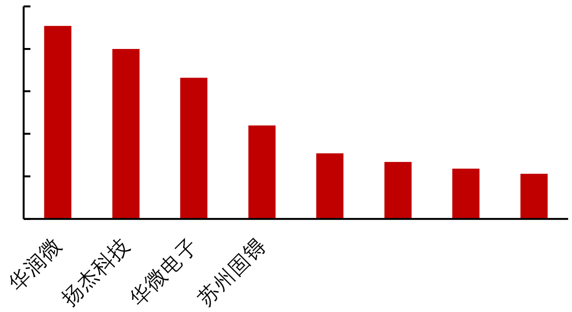
-
  MOSFET IGBT SJNFET /
  -100V 1500V MOSFET
  SiC/GaN
-
  5
  2025 2019 70%
  /
  /
  13
-
  50% 2017
  / MOSFET IGBT
  12
-
  6 650V 1200V SiC JBS
  SiC JBS
  MOSFET GaN 650V
  MOCVD
- 2020-2022 0.83 1.07 1.25
  2021 72 PE 77
-

1

1.

1.1 IDM

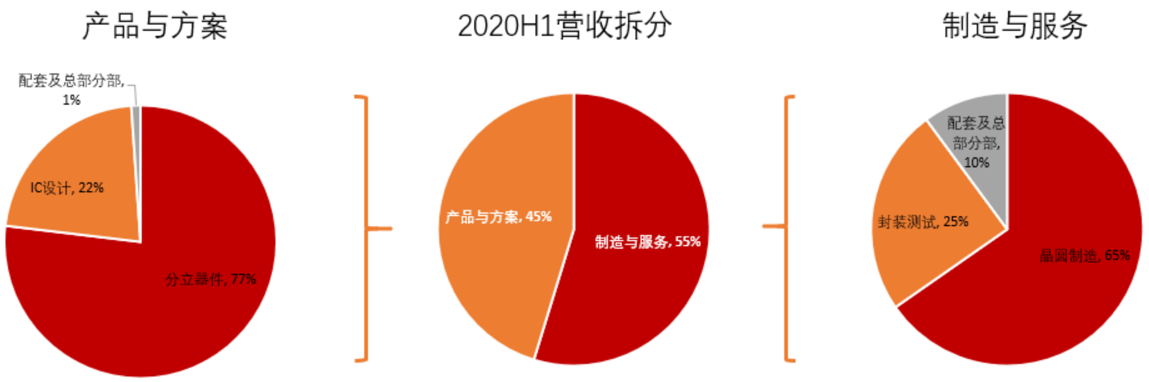
6-8 5 2 1
20
MOSFET IGBT SJNFET / -100V 1500V
MOSFET SiC/GaN



5-10

wind

2020 45% 55%
77%
65%



1.2 9

1983 4 1999

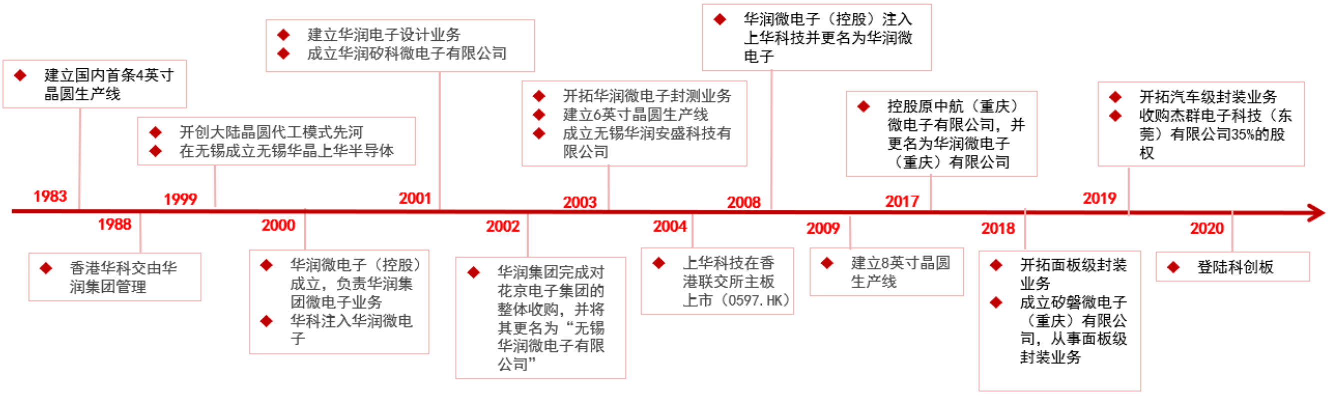
2001 2003 6

2004 0597.HK 2008

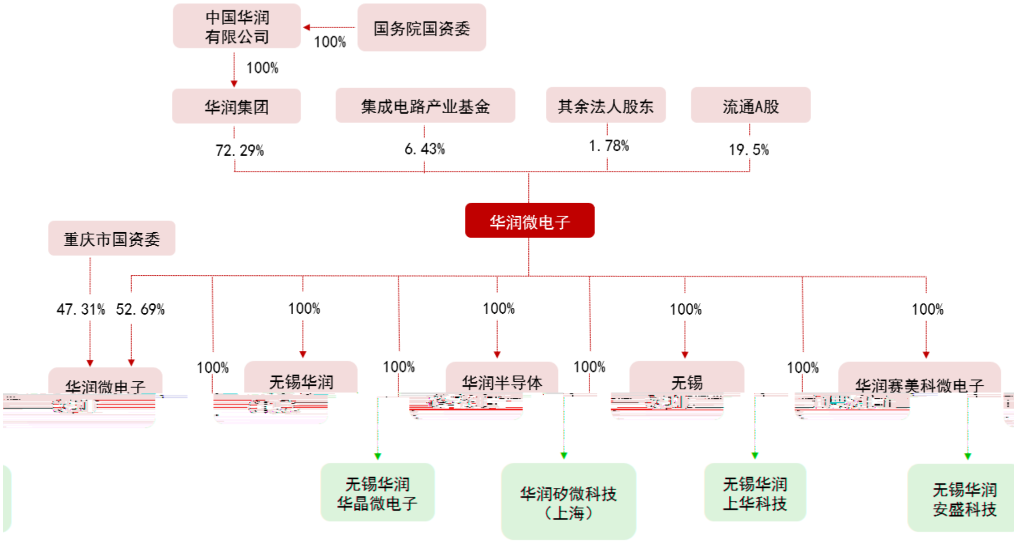
2009 8 2011 2017

2018 2019

2020



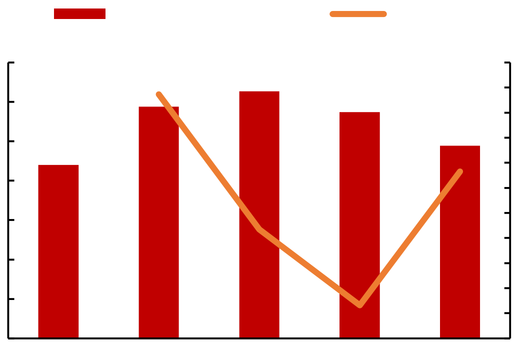
100%



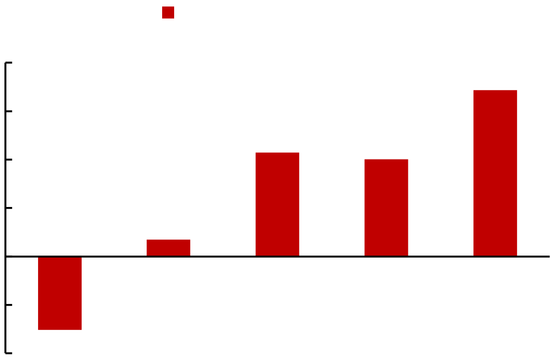
wind

1.3

2020 48.9 18.3%
2019 2020
6.9 155%

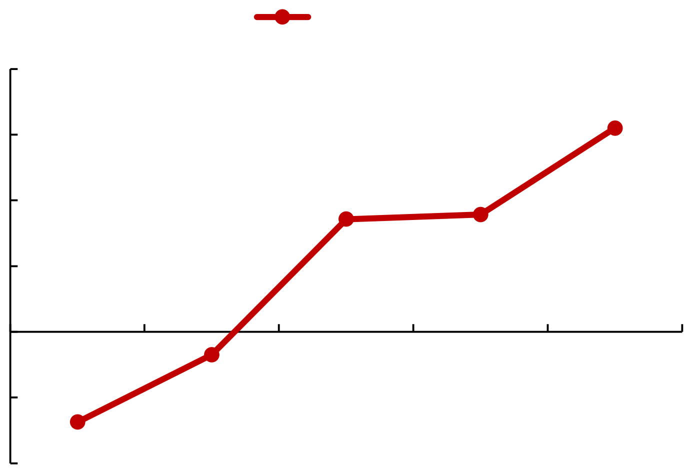


wind



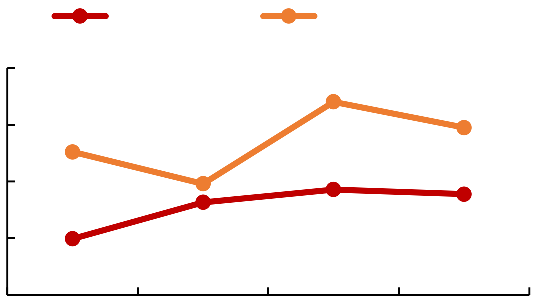
wind

2016 2020
-6.9% 15.5%

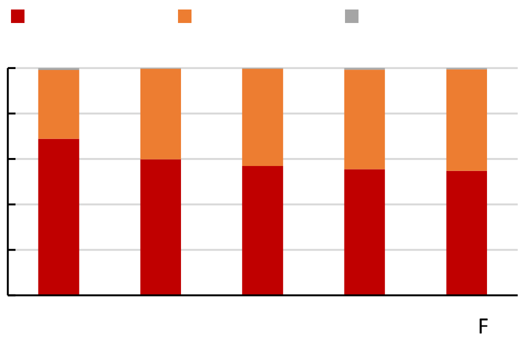


wind

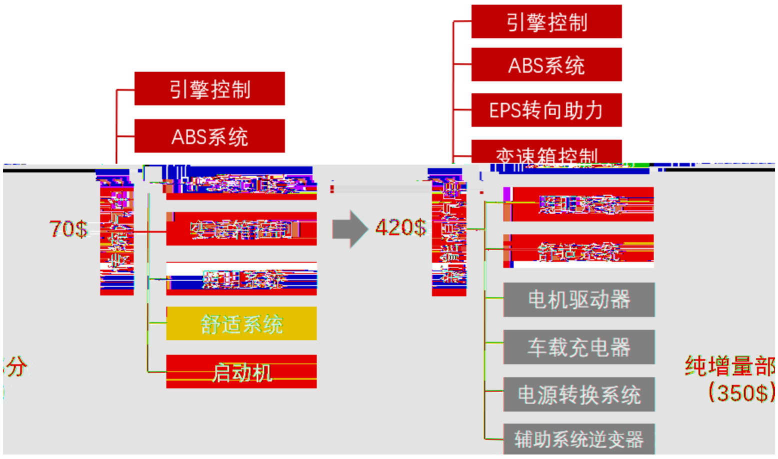
1 **IDM** IDM
30% 20% 10
IDM
2016 2020 IDM 30% 45%
IDM

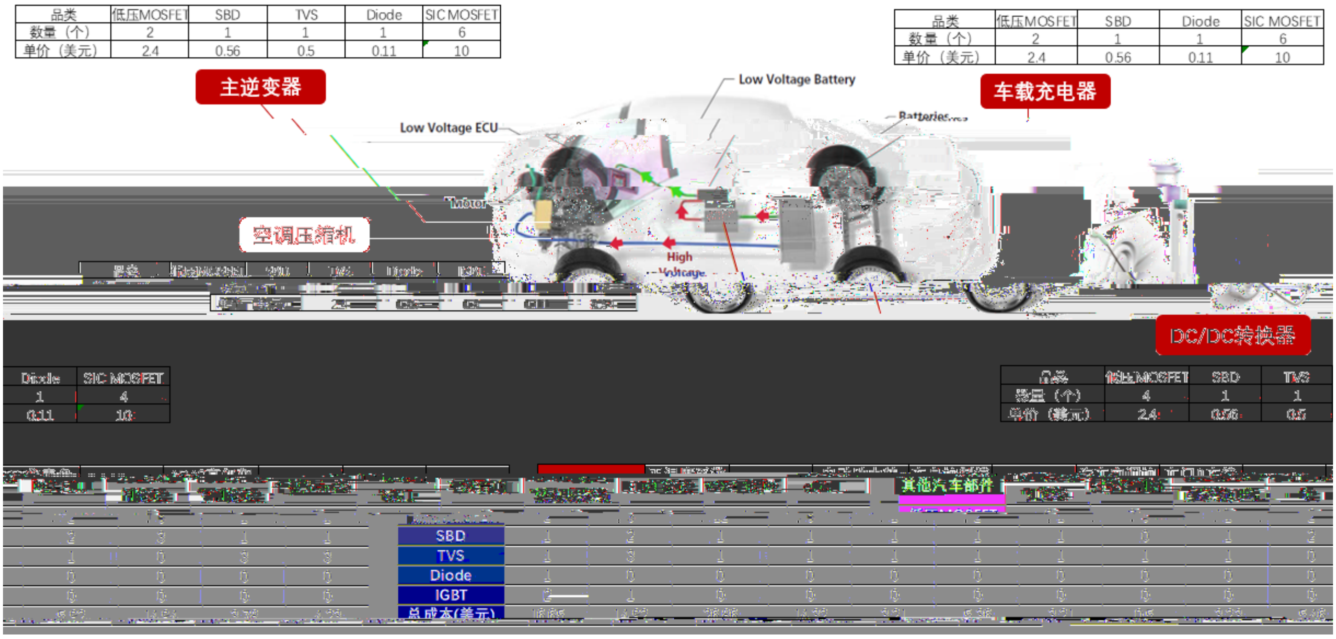


wind



wind





品类	低压MOSFET	SBD	TVS	Diode	SIC MOSFET
数量（个）	2	1	1	1	6
单价（美元）	2.4	0.56	0.5	0.11	10

品类	低压MOSFET	SBD	Diode	SIC MOSFET
数量（个）	2	1	1	6
单价（美元）	2.4	0.56	0.11	10

Diode	SIC MOSFET
1	4
0.11	10

品类	低压MOSFET	SBD	TVS
数量（个）	4	1	1
单价（美元）	2.4	0.56	0.5

* SiC MOSFET IGBT

ROHM

5 Strategy Analytics

70 48V/MHEV-

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 1/2

3

2021

24

EVTank

25 2021

MOSFET EVTank

2022 500

30% 50% 70% MOSFET 1.13 1.38 1.63

2019 2.7 3.1 3.5

26 MOSFET

* EVTank MOSFET EVTank

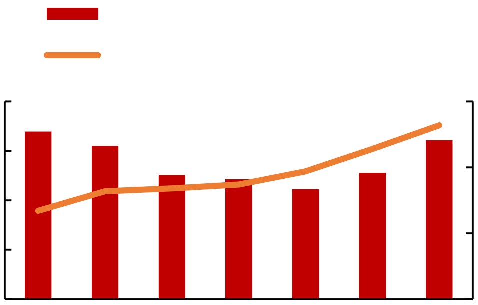
EVTank

2018 5
GB 17761-2018 2019 4 15
2018 2.5
90%
2.25 50% 2022-2024
4,000 7000 2019
55kg
ZDC
2013 6.7% 2019 13.2%

MOSFET MOSFET

27

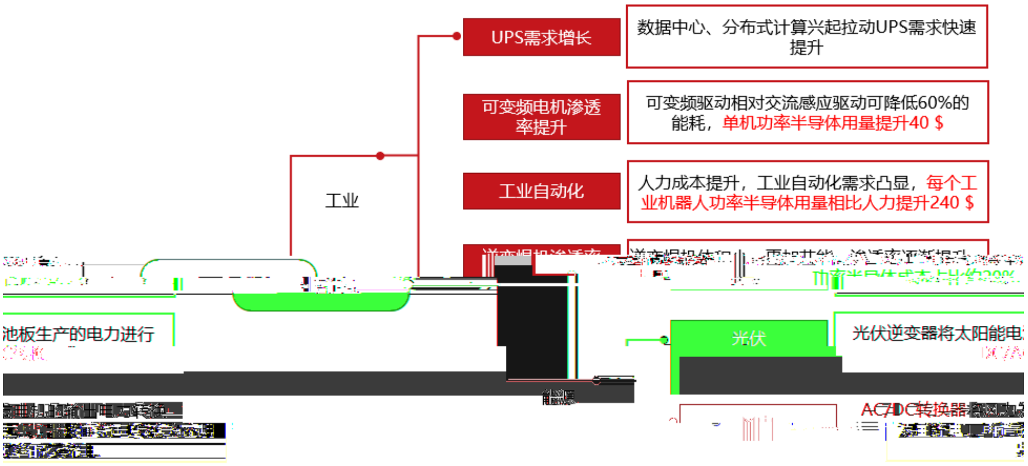
28



ZDC

- **/**

40
/ 240 / AC/DC DC/AC



数据来源：

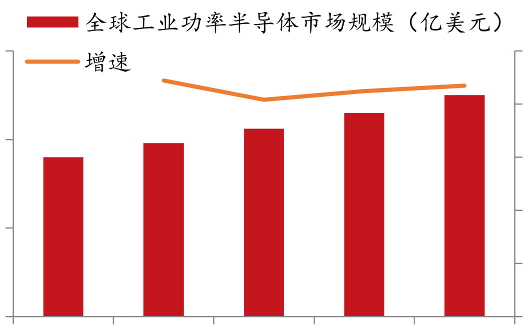
20-22 CAGR 8% 2019

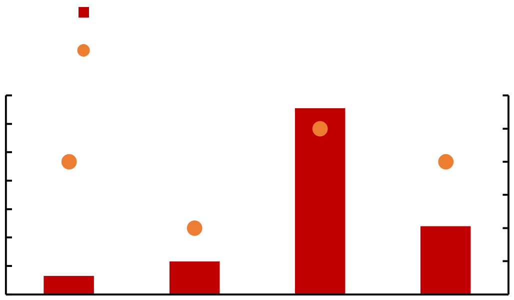
115 2020 125 9%

UPS

13 23 131 48 215

3 20-22 CAGR 8%

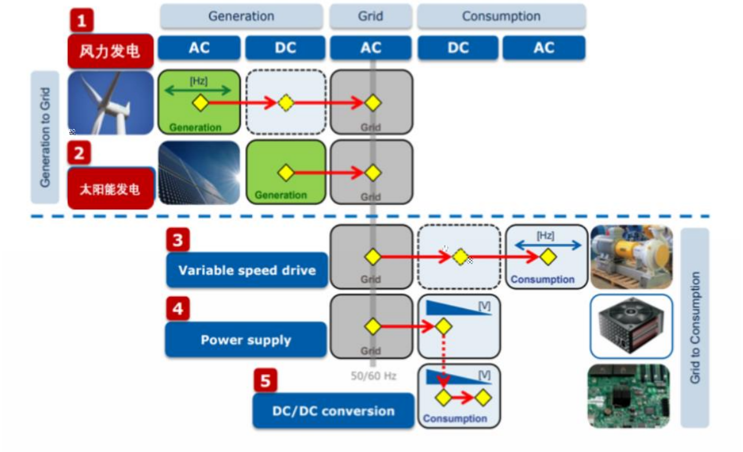




＊ UPS 20% 20%
26.5% 19%

AC/DC

DC/AC



数据来源：英飞凌、

50

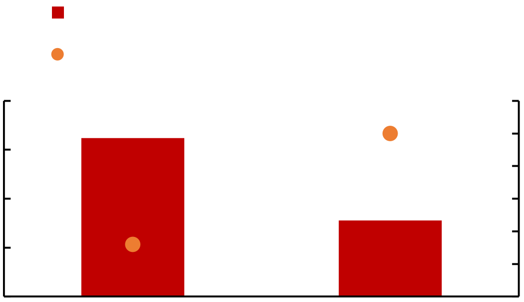
2018 36%

2019-2023 124GW 20GW

30 2018 25%

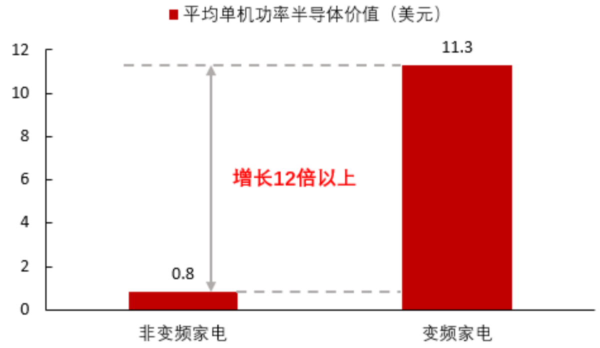
2022 385GW

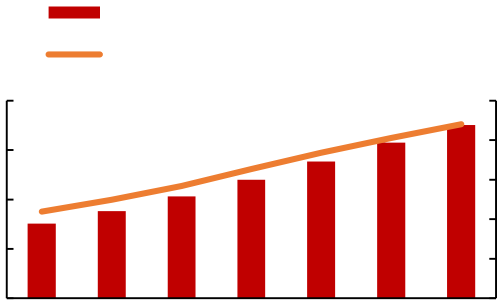
2022 20 19-22 CAGR 10%



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

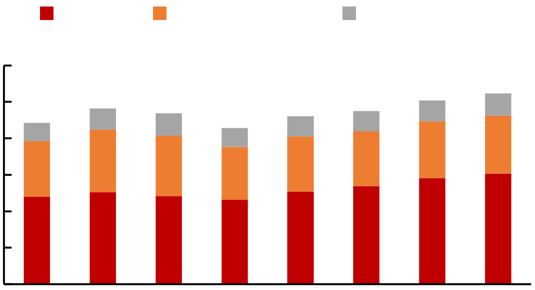
15%-30%
10 20 20%
2019 57% 2023 88% IPM MOSFET
IGBT 12
2019 41 2023 70 4
CAGR 14%

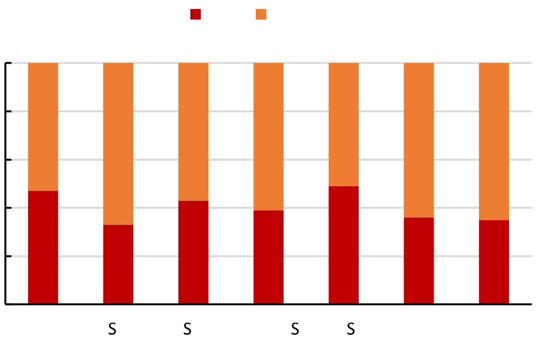




2.3

50% Omida 2019
468 36% IHS
2017 50%
IGBT MOSFET 30%





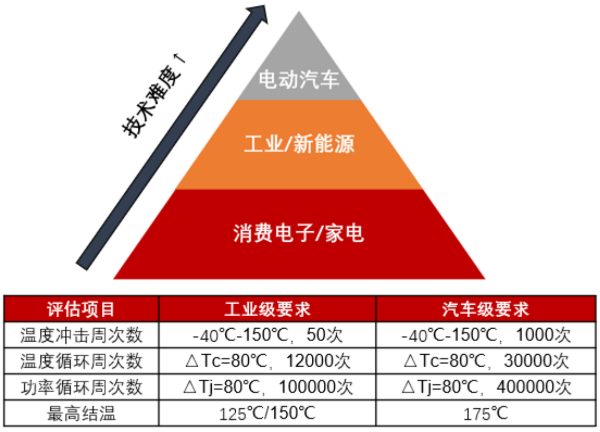
Omdia

Yole

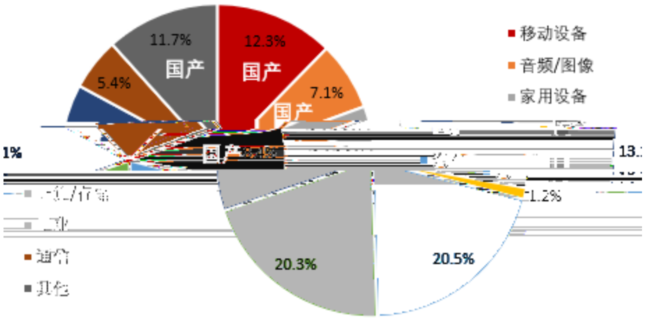
10

MOSFET 2016

/



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.

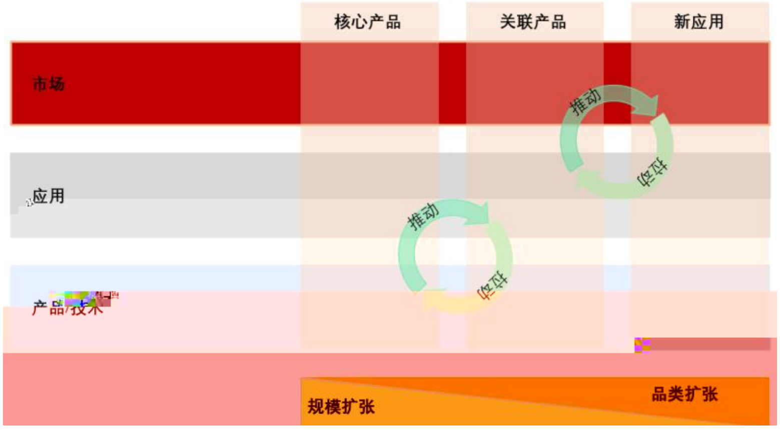
3.1

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 MOSFET IGBT
8 Trench
FRD
IC BCD
IC IC IC
IC LED IC IC



1 2
3

➢

MOS MOS MOS
2.2 5000 OBC/

I IGBT IGBT 2020 50% 6000 IGBT

2020 7 4 1200V 650V SiC 6 SiC

➢

GaN **IC** 2.44 650V 650V MOCVD GaN IP GaN GaN IC IC

56.2%

2019 IPM

500V 5A IPM 600V 15A

IPM

7 10 PT6007B PT6010

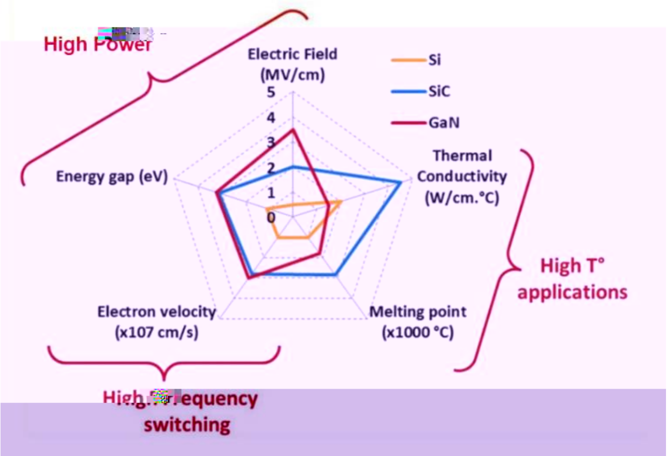
3.3

BCD MEMS

技术	BCD	HV CMOS	Mixed-Signal	Logic/RF	e-NVM
0.13um/0.11um	○			●	○
0.18um/0.153um	●	●	●	●	●
0.25um			●		
0.35pm			●		
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

27



数据来源：

SiC **Si** SiC

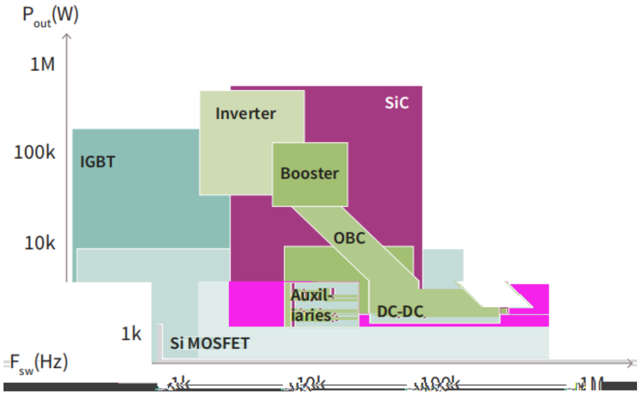
DC/AC DC/DC OBC DC/AC

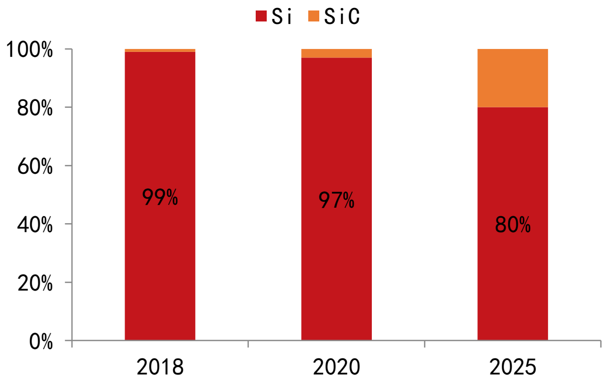
SiC Si

SiC 6kg 43%

75% SiC 3% 2025

20% 6





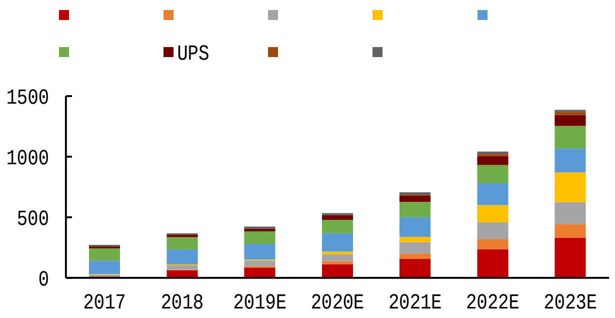
GaN

GaN IC

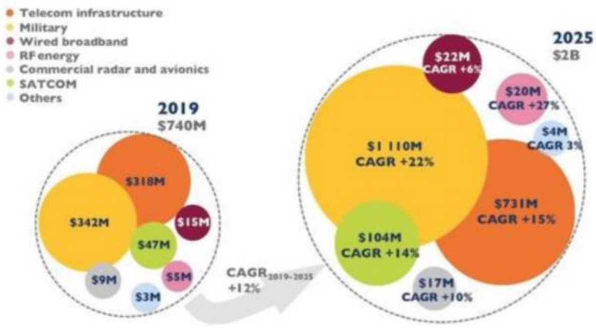
SiC **GaN** Yole

SiC 2018 3.7 2023 14 CAGR

30% GaN 2019 7.4 2025 20 CAGR 12%



Yole



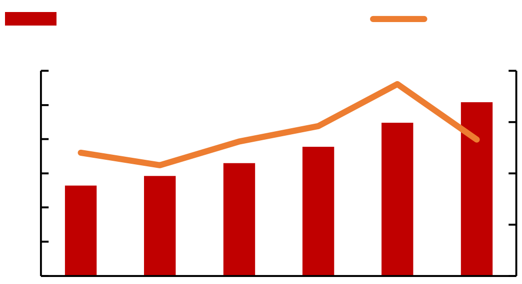
Yole

SiC GaN SiC GaN 1.42 2.44 6 650V 1200V SiC JBS SiC JBS MOSFET GaN 650V MOCVD SiC GaN

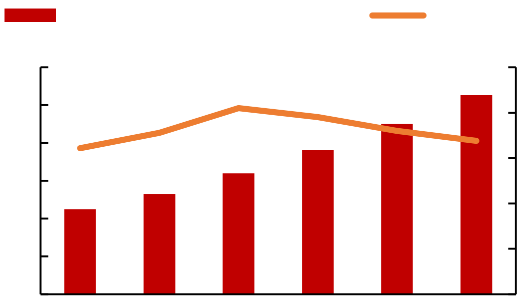
4.2

Yole 2019 MEMS 165 10%

2019 90 50%
MEMS 40%



Yole



MEMS
MEMS 8
6
MEMS 6 8
2019

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**

2020-2022 0.83 1.07 1.25

IDM MOSFET IGBT

\+ IGBT IDM MOSFET

2021 72 PE 77

1

MOSFET MOSFET IGBT

2

3

4

10%

:	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%