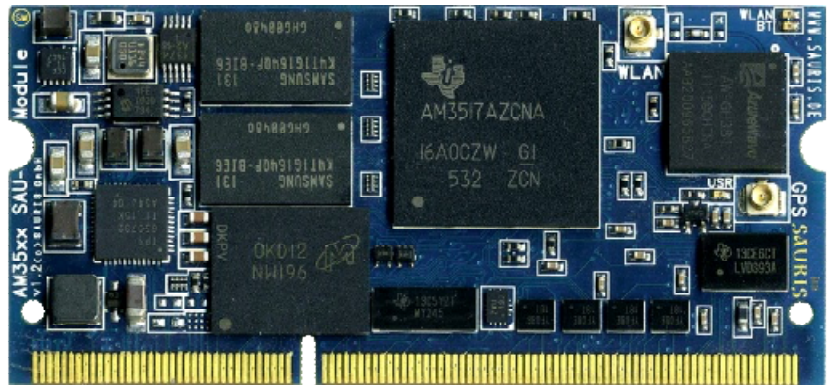


## AM3517/05 SAU-Module



### General Features

- **Texas Instruments Sitara Microprocessor AM3517/05**
  - 600 MHz Sitara ARM Cortex-A8 Core
  - NEON SIMD Coprocessor (AM3517 only)
  - 64K SRAM
  - MMC/SD/SDIO Interface
  - High-End CAN Controller
  - 10/100 Mbit Ethernet MAC
  - USB OTG subsystem with standard DP/DM interface [HS/FS/LS]
  - 2 Master/Slave Multichannel Serial Port Interface McSPI
  - 1 Multichannel Buffered Serial Ports
  - 2 UART
  - 2 I2C
  - 1-Wire
  - 2 CVBS
  - CCDC Interface
  - General Purpose Memory Controller GPMC
    - 16 Data
    - 11 Address
    - Control
- **Texas Instruments Single Chip Power Solution TPS650732**
  - Touch Screen Interface
  - Li-Ion or Li-Polymer Battery Charger
  - BackLight with Dimmer
  - DC/DC and LDO I<sup>2</sup>C Controlled
  - I<sup>2</sup>C Controlled
- **Maxim/Dallas RTC DS1374U**
  - Ultracapacitor EDL 20 mF Timekeeping
- **Texas Instruments Stereo Audio Codec TLV320AIC3105**
  - Stereo Audio ADC
    - Supports Rates From 8 kHz to 96 kHz
    - 92-dBA Signal-to-Noise Ratio
  - Stereo Audio DAC
    - Supports Rates From 8 kHz to 96 kHz
    - 102-dBA Signal-to-Noise Ratio
    - 16/20/24/32-Bit Data
    - 3D/Bass/Treble/EQ/De-Emphasis Effects
  - Programmable Input/Output Analog Gains

- **Texas Instruments Keypad Scan IC TCA8418EYFP**
  - ESD Protection  $\pm 15\text{kV}$  Human Body Model High Voltage
  - 8x10 Keypad Array (80 Buttons)
- **AzureWave AW-GH381 Wireless LAN & Bluetooth Module IC**
  - IEEE 802.11 b/g/e/i
  - Bluetooth 2.1+Enhanced Data Rate (EDR)
  - Support BT 3.0 + HS
  - Major Chipset Marvell 8688
- **Texas Instruments Flatlink Transmitter SN75LVDS83B**
  - Transfer Rate up to 135Mpps (Mega Pixel Per Second)
  - Pixel Clock Frequency Range 10MHz to 135MHz
  - Direct Interface to LCD Display Panels with Integrated LVDS
- **Texas Instruments Standalone USB Transceiver TUSB1210**
  - USB Specification Rev. 2.0
  - On-The-Go Supplement to the USB 2.0 Specification Rev. 1.3
  - Supports High Speed (480 Mbit/s), Full Speed (12 Mbit/s) and Low Speed (1.5 Mbit/s)
- **Texas Instruments ESD USB Protection TPD4S012 (2 pcs)**
- **Texas Instruments Bidirectional Voltage-Level Translators TXS0108E**
  - Output Voltage Level 1.8...3.3V
- **Texas Instruments Bus Transceivers SN74AVC32/8/4T245**
- **SMSC Ethernet PHY LAN8720**
- **Samsung DDR2 SDRAM K4T1G164QE (2 pcs) 256 Mbytes Total**
- **Nand Flash 512 Mbytes Total**
- **EEPROM Memory 24FC512 64Kbytes Total**
- **14 pin FFC/FPC JTAG Connector**
- **UMCC WiFi/Bluetooth Antenna Connector**
- **Form Factor SODIMM 204 pin, MO-268C**
- **Dimensions 67.6 x 31.8 mm**

#### *Navigation edition*

- **SiRFstarIV GSD4e WLCSP navigation processor**
- **Digital, triaxial acceleration sensor Bosch Sensortec BMA250**
- **Digital, barometric pressure sensor Bosch Sensortec BMP180**
- **Honeywell 3-Axis Digital Compass IC HMC5883L**

#### *Software*

- **Linux 2.6.37 Board Support Package**
- **Windows CE 6.0 R3 Board Support Package\***
- **Android Board Support Package\***

\* available on demand

## Pin Assignments and Descriptions

Table I

Pin	Name	Description	Type	Note
<b>Power Management</b>				
1	GND	Common	pwr	
3	PWR_AC	Input Power	pwr	
5	PWR_USB	Input Power	pwr	
7	VSYS	System Voltage	pwr	
9	VBAT	Charger Power Input, Stage Output, Connect To Battery	pwr	
11	TSENSE	Battery Temperature Sense Input	i	
13	CHRG_ISET	Charger Current Setup	i	
15	PWRBTN	Input Power Enable Button	i	
17	PWRON	Power On Input	i	
19	GND	Common	pwr	
21	LED_ISET1	Backlight Current Set 1	i	
23	LED_ISET2	Backlight Current Set 2	i	
25	LED_SINK1	Input To The Backlight Current Sink 1.	i	
27	LED_SINK2	Input To The Backlight Current Sink 2.	i	
29	LED_OUT	Backlight Boost Converter's Output	o	
31	GND	Common	pwr	
2	GND	Common	pwr	
4	PWR_AC	Input Power	pwr	
6	PWR_USB	Input Power	pwr	
8	VSYS	System Voltage	pwr	
10	THRESHOLD	Input For The Reset Comparator	i	
12	RESET	Open Drain Active Low Reset Output	o	
14	BUSVREF	Level Translator Voltage Reference	i	
16	3.3V	Power 3.3V Output	pwr	
18	1.8V	Power 1.8V Output	pwr	
20	POR	Cold Reset, Open Drain	i/o	①
22	RST	Warm Reset, Open Drain	i/o	①
24	VBCK	RTC Backup Supply Voltage	pwr	
<b>Audio interface</b>				
26	MIC/LINE3R	Right Input #3	i	
28	MICBIAS	Microphone Bias Voltage Output	o	
30	MIC/LINE3L	Left Input #3	i	
32	MIC/LINE2R	Right Input #2	i	
34	MIC/LINE2L	Left Input #2	i	
36	MIC/LINE1R	Right Input #1	i	
38	MIC/LINE1L	Left Input #1	i	
40	HPOUTL	High-Power Output Driver (Left +)	o	
42	HPCOML	High-Power Output Driver (Left -)	o	
44	HPCOMR	High-Power Output Driver (Right -)	o	
46	HPOUTR	High-Power Output Driver (Right +)	o	
48	LEFT_LOP	Left Line Output +	o	
50	LEFT_LOM	Left Line Output -	o	
52	RIGHT_LOP	Right Line Output +	o	
54	RIGHT_LOM	Right Line Output -	o	
56	GND	Common	pwr	
<b>Touchscreen interface</b>				
33	AD_IN1/TSX1	Analog Input 1 To The X-Plate.	i	
35	AD_IN2/TSX2	Analog Input 2 To The X-Plate.	i	
37	AD_IN3/TSY1	Analog Input 3 To The Y-Plate.	i	
39	AD_IN4/TSY2	Analog Input 4 To The Y-Plate.	i	
41	GND	Common	pwr	
<b>MCBSP4 Signals / Aux Touchscreen</b>				
49	MCBSP4_CLKX / X+	MCBSP4 clock	i/o	①
45	MCBSP4_FSX / X-	MCBSP4 frame sync	i/o	①
47	MCBSP4_DR / Y+	MCBSP4 DR data	i	②

Pin	Name	Description	Type	Note
43	MCBSP4 DX / Y-	MCBSP4 DX data	o	③
51	N.C. / AUX	No Connection		
53	GND	Common	pwr	
<b>USB Signals</b>				
55	ID1	USB Operating Mode Identification Pin 1	i	
57	DM1	Data 1 -	i/o	
59	DP1	Data 1 +	i/o	
61	VBUS1	VBUS 1	pwr	
58	VBEN1	VBUS1 Enable	o	
60	GND	Common	pwr	
62	ID2	USB Operating Mode Identification Pin 2	i	
64	DM2	Data 2 -	i/o	
66	DP2	Data 2 +	i/o	
68	VBUS2	VBUS 2	pwr	
70	VBEN2	VBUS 2 Enable	o	
72	GND	Common	pwr	
<b>TV Interface</b>				
63	GND	Common	pwr	
65	TV_OUT1	TV Analog Output 1	o	
67	TV_OUT2	TV Analog Output 2	o	
69	GND	Common	pwr	
<b>Other</b>				
71	BOOT5/GPIO	CPU Boot Select / GPIO	i/o	
<b>Processor Bus Signals</b>				
73	D0	Data 0	i/o	④
75	D1	Data 1	i/o	④
77	D2	Data 2	i/o	④
79	D3	Data 3	i/o	④
81	D4	Data 4	i/o	④
83	D5	Data 5	i/o	④
85	D6	Data 6	i/o	④
87	D7	Data 7	i/o	④
89	D8	Data 8	i/o	④
91	D9	Data 9	i/o	④
93	D10	Data 10	i/o	④
95	D11	Data 11	i/o	④
97	D12	Data 12	i/o	④
99	D13	Data 13	i/o	④
101	D14	Data 14	i/o	④
103	D15	Data 15	i/o	④
105	A1	Address 1	o	④
107	A2	Address 2	o	④
100	A3	Address 3	o	④
102	A4	Address 4	o	④
104	A5	Address 5	o	④
106	A6	Address 6	o	④
108	A7	Address 7	o	④
110	A8	Address 8	o	④
112	A9	Address 9	o	④
114	A10	Address 10	o	④
74	#ALE	Address Latch Enable	o	②
76	#WE	Write Enable	o	④
78	#OE	Output Enable	o	④
80	#CS1	Chip Select #1	o	④
82	#CS2	Chip Select #2	o	④
84	#CS3	Chip Select #3	o	④

Pin	Name	Description	Type	Note
86	#CS4	Chip Select #4	o	④
88	WAIT1	External Indication Of Wait	i	③
90	WAIT2	External Indication Of Wait	i	③
92	CLK	Clock GPMC	o	②
94	#BE0	LSB Enable	o	②
96	#BE1	MSB Enable	o	②
98	USRCLK	CLKOUT2	o	②
<b>Interfaces And Signals</b>				
109	MCBSP1_CLKS	MCBSP1 Clock Source		⑤
111	MCBSP1_CLKX	MCBSP1 TX Clock		⑤
113	MCBSP1_CLKR	MCBSP1 RX Clock		⑤
115	MCBSP1_FSX	MCBSP1 TX Frame Sync		⑤
117	MCBSP1_FSR	MCBSP1 RX Frame Sync		⑤
119	MCBSP1_DX	MCBSP1 TX Data	o	⑤
121	MCBSP1_DR	MCBSP1 RX Data	i	⑤
123	1WIRE	1-Wire	i/o	①
125	CANTX	CAN TX	o	①
127	CANRX	CAN RX	i	①
129	SCL2	I2C1 SCL	i/o	①
131	SDA2	I2C1 SDA	i/o	①
133	SCL3	I2C2 SCL	i/o	①
135	SDA3	I2C2 SDA	i/o	①
137	TXD1	UART1 TXD	i/o	①
139	RXD1	UART1 RXD	i/o	①
141	CTS1	UART1 CTS	i/o	①
143	RTS1	UART1 RTS	i/o	①
145	TXD3	UART3 TXD	i/o	①
147	RXD3	UART3 RXD	i/o	①
149	CTS3	UART3 CTS	i/o	①
151	RTS3	UART3 RTS	i/o	①
153	SPI1CLK	SPI1 CLOCK	i/o	①
155	SPI1SI	SPI1 SI/MO	i/o	①
157	SPI1SO	SPI1 SO/MI	i/o	①
159	SPI1CS0	SPI1 CS0	i/o	①
161	SPI1CS1	SPI1 CS1	i/o	①
163	SPI2CLK	SPI2 CLOCK	i/o	①
165	SPI2SI	SPI2 SI/MO	i/o	①
167	SPI2SO	SPI2 SO/MI	i/o	①
169	SPI2CS0	SPI2 CS0	i/o	①
171	SPI2CS1	SPI2 CS1	i/o	①
<b>Display - LVDS FlatLink / FPD Link</b>				
173	GND	Common	pwr	
199	Y0+	Channel 0 +	o	
201	Y0-	Channel 0 -	o	
179	GND	Common	pwr	
193	Y1+	Channel 1 +	o	
195	Y1-	Channel 1 -	o	
185	GND	Common	pwr	
187	Y2+	Channel 2 +	o	
189	Y2-	Channel 2 -	o	
191	GND	Common	pwr	
175	Y3+	Channel 3 +	o	
177	Y3-	Channel 3 -	o	
197	GND	Common	pwr	
181	CLK+	Clock +	o	
183	CLK-	Clock -	o	
203	GND	Common	pwr	

Pin	Name	Description	Type	Note
<b>CCDC Interface, 1.8V Level</b>				
116	CCDC_D0	CCDC Data Bit 0	i	⑤
118	CCDC_D1	CCDC Data Bit 1	i	⑤
120	CCDC_D2	CCDC Data Bit 2	i	⑤
122	CCDC_D3	CCDC Data Bit 3	i	⑤
124	CCDC_D4	CCDC Data Bit 4	i	⑤
126	CCDC_D5	CCDC Data Bit 5	i	⑤
128	CCDC_D6	CCDC Data Bit 6	i	⑤
130	CCDC_D7	CCDC Data Bit 7	i	⑤
132	CCDC_PCLK	CCDC Pixel Clock	i/o	⑤
134	CCDC_HD	CCDC Horizontal Sync	i/o	⑤
136	CCDC_VD	CCDC Vertical Sync	i/o	⑤
138	CCDC_WEN	CCDC Write Enable	i	⑤
140	CCDC_FIELD	CCDC Field ID Signal	i/o	⑤
<b>MMC/SD Interface</b>				
142	MMC_CLK	MMC/SD Output Clock	o	②
144	MMC_CMD	MMC/SD Command Signal	i/o	①
146	MMC_DAT0	MMC/SD Card Data Bit 0	i/o	①
148	MMC_DAT1	MMC/SD Card Data Bit 1	i/o	①
150	MMC_DAT2	MMC/SD Card Data Bit 2	i/o	①
152	MMC_DAT3	MMC/SD Card Data Bit 3	i/o	①
<b>Ethernet</b>				
154	ETHPWR	Power	pwr	
156	RXP	Transmit/Receive Positive Channel 2	i/o	
158	RXN	Transmit/Receive Negative Channel 2	i/o	
160	TXP	Transmit/Receive Positive Channel 1	i/o	
162	TXN	Transmit/Receive Negative Channel 1	i/o	
164	LED1	Link activity LED Indication.	i/o	
166	LED2	Link Speed LED Indication	o	
168	GND	Common	pwr	
<b>Keypad Scan IC Signals</b>				
190	ROW0	GPIO or row 0 in keypad matrix	i/o	
192	ROW1	GPIO or row 1 in keypad matrix	i/o	
194	ROW2	GPIO or row 2 in keypad matrix	i/o	
196	ROW3	GPIO or row 3 in keypad matrix	i/o	
198	ROW4	GPIO or row 4 in keypad matrix	i/o	
200	ROW5	GPIO or row 5 in keypad matrix	i/o	
202	ROW6	GPIO or row 6 in keypad matrix	i/o	
204	ROW7	GPIO or row 7 in keypad matrix	i/o	
188	COL0	GPIO or column 0 in keypad matrix	i/o	
186	COL1	GPIO or column 1 in keypad matrix	i/o	
184	COL2	GPIO or column 2 in keypad matrix	i/o	
182	COL3	GPIO or column 3 in keypad matrix	i/o	
180	COL4	GPIO or column 4 in keypad matrix	i/o	
178	COL5	GPIO or column 5 in keypad matrix	i/o	
176	COL6	GPIO or column 6 in keypad matrix	i/o	
174	COL7	GPIO or column 7 in keypad matrix	i/o	
172	COL8	GPIO or column 8 in keypad matrix	i/o	
170	COL9	GPIO or column 9 in keypad matrix	i/o	

- ① TXS0108E bidirectional voltage level translator. BUSVREF level output.
- ② SN74AVC8T245 dual supply bus transceiver. BUSVREF level output.
- ③ SN74AVC4T245 dual supply bus transceiver. BUSVREF level output.
- ④ SN74AVC32T245 dual supply bus transceiver. BUSVREF level output.
- ⑤ 1.8V out w/o translation

Table II Pin Assignments (numerical order)

Pin	Name	Pin	Name	Pin	Name	Pin	Name
1	GND	54	RIGHT LOM	107	A2	160	TXP
2	GND	55	ID1	108	A7	161	SPI1CS1
3	PWR AC	56	GND	109	MCBSP1_CLKS	162	TXN
4	PWR AC	57	DM1	110	A8	163	SPI2CLK
5	PWR USB	58	VBEN1	111	MCBSP1_CLKX	164	LED1
6	PWR USB	59	DP1	112	A9	165	SPI2SI
7	VSYS	60	GND	113	MCBSP1_CLKR	166	LED2
8	VSYS	61	VBUS1	114	A10	167	SPI2SO
9	VBAT	62	ID2	115	MCBSP1_FSX	168	GND
10	THRESHOLD	63	GND	116	CCDC_D0	169	SPI2CS0
11	TSENSE	64	DM2	117	MCBSP1_FSR	170	COL9
12	RESET	65	TV_OUT1	118	CCDC_D1	171	SPI2CS1
13	CHRG_ISET	66	DP2	119	MCBSP1_DX	172	COL8
14	BUSVREF	67	TV_OUT2	120	CCDC_D2	173	GND
15	PWRBTN	68	VBUS2	121	MCBSP1_DR	174	COL7
16	3.3V	69	GND	122	CCDC_D3	175	Y3+
17	PWRON	70	VBEN2	123	1WIRE	176	COL6
18	1.8V	71	BOOT5/GPIO	124	CCDC_D4	177	Y3-
19	GND	72	GND	125	CANTX	178	COL5
20	#POR	73	D0	126	CCDC_D5	179	GND
21	LED_ISET1	74	#ALE	127	CANRX	180	COL4
22	#RST	75	D1	128	CCDC_D6	181	CLK+
23	LED_ISET2	76	#WE	129	SCL2	182	COL3
24	VBCK	77	D2	130	CCDC_D7	183	CLK-
25	LED_SINK1	78	#OE	131	SDA2	184	COL2
26	MIC/LINE3R	79	D3	132	CCDC_PCLK	185	GND
27	LED_SINK2	80	#CS1	133	SCL3	186	COL1
28	MICBIAS	81	D4	134	CCDC_HD	187	Y2+
29	LED_OUT	82	#CS2	135	SDA3	188	COL0
30	MIC/LINE3L	83	D5	136	CCDC_VD	189	Y2-
31	GND	84	#CS3	137	TXD1	190	ROW0
32	MIC/LINE2R	85	D6	138	CCDC_WEN	191	GND
33	AD_IN1/TSX1	86	#CS4	139	RXD1	192	ROW1
34	MIC/LINE2L	87	D7	140	CCDC_FIELD	193	Y1+
35	AD_IN2/TSX2	88	WAIT1	141	CTS1	194	ROW2
36	MIC/LINE1R	89	D8	142	MMC_CLK	195	Y1-
37	AD_IN3/TSY1	90	WAIT2	143	RTS1	196	ROW3
38	MIC/LINE1L	91	D9	144	MMC_CMD	197	GND
39	AD_IN4/TSY2	92	CLK	145	TXD3	198	ROW4
40	HPOUTL	93	D10	146	MMC_DAT0	199	Y0+
41	GND	94	#BE0	147	RXD3	200	ROW5
42	HPCOML	95	D11	148	MMC_DAT1	201	Y0-
43	Y- / MCBSP4_DX	96	#BE1	149	CTS3	202	ROW6
44	HPCOMR	97	D12	150	MMC_DAT2	203	GND
45	X- / MCBSP4_FSX	98	USRCLK	151	RTS3	204	ROW7
46	HPOUTR	99	D13	152	MMC_DAT3		
47	Y+ / MCBSP4_DR	100	A3	153	SPI1CLK		
48	LEFT LOP	101	D14	154	ETHPWR		
49	X+ / MCBSP4_DX	102	A4	155	SPI1SI		
50	LEFT LOM	103	D15	156	RXP		
51	AUX / <free>	104	A5	157	SPI1SO		
52	RIGHT LOP	105	A1	158	RXN		
53	GND	106	A6	159	SPI1CS0		

Table III Odd Pin Assignments (Front View)

Pin	Name	Pin	Name	Pin	Name	Pin	Name
1	GND	53	GND	105	A1	157	SPI1SO
3	PWR AC	55	ID1	107	A2	159	SPI1CS0
5	PWR USB	57	DM1	109	MCBSP1_CLKS	161	SPI1CS1
7	VSYS	59	DP1	111	MCBSP1_CLKX	163	SPI2CLK
9	VBAT	61	VBUS1	113	MCBSP1_CLKR	165	SPI2SI
11	TSENSE	63	GND	115	MCBSP1_FSX	167	SPI2SO
13	CHRG ISET	65	TV_OUT1	117	MCBSP1_FSR	169	SPI2CS0
15	PWRBTN	67	TV_OUT2	119	MCBSP1_DX	171	SPI2CS1
17	PWRON	69	GND	121	MCBSP1_DR	173	GND
19	GND	71	BOOT5/GPIO	123	1WIRE	175	Y3+
21	LED_ISET1	73	D0	125	CANTX	177	Y3-
23	LED_ISET2	75	D1	127	CANRX	179	GND
25	LED_SINK1	77	D2	129	SCL2	181	CLK+
27	LED_SINK2	79	D3	131	SDA2	183	CLK-
29	LED_OUT	81	D4	133	SCL3	185	GND
31	GND	83	D5	135	SDA3	187	Y2+
33	AD_IN1/TSX1	85	D6	137	TXD1	189	Y2-
35	AD_IN2/TSX2	87	D7	139	RXD1	191	GND
37	AD_IN3/TSY1	89	D8	141	CTS1	193	Y1+
39	AD_IN4/TSY2	91	D9	143	RTS1	195	Y1-
41	GND	93	D10	145	TXD3	197	GND
43	Y- / MCBSP4_DX	95	D11	147	RXD3	199	Y0+
45	X- / MCBSP4_FSX	97	D12	149	CTS3	201	Y0-
47	Y+ / MCBSP4_DR	99	D13	151	RTS3	203	GND
49	X+ / MCBSP4_CLKX	101	D14	153	SPI1CLK		
51	AUX / <free>	103	D15	155	SPI1SI		

Table IV Even Pin Assignments (Back View)

Pin	Name	Pin	Name	Pin	Name	Pin	Name
2	GND	54	RIGHT LOM	106	A6	158	RXN
4	PWR AC	56	GND	108	A7	160	TXP
6	PWR USB	58	VBEN1	110	A8	162	TXN
8	VSYS	60	GND	112	A9	164	LED1
10	THRESHOLD	62	ID2	114	A10	166	LED2
12	RESET	64	DM2	116	CCDC_D0	168	GND
14	BUSVREF	66	DP2	118	CCDC_D1	170	COL9
16	3.3V	68	VBUS2	120	CCDC_D2	172	COL8
18	1.8V	70	VBEN2	122	CCDC_D3	174	COL7
20	#POR	72	GND	124	CCDC_D4	176	COL6
22	#RST	74	#ALE	126	CCDC_D5	178	COL5
24	VBCK	76	#WE	128	CCDC_D6	180	COL4
26	MIC/LINE3R	78	#OE	130	CCDC_D7	182	COL3
28	MICBIAS	80	#CS1	132	CCDC_PCLK	184	COL2
30	MIC/LINE3L	82	#CS2	134	CCDC_HD	186	COL1
32	MIC/LINE2R	84	#CS3	136	CCDC_VD	188	COL0
34	MIC/LINE2L	86	#CS4	138	CCDC_WEN	190	ROW0
36	MIC/LINE1R	88	WAIT1	140	CCDC_FIELD	192	ROW1
38	MIC/LINE1L	90	WAIT2	142	MMC_CLK	194	ROW2
40	HPOUTL	92	CLK	144	MMC_CMD	196	ROW3
42	HPCOML	94	#BE0	146	MMC_DAT0	198	ROW4
44	HPCOMR	96	#BE1	148	MMC_DAT1	200	ROW5
46	HPOUTR	98	USRCLK	150	MMC_DAT2	202	ROW6
48	LEFT LOP	100	A3	152	MMC_DAT3	204	ROW7
50	LEFT LOM	102	A4	154	ETHPWR		
52	RIGHT LOP	104	A5	156	RXP		



**Mechanical Outline**

