

SOM-860-E



Website: www.emtop-tech.com	Product Wiki: docs.emtop-tech.com
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Revision History

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Hardware Overview

- Mechanical Parameters
 - Working Temperature: 0°C - 70°C
 - Humidity Range: 20% - 90%
 - Dimensions: 60mm x 27mm
 - Stacking Height: 1.5mm
 - Input Voltage: 3.3V
- Processor
 - ARM Cortex-A8 32-Bit RISC Processor up to 1GHz
 - NEON™ SIMD Coprocessor
 - SGX530 3D Graphics Engine
 - Up to 24-Bit Data Output, resolution up to 2048 × 2048
- Memories
 - 512MByte DDR3L @ 400MHz
 - 8GB eMMC
- Interfaces
 - One channel GMII interface
 - Parallel LCD interface
 - 16bit GPMC interface
 - Four channel UART interface
 - Two channel CAN interface
 - USB Host
 - USB OTG
 - Eight channel ADC inputs
 - SPI interface

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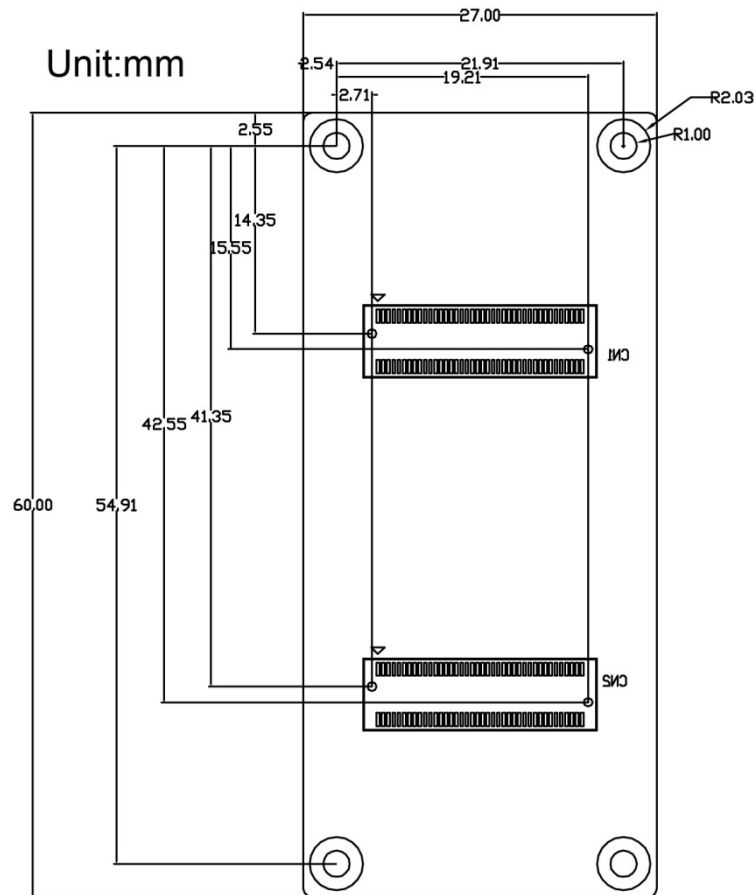
- I2S interface
- SDIO interface
- Data Transfer Interfaces
 - Serial Ports
 - UART0, 2 line serial port, TTL Logic
 - UART1, 2 line serial port, TTL Logic
 - UART3, 2 line serial port, TTL Logic
 - UART4, 2 line serial port, TTL Logic
 - USB Ports:
 - 1 x USB2.0 OTG, 480Mbps
 - 1 x USB2.0 HOST, 480Mbps
 - MMC card interface port by GPMC Interface
 - 1 channel GMAC
 - 1 channel I2C interface
 - 1 channel CAN bus

Application

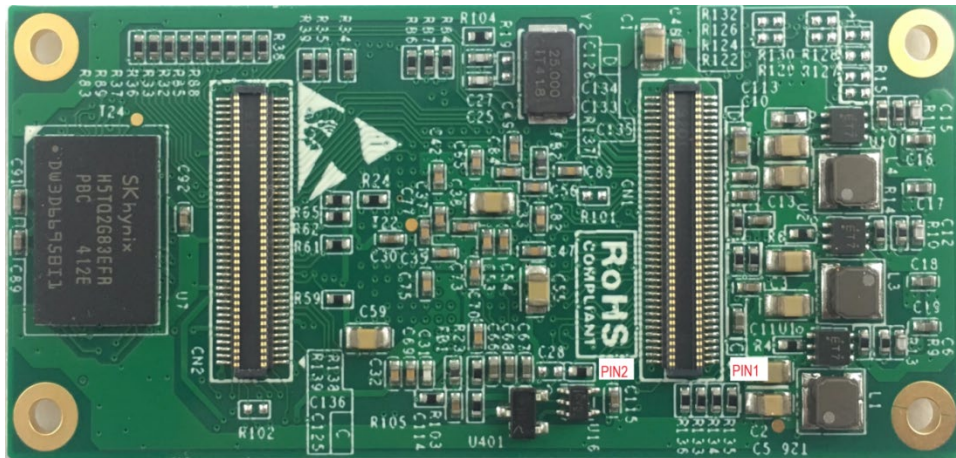
- HMI
- Medical appliances
- Industrial automation
- Weighing Scales
- Smart Toll Systems
- Educational Consoles

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Mechanical Dimension



Pin Definition



CN1					
Number	Signal	Power Logic	Input/Output		Pull Down/Up on Board
1	GND				
2	VDDS_RTC		RTC Power In		
3	CLK_OUT1	3.3V	In/Out		
4	CLK_OUT2	3.3V	In/Out		
5	MMC1_DAT0 ¹	3.3V	In/Out		
6	MMC1_DAT1 ²	3.3V	In/Out		
7	MMC1_DAT2 ³	3.3V	In/Out		
8	GLOBLE_RESETN	3.3V	In/Out		100K Pull-Down
9	MMC1_DAT3 ⁴	3.3V	In/Out		
10	AM335X_PWRON_R ESETN	3.3V	In		100K Pull-Up 3.3V
11	GND				
12	GND				
13	AM355X_PRU_UART O_CTS	3.3V	In/Out		
14	AM355X_PRU_UART O_RX	3.3V	In/Out		
15	AM355X_PRU_UART O_RTS	3.3V	In/Out		
16	AM355X_PRU_UART O_TX	3.3V	In/Out		
17	AM355X_UART0_RX	3.3V	In/Out		
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CN1					
Number	Signal	Power Logic	Input/Output		Pull Down/Up on Board
18	AM355X_UART3_RX	3.3V	In/Out		
19	AM355X_UART0_TX	3.3V	In/Out		
20	AM355X_UART3_TX	3.3V	In/Out		
21	AM355X_CAN0_RX	3.3V	In/Out		
22	AM355X_I2C0_SDA	3.3V	In/Out		
23	AM355X_CAN0_TX	3.3V	In/Out		
24	AM355X_I2C0_SCL	3.3V	In/Out		
25	AM355X_UART4_RX	3.3V	In/Out		
26	AM355X_UART1_RX	3.3V	In/Out		
27	AM355X_UART4_TX	3.3V	In/Out		
28	AM355X_UART1_TX	3.3V	In/Out		
29	GND				
30	GND				
31	MII1_COL	3.3V	In/Out		
32	AM355X_USB0_DRV VBUS	3.3V	In/Out		
33	MII1_TX_CLK	3.3V	In/Out		
34	AM355X_USB1_DRV VBUS	3.3V	In/Out		
35	MII1_TX_EN	3.3V	In/Out		
36	MII1_REF_CLK	3.3V	In/Out		
37	MII1_TXD3	3.3V	In/Out		
38	MII1_CRS	3.3V	In/Out		
39	MII1_TXD2	3.3V	In/Out		
40	MII1_RX_ER	3.3V	In/Out		
41	MII1_TXD1	3.3V	In/Out		
42	MII1_RX_DV	3.3V	In/Out		
43	MII1_TXD0	3.3V	In/Out		
44	MII1_RX_CLK	3.3V	In/Out		
45	MII_MDIO	3.3V	In/Out		
46	MII1_RXD3	3.3V	In/Out		
47	MII_MDC	3.3V	In/Out		
48	MII1_RXD2	3.3V	In/Out		
49	GND				
50	MII1_RXD1	3.3V	In/Out		
51	AM355X_USB0_DM	3.3V	In/Out		
52	MII1_RXD0	3.3V	In/Out		
53	AM355X_USB0_DP	3.3V	In/Out		
54	MMC1_CMD ⁵	3.3V	In/Out		
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CN1					
Number	Signal	Power Logic	Input/Output		Pull Down/Up on Board
55	GND				
56	USB0_VBUS	5V	USB Power In		
57	AM355X_USB1_DM	3.3V	In/Out		
58	AM355X_USB1_ID	3.3V	In		
59	AM355X_USB1_DP	3.3V	In/Out		
60	AM355X_USB0_ID	3.3V	In		
61	GND				
62	USB1_VBUS	5V	USB Power In		
63	GPMC_A0	3.3V	In/Out		
64	GPMC_A7	3.3V	In/Out		
65	GPMC_A5	3.3V	In/Out		
66	GPMC_A11	3.3V	In/Out		
67	GPMC_A4	3.3V	In/Out		
68	GPMC_A10	3.3V	In/Out		
69	GPMC_A3	3.3V	In/Out		
70	GPMC_A9	3.3V	In/Out		
71	GPMC_A2	3.3V	In/Out		
72	GPMC_A8	3.3V	In/Out		
73	GPMC_A6	3.3V	In/Out		
74	GPMC_A1	3.3V	In/Out		
75	GND				
76	GND				
77	VDD_3V3		Board Power In		
78	VDD_3V3		Board Power In		
79	VDD_3V3		Board Power In		
80	VDD_3V3		Board Power In		

Note:

- 1 Function out from GPMC_AD0, ball U7
- 2 Function out from GPMC_AD1, ball V7
- 3 Function out from GPMC_AD2, ball R8
- 4 Function out from GPMC_AD3, ball T8
- 5 Function out from GPMC_CSN2, ball V9

CN2					
Number	Signal	Power Logic	Input/Output		Pull Down/Up on Board
1	GND				
2	GND				

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CN2					
Number	Signal	Power Logic	Input/Output		Pull Down/Up on Board
3	MCASP0_AHCLKX	3.3V	In/Out		
4	MCASP0_ACLKX	3.3V	In/Out		
5	MCASP0_FSX	3.3V	In/Out		
6	MCASP0_AXR0	3.3V	In/Out		
7	MCASP0_AHCLKR	3.3V	In/Out		
8	MMC1_CLK ⁶	3.3V	In/Out		
9	MCASP0_FSR	3.3V	In/Out		
10	MCASP0_AXR1	3.3V	In/Out		
11	GND				
12	GND				
13	VDDA_ADC		ADC Power In		
14	AM355X_ADC0	VDDA_ADC	Analog In		
15	AM355X_ADC1	VDDA_ADC	Analog In		
16	AM355X_ADC2	VDDA_ADC	Analog In		
17	AM355X_ADC3	VDDA_ADC	Analog In		
18	AM355X_ADC4	VDDA_ADC	Analog In		
19	AM355X_ADC5	VDDA_ADC	Analog In		
20	AM355X_ADC6	VDDA_ADC	Analog In		
21	AM355X_ADC7	VDDA_ADC	Analog In		
22	GND_ADC				
23	GND				
24	GND				
25	LCD_DATA1	3.3V	In/Out		100k pull down
26	LCD_DATA12	3.3V	In/Out		100k pull down
27	LCD_DATA0	3.3V	In/Out		100k pull down
28	LCD_DATA10	3.3V	In/Out		100k pull down
29	LCD_DATA5	3.3V	In/Out		100k pull up
30	LCD_DATA13	3.3V	In/Out		100k pull down
31	LCD_DATA4	3.3V	In/Out		100k pull up
32	LCD_DATA11	3.3V	In/Out		100k pull down
33	LCD_DATA6	3.3V	In/Out		100k pull down
34	LCD_DATA14	3.3V	In/Out		100k pull down
35	LCD_DATA8	3.3V	In/Out		100k pull down
36	LCD_VSYNC	3.3V	In/Out		
37	GND				
38	GND				
39	LCD_DATA9	3.3V	In/Out		100k pull up
40	LCD_PCLK	3.3V	In/Out		
41	LCD_DATA15	3.3V	In/Out		100k pull up
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CN2					
Number	Signal	Power Logic	Input/Output		Pull Down/Up on Board
42	GPMC_AD11	3.3V	In/Out		
43	LCD_DATA3	3.3V	In/Out		100k pull up
44	GPMC_AD15	3.3V	In/Out		
45	LCD_DATA2	3.3V	In/Out		100k pull down
46	GPMC_AD14	3.3V	In/Out		
47	LCD_DATA7	3.3V	In/Out		100k pull down
48	GPMC_WAIT0	3.3V	In/Out		
49	LCD_HSYNC	3.3V	In/Out		
50	GPMC_BEN1	3.3V	In/Out		
51	GND				
52	GND				
53	LCD_EN	3.3V	In/Out		
54	GPMC_WPN	3.3V	In/Out		
55	GPMC_AD13	3.3V	In/Out		
56	GPMC_CSN3	3.3V	In/Out		
57	GPMC_AD9	3.3V	In/Out		
58	GPMC_CSN2	3.3V	In/Out		
59	GPMC_AD10	3.3V	In/Out		
60	GPMC_CLK	3.3V	In/Out		
61	GPMC_AD8	3.3V	In/Out		
62	GPMC_AD6	3.3V	In/Out		
63	GPMC_AD12	3.3V	In/Out		
64	GND				
65	GND				
66	GPMC_CSN1	3.3V	In/Out		
67	GPMC_ADVN_ALE	3.3V	In/Out		
68	GPMC_AD5	3.3V	In/Out		
69	GPMC_BEN0_CLE	3.3V	In/Out		
70	GPMC_AD4	3.3V	In/Out		
71	GPMC_OEN_REN	3.3V	In/Out		
72	GPMC_AD1	3.3V	In/Out		
73	GPMC_AD2	3.3V	In/Out		
74	GPMC_AD0	3.3V	In/Out		
75	GPMC_AD3	3.3V	In/Out		
76	GPMC_CSN0	3.3V	In/Out		
77	GPMC_AD7	3.3V	In/Out		
78	GPMC_WEN	3.3V	In/Out		
79	GND				
80	GND				
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Note

6 Function out from GPMC_CS1, ball U9

Software

Linux 4.16

Items		Notes
OS	Linux	Version 4.1.6
Device Driver	Serial	Serial driver
	Rtc	Hardware clock driver
	Net	2*10M/100M/Gb Ethernets
	Display	Display port (RGB TFT)
	MMC/SD	4-bit SDIO
	eMMC	8GB eMMC
	USB	3 High speed USB ports (2*Host, 1*OTG)
	Audio	Analog (headphone/MIC)
	RS485	1*RS485 port
	CAN	1*CAN Bus port
	Keypad	GPIO keyboard driver
	LED	User leds driver
Buzzer	1*buzzer	

Linux 3.2

Items		Notes
OS	Linux	Version 3.2
Device Driver	Serial	Serial driver
	Rtc	Hardware clock driver
	Net	2*10M/100M/Gb Ethernets
	Display	Display port (RGB TFT)
	MMC/SD	4-bit SDIO
	eMMC	8GB eMMC
	USB	3 High speed USB ports (2*Host, 1*OTG)
	Audio	Analog (headphone/MIC)
	RS485	1*RS485 port
	CAN	1*CAN Bus port
Keypad	GPIO keyboard driver	

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	LED	User leds driver
	Buzzer	1*buzzer