

APEXAR EMBEDDED SOLUTION

APEXAR SOM

SYSTEM ON MODULE

APX-SOM9G45
APX-SOM9M10

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1 OBJECTIVE

This manual presents all the characteristics and features of the APEXAR SOM modules.

2 SCOPE

Applies for all the APEXAR SOM modules.

3 REFERENCE

4 CONVENTION

SOM – System on module

5 OVERAL DESCRIPTION

Today's microcontroller's manufactures are developing smaller, faster, more complex components that improve performance and reduce costs. These advances force embedded designers to consider other factors: manufacturability, board density, testability and complexity versus time to market. Technical difficulties associated to the new advances keep current technology out of reach.

Apexar Technologies have developed a new SOM, with the new ATMEL eMPU processors the AT91SAM9G45 and SAM9M10.

With such performance characteristics that make of it the ideal solution for:

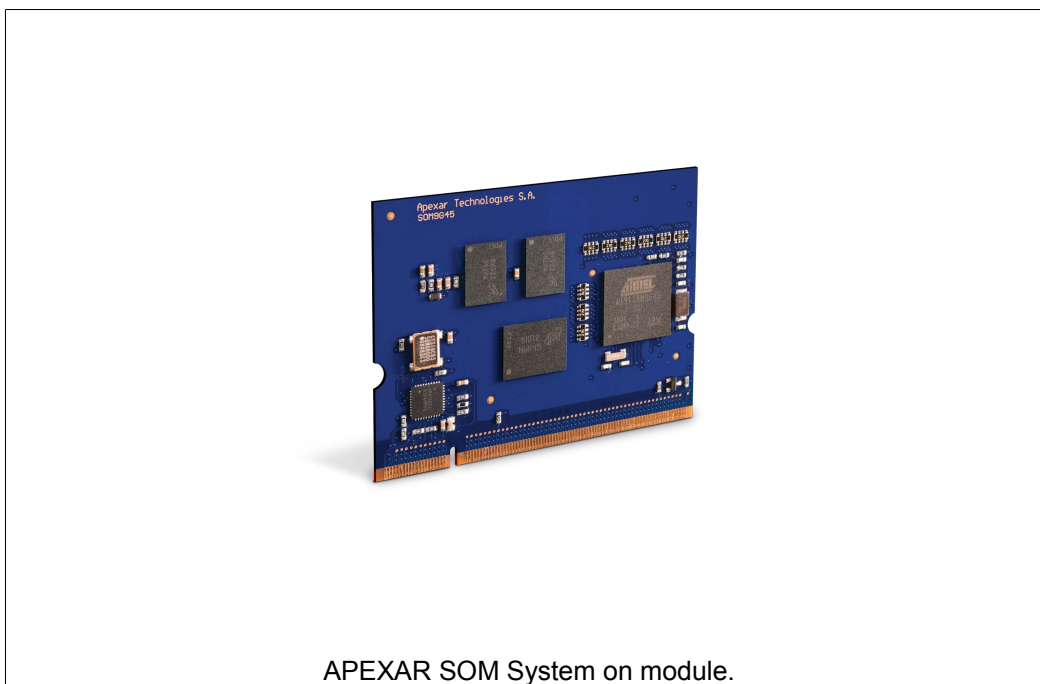
- main powered
- cost-sensitive industrial applications such as industrial and building control
- HVAC
- POS terminals
- alarm systems
- printers
- medical applications.

6 OVERVIEW

The APEXAR SOM is a compact, product-ready hardware and software solution that brings to embedded designers time to market reduction and cost benefits.

Using the small 200 pin SODIMM is the ideal processor engine for your next design. All of the AT91SAM9G45 processor's features is included on this board: Flash, Memory, Serial Ports, Ethernet, I2C, Audio, PWMs, Timer/Counters, A/D, digital I/O lines, video, Clock/Calendar, and more.

Apexar Technologies's module goes through a complete design process that includes hardware, software, and design for manufacturability reviews. This module puts the new technology at your reach.



6.1 Operation Requirements

Power	3,3 VDC
Temperature	Operation: -10 a +50 °C
	Storage: -40 a +85 °C
Relative Humidity	0 a 90 %

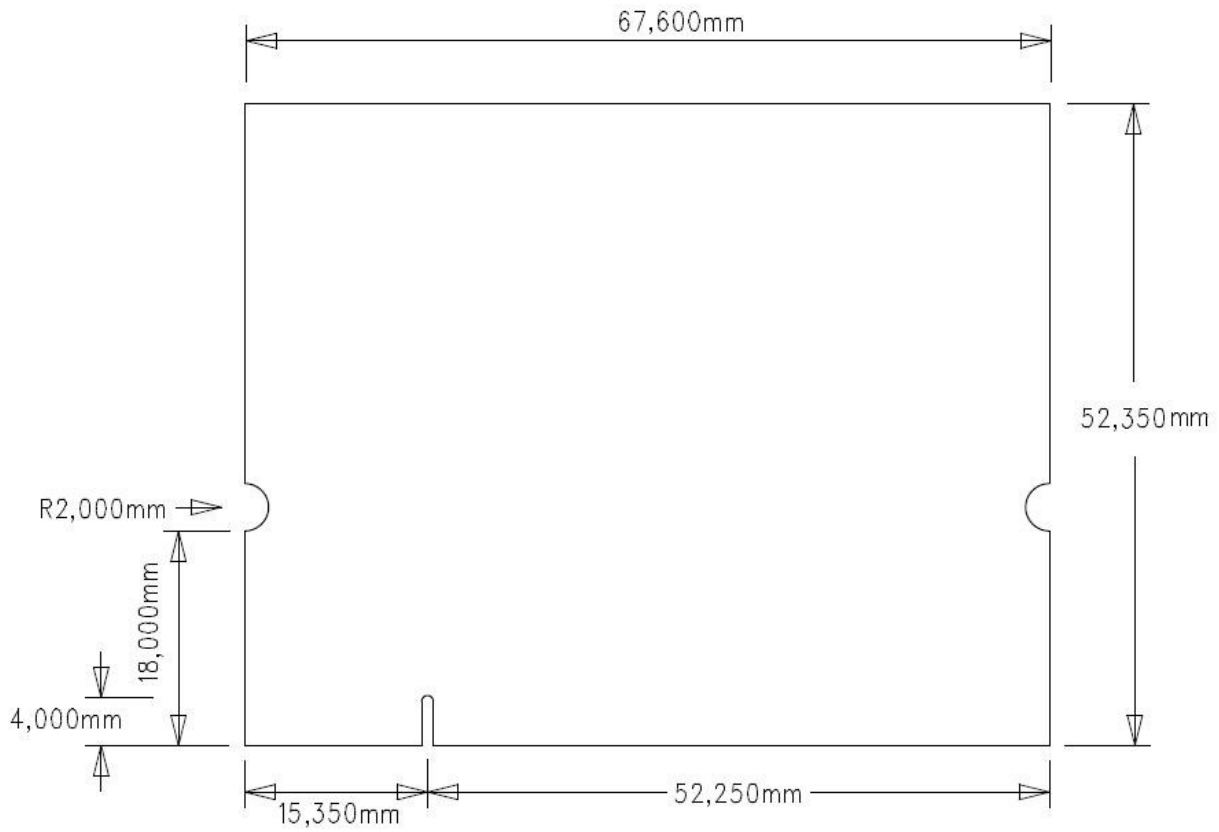
Table 1 – Operation Requirerments.

6.2 Specifications

Processor	400 MHz ARM926EJ-S™ - AT91SAM9G45 / AT91SAM9M10
Memories	128 MB RAM DDR2
	256 MB NAND FLASH
System	Periodic Interval Timer, Watchdog Timer, Real Time Timer and Real Time Clock
	Boot from NAND Flash, SD card
I/O	88 Programmables I/O lines
Peripheral	LCD Controller supporting STN and TFT displays up to 1280 * 860 pixels
	USB Device High Speed, USB Host High Speed and USB Host full speed
	10/100 Mbps Ethernet MAC Controller
	AC'97 Controller
	4 16-bit PWM Controller Channels
	2 wire Interface
	2 Master/ Slave Serial Peripheral Interfaces (SPI)
	4 USARTs with ISO7816, IrDA, Manchester and SPI modes
8 10-Bit ADC with 4-wire Touch Screen Support Channels	

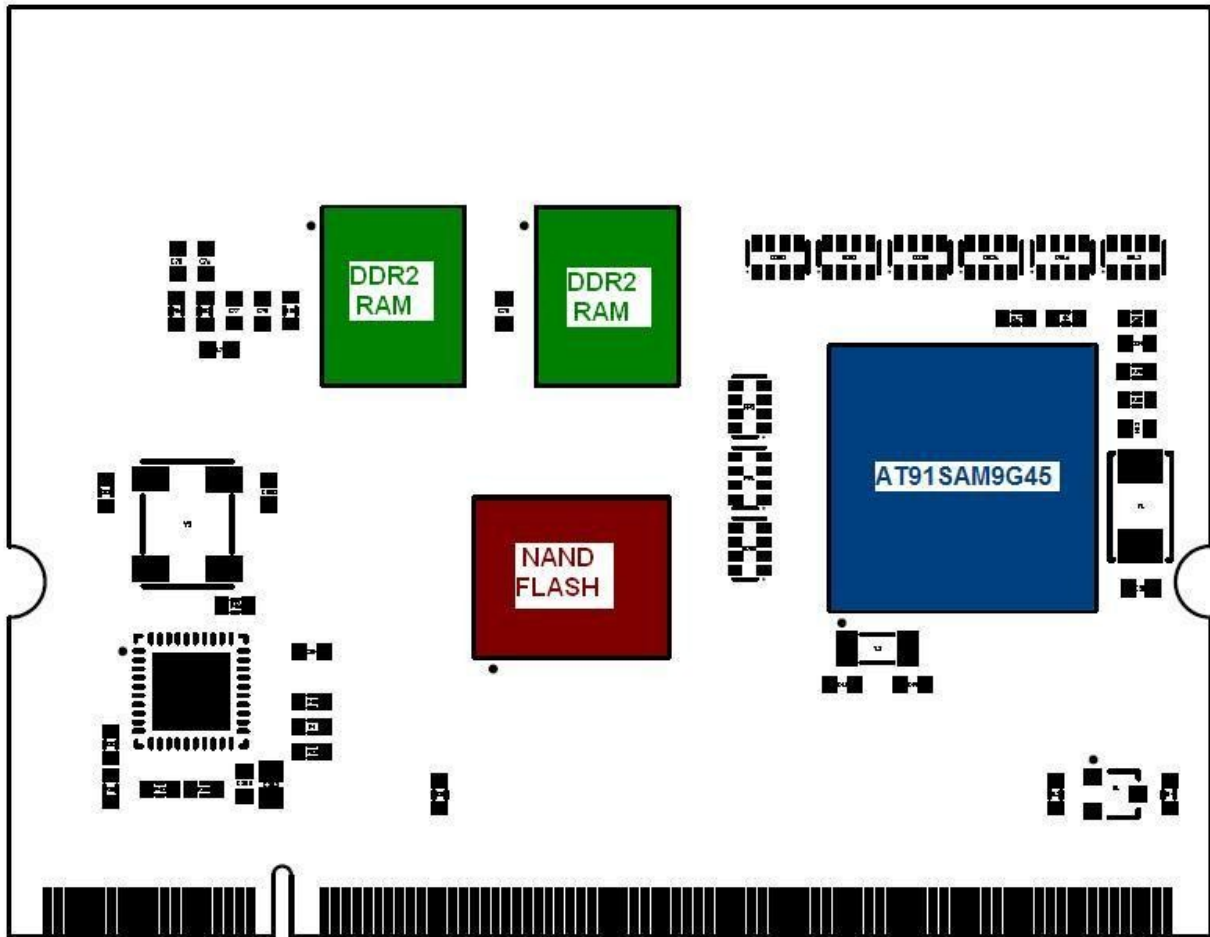
Table 3 – Specifications

6.3 Dimensions



Physical dimensions.

6.4 Layout



Layout

7 SODIMM 200 PINOUT

SODIMM PINS	DESCRIPTION	OBSERVATION
1	GND_ETH	
2	TX_N	
3	+AVDD3.3	
4	TX_P	
5	GND_POWER	
6	RX_N	
7	Not Connected	
8	RX_P	
9	Not Connected	
10	ETH_LED3	
11	ETH_LED3	
12	ETH_LED2	
13	GND_POWER	
14	Not Connected	
15	Not Connected	
16	Not Connected	
17	Not Connected	
18	Not Connected	
19	Not Connected	
20	+3,3 VCC	
21	Not Connected	
22	Not Connected	
23	Not Connected	
24	Not Connected	
25	Not Connected	
26	Not Connected	
27	GND_POWER	
28	Not Connected	
29	Not Connected	
30	Not Connected	
31	Not Connected	
32	+3,3 VCC	
33	Not Connected	
34	Not Connected	
35	Not Connected	
36	Not Connected	
37	Not Connected	

SODIMM PINS	DESCRIPTION	OBSERVATION
38	Not Connected	
39	Not Connected	
40	GND_POWER	
41	GND_POWER	
42	Not Connected	
43	Not Connected	
44	Not Connected	
45	Not Connected	
46	+3,3 VCC	
47	Not Connected	
48	Not Connected	
49	Not Connected	
50	Not Connected	
51	GND_POWER	
52	Not Connected	
53	Not Connected	
54	Not Connected	
55	Not Connected	
56	Not Connected	
57	Not Connected	
58	Not Connected	
59	Not Connected	
60	+3,3 VCC	
61	NAND_DSBL	NAND DISABLE
62	Not Connected	
63	Not Connected	
64	Not Connected	
65	GND_POWER	
66	Not Connected	
67	Not Connected	
68	Not Connected	
69	Not Connected	
70	Not Connected	
71	PA4	MCIO_DA2 / TIOA4
72	+3,3 VCC	
73	PA1	MCIO_CDA / TIOA3
74	PA2	MCIO_DA0 / TIOB3
75	PB17	SPI1_NPCS0 / RTS0
76	Not Connected	
77	Not Connected	

SODIMM PINS	DESCRIPTION	OBSERVATION
78	PA0	MCIO_CK / TCLK3
79	GND_POWER	
80	PA3	MCIO_DA1 / TCKL4
81	PA5	MCIO_DA3 / TIOB4
82	Not Connected	
83	PD31	TIOB1 / PWM1
84	PD30	TIOB0 / SCK2
85	PD29	TCLK1 / SCK1
86	PD28	TSADTRG / SPI1_NPCS1
87	Not Connected	
88	+3,3 VCC	
89	PD27	PCK1 / SPI0_NPCS3
90	Not Connected	
91	Not Connected	
92	PD26	PCK0 / PWM2
93	PB6	TXD2
94	PD23	TCLK0
95	GND_POWER	
96	PD22	TIOA2
97	PD21	TIOA1
98	PB19	TXD0 / SPI0_NPCS2
99	PB18	RXD0 / SPI0_NPCS1
100	Not Connected	
101	PD19	SPI1_NPCS3 / FIQ
102	PB4	TXD1
103	PB5	RXD1
104	Not Connected	
105	PB7	RXD2
106	+3,3 VCC	
107	PB0	SPI0_MISO
108	PB1	SPI0_MOSI
109	PB2	SPI0_SPCK
110	PB3	SPI0_NPCS0
111	PD17	CTS1
112	PD20	TIOA0
113	GND_POWER	
114	PD16	RTS1
115	PA20	TWD0
116	PA21	TWCK0
117	PB12	DRXD

SODIMM PINS	DESCRIPTION	OBSERVATION
118	PB13	DTXD
119	PD15	RF1
120	PD14	TF1
121	PD13	RK1
122	PD12	TK1
123	PD11	RD1
124	+3,3 VCC	
125	PD10	TD1
126	PD9	AC97CK / TCLK5
127	PD8	AC97FS / TIOB5
128	PD7	AC97TX / TIOA5
129	PD6	AC97RX
130	PE31	PWM2 / PCK1
131	GND_POWER	
132	PE0	LCDPWR / PCK0
133	PE30	LCDD23
134	PD5	RF0
135	PD18	SPI1_NPCS2 IRQ
136	PD4	RK0
137	PD3	RD0
138	PD25	SPI0_NPCS2 / PWM1
139	PD2	TD0
140	PD1	TF0
141	PD0	TK0
142	+3,3 VCC	
143	PE3	LCDVSYNC
144	PE4	LCDHSYNC
145	PE5	LCDDOTCK
146	PE6	LCDDEN
147	PE2	LCDDCC
148	PE1	LCDDMOD
149	PE25	LCDD18
150	PE7	LCDD0 / LCDD2
151	GND_POWER	
152	PE8	LCDD1 / LCDD3
153	PE9	LCDD2 / LCDD4
154	PE10	LCDD3 / LCDD5
155	PE11	LCDD4 / LCDD6
156	PE12	LCDD5 / LCDD7
157	PE27	LCDD20

SODIMM PINS	DESCRIPTION	OBSERVATION
158	PE26	LCDD19
159	PE13	LCDD6 / LCDD10
160	+3,3 VCC	
161	PE14	LCDD7 / LCDD11
162	PE15	LCDD8 / LCDD12
163	PE16	LCDD9 / LCDD13
164	PE17	LCDD10 / LCDD14
165	PE18	LCDD11 / LCDD15
166	PE28	LCDD21
167	PE29	LCDD22
168	PE19	LCDD12 / LCDD18
169	GND_POWER	
170	PE20	LCDD13 / LCDD19
171	PE21	LCDD14 / LCDD20
172	PE22	LCDD15 / LCDD21
173	PE23	LCDD16 / LCDD22
174	PE24	LCDD17 / LCDD23
175	PB16	SPI1_SPCK / SCK0
176	PB14	SPI1_MISO
177	WAKE_UP	
178	PB15	SPI1_MOSI / CTS0
179	SHUT_DOWN	
180	+3,3 VCC	
181	EN_1V2	NOT USED
182	HDDA_P	
183	VBAT	
184	HDDA_N	
185	GND_POWER	
186	GND_POWER	
187	NRST	
188	Hddb_P	
189	RTCK	
190	Hddb_N	
191	TDO	
192	+3,3 VCC	
193	NTRST	
194	Not Connected	
195	TDI	
196	Not Connected	
197	TCK	

SODIMM PINS	DESCRIPTION	OBSERVATION
198	Not Connected	
199	TMS	
200	Not Connected	

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