AD158A Datasheet

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Version：V1.1

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AD158A Features

CPU Core

- 32-bit CPU,Built-in ICACH, can be connected to Flash for expansion of code
- The main frequency is up to 120MHz

Memory

- Built-in Flash memory

Clock Source

- RC Clock frequency about 16MHz
- LRC clock frequency about 200KHz

Digital I/O

- 4 programmable digital I/O pins
- General the IO supports pull-up(10k),pull-down(60k), strong,weak output,input and high impedance
- 4 external interrupt/wake-up source(low power available,can be multiplexed to any I/O, with hardware filter)
- Input channel and Output channel, provide arbitrary IO input and output options for some modules

Digital peripherals

- Two UART Controllers(UART0/1) supports DMA and Flow Control
- Two SPI Controllers with DMA(SPI0/1) support master mode and slave mode
- Built-in Spi Flash to run code
- Three 32-bit Asynchronous Divider Timers
- One IIC Controller
- Three channel PWM output
- Infrared remote control decoder
- Watchdog

Analog Peripherals

- 0.5 watt Class-D audio amplifier output
- 10-bit high precision ADC
- Low voltage protection
- Power on reset

Operating Conditions

- Working voltage
  VBAT: 2.0v - 5.5v
  VDDIO: 2.0v - 3.4v
- Operating Temperature: -40°C to +85°C

Package

- SOP8

Application

- Sound Toy
- Audio player

1 Pin Definition

1.1 Pin Assignment

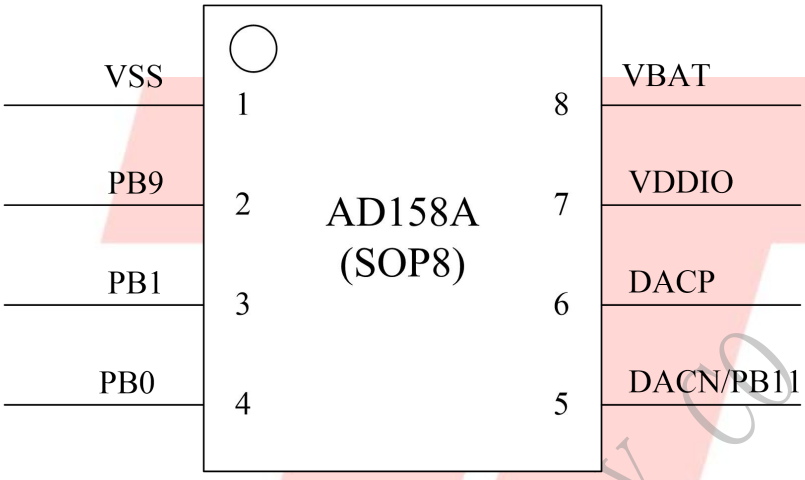


Figure 1-1 AD158A_SOP8 Package Diagram

1.2 Pin Description

Table 1-1 AD158A_SOP8 Pin Description

PIN NO.	Name	Type	Drive (mA)	Function	Description
1	VSS	G	/		Ground;
2	PB9	I/O	8	GPIO (High Voltage Resistance)	UART1TRXB:Uart1 Data In/Out(B); CAP1:Timer1 Capture;
3	PB1	I/O	8/64	GPIO (pull down)	ADC11:ADC Input Channel 11; SPI1DOA:SPI1 Data Out(A); I2C_SDA(A);
4	PB0	I/O	8/64	GPIO (pull down)	ADC10:ADC Input Channel 10; SPI1CLKA:SPI1 Clock(A); I2C_SCL(A);
5	PB11	I/O	8	GPIO (High Voltage Resistance)	OSCIB:Crystal Oscillator Input(B);
	DACN	O	/		Class-D APA Negative Output;
6	DACP	O	/		Class-D APA Positive Output;
7	VDDIO	P	/		Digital Power; (Internal linear regulator output)
8	VBAT	P	/		Battery Power Supply;

2 Electrical Characteristics

2.1 Absolute Maximum Ratings

Table 2-1

Symbol	Parameter	Min	Max	Unit
Tamb	Ambient Temperature	-40	+85	℃
Tstg	Storage temperature	-65	+150	℃
VBAT	Supply Voltage	-0.3	5.5	V
$V_{VDDIO33}$	3.3V IO Input Voltage	-0.3	3.6	V

Note : The chip can be damaged by any stress in excess of the absolute maximum ratings listed below.

2.2 PMU Characteristics

Table 2-2

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
VBAT	Voltage Input	2.0	3.7	5.5	V	_
V_{VDDIO}	Voltage output	2.0	3.0	3.4	V	VBAT = 3.7V, 100mA loading
I_{VDDIO}	Loading current	_	_	100	mA	VBAT=3.7V

2.3 IO Input/Output Electrical Logical Characteristics

Table 2-3

IO input characteristics						
Symbol	**Parameter**	**Min**	**Typ**	**Max**	**Unit**	**Test Conditions**
V_{IL}	Low-Level Input Voltage	-0.3	_	0.3* VDDIO	V	VDDIO = 3.3V
V_{IH}	High-Level Input Voltage	0.7* VDDIO	_	VDDIO+0.3	V	VDDIO = 3.3V
IO output characteristics						
V_{OL}	Low-Level Output Voltage	_	_	0.33	V	VDDIO = 3.3V
V_{OH}	High-Level Output Voltage	2.7	_	_	V	VDDIO = 3.3V

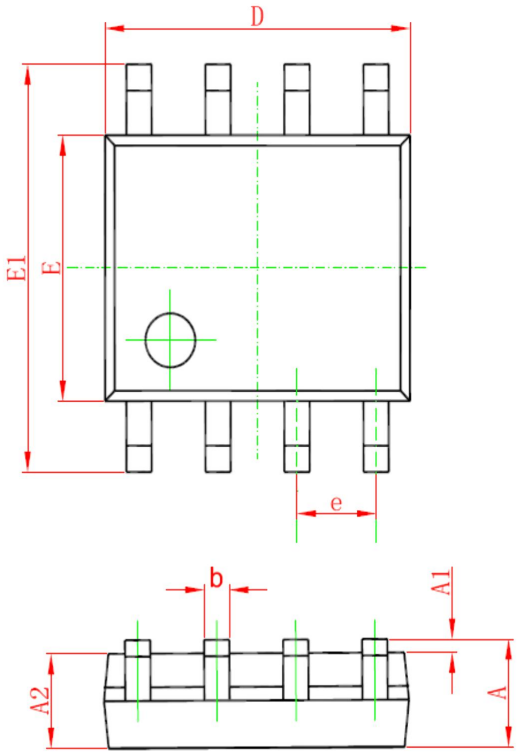
2.4 Internal Resistor Characteristics

Table 2-4

Port	General Output	High Drive	Internal Pull-Up Resistor	Internal Pull-Down Resistor	Comment
PB0,PB1	8mA	64mA	10K	60K	1、PB0 & PB1 default pull down 2、internal pull-up/pull-down resistance | accuracy ±20%
PB9,PB11	8mA	_	10K	60K	

3 Package Information

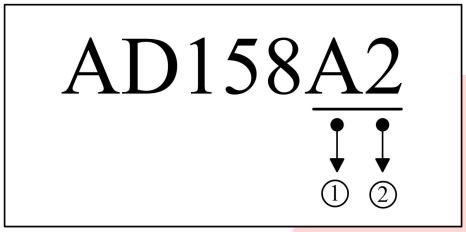
3.1 SOP8



Symbol	Dimension In Millimeters		Dimension In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.700	5.100	0.185	0.201
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.27TYP		0.050TYP	
L	0.400	1.270	0.016	0.050
θ	0^0	8^0	0^0	8^0

Figure 3-1. AD158A_SOP8 Package

4 Package Type Specification



①Represents different packages

②Represents different memory sizes

2: 2Mbit Flash

4: 4Mbit Flash

5 Revision History

Date	Revision	Description
2021.03.18	V1.0	Initial Release
2021.08.23	V1.1	Modify pin definition
2023.03.23	V1.2	Modify the Features.