General Product Notice	Date January 17, 2025
Product	Digi ConnectCore 6UL system-on-module (SOM) variants

Reason for Change

☐ Technical Requirement	☐ Product Transition
☐ Customer Requirement	☐ Product Discontinuation
☐ Quality Improvement	☒ **Product Enhancement**
	☐ Other

Audience	All Digi Embedded Partners and Customers

Description of Change	Change double data rate (DDR) memory refresh scheme to be triggered by the multi mode DDR controller (MMDC) clock on Digi ConnectCore 6UL SOM variants

Reason for Change	Digi received a report from a customer about a potential display issue on some units when tested over temperature. Digi's embedded team investigated this issue and found the root cause to be the stability (over temperature) of the internal low frequency ring oscillator when the input of the low frequency crystal is floating. The NXP i.MX6UL system-on-a-chip (SOC) has multiple options for the low frequency clock. In the ConnectCore 6UL design, the 32kHz crystal is not provisioned on the associated pads since an external microcontroller unit (MCU), Digi Microcontroller Assist™ (MCA), is used for this purpose (real-time clock or RTC, etc.) to save power. The i.MX 6UL microprocessor checks for the presence of an external crystal on these pads. If the crystal is not detected, the system automatically switches to the internal ring oscillator. However, the detection mechanism appears to be sensitive to noise on the RTC_XTALI pad, and this issue is further exacerbated within certain temperature ranges. Consequently, the stability of the low frequency clock tree may be compromised. Since the DDR memory refresh is, by default, driven by this clock, instability can lead to an increase in refresh commands, potentially degrading memory access performance. To resolve this, the configuration of the DDR refresh mechanism has been modified to trigger from the MMDC clock (derived from the 24MHz crystal) rather than the internal low frequency oscillator. This bypasses any potential interference generated by the internal oscillator leaving the DDR refresh mechanism solely dependent on the MMDC clock. Digi has tested this configuration on multiple units that exhibited the issue. The software update resolved the issues on all available devices. Additionally, Digi ran a full regression as well as multiple temperature and long duration tests, on multiple devices (both those that exhibited the issue

	and those that did not), to validate the change. Digi is comfortable and confident in the update and the stability of the fix. It is important to note that this issue is not reproducible across all devices.

Affected Part Numbers	– **CC-WMX-JN7A-NE** - Digi ConnectCore 6UL - 528 MHz, industrial temperature, 1 GB SLC NAND, 1 GB DDR3, dual 10/100 Ethernet, 802.11a/b/g/n/ac, Bluetooth® 5 – **CC-WMX-JN69-NN** - Digi ConnectCore 6UL - 528 MHz, industrial temperature, 512 MB SLC NAND, 512 MB DDR3, dual 10/100 Ethernet, 802.11a/b/g/n/ac, Bluetooth 5 – **CC-WMX-JN59-NN** - Digi ConnectCore 6UL - 528 MHz, industrial temperature, 512 MB SLC NAND, 256 MB DDR3, dual 10/100 Ethernet, 802.11a/b/g/n/ac, Bluetooth 5 – **CC-WMX-JN58-NE** - Digi ConnectCore 6UL - 528 MHz, industrial temperature, 256 MB SLC NAND, 256 MB DDR3, dual 10/100 Ethernet, 802.11a/b/g/n/ac, Bluetooth 5 – **CC-WMX-JN7A-CBX** - Digi ConnectCore 6UL - 1 GB SLC NAND, 1 GB DDR3, dual 10/100 Ethernet, 802.11a/b/g/n/ac, Bluetooth 5, custom variant – **CC-MX-JN7A-Z1** - Digi ConnectCore 6UL - 528 MHz, industrial temperature, 1 GB SLC NAND, 1 GB DDR3, dual 10/100 Ethernet – **CC-MX-JN69-ZN** - Digi ConnectCore 6UL - 528 MHz, industrial temperature, 512 MB SLC NAND, 512 MB DDR3, dual 10/100 Ethernet – **CC-MX-JN58-Z1** - Digi ConnectCore 6UL - 528 MHz, industrial temperature, 256 MB SLC NAND, 256 MB DDR3, dual 10/100 Ethernet – **CC-SBP-WMX-JN58** - Digi ConnectCore 6UL SBC Pro – **CC-SBP-WMX-JN7A** - Digi ConnectCore 6UL SBC Pro - 1GB flash, 1GB RAM

Timing of Change	Effective immediately
	
	Software patches are available on GitHub for Digi Embedded Yocto (DEY) versions: 4.0, 3.2, 3.0, 2.6, 2.4 and 2.2.
	
	This consists of the following two patches:
	• one in U-Boot (the main patch), available for the following versions/branches:
	  ○ v2020.04/maint
	  ○ v2017.03/maint
	  ○ v2015.04/maint
	• one in Linux (preventive, to skip potential DDR frequency scaling), available for the following versions/branches:
	  ○ v5.15/nxp/dey-4.0/maint
	  ○ v5.4/dey-3.2/maint
	  ○ v5.4/dey-3.0/maint

	○ v4.14/dey-2.6/maint ○ v4.9/dey-2.6/maint ○ v4.9/dey-2.4/maint ○ v4.9/dey-2.2/maint To get the patches refer to the Update Digi Embedded Yocto section of the online documentation, for your specific DEY version.

Notes	Digi recommends applying this fix for new products and field-deployed products to fix memory performance degradation over certain temperature ranges, which may result in effects such as liquid-crystal display (LCD) flickering or general system performance degradation. Please notify end customers using these part numbers. If you have concerns or questions about this notice, please contact your Digi Sales Representative.

Authorization	Digi International Product Management