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(54) **MULTIPLE-STAGE DOHERTY POWER AMPLIFIERS IMPLEMENTED WITH MULTIPLE SEMICONDUCTOR TECHNOLOGIES**

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(57) **ABSTRACT**

A device includes an integrated circuit (IC) die. The IC die includes a silicon germanium (SiGe) substrate, a first RF signal input terminal, a first RF signal output terminal, a first amplification path between the first RF signal input terminal and the first RF signal output terminal, a second RF signal input terminal, a second RF signal output terminal, and a second amplification path between the second RF signal input terminal and the second RF signal output terminal. The device includes a first power transistor die including a first input terminal electrically connected to the first RF signal output terminal and a second power transistor die including a second input terminal electrically connected to the second RF signal output terminal. The first amplification path can include two heterojunction bipolar transistors (HBTs) connected in a cascode configuration and the second amplification path can include two HBTs connected in a cascode configuration.

