

MOSFET IGBT SJNFET / MOSFET
-100V 1500V
SiC/GaN

5 2025 2019 70%

/ 13

1

50% 2017

/ MOSFET IGBT
12

SiC JBS 6 650V 1200V SiC JBS
MOSFET GaN MOCVD 650V

2020-2022 0.83 1.07 1.25
2021 72 PE 77



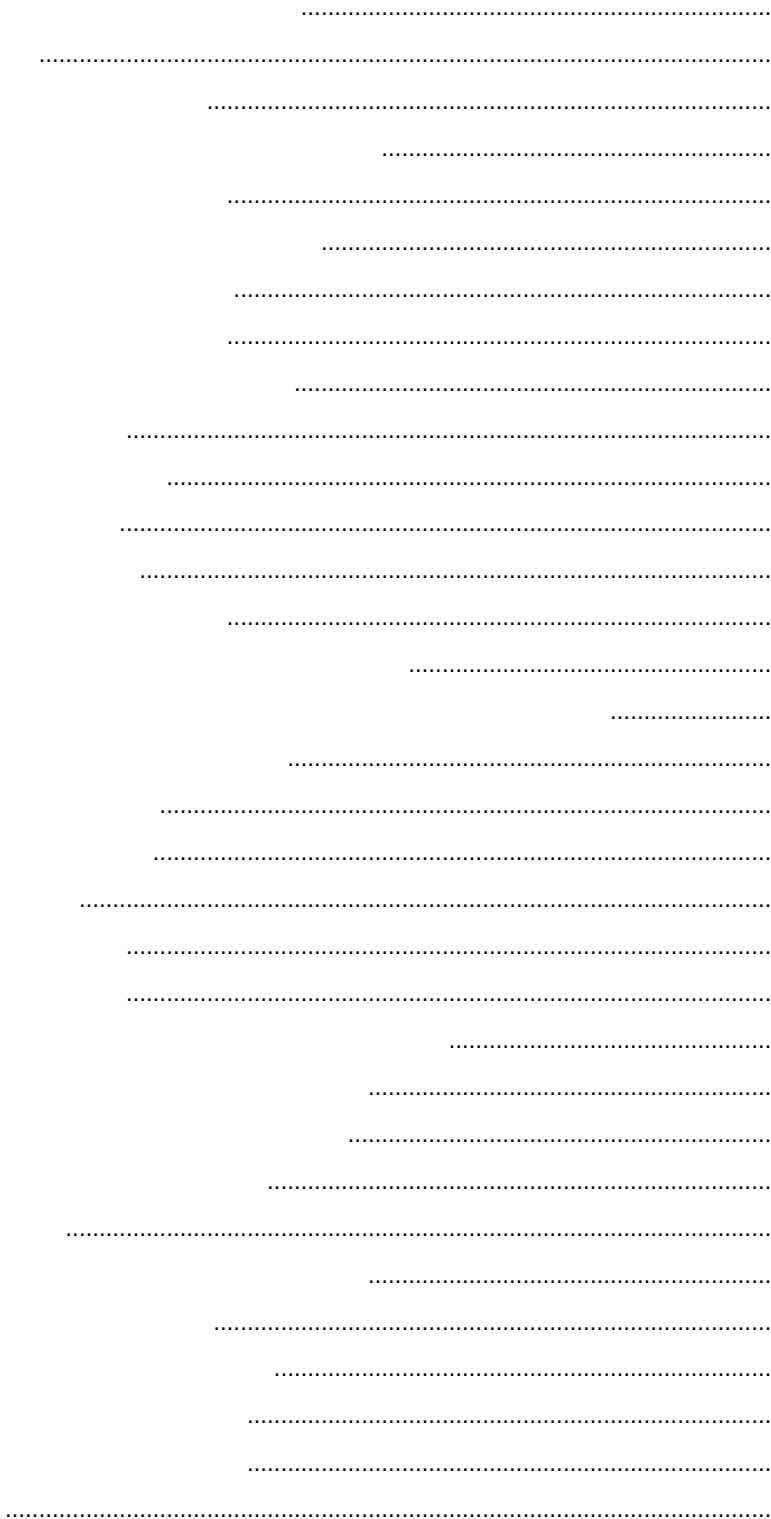
东方证券
ORIENT SECURITIES

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东方证券
ORIENT SECURITIES

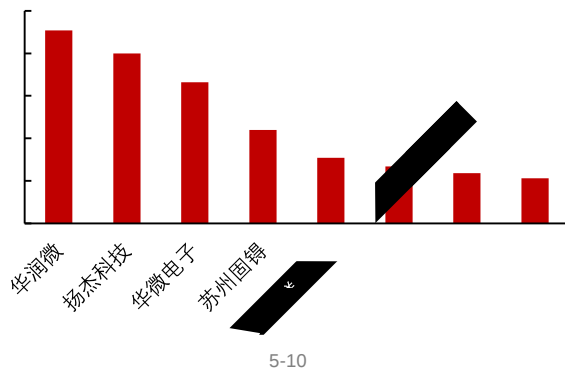
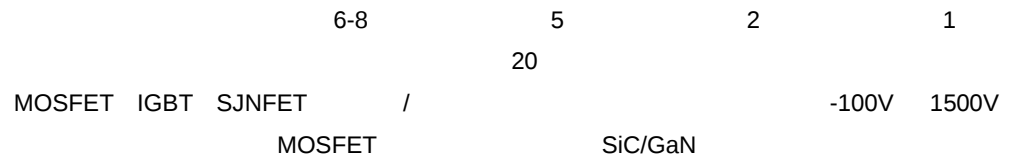
3



1.

1.1

IDM



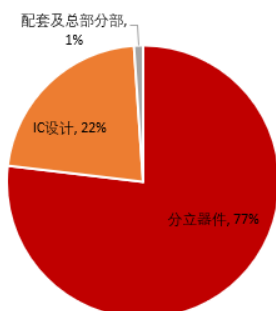
wind

2020

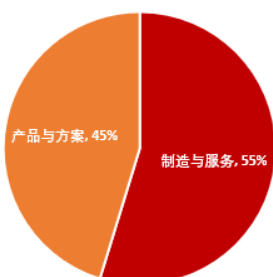
77%
65%

45% 55%

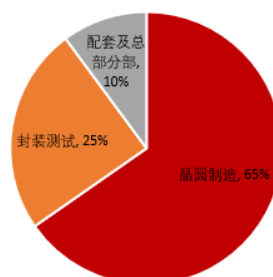
产品与方案



2020H1营收拆分



制造与服务



1.2

9

1983

4

1999

2001

2003

6

2004

0597.HK

2008

2009

8

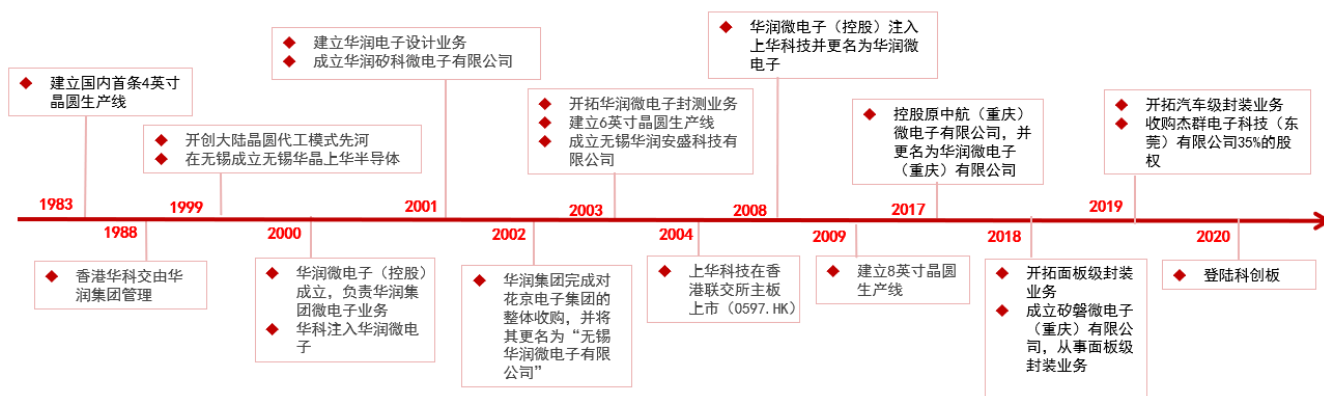
2011

2017

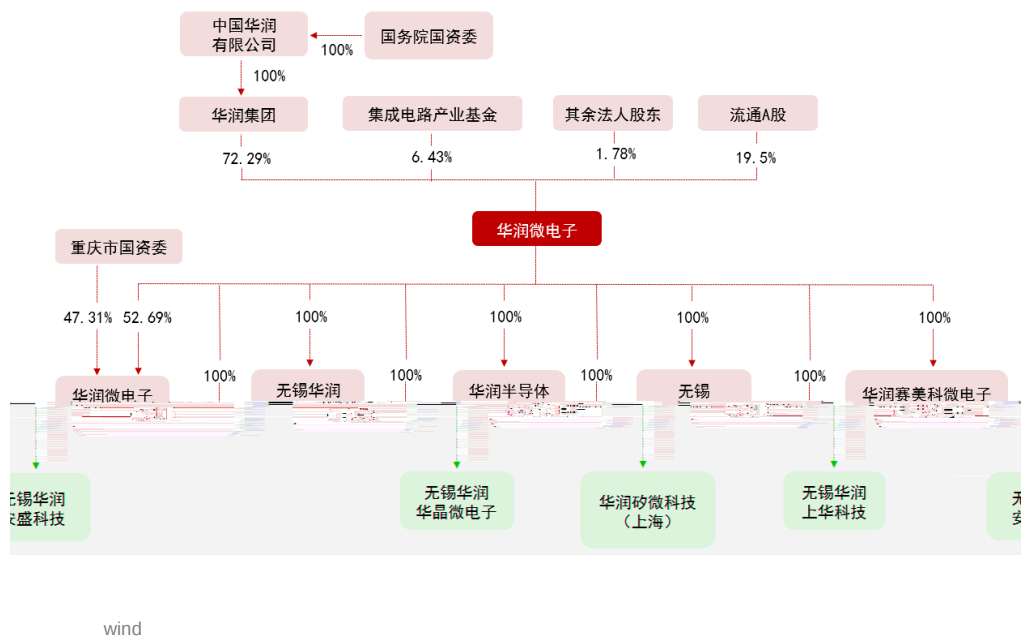
2018

2019

2020

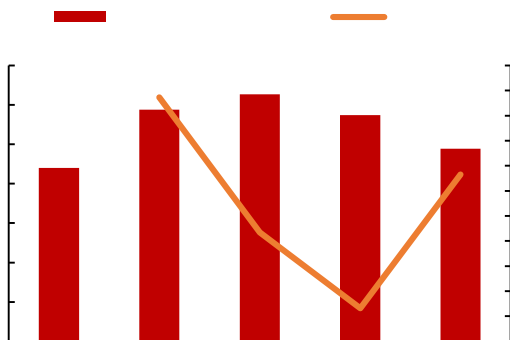


100%

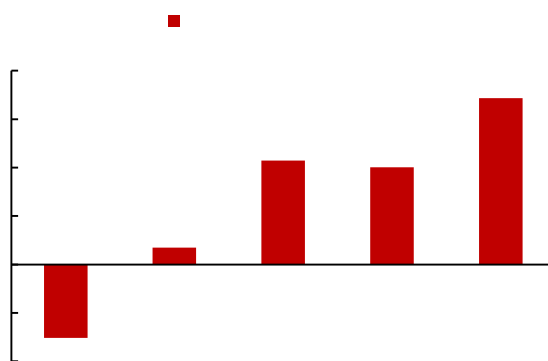


1.3

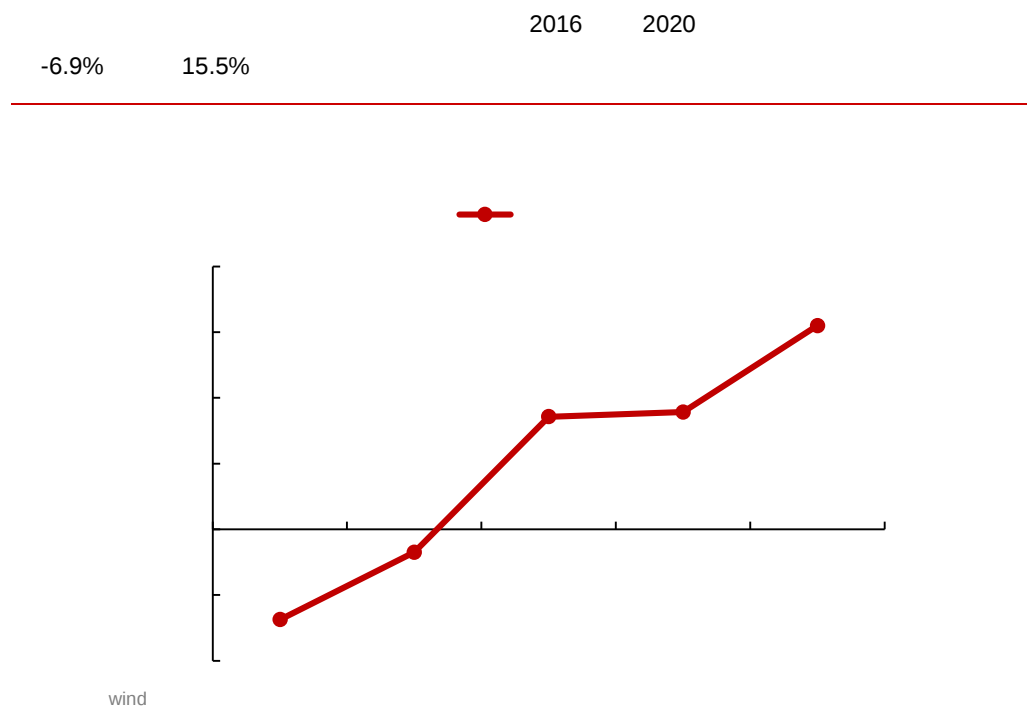
2020 48.9 18.3% 2020
2019 6.9 155%



wind



wind



1

IDM

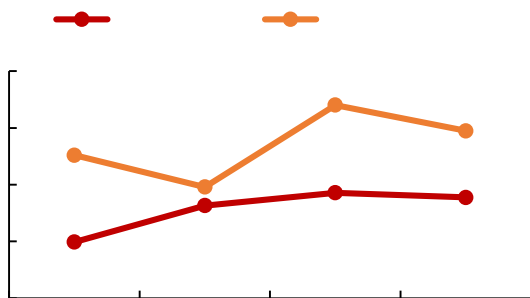
30% 20% 10

IDM IDM

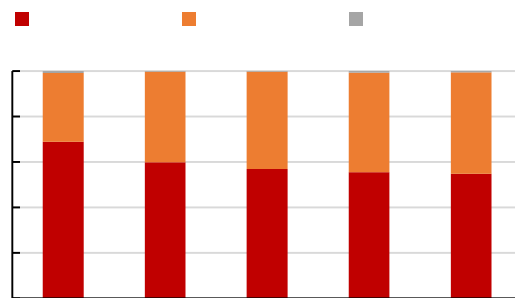
2016 2020

IDM 30% 45%

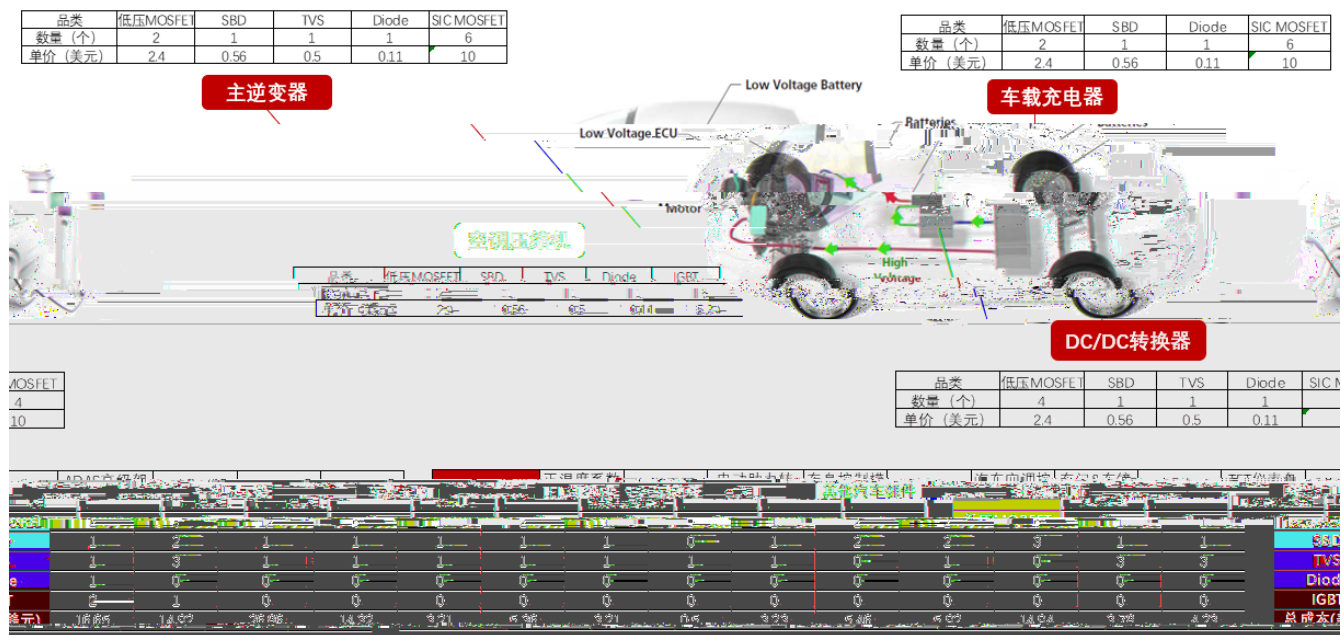
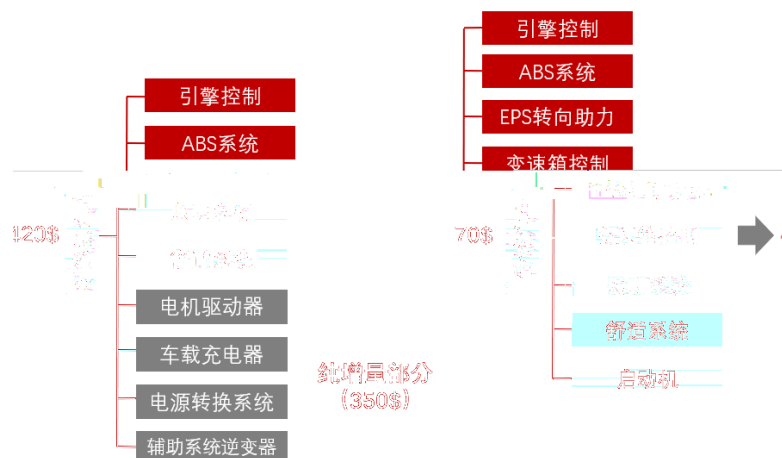
IDM



wind



wind



* SIC MOSFET IGBT
ROHM

	90	HEV/PHEV-	/		305
BEV-			350	5	

数据来源：英飞凌

			2019-2025				70%
				2025	288		
		/				2900	
		500			2025	271	
2020	2025	CAGR	13%				

➤

/

2

3

1/2

2021

24

EVTank

25

2021



MOSFET			EVTank		
2022			500		
30%	50%	70%	MOSFET	1.13	1.38
2019	2.7	3.1	3.5	1.63	

26 MOSFET

*

EVTank MOSFET

EVTank

EVTank

			2018	5
GB 17761-2018			2019	415
	2018			2.5
	90%			
	50%	2022-2024		
	7000		2019	
				55kg
			ZDC	
	2013	6.7%	2019	13.2%

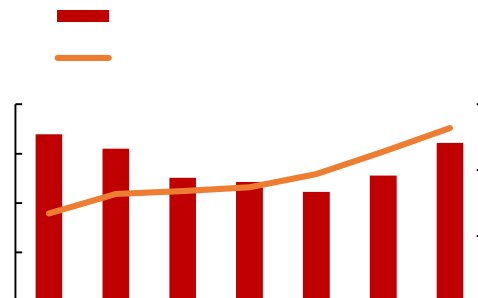
MOSFET

MOSFET

27



28



ZDC

>

/

/

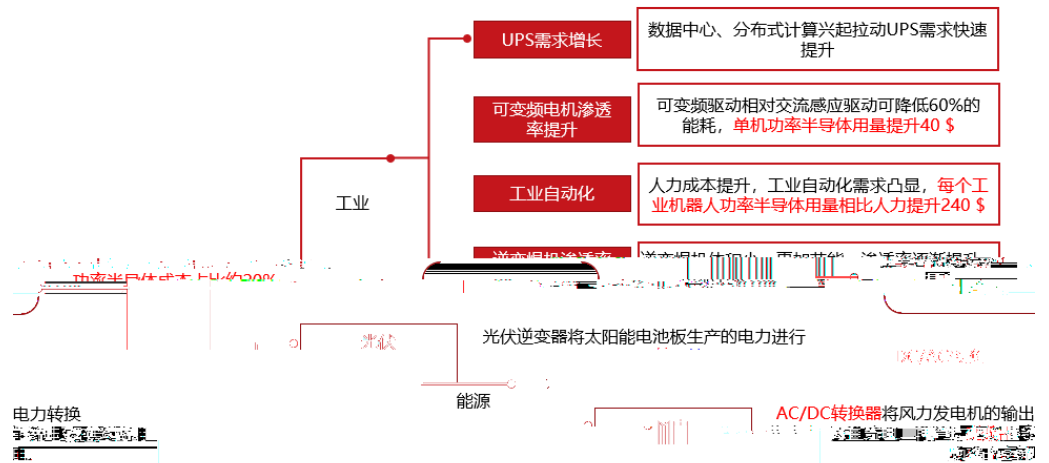
240

/

AC/DC

DC/AC

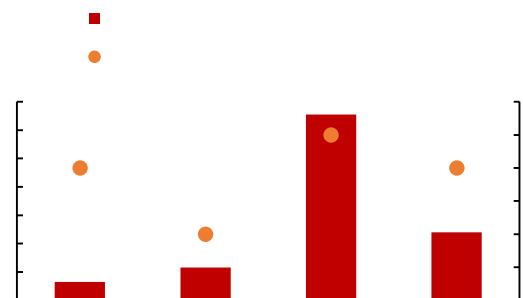
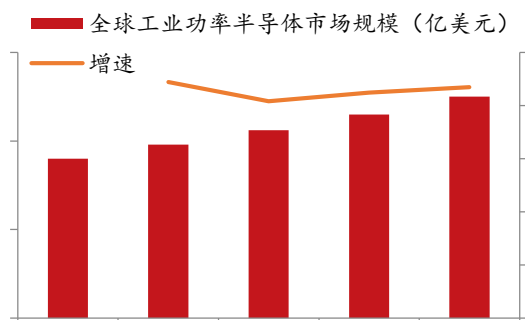
40



数据来源:

	20-22	CAGR	8%		2019
115		2020	125		9%
				UPS	
	13	23	131	48	215
20-22	CAGR	8%			

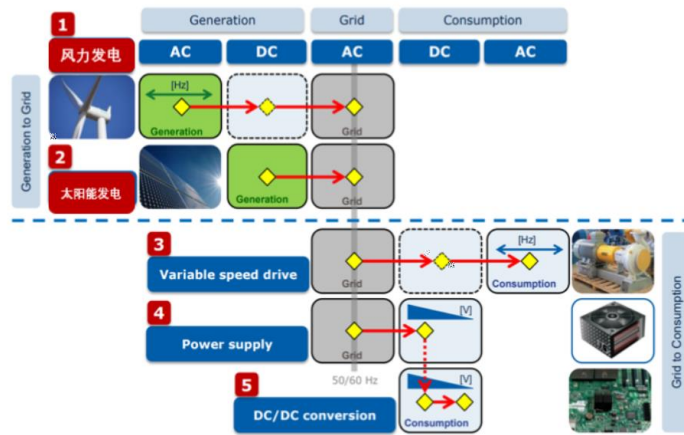
3



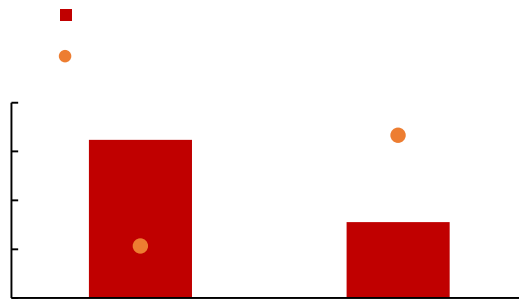
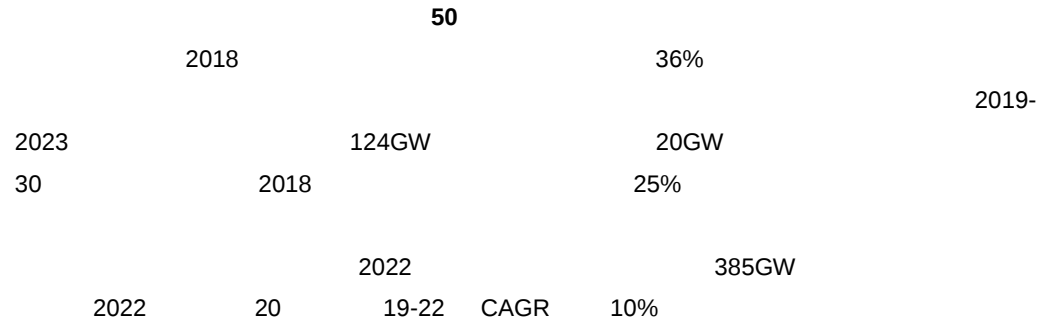
* UPS
26.5% 19%

20% 20%

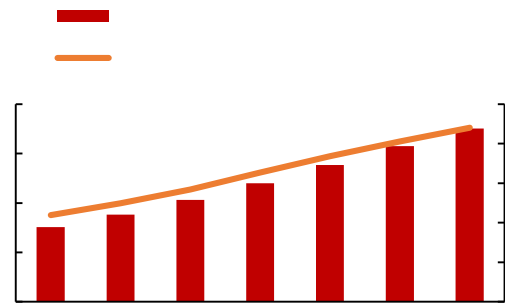
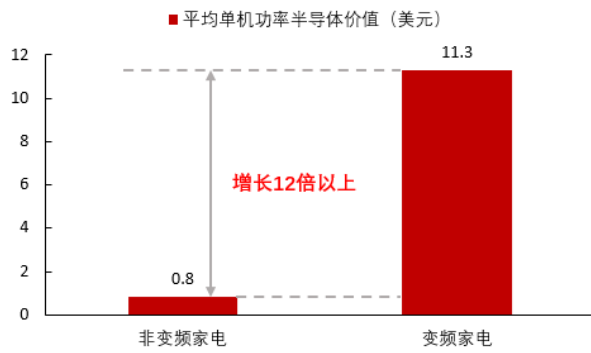
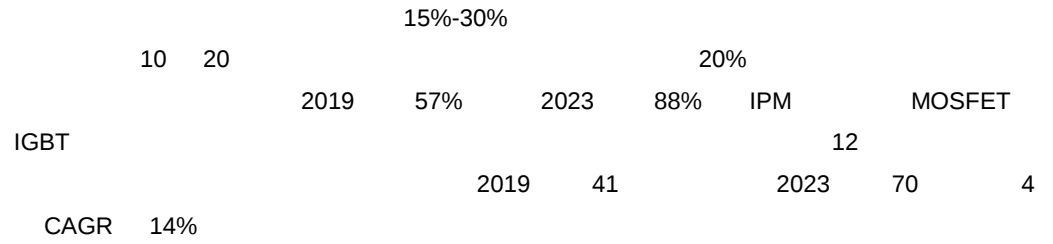
AC/DC



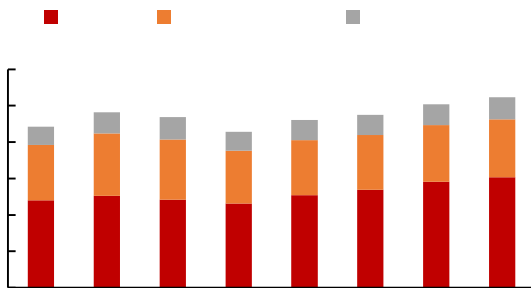
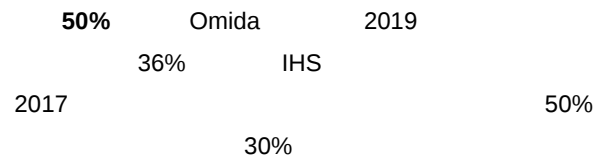
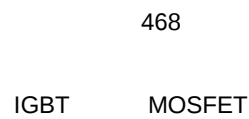
数据来源：英飞凌。



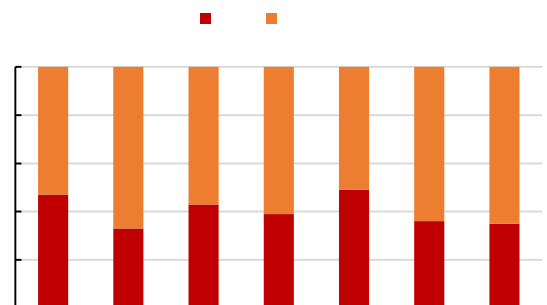
* 2.45 /MW 0.13 /W 0.2 /W 1 /MW



2.3



Omdia

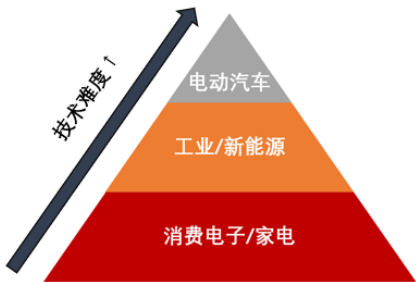


Yole

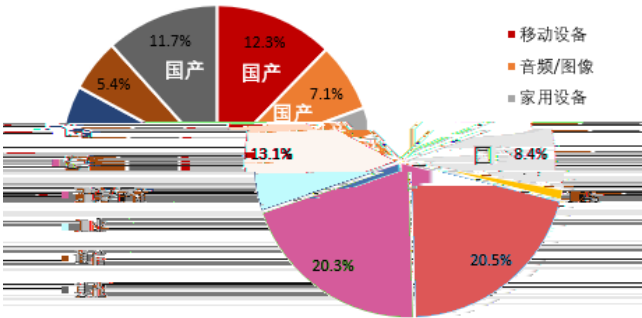
10

MOSFET2016

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评估项目	工业级要求	汽车级要求
温度冲击周次数	-40℃-150℃，50次	-40℃-150℃，1000次
温度循环周次数	△Tc=80℃，12000次	△Tc=80℃，30000次
功率循环周次数	△Tj=80℃，100000次	△Tj=80℃，400000次
最高结温	125℃/150℃	175℃



3.

3.1

MOSFET IGBT SJNFET /

MOSFET -100V
 1500V MOSFET MOSFET
MOS VDMOS
 MOS MOSFET

IGBT 20 80 IGBT 6
PT FS-Trench 600V 6500V
IGBT
IGBT

IC

8

Trench

FRD

IC

IC

IC

LED

IC

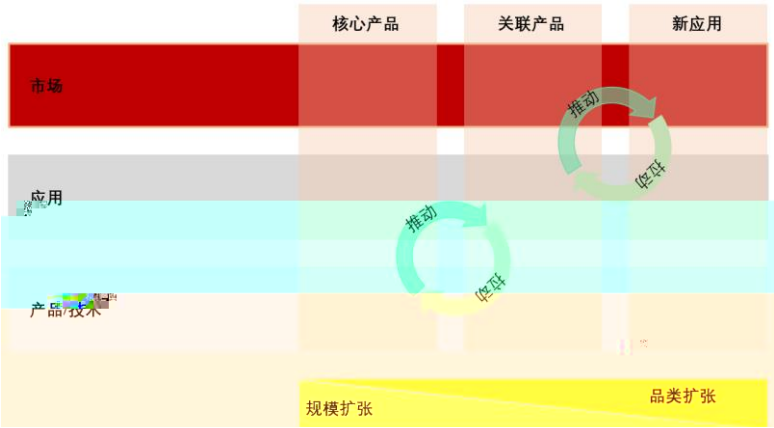
MOSFET

IGBT

BCD

IC

IC



1

2

3



MOS2.25000MOSMOSOBC/

/
 50%
 2020 7 4
 650V SiC
 IGBT 6000
 IGBT
 2020
 1200V
 6 SiC

➤
 GaN IC 2.44
 650V
 650V
 GaN MOCVD IP
 GaN
 IC IC

			56.2%	
			2019	IPM
500V 5A		IPM	600V 15A	
		IPM		

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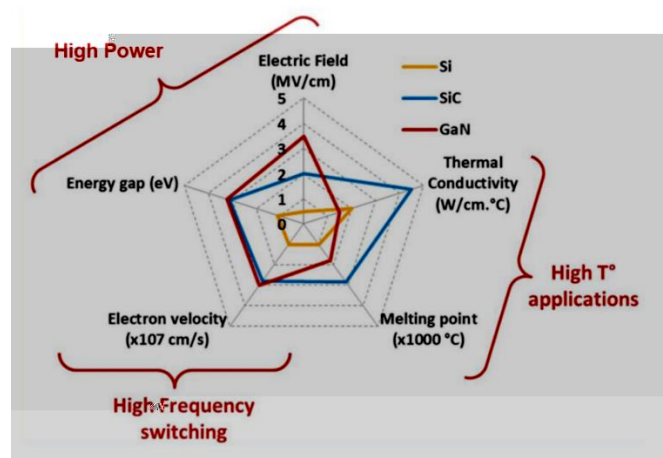
3.3

BCD

MEMS

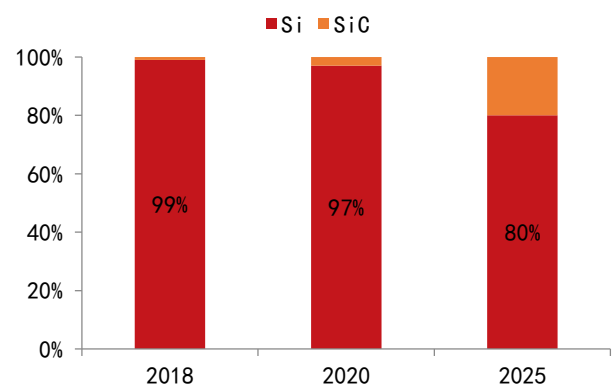
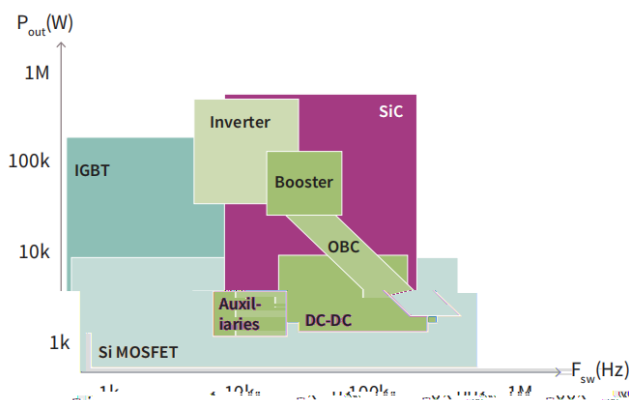
技术	BCD	HV CMOS	Mixed-Signal	Logic/RF	e-NVM
0.13um/0.11um	○			●	○
0.18um/0.153um	●	●	●	●	●
0.25um			●		
0.35um			●		
0.5um	●	●	●	●	●
>0.5um	●	●	●	●	
>1.0um		●	●	●	
MEMS	压力传感器。有 MiGrophone 传感器和 Photoele MEMS。 陀螺仪和加速度计正在开发中。				
Power Discrete	包括平面 DMOS、Trench DMOS、IGBT、FRD、双极晶体管。IGBT 3300V 6500V 正在开发中。				

●表示可获得 ○表示开发中



数据来源:

	SiC	Si	SiC
DC/AC	DC/DC	OBC	DC/AC
	SiC	Si	
	SiC		
75%		6kg	43%
20%		SiC	3%
	6		2025



	GaN				
GaN		IC			
		SiC	GaN		Yole
SiC		2018	3.7	2023	14
					CAGR

30%

GaN

2019

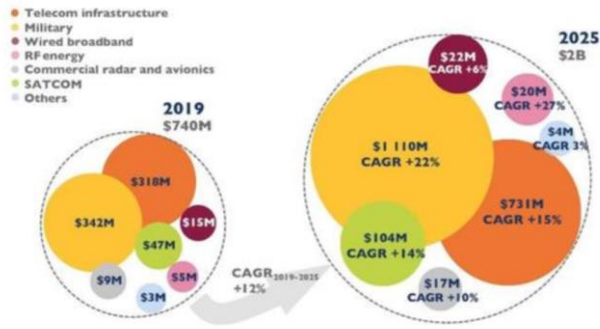
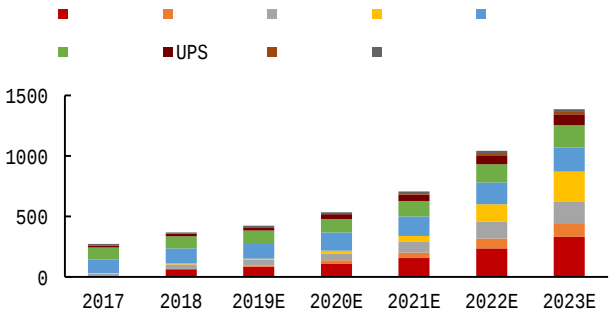
7.4

2025

20

CAGR

12%



Yole

Yole

SiC

GaN

1.42

2.44

6

650V

1200V

SiC JBS

GaN

MOSFET

SiC JBS

GaN

MOCVD

650V

SiC

GaN

4.2

165

10%

Yole

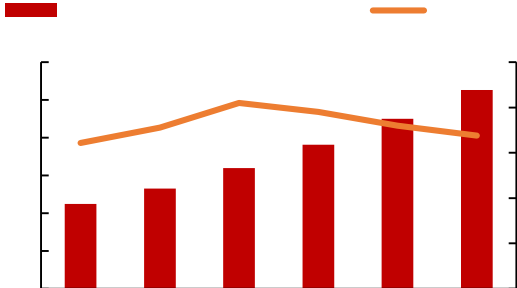
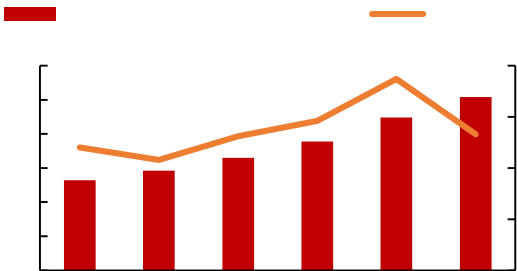
2019

MEMS

2019

90
MEMS

50%
40%



Yole

MEMS

MEMS

8

6
MEMS
2019

6

8

4.3

62

PEP INNOVATION

5.5

2020H1

1.27

35%

50

38

42

5G

AIOT

2020-2022

1)

2)

5G

20-22

22.7% 23.3% 23.7%

20-22

35.1% 35.7%

35.8%

20-22

28.3% 29.4% 30.2%

3)

20-22

1.64% 1.63% 1.58%

5.34% 5.3% 5.2%

20-22

7.36% 7.31% 7.26%

4)

20-22

3%

2018A

2019A

2020E

2021E

2022E

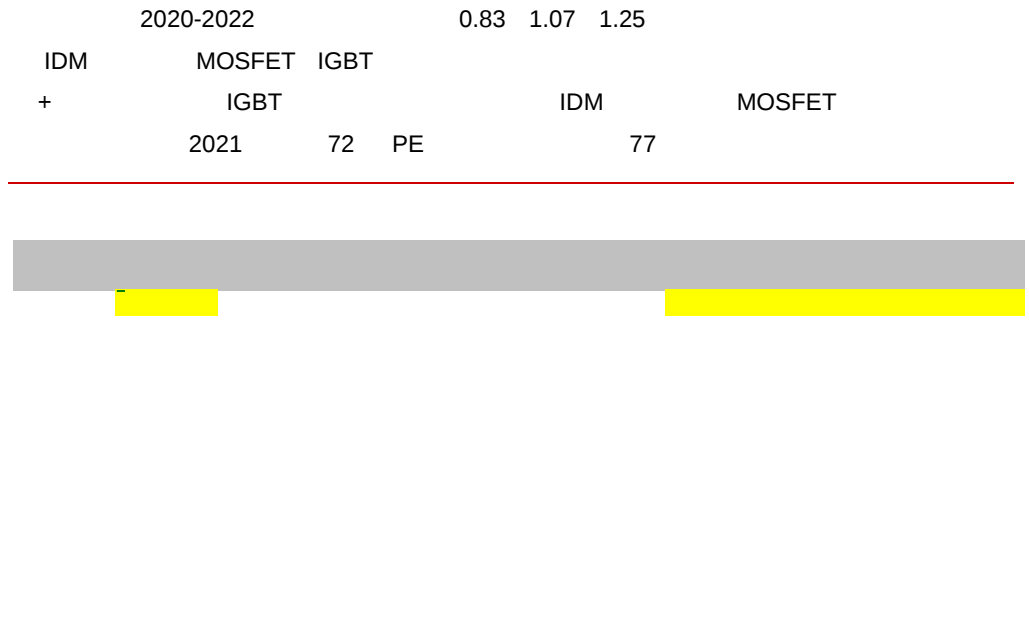
6,270.8

5,742.8

6,887.9

7,935.6

8,892.8



	2018A	2019A	2020E	2021E	2022E
:	1,538	1,931	8,353	9,295	10,022

	2018A	2019A	2020E	2021E	2022E
:	6,271	5,743	6,888	7,936	8,893

12

/

15%

5% 15%

-5% +5%

-5%

5%

-5% +5%

-5%

