Title: TI, ParkerVision join for advanced-radio push.(Company Business and Marketing)

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Manhasset, N.Y. - Texas Instruments Inc. and ParkerVision Inc. have forged a reciprocating strategic partnership to give long-awaited industry validation to ParkerVision's patented direct-conversion radio technology for wireless LANs and WANs.

The companies will jointly develop interfaces between ParkerVision's direct-conversion RF transceivers-based on its patented Direct2Data (D2D) technology-and TI's 'C55x digital baseband chip sets.

The second half of the agreement opens up foundry services for ParkerVision wireless ICs in TI's advanced BiCMOS semiconductor processes.

To reinforce the agreements, TI (Dallas) also invested in ParkerVision (Jacksonville, Fla.) to the tune of 83,451 shares of restricted common stock at $29.96 per share.

For TI, the agreement expands its baseband customers' RF options. TI had announced its own TRF6150 direct-conversion radio in time for last month's GSM World Congress. Bill Krenik, advanced architecture director at TI's wireless business unit, said ParkerVision's technology was particularly attractive since it was "attempting to employ down-conversion techniques without the traditional challenges of direct conversion, such as dc offsets and local-oscillator radiation."

For fabless ParkerVision, the agreement not only validates the D2D technology but also opens the gates to full-scale manufacturing, Jeffrey Parker, chairman and chief executive officer, said. Manufacturing may not be too far off, he said, with the company getting ready to sample its 802.11 WLAN radio before the second half. Versions for cellular IS-95/cdma-2000 handsets are scheduled to follow soon .

"With high volumes expected, we needed to work with a high-quality, high-capacity manufacturer, and TI's process fits those requirements," said Parker. "In addition, we're geared toward supplying complete solutions, so we also needed to partner with a leader in back-end solutions, which again pointed to TI."

Both companies will offer reference designs, with a "seamless" interface between the radio and baseband portions.

D2D itself has been promoted by ParkerVision as "direct conversion without the compromises," a reference to the dc offset and all the additional baseband processing typically employed to eliminate it.

David Sorrells, chief technical officer at ParkerVision, said the technology results in a power-transfer device that employs programmable, matched filters within the radio itself.

He likens it to a cross between two established techniques-a Gilbert-cell mixer and impulse sampling-"but with the best of both."

"The Gilbert cell, for example, relies on transistor pair-matching to mitigate the offset and get a good IP2-we don't," Sorrells said. More than 20 patents are pending for the technique.

With the technology, the company believes it can reduce the parts count in a typical radio to one IC and about 50 external components like capacitors and resistors, including the baseband and antenna. "A typical WLAN radio today uses between 170 and 220 components," said Sorrells, "so we can reduce the bill of materials by about 50 percent."

Key features of the device include high linearity/volt, a stable IP2s (60 dBm) over process and temperature variations, a 100-dB dynamic range and 55-dB adjacent-channel rejection. The noise figure is 13 dB at 1 GHz and 20 dB at 2.4 GHz.

While the first D2D devices will be based on a 0.35-micron BiCMOS process, the company expects to migrate to all CMOS as soon as possible. "What drives WLANs is performance and cost, hence CMOS is our goal," said Parker. The CMOS version will have the low-noise amplifier on-chip and the phase-locked loop off-chip.

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