Numo™ 3

NComputing®

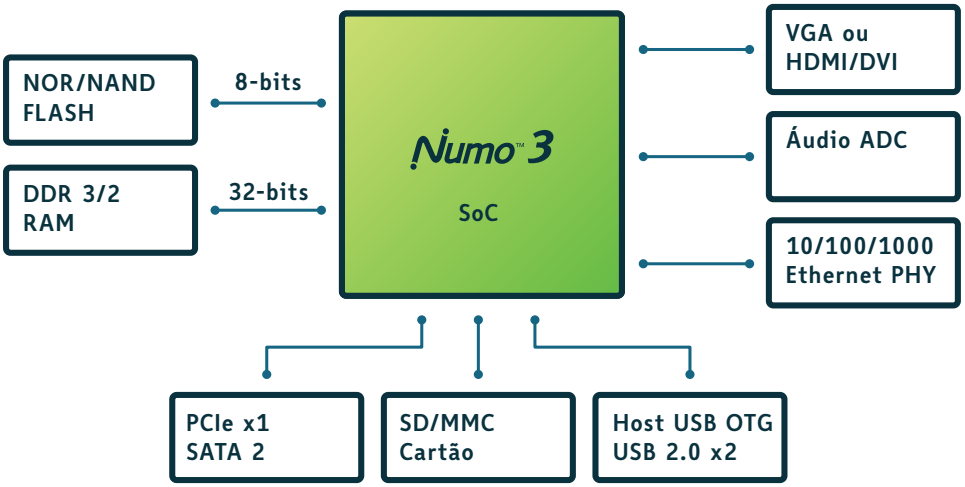
Project brief:
Numo™ 3

Overview

The Numo family of System-on-Chips (SoCs) are single chip devices that enable OEMs to design high performance, low cost, thin clients and other devices. Numo 3 leverages multiple generations of NComputing Numo technology that is deployed in millions of seats today. By adding support for Citrix HDX, Numo 3 delivers an unmatched level of performance, capability and cost to further propel desktop virtualization into enterprises worldwide.

The Numo 3 device is based on an ARM Cortex A9 Dual-Core processor and includes accelerators for TCP/IP packet processing and cryptographic encryption – ensuring maximum network security with minimal network impact. A powerful Numo codec is also integrated that offloads the processor from CPU intensive video processing functions for HDX client-side rendering and is capable of decoding incoming H.263, H.264, MPEG2/MPEG4, JPEG, VC1 and Sorenson Spark streams of up to 1080P resolution. These advanced graphics features enable support for the wide range of multimedia content demanded by today's end-users – while optimizing the use of host and network resources.

Numo™ 3 SoC system level block diagram



Standard peripheral ports include two USB 2.0 ports (for mouse, keyboard and other USB peripherals), one of which can be interfaced to an external USB hub if additional ports are required. A USB OTG host port is included for factory programming. The included Ethernet MAC has an interface to an external GMII/MMI 10/100 or Gigabit PHY. Additional ports include stereo audio in/out (via interface to external audio ADC), 8x GPIO pins, 2x Serial UART ports, 2x I2S interfaces, 4x I2C interfaces, a PCI-e (x1) expansion bus, SATA 2 controller, and memory card interface for external SD/MMC cards. This variety of ports enables a wide range of configuration possibilities to serve the special needs of practically any thin client application.

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The device boots from an internal ROM and interfaces to up to 2GB of NAND Flash for typical configurations – a parallel NOR and serial Flash interface is also included. Up to 1GB of DDR3 1066 memory can be attached.

The video output port supports an external VGA DAC or Digital HDMI/DVI interface, with up to 1920x1080 resolution at 60Hz covering current and future users' video demands.

NComputing has produced a thin client reference design for OEMs, with an evaluation board and design package, including a Linux-based firmware package and binary copy of an optimized HDX Receiver, allowing the system to interface to a Citrix XenDesktop, XenApp or other HDX compatible environment. Contact NComputing today to learn more about how this unique Numo solution can solve your design needs.

KEY FEATURES & BENEFITS

HDX READY CLIENT	System-on-Chip solution for Citrix™ HDX Ready clients allows OEMs to build high performance, low cost, low power, thin clients, network monitors and other form-factor devices that attach to Citrix XenDesktop or XenApp Servers
PROCESSOR	Dual Core ARM Cortex A9 Less than 2W typical power Integrated TCP/IP Accelerator & Cryptographic Security Processor
DISPLAY OUTPUT, VIDEO & GRAPHICS	VGA or HDMI/DVI port up to 1920x1080 resolution NUMO Codec for HDX client side rendering (includes H.263, H.264MP, MPEG2, MPEG4, JPEG, VC1, Sorenson Spark) 3D Graphics Accelerator – supports OpenGL ES 2.0
PERPHERAL PORTS	2x USB 2.0, 1x USB OTG Host, Ethernet (to external GMII/MMI PHY), Stereo Audio In/Out, 8x GPIO, 2x Serial UART, 2x I2S, 4x I2C, PCI-e (x1), SATA 2, SD/MMC
MEMORY INTERFACES	Up to 1 GB DDR3 1066 / DDR2 800 16/32bits wide Up to 2GB NAND Flash 32kb on-chip boot ROM & NOR/Serial Flash interface
REFERENCE DESIGN & SOFTWARE	Thin client reference design available with evaluation board, Linux-based firmware & binary copy of optimized HDX Receiver
PACKAGE	23x23mm PBGA

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