

/

IDM

2020 2 IDM 9 IDM

IDM

AC-DC DC-AC HV-LV DC-DC LV-HV DC-DC

15 8

IDM

64.4 74.5 82.4 2020 2022
EPS 0.38 0.50 0.60
PE 90.6 69.0 57.7

8

“ ”

	2018A	2019A	2020E	2021E	2022E
	6,271	5,743	6,436	7,446	8,237
(+/-)%	6.73%	-8.42%	12.07%	15.70%	10.62%
	429	401	467	612	733
(+/-)%	511.02%	-6.68%	16.46%	31.17%	19.66%
	0.52	0.48	0.38	0.50	0.60
	0.00	0.00	90.56	69.04	57.70
	0.00	0.00	6.78	6.17	5.58
(%)	10.35%	7.39%	7.48%	8.94%	9.66%
(%)	0.00%	0.00%	0.09%	0.00%	0.00%
()	830	830	1,216	1,216	1,216

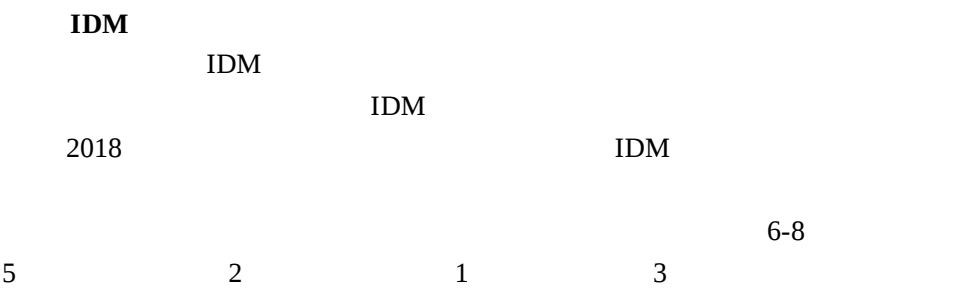
1.	IDM	5
1.1.	IDM	5
1.2.		7
1.3.		9
1.4.		12
2.		13
2.1.		13
2.2.	MOSFET	15
2.2.1.		15
2.2.2.		17
2.3.		19
2.4.	“ ” MOSFET	23
3.		24
3.1.	15	24
3.2.		24
4.		27
4.1.		27
4.2.		30

1	IDM	5
2		6
3	2018	6
4		7
5		7
6		8
7		9
8		9
9		9
10		10
11		10
12		10
13		10
14		10
15		11
16		11
17		11
18		12
19		13
20	Si GaN SiC	13
21	Si GaN SiC	13
22		14
23	IGBT MOSFET BJT	14
24	Si	15
25		16
26	MOSFET	16
27		17
28	wafer	18
29	12	18
30	8	19
31		19

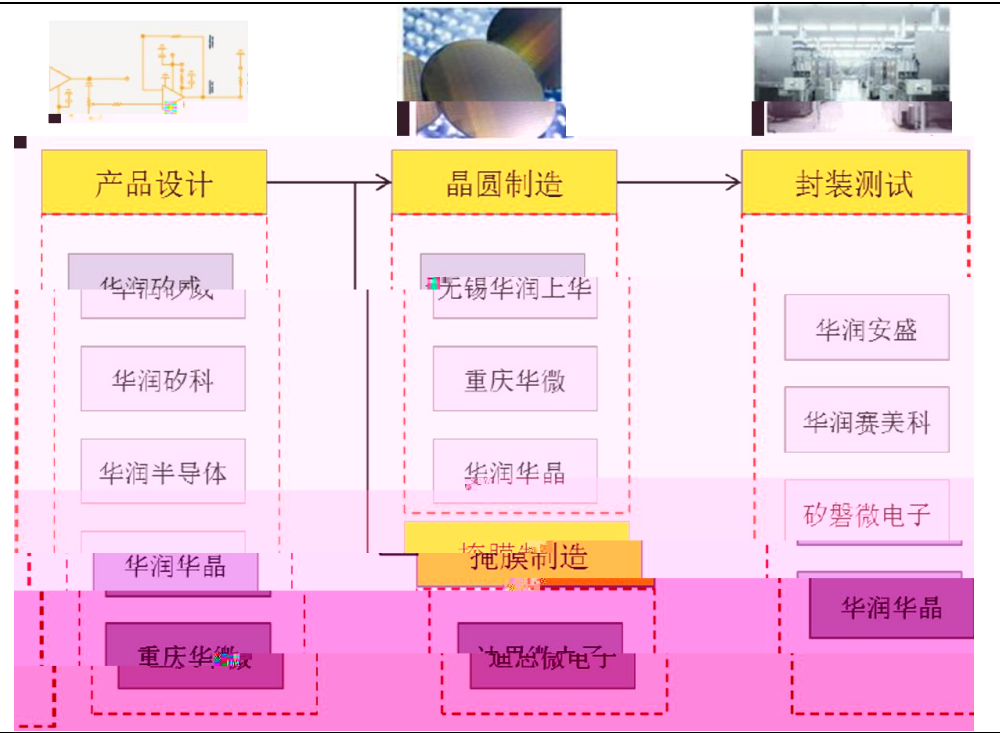
32	Infine on	2019	.....	19
33			.....	20
34	DC-AC		.....	21
35	DC-DC		.....	21
36			.....	22
37			.....	22
38			.....	23
39	2017	MOSFET	.....	23
40			.....	24
41	SiC	GaN	.....	25
42	SiC MOSFET	Si IGBT	.....	25
43	Si-IGBT	SiC-MOSFET	.....	26
44	Si-IGBT	SiC-MOSFET	.....	26
45	8		.....	27
46			.....	28
47			.....	29
48		PE	.....	30
49	IDM	PEBand	.....	30
50		PE Band	.....	31

1. IDM

1.1. IDM



1 IDM

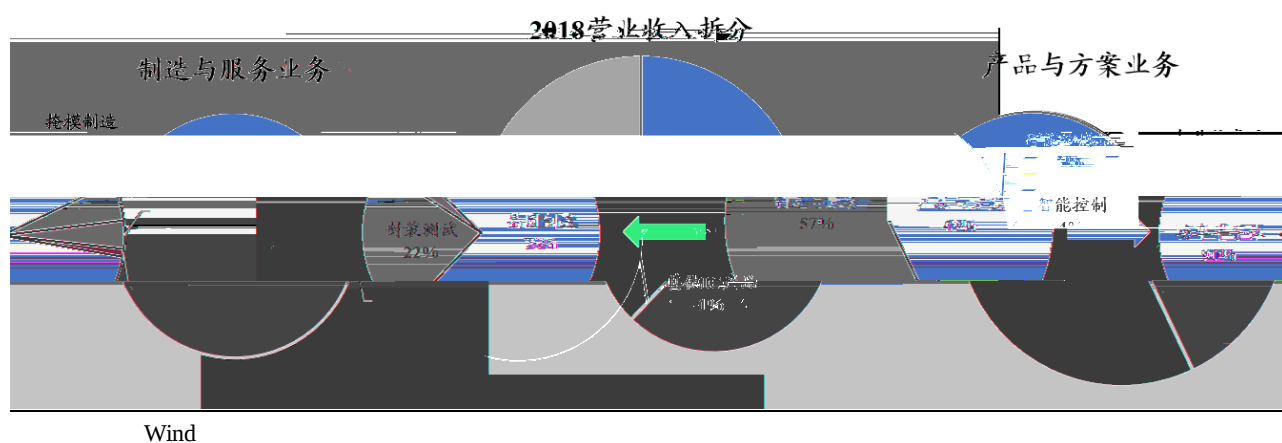


2

排名	企业	2018 年销售额 (亿元)	业务模式
1	深圳市海思半导体有限公司	509	设计
2	红芯芯微科技集团有限公司	248	设计
3	南通华达微电子有限公司	239	封测
4	中芯国际集成电路制造有限公司	225	代工
5	北京紫光展锐科技有限公司	111	设计
6	上海华虹(集团)有限公司	107	代工
7	天水华天科技股份有限公司	92	封测
8	北京智芯微电子技术有限公司	66	设计
9	华大半导体有限公司	63	IDM
10	发行人		

2018 57%
 43%
 75%
 90%

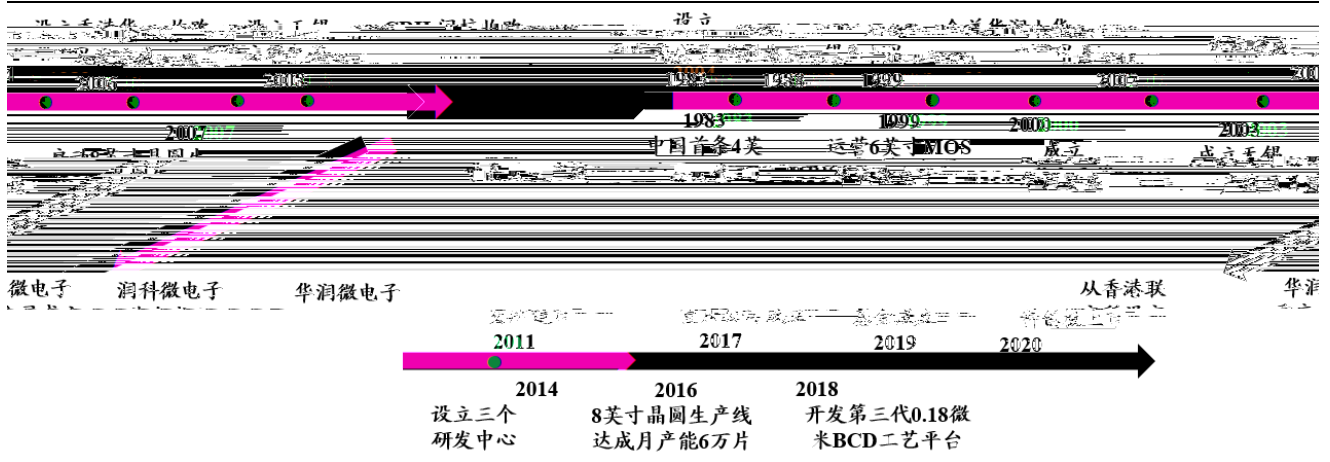
3 2018



CMOS/ANALOG BICMOS RF/Mixed-Signal CMOS
 BCD MEMS
 0.8μm/1.0μm UHV BCD
 DMOS DMOS IGBT BJT

IGBT 3300 V-6500 V

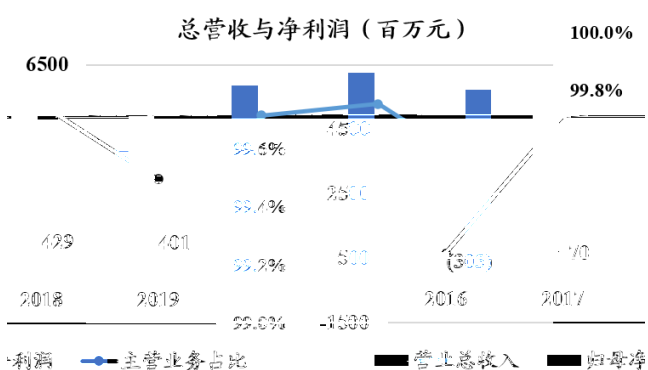
7



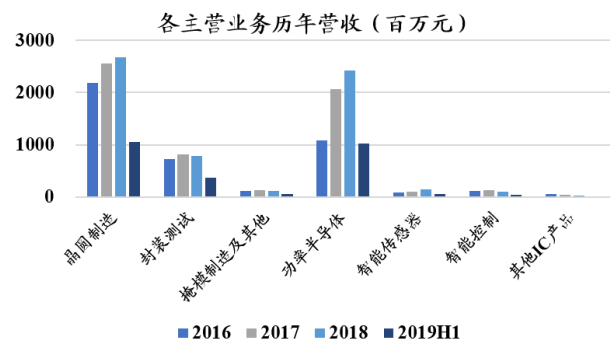
1.3.

2018 62.7 2017
 2018 4.3 2019
 99%

8



9



IC

“ ”
 2019
 43.4%
 “ ”
 20%-35%

“ ”

“ ” “ ”

“ ”

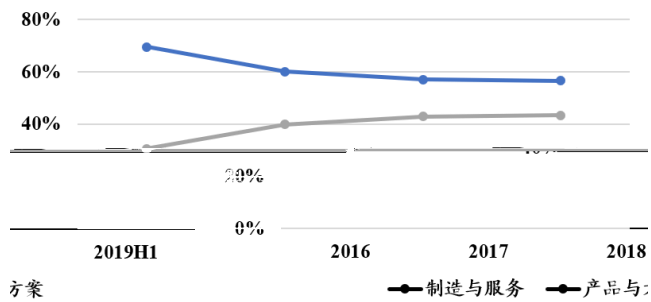
“ ”
 10%-20%
 “ ”
 “ ”

“ ”

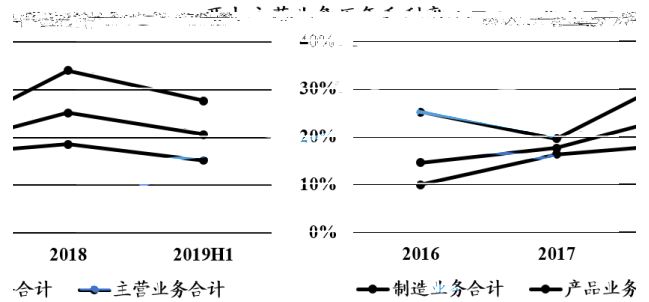
“ ”

10

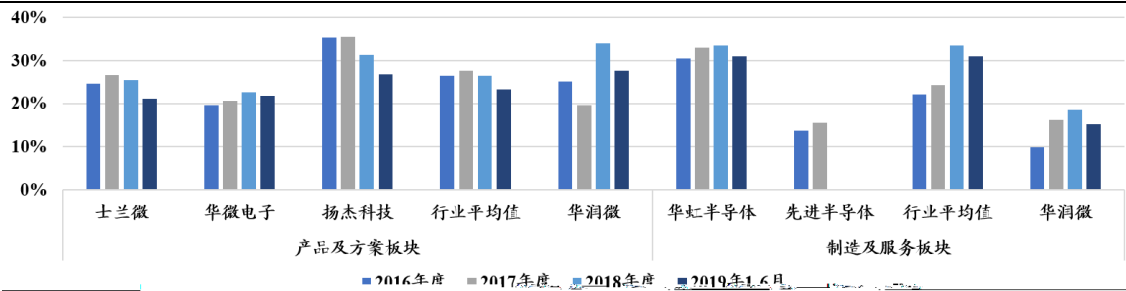
两大主营业务历年占比变化



11



12



“ ”

“ ”

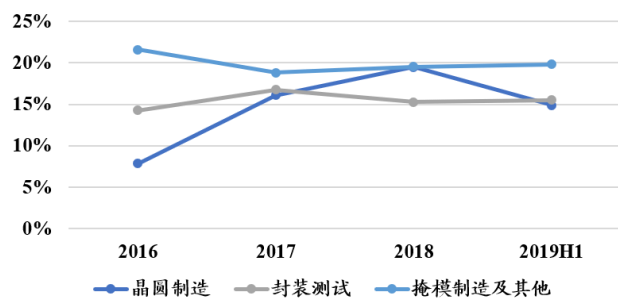
”

“ ”

77%

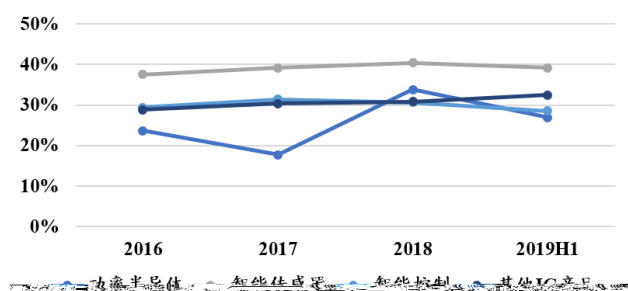
15

制造业务历年毛利率



16

产品业务历年毛利率



8

6

6

8

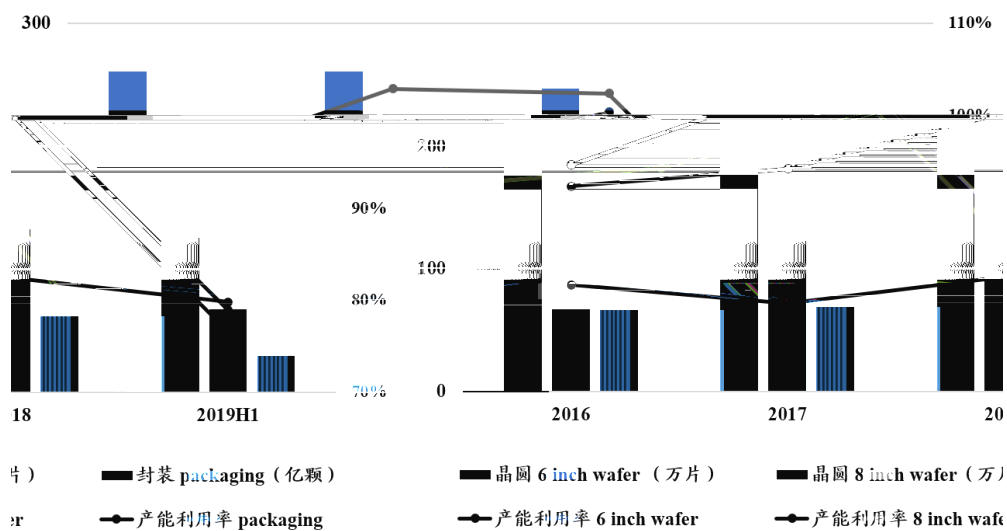
2018

8

6

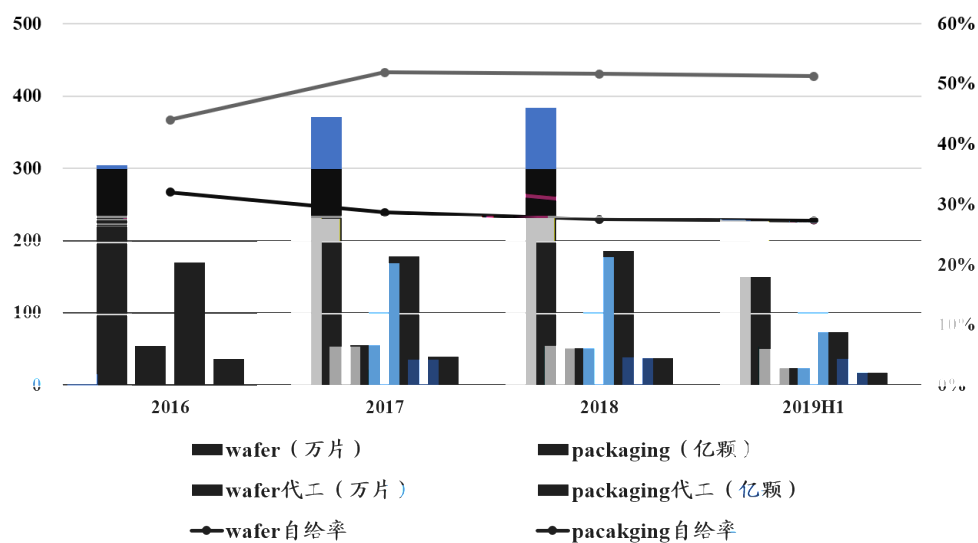
17

公司历年全年产能



18

晶圆封测历年产量与自给率



1.4.

4.47 4.50 4.83 2016 2019 3.46

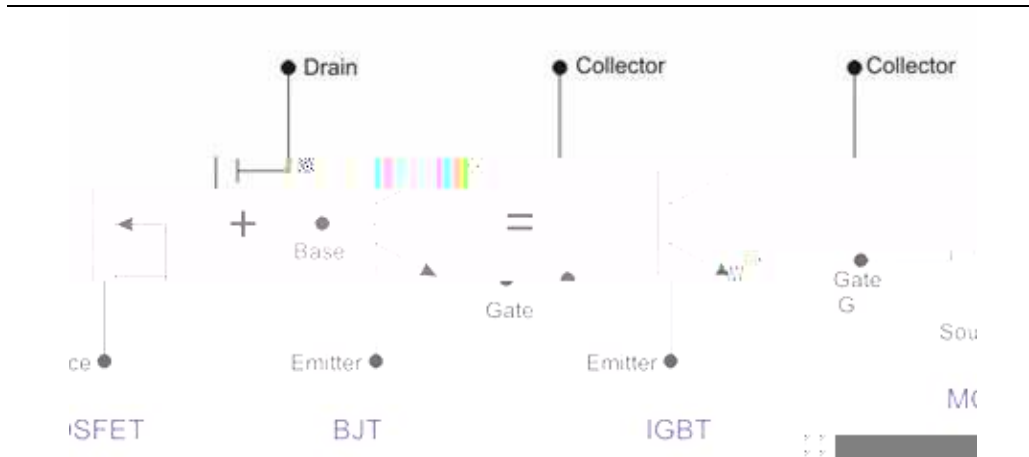
2.1.

BJT < 1 kV < 500 A
 MOSFET
 < 200 A ns IGBT
 MOSFET GJT
 IGBT > 1 kV > 500 A

22

器件特性	BJT	MOSFET	IGBT
	> 1kV	电压	< 1kV
	> 500 A	电流	< 200 A
驱动	电压驱动	电压驱动	电压驱动
低	高	高	输入阻抗
低	中	低	输出阻抗
慢 (μs)	快 (ns)	中	开关速度
低	中	高	效率

23 IGBT MOSFET BJT

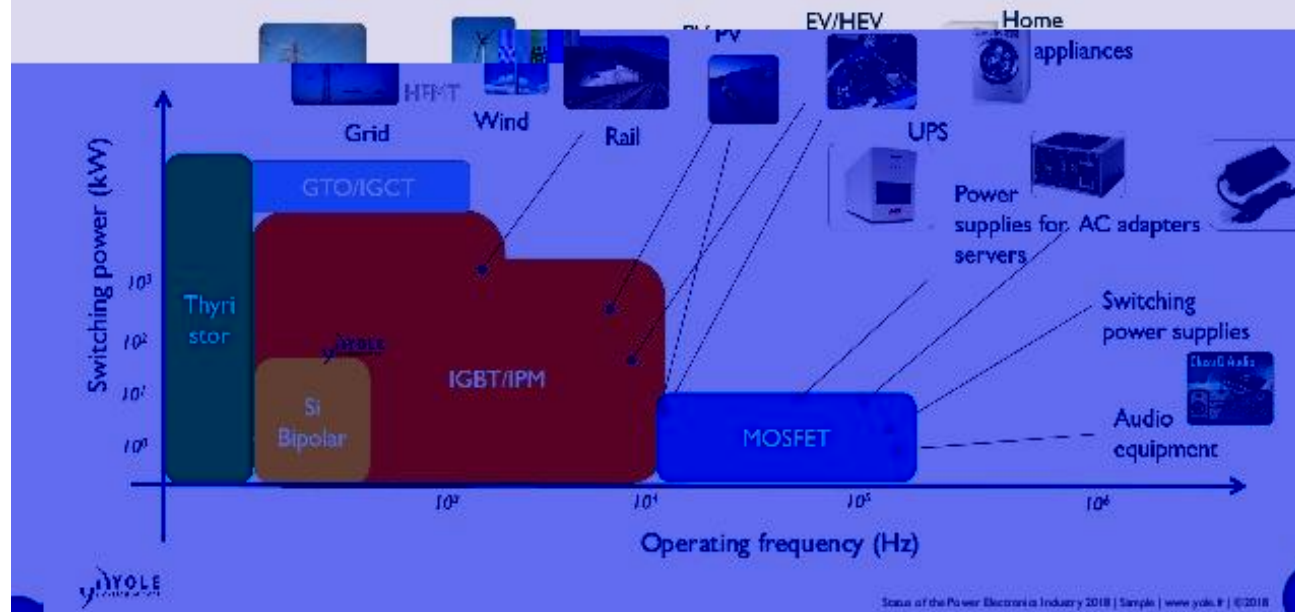


ns IGBT 10-10k
 10 kHz Hz BJT
 Hz UPS Thyristor

24 Si

POWER VS FREQUENCY ON ELECTRONICS

Power device technology positioning (2018)



Yole

2.2. MOSFET

2.2.1.

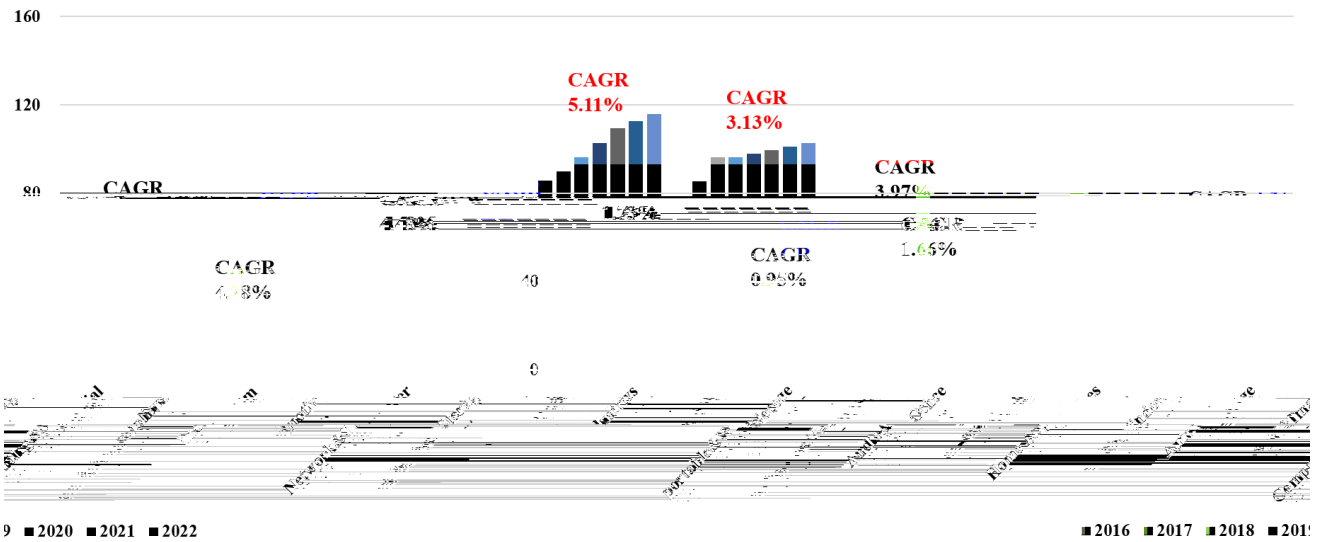
		IGBT		MOSFET	
		3.56%	2018		2070
2022	2381	PMIC			IGBT
7.62%			13.67%	MOSFET	
	22%				
“	”	“	”	MOSFET	MOSFET
2018	470.7			2022	523.5

全球功率器件封装措施（内环，2019 外环，2022 单位：亿元）

Yole

26 MOSFET

2016-2022功率MoSFET细分应用市场规模预测（亿元）



Yole

MOSFET

MOSFET

MOSFET

2016-2022
MOSFET

5.11%
2022

MOSFET
116

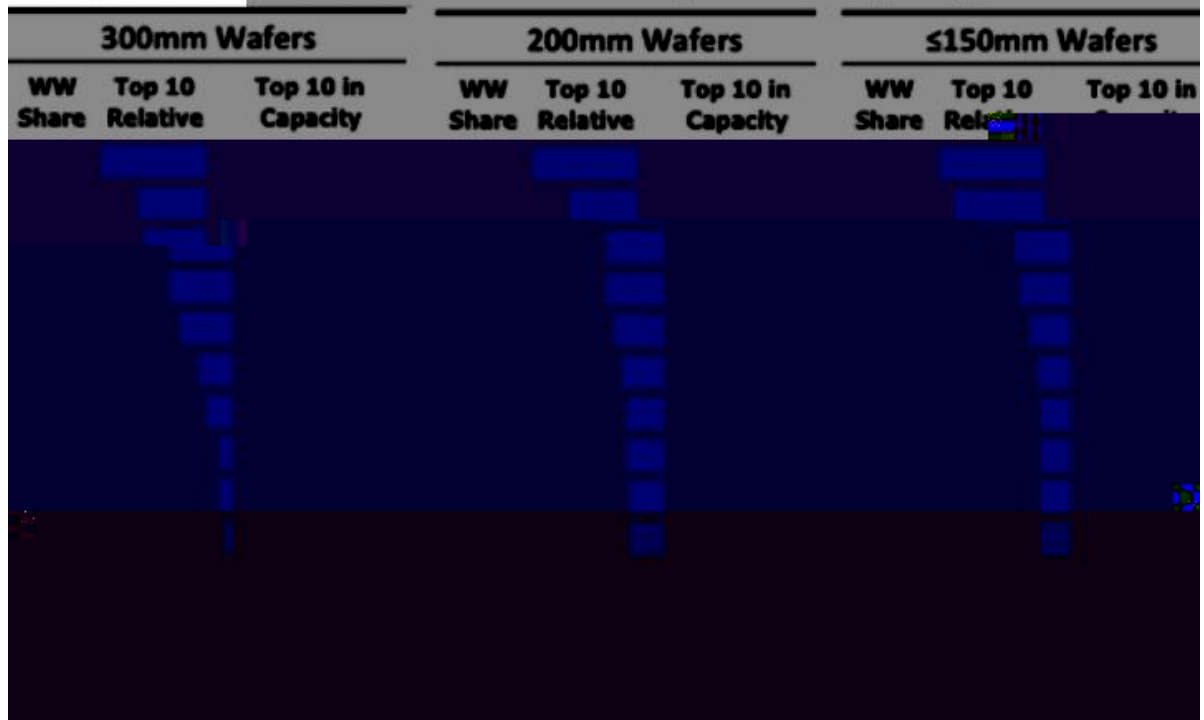
MOSFET

22.2% MOSFET

2.2.2.

27

Installed Capacity Leaders at Dec-2016 – by Wafer Size (Ranked by Share of Total WW Monthly Installed Capacity)



IC Insights

12 8
 12 300 mm wafer
 Micron SK Hynix Toshiba
 TSMC Intel Global Foundry UMC SMIC 6 150
 mm wafer
 6 IDM STMico
 35% 2018 8
 TSMC SMIC
 12 8
 IDM Infineon OnSemi Renesas 12
 IDM CRM Silan 8
 12 8 2.5
 12
 8

28

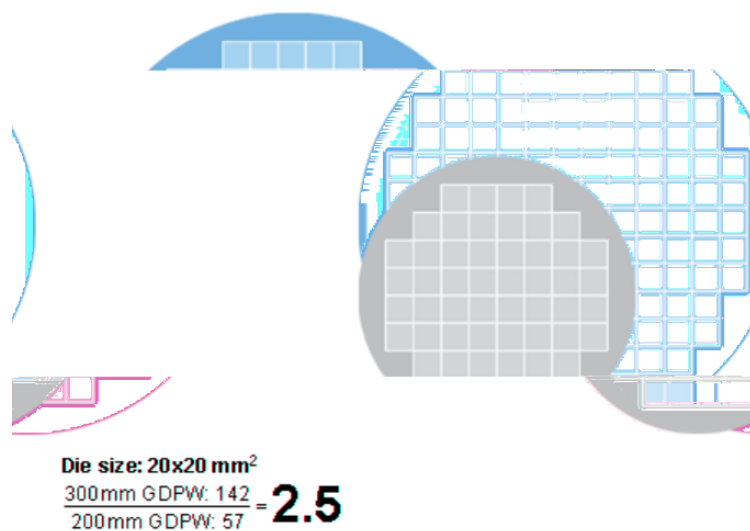
wafer

Foundry	Application	Wafer size	Process node
TSMC	BCD	12-inch、8-inch	0.6 um – 40 nm
SMIC	PMIC	8-inch	0.35 um - 0.14 um
UMC	BCD	6-inch、8-inch	0.35 um – 0.11 um

TSMC SMIC PowerChip UMC

29 12

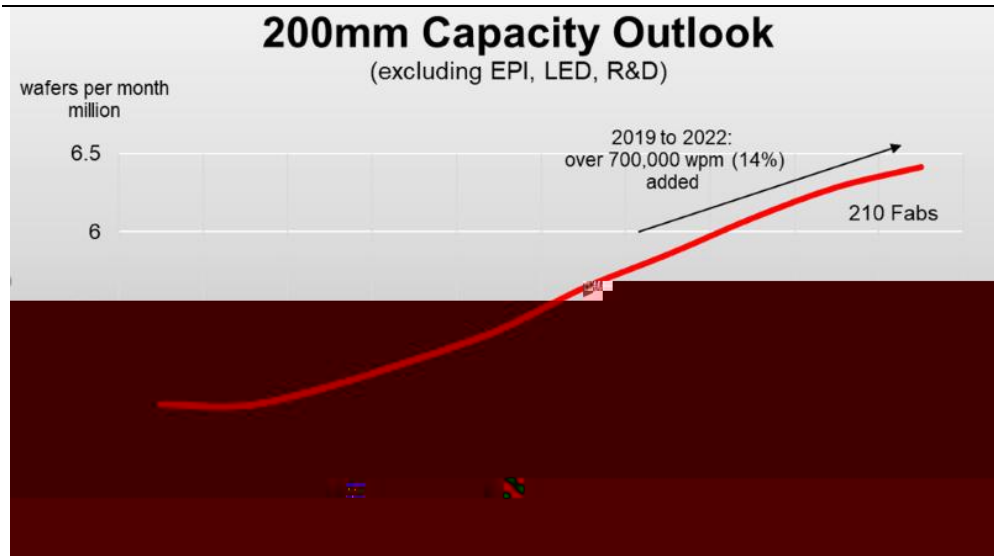
Larger Die Sizes More Efficiently Utilize 300mm Wafer Area



8	CAGR	2.89%			
SEMI	8	200 mm Wafer	2019	580	/
	IDM	8	2022	650	
/	2.89%				
3.56%	8				

30

8



SEMI

IDM

Infineon

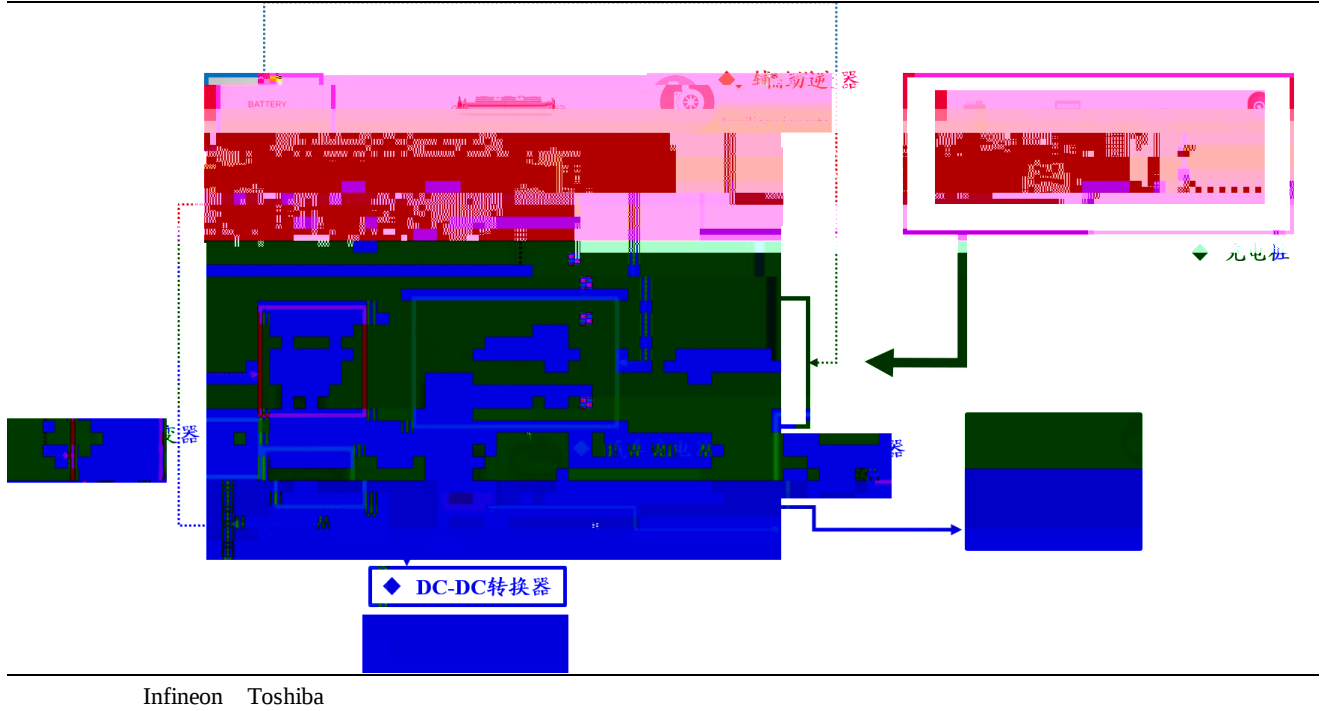
2019

22%

30%

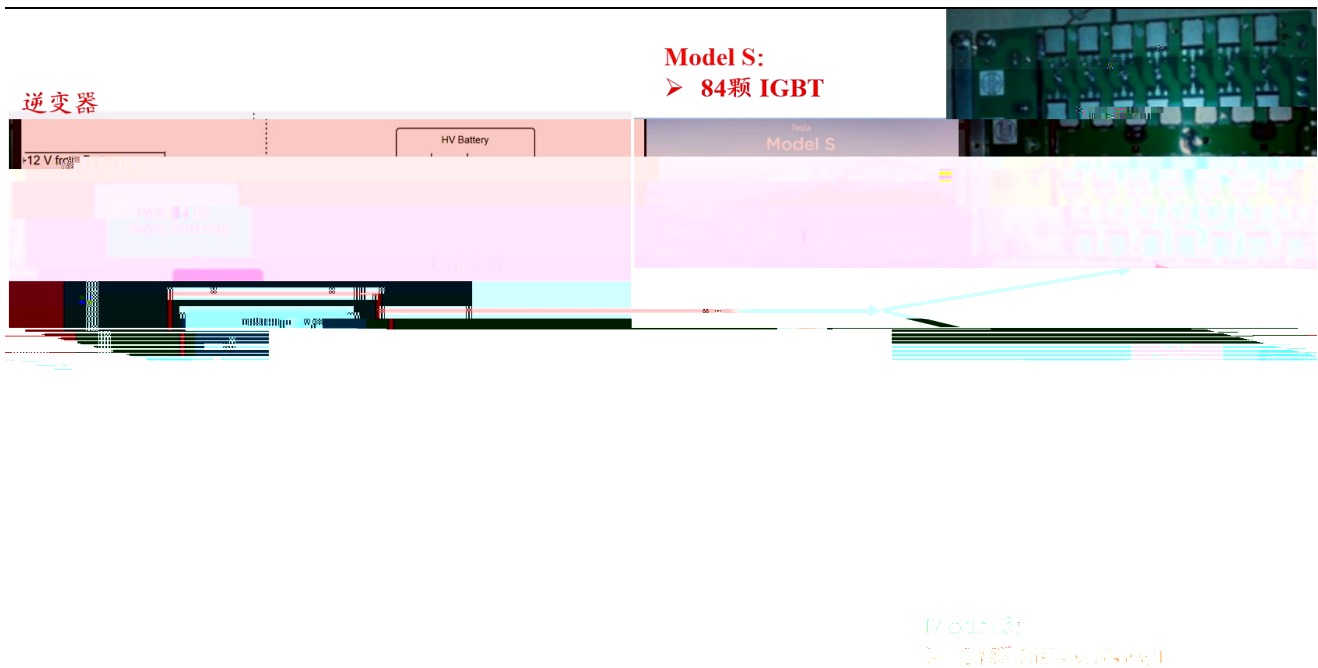
15%

33



DC-AC		Inverter	
SiC MOSFET		Model S	IGBT
IGBT	Model 3	24	84
		SiC MOSFET	

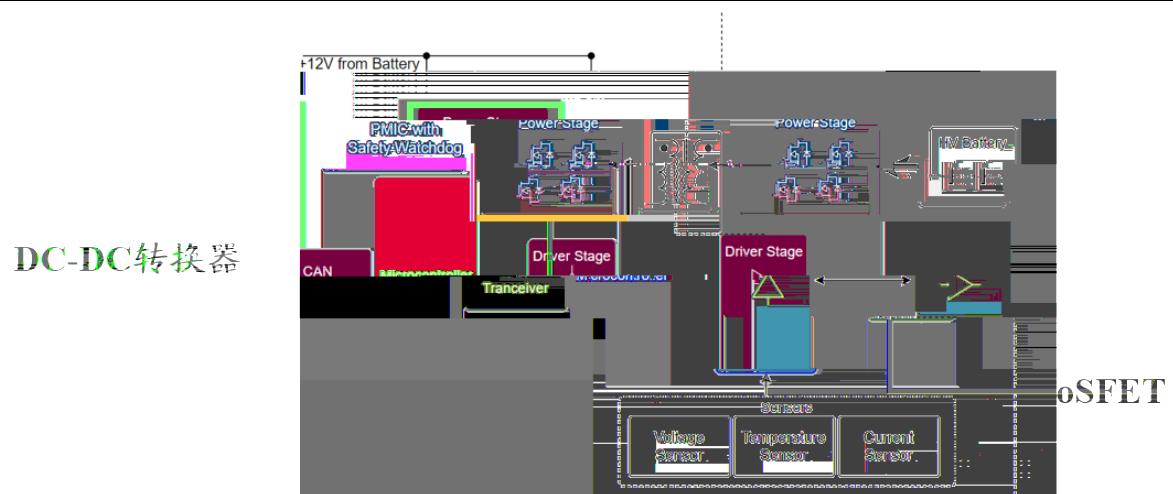
34 DC-AC



Infineon

		DC-DC		LV-HV		DC-DC	
		converter		voltage		low voltage to high	
Model S		400 V		650 V			
		LV-HV	DC-DC	400 V	650 V		
				HV-LV	DC-DC	400 V	
		MOSFET		DC-DC			

35 DC-DC

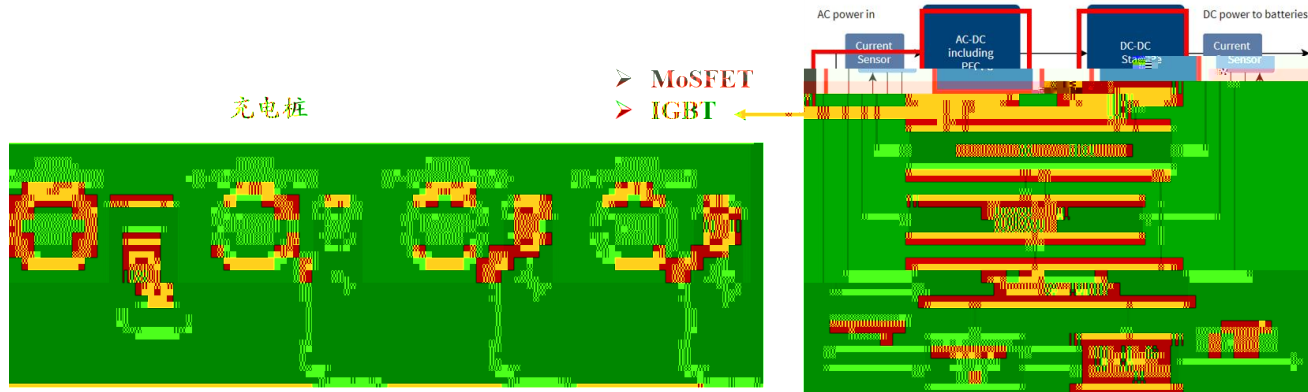


Infineon

AC-DC DC-DC

AC-DC DC-DC
MOSFET IGBT

36

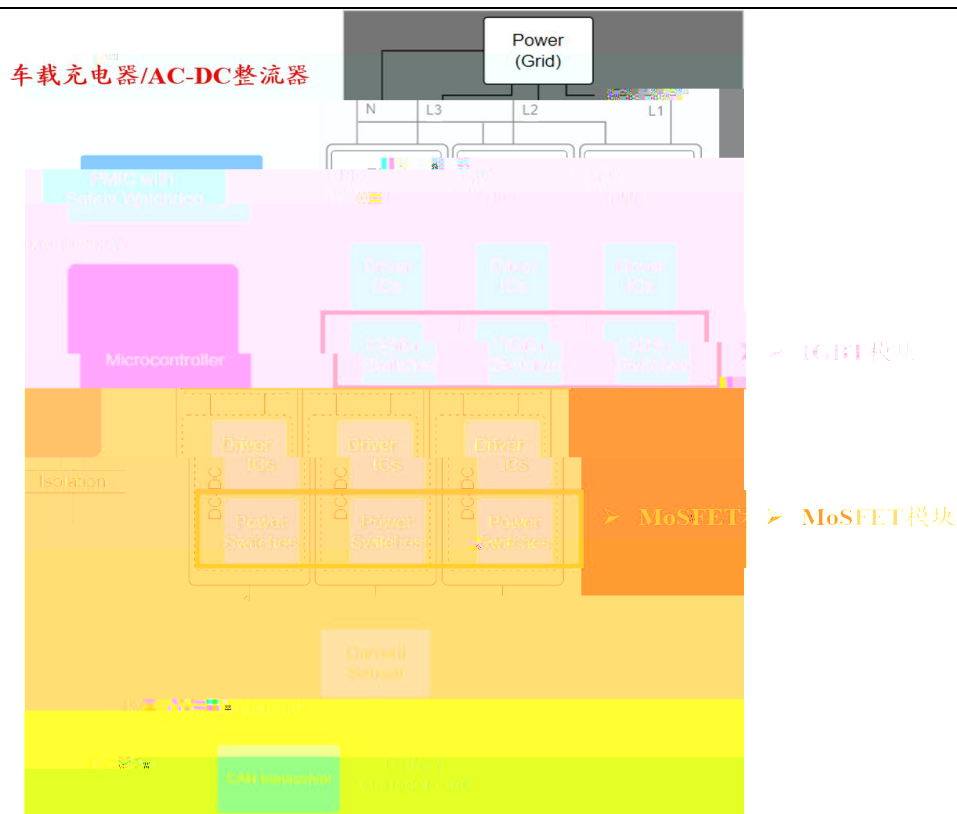


Infineon

OBC On-Board Charger IGBT MOSFET

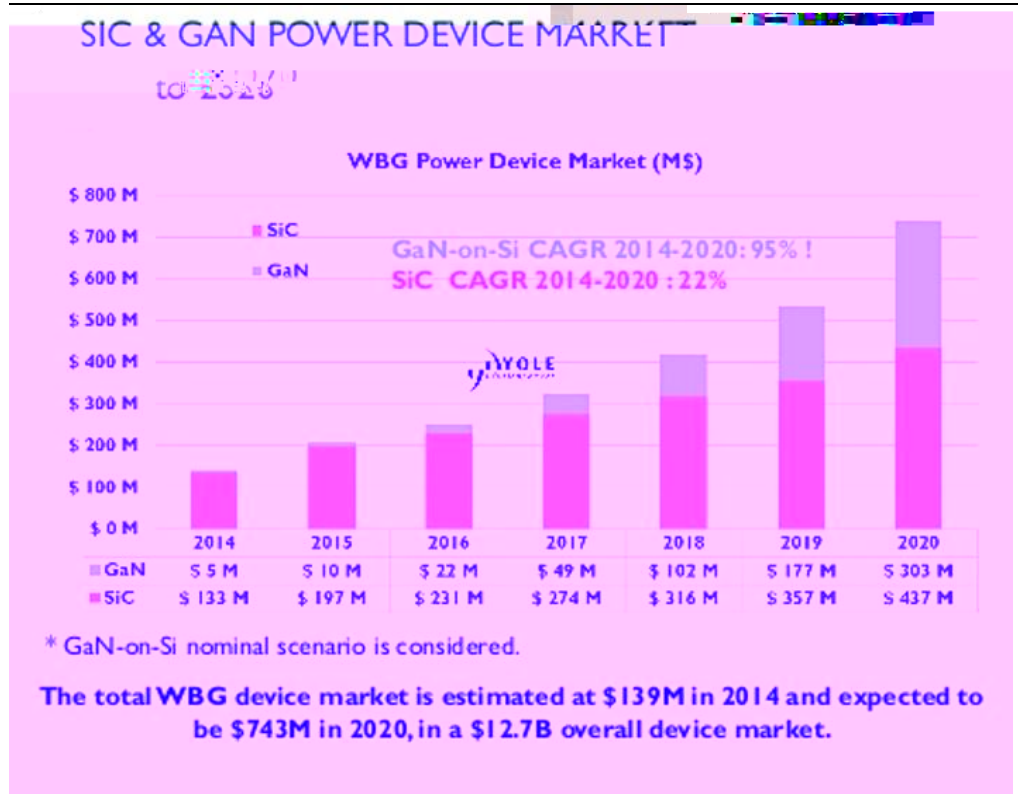
IGBT MOSFET

37



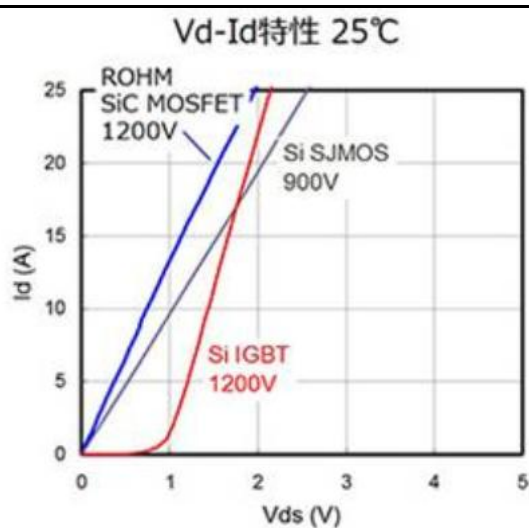
Infineon

41 SiC GaN



Yole

42 SiC MOSFET Si IGBT



SiC-MOSFET			IGBT	600-1200 V	SiC
MOSFET		Si	IGBT		
SiC	Si			MOSFET	IGBT
				IGBT	
SiC-MOSFET				IGBT	

SiC-MOSFET

SiC-MOSFET

Model S

IGBT

Model 3

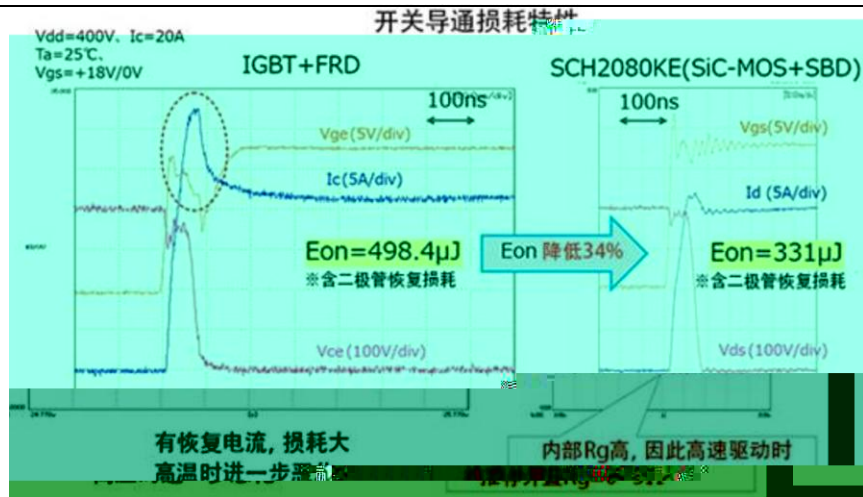
SiC-MOSFET

600-1200 V

SiC-MOSFET

IGBT

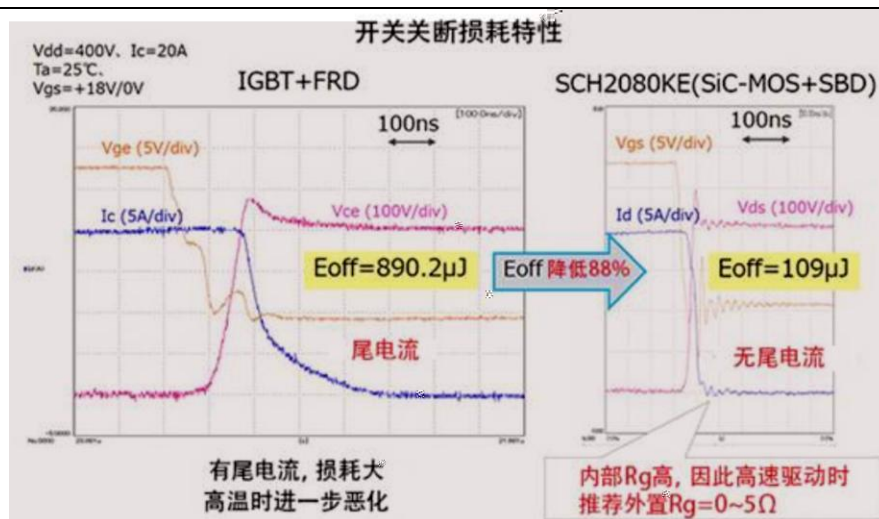
43 Si-IGBT SiC-MOSFET



Si-IGBT

SiC-MOSFET

44 Si-IGBT SiC-MOSFET



IGBT **Si-IGBT** **SiC-MOSFET** **Si-MOSFET**

4.

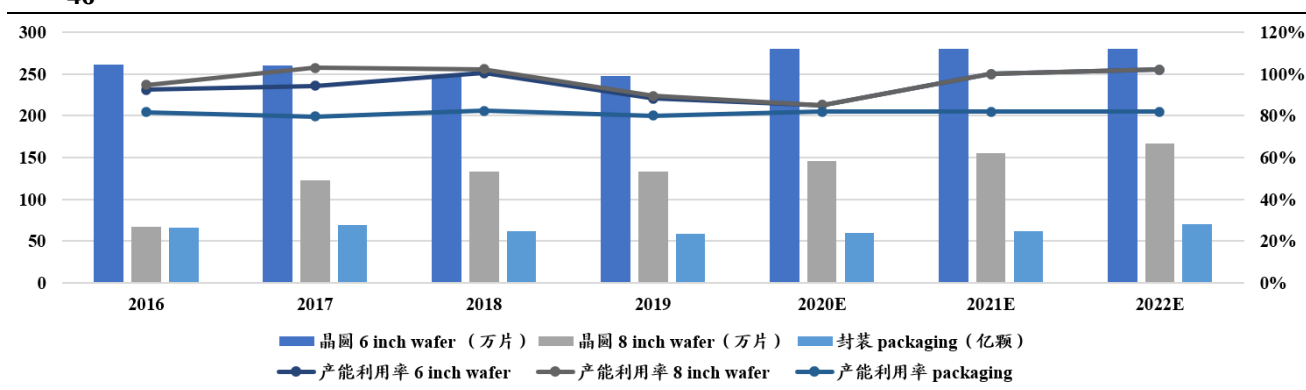
4.1.

8

8

8

46



2020	2022	64.4	74.5	82.4		
					2020	2022
	35.9	41.3	45.3		2020	2022
	28.2	32.9	36.8			

IDM

IDM

	2016	2017	2018	2019*	2020E	2021E	2022E
毛利率	18.00%	15.00%	20.00%	19.00%	7.85%	16.06%	
3.33%	-12.31%	1.20%	19.46%	8.68%	YoY		17.16%
85.68	732.62	854.40	867.02	973.24	729.37	820.11	
14.27%	16.75%	15.28%	16.52%	15.50%	16.00%	17.00%	毛利率
55.75	169.28	掩模制造及其他	114.42	136.35	111.96	105.81	130.38
2.00%	23.00%	毛利率	21.56%	18.79%	19.53%	21.00%	20.00%
9.46%	8.68%	YoY		19.17%	-17.89%	-5.49%	11.20%
132.79	4528.03	制造业务合计	3031.56	3519.76	3571.91	3183.52	3592.51
9.24%	18.72%	毛利率	9.91%	16.33%	18.57%	17.76%	15.30%
5.04%	9.56%	YoY		16.10%	1.48%	-10.87%	12.44%
898.77	3235.35	功率半导体	1081.18	2068.58	2418.86	2269.11	2493.49
2.00%	22.00%	毛利率	22.61%	17.71%	22.82%	22.46%	21.00%
	91.33%	16.93%	-6.19%	9.71%	16.25%	11.61%	YoY
	13.12%	30.00%	11.00%	10.00%	27.40%	39.18%	46.33%
	41.99%	0.86%	36.45%	17.46%	12.24%	YoY	13.57%
	31.43%	30.67%	30.22%	29.00%	31.00%	30.00%	毛利率
	9.55%	-22.06%	-9.62%	12.33%	20.95%	18.68%	YoY
	46.03	27.61	17.91	23.80	28.35	32.35	其他IC产品
	20.24%	20.86%	17.58%	22.00%	22.00%	22.00%	毛利率
	-5.68%	-40.02%	-35.15%	44.76%	19.14%	14.12%	YoY
%	毛利率	25.19%	19.60%	34.02%	29.48%	31.50%	33.48%
%	YoY		75.64%	14.73%	6.25%	11.58%	16.54%
52	主营业务合计	4363.29	5858.81	6255.40	5699.18	6416.38	7423.78
0%	毛利率	14.59%	17.62%	25.19%	17.92%	22.42%	25.55%
2.06%	15.70%	10.62%	YoY		34.28%	6.77%	-8.89%
9.31	22.34	24.71	非主营业务	33.47	16.77	15.40	23.00
7.00%	27.00%	27.00%	毛利率	3.16%	14.31%	29.26%	26.60%
16.04%	15.70%	10.62%	YoY		-49.89%	-8.19%	49.31%
435.60	7446.11	8237.23	营业总收入	1306.76	5875.59	6270.80	5733.18
0%	毛利率	14.49%	17.62%	25.20%	22.95%	22.44%	25.56%
2%	YoY		33.63%	6.73%	8.75%	11.95%	15.70%

Wind

* 2019

4.2.

				2020	2022			64.4	
74.5	82.4	EPS	0.38	0.50	0.60	PE	90.6	69.0	57.7

IDM

IDM

Fabless

A		IDM		PE
107.51		Fabless		PE
142.56				
120	PE	2020	45.6	

48 PE

截至2020.04.30收盘		EPS	PE	EPS	PE (TTM)
	收盘价	2019	2019	2020E	对应2019EPS
士兰微	14.18	0.01	1396.75	-	1280
扬杰科技	26.36	0.48	36.07	0.62	42.62
0.8	47.23	捷捷微电	37.67	0.62	37.41
1109	132	斯达半导	143.8	1.13	-
0.24	61.75	中芯国际	14.82		
0.75	20.08	华虹半导体	15.06		
0.38	99.55	华润微	37.83	0.48	-

Wind

49 IDM PE Band



Wind

	2018A	2019E	2020E	2021E
	1,931	2,775	3,998	5,290
	508	508	508	508
	1,006	1,171	1,332	1,477
	1,055	1,154	1,344	1,465
	594	1,214	1,200	1,207
	5,092	6,822	8,381	9,946
	0	0	0	0
	82	82	82	82

	2018A	2019E	2020E	2021E
	512	516	676	809
	6	0	0	0
	709	681	654	610
	0	0	0	0
	69	30	30	30
	0	-4	-4	-5
	-715	-632	-36	-46

“ ”

“ ”

33 / 34

