**REALTEK**

RTL8316C-GR/RTL8316CP-GR RTL8324B-GR/RTL8324BP-GR with RTL8208C-GR

16/24 - PORT 10/100M FAST ETHERNET SWITCH SYSTEM

Application Note

**Draft. V0.1
06 December 2007**



Realtek Semiconductor Corp.
No. 2, Innovation Road II, Hsinchu Science Park, Hsinchu 300, Taiwan
Tel.: +886-3-578-0211. Fax: +886-3-577-6047
www.realtek.com.tw

COPYRIGHT

©2007 Realtek Semiconductor Corp. All rights reserved. No part of this document may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language in any form or by any means without the written permission of Realtek Semiconductor Corp.

DISCLAIMER

Realtek provides this document “as is”, without warranty of any kind, neither expressed nor implied, including, but not limited to, the particular purpose. Realtek may make improvements and/or changes in this document or in the product described in this document at any time. This document could include technical inaccuracies or typographical errors.

TRADEMARKS

Realtek is a trademark of Realtek Semiconductor Corporation. Other names mentioned in this document are trademarks/registered trademarks of their respective owners.

USING THIS DOCUMENT

This document is intended for the software engineer’s reference and provides detailed programming information.

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
0.1	2007/12/06	Draft.

Table of Contents

1. General Description	4
2. Comparison.....	4
2.1. POWER SYSTEM.....	4
2.1.1. Switch controller comparison.....	4
2.1.2. Octal-PHY comparison.....	5
2.2. SYSTEM LED CIRCUIT	6
2.2.1. MAC Enhance Scan LED Driving.....	6
3. Conclusion.....	7

1. General Description

The RTL8316C/RTL8324B-GR Series with RTL8208C-GR 16/24 Port 10M/100M Fast Ethernet Switch system solution is Pin to Pin compatible with the RTL8316B/RTL8324-LF series with RTL8208B-LF system solution. The RTL8316C/RTL8324B-GR Series with RTL8208C-GR system solution could operate at 3.3V or 2.5V power system.

Under the circumstance when 3.3V is used as Figure-1 (for 1.8V BJT Power Solution), no change is required to be made on the circuit board. However, the diode (1N4001) should be removed and replaced by either a short or 0-ohm resistor when 2.5V is supplied as Figure-2 (for 1.8V BJT Power Solution). In addition, for 1.8V BJT Power Solution, the system power consumption and case temperature are improved upon using 2.5V with 1.8V BJT solution.

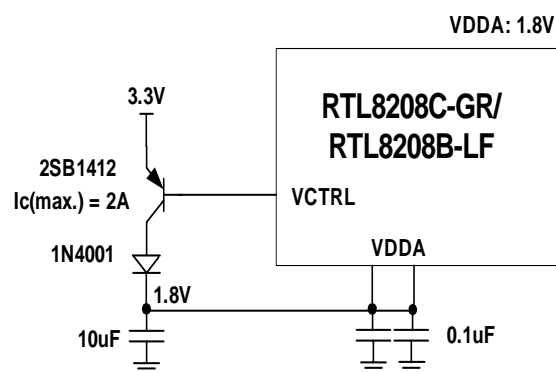


Figure-1 Using a PNP Transistor to transform 3.3V into 1.8V with the Diode

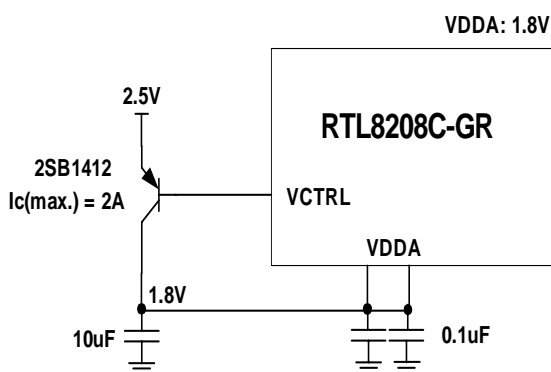


Figure-2 Using a PNP Transistor to transform 2.5V into 1.8V without the Diode

2. Comparison

2.1. Power System

2.1.1. Switch controller comparison

Table 1. MAC Power System Input Comparison

Pin Name	Pin No	RTL8316B/RTL8324-LF Series	RTL8316C /RTL8324B-GR Series
DVDD	10, 14 25, 32 43, 54 60, 71 83, 96, 112, 128	3.3V for digital I/O power.	3.3V for digital I/O power when system operates at 3.3V. 2.5V for digital I/O power when system operates at 2.5V.

Pin Name	Pin No	RTL8316B/RTL8324-LF Series	RTL8316C /RTL8324B-GR Series
RVDD	15 19	To input 3.3V for internal 1.8V regulator used.	To input 3.3V for 1.8V regulator used when system operates 3.3V. To input 2.5V for 1.8V regulator used when system operates 2.5V.
VCTRL	17	VCTRL Pin	NC Pin
NC		Voltage control: This pin controls a PNP transistor base when external BJT solution used. Keeping this pin floating when internal regulator solution used.	The RTL8316B-GR does not support external BJT solution. Keeping this pin floating.
AVDD	59	3.3V for PLL power.	3.3V for PLL power when system operates 3.3V. 2.5V for PLL power when system operates 2.5V.

2.1.2. Octal-PHY comparison

Table 2. PHY Power System Input Comparison

Pin Name	Pin No	RTL8208B-LF	RTL8208C-GR
VCTRL	126	For RTL8324/RTL8316B demo board version 2.1, 1.8V BJT power solution. System operates at 3.3V, the diode (1N4001) is required as Figure-1	For RTL8324/RTL8316B demo board version 2.1, 1.8V BJT power solution. 1. When system operates at 3.3V, the diode (1N4001) is required as Figure-1 . 2. When system operates at 2.5V, the diode (1N4001) should be removed and replaced by either a short or 0-ohm resistor as Figure-2 .
VDDAH	127	3.3V Power input for internal regulator control circuit	Power input for internal regulator control circuit: 1. Connect to 3.3V power rail when system operates at 3.3V. 2. Connect to 2.5V power rail when system operates at 2.5V
VDDO	46 68 103	3.3V Power input for Digital I/O	Power input for Digital I/O: 1. Connect to digital 3.3V power rail for digital I/O power when system operates at 3.3V. 2. Connect to digital 2.5V power rail for digital I/O power when system operates at 2.5V.

2.2. System LED Circuit

2.2.1. MAC Enhance Scan LED Driving

Table 3. MAC Scan LED Circuit Comparison

RTL8316B/RTL8324-LF Series	RTL8316C /RTL8324B-GR Series
Could use BJT to enhance Scan LED driving current as Figure-3.	Scan LED does not need the BJT to enhance the light intensity. <i>Note¹: The BJT could be used (as Figure-3) or not (as Figure-4) when system power operates at 3.3V. <i>Note²: The LED does not recommend with BJT circuit as Figure-3 when system power operate at 2.5V. That would caused LED do not work.</i></i>

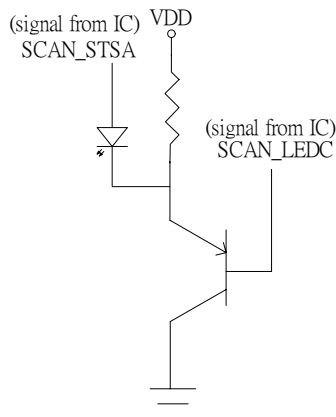


Figure-3 With a PNP BJT Scan LED Solution

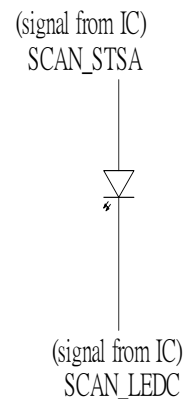


Figure-4 Without a PNP BJT Scan LED Solution

3. Conclusion

Table 4. Conclusion Table

System Voltage	Currently existing circuit RTL8316B/RTL8324-LP Series with RTL8208B-LF	Direct replace by RTL8316C /RTL8324B -GR Series with RTL8208C-GR	Note
3.3V/1.8V power system	RTL8316B/RTL8324 Series Scan LED with BJT	Yes	The lights are enhanced
	RTL8316B/RTL8324 Series Scan LED without BJT	Yes	The lights are enhanced
	RTL8208B Scan/Serial LED	Yes	
3.3V/1.8V power system Change to 2.5V/1.8V power system	RTL8316B/RTL8324 Series Scan LED with BJT	No	The BJT do not work
	RTL8316B/RTL8324 Series Scan LED without BJT	Yes	
	RTL8208B Scan/Serial LED	Yes	It is recommended to reduce the LED damping resistors value as Figure-5 and Figure-6 to meet your requirement.
New design 3.3V/1.8V or 2.5V/1.8V power system	-	-	Please contact Realtek FAE. switchfae @realtek.com.tw

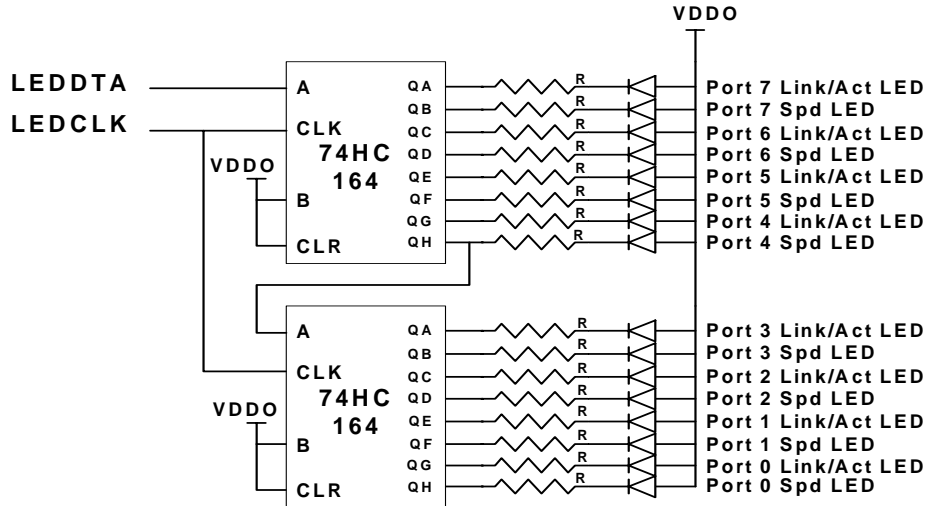


Figure 5 External Circuit for 2-Bit Serial LED Mode

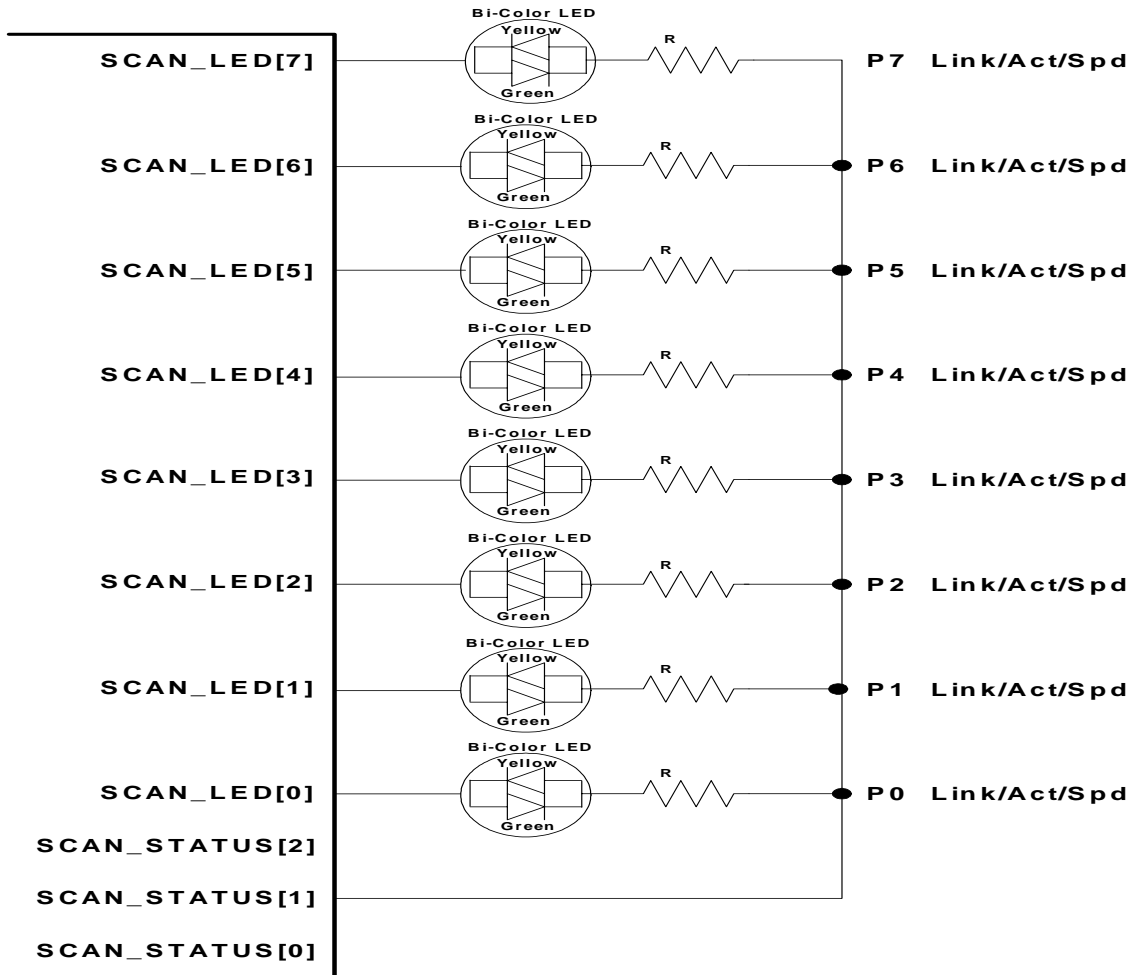


Figure 6 External Circuit for Scan LED Mode 2

Realtek Semiconductor Corp.**Headquarters**

No. 2, Innovation Road II

Hsinchu Science Park, Hsinchu 300, Taiwan

Tel.: +886-3-578-0211. Fax: +886-3-577-6047

www.realtek.com.tw