Spartan-6 FPGA LX45 CES Errata

EN117 (v1.5) June 25, 2010 **Errata Notification**

Introduction

Thank you for participating in the Spartan®-6 Engineering Sample Program. As part of this program, we are pleased to provide to you engineering samples of the devices listed in Table 1. Although Xilinx has made every effort to ensure the highest possible quality, these devices are subject to the limitations described in the following errata.

Devices

These errata apply to the Spartan-6 devices shown in Table 1.

Table 1: **Devices Affected by These Errata**

Devices	JTAG ID (Revision Code)
XC6SLX45-2CSG324CES	1
XC6SLX45-2FGG484CES	1

Hardware Errata Details

This section provides a detailed description of each hardware issue known at the release time of this document.

Block RAM

Dual Port Block RAM Address Overlap in READ_FIRST and Simple Dual Port Mode

When using the block RAM in True Dual Port (TDP) READ_FIRST mode or Simple Dual Port (SDP) mode, with different clocks on ports A and B, the user must ensure certain addresses do not occur simultaneously on both ports when both ports are enabled and one port is being written to. Failure to observe this restriction can result in read and/or memory array corruption.

The description is found in the Conflict Avoidance section in v1.2 of UG383, *Spartan-6 FPGA Block RAM Resources User Guide*.

This description was originally added to the *Spartan-6 FPGA Block RAM Resources User Guide*, v1.1, published 10/28/09. This errata is being provided to highlight this change and ensure that all users are aware of this design restriction. ISE® 12.1 software provides appropriate warnings for possible violations of these restrictions.

This issue will not be fixed in silicon.

Work-around

See Answer Record 34533.

9K Simple Dual Port Block RAM Width Restriction

The Spartan-6 FPGA RAMB8BWER in Simple Dual Port (SDP) mode (RAM_MODE=SDP) only supports the 36-bit data width on both ports. Failure to set both ports to 36 bits (DATA_WIDTH_A=36, DATA_WIDTH_B=36) can result in data corruption.

The description is found in the Possible Configurations section in v1.2 of UG383, *Spartan-6 FPGA Block RAM Resources User Guide*.

This description was originally added to the *Spartan-6 FPGA Block RAM Resources User Guide*, v1.2, published 02/23/10. This errata is being provided to highlight this change and ensure that all users are aware of this design restriction. ISE 12.1 software provides appropriate warnings for possible violations of these restrictions.

This issue will not be fixed in silicon.

Work-around

See Answer Record 34541.

Memory Controller Block (MCB)

MCB Performance

DS162, *Spartan-6 FPGA Data Sheet: DC and Switching Characteristics* (v1.5 or later) includes new data rate specifications for DDR2 and DDR3 interfaces implemented with the MCB. The new data rates are supported in the Standard MCB performance mode when operating within the standard V_{CCINT} recommended operating conditions. In addition, a new Extended MCB performance mode has been introduced with V_{CCINT} operating conditions that allow the MCB to operate at the originally specified performance.

Table 2: **MCB Performance Specification Comparison**

Performance Specification	V_{CCINT} Operating Range	DDR2 / DDR3 Performance
		-2
Original (No Longer Supported)	1.14V – 1.26V	667 Mb/s
New (Standard Performance)	1.14V – 1.26V	625 Mb/s
New (Extended Performance)	1.2V – 1.26V	667 Mb/s

This errata is being provided to highlight this change and ensure that all MCB users are aware of the new performance modes and specifications. The ISE 12.2 software (with MIG 3.5) will provide support for selection and timing validation of the new Standard and Extended MCB performance modes. Prior to the ISE 12.2 software release, these modes can be used by adhering to the correct V_{CCINT} range and ensuring that MIG tool selections are made in compliance with the new performance specifications.

Answer Record 35818 contains additional information.

MCB Calibration

For the devices listed in Table 1, for designs using Calibrated Input Termination, use the pin locations in Table 3 for the RZQ reference resistor.

Table 3: **Required RZQ Pins**

Package	MCB Bank 1	MCB Bank 3
CSG324	Pin M14	Pin L6
FGG484	Pin M19	Pin K7

MCB and Suspend

In the devices listed in Table 1, the MCB does not support the self-refresh mode of the external memory during FPGA Suspend.

MCB Address Bus Hold Time

In the devices listed in Table 1, some bits of the MCB address bus (mcbx_dram_addr) can violate the input hold time (t_{IH}) specification of the memory device.

Work-around

See Answer Record 34089.

DCM Minimum Frequency

The Digital Clock Manager (DCM_SP or DCM_CLKGEN) minimum frequency does not meet the data sheet specifications in the devices listed in Table 1. The following specifications deviate from the data sheet:

- CLKIN_FREQ_DLL Min: 25 MHz
- CLKOUT_FREQ_CLK0 Min: 25 MHz
- CLKOUT_FREQ_CLK90 Min: 25 MHz
- CLKOUT_FREQ_2X Min: 50 MHz
- CLKOUT_FREQ_DV Min: 1.6 MHz
- CLKIN_FREQ_FX Min: 0.8 MHz
- CLKOUT_FREQ_FX Min: 25 MHz
- CLKOUT_FREQ_FXDV: 0.8 MHz

Device DNA

Device DNA is not supported in the devices listed in Table 1. Do not use this feature.

Readback CRC

Readback CRC for SEU detection (POST_CRC) is not supported in the devices listed in Table 1.

Operational Guidelines

Design Software Requirements

The devices listed in Table 1, unless otherwise specified, require the following Xilinx development software installation.

- Speed specification v1.01 (or later), Xilinx ISE® Design Suite 11.3 (or later).
- Upgrading to ISE 12.1 or later is recommended.

Operating Conditions Required when Using I/O Delay Variable Mode

In the devices listed in Table 1, when using I/O Delay Variable Mode, the operating conditions must be:

- V_{CCINT} = 1.20V to 1.26V
- Junction temperature (T_J) = 25°C to 85°C

The I/O delay variable mode (also known as I/O delay calibration and reset) is used when the IODELAY2 CAL or RST are used or when IODELAY2 IDELAY_TYPE attribute is set to VARIABLE_FROM_ZERO, VARIABLE_FROM_HALF_MAX, or DIFF_PHASE_DETECTOR.

Traceability

The XC6SLX45 is marked as shown in Figure 1. The other devices listed in Table 1 are marked similarly.

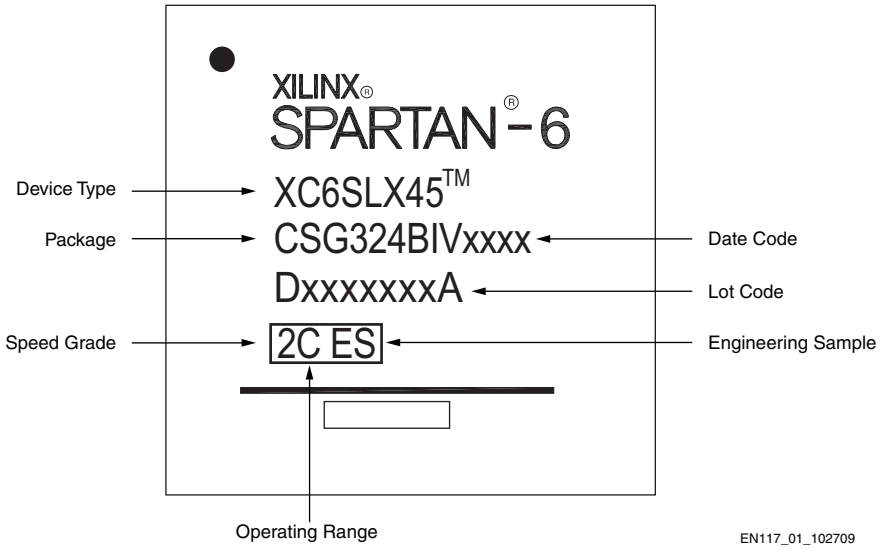

Figure 1: **XC6SLX45-2CSG324CES Marking**

Additional Questions or Clarifications

For additional questions regarding these errata, contact Xilinx Technical Support: http://www.xilinx.com/support/clearexpress/websupport.htm or your Xilinx Sales Representative: http://www.xilinx.com/company/contact.htm.

Revision History

Date	Version	Description
09/28/09	1.0	Initial Xilinx release.
10/14/09	1.1	Improved DCM Minimum Frequency with reduced specifications. Removed the Quiescent Current operational guideline because it is not a deviation from existing specifications; see Answer Record 33641 for more information on quiescent current.
11/02/09	1.2	Added MCB and Suspend and Readback CRC.
02/17/10	1.3	Added MCB Address Bus Hold Time.
05/07/10	1.4	Added Dual Port Block RAM Address Overlap in READ_FIRST and Simple Dual Port Mode and 9K Simple Dual Port Block RAM Width Restriction sections.
06/25/10	1.5	Added MCB Performance. Updated Design Software Requirements.

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