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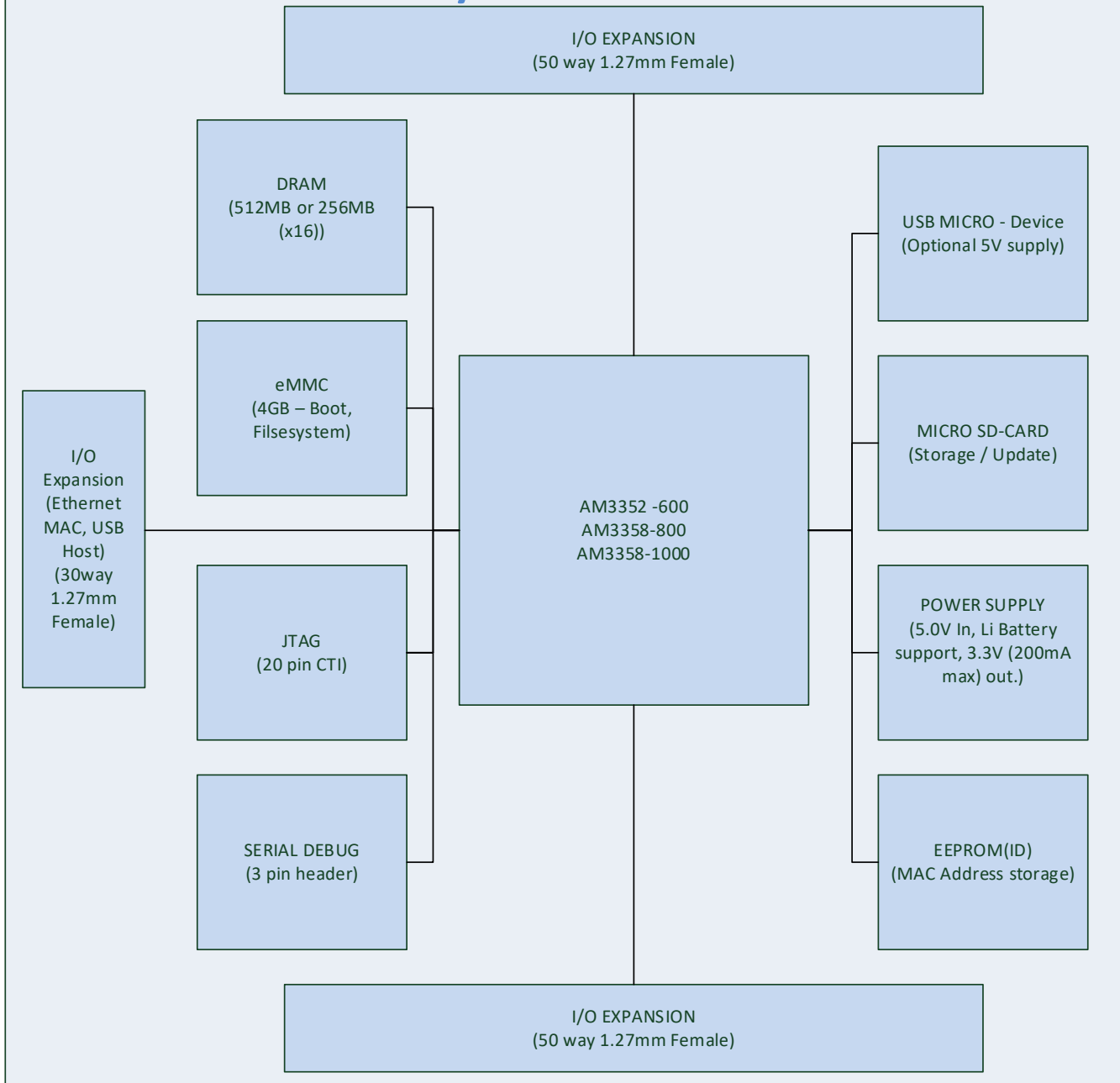
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ERD Cherry Blossom Module



Block Diagram

ALTRON



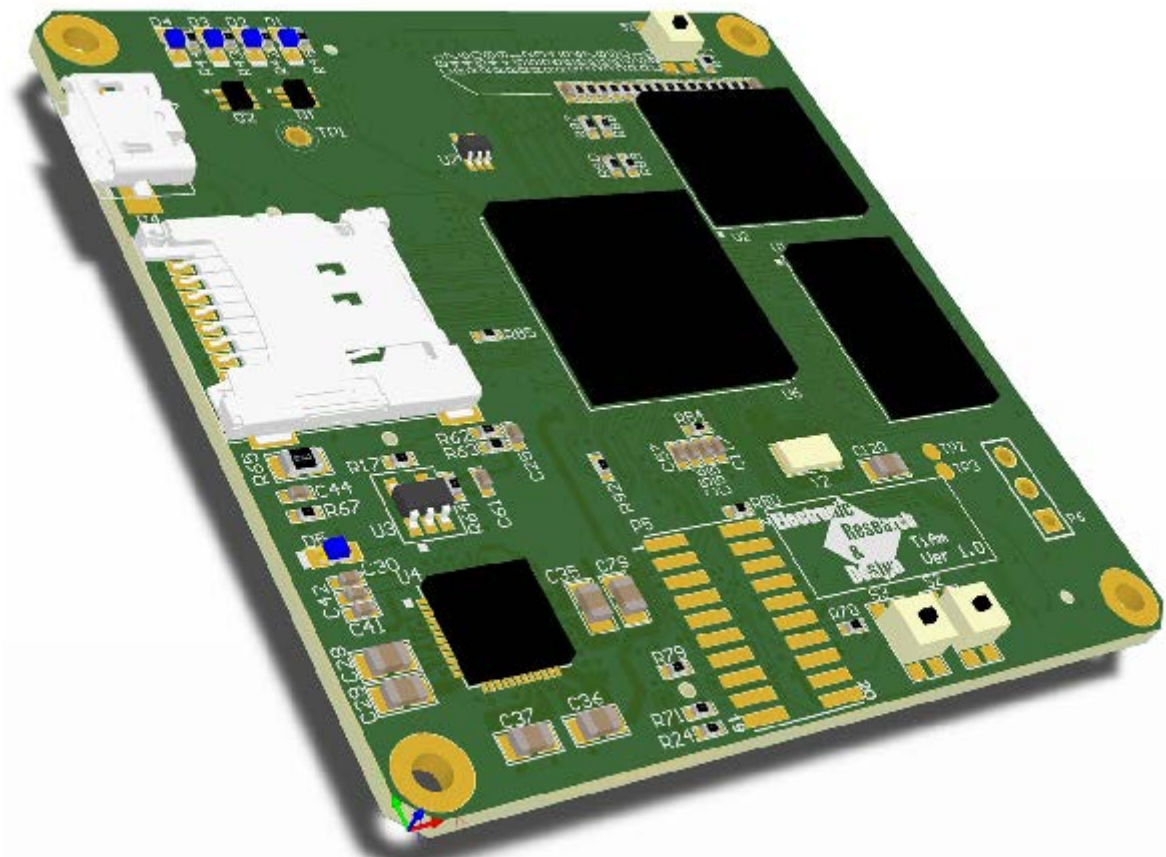


Figure 1- Top

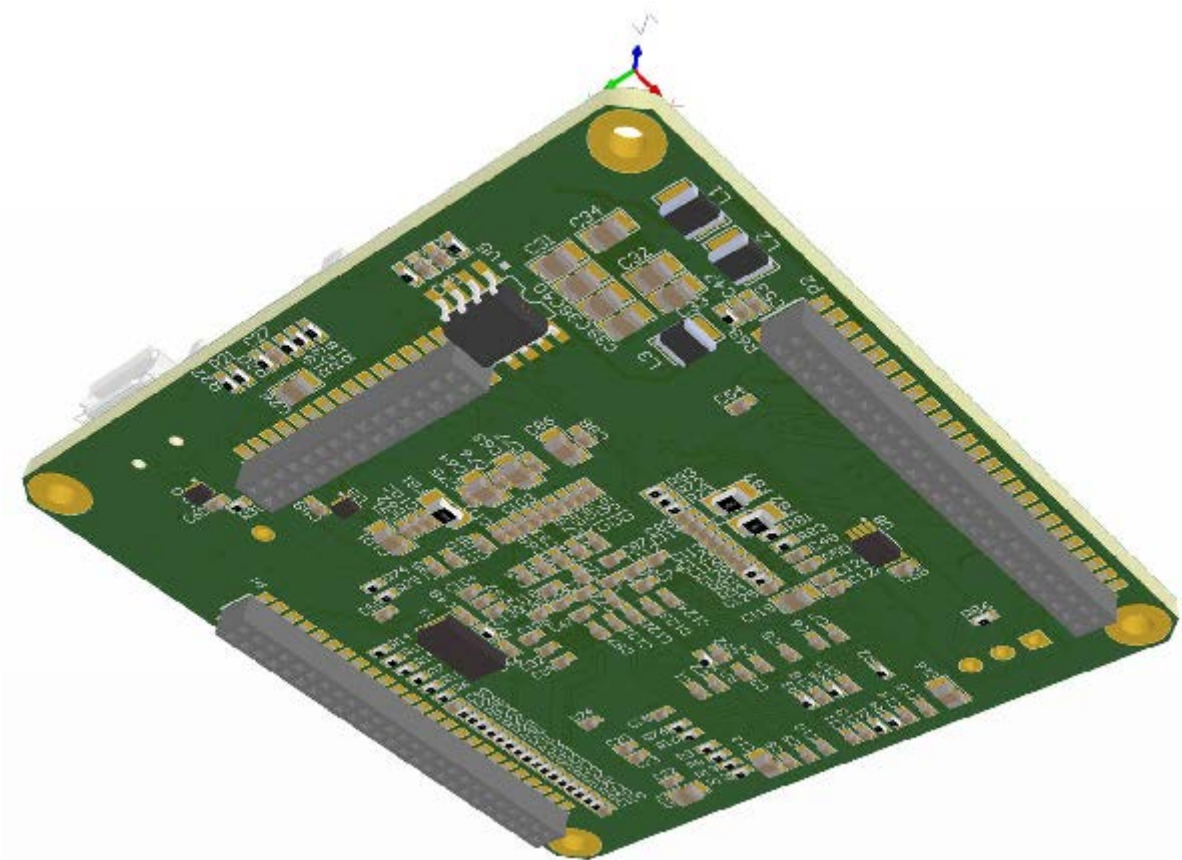


Figure 2- Bottom



Features

- 55mm x 55mm, 1.6mm PCB
- 5V in (1A max) via USB or expansion connector.
- 3.3V out (200mA max) via expansion connector.
- 3 Processor choices :
 - AM3352 – 600MHz
 - AM3358 – 800MHz
 - AM3358 – 1GHz
- 512MB DDR3 DRAM(256MB DRAM for AM3352 – 600MHz)
- 2GB eMMC storage on-board (Used for boot, filesystem – no SD needed)
- JTAG - 20 pin CTI connector
- Serial debug header (Terminal output from Linux)
- USB Micro – Device port (High speed)
- Micro-SD card for storage
- EEPROM for parameter storage
- 3 Expansion connectors (1.27mm pitch)

The I/O can be re-mapped on the processor for different functions – refer to the Data Sheet. The following shows the interface primary functions :

- P1(50 way):
 - MMC interface (shared with on-board eMMC)
 - LCD interface (Can be used for HDMI interface – driver circuitry needed)
 - GPIO's
 - Timers, PWMs, Counters
- P2 (50 way):
 - Power in (5V)
 - Battery interface (Li single cell supported)
 - 3.3V supply out (200mA max)
 - Power control
 - Reset
 - UARTS
 - I2C
 - SPI
 - Analog inputs
 - GPIO
 - Clock output
- P3 (30 way):
 - Ethernet MII port
 - USB Host port
 - I2C

Hardware configurable to run standard Beaglebone Software.



The diagram shows a 50x50 grid with three highlighted regions:

- P1 (Green):** A 10x2 region in the top-left corner, containing pairs of numbers (2, 1) through (50, 49).
- P2 (Orange):** A 10x2 region in the top-right corner, containing pairs of numbers (2, 1) through (50, 49).
- P3 (Blue):** A 10x10 region in the center, containing a 10x10 grid of numbers (2, 1) through (30, 29).

The grid is labeled "Bottom View" in the top-left corner.



1. Connector P1

| Conn Pin | Proc Pin | Name | Alternative functions | Voltage | BBB Function | BBB Pin | Notes |
|----------|----------|----------|---|---------|--------------|---------|-----------|
| 1 | | 3.3V I/O | 3.3V out from module | 3.3V | | | 200mA max |
| 2 | | 3.3V I/O | 3.3V out from module | 3.3V | | | 200mA max |
| 3 | R9 | GPIO1_6 | GPMC_AD6/MMC1_DAT6/GPIO1_6 | 3.3V | MMC1_DAT6 | P8_3 | |
| 4 | T9 | GPIO1_7 | GPMC_AD7/MMC1_DAT7/GPIO1_7 | 3.3V | MMC1_DAT7 | P8_4 | |
| 5 | R8 | GPIO1_2 | GPMC_AD2/MMC1_DAT2/GPIO1_2 | 3.3V | MMC1_DAT2 | P8_5 | |
| 6 | T8 | GPIO1_3 | GPMC_AD3/MMC1_DAT3/GPIO1_3 | 3.3V | MMC1_DAT3 | P8_6 | |
| 7 | R7 | GPIO2_2 | GPMC_ADV_N_ALE/TIMER4/GPIO2_2 | 3.3V | TIMER4 | P8_7 | |
| 8 | T7 | GPIO2_3 | GPMC_OEN_REN/TIMER7/EMU4/GPIO2_3 | 3.3V | TIMER7 | P8_8 | |
| 9 | T6 | GPIO2_5 | GPMC_BE0N_CLE/TIMER5/GPIO2_5 | 3.3V | TIMER5 | P8_9 | |
| 10 | U6 | GPIO2_4 | GPMC_WEN/TIMER6/GPIO2_4 | 3.3V | TIMER6 | P8_10 | |
| 11 | R12 | GPIO1_13 | GPMC_AD13/LCD_DATA18/MMC1_DAT5/MMC2_DAT1/EQEP2B_IN /PR1_MII0_TXD1/PR1_PRU0_PRU_R30_15/GPIO1_13 | 3.3V | GPIO1_13 | P8_11 | |
| 12 | T12 | GPIO1_12 | GPMC_AD12/LCD_DATA19/MMC1_DAT4/MMC2_DAT0/EQEP2A_IN /PR1_MII0_TXD2/PR1_PRU0_PRU_R30_14/GPIO1_12 | 3.3V | GPIO1_12 | P8_12 | |



| Conn Pin | Proc Pin | Name | Alternative functions | Voltage | BBB Function | BBB Pin | Notes |
|----------|----------|----------|--|---------|--------------|---------|-------|
| 13 | T10 | GPIO0_23 | GPMC_AD9/LCD_DATA22/MMC1_DAT1/MMC2_DAT5/EHRPWM2B/ PR1_MII0_CRS//GPIO0_23 | 3.3V | EHRPWM2B | P8_13 | |
| 14 | T11 | GPIO0_26 | GPMC_AD10/LCD_DATA21/MMC1_DAT2/MMC2_DAT6 /EHRPWM2_TRIPZONE_INPUT/PR1_MII0_TXEN//GPIO0_26 | 3.3V | GPIO0_26 | P8_14 | |
| 15 | U13 | GPIO1_15 | GPMC_AD15/LCD_DATA16/MMC1_DAT7/MMC2_DAT3 /EQEP2_STROBE/PR1_ECAP0_ECAP_CAPIN_APWM_O /PR1_PRU0_PRU_R31_15/GPIO1_15 | 3.3V | GPIO1_15 | P8_15 | |
| 16 | V13 | GPIO1_14 | GPMC_AD14/LCD_DATA17/MMC1_DAT6/MMC2_DAT2 /EQEP2_INDEX/PR1_MII0_TXD0/PR1_PRU0_PRU_R31_14/GPIO1_14 | 3.3V | GPIO1_14 | P8_16 | |
| 17 | U12 | GPIO0_27 | GPMC_AD11/LCD_DATA20/MMC1_DAT3/MMC2_DAT7 /EHRPWM2_SYNCI_O/PR1_MII0_TXD3//GPIO0_27 | 3.3V | GPIO0_27 | P8_17 | |
| 18 | V12 | GPIO2_1 | GPMC_CLK/LCD_MEM_CLK/GPMC_WAIT1/MMC2_CLK/PRT1_MII1_TXEN /MCASP0_FSR/GPIO2_1 | 3.3V | GPIO2_1 | P8_18 | |
| 19 | U10 | GPIO0_22 | GPMC_AD8/LCD_DATA23/MMC1_DAT0/MMC2_DAT4/EHRPWM2A /PR1_MII_MT0_CLK//GPIO0_22 | 3.3V | EHRPWM2A | P8_19 | |
| 20 | V9 | GPIO1_31 | GPMC_CSN2/GPMC_BE1N/MMC1_CMD/PR1_EDIO_DATA_IN7 /PR1_EDIO_DATA_OUT7/PR1_PRU1_PRU_R30_13/ PR1_PRU1_PRU_R31_13/GPIO1_31 | 3.3V | MMC1_CMD | P8_20 | |
| 21 | U9 | GPIO1_30 | GPMC_CSN1/GPMC_CLK/MMC1_CLK/PRT1EDIO_DATA_IN6/ PRT1_EDIO_DATA_OUT6/PR1_PRU1_PRU_R30_12/ PR1_PRU1_PRU_R31_12/GPIO1_30 | 3.3V | MMC1_CLK | P8_21 | |
| 22 | V8 | GPIO1_5 | GPMC_AD5/MMC1_DAT5/GPIO1_5 | 3.3V | MMC1_DAT5 | P8_22 | |



| Conn Pin | Proc Pin | Name | Alternative functions | Voltage | BBB Function | BBB Pin | Notes |
|----------|----------|----------|--|---------|--------------|---------|-------|
| 23 | U8 | GPIO1_4 | GPMC_AD4/MMC1_DAT4/GPIO1_4 | 3.3V | MMC1_DAT4 | P8_23 | |
| 24 | V7 | GPIO1_1 | GPMC_AD1/MMC1_DAT1/GPIO1_1 | 3.3V | MMC1_DAT1 | P8_24 | |
| 25 | U7 | GPIO1_0 | GPMC_AD0/MMC1_DAT0/GPIO1_0 | 3.3V | MMC1_DAT0 | P8_25 | |
| 26 | V6 | GPIO1_29 | GPMC_CSN0/GPIO1_29 | 3.3V | GPIO1_29 | P8_26 | |
| 27 | U5 | GPIO2_22 | LCD_VSYNC/GPMC_A8//PR1_EDIO_DATA_IN2/PR1_EDIO_DATA_OUT2 /PR1_PRU1_PRU_R30_8/PR1_PRU1_PRU_R31_8/GPIO2_22 | 3.3V | LCD_VSYNC | P8_27 | |
| 28 | V5 | GPIO2_24 | LCD_PCLK/GPMC_A10//PR1_EDIO_DATA_IN4/PR1_EDIO_DATA_OUT4 /PR1_PRU1_PRU_R30_10/PR1_PRU1_PRU_R31_10/GPIO2_24 | 3.3V | LCD_PCLK | P8_28 | |
| 29 | R5 | GPIO2_23 | LCD_HSYNC/GPMC_A9//PR1_EDIO_DATA_IN3/PR1_EDIO_DATA_OUT3 /PR1_PRU1_PRU_R30_9/PR1_PRU1_PRU_R31_9/GPIO2_23 | 3.3V | LCD_HSYNC | P8_29 | |
| 30 | R6 | GPIO2_25 | LCD_AC_BIAS_EN/GPMC_A11//PR1_EDIO_DATA_IN5/PR1_EDIO_DATA_OUT5 /PR1_PRU1_PRU_R30_11/PR1_PRU1_PRU_R31_11/GPIO2_25 | 3.3V | LCD_DE | P8_30 | |
| 31 | V4 | GPIO0_10 | LCD_DATA14/GPMC_A18/EQEP1_INDEX/MCASPO_AXR1/UART5_RXD /PR1_MII_MR0_CLK/UART5_CTSN/GPIO0_10 | 3.3V | LCD_DATA14 | P8_31 | |
| 32 | T5 | GPIO0_11 | LCD_DATA15/GPMC_A19/EQEP1_STROBE/MCASPO_AHCLKX /MCASPO_AXR3/PR1_MII0_RXDV/UART5_RTSN/GPIO0_11 | 3.3V | LCD_DATA15 | P8_32 | |
| 33 | V3 | GPIO0_9 | LCD_DATA13/GPMC_A17/EQEP1B_IN/MCASPO_FSR/MCASPO_AXR3 /PR1_MII0_RXER/UART4_RTSN/GPIO0_9 | 3.3V | LCD_DATA13 | P8_33 | |
| 34 | U4 | GPIO2_17 | LCD_DATA11/GPMC_A15/EHRPWM1B/MCASPO_AHCLKR/MCASPO_AXR2 /PR1_MII0_RXD0/UART3_RTSN/GPIO2_17 | 3.3V | LCD_DATA11 | P8_34 | |



| Conn Pin | Proc Pin | Name | Alternative functions | Voltage | BBB Function | BBB Pin | Notes |
|----------|----------|----------|--|---------|--------------|---------|-------|
| 35 | V2 | GPIO0_8 | LCD_DATA12/GPMC_A16/EQEP1A_IN/MCASPO_ACLKR/MCASPO_AXR2 /PR1_MII0_RXLINK/UART4_CTSN/GPIO0_8 | 3.3V | LCD_DATA12 | P8_35 | |
| 36 | U3 | GPIO2_16 | LCD_DATA10/GPMC_A14/EHRPWM1A/MCASPO_AXR0//PR1_MII0_RXD1 /UART3_CTSN/GPIO2_16 | 3.3V | LCD_DATA10 | P8_36 | |
| 37 | U1 | GPIO2_14 | LCD_DATA8/GPMC_A12/EHRPWM1_TRIPZONE_INPUT/MCASPO_ACLKX /UART5_TXD/PR1_MII0_RXD3/UART2_CTSN/GPIO2_14 | 3.3V | LCD_DATA8 | P8_37 | |
| 38 | U2 | GPIO2_15 | LCD_DATA9/GPMC_A13/EHRPWM1_SYNCI_O/MCASPO_FSX/UART5_RXD /PR1_MII0_RXD2/UART2_RTSN/GPIO2_15 | 3.3V | LCD_DATA9 | P8_38 | |
| 39 | T3 | GPIO2_12 | LCD_DATA6/GPMC_A6/PR1_EDIO_DATA_IN6/EQEP2_INDEX /PR1_EDIO_DATA_OUT6/PR1_PRU1_PRU_R30_6 /PR1_PRU1_PRU_R31_6/GPIO2_12 | 3.3V | LCD_DATA6 | P8_39 | |
| 40 | T4 | GPIO2_13 | LCD_DATA7/GPMC_A7/PR1_EDIO_DATA_IN7/EQEP2_STROBE /PR1_EDIO_DATA_OUT7/PR1_PRU1_PRU_R30_7 /PR1_PRU1_PRU_R31_7/GPIO2_13 | 3.3V | LCD_DATA7 | P8_40 | |
| 41 | T1 | GPIO2_10 | LCD_DATA4/GPMC_A4//EQEP2A_IN//PR1_PRU1_PRU_R30_4 /PR1_PRU1_PRU_R31_4/GPIO2_10 | 3.3V | LCD_DATA4 | P8_41 | |
| 42 | T2 | GPIO2_11 | LCD_DATA5/GPMC_A5//EQEP2B_IN//PR1_PRU1_PRU_R30_5 /PR1_PRU1_PRU_R31_5/GPIO2_11 | 3.3V | LCD_DATA5 | P8_42 | |
| 43 | R3 | GPIO2_8 | LCD_DATA2/GPMC_A2//EHRPWM2_TRIPZONE_INPUT /PR1_PRU1_PRU_R30_2/PR1_PRU1_PRU_R31_2/GPIO2_8 | 3.3V | LCD_DATA2 | P8_43 | |
| 44 | R4 | GPIO2_9 | LCD_DATA3/GPMC_A3//EHRPWM2_SYNCI_O /PR1_PRU1_PRU_R30_3/PR1_PRU1_PRU_R31_3/GPIO2_9 | 3.3V | LCD_DATA3 | P8_44 | |



2. Connector P2

| Con n Pin | Proc Pin | Name | Alternative functions | Voltage | BBB Function | BBB Pin | Notes |
|---------------------|-------------|---------------|---|---------|-----------------|------------|---|
| 1 | | BAT_SENSE | Single Cell Li-ion | 4.2V | | | Battery Voltage Sense |
| 2 | | VBAT | Single Cell Li-ion | 4.2V | | | Battery Voltage Connection |
| 3 | | BAT_TEMPSENSE | Single Cell Li-ion | 10k | | | Battery Temperature sense |
| 4 | | VBAT | Single Cell Li-ion | 4.2V | | | Battery Voltage Connection |
| 5 | | 5V_IN | 5.0V Input | 5.0V | | | Up to 1A |
| 6 | | 5V_IN | 5.0V Input | 5.0V | | | Up to 1A |
| 7 | | DGND | | | | | Digital Ground |
| 8 | | DGND | | | | | Digital Ground |
| 9 | | 3.3V I/O | 3.3V out from module | 3.3V | | | 200mA max |
| 10 | | 3.3V I/O | 3.3V out from module | 3.3V | | | 200mA max |
| 11 | | WP | | 3.3V | | | WP of EEPROM, pull to GND to enable writing |
| 12 | A15 | GPIO0_19 | EVENT_INTRO/TIMER4/CLKOUT1/SPI1_CS1/PR1PRU1R31_16 /EMU2/GPIO0_19 | | CLKOUT1 | | |



| Con n Pin | Proc Pin | Name | Alternative functions | Voltage | BBB Function | BBB Pin | Notes |
|---------------------|-------------|------------|--|---------|-----------------|------------|---------------------------------|
| 13 | | SYS_5V | | | | | Output from Power Management IC |
| 14 | | SYS_5V | | | | | Output from Power Management IC |
| 15 | | PWR_BUT | | | PWR_BUT | P9_9 | Switch on/off |
| 16 | | SYS_RESETh | | | SYS_RESET n | P9_10 | System reset signal(Active low) |
| 17 | T17 | GPIO0_30 | GPMC_WAIT0/GM112_CRS/GPMC_CSN4/RMII2_CRS_DV/MMC1_SDCD /PR1_MII1_RXDV/UART4_RXD/GPIO0_30 | 3.3V | UART4_RX D | P9_11 | |
| 18 | U18 | GPIO1_28 | GPMC_BE1N/GMII2_COL/GPMC_CSN6/MMC2_DAT3/GPMC_DIR /PR1_MII1_RXLINK/MCASPO_ACLKR/GPIO1_28 | 3.3V | GPIO1_28 | P9_12 | |
| 19 | U17 | GPIO0_31 | GPMC_WPN/GMII2_RXERR/GPMC_CSN5/RMII2_RXERR/MMC2_SDCD /PR1_MDIO_MDCLK/UART4_TXD/GPIO0_31 | 3.3V | UART4_TX D | P9_13 | |
| 20 | U14 | GPIO1_18 | GPMC_A2/GMII2_TXD3/RGMII2_TD3/MMC2_DAT1/GPMC_A18 /PR1_MII1_TXD2/EHRPWM1A/GPIO1_18 | 3.3V | EHRPWM1 A | P9_14 | |
| 21 | R13 | GPIO1_16 | GPMC_A0/GMII2_TXEN/RGMII2_TCTL/RMII2_TXEN/GPMC_A16 /PR1_MII_MT1_CLK/EHRPWM1_TRIPZONE_INPUT/GPIO1_16 | 3.3V | GPIO1_16 | P9_15 | Coupled to GPIO2_0(T13) via OR |
| 22 | T14 | GPIO1_19 | GPMC_A3/GMII2_TXD2/RGMII2_TD2/MMC2_DAT2/GPMC_A19 /PR1_MII1_TXD1/EHRPWM1B/GPIO1_19 | 3.3V | EHRPWM1 B | P9_16 | |



| Con n Pin | Proc Pin | Name | Alternative functions | Voltage | BBB Function | BBB Pin | Notes |
|---------------------|-----------------|----------|--|---------|-----------------|------------|-------|
| 23 | A16 | GPIO0_5 | SPIO_CS0/MMC2_SDWP/I2C1_SCL/EHRPWM0_SYNCI_O/PR1_UART0_TXD /PR1_EDIO_DATA_IN1/PR1_EDIO_DATA_OUT1/GPIO0_5 | 3.3V | I2C1_SCL | P9_17 | |
| 24 | B16 | GPIO0_4 | SPIO_D1/MMC1_SDWP/I2C1_SDA/EHRPWM0_TRIPZONE_INPUT /PR1_UART0_RXD/PR1_EDIO_DATA_IN0/PR1_EDIO_DATA_OUT0/GPIO0_ 4 | 3.3V | I2C1_SDA | P9_18 | |
| 25 | D17 | GPIO0_13 | UART1_RTSN/TIMER5/DCAN0_RX/I2C2_SCL/SPI1_CS1 /PR1_UART0_RTS_N/PR1_EDC_LATCH1_IN/GPIO0_13 | 3.3V | I2C2_SCL | P9_19 | |
| 26 | D18 | GPIO0_12 | UART1_CTSN/TIMER6/DCAN0_TX/I2C2_SDA/SPI1_CS0 /PR1_UART0_CTS_N/PR1_EDC_LATCH0_IN/GPIO0_12 | 3.3V | I2C2_SDA | P9_20 | |
| 27 | B17 | GPIO0_3 | SPIO_D0/UART2_TXD/I2C2_SCL/EHRPWM0B/PR1_UART0_RTS_N /PR1_EDIO_LATCH_IN/EMU3/GPIO0_3 | 3.3V | UART2_TX D | P9_21 | |
| 28 | A17 | GPIO0_2 | SPIO_SCLK/UART2_RXD/I2C2_SDA/EHRPWM0A/PR1_UART0_CTS_N /PR1_EDIO_SOF/EMU2/GPIO0_2 | 3.3V | UART2_RX D | P9_22 | |
| 29 | V14 | GPIO1_17 | GPMC_A1/GMII2_RXDV/RGMII2_RCTL/MMC2_DAT0/GPMC_A17 /PR1_MII1_TXD3/EHRPWM1_SYNCI_O/GPIO1_17 | 3.3V | GPIO1_17 | P9_23 | |
| 30 | D15 | GPIO0_15 | UART1_TXD/MMC2_SDWP/DCAN1_RX/I2C1_SCL//PR1_UART0_TXD /PR1_PRU0_PRU_R31_16/GPIO0_15 | 3.3V | UART1_TX D | P9_24 | |
| 31 | A14 | GPIO3_21 | MCASP0_AHCLKX/EQEP0_STROBE/MCASPO_AXR3/MCASP1_AXR1/EMU4 /PR1_PRU0_PRU_R30_7/PR1_PRU0_PRU_R31_7/GPIO3_21 | 3.3V | GPIO3_21 | P9_25 | |
| 32 | D16 | GPIO0_14 | UART1_RXD/MMC1_SDWP/DCAN1_TX/I2C1_SDA//PR1_UART0_RXD /PR1_PRU1_PRU_R31_16/GPIO0_14 | 3.3V | UART1_RX D | P9_26 | |



| Con n Pin | Proc Pin | Name | Alternative functions | Voltage | BBB Function | BBB Pin | Notes |
|---------------------|-------------|----------|---|---------|-----------------|------------|-------------------------------|
| 33 | C13 | GPIO3_19 | MCASP0_FSR/EQEP0B_IN/MCASPO_AXR3/MCASP1_FSX/EMU2 /PR1_PRU0_PRU_R30_5/PR1_PRU0_PRU_R31_5/GPIO3_19 | 3.3V | GPIO3_19 | P9_27 | |
| 34 | C12 | GPIO3_17 | MCASP0_AHCLKR/EHRPWM0_SYNCI_O/MCASPO_AXR2/SPI1_CS0/ECAP2_ IN_PWM2_OUT/PR1_PRU0_PRU_R30_3/PR1_PRU0_PRU_R31_3/GPIO3_ 17 | 3.3V | SPI1_CS0 | P9_28 | |
| 35 | B13 | GPIO3_15 | MCASP0_FSX/EHRPWM0B//SPI1_D0/MMC1_SDCD/PR1_PRU0_PRU_R30_ 1 /PR1_PRU0_PRU_R31_1/GPIO3_15 | 3.3V | SPI1_D0 | P9_29 | |
| 36 | D12 | GPIO3_16 | MCASP0_AXR0/EHRPWM0_TRIPZONE_INPUT//SPI1_D1/MMC2_SDCD /PR1_PRU0_PRU_R30_2/PR1_PRU0_PRU_R31_2/GPIO3_16 | 3.3V | SPI1_D1 | P9_30 | |
| 37 | A13 | GPIO3_14 | MCASP0_ACLKX/EHRPWM0A//SPI1_SCLK/MMC0_SDCD/PR1_PRU0_PRU_ R30_0 /PR1_PRU0_PRU_R31_0/GPIO3_14 | 3.3V | SPI1_SCLK | P9_31 | |
| 38 | | VDD_ADC | | 1.8V | VDD_ADC | P9_32 | Analogue Rail – (50mA Max) |
| 39 | | AIN4 | | 1.8V | AIN4 | P9_33 | |
| 40 | | AGND | | | AGND | P9_34 | Analogue ground |
| 41 | | AIN6 | | 1.8V | AIN6 | P9_35 | |
| 42 | | AIN5 | | 1.8V | AIN5 | P9_36 | |
| 43 | | AIN2 | | 1.8V | AIN2 | P9_37 | |
| 44 | | AIN3 | | 1.8V | AIN3 | P9_38 | |



3. Connector P3

| Conn Pin | Proc Pin | Name | Alternative functions | Voltage | BBB Function | Notes |
|-------------|-------------|----------|--|---------|--------------|-----------|
| 1 | | 3.3V I/O | 3.3V out from module | 3.3V | | 200mA max |
| 2 | | 3.3V I/O | 3.3V out from module | 3.3V | | 200mA max |
| 3 | J15 | GPIO3_2 | GMII1_RXERR/RMII1_RXERR/SPI1_D1/I2C1_SCL/MCASP1_FSX /UART5_RTSN/UART2_TXD/GPIO3_2 | 3.3V | MII1_RXERR | |
| 4 | H16 | GPIO3_0 | GMII1_COL/RMII2_REFCLK/SPI1_SCLK/UART5_RXD/MCASP1_AXR2 /MMC2_DAT3/MCASP0_AXR2/GPIO3_0 | 3.3V | MII1_COL | |
| 5 | L16 | GPIO2_19 | GMII1_RXD2/UART3_TXD/RGMII1_RD2/MMC0_DAT4/MMC1_DAT3 /UART1_RIN/MCASP0_AXR1/GPIO2_19 | 3.3V | MII1_RXD2 | |
| 6 | J18 | GPIO0_16 | GMII1_TXD3/DCAN0_TX/RGMII1_TD3/UART4_RXD/MCASP1_FSX /MMC2_DAT1/MCASP0_FSR/GPIO0_16 | 3.3V | MII1_TXD3 | |
| 7 | J17 | GPIO3_4 | GMII1_RXDV/LCD_MEMORY_CLK/RGMII1_RCTL/UART5_TXD /MCASP1_ACLKX/MMC2_DAT0/MCASP0_ACLKR/GPIO3_4 | 3.3V | MII1_RXDV | |
| 8 | J16 | GPIO3_3 | GMII1_TXEN/RMII1_TXEN/RGMII1_TCTL/TIMER4/MCASP1_AXR0 /EQEP0_INDEX/MMC2_CMD/GPIO3_3 | 3.3V | MII1_TXEN | |
| 9 | H18 | GPIO0_29 | RMII1_REFCLK/XDMA_EVENT_INTR2/SPI1_CS0/UART5_TXD/MCASP1_AXR3 /MMC0_POW/MCASP1_AHCLKX/GPIO0_29 | 3.3V | MII1_REFCLK | |
| 10 | H17 | GPIO3_1 | GMII1_CRS/RMII1_CRS_DV/SPI1_D0/I2C1_SDA/MCASP1_ACLKX /UART5_CTSN/UART2_RXD/GPIO3_1 | 3.3V | MII1_CRS_DV | |
| 11 | L15 | GPIO2_20 | GMII1_RXD1/RMII1_RXD1/RGMII1_RD1/MCASP1_AXR3/MCASP1_FSR /EQEP0_STROBE/MMC2_CLK/GPIO2_20 | 3.3V | MII1_RXD1 | |



| Conn Pin | Proc Pin | Name | Alternative functions | Voltage | BBB Function | Notes |
|-------------|-------------|----------|--|---------|--------------|-------|
| 12 | K17 | GPIO0_28 | GMII1_TXD0/RMII1_TXD0/RGMII1_TD0/MCASP1_AXR2/MCASP1_ACLKR /EQEP0B_IN/MMC1_CLK/GPIO0_28 | 3.3V | MII1_TXD0 | |
| 13 | L17 | GPIO2_18 | GMII1_RXD3/UART3_RXD/RGMII1_RD3/MMC0_DAT5/MMC1_DAT2 /UART1_DTRN/MCASP0_AXR0/GPIO2_18 | 3.3V | MII1_RXD3 | |
| 14 | K18 | GPIO3_9 | GMII1_TXCLK/UART2_RXD/RGMII1_TCLK/MMC0_DAT7/MMC1_DAT0 /UART1_DCDN/MCASP0_ACLKX/GPIO3_9 | 3.3V | MII1_TXCLK | |
| 15 | L18 | GPIO3_10 | GMII1_RXCLK/UART2_TXD/RGMII1_RCLK/MMC0_DAT6/MMC1_DAT1 /UART1_DSRN/MCASP0_FSX/GPIO3_10 | 3.3V | MII1_RXCLK | |
| 16 | K16 | GPIO0_21 | GMII1_TXD1/RMII1_TXD1/RGMII1_TD1/MCASP1_FSR/MCASP1_AXR1 /EQEP0A_IN/MMC1_CMD/GPIO0_21 | 3.3V | MII1_TXD1 | |
| 17 | M16 | GPIO2_21 | GMII1_RXD0/RMII1_RXD0/RGMII1_RD0/MCASP1_AHCLKX/MCASP1_AHCLKR /MCASP1_ACLKR/MCASP0_AXR3/GPIO2_21 | 3.3V | MII1_RXD0 | |
| 18 | K15 | GPIO0_17 | GMII1_TXD2/DCAN0_RX/RGMII1_TD2/UART4_TXD/MCASP1_AXR0 /MMC2_DAT2/MCASP0_AHCLKX/GPIO0_17 | 3.3V | MII1_TXD2 | |
| 19 | M17 | GPIO0_0 | MDIO_DATA/TIMER6/UART5_RXD/UART3_CTSN/MMC0_SDCD /MMC1_CMD/MMC2_CMD/GPIO0_0 | 3.3V | MDIO_DATA | |
| 20 | C17 | GPIO3_5 | I2C0_SDA/TIMER4/UART2_CTSN/ECAP2_IN_PWM2_OUT/GPIO3_5 | 3.3V | I2C0_SDA | |
| 21 | M18 | GPIO0_1 | MDIO_CLK/TIMER5/UART5_TXD/UART3_RTSN/MMC0_SDWP /MMC1_CLK/MMC2_CLK/GPIO0_1 | 3.3V | MDIO_CLK | |
| 22 | C16 | GPIO3_6 | I2C0_SCL/TIMER7/UART2_RTSN/ECAP1_IN_PWM1_OUT/GPIO3_6 | 3.3V | I2C0_SCL | |
| 23 | F15 | GPIO3_13 | USB1_DRVVBUS/GPIO3_13 | 3.3V | USB1_DRVVBUS | |

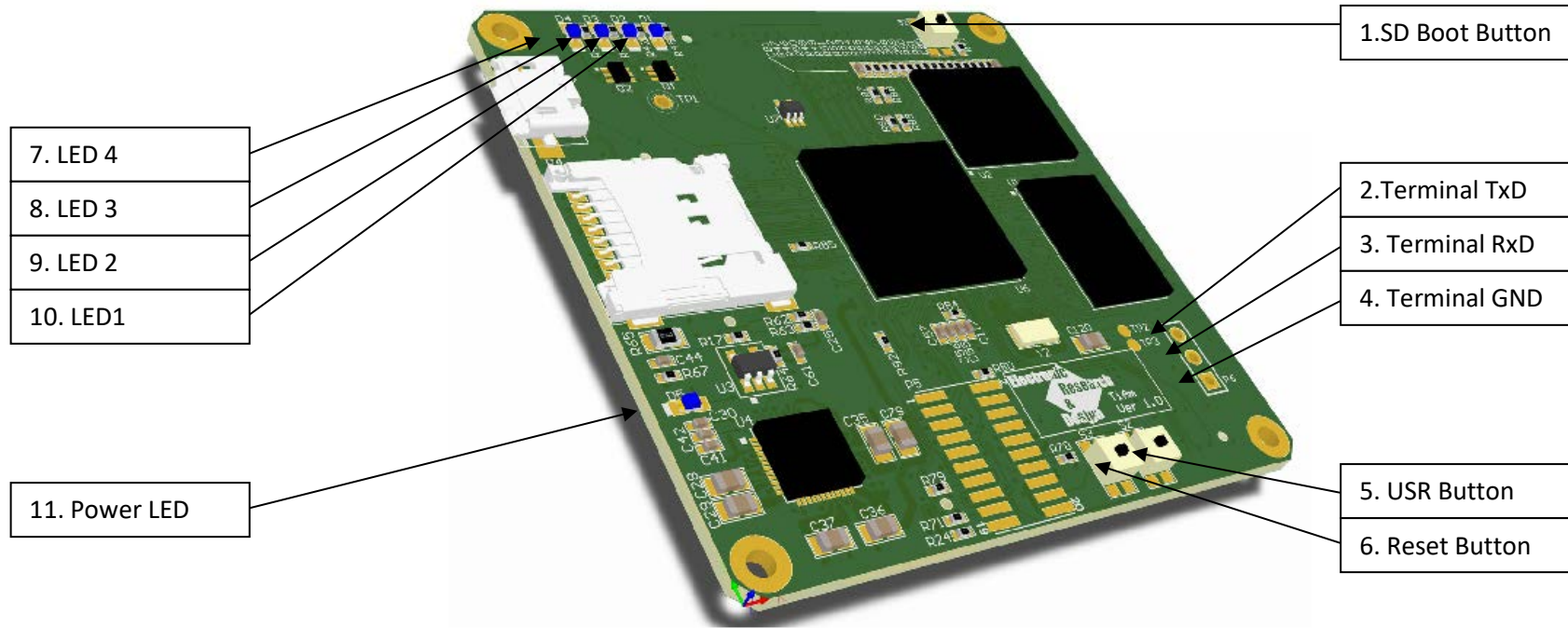


4. Boot Configuration

| BOOT15 | BOOT14 | BOOT13 | BOOT12 | BOOT11 | BOOT10 | BOOT9 | BOOT8 | BOOT7 | BOOT6 | BOOT5 | BOOT4 | BOOT3 | BOOT2 | BOOT1 | BOOT0 |
|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 |

- LCD_DATA[15:0] terminals are respectively SYSBOOT[15:0] inputs, latched on the rising edge of PWRONRSTn.
- Please ensure that the boot pins stay in their correct state during power on reset.
- More information on the above could be found in TI document [spruh73k.pdf](#). (Table 26-7)
- SD Boot button (see next page) pulls BOOT2 to ground to force booting from Micro SD.

Board definitions





- ii. SD Boot Button
Keep button in during power-up to force boot from SD.
- iii. Terminal TxD
Connect to **3.3V** level RxD on suitable serial cable.
- iv. Terminal RxD
Connect to **3.3V** level TxD on suitable serial cable.
- v. Terminal GND
Connect to GROUND on suitable serial Cable.
- vi. USR Button
Used by some distributions to shut down Linux.
- vii. Reset Button
Press button to force a hardware reset.
- viii. LED 4
Configured to light during eMMC accesses.
- ix. LED 3
Configured to light during CPU activity.
- x. LED2
Configured to light during microSD card accesses.
- xi. LED 1
Configured to blink in a heartbeat pattern.
- xii. Power LED
Indicates power supply active.



5. Software resources.

The ERD Cherry Blossom hardware is compatible to the BeagleBone Black except for not having the following on-board:

- i. HDMI – A NXP interface IC () is needed to convert the LCD outputs to HDMI.
- ii. Host USB (Second port) connection and USB output power control.
- iii. Ethernet – A PHY () is necessary to connect to the MII signals from the processor to the Ethernet magnetics and connector.

All signals to achieve the above are available on the expansion connectors. An example baseboard is available on request with full schematics and PCB layout in Altium format.

To connect your ERD Cherry Blossom to a Windows host please download and install the following drivers from the official BeagleBone Black site :

For Windows 64 bit :

http://beagleboard.org/static/Drivers/Windows/BONE_D64.exe

For Windows 32 bit:

http://beagleboard.org/static/Drivers/Windows/BONE_DRV.exe

It should connect by default to a Linux host without any driver software.

You can then connect to your board via USB:

<http://192.168.7.2/>

This document will be available for download there.



The following is a list of resources to assist in customizing the platform to your requirements:

- a. Host setup (Done on Ubuntu 14.04 LTS) for building the mainline Linux kernel

<http://eewiki.net/display/linuxonarm/BeagleBone+Black>

Get the latest versions and recipes from the above link!

To build the Kernel (in ~/bb-kernel):

[./build_kernel.sh](#)

To rebuild the Kernel (in ~/bb-kernel):

[tools/rebuild.sh](#)

After a kernel rebuild (with the board connected via USB) remember to export the kernel version (last line of build result)

[sudo sh -c "echo 'uname_r=\\${kernel_version}' > /media/user/rootfs/boot/uEnv.txt"](#)

*[sudo cp -v ./bb-kernel/deploy/\\${kernel_version}.zImage
/media/user/rootfs/boot/vmlinuz-\\${kernel_version}](#)*

[sudo mkdir -p /media/user/rootfs/boot/dtbs/\\${kernel_version}/](#)

*[sudo tar xfv ./bb-kernel/deploy/\\${kernel_version}-dtbs.tar.gz -C
/media/user/rootfs/boot/dtbs/\\${kernel_version}/](#)*

*[sudo tar xfv ./bb-kernel/deploy/\\${kernel_version}-modules.tar.gz -C
/media/user/rootfs/](#)*

- b. Setup Host for gateway to internet from device via USB.



On the Host (USB Ether internet access):

```
sudo iptables --table nat --append POSTROUTING --out-interface eth0 -j MASQUERADE
```

```
sudo iptables --append FORWARD --in-interface eth1 -j ACCEPT
```

```
sudo su
```

```
sudo echo 1 > /proc/sys/net/ipv4/ip_forward
```

```
exit
```

```
sudo apt-get install iptables-persistent
```

(This should take the current rules and make them persistent (If you selected 'yes'....)

Edit :

```
sudo gedit /etc/sysctl.conf
```

Uncomment (remove #) from the line:

```
#net.ipv4.ip_forward=1
```

On Device - update :

```
sudo apt-get update
```

Now you can install software...

- c. Install Eclipse and remote debugging for the device:

Set up Eclipse :

<http://www.michaelhleonard.com/cross-compile-for-beaglebone-black/>

(Only difference is use of cross-compile tools installed in host setup above)



On device (enable user root with password root):

```
sudo passwd root
```

```
root
```

```
root
```

Change the following :

```
sudo nano /etc/ssh/sshd_config
```

```
#PermitRootLogin without-password
```

```
PermitRootLogin yes
```

Then restart service :

```
service ssh restart
```

Install gdbserver (device):

```
sudo apt-get install gdbserver
```

d. Pin configuration

Check pin configuration on device:

```
cat /sys/kernel/debug/pinctrl/44e10800.pinmux/pingroups
```

e. Custom pin configuration

On the Host:

```
cd bb-kernel/KERNEL/arch/arm/boot/dts/
```

Start in the text file “am335x-boneblack.dts”



All the pre-defined peripheral/pin configurations are included from this file.

For the ERD Cherry Blossom please remove the line by commenting it out (`/*..*/`):

```
#include "am335x-boneblack-nxp-hdmi-no-audio.dtsi"
```

This is necessary as the Cherry Blossom board does not have HDMI on the core board. It can be added on the customer's base-board.

To order the SOM (and related stacker boards), please contact:



53-57 Yaldwin Road

Hughs Ext

Jetpark, 1459

South Africa

Tel: 011 923 9600

Mail: info@arrow.altech.co.za