

## Introduction

Thank you for designing with the Xilinx Virtex®-6 family of devices. Although Xilinx has made every effort to ensure the highest possible quality, the devices listed in [Table 1](#) are subject to the limitations described in the following errata.

## Devices

These errata apply to the devices shown in [Table 1](#).

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

Devices	XC6VLX760	JTAG ID (Revision Code): 2 or later
	XC6VLX550T	JTAG ID (Revision Code): 0 or later
	XC6VLX365T	JTAG ID (Revision Code): 0 or later
	XC6VLX240T	JTAG ID (Revision Code): 4 or later
	XC6VLX195T	JTAG ID (Revision Code): 4 or later
	XC6VLX130T	JTAG ID (Revision Code): 4 or later
	XC6VLX75T	JTAG ID (Revision Code): 4 or later
	XC6VSX475T	JTAG ID (Revision Code): 4 or later
	XC6VSX315T	JTAG ID (Revision Code): 4 or later
	XC6VHX250T	JTAG ID (Revision Code): 2 or later
	XC6VHX255T	JTAG ID (Revision Code): 4 or later
	XC6VHX380T	JTAG ID (Revision Code): 4 or later
	XC6VHX565T	JTAG ID (Revision Code): 2 or later
Packages	All	
Speed Grades	All	

## Hardware Errata Details

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

### MMCM

#### ***Restriction of Frequency Range for Bandwidth = HIGH or OPTIMIZED***

When the Phase Frequency Detector (PFD) frequency (FIN/D) is lower than 135 MHz and the BANDWIDTH attribute of the MMCM is set to HIGH or OPTIMIZED, a phase error between MMCM output clocks can occur, making the output clock signals invalid. This condition can also cause the fractional output counter to fail.

The ISE® software v12.4 and later provides appropriate warnings for possible violations of this restriction.

The ISE software v12.4 and later correctly handles designs set to OPTIMIZED bandwidth for all valid PFD frequencies.

This issue will not be fixed in the devices listed in [Table 1](#).

#### **Work-around**

PFD frequencies lower than 135 MHz must use LOW bandwidth mode to ensure correct operation.

See [Answer Record 38132](#) for more information.

## Restriction of Clock Divider Values

The input clock divider (DIVCLK\_DIVIDE) cannot have a value of 3 or 4 when the input clock frequency ( $F_{IN}$ ) of the MMCM is above 315 MHz.

The ISE software v12.4 and later provides appropriate warnings for possible violations of this restriction.

This issue will not be fixed in the devices listed in [Table 1](#).

### Work-around

In all designs in which  $F_{IN}$  is above 315 MHz and DIVCLK\_DIVIDE is set to 3 or 4, double the CLKFBOUT\_MULT\_F and DIVCLK\_DIVIDE values. See [Answer Record 38133](#) for more information.

## 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, Simple Dual Port (SDP) mode, or ECC 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 v1.3.1 (or later) of [UG363](#), *Virtex-6 FPGA Memory Resources User Guide*.

This description was originally added in UG363 (v1.1), published 9/16/09. This errata is being provided to highlight this change and ensure that all users are aware of this design restriction. The ISE v12.1 software and later provides appropriate warnings for possible violations of these restrictions.

This issue will not be fixed in the devices listed in [Table 1](#).

### Work-around

The recommended work-around is to configure the block RAM in WRITE\_FIRST mode. WRITE\_FIRST mode is available in block RAMs configured in TDP mode in all ISE software versions. WRITE\_FIRST mode is available in block RAMs configured in SDP mode from ISE v12.2 and later. See [Answer Record 34859](#).

## Synchronous Built-in FIFO

When using the Built-In FIFO as a Synchronous FIFO (EN\_SYN=TRUE) with asynchronous reset, correct behavior of the FIFO flags cannot be guaranteed after the first write.

All configurations other than EN\_SYN=TRUE are not affected by this issue.

### Work-arounds

To work around this issue, synchronize the negative edge of reset to RDCLK/WRCLK.

For more information and additional work-arounds see [Answer Record 41099](#).

## Configuration

### PROGRAM\_B Pin Behavior During Power-On

Holding the PROGRAM\_B input statically Low prior to the completion of the power-on reset does not hold the FPGA in configuration reset. Instead, the FPGA proceeds with its standard power-on configuration sequence.

This issue will not be fixed in the devices listed in [Table 1](#).

### Work-around

For systems that need to delay the FPGA configuration sequence at power-on, hold the INIT\_B pin Low.

See [Answer Record 38134](#) for more information.

## ***Input Logic Resets Using GSR***

When coming out of configuration after power-up or after asserting the PROGRAM\_B\_0 pin, the ILOGIC input registers (IFF, IDDR, and ISERDES) are not guaranteed to be initialized to zero. The same holds true if the GSR input of the STARTUP\_VIRTEX6 block is used to reset the ILOGIC input registers. Initializing the registers to a one (using the "INIT=1" attribute) works as expected.

### **Work-around**

If the user application requires the input registers to be initialized to zero, then a separate reset using general interconnect must be implemented.

## ***GTX Transceivers (Does not apply to the LX760 Device)***

### ***GTX Transceiver Initialization for Proper TXOUTCLK Functionality***

TXOUTCLK can operate at an incorrect frequency or can remain in a static state when the TXPLL\_DIVSEL\_OUT attribute is set to 2 or 4 and the TXOUTCLK\_CTRL attribute is set to "TXOUTCLKPCS", "TXOUTCLKPMA\_DIV1", or "TXOUTCLKPMA\_DIV2".

An updated reset sequence that ensures proper functionality is documented in version 2.4 of [UG366](#), *Virtex-6 FPGA GTX Transceiver User Guide*. Also see [Answer Record 35681](#) for more information.

### ***RXRECCLK Static Operating Behavior***

The RXRECCLK output port might operate at reduced frequency in buffer bypass mode if conditions (1) and (2) persist for more than 15,000 cumulative hours at 65°C Tj, 2,500 cumulative hours at 85°C Tj, or 800 cumulative hours at 100°C Tj:

1. Power has been applied to V<sub>CCINT</sub>.
2. The device is in one of the following states:
  - a. The FPGA is not configured
  - b. The FPGA is configured, but the transceiver is uninstantiated
  - c. The transceiver is instantiated, but no reference clock is toggling
  - d. The transceiver is instantiated, but is held in reset or power-down

### **Work-around**

#### ***Transceivers Uninstantiated in User Design but are Planned to be Used in the Future***

For transceivers that are not instantiated in the user design but are planned to be used in the future, power must be applied to MGTAVCC, and the user design must be implemented using ISE v12.1 (or later) software for automatic insertion of the work-around circuit.

#### ***Transceivers Uninstantiated in User Design but are Not Planned to be Used in the Future***

Automatic insertion of the work-around circuit can be disabled for uninstantiated transceivers that will not be used.

#### ***Transceivers Instantiated in User Design***

Transceivers instantiated in user design do not require a work-around circuit if the reference clock is toggling and the transceiver is not held in reset or power-down.

See [Answer Record 35055](#) for more information.

## ***GTX Transceiver Delay Aligner***

The GTX Transceiver Delay Aligner circuit is used when the TX Buffer and/or RX Elastic Buffer are bypassed.

The Transmitter Delay Aligner is no longer supported; additionally, the use model of the Receiver Delay Aligner must be changed.

Applications that use the TX Buffer and RX Elastic Buffer are not affected by this errata item.

Applications currently bypassing the TX Buffer and/or RX Elastic Buffer, including XAUI, RXAUI, CPRI, OBSAI, and PLBv46 RC/EP Bridge for PCI Express® IP cores and the Integrated Block for PCIe, must implement the following work-around.

### **Work-around**

The TX Buffer and RX Elastic Buffer can still be bypassed using work-arounds described in [Answer Record 39430](#) to maximize system margin.

## ***GTH Transceivers (Applies to all devices with GTH Transceivers)***

Refer to [Answer Record 40885](#) for updates regarding production silicon.

### ***T\_BLOCK\_TYPE Misclassification in 10 Gigabit Ethernet 64B/66B Mode***

The GTH transceiver implements a 10 Gigabit Ethernet 64B/66B block based on IEEE Std 802.3-2008 Clause 49. The GTH transceiver deviates from the T\_BLOCK\_TYPE classification requirements in Subclause 49.2.13.2.3.

In Subclause 49.2.13.2.3, an excerpt of T\_BLOCK\_TYPE states that:

T\_BLOCK\_TYPE will = C when: "one valid ordered set and four valid control characters other than /O/, /S/ and /T/."

The GTH 64B/66B encoder implements the following:

T\_BLOCK\_TYPE will = C when: "one valid ordered set and four valid control characters other than /E/, /O/, /S/ and /T/."

This behavior will only occur when a 64-bit XGMII TX word contains an ordered sequence/signal in one half and has one or more /E/ bytes in the other half of the word. This is avoidable at a user application level while still operating within the 10 Gigabit Ethernet specification. The 10GBASE-R core from Xilinx handles this issue correctly.

## **System Monitor**

### ***System Monitor Maximum DCLK Frequency***

The System Monitor intermittently generates an incorrect analog-to-digital conversion when the clock (DCLK) frequency is greater than 80 MHz. The maximum frequency specification for DCLK is being revised down from 250 MHz to 80 MHz. All designs should be updated to use 80 MHz max.

This issue will not be fixed in the devices listed in [Table 1](#).

### ***System Monitor Internal Reference Voltage***

The System Monitor Internal Reference Voltage is not supported in the devices listed in [Table 1](#). The External Reference Voltage must be used. See the System Monitor Dedicated Pins figure in [UG370](#), *Virtex-6 FPGA System Monitor User Guide*.

## Operational Guidelines

### Operating Range

Commercial Grade devices operate at their full junction temperature range, which is 0°C to 85°C.

Some Industrial Grade devices before certain date codes have limited junction temperature range. See [Table 2](#). Otherwise, the Industrial Grade devices operate at -40°C to 100°C.

Table 2: Industrial Junction Temperature Range per Date Code

Device	Date Code	Junction Temperature (T <sub>j</sub> ) Range
XC6VLX240T	Before 1021	-20°C to 100°C
XC6VLX130T	Before 1021	-20°C to 100°C

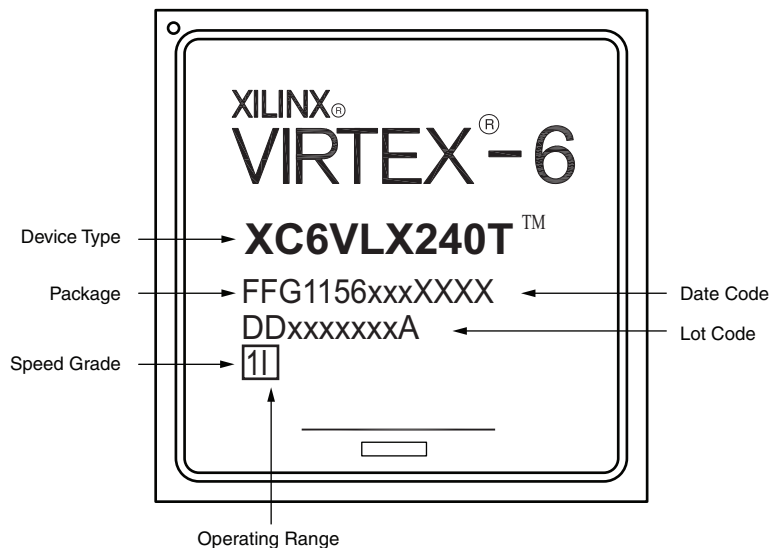
### Design Software Requirements

The devices listed in [Table 1](#), unless otherwise specified, require the following Xilinx development software installations.

- Refer to the Virtex-6 Device Production Software and Speed Specification Release table in [DS152](#), *Virtex-6 FPGA Data Sheet: DC and Switching Characteristics* for the Xilinx ISE Design Suite version required for the selected part.
- See Known Issues in [Answer Record 32929](#).

### Traceability

The XC6VLX240T is marked as shown in [Figure 1](#). The other devices listed in [Table 1](#) are marked similarly.



EN142\_01\_032610

Figure 1: XC6VLX240T-1FFG1156I Marking

### Additional Questions or Clarifications

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

## Revision History

Date	Version	Description
03/26/10	1.0	Initial Xilinx release.
04/09/10	1.1	Updated <a href="#">Figure 1</a> .
05/07/10	1.2	Added Commercial devices. Updated <a href="#">Hardware Errata Details</a> section. Added <a href="#">Dual Port Block RAM Address Overlap in READ_FIRST and Simple Dual Port Mode</a> and <a href="#">GTX Transceiver Initialization for Proper TXOUTCLK Functionality</a> sections. Updated <a href="#">Operating Range</a> , noting applicability for Industrial grade devices only.
06/04/10	1.3	Added LX195T production device. Updated <a href="#">Dual Port Block RAM Address Overlap in READ_FIRST and Simple Dual Port Mode</a> . Updated <a href="#">Operating Range</a> . Updated <a href="#">Design Software Requirements</a> .
06/18/10	1.4	Added the LX75T device and updated JTAG IDs and speed grades in <a href="#">Table 1</a> . Added System Monitor.
07/02/10	1.5	Added LX760, LX550T, SX475T, and SX315T production devices. The LX760 device does not include transceivers so the <a href="#">GTX Transceivers (Does not apply to the LX760 Device)</a> section does not apply to it.
07/30/10	1.6	Updated <a href="#">Block RAM</a> to reflect availability of WRITE_FIRST mode in ISE v12.2.
09/21/10	1.7	Added the LX365T production device. Added <a href="#">System Monitor Maximum DCLK Frequency</a> . Updated <a href="#">System Monitor Internal Reference Voltage</a> .
11/16/10	1.8	Updated JTAG ID (Revision Code) information in <a href="#">Table 1</a> . Added <a href="#">Restriction of Frequency Range for Bandwidth = HIGH or OPTIMIZED</a> , <a href="#">Restriction of Clock Divider Values</a> , <a href="#">PROGRAM_B Pin Behavior During Power-On</a> , and <a href="#">GTX Transceiver Initialization for Proper TXOUTCLK Functionality</a> .
01/17/11	1.9	Updated TXOUTCLK and RXRECCLK Static Operating Behavior; no longer applicable to TXOUTCLK. Added <a href="#">GTX Transceiver Delay Aligner</a> per Xilinx Customer Notice XCN11009.
01/24/11	1.10	Updated the document title. Added the HXT device. Updated JTAG ID Revision Code format in <a href="#">Table 1</a> .
02/02/11	1.11	Added the XC6VHX380T device.
02/25/11	1.12	Updated <a href="#">Table 1</a> and added <a href="#">T_BLOCK_TYPE Misclassification in 10 Gigabit Ethernet 64B/66B Mode</a> .
03/24/11	1.13	Added the XC6VHX255T and XC6VHX565T devices. Added <a href="#">Input Logic Resets Using GSR</a> and <a href="#">Synchronous Built-in FIFO</a> .

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