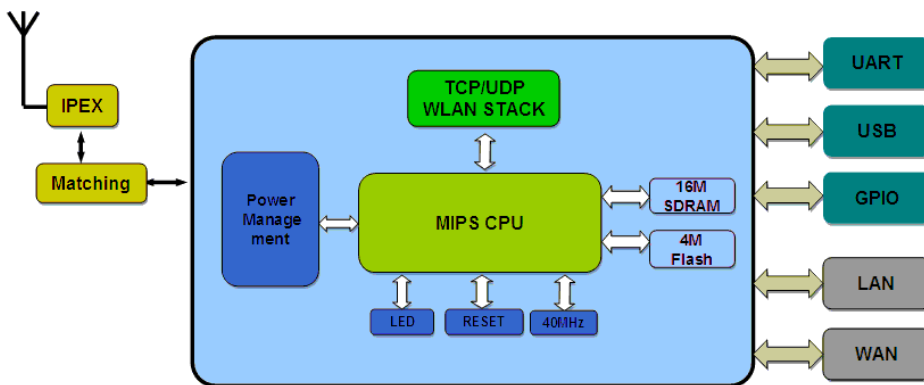


## Overview:

HLK-RM04 is a new low-cost embedded UART-ETH-WIFI module (serial port - Ethernet -Wireless network) developed by Shenzhen Hi-Link Electronic co., Ltd.

This product is an embedded module based on the universal serial interface network standard,built-in TCP / IP protocol stack, enabling the user serial port, Ethernet, wireless network (wifi) interface.Through the HLK-RM04 module, the traditional serial devices do not need to change any configuration,data can be transmitted through the Internet network. Provide a quick solution for the user's serial devices to transfer data via Ethernet

## Module Block Diagram



**Note:**The software support of usb and GPIO will be release later

## Benefits

- WiFi Router module solutions
- Ready to use in products
- Minimises product development time
- No RF test required for systems
- Compliant with CE and FCC part 15 rules.
- Serial to Wifi;Serial to Net;Both by one module

## Applications

- WiFi Led Control
- WiFi Power Switch
- Home and Commercial building automation
- OBDII WiFi Diagnose
- RFID Data Transfer
- Toys and gaming peripherals
- Industrial systems
- Telemetry
- Remote Control

## Features:

- 2.4GHz 802.11b/g/n,compatible
- Support IEEE 802.3、IEEE 802.3u
- WiFi Client/AP/Router Mode
- Support wps/wds
- The range of baudrate: 1200~500000bps
- Support transparent transmission mode
- Support multiple security authentication mechanisms:  
WEP64/WEP128/ TKIP/ AES  
WEP/WPA-PSK/WPA2-PSK
- Support wireless roam
- Support multiple network protocols:  
PPPOE/TCP/UDP/DDDNS  
/DHCP/DNS/HTTP/Firewre
- Support AT+ instruction set
- Support two config methods:Serial/WEB
- Device Dimensions 29mm\*40mm\* 8.8mm

**Lead-free and RoHS compliant**

## 1. Introduction

The HLK-RM04 module provides designers with a ready made component that provides a fully integrated solution for applications, using the IEEE802.11 standard in the 2.4-2.5GHz ISM frequency band, including 802.11b/g/n and also provides IEEE802.3, can be quickly and easily included in product designs. The modules integrate all of the RF components required, removing the need to perform expensive RF design and test. Products can be designed by simply connecting sensors and switches to the module IO pins or uart interface. The modules use ralink's chip Wireless Microcontroller, allowing designers to make use of the serial interface to connect with their device. Hence, this module allows designers to bring wireless applications to market in the minimum time with significantly reduced development effort and cost.

This product is an embedded module based on the universal serial interface network standard, built-in TCP / IP protocol stack, enabling the user serial port, Ethernet, wireless network (wifi) interface between the conversions. Through the HLK-RM04 module, the traditional serial devices do not need to change any configuration; data can be transmitted through the Internet network. Provide a quick solution for the user's serial devices to transfer data via Ethernet. Also the HLK-RM04 module has FCC modular approvals and is compliant with EU regulations.

## 2. Specifications

The parameters are defined here.

**VDD=5.0V @ +25°C**

| Typical DC Characteristics        |                     | Notes                                  |
|-----------------------------------|---------------------|--|
| Only wifi current                 | 140mA               | Wifi to serial, AP mode or Client mode |
| One rj45 current                  | 120mA               | Serial to RJ45.                        |
| Two rj45 current                  | 135mA               | One is Wan another is LAN              |
| WiFi and two rj45                 | 160mA               | Default Mode/Factory Mode              |
| Centre frequency accuracy         | +/-25ppm            | Additional +/-15ppm allowance          |
| Typical RF Characteristics        |                     | Notes                                  |
| Receive sensitivity               | -70dBm              | Use Iqview to adjust                   |
| Maximum Transmit power            | 18dBm/15dBm/13.5dBm | 802.11b/g/n                            |
| RF Port impedance – Ipe connector | 50 ohm              | 2.4 - 2.5GHz                           |
| VSWR (max)                        | 2:1                 | 2.4 - 2.5GHz                           |
| Centre frequency accuracy         | +/-25ppm            | Additional +/-15ppm allowance          |
| Peripherals                       |                     | Notes                                  |
| UART                              | 2pins               | 1200-500kbps                           |
| RJ45(WAN)                         | 4pins               | Support pppoe                          |
| RJ45(LAN)                         | 4pins               | Support dhcp                           |
| 3.3V Out                          | 1pins               | Support at most 300mA/3.3V             |
| 1.8V Out                          | 1pins               | Support at most 300mA/1.8V             |

### 3. Product Development

Hi-Link supplies all the development tools needed to enable end-product development to occur quickly and efficiently. These are all freely available from [www.hlktech.com](http://www.hlktech.com). A evaluation kits is also available, allowing products to be quickly bread boarded. Efficient development of software applications is enabled by the provision of a complete, unlimited, software developer kit. This package provides everything required to develop application code and to trial it with hardware representative of the final module.

### 4. Pin Configurations

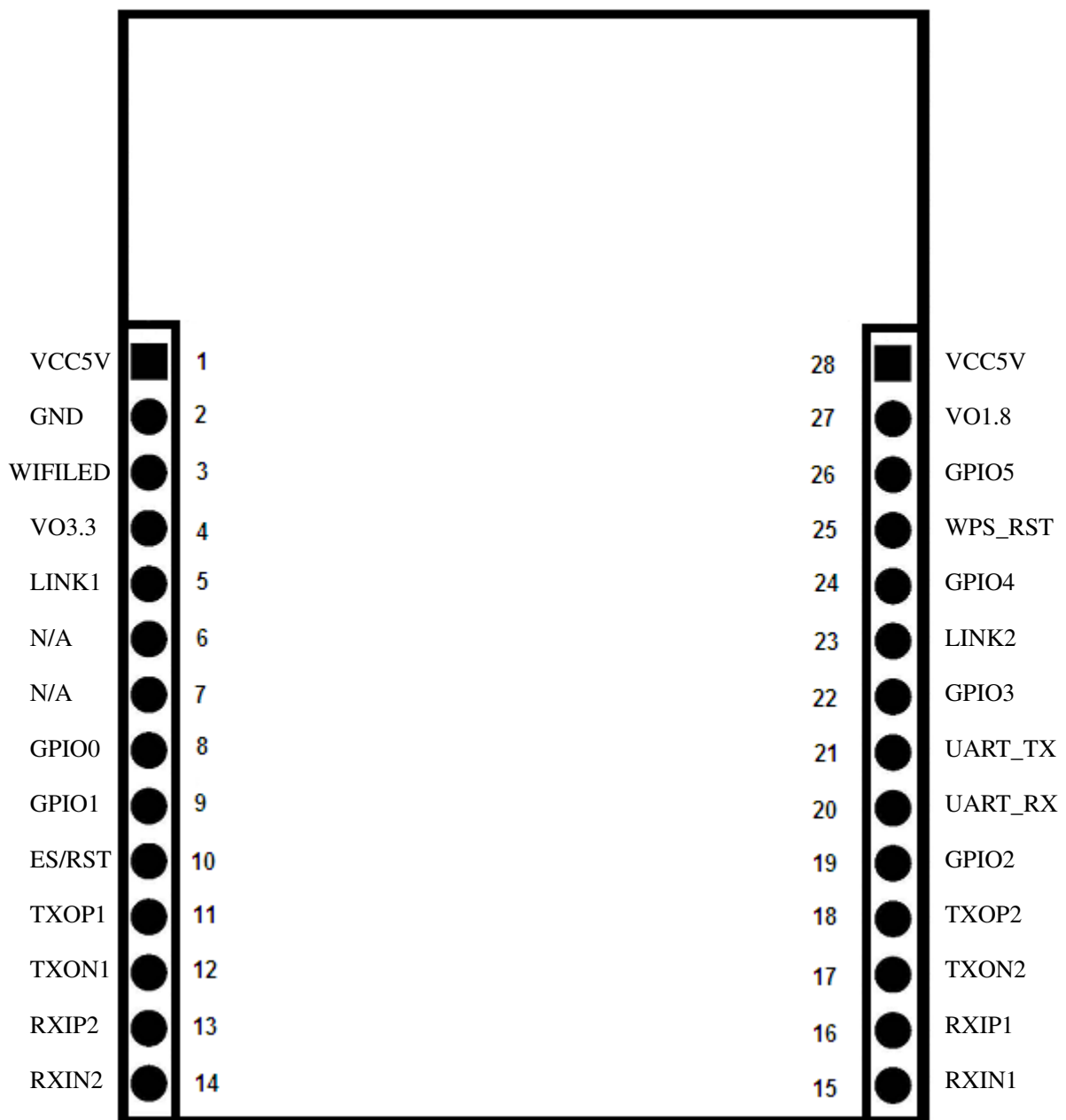


Figure 1: Pin Configuration (top view)

## 4.1. Pin Assignment

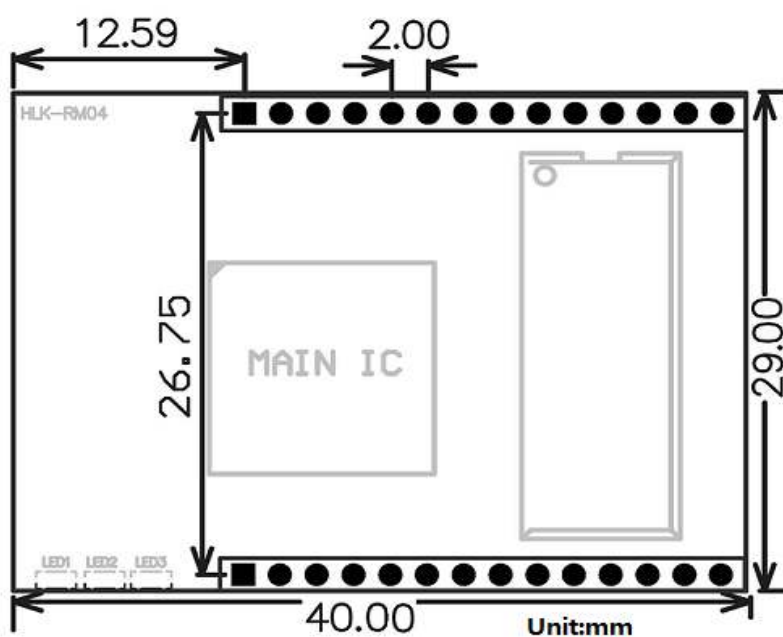
| Pin No | Signal Type | Description  |
|--------|-------------|--|
| 1      | VCC5V       | Supply Voltage, 5V+/-10%                                 |
| 2      | GND         | Analogue Ground  |
| 3      | WIFILED     | WLAN Activity LED  |
| 4      | VO3.3       | 3.3V Output (Suupport Atmost 300mA)                      |
| 5      | LINK1       | 10/100 PHY Port #1 activity LED                          |
| 6      | N/A         | Reserved   |
| 7      | N/A         | Reserved   |
| 8      | GPIO0       | General GPIO Reserved                                    |
| 9      | GPIO1       | General GPIO Reserved                                    |
| 10     | ES/RST      | Exit transparent transmission mode/Restore factory value |
| 11     | TXOP1       | 10/100 PHY Port #1 TXP                                   |
| 12     | TXON1       | 10/100 PHY Port #1 TXN                                   |
| 13     | RXIP2       | 10/100 PHY Port #2 TXP                                   |
| 14     | RXIN2       | 10/100 PHY Port #2 TXN                                   |
| 15     | RXIN1       | 10/100 PHY Port #1 RXN                                   |
| 16     | RXIP1       | 10/100 PHY Port #1 RXP                                   |
| 17     | TXON2       | 10/100 PHY Port #2 OXN                                   |
| 18     | TXOP2       | 10/100 PHY Port #2 OXP                                   |
| 19     | GPIO2       | General GPIO Reserved                                    |
| 20     | UART_RX     | UART RXD.  |
| 21     | UART_TX     | UART TXD.  |
| 22     | GPIO3       | General GPIO Reserved                                    |
| 23     | LINK2       | 10/100 PHY Port #2 activity LED                          |
| 24     | GPIO4       | General GPIO Reserved                                    |
| 25     | WPS/RST     | WiFi Protected Setup /Restore factory value              |
| 26     | GPIO5       | General GPIO Reserved                                    |
| 27     | VO1.8       | 1.8V Output (Suupport Atmost 300mA)                      |
| 28     | VCC5V       | Supply Voltage, 5V+/-10%                                 |

## 5. Electrical Characteristics

Exceeding these conditions will result in damage to the device

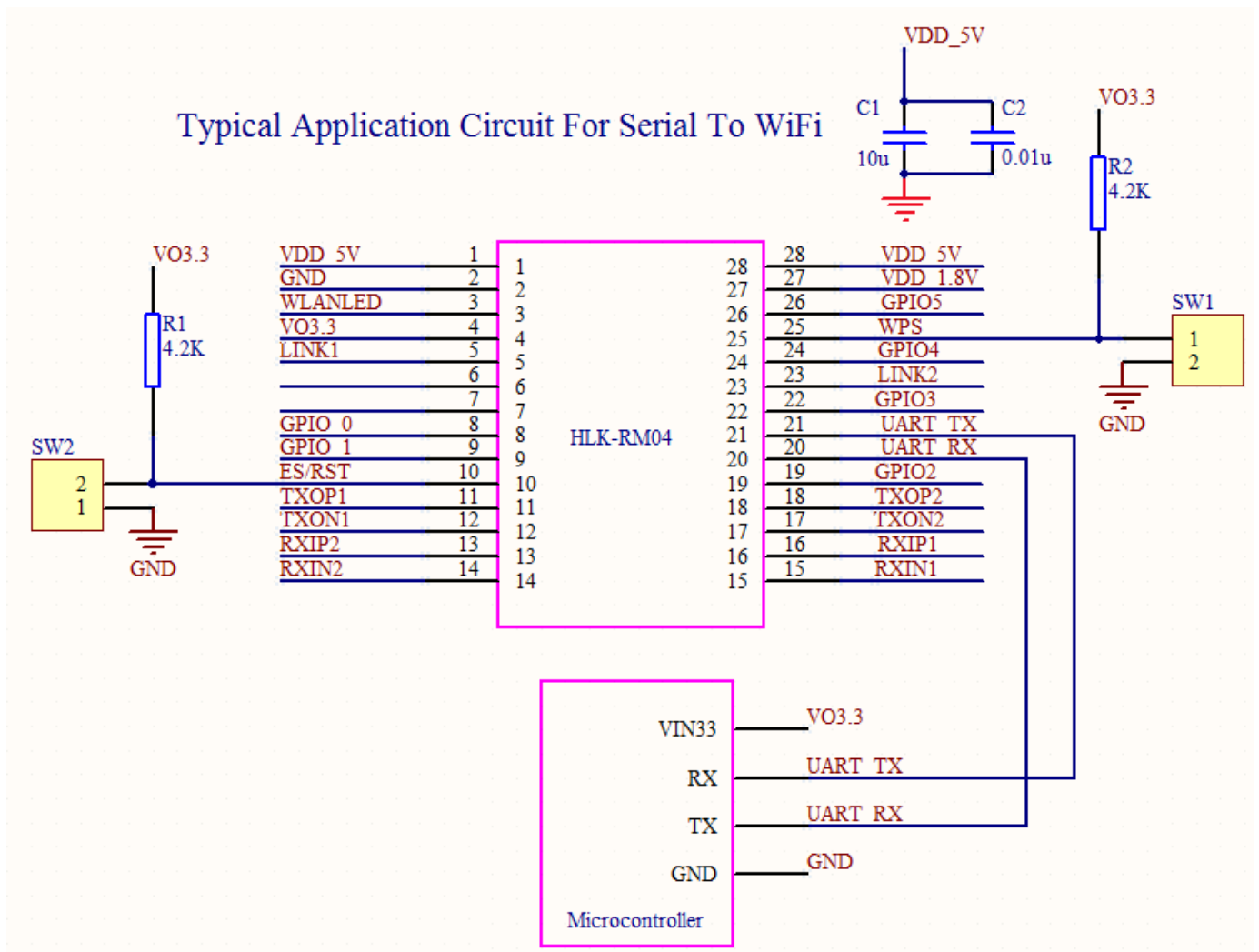
| Parameter                   | Min   | Max  |
|-----------------------------|-------|------|
| Module supply voltage VCC   | 3.9V  | 5.5V |
| Module Voltage Output VO3.3 | 3.1V  | 3.5  |
| Module Voltage Output VO1.8 | 1.65V | 1.9  |
| GPIO Voltage                | 3.1V  | 3.5V |
| Storage temperature         | -40°C | 95°C |

## 6. Outline Drawing



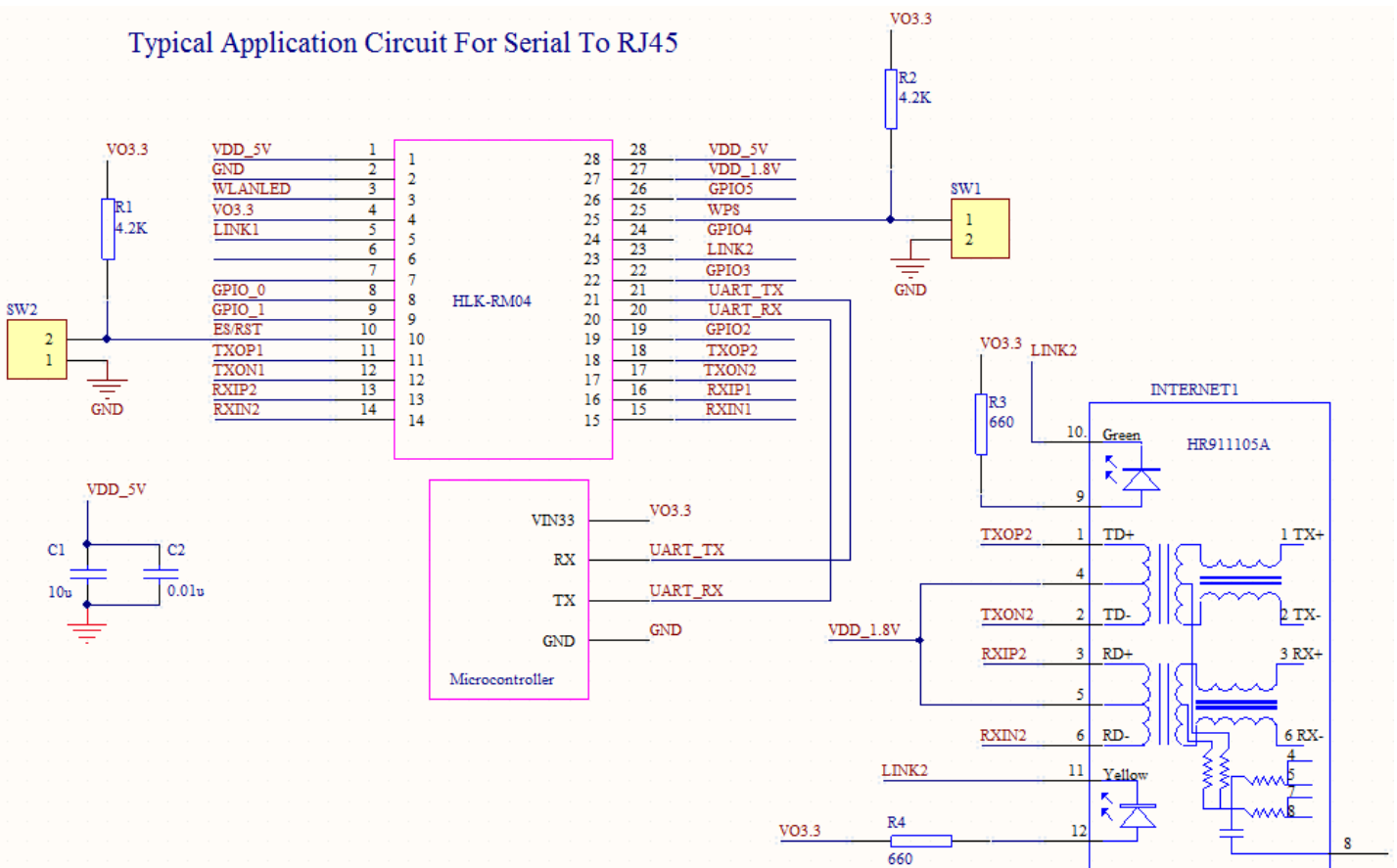
## 7. Typical Application Circuit

### 7.1 Serial To WiFi

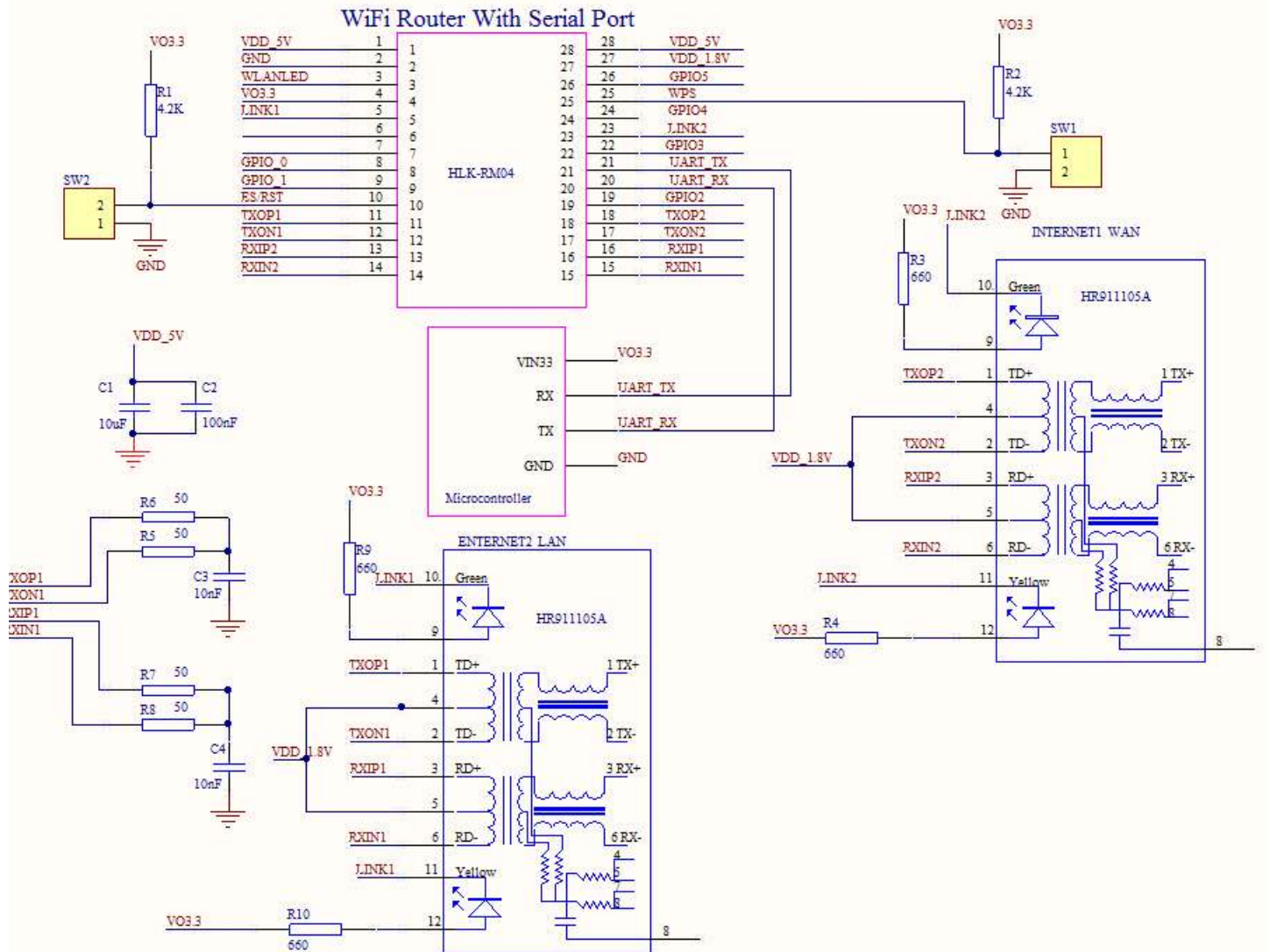


## 7.2 Serial To RJ45

Typical Application Circuit For Serial To RJ45



## 7.3 Wireless Router with Serial port(Default Mode)



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## HLK-RM04 Data Sheet

HLK-RM04-DS V1.2 11/20/2012

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