SCH3223

LPC IO with HWM, Dual UARTs, Power Button and Reset Support

Product Features

- General Features
  - 3.3 Volt Operation (SIO Block is 5 Volt Tolerant)
  - Programmable Wake-up Event (PME) Interface
  - PC99, PC2001 Compliant
  - ACPI 2.0 Compliant
  - Serial IRQ Interface Compatible with Serialized IRQ Support for PCI Systems
  - ISA Plug-and-Play Compatible Register Set
  - Four Address Options for Power On Configuration Port
  - System Management Interrupt (SMI)
  - 8 Dedicated General Purpose I/O pins
  - 2 GPIOs with VID compatible inputs
  - Security Key Register (32 byte) for Device Authentication
- Low Pin Count Bus (LPC) Interface
  - Supports Bus frequencies of 19MHz to 33MHz
- Watchdog Timer
- Resume and Main Power Good Generator
- 2 Full Function Serial Ports
  - High Speed NS16C550A Compatible UARTs with Send/Receive 16-Byte FIFOs
  - Supports 230k, 460k, 921k and 1.5M Baud
  - Programmable Baud Rate Generator
  - Modem Control Circuitry
  - 480 Address and 15 IRQ Options
  - Support IRQ Sharing among serial ports
  - RS485 Auto Direction Control Mode
- Hardware Monitor
  - Monitor Power supplies (+2.5V, +5V, +12V, Vccp processor voltage), VCC, Vbat and Vtr.
  - Remote Thermal Diode Sensing for One External Temperature Measurement accurate to 1.5°C
  - Internal Ambient Temperature Measurement
  - Limit Comparison of all Monitored Values
  - Programmable Automatic FAN control based on temperature
- IDE Reset Output and 3 PCI Reset Buffers with Software Control Capability
- Power Button Control and AC Power Failure Recovery
- Temperature Ranges Available
  - Industrial (+85°C to -40°C)
  - Commercial (+70°C to 0°C)
- 64-Ball WFBGA RoHS Compliant Package

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1.0 INTRODUCTION

1.1 General Description

The SCH3223 is a 3.3V (Super I/O Block is 5V tolerant) PC99/PC2001 compliant Super I/O controller with an LPC interface. The SCH3223 also includes Hardware Monitoring capabilities, enhanced Security features, Power Control logic and Motherboard Glue logic.

The SCH3223 is ACPI 1.0/2.0 compatible and therefore supports multiple low power-down modes. It incorporates sophisticated power control circuitry (PCC), which includes support for keyboard.

The SCH3223 supports the ISA Plug-and-Play Standard register set (Version 1.0a). The I/O Address and hardware IRQ of each Logical Device may be reprogrammed through the internal configuration registers. There are up to 480 I/O address location options, and a Serialized IRQ interface.

Super I/O functionality includes two serial ports. The serial ports are fully functional NS16550 compatible UARTs that support data rates up to 1.5 Mbps. They both have the full 8 pin interface. The Serial Ports contain programmable direction control, which will automatically drive nRTS when the Output Buffer is loaded, then drive nRTS when the Output Buffer is empty.

Hardware Monitoring (HWM) includes support for monitoring an external temperature via thermal diode inputs and an internal sensor for measuring local ambient temperature.

Hardware Monitoring also includes programmable, automatic fan control, consisting of a fan tachometer input and a pulse width modulator (PWM) fan control output, responding to temperature inputs and programmable via the LPC bus. It has the ability to alert the system to out-of-limit conditions and automatically control the speed of a fan in response.

Hardware Monitoring capability also includes voltage monitoring, and it has the ability to alert the system to out-of-limit conditions. There are four analog inputs for monitoring external voltages of +5V, +2.5V, +12V and Vccp (core processor voltage), as well as internal monitoring of the device’s internal VCC, VTR, and VBAT power supplies. SMI and PME Wake outputs are provided to indicate out-of-limit temperature, voltage, and fan speed conditions. Hardware Monitoring features are accessible via the LPC bus.

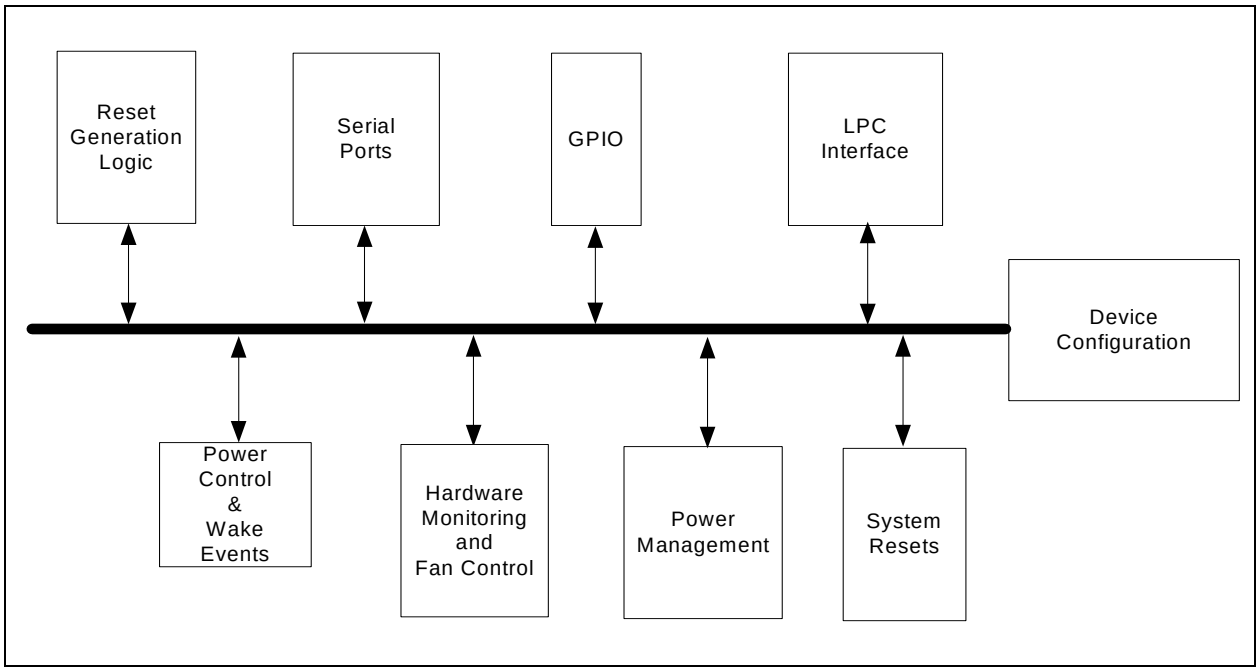
The Motherboard Glue logic includes various power management and system logic including generation of nRSMRST, and reset generation. The reset generation includes a watchdog timer which can be used to generate a reset pulse. The width of this pulse is selectable via an external strapping option.

System related functionality, which offers flexibility to the system designer, includes General Purpose I/O control functions, and control of two LED's.

1.2 Block Diagram

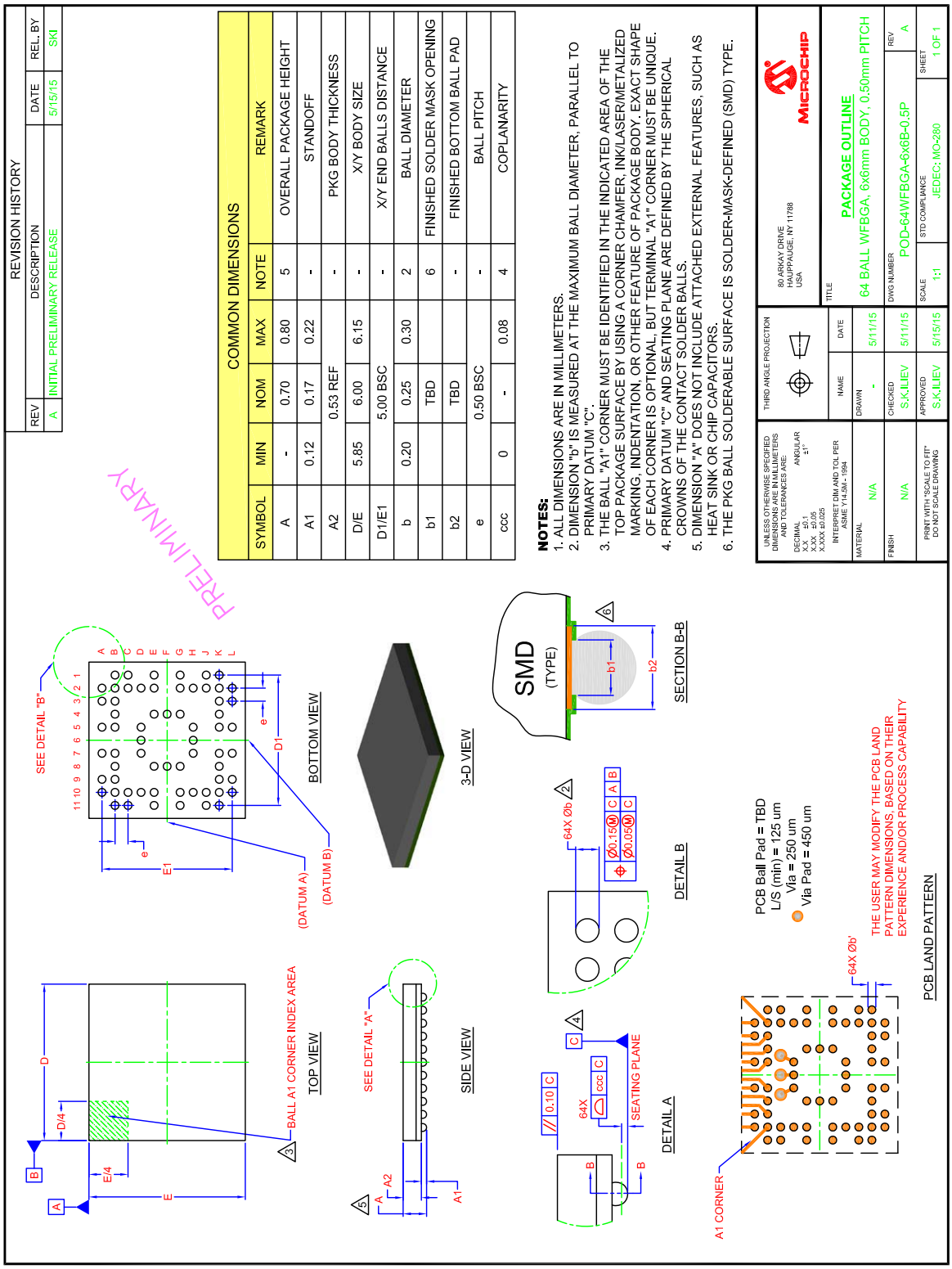
An internal block diagram of the SCH3223 is shown in Figure 1-1.

FIGURE 1-1: ARCHITECTURAL OVERVIEW



2.0 PACKAGE OUTLINE

FIGURE 2-1: SCH3223 64 WFBGA Package



3.0 BALL LAYOUT

3.1 SCH3223 Ball Layout Summary

FIGURE 3-1: SCH3223 FOOTPRINT DIAGRAM, TOP VIEW

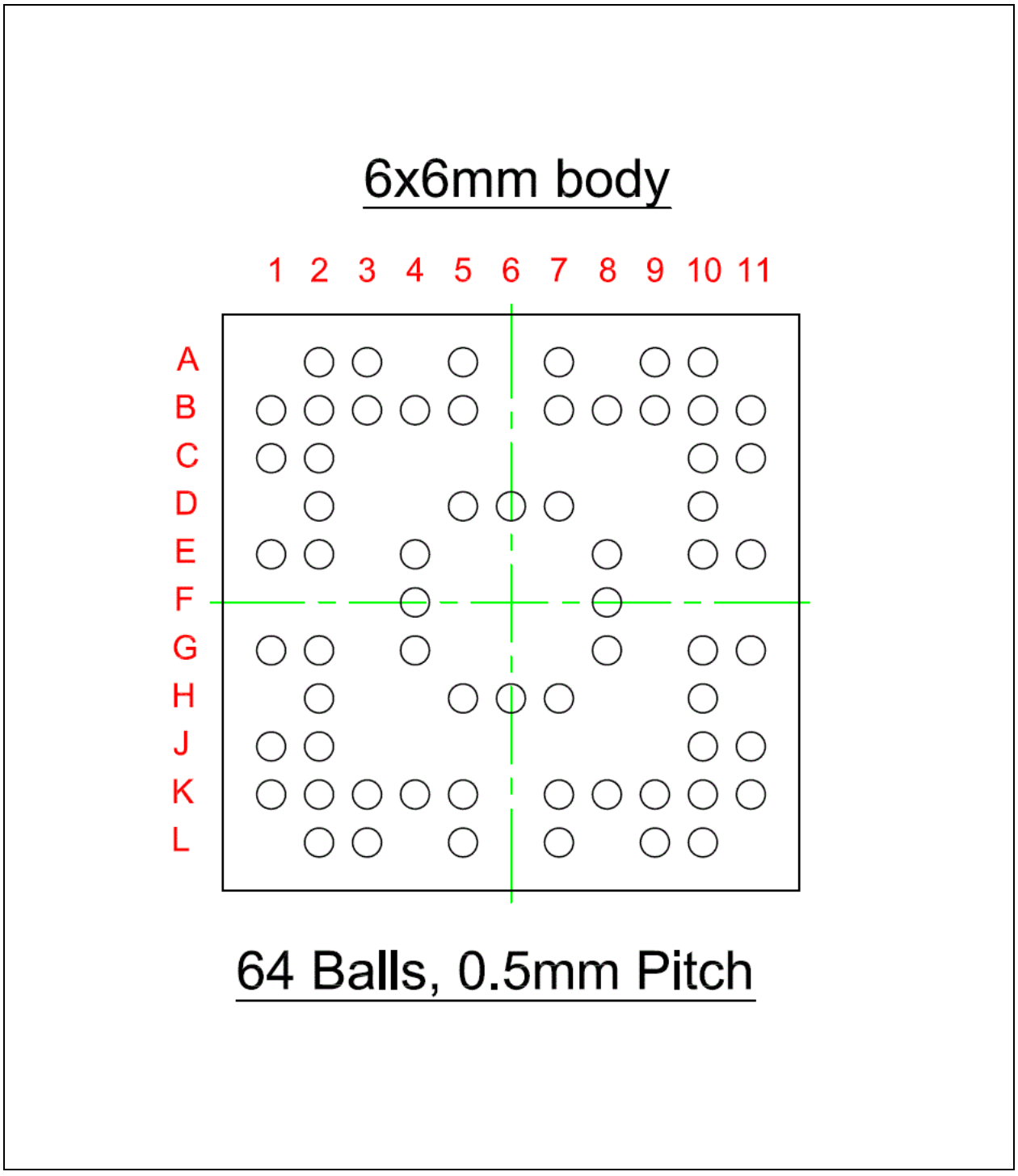


TABLE 3-1: SCH3223 SUMMARY

BALL#	FUNCTION[a]
B1	+12V_IN
C1	+5V_IN
C2	VTR
D2	TEST=VSS
E2	VSS
E1	CLOCKI
E4	LAD0
F4	LAD1
G4	LAD2
G2	LAD3
G1	LFRAME#
H6	PCI_RESET#
H5	PCI_CLK
H2	SER_IRQ
J2	VSS
K3	VCC
J1	nIDE_RSTDRV / GP44
K2	nPCIRST1 / GP45
K1	nPCIRST2 / GP46
L2	nPCIRST3 / GP47
L3	AVSS
K4	VBAT
K5	GP27 / nIO_SMI / P17
L5	VTR
L9	nRI1
L10	nDCD1
K11	RXD1
K7	TXD1 / SIOXNOROUT
K8	nDSR1
K9	nRTS1 / SYSOPT0
K10	nCTS1
J10	nDTR1 / SYSOPT1
J11	GP50 / nRI2
H10	VTR
L7	VSS
H7	GP51 / nDCD2
G11	GP52 / RXD2
G10	GP53 / TXD2
G8	GP54 / nDSR2
F8	GP55 / nRTS2 / RESGEN
E8	GP56 / nCTS2
D6	GP57 / nDTR2
D7	PB_OUT#
E10	PS_ON#

TABLE 3-1: SCH3223 SUMMARY (CONTINUED)

BALL#	FUNCTION[a]
E11	PB_IN#
D10	SLP_SX#
C11	GP42 / nIO_PME
C10	GP61 / nLED2 / CLKO
B11	GP60 / nLED1 / WDT
A10	GP63
B10	CLKI32
A9	nRSMRST
B9	GP62
B8	PWRGD_OUT
B7	PWRGD_PS
A7	nFPRST / GP30
A5	PWM1
B5	FANTACH1
D5	HVSS
B4	HVTR
B3	REMOTE1-
A3	REMOTE1+
B2	VCCP_IN
A2	+2.5V_IN

a. Device ID register at Plug&Play Index 0x20 holds 0x7D.

4.0 PRODUCT BRIEF REVISION HISTORY

TABLE 4-1: REVISION HISTORY

Revision Level & Date	Section/Figure/Entry	Correction
DS00002107A (02-16-16)	Document Release	

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PART NO.	[X]	-	XX	-	[XX]
Device	Temperature Range		Package		Tape and Reel Option

Device:	SCH3223	
Temperature Range:	Blank =	0°C to +70°C (Commercial)
	I =	-40°C to +85°C (Industrial)
Package:	7U =	64-pin WFBGA
Tape and Reel Option:	Blank =	Standard packaging (tray)
	TR =	Tape and Reel (Note 1)

Examples:

a) SCH3223-7U
Commercial temperature, 64-pin WFBGA, Tray

b) SCH3223I-7U-TR
Industrial temperature, 64-pin WFBGA, Tape & Reel

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ISBN: 9781522403012

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