World's Smallest 100 mW Direct Methanol Fuel Cell

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Toshiba America Electronic Components, Inc. (TAEC) and its parent Toshiba Corp. (Toshiba), the world leader in fuel-cell technology for handheld electronic devices, today announced the prototype of a highly compact direct methanol fuel cell (DMFC) that can be integrated into devices as small as digital audio players and wireless headsets for mobile phones.

At a compact 0.87 x 2.2 x 0.18 inches (22mm x 56mm x 4.5mm) with a maximum of 0.36 inches (9.1mm) for the fuel tank, the slim prototype DMFC offers a size advantage that will give greater design freedom for developers of handheld electronic devices. The latest prototype, with its total weight only 8.5 grams (g), is small enough for integration into a wireless headset for mobile phones, but still efficient enough to power an MP3 music player for as long as 20 hours on a single 2cc charge of highly concentrated methanol. The new fuel cell outputs 100 milliwatts of power, and can continue to do so, non-stop, for as long as users top up its integrated fuel tank a process that is as simple as it is safe.

The new DMFC adopts a "passive" fuel supply system which feeds methanol directly into the cell. In developing a passive DMFC, Toshiba found a solution to the potential problem of "methanol crossover," in which methanol and oxygen combine without an energy-producing reaction. The company has optimized the structure of the fuel cell's electrodes and polymer electrolyte membrane that trigger the reaction. This approach allows use of a highly concentrated methanol solution as a fuel, which also overcomes a major obstacle to small fuel cells:

achieving a very small fuel tank. The cumulative result of these advances is the world's smallest 100mW fuel cell; a more compact, more efficient DMFC that outperforms its predecessors by a factor of five in terms of power output.

Toshiba is a recognized leader in development of active DMFC for PCs and other portable devices. The company's latest announcement confirms its parallel leadership in passive fuel cells that can power the smallest portable devices on the market. Today's announcement demonstrates that Toshiba remains a step ahead of its competitor's in fuel cell miniaturization and operating efficiency. Toshiba expects to commercialize DMFC for PCs in 2004 and for smaller handheld devices in 2005.

"This development is evidence of Toshiba's commitment to innovative energy solutions, with emphasis on mobility and extended power life," said Sean Collins, business development director, Display Devices and Components Business Unit, for TAEC. "We understand that commercialization has many challenges but we are working with the appropriate bodies to insure a timely and cost effective market adoption. Toshiba's extensive experience in batteries, consumer devices and retail will prove beneficial for this introduction."

Source: www.toshiba.com/taec/