

Glomation



Evaluation Carrier Board
GECB-9GX5
Quick Start Guide

Preliminary

Table of Contents

Chapter 1 – Introducing the GECB-9GX5 Carrier Board	4
GECB-9GX5 Overview	4
Integrated Features.....	4
Chapter 2 – GECB-9GX5 Function Blocks.....	6
GECM-9GX5 SODIMM Module	6
Reset Circuitry	6
Power Supply	7
SODIMM 200 Interface	7
Connector.....	10
USB.....	10
Ethernet.....	11
RS-232 Port 0 and 1	11
RS-485	12
GPIO, SPI, I2C, LCD, etc.....	12
JTAG.....	15
Power Requirement.....	16

Preliminary

List of Tables

Table 1 Power Sources.....	7
Table 2 J1 SODIMM 200 Card Edge Connector.....	7
Table 3 J17 USB Device Port.....	11
Table 4 UART Port P0 Connector on GECB-9GX5.....	11
Table 5 UART Port P1 Connector.....	11
Table 6 RS-485 Port J8.....	12
Table 7 J20 JTAG Connector.....	16
Table 8 J1 Power Supply Connector.....	16

List of Figures

Figure 1 GECB-9GX5 Carrier Board.....	4
Figure 2 GECB-9GX5 Block Diagram.....	6
Figure 3 SODIMM.....	10
Figure 4 GPIO Header 1.....	13
Figure 5 GPIO Header 2.....	14
Figure 6 GPIO Header 3.....	15

Chapter 1 – Introducing the GECB-9GX5 Carrier Board

GECB-9GX5 Overview

The GECB-9GX5 is a compact sized evaluation board for the GECM-9G25/35 CPU Module. The GECM-9G25/35 embedded module plugs in the standard SODIMM socket on the GECB-9GX5 board. The GECB-9GX5 includes most common used peripheral functions to allow quick evaluation of the GECM-9G25/35 functionalities.



Figure 1 GECB-9GX5 Carrier Board

Integrated Features

The GECB-9GX5 includes the following features,

- 10/100 Mbps Ethernet MAC

- 12 channel 10-bit Analog-to-Digital Converter (ADC)
- 2 RS-232 ports (including one debug port)
- 2 USB Host Port
- 1 USB Device Port
- Real-Time Clock
- Hardware Debug Interface
- Micro SD/MMC Socket
- I2C Port
- SPI Port
- GPIO ports
- LCD interface signals for GECM-9G35

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Chapter 2 – GECB-9GX5 Function Blocks

The following diagram shows the GECB-9GX5 board architecture.

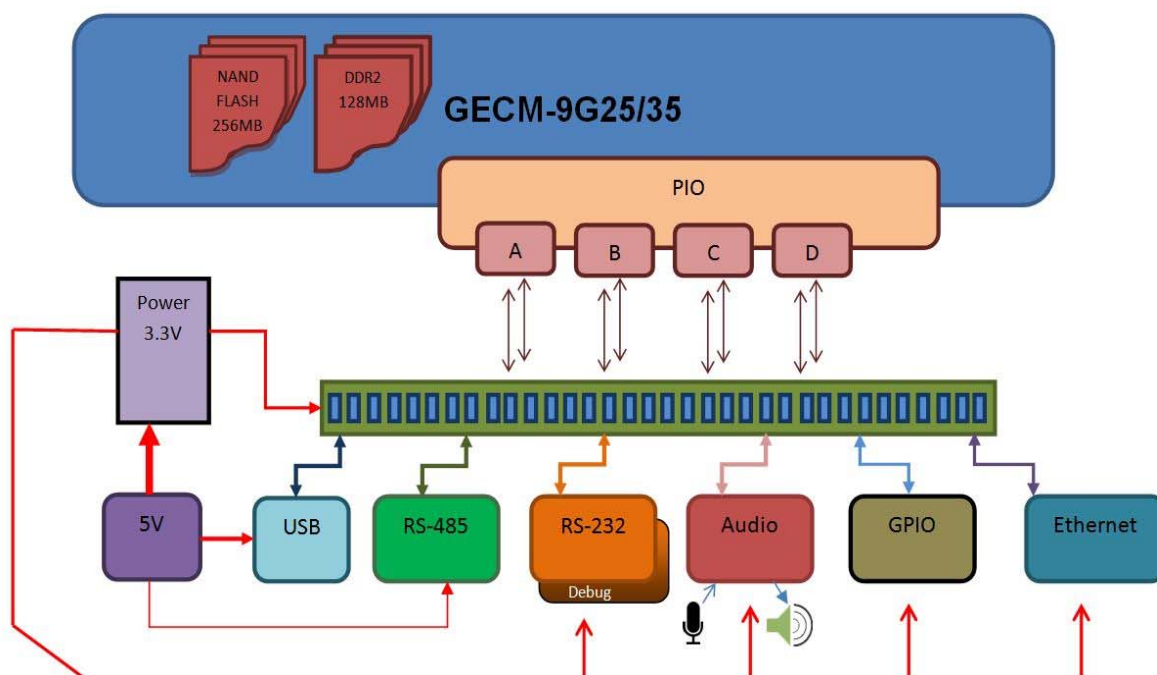


Figure 2 GECB-9GX5 Block Diagram

GECM-9GX5 SODIMM Module

The GECB-9GX5 is designed to work with Glomation GECM-9Gx5 SODIMM CPU modules. The GECM-9Gx5 module typically includes a Atmel AT91SAM9Gx5 series core processor on the computer module, 128MByte of DDR2RAM (double data rate synchronous dynamic memory), and 256 Mbytes of NAND FLASH memory.

Reset Circuitry

The reset sources for the GECB-9GX5 are,

- Power on reset
- Push button reset (from carrier board)
- JTAG reset from an in-circuit emulator (option JTAG interface on carrier board)

Power Supply

The GECB-9GX5 CPU Module contains its own power supply generation circuit to generate necessary power source for the processor and main memory. Additional power source for other peripheral functions should be provided by carrier board to the CPU module through the SODIMM interface. The following table lists the power source and functionality.

Table 1 Power Sources

Nominal	Name	Powers	Source
3.3V	VDDNF	NAND Flash and D16 ~ D32 Multiplex SMC Data Lines	Derived from 3.3V From SODIMM connector. Output to the SODIMM as VDDNF for carrier board voltage shifter (if needed).
3.3V	VDDIOP0	Partial Peripheral I/O lines	From SODIMM connector
3.3V	VDDIOP1	Partial Peripheral I/O lines	From SODIMM connector
3.0V	VDDBU	The Slow Clock Oscillator, the 32KHz RC, the Internal 12MHz RC and Part of the System Controller	From SODIMM connector
3.3V	VDDUTMII	The USB Device and Host UTMII+ Interface	From SODIMM connector
3.3V	VDDOSC	The Main Oscillator Cell	From SODIMM connector
3.3V	VDDANA	The Analog to Digital Converter	From SODIMM connector
1.8V	VDDIOM	The External Memory Interface	On-board Power Supply
1.0V	VDDUTMIC	DC Supply UDPHS and UPHS UTMI+ Core	On-board Power Supply
3.3V	VDDPLLUTMI	DC Supply UDPHS and UPHS UTMI interface	From SODIMM connector
1.0V	VDDPLLA	The PLLA Cell	From SODIMM connector
1.0V	VDDCORE	CPU Core Power Supply	On-board Power Supply
3.0V/3.3V	ADVREF	ADC Reference voltage	From SODIMM connector

SODIMM 200 Interface

The GECB-9GX5 CPU Module uses SODIMM card edge connector to interface the GECM-9Gx5 series CPU modules.

Table 2 J1 SODIMM 200 Card Edge Connector

Function	Type	x5 pad and name	SODIMM 200		x5 pad and name	Type	Function
		Front Side	A	B	Back Side		
VCC 3V3		Power Input	1	2	Power Input		VCC 3V3
VCC 3V3		Power Input	3	4	Power Input		VCC 3V3

GND			5	6	Power Input	VBAT	
USBC_DP	I/O	USB Data Positive	7	8		SYSC	JTAGSEL
USBC_DM	I/O	USB Data Negative	9	10		SYSC	WKUP
GND			11	12		SYSC	SHDN
USBB_DM	I/O	USB Data Negative	13	14		SYSC	BMS
USBB_DP	I/O	USB Data Positive	15	16		SYSC	NRST
GND			17	18		SYSC	NTRST
DIBP	I/O		19	20		RSTJTAG	TDI
DIBN	I/O		21	22		RSTJTAG	TCK
GBN			23	24		RSTJTAG	TMS
USBA_DM	I/O	USB Data Negative	25	26		RSTJTAG	TDO
USBA_DP	I/O	USB Data Positive	27	28		RSTJTAG	RTCK
GND			29	30	Power Enable Input		PWR_EN
RFU		RFU	31	32	RFU		RFU
RFU		RFU	33	34	RFU		RFU
RFU		RFU	35	36	RFU		RFU
RFU		RFU	37	38	RFU		RFU
RFU		RFU	39	40	RFU		RFU
GND			41	42			GND
RFU		RFU	43	44	RFU		RFU
RFU		RFU	45	46	RFU		RFU
RFU		RFU	47	48	RFU		RFU
RFU		RFU	49	50	RFU		RFU
GND			51	52			GND
RFU		RFU	53	54	RFU		RFU
RFU		RFU	55	56	RFU		RFU
RFU		RFU	57	58	RFU		RFU
RFU		RFU	59	60	RFU		RFU
VDDNF	NAND FLASH Power Domain		61	62	NAND FLASH Power Domain		VDDNF
PD0	GPIO D	NANDOE	63	64	NANDWE	GPIO D	PD1
PD2	GPIO D	A21/NANDALE	65	66	A22/NANDCLE	GPIO D	PD3
PD4	GPIO D	NCS3	67	68	NWAIT	GPIO D	PD5
PD6	GPIO D	D16	69	70	D17	GPIO D	PD7
PD8	GPIO D	D18	71	72	D19	GPIO D	PD9
GND			73	74			GND
PD10	GPIO D	D20	75	76	D21	GPIO D	PD11
PD12	GPIO D	D22	77	78	D23	GPIO D	PD13
PD14	GPIO D	D24	79	80	D25/A20	GPIO D	PD15
PD16	GPIO D	D26/A23	81	82	D27/A24	GPIO D	PD17
PD18	GPIO D	D28/A25	83	84	D29/NCS2	GPIO D	PD19
PD20	GPIO D	D30/NCS4	85	86	D31/NCS5	GPIO D	PD21
VDDIOP0	POWER INPUT		87	88	POWER INPUT		VDDIOP0
PA0	GPIO A	TXD0/SPI1-NPCS1	89	90	RXD0/SPI0-NPCS2	GPIO A	PA1
PA2	GPIO A	MCI1_DA1/E0_ETX0	91	92	CTS0/MCI1_DA2/E0_ETX1	GPIO A	PA3
PA4	GPIO A	SCK0/MCI1_DA3/E0_ETXER	93	94			GND
PA11	GPIO A	SPI0_MISO/MCI1_DA0	95	96	SPI0_MOSI/MCI1_CDA	GPIO A	PA12
PA13	GPIO A	SPI0_SPCK/MCI1_CK	97	98	SPI0_NPCS0	GPIO A	PA14
GND			99	100	TXD2/SPI0_NPCS1	GPIOA	PA7
PA8	GPIO A	RCD2/SPI1_NPCS0	101	102	TIOA0/SPI1_MISO	GPIO A	PA21

PA22	GPIO A	TIOA1/SPI1_MOS1	103	104	TIOA2/SPI1_SPCK	GPIO A	PA23
PA31	GPIO A	TWCK0/SPI1_NPC S2/E0_ETXEN	105	106	TWD0/SPI1_NPCS3 /E0_EMDC	GPIO A	PA30
GND			107	108	MCI0_DA0	GPIO A	PA15
PA16	GPIO A	MCI0_CDA	109	110	MCI0_CK	GPIO A	PA17
PA18	GPIO A	MCI0_DA1	111	112	MCI0_DA2	GPIO A	PA19
PA20	GPIO A	MCI0_DA3	113	114			GND
PA5	GPIO A	TXD1/CANTX1	115	116	RXD1/CANRX1	GPIO A	PA6
PA10	GPIO A	DTXD/CANTX0	117	118	DRXD/CANRX0	GPIO A	PA9
GND			119	120	TCLK0/TK	GPIO A	PA24
PA25	GPIO A	TCLK1/TF	121	122	TCLK2/TD	GPIO A	PA26
PA27	GPIO A	TIOB0/RD	123	124	TIOB1/RK	GPIO A	PA28
PA29	GPIO A	TIOB2/RF	125	126			GND
VDDOIP1	POWER INPUT		127	128	POWER INPUT		VDDIOP1
PC0	GPIO C	LCDDAT0/ISI_D0	129	130	LCDDAT1	GPIO C	PC1
PC2	GPIO C	LCDDAT2/ISI_D2	131	132	LCDDAT3	GPIO C	PC3
PC4	GPIO C	LCDDAT4	133	134	LCDDAT5	GPIO C	PC5
GND			135	136	LCDDAT6	GPIO C	PC6
PC7	GPIO C	LCDDAT7	137	138	LCDDAT8	GPIO C	PC8
PC9	GPIO C	LCDDAT9	139	140	LCDDAT10	GPIO C	PC10
PC11	GPIO C	LCDDAT11	141	142			GND
PC12	GPIO C	LCDDAT12	143	144	LCDDAT13	GPIO C	PC13
PC14	GPIO C	LCDDAT14	145	146	LCDDAT15	GPIO C	PC15
GND			147	148	LCDDAT16	GPIO C	PC16
PC17	GPIO C	LCDDAT17	149	150	LCDDAT18	GPIO C	PC18
PC19	GPIO C	LCDDAY19	151	152	LCDDAT20	GPIO C	PC20
PC21	GPIO C	LCDDAT21	153	154			GND
PC22	GPIO C	LCDDAT22	155	156	LCDDAT23	GPIO C	PC23
PC24	GPIO C	LCDDSIP	157	158		GPIO C	PC25
PC26	GPIO C	LCDPWM	159	160	LCDVSYNC	GPIO C	PC27
GND			161	162	LCDHSYNC	GPIO C	PC28
PC29	GPIO C	LCDDEN	163	164	E1_MDC	GPIO C	PC30
PC31	GPIO C	E1_MDIO	165	166			SELCONFIG
VDDANA	POWER INPUT		167	168	POWER INPUT		VDDANA
PB0	GPIO B	E0_RX0	169	170	E0_RX1	GPIO B	PB1
PB2	GPIO B	E0_RXER	171	172	E0_RXDV	GPIO B	PB3
PB4	GPIO B	E0_TXCK	173	174	E0_MDIO	GPIO B	PB5
PB6	GPIO B	E0_MDC	175	176	E0_TXEN	GPIO B	PB7
PB8	GPIO B	E0_TXER	177	178	GNDANA		
PB9	GPIO B	E0_TX0	179	180	E0_TX1	GPIO B	PB10
PB11	GPIO B	E0_TX2	181	182	E0_TX3	GPIO B	PB12
PB13	GPIO B	E0_RX2	183	184	E0_RX3	GPIO B	PB14
PB15	GPIO B	E0_RXCK	185	186	E0_CRS	GPIO B	PB16
PB17	GPIO B	E0_COL	187	188	GNDANA		
PB18	GPIO B	IRQ	189	190	A/D Voltage Reference		POWR_REF
GND			191	192			LED0
ETH0_TX+			193	194			LED1
ETH0_TX-			195	196			LED2
ETH0_RX+			197	198			AVDDT
ETH0_RX-			199	200			GND_ETH

Connector

The GECB-9GX5 CPU Module uses SODIMM card edge connector to interface the carrier board. The board dimensions is shown below.

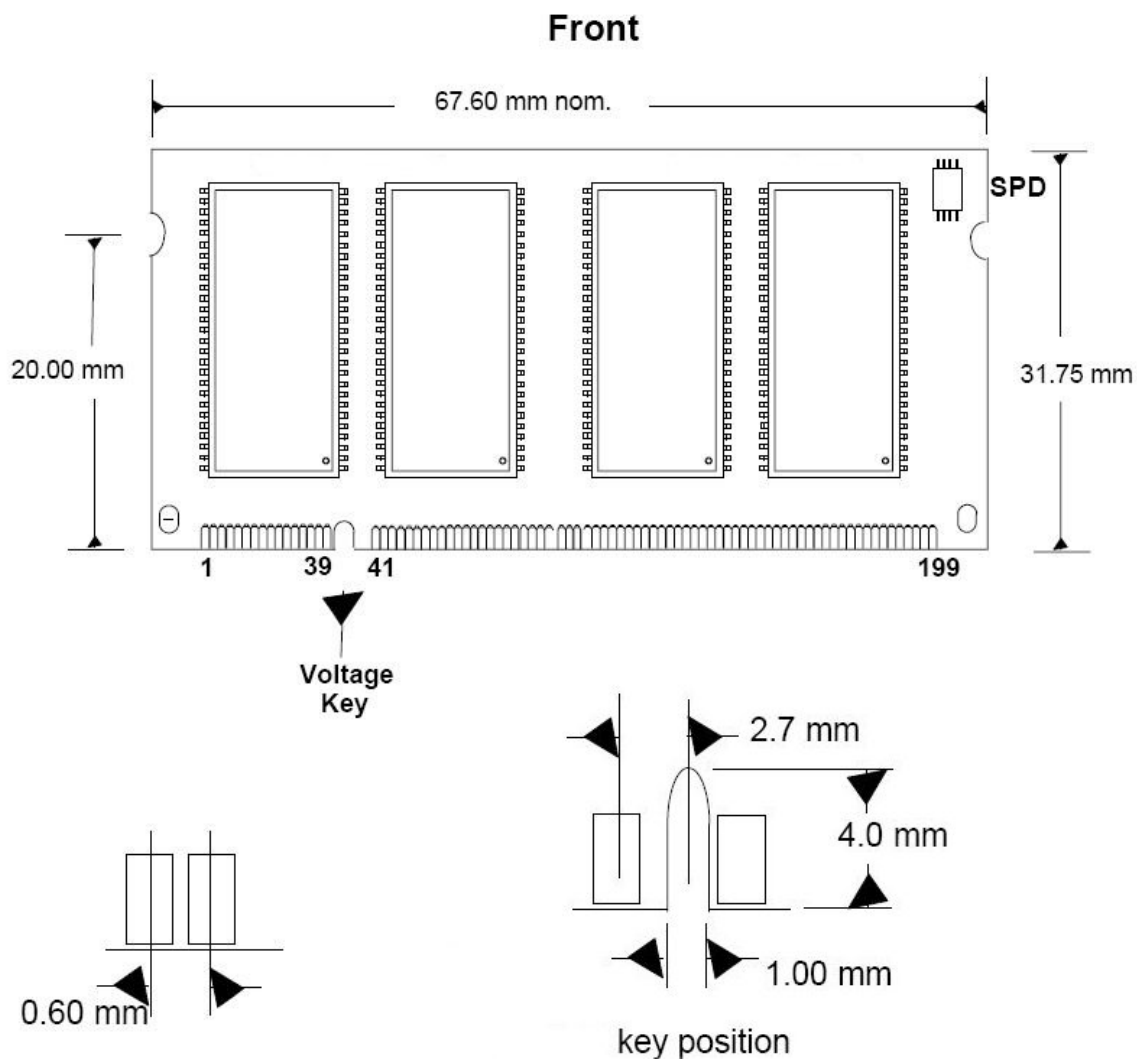


Figure 3 SODIMM

USB

The GECB-9GX5 Carrier Board provides two USB host connections. The USB host ports are brought out by a standard double deck USB type A connector.

The GECB-9GX5 Carrier Board provides one USB device port. The USB Device Port (UDP) is compliant with the Universal Serial Bus (USB) V2.0 full-speed device specification.

Table 3 J17 USB Device Port

Pin Number	Signal Name
1	USB connection
2	DM
3	DP
4	GROUND
5	GROUND

Ethernet

The GECB-9GX5 Carrier Board is shipped with support for a complete Ethernet interface. The 100Base-X / 10Base-T Ethernet interface is on a standard RJ45 connector.

RS-232 Port 0 and 1

The GECB-9GX5 Carrier Board is shipped with one 3-wire RS-232 UART interface, and one 5 wire RS-232 UART interface.

The port 0 is the debug USART port. The P0 connector is the 3 pin header on GECB-9GX5. The signal designation is listed in the following tables.

Table 4 UART Port P0 Connector on GECB-9GX5

Pin Number	Signal Name
1	RX
2	TX
3	GND

The serial port 1 is the USART 0 on the GECM-9Gx5 SODIMM module. It is provided via the DB-9 connector on GECB-9GX5.

Table 5 UART Port P1 Connector

Pin Number	Signal Name	Pin Number	Signal Name
1	NC	2	RX
3	TX	4	NC
5	GND	6	NC
7	RTS	8	CTS
9	NC	10	NC/NA

RS-485

The The GECB-9GX5 Carrier Board provides one half duplex RS-485 port. The RS-485 port is connected to USART3 with RTS signal for RS-485 driver direction control. The RS-485 signal is provided via a 1x3 2.54mm spacing header J8. J6 enables the on-board 120 ohm termination resistor.

Table 6 RS-485 Port J8

Pin Number	Signal Name
1	A
2	B
3	GND

The RTS3 is connected to the RS-485 driver chip for data direction control. The normal setting of RTS signal is normally low. For RS-485 mode the RTS signal must set to normally high. The user program must set the RTS mode before RS-485 port can be used.

GPIO, SPI, I2C, LCD, etc

The GECB-9GX5 Carrier Board provides GPIO, SPI, I2C, LCD connections using three 2x20 2.54mm spacing headers. The signal assignments is shown in the following diagrams.

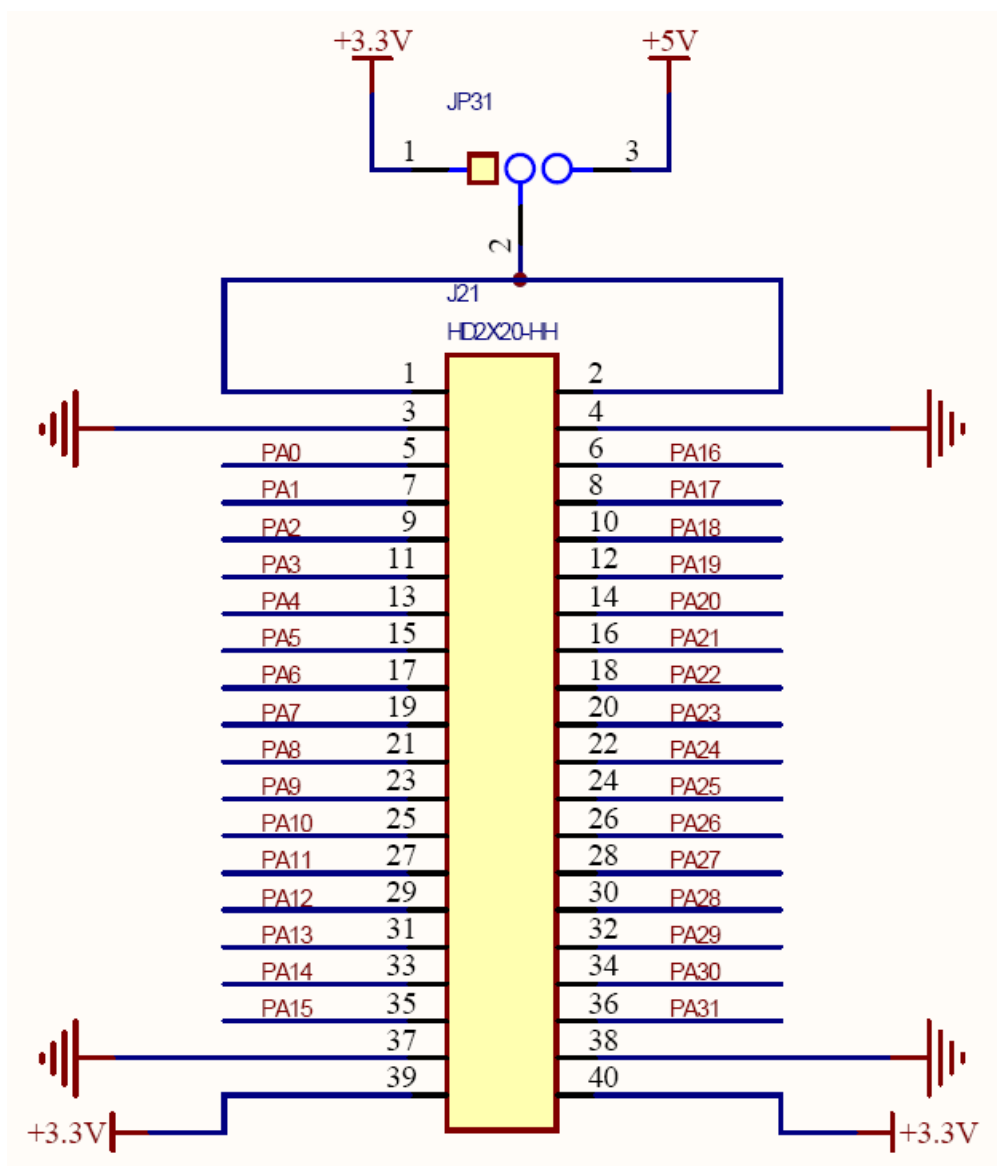


Figure 4 GPIO Header 1

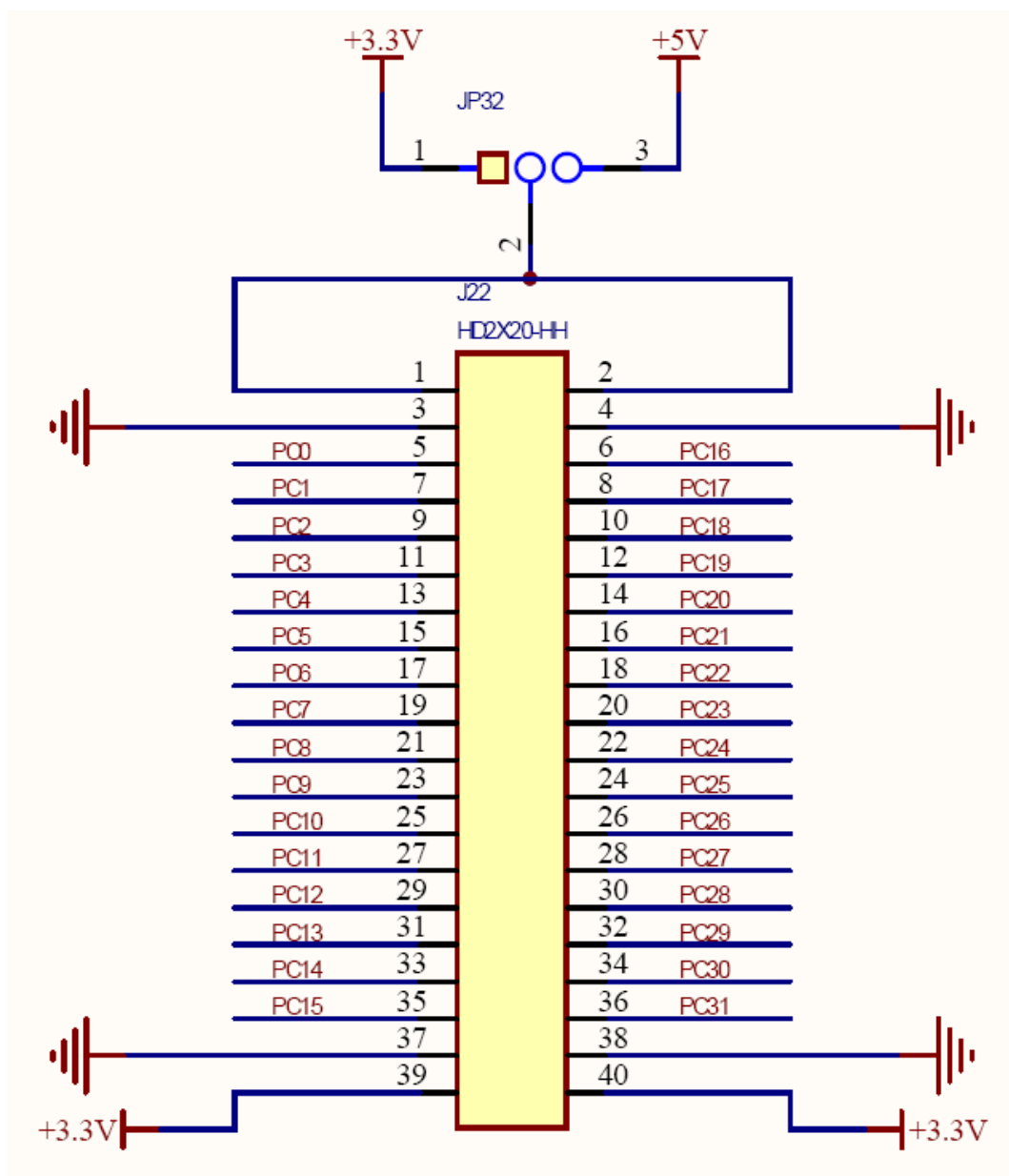


Figure 5 GPIO Header 2

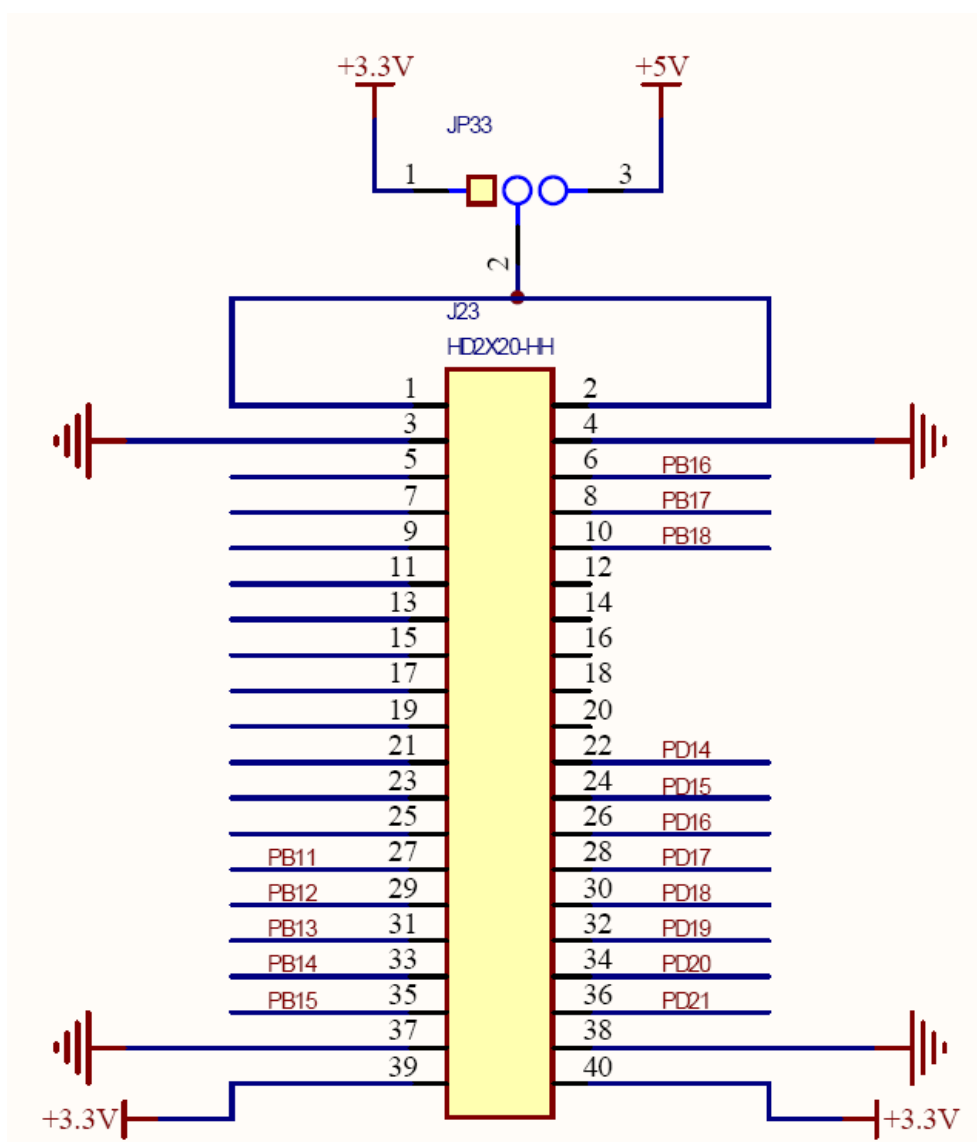


Figure 6 GPIO Header 3

JTAG

The GECB-9GX5 Carrier Board is shipped with a 10 pin connector that provides JTAG debug signals for the CPU. The JTAG provides the user with the ability to debug system level programs. The signal designation is listed in the following table.

Table 7 J20 JTAG Connector

Pin Number	Signal Name	Pin Number	Signal Name
1	3.3V	2	3.3V
3	NTRST	4	TDI
5	TMS	6	TCK
7	RTCK	8	TDO
9	GND	10	GND

Power Requirement

The GECB-9GX5 Carrier Board requires regulated 5V DC. The power supply should have minimum 300mA capacity.

Table 8 J1 Power Supply Connector

Pin Number	Signal Name
1	5V DC
2	GND