音频解码芯片规格书

——AC1074 芯片

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AC1074 Features

High performance 8-bit MCU

- DC-48MHZ operation
- Compatible with 8051
- Extended 16-bit DSP instructions
- All instructions are single-cycle except branching instructions
- Two data pointer for indirect addressing

Program Memory

- 16K Bytes OTP program memory

Interrupt Feature

- 16 Vectored interrupts
- External wake up/interrupt on 1 GPIOs
- 4 Levels interrupt priority

Flexible I/O

- 16 GPIO pins
- All GPIO pins can be programmable as input or output individually
- All GPIO pins are internal pull-up/pull-down selectable individually
- CMOS/TTL level Schmitt triggered input

Digital Peripheral Feature

- Two multi-function 8-bit timers,support capture and PWM mode
- Two multi-function 16-bit timers, support Capture mode
- Watchdog
- MPEG-1, MPEG-2, MPEG-2.5 Audio Layer 1,2,3 decoder，Bit rate 8-448Kbps, CBR/VBR/ABR
- Support 9 sampling frequency:
  8kHz/11.025kHz/12kHz/16kHz/22.05kHz/24kHz/32kHz/44.1kHz/48kHz
- One full-duplex UART
- LED controller, Drive 7PIN LED
- IIC HOST/DEVICE controller
- SD Card Host controller
- Full speed USB 2.0 HOST/DEVICE controller

Analog Peripheral Features

- One 1~24MHz Crystal Oscillator
- One internal RC oscillator
- One internal high- performance RC oscillator
- Full speed USB 2.0 PHY
- 48MHz PLL-based clock generator
- 16-bit Stereo DAC，SNR > 85dB
- Embedded headphone amplifier

- 2 channels Analog MUX
- 1 channels Analog MIC
- 7 hannels 10-bit ADC
- 2 channels 4 levels Low Voltage Detector
- Power-on reset
- Two LDO: 5V to 1.8V, 5V to 3.3V

Power Supply

- VDDLDO is 3.2V to 5.5V
- VDDIO is 3.0V to 3.6V
- RTCVDD is 1.6V to 2.0V

Packages

- SSOP24

Temperature

- Operating temperature: -40℃ to +85℃
- Storage temperature: -65℃ to +150℃

一、引脚定义

1.1 引脚分配

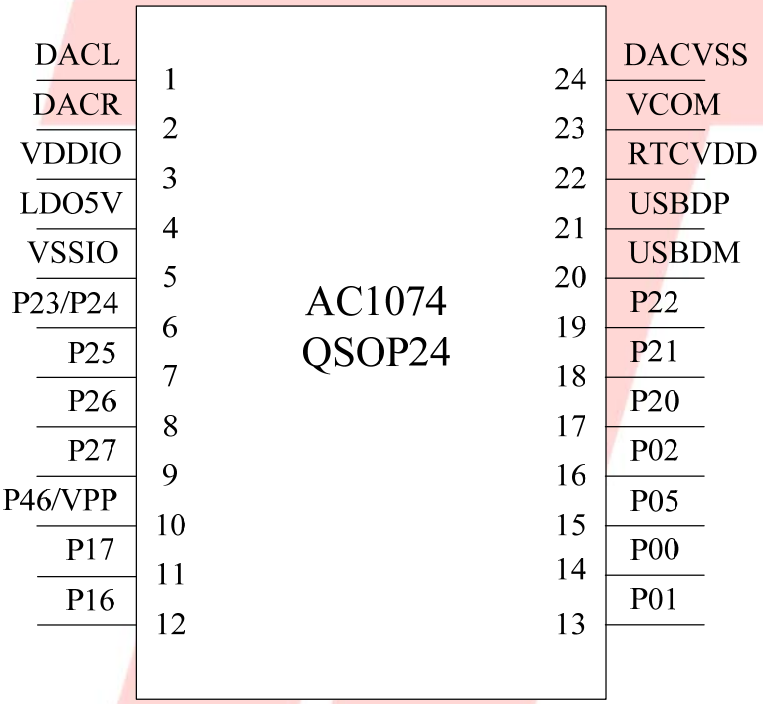


图 2　AC1074_24PIN 引脚分配图

1.2 引脚描述

表 1　AC1074 引脚描述

PIN	Name	I/O Type	Drive (mA)	Function	Other Function
1	DACL	O	/	DAC Left Channel	
2	DACR	O	/	DAC Right Channel	
3	VDDIO	P	/	IO Power 3.3V	
4	LDO5V	P	/	LDO Power 5V	
5	VSSIO	P	/	IO Ground	
6	P23	I/O	16/8	GPIO	T2CAP: Timer2 Capture Pin MIC: MIC input
	P24	I/O	16/8	GPIO	UARTTX1: UART Data Out(B) AUXL0: Analog MUX left channel input 0 ISD CLK0:ISD 2W Clock0

					FM IN:FM RF Signal In
7	P25	I/O	16/8	GPIO	UARTRX1: UART Data In(B) AUXR0: Analog MUX right channel input 0 ISD DAT0:ISD 2W Data0
8	P26	I/O	16/8	GPIO	IICK1: IIC Clock(B) AUXL1: Analog MUX left channel input 1
9	P27	I/O	16/8	GPIO	IICDA1: IIC Data(B) AUXR1: Analog MUX right channel input 1
10	VPP/P46	I/O	8	GPIO OTP Program Power	Additional Input Only Pin T3CAP: Timer3 Capture Pin WKUP4: Port Interrupt/Wakeup
11	P17	I/O	16/8	GPIO	EMID7: EMI Data 7 SPIDOA: SPI Data Out(A)
12	P16	I/O	16/8	GPIO	EMID6: EMI Data 6 SPICLKA: SPI Clock(A)
13	P01	I/O	16/8	GPIO	High Frequency Oscillator Out ISP Data In ADC1: ADC Channel 1 Input IICDA4: IIC Data(D) SPIDOB: SPI Data Out(B) SDDATB: SD Data(B) ISD DAT1:ISD 2W Data1
14	P00	I/O	16/8	GPIO	High Frequency Oscillator In ISP Clock In ADC0: ADC Channel 0 Input IICK4: IIC Clock(D) SPICLKB: SPI Clock(B) SDCMDB: SD Command(B) ISD CLK1:ISD 2W Clock1
15	P05	I/O	16/8	GPIO	ADC5: ADC Channel 5 Input T1CKIN: Timer1 Clock In WKUP1:Port Interrupt/Wakeup T2PWM: Timer2 PWM Output CLKOUT: Internal Clock Output
16	P02	I/O	16/8	GPIO	ADC2: ADC Channel 2 Input T0CAP: Timer0 Capture Pin WKUP0:Port Interrupt/Wakeup ISP Data Out DAC L:
17	P20	I/O	16/8	GPIO	SDCLKA: SD Clock(A) ADC8: ADC Channel 8 Input
18	P21	I/O	16/8	GPIO	SDCMDA: SD Command(A) ADC9: ADC Channel 9 Input
19	P22	I/O	16/8	GPIO	SDDATA: SD Data(A) ADC10: ADC Channel 10 Input T3CKIN: Timer3 Clock In
20	USBDM	I/O	/	USB Negative Data	UARTRX3: UART Data In(D) IICDA3: IIC Data(D)
21	USBDP	I/O	/	USB Positive Data	UARTTX3: UART Data Out(D) IICK3: IIC Clock(D)
22	RTCVDD	P	/	RTC Power 1.8V	RTC Power 1.8V

23	VCOM	P	/	DAC Reference	
24	DACVSS	P	/	DAC Ground	

二、电气特性

2.1 LDO 电压、电流特性

表 2-1

符号	参数	最小	典型	最大	单位	测试条件
LDO5V	Voltage Input	3.3	4.6	5.5	V	_
$V_{3.3}$	Voltage output	_	3.3	_	V	LDO5V = 5V, 100mA loading
$V_{1.8}$		_	1.8	_	V	LDO5V = 5V, 50mA loading
RTCVDD	RTC Voltage	_	1.8	_	V	LDO5V = 5V, 10mA loading
$I_{L3.3}$	Loading current	_	_	150	mA	LDO5V = 5V

2.2 IO 输入、输出高低逻辑特性

表 2-2

IO 输入特性						
符号	参数	最小	典型	最大	单位	测试条件
V_{IL}	Low-Level Input Voltaget	-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 输出特性						
V_{OL}	Low-Level Output Voltaget	_	_	0.33	V	VDDIO = 3.3V
V_{OH}	High-Level Output Voltaget	2.7	_	_	V	VDDIO = 3.3V

2.3 IO 输出能力、上下拉电阻特性

表 2-3

Port 口	普通输出	强输出	上拉电阻	下拉电阻	备注
P00~P05 P20~P27 P16,P17	串接 500 欧电阻（寄存器可控制）	16mA	10K	10K	1、内部上下拉阻抗因工艺波动差异，可能存在±20%的偏差
DP,DM	4mA	N/A	15K	1.5K	
VPP/P46	4mA	20mA	10K	500R	

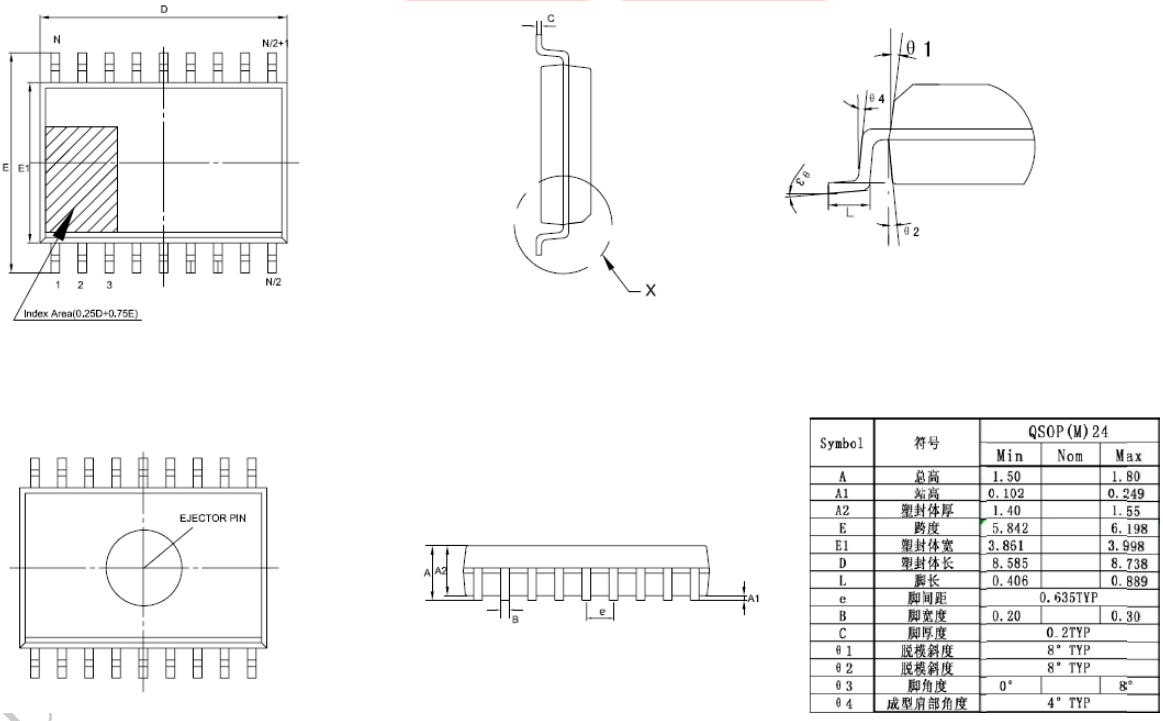
2.4 DAC 特性

表 2-4

参数	最小	典型	最大	单位	测试条件
Frequency Response	20	_	200000	Hz	_
THD+N	_	0.014	_	%	1KHz out = 1V RMS
S/N	_	85	_	dB	1KHz out = 1V RMS
Channel Separation	_	80	_	dB	_
DAC Output Power	_	>15	_	mW	32ohm loading

三、封装

3.1 AC1074_QSOP24



Symbol	符号	QSOP(M)24		
		Min	Nom	Max
A	总高	1.50		1.80
A1	站高	0.102		0.249
A2	塑封体厚	1.40		1.55
E	跨度	5.842		6.198
E1	塑封体宽	3.861		3.998
D	塑封体长	8.585		8.738
L	脚长	0.406		0.889
e	脚间距	0.635TYP		
B	脚宽度	0.20		0.30
C	脚厚度	0.2TYP		
θ1	脱模斜度	8° TYP		
θ2	脱模斜度	8° TYP		
θ3	脚角度	0°		8°
θ4	成型肩部角度	4° TYP		

图 3-1 AC1074_QSOP24 封装图

四、版本信息

日期	版本号	描述
2015.12.12	V1.0	原始版本