

LAN8840 Silicon Errata & Data Sheet Clarification

This document describes known silicon errata for the Microchip LAN8840 device, which include the following variants:

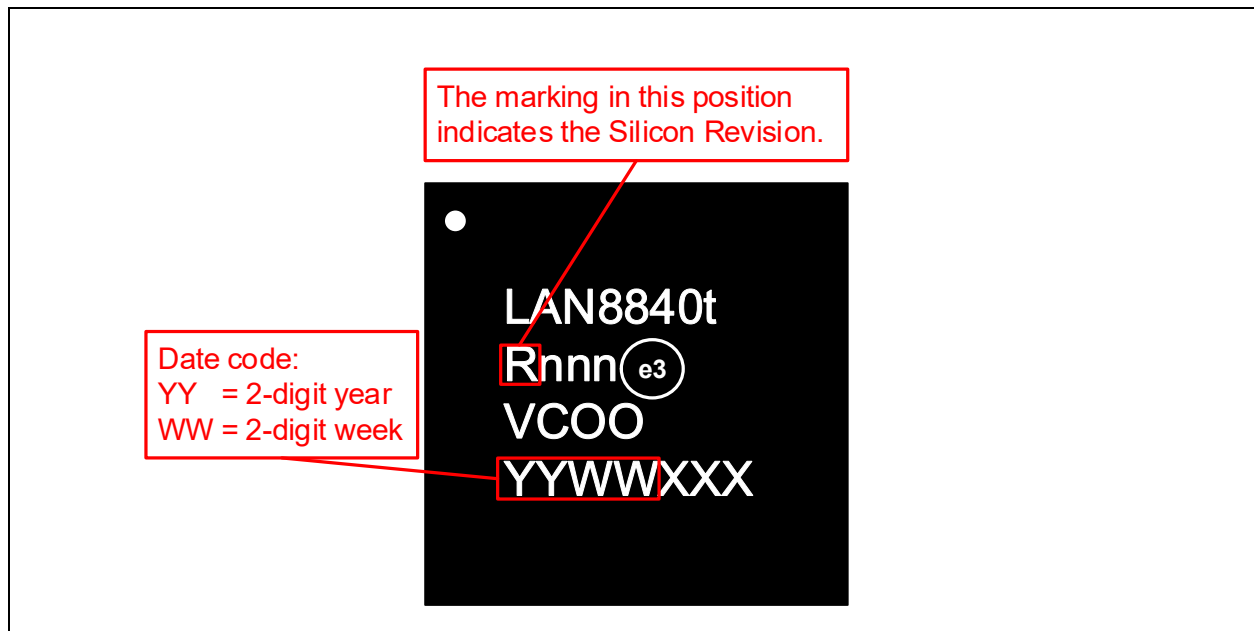
- LAN8840/PSA
- LAN8840V/PSA

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 as indicated in [Figure 1](#). A summary of LAN8840 silicon errata is provided in [Table 2](#).

TABLE 1: AFFECTED SILICON REVISIONS

Part Numbers	Silicon Revision
LAN8840/PSA LAN8840V/PSA	B

FIGURE 1: TOP MARKING DATE CODE INDICATION



Note: The purpose of [Figure 1](#) is to detail the top markings of an example part and highlight the location of the silicon revision code. Other top marking values may differ (lot codes, location of manufacture, etc.).

TABLE 2: SILICON ISSUE SUMMARY

Item Number	Silicon Issue Summary	Affected Silicon Revisions
1.	1000BASE-T Transmitter Distortion fails to meet IEEE compliance specification	B0
2.	Analog front-end not optimized for PHY-side shorted center taps	B0
3.	Register read may be needed after soft reset with 10/100 Link Partner	B0
4.	IEEE Clause 40 PMA compliance tests may fail	B0
5.	LDO tuning adjustment to supply proper VDD/VDDAL range to device	B0
6.	RGMI 100Mbps latency adjustment for PTP timing	B0

Silicon Errata Issues

Module 1: 1000BASE-T Transmitter Distortion fails to meet IEEE compliance specification

DESCRIPTION

The device's 1000BASE-T Transmitter Distortion exceeds the <10mV limit indicated in the IEEE specification.

END USER IMPLICATIONS

It is unlikely this specification failure will impact system performance. The following Application Note provides more details regarding the Gigabit Transmit Distortion test:

<https://www.microchip.com/en-us/application-notes/an3455>

Work Around

None

PLAN

This erratum will not be corrected in a future revision.

Module 2: Analog front-end not optimized for PHY-side shorted center taps

DESCRIPTION

When connecting the PHY to magnetics which short center-tap connections on the PHY-facing winding, the default register settings of the device need to be optimized for better electrical performance.

END USER IMPLICATIONS

When magnetics with shorted center-tap connections are used, register settings should be applied for optimized operation at 10Mbps and 100Mbps speeds. It is expected that the device is configuration strapped for use with shorted center-tap magnetics in such a design. If separate center-tap magnetics are used, then these settings are not needed.

Work Around

Check MMD Address 2, Register 2 bit 14 = 1 (Device is strapped for shorted center-tap magnetics). If this bit is set, the following two registers need configuration to the following values:

MMD Address 1C, Register 45 (MMD 28.69) = 0xBFFC

MMD Address 1C, Register 46 (MMD 28.70) = 0x00AF

PLAN

This erratum will not be corrected in a future revision.

Module 3: Register read may be needed after soft reset with 10/100 Link Partner

DESCRIPTION

After a soft reset, the device can have an issue if the link partner is in 10Mbps or 100Mbps speed. In such a situation, a read of any register will resolve the issue.

END USER IMPLICATIONS

The device will not link after soft reset as the duplex of the link is not resolved. A register read restarts the algorithm to establish the correct duplex mode for a 10/100Mbps link partner. The issue is not seen when the link partner is in auto-negotiation and 1000Mbps capable.

Work Around

A read of any device register after soft reset will resolve the issue.

PLAN

This erratum will not be corrected in a future revision.

Module 4: IEEE Clause 40 PMA compliance tests may fail

DESCRIPTION

The default register settings of the device's 1000BASE-T PMA are sub-optimal, and may result in UNH compliance failures for Clause 40 PMA Transmitter tests. The default register settings of the device require optimization.

END USER IMPLICATIONS

It is recommended to apply the settings unconditionally, for better PHY interoperability performance.

Work Around

The following registers settings will optimize PHY interoperability performance:

MMD Address 1C, Register 1 (MMD 28.1) = 0x0040

MMD Address 1C, Register D (MMD 28.13) = 0x0001

PLAN

This erratum will not be corrected in a future revision.

Module 5: LDO tuning adjustment to supply proper VDD/VDDAL range to device

DESCRIPTION

The device LDO provides VDD/VDDAL voltage slightly out of range using default settings. An LDO adjustment is necessary to provide adequate VDD/VDDAL operating voltage range to the device.

END USER IMPLICATIONS

It is recommended to apply the adjusted settings for designs using the LDO for proper VDD/VDDAL supply to the device. For non-LDO designs, these settings are optional, however these settings will not degrade performance in either LDO designs or non-LDO designs.

Work Around

The following register setting will optimize the LDO for VDD/VDDAL supply:

MMD Address 1C, Register E (MMD 28.14) = 0x1000

PLAN

This erratum will not be corrected in a future revision.

LAN8840

Module 6: RGMII 100Mbps latency adjustment for PTP timing

DESCRIPTION

At 100Mbps speed, the device may have link-to-link RGMII PTP latency variation between 0 ns and 40 ns. This PTP latency variation can be adjusted to between 0 ns and 8 ns. The RGMII PTP latency for 10Mbps or 1000Mbps is under 10 ns without any adjustments necessary.

END USER IMPLICATIONS

For applications which can handle PTP latency variation of up to 40 ns, no additional register setting is necessary. However, for applications which require tighter timing, register settings can improve the variation to a tighter 0 ns to 8 ns range. This improves the 100Mbps RGMII PTP accuracy for such applications.

Work Around

The RGMII 100Mbps PTP timing latency variation can be reduced with the following register writes:

MMD Address 1, Register C6 (MMD 1.198) = 0x0000

MMD Address 0, Register 11 (MMD 0.17) = 0x000A

PLAN

This erratum will not be corrected in a future revision.

APPENDIX A: DOCUMENT REVISION HISTORY

Revision Level & Date	Section/Figure/Entry	Correction
DS80001055A (10-06-22)	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 products:

- Microchip products meet the specifications contained in their particular Microchip Data Sheet.
- Microchip believes that its family of products is secure when used in the intended manner, within operating specifications, and under normal conditions.
- Microchip values and aggressively protects its intellectual property rights. Attempts to breach the code protection features of Microchip product is strictly prohibited and may violate the Digital Millennium Copyright Act.
- Neither Microchip nor any other semiconductor manufacturer can guarantee the security of its code. Code protection does not mean that we are guaranteeing the product is "unbreakable" Code protection is constantly evolving. Microchip is committed to continuously improving the code protection features of our products.

This publication and the information herein may be used only with Microchip products, including to design, test, and integrate Microchip products with your application. Use of this information in any other manner violates these terms. Information regarding device applications is provided only for your convenience and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications. Contact your local Microchip sales office for additional support or, obtain additional support at <https://www.microchip.com/en-us/support/design-help/client-support-services>.

THIS INFORMATION IS PROVIDED BY MICROCHIP "AS IS". MICROCHIP MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL, STATUTORY OR OTHERWISE, RELATED TO THE INFORMATION INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY, AND FITNESS FOR A PARTICULAR PURPOSE, OR WARRANTIES RELATED TO ITS CONDITION, QUALITY, OR PERFORMANCE.

IN NO EVENT WILL MICROCHIP BE LIABLE FOR ANY INDIRECT, SPECIAL, PUNITIVE, INCIDENTAL, OR CONSEQUENTIAL LOSS, DAMAGE, COST, OR EXPENSE OF ANY KIND WHATSOEVER RELATED TO THE INFORMATION OR ITS USE, HOWEVER CAUSED, EVEN IF MICROCHIP HAS BEEN ADVISED OF THE POSSIBILITY OR THE DAMAGES ARE FORESEEABLE. TO THE FULLEST EXTENT ALLOWED BY LAW, MICROCHIP'S TOTAL LIABILITY ON ALL CLAIMS IN ANY WAY RELATED TO THE INFORMATION OR ITS USE WILL NOT EXCEED THE AMOUNT OF FEES, IF ANY, THAT YOU HAVE PAID DIRECTLY TO MICROCHIP FOR THE INFORMATION.

Use of Microchip devices in life support and/or safety applications is entirely at the buyer's risk, and the buyer agrees to defend, indemnify and hold harmless Microchip from any and all damages, claims, suits, or expenses resulting from such use. No licenses are conveyed, implicitly or otherwise, under any Microchip intellectual property rights unless otherwise stated.

Trademarks

The Microchip name and logo, the Microchip logo, Adaptec, AVR, AVR logo, AVR Freaks, BesTime, BitCloud, CryptoMemory, CryptoRF, dsPIC, flexPWR, HELDO, IGLOO, JukeBlox, KeeLoq, Klear, LANCheck, LinkMD, maXStylus, maXTouch, MediaLB, megaAVR, Microsemi, Microsemi logo, MOST, MOST logo, MPLAB, OptoLyzer, PIC, picoPower, PICSTART, PIC32 logo, PolarFire, Prochip Designer, QTouch, SAM-BA, SenGenuity, SpyNIC, SST, SST Logo, SuperFlash, Symmetricom, SyncServer, Tachyon, TimeSource, tinyAVR, UNI/O, Vectron, and XMEGA are registered trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

AgileSwitch, APT, ClockWorks, The Embedded Control Solutions Company, EtherSynch, Flashtec, Hyper Speed Control, HyperLight Load, Libero, motorBench, mTouch, Powermite 3, Precision Edge, ProASIC, ProASIC Plus, ProASIC Plus logo, Quiet-Wire, SmartFusion, SyncWorld, Temux, TimeCesium, TimeHub, TimePictra, TimeProvider, TrueTime, and ZL are registered trademarks of Microchip Technology Incorporated in the U.S.A.

Adjacent Key Suppression, AKS, Analog-for-the-Digital Age, Any Capacitor, AnyIn, AnyOut, Augmented Switching, BlueSky, BodyCom, Clockstudio, CodeGuard, CryptoAuthentication, CryptoAutomotive, CryptoCompanion, CryptoController, dsPICDEM, dsPICDEM.net, Dynamic Average Matching, DAM, ECAN, Espresso T1S, EtherGREEN, GridTime, IdealBridge, In-Circuit Serial Programming, ICSP, INICnet, Intelligent Paralleling, IntelliMOS, Inter-Chip Connectivity, JitterBlocker, Knob-on-Display, KoD, maxCrypto, maxView, memBrain, Mindi, MiWi, MPASM, MPF, MPLAB Certified logo, MPLIB, MPLINK, MultiTRAK, NetDetach, Omniscient Code Generation, PICDEM, PICDEM.net, PCKit, PICTail, PowerSmart, PureSilicon, QMatrix, REAL ICE, Ripple Blocker, RTAX, RTG4, SAM-ICE, Serial Quad I/O, simpleMAP, SimpliPHY, SmartBuffer, SmartHLS, SMART-I.S., storClad, SQI, SuperSwitcher, SuperSwitcher II, Switchtec, SynchroPHY, Total Endurance, Trusted Time, TSHARC, USBCheck, VariSense, VectorBlox, VeriPHY, ViewSpan, WiperLock, XpressConnect, and ZENA are trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.

SQTP is a service mark of Microchip Technology Incorporated in the U.S.A.

The Adaptec logo, Frequency on Demand, Silicon Storage Technology, and Symmcom are registered trademarks of Microchip Technology Inc. in other countries.

GestIC is a registered trademark of Microchip Technology Germany II GmbH & Co. KG, a subsidiary of Microchip Technology Inc., in other countries.

All other trademarks mentioned herein are property of their respective companies.

© 2022, Microchip Technology Incorporated and its subsidiaries.

All Rights Reserved.

ISBN: 9781668313596

For information regarding Microchip's Quality Management Systems, please visit www.microchip.com/quality.



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: 45-4485-5910
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: 49-7131-72400

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