视频编码解码芯片规格书

——AC5201C 芯片

珠海市杰理科技有限公司

版本：V1.0

日期：2015.09.16

AC5201C 硬件设计说明书 V1.0

特别注意事项

1、 LDOIN、VDDIO、USBAVDD 要求使用 3.3V(±5%范围内)供电。

2、 HPAVDD 要求使用 3.3V 供电，纹波尽可能优化处理。

3、 AVSS 不能直接在芯片处连数字 GND，需要把其定义为模拟地作处理。

4、 晶振及其他时钟的走线要尽可能短，走线切勿与其他信号线平行走线，并需用地线或电源线包裹。

5、 AVDD18 和 AVDD28 为芯片输出电压，可供给摄像头模组等使用。

1. 版本信息

日期	版本号	描述
2015.09.16	V1.0	原始版本。

2. 引脚定义

2.1 引脚分配

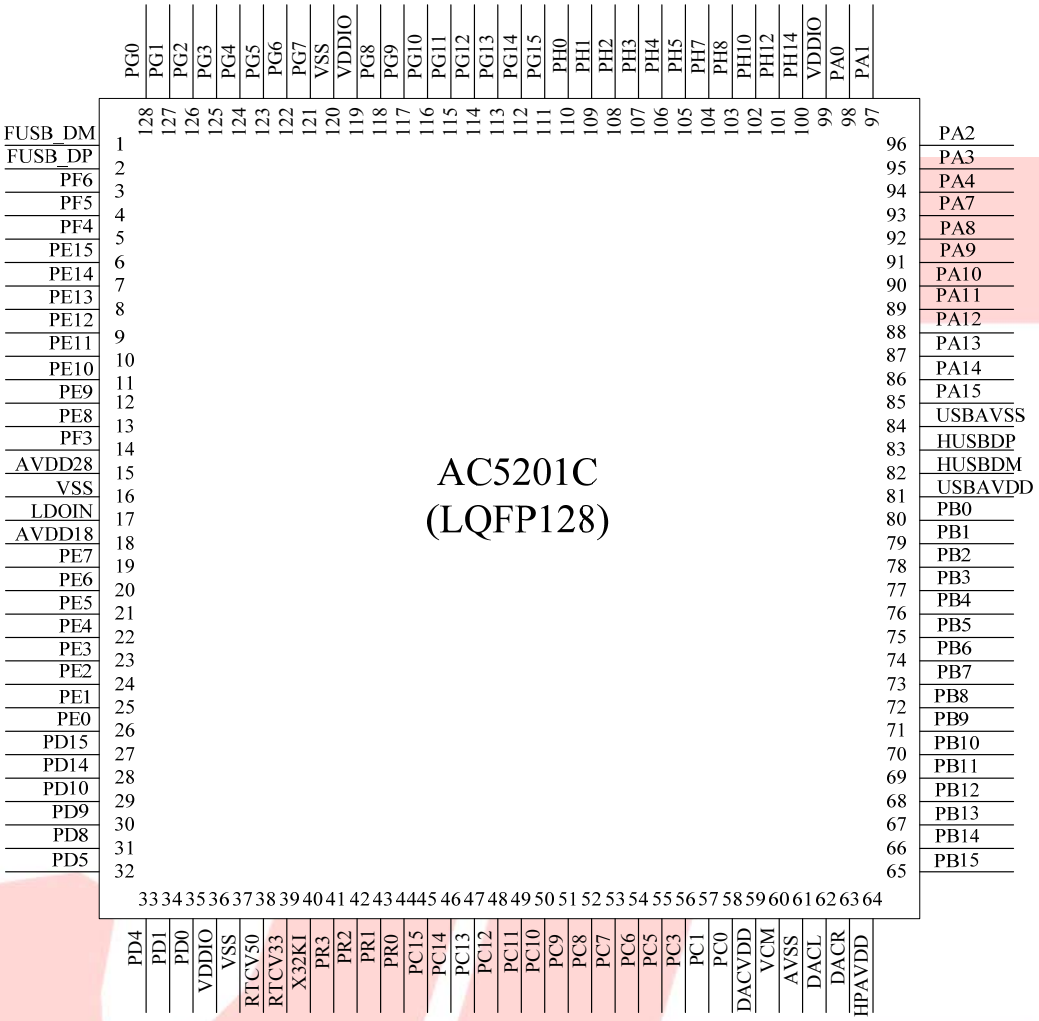


图 1　AC5201C _LQFP128

2.2 引脚描述

(AC5201C)Pin#	Name	I/O Type	Function	Other Function
1	FUSB_DM	I/O	GPIO	--
2	FUSB_DP	I/O	GPIO	--
3	PF6	I/O	GPIO	SDR_RAS_BC:SDRAM RAS# SENSOR1_VSYNC_B: SENSOR1 Vertical Synchronization SD1_CMD_A: SD CMD MPWM_L2_B: MOTOR PWM L2
4	PF5	I/O	GPIO	SDR_CAS_BC:SDRAM CAS# SENSOR1_HSYNC_B: SENSOR1 Horizontal Synchronization SD1_DAT3_A: SD Data 3 MPWM_H1_B: MOTOR PWMH H1
5	PF4	I/O	GPIO	SDR_WE_BC:SDRAM WE# SENSOR1_CLK_B: SENSOR1 PCLK SD1_DAT2_A: SD Data 2 MPWM_L1_B: MOTOR PWMH L1
6	PE15	I/O	GPIO	SDR_DQ15
7	PE14	I/O	GPIO	SDR_DQ14 SDR_A3_C:SDRAM A3
8	PE13	I/O	GPIO	SDR_DQ13 SDR_A2_C:SDRAM A2
9	PE12	I/O	GPIO	SDR_DQ12 SDR_A1_C:SDRAM A1
10	PE11	I/O	GPIO	SDR_DQ11 SDR_A0_C:SDRAM A0
11	PE10	I/O	GPIO	SDR_DQ10 SDR_A10_C:SDRAM A10
12	PE9	I/O	GPIO	SDR_DQ9 SDR_BA1_C:SDRAM BA1
13	PE8	I/O	GPIO	SDR_DQ8 SDR_BA0_C:SDRAM BA0
14	PF3	I/O	GPIO	UART2_RX_B: Uart2 Data In SDR_DQMH_BC: SDRAM DQ Mask High
15	AVDD28	P	LDO OUT	2.8V Output
16	VSS	P	Digital Ground	--
17	LDOIN	P	LDO Power In	--
18	AVDD18	P	LDO OUT	1.8V Output
19	PE7	I/O	GPIO	SDR_DQ7 SDR_A12_C:SDRAM A12

20	PE6	I/O	GPIO	SDR_DQ6 SDR_A11_C:SDRAM A11
21	PE5	I/O	GPIO	SDR_DQ5 SDR_A9_C:SDRAM A9
22	PE4	I/O	GPIO	SDR_DQ4 SDR_A8_C:SDRAM A8
23	PE3	I/O	GPIO	SDR_DQ3 SDR_A7_C:SDRAM A7
24	PE2	I/O	GPIO	SDR_DQ2 SDR_A6_C:SDRAM A6
25	PE1	I/O	GPIO	SDR_DQ1 SDR_A5_C:SDRAM A5
26	PE0	I/O	GPIO	SDR_DQ0 SDR_A4_C:SDRAM A4
27	PD15	I/O	GPIO	SDR_CLK_BC: SDRAM CLK SENSOR0_D0_A: SENSOR0 Data 0
28	PD14	I/O	GPIO	SDR_CKE_BC: SDRAM CKE SENSOR0_D1_A: SENSOR0 Data 1
29	PD10	I/O	GPIO	SDR_A8_B:SDRAM A8 SENSOR0_D5_A: SENSOR0 Data 5 SD1_DAT0_C:SD1 Data0
30	PD9	I/O	GPIO	SDR_A7_B:SDRAM A7 SENSOR0_D6_A: SENSOR0 Data 6 SD1_CLK_C:SD1 CLK
31	PD8	I/O	GPIO	SDR_A6_B:SDRAM A6 SENSOR0_D7_A: SENSOR0 Data 7 SD1_CMD_C:SD1 CMD
32	PD5	I/O	GPIO	UART0_RX_D: Uart0 Data In SENSOR0_VSYNC_A: SENSOR0 Vertical Synchronization IIC_SDA_A:IIC SDA
33	PD4	I/O	GPIO	UART0_TX_D: Uart0 Data Out SENSOR0_HSYNC_A: SENSOR0 Horizontal Synchronization IIC_SCL_A:IIC SCL
34	PD1	I/O	GPIO	SPI1_DO_B :SPI1 Data Out UART2_RX_C: Uart2 Data In
35	PD0	I/O	GPIO	SPI1_CLK_B:SPI1 Clock UART2_TX_C: Uart2 Data Out CAP2:TIMER2 Capture
36	VDDIO	P	IO Power	--
37	VSS	P	Digital Ground	--

38	RTCV50	P	RTC Power	--
39	RTCV33	P	RTC Power	--
40	X32KI	I/O	RTC 32K OSC In	--
41	PR3	I/O	RTCIO	RTC32K OSC OUT
42	PR2	I/O	RTCIO	ADC12:ADC Input Channel 12
43	PR1	I/O	RTCIO	ADC13:ADC Input Channel 13
44	PR0	I/O	RTCIO	--
45	PC15	I/O	GPIO	UART3_RX_C: Uart3 Data In SENSOR1_D7_A: SENSOR1 Data 7
46	PC14	I/O	GPIO	UART3_TX_C: Uart3 Data Out SENSOR1_D6_A: SENSOR1 Data 6
47	PC13	I/O	GPIO	ALNK_D3_B: AUDIO LINK Data3 SENSOR1_D5_A: SENSOR1 Data 5 SD0_DAT1_C:SD0 Data1 SPI0_DAT3_B:SPI0 Data3 CAP3:TIMER3 Capture
48	PC12	I/O	GPIO	ALNK_D2_B: AUDIO LINK Data2 SENSOR1_D4_A: SENSOR1 Data 4 SD0_DAT0_C:SD0 Data0 SPI0_CLK_B:SPI0 Clock
49	PC11	I/O	GPIO	ALNK_D1_B: AUDIO LINK Data1 SENSOR1_D3_A: SENSOR1 Data 3 SD0_CLK_C:SD0 CLK SPI0_DO(0)_B:SPI0 DO(Data 0)
50	PC10	I/O	GPIO	ALNK_D0_B: AUDIO LINK Data0 SENSOR1_D2_A: SENSOR1 Data 2 SD0_CMD_C:SD0 CMD SPI0_DAT2_B:SPI0 Data2
51	PC9	I/O	GPIO	ALNK_WS_B:AUDIO LINK WS SENSOR1_D1_A: SENSOR1 Data 1 SD0_DAT3_C:SD0 Data3 SPI0_DI(1)_B:SPI0 DI(Data 1)
52	PC8	I/O	GPIO	ALNK_CK_B:AUDIO LINK CLK SENSOR1_D0_A: SENSOR1 Data 0 SD0_DAT2_C:SD0 Data2 SPI0_CS_B :SPI0 Chip Select
53	PC7	I/O	GPIO	UART1_RX_D: Uart1 Data In SENSOR1_VSYNC_A: SENSOR1 Vertical Synchronization
54	PC6	I/O	GPIO	UART1_TX_D: Uart1 Data Out SENSOR1_HSYNC_A: SENSOR1 Horizontal Synchronization

55	PC5	I/O	GPIO	SENSOR1_CLK_A: SENSOR1 PCLK CAP0:TIMER0 Capture UART2_RX_A: Uart2 Data In
56	PC3	I/O	GPIO	VPP UART1_RX_A: Uart1 Data In PWM3:TIMER3 PWM Output
57	PC1	I/O	GPIO	AMUX1R: Simulator Channel 1 Right UART0_RX_A: Uart0 Data In LADC7
58	PC0	I/O	GPIO	AMUX1L: Simulator Channel 1 Left UART0_TX_A: UART0 Data Out PWM0:TIMER0 PWM Output LADC6
59	DACVDD	P	DAC Power	--
60	VCM	P	VCM	--
61	AVSS	P	Analog Gound	--
62	DACL	O	DAC Left Channel	DACL
63	DACR	O	DAC Right Channel	DACR
64	HPAVDD	P	Head Phone Power	--
65	PB15	I/O	GPIO	UART3_RX_B: Uart3 Data In MIC LADC5
66	PB14	I/O	GPIO	UART3_TX_B: Uart3 Data Out AMUX0R: Simulator Channel 0 Right IIC_SDA_B:IIC SDA WAKEUP9: Port Wakeup LADC4
67	PB13	I/O	GPIO	AVOUT: AV Output WAKEUP8: Port Wakeup LADC3 PWM1:TIMER1 PWM Output
68	PB12	I/O	GPIO	AMUX0L: Simulator Channel 0 Left SENSOR0_D0_B: SENSOR0 Data 0 IIC_SCL_B:IIC SCL
69	PB11	I/O	GPIO	SDR_DQML_A: SDRAM DQ Mask Low SENSOR0_D1_B: SENSOR0 Data 1
70	PB10	I/O	GPIO	SDR_WE_A: SDRAM WE# SENSOR0_D2_B: SENSOR0 Data 2

71	PB9	I/O	GPIO	SDR_CAS_A: SDRAM CAS# SENSOR0_D3_B: SENSOR0 Data 3
72	PB8	I/O	GPIO	SDR_RAS_A: SDRAM RAS# SENSOR0_D4_B: SENSOR0 Data 4
73	PB7	I/O	GPIO	SDR_CS_A: SDRAM CS# SENSOR0_D5_B: SENSOR0 Data 5
74	PB6	I/O	GPIO	SDR_BA0_A: SDRAM BA0 SENSOR0_D6_B: SENSOR0 Data 6
75	PB5	I/O	GPIO	SDR_BA1_A: SDRAM BA1 SENSOR0_D7_B: SENSOR0 Data 7
76	PB4	I/O	GPIO	SDR_A10_A: SDRAM A10 SENSOR0_D8_B: SENSOR0 Data 8
77	PB3	I/O	GPIO	SDR_A0_A: SDRAM A0 SENSOR0_D9_B: SENSOR0 Data 9
78	PB2	I/O	GPIO	SDR_A1_A: SDRAM A1 SENSOR0_VSYNC_B: SENSOR0 Vertical Synchronization
79	PB1	I/O	GPIO	SDR_A2_A: SDRAM A2 SENSOR0_HSYNC_B: SENSOR0 Horizontal Synchronization Timer1:TIMER1 Clock In
80	PB0	I/O	GPIO	SDR_A3_A: SDRAM A3 SENSOR0_CLK_B: SENSOR0 PCLK
81	USBAVDD	P	USB Power	--
82	HUSBDM	I/O	HUSB DM	--
83	HUSBDP	I/O	HUSB DP	--
84	USBAVSS	P	USB Ground	--
85	PA15	I/O	GPIO	SDR_A4_A: SDRAM A4 SENSOR1_CLK_C: SENSOR1 PCLK SD1_DAT1_D: SD Data 1 MPWM_H3_A: MOTOR PWM H3
86	PA14	I/O	GPIO	SDR_A5_A: SDRAM A5 SENSOR1_D7_C: SENSOR1 Data 7 SD1_DAT0_D: SD Data 0 MPWM_L3_A: MOTOR PWM L3
87	PA13	I/O	GPIO	SDR_A6_A: SDRAM A6 SENSOR1_D6_C: SENSOR1 Data 6 SD1_CLK_D: SD CLK MPWM_H2_A: MOTOR PWM H2
88	PA12	I/O	GPIO	SDR_A7_A: SDRAM A7 SENSOR1_D5_C: SENSOR1 Data 5 SD1_CMD_D: SD CMD MPWM_L2_A: MOTOR PWM L2

89	PA11	I/O	GPIO	SDR_A8_A: SDRAM A8 SENSOR1_D4_C: SENSOR1 Data 4 SD1_DAT3_D: SD Data 3 MPWM_H1_A: MOTOR PWM H1
90	PA10	I/O	GPIO	SDR_A9_A: SDRAM A9 SENSOR1_D3_C: SENSOR1 Data 3 SD1_DAT2_D: SD Data 2 MPWM_L1_A: MOTOR PWM L1
91	PA9	I/O	GPIO	SDR_A11_A: SDRAM A11 SENSOR1_D2_C: SENSOR1 Data 2 MPWM_FPIN_A: MOTOR PWM FPIN
92	PA8	I/O	GPIO	SDR_A12_A: SDRAM A12 SENSOR1_D1_C: SENSOR1 Data 1 UART3_RX_A: Uart3 Data In
93	PA7	I/O	GPIO	SDR_CKE_A: SDRAM CKE SENSOR1_D0_C: SENSOR1 Data 0 UART3_TX_A: Uart3 Data Out
94	PA4	I/O	GPIO	ADC1:ADC Input Channel 1 SPI0_CLK_A:SPI0 Clock SFC_CLK:SFC Clock SD0_DAT0_A: SD Data 0
95	PA3	I/O	GPIO	SPI0_D0(0)_A:SPI0 D0(Data 0) SFC_D0(0):SFC D0(Data 0) SD0_DAT2_A: SD Data 2
96	PA2	I/O	GPIO	ADC0:ADC Input Channel 0 IIC_SCL_A:IIC SCL SPI0_DAT2_A:SPI0 Data2 SFC_DAT2:SFC Data2 SD0_CLK_A: SD CLK
97	PA1	I/O	GPIO	IIC_SDA_C:IIC SDA SPI0_DI(1)_A:SPI0 DI(Data 1) SFC_DI(1): SFC_Data 1 SD0_CMD_A: SD CMD
98	PA0	I/O	GPIO	SPI0_CS_A :SPI0 Chip Select SFC_CS :SFC Chip Select
99	VDDIO	P	IO Power	--
100	PH14	I/O	GPIO	UART1_TX_C: Uart1 Data Out ADC6:ADC Input Channel 6 CLKOUT1: Clock Out 1 WAKEUP14: Port Wakeup

101	PH12	I/O	GPIO	UART0_TX_C: Uart0 Data Out ALNK_MCK:AUDIO LIN MASTER CLK PWM2:TIMER2 PWM Output LVD: LVD Test Pin
102	PH10	I/O	GPIO	LCD_DAT22:LCD Data22 ADC10:ADC Input Channel 10 SD0_DAT0_B: SD Data 0 LCD_COM4:LCD Com Output4 ALNK_D2A:AUDIO LINK Data2 WAKEUP13: Port Wakeup UART3_TX_D: Uart3 Data Out
103	PH8	I/O	GPIO	LCD_DAT20:LCD Data20 ADC8:ADC Input Channel 8 SD0_CLK_B: SD Clock LCD_COM2:LCD Com Output2 ALNK_D0A:AUDIO LINK Data0 IIC_SDA_D:IIC SDA
104	PH7	I/O	GPIO	LCD_DAT19:LCD Data19 ADC7:ADC Input Channel 7 SD0_CMD_B: SD CMD LCD_COM1:LCD Com Output1 ALNK_WSA:AUDIO LINK WS WAKEUP12: Port Wakeup IIC_SCL_D:IIC SCL
105	PH5	I/O	GPIO	LCD_VSYNC：LCD Vertical Synchronization UART1_RX_B: Uart1 Data In SPI1_DI_A :SPI1 Data In LCD_SEG21:LCD SEG Output21
106	PH4	I/O	GPIO	LCD_HSYNC:LCD Horizontal Synchronization SPI1_DO_A :SPI1 Data Out LCD_SEG20:LCD SEG Output20 EMI_RD:EMI Read
107	PH3	I/O	GPIO	LCD_DEN:LCD Data Enable EMI_WR:EMI Write SPI1_CLK_A:SPI1 Clock LCD_SEG19:LCD SEG Output19
108	PH2	I/O	GPIO	LCD_DCLK:LCD Data CLK UART1_TX_B: Uart1 Data Out LCD_SEG18:LCD SEG Output18

109	PH1	I/O	GPIO	LCD_DAT17:LCD Data17 UART2_RX_D: Uart2 Data In ADC5:ADC Input Channel 5 LCD_SEG17:LCD SEG Output17 Timer2:TIMER2 Clock In WAKEUP11: Port Wakeup OSCO:OSC Out
110	PH0	I/O	GPIO	LCD_DAT16:LCD Data16 UART2_TX_D: Uart2 Data Out ADC4:ADC Input Channel 4 LCD_SEG16:LCD SEG Output16 WAKEUP10: Port Wakeup OSCI:OSC In
111	PG15	I/O	GPIO	LCD_DAT15:LCD Data15 EMI_D15:EMI Data15 LCD_SEG15:LCD SEG Output15
112	PG14	I/O	GPIO	LCD_DAT14:LCD Data14 EMI_D14:EMI Data14 LCD_SEG14:LCD SEG Output14
113	PG13	I/O	GPIO	LCD_DAT13:LCD Data13 EMI_D13:EMI Data13 SD0_DAT1_D: SD Data 1 LCD_SEG13:LCD SEG Output13
114	PG12	I/O	GPIO	LCD_DAT12:LCD Data12 EMI_D12:EMI Data12 SD0_DAT0_D: SD Data 0 LCD_SEG12:LCD SEG Output12
115	PG11	I/O	GPIO	LCD_DAT11:LCD Data11 EMI_D11:EMI Data11 SD0_CLK_D: SD Clock LCD_SEG11:LCD SEG Output11
116	PG10	I/O	GPIO	LCD_DAT10:LCD Data10 EMI_D10:EMI Data10 SD0_CMD_D: SD Command LCD_SEG10:LCD SEG Output10
117	PG9	I/O	GPIO	LCD_DAT9:LCD Data9 EMI_D9:EMI Data9 SD0_DAT3_D: SD Data 3 LCD_SEG9:LCD SEG Output9
118	PG8	I/O	GPIO	LCD_DAT8:LCD Data8 EMI_D8:EMI Data8 SD0_DAT2_D: SD Data 2 LCD_SEG8:LCD SEG Output8

119	VDDIO	P	IO Power	--
120	VSS	P	Digital Ground	--
121	PG7	I/O	GPIO	LCD_DAT7:LCD Data7 EMI_D7:EMI Data7 UART0_RX_B: Uart0 Data In LCD_SEG7:LCD SEG Output7 ADC3:ADC Input Channel 3
122	PG6	I/O	GPIO	LCD_DAT6:LCD Data6 EMI_D6:EMI Data6 UART0_TX_B: Uart0 Data Out LCD_SEG6:LCD SEG Output6 ADC2:ADC Input Channel 2
123	PG5	I/O	GPIO	LCD_DAT5:LCD Data5 EMI_D5:EMI Data5 SD1_DAT1_B: SD Data 1 LCD_SEG5:LCD SEG Output5
124	PG4	I/O	GPIO	LCD_DAT4:LCD Data4 EMI_D4:EMI Data4 SD1_DAT0_B: SD Data 0 LCD_SEG4:LCD SEG Output4
125	PG3	I/O	GPIO	LCD_DAT3:LCD Data3 EMI_D3:EMI Data3 SD1_CLK_B: SD Clock LCD_SEG3:LCD SEG Output3
126	PG2	I/O	GPIO	LCD_DAT2:LCD Data2 EMI_D2:EMI Data2 SD1_CMD_B: SD Command LCD_SEG2:LCD SEG Output2
127	PG1	I/O	GPIO	LCD_DAT1:LCD Data1 EMI_D1:EMI Data1 SD1_DAT3_B: SD Data 3 LCD_SEG1:LCD SEG Output1
128	PG0	I/O	GPIO	LCD_DAT0:LCD Data0 EMI_D0:EMI Data0 SD1_DAT2_B: SD Data 2 LCD_SEG0:LCD SEG Output0

（★说明：1、P----Power Supply　　2、I----Input　　3、O----Output　　4、I/O----Bi-direction）

3. 电气特性

3.1 I/O 输入、输出高低逻辑特性

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
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

3.2 I/O 输出能力、上下拉电阻特性

Port 口	输出能力	上拉电阻	下拉电阻	备注
PA0 – PA4 PA7 – PA15 PB0 - PB15 PC0 PC1 PC5 - PC15 PD0 PD1 PD4 PD5 PD8 - PD10 PD14 PD15 PE0 - PE15 PF3 – PF6 PH12 PH14	强驱：24mA 弱驱： 8mA	10K	60K	---
PG0 – PG15 PH0 – PH8 PH10	强驱：24 mA 弱驱：8mA(片内串接 200Ω 电阻)	10K	60K	---
PC3	8 mA(无强弱驱之分)	10K	60K	---
PR0 – PR3	8mA(片内串接 200Ω 电阻)	10K	60K	RTC 模块需供电
FUSB_DP	10 mA	1.5K	15K	用作普通 IO 时
FUSB_DM	10 mA	180K	15K	用作普通 IO 时
AVDD18	电压可调：1.5V-1.9V （电流约为 60 mA）	---	---	LDOIN=3.3V
AVDD28	电压可调：2.7V-3.1V （电流约为 100 mA）	---	---	LDOIN=3.3V

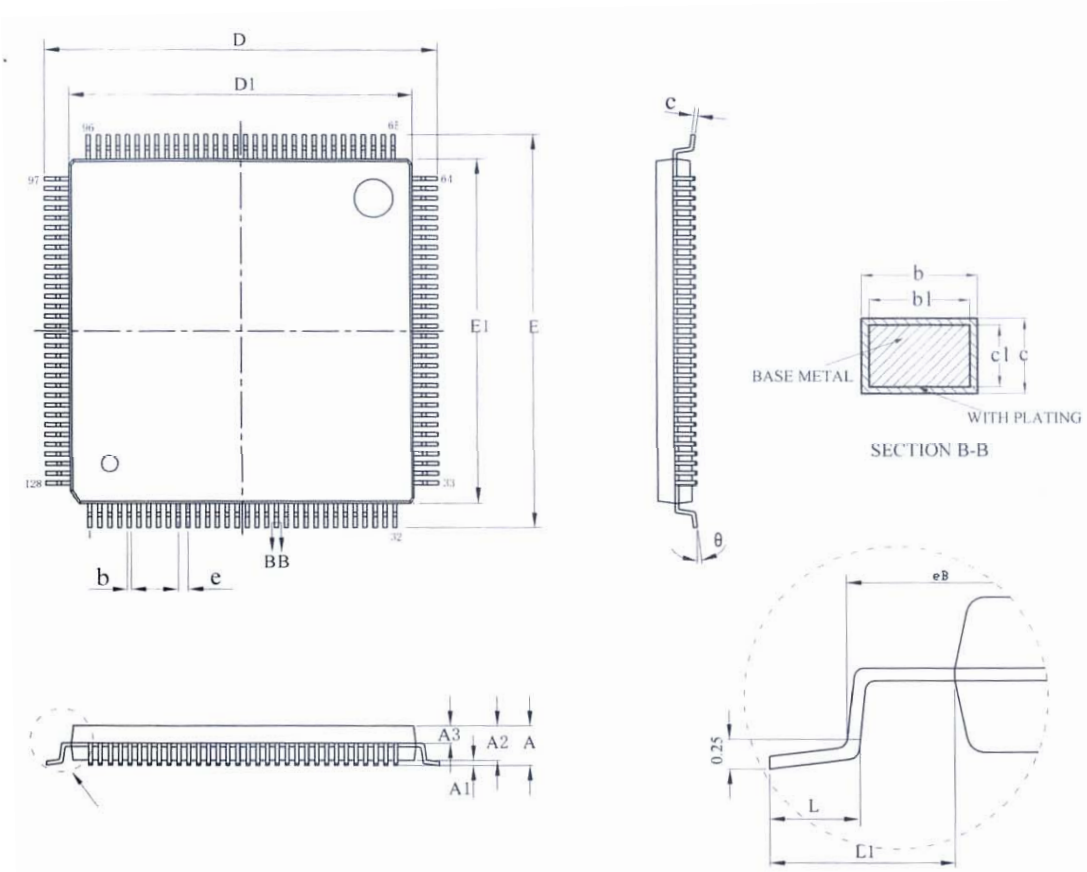
（★说明：上下拉电阻的精度约为±20%）

3.3 DAC 特性

符号	参数	最小	典型	最大	单位	测试条件
SNR	Signal to Noise Ratio		86		dB	1KHz，SR=44.1K，静音文件，CR=192Kbps
THD+N	Total Harmoni Distortion+Noise		-78		dB	(-1.5db) 1KHz， SR=44.1K，CR=192Kbps

4. 封装规格

4.1 LQFP-128PIN 封装图



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	—	—	1.60
A1	0.05	—	0.20
A2	1.35	1.40	1.45
A3	0.59	0.64	0.69
b	0.15	—	0.23
b1	0.14	0.16	0.19
c	0.13	—	0.18
c1	0.12	0.13	0.14
D	15.80	16.00	16.20
D1	13.90	14.00	14.10
E	15.80	16.00	16.20
E1	13.90	14.00	14.10
eB	15.05	—	15.35
e	0.40BSC		
L	0.45	—	0.75
L1	1.00BSC		
θ	0	—	7°
L/F载体尺寸 (mil)	196*196	236*236	
	256*256		
	354*354		