Abstracts

Power-amplifier module with digital adaptive predistortion for cellular phones (Dec. 2002 [T-MTT])

S. Kusunoki, K. Yamamoto, T. Hatsugai, H. Nagaoka, K. Tagami, N. Tominaga, K. Osawa, K. Tanabe, S. Sakurai and T. Iida. "Power-amplifier module with digital adaptive predistortion for cellular phones (Dec. 2002 [T-MTT])." 2002 Transactions on Microwave Theory and Techniques 50.12 (Dec. 2002 [T-MTT] (Special Issue on 2002 International Microwave Symposium)): 2979-2986.

This paper describes a new type of power amplifier (PA) module with a predistortion function and can be applied to a N-CDMA (narrow-band CDMA system defined in IS-95B Standard) handset terminals. Distortion compensation technology to improve the efficiency of the PA is discussed, quantitatively. Various parameters to be considered in designing are investigated in detail. The predistortion technology proposed is based on the lookup-table method using the input and output signal envelopes and can operate independently from the baseband block. By omitting adaptative predistortion for amplitude/phase modulation and integrating the main controlling functions on a single CMOS integrated-circuit chip, the predistortion capability has been realized in a PA module. The PA module has a power-added efficiency (PAE) of 48% at an output power of 27.5 dBm. This PAE is very high in comparison with that of the conventional PA module for N-CDMA.

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