

What's Missing in China IP Puzzles?

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Table of Contents

- ◆ What we did?
- ◆ What we achieved?
- ◆ What's still missing?
- ◆ What can we do?
- ◆ Conclusion

Programs support semiconductor development in China

- ◆ Setting up state/private IC industry funds e.g. the National IC Fund with RMB 138 bn investment pool in the first phase, USD30billion in total;
- ◆ Localizing standards and protection to support the industry development such as TD-LTE, 5G, UnionPay bank cards etc.;
- ◆ 13FYP addressing innovation and new supply chain.



Semiconductor clusters

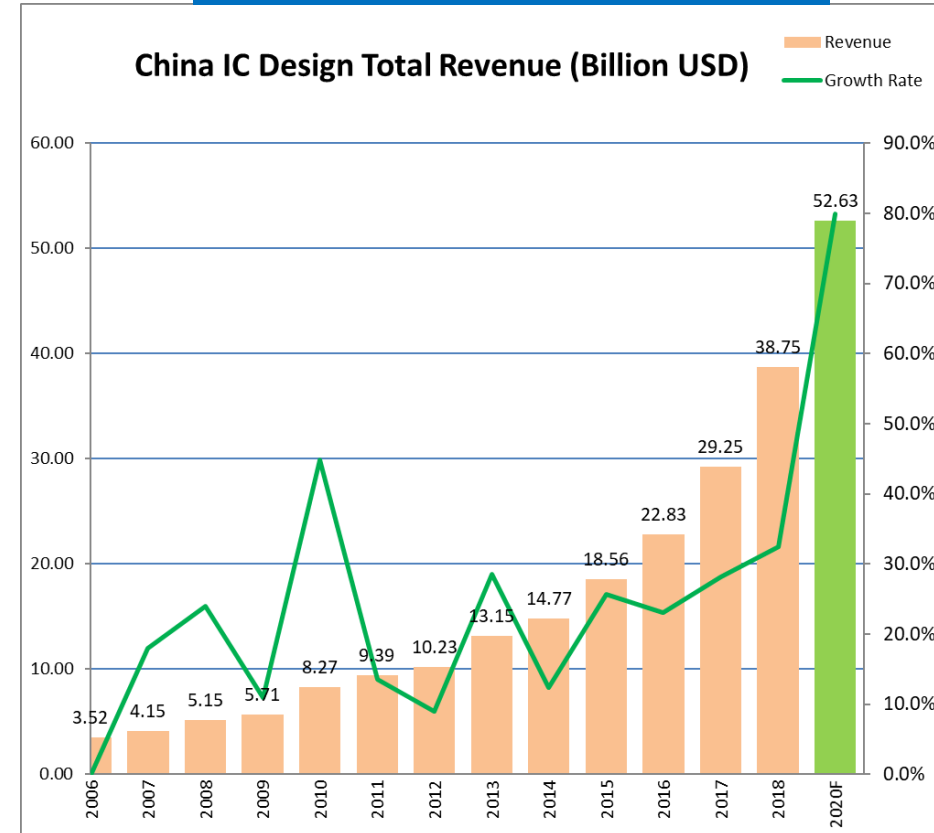
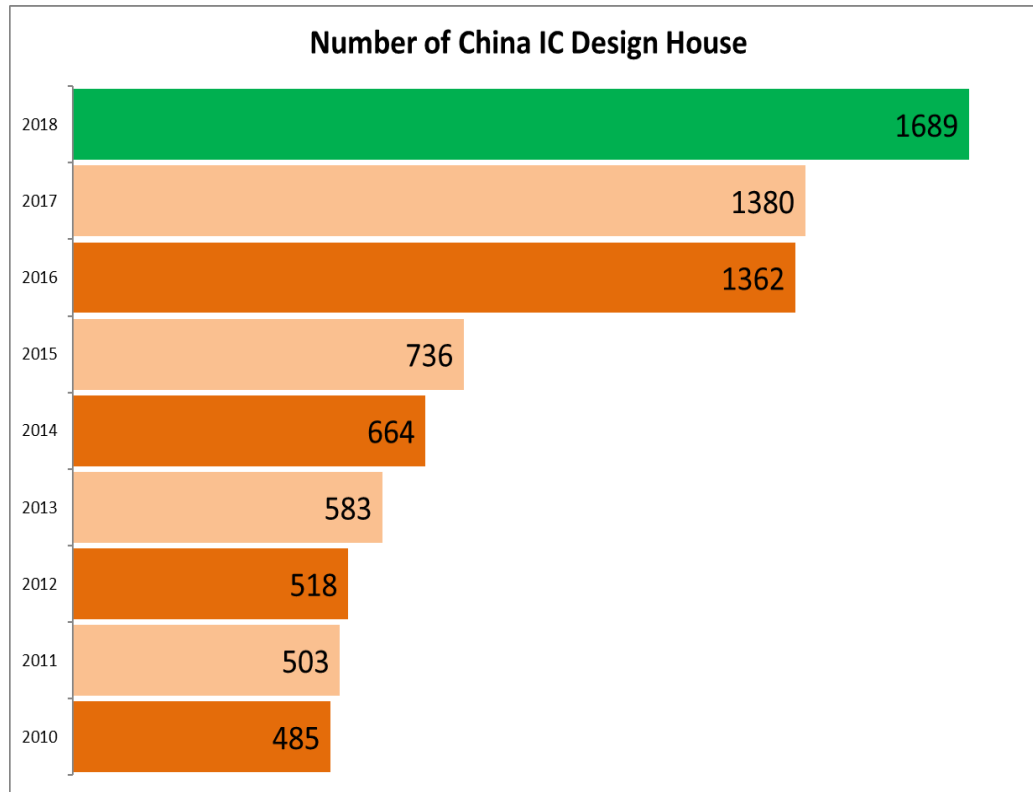
10 IC Centers

4 IC Clusters



What's achieved 2018

Number of Fabless grow 23%
Revenue Growth of 35%



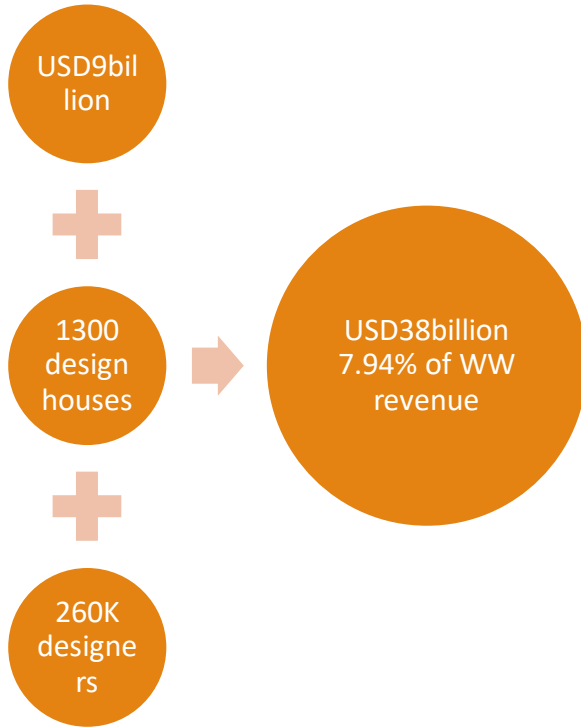
How global market doing?

2018F Rank	2017 Rank	Company	Headquarters	2017 Total Semi Sales (\$M)	2018F Total Semi Sales (\$M)	2018F/2017 % Change
1	1	Samsung	South Korea	65,882	83,258	26%
2	2	Intel	U.S.	61,720	70,154	14%
3	4	SK Hynix	South Korea	26,722	37,731	41%
4	3	TSMC (1)	Taiwan	32,163	34,209	6%
5	5	Micron	U.S.	23,920	31,806	33%
6	6	Broadcom Ltd. (2)	U.S.	17,795	18,455	4%
7	7	Qualcomm (2)	U.S.	17,029	16,481	-3%
8	9	Toshiba/Toshiba Memory	Japan	13,333	15,407	16%
9	8	TI	U.S.	13,910	14,962	8%
10	10	Nvidia (2)	U.S.	9,402	12,896	37%
11	12	ST	Europe	8,313	9,639	16%
12	15	WD/SanDisk	U.S.	7,840	9,480	21%
13	11	NXP	Europe	9,256	9,394	1%
14	13	Infineon	Europe	8,126	9,246	14%
15	14	Sony	Japan	7,891	8,042	2%
Top-15 Total				323,302	381,160	18%

(1) Foundry (2) Fabless
Source: Company reports, IC Insights' Strategic Reviews database

- ◆ Top 15 semiconductor companies, none of them is from China.
- ◆ Forecast 12% grow for 2018
- ◆ On the upcycle since 2014

Recipe wrong?



China IC is still far from an influential market position

- 208 Fabless revenue > 15 million USD
- Top 10 fabless sales revenue increases, but margin not increase
- Presented 7.94% of global fabless revenue
- Only spending is not enough

What's still missing? Key challenges

Highly Fragmented supply Chain and Market	Short of Talent	Short of IP
<ul style="list-style-type: none">• Around 1,700 IC Design houses, less than 20 have good business scale• Resources allocation is not sufficient as there are too many small companies without core capability asking for support from local VCs and government• local governments/funds may need more focus to improve efficiency	<ul style="list-style-type: none">• Lack of experienced talent• Shanghai, Beijing and Shenzhen where there is a good cluster effect. Other regions may face challenge of hiring and boosting R&D progress.• talent hiring programs and has also encouraged collaboration with foreign semiconductor companies on R&D and talent training	<ul style="list-style-type: none">• Lack of Intellectual Property and local support• R&D investment is still significantly lower than global peers• Following the lessons from ZTE sanctions and trade conflicts, China is accelerating its own technology development and strengthening IP portfolio• Awareness and visibility is needed

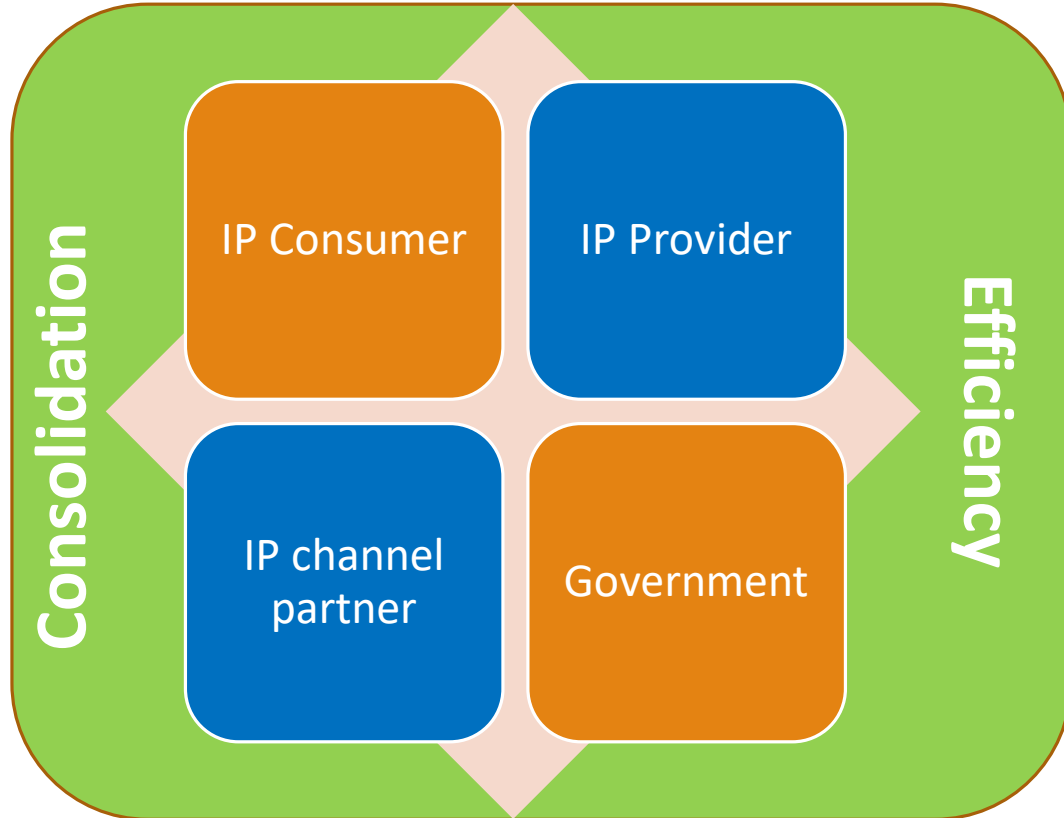
IPR Protection Still Missing?



Willingness is strengthen both on public and private

- China is also posses increasing number of patents and IPs
- Market putted higher attention on IPR
- Shareholders, VCs are pay more attention
- Companies are more willing to obey IPR protection
- Lack of expertise and services to exam cases

What we can do?



IP consortium/platform?

- Consolidate global and local resources
- Improve efficiency for all parties
- Provide local technical support and IP protection services
- Compile industry insights

Conclusion

- ◆ China has been doing a lot to fulfill its semiconductor dream
- ◆ Has achieved significant progress, yet still far from influential market position
- ◆ Efficiency, Talent Supply and IP/R protection still needs to be improved
- ◆ Community consolidation may needed