

# A rapid analysis of Intel's connected devices patent portfolio

Late last year, Intel [resurfaced the sale](#) of a connected devices patent portfolio that was sidelined during the \$1 billion sale of the majority of their smartphone modem assets to Apple (which included a pile of cellular wireless related patents). Intel has opened the sale to operating companies, defensive aggregators and even NPEs (non-binding indications of interest are due from bidders at the end of this month). We were asked to review the remaining portfolio and determine how it fits with the buying needs of participants in the secondary patent market.

This kind of problem presents itself to patent buyers on a regular basis. You can throw piles of lawyers at the problem, but today's analytics tools can be a huge help. Ideally, you want to quickly get to answers to the following questions: *How do I quickly evaluate the opportunity with my portfolio needs (ie, offensive/defensive or counter assertion) and estimate where a patent portfolio might be priced, in whole or in parts? In short, should I do a deep diligence dive?*

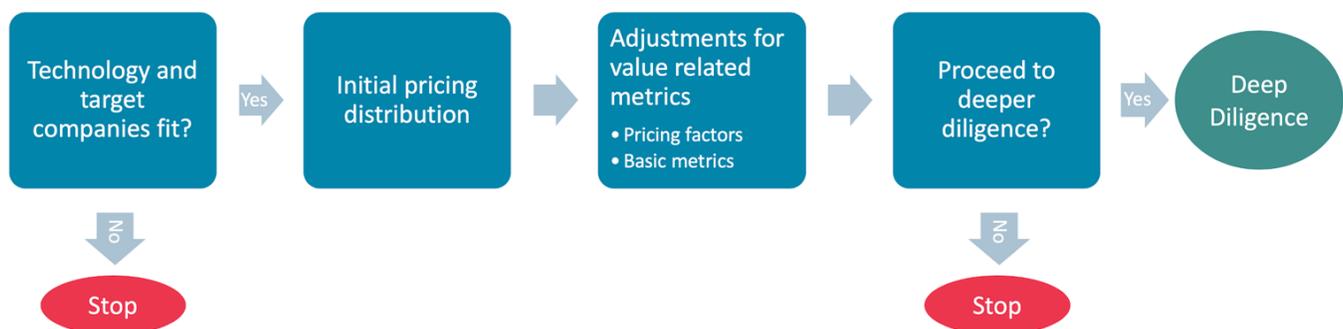
To make this example more realistic, assume that we represent a company with a weaker portfolio that is launching a new, strategic product within a litigious market (eg consumer electronic products with a WiFi connection) and we are looking to de-risk our patent position by bolstering our portfolio against known larger patent holders.

The first step is to analyse the Intel portfolio overview which you can see [here](#). For an explanation of a counter-assertion risk reduction strategy plan this article is a good start [here](#) but, essentially we need enough claim charted patents to use in litigation or licensing discussions when these

aggressive patent holders assert patents against us.

To substantially reduce our patent risk we believe a company needs about eight patents to read on seven different companies in that space (your specific needs may vary by industry, your business relationships in the industry, and your company's overall tolerance for patent risk.) Additionally, knowing that NPEs employ a similar analysis, our client must consider how the patents could be used against them. So, what steps do I take? Figure 1 below shows the general flow of this analysis.

**Figure 1 – Diligence Decision Flow**



## Technology and target company fit

First off you need to ask the question: "What are the chances that this portfolio will fulfill my business needs?" Paraphrasing Intel's marketing materials, the connected devices portfolio has 83 patent families, including 436 patents and applications, focused on semiconductor and electronics industries, including computer architecture, process technology, packaging and networking. The portfolio has 73 charted patents against 84 specific

implementations and standards. Now the question is whether we are likely to find patents infringed by the companies we are most at risk of being sued by? How do we quickly find out?

The best way to start is by running some clustering and similarity analysis. We want to identify the groups of assets of interest to our business (WiFi connectivity). Different tools provide different groupings of assets, but we used a combination of Aistemos's Cipher tool and classification information provided by Intel to group the patent assets and families. Table 1 shows the results.

The portfolio contains 48 WiFi patent families with 228 patent assets. Working with the Intel asset list, 21 families have claim charts, which is an unusually high number. So we know that the technology areas in the portfolio are at least a high level fit for our needs - recall that we are looking for about eight claim charted families against about seven companies and that some of the families will be useful against multiple companies. So, 21 claim charted families could work well.

*Table 1 - Initial Grouping of Assets by Technology Area*

<b>Technology Areas</b>	<b>Patent Families</b>	<b>Patent Assets</b>
Circuits	4	23
Semiconductor Process and Packaging	13	72
<b>WiFi Connectivity</b>	<b>48</b>	<b>228</b>
Processor Architecture	18	113
Grand Total	83	436

We also want to check which companies might be impacted by the portfolio. After loading the patent list into Cipher, the tool produces a list of companies with similar patent portfolios. Google has similar tools. Here is

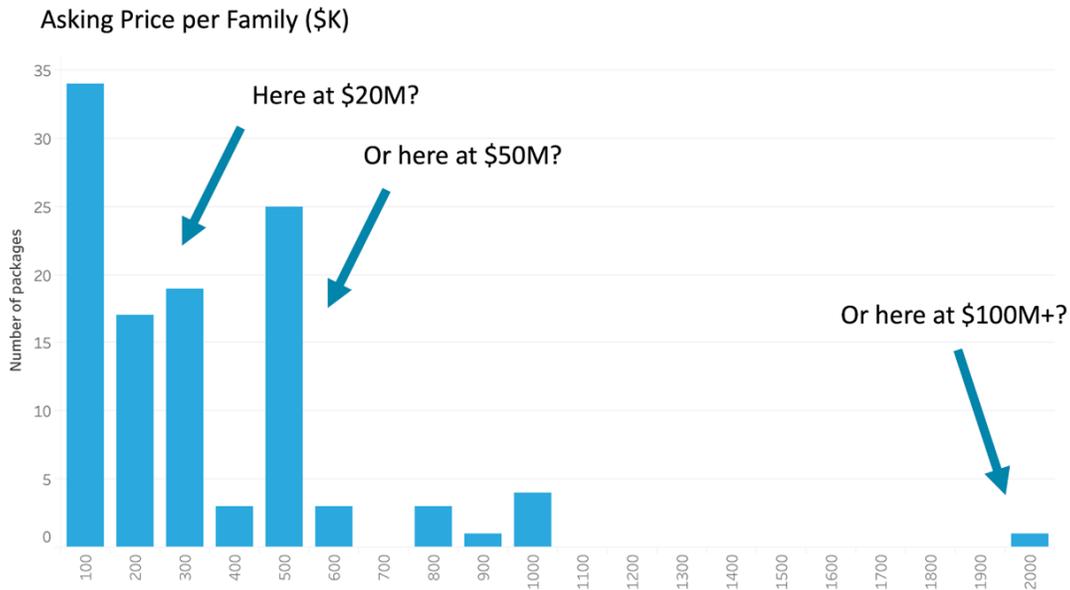
an example list of the companies with similar patents:

*Table 2 - Example Companies with Similar Portfolios*

<b><u>Cipher List of Companies with Similar Portfolios</u></b>
NEWRACOM
Maxlinear
Kaomedia
Ericsson
Huasan Communication
InterDigital
Meizu
Qualcomm
MediaTek

All of my target companies are on the list so this portfolio still looks interesting. If no companies were on the list, we'd recommend asking for more detail about the companies targeted in the claim charts (or simply stopping the analysis). Note, Intel states that the portfolio is lightly encumbered, with "75% of the addressable smartphone and 3 of the top 5 wireless semiconductor players, being unencumbered." So, we may find some companies will already be licensed, but we should still be able to find enough interesting targets in the claim charts.

## Figure 2 – Where Might this Deal Price?



### Pricing distributions and metrics adjustments

The next question is whether the portfolio is likely to meet our budget? This is not easily answered, but there are some immediate things that can be helpful. Patent pricing has a long tail distribution. In our most recent [brokered patent market survey](#) in *IAM*, we show some of the pricing distributions in our data set. Figure 2 shows an example histogram of asking prices per family for technologies generally related to the Intel portfolio. Will this portfolio likely price in the bottom pricing area, in the mid pricing area, or at the high-priced area? Figure 2 shows that most portfolios price around \$200,000 per family, however, the graph shows pricing all the way up to \$2 million per family. (To make the graph more readable, we cut off some of the deals that price above \$2 million, and there are some.)

Clearly, there is a large spread between \$200,000 and \$2 million per family so how do we estimate where this deal might price? In other words what are characteristics of patents that price at the high-end versus patents that

price at the low end? Let's look at some basic characteristics of the portfolio.

As you look at each characteristic, you can imagine your finger sliding left and right on the price per family axis as each factor is considered. This is not an exact science, but that is not the point. Remember that we are just trying to estimate how this portfolio might price so we can determine whether we want to invest further diligence dollars into the analysis, not actually price the portfolio.

*Table 3 - Initial Portfolio Characteristics and Implications*

Factor	Comment	Impact
Size of portfolio for sale	Bigger portfolios usually have lower per asset pricing because there is a lower proportion of high value patents in the portfolio.	The Intel portfolio is big so it should be a lower priced deal. (But...)
Number of claim charts	29 charted patents across 22 of 48 families. This is an <b>unusually high</b> number of claim charts.	The initial assessment that the pricing is lower because of "portfolio size" is the wrong assessment. Consider that a typical small deal has one claim charted family (one value driver) and a few additional patents. This portfolio appears to have more value drivers than is typical. In a case like this, we tend to price the entire portfolio as a group of smaller portfolios which tend to be higher priced.
Type of transaction	This is a special type of sale deal ("for sale by owner", no broker involved)	These types of deals tend to command about 100% premium over brokered transactions.

	transaction.	
Technology area	Hardware, WiFi and semiconductors.	Generally, this is a neutral to slightly down impact on prices, but we generated the histogram from the target technology areas so there is no adjustment needed in this case.
Standards related	Standards related patents generally command a higher price	23 of the claim charted patents are related to WiFi standards (this is from Intel's own data). The premium for standards related patents is 50-100%.

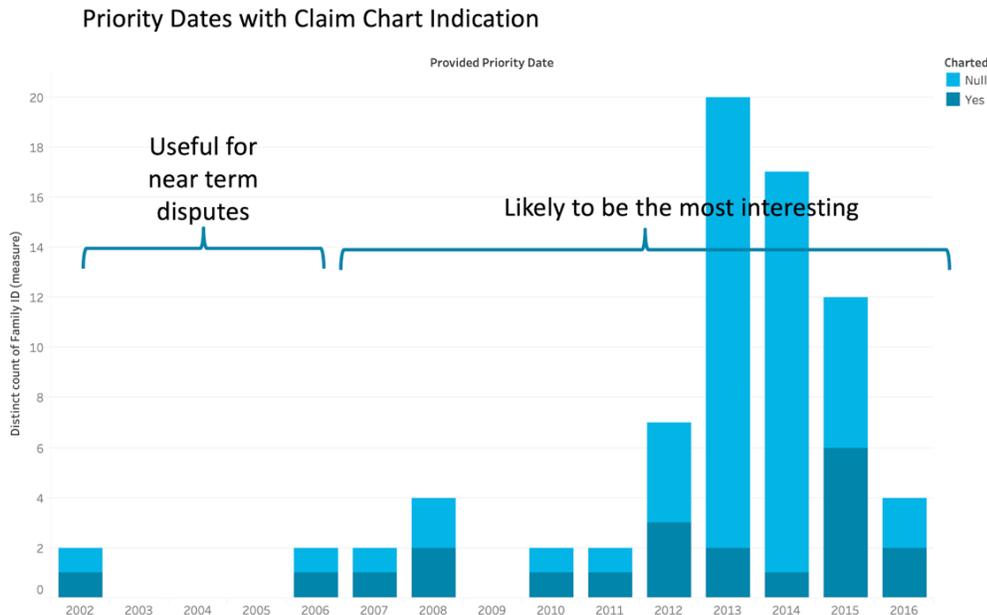
## Basic patent metrics help with pricing

We use a number of simple tools to help quickly judge whether a portfolio might be priced lower or higher than a typical deal in the market. The goal of using these tools is to look for unusual characteristics of the portfolio (positive and negative).

First, we look at the age of the assets. We use a distribution of the priority dates. Very old portfolios and very young portfolios tend to be much lower priced. Figure 3 shows the distribution of the assets and the assets with claim charts. For the example buyer, they are most focused on patents that are eight to twelve years old, with interests between five to fifteen years old. In this case, the vast majority of the portfolio falls into this range.

Patents that are older than fifteen years, unless they have extensions to the expiry date, are unlikely to be useful soon enough for most corporations, however they can also be the most difficult to knock out on prior art. Newer patents are often too recent to know whether there is mass adoption of the technology, however, if there are charts, it is worthwhile reviewing those. Note, you can also perform the analysis using estimated expiration dates, and where that data is available, it can be quite helpful.

### Figure 3 – Priority Dates with Claim Chart Indication



Next, we look at the international coverage. As the buyer operates internationally, having a good distribution of countries in which to enforce the patents bolsters their negotiation positions in any disputes. Typically, US patents are charted. But, for most of our buyers, international coverage is very desirable so internationally charted families boost the value.

Table 4 - International Coverage of Claim Charted Assets

Country	Charted Assets
US	22
CN	3
KR	2
EP	1
JP	1
Total	29

For some metrics, it is best to have a set of benchmarks for comparison. You can use another company (even your own) as an example. You generally want to pick a well-established company with a similar risk profile and generally similar goals.

To help compare portfolios, we often use a combination of third-party rankings, our own published ranking system (published under a creative commons licence [here](#)), and a few internally developed rules of thumb. In this case, we chose prosecution characteristics that are objectively better aligned with the types of patents our client wants to buy. Table 5 describes example characteristics we can quickly generate. In this case, the analysis shows that the Intel portfolio appears to have more age weighted highly cited patents and that its owner likely spent more effort managing the portfolio. This would normally be indicative of a portfolio with greater potential.

*Table 5 - Sample Metrics Comparing Portfolios*

Statistics	Intel Portfolio for Sale	Other High Tech Company	Comments
Avg. Number of Forward References	4	8	Higher is better, but age weighted matters more. Forward references are generally a better indicator of how big the market might be for the specific invented technology.
Avg. Age Weighted Forward Citation Score (1.0 Highest)	<b>0.8</b>	0.5	Higher is better. Here the Intel portfolio is substantially better. The implications are that there are more likely to be patents of interest in the Intel portfolio.
Avg. Number of Cited Non-	<b>33</b>	6	Higher is better. Intel cited substantially more non-patent literature in their

Patent Literature			cases.
Avg. Number of Applicant Cited Pats	<b>43</b>	17	Higher is better. This measures how much work Intel did in trying to cite prior art.
Avg. Num Cited Art	<b>80</b>	30	Higher is better. This measures generally how much art was cited against the patents.
Avg. Claim 1 Word Count	150	203	Lower is usually better, but the difference is not high enough to matter.
Avg. Number of Claims	<b>23</b>	15	Higher is better. US patent applicants pay for 20 claims so companies not getting all 20 claims may not be paying as close attention to their portfolio.
Avg. Number of Independent Claims	<b>4.2</b>	3	Higher is better. US patent applicants pay for 3 independent claims so companies not getting all 3 independent claims may not be paying as close attention to their portfolio.
Number of US Patents Analysed	73	50K	This is number of total US assets used to generate the benchmarks

Other prosecution metrics can be used to evaluate the portfolio. For example, 102/103 rejections for lack of novelty or for obviousness can help guide you to patents that have greater potential for blocking other companies. Litigation statistics can help you focus on the patents that might be of higher value (none of the Intel patents have been litigated).

One characteristic we tend not to focus on is how much the portfolio cost to build because we do not believe it is as helpful as other statistics. That said, the future costs can be quite helpful in estimating go forward costs for managing the portfolio.

## Should I proceed with deeper diligence?

So, after an initial test for potential fit to my business needs (enough of my target companies have similar patent portfolios), we examined where on the pricing distribution might this deal be. This article focuses on rapid portfolio analysis, and compared to diligencing claim charts, it is much more rapid.

I wish that I could say it was 30-minutes, and for some portfolios it is, but loading data into disparate tools and systems is not simple ("80% of data science is cleaning the data; the remaining 20% is complaining about cleaning the data" - Unknown bitter data scientist). Also, picking reasonable comparables, running clustering tools, and testing that the results make sense, are all part of the data analysis process. That said, the end result is you know whether a portfolio has a good chance of meeting your business need and you have a sense of what the purchase price might be before you have to dig into claim charts.

Looking at the results of the initial analysis, we have:

- A good overlap with companies we care about,
- An unusually high number of claim charts (possibly enough to cover all seven of my target companies and with enough claim charts for all of the targets),
- A good distribution of asset ages,
- A good distribution of claim charted patent families with international patents, and
- A good to much better set of prosecution metrics.

So now our team knows that this package is unlikely to price near market averages and more likely to be in the higher end of the pricing distributions (above the median and the mean, likely in the top quartile). The next steps

are to look at our budget, decide how much we are willing to spend to dig into the claim charts.

That process of vetting the claim charts involves traditional diligence and is quite expensive. What we answered here, with this lighter analysis, is whether that investment in greater diligence is likely to be worthwhile. For our hypothetical company entering a litigious market, the answer is yes.

*Note, we were paid to do the analysis on the portfolio, however the views herein are our own. Richardson Oliver Insights does not receive any compensation from the sale of the Intel assets.*