

AVR core and power
200v1.S01

Power supply, reset circuit, reference voltage and power indicator.

Port A
200v1.S02

Analogue and digital inputs with options for FET outputs

Port B
200v1.S03

Digital inputs with optional FET outputs (PB0 to PB3) and programming connector.
SPI and select lines.

Port C
200v1.S04

FET outputs with the option of digital inputs.

Port D
200v1.S05

Serial communications. 3 inputs. 3 FET outputs.

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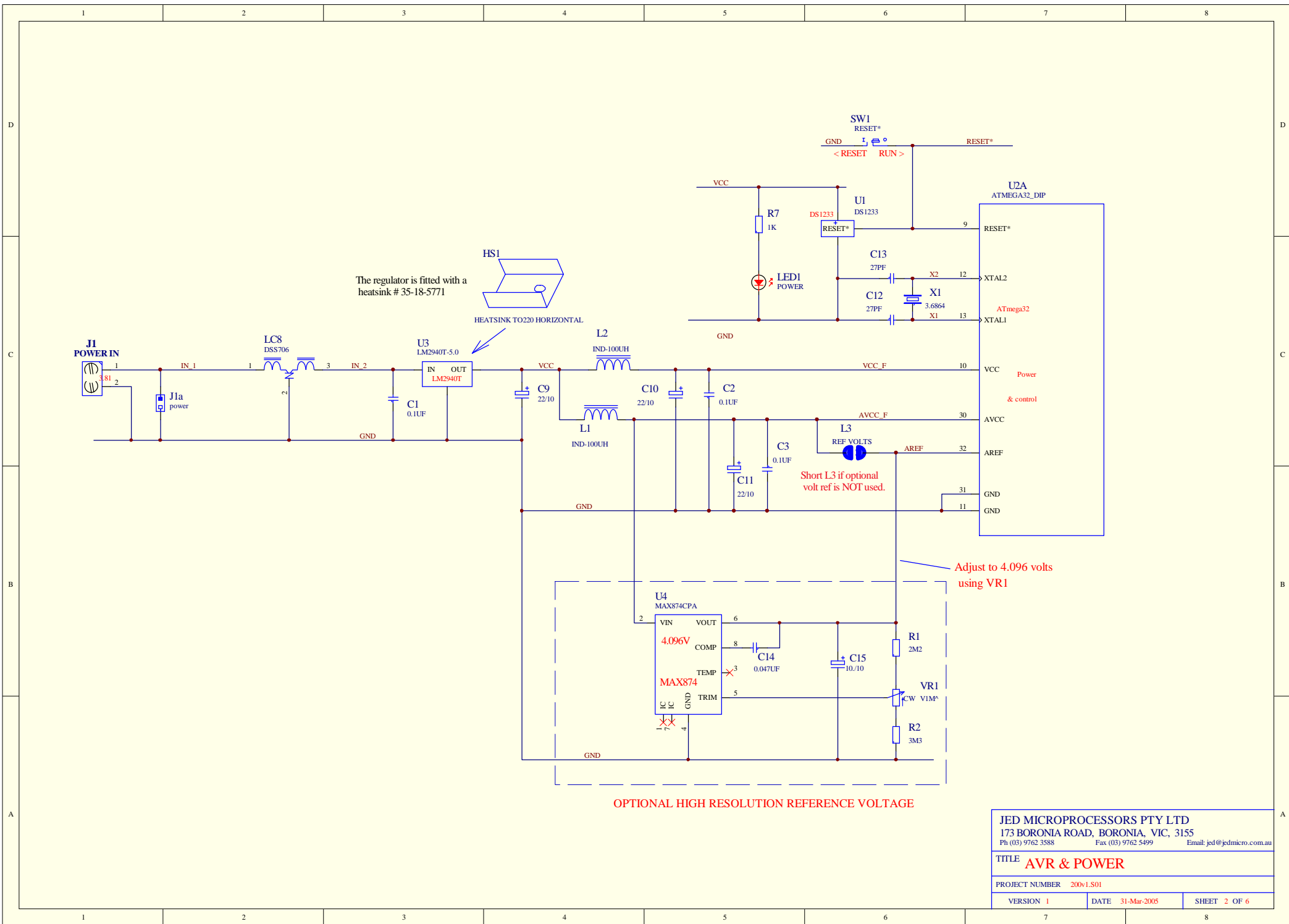
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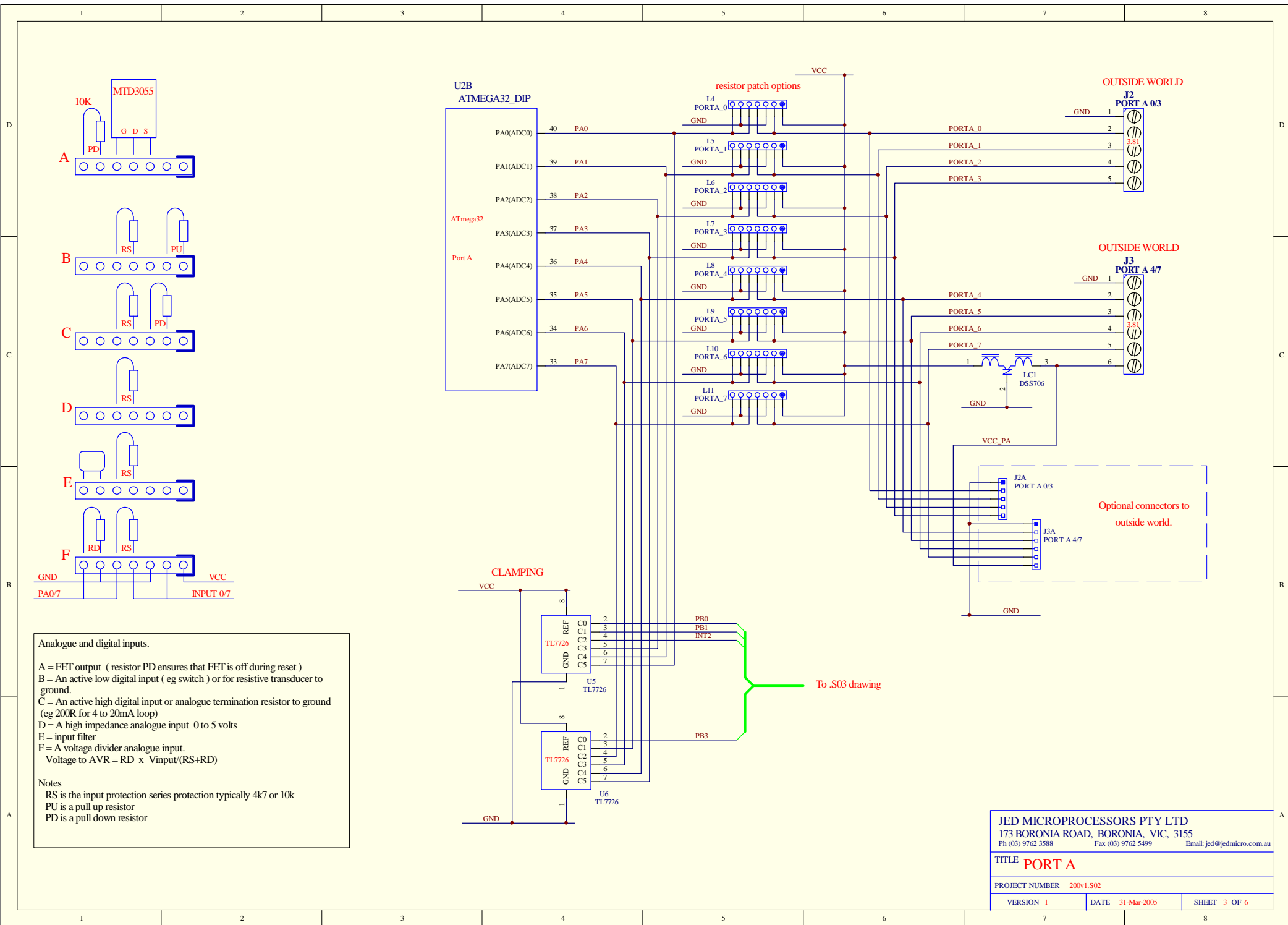
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Analogue and digital inputs.

A = FET output (resistor PD ensures that FET is off during reset)
 B = An active low digital input (eg switch) or for resistive transducer to ground.
 C = An active high digital input or analogue termination resistor to ground (eg 200R for 4 to 20mA loop)
 D = A high impedance analogue input 0 to 5 volts
 E = input filter
 F = A voltage divider analogue input.
 Voltage to AVR = $RD \times V_{input} / (RS + RD)$

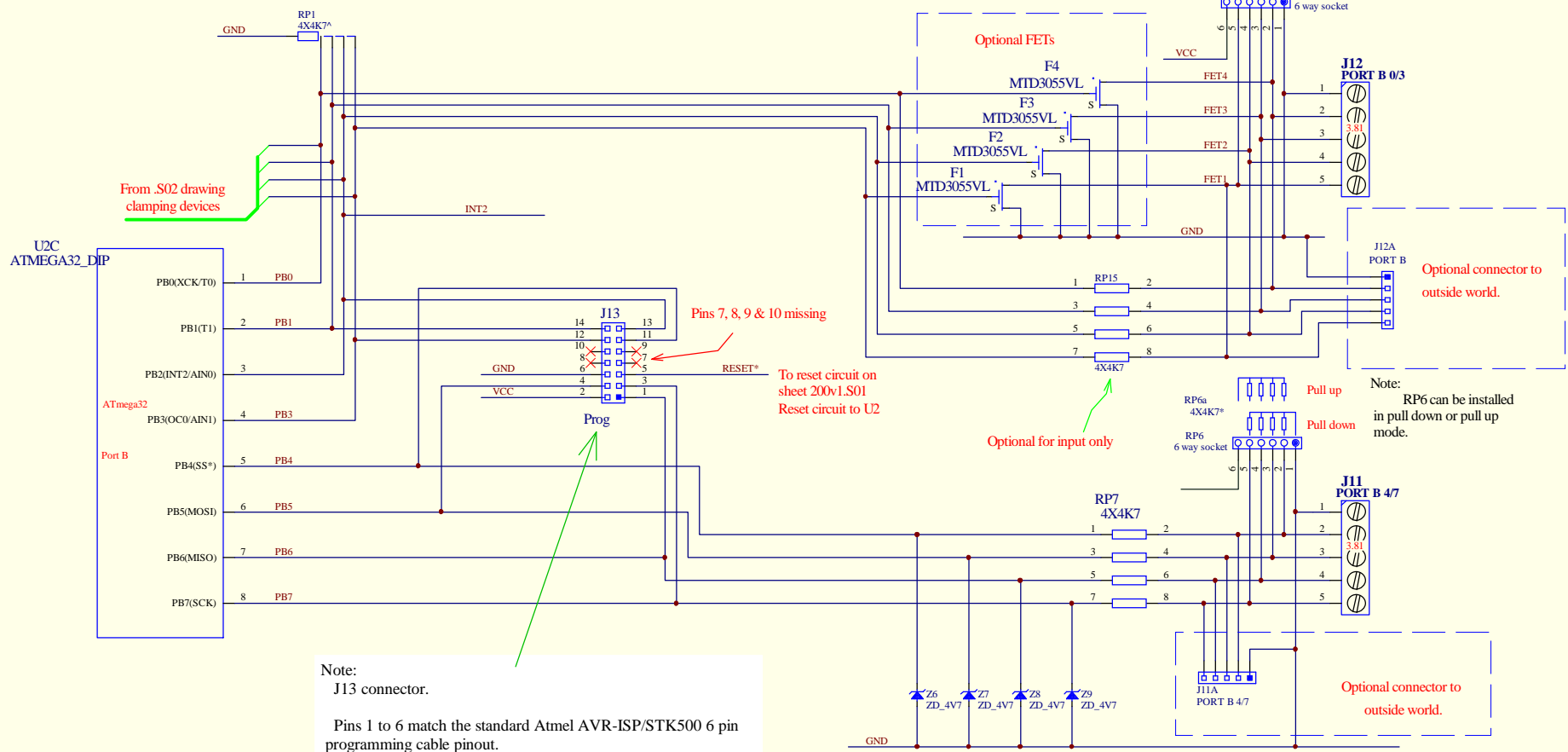
Notes
 RS is the input protection series protection typically 4k7 or 10k
 PU is a pull up resistor
 PD is a pull down resistor

Note:
 If PB0 to PB3 are used as inputs install RP5 (in socket) & RP15.
 RP5 can be installed as shown for pull down mode or reversed for pull up mode.
 If used as outputs fit F1, F2, F3 & F4 & RP1 but do not fit RP5 & RP15.

Note:
 Install RP1 only if PB0/PB3 used as outputs.

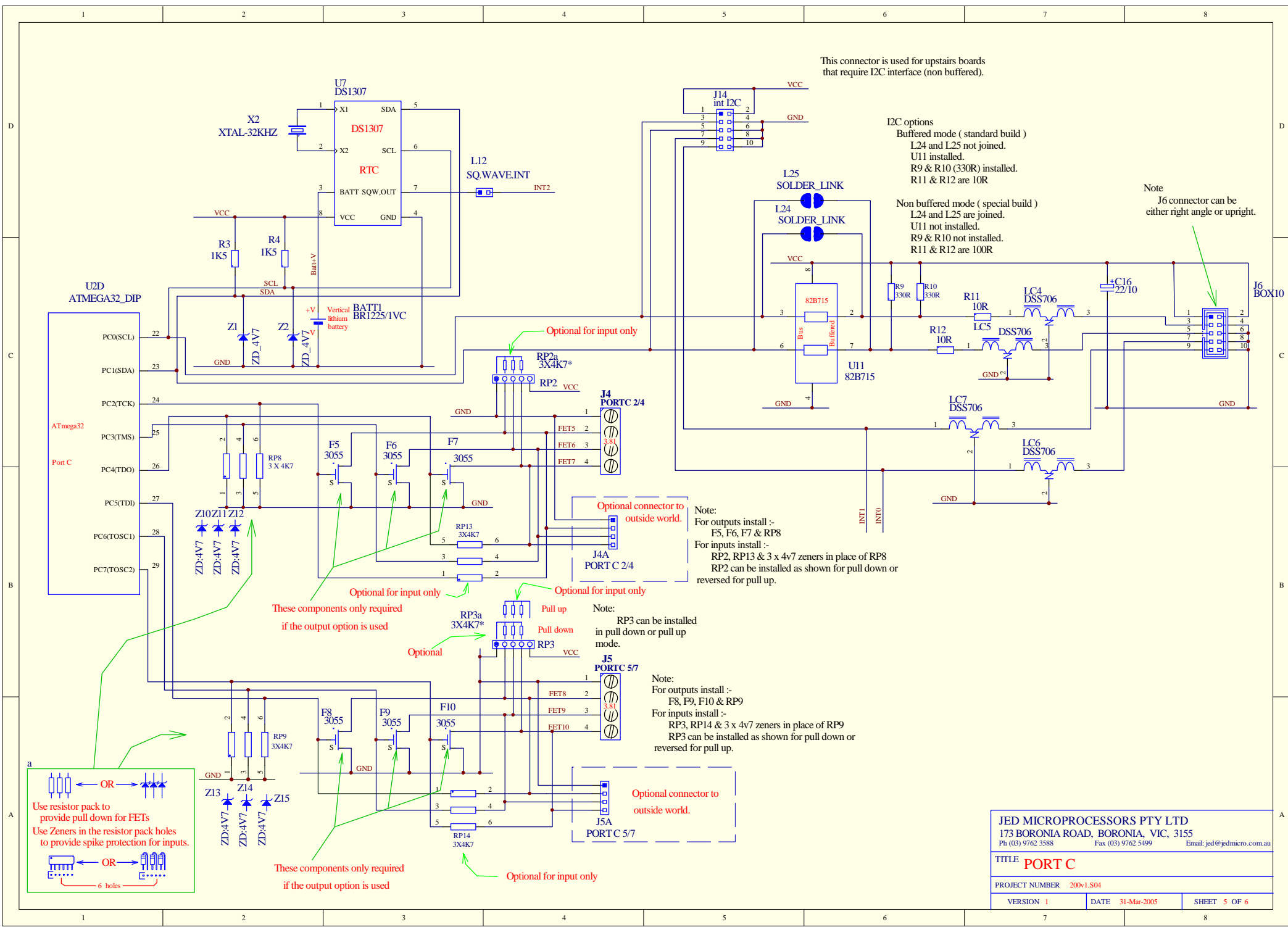
Note:
 RP5 can be installed in pull down or pull up mode.

Note:
 RP6 can be installed in pull down or pull up mode.



Pins 7, 8, 9 & 10 missing
 RESET*
 To reset circuit on sheet 200v1.S01
 Reset circuit to U2

Note:
 J13 connector.
 Pins 1 to 6 match the standard Atmel AVR-ISP/STK500 6 pin programming cable pinout.
 Use all of J13 for upstairs SPI expandable I/O.
 (pins 11 to 14, PB0 to PB3 can be used as chip selects)



This connector is used for upstairs boards that require I2C interface (non buffered).

I2C options
 Buffered mode (standard build)
 L24 and L25 not joined.
 U11 installed.
 R9 & R10 (330R) installed.
 R11 & R12 are 10R

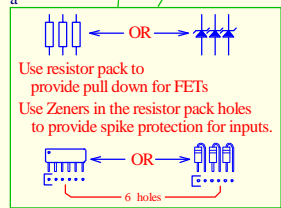
Non buffered mode (special build)
 L24 and L25 are joined.
 U11 not installed.
 R9 & R10 not installed.
 R11 & R12 are 100R

Note
 J6 connector can be either right angle or upright.

Note:
 For outputs install :-
 F5, F6, F7 & RP8
 For inputs install :-
 RP2, RP13 & 3 x 4v7 zeners in place of RP8
 RP2 can be installed as shown for pull down or reversed for pull up.

Note:
 RP3 can be installed in pull down or pull up mode.

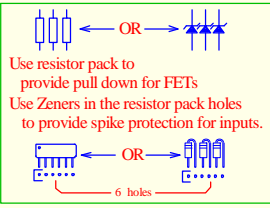
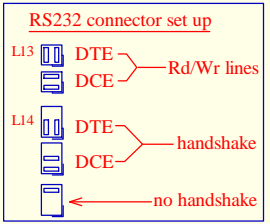
Note:
 For outputs install :-
 F8, F9, F10 & RP9
 For inputs install :-
 RP3, RP14 & 3 x 4v7 zeners in place of RP9
 RP3 can be installed as shown for pull down or reversed for pull up.



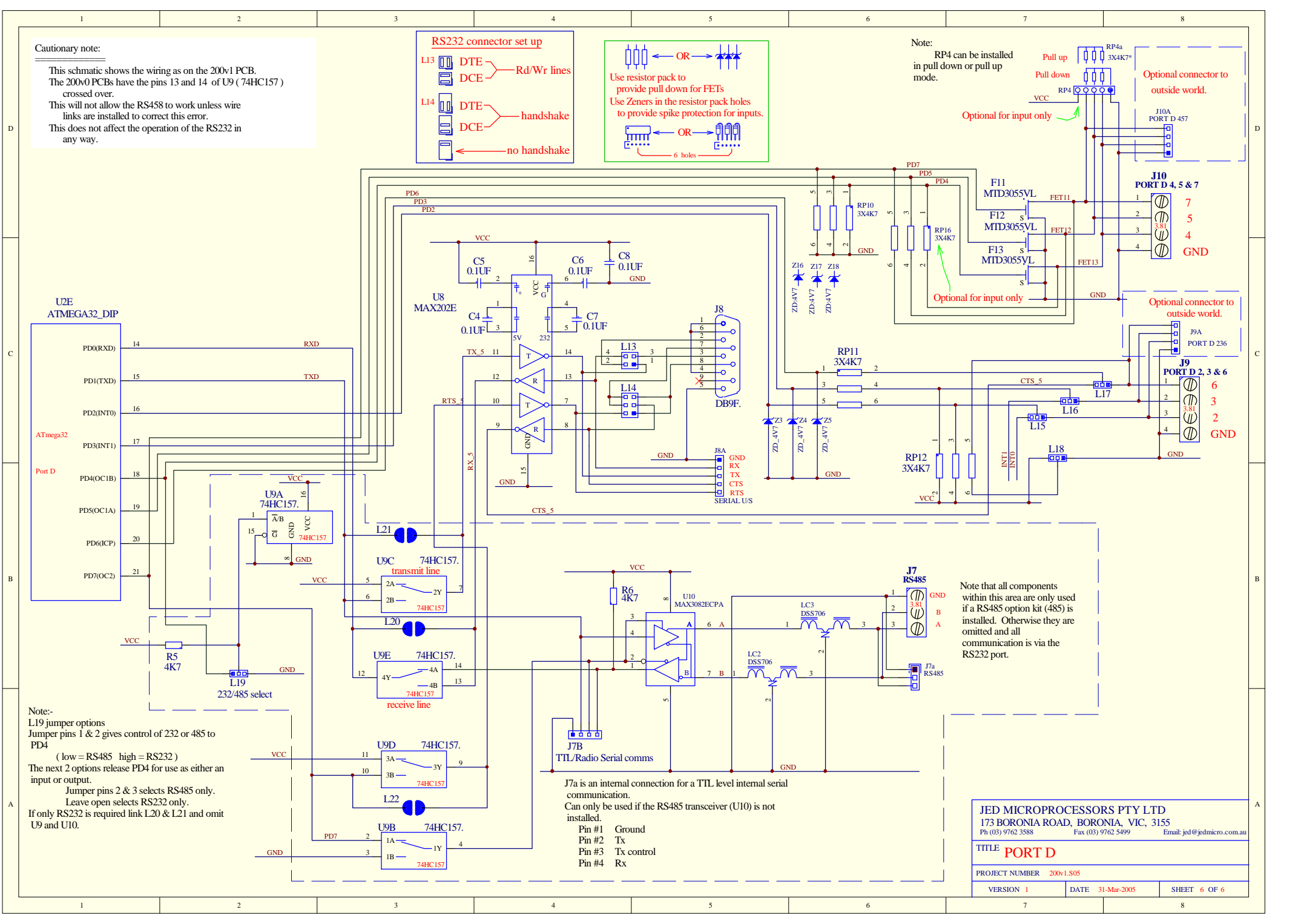
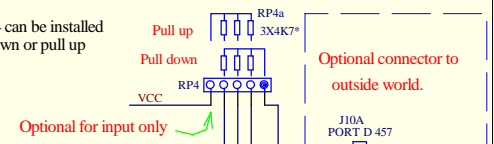
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Cautionary note:

This schematic shows the wiring as on the 200v1 PCB.
 The 200v0 PCBs have the pins 13 and 14 of U9 (74HC157) crossed over.
 This will not allow the RS485 to work unless wire links are installed to correct this error.
 This does not affect the operation of the RS232 in any way.



Note:
 RP4 can be installed in pull down or pull up mode.



Note:-
 L19 jumper options
 Jumper pins 1 & 2 gives control of 232 or 485 to PD4
 (low = RS485 high = RS232)
 The next 2 options release PD4 for use as either an input or output.
 Jumper pins 2 & 3 selects RS485 only.
 Leave open selects RS232 only.
 If only RS232 is required link L20 & L21 and omit U9 and U10.

J7a is an internal connection for a TTL level internal serial communication.
 Can only be used if the RS485 transceiver (U10) is not installed.
 Pin #1 Ground
 Pin #2 Tx
 Pin #3 Tx control
 Pin #4 Rx

Note that all components within this area are only used if a RS485 option kit (485) is installed. Otherwise they are omitted and all communication is via the RS232 port.

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