688396.SH

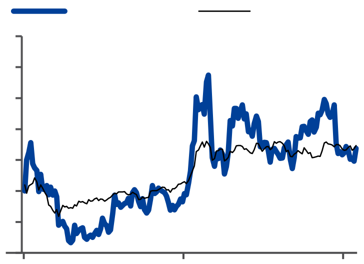
IDM

5G

8

MOSFET

12

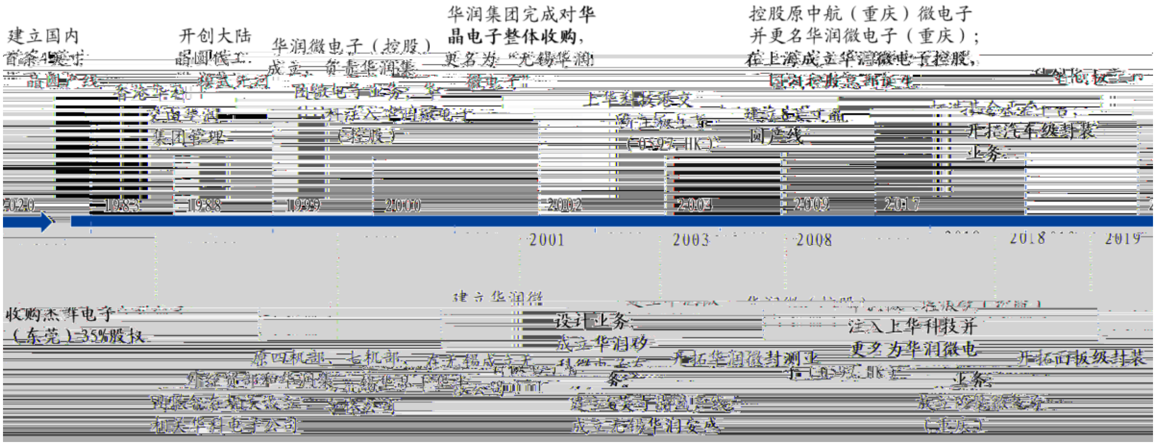


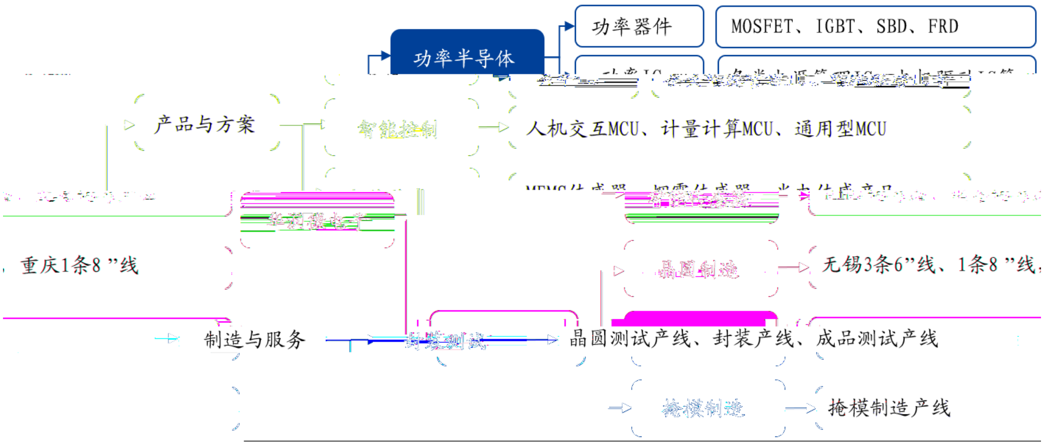
12

	2018A	2019A	2020E	2021E	2022E

IDM

1.1


建立国内首条4英寸
开创大陆晶圆代工
华润微电子（控股）成立
华润集团完成对华晶电子整体收购，更名为"无锡华润微电子"
控股原中航（重庆）微电子并更名华润微电子（重庆）；
1983
1988
1999
2000
2002
2004
2009
2017
2001
2003
2008
2018
2019
收购杰华电子（东莞）35%股权
建立华润微
设计业务
成立华润矽
注入上华科技并更名为华润微电
开拓面板级封装
业务
开拓汽车级封装
业务


功率半导体
功率器件
MOSFET、IGBT、SBD、FRD
产品与方案
智能控制
人机交互MCU、计量计算MCU、通用型MCU
重庆1条8"线
晶圆制造
无锡3条6"线、1条8"线
制造与服务
封装测试
晶圆测试产线、封装产线、成品测试产线
掩模制造
掩模制造产线

1.2 MOSFET

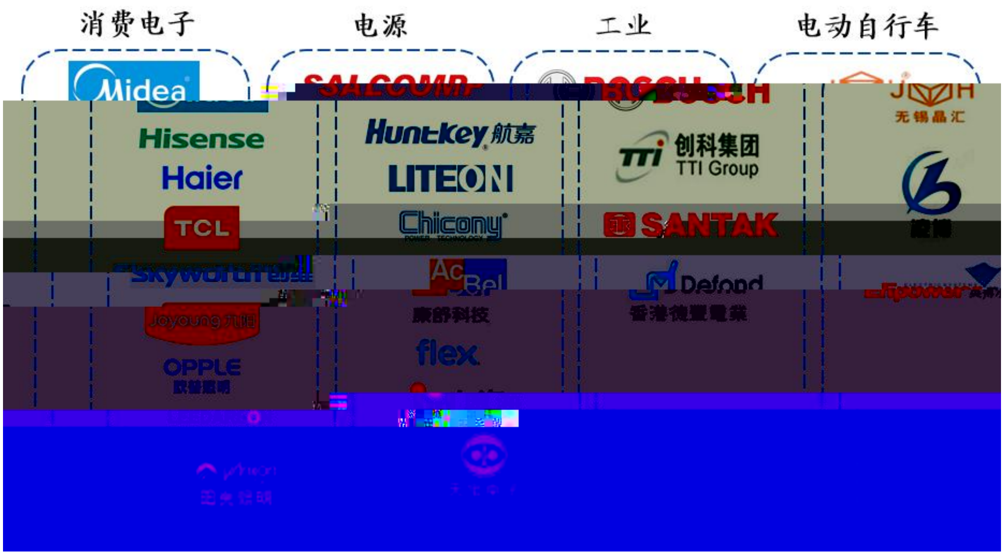
P.6

2019 MOS

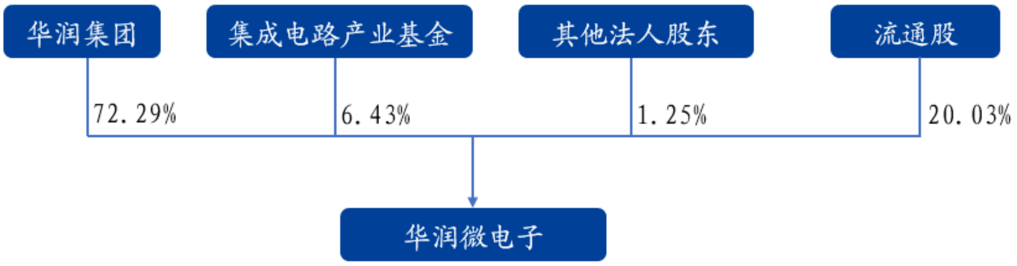
	16	7.5%

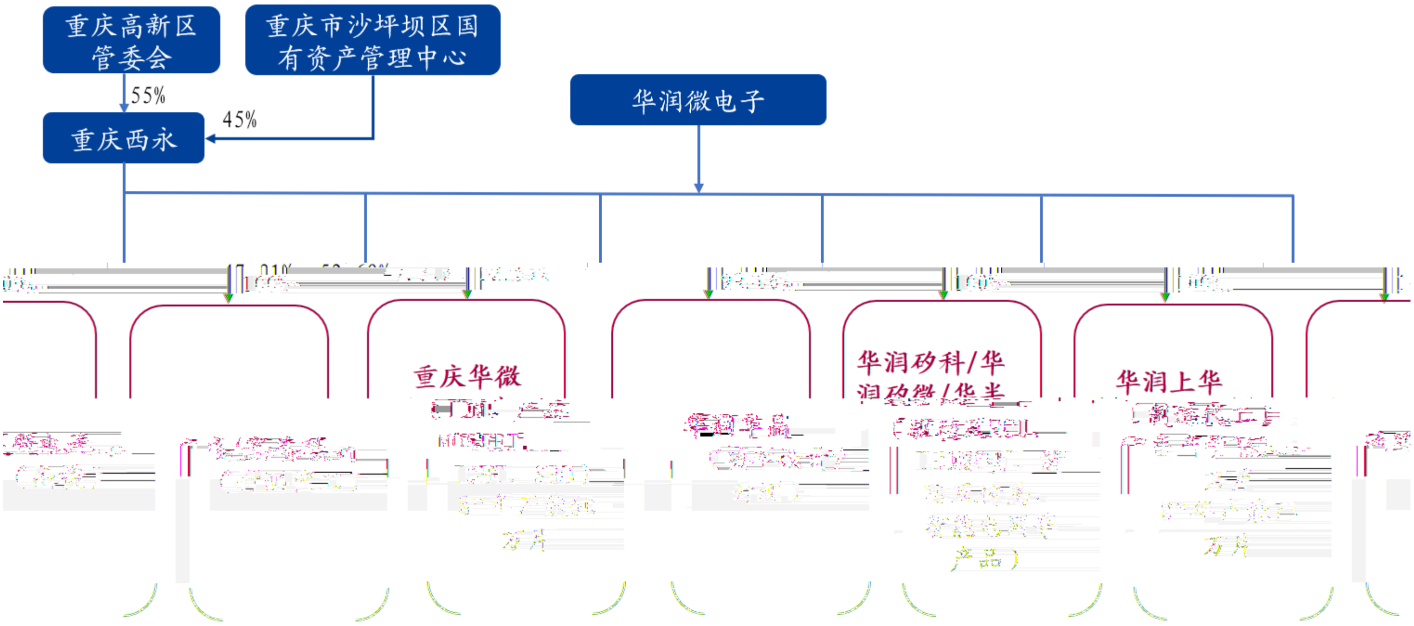
IC

2018

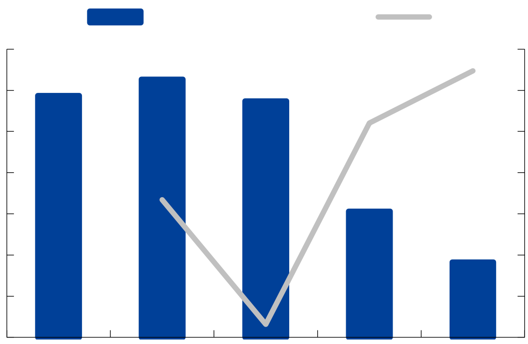

消费电子
电源
工业
电动自行车
Midea
Hisense
Haier
TCL
Skyworth创维
Joyoung九阳
OPPLE欧普照明
SALCOMP
Huntkey航嘉
LITEON
Chicony
AcBel
康舒科技
flex
BOSCH
TTI 创科集团 TTI Group
SANTAK
Defond
香港德丰电业
JH 无锡晶汇
Enpower

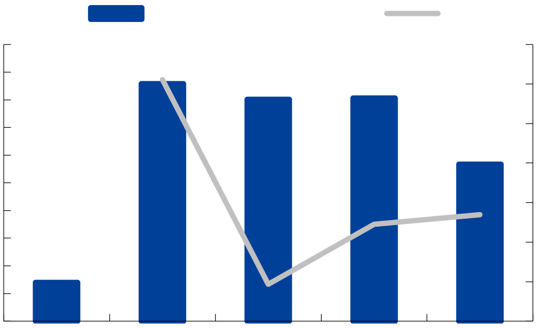
1.3


华润集团
集成电路产业基金
其他法人股东
流通股
72.29%
6.43%
1.25%
20.03%
华润微电子

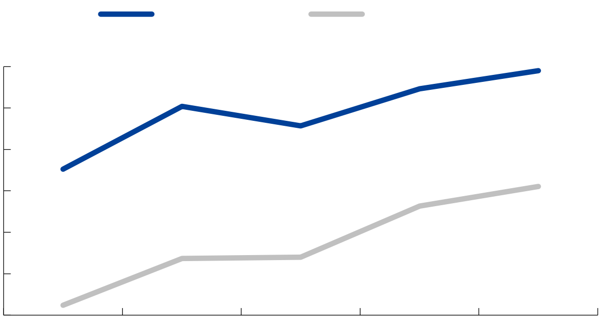

重庆高新区管委会
重庆市沙坪坝区国有资产管理中心
华润微电子
55%
45%
重庆西永
重庆华微
华润矽科/华润矽微/华光
华润上华
万片
产品）
万片

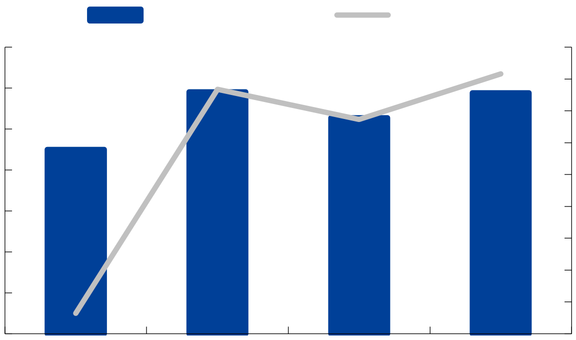
1.4

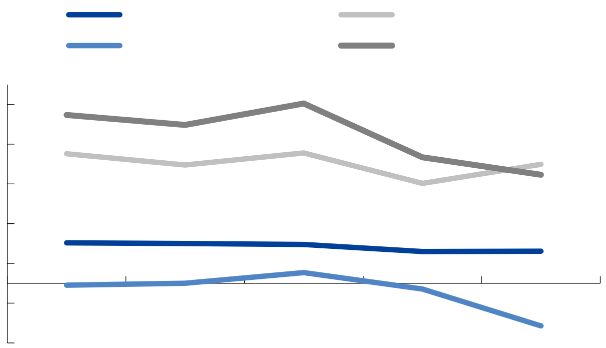


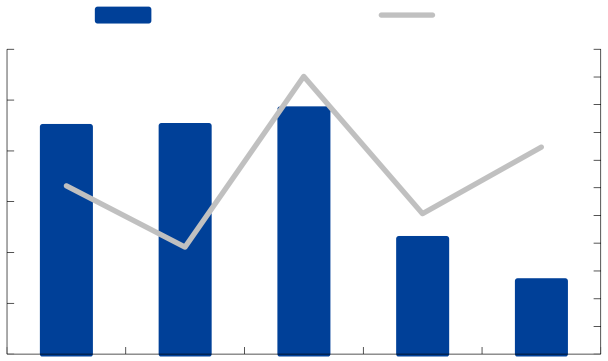


	2019	2018	2017	2019	2018	2017	2019	2018	2017
	25.2	26.8	23.4	44.1%	42.9%	39.9%	29.5%	34.0%	19.6%
	31.8	35.7	35.2	55.9%	57.1%	60.1%	17.8%	18.6%	16.3%
	57.0	62.6	58.6	100.0%	100.0%	100.0%	22.9%	25.2%	17.6%





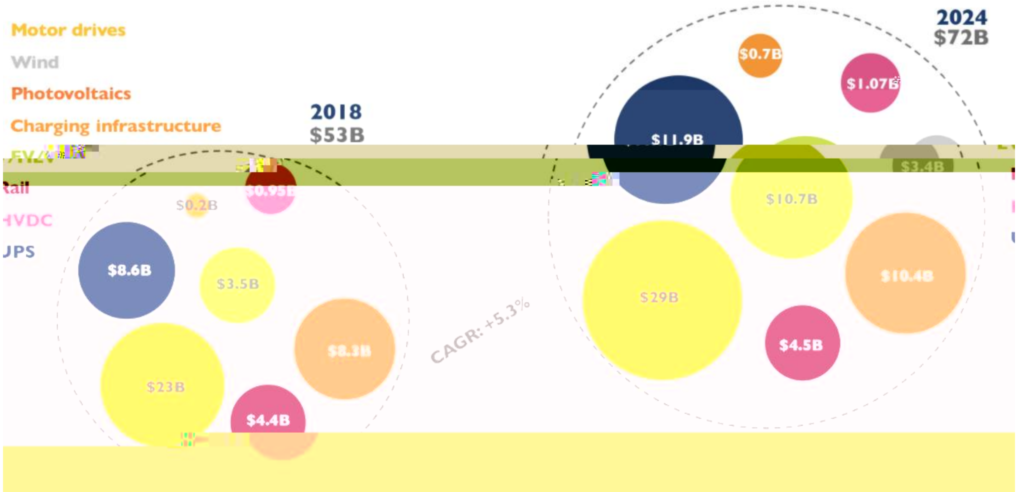




18 2017-2023 IGBT&MOSFET

Yole 2018

2.1 5G


Motor drives
Wind
Photovoltaics
Charging infrastructure
EV/HEV
Rail
HVDC
UPS
2018
$53B
$0.2B
$0.09B
$8.6B
$3.5B
$8.3B
$23B
$4.4B
CAGR: +5.3%
2024
$72B
$0.7B
$1.07B
$11.9B
$3.4B
$10.7B
$10.4B
$29B
$4.5B

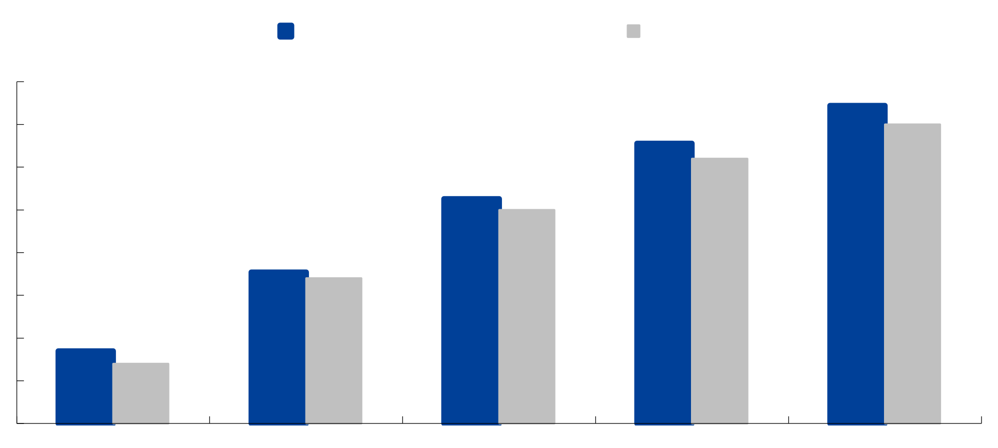
2.1.2 5G

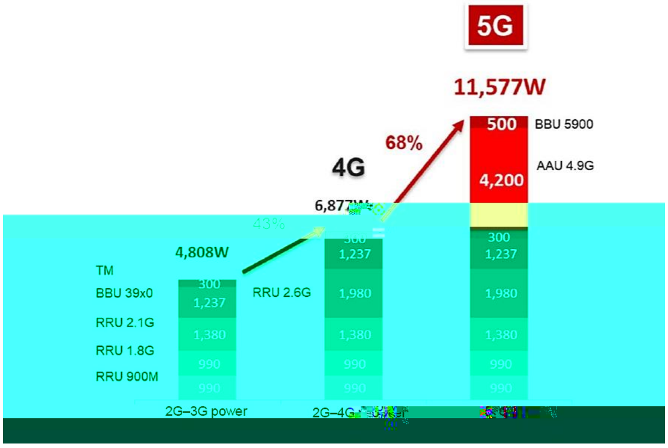
5G	5G

2.3GHz	3.5GHz	4.9GHz	26GHz	29GHz

5G

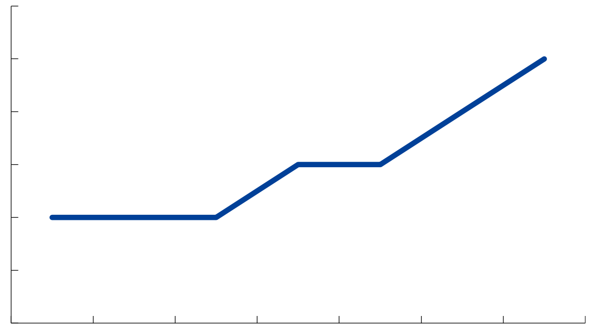
4G 2024 350

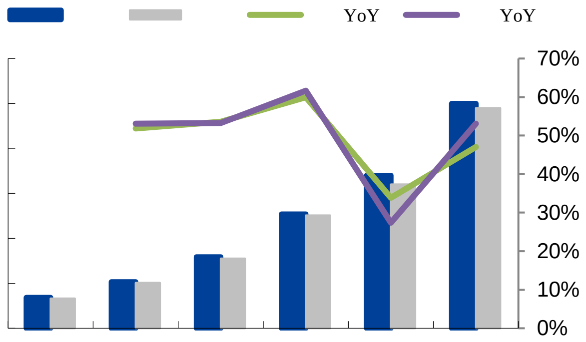




2.2 IBGT MOS

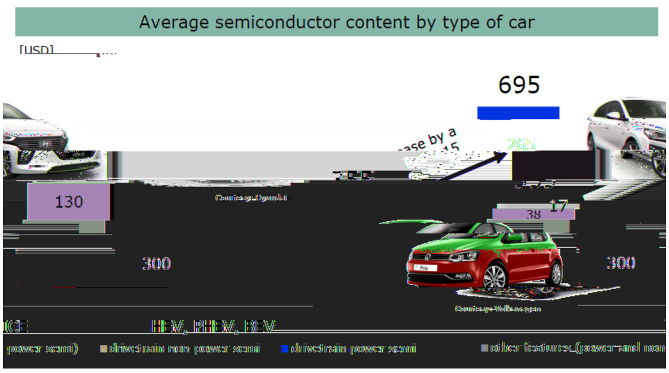
2011 8000 2017 79.4 2.7% 2012-2020 2020 200 500



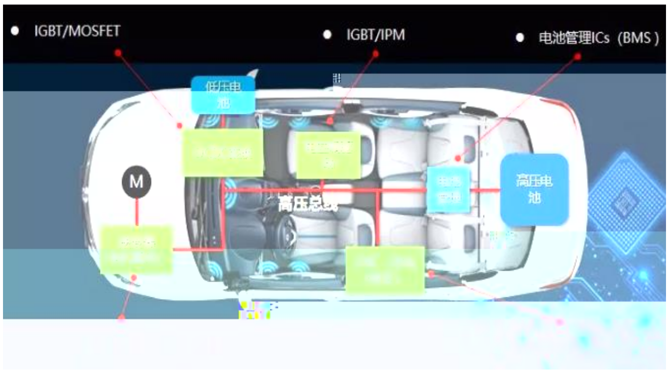


355 /
695
17 /
265 15

34



35



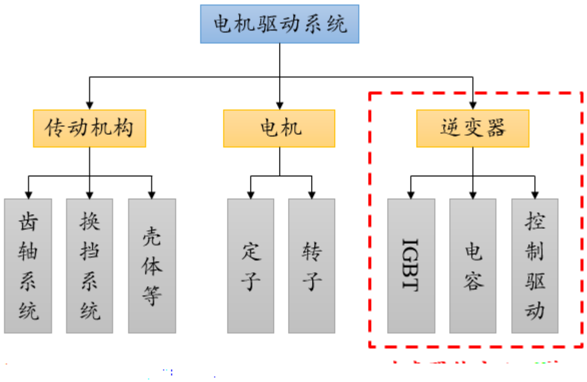
36

	SSV	Mild HEV	Full HEV	PHEV with EREV	EV BEV/FCV
/	**MOSFET** 1.5-10kw 3.5kw				
DC/DC			**MOSFET** 1.5-3kw 2.25kw		
		MOSFET/IGBT 5-20kw 15kw	**IGBT** 20-150kw 70kw		
			IGBT 20-40kw 30kw		
OBC +				**MOSFET** 3-6kw	
				IGBT 10-40kw	
	3.5kw	17.25kw	52.25kw	56.75-102.5kw	

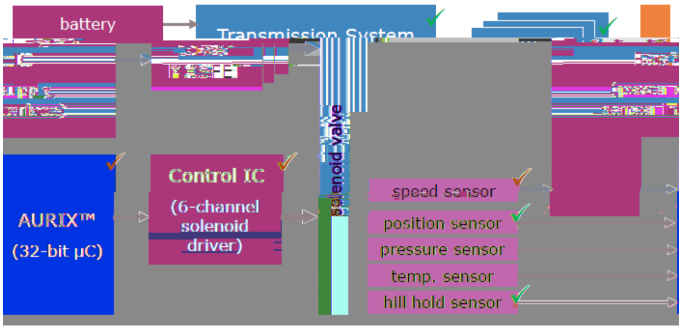
NE

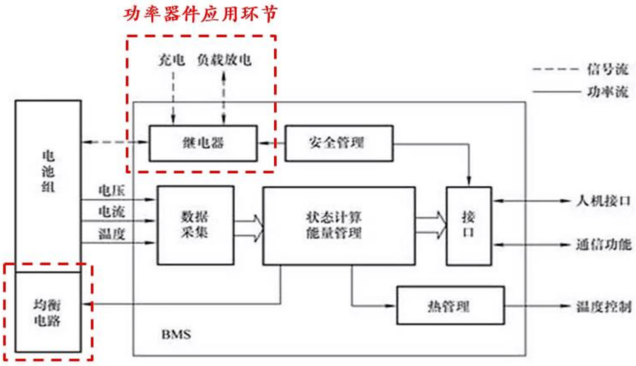
IGBT
SiC MOSFET

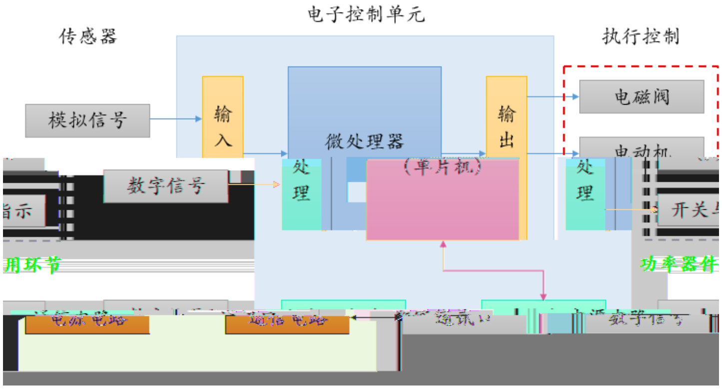
37



38



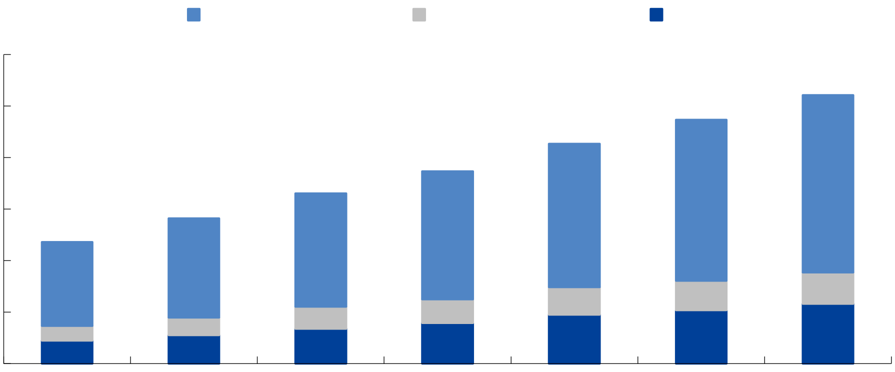




EV/HEV

EV/HEV

Yole 2017 BEV 2.2 2023 22% 5.8 HEV 2017 8.1 2023 17.2 CAGR 43.4%



IGBT

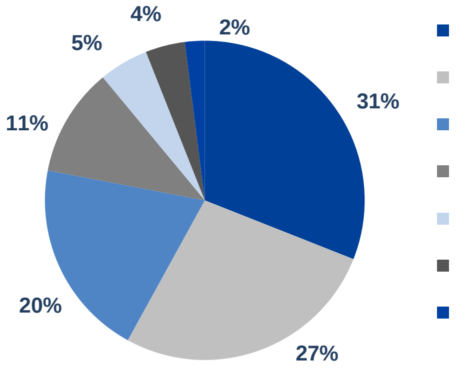
IGBT

2018 IGBT

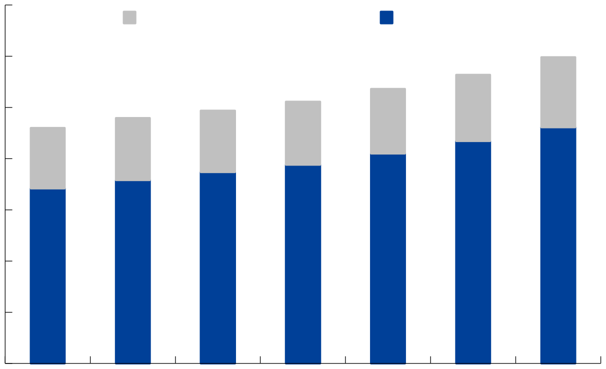
31% HIS Markit 2017 IGBT 47.9 Yole 2019

IGBT 50 2020-2025 CAGR 5%

2018 IGBT



IGBT



Yole

IGBT

50%

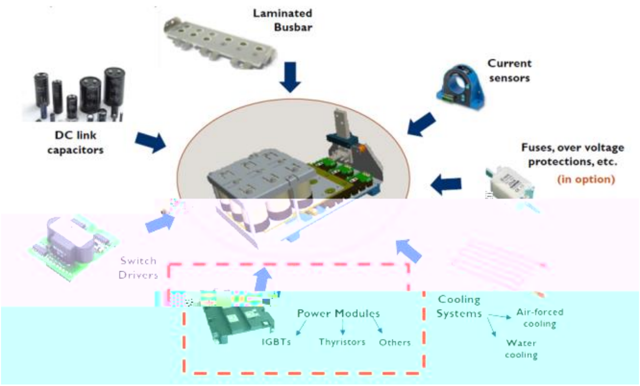
IGBT IGBT

IGBT

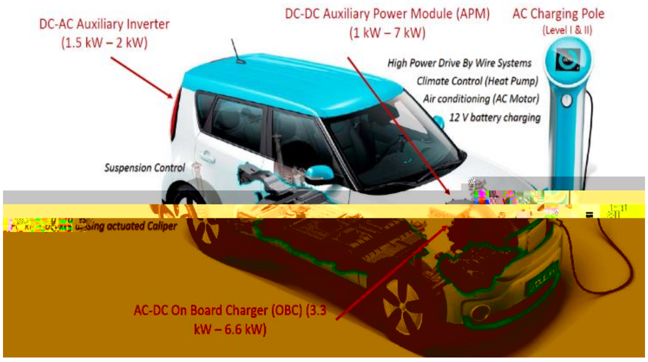
/ (DC/AC)

IGBT

44

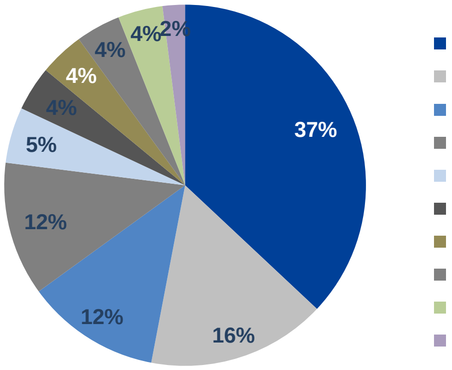


45 IGBT

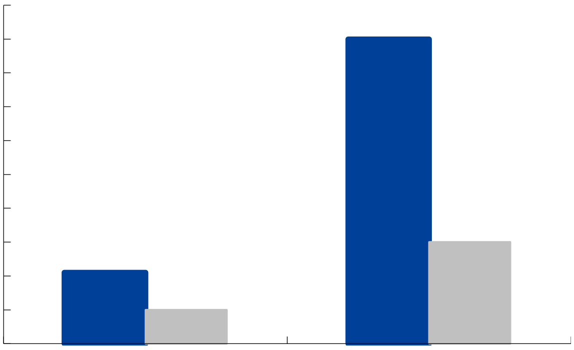


IGBT 15~20%
IGBT 40% **5%**
IGBT **20%**
Model X 132 IGBT
36 96 650

46



47 2025 IGBT



Trendforce

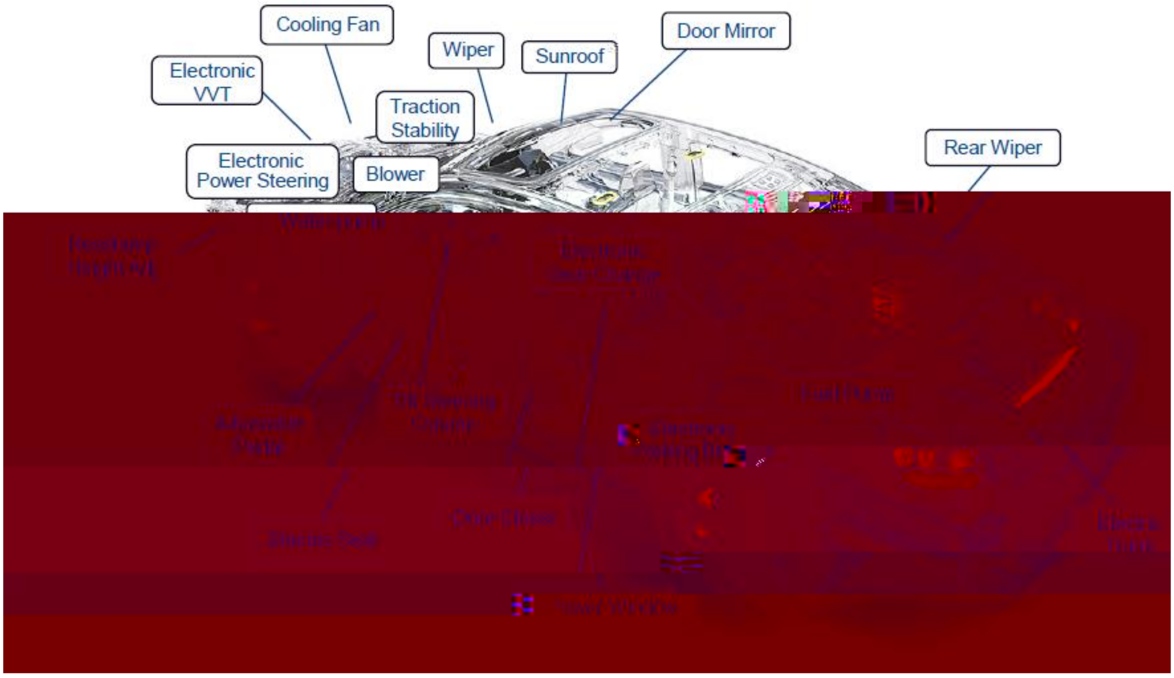
IGBT Trendforce
IGBT 2025 IGBT 210
2018-2025 8 900 2025
IGBT 100 8 300

MOSFET IGBT MOSFET

IGBT
MOSFET

MOSFET IGBT 1000V 350A

48 MOSFET



Didodes

2.3

MOSFET

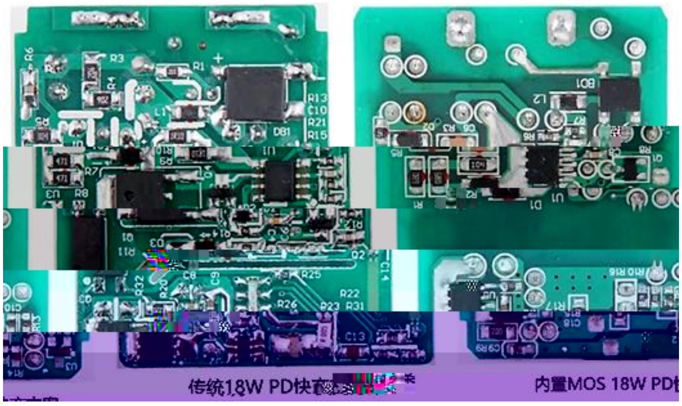
iPhone 12

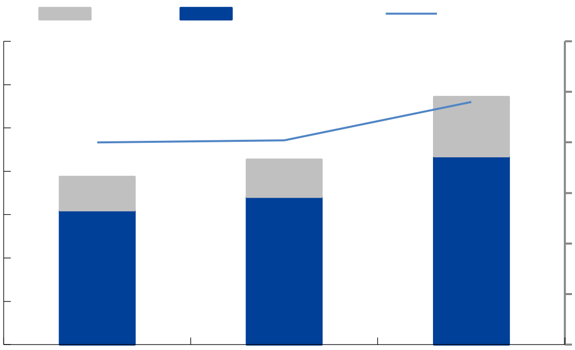
BCC Research 2017 85.49

20% 2022 27.4 24%

MOSFET MOS

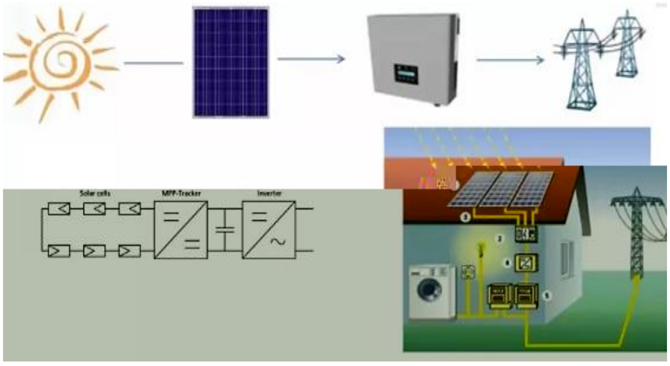
MOS MOS





15%-30%

55



56 IGBT

BP 2018 Energy Outlook

IGBT

CRH3 4
32 IGBT IGBT 128 IGBT
10 3300
IGBT
10 20 3300 IGBT
15

3.1

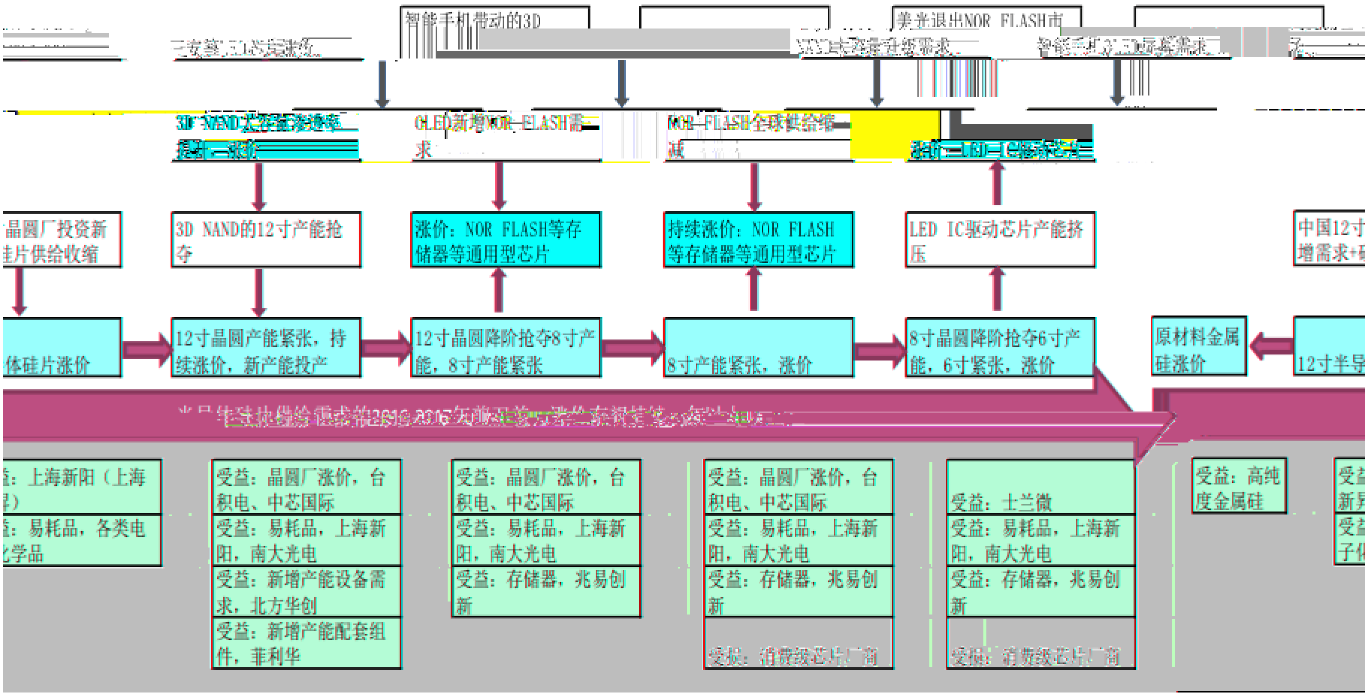
I

4-6

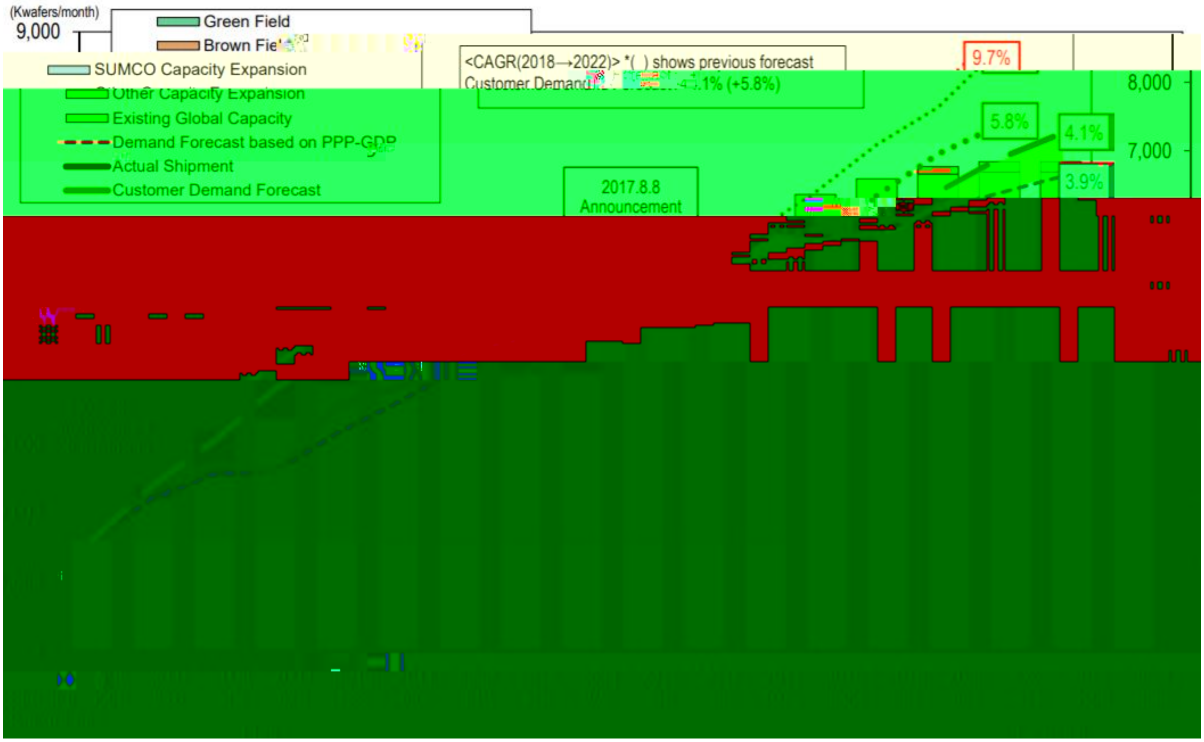
raw wafer
10%

12 8

57 12 8



12 **2020**
12 2001 SUMCO 2019
12 602 / 12 DRAM
EXCHANGE 2019 DRAM 120 / NAND
190 / **12** **2023** **200** **/**

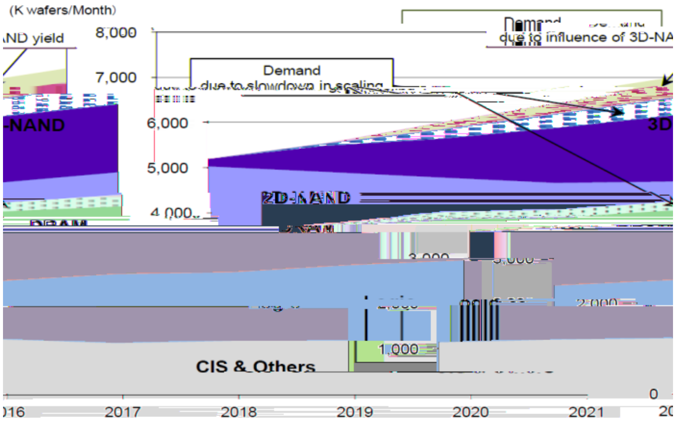


SUMCO

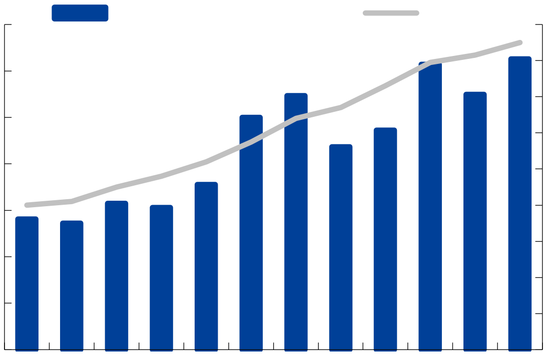
8 CIS PMIC Nor Flash IC
8 MEMS

59 12

60 12 2020~2023



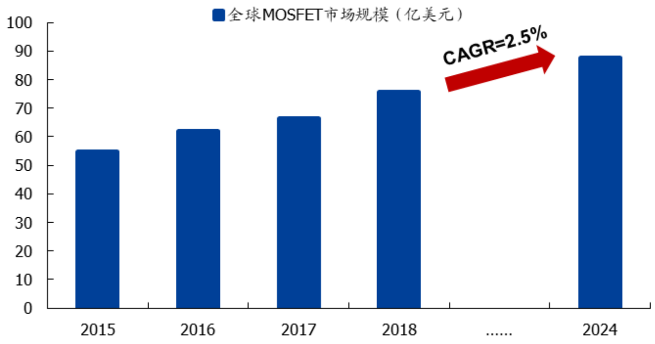
Semico

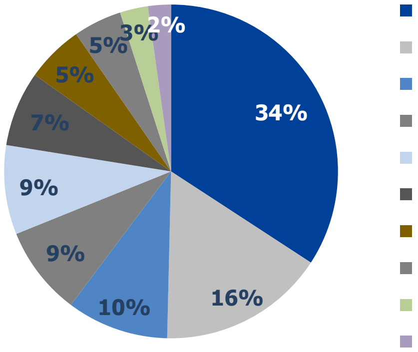


AnySilicon

8 6
12
8
MEMS 12 8
1990 2007 8 201 12
12 IC Insights 2009-2017

87 CAGR 2.5% MOSFET
62.8% TOP1 27.7%



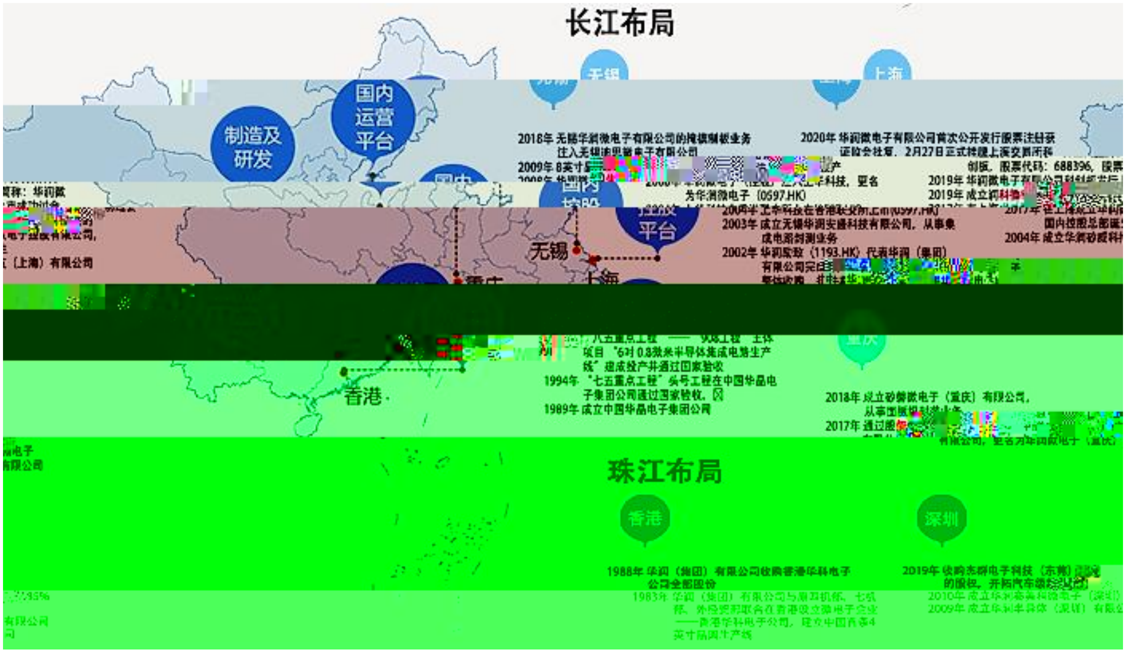


PMIC CIS IC Nor Flash 8 MOSFET 8

2017
2017 MOSFET
MOSFET MOSFET
8 -12 2019 MOSFET
MOSFET 12 MOSFET
16 MOSFET 20 2020

4.1 IDM

4.2



12

8

	PE-TTM	PB