HARDWARE
RELEASE NOTES

VM6250

CA.DT.A66-5e - May 2017

POSSIBILITIES START HERE kontron

VM6250 Hardware Release Notes

Disclaimer

Kontron would like to point out that the information contained in this manual may be subject to alteration, particularly as a result of the constant upgrading of Kontron products. This document does not entail any guarantee on the part of Kontron with respect to technical processes described in the manual or any product characteristics set out in the manual. Kontron assumes no responsibility or liability for the use of the described product(s), conveys no license or title under any patent, copyright or mask work rights to these products and makes no representations or warranties that these products are free from patent, copyright or mask work right infringement unless otherwise specified. Applications that are described in this manual are for illustration purposes only. Kontron makes no representation or warranty that such application will be suitable for the specified use without further testing or modification. Kontron expressly informs the user that this manual only contains a general description of processes and instructions which may not be applicable in every individual case. In cases of doubt, please contact Kontron.

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Revision History

PUBLICATION TITLE:	VM6250 Hardware Release Notes	
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Revision	Brief Description of Changes	Date of Issue
5e	New E.C. Levels	05-2017
4e	CRP added	07-2013
3e	Support of E.C. Level x3003 and x3004	07-2012
2e	Support of E.C. Level x3002 Add information related to CRP3815 and CRP3867	01-2012
1e	Support of E.C. Levels x3000 and x3001	01-2009
0e	Initial Version	10-2009

Customer Support

Please contact our support team at support.KFR@kontron.com

Customer Service

As a trusted technology innovator and global solutions provider, Kontron extends its embedded market strengths into a services portfolio allowing companies to break the barriers of traditional product lifecycles. Proven product expertise coupled with collaborative and highly-experienced support enables Kontron to provide exceptional peace of mind to build and maintain successful products.

For more details on Kontron's service offerings such as: enhanced repair services, extended warranty, Kontron training academy, and more visit http://www.kontron.com/support-and-services/services.

Customer Comments

If you have any difficulties using this manual, discover an error, or just want to provide some feedback, contact Kontron support. Detail any errors you find. We will correct the errors or problems as soon as possible and post the revised manual on our website.

Symbols

The following symbols may be used in this manual:

⚠DANGER	DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.
⚠WARNING	WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
⚠CAUTION	CAUTION indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.
NOTICE	NOTICE indicates a property damage message.
	**Electric Shock!** This symbol and title warn of hazards due to electrical shocks (> 60 V) when touching products or parts of them. Failure to observe the precautions indicated and/or prescribed by the law may endanger your life/health and/or result in damage to your material.
	**ESD Sensitive Device!** This symbol and title inform that the electronic boards and their components are sensitive to static electricity. Care must therefore be taken during all handling operations and inspections of this product in order to ensure product integrity at all times.
	**HOT Surface!** Do NOT touch! Allow to cool before servicing.
	**Laser!** This symbol inform of the risk of exposure to laser beam from an electrical device. Eye protection per manufacturer notice shall review before servicing.
	This symbol indicates general information about the product and the user manual. This symbol also indicates detail information about the specific product configuration.
	This symbol precedes helpful hints and tips for daily use.

For Your Safety

Your new Kontron product was developed and tested carefully to provide all features necessary to ensure its compliance with electrical safety requirements. It was also designed for a long fault-free life. However, the life expectancy of your product can be drastically reduced by improper treatment during unpacking and installation. Therefore, in the interest of your own safety and of the correct operation of your new Kontron product, you are requested to conform with the following guidelines.

High Voltage Safety Instructions

As a precaution and in case of danger, the power connector must be easily accessible. The power connector is the product's main disconnect device.

⚠CAUTION

Warning!
All operations on this device must be carried out by sufficiently skilled personnel only.

⚠CAUTION

Caution, Electric Shock!
Before installing a non hot-swappable Kontron product into a system always ensure that your mains power is switched off. This also applies to the installation of piggybacks. Serious electrical shock hazards can exist during all installation, repair, and maintenance operations on this product. Therefore, always unplug the power cable and any other cables which provide external voltages before performing any work on this product.
Earth ground connection to vehicle's chassis or a central grounding point shall remain connected. The earth ground cable shall be the last cable to be disconnected or the first cable to be connected when performing installation or removal procedures on this product.

Special Handling and Unpacking Instructions

ESD Sensitive Device!
Electronic boards and their components are sensitive to static electricity. Therefore, care must be taken during all handling operations and inspections of this product, in order to ensure product integrity at all times

Do not handle this product out of its protective enclosure while it is not used for operational purposes unless it is otherwise protected.

Whenever possible, unpack or pack this product only at EOS/ESD safe work stations. Where a safe work station is not guaranteed, it is important for the user to be electrically discharged before touching the product with his/her hands or tools. This is most easily done by touching a metal part of your system housing.

It is particularly important to observe standard anti-static precautions when changing piggybacks, ROM devices, jumper settings etc. If the product contains batteries for RTC or memory backup, ensure that the product is not placed on conductive surfaces, including anti-static plastics or sponges. They can cause short circuits and damage the batteries or conductive circuits on the product.

General Instructions on Usage

In order to maintain Kontron's product warranty, this product must not be altered or modified in any way. Changes or modifications to the product, that are not explicitly approved by Kontron and described in this manual or received from Kontron's Technical Support as a special handling instruction, will void your warranty.

This product should only be installed in or connected to systems that fulfill all necessary technical and specific environmental requirements. This also applies to the operational temperature range of the specific board version, that must not be exceeded. If batteries are present, their temperature restrictions must be taken into account.

In performing all necessary installation and application operations, only follow the instructions supplied by the present manual.

Keep all the original packaging material for future storage or warranty shipments. If it is necessary to store or ship the product then re-pack it in the same manner as it was delivered.

Special care is necessary when handling or unpacking the product. See Special Handling and Unpacking Instruction.

Environmental Protection Statement

This product has been manufactured to satisfy environmental protection requirements where possible. Many of the components used (structural parts, printed circuit boards, connectors, batteries, etc.) are capable of being recycled.

Final disposition of this product after its service life must be accomplished in accordance with applicable country, state, or local laws or regulations.

Environmental protection is a high priority with Kontron.
Kontron follows the DEEE/WEEE directive.
You are encouraged to return our products for proper disposal.

The Waste Electrical and Electronic Equipment (WEEE) Directive aims to:

- Reduce waste arising from electrical and electronic equipment (EEE)
- Make producers of EEE responsible for the environmental impact of their products, especially when they become waste
- Encourage separate collection and subsequent treatment, reuse, recovery, recycling and sound environmental disposal of EEE

Improve the environmental performance of all those involved during the lifecycle of EEE

Table Of Contents

1 / Introduction

This document describes the engineering evolution of the referenced products to the up-to-date ones which are detailled in the Kontron hardware documentation.

Functional changes that differ from previous version of the document are identified by a vertical bar in the margin.

You will find in the following pages:

This document applies to all VM6250 Environment Classes (if available): Standard (SA), Extended Temperature Air-Cooled (WA) and Rugged Conduction-Cooled (RC) versions.

If a specific information applies only to a specific environment class, it is clearly specified in the information description. For example, the reference VM6250/RC applies only to VM6250 Rugged Conduction-Cooled environment class.

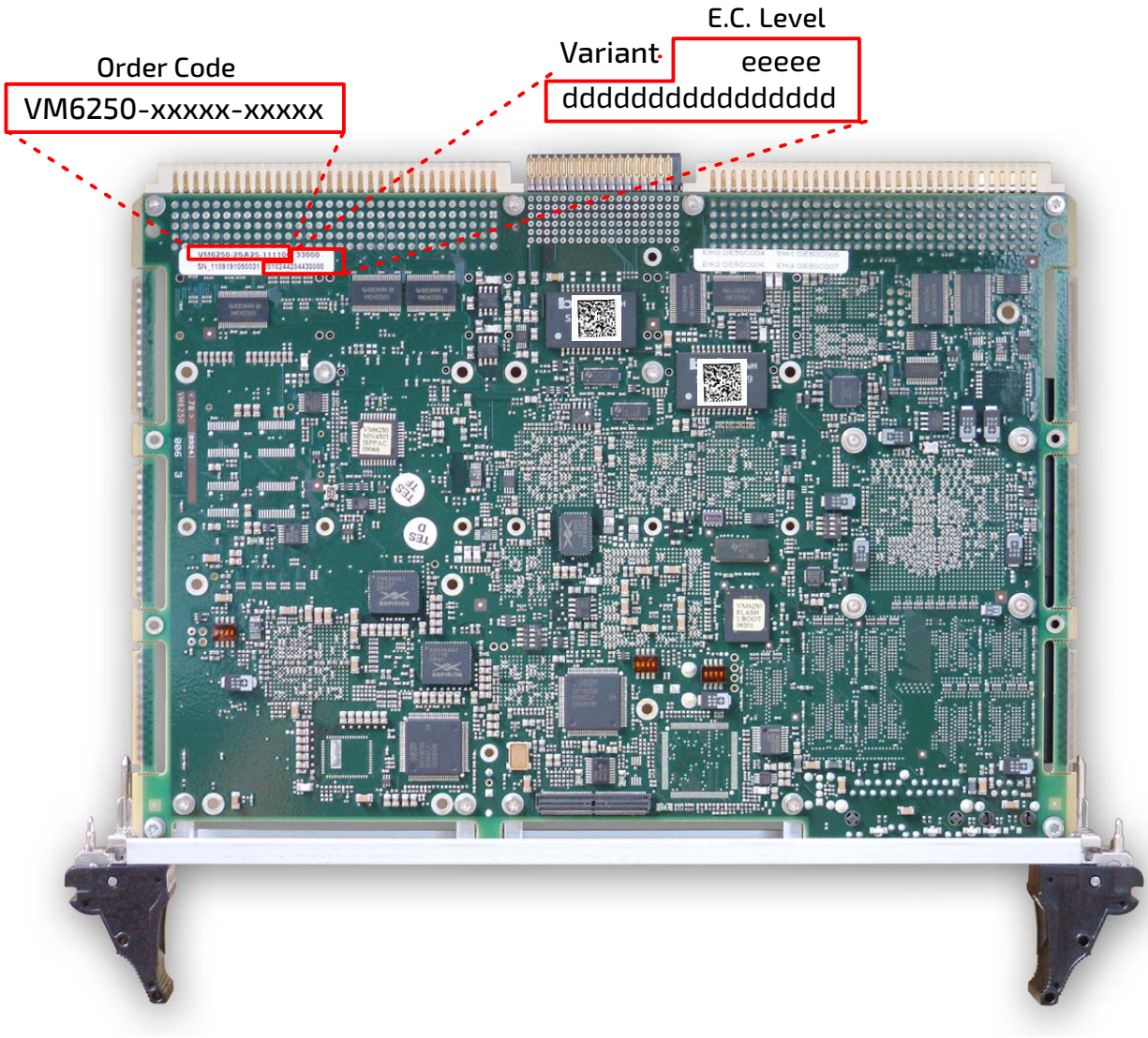
This document refers to the up-to-date release of the following hardware documentation:

- VM6250 User's Guide CA.DT.A65
- VM6250/RC User's Guide Supplement CA.DT.A75

2 / Board Identification

Engineering Change Level and Order Code

The Engineering Change Level (E.C. Level) and Order Code information is available on the the "Board Identification" label, located on the bottom side of the board.



3 / General Information

Personal Injuries

VM6250/SA and VM6250/WA

- Do not touch the CPU heatsink while removing the board from a rack because it can get very hot.
- Be careful while handling the board, because of the cutting edges of the heatsink.
- Do not place the board on any surface or in any form of storage container until the board and its heatsink have cooled down to room temperature.

VM6250/RC

- Do not touch the ruggedizer while removing the board from a rack because it can get very hot
- Do not place the board on any surface or in any form of storage container until the board and its ruggedizer have cooled down to room temperature.

PMCs Signaling Level

The PCI-X PMC V(I/O) voltage level is +3.3V only. It is not +5V tolerant. The user must check that its PMC type is compatible with this signaling voltage (refer to the Chapter "PMC Sites" in the VM6250 User's Guide).

EMC Gasket

In order to protect the EMC gasket located in the front panel, be careful during the insertion of the boards in the rack. It is recommended to insert the boards in a rack starting from the higher slot number and extract them starting from the lowest slot number.

Power Supplies

On +5V power supply, monotonic rise time no longer than 25 ms is required at Power on.

On +3.3V power supply, monotonic rise time no longer than 25 ms is required at Power on.

For a power off condition to be valid, the +5V and +3.3V power supply input should remain at 0V for at least one second.

Components Height on Top Side of the Board – CRP3738

The front panel connectors are slightly higher than the maximum height specified by the VME standard.

List of components of the VM6250 that do not respect the VME standard (13.7 mm top height):

- Front panel Ethernet connectors: 13.80 mm
- Front panel USB connector: 13.83 mm
- Front panel Console (RJ11) connector: 13.84 mm

No impact since the exceeding height is located very close to the front panel.

Component Height on Bottom Side of the Board - CRP3707

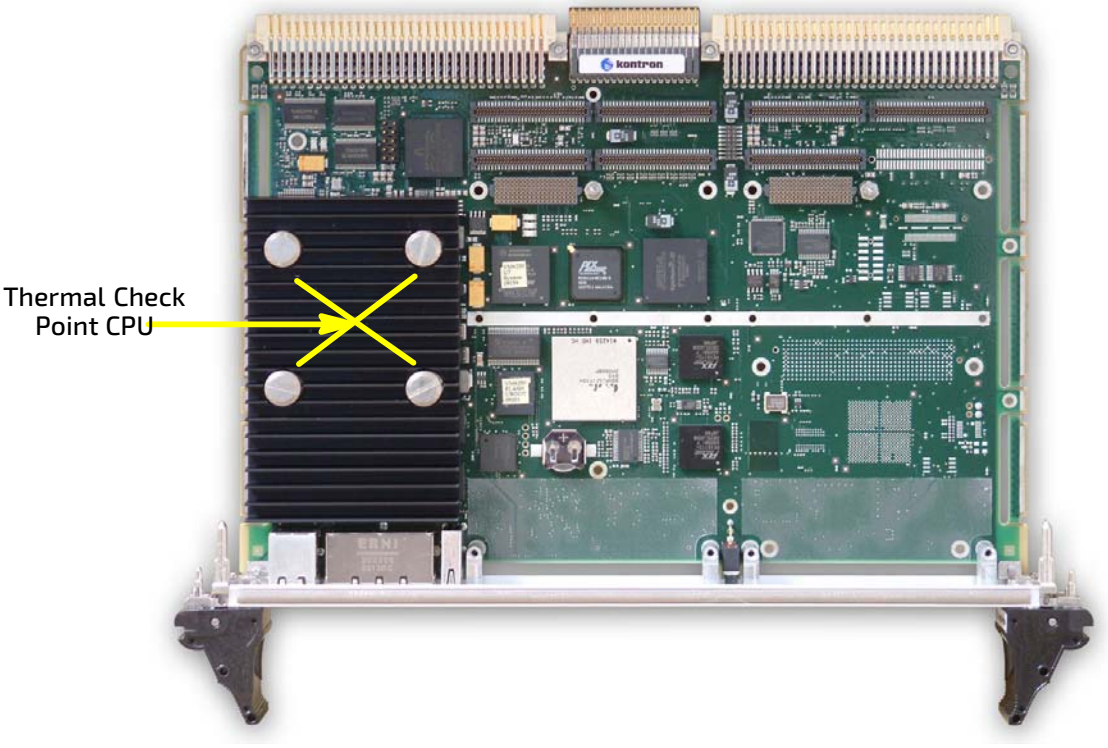
The Ethernet magnetics are slightly higher than the maximum height as specified by the VME standard (max. violation of 0.04 mm).

No problem have been reported. Nevertheless, it is recommended to insert the boards in a rack starting from the higher slot number and extract them starting from the lowest slot number. This good habit also protects EMC gaskets located on the front panels of all VME boards.

VM6250/SA Thermal Considerations

A linear air flow of at least 1.2 m/s (depending on the processor type and frequency, see CA.DT.A65) across the board operating at 55°C max. (through the CPU heatsinks) is required, no matter the number of PMCs installed.

A thermal check point is defined on the intersection of the diagonals of the CPU heatsink. Temperature (Tmax) at this point should not exceed 90° C.



VM6250/SA Handling

Do not lie the board on the CPU heatsink to avoid damages on the processors.

4 / Board Revision Guide

4.1 How to Use the Board Revision Guide Table

1. Find the E.C. Level associated to your board as described in the Chapter 2 "Board Identification" page 2.
2. Find the column associated to the E.C. Level of your board in this table.
3. Check for a specific item in the table lines:
   - 3.1. A X (cross) in the E.C. Level column indicates that this item applies to this E.C. Level.
   - 3.2. No X (cross) in the E.C. Level column indicates that this item does not apply to this E.C. Level.
   - 3.3. If the functionality described by the item is not available on your board don't take into account this item. To know the functionalities available or not on your board, read the User's Guide associated with your board version.

Each item is fully described in section 4.4 "Item Detailed Description" page 8.

4.2 Revision Guide Table for VM6250-SA/WA

Item	CRP	Description	E.C. Levels														
			x2000	x2001	X2002	X3000	X3001	X3002	X3003	X3004	X3024	X3064	X3065	X3066	X3124	X3164	X3165	X3166
1	3706	Boot Flash Write Protect	X															
2	-	VME Reset Action on VM6250	X	X														
3	3781	High-logic level on IRQ 10 does not work with VxWorks				X												
4	3770	GPIO IT does not work in Interrupt Falling Edge programming mode	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	-	Inversion of the numbering of ethernet connectors on the front panel	X	X	X													
6	3815	High side and low side Mofset inversion on DDR2 and CPU core power supplies	X	X	X	X	X	X	X									
7	3867	Battery current not limited when the protection diode is damaged	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8	3972	Power On problem if 5V starts after 3V3 (work around 3002 is partially functional)				X	X	X										
9	3949	Watchdog/Dual stage mode				X	X	X										
10	3868	IRQ9 become low-logic level				X	X	X										
11	4040	I2C Levels are not respected	X	X	X	X	X	X	X									
12	4129	Electrical and earth ground are connected together due to wrong resistor populating	Not Applicable															
13	4097	ALMA2f not detected on PCI after a power on	X	X	X	X	X	X	X	X								
14	4130	PCIe P0 link connection loss due to important jitter on PCIe clock	X	X	X	X	X	X	X	X	X				X			
15	4095	New NVSRAM reference	X	X	X	X	X	X	X	X	X	X	X	X				
16	4256	False detection of RTC battery low with PBIT	X	X	X	X	X	X	X	X	X	X			X	X		
17	4330	Ethernet bad packets	X	X	X	X	X	X	X	X	X	X	X		X	X	X	

- x: CPU Type
  - x= 0: MPC8641
  - x= 1: MPC8641D
  - x= 2: MPC8640
  - x= 3: MPC8640D

4.3 Revision Guide Table for VM6250-RC

Item	CRP	Description	E.C. Level																
			X2000	X2001	X2002	X3000	X3001	X3002	X3003	X3004	X3014	X3034	X3074	X3075	X3076	X3114	X3134	X3174	X3175	X3176
1	3706	Boot Flash Write Protect	X																	
2	-	VME Reset Action on VM6250	X	X																
3	3781	High-logic level on IRQ 10 does not work with VxWorks				X														
4	3770	GPIO IT does not work in Interrupt Falling Edge programming mode	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	-	Inversion of the numbering of Ethernet connectors on the front panel	X	X																
6	3815	High side and low side Mofset inversion on DDR2 and CPU core power supplies	X	X	X	X	X	X	X											
7	3867	Battery current not limited when the protection diode is diode is damaged	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8	3972	Power On problem if 5V starts after 3V3 (work around 3002 is partially functional)				X	X	X												
9	3949	Watchdog/Dual stage mode				X	X	X												
10	3868	IRQ9 become low-logic level				X	X	X												
11	4040	I2C level are not respected	X	X	X	X	X	X	X											
12	4129	Electrical and earth ground are connected together due to wrong resistor populating	X	X	X	X	X	X	X	X										
13	4097	ALMA2f not detected on PCI after a power on	X	X	X	X	X	X	X	X	X					X				
14	4130	PCIe P0 link connection loss due to important jitter on PCIe clock	X	X	X	X	X	X	X	X	X	X				X	X			
15	4095	New NVSRAM reference	X	X	X	X	X	X	X	X	X	X	X	X	X					
16	4256	False detection of RTC battery low with PBIT	X	X	X	X	X	X	X	X	X	X	X				X	X		
17	4330	Ethernet bad packets	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	

- x: CPU Type
  - x= 0: MPC8641
  - x= 1: MPC8641D
  - x= 2: MPC8640
  - x= 3: MPC8640D

4.4 Item Detailed Description

Each item applies only to a specific group of E.C. levels.
Refer to the table available in section 4.2 “Revision Guide” page 6 to find the specific E.C. levels associated to a specific item.

Item #1 Boot Flash Write Protect - CRP 3706

Description:	Only the first sector is write protected when the write protect switch of the boot Flash is activated.
Impact:	No total hardware write protection on boot flash.
Workaround:	Fixed by E.C. Levels x1001

Item #2 VME Reset Action on VM6250

Description:	VME Sysreset activation may not generate a VM6250 reset.
Impact:	VMe Sysreset not fully functionnal
Workaround:	Fixed by E.C. Level x2002

Item #3 High-logic level on IRQ 10 does not work with VxWorks - CRP 3781

Description:	Four ITs GPIO are used on the VM6250 to generate IRQ 10 to CPU. This CPU IRQ is high-logic level. Unfortunatly, VxWorks needs to use low-logic level.
Impact:	ITs GPIO does not work with VxWorks and Linux operating system.
Workaround:	Fixed by E.C. levels x3001.

Item #4 GPIO IT does not work in Interrupt Falling Edge programming mode - CRP 3770

Description:	GPIO IT has no effect on CPU IRQ 10 when interrupt falling edge mode is programmed in cPLD revision 11.
Impact:	No GPIO IT detected.
Workaround:	Not fixed.

Item #5 Inversion of the numbering of Ethernet connectors on the front panel

Description: The Ethernet link 0 (ETH0) is tagged 1 on front panel and the Ethernet link 1 (ETH1) is tagged 0 on front panel.

Inversion of the numbering of the Ethernet connectors

Impact: No functionnal impact

Workaround: Fixed by E.C. Level x3000.

Item #6 High side and low side Mofset inversion on DDR2 and CPU core power supplies - CRP3815

Description: High side and low side Mosfet references have been inverted in bill of materials. HAT2164 has been replaced by HAT2168 and vice versa. These Mosfet are used on DC/DC converter output stage of DDR2 and CPU power supplies.

Impact: No impact. Mosfet characteristic are roughly equivalent.

Workaround: Fixed by E.C. Level x3004.

Item #7 Battery current not limited when the protection diode is diode is damaged - CRP 3867

Description: To satisfied CE labeling or UL certification, and then satisfied EN60950 safety standard, lithium battery should be protected from charging current in case of protection diode failure. The common use is to insert a serial resistor in order to reduced this charging current to 3mA.

Impact: Battery destruction. Risk of protection diode failure is very weak.

Workaround: Not fixed

Item #8 Power On problem if 5V starts after 3V3 (work around 3002 is partially functional) - CRP 3972

Description: If 3.3V is on before (> 100mS) 5V, ispPAC starts before MAX6339 (MA4502; voltage supervisor): MAX6339 has a long setup time (about 180ms) and the THERM_FAULT signal may not be released, ispPAC can detect an error and then shut down the power supplies of the board.

Impact: Depending on the power supply used, some VM6250 may not start.

Workaround: Fixed by E.C. Level x3003.

Item #9 Watchdog/Dual stage mode - CRP 3949

Description: The double stage watchdog doesn't work, the interrupt occurs but the board reset doesn't occur. It seems the timer is disabled when the IT is acknowleged. The problem occurs because the same bit is used to trig and enabled the timer.

Impact: Double stage watchdog not functional.

Workaround: Fixed by E.C. Level x3003.

Item #10 IRQ9 become low-logic level - CRP 3868

Description: When the LM93 is out of temperature range, no ITs is generated. An IT should be generated through CPLD. The CPLD_INTERRUPT_STATUS register does not report any IT event.

Impact: No IT available if LM93 out of range.

Workaround: Fixed by E.C. Level x3003.

Item #11 I2C level are not respected - CRP 4040

Description: The LTC I2C chip buffer does not respect, in worst case, the I2C spécification for the low level input voltage. The LTC chip can be replaced by a chip Intersil ISL33002IUZ.

Impact: Interface errors on IPMB and SMB bus (VME P0 connector).

Workaround: Fixed by E.C. Level x3004.

Item #12 Electrical and earth ground are connected together due to wrong resistor populating - CRP 4129

Description: Electrical and earth ground have been connected together on the VME board. This configuration is not advised for VME board. This connection must be realized in the chassis.

Impact: This issue may increase sensibility to EMI/RFI.
This erratum is only applied on RC class of VM6250 board. No impact for SA and WA class board.

Workaround: Fixed by ECx3014 and higher.

Item #13 ALMA2f not detected on PCI after a power on - CRP 4097

Description: In rare case, the VME bridge (Alma2f) is not detected on Reset step after Power-on.
The issue occurs if the Power-on reset is asserted when the PLL sequencer is not locked.

Impact: Alma2f may not be seen on the PCI in less than 1% of Power on.

Workaround: Fixed by ECx3024 and higher. Move to Alma version 0x45 firmware.
Or
Power-off then Power-on the board.

Item #14 PCIe P0 link connection loss due to important jitter on PCIe clock- CRP 4130

Description: Important jitter have been noted on PCIe clock source during some VME access. PCIe errors may occur on PCIe P0 connector link. The board may reset in case of a lot of errors.

Impact: PCIe erros may occur on P0 external PCIe link with PCIe link loss and hard reset. Clock jitter may also impact the internal PCIe link and XMC slot.

Workaround: Fixed by ECx3x64 and higher.

Item #15 New NVSRAM reference - CRP 4095

Description: Obsolescence management of Simtek STK14CA8-RF45I replaced by Cypress CY14B101LA-SP45XI.

Impact: No impact (software compatible).

Workaround: Fixed by ECx3104 and higher.

Item #16 False detection of RTC battery low with PBIT - CRP 4256

Description: In case of the 5V VME PSU falls down very fast, a PBIT sequence may report a wrong battery failure after a power-on event, this despite the battery voltage is in range (higher than 2.9V).

Impact: After a board power-off, a low battery default may be logged in RTC RV8564C2 device. Date and time are not impacted.

Workaround: Fixed by E.C. Level ECx3075 and higher on SA/WA boards, and E.C. Level ECx3175 and higher for RC boards.

Item #17 Ethernet bad packets - CRP 4330

Description: Bad packets could be reported by Ethernet controller during transfer on eth0 and eth1 Ethernet interfaces. Ethernet interface eth2 and eth3 are not impacted by this issue (RC boards not impacted).

Impact: Data transfer may be corrupted.

Workaround: Fixed by E.C. Level ECx3076 and higher on SA/WA boards, and E.C. Level ECx3176 and higher for RC boards.

About Kontron

Kontron, a global leader in embedded computing technology and trusted advisor in IoT, works closely with its customers, allowing them to focus on their core competencies by offering a complete and integrated portfolio of hardware, software and services designed to help them make the most of their applications.

With a significant percentage of employees in research and development, Kontron creates many of the standards that drive the world's embedded computing platforms; bringing to life numerous technologies and applications that touch millions of lives. The result is an accelerated time-to-market, reduced total-cost-of-ownership, product longevity and the best possible overall application with leading-edge, highest reliability embedded technology

Kontron is a listed company. Its shares are traded in the Prime Standard segment of the Frankfurt Stock Exchange and on other exchanges under the symbol "KBC".
For more information, please visit: **www.kontron.com**

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