



US 20220385239A1

(19) **United States**(12) **Patent Application Publication**  
**Khlat**(10) **Pub. No.: US 2022/0385239 A1**(43) **Pub. Date: Dec. 1, 2022**(54) **RADIO FREQUENCY (RF) EQUALIZER IN  
AN ENVELOPE TRACKING (ET) CIRCUIT**(71) Applicant: **Qorvo US, Inc.**, Greensboro, NC (US)(72) Inventor: **Nadim Khlat**, Cugnaux (FR)(21) Appl. No.: **17/331,996**(22) Filed: **May 27, 2021****Publication Classification**(51) **Int. Cl.****H03F 1/02** (2006.01)**H03F 3/45** (2006.01)**H04B 1/04** (2006.01)(52) **U.S. Cl.**CPC ..... **H03F 1/0233** (2013.01); **H03F 3/45475**(2013.01); **H04B 1/04** (2013.01); **H03F****2200/105** (2013.01); **H03F 2200/451** (2013.01)

(57)

**ABSTRACT**

A radio frequency (RF) equalizer in an envelope tracking (ET) circuit is disclosed. A transmitter chain includes an ET circuit having an RF equalizer therein. The RF equalizer includes a two operational amplifier (op-amp) structure that provides a relatively flat gain and a relatively constant negative group delay across a frequency range of interest (e.g., up to 200 MHz). The simple two op-amp structure provides frequency response equalization and time tuning adjustment and/or creates a window Vcc signal.

