



2020.09.25

(688396)

81.07

81.07

55.19

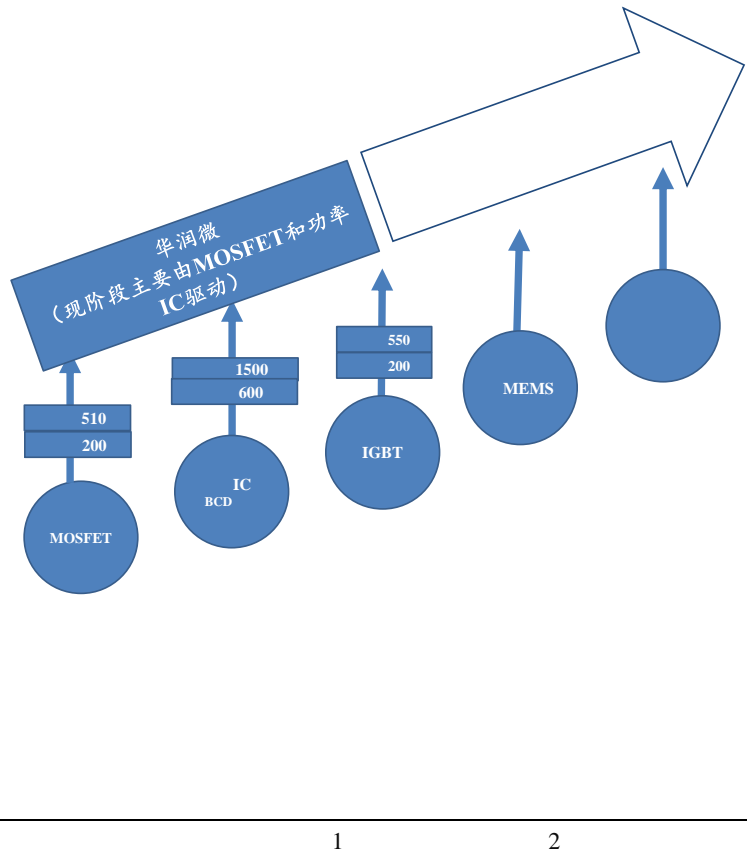
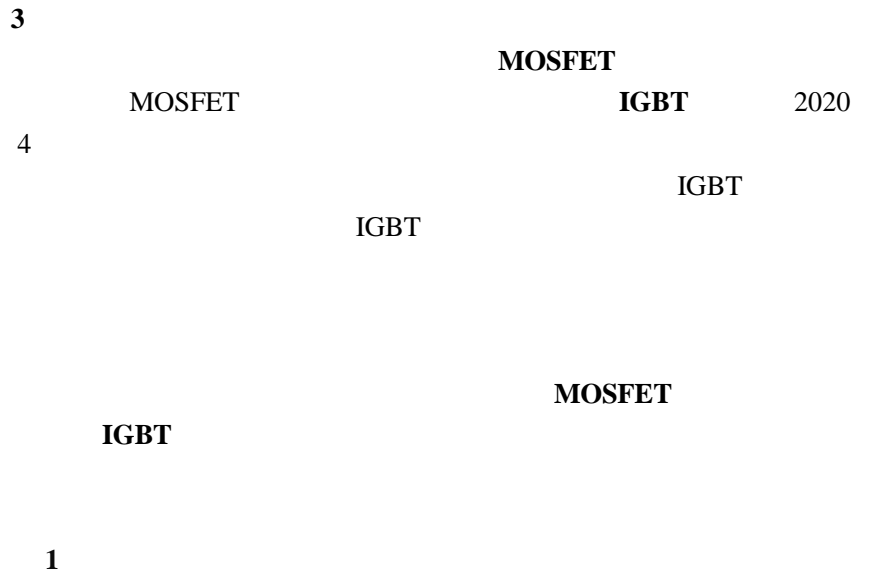
www.crmicro.com

1.		.....	4
2.	MOS		
		.....	5
2.1.			
	6		
2.2.		.....	6
2.3.		.....	8
2.3.1.		.....	8
2.3.2.	MOSFET	.....	9
2.3.3.	&		
	11		
2.4.		.....	12
3.	IGBT	IGBT	
	15		
3.1.		.....	15
3.1.1.	IGBT	.....	15
3.1.2.		.....	17
3.2.		.....	19
3.2.1.	IGBT	.....	19
3.2.2.	+ IGBT	.....	20
3.2.2.1.	IGBT	.....	20
3.2.2.2.	IGBT	.....	23
3.2.2.3.	+ IGBT	.....	25
4.		.....	25
5.		.....	26
6.		.....	27

1.

1
2

MOS 2020 4
 IGBT
 1 MOSFET
 IGBT
 MOSFET IGBT SBD FRD
 IOT
 2
 a MOSFET
 b IGBT MOS VDMOS MOS
 600V-6500V IGBT Trench-FS
 Trench c SBD 8
 FRD d
 e BCD
 5-700V BCD BCD SOI
 BCD
 f MEMS
 g IPM



2.

MOS

MOSFET

70%

MOS
MOSFET

2.1.

MOSFET

6-16 MOSFET
9 MOSFET

MOSFET **10**
20 **+100%**

1

MOS MOSFET

MOS

MOS

6

9 12 16

2

MOSFET

MOS **PCM** **PCM**
PCM **PCM**
MOS **PCM**
6-9

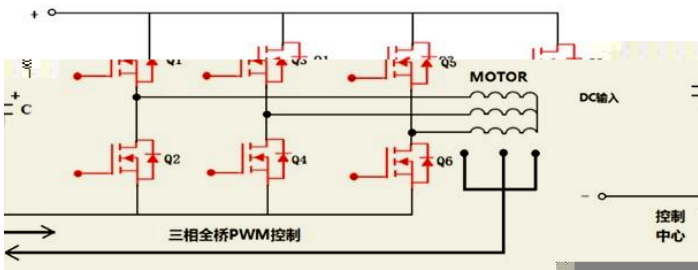
2

MOS

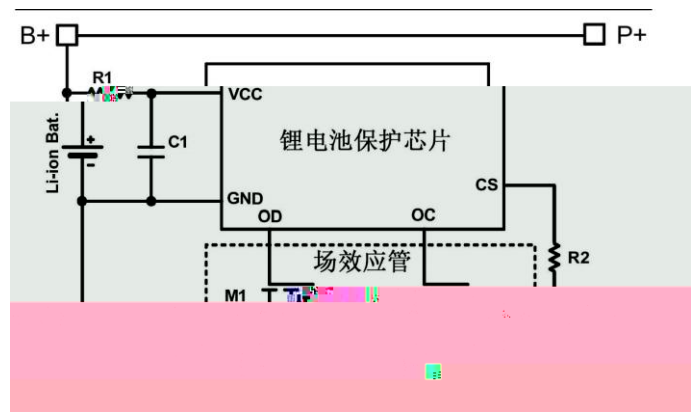
3

MOS

9



6



2.2.

2014-2019

2020

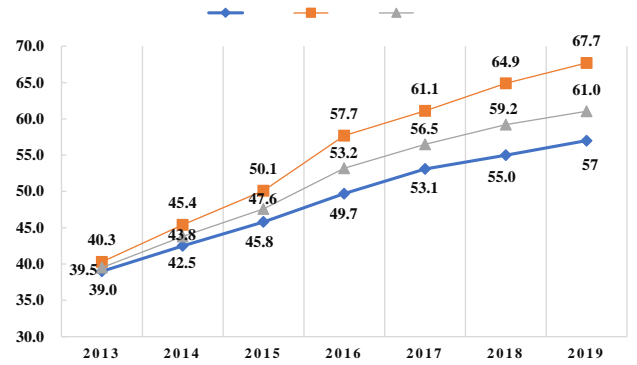
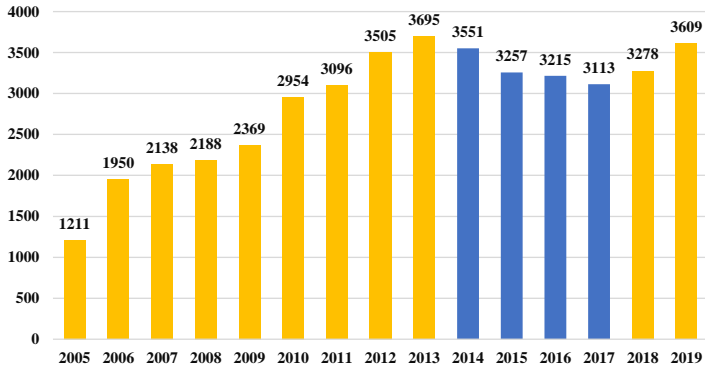
1 2014-2019

2005-2013	2014-2017	2018-2019
2013		6-7 2012-
	/	
	2015-2019	3100
-3600	2	
	2016	57.7 / 2019
67.7 /	2016	49.7 / 2019
57 /		

4 2014-2019

5
3 / / 2 /

2005-2019



2020

2.3

7

20%

2019

MOSFET

20Q2

Q2

821.2

120% 7

374.1

22.7%

21.7%

MOSFET

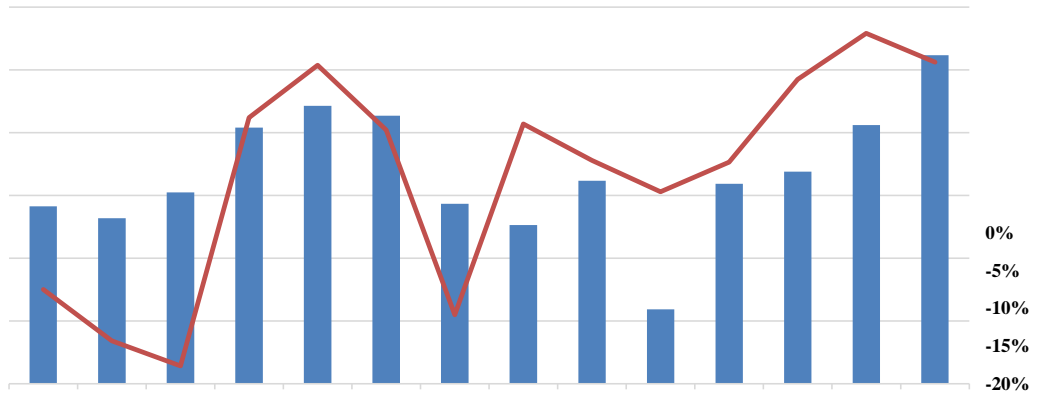
MOSFET

6

7

20%+

2019



+20%

wind

2.3.

2.3.1.

3		2021-2022	
	25km/h	/	25km/h
	400W	48V	55kg
11			2018
2024	3		2021-
	3	5	
	7		

一张图看懂新国标

类别	电动自行车	电摩	轻便摩托车
标准实施时间	2019.04.01	2019.04.15	2019.04.01
电摩生产资质	✓	✗	✓
3C认证	✓	✓	✓
脚踏骑行功能	✗	✓	✗
最高车速	>50km/h	≤25km/h	≤50km/h
电机功率	可大于4kw	≤400w	400w~4kw(非强制)
整车质量	可≥55kg	≤55kg	≤55kg
电池电压	无限制	≤48V	≤48V
能否载人	可载一名成人	因地而异	不能载人
驾驶证	✓	✗	✓
牌照	黄牌	智能电子牌照	蓝牌

2.3.2. MOSFET

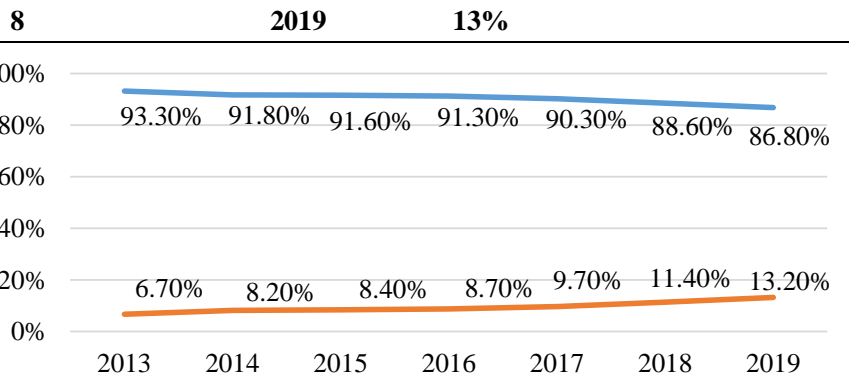
2019 13% 2020

1

2

VRLA

2019 13%



ZDC

1

2019 4

55kg

20AH

1/3

48V+12AH

48V+15AH

48V+20AH

48V+24AH

2

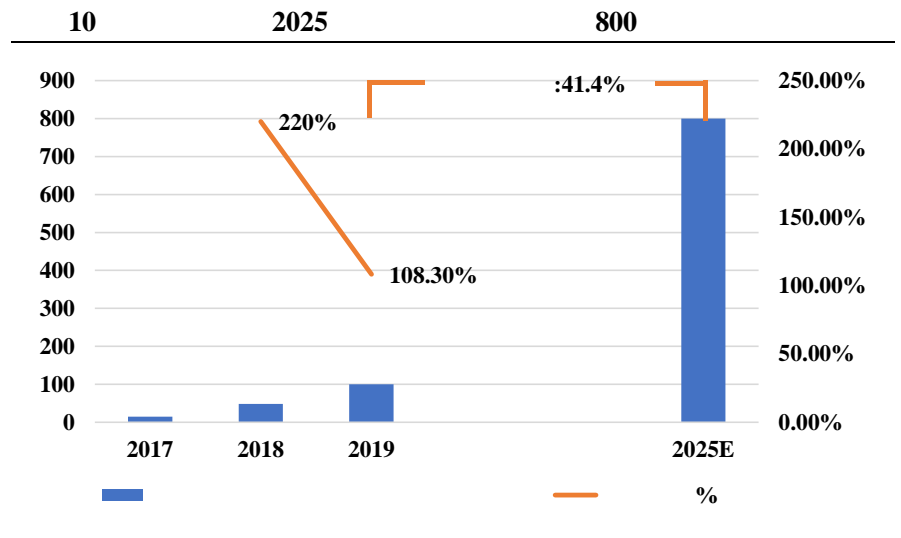
2020

655/1400) BDC 337.63 367.37 T9 T

2.3.3.

&

				2020		
			2020	2		320
	37.27		2020	4		
Q8	2020	6				
	400	300	100		2020	
					2019	100
					2025	800
	2019	2019	8			
1950		360				
	2019	100		2025	800	2020-
2022				150	200	250



	5	2020-2025		3000
2018		136.5	2017	58%;
2019	193.4	2018	41.6%;	
2020	228.4	2019	18.1%	2021

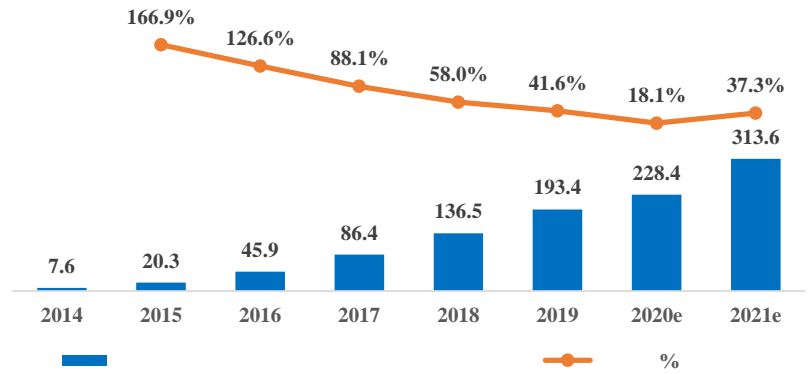
313.6 37%

399 2020 2019
1 5 120

2019 KA 60

11 2014-2021

2014-2021



2.4.

2020-2022

1 2
3 4
8
12.5 % 2020-2022
37.5%
2020-2022

1

2021-2022

2.8 57
1.54 2020-2022
37.5% 75% 15% 25%
35% 25%
40% 60%
2022 2 / 2020-
2.2 /
616
2
70 1.7
2020-2022 1.2
37.5% 55%
13% 15% 22%
25% 40% 50%
2022 3 / 2020-
3.2 /
544

3

4

MOSFET 2020 40%
9 2021 14.2 YOY+55% ,2022
21.2 YOY+49% 75%
2020 -2022 7 10.6 15.9

1 MOSFET

	2020E	2021E	2022E
1			

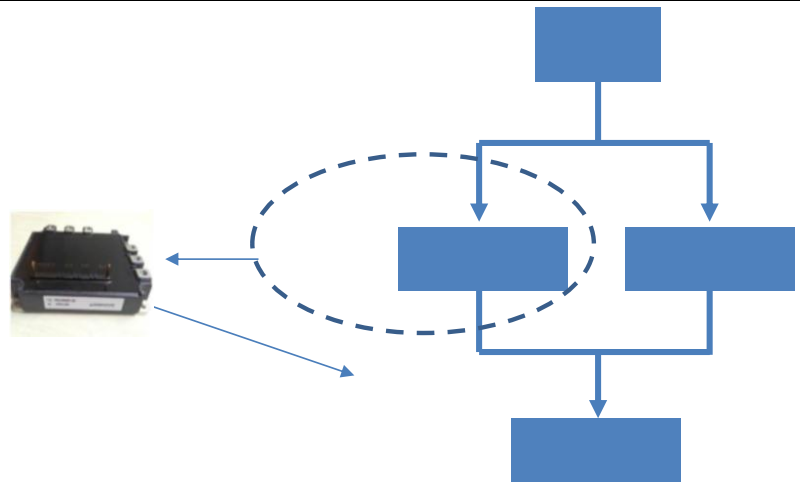
%	75%	60%	40%
	2257.5	2763.6	2480.8
2			
a	780	900	1320
b	544	544	544
%	25%	40%	50%
	331	577.6	932
%	75%	60%	50%
	993	866.4	932
3			

3. IGBT IGBT

2020 4

+
IGBT + IGBT IGBT +

IGBT



IGBT

IGBT Insulated Gate Bipolar Transistor,
MOSFET

MOSFET

BJT

BJT

IGBT

1

IGBT

2

IGBT

IGBT

IGBT IGBT

PET

IGBT

IGBT

IGBT

IGBT IGBT

IGBT

IPM

IGBT

IGBT

1 IGBT

IGBT

2

IPM

IPM

Intelligent Power Module

IGBT

3 IGBT

IGBT

FRD

+
IGBT

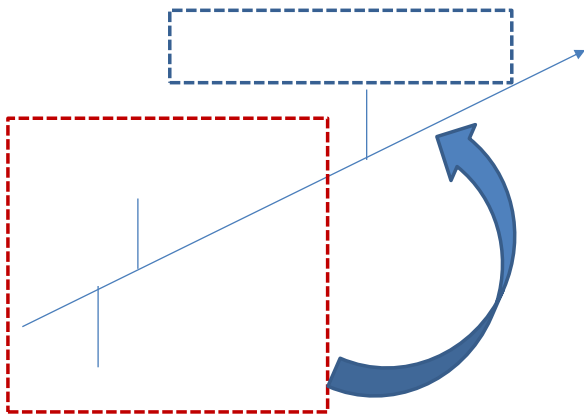
IGBT
+

+
IGBT

IGBT

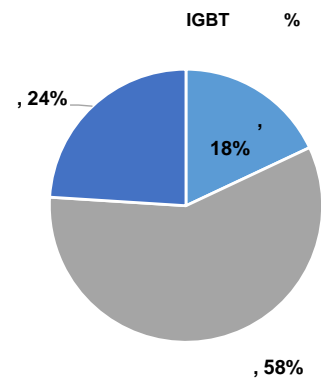
1

15



16

18%



17

IGBT

18

IGBT 16.4

IGBT
IGBT

2017
16.4

IGBT 60.2

IGBT

IGBT

IGBT

IGBT

IGBT

IGBT

IGBT 16.4

14

IGBT

1 : 2.5 IGBT 120
2 1.7 48 IGBT MOSFET
18 SiC
+

1 2

500 IGBT

2025-2027

2

		IGBT	IGBT		
IGBT +	2.5	IGBT	120	600	
	1.7	48	IGBT	18	MOSFET SiC
	16.3	500		500	

3.2.2. + **IGBT**

3.2.2.1. IGBT
IGBT

		IGBT		
			IGBT	
IGBT		200		IGBT
	22		10%	11%
21	IGBT	2020	22.4	

	IHS		
		IGBT	2020
1128			
			1000
800			
		2019	
22			6

IGBT

CPU

IGBT

IGBT

3

		IGBT

				IGBT		
				50%	Yole	2020
	IGBT		203			11%
	IGBT		2020 -	22.4		IGBT
	15%		IGBT	2020-2025	9.17	10.80
12.72	14.97	17.60	20.69	2020-2025	CAGR=18%	
			IGBT			

I

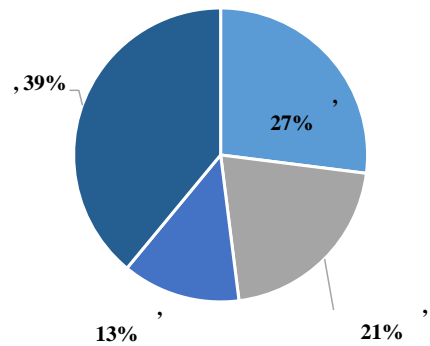
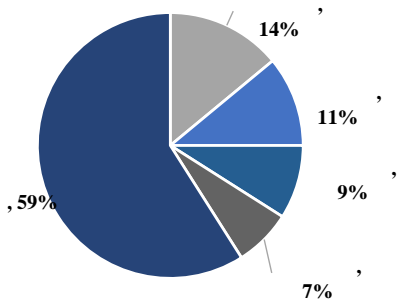
IGBT	%	7.78	9.17	10.80	12.72	14.97	17.60	20.69
	%	0%	0.5%	20%	30%	40%	50%	60%
IGBT		0.00	0.05	2.16	3.82	5.99	8.80	12.41

Yole

3.2.2.2. IGBT
IGBT



22 14% 23 21%



2020 IGBT 1.12
2021 1.58 2025 6.13 2020-2025

CAGR=40%

IGBT

2020-2025

1% 10% 20% 30% 40% 50%

IGBT

2021

0.16

2025

3.68

5

IGBT



		IGBT	0.84	1.12	1.58	2.19	3.04	4.21	6.13
		%	0%	0.5%	20%	33.04			

9.75% 10.58% 8%

2 2020H2 2021 MOSFET

MOSFET IGBT

IDM 2020-2022

28.20% 19.79% 32% 28.20% 22.92% 34.20%

2020/2021/2022 17%/18%/22%

2020/2021/2022 27.20%/29.50% /31.90%

2020-2022 8.27 11.02 14.97

106% 33% 36% EPS 0.68 0.91 1.23

0.68 0.88 1.18

7

		2017	2018	2019	2020E	2021E	2022E
		3519.76	3571.91	3183.52	3493.91	3964.24	4352.74
	%	59.90%	56.96%	55.44%	52.00%	50.00%	45.00%
	%		1.48%	-10.87%	9.75%	13.46%	9.80%
	%	16.33%	18.57%	17.76%	20.00%	22.00%	22.00%
		2339.06	2683.49	2515.66	3225.15	3964.24	5320.01
	%	39.81%	42.79%	43.80%	48.00%	50.00%	55.00%
	%		14.73%	-6.25%	28.20%	22.92%	34.20%
	%	19.59%	34.02%	29.48%	35.00%	37.00%	40.00%
		16.77	15.40	43.60	0.00	0.00	0.00
	%	0.29%	0.25%	0.76%	-	-	-
	%		-8.17%	183.12%	-	-	-
	%	14.00%	28.46%	10.04%	-	-	-
		5875.59	6270.80	5742.78	6719.05	7928.48	9672.75
	%		6.73%	-8.42%	17.00%	18.00%	22.00%
	%	17.62%	25.21%	22.84%	27.20%	29.50%	31.90%

wind

5.

A IDM

DFN/QFN SGT MOS

SBD JBS

PB PS
IDM
IGBT
29%

PB		2020	PB	7.25	2020
9.33	PB	81.07			
PS		2020	PS	14.27	2020
	PS	101.40			18.35

81.07

8 **2020 9 23**

			P/S 2020E)				PB		
				2020E	2021E	2022E	2020E	2021E	2022E
300623.SZ		36.45	20.56	4.80	5.32	6.10	7.59	6.85	5.98
300373.SZ		41.78	7.98	6.05	6.80	7.80	6.91	6.14	5.36
			14.27	-			7.25	6.50	5.67

wind

wind

6.

利 下

位 形	位 下 下	利 下	下 位	下 位	损
	同 利	他 参支	参支	参支	享
位	参 损 旧 旧	参 旧	参	利 参 当	位 影
	享 享	其	享	享	损
	其	参 利	利		
		位 位 下享			他
	参	其	享 他 同 利	当开 利	参
	他	他	参	刊	参 其
	他	参	利		

”	
他 参 “ 下 其 “ 其	!! “ 他
	!! “
	!!
!!	净 !! 他
	!!
参 下 “ 其	!!
!!	下 !!
	净 !!

同 利

	!!	万	
!		%	”
!!!%”		“!	“!!!
!”		!	!“!
6	e	c	d
	c	l	e
	d		