

36.07

()	12.16
A ()	2.37
()	438.58
()	50.99/35.66
300	3625
	2722

SAC S1130520010001
zhengbiyu gjzq.com.cn

SAC S1130519100004
zhang_chun gjzq.com.cn

SAC

18	2016-2021				12
19					12
20					13
21					13
22	MOSFET	IGBT	BJT		13
23					13
24					14
25		GaN	SiC		15
26					15
27					16
28	2018		IGBTs		16
29	2018		MOSFET		16
30					17
31				2020 2 18	18
32					18
33					19
34					19
35					19
36			IC		20
37					20
38					21
39					21
40	2018				22
41	2018				22
42					22
43					24
44					25
45					25
46				2020.03.23	25
47					26

1. IDM IDM IDM ,
 IDM Fabless IDM IDM

1

IDM IDM
 8 23 IDM
 IDM IDM
 IDM IDM
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 IDM IDM
 IDM IDM
 IDM IDM
 IDM IDM
 IDM IDM

2	IDM_		2018				
	3898	350	6270	1482	0	0	8.6%
	2557	871	3025	240	73	2.4%	2.5%
	1026	375	1709	423	48	2.8%	6.3%

	FRD	MOSFET	MOSFET	-100V	1500V
		MOSFET			MOSFET
					VDMOS
	MOS	MOS			
3	MOSFET				
	30V-900V	40V-900V	-60V-150V	-100V-1500V	
	MOS	MOS	MOS	MOS	MOS
	MOS	MOS		MOS	MOS
	MOS			MOS	MOS
	MOS		P	MOS	MOS
	MOS				P MOS
					MOS

MOSFET

MOS

VDMOS

Salcomp

MOS

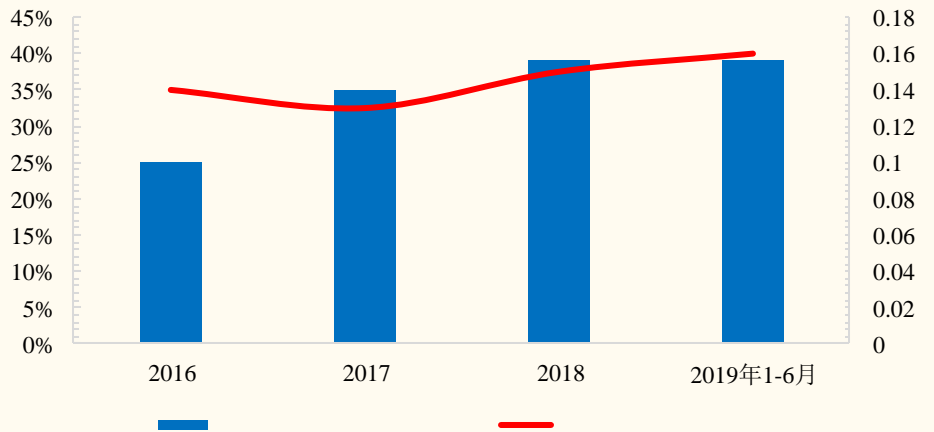
MOS

IGBT

600V-6500V IGBT
600V-1200V

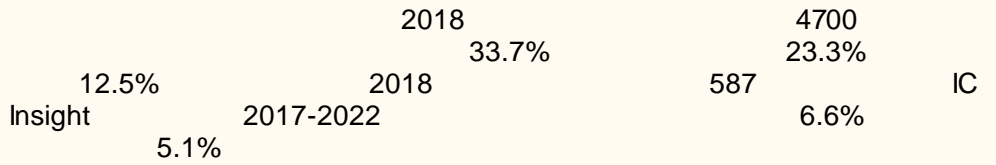
Trench-FS
IGBT

5

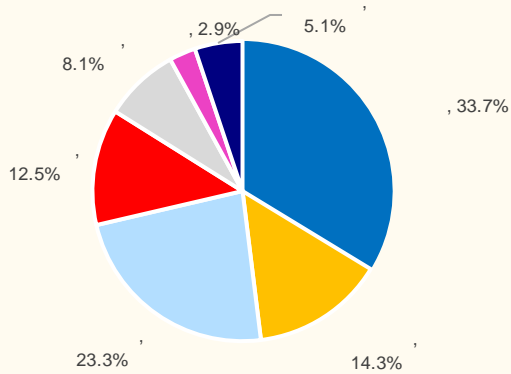


3.

IC



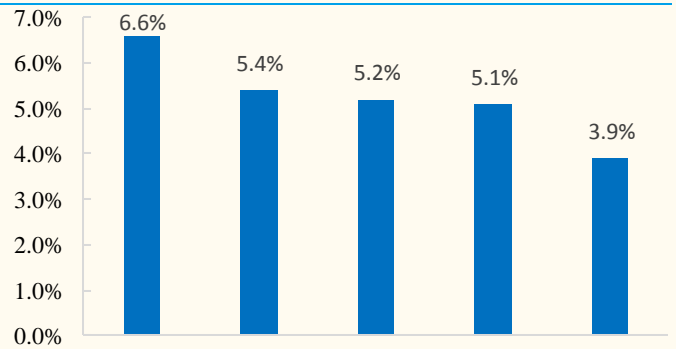
6 2018



WSTS

7

2017-2022E



IC Insight

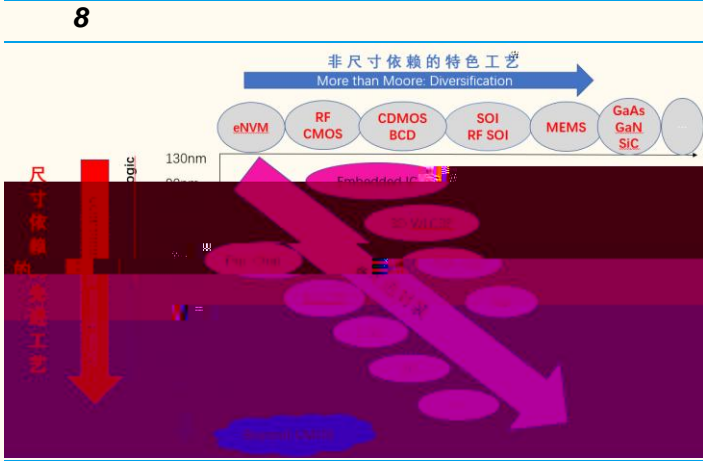
120 /

68 /

MEMS SOI BCD/CDMOS MEMS ; 130nm 5nm 3nm EUV IC RF-COMS SOI/RF-

2018

238
119
400 / 2019
90%
58
35%
37 / 68
8
50%
1450 / 75
38 / 120
77 ASP



9 vs. 8

Analogue vs. Digital: Main Differences

	Digital Moore's Law Boundaries	Specialty Analog Boundaries
Capacity Capable	High	Low
Technology Node	65nm-7nm	350nm-65nm - SPECIALTY
Product Lifetime	Short	Long
Vendor Engagement	Typically multi-source	Single source
Differentiation	At leading edge only	Across process technologies
Segment Sizes	Large	High value specialty through mid-size
Process Technologies	CMOS	CIS, SiGe, BCD, BiCMOS, MEMS

8 12 8
8 RF-COMOS SOI/RF-SOI BCD/CDMOS 8
Hynix 8
8 8 8
IC IC MOSFET MCU IGBT MOSFET CIS
2019 8 92.5%
MOSFET MOSFET

10 MOSFET

技术	制造商	目前货期	货期趋势	目前价格
低压 Mosfet	Infineon	15-30	延长	稳定
	Diodes Inc.	21-25	延长	稳定
	ON Semiconductor (Fairchild)	15-24	延长	稳定
	ON Semiconductor	13-20	延长	稳定
	Nexperia	12-20	延长	稳定
	STMicroelectronics	17-30	延长	稳定
高压 Mosfet	Vishay	17-22	延长	稳定
	Infineon	21-26	延长	稳定
	ON Semiconductor (Fairchild)	15-22	延长	依据市场进行选择性调整
	KYX	22-30	延长	稳定
	STMicroelectronics	19-24	延长	依据市场进行选择性调整
	ROHM	18-22	延长	稳定
MOSFET	Mitsumi	25-30	延长	稳定
	Vishay	15-17	延长	依据市场进行选择性调整

4.

2016 2018
44,976 44,742
7.86% 7.61% 7.17%

2019 6 30

7937

641
37%

2290

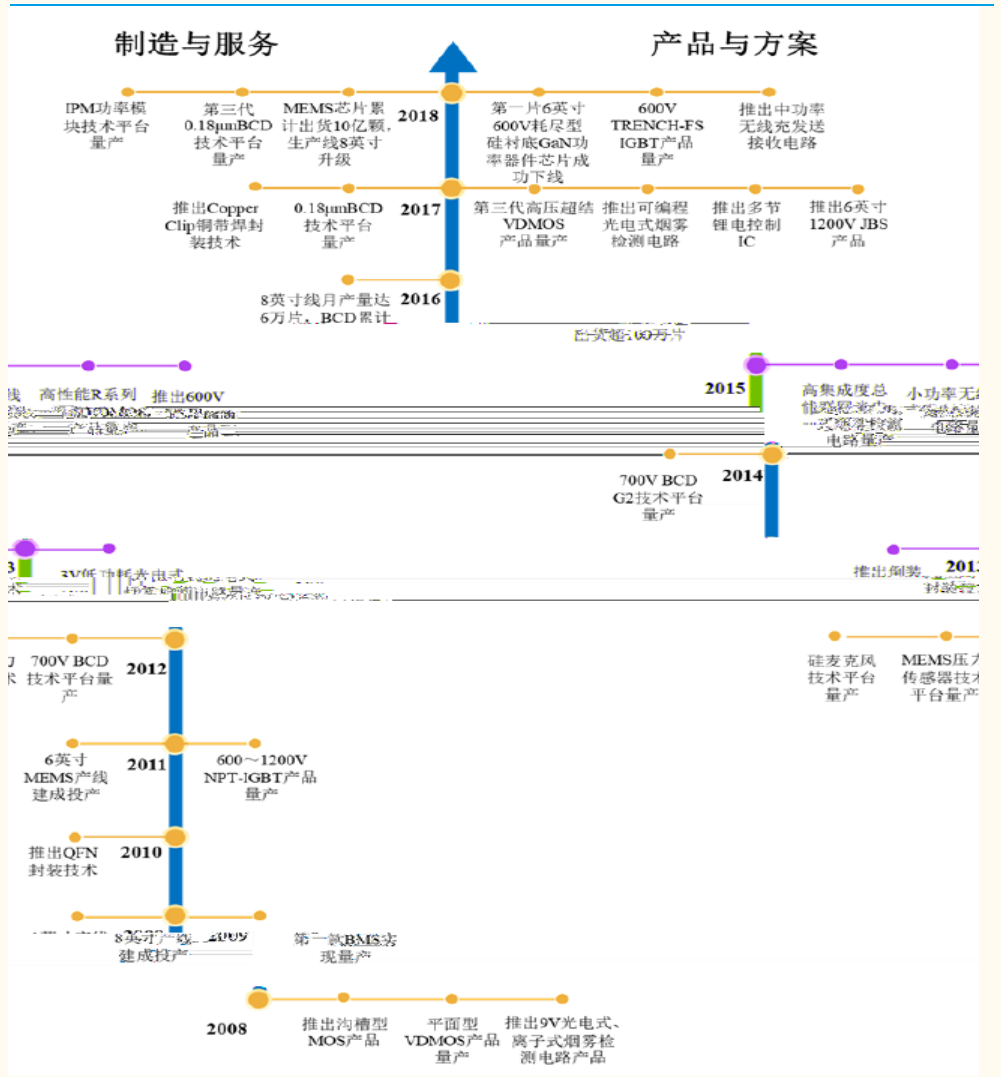
11

EDA

MOSFET IGBT

BCD MEMS BMS GaN

12 2008

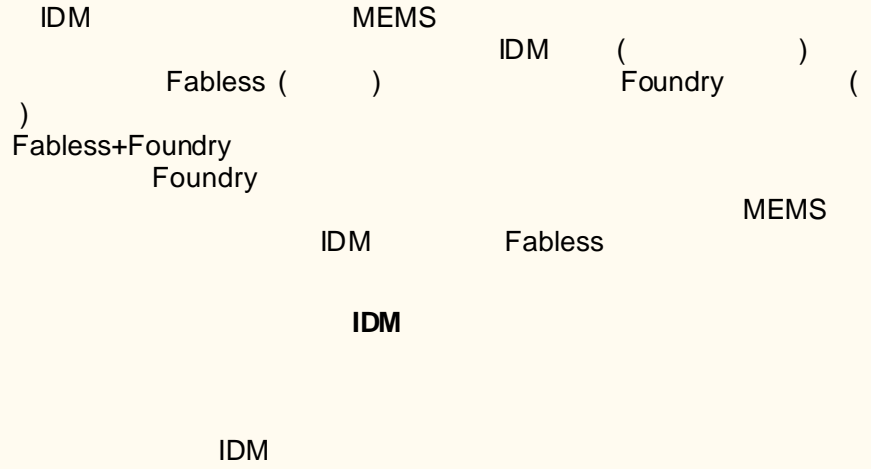


MOSFET IGBT FRD SBD MEMS
BCD

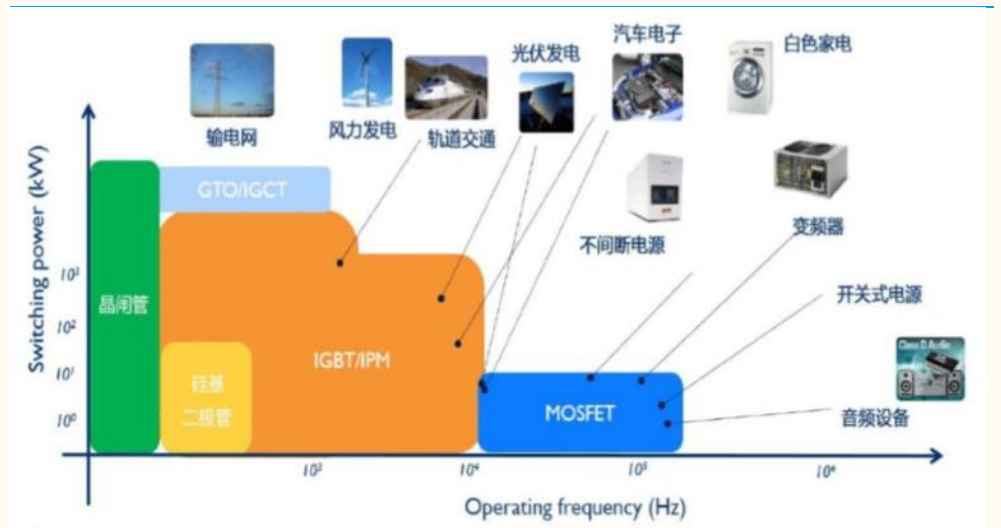
13

BCD	1 2 3	1.0-0.18μm	5V 700V	200 600V SOI	BCD	BCD	BCD
MEMS	1 2 3	MEMS		MEMS		MEMS	
	220 TO-3P TO247	IPM	IPM	TO-		MOSFET IPM	

1. IDM

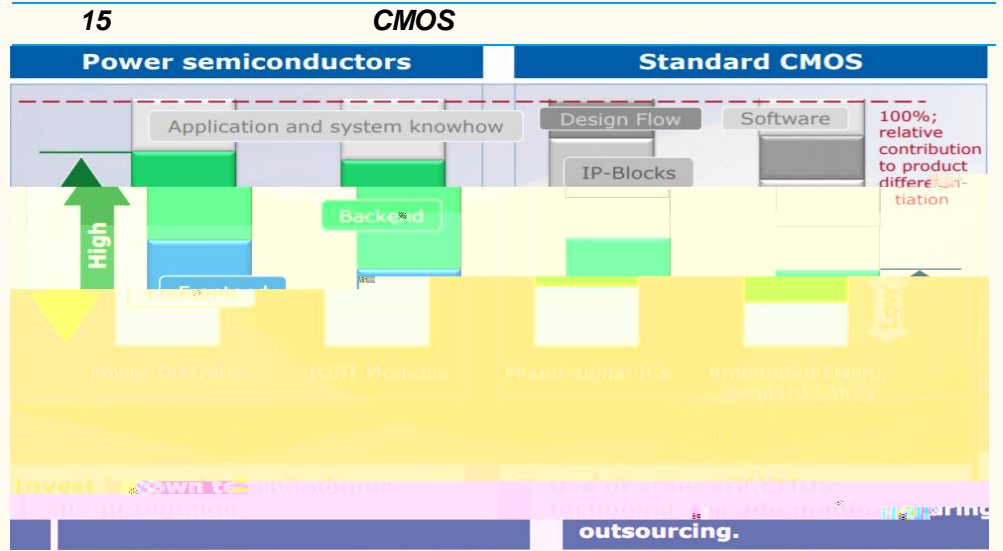


14



Yole

IP



IDM

IP
 MOSFET
 700V BCD G2
 IPM

Fabless

IDM

VDMOS
 600V TRENCH FS IGBT

IDM
 IDM

2008

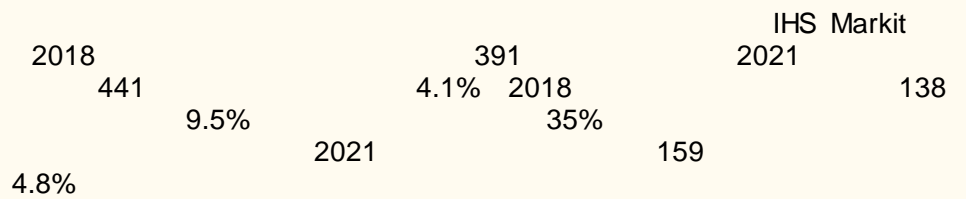
NPT-IGBT
 VDMOS

700V BCD
 1200V JBS

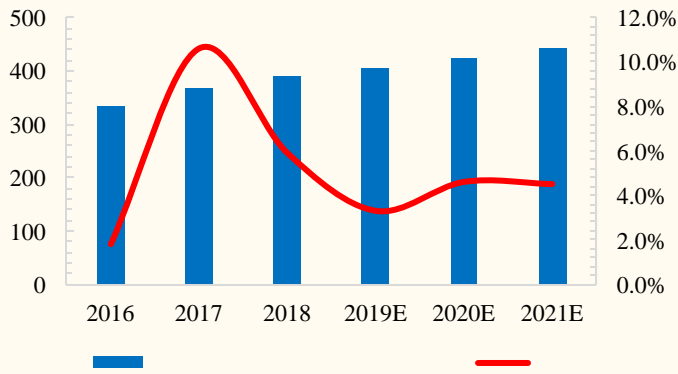
16

			IDM
			IDM
	IC	IC	IDM
	MOSFET	IGBT	IDM
			IDM
	(NXP)	MOSFET	IDM
	MOSFET	IGBT	IC
			SIC
			IDM

2.

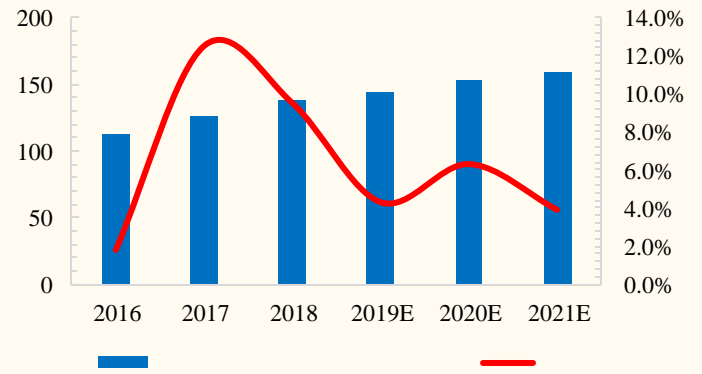


17 2016-2021



IHS Markit

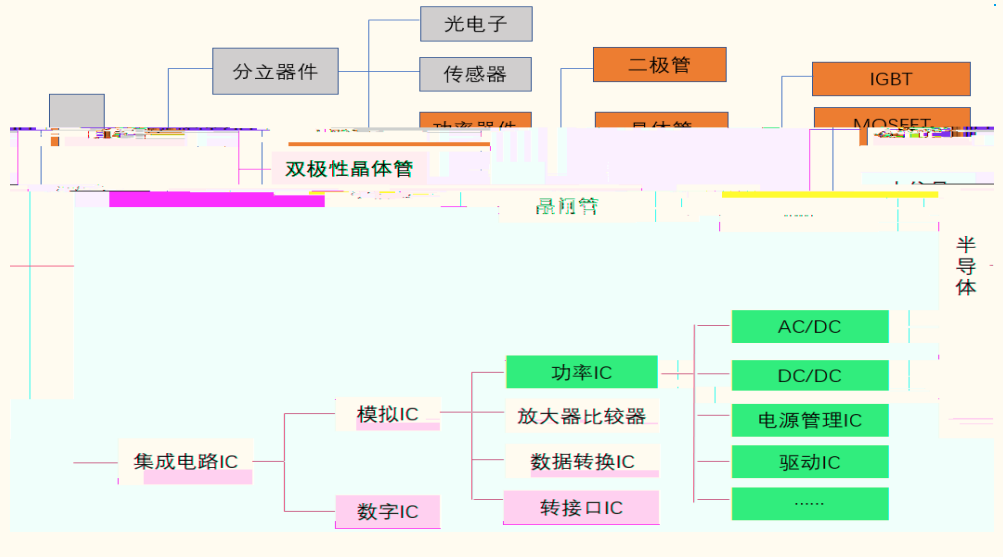
18 2016-2021



IHS Markit

IC		IGBT/MOSFET/BJT		2018	
/	/	IC	32.7%	13.3%	54.0%

19



	MOSFET	IGBT	SIC	
				23%
	20%		20%	15%
MOSFET		IGBT		
MOSFET			41%	21%
IGBT	7%			23%

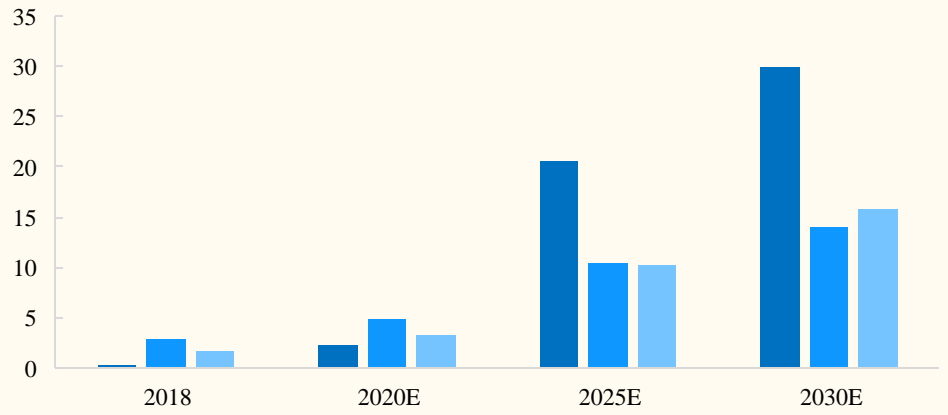
20

21

1050

1020

24



Infineon

300	Infineon	100 kW	2030	200-
2000	2019	IEA	1900	47.5

CAGR 5.9%
CAGR 8.8%
30

IGBT
2015-2025
15-25 CAGR 16.4%
1MW

IGBT

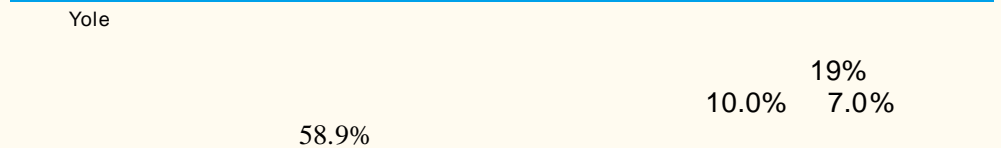
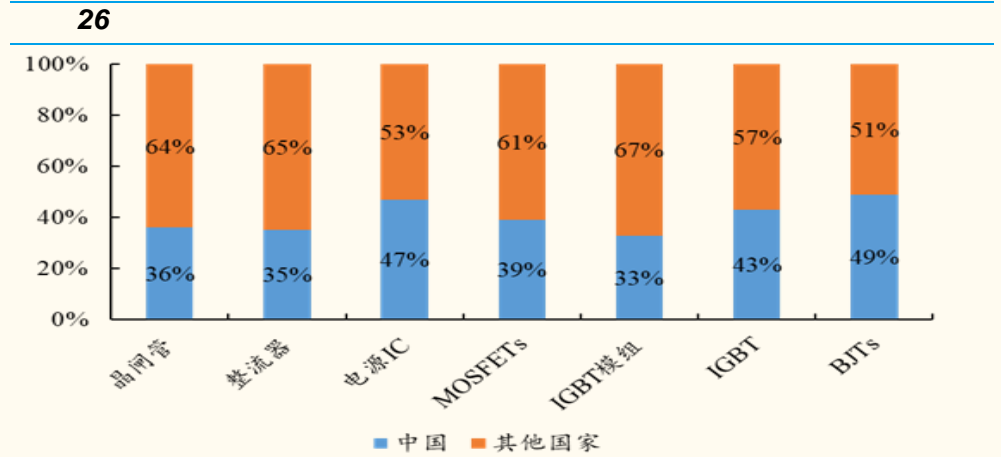
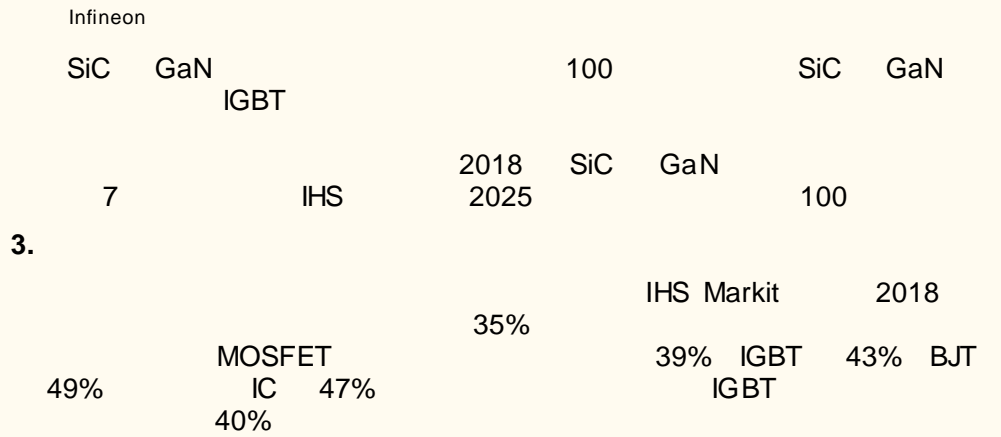
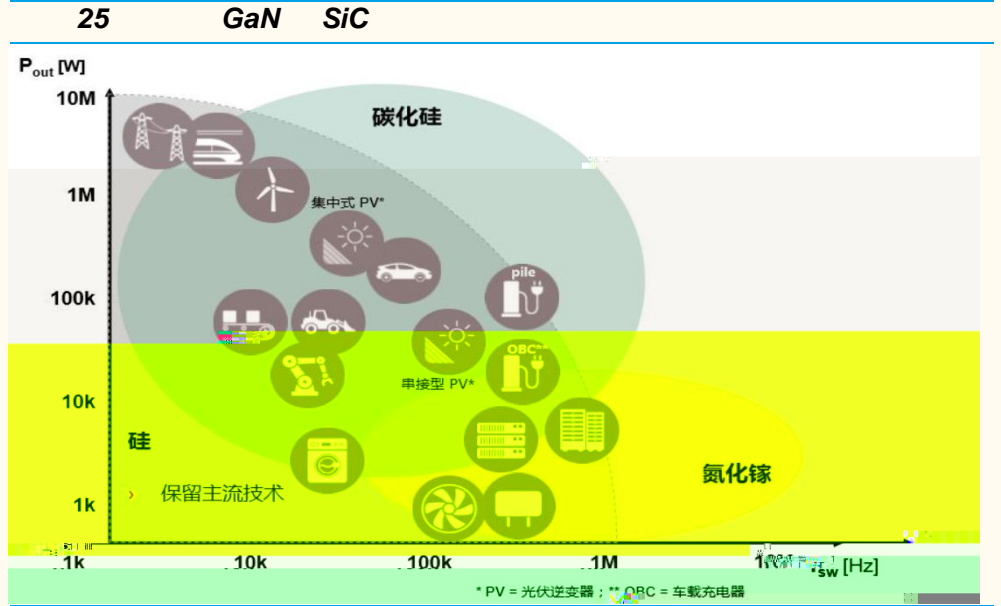
SiC GaN

SiC GaN
(>600V)

SiC GaN

GaN

SiC



31

2020 2 18

2. IDM+

43% 2016 31% 2019

32

	2019 1-6		2018		2017		2016	
	1140	43%	2683	43%	2339	40%	1332	31%
	1028	39%	2419	39%	2069	35%	1081	25%
	62	2%	138	2%	132	2%	112	2%

LED AC-DC LED IC BMS IC
 LED LED IC
 IC IC IC
 WPC QI IC IC BCD
 CMOS IC

36		IC	
AC-DC		AC-DC	
LED IC		LED	
BMS IC			
IC	78 1117		100mA-1A
IC	100W		
IC			
IC		AB D	5mW-50W

MEMS MEMS

37			
MEMS			

4 8 16 32 CPU MCU MCU MCU

38				
MCU	MCU	PC	MCU	
MCU	MCU		MCU	
MCU	CPU		8	16 32

2)

1 8 3 6

73 6

8 6

247 6

0.1-1 CMOS CMOS Bipolar BiCMOS SOI BCD

IGBT MEMS GaN SiC

BCD MEMS

1 8

60

IC

62

2.4

2018

27%

39

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

199

International

2018

Diodes Incorporated

Diodes
CIRRUS Logic

1984

BOSE

40

2018

41 2018

4.51%
3.33%
3.22%
2.98%
2.85%
16.89%

TCL

TTi

1.

2016 2017 2018 2019H1
0.13 / 0.15 / 0.16 /

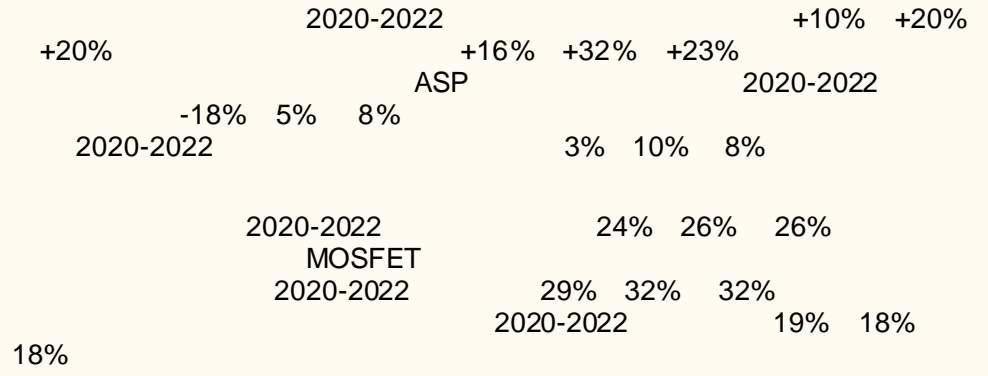
0.14 /

2022 +5% +10% +5%

2020-

2020-2022

2020-2022



43

2019

2020E

					2	3	1	4
0	0	0	0	0				
0	0	0	0	0				
0	0	0	0	0				
0	0	0	0	0				
0.00	0.00	0.00	0.00	0.00	1.00 = 3.01~4.0=	1.01~2.0=	2.01~3.0=	

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