

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

**Before the Honorable Cameron R. Elliot
Administrative Law Judge**

In the Matter of

**CERTAIN INTEGRATED CIRCUITS,
COMPONENTS THEREOF, AND
PRODUCTS CONTAINING THE SAME**

Investigation No. 337-TA-1350

JOINT FINAL CASE NARROWING DISCLOSURE PER G.R. 5.3

Per the Procedural Schedule (Order No. 7) and G.R. 5.3, Complainant Realtek Semiconductor Corporation (“Realtek” or “Complainant”) and Respondent Advanced Micro Devices, Inc. (“AMD” or “Respondent”) respectfully submit this Joint Final Case-Narrowing Disclosure.

Realtek respectfully submits that the maximum number of claims to be asserted for infringement and domestic industry technical prong is 13. Those claims are:

- ’245 Patent – Claim 1, 2, and 8
- ’218 Patent – Claims 12-13, 15-18
- ’582 Patent – Claims 1 & 2-4

Respondent respectfully submits that the following list of prior art products, patents, and publications are presently asserted as invalidating prior art, and/or to show the background and state of the art:

Products

- The Qualcomm RFR6122 Product
- The Marvell 88W8686 Product
- The Broadcom BCM1280/1480 Product
- The Qualcomm/Atheros AR6103T Product
- The Qualcomm RBR1000 Product
- The Xilinx XC7K325T Product

Documents and analysis associated with these products are identified in AMD's June 27, 2023 and July 3, 2023 Supplemental Invalidity Contentions at IV.B.3, in AMD's June 30, 2023 response to Interrogatory No. 108, and in AMD's August 28, 2023 Opposition to Realtek's Motion for Summary Determination. AMD reserves the right to rely on those documents as well as fact and expert witness testimony to (1) prove that the products qualify as prior art under pre-AIA 35 U.S.C. § 102(b) and post-AIA 35 U.S.C. § 102(a)(1); and (2) render one or more of the asserted claims invalid.

Patents and Printed Publications

For the patents and printed products identified below, AMD provides exemplary bates numbers where the reference may be found. In some cases, multiple copies of references have been produced, and AMD is not limiting its ability to rely on a copy of a reference that has a different bates number from the ones listed below.

- U.S. Patent No. 7,821,372 ("Ho-Hsiang"), produced at AMD-ITC-1350-0006889-910.
- U.S. Patent No. 6,794,977 ("Christensen"), produced at AMD-ITC-1350-0173476-89.
- U.S. Patent Application Pub. No. 2009/0002114 A1 ("Yang"), produced at AMD-ITC-1350-0191224-29.
- U.S. Patent No. 6,885,275 ("Chang"), produced at AMD-ITC-1350-0184298-407.

- U.S. Patent No. 6,967,555 (“Yu”), produced at AMD-ITC-1350-00061879-91.
- U.S. Patent Application Pub. No. 2006/0077028 A1 (“Huang”), produced at AMD-ITC-1350-0006911-7223.
- Jiang et al, “Benefits and Costs of Power-Gating Technique” (“Jiang”), produced at AMD-ITC-1350-0003005-12.
- Jiang et al, “Power/Ground Supply Network Optimization for Power-Gating” (“Jiang2”), produced at AMD-ITC-1350-0190459-64.
- Jiang et al, “Power-Gating Aware Floorplanning” (“Jiang3”), produced at AMD-ITC-1350-0190465-70.
- Kim et al, “Minimizing Inductive Noise in System-On-a-Chip with Multiple Power Gating Structures” (“Kim”), produced at AMD-ITC-1350-0191528-31.
- Li et al, “LVS Verification across Multiple Power Domains for a Quad-Core Microprocessor” (“Li”), produced at AMD-ITC-1350-0003144-54.
- Benini, “Advanced power management techniques: going beyond intelligent shutdown,” (“Benini”), produced at AMD-ITC-1350-0191253-57.
- Ran, “Via-Configurable Routing Architectures and Fast Design Mappability Estimation for Regular Fabrics,” (“Ran”), produced at AMD-ITC-1350-0190993-1000.
- Keating et al, Low Power Methodology Manual for System-on-Chip Design (“LPMM”), produced at AMD-ITC-1350-0190509-815.
- U.S. Patent No. 7,705,486 (“Lee”), produced at AMD-ITC-1350-0001898-905.
- U.S. Patent No. 7,948,292 (“Chiu”), produced at AMD-ITC-1350-0190436-54.
- U.S. Patent No. 7,671,623 (“Blisson”), produced at AMD-ITC-1350-0001857-70.
- U.S. Patent No. 7,013,436 (“Morton”), produced at AMD-ITC-1350-0001645-63.
- U.S. Patent No, 7,219,324 (“Sherlekar”), produced at AMD-ITC-1350-0192131-45.
- U.S. Patent No. 6,925,627 (“Longway”), produced at AMD-ITC-1350-0003170-83.
- U.S. Patent No. 7,260,805 (“Yan”), produced at AMD-ITC-1350-0191199-208.
- U.S. Patent No. 7,610,572 (“Kanno”), produced at AMD-ITC-1350-0001812-56.

- U.S. Patent No. 7,105,931 (“Attarwala”), produced at AMD-ITC-1350-0306260-319.
- U.S. Patent No. 9,270,247 (“Jing”), produced at AMD-ITC-1350-0030286-300.
- J. Gonzalez et al., “A 56-GHz LC-Tank VCO With 17% Tuning Range in 65-nm Bulk CMOS for Wireless HDMI, IEEE Transactions on Microwave Theory and Techniques,” Vol. 58, Issue 5 (May 2010) (“Gonzalez”), produced at AMD-ITC-1350-0192421-33.
- Mohammad Nariman et al., “A Switched-Capacitor mm-Wave VCO in 65 nm Digital CMOS,” 2010 IEEE Radio Frequency Integrated Circuits Symposium, May 23-25, 2010, pp. 157-160 (“Nariman”), produced at AMD-ITC-1350-0013324-27.
- M. Muh, “Design of a FinFET static frequency divider and a millimeter-wave CMOS push-push VCO,” Department of Electrical Engineering and Computer Sciences at the University of California at Berkeley (2005) (“Muh”), produced at AMD-ITC-1350-0183898-958.
- Ali M. Niknejad et al., “mm-Wave Silicon Technology 60 GHz and Beyond,” (Springer Science + Business Media 2008) (“Niknejad 2008”), produced at AMD-ITC-1350-0183959-4021.
- Paolo Lucci, “Frequency generation for mm-Wave and satellite applications,” 2012 PhD Dissertation (“Lucchi”), produced at AMD-ITC-1350-0185406-530.

To the extent the prior art status of any of the above publications is challenged, documents associated with these publications are listed in AMD’s June 27, 2023 and July 3, 2023 Supplemental Invalidity Contentions at IV.B.3, in AMD’s June 30, 2023 response to Interrogatory No. 108, and in AMD’s August 28, 2023 Opposition to Realtek’s Motion for Summary Determination. AMD reserves the right to rely on those documents as well as fact and expert witness testimony to (1) prove that the publications qualify as prior art under pre-AIA 35 U.S.C. § 102(b) and post-AIA 35 U.S.C. § 102(a)(1); and (2) render one or more of the asserted claims invalid.

Exemplary Documents and Products Showing Background and State of the Art (in Addition to Those Listed Above)

- The NXP PN544 Product
- The Broadcom BCM4335 Product
- The QLogic cLOM8214-KR Product
- The Nordic nRF24L01 Product
- S. Biswal, “Basic Electronics Volume I” (Atlantic Publishers 2001) (excerpts), produced at AMD-ITC-1350-0184022-51.
- Ali Niknejad & Robert Meyer, “Design, Simulation and Applications of Inductors and Transformers for Si RF ICs.” (Springer Science+Business Media 2000) (excerpts), produced at AMD-ITC-1350-0187049-171.
- Ali Niknejad, “Electromagnetics for High-Speed Analog and Digital Communication Circuits,” (Cambridge Univ. Press 2007) (excerpts), produced at AMD-ITC-1350-0184124-271.
- J. Burghartz, “Spiral Inductors on Silicon – Status and Trends (Invited Article),” International Journal of RF and Microwave Computer-Aided Engineering, V. 8, No. 6, 422-432 (Nov. 1998), produced at AMD-ITC-1350-0184272-83.
- O. Murphy et al., “Design of Multiple-Metal Stacked Inductors Incorporating an Extended Physical Model,” IEEE Transactions on Microwave Theory and Techniques, Vol. 53, No. 6, 2063-2072 (June 2005), produced at AMD-ITC-1350-0184284-97.
- U.S. Patent No. 6,759,937 to Kyriazidou, produced at AMD-ITC-1350-0187198-209.
- U.S. Patent No. 6,967,555 to Kao, produced at AMD-ITC-1350-0187210-22.
- U.S. Patent No. 8,325,001 to Huang, produced at AMD-ITC-1350-0187223-43.
- U.S. Patent Publication No. 2009/0322447 (“Daley”), produced at AMD-ITC-1350-0185531-49.
- Bahl, “Lumped Elements for RF and Microwave Circuits,” (Artech House 2003) (excerpts), produced at AMD-ITC-1350-0187244-56.
- U.S. Patent Application Publication No. US 2008/0074229 A1 to Moinian, produced at AMD-ITC-1350-0187367-79.

- D. Brook, “Differential Signals – Rules to Live By,” Printed Circuit Design (Oct. 2001), produced at AMD-ITC-1350-0187481-84.
- M. Soyuer et al., “Multilevel Monolithic Inductors in Silicon Technology,” Electronics Letters, Vol. 31 No. 5, 359-60 (March 2, 1995), produced at AMD-ITC-1350-0187476-77.
- J. Burghartz, “On the Design of RF Spiral Inductors on Silicon,” IEEE Transactions on Electron Devices, Vol. 50, No. 3 (March 2003), produced at AMD-ITC-1350-0187485-500.
- R. Lutz et al., “Modeling and Analysis of Multilevel Spiral Inductors for RFICs,” 1999 IEEE MTT-S International Microwave Symposium Digest (1999), produced at AMD-ITC-1350-0187501-10.
- Dae-Hee Weon et al., High Performance 3-D Helical RF Transformers, IEEE MTT-S Microwave Symposium digest. IEEE MTT-S International Microwave Symposium, Jun. 2007 pp. 1897-1900.
- Kral et al., “RF-CMOS Oscillators with Switched Tuning,” IEEE Custom Integrated Circuits Conference, May 14, 1998, produced at AMD-ITC-1350-0184705-08.
- Fei Yuan, “CMOS Active Inductors and Transformers Principle, Implementation, and Applications,” (Springer Science+Business Media, LLC 2008) (excerpts), produced at AMD-ITC-1350-0305813-79.
- Thomas H. Lee et al., “RF Passive IC Components in book entitled Circuits and Filters Handbook,” 2d Ed. (CRC Press LLC 2003) (excerpts), produced at AMD-ITC-1350-0184775-97.
- Agilent Technologies, Overview on interdigital capacitor design, 2001, produced at AMD-ITC-1350-0184798-807.
- Changhua Cao et al., “Millimeter-Wave Voltage-Controlled Oscillators in 0.13-um CMOS Technology,” IEEE Journal of Solid-State Circuits, Vol. 41, Issue 6 (June 2006), produced at AMD-ITC-1350-0185071-78.
- Yue Wu et al., “A Temperature Stabilized CMOS VCO for Zero-IF Cellular CDMA Receivers,” Digest of Technical Papers, 2005 Symposium on VLSI Circuits, June 16-18, 2005, produced at AMD-ITC-1350-0185079-82.
- Dorra Mellouli et al., “Design and Implementation of A 6-GHz Array of Four Differential VCOs Coupled Through a Resistive Network,” Analog Integrated Circuits and Signal Processing, Vol. 76, pp. 179-193 (2013), produced at AMD-ITC-1350-0185083-104.

- Xiao Shimao et al., “A novel 2.95–3.65 GHz CMOS LC-VCO using tuning curve compensation,” *Journal of Semiconductors*, Vol. 30, No. 10, 105001 (Oct. 2009), produced at AMD-ITC-1350-0185105-09.
- Mohammad Nariman et al., “A Switched-Capacitor mm-Wave VCO in 65 nm Digital CMOS,” 2010 IEEE Radio Frequency Integrated Circuits Symposium, May 23-25, 2010, pp. 157-160, produced at AMD-ITC-1350-0185110-14.
- Babak Soltanian et al., “An Ultra Compact Differentially Tuned 6 GHz CMOS LC VCO with Dynamic Common-Mode Feedback,” IEEE 2006 Custom Integrated Circuits Conference, Sept. 10-13, 2006, produced at AMD-ITC-1350-0185305-09.
- V. Macaitis et al., “Design of a 4.48-5.89 GHz LC-VCO in nm RF CMOS Technology,” *Elektronika IR Elektrotechnika*, Vol. 20, No. 2, 44-47 (Feb. 5, 2014), produced at AMD-ITC-1350-0185310-13.
- Judith Maget, “Varactors and Inductors for Integrated RF Circuits in Standard MOS Technologies,” Institute of Electronics at the University of Bundeswehr (2002), produced at AMD-ITC-1350-0185314-405.
- Bryant Derand Williamson, Masters Thesis, “A 2.4 GHz LC-VCO Using On-Chip Inductors and Accumulation- Mode Varactors in a CMOS 0.18 μm Process,” University of Tennessee – Knoxville, Aug. 2005, produced at AMD-ITC-1350-0184421-503.
- Axel Dominique Berny, PhD Dissertation. “Analysis and Design of Wideband LC VCOs,” Electrical Engineering and Computer Sciences, University Of California, Berkeley, Spring 2006, produced at AMD-ITC-1350-0184504-704.
- Kimiyoshi Usami et al., “Low-power Design Methodology and Applications utilizing Dual Supply Voltages,” Proceedings of the ASP-DAC 2000: Asia and South Pacific Design Automation Conference (2000), produced at AMD-ITC-1350-0251829-34.
- Sang Wook Park, PhD Dissertation, “Oscillator Architectures And Enhanced Frequency Synthesizer,” Texas A&M University (Dec. 2009) (“Park”), produced at AMD-ITC-1350-0184808-5070.
- Neric H. W. Fong, PhD Dissertation, “Low-Voltage Radio-Frequency CMOS Integrated Circuits in Silicon-On-Insulator, Department of Electronics, Carleton University, Ottawa, Canada (May 23, 2002), produced at AMD-ITC-1350-0185115-304.
- D. Demaw, “First Steps in Radio, Resonance and Tuning Methods,” *QST*, pp. 28-31 (April 1985), produced at AMD-ITC-1350-0304164-68.
- U.S. Patent No.4,999,589 to DaSilva, produced at AMD-ITC-1350-0192438-47.

- Encyclopedia of Electronics, 2d Ed. (McGraw-Hill 1990) (excerpts), produced at AMD-ITC-1350-0305224-261.
- U.S. Patent No. 7,656,264 to Hsu, produced at AMD-ITC-1350-0006306-28.
- U.S. Patent No. 7,872,355 to Owa, produced at AMD-ITC-1350-0004141-55.
- U.S. Patent No. 7,969,014 to Chuang, produced at AMD-ITC-1350-0004156-66.
- U.S. Patent No. 6,480,989 to Chan, produced at AMD-ITC-1350-0190419-35.
- U.S. Patent No. 7,424,696 to Vogel, produced at AMD-ITC-1350-0191182-98.
- U.S. Patent No. 8,247,906 to Law, produced at AMD-ITC-1350-0004167-94.
- U.S. Patent Application Publication No. 2007/0033562 to Correale, produced at AMD-ITC-1350-0001195-1210.
- P. Zarkesh-Ha, “Global Interconnect Modeling for a Gigascale System-on-a-Chip (GSoC),” Georgia Institute of Technology (Feb. 2001), produced at AMD-ITC-1350-0003571-788.
- U.S. Patent Application Publication No. 2007/0007629 to Schoellkopf, produced at AMD-ITC-1350-0003892-901.
- U.S. Patent No. 8,471,357 (Exhibit 6 to June 30, 2023 deposition of Kai-Yi Huang).
- U.S. Patent App. Pub. No. 2006/0077028, produced at AMD-ITC-1350-006911-28.
- U.S. Patent No. 6,094,335 to Early, produced at AMD-ITC-1350-0271219-37.
- Jonghae Kim et al., 3-Dimensional Vertical Parallel Plate Capacitors in an Technology for Integrated RF Circuits, 2003 Symposium on VLSI Circuits Digest of Technical Papers, produced at AMD-ITC-1350-0271238-41.
- Daeik Kim et al., Symmetric Vertical Parallel Plate Capacitors for On-Chip RF Circuits in 65-nm SOI Technology, IEEE Electron Device Letters, Vol. 28, No. 7, July 2007, produced at AMD-ITC-1350-0271242-44.

AMD reserves the right to rely on other documents not specifically identified above, such as the prior art references of record in the prosecution history of the Asserted Patents, dictionary definitions of certain claim terms, as well as fact and expert witness testimony and additional

documents to establish the background and state of the relevant art with respect to the Asserted Patents. Identification of a reference as showing background or state of the art is not a concession that such a reference is not invalidating if such a reference is included in AMD's Invalidity Contentions served June 27, 2023 and supplemented on July 3, 2023.

September 6, 2023

Respectfully submitted,

/s/ Brian E. Ferguson
Brian E. Ferguson
Thomas L. Jarvis
Joseph C. Masullo
Robert T. Vlasik III
Winston & Strawn LLP
1901 L Street, N.W.
Washington, D.C. 20036-3506
Phone: (202) 282-5000
Fax: (202) 282-5100
AMD-Realtek-ITC@winston.com

David Enzlinger
WINSTON & STRAWN LLP
333 South Grand Ave, 38th Floor
Los Angeles, CA 90071
Telephone: (213) 615-1700

Rex Mann
Charles Liu
Steven R. Laxton
Winston & Strawn LLP
2121 N. Pearl Street, Suite 900
Dallas, TX 75201
Phone: (214) 453-6500

Louis L. Campbell
Winston & Strawn LLP
255 Shoreline Drive, Suite 520
Redwood City, CA 94065
Phone: (650) 858-6500

Respectfully submitted,

/s/ Theodore J. Angelis
Theodore J. Angelis
theo.angelis@klgates.com
Elizabeth J. Weiskopf
Elizabeth.weiskopf@klgates.com
K&L GATES LLP
925 4th Avenue, Suite 2900
Seattle, Washington 98104
Telephone: 206.370.8101
Facsimile: 206.370.6006

George C. Summerfield
george.summerfield@klgates.com
Nelson Hua
nelson.hua@klgates.com
Ewa Wojciechowska
ewa.wojciechowska@klgates.com
Jiang Wu
jiang.wu@klgates.com
K&L GATES LLP
70 W. Madison, Suite 3100
Chicago, Illinois 60602
Telephone: 312.558.5347
Facsimile: 312.827.8185

Jay C. Chiu
jay.chiu@klgates.com
K&L GATES LLP
1 Park Plaza, Twelfth Floor
Irvine, California 92614
Telephone: 949.253.0900
Facsimile: 949.253.0902

Chris Gresalfi
Winston & Strawn LLP
MetLife Building
200 Park Ave
New York, NY 10166
Phone: (212) 294-6700

Evan Lewis
Winston & Strawn LLP
800 Capitol Street, Suite 2400
Houston, TX 77002
Phone: (713) 651-2600

*Attorneys for Respondent
Advanced Micro Devices, Inc.*

Steven S. Baik
White Hat Legal
1470 Michigan Avenue
Alviso, California 95002
sbaik@whitehat.legal

*Counsel for Complainant Realtek
Semiconductor Corporation*

CERTIFICATE OF SERVICE

I hereby certify that copies of the forgoing, JOINT FINAL CASE NARROWING DISCLOSURE PER G.R. 5.3, has been served upon the following parties as indicated below on this 6th day of September 2023.

<p>Lisa R. Barton Secretary to the Commission U.S. International Trade Commission 500 E. Street, S.W. Washington, D.C. 20436</p>	<p><input checked="" type="checkbox"/> EDIS Electronic Filing <input type="checkbox"/> Via Hand Delivery <input type="checkbox"/> Via Overnight Carrier <input type="checkbox"/> Via Electronic Mail <input type="checkbox"/> Via U.S. First Class Mail</p>
<p>The Honorable Cameron R. Elliot Administrative Law Judge U.S. International Trade Commission 500 E. Street, S.W., Room 317 Washington, DC 20436 Email: Michael.Turner@usitc.gov</p>	<p><input type="checkbox"/> Via Hand Delivery <input type="checkbox"/> Via Overnight Carrier <input checked="" type="checkbox"/> Via Electronic Mail <input type="checkbox"/> Via File Transfer Protocol (FTP) <input type="checkbox"/> Via U.S. First Class Mail</p>
<p>Brian E. Ferguson Winston & Strawn LLP 1901 L Street, N.W. Washington, D.C. 20036-3506 Phone: (202) 282-5000 Fax: (202) 282-5100 Email: BEFerguson@winston.com Email: AMD-Realtek-ITC@winston.com</p>	<p><input type="checkbox"/> Via Hand Delivery <input type="checkbox"/> Via Overnight Carrier <input checked="" type="checkbox"/> Via Electronic Mail <input type="checkbox"/> Via File Transfer Protocol (FTP) <input type="checkbox"/> Via U.S. First Class Mail</p>
<p>David F. Nickel John F. Presper FOSTER, MURPHY, ALTMAN & NICKEL, PC 1150 18th Street NW, Suite 775 Washington, D.C. 20036 Phone: 202-822-4100 Fax: 202-822-4199 Email: FM-AMD-1350@fostermurphy.com</p>	<p><input type="checkbox"/> Via Hand Delivery <input type="checkbox"/> Via Overnight Carrier <input checked="" type="checkbox"/> Via Electronic Mail <input type="checkbox"/> Via File Transfer Protocol (FTP) <input type="checkbox"/> Via U.S. First Class Mail</p>

/s/ Perry C. Brooks
 Perry C. Brooks
 perry.brooks@klgates.com