# Product Change Notification - SYST-11YPLB717

**Date:** 12 Jan 2016

**Product Category:** SMSC

**Affected CPNs:** 

**Notification subject:** ERRATA - LAN8740A/LAN8740Ai - Silicon Errata and Data Sheet Clarification Errata Document Revision

**Notification text:**

SYST-11YPLB717

Microchip has released a new DeviceDoc for the LAN8740A/LAN8740Ai - Silicon Errata and Data Sheet Clarification of devices. If you are using one of these devices please read the document located at LAN8740A/LAN8740Ai - Silicon Errata and Data Sheet Clarification.

**Notification Status:** Final

**Description of Change:** Rev A replaces the previous SMSC version Rev. 1.2

**Impacts to Data Sheet:** None

**Reason for Change:** To Improve Productivity

**Change Implementation Status:** Complete

**Date Document Changes Effective:** 12 Jan 2016

**NOTE:** Please be advised that this is a change to the document only the product has not been changed.

**Markings to Distinguish Revised from Unrevised Devices:** N/A

**Attachment(s):** LAN8740A/LAN8740Ai - Silicon Errata and Data Sheet Clarification

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Affected Catalog Part Numbers (CPN)

LAN8740AI-EN-TR

LAN8740AI-EN

LAN8740A-EN-TR

LAN8740A-EN

# LAN8740A/LAN8740Ai
# Silicon Errata and Data Sheet Clarification

This document describes known anomalies for functional revision A and B of the LAN8740A/LAN8740Ai device. The functional revision can be determined by its top marking as indicated in Figure 1 and Figure 2.

**TABLE 1: HARDWARE ERRATAS SUMMARY**

| HARDWARE FUNCTIONAL REV | | DESCRIPTION |
|---|---|---|
| A | B | |
| X | X | Section Module 1 :, "EEE Mode Link Failures with Cables Greater than 100m" |
| X | X | Section Module 2 :, "EEE Mode Link Drops with BCM53125 Link Partner for Cables Less than 20m" |
| X | | Section Module 3 :, "EEE Mode Drops Link with Devices that Do Not Meet the Minimum IEEE 802.3az Transmit Wake Time Specification" |
| X | | Section Module 4 :, "Cable Diagnostics Incorrectly Returns “Open” Cable Condition for Terminated Cable" |
| X | X | Section Module 5 :, "EEE Mode Link Drops with Realtek RTL8305N or RTL8309E Link Partners" |

**Note:** X = Applicable to the Functional Rev.

For the purposes of this anomaly sheet, the part number indicated throughout the document includes an “A”. Though only functional revision B parts contain an “A” in the device part number, this anomaly sheet also applies to the LAN8740 parts. The “A” in the part number is not indicative of the functional revision. Refer to Figure 1 and Figure 2 for the proper identification of the functional revision of a given device.

**FIGURE 1: TOP MARKING FOR FUNCTIONAL REVISION A DEVICE**

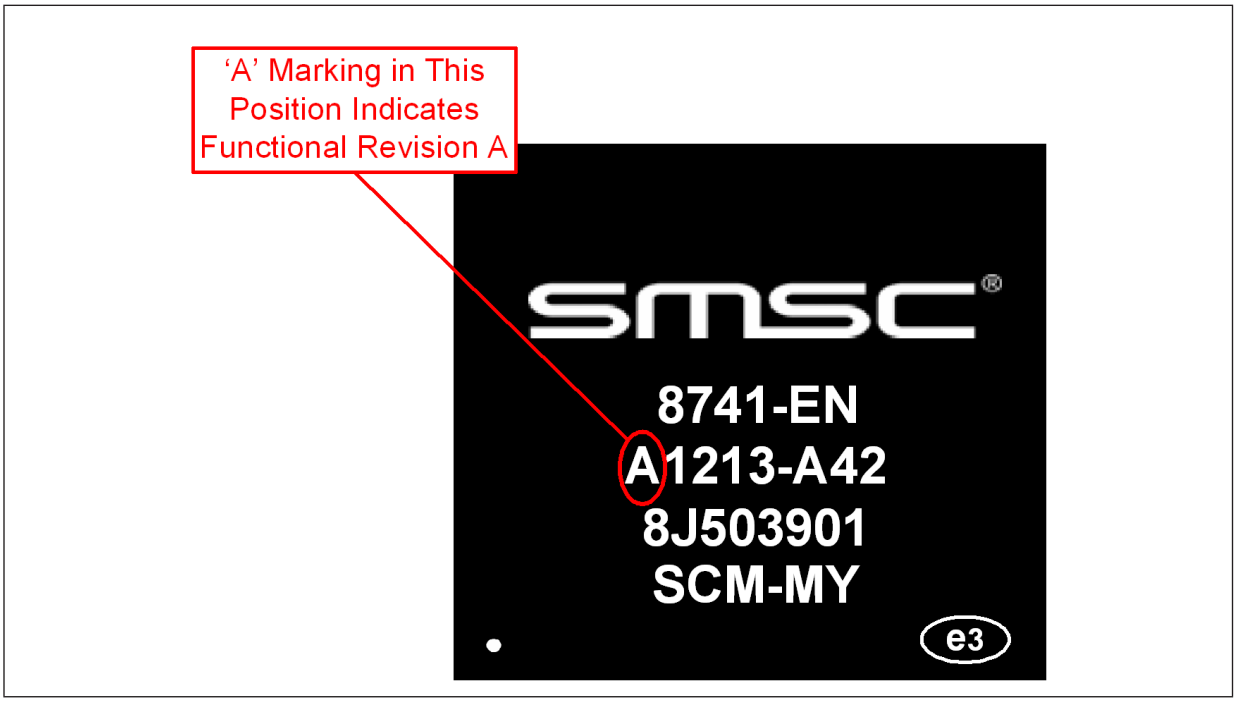
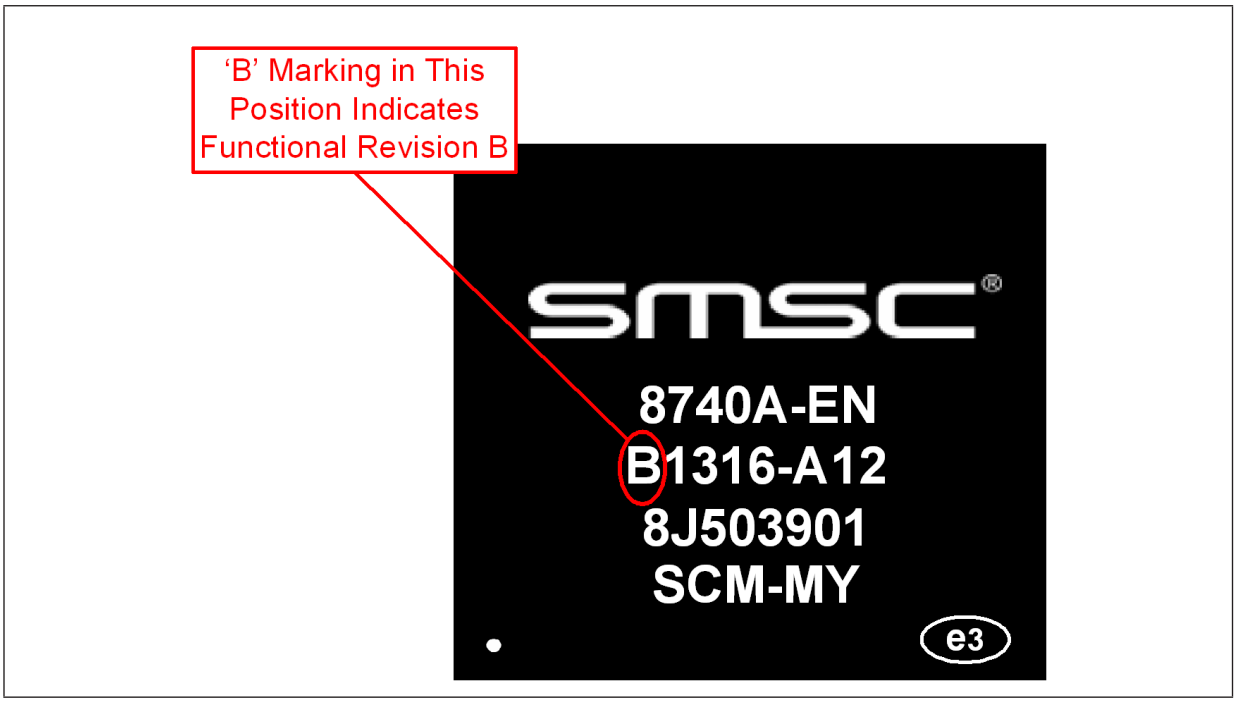



**FIGURE 2: TOP MARKING FOR FUNCTIONAL REVISION B DEVICE**




**Note:** Figure 1 and Figure 2 detail the top markings of example parts. Other than the highlighted revision marking, other top marking values may differ (manufacture date, lot codes, industrial temperature part, etc.)

### Module 1: EEE Mode Link Failures with Cables Greater than 100m

DESCRIPTION

In EEE mode, the device may fail to link or drop link at cable lengths exceeding the IEEE 802.3 specification of 100 meters.

END USER IMPLICATIONS

When in EEE mode, the device may either fail to link or will drop link when using cable lengths greater than the IEEE 802.3 specification of 100 meters. This anomaly does not impact 10Mb or non-EEE operation.

**Work around**

When using EEE mode, limit cable length to 100 meters or less.

PLAN

This will not be addressed in a future revision of the device.

### Module 2: EEE Mode Link Drops with BCM53125 Link Partner for Cables Less than 20m

DESCRIPTION

In EEE mode, the device may drop link when using a Broadcom BCM53125 link partner at cable lengths less than 20 meters.

END USER IMPLICATIONS

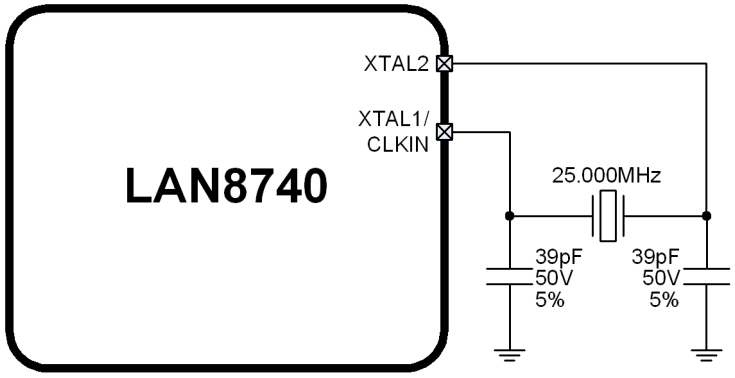
When using a Broadcom BCM53125 link partner in EEE mode, the device may drop link when using cable lengths less than 20 meters. The BCM53125 has exhibited a sensitivity to minute deviations in its link partner's transmit clock frequency during 100Mb EEE operation. This issue is exacerbated at short cable lengths. This anomaly does not impact 10Mb or non-EEE operation.

**Work around**

There are three methods to reduce the likelihood of occurrence:

1. Utilize an Ethernet cable length of greater than 20m.
2. Increase the load capacitors on the LAN8740A/LAN8740Ai external crystal circuit to 39pF and exercise best practices for board layout. Refer to FIGURE 3: for an example external crystal circuit.

**FIGURE 3: EXAMPLE EXTERNAL CRYSTAL CIRCUIT**




3. Use a single-ended 25MHz clock source that meets the LAN8740A/LAN8740Ai specification requirements in lieu of a crystal.

PLAN

This will not be addressed in a future revision of the device.

### Module 3: EEE Mode Drops Link with Devices that Do Not Meet the Minimum IEEE 802.3az Transmit Wake Time Specification

DESCRIPTION

The LAN8740A/LAN8740Ai will not maintain link with devices that do not meet the minimum IEEE 802.3az transmit wake time specification.

END USER IMPLICATIONS

The device will drop link when entering EEE mode. This does not impact 10Mb or non-EEE operation.

**Work around**

The following sequence of PHY register writes may be used as a work-around:

Write PHY Register 0x00: 0x2100
Write PHY Register 0x14: 0x0000
Write PHY Register 0x14: 0x0000
Write PHY Register 0x14: 0x0000
Write PHY Register 0x14: 0x0400
Write PHY Register 0x14: 0x0000
Write PHY Register 0x14: 0x0400
Write PHY Register 0x17: 0x1002
Write PHY Register 0x14: 0x4C00
Write PHY Register 0x17: 0x18BC
Write PHY Register 0x14: 0x4C03
Write PHY Register 0x17: 0x017C
Write PHY Register 0x14: 0x4C04
Write PHY Register 0x17: 0x017C
Write PHY Register 0x14: 0x4C05
Write PHY Register 0x17: 0x017C
Write PHY Register 0x14: 0x4C06
Write PHY Register 0x17: 0x0610
Write PHY Register 0x14: 0x4C08
Write PHY Register 0x17: 0x0270
Write PHY Register 0x14: 0x4C07
Write PHY Register 0x17: 0x0088
Write PHY Register 0x14: 0x4C09
Write PHY Register 0x17: 0x66FF
Write PHY Register 0x14: 0x4C0A
Write PHY Register 0x00: 0x3100

This work-around does not impact interoperability with other IEEE 802.3az compliant devices.

PLAN

This anomaly has been fixed in functional revision B and newer devices.

### Module 4: Cable Diagnostics Incorrectly Returns “Open” Cable Condition for Terminated Cable

#### DESCRIPTION

The TDR Control/Status register bits [10:9] (TDR Channel Cable Type) return 10b indicating an “Open” condition when the cable is properly terminated (connected to a link partner). For a properly terminated cable, this field should return 11b (Match condition).

#### END USER IMPLICATIONS

The TDR does not return 11b for a properly terminated cable. Short and Open conditions are detected and reported correctly. There are no functional implications associated with this anomaly.

**Work around**

The following sequence of PHY register writes may be used as a work-around:

Write PHY Register 0x18: 0x9B9D

Write PHY Register 0x0D: 0x001E

Write PHY Register 0x0E: 0x000B

Write PHY Register 0x0D: 0x401E

Write PHY Register 0x0E: 0x0249

Write PHY Register 0x0D: 0x001E

Write PHY Register 0x0E: 0x000C

Write PHY Register 0x0D: 0x401E

Write PHY Register 0x0E: 0x0132

#### PLAN

This anomaly has been fixed in functional revision B and newer devices.

### Module 5: EEE Mode Link Drops with Realtek RTL8305N or RTL8309E Link Partners

#### DESCRIPTION

In 100Mb EEE mode, the device may infrequently drop link during continuous high-traffic operation when linked to the Realtek RTL8305N or RTL8309E devices.

#### END USER IMPLICATIONS

When using a Realtek RTL8305N or RTL8309E link partner in 100Mb EEE mode, the device may drop link during continuous high-traffic operation. It is unlikely that this behavior will create any user-visible interference to the operation of applications anticipated for the device. This anomaly does not impact 10Mb or non-EEE operation.

**Work around**

No solution is required.

#### PLAN

This will not be addressed in a future revision of the device.

## APPENDIX A: LAN8740A/LAN8740Ai DOCUMENT REVISION HISTORY

| REVISION LEVEL AND DATE | DESCRIPTION |
|---|---|
| DS80000677A (12-3-15) | Rev A replaces the previous SMSC version Rev. 1.2 |
| Rev. 1.2 (06-03-13) | Added functional revision B information. |
| | Added Section Module 5 :, "EEE Mode Link Drops with Realtek RTL8305N or RTL8309E Link Partners" |
| Rev. 1.1 (10-17-12) | Updated Section Module 4 :, "Cable Diagnostics Incorrectly Returns “Open” Cable Condition for Terminated Cable," on page 5 including solution information. Co-branded document with Microchip logo, modified legal disclaimer. |
| | Updated Section Module 3 :, "EEE Mode Drops Link with Devices that Do Not Meet the Minimum IEEE 802.3az Transmit Wake Time Specification," on page 4 solution information |
| | Updated Section Module 2 :, "EEE Mode Link Drops with BCM53125 Link Partner for Cables Less than 20m," on page 3 including end user implications and solution information |
| | Updated Section Module 1 :, "EEE Mode Link Failures with Cables Greater than 100m," on page 3 |
| Rev. 1.0 (05-14-12) | Initial release |

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