

SAM9G45 SODIMM-200 Module

Cost efficient, high performance, reliable

- + Guaranteed availability >5 years (with customer outline agreement)
- + Easy design-in at low risk
- + Cost saving by short development cycles
- + Development board and starter kit available

Features

ARM AT91SAM9G45 processor with 400MHz:

- 32kB Data Cache, 32kB Instruction Cache
- 64kB int. SRAM, 64kB int. ROM

On-Board memory:

- 128MB, up to 512MB DDR2 RAM (EBI1)
- 8MB NOR Flash (EBI2)
- 256MB, up to 4GB NAND (EBI2)

Available interfaces:

- 1x 10/100Mbit Ethernet PHY (DP83848K)
- 1x USB 2.0 High Speed Host (480 Mbit)
- 1x USB 2.0 High Speed Device (480 Mbit)
- 4x USART + 1x DBG-UART
- 2x Synchronous Serial Controller (SSC)
- 2x SPI
- 2x I²C (TWI)
- 1x AC97 Sound CODEC Interface
- 2x High Speed Memory Card Hosts (MCI)
- 8x ADC + Touch Screen Controller with Interrupt Signal
- 1x four channel PWM
- 1x JTAG
- LCD Size up to 2048x2048, or 720p Video
- Image Sensor Interface (ISI)

Access to all available GPIOs!

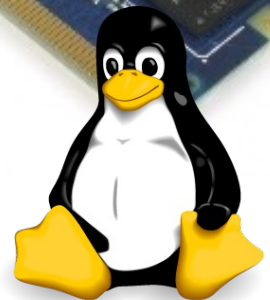
Only one 3.3V to 5V power supply required

Generated On-Board:

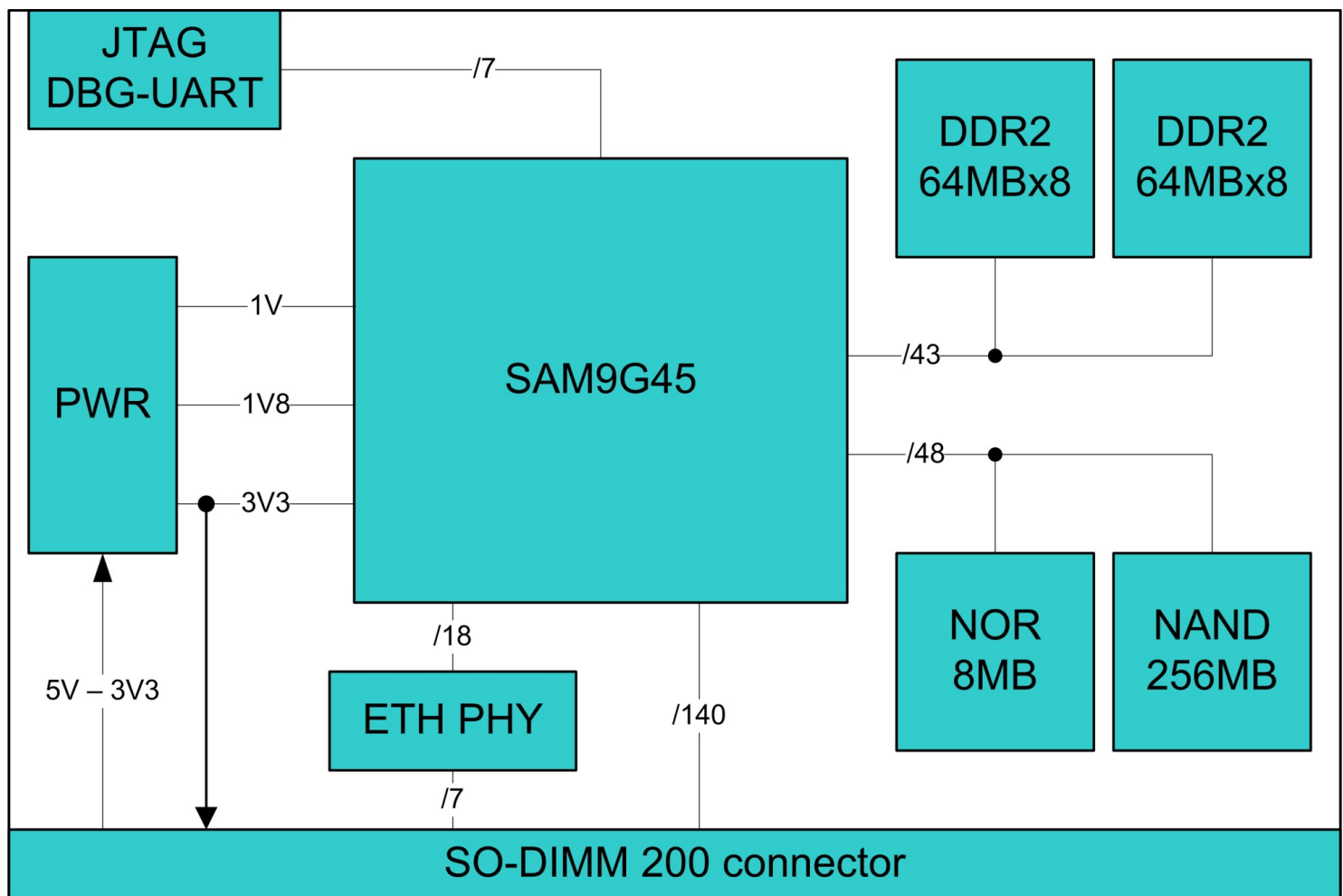
- 3.3V (I/O)
- 1.8V (DDR2)
- 1.0V (Core)
- Power consumption max. 1W

Dimensions:

- 67.6 x 26 x 3.5mm
- Temperature range -10°C to 70°C (optional -40°C to 85°C)



Block diagramm



The ICnova SAM9G45 SODIMM Module incorporates the following features:

- High processor speed at low power consumption
- High bandwidth 128MByte DDR2 RAM on a dedicated memory bus
- Large capacity Flash (8MByte NOR + 256MByte NAND) on a dedicated memory bus
- one ethernet PHY by TI (DP83848K)

Achieving high data rate communication using 100Mbit Ethernet or 480Mbit USB2.0 is easily possible as well as controlling TFT or LCD displays or accessing periphery via SPI, I2C, UART, and many others.

Nearly all signals of the SAM9G45 are available at the pins on the SODIMM module. The memory interface is not provided in order to assure signal integrity.

A detailed description of the pins can be found on the following pages.

Pinout

SODIMM	ICnova SAM9G45 SODIMM200					
Pin	Name	V-Level	I/O Line	Peripheral A	Peripheral B	COMMENTS
1	VCC	3.3 – 5V		power supply input		
2	VCC	3.3 – 5V		power supply input		
3	VCC	3.3 – 5V		power supply input		
4	VCC	3.3 – 5V		power supply input		
5	VDDIO	3.3V		Power outputs		
6	VDDIO	3.3V		Power outputs		
7	VDDIO	3.3V		Power outputs		
8	BMS	3.3V	BMS	Pull to VDDIO: boot from embedded ROM / Sam-BA Monitor Pull to GND : boot from NOR-Flash internally pulled down with 100k		
9	3V3	3.3V		connected to VDDIO		
10	3V3	3.3V		connected to VDDIO		
11	3V3	3.3V		connected to VDDIO		
12	3V3	3.3V		connected to VDDIO		
13	VDDBU	3.3V	VDDBU	connect backup battery here, if not used connect to VDDIO		
14	NC(TRST)	3.3V	NTRST			only revision C
15	RST_OUT	3.3V	low active output of RESET-signal			
16	CREATE_POR_IN	3.3V	connect button to GND to generate a POR-event			
17	RST_IN	3.3V	connect button to GND to generate a RESET			
18	GND	0V	ground			
19	ETH_TXN		TD-			
20	ETH_LINKLED	3.3V	LED_LINK			
21	ETH_TXP		TD+			
22	ETH_3V3	3.3V	VCCA_ETH			
23	ETH_RXN		RD-			
24	ETH_ACTLED	3.3V	LED_SPEED			
25	ETH_RXP		RD+			
26	GND	0V	ground			
27	PC0	3.3V	PC0	DQM2		
28	PC1	3.3V	PC1	DQM3		
29	USBH_DM	3.3V	HHSDMA			
30	NC(TMS)	3.3V	TMS			only revision C
31	USBH_DP	3.3V	HHSDPA			
32	GND	0V	ground			
33	NC		not connected			
34	NC(TDO)	3.3V	TDO			only revision C
35	USBOTG_DM	3.3V	HHSDMB/DHSDM			
36	NC(TDI)	3.3V	TDI			only revision C
37	USBOTG_DP	3.3V	HHSDPB/DHSDP			
38	NC(TCK)	3.3V	TCK			only revision C
39	GND	0V	ground			
40	PA20/TWD0	3.3V	PA20	TWD0		
41	PA21/TWCK0	3.3V	PA21	TWCK0		
42	PE31/PWM2	3.3V	PE31	PWM2	PCK1	
43	RTCK	3.3V	RTCK			
44	PB3/SPI0_CS0	3.3V	PB3	SPI0_NPCS0		
45	PD24/SPI0_CS1	3.3V	PD24	SPI0_NPCS1	PWM0	GPAD4
46	PB1/SPI0_MOSI	3.3V	PB1	SPI0_MOSI		
47	PB0/SPI0_MISO	3.3V	PB0	SPI0_MISO		
48	PB2/SPI0_SCK	3.3V	PB2	SPI0_SPCK		
49	NC		not connected			

Pinout

SODIMM	ICnova SAM9G45 SODIMM200					
Pin	Name	V-Level	I/O Line	Peripheral A	Peripheral B	COMMENTS
50	GND	0V	ground			
51	PC6	3.3V	PC6	A23		
52	PA2/MCI0_DA0	3.3V	PA2	MCI0_DA0	TIOB3	
53	PA3/MCI0_DA1	3.3V	PA3	MCI0_DA1	TCKL4	
54	PA4/MCI0_DA2	3.3V	PA4	MCI0_DA2	TIOA4	
55	PA5/MCI0_DA3	3.3V	PA5	MCI0_DA3	TIOB4	
56	PA1/MCI0_CDA	3.3V	PA1	MCI0_CDA	TIOA3	
57	PA0/MCI0_CK	3.3V	PA0	MCI0_CK	TCLK3	
58	GND	0V	ground			
59	PB19/TXD0	3.3V	PB19	TXD0	SPI0_NPCS2	
60	PB18/RXD0	3.3V	PB18	RXD0	SPI0_NPCS1	
61	PB17/RTS0	3.3V	PB17	SPI1_NPCS0	RTS0	
62	PB15/CTS0	3.3V	PB15	SPI1_MOSI	CTS0	
63	PB4/TXD1	3.3V	PB4	TXD1		
64	PB5/RXD1	3.3V	PB5	RXD1		
65	PD16/RTS1	3.3V	PD16	RTS1		
66	PD17/CTS1	3.3V	PD17	CTS1		
67	PB6/TXD2	3.3V	PB6	TXD2		
68	PB7/RXD2	3.3V	PB7	RXD2		
69	PC9/RTS2	3.3V	PC9	CFCE2	RTS2	
70	PC11/CTS2	3.3V	PC11	NCS5/CFCS1	CTS2	
71	GND	0V	ground			
72	NC		not connected			
73	NC		not connected			
74	NC		not connected			
75	NC		not connected			
76	NC		not connected			
77	NC		not connected			
78	NC		not connected			
79	NC		not connected			
80	NC		not connected			
81	NC		not connected			
82	GND	0V	ground			
83	PD18/IRQ	3.3V	PD18	SPI1_NPCS2	IRQ	
84	PD7/AC97TX	3.3V	PD7	AC97TX	TIOA5	
85	PD6/AC97RX	3.3V	PD6	AC97RX		
86	PD9/AC97CK	3.3V	PD9	AC97CK	TCLK5	
87	PD8/AC97FS	3.3V	PD8	AC97FS	TIOB5	
88	GND	0V	ground			
89	PD5/SSC0_RF	3.3V	PD5	RF0		
90	PD3/SSC0_RD	3.3V	PD3	RD0		
91	PD2/SSC0_TD	3.3V	PD2	TD0		
92	PD0/SSC0_TK	3.3V	PD0	TK0	PWM3	
93	PD1/SSC0_TF	3.3V	PD1	TF0		
94	GND	0V	ground			
95	PC7	3.3V	PC7	A24		
96	PA23/MCI1_DA0	3.3V	PA23	MCI1_DA0	RTS3	
97	PA24/MCI1_DA1	3.3V	PA24	MCI1_DA1	CTS3	
98	PA25/MCI1_DA2	3.3V	PA25	MCI1_DA2	PWM3	
99	PA26/MCI1_DA3	3.3V	PA26	MCI1_DA3	TIOB2	

Pinout

SODIMM	ICnova SAM9G45 SODIMM200					
Pin	Name	V-Level	I/O Line	Peripheral A	Peripheral B	COMMENTS
100	PA22/MCI1_CDA	3.3V	PA22	MCI1_CDA	SCK3	
101	PA31/MCI1_CK	3.3V	PA31	MCI1_CK	PCK0	
102	GND	0V	ground			
103	PB20/ISI_D0	3.3V	PB20	ISI_D0		
104	PB21/ISI_D1	3.3V	PB21	ISI_D1		
105	PB22/ISI_D2	3.3V	PB22	ISI_D2		
106	PB23/ISI_D3	3.3V	PB23	ISI_D3		
107	PB24/ISI_D4	3.3V	PB24	ISI_D4		
108	PB25/ISI_D5	3.3V	PB25	ISI_D5		
109	PB26/ISI_D6	3.3V	PB26	ISI_D6		
110	PB27/ISI_D7	3.3V	PB27	ISI_D7		
111	GND	0V	ground			
112	PB30/ISI_HS	3.3V	PB30	ISI_HSYNC		
113	PB29/ISI_VS	3.3V	PB29	ISI_VSYNC		
114	PB28/ISI_PCK	3.3V	PB28	ISI_PCK		
115	PB31/ISI_MCK	3.3V	PB31	ISI_MCK	PCK1	
116	GND	0V	ground			
117	PE7/LCD_D0	3.3V	PE7	LCDD0	LCDD2	
118	PE8/LCD_D1	3.3V	PE8	LCDD1	LCDD3	
119	PE9/LCD_D2	3.3V	PE9	LCDD2	LCDD4	
120	PE10/LCD_D3	3.3V	PE10	LCDD3	LCDD5	
121	PE11/LCD_D4	3.3V	PE11	LCDD4	LCDD6	
122	PE12/LCD_D5	3.3V	PE12	LCDD5	LCDD7	
123	PE13/LCD_D6	3.3V	PE13	LCDD6	LCDD10	
124	PE14/LCD_D7	3.3V	PE14	LCDD7	LCDD11	
125	PE15/LCD_D8	3.3V	PE15	LCDD8	LCDD12	
126	PE16/LCD_D9	3.3V	PE16	LCDD9	LCDD13	
127	PE17/LCD_D10	3.3V	PE17	LCDD10	LCDD14	
128	PE18/LCD_D11	3.3V	PE18	LCDD11	LCDD15	
129	GND	0V	ground			
130	PE19/LCD_D12	3.3V	PE19	LCDD12	LCDD18	
131	PE20/LCD_D13	3.3V	PE20	LCDD13	LCDD19	
132	PE21/LCD_D14	3.3V	PE21	LCDD14	LCDD20	
133	PE22/LCD_D15	3.3V	PE22	LCDD15	LCDD21	
134	PE23/LCD_D16	3.3V	PE23	LCDD16	LCDD22	
135	PE24/LCD_D17	3.3V	PE24	LCDD17	LCDD23	
136	PE25/LCD_D18	3.3V	PE25	LCDD18		
137	PE26/LCD_D19	3.3V	PE26	LCDD19		
138	PE27/LCD_D20	3.3V	PE27	LCDD20		
139	PE28/LCD_D21	3.3V	PE28	LCDD21		
140	PE29/LCD_D22	3.3V	PE29	LCDD22		
141	PE30/LCD_D23	3.3V	PE30	LCDD23		
142	GND	0V	ground			
143	PE4/LCD_HS	3.3V	PE4	LCDHSYNC		
144	PE3/LCD_VS	3.3V	PE3	LCDVSYNC		
145	PE0/LCD_PWR	3.3V	PE0	LCDPWR	PCK0	
146	PE5/LCD_PCLK	3.3V	PE5	LCDDOTCLK		
147	GND	0V	ground			
148	NC		not connected			
149	PE2/LCD_CC	3.3V	PE2	LCDDCC		

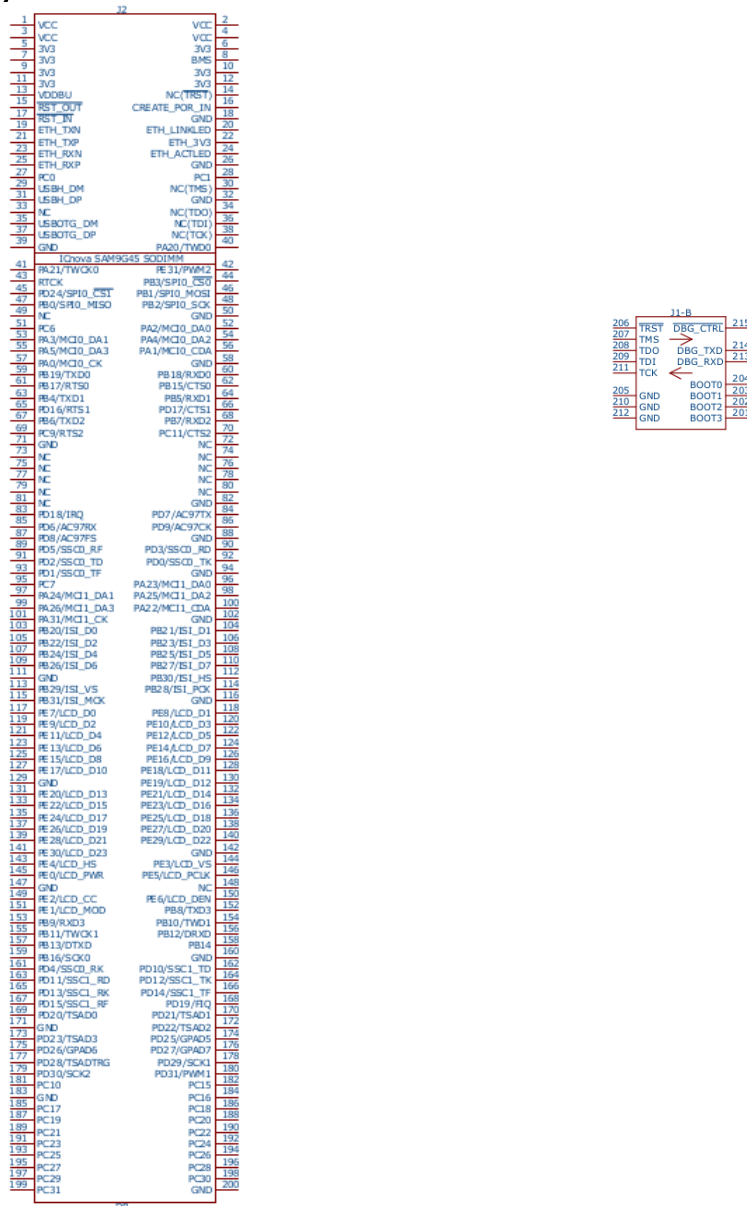
Pinout

SODIMM		ICnova SAM9G45 SODIMM200				
Pin	Name	V-Level	I/O Line	Peripheral A	Peripheral B	COMMENTS
150	PE6/LCD_DEN	3.3V	PE6	LCDDEN		
151	PE1/LCD_MOD	3.3V	PE1	LCDMOD		
152	PB8/TXD3	3.3V	PB8	TXD3	ISI_D8	
153	PB9/RXD3	3.3V	PB9	RXD3	ISI_D9	
154	PB10/TWD1	3.3V	PB10	TWD1	ISI_D10	
155	PB11/TWCK1	3.3V	PB11	TWCK1	ISI_D11	
156	PB12/DRXD	3.3V	PB12	DRXD		NC if DBG_CTRL connected to GND
157	PB13/DTXD	3.3V	PB13	DTXD		
158	PB14	3.3V	PB14	SPI1_MISO		
159	PB16/SCK0	3.3V	PB16	SPI1_SPCK	SCK0	
160	GND	0V	ground			
161	PD4/SSC0_RK	3.3V	PD4	RK0		
162	PD10/SSC1_TD	3.3V	PD10	TD1		
163	PD11/SSC1_RD	3.3V	PD11	RD1		
164	PD12/SSC1_TK	3.3V	PD12	TK1	PCK0	
165	PD13/SSC1_RK	3.3V	PD13	RK1		
166	PD14/SSC1_TF	3.3V	PD14	TF1		
167	PD15/SSC1_RF	3.3V	PD15	RF1		
168	PD19/FIQ	3.3V	PD19	SPI1_NPCS3	FIQ	
169	PD20/TSAD0	3.3V	PD20	TIOA0		TSAD0
170	PD21/TSAD1	3.3V	PD21	TIOA1		TSAD1
171	GND	0V	ground			
172	PD22/TSAD2	3.3V	PD22	TIOA2		TSAD2
173	PD23/TSAD3	3.3V	PD23	TCLK0		TSAD3
174	PD25/GPAD5	3.3V	PD25	SPI0_NPCS2	PWM1	GPAD5
175	PD26/GPAD6	3.3V	PD26	PCK0	PWM2	GPAD6
176	PD27/GPAD7	3.3V	PD27	PCK1	SPI0_NPCS3	GPAD7
177	PD28/TSADTRG	3.3V	PD28	TSADTRG	SPI1_NPCS1	
178	PD29/SCK1	3.3V	PD29	TCLK1	SCK1	
179	PD30/SCK2	3.3V	PD30	TIOB0	SCK2	
180	PD31/PWM1	3.3V	PD31	TIOB1	PWM1	
181	PC10	3.3V	PC10	NCS4/CFCS0	TCLK2	
182	PC15	3.3V	PC15	NWAIT		
183	GND	0V	ground			
184	PC16	3.3V	PC16	D16		PC16 on revision A
185	PC17	3.3V	PC17	D17		PC17 on revision A
186	PC18	3.3V	PC18	D18		PC18 on revision A
187	PC19	3.3V	PC19	D19		PC19 on revision A
188	PC20	3.3V	PC20	D20		GND on revision A
189	PC21	3.3V	PC21	D21		
190	PC22	3.3V	PC22	D22		
191	PC23	3.3V	PC23	D23		
192	PC24	3.3V	PC24	D24		
193	PC25	3.3V	PC25	D25		
194	PC26	3.3V	PC26	D26		
195	PC27	3.3V	PC27	D27		
196	PC28	3.3V	PC28	D28		
197	PC29	3.3V	PC29	D29		
198	PC30	3.3V	PC30	D30		
199	PC31	3.3V	PC31	D31		
200	GND	0V	ground			

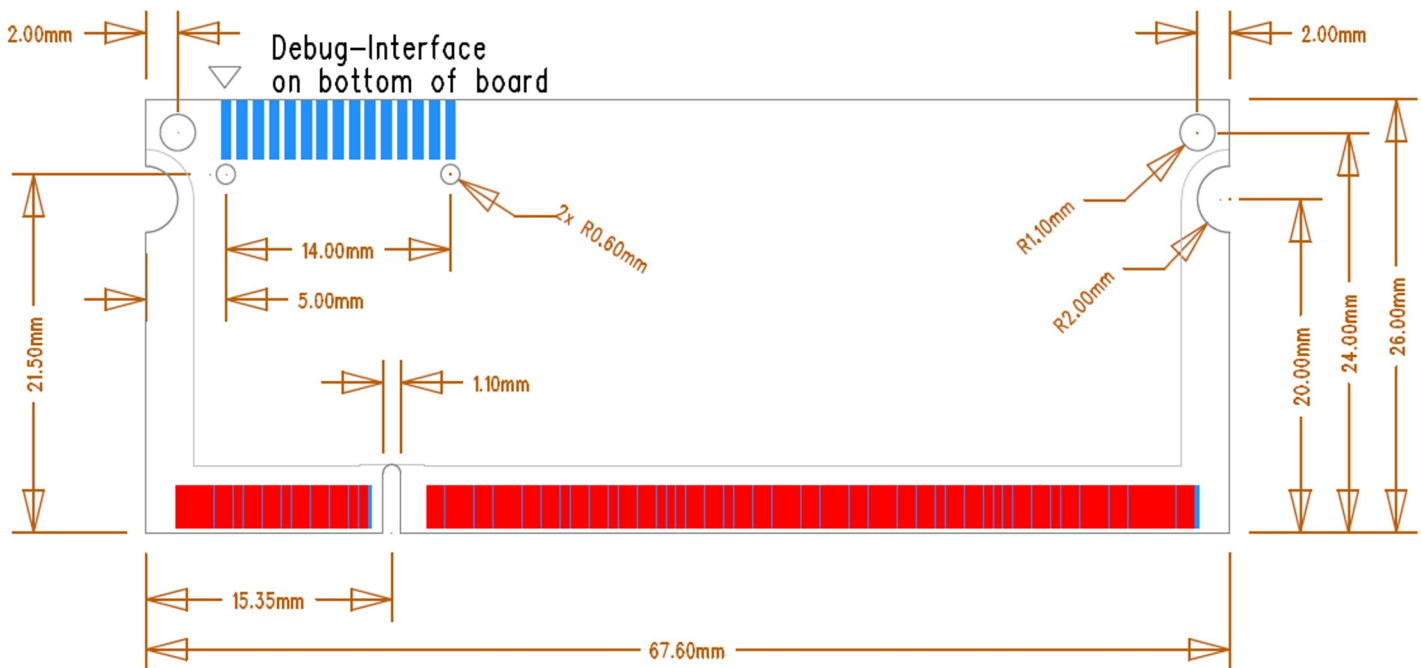
Pinout

SODIMM	ICnova SAM9G45 SODIMM200					
Pin	Name	V-Level	I/O Line	Peripheral A	Peripheral B	COMMENTS
201	BOOT3					not connected
202	BOOT2					not connected
203	BOOT1					not connected
204	BOOT0					not connected
205	GND	0V				ground
206	TRST	3.3V	NTRST			
207	TMS	3.3V	TMS			
208	TDO	3.3V	TDO			
209	TDI	3.3V	TDI			
210	GND	0V				ground
211	TCK	3.3V	TCK			
212	GND	0V				ground
213	DBG_RXD	3.3V	PB12	DRXD		
214	DBG_TXD	3.3V	PB13	DTXD		
215	DBG_CTRL	3.3V				connect to GND if DBG-UART is used for debugging

Schematic symbol for SAM9G45



Mechanical dimension



Pin1

Pin199



Pin200

Pin2

The ICnova SAM9G45 SODIMM module fits in a regular SO-DIMM 200 2.5V socket.
We recommend the following part:

Manufacturer	Part number	Height	Total height	Board to board space
TE Connectivity	1612618-1	9,2 mm	9,7 mm	7 mm

Application

The ADB4004 is designed as evaluation board for the SAM9G45 module. Also a starter kit consisting of the ADB4004 and a SAM9G45 module with pre-installed Linux-OS is available.



We also offer:

- Hardware design of base boards optimized for your application
- Prototype and mass production using our in-house production lines
- Assembly options, adapted to your requirements, of our standard products
- Linux driver development and adaption



Contact

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Change history:

Version	Date	Changes	Editor
A	03.11.2010	First Version	Stork
B	24.01.2011	Update pinlist, Order information	Träger
C	30.07.2014	Add information for module revision C and evaluation board	Schmidt