Patently100®

The world's leading 5G patent owners

2025

Disclaimer

This report reflects the opinions and interpretations of experts based on the information available at the time of preparation. These findings are provided for informational purposes only and should not be considered legal advice or a substitute for professional legal counsel. The counts, essentiality rate indications and related assessments are subject to change and may not be definitive. Readers should exercise independent judgment and seek qualified legal or technical advice before making decisions or relying on the information presented in this report. Neither the author nor Patently Ltd, nor indeed Questel and their affiliates, accept any liability for any actions taken based on this report.

The Patently 100 annual ranking reviews the entities that own the most SEPs relating to 5G cellular technology, using Patently License.

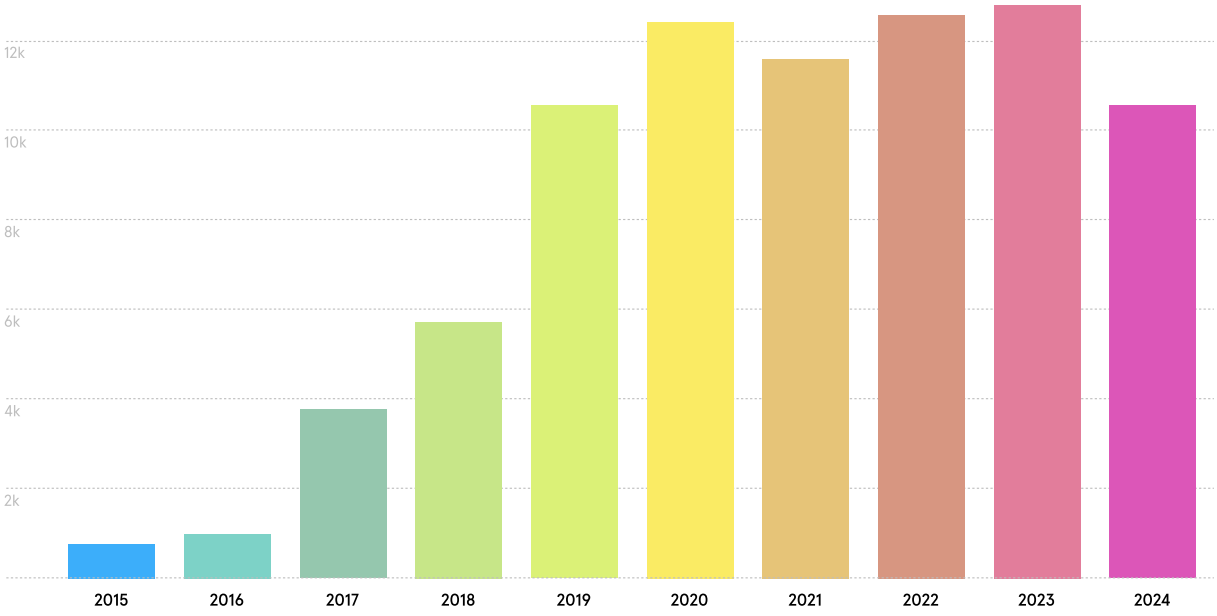
Learn more about our solution and the data here.

Contents

Background

5G standardisation began in 2015. The number of Standard Essential Patents (SEPs) declared to 5G since then has increased dramatically. 5G has accelerated global innovation by driving adoption and reducing barriers to market entry.

First declaration date of SEP families declared to 5G



Showing count of SEP families with declared 5G standards per year limited to those considered relevant according to their First declaration date (at the case level) between 2015 and 2024

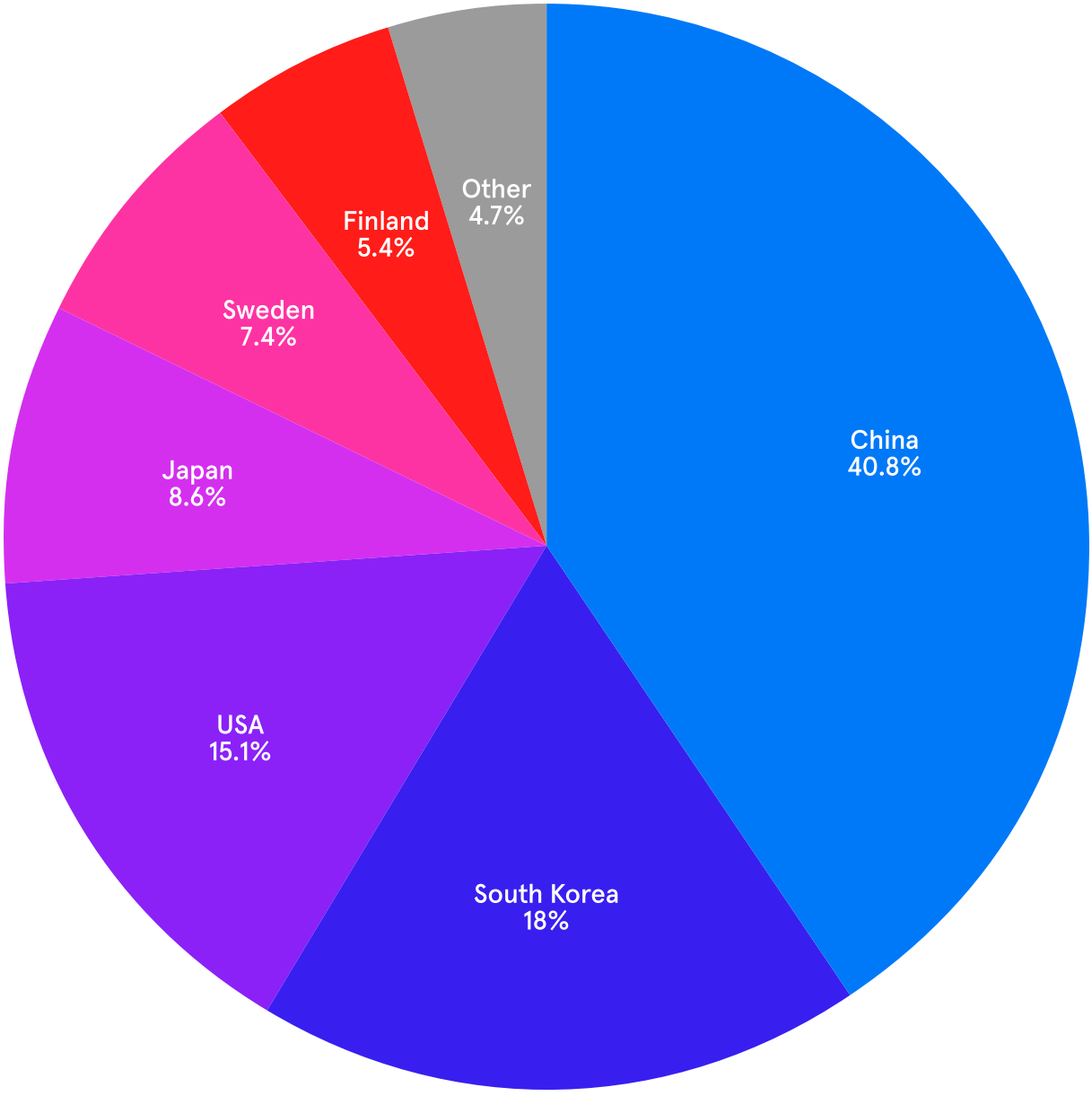
In 2015, there were 737 SEP families declared to 5G. In the last five years, from 2020 to 2024 inclusive, there has been an average of around 12,000 SEP families per annum declared to 5G. Note that the numbers shown in the chart above for 2023 and 2024 remain below actual declaration numbers due to the fact that the chart only shows published families (patent families are published 18 months after the earliest priority date), whilst some SEP owners submit declarations for as-yet unpublished families. As of December 2024, we have identified over 87,000 published SEP families that have been declared to 5G.

Top 5G SEP owners across the globe

While there is no shortage of research and interest in which companies own the patents for technologies in the 5G patent landscape, the findings of these reports vary considerably as there is still some disagreement among analysts about which companies and countries are leading the race. Though patent holders may disclose their potentially essential 5G patents to the European Telecommunications Standards Institute (ETSI), this declaration database represents only one of various inputs in determining ranking. Priority relationships are also important in correctly defining patent families, and Ultimate Owner determination requires up-to-date information on corporate groupings.

Though innovations on cellular networks were once dominated by Western countries, China's concentrated effort over the past decade has significantly shifted the ecosystem as it continues to build out 5G networks and set operating standards around the globe. Representing 40.8% of all 5G-declared SEP families, the region is home to several of the top Ultimate Owners. Furthermore, 95.3% of all 5G-declared SEP families are owned by Ultimate Owners in only 6 countries, namely China, South Korea, the USA, Japan, Sweden and Finland; this trend is captured in the graph below.

Count of SEP families declared to 5G per Ultimate Owner country



How are regulatory changes and technological advancements shaping the future of SEP licensing?

With increasing SEP-related litigation, regulators seek to build frameworks that consider the interests of both patent holders and implementers. Global policy developments will set the pace of regulatory change. In the USA, the increased scrutiny of SEP licensing from an antitrust perspective has redefined the terrain, while the European Commission has led efforts to create a unified approach to SEP licensing with its proposals aimed at establishing a mandatory SEP register, essentiality checks, and a framework for determining aggregate royalty rates.

As the complexity of SEP portfolios grows, we've seen an increase in the need for tools to manage these portfolios more effectively. Artificial intelligence (AI) already plays a role in SEP licensing, offering new ways to streamline processes and enhance transparency. The rise of AI-powered patent analysis, where AI is leveraged to analyse large SEP portfolios, has simplified the landscape, helping identify potential overlaps and essentiality concerns. This technology can also support the prediction of outcomes of licensing negotiations or litigation.

What are the driving forces behind SEP standards?

Interoperability and monetisation drive the development of standards. Interoperability requires technical innovation. New entrants make use of the innovation that SEP owners have invested in and must pay to play via licensing fee dues. The question is how much should be paid, and to answer that, licensees need to know how much of what they do is covered by SEPs.

Operating companies may receive an approach from an SEP owner. These companies must understand their exposure, particularly if they do not own any SEPs. An operating company that owns SEPs may want other companies to take a license under its SEPs and will seek to understand how its proportion of SEPs compares to other owners. Not all SEPs are truly essential, which will affect how much licensees should pay and what licensees should ask.

The interest in monetising technology may not be the primary force behind the development of standards, but it is important. Historically, litigation cases have centered around cellular standards, attesting to their role from a royalty perspective for other technology standards.

Why does the licensing of SEPs represent a complex terrain to navigate?

The number of patent families declared essential to 5G stands at over 85,000 at the end of 2024, which is nearly three times the number that have been declared for 4G. Furthermore, the number of licensors of 5G patent families is also rising, from a few dozen when 5G was introduced to more than 100 worldwide.[1]

This growth has been questioned in some jurisdictions, with concerns about competition and transparency. In 2023, the UK Intellectual Property Office, UKIPO, surveyed SMEs to review the efficiency of the current framework for SEPs to establish the country as a future hub for science and technology.[2] The survey questioned respondents on whether or not they had sufficient information on how their innovation relates to SEPs, the fairness of the current system for everyone involved, and if change was needed. According to the responses, the current system favours the SEP holder, citing a UK Supreme Court's decision, Unwired Planet (and in which Patently data was presented by Unwired Planet as evidence for licensing rates), setting a precedent for court-determined global portfolio licenses.[3] Another respondent of the survey highlighted a lack of competition in standard development with contributions to 5G standards. These different perspectives attest to the need to consider and weigh the interests of both patent holders and implementers with global policy developments.

[1] https://globalcompetitionreview.com/hub/sepfrand-hub/2023/article/recent-developments-in-5g-sep-litigation-reveal-lessons-future-us-litigants

[2] https://www.gov.uk/government/news/seps-questionnaire-for-sme-small-cap-and-mid-cap-businesses

[3] https://www.gov.uk/government/consultations/standard-essential-patents-and-innovation-call-for-views/outcome/standard-essential-patents-and-innovation-summary-of-responses-to-the-call-for-views

How can we help balance the ecosystem?

A balanced ecosystem is essential to support competition and innovation across the globe. While the ecosystem continues to work well, there are challenges for both SEP holders and implementers, including the availability of SEP licenses, royalty rates and transparency surrounding FRAND. Regulators play a vital role in developing policy frameworks and participating in international forums.

Patently 100 is helping drive change by providing companies with a complete understanding of who owns what proportion of 5G SEPs. Patently License provides detailed analytics that support this annual ranking.

Who are the 100 strongest players in the SEP landscape?

We evaluated owners of SEPs based on the number of families declared to 5G, revealing the SEP owners driving faster and more efficient digital experiences across the globe as well as the owner breakdown of 5G families. We've outlined the top 10 owners, followed by an extended list, which covers emerging entrants to incumbent SEP players.

1.

Founded in 1987, Huawei Technologies has become the third-largest manufacturer of routers, switches and other telecommunications equipment. Huawei's products and solutions are deployed in over 170 countries and serve over one-third of the global population.[4] In 2022, its licensing revenue amounted to $560 million.[5]

With over 200 bilateral patent licenses, hundreds of companies around the globe have obtained licenses for Huawei's patents through patent pools.[6] Under these licenses, the company's total past royalty payment is about three times its total royalty collection. With its balanced approach to patent licensing, the company believes that reasonable royalty rates will incentivise both the creation and adoption of innovations.

Its role in the smartphone landscape continues to evolve as it enters a new phase of development with mobile AI as new connections and services pose growing demands on operators.

[4] https://martinroll.com/resources/articles/strategy/huawei-transforming-chinese-technology-business-global-brand/

[5] https://www.reuters.com/technology/chinas-huawei-says-it-earned-patent-revenues-560-mln-last-year-2023-07-13/

[6] https://www.huawei.com/en/news/2023/7/ipr-innovation-horizon

Qualcomm

Set up in 1985 by seven former Linkabit colleagues, Qualcomm was formed with zero products, no business plan and a limited staff.[7] The San Diego-based company quickly gained momentum with its visionary wireless technology. While its annual revenue from patent licensing in 2021 was impacted by the coronavirus downturn, it remains an essential part of its business models.[8] Qualcomm has incorporated its patent licensing business next to its chip business, becoming a "champion" of patent rights and engaging actively with the patent community. Today, it has over 24,000 active patent families and a patent portfolio of 140,000 global patents.

What truly sets the company apart is its ecosystem-wide focus and enduring commitment to innovation. It has invested over $90 billion in research and development since its founding and works closely across the ecosystem to drive technology improvement, enable crucial capabilities and features, and achieve scale through standardisation, including compatibility and future-proof scalability.[9] Qualcomm's success in 5G was not by chance. It has come about, thanks to continuous investments and focused innovation. In 2023 alone, it averaged more than 10 patents granted per day. Approximately 75% of these patents are focused on 5G, 5G-Advanced and 6G technologies, further solidifying its position as a leader in connectivity.

[7] https://www.qualcomm.com/research/stories/man-behind-billion-connections

[8] https://assets.publishing.service.gov.uk/media/625009d98fa8f54a841bbe09/Qualcomm.pdf

[9] https://www.qualcomm.com/news/onq/2024/02/rooted-in-tomorrow-qualcomm-and-its-inventors-are-focused-on-the-future

3.

SAMSUNG

Headquartered in Samsung Digital City just south of Seoul, Korea, Samsung Electronics Co., Ltd. began its celluar mobile journey nearly five decades ago, when it entered the telecommunications industry in 1977.[10] As the industry evolved, Samsung has been at the forefront, leading innovation. It ranked first in 5G Standard Essential Patent shares according to a patent essentiality report published in 2021.[11]

Samsung has secured a strong position thanks to its successful delivery of 5G end-to-end solutions including chipsets, radios, and cores.[12] Through ongoing research and development, it drives the advancement of the 5G network with fully virtualised RAN and Core-to-private network solutions and AI-powered automation tools. It continues to provide connectivity to hundreds of millions of users worldwide ensuring its enduring position as a leading SEP owner.

[10] https://www.samsungsem.com/global/museum/history/1973.do

[11] https://www.samsung.com/global/business/networks/insights/press-release/0308-samsung-extends-leadership-in-5g-patents/

[12] https://www.samsung.com/global/business/networks/insights/press-release/0621-samsung-unveils-new-chipsets-to-enhance-next-generation-5g-ran-portfolio/

Founded in 1958, Goldstar played a pivotal role in LG's history with the release of Korea's very first radio in 1959, later adding further categories of electronics.[13] Together, the Lucky Goldstar company ushered in a new age of openness, globalisation and information in the 90s. Nearly two decades later, the company embarked on a new chapter of transformation to actively engage with customers across various touchpoints.

In 2024, LG Electronics, LG, announced that the company is stepping up its presence in the 5G private network market. It became the first in the 5G private network industry to receive the "Domestic Network Equipment Certification" for its self-developed solution.[14] This certification marks LG's official recognition for internalising core 5G private network technologies to deploy in specific areas like factories and buildings. These networks offer high-speed data transmission and exceptional stability. The company's software-based approach allows for faster data processing and improved stability, with the added benefit of enabling upgrades without hardware replacement, significantly lowering operational costs.

LG currently holds over 30,000 telecommunications patents, including many related to 5G, ranking it among the world's top innovators. According to its 'Future Vision 2030' goal, LG will aggressively promote the commercialization of intangible assets, such as its standard essential patents in critical areas of technology including communications, media, mobility and IoT connectivity.[15]

[13] https://www.lg.com/global/our-brand/brand-story

[14] https://lgcorp.com/media/release/28170

[15] https://lgcorp.com/media/release/27223

5.

ERICSSON

Ahead of its time, Ericsson designed its very first mobile phone in 1956. Weighing over 40 kilos, it was far from the portable designs we carry today.[16] The first real handheld mobile phone was launched in 1987 by the company. In the years to come with the widespread adoption of mobile phones, Ericsson's world-leading technology resulted from sizable investments of more than $100B in research and development. Featuring one of the highest-quality patent portfolios in the industry, the company has more than 60,000 granted patents worldwide, including 5G essential patents.[17] Ericsson's licensing programme has over 100 license agreements signed, providing access to the company's essential technology innovation on reasonable terms. This approach allows the company to reinvest in developing next-generation technology and drive innovation globally.

According to Ericsson's corporate website, the company filed a landmark 5G patent application, based on years of research and incorporating numerous Ericsson inventions, into a complete architecture for the 5G network standard. The company drove the development of the 5G standard, building on the 70,000 contributions.[18] What was the result of all this 5G investment? Today, Ericsson is a leader in 5G essential patents. Applying an essentiality filter, the company is the lead holder of 5G essential patents, securing a top spot of 17.6-20.1%.

While some analysts have attempted to apply more rigour in calculating 5G patent shares, former Commissioner for Patents at the USPTO Robert Stoll highlighted the importance of focusing on what's essential.[19] When employing this approach and applying an essentiality filter, he considered that Ericsson was a clear leader.

[16] https://www.ericsson.com/en/about-us/history/products/mobile-telephony/mobile-phones--from-luggables-to-pocket-phones

[17] https://www.ericsson.com/en/patents

[18] https://www.ericsson.com/en/patents/patent-leadership

[19] https://www.ericsson.com/en/patents/articles/ericsson-reached-6000-patent-declarations

ZTE

First founded in 1985 as Zhongxing Semiconductor, Ltd. in Shenzhen, ZTE Corporation later became the largest vendor of GSM telecom equipment worldwide.[20] Four years ago, the company declared 2,561 families of 5G Standard-Essential Patents (SEP) to the European Telecommunications Standards Institute (ETSI).[21] During this time, ZTE had applied for more than 74,000 global patent assets, including over 34,000 granted patents worldwide. Furthermore, the company had 3,900 chip patent applications, covering Europe, the US, Japan, Korea and other countries. Over 7,000 5GNR/5GC proposals were submitted to international standardisation organisations.[22]

To date, ZTE has obtained 46 commercial 5G contracts in major markets, such as Europe, Asia Pacific, Middle East and Africa (MEA). ZTE commits 10 percent of its annual revenues to research and development and takes leadership roles in international standard-setting organisations.[23]

As of mid-2023, the group had approximately 86,500 global patent applications and a total of around 44,000 authorised patents worldwide.[24] ZTE Corporation allocated RMB 12.79 billion ($1.75 billion) to research and development to enhance its infrastructure product and solution capabilities and boost competitiveness across various business domains.[25]

---

[20] https://www.gsma.com/solutions-and-impact/technologies/networks/innovator-profile/innovator-profile-zte/

[21] https://timesofindia.indiatimes.com/zte-ranks-global-top-3-with-2561-families-of-5g-declared-standard-essential-patents-to-etsi/articleshow/74391043.cms#

[22] https://www.telecomreviewasia.com/news/industry-news/1926-zte-reports-year-end-high-with-increase-in-operating-revenues/

[23] https://www.zte.com.cn/global/about/news/20200408e1.html

[24] https://www.zte.com.cn/content/dam/zte-site/investorrelations/en_announcement/2023081803.pdf

[25] https://www.zte.com.cn/global/about/news/zte-reports-revenue-of-rmb-90-04-billion-and-net-profi-of-rmb-7-91-billion-in-the-first-three-quarters-of-2024.html

7.

NOKIA

Finnish company Nokia can trace its roots to the mid-19th century. The world's first global system for mobile communications (GSM) was made using Nokia equipment in 1991.[26] For over three decades, Nokia has pushed the boundaries of innovation in communication and defined many of the essential technologies used in all mobile devices, assuming a leading position in open standardisation. The company's leadership in cellular innovation is built on €150 billion invested in research and development since 2000.[27] In 2023 alone, it invested more than €4 billion in research and development, while continuously renewing and strengthening its portfolio of cellular patents.[28] It is the driving force in global standardisation bodies and industry groups for cellular connectivity, including 3GPP.

In recent years, Nokia has turned its attention to 5G-Advanced, which will bring out the richest capabilities of 5G, thanks to immersive extended reality (XR) experiences and high-precision location, presence and timing technologies.[29] These advancements will significantly transform what can be achieved with cellular networks. AI data collection and analytics, coupled with introducing AI technologies in Core, RAN and network management, will bring many advantages and new levels of efficiency. Nokia has driven 5G-Advanced forward through the 3GPP standards body with the first release in 2024, contributing to the standardisation process and providing a clear and stable foundation for the development and deployment of this technology. The second and last major release of 5G-Advanced, Release 19, started recently and will be completed by the end of 2025.[30]

[26] https://www.nokia.com/blog/thirty-years-on-from-the-call-that-transformed-how-we-communicate/

[27] https://www.nokia.com/licensing/patents/

[28] https://www.nokia.com/licensing/patents/mobile-devices/

[29] https://www.nokia.com/blog/5g-advanced-will-power-mobile-xr-experiences-virtually-anywhere/

[30] https://www.nokia.com/networks/5g/5g-advanced/

Established in China in 2004 as Guangdong OPPO Mobile Telecommunications Corp. Ltd., the company surpassed Samsung as the biggest smartphone maker in China in 2016.[31] With over 6,200 families of global patent applications filed for 5G communication standards across more than 40 countries, OPPO first showcased its CybeReal AR application in 2020.[32] The application used mobile network information such as GPS, Wi-Fi, and Bluetooth®, together with SLAM and AI algorithms, to achieve high-precision, full-time positioning and scene recognition.[33] CybeReal reconstructs the physical world in a digital representation with extreme precision. The application represented a huge leap forward in realising true digital twin technology.

OPPO's recent royalty-bearing license agreement with Ericsson has encouraged further investment in fundamental communications technologies.[34] The global patent cross-license between the two companies covered cellular standard-essential patents, including 5G. At the beginning of 2024, OPPO announced that it had signed a global patent cross-license agreement with Nokia covering standard-essential patents in 5G and other cellular communication technologies. Feng Ying, Chief Intellectual Property Officer at OPPO, said the agreement reflected the mutual recognition and respect for each other's intellectual property.[35]

---

[31] https://www.theguardian.com/technology/2016/jan/30/apple-xiaomi-vivo-oppo-challengers-leading-charge-china

[32] https://www.oppo.com/en/newsroom/ip/oppo-and-ericsson-sign-global-cooperation-agreement/

[33] https://www.oppo.com/en/newsroom/stories/future-5g-6g-b5g/

[34] https://www.ericsson.com/en/press-releases/2024/7/ericsson-and-oppo-sign-global-patent-cross-license-agreement

[35] https://www.oppo.com/uk/newsroom/ip/oppo-and-nokia-sign-5g-patent-cross-license-agreement/

9.

大唐电信科技产业集团
DATANG TELECOM TECHNOLOGY & INDUSTRY GROUP

Datang, these days often referred to as Datang Telecom Group, headquartered in Beijing, was founded in 1998 by the China Academy of Telecommunications Technology (CATT). It is a state-run group of companies that includes Datang Mobile, itself founded in 2002[36], which has taken on ownership of SEPs from CATT. Datang Mobile plays a crucial role in 5G technical development and mobile technology with Next Generation Internet and Internet of Things.

The group has capitalised on its research and development capabilities and regional presence. It owns core TD-SCDMA and TD-LTE IPR infrastructure and terminal products and champions the development of relevant extended technologies.[37] Datang also offers technical support, system integration and installation services of base station antennas to the corporate clients of PRC's mobile communication network operators and mobile communication equipment vendors and system integrators. It promotes 5G technologies and solutions as it strives to consolidate a health industry chain by delivering high-quality products and services to its global customers.

[36] https://www1.hkexnews.hk/listedco/listconews/gem/2007/1227/gln20071227041.pdf

[37] https://www.gsma.com/get-involved/gsma-membership/gsma_orgs/datangmobile/

Vivo has rapidly expanded its global presence since its founding in China in 2009. Its predecessor, BBK Electronics, was a top consumer electronics company that specialised in audio and video equipment, home entertainment and appliances. It later developed smartphones, tablets, smartwatches, smart TVs, Hi-Fi devices and Blu-ray players, as well as digital cameras. In 2017, the company shipped 56.7 million smartphones and surpassed both Huawei and Apple to claim the spot of the 2nd largest manufacturer in the world, after Samsung. Over the years, Vivo has refined its mission by creating great products for users and win-win platforms for partners based on trust as it continues to focus on 5G, artificial intelligence, industrial design, imaging systems and other up-and-coming technologies.[38]

Today, Vivo Mobile Communication Co., Ltd. serves more than 500 million users with its mobile products and services in over 60 countries and regions. The Chinese multinational technology company specialises in designing and developing smartphones, smartphone accessories, software, and online services.

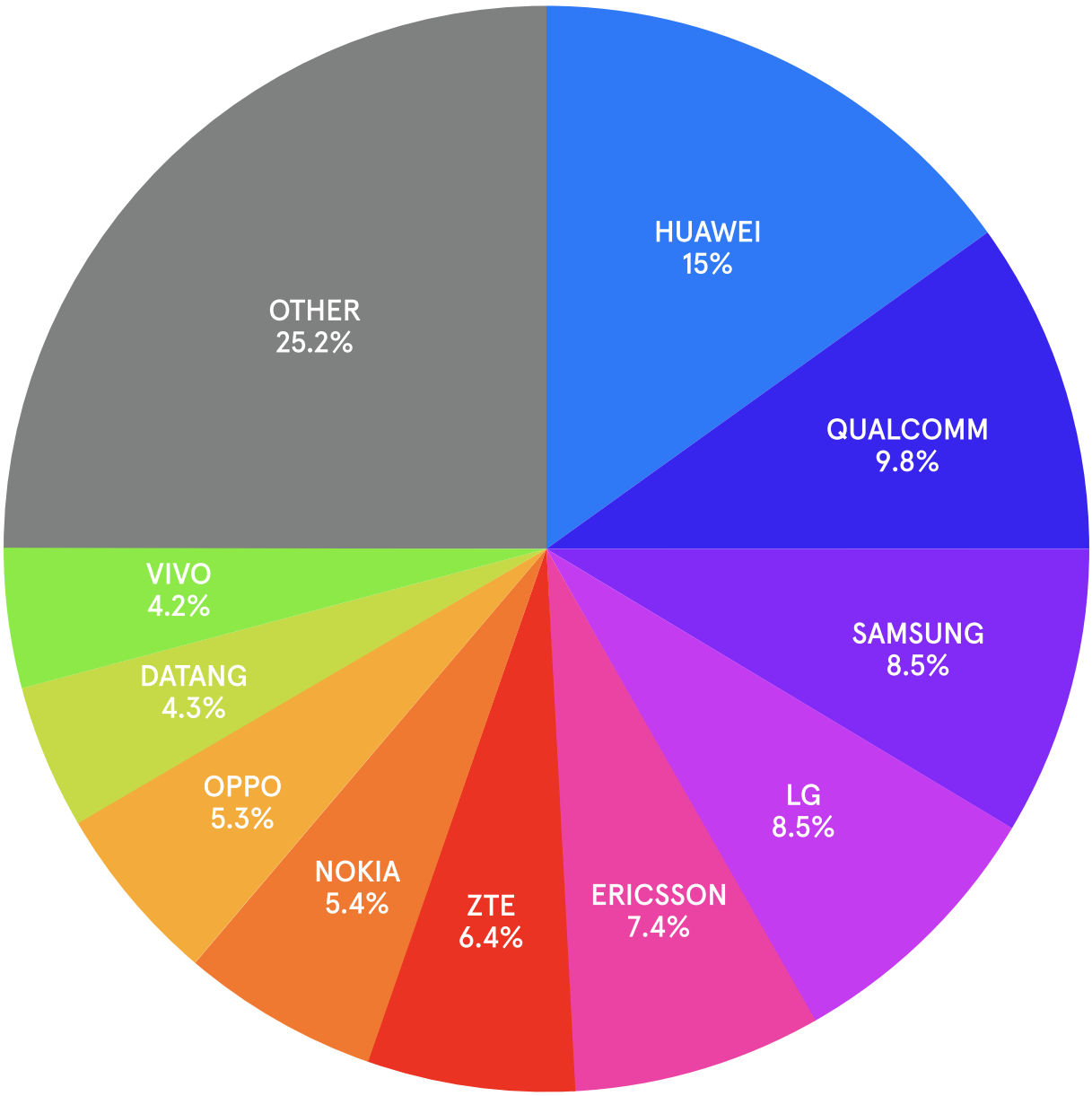
In 2023, Vivo was ranked among the top five smartphone makers, achieving a global market share of 10%. Following this growth, Huawei and Vivo signed a global patent cross-licensing agreement that covered cellular Standard Essential Patents, including 5G. The licensing agreement reflects both companies' mutual respect and commitment to drive better products and services.[39] At the end of 2024, the company announced the global launch of its latest flagship X series, X200 and X200 Pro.[40] The X200 series represents a huge step forward in smartphone technology, thanks to innovative advancements in telephoto capabilities, which were jointly developed by Vivo and ZEISS. Unparalleled performance, ranging from battery life to durability, and a sleek, sophisticated design reflect the ongoing support of Vivo's extensive research and design centres across China.

[38] https://www.vivo.com/en/about-vivo/culture

[39] https://www.huawei.com/en/news/2024/3/huawei-vivo-global-patent-crosslicensing-agreement

[40] https://www.prnewswire.com/news-releases/vivo-sets-a-new-standard-in-user-experience-with-latest-flagship-x-series-smartphone-launch-302331201.html

Top 10 Ultimate Owners: Share of Total



As shown above approximately 75% of all Established 5G SEP families are owned by the top 10 Ultimate Owners. There are approximately 56,000 Established families in total at the start of 2025.

Here is the full Patently 100: 5G SEP Ownership in 2025

#	Ultimate owner	SEP Families		VENUE™	SEP Families with issued US	
		Count	% of total	Score	Count	% of total
1	Huawei	8,408	15.0 %	Low	5,057	12.9 %
2	Qualcomm	5,487	9.8 %	Medium	5,263	13.4 %
3	Samsung	4,770	8.5 %	Medium	4,428	11.3 %
4	LG	4,744	8.5 %	Medium	4,392	11.2 %
5	Ericsson	4,160	7.4 %	Medium	3,476	8.9 %
6	ZTE	3,564	6.4 %	Medium	1,567	4.0 %
7	Nokia	3,004	5.4 %	Medium	2,440	6.2 %
8	Oppo	2,975	5.3 %	Medium	1,390	3.5 %
9	Datang	2,381	4.3 %	Medium	649	1.7 %
10	Vivo	2,321	4.2 %	Low	526	1.3 %
11	Xiaomi	1,698	3.0 %	Low	688	1.8 %
12	NTT	1,680	3.0 %	High	987	2.5 %
13	Apple	1,438	2.6 %	High	1,234	3.1 %
14	Sharp	1,342	2.4 %	High	1,098	2.8 %
15	Mediatek	808	1.4 %	High	620	1.6 %
16	NEC	695	1.2 %	High	524	1.3 %
17	Interdigital	624	1.1 %	High	548	1.4 %
18	Lenovo	499	0.9 %	High	440	1.1 %
19	Langbo	433	0.8 %	Medium	142	0.4 %
20	Intel	409	0.7 %	Medium	307	0.8 %
21	Sony	368	0.7 %	Low	336	0.9 %

#	Ultimate owner	SEP Families		VENUE™ Score	SEP Families with issued US	
		Count	% of total		Count	% of total
22	Honor Device	348	0.6 %	Low	272	0.7 %
23	ASUS	303	0.5 %	High	269	0.7 %
24	ETRI	276	0.5 %	High	229	0.6 %
25	UNISOC	270	0.5 %	Medium	63	0.2 %
26	Fujitsu	246	0.4 %	High	174	0.4 %
27	HTC	211	0.4 %	High	193	0.5 %
28	Fraunhofer	153	0.3 %	Low	126	0.3 %
29	KT Corp	148	0.3 %	High	70	0.2 %
30	Panasonic	147	0.3 %	High	131	0.3 %
31	Alphabet	129	0.2 %	High	107	0.3 %
32	Kyocera	118	0.2 %	Medium	103	0.3 %
33	ITRI	111	0.2 %	Medium	106	0.3 %
34	Philips	109	0.2 %	Medium	99	0.3 %
35	Foxconn	85	0.2 %	High	60	0.2 %
36	Mitsubishi	75	0.1 %	High	65	0.2 %
37	Dominion Harbor	72	0.1 %	Low	32	0.1 %
38	KPI (Key Patent Innovations)	71	0.1 %	High	67	0.2 %
39	ASC (Advanced Standard Communication)	55	0.1 %	Low	52	0.1 %
40	Blackberry	55	0.1 %	High	51	0.1 %
41	IP Bridge	49	0.1 %	Medium	49	0.1 %
42	Wilus	48	0.1 %	Low	43	0.1 %
43	KDDI	46	0.1 %	n/a	13	0.1 %
44	TCL	45	0.1 %	Medium	28	0.1 %

#	Ultimate owner	SEP Families		VENUE™ Score	SEP Families with issued US	
		Count	% of total		Count	% of total
45	Coolpad	41	0.1 %	n/a	40	0.1 %
46	DT (Deutsche Telekom)	38	0.1 %	Medium	32	0.1 %
47	Orange	36	0.1 %	Low	36	0.1 %
48	Sun Patent Trust	36	0.1 %	High	36	0.1 %
49	KPN	34	0.1 %	Low	29	0.1 %
50	Quectel	34	0.1 %	Low	10	0.0 %
51	ITL	32	0.1 %	High	18	0.0 %
52	Longhorn IP	32	0.1 %	High	32	0.1 %
53	Ueran Technology	31	0.1 %	Low	31	0.1 %
54	Convida Wireless	30	0.1 %	Low	29	0.1 %
55	Meizu	30	0.1 %	n/a	0	0.0 %
56	Panoptis	28	0.1 %	High	28	0.1 %
57	Hyundai	27	0.0 %	Low	22	0.1 %
58	Semtech	21	0.0 %	Low	19	0.0 %
59	Transsion	21	0.0 %	Low	0	0.0 %
60	IPCom	20	0.0 %	n/a	12	0.0 %
61	Acer	18	0.0 %	Low	18	0.0 %
62	Sisvel	18	0.0 %	High	16	0.0 %
63	Southeast University	18	0.0 %	n/a	0	0.0 %
64	Fortress	12	0.0 %	n/a	12	0.0 %
65	III (Institute for Information Industry)	16	0.0 %	High	14	0.0 %
66	Toyota	15	0.0 %	Low	14	0.0 %

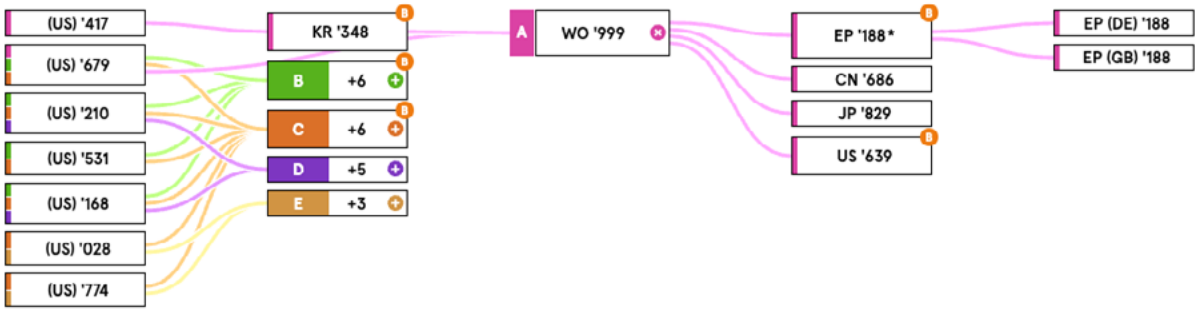
#	Ultimate owner	SEP Families		VENUE™ Score	SEP Families with issued US	
		Count	% of total		Count	% of total
67	CloudMinds	14	0.0 %	Low	12	0.0 %
68	Denso Corp	14	0.0 %	n/a	3	0.0 %
69	New Radio	14	0.0 %	High	14	0.0 %
70	Top Quality Telephony	14	0.0 %	Low	14	0.0 %
71	G+ Communication	13	0.0 %	Medium	12	0.0 %
72	Beiijing Jingshi	12	0.0 %	High	9	0.0 %
73	Vodafone	12	0.0 %	n/a	9	0.0 %
74	Cisco	11	0.0 %	n/a	10	0.0 %
75	Comba	11	0.0 %	n/a	0	0.0 %
76	Siemens	11	0.0 %	High	10	0.0 %
77	Telit Centerion	11	0.0 %	Low	8	0.0 %
78	SK Telecom	10	0.0 %	Low	8	0.0 %
79	Wistron	10	0.0 %	n/a	9	0.0 %
80	Crystal Clear Codec	9	0.0 %	Low	9	0.0 %
81	HMD	9	0.0 %	n/a	9	0.0 %
82	Ukpik	9	0.0 %	n/a	9	0.0 %
83	Verizon	9	0.0 %	n/a	9	0.0 %
84	Apex Beam	8	0.0 %	High	8	0.0 %
85	Gionee	8	0.0 %	Low	0	0.0 %
86	Nantong Langheng	8	0.0 %	n/a	0	0.0 %
87	Conversant	6	0.0 %	High	6	0.0 %

#	Ultimate owner	SEP Families		VENUE™ Score	SEP Families with issued US	
		Count	% of total		Count	% of total
88	IPVAL	6	0.0 %	n/a	5	0.0 %
89	Tahoe Research	6	0.0 %	Low	6	0.0 %
90	Harfang IP	5	0.0 %	Low	5	0.0 %
91	Miics & Partners	5	0.0 %	Low	4	0.0 %
92	Ruijie Networks	5	0.0 %	n/a	0	0.0 %
93	Eight Deer Ventures	4	0.0 %	n/a	2	0.0 %
94	Lepatent	4	0.0 %	n/a	4	0.0 %
95	National Instruments	4	0.0 %	n/a	4	0.0 %
96	Nera Innovations	4	0.0 %	n/a	4	0.0 %
97	Pantech	4	0.0 %	n/a	4	0.0 %
98	Rakuten	4	0.0 %	n/a	4	0.0 %
99	KIA MOTORS	3	0.0 %	n/a	3	0.0 %
100	SAGO Strategic Solutions	3	0.0 %	n/a	3	0.0 %

How Patently SEP data is produced

Our unique and proprietary family data builds Genetic® patent families and corresponds to “ETSI families”, as defined by the European Telecommunications Standards Institute (ETSI). This data identifies those that contain basis patents declared to 5G standards. These we refer to as SEP families.

Below is an example of an extended family (Patently family ref. F081001-WXU) containing interconnected Genetic families, labelled A to E, which is owned by LG. For clarity, only Genetic family A is open; the others are collapsed down. All of the Genetic families are interconnected by a set of US priority filings but they each have different priorities. Of the different Genetic families, only A, B and C have basis patents (labelled with a “B” marker disc). So in this case there are three SEP families within this extended family.



Within the SEP families, we focus on those that have a Family Status of Established (i.e., have at least one member that has been granted and is in force).

As for ownership, we determine the Ultimate Owner as an indicator of the party that is responsible for licensing its share of the SEPs, based on publicly available corporate structure data.[41] Each SEP family is accorded a single Ultimate Owner according to the latest recorded owner data for each family. Where an SEP family has joint ownership, a single owner is determined according to the latest declarant, which is indicative of the most active licensor. Where a family has split ownership, the latest recorded owner wins. By counting each SEP family as a single element of ownership, the Patently listed SEP ownership corresponds with the totals of SEP families, which is not the case with reports made available by other companies (which therefore suffer from over-counting).

From a count of these SEP families, per Ultimate Owner, we generate the Patently 100 rankings.

[41] One exception we have made is in the case of Sharp Corp. Whilst it is technically a subsidiary of Foxconn (Hon Hai Precision Industry Co Ltd), it is understood that Sharp is the licensor of its SEPs.

Questel partnership

In 2024, we partnered with Questel, a global leader in intellectual property (IP) solutions. The partnership expanded our database and marked a significant milestone in the delivery of enhanced patent data and services to a broader range of IP professionals. The company's extensive global coverage, expert essentiality evaluations performed by Concur IP, a Questel company, and meticulous methodology have brought a new dimension to the partnership, underscoring the essentiality evaluation data and its ongoing importance.

From the essentiality evaluations, we have produced the Verified Essentiality Normalisation for User Equipment (VENUE™) essentiality score. PLQ brings a powerful Verified Essentiality filter so you can can focus on the declared patent families that are not just declared as essential to 5G but have been evaluated to be essential and have claims that have been evaluated to apply to UEs. The normalised scores are broad categories (High, Medium and Low): exact essentiality rates, and extrapolations across entire portfolios of the relevant Ultimate Owner, along with other essentiality analytics, are available by subscription to PLQ.

Not all Ultimate Owners have VENUE scores. Where no SEP families belonging to a particular entity have been reviewed, we mark it n/a. For entities with only small numbers of SEP families these ratings may have a low confidence due to the number of families having been reviewed for these entities being low, at absolute minimum only two SEP families. Therefore such ratings in the lower half of the table are particularly susceptible to statistical error and may not be representative of the entire set of SEP families held. For the upper part of the table, the numbers reviewed are far higher and VENUE scores are given with a higher degree of confidence.

Want to know more about Patent Families in Patently?

If you would like to learn more about how Genetic® patent families within an extended family can empower your licensing and help avoid possible misidentification in the future, please send an email to ask@patently.com.

Speak to us

Patently License with Questel is powered by advanced Standard Essential Patent (SEP) analytics, allowing you to explore ownership, geographical coverage and technology coverage of SEPs based on Patently's highly accurate SEP family Ultimate Owner data and Questel's true essentiality analysis so you can better understand ownership of patents to support negotiations around rates.

Book a demo today

About the author

Jerome Spaargaren
Co-founder, Patently

Jerome Spaargaren is a patent attorney and co-founder at Patently. Jerome has worked for over 30 years in the field of telecommunications, SEPs and licensing.

Patently100®

patently.com