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NEWS

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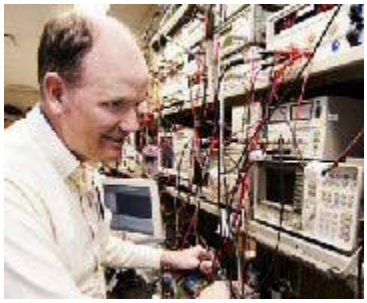
TriQuint set to deliver record-efficiency PAs

The Portland, Oregon, based RF semiconductor company will imminently start addressing strong demand for its HV-HBT cellular base station amplifiers.

TriQuint Semiconductor is to start commercial production early in 2009 on GaAs amplifier products that have recently claimed a cellular base station efficiency record.

Low-volume initial production will begin on high-voltage HBT (HV-HBT) devices and ramp into 2010 in response to a strong interest in the technology's power-saving potential.

“I've got more customers coming to me asking for samples, data and evaluation boards than I can possibly deal with today,” Doug Slansky, TriQuint's base-station product marketing manager, told *compoundsemiconductor.net*.



Kimball's Envelope Tracking

In October, Donald Kimball of the University of California, San Diego, (UCSD) presented results underlining the technology's efficiency at the Compound Semiconductor Integrated circuit Symposium (CSICS).

At that Monterey, California, event Kimball used a method previously responsible for GaN and silicon LDMOS performance records to even better effect with HV-HBT devices.

Samples from TriQuint provided record average power added efficiency (PAE) above 58 percent at 42 W average output power and 10.2 dB gain in a single-stage wideband CDMA base-station PA.

“One source of the improved efficiency is the lower on-resistance encountered with HV-HBTs,” Kimball wrote.

Envelope Tracking

UCSD uses an approach called envelope tracking that dynamically controls supply voltage to minimize the power consumed by a PA. The actual output of a base station PA varies with demand, but base stations often maintain a single constant supply voltage regardless.

In envelope tracking, the supply voltage is adjusted to levels much closer to those actually needed at any time by the PA, reducing power loss from the system. To take most advantage of this, an amplifier should be efficient across all the supply voltages that the envelope tracking system varies through.

“GaAs HV-HBTs are attractive options since they can provide high efficiency and gain over a wide dynamic range,” said Kimball.

Envelope tracking is not an exclusive technology to UCSD, and is now under development at companies across the globe, although it is not yet being commercially deployed.

“We've been talking HV-HBT technology to all of the major base station manufacturers,” explained TriQuint's Slansky. “Most of them are looking at envelope tracking as a next-generation technology, or maybe one and a half generations from now.”

In the interim, the company will offer discrete HV-HBT products that it has also tested in a Doherty configuration, another efficiency-boosting approach.

“Discrete output stage transistors from 50 W to 250 W, at several power levels, will be offered for most major cellular bands,” explained Slansky.

“The first level of product offering will be discrete devices targeting the final PA stage, where the biggest efficiency impact is, because that is where most of the power is consumed.”