



- (51) **International Patent Classification:**
H03F 1/38 (2006.01)

(21) **International Application Number:**
PCT/US2012/020971

(22) **International Filing Date:**
11 January 2012 (11.01.2012)

(25) **Filing Language:** English

(26) **Publication Language:** English

(30) **Priority Data:**
61/431,796 11 January 2011 (11.01.2011) US

(71) **Applicant (for all designated States except US):** **AVIAT NETWORKS, INC.** [US/US]; 5200 Great America Parkway, Santa Clara, CA 95054 (US).

(72) **Inventors; and**

(75) **Inventors/Applicants (for US only):** **NATH, Jayesh** [IN/US]; 4511 Carlyle Court, Apt. No. 1422, Santa Clara, CA 95054 (US). **SHEN, Ying** [US/US]; 100 River Birch Lane, Chapel Hill, NC 27514 (US). **MATSUMOTO, Frank** [US/US]; 430 Thistle Way, San Ramon, CA 94583 (US). **QIN, Youming** [US/US]; 907 South Bernardo, Sunnyvale, CA 94087 (US). **PHAM, David, C.m.** [US/US]; 3469 Monte Sereno Terrace, Fremont, CA 94539 (US).

(74) **Agents:** **KLOKE, Daniel, C.** et al.; Sheppard, Mullin, Richter & Hampton LLP, 379 Lytton Avenue, Palo Alto, CA 94301 (US).

(81) **Designated States (unless otherwise indicated, for every kind of national protection available):** AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) **Designated States (unless otherwise indicated, for every kind of regional protection available):** ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— with international search report (Art. 21(3))

(54) Title: SYSTEMS AND METHODS FOR A RADIO FREQUENCY TRANSMITTER WITH IMPROVED LINEARITY AND POWER OUT UTILIZING PRE-DISTORTION AND A GAN (GALLIUM NITRIDE) POWER AMPLIFIER DEVICE

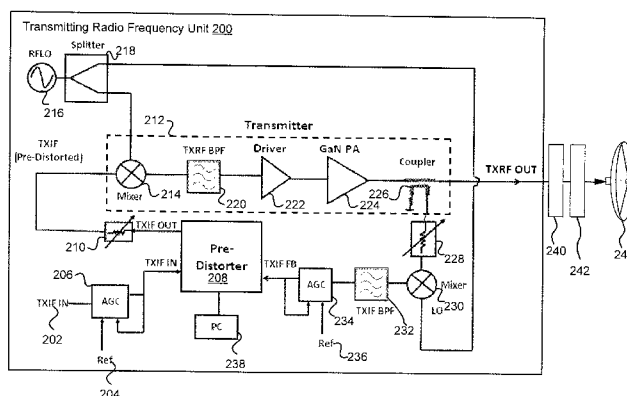


FIG. 2

(S7) Abstract: Various embodiments provide for systems and methods for increased linear output power of a transmitter. An exemplary wireless communications system for transmitting an input signal comprises a predistorter module, a GaN power amplifier, a coupler, and an antenna. The predistorter module is configured to detect existing distortion by comparing the input signal to a feedback signal and generate a correction signal. The predistorter may adaptively adjust its operation to minimize the existing distortion due to GaN power amplifier nonlinear characteristics. The result is that the GaN power amplifier may send a power signal of improved linearity to the antenna. The coupler is configured to sample the amplified signal from the GaN power amplifier to generate the feedback signal. The antenna is configured to transmit the amplified signal.