

Texas Instruments Breaks 65nm Leakage Power Barrier with SmartReflex Technologies

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The potential for leakage power or battery life drain increases dramatically as the industry advances to smaller process node geometries, a challenge that has been viewed as a barrier for developing high-speed, high-integration, low-power 65nm mobile devices. Texas Instruments announced today it has solved the 65nm leakage power challenge for mobile devices with its SmartReflex power and performance management technologies, opening the door for new wireless entertainment, communications and connectivity applications in advanced mobile devices.

TI's SmartReflex technologies are a combination of intelligent and adaptive silicon, circuit design and software designed to solve power and performance management challenges at smaller process nodes, enabling OEMs to offer sleeker, multimedia-enabled mobile devices with long battery life and less heat dissipation.

Historically, power consumption challenges have been managed through limited, simple approaches such as idle/sleep modes, clock gating and dynamic voltage and frequency scaling (DVFS) that focus on dynamic power, not leakage power. However, the convergence of communications, computing and entertainment onto mobile devices has led to higher levels of silicon integration at smaller, more cost-effective process nodes. The combination of higher performance processing needs and the dramatic increase in leakage power from advanced processes

creates a severe power management challenge that requires a more comprehensive system-level solution.

"Performance-hungry multimedia and productivity applications are generating new opportunities for marketplace growth, but not without posing power and performance challenges at the silicon level," said Bill Krenik, TI's wireless advanced architecture manager, Wireless Terminals Business Unit. "TI's SmartReflex technologies are the bridge to addressing critical process issues head on - taking leaps to reduce leakage power, boost performance and manage heat dissipation while enabling more features on mobile devices."

TI's SmartReflex technologies go well-beyond traditional device power management techniques by solving the critical issue of leakage power in 65nm for mobile devices. Specifically, TI's SmartReflex product-proven technologies incorporate a system-level approach, from integrated circuit design to system software that guarantees performance while aggressively addressing the power consumption challenge for mobile devices at deep sub-micron process nodes. Leveraging TI's power management-focused silicon IP, System on Chip (SoC) design, and system software, SmartReflex technologies extend to the entire SoC and incorporate a broad range of intelligent and adaptive hardware and software technologies that dynamically control voltage, frequency and power based on device activity, modes of operation and process and temperature variation. This saves additional power without compromising end performance to run complex multimedia applications.

"Power and performance management is becoming a major battleground for the wireless industry, as new process technologies and more features threaten to erode battery life. TI's new SmartReflex technologies appear to be the most comprehensive response yet to this challenge," said Chris Ambarian, senior analyst, power management, iSuppli Corporation. "As semiconductor innovation pushes into the deep sub-micron process

range, power and performance management strategies must evolve to capture the full benefits of smaller design features. TI's system-level approach with its SmartReflex technologies can be used to significantly reduce power consumption per function -- an important enabling factor in the continued expansion of wireless entertainment, gaming and music applications on advanced mobile devices."

TI first introduced technology elements of SmartReflex technologies at the 90nm process node and is now applying advanced techniques of the solution to 65nm. Technology components of SmartReflex have been integrated into over 100 million mobile devices. TI is incorporating the technology in its family of OMAP™ 2 applications processors and has plans to introduce incrementally more advanced SmartReflex technologies in future generations of wireless products.

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