

Company Profile & Product Roadmap

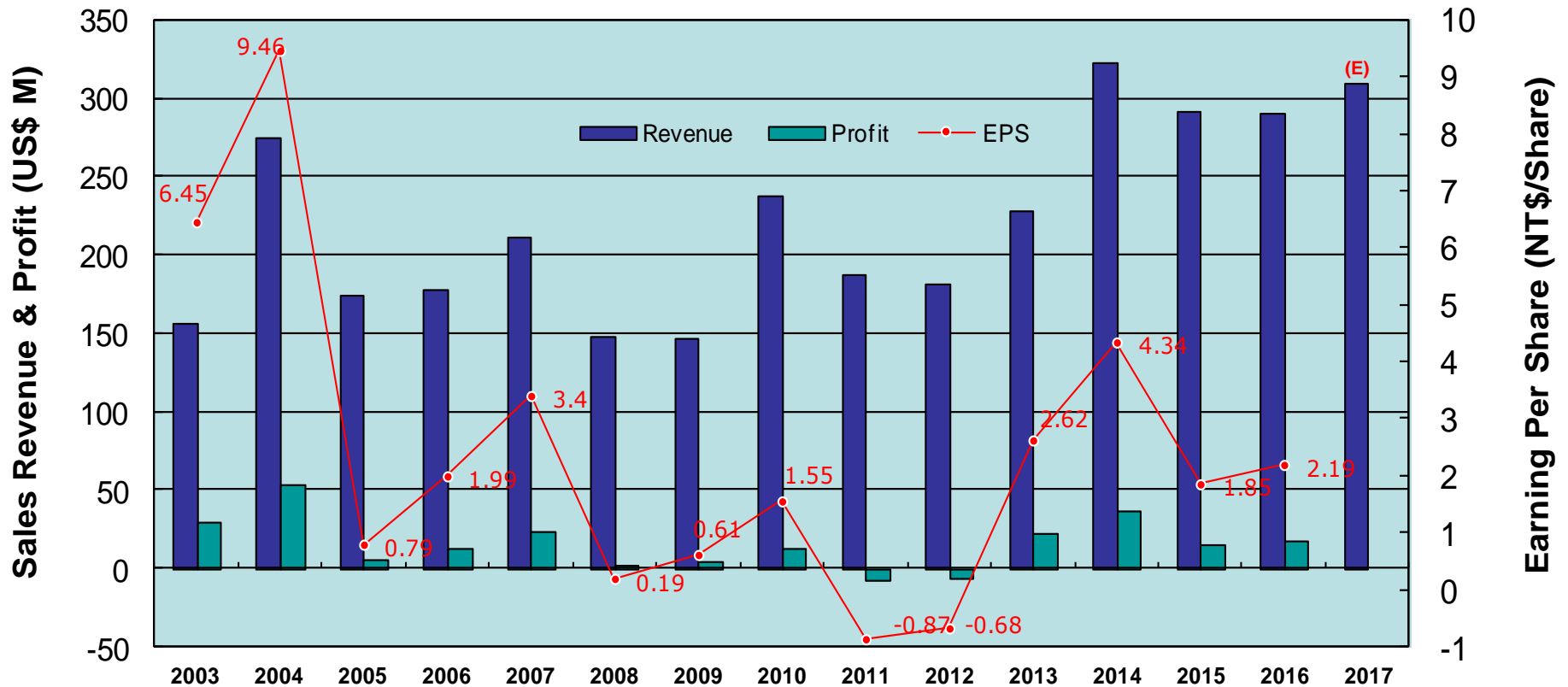
ESMT Elite Semiconductor Memory Technology Inc.

July, 2017

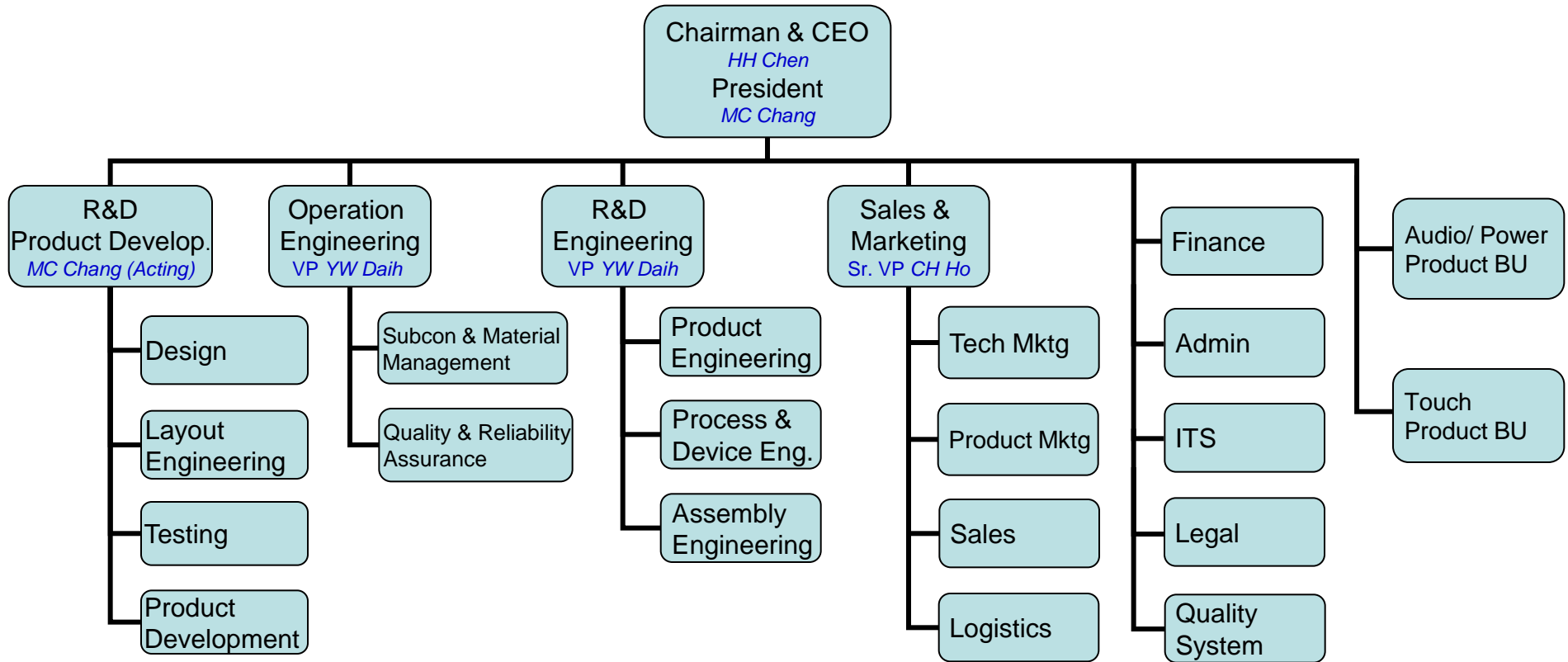
Company Highlights

- Established : August, 1997
- Collected Capital : NT\$ 2.71B (US\$ 87M)
- Public Listed in TSE : March 2002
- Certification : ISO 9001, ISO 14001
- Revenue in 2016 : US\$ 291M
- Number of Employees : 403
- Location : Hsinchu Science Park, Taiwan
- Oversea Offices : Shenzhen, Shanghai, Xian, Tokyo and Seoul

Performance Sales Revenue, Profit & EPS



Company Organization



Manufacture Partners

FAB Partners



PowerChip Semiconductor Corp. (PSC)



Wuhan Xinxin Semiconductor Manufacturing Corp. (XMC)



NANYA Technology Corp. (NTC)



Dongbu HiTek Co., Ltd. (DBH)

Assembly/Testing Partners



Siliconware Precision Industrial Ltd.



ChipMos Technology Inc.



King Yuan Electronics Co., Ltd.



Taiwan IC Packaging Inc.



Formosa Advanced Technology Co., Ltd.



Powertech Technology Inc.

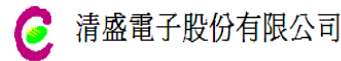
Others



Semiconductor Manufacturing International Corp.



Greatek Electronics Inc.



Chant World Technology, Inc.



Chipbond Technology Corporation.



Advanced Semiconductor Engineering Inc.



Orient Semiconductor Electronics, Ltd.



Sitec Semiconductor Ltd.(D.G.)



Hi-Lo System Research Co. Ltd.

ESMT Product Coverage

DRAM

16Mb	32Mb	64Mb	128Mb	256Mb	512Mb	1Gb	2Gb	4Gb
SDRAM 70/65/60/40/30nm								
DDR SDRAM 70/60/40/30nm								
	LP SDRAM 65/60/40nm							
	LP DDR/DDR2 SDRAM 65/60/40/30nm							
		DDR2 SDRAM 60/40/30/25nm						
					DDR3 SDRAM 30/25nm			

NAND Flash

1Gb	2Gb	4Gb
NAND 40nm		


NAND-Based MCP

1G+256M	1G+512M	1G+1G	2G+1G	2G+2G	4G+2G	4G+4G
MCP 40/20nm NAND + 60/40/30nm mSD/mDDR/LPDDR2						

eMCP

4GB+4Gb	8GB+8Gb
eMCP 20nm/3D NAND + 30/25nm LPDDR2/LPDDR3	

ESMT Product Coverage

NOR Flash 

1Mb	2Mb	4Mb	8Mb	16Mb	32Mb	64Mb	128Mb	256Mb
							3V Serial NOR 90/65nm	
						1.8V Serial NOR 90/65nm		
		3V Parallel NOR 180/130/90/65nm						
			1.8V Parallel NOR 130nm					
							S/O Flash 130nm	

- ✓ We Offer Specialty Memory Includes DRAM, NAND Flash, NOR Flash and MCP/eMCP.
- ✓ ESMT is Your Best Specialty Memory Partner.

Product Roadmap SDRAM

ES CS MP

Density	Configuration & Package	2017		2018				2019			
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
16Mb	1Mx16 1.8/2.5/3.3V 143/200MHz 50TSOPII/KGD	70nm									
		60nm									
32Mb	1Mx32 1.8/2.5/3.3V 143/166/183MHz 90FBGA/KGD	70nm									
64Mb	4Mx16 2.5/3.3V 143/200MHz 54TSOPII/54FBGA/KGD	60nm									
		40nm									
128Mb	2Mx32 1.8/2.5/3.3V 143/166/200MHz 86TSOPII/90FBGA/KGD	60nm									
		30nm									
256Mb	8Mx16 2.5/3.3V 143/166/200MHz 54TSOPII/54FBGA/KGD	60nm									
		65nm									
256Mb	4Mx32 3.3V 143/166MHz 86TSOPII/90FBGA/KGD	40nm									
		30nm									
256Mb	16Mx16 2.5/3.3V 143/166/200MHz 54TSOPII/54FBGA/KGD	40nm									
		30nm									

Product Roadmap DDR SDRAM

ES CS MP

Density	Configuration & Package	2017		2018				2019				
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
32Mb	1Mx32 2.5V 333/400Mbps 144FBGA/KGD											
		70nm										
64Mb	4Mx16 1.8/2.5V 333/400/500Mbps 66TSOPII/60FBGA/KGD											
		60nm				40nm						
128Mb	8Mx16 1.8/2.5V 333/400/500Mbps 66TSOPII/60FBGA/KGD											
		60nm				30nm						
256Mb	16Mx16 1.8/2.5V 333/400/500Mbps 66TSOPII/60FBGA/KGD											
		40nm				30nm						
512Mb	32Mx16 2.5V 400Mbps 66TSOPII											
		40nm										

Product Roadmap LP SDRAM

ES CS MP

Density	Configuration & Package	2017		2018				2019			
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
64Mb	4Mx16 1.8V 133/183/200MHz 54FBGA/KGD					65nm					
	2Mx32 1.8V 133/183/200MHz 90FBGA/KGD					60nm					
128Mb	8Mx16 1.8/2.5V 100/143/200MHz 54FBGA/KGD					65nm					
	4Mx32 1.8/2.5V 100/143/200MHz 90FBGA/KGD					65nm					
256Mb	16Mx16 1.8V 100/143/200MHz 54FBGA/KGD					60nm					
512Mb	32Mx16 1.8V 166/200MHz 54FBGA/KGD					40nm					
	16Mx32 1.8V 166/200MHz 90FBGA/KGD					40nm					

Product Roadmap LP DDR SDRAM

ES CS MP

Density	Configuration & Package	2017		2018				2019			
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
64Mb	4Mx16 1.8/2.5V 266/333/400Mbps KGD	40nm									
	2Mx32 1.8/2.5V 266/333/400Mbps KGD	60nm									
128Mb	8Mx16 1.8/2.5V 266/333/400Mbps 60FBGA/KGD	65nm									
	4Mx32 1.8/2.5V 266/333/400Mbps 144FBGA/KGD	65nm									
256Mb	16Mx16 1.8V 266/333/400Mbps 60FBGA/KGD	60nm									
	8Mx32 1.8V 266/333/400Mbps 144FBGA/KGD	60nm									
512Mb	32Mx16 1.8V 266/333/400Mbps 60FBGA/KGD	40nm									
	16Mx32 1.8V 266/333/400Mbps 144FBGA/KGD	40nm									
1Gb	64Mx16 1.8V 266/333/400Mbps 60FBGA/KGD	30nm									
	32Mx32 1.8V 266/333/400Mbps 144FBGA/KGD	30nm									

Product Roadmap LP DDR2 SDRAM

ES CS MP

Density	Configuration & Package	2017		2018				2019				
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
1Gb	64Mx16 1.2/1.8V 800/1066Mbps 134FBGA/KGD											
	32Mx32 1.2/1.8V 800/1066Mbps 134FBGA/KGD											
2Gb	128Mx16 1.2/1.8V 800/1066Mbps 134FBGA/KGD											
	64Mx32 1.2/1.8V 800/1066Mbps 134FBGA/KGD											

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Product Roadmap DDR2/DDR3 SDRAM

ES CS MP

Density	Configuration & Package	2017		2018				2019			
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q2
128Mb DDR2	8Mx16 1.8V 667/800/1066Mbps 84FBGA/KGD	60nm		40nm							
256Mb DDR2	16Mx16 1.8V 667/800/1066/1333Mbps 84FBGA/KGD			40nm				30nm			
512Mb DDR2	32Mx16 1.8V 667/800/1066/1333Mbps 84FBGA/KGD	40nm		30nm				25nm			
1Gb DDR2	64Mx16 1.8V 667/800/1066/1333Mbps 84FBGA/KGD			30nm							
512Mb DDR3	32Mx16 1.35/1.5V 1600/1866Mbps 96FBGA/KGD			30nm							
1Gb DDR3	64Mx16 1.35/1.5V 1600/1866Mbps 96FBGA/KGD			30nm				25nm			
2Gb DDR3	128Mx16/64Mx32 1.35/1.5V 1600/1866Mbps 96FBGA/KGD			30nm				25nm			
4Gb DDR3	256Mx16 1.35/1.5V 1600/1866Mbps 96FBGA			30nm							

Product Roadmap NAND Flash

ES CS MP

Density	Configuration & Package	2017		2018				2019			
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1Gb	3V 128Mbx8 SLC 25ns TSOP48, 63/67FBGA 1/4-bit ECC/528 byte, 2KB Page/128KB Block	40nm									
	1.8V 128Mbx8 SLC 45ns TSOP48, 63/67FBGA 1/4-bit ECC/528 byte, 2KB Page/128KB Block	40nm									
2Gb	3V 256Mbx8 SLC 25ns TSOP48, 63FBGA 4-bit ECC/528 byte, 2KB Page/128KB Block	40nm									
	1.8V 256Mbx8 SLC 45ns TSOP48, 63FBGA 4-bit ECC/528 byte, 2KB Page/128KB Block	40nm									
4Gb	3V 512Mbx8 SLC 25ns TSOP48 4-bit ECC/528 byte, 2KB Page/128KB Block	40nm									
	1.8V 512Mbx8 SLC 45ns TSOP48 4-bit ECC/528 byte, 2KB Page/128KB Block	40nm									
1Gb SPI NAND	3V 128Mbx8 SLC LGA8x6 Internal ECC, 2KB Page/128KB Block	40nm									
	1.8V 128Mbx8 SLC LGA8x6 Internal ECC, 2KB Page/128KB Block	40nm									
2Gb SPI NAND	3V 256Mbx8 SLC LGA8x6 Internal ECC, 2KB Page/128KB Block	40nm									
	1.8V 256Mbx8 SLC LGA8x6 Internal ECC, 2KB Page/128KB Block	40nm									

Product Roadmap NAND-Based MCP

ES CS MP

Density	Configuration & Package	2017		2018				2019			
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
1G+256M	1.8V 1G NAND + 1.8V 256M mSD/mDDR 107/130/137Ball	40nm NAND + 60nm mSD/mDDR									
	1.8V 1G NAND + 1.8V 512M mSD/mDDR 107/130/137Ball	40nm NAND + 40nm mSD/mDDR									
1G+512M	1.8V 1G NAND + 1.8V 512M LPDDR2 162Ball	40nm NAND + 30nm LPDDR2									
	1.8V 1G NAND + 1.8V 1G LPDDR2 162Ball	40nm NAND + 40nm LPDDR2									
1G+1G	1.8V 1G NAND + 1.8V 1G LPDDR2 162Ball	40nm NAND + 30nm LPDDR2									
	1.8V 2G NAND + 1.8V 1G mDDR 107/130/137Ball	40nm NAND + 40nm mDDR									
2G+1G	1.8V 2G NAND + 1.8V 1G LPDDR2 162Ball	40nm NAND + 40nm LPDDR2									
	1.8V 2G NAND + 1.8V 1G LPDDR2 162Ball	40nm NAND + 30nm LPDDR2									
		20nm NAND + 30nm LPDDR2									

Product Roadmap NAND-Based MCP

ES CS MP

Density	Configuration & Package	2017		2018				2019			
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
2G+2G	1.8V 2G NAND + 1.8V 2G LPDDR2 162Ball					20nm NAND + 30nm LPDDR2					
4G+2G	1.8V 4G NAND + 1.8V 2G mDDR 137Ball	40nm NAND + 30nm mDDR									
	1.8V 4G NAND + 1.8V 2G LPDDR2 162Ball					20nm NAND + 30nm LPDDR2					
4G+4G	1.8V 4G NAND + 1.8V 4G LPDDR2 162Ball					20nm NAND + 30nm LPDDR2					

Product Roadmap eMCP

ES CS MP

Density	Configuration & Package	2017		2018				2019			
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
4GB+4Gb	4GB MLC NAND + 4Gb LPDDR2 162Ball eMMC5.0					20nm NAND + 30nm LPDDR2					
	4GB MLC NAND + 4Gb LPDDR3 221Ball eMMC5.0					20nm NAND + 30nm LPDDR3					
8GB+8Gb	8GB MLC NAND + 8Gb LPDDR3 221Ball eMMC5.0					3D NAND + 25nm LPDDR3					

Product Roadmap 3V Serial NOR Flash

ES CS MP

Density	Configuration & Package	2017		2018				2019			
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q1	Q2
1Mb	2.7-3.6V 104Mhz (x1, x2, x4) SOP-8/USON-8/VDFN-8/KGD			90nm				65nm			
2Mb	2.7-3.6V 104Mhz (x1, x2, x4) SOP-8/USON-8/VDFN-8/KGD			90nm				65nm			
4Mb	2.7-3.6V 104Mhz (x1, x2, x4) SOP-8/USON-8/VDFN-8/KGD			90nm				65nm			
8Mb	2.7-3.6V 104Mhz (x1, x2, x4) SOP-8/USON-8/VDFN-8 PDIP-8/BGA-24/KGD			90nm				65nm			
16Mb	2.7-3.6V 104MHz (x1, x2, x4) SOP-8/USON-8/VDFN-8 PDIP-8/BGA-24/KGD			90nm				65nm			
32Mb	2.7-3.6V 104MHz (x1, x2, x4) SOP-8/VDFN-8/BGA-24/KGD			90nm				65nm			
64Mb	2.7-3.6V 104MHz (x1, x2, x4) SOP-8/SOP-16/VDFN-8 PDIP-8/BGA-24/KGD			65nm							

Product Roadmap 3V Serial NOR Flash

ES CS MP

Density	Configuration & Package	2017		2018				2019				
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q4	Q1	Q2	
128Mb	2.7-3.6V 104MHz (x1, x2, x4) SOP-8/SOP-16/VDFN-8 PDIP-8/BGA-24/KGD											
		65nm										
256Mb	2.7-3.6V 80MHz (x1, x2)/50Mhz (x4) SOP-16/VDFN-8											
		90nm										

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Product Roadmap 1.8V Serial NOR Flash

ES CS MP

Density	Configuration & Package	2017		2018				2019			
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q1	Q2
1M	1.65-1.95V 104Mhz (x1, x2, x4) SOP-8/USON-8/VDFN-8/KGD	90nm				65nm					
2M	1.65-1.95V 104Mhz (x1, x2, x4) SOP-8/USON-8/VDFN-8/KGD	90nm				65nm					
4M	1.65-1.95V 104Mhz (x1, x2, x4) SOP-8/USON-8/VDFN-8/KGD	90nm				65nm					
8M	1.65-1.95V 104Mhz (x1, x2, x4) SOP-8/VDFN-8/KGD	65nm									
16M	1.65-1.95V 104MHz (x1, x2, x4) SOP-8/USON-8/VDFN-8/KGD	65nm									
32M	1.65-1.95V 104MHz (x1, x2, x4) SOP-8/VDFN-8/BGA-24/KGD	90nm				65nm					
64M	1.65-1.95V 104MHz (x1, x2, x4) SOP-8/VDFN-8/KGD	65nm									
128M	1.65-1.95V 104MHz (x1, x2, x4) SOP-8/VDFN-8/BGA-24/KGD	65nm									

Product Roadmap Parallel NOR Flash

ES CS MP

Density	Configuration & Package	2017		2018				2019			
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q1	Q2
1Mb	2.7-3.6V 70ns 4KB sector PLCC-32/STSOP-32/WFBGA-34 KGD	180nm									
		65nm									
4Mb	2.7-3.6V 70ns Uniform Sector / Top Bottom Boot PLCC-32/STSOP-32/TSOP-48 FBGA-48/WFBGA-48/KGD	180nm									
		65nm									
8Mb	2.7-3.6V 70ns Top Bottom Boot TSOP-48/FBGA-48/KGD	130nm									
		65nm									
16Mb	1.65-1.95V 70ns 4K Sector FBGA-48/WFBGA-48/KGD	130nm									
		90nm									
16Mb	2.7-3.6V 70ns Top Bottom Boot TSOP-48/FBGA-48/KGD	65nm									
		130nm									

Product Roadmap Parallel NOR Flash

ES CS MP

Density	Configuration & Package	2017		2018				2019			
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q1	Q2
32Mb	2.7-3.6V 70ns Top Bottom Boot TSOP-48/FBGA-48/KGD	90nm									
		65nm									
64Mb	2.7-3.6V 90ns Top Bottom Boot TSOP-48/FBGA-48/KGD	90nm									
	2.7-3.6V 90ns Top Bottom Boot TSOP-48/FBGA-48/KGD	65nm									
	2.7-3.6V 70ns Page Read Uniform Sector / Top Bottom Boot TSOP-48/TSOP-56 FBGA-48/KGD	90nm									
	2.7-3.6V 70ns/25ns(Burst) Simultaneous Operation TSOP-48/KGD	130nm									

Thank you
ESMT