

# **AD157A0 Datasheet**

**Zhuhai Jieli Technology Co.,LTD**

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# AD157A0 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

- Off-chip Flash memory is required

## Clock Source

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

## Digital I/O

- Up to 24 programmable digital I/O pins
- General the IO supports pull-up(10k),pull-down(60k), strong,weak output,input and high impedance
- Up to 12 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

- One Spi Flash Controller to run code
- One SD host controller
- Three 32-bit Asynchronous Divider Timers
- One IIC Controller
- Four channel PWM output
- Infrared remote control decoder
- Watchdog
- 64-bit EFUSE

## 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
- Soft-off current is 2uA
- Operating Temperature: -40°C to +85°C

## Package

- QSOP28

## Application

- Sound Toy
- Audio player
- Universal Microcontroller

# 1 Pin Definition

## 1.1 Pin Assignment

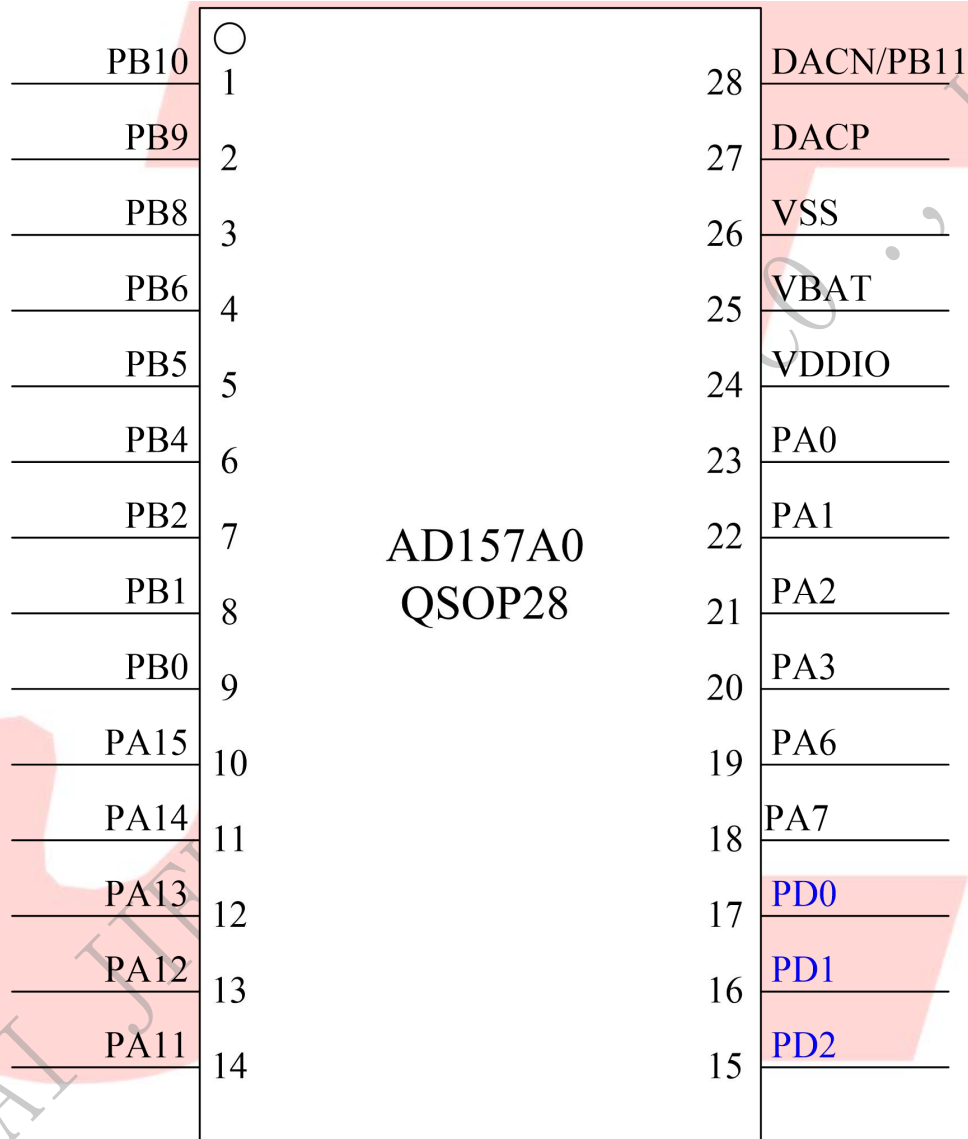


Figure 1-1 AD157A0\_QSOP28 Package Diagram

## 1.2 Pin Description

**Table 1-1 AD157A0\_QSOP28 Pin Description**

PIN NO.	Name	Type	Drive (mA)	Function	Description
1	PB10	I/O	8	GPIO (pull up) (High Voltage Resistance)	MCLR(0 effective);
2	PB9	I/O	8	GPIO (High Voltage Resistance)	SPI1DOD:SPI1 Data Out(D); UART1TRXB:Uart1 Data In/Out(B); I2C_SDA(D); CAP1:Timer1 Capture;
3	PB8	I/O	8	GPIO (High Voltage Resistance)	SPI1CLKD:SPI1 Clock(D); I2C_SCL(D); OSCIA:Crystal Oscillator Input(A);
4	PB6	I/O	8/64	GPIO	SD0DATC:SD0 Data(C);
5	PB5	I/O	8/64	GPIO	ADC13:ADC Input Channel 13; SD0CMDC:SD0 Command(C);
6	PB4	I/O	8/64	GPIO	ADC12:ADC Input Channel 12; SD0CLKC:SD0 Clock(C);
7	PB2	I/O	8/64	GPIO	SPI1DIA:SPI1 Data In(A); SD0DATB:SD0 Data(B); TDM_DAT;
8	PB1	I/O	8/64	GPIO (pull down)	ADC11:ADC Input Channel 11; SPI1DOA:SPI1 Data Out(A); SD0CMDB:SD0 Command(B); I2C_SDA(A); TDM_SYN;
9	PB0	I/O	8/64	GPIO (pull down)	ADC10:ADC Input Channel 10; SPI1CLKA:SPI1 Clock(A); SD0CLKB:SD0 Clock(B); I2C_SCL(A); TDM_CLK;
10	PA15	I/O	8/64	GPIO	ADC9:ADC Input Channel 9; SPI1DOB:SPI1 Data Out(B); MCAP3:Motor Timer3 Capture;
11	PA14	I/O	8/64	GPIO	ADC8:ADC Input Channel 8; SPI1CLKB:SPI1 Clock(B); CAP0:Timer0 Capture; MCAP2:Motor Timer2 Capture;

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12	PA13	I/O	8/64	GPIO	SPI1DIB:SPI1 Data In(B); TMR1:Timer1 Clock In; MCAP1:Motor Timer1 Capture;
13	PA12	I/O	8/64	GPIO	MPWM3:PWM Channel3 Output;
14	PA11	I/O	8/64	GPIO	TMR0:Timer0 Clock In; MPWM2:PWM Channel2 Output;
15	PD2	I/O	8/64	GPIO (pull up)	SPI0CSA:SPI0 Chip Select(A); SFCCSA:SFC Chip Select(A);
16	PD1	I/O	8/64	GPIO	SPI0DOA(0):SPI0 Data0 Out(A); SFCDOA(0):SFC Data0 Out(A);
17	PD0	I/O	8/64	GPIO	SPI0CLKA:SPI0 Clock(A); SFCCCLKA:SFC Clock(A);
18	PA7	I/O	8/64	GPIO	ADC7:ADC Input Channel 7; SPI1DOC:SPI1 Data Out(C); UART0RXA:Uart0 Data In(A); I2C_SDA(C); MPWM1:PWM Channel1 Output;
19	PA6	I/O	8/64	GPIO	ADC6:ADC Input Channel 6; SPI1CLKC:SPI1 Clock(C); UART0TXA:Uart0 Data Out(A); I2C_SCL(C); TMR2:Timer2 Clock In; MPWM0:PWM Channel0 Output;
20	PA3	I/O	8/64	GPIO	ADC3:ADC Input Channel 3; SPI0DIB(1):SPI0 Data1 In(B); SD0DATA:SD0 Data(A); CLKOUT; PWM2(B); MCAP0:Motor Timer0 Capture;
21	PA2	I/O	8/64	GPIO	ADC2:ADC Input Channel 2; SPI0DOB(0):SPI0 Data0 Out(B); SD0CMDA:SD0 Command(A); I2C_SDA(B); PWM2(A);
22	PA1	I/O	8/64	GPIO	ADC1:ADC Input Channel 1; SPI0CLKB:SPI0 Clock(B); SD0CLKA:SD0 Clock(A); UART0RXB:Uart0 Data In(B); I2C_SCL(B); CAP2:Timer2 Capture;
23	PA0	I/O	8/64	GPIO (pull up)	Long Press Reset; ADC0:ADC Input Channel 0; UART0TXB:Uart0 Data Out(B);

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24	VDDIO	P	/		Digital Power; (Internal linear regulator output)
25	VBAT	P	/		Battery Power Supply;
26	VSS	G			Ground;
27	DACP	O	/		Class-D APA Positive Output;
28	DACN	O	/		Class-D APA Negative Output;
	PB11	I/O	8	GPIO (High Voltage Resistance)	OSCIB:Crystal Oscillator Input(B);

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## 2 Electrical Characteristics

### 2.1 Absolute Maximum Ratings

Table 2-1

Symbol	Parameter	Min	Max	Unit
Tamb	Ambient Temperature	-40	+85	°C
Tstg	Storage temperature	-65	+150	°C
VBAT	Supply Voltage	-0.3	5.5	V
V <sub>VDDIO33</sub>	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 <sub>VDDIO</sub>	Voltage output	2.0	3.0	3.4	V	VBAT = 3.7V, 100mA loading
I <sub>VDDIO</sub>	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 <sub>IL</sub>	Low-Level Input Voltage	-0.3	—	0.3* VDDIO	V	VDDIO = 3.3V
V <sub>IH</sub>	High-Level Input Voltage	0.7* VDDIO	—	VDDIO+0.3	V	VDDIO = 3.3V
IO output characteristics						
V <sub>OL</sub>	Low-Level Output Voltage	—	—	0.33	V	VDDIO = 3.3V
V <sub>OH</sub>	High-Level Output Voltage	2.7	—	—	V	VDDIO = 3.3V

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## 2.4 Internal Resistor Characteristics

Table 2-4

Port	General Output	High Drive	Internal Pull-Up Resistor	Internal Pull-Down Resistor	Comment
PA0~PA3 PA6,PA7 PA11~PA15 PB0~PB2 PB4~PB6 PD0~PD2	8mA	64mA	10K	60K	1、PA0,PB10,PD2 default pull up 2、PB0 & PB1 default pull down 3、internal pull-up/pull-down resistance   accuracy $\pm 20\%$
PB8~PB11	8mA	—	10K	60K	

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## 3 Package Information

### 3.1 QSOP28

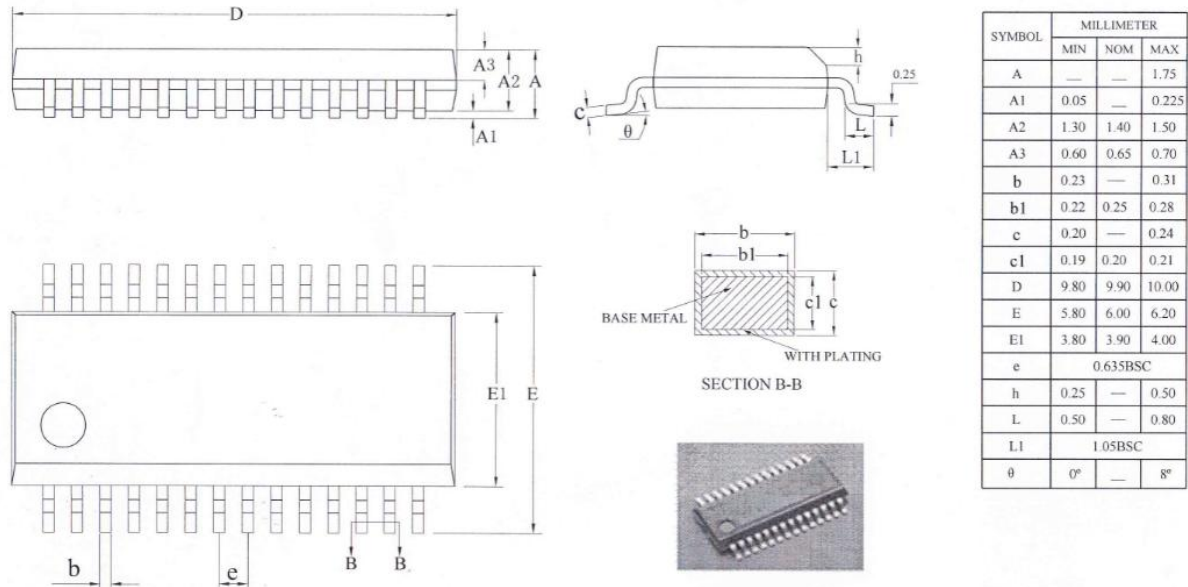


Figure 3-1. AD157A0\_QSOP28 Package

## 4 Package Type Specification



① Represents different packages

② Represents different memory sizes

0: No memory

2: 2Mbit Flash

4: 4Mbit Flash

8: 8Mbit Flash

## 5 Revision History

Date	Revision	Description
2021.10.21	V1.0	Initial Release
2023.03.23	V1.1	Modify the Features.

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