iam

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Canon's portfolio might be shrinking but it's still world class

Canon is a prolific patent filer and possesses the world's third largest portfolio of US grants, according to the most recent *IAM/***ktMINE US Patent 100**.

Despite having a reputation for pursuing a conservative patent strategy, the Japanese company has made a number of unexpected moves in the past year. For example, it has upped its rate of litigation in the US and **has assigned** an OLED-related patent portfolio to Samsung.

An analysis of Canon's holdings shows that at portfolio level things are changing, too. The company has significantly decreased its filing activity and allowed chunks of its US holdings to lapse.

Portfolio breakdown

Canon has 105,394 active grants worldwide, according to **Anaqua's AcclaimIP**. It has prioritised protection in its home jurisdiction and has significant holdings in the US (see graph below).
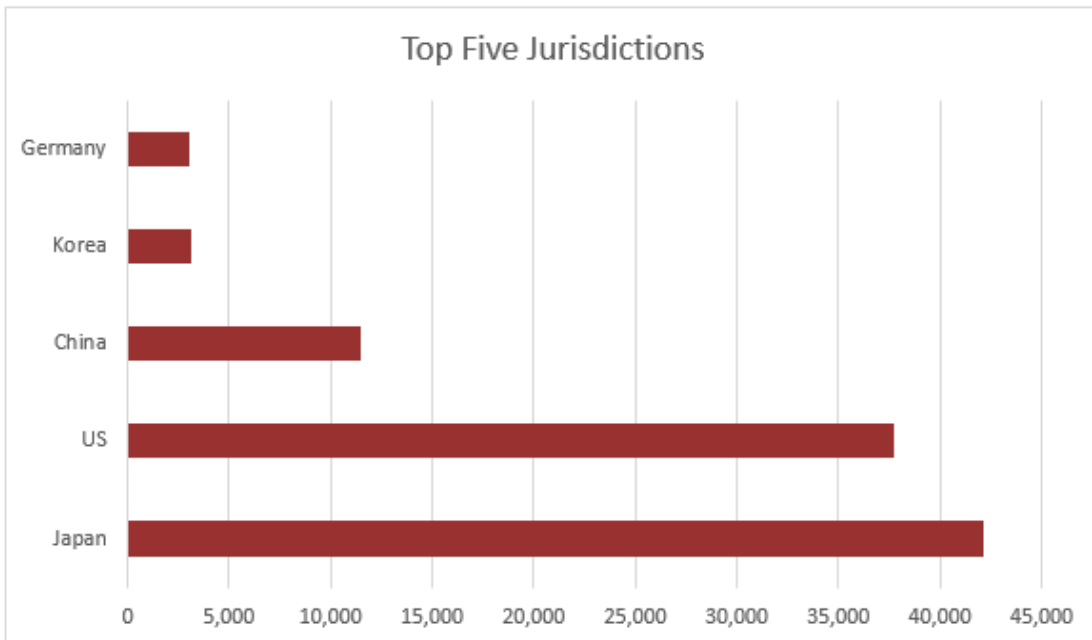
Source: Anaqua's AcclaimIP Analytics Software

It has possessed the third largest US patent portfolio for two years in a row, but the company's strategy in the jurisdiction seems to have shifted drastically with patent abandonments climbing steeply over the past five years (see graph below).
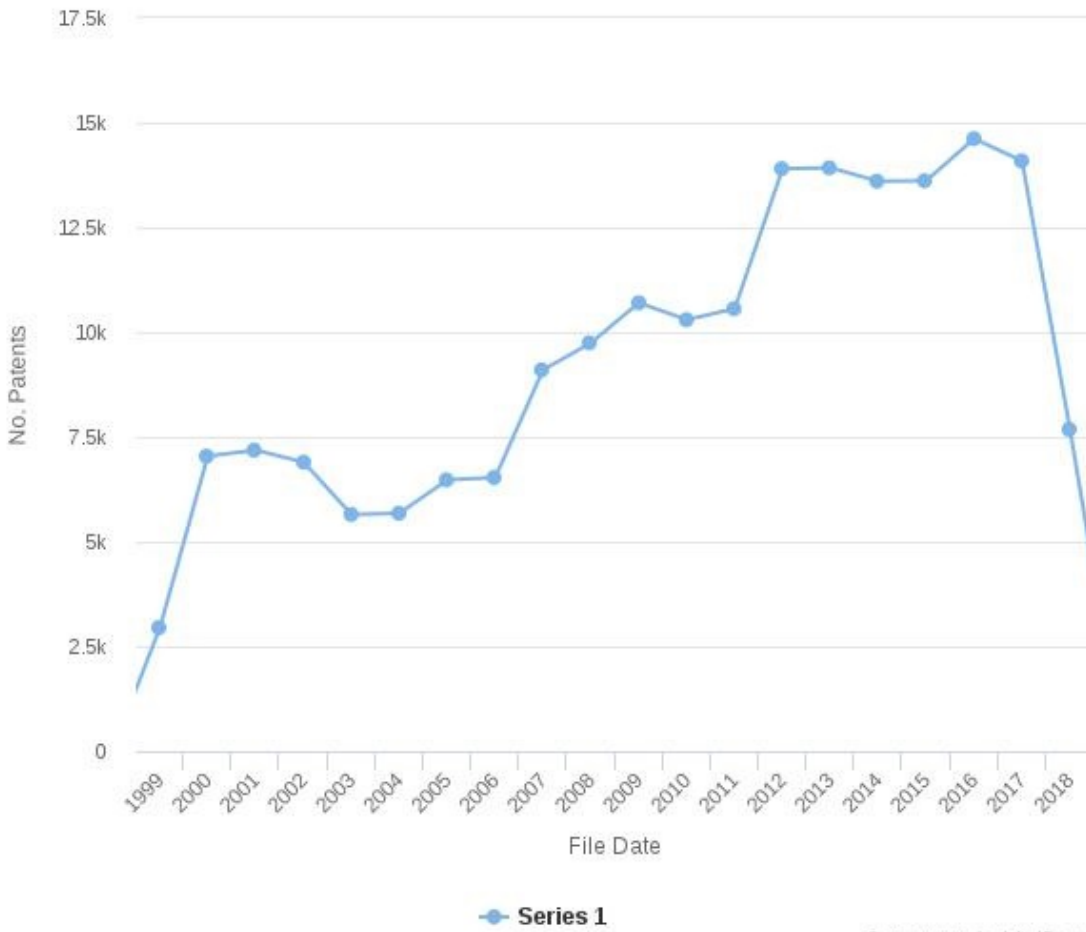
US Patent Abandonment Trends

Source: www.AcclaimIP.com
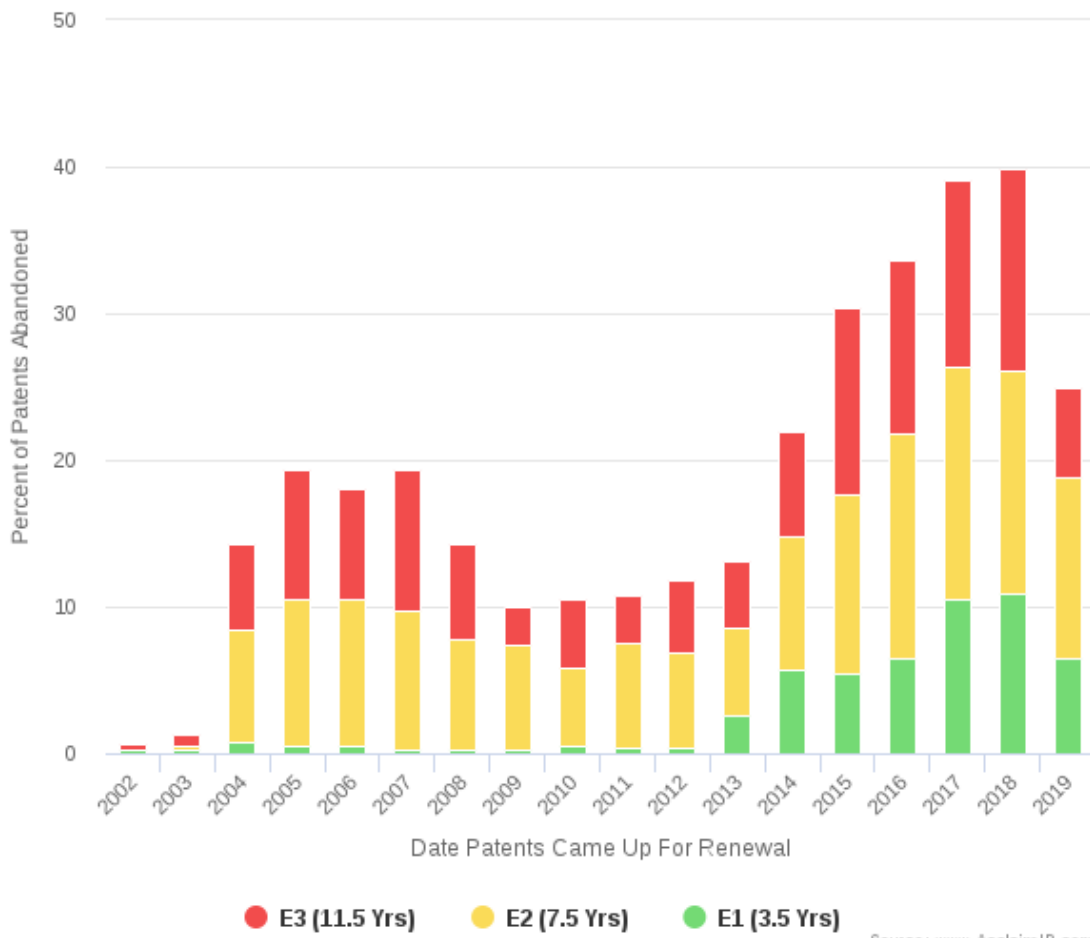
Source: Anaqua's AcclaimIP Analytics Software

Canon's filing levels are cyclical, with activity tapering off recently (see graph below).

Patents by File Date

Source: www.AcclaimIP.com

Source: Anaqua's AcclaimIP Analytics Software

The drop in the company's filings could have led to a reduction in the amount it spends on its portfolio, according to CPA calculations (see graph below). Canon may have spent as much as $5.5 billion over a 10-year period maintaining and building it portfolio (this is not necessarily the actual amount that Canon is paying, just an estimate based on what active assets Canon owns and what has come up for renewal in various jurisdictions within the past 10 years). This is five times the amount that, for example, Alphabet has spent.

Active Patents – 10 Year Annual Spend

Legend: Estimated Cost, Filed, Active
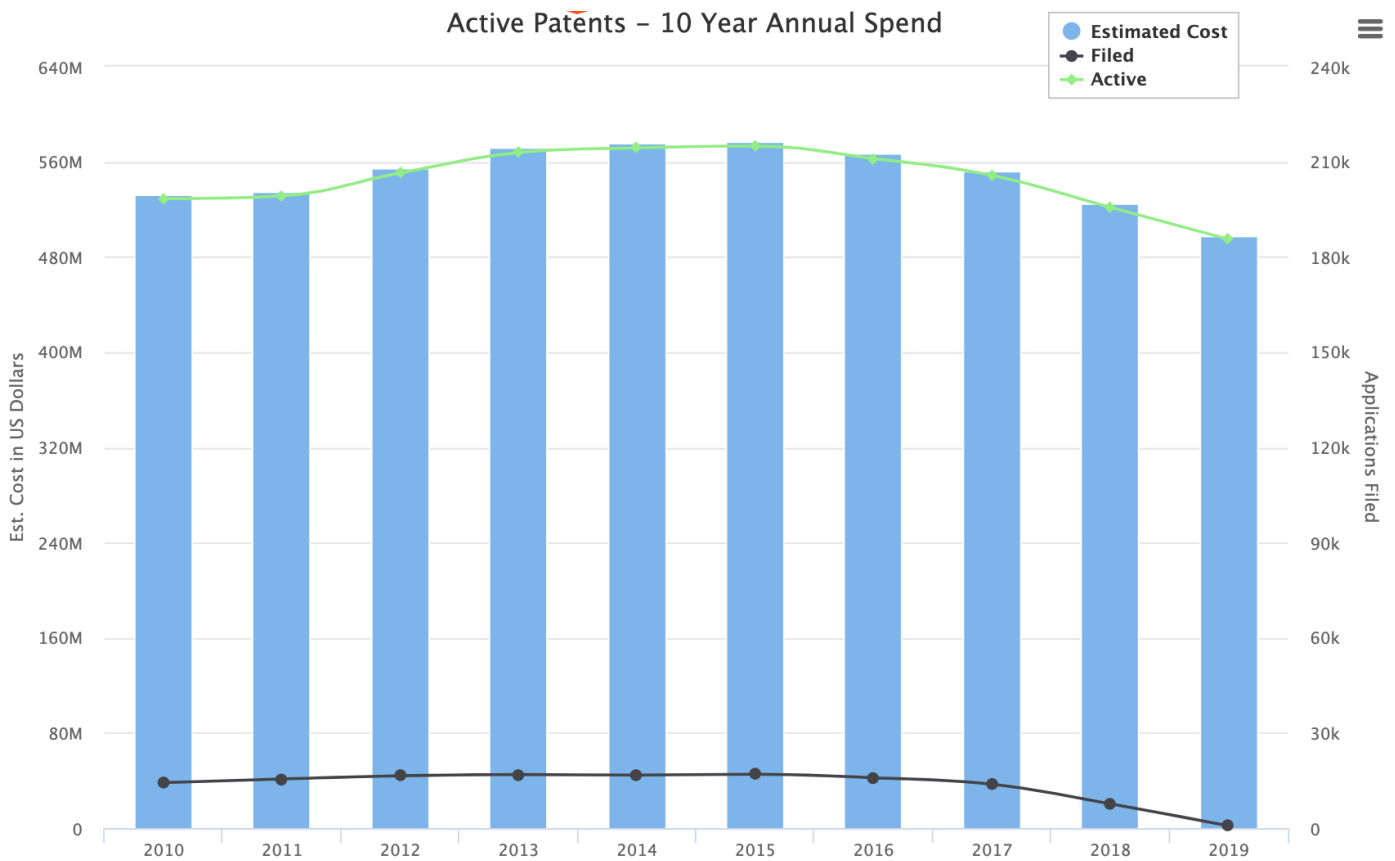
*Source: **CPA Global's IP Intelligence Software***

Key technologies and R&D activity

G03G15 (apparatus for electrographic processes using a charge pattern), H04N5 (details of television systems) and H04N1 (scanning, transmission or reproduction of documents or the like, ie facsimile transmission; details thereof) are the most cited CPC codes in Canon's active portfolio.

Still picture apparatus used for multiple functions, focusing based on image signals and remote printer technologies are a few of the main technology areas covered by Canon's patents, according to an ***IAM commissioned report*** by **Relecura**.

The highest quality patents, those which received a Relecura star rating of three or higher, are related to hardware or software aspects of TV signals, apparatus for electrographic process, and storage and transmission aspects of cameras (see chart below).

High Quality* Patents - Top Sub-technologies Covered
(*High Quality ~ Relecura Star Rating 3 or more on a scale of 5)

Sub-technologies	Relecura Star Rating			
	3	3.5	4	4.5
Hardware or software aspects of TV signals	925	77	11	5
Apparatus for electrographic process	721	72	13	6
Generation, transmission, storage, reproduction of documents or pictures, storage or transmission aspects of cameras	595	35	9	1
Reading or recognizing printed or written characters	498	50	10	4
Digital interface arrangements	499	39	16	2
Other features for forming images	368	57	10	6
Apparatus for electrophotographic processes	329	25	8	3
Image analysis	290	35	9	3
Image analysis or enhancement	287	32	10	2
Typewriters or selective printing characterized by printing process	247	26	1	1
Multiple semiconductor or solid-state devices components formed on a common substrate	199	35	21	4
Digital data processing in printers	240	13	1	0
Colour TV details	214	18	3	1
Digital computers and data processing devices	175	15	8	1
TV systems	165	24	3	2
Radiation diagnosis apparatus	177	9	3	0
Medical diagnostics	151	16	4	0
Coding, decoding, compressing or decompressing digital video signals	148	16	0	0
Function specific digital computer	140	17	6	0
Image enhancement or restoration	138	14	4	2

Source: Relecura

Technologies falling under image analysis, wireless communications and TV systems are some of the fastest growing segments within the portfolio (see graph below).

Fast Growing Technology Segments
(Numbers shown are for Patent Equivalents)

Sub-technology	Specific Segment	2013	2014	2015	2016	2017	2018	Trend
Image analysis	Analysis of geometric attributes	6	4	12	28	33	67	
	Range image, Depth image, 3D point clouds	5	9	12	25	40	64	
	Recognising human being	17	19	21	33	53	80	
	Magnetic resonance imaging	6	7	17	27	56	65	
	Color image analysis	35	37	36	51	75	114	
	Position or orientation of objects, cameras	36	40	44	68	123	175	
Wireless communication	Services using short range communication	6	5	25	70	112	166	
	WLAN	25	32	46	68	132	192	
Handling of filamentary materials	Pile receivers	8	6	9	38	34	67	
	Magazines for piles from articles separated	7	7	24	29	49	76	
	Apparatus for auxiliary operations	12	11	25	47	46	80	
Electrographic apparatus	Supplying of sheet copy material	32	28	33	41	62	120	
	Measuring copy material characteristics	26	21	22	24	23	54	
TV systems	Receiving images from remote sources	12	11	15	22	36	56	
	Closed circuit television systems	49	55	59	93	119	174	
	Control of parameters	21	34	46	77	125	171	
	Additional storage options	15	21	13	26	53	74	
	Mounting of decices	20	20	20	35	47	68	
	Brightness improvement	23	15	28	29	48	70	
Camera bodies, accessories	Supplementary lenses, filters	31	43	49	55	48	113	
Reading, recognising printed characters	Recognising scenes	18	16	17	35	60	85	
	Recognising human or animal bodies	11	8	19	35	35	62	
Developers for electrostatic image	Non-homogenuous distribution of components	8	12	20	26	37	55	

Source: Relecura

Valuenex conducted an analysis of Canon's US holdings from 1st January 2000 to 14th August 2019. The dataset consisted of 54,544 patents. The trend line has not drastically changed. This indicates that Canon has a strong R&D strategy and has been steady in building up its business fields (see graph below).
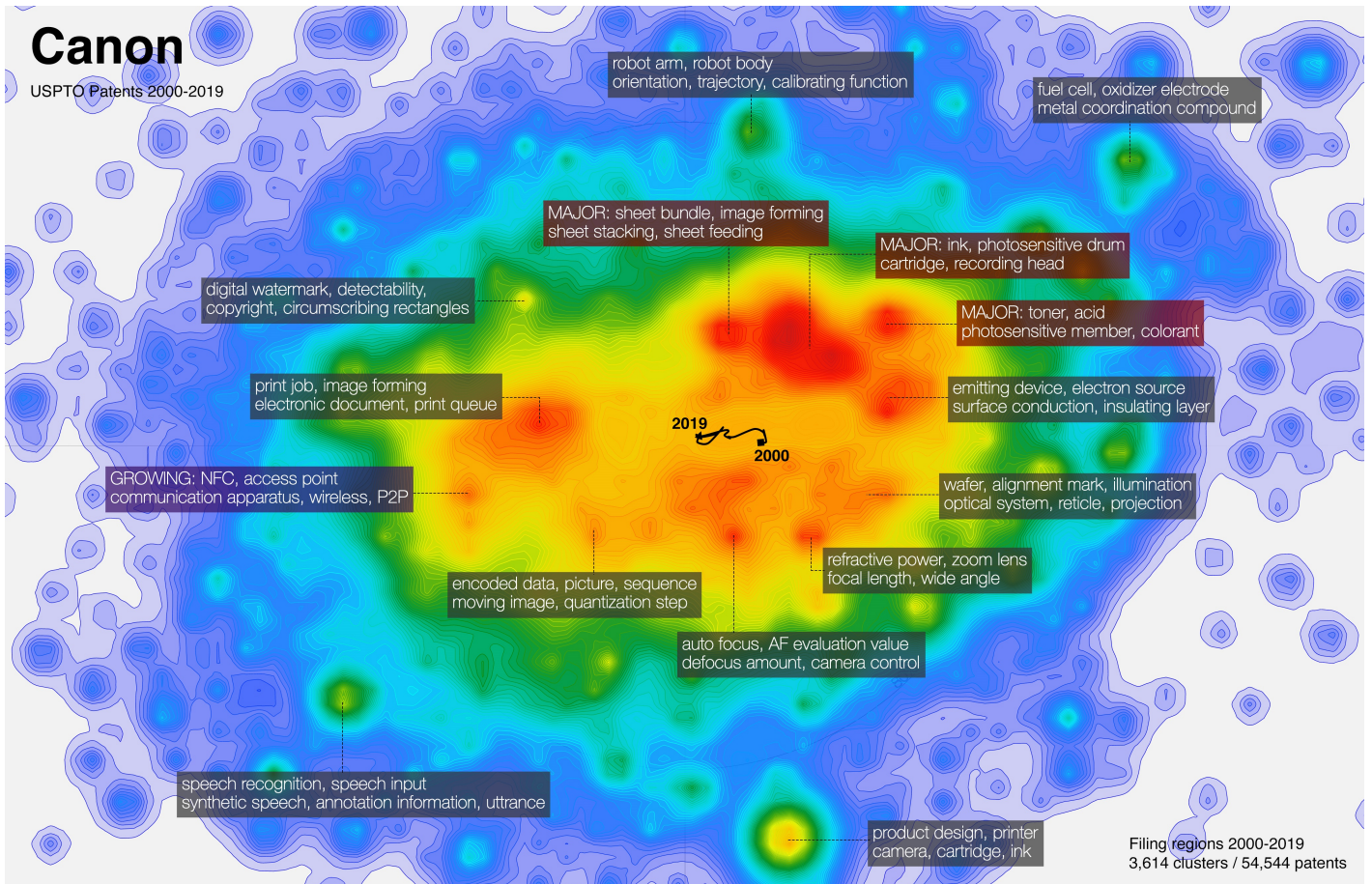
Source: VALUENEX, see full size image **here**

A comparison of Canon's patent landscape in 2000 and 2019 shows how consistent the company's R&D strategy has been over the past two decades (see images below). Although the portfolio is broad and substantial, only one growing area appears (NFC, access point communication apparatus, wireless, P2P). Analysts from Valuenex say that this focused strategy has limited Canon's growth into new business fields, and suggest that there needs to be a balance between consistency and innovation to achieve long term dominance.

Canon

USPTO Patents 2000-2019

robot arm, robot body
orientation, trajectory, calibrating function

fuel cell, oxidizer electrode
metal coordination compound

MAJOR: sheet bundle, image forming
sheet stacking, sheet feeding

MAJOR: ink, photosensitive drum
cartridge, recording head

MAJOR: toner, acid
photosensitive member, colorant

digital watermark, detectability,
copyright, circumscribing rectangles

emitting device, electron source
surface conduction, insulating layer

print job, image forming
electronic document, print queue

2019

2000

GROWING: NFC, access point
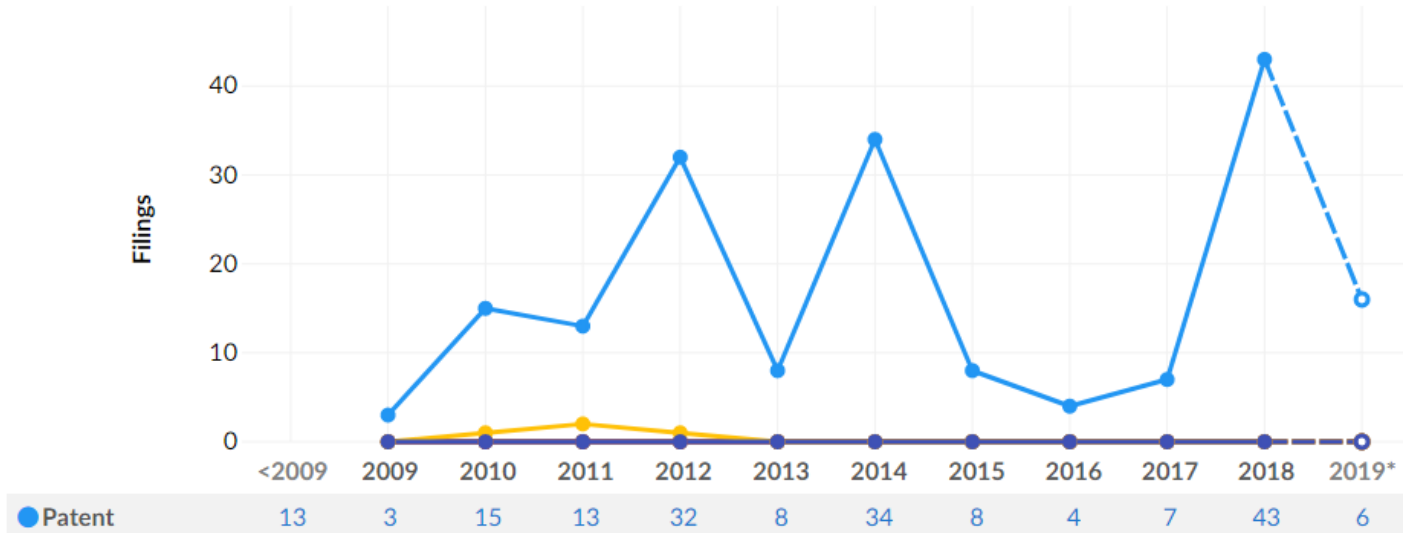communication apparatus, wireless, P2P

wafer, alignment mark, illumination
optical system, reticle, projection

refractive power, zoom lens
focal length, wide angle

encoded data, picture, sequence
moving image, quantization step

auto focus, AF evaluation value
defocus amount, camera control

speech recognition, speech input
synthetic speech, annotation information, uttrance

product design, printer
camera, cartridge, ink

Filing regions in 2000
802 clusters / 2,008 patents

Canon

USPTO Patents 2000-2019

robot arm, robot body
orientation, trajectory, calibrating function

fuel cell, oxidizer electrode
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MAJOR: sheet bundle, image forming
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2000

GROWING: NFC, access point
communication apparatus, wireless, P2P

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speech recognition, speech input
synthetic speech, annotation information, uttrance

product design, printer
camera, cartridge, ink

Filing regions in 2019
938 clusters / 2,108 patents

Source: VALUENEX, see full size images here and here
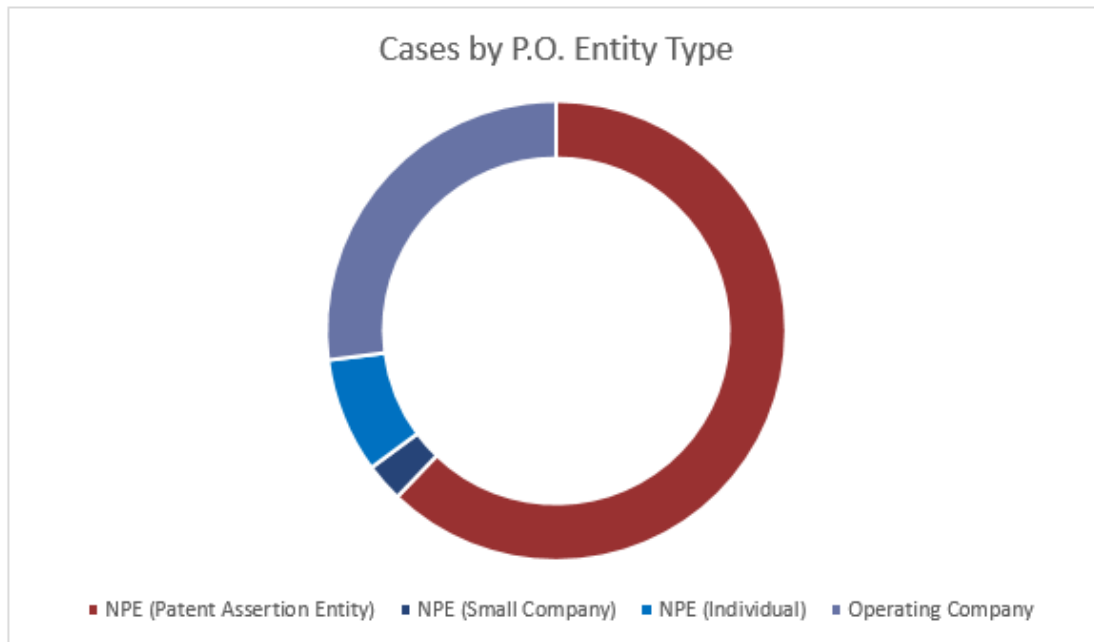
Litigation and secondary market activity

Canon does not often target major technology companies in lawsuits, but it is aggressive when it comes to taking on smaller players. Since 2009 the the company has been involved in 186 patent cases in the US (see graph below). It was a defendant 84 times and acted as the plaintiff 95. In 2012, 2014 and 2018 – the years that litigious activity spiked – Canon was overwhelmingly the plaintiff.

Case Filings (Top 6 by Focus Order)

	<2009	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019*
● Patent	13	3	15	13	32	8	34	8	4	7	43	6

Source: **Lex Machina**

The Japanese company is not as active when it comes to the PTAB. It has filed 37 *inter partes* reviews (IPRs) since 2013. Of these, 91.9% related to high-tech patents, while patent assertion entities were the most common patent owners targeted (see graph below). There have been a total of 11 *inter partes* reveiws filed against Canon.


Cases by P.O. Entity Type

■ NPE (Patent Assertion Entity)   ■ NPE (Small Company)   ■ NPE (Individual)   ■ Operating Company

Source: **Unified Patents**

As for secondary market transactions there are few to report. Almost all outbound transactions were to the LOT Network (approximately 23 assets), according to **Richardson Oliver Insights**. There was one outlier which was assigned to the General Hospital Corporation.

Of the 43 inbound assets 31 were from Toshiba, probably because Canon acquired its medical unit in 2016. There were six assets assigned from AT&T Mobility in 2017, as well as a few patents from Hitachi and one of its subsidiaries.

Market comparison

Sony and Kyocera are the top citing entities of Canon's patents, according to analysis conducted by **Derwent, a Clarivate Analytics company** (see graph below).
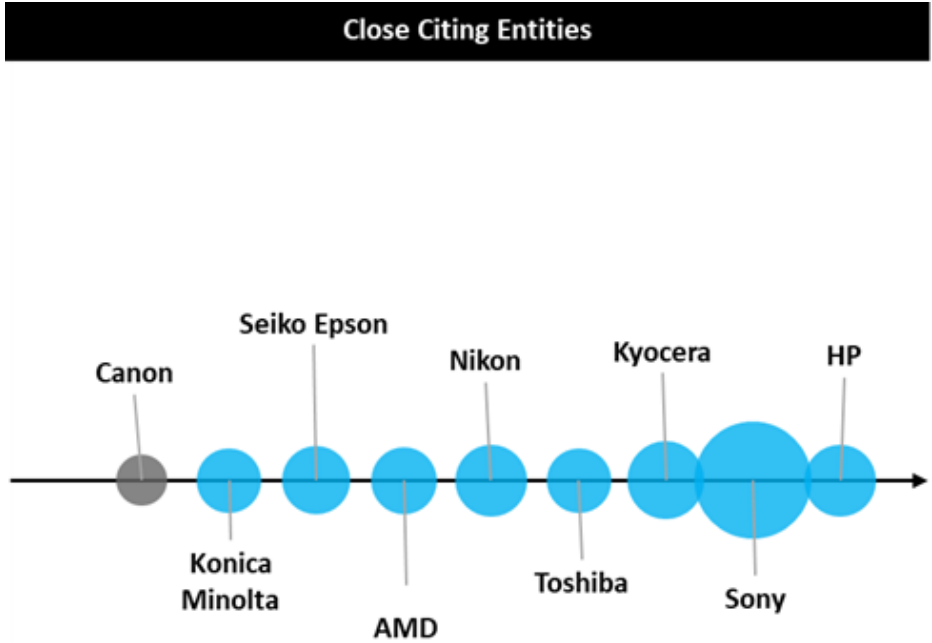
Source: Derwent, a Clarivate Analytics company; Note: Graphic shows entities citing Canon patents in their prosecution. These are all X or Y examiner citations. The bubble size represents the number of citations, and they are arranged from oldest to newest based on average publication date of the citing patents.

Relecura conducted an analysis of Canon's competitors and found that the company generally leads across key technology areas, such as image printing and processing, as well as optical devices (see graph below).

Competitor Comparison – Break-up by Technology Categories
(# Applications given for color-coded categories) – Part 1

Technology Categories			Canon	Konica Minolta	Xerox	Nikon	Sony	Epson
Image Printing	Electrographic apparatus	Developing	8673	2193	4033	0	0	0
		Exposing	2244	592	890	11	6	0
		Fixing	6185	2888	3739	0	1	0
		Machine control	4436	1469	1523	0	2	0
		Sensitising	3003	451	1519	0	3	0
	Electrophotographic apparatus		9055	2531	5041	0	3	0
	Forming images		17214	6519	8124	2	14	1
	Image developing		3813	2085	4786	0	0	0
	Photolithographic processing	Photographic sheets, surfaces	1244	2	4	1654	52	1
		Textured surface for images	6139	690	163	9807	525	4
	Thin film handling	Applcations	2030	530	779	47	4	0
		Feeding articles	2517	907	948	4	19	0
		Handling	1729	472	560	22	10	0
		Separating articles	1967	585	562	0	11	0
		Supports	1659	448	513	1	14	0
Image Processing	Analysis, enhancement		4585	666	541	345	2704	2
	Enhancement, restoration		3783	680	742	411	1761	2
	Generating 2D Images		2410	327	609	105	1465	0
	Image analysis		6112	995	1071	605	3842	3
Medical & Diagnosis	Diagnostics	For reproductive systems	311	5	4	0	3	0
		Measuring energy	1270	2	0	0	1	0
		Using light	750	105	71	18	257	0
		Using microwaves	1218	116	10	3	124	0
	Eye testing		2333	15	56	62	237	0
	Radiation diagnosis		5324	1554	18	13	70	1
	Sonic wave devices		2962	1043	7	0	50	0
Nanostructure Applications	Applications		1342	35	118	307	268	0
	Manufacture, treatment		1302	53	84	172	131	0
Optical devices	Application specific cameras		2382	1293	31	1731	758	2
	Magnification types		2438	354	0	1411	337	0
	Material types		1097	983	40	557	420	8
	Mountings, connections		8001	1057	73	3117	1438	1
	Other optical devices		3315	857	98	2016	3468	26

Source: Relecura

Sony overtakes Canon when it comes patents relating to semiconductor devices and wireless communication networks (see graph below).

Competitor Comparison – Break-up by Technology Categories
(# Applications given for color-coded categories) – Part 2

Technology Categories			Canon	Konica Minolta	Xerox	Nikon	Sony	Epson
Pictorial communication	Scanning	Control console	2856	1101	1130	99	299	0
		Storage	4476	1401	1348	240	675	0
	Still video cameras	Connection system	2028	635	490	111	221	0
		Digital still camera	716	24	33	218	276	0
		Image printer	850	193	307	23	13	0
	TV systems	Signal recording	5370	490	239	1370	6777	2
		Studio devices	24440	1806	337	6673	11084	6
		Video transmission	8288	673	102	1637	7562	3
Printers	Accessories		11434	3879	4673	9	137	12
	Ink jet	Ink handling	4992	540	1537	0	76	28
		Jet generation	3970	644	1080	1	200	0
		Nozzles	6896	994	1427	1	242	2
	Printer computing	Interface arrangements	19760	5656	7934	566	13935	26
		Security	3216	760	1690	58	4017	0
Semiconductor devices	Connection, disconnection		592	115	225	273	2340	25
	Devices with magnetic effects		399	17	3	1	520	0
	Manufacturing process		1052	219	310	83	2246	6
	Multiple semiconductors		5615	868	328	963	10680	5
	With active organic material		1860	2573	641	181	2819	0
Wireless communication networks	Data management		893	23	40	6	1561	0
	Network topologies		2141	44	97	23	3232	0
	Security		776	42	132	3	1224	0
	User network		1245	89	252	34	3916	0
	Wireless management		1237	43	70	6	2173	0

Source: Relecura

IAM says:

Canon has been eliminating deadweight in its US portfolio for a number of years, as well as more recently cutting down its global filing activity. This streamlining has had no significant effect on its portfolio, as it still has the third largest holdings of US assets.

The company's filings have previously gone through quiet periods to be followed by a surge in growth. It may be that Canon is preparing to ramp up activity in a new area.