

LAN9500A/9500Ai Family Silicon Errata and Data Sheet Clarification

This document describes known anomalies for functional revisions A, B, and C of the LAN9500A/LAN9500Ai device. The functional revision can be determined by its top marking as indicated in [Figure 1](#), [Figure 2](#), and [Figure 3](#).

TABLE 1: SILICON ISSUE SUMMARY

Hardware Functional Rev A	Hardware Functional Rev B	Hardware Functional Rev C	Description
X	X	—	Module 1 : “Device May Not Reset Properly During Power Brownout”
X	X	—	Module 2 : “Surprise Disconnect Triggers Unrecoverable State”
Legend: X = Applicable to the Functional Rev.			

FIGURE 1: TOP MARKING FOR FUNCTIONAL REVISION A DEVICE

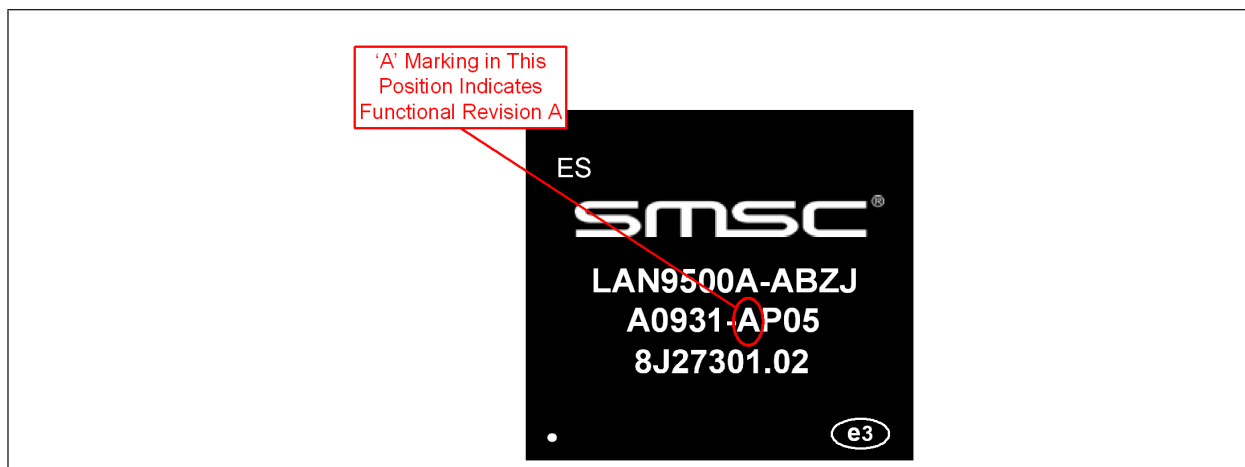
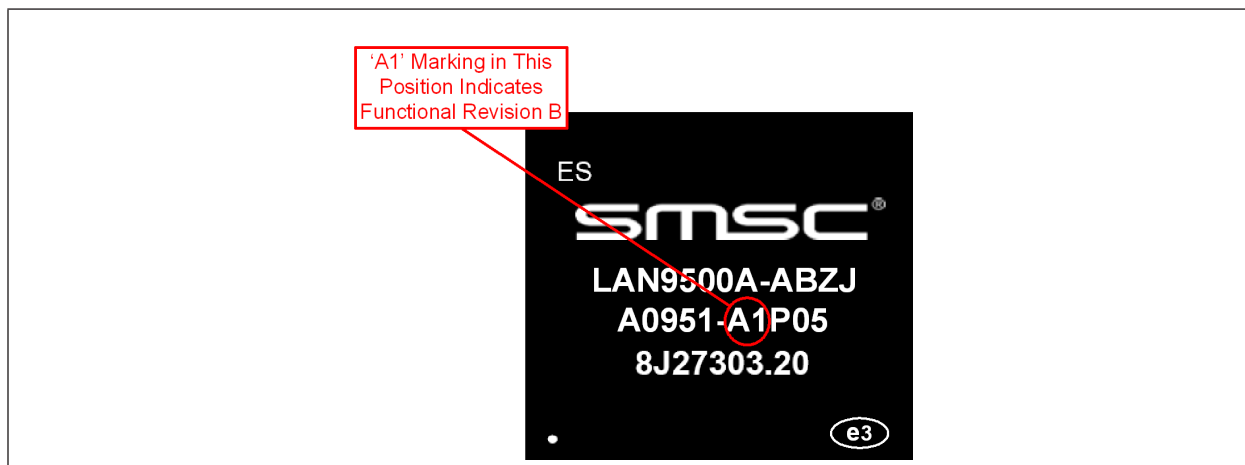
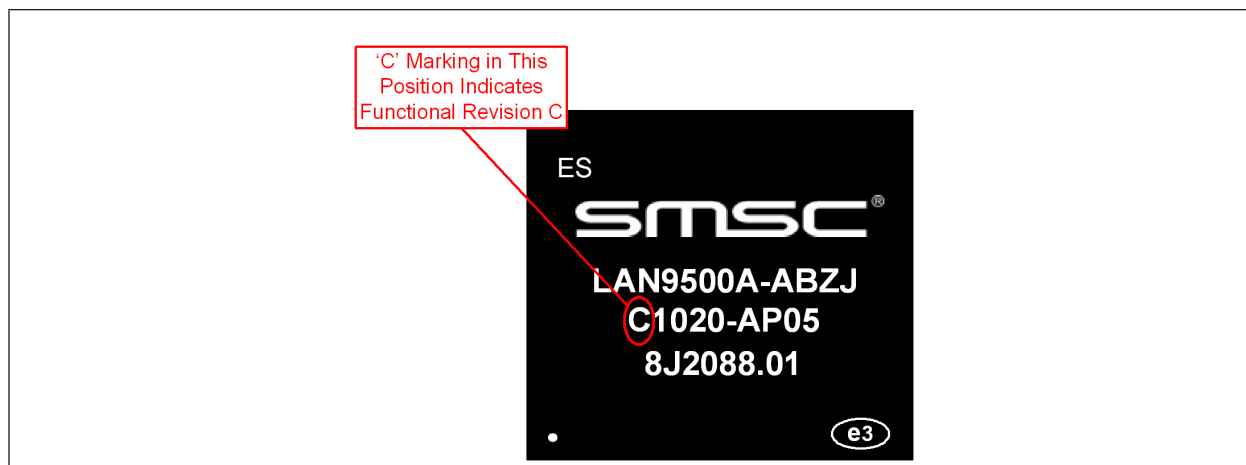


FIGURE 2: TOP MARKING FOR FUNCTIONAL REVISION B DEVICE



LAN9500A/9500Ai

FIGURE 3: TOP MARKING FOR FUNCTIONAL REVISION C DEVICE



Note: Figure 1, Figure 2, and Figure 3 detail the top markings of an example part. Other than the highlighted functional revision marking, other top marking values may differ (manufacture date, lot codes, industrial temperature part, etc.).

Silicon Errata Issue

Module 1: Device May Not Reset Properly During Power Brownout

Description

The LAN9500A/LAN9500Ai device may not reset properly during a power brownout. This can occur when the device's 3.3V power supply drops below ~2.5V, but does not drop to 0V before power returns to operational levels. In this case, the device may improperly latch its configuration straps placing it in an illegal state upon power-up.

The anomaly may manifest itself in bus-powered applications during re-enumeration. In this case, if the upstream controller disables power to the device for a brief period of time (<100mS in a typical system application), decoupling capacitors may not fully discharge keeping the device power between 0 and 2.5V. Upon restoration of power, the LAN9500A/LAN9500Ai may come up in an illegal state.

End User Implications

This issue has minimal implications and is unlikely to create problems in a real-world application. This anomaly has not been seen during normal operation. In a typical operating system environment (for example, a Windows® environment), power to downstream devices is usually disabled for many hundreds of milliseconds during re-enumeration. In this case, the device power is given ample time to drop to reset levels.

To date, this anomaly has only been seen during bus-powered operation while re-enumerating under control of the USB I/F compliance tools and only when operating behind certain hubs. In this case, the tool can disable downstream power for a brief period of time (on the order of 80mS) and will not allow the device power to drop to reset levels.

Solution

A hardware reset (nRESET) assertion or power cycle will clear the condition.

Plan

This anomaly has been fixed in functional revision C.

Module 2: Surprise Disconnect Triggers Unrecoverable State

Description

In self-powered or permanently attached applications where VBUS_DET is permanently tied high, the LAN9500A/LAN9500Ai may enter an unrecoverable state from the CONFIGURED state during a surprise disconnect. This condition may only occur if the surprise disconnect puts the resume signaling on the USB lines between 6mS to 8mS after the USB is idle.

This anomaly is most likely to be seen in permanently attached applications where all of the following conditions are met:

- VBUS_DET is tied high
- The device is located behind a hub
- The upstream port of the hub is detached from the host

End User Implications

In applications that meet the aforementioned criteria, the device may become unresponsive after a surprise disconnect.

Solution

If the device is configured for self-powered operation, pulsing VBUS_DET low for greater than 80mS or asserting nRESET will clear the condition. If the device is configured for bus-powered operation, nRESET must be asserted to clear the condition.

Alternatively, the customer may migrate to functional revision C of the device, which does not exhibit this anomaly.

Plan

This anomaly has been fixed in functional revision C.

LAN9500A/9500AI

APPENDIX A: DOCUMENT REVISION HISTORY

Revision Level & Date	Section/Figure/Entry	Correction
DS80000686A, 01/06/2016	Replaces SMSC version LAN9500A/9500Ai Anomaly Rev. 1.1 (05-26-10).	
Rev. 1.1 (05-26-10)	Entire document.	Added information (top marking, etc.) for Functional Revision B & C.
	Module 1 : “Device May Not Reset Properly During Power Brownout”	Added section.
	Module 2 : “Surprise Disconnect Triggers Unrecoverable State”	Added section.
	Figure 1, Figure 2, and Figure 3	Added clarification to the figures in the TLU section indicating that this anomaly is applicable to functional revision A only.
Rev. 1.0 (09-01-09)	Initial release.	

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