

## Computer On Module

- Processor TI Sitara™ AM3354  
720 MHz ARM® Cortex™-A8
- RAM 256MB DDR3 SDRAM
- ROM 128MB NAND Flash
- RTC DS1339 Real Time Clock
- Power supply Single 3.1V to 5.5V
- Size 26mm SO-DIMM
- Temp.-Range -40°C..85°C

## Key Features

- 10/100Mbps Ethernet
- Two High-Speed USB 2.0 ports
- True colour LCD controller
- Two CAN interfaces
- 4/5 wire Touchscreen interface
- Several peripheral interfaces:  
UART, SD-CARD, I2C, PWM, Serial Audio, SPI
- Power management optimized for long battery life
- 3.3V I/O

## OS Support

- Windows® Embedded Compact 7
- Linux

## Development System

- Starter-Kit V



**720 MHz**  
**Cortex™-A8**

## Board highlights:

- Lowest cost 720MHz Cortex™-A8
- Industrial temperature range
- Standard TX-DIMM pinout
- as small as possible - only 26mm

TX modules are complete computers, implemented on a board smaller than a credit card, and ready to be designed into your embedded system.

The TX-48 is pin compatible with all TX modules. This approach has the advantage of providing the developer with the potential for creating scalable systems. All modules can be supplied with the same hardware reference platform that supports both Linux and Microsoft Windows® Embedded.

## Computer on module

- TI Sitara™ AM3354 720 MHz ARM® Cortex™-A8
- 256 MByte DDR3 SDRAM (16bit)
- 128 MByte NAND Flash memory
- DIMM200-module (67,6mm x 26 mm x 3,6mm)
- Operating temperature range -40..85°C

## Sitara™ AM335x Processor for Industrial Applications

The AM335x processors based on the ARM® Cortex™-A8 are enhanced with image, graphics processing, peripherals and industrial interface options such as EtherCAT.

AM335x processors are broad market application processors with image, graphics processing, and peripherals.

The AM335x processor contains these subsections:

- Microprocessor unit (MPU) subsystem based on the ARM® Cortex™-A8 processor
- POWERVR® SGX Graphics Accelerator Subsystem for 3D graphics acceleration to support display and gaming effects.
- Programmable Real-time Unit (PRU) subsystem enables the user to create a variety of digital resources beyond native peripherals of the device. In addition, the PRU is separate from the ARM core. This allows independent operation and clocking to give the device greater flexibility in complex system solutions.
- High performance interconnects provide high-bandwidth data transfers for multiple initiators to the internal and external memory controllers and to on-chip peripherals. The device also offers a comprehensive clock-management scheme.
- The on-chip analog to digital converter (ADC) can be coupled with the LCD controller to provide an integrated touch screen solution. In addition, the ADC can be used in combination with the pulse width module to create a closed loop motor control solution.
- Real-time Clock (RTC) provides a clock reference on a separate power domain. This enables battery backed clock reference.

## Standard TX-DIMM pinout:

- 4-wire UARTs (x3)
- LCD
- I2C / PWM
- Serial Audio Interfaces (x2)
- 4-wire SD-Card/SDIO

High-Speed communication interfaces incl. onboard Ethernet PHY / on-chip USB PHY allows direct use of connectors/magnetics on the baseboard without the need for additional logic:

- 10/100 Mbps Ethernet
- 480 Mbps USB OTG
- 480 Mbps USB Host

Additional interfaces like CAN, 4/5-wire resistive touch-screen, 2 UARTs are available on TX48 specific pins. Some interfaces are multiplexed with other functions.

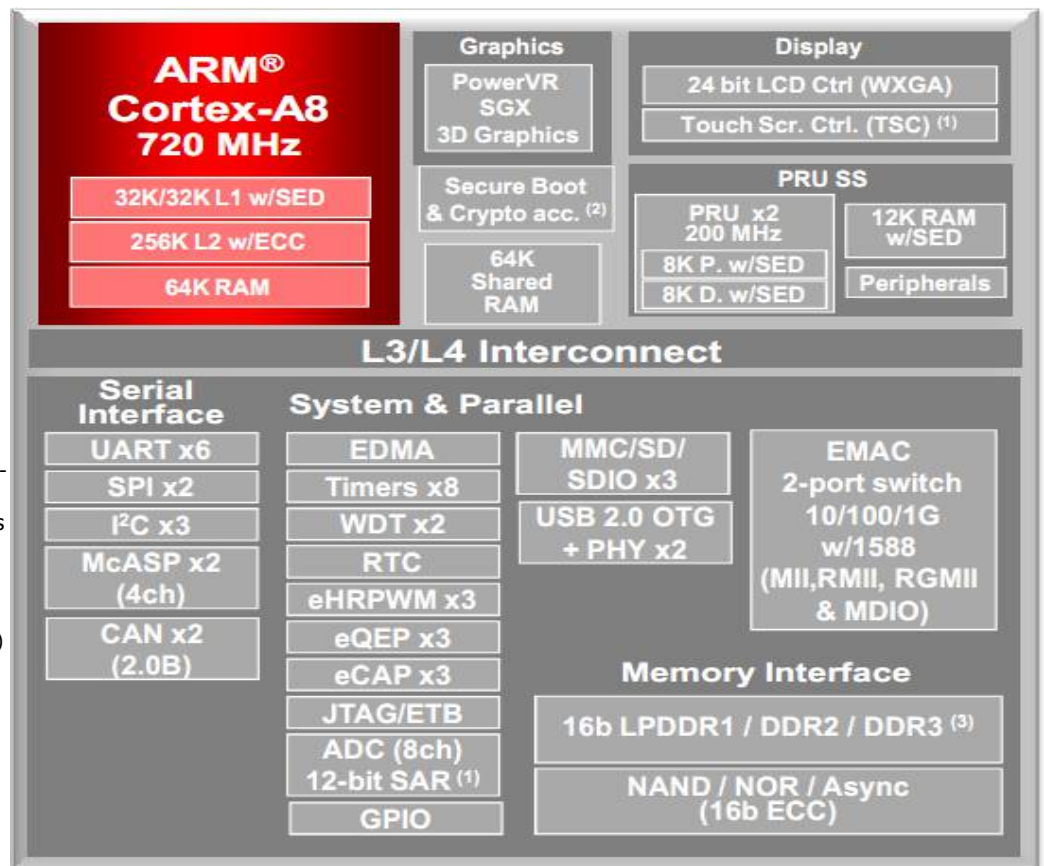
## Power Supply

The TX48 accepts an input voltage from various sources:

- 1-cell Li-Ion/Polymer (3.1V to 4.2V)
- 5.0V USB supply or AC wall adapter
- 3.3V

## Read more in our TX-Guide:

[www.karo-electronics.com/TX-Guide](http://www.karo-electronics.com/TX-Guide)



## Ordering Information

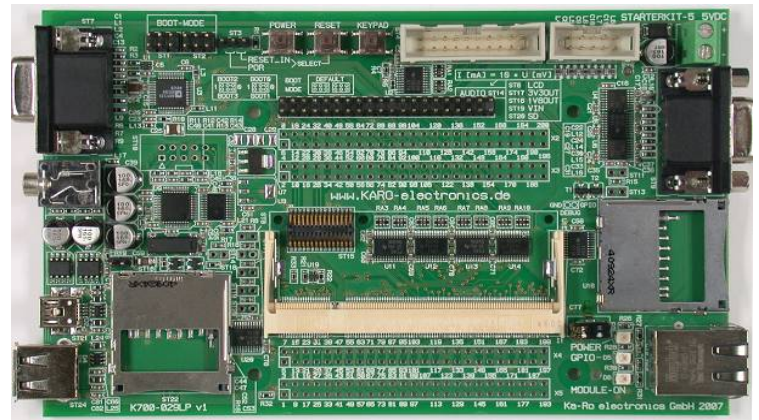
Order Number	CPU	SDRAM	Flash	Temp.
TX48/720/256S/128F/I	720MHz AM3354	256MB	128MB	-40°C..85°C



## STARTER-KIT V

The Starter-Kit V is a ready-to-use development system for building applications based on the TX embedded processor boards.

- DIMM200 TX socket
- Two SD-card sockets
- USB 2.0 OTG and USB 2.0 Host connector
- D-SUB 15 VGA connector
- 40pin LCD flat cable header
- 3.5mm headphone connector
- JTAG interface
- SGTL5000 audio codec
- TSC2007 touchscreen controller
- RS232 on 10pin flat cable and SUB-D header
- All pins of the TX socket are connected to daughter board slot for easy application design-in
- 10/100 Mbit/s Ethernet
- 5VDC Power Supply by USB-OTG or power jack.
- 100mm x 160mm
- Schematics of the base board are included for reference.



## DISPLAY OPTIONS

The optional display comes with an FFC cable and a small adapter PCB which can be plugged directly onto the Starter-Kit 40pin LCD header.

### Option 1: 5,7" VGA Resistive Touch

- 5,7 inch TFT display
- 640 x 480 dots
- White LED backlight
- Resistive Touchscreen

### Option 2: 5,7" VGA PolyTouch™

- 5,7 inch TFT display
- 640 x 480 dots
- White LED backlight
- Capacitive Touchscreen



PINOUT			Marked yellow: Not connected			
PIN	Type	Function	AM335x Pad Name	Alternate functions	GPIO	Description (refer to AM335x processor manuals for details)
<b>POWER SUPPLY &amp; RESET</b>						
1-4	power	VIN				Module power supply input (3.1V-5.5V)
5-7, 9-12	power	VOUT				3.3V power supply output (up to 1A)
8	3V3	BOOTMODE			10K-PU	Boot mode select H: Boot from NAND / L: Boot from UART/USB
13	power	VBACKUP				DS1339 RTC backup power supply. Supply voltage must be held between 1.3V and 3.7V for proper RTC operation. This pin can be connected to a primary cell such as a lithium button cell. Additionally, this pin can be connected to a rechargeable cell or a super cap when used with the trickle charge feature.
14	VIN	PMIC_PWR_BTN			1M-PU TO VIN	Connected to LTC3589 WAKE. Drive this pin pin LOW to turn off the power supply, leave unconnected, if not used. Refer to LTC3589 datasheet, page 29 for details. LTC3589 IRQ is connected to AM335x pad EXTINTn
15	3V3	#RESET_OUT	EMU1		GPIO3_8 10K-PU to ETN_3V3	Ethernet PHY reset – active low output signal. This pin is hard wired to the onboard Ethernet PHY and provides a fixed function.
16	VIN	#POR	PWRONRSTn		10K-PU to VIN	Power On Reset—Active low input signal. Leave unconnected, if not used.
17	3V3	#RESET_IN	WARMRSTn		68K-PU	nRESETIN_OUT warm reset signal. Refer to External Warm Reset section of the AM335x Technical Reference Manual.
18	GND	GND				
<b>Ethernet</b>						
19	analog	ETN_TXN				Transmit Data Negative: 100Base-TX or 10Base-T differential transmit output to magnetics.
20	3V3	#ETN_LED2				Active low - output is driven active when the operating speed is 100Mbps. This LED will go inactive when the operating speed is 10Mbps or during line isolation.
21	analog	ETN_TXP				Transmit Data Positive: 100Base-TX or 10Base-T differential transmit output to magnetics.
22	power	ETN_3V3				+3.3V analog power supply output to magnetics
23	analog	ETN_RXN				Receive Data Negative: 100Base-TX or 10Base-T differential receive input from magnetics.
24	3V3	#ETN_LED1				Active low - output is driven active whenever the device detects a valid link, and blinks indicating activity.
25	analog	ETN_RXP				Receive Data Positive: 100Base-TX or 10Base-T differential receive input from magnetics.
26	GND	GND				
<b>USB-HOST</b>						
27	3V3	USBH_VBUSEN	USB1_DRVVBUS		GPIO3_13	Active high external 5V supply enable. This pin is used to enable the external VBUS power supply.
28	3V3	#USBH_OC	USB0_DRVVBUS		GPIO0_18 10K-PU	Active low over-current indicator input connected to a GPIO.
29	analog	USBH_DM	<b>USB1_DM</b>			D- pin of the USB cable
30	analog	USBH_VBUS	USB1_VBUS			VBUS pin of the USB cable. This pin is used for the VBUS comparator inputs.
31	analog	USBH_DP	<b>USB1_DP</b>			D+ pin of the USB cable
32	GND	GND				
<b>USB-OTG / 2<sup>nd</sup> CAN</b>						
33	3V3	USBOTG_ID	<b>USB0_ID</b>			ID pin of the USB cable. For an A-Device ID is grounded. For a B-Device ID is floated.
34	3V3	USBOTG_VBUSEN	MMC0_CLK	GPMC_A24 UART3_CTSN UART2_RXD DCAN1_TX PR1_PRU0_PRU_R30_12 PR1_PRU0_PRU_R31_12	GPIO2_30	Active high external 5V supply enable. This pin is used to enable the external VBUS power supply.
35	analog	USBOTG_DM	<b>USB0_DM</b>			D- pin of the USB cable
36	3V3	#USBOTG_OC	MMC0_CMD	GPMC_A25 UART3_RTSN UART2_TXD DCAN1_RX PR1_PRU0_PRU_R30_13 PR1_PRU0_PRU_R31_13	GPIO2_31 10K-PU	Active low over-current indicator input connected to a GPIO.
37	analog	USBOTG_DP	<b>USB0_DP</b>			D+ pin of the USB cable
38	analog	USBOTG_VBUS	USB0_VBUS			
39	GND	GND				

PIN	Type	Function	AM335x Pad Name	Alternate functions	GPIO	Description (refer to AM335x processor manuals for details)
<b>I2C</b>						
40	3V3	I2C_DATA	<b>I2C0_SDA</b>	TIMER4 UART2_CTSN ECAP2_IN_PWM2_OUT	GPIO3_5 1K-PU	The I2C port operates at speeds up to 400kHz.  Devices on the bus @ address:  DS1339 1101 000x LTC3589 0110 100x
41	3V3	I2C_CLK	<b>I2C0_SCL</b>	TIMER7 UART2_RTSN ECAP1_IN_PWM1_OUT	GPIO3_6 1K-PU	
<b>PWM</b>						
42	3V3	PWM	MCASP0_ACLKX	<b>EHRPWM0A</b> SPI1_SCLK MMC0_SDCD PR1_PRU0_PRU_R30_0 PR1_PRU0_PRU_R31_0	GPIO3_14	PWM Output
<b>1-WIRE</b>						
43	3V3	OWDAT	MMC0_DAT2	GPMC_A21 UART4_RTSN TIMER6 UART1_DSRN PR1_PRU0_PRU_R30_9 PR1_PRU0_PRU_R31_9	<b>GPIO2_27</b>	The AM335x has no 1-Wire controller – a GPIO is used here instead. 1-Wire bus requires an external pull-up resistor. The recommended resistor is specified by the generic 1-Wire device used in a given system.
<b>CSPI – Configurable Serial Peripheral Interface</b>						
44	3V3	CSPI_SS	<b>SPI0_CS0</b>	MMC2_SDWP I2C1_SCL EHRPWM0_SYNCI PR1_UART0_TXD PR1_EDIO_DATA_IN1 PR1_EDIO_DATA_OUT1	GPIO0_5	Slave Select signal
45	3V3	CSPI_SS	<b>SPI0_CS1</b>	UART3_RXD ECAP1_IN_PWM1_OUT MMC0_POW XDMA_EVENT_INTR2 MMC0_SDCD EMU4	GPIO0_6	Slave Select signal
46	3V3	CSPI_MOSI	<b>SPI0_D0</b>	UART2_TXD I2C2_SCL EHRPWM0B PR1_UART0_RTS_N PR1_EDIO_LATCH_IN EMU3	GPIO0_3	Master Out/Slave In signal
47	3V3	CSPI_MISO	<b>SPI0_D1</b>	MMC1_SDWP I2C1_SDA EHRPWM0_TRIPZONE_IN PUT PR1_UART0_RXD PR1_EDIO_DATA_IN0 PR1_EDIO_DATA_OUT0	GPIO0_4	Master In/Slave Out signal
48	3V3	CSPI_SCLK	<b>SPI0_SCLK</b>	UART2_RXD I2C2_SDA EHRPWM0A PR1_UART0_CTS_N PR1_EDIO_SOF EMU2	GPIO0_2	Serial Clock signal
49	NC					not connected
50	GND	GND				

PIN	Type	Function	AM335x Pad Name	Alternate functions	GPIO	Description (refer to AM335x processor manuals for details)
<b>SD – Secure Digital Interface 1</b>						
51	3V3	SD1_CD	MCASP0_FSX	EHRPWM0B SPI1_D0 <b>MMC1_SDCD</b> PR1_PRU0_PRU_R30_1 PR1_PRU0_PRU_R31_1	GPIO3_15	SD Card Detect
52	3V3	SD1_D[0]	MII1_TX_CLK	GMII1_TXCLK UART2_RXD RGMII1_TCLK MMC0_DAT7 <b>MMC1_DAT0</b> UART1_DCDN MCASP0_ACLKX	GPIO3_9	SD Data bidirectional signals  If the system designer does not want to make use of the internal pull-up, via the Pull-up enable register, a 50 K–69 K external pull up resistor must be added.
53	3V3	SD1_D[1]	MII1_RX_CLK	GMII1_RXCLK UART2_TXD RGMII1_RCLK MMC0_DAT6 <b>MMC1_DAT1</b> UART1_DSRN MCASP0_FSX	GPIO3_10	
54	3V3	SD1_D[2]	MII1_RXD3	GMII1_RXD3 UART3_RXD RGMII1_RD3 MMC0_DAT5 <b>MMC1_DAT2</b> UART1_DTRN MCASP0_AXR0	GPIO2_18	
55	3V3	SD1_D[3]	MII1_RXD2	GMII1_RXD2 UART3_TXD RGMII1_RD2 MMC0_DAT4 <b>MMC1_DAT3</b> UART1_RIN MCASP0_AXR1	GPIO2_19	
56	3V3	SD1_CMD	GPMC_CSn2	GPMC_CSn2 GPMC_BE1N <b>MMC1_CMD</b> PR1_EDIO_DATA_IN7 PR1_EDIO_DATA_OUT7 PR1_PRU1_PRU_R30_13 PR1_PRU1_PRU_R31_13	GPIO1_31	SD Command bidirectional signal
57	3V3	SD1_CLK	GPMC_CSn1	GPMC_CSn1 GPMC_CLK <b>MMC1_CLK</b> PR1_EDIO_DATA_IN6 PR1_EDIO_DATA_OUT6 PR1_PRU1_PRU_R30_12 PR1_PRU1_PRU_R31_12	GPIO1_30	SD Output Clock.
58	GND	GND				
<b>1<sup>st</sup> UART</b>						
59	3V3	TXD	<b>UART0_TXD</b>	SPI1_CS1 DCAN0_RX I2C2_SCL ECAP1_IN_PWM1_OUT PR1_PRU1_PRU_R30_15 PR1_PRU1_PRU_R31_15	GPIO1_11	Debug UART Transmit Data output signal
60	3V3	RXD	<b>UART0_RXD</b>	SPI1_CS0 DCAN0_TX I2C2_SDA ECAP2_IN_PWM2_OUT PR1_PRU1_PRU_R30_14 PR1_PRU1_PRU_R31_14	GPIO1_10	Debug UART Receive Data input signal
61	3V3	RTS/CTS IN	<b>UART0_CTSn</b>	UART4_RXD DCAN1_TX I2C1_SDA SPI1_D0 TIMER7 PR1_EDC_SYNC0_OUT	GPIO1_8	Debug UART RTS/CTS handshake <b>input</b> signal
62	3V3	CTS/RTS OUT	<b>UART0_RTSn</b>	UART4_TXD DCAN1_RX I2C1_SCL SPI1_D1 SPI1_CS0 PR1_EDC_SYNC1_OUT	GPIO1_9	Debug UART RTS/CTS handshake <b>output</b> signal

PIN	Type	Function	AM335x Pad Name	Alternate functions	GPIO	Description (refer to AM335x processor manuals for details)
<b>2<sup>nd</sup> UART</b>						
63	3V3	TXD	<b>UART1_TXD</b>	MMC2_SDWP DCAN1_RX I2C1_SCL PR1_UART0_TXD PR1_PRU0_PRU_R31_16	GPIO0_15	Application UART 1 Transmit Data output signal
64	3V3	RXD	<b>UART1_RXD</b>	MMC1_SDWP DCAN1_TX I2C1_SDA PR1_UART0_RXD PR1_PRU1_PRU_R31_16	GPIO0_14	Application UART 1 Receive Data input signal
65	3V3	RTS/CTS IN	<b>UART1_CTSn</b>	TIMER6 DCAN0_TX I2C2_SDA SPI1_CS0 PR1_UART0_CTS_N PR1_EDC_LATCH0_IN	GPIO0_12	Application UART 1 RTS/CTS handshake <b>input</b> signal
66	3V3	CTS/RTS OUT	<b>UART1_RTSn</b>	TIMER5 DCAN0_RX I2C2_SCL SPI1_CS1 PR1_UART0_RTS_N PR1_EDC_LATCH1_IN	GPIO0_13	Application UART 1 RTS/CTS handshake <b>output</b> signal
<b>3<sup>rd</sup> UART</b>						
67	3V3	TXD	MIII_RX_DV	GMI11_RXDV LCD_MEMORY_CLK RGMII1_RCTL <b>UART5_TXD</b> MCASP1_ACLKX MMC2_DAT0 MCASP0_ACLKR	GPIO3_4	Application UART 3 Transmit Data output signal
68	3V3	RXD	MIII_COL	GMI11_COL RMII2_REFCLK SPI1_SCLK <b>UART5_RXD</b> MCASP1_AXR2 MMC2_DAT3 MCASP0_AXR2	GPIO3_0	Application UART 3 Receive Data input signal
69	3V3	RTS/CTS IN	MMC0_DAT1	MMC0_DAT1 GPMC_A22 <b>UART5_CTSN</b> UART3_RXD UART1_DTRN PR1_PRU0_PRU_R30_10 PR1_PRU0_PRU_R31_10	GPIO2_28	Application UART 3 RTS/CTS handshake <b>input</b> signal
70	3V3	CTS/RTS OUT	MMC0_DAT0	MMC0_DAT0 GPMC_A23 <b>UART5_RTsn</b> UART3_TXD UART1_RIN PR1_PRU0_PRU_R30_11 PR1_PRU0_PRU_R31_11	GPIO2_29	Application UART 3 RTS/CTS handshake <b>output</b> signal
71	GND	GND				
<b>KEYPAD / 1<sup>st</sup> CAN</b>						
72	3V3	KP_COL[0]	MMC0_DAT3	GPMC_A20 UART4_CTSN TIMER5 UART1_DCDN PR1_PRU0_PRU_R30_8 PR1_PRU0_PRU_R31_8	GPIO2_26	
73	3V3	KP_COL[1]	MCASP0_AHCLKR	EHRPWM0_SYNCI MCASP0_AXR2 SPI1_CS0 ECAP2_IN_PWM2_OUT PR1_PRU0_PRU_R30_3 PR1_PRU0_PRU_R31_3	GPIO3_17	
74	3V3	KP_COL[2]	ECAP0_IN_PWM0_OUT	UART3_TXD SPI1_CS1 PR1_ECAP0_ECAP_CAPIN _APWM_O SPI1_SCLK MMC0_SDWP XDMA_EVENT_INTR2	GPIO0_7	



PIN	Type	Function	AM335x Pad Name	Alternate functions	GPIO	Description (refer to AM335x processor manuals for details)
75	3V3	KP_COL[3]	GPMC_BEn1	GPMC_BE1N GMII2_COL GPMC_CSN6 MMC2_DAT3 GPMC_DIR PR1_MII1_RXLINK MCASP0_ACLKR	<b>GPIO1_28</b>	
76	3V3	TXCAN	MII1_TXD3	GMII1_TXD3 <b>DCAN0_TX</b> RGMII1_TD3 UART4_RXD MCASP1_FSX MMC2_DAT1 MCASP0_FSR	GPIO0_16	
77	3V3	KP_ROW[0]	XDMA_EVENT_INTR0	TIMER4 CLKOUT1 SPI1_CS1 PR1_PRU1_PRU_R31_16 EMU2	<b>GPIO0_19</b>	
78	3V3	KP_ROW[1]	XDMA_EVENT_INTR1	TCLKIN CLKOUT2 TIMER7 PR1_PRU0_PRU_R31_16 EMU3	<b>GPIO0_20</b>	
79	3V3	KP_ROW[2]	GPMC_CLK	LCD_MEMORY_CLK GPMC_WAIT1 MMC2_CLK PR1_MII1_CRS PR1_MDIO_MDCLK MCASP0_FSR	<b>GPIO2_1</b>	
80	3V3	KP_ROW[3]	GPMC_CSn3	GPMC_CSN3 MMC2_CMD PR1_MII0_CRS PR1_MDIO_DATA EMU4	<b>GPIO2_0</b>	
81	3V3	RXCAN	MII1_TXD2	GMII1_TXD2 <b>DCAN0_RX</b> RGMII1_TD2 UART4_TXD MCASP1_AXR0 MMC2_DAT2 MCASP0_AHCLKX	GPIO0_17	
82	GND	GND				

### SSI 1 - Serial Audio Port 1

83	3V3	SSI1_INT	MCASP0_AXR0	EHRPWM0_TRIPZONE_IN PUT SPI1_D1 MMC2_SDCD PR1_PRU0_PRU_R30_2 PR1_PRU0_PRU_R31_2	<b>GPIO3_16</b>	
84	3V3	SSI1_RXD	MCASP0_AXR1	MCASP0_AXR1 EQEP0_INDEX <b>MCASP1_AXR0</b> EMU3 PR1_PRU0_PRU_R30_6 PR1_PRU0_PRU_R31_6	GPIO3_20	Serial Audio Interface 0 serial data line 1
85	3V3	SSI1_TXD	MCASP0_AHCLKX	MCASP0_AHCLKX EQEP0_STROBE MCASP0_AXR3 <b>MCASP1_AXR1</b> EMU4 PR1_PRU0_PRU_R30_7 PR1_PRU0_PRU_R31_7	GPIO3_21	Serial Audio Interface 0 serial data line 0
86	3V3	SSI1_CLK	MCASP0_ACLKR	EQEP0A_IN MCASP0_AXR2 <b>MCASP1_ACLKX</b> MMC0_SDWP PR1_PRU0_PRU_R30_4 PR1_PRU0_PRU_R31_4	GPIO3_18	Serial Audio Interface 0 serial bit clock
87	3V3	SSI1_FS	MCASP0_FSR	MCASP0_FSR EQEP0B_IN MCASP0_AXR3 <b>MCASP1_FSX</b> EMU2 PR1_PRU0_PRU_R30_5 PR1_PRU0_PRU_R31_5	GPIO3_19	Serial Audio Interface 0 left/right clock
88	GND	GND				



PIN	Type	Function	AM335x Pad Name	Alternate functions	GPIO	Description (refer to AM335x processor manuals for details)
<b>SSI 2 - Serial Audio Port 2</b>						
89	NC					not connected
90	NC					not connected
91	NC					not connected
92	NC					not connected
93	NC					not connected
94	GND	GND				
<b>Secure Digital Interface 2</b>						
95	NC					not connected
96	NC					not connected
97	NC					not connected
98	NC					not connected
99	NC					not connected
100	NC					not connected
101	NC					not connected
102	GND	GND				
<b>CMOS Sensor Interface</b>						
103	NC					not connected
104	NC					not connected
105	NC					not connected
106	NC					not connected
107	NC					not connected
108	NC					not connected
109	NC					not connected
110	NC					not connected
111	GND	GND				
112	NC					not connected
113	NC					not connected
114	NC					not connected
115	NC					not connected
116	GND	GND				
<b>LCD Controller and Smart LCD Controller</b>						
117	3V3	LD0	GPMC_AD8	<b>LCD_DATA23</b> MMC1_DAT0 MMC2_DAT4 EHRPWM2A PR1_MII_MT0_CLK	GPIO0_22	LCD Data Bus
118	3V3	LD1	GPMC_AD11	<b>LCD_DATA20</b> MMC1_DAT3 MMC2_DAT7 EHRPWM0_SYNC0 PR1_MII0_TXD3	GPIO0_27	LCD Data Bus
119	3V3	LD2	GPMC_AD14	<b>LCD_DATA17</b> MMC1_DAT6 MMC2_DAT2 EQEP2_INDEX PR1_MII0_TXD0 PR1_PRU0_PRU_R31_14	GPIO1_14	LCD Data Bus

PIN	Type	Function	AM335x Pad Name	Alternate functions	GPIO	Description (refer to AM335x processor manuals for details)
120	3V3	LD3	<b>LCD_DATA11</b>	GPMC_A15 EHRPWM1B MCASP0_AHCLKR MCASP0_AXR2 PR1_MII0_RXD0 UART3_RTSN	GPIO2_17 10K-PD	LCD Data Bus SYS_BOOT11
121	3V3	LD4	<b>LCD_DATA12</b>	GPMC_A16 EQEP1A_IN MCASP0_ACLKR MCASP0_AXR2 PR1_MII0_RXLINK UART4_CTSN	GPIO0_8 10K-PD	LCD Data Bus SYS_BOOT12
122	3V3	LD5	<b>LCD_DATA13</b>	GPMC_A17 EQEP1B_IN MCASP0_FSR MCASP0_AXR3 PR1_MII0_RXER UART4_RTSN	GPIO0_9 10K-PD	LCD Data Bus SYS_BOOT13
123	3V3	LD6	<b>LCD_DATA14</b>	GPMC_A18 EQEP1_INDEX MCASP0_AXR1 UART5_RXD PR1_MII_MRO_CLK UART5_CTSN	GPIO0_10 10K-PU	LCD Data Bus SYS_BOOT14
124	3V3	LD7	<b>LCD_DATA15</b>	GPMC_A19 EQEP1_STROBE MCASP0_AHCLKX MCASP0_AXR3 PR1_MII0_RXDV UART5_RTSN	GPIO0_11 10K-PD	LCD Data Bus SYS_BOOT15
125	3V3	LD8	GPMC_AD9	<b>LCD_DATA22</b> MMC1_DAT1 MMC2_DAT5 EHRPWM2B PR1_MII0_COL	GPIO0_23	LCD Data Bus
126	3V3	LD9	GPMC_AD12	<b>LCD_DATA19</b> MMC1_DAT4 MMC2_DAT0 EQEP2A_IN PR1_MII0_TXD2 PR1_PRU0_PRU_R30_14	GPIO1_12	LCD Data Bus
127	3V3	LD10	<b>LCD_DATA5</b>	GPMC_A5 PR1_MII0_TXD0 EQEP2B_IN PR1_PRU1_PRU_R30_5 PR1_PRU1_PRU_R31_5	GPIO2_11 10K-PD	LCD Data Bus SYS_BOOT5
128	3V3	LD11	<b>LCD_DATA6</b>	GPMC_A6 PR1_EDIO_DATA_IN6 EQEP2_INDEX PR1_EDIO_DATA_OUT6 PR1_PRU1_PRU_R30_6 PR1_PRU1_PRU_R31_6	GPIO2_12 10K-PU	LCD Data Bus SYS_BOOT6
129	GND	GND				
130	3V3	LD12	<b>LCD_DATA7</b>	GPMC_A7 PR1_EDIO_DATA_IN7 EQEP2_STROBE PR1_EDIO_DATA_OUT7 PR1_PRU1_PRU_R30_7 PR1_PRU1_PRU_R31_7	GPIO2_13 10K-PD	LCD Data Bus SYS_BOOT7
131	3V3	LD13	<b>LCD_DATA8</b>	GPMC_A12 EHRPWM1_TRIPZONE_IN PUT MCASP0_ACLKX UART5_TXD PR1_MII0_RXD3 UART2_CTSN	GPIO2_14 10K-PD	LCD Data Bus SYS_BOOT8

PIN	Type	Function	AM335x Pad Name	Alternate functions	GPIO	Description (refer to AM335x processor manuals for details)
132	3V3	LD14	<b>LCD_DATA9</b>	GPMC_A13 EHRPWM0_SYNCO MCASP0_FSX UART5_RXD PR1_MII0_RXD2 UART2_RTSN	GPIO2_15  10K-PD	LCD Data Bus  SYS_BOOT9
133	3V3	LD15	<b>LCD_DATA10</b>	GPMC_A14 EHRPWM1A MCASP0_AXR0 PR1_MII0_RXD1 UART3_CTSN	GPIO2_16  10K-PD	LCD Data Bus  SYS_BOOT10
134	3V3	LD16	GPMC_AD10	<b>LCD_DATA21</b> MMC1_DAT2 MMC2_DAT6 EHRPWM2_TRIPZONE_IN PUT PR1_MII0_TXEN	GPIO0_26	LCD Data Bus
135	3V3	LD17	GPMC_AD13	<b>LCD_DATA18</b> MMC1_DAT5 MMC2_DAT1 EQEP2B_IN PR1_MII0_TXD1 PR1_PRU0_PRU_R30_15	GPIO1_13	LCD Data Bus
136	3V3	LD18	GPMC_AD15	<b>LCD_DATA16</b> MMC1_DAT7 MMC2_DAT3 EQEP2_STROBE PR1_ECAP0_ECAP_CAPIN _APWM_O PR1_PRU0_PRU_R31_15	GPIO1_15	LCD Data Bus
137	3V3	LD19	<b>LCD_DATA0</b>	GPMC_A0 PR1_MII_MT0_CLK EHRPWM2A PR1_PRU1_PRU_R30_0 PR1_PRU1_PRU_R31_0	GPIO2_6  10K-PD	LCD Data Bus  SYS_BOOT0
138	3V3	LD20	<b>LCD_DATA1</b>	GPMC_A1 PR1_MII0_TXEN EHRPWM2B PR1_PRU1_PRU_R30_1 PR1_PRU1_PRU_R31_1	GPIO2_7  20K-PU	LCD Data Bus  SYS_BOOT1 (10K-PD if BOOTMODE = L)
139	3V3	LD21	<b>LCD_DATA2</b>	GPMC_A2 PR1_MII0_TXD3 EHRPWM2_TRIPZONE_IN PUT PR1_PRU1_PRU_R30_2 PR1_PRU1_PRU_R31_2	GPIO2_8  10K-PD	LCD Data Bus  SYS_BOOT2 (10K-PU if BOOTMODE = L)
140	3V3	LD22	<b>LCD_DATA3</b>	GPMC_A3 PR1_MII0_TXD2 EHRPWM0_SYNCO PR1_PRU1_PRU_R30_3 PR1_PRU1_PRU_R31_3	GPIO2_9  10K-PD	LCD Data Bus  SYS_BOOT3 (10K-PU if BOOTMODE = L)
141	3V3	LD23	<b>LCD_DATA4</b>	GPMC_A4 PR1_MII0_TXD1 EQEP2A_IN PR1_PRU1_PRU_R30_4 PR1_PRU1_PRU_R31_4	GPIO2_10  10K-PU	LCD Data Bus  SYS_BOOT4
142	GND	GND				
143	3V3	HSYNC	<b>LCD_HSYNC</b>	GPMC_A9 PR1_EDIO_DATA_IN3 PR1_EDIO_DATA_OUT3 PR1_PRU1_PRU_R30_9 PR1_PRU1_PRU_R31_9	GPIO2_23	

PIN	Type	Function	AM335x Pad Name	Alternate functions	GPIO	Description (refer to AM335x processor manuals for details)
144	3V3	VSYNC	<b>LCD_VSYNC</b>	GPMC_A8 PR1_EDIO_DATA_IN2 PR1_EDIO_DATA_OUT2 PR1_PRU1_PRU_R30_8 PR1_PRU1_PRU_R31_8	GPIO2_22	
145	3V3	OE_ACD	<b>LCD_AC_BIAS_EN</b>	GPMC_A11 PR1_MII1_CRS PR1_EDIO_DATA_IN5 PR1_EDIO_DATA_OUT5 PR1_PRU1_PRU_R30_11 PR1_PRU1_PRU_R31_11	GPIO2_25	
146	3V3	LSCLK	<b>LCD_PCLK</b>	GPMC_A10 PR1_MII0_CRS PR1_EDIO_DATA_IN4 PR1_EDIO_DATA_OUT4 PR1_PRU1_PRU_R30_10 PR1_PRU1_PRU_R31_10	GPIO2_24	LCD Dotclock
147	GND	GND				

### Module Specific Signals

148	3V3	GPIO	GPMC_A1	GMII2_RXDV RGMII2_RCTL MMC2_DAT0 GPMC_A17 PR1_MII1_TXD3 EHRPWM0_SYNCO	GPIO1_17	
149	3V3	GPIO	GPMC_A2	GMII2_TXD3 RGMII2_TD3 MMC2_DAT1 GPMC_A18 PR1_MII1_TXD2 EHRPWM1A	GPIO1_18	
150	3V3	GPIO	GPMC_A3	GMII2_TXD2 RGMII2_TD2 MMC2_DAT2 GPMC_A19 PR1_MII1_TXD1 EHRPWM1B	GPIO1_19	
151	3V3	GPIO	GPMC_A6	GMII2_TXCLK RGMII2_TCLK MMC2_DAT4 GPMC_A22 PR1_MII1_RXD2 EQEP1_INDEX	GPIO1_22	
152	3V3	GPIO	GPMC_A11	GMII2_RXD0 RGMII2_RD0 RMII2_RXD0 GPMC_A27 PR1_MII1_RXER MCASP0_AXR1	GPIO1_27	
153	3V3	GPIO	GPMC_A10	GMII2_RXD1 RGMII2_RD1 RMII2_RXD1 GPMC_A26 PR1_MII1_RXDV MCASP0_AXR0	GPIO1_26	
154	3V3	GPIO	GPMC_A5	GMII2_TXD0 RGMII2_TD0 RMII2_TXD0 GPMC_A21 PR1_MII1_RXD3 EQEP1B_IN	GPIO1_21	
155	3V3	GPIO	GPMC_A4	GMII2_TXD1 RGMII2_TD1 RMII2_TXD1 GPMC_A20 PR1_MII1_TXD0 EQEP1A_IN	GPIO1_20	
156	3V3	GPIO	GPMC_A0	GMII2_TXEN RGMII2_TCTL RMII2_TXEN GPMC_A16 PR1_MII_MT1_CLK EHRPWM1_TRIPZONE_IN PUT	GPIO1_16	

PIN	Type	Function	AM335x Pad Name	Alternate functions	GPIO	Description (refer to AM335x processor manuals for details)
157	3V3	GPIO	GPMC_A7	GMI12_RXCLK RGMII2_RCLK MMC2_DAT5 GPMC_A23 PR1_MII1_RXD1 EQEP1_STROBE	GPIO1_23	
158	3V3	GPIO	GPMC_A8	GMI12_RXD3 RGMII2_RD3 MMC2_DAT6 GPMC_A24 PR1_MII1_RXD0 MCASP0_ACLKX	GPIO1_24	
159		GPIO	GPMC_A9	GMI12_RXD2 RGMII2_RD2 MMC2_DAT7 GPMC_A25 PR1_MII_MR1_CLK MCASP0_FSX	GPIO1_25	
160	GND	GND				
161	NC					not connected
162	NC					not connected
163	NC					not connected
164	NC					not connected
165	NC					not connected
166	NC					not connected
167	NC					not connected
168	NC					not connected
169	NC					not connected
170	NC					not connected
171	GND	GND				
172	NC					not connected
173	NC					not connected
174	NC					not connected
175	NC					not connected
176	NC					not connected
177	NC					not connected
178	NC					not connected
179	3V3					Fixed function GPMI_CLE used for NAND flash
180	3V3					Fixed function GPMI_ALE used for NAND flash
181	3V3					Fixed function GPMI_WRN used for NAND flash
182	3V3					Fixed function GPMI_RDN used for NAND flash
183	GND		VSSA_ADC			Connected to GND onboard
184	NC					not connected
185	analog	XN	<b>AIN0</b>			Touscreen ADC input channels
186	analog	XP	<b>AIN1</b>			
187	analog	YN	<b>AIN2</b>			
188	analog	YP	<b>AIN3</b>			
189	analog	WIPER	<b>AIN4</b>			



PIN	Type	Function	AM335x Pad Name	Alternate functions	GPIO	Description (refer to AM335x processor manuals for details)
190	analog		<b>AIN5</b>			General purpose measurements channels
191	analog		<b>AIN6</b>			
192	analog		<b>AIN7</b>			
193	1V8		EXT_WAKEUP			
194	NC					not connected
195	NC					not connected
196	NC					not connected
197	3V3		EMU0		<b>GPIO3_7</b> 10K-PU to ETN_3V3	Fixed function input used for Ethernet PHY Interrupt
198	3V3		<b>MDC</b>	<b>MDIO_CLK</b> TIMER5 UART5_TXD UART3_RTSN MMC0_SDWP MMC1_CLK MMC2_CLK	GPIO0_1	Fixed function ENET_MDC used for Ethernet PHY
199	3V3		<b>MDIO</b>	<b>MDIO_DATA</b> TIMER6 UART5_RXD UART3_CTSN MMC0_SDCD MMC1_CMD MMC2_CMD	GPIO0_0 1K5-PU to ETN_3V3	Fixed function ENET0_MDIO used for Ethernet PHY
200	GND	GND	GND			