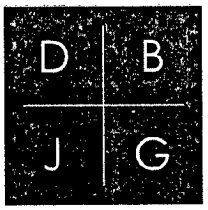
# Exhibit A

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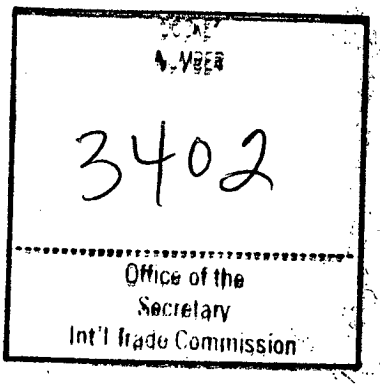



August 9, 2019

**VIA HAND DELIVERY**

The Honorable Lisa R. Barton
Secretary to the Commission
U.S. International Trade Commission
500 E Street, S.W., Room 112
Washington, D.C. 20436

Re: *Certain Wireless Communication Devices and Related Components Thereof*

Dear Secretary Barton:

Enclosed for filing on behalf of Complainant Innovation Sciences LLC ("Innovation") are the following documents in support of Innovation's request that the Commission institute an investigation pursuant to Section 337 of the Tariff Act of 1930, as amended. A request for confidential treatment of Confidential Exhibits 5 and 6 is included with this submission.

Accordingly, Complainant submits the following:

1. One (1) original and eight (8) true paper copies of Innovation's non-confidential Complaint pursuant to Commission Rule 210.8(a)(1)(i);

2. One (1) original and eight (8) true paper copies of Innovation's confidential Complaint pursuant to Commission Rule 210.8(a)(1)(i);

3. One (1) electronic copy of the non-confidential exhibits to the Complaint, pursuant to Commission Rule 210.8(a)(l)(i);

4. One (1) electronic copy of the confidential exhibits to the Complaint, pursuant to Commission Rules 201.6(c) and 210.8(a)(1)(ii);

5. Three (3) additional copies of the non-confidential Complaint, for service upon Proposed Respondents pursuant to Commission Rule 210.8(a)(1)(iii);

6. Three (3) additional copies of the non-confidential exhibits for service upon Proposed Respondents, pursuant to Commission Rule 210.8(a)(1)(iii);

7. Three (3) additional electronic copies of the confidential exhibits (under a separate confidential cover letter) for service upon Proposed Respondents once appropriate subscriptions to a protective order have been filed, pursuant to Commission Rule 210.8(a)(1)(iii);

8. One (1) additional paper copy of the non-confidential Complaint for service on the embassy of Republic of China (Taiwan) pursuant to Commission Rule 210.8(a)(1)(iv);

9. A letter and certification requesting confidential treatment for the information contained in Confidential Exhibits 5 and 6 to the Complaint and the portions of the Complaint that discuss the substance of that Confidential Exhibits, pursuant to Commission Rules 201.6(b) and 210.5(d); and

10. A Statement on the Public Interest, pursuant to Commission Rule 210.8(b).

In accordance with 19 C.F.R. §210.12(a) and (c), the following documents are submitted within the exhibit or appendices to this patent-based Complaint;

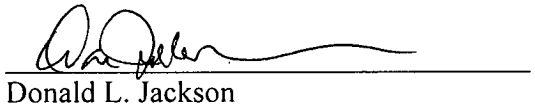
- One (1) certified copy of U.S. Patent Nos. 10,104,425 B2 and 10,136,179 B2 (collectively the "asserted patents"), and their respective certified assignment records, included as Exhibits 1-4.

- One (1) certified copy and four (4) additional electronic copies of the U.S. Patent and Trademark Office prosecution history for U.S. Patent Nos. 10,104,425 B2 and 10,136,179 B2 included with the Complaint as Appendices A, and C; and

- Four (4) electronic copies of the technical references cited in the prosecution history for U.S. Patent Nos. 10,104,425 B2 and 10,136,179 B2 included with the Complaint as Appendices B, and D.

Thank you for your attention in this matter. Please contact me if you have any questions regarding this submission.

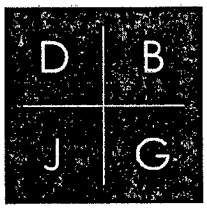
Respectfully submitted,



Donald L. Jackson
Davidson Berquist Jackson & Gowdey, LLP
8300 Greensboro Drive, Suite 500
McLean, VA 22102
(571) 765-7710

*Counsel for Complainant*
*Innovation Sciences LLC*

Enclosures

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August 9, 2019

**VIA HAND DELIVERY**

The Honorable Lisa R. Barton
Secretary to the Commission
U.S. International Trade Commission
500 E Street, S.W., Room 112
Washington, D.C. 20436

Re: *Certain Wireless Communication Devices and Related Components Thereof*

Dear Secretary Barton:

This firm represents Complainant Innovation Sciences ("Innovation"), who is concurrently filing a Complaint pursuant to section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337.

In accordance with Commission Rules 201.6 and 210.5, 19 C.F.R. §§201.6, 210.5, Innovation respectfully requests that the Commission grant confidential treatment of the confidential business information contained in Confidential Exhibit Nos. 5 and 6 to Innovation's verified Complaint, and the portions of the Complaint that discuss the substance of those Confidential Exhibits.

The information for which confidential treatment is sought is proprietary commercial information that is not otherwise publicly available. More specifically, Confidential Exhibit No. 5 contains confidential information regarding Innovations' licensing practices and strategies, namely Confidential Exhibit No. 6 contains confidential information regarding Innovation's licensee LG Electronics and its affiliates.

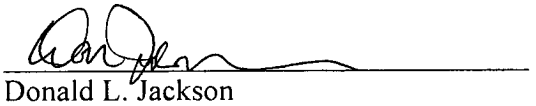
The information described above qualifies as confidential business information pursuant to Commission Rule 210.6(a) because:

1. it is not available to the public;
2. unauthorized disclosure of the information could cause substantial harm to Complainant's competitive position; and

3. the disclosure of the information could impair the Commission's ability to obtain information necessary to perform its statutory function.

I certify that substantially identical information is not reasonably available to the public. Please contact me if you have any questions about this submission.

Respectfully submitted,



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*Counsel for Complainant*
*Innovation Sciences LLC*

**UNITED STATES INTERNATIONAL TRADE COMMISSION**
**WASHINGTON, D.C.**

| | |
|---|---|
| In the Matter of<br><br>CERTAIN WIRELESS COMMUNICATION DEVICES, AND RELATED COMPONENTS THEREOF | Investigation No. 337-TA-____ |

## COMPLAINANT'S STATEMENT REGARDING THE PUBLIC INTEREST

Complainant Innovation Sciences, LLC ("Innovation") hereby submits this Statement Regarding the Public Interest in compliance with 19 C.F.R. § 210.8(b). As set forth below, Innovation submits that the issuance of the relief requested in the concurrently-filed Complaint, including a permanent limited exclusion order and permanent cease and desist orders covering the accused wireless communication devices and related components and systems thereof will not adversely impact the public health, safety, or welfare conditions in the United States, the competitive conditions in the United States economy, the production of like or directly competitive articles in the United States, or United States consumers.

Innovation has licensed its patent portfolio, including the Asserted Patents, to a number of companies including LG Electronics, which supplies the U.S. market with wireless communications devices that may work as (or with) a hub in a wireless system that permits users to communicate with, monitor, and/or control wireless sensors, controllers, devices, and appliances in the user's home or office. The exclusion of Respondents' wireless communications devices and related components and systems would not implicate any public health, safety, or welfare concerns, as consumers would not face any potential shortage of like or competitive products in the United States. As set forth more fully in the Complaint, Innovation has licensed its technology and patent portfolio to LG Electronics which now services the market

for wireless communication devices that are capable of working as (or with) a hub in a wireless system that permits users to communicate with, monitor, and control wireless sensors, controllers, devices, and appliances in a user's home or office, such as the smart devices, smart appliances, and related products and systems that LG Electronics sells and markets under its SmartThinQ® brand of appliances and its ThinQ® brand of smartphones within the United States. This investigation does not present a situation where a compelling public interest might supersede entry of remedial orders in the event a violation of Section 337 is found.

Nor is this a case where the Commission, the parties, and the public should be required to undertake the time and expense of discovery into any potential public interest issues, the presentation of evidence on such issues before the Administrative Law Judge, and the issuance of any Recommended Determination by the Administrative Law Judge on the public interest issue. Such an endeavor would be a waste of administrative resources and the parties' resources.

## I. Use of Articles Potentially Subject to Remedial Orders in the United States

The Respondents' products potentially subject to remedial orders in the proposed Investigation are wireless communication devices that may work as (or with) a hub in a wireless system the permits users to communicate with, monitor, and/or control various wireless sensors, controllers, devices, and appliances in a user's home or office, including the control of communication signals/content between the various connected devices, such as the provision of audio and/or video content. Such wireless communication devices can come in a variety of forms, and allow users to communicate efficiently with wireless sensors, controllers, devices, and/or appliances.

## II. There Are No Public Health, Safety, or Welfare Concerns in the United States Relating to the Potential Remedial Orders

Excluding the Respondents from importation into the United States would not implicate any public health, safety, or welfare concerns, as like products are readily available in the United States from Innovation's licensee LG Electronics. As such, there are no public health, safety, or welfare concerns that would caution against excluding Respondents' accused products.

## III. Articles That Can Replace the Subject Articles if the Commission Excluded Them from the United States

Wireless communication devices that may work as (or with) a hub in a wireless system that permits users to communicate with, monitor, and/or control wireless sensors, controllers, devices, and smart appliances in the user's home or office, are readily available in the United States from Innovation's licensee LG Electronics, which sells authorized products that compete with Respondents'. Respondents' products have no unique health or safety-related features that cannot be satisfied using competitive authorized products and systems from Innovation's licensee LG Electronics. No public interest concerns arise when the market maintains an adequate supply of competitive and/or substitute products for those subject to a remedial order. *Certain Lens Fitted Film Packages*, Inv. No. 337-TA-406, Comm'n Op. at 18 (June 28, 1999). The U.S. market is competitive for wireless communication devices that may serve as (or with) a hub in a wireless system that permits users to communicate with, monitor, and/or control wireless sensors, controllers, devices, and appliances in the user's home or office, and Innovation's licensees have the capacity to replace the volume of Respondents' infringing products within the United States.

## IV. The Domestic Industry for Wireless Communication Devices can be Satisfied with Existing Products

Wireless communication devices that may work as or with a hub in a wireless system that permits users to communicate with, monitor, and/or control wireless sensors, controllers,

devices, and smart appliances in the user's home or office currently available in the United States from Innovation's licensee LG Electronics. It is unnecessary to hold an evidentiary hearing to establish that the exclusion of Respondents' wireless communication devices would not result in any adverse impact to the presently-supplied market.

## V. The Requested Remedial Orders Will Not Have a Significant Negative Impact on Consumers in the United States

Respondents' customers of wireless communication devices may use their devices as or with a hub in a wireless system for communication with, monitoring, and controlling wireless sensors, controllers, devices, and smart appliances in their homes or offices. These users can select wireless communication devices and their related components (sensors, controllers, devices, and appliances) from Innovation's licensee LG Electronics. The issuance of the requested exclusion and cease-and-desist orders during the remaining term of the Asserted Patents will have no meaningful adverse impact on U.S. consumers.

Further, the public interest favors the protection of intellectual property rights in the United States. *See Certain Two-Handle Centerset Faucets & Escutcheans, and Components Thereof*, Inv. No. 337-TA-422, Comm'n Op. at 9 (June 19, 2000). Issuance of the requested relief here to exclude the infringing products would serve the public interest by protecting Innovation's intellectual property rights. Precluding Respondents from importing and selling their infringing wireless communication devices and related components will benefit the public interest by protecting innovators, such as Innovation, which has made significant investments in the United States to research, develop, patent, and license their innovative and efficient wireless communication devices, systems, and their related components.

Moreover, declining to issue remedial orders in this proposed Investigation to exclude Respondents' infringing wireless communication devices would serve to effectively encourage

and subsidize Respondents' infringement and unfair competition by allowing them to benefit from Innovation's years of research, development, and innovation without just compensation. Allowing unlicensed suppliers such as Respondents to import and sell infringing wireless communication devices and related components in the United States not only devalues the licenses that Innovation has granted, but also discourages others from licensing the patented technologies.

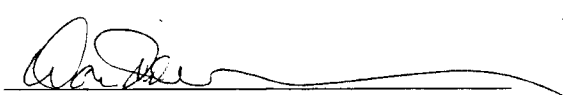
## VI. Conclusion

Issuance of a permanent exclusion order and cease-and-desist orders against Respondents' infringing products will not negatively affect the public health, safety, and welfare in the United States, competitive conditions in the United States economy, the production of like or competitive articles in the United States, and the availability of such products to U.S. consumers. The continued availability of Respondents' accused wireless communication devices and related components is not essential to the public health, safety, or welfare concerns because, *inter alia*, they contain no unique health or safety-related features, and the U.S. market has adequate alternative products that are authorized by Innovation.

Consequently, there are no public interest concerns preventing the issuance of a permanent exclusion order and cease-and-desist orders, or that would necessitate discovery, presentation of evidence, and a Recommended Determination by the Administrative Law Judge on the issue of public interest.

Dated: August 9, 2019

Respectfully submitted,



Donald L. Jackson

Counsel for Complainant

***PUBLIC VERSION***

**UNITED STATES INTERNATIONAL TRADE COMMISSION**
**WASHINGTON, D.C.**

| | |
|---|---|
| In the Matter of<br><br>CERTAIN WIRELESS COMMUNICATION DEVICES, AND RELATED COMPONENTS THEREOF | Investigation No. 337-TA-____ |

**COMPLAINT OF INNOVATION SCIENCES**
**UNDER SECTION 337 OF THE TARIFF ACT OF 1930, AS AMENDED**

**COMPLAINANT**
INNOVATION SCIENCES LLC
5800 Legacy Circle, Suite 311
Plano, Texas 75024
Tel. (972) 696-9116

**COUNSEL FOR COMPLAINANT**
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8300 Greensboro Drive, Suite 500
McLean, VA 22102
Tel. (571) 765-7700
Fax. (571) 765-7200

**PROPOSED RESPONDENTS**
Resideo Technologies, Inc.
901 East Sixth Street
Austin, Texas 78702
Tel. (763) 954-5204

HTC CORPORATION
23 Xinghua Road, Tayouan, 330
Republic of China (Taiwan)
Tel. 886 3 375 3252

HTC AMERICA, INC.
308 Occidental Ave. S., Suite 300
Seattle, Washington 98104
Tel. (425) 679-5318

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***PUBLIC VERSION***

***PUBLIC VERSION***

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| C | Certified Prosecution History of United States Patent No. 10,104,425 |
| D | Copies of References Cited in Prosecution History of U.S. Patent No. 10,104,425 |

***PUBLIC VERSION***

## I. INTRODUCTION

1. Innovation Sciences LLC ("Innovation" or "Complainant") respectfully requests that the United States International Trade Commission commence an investigation pursuant to section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337 ("Section 337"), to remedy the unlawful importation into the United States, sale for importation into the United States, or sale within the United States after importation, by the owner, importer, consignee (or their agents), of certain wireless communication devices, and related components thereof, that infringe valid and enforceable claims of Innovation's U.S. Patent Nos. 10,136,179 ("the '179 Patent") and 10,104,425 ("the '425 Patent), (collectively, "the Asserted Patents"). The Table below lists the claims asserted by Innovation in this Complaint for each of the Asserted Patents ("the Asserted Claims") with independent claims in bold:

| Asserted Patent | Asserted Claims |
|---|---|
| '179 | **1**, 2, 3, 5, 6, **9**, 11,12, 14, **15**, 16, 17, 18 |
| '425 | **14**, 15, 16, 17, 18, **45**, 46, 47, 48 |

**Table 1.** List of Asserted Claims

2. The Asserted Patents are directed generally to wireless communication devices that work as or with a communications "hub" within a smart home system, to assist users in communicating with, monitoring, and/or controlling various wireless smart devices and/or smart appliances in the user's home or office. The wireless communication devices covered by the Asserted Patents may take varied forms including

cellular phones, home security products/systems, and smart home appliances. Pursuant to Commission Rule 210.12(a)(9)(1), certified copies of the Asserted Patents accompany this Complaint as Exhibits 1 and 2, respectively. Further, as shown in the Certified Assignments as recorded in the U.S. Patent and Trademark Office for the '179 Patent (Exhibit 3) and '425 Patent (Exhibit 4), Innovation owns the entire right, title, and interest in and to the Asserted Patents. Certified Copies of the Prosecution Histories and cited references for the Asserted Patents are also submitted with this Complaint and are found at Appendices A-D.

3. The Proposed Respondents are: (1) Resideo Technologies, Inc., and its direct and indirect subsidiaries (collectively, "Resideo"); (2) HTC Corporation; and (3) HTC America Inc, and their direct and indirect subsidiaries (collectively, "HTC").

4. A domestic industry, as required by 19 U.S.C. §§ 1337(a)(2) and (3), exists in the United States relating to articles and/or technology protected by the Asserted Patents, through both: (1) Innovation's significant investments in plant and equipment, labor or capital, and exploitation of the technologies claimed in the Asserted Patents including engineering, research and development, and licensing of the technologies protected by the Asserted Patents; and (2) the substantial investments made by Innovation's licensee LG Electronics, Inc., LG Electronics, U.S.A., Inc. and LG Electronics MobileComm USA, Inc. (collectively "LG") in plant and equipment, labor or capital, and exploitation of the technologies claimed in the Asserted Patents including engineering, research and development, and licensing of the technologies protected by the Asserted Patents related to LG's SmartThinQ® and ThinQ® wireless smart home technologies that are incorporated in LG's smart appliances, smart cellular phones, smart

home security monitoring and control, and the technologies that allows communications between such devices and systems, and which are licensed under the Asserted Patents. *See* Domestic Industry Section IX.

5. Innovation respectfully requests that the Commission institute an investigation into the unlawful acts of Respondents. Innovation seeks a permanent limited exclusion order pursuant to Section 377(d), excluding entry into the United States of all Accused Products and related components thereof, that infringe, whether directly or indirectly, one or more claims of the Asserted Patents. Innovation also seeks a permanent cease and desist orders pursuant to Section 337(f), directing Respondents, their parents, subsidiaries, related companies, and agents to cease and desist from activities that include, but are not limited to, importing, marketing, advertising, demonstrating, offering for sale, selling, distributing, licensing, leasing, warehousing inventory for distribution or sale, or otherwise using the Accused Products and related components to infringe the Asserted Patents, or from aiding or abetting others in such activities. Additionally, Innovation requests that the Commission impose a bond during the 60-day Presidential review period pursuant to 19 U.S.C. §§ 1337(e)(1), (f)(1), and (j)(3) to prevent further injury to Innovation relating to the Asserted Patents.

## II. COMPLAINANT

6. Innovation Sciences LLC is a limited liability company incorporated under the laws of the State of Texas, with its offices located at 5800 Legacy Circle, Suite 311, Plano, Texas 75024. See Ex. 5, Declaration of Dr. Anne Wong, ("Wong Declaration") at ¶¶ 1, 2, 9, 17.

***PUBLIC VERSION***

7. In 2005, Dr. Anne Wong and her brother, Dr. Tiejun Wang, formed the company SellerBid, Inc. ("SellerBid"). Ex. 5, Wong Declaration at ¶10. In 2006, Dr. Wong and her brother formed a second company, Virginia E-Commerce Solutions. Id. at ¶11. In 2012, SellerBid changed its name to Virginia Innovation Sciences, Inc. Id. at ¶14. And in 2018, Virginia Innovation Sciences, Inc. was merged into Innovation Sciences, LLC. Id. at ¶17.

8. Since 2005, through the efforts of Dr. Wong, her brother, and others, the company has researched and developed numerous inventions involving wireless communications devices and systems, and has received more than fifty patents in the United States and abroad. Id. at ¶22. For example, the inventions developed by Innovation include those directed to advancing wireless communication technology, such as development of wireless communication devices that can work as (or with) a hub for communication with, monitoring and/or control of smart wireless devices, systems, and appliances, the control and provision of audio and multimedia content, and the integration of multiple wireless communications over different networks. *See* Ex. 5, Wong Declaration Attachment A listing Complainant's patents.

9. In addition, Innovation also developed software and prototypes, such as those for wireless communication devices and systems for the monitoring and control of wireless smart home devices and technologies. The software and prototypes were developed in support of different aspects of the innovative technology regarding secure payment transactions and smart home technology, and included, for example, technology that assisted more efficient communications for multiple wireless communications over

multiple networks that use different communication types and protocols. See Ex. 5, Wong Declaration at ¶25.

10. In furtherance of its activities, Innovation has made significant and substantial investments in the United States in plants and equipment, labor or capital, and exploitation of the inventions of the Asserted Patents, including its research and development costs and licensing program expenditures. See Ex. 5, Wong Declaration at ¶¶9-43. These include direct investments by Innovation in facilities and equipment, and labor and capital to support the company's research and development, Id. at ¶¶15-30, as well as substantial investments in its licensing program, through which the company has derived revenue from companies that have taken licenses under Innovation's patent portfolio, including LG who manufactures, sells, markets, researches, and develops products in the United States, which are covered by at least one claim of the Asserted Patents. Id. at ¶¶31-42.

## III. PROPOSED RESPONDENTS

11. Proposed Respondent Resideo Technologies, Inc. ("Resideo") is corporation organized and existing under the laws of Delaware, with its principal place of business located at 901 East Sixth Street, Austin, Texas 78702. Resideo is responsible, either directly and/or indirectly through one of its subsidiaries, for designing, developing, and manufacturing the Accused Products, and related components, and selling such devices for importation into the United States, importing such devices into the United States, and/or selling such devices in the United States after importation. Resideo has and continues to engage in these activities without a license from Innovation.

12. Proposed Respondent HTC Corporation is a corporation organized and existing under the laws of the Republic of China and having its principal place of business located at 23 Xinghua Road, Taoyuan, 330, Republic of China (Taiwan). HTC Corporation is responsible, either directly and/or indirectly through one of its subsidiaries, for designing, developing, and manufacturing the Accused Products, and related components, and selling such devices for importation into the United States, importing such devices into the United States, and/or selling such devices in the United States after importation. HTC Corporation has and continues to engage in these activities without a license from Innovation.

13. Proposed Respondent HTC America, Inc. is a corporation organized and existing under the laws of the state of Washington and having its principal place of business located at 308 Occidental Ave. S., Suite 300, Seattle, Washington 98104. HTC Corporation is responsible, either directly and/or indirectly through one of its subsidiaries, for designing, developing, and manufacturing the Accused Products, and related components, and selling such devices for importation into the United States, importing such devices into the United States, and/or selling such devices in the United States after importation. HTC America, Inc. has and continues to engage in these activities without a license from Innovation.

## IV. THE ACCUSED PRODUCTS AT ISSUE

### A. Commission Rule 210.10(b)(1) Statement

14. Pursuant to Commission Rules 210.10 (b)(1) and 210.12(a)(12), the category of Accused Products may be plainly described as smart cellular phones, smart thermostats, and smart home control and monitoring systems with their associated

wireless security sensors (door and window, smoke and fire, motion and sound, leak and freeze), wireless controllers (door locks, lighting, home appliances), and smart video cameras (indoor and outdoor cameras, doorbell cameras), which may be configured to serve as (or with) smart hubs for communicating with, monitoring, and/or controlling such wireless smart devices, systems, and/or appliances in the home or office, and can control the communication of signals/content between those wireless smart devices, systems, and/or appliances. The Accused Products include: (1) Resideo's Honeywell RCHS5200WF Smart Home Base Station and related components; (2) Resideo's Honeywell Lynx Series home security control panels and related components; (3) Resideo's Honeywell Lyric Series home security control panels and related components; (4) Resideo's Honeywell Smart WiFi Thermostats; (5) Resideo's Honeywell Smart WiFi Video Cameras; (6) Resideo's Honeywell Smart WiFi Water Leak & Freeze Detectors; (7) Resideo's Honeywell 5800 Series Wireless Sensors; (8) Resideo's Honeywell SiX Series Wireless Sensors; (9) HTC's U11 cellular phones and related components; (10) HTC's U11 Life cellular phones and related components; and (11) HTC's U12+ cellular phones and related components.

15. Related components of the Accused Products include those hardware, firmware, and/or software components that permit the implementation of the Accused Products in serving as (or with) a wireless hub for communicating with, monitoring, and/or controlling wireless devices, systems, and/or appliances in the home or office, and control the communication of signals/content between those devices, systems, and/or appliances, including wireless sensors, controllers, and/or appliances, and those

components, systems, and software that permit users to communicate with, monitor, and/or control such devices and systems in the home or office.

## V. THE PATENTS-AT-ISSUE

### A. Identification of the Asserted Patents and Ownership by Innovation

16. The Accused Products infringe Innovation's patent rights under at least U.S. Patent Nos. 10,136,179 ("the '179 patent") and 10,104,425 ("the '425 patent"), (collectively, "the Asserted Patents").

17. Innovation owns the entire right, title, and interest to the Asserted Patents as evidenced by the Certified Assignment documents recorded at the U.S. Patent & Trademark Office. See Exs. 3 and 4.

### B. Non-Technical Description of the Asserted Patents[1]

18. The Asserted Patents are generally directed to various wireless communication devices, namely, cellular phones, smart home systems with their related wireless sensors, controllers, and video cameras, that can work as (or with) a smart home hub to help users: (1) communicate with, monitor, and/or control a variety of smart home devices such as wireless sensors, controllers, and/or appliances connected in a wireless network using short-range wireless communications technologies, wireless area networks, and/or voice command technologies; and (2) communicate via network communication connections/channels to access their home/office devices and systems, to monitor and control those devices and systems remotely, and related components,

[1] This non-technical description, as well as any other non-technical descriptions contained herein, are designed for illustrative purposes only, and any statements are not intended to express any position on the part of Complainant, whether directly or indirectly, regarding the appropriate meaning, scope, or construction of any claim term in the Asserted Patents.

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including software and hardware, that help direct and control the communication of signals/content between various components in the system.

**1. The '179 Patent**

19. The '179 Patent, entitled "Method and system for efficient communication" issued on November 20, 2018. Ex. 1 at Title Page. The '179 Patent issued from U.S. Patent Application Serial No. 15/890,405 filed on February 7, 2018. *Id.* The '179 Patent expires on June 24, 2025.

20. The '179 patent relates generally to various aspects of wireless communications devices and systems, that can serve as (or with) a hub to communicate with, monitor, and/or control smart wireless devices and systems such as sensors, controllers, and/or appliances in the home or office, as well as the specific smart home appliances and devices that include sensors and transmitters for communication of information to a user's mobile terminal.

**2. The '425 Patent**

21. The '425 Patent, also entitled "Method and system for efficient communication" issued on October 16, 2018. Ex. 2 at Title Page. The '425 Patent issued from U.S. Patent Application Serial No. 15/890,411 filed on February 7, 2018. *Id.* The '425 Patent expires on June 24, 2025.

22. The '425 patent relates generally to wireless communications devices and systems, that can serve as (or with) a hub to communicate with, monitor, and/or control smart wireless devices and systems such as sensors, controllers, and/or appliances in the home or office.

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**C. Foreign Patents Relating to the Asserted Patents**

23. Pursuant to 19 C.F.R 210.12(a)(9)(v), Innovation lists the following foreign patents and foreign patent applications corresponding to the Asserted Patents: CN101164322; CN101513086; CN102413173; CN104184793, CN103346997; CN101247196; CN104994440;CN101237257; CN104093036; and pending Chinese patent application numbers 201610821617.9; 201810005772.2; 201811244982.3; 201810900990.2; 201810005890.3; and 201710556436.2.

**D. Related Litigation**

24. Pursuant to Commission Rule 210.12(a)(5), Innovation states that concurrent with the filing of this Complaint, Complainant is involved in litigation with Resdieo in the U.S. District Court for the Eastern District of Texas, with respect to different patents in the Innovation Sciences patent portfolio than the Asserted Patents. *Innovation Sciences, Inc. v. Resideo*, Civil Action No. 4:18-cv-00475-ALM.

25. Pursuant to Commission Rule 210.12(a)(5), Innovation states that concurrent with the filing of this Complaint, Complainant is involved in litigation with HTC in the U.S. District Court for the Eastern District of Texas, with respect to different patents in the Innovation Sciences patent portfolio than the Asserted Patents. *Innovation Sciences, Inc. v. HTC*, Civil Action No. 4:18-cv-00476-ALM.

26. As of March 13, 2019, the district court cases against Resideo and HTC were consolidated under the case styled, *Virginia Innovation Sciences, Inc. v. Amazon.com, Inc.*, Civil Action No. 4:18-cv-00474-ALM. *See id.* at Dkt. No. 69, March 13, 2019. The litigation is ongoing, and the parties are presently pursuing discovery and conducting claim construction proceedings. The Defendants in the consolidated district

court action have all alleged non-infringement and invalidity of the claims of the patents asserted there. Two of the four defendants, including Resideo, have alleged that Innovation does not own all rights under the Asserted Patents based on one of the two co-inventor's purported obligation to assign his patent rights to a former employer. The former employer, not a party in the district court action, has not made the same allegation. The issue remains unresolved in the district court and does not preclude the institution of this Investigation.

27. Aside from the litigations noted above with respect to the different related patents, the Asserted Patents have not been asserted against any entity in the United States District Courts.

**E. Patent Office Proceedings**

28. The Asserted Patents have not been the subject of any Patent Office post-grant proceedings. However, the Asserted Patents claim priority through a series of continuing patent applications to U.S. Patent Application Serial No. 13/833,328, which is a Continuation-in-Part application that itself claims priority to three separate chains of patent applications. Although not relevant here due to differences in the claimed subject matter, a number of patents in one of those original chains of applications were involved in Inter Partes Review Proceeding Nos. IPR2017-00870 through IPR2017-00879, all of which were terminated in 2018.

**F. Licensees Under the Asserted Patents**

29. A number of entities have obtained licenses under the Asserted Patents including LG Electronics. See Confidential Ex. 6. The Asserted Patents claim priority through a series of continuing patent applications to U.S. Patent Application Serial No.

13/833,328, which is a Continuation-in-Part application that itself claims priority to three separate chains of patent applications. The Wong Declaration sets forth other licensees of patents in the Innovation patent portfolio. See Ex. 5, Wong Declaration at ¶¶12-13, 34.

## VI. UNLAWFUL AND UNFAIR ACTS OF RESPONDENTS – PATENT INFRINGEMENT

### A. Claims and Infringing Activity of Resideo

30. Respondent Resideo continues to infringe Innovation's patents and harm the domestic industry that has been established through Innovation's own substantial investments, as well as the activities and substantial investments of Innovation's licensee LG.

31. Respondent Resideo continues to unlawfully import and sell after importation, the Honeywell RCHS5200WF Base Station, and its related products, that infringe at least independent claim 15 of the '179 patent. See Ex. 8 (Infringement claim chart for the Honeywell RCHS5200WF Base Station).

32. Respondent Resideo continues to unlawfully import and sell after importation, the Honeywell Lynx-Series control panels including at least the Lynx Touch 7000, Lynx Touch 5210, and Lynx Plus models, and their related Honeywell 5800-series and SiX-series sensors/detectors, that infringe at least independent claim 9 of the '179 patent. See Ex. 9 (Infringement claim chart for the Honeywell Lynx-Series control panels used with Honeywell Series-5800 and SiX-Series wireless sensors/detectors, and related products).

33. Respondent Resideo continues to unlawfully import and sell after importation, the Honeywell Lyric-Series control panels including at least the Lyric

Controller and Lyric Gateway control panels, and their related Honeywell 5800-series and SiX-series sensors/detectors, that infringe at least independent claim 9 of the '179 patent. See Ex. 9 (Infringement claim chart for Honeywell Lyric-Series control panels used with Honeywell Series-5800 and SiX-Series wireless sensors/detectors, and related products).

34. Respondent Resideo continues to unlawfully import and sell after importation, Honeywell T-Series and RCH-Series WiFi Thermostats, that infringe at least independent claim 1 of the '179 patent. See Ex. 10 (Infringement claim chart for Honeywell WiFi Thermostats).

35. Respondent Resideo continues to unlawfully import and sell after importation, the Honeywell WiFi Water Leak & Freeze Detector that infringes at least independent claim 1 of the '179 patent. See Ex. 11 (Infringement claim chart for Honeywell WiFi Water Leak & Freeze Detector).

36. Respondent Resideo continues to unlawfully import and sell after importation, the Honeywell C1 and C2 WiFi Video Cameras that infringe at least independent claim 1 of the '179 patent. See Ex. 12 (Infringement claim chart for Honeywell C1 and C2 WiFi Cameras).

37. Following importation, Resideo sells its Accused Products in the United States including through its website and through various retailers throughout the United States such as the HoneywellStore.com, Amazon.com, Best Buy, PC Richard, Home Depot and others. See, e.g., Exs.13-21 (various websites illustrating the offering for sale of Resideo's Accused Products).

**B. Asserted Claims and Infringing Activities of HTC Corporation**

38. Respondent HTC Corporation continues to infringe Innovation's patents and harm the domestic industry that has been established and continues to be established through Innovation's own investments, and also those activities and substantial investments of Innovation's licensee LG.

39. Respondent HTC Corporation continues to unlawfully sell and import to the United States for sale after importation, the accused U11, U11 Life, and U12+ cellular phones that can serve to communicate with, monitor, and/or control various wireless devices and systems including sensors, controllers, and/or appliances in a user's home or office, and which infringe at least independent claims 14 and 45 of the '425 patent. See Ex. 22, (infringement claim chart for independent claim 45 of the '425 patent); Ex. 23, (infringement claim chart for independent claim 14 of the '425 patent).

40. HTC Corporation sells the accused U11, U11 Life, and U12+ cellular phones for importation into the United States and subsequent sale in the United States after importation through various retailers throughout the United States such as the HTC website, Amazon.com, Walmart, and others. See, e.g., Exs. 24-29 (various websites that illustrate the offering for sale of the Accused Products).

**C. Asserted Claims and Infringing Activities of HTC America, Inc.**

41. Respondent HTC America, Inc. continues to infringe Innovation's patents and harm the domestic industry that has been established and continues to be established through Innovation's own investments, and also those activities and substantial investments of Innovation's licensee LG.

42. Respondent HTC America, Inc. continues to unlawfully import and sell after importation, the accused U11, U11 Life, and U12+ cellular phones that can serve to

communicate with, monitor, and/or control various wireless devices and systems including sensors, controllers, and/or appliances in a user's home or office, and which infringe at least independent claims 14 and 45 of the '425 patent. See Ex. 22, (infringement claim charts for claim 45 of the '425 patent); Ex. 23, (infringement claim chart for claim 14 of the '425 patent).

43. Following importation, HTC America, Inc. sells the U11, U11 Life, and U12+ cellular phones in the United States through various retailers throughout the United States such as the HTC website, Amazon.com, Walmart, and others. See ¶40.

## VII. SPECIFIC INSTANCES OF UNFAIR IMPORTATION AND SALE

44. Proposed Respondent Resideo imports the Honeywell RCHS5200WF Base Station, and related components, from China.

45. The box in which the Honeywell RCHS5200WF Base Station is packaged explicitly states "Country of Origin: China." Ex. 30.

46. The Honeywell RCHS5200WF Base Stations are subsequently imported and sold in the United States after importation by Resideo including through various retailers throughout the United States such as the HoneywellStore.com, Amazon.com, Best Buy, PC Richard, Home Depot and others. See ¶37.

47. Proposed Respondent Resideo imports the Honeywell Lynx Series home security control panels, and related components, from Mexico.

48. Packaging for the Honeywell Lynx Series home security control panels, and related components, indicate they are manufactured in Mexico. See, e.g. Ex. 89; Ex. 32.

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49. The Honeywell Lynx Series home security control panels are subsequently imported and sold in the United States after importation by Resideo including through various retailers throughout the United States such as the HoneywellStore.com, Amazon.com, Best Buy, PC Richard, Home Depot and others. See ¶37.

50. Proposed Respondent Resideo imports the Honeywell Lyric Series home security control panels, and related components, from China.

51. Packaging for the Honeywell Lyric Series home security control panels, and related components, are manufactured in China. See Ex. 90 and 91; Ex. 34, (https://www.ebay.com/p/Honeywell-Lyric-Gateway-Lcp300-Security-Plus-Home-Control-System/13011281242).

52. The Honeywell Lyric Series home security control panels are subsequently imported and sold in the United States after importation by Resideo including through various retailers throughout the United States such as the HoneywellStore.com, Amazon.com, Best Buy, PC Richard, Home Depot and others. See ¶37.

53. Proposed Respondent Resideo imports the Honeywell WiFi Thermostat, and related components, from Mexico.

54. The specifications and packaging for the accused Honeywell WiFi Thermostats, and related components, are manufactured in Mexico. For example, the packaging for the Honeywell T9 and RTH9585WF thermostats shows that its country of origin is Mexico. Exs. 75 and 76; See also Exs. 35-38 (showing thermostat specifications for other Honeywell thermostat models).

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55. The Honeywell WiFi Thermostats are subsequently imported and sold in the United States after importation by Resideo including through various retailers throughout the United States such as the HoneywellStore.com, Amazon.com, Best Buy, PC Richard, Home Depot and others. See ¶37.

56. Proposed Respondent Resideo imports the Honeywell WiFi Water Leak & Freeze Detector, and related components, from Taiwan.

57. Packaging for the Honeywell WiFi Water Leak & Freeze Detector indicates that it is manufactured in Taiwan. See Ex. 77; see also Ex. 39, (https://i.sears.com/s/d/pdf/mp-tc/10034158/prod_2252150912).

58. The Honeywell Water Leak & Freeze Detectors are subsequently imported and sold in the United States after importation by Resideo including through various retailers throughout the United States such as the HoneywellStore.com, Amazon.com, Best Buy, PC Richard, Home Depot and others. See ¶37.

59. Proposed Respondent Resideo imports the Honeywell WiFi C1 and C2 video cameras from China.

60. Packaging for the Honeywell Honeywell WiFi C1 and C2 video cameras indicate they are manufactured in China. Ex. 78; Ex. 40, (http://gadizmo.com/hands-on-review-honeywell-lyric-c1-wi-fi-security-camera.php); Ex. 41, (https://www.gearbrain.com/honeywell-lyric-c2-wifi-security-camera-review-2566518844.html).

61. The Honeywell WiFi C1 and C2 video cameras are subsequently imported and sold in the United States after importation by Resideo including through various

retailers throughout the United States such as the HoneywellStore.com, Amazon.com, Best Buy, PC Richard, Home Depot and others. See ¶37.

62. Proposed Respondent Resideo imports the Honeywell 5800-Series and SiX-Series wireless sensors, and related components, from Mexico and China.

63. Packaging for a number of the Honeywell 5800 Series and SiX Series wireless sensors indicate various countries of origin including China and Mexico, and upon information and belief, other Honeywell 5800 Series and SiX Series sensors are also manufactured in China and Mexico. See, e.g., Exs. 80-88; See also Exs. 42-45 (showing packaging for various Honeywell 5800-Series and SiX-Series sensors/detectors).

64. The Honeywell 5800 Series and SiX Series wireless sensors, are subsequently imported and sold in the United States after importation by Resideo including through various retailers throughout the United States such as the HoneywellStore.com, Amazon.com, Best Buy, PC Richard, Home Depot and others. See ¶37.

65. Proposed Respondent HTC Corporation sells for importation into the United States and imports the accused U11, U11 Life, and U12+ cellular phones from Taiwan.

66. The packaging for the HTC U11 cellular phone states that it is made in Taiwan. Ex. 79; See, e.g., Ex. 46, (https://www.androidcentral.com/how-htc-u11-was-made)

67. The packaging for the HTC U11 Life cellular phone states that it is made in Taiwan. Ex. 96; Ex. 47, (https://www.zdnet.com/pictures/10-best-smartphones-not-made-in-china/5/).

68. The packaging for the HTC U12+ cellular phone states that it is made in Taiwan. Ex. 48; See also Ex. 49, (https://www.techgenyz.com/2018/12/03/htc-u12-supports-personalized-customization/).

69. The HTC U11, U11 Life, and U12+ cellular phones are subsequently imported and sold in the United States after importation by HTC Corporation including through the HTC website, and through various retailers such as Walmart, Amazon.com, and others. See ¶40.

70. Proposed Respondent HTC America, Inc. imports and sells in the United States after importation the accused U11, U11 Life, and U12+ cellular phones from Taiwan. Specifically, the packaging for the HTC U11, U11 Life and U12+ cellular phone indicate they are made in Taiwan. Ex. 48; see also Ex. 47, (https://www.zdnet.com/pictures/10-best-smartphones-not-made-in-china/5/); Ex. 49, (https://www.techgenyz.com/2018/12/03/htc-u12-supports-personalized-customization/).

71. The HTC U11, U11 Life, and U12+ cellular phones are subsequently imported and sold in the United States after importation by HTC America, Inc., including through the HTC website, and through various retailers such as Walmart, Amazon.com, and others. See ¶40.

## VIII. CLASSIFICATION OF ACCUSED PRODUCTS UNDER THE HARMONIZED TARIFF SCHEDULE

72. The Classification of the Resideo/Honeywell RCHS5200WF Base Station under the Harmonized Tariff Schedule is 8517.61.00

73. The Classification of the Resideo/Honeywell Lynx Series home security control panels under the Harmonized Tariff Schedule is 8517.18.50.

74. The Classification of the Resideo/Honeywell Lyric Series home security control panels under the Harmonized Tariff Schedule is 8517.18.50.

75. The Classification of the Resideo/Honeywell WiFi Thermostats under the Harmonized Tariff Schedule is 8517.18.50.

76. The Classification of the Resideo/Honeywell WiFi C1 and C2 video cameras under the Harmonized Tariff Schedule is 8517.18.50.

77. The Classification of the Resideo/Honeywell WiFi Water Leak & Freeze Detector under the Harmonized Tariff Schedule is 8517.18.50.

78. The Classification of the Resideo/Honeywell 5800 Series and SiX Series wireless sensors under the Harmonized Tariff Schedule is 8517.18.50.

79. The Classification of the HTC U11, U11 Life, and U12+ cellular telephones under the Harmonized Tariff Schedule is 8517.18.50.

## IX. THE DOMESTIC INDUSTRY

### A. Economic Prong

#### 1. Significant and Substantial Investment in Exploiting the Asserted Patents Exists

80. Pursuant to Section 337(a)(2) and (3), and Commission Rules 210.12(a)(6) and (a)(9)(ix), a Domestic Industry exists in the United States relating to articles and/or technology protected by the Asserted Patents, through both: (1) the substantial investments made by Innovation's licensee LG in plant and equipment, labor or capital, and exploitation of the technologies claimed in the Asserted Patents including engineering, research and development, and licensing of the technologies protected by

the Asserted Patents related to LG's SmartThinQ® and ThinQ® wireless smart home technologies that are incorporated in LG's smart appliances, smart cellular phones, smart home security systems for monitoring and control, and the technologies that allows communications between such devices and systems, and which are licensed under the Asserted Patents; and (2) Innovation's significant investments in plant and equipment, labor or capital, and exploitation of the technologies claimed in the Asserted Patents including engineering, research and development, and licensing of the technologies protected by the Asserted Patents.

**2. LG's Activities**

81. Pursuant to Section 337(a)(2) and (3), and Commission Rules 210.12(a)(6) and (a)(9)(ix), a Domestic Industry exists based in part on the activities of Innovation's licensee LG Electronics, [redacted], which is licensed under the Innovation patent portfolio, including the Asserted Patents. See Confidential Ex. 6 [redacted]

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[redacted]

82. [redacted]

83. LG has made significant and substantial investments in the United States in plant and equipment, labor or capital, and to exploit technologies covered by the Asserted Patents, including manufacturing, engineering, and research & development of products that are covered by at least one claim of the Asserted Patents.

84. In particular, LG has made significant and substantial investments in the United States in plant and equipment, employment of labor and capital, and/or substantial investment in exploitation in the United States of the subject matter of the Asserted Patents through the manufacturing, and development of its SmartThinQ® brand of smart home appliances and products such as refrigerators, washers/dryers, and robotic vacuums that incorporate its SmartThinQ® technology, and LG smart cellular phones that

incorporate its ThinQ® technology, which also incorporate technologies covered by at least one claim of the Asserted Patents. Ex. 50 (https://www.lg.com/us/lg-thinq#products). "What is LG ThinQ? It's both a brand and an AI platform whose products include appliances and consumer electronics. LGSmartThinQ® products leverage voice control, as well as sensor data, and features such as product recognition and a learning engine to enhance its performance." See Ex. 51 (https://www.cnet.com/paid-content/news/how-lg-thinq-products-aim-to-make-life-better-for-all/).

85. LG has made and continues to make significant and substantial investments in a number of facilities in the United States that directly and indirectly support the Domestic Industry for wireless communication devices covered by at least one claim of the Asserted Patents, including LG's products that incorporate LG's SmartThinQ® and ThinQ® technology. See Ex. 52 (https://www.lg.com/us/discover/smartthinq/thinq); Ex. 50 (https://www.lg.com/us/lg-thinq#products).

**a. LG's Smart Appliance Manufacturing Facility Located in Clarksville, Tennessee**

**i. Significant Investment in Plants and Equipment**

86. LG presently has a 1 Million square-foot appliance manufacturing plant located near Clarksville, Tennessee, that manufactures washing machines including LG's SmartThinQ® technology, to supply U.S. demand. Ex. 92 (https://www.theleafchronicle.com/story/news/local/clarksville/2019/05/30/lg-electronics-plant-opening-5-things-know/1269343001/); Ex. 93 (https://www.bizjournals.com/nashville/news/2019/06/03/photo-tour-watch-where-you-

walk-inside-lgs-massive.html); Ex. 53 (https://www.theleafchronicle.com/story/news/local/clarksville/2019/02/07/lg-clarksville-factory-washing-machines-jobs/2743528002/); see also Ex. 54 (https://www.prnewswire.com/news-releases/lg-helps-music-lovers-have-fun-be-themselves-and-getdirty-at-bonnaroo-2018-300654423.html). LG originally announced plans to construct this manufacturing plant on February 28, 2017, for the purpose of manufacturing appliances, including its washing machines with SmartThinQ® technology, with room to expand to other home appliances. Ex. 55 (https://www.lg.com/us/press-release/lg-electronics-to-build-us-factory-for-home-appliances-in-tennessee). According to LG's press release at that time, "LG is proud to make further investments in America, to create jobs and to bring state-of-the-art home appliance production technology to the great state of Tennessee." Id.

87. Construction on the $250 Million Clarksville, Tennessee facility began on or about August 24, 2017. Ex. 56 (https://www.prnewswire.com/news-releases/lg-electronics-breaks-ground-on-us-home-appliance-factory-in-tennessee-set-for-completion-in-early-2019-300509324.html).

88. LG's website markets its smart washing machines and dryers that incorporate its SmartThinQ® technology: "Go ahead. Do laundry from the couch. SmartThinQ® technology lets you start and stop wash cycles remotely, get notifications when your laundry is done and receive helpful reminders about scheduled maintenance." See, Ex. 57 (https://www.lg.com/us/discover/smartthinq/laundry.jsp). "Think you can't do your laundry on the go. Think again. Use the SmartThinQ® app on your smartphone to start a washer or dryer cycle from anywhere." Id.

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**ii. Significant Employment of Labor or Capital**

89. As of February 7, 2019, LG's Clarksville, Tennessee washing machine manufacturing plant had hired 450 people, and had made another 92 job offers. Ex. 58 (https://www.theleafchronicle.com/story/news/local/clarksville/2019/03/14/lg-plans-clarksville-hiring-event/3161507002/). In August 2018, LG hosted a job fair, and reported at the time that LG had already hired 160 employees for initial training and limited production of washing machines, and that LG expected to have 450 employees by the end of 2018, and expected to reach its goal of 600 employees in 2019. See Ex. 59 (https://www.theleafchronicle.com/story/news/local/clarksville/2018/08/21/lg-clarksville-hiring-event-but-you-have-apply-first/1040991002/); Ex. 55 (https://www.lg.com/us/press-release/lg-electronics-to-build-us-factory-for-home-appliances-in-tennessee.

90. In 2019, LG has hosted job fairs for the Clarksville, Tennessee facility including one on June 6, 2019, Ex. 94, (https://www.theleafchronicle.com/story/news/local/clarksville/2019/05/29/lg-still-hiring-clarksville-plant-revealed-community/1228718001/), and one on March 22, 2019. See Ex. 58 (https://www.theleafchronicle.com/story/news/local/clarksville/2019/03/14/lg-plans-clarksville-hiring-event/3161507002/); Ex. 60 (https://clarksvillenow.com/local/lg-electronics-in-clarksville-hosting-hiring-event/).

91. LG expended significant capital in building the Clarksville, Tennessee appliance manufacturing facility. The cost of the facility was $250 Million. See Ex. 61 (https://www.prnewswire.com/news-releases/lg-electronics-breaks-ground-for-north-american-headquarters-300403548.html). Construction of the facility required 800

construction workers. Ex. 62 (https://www.dpr.com/projects/lg-tennessee-manufacturing-facility-phase-1).

**b. LG Electronics U.S.A.'s U.S. Headquarters Located in Englewood Cliffs, New Jersey**

**i. Significant Investment in Plants and Equipment**

92. LG Electronics U.S.A., Inc. is headquartered at 1000 Sylvan Avenue in Englewood Cliffs, New Jersey, 07632. According to LG, Englewood Cliffs has been home to LG in the United States for thirty years. Ex. 61 (https://www.prnewswire.com/news-releases/lg-electronics-breaks-ground-for-north-american-headquarters-300403548.html). According to an LG website, the headquarters supports a number of business units, including Home Appliances, and is "[d]edicated to enhancing consumer lifestyle with stylish, smart products that deliver exception performance and innovation, this business unit offers opportunities for the most innovative professionals to implement our LG Smart ThinQ feature, as well as built-in WiFi capabilities that provide customers with the latest in digital convenience." Ex. 95, (https://lgecareers.com/individual-business-units/#)

93. LG is presently building its new 352,000 square foot U.S. headquarters located at 111 Sylvan Ave., Englewood Cliffs, New Jersey, 07632, which will open in 2019. See Ex. 63 (https://www.enr.com/articles/45854-lg-tops-new-jersey-palisades-after-rocky-road-to-build-new-headquarters). LG broke ground on the new U.S. headquarters on February 7, 2017. Ex. 64 (https://www.lg.com/us/Press%20Release/2015%20press%20releases/LG%20GROUND%20BREAKING%20-%20FEB%20%207%202017%20-%20FINAL.pdf); Ex. 61 (https://www.prnewswire.com/news-releases/lg-electronics-breaks-ground-for-north-

american-headquarters-300403548.html). According to LG, the facility is a $300 Million project that had been planned since 2009. Id.

94. LG's new U.S. headquarters will support its U.S. business units, including its smart cellular phones that include LG's ThinQ® technology, and LG's smart home appliances that include the SmartThinQ® technology. Although publicly available information is not available on how much of LG's investments in its new U.S. headquarters are attributable to LG's ThinQ® smart cellular phones and SmartThinQ® smart appliances that exploit the technology claimed in the Asserted Patents, Complainant expects that the amount is substantial given the importance of the technology to LG. At the 2019 CES conference, LG's Chief Technology Officer, Dr. I.P. Park, discussed LG's commitment to its ThinQ® and SmartThinQ® brand technology. According to LG's Press Release regarding the event, "[s]ince its launch in 2018, the company's AI brand LG ThinQ has seen its portfolio grow rapidly to include air conditioners, washing machines, TVs, smartphones and robot vacuum cleaners. Dr. Park presented LG's latest innovations in these appliances which leveraged the power of AI: the world's most advanced AI chip for home appliances, a washing machine with reinforced learning, and "self-healing" machines that can detect and fix malfunctions automatically without interrupting operation." See Ex. 65 (https://www.lg.com/us/PDF/press-release/CES2019-LG-CTO-Keynote-Releases_US.pdf).

95. Further, according to LG Electronic's 2018 Annual Report, the company's business units had the following annual revenues:

| LG Business Unit | 2018 Annual Revenues ($USD) |
|---|---|
| LG Home Appliance & Air Solution Co. | 17.17 Billion |

***PUBLIC VERSION***

| | |
|---|---|
| LG Home Entertainment Co. | 14.37 Billion |
| LG Mobile Communications Co. | 7.08 Billion |
| LG Vehicle Communications Co. | 3.80 Billion |
| LG Business to Business Co. | 2.13 Billion |

See, Ex. 66 (http://www.lgnewsroom.com/2019/01/lg-announces-2018-financial-results/).

96. Based on LG Electronic's 2018 Annual Report, the company's business units had a relative percentage share of the whole as follows:

| LG Electronics Business Unit | LG Unit % of 2018 Annual Revenues |
|---|---|
| LG Home Appliance & Air Solution Co. | 17.17/44.55 Billion = 38.5 % |
| LG Home Entertainment Co. | 14.37/44.55 Billion = 32.2 % |
| LG Mobile Communications Co. | 7.08/44.55 Billion = 15.9 % |
| LG Vehicle Communications Co. | 3.80/44.55 Billion = 8.5 % |
| LG Business to Business Co. | 2.13/44.55 Billion = 4.8 % |

See, Ex. 66 (http://www.lgnewsroom.com/2019/01/lg-announces-2018-financial-results/).

97. Accordingly the LG Mobile Communications Co. unit (which includes the LG ThinQ® phones) and the LG Home Appliance & Air Solution Co. unit (which includes the LG SmartThinQ® appliances) make up over half of LG's $24.25 Billion in sales during 2018 alone. This information is further supported by Statista, a third party entity that monitors the performance of various companies, and which reports the breakdown of products by "business segment" sold by LG Electronics from 2014 to 2018. Ex. 67, (https://www.statista.com/statistics/364988/lg-electronics-quarterly-revenue-by-segment/). According to Statista, the LG mobile communications segment (which includes the LG ThinQ® phones) and the LG home appliance segment (which includes the LG SmartThinQ® appliances) made up roughly $5.4 Billion in sales during the 4th quarter of 2018 alone. Notably, LG reported similar revenues of $5.35 Billion. See, Ex. 66 (http://www.lgnewsroom.com/2019/01/lg-announces-2018-financial-results/).

98. Although LG Electronics' Annual Report does not break down the revenues of LG Electronics USA, according to Statista, during the years 2015 to 2017, LG's North American sales made up approximately 15.5% of LG Electronic's worldwide sales. See Ex. 68 (https://www.statista.com/statistics/365029/sales-lg-electronics-by-geographical-region/). Accordingly, using the 15.5% value as an approximation, LG Electronic USA's sales for the mobile communications and home appliance business units in the 4th quarter of 2018 would be approximately $837 Million. For all of 2018, LG Electronic USA's revenues for those two business units would be approximately $4 Billion. Id. Given the importance and priority that LG has publicly announced regarding its ThinQ® and SmartThinQ® technology products, including its ThinQ cellular phones and SmartThinQ smart home appliances, upon information and belief, over half of LG's 2018 U.S. sales of approximately $4 Billion are for products that include the technologies covered by at least one claim of the Asserted Patents.

99. Complainant expects to further refine the amounts of LG's investments attributable to LG's ThinQ® smart cellular phones and SmartThinQ® smart appliances that exploit the technology claimed in the Asserted Patents during discovery from LG,

[redacted]

**ii. Significant Employment of Labor or Capital**

100. LG Electronics USA has stated that its new Englewood, NJ corporate headquarters will double its present employment to more than 1000 people by 2019. Ex. 61 (https://www.prnewswire.com/news-releases/lg-electronics-breaks-ground-for-north-american-headquarters-300403548.html). According to LG, the LG Electronics USA

headquarters supports its U.S. businesses in mobile devices (including cellular phones), and smart home appliances, all of which include products equipped with LG's SmartThinQ® technology. Ex. 69 (https://www.lg.com/us).

101. LG invested significant capital in the construction of the LG Electronics USA headquarters. The cost of the project was reported as $300 Million, including creation of 2000 construction jobs. Ex. 61 (https://www.prnewswire.com/news-releases/lg-electronics-breaks-ground-for-north-american-headquarters-300403548.html).

102. LG's new U.S. headquarters will support its U.S. businesses, including its smart cellular phones that include LG's ThinQ® technology, and LG's smart home appliances that include the SmartThinQ® technology. Although publicly available information is not available on how many employees in LG's U.S. headquarters support LG's smart cellular phones and smart appliances that exploit the technology claimed in the Asserted Patents, Complainant expects that the number is substantial given the importance of the technology to LG, and that the information will be obtained from LG during discovery, [redacted]

**c. LG's Home Appliance Research and Development Center in Buffalo Grove, Illinois.**

**i. Significant Investment in Plants and Equipment**

103. LG has also made and continues to make substantial and significant investments in plants and equipment for continued research and development of its wireless communication devices in the United States, including engineering and research and development on its smart cellular phone products equipped with LG's ThinQ® technology and its smart home appliances equipped with LG's SmartThinQ® technology.

***PUBLIC VERSION***

104. On September 28, 2011, LG opened its $6.5 Million Home Appliance Research and Development Center in Buffalo Grove, Illinois. Ex. 70 (https://www.prnewswire.com/news-releases/lg-electronics-opens-first-us-home-appliance-rd-center-for-innovative-appliance-testing-130710628.html). According to its Press Release, LG opened this 30,770 square foot facility to provide "high-precision product testing and consumer research using state-of-the-art methodologies and technologies" and to "help assure that LG appliances meet or exceed industry standards, explore new technologies, and, most importantly, drive innovation for next-generation of products." Id. According to its Press Release, the 15,350 square foot first floor is "dedicated to major appliance testing including refrigerators, washing machines, clothes dryers, ovens, ranges, cooktops, microwave ovens, dishwashers and vacuum cleaners." Id. The press release also notes that the LG R&D Center has the capability to test hundreds of appliances annually and that the center "is the last stop before LG products begin production." Id.

105. Although publicly available information is not available on how much of LG's investments in its Home Appliance Research and Development Center in Buffalo Grove, Illinois are attributable to LG's smart appliances equipped with its SmartThinQ technology that exploits the technology claimed in the Asserted Patents, Complainant expects it is a substantial amount given the importance of the technology to LG, and that the information will be obtained from LG during discovery, [redacted]

**ii. Significant Employment of Labor or Capital**

***PUBLIC VERSION***

106. At the time of its opening in 2011, LG's Home Appliance Research and Development Center in Buffalo Grove, Illinois employed 39 people. See Ex. 70. Although publicly available information is not available on how many employees LG's Home Appliance Research and Development Center in Buffalo Grove, Illinois presently employs, and who are attributable to LG's smart appliances equipped with its SmartThinQ technology that exploits the technology claimed in the Asserted Patents, Complainant expects it is a substantial amount given the importance of the technology to LG, and that the information will be obtained from LG during discovery, [redacted]

**iii. Substantial Investments in Research and Development**

107. LG opened its $6.5 Million Home Appliance Research and Development Center in Buffalo Grove, Illinois in 2011. Ex. 70 (https://www.prnewswire.com/news-releases/lg-electronics-opens-first-us-home-appliance-rd-center-for-innovative-appliance-testing-130710628.html). According to its Press Release, LG opened this 30,770 square foot facility to provide "high-precision product testing and consumer research using state-of-the-art methodologies and technologies" and to "help assure that LG appliances meet or exceed industry standards, explore new technologies, and, most importantly, drive innovation for next-generation of products." Id.

108. According to its Press Release, the 15,350 square foot first floor is "dedicated to major appliance testing including refrigerators, washing machines, clothes dryers, ovens, ranges, cooktops, microwave ovens, dishwashers and vacuum cleaners." Id. The press release also notes that the LG R&D Center has the capability to test

hundreds of appliances annually and that the center "is the last stop before LG products begin production." Id. Although publicly available information is not available on how much of LG's investments in its Home Appliance Research and Development Center in Buffalo Grove, Illinois are attributable to LG's smart appliances equipped with its SmartThinQ technology that exploits the technology claimed in the Asserted Patents, Complainant expects it is a substantial amount given the importance of the technology to LG, and that the information will be obtained from LG during discovery, [redacted]

**d. LG Silicon Valley Labs located at both 5150 Great America Parkway, Santa Clara, CA 95054 and 642 Harrison Street Suite 100, San Francisco, CA 94107**

**i. Significant Investment in Plants and Equipment**

109. In 2013, LG acquired its Silicon Valley Lab from Hewlett Packard, and now has facilities located at both 5150 Great America Parkway, Santa Clara, CA 95054 and 642 Harrison Street Suite 100, San Francisco, CA 94107. See Ex. 71 (http://lgsvl.com); Ex. 72 (http://lgsvl.com/contact/).

110. The LG Silicon Valley Lab presently supports LG ThinQ® technology that is "both a brand and an AI platform whose products include appliances and consumer electronics. LG ThinQ products leverage voice control, as well as sensor data, and features such as product recognition and a learning engine to enhance its performance." See Ex. 51 (https://www.cnet.com/paid-content/news/how-lg-thinq-products-aim-to-make-life-better-for-all/).

***PUBLIC VERSION***

111. Although publicly available information is not available on how much LG's invested in its facilities at 5150 Great America Parkway, Santa Clara, CA 95054 and 642 Harrison Street Suite 100, San Francisco, CA 94107, or how much of those investments are attributable to LG's smart cellular phones equipped with its ThinQ technology or LG's smart appliances equipped with its SmartThinQ technology, both of which exploit the technology claimed in the Asserted Patents, Complainant expects it is a substantial amount given the importance of the technology to LG, and that the information will be obtained from LG during discovery, [redacted]

**ii. Significant Employment of Labor or Capital**

112. Although publicly available information is not available on how many people are employed at LG's Silicon Valley Lab, or how many of those employees support LG's smart cellular phones equipped with its ThinQ technology or LG's smart appliances equipped with its SmartThinQ technology, both of which exploit the technology claimed in the Asserted Patents, Complainant expects it is a substantial amount given the importance of the technology to LG, and that the information will be obtained from LG during discovery, [redacted]

**iii. Substantial Investments in Research and Development**

113. LG has invested substantially in research and development in its Silicon Valley Labs located at both 5150 Great America Parkway, Santa Clara, CA 95054 and

***PUBLIC VERSION***

642 Harrison Street Suite 100, San Francisco, CA 94107. See Ex. 71 (http://lgsvl.com); Ex. 72 (http://lgsvl.com/contact/).

114. The LG Silicon Valley Lab supports LG ThinQ® technology that is "both a brand and an AI platform whose products include appliances and consumer electronics. LG ThinQ products leverage voice control, as well as sensor data, and features such as product recognition and a learning engine to enhance its performance." See Ex. 51 (https://www.cnet.com/paid-content/news/how-lg-thinq-products-aim-to-make-life-better-for-all/).

115. Although publicly available information is not available on how much LG is investing in research and development of LG's smart cellular phones equipped with its ThinQ technology or LG's smart appliances equipped with its SmartThinQ technology at its Silicon Valley Labs, both of which exploit the technology claimed in the Asserted Patents, Complainant expects it is a substantial amount given the importance of the technology to LG, and that the information will be obtained from LG during discovery, [redacted]

**3. Innovation's Activities**

**i. Significant Investments in Plant and Equipment**

116. Innovation has made and continues to make significant and substantial investments in facilities and equipment related to the company's research and development of its technologies, and the licensing program for its intellectual property portfolio, including the Asserted Patents. See Ex. 5 Wong Declaration at ¶¶15-42.

***PUBLIC VERSION***

117. More specifically, during the company's existence, including its predecessor companies, it has leased various facilities to support the company's activities. Presently, the Company maintains a facility at 5800 Legacy Circle in Plano, Texas, 75024, which supports to the Company's research and development, patent procurement activities, and licensing program. See Ex. 5 Wong Declaration at ¶¶1, 9, 17. The cost for the Company's office includes a monthly rent of approximately [redacted]. See Ex. 5, Wong Declaration at ¶17. Prior to November of 2018, the Company owned a facility at 6301 Edsall Road, Suite 517, Alexandria, VA, which also supported the Company's research and development, patent procurement, and licensing of the Company's patented technology. [redacted]. See Ex. 5, Wong Declaration at ¶16.

118. Also during the Company's existence, equipment was purchased (and/or leased) for the purpose of supporting the Company's activities. [redacted]. See Ex. 5, Wong Declaration at ¶18.

**ii. Significant Employment of Labor or Capital**

119. During the Company's existence, it has made significant investments in labor and capital. For example, Dr. Wong and her co-inventor, Dr. Tiejun Wang, as well as consultants, technical experts, economic experts, patent attorneys, and licensing

professionals have been paid [redacted] for their work for the Company on its research and development and support of its licensing program for the Asserted Patents. See Ex. 5, Wong Declaration at ¶¶21-41.

**iii. Substantial Investments in Research and Development**

120. During the company's existence, it has made substantial investments in research and development. Specifically, the Company has invested at least [redacted] on its research and development activities related to the Asserted Patents. See Ex. 5, Wong Declaration at ¶¶21-30.

**B. Technical Prong**

121. LG sells various smart appliances and devices with SmartThinQ® technology related to monitoring and control of smart home devices that are covered by at least one claim of the asserted '179 patent. See, e.g., Ex. 73 (DI Technical Prong claim chart for claim 1 of the '179 patent).

122. LG also sells smart cellular phones that are covered by at least one claim of the asserted '425 patent. See Ex. 74 (DI Technical Prong claim chart for claim 45 of the '425 patent).

## X. RELIEF REQUESTED

123. WHEREFORE, by reason of the foregoing, Innovation respectfully requests that the United States International Trade Commission:

(a) institute an immediate investigation, pursuant to Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, with respect to violations of Section 337 based upon the importation into the United States of wireless

communication devices, and related components thereof, that infringe one or more of the asserted claims of IS's U.S. Patent Nos. 10,136,179 and 10,104,425;

(b) schedule and conduct a hearing on said unlawful acts and, following said hearing, determine whether there has been a violation of Section 337;

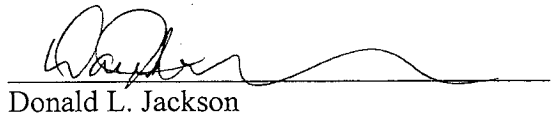
(c) issue a permanent limited exclusion order pursuant to 19 U.S.C. § 1337(d), excluding from entry into the United States all infringing wireless communication devices and related components thereof imported by or on behalf of Respondents, thereby causing the infringement of IS's patents in the United States;

(d) issue a permanent limited cease and desist order pursuant to 19 U.S.C. § 1337(f), directing each respondent to cease and desist from importing, marketing, advertising, demonstrating, warehousing inventory for distribution, selling, offering for sale, distributing, licensing, or using the wireless communication devices and related components thereof that infringe or enable infringement of one or more claims of the Asserted Patents;

(e) impose a bond during the 60-Day Presidential review period pursuant to 19 U.S.C. § 1337 (e)(1), (f)(1), and (j)(3) to prevent further injury to IS and its licensees' domestic industry related to each of the Asserted Patents; and

(f) grant such further and other relief as the Commission deems just and proper based on the facts determined by the investigation and the authority of the Commission.

Respectfully submitted,



Donald L. Jackson
Davidson Berquist Jackson & Gowdey LLP
8300 Greensboro Dr., Suite 500
McLean, Virginia 22102
571-765-7700 (p)
571-765-7200 (f)

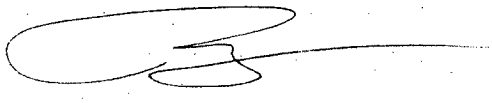
Attorneys for Complainant

## VERIFICATION OF COMPLAINT

I, Anne Wong, declare, in accordance with 19 C.F.R. §§ 201.8, 210.12(a)(1), and 210.4(c)(1)-(3), under penalty of perjury, that the following statements are true:

1. That I am the CEO of Innovation Sciences LLC;
2. I am duly authorized to verify this Complaint on behalf of Innovation Sciences LLC;
3. I have read the foregoing Complaint;
4. To the best of my knowledge, information, and belief, based on reasonable inquiry, the allegations in the foregoing Complaint are well-founded in fact and are warranted by existing law or by a non-frivolous argument for the extension, modification, or reversal of existing law or the establishment of new law;
5. The allegations and other factual contentions in the foregoing Complaint have evidentiary support or are likely to have evidentiary support after a reasonable opportunity for further investigation or discovery; and
6. The foregoing Complaint is not being filed for an improper purpose, such as to harass or to cause unnecessary delay or needless increase in the cost of litigation.

Executed this 9th day of August 2019.



# EXHIBIT 22

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**

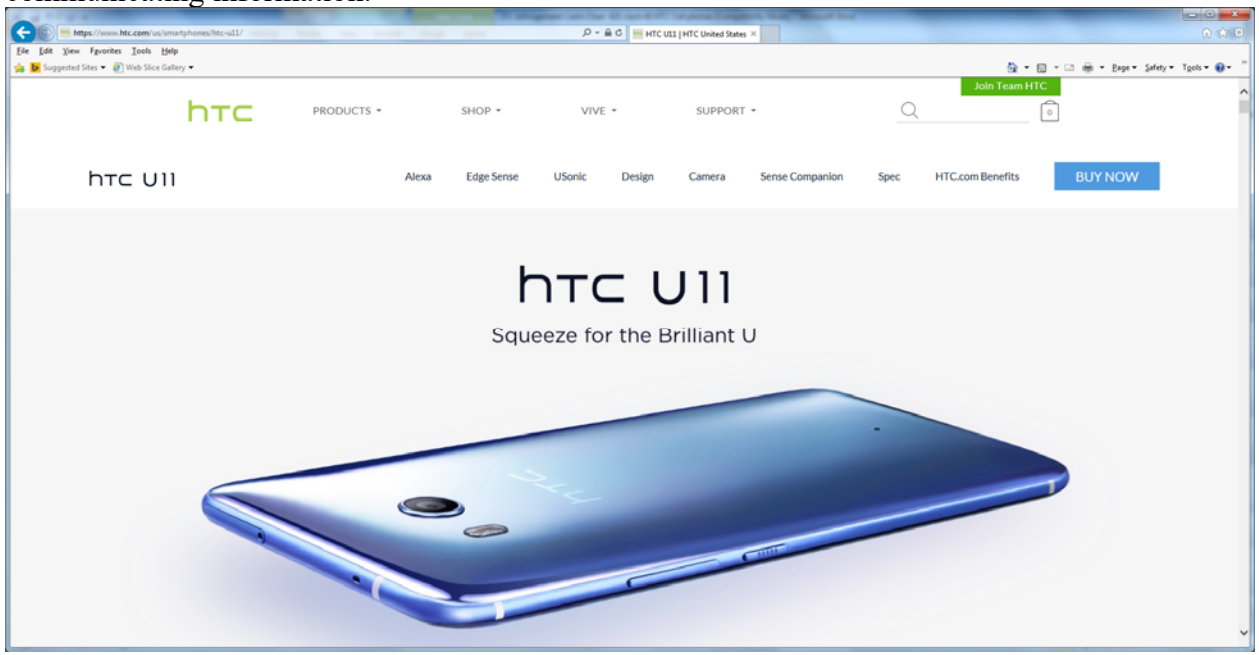
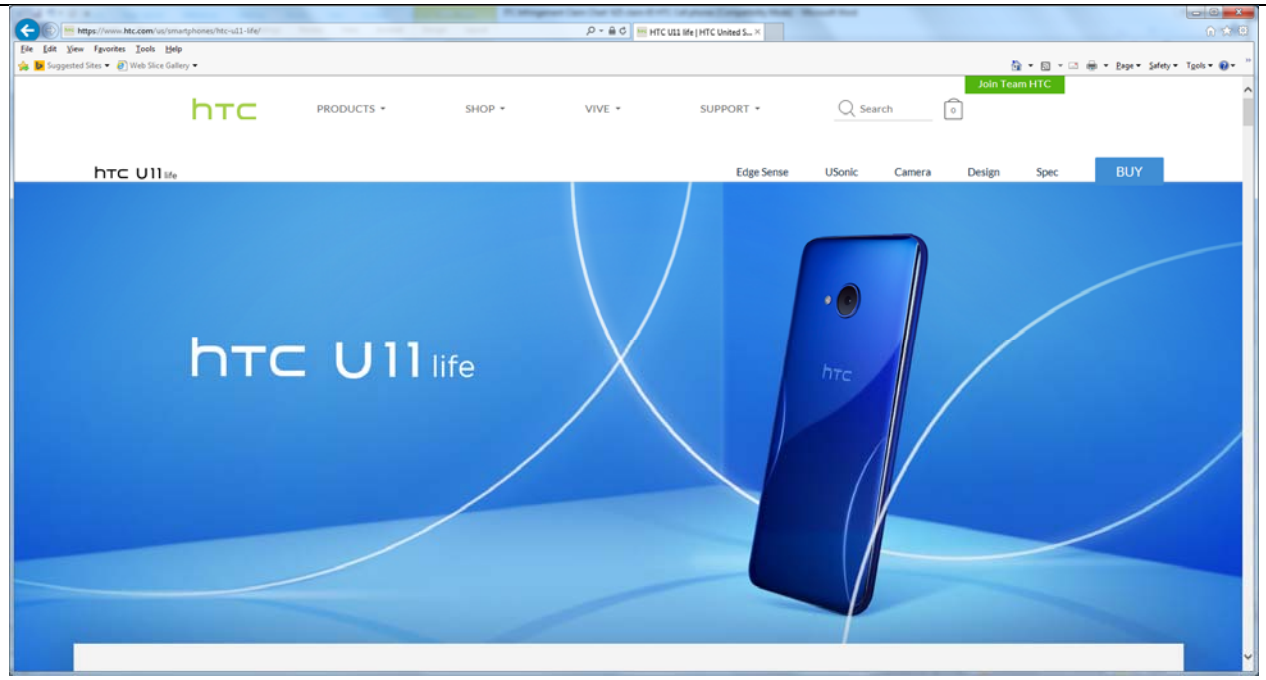
| The '425 Patent – Claims | HTC U11, U11 Life, and U12+ Cellular Phones with Alexa Application |
|---|---|
| 45. A wireless device for communicating information comprising: | The HTC U11, U11 Life, and U12+ cellular phones running the Alexa applications are wireless devices for communicating information.<br>  <br>See https://www.htc.com/us/smartphones/htc-u11/. |

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**




See https://www.htc.com/us/smartphones/htc-u11-life/.

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**

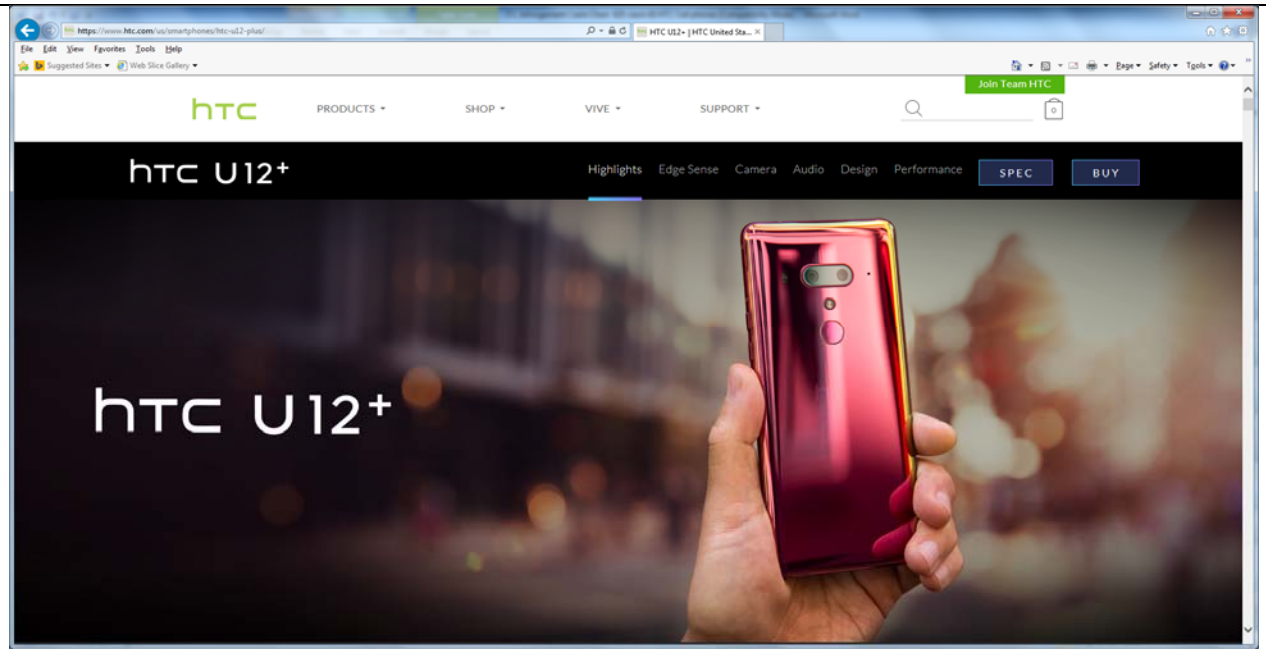
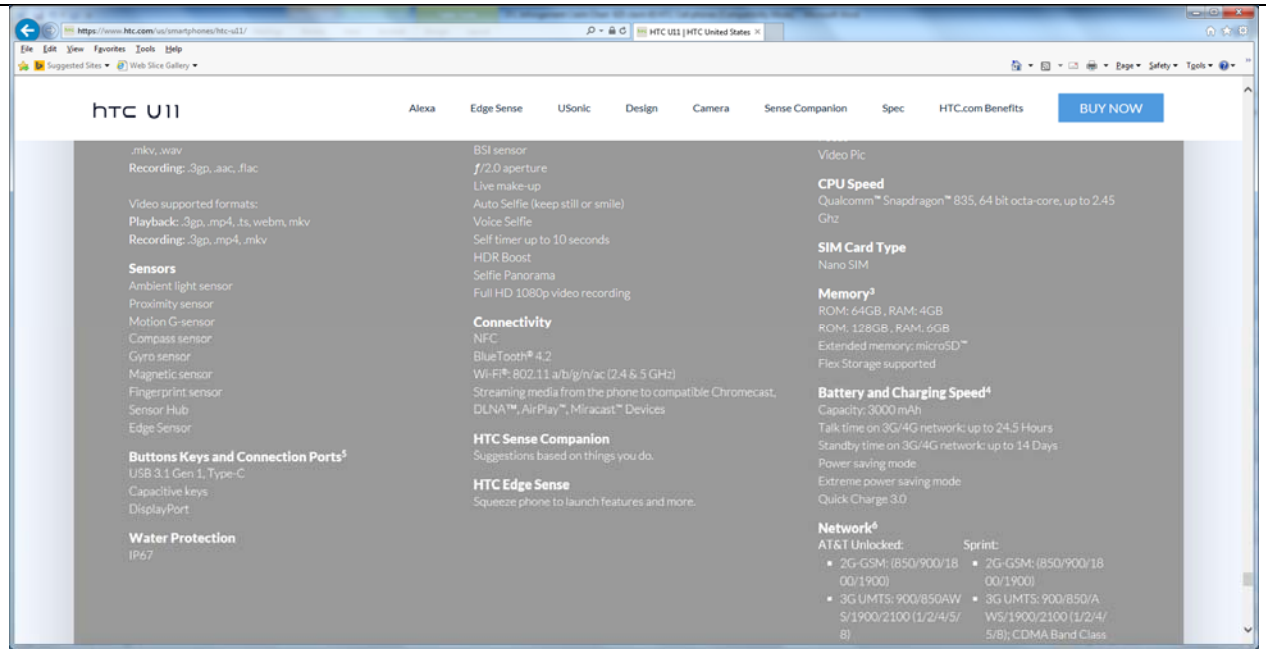
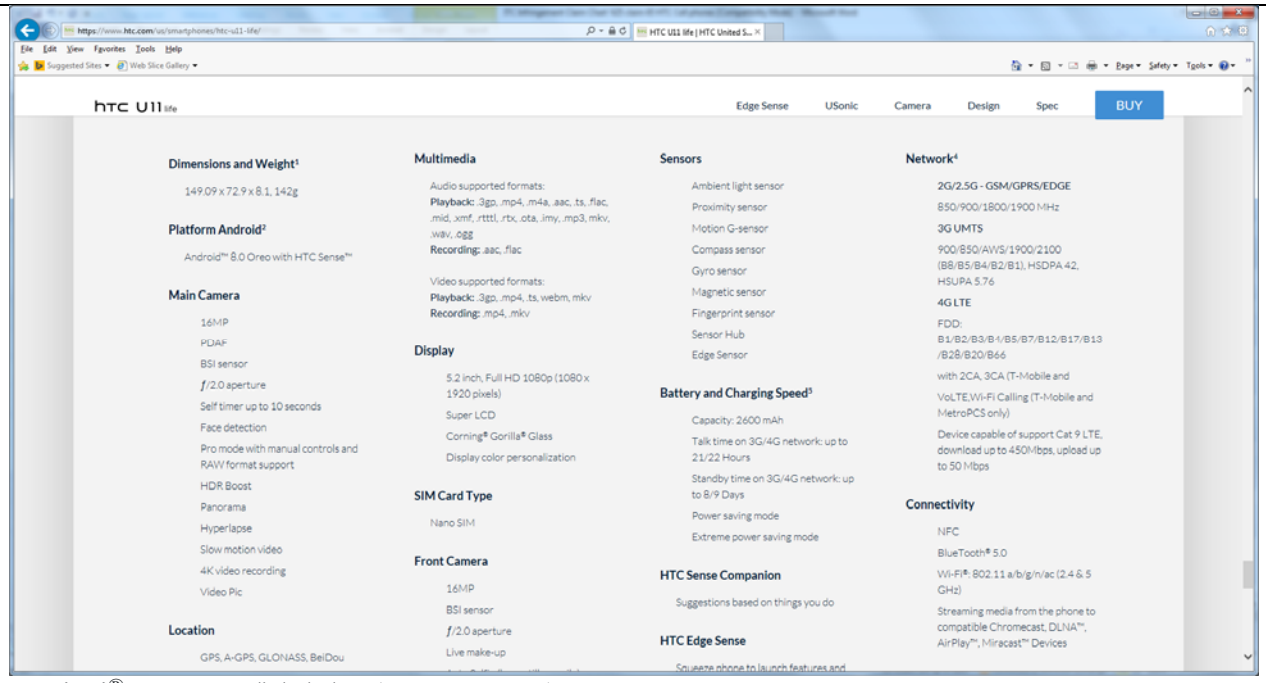
| | |
|---|---|
| |  <br>See https://www.htc.com/us/smartphones/htc-u12-plus/. |
| [a] a transceiver configured to receive, via a WiFi network, a first wireless signal corresponding to information directed to the wireless device, the information comprising a call, | The HTC U11, U11 Life, and U12+ cellular phones include a transceiver configured to receive, via a WiFi network, a first wireless signal corresponding to information directed to the wireless device, the information comprising a call.<br><br>More specifically, the HTC U11, U11 Life, and U12+ cellular phones include a transceiver that is configured to receive information, including calls, via a Wi-Fi network, as set forth in the product specifications under "connectivity": |

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**



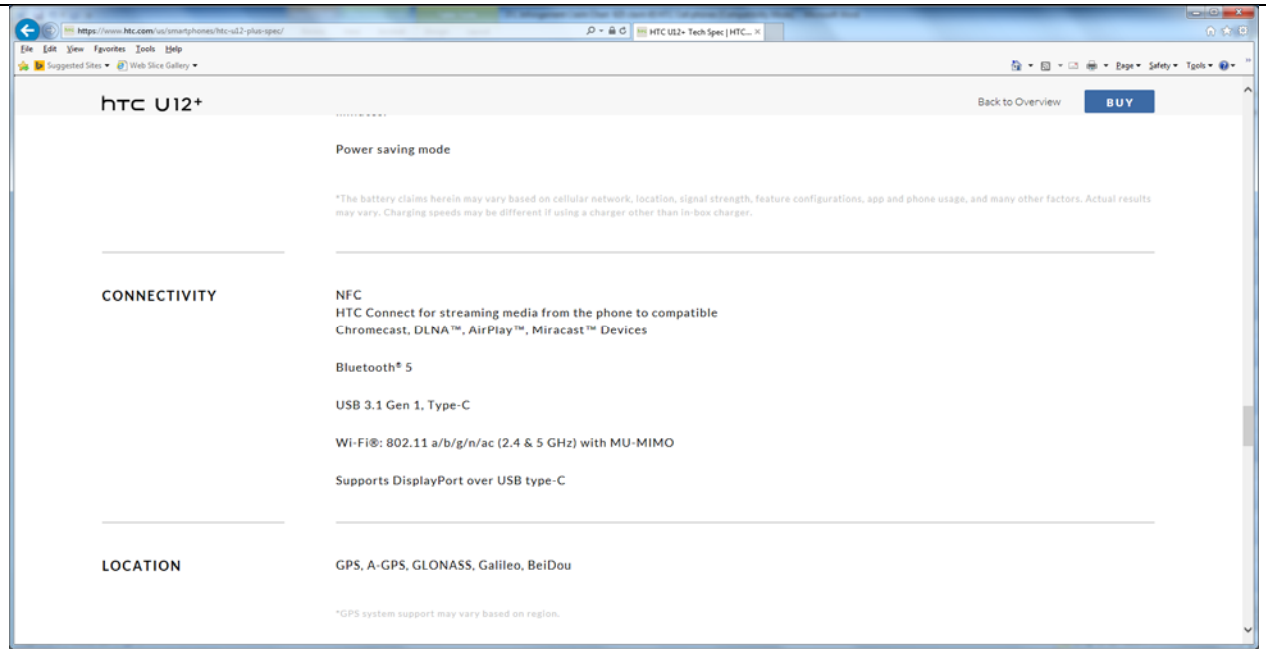

"Wi-Fi®: 802.11 a/b/g/n/ac (2.4 & 5 GHz)"
See "Spec" section at https://www.htc.com/us/smartphones/htc-u11/.

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**




" Wi-Fi®: 802.11 a/b/g/n/ac (2.4 & 5 GHz)"
See "spec" section at https://www.htc.com/us/smartphones/htc-u11-life/

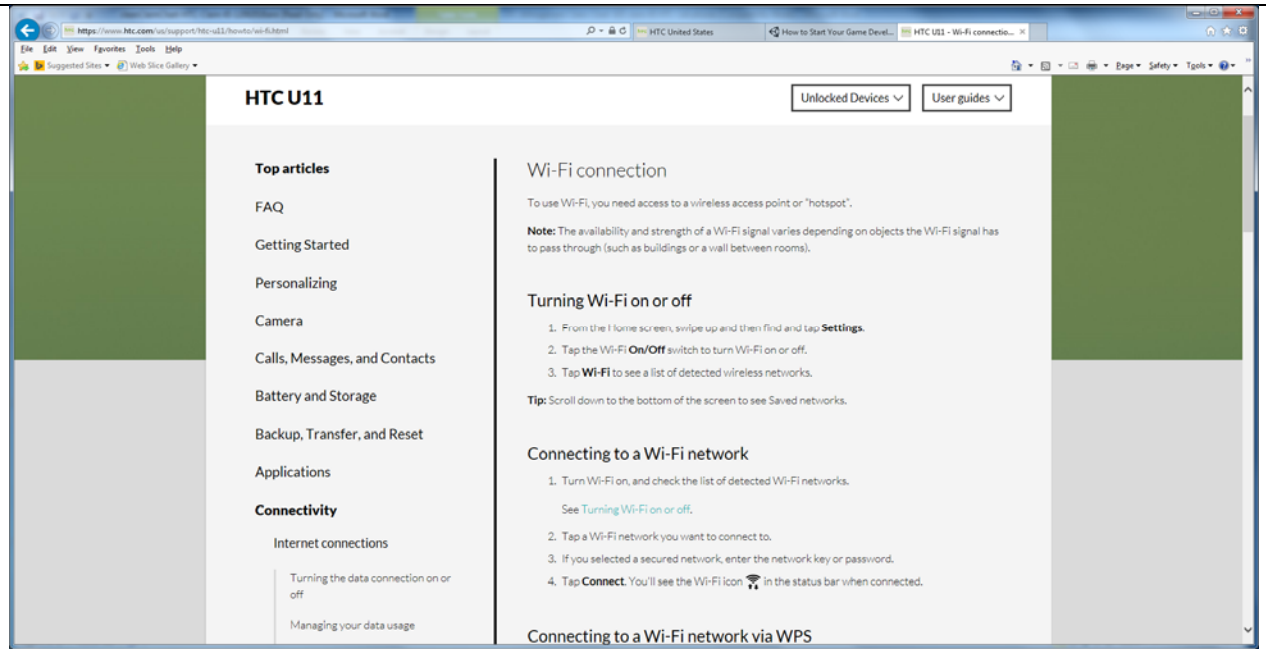
**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**




"Wi-Fi®: 802.11 a/b/g/n/ac (2.4 & 5 GHz) with MU-MIMO"
See https://www.htc.com/us/smartphones/htc-u12-plus-spec/.

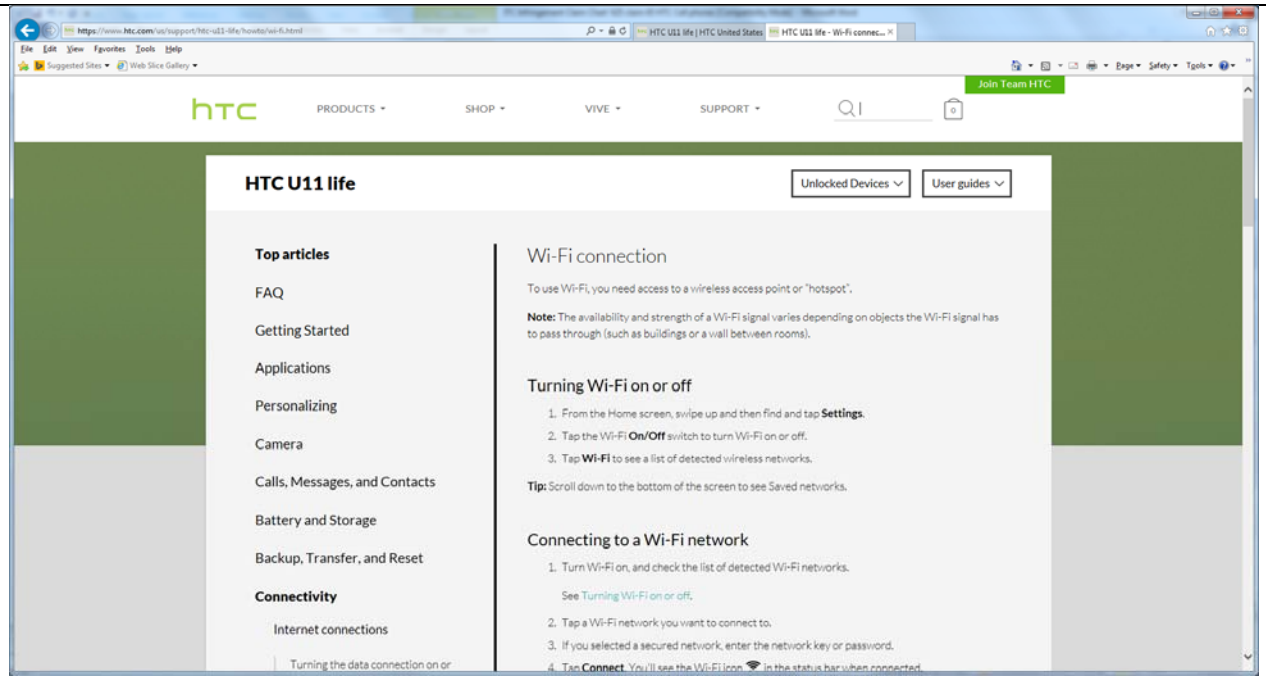
The HTC website provides support on connecting the U11, U11 Life, and U12+ to a Wi-Fi network:

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**



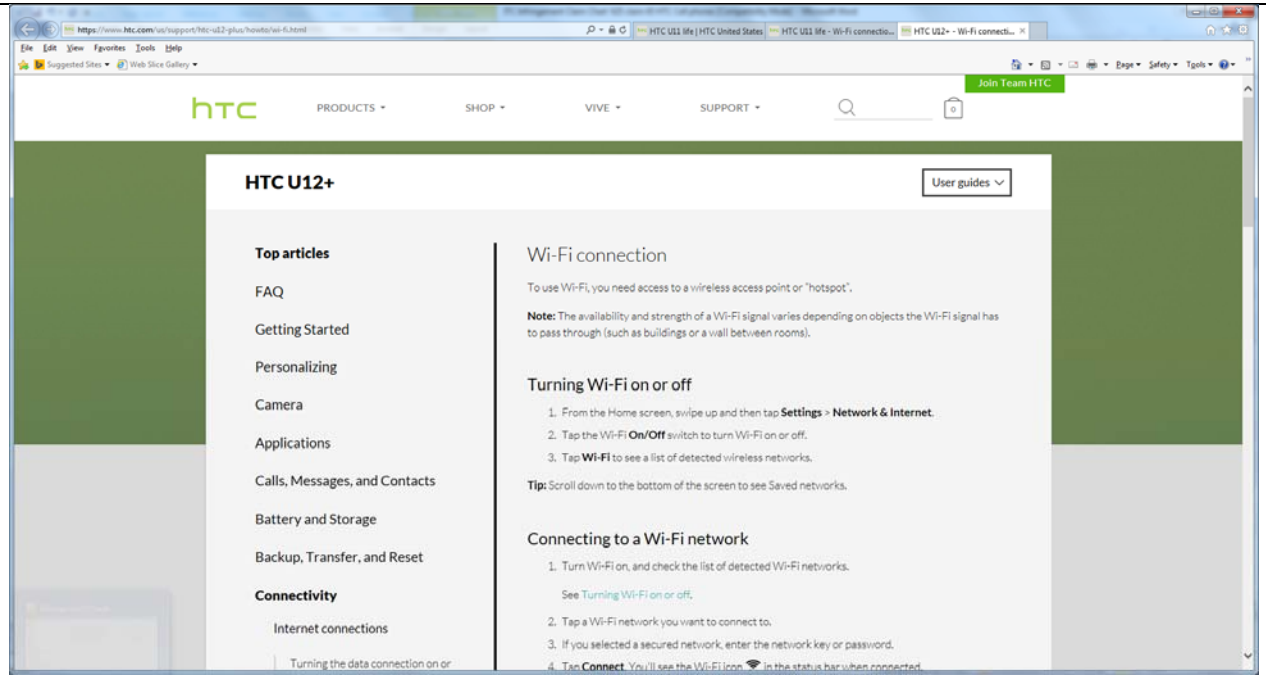

See https://www.htc.com/us/support/htc-u11/howto/wi-fi.html;

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**




See https://www.htc.com/us/support/htc-u11-life/howto/wi-fi.html.

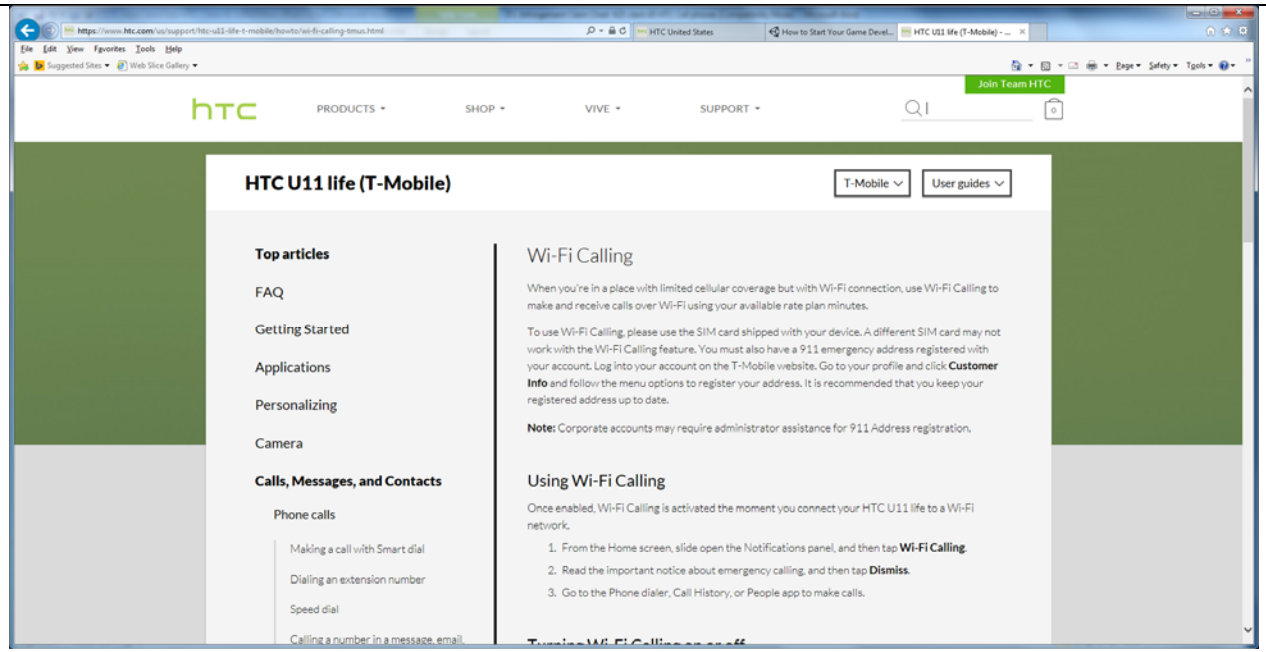
**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**




See https://www.htc.com/us/support/htc-u12-plus/howto/wi-fi.html.

HTC's website also provides support on configuring the phones for Wi-Fi calling:

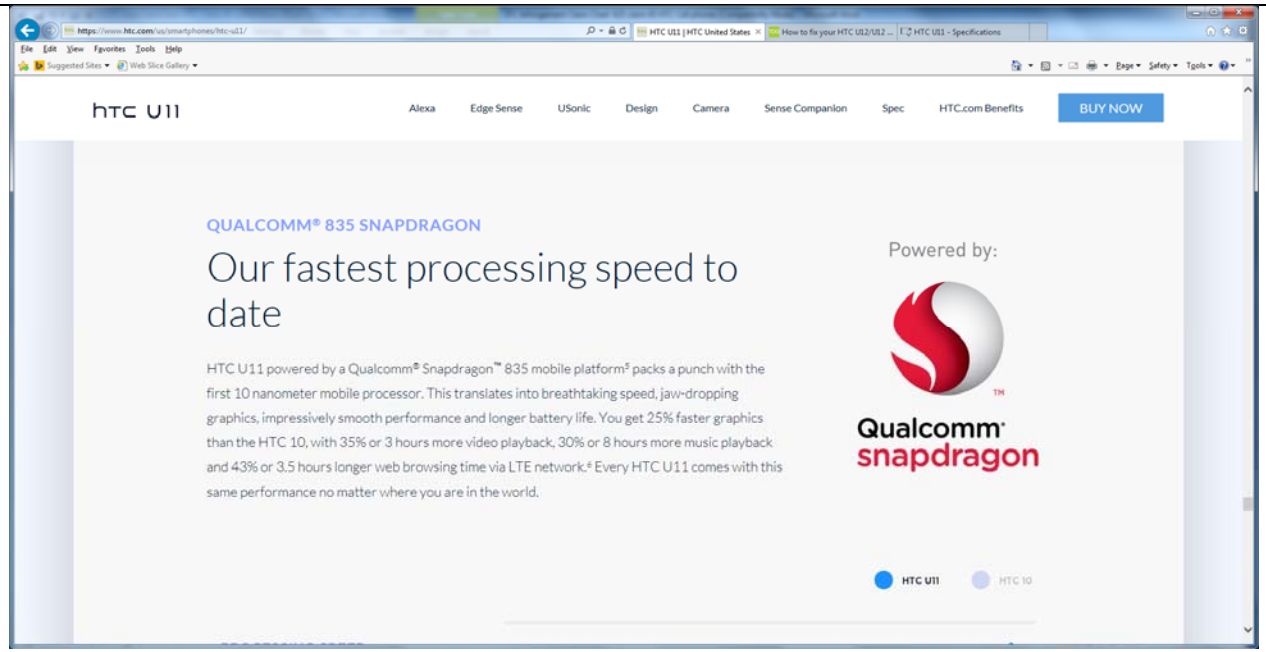
**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**




See https://www.htc.com/us/support/htc-u11-life-t-mobile/howto/wi-fi-calling-tmus.html; see also https://thedroidguy.com/2018/09/how-to-fix-your-htc-u12-u12-plus-that-suddenly-failed-to-connect-to-wi-fi-troubleshooting-guide-1090786.

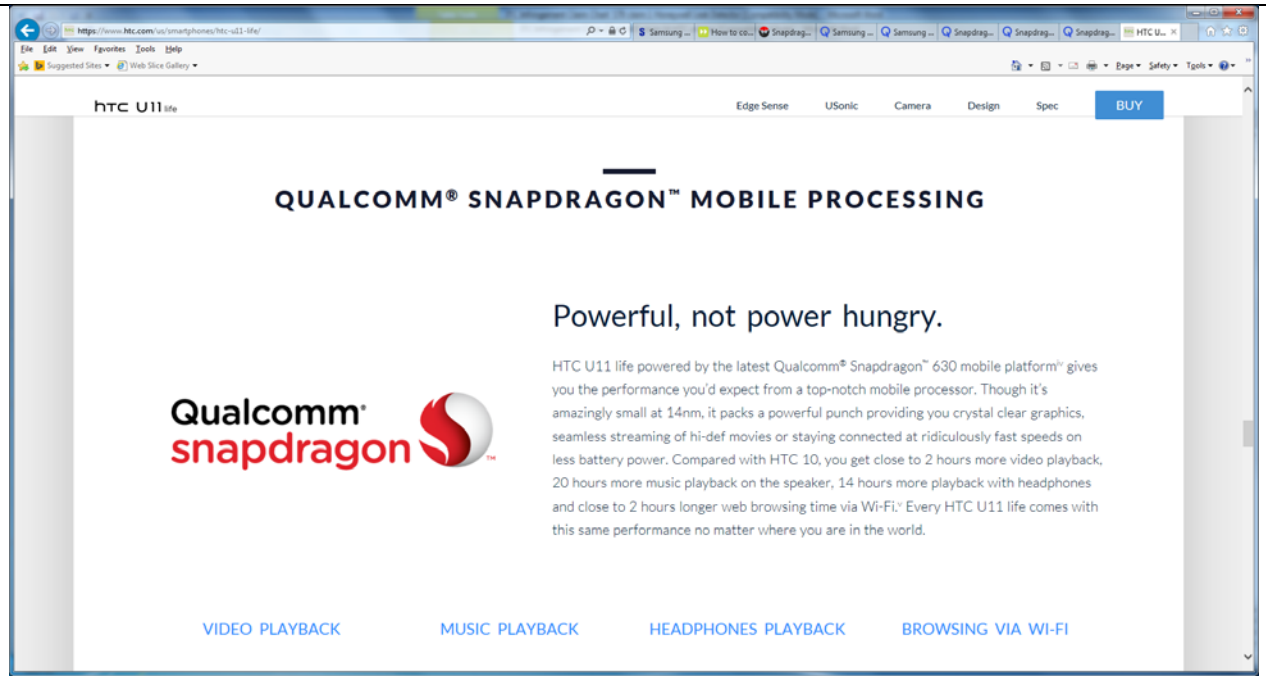
The transceiver for the HTC U11, U11 Life, and U12+ cellular phones are incorporated in the Qualcomm Snapdragon SoC processors used in the phones, such as the Qualcomm Snapdragon 835 in the HTC U11, the Qualcomm Snapdragon 630 in the U11 Life, and the Qualcomm Snapdragon 845 in the HTC U12+.

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**




See https://www.htc.com/us/smartphones/htc-u11/.

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**




https://www.htc.com/us/smartphones/htc-u11-life/

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**

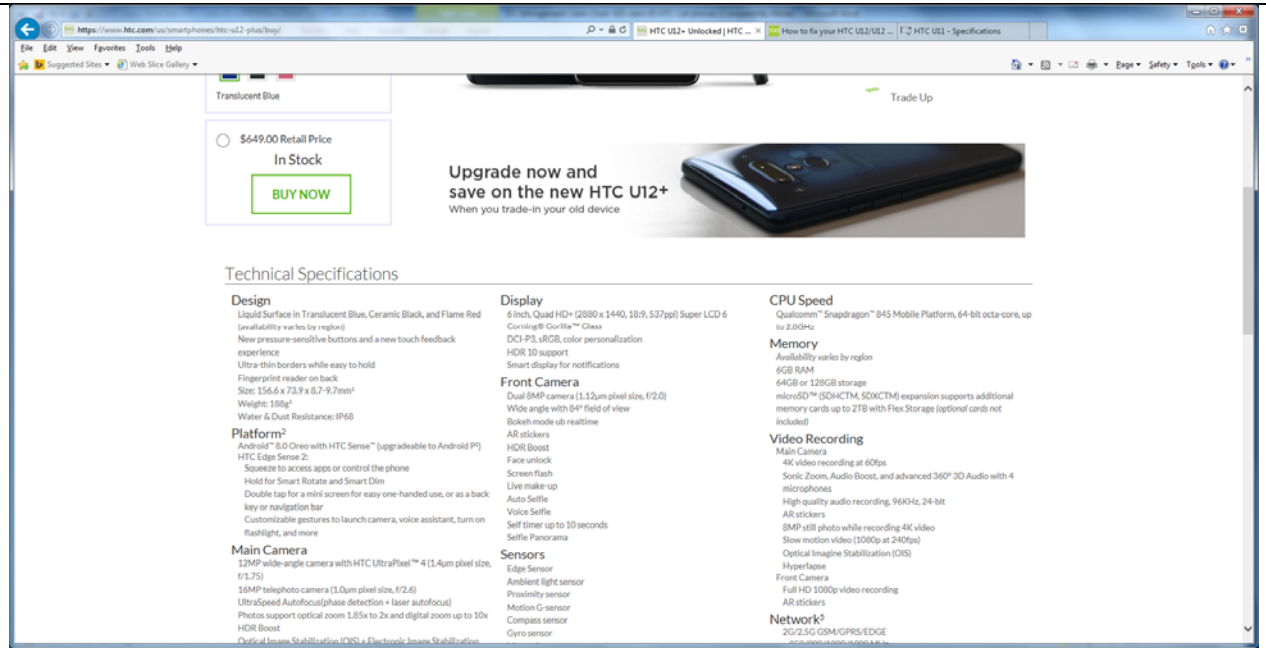
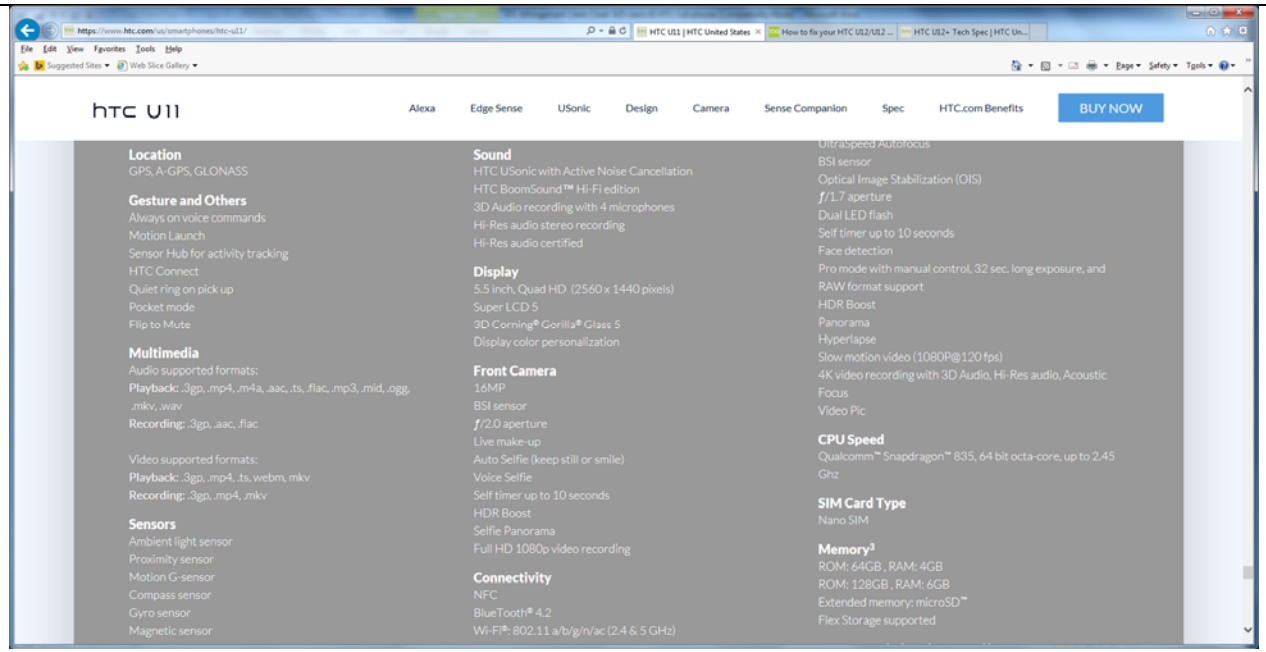
| | |
|---|---|
| |  <br>See https://www.htc.com/us/smartphones/htc-u12-plus/buy/. |
| [b] the first wireless signal being a compressed signal, | The HTC U11, U11 Life, and U12+ cellular phones are configured to receive compressed signals, including compressed audio and compressed video signals.<br><br>More specifically, the HTC U11 supports the following audio and video codecs for compressed signals: |

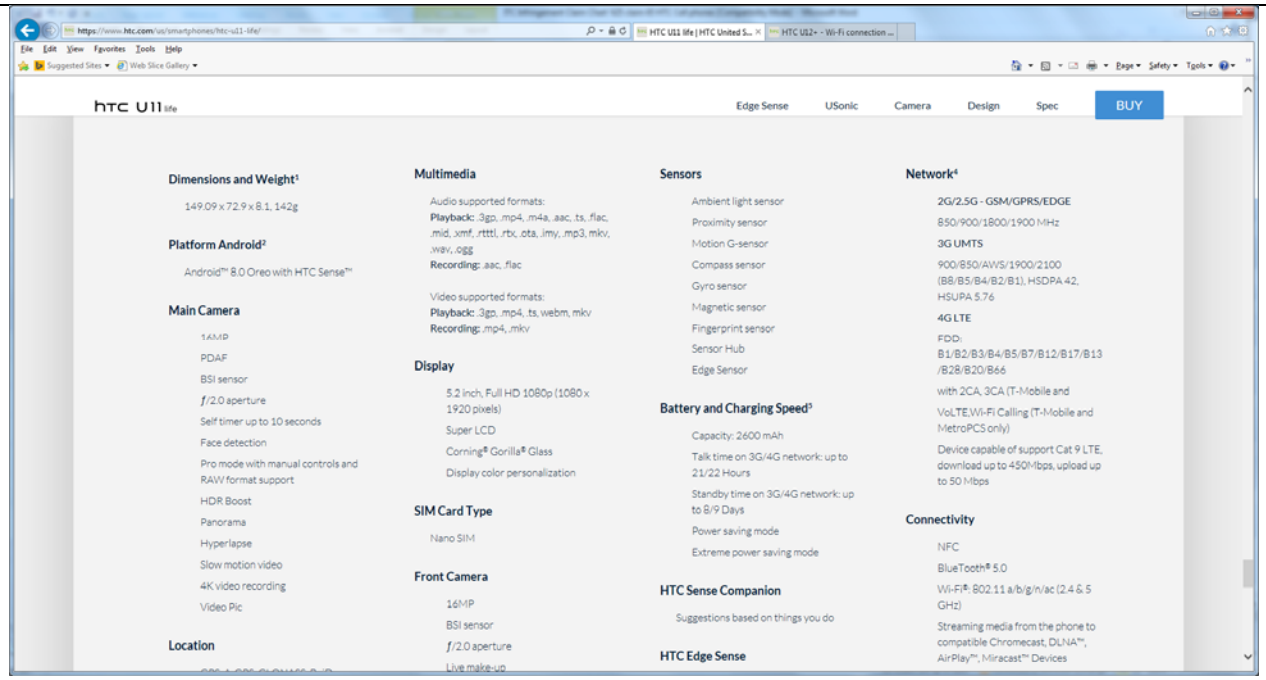
**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**




See https://www.htc.com/us/smartphones/htc-u11/.

The HTC U11 Life supports the following audio and video codecs for compressed signals:

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**




"Audio supported formats:
**Playback:** .3gp, .mp4, .m4a, .aac, .ts, .flac, .mid, .xmf, .rtttl, .rtx, .ota, .imy, .mp3, mkv, .wav, .ogg
**Recording:** .aac, .flac

Video supported formats:
**Playback:** .3gp, .mp4, .ts, webm, mkv
**Recording:** .mp4, .mkv"

https://www.htc.com/us/smartphones/htc-u11-life/.

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**

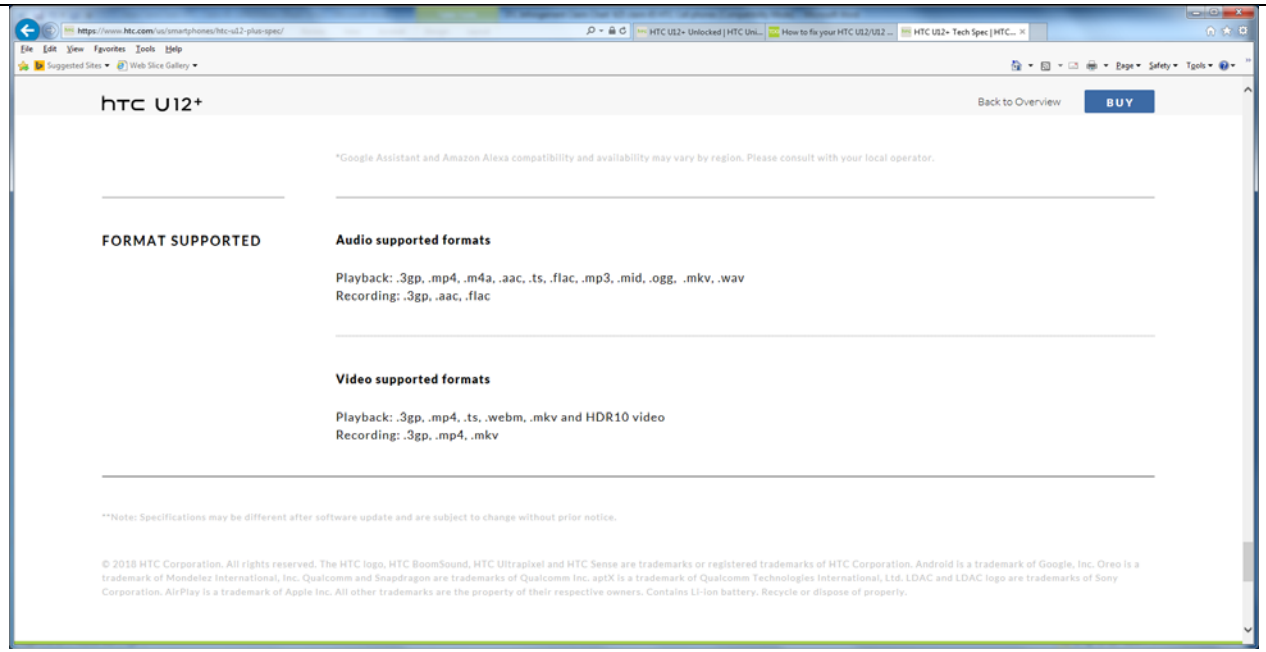
| | |
|---|---|
| |  <br>“ Audio supported formats<br>Playback: .3gp, .mp4, .m4a, .aac, .ts, .flac, .mp3, .mid, .ogg, .mkv, .wav<br>Recording: .3gp, .aac, .flac<br>Video supported formats<br>Playback: .3gp, .mp4, .ts, .webm, .mkv and HDR10 video<br>Recording: .3gp, .mp4, .mkv “<br><br>See https://www.htc.com/us/smartphones/htc-u12-plus-spec/. |
| [c] wherein the wireless device is configured to receive an instruction to make | The HTC U11, U11 Life, and U12+ cellular phones are configured to receive an instruction to make the call.<br><br>More specifically, there are a number of methods for instructing these accused HTC cellular phones to make a call, including actual dialing of a number, or initiation of calls via short cuts for established contacts such as |

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**

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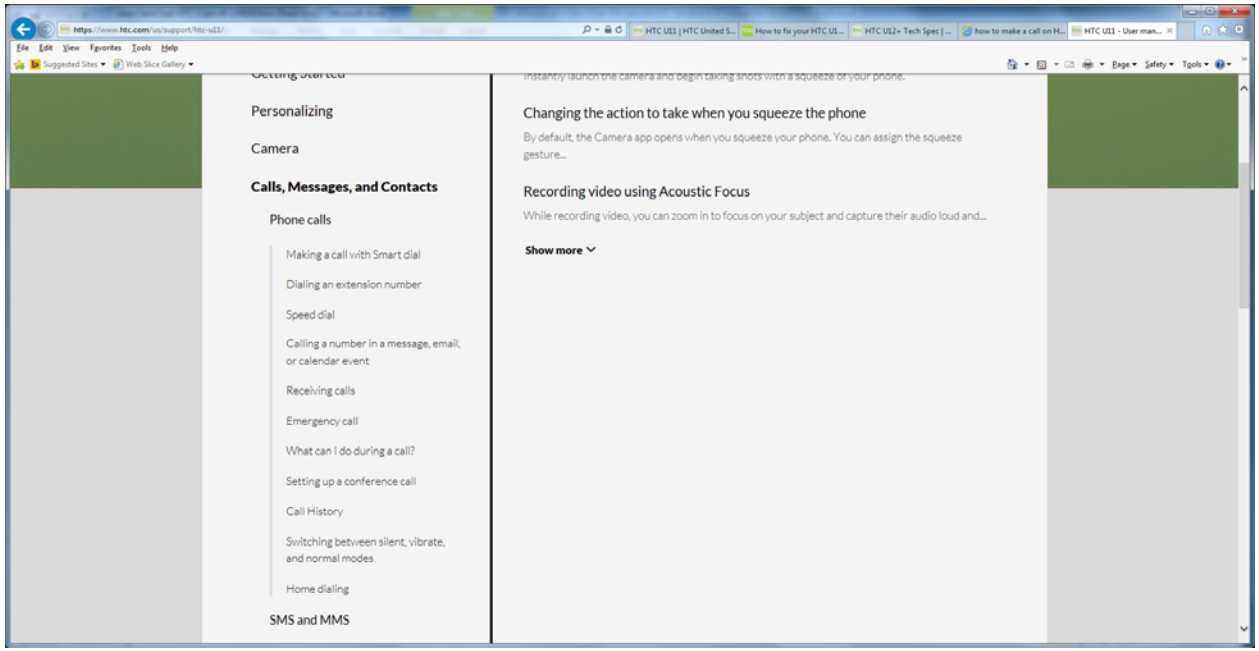
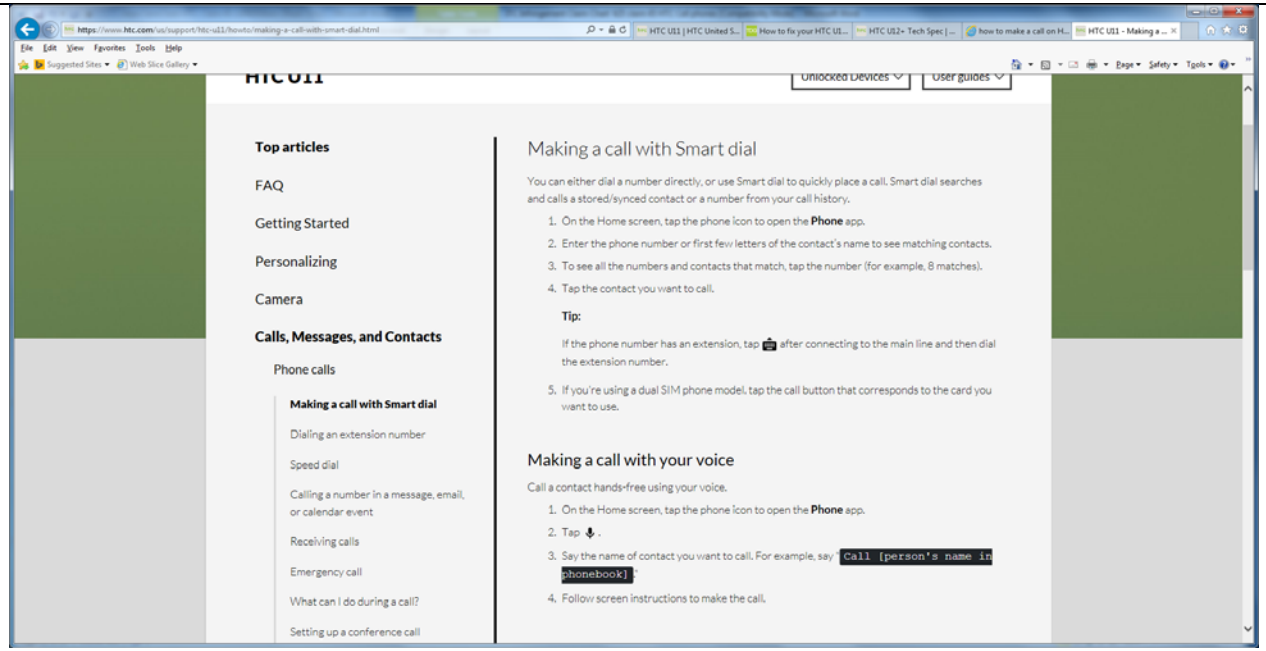
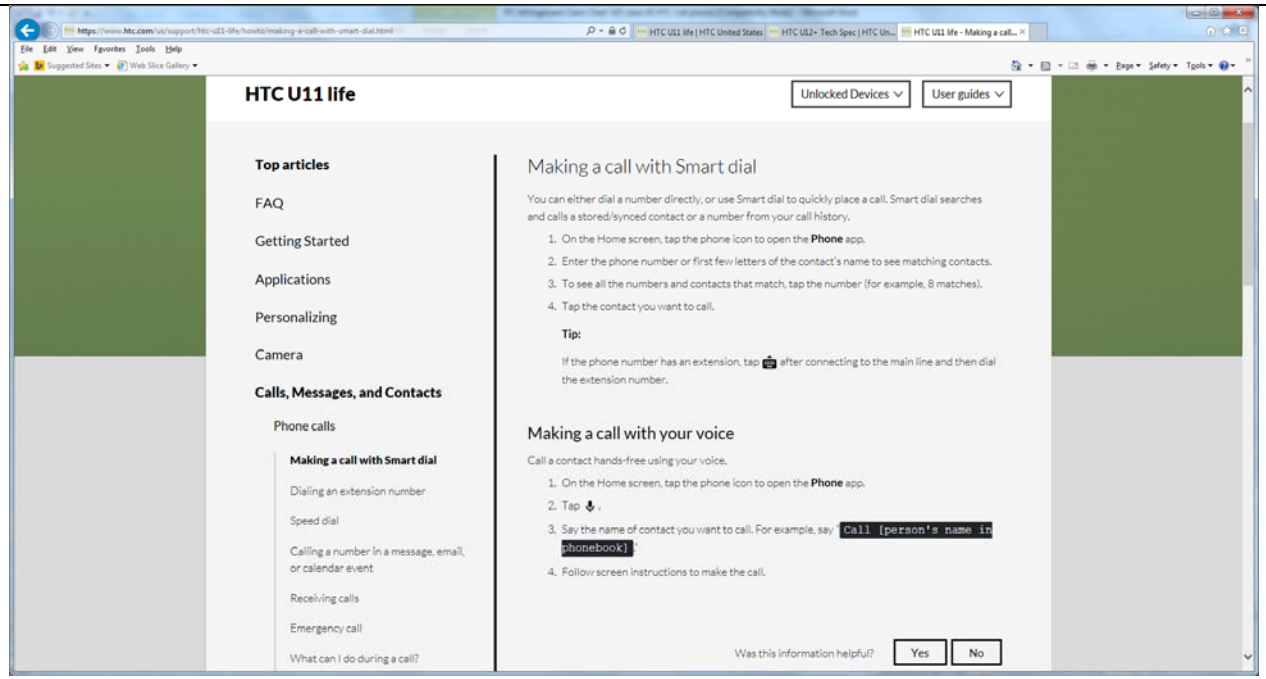
|---|---|
| the call; and | speed dial, as well as voice activated instructions:<br>  <br>See https://www.htc.com/us/support/htc-u11/; |

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**




See https://www.htc.com/us/support/htc-u11/howto/making-a-call-with-smart-dial.html.

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**




See https://www.htc.com/us/support/htc-u11-life/howto/making-a-call-with-smart-dial.html;

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**

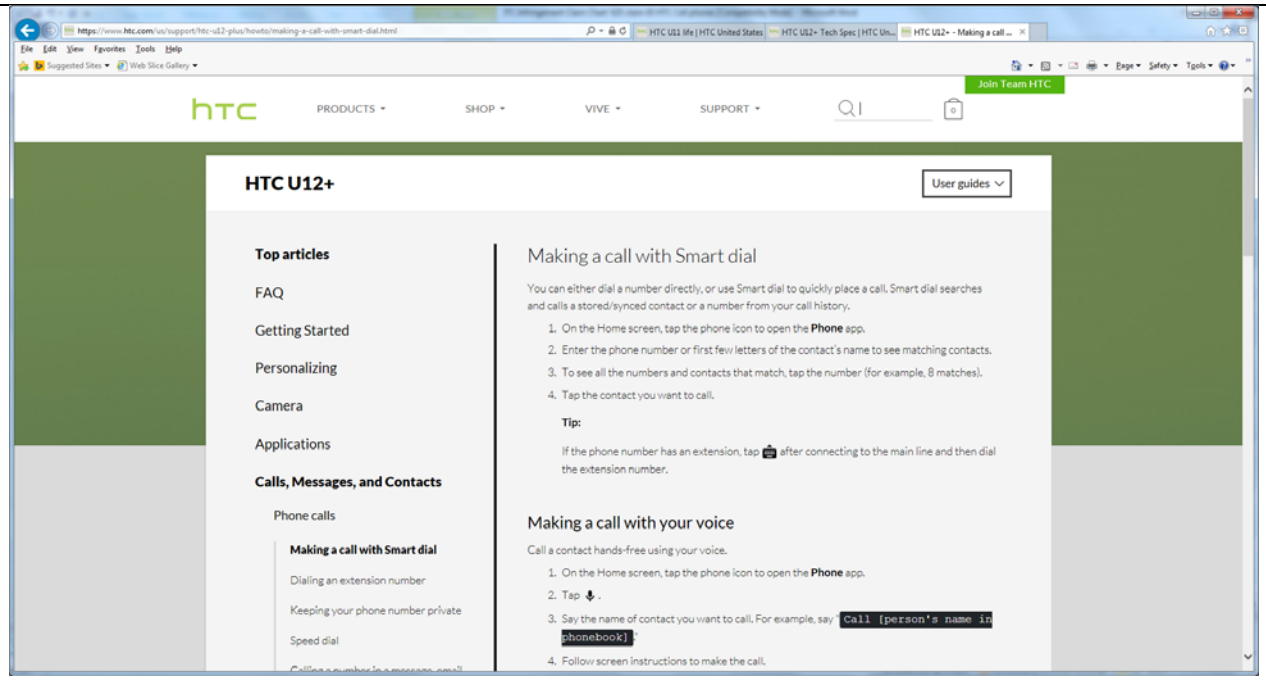
| | |
|---|---|
| |  <br>See https://www.htc.com/us/support/htc-u12-plus/howto/making-a-call-with-smart-dial.html. |
| [d] a wireless signal conversion unit including a decoder configured to perform a conversion of the first wireless signal to accommodate production of the information, | The HTC U11, U11 Life, and U12+ cellular phones have a wireless signal conversion unit including a decoder configured to perform a conversion of the first wireless signal to accommodate production of the information.<br><br>More specifically, the Qualcomm Snapdragon SoC processors used in the HTC U11, U11 Life, and U12+ phones, as discussed in subsection [b], include a signal conversion unit with a decoder that is configured to perform a conversion of the first wireless signal to accommodate production of the information.<br><br>That is the Qualcomm Snapdragon 835, 630, and 845 processors support various audio and video codecs as set forth in subsection [b], which indicates that the HTC U11, U11 Life, and U12+ cellular phones are configured to support the receipt of compressed audio and/or video signals, and conversion of the compressed signals to |

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**

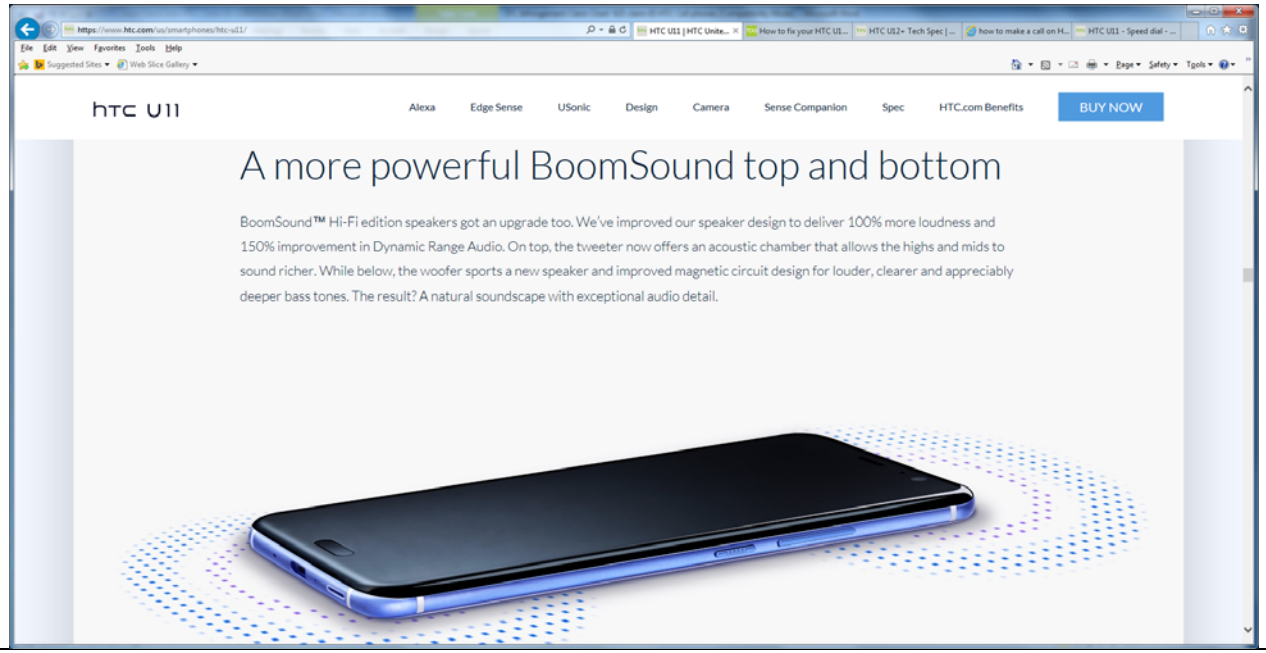
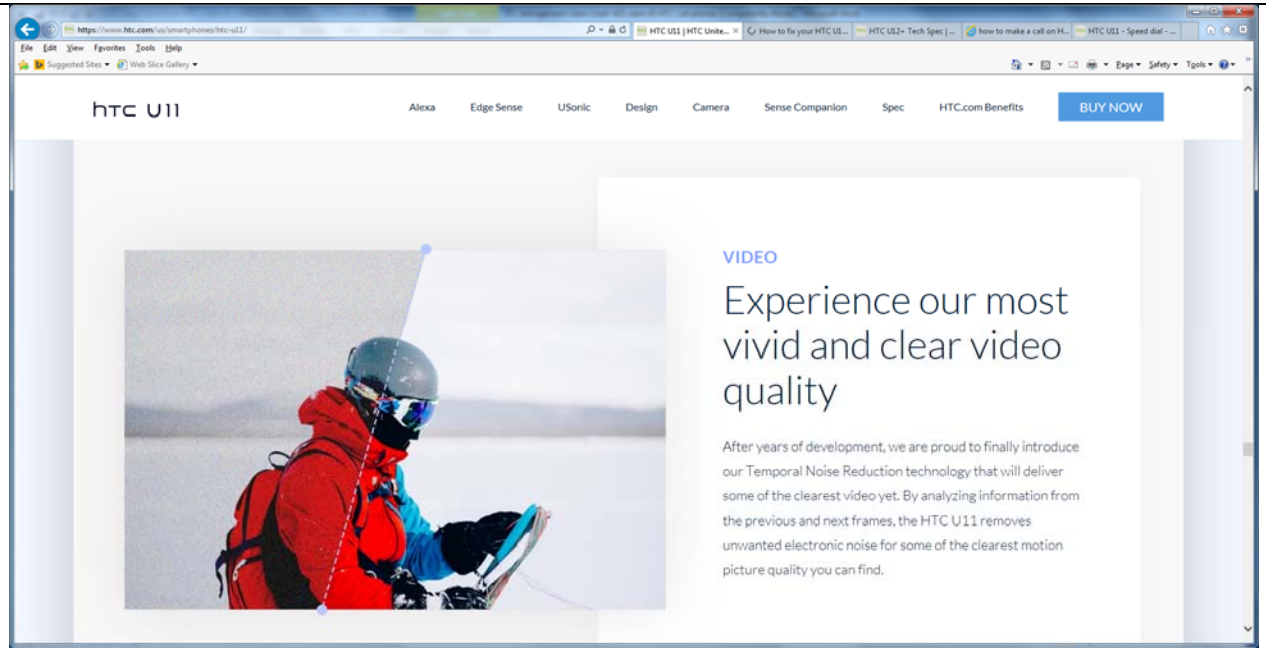
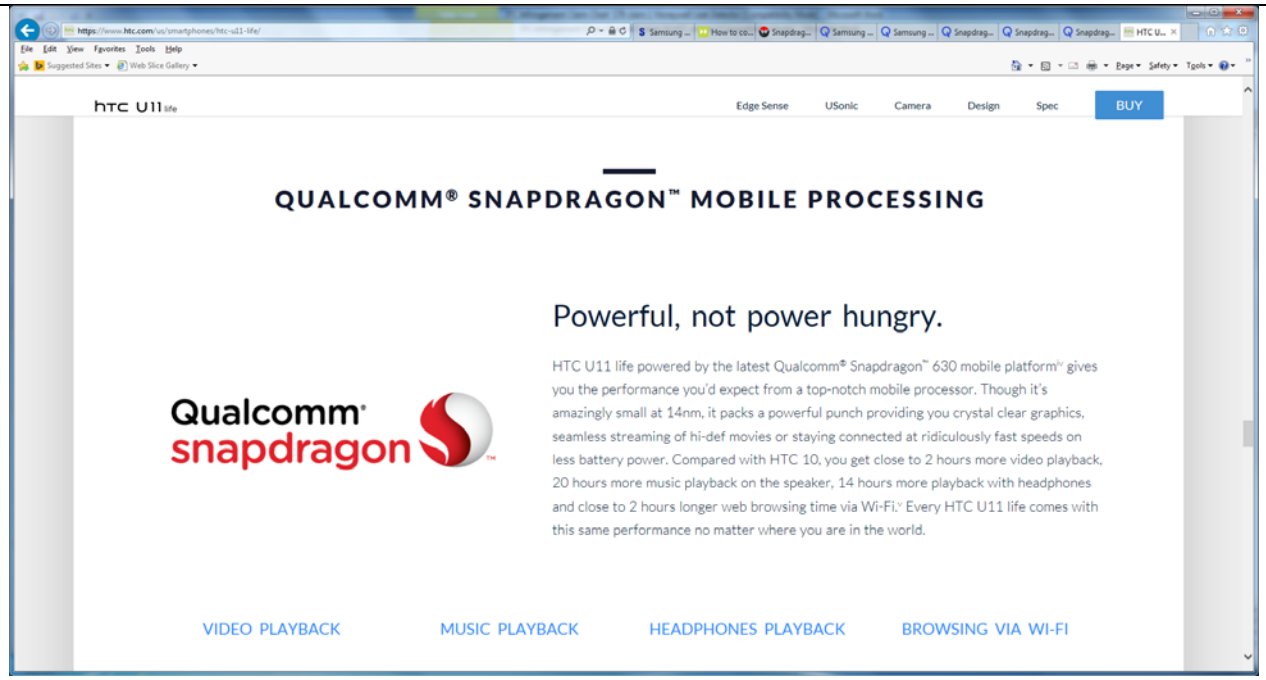
| | |
|---|---|
| | decompressed audio and/or video signals that can be played (as high definition music and/or video) on the HTC U11 and U12+ devices.<br>  |

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**




See https://www.htc.com/us/smartphones/htc-u11/.

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**




https://www.htc.com/us/smartphones/htc-u11-life/

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**

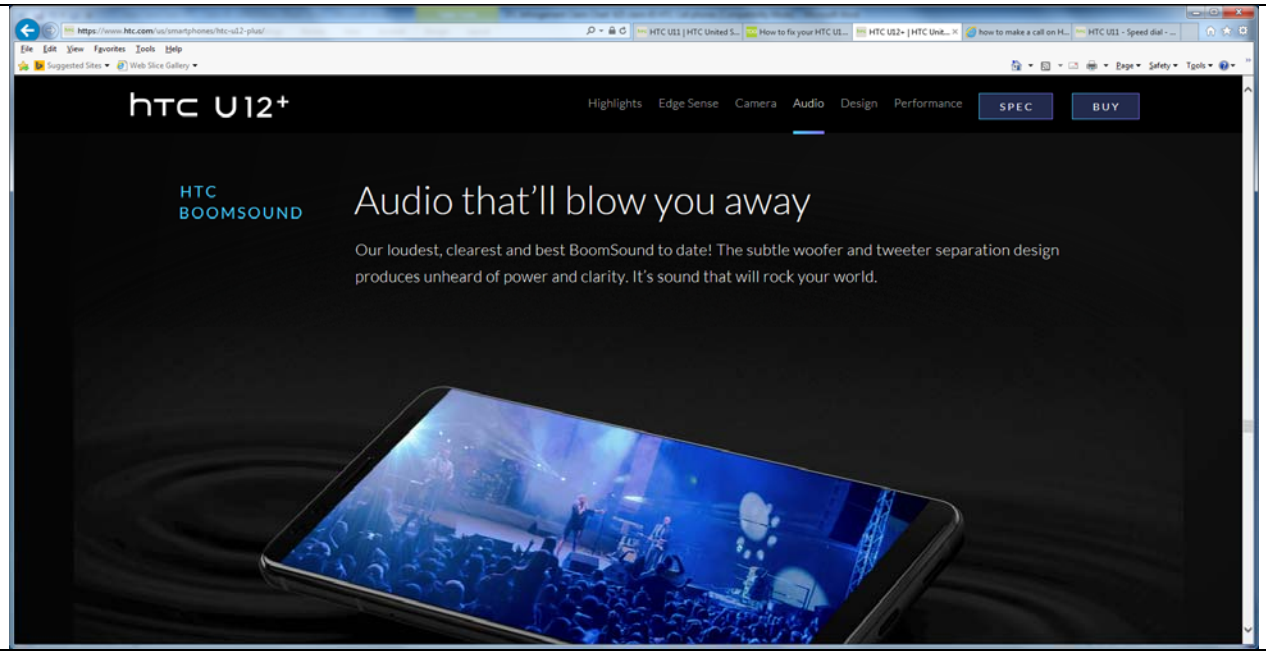
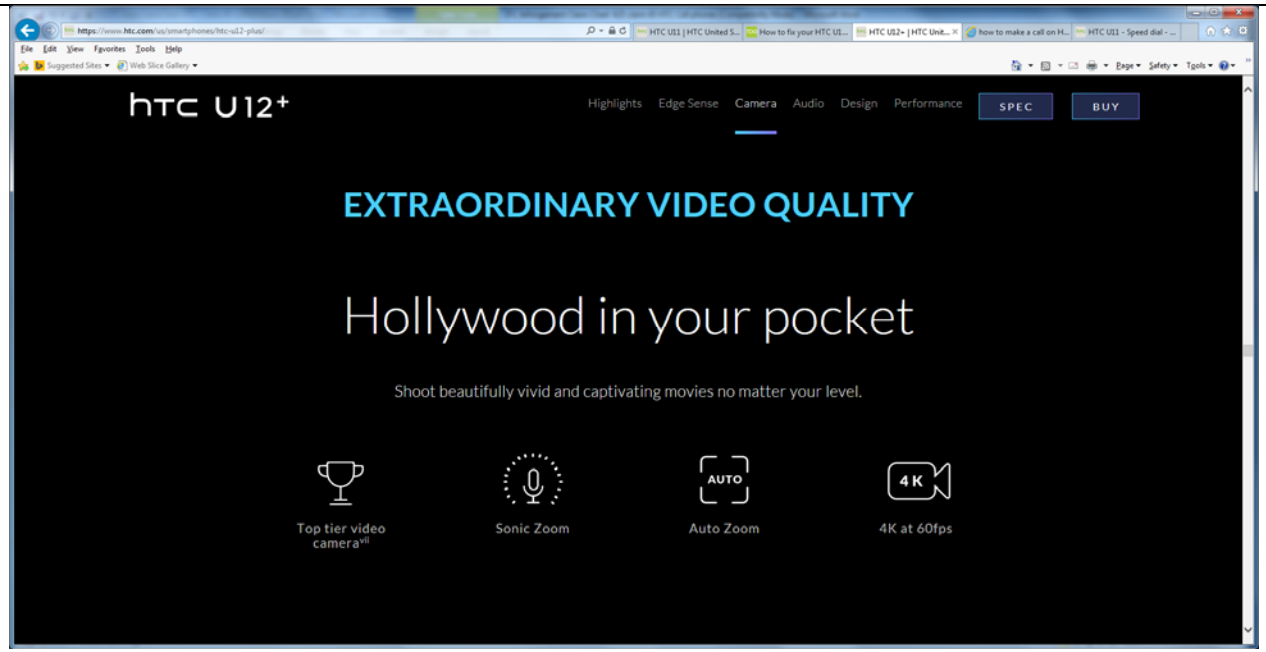
| | | |
|---|---|---|
| |  | |

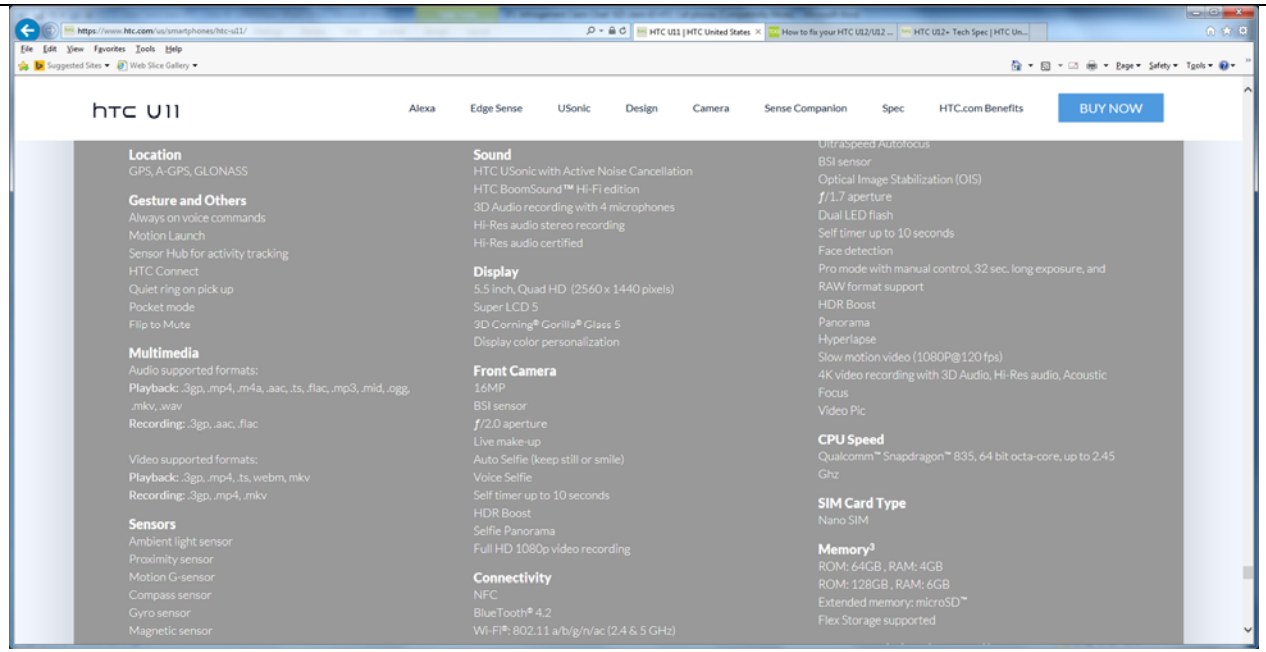
**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**




See https://www.htc.com/us/smartphones/htc-u12-plus/.

Even more specifically, the HTC U11 supports the following audio and video codecs for compressed signals:

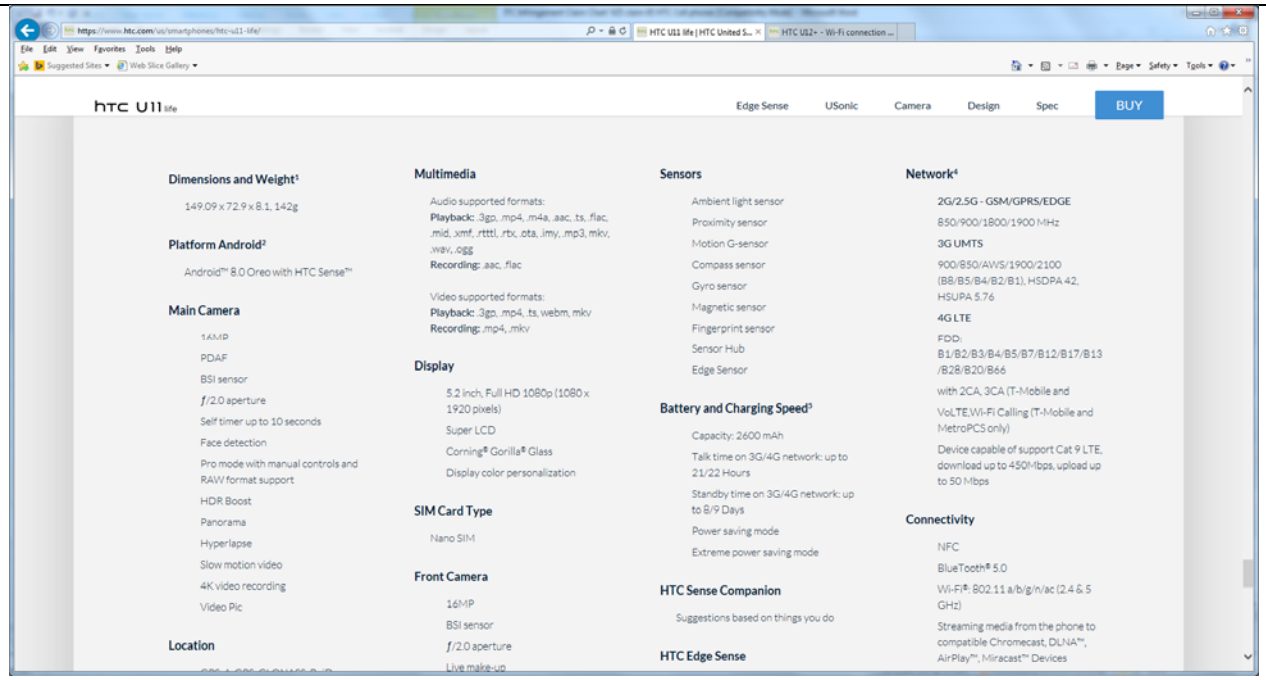
**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**




See https://www.htc.com/us/smartphones/htc-u11/.

The HTC U11 Life supports the following audio and video codecs for compressed signals:

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**




"Audio supported formats:
**Playback:** .3gp, .mp4, .m4a, .aac, .ts, .flac, .mid, .xmf, .rtttl, .rtx, .ota, .imy, .mp3, mkv, .wav, .ogg
**Recording:** .aac, .flac

Video supported formats:
**Playback:** .3gp, .mp4, .ts, webm, mkv
**Recording:** .mp4, .mkv"

https://www.htc.com/us/smartphones/htc-u11-life/.

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**

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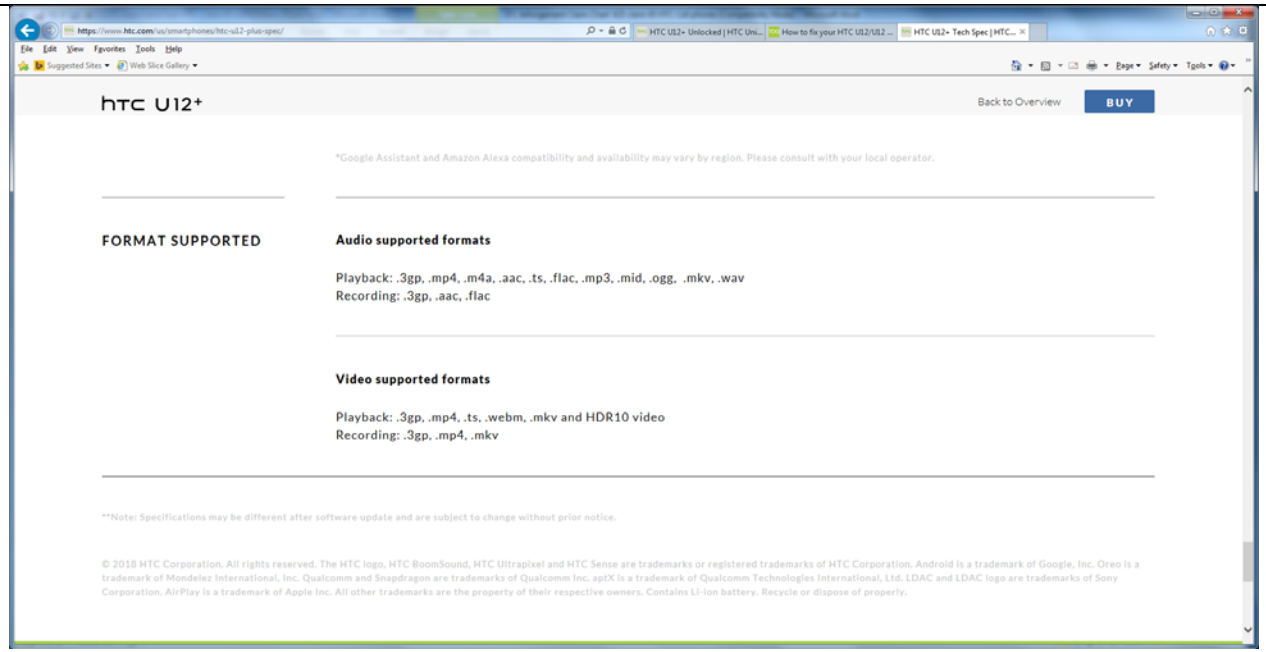
|---|---|
| |  <br>" Audio supported formats<br>Playback: .3gp, .mp4, .m4a, .aac, .ts, .flac, .mp3, .mid, .ogg, .mkv, .wav<br>Recording: .3gp, .aac, .flac<br>Video supported formats<br>Playback: .3gp, .mp4, .ts, .webm, .mkv and HDR10 video<br>Recording: .3gp, .mp4, .mkv "<br><br>See https://www.htc.com/us/smartphones/htc-u12-plus-spec/. |
| [e] wherein the decoder is configured to decompress the first wireless signal, said | The HTC U11, U11 Life, and U12+ cellular phones include a decoder that is configured to decompress the first wireless signal, said conversion comprising decompressing the first wireless signal.<br><br>More specifically, as set forth previously in subsection [b], the Qualcomm Snapdragon 835, 630, and 845 SoC |

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**

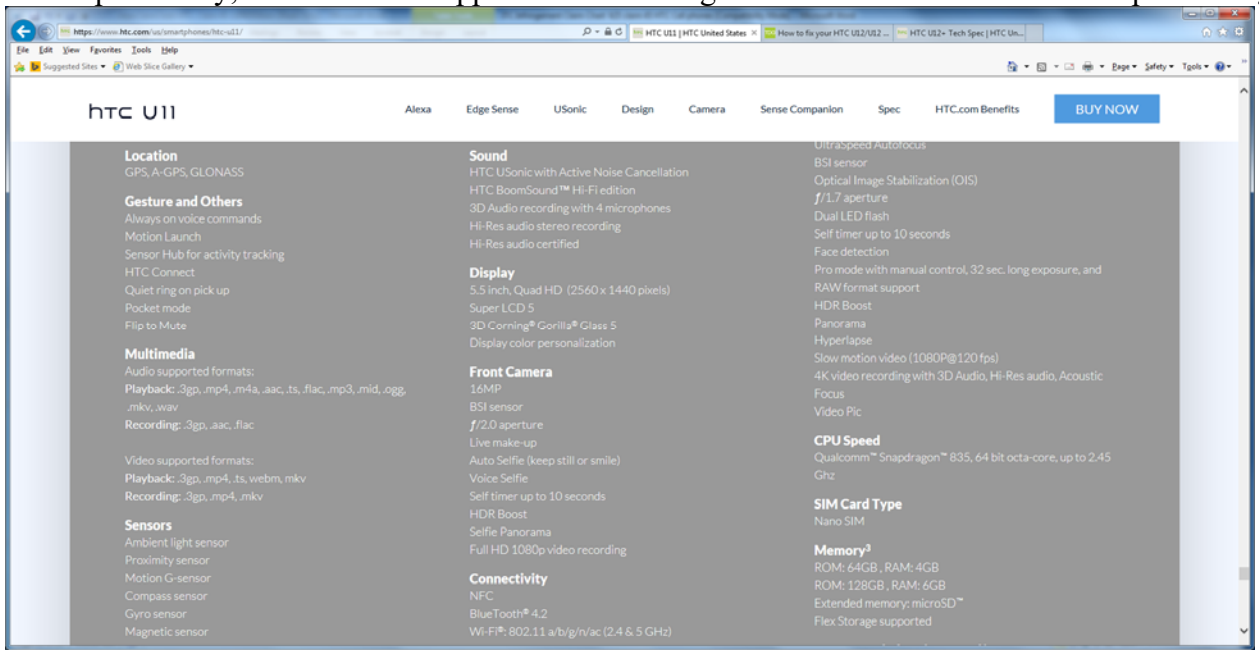
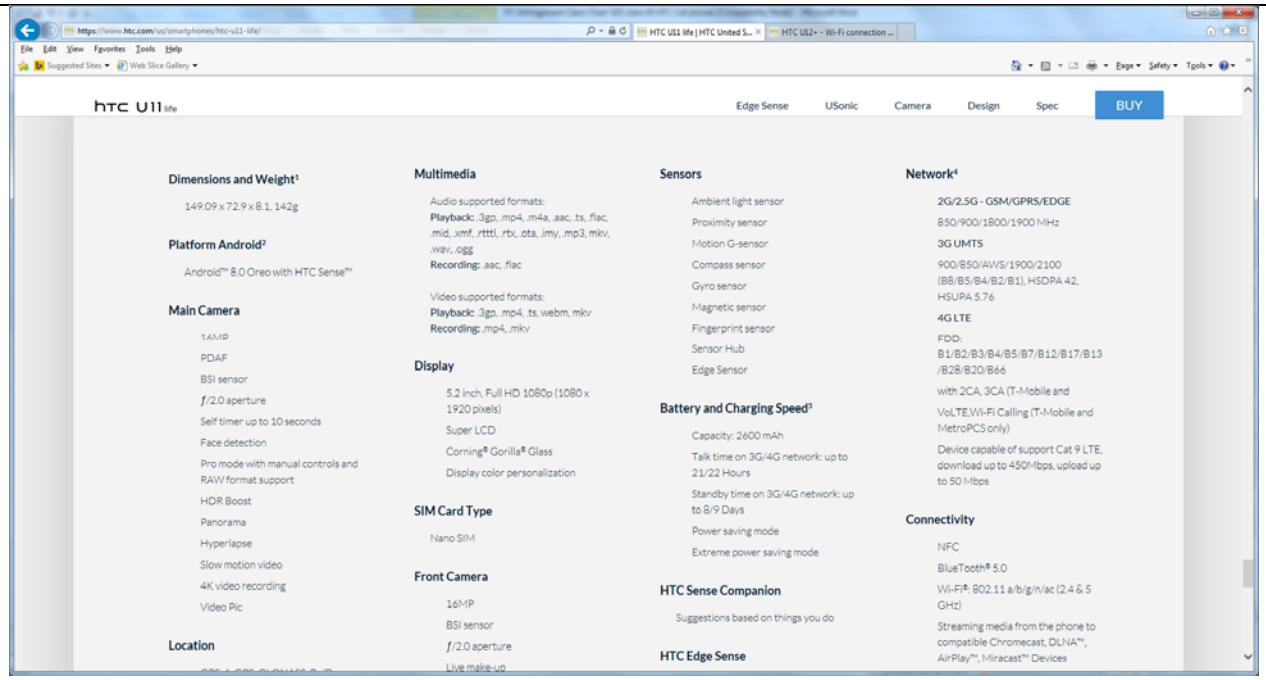
| | |
|---|---|
| conversion comprising decompressing the first wireless signal; | processors used in the HTC U11, U11 Life, and U12+ cellular phones, respectively, include a decoder that is configured to decompress the first wireless signal and supports various audio and video codecs for such decompression, as set forth in subsection [b].<br><br>More specifically, the HTC U11 supports the following audio and video codecs for compressed signals:<br>  <br><br>See https://www.htc.com/us/smartphones/htc-u11/.<br><br>The HTC U11 Life supports the following audio and video codecs for compressed signals: |

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**




"Audio supported formats:
**Playback:** .3gp, .mp4, .m4a, .aac, .ts, .flac, .mid, .xmf, .rtttl, .rtx, .ota, .imy, .mp3, mkv, .wav, .ogg
**Recording:** .aac, .flac

Video supported formats:
**Playback:** .3gp, .mp4, .ts, webm, mkv
**Recording:** .mp4, .mkv"

https://www.htc.com/us/smartphones/htc-u11-life/.

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**

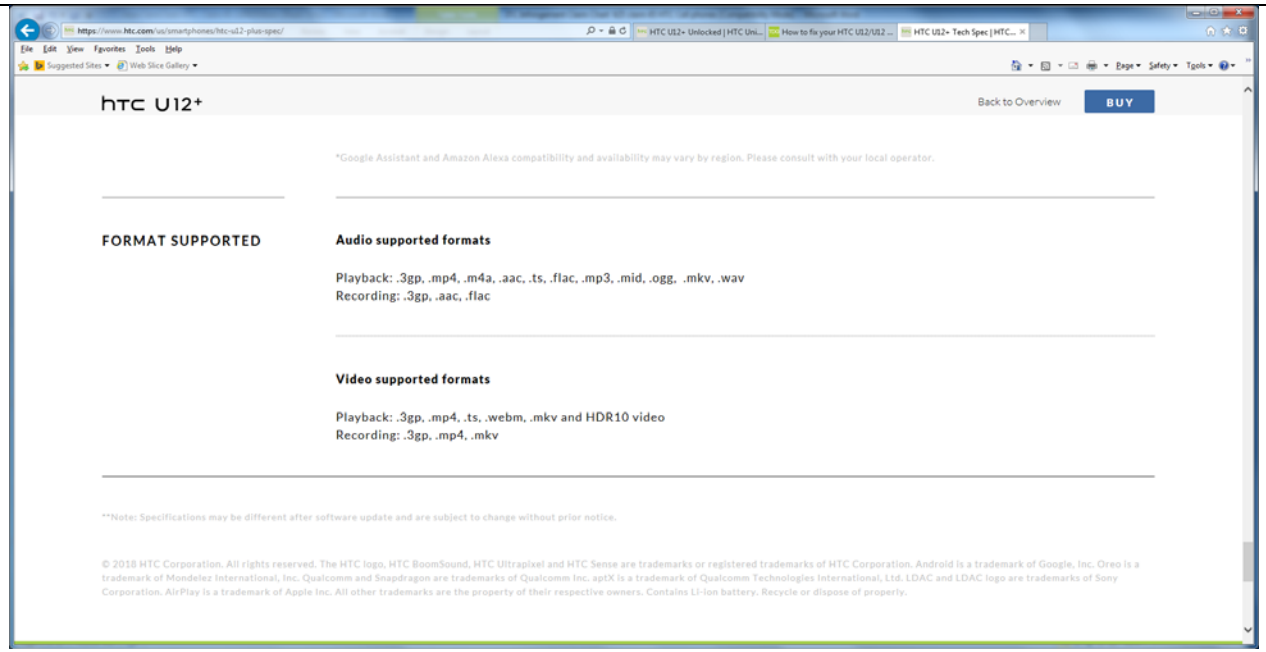
| | |
|---|---|
| |  <br>“ Audio supported formats<br>Playback: .3gp, .mp4, .m4a, .aac, .ts, .flac, .mp3, .mid, .ogg, .mkv, .wav<br>Recording: .3gp, .aac, .flac<br>Video supported formats<br>Playback: .3gp, .mp4, .ts, .webm, .mkv and HDR10 video<br>Recording: .3gp, .mp4, .mkv “<br><br>See https://www.htc.com/us/smartphones/htc-u12-plus-spec/. |
| [f] wherein the wireless device is further configured to communicate | The HTC U11, U11 Life, and U12+ cellular phones are also configured to communicate information for managing a status update via the WiFi network in connection with a second wireless signal regarding the status update. |

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**

| | |
|---|---|
| information for managing a status update via the WiFi network in connection with a second wireless signal regarding the status update, | More specifically, the HTC U11, U11 Life, and U12+ cellular phones running the Amazon Alexa application are configured to communicate information for managing a status update via the WiFi network in connection with a second wireless signal regarding the status update.<br><br>That is, using the Alexa application, the HTC U11, U11 Life, and U12+ cellular phones can monitor/control various household sensors and/or controllers that operate via a short-range wireless network.<br><br>More specifically, the HTC U11, U11 Life, and U12+ phones with the HTC Alexa application running are further configured to communicate information for managing a status update via the WiFi network in connection with a second wireless signal regarding the status update. |

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**

The HTC U11 with HTC Alexa is the world's first smartphone to launch Amazon's Alexa voice service hands-free by simply saying 'Alexa'.2

With Always-On Microphone capability, even when you're not using your phone you can wake up your phone by just asking; "Alexa, what's the weather today?" or "Alexa, turn on my living room lights." Alexa will respond anywhere and anytime—no app to tap, no buttons to push. It's Alexa on the go.

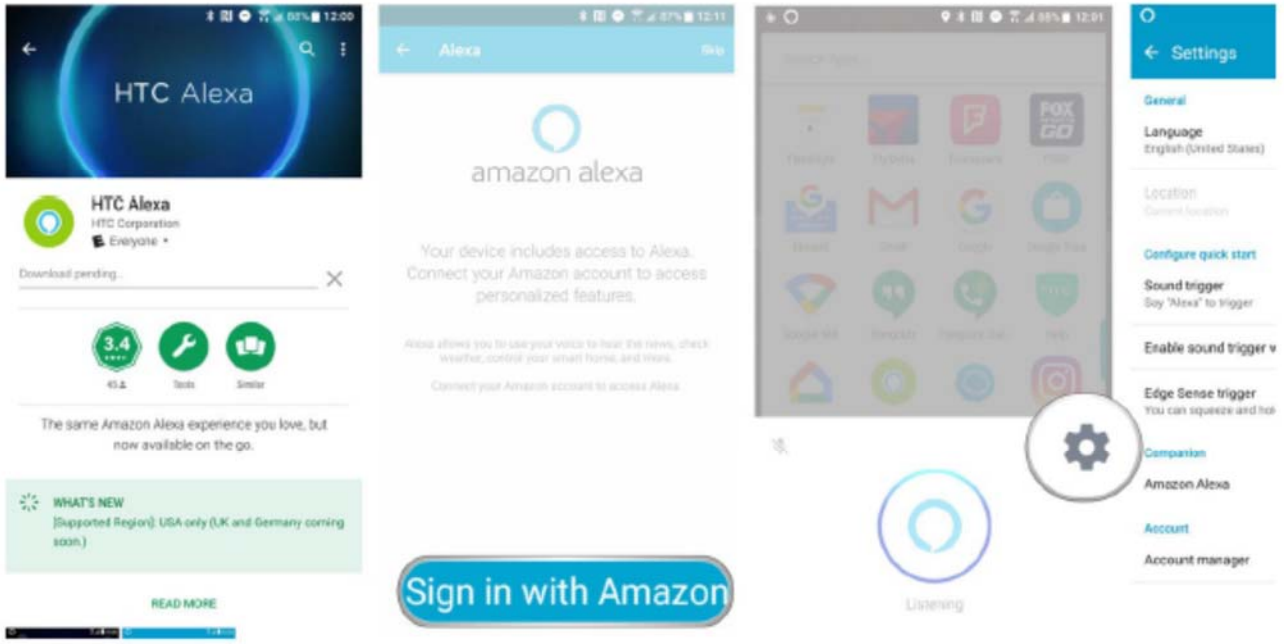
HTC Alexa gives you fast, easy access to Alexa's extensive services.

- Shop for birthday presents.
- Create a shopping list.
- Get a Flash Briefing from your favorite news sources.
- Listen to music, audiobooks, and so much more...


https://www.htc.com/us/smartphones/htc-u11/

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**

1. Head to the **Google Play Store** and install the "HTC Alexa" app.
2. Open the **HTC Alexa app** and **sign into your Amazon account**.
3. Accept the prompt to **grant location access** to Alexa.
4. Tap **Next** and then **Finish** and you'll see the Alexa voice prompt for the first time.
5. Tap the **Settings gear** to see the short list of settings.
   - Here, you can simply turn off the voice trigger and Edge Sense trigger.
6. Though not required, it's also useful to install the generic Amazon Alexa app.
   - The Alexa app lets you configure Alexa on your U11 the same way you would an Amazon Echo speaker.




You can get started with Alexa right away after these steps. Just start talking to it!

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**

| | |
|---|---|
| | https://www.androidcentral.com/how-install-amazon-alexa-htc-u11<br><br>In order to use the HTC Alexa application on the HTC U11, firmware version 1.13.651.6 or later for the Sprint model, or version 1.16.617.6 or later for the U.S. unlocked model, is needed.<br><br>Getting started with Amazon Alexa is as easy as installing and launching an app. But as a prerequisite, you'll need to firmware — 1.13.651.6 or later for the Sprint model and 1.16.617.6 or later for the U.S. unlocked model.<br>https://www.androidcentral.com/how-install-amazon-alexa-htc-u11<br><br>The HTC U11 with the HTC Alexa application can manage information communications. For example, the HTC U11 can control, monitor, or otherwise manage smart home devices.<br><br>"The Alexa assistant on the U11 can play music from Amazon, add things to my Alexa shopping and to-do lists, play my flash briefing, tell a joke, provide weather information, control smart home gadgets, use third-party "skills," add events to my calendar, give me sports scores, or answer a host of other questions."<br><br>https://www.theverge.com/2017/7/17/15974196/htc-u11-amazon-alexa-assistant-release-review<br><br>HTC is redoubling its efforts to offer a choice of digital assistants, with both Google Assistant and Amazon Alexa preloaded on the U12 Plus. In China, they're replaced with Baidu Assistant. The software, based on Android 8.0, is otherwise broadly unchanged.<br>https://www.theverge.com/2018/5/23/17379244/htc-u12-plus-specs-price-release-date-edge-sense |

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**

| | |
|---|---|
| | What is HTC Alexa?<br><br>**Note:** The help content here is based on the following app version: 1.20.1x.<br><br>HTC Alexa transforms your phone into an Alexa-capable device. Alexa is a cloud-based voice service that can search for information, play music, provide weather forecasts and news, and more. The more you use Alexa, the better it learns your information needs, speech patterns, vocabulary, and personal and location preferences.<br><br>https://www.htc.com/us/support/htc-u12-plus/howto/what-is-htc-alexa.html |

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**

## Using HTC Alexa

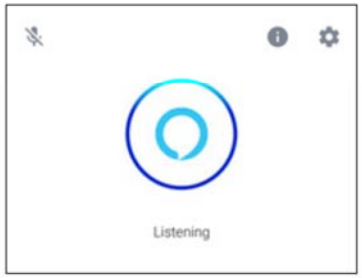
HTC Alexa answers questions, assists in voice shopping, provides news, and more.

1. Do any of the following:
   - Use the assigned Edge Sense gesture to launch HTC Alexa.

     **Note:** If your phone has a screen lock, you'll need to unlock the screen before HTC Alexa launches.

   - From the Home screen, swipe up and then find and tap **HTC Alexa**.

   HTC Alexa launches.




2. Ask a question or say a command. Try:
   - " Find me the nearest dog park ."
   - " What's the weather in Seattle tomorrow ?"
   - " How's traffic going home ?"
   - " Play Beethoven's 5th Symphony ."

**Tip:** You can add more functions to Alexa by installing new skills. Find and download skills from the Amazon Alexa skills store at amazon.com.

https://www.htc.com/us/support/htc-u12-plus/howto/using-htc-alexa.html

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**

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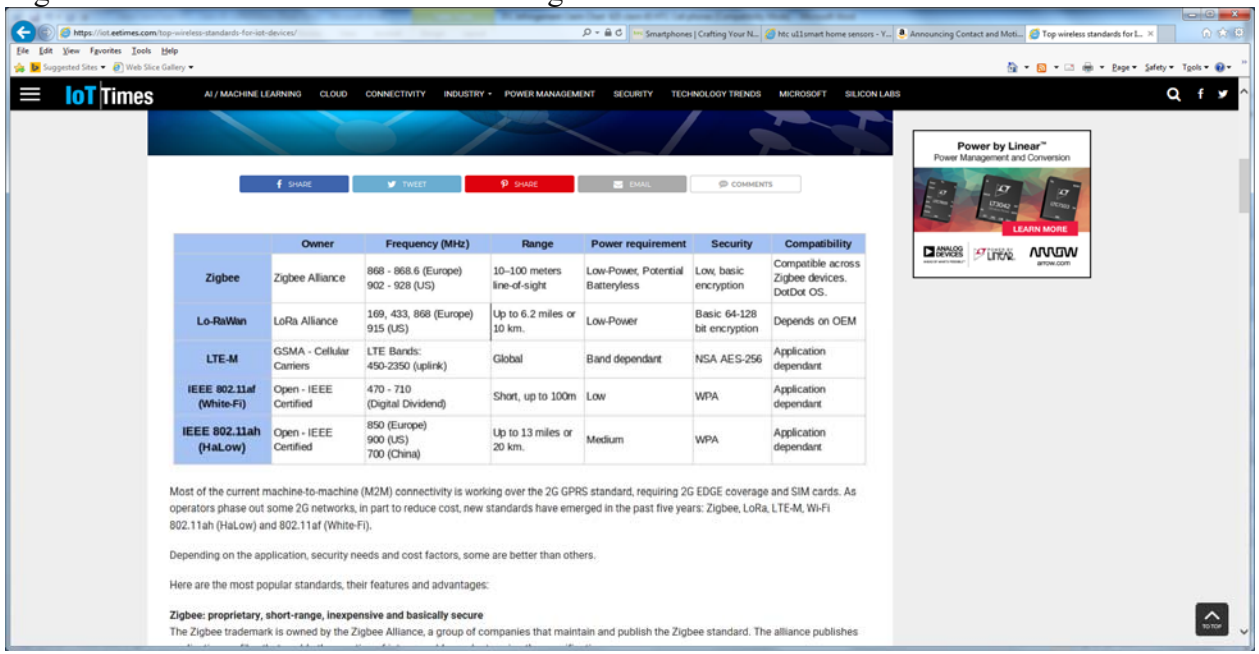
|---|---|
| | See, also https://developer.amazon.com/blogs/alexa/post/bda9d70c-2f0d-454d-9939-2eb82868cf35/announcing-contact-and-motion-sensor-apis-and-integration-into-alexa-routines-adding-new-home-automation-features-for-customers-and-new-opportunities-for-smart-home-developers.<br><br>In addition, for those users that also have an Amazon echo in their homes, Amazon Guard allows the Echo to monitor home security devices and sensors, and receive alerts on their cellular phones, such as the HTC U11, U11 Life, and U12+, when a sensor detects a change in status.<br>See, e.g., https://www.cnet.com/news/amazons-alexa-guard-can-alert-you-if-an-echo-detects-smoke-alarm-breaking-glass/. |
| [g] the second wireless signal being transmitted from a sensing device via a short range wireless communication channel, | The second wireless signal is transmitted from a sensing device via a short range wireless communication channel.<br><br>"Customers can connect contact and motion sensors to Alexa in two ways: either through a smart home skill that uses the new Contact and Motion Sensor APIs, or with a compatible Zigbee sensor paired directly to Echo Plus or a compatible smart home hub. And starting today, SmartThings customers can use the sensors connected to their SmartThings hub with Alexa by enabling the SmartThings skill. So now, with the appropriately configured smart home skill or connected Zigbee sensor, a customer can ask, "Alexa, is the master bedroom window open?" and Alexa will respond with its status."<br><br>"By updating your smart home skill to use the new Contact and Motion Sensor APIs, you can enable your customers to connect their contact and motion sensors to Alexa. These new additions to the Smart Home Skill API are available in the US today, with support for additonal locales coming soon. SmartThings is leveraging these new smart home capabilities so customers can use their SmartThings multi-purpose sensor and SmartThings motion sensor, connected to a SmartThings hub, with Alexa Routines and voice query.<br><br>Customers with an Echo Plus can already use its built-in smart home hub to seamlessly connect and control compatible Zigbee devices, such as light bulbs, door locks, in-wall switches, and plugs, without the need for a separate hub or a smart home skill. Now, Echo Plus can connect to compatible Zigbee contact and motion sensors including contact and motion sensors from Centralite, and contact and motion sensors from Sylvania, |

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**

| | |
|---|---|
| | with support from SmartThings sensors coming soon."<br><br>See https://developer.amazon.com/blogs/alexa/post/bda9d70c-2f0d-454d-9939-2eb82868cf35/announcing-contact-and-motion-sensor-apis-and-integration-into-alexa-routines-adding-new-home-automation-features-for-customers-and-new-opportunities-for-smart-home-developers.<br><br>Zigbee sensors communicate via short-range wireless communication channels.<br>  <br>IoT Times<br>AI / MACHINE LEARNING CLOUD CONNECTIVITY INDUSTRY POWER MANAGEMENT SECURITY TECHNOLOGY TRENDS MICROSOFT SILICON LABS<br>SHARE TWEET SHARE EMAIL COMMENTS<br>Power by Linear™ Power Management and Conversion LEARN MORE<br>Most of the current machine-to-machine (M2M) connectivity is working over the 2G GPRS standard, requiring 2G EDGE coverage and SIM cards. As operators phase out some 2G networks, in part to reduce cost, new standards have emerged in the past five years: Zigbee, LoRa, LTE-M, Wi-Fi 802.11ah (HaLow) and 802.11af (White-Fi).<br>Depending on the application, security needs and cost factors, some are better than others.<br>Here are the most popular standards, their features and advantages:<br>**Zigbee: proprietary, short-range, inexpensive and basically secure**<br>The Zigbee trademark is owned by the Zigbee Alliance, a group of companies that maintain and publish the Zigbee standard. The alliance publishes<br><br>See https://iot.eetimes.com/top-wireless-standards-for-iot-devices/.<br><br>See also https://www.youtube.com/watch?v=QmgzJ7dYfiI. |

| | Owner | Frequency (MHz) | Range | Power requirement | Security | Compatibility |
|---|---|---|---|---|---|---|
| Zigbee | Zigbee Alliance | 868 - 868.6 (Europe)<br>902 - 928 (US) | 10–100 meters line-of-sight | Low-Power, Potential Batteryless | Low, basic encryption | Compatible across Zigbee devices. DotDot OS. |
| Lo-RaWan | LoRa Alliance | 169, 433, 868 (Europe)<br>915 (US) | Up to 6.2 miles or 10 km. | Low-Power | Basic 64-128 bit encryption | Depends on OEM |
| LTE-M | GSMA - Cellular Carriers | LTE Bands:<br>450-2350 (uplink) | Global | Band dependant | NSA AES-256 | Application dependant |
| IEEE 802.11af (White-Fi) | Open - IEEE Certified | 470 - 710<br>(Digital Dividend) | Short, up to 100m | Low | WPA | Application dependant |
| IEEE 802.11ah (HaLow) | Open - IEEE Certified | 850 (Europe)<br>900 (US)<br>700 (China) | Up to 13 miles or 20 km. | Medium | WPA | Application dependant |

| | |
|---|---|
| [h] the second wireless signal comprising information associated with an identifier for | The second wireless signal comprises information associated with an identifier for the sensing device.<br><br>That is, when a sensing device detects a change in status, it sends a signal via the short-range wireless channel, notifying the user on their cellular phone running the Alexa application of the change in status, including a |

| | |
|---|---|
| the sensing device; and | descriptor of what sensor detected the change.<br><br>Even more specifically, when a user sets up sensors in the home, such as door/window contact sensors, motion sensors, thermostats, or other sensors, a skill must also be set up to accommodate the addition of the sensors, and the configuration of how the user is to be notified when a sensor detects a change in status.<br><br>"Sensors are slightly different than other types of endpoints in that the capabilities do not define specific directives and utterances that trigger directives, but instead send events in response to a state request from Alexa, or send Alexa change reports when their state changes."<br><br>See https://developer.amazon.com/docs/smarthome/build-smart-home-skills-for-sensors.html.<br><br>Thus, when setting up the skills, the sensors have to include an identifier known as an "endpointID" such as "sensor 001" and a descriptor to allow the user to know what sensor was triggered, such as "bedroom sensor" . |

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**

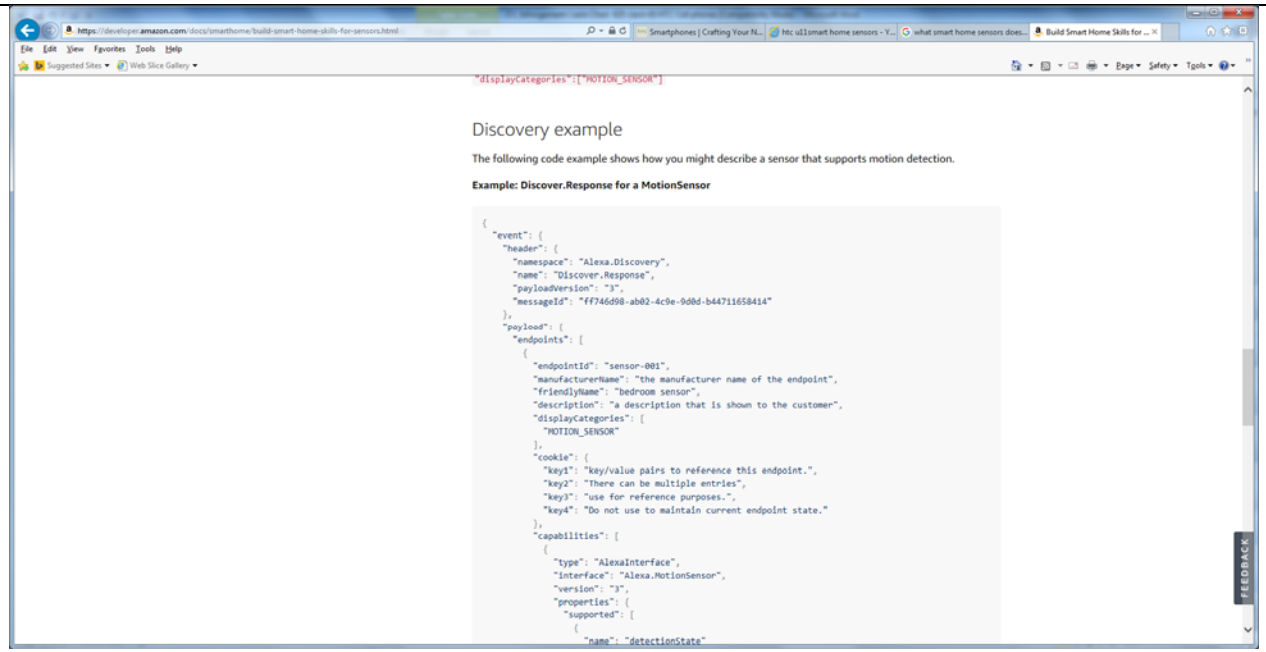
| | |
|---|---|
| |  <br>See https://developer.amazon.com/docs/smarthome/build-smart-home-skills-for-sensors.html. |
| [i] wherein the WiFi network is separate from the short range wireless communication channel. | For the HTC U11 and U12+ cellular phones, the Wi-Fi network to which the cellular phones are connected are separate from the short range wireless communication channel used for communication by the sensors/controllers within a user's home, such as Zigbee communications channel.<br><br>More specifically, see subsection [a] regarding Wi-Fi connectivity and subsection [g] regarding the short range communication channel, such as the Zigbee standard. |
| | |

**Exhibit 22 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life, and U12+ Cellular Phones Running the Alexa Application**

# EXHIBIT 23

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**

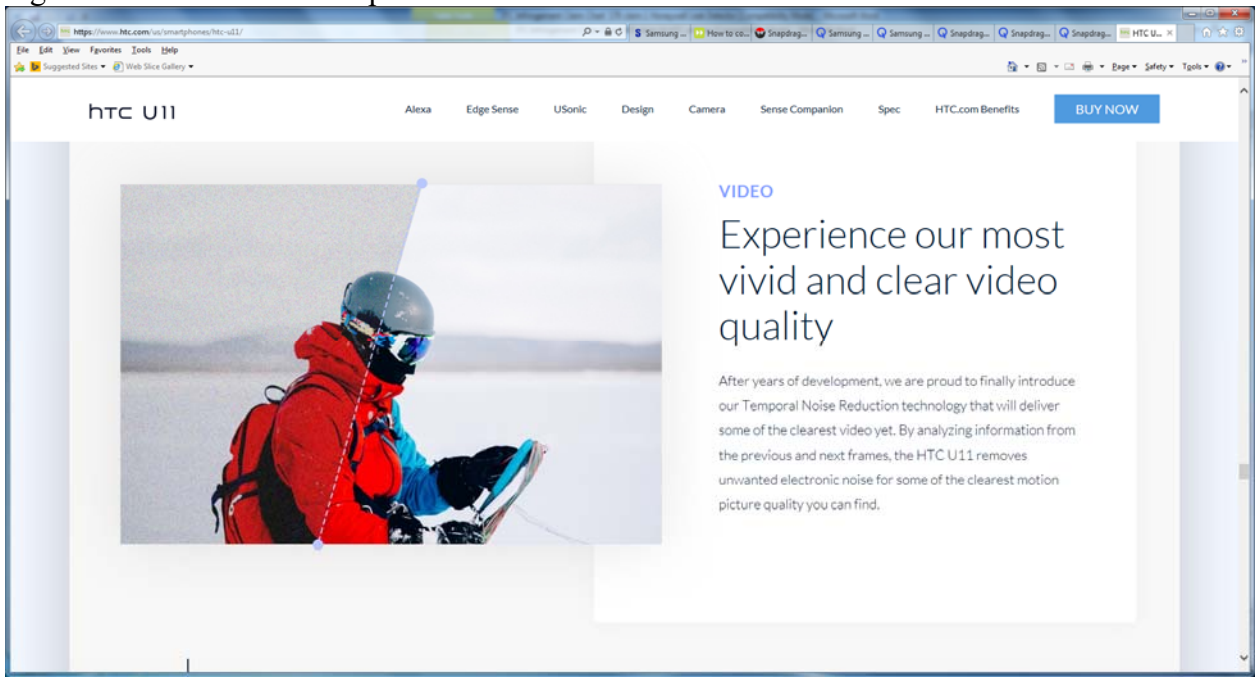
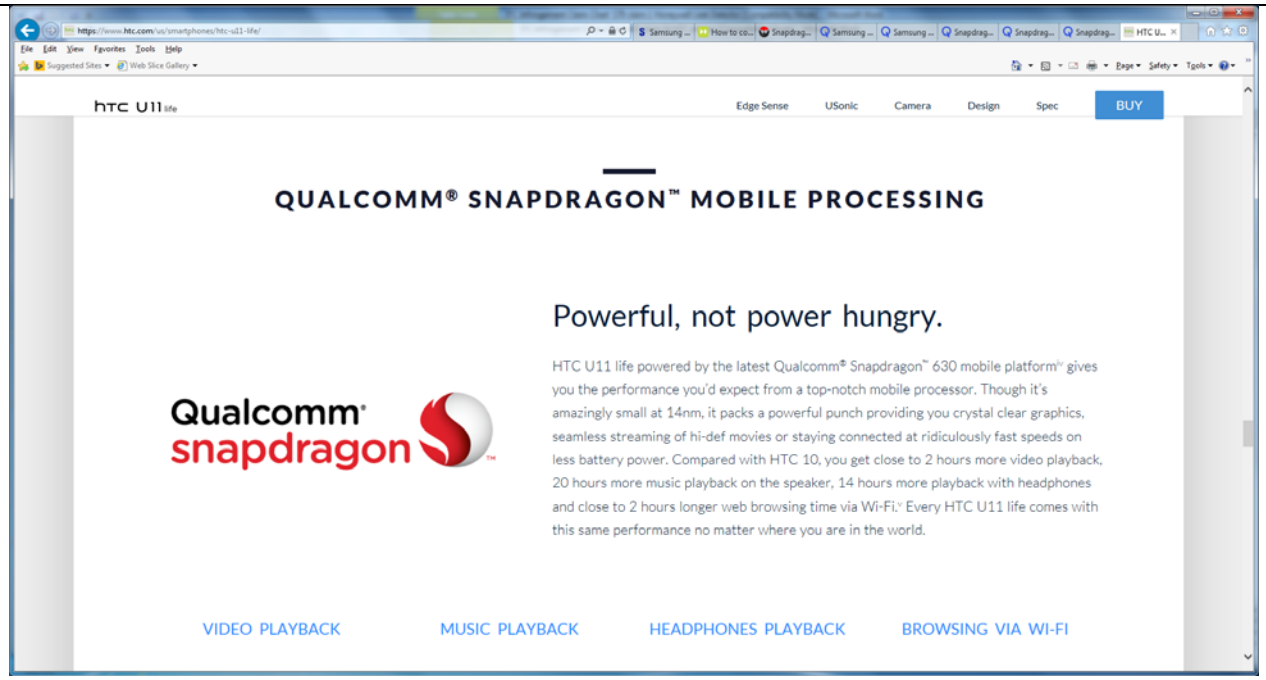
| The '425 Patent – Claims | HTC U11, U11 Life and U12+ Cellular Phones |
|---|---|
| 14. A mobile terminal comprising: | The HTC U11, U11 Life, and U12+ cellular phones are mobile terminals.<br><br>More specifically, the HTC U11, U11 Life, and U12+ cellular phones are all configured to receive and play high definition video on the phones.<br>  <br>https://www.htc.com/us/smartphones/htc-u11/ |

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**




https://www.htc.com/us/smartphones/htc-u11-life/

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**

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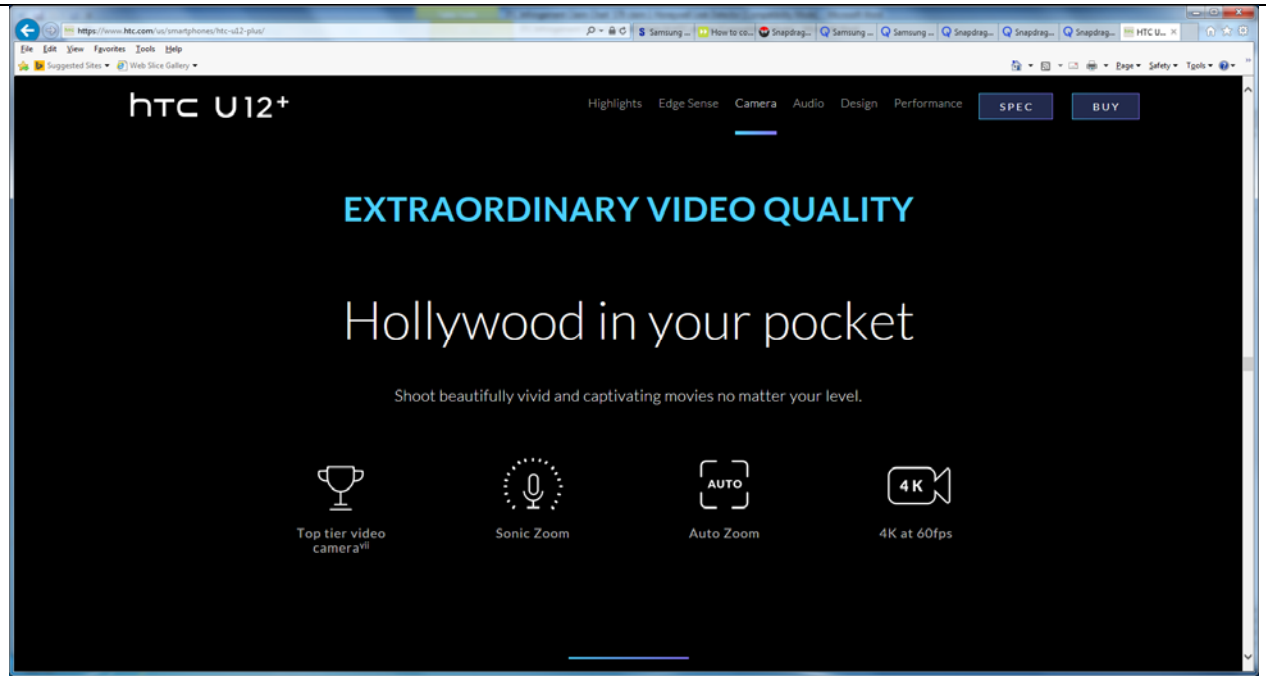
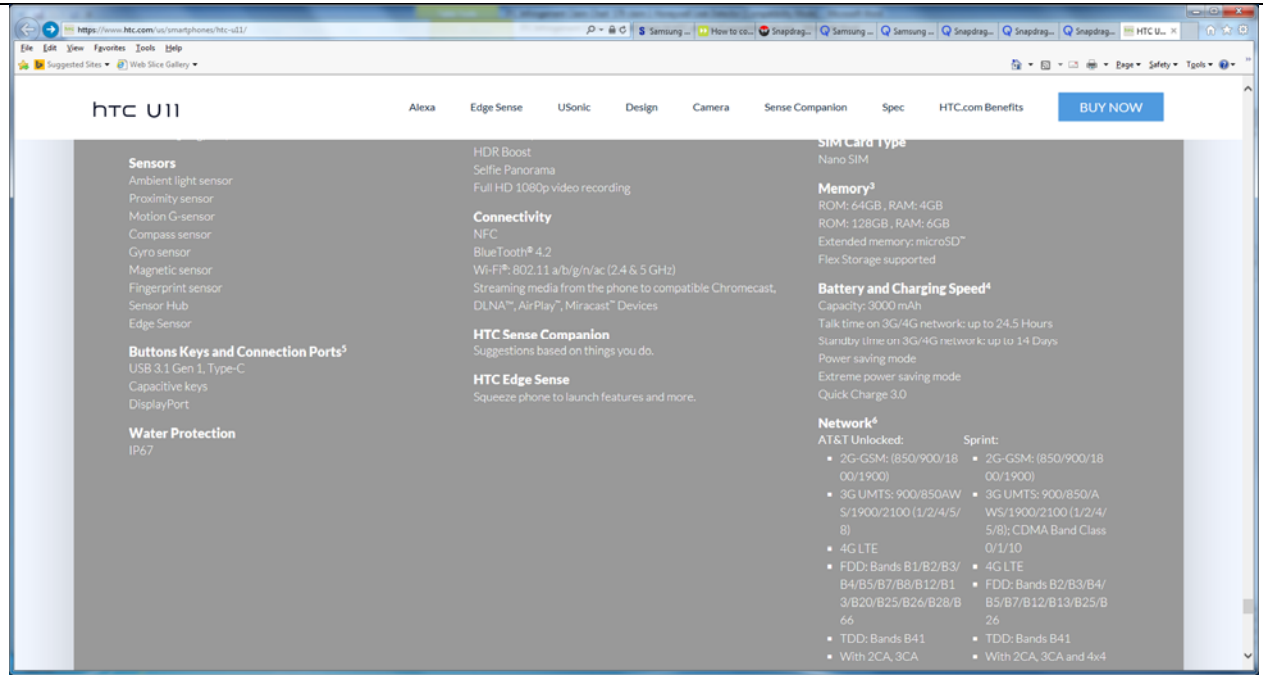
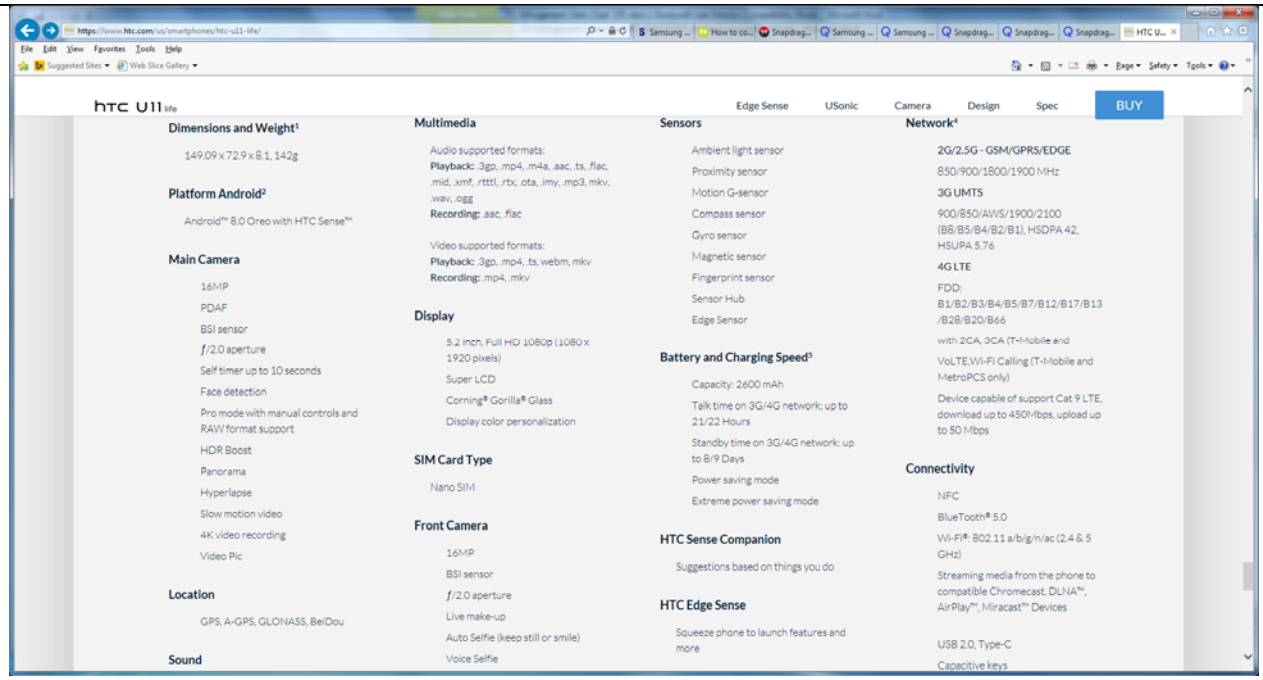
|---|---|
| |  <br>https://www.htc.com/us/smartphones/htc-u12-plus/ |
| [a] a wireless interface configured to communicate via a wireless network; | The HTC U11, U11 Life, and U12+ cellular phones<br><br>More specifically, the HTC U11, U11 Life, and U12+ cellular phones each have a wireless interface configured to communicate via a wireless network, including cellular and WiFi. |

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**




See, e.g., https://www.htc.com/us/smartphones/htc-u11/

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**




See, e.g., https://www.htc.com/us/smartphones/htc-u11-life/

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**

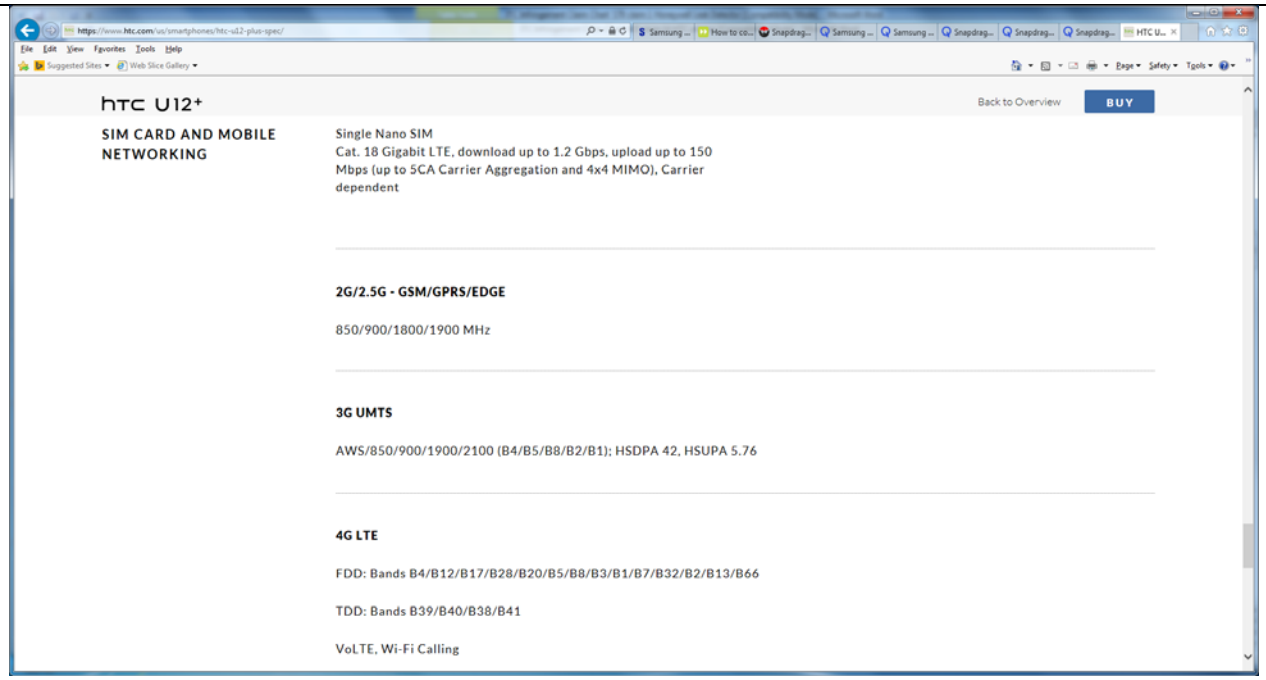
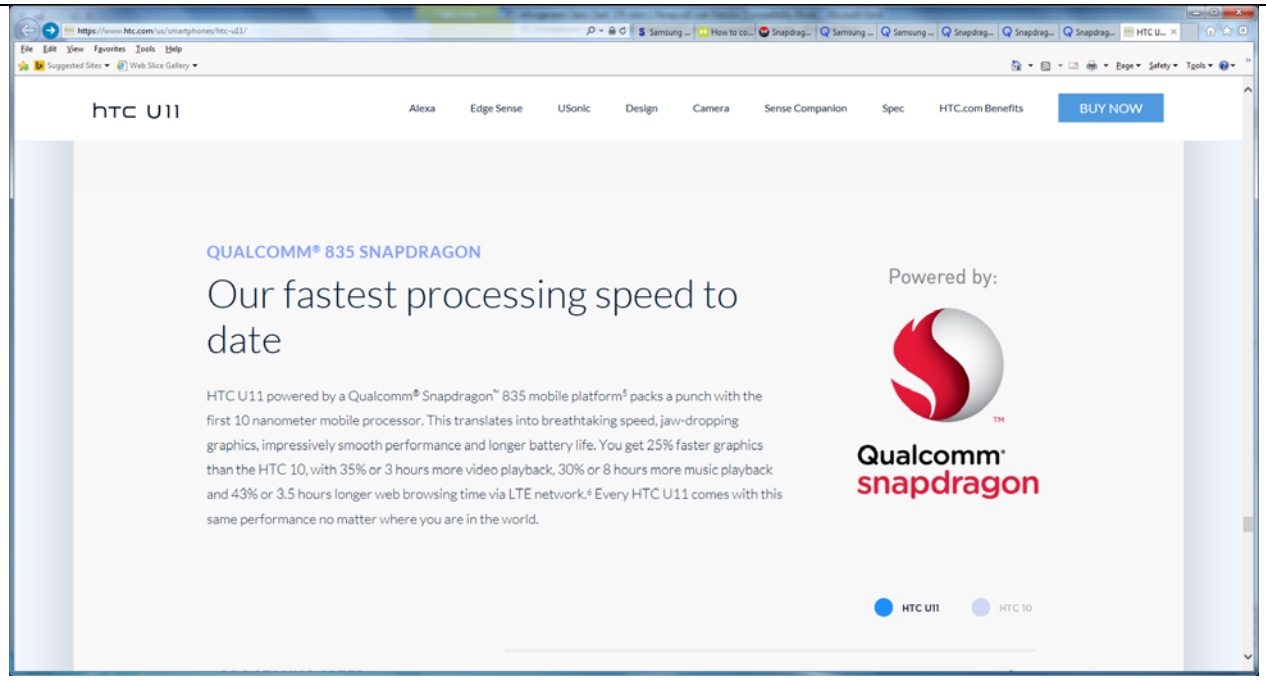
| | |
|---|---|
| |  <br>See, e.g., https://www.htc.com/us/smartphones/htc-u12-plus-spec/ |
| [b] a high definition digital interface; | The HTC U11, U11 Life, and U12+ cellular phones have a high definition digital interface.<br><br>"Use a USB-C to HDMI adapter<br>Unlike the vast majority of phones on the market, the HTC U11 supports USB-C to HDMI adapters. These are the best way to connect your phone to a monitor, projector or TV without sacrificing visual quality or adding latency, and it works even in situations where you don't have (reliable) Wi-Fi, like in hotel rooms, schools and RVs."<br>https://www.mobilefun.co.uk/blog/2017/07/how-to-connect-htc-u11-to-tv/ |

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**

| | |
|---|---|
| | "The most common alternative to connecting your HTC U11 to your TV is using an HDMI cable. Make sure you have access to an HDMI port on your HTC U11 before buying or using such a connection. The most common formats on smartphones are the mini-HDMI or micro-HDMI."<br><br>https://phones.brain-start.tech/tv/how-to-connect-your-htc-u11-to-your-tv/<br>See also https://www.jagek.com/en/htc-accessories/htc-u11-life/usb-c-to-hdmi-cable-for-htc-u11-life-21699.html; https://www.jagek.com/en/htc-accessories/htc-u12-life/usb-c-to-hdmi-cable-for-htc-u12-life-29302.html. |
| [c] a high definition digital multimedia conversion circuit coupled to the wireless interface and configured to process a compressed high definition digital multimedia signal corresponding to high definition digital multimedia content; | The HTC U11, U11 Life, and U12+ cellular phones have a high definition digital multimedia conversion circuit coupled to the wireless interface and configured to process a compressed high definition digital multimedia signal corresponding to high definition digital multimedia content.<br><br>More specifically, the HTC U11, U11 Life, and U12+ cellular phones each have a processor, that includes a high definition digital multimedia conversion circuit coupled to the wireless interface and configured to process a compressed high definition digital multimedia signal corresponding to high definition digital multimedia content.<br><br>Even more specifically, the HTC U11 includes a Qualcomm Snapdragon 835 processor: |

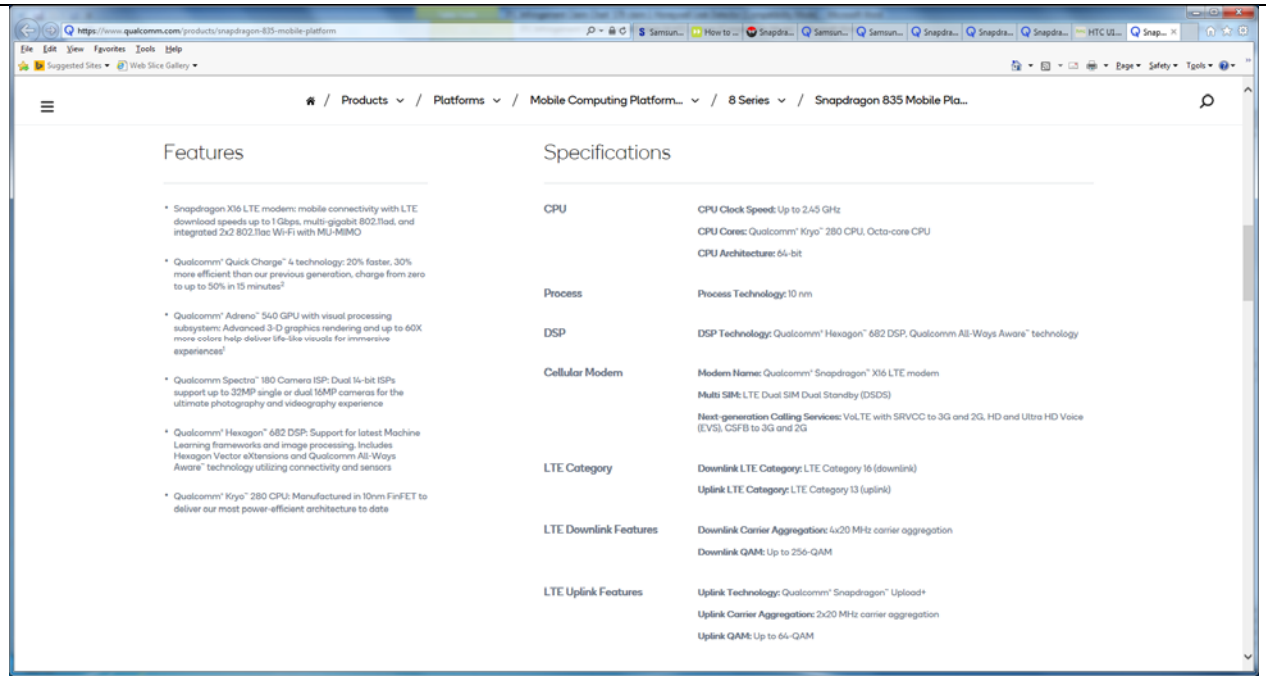
**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**




https://www.htc.com/us/smartphones/htc-u11/.

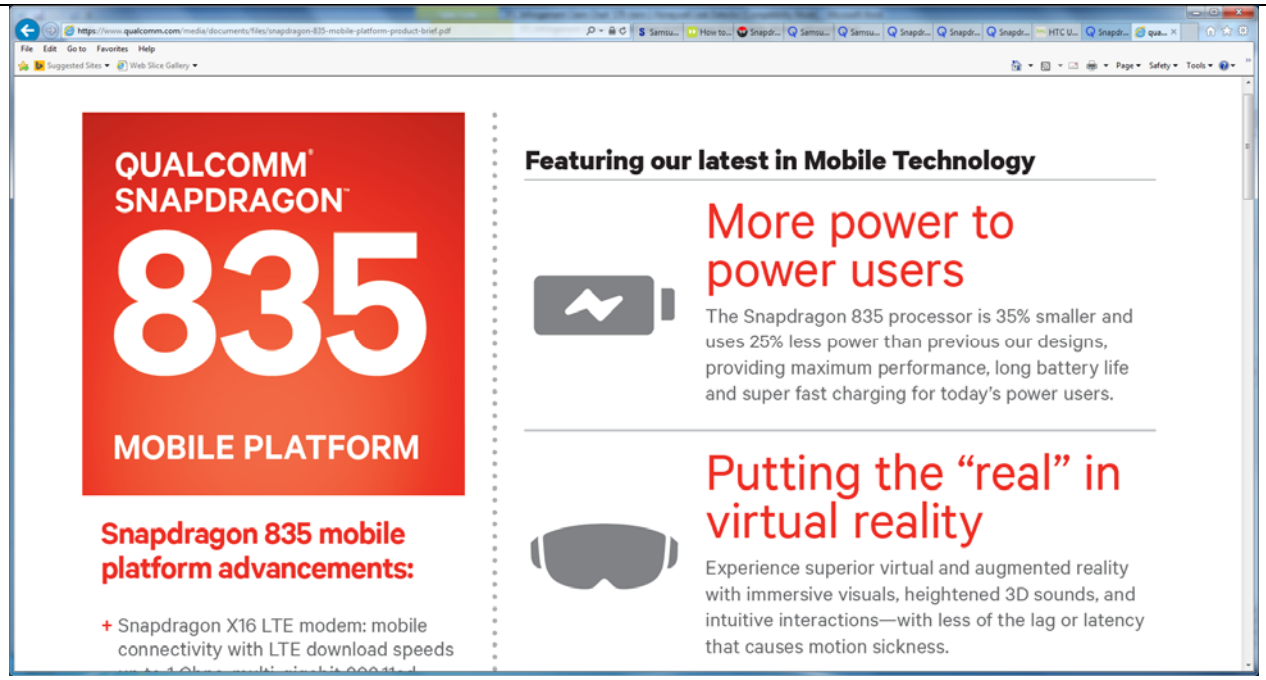
The Qualcomm Snapdragon 835 processor includes:
"Qualcomm® Hexagon™ 682 DSP, Qualcomm All-Ways Aware™ technology"

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**




https://www.qualcomm.com/products/snapdragon-835-mobile-platform;

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**

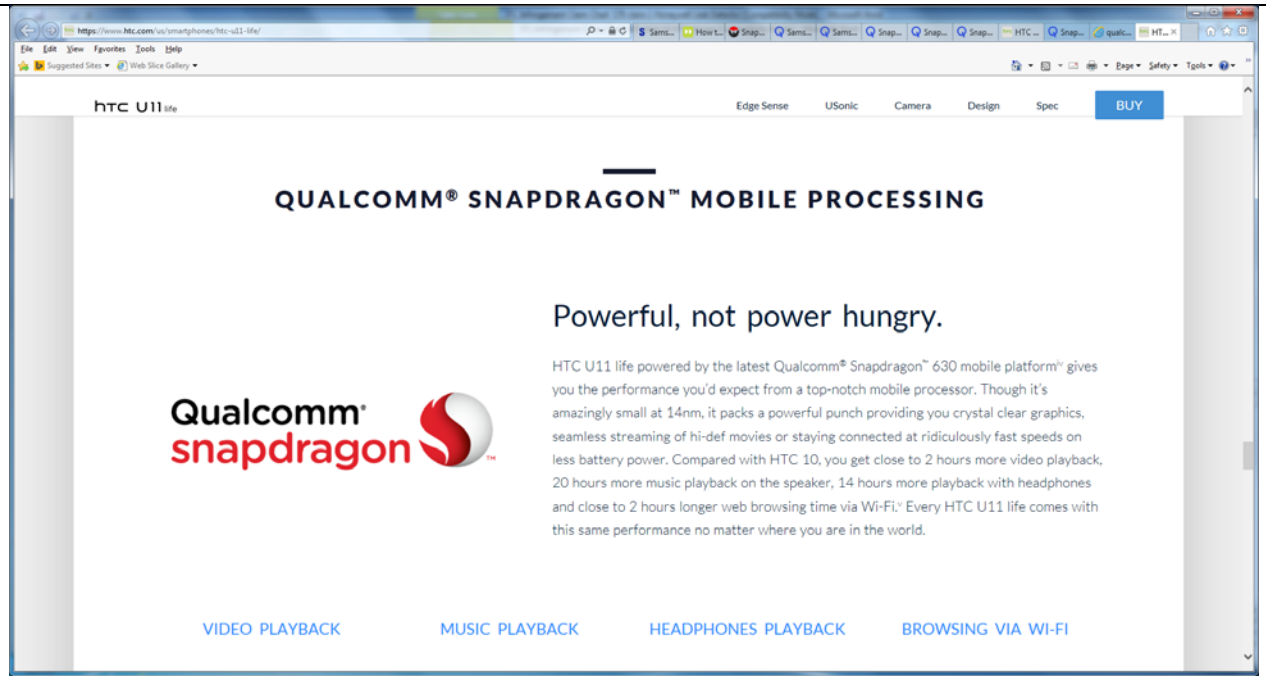



See, e.g., https://www.qualcomm.com/media/documents/files/snapdragon-835-mobile-platform-product-brief.pdf;

"Snapdragon 835 includes new video capture and playback capabilities too. The 835's VPU and DPU can now decode and display 4K Ultra HD premium (HDR10) video….Snapdragon 835 can also decode H.264 (AVC) and H.265 (HEVC) video at up to 2160p60, 1440p120, or 1080p240."
See https://www.anandtech.com/show/10948/qualcomm-snapdragon-835-kryo-280-adreno-540/3.

The HTC U11 Life has a Qualcomm Snapdragon 630 processor:

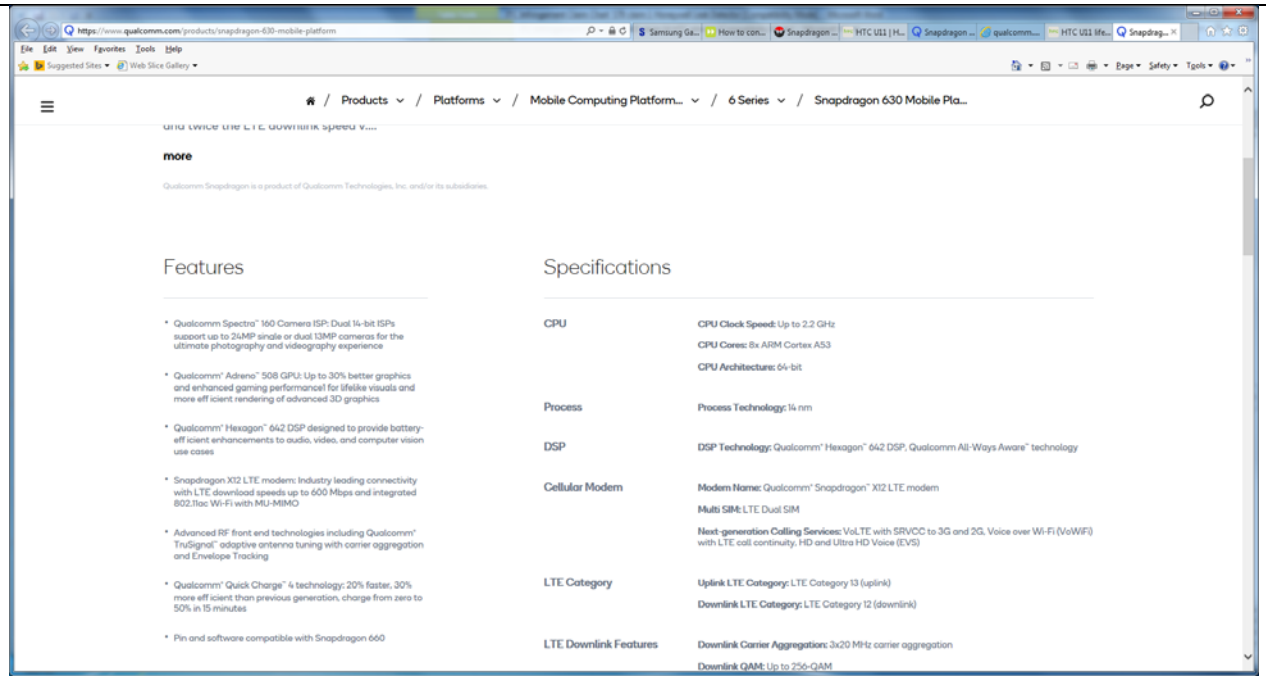
**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**




https://www.htc.com/us/smartphones/htc-u11-life/.

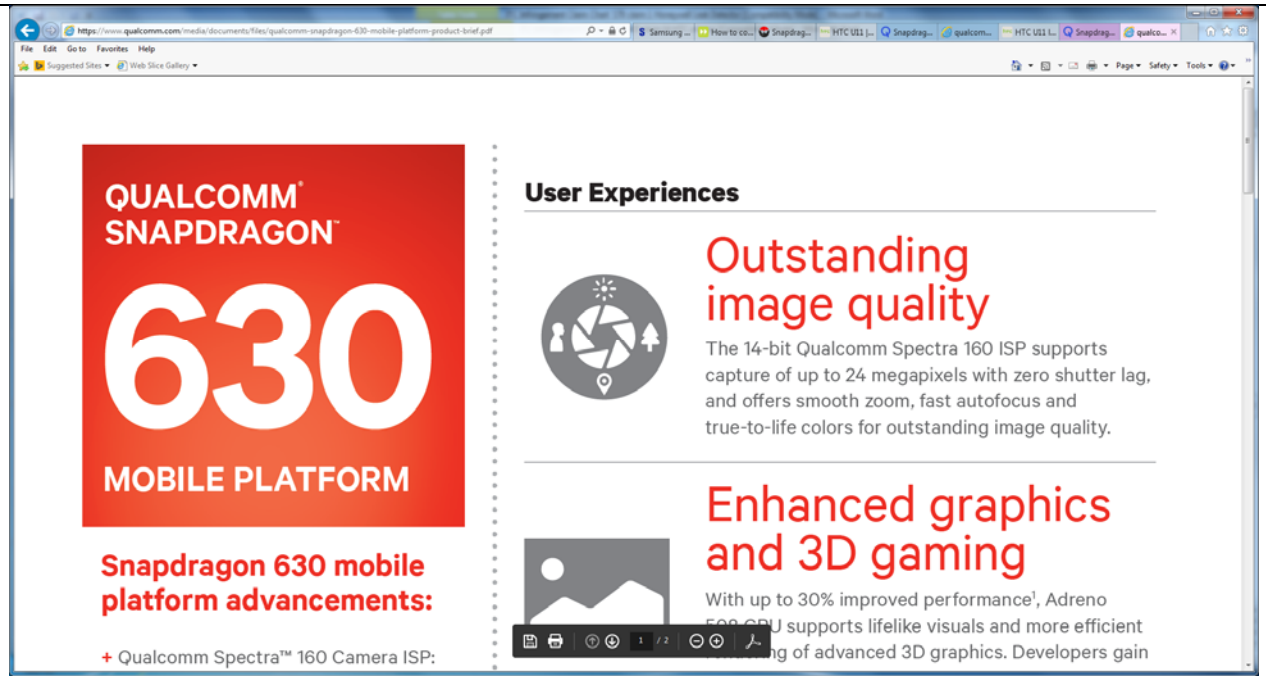
The Qualcomm Snapdragon 630 processor includes:

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**




"Qualcomm® Hexagon™ 642 DSP, Qualcomm All-Ways Aware™ technology" Id.; https://www.qualcomm.com/products/snapdragon-630-mobile-platform;

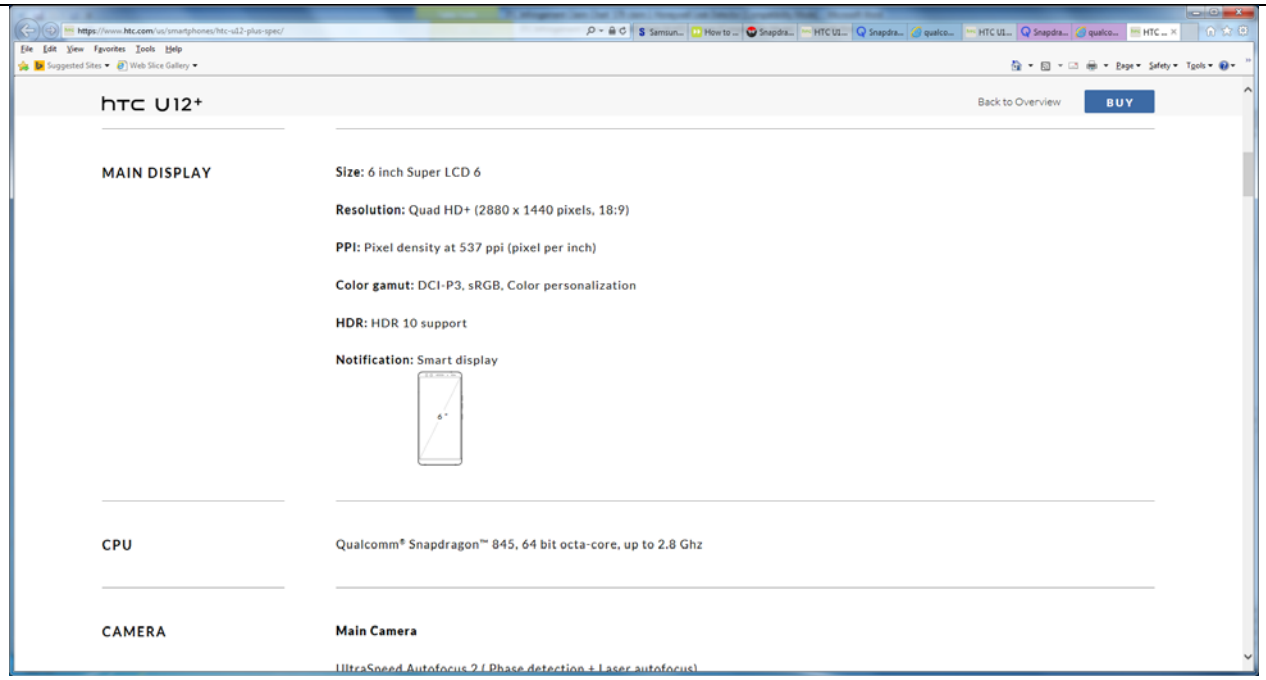
**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**




https://www.qualcomm.com/media/documents/files/qualcomm-snapdragon-630-mobile-platform-product-brief.pdf;

And the HTC U12+ has a Qualcomm Snapdragon 845 processor:

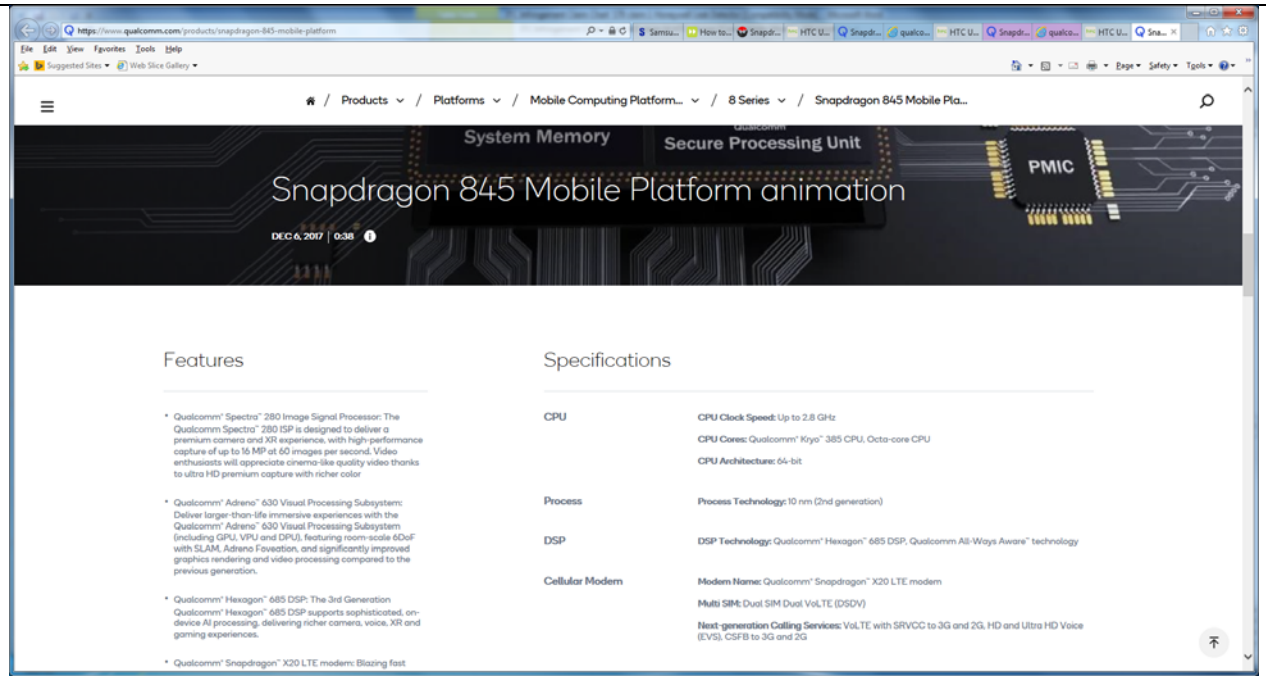
**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**




https://www.htc.com/us/smartphones/htc-u12-plus-spec/.

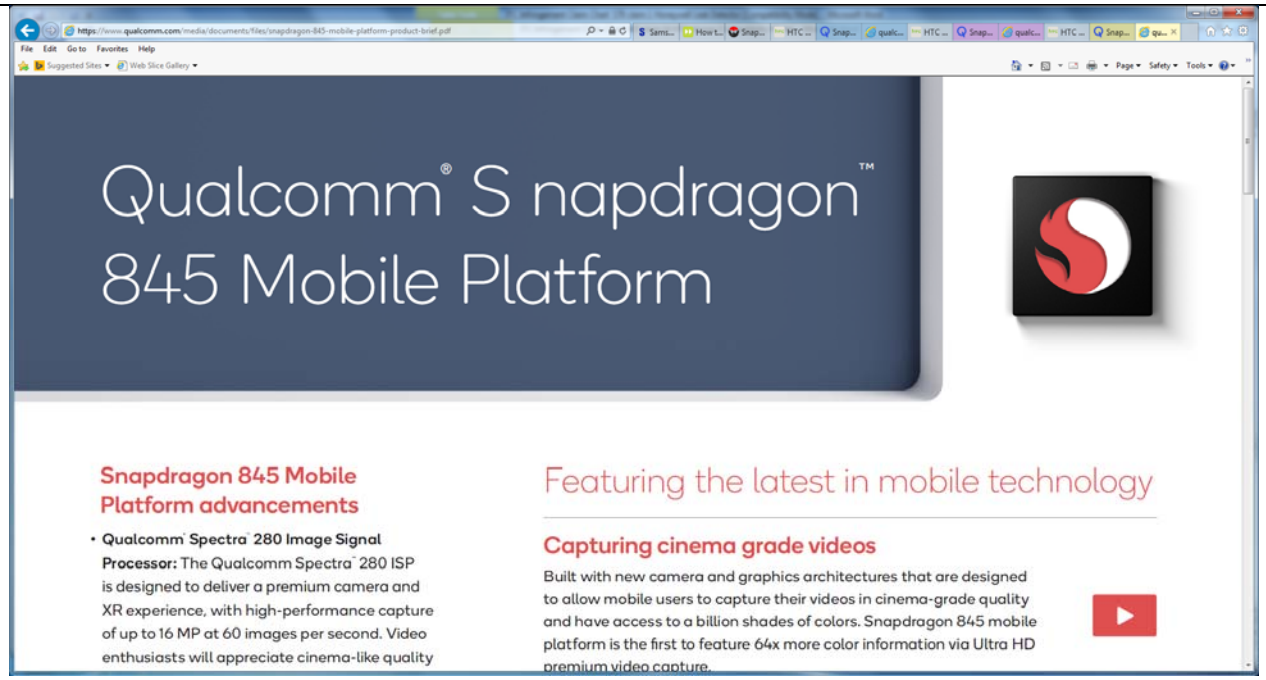
The Qualcomm Snapdragon 845 processor includes:

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**




"Qualcomm® Hexagon™ 685 DSP, Qualcomm All-Ways Aware™ technology" https://www.qualcomm.com/products/snapdragon-845-mobile-platform;

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**




https://www.qualcomm.com/media/documents/files/snapdragon-845-mobile-platform-product-brief.pdf.

"Qualcomm Technologies developed the Hexagon Digital Signal Processor (DSP) as a world class processor with both CPU and DSP functionality to support deeply embedded processing needs of the mobile platform for both multimedia and modem functions. It is an advanced, variable instruction length, Very Long Instruction Word (VLIW) processor architecture with hardware multi -threading. The Hexagon architecture and family of cores provides Qualcomm Technologies a competitive advantage in performance and power efficiency for modem and multi-media applications and is a key component of all of Qualcomm's Snapdragon™ processors."

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**

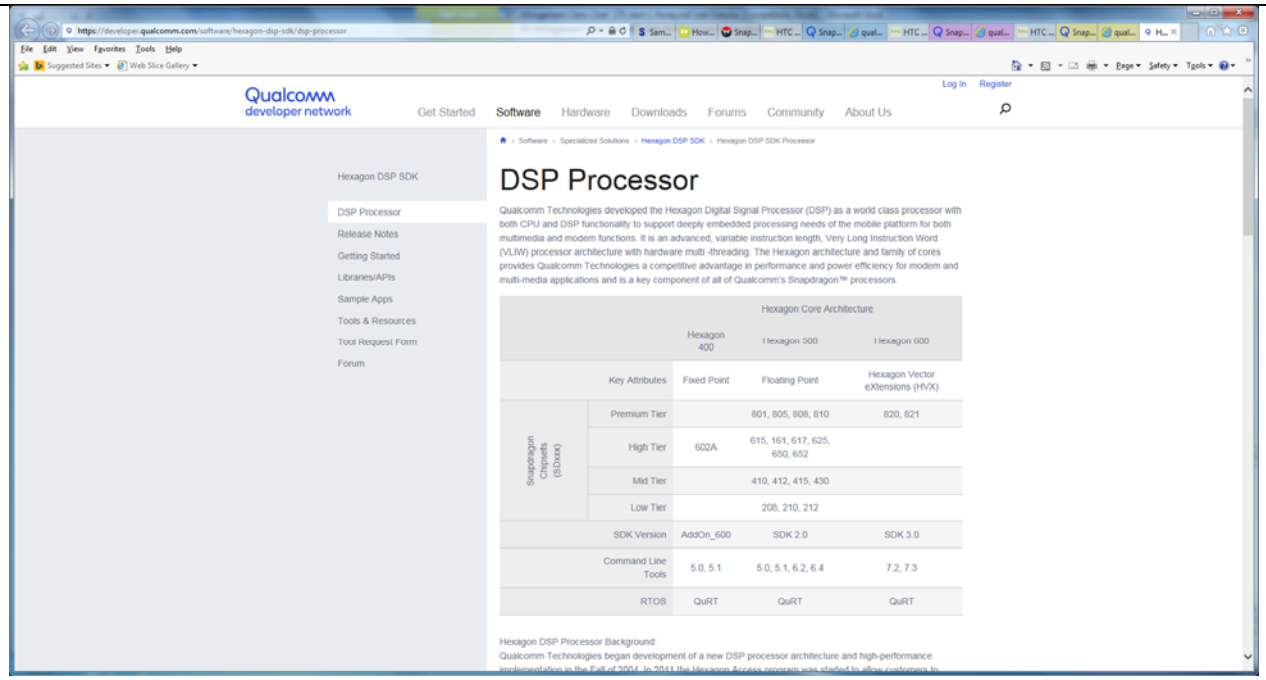
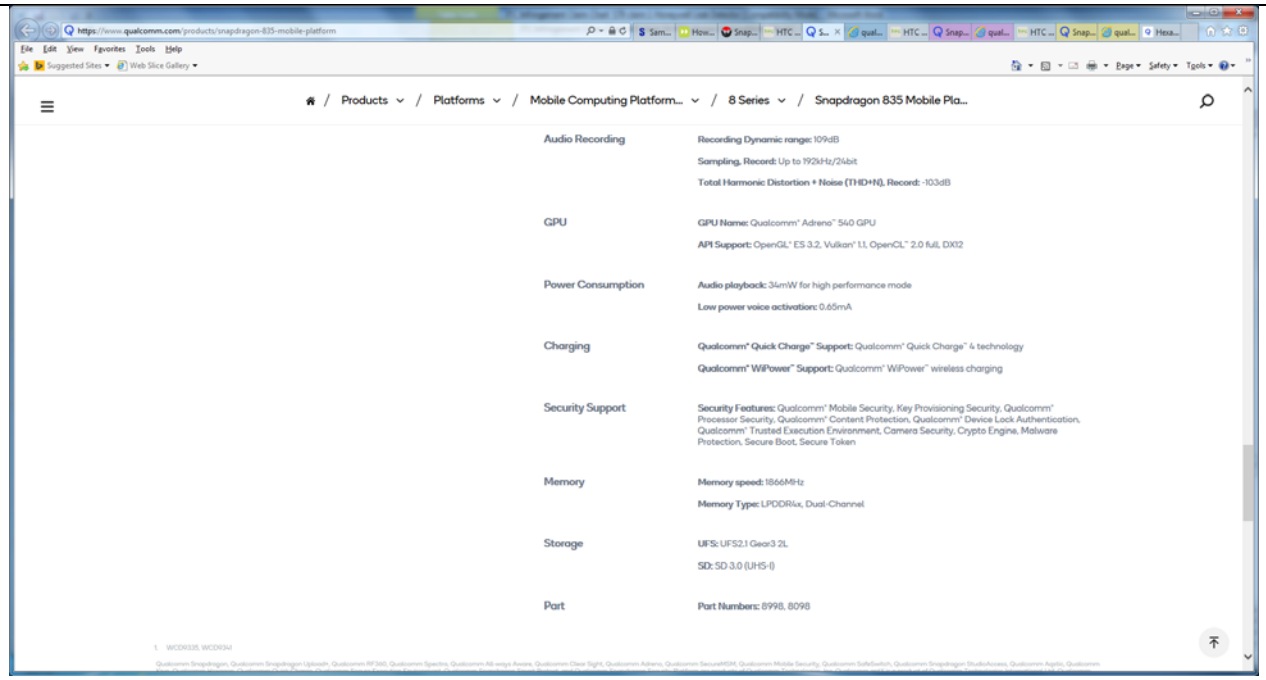
| | |
|---|---|
| |  <br>See https://developer.qualcomm.com/software/hexagon-dsp-sdk/dsp-processor. |
| [d] a buffer coupled to the high definition digital multimedia conversion circuit; | The HTC U11, U11 Life, and U12+ cellular phones include a buffer coupled to the high definition digital multimedia conversion circuit.<br><br>More specifically, the Qualcomm Snapdragon 835 used in the HTC U11 cellular phones includes: |

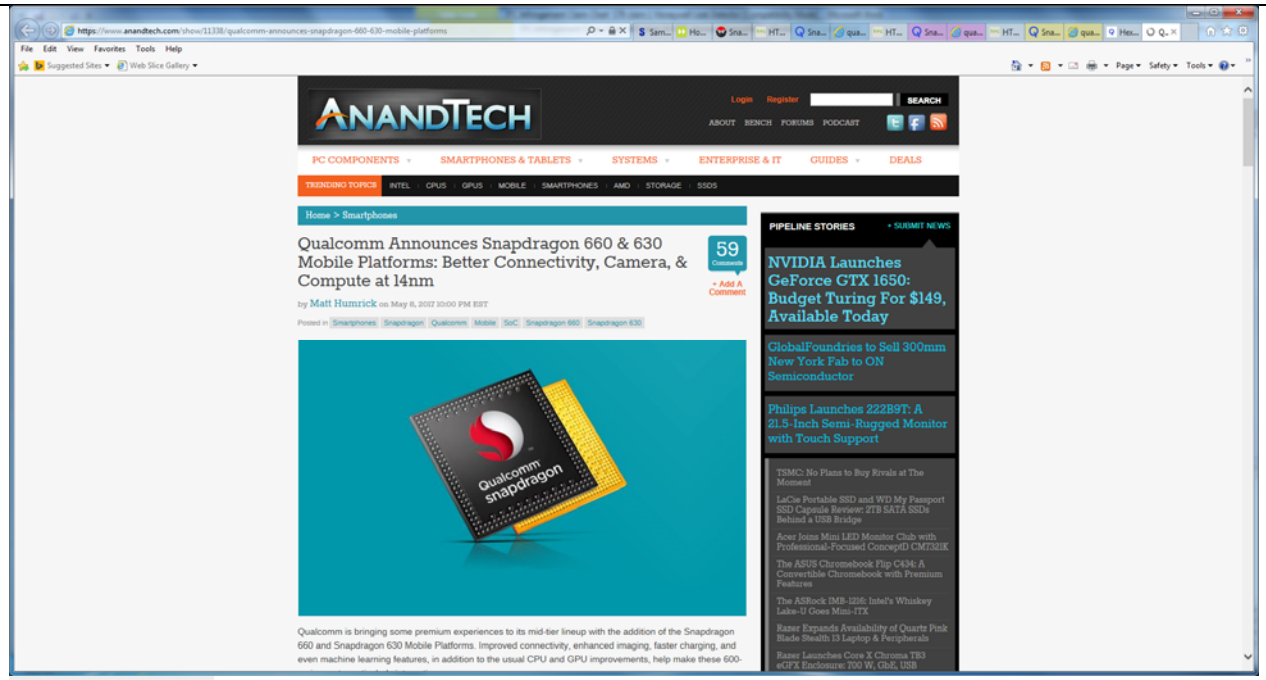
**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**




**"UFS:** UFS2.1 Gear3 2L
**SD:** SD 3.0 (UHS-I)"
See https://www.qualcomm.com/products/snapdragon-835-mobile-platform;
See also https://www.anandtech.com/show/10948/qualcomm-snapdragon-835-kryo-280-adreno-540/2;
https://developer.qualcomm.com/download/hexagon/hexagon-dsp-architecture.pdf ;
https://www.androidauthority.com/lpddr4-everything-need-know-599759/.

The Qualcomm Snapdragon 630 used in the HTC U11 Life includes:

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**




"eMMC / UFS"
https://www.anandtech.com/show/11338/qualcomm-announces-snapdragon-660-630-mobile-platforms

The Qualcomm Snapdragon 845 used in the HTC U12+ includes a buffer:

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**

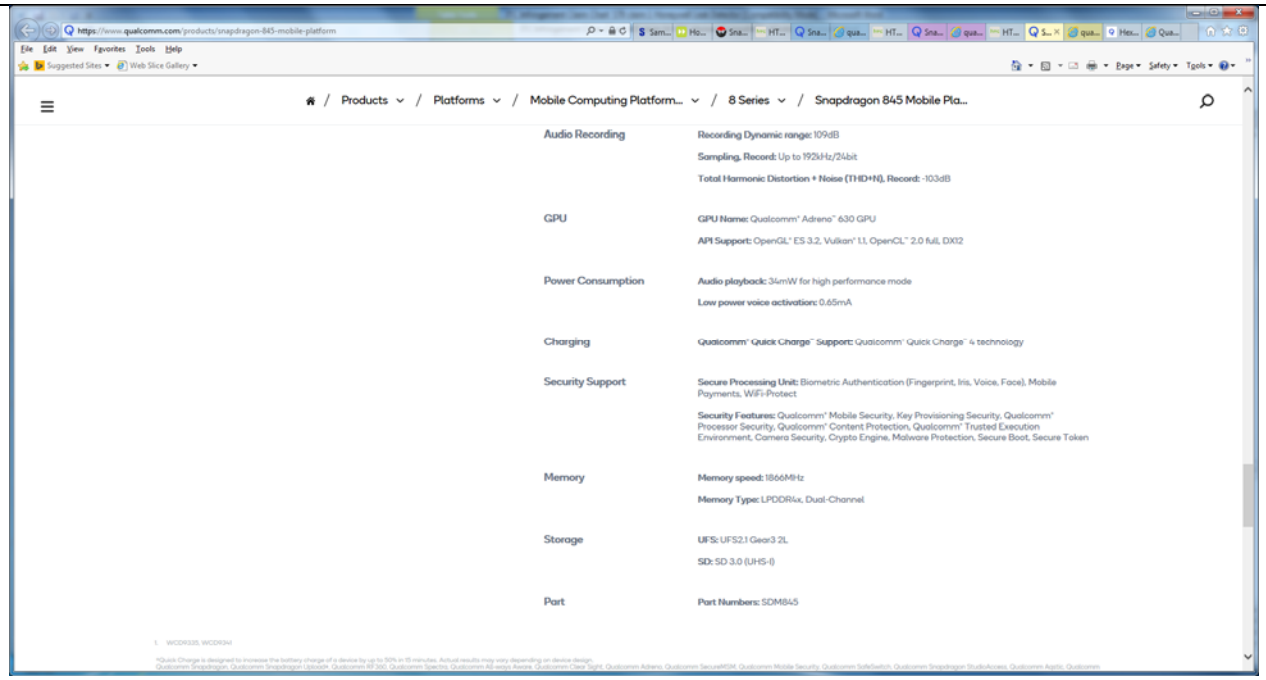
| | |
|---|---|
| |  <br>**"UFS:** UFS2.1 Gear3 2L<br>**SD:** SD 3.0 (UHS-I)"<br>See https://www.qualcomm.com/products/snapdragon-845-mobile-platform.<br><br>See also https://www.xda-developers.com/qualcomm-snapdragon-845-hexagon-685-dsp/.<br>See also https://www.xda-developers.com/qualcomm-2018-snapdragon-tech-summit-roundup/.<br>See also https://www.intrinsyc.com/snapdragon-embedded-development-kits/open-q-845-development-kit/. |
| [e] a processor; and | The HTC U11, U11 Life, and U12+ cellular phones include processors.<br><br>More specifically, as discussed previously in subsection [c], the HTC U11, U11 Life, and U12+ each have Qualcomm Snapdragon processors. |

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**

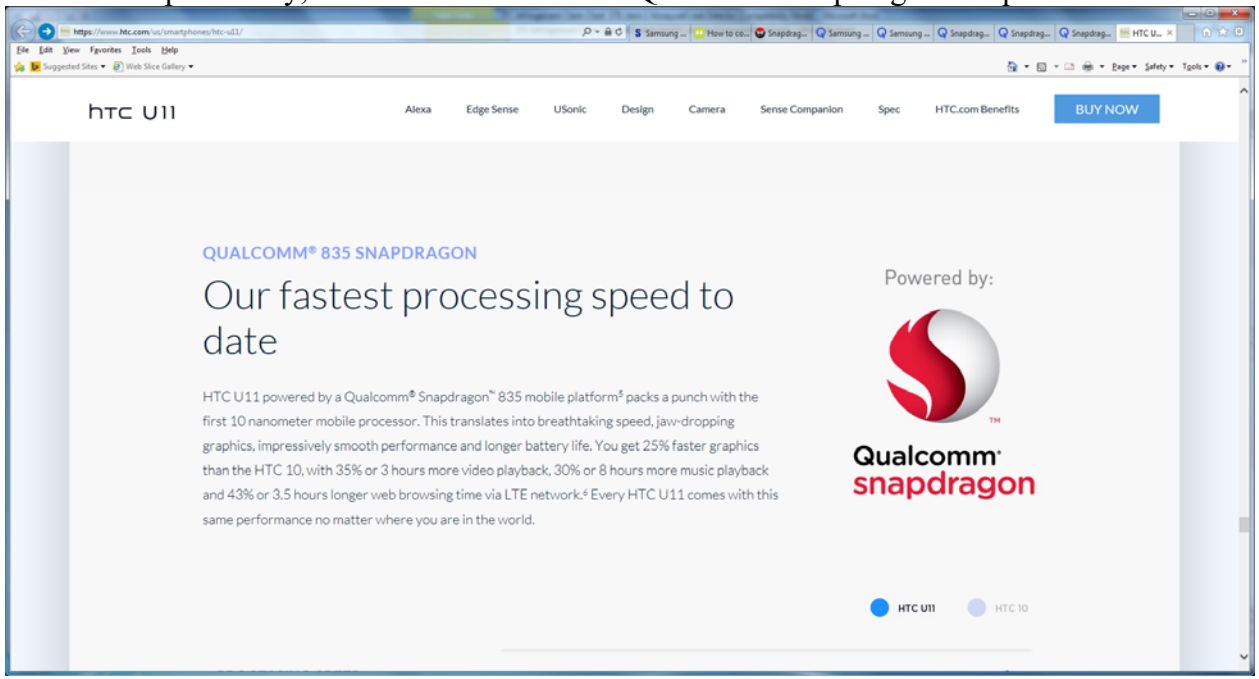
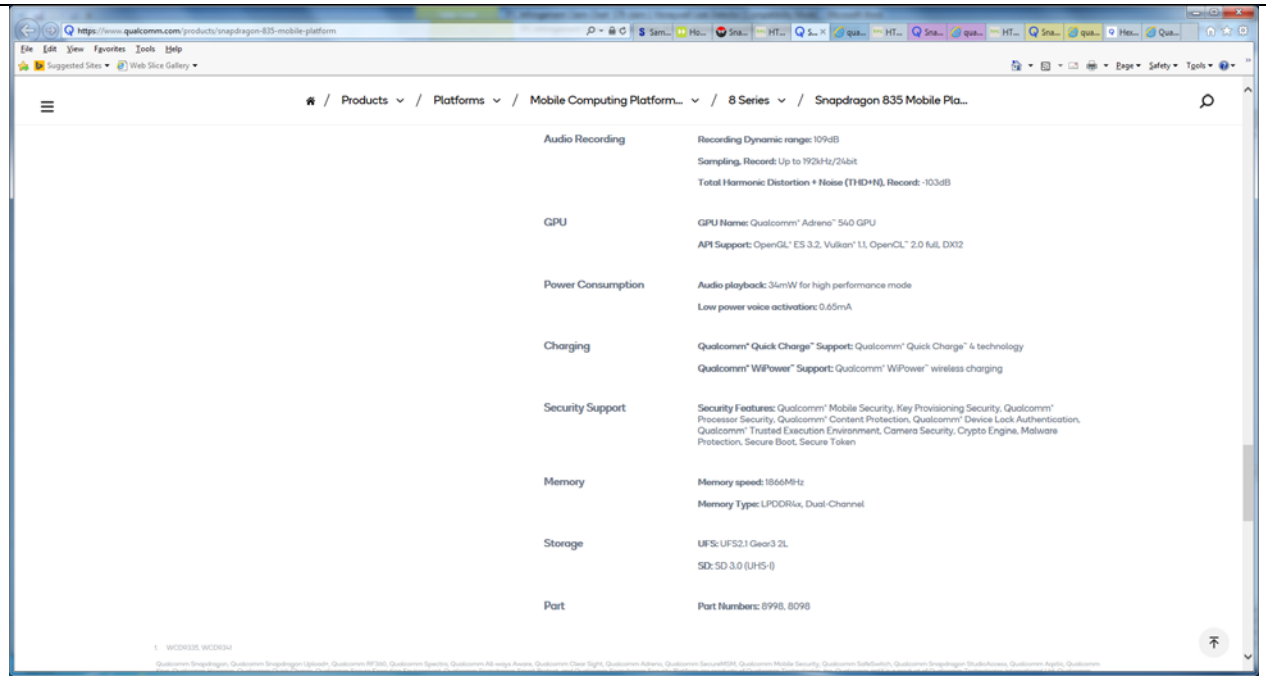
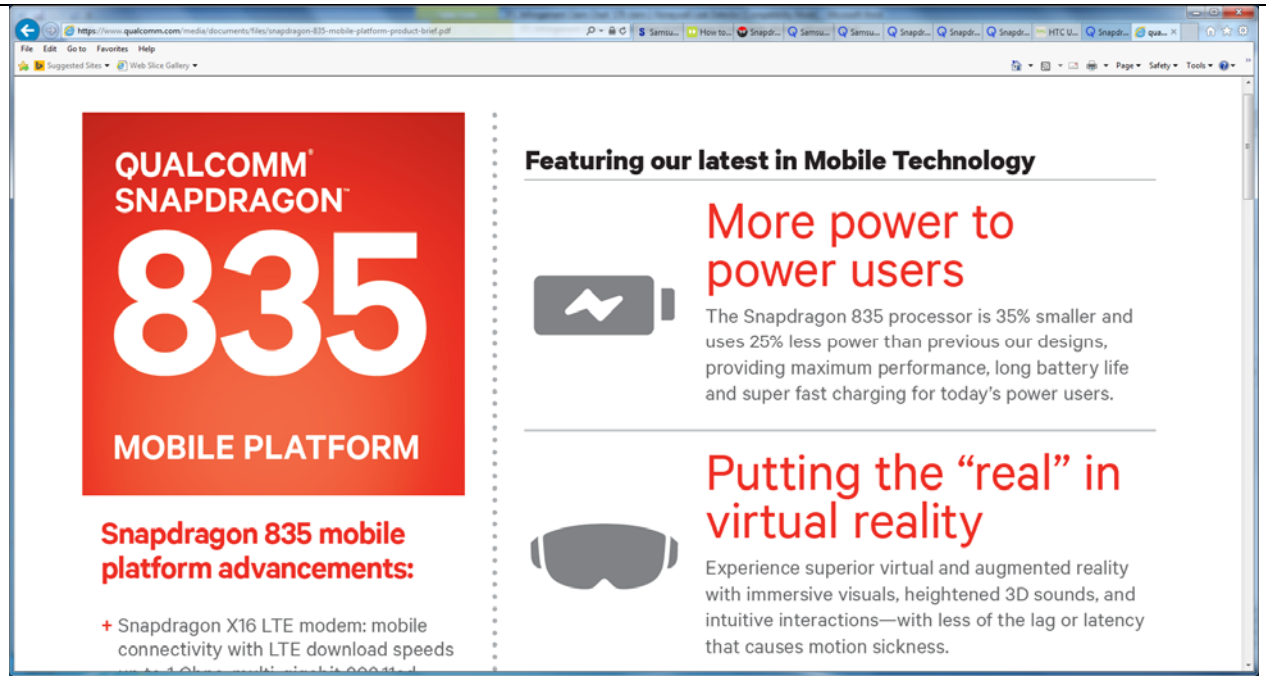
| | |
|---|---|
| | Even more specifically, the HTC U11 includes a Qualcomm Snapdragon 835 processor:<br>  <br><br>https://www.htc.com/us/smartphones/htc-u11/.<br><br>The Qualcomm Snapdragon 835 processor includes: |

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**




"Qualcomm® Hexagon™ 682 DSP, Qualcomm All-Ways Aware™ technology"
Id.;

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**

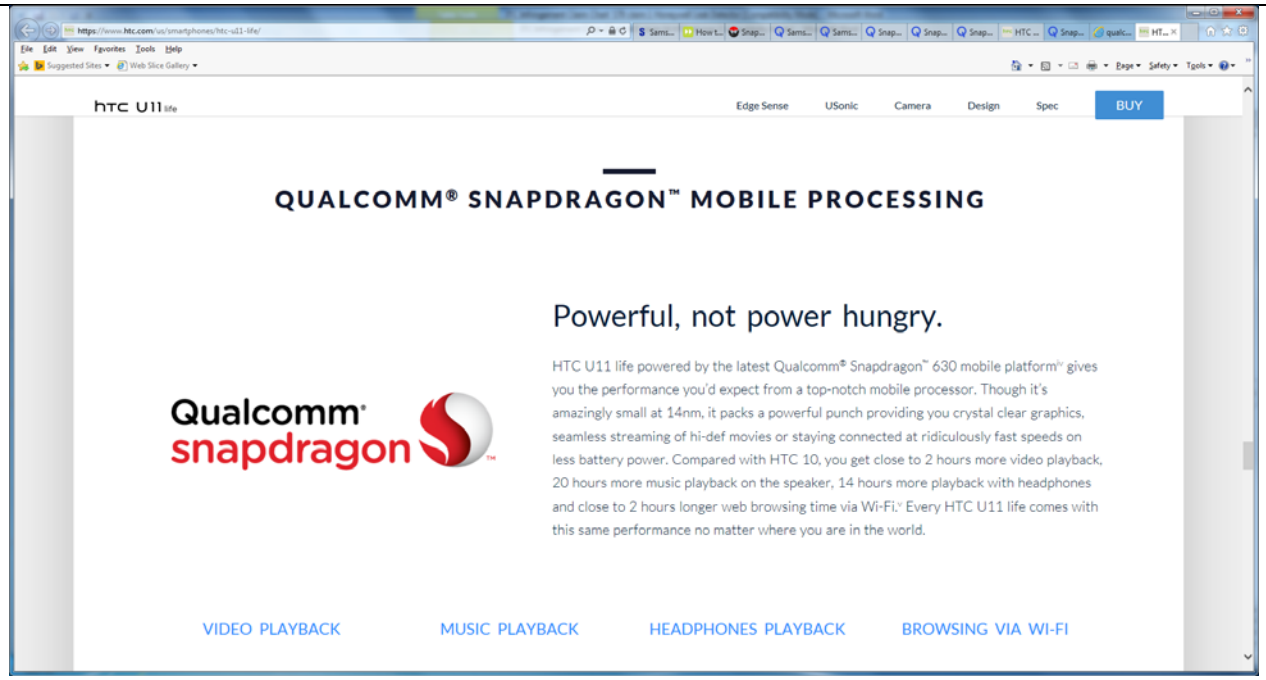



https://www.qualcomm.com/products/snapdragon-835-mobile-platform;
https://www.qualcomm.com/media/documents/files/snapdragon-835-mobile-platform-product-brief.pdf;

"Snapdragon 835 includes new video capture and playback capabilities too. The 835's VPU and DPU can now decode and display 4K Ultra HD premium (HDR10) video….Snapdragon 835 can also decode H.264 (AVC) and H.265 (HEVC) video at up to 2160p60, 1440p120, or 1080p240."
See https://www.anandtech.com/show/10948/qualcomm-snapdragon-835-kryo-280-adreno-540/3.

The HTC U11 Life has a Qualcomm Snapdragon 630 processor:

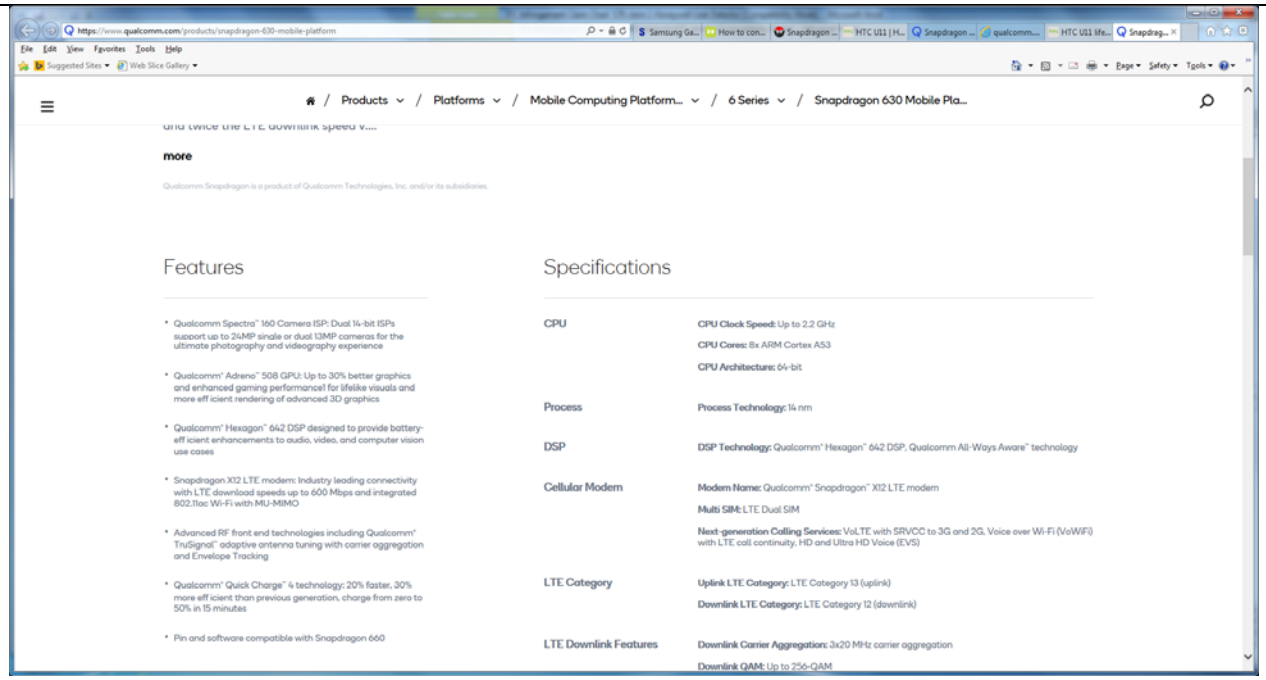
**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**




https://www.htc.com/us/smartphones/htc-u11-life/.

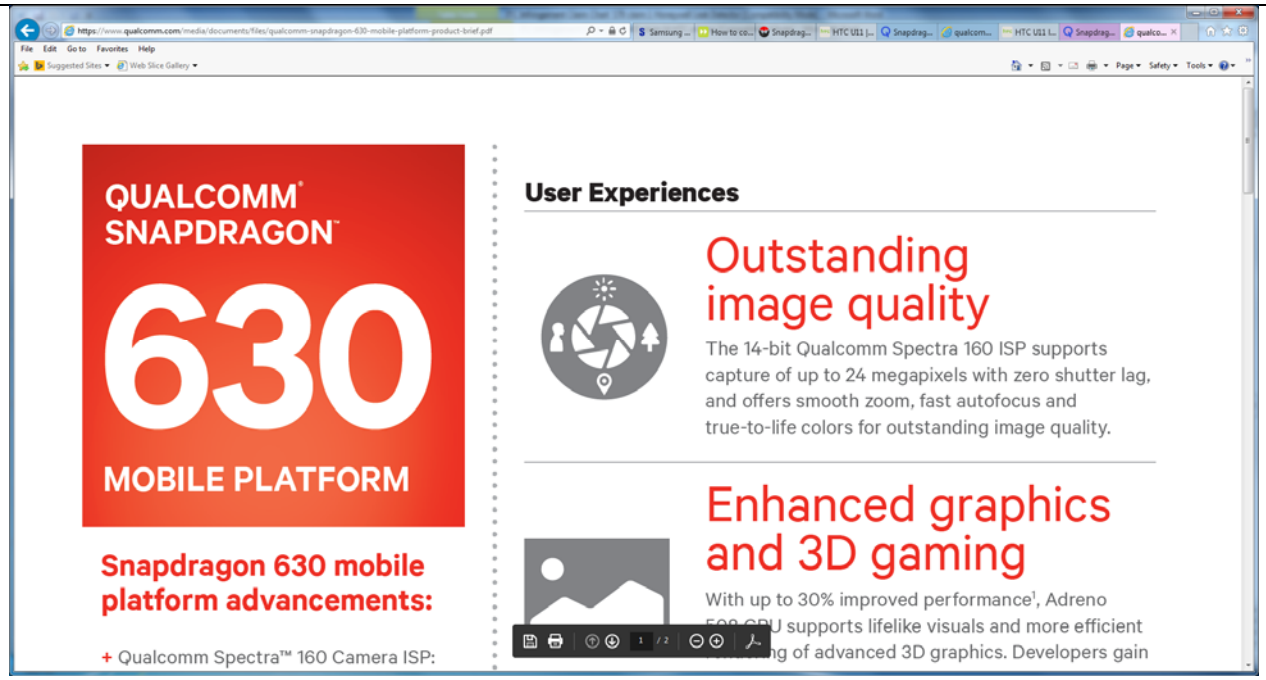
The Qualcomm Snapdragon 630 processor includes:

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**




"Qualcomm® Hexagon™ 642 DSP, Qualcomm All-Ways Aware™ technology"
Id.

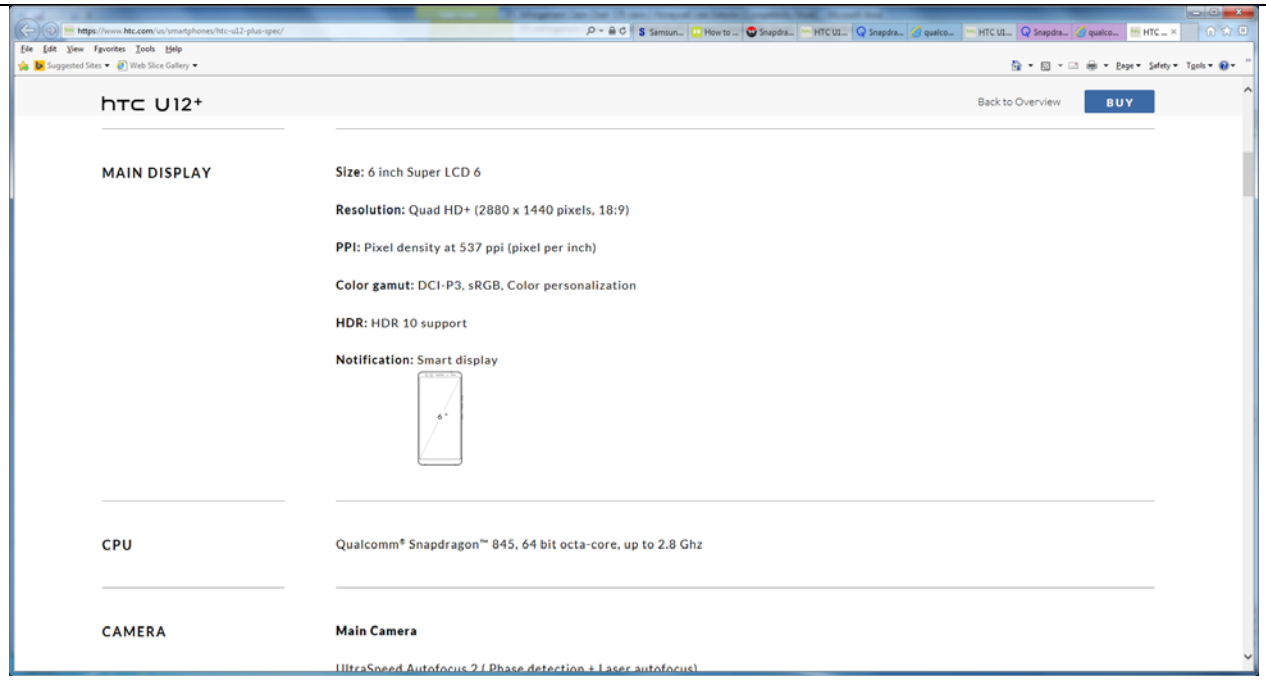
**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**




https://www.qualcomm.com/products/snapdragon-630-mobile-platform;
https://www.qualcomm.com/media/documents/files/qualcomm-snapdragon-630-mobile-platform-product-brief.pdf;

And the HTC U12+ has a Qualcomm Snapdragon 845 processor:

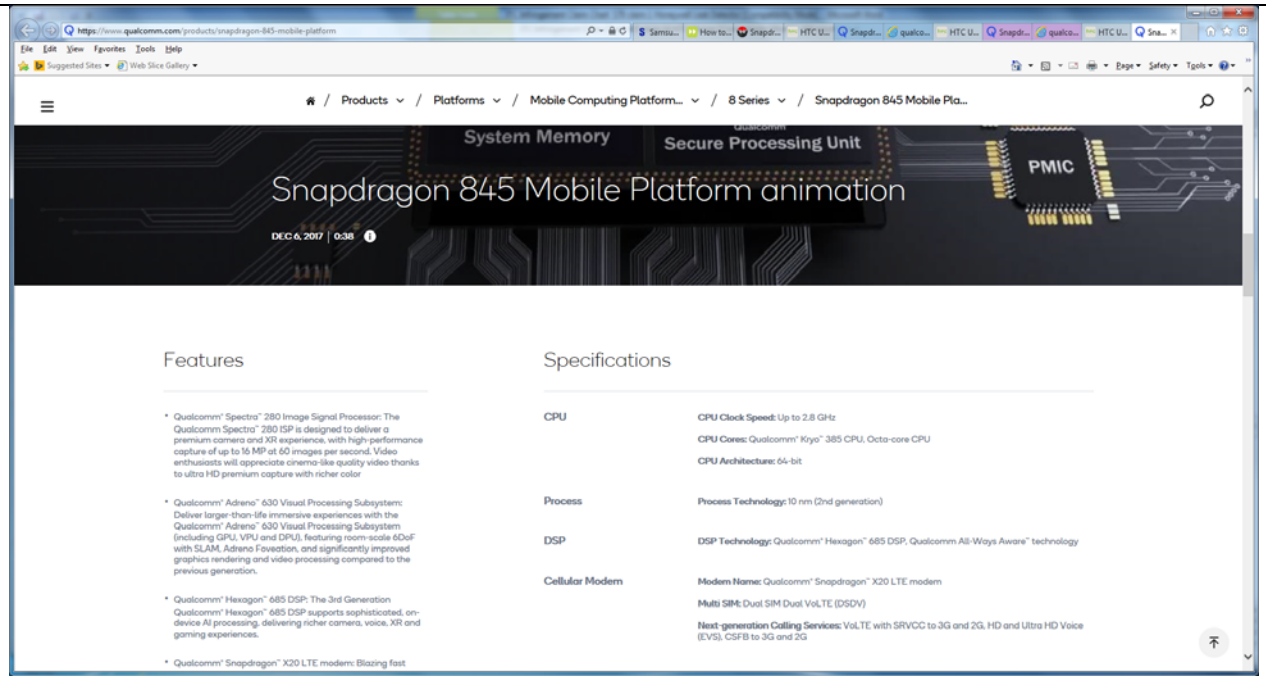
**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**




https://www.htc.com/us/smartphones/htc-u12-plus-spec/.

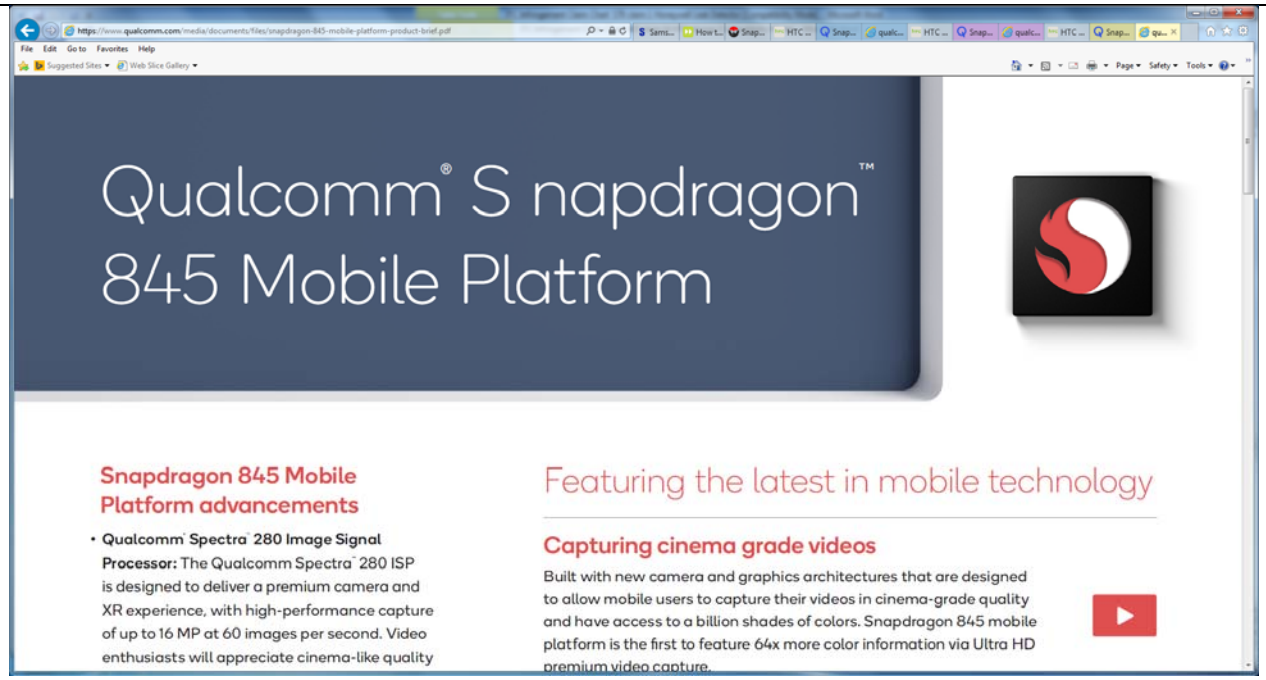
The Qualcomm Snapdragon 845 processor includes:

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**




"Qualcomm® Hexagon™ 685 DSP, Qualcomm All-Ways Aware™ technology"
Id.; https://www.qualcomm.com/products/snapdragon-845-mobile-platform;

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**




https://www.qualcomm.com/media/documents/files/snapdragon-845-mobile-platform-product-brief.pdf.

"Qualcomm Technologies developed the Hexagon Digital Signal Processor (DSP) as a world class processor with both CPU and DSP functionality to support deeply embedded processing needs of the mobile platform for both multimedia and modem functions. It is an advanced, variable instruction length, Very Long Instruction Word (VLIW) processor architecture with hardware multi -threading. The Hexagon architecture and family of cores provides Qualcomm Technologies a competitive advantage in performance and power efficiency for modem and multi-media applications and is a key component of all of Qualcomm's Snapdragon™ processors."

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**

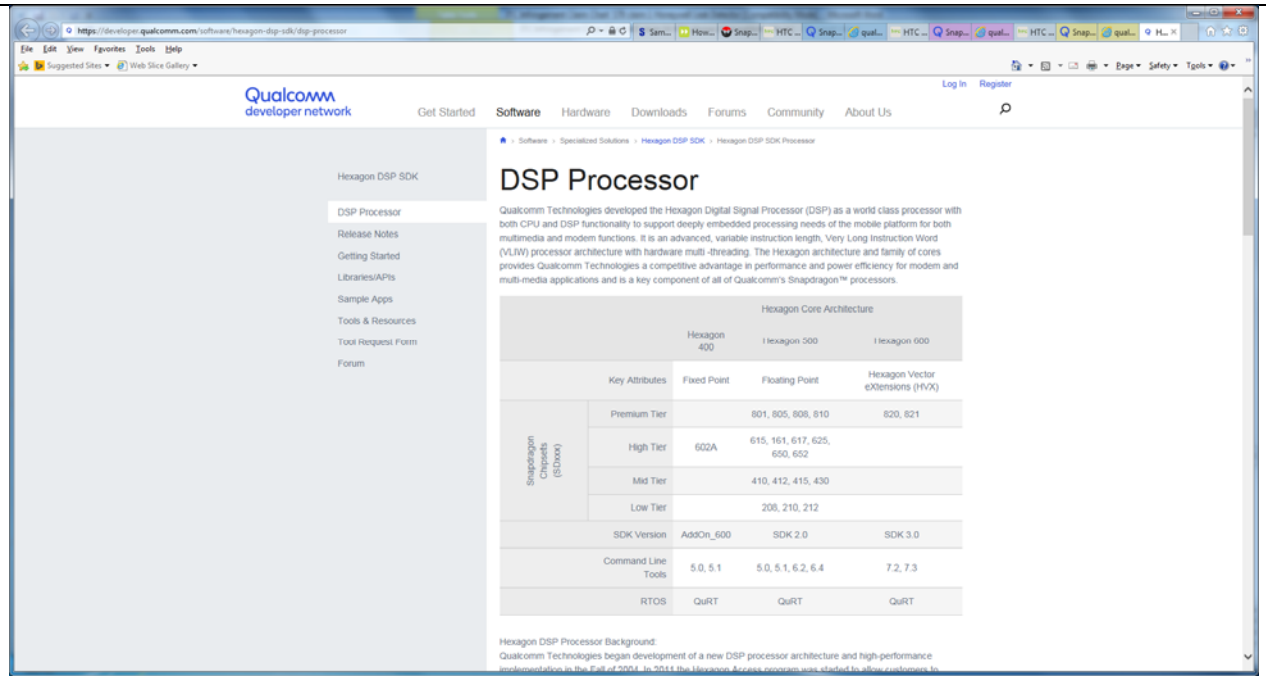
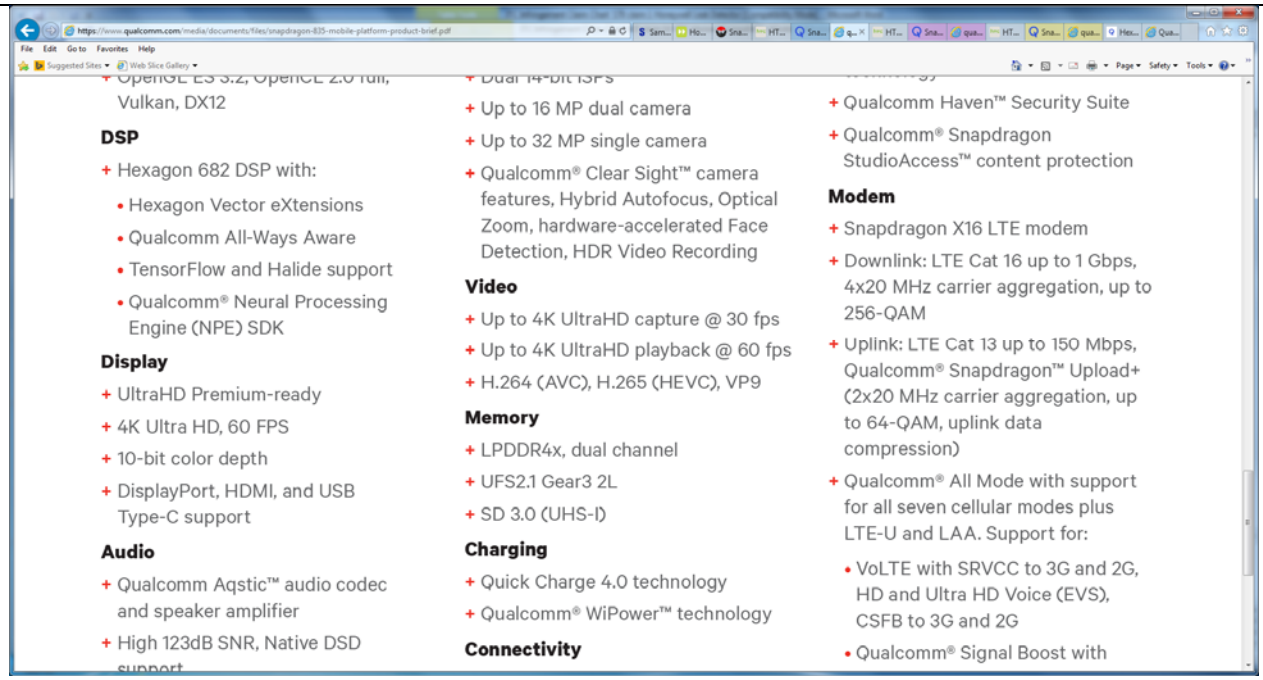
| | |
|---|---|
| |  <br>See https://developer.qualcomm.com/software/hexagon-dsp-sdk/dsp-processor. |
| [f] a memory storing instructions that, when executed by the processor, cause the processor to perform operations comprising: | The HTC U11, U11 Life, and U12+ cellular phones have memory storing instructions that, when executed by the processor, cause the processor to perform operations set forth in subsections [g]-[i] below.<br><br>More specifically, the Qualcomm Snapdragon chips used in the HTC U11, U11 Life, and U12+ each have memory that stores instructions that, when executed by the processor, cause the processor to perform the operations in subsections [g]-[i] below.<br><br>The HTC U11 includes the Qualcomm Snapdragon 835 processor that includes: |

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**



Vulkan, DX12

**DSP**
+ Hexagon 682 DSP with:
  - Hexagon Vector eXtensions
  - Qualcomm All-Ways Aware
  - TensorFlow and Halide support
  - Qualcomm® Neural Processing Engine (NPE) SDK

**Display**
+ UltraHD Premium-ready
+ 4K Ultra HD, 60 FPS
+ 10-bit color depth
+ DisplayPort, HDMI, and USB Type-C support

**Audio**
+ Qualcomm Aqstic™ audio codec and speaker amplifier
+ High 123dB SNR, Native DSD support

+ Up to 16 MP dual camera
+ Up to 32 MP single camera
+ Qualcomm® Clear Sight™ camera features, Hybrid Autofocus, Optical Zoom, hardware-accelerated Face Detection, HDR Video Recording

**Video**
+ Up to 4K UltraHD capture @ 30 fps
+ Up to 4K UltraHD playback @ 60 fps
+ H.264 (AVC), H.265 (HEVC), VP9

**Memory**
+ LPDDR4x, dual channel
+ UFS2.1 Gear3 2L
+ SD 3.0 (UHS-I)

**Charging**
+ Quick Charge 4.0 technology
+ Qualcomm® WiPower™ technology

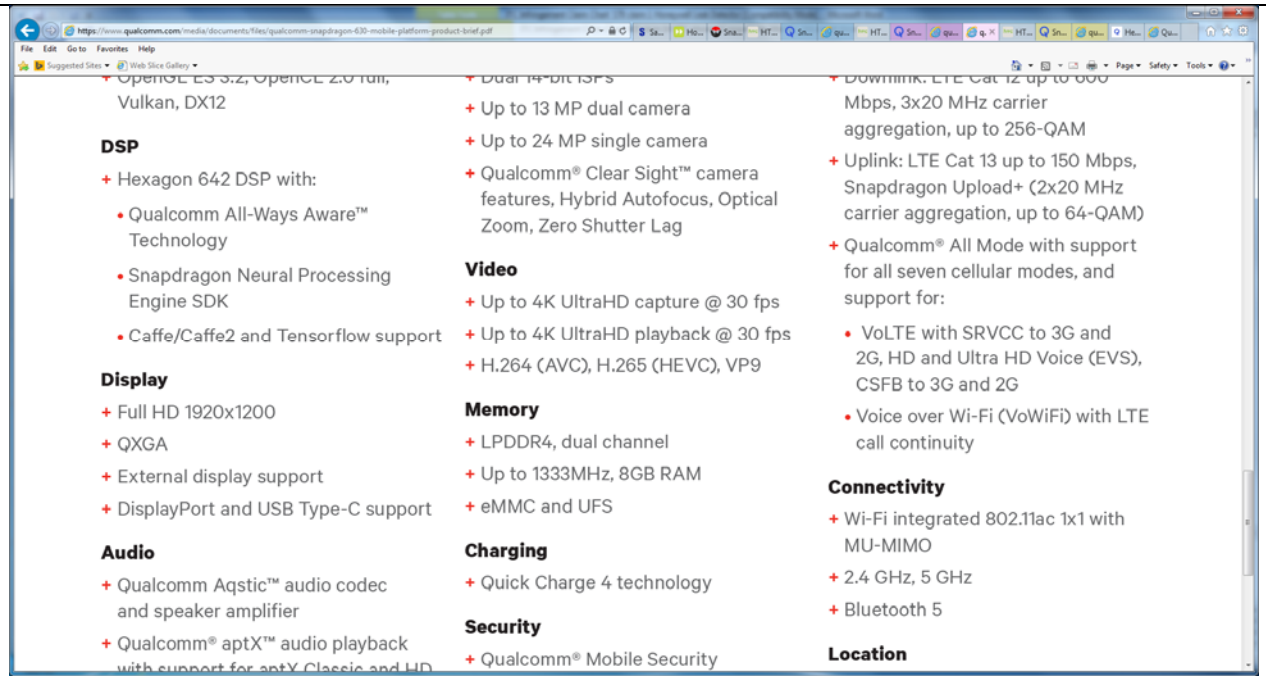
**Connectivity**
+ Qualcomm Haven™ Security Suite
+ Qualcomm® Snapdragon StudioAccess™ content protection

**Modem**
+ Snapdragon X16 LTE modem
+ Downlink: LTE Cat 16 up to 1 Gbps, 4x20 MHz carrier aggregation, up to 256-QAM
+ Uplink: LTE Cat 13 up to 150 Mbps, Qualcomm® Snapdragon™ Upload+ (2x20 MHz carrier aggregation, up to 64-QAM, uplink data compression)
+ Qualcomm® All Mode with support for all seven cellular modes plus LTE-U and LAA. Support for:
  - VoLTE with SRVCC to 3G and 2G, HD and Ultra HD Voice (EVS), CSFB to 3G and 2G
  - Qualcomm® Signal Boost with

**"Memory**
+ LPDDR4x, dual channel
+ UFS2.1 Gear3 2L
+ SD 3.0 (UHS-I)"
https://www.qualcomm.com/media/documents/files/snapdragon-835-mobile-platform-product-brief.pdf

The HTC U11 Life includes the Qualcomm Snapdragon 630 processor that includes:

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**



Vulkan, DX12

**DSP**
+ Hexagon 642 DSP with:
  - Qualcomm All-Ways Aware™ Technology
  - Snapdragon Neural Processing Engine SDK
  - Caffe/Caffe2 and Tensorflow support

**Display**
+ Full HD 1920x1200
+ QXGA
+ External display support
+ DisplayPort and USB Type-C support

**Audio**
+ Qualcomm Aqstic™ audio codec and speaker amplifier
+ Qualcomm® aptX™ audio playback

+ Up to 13 MP dual camera
+ Up to 24 MP single camera
+ Qualcomm® Clear Sight™ camera features, Hybrid Autofocus, Optical Zoom, Zero Shutter Lag

**Video**
+ Up to 4K UltraHD capture @ 30 fps
+ Up to 4K UltraHD playback @ 30 fps
+ H.264 (AVC), H.265 (HEVC), VP9

**Memory**
+ LPDDR4, dual channel
+ Up to 1333MHz, 8GB RAM
+ eMMC and UFS

**Charging**
+ Quick Charge 4 technology

**Security**
+ Qualcomm® Mobile Security

Mbps, 3x20 MHz carrier aggregation, up to 256-QAM
+ Uplink: LTE Cat 13 up to 150 Mbps, Snapdragon Upload+ (2x20 MHz carrier aggregation, up to 64-QAM)
+ Qualcomm® All Mode with support for all seven cellular modes, and support for:
  - VoLTE with SRVCC to 3G and 2G, HD and Ultra HD Voice (EVS), CSFB to 3G and 2G
  - Voice over Wi-Fi (VoWiFi) with LTE call continuity

**Connectivity**
+ Wi-Fi integrated 802.11ac 1x1 with MU-MIMO
+ 2.4 GHz, 5 GHz
+ Bluetooth 5

**Location**

"**Memory**
+ LPDDR4, dual channel
+ Up to 1333MHz, 8GB RAM
+ eMMC and UFS"
https://www.qualcomm.com/media/documents/files/qualcomm-snapdragon-630-mobile-platform-product-brief.pdf

The HTC U12+ includes the Qualcomm Snapdragon 845 processor that includes:

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**

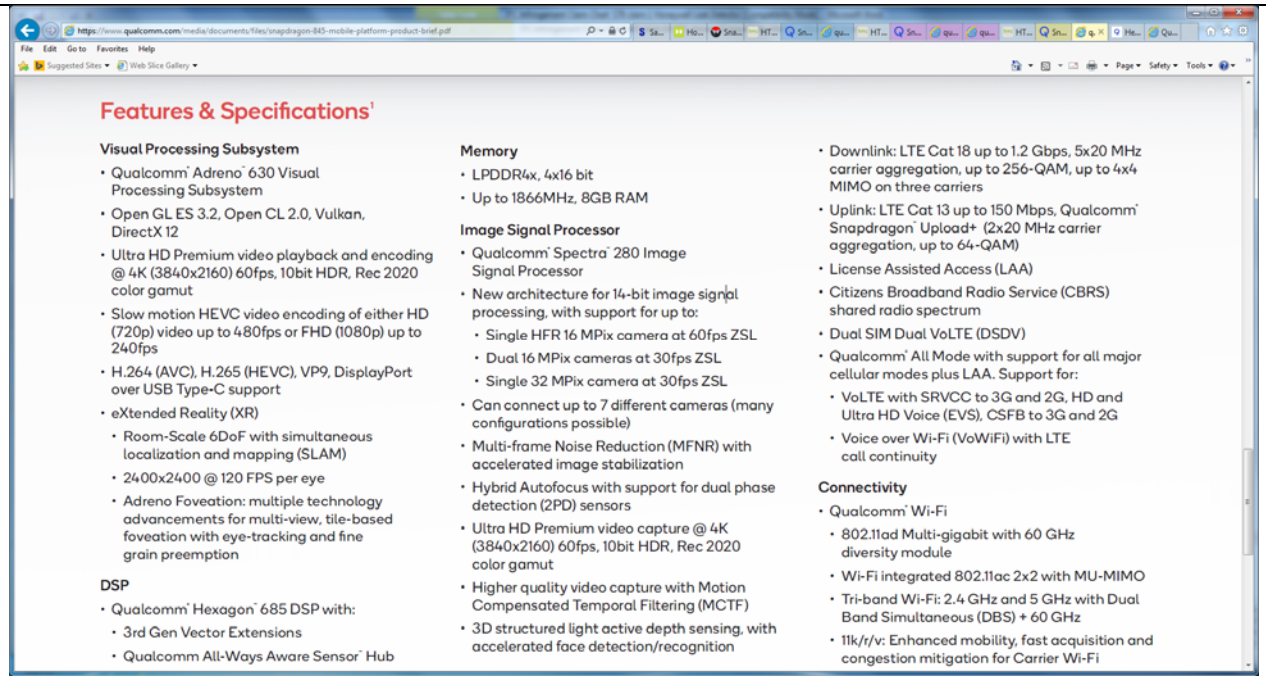
| | |
|---|---|
| |  <br>Features & Specifications[1]<br>**Visual Processing Subsystem**<br>• Qualcomm® Adreno™ 630 Visual Processing Subsystem<br>• Open GL ES 3.2, Open CL 2.0, Vulkan, DirectX 12<br>• Ultra HD Premium video playback and encoding @ 4K (3840x2160) 60fps, 10bit HDR, Rec 2020 color gamut<br>• Slow motion HEVC video encoding of either HD (720p) video up to 480fps or FHD (1080p) up to 240fps<br>• H.264 (AVC), H.265 (HEVC), VP9, DisplayPort over USB Type-C support<br>• eXtended Reality (XR)<br>  • Room-Scale 6DoF with simultaneous localization and mapping (SLAM)<br>  • 2400x2400 @ 120 FPS per eye<br>  • Adreno Foveation: multiple technology advancements for multi-view, tile-based foveation with eye-tracking and fine grain preemption<br>**DSP**<br>• Qualcomm® Hexagon™ 685 DSP with:<br>  • 3rd Gen Vector Extensions<br>  • Qualcomm All-Ways Aware Sensor™ Hub<br>**Memory**<br>• LPDDR4x, 4x16 bit<br>• Up to 1866MHz, 8GB RAM<br>**Image Signal Processor**<br>• Qualcomm® Spectra™ 280 Image Signal Processor<br>• New architecture for 14-bit image signal processing, with support for up to:<br>  • Single HFR 16 MPix camera at 60fps ZSL<br>  • Dual 16 MPix cameras at 30fps ZSL<br>  • Single 32 MPix camera at 30fps ZSL<br>• Can connect up to 7 different cameras (many configurations possible)<br>• Multi-frame Noise Reduction (MFNR) with accelerated image stabilization<br>• Hybrid Autofocus with support for dual phase detection (2PD) sensors<br>• Ultra HD Premium video capture @ 4K (3840x2160) 60fps, 10bit HDR, Rec 2020 color gamut<br>• Higher quality video capture with Motion Compensated Temporal Filtering (MCTF)<br>• 3D structured light active depth sensing, with accelerated face detection/recognition<br>• Downlink: LTE Cat 18 up to 1.2 Gbps, 5x20 MHz carrier aggregation, up to 256-QAM, up to 4x4 MIMO on three carriers<br>• Uplink: LTE Cat 13 up to 150 Mbps, Qualcomm® Snapdragon™ Upload+ (2x20 MHz carrier aggregation, up to 64-QAM)<br>• License Assisted Access (LAA)<br>• Citizens Broadband Radio Service (CBRS) shared radio spectrum<br>• Dual SIM Dual VoLTE (DSDV)<br>• Qualcomm® All Mode with support for all major cellular modes plus LAA. Support for:<br>  • VoLTE with SRVCC to 3G and 2G, HD and Ultra HD Voice (EVS), CSFB to 3G and 2G<br>  • Voice over Wi-Fi (VoWiFi) with LTE call continuity<br>**Connectivity**<br>• Qualcomm® Wi-Fi<br>  • 802.11ad Multi-gigabit with 60 GHz diversity module<br>  • Wi-Fi integrated 802.11ac 2x2 with MU-MIMO<br>  • Tri-band Wi-Fi: 2.4 GHz and 5 GHz with Dual Band Simultaneous (DBS) + 60 GHz<br>  • 11k/r/v: Enhanced mobility, fast acquisition and congestion mitigation for Carrier Wi-Fi<br>"Memory<br>LPDDR4x, 4x16 bit<br>Up to 1866MHz, 8GB RAM"<br>https://www.qualcomm.com/media/documents/files/snapdragon-845-mobile-platform-product-brief.pdf. |
| [g] receiving, via the wireless interface, the compressed high definition digital multimedia signal appropriate for displaying the high definition digital | The Qualcomm Snapdragon chips used in the HTC U11, U11 Life, and U12+ cellular phones are configured to receive, via the wireless interface, the compressed high definition digital multimedia signal appropriate for displaying the high definition digital multimedia content on the mobile terminal.<br><br>More specifically, as noted previously, the cellular phones can receive via cellular or WiFi, compressed high definition digital multimedia signal appropriate for displaying the high definition digital multimedia content on the mobile terminal. |

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**

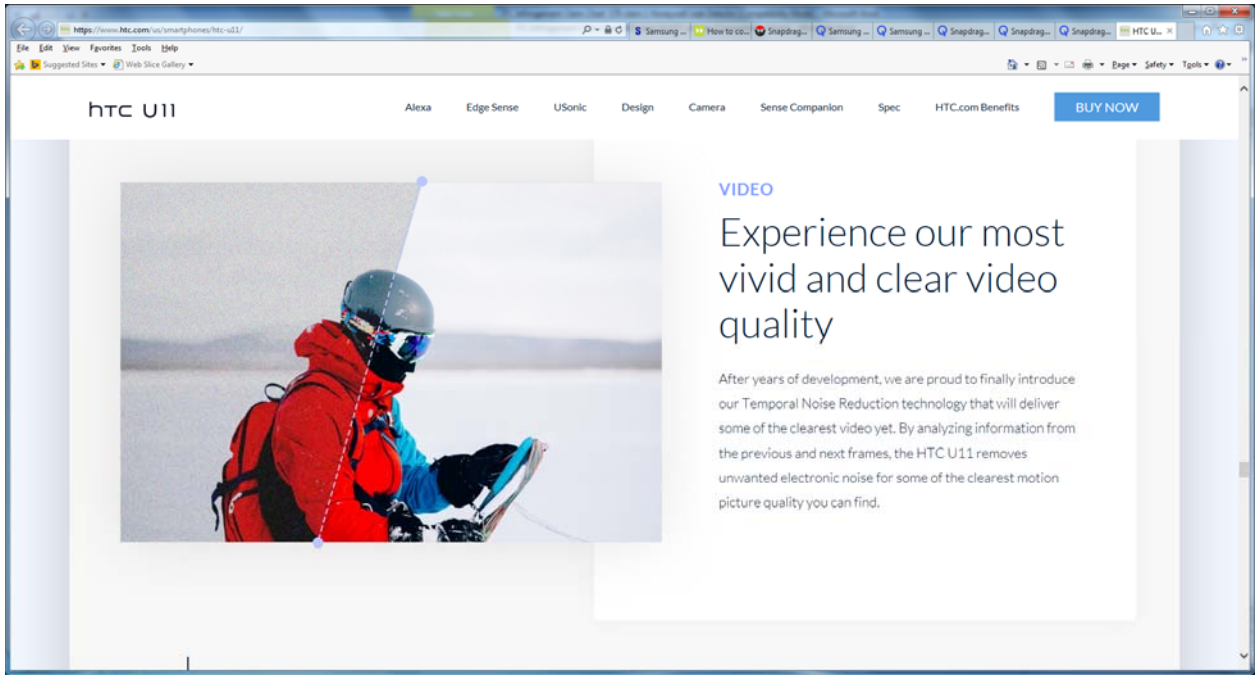
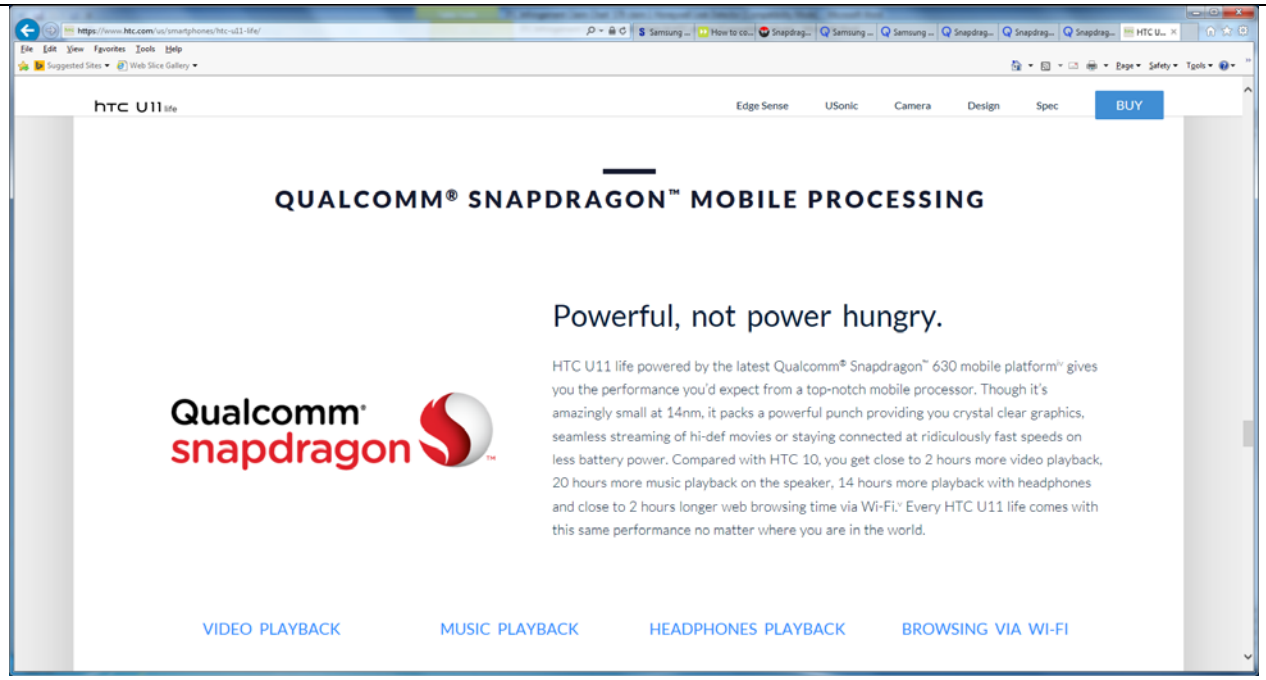
| | |
|---|---|
| multimedia content on the mobile terminal; and | Even more specifically, the HTC website markets the HTC U11, U11 Life, and U12+ as capable of receiving and playing HD video.<br>  <br>https://www.htc.com/us/smartphones/htc-u11/ |

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**




https://www.htc.com/us/smartphones/htc-u11-life/

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**

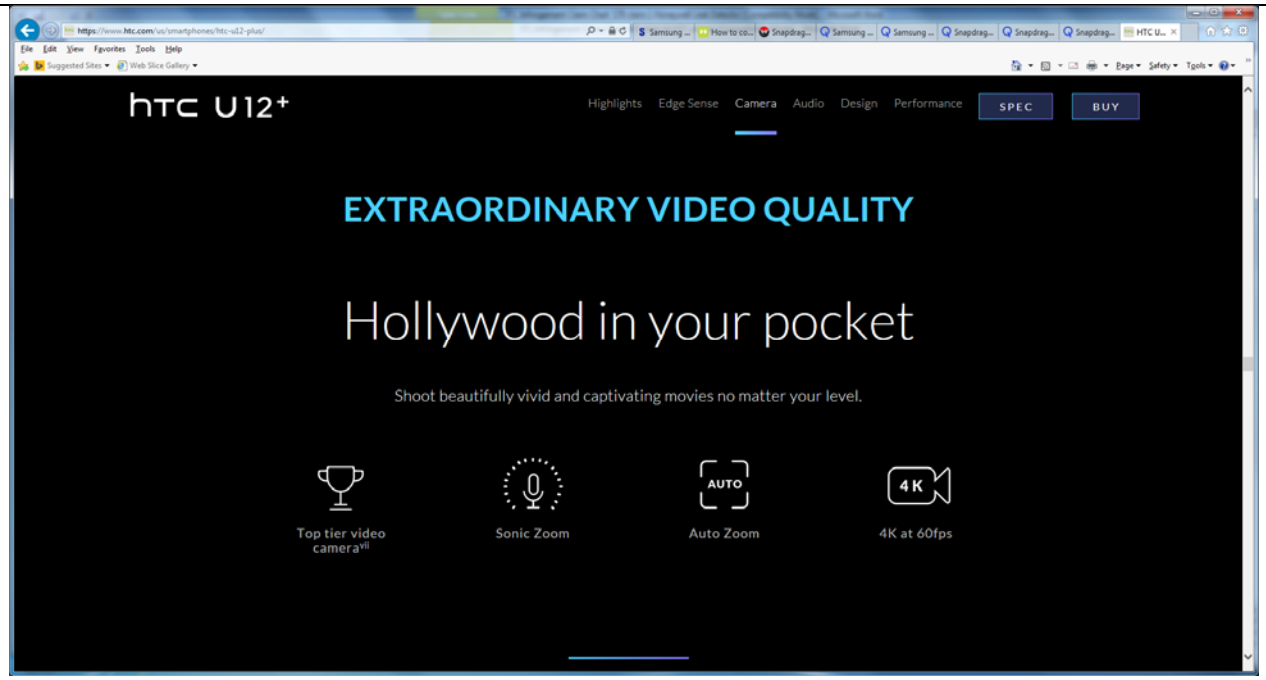
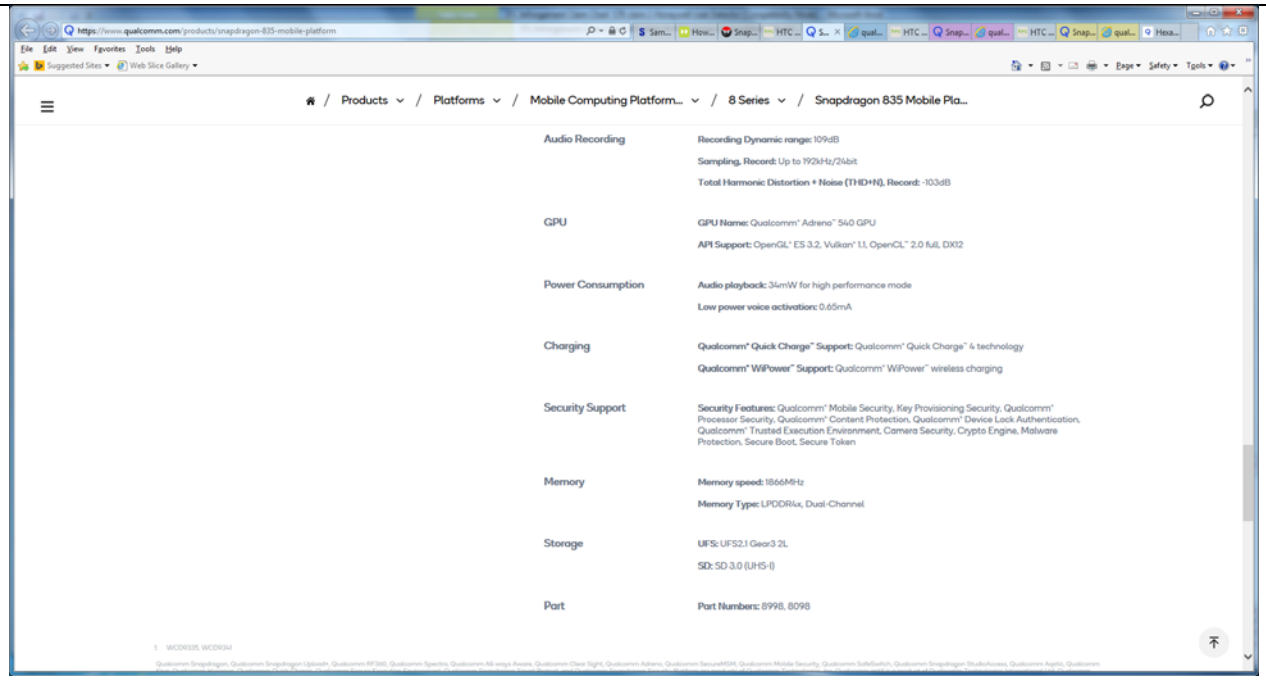
| | |
|---|---|
| |  <br>https://www.htc.com/us/smartphones/htc-u12-plus/ |
| [h] storing the compressed high definition digital multimedia signal in the buffer, | The Qualcomm Snapdragon chips used in the HTC U11, U11 Life, and U12+ cellular phones are configured to store the compressed high definition digital multimedia signal in the buffer.<br><br>More specifically, as noted previously in subsection [d], the cellular phones store HD video signals in a buffer. |

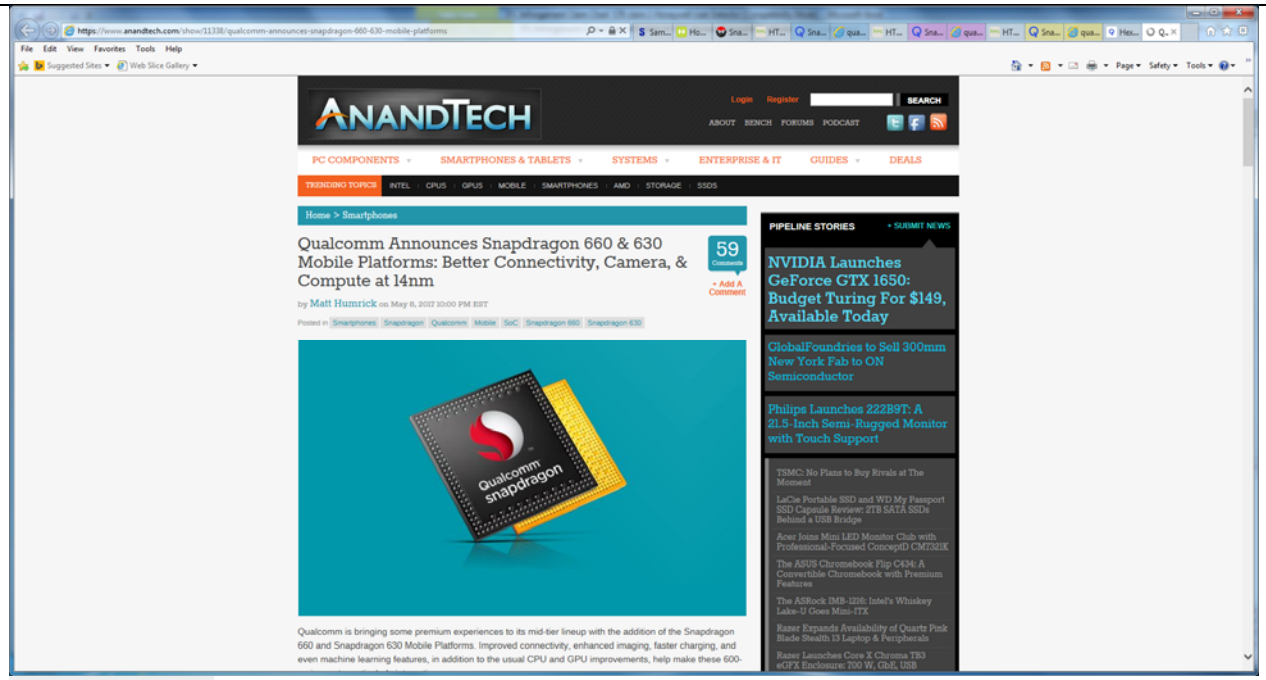
**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**




**"UFS:** UFS2.1 Gear3 2L
**SD:** SD 3.0 (UHS-I)"
See https://www.qualcomm.com/products/snapdragon-835-mobile-platform;
See also https://www.anandtech.com/show/10948/qualcomm-snapdragon-835-kryo-280-adreno-540/2;
https://developer.qualcomm.com/download/hexagon/hexagon-dsp-architecture.pdf ;
https://www.androidauthority.com/lpddr4-everything-need-know-599759/.

The Qualcomm Snapdragon 630 used in the HTC U11 Life includes:

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**




"eMMC / UFS"
https://www.anandtech.com/show/11338/qualcomm-announces-snapdragon-660-630-mobile-platforms

The Qualcomm Snapdragon 845 used in the HTC U12+ includes a buffer:

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**

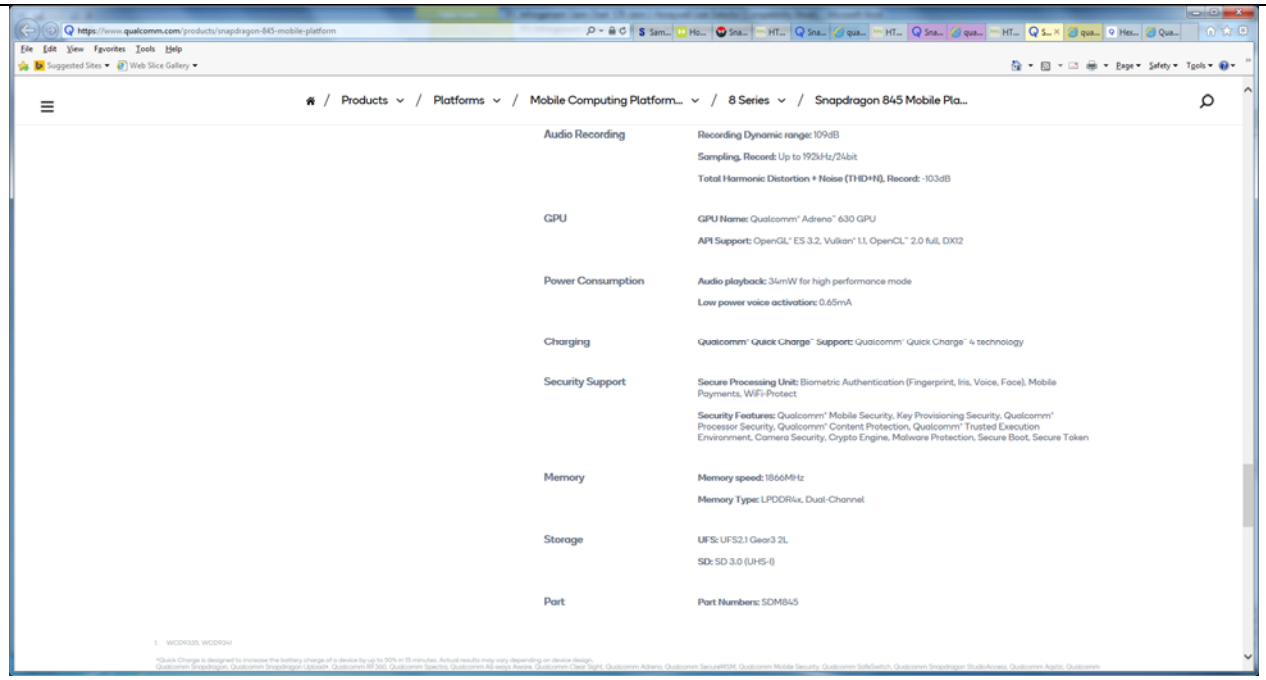
| | |
|---|---|
| |  <br>**"UFS:** UFS2.1 Gear3 2L<br>**SD:** SD 3.0 (UHS-I)"<br>See https://www.qualcomm.com/products/snapdragon-845-mobile-platform.<br><br>See also https://www.xda-developers.com/qualcomm-snapdragon-845-hexagon-685-dsp/.<br>See also https://www.xda-developers.com/qualcomm-2018-snapdragon-tech-summit-roundup/.<br>See also https://www.intrinsyc.com/snapdragon-embedded-development-kits/open-q-845-development-kit/. |
| [i] wherein the high definition digital multimedia conversion circuit is further configured to | The HTC U11, U11 Life, and U12+ cellular phones' high definition digital multimedia conversion circuit is further configured to decompress the compressed high definition digital multimedia signal retrieved from the buffer to generate a decompressed signal, the decompressed signal comprising a high definition digital video signal. |

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**

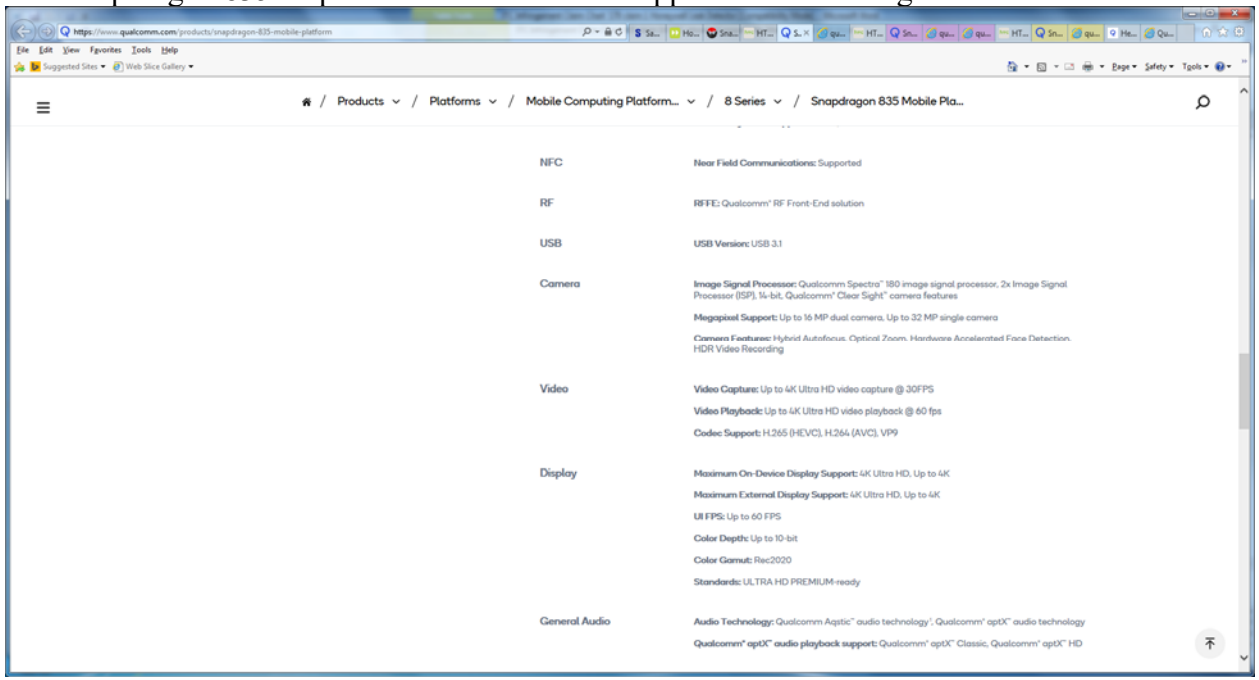
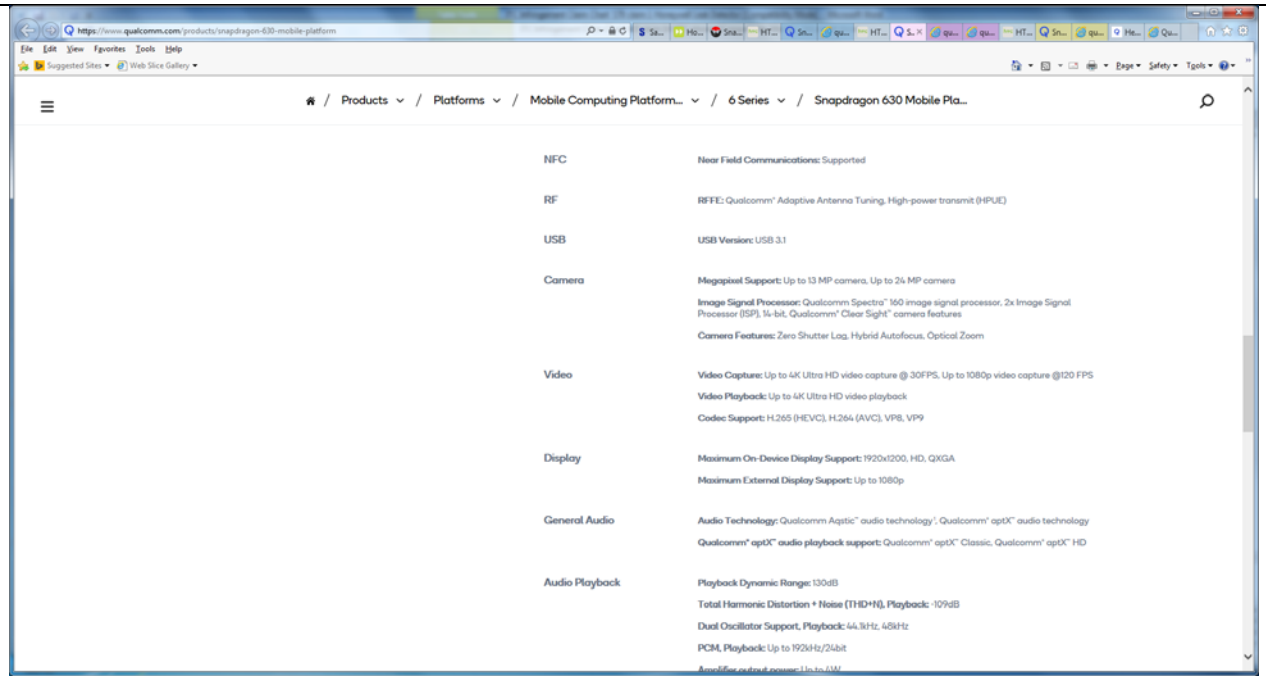
| | |
|---|---|
| decompress the compressed high definition digital multimedia signal retrieved from the buffer to generate a decompressed signal, the decompressed signal comprising a high definition digital video signal; | More specifically, the specifications for the Snapdragon chips used in the HTC U11, U11 Life, and U12+ cellular phones, indicate that they are configured to decompress various video codecs,<br><br>The Snapdragon 835 chip used in the HTC U11 supports the following codecs:<br>  <br><br>**"Codec Support:** H.265 (HEVC), H.264 (AVC), VP9"<br>See https://www.qualcomm.com/products/snapdragon-835-mobile-platform.<br><br>The Snapdragon 630 chip, used in the HTC U11 Life, supports the following codecs: |

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**




**"Codec Support:** H.265 (HEVC), H.264 (AVC), VP8, VP9"
See https://www.qualcomm.com/products/snapdragon-630-mobile-platform.

The Snapdragon 845 chip, used in the HTC U12+, supports the following codecs:

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**

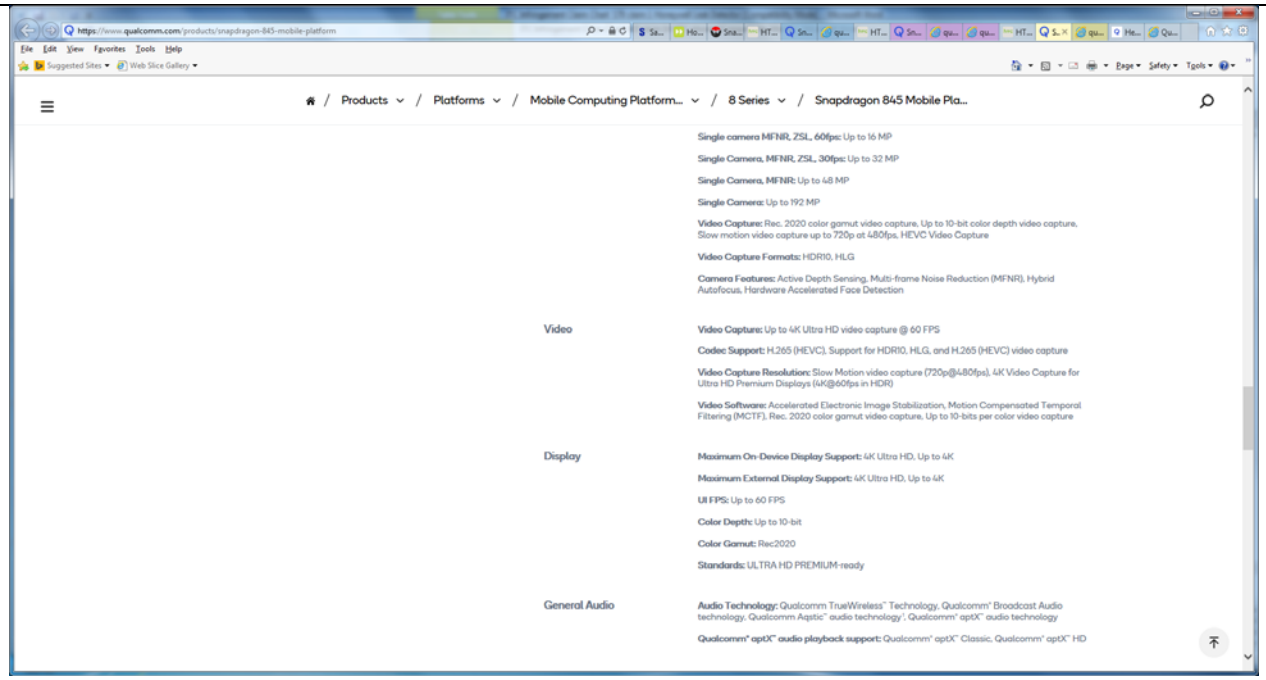
| | |
|---|---|
| |  <br>“ **Codec Support:** H.265 (HEVC), Support for HDR10, HLG, and H.265 (HEVC) video capture”<br>See https://www.qualcomm.com/products/snapdragon-845-mobile-platform. |
| [j] wherein the high definition digital multimedia conversion circuit is further configured to encode the decompressed signal to generate an encoded decompressed high definition digital | The HTC U11, U11 Life, and U12+ cellular phones are all configured such that the high definition digital multimedia conversion circuit is further configured to encode the decompressed signal to generate an encoded decompressed high definition digital signal.<br><br>More specifically, using a USB-C to HDMI adapter, the HTC U11, U11 Life, and U12+ each can encode the decompressed signal to generate an encoded decompressed high definition digital signal: |

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**

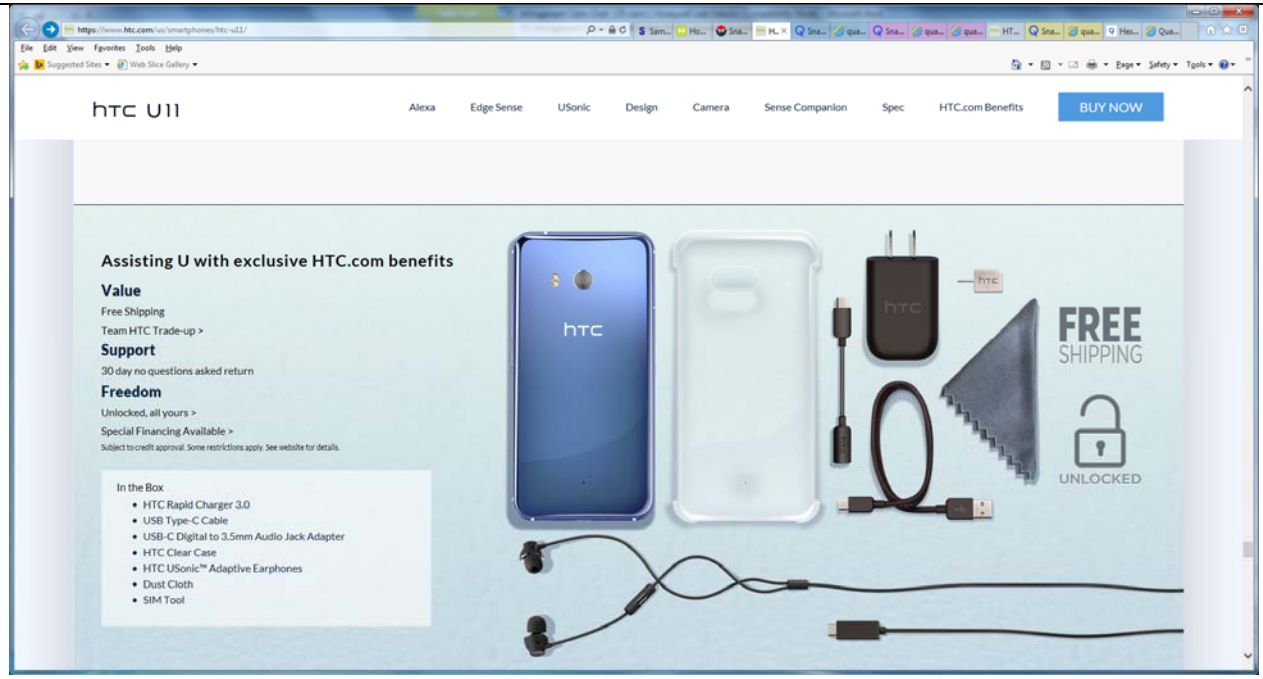
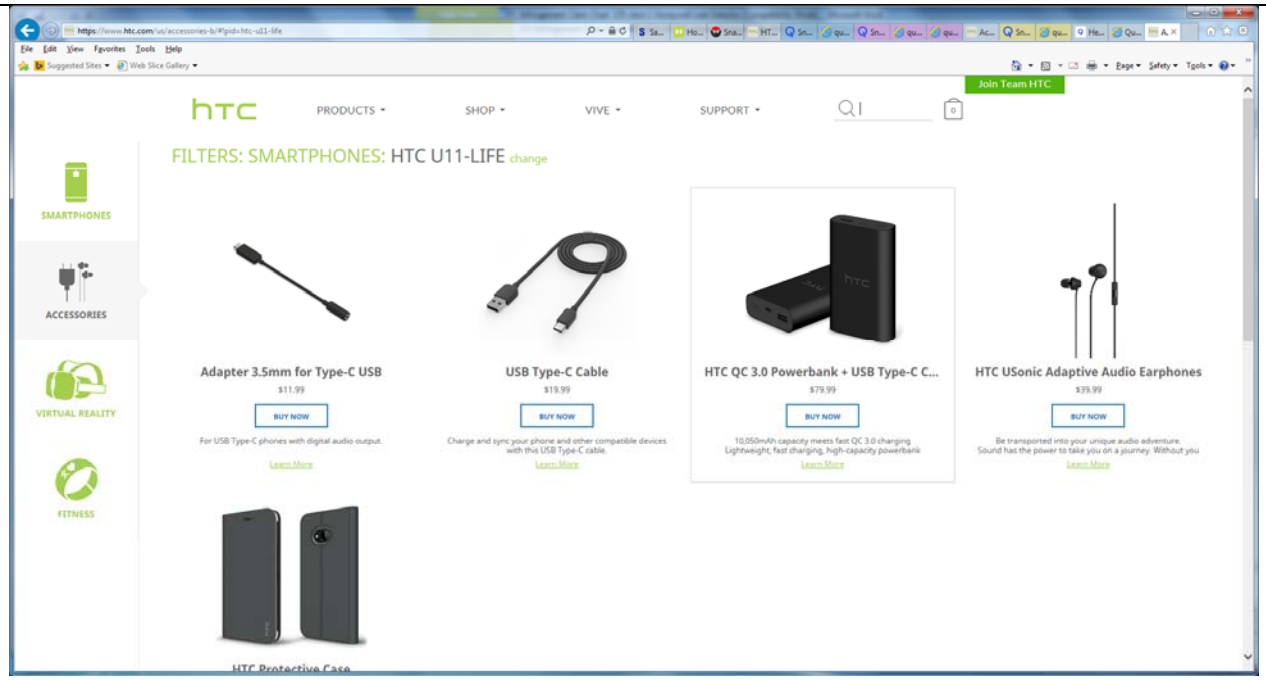
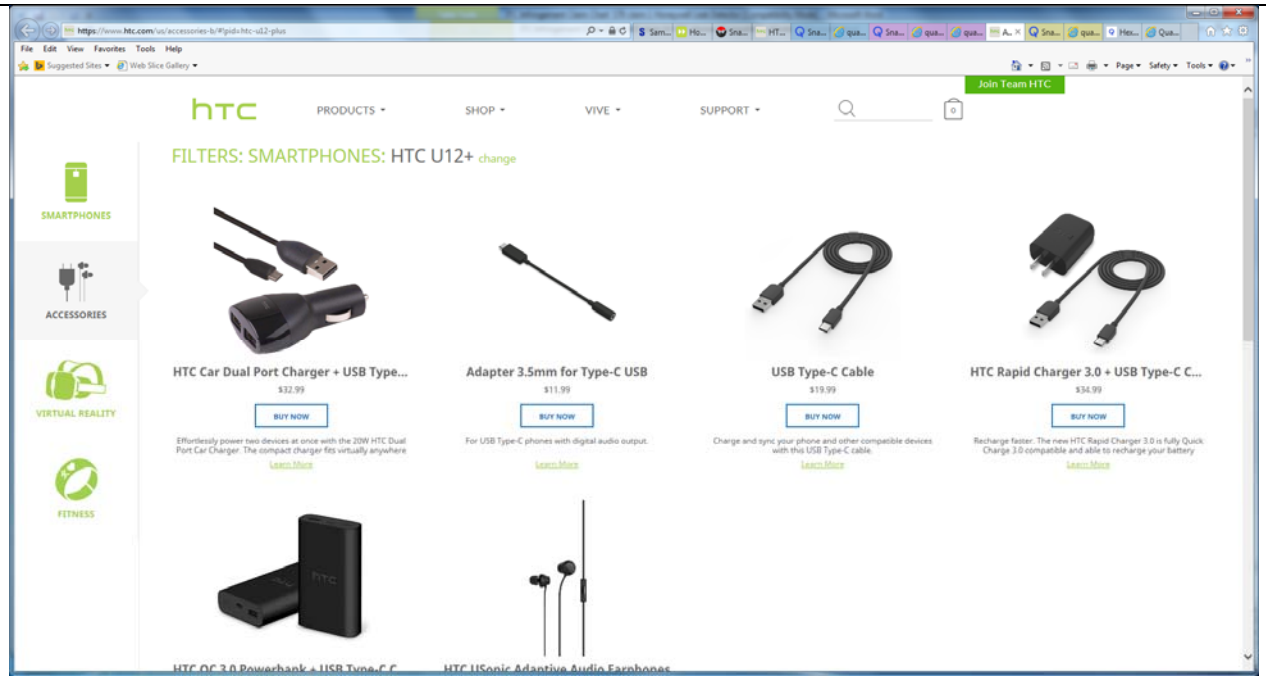
| | |
|---|---|
| signal; and |  <br>https://www.htc.com/us/smartphones/htc-u11/ |

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**




https://www.htc.com/us/accessories-b/#!pid=htc-u11-life

**Exhibit 23 – Infringement Claim Chart for U.S. Patent No. 10,104,425**
**HTC U11, U11 Life and U12+ Cellular Phones**




https://www.htc.com/us/accessories-b/#!pid=htc-u12-plus

"Use a USB-C to HDMI adapter
Unlike the vast majority of phones on the market, the HTC U11 supports USB-C to HDMI adapters. These are the best way to connect your phone to a monitor, projector or TV without sacrificing visual quality or adding latency, and it works even in situations where you don't have (reliable) Wi-Fi, like in hotel rooms, schools and RVs."
https://www.mobilefun.co.uk/blog/2017/07/how-to-connect-htc-u11-to-tv/

"The most common alternative to connecting your HTC U11 to your TV is using an HDMI cable. Make sure you have access to an HDMI port on your HTC U11 before buying or using such a connection. The most

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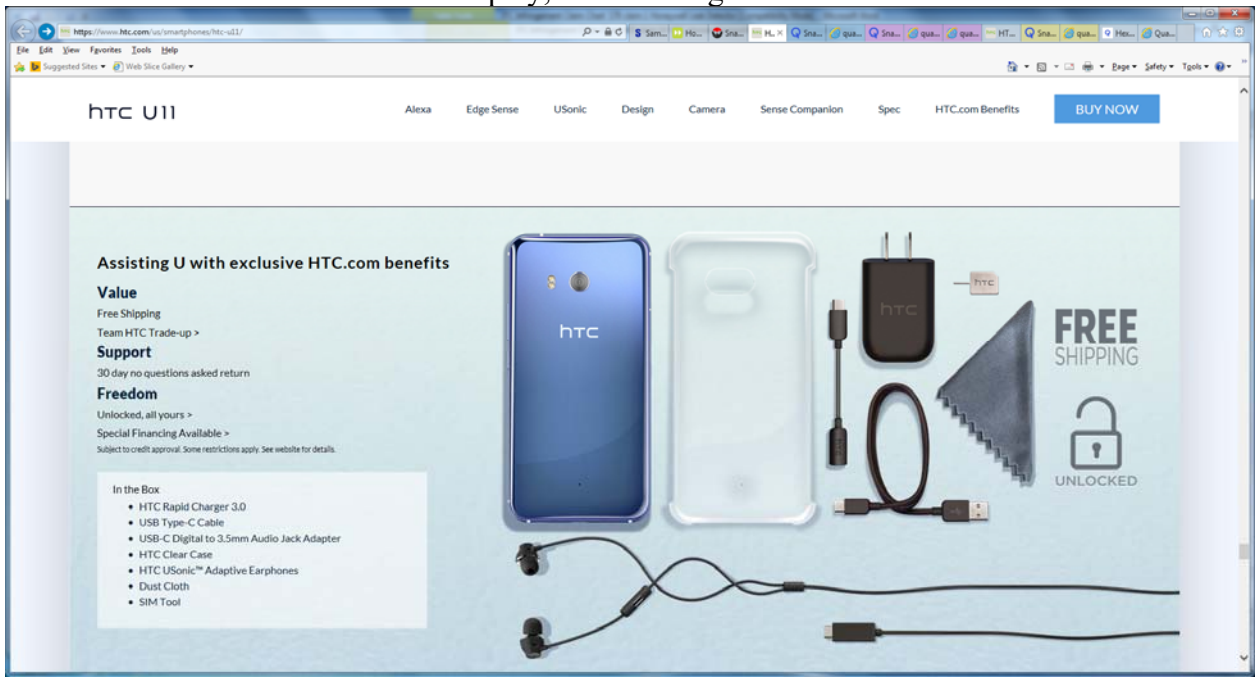
| | |
|---|---|
| | common formats on smartphones are the mini-HDMI or micro-HDMI."<br><br>https://phones.brain-start.tech/tv/how-to-connect-your-htc-u11-to-your-tv/<br>See also https://www.jagek.com/en/htc-accessories/htc-u11-life/usb-c-to-hdmi-cable-for-htc-u11-life-21699.html; https://www.jagek.com/en/htc-accessories/htc-u12-life/usb-c-to-hdmi-cable-for-htc-u12-life-29302.html. |
| [k] wherein the high definition digital interface is further configured to communicate the encoded decompressed high definition digital signal to accommodate production of the high definition digital multimedia content on an external display. | The HTC U11, U11 Life, and U12+ cellular phones are all configured to communicate the encoded decompressed high definition digital signal to accommodate production of the high definition digital multimedia content on an external display, such as a high definition television.<br>  <br>https://www.htc.com/us/smartphones/htc-u11/ |

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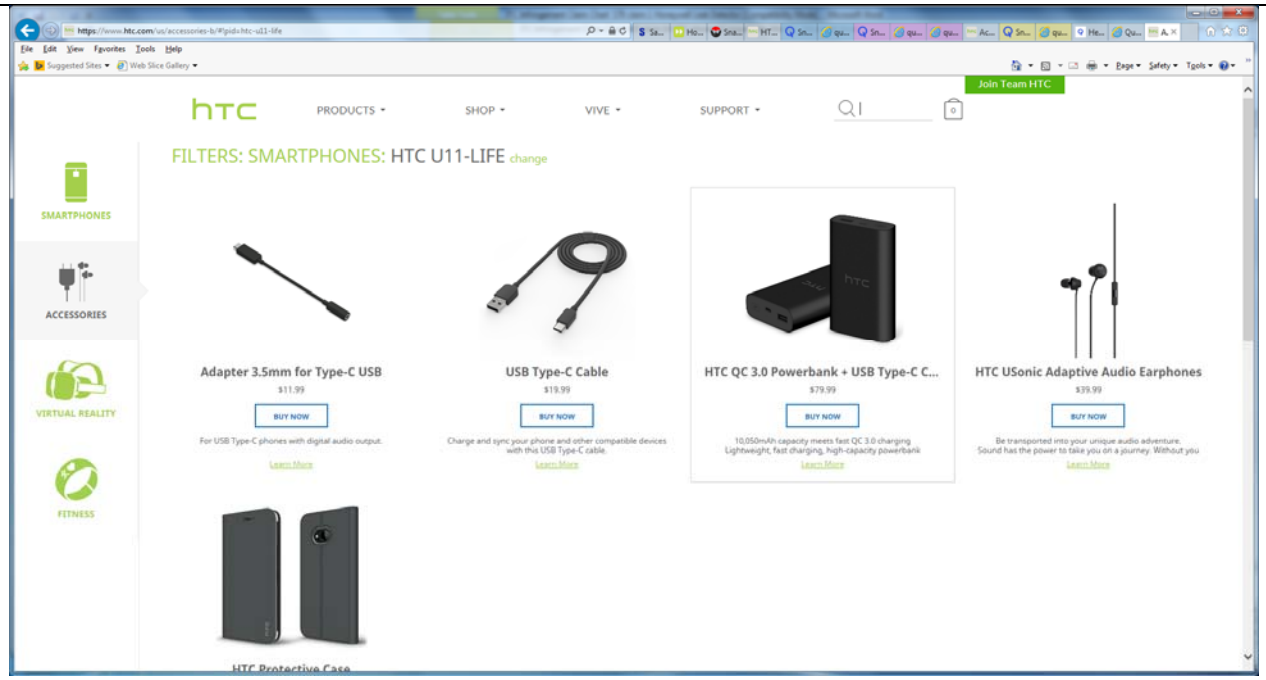
| |  <br>https://www.htc.com/us/accessories-b/#!pid=htc-u11-life |

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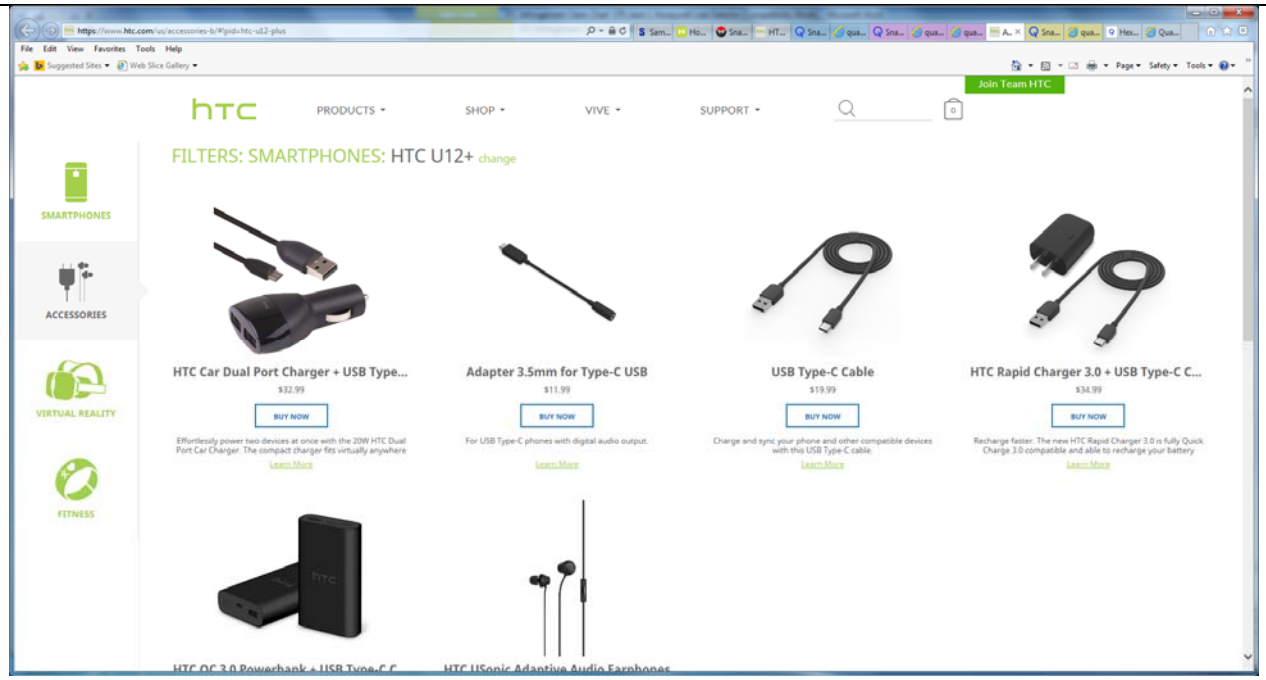


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