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AT91RM9200 Development Kit

User Guide

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Section 1
Overview

1.1 Scope

The AT91RM9200 Development Board enables real-time code development and evaluation. It supports the AT91RM9200 ARM9-based 32-bit RISC microcontroller.

This guide focuses on the AT91RM9200 Development Board as an evaluation and demonstration platform:

- Section 1 is this overview.
- Section 2 gives information on setting up the installation.
- Section 3 contains a description of the development board.
- Section 4 details the configuration straps.
- Section 5 shows board schematics.

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1.2 Deliverables

The development kit is delivered with:

- One AC adapter 100 - 240V ~ 1.0A, 50 - 60 Hz
- One modem RS232 cable
- One RJ45 Ethernet crossed cable
- One A/B-type USB cable
- Two power supply cables, one US format, one French format
- One CD-ROM containing summary and full datasheets, datasheets with electrical and mechanical characteristics, application notes and getting started documents for all development boards and AT91 microcontrollers. An AT91 software package with C and assembly listings is also provided. This allows the user to begin evaluating the AT91 ARM® Thumb® 32-bit microcontroller quickly.

1.3 The AT91RM9200 Development Board

The board consists of an AT91RM9200 together with the following:

- 2M bytes of parallel Flash memory
- Four banks of 2M x 32-bit SDRAM
- 128K bytes of EEPROM with two-wire interface access

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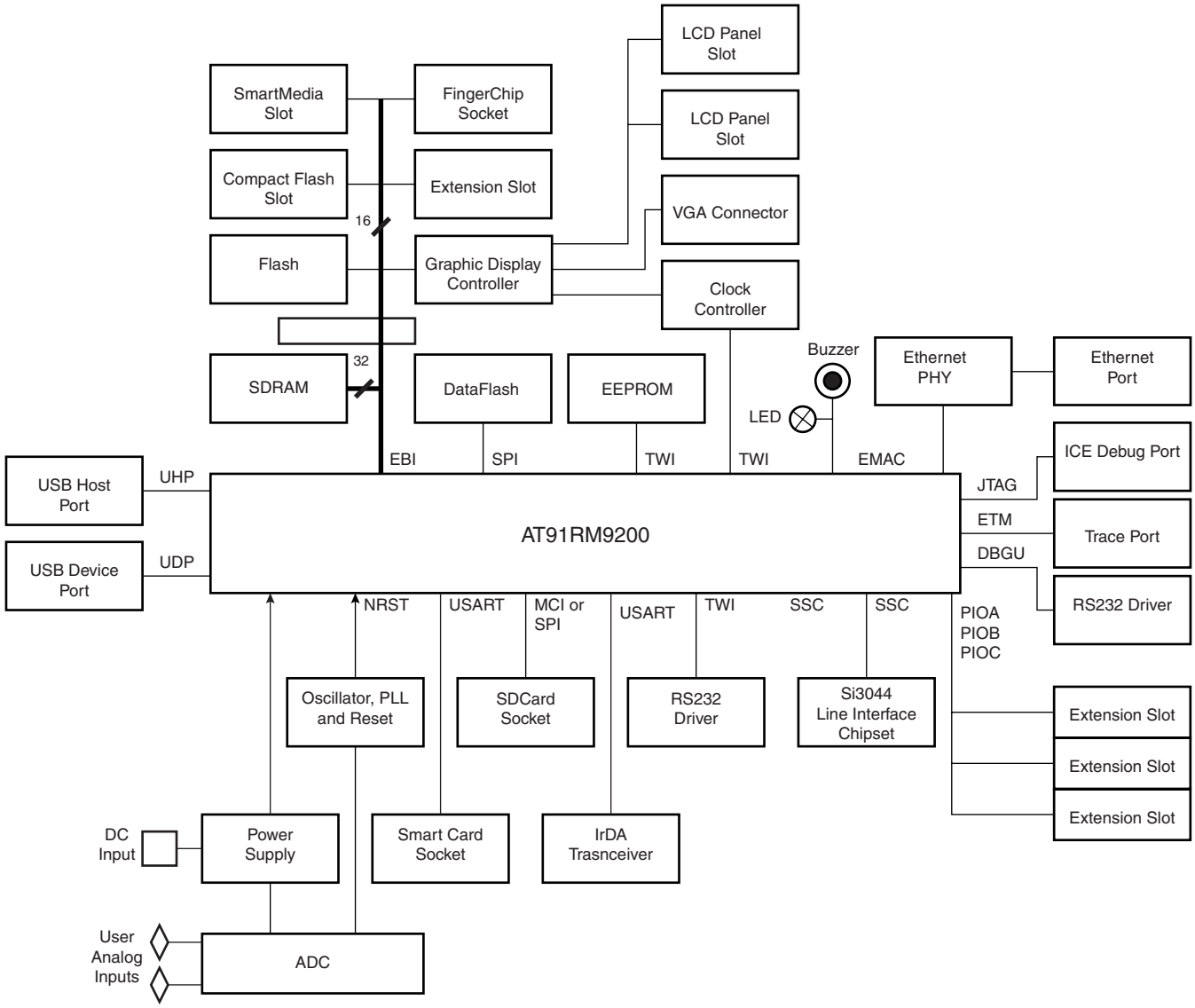
- 8M bytes of serial DataFlash®
- Five communication ports (USB host and device, Ethernet, serial and IrDA)
- Graphic controller with output to a standard VGA monitor
- JTAG/ICE, ETM and debug interface
- Expansion connector

Figure 1-1. AT91RM9200 Development Board Block Diagram



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Section 2

Setting Up the AT91RM9200 Development Board

2.1 Electrostatic Warning

The AT91RM9200 development board is shipped in protective anti-static packaging. The board must not be subjected to high electrostatic potentials. A grounding strap or similar protective device should be worn when handling the board. Avoid touching the component pins or any other metallic element.

2.2 Requirements

In order to connect the AT91RM9200 development board, the following elements are required:

- The AT91RM9200 development board itself
- Power supply cable capable of supplying 7V to 12V at 1A (not supplied)

2.3 Powering Up the Board

DC power is supplied to the board via the 2.1 mm socket (J1). The polarity of the power supply is not critical. The minimum voltage required is 7V.

The board has a voltage regulator providing +3.3V. The regulator allows the input voltage range to be from 7V to 12V.

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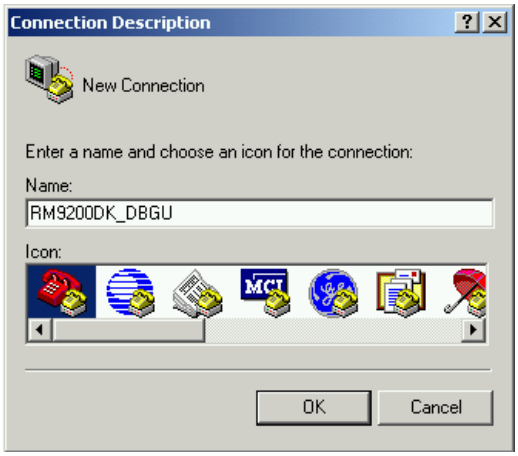
2.4 Connecting the Board

- Using the RS232 cable supplied in the AT91RM9200-DK kit, connect the board to your PC via the Serial Debug Port (J23).
- Start the HyperTerminal application:

- In the window *Connection Description*, enter a name for the connection, e.g., “RM9200K_DBGU”.



- Click on *OK*.
- In the window *Connect To*, click on the drop-down list arrow at *Connect using:*. Select the COM port used.

- Click on *OK*.
- Set the serial parameters of the COM port as follows:
  - Bit rate: 115 kbps
  - Data bit: 8
  - Parity: NONE
  - Stop bit: 1
  - Flux control: NONE
- Click on *OK*.

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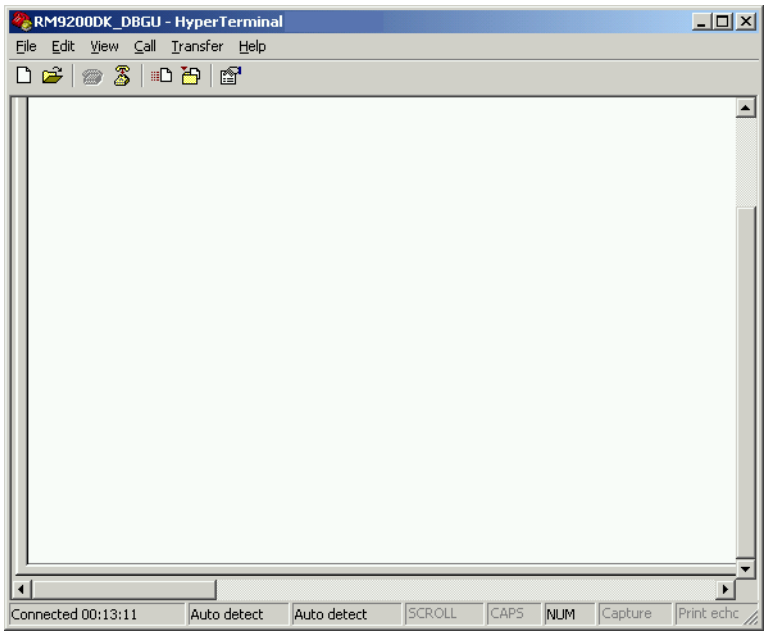
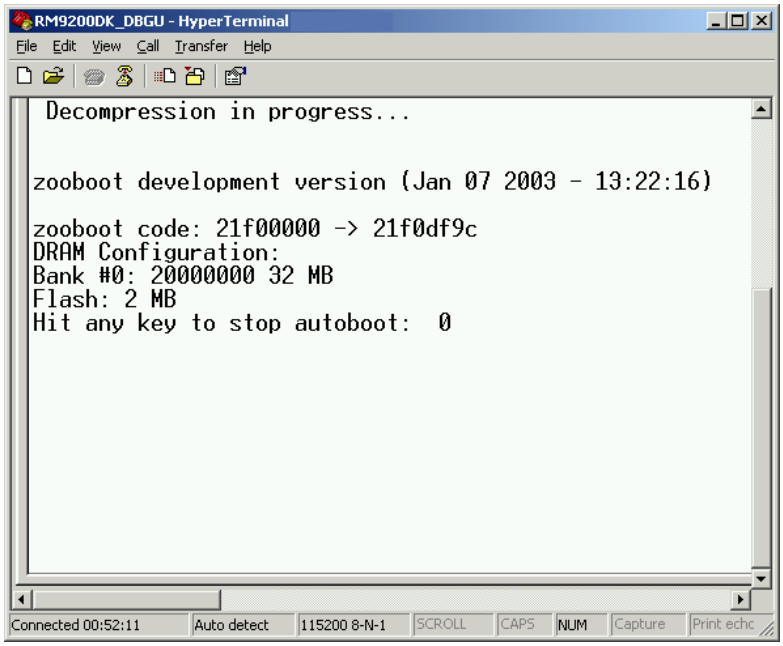
- The AT91RM9200-DK and your PC are connected, as indicated in the lower left-hand corner of the console and by the title bar.



- Press the RESET button on the board.
- A message is sent from the board to the HyperTerminal console. Note that this message can vary depending on the version of Zooboot.



2.5 Getting Started with the AT91RM9200

The AT91RM9200 Development Kit is delivered with a CD-ROM containing all necessary information and step-by-step procedures for working with the most common development toolchains. Please refer to this CD-ROM, or to the AT91 web site, http://www.atmel.com/products/AT91/, for the most up-to-date information on getting started with the AT91RM9200.

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Section 3
Board Description

3.1 AT91RM9200 Processor

- Incorporates the ARM920T™ ARM® Thumb® Processor
  - 200 MIPS at 180 MHz
  - 16-KByte Data Cache, 16-KByte Instruction Cache, Write Buffer
  - Memory Management Unit
  - In-circuit Emulator including Debug Communication Channel
  - Mid-level Implementation Embedded Trace Macrocell
- Additional Embedded Memories
  - 16K Bytes of SRAM and 128K Bytes of ROM
- External Bus Interface (EBI)
  - Supports SDRAM, Static Memory, Burst Flash, Glueless Connection to CompactFlash®, SmartMedia™ and NAND Flash
- System Peripherals:
  - Enhanced Clock Generator and Power Management Controller
  - Two On-chip Oscillators with Two PLLs
  - Very Slow Clock Operating Mode and Software Power Optimization Capabilities
  - Four Programmable External Clock Signals
  - System Timer Including Periodic Interrupt, Watchdog and Second Counter
  - Real-time Clock with Alarm Interrupt
  - Debug Unit, Two-wire UART and Support for Debug Communication Channel
  - Advanced Interrupt Controller with 8-level Priority, Individually Maskable Vectored Interrupt Sources, Spurious Interrupt Protected
  - Seven External Interrupt Sources and One Fast Interrupt Source
  - Four 32-bit PIO Controllers with Up to 122 Programmable I/O Lines, Input Change Interrupt and Open-drain Capability on Each Line
  - 20-channel Peripheral Data Controller (DMA)
- Ethernet MAC 10/100 Base-T
- USB 2.0 Full Speed (12 M-bits per second) Host Double Port and Device Port

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- Multimedia Card Interface (MCI)
- Three Synchronous Serial Controllers (SSC)
- Four Universal Synchronous/Asynchronous Receiver/Transmitters (USART)
- Master/Slave Serial Peripheral Interface (SPI)
- Two 3-channel, 16-bit Timer/Counters (TC)
- Two-wire Interface (TWI)
- IEEE 1149.1 JTAG Boundary Scan on All Digital Pins

3.2 Memory

- 2-Mbyte parallel Flash memory
- Four banks of 2M x 32-bit SDRAM
- 128-Kbyte EEPROM with 2-wire interface
- 8-Mbyte serial DataFlash

3.3 Memory Card

- SD Card/MMC
  - Supports MultiMedia and SD Card
  - Analog switches provide support for DataFlash Card
- Smart Media® Socket
- CompactFlash® Socket
- Smart Card Interface

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3.4 Clock Circuitry and Analog Functions

- 32.768 kHz standard crystal for the AT91RM9200
- 18.432 MHz standard crystal for the AT91RM9200
- 50 MHz CMOS oscillator for the Display Controller
- Temperature sensor
- Analog-to-digital converter
- FingerChip (Socket only)

3.5 Reset Circuitry

- Reset Controller

3.6 Power Supply Circuitry

- 3.3V DC/DC converter
- 1.8V DC/DC converter

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3.7 Remote Communication

- Fast Ethernet Physical Layer Single Chip Transceiver
- IrDA Transceiver
- Host Interface via RS-232 DB9 male socket
- Line interface
- Debug Port via RS-232 DB9 connector
- Host and Device USB socket

3.8 User Interface

- Graphic Display Controller
- TFT/SNT panel socket
- 15-pin standard socket for an external VGA monitor
- On-board buzzer and one LED managed via general PIO lines

3.9 Expansion Slots

- Three expansion slots give access to all the microcontroller's signals

3.10 Debug Interface

- 38-pin trace Port socket
- 20-pin JTAG interface connector
- Serial Debug Unit

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Section 4
Configuration Straps

4.1 Configuration Straps and Jumper Settings

Table 4-1 gives details on configuration straps and jumper settings on the AT91RM9200 development board and their default settings.

Table 4-1. Configuration Straps and Jumper Settings

Designation	Default Setting	Feature
S1	Closed	The earth plane and the GDN potential are connected.
S3	Closed	The ETM reset (NSRST) and the System Reset (NRST) are connected.
S4	Closed	The **PD6**/DTXD PIO line is connected to the **READY/NBUSY** output signal of the SPI DataFlash (MN13).
S5	Opened	The Write Protect feature of the SPI DataFlash (MN13) is disabled.
S6	Closed	The PA26/**TWCK**/IRQ1 signal is connected to three remote devices (MN14, MN33, MN34).
S7	Closed	The PA25/**TWD**/IRQ2 signal is connected to three remote devices (MN14, MN33, MN34).
S8	Opened	The PA3/**NPCS0**/IRQ5 output signal is not connected to the **NCS** of the serial DataFlash (MN13).
S9	Closed	The PA5/**NPCS2**/TXD3 signal is connected to the 10-bit SPI ADC (MN15).
S10	Closed	The PC15 I/O line is connected to the 10-bit ADC to read the End Of Conversion event (MN15).
S11	Closed	Not Used: The PS2 Controller is not installed.
S12	Closed	Not Used: The PS2 Controller is not installed.
S13	Closed	The PB12/**TF2**/ETX2 signal is connected to the NRGDT/FSD output signal of the Line Interface (MN23).
S14	Closed	The PB16/**RK2**/ERX2 signal is connected to the NOFHK input signal of the Line Interface (MN23).
S15	Closed	The PB17/**RF2**/ERXDV signal is connected to the NFSYN input signal of the Line Interface (MN23).

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Table 4-1. Configuration Straps and Jumper Settings

Designation	Default Setting	Feature
S16	Closed	The PB13/**TK2**/ETX3 signal is connected to the SCLK output signal of the Line Interface (MN23).
S17	Closed	The PB15/**RD2**/ERX2 signal is connected to the SDO output signal of the Line Interface (MN23).
S18	Closed	Not Used: The Front End AC97 is not installed.
S19	Closed	The PA30/**DRXD**/CTS2 signal is connected to the receive buffer output of the DBGU transceiver (MN26).
S20	Closed	The AT91RM9200's PC14 PIO line is connected to the NREADY output signal of the Smart Card Interface (MN29).
S21	Closed	The PA17/TXD0/TIOA0 is connected to the DATA input/output signal of the Smart Card Interface (MN29).
S22	Closed	The PA22/**RXD2**/TIOB2 is connected to the RX output signal of the IrDA Transceiver (MN30).
S23	Closed	Enables all output signals (DCD1, DSR1, RXD1, CTS1, RI1) of the Transceiver (MN28) used for the RS232 Port COM.
S24	Closed	The **PD4**/ETXEN input line is connected to the USB device socket (J28) to detect a host connection.
S25	Closed	The System Reset signal (NRST) is connected to the ICE/JTAG socket (J8, pin 15).
S26	Closed	The NCS2 output signal is connected to the display controller (MN32).
S27	Closed	The NCS0 output signal is connected to the parallel Flash memory (MN21).
S28	Closed	Enables the OE signal from the Atmel FingerChip (MN31). Only the socket is installed.
S29	Closed	The **SMCS**/NCS3 output signal is connected to the bidirectional buffer used by the Smart Media Connector (MN20B).
S30	Closed	The PA15/**EMDC**/TCLK2 output signal is connected to the **MDC** input signal of the Ethernet Transceiver (MN22).
S31	Closed	The PA16/**EMDIO**/IRQ6 input/output signal is connected to the **MDIO** input/output signal of the Ethernet Transceiver (MN22).
S32	Closed	Disables the power-down mode of the Ethernet Transceiver (MN22).
S33	Closed	Not Used: The Front End AC97 is not installed.
S34	Closed	Not Used: The Front End AC97 is not installed.
S35	Closed	Not Used: The Front End AC97 is not installed.
S36	Closed	Connects the system ground to the Ethernet ground.
S37	Closed	Not Used: The Front End AC97 is not installed.

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Table 4-1. Configuration Straps and Jumper Settings

Designation	Default Setting	Feature
S38	Opened	The AT91RM9200 boots up from the parallel Flash Memory.
S39	Closed	Enables the use of the User LED (DS5).
S40	Closed	Not Used: The Buzzer is not installed.

Note: Shaded cells indicate configuration straps/jumpers with open connections.

Note: Signal names in bold indicate that the function is shared between several signals.

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Section 5
Schematics

5.1 Schematics

This section contains the following schematics:

- AT91RM9200 Board Layout - Top View
- AT91RM9200 Board Layout - Bottom View
- Power Supply
- AT91RM9200 Chip
- Buffers
- SDRAM and Flash
- Serial Devices
- PS2 COM Ports
- 3V3 Memory Card
- Ethernet
- DAA
- AC97 Analog Front End
- Serial Interfaces
- Fingerchip
- VGA TFT/CRT Display

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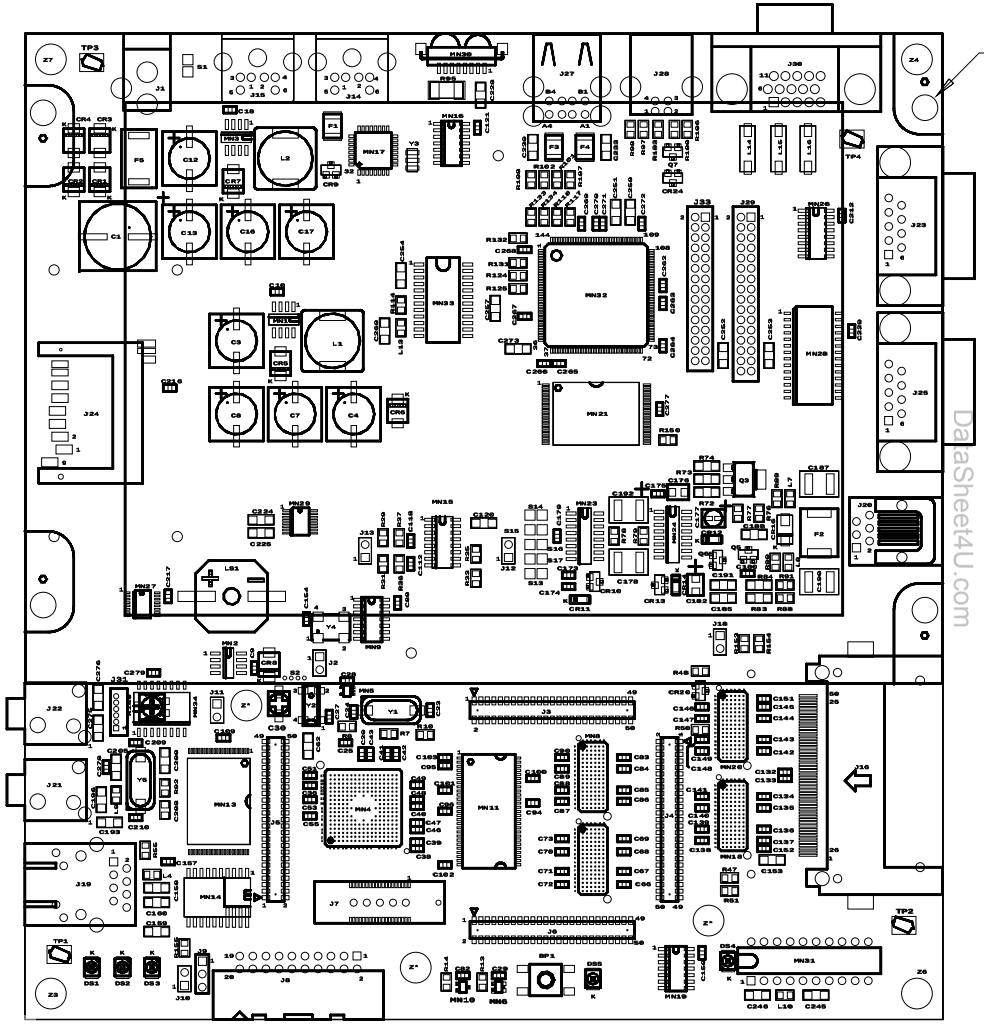
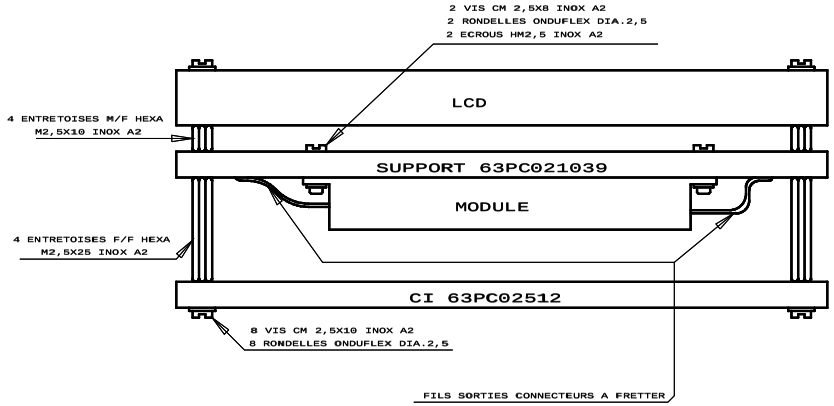


MONTAGE DU LCD
SUR SUPPORT 63PC021039 VOIR DETAIL



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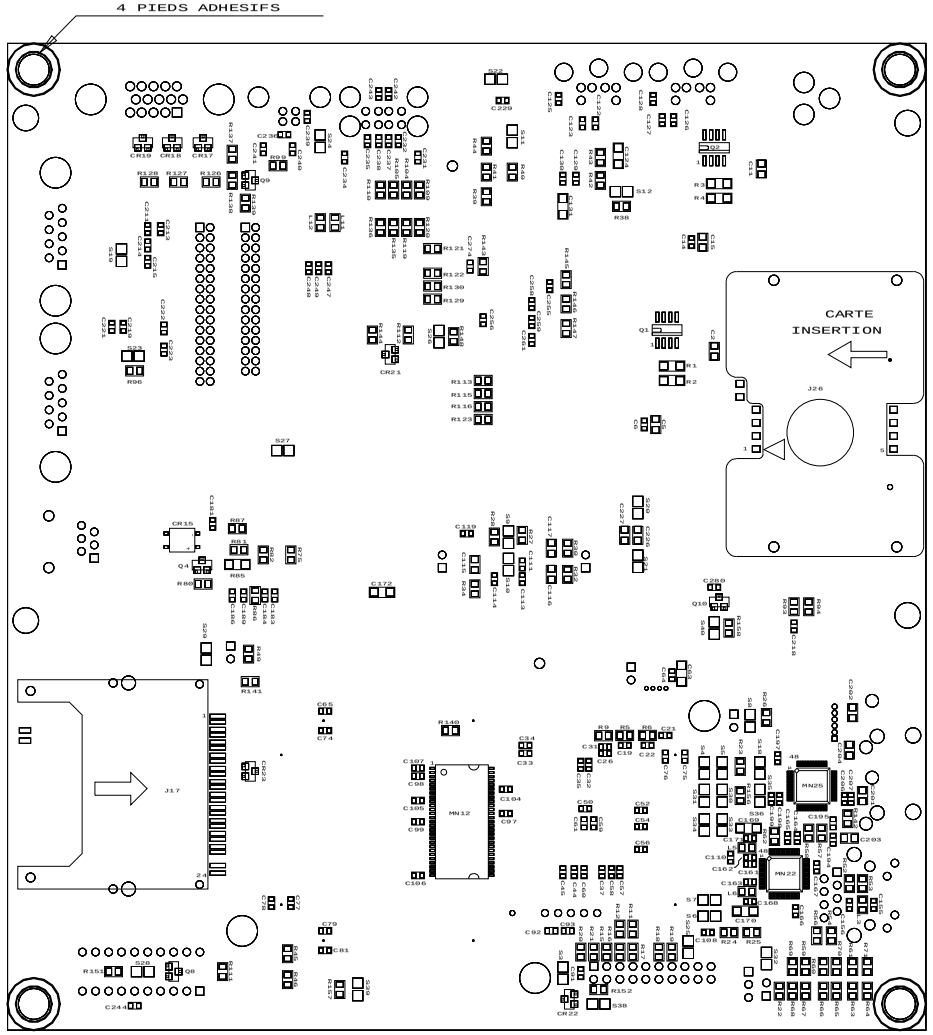

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12V TO 14V DC INPUT

MP179_2.1mm

J1

C R1 STP S340

C R2 STP S340

C R3 STP S340

C R4 STP S340

F5 2A

C1 25V 470uF

VIN

R1 R068

R2 R068

I limit = 0.1V / R ... about 2.9A

C2 1µF

C3 220uF 16V

MN1 MAX1626 (V+, SHDN, 3/5, REF, GND, CS, EXT, OUT)

C10 100NF

Q1 IRF7425

L1 22uH 3.8A

C R5 STP S340

3V3

C R6 3.3V

MN2 TPS77618D (VIN, VIN, VOUT, VOUT, GND, EN, RES/PG, FB/NC)

1V8

C9 100NF

C5 100NF

C4 220uF

C6 1µF

C7 220uF

C8 220uF

R3 R068

R4 R068

I limit = 0.1V / R ... about 2.9A

C11 1µF

C12 220uF 16V

MN3 MAX1626 (V+, SHDN, 3/5, REF, GND, CS, EXT, OUT)

C18 100NF

Q2 IRF7425

L2 22uH 3.8A

C R7 STP S340

5V

C14 100NF

C13 220uF

C15 1µF

C16 220uF

C17 220uF

GUARD RING

Z3 TM Z4 TM

Z6 TM Z7 TM

S1

NORMALLY CLOSED

TP1 TP2 TP3 TP4

Z1 16 Z2 16 Z5 16 Z8 16 Z9 16

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POWER SUPPLY

AT91RM9200-DK

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AT91RM9200

MN4

PB[0..29]
PA[0..31]
PD[0..27]
PC[0..15]
D[0..31]
A[0..25]

TEMPERATURE SENSOR
MN5
MAX6605

MN6
MAX6390XS29D4-T

BOOT MODE SELECT
S38
CR22
BAT54

RESET
BP1

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AT91RM9200-DK

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AB[0..25]
PD[0..27]
PC[0..15]
PB[0..29]
PA[0..31]
D[0..31]
DB[0..31]

MN7A
MN7B
MN7C
MN7D
MN7E
74ALVCH32245
C67 100NF
C69 100NF
C71 100NF
C73 100NF
C66 100NF
C68 100NF
C70 100NF
C72 100NF
C3 C4 F3 F4 L3 L4 P3 P4
B3 B4 D3 D4 E3 E4 G3 G4 K3 K4 M3 M4 N3 N4 R3 R4
3V3
AB2 NWR2
BFCS_NCS0
SMCS_NCS3
CFWE_NWE_NWR0
CFIOR_NBS1_NWR1
CFIOW_NBS3_NWR3
CFOE_NOE_NRD
NCS2
NCS0
NCS3
NWR0
NWR1
NWR3
NRD

J3
C65 100NF
C74 100NF
R140 1K
WAIT
A24

J4
J5
C75 100NF
C76 100NF
C77 100NF
C78 100NF

MN8A
MN8B
MN8C
MN8D
MN8E
C84 100NF
C86 100NF
C88 100NF
C90 100NF
C83 100NF
C85 100NF
C87 100NF
C89 100NF

MN9G
74ALVCH04
C80 100NF
MN9A
SDCS

J6
C79 100NF
C81 100NF

MN10
MAX6383XR30D3-T
C82 100NF
R14 1K
NTRST

ICE / JTAG INTERFACE
JTAG
ICE
J8
J9
C91 100NF
R15 10K
R16 10K
R17 10K
R18 10K
R19 10K
TDI
TMS
TCK
TDO
S25
JTAGSEL

ETM
TRACE PORT
J7
R 20 10K
C92 100NF
C93 100NF
PIPESTAT[0]
PIPESTAT[1]
PIPESTAT[2]
TRACESYNC
TRACEPKT[0]
TRACEPKT[1]
TRACEPKT[2]
TRACEPKT[3]
TRACEPKT[4]
TRACEPKT[5]
TRACEPKT[6]
TRACEPKT[7]
VSUPPLY
EXTTRIG
TRACECLK
TRACEPKT[8]
TRACEPKT[9]
TRACEPKT[10]
TRACEPKT[11]
TRACEPKT[12]
TRACEPKT[13]
TRACEPKT[14]
TRACEPKT[15]
NTRST
TDI
TMS
TCK
TDO
NSRST
DBGRQ
GND

SYSTEM RESET
S3
R21 10K

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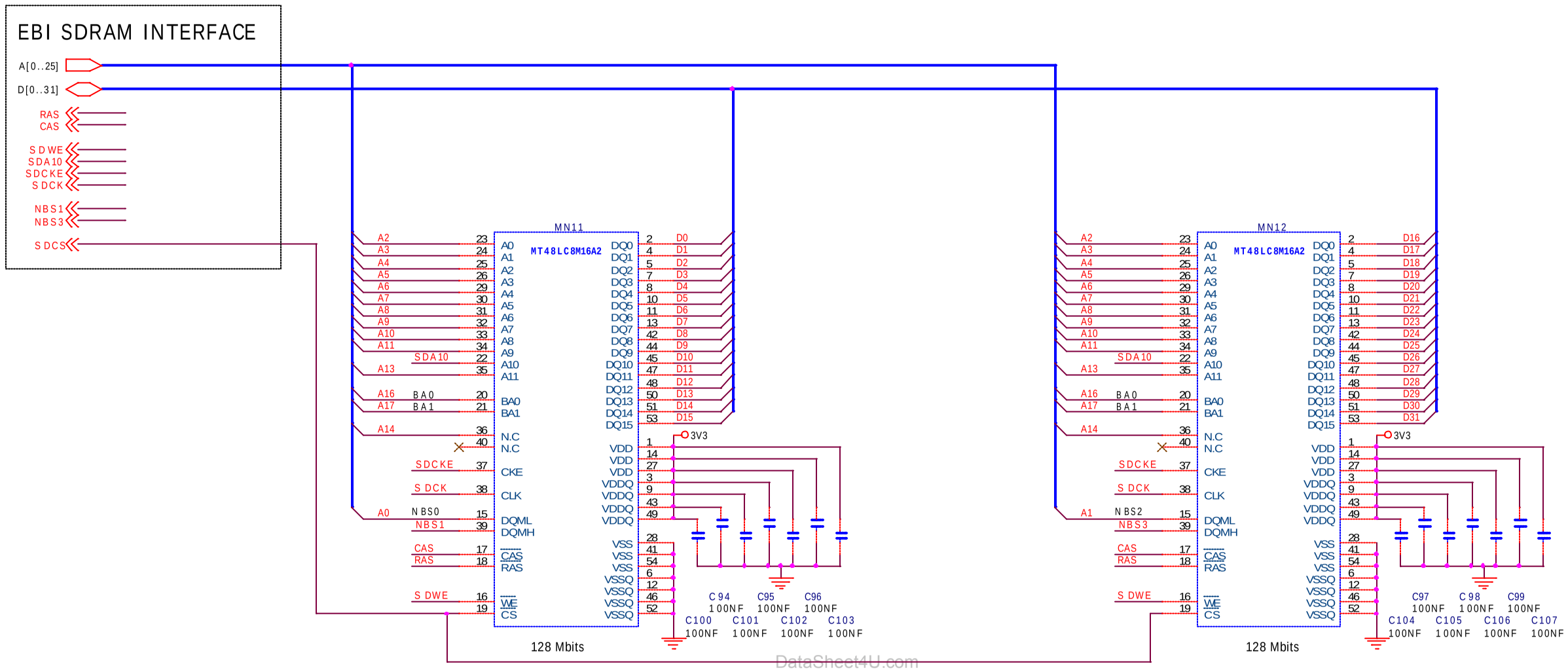
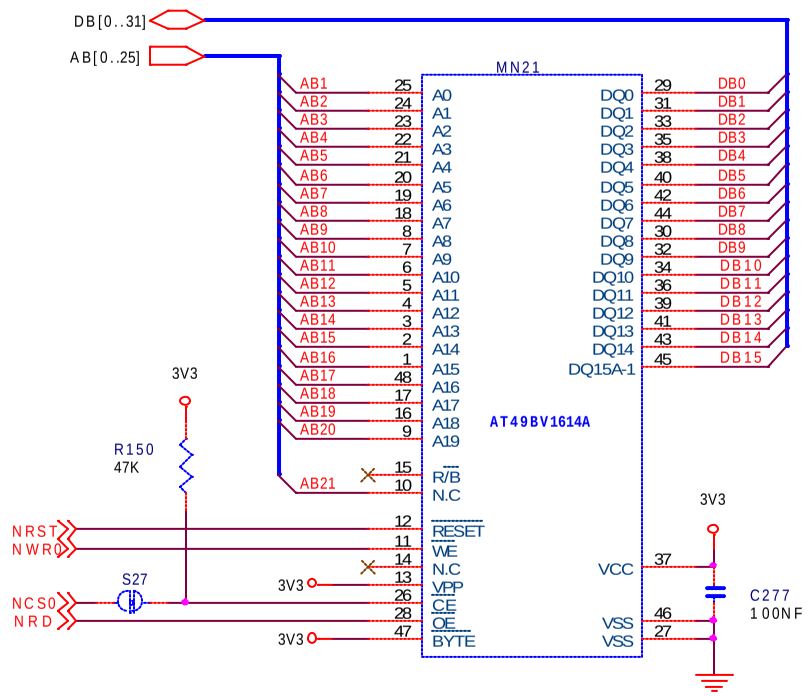
EBI SDRAM INTERFACE





Wednesday, May 21, 2003

STUDIEL 1027 Av du docteur LEFEBVRE 06271 VILLENEUVE LOUBET Tél 04 92 02 45 45 Fax 04 92 02 45 46						
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	B		JPG	30/01/03		
	A	EDT ORG	JPG	04/04/02		
	IND	MODIF.	DESS.	Date:	VERIF	Date:
A TMEL SDRAM & FLASH AT91RM9200-DK	Ech: 1/1		CL TYPE	NUMERO	IND PAGE	NB PAGE
				63SC020514C	4/13	3

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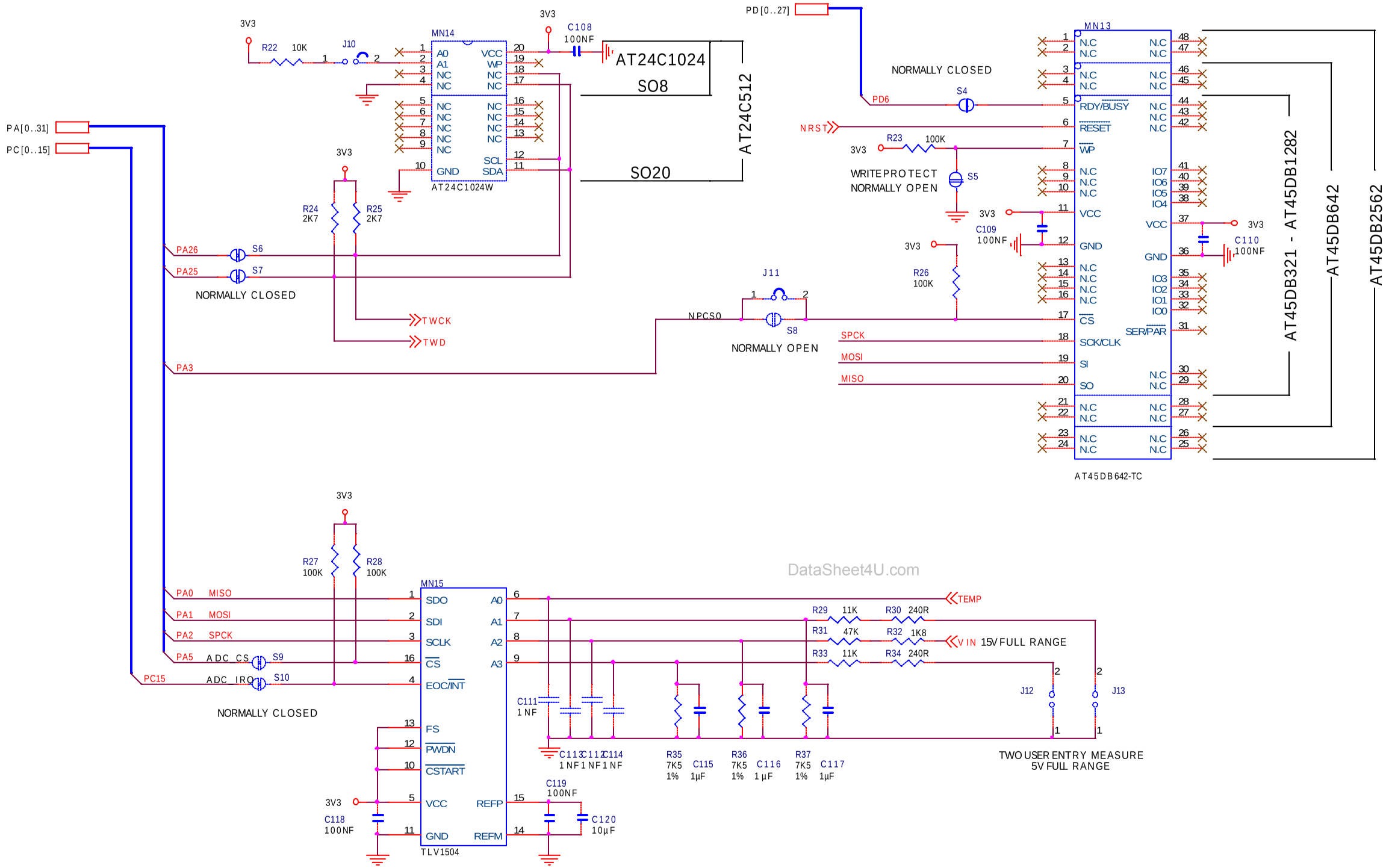

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ATMEL	A	EDT ORG	JPG	04/04/02		
SERIAL DEVICES	IND	MODIF.	DESS.	Date:	VERIF.	Date:
AT91RM9200-DK	Ech: 1/1		CL TYPE	NUMERO	IND.	Feuille 5/13
				63SC020514C		

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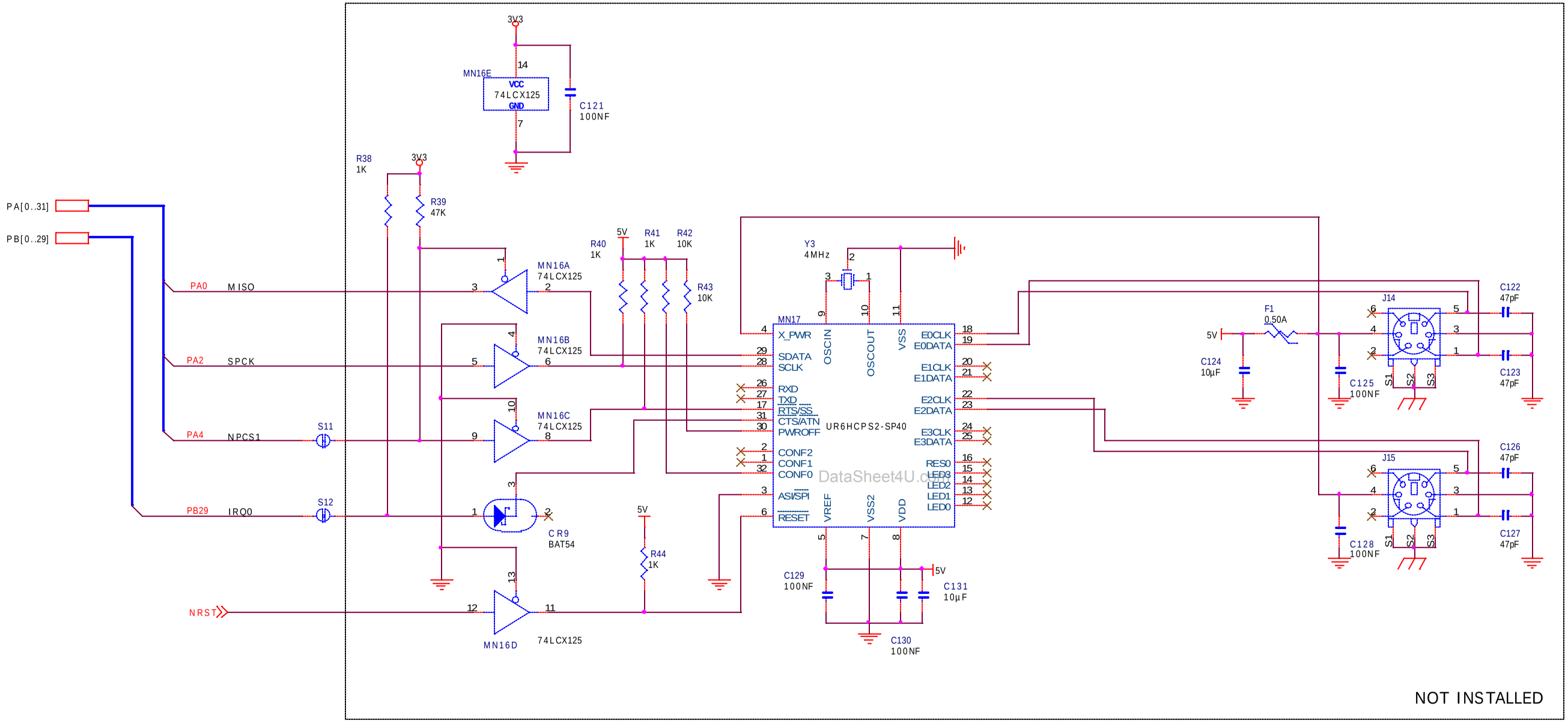

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STUDIEL 1027 Av du docteur LEFEBVRE 06271 VILLENEUVE LOUBET Tél 04 92 02 45 45 Fax 04 92 02 45 46	C		JPG	21/05/03	MMA	21/05/03
	B		JPG	30/01/03		
	A	EDT ORG	JPG	04/04/02		
	IND	MODIF.	DESS.	Date:	VERIF	Date:
ATMEL	Ech: 1/1		CL TYPE	NUMERO	IND	PAGE
PS2 COM PORTS				63SC020514C		6/13
AT91RM9200-DK						

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COMPACT FLASH CONNECTOR

DB[0..31]
AB[0..25]
PC[0..15]

C135 C137 C139 C141 100NF
C134 C136 C138 C140 100NF
3V3
74ALVCH32245 MN18E
C3 C4 F3 F4 L3 L4 P3 P4
VCC GND
B3 B4 D3 D4 E3 E4 G3 G4 K3 K4 M3 M4 N3 N4 R3 R4

C143 C145 C147 C149 100NF
C142 C144 C146 C148 100NF
3V3
74ALVCH32245 MN20E
C3 C4 F3 F4 L3 L4 P3 P4
VCC GND
B3 B4 D3 D4 E3 E4 G3 G4 K3 K4 M3 M4 N3 N4 R3 R4

MN18A
DB15 DB14 DB13 DB12 DB11 DB10 DB9 DB8
A2 A1 B2 B1 C2 C1 D2 D1
1B1 1B2 1B3 1B4 1B5 1B6 1B7 1B8
1A1 1A2 1A3 1A4 1A5 1A6 1A7 1A8
A5 A6 B5 B6 C5 C6 D5 D6
A3 A4 1DIR 1OE

MN18B
DB7 DB6 DB5 DB4 DB3 DB2 DB1 DB0
E2 E1 F2 F1 G2 G1 H2 H1
2B1 2B2 2B3 2B4 2B5 2B6 2B7 2B8
2A1 2A2 2A3 2A4 2A5 2A6 2A7 2A8
E5 E6 F5 F6 G5 G6 H5 H6
AB25 CFRNW
H3 H4 2DIR 2OE

PC10 C FCS
MN19B 74LVC32A

MN18C
AB10 AB9 AB8 AB7 AB6 AB5 AB4 AB3
J5 J6 K5 K6 L5 L6 M5 M6
3A1 3A2 3A3 3A4 3A5 3A6 3A7 3A8
3B1 3B2 3B3 3B4 3B5 3B6 3B7 3B8
J2 J1 K2 K1 L2 L1 M2 M1
J3 J4 3DIR 3OE

3V3 R47 10K

MN18D
AB2 AB1 AB0 AB22 REG
N5 N6 P5 P6 R5 R6 T6 T5
4A1 4A2 4A3 4A4 4A5 4A6 4A7 4A8
4B1 4B2 4B3 4B4 4B5 4B6 4B7 4B8
N2 N1 P2 P1 R2 R1 T1 T2
CFWE_NWE_NWR0
CFOE_NOE_NRD
CFIOR_NBS1_NWR1
CFIOW_NBS3_NWR3
T3 T4 4DIR 4OE

MN20A
PC12 C FCE2
PC11 C FCE1
PC5
A5 A6 B5 B6 C5 C6 D5 D6
1A1 1A2 1A3 1A4 1A5 1A6 1A7 1A8
1B1 1B2 1B3 1B4 1B5 1B6 1B7 1B8
A2 A1 B2 B1 C2 C1 D2 D1
A3 A4 1DIR 1OE
RESET
R48 47K 3V3 PB0 PB[0..29]
COMPACTFLASH CARD DETECT

PC6
CR20 BAT54

J16
31 30 29 28 27 49 48 47 6 5 4 3 2 23 22 21
D15 D14 D13 D12 D11 D10 D09 D08 D07 D06 D05 D04 D03 D02 D01 D00
8 10 11 12 14 15 16 17 18 19 20
A10 A09 A08 A07 A06 A05 A04 A03 A02 A01 A00
44 REG#
36 WE#
9 OE#
35 IOWR#
34 IORD#
32 CE2#
7 CE1#
24 WP
42 WAIT#
41 RESET
25 CD2#
26 CD1#
N7E50-7516VY-20

3V3
R45 10K
R46 10K
MN19A 74LVC32A

3V3
R141 47K

3V3
C132 100NF
C133 100NF
VCC 38
VCC 13
GND 50
GND 1

CSEL# 39
INPACK# 43
BVD2 45
BVD1 46
VS2# 40
VS1# 33
RDY/BSY 37

3V3
MN19E 14
VCC
74LVC32A
GND 7
C150 100NF

MN19C 74LVC32A
MN9E 74ALVC04
MN9F 74ALVC04
MN9B 74ALVC04

MN20D
N5 N6 P5 P6 R5 R6 T6 T5
4A1 4A2 4A3 4A4 4A5 4A6 4A7 4A8
4B1 4B2 4B3 4B4 4B5 4B6 4B7 4B8
N2 N1 P2 P1 R2 R1 T1 T2
T3 T4 4DIR 4OE
3V3
RESERVED

MN20B
DB7 DB6 DB5 DB4 DB3 DB2 DB1 DB0
E2 E1 F2 F1 G2 G1 H2 H1
2B1 2B2 2B3 2B4 2B5 2B6 2B7 2B8
2A1 2A2 2A3 2A4 2A5 2A6 2A7 2A8
E5 E6 F5 F6 G5 G6 H5 H6
AD7 AD6 AD5 AD4 AD3 AD2 AD1 AD0
H3 H4 2DIR 2OE

3V3 R153 47K
SMCS_NCS3
S29

MN20C
AB22 AB21
J2 J1 K2 K1 L2 L1 M2 M1
3B1 3B2 3B3 3B4 3B5 3B6 3B7 3B8
3A1 3A2 3A3 3A4 3A5 3A6 3A7 3A8
J5 J6 K5 K6 L5 L6 M5 M6
ALE CLE SMWE SMOE SMCE PC2
J3 J4 3DIR 3OE
PC3 PC1 PC0 SMRDY
3V3 R50 10K
PC2 Smart Media RDY/BSY
R154 47K 3V3
PB1 PB[0..29]
SMARTMEDIA CARD DETECT
R51 10K 3V3

SMART MEDIA CONNECTOR
C151 100NF
C152 100NF
C153 10µF
J17
SMCE SMOE SMRDY
AD7 AD6 AD5 AD4
22 21 20 19 18 17 16 15 14 13 12
1 2 3 4 5 6 7 8 9 10 11 23 24
CLE ALE SMWE
AD0 AD1 AD2 AD3
3V3
CN015

3V3 R49 47K
NRST
CR23 BAT54
-WP
CLOSE TO WP
J18

Wednesday, May 21, 2003

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1027 Av du docteur LEFEBVRE
06271 VILLENEUVE LOUBET
Tél 04 92 02 45 45 Fax 04 92 02 45 46

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C		JPG	21/05/03	MMA	21/05/03
B		JPG	30/01/03		
A	EDT ORG	JPG	04/04/02		

ATMEL
3V3 MEMORY CARD
AT91RM9200-DK
Ech: 1/1
CL TYPE NUMERO IND DOSSIER
63SC020514C 7/13 3

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Y4 50 MHz (N.C, VDD, VSS, OUT) — 3V3 — C154 100NF

MN9D 74ALVC04 → 50MHZ DISPLAY CONTROLLER

MN9C 74ALVC04

PA[0..31]

PC[0..15]

MN22 DM9161E

PA7	REFCK	42	REF_CLK/XT2
		17	TXD3
		18	TXD2
PA10	ETX1	19	TXD1
PA9	ETX0	20	TXD0
PA8	ETXEN	21	TX_EN
		22	TX_CLK/ISOLATE
		26	RXD3/ADR3
		27	RXD2/ADR2
PA13	ERX1	28	RXD1/ADR1
PA12	ERX0	29	RXD0/ADR0
		31	RX_EN
PA11	ECRSDV	34	RX_CLK/SCRAMEN/10BTSER
		37	RX_DV/TESTMODE
		16	TX_ER/TXD4
PA14	ERXER	38	RX_ER/RXD4/RPTR
		36	COL/RMII
		35	CRS/ADR4
PA15	EMDC	24	MDC
PA16	EMDIO	25	MDIO
PC4	IRQ	32	MDINTR
		41	DVDD
		39	DVDD
		30	DVDD
		23	DVDD
		15	DGND
		33	DGND
		44	DGND
		10	PWRDWN
		40	RESET
		43	XT1
		7	TX+
		8	TX-
		3	RX+
		4	RX-
		1	AVDD
		2	AVDD
		9	AVDD
		5	AGND
		6	AGND
		46	AGND
		47	BGRESG
		48	BGRES
		11	FDX/COLLED/OP0
		12	SPEEDLED/OP1
		13	LINK/ACTLED/OP2
		14	CABLESTS/LINKSTS
		45	N.C

S30, S31, S32, S36

R55 10K, R57 10K, R58 2K2, R155 47K

C164 100NF, C165 100NF, C166 100NF, C167 100NF

NRST

VCCA — 742792093 L3 — C155 100NF, C156 100NF

742792093 L4 — C157 100NF

R52 49R9 1%, R53 49R9 1%, R54 49R9 1%, R56 49R9 1%, C158 100NF, C159 100NF, C160 100NF

C161 100NF, C162 100NF, C163 100NF

R62 6K8 1%

742792093 L5 — C168 100NF, C169 10µF, C170 10µF

742792093 L6 — C171 100NF

J19 J0026D21

J19	J0026D21
TD+	TX+ 1
CT	
TD-	TX- 2
RD+	RX+ 3
CT	
RD-	RX- 6
4	4
5	5
	7
	8

75, 75, 75, 75, 1nF

R59 10K, R60 10K, R61 10K

R63 270R, R64 NOT INSTALLED, R65 270R, R66 NOT INSTALLED, R67 270R, R68 NOT INSTALLED

OP0	DS1	RECEIVE STATUS YELLOW
OP1	DS2	DISPLAY SPEED STATUS GREEN = 100 Mb
OP2	DS3	ACT LED GREEN

R69 R70 R71 NOT INSTALLED

OP2	OP1	OP0	
0	0	0	Dual speed 100/10 HDX
0	0	1	Reserved
0	1	0	Reserved
0	1	1	Manually select 10TX HDX
1	0	0	Manually select 10TX FDX
1	0	1	Manually select 100TX HDX
1	1	0	Manually select 100TX FDX
1	1	1	Auto negociation enables all capabilities (default)

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STUDIEL
1027 Av du docteur LEFEBVRE
06271 VILLENEUVE LOUBET
Tél 04 92 02 45 45 Fax 04 92 02 45 46

ATMEL
ETHERNET
AT91RM9200-DK

IND	MODIF.	DESS.	Date:	VERIF.	Date:
C		JPG	21/05/03	MMA	21/05/03
B		JPG	30/01/03		
A	EDT ORG	JPG	04/04/02		

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PA[0..31]

PA24 MCLK

PB[0..29]

PB12 RGDT

PB16 OFHK

PB17 FSYNC

PB13 SCLK

PB15 SDO

PB14 SDI

NRST

S13 S14 S15 S16 S17

3V3

MN23

SI3021

MCLK FSYNC SCLK VD SDO SDI FC/RGDT RESET

OFHK RGDT/FSD M0 VA GND C1A M1 AOUT

C179 100NF

SI3044_AOUT

AC97 ANALOG FRONT END

CR11 BZV55-C5V6

C173 100NF

C174 100NF

C172 10µF

CR10 BAV99

NOTE : VA supply, use internal charge pump

R78 10R

NO GROUND PLANE IN DAA SECTION

C178 150PF 3KV

R79 10R

MN24

SI3015

QE2 DCT IGND C1B RNG1 RNG2 QB QE

FILT2 FILT RX REXT REXT2 REF VREG2 VREG

R74 5K36 1%

R72 5K36 1%

R73 5K36 1%

C175 100NF

C176 1uF 20V

C177 0.1uF 50V

R77 2K2

Q3 BCP56T1

Q4 MMBTA42

Q5 MMBTA92

Q6 MMBTA42

R75 150R

R76 100K

R80 120K

R81 9K31 1%

R82 78R7 1%

R83 5K36 1%

R84 5K36 1%

R85 5K36 1%

R86 215R 1%

R87 402R 1%

C180 10NF

C181 1.8NF

CR12 BZV55-C43

CR13 BAV99

CR14 BZV55-C5V6

C182 0.68uF 20V

C183 100NF

C184 100NF

C185 560PF 600V

R88 56K

C186 3.9NF

C189 3.9NF

C191 560PF 600V

R91 56K

C192 150PF 3KV

CR15 MB4S

C188 10NF 250V

R89 10M

R90 10M

C187 1NF 3KV

C190 1NF 3KV

L7 742792041

L8 742792041

F2 250V 0.13A

CR16 270V

POLYSWITCH

J20 RJ12

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	A	EDT ORG	JPG	04/04/02		
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DAA	Ech:	1/1	CL	TYPE	NUMERO	IND PAGE
AT91RM9200-DK				63SC020514C		9/13

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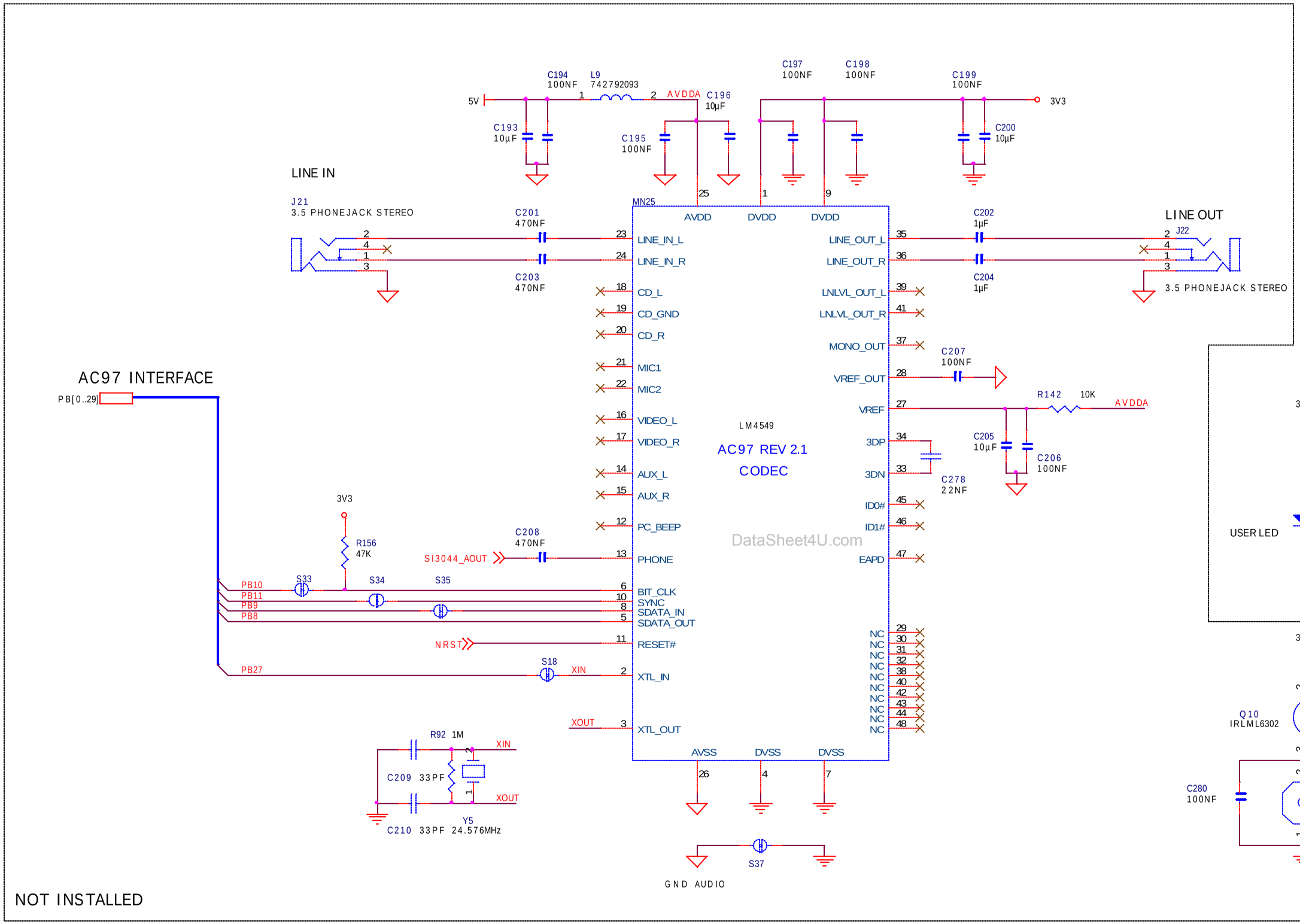

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	B		JPG	30/01/03		
	A	EDT ORG	JPG	04/04/02		
ATMEL	IND	MODIF.	DESS.	Date:	VERIF.	Date:
AC97 ANALOG FRONT END	Ech:	1/1	CL	TYPE	NUMERO	IND
AT91RM9200-DK				63SC020514C		10/13

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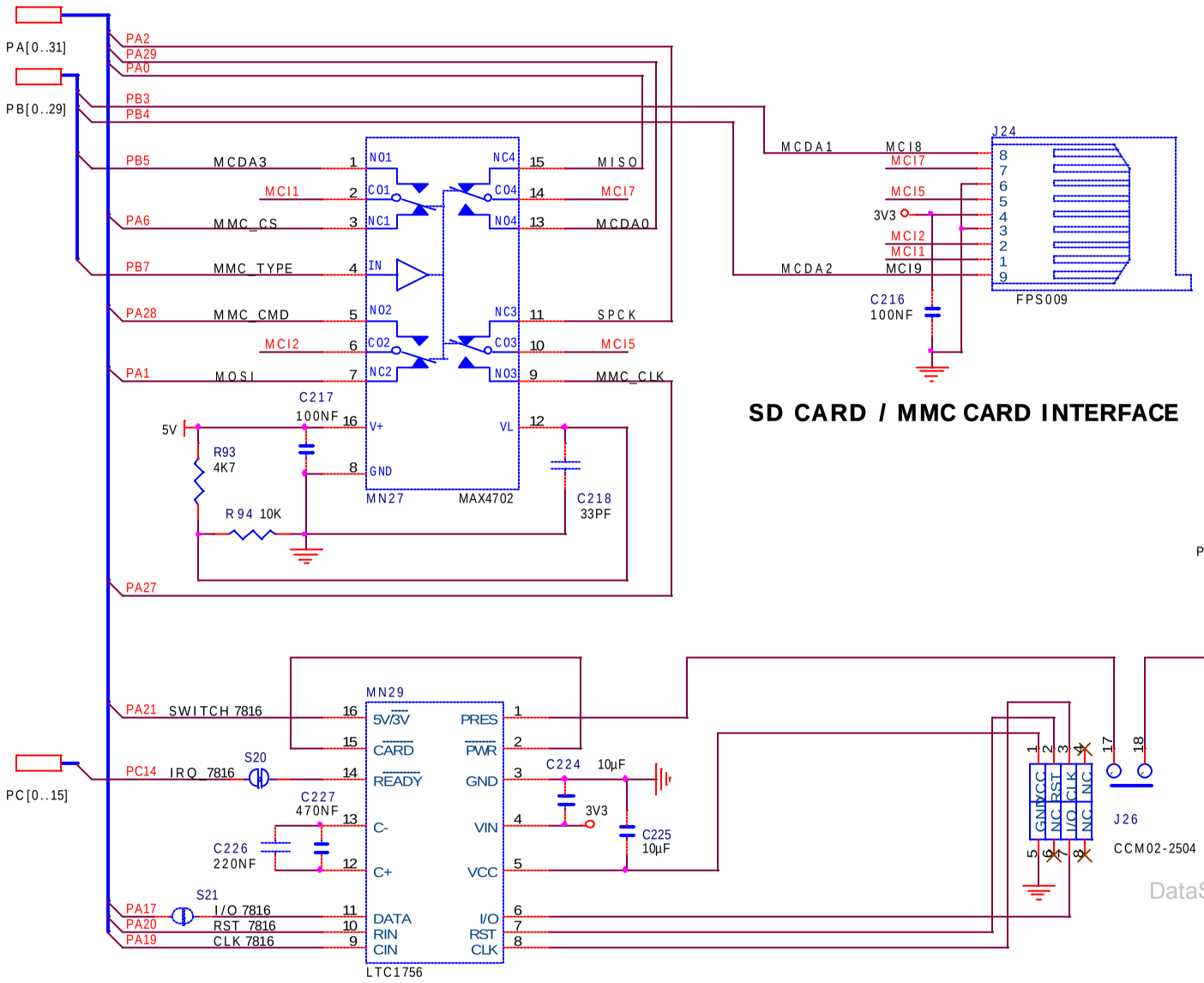
SD CARD / MMC CARD INTERFACE



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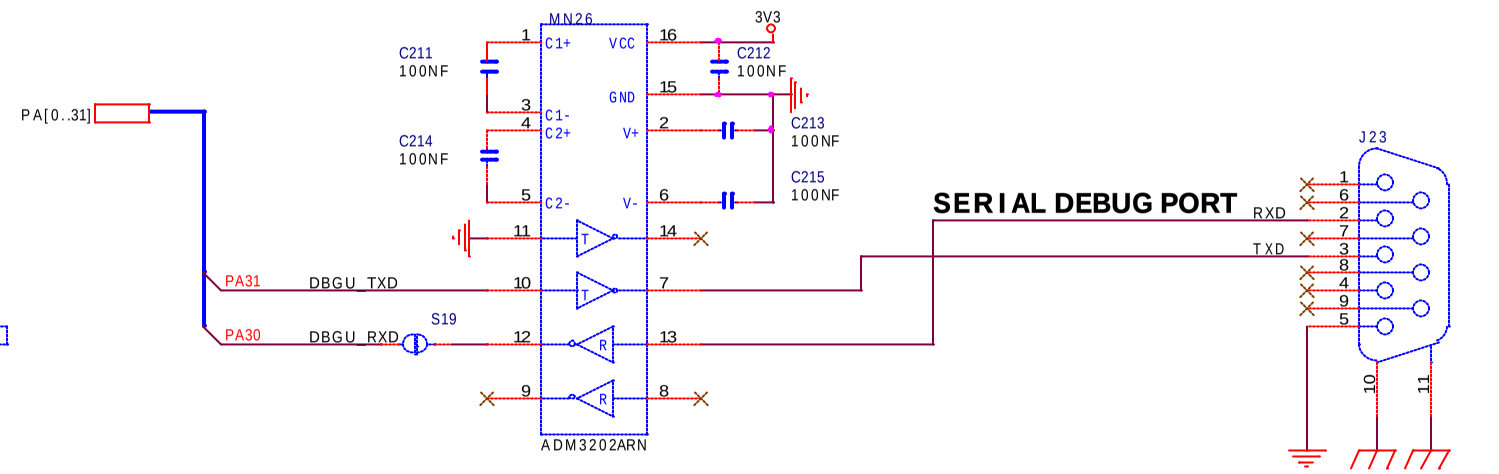
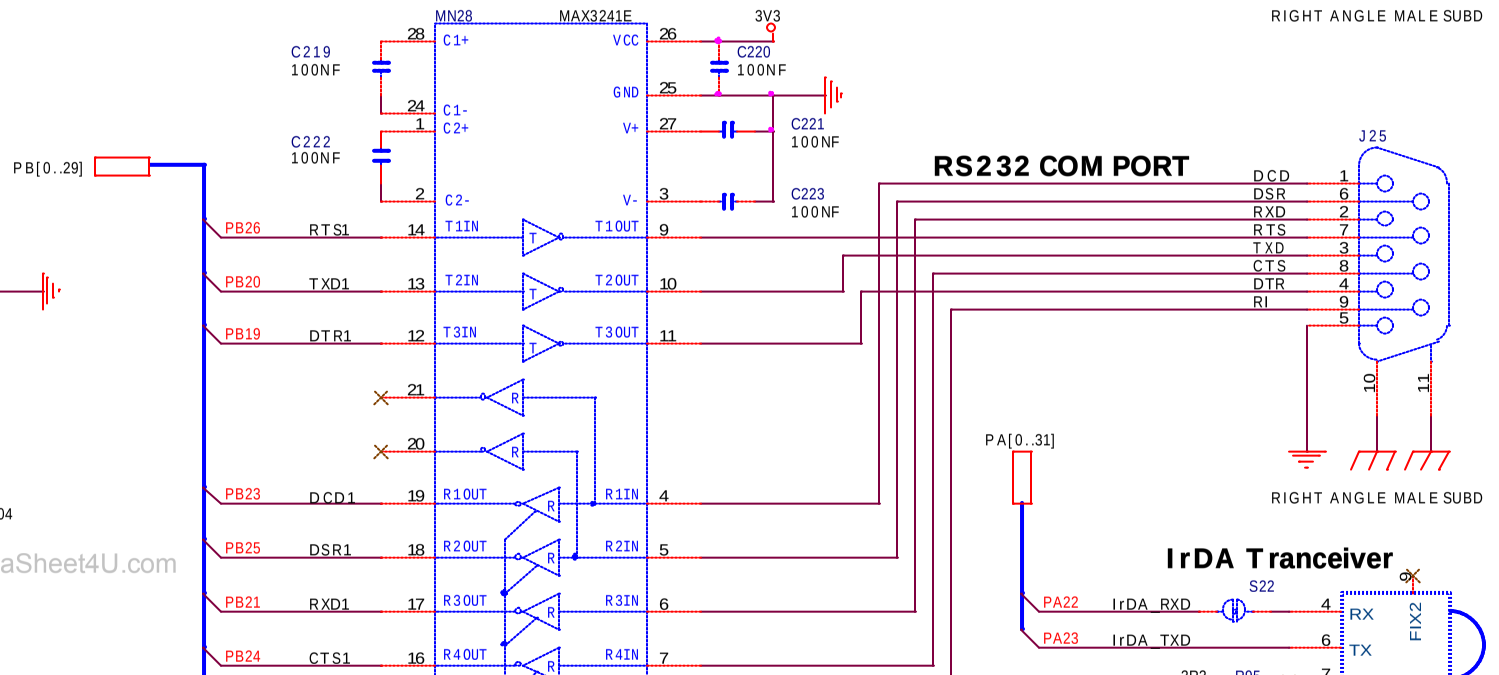


SMART CARD READER

RS232 COM PORT



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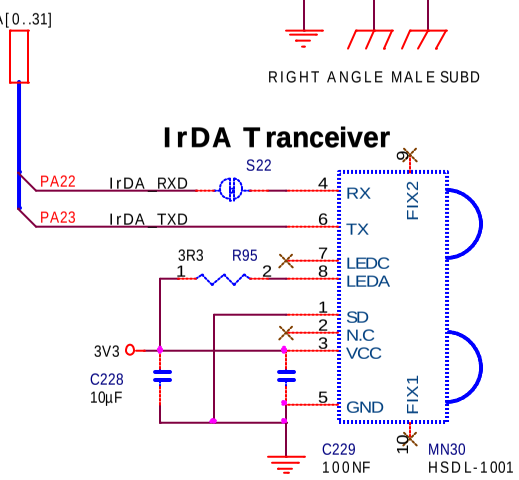
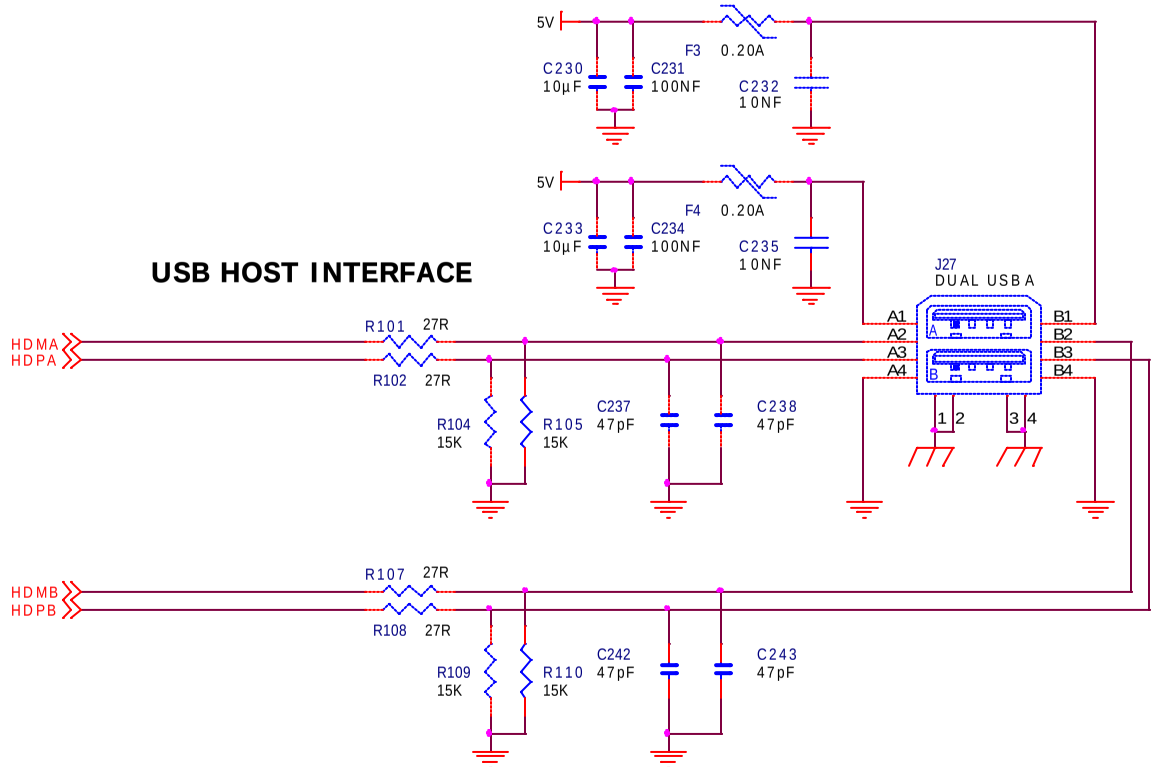
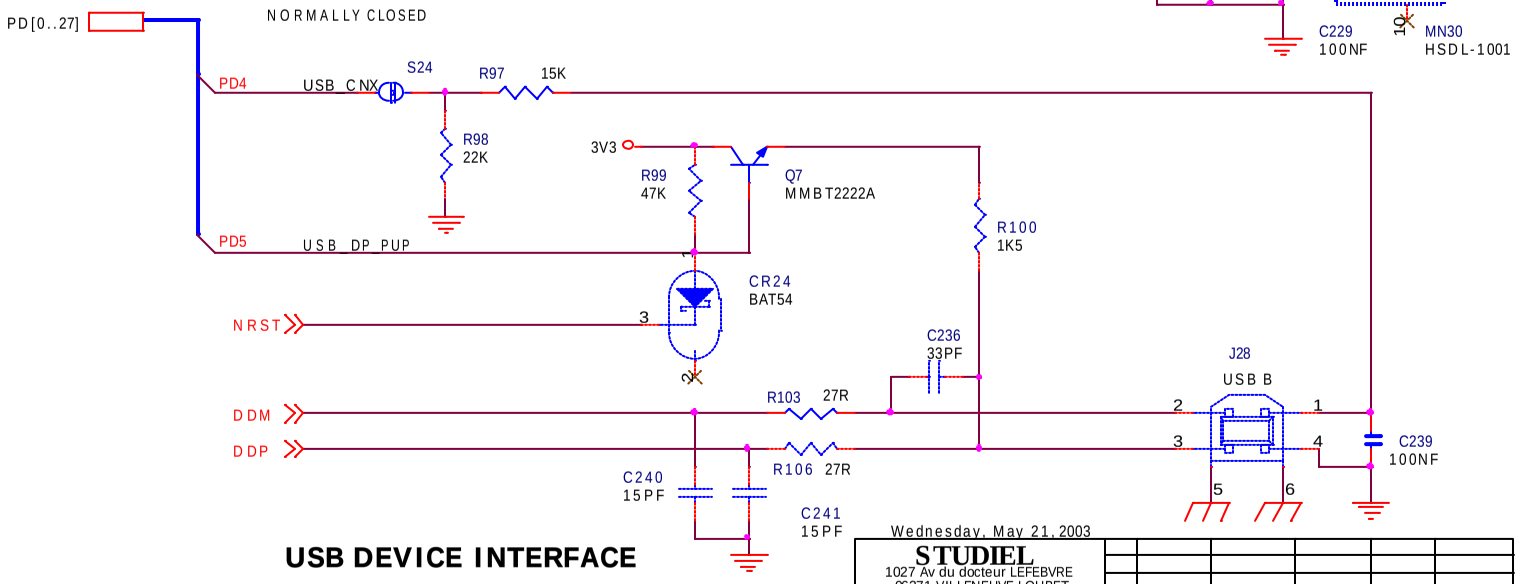


USB HOST INTERFACE



USB DEVICE INTERFACE



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	B		JPG	30/01/03		
	A	EDT ORG	JPG	04/04/02		
ATMEL SERIAL INTERFACES AT91RM9200-DK	IND	MODIF.	DESS.	Date:	VERIF.	Date:
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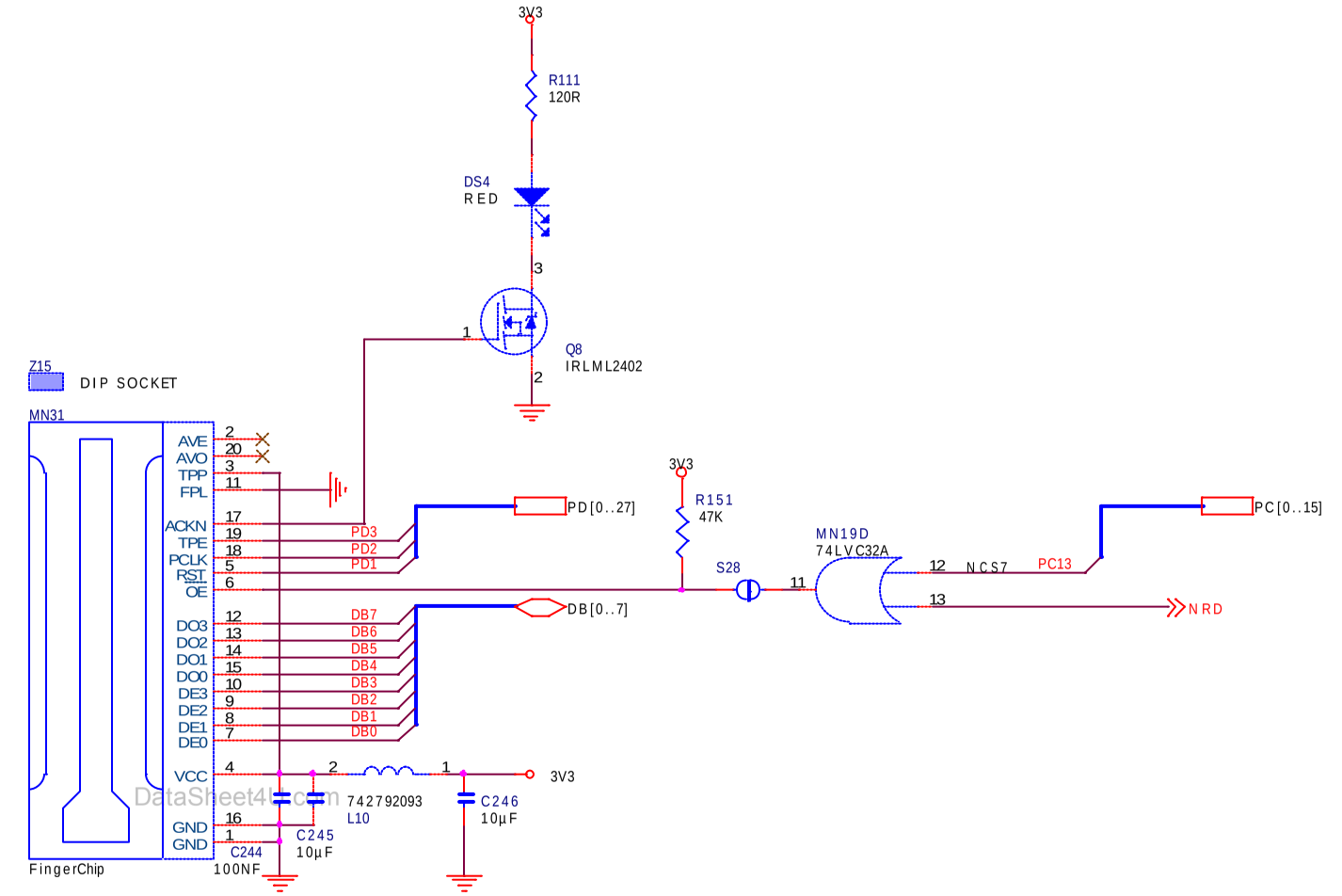

DO NOT SOLDER

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	B		JPG	30/01/03		
	A	EDT ORG	JPG	04/04/02		
	IND	MODIF.	DESS.	Date:	VERIF	Date:
ATMEL FINGERCHIP AT91RM9200-DK	Ech: 1/1		CL TYPE	NUMERO	IND	PAGE
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S1D13806
DISPLAY CONTROLLER

MN32

AB[0..25]
DB[0..31]
PC[0..15]

L11 742792093
C248 100NF
C247 100NF
C249 100NF
AVDDV
C250 10µF
L12 742792093
C251 10µF
3V3

C275 10µF
C276 10µF
LUMINANCE 20% ..100%
J31
R149 10K 20%
5V

MN34
TWD
TWCK
SDA
SCL
A0
A2
A3
NC
WP
VCC
VSS
RH/VH
RW/VW
RL/VL
X9429-10K
C279 100NF

J29
J33
HSYNC
DOTCLK
VSYNC
DATAEN
C253 10µF
C252 10µF

CR17 BAV99
CR18 BAV99
CR19 BAV99

J30
HD-22 RIGHT ANGLE 15PTS
BDS3/3/8.9-4S2
L14
L15
L16
R
G
B

R126 150R 1%
R127 150R 1%
R128 150R 1%

4.6mA

R137 1K5 1%
Q9 MMBT2222A
R138 1K 1%
R139 140R 1%

CR21 SHUNTED
PC6
R143 2K2
C274 100NF
R144 47K
R112 15K
S26
R148 47K
R160 0R
R113 10R
R115 10R
R116 10R
R117 330K
R118 330K
R119 330K
R120 330K
R121 330K
R122 330K
R124 330K
R125 330K

C255 100NF
C254 10µF
MN33
VDDD
VSSD
PDEN
EXTFB
HSYNC
EXTFIL
XFILRET
VDDA
VSSA
OSC
IREF
CLK/2+
CLK/2-
CLK+
CLK-
VSSQ
VDDQ
CLK
CLK/2
FUNC
LOCK/REF
I2CADR
ICS1523
C256 100NF
C257 10µF
R145 10K
R146 10K
R147 10K
C258 3.3NF
C259 150pF
R114 6K8
C260 10µF
C261 100NF
R123 47R
50MHZ

Generic Little Indian
(Default)

NOT INSTA LLED R129
NOT INSTA LLED R130
NOT INSTA LLED R131
NOT INSTA LLED R132
NOT INSTA LLED R133
NOT INSTA LLED R134
NOT INSTA LLED R135
NOT INSTA LLED R136

C262 100NF
C263 100NF
C264 100NF
C265 100NF
C266 100NF
C267 100NF
C268 100NF
C269 100NF
C270 100NF
C271 100NF
C272 100NF
C273 10µF

Wednesday, May 21, 2003

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06271 VILLENEUVE LOUBET
Tél 04 92 02 45 45 Fax 04 92 02 45 46

ATMEL
VGA TFT/CRT DISPLAY
AT91RM9200-DK

IND	MODIF.	DESS.	Date:	VERIF	Date:
C		JPG	21/05/03	MMA	21/05/03
B		JPG	30/01/03		
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