Arria10 SoC/FPGA FMC+ Development platform

Linux4.9.78-YoctoPyro Release Notes

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1. Purpose

The main purpose of this release is to support Linux 4.9.78 Kernel with Yocto Pyro BSP for iW-Rainbow-G24M SX480 SOM based Arria10 SOC/FPGA FMC+ Development platform. This release package contains BSP source, Binaries, FPGA sample design, User Manuals and Programming Tool.

2. Release contents

Features	Category	File Name	Description
Binaries	FPGA	ghrd_10as066n2.rbf	This raw binary file is used to program FPGA of iW-Rainbow-G24M Arria10 SOC/FPGA FMC+ Development platform.
	U-Boot	uboot_w_dtb-mkpimage.bin	This Uboot binary is used as the boot loader for iW-Rainbow-G24M Arria10 SOC/FPGA FMC+ Development platform.
	Linux	socfpga_arria10_iwg24m_prfxr_sx480.dtb	This device tree binary contains the hardware configuration and used by Linux OS to configure the peripherals of iW-Rainbow-G24M Arria10 SOC/FPGA FMC+ Development platform.
		zImage	This Linux kernel binary is used to test all the features of iW-Rainbow-G24M Arria10 SOC/FPGA FMC+ Development platform.
		rootfs.tar.gz	This binary is used to launch the Yocto Pyro file system in iW-Rainbow-G24M Arria10 SOC/FPGA FMC+ Development platform.
		iwtest	This folder contains Linux test application to test Dipswitch and GPIO loopback.
Documents	FPGA User Guide	iW-PRFXR-Arria10_SoC_FPGA_Dev Kit-FPGAUserGuide-REL0.1.pdf	This document is the FPGA user guide for iW-Rainbow-G24M Arria10 SOC/FPGA FMC+ Development platform. This guide provides the detailed information of FPGA design used in iW-Rainbow-G24M Arria10 SOC/FPGA FMC+ Development platform.
	Hardware User Guide	iW-RainboW-G24M-Arria10_SoC_FPGA_SOM-HardwareUserGuide-REL1.2.pdf	This document is the Hardware user guide for iW-Rainbow-G24M SOM. This Guide provides detailed information on the overall design and usage of SOM from Hardware System perspective.
		iW-PRFXR-Arria10_SoC_FPGA_Dev Kit-HardwareUserGuide-REL0.1.pdf	This document is the Hardware user guide for iW-Rainbow-G24M Arria10 SOC/FPGA FMC+ Development platform. This provides detailed information on the overall design and usage of carrier board from Hardware System perspective.

Features	Category	File Name	Description
	Software User Guide	iW-PRFXR-Arria10_SoC_FPGA-Linux4.9.78-SoftwareUserGuide-REL0.1.pdf	This document is to help the software engineers to program and test the iW-Rainbow-G24M Arria10 SOC/FPGA FMC+ Development platform. This will also guide to configure the Linux development environment in the Host PC and build the board support package.
	Release Note	iW-PRFXR-Arria10_SoC_FPGA-SX480-Linux4.9.78-YoctoPyro-ReleaseNote-REL0.1.pdf	This document contains important information about the software release contents, supported features and known issues/limitations.
Programming Tool	Programming Script	make_sdimage.py	This file is used to create SD card binary to program iW-Rainbow-G24M Arria10 SOC/FPGA FMC+ Development platform.
Source-Code	FPGA	iW-PRFXR-SY-01-R1.0-REL0.1.tar.gz	This folder contains the example FPGA design which includes all the peripherals of iW-Rainbow-G24M Arria10 SOC/FPGA FMC+ Development platform.
		Board_XML_Files	This folder contains the XML files which are used in creating the device tree of iW-Rainbow-G24M Arria10 SOC/FPGA FMC+ Development platform.
	Yocto	PATCH000-iW-PRFXR-SC-01-R1.0-REL0.1-YoctoPyro_basic_customization.patch	This patch incorporates the basic customization of Yocto for iW-Rainbow-G24M Arria10 SOC/FPGA FMC+ Development platform.
	U-Boot	PATCH001-iW-PRFXR-SC-01-R1.0-REL0.1-Linux4.9.78-UBoot_basic_customization.patch	This patch incorporates the basic customization of U-boot for iW-Rainbow-G24M Arria10 SOC/FPGA FMC+ Development platform.
	Linux	PATCH002-iW-PRFXR-SC-01-R1.0-REL0.1-Linux4.9.78-Kernel_basic_customization.patch	This patch incorporates the basic customization of Linux for iW-Rainbow-G24M Arria10 SOC/FPGA FMC+ Development platform.

3. BSP Supported Features

Feature	Comments
Supported Processors	
Processors	Intel's Arria 10 SX480
Kernel	
Kernel	Linux 4.9.78
File System	Yocto Pyro file system is used in EXT3 partition of SD card.
Boot Loader	
U-Boot	U-Boot Version: 2014.10 with SoC Embedded Design Suite Tool Version 18.1
Character Device Drivers	
UART	Console support via Debug HPS UART0.
High Speed interfaces	
FMC+	Supports FMC+ loopback of Single ended GPIOs and 16 high speed transceiver channels @10Gbps through FPGA transceiver PHY.
PCIe x4	Supports PCI express via FPGA PCIe Hard IP.
NVMe x4	Supports NVM express via FPGA PCIe Hard IP.
Networking Drivers	
Ethernet (1000Mbps)	Supports KSZ9031 Ethernet PHY via HPS EMAC1.
Block drivers	
SD/MMC	Supports Micro SD (4-bit) on SOM.
USB Drivers	
USB 2.0 OTG	Supports USB2.0 OTG (host mode) via HPS USB1.
Graphic Drivers	
Frame buffer driver	Supports frame buffer via FPGA Video and Image Processing IP.
HDMI	Supports ADV7511W HDMI transmitter with Full HD resolution.
General drivers	
I2C	Supports I2C master.
GPIO	Supports HPS/FPGA LED, Sliding switch and Push buttons through GPIO drivers.
PMOD	Supports 6Pin and 12Pin PMOD interface through FPGA I/O.
Programming Interface	
USB-Blaster II	Supports JTAG USB Blaster interface via MAX10.