

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE PATENT TRIAL AND APPEAL BOARD

---

REALTEK SEMICONDUCTOR CORP.,  
Petitioner,

v.

ATI TECHNOLOGIES ULC  
Patent Owner.

---

Case No. IPR2023-00922  
U.S. Patent No. 8,760,454

---

**PATENT OWNER'S PRELIMINARY RESPONSE  
PURSUANT TO 37 C.F.R. § 42.107(A)**

## Table of Contents

<b>I.</b>	<b>INTRODUCTION .....</b>	<b>1</b>
<b>II.</b>	<b>GRAPHICS PROCESSING PRIMER.....</b>	<b>3</b>
A.	Graphics Processors Use Vertex and Pixel Data to Create Display Images .	3
B.	Graphics Processors Use Instruction “Threads” To Transform Vertex and Pixel Data.....	5
C.	Conventional Graphics Processors Executed Vertex and Pixel Threads Using Separate Vertex Shaders and Pixel Shaders .....	7
<b>III.</b>	<b>’454 PATENT OVERVIEW .....</b>	<b>9</b>
A.	The ’454 Patent’s Unified Shader.....	10
B.	The Unified Shader Can Simultaneously Execute Vertex and Pixel Threads And Switch Quickly Between Threads At Various Degrees Of Completion .....	11
C.	The Invention of The ’454 Patent Determines What Data to Process By Evaluating Dynamic Storage Capacity.....	13
D.	The Invention Of The ’454 Patent Triggers Execution By Transmitting Data Rather Than Instructions.....	14
E.	The ’454 Patent’s Challenged Claims .....	15
1.	All Challenged Claims Require a Unified Shader.....	15
2.	Challenged Claims 1 And 3-11 Require Performing Operations Based On Dynamically-Monitored Data Storage Capacity .....	15
3.	Challenged Claim 2 Is Directed to a Unified Shader Processor That Executes Pixel or Vertex Thread Instructions In Response To Receiving Selected Data From A Register .....	17
<b>IV.</b>	<b>IPR Challenged Claims and Grounds .....</b>	<b>17</b>
A.	Lindholm ’685 .....	18
B.	Amanatides.....	20
C.	Selzer.....	21
<b>V.</b>	<b>PETITIONER HAS FAILED TO ESTABLISH THE REQUIRED REASONABLE LIKELIHOOD OF SUCCESS FOR ANY GROUNDS .....</b>	<b>24</b>
A.	Ground 1: Lindholm ’685 + Lindholm ’913.....	24

1.	Neither Lindholm '685 Nor Lindholm '913 Are Prior Art .....	24
a.	The '454 Patent Inventors Conceived of the Inventions At Least By August 24, 2001 .....	25
b.	The '454 Patent Exercised Diligence In Constructively Reducing To Practice From Shortly After Conception Until The Filing Of The Parent Patent On November 20, 2003 .....	31
i.	The '454 Patent Was Constructively Reduced To Practice At Least by November 20, 2003 .....	31
ii.	The Inventors and Other ATI Employees Diligently Worked Every Business Day to Reduce the Claimed Invention to Practice .....	31
c.	The Federal Circuit Ruled That the Same R400 Evidence Established an Conception Date Before The Lindholm Patents And Diligent Reduction To Practice .....	35
d.	Petitioner's Arguments Regarding a Prior ITC Case Not Involving ATI Are Incorrect .....	37
2.	No Unified Shader, Because No Ability to Switch Between Unfinished Vertex And Pixel Threads (All Claims) .....	39
3.	No Determination of Data to Process Based On Evaluation of Data Storage Space (Claims 1, 3-11) .....	40
4.	No Execution of Instructions "In Response to" Receiving Selected Data (Claim 2) .....	42
B.	Ground 2: Amanatides + Kohn .....	43
1.	No Unified Shader, Because No Ability to Switch Between Unfinished Vertex And Pixel Threads (All Claims) .....	44
2.	No Determination of Data to Process Based on Evaluation of Data Storage Space (Claims 1, 3-11) .....	46
3.	No "Selected Data" (Claims 2, 5) .....	48
C.	Ground 3: Selzer + Fiske .....	49
1.	No Unified Shader, Because No Ability to Switch Between Unfinished Vertex And Pixel Threads (All Claims) .....	49
2.	No Determination of Data to Process Based On Evaluation of Data Storage Space (Claims 1, 3-11) .....	52

3. No Execution of Instructions “In Response to” Receiving Selected Data  
(Claim 2).....53

**VI. CONCLUSION .....53**

## TABLE OF AUTHORITIES

	<b>Page(s)</b>
<b>Cases</b>	
<i>ATI Techs. ULC v. Iancu</i> , 920 F.3d 1362 (Fed. Cir. 2019) .....	24, 36, 37, 38
<i>Certain Consumer Electronics and Display Devices with Graphics Processing and Graphics Processing Units Therein</i> , Inv. No. 337-TA-932 .....	38, 46
<i>Perfect Surgical Techniques, Inc. v. Olympus Am., Inc.</i> , 841 F.3d 1004 (Fed. Cir. 2016) .....	31
<i>Scott v. Koyama</i> , 281 F.3d 1243 (Fed. Cir. 2002) .....	31
<i>Singh v. Brake</i> , 317 F.3d 1334 (Fed. Cir. 2003) .....	25
<i>Townsend v. Smith</i> , 36 F.2d 292 (C.C.P.A. 1929) .....	25
<b>Statutes and Other Authorities</b>	
35 U.S.C. § 102(e) .....	1
37 C.F.R. §42.24(d) .....	56

# Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

## Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

## Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

## Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

## API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

## LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

## FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

## E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.