EMERALD-P
CPU MODULE
SK-86R12-CPU01

USERGUIDE

FUJITSU

Revision History

Date	Issue
30 Nov 2011	V1.0 Herbert Hönig First release
07 Dec 2011	V1.01 Herbert Hoenig Corrected typo
12 Jan 2012	V1.1 Herbert Hönig Added PSMODE information

This document contains 11 pages.

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Contents

0 Introduction / Features

Here you will find a short summary and overview of the features that the SK-86R12-CPU01 Module offers.

It provides

- 3x APIX2 Video Outputs, 1x APIX2 Video Input

- 1x USB Host

- JTAG/Trace Debug Connectors (20 Pin + Mictor Connector)

- NOR Flash 1GBit

- DDR3 2x 2GBit (= 512MByte)

- NOR Flash usage with 16 oder 32 Bit access

- Base Connectors for use with Emerald European Base Board SK-86R11-BASE and Japanese Baseboard MB86R11EVB-BASE01

Mechanical dimensions:

- PCB : 117 x 127 mm

For details about interfaces refer to the Emerald-P Hardware Manual (see appendix).

1 System Overview

The Emerald-P system consists of three modules:

- CPU module (Emerald-P chip, USB connector): SK-86R12-CPU01

- Base board (supplies interfaces and power): SK-86R11-BASE

- Additional Addon board (from Jade-L system), provides 2x DVI output and 2x CVBS input : SK-86R03-VIDEO
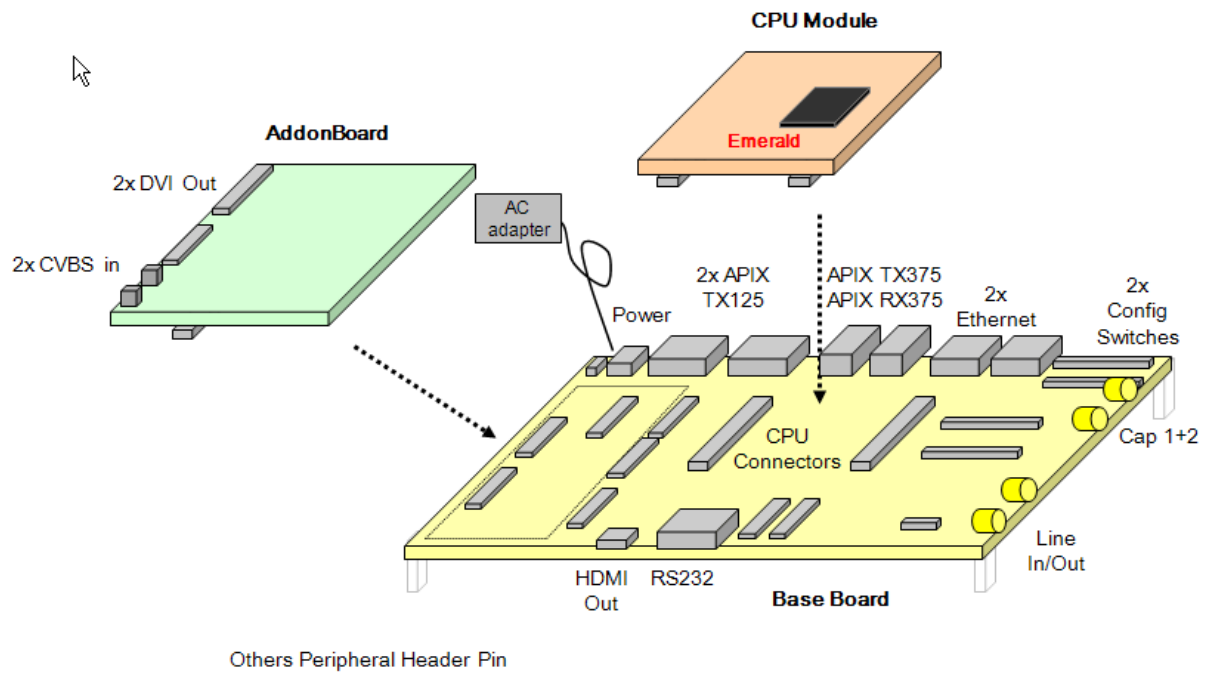

Figure 1-1: System Overview

2 Startup CPU Module

- Connect the CPU Module to the baseboard
- Connect appropriate cables (HDMI, RS232, Power etc) to baseboard
  (Please refer here to the Baseboard Manual – see appendix)
- Set switches SW1, SW11 and SW12 according to your needs (please refer here to the Hardware Manual – see appendix)
- Power on baseboard
- Demo starts up on HDMI output

Default settings for the CPU Module :

- Clock PLL set to 533MHZ
- NOR Flash boot activated
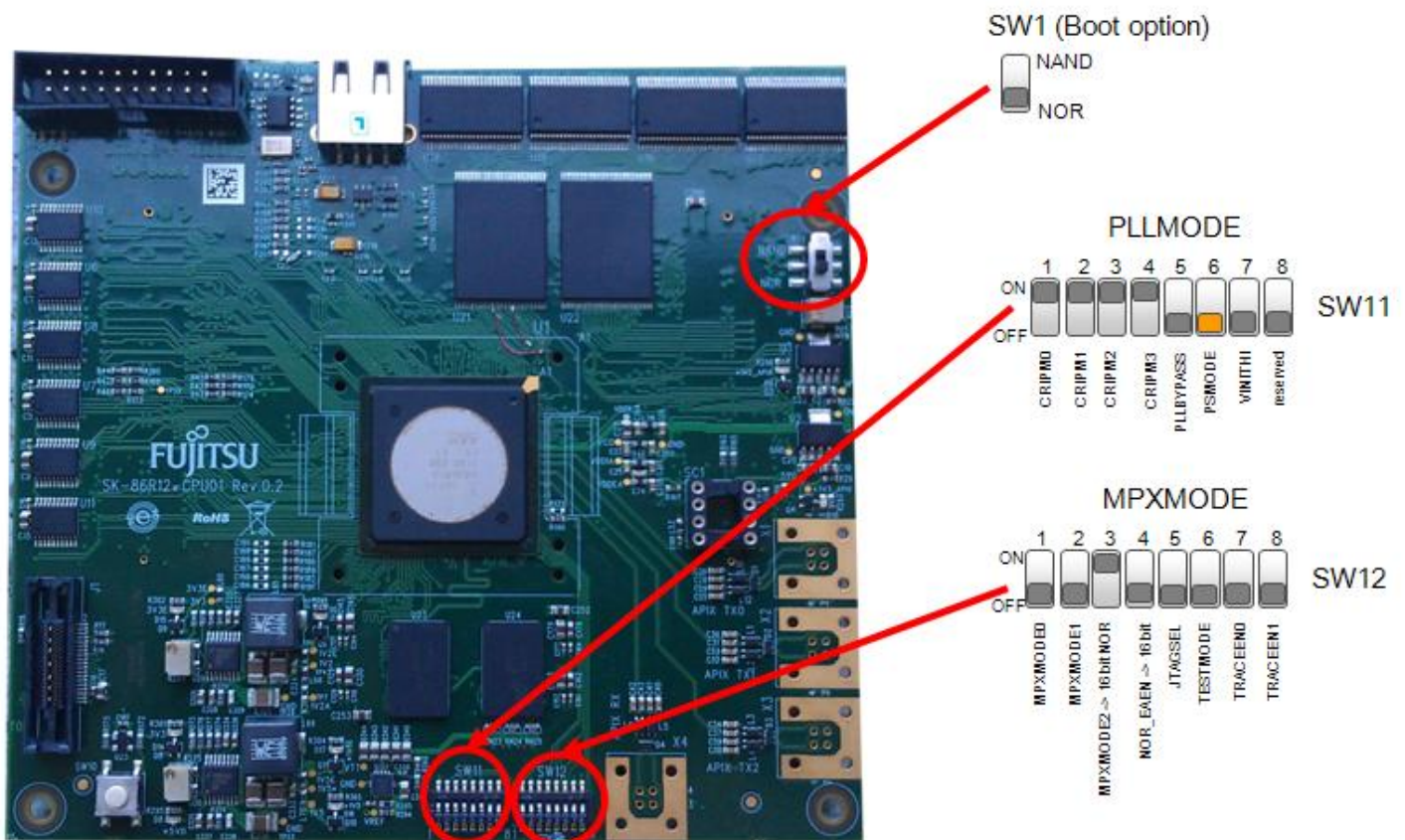- Bootloader and Linux system flashed in NOR and NAND Flash

Figure 2-1: Board Layout

3 Detailed Settings

3.1 NAND / NOR Boot Option

For NAND/NOR Boot Option SW1 is used

NAND   SELFL = HIGH   Boot from NAND
NOR   SEFLL = LOW   Boot from onboard NOR (default)

3.2 DIP Switches

SW11 – PLL Mode

SW11	Signal	Description	Default
1	CRIPM0	ON = 0, OFF = 1	ON
2	CRIPM1	ON = 0, OFF = 1	ON
3	CRIPM2	ON = 0, OFF = 1	ON
4	CRIPM3	ON = 0, OFF = 1	ON
5	PLLBYPASS	ON = PLL Clock is bypassed OFF = PLL Clock is not bypassed	OFF
6	PSMODE	OFF = PLL clock frequency divider ratio = 0 ON = PLL clock frequency divider ratio = 1	OFF
7	VINITHI	ON = Exception Vectors located at 0xFFFF0000 OFF = Exception Vectors located at 0x00000000	OFF
8	-	Unused	OFF

Notes:
CRIPM[0:3] default settings results in 533 MHz clock frequency

SW12 – MPX Mode

SW12	Signal	Description	Default
1	MPXMODE0	ON = 1, OFF = 0	OFF
2	MPXMODE1	ON = 1, OFF = 0	OFF
3	MPXMODE2	ON = 1, OFF = 0	OFF
4	NOREAN	NOR Flash Bus Width Select ON = 32 Bit = 0 (Default) OFF = 16 Bit = 1	ON
5	JTAGSEL	JTAG Select ON = DFT OFF = Normal (Default)	OFF
6	TESTMODE	Test Mode Select ON= Test Mode OFF = Normal (Default)	OFF
7	TRACEEN0	Pin Group B ETM ON = use OFF = not in use (Default)	OFF
8	TRACEEN1	Pin Group H ETM ON = use OFF = not in use (Default)	OFF

Notes:

MPX Mode Settings also available on Main Connector A

Attention: Do not set SW12-7 and SW12-8 to ON at the same time!

3.3   Power presets

R24   1.2V APIX Power Supply Adjustment   Set to 1.2V at Test Point TP8
R269   1.2V Power Supply Adjustment   Set to 1.2V at Test Point TP4
R275   1.5V Power Supply Adjustment   Set to 1.5V at Test Point TP13

3.3V APIX Power Supply : Dedicated LDO: R19 = OPEN, R20 = 0R
1.2V APIX Power Supply: Dedicated LDO: R21 = DNI, R22 = 0R

3.4   USB HOST

Settings:
Chip Select : used MEM_nCS2 -> R205 = 0R, R204 = OPEN
Interrupt : IRQ = INT_A0 -> R206 = 0R, R209 = OPEN

3.5   LEDs

D8   Global 5V Supply from base board connector
D9   1.2V supply to MB86R12 (APIX)
D10   3.3V supply to MB86R12 (APIX)
D12   1.2V supply to MB86R12 (general)
D13   5V Supply to USB bus
D14   Global 3.3V Supply from base board connector
D15   3.3V supply to MB86R12 (general)
D16   1.5V supply to DDR3 memory
D15   3.3V supply to MB86R12 (general)

4 Appendix

4.1 Used literature

- Emerald-P Hardware Manual:
  http://www.fujitsu.com/emea/services/microelectronics/gdc/gdcdevices/mb86r12-emerald-p.html

- Emerald-P CPU Module Schematics:
  http://www.fujitsu.com/emea/services/microelectronics/gdc/evalbds/emerald-p-starterkit.html

- Emerald-L Base Board Schematics:
  http://www.fujitsu.com/emea/services/microelectronics/gdc/evalbds/emerald-p-starterkit.html

- Software Update: Please check Website regularly for updates of the used Linux system
  http://www.fujitsu.com/emea/services/microelectronics/gdc/swtools/gdc-software-index.html

4.2 Figures