**IN THE UNITED STATES DISTRICT COURT**
**FOR THE EASTERN DISTRICT OF TEXAS**
**MARSHALL DIVISION**

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| ADVANCED MICRO DEVICES, INC.; and ATI TECHNOLOGIES ULC<br><br>Plaintiffs,<br><br>v.<br><br>TCL INDUSTRIES HOLDINGS CO., LTD.; TCL INDUSTRIES HOLDINGS (H.K.) LIMITED; TCL ELECTRONICS HOLDINGS LIMITED; TCL TECHNOLOGY GROUP CORPORATION; TTE CORPORATION; TCL HOLDINGS (BVI) LIMITED; TCL KING ELECTRICAL APPLIANCES (HUIZHOU) CO. LTD.; SHENZHEN TCL NEW TECHNOLOGIES CO., LTD.; TCL MOKA INTERNATIONAL LIMITED; TCL SMART DEVICE (VIETNAM) CO., LTD; MANUFACTURAS AVANZADAS SA DE CV; TCL ELECTRONICS MEXICO, S DE RL DE CV; TCL OVERSEAS MARKETING LTD.; and REALTEK SEMICONDUCTOR CORP.<br><br>Defendants. | C.A. No.: 2:22-cv-00134<br><br>JURY TRIAL DEMANDED |

**COMPLAINT FOR PATENT INFRINGEMENT**

Plaintiffs Advanced Micro Devices, Inc. and ATI Technologies ULC (collectively, "AMD" or "Plaintiffs"), bring this action for patent infringement under 35 U.S.C. § 271 against Defendants TCL Industries Holdings Co. Ltd., TCL Industries Holdings (H.K.) Limited, TCL Electronics Holdings Limited, TCL Technology Group Corporation, TTE Corporation, TCL

Holdings (BVI) Limited, TCL King Electrical Appliances (Huizhou) Co. Ltd., Shenzhen TCL New Technologies Co., Ltd., TCL MOKA International Limited, and TCL Smart Device (Vietnam) Co., Ltd, Manufacturas Avanzadas SA de CV, TCL Electronics Mexico, S de RL de CV, and TCL Overseas Marketing Ltd. (together, "TCL"), and against Defendant Realtek Semiconductor Corp. ("Realtek") (TCL and Realtek together, "Defendants"). Plaintiffs allege as follows:

**Plaintiffs' Patented Technology**

1. Plaintiff Advanced Micro Devices, Inc. is a corporation organized and existing under the laws of the State of Delaware, and maintains its principal place of business at 2485 Augustine Drive, Santa Clara, California 95054. Plaintiff ATI Technologies ULC is incorporated in Canada and has a principal place of business at 1 Commerce Valley Drive East, Markham, Ontario L3T 7X6, Canada. Plaintiff ATI Technologies ULC is a wholly-owned indirect subsidiary of Plaintiff Advanced Micro Devices, Inc.

2. Advanced Micro Devices, Inc. was founded in 1969 as a Silicon Valley start-up, with a few dozen employees focused on leading-edge semiconductor products. ATI Technologies ULC began as a semiconductor technology corporation based in Markham, Ontario and with locations in Silicon Valley, specializing in the development of graphics processing units and chipsets. Since at least as early as 1985, ATI Technologies ULC has made substantial investments to research, develop, and have manufactured high quality graphics systems. On July 24, 2006, Advanced Micro Devices, Inc. and ATI Technologies ULC jointly announced that Advanced Micro Devices, Inc. would acquire ATI Technologies ULC in a deal valued at $5.4 billion.

3. From those modest beginnings, AMD has grown into a global company, achieving many important industry firsts, and today develops high-performance computing products to address some of the world's toughest challenges. As of December 25, 2021, AMD has

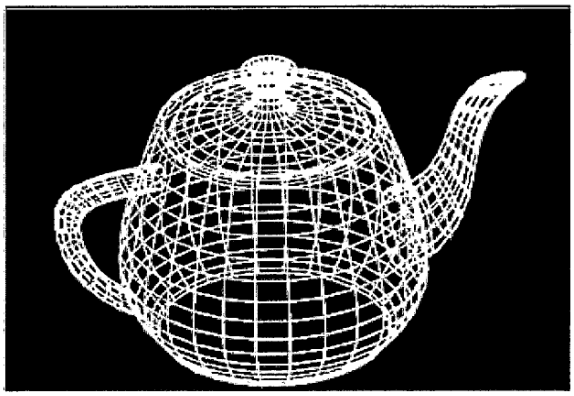
approximately 15,500 employees across the globe, as reported in AMD's annual report in February 2022.

4. The Asserted Patents stem from the research and design of innovative proprietary technology developed by AMD. AMD has continued to make substantial investments to research, develop, and have manufactured high quality graphics systems that practice the Asserted Patents. AMD has invested substantial resources collectively researching, developing, testing, launching, supporting, and maintaining groundbreaking graphics technology that practices the Asserted Patents.

5. The Asserted Patents cover inventions relating to important aspects of AMD's graphics processing units ("GPUs"), central processing units ("CPUs"), and accelerated processing units ("APUs").

6. One of the patents asserted in this action (U.S. Patent No. 7,742,053) has been upheld as valid by the U.S. Court of Appeals for the Federal Circuit. *ATI Techs. ULC v. Iancu*, 920 F.3d 1362, 1364-65 (Fed. Cir. 2019). According to the Federal Circuit's background description:

> The prior art describes that computer-graphics images are drawn on a screen by filling in a grid of dots called 'pixels.' Shapes are represented by a collection of simple polygons such as triangles or squares, called 'primitives,' formed by the interconnection of pixels. The corner of each primitive is called a 'vertex,' with each vertex defined by the spatial coordinates: x, y, and z. Color and texture are applied to the individual pixels that comprise the shape, based on the location of the pixels within the primitive and the primitive's orientation relative to the generated shape. *Id.* To orient the wireframe three-dimensional model, matrix transformations applied to vertices Vx, Vy, and Vz of the primitives generate new vertices Vx', Vy', and Vz', which are then translated into pixels. The graphics processor interconnects the primitives and applies color and texture to the generated shapes. The following illustration shows an example set of graphics displaying a three-dimensional object as a two-dimensional image:



> Prior art processors required separate shaders to specify how and with what attributes a final image is drawn, in transforming primitives by adjusting the x, y, and z coordinates of their vertices. Prior art graphics processors required both a vertex shader and a pixel shader, because vertex operations and pixel operations have different processing requirements and were required to be performed separately and sequentially by separate shader systems.

*Id.* (citing *inter alia*, U.S. Patent No. 6,897,871 at 1:11-60).

7. The '053 Patent asserted in this action, as well as others, as described more specifically below, claim novel systems that perform unified shading.

**The TCL Defendants and Their Product Offerings**

8. The TCL Defendants in this action (collectively referred to as "TCL") are foreign-based corporations who, along with their own subsidiaries and associates, operate as agents of one another, and work in concert together as a business group to make, use, offer to sell, or sell any patented invention, within the United States or import into the United States infringing products, including digital TVs, in the United States, including in Texas and this judicial district.

9. For example, in TCL's Annual Report 2020, TCL first defines "TCL Holdings" as "**TCL Industries Holdings Co. Ltd.**," which is a "joint stock limited company established under the laws of the PRC, **the ultimate controlling shareholder of the Company**" and "TCL Holdings Group" as "TCL Holdings and its subsidiaries." TCL Annual Report 2020 at 315 (emphasis added)

(https://doc.irasia.com/listco/hk/tclelectronics/annual/2020/ar2020.pdf) (accessed Mar. 8, 2022). Second, TCL defines "T.C.L. Industries (H.K.)" as "**T.C.L. Industries Holdings (H.K.) Limited**," which is "a company incorporated in Hong Kong with limited liability, the immediate controlling shareholder of the Company and a wholly-owned subsidiary of TCL Holdings." *Id.* Third, TCL defines the "Company" as "**TCL Electronics Holdings Limited**, a company incorporated in the Cayman Islands with limited liability[,]" and the "Group" as "the Company and its subsidiaries." And fourth, TCL defines "TCL Technology" as "**TCL Technology Group Corporation**[,] formerly known as TCL Corporation[,] a joint stock limited company established under the laws of the PRC" and defines "TCL Technology Group" as "TCL Technology and its subsidiaries." *Id.* at 316. As explained by TCL "the ultimate holding company of the Company [i.e, TCL Electronics Holdings Limited] has changed to TCL Holdings [i.e, TCL Electronics Holdings Limited] following the completion of [a] restructuring" relating to TCL Technology Group Corporation. *Id.* at 139. However, as TCL also explains, because "the major shareholders of TCL Holdings are the key management of TCL Technology [i.e., TCL Technology Group Corporation], TCL Technology [Group Corporation] remained a related party of the Group [i.e., the Company (TCL Electronics Holdings Limited) and its subsidiaries]." *Id.*

10. TCL describes its various corporate relatives as operating together in "synergies" in order to establish an "eco-system enterprise based on smart TVs":

> [T]he Company [i.e., **TCL Electronics Holdings Limited**] maintains good relationships with its suppliers[.] Further, the Group [i.e., TCL Electronics Holdings Limited and its subsidiaries] has been pursuing and will continue to pursue synergies with multiple industries of TCL Holdings Group [i.e., **TCL Industries Holdings Co. Ltd.** and its subsidiaries] and TCL Technology Group [i.e., **TCL Technology Group Corporation** and its subsidiaries] and leverage the advantages from the long-term relationship with CSOT (which is a major panel supplier in the PRC) from integrated industrial chain in order to become a forerunner in capitalising [sic]

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