30 Jul
2019

Asian companies will drive growth in semiconductor IP

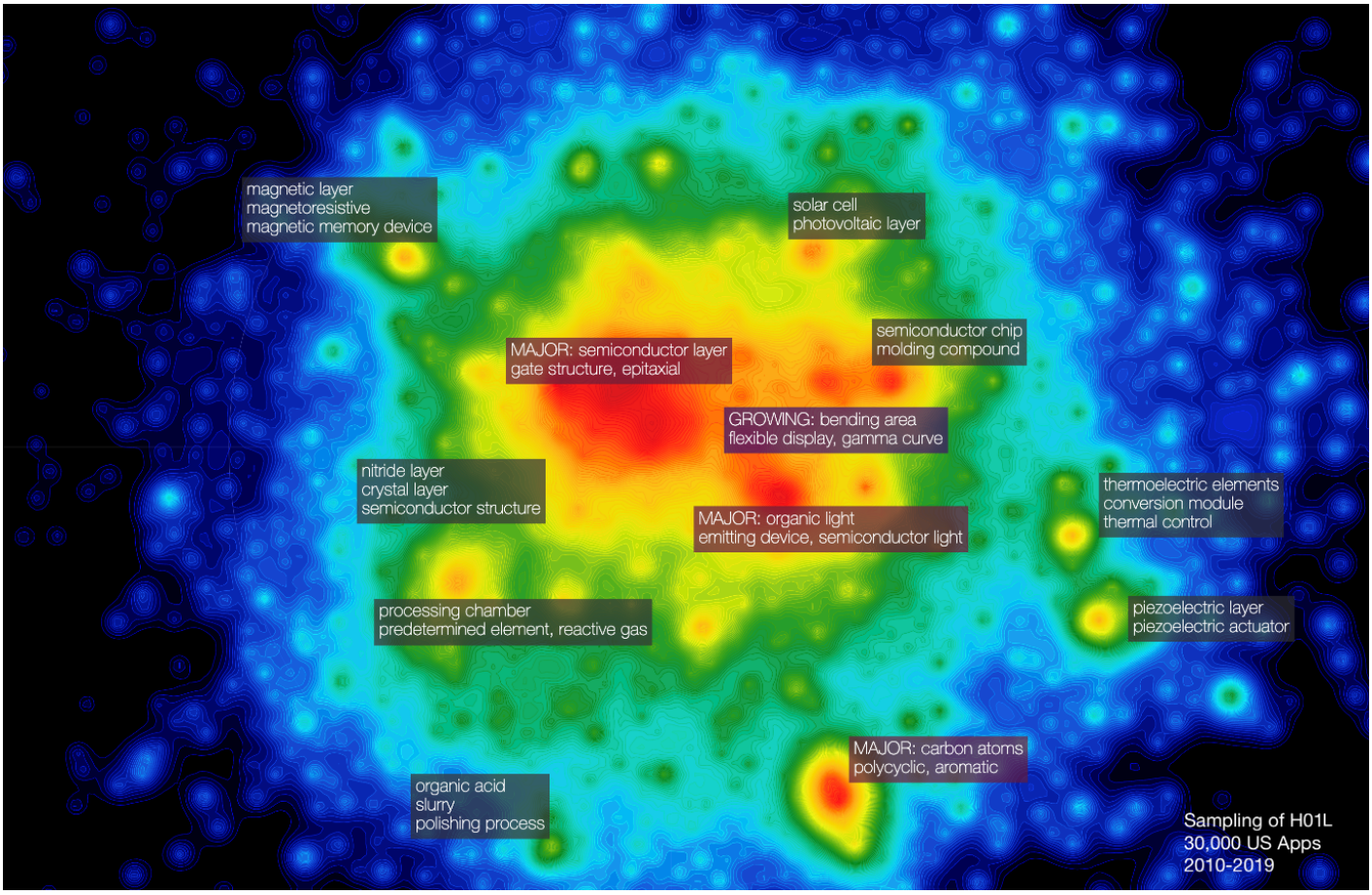
The global semiconductor market is **projected to grow** at a rate of 8.8% between 2018 and 2026.

But despite this outlook, the most recent data shows that the filing of new patent families relating to semiconductor technologies is in decline.

We have conducted an analysis of the overall semiconductor patent landscape, singling out some of the major players to understand how their holdings in this area have developed.

Industry Trends and Key Players

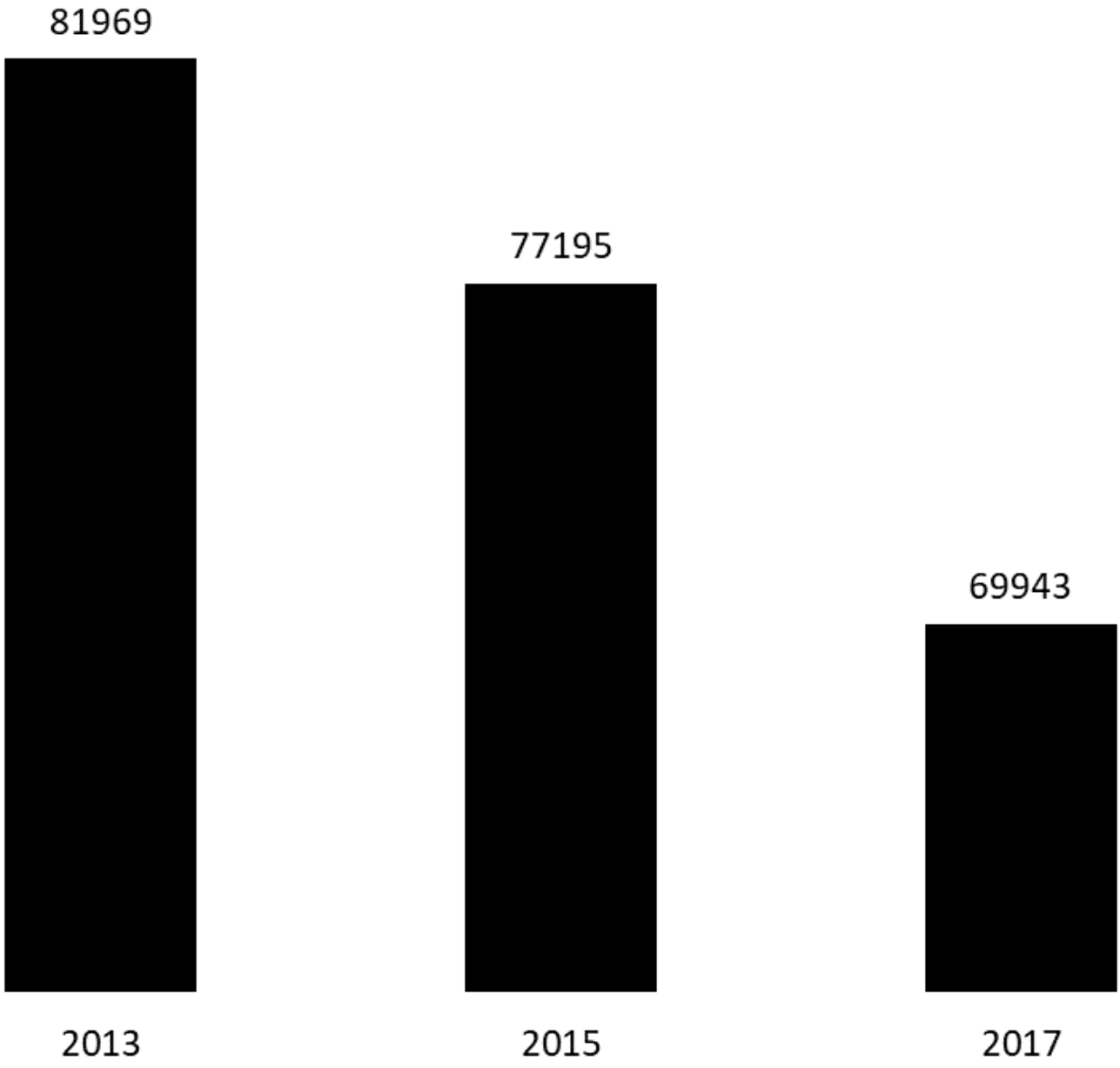
Valuenex undertook an analysis of 30,000 US applications where H01L (semiconductor devices; electric solid-state devices not otherwise provided for) was the primary IPC. The data was pulled from 190,087 USPTO applications from 1st January 2010 to 22nd July 2019.



*Source: VALUENEX, see full size image **here***

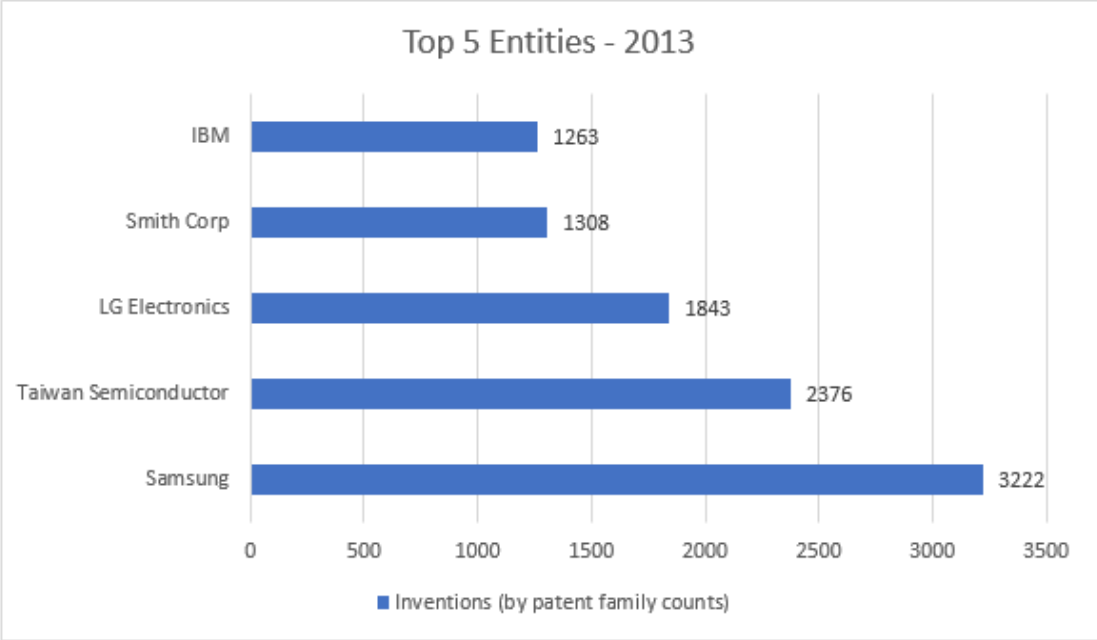
The industry has not seen a clear directional shift, but has evolved in a relatively balanced way, according to Valuenex analysis. The top filer from the sample was IBM, followed by Toshiba and Samsung.

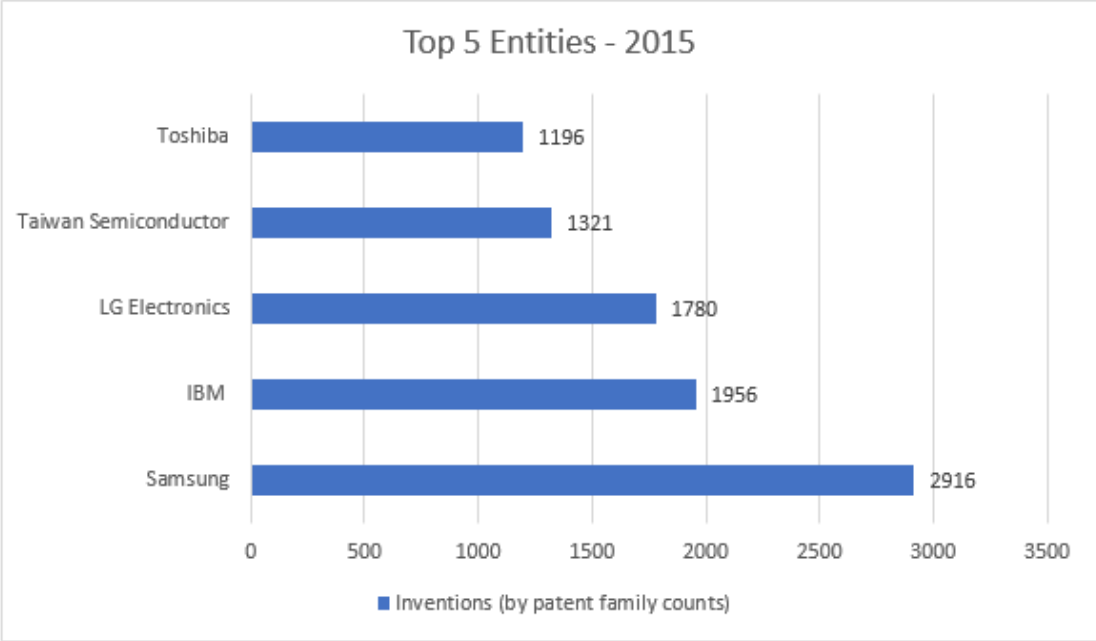
Filings relating to semiconductors have been on a decline globally. The graph below shows the new families with priority filings in 2013, 2015 and 2017.

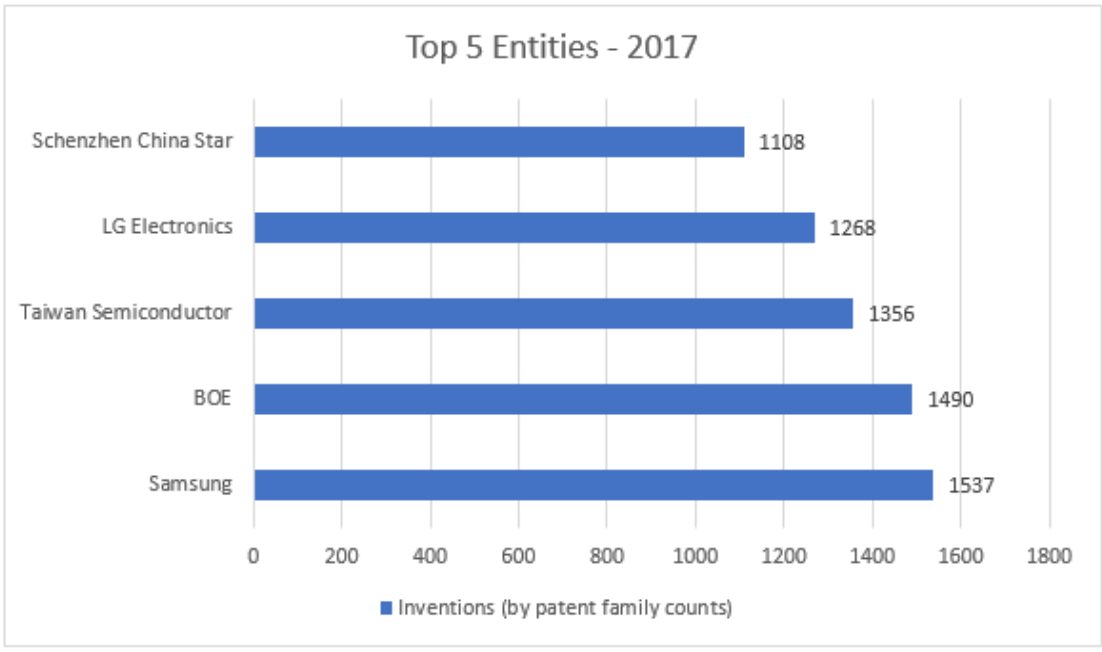


*Source: **Derwent, a Clarivate Analytics company***

Samsung has continuously been a prolific filer of semiconductor patents and topped the charts in 2013, 2015 and 2017 (see graphs below). BOE, a Chinese company, appeared in the top 10 in each year examined. Its activity skyrocketed in 2017, allowing it to take second place. Another notable appearance in the 2017 rankings is Shenzhen China Star. Its filings doubled between 2015 and 2017.


Top 5 Entities - 2013
IBM
1263
Smith Corp
1308
LG Electronics
1843
Taiwan Semiconductor
2376
Samsung
3222
0
500
1000
1500
2000
2500
3000
3500
Inventions (by patent family counts)

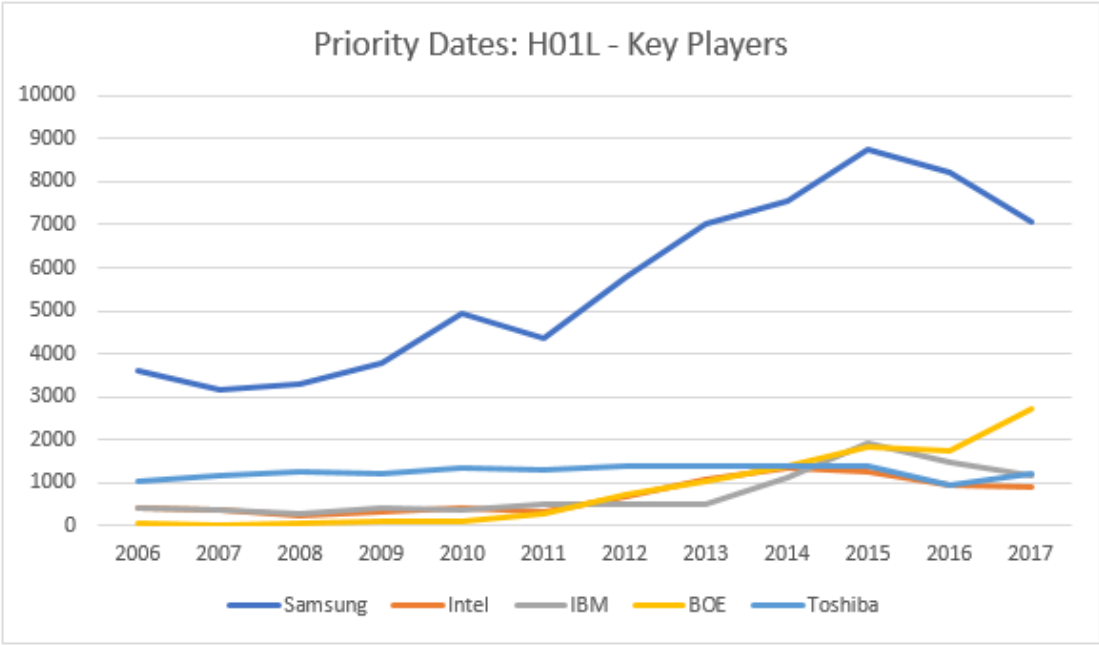

Top 5 Entities - 2015
Toshiba
1196
Taiwan Semiconductor
1321
LG Electronics
1780
IBM
1956
Samsung
2916
0
500
1000
1500
2000
2500
3000
3500
Inventions (by patent family counts)



Source: Derwent, a Clarivate Analytics company

We have done a deep dive into the H01L portfolios of some of the top filers of semiconductor related patents: Samsung, BOE, Toshiba, IBM and Intel. Figure 1 shows the filings of these key players by priority date.

Figure 1



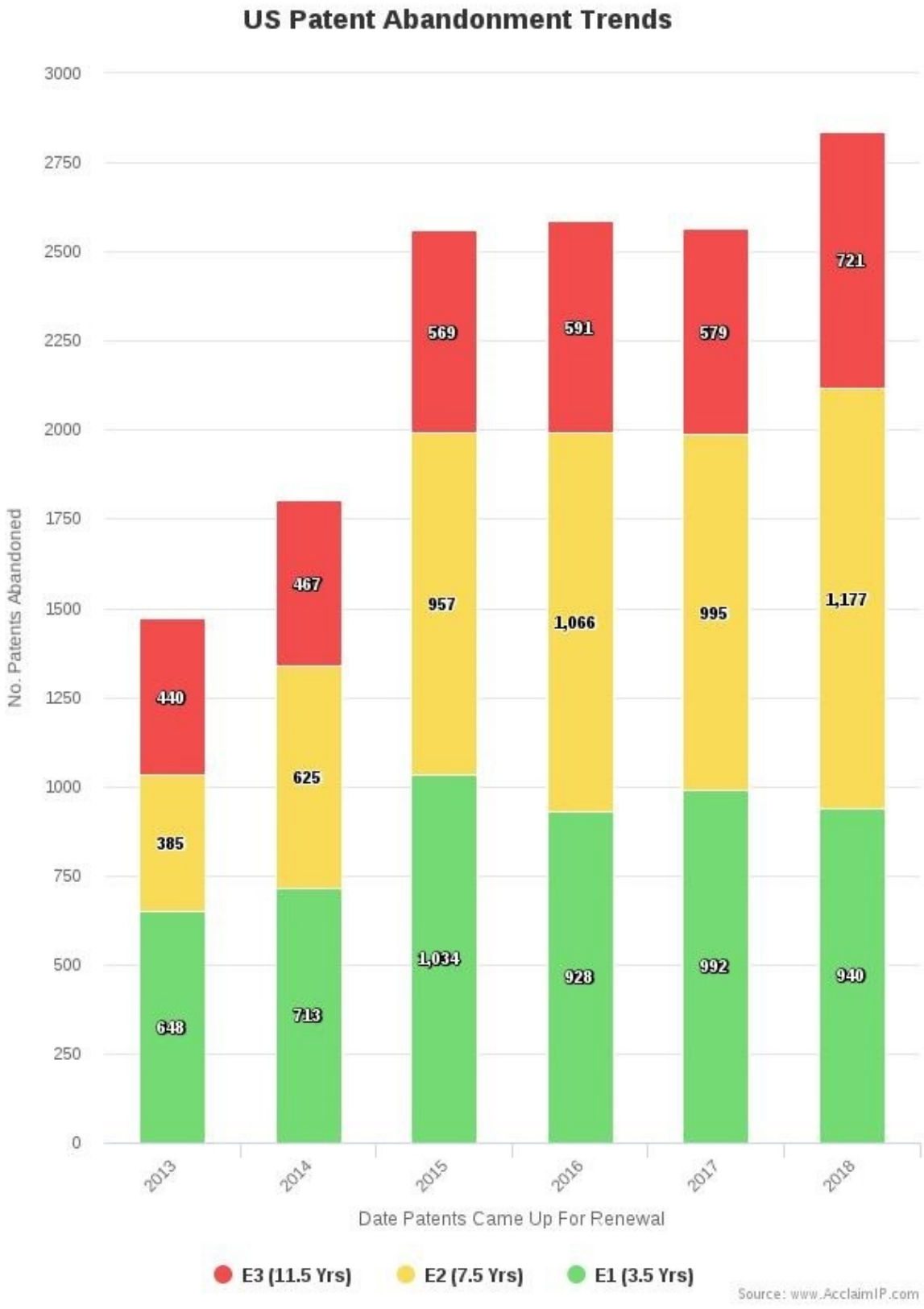
*Source: **Anaqua's AcclaimIP Analytics Software***

Samsung

Samsung is the **second top** semiconductor company in terms of sales. It is a leader in the space based on its patent holdings and filing activity. Although the company is based in South Korea, 39.9% of its H01L holdings are protected in the US. South Korea is the second most used jurisdiction, covering 32.8%.

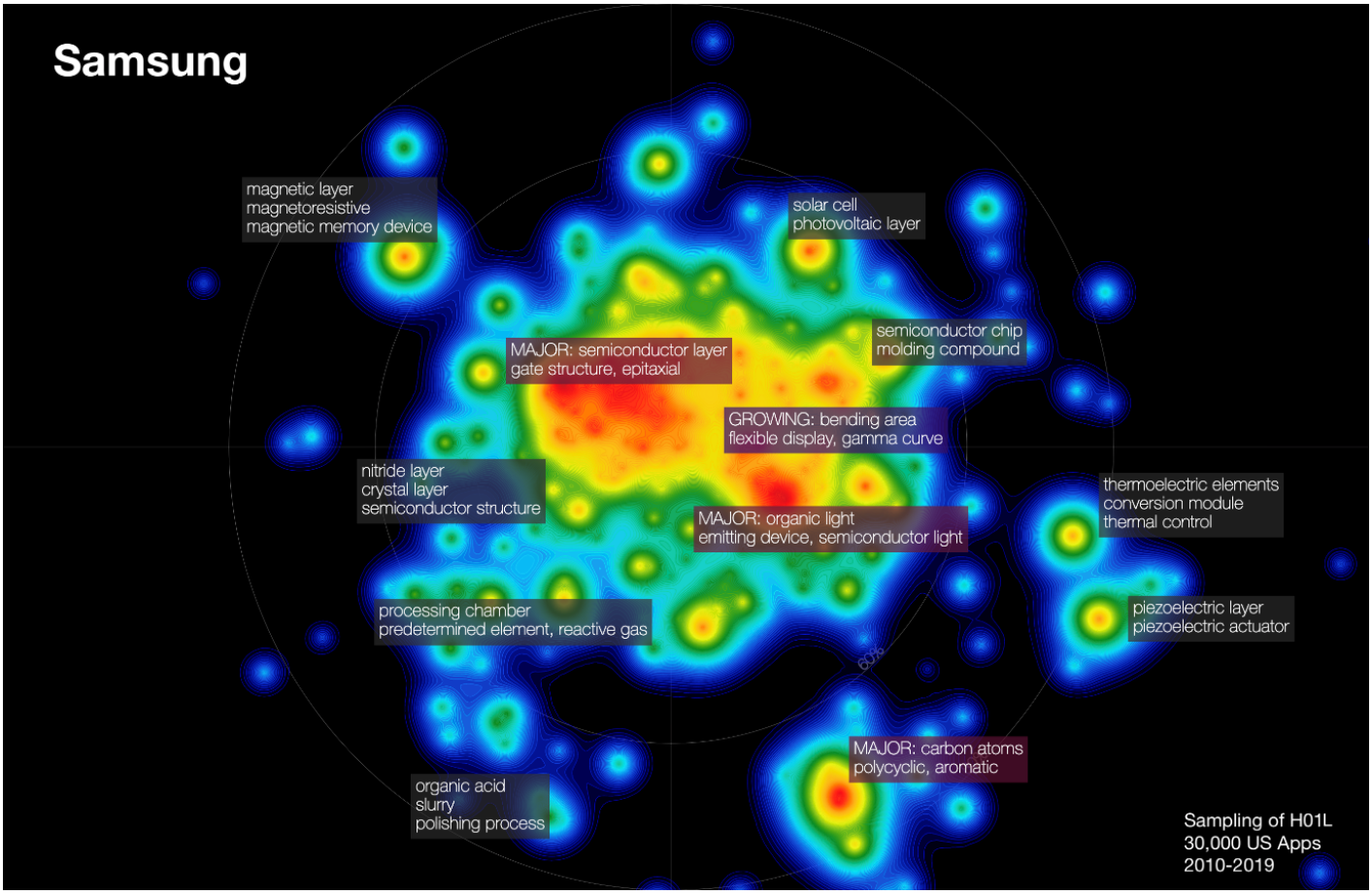
H01L is the most commonly cited IPC code within the portfolio, accounting for 18% of Samsung's entire holdings. It is followed by G06F (electrical digital data processing) and H04N (pictorial communication), representing 13.3% and 9% respectively.

There was a sharp uptick in Samsung's abandonments of US patents in 2015 (see graph below). Semiconductor patents represent 20% of US patents abandoned by the company between 2013 and 2018. A quarter of the patents abandoned in tranche three, which consists of older patents, are cited under H01L.



Source: Anaqua's AcclaimIP Analytics Software

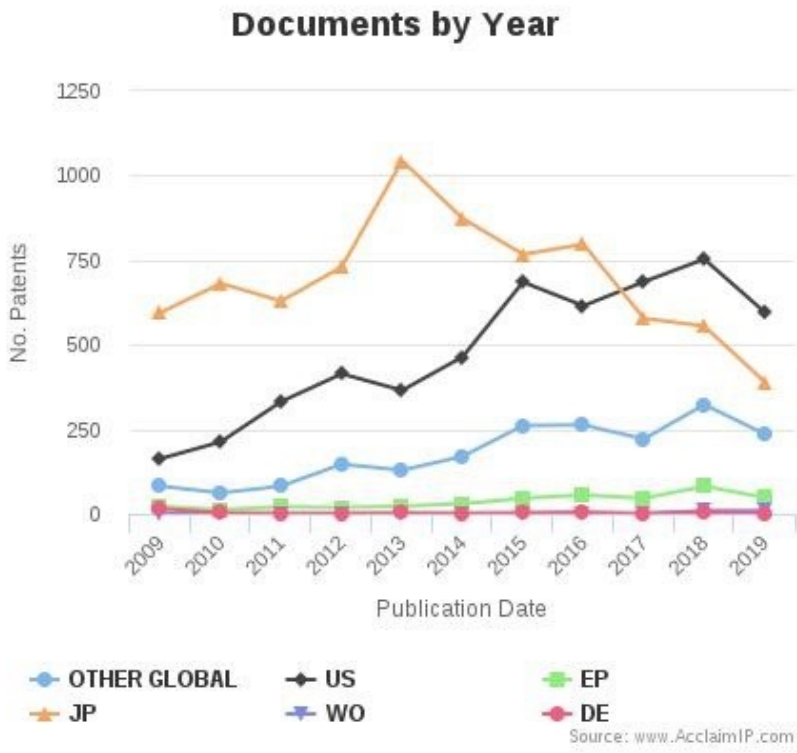
Samsung has developed its semiconductor portfolio across a number of areas (see graph below). Its core technologies are semiconductor layer gate structure, epitaxial; organic light emitting device, semiconductor light; and carbon atoms polycyclic, aromatic. Bending area flexible display, gamma curve, is experiencing the most growth. Both the major and developing technological areas seen in Samsung's portfolio are part of a wider trend, as they also appear in the Intel, IBM and Toshiba landscapes.



Source: VALUENEX, see full size image ***here***

Toshiba

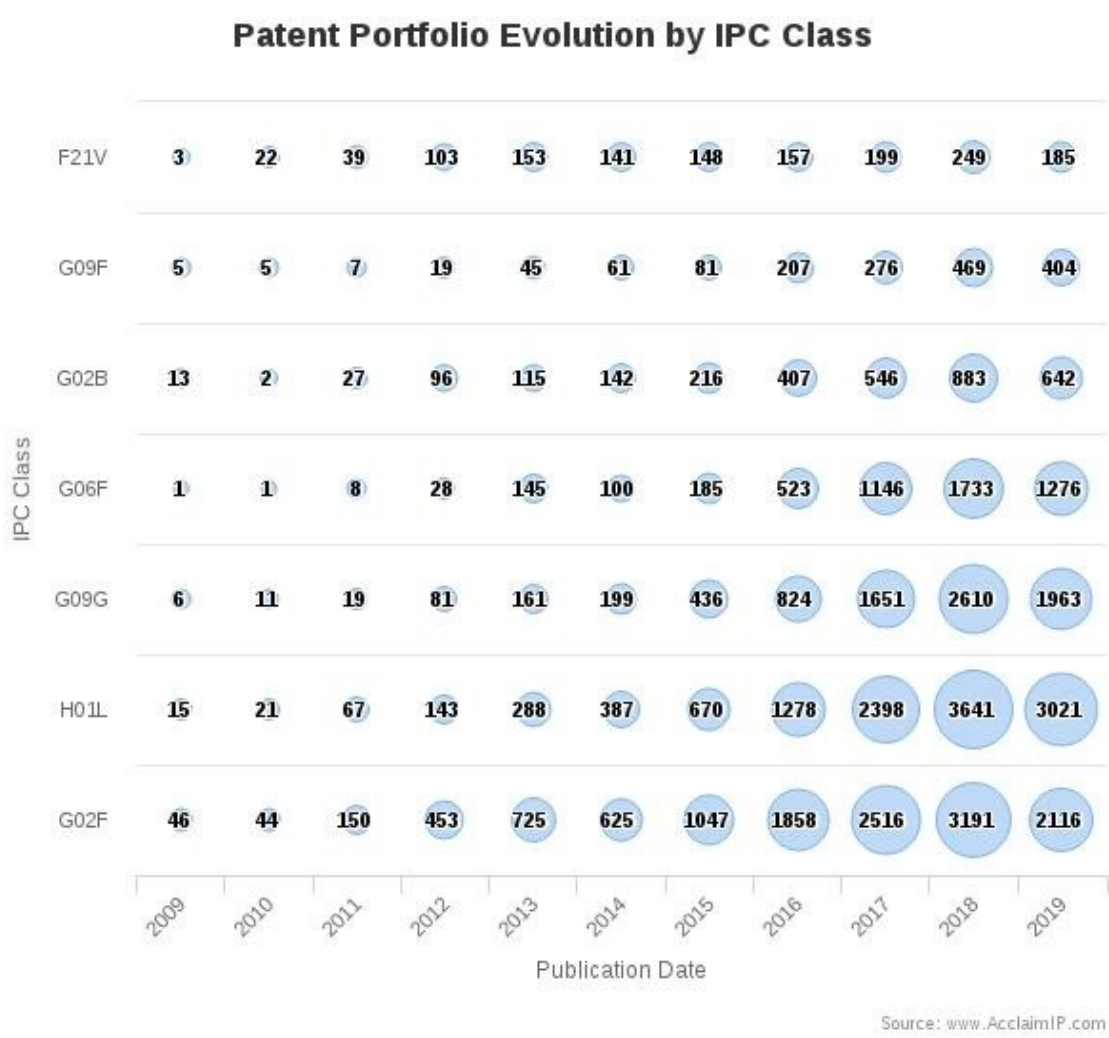
Toshiba is one of the industry's traditional players. Patents reading on semiconductors form a large part of its portfolio, accounting for 19.6% of the company's entire holding. G06F (electrical digital data processing) and H04N (pictorial communication) are the second and third most cited IPC codes, making up 12.9% and 9% respectively. Although a Japanese company, Toshiba's filings of semiconductor patents in the US surpassed those in its home jurisdiction in 2017 (see graph below).



Source: Anaqua's AcclaimIP Analytics Software

BOE

BOE exhibited strong growth between 2015 and 2017 relative to other global players. Its filings under IPC code H01L have shown even more impressive growth within its own portfolio in 2018 and 2019 (see graph below). Although the uptick in filings was relatively recent, H01L accounts for a significant chunk of the company's overall patent holdings, 22.2%. G02F (devices or arrangements, the optical operation of which is modified by changing the optical properties of the medium of the devices or arrangement for the control of the intensity, colour, phase, polarisation or direction of light), makes up a slightly higher proportion of the portfolio at 24%.

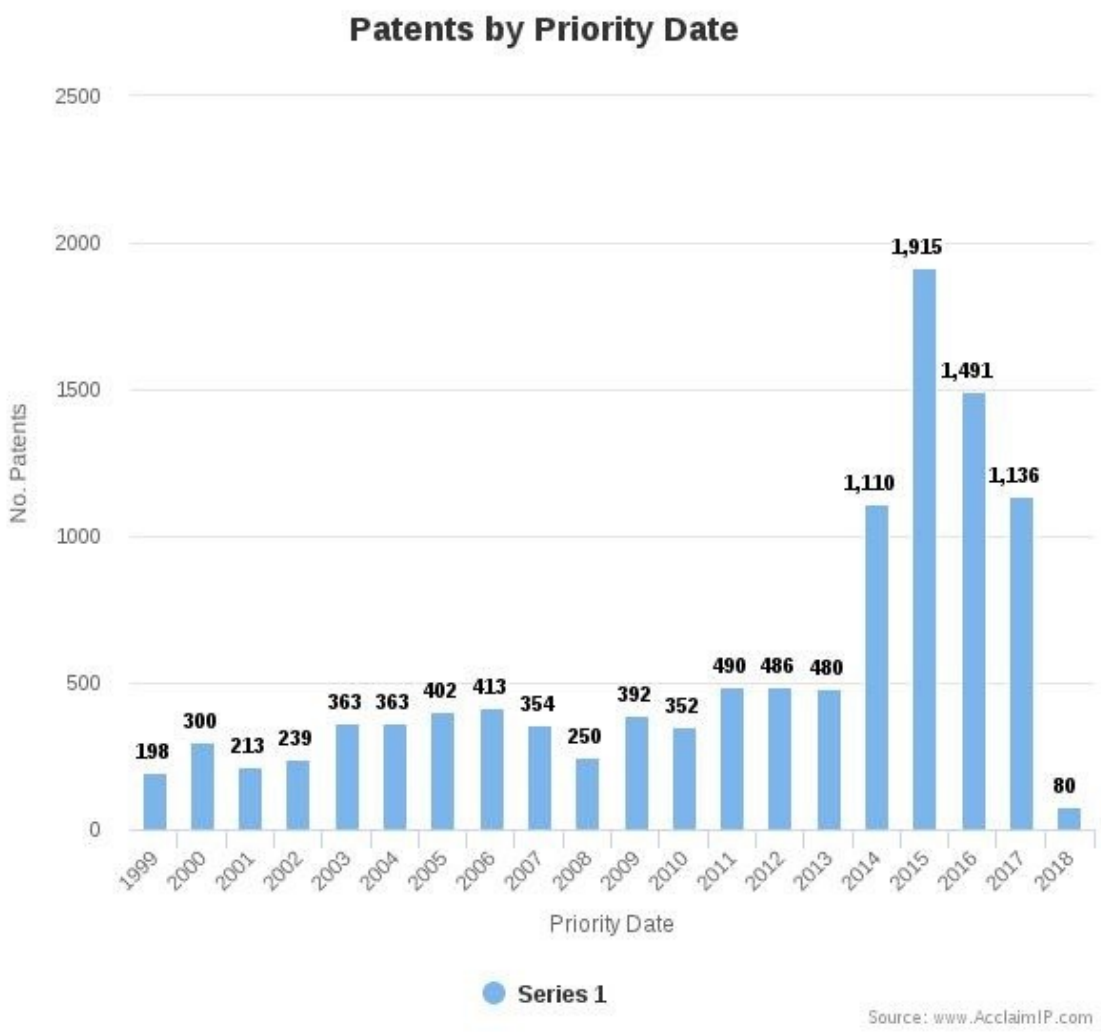


Source: Anaqua's AcclaimIP Analytics Software

Most Chinese companies limit their filings to the domestic level and BOE has filed 58% of its semiconductor patents in China. However, 29.8% of BOE's patents reading on semiconductor technology are filed in the US, while 6.4% have been filed at the EPO and 4.8% via the PCT route.

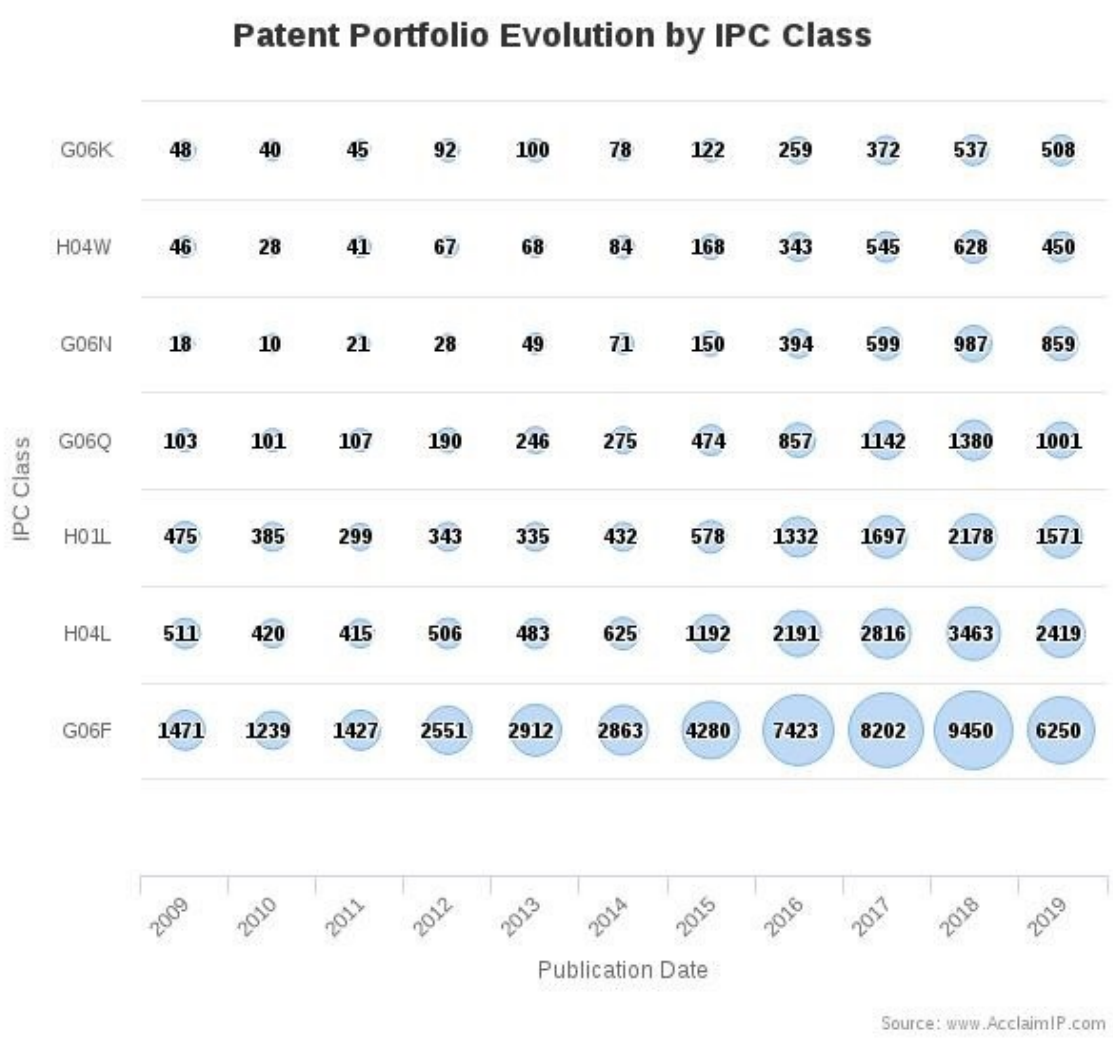
IBM

IBM's activity has tapered off since 2015 (see graph below).



Source: Anaqua's AcclaimIP Analytics Software

Its patents citing H01L are heavily weighted to the US, as is the rest of its portfolio. Although Big Blue is a leader in the semiconductor space, the growth of such patents is minimal compared to the rest of its portfolio (see graph below). G06F and H04L (transmission of digital information, ie telegraphic communication) are far more significant technological areas, accounting for 47.4% and 15.1% respectively. H01L represents 10% of the entire portfolio.

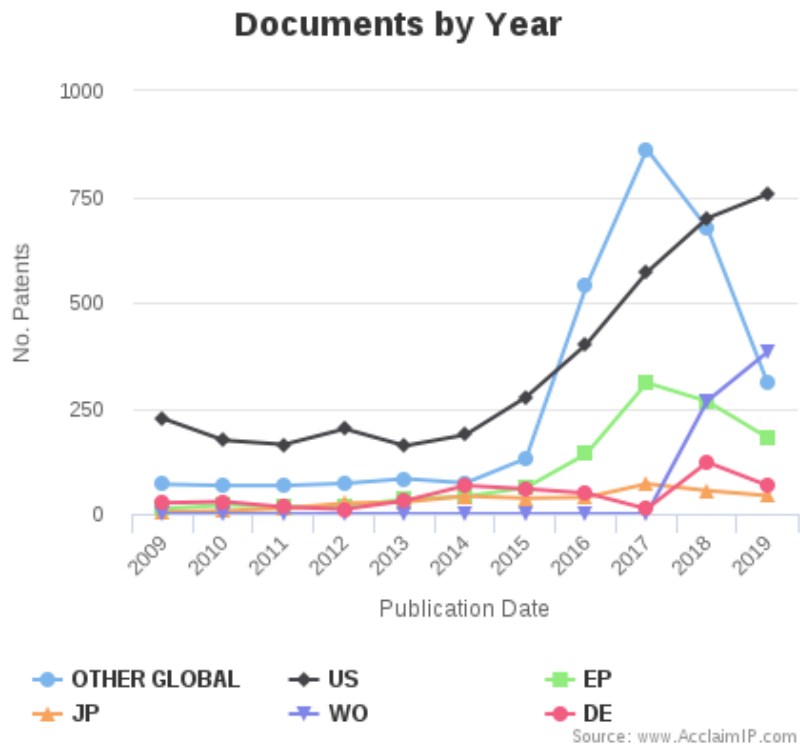


Source: Anaqua's AcclaimIP Analytics Software

Intel

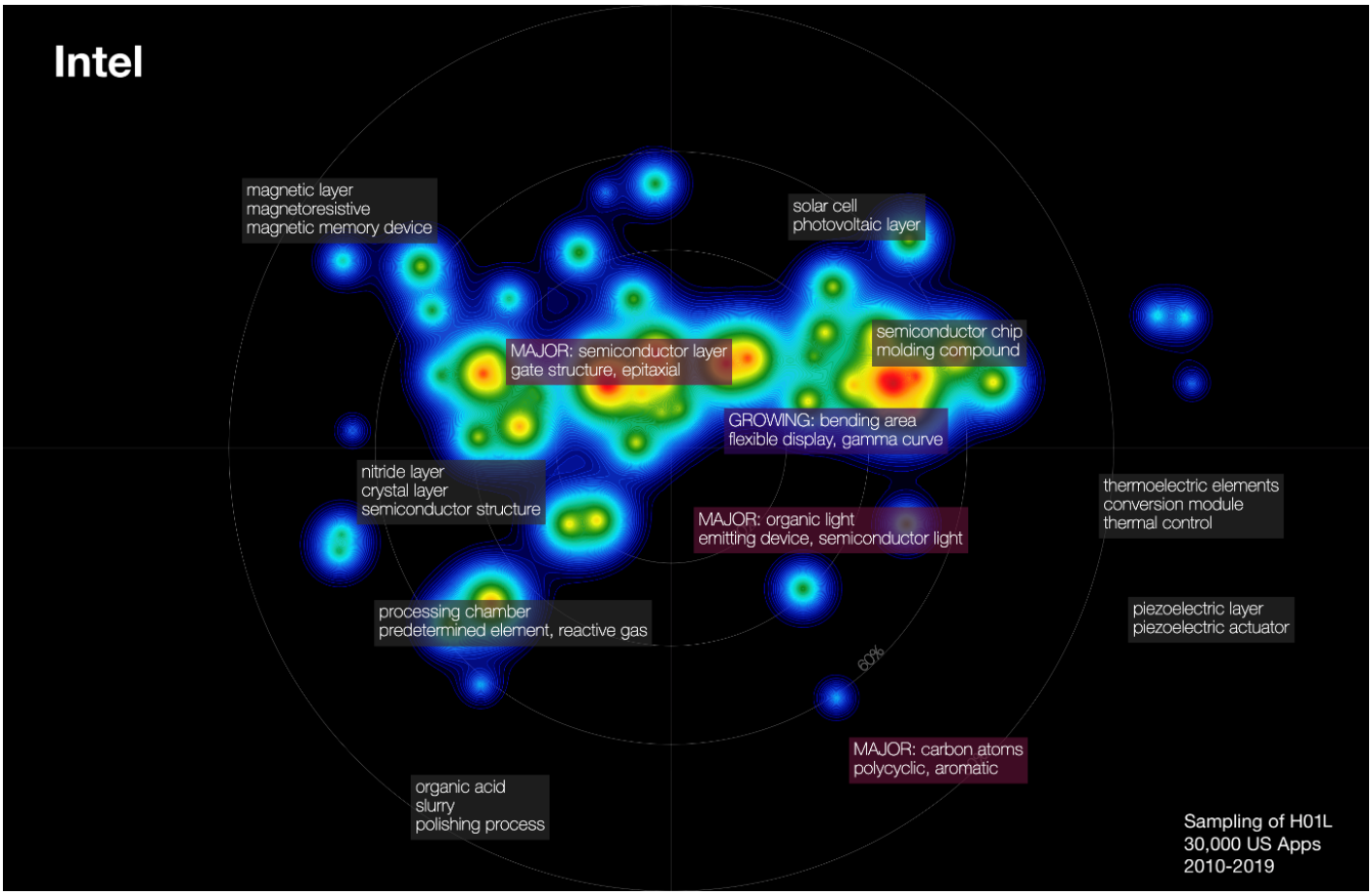
Intel is widely seen as one of the top semiconductor companies. Indeed, **it ranks first** when it comes to sales ($56.31 billion as of 2017). Its patenting activity (by priority date) peaked in 2014 and has since dropped off.

The growth in Intel's filings relating to semiconductors between 2016 and 2017 was largely driven by Chinese applications (see graph below). Recently it has sought more international protection, using the PCT route far more than it has in the past.



Source: Anaqua's AcclaimIP Analytics Software

Intel's semiconductor landscape – especially compared to Samsung's – shows that this technology area is not its number one priority (see graph below). H01L only accounts for 11.2% of the portfolio. It falls behind G06F, H04W (wireless communication networks) and H04L, which make up for 29.9%, 14.4% and 11.7% respectively.



*Source: VALUENEX, see full size image **here***

***IAM says**:*

*The Asia Pacific region is expected to lead the global semiconductor IP market between 2018 and 2026, propelled forward by investments by key companies in the space. There seems to be truth to this prediction based on our data. **WIPO's 2018 Indicators report** showed that the most semiconductor filings between 2014 and 2016 were made by entities based in the Republic of Korea and Japan. Samsung is the clear leader in the industry and while its activity has tapered off in recent years this does nothing to change its position as it continues to focus on the development of semiconductor technologies. Toshiba and BOE are the only companies to have exhibited an increase in filings in recent years, which is worth noting considering that global activity is experiencing a decrease.*

Bridget Diakun

Author | Data Reporter
bdiakun@globebmg.com

TAGS

Market Developments, Patents, Semiconductors, Japan, South Korea, Asia-Pacific, China, North America, United States of America