# Trends in US patent litigation

The electronics industry has been at the heart of the explosion in US patent suits over the past 20 years. It is important not to forget that – before coming to conclusions about overall filing, litigation and licensing activity

#### By Terry Ludlow

Since the creation of the US Court of Appeals for the Federal Circuit in 1982, the value of patents in litigation in the United States has risen rapidly. Technology companies have been a dominant presence and equally, if not more so, in licensing, litigation's clandestine godfather.

The electronics industry requires crosslicences. In its April 2011 Securities and Exchange Commission filings, before its initial public offering, RPX Corporation stated: "Based on our research, we believe there are more than 250,000 patents relevant to today's smartphones." I believe this to be a huge underestimate - there are likely to be around 250,000 patents in a smartphone's main processor chip alone. New products based on microelectronics each incorporate hundreds of thousands of patented inventions, many of which are not licensed by the manufacturer. Freedom to operate requires the gradual acquisition of a sufficient number of cross-licences from competitors and other leading co-developers of the technology in your product. With enough patents in their portfolios, most large companies can find patents that their competitors infringe when circumstances require claim charts - for example, in licensing discussions or litigation and cross-complaints.

Non-practising entities (NPEs), sometimes known as patent trolls, are a major irritant to technology companies. The fundamental nature of electronics technology – based around products that use vast numbers of individual inventions in a single product or chip – makes it vulnerable to the NPE business model. Since NPEs do not require a cross-licence, they are immune to the usual technology company patent cross-complaint.

This article traces a little of the history that has shaped technology litigation and, by inference, technology licensing over the past few decades. It attempts to put today's patent statistics into context from the perspective of the semiconductor and microelectronics business, which continues to be the main battleground in the patent wars.

#### Methodology

Our analysis is based on public information made available through a variety of sources, as well as data that is tracked and compiled internally at my company, Chipworks. We have tracked total US litigations, as well as the litigation activity of 600 semiconductor and electronics companies. We believe that most of the major litigation battles in the United States will involve one of these 600 companies as either plaintiff or defendant. The numbers may be slightly conservative owing to the limitations of the data collection methodology.

#### A brief history of technology licensing

In the mid-1980s Texas Instruments was one of the first companies to realise the value of the revised patent enforcement system in the United States. An established, US-based semiconductor company, it had an impressive portfolio of technology patents, including the Kilby patent for the integrated circuit (rivaling Fairchild's Noyce patents), the Boone patent for the single chip microprocessor (rivaling Intel's claim) and a host of other chip technology patents.

In the early days of the semiconductor industry, competition was intense on a product-to-product basis. Despite considerable second sourcing that helped to establish an industry with standard product specifications, a typical cross-licence agreement was a friendly and simple affair. In the early 1980s it was not unknown for major companies to sign one-page agreements on cross-licensing, with no royalties paid by either side.

Then Japan entered the market, most prominently in the memory business dynamic random access memory was a major battleground. Texas Instruments and other established memory makers felt a significant challenge to their high-volume memory business. Facing a severe loss of market share, Texas Instruments embarked on an ambitious licensing programme that focused on the Japanese memory makers -NEC, Hitachi, Fujitsu, OKI Electric and Toshiba - plus Samsung of Korea. The Asian semiconductor companies were completely unprepared: Samsung Electronics, now the world's second-largest producer of semiconductors, had only one issued US patent at the time. Most of the companies had little in-house experience or no licensing department or experience in-house. Texas Instruments' pressure in the district courts and before the US International Trade Commission (ITC) resulted in a major victory and the establishment of IP licensing as a significant revenue generator for the company.

Mel Sharp and Rich Donaldson were the strategists responsible for the aggressive IP approach that woke up the semiconductor industry. Companies rushed to file large volumes of patents and establish IP departments. They also drove the expansion of patent grants and the explosion in patent litigation. In the 20 years that followed the ITC case, worldwide patent grants doubled to around 800,000 a year (Figure 1). Substantial growth has also been apparent in the United States, with 76,000 patents granted in 1986 compared to approximately 244,000 patents in 2010. In 1986 around 1,100 patent litigation cases were filed in the United States, whereas in 2006 there were more than 2,700 (Figure 2).

From the mid-1980s and throughout the 1990s, IP-savvy microelectronics companies, including Texas Instruments, IBM and Qualcomm, leveraged their patent portfolios into IP licensing businesses that generated revenues in excess of US\$1 billion in many years, in addition to supporting







Figure 3. Total US patent litigations by year (2005-2010)



Figure 1. Number of patents granted worldwide (1986-2008)

Figure 4. US patent litigations (2005-2010)



Figure 5. Semiconductor v total US patents (1990-2010) 70,000 35% Percentage of total US patents which are semiconductor Total semiconductor patents 60,000 30% 50,000 25% 40,000 20% 15% 30,000 20,000 10% 10.000 5% 2005 2002 2003 2006 2007 2008 2009 2010 666 2000 2004 66 998 2001 Source: Chipworks 2010

Figure 6. Top US patent holders (2008-2010)

Rank	Company	Patents			
		2010	2009	2008	
1	IBM	5,896	4,887	4,186	
2	Samsung	4,551	3,592	3,515	
3	Microsoft	3,094	2,929	2,030	
4	Canon	2,552	2,241	2,114	
5	Panasonic	2,482	1,759	1,745	
6	Toshiba	2,246	1,669	1,609	
7	Sony	2,150	1,656	1,485	
8	Intel	1,653	1,534	1,776	
9	LG Electronics	1,490	1,064	805	
10	HP	1,480	1,269	1,424	

Source: IFI Patent Intelligence 2011

other strategic goals.

#### Influence of false marking cases

According to www.grayonclaims.com, false markings accounted for over 700 patent litigations in 2010. With the 2009 *Bon Tool* decision as a precedent, damages of up to US\$500 could be awarded for each item sold, compared to a one-off penalty of US\$500 before *Bon Tool*. False marking case filings skyrocketed. When false marking cases are dropped from the equation, it becomes clear that the number of patent litigations has remained relatively stable over the past five years (Figure 3).

Annual statistics are not precise enough to reflect changes such as the influence of the 2008 financial meltdown on the filing of litigations. Filings crashed below the trend line in the third quarter of 2008, around the time of the Lehman Brothers US bankruptcy filing and the full onslaught of the financial crisis. Given the uncertain economic climate and the need to conserve cash, it is unsurprising that litigations hit an all-time low in the fourth quarter of 2009. However, the numbers rose rapidly in 2010, with the biggest uptick observed in the second half of the year (Figure 4). Significantly, the quarterly graph includes approximately 750 patent marking suits in 2010. If these are removed, the trend line is almost flat during this fouryear period. Also, depending on the distribution of marking cases in 2010, the first quarter will extend and perhaps deepen the dip in litigation filings. Nonetheless, the increase in litigations from July 2010 to December 2010 is notably higher than in any previous quarter.

#### Mutually assured destruction

During the Cold War, the policy of mutually assured destruction (MAD) helped to prevent a nuclear apocalypse. In electronics IP strategy, heavyweight patent opponents often employ the same tactic. If a potential licensee is heavily armed with patents, ignore it or the consequence will be a patent litigation apocalypse, with neither party free to carry on business. The attainment of MAD status has been a motivating factor in the prosecution departments of many electronics companies as they create vast portfolios of patents covering even the tiniest of innovations. A semiconductor patent counsel once told me that he looked for both quantity and quality in his portfolio, but that one was easier to achieve than the other! As a result, semiconductor patents took an oversize share of patent filings.

Texas Instruments' success before the ITC launched an aggressive IP strategy in

#### Figure 7. Business sector TOP PCT applications, 2009

Rank	Applicant's name	Country of origin	Number of PCT applications	Change from 2008	
1	Panasonic Corporation	Japan	1,891	162	
2	Huawei Technologies Co Ltd	China	1,847	110	
3	Robert Bosch GmbH	Germany	1,587	314	
4	Koninklijke Philips Electronics NV	Netherlands	1,295	-256	
5	Qualcomm Incorporated	United States	1,280	373	
6	Telefonaktiebolaget LM Ericsson (PUBL)	Sweden	1,240	256	
7	LG Electronics Inc	Republic of Korea	1,090	98	
8	NEC Corporation	Japan	1,069	244	
9	Toyota Jidosha Kabushiki Kaisha	Japan	1,068	-296	
10	Sharp Kabushiki Kaisha	Japan	997	183	
11	Siemens Aktiengesellschaft	Germany	932	-157	
12	Fujitsu Limited	Japan	817	-167	
13	BASF SE	Germany	739	18	
14	3M Innovative Properties Company	United States	688	25	
15	Nokia Corporation	Finland	663	-342	
16	Microsoft Corporation	United States	644	-161	
17	Samsung Electronics Co Ltd	Republic of Korea	596	-43	
18	NXP BV	Netherlands	593	186	
19	Mitsubishi Electric Corporation	Japan	569	66	
20	Hewlett-Packard Development Company LP	United States	554	58	

Source: WIPO 2010

#### Figure 8. Total US patent litigations by industry (2008-2010)



microelectronics and ushered in a golden age of licensing for North American and European semiconductor companies. Through the 1990s and 2000s, patent filings grew steadily in the semiconductor category. In 20 years, annual patent grants increased more than fourfold and, as a percentage of all US patent grants, semiconductor patents peaked at more than 30% (Figure 5).

Since the 1980s, semiconductor technology has become vastly more complex: its patents are harder to understand, harder to investigate for infringement and harder to enforce. The IP strategies established in the semiconductor industry proliferated — along with the chips themselves — in many other industries and in new industry sectors that the chips had created. Today, microelectronics is central to sectors such as telecommunications, personal computing and automotive, medical and consumer products. The World Intellectual Property Organisation (WIPO) reports that more than 50% of issued patents worldwide fall into the electronics category. Beyond the limitations of the patent classification system, many patents developed in the microelectronics industry are classified as chemical, mechanical or



#### Figure 9. Who is suing whom

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Source: Wall Street Journal. October 2010





other categories.

The list of top patent recipients in the United States and the Patent Cooperation Treaty (PCT) is dominated by electronics companies. Of the US top 10, only Microsoft is (arguably) not predominantly an electronics company. Software is a crucial element of many modern electronic devices, so Microsoft is not truly exceptional. The number of patents granted to these companies illustrates the default quantity strategy being employed (Figure 6).

WIPO's 2010 table of top PCT grant recipients tells a similar story. Toyota is the exception in the top 10, although it is a developer of microelectronics-based systems for its vehicles (Figure 7). Toyota's US patent grants (excluding design patents) from 2008 to 2010 include approximately 16% *Ho* classified electronics patents.

## Consumer electronics litigations prominent in 2010

When litigations within the microelectronics industry are broken down, interesting changes emerge. Single case filings in consumer electronics almost doubled from 2008 to 2010, while the number of litigations in semiconductors fell. This suggests that litigations are moving up the value chain, from suppliers to end products with higher associated revenues (Figure 8). For example, as competition for market share in the cellular handset industry has intensified, there has been a spate of highly visible litigations in the past year (Figure 9).

Apple brought computer technology into a mobile phone platform to create the enormously popular iPhone in early 2007. Since then, Apple has sold more than 50 million iPhones; according to asymco.com, its market share of cellular handset revenues worldwide grew to around 22% in 2010. Established cellular handset companies, such as Nokia and Motorola, were caught unprepared and borrowed from Texas Instruments' old playbook, launching massive patent assaults to try to slow the loss of market share and perhaps get some return on their research and development investment in the cellphone platform on which Apple freely built. At the same time, a number of new, lower-cost players – such as HTC from Taiwan and ZTE from China – are emerging with little or no patent position. Their rapid growth makes them prime targets for licensing and litigation. From 2006 to 2010 HTC was involved in 76 litigations, but was the plaintiff in only five.

Just recently, the importance of patents in this market was again demonstrated by

#### Figure 11. Semi/electronics cases v total ITC cases (2007-2010)

Year	Total ITC Section 337 cases	Semi/electronics ITC Section 337 cases
2007	35	28 (~80%)
2008	41	27 (~66%)
2009	31	20 (~65%)
2010	58	47 (~87%)

Source: WIPO 2010

#### Figure 12. Operating companies and NPE litigations

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No	Company name	2006	2007	2008	2009	2010	Total
1	ЦD	9	12	20	17	17	79
1		0	10	10	17	20	70
2	Apple	3	12	12	23	20	70
3	AI&I	6	16	9	10	16	57
4	Sony	5	10	11	16	13	55
5	Microsoft	6	16	13	14	5	54
6	Dell	8	10	8	17	10	53
7	Samsung	8	14	11	6	12	51
7	Motorola	4	12	14	10	11	51
9	LG	3	14	8	7	15	46
10	Verizon	3	14	8	7	10	42
11	Panasonic	4	9	9	12	6	40
12	Nokia	4	10	9	11	5	39
13	Time Warner	6	9	5	3	14	37
14	Google	3	10	7	10	6	36
14	Cisco	-	13	6	7	10	36
14	HTC	3	5	10	7	11	36
17	Sprint Nextel	3	11	8	6	6	35
18	Toshiba	4	9	5	8	7	33
19	Deutsche Telecom	2	12	5	5	6	30
19	RIM	2	3	11	6	8	30
21	Acer	4	7	8	7	3	29
22	IBM	3	7	2	10	5	27
22	Yahoo	2	11	2	7	5	27
24	Oracle	6	4	7	8	1	26
24	Fujitsu	3	3	7	8	5	26

Source: Patent Freedom 2011

the outcome of the Nortel patent auction, in which a consortium of six companies — Apple, Microsoft, Sony, Ericsson, RIM and EMC — outbid a Google/Intel consortium to secure a portfolio rich in patents that read on mobile telephony technology. Clearly, one of the motives behind the consortium's decision to table its successful US \$4.5 billion bid was to prevent Google getting its hands on those rights — a move that would have turned a relatively weak patent position into something much stronger.

#### **Expanding role of the ITC**

The ITC is an administrative proceeding that uses customs law to enforce an import ban on products that are found to injure US industry unfairly. Infringing a US patent is considered unfair injury.

In recent years the requirement to show injury to domestic industry has become an extremely easy standard to meet. An NPE that has a business based on licensing US patents has been considered a domestic industry worth protecting. In Certain Coaxial Cable Connectors and Components Thereof and Products Containing Same (ITC Investigation 337-TA-650) it was found that that in most circumstances, merely engaging in litigation – and spending money on it – is enough to qualify an ITC complainant as an industry worthy of protection. As Law.com reported on 17th May 2010: "In essence, the Coaxial Cable case represented the first open, public battle over who deserves to be at the ITC, pitting Big Tech on one side against NPEs on the other – and Big Tech came out the big



#### Figure 13. NPE v non-NPE cases, semi/electronics (2010)









loser." (Figure 10)

The reduction in the opportunities to obtain an injunction following the Supreme Court's decision in *eBay Inc v MercExchange* (547 US 388, May 2006) prompted an increasing shift to the ITC. From a base of around 25 Section 337 cases a year, the number of ITC cases had risen to 58 by 2010. Electronics-related cases have driven this growth, representing more than twothirds of the cases in recent years. Their numbers have approximately doubled in the past four years, whereas the number of cases in other industries has generally remained static (Figure 11).

#### Enter the patent troll

Given the large number of patents in the electronics field and vast sums of money being made, the emergence of the patent troll was inevitable. Trolls are not new: the Selden patent covering the automobile (US 549,160) was granted in 1895 and was extensively licensed throughout in the US automotive industry for more than 10 years until it was challenged and found not infringed in 1911. Today, trolls are most prominent and active in the electronics industry.

Figure 12 lists the top 25 NPE litigation defendants over the past five years. All are technology companies; 16 are microelectronics companies. The exceptions are Microsoft and Oracle (software), Yahoo and Google (internet), Time Warner (telecommunications, cable and media) and AT&T, Verizon, Sprint Nextel and Deutsche Telecom (telecommunications). In 2010 NPEs were involved in almost 57% of the semiconductor cases and 48% of the electronics cases tracked by Chipworks (Figure 13).

The increased value of patents in the United States, supported by the creation of the Court of Appeals for the Federal Circuit, has made the economics of the NPE business model more attractive. Figure 14 shows the growth in NPE cases from 1998 to 2010. The increasing volume and prominence of NPE cases helped to drive the call for patent reform in the United States. Most famously, NTP v Research In Motion (2001 to 2006), which threatened to turn off BlackBerry service to US congressmen, caught the attention of legislators and the judiciary. Since that case, a series of court decisions has steadily reduced the value of patents in the United States and made the NPE business model less attractive, although still significant.

In practical terms, *eBay* eliminated the threat to an operating company of an injunction from an NPE. Since then, operating companies have been increasingly

willing to risk losing a district court case. Although the damages can be large, cases can be won by vigorously attacking the patent through re-examinations and validity and non-infringement arguments. Many companies wish to be known as hard targets that will vigorously defend and not settle easily or early.

## Growth of re-examinations as a troll defence

Targeting a troll's assets - its patents - is an increasingly popular defence for operating companies under attack. A reexamination will often buy time if a stay is granted in the related litigation. A change in the patent claim can strengthen a defence of non-infringement and, in the best case, the patent may be held invalid. On the other hand, a patent that is re-affirmed by the US Patent and Trademark Office will be much more valuable to the patent owner. *Ex parte* re-examinations have grown from about 500 cases filed annually to about 800 a year in the past five years. Approximately half of these cases involve patents that are known to be in litigation. Inter partes reexaminations are relatively new and are seeing more dramatic growth, from only a few cases in 2006 to almost 300 in 2010. Electronics patents make up about twothirds of these re-examinations and a significant majority of the patents are known to be in litigation (Figure 15).

#### Fear of declaratory judgments

The Court of Appeals for the Federal Circuit's decision in Sandisk v STMicro in March 2007, citing the Supreme Court decision in Medimmune, lowered the threshold for filing a declaratory judgment action. Merely sending a notification letter to a potential licensee is now grounds for a declaratory judgment. NPEs have responded by filing more cases before starting negotiations, generally even before talking to a potential licensee, in order to preserve their choice of venue. Despite the widespread fear of declaratory judgments among NPEs, the numbers do not show a significant change following the Sandisk decision (Figure 16). This could be a result of NPEs filing more routinely before contacting or perhaps a consequence of the unwillingness of operating companies to file declaratory judgments on every threat that they receive, as the cost of doing so could be huge.

#### Multiple defendant cases multiply

Another effect of the *eBay* and *Sandisk* decisions on NPE strategy has been a proliferation of cases with large numbers of











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#### Figure 19. Patent holder median damages awarded (1995-2009)





defendants (Figure 17). The average number of defendants in NPE cases in 2010 was over six, compared to just over two in 2005. As operating companies fight harder when motivated, an increasingly popular NPE strategy is the nuisance settlement. If a case can be settled for substantially less than the legal cost of proceeding, an operating company will think carefully about risking more money with an uncertain outcome. In NPE circles, the million-dollar rule marks the fuzzy threshold above which a defendant will vigorously defend; below it, an early negotiated settlement is more likely.

The mass defendant strategy is exemplified by Webvention in a group of three cases in the courts of the Eastern District of Texas against a combined total of 61 defendants with retail websites. The court actions coincided with a mailing to other website owners, inviting them to take a paidup licence for a one-off fee of US\$80,000 – a special offer for fast action, as opposed to the licence agreement amount of US\$300,000. The demand letter and licence agreement have thoughtfully been made public by the retailer Marie Claire, which is one of 22 companies filing declaratory judgment actions against Webvention in district court in Delaware. The fee of US\$80,000 must have made it tempting for Marie Claire to settle, given that US\$80,000 buys very little of a US patent litigator's time!

#### **Damages** awards

Over 97% of patent cases settle before going to trial ("Where to File your Patent Case", Mark Lemley, October 2010) (Figure 18). The small number of cases that go to a jury for a decision — fewer than 100 a year — provide the basis for damages awards statistics (Figures 19 and 20). Most settlements are for much less than the published damages awards that we read about. Significantly, the median damages award for NPEs is more than three times greater than the award for practising entities (Figure 20). I believe that this reflects the million-dollar rule — low-value cases are settled, but high-value cases are more likely to be vigorously defended and go to trial.

#### Patent litigation goes international

Semiconductor and electronics industry licensing has always had a global focus. However, US patents have historically formed the basis for enforcement due to a reliable court system that placed a high value on patents and the existence of a large market for goods that forms a large base for damages. As the US legal environment has reduced the value of patents, a few foreign venues are emerging as alternate forums for litigation. The favourites include Germany, the United Kingdom and, potentially, China. Litigations are commonly filed in multiple venues with the goal of securing a worldwide licence or cross-licence. Examples include:

- Nokia v Apple (US) (Apple v Nokia in the United Kingdom, Germany and the Netherlands).
- Apple v Samsung (US) (Samsung v Apple in Korea, Japan and Germany).
- Huawei v ZTE (in Germany, France and Hungary, with ZTE fighting back in China).
- *Ericsson v ZTE* (in the United Kingdom, Italy and Germany).
- LG v Sony (in the Netherlands).
- Osram v Samsung LG (the United States, Germany and Korea).

NPEs are beginning to follow. IPCom's recent win in Germany and the United Kingdom against Nokia (now under appeal) is a good example, as is its win in Germany in 2010 against HTC.

China has an emerging reputation for

### Action plan

The licensing and litigation of electronics patents have some unique features which are driving the trends that we see in today's patent statistics:

- Cross-licensing to achieve freedom to operate is a major driver of IP strategy.
- Mutually assured destruction prompts the ostrich strategy for some cross-licences.
- Disruptive technologies are met with patent licensing and litigation counterassaults.
- Assertive IP strategies are moving up the value chain to electronics systems companies and consumer electronics companies.
- The ITC has become a venue of choice for cross-licence disputes due to the availability of an injunction.
- The patent troll business model matches

supporting plaintiffs in IP disputes, with win rates consistently over 80% for the past four years, according to www.ciela.cn. This trend is expected to continue as IP litigation grows in China. The number to watch is the Invention patent litigation total. Chinese and foreign firms are beginning to appreciate the value of a Chinese court injunction, which is relatively quick to obtain. Damages are also rising, with notable cases such as Schneider v Chint settling for multimillion-dollar amounts. Chinese utility model patents are not examined at filing. They form the basis for many Chinese-against-Chinese litigations and fuel the Chinese patent cockroach – a discount version of a US patent troll. Data in many jurisdictions is difficult or impossible to obtain, as many courts are neither as automated nor as public with case data as US courts.

#### The driving force

Electronics powered by semiconductor chips has infiltrated every part of our daily lives. This has been reflected in the patent licensing and litigation industry and magnified by strategies popularised by Texas Instruments, IBM, Qualcomm and a few other companies in the 1980s and 1990s. Patent licensing in the microelectronics industry has some unique features. The use of massive numbers of patented technologies, many of them unlicensed and extremely difficult to detect, makes cross-licensing a must and exposes large industry players to attacks by NPEs.

Cross-licensing for operating companies

the microelectronics business well. Trolls like multiple defendant suits.

- Trolls fear declaratory judgment actions since Sandisk – but statistically declaratory judgments are not more prevalent.
- Re-examinations have become a key counter-troll strategy for electronics operating companies.
- Litigation is becoming slightly more international, with Germany an increasingly popular option and China on the horizon.

These characteristics and trends must be kept in mind when reviewing and seeking to understand the patent grant and patent litigation statistics that we eagerly consume each new year.

became firmly established in the industry in the 1990s and continues to thrive, both as a tool to achieve freedom to operate and as a competitive weapon to buy time for established companies that stumble or find themselves blindsided by disruptive technologies.

The NPE business model fits the microelectronics industry extremely well, making such entities a plague on the industry. Operating companies are increasingly mounting aggressive defences and counterattacks on NPE assets. These often seem financially unjustifiable, except as an attempt to discourage the bottom end of the industry.

These unique characteristics must be kept in mind when reviewing and seeking to understand the patent grant and patent litigation statistics that we eagerly consume each new year. **iam** 

**Terry Ludlow** is the founder and chairman of Chipworks, Ottawa, Canada *tludlow@chipworks.com* 



