KSZ8563R

KSZ8563R Silicon Errata and Data Sheet Clarification

This document describes known silicon errata for the Microchip KSZ8563R. The silicon errata discussed in this document are for silicon revisions as listed in Table 1. The silicon revision can be determined by the device's top marking. A summary of KSZ8563R silicon errata is provided in Table 2.

TABLE 1: AFFECTED SILICON REVISIONS

Part Number	Silicon Revision
KSZ8563RNX	B2

TABLE 2: SILICON ISSUE SUMMARY

Item Number	Silicon Issue Summary	Affected Silicon Revisions
1.	When tail tag is enabled, frame length field check fails for 802.3 frames	B2
2.	Port based priority remapping is not supported	B2
3.	Transmission halt with late collisions	B2
4.	LEDx_0 in Single-LED Mode does not indicate link activity	B2
5.	GPIO_2 does not function properly	B2

Silicon Errata Issues

Module 1: When tail tag is enabled, frame length field check fails for 802.3 frames

DESCRIPTION

The comparison of the length field of the Ethernet frame with the actual length of the data field portion of the frame fails for the ingress packets with tail tag. This issue is not applicable to packets with the type field in the frame.

END USER IMPLICATIONS

The packets will be dropped when length check fails for the packet.

Work Around

Disable the length check in bit 3 of the register 0x0330 (Global Switch MAC Control Register 0). The Microchip provided driver disables the length check.

PLAN

This erratum will not be corrected in a future revision.

Module 2: Port based priority remapping is not supported

DESCRIPTION

The 802.1Q-2014 Clause 6 (6.9.4 Regenerating priority) describes the Priority Regeneration Table for the reception port, which is required to support an AVB boundary port. The boundary port in the AVB domain needs to remap the priority field of the incoming traffic.

Since the device do not support port based priority remapping, the port cannot be used as a boundary port.

This erratum is not applicable if all the device ports are AVB domain ports.

END USER IMPLICATIONS

The device port cannot be used as an AVB domain boundary port to networks that utilize the scheduler.

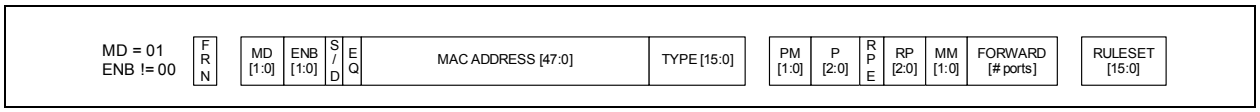
Work Around

A software workaround is available to remap the priority of all the incoming traffic to the port. The workaround uses an ACL (Access Control List) mechanism to remap the priority of the incoming traffic to 0. With the workaround, there is no impact on AVB traffic. If the incoming traffic uses QoS, priorities are also remapped to 0. This may have a minor impact on the QoS traffic (i.e., all the QoS traffic uses one egress queue instead of using the two queues available in the device).The workaround is available in Microchip provided driver software.

Software Workaround:

Program the ACL rule to remap all the incoming layer 2 packets to priority 0 (ACL rule format shown in Figure 1).

FIGURE 1: ACL RULE FORMAT



Rule Description:

MD = 01 : Layer 2
ENB = 10 : Comparison on EtherType value
EQ = 0 & TYPE = 0 : I.e., all packets (condition is when EtherType != 0)
PM = 11 : Always change priority to P[2:0]
P = 0 : Priority value to be changed

PLAN

This erratum will not be corrected in a future revision.

Module 3: Transmission halt with late collisions

DESCRIPTION

Section 4 of the IEEE 802.3 Specification details Carrier Sense Multiple Access / Collision Detection (CSMA/CD) parameters when operating in half-duplex mode. The first 512 bit times are designated as the slotTime, which is the maximum amount of time allowed for a collision to occur. If a link partner is configured incorrectly, where the PHY is linking in half-duplex mode but the MAC is configured in full-duplex mode, there is a chance that the link partner will generate a collision after the first 512 bit times, violating the IEEE 802.3 specification. These late collisions, combined with other factors, can cause the switch port transmitter to lock up and stop sending packets. The receiver will still function.

END USER IMPLICATIONS

If this erratum occurs, the switch will stop transmitting data to the half-duplex port, making it seem the half-duplex link partner has stopped communicating to the network. The more traffic there is, the greater the risk of the violating link partner generating a late collision that will affect the port.

Work Around

Ideally, the link partner that is violating the specification would need to be updated so the MAC and PHY are correctly configured to the same duplex setting. If the link partner cannot be modified to conform to the IEEE 802.3 specification, the switch can be re-configured to full-duplex when late collisions are detected to avoid a lock up condition. Of note, each switch port functions independently. Therefore, any work around must be implemented separately for each port.

Method 1:

To avoid transmitter lock up, when a port is linked in half-duplex mode, the software should monitor the TxLateCollision MIB counter (MIB Index 0x16). If the number is ever non-zero, the software should force the link to function in full-duplex mode by disabling auto-negotiation and setting full-duplex and the appropriate speed in the PHY Basic Control Registers (addresses 0xN100 - 0xN101).

Method 2:

To detect transmitter lock up, the software should monitor the TxByteCnt (MIB Index 0x81) and the RxByteCnt (MIB Index 0x80). If the RxByteCnt is incrementing but the TxByteCnt remains the same, the software should perform a hard reset of the switch.

PLAN

This erratum will not be corrected in a future revision.

Module 4: LEDx_0 in Single-LED Mode does not indicate link activity

DESCRIPTION

The PHY Port (1-2) LEDx_0 does not go low in the presence of link activity when in Single-LED Mode.

END USER IMPLICATIONS

Link activity cannot be determined in Single-LED Mode. However, LEDx_1 will indicate if the link is up or down. The lack of status lends to uncertainty that traffic is passing through the port.

Work Around

No work around exists for Single-LED Mode. Both PHY port LEDs work properly in Tri-Color Dual-LED Mode, which is the default LED mode.

PLAN

This erratum will not be corrected in a future revision.

Module 5: GPIO_2 does not function properly

DESCRIPTION

Pins GPIO_1 and GPIO_2 are intended to output programmed signals that are timed to the internal clock. They may also be used for timestamping of input signals. GPIO_1 functions as intended, but GPIO_2 does not. GPIO_2 outputs a 25MHz clock when link is up on either of the two PHY ports, preventing it's use as a GPIO. If a second GPIO output pin is needed, the LED2_1 pin can be re-assigned for this purpose.

END USER IMPLICATIONS

GPIO_2 cannot be used for input timestamping or for outputting programmed signals. The 25MHz clock output on GPIO_2 cannot be disabled, so it is best to leave the pin unconnected on board designs. LED2_1 can be assigned to take the place of GPIO_2 for output functionality, but this displaces the LED functionality of LED2_1.

There is no alternative for input timestamping on GPIO_2. Input timestamping is available only on GPIO_1, not on any other pins.

Work Around

The output functionality of GPIO_2 can be routed to LED2_1 by setting bit 3 in the LED2_0/LED2_1 Source Register at address 0x0128 - 0x012B.

No other changes are required. When setting up the trigger output units, any output programmed to go to GPIO_2 will output on LED2_1 if the above bit is set. Any of the three trigger units can be used.

PLAN

This erratum will not be corrected in a future revision.

APPENDIX A: DOCUMENT REVISION HISTORY

Revision Level & Date	Section/Figure/Entry	Correction
DS80000787C (12-04-18)	Module 5.	Added new errata.
	Module: “PTP messages get dropped in PTP 2-Step Mode”	Removed errata from document.
DS80000787B (08-17-18)	Modules 3., 4.	Added new errata.
DS80000787A (04-05-18)	All	Initial release.

THE MICROCHIP WEB SITE

Microchip provides online support via our WWW site at www.microchip.com. This web site is used as a means to make files and information easily available to customers. Accessible by using your favorite Internet browser, the web site contains the following information:

- **Product Support** – Data sheets and errata, application notes and sample programs, design resources, user's guides and hardware support documents, latest software releases and archived software
- **General Technical Support** – Frequently Asked Questions (FAQ), technical support requests, online discussion groups, Microchip consultant program member listing
- **Business of Microchip** – Product selector and ordering guides, latest Microchip press releases, listing of seminars and events, listings of Microchip sales offices, distributors and factory representatives

CUSTOMER CHANGE NOTIFICATION SERVICE

Microchip's customer notification service helps keep customers current on Microchip products. Subscribers will receive e-mail notification whenever there are changes, updates, revisions or errata related to a specified product family or development tool of interest.

To register, access the Microchip web site at www.microchip.com. Under "Support", click on "Customer Change Notification" and follow the registration instructions.

CUSTOMER SUPPORT

Users of Microchip products can receive assistance through several channels:

- Distributor or Representative
- Local Sales Office
- Field Application Engineer (FAE)
- Technical Support

Customers should contact their distributor, representative or Field Application Engineer (FAE) for support. Local sales offices are also available to help customers. A listing of sales offices and locations is included in the back of this document.

Technical support is available through the web site at: http://microchip.com/support

Note the following details of the code protection feature on Microchip devices:

- Microchip products meet the specification contained in their particular Microchip Data Sheet.
- Microchip believes that its family of products is one of the most secure families of its kind on the market today, when used in the intended manner and under normal conditions.
- There are dishonest and possibly illegal methods used to breach the code protection feature. All of these methods, to our knowledge, require using the Microchip products in a manner outside the operating specifications contained in Microchip's Data Sheets. Most likely, the person doing so is engaged in theft of intellectual property.
- Microchip is willing to work with the customer who is concerned about the integrity of their code.
- Neither Microchip nor any other semiconductor manufacturer can guarantee the security of their code. Code protection does not mean that we are guaranteeing the product as "unbreakable."

Code protection is constantly evolving. We at Microchip are committed to continuously improving the code protection features of our products. Attempts to break Microchip's code protection feature may be a violation of the Digital Millennium Copyright Act. If such acts allow unauthorized access to your software or other copyrighted work, you may have a right to sue for relief under that Act.

ISBN: 9781522439349

QUALITY MANAGEMENT SYSTEM
CERTIFIED BY DNV
═ ISO/TS 16949 ═

Microchip received ISO/TS-16949:2009 certification for its worldwide headquarters, design and wafer fabrication facilities in Chandler and Tempe, Arizona; Gresham, Oregon and design centers in California and India. The Company's quality system processes and procedures are for its PIC® MCUs and dsPIC® DSCs, KEELOQ® code hopping devices, Serial EEPROMs, microperipherals, nonvolatile memory and analog products. In addition, Microchip's quality system for the design and manufacture of development systems is ISO 9001:2000 certified.

Worldwide Sales and Service

AMERICAS

Corporate Office
2355 West Chandler Blvd.
Chandler, AZ 85224-6199
Tel: 480-792-7200
Fax: 480-792-7277
Technical Support:
http://www.microchip.com/support
Web Address:
www.microchip.com

Atlanta
Duluth, GA
Tel: 678-957-9614
Fax: 678-957-1455

Austin, TX
Tel: 512-257-3370

Boston
Westborough, MA
Tel: 774-760-0087
Fax: 774-760-0088

Chicago
Itasca, IL
Tel: 630-285-0071
Fax: 630-285-0075

Dallas
Addison, TX
Tel: 972-818-7423
Fax: 972-818-2924

Detroit
Novi, MI
Tel: 248-848-4000

Houston, TX
Tel: 281-894-5983

Indianapolis
Noblesville, IN
Tel: 317-773-8323
Fax: 317-773-5453
Tel: 317-536-2380

Los Angeles
Mission Viejo, CA
Tel: 949-462-9523
Fax: 949-462-9608
Tel: 951-273-7800

Raleigh, NC
Tel: 919-844-7510

New York, NY
Tel: 631-435-6000

San Jose, CA
Tel: 408-735-9110
Tel: 408-436-4270

Canada - Toronto
Tel: 905-695-1980
Fax: 905-695-2078

ASIA/PACIFIC

Australia - Sydney
Tel: 61-2-9868-6733

China - Beijing
Tel: 86-10-8569-7000

China - Chengdu
Tel: 86-28-8665-5511

China - Chongqing
Tel: 86-23-8980-9588

China - Dongguan
Tel: 86-769-8702-9880

China - Guangzhou
Tel: 86-20-8755-8029

China - Hangzhou
Tel: 86-571-8792-8115

China - Hong Kong SAR
Tel: 852-2943-5100

China - Nanjing
Tel: 86-25-8473-2460

China - Qingdao
Tel: 86-532-8502-7355

China - Shanghai
Tel: 86-21-3326-8000

China - Shenyang
Tel: 86-24-2334-2829

China - Shenzhen
Tel: 86-755-8864-2200

China - Suzhou
Tel: 86-186-6233-1526

China - Wuhan
Tel: 86-27-5980-5300

China - Xian
Tel: 86-29-8833-7252

China - Xiamen
Tel: 86-592-2388138

China - Zhuhai
Tel: 86-756-3210040

ASIA/PACIFIC

India - Bangalore
Tel: 91-80-3090-4444

India - New Delhi
Tel: 91-11-4160-8631

India - Pune
Tel: 91-20-4121-0141

Japan - Osaka
Tel: 81-6-6152-7160

Japan - Tokyo
Tel: 81-3-6880- 3770

Korea - Daegu
Tel: 82-53-744-4301

Korea - Seoul
Tel: 82-2-554-7200

Malaysia - Kuala Lumpur
Tel: 60-3-7651-7906

Malaysia - Penang
Tel: 60-4-227-8870

Philippines - Manila
Tel: 63-2-634-9065

Singapore
Tel: 65-6334-8870

Taiwan - Hsin Chu
Tel: 886-3-577-8366

Taiwan - Kaohsiung
Tel: 886-7-213-7830

Taiwan - Taipei
Tel: 886-2-2508-8600

Thailand - Bangkok
Tel: 66-2-694-1351

Vietnam - Ho Chi Minh
Tel: 84-28-5448-2100

EUROPE

Austria - Wels
Tel: 43-7242-2244-39
Fax: 43-7242-2244-393

Denmark - Copenhagen
Tel: 45-4450-2828
Fax: 45-4485-2829

Finland - Espoo
Tel: 358-9-4520-820

France - Paris
Tel: 33-1-69-53-63-20
Fax: 33-1-69-30-90-79

Germany - Garching
Tel: 49-8931-9700

Germany - Haan
Tel: 49-2129-3766400

Germany - Heilbronn
Tel: 49-7131-67-3636

Germany - Karlsruhe
Tel: 49-721-625370

Germany - Munich
Tel: 49-89-627-144-0
Fax: 49-89-627-144-44

Germany - Rosenheim
Tel: 49-8031-354-560

Israel - Ra'anana
Tel: 972-9-744-7705

Italy - Milan
Tel: 39-0331-742611
Fax: 39-0331-466781

Italy - Padova
Tel: 39-049-7625286

Netherlands - Drunen
Tel: 31-416-690399
Fax: 31-416-690340

Norway - Trondheim
Tel: 47-7288-4388

Poland - Warsaw
Tel: 48-22-3325737

Romania - Bucharest
Tel: 40-21-407-87-50

Spain - Madrid
Tel: 34-91-708-08-90
Fax: 34-91-708-08-91

Sweden - Gothenberg
Tel: 46-31-704-60-40

Sweden - Stockholm
Tel: 46-8-5090-4654

UK - Wokingham
Tel: 44-118-921-5800
Fax: 44-118-921-5820