AM572x General-Purpose EVM Hardware

This document describes the hardware architecture of the AM572x Evaluation Module (EVM) (Part # TMDSEVM572X), based on the Texas Instruments AM572x processor. This EVM is also commonly known as the AM572x general-purpose (GP) EVM.

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Trademarks

1 Introduction

The AM572x general-purpose EVM is a standalone test, development, and evaluation module system that enables developers to write software and develop hardware around an AM572x processor subsystem. The main elements of the AM572x subsystem are already available on the base board of the EVM, which gives developers the basic resources needed for most general-purpose type projects that encompass the AM572x as the main processor. Furthermore, additional, "typical" type peripherals are built into the EVM such as memory, sensors, LCD, Ethernet PHY, and so forth, so that prospective systems can be modeled quickly without significant additional hardware resources. The following sections provide more details regarding the EVM.

1.1 EVM System View

The system view of the AM572x general-purpose EVM consists the processor module and LCD module stacked together and connected through SMT connectors. The camera module, TMDSCM572x, is optional and it must be purchased separately, see Figure 1.

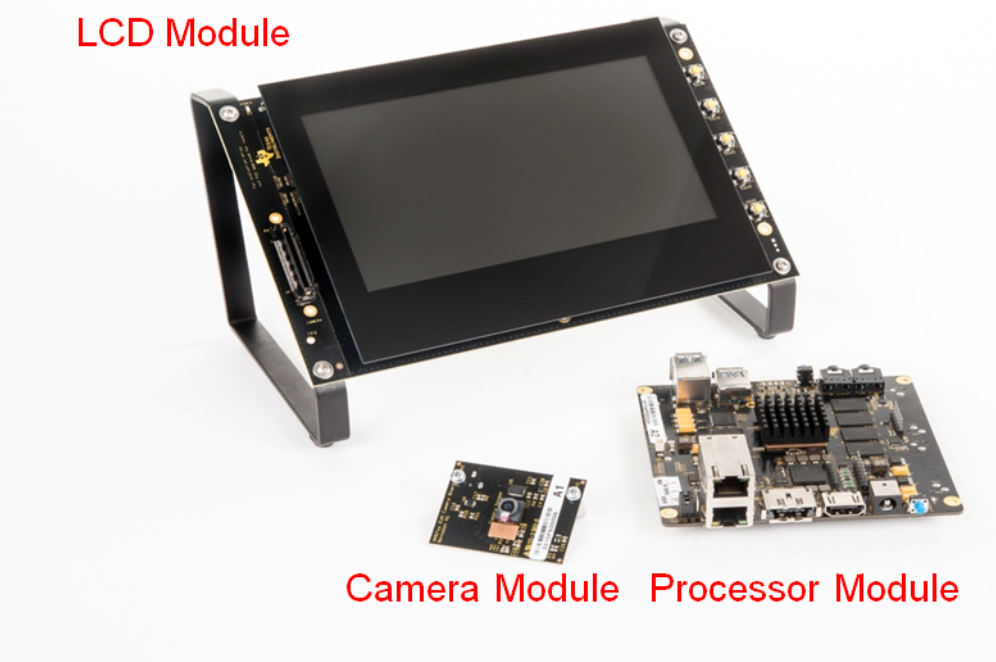

Figure 1. AM572x General-Purpose EVM

1.2 Schematics/Design/Errata Files

Hardware Documentation [1] - Schematics, Design Files, and other related Hardware Documentation

1.3 Other Useful Links

- AM572x GP Evaluation Module [2]
- AM572x GP EVM Quick Start Guide [3]
- AM572x GP EVM Hardware Setup [4]
- AM572x GP EVM Videos:
  - Meet the AM572x Development Kit [5]
  - Getting Started Out of the Box With the AM5728 EVM [6]

2 Important Usage Notes

2.1 Isolated Power Supply

An isolated Power Supply (GND sleeve of DC barrel not shorted to earth GND) must be used. For additional power supply requirements, see Section 4.1.

2.2 Powering On EVM

If the PMIC needs to be on for more than 7 sec without SD boot image (connecting with Code Composer Studio™ - CCS), a zero Ω shunt can be installed in J5.

CAUTION

Do not leave the board on without:

- Booting using the Linux SDK boot image
- Booting using the RTOS SDK boot image (using SBL)
- Connecting to CCS and running the AM572x GEL file (using fast JTAG connection such as XDS560)

This is required because the AM57x device has limited Power-On-Hours without releasing eMMC contention after reset. Refer to the Device Silicon Errata (i863) for more details.

A boot option was added to silicon revision 2.0 which allows the user to disable internal pull-down resistors on the eMMC signals and avoid the issue. However, this option was not implemented on the earlier AM572x GP EVMs even though they contain silicon revision 2.0 devices with this option. All TMDXEVM5728 and TMDSEVM572X revisions earlier than A3a, have the SYSBOOT[15] input pulled low which doesn't disable the internal pull-down resistors on the MMC2 terminals. To disable the internal pull-down resistors without software intervention, remove R432 and install R197 which pulls SYSBOOT[15] high, and install external 47k ohm resistors into positions R250, R251, R252, R253, R254, R255, R256, R257, R258, and R259. This should be done if you plan to have power applied to the AM572x GP EVM for long periods of time without software properly initializing the internal pull resistors.

There is one additional concern with adding a shunt to J5. The Linux image for the AM572x GP EVM contains thermal management code that will automatically turn off power to the AM572x GP EVM if it detects a dangerous junction temperature. When a shunt is installed in J5, software will not be able to power off the EVM and you run the risk of damaging the processor if you are not providing an alternate thermal management solution.

2.3 Powering Off EVM

NOTE: Do NOT remove the DC power jack to turn off the board, as it may cause damage.

The proper procedure to power down the board is as follows:

1. Use software to gracefully power off (for example, in Linux, use the "poweroff" command).
2. If unable to use software (for example, software has crashed or does not have a shut down command), press the power button for at least 15 seconds until the power LED (D3) turns off.
3. If you need to remove the DC power jack:
   (a) Follow above steps to gracefully power down the board.
   (b) Disconnect AC power cord from the power brick.
   (c) Wait several seconds until the DC LED (D41) turns off (the power brick discharges its voltage).
   (d) Disconnect DC barrel of power brick from the board's DC jack.

2.4 Removing Processor and LCD Module Boards

Frequent removal and reattaching of the LCD Module should be avoided. The LCD Module connectors are spec'ed an insertion/extraction lifetime of 500 times.

The proper procedure for removing the LCD Module is as follows:

1. Unplug from power.
2. Lift straight up at arrows on the LCD Module.
3. "Unzip" connectors lengthwise, not back and forth. Removing the LCD Module with a back and forth motion (perpendicular to long edge of connectors), may damage the connectors.

The proper procedure for reattaching the LCD Module is as follows:

1. Unplug from power.
2. Place LCD Module face down on a flat surface.
3. Align connectors on processor module with those on LCD module.
4. Push down on all four connectors evenly to attach processor module.

2.5 Removing Camera Module Board

The proper procedure for removing the Camera Module is as follows:

1. Unplug from power.
2. Either "unzip" along long edge or pull straight up at connector ends. Removing the Camera Module with a back and forth motion (perpendicular to long edge of connectors), may damage the connector.

2.6 Caution: Hot Surface

The Processor Module can get extremely hot. Observe the caution hot icon in silk screen next to processor, and never touch the heatsink without feeling if its hot first.

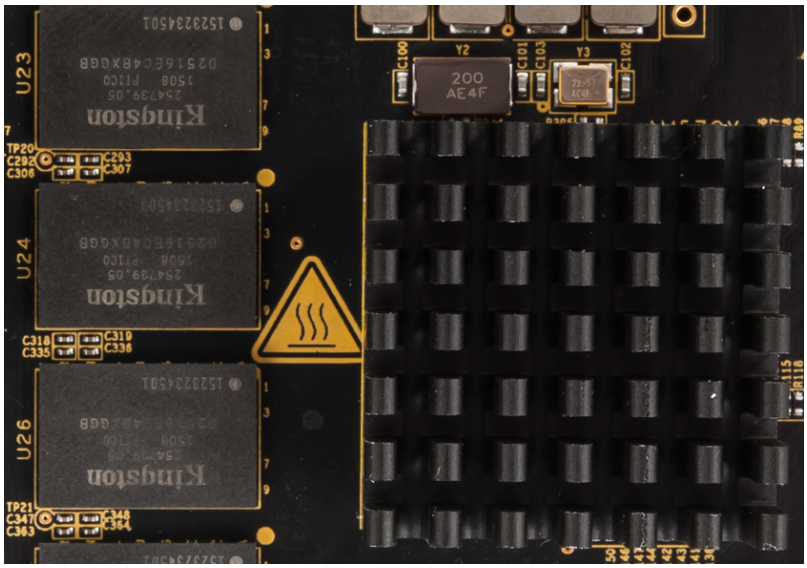

Figure 2. Caution Hot Icon on Processor Module Board

3 System Description

3.1 System Board Diagram

The complete AM572x general-purpose EVM is partitioned across three different boards for modularity.

The GP EVM consists of the processor module (processor and peripherals), LCD Module (LCD, touchscreen, and peripherals), and the Camera Module (CM).

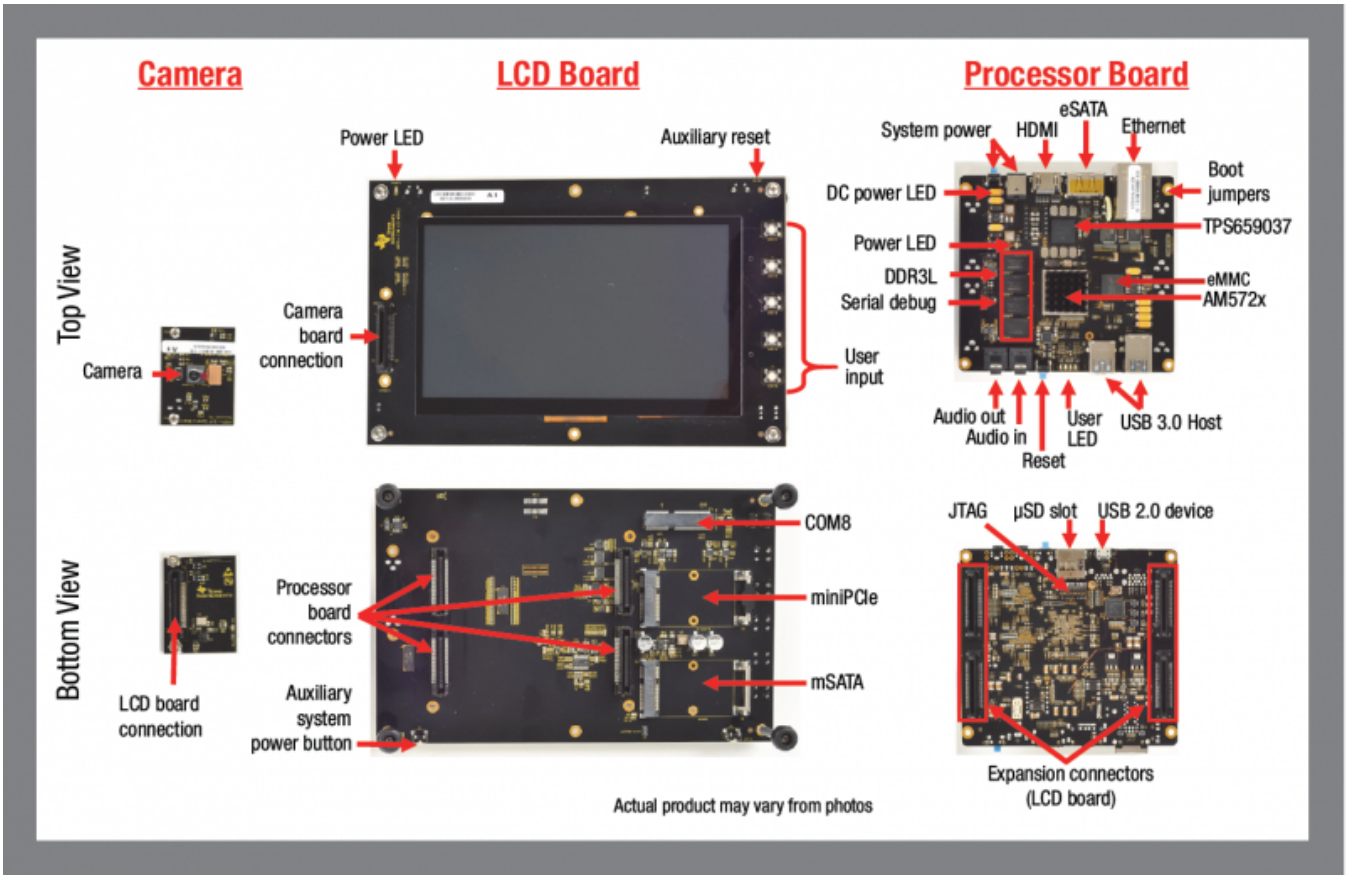

Figure 3. AM572x GP EVM Key Components

3.2 Processor

The AM5728FCBGA processor is the central processor to this EVM. All the resources on the board surround the AM5728 processor to provide development capabilities for hardware and software. For the details about the processor, see the *AM572x Sitara™ Processors Silicon Revision 2.0 Data Manual* [9] and the *AM572x Sitara™ Processors Technical Reference Manual* [8].

There are system configuration signals, SYSBOOT, that can be set on the EVM to define some startup parameters on the AM572x processor. For more details, see Section 5.

3.3 Clocks

The EVM has several clocks to support the AM5728 processor.

The main clock for the processor is derived from a 20 MHz crystal. An on-board oscillator in the AM5728 generates the base clock and subsequent module clocks as needed within the AM5728 processor. An Auxiliary Oscillator in the AM5728 generates 22.5792 MHZ (evenly divides to 44.1 KHz and 180.6336 MHz).

3.4 Reset Signals

RSTOUTn is a warm reset generated by AM572x (RSTOUTN signal). Whenever driven low, it generates a PORZ pulse causing a power-on-reset.

CPU_POR_RESETn is asserted by the reset pushbutton (S2) and is used to force a reset of the AM572x.

PMIC_RESET_OUT is controlled by the PMIC and is used to hold the AM572x in PORZ until all power supplies are ramped and/or stable.

4 Power System

This section describes how the power supply will be implemented.

4.1 Power Source

A power supply with the following specs should be used with the AM572x Evaluation Module (power supply is not included):

- 5A output
- Positive inner and negative outer terminals
- Female barrel with 2.5 mm tuning fork inner contact and 5.5 mm outer diameter contact
- Isolated power supply

Figure 4. Isolated Power Supply

The push button S1 near to the power cable is used for power ON/OFF. The main power is off until the push button is pressed. After pressing the S1 push button, the main power stays on for 7 seconds then powers off. To keep the power on, see the Important Notice of this document. Holding the push button for 15 seconds will forcibly turn the main power off.

NOTE: Do not remove the DC power jack to turn off the board, as it may cause damage.

The proper power down procedure is documented in Important Notice of this document.

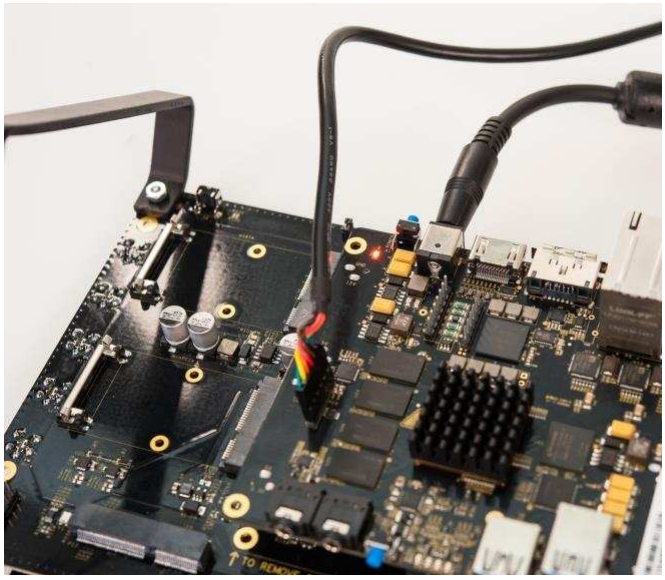

Figure 5. AM572x GP EVM DC Power Jack

The AM572x Processor Module also includes a connector for a Lithium CR1220 non-rechargeable battery for powering a battery back external Real Time Clock (RTC) MCP79410.

- The CR1220 battery is NOT included with the AM572x Evaluation Module and needs to be purchased separately, if the MCP79410 is required.
- This battery should only be replaced by a trained technician.
- If the battery is installed, R416 must first be removed to avoid shorting the battery.

4.2 Power Nets

The power nets used in the AM572x Processor Module schematics are listed in Table 1, Table 2 and Table 3.

Table 1. AM572x Processor Module Power Nets

Net	Description
12 V	Main board supply voltage. Supplies all other voltages including LCD module. There is a 5A fuse from DC jack to board. Powered when DC jack connected. Note that the DC LED (D41) indicates power.
LDO_VRTC	Always on PMIC voltage for control signals (boot0/1), AM572x RTC bias and RTC oscillator analog power supply. Supplied by PMIC LDOVRTC_OUT. Powered when DC jack connected.
5V0	5 V supply to the PMIC (LDO7USB_IN1, LDOUSB_IN2, LDO12_IN), LEDS, HDMI, and the expansion headers. Powered when DC jack connected. TPS54531 switching regulator supply rated at 4A.
USB_5V	Dedicated supply for USB3.0 ports. Supplied by 12V. TPS54531 switching regulator rated at 4A. Ramps during PMIC power sequence.
PS_3V3	Supplies PMIC LDOs and SMPS rails (LDO34_IN, LDO9_IN, LDOLN_IN, SMPS1-9 rails), also supplies VDD_3V3. Powered when DC jack connected. TPS54531 switching regulator supply rated at 4A.
VDD_3V3	Main I/O rail for the board and the expansion headers. Ramps during PMIC power sequence (with regen1). Load switch from PS_3V3. Supplies AM572x VDDSHV1, VDDSHV2, VDDSHV3, VDDSHV4, VDDSHV6, VDDSHV7, VDDSHV9, VDDSHV10, VDDSHV11 rails.
VDDA_1V8_PHYA	Supplies AM572x PHYs (VDDA_SATA, VDDA_USB3). Supplied by PMIC LDO3_OUT. Ramps during PMIC power sequence.
VDDA_1V8_PHYB	Supplies AM572x PHYs (VDDA_HDMI, VDDA_PCIE0, VDDA_PCIE1, VDDA_PCIE). Supplied by PMIC LDO4_OUT. Ramps during PMIC power sequence.
VDD_SHV5	Supplies AM572x RTC Power Group. Supplied by PMIC LDO2_OUT.
VDD_SD	Supplies AM572x SD card IOs, pull-ups for SD card. Supplied by PMIC LDO1_OUT.
VUSB_3V3	Supplies AM572x USB 3.3V analog power supplies. Supplied by PMIC LDOUSB_OUT.

Table 1. AM572x Processor Module Power Nets (continued)

Net	Description
VDD_RTC	Supplies AM572x RTC domain. Supplied by PMIC LDO9_OUT.
VDDA_1V8_PLL	Analog supply for GPU, DEBUG, DDR, VIDEO, IVA, DSP, GMAC_CORE, MPU, ABE_PER. Supplied by PMIC LDOLN_OUT.
VDD_MPU	Supplies AM572x VDD_MPU rails. Supplied by PMIC SMPS1 & SMPS2, AVS voltage.
VDD_DDR	Supplies AM572x VDDS_DDR rails & DDR3L DRAMs. Supplied by PMIC SMPS3, PMIC boot1 pin selects 1.5V or 1.35V (default).
VDD_DSP	Supplies AM572x VDD_DSP, VDD_IVA, VDD_GPU. Supplied by PMIC SMPS4 & SMPS5, AVS votage.
VDD_CORE	AM572x core supply voltage. Supplied by PMIC SMPS, AVS voltage.
VDD_1V8	Supplies AM572x vdds18v rails. Supplied by PMIC SMPS8.

Table 2. AM572x LCD Module Power Nets

Net	Description
12V	From by PM board expansion connectors.
5V	Supplies 5V0 through load switch. From by PM board expansion connectors.
VDD_3V3	Main I/O rail for the board. From by PM board expansion connectors, camera, push buttons, SATA redriver, touchscreen controller, board ID EEPROM, control signals, signal buffers & level shifters.
PS_3V3	Supplies mSATA & mPCIe connectors Supplied by 12 V.
5V0	Source supply for LCD voltages, LCD backlight boost converter, load switch from 5V. Enabled with VDD_3V3. Ramps during PMIC power sequence.
PCI_1.5V	PCIe 1.5 V supply. Supplied by PS_3V3.
Thin film transistor (TFT) LCD display voltages sourced by TPS65105:	
VCOM	LCD Common voltage, 3.96 V
VDD	LCD DVDD P Power for Digital Circuit, 3.3 V
VGH	LCD Gate ON Voltage, 17.75 V
VGL	LCD -8.5V supplied by negative charge pump of TPS65105
AVDD	LCD Power for Analog Circuit, 9.64 V
VLED+	LCD LED backlight power (Anode), 9.6 V (9.9max)
VLED-	LCD LED backlight power (Cathode)

Table 3. AM572x Camera Module Power Nets

Net	Description
VDD_3V3	Main I/O rail for the board. Supplied by LM board (from expansion connectors).
VDD_2V8	Analog and IO voltage for MT9T111 image sensor. From 3.3 V level shifter. Supplied by VDD_3V3, 2.8 V
VDD_1V8	Digital voltage for MT9T111 image sensor. From 3.3 V level shifter. Supplied by VDD_3V3.

The power sequencing requirements of the AM572x processor are handled automatically by the TPS659037 PMIC. For more information, see the *AM572x Sitara™ Processors Silicon Revision 2.0 Data Manual* [9].

4.3 Power Management IC Power Supplies

The AM572x Processor Module uses the TPS659037 power management IC with the power supply configuration shown in Table 4.

Table 4. AM572x Power Supplies From TPS659037

TPS659037 Power Supply	AM572x Power Rail	Schematic Net Name	Voltage
SMPS1/2	VDD_MPU	VDD_MPU	1.10 V at reset
SMPS3	VDDS_DDR1/2	VDD_DDR	1.35 V for DDR3L
SMPS4/5	VDD_DSPEVE, VDD_GPU, VDD_IVA	VDD_DSP	1.06 V at reset
SMPS6	VDD	VDD_CORE	1.06 V at reset
SMPS7	SW configuration after boot		
SMPS8	VDDS18V, VDDS18V_DDR1/2	VDD_1V8	1.8 V
SMPS9	SW configuration after boot		
LDOUSB_OUT	VDDA33V_USB1/2	VUSB_3V3	3.3 V I/O
LDOVRTC_OUT	VDDA_RTC	LDO_VRTC	1.8 V
LDOVANA_OUT	Ground	GND	
LDO1_OUT	VDDSHV8	VDD_SD	3.3 V
LDO2_OUT	VDDSHV5	VDD_SHV5	3.3 V
LDO3_OUT	VDDA_USB1/2/3, VDDA_SATA	VDDA_1V8_PHYA	1.8 V
LDO4_OUT	VDDA_HDMI, VDDA_PCIE, VDDA_PCIE0/1	VDDA_1V8_PHYB	1.8 V
LDO9_OUT	VDD_RTC	VDD_RTC	1.0 V
LDOLN_OUT	VDDA_ABE_PER, VDDA_DDR, VDDA_DEBUG, VDDA_DSP_EVE, VDDA_GMAC_CORE, VDDA_GPU, VDDA_IVA, VDDA_VIDEO, VDDA_MPU, VDDA_OSC	VDDA_1V8_PLL	1.8 V
LDO7USB_IN1/2	-	5V0	5.0 V
LDO12_IN	-	5.0 V	5.0 V
LDO32_IN/_1	-	PS_3V3	3.3 V
LDO9_IN	-	PS_3V3	3.3 V
LDOLN_IN	-	PS_3V3	3.3 V

4.4 APM Sense Resistors

The AM572x Processor Module has the following sub-systems with current sense resistors. These resistors allow the power to be monitored on each supply rail to check AM572x power requirements during real time software execution. All supply rails with sense resistors have their test points located on headers P2 and P3 so that they can be read easily by a multimeter or connected to a TI INA226 current and power monitor. The value of the resistors are selected to provide the best dynamic range when using a TI INA226 EVM.

Table 5. AM572x Baseboard APM Sense Resistors

Board Resistor	Voltage Net	Sense Resistor Value
R34	VDD_MPU	0.01 Ω
R35	VDD_DSP	0.01 Ω
R36	VDD_CORE	0.02 Ω
R1	PS_3V3	0.01 Ω
R7	5V0	0.01 Ω

5 Configuration/Setup

5.1 Boot and Emulation Setup

The AM572x boot mode sequence is selected via three jumpers on the board (J3, J4, J6).

There are three boot mode options (described below) supported by this board.

- OPTION 1 Boot Order:
  - SD Boot. This mode will boot from the microSD slot. It can be used to override what is on the eMMC device or to program the eMMC when used in the manufacturing process or for field updates.
  - eMMC Boot. This is the default boot mode, if the microSD is NOT inserted, and will allow for the fastest boot time.
- OPTION 2 Boot Order:
  - UART Boot. The EVM is hardwired to boot from UART3 in this mode. Note the Linux debug serial boot also uses this same UART port and pinmuxing.
- OPTION 3 Boot Order:
  - SATA Boot. This mode will boot from the eSATA connector. This mode can be used to override what is on the microSD.
  - SD Boot. This mode will boot from the microSD slot.

Table 6 summarizes the jumper configuration for the three bode mode sequence options supported by the board.

Table 6. Jumper Configuration for Boot Mode Selection

Option	Header	Jumper on Pin 1-2	Jumper on Pin 2-3
Option1	J3		X
	J4		X
	J6		X
Option2	J3	X	
	J4	X	
	J6	X	
Option3	J3	X	
	J4		X
	J6		X

5.1.1 Emulation and Hardware Setup

For complete list of supported emulators and hardware configuration required to connect to the GP EVM using CCS, see the AM572x GP EVM Hardware Setup wiki.

5.2 I2C Address Assignments

In the AM572x GP EVM boards, each separate board has an I2C ID memory that contains the details of the identity of that board such as it's configuration, and so forth. For more details on the memories' contents, see the sections below.

Table 7. AM572x Processor Module I2C Bus Addresses

AM572x Processor Module Function	AM572x I2C Port	Address
Processor Module ID memory	I2C1	0x50
AM572x PMIC Control	I2C1	0x58 (Power registers), 0x59 (Interfaces and auxiliaries), 0x5A (Trimming and test), 0x5B (OTP), 0x12 (DVS)
Temperature Sensor	I2C1	0x48
AIC3104 Audio codec	I2C1	0x18
Real Time Clock	I2C3	0x6F (SRAM and RTCC access), 0x57 (EEPROM access)
USB 3.0 Hub	I2C3	0x50

Table 8. AM572x LCD Module I2C Bus Addresses

AM572x LCD Module Function	AM572x I2C Port	Address
LCD Module ID memory	I2C5	0x50
Touchscreen Connector for OSD Display	I2C5	0x5C

Table 9. AM572x Camera Module I2C Bus Addresses

AM572x Camera Module Function	AM572x I2C Port	Address
Camera	I2C3	0x3C

5.3 I2C ID Memory

The Processor Module and LCD Module boards each have a dedicated I2C EEPROM which contains specific identity/configuration information for that board. In addition, there is available space in each memory for user specific configuration information.

The part number of the memory device is pn#CAT24C256WI-G.

Table 10. AM572x Processor Module EEPROM Data

Name	Size (bytes)	Contents
Header	4	MSB 0xEE3355AA LSB
Board Name	8	Name for board in ASCII "AM572PM_" = AM572x GP EVM Processor Board
Version	4	Hardware version code for board in ASCII "A.20" = rev. A2
Serial Number	12	Serial number of the board. This is a 12 character string which is: WWYY4P55nnnn where: WW = 2 digit week of the year of production YY = 2 digit year of production nnnn = incrementing board number
Configuration	32	Codes to show the configuration setup on this board. Reserved.
Reserved	6	Reserved
Reserved	6	Reserved
Available	32696	Available space for other non-volatile codes/data

Table 11. AM572x LCD Module EEPROM Data

Name	Size (bytes)	Contents
Header	4	MSB 0xEE3355AA LSB
Board Name	8	Name for board in ASCII "AM572LM_" = AM572x GP EVM LCD Board
Version	4	Hardware version code for board in ASCII "A.20" = rev. A2
Serial Number	12	Serial number of the board. This is a 12 character string which is: WWYY4P57nnnn where: WW = 2 digit week of the year of production YY = 2 digit year of production nnnn = incrementing board number
Configuration	32	Codes to show the configuration setup on this board. Reserved.
Reserved	6	Reserved
Reserved	6	Reserved
Available	32696	Available space for other non-volatile codes/data

6 Processor Module Functional Block Descriptions

This section describes major functional blocks of the AM572x EVM Processor Module System.

6.1 Memory

Described in the following sections are the four memory devices found on the board.

6.1.1 4KB EEPROM (Board Identity Memory)

The Processor Module and LCD Module boards each contain a single 4KB EEPROM provided on I2C1 that contains the board specific information and allows the processor to automatically detect which board is connected and the version of that board. Other hardware specific data can be stored on this memory device as well. The WP pin on the EEPPROM device should be pulled to GND before writing to the device. Note that over writing the pre-programmed data in the EEPROM will inhibit TI software from running as-is.

The part number of the memory device is pn#CAT24C256WI-G. For details on the data in this memory, see Section 5.

6.1.2 2GB DDR3L

The Processor Module contains four 4 Gb (256M x16) of DDR3L SDRAM memories from Kingston. The part number for the DDR3L SDRAM memory used is D2516EC4BXGGB. The AM572x has two 32 bit memory buses with two DDR3L devices on each bus.

A regulator is implemented on the Processor Module that handles the VTT voltage rail. The regulator creates the voltage for the termination circuits and the DDR_VREF level as well. This regulator supplies the required functions for both of the DDR3L banks on the Processor Module. Termination resistors are used.

6.1.3 eMMC Flash Memory

A single Kingston 4GB eMMC Flash Memory is on the Processor Module and can be used for booting and non-volatile storage. The eMMC device connects to the MMC2 port of the processor, allowing for 8-bit wide access.

6.1.4 MicroSD (MMC1) Connector

The MMC1 connector on the Processor Module is an ALPS card socket #SCHA5B0200. This is a standard SD/MMC Card type of connector. It is connected to the MMC1 port of the AM572x processor. Check the AM572x data sheet and TRM for supported card types/densities.

6.2 Temperature Sensor

A TI TMP102A temperature sensor on the Processor Module is used to report ambient temperature near the processor. It is controlled by I2C and is configured for an I2C slave address of 0x48.

The sensor is connected to the I2C1 bus on the processor. The alert pin that indicates that the temperature has exceeded the configurable limit is connected to GPIO7_16 on the processor.

6.3 Real Time Clock

A battery back external Real Time Clock (RTC) MCP79410 is provided to keep the current clock active while the board is powered down. It can be used in conjunction with the internal Real Time Clock of the processor which will reset when power is removed from the board.

In addition to the typical RTC functions, the MCP79410 device has 64 bytes of battery backed RAM and 1Kb of EEPROM.

The MCP79410 RTC IC will only keep time when RTC coin battery is installed. The AM572x GP EVM does not ship with a coin battery. However, the Processor Module includes connections for a CR1220 non-rechargeable battery that is capable of supplying 35mAh of backup power and is sufficient to keep the RTC active for a couple of years.

The CR1220 battery must be installed by a trained technician. When installing the CR1220, make sure to remove R416 that shorts across the battery. R416 is needed for MCP79410 to operate without a battery. After the battery is installed, make sure to not short the battery by placing the board on a conductive surface when not in use, as the RTC time will be lost.

6.4 10/100/1000 Ethernet

The AM572x GP EVM has two 10/100/1000 Ethernet transceiver from Micrel(KSZ9031RN) that is connected to a dual RJ45 (P5) connector. The two Ethernet interfaces are connected to the switch inside the AM572x processor.

The reset on the transceivers are driven by the board system reset signal ENET0/1_PORZ. A 25MHz crystal drives the clock input of the KSZ9031RN Ethernet PHY.

The PHY address on the MDIO bus is set to 0x00h.

6.5 USB

The Processor Module connects the AM572x USB1/USB2 ports as follows:

- AM572x USB1 port (capable of USB 3.0 SuperSpeed) --> USB 3.0 hub w/ 3 downstream ports
- AM572x USB2 port (limited to USB 2.0 High-Speed) --> microUSB B connector (Client mode only)

The AM572x USB1 port has its USB_ID pin (GPIO7_25) pulled low for host mode. The three downstream ports of the USB 3.0 hub attached to the AM572x USB1 port are connected to a single port USB 3.0 A connector and a stacked, two port USB 3.0 A connector.

The AM572x USB2 port has its USB_ID pin (GPIO7_24) pulled high for client, or device, mode. By default, the USB2 port is routed to a microUSB client port (P7) on the Processor Module. Alternatively, the AM572x USB2 signals are also available on the expansion connectors for use with an expansion board. To route the USB2 port to a custom daughter board on the expansion connector, remove R210 and R211 and populate R314 and R315 with 0-ohm resistors. To support host mode or OTG, VBUS 5V must be supplied by the custom daughter board.

6.6 Audio

There are two sources of audio on the Processor Module:

- The HDMI interface, or
- Via two stereo jacks on the board that are connected to the AIC3104 CODEC

This section covers the stereo CODEC. The HDMI interface is covered in the following section.

The AIC3104 CODEC is controlled from AM572x by I2C which is at address 0x18 and is connected to the McASP3 I2S interface on the AM572x processor. The AIC3104 requires a master clock (MCLK) that is supplied by the processor using the AM572x CLKOOUT2 pin. Depending on the requirements, this clock can be any range from 512 KHz to 50 MHz. The most likely frequencies to be used are 12 MHZ, 13 MHZ, 16 MHz, 19.2 MHZ or 19.68 MHZ. Additionally, the RSTOUTn signal provides a reset to the AIC3014 whenever the system is reset.

6.7 HDMI

A single HDMI interface is provided direct from the processor. The Processor Module supports level translation from 3.3 V to 5 V for the HDMI interface.

A standard (not mini) HDMI connector is implemented on the Processor Module.

6.8 eSATA

A switch is used to direct the SATA signals to the onboard eSATA connector or to the expansion header, where they are routed to the mSATA connector on the LCD Module. If the signal on the expansion header, P19-4, is left open, the signals go to the eSATA onboard connector. If the pin is grounded via the SATA_SEL jumper (J1) on the LCD Module, the switch is activated and the signals are routed to the expansion headers.

The eSATA interface on the Processor Module is a combination of two separate interfaces, SATA and USB. The eSATA port can be used as an eSATA or a USB 2.0 port. The USB signals originate from the USB 3.0 HUB. The SATA interfaces originate from the AM57xx processor via the switch.

Power for the eSATA is from the USB power pins, 5V. Power is routed to the eSATA connector via the TPS2560 FET switch. It is capable of providing the 500mA required by the eSATA connector. Only 5V is supplied.

NOTE: When J1 on the LCD Module is installed (for mSATA), the eSATA on the Processor Module will no longer function. However, the connector can still function as a USB 2.0 port.

6.9 Serial Debug Header

The Processor Module has a 6-pin Serial Debug Header that enables the AM572x UART3 to be used as a serial debug port. It provides TX, RX, and ground signals. An isolation buffer (SN74LVC2G241) is located between the System-on-Chip (SoC) and header to prevent the signals from being fed back into the processor when the board is powered off.

The UART TX and RX signals provided to this header are 3.3 V level. In order to connect them to a PC, a USB to serial converter is required. A common converter is the FTDI USB to TTL cable (TTL-232R-3V3). However, make sure to use the 3.3V version and not the 5V version.

7 AM572x EVM LCD Module Functional Block Descriptions

This section describes major functional blocks of the AM572x EVM LCD Module System.

7.1 LCD Screen

The LCD is a OSD 7in WVGA (800x480) RGB LCD panel part number #OSD070T1718-19TS v1 3. It is a 24bit RGB TFT LCD with 21 white LED's for backlight (controlled by one power regulator). The connector is FPC 50pin pn #XF3M-5015-1B.

The LED backlight on the LCD is controlled by a TPS61080 PWM controlled LED driver.

7.2 Capacitive Touch Screen

The Pixcir Tango C48 touchscreen is integrated into the OSD070T1718-19TS v1 3. It supports multi-touch for 5 fingers using the I2C interface.

7.3 mSATA

There is a single mSATA connector on the backside of the LCD Module for use with SSD drives.

Only one SATA interface exists on the Processor Module. In order to use this interface on the LCD Module, SATA_SEL jumper (located on the LCD Module) must be installed. This switches the SATA mux on the Processor Module to the expansion connectors. When the SATA_SEL jumper (J1) is installed, the eSATA on the Processor Module will no longer function. However, the connector can still function as a USB 2.0 port.

7.4 miniPCIe

The miniPCIe (single lane) connector is identical to the mSATA connector. However, different pins are used. miniPCIe can support several different functions such as WLAN/WIFI, Ethernet, Video, Analog, GPS, and Memory.

7.5 COM8 Interface – Mobile Connectivity Expansion Connector

A single COM8 connector and interface is provided on the LCD Module. This connector is intended to facilitate the plugging in of TI WiLink8 type devices for the addition of a Wi-Fi interface. The COM8 connector is a Samtec card edge type connector pn# MEC. This connector thus supports TI WiLink8 types of boards, and more details about this connector can be found in the TI WiLink8 board documents.

The COM connector requires on 3.6V on the power supply. Thus a TPS74801 LDO regulator is used to provide this voltage supply from the base 5.0V supply. The signals on the COM board are all 1.8 V voltage level. Thus voltage translators are placed to convert to/from 3.3V of the AM572x rail for a particular signal which is running at 3.3 V.

The TI WiLink8 evaluation modules have a built-in antennae. However, the LCD Module has holes cut to accommodate a custom board with antennae if needed.

8 AM572x EVM Camera Module Functional Block Descriptions

The device video input port allows interfacing to a camera. The Camera Module board has either the Leopard Imaging LI-3M02CM 3MP image with the Aptina MT911 sensor or the Omnivision 1MP OV10635 sensor module. Level shifters and buffers are provided on the board to interface to the 3.3 V of the expansion headers. Control signals from the Processor Module controls the modules. These include I2C, oscillator and power down. A dedicated clock oscillator is provided for the camera module.

9 Board Connectors

The pinout details of all the connectors used in the GP EVM are provided in Table 12.

9.1 Gigabit Ethernet - P5 (Processor Module)

Table 12. AM572x Gbit Ethernet Pin Details

Pin Number	Signal Name	Description
1	P1_TRD[0]P	Data 0 +ve
2	P1_TRD[0]N	Data 0 -ve
3	P1_TRD[1]P	Data 1 +ve
4	P1_TRD[1]N	Data 1 -ve
5	P1_TRD[2]P	Data 2 +ve
6	P1_TRD[2]N	Data 2 -ve
7	P1_TRD[3]P	Data 3 +ve
8	P1_TRD[3]N	Data 3 -ve
9	NC	No Connect
10	GND	Ground

Table 12. AM572x Gbit Ethernet Pin Details (continued)

Pin Number	Signal Name	Description
11	P0_TRD[0]P	Data 0 +ve
12	P0_TRD[0]N	Data 0 -ve
13	P0_TRD[1]P	Data 1 +ve
14	P0_TRD[1]N	Data 1 -ve
15	P0_TRD[2]P	Data 2 +ve
16	P0_TRD[2]N	Data 2 -ve
17	P0_TRD[3]P	Data 3 +ve
18	P0_TRD[3]N	Data 3 -ve
19	NC	No Connect
20	GND	Ground
D1	E1_GRN	Cathode of LINK LED
D2	VDD_3V3	Anode of LINK LED
D3	E1_YEL	Anode of ACT LED
D4	VDD_3V3	Cathode of ACT LED
D5	E0_GRN	Cathode of LINK LED
D6	VDD_3V3	Anode of LINK LED
D7	E0_YEL	Anode of ACT LED
D8	VDD_3V3	Cathode of ACT LED
M1	NC	No Connect
M2	NC	No Connect
SHLD1	DGND	Ground
SHLD2	DGND	Ground
SHLD3	DGND	Ground
SHLD4	DGND	Ground

9.2 eSATA / USB - P6 (Processor Module)

The fourth port of the Processor Module's USB 3.0 hub is connected to P6 and is limited to USB 2.0 (High-speed).

Table 13. eSATA Connector Pin Details

Pin Number	Signal	Description
1	USB4VBUS	USB Hub Port 4 5V Supply
2	USB_DM3	USB Hub Port 4 High-speed Transceiver (Negative)
3	USB_DP3	USB Hub Port 4 High-speed Transceiver (Positive)
4	GND1	Ground
5	GND2	Ground
6	eSATA_T+	eSATA Data Transmit (Positive)
7	eSATA_T-	eSATA Data Transmit (Negative)
8	GND3	Ground
9	eSATA_R-	eSATA Data Receive (Negative)
10	eSATA_R+	eSATA Data Receive (Positive)
11	GND4	Ground
M1	NC	No Connect
M2	NC	No Connect

9.3 USB

9.3.1 AM572x USB2 (USB 2.0 Client) - P7 (Processor Module)

Table 14. AM572x USB2 (USB 2.0 Client)

Pin Number	Signal Name	Description
1	USB2_5V	AM572x USB2 5V Supply
2	USBSP_DM	AM572x USB2 High-Speed Transceiver (Negative)
3	USBSP_DP	AM572x USB2 High-Speed Transceiver (Positive)
4	ID	Not connected (USB device/client mode only)
5	DGND	Ground

9.3.2 AM572x USB1 (USB 3.0 Host) - P13, P15 (Processor Module)

The AM572x USB1 port supports USB 3.0 speeds and is connected to a 4-port USB 3.0 hub. Three are accessible on the USB 3.0 Host ports while the fourth is located in the eSATA/USB combination port and is therefore limited to USB 2.0.

Table 15. USB 3.0 Hub Port 1 (AM572x USB1 Port) - P13

Pin Number	Signal Name	Description
1	USBxVBUS	USB Hub Port 0 5V Supply
2	USB_DM0	USB Hub Port 0 High-speed Transceiver (Negative)
3	USB_DP0	USB Hub Port 0 High-speed Transceiver (Positive)
4	GND	Ground
5	USB_RXM0	USB Hub Port 0 SuperSpeed Receiver (Negative)
6	USB_RXP0	USB Hub Port 0 SuperSpeed Receiver (Positive)
7	GND	Ground
8	USB_TXM0	USB Hub Port 0 SuperSpeed Transmitter (Negative)
9	USB_TXP0	USB Hub Port 0 SuperSpeed Transmitter (Positive)
10	P13P15_SHLD	Shield
11	P13P15_SHLD	Shield

Table 16. USB 3.0 Hub Port 2/3 (AM572x USB1 Port) - P15

Pin Number	Signal Name	Description
1	USBxVBUS	USB Hub Port 1 5V Supply
2	USB_DM1	USB Hub Port 1 High-speed Transceiver (Negative)
3	USB_DP1	USB 3.0 Hub USB2 High-speed Transceiver (Positive)
4	GND	Ground
5	USB_RXM1	USB Hub Port 1 SuperSpeed Receiver (Negative)
6	USB_RXP1	USB Hub Port 1 SuperSpeed Receiver (Positive)
7	GND	Ground
8	USB_TXM1	USB Hub Port 1 SuperSpeed Transmitter (Negative)
9	USB_TXP1	USB Hub Port 1 SuperSpeed Transmitter (Positive)
10	USB3VBUS	USB Hub Port 2 Bus Voltage
11	USB_DM2	USB Hub Port 2 High-speed Transceiver (Negative)
12	USB_DP2	USB Hub Port 2 High-speed Transceiver (Positive)
13	GND	Ground

Table 16. USB 3.0 Hub Port 2/3 (AM572x USB1 Port) - P15 (continued)

Pin Number	Signal Name	Description
14	USB_RXM2	USB Hub Port 2 SuperSpeed Receiver (Negative)
15	USB_RXP2	USB Hub Port 2 SuperSpeed Receiver (Positive)
16	GND	Ground
17	USB_TXM2	USB Hub Port 2 SuperSpeed Transmitter (Negative)
18	USB_TXP2	USB Hub Port 2 SuperSpeed Transmitter (Positive)
19	P13P15_SHLD	Shield
20	P13P15_SHLD	Shield
21	P13P15_SHLD	Shield
22	P13P15_SHLD	Shield

9.4 Serial Debug Header - P10 (Processor Module)

Table 17. Serial Debug Header Pin Details

Pin Number	Signal	Description
1	GND	Ground
2	NC	No Connect
3	NC	No Connect
4	UART3_RX	UART3 Receive Data
5	UART3_TX	UART3 Transmit Data
6	NC	No Connect

9.5 HDMI - P11 (Processor Module)

Table 18. HDMI Connector Pin Details

Pin Number	Signal	Description
1	HDMI_TX2+	HDMI Data 2 Differential Pair (Y)
2	GND	HDMI Data 2 Shield
3	HDMI_TX2-	HDMI Data 2 Differential Pair (X)
4	HDMI_TX1+	HDMI Data 1 Differential Pair (Y)
5	GND	HDMI Data 2 Shield
6	HDMI_TX1-	HDMI Data 1 Differential Pair (X)
7	HDMI_TX0+	HDMI Data 0 Differential Pair (Y)
8	GND	HDMI Data 0 Shield
9	HDMI_TX0-	HDMI Data 0 Differential Pair (X)
10	HDMI_TXC+	HDMI Clock Differential Pair (Y)
11	GND	HDMI Clock Shield
12	HDMI_TXC-	HDMI Clock Differential Pair (X)
13	HDMI_CEC_B	HDMI Consumer Electronics Control (CEC) Interface
14	NC	No connect
15	HDMI_SCL_B	HDMI Display Data Channel (DDC) I2C Clock
16	HDMI_SDA_B	HDMI Display Data Channel (DDC) I2C Data
17	GND	Ground
18	HDMI_5VOUT	HDMI 5V Supply (55mA max)

Table 18. HDMI Connector Pin Details (continued)

Pin Number	Signal	Description
19	HDMI_HPD_B	HDMI Hot Plug Detect (HPD)
MTG1	P11_ESD	
MTG2	P11_ESD	
MTG3	P11_ESD	
MTG4	P11_ESD	

9.6 MicroSD - P12 (Processor Module)

Table 19. AM572x MMC1 Connector Pin Details

Pin Number	Signal	Description
1	DAT2	MMC1 Data 2
2	DAT3/CD	MMC1 Data 3
3	CMD	MMC1 Command
4	VDD	VDD_SD (3.3V)
5	CLK	MMC1 Clock
6	VSS	Ground
7	DAT0	MMC1 Data 0
8	DAT1	MMC1 Data 1
10	CD	MMC1 Card Detect

9.7 Expansion Connectors

The expansion connector details are listed in Table 20 through Table 23.

9.7.1 Processor Module P16/LCD Module P1

Table 20. AM572x P16 Expansion Connector

Pin Number	Processor Module		LCD Module	
	Signal	Description	Signal	Description
A1	NC	No Connect	Not connected	
A2	GND	Ground	Same as PM	
A3	VDD_3V3	3.3 V Power Supply	Same as PM	
A4	NC	No Connect	Not connected	
B1	12V	12 V Power Supply (always-on)	Same as PM	
B2	5V0	5V Power Supply (always-on)	Same as PM	
1	GND	Ground	Same as PM	
2	GND	Ground	Same as PM	
3	GPIO4_17	GPIO4[17]	Same as PM	
4	GPIO5_11	GPIO5[11]	Same as PM	
5	MCASP7_AXR0	McASP7 Audio Transmit/Receive (Pin 0)	PCM_DOUT	COM Port Bluetooth Audio Out (to AM57xx)
6	VIN3A_D22	Video Input 3 Port A Data Input	Same as PM	
7	GPIO2_3	GPIO2[3]	Not connected	
8	GPIO2_8	GPIO2[8]	PCIe_RESET	PCI-Express Mini Card RESET (active high)

Table 20. AM572x P16 Expansion Connector (continued)

Pin Number	Processor Module		LCD Module	
	Signal	Description	Signal	Description
9	VIN3A_HSYNC	Video Input 3 Port A Horizontal Sync Input	Same as PM	
10	VIN3A_D20	Video Input 3 Port A Data Input	Same as PM	
11	DMA_EVT3	System DMA Event Input 3	Not connected	
12	VIN3A_D18	Video Input 3 Port A Data Input	Same as PM	
13	VIN3A_D21	Video Input 3 Port A Data Input	Same as PM	
14	VIN3A_DEO	Video Input 3 Port A Data Enable Input	Same as PM	
15	VIN3A_D4	Video Input 3 Port A Data Input	Same as PM	
16	VIN3A_D2	Video Input 3 Port A Data Input	Same as PM	
17	DMA_EVT4	System DMA Event Input 4	Not connected	
18	VIN3A_D5	Video Input 3 Port A Data Input	Same as PM	
19	GPIO2_25	GPIO2[25]	PB2	LCD Module Push Button 2
20	GPIO2_28	GPIO2[28]	PB3	LCD Module Push Button 3
21	GPIO2_23	GPIO2[23]	PB1	LCD Module Push Button 1
22	VIN3A_D3	Video Input 3 Port A Data Input	Same as PM	
23	VIN3A_D8	Video Input 3 Port A Data Input	Same as PM	
24	VIN3A_D12	Video Input 3 Port A Data Input	Same as PM	
25	VIN3A_D15	Video Input 3 Port A Data Input	Same as PM	
26	VIN3A_D13	Video Input 3 Port A Data Input	Same as PM	
27	VIN3A_D14	Video Input 3 Port A Data Input	Same as PM	
28	GND	Ground	Not connected	
29	USB2_DMEX	USB2 USB 2.0 Data (Negative)	Not connected	
30	GND	Ground	Not connected	
31	GND	Ground	Same as PM	
32	GND	Ground	Same as PM	
33	GPIO5_12	GPIO5[12]	Same as PM	
34	GPIO5_10	GPIO5[10]	Same as PM	
35	DMA_EVT1	System DMA Event Input 1	Not connected	
36	VIN3A_D16	Video Input 3 Port A Data Input	Same as PM	
37	VIN3A_VSYNC	Video Input 3 Port A Vertical Sync Input	Same as PM	
38	GPIO2_5	GPIO2[5]	LCDPWR	LCD Power Supply Enable (active-high)
39	GPIO2_6	GPIO2[6]	CAP_RST	Touch Controller Reset
40	GPIO2_4	GPIO2[4]	CAP_INT	Touch Controller Interrupt
41	GPIO2_19	GPIO2[19]	Not connected	
42	VIN3A_D19	Video Input 3 Port A Data Input	Same as PM	
43	VIN3A_D17	Video Input 3 Port A Data Input	Same as PM	
44	VIN3A_FLD	Video Input 3 Port A Field ID Input	Same as PM	
45	VIN3A_D23	Video Input 3 Port A Data Input	Same as PM	
46	GPIO2_2	GPIO2[2]	LCD_RSTn	LCD Reset (may not be connected)
47	GPIO2_24	GPIO2[24]	PB4	LCD Module Push Button 4
48	GPIO2_17	GPIO2[17]	Not connected	
49	GPIO2_20	GPIO2[20]	PB5	LCD Module Push Button 5
50	VIN3A_CLK0	Video Input 3 Port A Clock	Same as PM	
51	VIN3A_D0	Video Input 3 Port A Data Input	Same as PM	

Table 20. AM572x P16 Expansion Connector (continued)

Pin Number	Processor Module		LCD Module	
	Signal	Description	Signal	Description
52	VIN3A_D1	Video Input 3 Port A Data Input	Same as PM	
53	VIN3A_D6	Video Input 3 Port A Data Input	Same as PM	
54	VIN3A_D7	Video Input 3 Port A Data Input	Same as PM	
55	VIN3A_D11	Video Input 3 Port A Data Input	Same as PM	
56	VIN3A_D10	Video Input 3 Port A Data Input	Same as PM	
57	VIN3A_D9	Video Input 3 Port A Data Input	Same as PM	
58	GND	Ground	Not connected	
59	USB2_DPEX	USB2 USB 2.0 Data (Positive)	Not connected	
60	GND	Ground	Not connected	

9.7.2 Processor Module P17 / LCD Module P3

Table 21. AM572x P17 Expansion Connector

Pin Number	Processor Module		LCD Module	
	Signal	Description	Signal	Description
A1	NC	No Connect	Not connected	
A2	GND	Ground	Same as PM	
A3	VDD_3V3	3.3V Power Supply	Same as PM	
A4	NC	No Connect	Not connected	
B1	12V	12V Power Supply (always-on)	Same as PM	
B2	5V0	5V Power Supply (always-on)	Same as PM	
1	GND	Ground	Same as PM	
2	GND	Ground	Same as PM	
3	GPIO6_11	GPIO6[11]	CAM_ENn	Camera Module Enable (active-low)
4	MMC3_CMD	MMC3 Command	COMQ_MMC0_CMD	COM Port WLAN SDIO CMD
5	EHRPWM2A	Enhanced High-Resolution PWM Module 2 Output A	BLPWM	LCD Module Brightness Control (PWM)
6	MMC3_DAT7	MMC3 Data (Bit 7)	Not connected	
7	MMC3_DAT0	MMC3 Data (Bit 0)	COMQ_MMC0_DAT0	COM Port WLAN SDIO Data
8	MMC3_DAT2	MMC3 Data (Bit 2)	COMQ_MMC0_DAT2	COM Port WLAN SDIO Data
9	UART9_TXD	UART9 Data Transmit (Output)	Not connected	
10	UART9_RXD	UART9 Data Receive (Input)	Not connected	
11	UART8_CTS	UART8 Clear to Send	BT_UART_RTS	COM Port Bluetooth Request to Send
12	TIMER3	PWM output/event trigger input	Not connected	
13	TIMER2	PWM output/event trigger input	Not connected	
14	UART8_RTS	UART8 Request to Send	BT_UART_CTS	COM Port Bluetooth Clear to Send
15	GPIO5_7	GPIO5[7]	WLAN_IRQ	COM Port WLAN IRQ
16	MCASP2_AXR4	McASP2 Audio Transmit/Receive (Pin 4)	Not connected	
17	GPIO5_5	GPIO5[5]	GPS_PPS_OUT	COM Port GPS Pulse Per Second
18	MCASP2_AXR2	MCASP22 Audio Transmit/Receive (Pin 2)	Not connected	

Table 21. AM572x P17 Expansion Connector (continued)

Pin Number	Processor Module		LCD Module	
	Signal	Description	Signal	Description
19	MCASP7_FSX	MCASP7 Audio Transmit Frame Sync I/O	PCM_FSYNC	COM Port Bluetooth Audio Frame Sync
20	DCAN1_RX	DCAN1 Data Receive Pin	Not connected	
21	MCASP2_CLKX	MCASP2 Audio Transmit Clock I/O	Not connected	
22	MCASP2_AXR3	MCASP2 Audio Transmit/Receive (Pin 3)	Not connected	
23	MCASP2_AXR1	MCASP2 Audio Transmit/Receive (Pin 1)	Not connected	
24	MCASP2_AXR5	MCASP2 Audio Transmit/Receive (Pin 5)	Not connected	
25	GPIO5_9	GPIO5[9]	Not connected	
26	MCASP2_AXR6	MCASP2 Audio Transmit/Receive (Pin 6)	Not connected	
27	UART8_TXD	UART8 Data Transmit (Output)	BT_UART_RX	COM Port Bluetooth Data Recieve
28	GPIO6_19	GPIO6[19]	Not connected	
29	USB2_OC	GPIO7[17]	Not connected	
30	USB2_ID	GPIO7[24] (pulled up - 10k ohms)	Not connected	
31	GND	Ground	Same as PM	
32	GND	Ground	Same as PM	
33	MMC3_DAT3	MMC3 Data (Bit 3)	COMQ_MMC0_DAT3	COM Port WLAN SDIO Data
34	MMC3_CLK	MMC3 Clock	COMQ_MMC0_CLK	COM Port WLAN SDIO Clock
35	MMC3_DAT5	MMC3 Data (Bit 5)	Not connected	
36	MMC3_DAT1	MMC3 Data (Bit 1)	COMQ_MMC0_DAT1	COM Port WLAN SDIO Data
37	MMC3_DAT4	MMC3 Data (Bit 4)	Not connected	
38	MMC3_DAT6	MMC3 Data (Bit 6)	Not connected	
39	UART9_RTSN	UART9 Request to Send active low	Not connected	
40	UART9_CTSN	UART9 Clear to Send active low	Not connected	
41	CLKOUT3	Device Clock Output 3	Not connected	
42	TIMER1	PWM output/event trigger input	Not connected	
43	UART8_RXD	UART8 Receive Data (Input)	BT_UART_TXD	COM Port Bluetooth Data Transmit
44	MCASP2_ACLKR	McASP2 Audio Receive Clock I/O	Not connected	
45	GPIO5_6	GPIO5[6]	GPS_TIME_STAMP	COM Port GPS Time Stamp
46	I2C4_SCL	I2C Port 4 Serial Clock	Same as PM	
47	GPIO5_4	GPIO5[4]	BT_EN	COM Port Bluetooth Enable
48	MCASP7_ACLKX	McASP7 Audio Transmit Bit Clock I/O	PCM_CLK	COM Port Bluetooth Audio Clock
49	MCASP7_AXR1	McASP7 Audio Transmit/Receive (Pin 1)	PCM_DIN	COM Port Bluetooth Audio In (from AM57xx)
50	DCAN1_TX	DCAN1 Data Transmit Pin	Not connected	
51	GPIO7_7	GPIO7[7]	Not connected	
52	MCASP2_FSX	McASP2 Audio Transmit Frame Sync I/O	Not connected	
53	I2C4_SDA	I2C Port 4 Serial Data	Same as PM	
54	MCASP2_AXR0	McASP2 Audio Transmit/Receive (Pin 0)	Not connected	
55	GPIO5_8	GPIO5[8]	WL_EN	COM Port WLAN Enable

Table 21. AM572x P17 Expansion Connector (continued)

Pin Number	Processor Module		LCD Module	
	Signal	Description	Signal	Description
56	MCASP2_AXR7	McASP2 Audio Transmit/Receive (Pin 7)	Not connected	
57	MCASP2_FSR	McASP2 Audio Receive Frame Sync I/O	Not connected	
58	GPIO6_18	GPIO6[18]	Not connected	
59	USB2_DRVBUS	USB2 Host VBUS Signal output	Not connected	
60	USB2VBUS_EXP	USB2 Client VBUS Signal input (depends on resistor configuration)	Not connected	

9.7.3 Processor Module P18 / LCD Module P4

Table 22. AM572x P18 Expansion Connector

Pin Number	Processor Module		LCD Module	
	Signal	Description	Signal	Description
A1	NC	No Connect	Not connected	
A2	GND	Ground	Same as PM	
A3	VDD_3V3	3.3V Power Supply	Same as PM	
A4	NC	No Connect	Not connected	
B1	12V	12V Power Supply (always-on)	Same as PM	
B2	5V0	5V Power Supply (always-on)	Same as PM	
1	GND	Ground	Same as PM	
2	GND	Ground	Same as PM	
3	I2C5_SDA	I2C Port 5 Serial Data	1V8_I2C5_SDA	COM Port I2C Serial Data
4	I2C5_SCL	I2C Port 5 Serial Clock	1V8_I2C5_SCL	COM Port I2C Serial Clock
5	PWRON	Power On Signal (active-low)	Same as PM	
6	EHRPWM2_TRIPZONE_INPUT	Enhanced High-Resolution PWM Port 2 Trip Zone Input	Not connected	
7	GPIO4_10	GPIO4[10]	Not connected	
8	UART10_RTSn	UART10 Request to Send (active low)	Not connected	
9	GPIO3_29	GPIO3[29]	Not connected	
10	PR1_UART0_TXD	PRU-ICSS1 UART Data Transmit	Not connected	
11	GPIO3_28	GPIO3[28]	Not connected	
12	UART10_RXD	UART10 Data Receive (Input)	Not connected	
13	UART10_CTSn	UART10 Clear to Send (active low)	Not connected	
14	VOUT1_D15	Video Output 1 Data Output	Same as PM	
15	VOUT1_D13	Video Output 1 Data Output	Same as PM	
16	VOUT1_D10	Video Output 1 Data Output	Same as PM	
17	VOUT1_D14	Video Output 1 Data Output	Same as PM	
18	VOUT1_D11	Video Output 1 Data Output	Same as PM	
19	VOUT1_D20	Video Output 1 Data Output	Same as PM	
20	VOUT1_D12	Video Output 1 Data Output	Same as PM	
21	VOUT1_D18	Video Output 1 Data Output	Same as PM	
22	VOUT1_D19	Video Output 1 Data Output	Same as PM	
23	VOUT1_D21	Video Output 1 Data Output	Same as PM	

Table 22. AM572x P18 Expansion Connector (continued)

Pin Number	Processor Module		LCD Module	
	Signal	Description	Signal	Description
24	VOUT1_D23	Video Output 1 Data Output	Same as PM	
25	VOUT1_D0	Video Output 1 Data Output	Same as PM	
26	VOUT1_D3	Video Output 1 Data Output	Same as PM	
27	VOUT1_HSYNC	Video Output 1 Horizontal Sync Output	Same as PM	
28	VOUT1_VSYNC	Video Output 1 Vertical Sync Output	Same as PM	
29	GPIO5_19	GPIO5[19]	Not connected	
30	UART1_TXD	UART1 Data Transmit (Output)	Not connected	
31	GND	Ground	Same as PM	
32	GND	Ground	Same as PM	
33	RSTOUTn	Reset Out (active-low)	Not connected	
34	RESETIN	Reset Signal (active-low)	Same as PM	
35	EXT_WAKE		Not connected	
36	GPIO3_30	GPIO3[30]	Not connected	
37	PR1_UART0_RTSn	PRU-ICSS1 UART Request to Send (active low)	Not connected	
38	GPIO4_9	GPIO4[9]	Not connected	
39	GPIO4_8	GPIO4[8]	Not connected	
40	PR1_UART0_CTSn	PRU-ICSS1 UART Clear to Send (active low)	Not connected	
41	PR1_UART0_RXD	PRU-ICSS1 UART Data Receive	Not connected	
42	UART10_TXD	UART10 Data Transmit (Output)	Not connected	
43	GPIO4_7	GPIO4[7]	Not connected	
44	EHRPWM2B	Enhanced High-Resolution PWM Port 2 Output B	Not connected	
45	VOUT1_D6	Video Output 1 Data Output	Same as PM	
46	VOUT1_D7	Video Output 1 Data Output	Same as PM	
47	VOUT1_D8	Video Output 1 Data Output	Same as PM	
48	VOUT1_D4	Video Output 1 Data Output	Same as PM	
49	VOUT1_D5	Video Output 1 Data Output	Same as PM	
50	VOUT1_D16	Video Output 1 Data Output	Same as PM	
51	VOUT1_D17	Video Output 1 Data Output	Same as PM	
52	VOUT1_D22	Video Output 1 Data Output	Same as PM	
53	VOUT1_DE	Video Output 1 Data Enable Output	Same as PM	
54	VOUT1_D2	Video Output 1 Data Output	Same as PM	
55	VOUT1_D1	Video Output 1 Data Output	Same as PM	
56	VOUT1_D9	Video Output 1 Data Output	Same as PM	
57	VOUT1_CLK	Video Output 1 Clock Output	Same as PM	
58	NC	No Connect	Same as PM	
59	GPIO5_18	GPIO5[18]	Not connected	
60	UART1_RXD	UART1 Data Receive (Input)	Not connected	

9.7.4 Processor Module P19 / LCD Module P2

Table 23. Table 23: AM572x P19 Expansion Connector

Pin Number	Processor Module		LCD Module	
	Signal	Description	Signal	Description
A1	NC	No Connect	Not connected	
A2	GND	Ground	Same as PM	
A3	VDD_3V3	3.3V Power Supply	Same as PM	
A4	NC	No Connect	Not connected	
B1	12V	12V Power Supply (always-on)	Same as PM	
B2	5V0	5V Power Supply (always-on)	Same as PM	
1	GND	Ground	Same as PM	
2	NC	No Connect	GND	Ground (does not conflict with PM)
3	NC	No Connect	Not connected	
4	GND	Ground	Not connected	
5	GND	Ground	Same as PM	
6	SATA_SEL	Ground to enable SATA on P19	SATA_SEL	Ground to enable mSATA card slot
7	EXP_SATA_RXN	SATA Data Receive (Negative)	Same as PM	
8	EXP_SATA_RXP	SATA Data Receive (Positive)	Same as PM	
9	GND	Ground	Same as PM	
10	GND	Ground	Same as PM	
11	GPIO3_20	GPIO3[20]	Same as PM	
12	GPIO3_24	GPIO3[24]	Same as PM	
13	GND	Ground	Same as PM	
14	GPIO3_11	GPIO3[11]	Same as PM	
15	GPIO3_12	GPIO3[12]	Same as PM	
16	GND	Ground	Same as PM	
17	CON.PCIE_RXP1	PCI-Express Lane 1 Receive (Positive)	Not connected	
18	CON.PCIE_RXN1	PCI-Express Lane 1 Receive (Negative)	Not connected	
19	GND	Ground	Same as PM	
20	CON.PCIE_TXP1	PCI-Express Lane 1 Transmit (Positive)	Not connected	
21	CON.PCIE_TXN1	PCI-Express Lane 1 Transmit (Negative)	Not connected	
22	GND	Ground	Not connected	
23	GND	Ground	Same as PM	
24	CON.PCIE_RXP0	PCI-Express Lane 0 Receive (Positive)	Same as PM	
25	CON.PCIE_RXN0	PCI-Express Lane 0 Receive (Negative)	Same as PM	
26	GND	Ground	Same as PM	
27	CON.PCIE_TXP0	PCI-Express Lane 0 Transmit (Positive)	Same as PM	
28	CON.PCIE_TXN0	PCI-Express Lane 0 Transmit (Negative)	Same as PM	
29	GND	Ground	Not connected	
30	No Connect	Not connected		
31	GND	Ground	Same as PM	
32	GND	Ground	Same as PM	

Table 23. Table 23: AM572x P19 Expansion Connector (continued)

Pin Number	Processor Module		LCD Module	
	Signal	Description	Signal	Description
33	NC	No Connect	Not connected	
34	GND	Ground	Same as PM	
35	EXP_SATA_TXP	SATA Data Transmit (Positive)	Same as PM	
36	EXP_SATA_TXN	SATA Data Transmit (Negative)	Same as PM	
37	GND	Ground	Same as PM	
38	GND	Ground	Same as PM	
39	GPIO3_23	GPIO3[23]	Same as PM	
40	GPIO3_26	GPIO3[26]	Same as PM	
41	GND	Ground	Same as PM	
42	GPIO3_16	GPIO3[16]	Same as PM	
43	GPIO3_18	GPIO3[18]	Same as PM	
44	GND	Ground	Same as PM	
45	GPIO3_8	GPIO3[8]	Same as PM	
46	GPIO3_14	GPIO3[14]	Same as PM	
47	GND	Ground	Same as PM	
48	GPIO3_9	GPIO3[9]	Same as PM	
49	GPIO3_15	GPIO3[15]	Same as PM	
50	GND	Ground	Same as PM	
51	GND	Ground	Same as PM	
52	GPIO3_7	GPIO3[7]	Same as PM	
53	GPIO3_10	GPIO3[10]	Same as PM	
54	GND	Ground	Same as PM	
55	GPIO2_31	GPIO2[31]	Same as PM	
56	GPIO3_6	GPIO3[6]	Same as PM	
57	GND	Ground	Same as PM	
58	PCI_CONN_REFN	PCI-Express Reference Signal (Negative)	Same as PM	
59	PCI_CONN_REFP	PCI-Express Reference Signal (Positive)	Same as PM	
60	GND	Ground	Same as PM	

9.8 JTAG Connector

20-pin TI connector. Other JTAG adaptors are available on TI e-store and you can find relevant information and links to purchase from here [7].

9.9 LCD Connector - P5 (LCD Module)

The LCD Module's backlight supply comes from a TPS61080 LED Driver / Boost-Converter. It outputs 9.9 V max and is controlled by PWM (see: EHRPWM2A on Pin 5 of P17 Processor Module).

Table 24. LCD Module Capacitive Touch Screen Pin Details

Pin Number	Signal	Description
1	VLED+	LED Backlight Supply+
2	VLED+	LED Backlight Supply+
3	VLED-	LED Backlight Supply-
4	VLED-	LED Backlight Supply-

Table 24. LCD Module Capacitive Touch Screen Pin Details (continued)

Pin Number	Signal	Description
5	GND	Ground
6	VCOM	LCD COM Voltage
7	VDD	LCD Main Voltage
8	MODE	Not Connected
9	DE	Data Enable
10	VS	Vertical Sync
11	HS	Horizontal Sync
12-19	B7-B0	Pixel's Blue Data
20-27	G7-G0	Pixel's Green Data
28-35	R7-R0	Pixel's Red Data
36	GND	Ground
37	PCLK	Pixel Clock
38	GND	Ground
39	L/R	Not Connected
40	U/D	Not Connected
41	VGH	LCD Bias Voltage
42	VGL	LCD Bias Voltage
43	AVDD	LCD Main Analog Voltage
44	LCDRSTn	LCD Reset Signal (always-high)
45	NC	Not Connected
46	VCOM	LCD COM Voltage
47	DITHB	Not Connected
48	GND	Ground
49	NC	Not Connected
50	NC	Not Connected

9.10 Touchscreen Connector - P15 (LCD Module)

Table 25. LCD Module Capacitive Touch Screen Pin Details

Pin Number	Signal	Description
1	NC	Not Connected
2	NC	Not Connected
3	CAP_INT	Touch Controller Interrupt (GPIO2_4)
4	I2C5_SDA	I2C Port 5 Serial Data
5	I2C5_SCL	I2C Port 5 Serial Clock
6	CAP_RST	Touch Controller RESET (GPIO2_6)
7	GND	Ground
8	VDD_3V3	3.3 V Supply

9.11 PCI-Express Mini Card Slot - P7 (LCD Module)

PCI-Express Mini Card Slot supports x1 speeds. 3.3 V Supply 1.5A max. 1.5 V Supply 0.5A max.

Table 26. PCIe Mini Card Connector Pin Details

Pin Number	Signal	Description
1	WAKEn	Not Connected
2	PS_3V3	3.3 V Supply
3	COEX1	Not Connected
4	GND	Ground
5	COEX2	Not Connected
6	PCI_1.5V	1.5 V Supply
7	CLKREQn	Not Connected
8	UIM_PWR	Not Connected
9	GND	Ground
10	UIM_DATA	Not Connected
11	REFCLK-	PCI-Express Reference Clock Differential Pair (Negative)
12	UIM_CLK	Not Connected
13	REFCLK+	PCI-Express Reference Clock Differential Pair (Positive)
14	UIM_RESET	Not Connected
15	GND	Ground
16	UIM_VPP	Not Connected
17	RSVD1	Not Connected
18	GND	Ground
19	RSVD2	Not Connected
20	W_DISABLEn	Not Connected
21	GND	Ground
22	PERSTn	Not Connected
23	PERn0	PCI-Express Lane 0 Receive Differential Pair (Negative)
24	VDD_3V3	3.3 V Supply
25	PERp0	PCI-Express Lane 0 Receive Differential Pair (Positive)
26	GND	Ground
27	GND	Ground
28	PCI_1.5V	1.5 V Supply
29	GND	Ground
30	SMBus_CLK	AM57xx I2C Port 4 Serial Clock
31	PETn0	PCI-Express Lane 0 Transmit Differential Pair (Negative)
32	SMBus_DATA	AM57xx I2C Port 4 Serial Data
33	PETp0	PCI-Express Lane 0 Transmit Differential Pair (Positive)
34	GND	Ground
35	GND	Ground
36	USB_D-	Not Connected
37	GND	Ground
38	USB_D+	Not Connected
39	PS_3V3	3.3 V Supply
40	GND	Ground
41	PS_3V3	3.3 V Supply
42	LED_WWANn	Not Connected
43	GND	Ground
44	LED_WLANn	Not Connected

Table 26. PCIe Mini Card Connector Pin Details (continued)

Pin Number	Signal	Description
45	RSVD3	Not Connected
46	LED_WPANn	Not Connected
47	RSVD4	Not Connected
48	PCI_1.5V	1.5 V Supply
49	RSVD5	Not Connected
50	GND	Ground
51	RSVD6	Not Connected
52	PS_3V3	3.3 V Supply

9.12 mSATA Connector - P8 (LCD Module)

The mSATA slot is intended to support SATA based Solid State Drives compatible with the PCI-Express Mini Card slot physical specification but carry SATA signals instead of PCI-E. There is a remote LED indicator at Pin 49 called “Device Activity Signal”. The mSATA card should sink current on Pin 49 to allow the LED to flash to indicate an ACTIVITY.

Table 27. mSATA Connector Pin Details

Pin Number	Signal	Description
1	NC	Not Connected
2	PS_3V3	3.3 V Supply
3	NC	Not Connected
4	GND	Ground
5	NC	Not Connected
6	NC	Not Connected
7	NC	Not Connected
8	NC	Not Connected
9	GND	Ground
10	NC	Not Connected
11	NC	Not Connected
12	NC	Not Connected
13	NC	Not Connected
14	NC	Not Connected
15	GND	Ground
16	NC	Not Connected
17	NC	Not Connected
18	GND	Ground
19	NC	Not Connected
20	NC	Not Connected
21	GND	Ground
22	NC	Not Connected
23	RXP	SATA Receive (Positive)
24	VDD_3V3	3.3 V Supply
25	RXN	SATA Receive (Negative)
26	GND	Ground
27	GND	Ground
28	NC	Not Connected

Table 27. mSATA Connector Pin Details (continued)

Pin Number	Signal	Description
29	GND	Ground
30	NC	Not Connected
31	TXN	SATA Transmit (Negative)
32	NC	Not Connected
33	TXP	SATA Transmit (Positive)
34	GND	Ground
35	GND	Ground
36	NC	Not Connected
37	GND	Ground
38	NC	Not Connected
39	PS_3V3	3.3 V Supply
40	GND	Ground
41	PS_3V3	3.3 V Supply
42	NC	Not Connected
43	NC	Not Connected
44	NC	Not Connected
45	NC	Not Connected
46	NC	Not Connected
47	NC	Not Connected
48	NC	Not Connected
49	DA/DSS	Device Activity Signal
50	GND	Ground
51	RSVD6	Not Connected
52	PS_3V3	3.3 V Supply

9.13 Camera Connector - P9 (LCD Module), P9 (Camera Module)

Table 28. Camera Connector Pin Details

Pin Number	Signal	Description
A1	NC	No Connect
A2	GND	Ground
A3	VDD_3V3	3.3V Power Supply
A4	NC	No Connect
B1	12V	12V Power Supply (always-on)
B2	5V0	5V Power Supply (always-on)
1	GND	Ground
2	GPIO3_20	GPIO3[20]
3	GPIO3_24	GPIO3[24]
4	GND	Ground
5	GPIO3_11	GPIO3[11]
6	GPIO3_12	GPIO3[12]
7	GND	Ground
8	GPIO3_15	GPIO3[15]
9	GPIO3_9	GPIO3[9]
10	GND	Ground

Table 28. Camera Connector Pin Details (continued)

Pin Number	Signal	Description
11	GPIO2_31	GPIO2[31]
12	GPIO3_6	GPIO3[6]
13	GND	Ground
14	VIN3A_D0	Video Input Port 3A Data
15	VIN3A_D2	Video Input Port 3A Data
16	VIN3A_D4	Video Input Port 3A Data
17	VIN3A_D6	Video Input Port 3A Data
18	VIN3A_D8	Video Input Port 3A Data
19	VIN3A_D10	Video Input Port 3A Data
20	VIN3A_D12	Video Input Port 3A Data
21	VIN3A_D14	Video Input Port 3A Data
22	VIN3A_D16	Video Input Port 3A Data
23	VIN3A_D18	Video Input Port 3A Data
24	VIN3A_D20	Video Input Port 3A Data
25	VIN3A_D22	Video Input Port 3A Data
26	VIN3A_HSYNC	Video Input Port 3A HSYNC
27	VIN3A_VSYNC	Video Input Port 3A VSYNC
28	VIN3A_CLK	Video Input Port 3A CLK
29	I2C5_SCL	AM572x I2C Port 5 Serial Clock
30	I2C5_SDA	AM572x I2C Port 5 Serial Data
31	GPIO3_23	GPIO3[23]
32	GPIO3_26	GPIO3[26]
33	GND	Ground
34	GPIO3_16	GPIO3[16]
35	GPIO3_18	GPIO3[18]
36	GND	Ground
37	GPIO3_8	GPIO3[8]
38	GPIO3_14	GPIO3[14]
39	GND	Ground
40	GPIO3_10	GPIO3[10]
41	GPIO3_7	GPIO3[7]
42	GND	Ground
43	VIN3A_D1	Video Input Port 3A Data
44	VIN3A_D3	Video Input Port 3A Data
45	VIN3A_D5	Video Input Port 3A Data
46	VIN3A_D7	Video Input Port 3A Data
47	VIN3A_D9	Video Input Port 3A Data
48	VIN3A_D11	Video Input Port 3A Data
49	VIN3A_D13	Video Input Port 3A Data
50	VIN3A_D15	Video Input Port 3A Data
51	VIN3A_D17	Video Input Port 3A Data
52	VIN3A_D19	Video Input Port 3A Data
53	VIN3A_D21	Video Input Port 3A Data
54	VIN3A_D23	Video Input Port 3A Data
55	VIN3A_DE0	Video Input Port 3A DE0
56	VIN3A_FLD	Video Input Port 3A FLD
57	GPIO5_10	GPIO5[10]

Table 28. Camera Connector Pin Details (continued)

Pin Number	Signal	Description
58	GPIO5_11	GPIO5[11]
59	GPIO5_12	GPIO5[12]
60	GPIO4_17	GPIO4[17]

9.14 Communications Connector - P12 (LCD Module)

The Communications Connector (P12) on the LCD module is intended for use with WiLink boards. All I/O operate at 1.8 V logic levels behind level shifters that limit some GPIO signal directions. The 3.6 V and 1.8 V rails are supplied by separate LDOs capable of 1.5A max each.

Table 29. COM Connector Pin Details

Pin Number	Signal	Description
1	SLEEP_CLK	32.768 kHz low power clock (TC32M5I32K7680)
2	GND	Ground
3	GND	Ground
4	WL_EN	WLAN Enable (GPIO5_8 output)
5	COM_3V6	3.6 V Power Supply (1.5A max)
6	GND	Ground
7	COM_3V6	3.6 V Power Supply (1.5A max)
8	COM_1V8	1.8 V Power Supply (1.5A max)
9	GND	Ground
10	NC	Not Connected
11	NC	Not Connected
12	NC	Not Connected
13	NC	Not Connected
14	NC	Not Connected
15	NC	Not Connected
16	NC	Not Connected
17	NC	Not Connected
18	GND	Ground
19	GND	Ground
20	COMQ_MMC0_CLK	AM572x SDIO Clock
21	NC	Not Connected
22	GND	Ground
23	NC	Not Connected
24	COMQ_MMC0_CMD	AM572x SDIO Command
25	NC	Not Connected
26	COMQ_MMC0_DAT0	AM572x SDIO Data
27	NC	Not Connected
28	COMQ_MMC0_DAT1	AM572x SDIO Data
29	NC	Not Connected
30	COMQ_MMC0_DAT2	AM572x SDIO Data
31	1V8_I2C5_SCL	AM572x I2C Port 5 Serial Clock (at 1.8 V)
32	COMQ_MMC0_DAT3	AM572x SDIO Data
33	1V8_I2C5_SDA	AM572x I2C Port 5 Serial Data (at 1.8 V)
34	WLAN_IRQ	WLAN Interrupt Request (GPIO5_7 input)

Table 29. COM Connector Pin Details (continued)

Pin Number	Signal	Description
35	NC	Not Connected
36	NC	Not Connected
37	GND	Ground
38	NC	Not Connected
39	NC	Not Connected
40	NC	Not Connected
41	NC	Not Connected
42	GND	Ground
43	NC	Not Connected
44	NC	Not Connected
45	NC	Not Connected
46	NC	Not Connected
47	GND	Ground
48	GPS_TIME_STAMP	GPS Time Stamp (GPIO5_6 output)
49	NC	Not Connected
50	GPS_PPS_OUT	GPS Pulse Per Second (GPIO5_5 input)
51	NC	Not Connected
52	PCM_CLK	Bluetooth's PCM Clock
53	NC	Not Connected
54	PCM_FSYNC	Bluetooth's PCM Frame Sync
55	NC	Not Connected
56	PCM_DIN	Bluetooth's PCM Audio In
57	NC	Not Connected
58	PCM_DOUT	Bluetooth's PCM Audio Out
59	NC	Not Connected
60	GND	Ground
61	NC	Not Connected
62	NC	Not Connected
63	GND	Ground
64	GND	Ground
65	NC	Not Connected
66	BT_UART_RX	Bluetooth's UART Data Transmit
67	NC	Not Connected
68	BT_UART_RX	Bluetooth's UART Data Receive
69	NC	Not Connected
70	BT_UART_CTS	Bluetooth's UART Clear to Send
71	NC	Not Connected
72	BT_UART_RTS	Bluetooth's UART Request to Send
73	NC	Not Connected
74	NC	Not Connected
75	NC	Not Connected
76	NC	Not Connected
77	GND	Ground
78	NC	Not Connected
79	NC	Not Connected
80	NC	Not Connected
81	NC	Not Connected

Table 29. COM Connector Pin Details (continued)

Pin Number	Signal	Description
82	NC	Not Connected
83	GND	Ground
84	NC	Not Connected
85	NC	Not Connected
86	NC	Not Connected
87	GND	Ground
88	NC	Not Connected
89	BT_EN	WPAN Bluetooth Enable (GPIO5_4 output)
90	NC	Not Connected
91	NC	Not Connected
92	GND	Ground
93	NC	Not Connected
94	NC	Not Connected
95	GND	Ground
96	NC	Not Connected
97	GND	Ground
98	NC	Not Connected
99	NC	Not Connected
100	NC	Not Connected

10 References

1. AM572x technical documents
2. *AM572x Evaluation Module*
3. *AM572x Evaluation Module Quick Start Guide*
4. *AM572x GP EVM Hardware Setup* wiki
5. *Introducing the AM572x Development Kit for Sitara™ AM57x Processors*
6. *Getting Started Out of the Box With the AM5728 EVM*
7. *JTAG Adapters*
8. *AM572x Sitara™ Processors Technical Reference Manual*
9. *AM572x Sitara™ Processors Silicon Revision 2.0 Data Manual*

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      3.1.1 *Notice applicable to EVMs not FCC-Approved:*

      FCC NOTICE: This kit is designed to allow product developers to evaluate electronic components, circuitry, or software associated with the kit to determine whether to incorporate such items in a finished product and software developers to write software applications for use with the end product. This kit is not a finished product and when assembled may not be resold or otherwise marketed unless all required FCC equipment authorizations are first obtained. Operation is subject to the condition that this product not cause harmful interference to licensed radio stations and that this product accept harmful interference. Unless the assembled kit is designed to operate under part 15, part 18 or part 95 of this chapter, the operator of the kit must operate under the authority of an FCC license holder or must secure an experimental authorization under part 5 of this chapter.

      3.1.2 *For EVMs annotated as FCC – FEDERAL COMMUNICATIONS COMMISSION Part 15 Compliant:*

      CAUTION

      This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

      Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

      FCC Interference Statement for Class A EVM devices

      NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Interference Statement for Class B EVM devices

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- *Reorient or relocate the receiving antenna.*
- *Increase the separation between the equipment and receiver.*
- *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
- *Consult the dealer or an experienced radio/TV technician for help.*

3.2 *Canada*

3.2.1 *For EVMs issued with an Industry Canada Certificate of Conformance to RSS-210 or RSS-247*

Concerning EVMs Including Radio Transmitters:

This device complies with Industry Canada license-exempt RSSs. Operation is subject to the following two conditions:

(1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Concernant les EVMs avec appareils radio:

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Concerning EVMs Including Detachable Antennas:

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication. This radio transmitter has been approved by Industry Canada to operate with the antenna types listed in the user guide with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Concernant les EVMs avec antennes détachables

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante. Le présent émetteur radio a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés dans le manuel d'usage et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur

3.3 *Japan*

3.3.1 *Notice for EVMs delivered in Japan:* Please see http://www.tij.co.jp/lsds/ti_ja/general/eStore/notice_01.page 日本国内に輸入される評価用キット、ボードについては、次のところをご覧ください。
http://www.tij.co.jp/lsds/ti_ja/general/eStore/notice_01.page

3.3.2 *Notice for Users of EVMs Considered "Radio Frequency Products" in Japan:* EVMs entering Japan may not be certified by TI as conforming to Technical Regulations of Radio Law of Japan.

If User uses EVMs in Japan, not certified to Technical Regulations of Radio Law of Japan, User is required to follow the instructions set forth by Radio Law of Japan, which includes, but is not limited to, the instructions below with respect to EVMs (which for the avoidance of doubt are stated strictly for convenience and should be verified by User):

1. Use EVMs in a shielded room or any other test facility as defined in the notification #173 issued by Ministry of Internal Affairs and Communications on March 28, 2006, based on Sub-section 1.1 of Article 6 of the Ministry's Rule for Enforcement of Radio Law of Japan,
2. Use EVMs only after User obtains the license of Test Radio Station as provided in Radio Law of Japan with respect to EVMs, or
3. Use of EVMs only after User obtains the Technical Regulations Conformity Certification as provided in Radio Law of Japan with respect to EVMs. Also, do not transfer EVMs, unless User gives the same notice above to the transferee. Please note that if User does not follow the instructions above, User will be subject to penalties of Radio Law of Japan.

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2. 実験局の免許を取得後ご使用いただく。
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3.3.3 *Notice for EVMs for Power Line Communication:* Please see http://www.tij.co.jp/lsds/ti_ja/general/eStore/notice_02.page

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3.4 *European Union*

3.4.1 *For EVMs subject to EU Directive 2014/30/EU (Electromagnetic Compatibility Directive)*:

This is a class A product intended for use in environments other than domestic environments that are connected to a low-voltage power-supply network that supplies buildings used for domestic purposes. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

4 *EVM Use Restrictions and Warnings:*

4.1 EVMS ARE NOT FOR USE IN FUNCTIONAL SAFETY AND/OR SAFETY CRITICAL EVALUATIONS, INCLUDING BUT NOT LIMITED TO EVALUATIONS OF LIFE SUPPORT APPLICATIONS.

4.2 User must read and apply the user guide and other available documentation provided by TI regarding the EVM prior to handling or using the EVM, including without limitation any warning or restriction notices. The notices contain important safety information related to, for example, temperatures and voltages.

4.3 *Safety-Related Warnings and Restrictions:*

4.3.1 User shall operate the EVM within TI's recommended specifications and environmental considerations stated in the user guide, other available documentation provided by TI, and any other applicable requirements and employ reasonable and customary safeguards. Exceeding the specified performance ratings and specifications (including but not limited to input and output voltage, current, power, and environmental ranges) for the EVM may cause personal injury or death, or property damage. If there are questions concerning performance ratings and specifications, User should contact a TI field representative prior to connecting interface electronics including input power and intended loads. Any loads applied outside of the specified output range may also result in unintended and/or inaccurate operation and/or possible permanent damage to the EVM and/or interface electronics. Please consult the EVM user guide prior to connecting any load to the EVM output. If there is uncertainty as to the load specification, please contact a TI field representative. During normal operation, even with the inputs and outputs kept within the specified allowable ranges, some circuit components may have elevated case temperatures. These components include but are not limited to linear regulators, switching transistors, pass transistors, current sense resistors, and heat sinks, which can be identified using the information in the associated documentation. When working with the EVM, please be aware that the EVM may become very warm.

4.3.2 EVMs are intended solely for use by technically qualified, professional electronics experts who are familiar with the dangers and application risks associated with handling electrical mechanical components, systems, and subsystems. User assumes all responsibility and liability for proper and safe handling and use of the EVM by User or its employees, affiliates, contractors or designees. User assumes all responsibility and liability to ensure that any interfaces (electronic and/or mechanical) between the EVM and any human body are designed with suitable isolation and means to safely limit accessible leakage currents to minimize the risk of electrical shock hazard. User assumes all responsibility and liability for any improper or unsafe handling or use of the EVM by User or its employees, affiliates, contractors or designees.

4.4 User assumes all responsibility and liability to determine whether the EVM is subject to any applicable international, federal, state, or local laws and regulations related to User's handling and use of the EVM and, if applicable, User assumes all responsibility and liability for compliance in all respects with such laws and regulations. User assumes all responsibility and liability for proper disposal and recycling of the EVM consistent with all applicable international, federal, state, and local requirements.

5. *Accuracy of Information:* To the extent TI provides information on the availability and function of EVMs, TI attempts to be as accurate as possible. However, TI does not warrant the accuracy of EVM descriptions, EVM availability or other information on its websites as accurate, complete, reliable, current, or error-free.

6. *Disclaimers:*

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