## Overview

The Vadem VG330 is a 32MHz single-chip platform which provides OEMs with a highly battery-efficient means to develop cost sensitive, DOS-based, handheld electronic products. VG330 offers fastest time to market with available DOS based GUI solutions.

Potential applications for VG330 are smartphones, display phones, low cost internet access devices, organizers, handheld POS terminals, GPS terminals, and other price sensitive consumer products.

The chip contains a processor, all standard PC peripherals, additional high-value peripherals and a 16 bit AT style expansion bus. Its integrated video architecture shows very fast video performance. Extensive and proven power management is also standard.

The VG330 contains the latest NEC V30MX processor and also embodies a standard PC architecture combined with hardware and software features for rapid design of products with extensive ROM-based software. PC Card 2.1; ExCA PC Cards are fully supported. The VG330 single-chip PC platform is a single 160-pin CMOS chip handling all PC functions including 16-bit CPU, LCD controller, keyboard scanner and PC Card controller. All that is required for a basic system is the VG330, memory, power supply, display and associated packaging.

VG330 Block Diagram
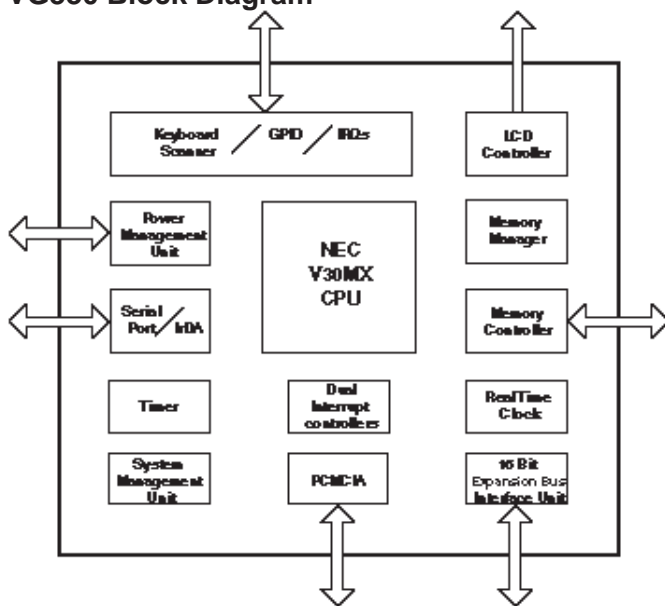
Key Features

■ Built-in x86 compatible 16-bit, 32MHz NEC V30MX processor offers a high performance single-chip solution.

Supports GUI solutions from Geoworks, PenRight! and other DOS based applications.

Unified memory architecture eliminates additional video memory requirements.

Single 160-pin thin QFP chip permits glueless implementation of a fully compatible PC. Local-bus video offers up to 9x the video performance of AT systems.

Field-proven, industry standard power management, based on activity monitoring, extends battery life.

Scans up to 101 keys without an external keyboard controller.

Integrated local-bus PC compatible LCD graphics controller with support up to 640x480 resolution. Supports a wide variety of standard and custom panel resolutions.

One PC Card 2.1 ExCA card slot support allowing "hot" insertion/removal.*

Integrated serial port, real-time clock, dual programmable interrupt controllers and internal timer.

Support for DRAM, SRAM, PSRAM and slow refresh memory. Allows up to six 16-bit RAM banks.

Standard ICE capability simplifies debugging of system designs.

Serial infrared interface.

With external buffers.

Functional Description

In addition to the processor, the basic compatibility logic, Timer, Interrupt Controller, a Serial Port and a Real Time Clock (RTC), the VG330 includes high-value peripherals key to building battery-powered handheld personal electronic products:

■ A PC Card Controller handles PC Card 2.1; ExCA cards. Both I/O and memory cards are fully supported, as is the memory-saving XIP ("execute-in-place") standard.

The LCD Controller supports a wide variety of LCD panel resolutions, 640x200 and AT&T 640x400 monochrome graphics mode included along with support for VGA mode 11 monochrome 640x480 graphics mode. The LCD Controller shares main system memory with the CPU, eliminating dedicated display memory altogether. This local-bus implementation supports direct screen writes for high video performance. The LCD Controller may be disabled if an external controller (for example the VG-660 VGA LCD/CRT Controller) is to be used.

24 enhanced GPIO pins provide maximum flexibility, including an external, variable size key matrix and internal keyboard scanner.

Vadem's field-proven power management significantly extends battery life by reducing the CPU clock rate and by cutting power to inactive functional blocks and peripherals. The PMU also monitors battery voltage and can produce a maskable interrupt on Low Battery and Low, Low Battery.

The VG330 single-chip platform is built around a Single Bus Architecture (pat. pend.). The address and data lines of the Single Bus support 8 bit or 16 bit AT style memory and I/O devices, altering signals and timing on the fly as appropriate.

The VG330 single-chip GUI platform may be debugged using an ICE. A simple interface in the form of a daughterboard connects between the motherboard's VG330 socket and the ICE.

ADDITIONAL INFORMATION
Additional information regarding pinout and pin descriptions, register descriptions, timing characteristics and operating conditions may be obtained from the VG330 data manual.