

Abstracts

A distortion control technique for achieving high power efficiency in an HPA array

T. Kaho, Y. Nakasuga, H. Okazaki, K. Araki and K. Horikawa. "A distortion control technique for achieving high power efficiency in an HPA array." 2002 Transactions on Microwave Theory and Techniques 50.11 (Nov. 2002 [T-MTT] (Mini-Special Issue on the 2002 IEEE Radio Frequency Integrated Circuit (RFIC) Symposium)): 2505-2512.

This paper proposes a new technique for reducing the intermodulation (IM) distortion products in a high-power amplifier (HPA) array. The proposed technique dissolves the relations between carriers and IMs by applying IM phase control. As a result, IMs are distributed to all the output ports in the array, and the carrier power to intermodulation power ratio (C/IM) of the HPA array can be increased. The improvement in C/I/M is as high as $10\log N$ dB, where N is the number of HPAs. Newly developed even-order distortion implemented intermodulation distortion controllers (EODICs) are used to achieve the IM phase control. A test carried out using a four-parallel HPA array with EODICs confirms that the technique noticeably improves C/IM and demonstrates its validity.

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