

# REALTEK

## RTL8305SC

### SINGLE-CHIP 5-PORT 10/100MBPS SWITCH CONTROLLER WITH DUAL MII INTERFACES

### UTP to UTP Application Notes

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**USING THIS DOCUMENT**

This document provides detailed user guidelines to achieve the best performance when implementing a UTP to UTP application with the RTL8305SC 5-port 10/100Mbps Single-Chip Dual MII Switch Controller With Dual MII Interfaces.

Though every effort has been made to ensure that this document is current and accurate, more information may have become available subsequent to the production of this guide. In that event, please contact your Realtek representative for additional information that may help in the development process.

**REVISION HISTORY**

Revision	Release Date	Summary
1.0	2005/03/25	First release.

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## **1. General Description**

This application note provides information and design-specific considerations for system designers interested in implementing point-to-point Ethernet over proprietary, printed circuit board (PCB).

The typical application configurations shown are implemented using Realtek's single chip 10/100 Fast Ethernet Switch and Transceivers.

This application note assumes the reader is familiar with Fast Ethernet, and focuses on the twisted Pair interface and interoperability between the selected transceivers.

Since the Ethernet transceiver applications described here are non-standard, the reader should understand that the resulting configurations are not meant to imply that the magnetic-less interface meets the full intent of compliance with the IEEE 802.3 specification.

### ***1.1. UTP to UTP Termination Networks***

The termination networks referenced for the devices were developed under the following constraints:

- Magnetic-less interface is over 100ohms differential impedance traces.
- PCB trace length does not exceed 10 centimeters.
- 100Base-TX or 10Base-T applications are supported.
- Full-duplex and half-duplex data transmissions are supported.

## 1.2. RTL8305SC & RTL8309SB / RTL8305SC / RTL8201CL(P) / RTL8208B

RTL8305SC UTP to UTP  
connection application (1)

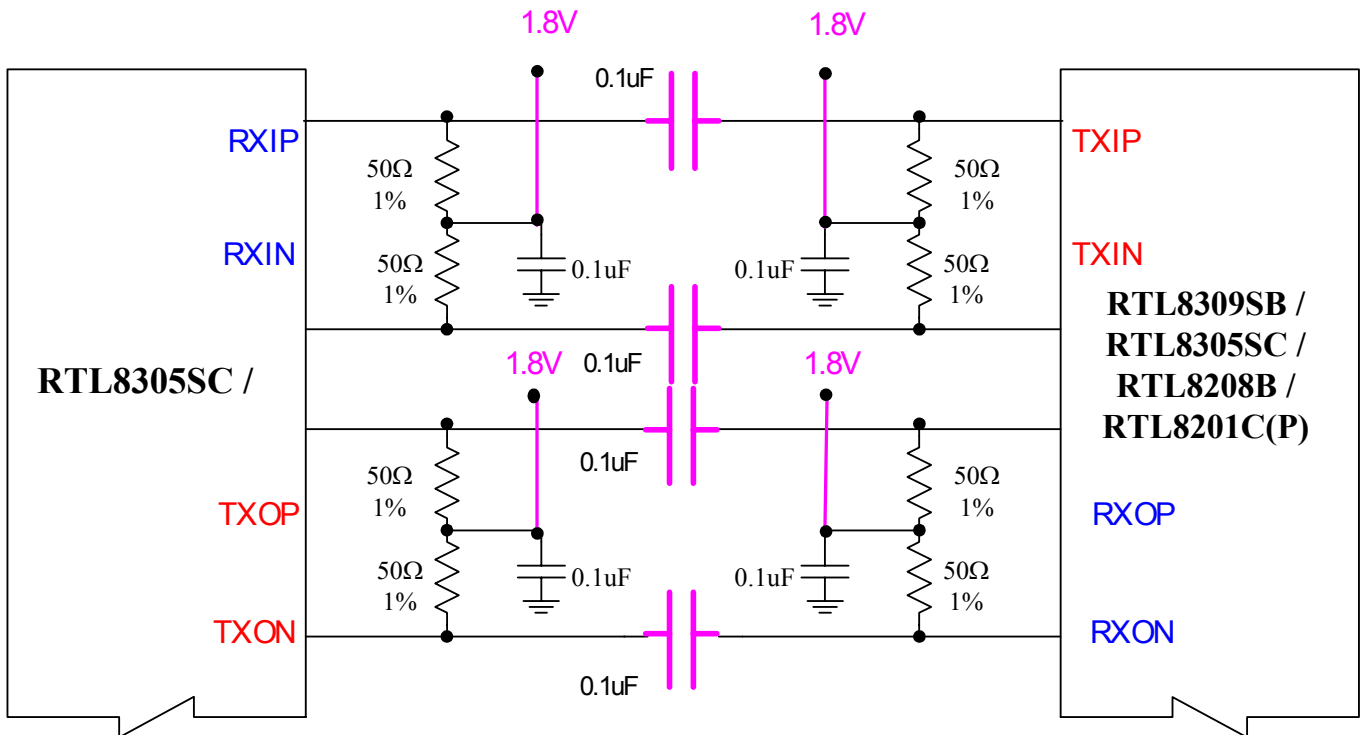
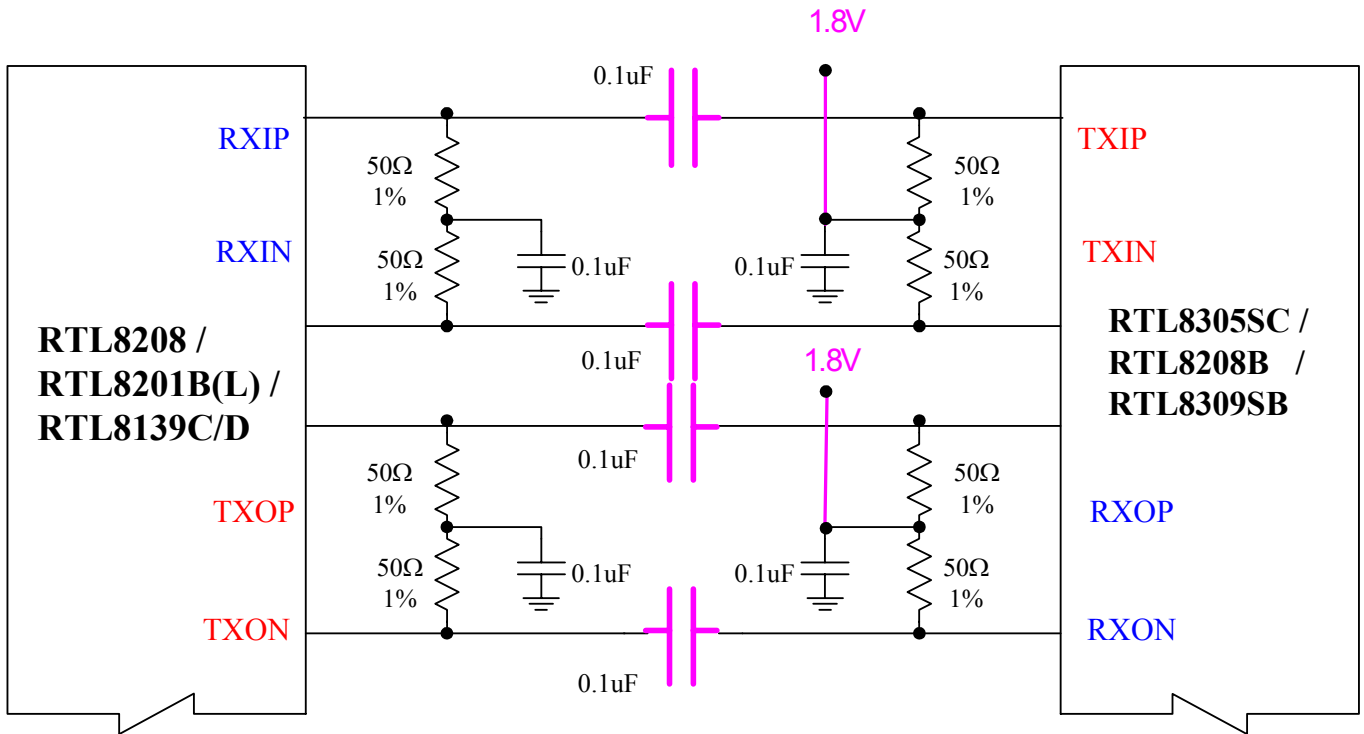


Figure 1. RTL8305SC UTP2UTP Application (1)

**1.3. RTL8305SC & RTL8305SB(Ver.D) / RTL8139C(D) /  
 RTL8201B(L) / RTL8208**

**RTL8305SC UTP to UTP  
 connection application (2)**



**Figure 2. RTL8305SC UTP2UTP Application (2)**

### 1.4. RTL8305SC / RTL8309SB & RTL8019AS

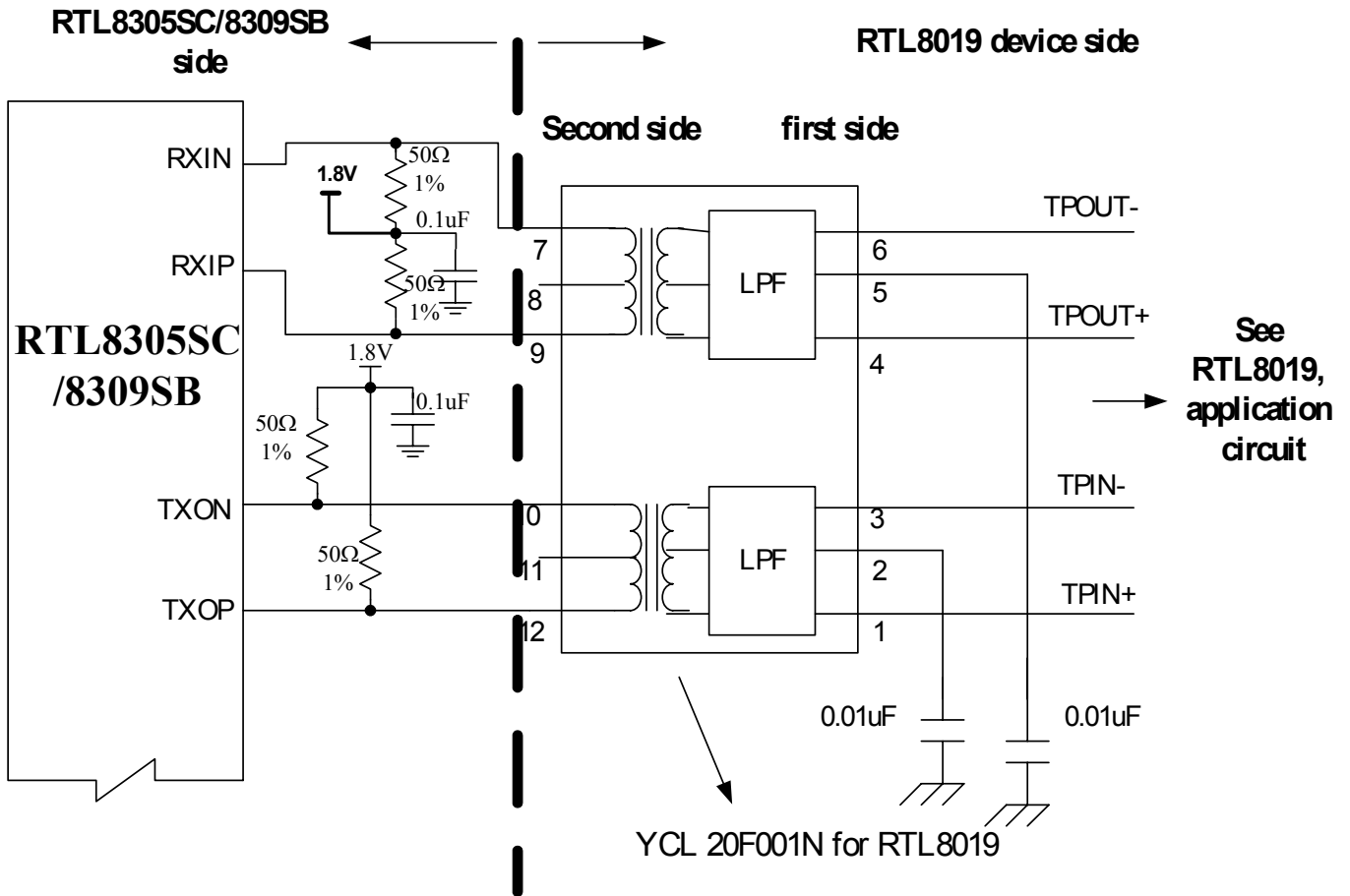


Figure 3. RTL8305SC UTP2UTP Application (3)

## 2. Recommendations

It is recommended that system designers lay out the PCB following the recommendations below:

- The termination circuit should be close to the device.
- Differential traces should be as short as possible.
- Use a 100 ohm differential impedance across the differential pairs.
- Keep sufficient spacing on TXOP(N) / RXIP(N) differential pairs.
- Minimize vias.

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