

5. U.S. Patent No. 6,339,711 (“Otaka ’711”)
6. U.S. Patent No. 6,392,487 (“Alexanian ’487”)
7. U.S. Patent No. 6,687,491 (“Wieck ’491”)
8. U.S. Patent No. 6,766,156 (“Hayashihara ’156”)
9. U.S. Patent No. 7,299,021 (“Parsinnen ’021”)
10. U.S. Patent Pub. No. 2002/0193958 (“Underbrink ’958”)
11. European Patent Pub. No. EP1168645A2 (“Rohmer ’645”)
12. WO 2000/19644 (“Cox ’644”)
13. WPIC System
14. IPR prior art references
 - a. Behbahani, “Adaptive Analog IF Signal Processor for a Wide-Band CMOS Wireless Receiver,” IEEE Journal of Solid-State Circuits, Vol. 36, No. 8 (“Behbahani”)
 - b. Farbod Behbahani, *et al*, “A 2.4-GHz Low-IF Receiver for Wideband WLAN in 0.6- μ m CMOS—Architecture and Front-End,” IEEE Journal of Solid-State Circuits, Vol. 35, No. 12 (“Leete”)
 - c. F. Behbahani, Weeguan Tan, A. Karimi-Sanjaani, A. Roithmeier and A. A. Abidi, “A broad-band tunable CMOS channel-select filter for a low-IF wireless receiver,” IEEE Journal of Solid-State Circuits, vol. 35, no. 4, pp. 476-89 (“Tan”)
15. Analog Devices, AD9870
16. Qualcomm IFR3000
17. Qualcomm Prior Invention (including [REDACTED], RFR 6125, RFR6500, and/or RFR5200)
18. Zhu, Jiahua et al, “A Multi-IDT Input Tunable Surface Acoustic Wave Filter,” IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control, Vol. 48, No.5
19. De Los Santos, Hector et al, “MEMS for RF/Microwave Wireless Applications: The Next Wave – Part II,” Microwave Journal
20. Newman, X-Amp,TM A New 45-dB 500-MHz Variable Gain Amplifier (VGA) Simplifies Adaptive Receiver Designs, Analog Dialogue 36-01

Dated: May 7, 2025

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CERTIFICATE OF SERVICE

The undersigned certifies that on May 7, 2025, a true and correct copy of the foregoing **DEFENDANT APPLE INC.'S INITIAL NARROWING OF PRIOR ART** was caused to be served via electronic mail to counsel of record for all parties.

Dated: May 7, 2025

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