

PCN Overview

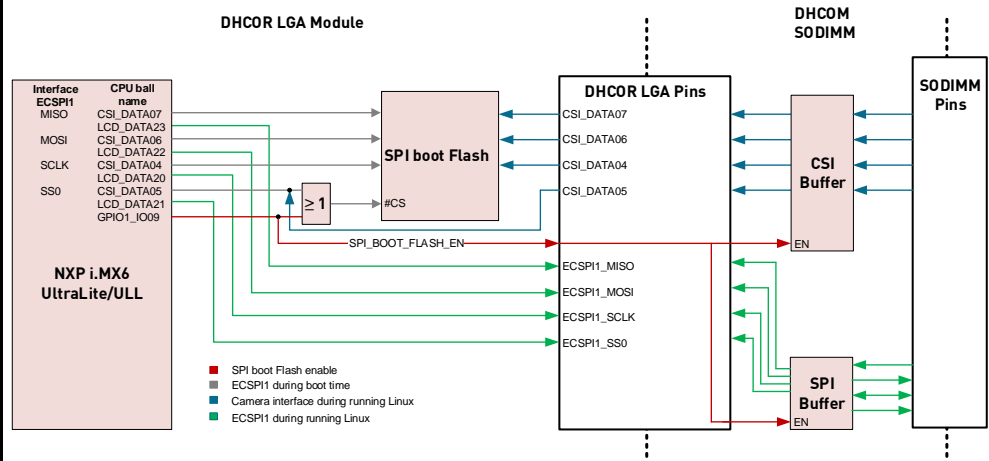


PCN Number	DHCOR-iMX6ULL-003		
PCN Date	17.02.2020		
Type of Change	Change Software		
History			
Revision	Date	Description	Name
R01	17.02.2020	First draft	CN
R01	18.02.2020	Released	AG

Change Information

Reason of Change

Changing the default bootloader location on DHCOR i.MX6ULL eMMC modules from SPI boot flash to eMMC:
 The reason is the lack of available pins of the i.MX6ULL. That's why the design shares i.MX6ULL ECSPi1 interface between SPI boot flash and DHCOR SPI1 port. For this reason, you can either access the SPI boot flash in Linux or you can use the DHCOR SPI1 port and DHCOR CSI_DATA* / GPIO pins. The next drawing shows a schematic overview:



The SPI boot flash is only available if SPI_BOOT_FLASH_EN pin is set to low and this is only the case until the bootloader has started. During Linux boot, SPI_BOOT_FLASH_EN will be set to high permanent. This means ECSPi1 can be used for DHCOR SPI1 interface and the CSI_DATA* can be used as GPIOs or Camera interface signals during normal operation.

This has the disadvantage that it is not possibility to access SPI boot flash during running Linux system. It follows that no bootloader or bootloader environment update is possible at this stage. By changing the bootloader location to the eMMC, it is no longer necessary to access the SPI boot flash during Linux operation. Therefore programming/updating the bootloader can be done without the mentioned disadvantages.

Description of Changes	<p>We changed the default boot device with our eMMC equipped modules from SPI boot flash to eMMC. This has the advantage that you can use DHCOR SPI1 and GPIO N through GPIO U in Linux and simultaneously you can access the bootloader and bootloader environment location from a running Linux system.</p> <p>With eMMC as boot device the U-Boot bootloader and the U-Boot environment are stored in the eMMC BOOT0 hardware partition. This hardware partition (2 MB or larger) is part of the eMMC specification (4.3 or newer) and each eMMC device must have at least one or more small partitions for firmware/bootloader.</p> <p>We used the following layout in BOOT0 (this is identical to our SPI NOR flash layout before):</p> <pre> 0x00_0000 - 0x00_03ff 1.024 UNUSED 0x00_0400 - 0x0f_ffff 1.047.552 SPL + U-Boot 0x10_0000 - 0x10_3fff 16.384 U-Boot env #1 0x10_4000 - 0x10_ffff 49.152 UNUSED 0x11_0000 - 0x11_3fff 16.384 U-Boot env #2 0x11_4000 - 0x11_ffff 49.152 UNUSED 0x12_0000 - 0x1f_ffff 917.504 UNUSED </pre>
Customer Impact	<p>From the customer's point of view there is no difference when booting the DHCOR module. Updating the bootloader by command "update bootloader filename.imx" will recognize the bootloader location and program it into the right place.</p> <p>Customers are only affected if they program/update the bootloader by their own.</p> <p>Note for DHCOR customers: This PCN only has an impact, if an eMMC flash is connected on your carrier board to the DHCOR i.MX6ULL module.</p>
Suggested Measures	<p>If customers program/update the Bootloader by their own they have to update their bootloader program instruction. The following is an example of programming from bootloader and one from Linux:</p> <p>Program the bootloader binary from USB to eMMC via U-Boot console:</p> <pre> usb start mmc dev 2 1 load usb 0:1 \${loadaddr} u-boot-with-spl.imx setexpr bsize \${filesize} / 200 setexpr bsize \${bsize} + 1 mmc write \${loadaddr} 2 \${bsize} </pre> <p>Programming the bootloader binary on Linux console:</p> <pre> echo 0 > /sys/block/mmcblk2boot0/force_ro dd if=u-boot-with-spl.imx of=/dev/mmcblk2boot0 bs=1k seek=1 </pre>
Logistics	-

Affected Products	
HI00062	DHCM-iMX6ULL-C090-R051-F0409-SPI-E2-CAN2-RTC-WBT-ADC-C-01D2
HI00063	DHCM-iMX6ULL-C090-R051-F0409-SPI-E2-CAN2-SD-RTC-ADC-C-01D2
HI00067	DHCR-iMX6ULL-C052-R025-SPI-C-01LG

HI00068	DHCR-iMX6ULL-C090-R051-SPI-C-01LG
HI00069	DHCR-iMX6ULL-C052-R025-SPI-WBT-C-01LG
HI00070	DHCR-iMX6ULL-C090-R051-SPI-WBT-C-01LG
HI00072	DHCR-iMX6ULL-C080-R051-SPI-WBT-I-01LG
HI00073	DHCM-iMX6ULL-C090-R051-F0409-SPI-E2-CAN2-RTC-WBT-ADC-C-01D2
HI00076	DHCM-iMX6ULL-C052-R025-F0409-SPI-E-RTC-C-01D2
HI00084	DHCM-iMX6ULL-C090-R051-F0409-SPI-E-CAN2-RTC-WBT-C-01D2

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