 70: x 64 200pin Unbuffered SODIMM
- 71: x 64 204pin Unbuffered SODIMM
- 74: x 72/ECC Unbuffered DIMM with SPD for 168pin (Intel/JEDEC)
- 77: x 72/ECC PLL + Register DIMM with SPD for 168pin (Intel PC100)
- 78: x 64 240pin Unbuffered DIMM
- 81: x 72 184pin ECC unbuffered DIMM
- 83: x 72 184pin Registered DIMM
- 90: x 72/ECC PLL + Register DIMM
- 91: x 72 240pin ECC unbuffered DIMM
- 92: x 72 240pin VLP Registered DIMM
- 93: x 72 240pin Registered DIMM
- 95: x 72 240pin Fully Buffered DIMM with SPD for 168pin (JEDEC PC133)

### 4. DRAM Component Type

- B: DDR3 SDRAM (1.5V VDD)
- L: DDR SDRAM (2.5V VDD)
- S: SDRAM
- T: DDR2 SDRAM (1.8V VDD)

## 5. Depth

- 09: 8M (for 128Mb/512Mb)
- 17: 16M (for 128Mb/512Mb)
- 16: 16M
- 28: 128M
- 29: 128M (for 128Mb/512Mb)
- 32: 32M
- 33: 32M (for 128Mb/512Mb)
- 51: 512M
- 52: 512M (for 512Mb/2Gb)
- 56: 256M
- 57: 256M (for 512Mb/2Gb)
- 59: 256M (for 128Mb/512Mb)
- 64: 64M
- 65: 64M (for 128Mb/512Mb)
- 1G: 1G
- 1K: 1G (for 2Gb)

## 6. # of Banks in Comp. & Interface

- 1: 4K/64mxRef., 4Banks & SSTL-2
- 2: 8K/64ms Ref., 4Banks & SSTL-2
- 2: 4K/64ms Ref., 4Banks & LVTTL (SDR Only)
- 5: 8K/64ms Ref., 4Banks & LVTTL (SDR Only)
- 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. Generation

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

## 9. Package

- E: FBGA QDP (Lead-free & Halogen-free)
- G: FBGA
- H: FBGA (Lead-free & Halogen-free)
- J: FBGA DDP (Lead-free)
- M: FBGA DDP (Lead-free & Halogen-free)
- N: sTSSOP
- Q: FBGA QDP (Lead-free)
- T: TSOP II (400mil)
- U: TSOP II (Lead-Free)
- V: sTSSOP II (Lead-Free)
- Z: FBGA (Lead-free)

## 10. PCB Revision

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

## 11. Temp & Power

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

## 12. Speed

- CC: (200MHz @ CL=3, tRCD=3, tRP=3)
- D5: (266MHz @ CL=4, tRCD=4, tRP=4)
- E6: (333MHz @ CL=5, tRCD=5, tRP=5)
- F7: (400MHz @ CL=6, tRCD=6, tRP=6)
- E7: (400MHz @ CL=5, tRCD=5, tRP=5)
- F8: (533MHz @ CL=7, tRCD=7, tRP=7)
- G8: (533MHz @ CL=8, tRCD=8, tRP=8)
- H9: (667MHz @ CL=9, tRCD=9, tRP=9)
- K0: (800MHz @ CL=10, tRCD=10, tRP=10)
- 7A: (133MHz CL=3/PC100 CL2)

## 13. AMB Vendor for FBDIMM

- 0, 5: Intel
  - 1, 6, 8: IDT
  - 9: Montage
- Note: All Lead-free and Halogen-free products are in compliance with RoHS

# DDR4 SDRAM MODULE ORDERING INFORMATION

	1	2	3	4	5	6	7	8	9	10	11	12
	M	X	XX	A	XX	X	X	X	X	X	X	XX
Memory Module												Speed
DIMM Type												Temp & Power
Data bits												PCB Revision
DRAM Component Type												Package
Depth												Component Revision
# of Banks in Comp. & Interface												
Bit Organization												

## 1. Memory Module: M

### 2. DIMM Type

3: R/LRDIMM  
4: SODIMM

### 3. Data bits

74: x 72 260pin SODIMM  
86: x 72 288pin Load Reduced DIMM  
93: x 72 288pin Registered DIMM

### 4. DRAM Component Type

A: DDR4 SDRAM (1.2V VDD)

### 5. Depth

1G: 1G  
2G: 2G  
4G: 4G  
8G: 8G  
1K: 1G (for 8Gb)  
2K: 2G (for 8Gb)

## 6. # of Banks in Comp. & Interface

4: 16Banks & POD-1.2V

### 7. Bit Organization

0: x 4  
3: x 8

## 8. Component 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.

## 9. Package

B: FBGA (Halogen-free & Lead-free, Flip Chip)  
M: FBGA (Halogen-free & Lead-free, DDP)

### 10. PCB Revision

0: None  
1: 1st Rev.  
2: 2nd Rev.  
3: 3rd Rev.  
4: 4th Rev.

### 11. Temp & Power

C: Commercial Temp. (0°C ~ 85°C) & Normal Power

### 12. Speed

PB: DDR4-2133  
(1066MHz @ CL=15, tRCD=15, tRP=15)

## DDR4 SDRAM MEMORY ORDERING INFORMATION

	1	2	3	4	5	6	7	8	9	10	11
	K	4	A	XX	XX	X	X	X	X	X	XX
Samsung Memory											Speed
DRAM											Temp & Power
DRAM Type											Package Type
Density											Revision
Bit Organization											Interface (VDD, VDDQ)
											#of Internal Banks

### 1. Samsung Memory: K

### 2. DRAM: 4

### 3. DRAM Type

A: DDR4 SDRAM

### 4. Density

4G: 4Gb  
8G: 8Gb

### 5. Bit Organization

04: x 4  
08: x 8

### 6. # of Internal Banks

5: 16Banks

### 7. Interface (VDD, VDDQ)

W: POD (1.2V, 1.2V)

### 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.

### 9. Package Type

B: FBGA (Halogen-free & Lead-free, Flip Chip)  
M: FBGA (Halogen-free & Lead-free, DDP)

### 10. Temp & Power

C: Commercial Temp. (0°C ~ 85°C) & Normal Power

### 11. Speed

PB: DDR4-2133  
(1066MHz @ CL=15, tRCD=15, tRP=15)  
RC: DDR4-2400  
(1200MHz @ CL=17, tRCD=17, tRP=17)

## MOBILE STORAGE

Application	Product	Density	Org	Type	Flash Die	Part Number	Seq R/W MB/s	Random R/W IOPS	mm Pkg Size (X,Y,Z)	Status
High-End	UFS v2.1 (Gear 3 x 2 lanes)	256GB	256Gb*8	TLC	M-die	KLUEG8U1EM-B0C10**	890/260	48K / 42K	11.5 x 13.0 x 1.0	CS
		128GB	128Gb*8		E-die	KLUDG8V1EE-B0C10**	880/230	40K / 33K		
		64GB	128Gb*4	MLC	D-die	KLUCG4J1ED-B0C10**	880/200	48K / 35K		
	UFS v2.0 (Gear 3 x 2 lanes)	256GB	256Gb*8	TLC	M-die	KLUEG8U1EM-B0B10**	850/260	45K / 40K	11.5 x 13.0 x 1.2	MP
Mainstream	UFS 2.0 (Gear 3 x 1 lane)	128GB	128Gb*8	MLC	B-die	KLUDG8J1CB-B0B10**	460/160	20K / 14K	11.5 x 13.0 x 1.2	MP
		64GB	128Gb*4			KLUCG4J1CB-B0B10**				
		32GB	64Gb*4		E-die	KLUBG4G1CE-B0B10**				
	eMMC v5.1 (Gear 3 x 1 lane)	256GB	256Gb*8	TLC	M-die	KLMEG8UERM-C0410**	320/150	22K / 18K	11.5 x 13.0 x 1.0	CS
		128GB	256Gb*4			KLMDG4UERM-B0410**				
		64GB	128Gb*4	MLC	D-die	KLMDG4JETD-B0410**			11.5 x 13.0 x 0.8	CS in Dec / Jan
		32GB	128Gb*2			KLMBG2JETD-B0410**				
		16GB	128Gb*1			KLMDG1JETD-B0410**				
		8GB	64Gb*1		F-die	KLM8G1GETF-B0410**				

MMC5.1 is backwards compatible with 5.0 & 4.5

\*Denotes bucket code for latest firmware patch

### eMCP: eMMC + LPDDR3

Memory	eMMC Density	DRAM Density/Organization	Voltage (eMMC-DRAM)	Package
eMMC & MDRAM	8GB	8Gb (x32)	3.3V/1.8V - 1.8V/1.2V	221FBGA 11.5 x 13mm
		8Gb (x32)		
	16GB	8Gb*2 (x32)	3.3V/1.8V - 1.8V/1.2V	221FBGA 11.5 x 13mm
		6Gb*4 (x32)		
	32GB	8Gb*2 (x32)	3.3V/1.8V - 1.8V/1.2V	221FBGA 11.5 x 13mm
		6Gb*4 (x32)		
		8Gb*4 (x32)		
	64GB	6Gb*4 (x32)	3.3V/1.8V - 1.8V/1.2V	221FBGA 11.5 x 13mm
		8Gb*4 (x32)		
	128GB	8Gb*4 (x32)	3.3V/1.8V - 1.8V/1.2V	221FBGA 11.5 x 13mm

### eMCP: eMMC + LPDDR4X

Memory	eMMC Density	DRAM Density/Organization	Voltage (eMMC-DRAM)	Package
eMMC & MDRAM	32GB	12Gb*2 (x32)	3.3V/1.8V - 1.8V/1.2V/0.6V	254FBGA 11.5 x 13mm
		8Gb*4 (x32)		
	64GB	12Gb*2 (x32)	3.3V/1.8V - 1.8V/1.2V/0.6V	254FBGA 11.5 x 13mm
		8Gb*4 (x32)		
		12Gb*4 (x32)		
	128GB	12Gb*4 (x32)	3.3V/1.8V - 1.8V/1.2V/0.6V	254FBGA 12 x 15mm

### ePoP: eMMC + LPDDR3

Memory	eMMC Density	DRAM Density/Organization	Voltage (eMMC-DRAM)	Package
eMMC & MDRAM	4GB	4Gb (x32)	3.3V/1.8V - 1.8V/1.2V	168FBGA 12x12mm
		6Gb (x32)		
	4GB	4Gb (x32)	3.3V/1.8V - 1.8V/1.2V	136FBGA 10x10mm
		6Gb (x32)		
	8GB	8Gb (x32)	3.3V/1.8V - 1.8V/1.2V	136FBGA 10x10mm

# Solid State Drives (SSDs)

	Server & Cloud Datacenter		Enterprise		
	LEGACY SERVERS	HIGH-DENSITY SERVERS	ALL FLASH PRIMARY STORAGE Hard Disk Drive Replacement	LOW LATENCY PRIMARY STORAGE Next-Generation All Flash Array	EXTREME PERFORMANCE SERIES Server-side Caching
	PM863a	PM963	PM1633a	PM1725a	PM1725a
<b>Host Interface</b>	SATA 3.0 @ 6 Gbit/s	PCIe Gen 3 x4 @ 32Gbit/s (NVMe)	SAS 3.0 @ 12 Gbit/s	PCIe Gen 3 x4 @ 32Gbit/s (NVMe)	PCIe Gen 3 x8 @ 64Gbit/s (NVMe)
<b>Form Factor</b>	2.5"	M.2 (22x110mm)	2.5"	2.5" / U.2	Add-in Card (HHHL)
<b>Capacity (GB)</b>	240/480/960/1920/3840	960/1920	480/960/1920/3840/7680/15360	3840/7680/15360	1600/3200/6400
<b>Endurance (up to)</b>	1.3 DWPD for 3 Years	1.3 DWPD for 3 Years	1-3 DWPD for 5 Years	5 DWPD for 5 Years	5 DWPD for 5 Years
<b>Power Consumption (Active)</b>	4 W	7.5 W	13 W	25 W	23 W
<b>Power Consumption (Idle)</b>	1.3 W	2.5 W	7 W	7 W	7.7 W
<b>Random Reads (up to)</b>	99,000 IOPS	430,000 IOPS	205,000 IOPS	740,000 IOPS	1,080,000 IOPS
<b>Random Writes (up to)</b>	18,000 IOPS	40,000 IOPS	39,000 IOPS	70,000 IOPS	170,000 IOPS
<b>Sequential Reads (up to)</b>	520 MB/s	2,000 MB/s	1,300 MB/s	3,100 MB/s	6,400 MB/s
<b>Sequential Writes (up to)</b>	480 MB/s	1,800 MB/s	1,400 MB/s	3,000 MB/s	3,000 MB/s
<b>MTBF</b>	2.0 Million Hours	2.0 Million Hours	2.0 Million Hours	2.0 Million Hours	2.0 Million Hours
<b>Uncorrectable Bit Error Rate (UBER)</b>	1 in 10 <sup>17</sup>	1 in 10 <sup>17</sup>	1 in 10 <sup>17</sup>	1 in 10 <sup>17</sup>	1 in 10 <sup>17</sup>
<b>Physical Dimensions</b>	100 x 70 x 7mm	22 x 110 x 4.15 mm	100 x 70 x 15 mm	100 x 70 x 15 mm	168 x 70 x 19 mm (HHHL)
<b>Weight</b>	55 g	20 g	160 g	160 g	330 g



## SOLID STATE DRIVES (SSD)

Drive Type	Power-loss Protection	Form Factor	Interface	Connector	Product Family	Write Endurance	Capacity (GB)	Part Number		
Client PC/ Embedded	No	M.2 22 x 80 mm	SATA 3.0 @ 6 Gbit/s	M.2	PM871a	PC Workload	256	MZNLN256HMHQ-00000		
							512	MZNLN512HMJP-00000		
							1024	MZNLN1TOHMLH-00000		
			PCIe Gen 3 x4 @ 32Gbit/s (NVMe)		PM951		128	MZVLV128HCGR-00000		
							256	MZVLV256HCHP-00000		
							512	MZVLV512HCJH-00000		
Datacenter	Yes	2.5" 7mmT	SATA 3.0 @ 6 Gbit/s	SFF-8223	PM863a	0.8 DWPD for 5 Years	240	MZ7LM240HMHQ-00005		
							480	MZ7LM480HMHQ-00005		
							960	MZ7LM960HMJP-00005		
							1920	MZ7LM1T9HMJP-00005		
							3840	MZ7LM3T8HMLP-00005		
							SM863	3.6 DWPD for 5 Years	120	MZ7KM120HAFD-00005
			240		MZ7KM240HAGR-00005					
			480		MZ7KM480HAHP-00005					
			960		MZ7KM960HAHP-00005					
			1920		MZ7KM1T9HAJM-00005					
			10 DWPD for 5 Years		100	MZ7KM120HAFD-00005				
					200	MZ7KM240HAGR-00005				
		400		MZ7KM480HAHP-00005						
		800		MZ7KM960HAHP-00005						
		1600		MZ7KM1T9HAJM-00005						
		M.2 22 x 110 mm		PCIe Gen 3x4 @ 32Gbit/s (NVMe)	U.2 (SFF-8639)	PM963	0.8 DWPD for 5 Years	480	MZQLW480HMHQ-00003	
			960					MZQLW960HMJP-00003		
			1920					MZQLW1T9HMJP-00003		
			3840					MZQLW3T8HMLP-00003		
			SM963					3.6 DWPD for 5 Years	960	MZQKW960HMJP-00003
									1920	MZQKW1T9HMJP-00003
				3840	MZQKW3T8HMLH-00003					
				10 DWPD for 5 Years	800	MZQKW960HMJP-00003				
					1600	MZQKW1T9HMJP-00003				
3200	MZQKW3T8HMLH-00003									
PM963	0.8 DWPD for 5 Years		480		MZ1LW480HMHQ-00003					
			960		MZ1LW960HMJP-00003					
		1920	MZ1LW1T9HMJS-00003							
		SM963	3.6 DWPD for 5 Years	960	MZ1KW960HMJP-00003					
				1920	MZ1KW1T9HMJP-00003					
				10 DWPD for 5 Years	800	MZ1KW960HMJP-00003				
1600	MZ1KW1T9HMJP-00003									

## SOLID STATE DRIVES (SSD) *continued*

Drive Type	Power-loss Protection	Form Factor	Interface	Connector	Product Family	Write Endurance	Capacity (GB)	Part Number
Enterprise	Yes	2.5" 15mmT	SAS 3.0 @ 12 Gbit/s	SFF-8680	PM1633	1 DWPD for 5 Years	480	MZILS480HCGR-00003
							960	MZILS960HCHP-00003
							1920	MZILS1T9HCHP-00003
							3840	MZILS3T8HCJM-00003
						3 DWPD for 5 Years	400	MZILS480HCGR-00003
							800	MZILS960HCHP-00003
			PM1633a	1 DWPD for 5 Years	1600	MZILS1T9HCHP-00003		
					3200	MZILS3T8HCJM-00003		
					480	MZILS480HEGR-00007		
					960	MZILS960HEHP-00007		
					1920	MZILS1T9HEJH-00007		
					3840	MZILS3T8HMLH-00007		
		PM1725a	5 DWPD for 5 Years	7680	MZILS7T6HMLS-00007			
				15360	MZILS15THMLS-00007			
				Add-in Card (HHHL)	PCIe Gen 3 x8 @ 64Gbit/s (NVMe)	Edge Connector	800	MZWLL800HEHP-00003
							1600	MZWLL1T6HEHP-00003
Add-in Card (HHHL)	PCIe Gen 3 x8 @ 64Gbit/s (NVMe)			Edge Connector	3200	MZWLL3T2HMJP-00003		
					6400	MZWLL6T4HMLS-00003		
		1600	MZPLL1T6HEHP-00003					
		3200	MZPLL3T2HMJP-00003					
						6400	MZPLL6T4HMLT-00003	

## Public Information Display (PID) Product Classification

<b>Super Narrow Bezel (SNB)/ Ultra Narrow Bezel (UNB)</b>	» Video Wall	» SNB: 5.9mm A-to-A	» UNB: 3.9mm A-to-A
<b>Indoor PID</b>	» Narrow Bezel	» 40"/46"/55"/75"	» 700 nits Brightness
<b>E-Board PID</b>	» Landscape Orientation	» 55"/70"/82" Edge LED	» AGAR Surface Treatment
<b>Outdoor PID</b>	» High Brightness	» Full High Definition	» 110°C Clearing Point

### Why PID instead of TV?

	COMMERCIAL (PID)	CONSUMER (TV)
<b>WARRANTY</b>	18 months to 2 years	90 days to 1 year
<b>RELIABILITY</b>	Public environments 20+ hours daily duty cycle Variety of temperatures & location	5-8 hour daily duty cycle Designed for in-home use in controlled environment In-home living room
<b>PRODUCTION LIFECYCLE</b>	24-36 months	12-15 months
<b>PICTURE QUALITY</b>	Designed to resist image retention LCD backlight covers a wider color spectrum necessary for PC source integration, giving better picture quality AGAR coating for public viewing	120Hz / 240Hz for full-motion video Designed for TV signals Gloss surface treatment
<b>LOCATION</b>	Most models portrait capable	Can only be oriented in landscape mode

## Product Segmentation

HEAVY USE ↑ ↓ LIGHT USE	<b>SNB / UNB</b>	<b>Professional</b> • Control Room • Simulation	<b>Indoor Events</b> • Scoreboard • Sports Broadcasting	<b>Billboard</b> • Dynamic Signage
	<b>Indoor PID</b>	<b>Entertainment</b> • Casino • Theatre • Menu	<b>Transportation</b> • Airport • Train/Bus Station	<b>Communication</b> • Conference Room
	<b>E-Board PID</b>	<b>Commercial</b> • Kiosk • Conference Systems	<b>Education</b> • Interactive FPD	<b>Hospitality</b> • Hotel Signage
	<b>Outdoor PID</b>	<b>Commercial</b> • Kiosk • Conference Systems	<b>Education</b> • Interactive FPD	<b>Hospitality</b> • Hotel Signage

### Product Segmentation

Type	Class	Warranty	Bezel	Suggested Run Time	Brightness	Usage	Applications	Value Tier
ENB / UNB / SNB	Ultra / Super Narrow Bezel	2 years	1.9mm - 5.9mm A-to-A	20+ hours	500-700 nits	Heavy	Video Walls	Premium commercial range
Indoor PID	Indoor Commercial Panels	2 years	Narrow	20+ hours	600/700 nits	Medium	Semi-Outdoor	Mid-price range
E-Board	Value, Large Format	18 months	Normal	12 hours	450 nits	Daily	Indoor, e-Board	High-value commercial range
Outdoor PID	High Bright, Wide Temp	2 years	Normal	20+ hours	2500-5000 nits	Heavy	Outdoor	Premium commercial range
Specialty	Value, Large Format	2 years	Narrow	20+ hours	500/ 1500 nits	Medium	specialty	

# SAMSUNG DIGITAL INFORMATION DISPLAY (DID) PANEL LINEUP

Category	Model	Size	Model Resolution	Bezel	Backlight	Brightness (typical)	Contrast Ratio	Response Time	Frequency	MP*	Comment						
SNB / UNB / ENB	LTI460HN09-0	46"	FHD	Super narrow	D-LED	500 nits	3,000:1	8ms	60Hz	Now	5.9mm Active to Active, LED						
	LTI460HN11-A			Ultra narrow		500 nits					3.9mm Active to Active, LED						
	LTI460HN12-V			700 nits		2.0mm Active to Active, LED											
	LTI460HN13-V			Extreme narrow							700 nits						
	LTI460HN14-V	500 nits	Feb., '17 Q2, '17														
	LTI550HN11-V	55"		Ultra narrow	500 nits	Now	3.9mm Active to Active, LED										
	LTI550HN12-V				700 nits												
Indoor PID	LTI550HN13-V (Broadcast)	55"	FHD	Ultra narrow	D-LED			700 nits	3,000:1	8ms	60Hz	Now	3.9mm Active to Active, LED				
	LTI550HN14-V				55"	eLED	700 nits	4,000:1						Slim eLED, Landscape / Portrait			
	LTI550HN17-V				55"		500 nits								eLED, Landscape / Portrait		
	LTI460HN08	46"			48"	Slim eLED	700 nits	4,000:1	E-Board; Landscape/Portrait								
	LTI480HN01-0	500 nits					Slim eLED, Landscape / Portrait										
	LTI480HN02-0	700 nits			eLED	450 nits		4,000:1	Slim eLED, Landscape / Portrait								
	LTI550HN06	55"				UHD	Slim eLED						500 nits	120Hz	Landscape / Portrait		
	LTI550HN07-0				500 nits												
	LTI550FN01-N	98"			FHD	Normal	D-LED	400 nits	3,500:1				16. Q2	60Hz	Jan., '17	eLED Landscape / Portrait	
	LTI750HF02-0	75"					UHD	D-LED	500 nits								5,000:1
	LTI750FJ01-N								600 nits								4,000:1
	LTI750FN01-V	500 nits															
	E-Board	LTI550HN15-0			55"	FHD	Narrow	eLED	380 nits				4,000:1	8ms	60Hz	Now	Value PID
		LTI700HA02-0			70"				350 nits								E-Board; Landscape mode only
LTI750HF02-0		75"	Normal	D-LED	450 nits		E-Board; Landscape mode only										
LTI750FN02-N					350 nits												
Outdoor	LTI460HZ01-V	46"	FHD	Narrow	D-LED	5,000 nits	4,000:1	8ms	60Hz	Now	High Bright, Hi Temp LC, 1/4λ Pol.						
	LTI460HF01-V	55"				3,000:1			120Hz								
	LTH550HF04-V(A)						2,500 nits										
	LTI750HF01-V						75"					3,500 nits					
Specialty	LTI290LN01-0	29"	Half FHD	Narrow	eLED	500 nits	4,000:1	16ms	60Hz	Now	Stretched, 40"/2, Hi Temp LC						
	LTI290LN02-0					700 nits					Stretched, 46"/2, Hi Temp LC						
	LTI370LN03-V	37"				1500 nits											
	LTI370LN02-V					1500 nits											

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## Contacts

Feel free to contact your local distributor or sales representative with any Samsung sales inquiries.

### Adelsa | [www.adetronics.com.mx](http://www.adetronics.com.mx)

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	<b>MONTERREY OFFICE</b>		52-818-214-0011	
	<b>CD. JUAREZ OFFICE</b>		52-656-613-3517	
	<b>REYNOSA OFFICE</b>		52-899-922-5540	

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	<b>WASHINGTON</b>	8581 154th Avenue NE Redmond WA 98052	425-869-7636	425-869-9841

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	<b>MAIN OFFICE - INDIANA</b>	11451 Overlook Drive Fishers, IN 46037	440-832-7637	317-845-8650
	<b>MICHIGAN</b>	5506 Alpine Ridge Stevensville, MI 49127	440-526-1991	440-526-5426

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→ For all product information please visit: [www.samsung.com/us/samsungsemiconductor](http://www.samsung.com/us/samsungsemiconductor)

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**IRI Rep** | [www.irirep.com](http://www.irirep.com)

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	<b>DALLAS</b> 2745 Dallas Pkwy, Suite 460 Plano, TX 75093	972-680-2800	972-699-0330
	<b>HOUSTON</b> 24624 Interstate 45 North, Suite 200 Spring, TX 77386	832-940-9600	512-343-1922

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	<b>FLORIDA</b>	704 516-0242	
	<b>GEORGIA</b> 3000 Langford Road, Building 300 Norcross, GA 30071	770-209-9242 678-591-6753	770-209-9245
	<b>NORTH &amp; SOUTH CAROLINA</b> 912 Oleander Lane Waxhaw, NC 28173	704 516-0242	

**Tech Coast Sales** | [www.tc-sales.com](http://www.tc-sales.com)

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