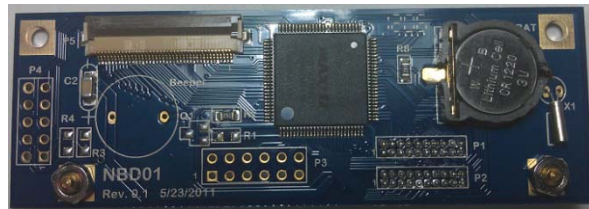


# Shanghai Naxing Electronics Co., Ltd. NBD01 PandaBoard Companion Board

Data Sheet Rev. 0.1



## Features

### Interface and Resource

- 1 x TSC2046 Touch screen driver chip
- 1 x RTC with Battery(DS1302)
- 1 x Altera EPM570 CPLD
- 1 x 40 pins LCD i/f with touch panel signals

### Expand Interface

- 2 x 20-Pins 1.27mm headers for PandaBoard connection

### Dimension

- 85.6 x 29.1(mm)

## Overview

NBD01 PandaBoard Companion Board is designed to work with TI OMAP4 PandaBoard or PandaBoard ES to expand LCD connection for various small size TFT LCD screens(3.5" to 10.1 Inches).

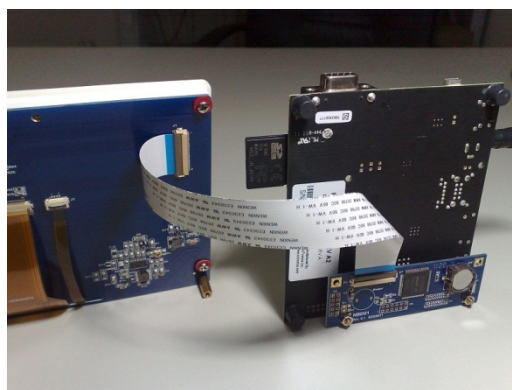


Figure 1. NBD01 Board piggybacks on PandaBoard

NBD01 PandaBoard Companion Board can piggyback on TI PandaBoard or PandaBoard ES via it's P1&P2 headers.

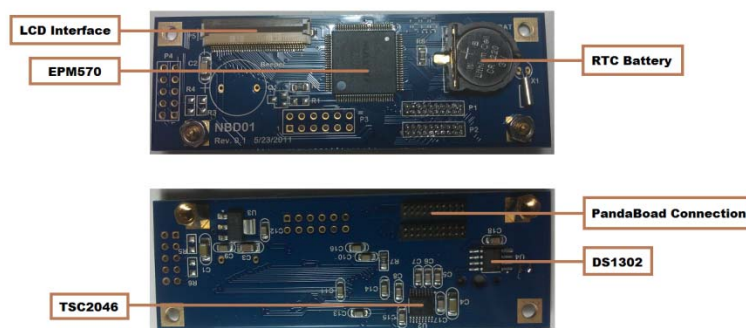


Figure 2. NBD01 Overview

Besides LCD interface, some extra functions are implemented on this companion board like TSC2046 touch screen driver, DS1302 real time clock and PWM backlight control function. PandaBoard can communicate with companion board for these extra functions through I2C interface on it's J1&J4 headers.

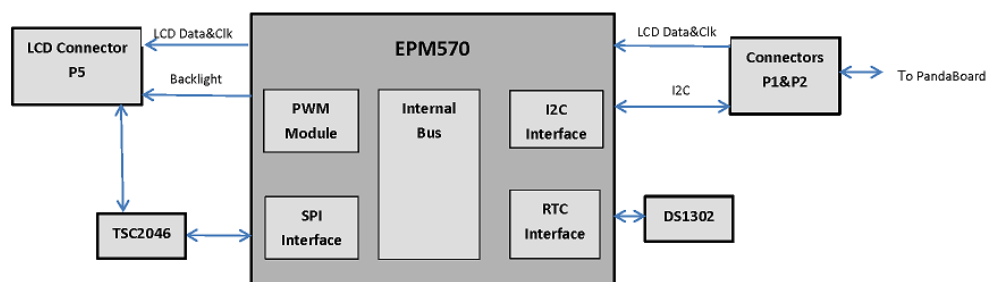


Figure 3. NBD01 Functional Blocks

Signal name definition on PandaBoard J1&J4 headers engaged by NBD01 board.

Pin#	Signal	I/O	Description
1	DC_5V	PWR	DC rail from the Main DC supply
2	DC_5V	PWR	DC rail from the Main DC supply
3	EXP_DSS_DAT1	I	LCD Pixel Data bit 1
4	EXP_DSS_DAT0	I	LCD Pixel Data bit 0
5	EXP_DSS_DAT3	I	LCD Pixel Data bit 3
6	EXP_DSS_DAT2	I	LCD Pixel Data bit 2
7	EXP_DSS_DAT5	I	LCD Pixel Data bit 5
8	EXP_DSS_DAT4	I	LCD Pixel Data bit 4
9	EXP_DSS_DAT12	I	LCD Pixel Data bit 12
10	EXP_DSS_DAT10	I	LCD Pixel Data bit 10
11	EXP_DSS_DAT23	I	LCD Pixel Data bit 23
12	EXP_DSS_DAT14	I	LCD Pixel Data bit 14
13	EXP_DSS_DAT19	I	LCD Pixel Data bit 19
14	XP_DSS_DAT22	I	LCD Pixel Data bit 22
15	H_I2C2_SDA	I/O	I2C2 Serial Data
16	EXP_DSS_DAT11	I	LCD Pixel Data bit 11
17	EXP_DSS_VSYNC	I	LCD Vertical Sync Signal
18	H_DPM_EMU2	I	Reset
19	GND	PWR	Ground bus
20	GND	PWR	Ground bus

Table 1. PandaBoard J1 Pin Occupation

Pin#	Signal	I/O	Description
1	VDD_VAUX2	PWR	Not connect
2	VIO_1V8	PWR	1.8V system I/O voltage
3	DVI_DATA20	I	LCD Pixel Data bit 20
4	DVI_DATA21	I	LCD Pixel Data bit 21
5	DVI_DATA17	I	LCD Pixel Data bit 17
6	DVI_DATA18	I	LCD Pixel Data bit 18
7	DVI_DATA15	I	LCD Pixel Data bit 15
8	DVI_DATA16	I	LCD Pixel Data bit 16
9	DVI_DATA7	I	LCD Pixel Data bit 7
10	DVI_DATA13	I	LCD Pixel Data bit 13
11	DVI_DATA8	I	LCD Pixel Data bit 8
12	NUSB_PWR	O	Not connect
13	DVI_DATA9	I	LCD Pixel Data bit 9
14	I2C2_SCL	I	I2C2 Serial Clock
15	DVI_DATA6	I	LCD Pixel Data bit 6
16	DVI_CLK+	I	DVI Clock
17	DVI_DEN	I	Data Enable
18	DVI_HSYNC	I	Horizontal Sync
19	GND	PWR	Ground bus
20	GND	PWR	Ground bus

Table 2. PandaBoard J4 Pin Occupation

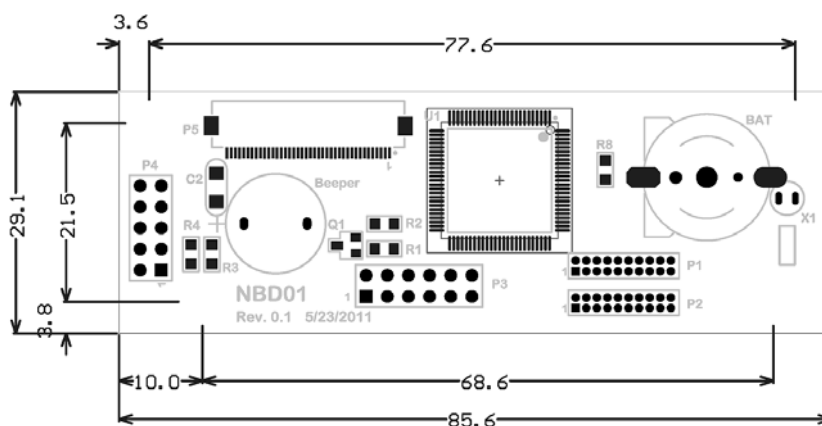
**Register Map**

Module Name	Address	Command	R/W	Data1		Data2		
<b>RTC</b>	1010001	0x01	W	Second		N/A		
		0x02	W	Minute		N/A		
		0x03	W	Hour		N/A		
		0x04	W	Date		N/A		
		0x05	W	Month		N/A		
		0x06	W	Day		N/A		
		0x07	W	Year		N/A		
			0x11	R	Second		N/A	
			0x12	R	Minute		N/A	
			0x13	R	Hour		N/A	
			0x14	R	Date		N/A	
			0x15	R	Month		N/A	
			0x16	R	Day		N/A	
			0x17	R	Year		N/A	
	<b>TSC</b>	1010010	0x01	W	TSC_Config		N/A	
					Bit7	PD1		
					Bit6	PD0		
				Bit5-Bit0	N/A			
			0x11	R	X1		X2	
					Bit7-Bit0	POS_X(11..4)	Bit7-Bit4	POS_X(3..0)
							Bit3-Bit1	“000”
							Bit0	PENIRQ
			0x12	R	Y1		Y2	
					Bit7-Bit0	POS_Y(11..4)	Bit7-Bit4	POS_Y(3..0)
							Bit3-Bit1	“000”
							Bit0	PENIRQ
<b>PWM</b>		1010011	0x01	W	PWM_Sel		N/A	
				Bit7	PWM4 freq, '1' for 256 divide			
				Bit6	PWM3 freq, '1' for 256 divide			
				Bit5	PWM2 freq, '1' for 256 divide			
				Bit4	PWM1 freq, '1' for 256 divide			
				Bit3	Enable GPIO(3)			
				Bit2	Enable GPIO(2)			
			Bit1	Enable GPIO(1)				
			Bit0	Enable GPIO(0)				
			0x02	W	PWM1_high		N/A	
			0x03	W	PWM1_low		N/A	
			0x04	W	PWM2_high		N/A	
		0x05	W	PWM2_low		N/A		
		0x06	W	PWM3_high		N/A		

		0x07	W	PWM3_low	N/A
		0x08	W	PWM4_high	N/A
		0x09	W	PWM4_low	N/A

Table 3. EPM570 Register Map

### Mechanical Dimensions



Unit: mm

Figure 4. NBD01Mechanical Outline(Top View)

### Ordering Information

Part No.	Part Name	Operation Temp.	Remark
NDK01001	PandaBoard Companion Board	0°C to +70°C	Commercial grade part

Table 4. NBD01 Deliverables

Part No.	Part Name	Quantity	Remark
NBD01002	PandaBoard Companion Board PCBA	1	Commercial grade part
NC001002	20CM FPC CABLE	1	
NS001001	2*10 1.27MM SLOT	2	These 2 slots are for PandaBoard and PandaBoard ES J4&J4 socket mount

Table 5. NDK01001 BOM(Bill Of Materials)

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**Revision History**

Rev.	Date	Description	Author
0.1	28-Sept-2012	Initial release	wdzhou

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