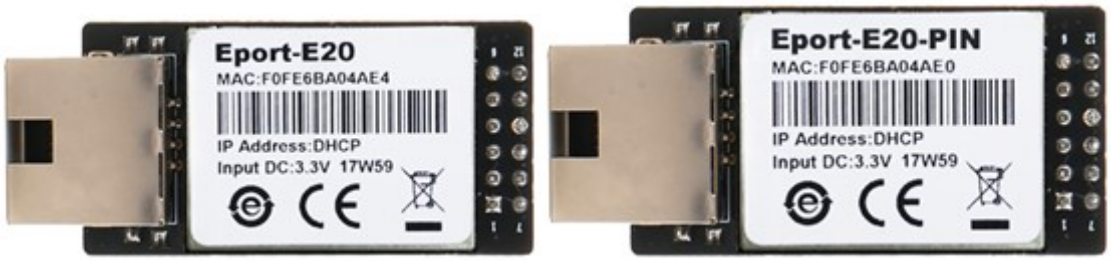
Eport-E20/Eport-E20-PIN

Super Port User Manual

V 1.2



Overview of Characteristic

- ✧ **MIPS MCU with 2MB Flash and 128KB RAM**
- ✧ **Use FreeRTOS Operation System**
- ✧ **Support TCP/IP/Telnet/Modbus TCP Protocol**
- ✧ **Support Serial To 10/100M Ethernet Conversion, Serial Speed Upto 921600 bps**
- ✧ **Support 10/100M Ethernet Auto-Negotiation**
- ✧ **Support Easy Configuration Through a Web Interface**
- ✧ **Support Security Protocol Such As TLS/AES/DES3**
- ✧ **Support Web OTA Wirelss Upgrade**
- ✧ **Single +3.3V Power Supply**
- ✧ **Size: 50 x 23 x 11 mm (L x W x H)**
- ✧ **FCC/CE/RoHS Certificated**

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HISTORY

Ed. V1.0	11-16-2017	First Version
Ed. V1.1	01-10-2018	Add Eport-E20-PIN, Update Eport-E20 size and appearance.
Ed. V1.2	04-16-2019	Update software function to another document.

1. PRODUCT OVERVIEW

1.1. General Description

The Eport-E20 series is a fully self-contained small form-factor, most compact, integrated solution, which provide a serial interface to Ethernet connectivity to web enable any device. The Eport-E20 integrate TCP/IP controller, memory, 10/100M Ethernet transceiver, high-speed serial port within a compact RJ45 package and integrates a fully developed TCP/IP network stack and FreeRTOS.The Eport-E20 also includes an embedded web server used to remotely configure, monitor, or troubleshoot the attached device.

The Eport-E20 series using highly integrated hardware and software platform,It has been optimized for all kinds of applications in the industrial control, smart grid , personal medical application and remote control that have lower data rates, and transmit or receive data on an infrequent basis. By simply adding an Eport-E20 unit to a product Design, device manufacturers can reduce their Design cycle and speed up Time-To-Market with very low risk.

The Eport-E20 series integrates all serial to Ethernet functionality into a low-profile, 50 x 23 x 11mm standard RJ45 module package that can be easily mounted on main PCB with application specific circuits and even not change your original Design.

Eport-E20-PIN is Eport-E20 with PIN transformation board. The function is the same.

1.2. Device Paremeters

Table1. Eport-E20 Series Module Technical Specifications

Item	Parameters
System Information	
Processor/Frequency	Cortex-M3/96MHz
Flash/SDRAM	2MB/128KB
Operating System	FreeRTOS
Ethernet Port	
Port Number	1 RJ45 with LED
Interface Standard	10/100 Base-T Auto-Negotiation
Protection	1.5KV Isolation
Transformer	Integrated
Network Protocol	IP，TCP，UDP，DHCP，DNS，HTTP Server/Client，ARP, BOOTP, AutoIP，ICMPTelnet, NTP,Modbus TCP
Security Protocol	TLS AES 128Bit DES3
IPV6 Support	No
Serial Port	

Port Number	1 + 1 debug
Interface Standard	3.3V TTL: 2 wire（TX,RX）
Data Bits	5,6,7,8
Stop Bit	1,2
Check Bit	None,Even,Odd
Baud Rate	TTL: 6000 bps~921600bps
Flow Control	No Flow control Hardware RTS/CTS、DSR/DTR Software Xon/ Xoff flow control
Software	
Web Pages	Http Web Configuration Customization of HTTP Web Pages
Log	Remote Realtime Log,
Configuration	Web CLI XML import Telnet IOTService PC Software UART Fast Config
Firmware Upgrade	Web, IOTService
Basic Parameter	
Size	Eport-E20: 50 x 23 x 11 mm Eport-E20-PIN: 50 x 23 x 12mm
Operating Temp.	-45 ~ 85°C
Storage Temp.	-45 ~ 105°C, 5 ~ 95% RH（no condensation）
Input Voltage	3.3V
Working Current	~100mA
Power	<400mW

1.3. Key Application

The Eport-E20 device connects serial device to Ethernet networks using the TCP/IP protocol:

- Remote equipment monitoring
- Asset tracking and telemetry
- Security Application
- Industrial sensors and controls
- Medical devices
- ATM machines
- Data collection devices
- Universal Power Supply (UPS) management units
- Telecommunications equipment
- Data display devices
- Handheld instruments
- Modems
- Time/attendance clocks and terminals

2. HARDWARE INTRODUCTION

The Eport-E20 series is a complete solution for serial port device connecting to network. Packageed into a RJ45 connector, this powerful device supports a 10/100BASE-T Ethernet connection, a reliable and proven operating system stored in flash memory, an embedded web server, a full TCP/IP protocol stack,and standards-based (AES) encryption.

Through Ethernet cable connect router with Eport –E20 serial server for data transfer, which makes the electromechanical integration very simple. Eport-E20 meet EMC Class B security level,It can pass every countries relevant certification test

2.1. Appearance

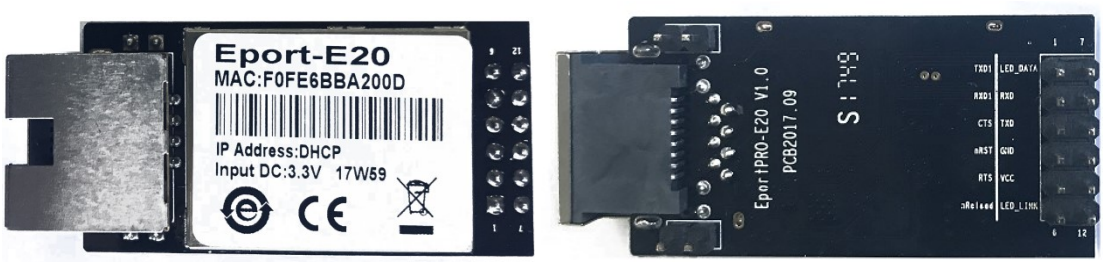


Figure 1. Eport-E20 Appearance

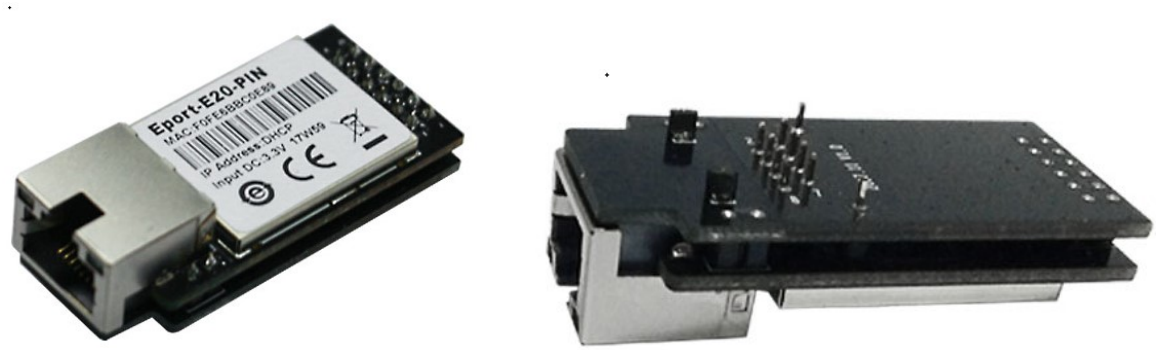


Figure 2. Eport-E20-PIN Appearance

2.2. Eport-E20 Pins Definition

Figure 3. Eport-E20 Pins Map

Table2. Eport-E20 Pins Definition

Pin	DES3cribtion	Net Name	Signal Type	Comments
1	GPIO	GPIO1	I/O	Can be configured to UART1:TXD2
2	GPIO	GPIO2	I/O	Can be configured to UART1:RXD2
3	UART0	CTS	I	Can be configured to GPIO
4	External Reset In	nRST	I, PU	“Low” effective reset input.
5	UART0	RTS	O	Can be configured as RS485 control pin
6	Multi-Function Pin	nReload	I,PU	Detailed functions see <Notes>
7	LED indicator	LED2_Data	O	Detailed functions see <Notes>
8	UART0	RXD	I	3.3V, TTL.
9	UART0	TXD	O	3.3V, TTL.
10	Ground	GND	GND	Power Ground
11	+3.3V Power	DVDD	Power	+3.3V
12	LED indicator	LED1_Link	O	Detailed functions see <Notes>
EGND	EGND	EGND	EGND	Earth GND, Used to shield EMC signal. Connect to Ethernet Metal Shell Internally. It is not allowed to connect to GND.

<Notes>

nReload Pin function:

1. Put this pin low before the device powered on (or Reset), This device works in mass production mode to upgrade its firmware, this mode is used for upgrade customized firmware. The corresponding PC tools can be download on High Flying website.
2. After device is powered up, If put this pin to low more than 3 seconds and then put to High, It will restore the product parameters to factory setting.

We strongly suggest user to fan out this pin.

LED2_Data Pin

1. When there are data transmiting and receiving, This LED will flashing. If there is no data transmit and receive, It will output High.

LED1_Link Pin

1. When Ethernet connected normal, It will output Low, If there is no Ethernet connection, It will output High.

2.3. Eport-E20-PIN Pins Definition

Figure 4. Eport-E20-PIN Pins Map

Table3. Eport-E20-PIN Pins Definition

Pin	Describtion	Net Name	Signal Type	Comments
1	Ground	GND	GND	Power Ground
2	+3.3V Power	DVDD	Power	+3.3V
3	External Reset In	nRST	I, PU	“Low” effective reset input.
4	UART0	TXD	O	3.3V, TTL.
5	UART0	RXD	I	3.3V, TTL.
6	UART0	RTS	I	Can be configured as RS485 control pin
7	Multi-Function Pin	nReload	I,PU	Detailed functions see <Notes>
8	UART0	CTS	O	Can be configured to GPIO
EGND	EGND	EGND	EGND	Earth GND, Used to shield EMC signal. Connect to Ethernet Metal Shell Internally. It is not allowed to connect to GND.

<Notes>

nReload Pin function: Same as above.

2.4. Electrical Characteristics

Table4. Absolute Maximum Ratings:

Parameter	Condition	Min.	Typ.	Max.	Unit
Storage Temperature Range		-45		125	°C
Maximum Soldering Temperature	IPC/JEDEC J-STD-020			260	°C
Supply Voltage		0		3.8	V
Voltage on any I/O pin		0		3.3	V
ESD (Human Body Model HBM)	TAMB=25°C			2	KV
ESD (Charged Device Model, CDM)	TAMB=25°C			1	KV

Table5. Power Supply & Power Consumption:

Parameter	Condition	Min.	Typ.	Max.	Unit
Operating Supply Voltage		3.0	3.3	3.6	V
Operating Temperature Range		-45		85	°C
Supply Current (10BASE-T activity)@ 96MHz	Without date transmit and receive		40		mA
Supply Current (100BASE-T activity)@ 96MHz	5KB/S data		140		mA
Input Leakage Current	Ii	-10		10	uA
Output high voltage	@IOH=2mA	2.8			V
Output Low Voltage	@IOL=2mA			0.3	V
Input High Voltage		1.6		3.6	V
Input Low Voltage		-0.3		1.4	V
GPIO Input pull-up resistor			200		kΩ
GPIO Input pull-down resistor			200		kΩ

2.5. Ethernet Interface

The 10/100 Ethernet magnetics, network status LEDs, and RJ45 connector are all integrated into the Eport-E20 unit.

Table6. Ethernet Interface Definition

Pin	Describtion	Net Name	Signal Type
1	Transmit Data +	TX+	O
2	Transmit Data -	TX-	O
3	Receive Data +	RX+	I
4	NC		
5	NC		
6	Receive Data -	RX-	I
7	NC		
8	NC		
9	Case Ground	SHIELD	

2.6. Ethernet LED Interface

The device contains two bi-color Ethernet LED indicator (Detailed postion is in dimension drawing .)

Table7. LED Interface Definition

Link LED (Left Side)		Activity LED (Right Side)	
Color	Meaning	Color	Meaning
Off	No Connection	Off	No Data
Yellow	10/100Mbps	Green	Have Data

2.7. Eport-E20 Mechanical Size

The dimensions of Eport-E20 are defined as following picture (mm):

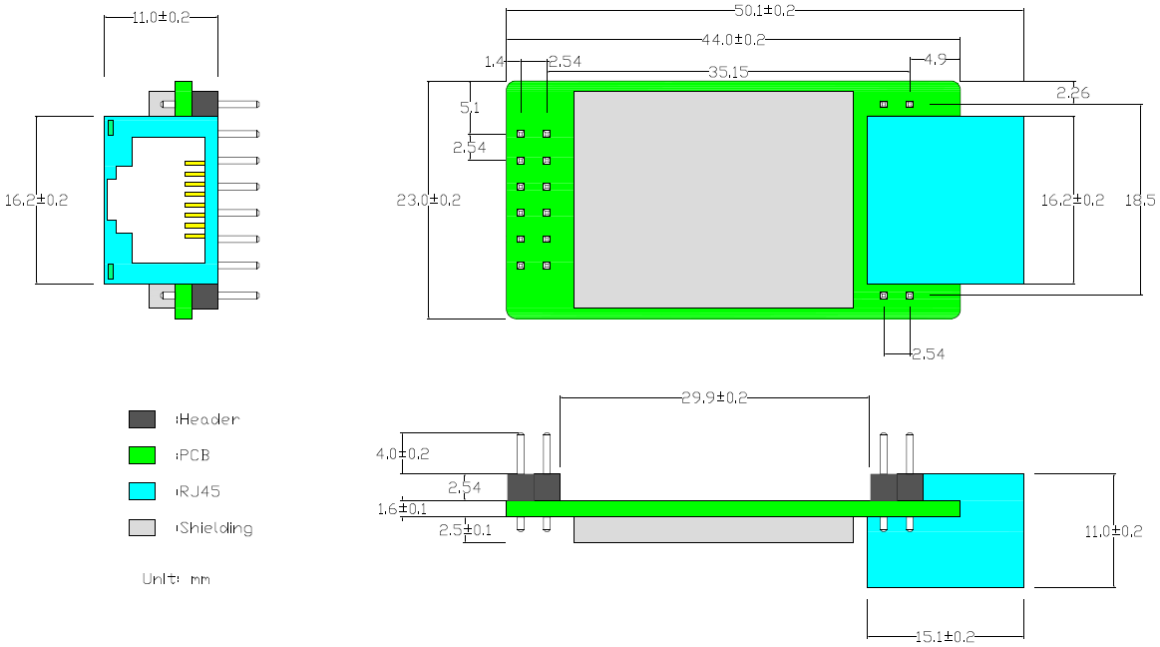


Figure 5. Eport-E20 Mechanical Dimension

2.8. Eport-E20-PIN Mechanical Size

The dimensions of Eport-E20-PIN are defined as following picture (mm):

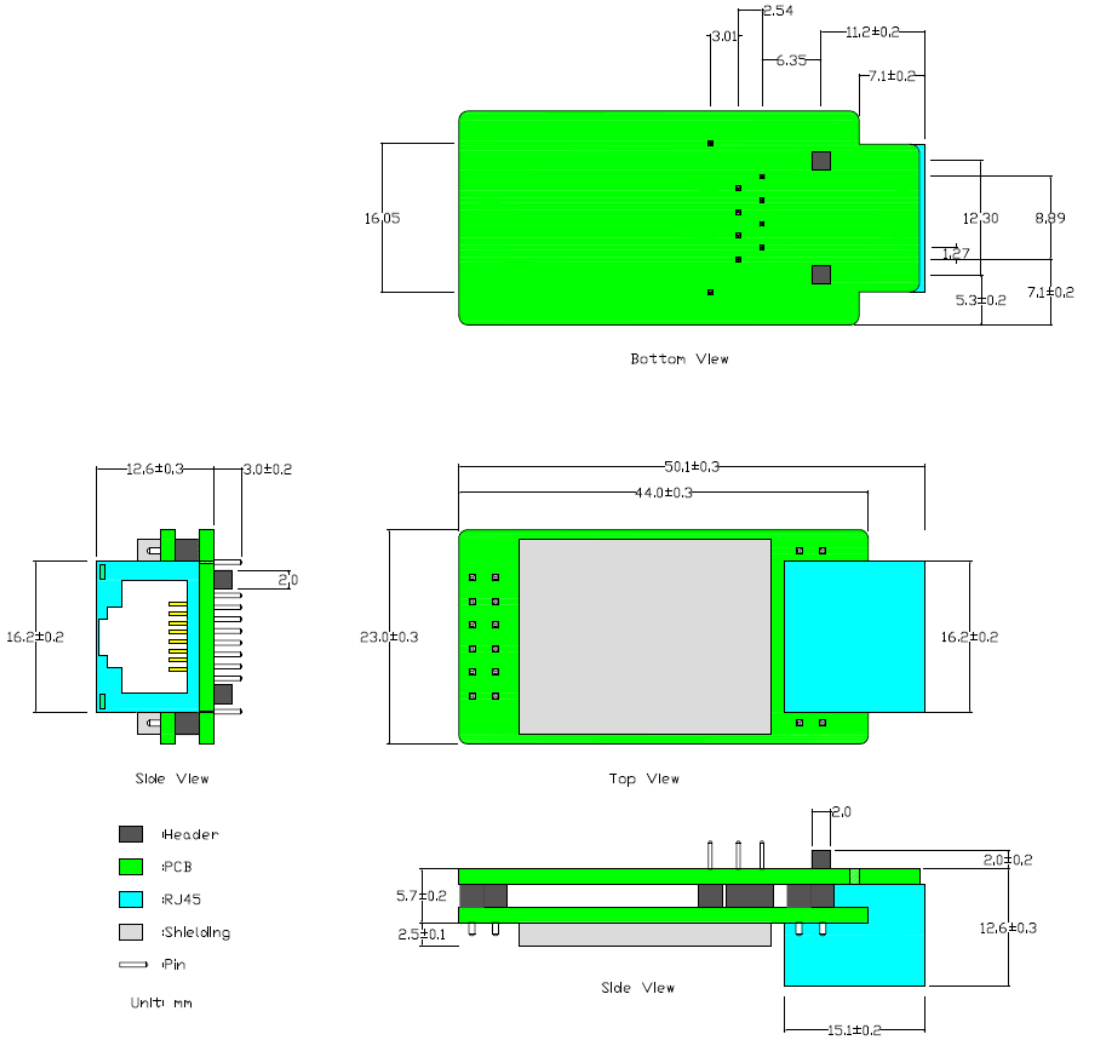


Figure 6. Eport-E20 Mechanical Dimension

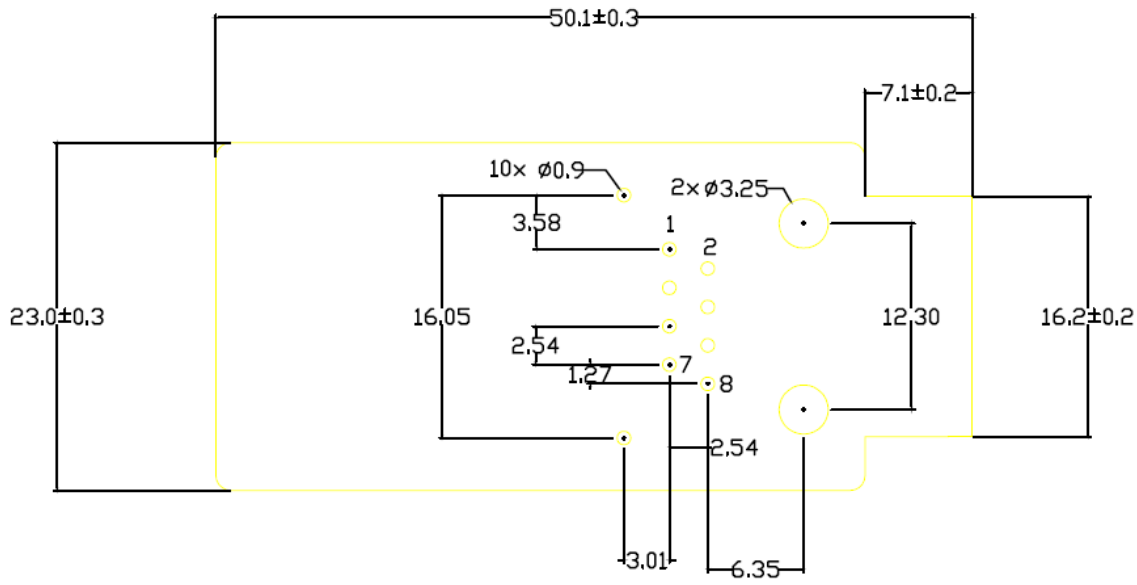


Figure 7. Eport-E20-PIN recommended PCB layout

2.9. Order Information

Base on customer detailed requirement, Eport-E20 provide different configuration version, Details as below:

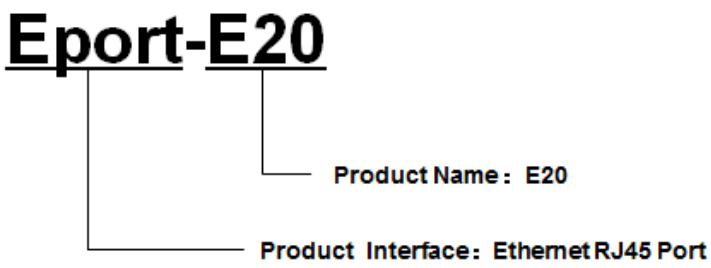


Figure 8. Eport-E20 Product Number Defination

2.10. Evaluation Kits

We provide evaluation kit for user to learn to use Eport-E20(Eport-E20-PIN is the same as Eport-E20, so for evaluation, juse use Eport-E20). Evaluation kit picture is as following, User can use RS232, USB Serial or Ethernet interface to configure parameters, manage equipment and do some function test. (onboard FT232R chip switch, its driver can be download from high flying website, When using USB Serial, the top right corner jumper need to all jump to the left side). .

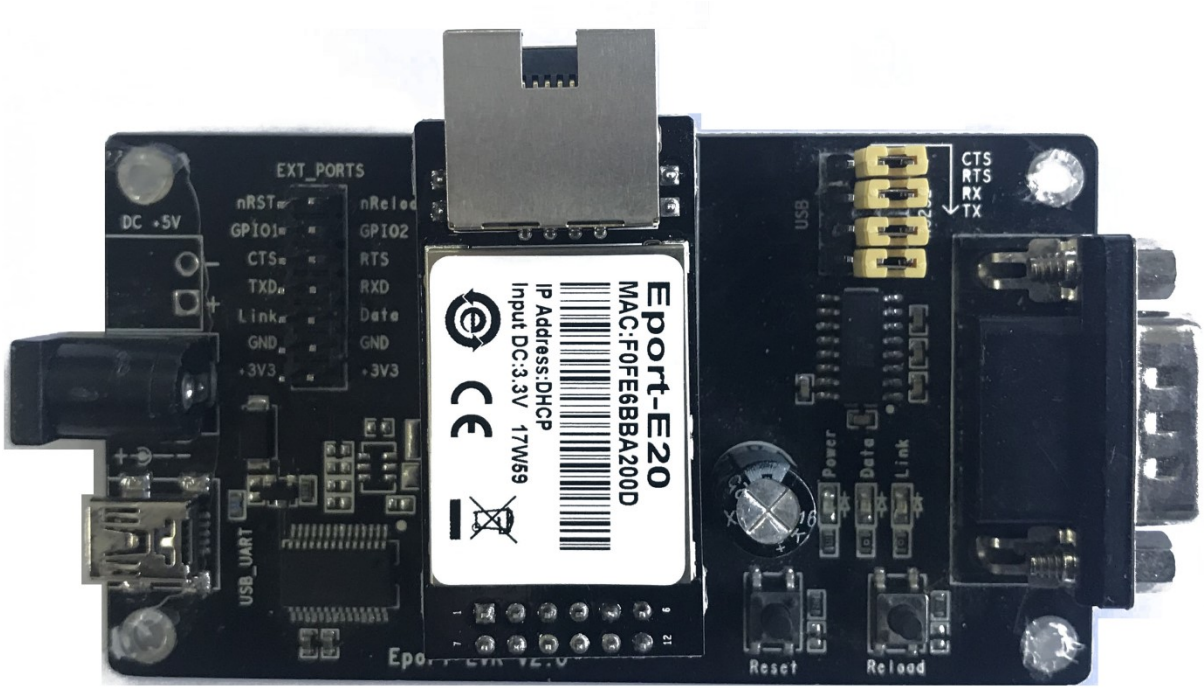


Figure 9. Eport-E20 EVK

Evaluation kit interface details as following:

Table8. Eport-E20 EVK Interface

Function	Name	Describe
External Interface	COM	Main data/command RS-232 interface
	USB_UART	UART to USB debug interface（Used for PC debug envirement which without RS232 interface, Need load drivers to use）, Can be power supply port
	DC5	DC 5V input
	EXT PORT	GPIO Pin interface
	JMP	4Pin USB or RS232 jumper. All jump to left choose USB Serial.. All jump to right choose RS232
LED	Power	3.3V Power Indicate
	Link	Network indicator, **Detailed functions see** LED1_Link Pin**<Notes>**
	Data	Communication indicator, **Detailed functions see** LED2_Data Pin**<Notes>**
Button	Reset	“Reset” Button
	Reload	Press down the button more than 3s and then loose to restore factory setting

2.11. Typical Application

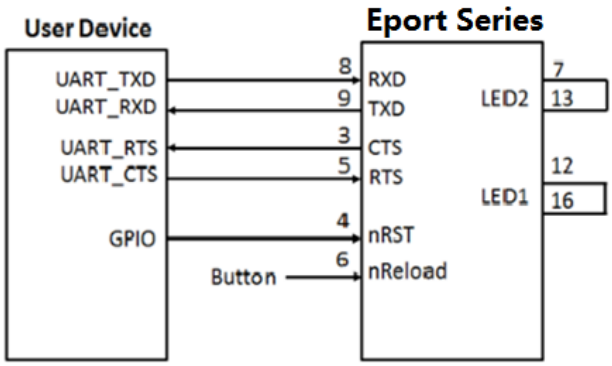


Figure 10. Eport-E20 Hardware Typical Application

Notes:

nRST- Input.Hardware reset signal. Effective Low.

There is internal pull-up resistor to 3.3V and no external pull-up resistor needed. MCU put nRST signal to low for at least 10ms if need to reset the device.

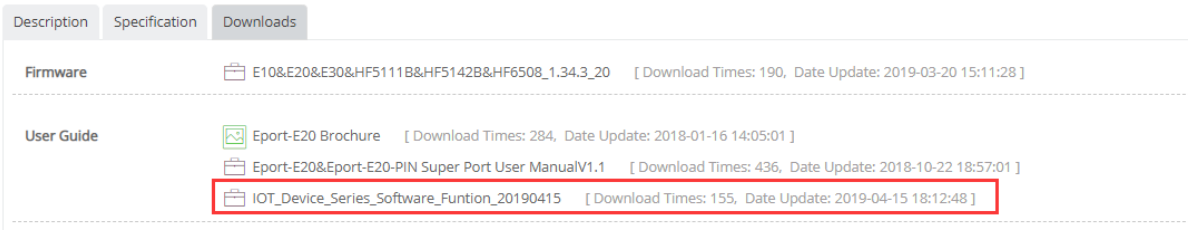
nReload- Input.Device restore to factory default configuration. Effective Low; （**Recommend this pin to connect button or jumper header, Used for batch upgrade and configuration**）

Can connect with external button or chip pin, When press nReload button, pull the pin to Low level more than 3s, then loose, device will restore to factory default setting and restart itself. If nReload function is not required, Can leave this pin open, Don’t need any connection.

TXD/RXD- UART port data transmit and receive signal.

2.12. Software Function

Refer to “IOT_Device_Series_Software_Funtion” for detailed usage.



APPENDIX A: HW REFERENCE DESIGN

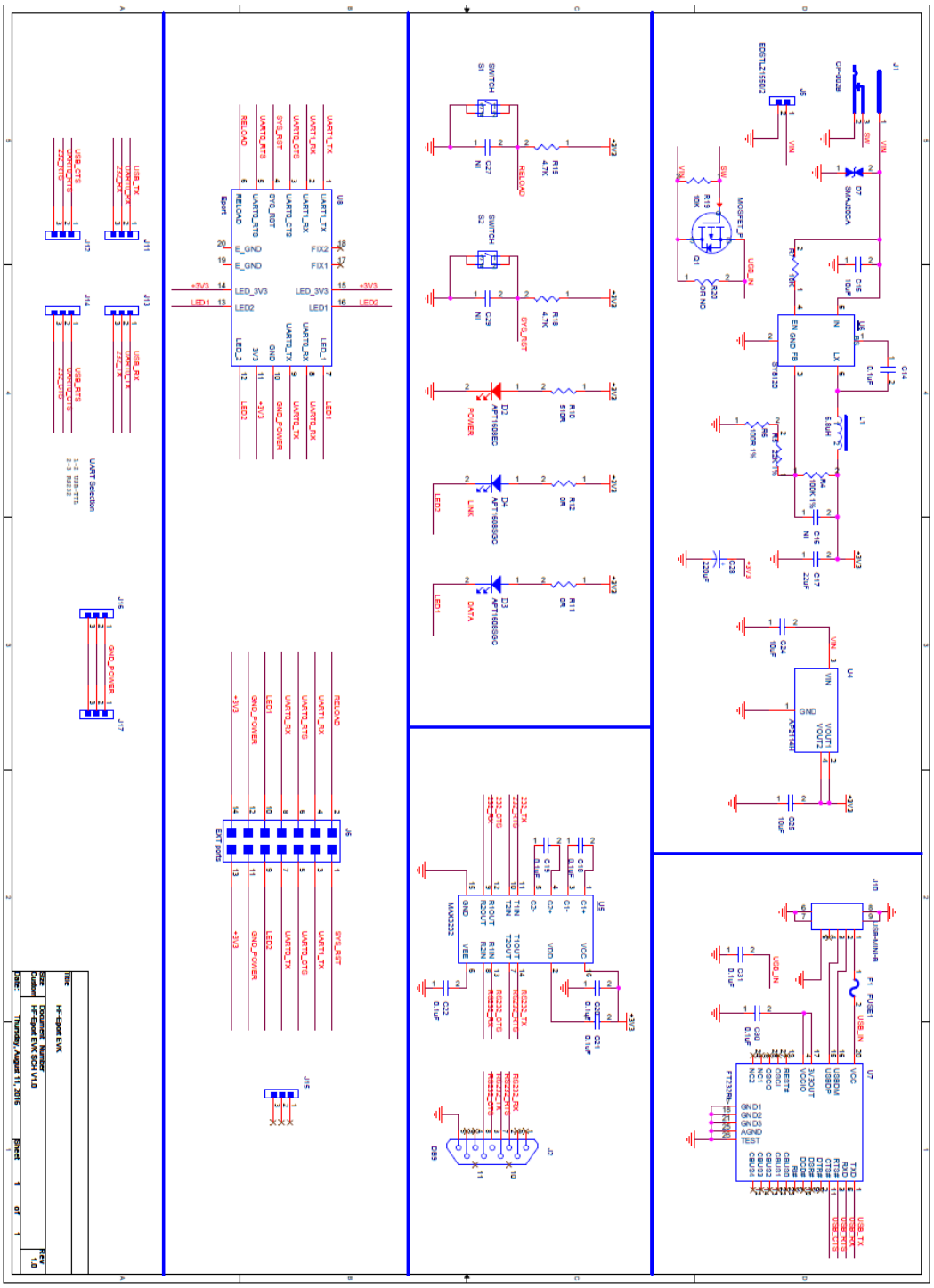


Figure 11. HW REFERENCE DESIGN

Detailed Eport-E20 Evluation Board Design source files, pls access IOTworkshop or High-Flying web download page or contact with High-Flying technical support people to acquire.

APPENDIX B:REFERENCES

B.1. More materials

http://www.hi-flying.com/ethernet-iot/super-ethernet/eport-e20

APPENDIX C: CONTACT INFORMATION

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