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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 optical disc drives as well as flash storage, such as Solid State Drives, and a range of embedded flash storage products.

Markets

	DRAM	SSD	FLASH	ASIC	LOGIC	LFD/OLED
MOBILE/WIRELESS	●	N/A	●	●	●	●
NOTEBOOK PCs/ ULTRABOOKS™	●	●	●	●	●	●
DESKTOP PCs/ WORKSTATIONS	●	●	●	●	●	●
SERVERS	●	●	●	●	●	●
NETWORKING/ COMMUNICATIONS	●	●	●	●	●	N/A
CONSUMER ELECTRONICS	●	N/A	●	●	●	●

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TABLE OF CONTENTS



DRAM

PAGES 4-14

samsung.com/dram

- DDR4 SDRAM
- DDR3 SDRAM
- DDR2 SDRAM
- Graphics DRAM
- Mobile DRAM
- Ordering Info



FLASH - SSD

PAGES 15-16

samsung.com/flash

- eMMC
- Universal Flash Storage (UFS)
- Solid State Drives (SSD)



MULTI-CHIP PACKAGES

PAGES 17-18

samsung.com/mcp

- eMMC + LPDDR2
- eMMC + LPDDR3



STORAGE

PAGES 19-21

samsung.com/flash-ssd

- Solid State Drives (SSD)



DISPLAYS

PAGES 22-23

samsungdisplay.com

- Public Information Display (PID)
- Product Classification
- SNB/UNB
- Indoor PID
- E-Board
- Outdoor PID



CONTACTS

PAGES 24-25

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
		512M x 8	K4A4G085WD-BCRC/PB	78 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	2400/2133	7.5x11mm	Now
		256M x 16	K4A4G165WD-BCRC/PB	96 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	2400/2133	7.5x13.3mm	Now
		1G x 4	K4A4G045WE-BCRC/PB	78 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	2400/2133	7.5x11mm	Now
		512M x 8	K4A4G085WE-BCRC/PB	78 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	2400/2133	7.5x11mm	Now
		256M x 16	K4A4G165WE-BCRC/PB	96 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	2400/2133	7.5x13.3mm	Now
8Gb	1.2V	1G x 8	K4A8G085WB-BCRC/PB	78 ball FBGA	Lead Free & Halogen Free, Flip Chip	2400/2133	7.5x11mm	Now
		512M x16	K4A8G165WB-BCRC/PB	96 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	2400/2133	7.5x13.3mm	CS: '15, 1Q

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	4Gb (512M x8) * 9	Lead Free & Halogen Free, Flip Chip	2400	1	Now
8GB	1.2V	1G x 72	M393A1G40DB0-CPB	4Gb (1G x4) * 18	Lead Free & Halogen Free, Flip Chip	2133	1	Now
			M393A1G40DB1-CRC	4Gb (1G x4) * 18	Lead Free & Halogen Free, Flip Chip	2400	1	Now
			M393A1G43DB0-CPB	4Gb (512M x8) * 18	Lead Free & Halogen Free, Flip Chip	2133	2	Now
			M393A1G43DB1-CRC	4Gb (512M x8) * 18	Lead Free & Halogen Free, Flip Chip	2400	2	Now
			M393A1G40EB1-CPB	4Gb (1G x4) * 18	Lead Free & Halogen Free, Flip Chip	2133	1	Now
			M393A1G40EB1-CRC	4Gb (1G x4) * 18	Lead Free & Halogen Free, Flip Chip	2400	1	Now
			M393A1G43EB1-CPB	4Gb (512M x8) * 18	Lead Free & Halogen Free, Flip Chip	2133	2	Now
			M393A1G43EB1-CRC	4Gb (512M x8) * 18	Lead Free & Halogen Free, Flip Chip	2400	2	Now
16GB	1.2V	2G x 72	M393A2G40DB0-CPB	4Gb (1G x4) * 36	Lead Free & Halogen Free, Flip Chip	2133	2	Now
			M393A2G40DB1-CRC	4Gb (1G x4) * 36	Lead Free & Halogen Free, Flip Chip	2400	2	Now
			M393A2G40EB1-CPB	4Gb (1G x4) * 36	Lead Free & Halogen Free, Flip Chip	2133	2	Now
			M393A2G40EB1-CRC	4Gb (1G x4) * 36	Lead Free & Halogen Free, Flip Chip	2400	2	Now
			M393A2K40BB0-CPB	8Gb (2G x4) * 18	Lead Free & Halogen Free, Flip Chip	2133	1	Now
			M393A2K40BB1-CRC	8Gb (2G x4) * 18	Lead Free & Halogen Free, Flip Chip	2400	1	Now
			M393A2K43BB1-CPB/CRC	8Gb (1G x8) * 18	Lead Free & Halogen Free, Flip Chip	2133/2400	2	Now
32GB	1.2V	4G x 72	M393A4K40BB0-CPB	8Gb (2G x4) * 36	Lead Free & Halogen Free, Flip Chip	2133	2	Now
			M393A4K40BB1-CRC	8Gb (2G x4) * 36	Lead Free & Halogen Free, Flip Chip	2400	2	Now
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	Now
			M393A8K40B21-CTC	8Gb 2H TSV (4G x4) * 36	Lead Free & Halogen Free, 2High TSV	2400	4	Now
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	4Gb DDP (2G x4) * 36	Lead Free & Halogen Free, DDP	2400	4	Now
			M386A4K40BB0-CRC5	8G (2Gx4)*36	Lead Free & Halogen Free, Flip Chip	2400	2	Now
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	M392A2G40DM0-CPB	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	2	Now
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	4Gb (512M x8) *8	Lead Free & Halogen Free	2133	1	Now
			M378A5143EB2-CRC	4Gb (512M x8) *8	Lead Free & Halogen Free	2400	1	Now
8GB	1.2V	1G x 64	M378A1G43DB0-CPB	4Gb (512M x8) *16	Lead Free & Halogen Free	2133	2	Now
			M378A1G43EB1-CRC	4Gb (512M x8) *16	Lead Free & Halogen Free	2400	2	Now
			M378A1K43BB1-CPB	8Gb (1G x8) *8	Lead Free & Halogen Free	2133	2	Now
			M378A1K43BB2-CRC	8Gb (1G x8) *8	Lead Free & Halogen Free	2400	2	Now
16GB	1.2V	2G x 64	M378A2K43BB1-CPB/CRC	8Gb (1G x8) * 16	Lead Free & Halogen Free	2133/2400	2	Now

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	4Gb (512M x8) * 9	Lead Free & Halogen Free, Flip Chip	2133/2400	1	Now
8GB	1.2V	1G x72	M391A1G43DB0-CPB/CRC	4Gb (512M x8) * 18	Lead Free & Halogen Free, Flip Chip	2133/2400	2	Now
			M391A1K43BB1-CPB/CRC	8Gb (1G x8) * 9	Lead Free & Halogen Free, Flip Chip	2133/2400	2	Now
16GB	1.2V	2G x72	M391A2K43BB1-CPB/CRC	8Gb (1G x8) * 18	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/CRC	4Gb (512M x8) * 8	Lead Free & Halogen Free	2133/2400	1	Now
8GB	1.2V	1G x 64	M471A1G43DB0-CPB	4Gb (512M x8) * 16	Lead Free & Halogen Free	2133	2	Now
			M471A1G43EB1-CPB/CRC	4Gb (512M x8) * 16	Lead Free & Halogen Free	2133/2400	2	Now
			M471A1K43BB1-CPB/CRC	8Gb (1Gx8)*8	Lead Free & Halogen Free	2133/2400	1	Now
16GB	1.2V	2G x 64	M471A2K43BB1-CPB/CRC	8Gb (1G x8) * 16	Lead Free & Halogen Free	2133/2400	2	Now

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	4Gb (512M x8) * 18	Lead Free & Halogen Free, Flip Chip	2400	2	Now
			M474A1G43EB1-CPB/CRC	4Gb (512M x8) * 18	Lead Free & Halogen Free, Flip Chip	2133/2400	2	Now
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	M393B1K70QB0-CMA	2Gb (512M x4) * 36	Lead Free & Halogen Free, Flip Chip	1866	2	EOL (LTS:3/31/16)
			M393B1G70QH0-CMA	4Gb (1G x4) * 18	Lead Free & Halogen Free	1866	1	EOL (LTS:3/31/16)
			M393B1G70EB0-CMA	4Gb (1G x4) * 18	Lead Free & Halogen Free, Flip Chip	1866	1	Now
			M393B1G73QH0-CMA	4Gb (512M x8) * 18	Lead Free & Halogen Free	1866	2	EOL (LTS:3/31/16)
			M393B1G73EB0-CMA	4Gb (512M x8) * 18	Lead Free & Halogen Free, Flip Chip	1866	2	Now
	1.35V		M393B1K70QB0-YK0	2Gb (512M x4) * 36	Lead Free & Halogen Free, Flip Chip	1600	2	EOL (LTS:3/31/16)
			M393B1G70QH0-YK0	4Gb (1G x4) * 18	Lead Free & Halogen Free	1600	1	Now
			M393B1G70EB0-YK0	4Gb (1G x4) * 18	Lead Free & Halogen Free, Flip Chip	1600	1	Now
			M393B1G73EB0-YK0	4Gb (2R x8) * 18	Lead Free & Halogen Free, Flip Chip	1600	2	Now
16GB	1.5V	2G x 72	M393B2G70QH0-CMA	4Gb (1G x4) * 36	Lead Free & Halogen Free	1866	2	EOL (LTS:3/31/16)
			M393B2G70DB0-CMA	4Gb (1G x4) * 36	Lead Free & Halogen Free, Flip Chip	1866	2	Now
			M393B2G70EB0-CMA	4Gb (1G x4) * 36	Lead Free & Halogen Free, Flip Chip	1866	2	Now
	1.35V		M393B2G70QH0-YK0	4Gb (1G x4) * 36	Lead Free & Halogen Free	1600	2	EOL (LTS:3/31/16)
			M393B2G70DB0-YK0	4Gb (1G x4) * 36	Lead Free & Halogen Free, Flip Chip	1600	2	Now
			M393B2G70EB0-YK0	4Gb (1G x4) * 36	Lead Free & Halogen Free, Flip Chip	1600	2	Now
32GB	1.35V	4G x 72	M393B4G70DM0-YH9	4Gb DDP (2G x4) * 36	Lead Free & Halogen Free. DDP	1333	4	Now

Notes: 8 = IDT A1 Evergreen 2 = IDT (E-die) YK = DDR3-1600 (11-11-11)
9 = Inphi UVGS02 3 = Inphi (E-die) 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	M386B4G70DM0-YK0	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)	4Gb QDP (4G x4) * 36	Lead Free & Halogen Free, QDP	1600	8	Now

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	M392B1G70DB0-CMA	4Gb (1Gx4) * 18	Lead Free & Halogen Free, Flip Chip	1866	1	Now
			M392B1G73DB0-CMA	4Gb (512M x8) * 18	Lead Free & Halogen Free, Flip Chip	1866	2	Now
	1.35V		M392B1G70DB0-YK0	4Gb (1Gx4) * 18	Lead Free & Halogen Free, Flip Chip	1600	1	Now
			M392B1G73DB0-YK0	4Gb (512M x8) * 18	Lead Free & Halogen Free, Flip Chip	1600	2	Now
16GB	1.5V	2G x 72	M392B2G70DM0-CMA	4Gb DDP (2G x4) * 18	Lead Free & Halogen Free, DDP	1866	2	Now
	1.35V		M392B2G70DM0-YK0	4Gb DDP (2G x4) * 18	Lead Free & Halogen Free, DDP	1600	2	Now
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	M378B5173QH0-CK0/CMA	4Gb (512M x8) * 8	Lead Free & Halogen Free	1600/1866	1	EOL(LTS: 3/31/16)
			M378B5173DB0-CK0/CMA	4Gb (512M x8) * 8	Lead Free & Halogen Free. Flip Chip	1600/1866	1	Now
			M378B5173EB0-CK0/CMA	4Gb (512M x8) * 8	Lead Free & Halogen Free. Flip Chip	1600/1866	1	Now
	1.35V		M378B5173QH0-YK0/YMA	4Gb (512M x8) * 8	Lead Free & Halogen Free	1600/1866	1	EOL(LTS: 3/31/16)
			M378B5173EB0-YK0/*CMA	4Gb (512M x8) * 8	Lead Free & Halogen Free. Flip Chip	1600/1866	1	Now
8GB	1.5V	1G x 64	M378B1G73QH0-CK0/MA	4Gb (512M x8) * 16	Lead Free & Halogen Free	1600/1866	2	EOL(LTS: 3/31/16)
			M378B1G73DB0-CK0/MA	4Gb (512M x8) * 16	Lead Free & Halogen Free. Flip Chip	1600/1866	2	Now
			M378B1G73EB0-CK0/CMA	4Gb (512M x8) * 16	Lead Free & Halogen Free. Flip Chip	1600/1866	2	Now
	1.35V		M378B1G73QH0-YK0/MA	4Gb (512M x8) * 16	Lead Free & Halogen Free	1600/1866	2	EOL(LTS: 3/31/16)
			M378B1G73EB0-YK0/*CMA	4Gb (512M x8) * 16	Lead Free & Halogen Free. Flip Chip	1600/1866	2	Now

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	M391B5173EB0-CMA	4Gb (512M x8) * 9	Lead Free & Halogen Free	1866	1	Now
	1.35V		M391B5173EB0-YK0	4Gb (512M x8) * 9	Lead Free & Halogen Free	1600	1	Now
8GB	1.5V	1G x 72	M391B1G73QH0-CMA	4Gb (512M x8) * 18	Lead Free & Halogen Free	1866	2	Now
			M391B1G73EB0-CMA	4Gb (512M x8) * 18	Lead Free & Halogen Free	1866	2	Now
	1.35V		M391B1G73EB0-YK0	4Gb (512M x8) * 18	Lead Free & Halogen Free	1600	2	Now

Notes: YK0 = 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	M474B5173EB0-YK0	4Gb (512M x8) * 9	Lead Free & Halogen Free, Flip Chip	1866	1	Now
8GB	1.5V	1G x 72	M474B1G73QH0-CMA	4Gb (512M x8) * 18	Lead Free & Halogen Free	1866	2	EOL(LTS: 3/31/16)
			M474B1G73EB0-CMA	4Gb (512M x8) * 18	Lead Free & Halogen Free, Flip Chip	1866	2	Now
			M474B1G73QH0-YK0	4Gb (512M x8) * 18	Lead Free & Halogen Free	1600	2	EOL(LTS: 3/31/16)
	1.35V		M474B1G73EB0-YK000	4Gb (512M x8) * 18	Lead Free & Halogen Free, Flip Chip	1600	2	Now

DDR3 SDRAM COMPONENTS

Density	Voltage	Organization	Part Number	# Pins- Package	Compliance	Speed (Mbps)	Dimensions	Production
1Gb	1.5V	128M x 8	K4B1G0846G-BCH9/K0/MA	78 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	1333/1600/1866	7.5x11mm	Now
		128M x 16	K4B1G1646G-BCH9/K0/MA/NB	96 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	1333/1600/1866/2133	7.5x13.3mm	Now
		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	Lead Free & Halogen Free, Flip Chip	1600/1866/2133	7.5x13.3mm	Now
	1.35V	128M x 8	K4B1G0846G-BYH9/K0	78 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	1333/1600	7.5x11mm	Now
		128M x 16	K4B1G1646G-BYH9/K0	96 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	1333/1600	7.5x13.3mm	Now
		128M x 8	K4B1G0846I-BYK0/MA	78 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	1600/1800	7.5x11mm	Now
		128M x 16	K4B1G1646I-BYK0/MA	96 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	1600/1800	7.5x13.3mm	Now
2Gb	1.5V	256M x 8	K4B2G0846Q-BCK0/MA/NB	78 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	1600/1866/2133	7.5x11mm	EOL(LTS: 3/31/16)
		128M x 16	K4B2G1646Q-BCK0/MA/NB	96 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	1600/1866/2133	7.5x13.3mm	EOL(LTS: 3/31/16)
		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	Lead Free & Halogen Free, Flip Chip	1600/1866/2133	7.5x13.3mm	Now
	1.35V	512M x 4	K4B2G0446Q-BYK0	78 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	1600	7.5x11mm	EOL(LTS: 3/31/16)
		256M x 8	K4B2G0846Q-BYK0/MA	78 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	1600/1866	7.5x11mm	EOL(LTS: 3/31/16)
		128M x 16	K4B2G1646Q-BYK0/MA	96 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	1600/1866	7.5x13.3mm	EOL(LTS: 3/31/16)
		256M x 8	K4B2G0846F-BK0/MA	78 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	1600/1866	7.5x11mm	Now
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	Lead Free & Halogen Free, Flip Chip	1600/1866/2133	7.5x13.3mm	Now
		512M x 8	K4B4G0846E-BCK0/MA/NB	78 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	1600/1866/2133	7.5x11mm	Now
		256M x 16	K4B4G1646E-BCK0/MA/NB	96 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	1600/1866/2133	7.5x13.3mm	Now
	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	78 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	1600	7.5x11mm	Now
		256M x 16	K4B4G1646D-BYK0/MA	96 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	1600/1866	7.5x13.3mm	Now
		1G x 4	K4B4G0446E-BYK0/MA	78 Ball -FBGA	Lead Free & Halogen Free, Flip Chip	1600/1866	7.5x11mm	Now
8Gb	1.5V	512M x 16	K4B8G1646Q-MCK0/MA	96 Ball -FBGA	Lead Free & Halogen Free	1600/1866	11x13.3mm	Now
			K4G8G1646D-MCK0/MA	96 Ball -FBGA	Lead Free & Halogen Free	1600/1866	11x13.3mm	Now
		512M x 16	K4B8G1646Q-MYK0	96 Ball -FBGA	Lead Free & Halogen Free	1600	11x13.3mm	Now
			K4G8G1646D-MYK0/ (MA)	96 Ball -FBGA	Lead Free & Halogen Free	1600 / (1866)	11x13.3mm	Now
	1.35V	512M x 16	K4B8G1646Q-MYK0	96 Ball -FBGA	Lead Free & Halogen Free	1600	11x13.3mm	Now
			K4G8G1646D-MYK0/ (MA)	96 Ball -FBGA	Lead Free & Halogen Free	1600 / (1866)	11x13.3mm	Now
		512M x 16	K4B8G1646Q-MYK0	96 Ball -FBGA	Lead Free & Halogen Free	1600	11x13.3mm	Now
			K4G8G1646D-MYK0/ (MA)	96 Ball -FBGA	Lead Free & Halogen Free	1600 / (1866)	11x13.3mm	Now

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	K4T51083QQ-BC(E6/F7/E7/F8)	60-FBGA	7.5x9.5mm	Lead free & Halogen free , Flip chip	667/800/1066	Now
	32M x 16	K4T51163QQ-BC(E6/F7/E7/F8)	84-FBGA	7.5x12.5mm	Lead free & Halogen free , Flip chip	667/800/1066	Now
1Gb	128M x 8	K4T1G084QG-BC(E6/F7/E7/F8)	60-FBGA	7.5x9.5mm	Lead free & Halogen free , Flip chip	667/800/1066	Now
	64M x 16	K4T1G164QG-BC(E6/F7/E7/F8)	84-FBGA	7.5x12.5mm	Lead free & Halogen free , Flip chip	667/800/1066	Now

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)	170-FCFBGA	1.5V/1.5V	6000/7000/8000	Now
			K4G80325FB-HC(03/28/25)	170-FCFBGA	1.35V/1.35V	5000/6000/(TBD)	Now
	4Gb	128M x 32	K4G41325FE-HC2(03/28/25/22)	170-FCFBGA	1.5V/1.5V	6000/7000/8000/9000	Now
			K4G41325FE-HC2(03/28/25/22)	170-FCFBGA	1.35V/1.35V	5000/6000/7000/TBD	Now
gDDR3	4Gb	256M x 16	K4W4G1646E-BC(1A/1B)	96-FCFBGA	1.5V/1.5V	2133/2400	Now
			K4W4G1646E-BC(1A/1B)	96-FCFBGA	1.35V/1.35V	1866/2133	Now
	2Gb	128M x 16	K4W2G1646Q-BC(12/11/1A)	96-FCFBGA	1.5V/1.5V	1600/1866/2133	Now
			K4W2G1646Q-BC(1A)	96-FCFBGA	1.35V/1.35V	1866	Now
			K4W2G1646Q-BY(12)	96-FCFBGA	1.35V/1.35V	1600	Now

Notes: Package & Speed Bin Codes

H: FBGA (Halogen Free & Lead Free) (DDR3)	03: 0.3ns (6000Mbps)
B: FCFBGA (Halogen Free & Lead Free) (DDR3)	04: 0.4ns (5000Mbps)
H: FCFBGA (Halogen Free & Lead Free) (GDDR5)	05: 0.5ns (4000Mbps)
F: FBGA (Halogen Free & Lead Free) (GDDR5)	1B: 8.3ns (2400Mbps gDDR3)
22: 0.22ns (9000Mbps)	1A: 1.0ns (2133Mbps gDDR3)
25: 0.25ns (8000Mbps)	11: 1.1ns (1866Mbps)
28: 0.28ns (7000Mbps)	12: 1.25ns (1600Mbps)

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	1.8V/1.2V/1.2V	Now
		2CH x 32	K3QF1F10EM-AGCE	253-FBGA, 11x11.5, DDP, 1600Mbps	1.8V/1.2V/1.2V	Now
			K3QF1F10EM-BGCE	216-FBGA, 12x12, DDP, 1600Mbps	1.8V/1.2V/1.2V	Now
			K3QF1F10EM-FGCE	256-FBGA, 14x14, DDP, 1600Mbps	1.8V/1.2V/1.2V	Now
	12Gb	1CH x 32	K4E2E304EA-AGCF	168-FBGA, 12x12, DDP, 1866Mbps	1.8V/1.2V/1.2V	Now
			K4E2E304EA-AGCF	168-FBGA, 12x12, DDP, 1866Mbps	1.8V/1.2V/1.2V	Now
	16Gb	1CH x 32	K4E6E304EB-EGCF	178-FBGA, 11x11.5, DDP, 1866Mbps	1.8V/1.2V/1.2V	Now
			K4E6E304EB-AGCF	168-FBGA, 12x12, DDP, 1866Mbps	1.8V/1.2V/1.2V	Now
		2CH x 32	K3QF2F20BM-AGCF	253-FBGA, 11x11.5, DDP, 1866Mbps	1.8V/1.2V/1.2V	Now
			K3QF3F30BM-BGCF	216-FBGA, 12x12, DDP, 1866Mbps	1.8V/1.2V/1.2V	Now
			K3QF3F30BM-FGCF	256-FBGA, 14x14, DDP, 1866Mbps	1.8V/1.2V/1.2V	Now
			K3QF3F30BM-QGCF	216-FBGA, 15x15, DDP, 1866Mbps	1.8V/1.2V/1.2V	Now
	24Gb	1CH x 32	K4EHE304EA-AGCF	168-FBGA, 12x12, QDP, 1866Mbps	1.8V/1.2V/1.2V	Now
			K3QF6F60AM-BGCF	216-FBGA, 12x12, QDP, 1866Mbps	1.8V/1.2V/1.2V	Now
		2CH x 32	K3QF6F60AM-FGCF	256-FBGA, 14x14, QDP, 1866Mbps	1.8V/1.2V/1.2V	Now
			K3QF6F60AM-QGCF	216-FBGA, 15x15, QDP, 1866Mbps	1.8V/1.2V/1.2V	Now
	32Gb	1CH x 32	K4EBE304EB-EGCF	178-FBGA, 11x11.5, QDP, 1866Mbps	1.8V/1.2V/1.2V	Now
		2CH x 32	K3QF4F40BM-AGCF	253-FBGA, 11x11.5, QDP, 1866Mbps	1.8V/1.2V/1.2V	Now
			K3QF4F40BM-FGCF	256-FBGA, 14x14, QDP, 1866Mbps	1.8V/1.2V/1.2V	Now
LPDDR4	8Gb	2CH x 16	K4F8E304HB-MGCJ	200-FBGA, 10x15, SDP, 3733Mbps	1.8V/1.1V/1.1V	Now
	12Gb	2CH x 16	K4F2E3S4HM-MGCJ	200-FBGA, 10x15, SDP, 3733Mbps	1.8V/1.1V/1.1V	Now
	16Gb	2CH x 16	K4F6E304HB-MGCJ	200-FBGA, 10x15, DDP, 3733Mbps	1.8V/1.1V/1.1V	Now
		4CH x 16	K3RG1G10BM-MGCH	366-FBGA, 15x15, DDP, 3200Mbps	1.8V/1.1V/1.1V	Now
	24Gb	2CH x 16	K4FHE3D4HM-MFCH	200-FBGA, 10x15, DDP, 3200Mbps	1.8V/1.1V/1.1V	CS
		4CH x 16	K3RG4G40MM-AGCH	272-FBGA, 15x15, DDP, 3200Mbps	1.8V/1.1V/1.1V	CS
			K3RG4G40MM-MGCJ	366-FBGA, 15x15, DDP, 3733Mbps	1.8V/1.1V/1.1V	Now
	32Gb	4CH x 16	K3RG2G20BM-AGCH	272-FBGA, 15x15, QDP, 3200Mbps	1.8V/1.1V/1.1V	Now
			K3RG2G20BM-MGCJ	366-FBGA, 15x15, QDP, 3733Mbps	1.8V/1.1V/1.1V	Now
			K3RG2G20BM-FGCH	432-FBGA, 15x15, QDP, 3200Mbps	1.8V/1.1V/1.1V	CS
	48Gb	4CH x 16	K3RG6G60MM-MGCJ	366-FBGA, 15x15, QDP, 3733Mbps	1.8V/1.1V/1.1V	CS

[illegible]

L TSOP II (Lead-free & Halogen-free)
N: STSOP II
T: TSOP II
U: TSOP II (Lead-free)
V: sTSOP II (Lead-free)

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											
DRAM											Speed
DRAM Type											Temp & Power
Density											Package Type
Bit Organization											Generation
											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

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

**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"

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 & LVTTTL (SDR Only)
- 5: 8K/64ms Ref., 4Banks & LVTTTL (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: sTSOP
- Q: FBGA QDP (Lead-free)
- T: TSOP II (400mil)
- U: TSOP II (Lead-Free)
- V: sTSOP 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)

Application	Interface	Bandwidth	Density	Flash Die	Part Number	Seq R/W MB/s	Random R/W IOPS	mm Pkg Size (X,Y,Z)	Status	
High Performance	UFS 2.0	6Gb/s per lane Up to 2 lanes	256GB	256Gb*8	KLUEG8U1EM-B0B10**	850/260	50K / 30K	11.5 x 13.0 x 1.2	Sampling	
		6Gb/s per lane 1 lane only	128GB	128Gb*8	KLUDG8J1CB-B0B10**	460/160	20K / 14K	11.5 x 13.0 x 1.0	MP	
			64GB	128Gb*4	KLUCG4J1CB-B0B10**					
			32GB	64Gb*4	KLUBG4G1CE-B0B10**					
			16GB	64Gb*2	KLUAG2G1CE-B0B10**	440/80	18K / 10K			
Mainstream	eMMC v5.1	400 MB/s	128GB	128Gb*8	KLMDG8JENB-B0410**	310/140	14K / 14K	11.5 x 13.0 x 1.0	MP	
			64GB	128Gb*4	KLMCG4JENB-B0410**			11.5 x 13.0 x 0.8		
			32GB	128Gb*2	KLMBG2JENB-B0410**	310/70	13K / 14K	11.5 x 13.0 x 0.8		
	eMMC v5.0		64GB	64Gb*8	KLMCG8GEND-B0310**	250/100	6.5K / 13K	11.5 x 13.0 x 1.0		
			32GB	64Gb*4	KLMBG4GEND-B0310**		6.5K / 12K	11.5 x 13.0 x 1.0		
			128GB	64Gb*16	KLMDGAWEBD-B0310**	250/45	6K / 5K	11.5 x 13.0 x 1.4		
			64GB	64Gb*8	KLMCG8WEBD-B0310**	260/46		11.5 x 13.0 x 1.0		
			32GB	64Gb*4	KLMBG4WEBD-B0310**			11.5 x 13.0 x 1.0		
Low End	eMMC v5.1	400 MB/s	16GB	128Gb*1	KLMAG1JENB-B0410**	285/40	8K / 10K	11.5 x 13.0 x 0.8	MP	
			8GB	64Gb*1	KLM8G1GEME-B0410**	185/40	5.2K / 2.5K	11.5 x 13.0 x 0.8		
	eMMC v5.0		16GB	64Gb*2	KLMAG2GEND-B0310**	230/50	6.5K / 6K	11.5 x 13.0 x 0.8		
			8GB	64Gb*1	KLM8G1GEND-B0310**	160/25	6.5K / 2.5K	11.5 x 13.0 x 0.8		
			4GB	32Gb*1	KLM4G1FEPD-B0310**	120/20	5K / 0.5K	11.0 x 10.0 x 0.8		
			16GB	64Gb*2	KLMAG2WEPD-B0310**	150/12	5K / 1.2K	11.5 x 13.0 x 0.8		
			8GB	64Gb*1	KLM8G1WEPD-B0310**	140/8	5K / 0.6K	11.5 x 13.0 x 0.8		

MMC5.1 is backwards compatible with 5.0 & 4.5

*Denotes bucket code for latest firmware patch

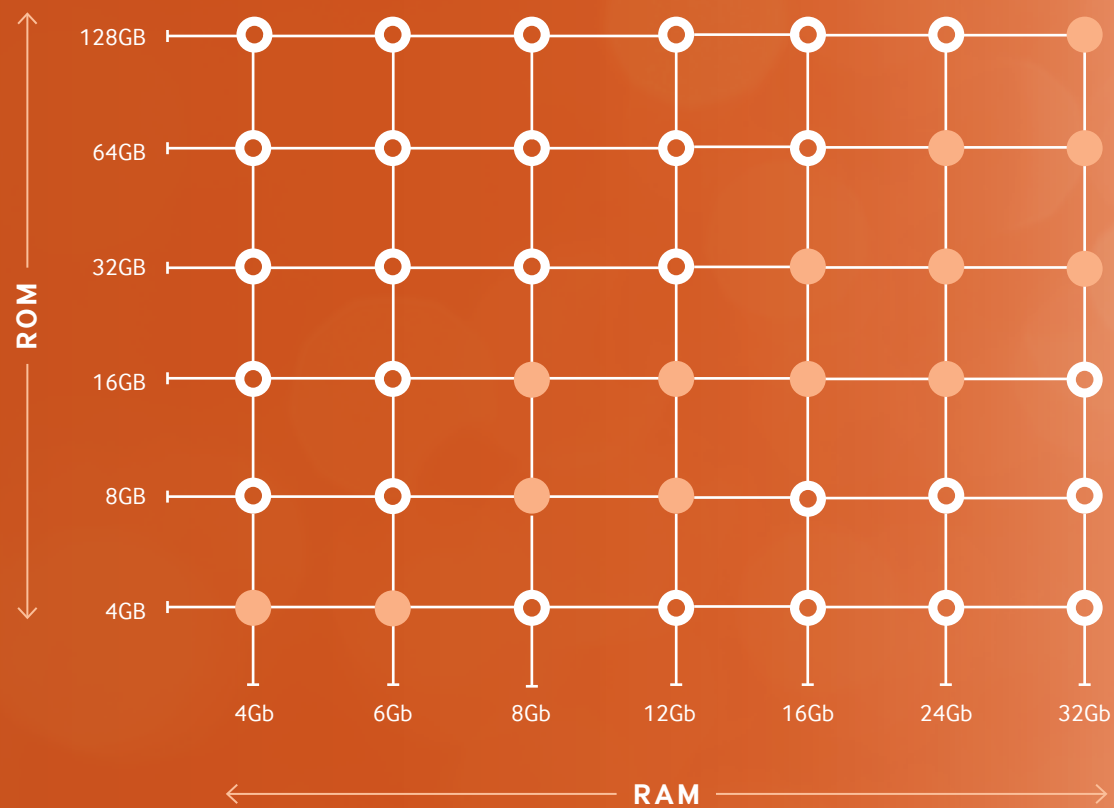
SOLID STATE DRIVES (SSD)

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	MZNLN256MHQ-00000
			PCIe Gen 3 x4 @ 32Gbit/s (NVMe)		PM951		512	MZNLN512HMLH-00000
							1024	MZNLN1T0HMLH-00000
							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	MZ7LM240MHQ-00005
							480	MZ7LM480MHQ-00005
							960	MZ7LM960HMLH-00005
							1920	MZ7LM1T9HMLH-00005
							3840	MZ7LM3T8HMLH-00005
					SM863	3.6 DWPD for 5 Years	120	MZ7KM120HAFD-00005
							240	MZ7KM240HAGR-00005
							480	MZ7KM480HAGR-00005
							960	MZ7KM960HAGR-00005
							1920	MZ7KM1T9HAGR-00005
						10 DWPD for 5 Years	100	MZ7KM120HAFD-00005
							200	MZ7KM240HAGR-00005
							400	MZ7KM480HAGR-00005
							800	MZ7KM960HAGR-00005
							1600	MZ7KM1T9HAGR-00005
			PCIe Gen 3x4 @ 32Gbit/s (NVMe)	U.2 (SFF-8639)	PM963	0.8 DWPD for 5 Years	480	MZQLW480MHQ-00003
							960	MZQLW960HMLH-00003
							1920	MZQLW1T9HMLH-00003
							3840	MZQLW3T8HMLH-00003
					SM963	3.6 DWPD for 5 Years	960	MZQKW960HMLH-00003
							1920	MZQKW1T9HMLH-00003
							3840	MZQKW3T8HMLH-00003
							800	MZQKW960HMLH-00003
						10 DWPD for 5 Years	1600	MZQKW1T9HMLH-00003
							3200	MZQKW3T8HMLH-00003
		M.2 22 x 110 mm	M.2	PM963	0.8 DWPD for 5 Years	480	MZ1LW480MHQ-00003	
						960	MZ1LW960HMLH-00003	
						1920	MZ1LW1T9HMLH-00003	
						960	MZ1KW960HMLH-00003	
				SM963	3.6 DWPD for 5 Years	1920	MZ1KW1T9HMLH-00003	
						800	MZ1KW960HMLH-00003	
					10 DWPD for 5 Years	1600	MZ1KW1T9HMLH-00003	
							MZ1KW1T9HMLH-00003	

Samsung has a portfolio of eMCP products for a variety of devices, such as mobile phones and tablets. The following illustration shows Samsung's lineup of eMCP memory solutions, which can be deployed in almost any application.

→ Samsung eMCP product suite with different densities and types of Mobile DRAM and eMMC

eMCP = eMMC + LPDDR3



eMCP: 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	221FBGA 11.5 x 13mm
		6Gb (x32)	3.3V/1.8V - 1.8V/1.2V	221FBGA 11.5 x 13mm
	8GB	8Gb (x32)	3.3V/1.8V - 1.8V/1.2V	221FBGA 11.5 x 13mm
		6Gb*2 (x32)	3.3V/1.8V - 1.8V/1.2V	221FBGA 11.5 x 13mm
	16GB	8Gb (x32)	3.3V/1.8V - 1.8V/1.2V	221FBGA 11.5 x 13mm
		6Gb*2 (x32)	3.3V/1.8V - 1.8V/1.2V	221FBGA 11.5 x 13mm
		8Gb*2 (x32)	3.3V/1.8V - 1.8V/1.2V	221FBGA 11.5 x 13mm
		6Gb*4 (x32)	3.3V/1.8V - 1.8V/1.2V	221FBGA 11.5 x 13mm
	32GB	8Gb*2 (x32)	3.3V/1.8V - 1.8V/1.2V	221FBGA 11.5 x 13mm
		6Gb*4 (x32)	3.3V/1.8V - 1.8V/1.2V	221FBGA 11.5 x 13mm
		8Gb*4 (x32)	3.3V/1.8V - 1.8V/1.2V	221FBGA 11.5 x 13mm
	64GB	6Gb*4 (x32)	3.3V/1.8V - 1.8V/1.2V	221FBGA 11.5 x 13mm
		8Gb*4 (x32)	3.3V/1.8V - 1.8V/1.2V	221FBGA 11.5 x 13mm
	128GB	8Gb*4 (x32)	3.3V/1.8V - 1.8V/1.2V	221FBGA 11.5 x 13mm

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)	3.3V/1.8V - 1.8V/1.2V	168FBGA 12x12mm
	4GB	4Gb (x32)	3.3V/1.8V - 1.8V/1.2V	136FBGA 10x10mm
		6Gb (x32)	3.3V/1.8V - 1.8V/1.2V	136FBGA 10x10mm
	8GB	8Gb (x32)	3.3V/1.8V - 1.8V/1.2V	136FBGA 10x10mm

Solid State Drives (SSDs)

	Client PC / Embedded		Datacenter		Enterprise	
	LEGACY PC CLIENT	HIGH PERFORMANCE PC CLIENT	LEGACY DATACENTER SERIES	HIGH PERFORMANCE DATACENTER SERIES	ENTERPRISE STORAGE SERIES High Availability Primary Storage	EXTREME PERFORMANCE SERIES Cache Applications
	PM871a	PM951	PM863a	PM963	PM1633/PM1633a	PM1725a
Host Interface	SATA 3.0 @ 6 Gbit/s	PCIe Gen 3 x4 @ 32Gbit/s (NVMe)	SATA 3.0 @ 6 Gbit/s	PCIe Gen 3 x4 @ 32Gbit/s (NVMe)	SAS 3.0 @ 12 Gbit/s	PCIe Gen 3 x8 @ 64Gbit/s (NVMe)
Form Factor	M.2	M.2	2.5"	M.2	2.5"	Add-in Card (HHHL)
Capacity (GB)	256/512/1024	128/256/512	240/480/960/1920/3840	480/960/1920	480/960/1920/3840/7680/15360	1600/3200/6400
Endurance (up to)	Client workload	Client workload	0.8 DWPD for 5 Years	0.8 DWPD for 5 Years	1-3 DWPD for 5 Years	5-10 DWPD for 5 Years
Power Consumption (Active)	100 mW	4.5 W	4.1 W	7 W	12 W	25 W
Power Consumption (Idle)	2 mW (DevSlp)	2.5 mW (L1.2)	1.3 W	1.9 W	4 W	7 W
Random Reads (up to)	97,000 IOPS	270,000 IOPS	99,000 IOPS	240,000 IOPS	200,000 IOPS	1,000,000 IOPS
Random Writes (up to)	88,000 IOPS	150,000 IOPS	18,000 IOPS	19,000 IOPS	37,000 IOPS	140,000 IOPS
Sequential Reads (up to)	530 MB/s	1,820 MB/s	540 MB/s	1,000 MB/s	1,400 MB/s	6,000 MB/s
Sequential Writes (up to)	515 MB/s	600 MB/s	480 MB/s	870 MB/s	930 MB/s	1,900 MB/s
MTBF	1.5 Million Hours	1.5 Million Hours	2.0 Million Hours	2.0 Million Hours	2.0 Million Hours	2.0 Million Hours
Uncorrectable Bit Error Rate (UBER)	1 in 10 ¹⁵	1 in 10 ¹⁵	1 in 10 ¹⁷	1 in 10 ¹⁷	1 in 10 ¹⁷	1 in 10 ¹⁷
Physical Dimensions	22 x 80 x 2.38 mm	22 x 80 x 3.7 mm	100 x 70 x 7mm	22 x 110 x 5.48 mm	100 x 70 x 15 mm	168 x 70 x 19 mm (HHHL)
Weight	9.0 g	8.0 g	60 g	15 g	140 g	320 g

→ Which SSD is right for you?

For more information, email: SSD@ssi.samsung.com

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
			PCIe Gen 3 x4 @ 32Gbit/s (NVMe)		PM951		512	MZNLN512HMLP-00000
							1024	MZNLN1T0HMLH-00000
							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	MZ7LM960HMLP-00005
							1920	MZ7LM1T9HMLP-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
			PCIe Gen 3x4 @ 32Gbit/s (NVMe)	U.2 (SFF-8639)	PM963	0.8 DWPD for 5 Years	480	MZQLW480HMHQ-00003
							960	MZQLW960HMLP-00003
							1920	MZQLW1T9HMLP-00003
							3840	MZQLW3T8HMLP-00003
					SM963	3.6 DWPD for 5 Years	960	MZQKW960HMLP-00003
							1920	MZQKW1T9HMLP-00003
							3840	MZQKW3T8HMLH-00003
							800	MZQKW960HMLP-00003
						10 DWPD for 5 Years	1600	MZQKW1T9HMLP-00003
							3200	MZQKW3T8HMLH-00003
		M.2 22 x 110 mm	M.2	PM963	0.8 DWPD for 5 Years	480	MZ1LW480HMHQ-00003	
						960	MZ1LW960HMLP-00003	
						1920	MZ1LW1T9HMLS-00003	
						960	MZ1KW960HMLP-00003	
				SM963	3.6 DWPD for 5 Years	1920	MZ1KW1T9HMLP-00003	
						800	MZ1KW960HMLP-00003	
					10 DWPD for 5 Years	1600	MZ1KW1T9HMLP-00003	
						1600	MZ1KW1T9HMLP-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
					PM1633	3 DWPD for 5 Years	400	MZILS480HCGR-00003
							800	MZILS960HCHP-00003
							1600	MZILS1T9HCHP-00003
							3200	MZILS3T8HCJM-00003
			PCIe Gen 3x4 @ 32Gbit/s (NVMe)	U.2 (SFF-8639)	PM1633a	1 DWPD for 5 Years	7680	MZILS7T6HMLS-00003
							15360	MZILS15THMLS-00003
		Add-in Card (HHHL)	PCIe Gen 3 x8 @ 64Gbit/s (NVMe)	Edge Connector	PM1725a	3 DWPD for 5 Years	6400	MZILS7T6HMLS-00003
							12800	MZILS15THMLS-00003
						5 DWPD for 5 Years	800	MZWLL800HEHP-00003
							1600	MZWLL1T6HEHP-00003
							3200	MZWLL3T2HMLJP-00003
							6400	MZWLL6T4HMLS-00003
							1600	MZPLL1T6HEHP-00003
							3200	MZPLL3T2HMLJP-00003
							6400	MZPLL6T4HMLT-00003

Public Information Display (PID) Product Classification

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

Why PID instead of TV?

	COMMERCIAL (PID)	CONSUMER (TV)
WARRANTY	18 months to 2 years	90 days to 1 year
RELIABILITY	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
PRODUCTION LIFECYCLE	24-36 months	12-15 months
PICTURE QUALITY	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
LOCATION	Most models portrait capable	Can only be oriented in landscape mode

Product Segmentation

HEAVY USE ↑ ↓ LIGHT USE	SNB / UNB	Professional - Control Room - Simulation	Indoor Events - Scoreboard - Sports Broadcasting	Billboard Dynamic Signage
	Indoor PID	Entertainment - Casino - Theatre - Menu	Transportation - Airport - Train/Bus Station	Communication Conference Room
	E-Board PID	Commercial - Kiosk - Conference Systems	Education Interactive FPD	Hospitality Hotel Signage
	Outdoor PID	Commercial - Kiosk - Conference Systems	Education Interactive FPD	Hospitality 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	LTI460HN01 (EOL '15.4Q)	46"	FHD	Super narrow	D-LED	700 nits	3,000:1	8ms	60Hz	Now	5.9mm Active to Active, LED
	LTI460HN09	46"	FHD	Super narrow	D-LED	500 nits	3,000:1	8ms	60Hz	Now	5.9mm Active to Active, LED
	LTI460HN11	46"	FHD	Ultra narrow	D-LED	500 nits	3,000:1	8ms	60Hz	Now	3.9mm Active to Active, LED
	LTI460HN12	46"	FHD	Ultra narrow	D-LED	700 nits	3,000:1	8ms	60Hz	Now	3.9mm Active to Active, LED
	LTI550HN01 (EOL '15.4Q)	55"	FHD	Super narrow	D-LED	700 nits	3,000:1	8ms	60Hz	Now	5.9mm Active to Active, LED
	LTI550HN08 (EOL '16.2Q)	55"	FHD	Super narrow	D-LED	500 nits	3,000:1	8ms	60Hz	Now	5.7mm Active to Active, LED
	LTI550HN11-V	55"	FHD	Ultra narrow	D-LED	500 nits	3,000:1	8ms	60Hz	Now	3.9mm Active to Active, LED
	LTI550HN12-V	55"	FHD	Ultra narrow	D-LED	700 nits	3,000:1	8ms	60Hz	Now	3.9mm Active to Active, LED
	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 (MP '16.2Q)	55"	FHD	Extreme narrow	D-LED	700 nits	3,000:1	8ms	60Hz	Now	1.94mm Active to Active, LED
Indoor PID	LTI400HA10	40"	FHD	Narrow	eLED	700 nits	3,000:1	8ms	60Hz	Now	eLED, Landscape / Portrait
	LTI460HN08	46"	FHD	Narrow	eLED	700 nits	4,000:1	8ms	60Hz	Now	eLED, Landscape / Portrait
	LTI480HN01	48"	FHD	Narrow	Slim eLED	700 nits	4,000:1	8ms	60Hz	16. Q4	Slim eLED, Landscape / Portrait
	LTI480HN02	48"	FHD	Narrow	Slim eLED	500 nits	4,000:1	8ms	60Hz	16. Q4	Slim eLED, Landscape / Portrait
	LTI550HN06	55"	FHD	Narrow	eLED	700 nits	4,000:1	8ms	60Hz	Now	eLED, Landscape / Portrait
	LTI550HN07	55"	FHD	Narrow	eLED	450 nits	4,000:1	8ms	60Hz	Now	E-Board; Landscape/Portrait
	LTI550FN01	55"	UHD	Narrow	Slim eLED	500 nits	4,000:1	8ms	60Hz	16. Q3	Slim eLED, Landscape / Portrait
	LTI750HF02-0	75"	FHD	Normal	D-LED	400 nits	3,500:1	8ms	120Hz	Now	Landscape / Portrait
	LTI750FJ01	75"	UHD	Normal	D-LED	500 nits	5,000:1	8ms	120Hz	Now	Landscape / Portrait
	LTI750FN01	75"	UHD	Normal	eLED	600 nits	4,000:1	8ms	60Hz	16. Q2	eLED Landscape / Portrait
E-Board	LTI980FN01	98"	UHD	Normal	eLED	500 nits	4,000:1	8ms	60Hz	16. Q2	eLED Landscape / Portrait
	LTI700HN02	70"	FHD	Normal	eLED	350 nits	4,000:1	8ms	60Hz	16. Q2	E-Board; Landscape mode only
Outdoor	LTI750FN02	75"	UHD	Normal	eLED	350 nits	4,000:1	8ms	60Hz	16. Q3	E-Board; Landscape mode only
	LTI460HZ01	46"	FHD	Narrow	D-LED	5,000 nits	4,000:1	8ms	60Hz	Now	High Bright, Hi Temp LC, 1/4λ Pol.
	LTI460HF01-V	46"	FHD	Narrow	D-LED	2,500 nits	3,000:1	8ms	120Hz	Now	High Bright, Hi Temp LC, 1/4λ Pol.
	LTH550HF04-V	55"	FHD	Narrow	D-LED	2,500 nits	3,000:1	8ms	120Hz	Now	High Bright, Hi Temp LC, 1/4λ Pol.
Specialty	LTI750HF01-V	75"	FHD	Narrow	D-LED	3,500 nits	3,000:1	8ms	120Hz	Now	High Bright, Hi Temp LC, 1/4λ Pol.
	LTI290LN01	29"	Half FHD	Narrow	eLED	500 nits	4,000:1	16ms	60Hz	16. Q2	Stretched, 40"/2, Hi Temp LC
	LTI290LN02	29"	Half FHD	Narrow	eLED	700 nits	4,000:1	16ms	60Hz	16. Q3	Stretched, 40"/2, Hi Temp LC
	LTI370LN01	37"	Half FHD	Narrow	eLED	700 nits	4,000:1	16ms	60Hz	16. Q2	Stretched, 46"/2, Hi Temp LC
	LTI370LN02	37"	Half FHD	Narrow	eLED	1500 nits	4,000:1	16ms	60Hz	16. Q3	Stretched, 46"/2, Hi Temp LC

Contacts

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

Adelsa | www.adetronics.com.mx

PRODUCTS	ADDRESS		MAIN PHONE	FAX
Memory, SLSI, LCD	MEXICO	Hacienda Corralejo #80, Bosque de Echegaray, Naucalpan, Mexico 53310	52-555-560-5002	
	GUADALAJARA OFFICE		52-333-122-3054	
	MONTERREY OFFICE		52-818-214-0011	
	CD. JUAREZ OFFICE		52-656-613-3517	
	REYNOSA OFFICE		52-899-922-5540	

ATMI Sales | www.atmisales.com

PRODUCTS	ADDRESS		MAIN PHONE	FAX
Memory, LCD	OREGON	4900 S.W. Griffith Drive, Suite 253 Beaverton, OR 97005	1-800-898-2446, 503-643-8307	503-643-4364
	WASHINGTON	8581 154th Avenue NE Redmond WA 98052	425-869-7636	425-869-9841

Bear VAI Technology | www.bearvai.com

PRODUCTS	ADDRESS		MAIN PHONE	FAX
Memory, SLSI, LCD	MAIN OFFICE - BRECKSVILLE, OHIO	6910 Treeline Drive, Unit H Brecksville, OH 44141	440-526-1991	440-526-5426
	MAIN OFFICE - INDIANA	11451 Overlook Drive Fishers, IN 46037	440-832-7637	317-845-8650
	MICHIGAN	17426 Willow Ridge Drive Northville, MI 48168	440-526-1991	440-526-5426

Core Sales, Inc. | www.coresales.com

PRODUCTS	ADDRESS		MAIN PHONE	FAX
Memory, SLSI, LCD	901 Warrenville Road, Suite 211, Lisle, IL 60532		847-843-8888	

Crestone Technology Group | www.crestonegroup.com

PRODUCTS	ADDRESS		MAIN PHONE	FAX
Memory, SLSI, LCD	UTAH OFFICE	1578 Trailside Road Farmington, UT 84025	801-245-9752	
	COLORADO	7108 S. Alton Way, Building L, Suite A Centennial, CO 80112	303-280-7202	720-482-2220

Customer 1st | www.customer1st.com

PRODUCTS	ADDRESS		MAIN PHONE	FAX
Memory, SLSI, LCD	MINNESOTA	2950 Metro Drive, Suite 101 Bloomington, MN 55425	952-851-7909	952-851-7907
	KANSAS	2111 E. Crossroad Lane, #202 Olathe, KS 66062		

→ For all product information please visit: www.samsung.com/us/samsungsemiconductor

InTELaTECH | www.intelatech.com

PRODUCTS	ADDRESS	MAIN PHONE	FAX
Memory, SLSI	5225 Orbitor Drive, Suite 2, Mississauga, ONT Canada L4W 4Y8	905-629-0082	905-624-6909 905-629-1795 905-629-8910
	21 Concourse Gate, Suite 12, Ottawa, ONT Canada K2E 7S4	905-629-0082	613-221-9160

I-Squared Incorporated | www.isquared.com

PRODUCTS	ADDRESS	MAIN PHONE	FAX
Memory, SLSI, LCD	2635 N. 1st Street, Suite 128, San Jose, CA 95134	408-988-3400	408-988-2079
	1250 B Street, Petaluma, CA 94952	707-773-3108	

Neptune Electronics (necco) | www.neccoelect.com

PRODUCTS	ADDRESS	MAIN PHONE	FAX
Memory, SLSI, LCD	11 Oval Drive, Suite 169, Islandia, NY 11749	631-234-2525	631-234-2707

New Elpis, Inc. | www.newelpis.com

PRODUCTS	ADDRESS	MAIN PHONE	FAX
LCD	165 Dundas St. W., Suite 702, Mississauga, ONT, Canada L4Z 2H6	905-275-3516	905-275-4109

New Tech Solutions

PRODUCTS	ADDRESS	MAIN PHONE	FAX
Memory, SLSI, LCD	26 Ray Avenue, Burlington, MA 01803	781-229-8888	781-229-1614

Rep One Associates, Inc. | www.repone.com

PRODUCTS	ADDRESS		MAIN PHONE	FAX
Memory, SLSI, LCD	ALABAMA	303 Williams Avenue, Suite 1011 Huntsville, AL 35801	256-539-7371	256-533-4509
	GEORGIA	3000 Langford Road, Bldg 300 Norcross, GA 30071	770-209-9242 678-591-6753	770-209-9245

Tech Coast Sales | www.tc-sales.com

PRODUCTS	ADDRESS	MAIN PHONE	EMAIL
Memory, SLSI, LCD	23121 Verdugo Drive, Suite 101, Laguna Hills, CA 92653	949-305-6869	sales@tc-sales.com

West Associates | www.westassociates.com

PRODUCTS	ADDRESS		MAIN PHONE	FAX
Memory, SLSI, LCD	AUSTIN / SAN ANTONIO	4100 Duval Road, Building 1, Suite 102, Austin, TX 78759	512-343-1199	512-343-1922
	DALLAS / OKLAHOMA / ARKANSAS	2745 Dallas Parkway, Suite 460, Plano, TX 75093	972-680-2800	972-699-0330
	HOUSTON / VALLEY / LOUISIANA	24624 Interstate 45 North, Suite 200, Spring, TX 77386	512-343-1199	512-343-1922

This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Notes

This image shows a full page of blank, lined paper. It features approximately 20 horizontal blue lines spaced evenly across the page, typical of notebook paper. The lines are thin and light blue, set against a plain white background. There is no handwriting or other markings on the page.

SAMSUNG

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