NePort™ Hardware Manual

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Disclaimer

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Contents

NePort Overview

Conextop Technologies target at providing the most reliable and security M2M solution for the worldwide customers, and NePort is the most compact serial-IP module released in 2002, which has embedded all in a standard RJ45 connector, Neport is powered by our network processor SoC(Nechip), which includes a 10/100 MAC/PHY and 256 KB of SRAM on chip. It features a built-in web server for communications with a device via a standard Internet browser. Web capability can be used for remote configuration, real-time monitoring or troubleshooting. Neport has 512 KB of on-chip Flash for web pages and software upgrades. It acts as a dedicated co-processor that optimizes network activities permitting the host microprocessor to function at maximum efficiency.

1. Features:

- Embed Web Server
  Support update customized web
- Embed Telnet Server
- Provide RS232/422/485 signals.Can communicate with any devices with serial port
- Port buffer for every serial port
- High efficient Device Management and Trouble shoot tools
- All parameters can be configured through internal web server
- Provide serial login mode and configure system through serial port
- Telnet server enables remote management
- Email Alarm and data encryption

2. Product Character:

- The most compact size, High intefration
  compatible with standard RJ45 connector
- High Performance, High Reliability, Industrial Temerature
- 32bits RISC NP7 series (NeChip NP7 series)
  ARM7TDMI 55DMIPS
- 128KB SRAM (EN: 256KB SRAM)
  256KB/512KB Code + 32KB Boot
- 10/100Mbps Ethernet Interface (Auto sensing)）
- Provide 1-3 high speed serial ports
- Serial Port: selectable Data bite 5.6.7.8 bits
- Serial Port: selectable stop bite 1，2 bits

- Baud rate: 110 – 460800bps
  110 – 921600bps (EN Version)
- Provide RS485/422 controller
- Smart/High reliability networking stacks:

ETH、ARP、IP、UDP、TCP、ICMP、PING、BOOTP、AutoIP、DHCP、SNTP、POP3、SMTP、TFTP、DNS、TELNET、HTTP、PPP/PPPoE
SSH、SSL/TLS、HTTPS（EN Optional）

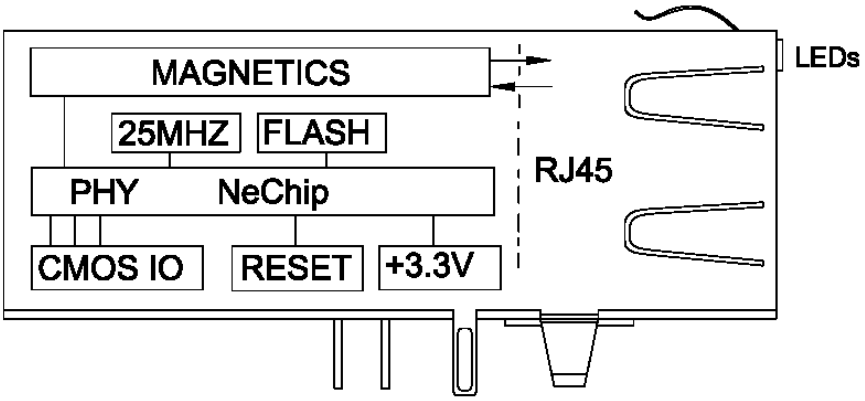
- Embedded Web Server, support update customized webs
- Email Alarm according to the triggers（EN Optional）
- Data Encryption:
  128-,192-,256bit AES / Tri-DES (Optional)
- Multiplex communication modes: TCP Server/client, UDP Uni-cast/Multi-cast modes
- Provide two programmable I/O
- Support Windows 95/98/ME/NT/2000/XP/2003/XP x64/2003 x64 COM driver、Linux real、TTY、UNIX
- Operation Voltage: 3.14~3.6 VDC
- Low Power Consumption: 110 – 155mA @ 3.3V
- Support POE
- 1.5KV electromagnetism isolation
- All pins support anti-static protection
- Operation Temperature
  0°C to +70°C (32°F to 158°F)，5% to 95% RH （Commercial Model）
  -40°C to +80°C (-40°F to 176°F)，5% to 95% RH (Industrial Model)
- Storage Temperature
  -40°C to +80°C (-40°F to 176°F)，5% to 95% RH

NePort Hardware Description

1. NePort Internal Structure

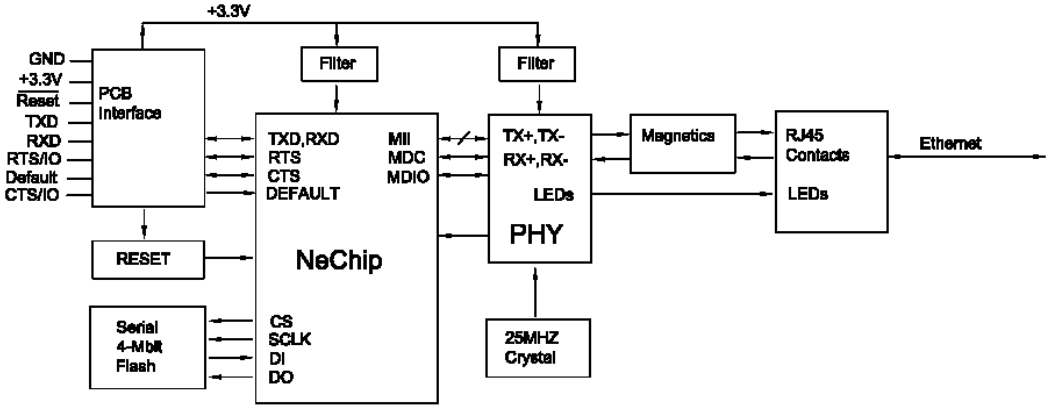
NePort Integrate nechip,PHY,OSC,Reset and power circuit.

Chart2-1. Internal Structure



2. NePort Internal Circuit

Chart2-2. Function Circuit



3. PCB Interface

NePort can provide up to three high speed serial ports with standard CMOS signals which can tolerate 5V TTL signals. In the real application, neport's serial port directly connect to the local CPU(or other processor) , then user devices can connect to Ethernet through neport now,serial data from local cpu will be sent to neport,and neport will convert the data from serial port to Ethernet according to the networking configuration

NePort Series include –POE,-L,-R,-EN versions, this doc just descript the standard version of neport.

NePort series with 8 pins

Chart2-1. Valid for NePort-L 、NePort-R and the other versions with 8 pins

PinNum	Pin Name	Type	Description
1	GND	Power	Ground
2	VDD	Power	Power Input (+3.3V)
3	RESET	Input	Low level to reset (5V tolerant)
4	TXD	Output	Serial port: Data Output(5V tolerant)
5	RXD	Input	Serial port: Data Input(5V tolerant)
6	IO/RTS	I/O	Programmable I/O with multiplex Function:(5V tolerant) 1.RTS(Request to Send): Output, Hardware Flow Control 2.IO(input/output): Can be configured by web or device manager (Only for special models) 3.TCP Connection Status，Invalid when hardware flow control is enabled 4. System status ,Invalid when hardware flow control is enabled 5. RS-485/RS422 Controller (RS422: Low level)
7	Default	Input	Low level valid,Force to load factory setting(5V tolerant) Keep this pin be low level for more than 5 seconds,NePort will be forced to load the factory setting and automatically reboot system
8	IO/CTS	I/O	Programmable I/O with multiplex Function:(5V tolerant) 1.RTS(Request to Send): InPut, Hardware Flow Control 2.IO(input/output): Can be configured by web or device manager (Only for special models) 3.TCP Connection Status，Invalid when hardware flow control is enabled 4. System status ,Invalid when hardware flow control is enabled 5. RS-422 Controller: High Level

Mark:

1. Place a 10uF capacitor between power and ground, and had better be close to NePort.
2. Should not connect upload resistance on Reset pin(Pin 3).
3. Recommend to connect upload resistance on RTS and CTS pin when uart work under rs232 mode
4. Recommend to connect download resistance on RTS and CTS pin when uart work under rs485/422 mode

10Pin Model of Neport Series

Chart2-2. Valid for NePort 、NePort-EN Series

PinNum	Pin Name	Type	Description
1	IO/CTS RXD2	Bid	Programmable I/O with multiplex Function:(5V tolerant) 1.RTS(Request to Send): InPut, Hardware Flow Control 2.IO(input/output): Can be configured by web or device manager (Only for special models) 3.TCP Connection Status，Invalid when hardware flow control is enabled 4. System status ,Invalid when hardware flow control is enabled 5. RS-422 Controller: High Level 6.UART2 TXD
2	GND	Power	Ground
3	VDD	Power	Power Input (+3.3V)
4	RESET	Input	Low level to reset (5V tolerant)
5	TXD1	Output	Serial port: Data Output(5V tolerant)
6	RXD1	Input	Serial port: Data Input(5V tolerant)
7	IO/RTS TXD2	Bid	Programmable I/O with multiplex Function:(5V tolerant) 1.RTS(Request to Send): Output, Hardware Flow Control 2.IO(input/output): Can be configured by web or device manager (Only for special models) 3.TCP Connection Status，Invalid when hardware flow control is enabled 4. System status ,Invalid when hardware flow control is enabled 5. RS-485/RS422 Controller (RS422: Low level) 6.UART2 TXD
8	Default	Input	Low level valid,Force to load factory setting(5V tolerant) Keep this pin be low level for more than 5 seconds,NePort will be forced to load the factory setting and automatically reboot system
9	IO/P+ TXD3	Bid	1. IO(input/output): Can be configured by web or device manager (Only for special models) 2. Anode output Of PoE 3. UART3 TXD
10	IO/P+ RXD3	Bid	1. IO(input/output): Can be configured by web or device manager (Only for special models) 2. Cathode output of PoE 3. UART3 RXD

Mark::

1. Place a 10uF capacitor between power and ground, and had better be close to NePort
2. Should not connect upload resistance on Reset pin(Pin 3)
3. Recommend to connect upload resistance on RTS and CTS pin when uart work under rs232 mode
4. Recommend to connect download resistance on RTS and CTS pin when uart work under rs485/422 mode
5. 8Pin Models are compatible with 10Pin models of NePort Series except CTS、P+、P- signals。

4. Ethernet Interface

NePort has integrated Ethernet transformer,RJ45 connector and status leds

Chart2-3. Standard Ethernet signals(Industrial Starndard)

Signal	Type	Pin Num	Function Description	Mark
TX+	Output	1	Transmit signal: Positive	
TX-	Output	2	Transmit signal: cathode	
RX+	Input	3	Receive signal: Positive	
RX-	Input	6	Receive signal: cathode	
Not used		4		
Not used		5		
Not used		7		
Not used		8		
SHIELD			Shield (Connect to Ground)	2KV electromagnetism Isolation

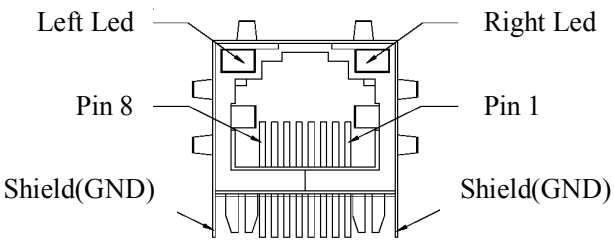
Mark: Please refer to Sheet2-4 for detailed pin description of RJ45 connector

5. Status Leds

NePort includes the follow status leds

- LINK（Green, Left Led）
- ACT（Yellow，Right Led）

Chart2-3. NePort Front View (Led)



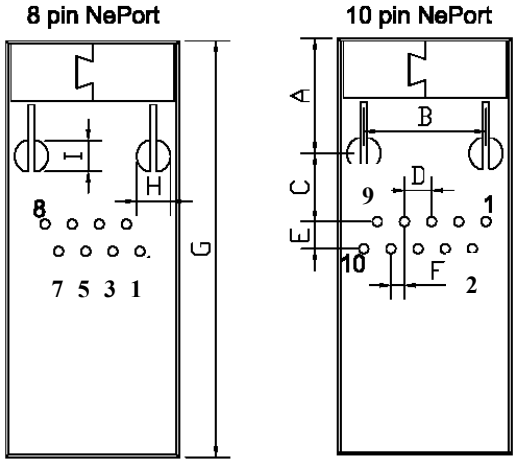
Sheet2-4.Description of status leds

LINK LED （Left）		ACT LED （Right）	
Status	Description	Status	Description
ON	Link is normal	Flash	Transceive Ethernet packets
OFF(Flash)	Cable dropped / Link disconnected	OFF	No data flow

6. Capsulation

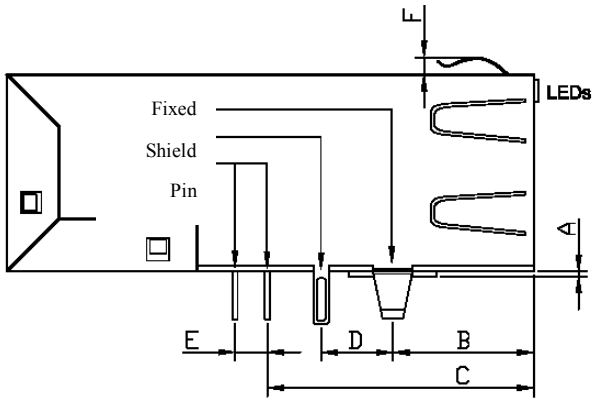
NePort Shell as below:

Chart2-5. Bottom View



	mm		
Dim	**Min**	**Typ**	**Max**
A	10.78	10.80	10.96
B		11.43	
C		6.35	
D		2.54	
E		2.54	
F		1.27	
G	37.92	38.20	38.50
H	3.10	3.15	3.20
I	2.80	2.85	2.90

Chart2-6. Side View



	mm		
Dim	**Min**	**Typ**	**Max**
A	0.20	0.25	0.30
B	10.78	10.80	10.96
C	-	17.15	-
D	2.85	3.05	3.25
E	-	2.54	-
F	-	1.80	-

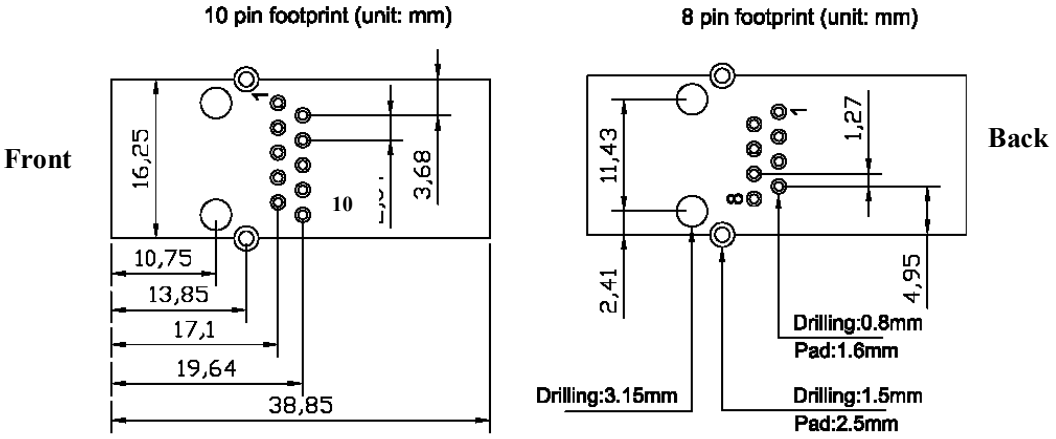
7. PCB Layout

For high reliability application with NePort embedded in user products,the follow items are strongly recommended:

1. Should place decoupling capacitor(0.1uF) beside neport
2. Place 10uF capacitor between power and ground beside neport

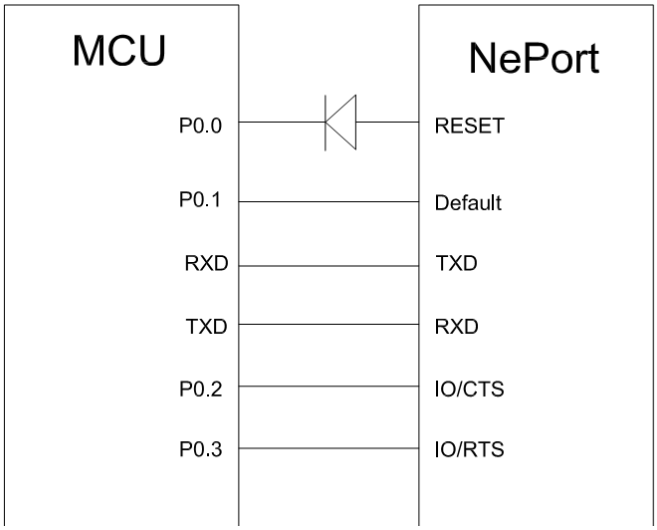
3. Had better provide isolated/independent power(3.3V) for neport

Chart2-7. Recommended PCB Capsulation



NePort has integrated power-on reset circuit inside, no need external circuit to power-on reset neport, so reset pin can be left unconnected, if user need reset neport by additional I/O provided by MCU/DSP, we will recommend the follow application circuit.

Chart2-8. Recommended application circuit

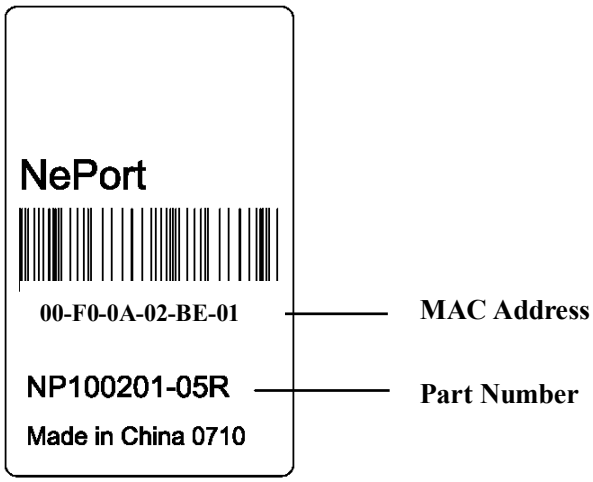


8. Product Mark

Product mark includes the follow information. (Chart2-9)

1. Neport series
2. MAC address
3. Part number
4. Operation condition: temperature and work voltage

Chart2-9. Product mark



9. Performance Guide

Sheet2-4. NePort electrical parameters

Name	Description	Min	Max	Unit	Condition
V_{DD}	Power Volatage	-0.3	3.6	V	
I_{DD}	Work Current	140	170	mA	Full loading (-40℃ / +85℃)
V_I	Signal input voltage	0	5.5	V	
V_O	Signal output voltage	0	V_{DD}	V	
V_{IH}	High level input voltage	2	-	V	
V_{IL}	Low level input voltage	-	0.8	V	
V_{OH}	High level output voltage	V_{DD}-0.4	-		
V_{OL}	Low level output voltage	-	0.4		
I_{OH}	High level output current	-4	-		V_{OH}= V_{DD}-0.4V
I_{OL}	Low level output current	4	-		V_{OL}= 0.4V

Sheet2-5. Normal electrical parameters

Name	Description	Min	Typical	Max	Unit	Condition
V_{DD}	Work Voltage	3.1	3.3	3.5	V	
I_{DD}	Work Current	140	150	160	mA	
soldering	Jointing	Jointing Tem:260℃±5℃，DippingTime≤5±0.5s				

10. Evaluation Kit

The evaluation kit targets at helping customers to integrate neport in their products efficiently. It includes the follow components

- NePor Evaluation Board
- NePort
- +9V Power Adaptor
- RS232 cross-over cable（DB9，Fmale-Female）
- CAT5e UTP RJ45M/M
- Product Disk

Chart 2-10. Evaluation Kit

Description of EVB

This Kit provide the whole platform for testing neport series, it includes ae neport(Standard version), a neport plug with 8/10 pins,standard RS232 interface with coms to rs232 converter chip and led indicators

Chart 2-11. Evaluation Board

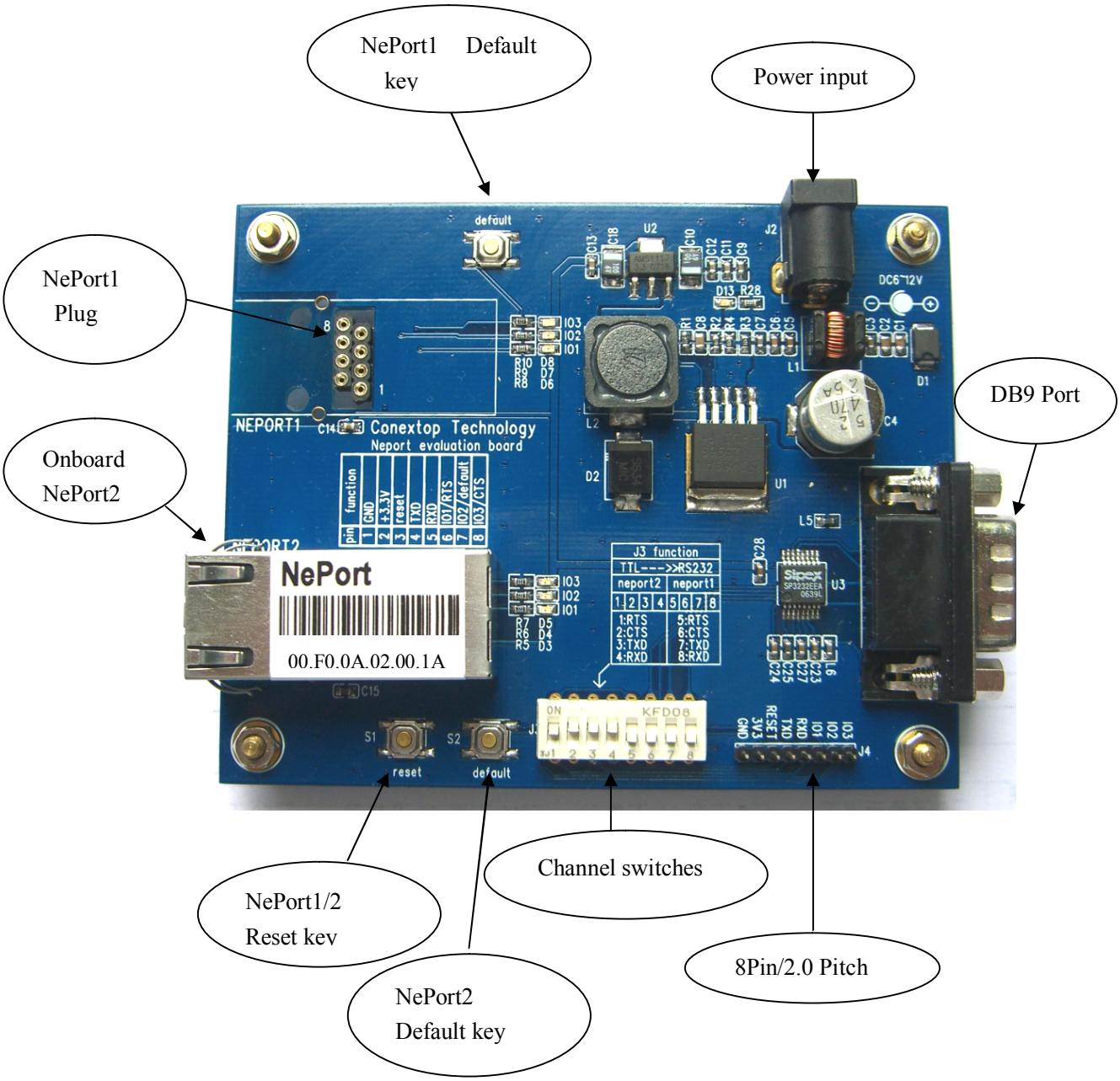
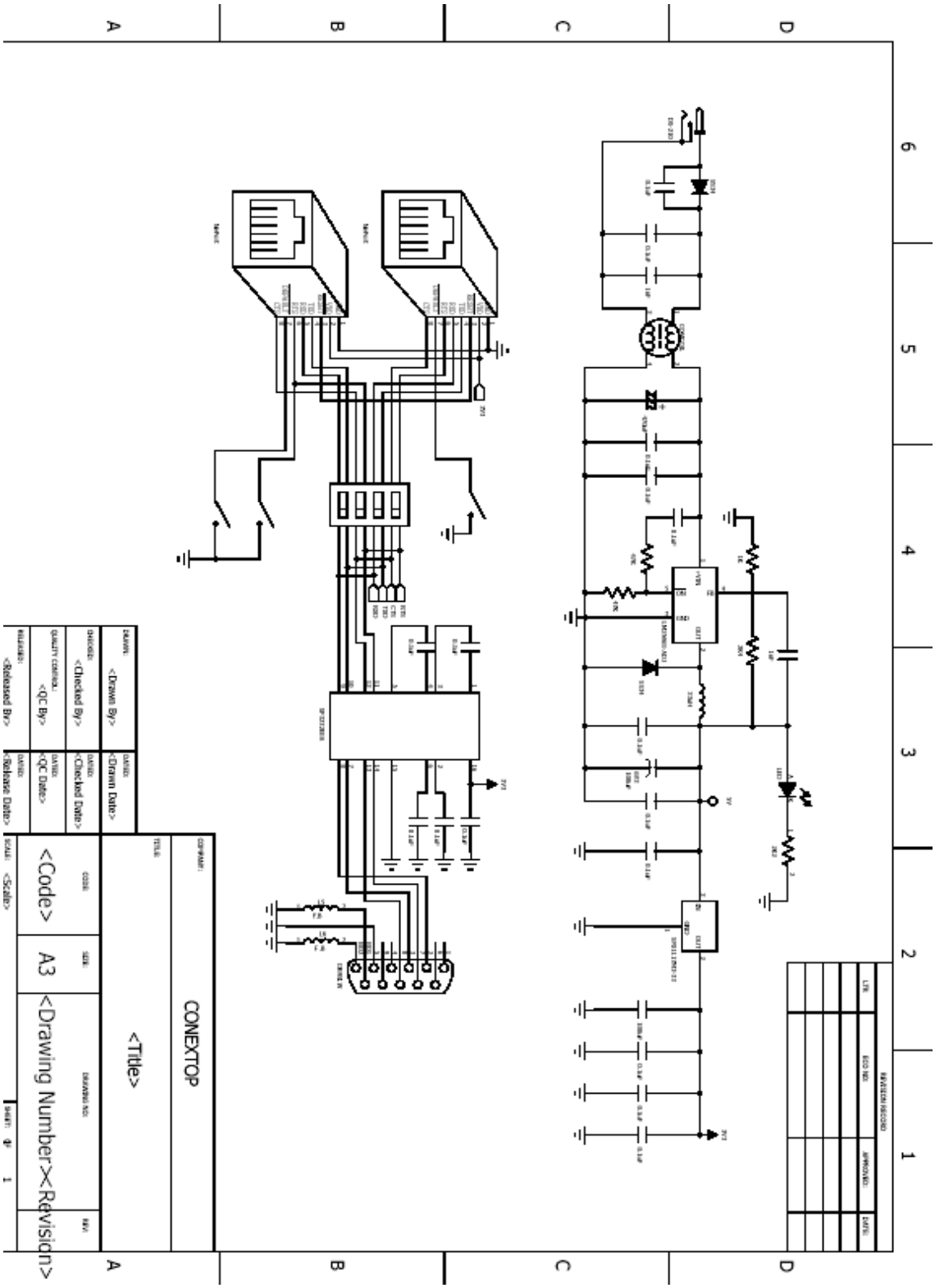


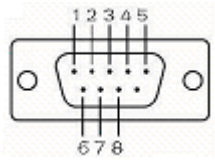
Chart 2-10. Schematic of Evaluation Board



RS232 Interface

There is one onboard RS232 chip from SIPEX, it is used to convert 3.3V COMS signals to RS232 signal, normally, RS232 interface provide one DB9 connector to communicate with external DTE, for instance, connect to PC serial port.

Chart 2-11. DB9 Pin Information



Sheet 2-6. Signal Description of RS232 Interface

NePort Signal		Terminal Device（DTE）	
DB9 Pin #	Signal Name	DB9 Pin #	Signal Name
2	RXD	2	TXD
3	TXD	3	RXD
5	GND	5	GND
7	RTS	7	CTS
8	CTS	8	RTS

Mark：1. Pin not listed in the above sheet is not used by evaluation board

2. Recommend to make the shield of DB9 connect to ground

Power

On board DC JACK with internal size : 2.0mm,， power circuit support pole protection，input voltage arrange:7.5V~12V。adjustable power chips are LM2596 DC-DC and LM1117-3.3V LDO from SIPEX。

Selectable Channel Switch

The Evaluation board provide 8bits DIP16/8 switch to select neport1 or neport2 to communicate with external rs232 interface. Push switch to ON will enable the corresponding signal.

Attention：

1. User just can enable one group of this 8bits switch,(group 1:one:1-4 , Group 2:5-8), or Evaluation board can't communicate with external rs232 devices
2. When all of 8bits switch are disconnected or one group are disconnect but no neport on the other group, such setting may cause no signal output to rs232

8Pin/2.0 pitch header

The Evaluation board provides 8pins pitch header for OEM/ODM customized development, and this pitch header can make neport signals connect to user's MCU/DSP efficiently to debug or testing according to the real application

Attention：

Should disconnect the extern rs232 interface to avoid effect testing result

Buttons

The Evaluation Board integrates three buttons used as reset / defaulting setting

NePort Summary

Embedded Seial-IP series		NePort –L Series		NePort-R Series		NePort Series		NePort-EN Series		
Single port series		LX	LX -485	RX	RX -485	SX	SX -485	EXH	EXH -485	ESX
Memory and Speed	Flash Code/Boot(KB)	128k /32	128k /32	256k /32	256k /32	512k /32	512k /32	512k /32	512k /32	512k /32
	SRAM(KB)	80/128	80/128	128	128	256	256	256	256	256
	Speed (MIPS)	55	55	55	55	55	55	60	60	60
Core and System	ARM7TDMI	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Multi-T RTOS	Y	Y	Y	Y	Y	Y	Y	Y	Y
Serial Interfaces	Ethernet Speed (M)	10/100	10/100	10/100	10/100	10/100	10/100	10/100	10/100	10/100
	Uart RS232	Y	Y	Y	Y	Y	Y	Y	Y	Y
	Uart RS485/422		Y		Y		Y		Y	Y
	Max-Baudrate(bps)	115200	115200	460800	460800	460800	460800	921600	921600	921600
	Serial port Number	1	1	1	1	1	1	1/2/3	1/2/3	1/2/3
Programmable I/O	PIO Number	--	2	--	2	--	--	--	2	2
Protocol stacks	ARP/IP/ICMP/DHCP /BOOTP/TCP/UDP	Y	Y	Y	Y	Y	Y	Y	Y	Y
	TFTP	Y	Y	Y	Y	Y	Y	Y	Y	Y
	SNTP	--	--	--	--	Y	Y	--	Y	Y
	Http Server (web customized)		--Y	Y	Y	Y	Y	Y	Y	Y
	Telnet Server	Y(*)	Y(*)	Y	Y	Y	Y	Y	Y	Y
	DNS	Y(*)	Y(*)	Y(*)	Y(*)	Y	Y	Y	Y	Y
	Smtp (Email Trigger)	--	--	--	--	Y(*)	Y(*)	--	Y	Y
	PPP/PPPOE	--	--	--	--	--	Y(*)	--	--	Y
Advanced encryption protocols	SSH	--	--	--	--	--	--	--	--	Y
	SSL/TLS	--	--	--	--	--	--	--	--	Y
	Https	--	--	--	--	--	--	--	--	Y
	Smtps	--	--	--	--	--	--	--	--	Y
Encryption Arithmetic	AES	--	--	--	--	--	--	--	--	Y
	DES/Triple-DES	--	--	--	--	--	--	--	--	Y
	RC4	--	--	--	--	--	--	--	--	Y
	MD5	--	--	--	--	--	--	--	--	Y
Analog parameters	Power suppler(V)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
	I/O Tolerant(V)	5	5	5	5	5	5	5	5	5
PowerConsumption (mA)	10Base-T Activity	165	165	165	165	165	165	165	165	165
	100Base-T Activity	155	155	155	155	155	155	155	155	155
Operating temperature arrange C = 0 - +75° C I = - 40 - +85° C		C,I	C,I	C,I	C,I	C,I	C,I	C,I	C,I	C,I
Package Option  (RJ45)		RJ45 Low Cost	RJ45 Low Cost	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45	RJ45

More details by: http://www.conextop.com/products/embeddedsolution/wiredmodules/index.htm
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