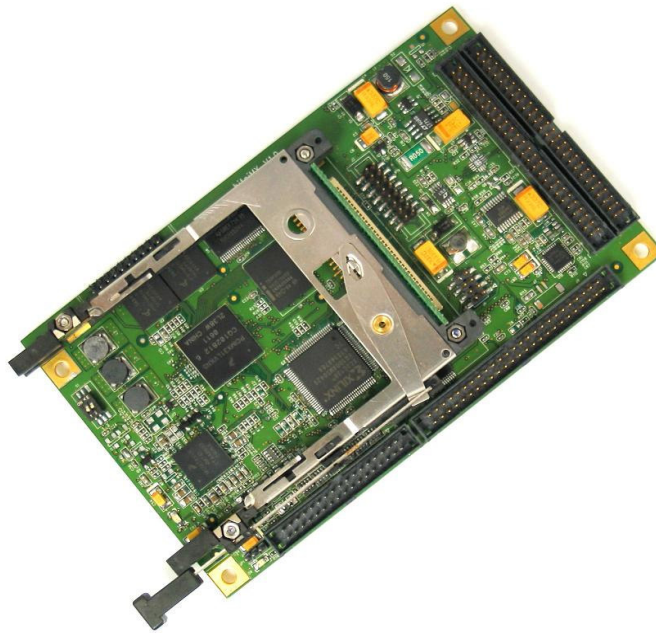


Bitsy G5

User's Manual



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About the Cover Image

The cover image shows a revision 3 Bitsy G5.

Printing this Manual

This manual has been designed for printing on both sides of an 8.5x11 inch paper, but can be printed single-sided as well. It has also been optimized for use in electronic form with active cross-reference links for quick access to information.

Organization of this Manual

The manual organizes information in seven key sections:

Introduction	Provides an overview of the functionality and organization of the Bitsy G5.
Getting Started	Describes the platform for developing applications, as well as how to obtain additional information.
Hardware Reference	Defines the configuration settings and pinouts for all connectors and jumpers on the Bitsy G5.
Feature Reference	Gives details about the various subsystems of the Bitsy G5.
Power Management	Provides key information about power management and tips for system integration.
System Specifications	Specifies mechanical and electrical interfaces.
Revision History	Identifies and explains board revisions.

To locate the information you need, try the following:

1. Browse the *Table of Contents*. Section titles include connector designators and their function.
2. Follow cross-references between sections.
3. View and search this manual in PDF format.

Revision History

The following list summarizes the changes that have been made between released revisions of the manual.

REV	DESCRIPTION	BY
1	Preliminary release of Sections 1,2,3 and 7	08/09/2007 ch
2	Second preliminary release Added details about Bitsy G5 personality board Updated block diagrams Marked deprecated signals as "reserved"	9/20/07 ch

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1 Introduction

1.1 Overview

The Bitsy G5 is a full-featured single board computer using the Freescale i.MX31 multimedia applications processor. The Bitsy G5 is designed to meet the needs of embedded and graphical systems developers.

This manual applies to the latest revision of the Bitsy G5, as listed in the revision history, section 7.2.

1.2 Features

1.2.1 Processor

- Freescale i.MX31 32-bit ARM RISC Processor
- ARM1136JF-S core with Vector Floating Point Coprocessor and Multi-level Cache System
- Multimedia support including VGA MPEG-4 Hardware Encoder, Image Processing Unit and Graphics Accelerator
- Clock rates up to 532 MHz

1.2.2 Power Supply

- 6-15 V main power input
- Freescale MC13783 Power Management and Audio Circuit

1.2.3 Memory

- 128 MiB DDR SDRAM¹
- 32 MiB NOR Flash memory²
- PCMCIA, Type I and II, 3.3 and 5 V
- Battery-backed real-time clock

¹ MiB is the IEC abbreviation for mebibyte = 2^{20} byte = 1 048 576 byte. The kibi and mebi prefixes are based on the 1998 IEC standard for binary multiples. For further reading, see the US NIST web site, <http://physics.nist.gov/cuu/Units/binary.html>

² The Bitsy G5 supports up to 64 MiB of NOR flash memory.

1.2.4 Communications

- USB 2.0 Host port supporting high (480 Mbps), full (12 Mbps) and low (1.5 Mbps) speeds
- On-The-Go (OTG) port supporting full and low speeds
- Three Serial ports
 - Serial 1: EIA-232 (9-wire)³
 - Serial 2: 3.3 V logic level (3-wire)⁴
 - Serial 3: EIA-232 (5-wire)³
- I²C bus with I²C master device
- Serial Peripheral Interface (SPI) port
- Secure Digital (SD/SDIO) and Multimedia Card (MMC) support
- Expansion bus
- 10/100BT Ethernet, RJ45 with optional personality board

1.2.5 User Interface and Display

- Flat Panel interface
- Analog Touch Panel interface (four- or five-wire options)

1.2.6 I/O

- Nine ADSmartIOTM ports configurable for digital I/O, A/D inputs (up to four) and/or up to 4x5 keypad
- Ten digital I/Os
- Backlight control signals for Intensity and On/Off

1.2.7 Audio Interface

- Codec implemented by Freescale MC13783 Power Management and Audio Circuit
- Stereo microphone input
- Stereo 1W speaker outputs
- Headphone output with optional personality board

³ A 3.3 V logic level configuration is available as a volume production option.

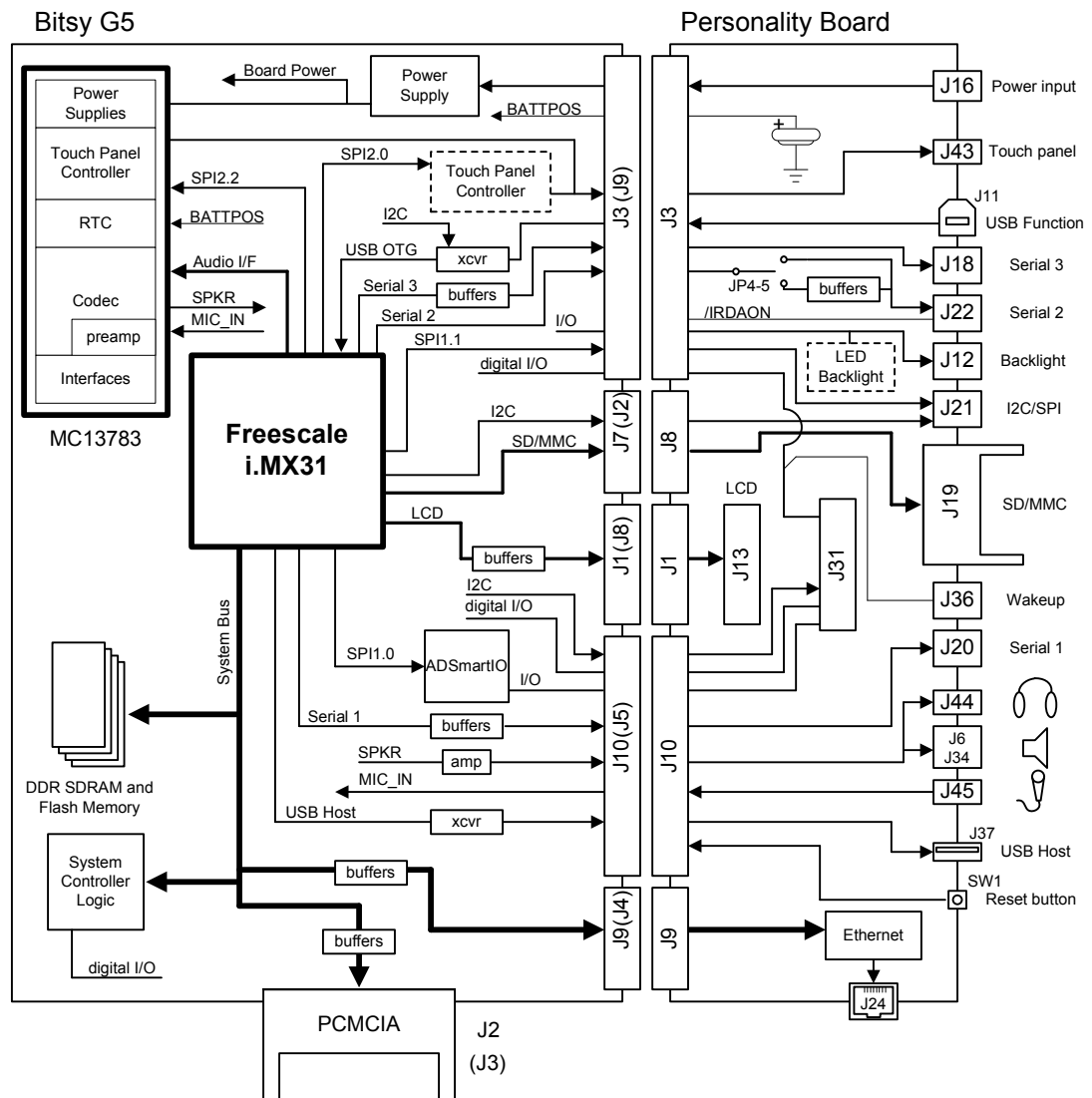
⁴ Optional personality board supports EIA-232 levels on Serial 2.

1.3 Block Diagram

The following diagram illustrates the system organization of the Bitsy G5. Arrows indicate the direction of control and not necessarily signal flow. Optional circuitry is drawn with dotted lines.

Connector reference designators given are for the Bitsy family products. Connector reference designators on the Bitsy G5 are labeled differently and are shown as (Jx).

The diagram also illustrates the Bitsy G5 Personality Board. See section 2.1.2 for additional details about the personality board.



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2 Getting Started

2.1 Development Systems

Bitsy G5 boards are shipped as development systems designed to get the developer up and running quickly.

To use the system, simply plug the power supply into the mini DIN-8 receptacle on the system.

If the screen does not display anything after five to ten seconds, check the *Frequently Asked Questions*, below. Most operating systems cold boot within twenty seconds.

2.1.1 System Components

A typical development system is shown at right. It consists of the following components:

- Bitsy G5 single-board computer
- Bitsy G5 Personality Board
- Flat panel display and cable
- Backlight inverter and cable
- Touch screen and cable
- 100-240 VAC power adapter
- Plexiglas mounting
- Developer's Cable Kit including
 - Serial Port DB9 adapter (ADS cable #610111-80001)
 - DB9F/F null modem cable
 - USB A-B cable
- Operating system of your choice
- User's Guide (this document and operating system guide)



Please make sure you have received *all* the components before you begin your development.

2.1.2 Bitsy G5 Personality Board

The Bitsy G5 often works in tandem with another board to add functionality and customize the system for its application. The Bitsy G5 Personality Board adds custom circuits and locates connectors best suited for the application design.

Signals from the Bitsy G5 are brought out to standard interface connectors and dedicated headers. Connectivity is included for a wide range of functions including power, touch panel, USB, serial, backlight, I²C, SPI, SD/MMC, LCD display and audio. A reset button is provided also.

The personality board expands the Bitsy G5 functionalities. An Ethernet chip and associated line drivers connected to the Bitsy G5 expansion bus provide Ethernet capability. An EIA-232 option is included for the Serial 2 port. Likewise, an optional step-up DC/DC converter can be populated to drive up to 20 White LED backlights.

2.2 ***Frequently Asked Questions***

The following are some of the most commonly asked questions about development systems:

Q: When I plug in power, my screen is white and nothing comes up on it.

A: Check the connector seating. The flat panel connector may have come loose in shipping. Press it firmly into the panel and reapply power to your system.

Q: Is there online support?

A: Yes. Information about the Bitsy G5 hardware and software is available on the ADS support site at <http://www.applieddata.net/support>. See section 2.3 for further details.

Q: When I plug in power, the LED doesn't turn on.

A: Your system may still be booting. The LED is software controlled and is not necessarily turned on at boot.

Q: Do I have to turn off the system before I insert a PCMCIA?

A: No. The Bitsy G5 supports hot-swapping of PCMCIA cards. Consult the operating system documentation for details.

Q: Do I need to observe any ESD precautions when working with the system?

A: Yes. If possible, work on a grounded anti-static mat. At a minimum, touch an electrically grounded object before handling the board or touching any components on the board.

Q: What do I need to start developing my application for the system?

A: You will need a flash ATA card (32 MiB or larger, 128 MiB recommended) and the cables supplied with your system to interface your development station to the system. For further direction, consult the ADS guide for the installed operating system.

Q: Who can I call if I need help developing my application?

A: ADS provides technical support to get your development system running. For customers who establish a business relationship with ADS, we provide support to develop applications and drivers.

Q: Can I upgrade the version of the operating system?

A: Yes. ADS provides regular operating system updates on its developers' web site. For operating systems not maintained by ADS, contact the operating system vendor.

Q: I would like to interface to a different display panel. How can I do this?

A: ADS may have already interfaced to the panel you are interested in. Consult ADS for availability.

2.3

Errata, Addenda and Further Information

Errata and addenda to this manual are posted on the ADS support forums along with the latest release of the manual. Consult the support forums any time you need further information or feel information in this manual is in error. You may access the forums from the ADS support site,

<http://www.AppliedData.net/Support>

In addition to manuals, the support forums include downloads, troubleshooting guides, operating system updates and answers to hundreds of questions about developing applications for ADS products. You may also post questions you have about ADS products on the forums.

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3 Hardware Reference

This section gives an overview of the hardware features of the Bitsy G5. The overview includes a description of the switches, jumper settings, connectors, and connector pinouts.

Many connectors and headers have a visible number or marking on the board that indicates pin 1. As seen from the component side, double-row headers on the board are numbered as shown in the figure to the right.

2	4	6	8...
1	3	5	7...

If that pin is not clearly marked, there are two ways to locate pin 1:

1. For through-hole connectors, look at the underside of the board. The square pad is pin 1.
2. For surface-mount connectors, look for numbers silk screened on the component side⁵ of the Bitsy G5.

3.1 Switches, Controls and Indicators

3.1.1 S1: DIP Switch

S1 is a two-position DIP switch located on the edge of the board at the opening of the PCMCIA socket. When in the "ON" position, switches are closed and connect to ground. Otherwise they are pulled up.

DIP switch positions "1" and "2" connect to the i.MX31. Most operating systems on the Bitsy G5 reserve these switches for their use. Consult the operating system manual for details.

3.1.2 D9: Green LED Indicator

The Bitsy G5 has one onboard green light-emitting diode (LED), located on the corner of the board next to JP2, that is controlled by the processor. The LED is driven by the same buffers as the display driver data lines. The LED will be off when the display buffers are disabled.

3.2 Jumper Settings

There is just one user-selectable jumper on the Bitsy G5. It uses a 2mm shorting block (shunt) to select the setting. Turn off power to the Bitsy G5 before changing the position of a shunt.

3.2.1 JP2: LCD Display Power Select

Type: 3-post header, 2mm

This jumper selects the supply voltage for the LCD display. The three-pin header is located near the PCMCIA ejector button.

Jumper setting	Voltage Selected
1-2	Vcc (5.0 V)
2-3	Vddx (3.3 V)



WARNING! The pin out of JP2 on the Bitsy G5 is not the same as the pin out for the BitsyXb. Make sure you have selected the correct voltage before connecting the panel. Flat panels can be irreparably damaged by incorrect voltages.

⁵ The "component side" of the Bitsy G5 is the one on which the PCMCIA ejector is installed.

3.3 Signal Connectors

The following tables describe the electrical signals available on the connectors of the Bitsy G5. Each section provides relevant details about the connector including part numbers, mating connectors, signal descriptions, and references to related chapters.

Legend:

n/c	Not connected
GND	Bitsy G5 ground plane
(4.1)	Reference section(s) for signals

Signal Types:

I	signal is an input to the system
O	signal is an output from the system
IO	signal may be input or output
P	power and ground
A	analog signal
OC	open collector output



The reference designators on the Bitsy G5 are labeled differently than the previous four generations of Bitsy family products or mating personality boards. The reference designators for the Bitsy family products are given in the following sections with the Bitsy G5 reference designators shown as (Jx).

3.3.1 J1 (J8): LCD Panel Interface Connector

Board Connector: 2x17 shrouded header, 2mm, Samtec STMM-117-02-G-D

Recommended Board-to-Cable Connector: TCSD series

Recommended Board-to-Board Connector: ESQT series (e.g. ESQT-117-02-F-D-500)

The following table describes the signals on the LCD panel interface connector. Signal names shown are for TFT active matrix color LCDs at 18 bpp (bit-per-pixel). Signals from the i.MX31 are buffered and RFI filtered before reaching J1 (J8). The LCD panel output buffers operate at a fixed 3.3 V.

Pin	i.MX31 Signal Name	Color Active TFT Display at 16bpp	
		ADS Signal Name	Description
1		n/c	
2		GND	ground
3	FPSHIFT	PNL_PIXCLK	Pixel Clock
4	HSYNC	PNL_HSYNC	Horizontal Sync
5	VSYNC3	PNL_VSYNC	Vertical Sync
6		GND	ground
7	LD12	PNL_RED0	Red Bit 0
8	LD13	PNL_RED1	Red Bit 1
9	LD14	PNL_RED2	Red Bit 2
10	LD15	PNL_RED3	Red Bit 3
11	LD16	PNL_RED4	Red Bit 4
12	LD17	PNL_RED5	Red Bit 5
13		GND	ground

14	LD6	PNL_GREEN0	Green Bit 0
15	LD7	PNL_GREEN1	Green Bit 1
16	LD8	PNL_GREEN2	Green Bit 2
17	LD9	PNL_GREEN3	Green Bit 3
18	LD10	PNL_GREEN4	Green Bit 4
19	LD11	PNL_GREEN5	Green Bit 5
20		GND	ground
21	LD0	PNL_BLUE0	Blue Bit 0
22	LD1	PNL_BLUE1	Blue Bit 1
23	LD2	PNL_BLUE2	Blue Bit 2
24	LD3	PNL_BLUE3	Blue Bit 3
25	LD4	PNL_BLUE4	Blue Bit 4
26	LD5	PNL_BLUE5	Blue Bit 5
27		GND	ground
28	DRDY0	PNL_LBIAS	Data Enable
29		PNL_PWR	Vcc (5 V) or 3.3 V (3.2.1)
30			
31		PNL_RL	Horizontal mode select (set by R247 or R246) ⁶
32		PNL_UD	Vertical mode select (set by R248 or R249) ⁶
33	reserved		
34	ADSmartIO (PD4)	VCON	low-voltage adjust for contrast control of some displays

3.3.2 J2 (J3): PCMCIA

Integrated Ejector: FCI 95620-050CA

The 68-pin PCMCIA socket conforms to the PCMCIA standard for 5V-tolerant Type II cards, and can also be run at 3.3 V. Normally, the socket is de-energized. The operating system is responsible for turning on the socket when a card is inserted and turning it off when the card is removed.

Ejector hardware is standard.

V_{pp} (pins 18 and 52), which is 12 V in older PCMCIA implementations, is left unconnected in this implementation.

⁶ The LCD panel scan direction is selected by changing the voltage on the PNL_RL and PNL_UD signals. These signals are pulled up on standard Bitsy G5 boards.

3.3.3 J3 (J9): Power, I/O, Serial 2 & 3, USB, Touch Screen and others

Board Connector: 2x25 shrouded header, 2mm, Samtec STMM-125-02-G-D

Recommended Board-to-Cable Connector: TCSD series

Recommended Board-to-Board Connector: ESQT series (e.g. ESQT-125-02-F-D-500)

Pin	Name	Pin	Type	Description		
1	EIO9		IO	General Purpose Digital I/Os		
	EIO8	2	IO			
3	EIO7		IO			
	GND	4 6	P	ground		
	VCC	8 10	PO	5 V		
5	reserved					
7	reserved					
9	/IRDAON		O	External IRDA control		
11	TSPX		AIO	right	UL	Touch screen
13	TSMY		AIO	top	LR	
15	TSMX		AIO	left	LL	
17	TSPY		AIO	bottom	UR	
	EIO5	12	IO	General Purpose Digital I/Os		
	EIO6	14	IO			
	BACKLIGHT PWM	16	AO	Backlight Intensity		
	/BACKLIGHT ON	18	OC	Backlight On/Off		
19	RXD2T		I	Serial 2 (3.3 V logic level)		
	TXD2T	20	O			
21	WIPER		AI	Touch screen wiper (optional 5-wire touch)		
	reserved	22				
23	GND		P	ground		
	PE2	24	O	Power Enable #2 for external devices		
25	CTS3		I	Serial 3 (EIA-232)		
	TXD3	26	O			
27	RTS3		O			
	RXD3	28	I			
29	USB+		IO	USB Client		
	USB-	30	IO			
31	GND		P	ground		
	HP_IN	32	I	Headphone connected		
33	USB_RECONN		O	USB Client power management ⁷		
	GND	34 36	P	ground		
35	STXD		O	MOSI	SPI signals	
37	SRXD		I	MISO		
39	SCLK2		O	SCLK		
43	SFRM2		O	SS		

⁷ The USB_RECONN output does not have any series resistance or ESD protection.

Pin	Name	Pin	Type	Description
	VBATT_POS	38	PI	External battery
	reserved	40		
41	POWERENABLE		O	Power supply control
	/PE1	42	O	Power Enable #1 for external devices
	DCIN_POS	44	PI	External power
		48		
45	/RQONOFF		I	"Request On/Off" Switch
	GND	46	P	ground
47				
49				
	BATPOS	50	PI	Real-time clock backup battery

3.3.4 J7 (J2): I²C and SD/MMC

Board Connector: 2x8 shrouded header, 2mm, Samtec STMM-108-02-G-D-SM

Recommended Board-to-Cable Connector: TCSD series

Recommended Board-to-Board Connector: ESQT series (e.g. ESQT-108-02-F-D-450)⁸

This header supplies the signals for the I²C bus and SD/MMC interface.

Pin	Name	Type	Description
1	I2C_SDA	IO	I ² C bus
2	I2C_SCL	IO	
3	GND	P	ground
4		P	
5	SD_DAT2	IO	SD/MMC signals ⁹
6	SD_DAT3	IO	
7	SD_CMD	IO	
8	SD_DAT0	IO	
9	SD_CLK	O	
10	/SD_CD	I	
11	VDDX	PO	3.3 V
12	VCC	PO	5 V
13	/SD_WP	I	SD/MMC signals
14	/SDIO_IRQ	I	
15	/SD_PWREN	O	
16	SD_DAT1	IO	

⁸ Note that the STMM header is 0.050-inch higher than the other 2mm headers on the board because it is a surface-mount part. Use a correspondingly shorter socket on mating boards.

⁹ Signal /SD_CD includes a 4.7kΩ pull up resistor.

3.3.5 J9 (J4): Expansion Bus

Board Connector: 2x25 shrouded header, 2mm, Samtec STMM-125-02-G-D

Recommended Board-to-Cable Connector: TCSD series

Recommended Board-to-Board Connector: ESQT series (e.g. ESQT-125-02-F-D-500)

These signals can be used to expand the capabilities of the Bitsy G5 as a 3.3 V digital expansion bus.

Pin	Name	Pin	Type	Description
1	GND		P	ground
	n/c	2		
	n/c	4		
3	PCBD10		IO	Data8-10
5	PCBD9		IO	
7	PCBD8		IO	
	PCBD2	6	IO	Data0-2
	PCBD1	8	IO	
	PCBD0	10	IO	
9	n/c			
11	n/c			
	n/c	12		
13	PCBA11		O	Address 11
15	VCC		PO	5 V
17	/CARDBWAIT		I	Wait
19	CARDBRES		O	Reset
	PCBA0	14	O	Address0-6
	PCBA1	16	O	
	PCBA2	18	O	
	PCBA3	20	O	
	PCBA4	22	O	
	PCBA5	24	O	
	PCBA6	28	O	
21	n/c			
23	+3.3V		PO	+3.3 V
25	/CARDBON		O	5 V power control
	n/c	26		
27	/CF_INT		I	Interrupt
29	/CARDBMWR		O	Memory Write
31	n/c			
33	/BEB1		O	IO Read
	PCBA7	30	O	Address7-9
	PCBA8	32	O	
	PCBA9	36	O	
	/CARDBMRD	34	O	Memory Read
35	n/c			
37	CS_CF		O	Chip Select
		38		

Pin	Name	Pin	Type	Description
39	PCBD15		IO	Data11-15
41	PCBD14		IO	
43	PCBD13		IO	
45	PCBD12		IO	
47	PCBD11		IO	
	PCBD7	40	IO	Data3-7
	PCBD6	42	IO	
	PCBD5	44	IO	
	PCBD4	46	IO	
	PCBD3	48	IO	
49	n/c			
	/CARDBON_3P3V	50	O	3.3 V power control

3.3.6

J10 (J5): ADSmartIO, USB, Serial 1, Stereo Audio, I/Os

Board Connector: 2x25 shrouded header, 2mm, Samtec STMM-125-02-G-D

Recommended Board-to-Cable Connector: TCSD series

Recommended Board-to-Board Connector: ESQT series (e.g. ESQT-125-02-F-D-500)

Pin	Name	Pin	Type	Description
1	/EXT_IRQ1		I	External Interrupt 1
3	/EXT_IRQ2		I	External Interrupt 2
5	EIO4	2	IO	General Purpose Digital I/Os
	EIO3		IO	
	EIO2		IO	
	EIO1		IO	
	EIO0		IO	
7	reserved			
9	reserved			
	USB_PWR_SENSE	10	I	Sense from external USB Host power switch
	USB_PWR_CTRL	12	O	Control to external USB Host power switch
	USB_UDC-	14	IO	USB Host
	USB_UDC+	16	IO	
11	I2C_SCL		IO	PC6 I ² C clock ¹⁰
13	reserved			
15	reserved			
	SPKR_R-	18	AO	Stereo Speaker, right channel
	SPKR_R+	20	AO	
	SPKR_L-	22	AO	Stereo Speaker, left channel
	SPKR_L+	24	AO	

¹⁰ Standard Bitsy G5 boards do not connect PC6 and PC7 of the ADSmartIO controller to the I²C bus.

Pin	Name	Pin	Type	Description	
17	ROW0		IO	PC0	ADSmartIO
19	ROW1		IO	PC1	
21	ROW2		IO	PC2	
23	ROW3		IO	PC3	
25	ROW4		IO	PC4	
27	COL0		IO	PA0	
29	COL1		IO	PA1	
31	COL2		IO	PA2	
33	COL3		IO	PA3	
	RI1	26	I	Serial 1 (EIA-232)	
	DCD1	28	I		
	DSR1	30	I		
	DTR1	32	O		
	RXD1	34	I		
	TXD1	36	O		
	CTS1	38	I		
	RTS1	40	O		
35	/EXT_IRQ3		I	External Interrupt 3	
37	VDDX		PO	3.3 V	
39	MIC_GND		P	Microphone ground	
41					
	MIC_L	42	AI	Stereo Microphone	
	MIC_R	44	AI		
43	reserved				
45	/RESET_IN		I	External reset	
47	VDDX		PO	3.3 V	
	VCC	46	PO	5 V	
		48			
49	I2C_SDA		IO	PC7	I ² C data ¹⁰
	GND	50	P	Ground	

3.3.7 J11 (J7): Supercapacitor Input

Supercapacitors are not supported by the Bitsy G5. This socket may not be populated on all boards.

3.3.8 J16 (J1): JTAG/In-System Programming

Board Connector: 2x10 shrouded header, 2mm, Samtec STMM-110-02-T-D

Recommended Board-to-Cable Connector: TCSD series

Recommended Board-to-Board Connector: ESQT series (e.g. ESQT-110-02-F-D-500)

This header is used during manufacturing for programming and debug, but is not otherwise supported for application use. Production customers may use this header to reprogram boot code.

Pin	Name	Type	Description
1	<i>/PM_RSTMCU</i>	<i>I</i>	<i>System reset</i>
2	<i>/TRST</i>	<i>I</i>	<i>JTAG</i>
3	<i>TMS</i>	<i>I</i>	
4	<i>GND</i>	<i>P</i>	
5	<i>TCLK</i>	<i>I</i>	
6	<i>GND</i>	<i>P</i>	
7	<i>TDI</i>	<i>I</i>	
8	<i>GND</i>	<i>P</i>	
9	<i>TDO</i>	<i>O</i>	
10	<i>GND</i>	<i>P</i>	
11	<i>RTCK</i>	<i>O</i>	
12	<i>JTAG_VREF</i>	<i>PO</i>	<i>Reference voltage</i>
13	<i>PRG</i>	<i>I</i>	<i>ATMega/ADSmartIO</i>
14	<i>VDDX</i>	<i>PO</i>	<i>AVR Vref</i>
15	<i>MISO</i>	<i>O</i>	<i>ATMega/ADSmartIO</i>
16	<i>/DE</i>	<i>I</i>	<i>JTAG</i>
17	<i>MOSI</i>	<i>I</i>	<i>ATMega/ADSmartIO</i>
18	<i>GND</i>	<i>P</i>	
19	<i>SCK</i>	<i>I</i>	
20	<i>GND</i>	<i>P</i>	

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4 Feature Reference

This section is to be determined.

5 Power and Power Management

This section is to be determined.

6 System Specifications

This section is to be determined.

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7 Board Revision History

7.1 *Identifying the board revision*

The product revision number of the Bitsy G5 is etched on the underside of the printed circuit board. That number is 170121-4000x, where "x" is the board revision.

7.2 *Revision History*

This section describes the differences between the revisions of the Bitsy G5.

7.2.1 Revision 2

Pre-production

If you are using a Bitsy G5 as a replacement for the BitsyXb, please note these differences from revision A of the BitsyXb.

New Features

Freescale i.MX31 processor replaces XScale PXA270.

Freescale MC13783 Power Management and Audio Circuit:

- Replaces discrete microphone preamp circuitry and Crystal CS4202 AC'97 stereo codec.
- Replaces discrete switching regulator, linear voltage regulator, and step down converters providing supply voltages for processor, memories, CPLD, and IO.
- Provides 4-wire analog touch panel capability.
- Replaces discrete RTC component.

DDR SDRAM replaces SDR SDRAM.

USB 2.0 Host port and USB 2.0 On-The-Go (OTG) port replaces USB 1.1 ports.

Changes

Pinout of JP2 swapped.

Voltage Setting	Jumper Setting	
	From	To
<i>V_{ddx} (3.3 V)</i>	<i>1-2</i>	<i>2-3</i>
<i>V_{cc} (5.0 V)</i>	<i>2-3</i>	<i>1-2</i>

Connector reference designators labeled differently. In this manual, all Bitsy G5 reference designators are shown as (Jx).

Input Power connector, J6, removed.

Vee Adapter connector, J8, removed.

Series resistor removed from USB_RECONN output, J3 (J9) pin 33.

Option to operate LCD panel buffers at either 3.3 V or 5 V removed. Supports LCD display data at 3.3 V only.

Supercapacitor Input connector, J11 (J7), not supported.

Secure Digital (SD/SDIO) and Multimedia Card (MMC) not supported.

RTC interface changed from I²C bus to SPI.

Pull up resistor value on I²C bus changed from 1.2k Ω to 2.2k Ω .

Crystal frequencies changed. Removed 24.576 MHz, 32.768 kHz, and 13.000 MHz. Added 19.2 MHz and 26.000 MHz.

USB OTG transceiver added to I²C bus at address 010 1101.

Signals on J1 (J8) changed as follows:

Pin	From	To
1	PNL_VEE	n/c
33	PNL_ENA	reserved

External CompactFlash not supported.

Connector J9 (J4) used for 3.3 V expansion bus only.

Signals on J9 (J4) changed as follows:

Pin	From	To
2	/CARDBDET2	n/c
4	/CARDB16	n/c
9	CARDBSTSCHG	n/c
11	CARDBSPK	n/c
12	PCBA0	n/c
13	/CARDBREG	PCBA11
14	PCBA1	PCBA0
16	PCBA2	PCBA1
18	PCBA3	PCBA2
20	PCBA4	PCBA3
21	/CARDBVS2	n/c
22	PCBA5	PCBA4
24	PCBA6	PCBA5
26	CARDBVCC	n/c
27	CARDBIRQ	/CF_INT
28	PCBA7	PCBA6
30	PCBA8	PCBA7
31	/CARDBIOWR	n/c
32	PCBA9	PCBA8
33	/CARDBIORD	/BEB1
35	/CARDB_VS1	n/c
36	PCBA10	PCBA9
37	/CARDBCE2	CS_CF
38	/CARDBCE1	CS_CF
49	/CARDBDET1	n/c

External temperature probe not supported.

Battery trickle charger not supported.

Signals on J3 (J9) changed as follows:

Pin	From	To
5	TEMP_SENSOR_MINUS	reserved
7	TEMP_SENSOR_PLUS	reserved
22	CHARGE	reserved
40	VBATT_NEG	reserved

External PS/2 keyboard not supported.

Signals on J10 (J5) changed as follows:

Pin	From	To
7	SIGPS2	reserved
9	CLKPS2	reserved
13	SMTIO1	reserved
15	SMTIO0	reserved
43	VREF	reserved

Connector J16 (J1) changed from 16 pin STMM-108-02-G-D-SM to 20 pin STMM-110-02-T-D.

Pinout changed as follows:

Name	From	To
/TRST	1	2
TMS	2	3
GND	3	4
TDI	4	7
TCLK	5	5
VDDX	6	14
GND	7	6
TDO	8	9
/FEW	9	
FRDY	10	
MISO	11	15
VCC	12	
SCK	13	19
MOSI	14	17
PRG	15	13
GND	16	18
/PM_RSTMCU		1
GND		8
GND		10
RTCK		11
JTAG_VREF		12
/DE		16
GND		20

7.2.2 Revision 3

Initial release

Secure Digital (SD/SDIO) and Multimedia Card (MMC) supported.

Pull up resistor value on /SD_CD signal, J7 (J2) pin 10, changed from 47k Ω to 4.7k Ω .

7.2.3 Revision A

Production release

Available Q4 2007