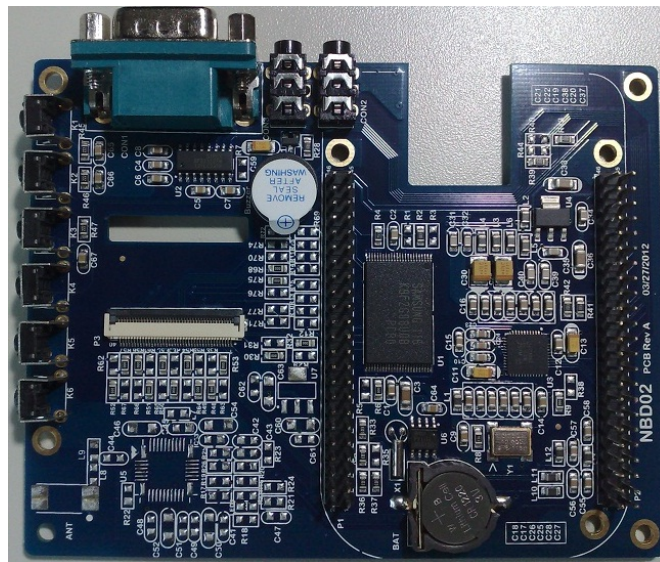


Shanghai Naxing Electronics Co., Ltd. NBD02 BeagleBone Companion Board

Data Sheet Rev. 0.1



Features

Interface and Resource

- 1 x 256MB Nand Flash(K9F2G08)
- 1 x RS232 serial ports(UART1 w/ CTS&RTS)
- 1 x Stereo audio out
- 1 x Micro phone in
- 6 x USER buttons
- 1 x PWM Buzzer
- 1 x RTC with Battery(DS1302)
- 1 x 40 pins LCD i/f with touch panel signals

Expand Interface

- 2 x 46-Pins 2.54mm headers for Beaglebone expansion connectors

Dimension

- 113.5 x 88.0(mm)

Overview

NBD02 BeagleBone Companion Board can piggyback TI Cortex-A8 BeagleBone board on it's P1&P2 extension headers. All expanded function circuits on companion board are wired to TI Cortex-A8 AM3359 MPU via these P1&P2 headers.

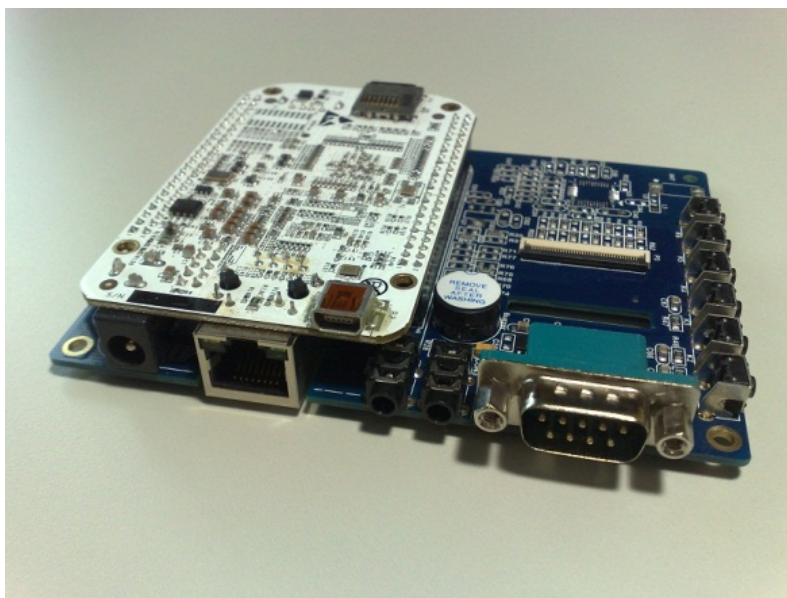


Figure 1. NBD02 Board piggybacks with BeagleBone

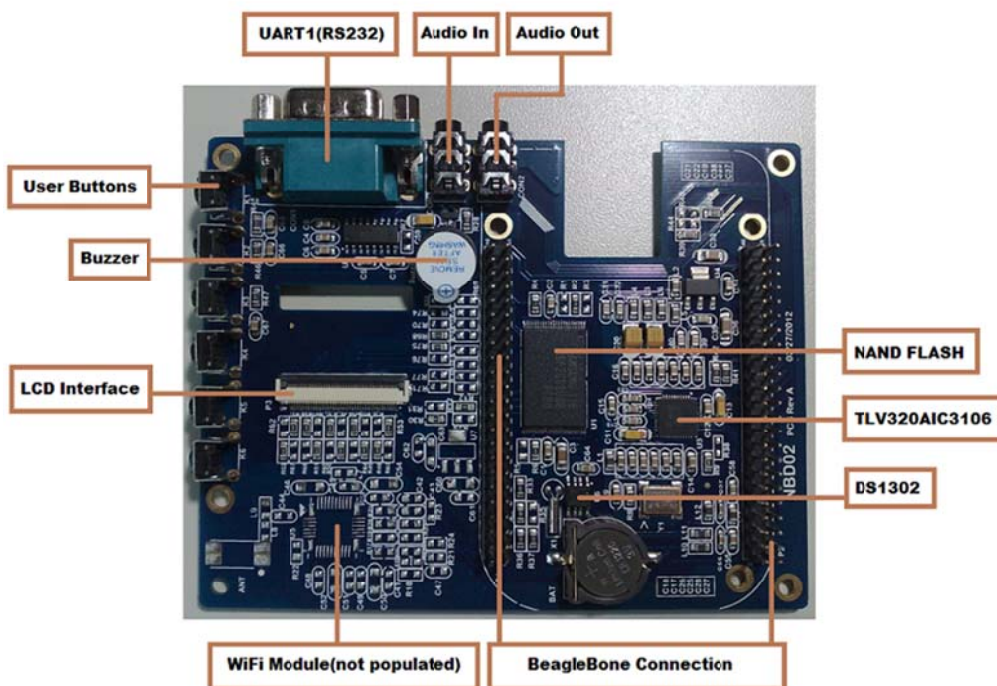


Figure 2. NBD02 Functional Blocks

Signal name definition on BeagleBone P8&P9 headers engaged by NBD02 board.

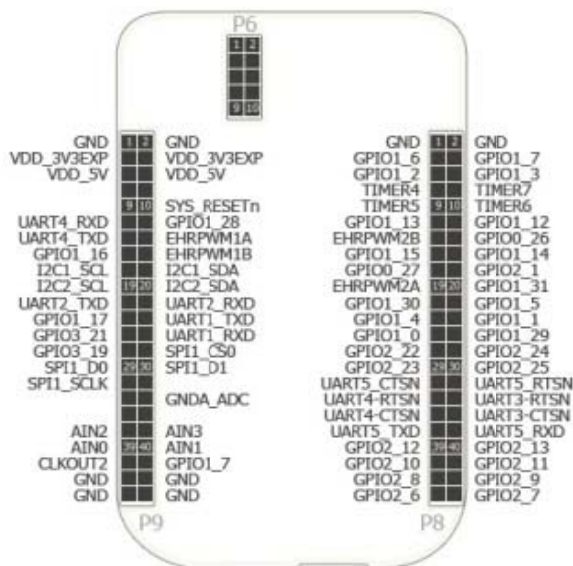


Figure 3. BeagleBone P8&P9 Pin Occupation

Nand Flash Function

Nand flash circuit on NBD02 board can support various Samsung Nand Flash chips like K9F2G08, K9K8G08 and K9GBG08.

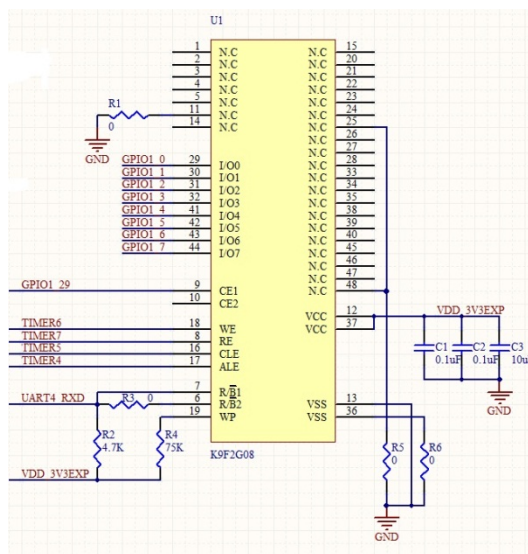


Figure 4. Nand Flash Function

UART Function

BeagleBone UART1 was routed to companion board DB9 connector via a RS232 level shifting circuit.

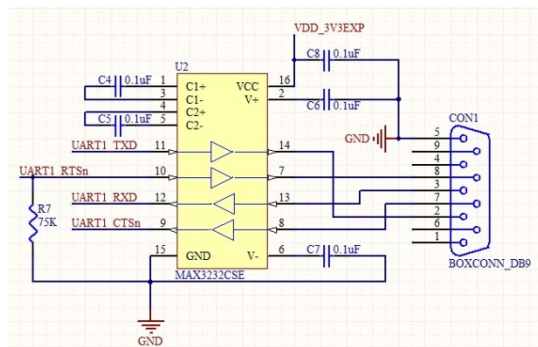


Figure 5. UART function

By populating resistors R40&R44 on the board, end user may choose to route an additional UART port(UART2) to the DB9 connector simultaneously with UART1. The board will be shipped with resistors R39&R43 mounted so UART1_RTSn and UART1_CTSn signals will be engaged by default.

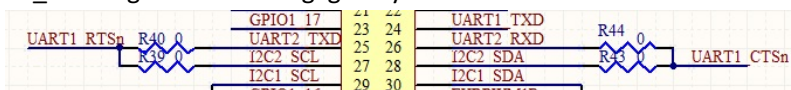


Figure 6. UART multiplexing

Audio Function

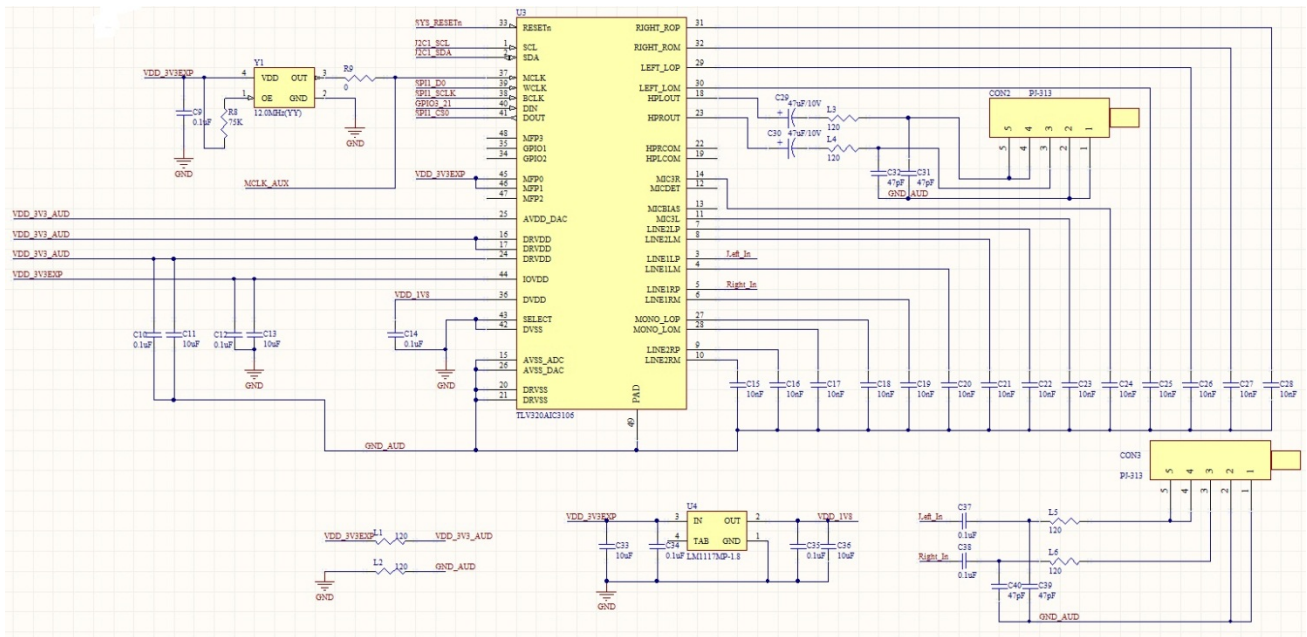


Figure 7. Audio Function

RTC Function

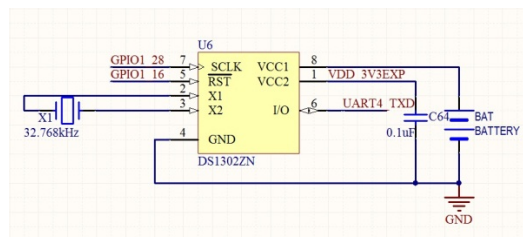


Figure 8. RTC Function

Buzzer Function

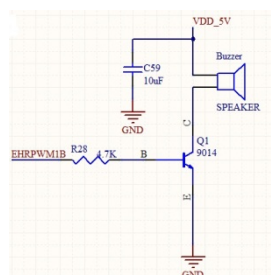


Figure 9. Buzzer Function

USER Buttons

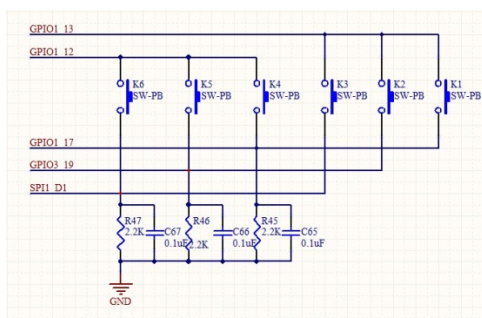


Figure 10. USER Buttons

LCD Interface

End user can engage NBD02 board to support different LCD BPP mode by populating different crossover resistors.

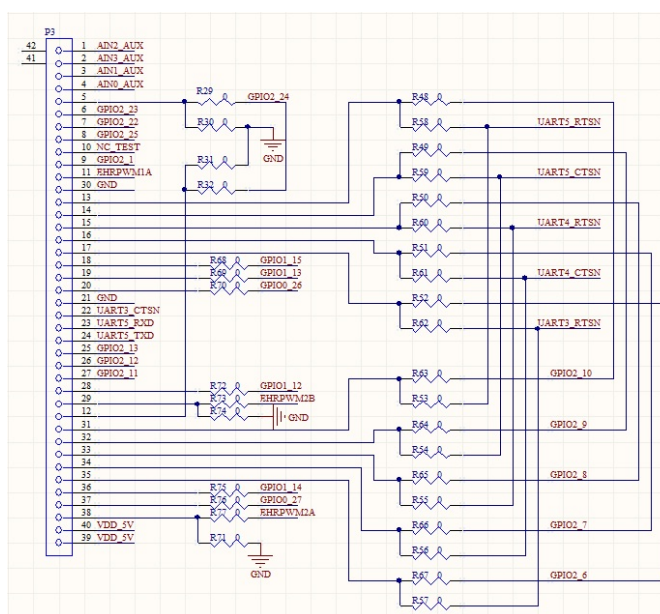


Figure 11. LCD Interface

AM335x LCD BPP Mode	Crossover Resistors	Remark
16BPP	R58,R59,R60,R61,R62,R63,R64,R65,R66,R67	
24BPP	R48,R49,R50,R51,R52,R53,R54,R55,R56,R57	This is default configuration with shipment

Note: Please refer to AM335x ARM Cortex-A8 Microprocessors Silicon Revision 1.0 Silicon Errata for more details of AM335x LCD signal pin assignment.

Table 1. LCD BPP Mode

Boot Mode Configuration

Various bootmode can be selected by populating different pullup/pulldown resistors on NBD02 board.

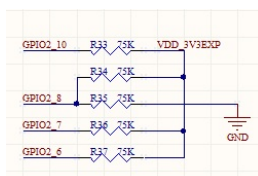


Figure 12. Boot Mode Configuration

Boot Mode Setting	Pullup/Pulldown Resistors	SYSBOOT[4:0]	Remark
BeagleBone	R80,R81,R82,R84,R103	'10111'	Default configuration with shipment
NBD02	R33,R34,R36,R37	'10111'	Default configuration with shipment
Equivalent Boot mode		'10111'	

Note: Please refer to AM335x ARM Cortex-A8 Microprocessors Technical Reference Manual for more details of AM335x Boot mode setting.

Table 2. AM335x Boot Mode Equivalent

Electrical Characteristics

Symbol	Parameter	Min	Typ.	Max	Unit
VDD_3V3EXP	3.3V Power supply, from BeagleBone expansion header	3.0	3.3	3.6	V
VDD_5V	5V Power supply, from BeagleBone expansion header	4.5	5.0	5.5	V

Table 3. Operating Conditions

Symbol	Parameter	Condition	Min	Typ.	Max	Unit
I_3V3EXP	Current on 3.3V Power supply	TBD	TBD	TBD	TBD	mA
I_5V	Current on 5V Power supply	TBD	TBD	TBD	TBD	mA

Table 4. DC Electrical Characteristics

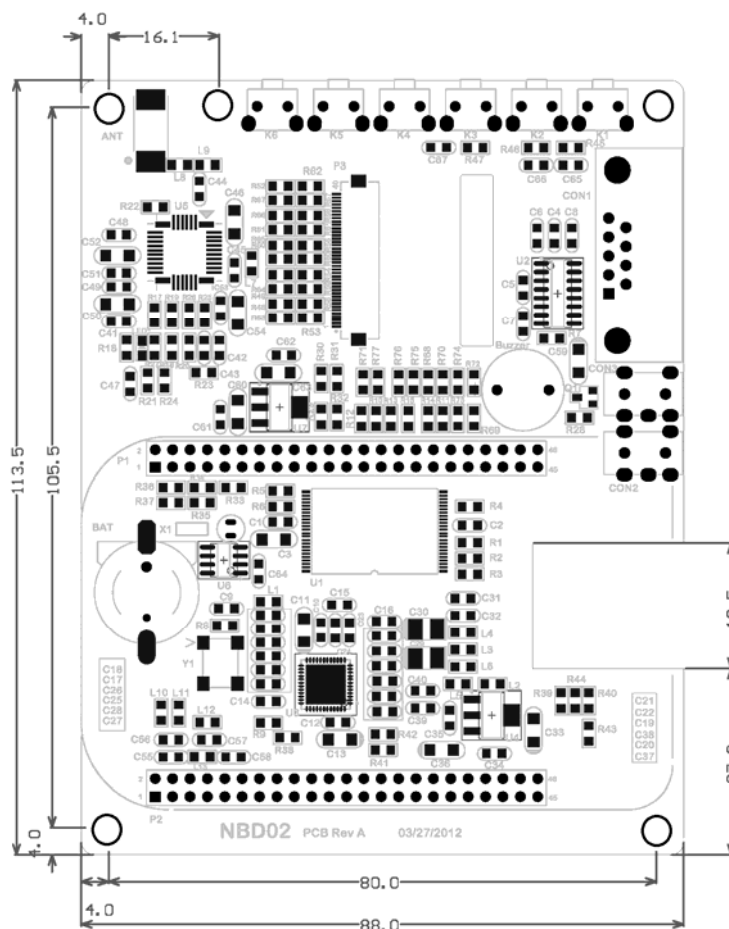
Environment Parameters

	Min	Max
Operating Temperature Range, Commercial	0°C	+70°C
Storage Temperature Range	-55°C	+105°C
Operating Temperature Range, Industrial*	-40°C	+85°C

Note* Please contact Naxing Eletronics for Industrial grade parts.

Table 5. Temperature Parameters

Mechanical Dimensions



Unit: mm

Figure 13. NBD02 Mechanical Outline(Top View)

Ordering Information

Part No.	Part Name	Operation Temp.	Remark
NDK03001	BeagleBone Companion Board	0°C to +70°C	Commercial grade part
NDK03002	BeagleBone Companion Board - Industrial Grade	-40°C to +85°C	Industrial grade part, please contact Naxing Electronics for further information

Table 6. NBD02 Deliverables

Part No.	Part Name	Quantity	Remark
NBD02001	BeagleBone Companion Board PCBA	1	Commercial grade part
NC001001	5CM FPC CABLE	1	
NA001001	Mounting Package Standoff Gasket Screw	1	

Table 7. NDK03001 Deliverable BOM(Bill Of Materials)

Warranty Terms

Naxing Electronics guarantees hardware products against defects in workmanship and material for a period of one (1) year from the date of shipment. Your sole remedy and Naxing Electronics' sole liability shall be for Naxing Electronics, at its sole discretion, to either repair or replace the defective hardware product at no charge or to refund the purchase price. Shipment costs in both directions are the responsibility of the customer. This warranty is void if the hardware product has been altered or damaged by accident, misuse or abuse.

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Revision History

Rev.	Date	Description	Author
0.1	23-Sept-2012	Initial release	wdzhou

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