



US 20220385248A1

(19) **United States**(12) **Patent Application Publication**
LIU et al.(10) **Pub. No.: US 2022/0385248 A1**(43) **Pub. Date: Dec. 1, 2022**(54) **RADIO FREQUENCY POWER AMPLIFIER**(71) Applicant: **InPlay, Inc.**, Irvine, CA (US)(72) Inventors: **Ruifeng LIU**, Irvine, CA (US); **Russell MOHN**, Santa Ana, CA (US)(21) Appl. No.: **17/303,292**(22) Filed: **May 26, 2021****Publication Classification**(51) **Int. Cl.****H03F 3/24** (2006.01)**H03F 1/56** (2006.01)**H03F 3/193** (2006.01)(52) **U.S. Cl.**CPC **H03F 3/245** (2013.01); **H03F 1/565**
(2013.01); **H03F 3/193** (2013.01); **H03F**
2200/451 (2013.01); **H03F 2200/171** (2013.01)

(57)

ABSTRACT

A class-D RF power amplifier (PA) architecture with duty cycle control has improved power efficiency while suppressing even-order harmonics. An inductor and capacitor (LC) low pass filter (LPF) can also be integrated on-chip to further suppress harmonics and provide impedance transformation between the PA and load. This eases the design for customers and reduce their bill of materials cost. The LPF can also match the PA to the load impedance to improve efficiency. The harmonic levels can also be controlled by adjusting the duty cycle of the PA output.

