

FDC37C6XX SUPER I/O UNIVERSAL DESIGN-IN APPLICATION NOTE

This note discusses the proper way to lay out a printed circuit board to accept any one of six different chips in SMSC's Super I/O Floppy Disk Controller product line. There are 11 pins on the Super I/O family of products that have different uses for different versions or modes available. These pins are described in detail below and a sample schematic is included. Please refer to the Super I/O Pin Identification Table at the end of this application note for a summary of the different Super I/O pinouts. Please note that any SMSC FDC37C6XX chip may be plugged into an SMSC FDC37C651 socket, and that no changes need be implemented if no special modes are selected.

PIN 18

37C651/37C652	Labeled as PREN and should be connected to VCC or GND. This selects the normal precomp (GND - the default) or the alternate values (VCC - explained in the FDC37C651 data sheet).
37C661/37C662	Labeled as DRATE1 and not connected to any external device.
37C665/37C666	Labeled as DRATE1/MEDIA ID1 and not connected in the DRATE1 mode but connected to the floppy connector pin 29 for the MEDIA ID1 mode. It should be decided which mode will be used prior to power on. DRATE1 is an output and MEDIA ID1 is an input.
ALL	To take any chip into account, connect pin 18 to a jumper that selects GND or VCC (the sample schematic only shows ground because its the most common application). Also connect pin 18 to a jumper that selects floppy connector pin 29. In the DRATE1 mode, set none of these jumpers.

PIN 19

37C651/37C652	Labeled as DRVTYP and should be connected to VCC or GND. This selects single speed (VCC = default) or dual speed (GND) diskette drives.
37C661/37C662	Labeled as DRATE0 and should be connected to pin 6 of the floppy connector. DRATE1 is an output to the diskette drive.
37C665/37C666	Are labeled as DRATE0/MEDIA ID0 and should be connected to floppy pin 6 for the DRATE mode or floppy pin 33 for the MEDIA ID mode. The proper selection must be made prior to powering up the circuit as DRATEs are an output from the chip and MEDIA IDs are an input to the chip.
ALL	To take any chip into account, connect pin 19 to a jumper that selects GND or VCC (the sample schematic only shows a direct connection through a 4.7K resistor to VCC because that is the most common application). Also connect pin 19 to a jumper that selects pin 33 or pin 6 of the floppy connector.

PIN 25

37C651/37C652
37C661/37C662
37C665

Labeled as HDCS0 and should be connected to pin 37 of the IDE connector.

37C666

Labeled as HDCS0/IDEACF and should be connected to pin 37 of the IDE connector and to a pull-up/pull-down jumper. This is a multiplexed pin read at power on that configures the IDE drive and then becomes the IDE select.

ALL

To take any chip into account, connect pin 25 to pin 37 of the IDE connector and to a pull-up/pull-down jumper.

PIN 26

37C651/37C652
37C661/37C662
37C665

Labeled as HDCS1 and should be connected to pin 38 of the IDE connector.

37C666

Labeled as HDCS1/FACF and should be connected to pin 38 of the IDE connector and to a pull-up/pull-down jumper. This is a multiplexed pin read at power on that configures the floppy and then becomes the second IDE select.

ALL

To take any chip into account, connect pin 26 to pin 38 of the IDE connector and to a pull-up/pull-down jumper.

PIN 58

37C651/37C661
37C665

Labeled as PWRGD and does not need to be connected to anything.

37C652/37C662

Labeled as GAMECS and should be connected to the game port enable circuitry.

37C666

Labeled as GAMECS/PADCF and should be connected to the game port enable circuitry and to a pull-up/pull-down jumper. This is a multiplexed pin that reads Printer configuration at power-on and then becomes the game port select line.

ALL

To take any chip into account, connect pin 58 to a jumper selecting game circuitry and to a pull-up/pull-down jumper. No jumpers should be set for the 651/661/665 chips.

PIN 94

37C651/37C652
37C662

Labeled as SERIAL CLK and does not need to be connected to anything.

37C661

Labeled as SERIAL CLK/DR2 and can be used as the serial clock output or the drive 2 present signal for the PS/2 modes.

37C665

Labeled as DR2/ADRX and can be connected to the drive 2 present signal for the PS/2 modes or to an external chip whose address is decoded by the 37C665. The external chip decode becomes a chip select out for any 11 bit address.

37C666

Labeled as ADRX/ECPEN and should be connected to a pull-up/pull-down jumper and to an external chip whose address is decoded by the 37C666. The pull-up/pull-down is to select ECP enable/disable on power-up and then the pin becomes a chip select out for any 11 bit address.

ALL

To take any chip into account, connect pin 94 to a pull-up/pull-down jumper and to an external chip whose address is decoded by the 37C6XX.

PIN 96

- 37C651/37C652 Labeled as MTR2 and should be connected to pin 10 of the SECOND floppy connector.
- 37C661/37C662 Labeled as MTR2/MEDIA ID1 and should be connected to pin 10 of the SECOND floppy connector or to pin 29 of all floppy connectors. If MEDIA ID mode is used, then the use of more than three drives is not supported by the SMSC chip.
- 37C665/37C666 Labeled as MTR2/PDACK and should be connected to pin 10 of the SECOND floppy diskette connector or to a DACK1/DACK3 jumper connected to the DACK's on the system bus. PDACK is used for the ECP mode of the 665/666 and precludes the support of more than two drives without the use of external decode. Four drive support is available in ECP mode using external decoders.
- ALL To take any chip into account, connect pin 96 to a jumper selecting pin 10 of the SECOND floppy connector or pin 29 of all floppy connectors. Also connect pin 96 to a jumper selecting DACK1 or DACK3 on the system bus.

PIN 97

- 37C651/37C652 Labeled as DRV3 and should be connected to pin 12 of the SECOND floppy connector.
- 37C661/37C662 Labeled as DRV3/A10 and should be connected to pin 12 of the SECOND floppy connector or to A10 of the system bus.
- 37C665/37C666 Labeled as DRV3/A10 and should be connected to pin 12 of the SECOND floppy connector or to A10 of the system bus.
- ALL To take any chip into account, connect pin 97 to a jumper selecting pin 12 of the SECOND floppy connector or A10 of the system bus.

PIN 98

- 37C651/37C652 Labeled as DRV2 and should be connected to pin 14 of the SECOND floppy connector.
- 37C661/37C662 Labeled as DRV2/MEDIA ID0 and should be connected to pin 14 of the SECOND floppy connector or to pin 33 of ALL floppy connectors. If MEDIA ID mode is used, then the use of more than three drives is not supported by the SMSC chip.
- 37C665/37C666 Labeled as DRV2/PDIR and should be connected to pin 14 of the SECOND floppy connector. The PDIR signal is only necessary if external buffers are to be used for the ECP mode of operation (Not necessary).
- ALL To take any chip into account, connect pin 98 to a jumper selecting pin 14 of the SECOND floppy connector or pin 33 of all floppy connectors.

PIN 99

- 37C651/37C652 Labeled as MTR3 and should be connected to pin 16 of the SECOND floppy connector.
- 37C661/37C662 Labeled as MTR3/PDRQ and should be connected to pin 16 of the SECOND floppy connector or a jumper that selects DRQ1 or DRQ3 on the system bus.
- 37C665/37C666 Labeled as MTR3/PDRQ and should be connected to pin 16 of the SECOND floppy connector or a jumper that selects DRQ1 or DRQ3 on the system bus.
- ALL To take any chip into account, connect pin 99 to pin 16 of the SECOND floppy connector and to a jumper selecting DRQ1 or DRQ3 of the system bus.

PIN 100

37C651/37C652 Labeled as NC and need not be connected to anything.
37C661/37C662

37C665/37C666 Labeled as IOCHRDY and should be connected to IO channel ready on the system bus.

ALL To take any chip into account, connect pin 100 to I/O Channel ready on the system bus.

SUPER I/O PIN IDENTIFICATION TABLE

PIN	FDC37C651 FDC37C652	FDC37C661 FDC37C662	FDC37C665 (FDC37C666) 661/662 Compatible Mode	FDC37C665 (FDC37C666) Floppy Enhanced Mode 2	FDC7C665 (FDC37C666) ECP Mode (Note 1)
18	PREN	DRATE1	DRATE1	Media ID1	Note 2
19	DRV2YP	DRATE0	DRATE0	Media ID0	Note 2
25	HDCS0	HDCS0	HDCS0 (IDEACF)	HDCS0 (IDEACF)	HDCS0 (IDEACF)
26	HDCS1	HDCS1	HDCS1 (FACF)	HDCS1 (FACF)	HDCS1 (FACF)
58	PWRGD/ GAMECS	PWRGD/ GAMECS	PWRGD/ GAMECS (PADCF)	PWRGD/ GAMECS (PADCF)	PWRGD/ GAMECS (PADCF)
94	SERIAL CLK	SERIAL CLK	DR2/ADR _x / (ECPEN)	DR2/ADR _x / (ECPEN)	DR2/ADR _x / (ECPEN)
95	VSS	VSS	VSS	VSS	VSS
96	MTR2	MTR2 MEDIA ID1	MTR2	MTR2	PDAK
97	DRV3	DRV3	DRV3	DRV3	A10
98	DRV2	DRV2 MEDIA ID0	DRV2	DRV2	PDIR
99	MTR3	MTR3	MTR3	MTR3	PDRQ
100	(NC)	(NC)	IOCHRDY	IOCHRDY	IOCHRDY

Note 1: The items in brackets (xxx) indicate pull-up/down options for the FDC37C666 only. In ECP mode the chip supports 2 drives directly or through software configuration can be set to support 4 drives with an external decoder.

Note 2: These pins can be configured as DRATE0,1 outputs or MEDIA_ID0,1 inputs.



80 Arkay Drive
Hauppauge, NY 11788
(631) 435-6000
FAX (631) 273-3123

Copyright © SMSC 2004. All rights reserved.

Circuit diagrams and other information relating to SMSC products are included as a means of illustrating typical applications. Consequently, complete information sufficient for construction purposes is not necessarily given. Although the information has been checked and is believed to be accurate, no responsibility is assumed for inaccuracies. SMSC reserves the right to make changes to specifications and product descriptions at any time without notice. Contact your local SMSC sales office to obtain the latest specifications before placing your product order. The provision of this information does not convey to the purchaser of the described semiconductor devices any licenses under any patent rights or other intellectual property rights of SMSC or others. All sales are expressly conditional on your agreement to the terms and conditions of the most recently dated version of SMSC's standard Terms of Sale Agreement dated before the date of your order (the "Terms of Sale Agreement"). The product may contain design defects or errors known as anomalies which may cause the product's functions to deviate from published specifications. Anomaly sheets are available upon request. SMSC products are not designed, intended, authorized or warranted for use in any life support or other application where product failure could cause or contribute to personal injury or severe property damage. Any and all such uses without prior written approval of an Officer of SMSC and further testing and/or modification will be fully at the risk of the customer. Copies of this document or other SMSC literature, as well as the Terms of Sale Agreement, may be obtained by visiting SMSC's website at <http://www.smsc.com>. SMSC is a registered trademark of Standard Microsystems Corporation ("SMSC"). Product names and company names are the trademarks of their respective holders.

SMSC DISCLAIMS AND EXCLUDES ANY AND ALL WARRANTIES, INCLUDING WITHOUT LIMITATION ANY AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE, AND AGAINST INFRINGEMENT AND THE LIKE, AND ANY AND ALL WARRANTIES ARISING FROM ANY COURSE OF DEALING OR USAGE OF TRADE.

IN NO EVENT SHALL SMSC BE LIABLE FOR ANY DIRECT, INCIDENTAL, INDIRECT, SPECIAL, PUNITIVE, OR CONSEQUENTIAL DAMAGES; OR FOR LOST DATA, PROFITS, SAVINGS OR REVENUES OF ANY KIND; REGARDLESS OF THE FORM OF ACTION, WHETHER BASED ON CONTRACT; TORT; NEGLIGENCE OF SMSC OR OTHERS; STRICT LIABILITY; BREACH OF WARRANTY; OR OTHERWISE; WHETHER OR NOT ANY REMEDY OF BUYER IS HELD TO HAVE FAILED OF ITS ESSENTIAL PURPOSE, AND WHETHER OR NOT SMSC HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.