

TABLE S8-8

## USPTO patents and patent families granted in digital communication, by region, country, or economy: 1998–2018

(Number)

Region, country, or economy	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		2017		2018		
	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families			
World	3,102	4,231	3,630	5,592	4,237	5,780	4,428	4,912	4,819	4,946	5,299	6,605	6,438	8,090	6,320	8,062	9,824	11,194	9,004	11,619	10,355	11,564	12,006	13,348	16,207	15,219	17,676	18,521	21,068	21,054	23,948	20,913	28,396	23,372	27,919	24,329	28,835	26,155	30,220	27,941	29,245	32,155	
North America	1,925	2,266	1,618	1,618	1,375	1,822	2,819	1,726	2,996	1,839	3,302	1,979	4,142	2,392	4,055	2,145	6,309	2,459	5,660	2,123	6,385	2,282	7,482	2,448	10,384	2,664	11,993	3,304	13,397	3,635	16,035	4,700	16,073	5,348	15,835	5,454	16,437	5,387	15,878	5,264			
Canada	78	63	127	100	147	108	149	116	146	108	169	124	212	141	193	106	303	130	290	165	379	193	424	208	582	208	654	214	826	254	983	300	1,137	354	1,020	347	873	307	901	302	844	286	
Mexico	0	0	1	1	1	1	2	1	3	2	3	2	2	1	3	3	2	0	0	0	1	1	0	0	1	0	1	0	2	1	0	1	0	2	5	7	7	8					
Puerto Rico	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0	1	0	2					
United States	1,847	1,312	2,138	1,517	2,597	1,714	2,668	1,610	2,847	1,729	3,130	1,853	3,927	2,249	3,859	2,037	6,004	2,329	5,369	1,958	6,005	2,089	7,058	2,240	9,293	2,640	9,730	2,450	11,164	3,050	12,413	3,335	14,895	4,346	15,051	4,999	14,956	5,143	15,528	5,078	15,025	4,970	
All others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Central and South America	1	1	1	1	1	1	1	1	2	1	2	2	2	2	2	1	4	1	4	1	5	0	8	2	9	3	15	4	30	3	26	11	33	12	31	12	33	15	41	14	44	18	
Argentina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	1	0	4	0	8	0	6	1	6	2	8	2	5	1	7	0		
Brazil	0	0	0	0	0	0	0	0	2	1	0	0	1	1	1	1	1	0	1	0	3	0	3	1	3	0	2	3	2	12	2	8	1	20	8	18	10	28	12	31	15		
All others	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	3	1	1	0	2	0	3	0	3	1	6	3	7	2	12	3	6	1	20	8	28	12	31	15				
Europe	441	512	527	613	593	781	632	872	741	894	849	1,234	969	1,301	937	1,458	1,360	1,371	1,220	1,200	1,406	1,162	1,478	1,047	2,037	1,083	2,296	1,119	2,775	1,444	3,255	1,328	4,003	1,538	3,751	1,562	4,033	1,652	4,113	1,742	3,823	1,799	
EU	426	472	505	558	578	741	610	829	717	841	819	1,138	935	1,207	900	1,348	1,308	1,275	1,169	1,097	1,339	1,069	1,406	933	1,937	989	2,186	1,024	2,648	1,307	3,126	1,230	3,826	1,401	3,551	1,401	3,798	1,480	3,849	1,537	3,580	1,594	
Austria	0	5	2	7	3	6	3	9	7	12	7	14	7	22	6	20	13	33	5	20	16	16	9	24	12	23	11	28	32	15	38	24	36	20	41	21	43	27	44	19			
Belgium	12	6	8	3	7	5	9	10	11	6	13	7	23	19	26	29	29	31	19	31	29	29	39	18	44	24	51	25	54	28	68	33	65	27	63	24	63	40	63	52	60	41	
Denmark	0	0	3	3	2	3	2	3	5	3	12	10	8	10	16	15	26	22	20	16	22	16	22	8	26	12	33	5	37	9	44	21	57	15	57	15	40	37	40	35	40	12	
Finland	65	68	97	95	87	157	98	176	133	137	159	192	221	210	152	139	258	108	255	92	270	82	260	93	333	75	286	66	326	90	432	173	387	140	410	108	383	87	300	80			
France	77	86	82	117	95	164	99	147	109	190	120	296	135	302	128	363	194	310	186	265	236	277	194	226	303	211	341	242	385	323	440	253	504	301	431	283	434	325	464	357	403	385	
Germany	72	136	77	133	106	139	114	128	131	154	177	191	170	196	195	409	312	404	260	361	292	351	351	261	462	296	503	268	523	341	616	318	749	319	689	317	690	325	678	334	662	401	
Hungary	0	1	0	2	1	0	0	1	0	0	6	5	3	3	5	3	5	2	9	4	7	4	11	2	14	3	23	3	26	5	39	7	55	10	45	5	52	7	49	5	28	4	
Ireland	1	3	1	7	3	6	12	9	11	12	25	14	24	14	11	7	15	4	12	7	18	6	14	5	32	8	40	6	40	13	67	14	76	20	100	48	105	48	131	64			
Italy	4	22	6	22	8	37	5	40	11	33	13	19	15	26	11	32	15	27	23	39	27	39	27	49	31	64	28	104	38	120	46	137	36	124	26	111	26	116	79	99	57		
Netherlands	23	19	29	30	29	17	22	27	28	23	27	15	34	16	46	25	58	29	37	26	54	31	63	28	79	30	97	26	107	35	130	30	160	29	137	34	160	49	155	49	153	39	
Spain	5	14	2	7	2	11	4	12	5	7	3	14	8	18	6	26	9	29	17	23	17	24	18	34	22	41	27	65	60	82	64	70	64	84	70	76	46	69	40	63	48		
Sweden	78	71	99	81	127	115	123	181	145	156	133	164	124	142	119	76	116	63	81	37	86	36	98	49	157	241	65	402	66	691	83	657	82	691	83	657	82	691	83	657	82	691	83
United Kingdom	88	39	97	46	107	74	117	80	119	99	133	180	161	213	173	206	236	211	228	172	255	148	248	143	348	155	384	183	475	234	583	218	727	271	705	334	733	347	728	246	713	298	
All others	0	2	1	4	1	5	0	7	1	8	4	6	2	15	4	12	6	15	11	15	10	20	21	26	34	32	22	65	32	66	47	90	42	85	42	117	57	150	74	169	71		
Other Europe	15	41	23	55	15	40	22	43	24	53	30	96	35	94	38	110	52	96	50	103	66	93	72	114	100	94	111	129	98	177	128	200	161	235	172	264	205	243	204				
Former Soviet Union	0	0	0	0	0	0	1	1	0	1	0	5	0	6	1	0	2	1	5	0	1	5	0	4	2	8	1	3	2	15	4	5	4	11	5	9	6	12	6	11	5		
Norway	3	3	1	4	1	7	5	6	6	14	7	14	6	8	8	19	5	9	9	14	10	13	11	13	8	5	9	6	22	7	27	11	36	11	23	6	35	9					
Russia	1	30	2	42	2	24	2	24	2	30	1	67	4	62	2	76	63	63	16	58	14	63	14	76	61	31	65	41	92	35	64	55	101	64	58	98	70	126	57	134			
Switzerland	10	7	16	6	9	6	8	11	12	5	20	10	21	16	23	13	39	21	30	19	37	19	44	22	59	18	66	20	67	23	74	21	96	22	98	34	121	48	142	58	127	49	
All others	1	0	4	2	3	3	5	1	4	3	3	0	4	2	4	1	2	1	3																								

TABLE S8-8

## USPTO patents and patent families granted in digital communication, by region, country, or economy: 1998–2018

(Number)

Region, country, or economy	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		2017		2018		
	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families	USPTO patents	Patent families			
China	2	4	4	9	5	17	3	42	3	27	6	211	10	521	18	504	58	722	48	1,264	84	3,373	149	5,157	332	5,988	481	7,800	751	9,502	1,110	8,564	1,569	9,506	1,526	11,409	2,033	12,384	2,386	14,647	2,495	19,236	
India	0	0	0	1	1	0	4	3	6	4	12	10	18	15	22	16	38	16	55	27	83	43	84	35	174	55	185	55	271	371	134	550	193	656	284	792	349	886	382	962	424		
Japan	597	1,576	658	1,887	693	1,692	722	1,586	773	1,481	824	1,837	884	1,922	864	1,910	1,375	2,042	1,247	2,484	1,365	2,219	1,550	2,719	1,993	3,186	2,207	4,002	2,772	3,531	2,414	2,278	2,255	2,429	2,277	2,252	2,429	2,277	2,046	2,253			
Malaysia	0	0	0	0	0	0	1	0	1	0	1	0	2	2	1	4	2	4	3	3	4	1	5	7	6	7	11	7	8	27	15	7	25	9	37	28	42	11	34	13	32		
Singapore	2	2	3	2	5	2	3	3	15	7	10	3	10	5	6	5	15	4	19	7	14	4	35	14	35	6	38	4	41	7	31	7	42	6	40	9	45	16	48	14	45	17	
South Korea	80	686	101	1,378	117	1,377	150	518	160	505	153	1,059	215	1,587	206	1,623	350	4,122	417	4,160	623	2,236	750	1,625	1,092	1,708	1,358	2,552	1,681	2,241	1,950	2,541	2,167	2,988	2,217	2,474	2,524	2,882	2,587	2,729	2,551	2,459	
Taiwan	13	43	19	51	25	45	21	102	35	108	30	193	61	250	57	310	114	360	153	270	176	145	182	178	260	204	315	206	466	317	487	489	525	614	513	635	501	610	576	442	528	343	
All others	0	1	1	0	3	0	2	1	0	0	0	0	2	1	1	0	3	2	1	2	5	3	5	3	5	2	5	7	7	11	11	15	12	7	10	8	13	9	9	6			
Middle East	32	23	44	24	38	32	59	39	76	54	94	62	103	69	117	55	147	63	126	40	142	51	214	70	303	86	296	61	361	84	429	96	529	147	558	159	594	198	678	234	699	238	
Israel	32	23	43	24	38	32	58	38	75	54	93	60	102	69	116	55	146	62	125	39	141	50	212	65	297	83	287	57	344	71	405	87	505	133	528	143	564	186	642	216	664	222	
All others	0	0	0	0	0	0	1	0	1	0	1	1	0	1	0	2	1	1	1	1	1	1	3	5	6	3	9	4	17	12	24	9	24	14	29	15	30	12	36	18	35	16	
Africa	2	1	1	2	2	1	1	2	1	3	1	2	3	7	3	5	2	6	2	4	3	12	1	7	6	6	4	3	9	7	6	11	6	12	5	32	14	30	17	25	10		
South Africa	2	1	1	1	2	0	0	0	1	0	2	0	2	6	2	4	1	5	1	3	2	10	0	7	3	5	2	1	3	1	6	2	3	4	9	4	20	11	18	11	3		
All others	0	0	0	2	0	0	1	1	0	2	1	0	1	1	1	1	1	1	1	1	1	1	0	3	1	2	2	4	3	5	4	3	4	4	3	1	10	3	14	6	7		
Australia and Oceania	7	5	6	4	9	10	12	18	9	23	15	14	17	16	29	26	47	21	50	33	66	30	63	36	78	34	96	34	104	57	113	48	130	95	108	105	123	98	127	39	123	56	
Australia	5	5	6	4	9	10	11	18	8	23	13	14	17	15	27	24	44	21	48	31	64	30	59	35	72	34	88	32	95	54	46	122	93	98	102	116	97	116	37	112	54		
New Zealand	2	0	0	0	0	0	1	0	1	0	2	0	1	0	3	2	3	1	1	2	2	0	4	0	6	0	8	2	9	3	8	2	9	3	9	3	7	2	11	2	10	2	
All others	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Unclassified	0	2	0	1	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

EU = European Union; USPTO = U.S. Patent and Trademark Office.

## Note(s)

USPTO patents are allocated according to patent inventorship information. USPTO patents are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Patents are classified under the World Intellectual Property Organization (WIPO) classification of patents, which classifies International Patent Classification (IPC) codes under 35 technical fields. IPC reformed codes take into account changes that were made to the WIPO classification in 2006 under the eighth version of the classification and were used to prepare these data. However, because PatentsView only provides the original IPC codes as they appeared on patents and not the IPC reformed codes, current Cooperative Patent Classification codes on patents were converted back to the most recent IPC classification to prepare these statistics. Fractional counts of patents were assigned to each technological field on patents to assign the proper weight of a patent to the corresponding technological fields under the classification. International Patent Documentation (INPADOC) patent families across all patent offices covered in the Worldwide Patent Statistical Database (PATSTAT) are counted according to the year of the first granted patent in the patent family. Patent families are allocated according to patent inventorship information found on the priority patent of the INPADOC patent families. To account for missing ownership information in PATSTAT for some offices, a method designed by de Rassenfosse et al. (2012) is used to fill in missing information on priority patents using information in successive filings within the patent families (see technical documentation for details). Patent families are fractionally allocated among regions, countries, or economies based on the proportion of residences of all named inventors. Because of data coverage issues for some patent offices in PATSTAT, statistics for some countries may be underestimated partially for some years or across the whole trend. Countries with identified issues include India (missing data) and South Africa (no data for 2018). For Italy, because of data gaps regarding information on granted patents, patent applications are used instead, which slightly overestimates Italy's output and creates a small shift in the year for which its output is accounted. The EU includes 28 member countries. China includes Hong Kong.

## Source(s)

Science-Metrix; PATSTAT, accessed April 2019; PatentsView, USPTO, accessed June 2019.