Badgiimo Interface Module

Features

- Top-notch engineering
- Badgiimo compatible
  - SAO 1.69bis protocol
- 3.3V pin voltage
  - Do **not** use 5V logic on pins
- CPU
  - **144MHz** 32-bit MCU
- Memory
  - **520kB SRAM**
  - **4MB QSPI flash**
- Serial communication interfaces
  - UART
  - I^{2}C
  - Shift register controller
- Input interrupts
  - Every GPIO is an interrupt
- Digital to analog converter
  - x3 8-bit inputs
- Drives all the LEDs
  - Clockless LED driver
- State-of-the-art encryption module
  - XOR encryption
- IO and Packaging
  - 25 Programmable IO
  - 40 pin package

Description

The HHVDC31 is the first-of-its-class follow up the HHVDC30, developed specifically for controlling and driving electronic conference badges. It is capable of driving more LEDs than any competing conference badge module to ensure badges are even more blinding.

The HHVDC31 features a brand-new specification, Badgiimo support. Badgiimos are add-ons for electronic conference badges that can modify and manipulate the functionality of the badge. Badgiimos are designed to work with the SAO 1.69bis protocol.

The sky is the limit for how Badgiimos can be used. Use Badgiimos to enhance a talk for workshop. Use Badgiimos to selectively allow certain attendees specific functionality. Lock out attendees from accessing really cool badge features unless they buy the Official conference Badgiimo.

Applications

- Conference badges
- Local meetup event badges
- Bowling team badges
- Dog birthday party badges
- BADGES!

Application Circuit
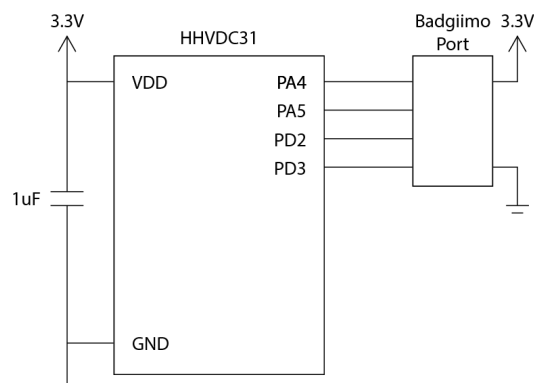
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Pin Configuration and Functions

PA0	1		40	VDD
PA1	2		39	VSYS
GND	3		38	GND
PA2	4		37	3V3_EN
PA3	5		36	3V3
PA4	6		35	ADC_Ref
PA5	7		34	PD3
GND	8		33	GND
PA6	9		32	PD2
PA7	10		31	PD1
PB0	11		30	RUN
PB1	12		29	PD0
GND	13		28	GND
PB2	14		27	PC5
PB3	15		26	PC4
PB4	16		25	PC3
PB5	17		24	PC2
GND	18		23	GND
PB6	19		22	PC1
PB7	20		21	PC0

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No.	Name	I/O	Description	ADC	Shift Reg	I2C	UART
40	VDD	I	Input voltage				
39	VSYS	—	System voltage				
36	3V3	O	Regulated 3.3V output				
35	ADC_Ref	I	Reference for ADC				
37	3V3_EN	I	Enable for 3.3V output				
30	RUN	—	HHV{RTFM_2_Win}				
1	PA0	IO	General purpose IO				UART TX
2	PA1	IO	General purpose IO				UART RX
4	PA2	IO	General purpose IO				
5	PA3	IO	General purpose IO				
6	PA4	IO	General purpose IO			SDA	
7	PA5	IO	General purpose IO			SCL	
9	PA6	O	LED drive pin				
10	PA7	O	LED drive pin				
11	PB0	O	LED drive pin				
12	PB1	O	LED drive pin				
14	PB2	I	LED sink pin				
15	PB3	I	LED sink pin				
16	PB4	I	LED sink pin				
17	PB5	IO	General purpose IO				
19	PB6	IO	General purpose IO				
20	PB7	IO	General purpose IO				
21	PC0	IO	General purpose IO				
22	PC1	IO	General purpose IO				
24	PC2	IO	General purpose IO				

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PIN		I/O	Description	ADC	Shift Reg	I2C	UART
No.	Name						
25	PC3	IO	General purpose IO				
26	PC4	IO	General purpose IO		SER		
27	PC5	IO	General purpose IO		RCLK		
29	PD0	IO	General purpose IO		CLK		
31	PD1	IO	General purpose IO	ADC0	CLR		
32	PD2	IO	General purpose IO	ADC1			
34	PD3	IO	General purpose IO	ADC2			
3	GND	—	Ground				
8	GND	—	Ground				
13	GND	—	Ground				
18	GND	—	Ground				
23	GND	—	Ground				
28	GND	—	Ground				
33	GND	—	Ground				
38	GND	—	Ground				

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Recommended Voltages

		Min	Typical	Max	Unit
V_{IN}	Input voltage	2.3	3.3	3.6	V
V_{SAO}	SAO output voltage	-	3.3	-	V

DC Characteristics

		Min	Typical	Max	Unit
C_{IN}	Pin capacitance	-	2	-	pF
V_{IH}	High-level input voltage	$0.75 \times V_{DD}$	3.3	$V_{DD} + 0.3$	V
V_{IL}	Low-level input voltage	-0.3	V_{IN}	$0.25 \times V_{DD}$	V
I_{IH}	High-level input current	-	-	50	nA
I_{IL}	Low-level input current	-	-	50	nA
V_{OH}	High-level output voltage	$0.8 \times V_{DD}$	-	-	V
V_{OL}	Low-level output voltage	-	-	$0.1 \times V_{DD}$	V
I_{OH}	High-level source current	-	20	-	mA
I_{OL}	Low-level sink current	-	28	-	mA
V_{SPCH}	SAO power control high output voltage	$0.8 \times V_{DD}$	-	-	V
V_{SPCL}	SAO power control low output voltage	-	-	$0.1 \times V_{DD}$	V
R_{PU}	Resistance of internal pull-up resistor		45		kΩ
R_{PD}	Resistance of internal pull-down resistor		45		kΩ

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Badgiimo Overview

Badgiimos are a brand new style of conference badge add-on. Badgiimos can be attached to a badge via the 2x3 Secondary Add-On (SAO) header to modify and manipulate the functionality of an electronic conference badge. Once attached, the badge can use the encrypted Badgiimo protocol to request the Badgiimo's ID and supported feature set. The badge can then release new uses and modes based on the ID of the Badgiimo.

As part of the Badgiimo protocol, the Badgiimo may use SAO GPIO2 to signal to a badge that it is ready to be read. The HHVDC31 uses the feature to detect the attachment of a Badgiimo in order to begin the Badgiimo query process.

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Packaging Information

Device Part Number	Status	Package Type	Pins	Op Temp (° C)	Device Marking
HHVDC31	PRE	DIP	40	-10 to 125	HHVDC31

Ordering Information

This module is currently in pre-production. Find the HHV Technologies booth at your local conferences to play with our pre-production demo unit.

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Revision History

Date	Version	Release notes
2023.08	V1.0	• Initial release