AT85DVK-07 Development Board

Hardware User's Guide

Section 1

Section 2

Section 1
Introduction

Congratulations on your purchase of the C51 AT85DVK-07 Starter Kit. It is designed to give designers a quick start to develop code on the AT85C51SND3Bx and for prototyping and testing of new designs.

1.1 Overview

This document describes the development board part of the AT85DVK-07 Starter Kit dedicated to the AT85C51SND3Bx microcontroller. This board is designed to allow an easy evaluation of the product using Atmel's demonstration software.

To increase its demonstrative capabilities, this stand alone board has numerous interfaces (USB, PSI, RS232, SPI) and on-board resources (keyboard & 128x64 graphic LCD).

This user's guide acts as a general getting started guide as well as a complete technical reference for advanced users.

1.1.1 Typical Applications

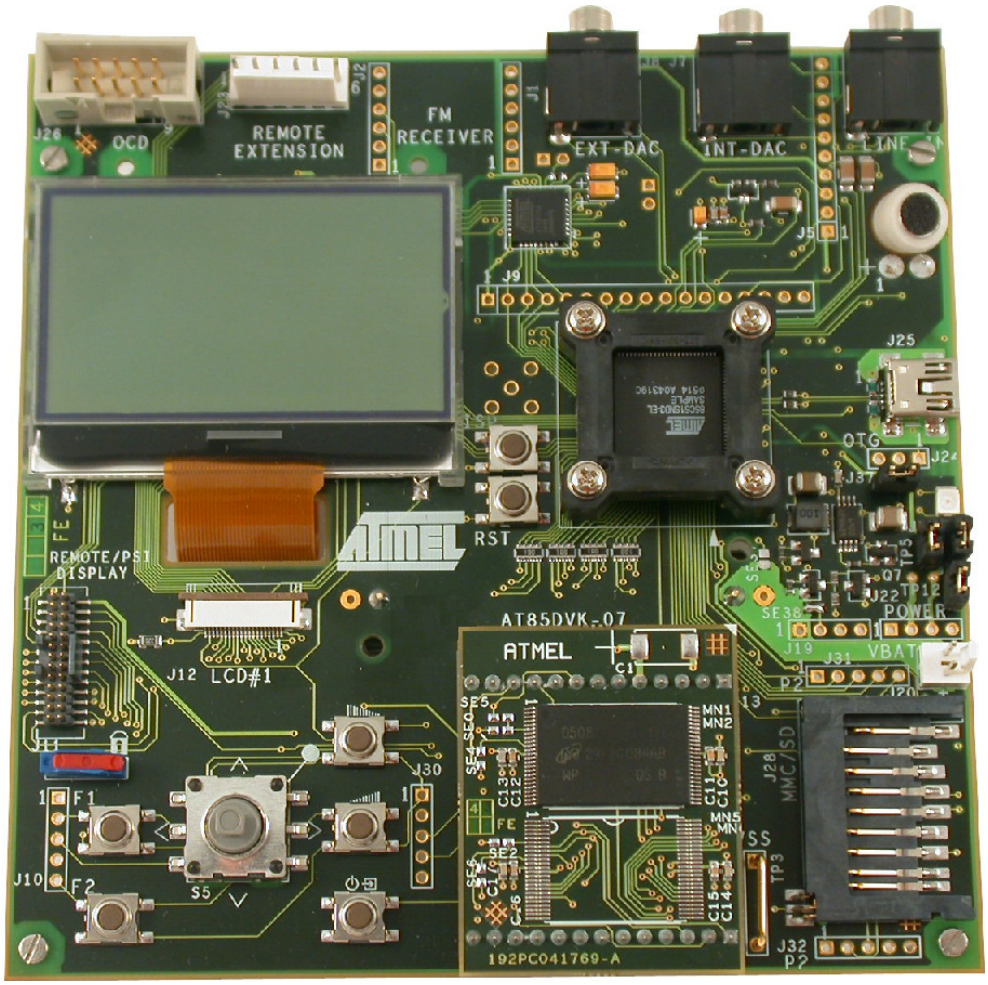
- MP3/WMA/… Audio Player
- PDA, Camera, Mobile Phone Audio Player
- Car Audio/Multimedia Audio Player
- Home Audio/Multimedia Audio Player
- Karaoke

1.2 AT85DVK-07 Starter Kit Content

The AT85DVK-07 Starter Kit contains the following items:

- a AT85DVK-07 Board V1.0.x
- a Nand Flash daughter board equipped with one Nand Flash memory
- a bare PCB Nand Flash daughter board for user's nand flash evaluation
- a USB 2.0 high speed cable
- a USB host adapter cable
- a demonstration firmware programmed inside the Nand Flash memory
- an OCD dongle with target cable for debugging the application

Figure 1-1. AT85DVK-07 Board Photo



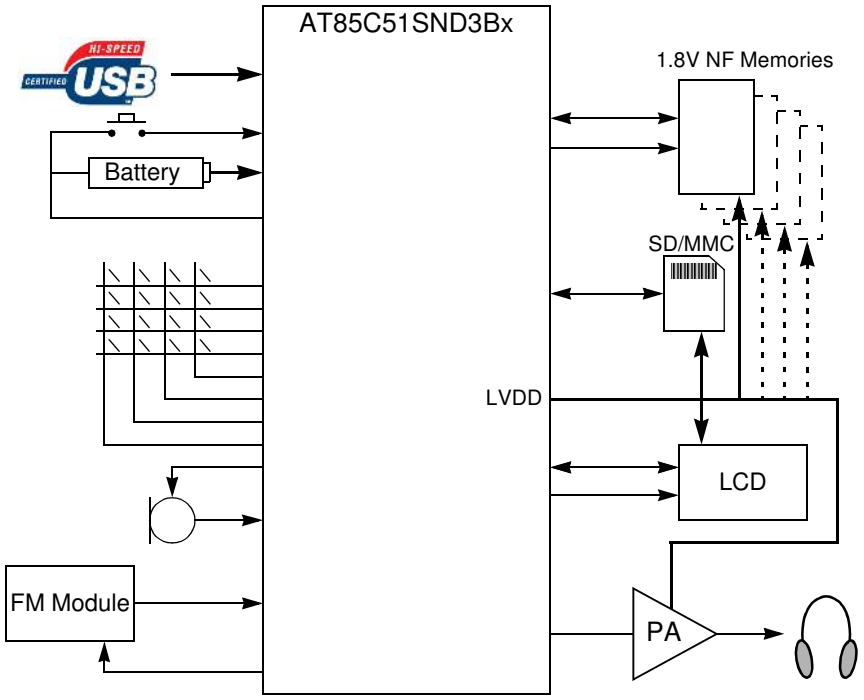
1.3 AT85DVK-07 Starter Kit Information

The AT85DVK-07 Starter Kit allows demonstrating of 2 typical applications which differentiate by the power supply voltage:

- The Very Low Voltage System
  The player operates at 1.8V and allows very low power consumption.
- The Low Voltage System
  The player operates at 3V and allows low power consumption.

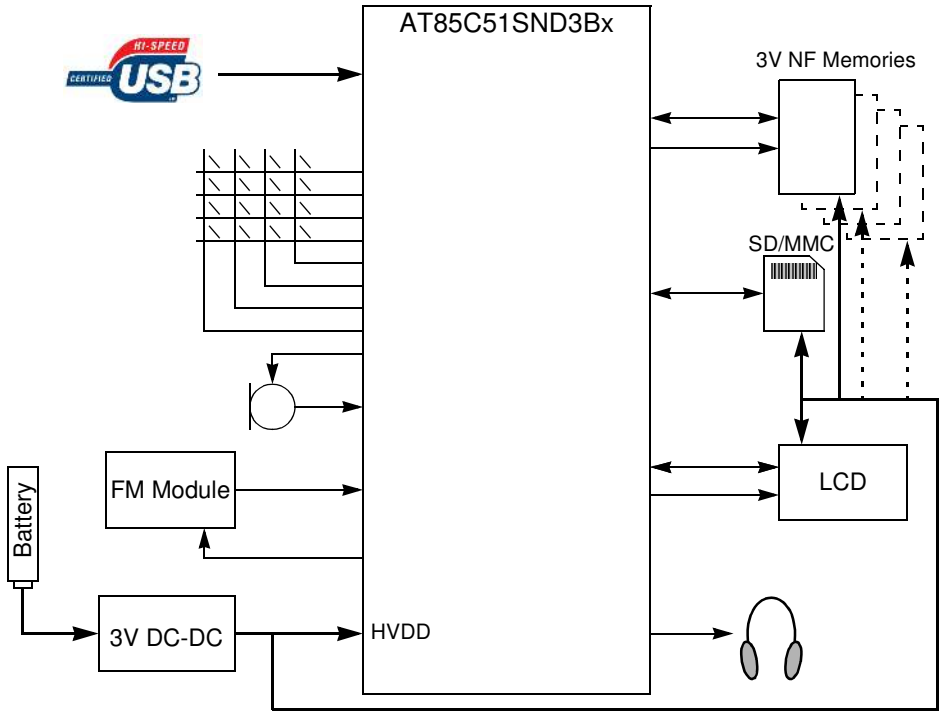
1.3.1 Very Low Voltage 1.8V System

Figure 1-2. Typical Very Low Voltage 1.8V Application



1.3.2 Low Voltage 3V System

Figure 1-3. Typical Low Voltage 3V Application



Section 2

Using the AT85DVK-07 Board

The AT85DVK-07 Board can be used as a stand-alone USB mass storage disk and master or slave multi-format audio player.

2.1 Development Board

Figure 2-1. AT85DVK-07 Board Block Diagram

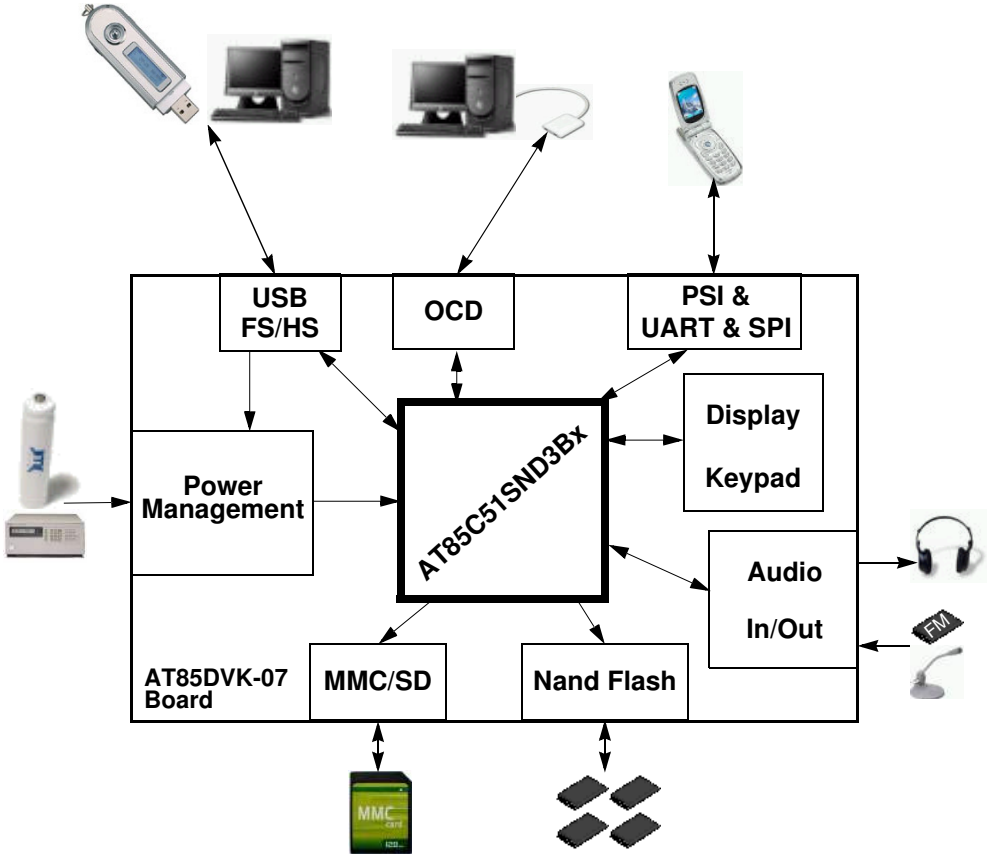
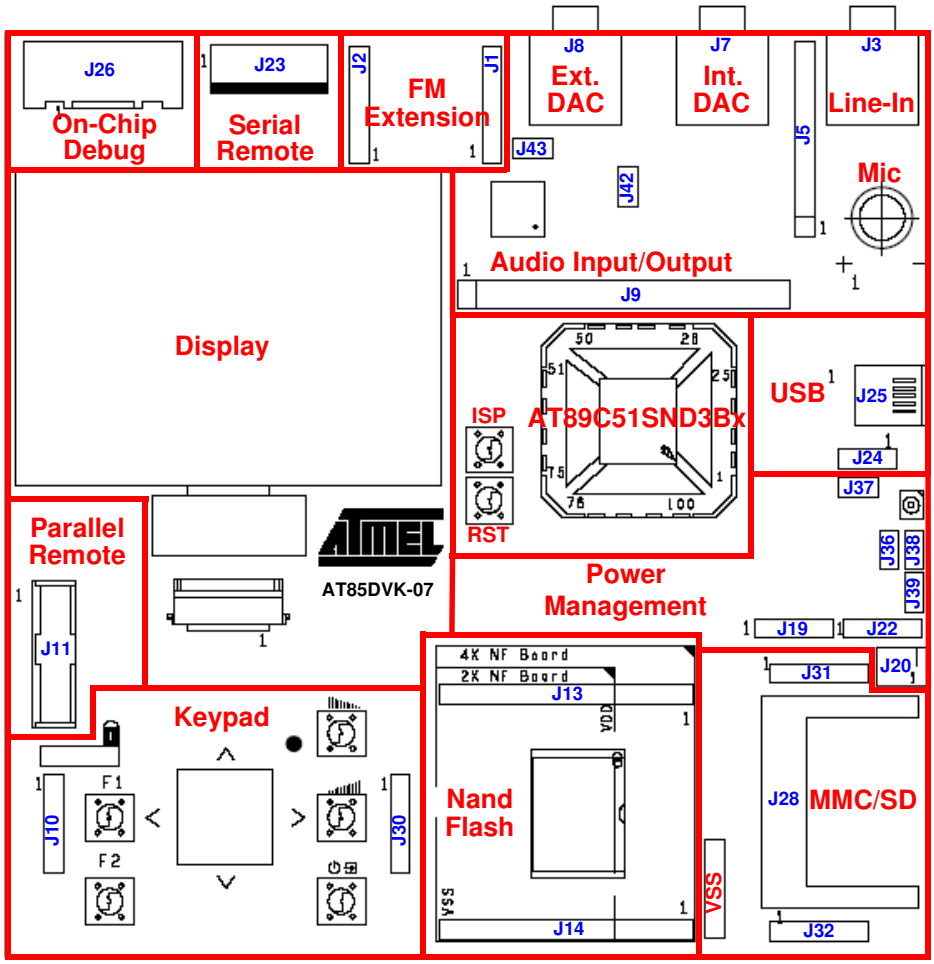


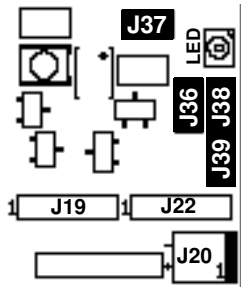
Figure 2-2. AT85DVK-07 Board



2.2 Power Management Unit

The Power Management unit allows three different power supply sources along with a set of solder strap allowing configuration of “Very Low Voltage 1.8V application” or “Low Voltage 3V application”. Figure 2-3 shows the power management unit implementation. Jumpers J36, J37, J38, J39 must always be in place for proper operation and are implemented for current measurement purpose only (see Section 2.14).

Figure 2-3. Power Management Unit Implementation



2.2.1 Battery Power Supply

The AT85DVK-07 Board allows direct plug-in of a single AAA battery element or a AA battery as an option.

Table 2-1. Battery Power Supply Range

Power supply source	Min.	Max.	Unit
Battery Power Supply	0.9	1.5	V

2.2.2 External Power Supply Connection

In order to operate without battery during firmware development process the AT85DVK-07 Board provides an external power supply input through connector J20.

Notes: 1. Remove any plugged battery from the socket before applying the external voltage.
2. The external power supply input is ***not protected*** against polarization inversion.

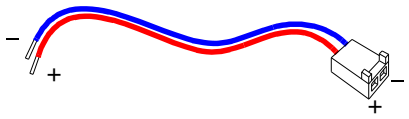
Table 2-2. External Power Supply Connector Pinout (J20)

Pin Number	Pin Name	Pin Description
1	VBAT	+ 1.5V supply voltage
2	VSS	0V supply reference

Table 2-3. External Power Supply Range

Power supply source	Min.	Max.	Unit
External Power Supply	0.9	3.0	V

Figure 2-4. External Power Supply Cable



2.2.3 USB V_{BUS} Power Supply

The AT85C51SND3Bx provides direct connection of USB V_{BUS} power supply. When V_{BUS} is present, the on-chip or on-board DC-DC is disabled to avoid battery power consumption.

Table 2-4. USB V_{BUS} Power Supply Range

Power supply source	Min.	Max.	Unit
V_{BUS} Power Supply	4.4	5.5	V

2.2.4 Power Configuration

The power configuration is done through a set of solder straps. By default, the AT85DVK-07 Board is delivered configured in “Low Voltage 3V application” meaning all external components (LCD, NF, MMC…) are powered at 3V.

Note: “Very Low Voltage 1.8V application” uses the on-chip 1.8V DC-DC of the AT85C51SND3Bx while “Low Voltage 3V application” uses the external on-board DC-DC.

Table 2-5. Power Configuration

Solder Strap	Very Low Voltage Application	Low Voltage Application	Comment
SE32	X		VDD selection amongst HVDD or LVDD
SE34		X	
SE33	X		AVDD2 selection amongst HVDD or LVDD
SE35		X	
SE37	X	X(1)	Internal / External DC-DC V_{BAT} Selection
SE38		X(3)	
SE56		X(3)	On-board DC-DC output insulation
SE57	X	X(2)	Power-on switch routing
SE58		X	

Notes: 1. Option to allow battery voltage monitoring by the AT85C51SND3Bx.
2. Option to allow power key-press detection by the AT85C51SND3Bx.
3. Remove this connection when using a daughter board DC-DC extension.

Figure 2-5. Very Low Voltage Application Power Configuration

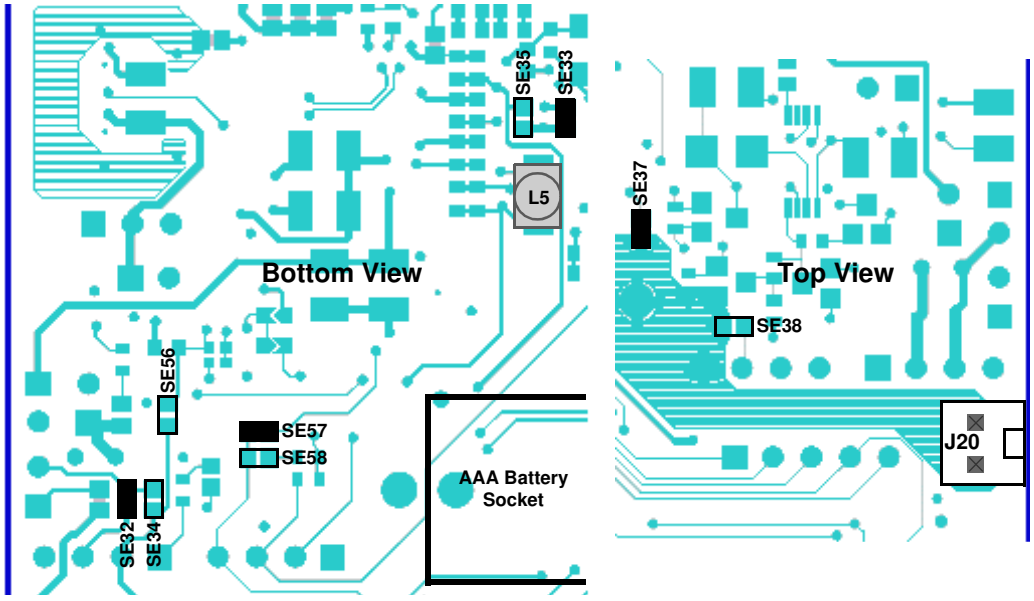
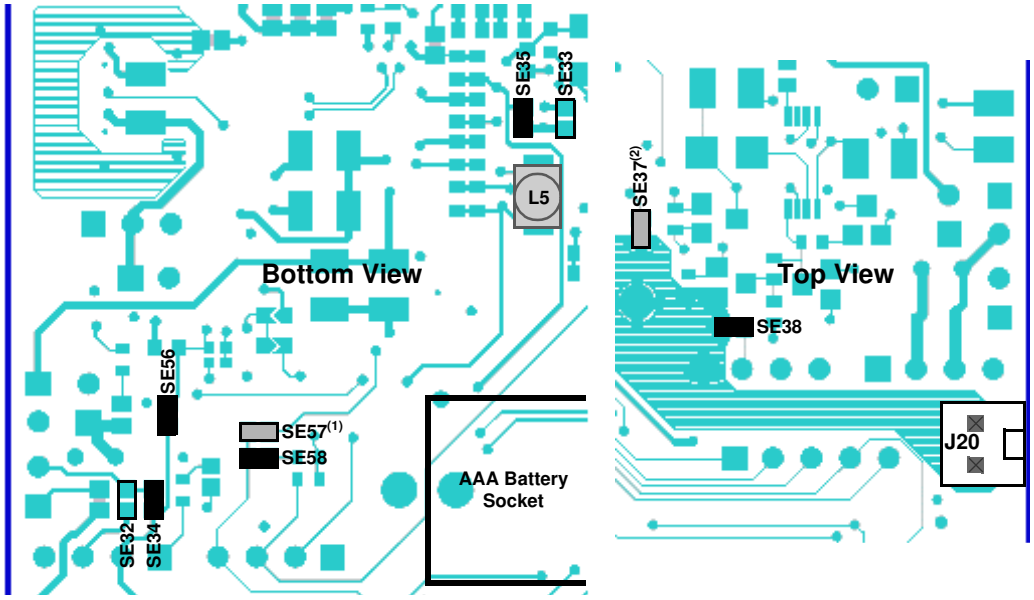


Figure 2-6. Low Voltage Application Power Configuration



Notes: 1. Option to allow power key-press detection by the AT85C51SND3Bx.
2. Option to allow battery voltage monitoring by the AT85C51SND3Bx.

2.2.5 External DC-DC Replacement

In order to allow developers to validate other external DC-DC power supply solution, two extension connectors J19 and J22 (see Table 2-6 and Table 2-7) are provided as option to plug a daughter board featuring an external 3V low voltage DC-DC.
In such configuration the board must be configured in “Low Voltage” mode and SE38 along with SE56 must be open.

Table 2-6. External DC-DC Extension Connector (J19)

Pin Number	Pin Name	Pin Description
1	VBAT	Direct battery supply voltage
2	EXTDC	Battery supply voltage (SE38 ON)
3	P3.4/EXTDC_ON	Asserted low permanent power-on signal
4	SW_ON	Active low power-on switch

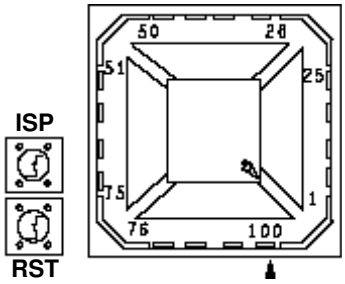
Table 2-7. External DC-DC Extension Connector (J22)

Pin Number	Pin Name	Pin Description
1	VBUS	USB +5V supply voltage
2	HVDD	3V supply voltage
3	LVDD	1.8V supply voltage
4	VSS	0V digital supply reference

2.3 Microcontroller Unit

The Microcontroller unit consists in the AT85C51SND3Bx component in LQFP100 pin package including its 12 MHz oscillator and the reset (RST) and in system programming (ISP) push-buttons.

Figure 2-7. Microcontroller Unit Implementation



2.3.1 Socket

For development purpose, a ZIF socket may be soldered in place of the AT85C51SND3Bx chip.

2.3.2 Reset

By pressing the RST push-button, a warm RESET of the AT85C51SND3Bx is performed.

2.3.3 In System Programming

Pressing the ISP push-button while releasing the RST bush button enters the in system programming boot loader.

Note: The AT85C51SND3Bx embeds a generic Nand Flash boot-loader.

2.4 Remote Control Unit

The Remote Control unit is split in two different units: the Serial Remote Control Unit and the Parallel Remote Control Unit.

2.4.1 Serial Remote Unit

The Serial Remote Control unit implements a 6-pin connector J23 sharing the UART and high-speed SPI Interfaces. This connector allows easy connection with a host able to control the audio player remotely.

Note: The AT85DVK-07 Board is supplied without any RS-232 driver/receiver.

Figure 2-8. Serial Remote Control Unit Implementation

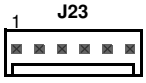


Table 2-8. Remote Control Connector (J23)

Pin Number	Pin Name	Pin Description
1	VDD	IOVDD power supply 1.8V or 3V depending on the power configuration
2	P3.0/RXD/MISO	UART Receive Serial Data SPI Master Input Slave Output Data Line
3	P3.1/TXD/MOSI	UART Transmit Serial Data SPI Master Output Slave Input Data Line
4	P3.2/$\overline{\text{INT0}}$/$\overline{\text{RTS}}$/SCK	UART Request To Send Control Line SPI Clock Line
5	P3.3/$\overline{\text{INT1}}$/$\overline{\text{CTS}}$/$\overline{\text{SS}}$	UART Clear To Send Control Line SPI Slave Select Line
6	VSS	0V digital supply reference

2.4.2 Parallel Remote Unit

The Parallel Remote Control unit implements a 26-pin connector J11 sharing the PSI (8-bit Parallel Slave Interface) UART and high-speed SPI Interfaces. This connector allows easy connection with a host able to control the audio player remotely.

Note: The Parallel Slave Interface and Display Interface are sharing same signals. So on board LCD must then be disconnected by removing its flat cable from J34 socket.

Figure 2-9. Parallel Remote Control Unit Implementation

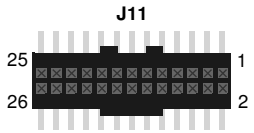


Table 2-9. Remote Control Connector (J11)

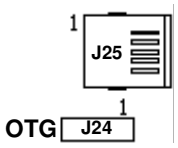
Pin Number	Pin Name	Pin Description
1	VDD	IOVDD power supply 1.8V or 3V depending on the power configuration
2	BLVDD	Controlled HVDD for back-light usage (LCD extension)
3	P3.0/RXD/MISO	UART Receive Serial Data SPI Master Input Slave Output Data Line
4	P1.7	General purpose I/O or back-light control (LCD extension)
5	P3.1/TXD/MOSI	UART Transmit Serial Data SPI Master Output Slave Input Data Line
6	$\overline{\text{nRST}}$	Chip Reset (optional through SE30 solder strap)
7	P3.2/$\overline{\text{INT0}}$/$\overline{\text{RTS}}$/SCK	External Interrupt 0 UART Request To Send Control Line SPI Clock Line
8	P5.1/$\overline{\text{SCS}}$/$\overline{\text{LCS}}$	PSI Slave Chip Select LCD Chip Select
9	P3.3/$\overline{\text{INT1}}$/$\overline{\text{CTS}}$/$\overline{\text{SS}}$	External Interrupt 1 UART Clear To Send Control Line SPI Slave Select Line
10	P5.2/SA0/LA0/LRS	PSI Slave Address Bit 0 LCD Address Bit 0 (8080) Register Select Signal (6800)
11	VSS	0V digital supply reference
12	P5.3/$\overline{\text{SWR}}$/$\overline{\text{LWR}}$/LRW	PSI Slave Write Signal LCD Write Signal (8080) Read/Write Signal (6800)
13	VSS	0V digital supply reference
14	P5.0/$\overline{\text{SRD}}$/$\overline{\text{LRD}}$/LDE	PSI Slave Write Signal LCD Read Signal (8080) Enable Signal (6800)
15	VSS	0V digital supply reference
16	P0.0/SD0/LD0	PSI Slave Data Bit 0 LCD Data Bit 0
17	VSS	0V digital supply reference
18	P0.1/SD1/LD1	PSI Slave Data Bit 1 LCD Data Bit 1
19	VSS	0V digital supply reference
20	P0.2/SD2/LD2	PSI Slave Data Bit 2 LCD Data Bit 2
21	VSS	0V digital supply reference
22	P0.3/SD3/LD3	PSI Slave Data Bit 3 LCD Data Bit 3
23	P0.5/SD5/LD5	PSI Slave Data Bit 5 LCD Data Bit 5

Pin Number	Pin Name	Pin Description
24	P0.4/SD4/LD4	PSI Slave Data Bit 4 LCD Data Bit 4
25	P0.7/SD7/LD7	PSI Slave Data Bit 7 LCD Data Bit 7
26	P0.6/SD6/LD6	PSI Slave Data Bit 6 LCD Data Bit 6

2.5 USB Unit

The USB unit provides all the required hardware to develop USB V2.0 full-speed and high-speed devices and full-speed reduced-host / OTG compliant applications. It consists in a USB mini AB connector (including ID pin) and an OTG extension connector J24 (see Table 2-10) which allows control of an external VBUS power supply able to power USB device.
Details on how to connect a USB storage device to the AT85DVK-07 Board are provided in Section 2.15.

Figure 2-10. USB Unit Implementation



2.5.1 OTG Extension

Table 2-10. OTG Extension Connector (J24)

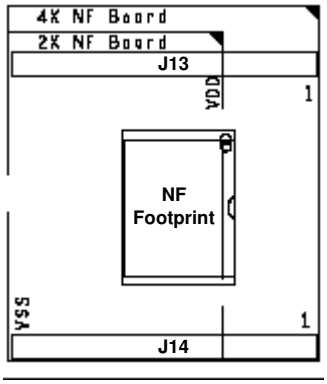
Pin Number	Pin Name	Pin Description
1	UVCON	External VBUS $\overline{\text{ON}}$/OFF control line
2	VBUS	+5V VBUS from external power supply
3	VSS	0V digital supply reference

2.6 Nand Flash Unit

The Nand Flash unit consists in a standard nand flash memory foot print allowing user to solder its own nand flash memory and 2 extension connectors J13 & J14 allowing insertion of a 2x NF daughter board or a 4x NF daughter board supporting up to 2 or 4 nand flash memories.

A 4x nand flash daughter board equipped with 1 memory along with a bare PCB (see Section 2.16) is delivered inside the AT85DVK-07 Starter Kit. Figure 2-12 shows the daughter-board plug-in orientation.

Figure 2-11. Nand Flash Unit Implementation



2.6.1 Nand Flash Extension

Table 2-11. Nand Flash Daughter Board Extension Connector (J13)

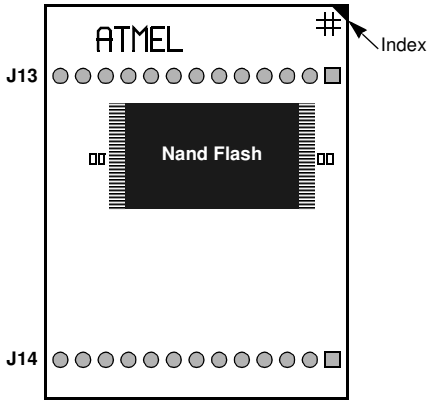
Pin Number	Pin Name	Pin Description
1	$\overline{\text{NFWP}}$	Write Protect Signal
2	$\overline{\text{NFCE3}}$ $\overline{\text{SMCE}}$	Nand Flash 3 Chip Enable SmartMediaCard/xD-Picture Card Chip Enable
3	$\overline{\text{NFCE2}}$ $\overline{\text{SMINS}}$	Nand Flash 2 Chip Enable SmartMediaCard/xD-Picture Card Insertion Signal
4	$\overline{\text{NFWP}}$	Write Protect Signal
5	VDD	IOVDD power supply 1.8V or 3V depending on the power configuration
6	NFCLE	Command Latch Enable Signal
7	NFALE	Address Latch Enable Signal
8	NC	Not Used
9	$\overline{\text{NFCE0}}$	Nand Flash 0 Chip Enable
10	NC	Not Used
11	$\overline{\text{NFCE1}}$ $\overline{\text{SMLCK}}$	Nand Flash 1 Chip Enable SmartMediaCard/xD-Picture Card Write Lock Signal
12	$\overline{\text{NFRE}}$	Read Enable Signal
13	$\overline{\text{NFWE}}$	Write Enable Signal

Table 2-12. Nand Flash Daughter Board Extension Connector (J14)

Pin Number	Pin Name	Pin Description
1	$\overline{\text{NFWP}}$	Write Protect Signal
2	NC	Not Used
3	NC	Not Used
4	$\overline{\text{NFWP}}$	Write Protect Signal
5	NFD7	Data Bit 7
6	NFD6	Data Bit 6
7	NFD5	Data Bit 5
8	NFD4	Data Bit 4
9	NFD3	Data Bit 3
10	NFD2	Data Bit 2

Pin Number	Pin Name	Pin Description
11	NFD1	Data Bit 1
12	NFD0	Data Bit 0
13	VSS	0V digital supply reference

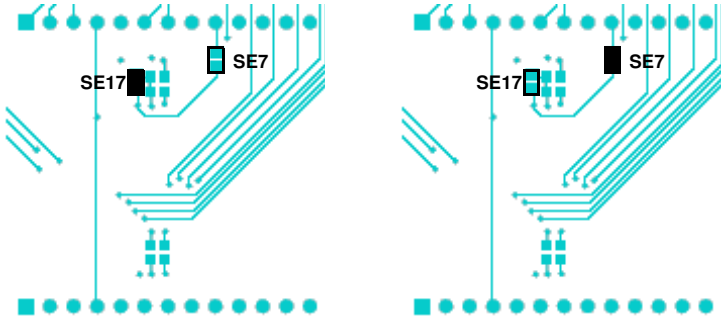
Figure 2-12. Nand Flash Daughter Board Plug-In



2.6.2 On-Board Nand Flash Configuration

In case nand flash memory is soldered on board (user's responsibility) a hardware configuration must be applied (see Figure 2-13) to avoid any conflict with a nand flash daughter board that may be plugged-in.
When no nand flash memory is soldered solder straps may be left opened.

Figure 2-13. Nand Flash Configuration (bottom view)

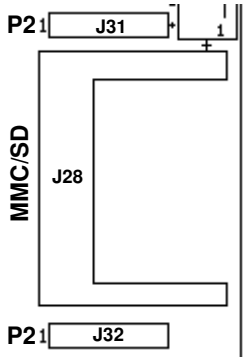


On-board Nand Flash not used **On-board Nand Flash used**

2.7 MMC/SD Unit

The MMC/SD unit consists in a single card socket that allows direct plug-in of MMC, RS-MMC and SD cards.

Figure 2-14. MMC/SD Unit Implementation



2.7.1 MMC I/O Extension

Two extension connectors J31 and J32 (see Table 2-13 and Table 2-14) are implemented to get an access to the P2 alternate I/Os in case MMC is not used, or to plug an other socket (e.g. Mini-SD) through a daughter board.

Table 2-13. MMC/SD I/O Extension Connector (J31)

Pin Number	Pin Name	Pin Description
1	P2.0/$\overline{\text{SDINS}}$	SD/MMC Card Insertion Signal
2	P2.1/$\overline{\text{SDLCK}}$	SD Card Write Lock Signal
3	P2.2/SDCMD	SD/MMC Command Line
4	P2.3/SDCLK	SD/MMC Clock
5	P2.4/SDDAT0	SD/MMC Data Line 0

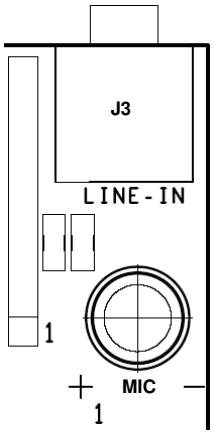
Table 2-14. MMC/SD I/O Extension Connector (J32)

Pin Number	Pin Name	Pin Description
1	P2.5/SDDAT1	SD/MMC Data Line 1
2	P2.6/SDDAT2	SD/MMC Data Line 2
3	P2.7/SDDAT3	SD/MMC Data Line 3
4	VDD	IOVDD power supply 1.8V or 3V depending on the power configuration
5	VSS	0V digital supply reference

2.8 Audio Input Unit

The Audio Input unit consists in the electret microphone unit and a 3.5mm stereo input jack J3.

Figure 2-15. Audio Input Unit Implementation



2.9 Audio Output Unit

The Audio Output unit consists in 2 stereo 3.5 mm jacks J7 & J8 allowing output selection between on-chip audio codec (with its optional on-board headphone amplifier) and on-board audio DAC. Moreover 2 extension connectors J5 and J9 (see Table 2-15 and Table 2-16) allow user to plug daughter boards replacing on-board headphone amplifier or on-board audio DAC. In this case, solder straps SE1, SE2, SE19, SE18, SE51 for external headphone amplifier and SE49, SE50 for external audio DAC must be left opened to avoid short circuits.

Note: On-board DAC and on-chip DAC (audio codec) usage is exclusive. User's selection can be configured in the audio firmware driver (for further information, refer to the firmware user's manual).

Figure 2-16. Audio Output Unit Implementation

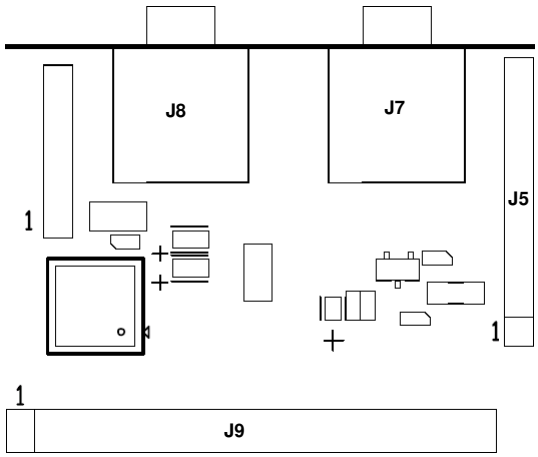


Table 2-15. Headphone Amplifier Extension Connector (J5)

Pin Number	Pin Name	Pin Description
1	LVDD	Very Low Voltage VDD power supply 1.8V
2	$\overline{\text{AMP\_EN}}$	Active low amplifier enable signal
3	AMP_IR	Amplifier left channel analog input
4	AMP_IC	Common reference analog input
5	AMP_IL	Amplifier right channel analog input
6	AMP_OR	Amplifier left channel output

Pin Number	Pin Name	Pin Description
7	AMP_OC	Common reference amplifier output
8	AMP_OL	Amplifier right channel output
9	AVSS	0V analog supply reference
10	NC	

Table 2-16. Audio DAC Extension Connector (J9)

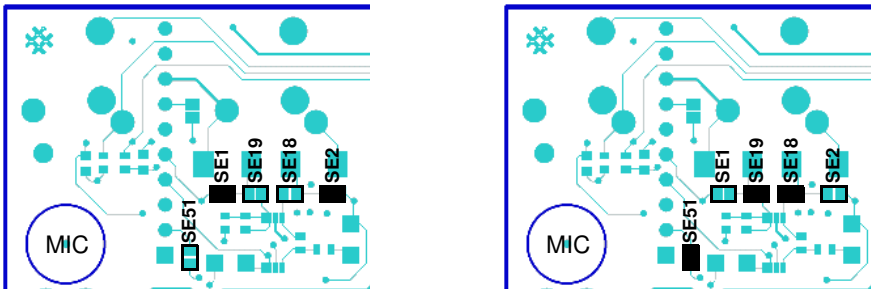
Pin Number	Pin Name	Pin Description
1	VDD	IOVDD power supply 1.8V or 3V depending on the power configuration
2	DAC_I0	DAC control bit 0
3	DAC_I1	DAC control bit 1
4	DAC_I2	DAC control bit 2
5	DAC_I3	DAC control bit 3
6	$\overline{\text{DAC\_nRST}}$	Active low DAC reset signal
7	DAC_OCLK	DAC oversampling clock
8	DAC_DCLK	DAC data clock
9	DAC_DDAT	DAC data line
10	DAC_DSEL	DAC channel select line
11	VSS	0V digital supply reference
12	VSS	0V digital supply reference
13	DAC_OR	DAC left channel output
14	DAC_OC	Common reference DAC output
15	DAC_OL	DAC right channel output
16	AVSS	0V analog supply reference
17	AVSS	0V analog supply reference

2.9.1 Headphone Amp Configuration

In very-low voltage application, the on-chip headphone amplifier is not able to drive the headphone. In this case an external amplifier must be configured as detailed in Figure 2-17.

Note: On-board or on-chip headphone amplifier option must also be configured by user in the audio firmware driver (for further information, refer to the firmware user's manual).

Figure 2-17. Headphone Amplifier Configuration (bottom view)



Low Voltage Application
(on-chip amplifier)

Very Low Voltage Application
(on-board amplifier)

2.10 FM Receiver Unit

The FM unit consists in 2 extension connectors J1 & J2 (see Table 2-17 and Table 2-18) allowing user to plug a daughter board featuring a FM receiver.

Note: Using P4.3:0 I/O port to control the FM receiver chip implies that the on-board DAC can not be used in this configuration.

Table 2-17. FM Receiver Extension Connector (J1)

Pin Number	Pin Name	Pin Description
1	VDD	IOVDD power supply 1.8V or 3V depending on the power configuration
2	LINL	Left channel analog input
3	LINC	Common reference analog input
4	LINR	Right channel analog input
5	AVSS	0V analog supply reference
6	AVSS	0V analog supply reference

Table 2-18. FM Receiver Extension Connector (J2)

Pin Number	Pin Name	Pin Description
1	VDD	IOVDD power supply 1.8V or 3V depending on the power configuration
2	P4.0/OCLK	FM receiver control bit 0
3	P4.1/DCLK	FM receiver control bit 1
4	P4.2/DDAT	FM receiver control bit 2
5	P4.3/DSEL	FM receiver control bit 3
6	VSS	0V digital supply reference

2.11 Display Unit

The Display unit consists in a 128x64 monochrome pixels LCD. It is possible to plug a daughter board equipped with an other LCD (color, higher resolution…) using J11 connector (see Section 2.4.2).

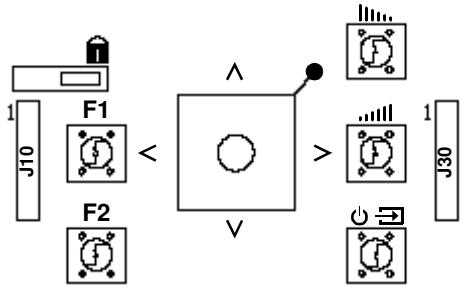
Note: On-board LCD must be disconnected before plugging any daughter boards.

2.12 Keypad Unit

The Keypad unit consists in a 3 x 4 key matrix including a 4-direction mini joystick and power-on key along with 2 extension connectors. J10 & J30 allow user to plug a daughter board featuring particular keys like 2-direction mini joystick, rolling wheel…

Note: To ease software implementation with generic software keypad driver, user's keypad arrangement must fit with an available matrix configuration (for further information, refer to the firmware user's manual).

Figure 2-18. Keypad Unit Implementation



2.12.1 Keypad Extension

Table 2-19. Keypad Extension Connector (J10)

Pin Number	Pin Name	Pin Description
1	VDD	IOVDD power supply 1.8V or 3V depending on the power configuration
2	P1.4	General purpose I/O used for matrix row
3	P1.3/KIN3	General purpose I/O used for matrix row or matrix column 3 input(1)
4	P1.2/KIN2	General purpose I/O used for matrix row or matrix column 2 input(1)
5	P1.5	General purpose I/O used for matrix row

Table 2-20. Keypad Extension Connector (J30)

Pin Number	Pin Name	Pin Description
1	P1.0/KIN0	Matrix column 0 input
2	P1.1/KIN1	Matrix column 1 input
3	P1.6(2)	General purpose I/O
4	P1.7(3)	General purpose I/O
5	VSS	0V digital supply reference

Notes: 1. Depends on matrix configuration.
2. P1.6 is also used as external headphone amplifier enable signal and so may only be available when not used for such purpose.
3. P1.7 is also used as LCD backlight control signal and so may only be available when not used for such purpose.

2.13 On-Chip Debug Unit

The On-Chip Debug (OCD) unit consists in a 10-pin or 6-pin connector J26 allowing connection of the OCD dongle V1 or V2 through a flat cable. This dongle is part of the development kit and allows debugging of the firmware using Keil's Integrated Development Environment.

Table 2-21. 10-pin OCD Connector (J26)

Pin Number	Pin Name	Pin Description	Pin Number	Pin Name	Pin Description
1	NC		2	NC	
3	VSS	0V digital supply reference	4(1)	OCDT	OCD Transmit signal
5(1)	$\overline{\text{RST}}$	MCU Reset signal	6(1)	OCDR	OCD Receive signal
7	VSS	0V digital supply reference	8(1)	VSS	0V digital supply reference
9	VSS	0V digital supply reference	10(1)	$\overline{\text{RST}}$	MCU Reset signal

Note: 1. Mandatory signals to implement on user's development board. Signal to connect to the OCD dongle for debugging.

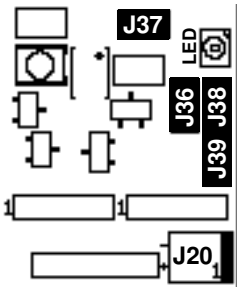
Table 2-22. 6-pin OCD Connector (J26)

Pin Number	Pin Name	Pin Description	Pin Number	Pin Name	Pin Description
1	NC		2	NC	
3	VSS	0V digital supply reference	4	OCDT	OCD Transmit signal
5	$\overline{\text{RST}}$	MCU Reset signal	6	OCDR	OCD Receive signal

2.14 Power Consumption Measurement

In order to ease the power supply measurement, 4 jumpers are implemented as detailed in Figure 2-19:

Figure 2-19. Power Management Unit Implementation



- J37
  - This jumper allows insertion of a ammeter on VBUS power supply.
  - Mass storage power consumption can be monitored using this jumper.
- J36
  - This jumper allows insertion of a ammeter on AT85C51SND3Bx HV_{DD} power supply.
  - The AT85C51SND3Bx HI_{DD} power consumption can be monitored using this jumper.
- J38
  - This jumper allows insertion of a ammeter on AT85C51SND3Bx LV_{DD} power supply.
  - The AT85C51SND3Bx LI_{DD} power consumption can be monitored using this jumper.
- J39
  - This jumper allows insertion of a ammeter on board V_{DD} power supply (LV_{DD} or HVDD depending on power configuration).
  - The NF, MMC, LCD… power consumption can be monitored using this jumper.

Note: In order to remove non significant consumption linked to the led power supply (HV_{DD}), remove SE31 solder strap.

2.15 USB Storage Device Connection

A USB storage device can be connected to the AT85DVK-07 Board using the “Mini A to Receptacle A USB cable” as shown in Figure 2-20.
In order to power the USB storage device, an external 5V controlled VBUS power supply must be connected to J24 (see Table 2-10) according to Figure 2-21.
The VBUS power supply is controlled by the active-low UVCON signal.

Figure 2-20. USB Mass Storage Device Connection

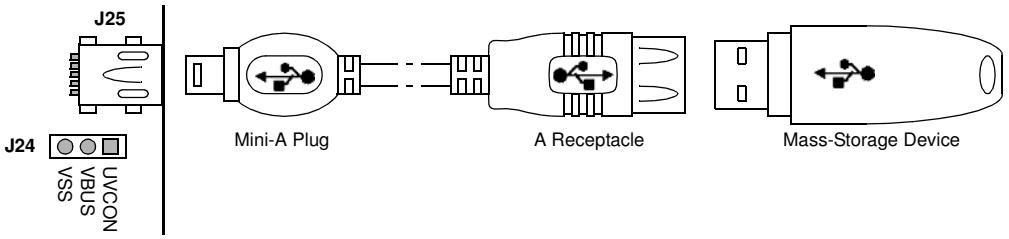
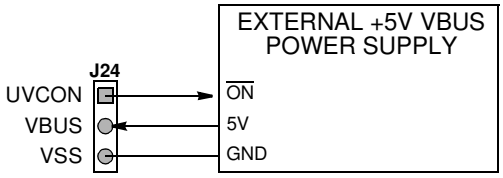


Figure 2-21. USB Device Power Supply Connection



2.16 Nand Flash Board Extension

The Nand Flash bare PCB is delivered to make easy new Nand Flash testing.

The AT85C51SND3Bx Nand Flash drivers support up to 4 nand flash with 1x, 2x or 4x configuration. The Nand Flash extension board can be configured for operation with single $\overline{CE}$ or double $\overline{CE}$ Nand Flash memories (double dies per package).

Figure 2-22 shows the board implementation while Table 2-23 and Table 2-24 summarize the board configuration depending on Nand Flash memory type.

Note: In order to fit with generic software driver, the Nand Flash memories soldered on one board must be of same part number.

Figure 2-22. Nand Flash Board Implementation

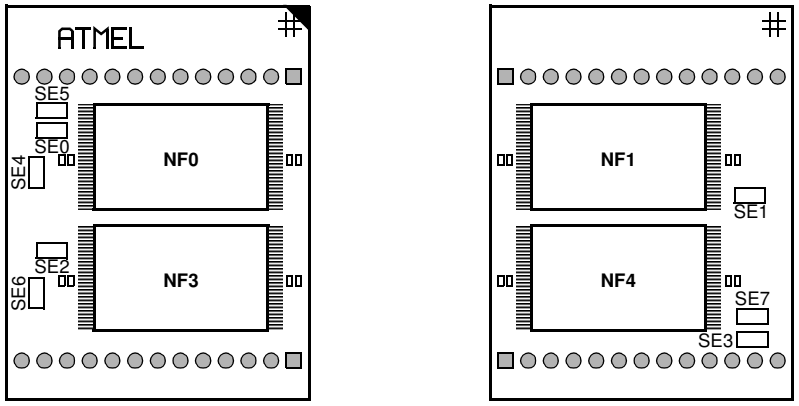


Table 2-23. Single $\overline{CE}$ Nand Flash Memory Configuration

Number of NF	Populated Footprint				Solder Strap Configuration							
	NF0	NF1	NF2	NF3	SE0(1)	SE1(1)	SE2(1)	SE3(1)	SE4	SE5	SE6	SE7
x1	X				X							
x2	X	X			X	X						
x4	X	X	X	X	X	X	X	X				

Note: 1. Optional configuration depending on Nand Flash Manufacturer. These solder straps connect pin 6 (TSOP package) of selected NF to VSS (check Nand Flash datasheet).

Table 2-24. Double $\overline{CE}$ Nand Flash Memory Configuration

Number of NF	Populated Footprint				Solder Strap Configuration							
	NF0	NF1	NF2	NF3	SE0	SE1	SE2	SE3	SE4	SE5	SE6	SE7
x1	X								X	X		
x2	X		X						X	X	X	X

Section 3

Technical Specifications

- System Unit
  - Physical Dimensions L= 120 x W= 120 x H= 25 mm
  - Weight 100 g

- Operating Conditions
  - Voltage Supply
    1.5V single battery element or USB V_{BUS} or external power supply (battery replacement)

Section 4

Development Board Errata List

4.1 Board V1.0.0

- **On-Board 3V DC-DC - Bad Startup**
  DC-DC is not properly maintained after power-up.
  Workaround:
  Do not use external DC-DC: power the board using USB cable.

- **Microphone Input - DC Decoupling**
  The decoupling capacitor is missing between microphone and MICIN input.
  Workaround:
  Add 1uF capacitor between microphone and MICIN input (layout cut).

- **External DAC - Conflict Using SPI/SIO Interface**
  External DAC being controlled by the SPI/SIO lines, SPI or SIO transfers are disturbed by the SPI_DOUT line when SPI_CSB line is asserted.
  Workaround:
  Insulate SPI DAC control lines (layout cut).

- **LCD - Display Stability @ 1.8V**
  The display shows flickering when operating @ 1.8V (LCD charge pump issue).
  Workaround:
  None.

4.2 Board V1.0.1

- **LCD - Display Stability @ 1.8V**
  The display shows flickering when operating @ 1.8V (LCD charge pump issue).
  Workaround:
  None.

Section 5

Technical Support

There are two ways to report a technical issue:

- Through E-mail at *mcu@atmel.com*
- Through web site at http://support.atmel.no/bin/customer

When requesting technical support, please report the following information:

5.1 Problem Reporting

- Object:
  - Company Name
  - Product Name
  - Short Description

Example: COMPANY – AT85C51SND3B2 – Audio File Stop Playing

Note: For follow-up reason, report problems separately i.e. one problem per report.

- Problem Description
  - Give a detailed description of your problem

5.2 Firmware

- Send your complete firmware project unless it is strictly confidential
- Package
  - Base Name: e.g. snd3b-refd1-1_0_33
  - Any useful information about changes...

5.3 Hardware

- Silicon
  - Part Number: e.g. 85C51SND3B1-EL
  - Date Code: e.g. 0441
  - Lot Number: e.g. A04319B
- Memories
  - NF Part Number: e.g. Micron MT29F2G08AABWG,
  - Device Number: e.g. #2

- MMC/SD Ref: e.g. Sandisk 256MB
- File System: e.g. FAT32

Note: In order to be able to reproduce and investigate the problem in our laboratory, be ready to send memory samples if any.

- Board
  - Version: e.g. V1.0.1
  - Oscillator Frequency: e.g. 12 MHz
  - Voltage configuration: e.g. On board DC-DC
  - Operating Voltage: e.g. 3V

Any useful information about configuration

Note: In order to be able to reproduce and investigate the problem in our laboratory, be ready to send to send schematic, bread board…

- Host
  - Operating System e.g. WIN 2000
  - Version/build e.g. Service Pack 4

5.4 Tools

- OCD
  - Dongle Firmware Version
- KEIL
  - Add “about” windows screen-shot in attachment
- ISP
  - Software “music_player_isp.exe” version

5.5 Audio Player

Send any audio files that fail.

5.6 Picture Viewer

Send any picture files that fail.

Atmel Corporation

2325 Orchard Parkway
San Jose, CA 95131
Tel: 1(408) 441-0311
Fax: 1(408) 487-2600

Regional Headquarters

Europe
Atmel Sarl
Route des Arsenaux 41
Case Postale 80
CH-1705 Fribourg
Switzerland
Tel: (41) 26-426-5555
Fax: (41) 26-426-5500

Asia
Room 1219
Chinachem Golden Plaza
77 Mody Road Tsimshatsui
East Kowloon
Hong Kong
Tel: (852) 2721-9778
Fax: (852) 2722-1369

Japan
9F, Tonetsu Shinkawa Bldg.
1-24-8 Shinkawa
Chuo-ku, Tokyo 104-0033
Japan
Tel: (81) 3-3523-3551
Fax: (81) 3-3523-7581

Atmel Operations

Memory
2325 Orchard Parkway
San Jose, CA 95131
Tel: 1(408) 441-0311
Fax: 1(408) 436-4314

Microcontrollers
2325 Orchard Parkway
San Jose, CA 95131
Tel: 1(408) 441-0311
Fax: 1(408) 436-4314

La Chantrerie
BP 70602
44306 Nantes Cedex 3, France
Tel: (33) 2-40-18-18-18
Fax: (33) 2-40-18-19-60

ASIC/ASSP/Smart Cards
Zone Industrielle
13106 Rousset Cedex, France
Tel: (33) 4-42-53-60-00
Fax: (33) 4-42-53-60-01

1150 East Cheyenne Mtn. Blvd.
Colorado Springs, CO 80906
Tel: 1(719) 576-3300
Fax: 1(719) 540-1759

Scottish Enterprise Technology Park
Maxwell Building
East Kilbride G75 0QR, Scotland
Tel: (44) 1355-803-000
Fax: (44) 1355-242-743

RF/Automotive
Theresienstrasse 2
Postfach 3535
74025 Heilbronn, Germany
Tel: (49) 71-31-67-0
Fax: (49) 71-31-67-2340

1150 East Cheyenne Mtn. Blvd.
Colorado Springs, CO 80906
Tel: 1(719) 576-3300
Fax: 1(719) 540-1759

Biometrics/Imaging/Hi-Rel MPU/
High Speed Converters/RF Datacom
Avenue de Rochepleine
BP 123
38521 Saint-Egreve Cedex, France
Tel: (33) 4-76-58-30-00
Fax: (33) 4-76-58-34-80

e-mail
literature@atmel.com

Web Site
http://www.atmel.com

4391B–MP3–07/07 /xM