Breakthrough Battery Technology For Redefining Smartphone and Tablet Design

IPS Showcases Paper-thin, Non-Flammable Battery Technology for Consumer Devices

Infinite Power Solutions announced it has successfully demonstrated a new battery technology to replace conventional lithium-ion batteries and redefine the design of smart phones, tablets and other consumer devices by enabling thinner form factors and better performance. IPS demonstrated record-breaking energy storage capacity for an organic-free, all-solid-state, thin-film battery. Using single-sided deposition, a paper-thin rechargeable cell achieved a capacity density of 1.25mAh/cm2. IPS also announced it has already initiated talks with original equipment manufacturers for future adoption of this technology in consumer devices. Furthermore, IPS released a white paper documenting a path to manufacturing this new battery technology using roll-to-roll manufacturing and double-sided deposition in order to achieve a capacity density of 2.5mAh/cm2, which is equivalent to prismatic lithium-ion cells (but without the risk of thermal runaway), and at comparable production costs. This new solid-state battery could be manufactured in volume for less than $1/Wh and, when fully packaged, provide 700Wh/liter—a 25 percent increase in energy density over today's lithium-ion cells.

"Today, smart phones are limited by and, to a degree, designed around the battery. With this new technology we are moving toward designing the battery around the phone, thereby impacting how smart phones and other devices look and perform, as well as which companies win and lose market share in the future," declared Jim Norrod, IPS' president and chief executive officer. "This is simply a better battery technology for today's smart phones and other devices. It is thinner and more flexible in how it can be shaped, promises more volumetric energy density and is also safer, while still being comparably priced. It is based on proprietary IPS technology, which means the consumer electronics company possessing it will have a sustainable advantage in terms of styling, performance and safety. In our view this is a game changer in the mobile electronics landscape and especially the smart phone market, where styling and performance are paramount to market success."

"We have made significant strides in developing both the technology and manufacturing roadmap for producing the next generation of batteries for consumer devices," commented Dr. Bernd Neudecker, IPS' chief technology officer. "Battery

experts know that it's extremely difficult to maintain high energy density, regardless of the battery chemistry, as the cell thickness is reduced. This is especially true when going below 2mm of thickness for a fully packaged battery. However, by using our unique battery architecture, all-solid-state electrolyte and proprietary manufacturing process, energy densities of more than 700Wh/liter can be achieved."

High-capacity cells can be arranged in a variety of configurations, including designing a battery around the form factor of the display of a smart phone or tablet. For example, cells can be safely stacked in a parallel configuration to form a 3.95V all-solid-state, thin-film battery pack about the size and thinness of five standard playing cards, which is three times thinner than today's lithium-ion cell-phone batteries of equivalent capacity. Such a battery would have a capacity of approximately 1.4Ah with a maximum current of 7A and could serve a variety of common hand-held consumer devices. Due to the all-solid-state (completely dry) nature of this technology, there is no organic liquid or gel electrolyte that needs to be safely contained, unlike prismatic lithium-ion cells. Therefore, IPS can leverage its proprietary flexible circuit encapsulation to achieve the thinnest battery encapsulation possible and enable the thinnest smart phones ever marketed.

IPS' technical white paper entitled, "Organic-Free, All-Solid-State, Thin-Film Batteries for Cell Phones, Tablets, and Future Devices [1]," discusses how the company has exceeded the perceived limits of thin-film battery technology and how these batteries can be manufactured in the future. The white paper includes an overview description of the proposed battery chemistry, architecture and performance advantages, as well as the projected materials and manufacturing costs. It can be downloaded from the IPS website at http://www.infinitepowersolutions.com/sites/wirelessdesignmag.com/files/legacyimages/stories/IPS_All-Solid-State_Cell_Phone_Battery.pdf [2].

Infinite Power Solutions (www.InfinitePowerSolutions.com [3])

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