

IGLOO2 M2GL050 (T, TS) Device Errata

ER0200 v1.3 April 2016

This Errata sheet contains information about known Errata specific to the IGLOO®2 M2GL050 (T, TS) device family and provides available fixes and solutions.

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Table 1: Revision History

Date	Version	Changes
April 2016	1.3	Added Errata item 19 .
January 2016	1.2	Updated Table 4 and Table 5 : Auto Programming and 2 Step IAP use SC_SPI programming interface.
January 2016	1.1	Added the following: <ul style="list-style-type: none"> • Information about Revision 2 of the M2GL050 device • Errata item 18. • Table 5
June 2015	1.0	Combined all M2GL050 (T,TS) device Errata.

Table 2: Revisions Released per Device

Silicon Devices	Revisions	Device Status
M2GL050 (T, TS)	All Temperature Grades	Production

Errata for IGLOO2 M2GL050 (T, TS) All Temperature Grades

Table 3 lists the specific device Errata and the affected IGLOO2 M2GL050 (T, TS) revisions of all temperature grade devices.

Table 3: Summary of IGLOO2 M2GL050 (T, TS) Device Errata

Errata No.	Errata	Silicon Revisions M2GL050 (T, TS)		Software Errata
		Rev (0, 1)	Rev 2	
1.	MDDR and FDDR AXI interface does not support exclusive access	X	X	–
2.	Apply DEVRST_N after ISP programming	X	–	–
3.	AXI wrap transfers with more than 32 bytes in burst mode are not supported for MDDR and FDDR	X	X	–
4.	The MDDR/FDDR controller must be used with sequential burst mode with BL = 8 and PHY = 32, or PHY = 16	X	X	–
5.	HPMS may reset when ENC_DATA_AUTHENTICATION or DEVICE_INFO STAPL commands are sent	X	–	–
6.	VPP must be set to 2.5 V when programming/writing the eNVM at Industrial temperature range	X	–	–
7.	Over-voltage support on MSIOs during Flash*Freeze mode	X	–	–
8.	Verification of the FPGA fabric at junction temperatures higher than 50°C erroneously indicates a failure	X	–	–
9.	DDR_OUT and I/O-Reg functional Errata due to a software bug	–	–	X
10.	Dedicated differential I/O driving the reference clock of the CCC may cause a functional failure due to a software bug	–	–	X
11.	NVM Ready bit in eNVM Status register can generate a false READY signal	X	–	–
12.	Power-up Digest is not supported	X	–	–
13.	Programming of the eNVM must only occur as part of a bitstream also containing the FPGA fabric	–	–	X
14.	Updating eNVM from the FPGA fabric requires changes in the NV_FREQRNG register	X	X	–
15.	SYSCTRL_RESET_STATUS macro is not supported	X	X	–
16.	Zeroization is not supported	X	X	–
17.	PCIe Hot Reset support requires a soft reset solution	X	X	–
18.	The DDR I/Os in M2GL050 (T, TS)-FG896 are non-compliant with the DDR3 standard	X	X	–
19.	For S (security) grade devices, user must not enable write protection for Protected 4 K Regions, also known as Special Sectors in the eNVM	X	X	–
Note: Contact Microsemi SoC technical support, if you have additional questions. To order a specific die, contact your local Microsemi sales office.				

Errata Descriptions and Solutions

- 1. MDDR and FDDR AXI interface does not support exclusive access**

The MDDR and FDDR AXI interface in the M2GL050 device is compliant with AMBA AXI Protocol Specification v1.0, except for the exclusive access functionality. The future version of the Errata will have an updated information about the exclusive access functionality for the AXI interface.
- 2. Apply DEVRST_N after ISP programming**

M2GL050 devices support device programming in JTAG, Slave SPI, and ISP programming modes. However, after ISP programming, DEVRST_N needs to be asserted to reset the device or power cycle the device to run the new design.
- 3. AXI wrap transfers with more than 32 bytes in burst mode are not supported for MDDR and FDDR**

Do not use wrap transfers with more than 32 bytes.
- 4. The MDDR/FDDR controller must be used with sequential burst mode with BL = 8 and PHY = 32, or PHY = 16**

Though the MDDR and FDDR controllers in the M2GL050 devices support various burst modes/lengths and PHY settings (as specified in the [UG0446: SmartFusion2 and IGLOO2 FPGA High Speed DDR Interfaces User Guide](#)), only a subset of these settings are supported.

Recommendation:

Only use sequential burst mode with BL = 8 for PHY16, or PHY32 modes for the MDDR or FDDR.
- 5. HPMS may reset when ENC_DATA_AUTHENTICATION or DEVICE_INFO STAPL commands are sent**

The HPMS resets after executing one of the following STAPL actions:

 - ENC_DATA_AUTHENTICATION
 - DEVICE_INFO

Additionally, if any of these actions are executed while a SmartDebug session is active, HPMS resets are observed.
- 6. VPP must be set to 2.5 V when programming/writing the eNVM at Industrial temperature range**

VPP can be set to 2.5 V or 3.3 V. However, when writing or programming the eNVM of the M2GL050 devices below 0°C, VPP must be set to 2.5 V.

Refer to the [DS0128: IGLOO2 FPGA and SmartFusion2 SoC FPGA Datasheet](#) for VPP minimum and maximum settings. Note that the eNVM reading with VPP set to 3.3 V or 2.5 V operates as intended.
- 7. Over-voltage support on MSIOs during Flash*Freeze mode**

When the input voltage is driven above the reference voltage for that bank, additional current can be consumed in Flash*Freeze mode.

8. **Verification of the FPGA fabric at junction temperatures higher than 50°C erroneously indicates a failure**

Standalone verification (STAPL VERIFY action) must run at temperatures lower than 50°C. If a VERIFY action is run at temperatures higher than 50°C, a false verify failure may be reported. Note that the Check Digest system services can be used to confirm design integrity at temperatures within the recommended operation conditions.

9. **DDR_OUT and I/O-Reg functional Errata due to a software bug**

This Errata is applicable only if you have created or updated the design using Libero® SoC v11.1 SP1 or v11.1 SP2.

The corresponding I/O does not function properly in the silicon due to the wrong software implementation of the I/O macro, if you have one of the following in the design:

- If you use DDR_OUT macro in the design
- If you combine an output or output enable register with an I/O using the PDC command `set_io <portName> -register yes`

Solution:

Both Errata are fixed in Libero SoC v11.1 SP3. Migrate the design to Libero SoC v11.1 SP3 or a newer version, and re-run Compile and Layout.

10. **Dedicated differential I/O driving the reference clock of the CCC may cause a functional failure due to a software bug**

If the design has a dedicated differential I/O pair driving the reference clock of the CCC, the input clock may not propagate to CCC due to a software bug and the device fails during silicon testing. There are several options to drive the ref clock of the CCC. One of the options is to drive from "Dedicated Input PAD x" (x = 0 to 3); this uses hardwired routing. In this option, choose single-ended I/O or differential I/O as the ref clock. This Errata exists when you choose the differential I/O option (dedicated differential I/O is used as CCC reference clock input).

This Errata cannot be detected in any functional simulation, and can only be detected in silicon testing.

Solution:

The Errata is fixed in the Libero SoC 11.1 SP3. Migrate the design to Libero SoC 11.1 SP3 or newer version, and re-run Compile and Layout.

11. **NVM Ready bit in eNVM Status register can generate a false READY signal**

If you send an instruction to the eNVM controller and then start polling the READY signal (bit0 of the eNVM Status register) to check when the eNVM controller is ready for the next function, the first assertion of the READY signal occurs when the eNVM controller is not yet ready, resulting in the generation of a false READY signal. However, the immediate next assertion of the READY signal correctly indicates that the eNVM controller is ready.

Workaround:

Add an extra eNVM Status bit read that polls/reads the eNVM Status bit twice as READY.

12. **Power-up Digest is not supported**

Workaround:

Use NVM Data Integrity Check System service after the device is switched ON, and check the data integrity.

13. Programming of the eNVM must only occur as part of a bitstream also containing the FPGA fabric

The Bitstream Configuration Dialog Box in the Libero SoC allows the user to program eNVM and the FPGA fabric separately. However, for the current production of IGLOO2 FPGAs, the user needs to program the eNVM along with the FPGA fabric. The fabric can be programmed separately if needed.

Solution:

The Errata is fixed in the Libero SoC 11.1 SP3. Migrate the design to the Libero SoC 11.1 SP3 or newer version, and re-run Compile and Layout.

14. Updating eNVM from the FPGA fabric requires changes in the NV_FREQRNG register

When updating the eNVM from the FPGA fabric, NV_FREQRNG register must be changed from 0x07(default) to 0x0F, eNVM reads are not affected.

15. SYSCTRL_RESET_STATUS macro is not supported

16. Zeroization is not supported

17. PCIe Hot Reset support requires a soft reset solution

On the IGLOO2 devices, a PCIe® Hot Reset requires a soft FPGA logic reset scheme which clears the sticky bits of the PCI configuration space.

Workaround:

The application note [AC437: Implementing PCIe Reset Sequence in SmartFusion2 and IGLOO2 Devices](#) describes the PCIe Hot Reset reset scheme. However, this reset scheme causes PCIe violations in some cases.

- At Gen1 rates, there are no violations.
- At Gen2 rates, there are two PCIe CV violations.
 - Test case 1: TD_1_7 (Advanced Error Reporting Capability)
 - Test case 2: TD_1_41 (LinkCap2Control2Status2 Reg)

18. The DDR I/Os in M2GL050 (T, TS)-FG896 are non-compliant with the DDR3 standard

The DDR controller in the M2GL050-FG896 device is non-compliant with the DDR3 standard. Contact [SoC tech support](#) for additional information.

19. For S (security) grade devices, user must not enable write protection for Protected 4 K Regions, also known as Special Sectors in the eNVM

For S (security) devices, there are two or four 4 KB regions per eNVM array that can be protected for read and write, these regions are known as Protected 4 K Regions or Special Sectors. If write protection is enabled for any of these regions, none of the locked pages inside the same eNVM block can be unlocked.

Usage Guidelines for IGLOO2 Devices

Microsemi recommends the following conditions for the IGLOO2 device usage.

1. Programming Support

There may be package dependencies that may not expose certain programming interfaces. Refer to the [DS0124: IGLOO2 Pin Descriptions Datasheet](#) for device/package specific features.

Table 4: Revision 0 and Revision 1 Devices

Programming Mode	JTAG	SPI Slave	Auto Programming	Auto Update	2 Step IAP	Programming Recovery
Programming Interface	JTAG	SC_SPI	SC_SPI	SPI_0	SC_SPI	SPI_0
M2GL050 (T,TS)	Yes	Yes	No	No	No	No

Table 5: Revision 2 Device

Programming Mode	JTAG	SPI Slave	Auto Programming	Auto Update	2 Step IAP	Programming Recovery
Programming Interface	JTAG	SC_SPI	SC_SPI	SPI_0	SC_SPI	SPI_0
M2GL050 (T,TS)	Yes	Yes	Yes	No	Yes	No

2. SHA-256 System Service

Microsemi recommends the message required to be on byte boundary when using SHA-256 System Service for the IGLOO2 devices.

3. Accessing the PCIe Bridge Register in High-speed Serial Interface

The PCIe Bridge registers must not be accessed before the PHY is ready. Wait for the PHY_READY signal (which indicates when PHY is ready) to be asserted before updating the PCIe Bridge registers.

The PHY_READY signal is normally asserted within 200 μ s after the device is powered up. Wait for 200 μ s before accessing the PCIe Bridge registers.

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From North America, call **800.262.1060**

From the rest of the world, call **650.318.4460**

Fax, from anywhere in the world **650. 318.8044**

Customer Technical Support Center

Microsemi SoC Products Group staffs its Customer Technical Support Center with highly skilled engineers who can help answer your hardware, software, and design questions about Microsemi SoC Products. The Customer Technical Support Center spends a great deal of time creating application notes, answers to common design cycle questions, documentation of known Errata and various FAQs. So, before you contact us, please visit our online resources. It is very likely we have already answered your questions.

Technical Support

For Microsemi SoC Products Support, visit

<http://www.microsemi.com/products/fpga-soc/design-support/fpga-soc-support>

Website

You can browse a variety of technical and non-technical information on the SoC [home page](http://www.microsemi.com/products/fpga-soc/fpga-and-soc), at <http://www.microsemi.com/products/fpga-soc/fpga-and-soc>.

Contacting the Customer Technical Support Center

Highly skilled engineers staff the Technical Support Center. The Technical Support Center can be contacted by email or through the Microsemi SoC Products Group website.

Email

You can communicate your technical questions to our email address and receive answers back by email, fax, or phone. Also, if you have design problems, you can email your design files to receive assistance. We constantly monitor the email account throughout the day. When sending your request to us, please be sure to include your full name, company name, and your contact information for efficient processing of your request.

The technical support email address is soc_tech@microsemi.com.

My Cases

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Outside the U.S.

Customers needing assistance outside the US time zones can either contact technical support via email (soc_tech@microsemi.com) or contact a local sales office. Visit [About Us](#) for [sales office listings](#) and [corporate contacts](#).

ITAR Technical Support

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