

**UNITED STATES DISTRICT COURT  
EASTERN DISTRICT OF NORTH CAROLINA  
WESTERN DIVISION**

**TELEFONAKTIEBOLAGET LM ERICSSON,**

**PLAINTIFF,**

**VS.**

**LENOVO (UNITED STATES), INC., LENOVO  
(SHANGHAI) ELECTRONICS TECHNOLOGY  
CO. LTD., LENOVO BEIJING CO., LTD.,  
LENOVO GROUP, LTD., LENOVO PC HK  
LTD., LENOVO INFORMATION  
PRODUCTIONS (SHENZHEN) CO. LTD.**

**DEFENDANTS.**

**CIVIL ACTION NO. 5:23-CV-00714**

**JURY TRIAL DEMANDED**

**ORIGINAL COMPLAINT**

Plaintiff Telefonaktiebolaget LM Ericsson (“Ericsson”) files this Original Complaint against Lenovo (United States) Inc.; Lenovo Group Limited; Lenovo (Shanghai) Electronics Technology Co. Ltd.; Lenovo Beijing Co., Limited; Lenovo PC HK Limited; and Lenovo Information Products (Shenzhen) Co. Ltd. (collectively, “Defendants” or “Lenovo”) and alleges as follows:

**INTRODUCTION**

1. Ericsson is widely viewed as one of the leading innovators in the field of telecommunications. Due to the work of approximately 29,304 Ericsson research and development employees, Ericsson’s inventions are a valuable part of the fundamental technology that powers computers and seamlessly connects mobile devices. *See* <https://mb.cision.com/Main/15448/3729193/1896984.pdf> (Ericsson Financial Report 2022) at 17. As a result of its extensive research and development efforts, Ericsson has been awarded more than 60,000 patents worldwide. *See id.* at 8, 17.

2. Among these innovations, Ericsson has developed video coding technologies that provide increased performance and new features for the benefit of consumers. For example, many of Ericsson's video coding patents relate to the High Efficiency Video Coding ("HEVC/H.265") standard. As a video coding innovator, Ericsson contributed numerous innovations to the development of the HEVC/H.265 standard.

3. The HEVC/H.265 standard enables efficient and reliable video decoding in millions of devices, including computers. This advance in video coding technology was made possible by the work of Ericsson and other video coding innovators.

4. Over the last few decades, internet traffic has evolved from simple, text-based interfaces to a plethora of media, including video. As technology has evolved, the use of video has skyrocketed. Video coding technologies have enabled the rise of video communications to allow people to consume not only traditional broadcast programming, including news, sports, movies, shows, and other entertainment on demand, but also newer technologies including short-form video, video calling and conferencing, live streaming, video sharing on social media, and video messaging on televisions, computers, and mobile devices.

5. The HEVC/H.265 Standard, first released in 2013, is a successor to the popular Advanced Video Coding ("AVC")/H.264 standard. Decoding using the HEVC/H.265 Standard is roughly twice as efficient as the previous AVC/H.264 standard and enables consumers to decode higher quality video in higher resolutions at the same bandwidth as if the AVC/H.264 standard was used. The benefits realized by this increase in efficiency are substantial and far-reaching. For example, the improved quality-to-bitrate ratio of HEVC/H.265 improves the performance of video distribution networks and improves subjective video quality for the video consumer. *See <https://aws.amazon.com/media/tech/high-efficiency-video-coding/>.*

6. Ericsson has been a main driver in the development of H.265/HEVC. For instance, Ericsson launched its SVP 5500, an HEVC/H.265 encoder for mobile devices, in August of 2012. *See* <https://www.ericsson.com/en/blog/2013/2/h.265--hevc-finalized-by-itu-mpeg>. In December of 2012, Ericsson Research demonstrated the world's first H.265 multi-party HD video conference. *Id.* On January 25, 2013, the International Telecommunications Union ("ITU") recognized that Ericsson was one of the few companies that had already showcased HEVC/H.265 implementations prior to the approval of the standard in January 2013. *See* [https://www.itu.int/net/pressoffice/press\\_releases/2013/01.aspx](https://www.itu.int/net/pressoffice/press_releases/2013/01.aspx).

7. Certain claims of Ericsson's United States Patent Nos. 9,641,841, 10,142,659, 10,708,618, and 10,708,613 (collectively, the "Asserted Patents") are essential to the HEVC/H.265 Standard. Ericsson has been and remains prepared to grant a license on a worldwide, non-discriminatory basis and on reasonable terms and conditions to any essential claims of the Asserted Patents.

8. Ericsson offered Lenovo a license to Ericsson's HEVC/H.265 portfolio on October 11, 2023. To date, Lenovo has not accepted Ericsson's offer but that offer remains open for Lenovo to accept. None of the Lenovo Defendants are licensed to Ericsson's HEVC/H.265 portfolio. Lenovo cannot continue to benefit from its delay. Accordingly, Ericsson asks this Court to find Lenovo liable for infringing the Asserted Patents.

### **PARTIES**

9. Plaintiff Telefonaktiebolaget LM Ericsson ("Ericsson") is a corporation organized under the laws of the Kingdom of Sweden with its principal place of business at Torshamnsgatan 21, Kista, 164 83, Stockholm, Sweden. Telefonaktiebolaget LM Ericsson is the sole owner by assignment of all right, title, and interest in the Asserted Patents.

10. Defendant Lenovo (United States), Inc. (“Lenovo USA”) is a company organized under the laws of the Delaware, with its principal place of business at 8001 Development Drive, Morrisville, North Carolina 27560. Lenovo USA operates as a subsidiary of Lenovo Group.

11. Defendant Lenovo (Shanghai) Electronics Technology Co. Ltd. is a company organized under the laws of the People’s Republic of China, with its principal place of business at Section 304-305, Building No. 4, #222, Meiyue Road, China (Shanghai) Pilot Free Trade Zone, Shanghai, SAR, China, 200131. Lenovo (Shanghai) Electronics Technology Co. Ltd. operates as a subsidiary of Lenovo Group.

12. Defendant Lenovo Beijing Co., Ltd. is a company organized under the laws of the People’s Republic of China, with its principal place of business at Lenovo Building, 6 Chuangye Rd, Shangdi Haidian District, Beijing, SAR, China 100085. Lenovo Beijing, Ltd. operates as a subsidiary of Lenovo Group.

13. Defendant Lenovo Group, Ltd. (“Lenovo Group”) is a company organized under the laws of the People’s Republic of China, with its principal place of business at Lincoln House, 23rd Floor, Taikoo Place, 979 King’s Road, Quarry Bay, Hong Kong, SAR, China.

14. Defendant Lenovo PC HK Ltd. is a corporation operating under the laws of China with its principal place of business at 23<sup>rd</sup> Floor, Lincoln House Taikoo Place 979 King’s Road, Hong Kong, SAR, China. Lenovo PC HK Limited operates as a subsidiary of Lenovo Group.

15. Defendant Lenovo Information Products (Shenzhen) Co. Ltd. is a corporation operating under the laws of China with its principal place of business at Fuitan Trade Zone, ISH2 Building, No. 3 Guanglan Road Shenzhen, SAR, China 518038. Lenovo Information Products (Shenzhen) Co. Ltd. operates as a subsidiary of Lenovo Group.

16. Defendants design, manufacture, use, import into the United States, sell, and/or offer for sale in the United States computers and similar products and services (the “Accused Products”) that practice the HEVC Standard and infringe the Asserted Patents.

### **JURISDICTION AND VENUE**

17. This Court has subject matter jurisdiction under 28 U.S.C. §§ 1331 and/or 1338.

18. Venue is proper in this judicial district under 28 U.S.C. §1400. Lenovo USA maintains offices in North Carolina and this District, has employees in North Carolina, including senior executives, has committed acts of infringement in North Carolina and this District, and has argued that venue is proper in this District in prior patent infringement cases.<sup>1</sup>

19. This Court has general personal jurisdiction over Lenovo USA, which has its principal place of business in North Carolina. The Court also has specific personal jurisdiction over all Defendants. Defendants have continuous and systematic business contacts with the State of North Carolina that subject them to the personal jurisdiction of the Court. Defendants, directly or through subsidiaries or intermediaries (including distributors, retailers, and others), conduct their business extensively throughout the State of North Carolina and the Eastern District of North Carolina. Defendants purposefully and voluntarily placed the Accused Products into this District and into the stream of commerce with the intention and expectation that they will be purchased and used by consumers in this District. The Accused Products have been and continue to be purchased and used by consumers in this District.

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<sup>1</sup> *E.g., MyMail, Ltd. v. Motorola Mobility, LLC et al.*, 1:18-cv-00048-LY, Dkt. No. 22 at pp. 1, 11 (W.D. Tex.) (“If, however, this Court chooses, in lieu of dismissal, to transfer this case, Lenovo [] respectfully submit[s] that the Eastern District of North Carolina (EDNC), and specifically the Raleigh Division, is both a proper forum for this dispute and the most convenient forum. . . . Under the patent venue statute, the Eastern District of North Carolina is a proper venue for [] Lenovo. See 28 U.S.C. § 1400.”)

20. Defendants committed acts of patent infringement within the State of North Carolina and, more particularly, within the Eastern District of North Carolina. Jurisdiction over Lenovo USA is also proper because they have voluntarily submitted themselves to the jurisdiction of the courts by commencing litigations within the State of North Carolina, by registering with the North Carolina Secretary of State's Office to do business in the State of North Carolina, and/or by appointing a registered agent.

21. All Defendants are part of the same corporate structure and distribution chain for making, importing, offering to sell, selling, and/or using the Accused Products, including in the State of North Carolina generally and this District in particular. The Defendants share the same management, common ownership, advertising platforms, facilities, distribution chains and platforms, and accused product lines and products involving related technologies. Thus, they operate as a unitary business venture.

22. Lenovo USA also engaged in negotiations over a license to Ericsson's patents from North Carolina and this District and purposefully and intentionally created continuous and systematic business contacts in North Carolina and this District regarding licensing negotiations with Ericsson. When Ericsson contacted Lenovo Group in 2010 regarding Lenovo Group's need to take a license to Ericsson's patents, Lenovo Group directed Ericsson to Lenovo USA and appointed employees of Lenovo USA based in North Carolina and this District to negotiate on behalf of Lenovo. When Lenovo USA continued to stall negotiations, Ericsson reached out again and requested to negotiate directly with Lenovo Group. Lenovo Group employees agreed to meet but insisted that employees of Lenovo USA based in North Carolina and this District also participate in the negotiations. After the meeting with Lenovo Group and Lenovo USA, employees of Lenovo USA continued to negotiate with Ericsson. Thus, Lenovo Group appointed Lenovo

USA and Lenovo USA's employees to negotiate a license on Lenovo Group's behalf, including employees from North Carolina and this District.

### **FACTUAL BACKGROUND**

#### **A. International Telecommunications Union's ("ITU") RAND Obligation**

23. The ITU is an SDO that publishes the HEVC/H.265 standard. The ITU was formed in 1865 at the International Telegraph Convention and, in 1947, became a specialized agency of the United Nations, responsible for issues that concern information and communication technologies. The ITU handles a number of different matters and thus is organized into various sectors. One of the sectors is Telecommunication Standardization or "ITU-T." The mission of ITU-T is to ensure efficient and timely production of standards related to the field of telecommunications. The standards developed by ITU-T are referred to as "Recommendations."

24. Within ITU-T, members come together in various teams or groups to propose and contribute innovative technology that best meets the aims of the organization and its members and draft the Recommendations. A goal of ITU-T is to draft Recommendations that incorporate the best available technology to ensure that the standards are the highest possible quality. The HEVC/H.265 standard is explicitly detailed in the H.265 Recommendation.

25. As it searches for the best available technical solutions, the ITU considers that many parts of its standards will be covered by claims in patents owned by members and third parties. To assist with the usage of patented technologies in standardized communication protocols, the ITU adopted a Common Patent Policy which states that "a patent embodied fully or partly in a Recommendation | Deliverable must be accessible to everybody without undue constraints." This patent policy applies to the ITU and ITU-T.

26. The ITU published Patent Guidelines that define the term "Patent," as used in the Common Patent Policy, to be:

those claims contained in and identified by patents, utility models and other similar statutory rights based on inventions (including applications for any of these) solely to the extent that any such claims are essential to the implementation of a Recommendation | Deliverable. Essential patents are patents that would be required to implement a specific Recommendation | Deliverable

Ex. 1 (ITU Patent Guidelines) at 2.

27. The definition of “Patent” provided by the Guidelines is also applicable to the Patent Statement and Licensing Declaration Form, which is prepared by each patent holder when declaring to HEVC/H.265. The ITU thus deems “essential” only patent claims that are required for implementation of a specific Recommendation.

28. Ericsson voluntarily and publicly committed that it is prepared to grant licenses under its portfolio of patents to claims that are essential to practice the HEVC/H.265 standard on a non-discriminatory basis and on reasonable terms and conditions (“RAND”).

29. In accordance with the Common Patent Policy set by the ITU, on February 15, 2013, Ericsson timely submitted a Patent Statement and Licensing Declaration to ITU in which it declared that it is “prepared to grant a license to an unrestricted number of applicants on a worldwide, non-discriminatory basis and on reasonable terms and conditions to make, use, and sell implementations” of the HEVC/H.265 Standard. Ericsson conditioned its RAND commitment upon reciprocity, as expressly permitted by the ITU’s Patent Statement and Licensing Declaration form and Guidelines for Implementation of the Common Patent Policy.

**B. Ericsson’s Compliance with Its RAND Commitments**

30. Ericsson has voluntarily and publicly committed that it is prepared to grant licenses to the claims of its portfolio of patents that are essential to practice the HEVC/H.265 standard on a worldwide, non-discriminatory basis and on RAND terms and conditions.

31. In accordance with the Common Patent Policy set by the ITU, on February 15, 2013, Ericsson declared to the ITU that it is “prepared to grant a license to an unrestricted number

of applicants on a worldwide, non-discriminatory basis and on reasonable terms and conditions to make, use, and sell implementations” of the HEVC/H.265 Standard. *See* Ex. 2 (Ericsson’s HEVC Declaration) at 1-2.

32. Certain claims of the Asserted Patents are essential to the HEVC/H.265 Standard, and Ericsson has been and remains prepared to grant a license on a worldwide, non-discriminatory basis and on RAND terms and conditions to any essential claims of the Asserted Patents.

33. Ericsson has widely licensed its portfolio of HEVC/H.265 Patents in dozens of agreements with members of the telecommunications industry who have agreed to pay royalties to Ericsson for a global portfolio license.

34. Ericsson has negotiated in good faith and made substantial efforts to enter into a license agreement for its HEVC/H.265 Standard Essential Patent claims with Lenovo on a worldwide, non-discriminatory basis and on RAND terms and conditions, as proven by Ericsson’s conduct in overall licensing negotiations. Ericsson, negotiating on behalf of its affiliates, and Lenovo USA, negotiating on behalf of Lenovo, have been in licensing negotiations for over a decade, yet Lenovo has continued to delay. Its most recent delay tactic has been to drag out negotiations over the terms of an NDA for years.

35. In a final attempt to negotiate in good faith with Lenovo, Ericsson offered Lenovo a license to Ericsson’s HEVC/H.265 portfolio on October 11, 2023. To date, Lenovo has not accepted Ericsson’s offer but that offer remains open for Lenovo to accept. None of the Lenovo parties are licensed to Ericsson’s HEVC/H.265 portfolio.

36. In sum, consistent with its commitment to ITU, Ericsson has sought in good faith to reach a RAND-compliant license agreement with Lenovo. Ericsson’s efforts have failed because Lenovo has not agreed to enter into a license on RAND terms.

37. Ericsson has complied with its RAND commitment and all applicable laws, and is entitled to assert the claims and seek the relief requested herein.

### **THE ERICSSON ASSERTED PATENTS**

#### **A. The '841 Patent**

38. United States Patent No. 9,641,841 (the "'841 Patent") is titled "Deblocking filtering control" and issued on May 2, 2017. The '841 Patent expires on November 15, 2033, is based on United States Patent Application No. 14/001,627 filed on Dec. 16, 2011, and claims priority United States Provisional Patent Application No. 61/447,862 filed on March 1, 2011. A true and correct copy of the '841 Patent is attached as Ex. 3.

39. Ericsson owns, by assignment, all right, title, and interest in and to the '841 Patent. The inventors of the '841 Patent, Andrey Norkin, Rickard Sjöberg, and Kenneth Andersson, assigned their rights in the '841 Patent to Ericsson on December 19, 2011. Ericsson subsequently assigned all rights to Ericsson LLC on Aug. 15, 2018, who then assigned their rights in the '841 Patent to Velos Media, LLC, also on Aug. 15, 2018. Velos Media, LLC then assigned all rights in the '841 Patent back to Ericsson LLC on July 27, 2021. Ericsson LLC assigned its rights in the '841 Patent back to Ericsson July 28, 2021.

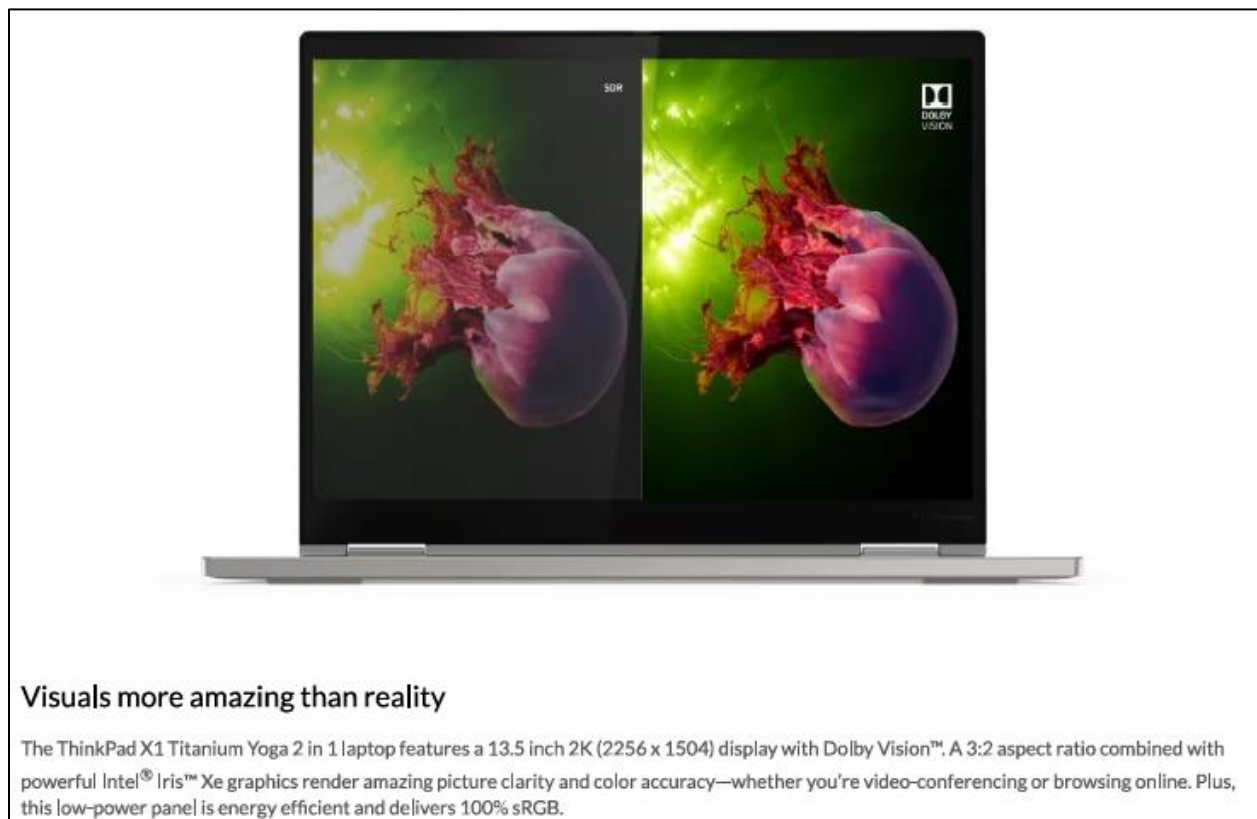
40. Independent coding of blocks in a video coding scheme creates discontinuities at block boundaries reducing the subjective quality of the video resulting from the decoded bitstream. To reduce these blocking artifacts, a deblocking filter can be applied. Prior to the '841 Patent, deblocking filtering in HEVC was applied to both sides of the block boundary without taking into account that the structure on one side of the block boundary can be different and require a different amount of filtering than the other side.

41. The '841 Patent relates to an improvement for independent filtering on either side of a block boundary. The '841 Patent discloses, for example, an improved method for deblocking

filtering. For example, the '841 Patent recites determining whether to filter pixels on each side of a block boundary using separate equations for each side (*e.g.*,  $|p2_i - 2p1_i + p0_i|$  and  $|q2_i - 2q1_i + q0_i|$ ). The functionality recited in the '841 Patent has been incorporated into the H.265/HEVC standard.

42. On information and belief, Lenovo directly infringes at least Claims 1-3, 5-7, 9-11, and 14-16 of the '841 Patent through its manufacture, sale for importation, importation, use (including testing), and sale after importation of the Accused Products.

43. As just one example of Lenovo's infringement, Lenovo manufactures and sells computers that practice the HEVC Standard. An example of a Lenovo Accused Product is the Lenovo ThinkPad X1, which Lenovo advertises and encourages end users to decode HEVC/H.265 video:



Ex. 4 (Lenovo ThinkPad X1 Datasheet) at 3.

44. Lenovo knowingly and intentionally induces users of its Accused Products to directly infringe one or more claims of the '841 Patent by encouraging, instructing, and aiding one or more persons in the United States to make, use (including through testing), sell, import, or offer to sell one or more of the Accused Products in a manner that infringes the '841 Patent.

45. For example, as seen in the exemplary advertisement above, Lenovo advertises the Lenovo ThinkPad X1 so that consumers will purchase and use the products, thus inducing those customers to infringe the '841 Patent. On information and belief, Lenovo advertises all of the Accused Products and thus induces infringement of the '841 Patent.

46. On information and belief, Lenovo was aware of the '841 Patent and/or acted with willful blindness as to the existence of the '841 Patent at least as a result of prior notice of Ericsson's HEVC patents and/or the filing of this Complaint. On April 5, 2022, Ericsson sent HEVC patent lists, notifying Lenovo of patents that cover equipment such as Lenovo's laptop computers and PCs. Ericsson disclosed the '841 Patent to Lenovo as a patent covering Lenovo's equipment "such as Lenovo's ... laptop computers [and] PCs."

47. On information and belief, Lenovo contributes to the infringement of one or more claims of the '841 Patent by offering to sell or selling and/or importing a patented component or material and/or apparatus used to practice a patented process, constituting a material part of the inventions, knowing the same to be especially made or especially adapted for use in an infringement and not a staple article or commodity of commerce suitable for substantial non-infringing use.

48. A claim chart that applies each of the asserted independent claims of the '841 Patent to the Accused Products is attached as Ex. 5.

## **B. The '659 Patent**

49. United States Patent No. 10,142,659 (the “'659 Patent”) is titled “Deblocking filtering” and issued on Nov. 27, 2018. The '659 Patent expires on Oct. 6, 2031, and is based on United States Patent Application No. 15/639,229 filed on June 30, 2017, and claims priority to International Patent Application No. PCT/SE2011/051199 filed on Oct. 6, 2011, and United States Provisional Patent Application No. 61/432,751 filed on Jan. 14, 2011. *See* Ex. 6 ('659 Patent).

50. Ericsson owns, by assignment, all right, title, and interest in and to the '659 Patent. Two inventors of the '659 Patent, Andrey Norkin and Rickard Sjöberg, assigned their rights in the '659 Patent to Ericsson on Oct. 18, 2011. The third inventor of the '659 Patent, Kenneth Andersson, assigned his rights in the '659 Patent to Ericsson on Oct. 19, 2011. Ericsson subsequently assigned all rights to Ericsson LLC on Aug. 15, 2018. Ericsson LLC then assigned their rights in the '659 Patent to Velos Media, LLC, also on Aug. 15, 2018. Velos Media, LLC then assigned all rights in the '659 Patent back to Ericsson LLC on July 27, 2021, with Ericsson LLC assigning their rights in the '659 Patent back to Ericsson the next day on July 28, 2021.

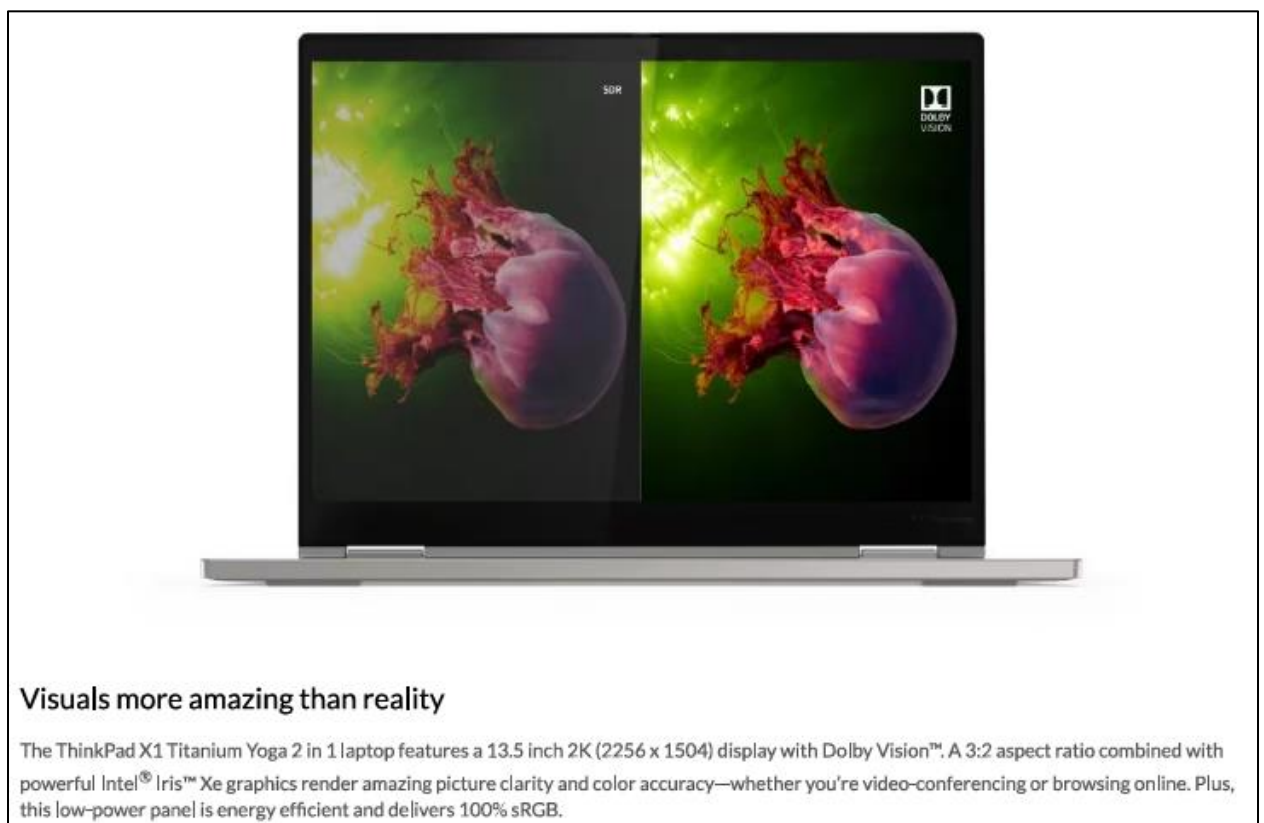
51. In previous video codecs such as AVC/H.264, two types of deblocking filters were used: “normal” filtering and “strong” filtering. For normal filtering, values based on quantization parameters were used to modify block boundary pixels. In early versions of HEVC/H.265, the weak or normal filtering was changed to require computing an offset to modify the pixel values closest to the block boundary, and then dividing that offset by two to calculate additional modified pixel values farther away from the block boundary.

52. The '659 Patent relates to an improved deblocking filter that has good lowpass characteristics and can remove high frequencies that can appear near the block boundary. As an example, the '659 Patent describes calculating a specific offset and using that offset to modify pixels near the block boundary. The specific equation recited in the '659 patent for calculating the

offset is  $(9 \times (q_0 - p_0) - 3 \times (q_1 - p_1) + 8) \gg 4$ . The functionality recited in the '659 Patent has been incorporated into the H.265/HEVC standard.

53. On information and belief, Lenovo directly infringes at least Claims 1-7 and 10-16 of the '659 Patent through its manufacture, sale for importation, importation, use (including testing), and sale after importation of the Accused Products.

54. As just one example of Lenovo's infringement, Lenovo manufactures and sells computers that practice the HEVC Standard. An example of a Lenovo Accused Product is the Lenovo ThinkPad X1, which Lenovo advertises and encourages end users to decode HEVC/H.265 video:



Ex. 4 (Lenovo ThinkPad X1 Datasheet) at 3.

55. Lenovo knowingly and intentionally induces users of its Accused Products to directly infringe one or more claims of the '659 Patent by encouraging, instructing, and aiding one

or more persons in the United States to make, use (including through testing), sell, import, or offer to sell one or more of the Accused Products in a manner that infringes the '659 Patent.

56. For example, as seen in the exemplary advertisement above, Lenovo advertises the Lenovo ThinkPad X1 so that consumers will purchase and use the products, thus inducing those customers to infringe the '659 Patent. On information and belief, Lenovo advertises all of the Accused Products and thus induces infringement of the '659 Patent.

57. On information and belief, Lenovo was aware of the '659 Patent and/or acted with willful blindness as to the existence of the '659 Patent at least as a result of prior notice of Ericsson's HEVC patents and/or of the filing of this Complaint. On April 5, 2022, Ericsson sent HEVC patent lists, notifying Lenovo of patents that cover equipment such as Lenovo's laptop computers and PCs. Ericsson disclosed the '659 Patent to Lenovo as a patent covering Lenovo's equipment "such as Lenovo's ... laptop computers [and] PCs."

58. On information and belief, Lenovo contributes to the infringement of one or more claims of the '659 Patent by offering to sell or selling and/or importing a patented component or material and/or apparatus used to practice a patented process, constituting a material part of the inventions, knowing the same to be especially made or especially adapted for use in an infringement and not a staple article or commodity of commerce suitable for substantial non-infringing use.

59. A claim chart that applies each of the asserted independent claims of the '659 Patent to the Accused Products is attached as Ex. 7.

### **C. The '618 Patent**

60. United States Patent No. 10,708,618 (the "'618 Patent") is titled "Reference picture signaling" and issued on July 7, 2020. The '618 Patent expires on Apr. 26, 2032, and is based on United States Patent Application No. 16/440,274 filed on June 13, 2019, and claims priority to

International Patent Application No. PCT/SE2012/050439 filed on Apr. 26, 2012, and United States Provisional Patent Application No. 61/503,019 filed on June 30, 2011. *See* Ex. 8 ('618 Patent).

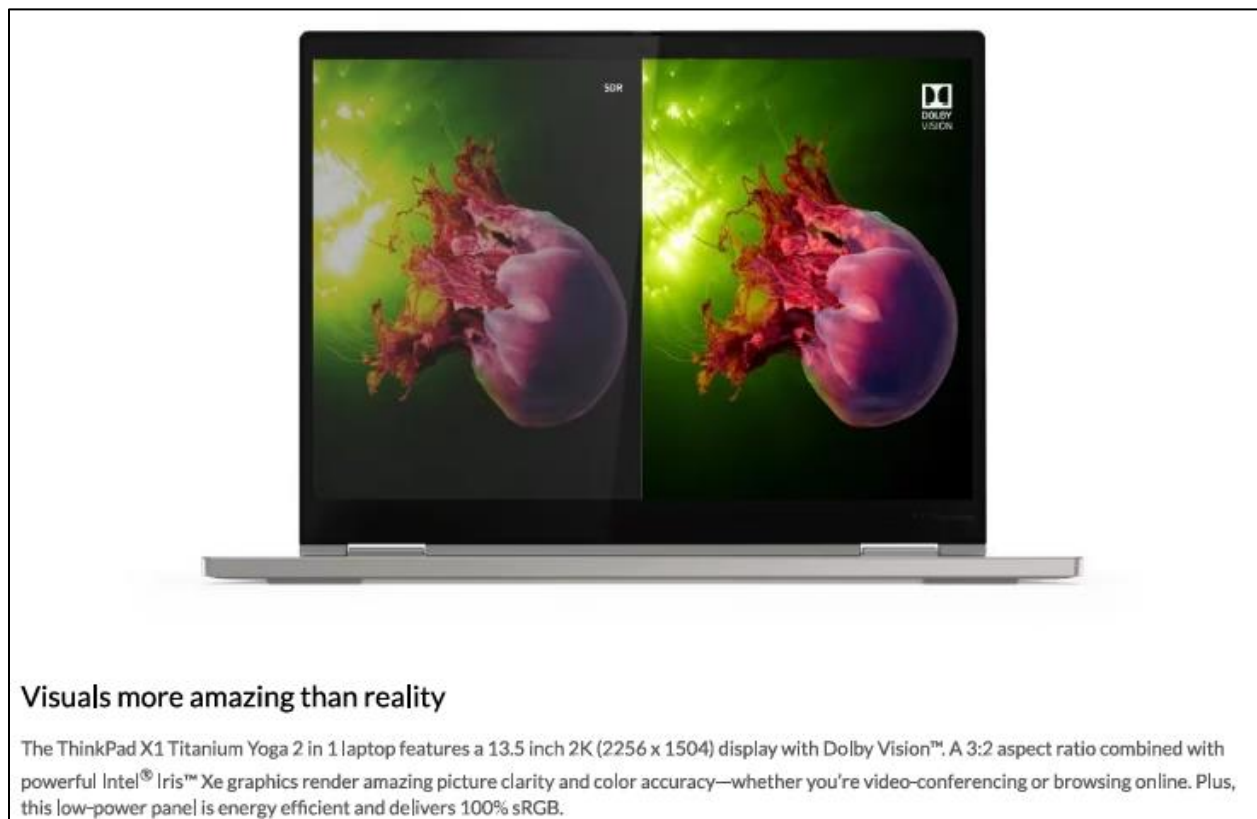
61. Ericsson owns, by assignment, all right, title, and interest in and to the '618 Patent. The two inventors of the '618 Patent, Jonatan Samuelsson and Rickard Sjöberg, assigned their rights in the '618 Patent to Ericsson on April 26, 2012.

62. In AVC/H.264 and previous versions of HEVC/H.265, reference pictures for updating the decoded picture buffer were signaled to the decoder through a sliding window process, or Memory Management Control Operations (MMCO) commands. The decoder was responsible for applying these operations and keeping track of which reference pictures could be used for reference. A problem with these prior art reference picture signaling schemes was that, if pictures were lost, the decoding process could be negatively affected by "incorrect" sliding window processes based on the missing pictures or having an incorrect number of reference pictures in the decoded picture buffer depending on the type of MMCO within the missing pictures.

63. The '618 Patent relates to an improved method for signaling reference pictures. The '618 Patent discloses, for example, including buffer description information defining a plurality of reference pictures in an encoded representation of the pictures. This buffer description information is then used to determine reference picture identifiers, which can then be used to update the decoded picture buffer. The functionality recited in the '618 Patent has been incorporated into the H.265/HEVC standard.

64. On information and belief, Lenovo directly infringes at least Claims 1-19 of the '618 Patent through its manufacture, sale for importation, importation, use (including testing), and sale after importation of the Accused Products.

65. As just one example of Lenovo's infringement, Lenovo manufactures and sells computers that practice the HEVC Standard. An example of a Lenovo Accused Product is the Lenovo ThinkPad X1, which Lenovo advertises and encourages end users to decode HEVC/H.265 video:



Ex. 4 (Lenovo ThinkPad X1 Datasheet) at 3.

66. Lenovo knowingly and intentionally induces users of its Accused Products to directly infringe one or more claims of the '618 Patent by encouraging, instructing, and aiding one or more persons in the United States to make, use (including through testing), sell, import, or offer to sell one or more of the Accused Products in a manner that infringes the '618 Patent.

67. For example, as seen in the exemplary advertisement above, Lenovo advertises the Lenovo ThinkPad X1 so that consumers will purchase and use the products, thus inducing those

customers to infringe the '618 Patent. On information and belief, Lenovo advertises all of the Accused Products and thus induces infringement of the '618 Patent.

68. On information and belief, Lenovo was aware of the '618 Patent and/or acted with willful blindness as to the existence of the '618 Patent at least as a result of prior notice of Ericsson's HEVC patents and/or the filing of this Complaint. On April 5, 2022, Ericsson sent HEVC patent lists, notifying Lenovo of patents that cover equipment such as Lenovo's laptop computers and PCs. Ericsson disclosed the '618 Patent to Lenovo as a patent covering Lenovo's equipment "such as Lenovo's ... laptop computers [and] PCs."

69. On information and belief, Lenovo contributes to the infringement of one or more claims of the '618 Patent by offering to sell or selling and/or importing a patented component or material and/or apparatus used to practice a patented process, constituting a material part of the inventions, knowing the same to be especially made or especially adapted for use in an infringement and not a staple article or commodity of commerce suitable for substantial non-infringing use.

70. A claim chart that applies each of the asserted independent claims of the '618 Patent to the Accused Products is attached as Ex. 9.

#### **D. The '613 Patent**

71. United States Patent No. 10,708,613 (the "'613 Patent") is titled "Encoder and decoder and methods thereof for encoding/decoding a picture of a video sequence" and issued on July 7, 2020. The '613 Patent expires on December 12, 2032, and is based on United States Patent Application No. 15/628,005 filed on Jun. 20, 2017, and claims priority to International Patent Application No. PCT/SE2012/051140 filed on Oct. 23, 2012, and United States Provisional Patent Application No. 61/550,646, filed on October 24, 2011. *See* Ex. 10 ('613 Patent).

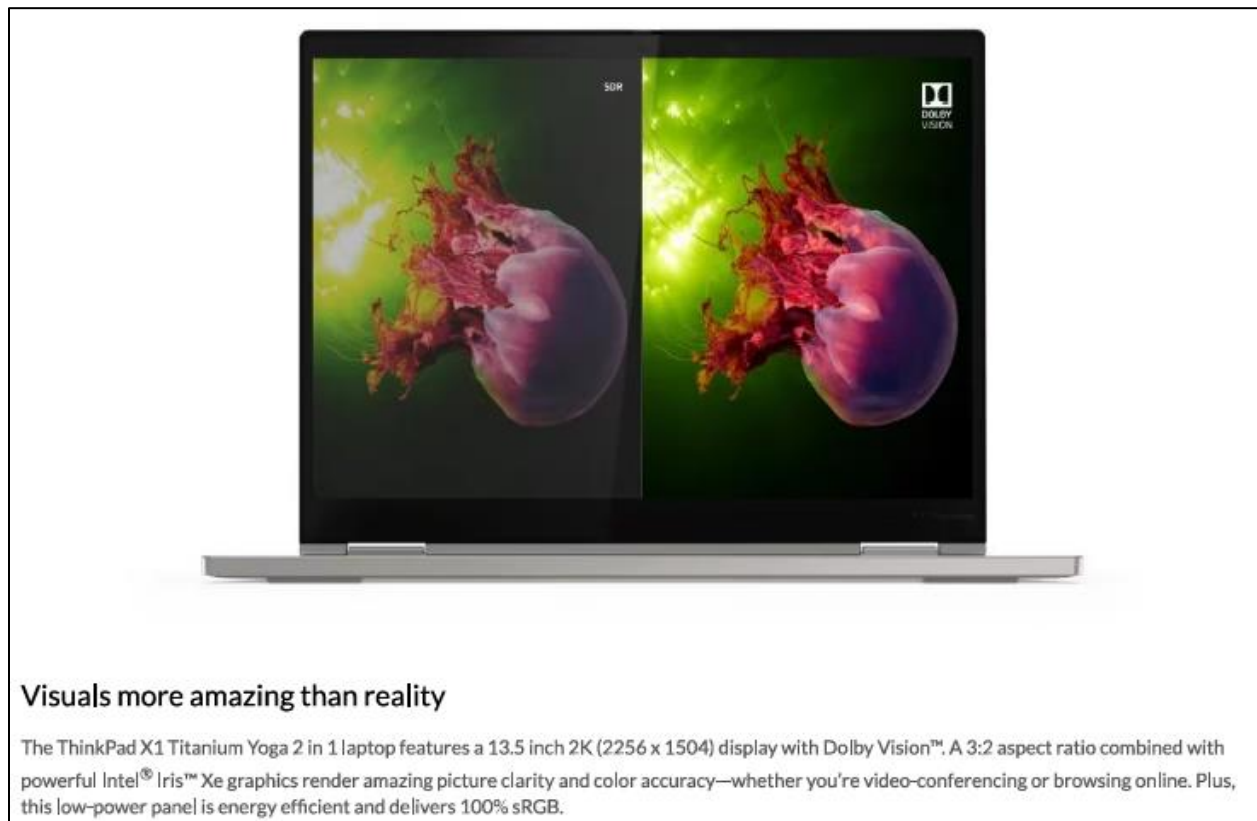
72. Ericsson owns, by assignment, all right, title, and interest in and to the '613 Patent. The inventors of the '613 Patent, Jonatan Samuelsson and Rickard Sjöberg, assigned their rights in the '613 Patent to Ericsson on November 6, 2012, and October 31, 2012, respectively. Ericsson subsequently assigned all rights to Ericsson LLC on May 7, 2018, who then assigned its rights in the '613 Patent to Velos Media, LLC, also on May 7, 2018. Velos Media, LLC then assigned all rights in the '613 Patent back to Ericsson LLC on July 27, 2021. Ericsson LLC assigned its rights in the '613 Patent back to Ericsson July 28, 2021.

73. The '613 Patent also relates to an improved reference picture handling for use in encoding and decoding of a video sequence. For example, the '613 Patent describes decoding a plurality of Picture Order Count (POC) values from a slice header. The '613 Patent then describes using these POC values to update whether a picture in the decoded picture buffer should be included in a long-term reference set or short-term reference set. The '613 Patent then describes updating the decoded pictures buffer to mark all pictures that were not included in the long-term reference set or short-term reference set as unused for reference. The decoded picture buffer is then used in decoding a video sequence. This improved maintenance of reference pictures improves the reliability and performance of the video coding process. The functionality recited in the '613 Patent has been incorporated into the H.265/HEVC standard.

74. On information and belief, Lenovo directly infringes at least Claims 1-9 of the '613 Patent through its manufacture, sale for importation, importation, use (including testing), and sale after importation of the Accused Products.

75. As just one example of Lenovo's infringement, Lenovo manufactures and sells computers that practice the HEVC Standard. An example of a Lenovo Accused Product is the

Lenovo ThinkPad X1, which Lenovo advertises and encourages end users to decode HEVC/H.265 video:



Ex. 4 (Lenovo ThinkPad X1 Datasheet) at 3.

76. Lenovo knowingly and intentionally induces users of its Accused Products to directly infringe one or more claims of the '613 Patent by encouraging, instructing, and aiding one or more persons in the United States to make, use (including through testing), sell, import, or offer to sell one or more of the Accused Products in a manner that infringes the '613 Patent.

77. For example, as seen in the exemplary advertisement above, Lenovo advertises the Lenovo ThinkPad X1 so that consumers will purchase and use the products, thus inducing those customers to infringe the '613 Patent. On information and belief, Lenovo advertises all of the Accused Products and thus induces infringement of the '613 Patent.

78. On information and belief, Lenovo was aware of the '613 Patent and/or acted with willful blindness as to the existence of the '613 Patent at least as a result of prior notice of Ericsson's HEVC patents and/or the filing of this Complaint. On April 5, 2022, Ericsson sent HEVC patent lists, notifying Lenovo of patents that cover equipment such as Lenovo's laptop computers and PCs. Ericsson disclosed the '613 Patent to Lenovo as a patent covering Lenovo's equipment "such as Lenovo's ... laptop computers [and] PCs."

79. On information and belief, Lenovo contributes to the infringement of one or more claims of the '613 Patent by offering to sell or selling and/or importing a patented component or material and/or apparatus used to practice a patented process, constituting a material part of the inventions, knowing the same to be especially made or especially adapted for use in an infringement and not a staple article or commodity of commerce suitable for substantial non-infringing use.

80. A claim chart that applies each of the asserted independent claims of the '613 Patent to the Accused Products is attached as Ex. 11.

**COUNT I: INFRINGEMENT OF U.S. PATENT NO. 9,641,841**

81. Ericsson incorporates by reference the preceding paragraphs as though fully set forth herein.

82. Lenovo infringes, contributes to the infringement of, and/or induces infringement of the '841 Patent by making, using, selling, offering for sale, and/or importing into the United States products and/or methods covered by claims of the '841 Patent.

83. Lenovo has been and is directly infringing and/or indirectly infringing the claims of the '841 Patent by way of inducement and/or contributory infringement, literally and/or under the Doctrine of Equivalents, in violation of 35 U.S.C. § 271, including by making, using, testing,

selling, consigning, importing into the United States, distributing within the United States, and/or exporting the Accused Products.

84. Lenovo makes, uses, sells, offers for sale, and/or imports the Accused Products in this District and elsewhere in the United States, and thus directly infringes the '841 Patent.

85. Lenovo has knowledge and notice of the '841 Patent at least as of April 5, 2022, and/or the filing of this Complaint. As explained above, Ericsson notified Lenovo on April 5, 2022, that the patent family containing the '841 Patent was relevant to HEVC and covered Lenovo's equipment "such as Lenovo's... laptop computers [and] PCs."

86. Lenovo indirectly infringes the '841 Patent, as provided in 35 U.S.C. § 271(b), by inducing infringement by others, such as customers and end-users, in this District and elsewhere in the United States. For example, Lenovo's customers and end-users directly infringe through their use of the inventions claimed in the '841 Patent. Lenovo induces this direct infringement through its affirmative acts of manufacturing, selling, distributing, and/or otherwise making available the Accused Products, and providing instructions, documentation, and other information to customers and end-users suggesting they use the Accused Products in an infringing manner, including in-store technical support, online technical support, marketing, product manuals, advertisements, and online documentation. As a result of Lenovo's inducement, Lenovo's customers and end-users use the Accused Products in the way Lenovo intends and directly infringe the '841 Patent. Lenovo has performed and continues to perform these affirmative acts with knowledge of the '841 Patent and with the intent, or willful blindness, that the induced acts directly infringe the '841 Patent.

87. Lenovo also indirectly infringes the '841 Patent, as provided by 35 U.S.C. § 271(c), by contributing to direct infringement committed by others, such as customers and end-users, in

this District and elsewhere in the United States. Lenovo's affirmative acts of selling and offering to sell, in this District and elsewhere in the United States, the Accused Products and causing the Accused Products to be manufactured, used, sold, and offered for sale contribute to customers' and end-users' use of the Accused Products, such that the '841 Patent is directly infringed. The accused components within the Accused Products are material to the invention of the '841 Patent, are not staple articles or commodities of commerce, have no substantial non-infringing uses, and are known by Lenovo to be especially made or especially adapted for use in infringement of the '841 Patent. Lenovo has performed and continues to perform these affirmative acts with knowledge of the '841 Patent and with intent, or willful blindness, that they cause the direct infringement of the '841 Patent.

88. Lenovo has known of the existence of the '841 Patent, and its acts of infringement have been willful and in disregard for the '841 Patent, without any reasonable basis for believing that it had a right to engage in the infringing conduct. Lenovo was aware of the '841 Patent at least as a result of Ericsson's April 5, 2022, notification.

89. On information and belief, Lenovo derives revenue, directly and indirectly, from the activities relating to the Accused Products, including their importation, testing, manufacture, use, sale, and offer for sale.

90. Lenovo's infringement of the '841 Patent has damaged and will continue to damage Ericsson.

91. Ericsson is entitled to damages in an amount that will fully compensate Ericsson for Lenovo's infringement of the '841 Patent, such damages not to be limited by RAND due to Lenovo's conduct as an unwilling licensee and Lenovo's failure to reciprocate.

**COUNT II: INFRINGEMENT OF U.S. PATENT NO. 10,142,659**

92. Ericsson incorporates by reference the preceding paragraphs as though fully set forth herein.

93. Lenovo infringes, contributes to the infringement of, and/or induces infringement of the '659 Patent by making, using, selling, offering for sale, and/or importing into the United States products and/or methods covered by claims of the '659 Patent.

94. Lenovo has been and is directly infringing and/or indirectly infringing the claims of the '659 Patent by way of inducement and/or contributory infringement, literally and/or under the Doctrine of Equivalents, in violation of 35 U.S.C. § 271, including by making, using, testing, selling, consigning, importing into the United States, distributing within the United States, and/or exporting the Accused Products.

95. Lenovo makes, uses, sells, offers for sale, and/or imports the Accused Products in this District and elsewhere in the United States, and thus directly infringes the '659 Patent.

96. Lenovo has knowledge and notice of the '659 Patent at least as of April 5, 2022, and/or the filing of this Complaint. As explained above, Ericsson notified Lenovo on April 5, 2022, that the patent family containing the '659 Patent was relevant to HEVC and covered Lenovo's equipment "such as Lenovo's... laptop computers [and] PCs."

97. Lenovo indirectly infringes the '659 Patent, as provided in 35 U.S.C. § 271(b), by inducing infringement by others, such as customers and end-users, in this District and elsewhere in the United States. For example, Lenovo's customers and end-users directly infringe through their use of the inventions claimed in the '659 Patent. Lenovo induces this direct infringement through its affirmative acts of manufacturing, selling, distributing, and/or otherwise making available the Accused Products, and providing instructions, documentation, and other information to customers and end-users suggesting they use the Accused Products in an infringing manner,

including in-store technical support, online technical support, marketing, product manuals, advertisements, and online documentation. As a result of Lenovo's inducement, Lenovo's customers and end-users use the Accused Products in the way Lenovo intends and directly infringe the '659 Patent. Lenovo has performed and continues to perform these affirmative acts with knowledge of the '659 Patent and with the intent, or willful blindness, that the induced acts directly infringe the '659 Patent.

98. Lenovo also indirectly infringes the '659 Patent, as provided by 35 U.S.C. § 271(c), by contributing to direct infringement committed by others, such as customers and end-users, in this District and elsewhere in the United States. Lenovo's affirmative acts of selling and offering to sell, in this District and elsewhere in the United States, the Accused Products and causing the Accused Products to be manufactured, used, sold, and offered for sale contribute to customers' and end-users' use of the Accused Products, such that the '659 Patent is directly infringed. The accused components within the Accused Products are material to the invention of the '659 Patent, are not staple articles or commodities of commerce, have no substantial non-infringing uses, and are known by Lenovo to be especially made or especially adapted for use in infringement of the '659 Patent. Lenovo has performed and continues to perform these affirmative acts with knowledge of the '659 Patent and with intent, or willful blindness, that they cause the direct infringement of the '659 Patent.

99. Lenovo has known of the existence of the '659 Patent, and its acts of infringement have been willful and in disregard for the '659 Patent, without any reasonable basis for believing that it had a right to engage in the infringing conduct. Lenovo was aware of the '659 Patent at least as a result of Ericsson's April 5, 2022, notification.

100. On information and belief, Lenovo derives revenue, directly and indirectly, from the activities relating to the Accused Products, including their importation, testing, manufacture, use, sale, and offer for sale.

101. Lenovo's infringement of the '659 Patent has damaged and will continue to damage Ericsson.

102. Ericsson is entitled to damages in an amount that will fully compensate Ericsson for Lenovo's infringement of the '659 Patent, such damages not to be limited by RAND due to Lenovo's conduct as an unwilling licensee and Lenovo's failure to reciprocate.

**COUNT III: INFRINGEMENT OF U.S. PATENT NO. 10,708,618**

103. Ericsson incorporates by reference the preceding paragraphs as though fully set forth herein.

104. Lenovo infringes, contributes to the infringement of, and/or induces infringement of the '618 Patent by making, using, selling, offering for sale, and/or importing into the United States products and/or methods covered by claims of the '618 Patent.

105. Lenovo has been and is directly infringing and/or indirectly infringing the claims of the '618 Patent by way of inducement and/or contributory infringement, literally and/or under the Doctrine of Equivalents, in violation of 35 U.S.C. § 271, including by making, using, testing, selling, consigning, importing into the United States, distributing within the United States, and/or exporting the Accused Products.

106. Lenovo makes, uses, sells, offers for sale, and/or imports the Accused Products in this District and elsewhere in the United States, and thus directly infringes the '618 Patent.

107. Lenovo has knowledge and notice of the '618 Patent at least as of April 5, 2022, and/or the filing of this Complaint. As explained above, Ericsson notified Lenovo on April 5, 2022,

that the patent family containing the '618 Patent was relevant to HEVC and covered Lenovo's equipment "such as Lenovo's... laptop computers [and] PCs."

108. Lenovo indirectly infringes the '618 Patent, as provided in 35 U.S.C. § 271(b), by inducing infringement by others, such as customers and end-users, in this District and elsewhere in the United States. For example, Lenovo's customers and end-users directly infringe through their use of the inventions claimed in the '618 Patent. Lenovo induces this direct infringement through its affirmative acts of manufacturing, selling, distributing, and/or otherwise making available the Accused Products, and providing instructions, documentation, and other information to customers and end-users suggesting they use the Accused Products in an infringing manner, including in-store technical support, online technical support, marketing, product manuals, advertisements, and online documentation. As a result of Lenovo's inducement, Lenovo's customers and end-users use the Accused Products in the way Lenovo intends and directly infringe the '618 Patent. Lenovo has performed and continues to perform these affirmative acts with knowledge of the '618 Patent and with the intent, or willful blindness, that the induced acts directly infringe the '618 Patent.

109. Lenovo also indirectly infringes the '618 Patent, as provided by 35 U.S.C. § 271(c), by contributing to direct infringement committed by others, such as customers and end-users, in this District and elsewhere in the United States. Lenovo's affirmative acts of selling and offering to sell, in this District and elsewhere in the United States, the Accused Products and causing the Accused Products to be manufactured, used, sold, and offered for sale contribute to customers' and end-users' use of the Accused Products, such that the '618 Patent is directly infringed. The accused components within the Accused Products are material to the invention of the '618 Patent, are not staple articles or commodities of commerce, have no substantial non-infringing uses, and

are known by Lenovo to be especially made or especially adapted for use in infringement of the '618 Patent. Lenovo has performed and continues to perform these affirmative acts with knowledge of the '618 Patent and with intent, or willful blindness, that they cause the direct infringement of the '618 Patent.

110. Lenovo has known of the existence of the '618 Patent, and its acts of infringement have been willful and in disregard for the '618 Patent, without any reasonable basis for believing that it had a right to engage in the infringing conduct. Lenovo was aware of the '618 Patent at least as a result of Ericsson's April 5, 2022, notification.

111. On information and belief, Lenovo derives revenue, directly and indirectly, from the activities relating to the Accused Products, including their importation, testing, manufacture, use, sale, and offer for sale.

112. Lenovo's infringement of the '618 Patent has damaged and will continue to damage Ericsson.

113. Ericsson is entitled to damages in an amount that will fully compensate Ericsson for Lenovo's infringement of the '618 Patent, such damages not to be limited by RAND due to Lenovo's conduct as an unwilling licensee and Lenovo's failure to reciprocate.

#### **COUNT IV: INFRINGEMENT OF U.S. PATENT NO. 10,708,613**

114. Ericsson incorporates by reference the preceding paragraphs as though fully set forth herein.

115. Lenovo infringes, contributes to the infringement of, and/or induces infringement of the '613 Patent by making, using, selling, offering for sale, and/or importing into the United States products and/or methods covered by claims of the '613 Patent.

116. Lenovo has been and is directly infringing and/or indirectly infringing the claims of the '613 Patent by way of inducement and/or contributory infringement, literally and/or under

the Doctrine of Equivalents, in violation of 35 U.S.C. § 271, including by making, using, testing, selling, consigning, importing into the United States, distributing within the United States, and/or exporting the Accused Products.

117. Lenovo makes, uses, sells, offers for sale, and/or imports the Accused Products in this District and elsewhere in the United States, and thus directly infringes the '613 Patent.

118. Lenovo has knowledge and notice of the '613 Patent at least as of April 5, 2022, and/or the filing of this Complaint. As explained above, Ericsson notified Lenovo on April 5, 2022, that the patent family containing the '613 Patent was relevant to HEVC and covered Lenovo's equipment "such as Lenovo's... laptop computers [and] PCs."

119. Lenovo indirectly infringes the '613 Patent, as provided in 35 U.S.C. § 271(b), by inducing infringement by others, such as customers and end-users, in this District and elsewhere in the United States. For example, Lenovo's customers and end-users directly infringe through their use of the inventions claimed in the '613 Patent. Lenovo induces this direct infringement through its affirmative acts of manufacturing, selling, distributing, and/or otherwise making available the Accused Products, and providing instructions, documentation, and other information to customers and end-users suggesting they use the Accused Products in an infringing manner, including in-store technical support, online technical support, marketing, product manuals, advertisements, and online documentation. As a result of Lenovo's inducement, Lenovo's customers and end-users use the Accused Products in the way Lenovo intends and directly infringe the '613 Patent. Lenovo has performed and continues to perform these affirmative acts with knowledge of the '613 Patent and with the intent, or willful blindness, that the induced acts directly infringe the '613 Patent.

120. Lenovo also indirectly infringes the '613 Patent, as provided by 35 U.S.C. § 271(c), by contributing to direct infringement committed by others, such as customers and end-users, in this District and elsewhere in the United States. Lenovo's affirmative acts of selling and offering to sell, in this District and elsewhere in the United States, the Accused Products and causing the Accused Products to be manufactured, used, sold, and offered for sale contribute to customers' and end-users' use of the Accused Products, such that the '613 Patent is directly infringed. The accused components within the Accused Products are material to the invention of the '613 Patent, are not staple articles or commodities of commerce, have no substantial non-infringing uses, and are known by Lenovo to be especially made or especially adapted for use in infringement of the '613 Patent. Lenovo has performed and continues to perform these affirmative acts with knowledge of the '613 Patent and with intent, or willful blindness, that they cause the direct infringement of the '613 Patent.

121. Lenovo has known of the existence of the '613 Patent, and its acts of infringement have been willful and in disregard for the '613 Patent, without any reasonable basis for believing that it had a right to engage in the infringing conduct. Lenovo was aware of the '613 Patent at least as a result of Ericsson's April 5, 2022, notification.

122. On information and belief, Lenovo derives revenue, directly and indirectly, from the activities relating to the Accused Products, including their importation, testing, manufacture, use, sale, and offer for sale.

123. Lenovo's infringement of the '613 Patent has damaged and will continue to damage Ericsson.

124. Ericsson is entitled to damages in an amount that will fully compensate Ericsson for Lenovo's infringement of the '613 Patent, such damages not to be limited by RAND due to Lenovo's conduct as an unwilling licensee and Lenovo's failure to reciprocate.

**DEMAND FOR JURY TRIAL**

125. Ericsson demands a jury trial for all issues so triable.

**PRAYER FOR RELIEF**

WHEREFORE, Ericsson respectfully requests that this Court enter judgment in its favor as follows and award Ericsson the following relief:

- (a) An entry of judgment holding Defendants infringed and are infringing the '841, '659, '818, and '613 Patents;
- (b) An award to Ericsson of such damages as it shall prove at trial against Defendants that are adequate to fully compensate Ericsson for Defendants' infringement of the '841, '659, '818, and '613 Patents, and such damages not to be limited by RAND due to Defendants' status as unwilling licensees and Defendants' failure to reciprocate;
- (c) Awarding enhanced damages pursuant to 35 U.S.C. § 284;
- (d) A finding that this case is "exceptional," and an award to Ericsson of its costs and reasonable attorneys' fees, as provided by 35 U.S.C. § 285;
- (e) An accounting of all infringing sales and revenues, together with post-judgment interest and pre-judgment interest from the first date of infringement of the '841, '659, '818, and '613 Patents;
- (f) An award to Ericsson of its costs;
- (g) Such further and other relief, in law or equity, to which Ericsson is entitled.

Dated: December 12, 2023.

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Respectfully submitted,

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**\*\*Local Civil Rule 83.1(e) Notices of  
Special Appearance Forthcoming**

**ATTORNEYS FOR PLAINTIFF  
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