

688396

+

68.98

+

“ + ”

12

MOSFET

MOSFET

IGBT

MOS

12

PMIC

MOS

-100V

MOS

1500V

6

PMIC

2017-2018

“ + ”

12

2020-2022

9.77/12.10/14.38

“ ”

0755-82755859

gengchen@hcyjs.com

S0360517100004

( )	121,593
( )	24,904
( )	838.75
( )	171.79
(%)	32.0
( )	8.4
12 /	74.89/31.74

( 12 )



	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
( )	143	82	66	56
( )	11	13	11	9

2020 12 7

“IDM+ ”  
2017-2018

“IDM+ ”  
IDM  
MOS

2017-2018

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5

9.4

IDM+

MEMS

MCU

IC

IC AC-DC LED

3

MOSFET IGBT

1

		/						
					MOSFET IGBT			
					IPM	IPM		
		IC	AC-DC	LED	IC	BMS IC	IC IC	
					MEMS			
					MCU	MCU	MCU	
			CMOS/ANALOG	BICMOS	RF/Mixed-Signal	CMOS	BCD	
					MEMS			
			IPM	Copper Clip				
			0.18μm	Stepper	0.13μm	3"x5" UT		
					1:1 Array			

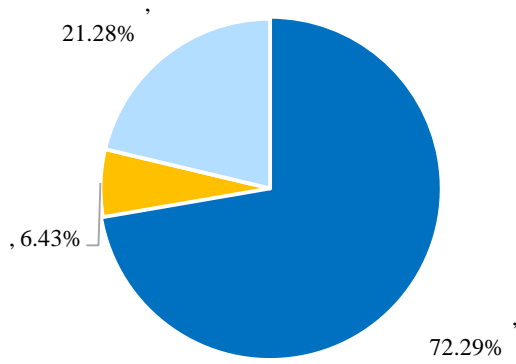
72.29%

20Q3

6.43%

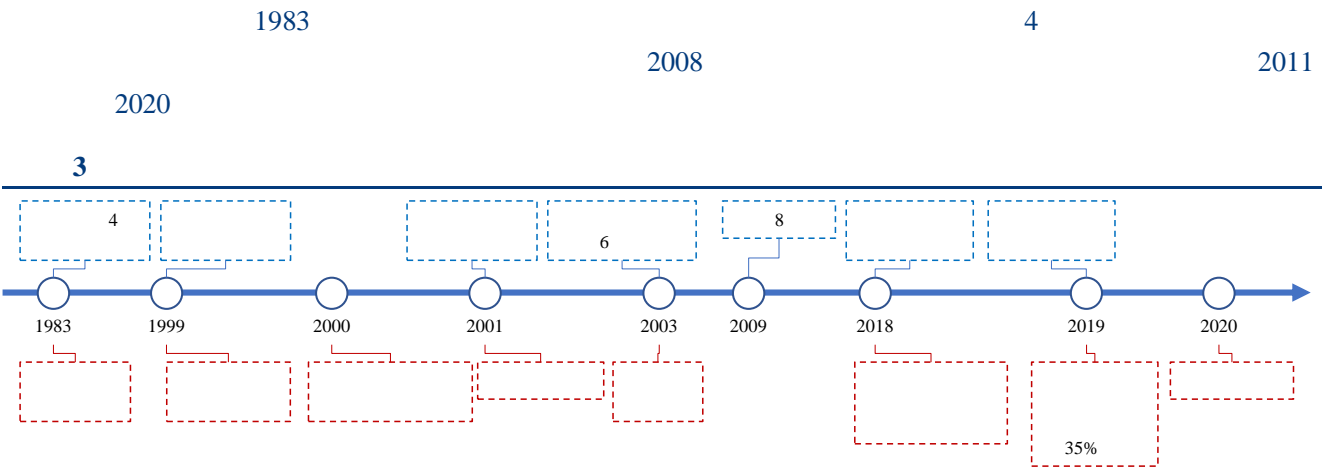
1%

2



Wind

3



4

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

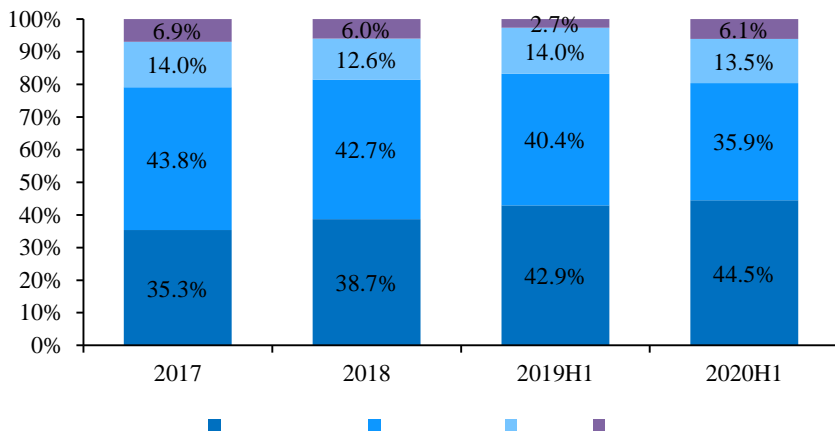
			SBD		60				
8		8	BCD	8	MEMS	19.2			
SiC 6		SiC JBS		MOSFET					
12		MOSFET		IGBT		3 /			
						199			
		QFP		QFN	PQFN	FC-QFN	TSSOP	SSOP	62
				MSOP		IPM		69	
								2.4	

**IDM**

**IDM**

44.94%      14pct      2016      30.52%      20H1

**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  
2018

MOSFET

16

8.7%

MOSFET

24.19

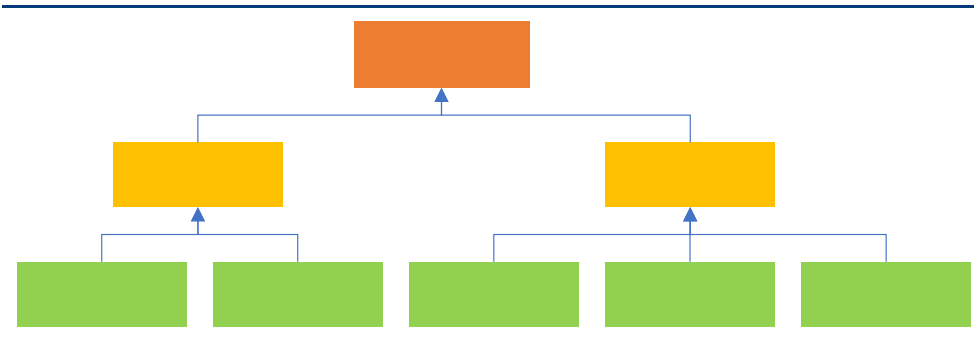
MOSFET

66%

IC

IC

7



21% IGBT  
SiC  
1200V

UPS  
2020  
SiC

7

20H1

6

SiC

50%

22%

MOSFET

2.

65.3%

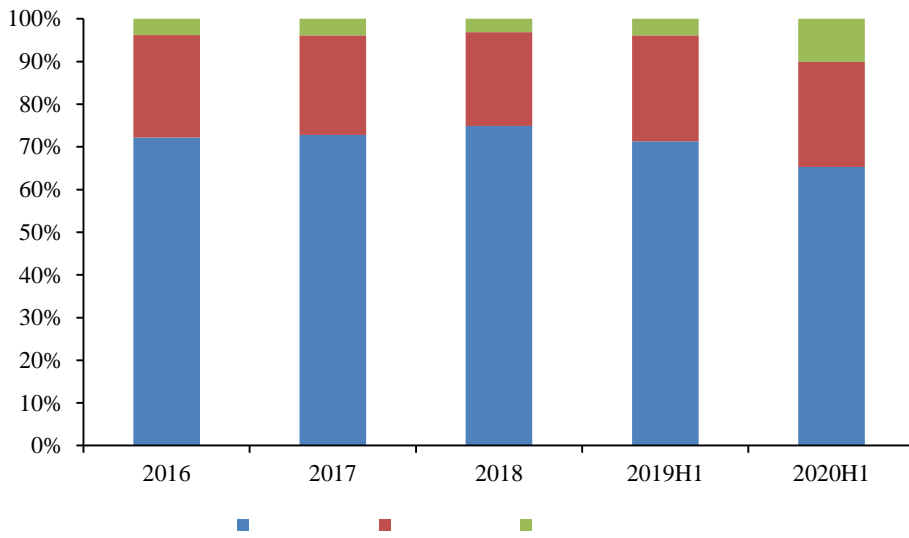
24.6%

6 2020H1

3%-4%

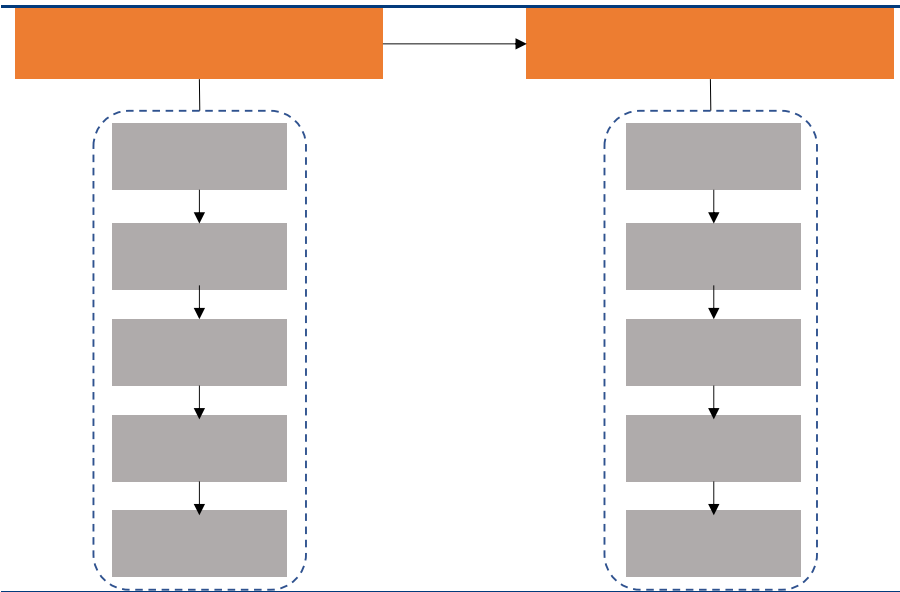
10.95

8



Wind

9



CMOS/ANALOG

BICMOS

RF/Mixed-Signal CMOS

BCD

MEMS

0.11μm

0.18μm

0.25μm

0.35μm

0.5μm

0.5μm

BCD

BCD

BCD

CMOS

CMOS

DMOS

MOSFET

IGBT

0.18μm BCD

8

6.5

6

20

2018

10

turn-key

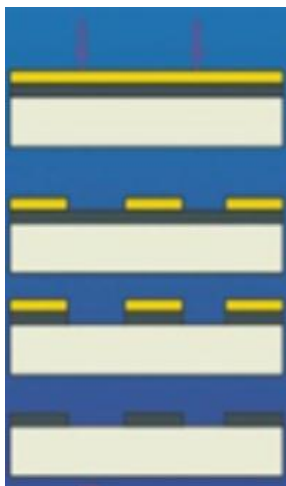


IC

2018

27%

11



**12**

	TCL

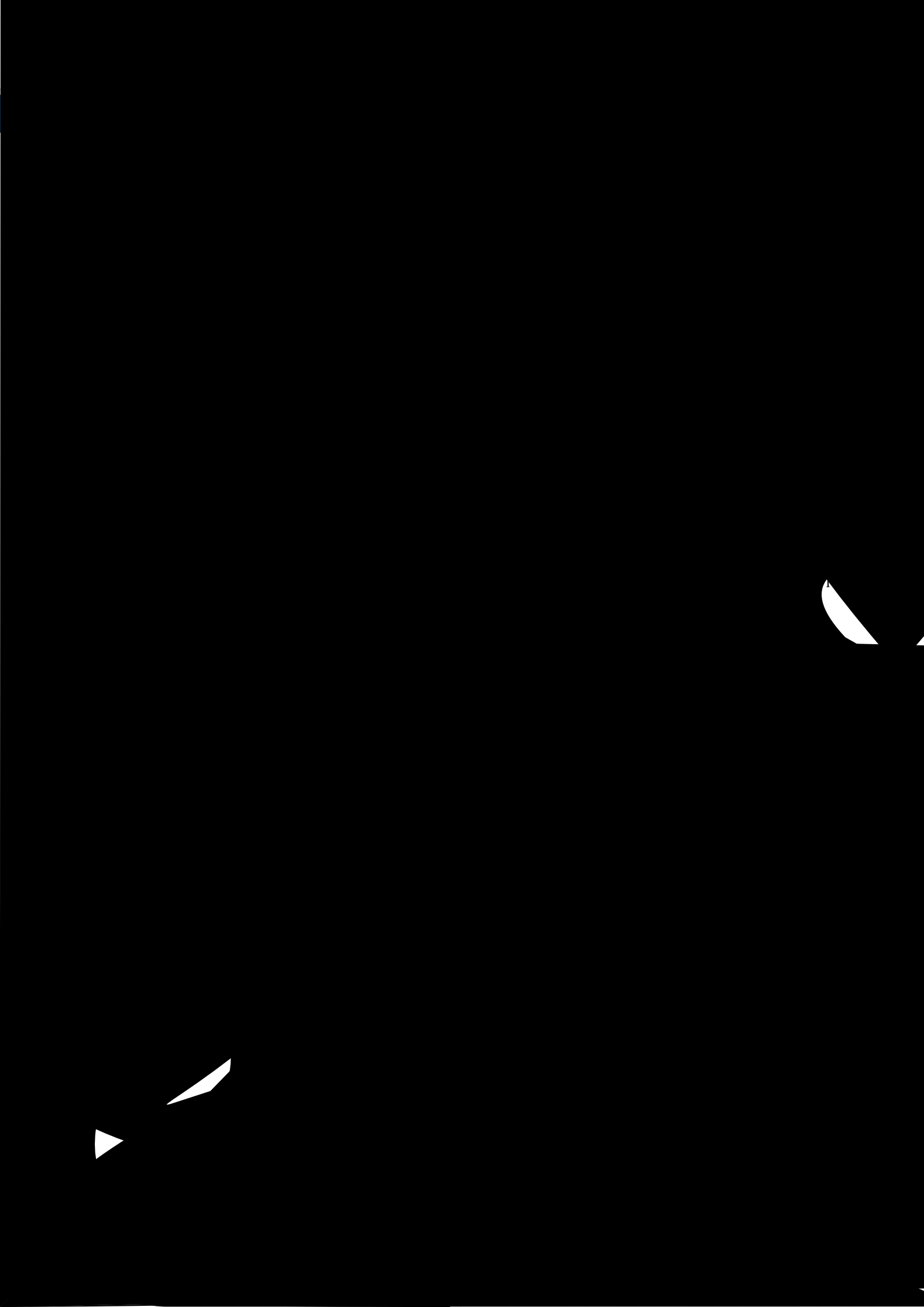
8:2                      17%                      2019H1                      2016-2020H1  
 40.49%

**13 2016-2020H1**

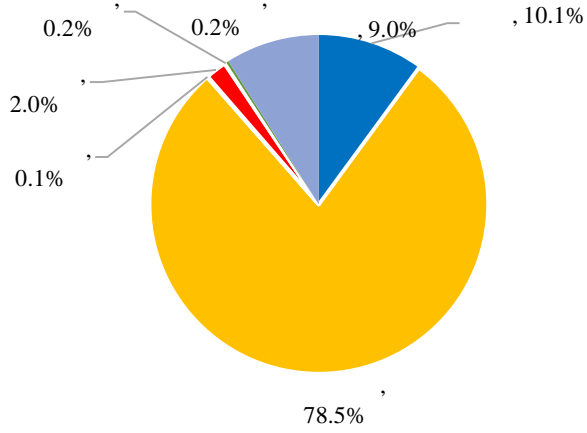
*Wind*

**14 2019H1 Top5**

MPS	14.43%



**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

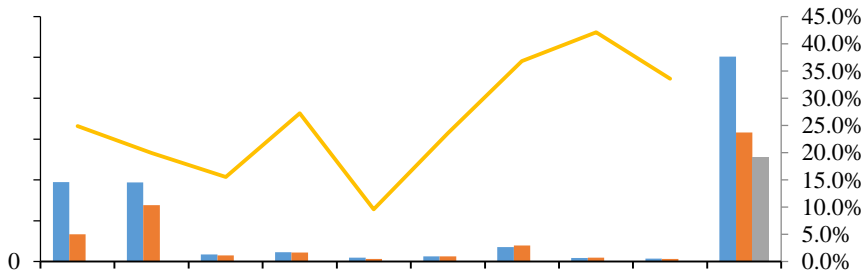
		2003
		2000
		1990

2020

2009 8 2017 8 2017 2016-2020H1 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**

**24 2016-2020H1**

Wind

Wind

8

23

8 BCD  
2018 9

2.75

8 MEMS  
2021 5

23.11

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  
MOSFET IGBT

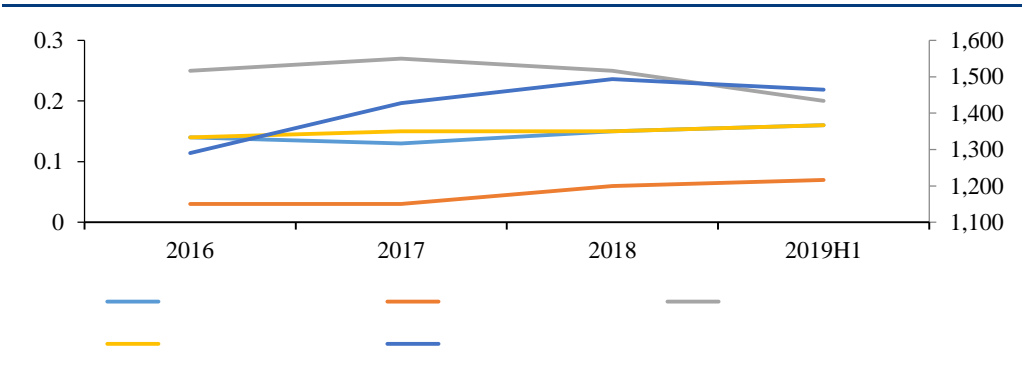
2016

ASP 0.14

2019H1 0.16

ASP 1290 1465  
ASP

26 2016-2019H1 ASP



2020

Wind

2020Q1

2017

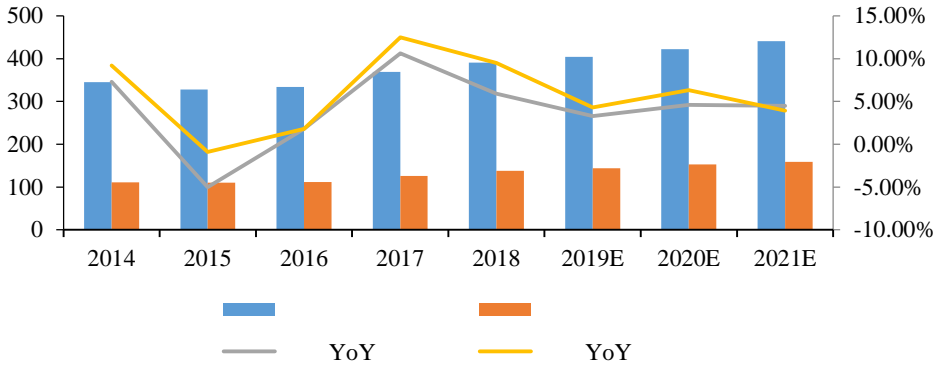
/  
3.3%

2019  
2018 2020H1





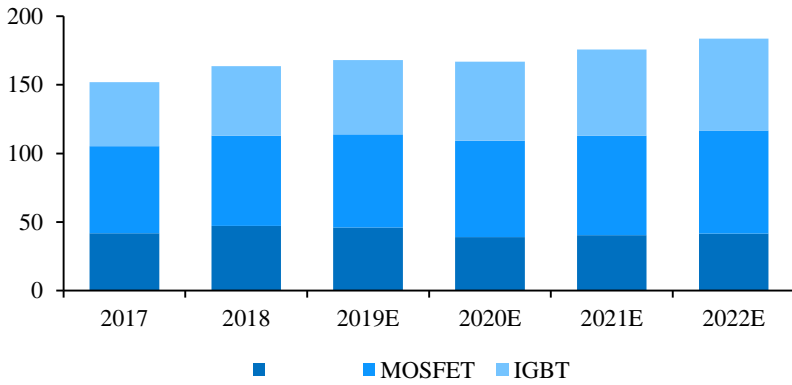
**31 2014-2021**



IHS Markit

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

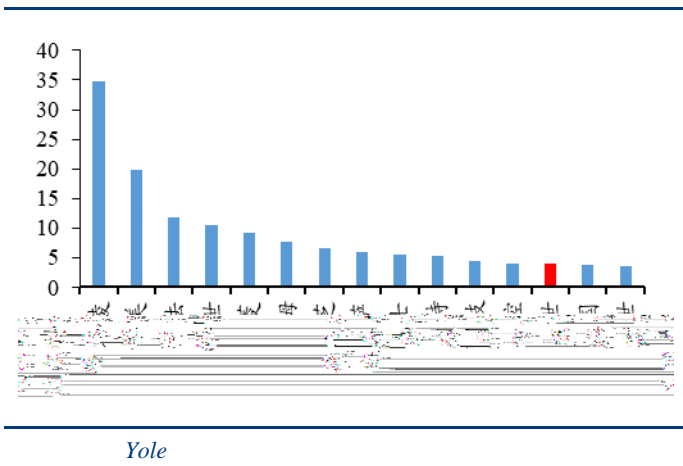
**32 2017-2022 MOSFET IGBT**



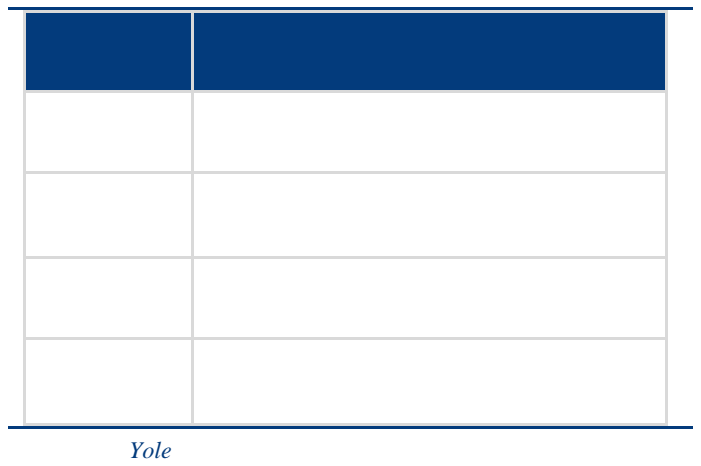
2.

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

33 To15 &

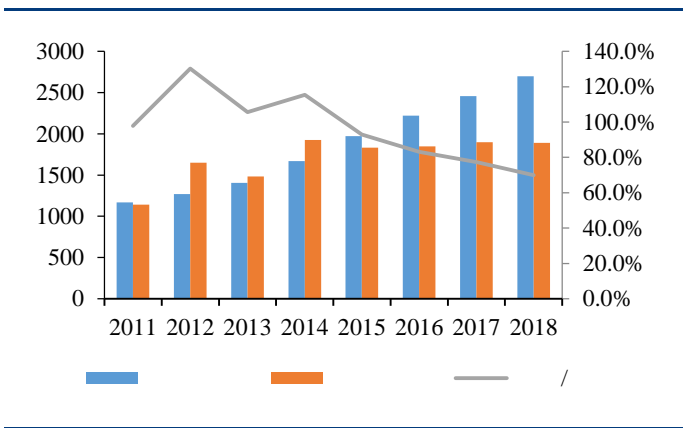


34

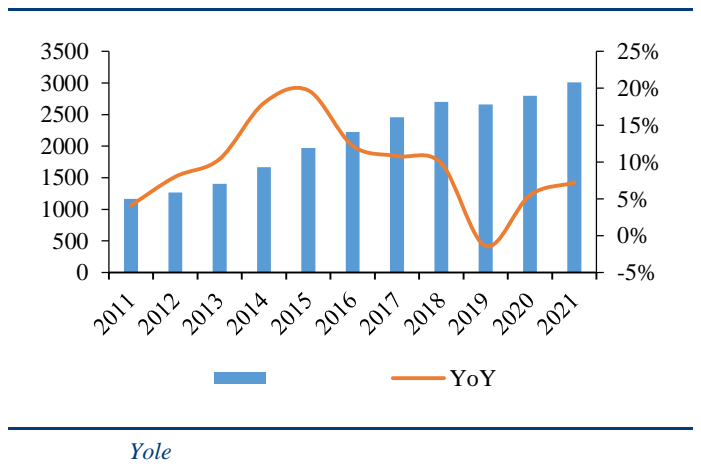


1970 1832 93% 2015  
2016-2018 83% 77% 70% 2017  
2025 3000 50% 1500 50%

35 2011-2018



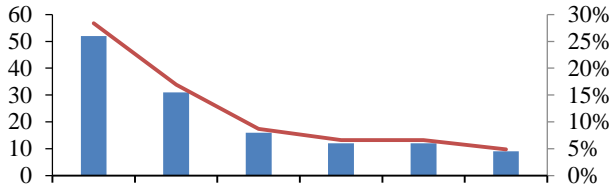
36 2011-2021



**MOSFET**  
MOSFET 52 28.4%  
MOSFET 16 8.7%  
72.1%

**IHS Markit** 2018  
16.9% 45.3%  
Top6 CR6

**37 2018 MOSFET**



*IHS Markit*

**IGBT**

**38 2018 MOSFET**

*IHS Markit*

IHS Markit 2018  
IGBT

IGBT  
90%

75%

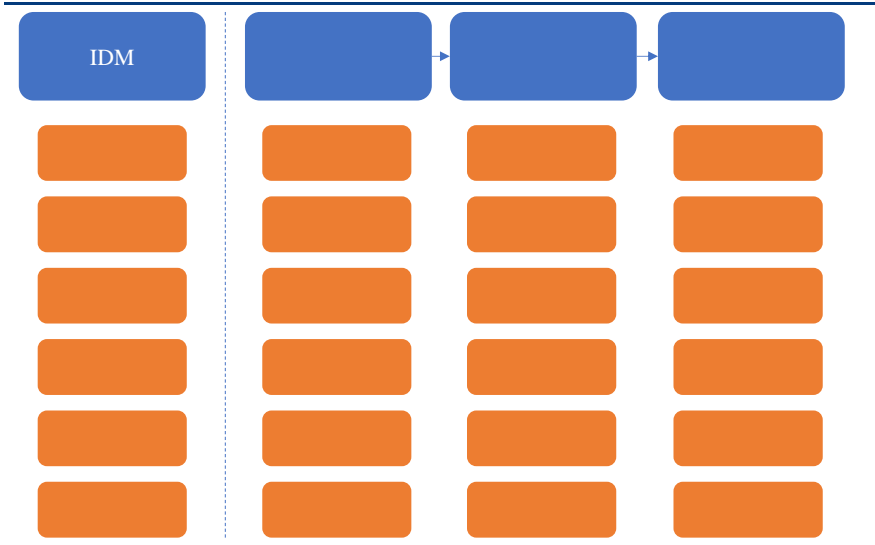
**39 2017 IGBT**

**IGBT**

**IDM**

**IDM**

40 IGBT

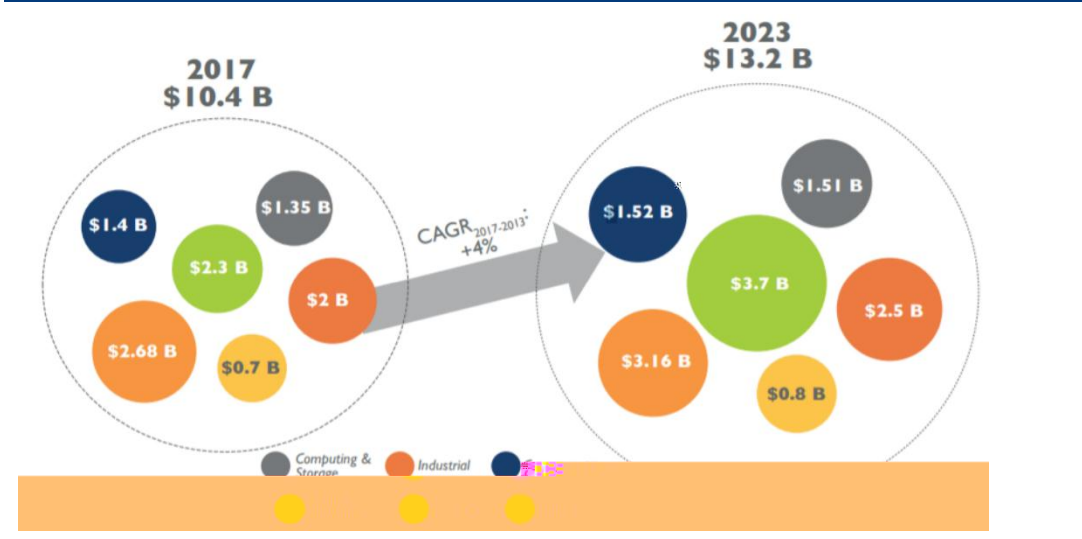


SITRI

5G

		5G				900
Yole	2017 -2023	IGBT	MOSFET	2025	2022	
				300		150
	2023			440		900

41 2017-2023 MOSFET IGBT



Yole

1.

300

17

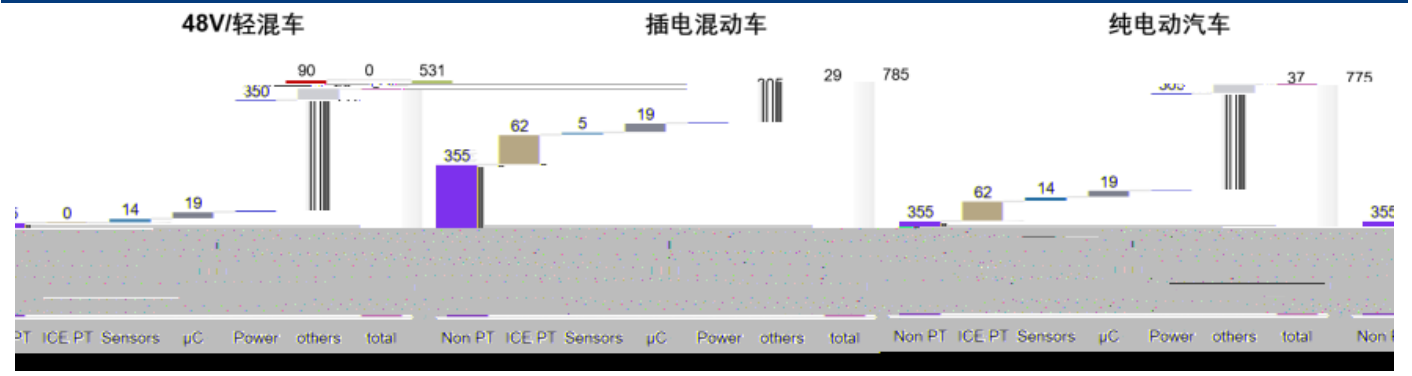
90

305

360

42

265



**MOSFET&IGBT**

300

MOSFET&IGBT  
2025

IGBT

MOSFET  
210

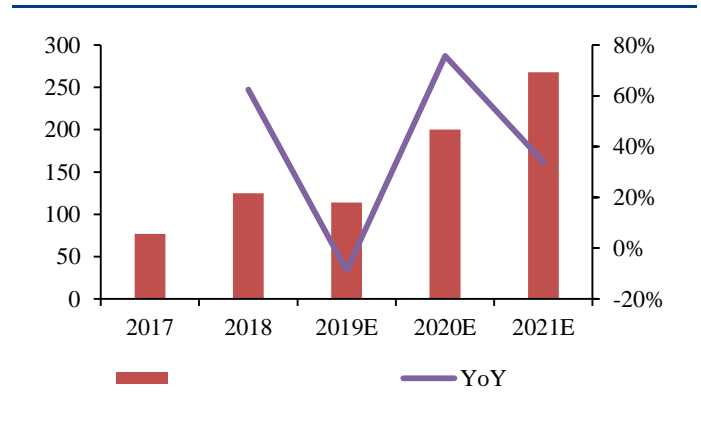
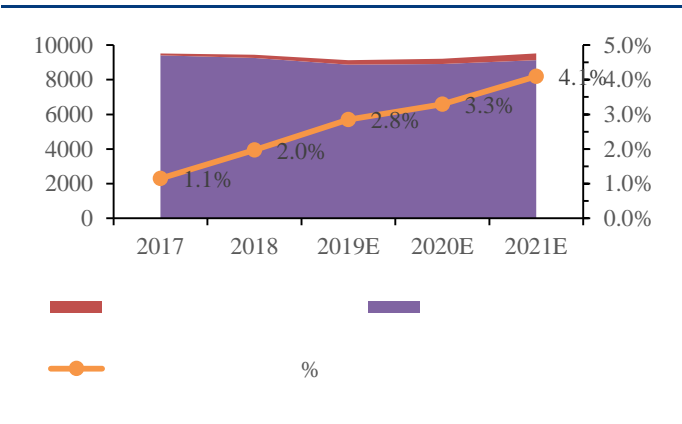
2022

116

IGBT  
310

43 2017-2021

44 2017-2021

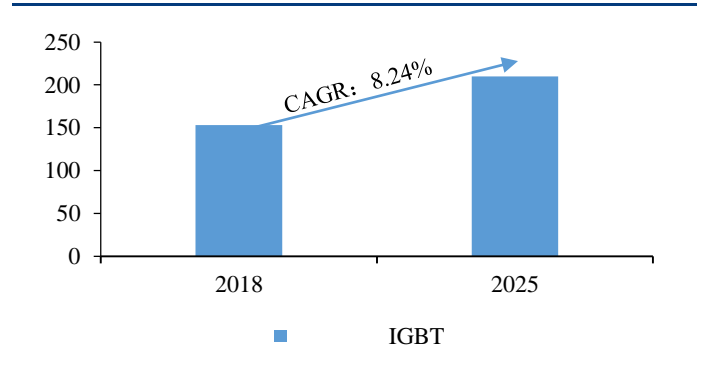
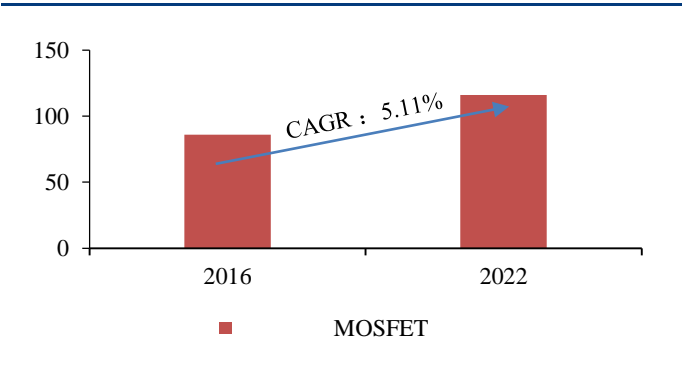


Bloomberg NEF marklines

45 **MOSFET**

46 **2025**

**IGBT**



2. 5G

5G

5G

5G

4G

47 5G

100

5G

4G

1.5

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1. 2017

**2017-2018 8**

2016 20.6% 14.6%  
5.0% 11.5% 2016-2018 8

8  
2017-2018 7.6% 7.1%  
CAGR 32% 20%

**53 2016-2018**

**8**

/

**54 2015-2018**

/

*SUMCO*

*Wind*

1 8

20

,2018 92%,  
50%

28%

IC insights  
26%

**55**

*IC insights*

**2017 8**

3% 2018Q1

2017 8  
10% 8

Q1

90%	2017	8	2016	8	
		44%			
<b>56</b>	<b>2007-2019</b>	<b>8</b>	<b>\$/</b>	<b>57</b>	<b>2016-2017</b> <b>8</b>

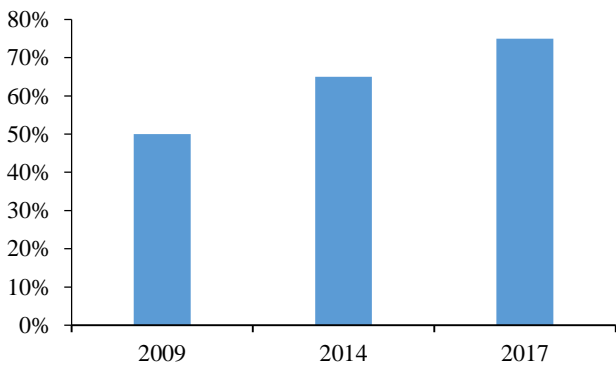
---

<b>1</b>	<b>8</b>	<b>10</b>						
	2007	8	1.4	/	2007	8		
		8			2017		43%	
SEMI	2008-2018				8			
	2018		25%		2008	8	200mm	35%
<b>58</b>	<b>2007-2018</b>	<b>8</b>			<b>59</b>	<b>2008-2018</b>		

---

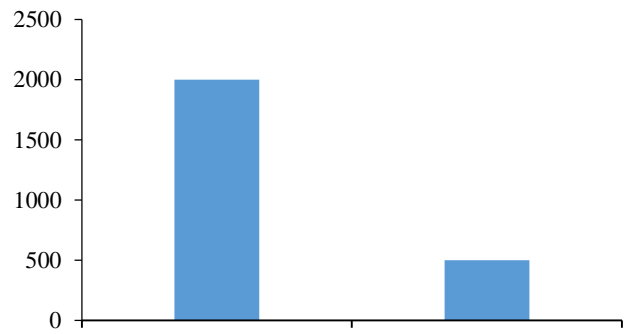
8  
8  
12 75%  
VLSI research  
8 9  
20 90 2000 2017  
12 12 8  
116  
8  
8  
Surplus Global  
2017 8  
2018 8 2000  
3 5 2018 8  
500 8  
8

60 2009-2017 12



IC Insights

61 2018 8



Surplus Global

2

IC MCU 8 3 8 CIS  
8 2016  
CIS 2017  
20% CIS 2017-2018 CIS 10 12 33%

62

%

63

Yole Frost&Sullivan,

ADAS

8

65%

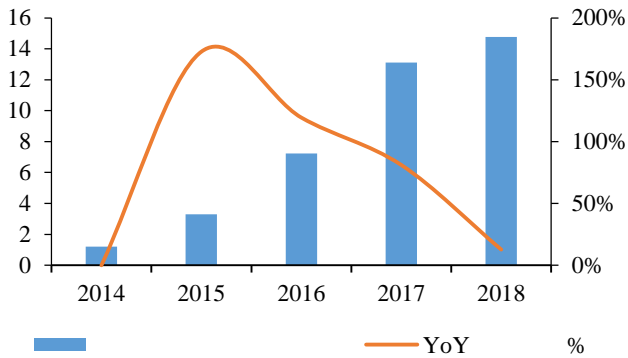
15% 2017-2018

53% 62%

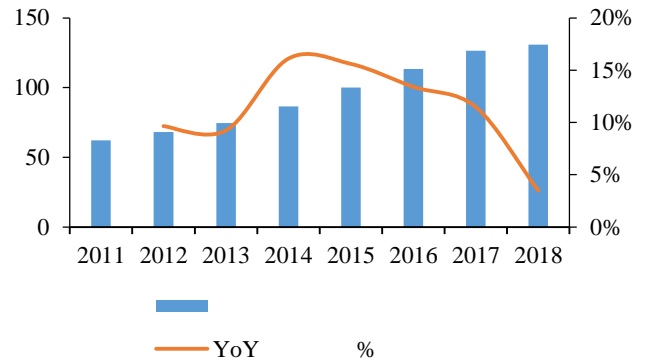
64 2016-2019

IGBT

65 2014-2018

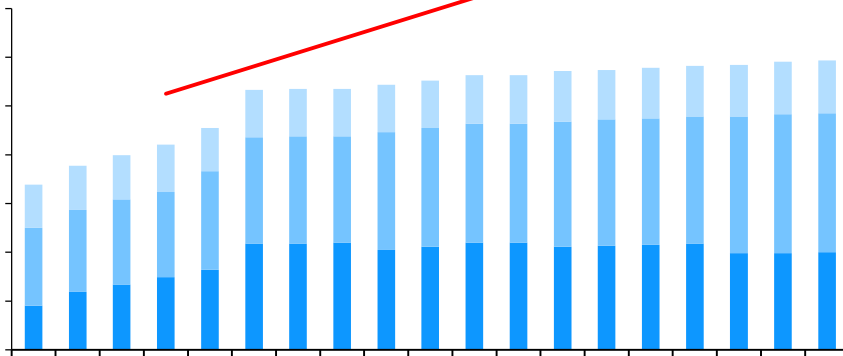


66 2011-2018



2017 8  
460 / 2017Q2 540 / 2016Q4 12.7% 8  
15 / SEMI 2021 8 550 / 2017 525

67 2016Q1-2020Q3 8 /



SUMCO

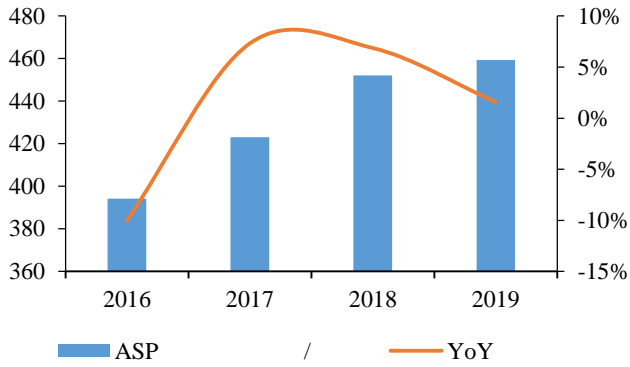
3

ASP

Period	ASP	YoY %	2017-2018
2017-2019	ASP	7.3%	-10.0%
2016-2019	ASP	6.9%	1.6%
2016-2019	ASP	10.6%	-1.9%

68 2016-2019

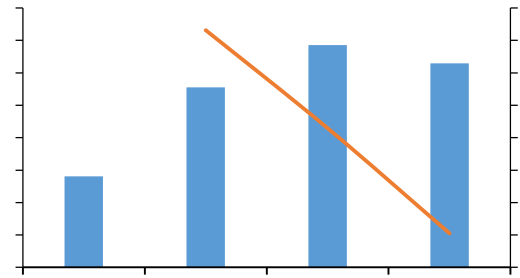
ASP



Wind

69 2016-2019H1

ASP



33.1% 33.4%  
2017-2018

2016 2019  
2016 2019

2016 2019

30%

2017-2018

70 2016-2019

71 2016-2019

EBITDA

Wind

2. 2020

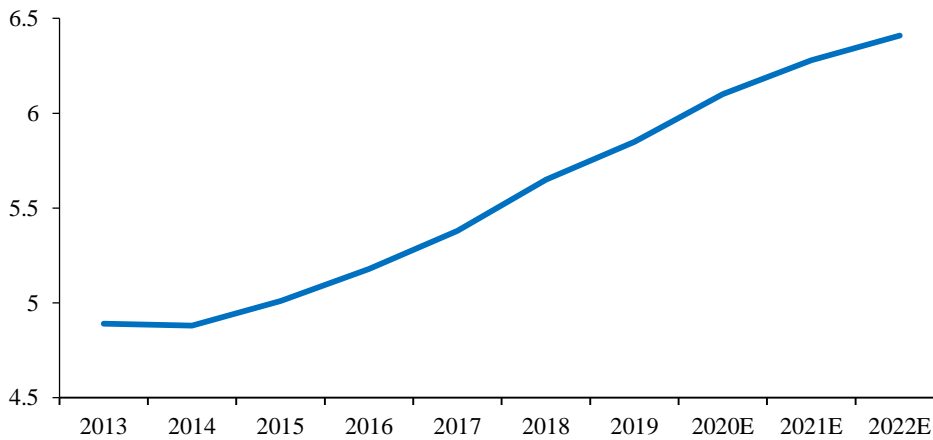
1 8

	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

7

2020 HI

IDM

73

**Beyond Borders: Semiconductors are a Uniquely Global Industry**

Typical semiconductor production process spans multiple countries: 4+ Countries, 4+ States, 3+ trips around the world, 25,000 miles travelled, 100 days TPT, 12 days in transit



SIA

2

5G

2017

2020

CINNO Research 2020

40%

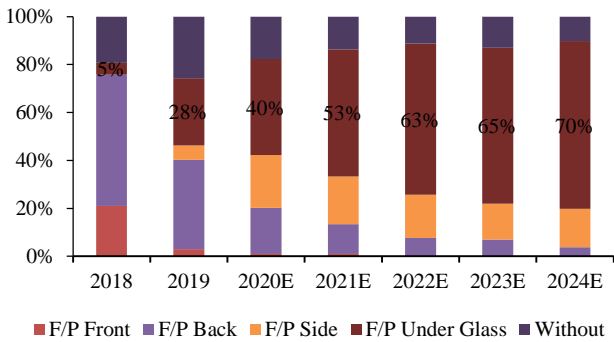
Counterpoint 2020Q1

3.5

8

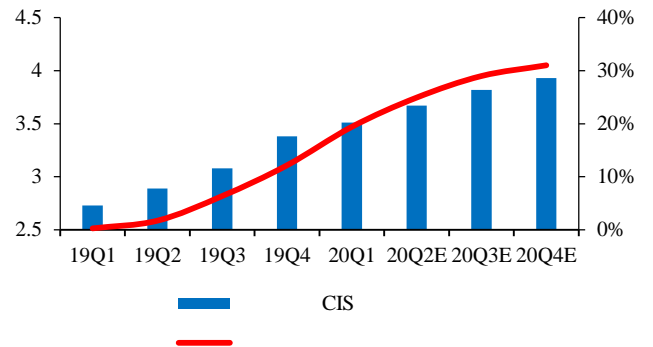
CIS

**74 2018-2024**



CINNO Research

**75 2019Q1-2020Q4**



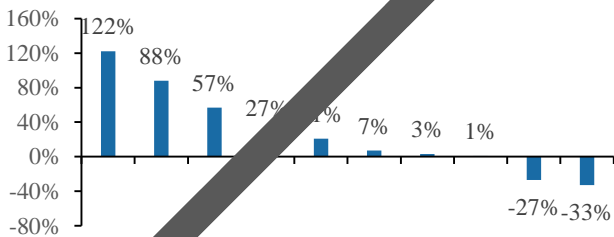
199IT

5G  
5G  
21%  
5G  
4G  
100  
4G  
1  
IGBT  
SCR  
52.5%  
2020  
7  
19.3%

Tom's Guide  
MOSFET  
130  
5G  
4  
5G  
NB/PAD  
NB/PAD  
23%  
1.245  
Q3

iPhone12  
5G  
BCC Research  
2020  
Massive MIMO  
5G  
UPS  
Canalys  
PC  
2020Q2-Q3  
88%  
57%  
10.9pct  
9-10  
65%

**76 2020Q3 PC**



199IT

**77 2020**

21%

20H1

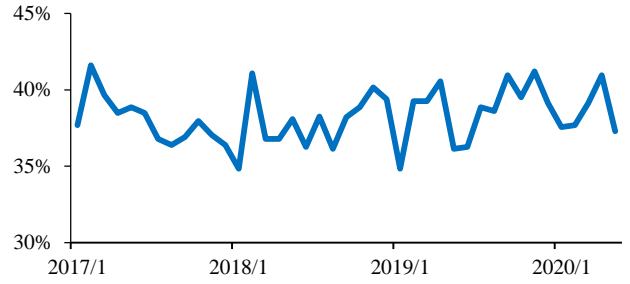
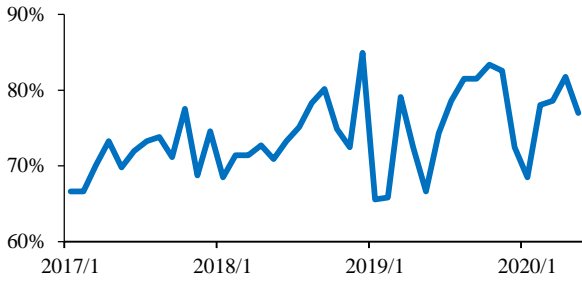
2019

11%

6

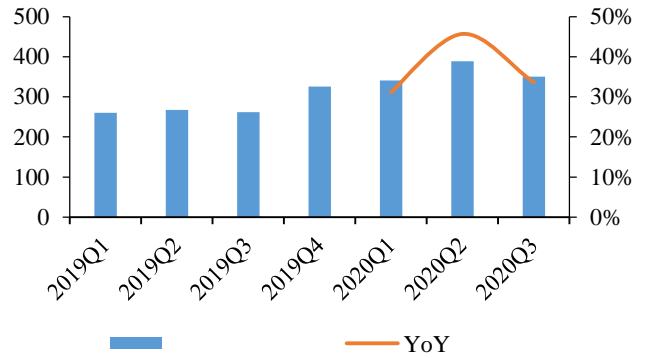
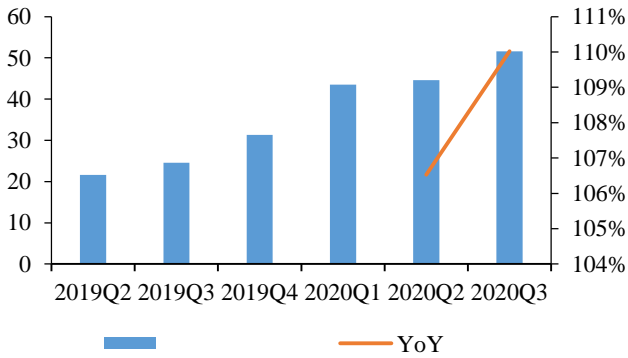
**78 2017-20H1**

**79 2017-20H1**



**80 2019Q2-2020Q3**

**81 2019Q2-2020Q3**



Wind

Wind

3 2020

8

5G

IC MOSFET

3D sensing

8

DIGITIMES

20H2

12

8

10-20%

IC

20Q3

MOS

**IDM+**

8

IC

know-how

IC

IC

20Q2 2019 51.7% 8 100 / 12 17.8 / 1:1 2019 8 2019 8 11 / 8 2019 8 45.7 / 22.8 / 8 8

94%

2017-2018

2020

100% 2019H1

79%—

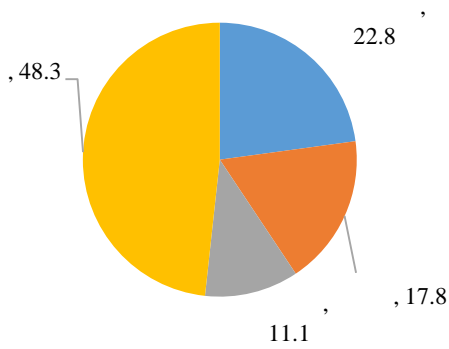
2016-2018

90%

82

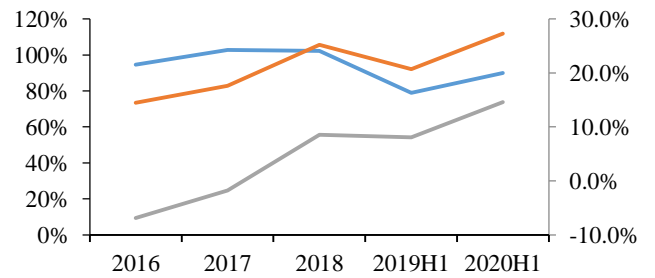
2019

8



2019

83 2016-2020H1



Wind

2020H1

90%

2020H1

8

12

2019 9

8

/ 12

2020

8

2021

1.6

12

84 2020H1

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

2020H1

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

IDM+

IDM

Fabless

50%

IDM

“Fabless+Foundry”

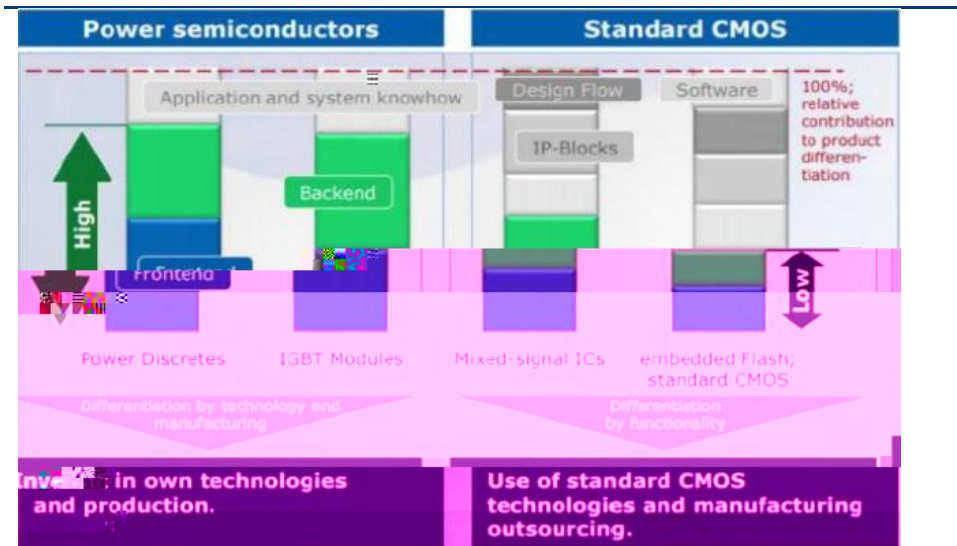
Fabless

IDM

Fabless

85

IC



IDM

Fabless

MOSFET

IDM

IDM

Fabless

IDM

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86      **IDM**      **Fabless**

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*Wind*

**IDM+**

**IDM**

**Fabless**

know-how

**IDM**

87

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

2020

2019A	2020E	2021E	2022E		2019A	2020E	2021E	2022E
1,931	2,169	3,184	4,723		<b>5,743</b>	<b>7,083</b>	<b>8,637</b>	<b>9,995</b>
191	580	628	671		4,431	5,082	6,203	7,282
815	886	1,044	1,211		66	82	100	100
52	60	73	85		112	131	157	172
1,055	1,069	1,362	1,667		377	446	539	592
0	0	0	0		483	567	691	800
1,048	2,132	2,454	2,612		31	14	14	11
5,092	6,896	8,745	10,969		31	0	0	0
3	3	3	3		-37	100	100	100
82	90	100	100		0	0	0	0
3,816	4,961	5,910	6,695		0	20	80	120
489	689	889	1,089		239	280	260	280
275	247	223	200		<b>478</b>	<b>1,181</b>	<b>1,423</b>	<b>1,658</b>
338	333	329	326		32	50	100	150
5,003	6,323	7,454	8,413		4	10	10	10
<b>10,095</b>	<b>13,219</b>	<b>16,199</b>	<b>19,382</b>		<b>506</b>	<b>1,221</b>	<b>1,513</b>	<b>1,798</b>
0	0	0	0		-6	0	0	0
100	87	105	136		<b>512</b>	<b>1,221</b>	<b>1,513</b>	<b>1,798</b>
749	859	1,048	1,230		112	244	303	360
112	187	200	219		<b>400</b>	<b>977</b>	<b>1,210</b>	<b>1,438</b>
0	0	0	0	NOPLAT	544	1,235	1,528	1,809
535	527	560	568	EPS( )	0.33	0.80	1.00	1.18
0	675	844	993					
482	684	929	1,125					
1,978	3,019	3,686	4,271		2019A	2020E	2021E	2022E
1,506	2,306	3,106	3,906					
0	0	0	0		-8.4%	23.3%	21.9%	15.7%
220	314	314	314	EBIT	-9.1%	130.1%	23.7%	18.4%
1,726	2,620	3,420	4,220		-6.7%	143.7%	23.9%	18.8%
<b>3,704</b>	<b>5,639</b>	<b>7,106</b>	<b>8,491</b>					
5,423	6,368	7,578	9,017		22.8%	28.3%	28.2%	27.1%
968	1,212	1,515	1,874	ROE	8.9%	17.2%	17.5%	18.0%
<b>6,391</b>	<b>7,580</b>	<b>9,093</b>	<b>10,891</b>	ROIC	6.3%	12.9%	13.3%	13.2%
<b>10,095</b>	<b>13,219</b>	<b>16,199</b>	<b>19,382</b>		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
2019A	2020E	2021E	2022E					
<b>576</b>	<b>540</b>	<b>1,762</b>	<b>2,325</b>					
1,253	1,923	2,408	2,849					
126	-14	-293	-305					
155	-568	-319	-323					
-72	164	254	240					
-887	-965	-288	-135					
<b>-41</b>	<b>-2,018</b>	<b>-2,020</b>	<b>-2,011</b>					
-746	-2,005	-2,004	-2,003					
-82	-8	-10	0					
787	-5	-6	-8					
<b>-180</b>	<b>1,716</b>	<b>1,273</b>	<b>1,225</b>					
-945	1,475	969	948					
-155	-49	-49	-49					
0	0	0	0					
920	290	353	326					

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021

( 300)

6	20%		
6	10%	20%	
6		-10%	10%
6	10%	20%	
3-6			5%
3-6			-5% 5%
3-6			5%

“ ”