

# Virtual desktop system on a chip

## Key features & benefits

### Zero client

- Client for NComputing vSpace™ desktop virtualization software; includes remote PC display, keyboard, mouse, sound input and output, and transparent USB port forwarding

### Display output

- VGA, HDMI, and DVI; up to 1920x1080 resolution supported, up to 24-bit colors
- Integrated video scaler, up to 1920x1080 resolution

### Ports

- USB peripherals, Ethernet, audio inputs and outputs, GPIO, Serial, I2S, I2C

### Memory Interfaces

- DDR2 controller, Flash (NOR and NAND) controller

### Audio Decoder

### Video Decoder

- Numo Codec, H264, MJPEG

### Software

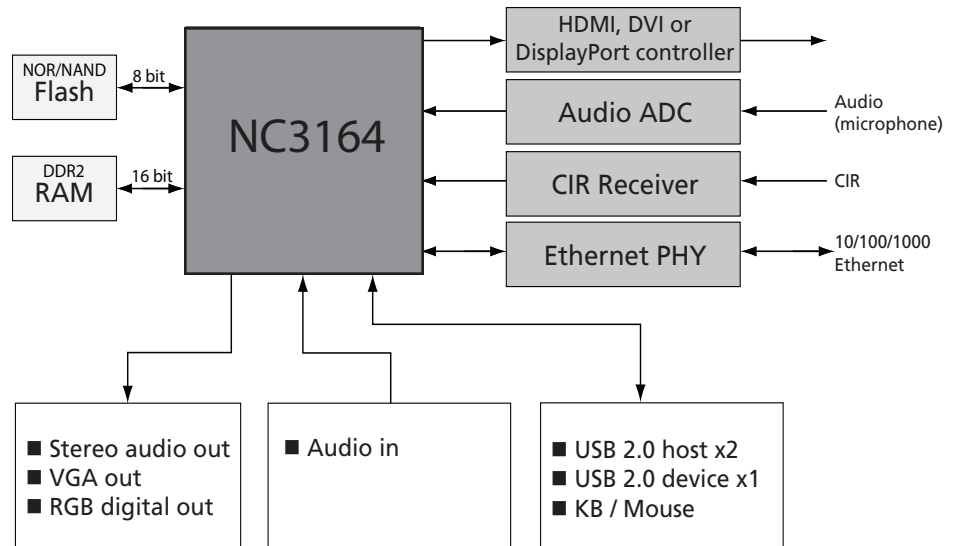
- Embedded Linux OS
- Android OS

### Technology

- 3.3V supply
- Dual Core ARM926EJ-S CPU
- 1 watt typical power

### Typical applications

- Zero clients
- Cloud devices
- Set-top boxes
- Consumer electronics
- Display kiosks
- Industrial applications



Numo family SOC top-level block diagram (may vary by model)

## Overview

The Numo family of SOCs are single chip devices that provide virtual desktop capabilities in an NComputing vSpace™ or cloud computing environment.

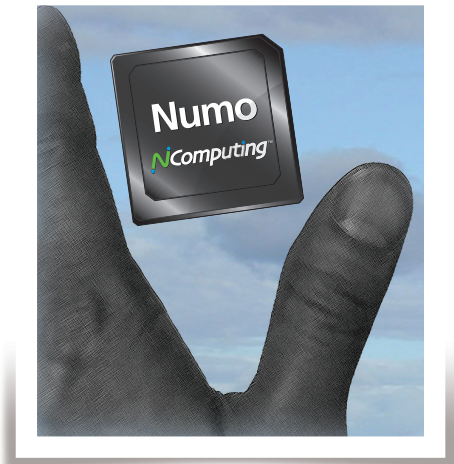
Numo powered chips are extremely flexible, designed to be integrated into both enterprise devices such as zero clients, laptops, and netbooks, and consumer devices such as set-top boxes, televisions, smartbooks, and other embedded applications that require low cost PC functionality in a networked environment while delivering full-fidelity multimedia.

Numo SOCs include an advanced architecture, based on dual core ARM 926EJ-S processors, with an H.264 video decoder, built in memory, audio and display interfaces, as well as integrated peripheral support for 10/100/1000 Ethernet, USB 2.0, and UARTs.

A Numo powered device connects to the host computer via a standard TCP/IP network using the NComputing UXP protocol and displays the user desktop session, transmits keyboard and mouse activities to the PC and interfaces to local peripherals.

Connection to a WLAN is possible using an internal or external 802.11n device connected to a USB port on a Numo powered chip. The efficient NComputing UXP protocol ensures excellent video and graphics performance and seamless keyboard and mouse response while optimizing for both host-side scalability and low bandwidth utilization.

Numo powered SOCs run a variety of embedded operating systems including Linux and Android. Video output is via a standard VGA port and supports resolutions from 640x480 up to 1920x1080 with 24-bit color. In addition, an external DVI, HDMI or DisplayPort controller can be driven from a digital video out port. An integrated video scaler allows scaling up to the maximum display resolution. An LCD port is available.



The Numo SOC includes Numo codec technology for high quality video in a vSpace™ environment. For cloud computing applications H264 and MJPEG are provided. Stereo audio output is supported using an analog output or I2S interface and microphone input is supported using an internal audio-to-digital converter (ADC) or I2S interface.

NComputing provides a reference design and evaluation board for Numo family SOCs and Linux software that allows OEMs to adapt the solution to their specific designs.

Specifications	
USB Support (via firmware)	Dedicated USB mouse and keyboard support, USB 2.0 devices transparently redirected to host computer
Ports	Dedicated USB keyboard and mouse, USB 2.0 host (x2), USB device, Ethernet (100 Mbps), speakers, microphone, VGA, DVI or HDMI, DisplayPort, I2S, RGB digital (LCD controller output), GPIO
Package	420 ball PBGA, lead free, 23mm x 23mm x 1.8mm (NC3164)

