Think Silicon Announces a New Scalable Multi-Core GPU Product Suite with Extended Graphics and Video Functionality

ATHENS, Greece and SAN JOSE, Calif., Dec. 8, 2020 – Think Silicon S.A., the leading provider of ultra-low power GPU IP for embedded systems, today announced it is shipping its updated NEMA®|pico XS and NEMA®|pico XL Multi-Core GPU IP-Series to customers. The series offers architectural innovation that brings performance graphics rendering to the smallest and most power-conservative embedded display devices. Additionally, customers have the benefit of implementing multicore configurations, vector graphics and video overlay functionality. Think Silicon offers a full complement of NEMA®|pico GPU IP to meet the needs of the growing embedded graphics market. Embedded systems customers now have access to the most flexible, versatile, high-performance and ultra-low power GPU platform in the market designed for a wide variety of devices from MCUs (microcontroller unit) to crossover processor SoCs (System-on-a-Chip).

"The insatiable demand and expectation for visually compelling and rich displays is growing exponentially in the workplace and at home," said Ulli Mueller, Director of IP Licensing and Marketing at Think Silicon. "The breadth and capabilities of the NEMA®|pico product family is groundbreaking, providing customers the ability to create captivating visual experiences with ultra-low power GPUs. We are excited to deliver these remarkable products to the industry and look forward to continuing to expand our offering of ultra-low power lightweight graphics solutions."

NEMA®|pico XS, with a silicon area of only $0.1mm^2$, the industry's lowest CPU utilization of less than 5% and GPU power consumption under 1mW, is designed for devices where CPU, on-chip memory, battery and bandwidth are very limited. It is optimized to work with MCUs (ARM® M class, ARC® EM5D, RISC-V) on a bare metal / RTOS, with clock frequencies as low as 10MHz up to 250MHz and provides ~60 fps. The tiny graphics library is as small as 30k Bytes fitting into the smallest on-chip DDR or flash memory. The NEMA®|GFX software driver stack, SDK and toolkit provides an easy to use programming environment with aggressive power savings, intelligent composition, rendering and bandwidth optimizations for customers to build an appealing ultra-low power graphical user experience for smart watches, thermostats and other Internet of Things (IoT) products that require lower power displays with graphics support.

With the NEMA®|pico IP-Series, Think Silicon provides cost-effective scalable hardware solutions without compromising graphics performance. The NEMA®|pico GPU processors offload the heavy lifting graphics capabilities freeing the CPU to perform more essential tasks while still operating within low power requirements.

The NEMA®|pico XL 2.5D multicore GPU is available in three configurations – the pico XL 1000 (one core), pico XL 2000 (two cores) and pico XL 4000 (four cores) – with clock frequencies from 100MHz to 700MHz, ~70-130 fps and a tiny silicon area from $0.21mm^2 - 0.71mm^2$ and power consumption as low as 2mW.
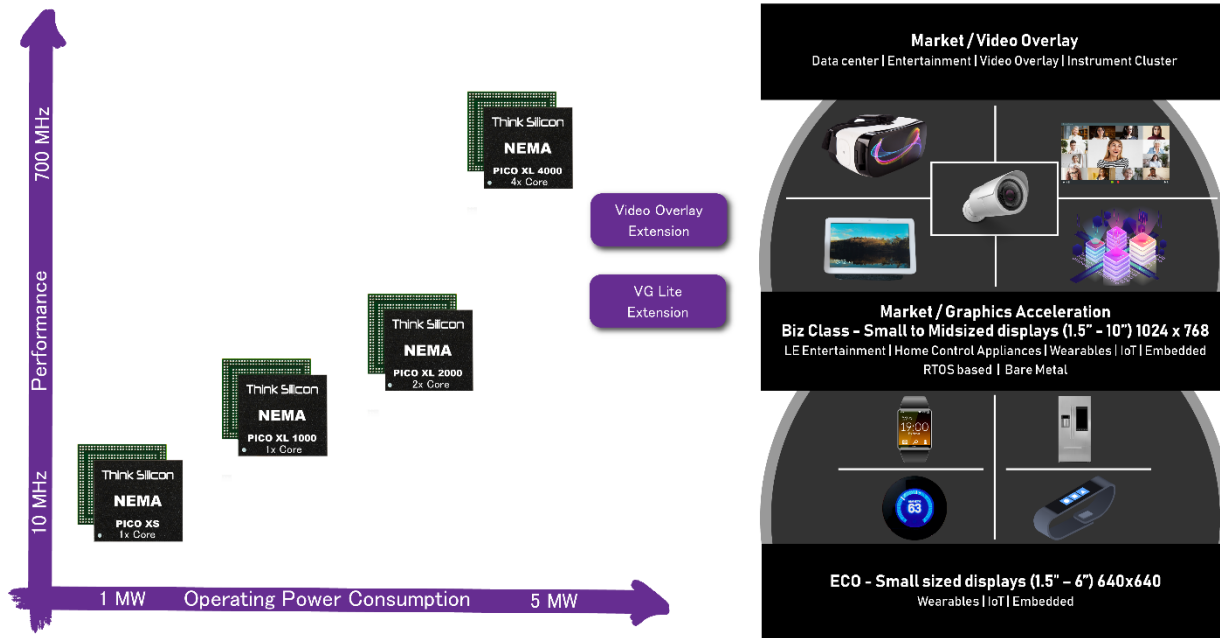
Now shipping to customers, the NEMA®|pico IP-Series is designed for a wide variety of applications including mid- to high-end wearables and embedded IoT display and camera products ranging from 1.5" to 10" with 1024x768 resolution, such as multiple smart sport/fitness watches, smart speakers, appliances, cameras, A/V systems, entertainment systems, industrial displays and client/server video overlay platforms.

Customers who choose the NEMA®|pico XL-Series can add additional extensions:

• The Vector Graphics Extension allows executing fast and precise resolution-independent rendering tasks for maps, fonts or rounded geometries such as circular displays by supporting different path segment types (Lines, Quadratic Beziers, Elliptical Arcs), paint (Color fill, Gradient, Texture) and path rendering (Fill, Blend, Stoke, etc.).

• The Video Overlay Extension enables video functions using the GPU cores to accelerate video operations such as video composition and overlaying, color space and format conversions by complementing the usual GPU raster operations (e.g. filling, blitting, affine projective transformation, blending, color keying, etc.). These functions can be used in combination in surveillance cameras and server/client video processing/composition environments for video watermarking, video subtitling, AI video tasks, image labeling and digital signage.

These two extensions are now available to customers with additional extensions anticipated in Q1 2021 to achieve increased graphics and video functionality.

The NEMA®|pico XS and NEMA®|pico XL Multi-Core GPU IP-Series

Now shipping to customers, the NEMA®|pico IP-Series from Think Silicon provides cost-effective scalable hardware solutions with high-performance graphics to a wide range of applications

The NEMA®|pico IP-Series is available now in RTL Verilog HDL code. It supports AMBA interfaces and embeds DMA controllers with command list for minimal CPU overhead. Drivers supported include: FreeRTOS, Linux OS, bare metal C library for OS-less systems, NEMA®|GFX API-library in C, acceleration driver for third-party backend graphic APIs, configurator tool, verification suite, scripts for STA, synthesis, formality, etc.

For more information about NEMA®|pico XS-XL Series, please visit: www.think-silicon.com.

About Think Silicon

Think Silicon Research and Technology S.A., an Applied Materials company, is a leading provider of ultra-low power 2D & 3D Graphics, AI and Video IP for smart IoT/edge connected end nodes such as display and camera devices and embedded systems. At Think Silicon our innovation enables the rapid deployment of multitude applications on resource-constrained devices while significantly improving battery life to shape a more sustainable future in graphics, vision and AI processing. Think Silicon Research and Technology S.A.'s headquarters and development center are based in Athens and Patras Greece, with sales and technical support offices in North America, Europe and Taiwan.