

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

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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/IM 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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