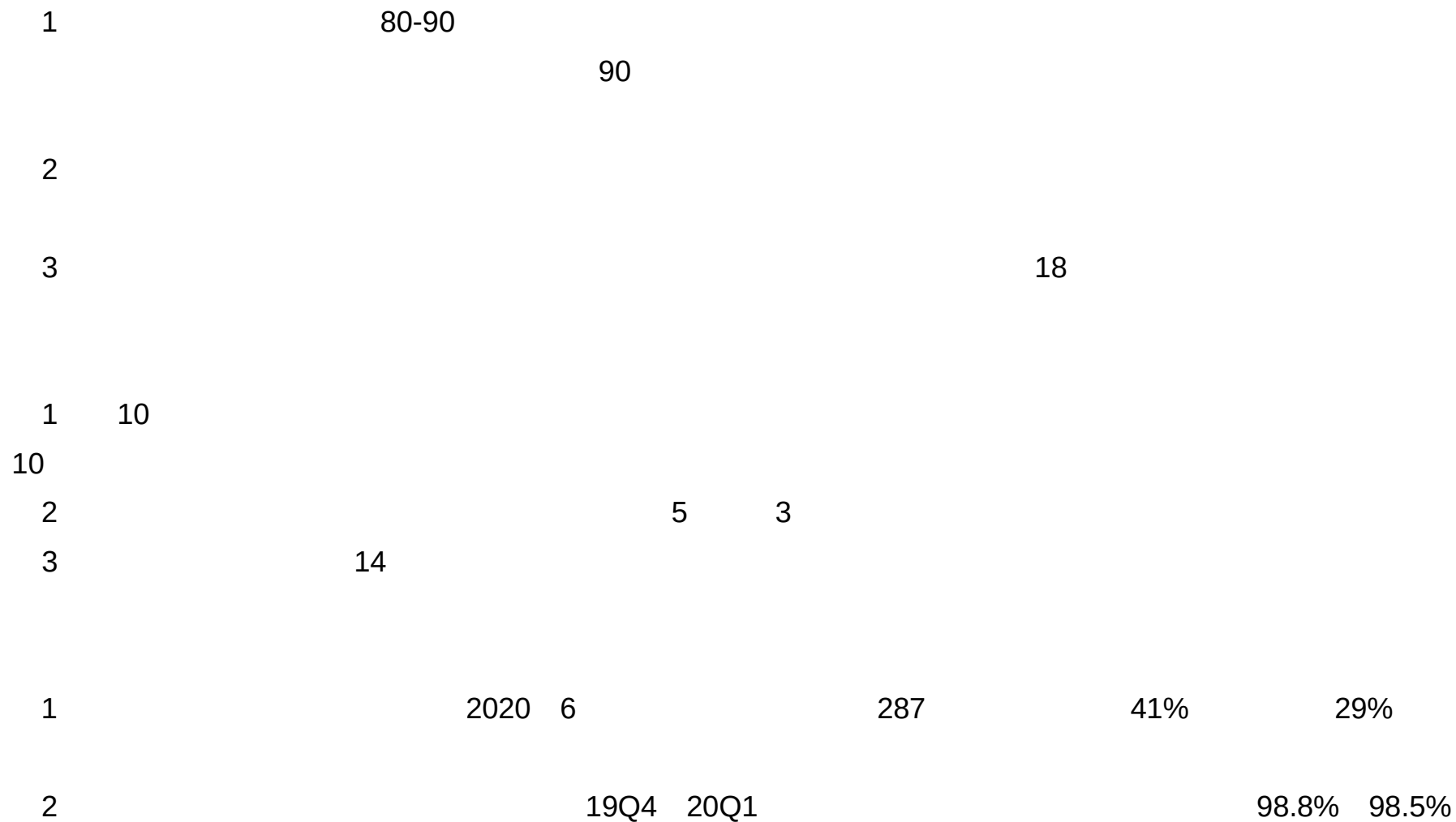


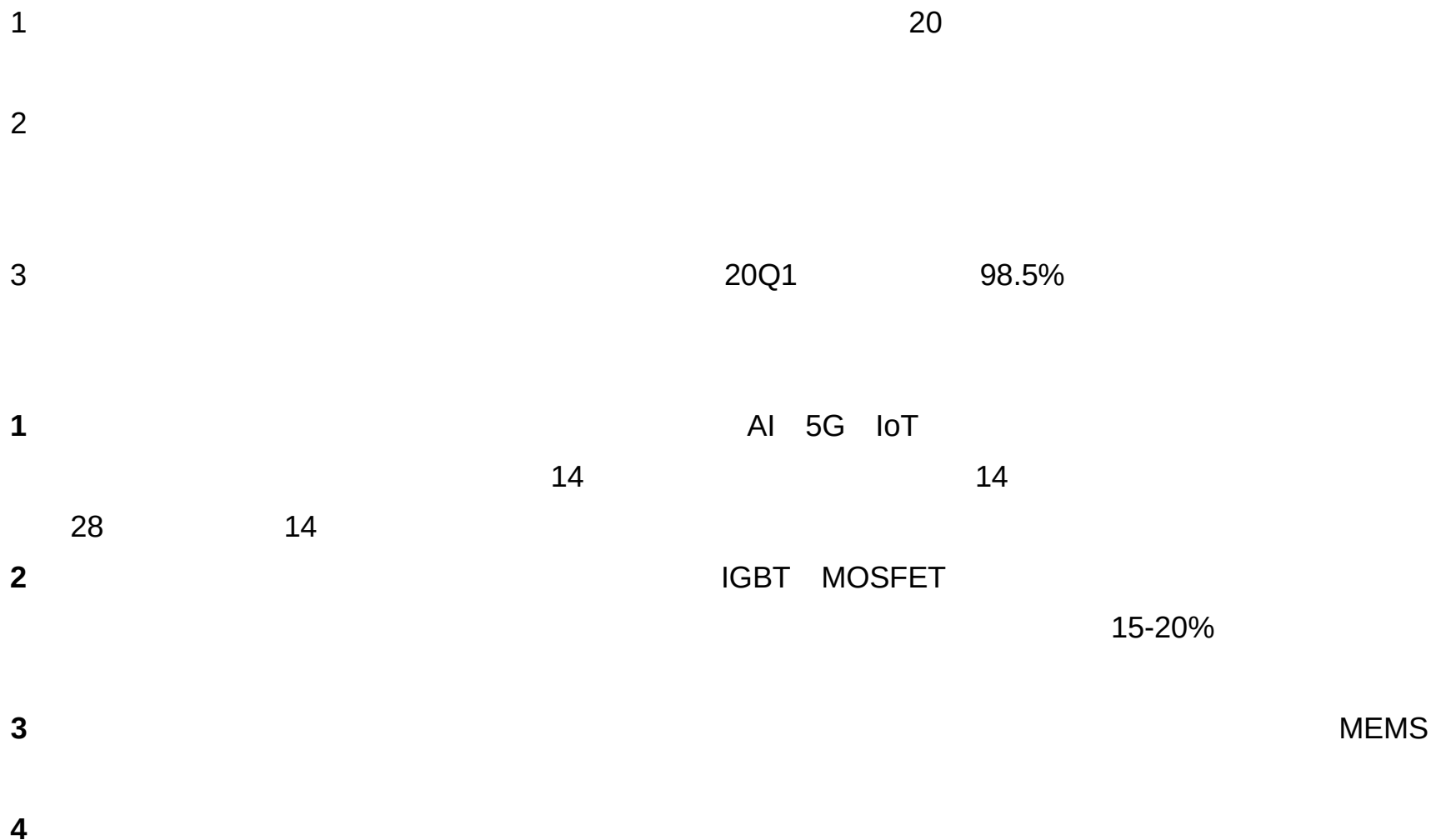


:

: S0020520060001

e-mail hemaofei@gyzq.com.cn





1.

2.

3.

4.

5.

6.

7.

8.



1987

4.8

➤ 2019

654

14

346

52.7%

2020Q2

101

2019

30.4%

36.78

15.7%

14.52

6.9%

10

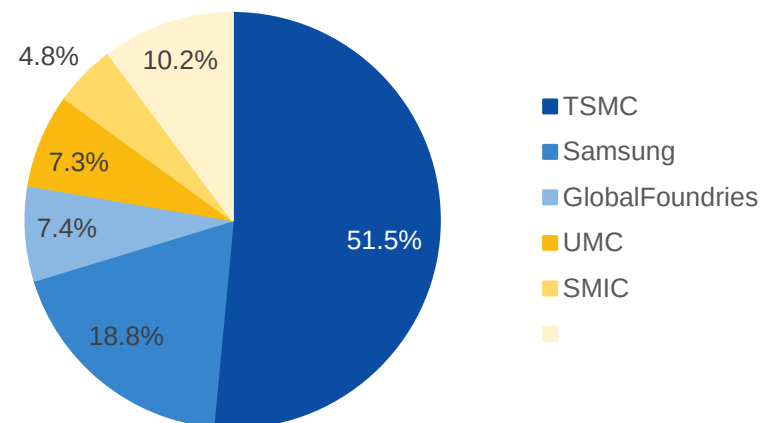
2020Q2

1	MSFT	US	1579.3	110.4	28.5	14.7	13.30%	
2	AAPL	US	1615.4	265.6	59.3	14.2	5.40%	
3	AMZN	US	1496.4	232.9	10.1	28.8	12.40%	
4	GOOGL	US	1013.8	136.8	30	21.4	15.70%	
5	FB	US	FACEBOOK	525.5	55.8	22.1	10.3	18.40%
6	BABA	US	686.2	37.8	10.1	5.6	14.70%	
7	700	HK	660.1	47.3	9.6	3.3	7.10%	
8	005930	KS	354.3	217.6	39.2	16.9	7.80%	
9	2330	TT	314.8	34.2	11.8	2.8	8.30%	
10	INTC	US	246.9	70.8	21.1	13.5	19.10%	

wind

*

2020 7 8



TrendForce,

a 1994

97

55

39

➤ 1994

97

CAGR 11%

7pcts 2019

10,700

346.3

1994

55

3,453

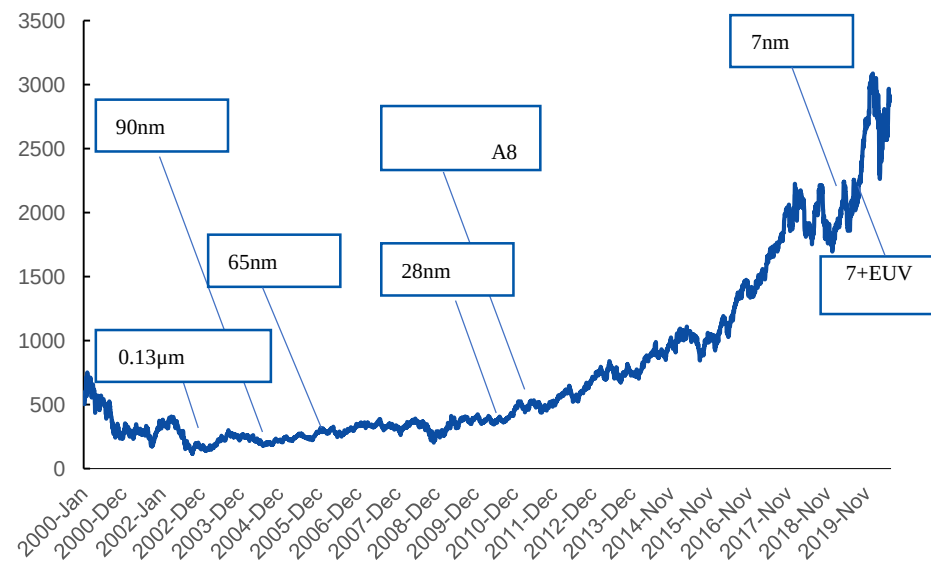
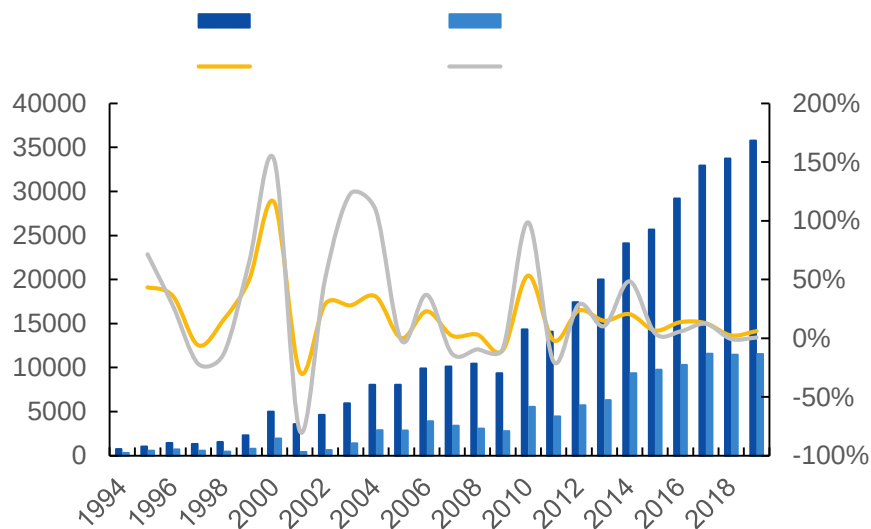
1994

39

10

11%

50%



Bloomberg wind

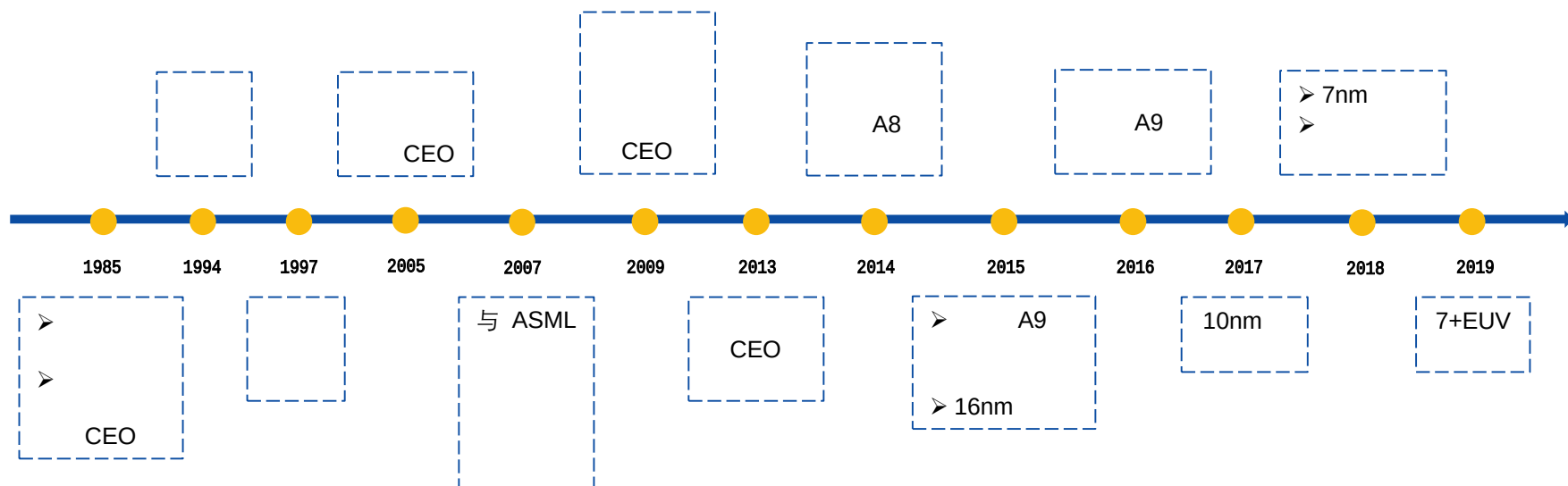
b



IC IDM

1 ASML 2

A8 3 16nm



1.

2.

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a

➤ 1987

IC

IC

IC

IC

➤ 1993

ISO 9001

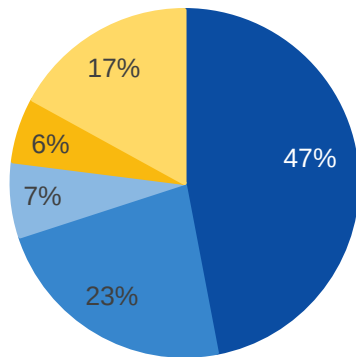
➤ 2000

“ ”

IDM

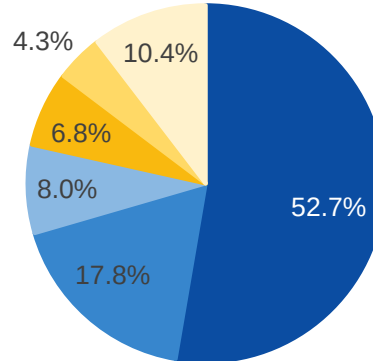
2004

TSMC UMC Chartered
SMIC Others



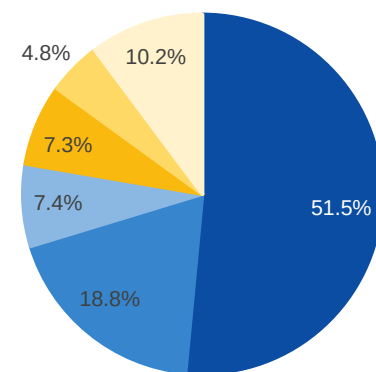
2019

TSMC Samsung
GlobalFoundries UMC
SMIC



2020Q2

TSMC Samsung
GlobalFoundries UMC
SMIC others



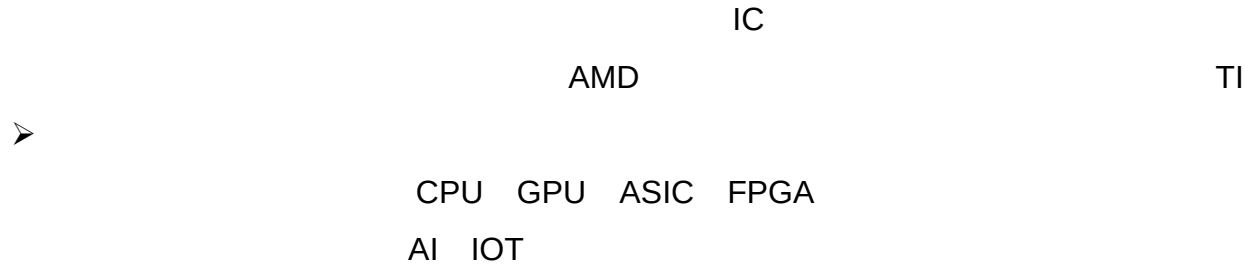
IC insight

IC insight

b

Fabless

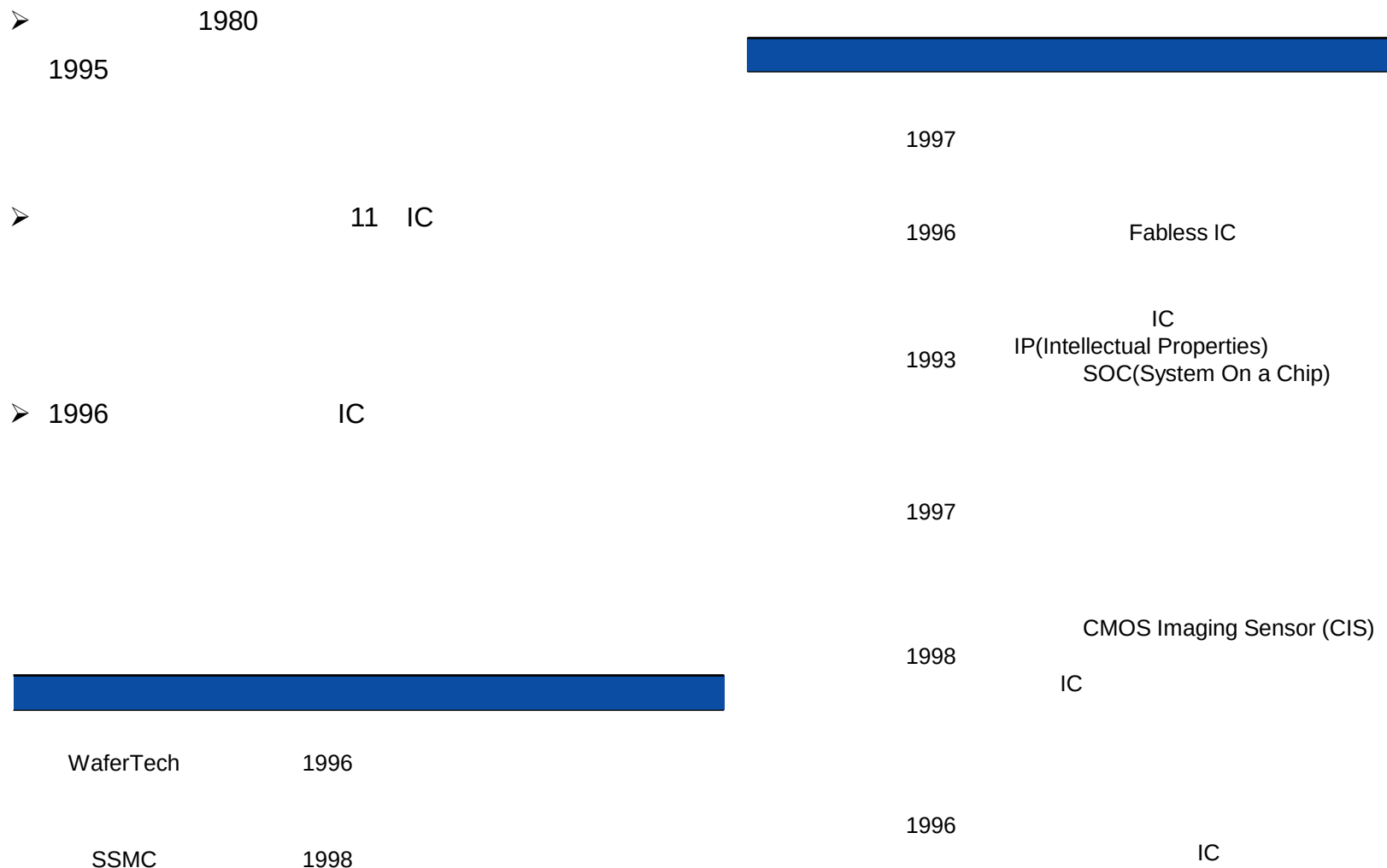
➤ Foundry Fabless



2000	2005	2011	2015	2017	2018		
Altera	Altera	Altera				A8	iPhone6S/6S Plus
		AMD				810	Note
						950	mate8
	NXP					AMD	GPU CPU
			AMD	AMD	AMD		RDNA 2
						BM1391	S15
						1000	OPPO A92s

b

IDM

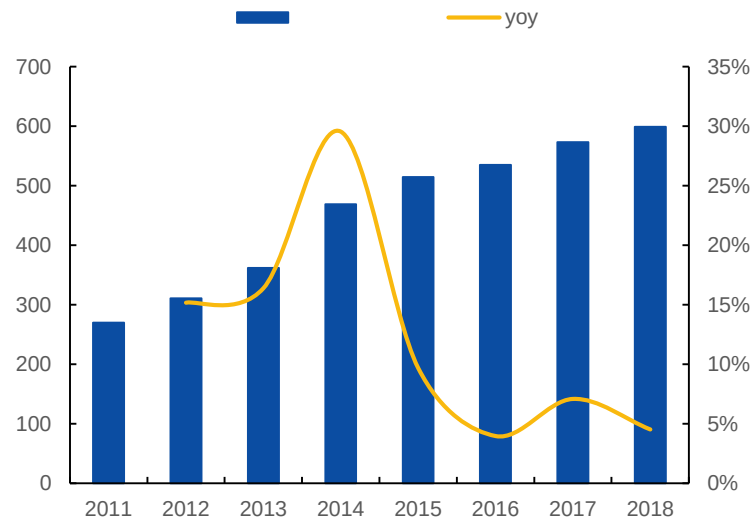


b



2017

573 2016 7.1% 2018
2017 54 60 2018 9.3% 4.5%



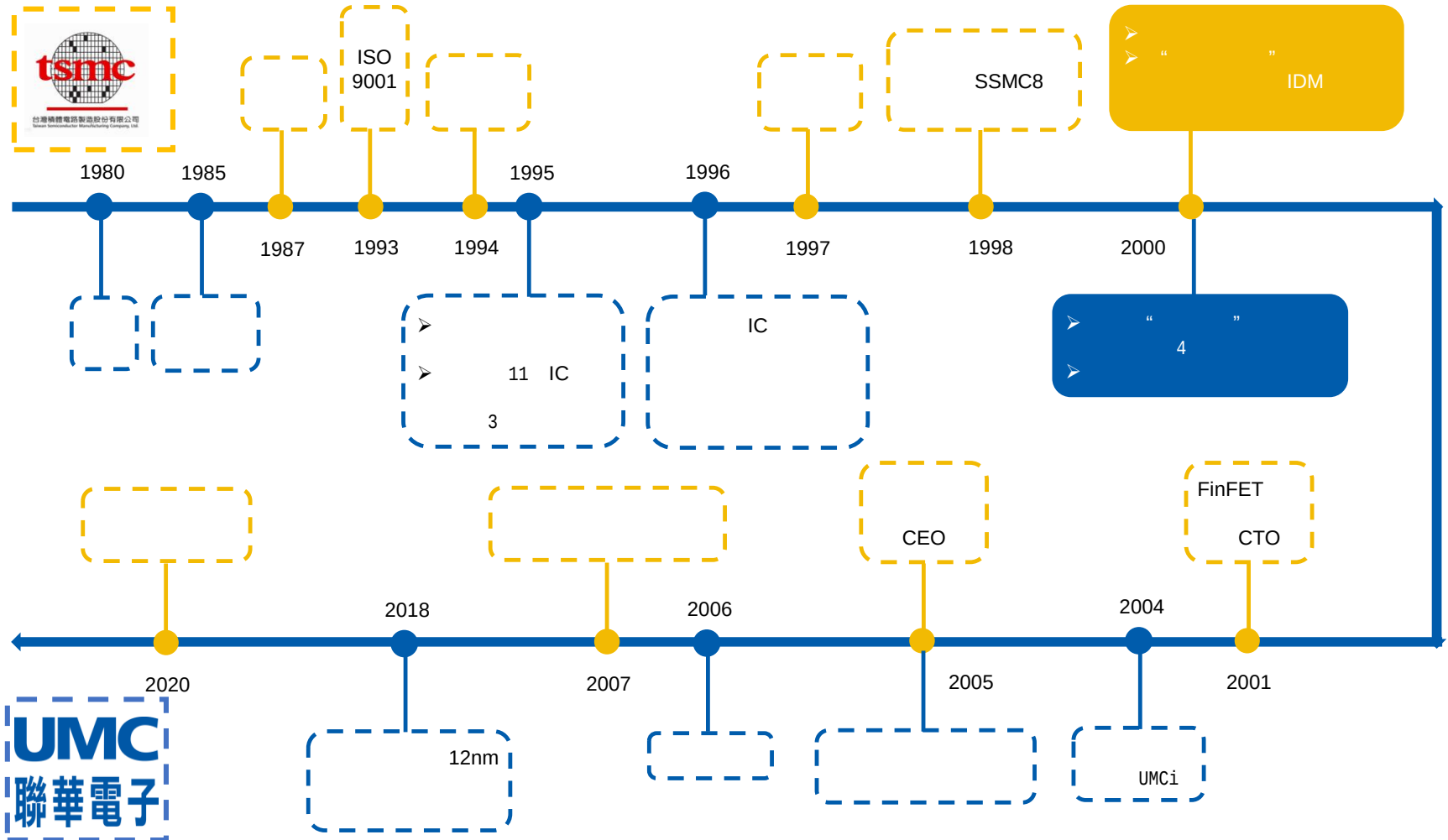
IC insight Gartner



b

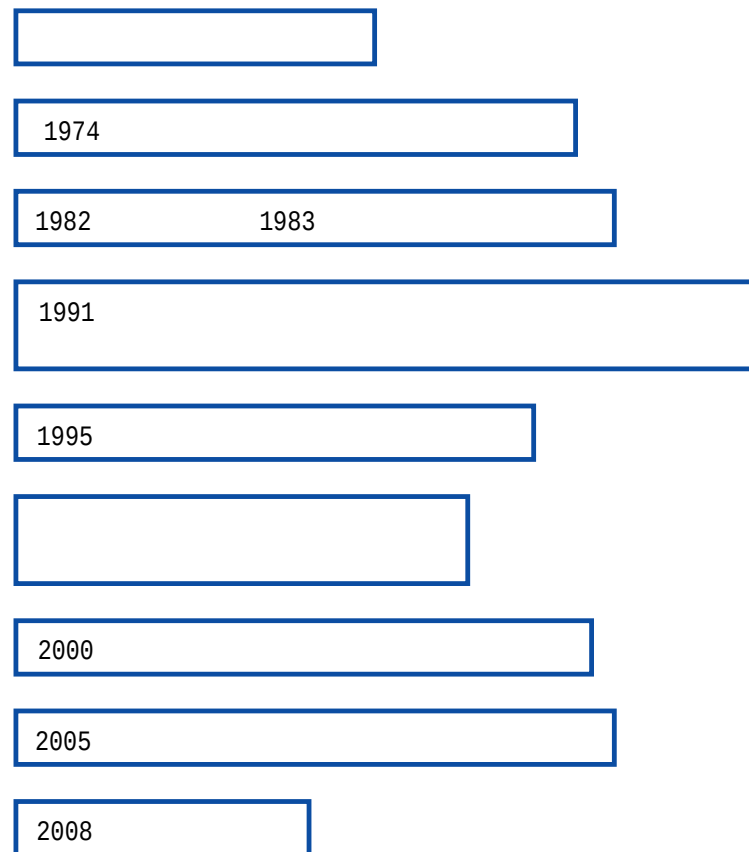
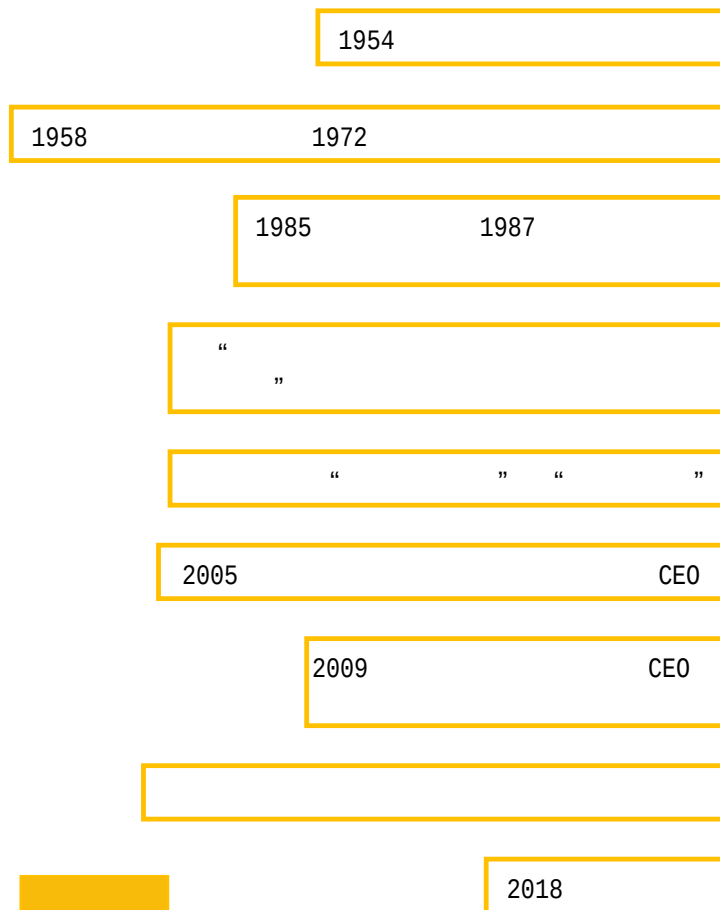
/

/



b

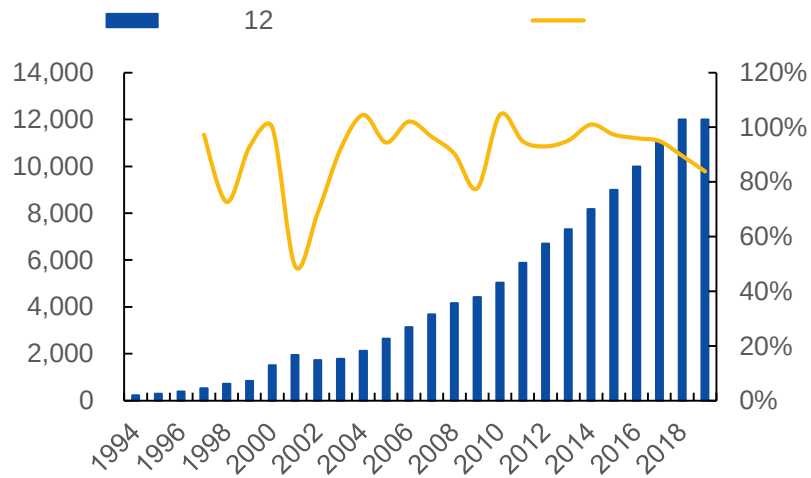
VS





a

➤	12	Fab 12	14	15	16	18	8	Fab3	5	6	8	10
SSMC	6	Fab2				5nm		3nm				
2020	2022											
➤ 2019					1200			2019			83.9%	
						2020						

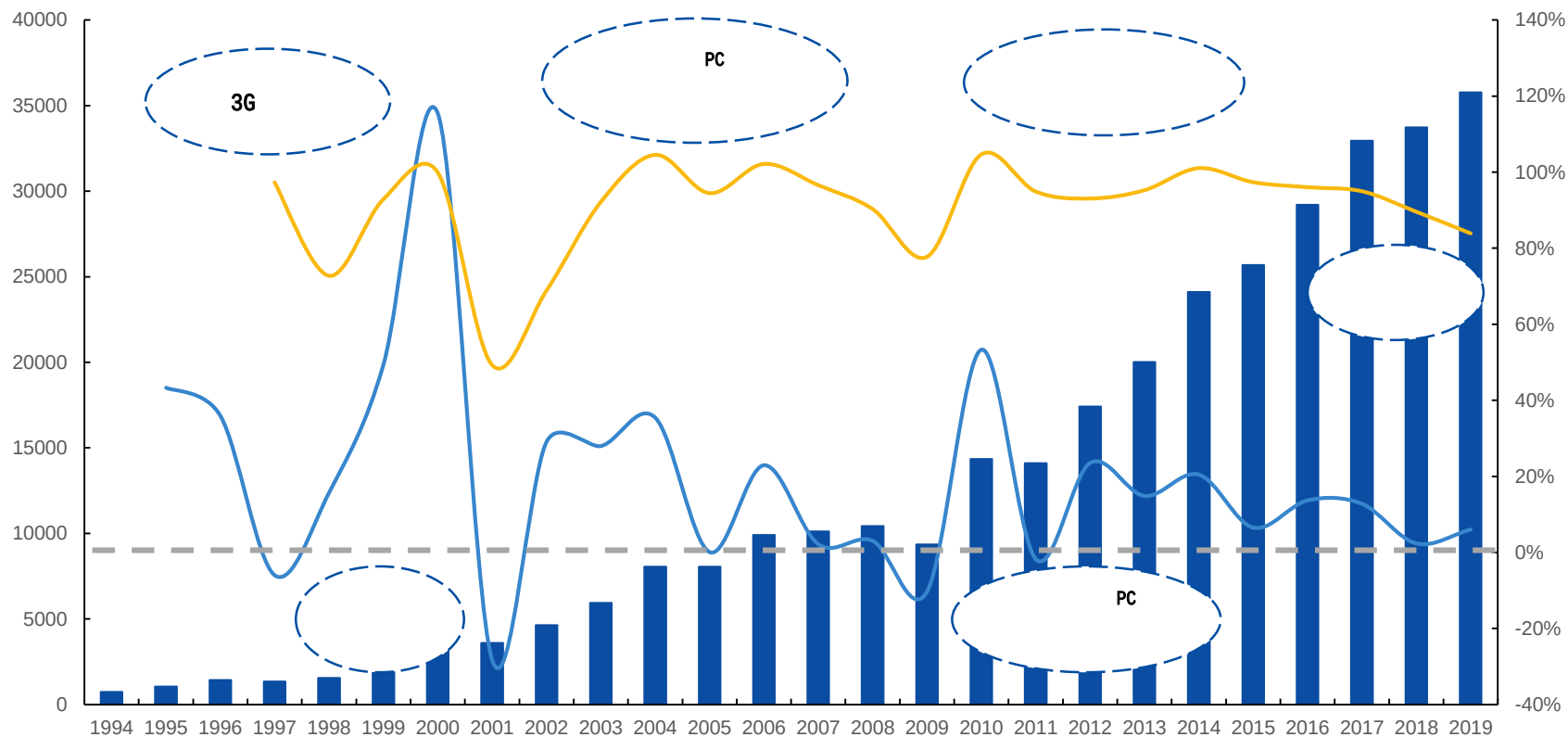


b

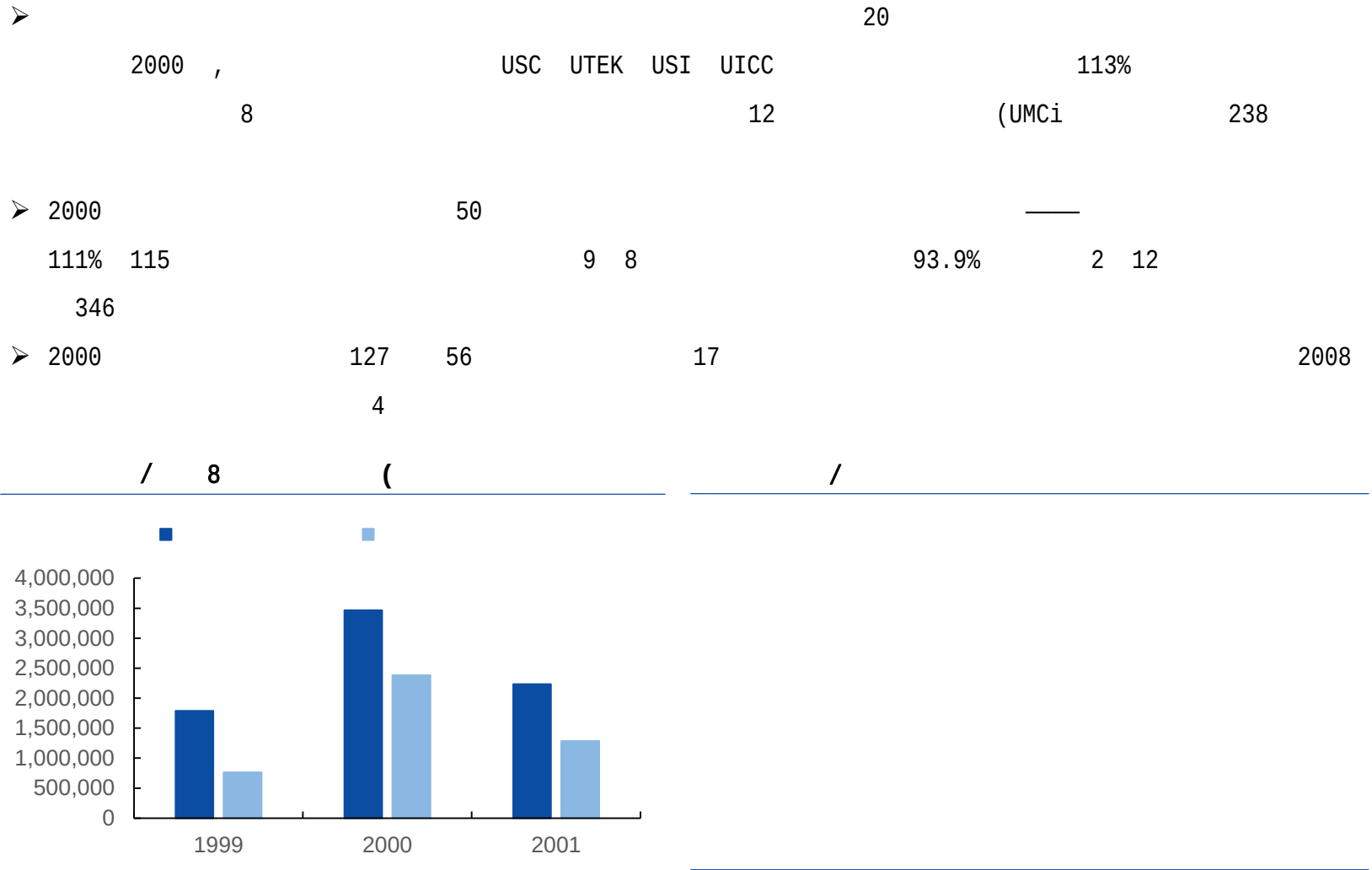


1

2



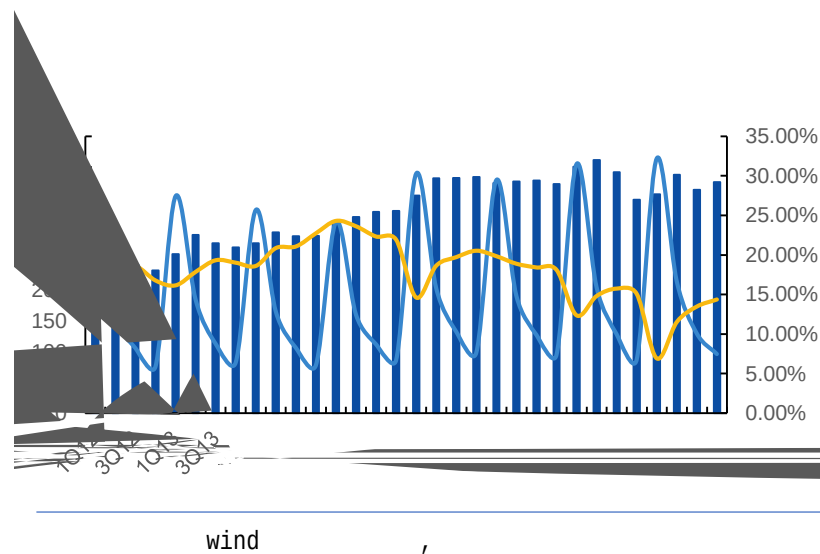
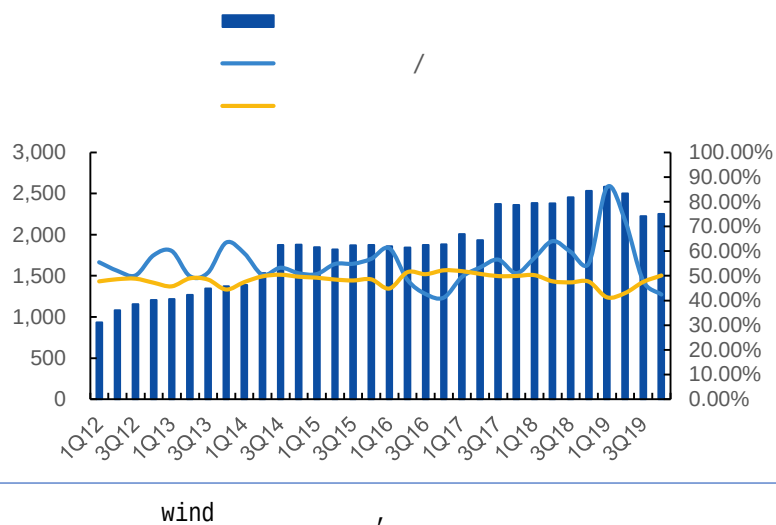
C 20



d



5
8
7 28nm
2016 28nm
6 12
2011
2017

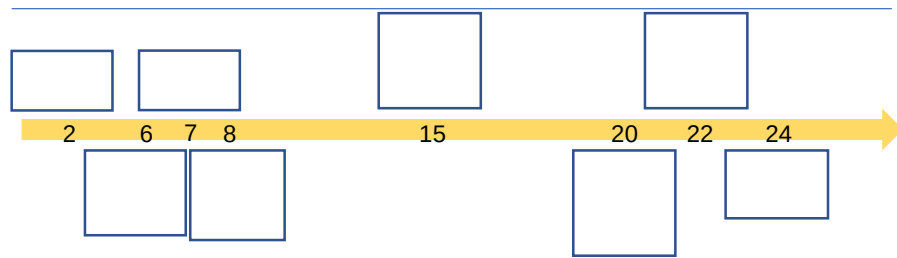


e

➤ 2016 7 2018 10 16nm FinFET

30 2019 15000 / 2020 2

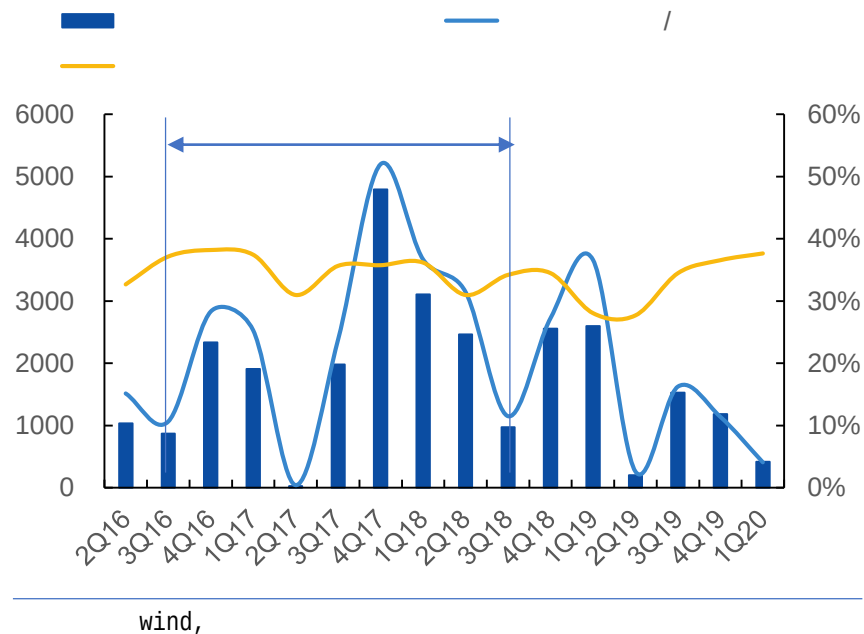
➤



(nm)	90/65	32/28	22/20	16/14	10/7	5/3
(\$M)	15-20	60-70	100-150	200-300	300-450	500-1500
(\$M)	2500-3000	3600-4500	4600-5700	5600-7000	6600-8500	15000-20000
(\$M)	200-400	600-800	1000-1300	1700-2200	2800-3600	4000-5000
(/)	3.5-5.0	3.5-5.0	3.5-5.0	3.5-5.0	3.5-5.0	3.5-5.0

WSTS, IBS

11

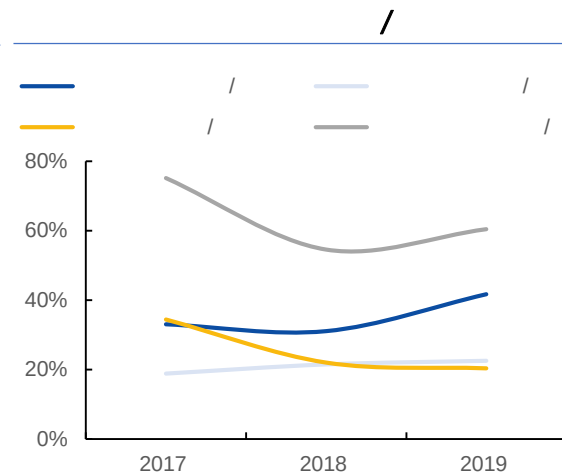
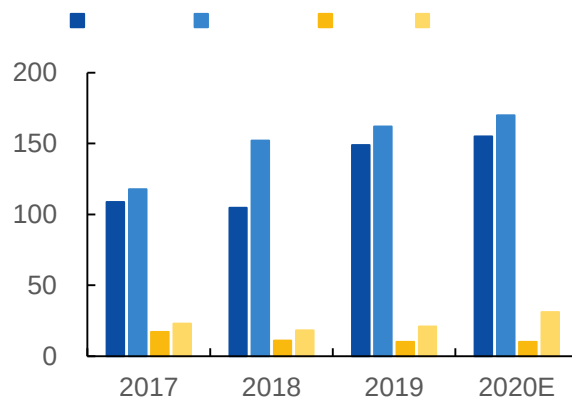
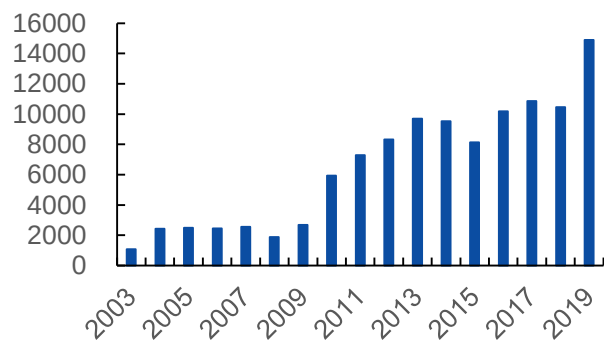


wind,

f 2019

			2018	2019		105	149
2020	150-160	130-140				63.9	
159.3%	Q1				5G	HPC	
	2020	150-160					
➤ 2019		16	5		/	0.42	
	0.60	0.20					

2019

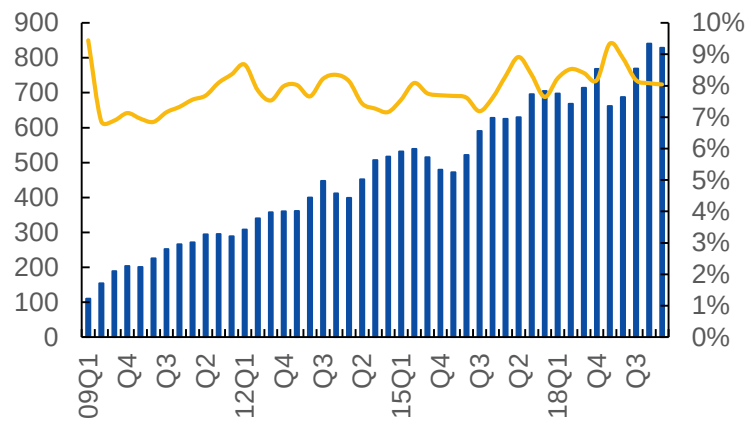




a

➤ 2019 8.5% 211
4.5 7.8 10 7%

➤ 14nm 2019 47
22%



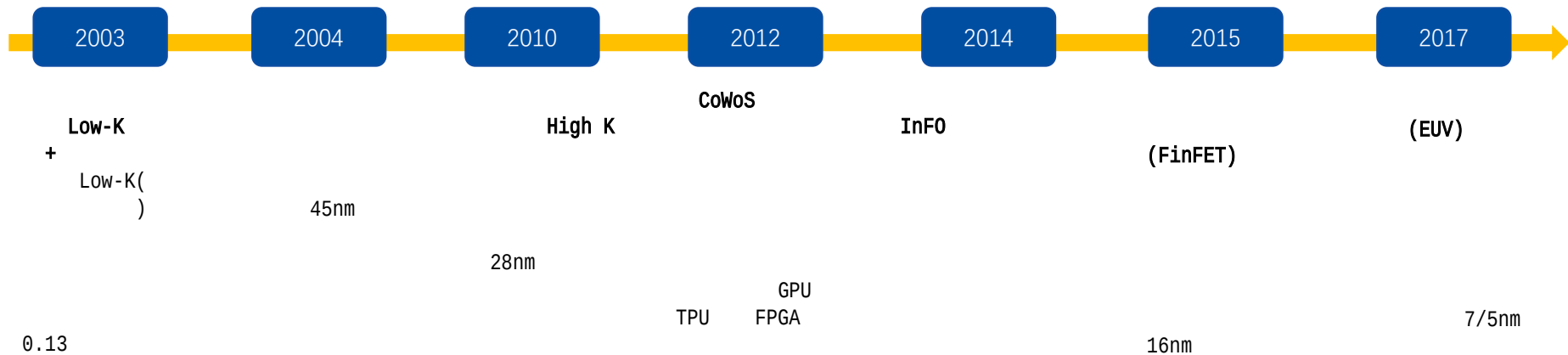
2017		2018		2019	
184	8%	186	8%	211	9%
36	17%	45	19%	47	22%
31	9%	28	9%	27	8%
3	6%	3	5%	4	7%
5	5%	5	6%	5	6%
4	8%	4	7%	5	8%

b



- 2004 ASML 32nm
- 2012 CoWoS
- 2015 16nm FinFET 14nm
- 2017 EUV 7nm

6

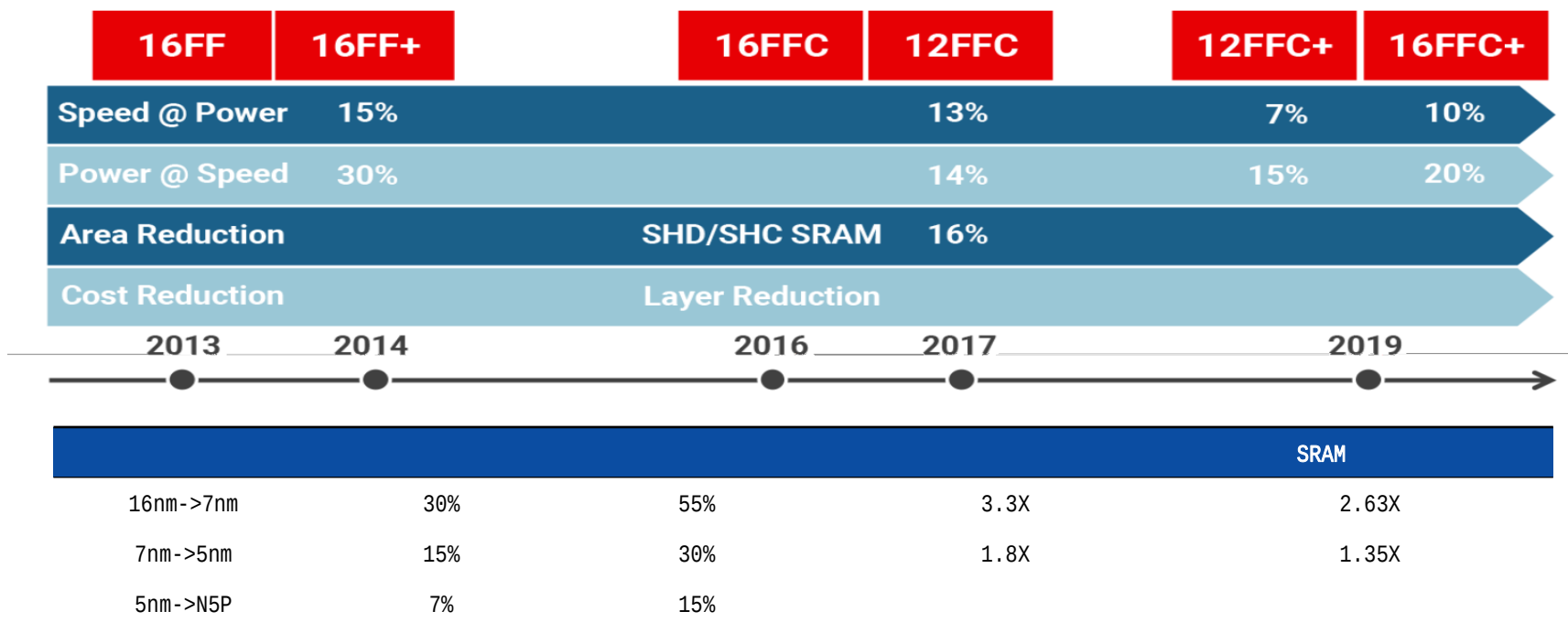


c PPAC

➤ PPAC

(Performance) (Power) (Area) (Cost)

15% 30% 5nm 5nm 7nm 1.8 N5P 7nm 1.35
 7% 15% FEOL MOL



d

➤ 0.13 1995-2000

2000 IBM Low-K 0.13

➤ 2001 FinFET CTO
45/40nm 1 28nm

3 2018

12nm

➤ FinFET

7nm

0.35um

e



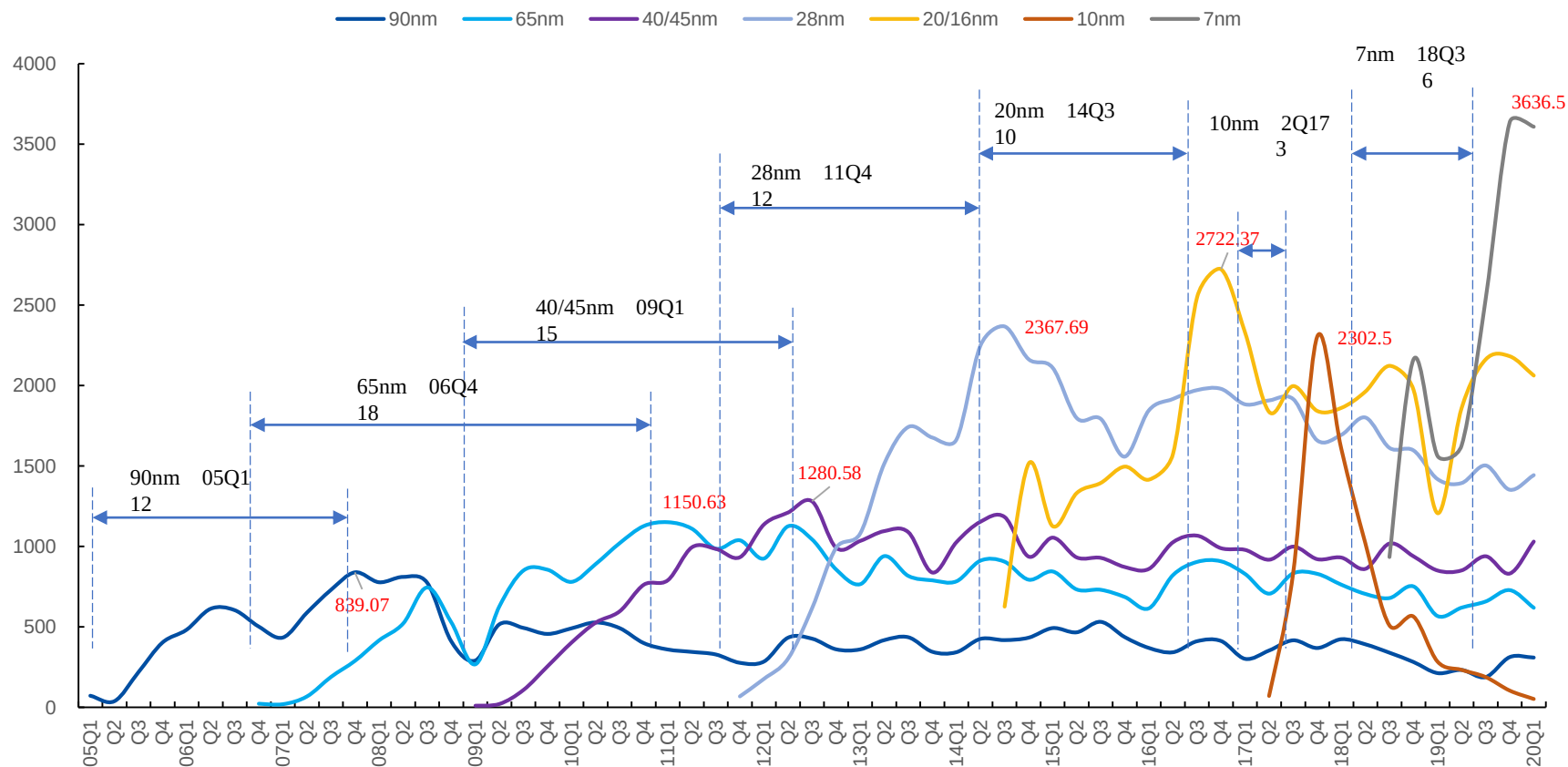
f

3-5

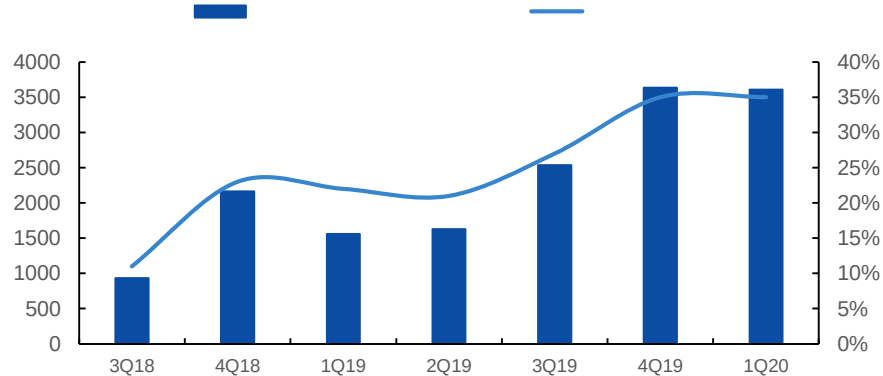
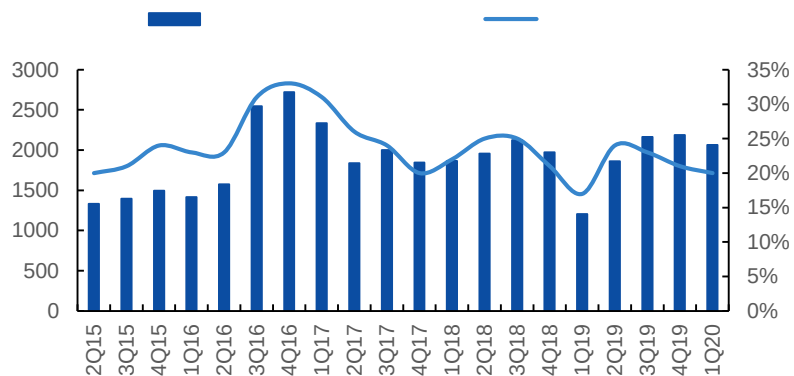
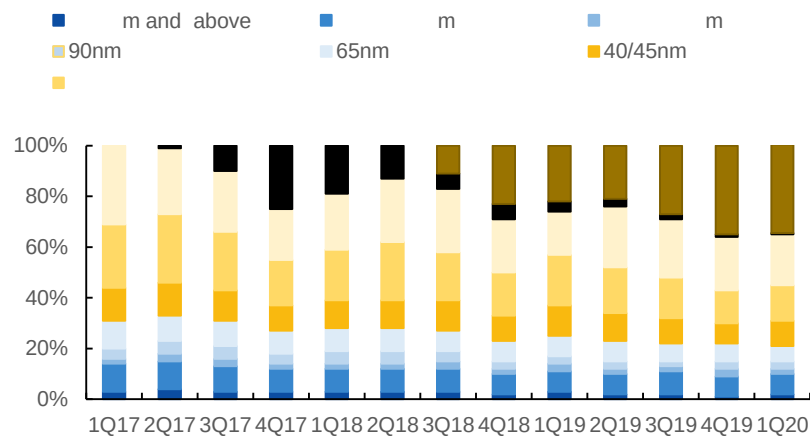
7nm

1

90nm 65nm 40/45nm 28nm 20/16nm 10nm 7nm



g



h

➤ 2004 90

90

2008

90

➤ 2011

29%

28

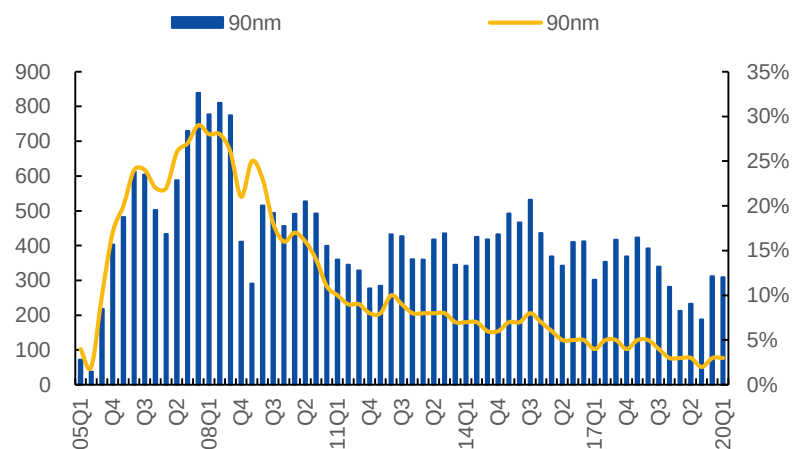
2011

2%

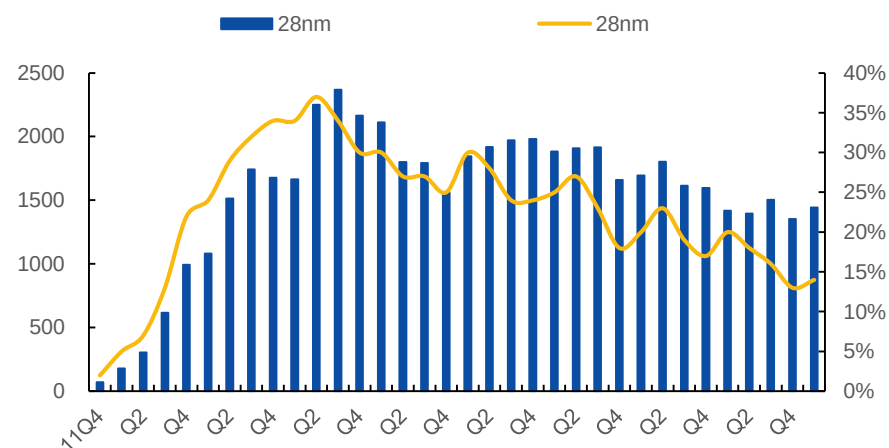
2020

14%

90nm



28nm



i1 28nm 28HP 28HPM 28LP 28HPL

➤ IC 28nm 2011

28nm 28nm 28HP 28HPL 28LP

28HPM 28nm

800

28nm

28nm

28nm	28HP		
• FPGA	CPU	GPU	APU

28nm	28HPM
• SoC	

28nm RF	28LP 28HPL - RF	28HPL
•		

i2 16

16FF 16FF+ 16FFC

➤ 2015	16nmFinFET	FF	16nm FinFET Plus	16FF +	16nm FinFET Compact	16FFC	
	20nm		16nm	50%	60%		
	AP/SoC	GPU	ASIC				
➤ 2011-2015		3G	4G/LTE		2015	61%	16nm
	A9	A10 Fusion		S2		Kirin950	930
	2015			Windows XP		Windows 10	
	8%					23%	

16nm

16nm FinFET	16FF	16nm FinFET Plus	16FF +	16nm FinFET Compact	FFC
/ - CPU - GPU - APU - FPGA - SoC		20nm 40 20SoC 50		16nm 16nm 16FFC	

i3

7nm

➤ AI

2016 7nm 2018 7nm FinFET 2019

N7P EUV

N16 N7 N10

N16 N7 N7 3.3 35-40 65 N7

N10 N7 D0

➤ 7nm

28

7nm 55nm 1/25 16/12nm FFC

AMD 7nm

990 A14 A13 A12 3000 RX 5700

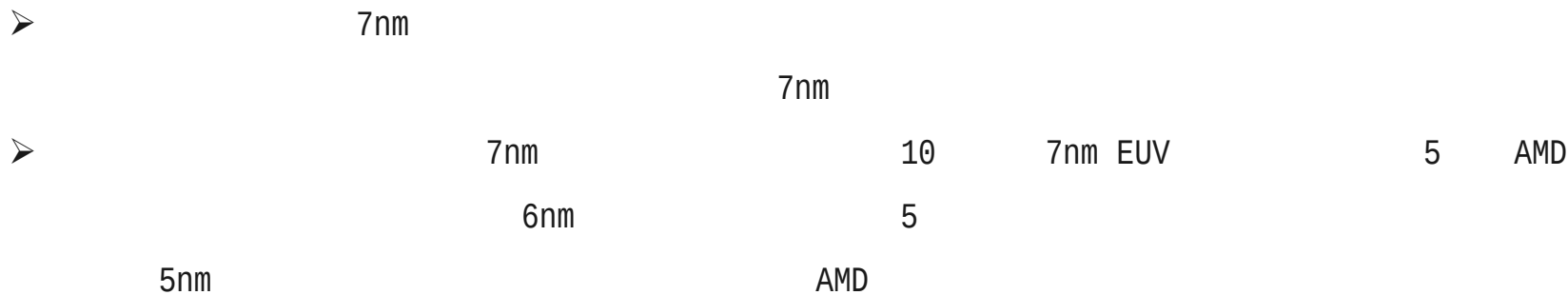
7nm

7nm FinFET		
• 10nm FinFET	7nm FinFET	20
40		
• 7nm FinFET		AI CPU
GPU		

7nm+		
• N7 +	EUV	
• 7nm FinFET	N7 +	15-20
	20	10

i4

7nm



7nm

7nm		7nm EUV		6nm		5nm	
AMD	CPU/GPU	AMD	CPU/GPU	AMD	CPU/GPU	AMD	CPU/GPU
Apple	AP(Smartphone/ Tablet)	Apple(potential)	AP(Smartphone/ Tablet)	Apple(potential)	AP(Smartphone/ Tablet)	Apple	AP(Smartphone/ Tablet)
Bitmain	5G Modern	Hisilicon	5G SoC	Hisilicon	silicon photonics	Hisilicon	FPGA
Broadcom	AI accelerator	Samsung LSI	ASIC	Samsung LSI	ASIC	Samsung LSI	
Hisilicon	FPGA	Qualcomm		Qualcomm		Xilinx	
MTK				Broadcom			
Nvidia				MTK			
Qualcomm							
Xilinx							

i4

7nm



➤	2019	7nm	EUV		AMD		2019	7nm
	LPP	EUV		IBM				
➤	5nm	3nm		2020		2020	6-7	3nm
		2021		2022 -2023		2020	5nm	
		1	/		3nm	2021		

7nm

Company	Category	2019E Capa.	Major Clients
TSMC	7nm Performance	100-110K wafers per month	AMD
	7nm with EUV		Apple
Samsung	7LPP(EUV)	10K wafers per month	Hisilicon
			Nvidia
			Qualcomm
			Xilinx
			Samsung LSI
			IBM(Power series)
			Qualcomm

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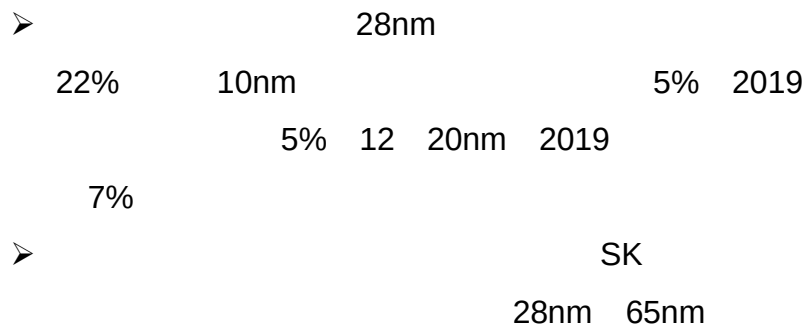
5.

6.

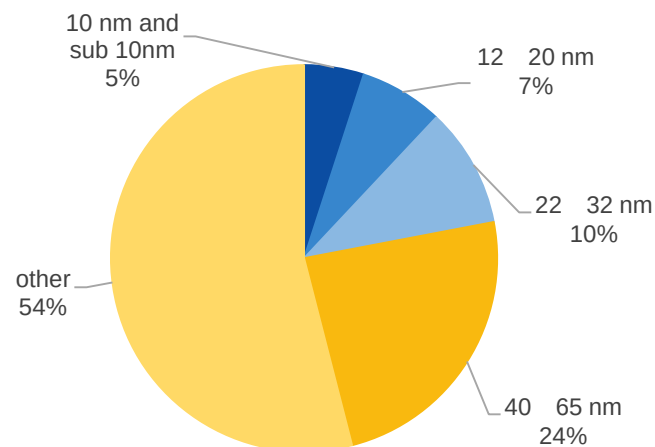
7.

8.

a



2019



Gartner,

28nm

FAB				(12)
GIGAFAB 12	12	20-7nm	240K	
GIGAFAB 14	12	20/16nm	367K	
GIGAFAB 15	12	28-7nm	153K	
FAB 16	12	16/12nm	15K	
FAB 18	12	5/3nm		
Fab 12A	12	m-14nm	37K	
Fab 12X	12	40-28nm	7.5K	
Fab 1	12	40/28/22nm	NA	
Fab 8	12	14/7nm	NA	
Fab 9	12	90-22nm	NA	
S1	12	8-65nm	NA	
S3	12	7-10nm	NA	
S4	12	65nm	7K	
V1	12	3-5-7nm	NA	
S2	12	11-65nm	4K	
300mm Fab	12	40-14nm	20K	
300mm Fab 2	12	40-28nm	35K	
	12	65/55-28nm	35K	
	12	28/22-14nm	40K	

b

➤ 2020 2003 1/2 2009 1/3 2020 1/8 2003 2009

➤ 2003 2003 3.4% 2009 6.4% 4.5%

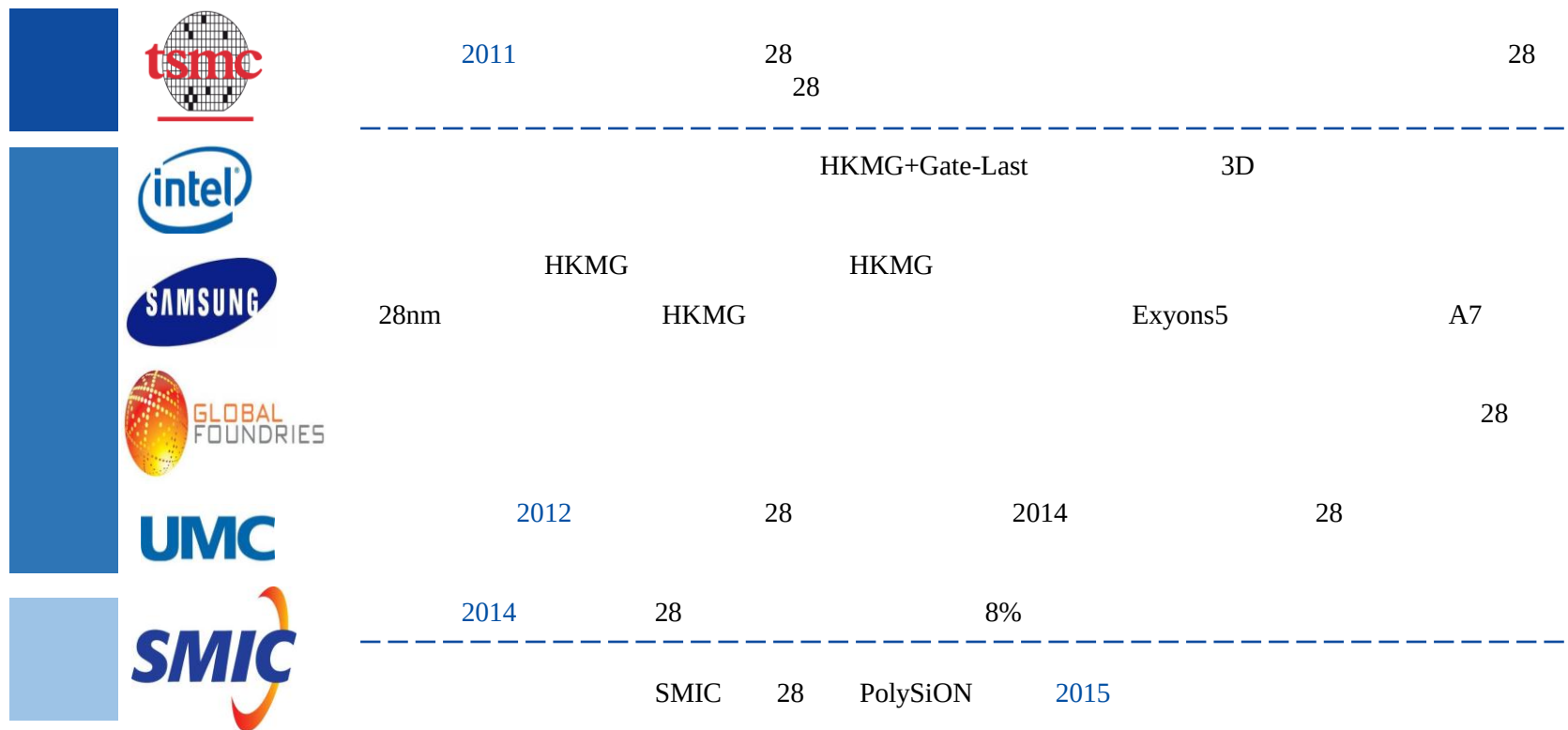
2003			
		2003	M/S
1	(TSMC)	5855	54.3%
2	(UMC)	2740	25.4%
3	(Chartered)	725	6.7%
4	(SMIC)	365	3.4%
5	DongbuAnam	330	3.1%
6	Jazz	185	1.7%
7	NEC	170	1.6%
8	SSMC	155	1.4%
9	X Fab	127	1.2%
10		125	1.2%

2009			
		2009	M/S
1	(TSMC)	8989	52.1%
2	(UMC)	2815	16.3%
3	(Chartered)	1540	8.9%
4	(GlobalFoundries)	1101	6.4%
5	(SMIC)	1075	6.2%
6	(Dongbu)	395	2.3%
7	(Vanguard)	382	2.2%
8	IBM	335	1.9%
9	(Samsung)	325	1.9%
10	(Grace)	310	1.8%

2020Q1			
		1Q20E	M/S
1	(TSMC)	10200	54.1%
2	(Samsung)	2996	15.9%
3	(GlobalFoundries)	1452	7.7%
4	(UMC)	1397	7.4%
5	(SMIC)	848	4.5%
6	(TowerJazz)	300	1.6%
7	(VIS)	258	1.4%
8	(PSMC)	251	1.3%
9	(Hua Hong)	200	1.1%
10	(DB HiTek)	158	0.8%

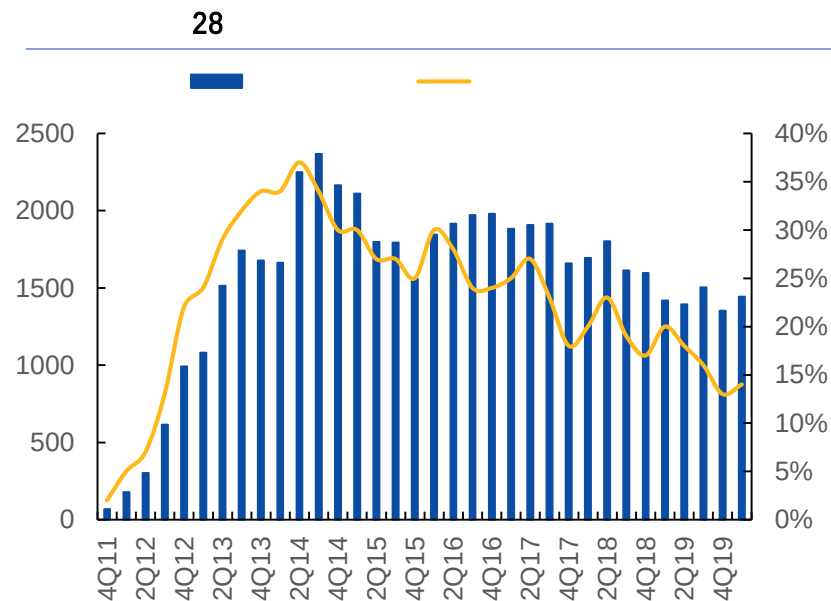
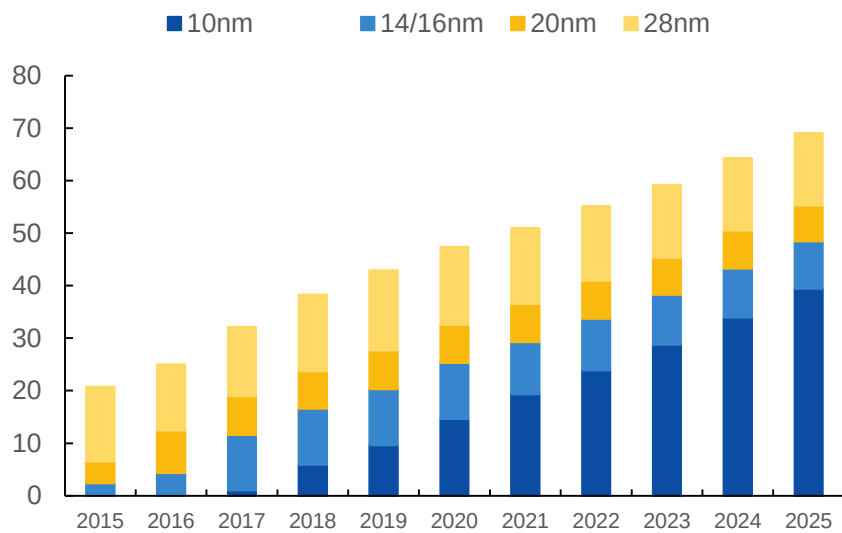
a 28nm

28nm					
2009	2011	2012	2014	2015	2016
32nm	28nm	28nm	28nm	28nm	28nm
	HKMG	HKMG		PolySion	HKMG
	28nm HKMG				



b 28nm

- 2019 28nm 20% 28nm 20 25% 28nm
- 28nm IC 28nm 28nm IoT/



a

- **2009** **28nm** 2011-2020
- 20nm 10nm 7nm 5nm 7nm/5nm
- 14/16nm 16 FinFET Plus 14
- 10%

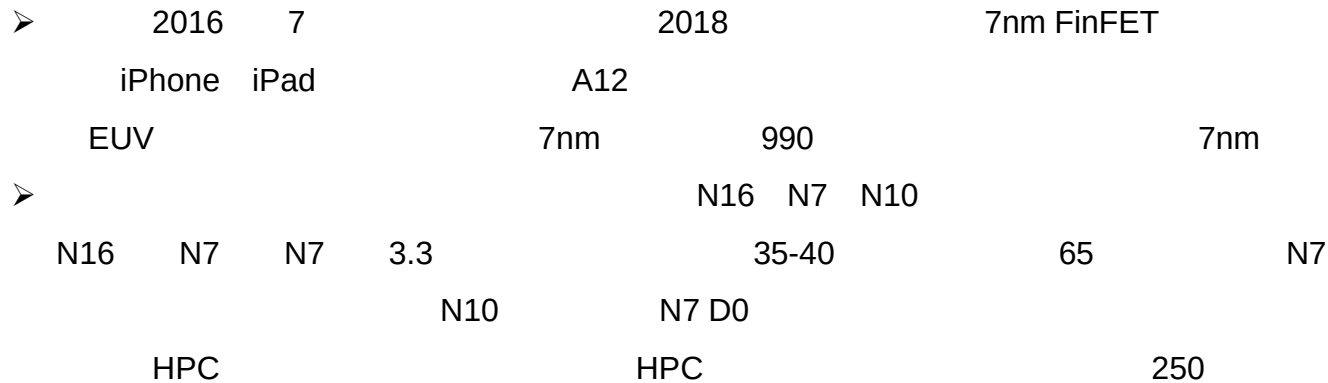
A

A9/A9X	A10 Fusion	A10 X Fusion	A11 Bionic	A12 Bionic	A13 Bionic
iPhone 6S	iPhone 7		iPhone 8	iPhone XS	iPhone 11
iPhone 6S Plus	iPhone 7 Plus	iPad Pro	iPhone 8 Plus	iPhone XS Max	iPhone Pro/Pro Max
iPad Pro			iPhone X	iPhone XR	iPhone SE
16/14nm	16nm	16nm	10nm	7nm	7nm+
/					
Sep-15	Sep-16	Jun-17	Sep-17	Sep-18	Sep-19
2015Q2/2015Q1	2015Q2	2015Q2	2017Q1	2018Q2	2019Q2

		7nm				10nm				16nm		14nm	
Lithography		TSMC		Samsung		TSMC		Samsung		TSMC		Samsung+GF	
		N7/N7+		7LPE,7LPP		10FF		10LPE/LPP/LPU		16FF/FF+/FFC		14LPE/LPP/LPC/LPU;11LPP	
		Aprill 2017		Aprill 2019		Jun-17		Aprill 2019		3Q/2015		2015	
		EUV		EUV		193nm		193nm		193nm		193nm	
		SE(EUV)		SE(EUV DP(193i		DUV+SAQP		DUV+SATP/LEL ELE		DUV+SADP		DUV+SADP/LEL E	
Fin		FinFET		FinFET		FinFET 0.70V		FinFET 0.75V		FinFET 0.75V		FinFET 0.80V	
	/	96.5		95.3		48.1		51.82		28.2		32.5	
	Pitch	Value	10nm	Value	10nm	Value	16nm	Value	10nm	Value	20nm	Value	20nm
		30nm	0.83x	27nm	0.64x	36nm	0.75x	42nm	0.88x	48nm		48nm	
		6nm	1.00x			6nm						8nm	
SRAM bitcell		52nm	1.24x			42nm	1.35x			37nm		37nm	
		8/10nm								34nm		30nm	
		64nm HP	0.82x	60nm HP	0.79x	66nm	64nm* 0.73x	68nm	0.87x	90nm	1X	78nm	1.22x
		57nm HD	0.95x	54nm HD)	0.75x	42nm	44nm* 0.69x	48nm	0.75x	64nm	1X	64nm	1.00x
		40nm		36nm									
DRAM bitcell				0.032	0.65x			0.049	0.61x			0.080	0.78x
		0.021	0.78x	0.026	0.65x	0.042	0.57x	0.040	0.63x	0.074	0.86x	0.064	0.79x
	eDRAM												
DRAM bitcell													

b 10nm

7nm



2003	2004	2005	2006	2007	2008	2009	2011	2013	2014	2015	2016	2017	2018	2019	2020
90nm		65nm		45nm		32nm	22nm FinFET		14nm FinFET		14nm+	14nm++		10nm	10nm+
130nm	90nm		65nm	55nm	45/40nm		28nm HKMG	20nm HKMG		16nm FinFET	16nm FFC	10nm FinFET	7nm FinFET	7nm+ (EUV)	5nm (EUV)
90nm			65nm				28nm HKMG			14nm FinFET	14nm LPC	10nm		7nm (EUV)	5nm (EUV)
90nm			65nm		45nm SOI	45nm	28nm HKMG	20nm HKMG		14nm FinFET		12nm FinFET	12nm FD-SOI		
			90nm			65nm	45nm			28nm PolySion	28nm HKMG		28nm HKC+	14nm FinFET	

1.

2.

3.

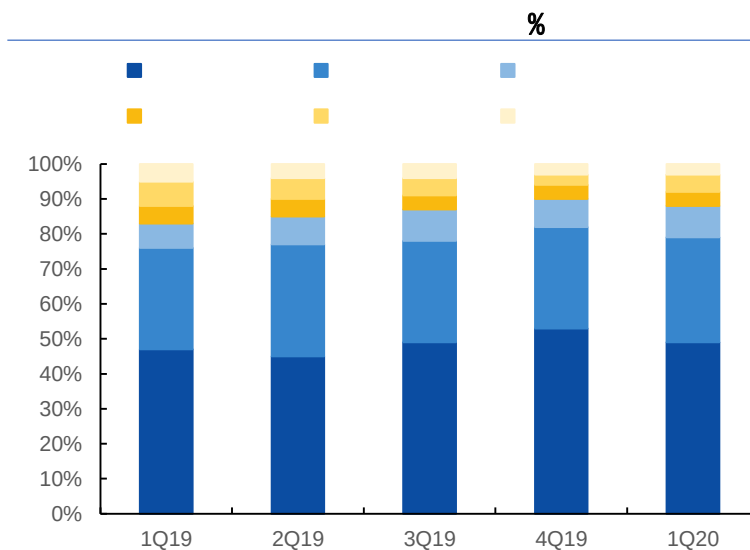
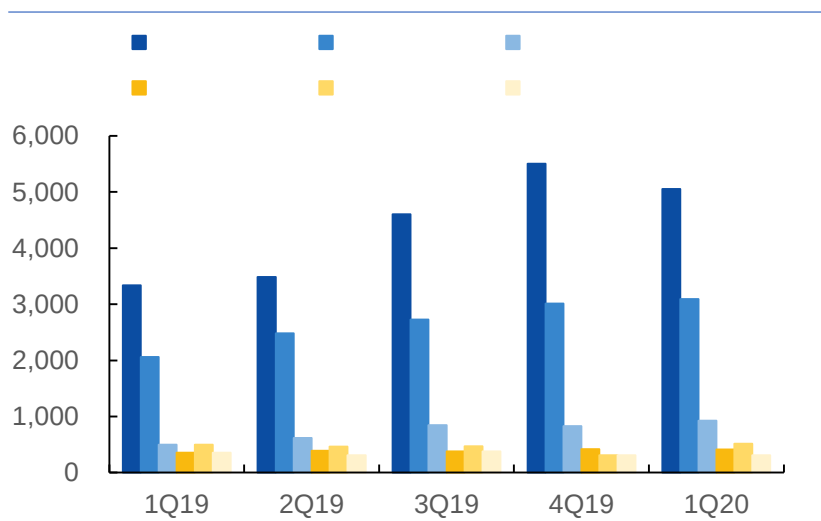
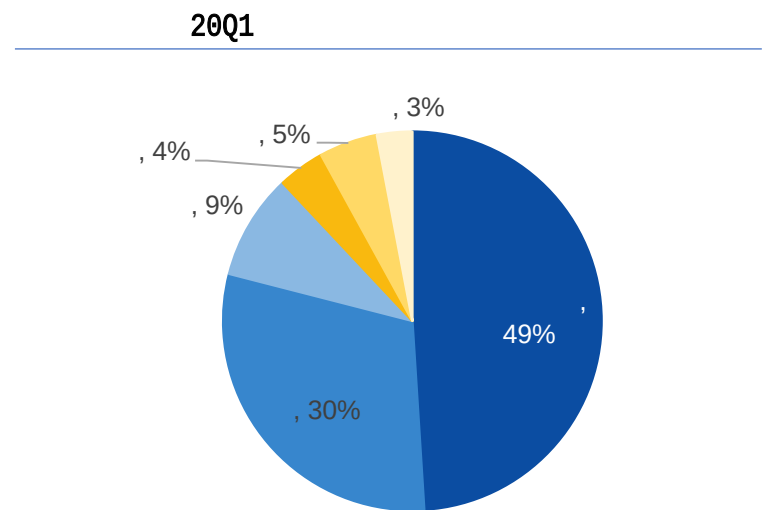
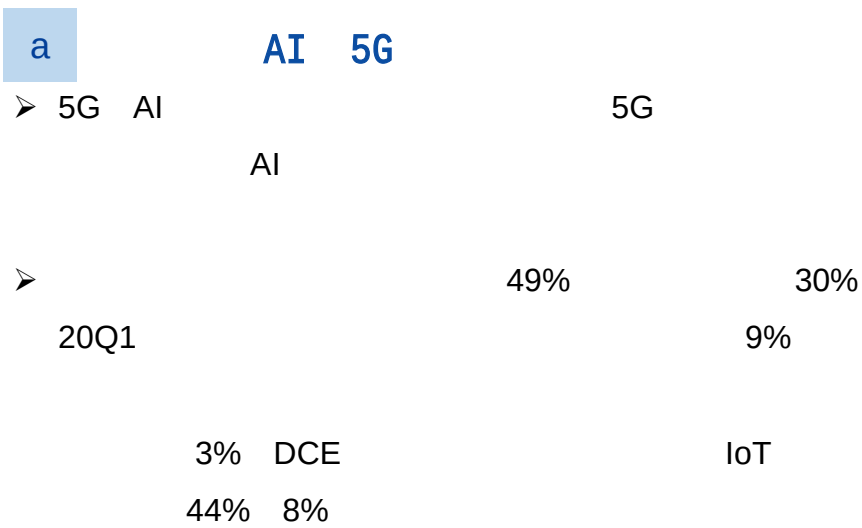
4.

5.

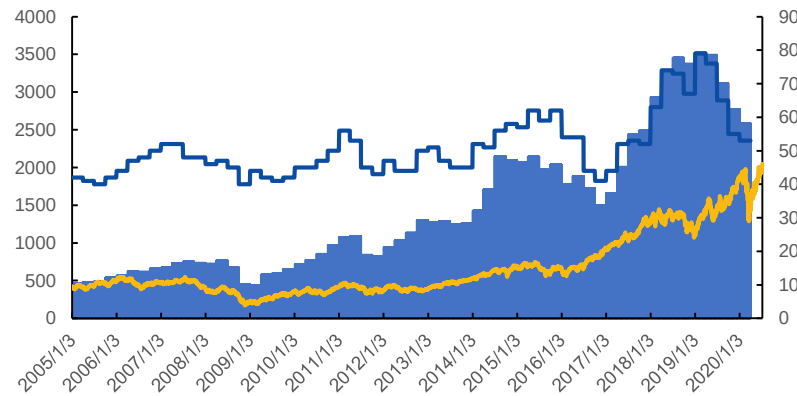
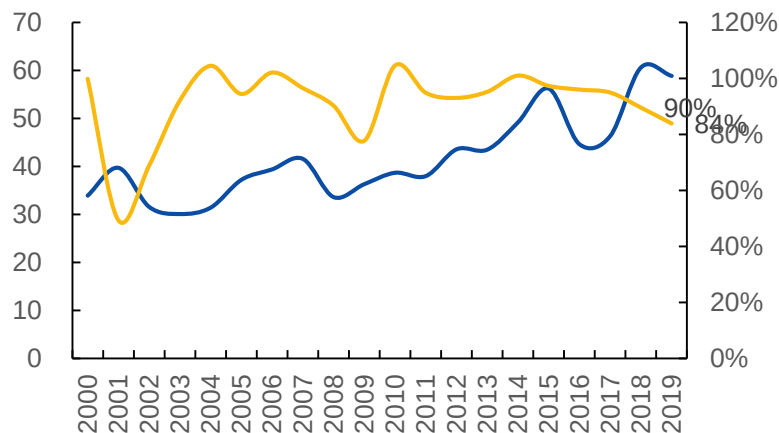
6.

7.

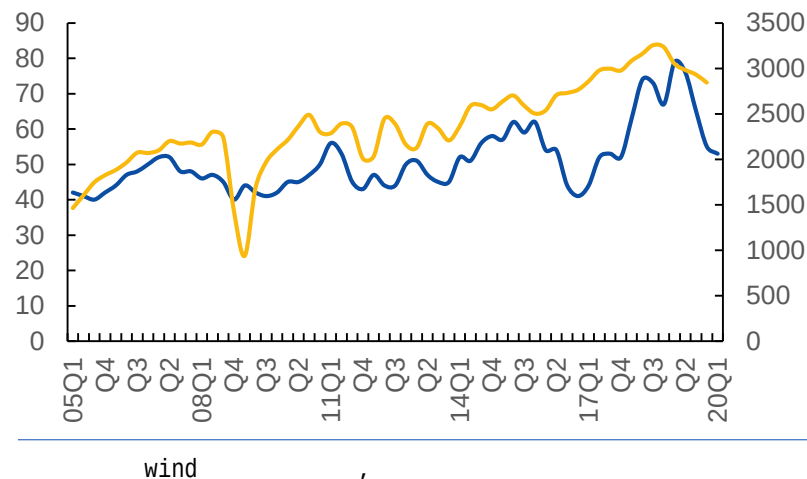
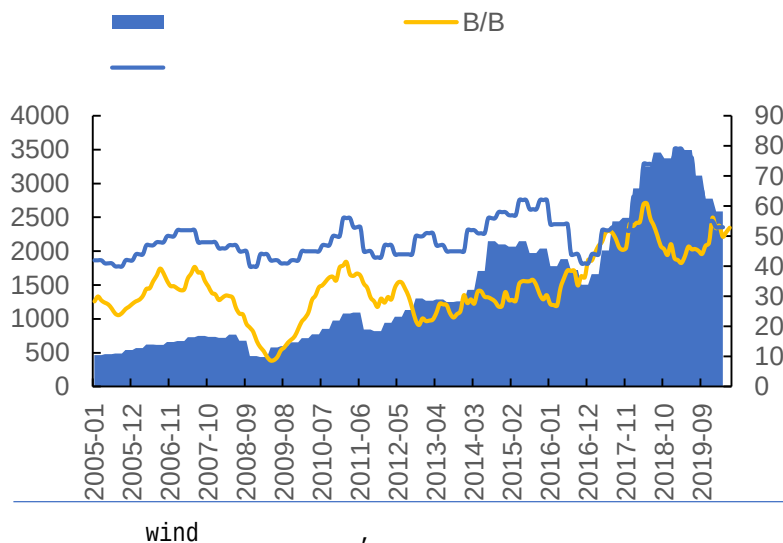
8.



b



B/B

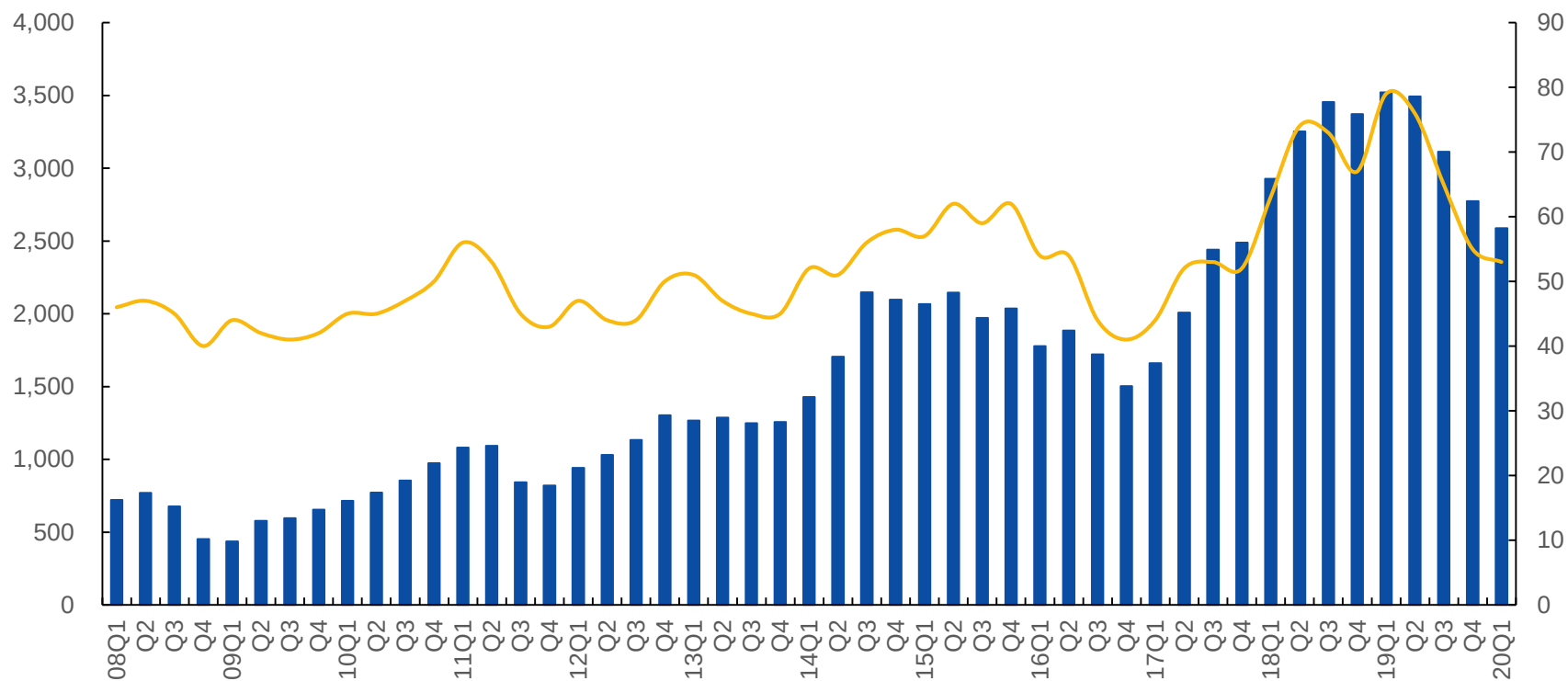


C

5G AI

➤

9 18Q1 20Q3 20Q1 17Q4



d 20Q2

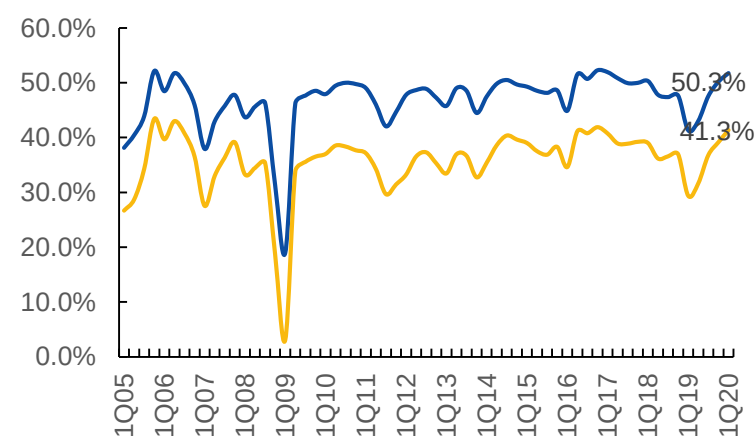
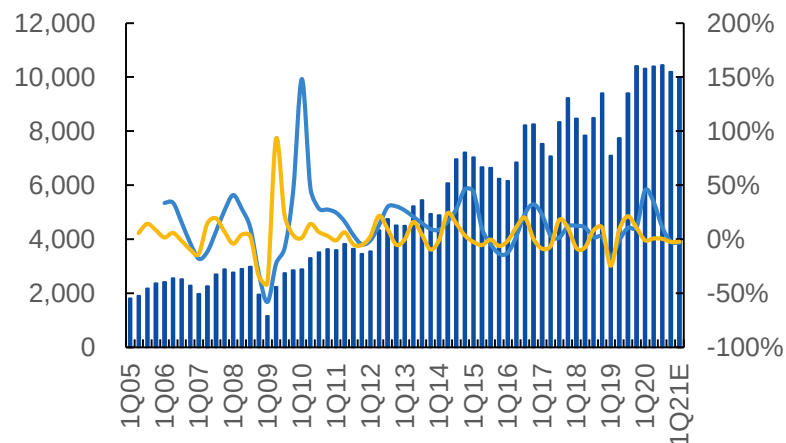
➤ 20Q1 103.1 -0.9% +45.4%

5G 20Q1 51.8% 4Q19 1.6

5nm

➤ 20Q2 101 104 0.6% Q2

50% 52% 20Q1 51.77%



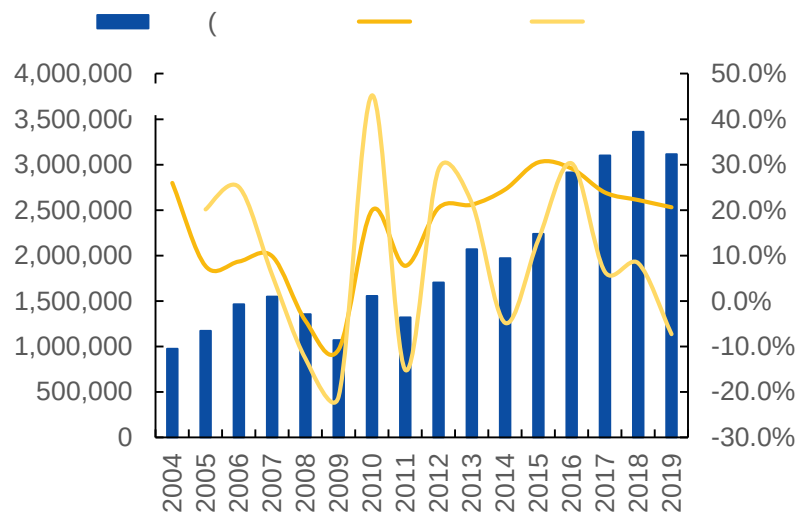


IDM

➤ 0.35 14
 8 12 2019 45 / 8

➤ IC Insights
 0.18/0.15 0.13/0.11 90 65/55 45/40 28

➤ IC Insights 2018 576
 2013-2018 9.73%



		1Q20E	1Q19	YoY	M/S
1	(TSMC)	10200	7096	43.7%	54.1%
2	(Samsung)	2996	2586	15.9%	15.9%
3	(GlobalFoundries)	1452	1256	15.6%	7.7%
4	(UMC)	1397	1057	32.2%	7.4%
5	(SMIC)	848	669	26.8%	4.5%
6	(TowerJazz)	300	310	-3.2%	1.6%
7	(VIS)	258	224	15.2%	1.4%
8	(PSMC)	251	178	41.0%	1.3%
9	(Hua Hong)	200	221	-9.5%	1.1%
10	(DB HiTek)	158	139	13.7%	0.8%

IC Insights

a

➤				2019	93%
➤					
➤	SN1	FinFET	3.5	6000	
	14				
➤		FinFET	20%	60%	
➤	14	FinFet	FinFet		
		5G			

	2019		2018		2017	
	1,999,379.30	93.12%	2,012,814.34	89.30%	2,012,943.61	95.94%
	71,464.46	3.33%	61,568.85	2.73%	59,510.66	2.84%
	47,623.52	2.22%	15,941.00	0.71%	11,224.32	0.53%
	28,530.42	1.33%	163,745.72	7.26%	14,486.32	0.69%
	2,146,997.70	100.00%	2,254,069.90	100.00%	2,098,164.91	100.00%

b



1Q2040nm

92.2%

CIS

IC



14nm

1.3%

1.5 /

2019

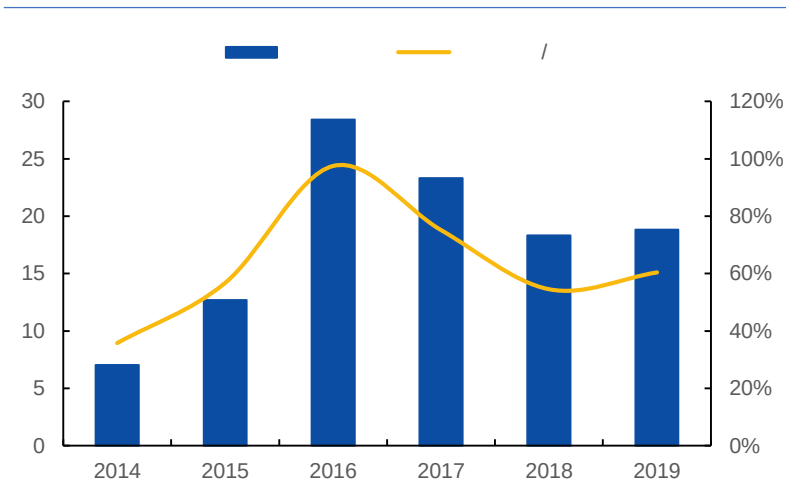
50.7%

90nm

66/65nm

27.3%

	2011	2012	2013	2014	2015	2016	2017	2018	2019
	28nm			20nm	16nm	10nm		7nm	
	32nm	28nm			14nm			12nm	
			28nm				14nm		
	40nm				28nm				14nm
		90nm		55nm		25nm			
						65nm	55nm	28nm	
				65nm					
				45nm					



C



2019

47.4

21.55%

8122

6527

5965

1595

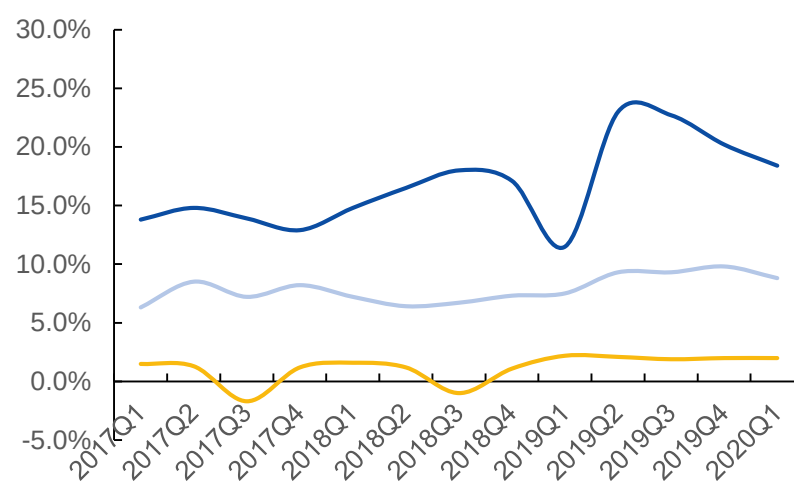
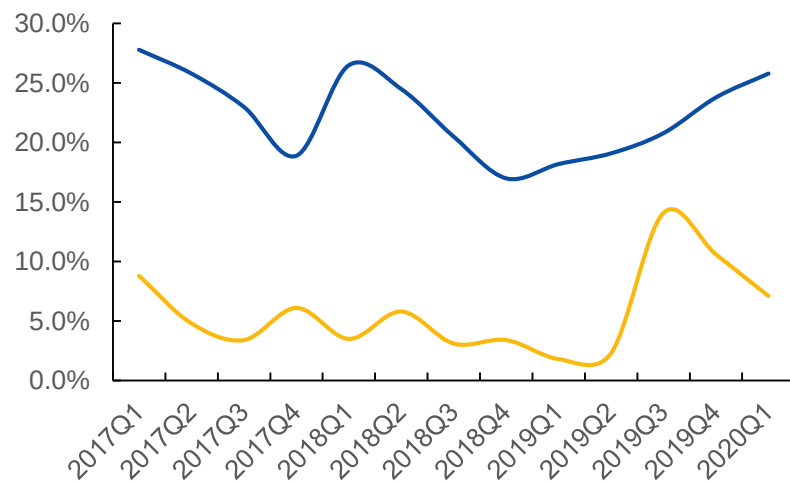


2019

1.8

15.2

0.8% 6.9%





2000~2008

0.25 0.18 90



2009~2016

65

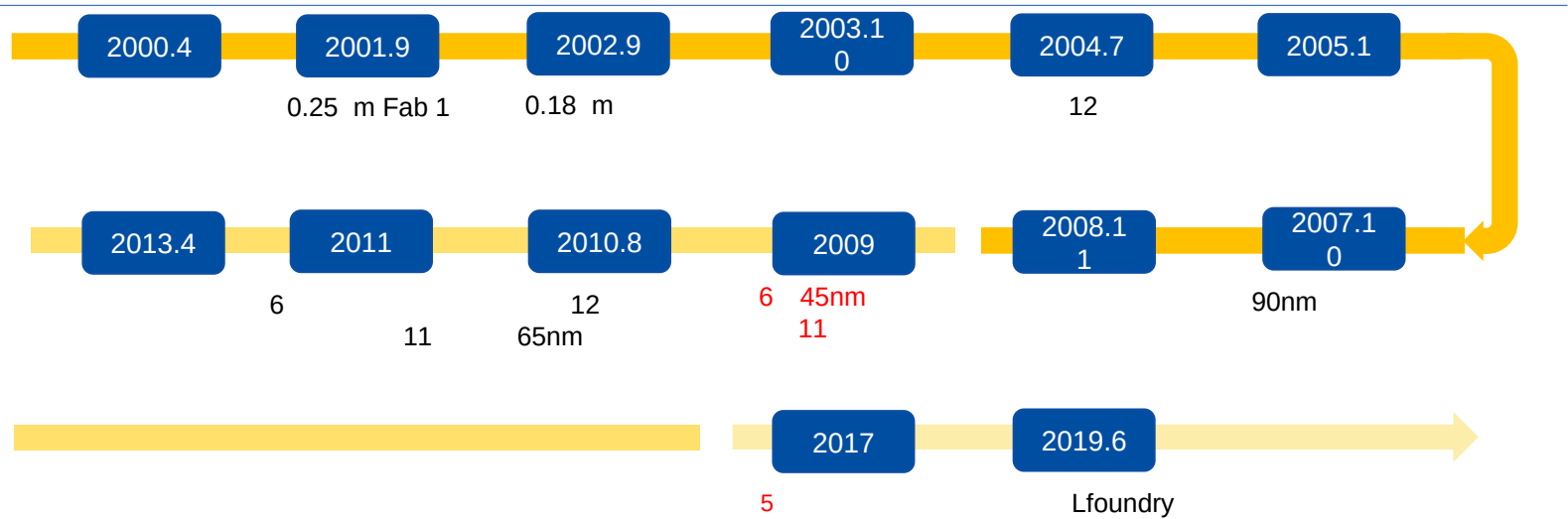
45 28



2017-

14nm

N+1 N+2



1

20

2

a

➤ 0.35 0.35 14 20

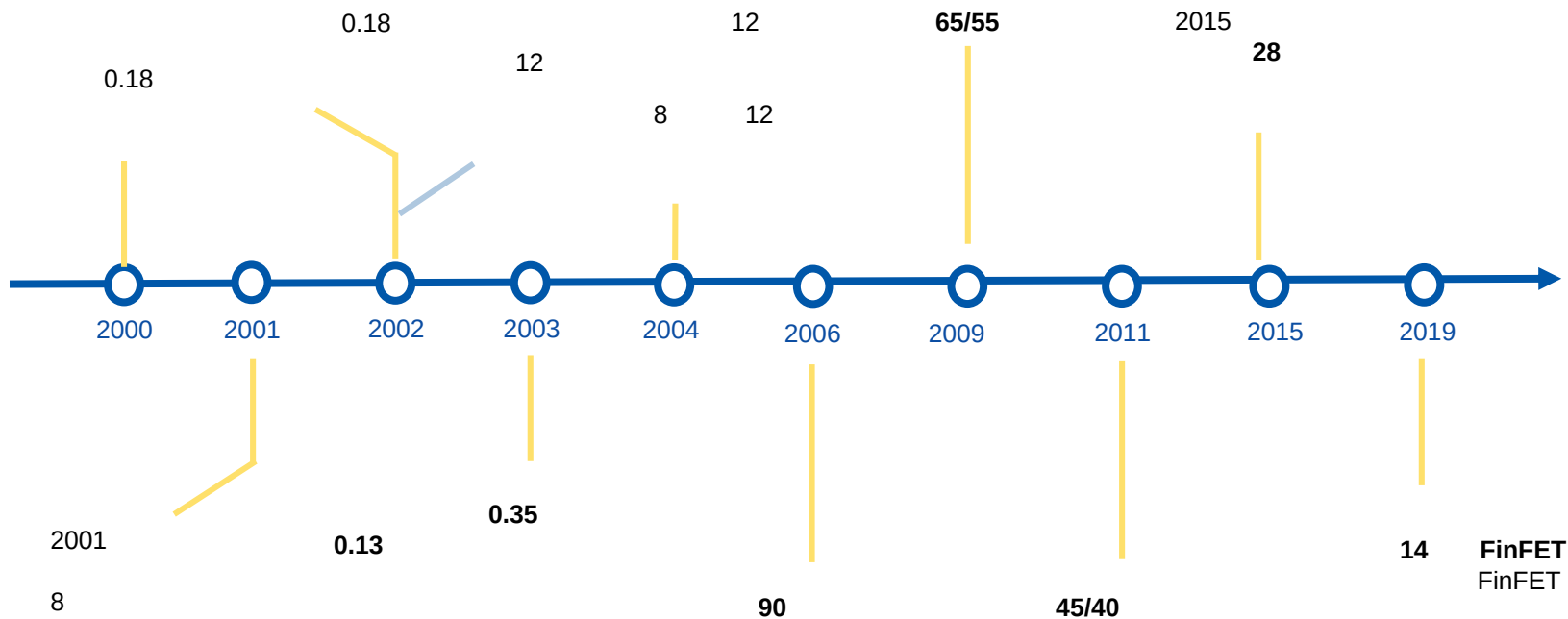
0.35 0.18 90 65 45 28 14 7

20

➤ 2017 2-3 2017

FinFET

FinFET



a



“

”

2019

47

22%



14

2019

33.2

14

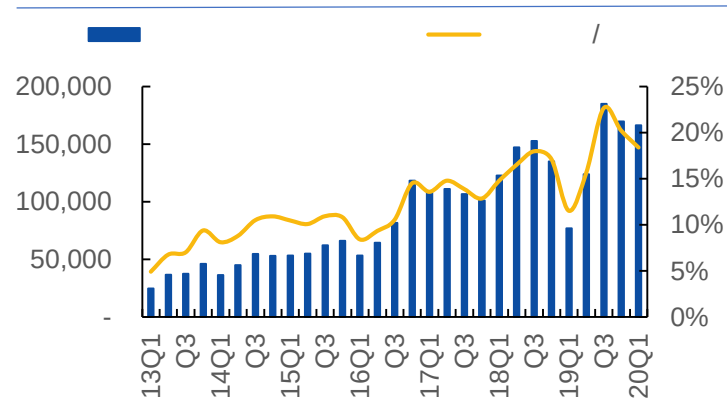
70%;

4.3

28

4.1

45



	2019	2018	2017
14	331828.22	284834.01	108585.55
28	42938.80	80171.50	173436.43
40/45	40812.12	33305.69	25158.97
55/65	12586.01	14415.43	14617.36
90	3069.79	906.00	2626.11
0.11/0.13	16305.92	10503.50	12250.89
0.15/0.18	21480.34	18398.17	17114.57
0.25	4.15	593.76	464.46
0.35	5411.31	3961.93	3353.45
	474436.66	447090.01	357607.79

2017

2018

2019

184

8%

186

8%

211

9%

36

17%

45

19%

47

22%

31

9%

28

9%

27

8%

3

6%

3

5%

4

7%

5

5%

5

6%

5

6%

4

8%

4

7%

5

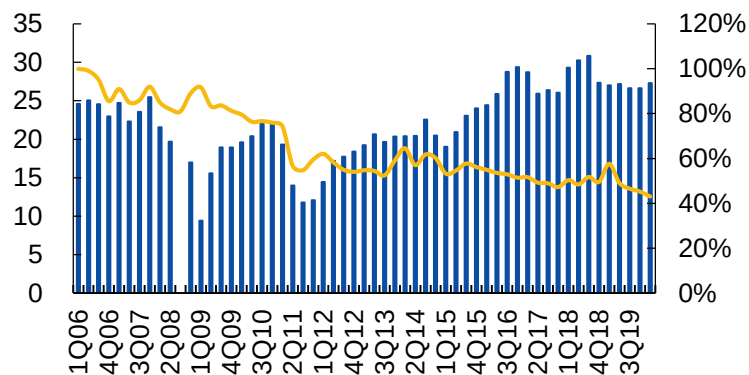
8%

14 FinFET

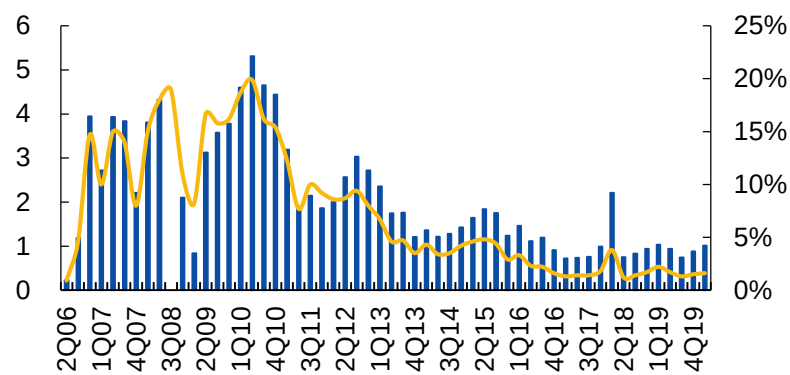
1 14 FinFET

b

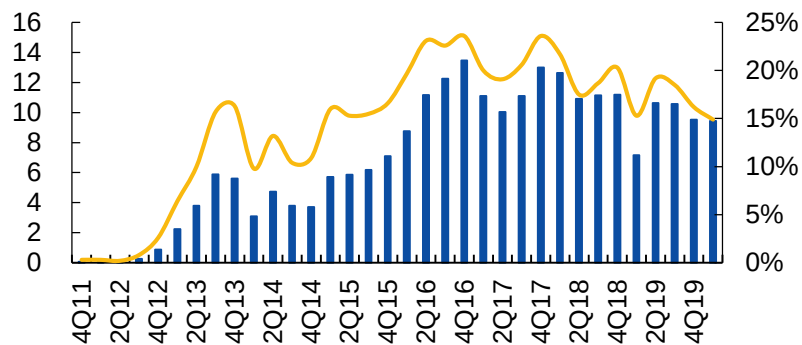
0.35 0.13



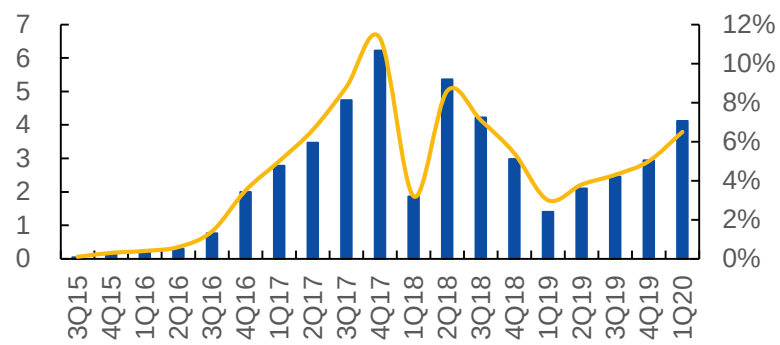
2006 90



4Q11 40/45



3Q15 28



C

55/65



19Q3

65

19Q4 20Q1

➤ 0.35-0.13

2000

20

0.35-0.13

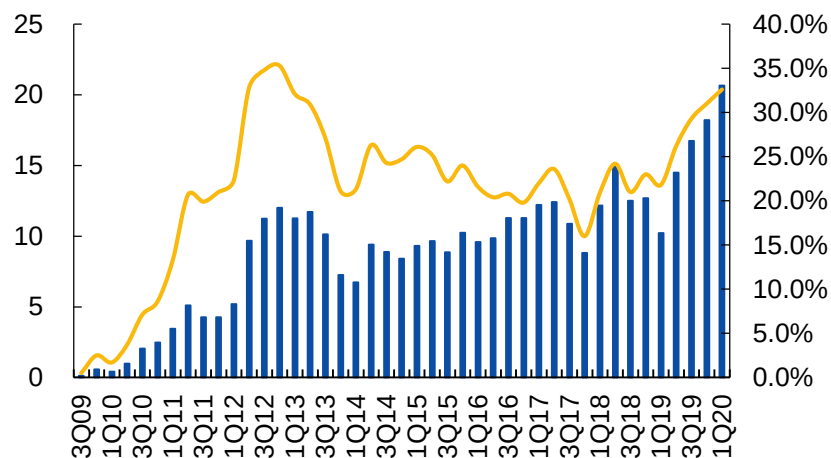
8

20Q1

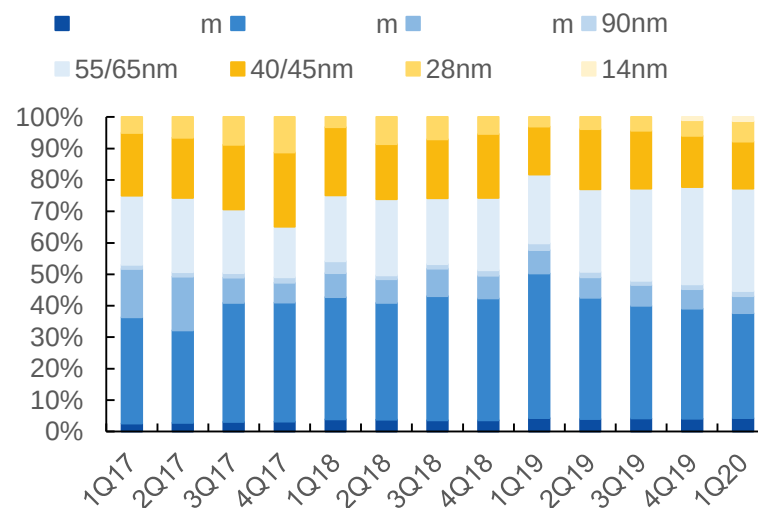
0.35-0.13

40%

55/65



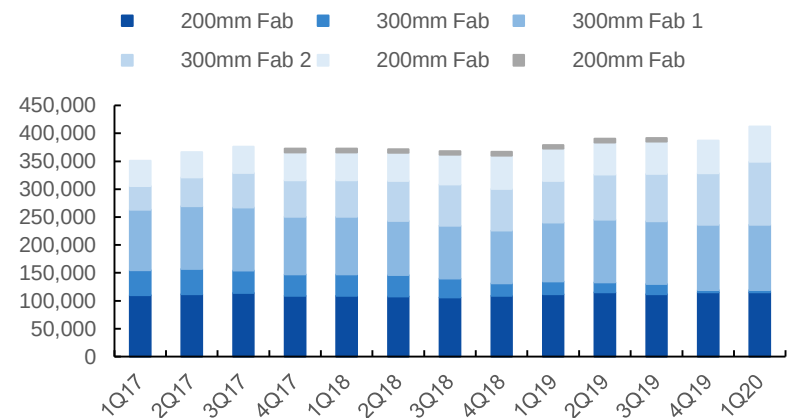
%



d

➤ 7 4 12 3 8
12 12 8
12
8 12

200mm Fab	0.35 μ m~90nm	120K
300mm Fab	40nm~14nm	20K
300mm Fab 1	0.18 μ m~55nm	50K
300mm Fab 2	40nm~28nm	35K
200mm Fab	0.35 μ m~0.15 μ m	50K
200mm Fab	0.18 μ m~0.13 μ m	60K
8		466K



e



6

2020 Q1

25.8%

20Q2

3~5%

19%

26~28%

98.5%

14nm

14nm

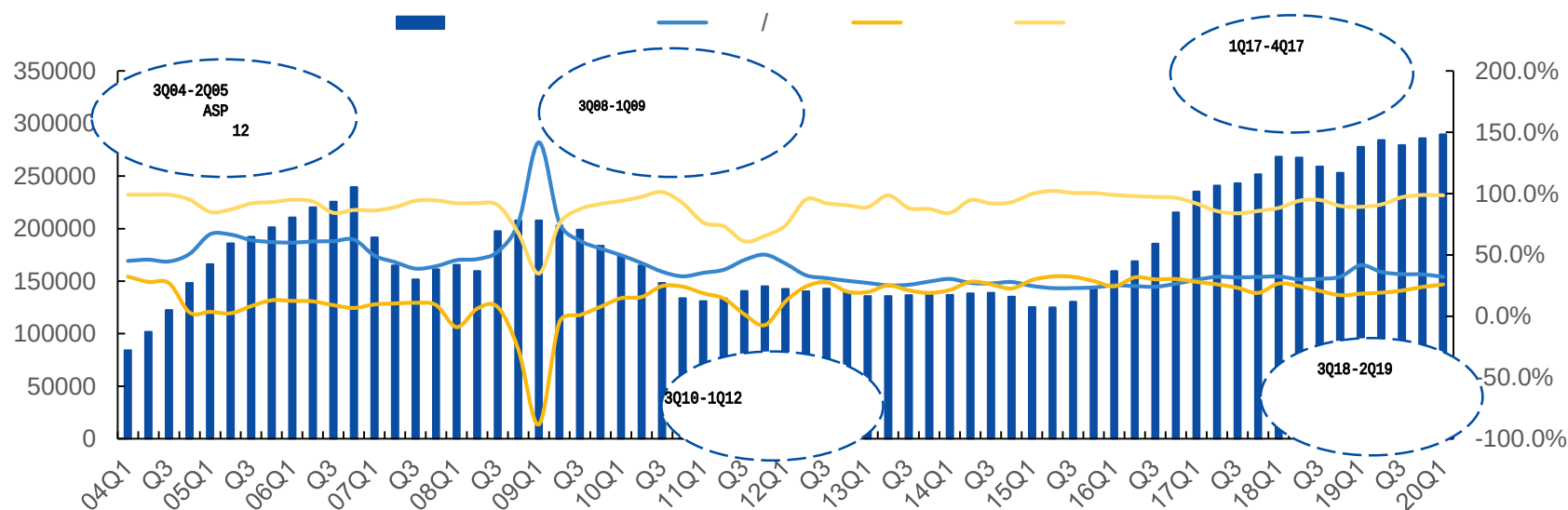


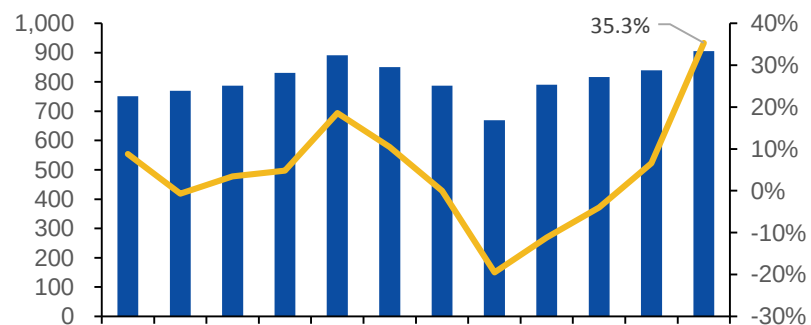
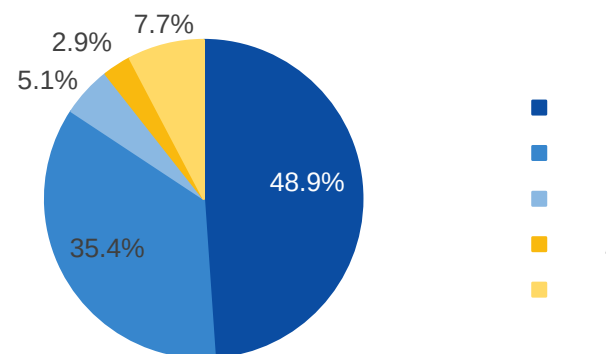
2019

Q3

2

/





e

➤ 2020 8

47.6 98.5%

8 22.3 -9.6% 12

23.4 +11.8%

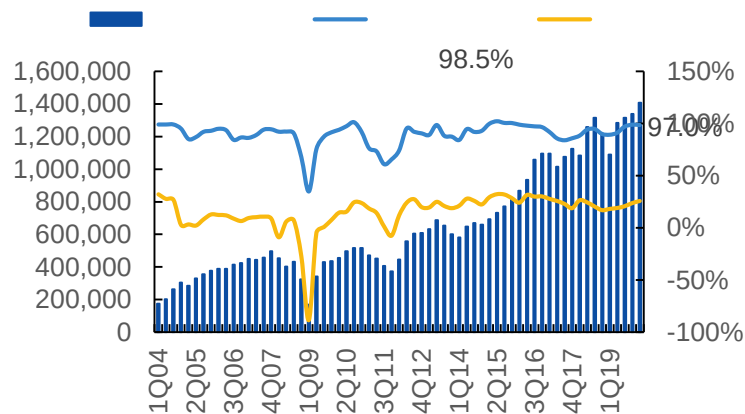
➤ 12 19Q4

6750 20Q1 9,000

33.3%

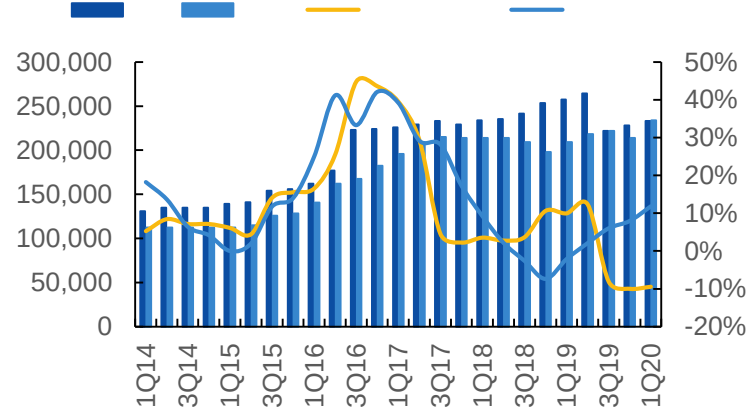


8



8

12



a

➤ 4.9

12

102 / 20.8 /

➤ 12

75% 12 50%

13 5 12

7 8 1 6 12

77.5 8

25.8

➤ 6 3 12

3 8 12

10.5 , 8 10.3

12

FAB

12	20-7nm	GIGAFAB 12	2001	
12	20/16nm	GIGAFAB 14	2004	
12	28-7nm	GIGAFAB 15	2011	166K/
12	16/12nm	FAB 16	2018	20K/
12	5/3nm	FAB 18	2020	120K/
8	0.15 μm	FAB 3	1995	100K/
8	0.15 μm	FAB 5	1997	48K/
8	0.11 μm	FAB 6	2000	99K/
8	0.11 μm	FAB 8	1998	85K/
8	0.25-0.15 μm	FAB 10	2004	120K/
8	0.25-0.18 μm	FAB 11WaferTech	1998	n.a
8	90-65nm	SSMC(NXP)	2001	n.a
6	0.15-0.12 μm	FAB 2	1990	88K/
				1000K/

12

FAB

12	40-14nm	300mm Fab	2019	20K/
12	40-28nm	300mm Fab 2	2015	35K/
12	0.18 μm-55nm	300mm Fab 1	2004	50K/
8	0.35 μm-90nm	200mm Fab	2001	54K/
8	0.35-0.15 μm	200mm Fab	2004	22K/
8	0.18-0.13 μm	200mm Fab	2014	27K/
				208K/

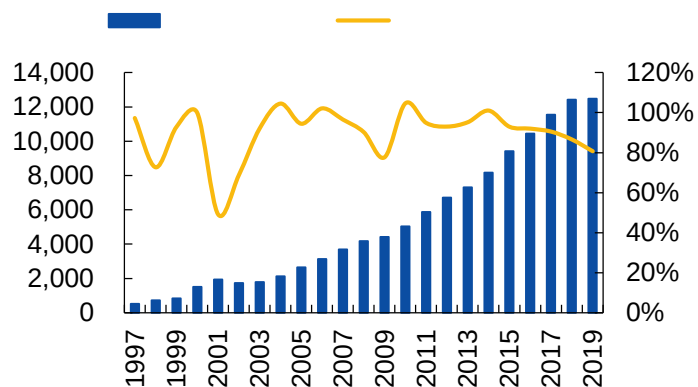
a



2

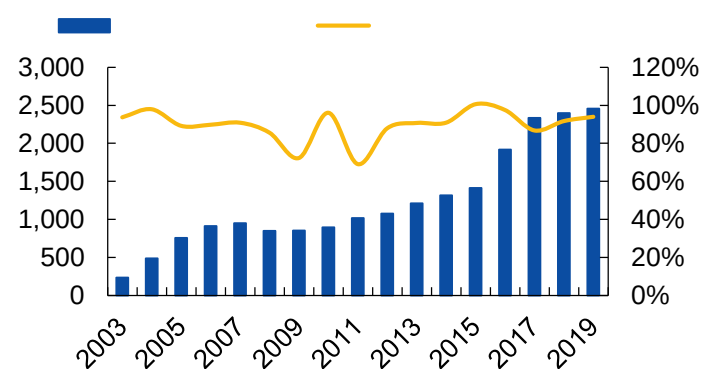
&

12



&

12



&

12

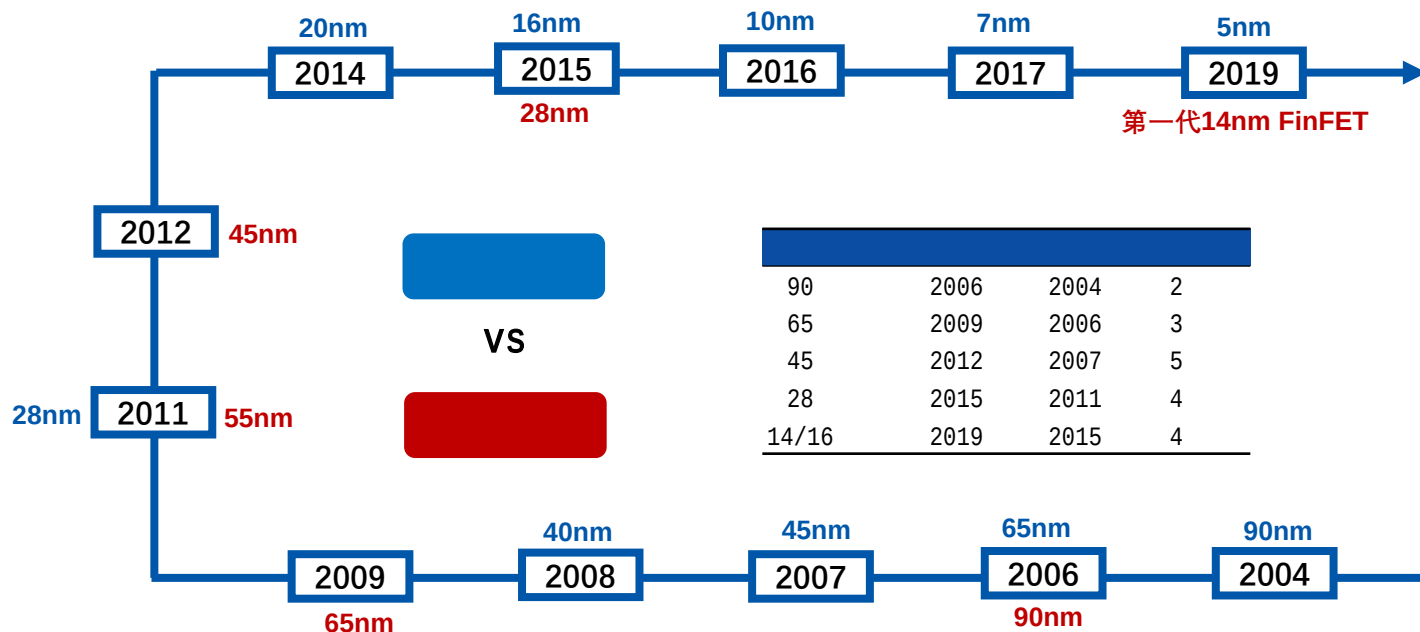
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	4,168	4,424	5,035	5,876	6,707	7,310	8,176	9,423	10,435	11,538	12,413	12,469
	13%	6%	14%	17%	14%	9%	12%	15%	11%	11%	8%	0%
	90%	78%	105%	95%	93%	95%	101%	93%	92%	91%	87%	81%
	849	854	893	1,016	1,077	1,212	1,315	1,414	1,918	2,334	2,399	2,455
	-11%	1%	5%	14%	6%	13%	8%	8%	36%	22%	3%	2%
	86%	72%	96%	69%	88%	91%	91%	101%	98%	87%	92%	94%

VS

b



2-3 45 3~4 90 65
4 14



VS

b

➤ 28			67%	4%
➤	7	16/14	28	
➤	0.18	65	45	

2019

2019

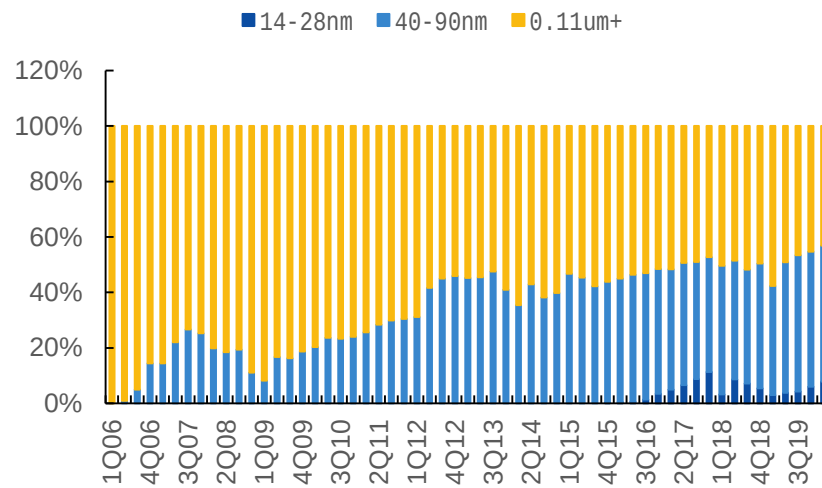
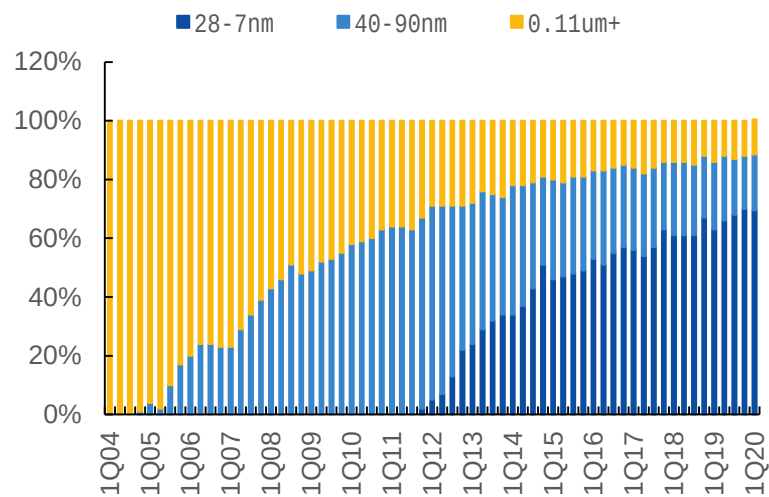
2019				2019			
7	58,228	27%		14/28	811	4%	4%
10	5,429	3%		40/45	3,447	17%	
16	43,564	20%		55/65	5,475	27%	
20	2,225	1%		90	406	2%	46%
28	34,902	16%	67%	0.13	1,419	7%	
40/45	21,785	10%		0.18	7,908	39%	
65	16,158	7%		0.35	811	4%	50%
90	5,979	3%	20%				
0.11/0.13	5,354	2%					
0.15/0.18	18,098	8%					
0.25	4,652	2%	12%				

VS

b



2004 0.11um+
2011
40-90nm
28nm
2006
2015 28nm+



VS

b



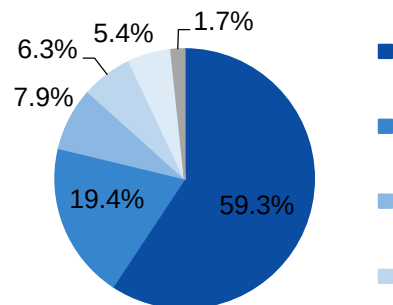
2019

59%
19%
59%
26%

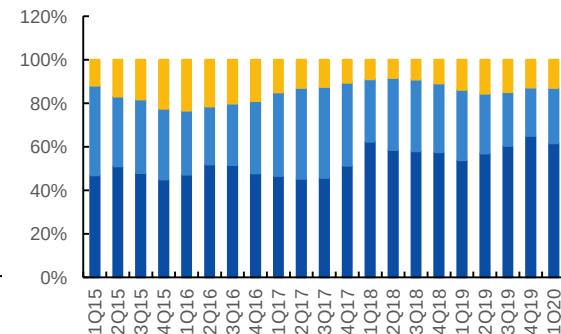
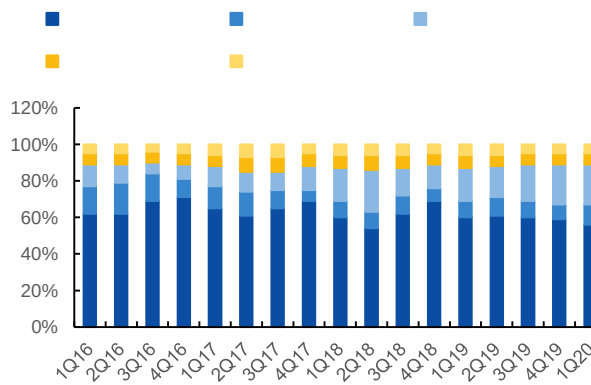
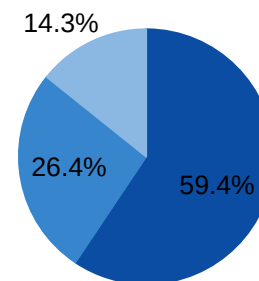


2016 10%
2019 20%
2019 60%

2019



2019

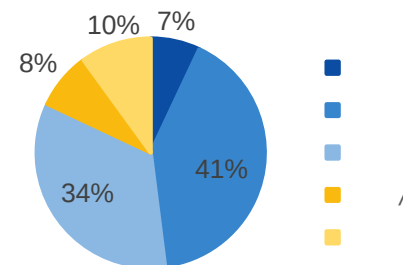
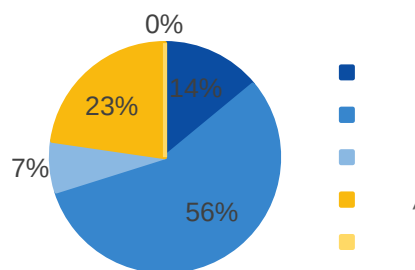


VS

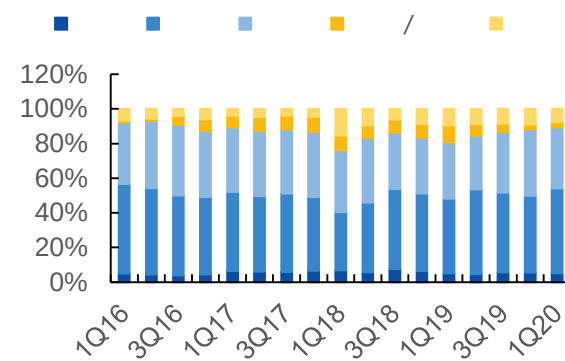
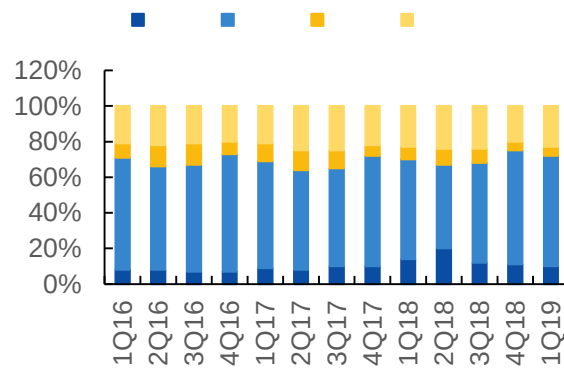
b

2019

2019



41% 34%



15% 55% 5% 25%

5% 40% 35% 10%

VS

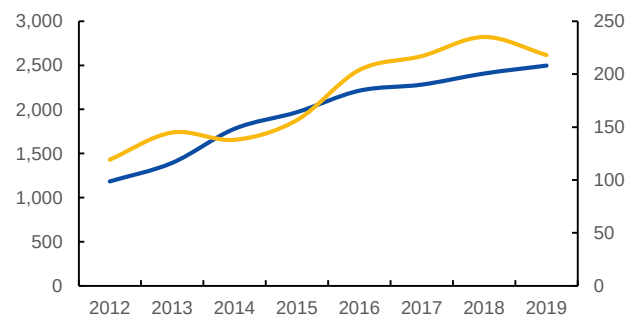
C



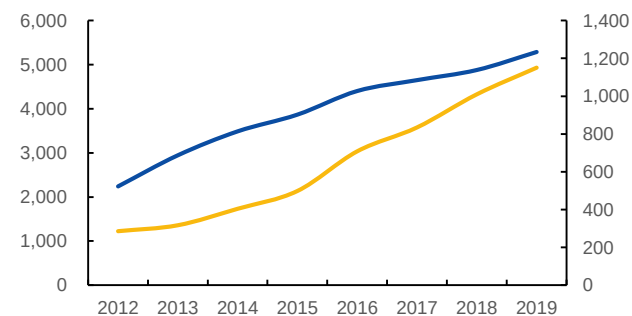
49% 34%

20% 30% 2% 9%

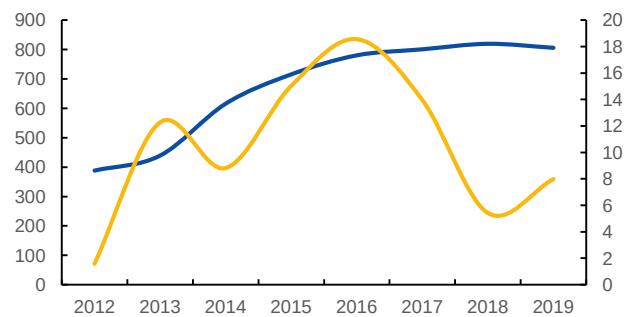
RMB



RMB

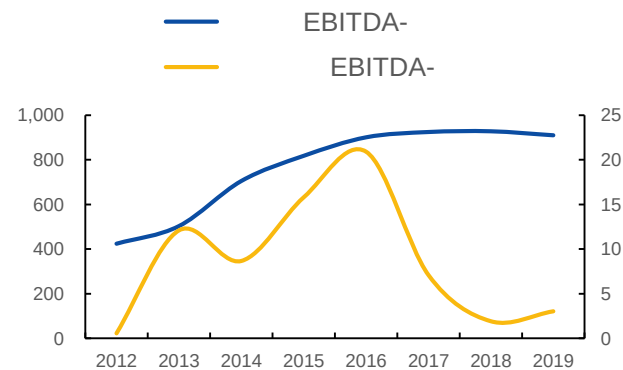


RMB



EBITDA

RMB



VS

C



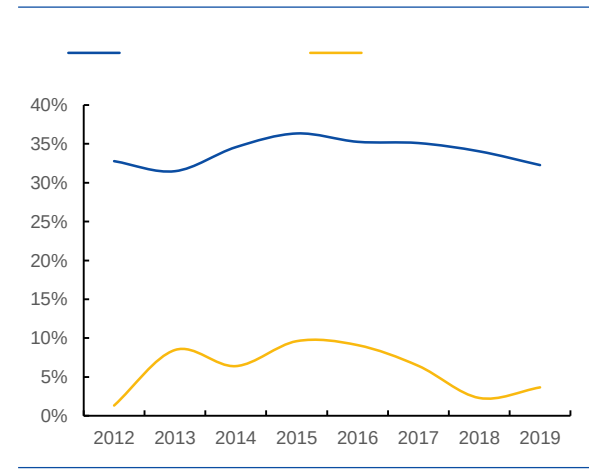
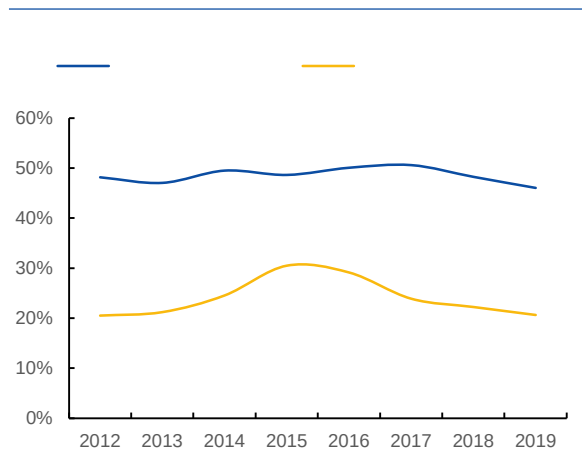
7~8
8~14
5~10
4~5

20 10 5

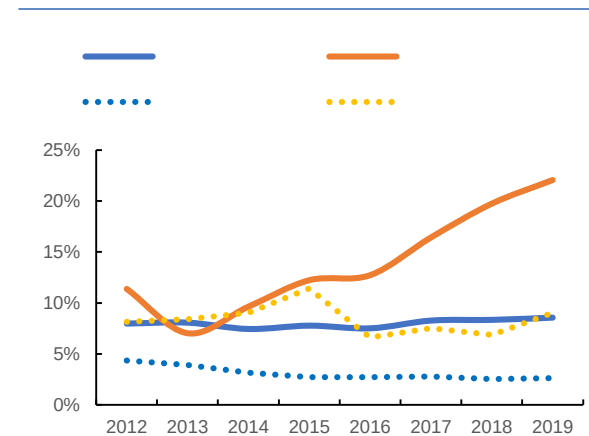
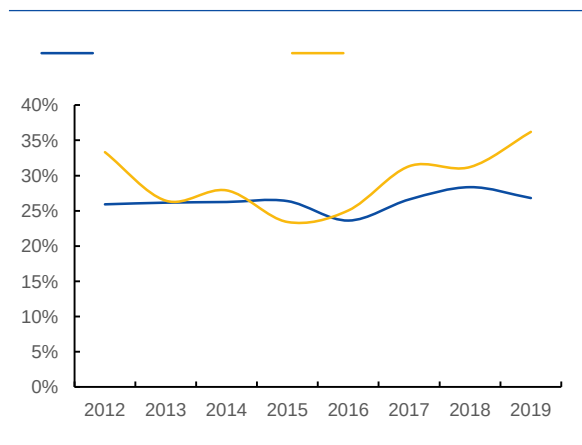
1



50% 70%~80%
20%~30%
30%
8% 3%
11% 2019 22%
10% 2012



&



VS

d

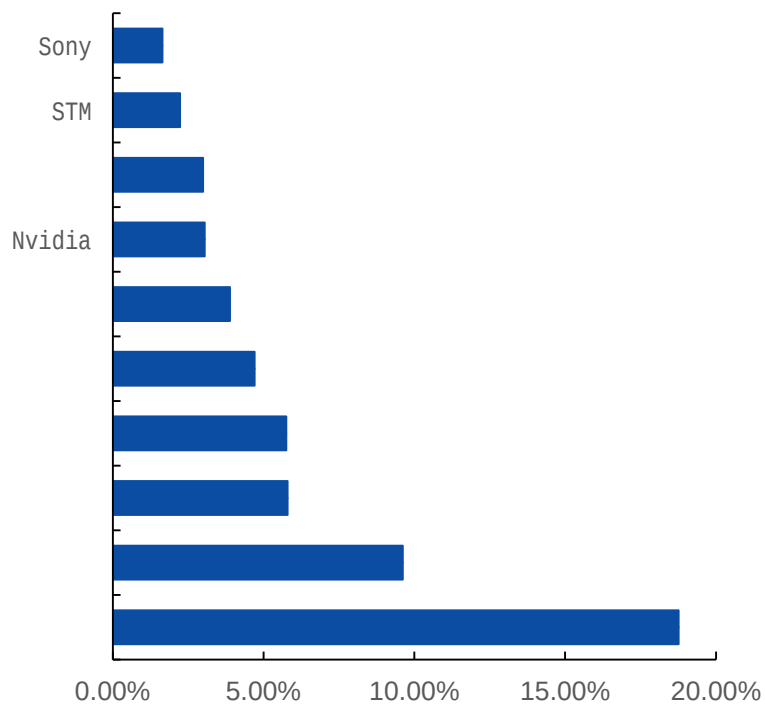


50%

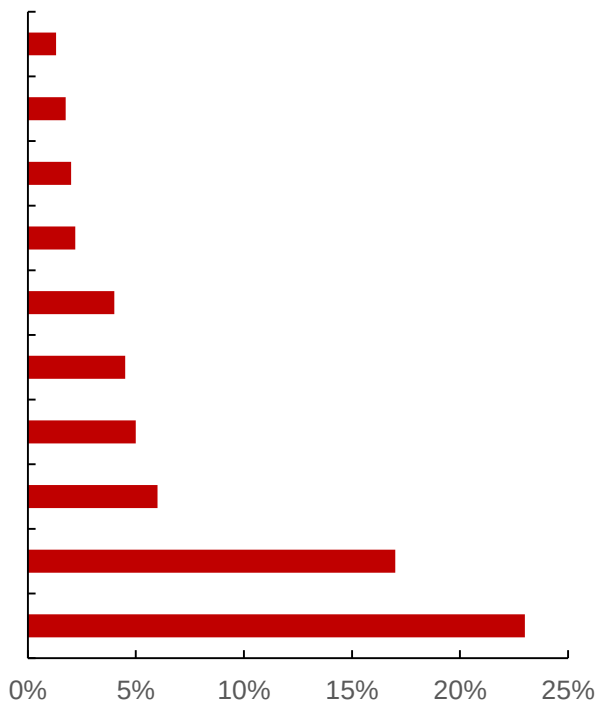
23% 17%

10%~20%

19% 10%



Bloomberg,

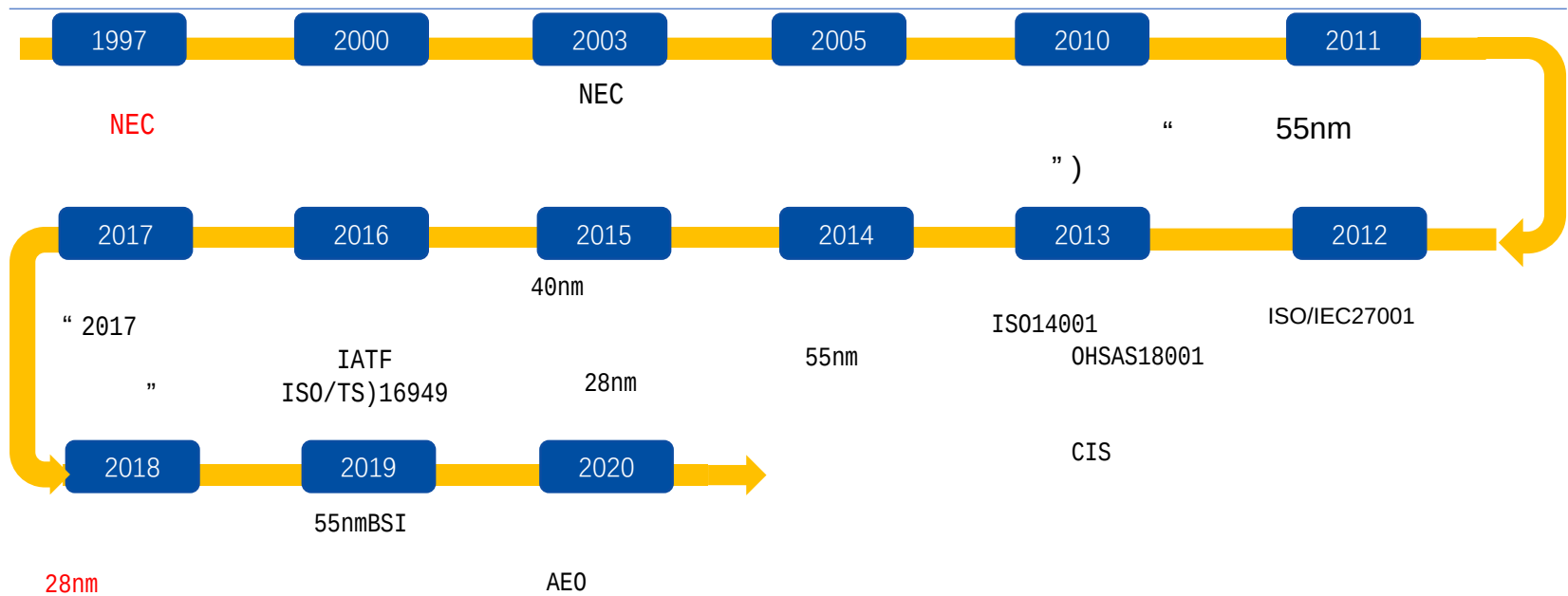


Bloomberg,

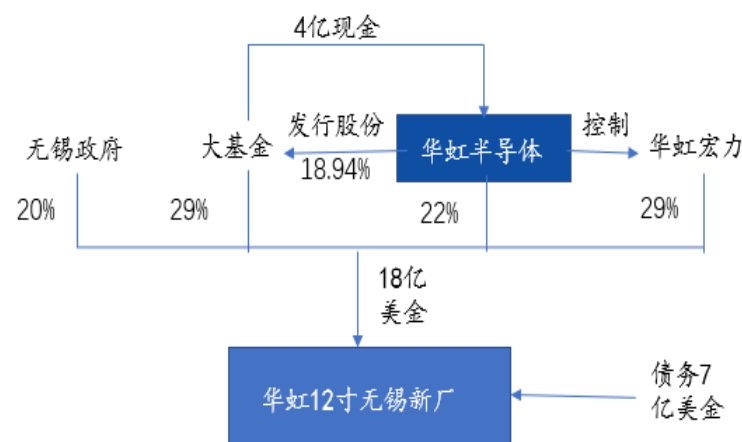
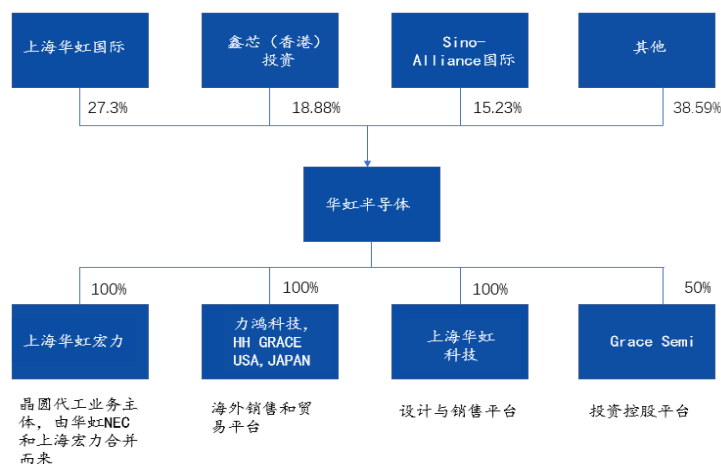
IDM

a

NEC



➤		8		18
			12	4
	5G		2019	
	12		12	
➤				12
	2011	4	12	
	65/55nm	40nm	28nm	3.5
				2018
	28/22nm	14nm		10
			4	





C

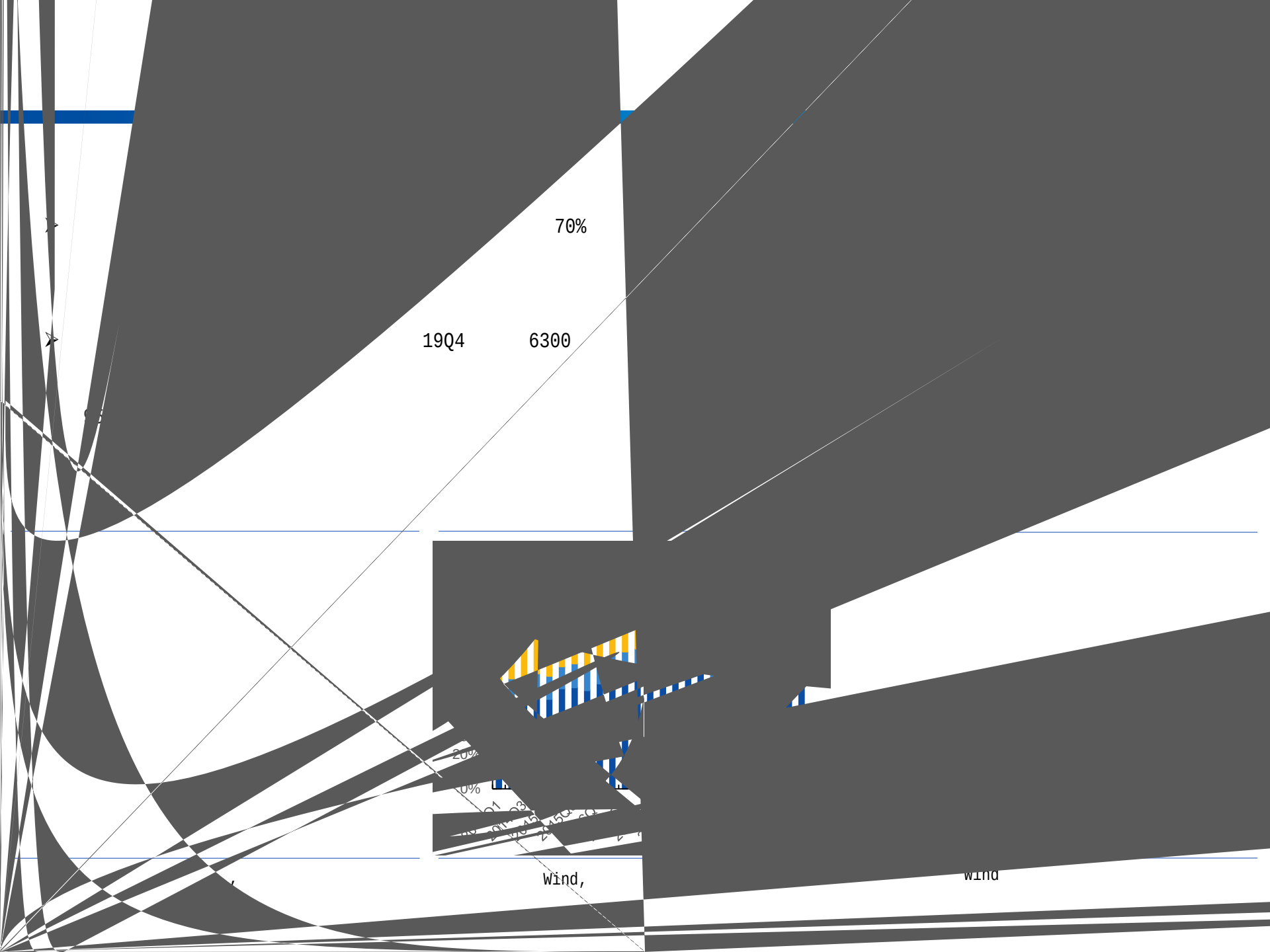
IGBT MOSFET



1 90



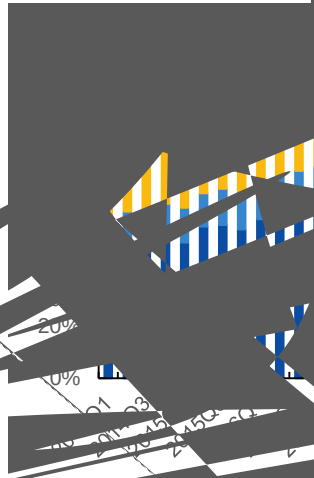
	(embedded NVM	CU(90,110,130nm 250nm)			90	130, 180,	StarChip Cypress	/	IC	Microchip STMicroelectronics	
	Discrete	Power MOSFET Junction	250 350nm	350nm	IGBT	Super	MACMIC, Alpha & Omega AOS),Diodes	Wuxi NCE Power Oriental Semi Sinopower	On Semi		
/	Analog/Power management IC	110 350nm	130 -LED	150	180 350nm	250	350nm /	Semi Power Semi Diodes	MACMIC, Cypress LED	Oriental Semi Bright	
/	Logic/RF	90 -RF SOI	110 200	130 130nm	150	180	250nm	On Semi	Cypress	Diodes	
	NVM	NOR			110	130	150	180	250nm	Cypress	NOR



70%

19Q4

6300



Wind,

wind

d



8

1

12

8

5G

2018

1

3

12

90nm

55nm



2019Q1

87.3%

20Q1

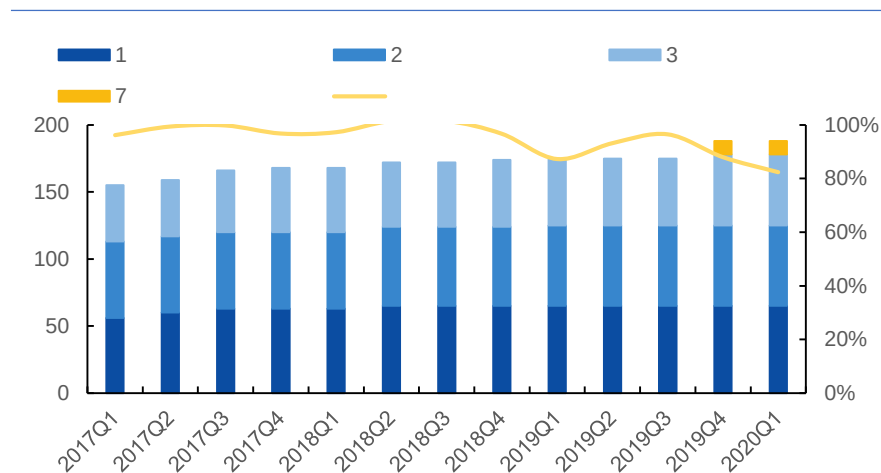
91.9%

2019Q4

12

31.6%

6.9% 20Q1



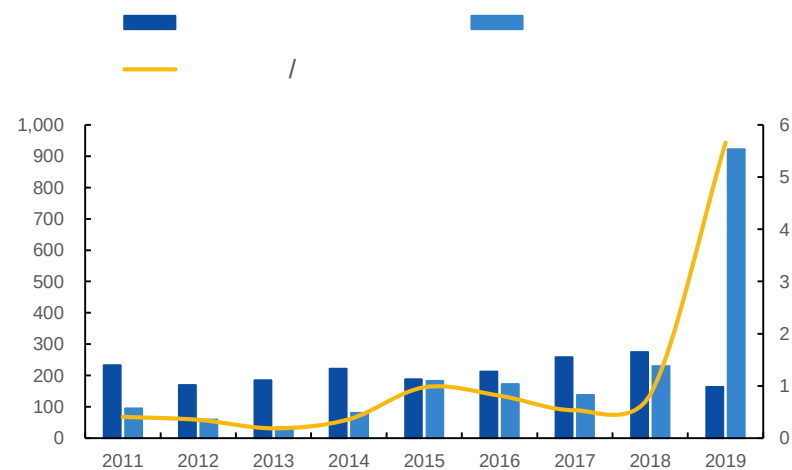
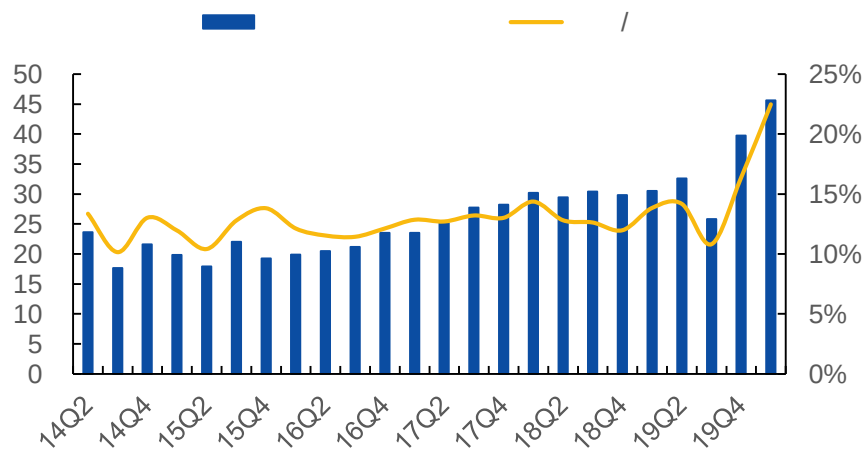
8

12

	2019Q1	2019Q2	2019Q3	2019Q4	2020Q1
8	87.3%	93.2%	96.5%	92.5%	91.9%
12				31.6%	6.9%
	87.3%	93.2%	96.5%	88.0%	82.4%

d

➤	2019	91.02%	2019	9.22
	7.91	85.8%		
➤		20%	33%	
			2019 Q4	0.71
	83.8%	77.6%		



e

28/14nm

- 65/55nm , 35K 28-14nm
40K 2018 10 18 14nm 2020
- 2020 1 14nmFinFET SRAM 25%



35K(12

65/55-28nm

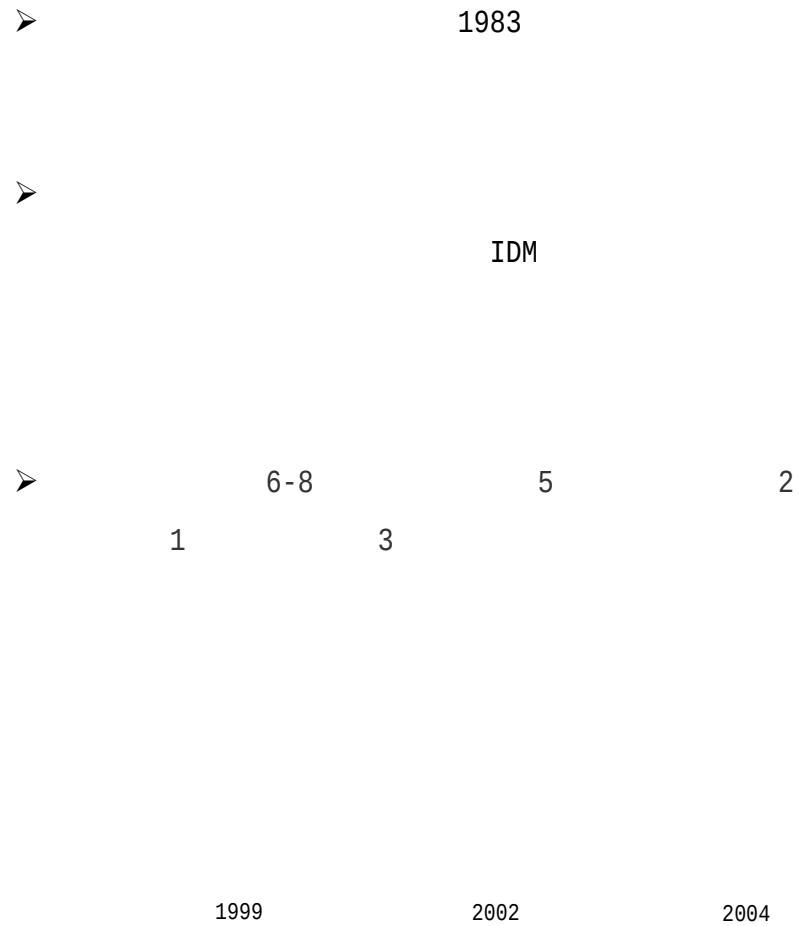


40K(12

28/22-14nm

:

IDM



➤	2	8	3	6	2019	6	247	/	8	133	/
➤					MOSFET		-100V		1500V		
➤										BCD	
					MEMS						

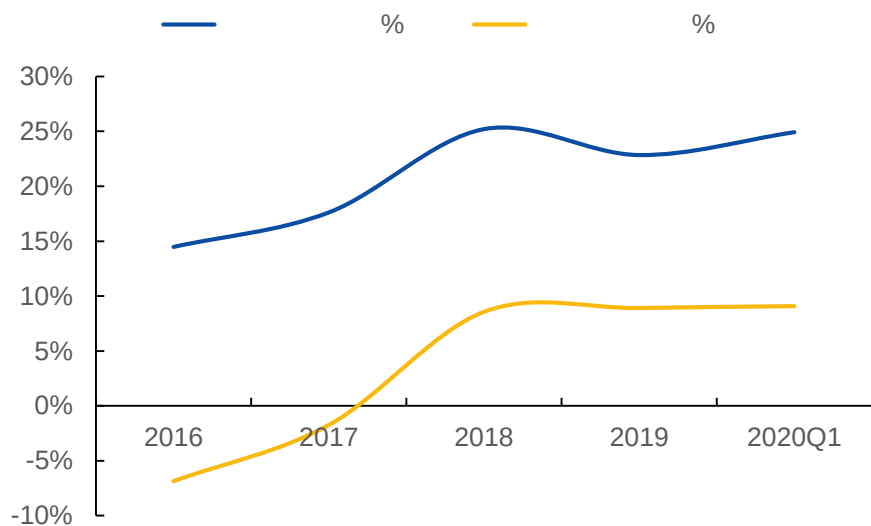
2018										
3	6	Analog	BCD	MEMS	DMOS	PowerDiscrete				247
1	8	Advance	BCD	Analog	DMOS					73
1	8		MOS		MOS	MOS	SBD			60
										199
		QFP	QFN	PQFN	FC-QFN	TSSOP	SSOP	MSOP	IPM	62
										69
										2.4

IC				
2019	2019	2019	2019	2019
5.91	22.52	8.09		19.24
0.07	3.20	0.38		2.39
8.09	64.38	17.10		33.03
3.96	12.13	11.50		25.29

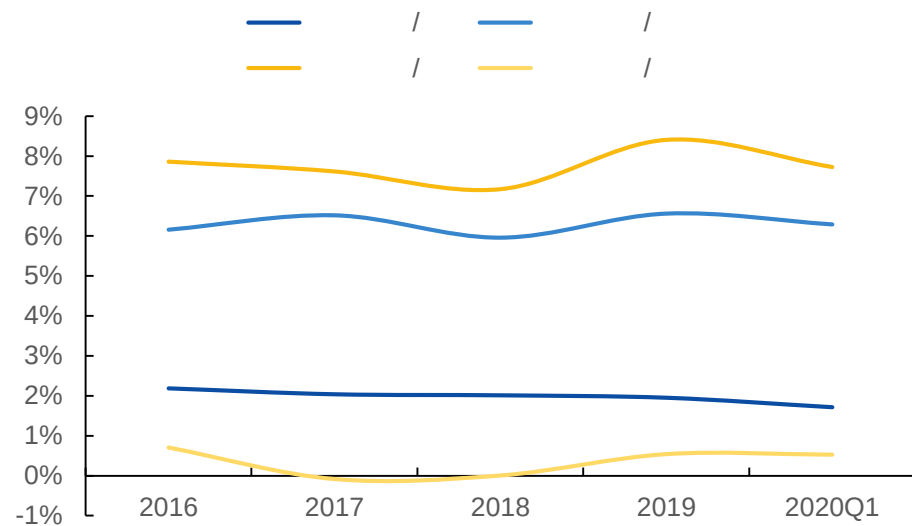
➤ 19Q3 2019 20Q1 8.72pct

0.90pct

➤ 2019 MEMS 4.8 MOSFET/IGBT/ IC 8.4% BCD



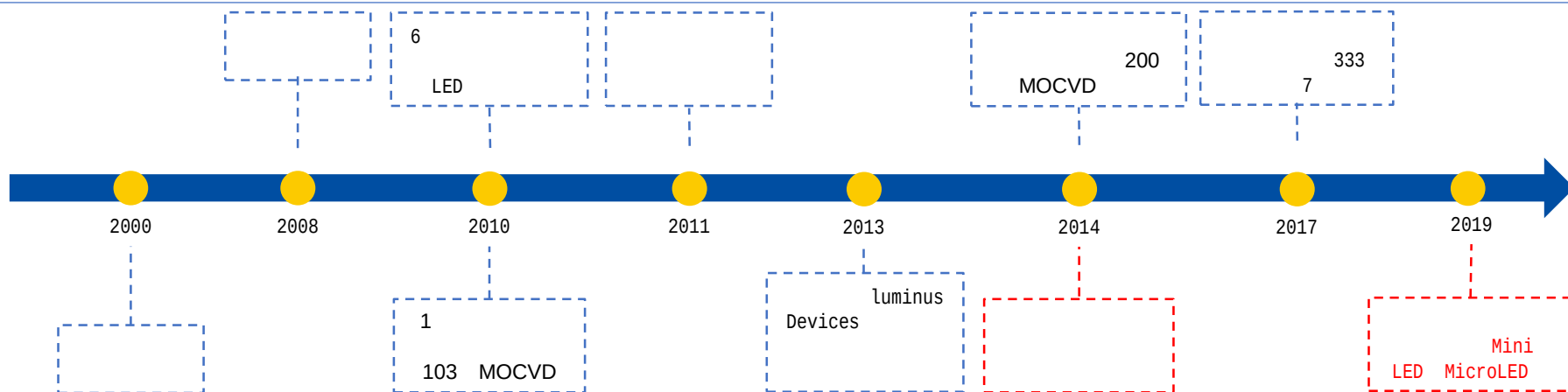
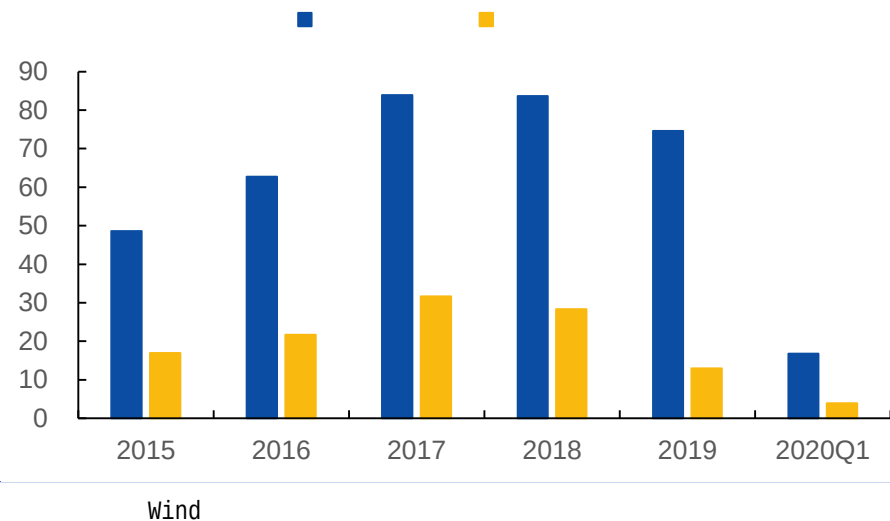
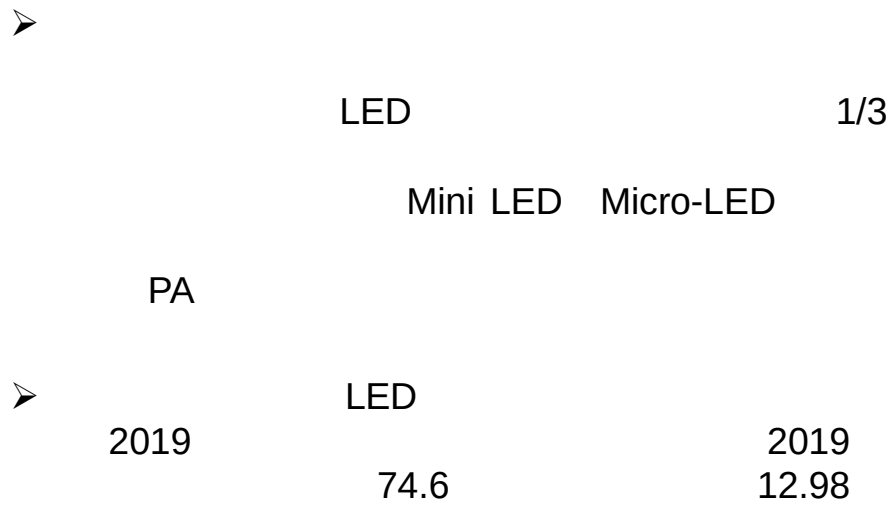
Wind,



Wind,

:

IDM

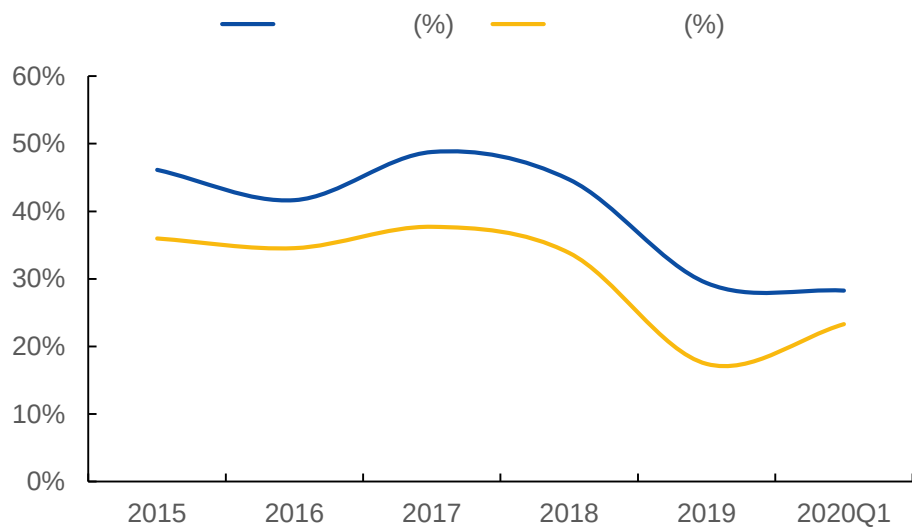


➤ 28.24% 23.29% 2019 2020Q1

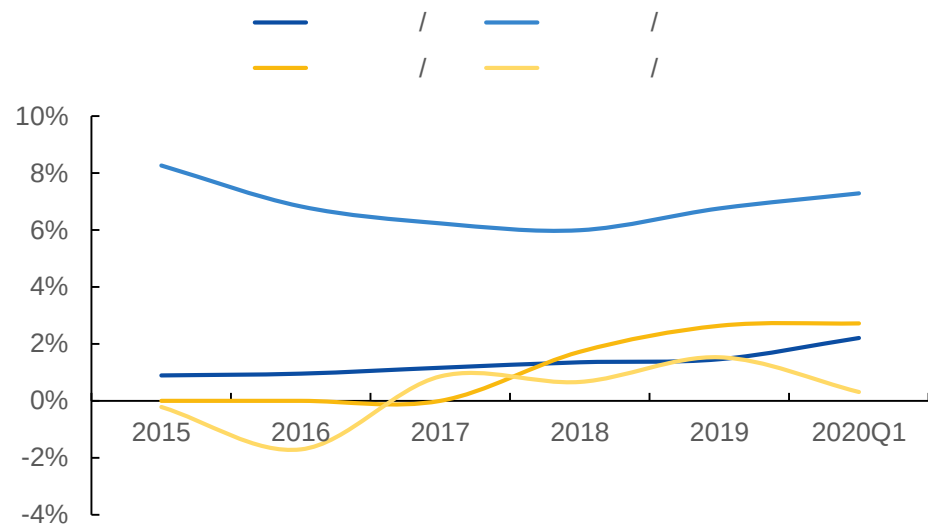
➤ 2019 1.46% 6.76% 1.53% 2.64%

➤ LED 34.16% 20Q1 87.5%

➤ Mini/Micro LED



Wind,



Wind,

➤ LED 7000 19.72% 2010
 103 MOCVD 2014 200 MOCVD
 1800 5000 2010
 150 180
 ➤ 2014 2017
 36 / 6

16 36 / 6

1 :
 (1) 769.20 Mini /Micro LED 161.60
 / 530.80 / UV 30.80 / 46
 /
 (2) PSS 923.40
 (3) 141.80
 2
 (1) GaAs LED 123.20 (Mini/Micro LED) 17.60 /
 IT0 34.90 / RS 19.10 / 14.20 /
 70 14.40 / 7.20 / 7.00 /
 8.80 /
 (2) 40.50 13.50 / 27.00
 /
 3 :
 (1) UV LED 81.40kk/ ;
 (2) Mini LED 8483.00 kk/
 (3) LED 57.80kk/
 (4) LED 63.20kk/
 (5) IR LED 39.00kk/

GaN

2022

4.6

4.9

23.5%

2023

13.1

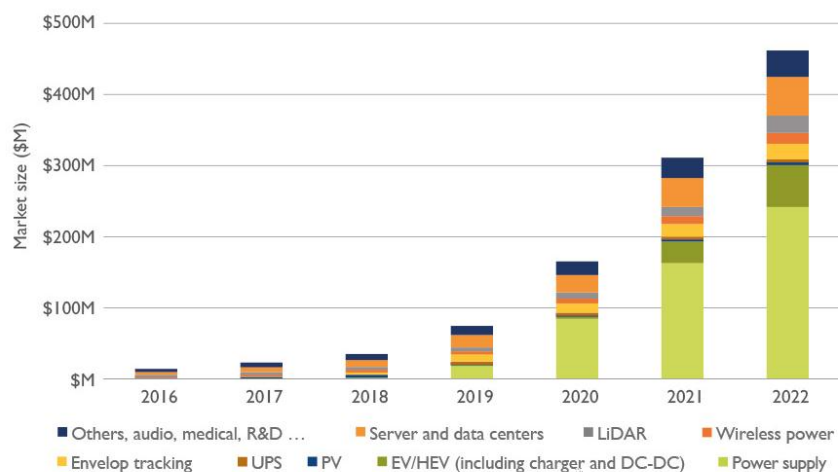
40%

Yole Developpement

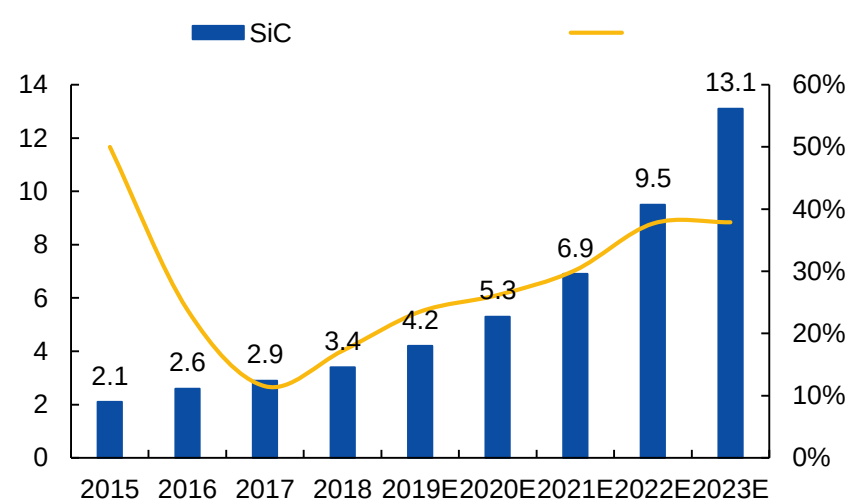
2.5

2019 SiC

GaN



SiC



Yole Developpement,

1

AI 5G IoT

14

14

28

14

2

IGBT MOSFET

15-20%

3

MEMS

4

				PE				PB				PS	
				2019A	2020E			2020Q1	2020E			2019A	2020E
0981.HK	212,866	1,562	1,560	136.24	136.44	49,936	49,020	4.26	4.34	21,792	25,324	9.77	8.41
1347.HK	40,166	1,135	809	35.40	49.67	15,815	18,718	2.54	2.15	6,523	7,002	6.16	5.74
600703.SH	126,676	1,298	1,826	97.56	69.38	24,321	25,038	5.21	5.06	7,460	8,731	16.98	14.51
688396.SH	68,371	401	483	170.60	141.56	10,531	7,661	6.49	8.92	5,743	6,513	11.91	10.50

wind

2020 7 10

1
2
3
4
5

1	2		
6	20%	6	10%
6	5-20%	6	± 10%
6	± 5%	6	10%
6	5%		

Z23834000),

“ ”

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