

PC87363 SuperI/O Reference Design

National Semiconductor
Shai Altman
December 1998



The PC87363, a member of National Semiconductor's 128-pin LPC SuperI/O family, introduces a MIDI interface for music devices and game port inputs for up to two joysticks. It also offers wake-up support for a wide range of wake-up events, and new hardware and software features to protect the system. Like all members of this family, it is PC99 and ACPI compliant, and offers a single-chip solution to the most commonly used PC I/O peripherals.

The PC87363 also incorporates: a Floppy Disk Controller (FDC), a Keyboard and Mouse Controller (KBC), a full IEEE 1284 Parallel Port, two enhanced Serial Ports (UARTs), one with Infrared (IR) support, ACCESS.bus® Interface (ACB), System Wake-Up Control (SWC), General-Purpose Input/Output (GPIO) support for 37 ports, and an enhanced WATCHDOG™ timer.

This application note provides schematic diagrams for the circuits required to support the PC87363 SuperI/O device.

SCHEMATIC DIAGRAMS FOR BASIC FUNCTIONS

- PC87363 block diagram
- PC87363 device connections
- System Wake-Up Control (SWC)
- Game and MIDI ports
- Fan Speed Control and Monitor (FSCM)
- Blinking LEDs
- Connections to the motherboard
- Floppy Disc Controller (FDC) connector
- Serial ports (UARTs)
- Keyboard and Mouse PS/2 connectors
- Parallel port terminations and connector

Each schematic diagram includes specific assembly information, where required.

Active low signals are either prefixed with an "n", or are denoted by an overline.

SCHEMATIC DIAGRAMS FOR ALTERNATE FUNCTIONS

The Appendices provide schematic diagrams for the following alternate functions:

- Appendix A - ACCESS.bus (ABC)
If the ACCESS.bus is connected:
 - SCL replaces GPIO12
 - SDA replaces GPIO13.
- Appendix B - Infrared (IR) Interface
If the IR Interface is connected:
 - IRTX replaces GPO15
 - IRRX2_IRSL0 replaces GPIE6
 - IRRX1 replaces GPIE7.

POWER SUPPLIES

The PC87363 SuperI/O device requires the following power supplies:

- Main 3.3V
- Standby 3.3V
- Main 5V
- Battery 3V

Preliminary information - subject to change without notice.

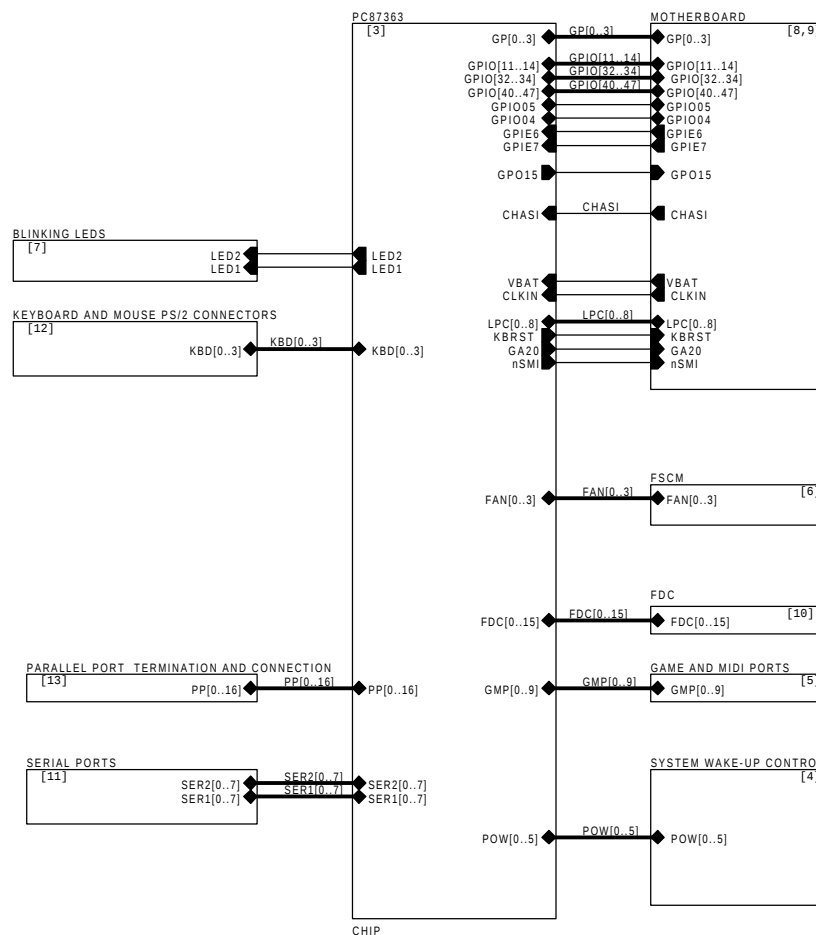
ACCESS.bus® is a registered trademark of Digital Equipment Corporation.
WATCHDOG™ is a trademark of National Semiconductor Corporation.
SuperI/O™ is a trademark of National Semiconductor Corporation.

PC87363 REFERENCE DESIGN



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Size		Document Number				Rev	
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Date:		Wednesday, November 25, 1998		Sheet		1 of 13	
				E			

BLOCK DIAGRAM



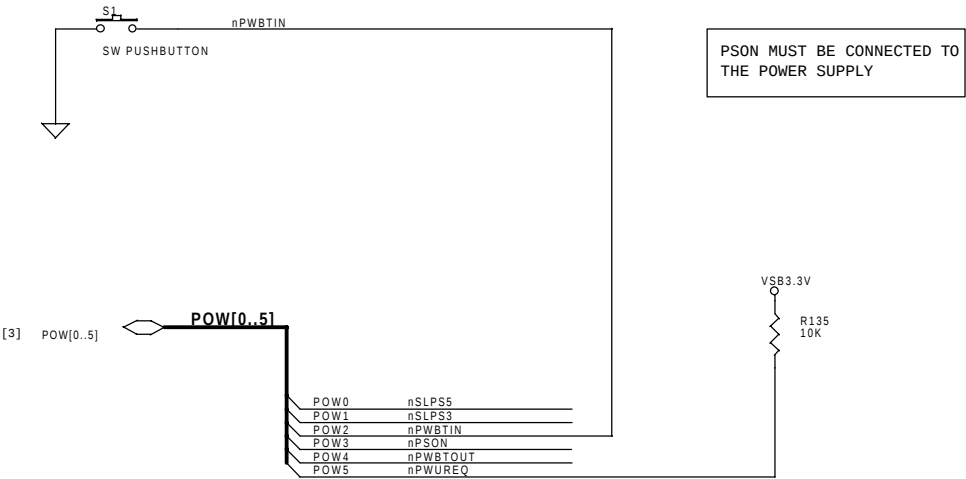
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Size	Document Number				Rev
B	(Doc)				0.2
Date: Wednesday, December 23, 1998			Sheet 2 of 13		

3



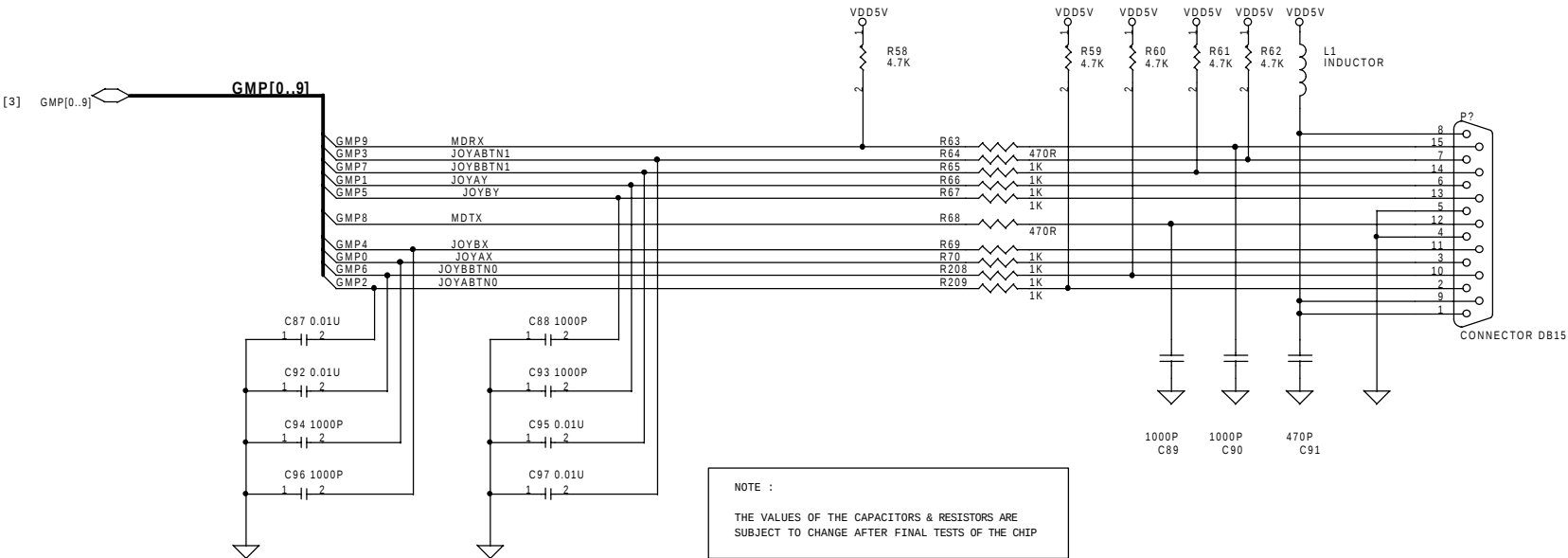
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Size B	Document Number (Doc)				Rev 0.2
Date:	Thursday, December 17, 1998		Sheet	3	of 13

SYSTEM WAKE-UP CONTROL



NATIONAL SEMICONDUCTOR (R)				PC87363 REFERENCE DESIGN			
Title							
SYSTEM WAKE-UP CONTROL							
Size	Document Number					Rev	
B	{Doc}					0.2	
Date:	Wednesday, December 23, 1998			Sheet	4	of	13
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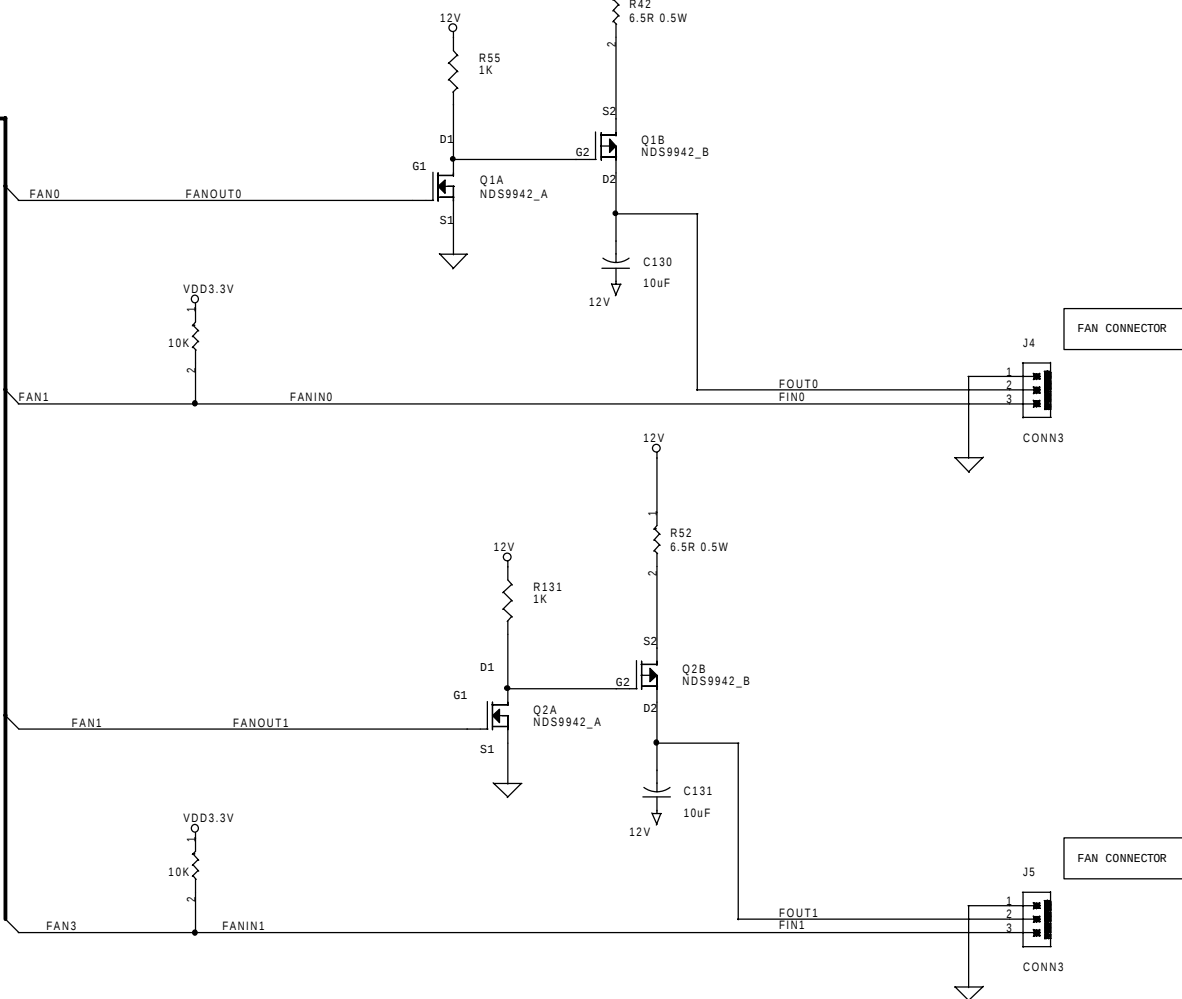
GAME AND MIDI PORTS



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Title GAME AND MIDI PORTS		
Size 8	Document Number (Doc)	Rev 0.2
Date:	Tuesday, December 01, 1998	Sheet 5 of 13

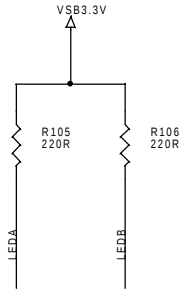
FAN SPEED CONTROL AND MONITOR (FSCM)

[3] FAN[0..3]



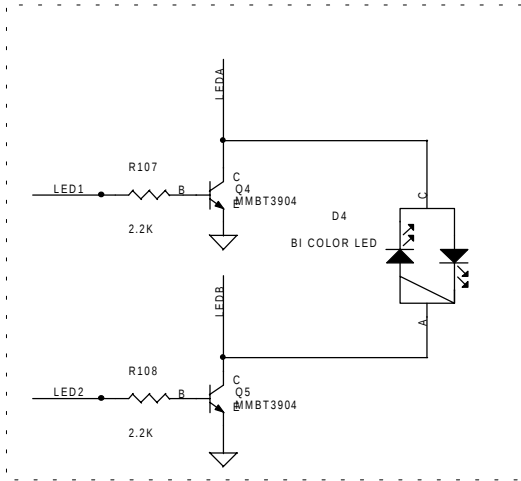
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FAN SPEED CONTROL AND MONITOR (FSCM)		
Size	Document Number	Rev
B	(Doc)	0.2
Date:	Wednesday, December 16, 1998	Sheet 6 of 13

BLINKING LEDS

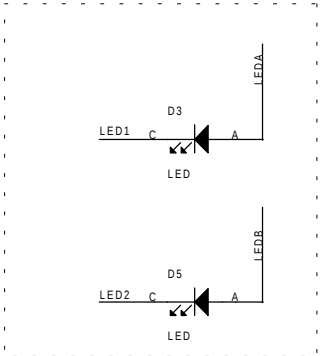


[3] LED1

[3] LED2



Altenative ONE



Altenative TWO

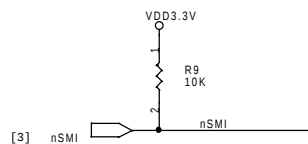
NOTE:
ONLY ONE OF THE TWO ALTERNATIVES
SHOULD BE MOUNTED ON THE BOARD



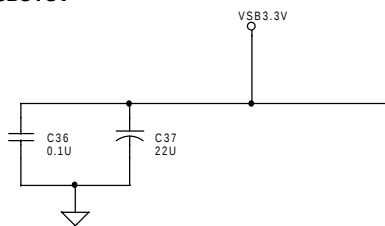
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Size B	Document Number (Doc)	Rev 0.2
Date:	Wednesday, December 16, 1998	Sheet 7 of 13

CONNECTIONS TO THE MOTHERBOARD, FIRST PAGE

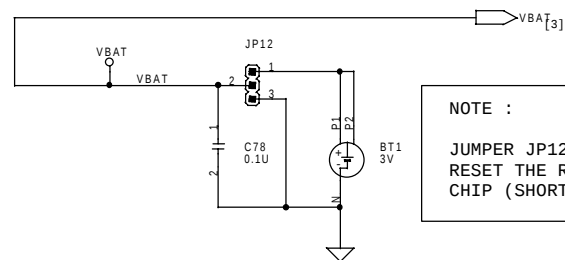
nSMI



VSB3.3V



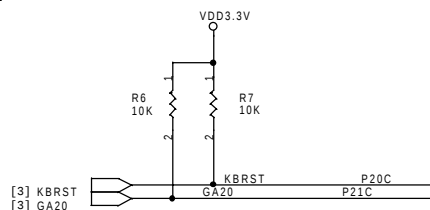
VBAT



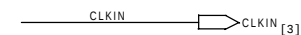
NOTE :

JUMPER JP12 IS RECOMMENDED TO RESET THE REGISTERS IN THE CHIP (SHORT PINS 2 & 3).

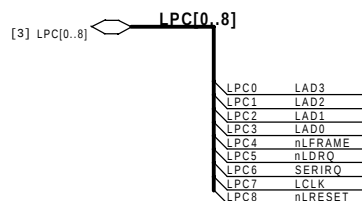
KBRST GA20



CLKIN 48MHz

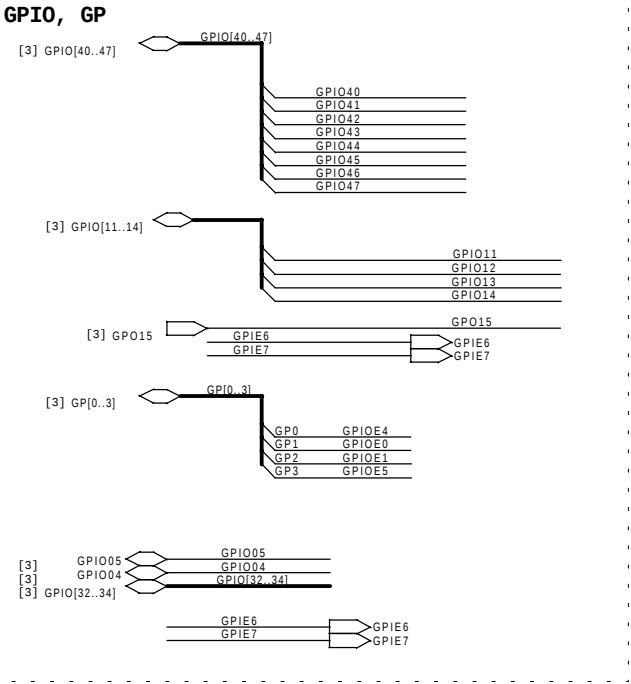
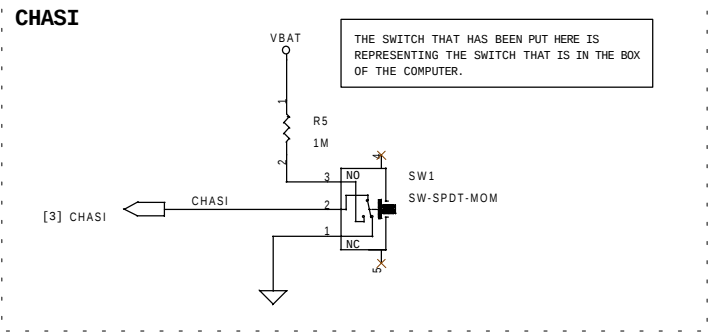


LPC

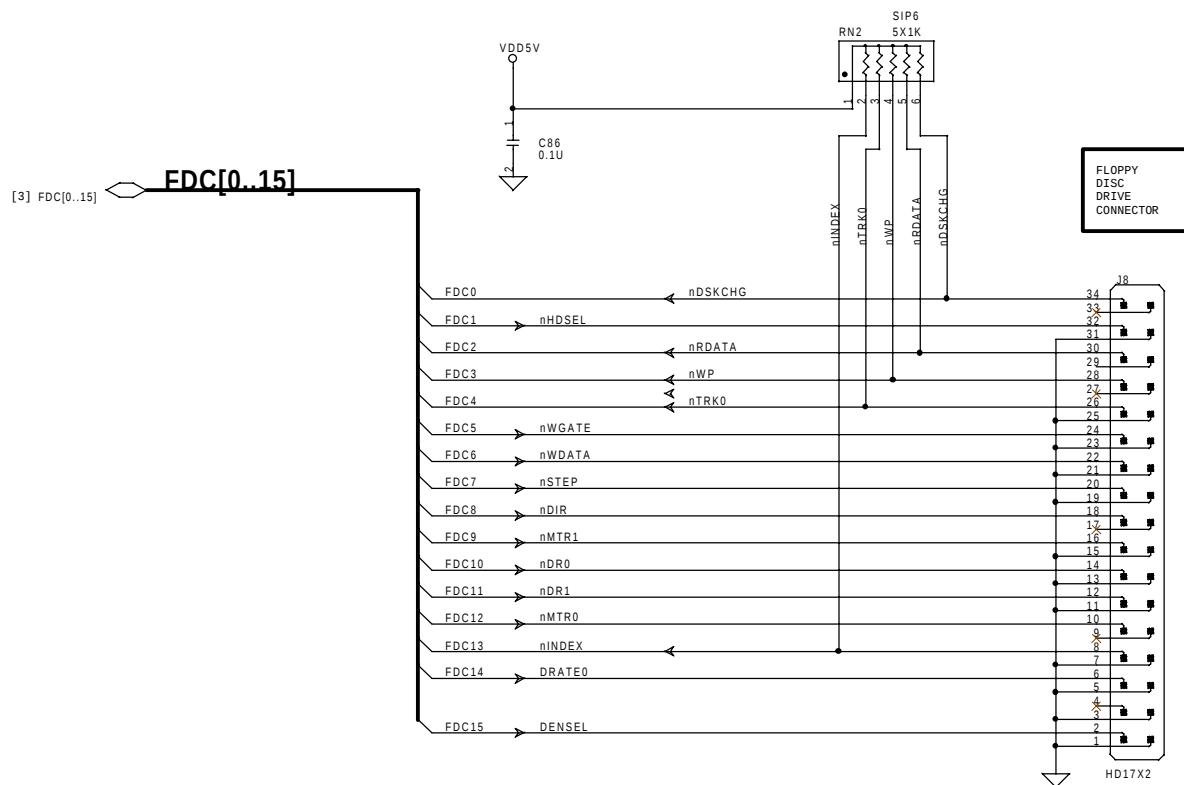


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CONNECTIONS TO THE MOTHERBOARD, FIRST PAGE		
Size	Document Number	Rev
B	(Doc)	0.2
Date:	Wednesday, December 16, 1998	Sheet 8 of 13
E		

CONNECTIONS TO THE MOTHERBOARD, SECOND PAGE

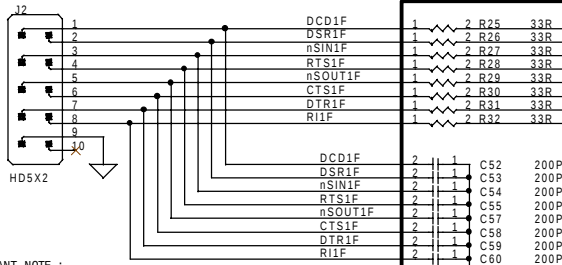


FLOPPY DISC CONTROLLER (FDC) CONNECTOR



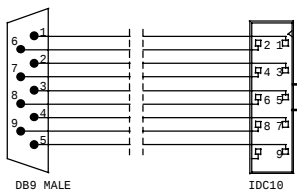
SERIAL PORTS

SERIAL
PORT #1
CONNECTOR



IMPORTANT NOTE :

USE ONLY THE CABLES
WITH STRAIGHT
CONNECTIONS



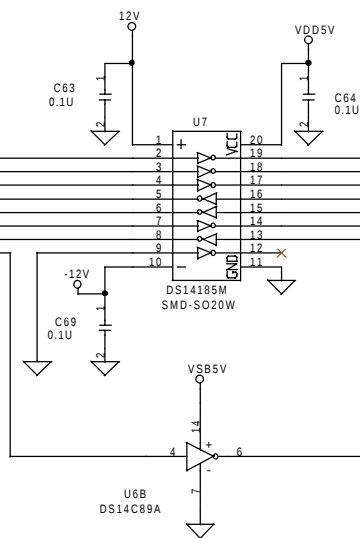
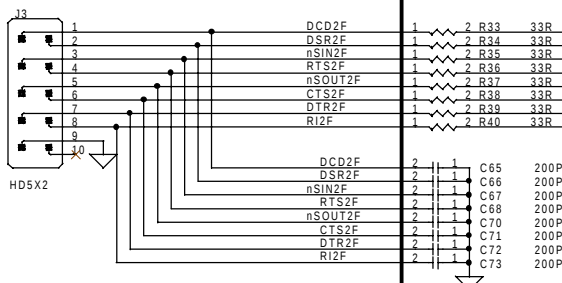
CONTACTS SIDE VIEW

SERIAL PORT
FEMALE

EMI FILTER
NOTE:

1. PLACE CLOSE TO CONNECTORS.
2. CONNECT THE CAPACITORS TO SHIELD.
3. ON THIS BOARD, DUE TO LAYOUT LIMITATIONS, THE CAPACITORS ARE CONNECTED TO GND.

SERIAL
PORT #2
CONNECTOR
MALE



SER1[0..7] SER1[0..7] [3]

SERIAL
PORT #1

NOTE:

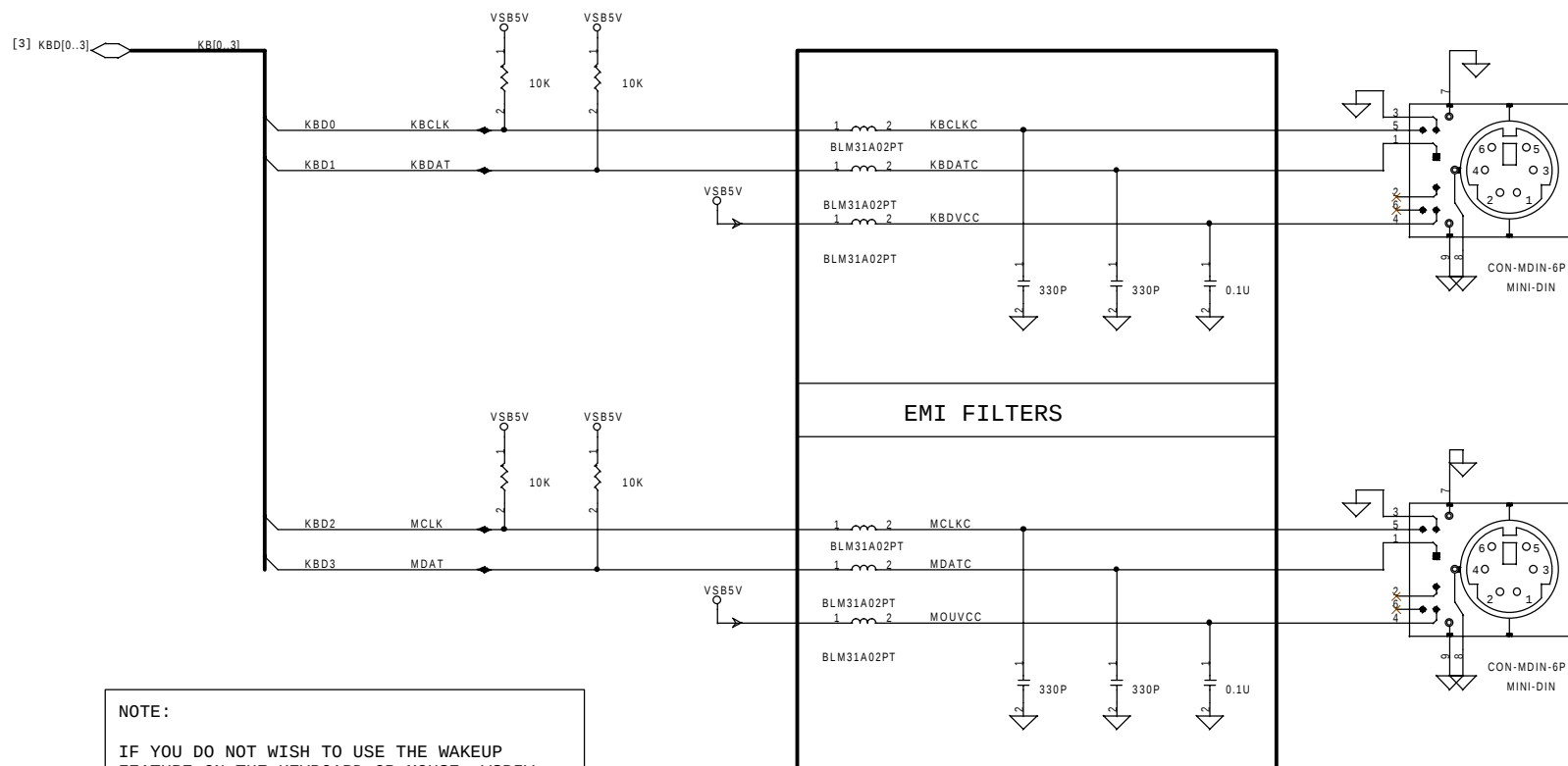
THE DS14C89A IS NEEDED ONLY IF WAKEUP DURING STANDBY IS REQUIRED. OTHERWISE DS14C89A IS NOT REQUIRED AND THE DS14185M CAN BE USED INSTEAD.

SER2[0..7] SER2[0..7] [3]

SERIAL
PORT #2

NATIONAL SEMICONDUCTOR (R)		PC87363 REFERENCE DESGIN
Title SERIAL PORTS		
Size B	Document Number (Doc)	Rev 0.2
Date: Wednesday, December 16, 1998	Sheet 11	of 13

KEYBOARD AND MOUSE PS/2 CONNECTORS



PS/2
KEYBOARD
CONNECTOR

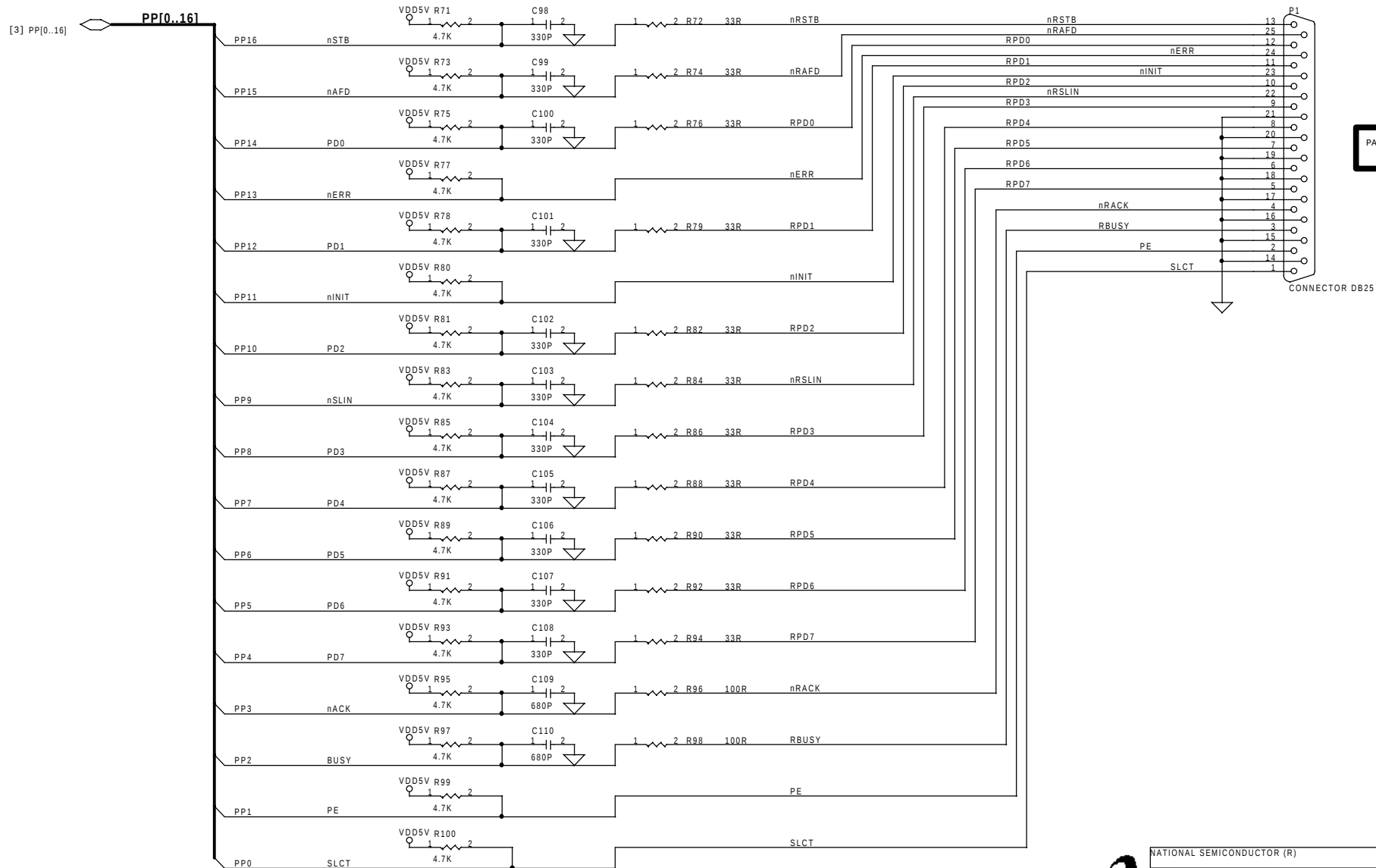
PS/2
MOUSE
CONNECTOR

NOTE:

IF YOU DO NOT WISH TO USE THE WAKEUP
FEATURE ON THE KEYBOARD OR MOUSE, VSB5V
CAN BE REPLACED WITH VDD5V.

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Title		
KEYBOARD AND MOUSE PS/2 CONNECTORS		
Size	Document Number	Rev
8	(Doc)	0.2
Date:	Wednesday, November 25, 1998	Sheet 12 of 13

PARALLEL PORT TERMINATIONS AND CONNECTOR



NATIONAL SEMICONDUCTOR (R)		PC87363 REFERENCE DESING
Title		
PARALLEL PORT TERMINATION AND CONNECTOR		
Size	Document Number	Rev
B	(Doc)	0.2
Date:	Tuesday, December 01, 1998	Sheet 13 of 13

APPENDIX

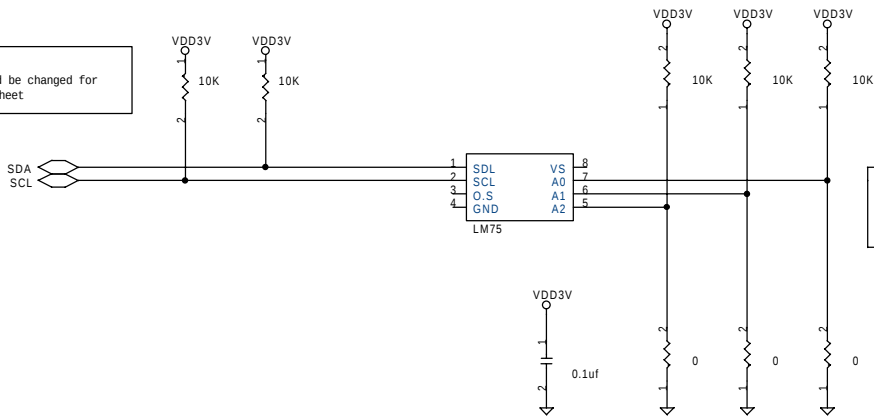


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PC87363 REFERENCE DESIGN		
Title COVER PAGE		
Size B	Document Number	Rev 0.2
Date Thursday, November 26, 1998	Sheet 1	of 3

APPENDIX A : ACCESS BUS

ACCESS BUS - LM75 connection

Note:
pullup resistor values should be changed for
other speeds. see LM75 data sheet

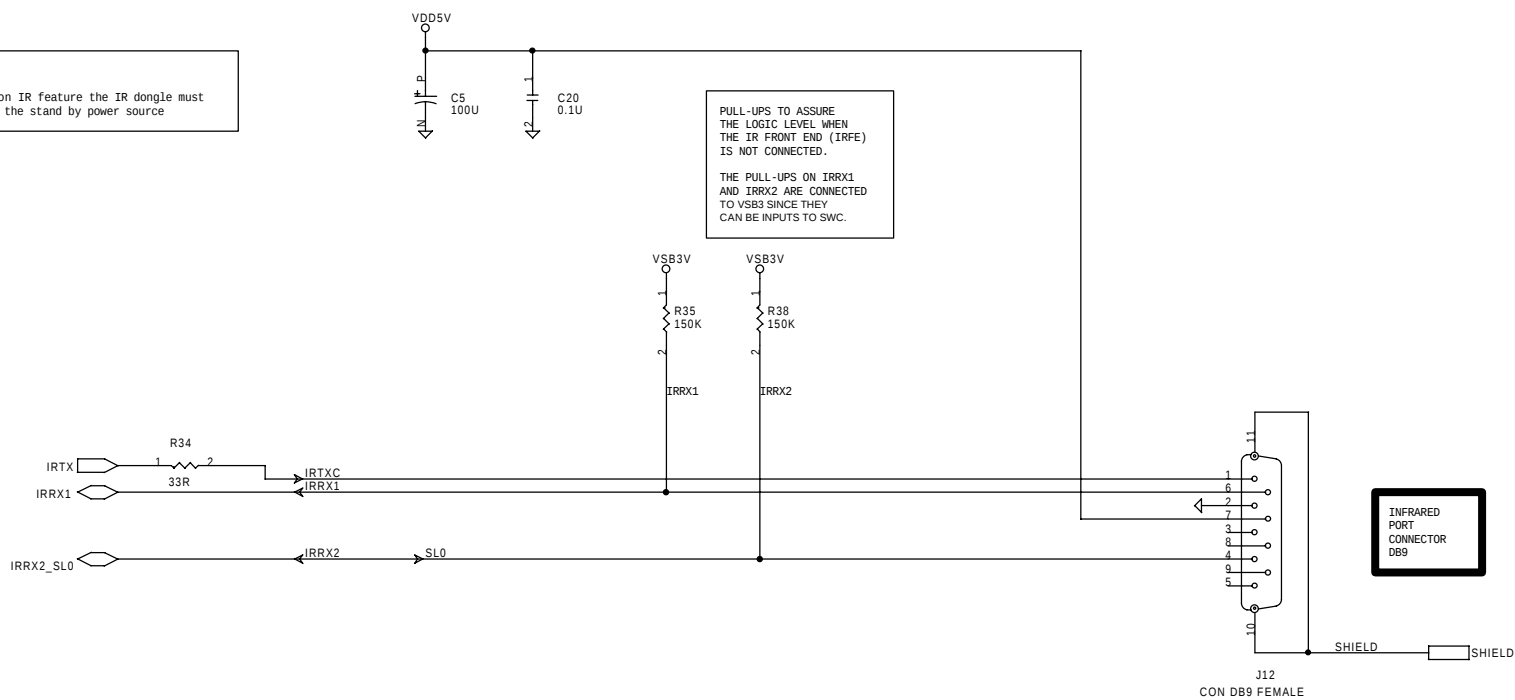


NOTE:
The resistors set the LM75 base address
only a pull up or a pull down should be connected
refer to the LM75 data sheet for more details

APPENDIX B : IR

NOTE :

To use the wake on IR feature the IR dongle must be supplied from the stand by power source



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Title	APPENDIX B : IR
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Rev	0.2
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Date:	Thursday, November 26, 1998	Sheet	3	of	3
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Sheet 3 of 3

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2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.



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