688396

“ + ” 68.98

❖ “ + ”

+

❖ **12**
MOSFET -100V 1500V
MOSFET MOS MOS
MOS IGBT 6

12

❖
PMIC
PMIC

❖
+
2017-2018

12
2020-2022
9.77/12.10/14.38

❖

	2019A	2020E	2021E	2022E
( )	5,743	7,083	8,637	9,995
(%)	-8.4%	23.3%	21.9%	15.7%
( )	400	977	1,210	1,438
(%)	-6.7%	143.7%	23.9%	18.8%
( )	0.33	0.80	1.00	1.18

(IGB)
2017-2018

(IGB)
IDM

MOS

2017-2018

目 录

图表目录

IDM+

3

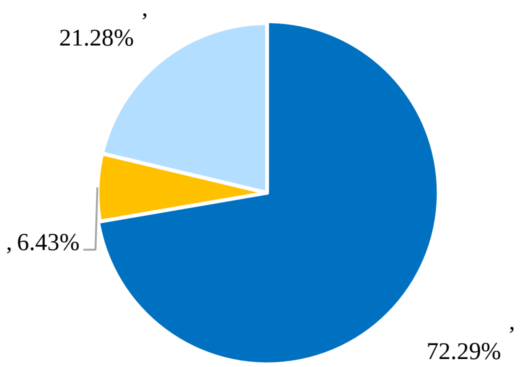
- IC MOSFET IGBT IC AC-DC LED
- MEMS
- MCU

1

			/
			MOSFET IGBT
			IPM IPM
		IC	AC-DC LED IC BMS IC IC IC IC IC
			MEMS
			MCU MCU MCU
			CMOS/ANALOG BICMOS RF/Mixed-Signal CMOS BCD MEMS
			IPM Copper Clip
			. ,/6 Stepper . ,/1 1 3 1:1 Array

20Q3 72.29% 6.43% 1%

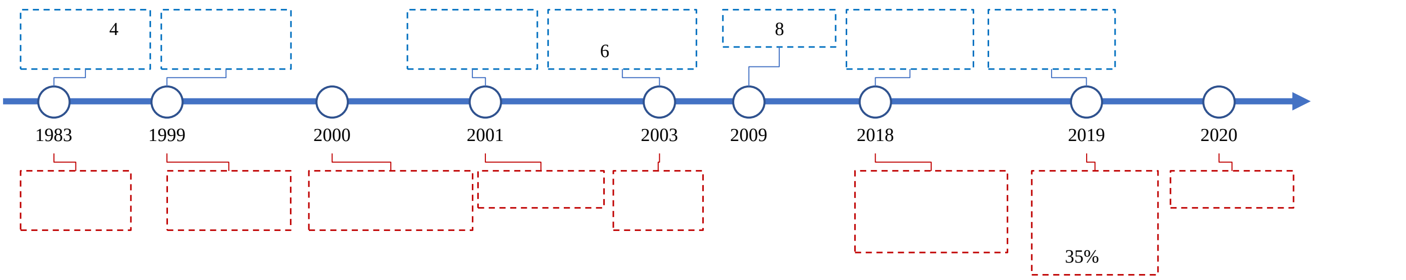
2



Wind

1983 4
2008 2011
2020

3



3 6 247
2 8 133 2017 8 19.2
12 100 199
62 69 2.4

4

		/		2018
	3 6		Analog BCD MEMS DMOS Power Discrete	247
	1 8		Advance BCD Analog DMOS	73
	1 8		MOS MOS MOS	

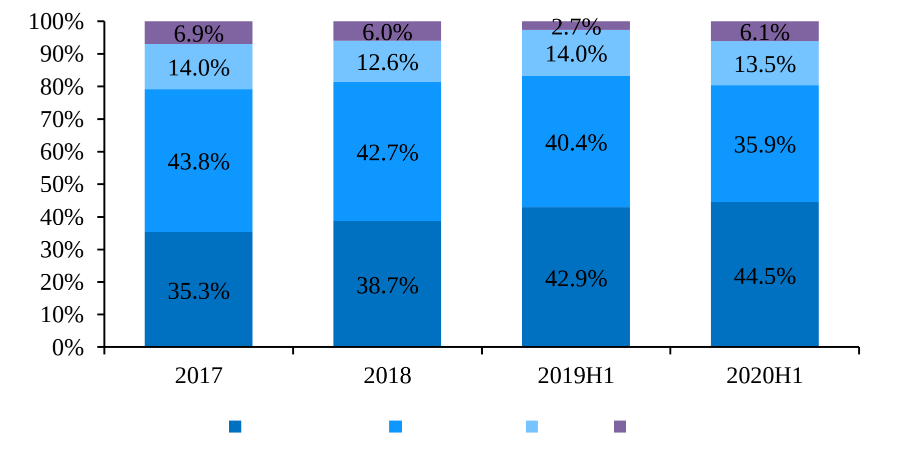
			SBD	60
	8		8 BCD 8 MEMS	19.2
	SiC 6		SiC JBS MOSFET	
	12		MOSFET IGBT	3 /
				199
			QFP QFN PQFN FC-QFN TSSOP SSOP MSOP IPM	62
				69
				2.4

IDM

IDM

2016 30.52% 20H1 44.94% 14pct

5 2017-2020H1



Wind

1. IDM

IDM IDM

IDM

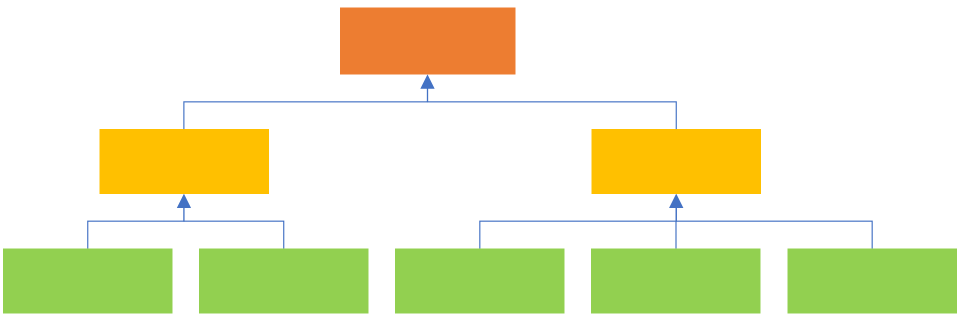
6 2018 Top10

		2018
1		21.7
2		18.5
3		17.1
4		8.1
5		7.7
6		7.2
7		6.9
8		6.0
9		5.4
10		4.9

MOSFET **6** **MOSFET** 2018 MOSFET 16 8.7% MOSFET 2018 24.19 MOSFET 66%

IC IC

7

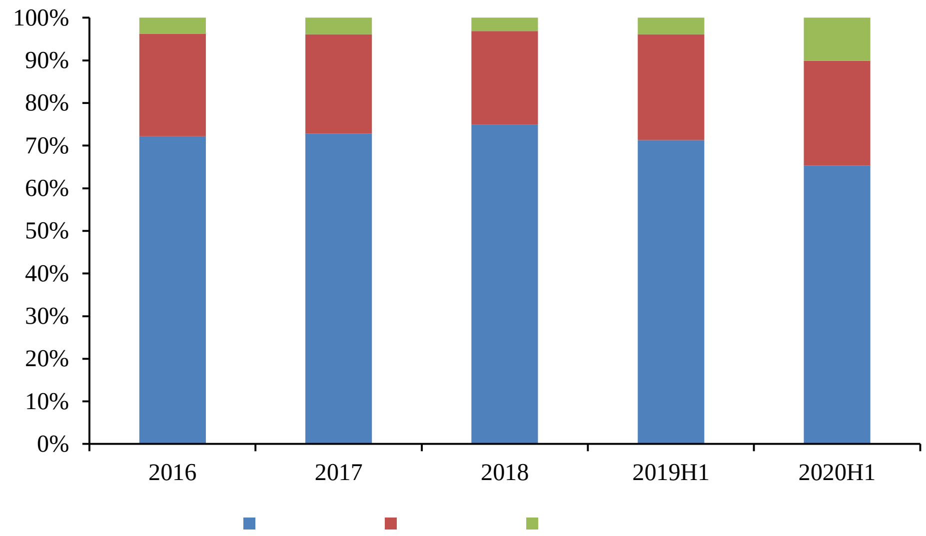


20H1 22% MOSFET 21% IGBT UPS 50% SiC 2020 7 6 SiC 1200V 650V SiC

2.

6 2020H1 10.95 65.3% 24.6% 3%-4%

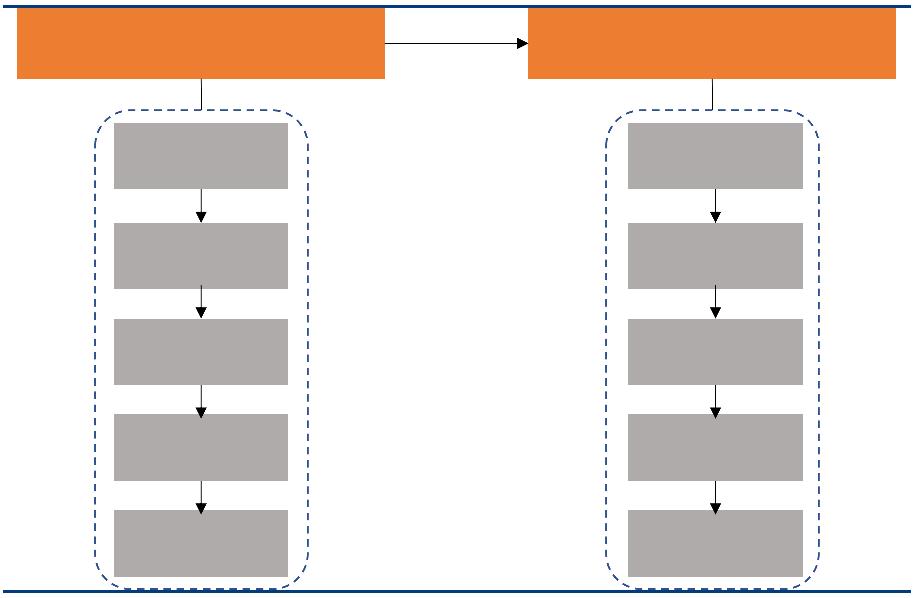
8



Wind

“ ”

9



/ /

CMOS/ANALOG BICMOS RF/Mixed-Signal CMOS BCD MEMS

. ,/ / . ,/ 6 . ,03 . ,1 3 . ,3 . ,3

BCD BCD CMOS CMOS DMOS BCD . ,/ 6 BCD MOSFET IGBT

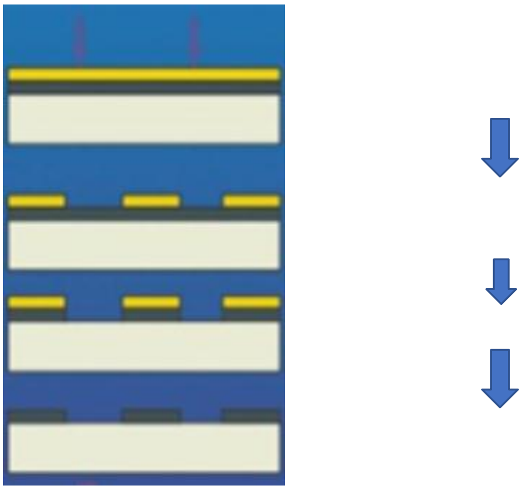
8 6.5 6 20
2018

10 turn-key

IC

2018
27%

11

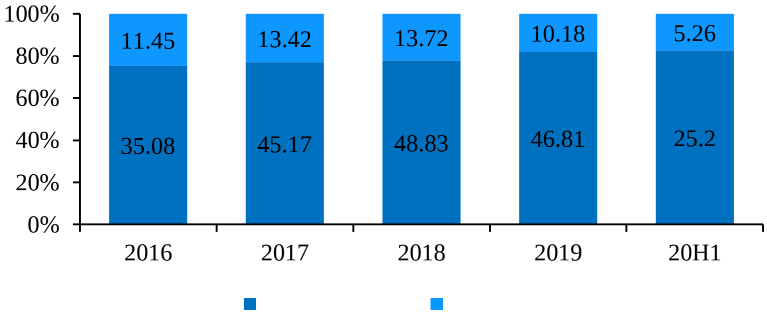


12

	TCL

17% 2016-2020H1
8:2 2019H1 40.49%

13 2016-2020H1



Wind

14 2019H1 Top5

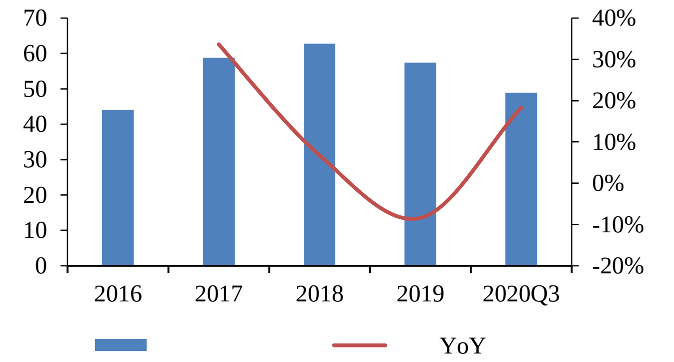
MPS	14.43%	
Diodes	11.32%	
O2 Micro	7.35%	IC
JUNWELL	3.95%	
CIRRUS Logic	3.44%	IC BOSE
	40.49%	

2016 44 2019 57 CAGR

9.3% CAGR 6.5% 8.7% 2019
8% 2019 2018 12.16%
2019H1 2020 49
18%

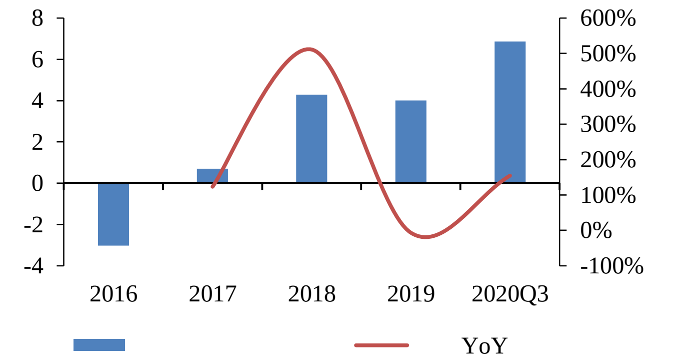
2017 2016 -3.03
2016 9 10
2015-2016 2017
0.7 2018 500% 4 2020
6.87 155%

15 2016



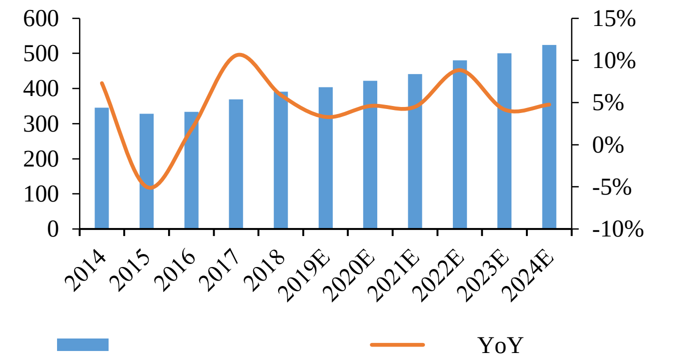
Wind

16 2016



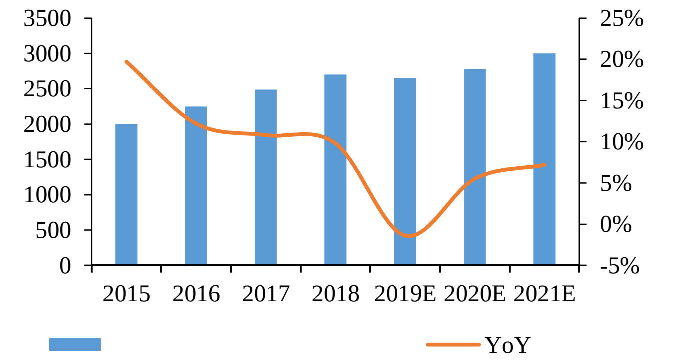
Wind

17 2014-2024



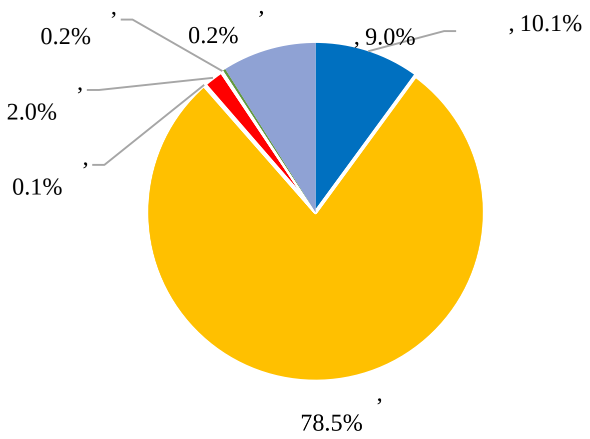
IHS Markit

18 2015-2021



IDM
20H1 78.5%
97.5%

19 2020H1



Wind

8 25 10 3-8 2012

2017 8 5359 5466

20 2020H1

		25	5%	3.80%
		8	2%	12.25%
		5	0%	20.00%
		3~5	0%~2%	19.60%~33.33%
		8	0%	12.50%
		5	0%	20.00%
		10	2%	9.80%

2020

21

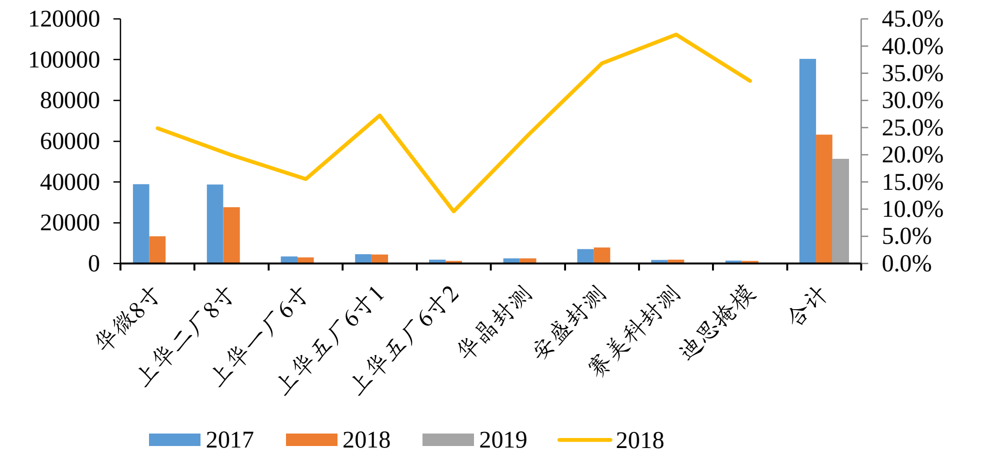
8		2009
8		2008
6		1997
6 1#		2005
6 2#		2007
		1987

		2003
		2000
		1990

2020

2017 8 2009 8 2017 2016-2020H1 9.06 13.09 9.15 6.62 3.18 2017 2017 22.3% 2020H1 10.4% 17.6% 27.3% 2017 4 52.41% 3.8 0.7

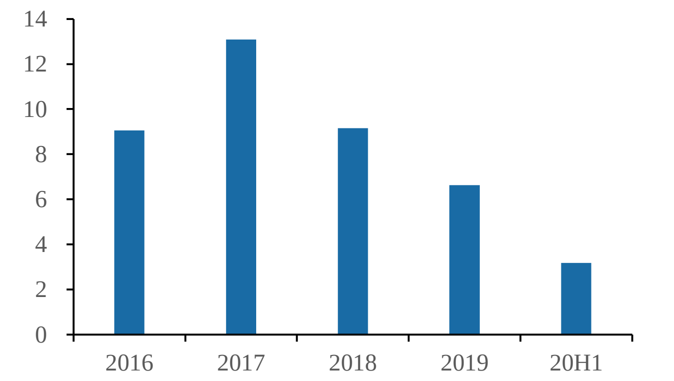
22 2017-2019 2018



2019

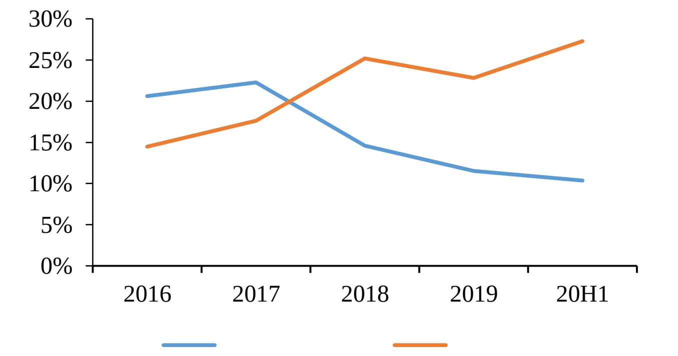
2019

23 2016-2020H1



Wind

24 2016-2020H1



Wind

8 23

8 BCD 8 MEMS 23.11
2018 9 2.75 2021 5

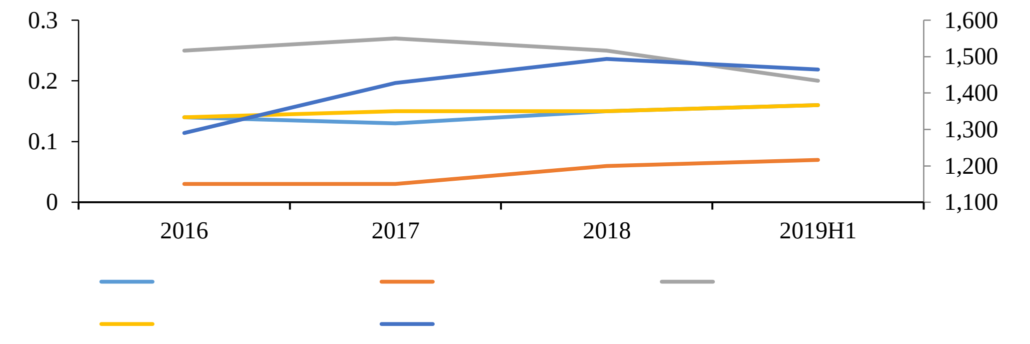
25 8

	46788	3.80%	1777.9
	129540	12.25%	15868.7
	39694	9.80%	3890.0
	15122		
	231144	9.32%	21536.6

2020

ASP 2016 ASP 0.14 2019H1 0.16
MOSFET IGBT ASP 1290 1465
ASP

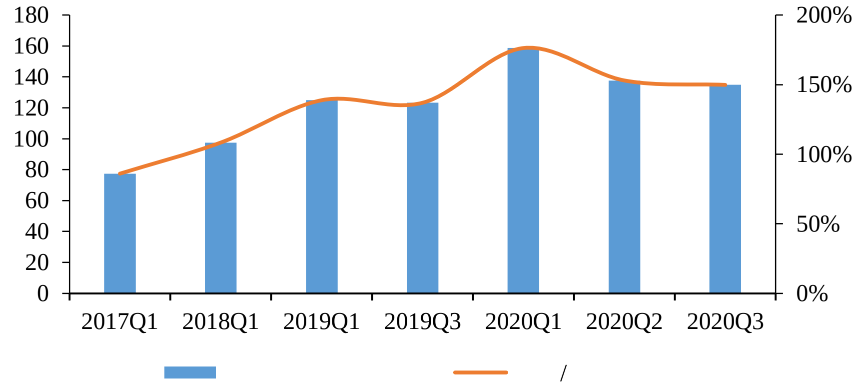
26 2016-2019H1 ASP



2020 Wind

2020Q1
2017 / 2019
3.3% 2018 2020H1

27 2016-2019H1



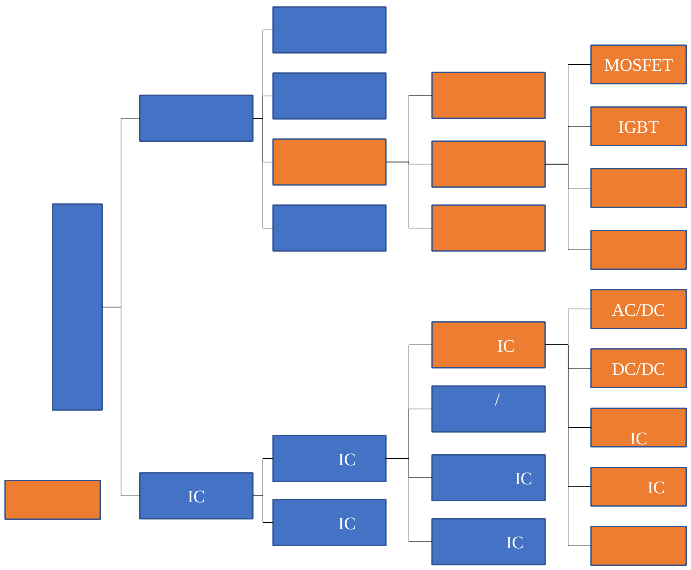
Wind

2020

IC

- P/N
- IC IC IC AC/DC DC/DC IC

28



MOSFET IGBT

SBD FRD SBD FRD

UPS

MOSFET MOS MOS MOS MOS IHS 40%

IGBT MOSFET IGBT 1700V

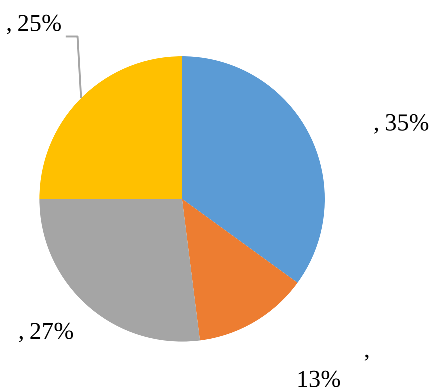
SiC GaN SiC GaN 5G SiC

1. 500

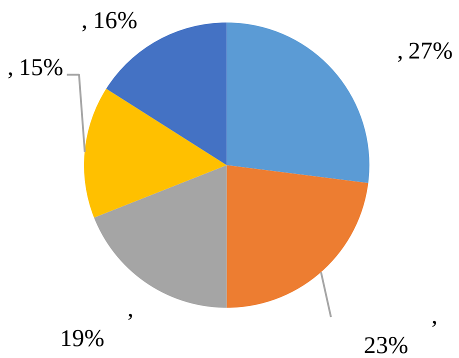
5G

35% 27% 13% 75% 27% 23% 19% 15% 16%

29 2019

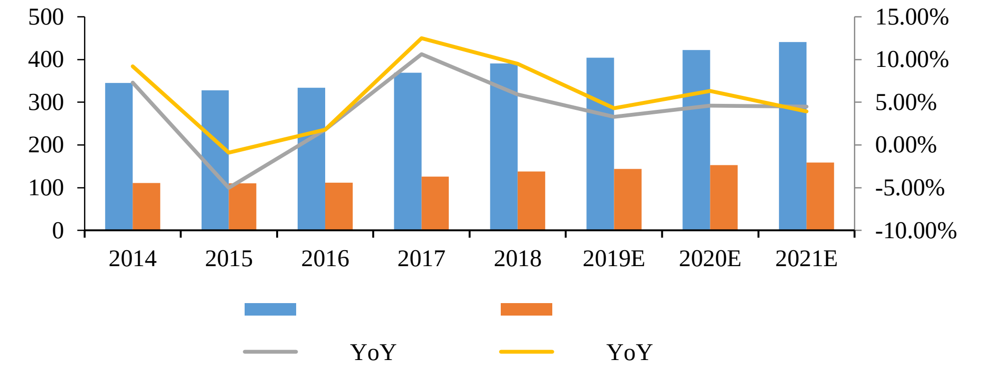


30 2019



500 IHS Markit 2019 404 Omida 2024 524 5.3% 2018 138 9.5% 35% 2021 159 4.8%

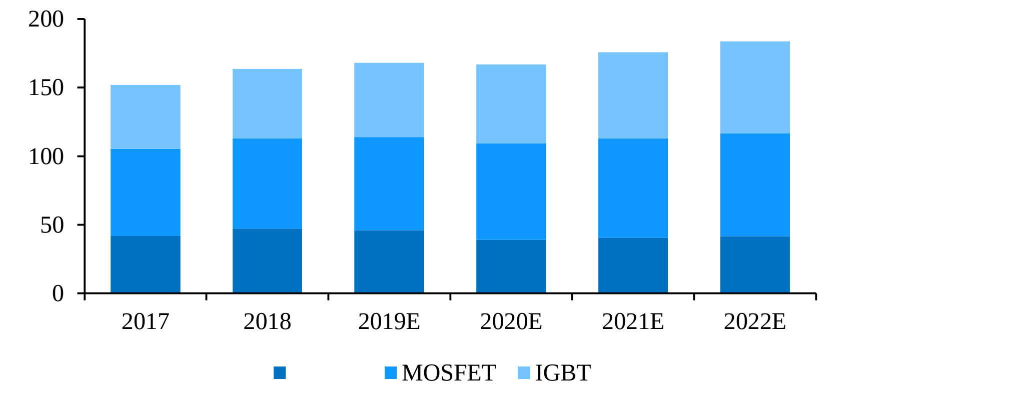
31 2014-2021



IHS Markit

MOSFET IGBT 60
IC Insights
MOSFET IGBT MOSFET 2019 68 2022
75 IGBT2020 58 2022 67

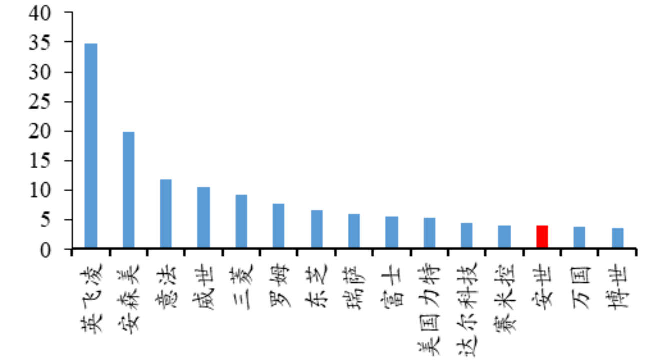
32 2017-2022 MOSFET IGBT



2.

Top10 Yole 2019
& 35 20
12 Top15 4 5 5 1
2019

33 To15 &



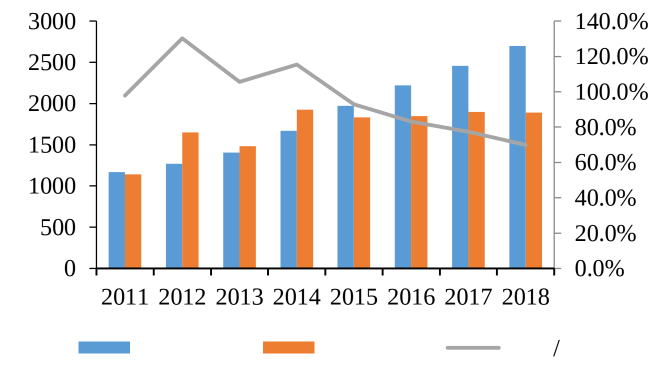
Yole

34

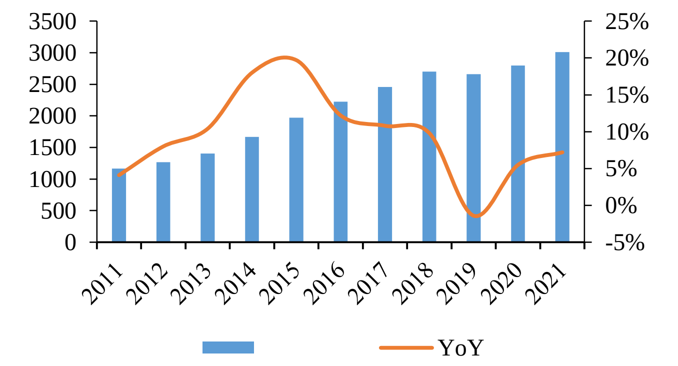
Yole

2015
1970 1832 93%
2016-2018 83% 77% 70% 2017
2025 50%
3000 50% 1500

35 2011-2018



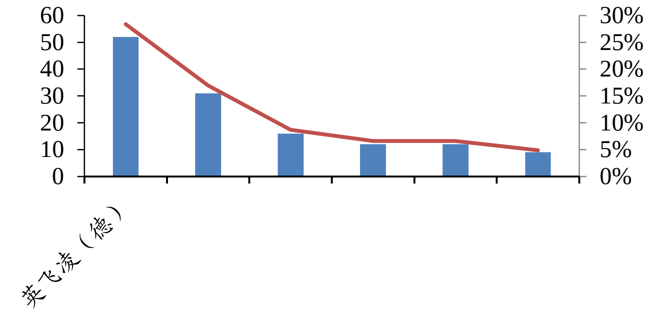
36 2011-2021



Yole

MOSFET IHS Markit 2018
MOSFET 52 28.4% 16.9% 45.3%
MOSFET 16 8.7% Top6 CR6
72.1%

37 2018 MOSFET



IHS Markit

38 2018 MOSFET

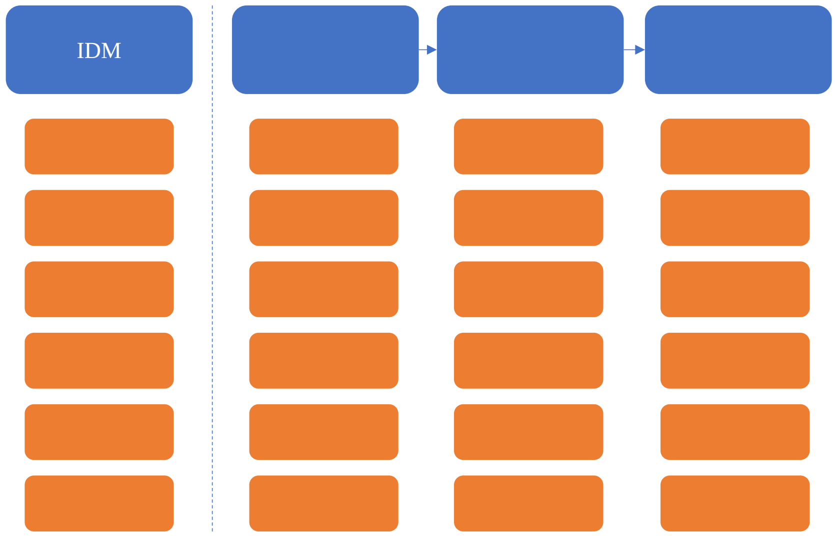
IHS Markit

IGBT IHS Markit 2018 IGBT 75% IGBT 90%

39 2017 IGBT

IGBT **IDM** **“Fabless+Foundry”** IDM

40 IGBT



SITRI

5G

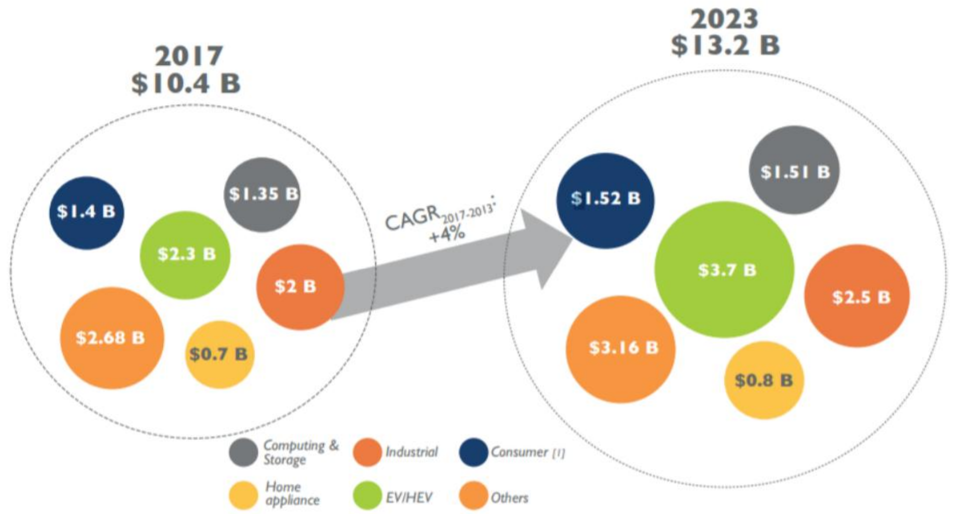
5G **900**

Yole 2017 -2023 IGBT MOSFET

300 2025 150

2023 440 2022 900

41 2017-2023 MOSFET IGBT



Yole

1. 300

17 90 305

360

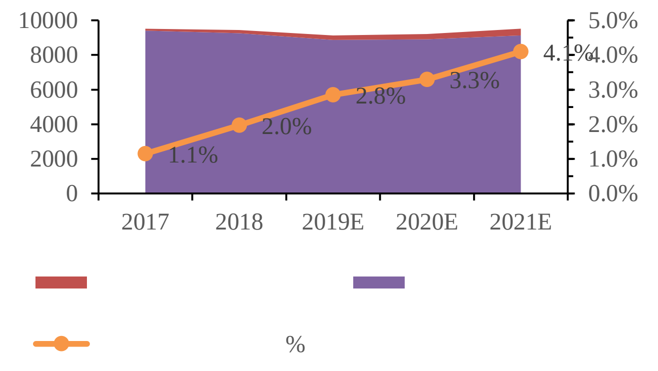
42 265

[redacted]

MOSFET&IGBT 300

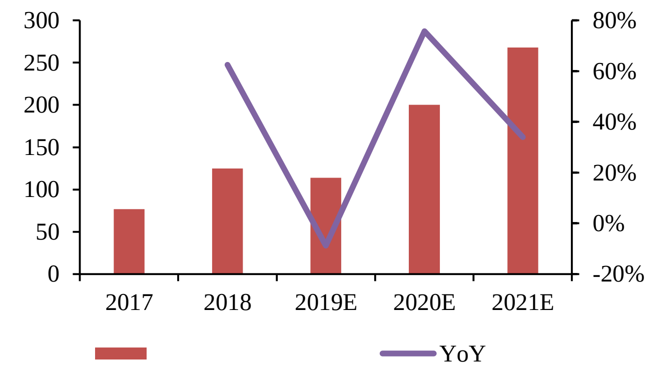
MOSFET&IGBT MOSFET 2022 116 2025 IGBT 210 IGBT 310

43 2017-2021

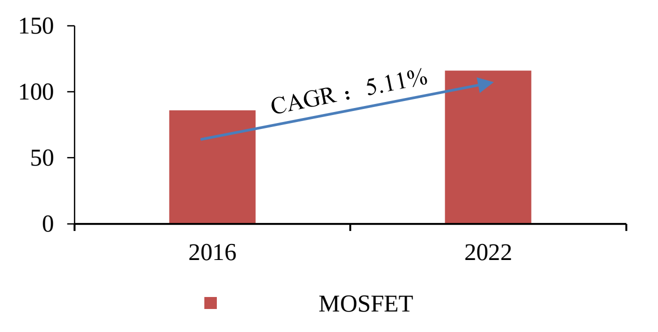


Bloomberg NEF marklines

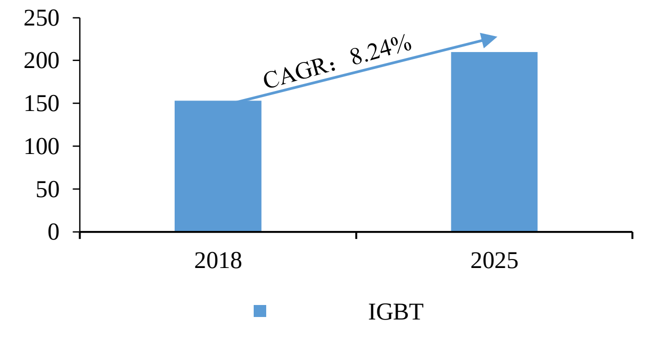
44 2017-2021



45 MOSFET



46 2025 IGBT

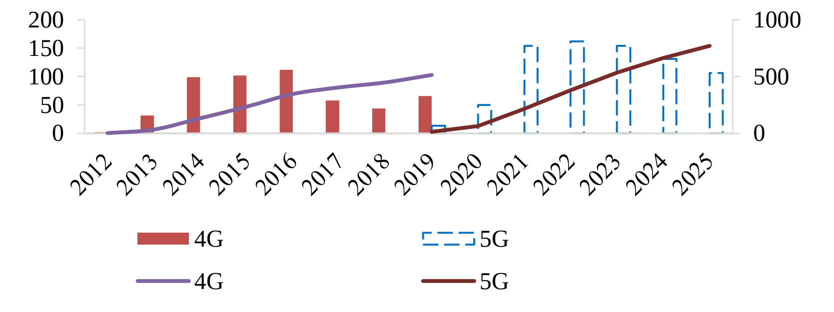


2. 5G 23

5G 5G Massive MIMO AAU DU CU 5G 100 4

5G **5G** **700** 4G 5G 5G 4G 1.5-2 4G 4G 1.5 5G 771 7.7

47 5G

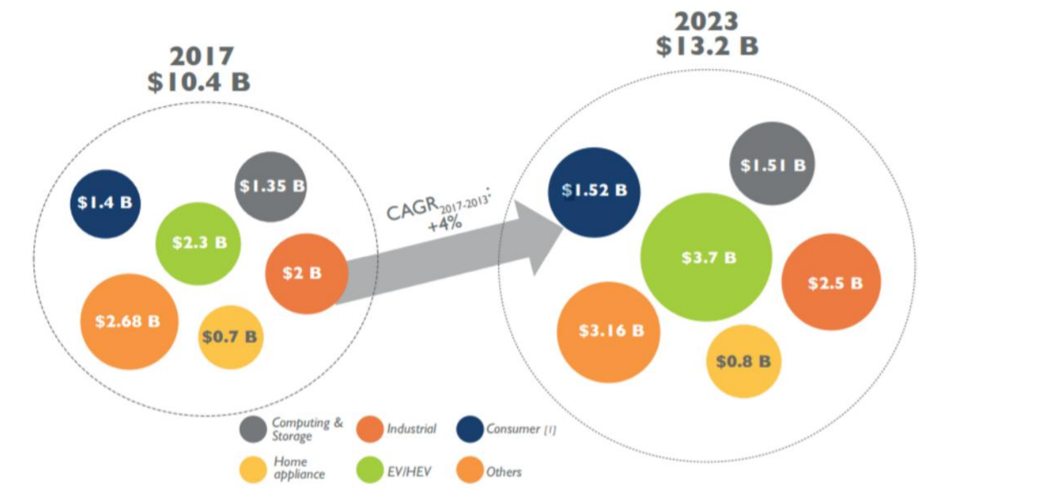


2019

UPS **UPS** UPS 6%-10% UPS IGBT& IGBT UPS

15 Yole 2017 & 13.5 2023 15.1

48 2017-2023



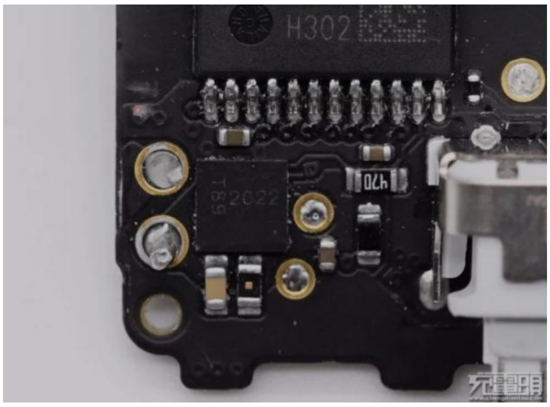
Yole

3. 68

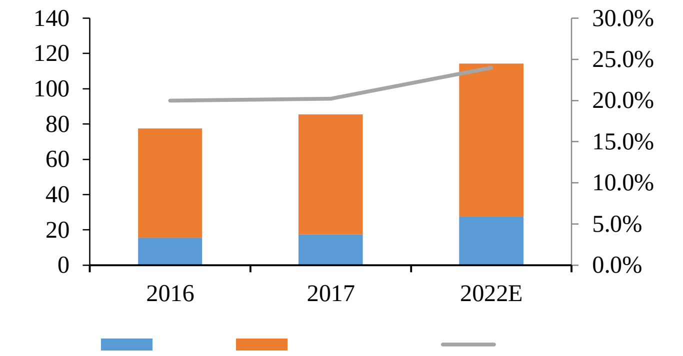
GaN-MOSFET

18W 50W 100W
MOS GaN
GaN GaN MOSFET

49 20W PD MOS

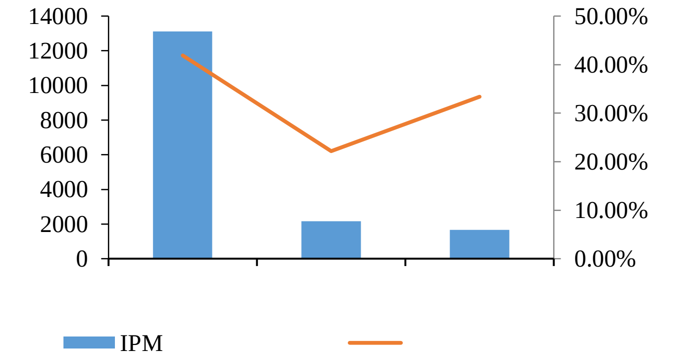


50

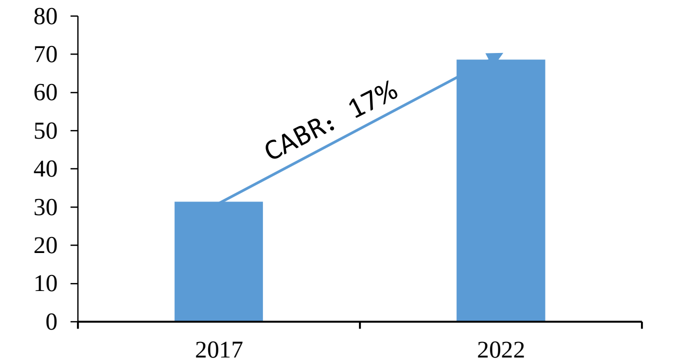


68
2018
41.9% 33.4% 22.2% IPM IPM
2018 1.3 2000 1600 2022 65%
2017 31.4 2022 68.6 CAGR 17%

51 2018 IPM



52

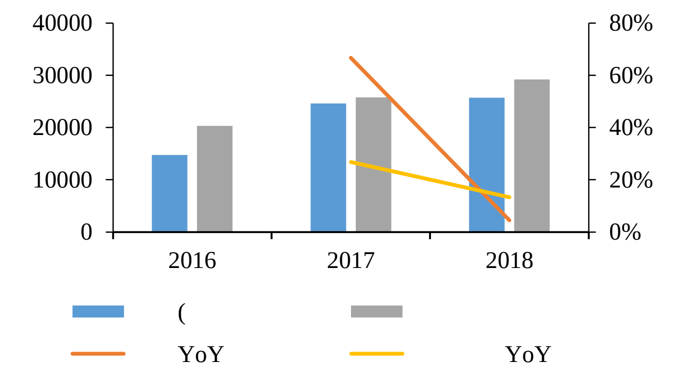


2017-2018
PMIC

1. 2017

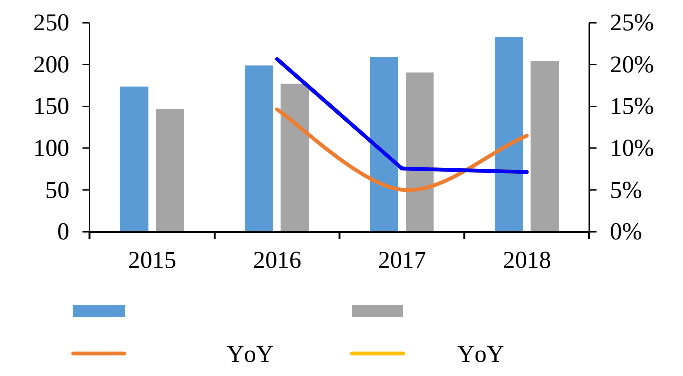
2017-2018 8 8
2016 20.6% 14.6% 2017-2018 7.6% 7.1%
5.0% 11.5% 2016-2018 8 CAGR 32% 20%

53 2016-2018 8
/



SUMCO

54 2015-2018
/

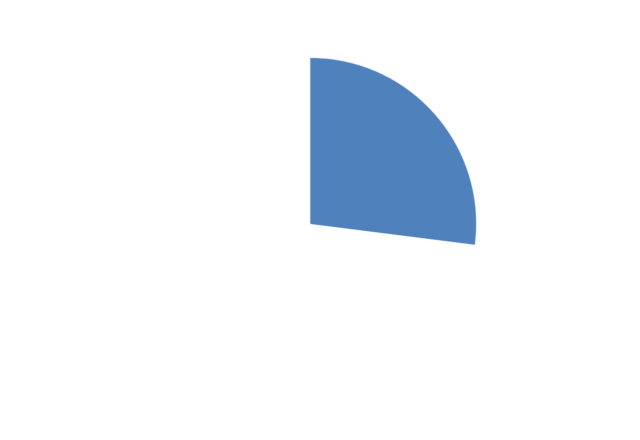


Wind

1 8

20
IC insights
,2018 92%, 28% 26%
50%

55



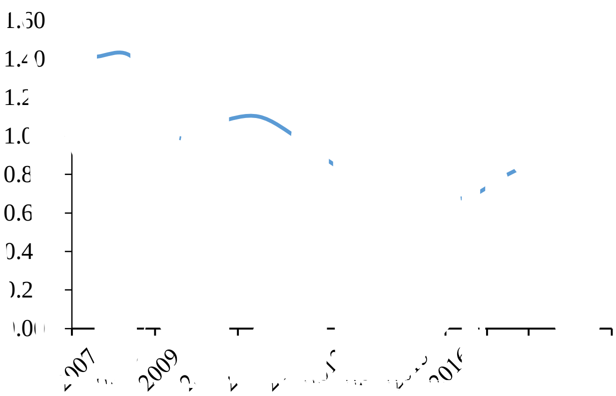
IC insights

2017 8 2017 8 Q1
3% 2018Q1 10% 8

16

90% 44%

5 20 8 8



10 2007 8

2007 8 2017

8

SEMI 18 2008 200mm

18

58 8 2008-2018

2 8 2018 8

1 5 8

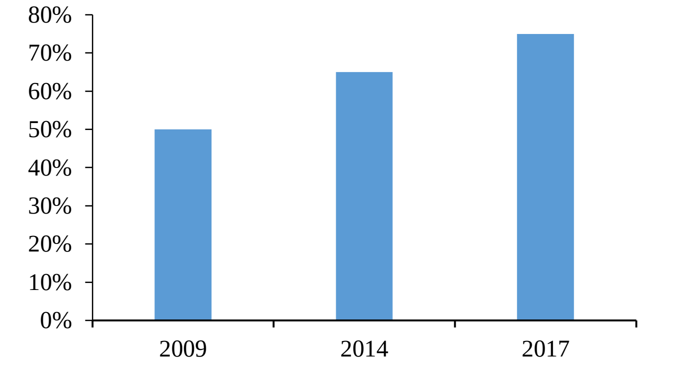
8

8 8 20 90 2000 2017
12 75% 12 8
VLSI research 2018 12 116
8 9 8 8

Surplus Global 2017 8
3 5 2018 2018 8 2000
500 8 8

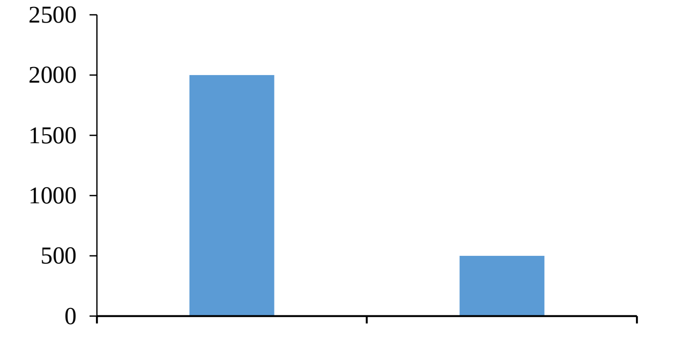
8

60 2009-2017 12



IC Insights

61 2018 8



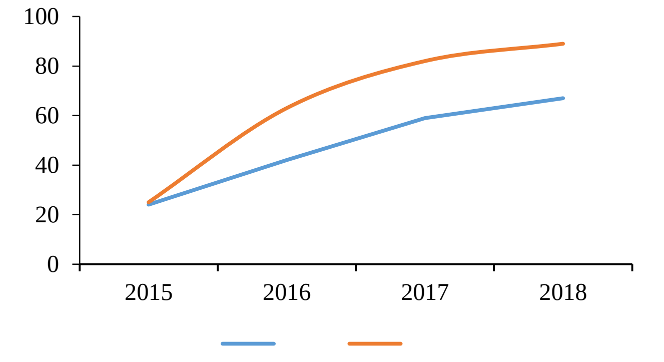
Surplus Global

2

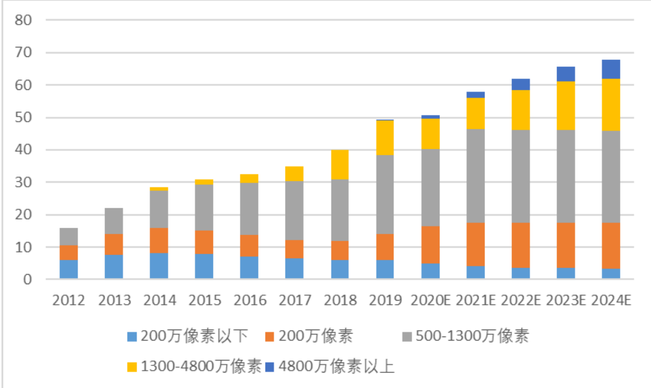
8 **3** 8 CIS
IC MCU 2016
8

8 CIS 2017
2017-2018 10 12 33%
20% CIS CIS

62 %



63



Yole Frost&Sullivan,

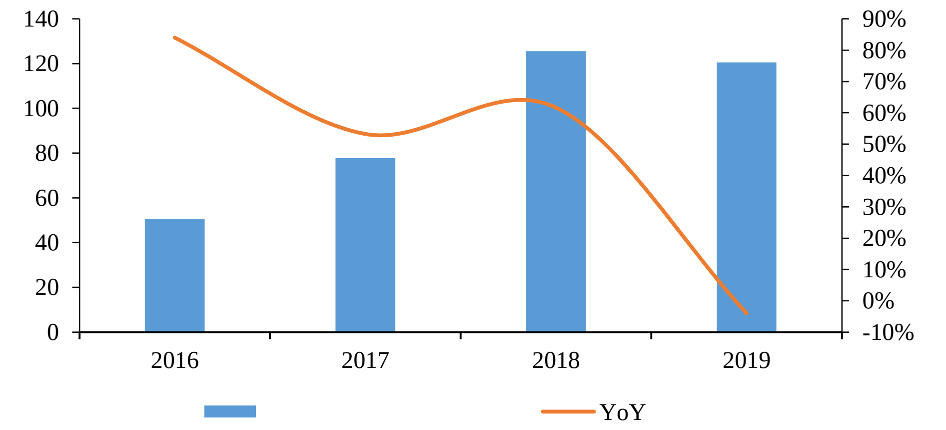
ADAS

8

65%

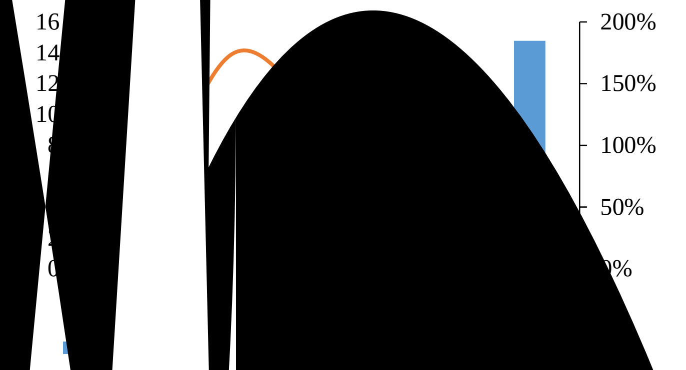
15% 2017-2018 53% 62%

64 2016-2019

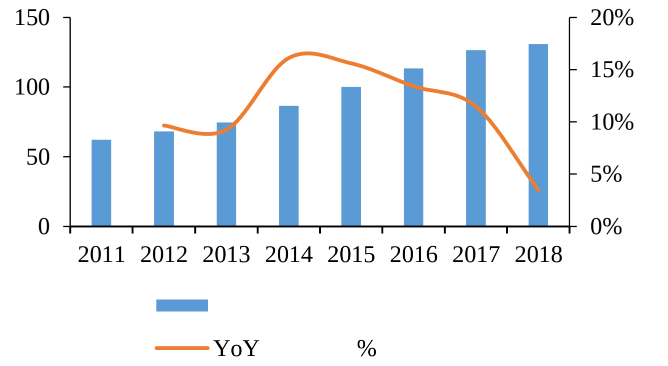


IGBT 8

018



66 2011-2018



SUMCO 2016 Q4

540 / 2016Q4 12

8

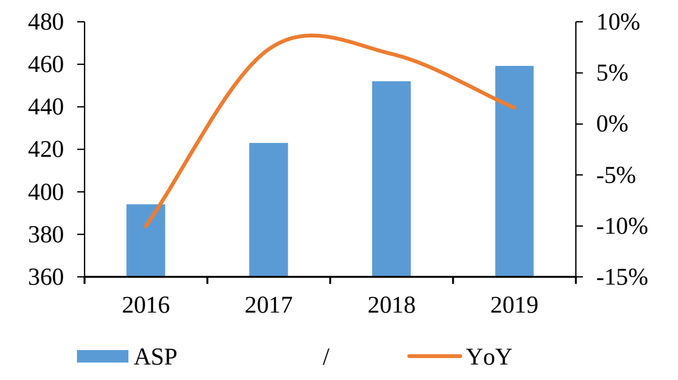
1 2020 8

2017-2018

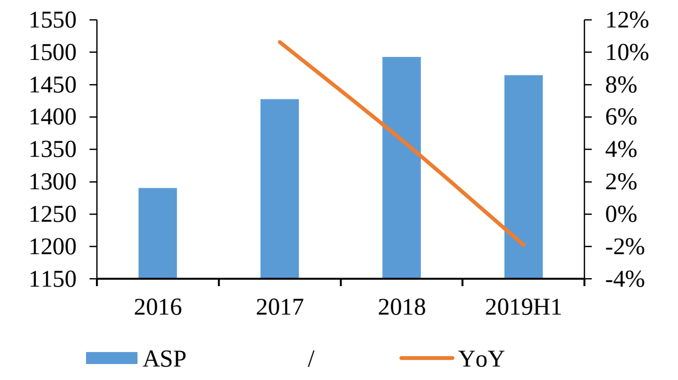
ASP 2019 ASP -10.0% 1.6%

201 -1.9%

68 2016-2019 ASP



69 2016-2019H1 ASP



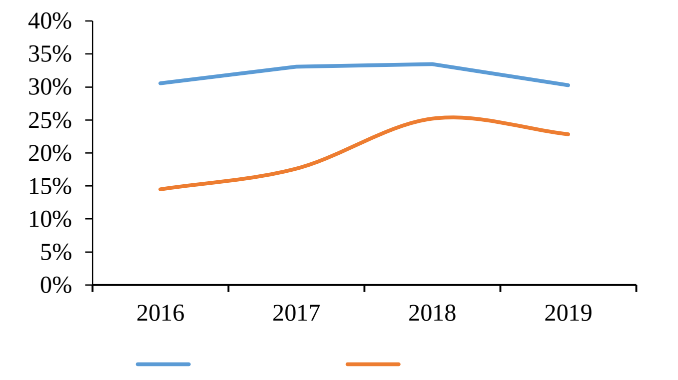
Wind

2016 2019 30% 2017-2018

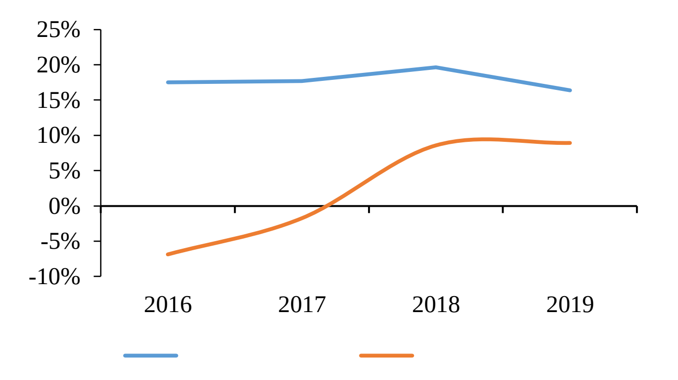
33.1% 33.4%

2017-2018 2016 2019

70 2016-2019



71 2016-2019 EBITDA



Wind

2. 2020

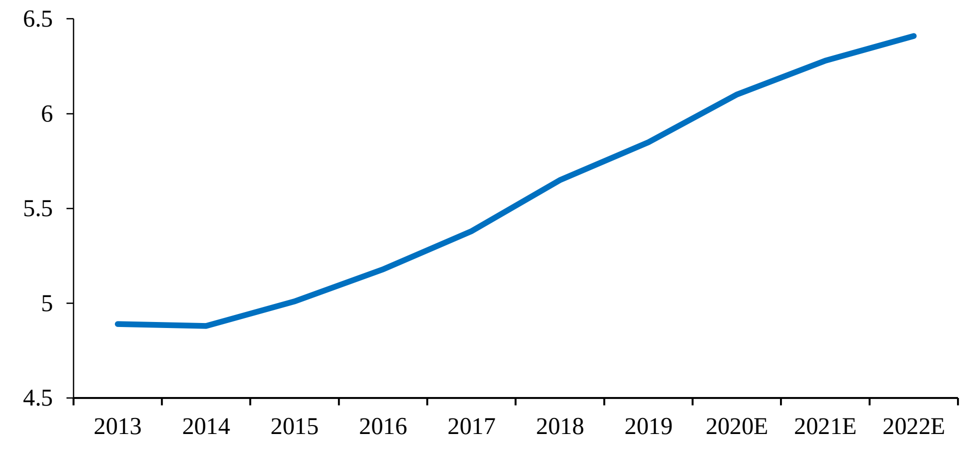
1 8

8 2018 15 8

SK 8 SEMI 2019-2022

16 8 14 70 2019-2022 CAGR 4.5%

72 2013-2022 8 /



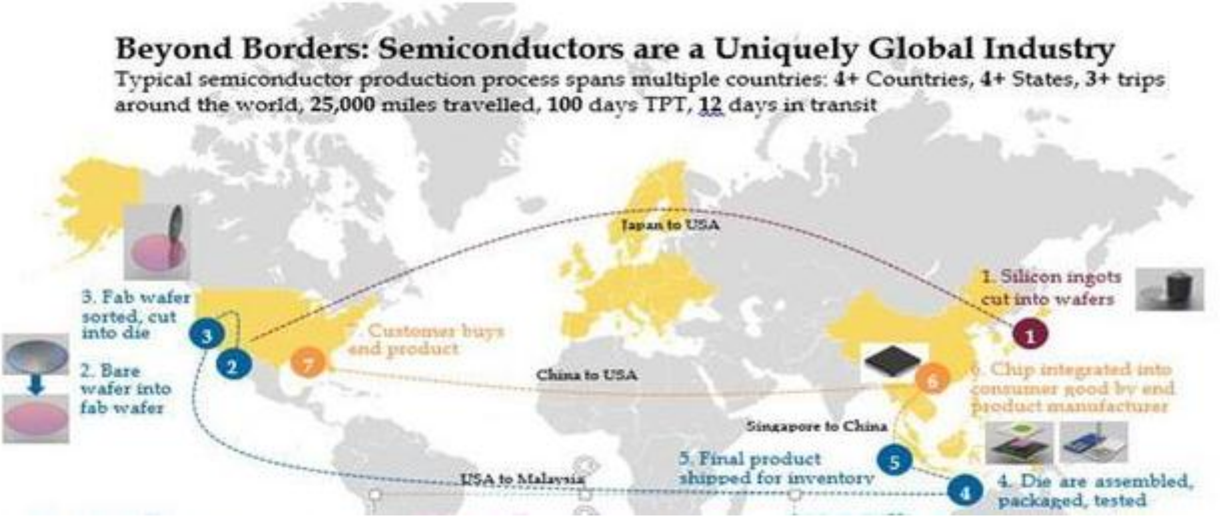
SEMI

2020

IDM

IDM 7 2020 H1

73



SIA

2 5G

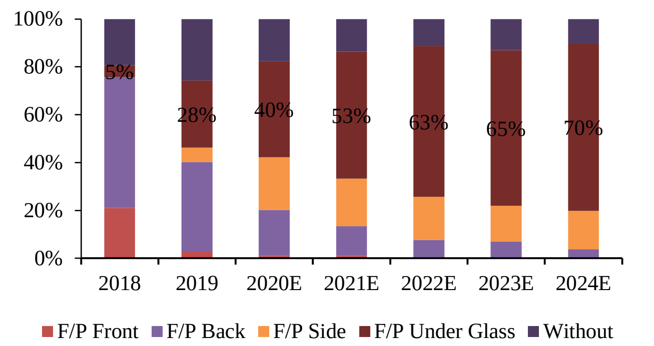
2017 2020

CINNO Research 2020 40% Counterpoint 2020Q1

3.5

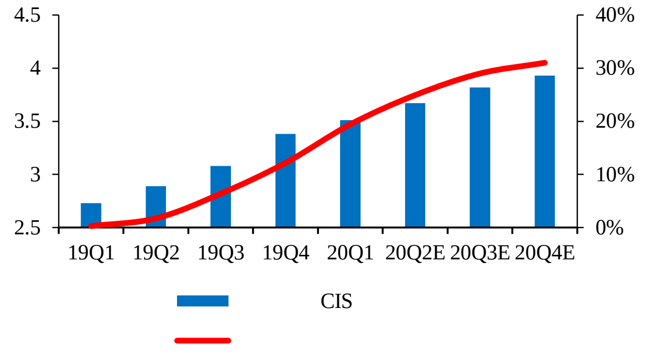
8 CIS

74 2018-2024



CINNO Research

75 2019Q1-2020Q4



199IT

5G 5G

5G 4G Guide iPhone12 5G 4G 2

BCC Research 2020

21% 130 MOSFET

5G Massive MIMO

100 4 5G

4G 1 5G UPS

IGBT SCR

NB/PAD

NB/PAD Canalys PC 2020Q2-Q3

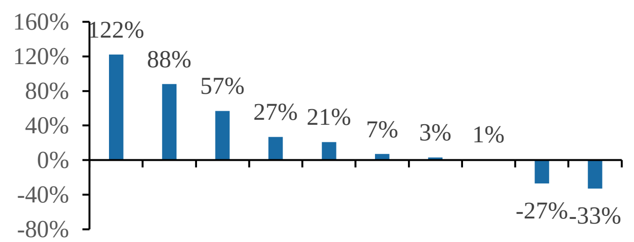
Q3 1.245 23% 88% 57%

10.9pct

52.5%

2020 7 19.3% 9-10 65%

76 2020Q3 PC

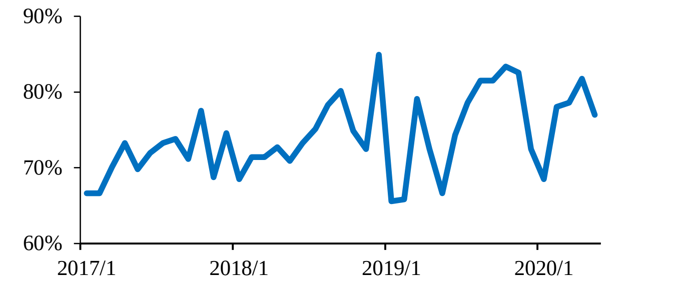


199IT

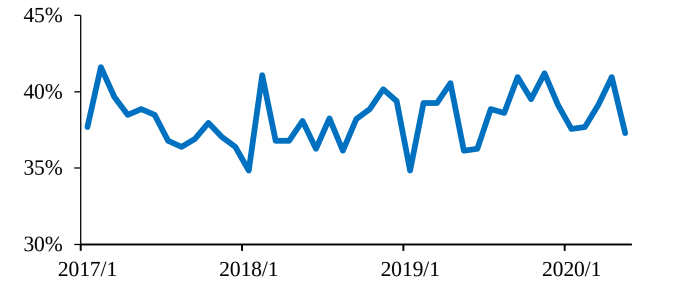
77 2020

20H1 2019 11% 6
21%

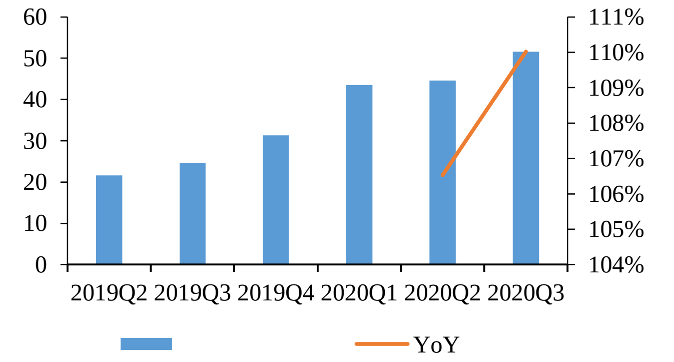
78 2017-20H1



79 2017-20H1

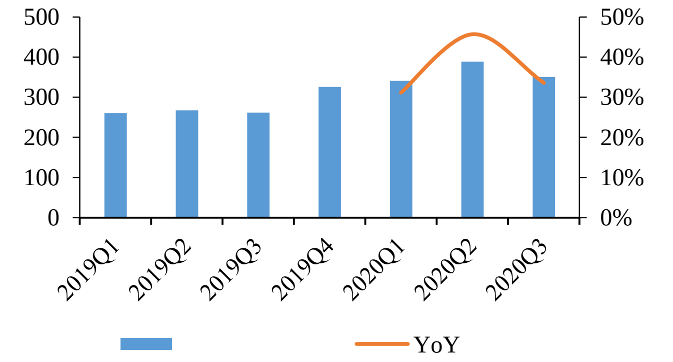


80 2019Q2-2020Q3



Wind

81 2019Q2-2020Q3



Wind

3 2020

8 5G
IC MOSFET 3D sensing
8 DIGITIMES 20H2 12
8 10-20%

MOS
IC 20Q3

IDM+

8

IC IC
IC know-how

84 2020H1

			/
	8	20H1	1.6
	12		
	12	2019 9	4
	8	20H1	1.5 2.1
	8	20H1	8

2020H1

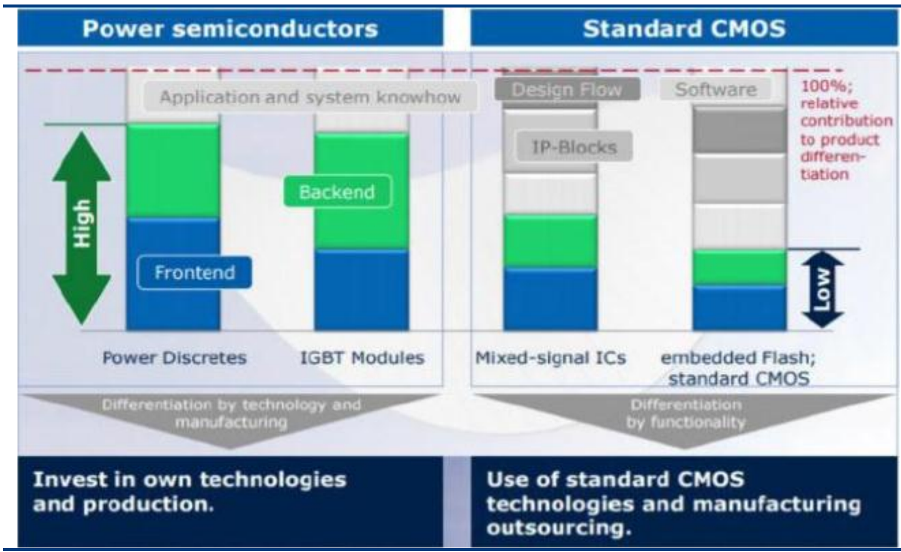
SEMI 2019-2022 16 8 14 70 2019-2022 CAGR 4.5% IHS Omida 2019-2024 CAGR 5.3%

IDM+

IDM **Fabless**

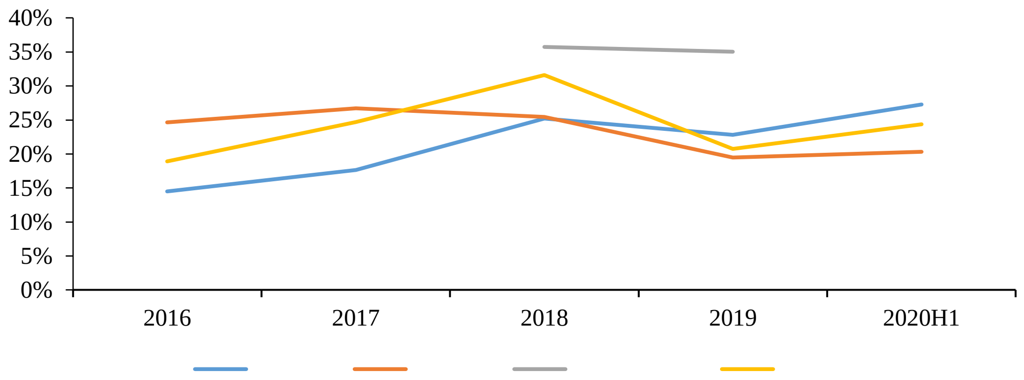
50% IDM D) D Fabless IDM Fabless

85 IC



IDM **Fabless** MOSFET IDM IDM Fabless IDM

86 IDM Fabless



Wind

IDM+ IDM Fabless

know-how

-
-
-

IDM Fabless

IDM+
MOSFET -100V-1500V IGBT 600-1200V 20H1 IGBT Trench-FS 20H1 6 SiC

87

	/						
MOSFET	MOSFET						
	MOSFET						
	MOSFET						
		1500V	700V	800V		300V	500V
IGBT							
		SiC	GaN		650V GaN		SiC MOS

2020

	2019A	2020E	2021E	2022E
	1,931	2,169	3,184	4,723
	191	580	628	671
	815	886	1,044	1,211
	52	60	73	85
	1,055	1,069	1,362	1,667
	0	0	0	0
	1,048	2,132	2,454	2,612
	5,092	6,896	8,745	10,969
	3	3	3	3
	82	90	100	100
	3,816	4,961	5,910	6,695
	489	689	889	1,089
	275	247	223	200
	338	333	329	326
	5,003	6,323	7,454	8,413
	10,095	**13,219**	**16,199**	**19,382**
	0	0	0	0
	100	87	105	136
	749	859	1,048	1,230
	112	187	200	219
	0	0	0	0
	535	527	560	568
	0	675	844	993
	482	684	929	1,125
	1,978	3,019	3,686	4,271
	1,506	2,306	3,106	3,906
	0	0	0	0
	220	314	314	314
	1,726	2,620	3,420	4,220
	3,704	**5,639**	**7,106**	**8,491**
	5,423	6,368	7,578	9,017
	968	1,212	1,515	1,874
	6,391	**7,580**	**9,093**	**10,891**
	10,095	**13,219**	**16,199**	**19,382**

	2019A	2020E	2021E	2022E
	576	**540**	**1,762**	**2,325**
	1,253	1,923	2,408	2,849
	126	-14	-293	-305
	155	-568	-319	-323
	-72	164	254	240
	-887	-965	-288	-135
	-41	**-2,018**	**-2,020**	**-2,011**
	-746	-2,005	-2,004	-2,003
	-82	-8	-10	0
	787	-5	-6	-8
	-180	**1,716**	**1,273**	**1,225**
	-945	1,475	969	948
	-155	-49	-49	-49
	0	0	0	0
	920	290	353	326

	2019A	2020E	2021E	2022E
	5,743	**7,083**	**8,637**	**9,995**
	4,431	5,082	6,203	7,282
	66	82	100	100
	112	131	157	172
	377	446	539	592
	483	567	691	800
	31	14	14	11
	31	0	0	0
	-37	100	100	100
	0	0	0	0
	0	20	80	120
	239	280	260	280
	478	**1,181**	**1,423**	**1,658**
	32	50	100	150
	4	10	10	10
	506	**1,221**	**1,513**	**1,798**
	-6	0	0	0
	512	**1,221**	**1,513**	**1,798**
	112	244	303	360
	400	**977**	**1,210**	**1,438**
NOPLAT	544	1,235	1,528	1,809
EPS( )	0.33	0.80	1.00	1.18

	2019A	2020E	2021E	2022E
	-8.4%	23.3%	21.9%	15.7%
EBIT	-9.1%	130.1%	23.7%	18.4%
	-6.7%	143.7%	23.9%	18.8%
	22.8%	28.3%	28.2%	27.1%
	8.9%	17.2%	17.5%	18.0%
ROE	6.3%	12.9%	13.3%	13.2%
ROIC	6.3%	10.9%	10.5%	10.1%
	36.7%	42.7%	43.9%	43.8%
	27.0%	43.5%	46.9%	47.9%
	257.4%	228.4%	237.2%	256.8%
	204.1%	193.0%	200.3%	217.8%
	0.6	0.5	0.5	0.5
	44	43	40	41
	59	57	55	56
	91	75	71	75
( )				
	0.33	0.80	1.00	1.18
	0.47	0.44	1.45	1.91
	4.46	5.24	6.23	7.42
P/E	143	82	66	56
P/B	11	13	11	9
EV/EBITDA	22	14	11	9

&

TMT

2019
2016 2017

2 TMT 2019

2019

3 2020

2020

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			010-63214683	guoyunlong@hcyjs.com
			010-66500867	liuyi@hcyjs.com
			010-63214683	dana@hcyjs.com
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			0755-83024576	zhuyan@hcyjs.com
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			021-20572257-2552	huangchang@hcyjs.com
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			021-20572506	wujun1@hcyjs.com
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			021-20572509	jiangyu@hcyjs.com
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			021-20572559	panyaqi@hcyjs.com
			021-20572559	wangziyang@hcyjs.com

(300)

6 20%

6 10% 20%

6 -10% 10%

6 10% 20%

3-6 5%

3-6 -5% 5%

3-6 5%

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