

TEBF0808 CPLD

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Overview

Firmware for PCB-Master CPLD with designator U17. Use first CPLD Device in Chain: LCMX02-1200HC.

Firmware for PCB-Slave CPLD with designator U39. Use second CPLD Device in Chain: LCMX02-1200HC.

There are 3 different Firmware variants available:

1. (Default): SCM_07A_default.jed/SCS_07A_default.jed
2. (optional): SCM_07B_powerdown_disabled.jed/SCS_07B_powerdown_disabled.jed - Power down Sequencing is disabled (See Note Power Managment).
3. (optional): SCM_07C_msdboot_disabled.jed/SCS_07C_msdboot_disabled.jed - CD Pin of MicroSD will not influence boot Mode (mircoSD can be used as Filesystem and system Boots from QSPI)

Feature Summary

- Power Management (Slave CPLD)

- Reset Management (both)
- CPLD JTAG (both)
- FMC JTAG / PJTAG (Master CPLD)
- FMC VADJ Power (Master CPLD)
- Boot Mode (Slave CPLD)
- PCIe (Slave CPLD)
- SD (both)
- UART SoC (Slave CPLD)
- UART (Debug) (Master CPLD)
- CAN (Master CPLD)
- USB (Master CPLD)
- DisplayPort (Master CPLD)
- SFP (Master CPLD)
- I2C (Master CPLD)
- LEDs (both)
- RGPIO (both)

Firmware Revision and supported PCB Revision

See Document Change History

Product Specification

Port Description

Name / opt. VHD Name	Direction	Pin	Bank Power	Description	CPLD	PCB REV02 Exception
C_T1		24	3V3SB	/ currently_not_used	U17	NC
C_T2		26	3V3SB	/ currently_not_used	U17	NC
C_T3		25	3V3SB	/ currently_not_used	U17	NC
C_TCK	in	131	3V3SB	JTAG J28 (XMOD2) / FMC JTAG	U17	
C_TDI	in	136	3V3SB	JTAG J28 (XMOD2) / FMC JTAG	U17	
C_TDO1 / C_TDO	out	137	3V3SB	JTAG J28 (XMOD2) / FMC JTAG	U17	
C_TMS	in	130	3V3SB	JTAG J28 (XMOD2) / FMC JTAG	U17	
CAN_FAULT		106	3V3SB	CAN	U17	
CAN_RX	in	107	3V3SB	CAN	U17	
CAN_S	out	105	3V3SB	CAN	U17	
CAN_TX	out	104	3V3SB	CAN	U17	
CLK_125MHz / PHY_CLK	in	70	1.8V	/ currently_not_used	U17	
CON_NTRST / JTAG_TRST	in	117	3V3SB	JTAG, Connector J30	U17	
CON_RTCK / JTAG_RTCK	out	125	3V3SB	JTAG, Connector J30	U17	
CON_sRST / JTAG_SRST	in	127	3V3SB	JTAG, Connector J30	U17	
CON_TCK / JTAG_TCK	in	122	3V3SB	JTAG, Connector J30	U17	
CON_TDI / JTAG_TDI	in	119	3V3SB	JTAG, Connector J30	U17	
CON_TDO / JTAG_TDO	out	126	3V3SB	JTAG, Connector J30	U17	
CON_TMS / JTAG_TMS	in	121	3V3SB	JTAG, Connector J30	U17	

DIR_T1		23	3V3SB	/ currently_not_used	U17	NC
DIR_T2		28	3V3SB	/ currently_not_used	U17	NC
DIR_T3		27	3V3SB	/ currently_not_used	U17	NC
DP_AUX_DE / DP_DE	out	92	3V3SB	Display Port	U17	
DP_AUX_RX / DP_RX	in	91	3V3SB	Display Port	U17	
DP_AUX_TX / DP_TX	out	93	3V3SB	Display Port	U17	
DP_EN	out	77	3V3SB	Display Port	U17	
DP_TX_HPD / DP_HPD	in	94	3V3SB	Display Port	U17	
ETH_RST	out	62	1.8V	ETH Reset	U17	
EX_IO1		112	3V3SB	/ currently_not_used	U17	
EX_IO2		113	3V3SB	/ currently_not_used	U17	
EX_IO3		114	3V3SB	/ currently_not_used	U17	
EX_IO4		115	3V3SB	/ currently_not_used	U17	
F2_EN		19	3V3SB	/ currently_not_used	U17	NC
F2PWM		20	3V3SB	/ currently_not_used	U17	NC
F2SENSE		21	3V3SB	/ currently_not_used	U17	NC
FMC_CLK_DIR / FMC_CLKDIR	in	73	3V3SB	FMC	U17	
FMC_TCK	out	95	3V3SB	FMC	U17	
FMC_TDI	out	96	3V3SB	FMC	U17	
FMC_TDO	in	97	3V3SB	FMC	U17	
FMC_TMS	out	98	3V3SB	FMC	U17	
FMC_VID0	out	139	3V3SB	FMC	U17	
FMC_VID1	out	140	3V3SB	FMC	U17	
FMC_VID2	out	141	3V3SB	FMC	U17	
GND		84	3V3SB	REV03 unconnected / currently_not_used	U17	USB_TRST, other USB HUB
HDIO_SC10 / SC10	out	60	1.8V	FPGA / DP_RX or 'Z'	U17	
HDIO_SC11 / SC11	in	59	1.8V	FPGA / DP_DE	U17	
HDIO_SC12 / SC12	out	58	1.8V	FPGA / DP_HPD	U17	
HDIO_SC13 / SC13	out	57	1.8V	FPGA / RGPIO TX	U17	
HDIO_SC14 / SC14	in	56	1.8V	FPGA / RGPIO RX	U17	
HDIO_SC15 / SC15	in	55	1.8V	FPGA / RGPIO CLK	U17	
HDIO_SC16 / SC16	in	54	1.8V	FPGA / CAN_S	U17	
HDIO_SC17 / SC17	in	52	1.8V	FPGA / XMOD LED	U17	
HDIO_SC18 / SC18	in	68	1.8V	FPGA / CAN_TX	U17	
HDIO_SC19 / SC19	out	69	1.8V	FPGA / CAN_RX	U17	
I2C_RST	out	61	1.8V	I2C	U17	
JTAGENB		120	3V3SB	external Pin for CPLD Firmware Update	U17	
LED_1A / JLED1	out	109	3V3SB	USB3.0 LED Jellow	U17	
LED_2A / JLED2A	out	111	3V3SB	USB3.0 LED Green/Orange	U17	

LED_2B / JLED2B	out	110	3V3SB	USB3.0 LED Green/Orange	U17	
MIO26	out	41	1.8V	MIO / PJTAG	U17	
MIO27	out	40	1.8V	MIO / PJTAG	U17	
MIO28	in	39	1.8V	MIO / PJTAG	U17	
MIO29	out	38	1.8V	MIO / PJTAG	U17	
OCLK_EN / OSC_EN	out	74	3V3SB	Programmable Oscillator U45	U17	
PHY_CONFIG	out	65	1.8V	ETH PHY	U17	
PHY_LED0	in	67	1.8V	ETH PHY	U17	
PHY_LED1	in	86	3V3SB	ETH PHY	U17	
PHY_LED2	in	85	3V3SB	ETH PHY	U17	
SC_CLK0 / CLK0	in	76	3V3SB	/ currently_not_used	U17	
SC_CLK1 / CLK1	in	75	3V3SB	/ currently_not_used	U17	
SC_IO0 / X0	out	50	1.8V	MTS dummy	U17	
SC_IO1 / X1	in	49	1.8V	internal cpld RGPIO CLK	U17	
SC_IO2 / X2	out	48	1.8V	internal cpld RGPIO TX	U17	
SC_IO3 / X3	in	47	1.8V	internal cpld RGPIO RX	U17	
SC_IO4 / X4	out	45	1.8V	SD WP to slave cpld	U17	
SC_IO5 / X5	in	44	1.8V	STM dummy	U17	
SC_IO6 / X6	out	43	1.8V	/ currently_not_used	U17	
SC_IO7 / X7	out	42	1.8V	/ currently_not_used	U17	
SC_IO8 / X8	in	22	3V3SB	internal cpld RGPIO available(1.8V on)	U17	
SC_SCL / SCL	in	14	3V3SB	I2C Mux U27 / currently_not_used	U17	
SC_SDA / SDA	in	13	3V3SB	I2C Mux U27 / currently_not_used	U17	
SC2_SW3 / SW3	in	6	3V3SB	DIP-Switch S5-3	U17	
SC2_SW4 / SW4	in	5	3V3SB	DIP-Switch S5-4	U17	
SD_WP	in	100	3V3SB	MMC SD WP	U17	
SFP_LED1 / SFP_LED0	out	81	3V3SB	SFP	U17	
SFP_LED2 / SFP_LED1	out	82	3V3SB	SFP	U17	
SFP_LED3 / SFP_LED2	out	78	3V3SB	SFP	U17	
SFP_LED4 / SFP_LED3	out	83	3V3SB	SFP	U17	
SFP1_LOS		32	3V3SB	SFP / currently_not_used	U17	
SFP1_TX_DIS	out	33	3V3SB	SFP	U17	
SFP2_LOS		35	3V3SB	SFP / currently_not_used	U17	
SFP2_TX_DIS	out	34	3V3SB	SFP	U17	
STAT_LED0 / LED0	out	99	3V3SB	LED D4 Green	U17	
STAT_LED1 / LED1	out	128	3V3SB	LED D1 Red	U17	
USB0_RST / USB_TRST		71	1.8V	USB (U9) PHY Reset	U17	
USBH_LED_G3		11	3V3SB	USB Hub (U4) / currently_not_used	U17	
USBH_LED_G4		12	3V3SB	USB Hub (U4) / currently_not_used	U17	
USBH_LED_SS1		9	3V3SB	USB Hub (U4) / currently_not_used	U17	

USBH_LED_SS2		133	3V3SB	USB Hub (U4) / currently_not_used	U17	
USBH_LED_SS3		132	3V3SB	USB Hub (U4) / currently_not_used	U17	
USBH_LED_SS4		138	3V3SB	USB Hub (U4) / currently_not_used	U17	
USBH_MODE0	out	142	3V3SB	USB Hub (U4)	U17	
USBH_MODE1	out	143	3V3SB	USB Hub (U4)	U17	
USBH_RST	out	10	3V3SB	USB Hub (U4)	U17	
XMOD1_A / XMOD_TXD	out	3	3V3SB	J28 (XMOD 2 UART)	U17	
XMOD1_B / XMOD_RXD	in	2	3V3SB	J28 (XMOD 2 UART)	U17	
XMOD1_E / XMOD_E	out	4	3V3SB	J28 (XMOD 2 LED)	U17	
XMOD1_G / XMOD_G	out	1	3V3SB	J28 (XMOD 2 Button)	U17	
1.8V_EN / EN_1V8	out	106	3V3SB	Enable 1.8V Power	U39	
5V_EN / EN_5V	out	115	3V3SB	Enable 5V Power, can be permanently enabled by S4-4	U39	
C_TCK		131	3V3SB	JTAG J28 (XMOD2) / currently_not_used	U39	
C_TDO	out	137	3V3SB	JTAG J28 (XMOD2)	U39	
C_TDO1 / C_TDI	in	136	3V3SB	JTAG J28 (XMOD2)	U39	
C_TMS		130	3V3SB	JTAG J28 (XMOD2) / currently_not_used	U39	
CLK_A / AUD_CLK	out	1	1.8V	AUDIO U3 CLK	U39	
CLK_CPLD / MEMS_CLKIN	in	128	3V3SB	U25 24,576MHz	U39	
DONE	in	67	1.8V	PS Done	U39	
EN_DDR	out	86	3V3SB	Enable Module DDR Power	U39	
EN_FMC / FMC_EN	out	104	3V3SB	FMC	U39	
EN_FPD	out	81	3V3SB	Enable Module PS FPD Power	U39	
EN_GT_L	out	77	3V3SB	Enable Module GT Power	U39	
EN_GT_R	out	93	3V3SB	Enable Module GT Power	U39	
EN_LPD	out	84	3V3SB	Enable Module PS LPD Power	U39	
EN_PL	out	95	3V3SB	Enable Module PL Power	U39	
EN_PLL_PWR	out	78	3V3SB	Enable Module SI5345 Power	U39	
EN_PSGT / EN_PSGTR	out	75	3V3SB	Enable Module PS GT Power	U39	
ERR_OUT / ERROR	in	70	1.8V	Module PS Error Out / Status	U39	
ERR_STATUS / ERR_STAT	in	69	1.8V	Module PS Error Status	U39	
F1PWM	out	121	3V3SB	FAN1	U39	
F1SENSE	in	125	3V3SB	FAN1	U39	
FAN_FMC_EN / FMC_FAN_EN		132	3V3SB	FMC FAN	U39	
FMC_PG_C2M	out	141	3V3SB	FMC PG	U39	
HD_LED_N / HDLED_N	out	112	3V3SB	J10 HD LED	U39	
HD_LED_P / HDLED_P	out	110	3V3SB	J10 HD LED	U39	
HDIO_SC0 / SC0	in	32	1.8V	FPGA IO / forward to HD_LED_P / HDLED_P	U39	
HDIO_SC1 / SC1	in	33	1.8V	/ currently_not_used	U39	
HDIO_SC2 / SC2	in	34	1.8V	/ currently_not_used	U39	

HDIO_SC3		35	1.8V	/ currently_not_used	U39	
HDIO_SC4		25	1.8V	/ currently_not_used	U39	
HDIO_SC5 / SC5	out	26	1.8V	FPGA IO / RGPIO	U39	
HDIO_SC6 / SC6	in	27	1.8V	FPGA IO / RGPIO CLK	U39	
HDIO_SC7 / SC7	in	28	1.8V	.FPGA IO / RGPIO	U39	
I2C_SCL / SCL	in	50	1.8V	I2C / currently_not_used	U39	
I2C_SDA / SDA	in	52	1.8V	I2C / currently_not_used	U39	
INIT_B / INIT	in	68	1.8V	Module PS Init_B	U39	
JTAGENB		120	3V3SB	external Pin for CPLD Firmware Update	U39	
LP_GOOD / PG_LPD	in	83	3V3SB	Module LP Power Good	U39	
MIO24		38	1.8V	MIO / currently_not_used	U39	
MIO25		39	1.8V	MIO / currently_not_used	U39	
MIO30	in	48	1.8V	MIO / USB Reset	U39	
MIO31	in	49	1.8V	MIO / PCIe Reset	U39	
MIO32		40	1.8V	MIO / currently_not_used	U39	
MIO33		41	1.8V	MIO / currently_not_used	U39	
MIO34		42	1.8V	MIO / currently_not_used	U39	
MIO35		43	1.8V	MIO / currently_not_used	U39	
MIO36		44	1.8V	MIO / currently_not_used	U39	
MIO37		45	1.8V	MIO / currently_not_used	U39	
MIO40	in	54	1.8V	MIO	U39	
MIO41		55	1.8V	MIO / currently_not_used	U39	
MIO42	out	60	1.8V	MIO	U39	
MIO43	in	61	1.8V	MIO	U39	
MIO44		47	1.8V	MIO	U39	
MOD_EN	out	119	3V3SB	Enable Main Module Power 3.3V	U39	
MODE0	out	6	1.8V	Module Boot Mode	U39	
MODE1	out	9	1.8V	Module Boot Mode	U39	
MODE2	out	10	1.8V	Module Boot Mode	U39	
MODE3	out	11	1.8V	Module Boot Mode	U39	
MR / MRESETn	out	92	3V3SB	Module PS Power Reset	U39	
PCI_SFP_EN	out	76	3V3SB	SFP	U39	
PER_EN	out	117	3V3SB	Enable 3.3V power	U39	
PERST / PERSTn	out	139	3V3SB	PCIE Resetn	U39	
PG_DDR	in	91	3V3SB	Module Power Good	U39	
PG_FPD	in	85	3V3SB	Module Power Good	U39	
PG_GT_L	in	96	3V3SB	Module Power Good	U39	
PG_GT_R	in	94	3V3SB	Module Power Good	U39	
PG_PL	in	82	3V3SB	Module Power Good	U39	
PG_PLL_1V8 / PG_PLL	in	73	3V3SB	Module Power Good	U39	

PG_PSGT	in	74	3V3SB	Module Power Good	U39	
PLL_LOL _n / PLL_LOL	in	58	1.8V	Module PLL / currently_not_used	U39	
PLL_RST / PLL_RST _n	out	56	1.8V	Module PLL Reset	U39	
PLL_SEL0	out	57	1.8V	Module PLL	U39	
PLL_SEL1	out	59	1.8V	Module PLL	U39	
POK_1V8	in	107	3V3SB	Carrier Power Good	U39	
POK_FMC	in	99	3V3SB	FMC Power Good	U39	
PROG_B	OUT	71	1.8V	Module PS_PROG_B	U39	
PSON	out	105	3V3SB	ATX J20 PS_ON _N	U39	
PWR_BTN	in	113	3V3SB	Power Button S1 or J10	U39	
PWRLED _N / LED _N	out	111	3V3SB	J10 PWR	U39	
PWRLED _P / LED _P	out	109	3V3SB	J10 PWR	U39	
PWROK	in	100	3V3SB	ATX J20 PWROK	U39	
RST_BTN	in	114	3V3SB	Reset Button S2 or J10	U39	
S_1		127	3V3SB	BEEPER / currently_not_used	U39	
SC_IO0 / X0	in	12	1.8V	MTS dummy	U39	
SC_IO1 / X1	out	13	1.8V	internal cpld RGPIO CLK	U39	
SC_IO2 / X2	in	14	1.8V	internal cpld RGPIO RX	U39	
SC_IO3 / X3	out	20	1.8V	internal cpld RGPIO TX	U39	
SC_IO4 / X4	in	21	1.8V	MMC SD WP from master	U39	
SC_IO5 / X5	out	22	1.8V	STM dummy	U39	
SC_IO6 / X6	in	23	1.8V	/ currently_not_used	U39	
SC_IO7 / X7	in	24	1.8V	/ currently_not_used	U39	
SC_IO8 / X8	out	126	3V3SB	internal cpld RGPIO available(1.8V on)	U39	
SC2_SW1 / SW1	in	133	3V3SB	S5-1 / Boot Mode Selection	U39	
SC2_SW2 / SW2	in	138	3V3SB	S5-2 / Boot Mode Selection	U39	
SD_A_EN	out	140	3V3SB	Micro SD	U39	
SD_B_EN	out	122	3V3SB	MMC SD	U39	
SD_CD / SD_CD_OUT	out	65	1.8V	SD Card detect to FPGA	U39	
SD_CD_B	in	143	3V3SB	MMC SD CD	U39	
SD_CD_S	in	142	3V3SB	Micro SD CD	U39	
SEL_SD / SD_SEL	out	62	1.8V	SD select (Mirco or MMC)	U39	
SRST_B / SRST _n	out	19	1.8V	Module PS_SRST_B	U39	
STAT_LED2 / LED2	out	98	3V3SB	LED D6 Green	U39	
STAT_LED3 / LED3	out	97	3V3SB	LED D7 Red	U39	
XMOD2_A / XMOD_TXD	out	5	1.8V	J12 (XMOD 1 UART)	U39	
XMOD2_B / XMOD_RXD	in	4	1.8V	J12 (XMOD 1 UART)	U39	
XMOD2_E / XMOD_LED	out	3	1.8V	J12 (XMOD 1 LED)	U39	
XMOD2_G / XMOD_BTN	in	2	1.8V	J12 (XMOD 1 Button)	U39	

Functional Description

JTAG

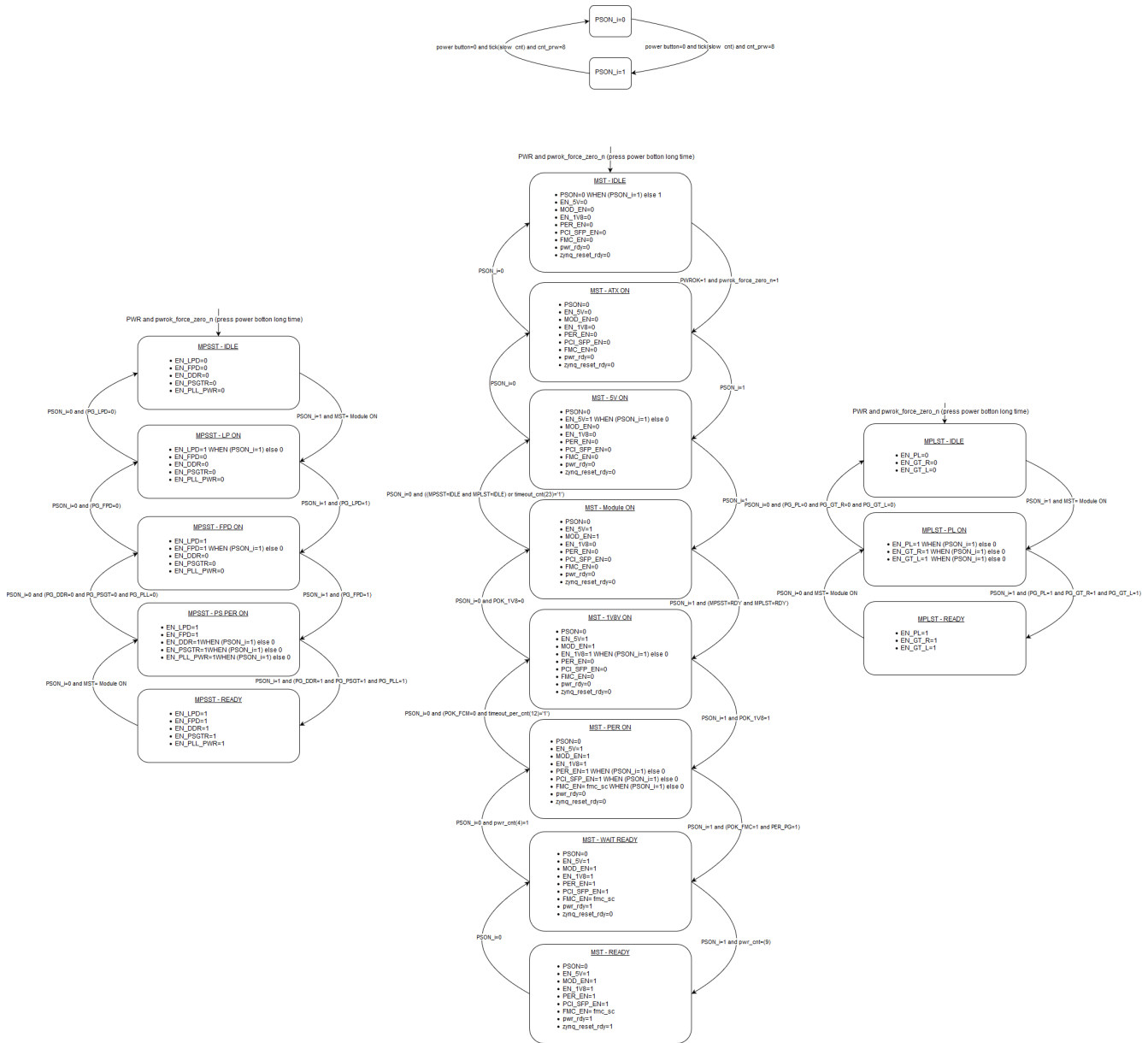
JTAGENB set carrier board CPLD into the chain for firmware update. For Update set DIP S4-3 to ON.

Power

FMC VADJ is handled on master CPLD.

DIP	Positon	Description
S5-4	ON	1.8V
S5-4	OFF	1.2V

Power on and off sequencing is done with slave CPLD.



Power On/OFF Sequencing

Note: Power downs sequencing above can be disabled with second optional CPLD Firmware:

1. Configure Firmware version SCM_07B_powerdown_disabled.jed/SCS_07B_powerdown_disabled.jed
2. Add Jumper to J10-6 and J10-8 instead of Enclosure Button
3. Module will be powered and boot on with Main power supply.

Reset

Power, Zynq reset and PCIe is handle on Slave CPLD

USB, I2C Reset is handled on Master CPLD

Type	controlled by
PCie	Power On Reset_N(pwr_rdy), MIO31
USB(PHY+HUB)	Power On Reset_N(pwr_rdy), MIO30
Modul PLL	Power On Reset_N(pwr_rdy)
PS_POR_B	Reset Button (hold long time ~3s), zynq_reset_ready
PS_SRST_B	Reset Button (hold short time ~1s), zynq_reset_ready
FMC_FAN_EN	Power On Reset_N(pwr_rdy)
I2C_RST	Power On Reset_N(pwr_rdy)
ETH_RST	Power On Reset_N(pwr_rdy)

JTAG

CPLD JTAG only needed for CPLD Firmware update.

FMC and CPLD JTAG is accessible over XMOD2(J28).

S4-3	
ON	CPLD Access on both CPLD
OFF	FMC JTAG Access

PJTAG on connector J17 is routed over Master CPLD to MIO26..29.

Signal	Connection
JTAG_TCK	MIO26
JTAG_RTCK	JTAG_TCK
JTAG_TDI	MIO27
JTAG_TDO	MIO28
JTAG_TMS	MIO29
JTAG_SRST	not usedconnected only to FPGA RGPIO
JTAG_TRST	not used, connected only to FPGA RGPIO

Boot Mode

Boot Mode is handled on Slave CPLD.

S5-1	S5-2	Description
ON	ON	Default, boot from SD/microSD or SPI Flash if no SD is detected
OFF	ON	Boot from eMMC
ON	OFF	Boot mode PJTAG0

OFF	OFF	Boot mode main JTAG
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Note: There is a second CPLD Variant available, where microSD will not change the boot mode.

1. Configure Firmware version SCM_07C_msdboot_disabled.jed/SCS_07C_msdboot_disabled.jed
2. Boot mode will be still QSPI,when microSD is inserted.

PCIe

PCIe is handled on Slave CPLD.

Signal	Connection
PERSTn	Power On reset and MIO31

SD

SD is mainly handled on Slave CPLD

SD Signal	Description
SD_SEL	CD Pin form microSD selects the SD Card, microSD has higher priority
CD (MIO45)	microSD and SD Card detect
WP(MIO44)	0 when microSD is used else SD card detect (forward over Master CPLD)

UART SoC

SoC(ZynqMP) is accessible over XMOD1(J12) and connected to ZynqMP over Slave CPLD

Signal	Description
XMOD_TXD	ZynqMP TX(MIO43), when PWR Ready else 1
XMOD_RXD	to ZynqMP RX(MIO42), when PWR Ready else 1

UART (Debug)

Simple Firmware Debug UART is accessible over XMOD2(28) over Master CPLD

Firmware Versions and some statistics can be displayed over second XMOD:

- Included since CPLD Firmware Update to REV07
- UART Speed is 115200
- Press XMOD Button to see output, otherwise RX/TX are loop backed

Signal	Description
XMOD_TXD	Debug output, when XMOD Button is pressed else RX loopback
XMOD_RXD	Debug input(currently no function), when XMOD Button is pressed else TX loopback

CAN

CAN is handled mainly on Master CPLD

Signal	Description
CAN_TX	SC18(FPGA LOC depends on module)
CAN_RX	SC19(FPGA LOC depends on module)
CAN_S	SC16(FPGA LOC depends on module)
CAN_FAULT	Monitoring over RGPIO only

USB

USB Reset is handled mainly on Master CPLD

Signal	Description
USB_RST	Power On Reset and MIO30 (over slave CPLD)
USBH_RST	Power On Reset and MIO30 (over slave CPLD)
USBH_MODE0	const 1
USBH_MODE1	const 1

DisplayPort

DisplayPort is handled on Master CPLD

Signal	Description
DP_EN	not Power On Reset
DP_RX	to SC10 when SC11 is 0 else Z
DP_TX	SX10
DP_DE	SC11
DP_HPD	SC12

SFP

ETH Reset is handled on Master CPLD

Signal	Description
SFP1_TX_DIS	const 0 (Enabled)
SFP2_TX_DIS	const 0 (Enabled)

I2C

I2C MUX is handled on Master CPLD

Signal	Description
I2C_RST	Power On Reset

ETH

ETH Reset is handled on Master CPLD

Signal	Description
ETH_RST	Power On Reset
PHY_CONFIG	const 1

LEDs

LEDs are handled on both CPLDs.

They used different Blink Sequence to indicate all state:

***** (slow blinking)	~0,7 Hz	continuous blinking, like SFP LEDs or Enclosure HD LED when board is powered down
***** (fast blinking)	~5,8 Hz	continuous blinking, like D6 LED or Enclosure Power LED when board is powered down
*****000	~0,7 Hz, duty cycle 5/8	5 times fast blink with a break
****0000	~0,7 Hz, duty cycle 4/8	4 times fast blink with a break
***00000	~0,7 Hz, duty cycle 3/8	3 times fast blink with a break
**000000	~0,7 Hz, duty cycle 2/8	2 times fast blink with a break
*0000000	~0,7 Hz, duty cycle 1/8	1 times fast blink with a break
ON	---	LED ON
OFF	---	LED OFF

Designator	Color	Usage	Description		
D7	Red	status	Priority	Description	Blink sequencing
			1	PS POR Reset pressed long time (or whole system is powered off)	ON
			2	PS Soft Reset pressed short time	OFF
			3	SD Boot	*0000000
			4	QSPI Boot	**000000
			5	eMMC Boot	***00000
			6	PJTAG Boot	****0000
			7	JTAG Boot	*****000
			8	Error	***** (fast blinking)

D6	Green	status	Priority	Description	Blink sequencing
			1	Power OFF	***** (fast blinking)
			2	PG_LPD low	****000
			3	PG_FPD low	****0000
			4	PG_PL low	***00000
			5	PG_DDR low or PG_PSGT low or PG_PLL low or PG_GT_L low or PG_GT_R low	**000000
			6	POK_1V8 low or POK_FMC low or perihpery_pg low or (Main Power State Machine Ready and FMC Sanity check low)	*0000000
			7	Main Power State Machine Ready	OFF
			8	ERROR some power failed, see XMOD LEDs	ON
J10 Power LED	Blue (symbol light bulb)	status /user	Priority	Description	Blink sequencing
			1	power button pressed long time forced power down	***** (fast blinking)
			2	Main Power State Machine Idle and Power of State is off	***** (slow blinking)
			3	power button pressed short time power to power on/off	****000
			4	PS reset button pressed long time	****0000
			5	PS reset button pressed short time	***00000
			6	power down sequencing is running	**000000
			7	whole system hold into reset	*0000000
			8	MIO40	User Defined
J10 HD LED	Red (symbol drive)	status /user	Priority	Description	Blink sequencing
			1	PS Init is low	***** (fast blinking)
			2	PS Error High	****000
			3	PS Error Status High	****0000
			4	SOC Done low	***00000
			5	SC0	User Defined

XMOD1 D4	Red	status	Priority	XMOD Button	Description	Blink sequencing
			1	Pressed	power button pressed long time forced power down	***** (fast blinking)
			2	Pressed	Main Power State Machine Idle and Power of State is power down sequencing	****000
			3	Pressed	PS reset button pressed	****0000
			4	Pressed	Power button pressed short time power on/off	***00000
			5	Pressed	Power of State is power down sequencing	**000000
			6	Pressed	System hold into reset	*0000000
			7	Pressed	PS Init low	ON
			1	Unpressed	Problem with other CPLD, FMC is disabled	***** (fast blinking)
			2	Unpressed	Main Power State Machine Wait Ready ON/OFF	****000
			3	Unpressed	Main Power State Machine 3.3V and VADJ ON/OFF	****0000
			4	Unpressed	power not ready (power reset)	**000000
			5	Unpressed	zynq reset	*0000000
			7	Unpressed	PS Init low	ON
			x	Pressed /Unpressed	all fine	OFF
			XMOD2 D4	Red	status /user	Priority
1	Power On Reset	***** (slow blinking)				
2	PS Init low	***** (fast blinking)				
3	SC17	User Defined				
SFP D1	Red	status /user	Priority	Description	Blink sequencing	
			1	Power On Reset	***** (slow blinking)	
			2	PS Init low	***** (fast blinking)	
			3	RGPIO(0), when RGPIO Enabled over FPGA	User Defined	
			4	--	OFF	
SFP D8	Green	status /user	Priority	Description	Blink sequencing	
			1	Power On Reset	***** (slow blinking)	
			2	PS Init low	***** (fast blinking)	
			3	RGPIO(1), when RGPIO Enabled over FPGA	User Defined	
			4	--	OFF	
D17 - USB HUB LED (Suspend)	Green	status	ON, no USB connected, OFF, USB connected			

SFP D9	Red	status /user	Priority	Description	Blink sequencing
			1	Power On Reset	***** (slow blinking)
			2	PS Init low	***** (fast blinking)
			3	RGPIO(2), when RGPIO Enabled over FPGA	User Defined
			4	--	OFF
SFP D10	Green	status /user	Priority	Description	Blink sequencing
			1	Power On Reset	***** (slow blinking)
			2	PS Init low	***** (fast blinking)
			3	RGPIO(3), when RGPIO Enabled over FPGA	User Defined
			4	--	OFF
ETH J7	Yellow	status	Priority	Description	Blink sequencing
			1	Power On Reset	***** (slow blinking)
			2	PS Init low	***** (fast blinking)
			3	ETH PHY LED	(not PHY_LED0)
ETH J7	Green/Orange	status	Priority	Description	Blink sequencing
			1	Power On Reset	***** (slow blinking)
			2	PS Init low	***** (fast blinking)
			3	ETH PHY LED	(PHY_LED1)
D4	Green	status /user	Priority	Description	Blink sequencing
			1	1.8V disabled, inter CPLD RGPIO is disabled	***** (fast blinking)
			2	1.8V enabled, inter CPLD RGPIO is disabled	*****000
			3	Power On Reset	****0000
			4	USB Reset	***00000
			5	RGPIO(4), when RGPIO Enabled over FPGA	User Defined
			6	all fine	*0000000
D5	Red	status /user	Priority	Description	Blink sequencing
			1	1.8V disabled, inter CPLD RGPIO is disabled	***** (fast blinking)
			2	1.8V enabled, inter CPLD RGPIO is disabled	*****000
			3	Power On Reset	****0000
			4	PCie Reset	***00000
			5	RGPIO(4), when RGPIO Enabled over FPGA	User Defined
			6	all fine	*0000000

RGPIO

There are 3 RGPIO interfaces, one InterCPLD RGPIO, and one from every CPLD to SoC.

InterCPLD RGPIO handles:

Signal	Description
Reset Button (SW)	for monitoring only
PS POR	for monitoring only
PS ERR Stat	for monitoring only
PS ERR	for monitoring only
PS Init	for monitoring only
PCIe Reset	for monitoring only
USB Reset	for USB Reset and monitoring
Power On Reset	for Power On Reset and monitoring
inter FPGA	Data from Slave RGPIO to Master RGPIO (for test only)

Master CPLD-SoC RGPIO (accesseble via SoC):

Signal	Description
FPGA Read (23)	JTAG_SRST
FPGA Read (22)	JTAG_TRST
FPGA Read (21)	FMC_CLKDIR
FPGA Read (20)	SD_WP
FPGA Read (19)	unused 0
FPGA Read (18)	SW4
FPGA Read (17)	SW3
FPGA Read (16)	XMOD_G
FPGA Read (15 dt 13)	PHY LEDs
FPGA Read (12)	CAN_FAULT
FPGA Read (11 dt 8)	current RGPIO Mux

FPGA Read (7 dt 0)	Data depends on MUX:	
	0	Data(7dt0) from Slave CPLD-SoC RGPIO
	1	POR Statistic
	2	PS RST Statistic
	3	PS POR Statistic
	4	PS Init Statistic
	5	PS ERR Statistic
	6	PS ERR Stat Statistic
	7	PCie RST Statistic
	8	USB RST Statistic
FPGA Write (23 dt 12)	unused	
FPGA Write (11 dt 8)	RGPIO Mux, see FPGA Read (7 dt 0) , when RGIO active	
FPGA Write (7 dt 6)	unused	
FPGA Write (5 dt 0)	Diverse LED controll(see LED description) , when RGIO active	

Slave CPLD-SoC RGPIO (accesseble via SoC):

Signal	Description
FPGA Read (23)	PLL_LOL
FPGA Read (22)	PG_PLL
FPGA Read (21)	PG_PL
FPGA Read (20)	PWROK and pwrok_force_zero_n
FPGA Read (19)	fmc_sanity_check
FPGA Read (18)	POK_FMC
FPGA Read (17)	PG_GT_R
FPGA Read (16)	PG_GT_L
FPGA Read (15)	PG_PSGT
FPGA Read (14)	PG_FPD
FPGA Read (13)	PG_DDR
FPGA Read (12)	PG_LPD
FPGA Read (11 dt 8)	current Boot Mode
FPGA Read (7)	ERR_STAT
FPGA Read (6)	ERROR
FPGA Read (5)	SD_CD_B
FPGA Read (4)	SD_CD_S
FPGA Read (3)	unused const 1

FPGA Read (2)	XMOD_BTN
FPGA Read (1)	SW2
FPGA Read (0)	SW1
FPGA Write (23 dt 8)	unused
FPGA Write (7dt 0)	Readable over Master CPLD-SoC RGPIO, when RGIO active

Appx. A: Change History and Legal Notices

Revision Changes

Master	Slave
CPLD REV06 to REV07 - complete rework - add inter CPLD RGPIO - new LED debugging sequencing - simple UART output with Revision Number and some statistic on second XMOD CPLD REV05 to REV06 - BUGFIX: renamed SC19 to SC17 - Connect FMC JTAG to XMOD2 JTAG - Connect PJTAG0 (MIO29..26) to JTAG Pin Header J30 - Connect CAN to PL - RGPIO Pin changes CPLD REV04 to REV05 - SD WP - XMOD LED access over PL Older Revision (PCB REV03) to CPLD REV04 - Fix USB HUB Mode default state over RGPIO - Invert JLED2B over RGPIO Older Revision (PCB REV02) to CPLD REV04 - Add all functionality from older Revision (PCB REV03)	CPLD REV06 to REV07 - complete rework - add variants (power up and SD)multi-functions for buttons - power on and power downs sequencing - module complete disable on power down - power on sequencing - power down sequencing --> can be forced with power button (hold longer) - Soft PS or PS POR Reset on Reset button (hold longer for PS POR Reset) - add inter CPLD RGPIO - new SoC RGPIO Pinout - removed reboot for pcie initialization - new LED debugging sequencing - Disabled UART on power down state - bugfix WP pin for microSD slot - removed PCIe Reboot. CPLD REV05 to REV06 - LED Status changes of LED D2 D3 and HD_LED, XMOD LED - extended Power Management CPLD REV04 to REV05 - PS reboot via FSBL over MIO30 (need for proper PCI initialization on first power on without press Reset Button) - SD Boot from micoSD only if switch S5-1/-2 is selected to ON - RGPIO connection - Add SD WP to FPGA - Power, Rest Button debounced - direct LED access via MIO and PL Older Revision (PCB REV03) to CPLD REV04 - Bugfix: PCIe Reset Pin location. - Bugfix: Swapping HDLED and PWRLED location. - Bugfix: MEMS_CLKIN Pin location. - Add XMOD 1 LED Older Revision (PCB REV02) to CPLD REV04 - Add all functionality from older Revision (PCB REV03)

Document Change History

To get content of older revision got to "Change History" of this page and select older document revision number.

Date	Document Revision	CPLD Firmware Revision	Supported PCB Revision	Authors	Description
Error rendering macro 'page-info' Ambiguous method overloading for method jdk.proxy279.\$Proxy4022#hasContentLevelPermission. Cannot resolve which method to invoke for [null, class java.lang.String, class com.atlassian.confluence.pages.Page] due to overlapping prototypes between: [interface com.atlassian.confluence.user.ConfluenceUser, class java.lang.String, class com.atlassian.confluence.core.ContentEntityObject] [interface com.atlassian.user.User, class java.lang.String, class com.atlassian.confluence.core.ContentEntityObject]	Error rendering macro 'page-info' Ambiguous method overloading for method jdk.proxy279.\$Proxy4022#hasContentLevelPermission. Cannot resolve which method to invoke for [null, class java.lang.String, class com.atlassian.confluence.pages.Page] due to overlapping prototypes between: [interface com.atlassian.confluence.user.ConfluenceUser, class java.lang.String, class com.atlassian.confluence.core.ContentEntityObject] [interface com.atlassian.user.User, class java.lang.String, class com.atlassian.confluence.core.ContentEntityObject]	REV07	REV03, REV04*	Error rendering macro 'page-info' Ambiguous method overloading for method jdk.proxy279.\$Proxy4022#hasContentLevelPermission. Cannot resolve which method to invoke for [null, class java.lang.String, class com.atlassian.confluence.pages.Page] due to overlapping prototypes between:	• REV07 finished (Firmware released on 2019-05-06) • *please write to Trenez Electronic support for PCB REV02

				[interface com. atlassian. confluence .user. Confluenc eUser, class java. lang. String, class com. atlassian. confluence .core. ContentEnt ityObject] [interface com. atlassian. user.User, class java. lang. String, class com. atlassian. confluence .core. ContentEnt ityObject]	
2017-06-07	v.1			Error rendering macro 'page-info' Ambiguous	Initial release (combine Master and Slave CPLD description)

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