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(54) **LOW-POWER APPROXIMATE DPD ACTUATOR FOR 5G-NEW RADIO**

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(57) **ABSTRACT**

Systems and methods are disclosed herein for providing efficient Digital Predistortion (DPD). In some embodiments, a system comprises a DPD system comprising a DPD actuator. The DPD actuator comprises a Look-Up Table (LUT), selection circuitry, and an approximate multiplication function. Each LUT entry comprises information that represents a first set of values $\{p_1, p_2, \ldots, p_k\}$ and a second set of values $\{s_1, s_2, \ldots, s_k\}$ that represent a LUT value of $s_1 \cdot 2^{P_1} + s_2 \cdot 2^{P_2} + \ldots + s_k \cdot 2^{P_k}$ where each value $s_i \epsilon \{+1, -1\}$ where $k \geq 2$. The selection circuitry is operable to, for each input sample of an input signal, select a LUT entry based on a value derived from the input sample that is indicative of a power of the input signal. The approximate multiplication function comprises shifting and combining circuitry that operates to, for each input sample, shift and combine bits that form a binary representation of the input sample in accordance with $\{p_1, p_2, \ldots, p_k\}$ and $\{s_1, s_2, \ldots, s_k\}$ to provide an output sample.