[redacted]

[redacted] (688396)

[redacted]

[redacted] 2003 [redacted] 8.79 [redacted] 12.16 [redacted] CRH [redacted] Micro [redacted] 100% [redacted] 8 [redacted] 2 [redacted] 6 [redacted] 3 [redacted] 2 [redacted] 1 [redacted] 3 [redacted] IDM [redacted] IDM [redacted]

[redacted] MOSFET [redacted]

[redacted] 2019 [redacted] IGBT [redacted] MOSFET [redacted] 35% [redacted] IHS [redacted] MOSFET [redacted] Markit [redacted] MOSFET [redacted]

IGBT [redacted]

[redacted] IGBT [redacted] 600V-6500V [redacted] IGBT [redacted]

SiC [redacted] GaN [redacted]

[redacted] MOSFET [redacted] IGBT [redacted] SiC [redacted] Yole [redacted] SBD [redacted] 2017-2023 [redacted] 31% [redacted] 2023 [redacted] 15 [redacted] Yole [redacted] SiC [redacted] GaN [redacted] 2022 [redacted] GaN [redacted] 4.5 [redacted]

[redacted]

[redacted]

[redacted] 688396

[redacted] 237.14

[redacted]
E sunyf@hx168.com.cn
SAC NO E S1120519080005

[redacted]
E wanghw1@hx168.com.cn
SAC NO E S1120519090003

[redacted]

IDM ⌐ ϟ ϋ ´ ˝ n ɾ ⌊ ⌊ SiC ⁻¹
لج GaN 650V ⁄ ⌊ لج ⁻¹سر م ϖ B
م ϑ SiC MOSFET ، م ⌊ لج SiC JBS ⌊
ɾ ⁄ ⌊ Ï

æ 2019~2021 ˝ ´ ϑ ⌋ ϱ 57.45 ، ϋ ⌊ 69.60 ،
ϋ ⌊ 83.52 ، ϋ Ï n -8.39% ⌊ 21.15% ⌊ 20%Ж
Л ˝ ´ ϰ ‰⌐ 4.01 ، ϋ ⌊ 6.35 ، ϋ ⌊ 8.16 ، ϋ ɾ æ ẅ
Ï æ ئھ `Y⁻¹ ⁻¹ φ ⁻¹ ڈ Ï 2021 شج PE ϱ
40 Ṗ Ґ ■ Ì 100 Ṗ ıı ϱ æ ẅ ЄÏ Л ˝ ´ سر MOSFET
Ѿ غي ɾ Ü Ï æ ɢ' æ ẅ м Ï
Ṇ ü ñ ṇ ɾ

سر ₣ Q Ï Ж ⁻¹ φ ƙ سر٪... Ж
₣ ئھ ⁻¹ ڈ سر ɾ
⌐ ₣ æ Ẅ

˙	2017A	2018A	2019E	2020E	2021E
ƙ ñ (ϑ ϋ)	5875.59	6270.80	5745.00	6960.00	8352.00
YoY	33.63%	6.73%	-8.38%	21.15%	20.00%
‰⌐ (ϑ ϋ)	70.28	429.44	400.75	651.91	833.59
YoY	123.22%	511.02%	-6.68%	62.67%	27.87%
⌐	17.62%	25.20%	23.50%	27.00%	28.00%
Ґ ϋ Є	0.06	0.37	0.34	0.56	0.71
ROE	1.83%	10.35%	4.38%	6.65%	7.84%
	0.00	0.00	0.00	0.00	0.00

E Wind Ï ⁻¹ ‖

9 2016~2019H1 ˝ ´ ᵐ ˏ Ŭ ĵ ৲ " Ґ ˍ ᾧ Є
10 ˝ ´ ˋ
11 ئھ `Y ڃي ˈ ڄ ڻ Ỹ
12 ئھ `Y MOS ᵉ ڈ ৲ Ŭ ڄ ڻ ڻھ
13 2018 Ϫ ئھ MOSFET ڤ ᶠ ˍ ৲ ڈ ڃي ᴓ Ґ %Є
14 Transistor/IGBT/MOSFET ĭ
15 IGBT ĵ
16 ˝ ´ Ᵽ ש U ৲ φ ĵ
17 ئھ `Y ˈ ৲ φ ˆ ˝ ´

1. [illegible] IDM&[illegible]

1.1. [illegible]

[illegible] 2003 [illegible] 8.79 [illegible] 12.16 [illegible] CRH [illegible] Micro [illegible] 100% [illegible]

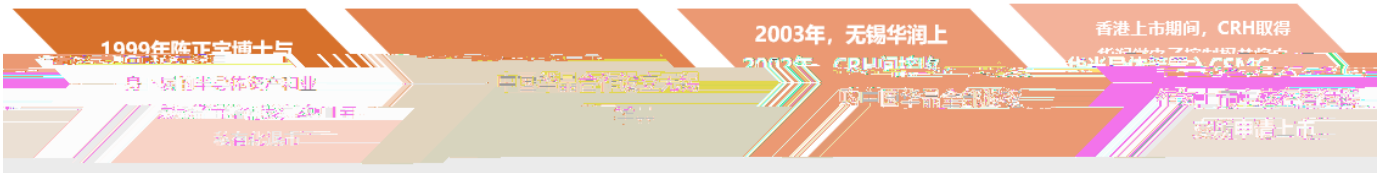
[illegible]1 [illegible]

[illegible]2 [illegible]

[illegible]3 [illegible] 1.00 [illegible]

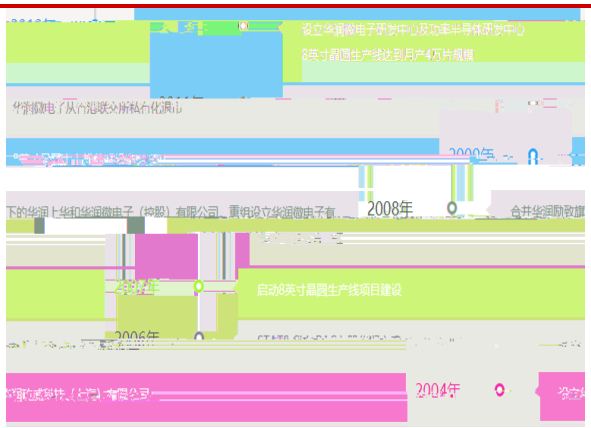
[illegible]4 [illegible] IPO [illegible]

图 1 [illegible]



[illegible]

图 2 2004~2013 [illegible]



[illegible]

图 3 2014~2020 [illegible]

[illegible]

2 ھ `Y' ۷ φ 2018 ة o

o	ب ƙ	2018 ة Ґ. ۿ Є
1	۷	21.7
2		18.5
3	۷	17.1
4	يم	8.1
5	æ	7.7
6		7.2
7	۷ φ	6.9
8	ϰ	6
9		5.4
10	. ˇ ϰ	4.9

E ö Ï ۷ ‖

4 ˝ ´ ˈ ج Ł ¸ ع Ů

¸ ع لخم	¸ ع	Ĩ
MOSFET	ختي φ Ï ¸ ع MOS ɻ MOS ɻ MOS ɻ MOS Ï ɻ نهـ	ɻ ĸ ┼ ɻ -100V-1500V
IGBT	Ů لخم φ Ï ¸ ع ˈ ɻ ˈ ɻ	ɻ ĸ ┼ ɻ تحج Ï ɻ نهـ 600V-1200V ɻ
SBD	ε Ï ¸ ع لخم SBD ɻ لخم SBD Ï ɻ نهـ 45V-150V Ï نهـ	ɻ 200mA-
FRD	ε Ï ɻ نهـ 200V-6500V	ɻ ɻ

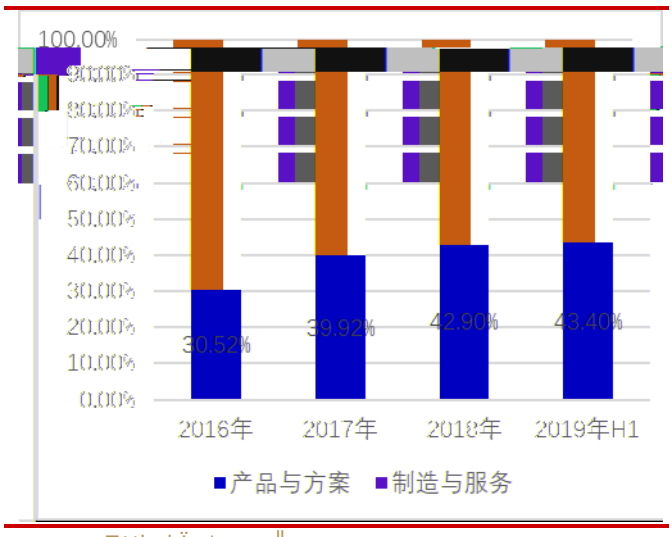
E ö Ï ɻ ‖

5 ˝ ´ ˈ IC Ґ IC Є ¸ ع Ů

¸ ع لخم	¸ ع	Ĩ
AC-DC	AC-DC Δ ¸ ع Ï ~ ┼ لج ɻ n ┼ لج ɻ ϣ ɻ	ɻ ĸ ┼
LED ˝ IC	LED ˝ Ï ¸ ع ~ ˝ ƒ Ω ˝	ɻ ɻ ĸ ┼

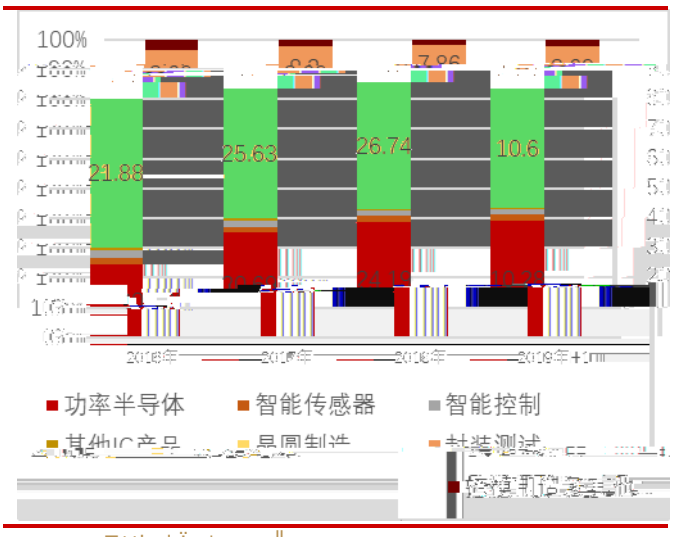
BMS IEMC/31D76

图 6 2016~2019H1 [illegible]



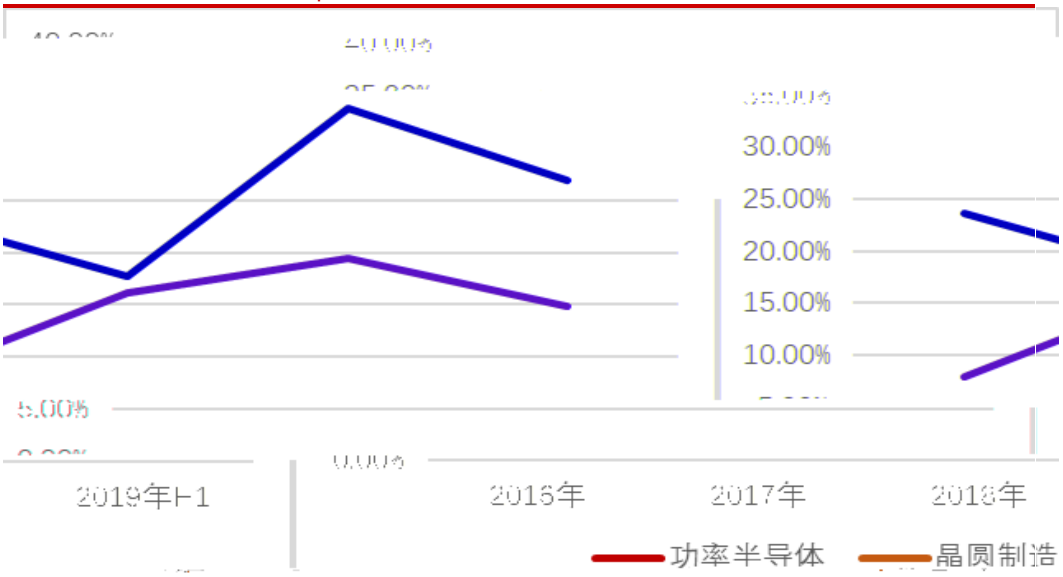
资料来源：Wind，[illegible]

图 7 2016~2019H1 [illegible]



资料来源：Wind，[illegible]

图 8 [illegible]



资料来源：[illegible]

1.3. [illegible]

[illegible] MOSFET [illegible] IGBT [illegible] 20 [illegible] 50 [illegible] 60-70 [illegible] 80 [illegible] 6000 [illegible] 6500 [illegible] 80 [illegible] MOSFET [illegible] IGBT [illegible] 6500V [illegible] 10-100kHz [illegible]

绿色电源
电子照明
特种二极管
双极型产品
MOS型产品

| | | |

90nm-0.13um MCU ɻ MCU ɻ ɻ DSP ɻ FPGA

8

0.13u

9 2016~2019H1 ˮ ´ ᳰ ، ᳲ ᳳ ৭ " Ґ ، ᳬ ∈

ᛁᛏᛖᛗ 11 ᛁᛏᛖᛗᛋ ᛁᛏᛖᛗᛋ ᛁᛏᛖᛗᛋ

| | | |

华欣证券研究报告 华欣证券研究报告 华欣证券研究报告

13 2018 Ϫ ϩ MOSFET ϯ ϩ ϟ ϫ ϩ ϩ ϩ ϩ %Є

	2018 MOS ϟ ϩ Ϫ ϩ ϩ ϩ Є	ϩ ϩ ϟ
ϟ	52	28.40%
	31	16.90%
ϟ	**16**	**8.70%**
	12	6.60%
ϟ	12	6.60%
ϟ φ	9	4.90%
ϟ ϟ ϟ ϟ	51	27.90%
ϟ	183	100%

E ϟ ϟ ϟ ‖

2.3.IGBT Ϫ Ϊ ϟ ϟ

IGBT Insulated Gate Bipolar Transistor Ϊ ϟ ϟ φ ϟ
BJT ϟ MOSFET ϟ ϟ φ ϟ ϟ Ϊ MOSFET ϟ ϟ ϟ
ϟ ϟ ϟ ϟ ϟ ϟ ϟ ϟ ϟ ϟ BJT ϟ ϟ ϟ
ϟ ϟ ϟ ϟ ϟ ϟ ϟ ϟ ϟ ϟ ϟ ϟ ϟ
ϟ ϟ ϟ ϟ ϟ ϟ ϟ ϟ ϟ ϟ ϟ ϟ ϟ
Ϊ IGBT 20 ϟ 80 ϟ ϟ ϟ ϟ ϟ : ϟ ϟ ϟ ϟ ϟ ϟ
ϟ MOSFET ϟ GTR Ϊ ϟ SCR ϟ GTO ϟ ϟ ϟ ϟ ϟ
ϟ ϟ ϟ ϟ BJT

ᴄᴏᴍᴍᴜᴛᴀᴛᴇᴅ ᴅᴇᴠᴇʟᴏᴘᴍᴇɴᴛ 20 ᴍᴏᴅᴜʟᴇ

ᴅᴇᴠᴇʟᴏᴘᴍᴇɴᴛ ᴏᴘᴇʀᴀᴛᴇᴅ ʙʏ Yole

ᴛᴏᴘᴏʟᴏɢʏ ᴏᴘᴛɪᴍɪᴢᴀᴛɪᴏɴ ᴏᴜᴛᴘᴜᴛ ᴄᴜʀʀᴇɴᴛ ᴄᴏᴍᴍᴜᴛᴀᴛᴇᴅ ᴅᴇᴠᴇʟᴏᴘᴍᴇɴᴛ ᴏᴘᴇʀᴀᴛᴇᴅ ʙʏ Yole ᴛᴏᴘᴏʟᴏɢʏ ᴏᴘᴛɪᴍɪᴢᴀᴛɪᴏɴ ᴏᴜᴛᴘᴜᴛ ᴄᴜʀʀᴇɴᴛ ᴄᴏᴍᴍᴜᴛᴀᴛᴇᴅ ᴅᴇᴠᴇʟᴏᴘᴍᴇɴᴛ ᴏᴘᴇʀᴀᴛᴇᴅ ʙʏ Yole

ᴛᴏᴘᴏʟᴏɢʏ ᴏᴘᴛɪᴍɪᴢᴀᴛɪᴏɴ ᴏᴜᴛᴘᴜᴛ ᴄᴜʀʀᴇɴᴛ ᴄᴏᴍᴍᴜᴛᴀᴛᴇᴅ ᴅᴇᴠᴇʟᴏᴘᴍᴇɴᴛ ᴏᴘᴇʀᴀᴛᴇᴅ ʙʏ Yole

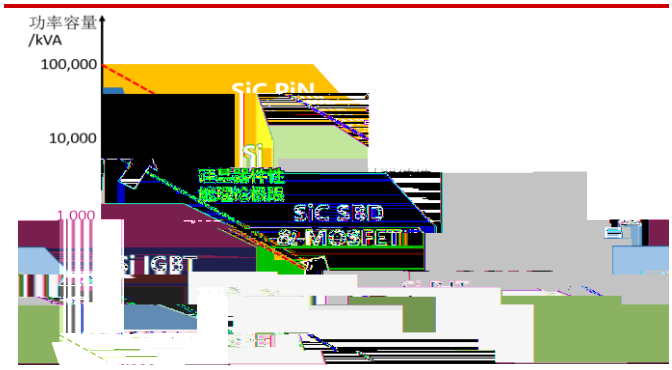
2.4.SiC ᴀɴᴅ GaN ᴍᴏᴅᴜʟᴇ ᴍᴀʀᴋᴇᴛ ᴏᴜᴛʟᴏᴏᴋ

ᴛᴏᴘᴏʟᴏɢʏ ᴏᴘᴛɪᴍɪᴢᴀᴛɪᴏɴ ᴏᴜᴛᴘᴜᴛ ᴄᴜʀʀᴇɴᴛ ᴄᴏᴍᴍᴜᴛᴀᴛᴇᴅ ᴅᴇᴠᴇʟᴏᴘᴍᴇɴᴛ ᴏᴘᴇʀᴀᴛᴇᴅ ʙʏ Yole

ᴛᴏᴘᴏʟᴏɢʏ ᴏᴘᴛɪᴍɪᴢᴀᴛɪᴏɴ ᴏᴜᴛᴘᴜᴛ ᴄᴜʀʀᴇɴᴛ ᴄᴏᴍᴍᴜᴛᴀᴛᴇᴅ ᴅᴇᴠᴇʟᴏᴘᴍᴇɴᴛ ᴏᴘᴇʀᴀᴛᴇᴅ ʙʏ Yole

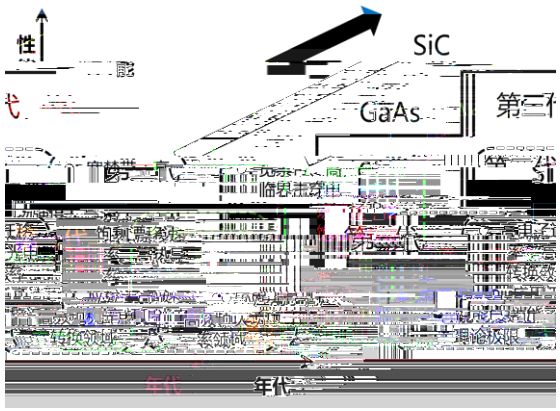
ᄀᄂᄃᄅᄆᄇᄉᄋᄌᄎᄏᄐᄑᄒ

图 22 [illegible]



[illegible]

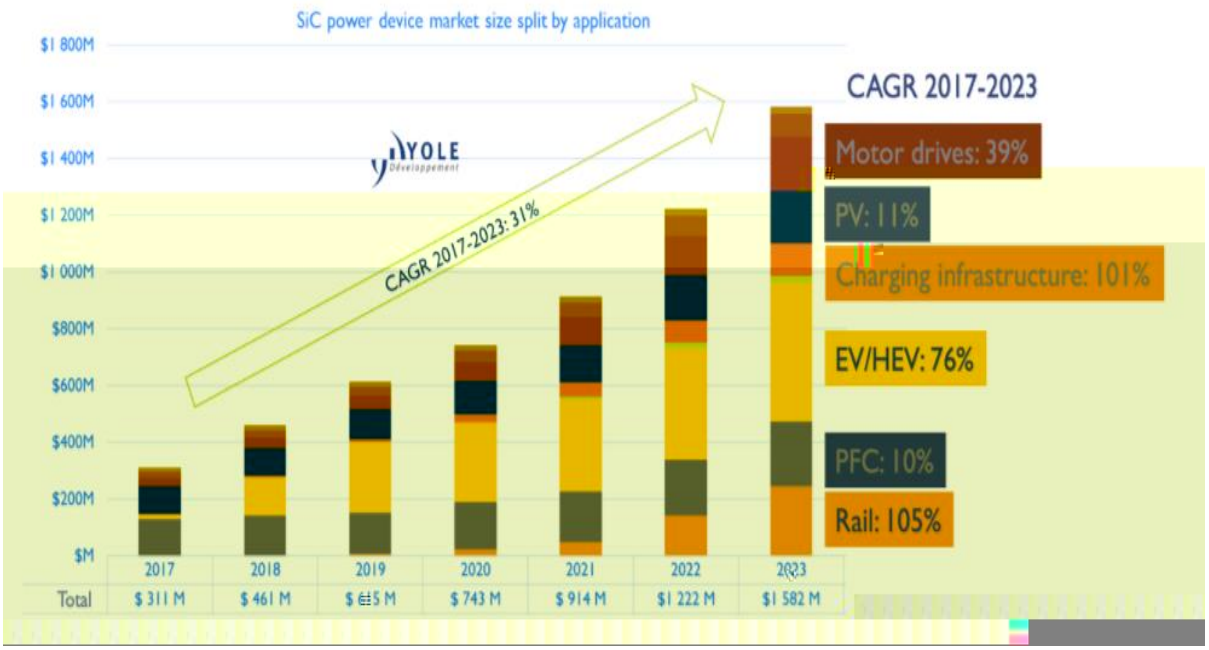
图 23 [illegible]



Google [illegible]

[illegible] 31% [illegible] 2017-2023 SiC [illegible] Yole [illegible] 15 [illegible] 2023 [illegible] 101% CAGR [illegible] 76%

图 24 2017~2023 SiC [illegible]



Yole [illegible]

بم 25 GaN ؛ چل ٤ ؟ ٤ ۵ ۵ ۵ ۵

E ٧ ‖

۵ ۵ چل ٤ Ï GaN ´ ५ خي ؛ م ۵
Ï چل ٤ ؛ Ï ؛ 5G Ḥ ؛ ؛ ‍ ۵
CoolGaN U ؛ ؛ ؛ ‍ ‍ ‍

3. ⌐

IHS Markit Ï 2018 ئھ MOSFET خي ع 27.92 ¸ ۋ Ï 2016 -2018 U شج ع 15.03% Ï Л ˹ ۷ φ ƙ شج ſ سر ſ Ϫ Ϫ Ϫ

ـ م / ـ

⌐ Ґ ъ ѿ Є	2018A	2019E	2020E	2021E
ƙ ŋ	6270.80	5745.00	6960.00	8352.00
YoY(%)	6.73%	-8.38%	21.15%	20.00%
ƙ	4690.26	4394.93	5080.80	6013.44

Ґ ъ ѿ Є	2018A	2019E	2020E	2021E
‰ ⌐	537.56	512.43	869.21	1111.46
م	953.19	868.90	908.90	948.90
Ŭ˝	-95.14	-39.31	-233.97	-140.00

ᴘᴏʀᴛᴜɢᴜᴇsᴇ ᴘᴏʀᴛᴜɢᴜᴇsᴇ ᴘᴏʀᴛᴜɢᴜᴇsᴇ

ᴘᴏʀᴛᴜɢᴜᴇsᴇ ᴘᴏʀᴛᴜɢᴜᴇsᴇ ᴘᴏʀᴛᴜɢᴜᴇsᴇ