

AC6369C Datasheet

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Version: V1.2

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AC6369C Features

CPU

- 32-bit DSP supports hardware Float Point Unit (FPU)
- Up to 160MHz programmable processor
- 64 Vectored interrupts
- 4 Levels interrupt priority

Bluetooth

- Compliant with Bluetooth V5.4+BR+EDR+BLE specification
- Meet class1 class2 and class3 transmitting power requirement
- Support GFSK and $\pi/4$ DQPSK all packet types
- Provides +6dbm transmitting power
- receiver with -90dBm sensitivity
- Fast AGC for enhanced dynamic range
- Supports
a2dp\avctp\avdtp\avrcp\hfp\spp\smp\att\gap\gatt\rfcomm\sdp\l2cap profile

Peripherals

- One full speed USB 2.0 OTG controller
- Six multi-function 32-bit timers, support capture and PWM mode
- Three full-duplex basic UART, UART0 and UART1 supports DMA mode

- Two SPI interface supports host and device mode
- One hardware IIC interface supports host and device mode
- 10-bit ADC for analog sampling
- External wake up/interrupt on all GPIOs

PMU

- Low voltage LDO for internal digital and analog circuit supply
- 3uA current consumption in the soft-off mode
- Built-in LDO for the core, I/O, Bluetooth and flash
- VBAT is 2.2V to 3.4V
- VDDIO is 2.2V to 3.4V

Temperature

- Operating temperature: -40°C to +125°C
- Storage temperature: -65°C to +150°C

Packages

- SOP16

Applications

- Bluetooth IOT

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1.2 Pin Description

Table 1-1 AC6369C Pin Description

PIN NO.	Name	I/O Type	Drive (mA)	Function	Other Function
1	PB6	I/O	24/8	GPIO	IIC_SCL_C: IIC SCL(C); SPI2_CLKA: SPI2 Clock(A); ADC8: ADC Input Channel 8; TMR3: Timer3 Clock Input; UART1TXA: Uart1 Data Out(A);
2	PB5	I/O	8	GPIO (High Voltage Resistance)	PWM3: Timer3 PWM Output; SPI2_DIA: SPI2 Data In(A); CAP1: Timer1 Capture; UART0TXC: Uart0 Data Out(C); UART0RXC: Uart0 Data In(C);
	LDOIN	P	/		Battery Charger In;
3	VBAT	P	/		Battery Power Supply;
4	VDDIO	P	/		IO Power 3.3v;
5	VSS	P	/		Ground;
6	BT_RF	/	/		BT Antenna;
7	BTOSCI	I	/		BT OSC In;
8	BTOSCO	O	/		BT OSC Out;
9	PC5	I/O	24/8	GPIO	IIC_SDA_B: IIC SDA(B); ADC12: ADC Input Channel 12; TMR1: Timer1 Clock Input; UART2RXD: Uart2 Data In(D);
10	PC4	I/O	24/8	GPIO	IIC_SCL_B: IIC SCL(B); ADC11: ADC Input Channel 11; PWM1: Timer1 PWM Output; UART2TXD: Uart2 Data Out (D);
11	USBDM	I/O	4	USB Negative Data (pull down)	IIC_SDA_A: IIC SDA(A); SPI2_DOB: SPI2 Data Out(B); ADC14: ADC Input Channel 14; UART1RXD: Uart1 Data In(D);
12	USBDP	I/O	4	USB Positive Data (pull down)	IIC_SCL_A: IIC SCL(A); SPI2_CLKB: SPI2 Clock(B); ADC13: ADC Input Channel 13; UART1TXD: Uart1 Data Output(D);

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13	PA5	I/O	24/8	GPIO	IIC_SCL_D: IIC SCL(D); PWM0: Timer0 PWM Output; UART0TXA: Uart0 Data Output(A);
14	PA3	I/O	24/8	GPIO	ADC2: ADC Input Channel 2; PWM5: Timer5 PWM Output; UART2TXA: Uart2 Data Output(A);
15	PA0	I/O	24/8	GPIO	ADC0: ADC Input Channel 0; UART1TXC: Uart1 Data Output(C);
16	PB7	I/O	24/8	GPIO	IIC_SDA_C: IIC DAT(C); SPI2_DOA: SPI2 Data Out(A); ADC9: ADC Input Channel 9; PWM5: Timer5 PWM Output; UART1RXA: Uart1 Data In(A);

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2、Electrical Characteristics

2.1 Absolute Maximum Ratings

Table 2-1

Symbol	Parameter	Min	Max	Unit
Tamb	Ambient Temperature	-40	+125	°C
Tstg	Storage temperature	-65	+150	°C
LDOIN	Charger Voltage	-0.3	6	V
VBAT	Supply Voltage	-0.3	4.5	V
V _{3.3IO}	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
LDOIN	Charger Voltage	4.5	5	5.5	V	
VBAT	Voltage Input	2.2	3.7	4.2	V	
V _{VDDIO}	Voltage Input	2.2	3.0	3.4	V	
I _{VDDIO}	Loading current	-	-	150	mA	VBAT = 4.2V

2.3 Battery Charge

Table 2-3

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
LDO_IN	Charge Input Voltage	4.5	5	5.5	V	-
V _{Charge}	Charge Voltage	4.15	4.2	4.25	V	-
I _{Charge}	Charge Current	20		300	mA	Charge current at fast charge mode
I _{Trickl}	Trickle Charge Current	20	45	70	mA	V _{BAT} < V _{Trickl}

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2.4 IO Input/Output Electrical Logical Characteristics

Table 2-4

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

2.5 Internal Resistor Characteristics

Table 2-5

Port	General Output	High Drive	Internal Pull-Up Resistor	Internal Pull-Down Resistor	Comment
PA5 PB4,PB6,PB7 PC4~PC5	8mA	24mA	10K	10K	1、USBDM & USBDP default pull down 2、PB5 can pull-up resistance to 5V 3、internal pull-up/pull-down resistance accuracy ±20%
PA0	Output 0	8mA	10K	10K	
	Output 1	8mA			
PB5	8mA	–	10K	10K	
USBDP	4mA	–	1.5K	15K	
USBDM	4mA	–	180K	15K	

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2.6 BT Characteristics

2.6.1 Transmitter

Basic Rate

Table 2-6

Parameter		Min	Typ	Max	Unit	Test Conditions
RF Transmit Power		-	4	6	dBm	25°C, Power Supply
RF Power Control Range		-	20	-	dB	
20dB Bandwidth		-	950	-	KHz	
In-band spurious Emissions (BQB Test Mode RF_Tx Power=4dBm)	F=F ₀ ±1MHz	-	-20	-	dBm	VBAT=3.7V 2441MHz DH5
	F=F ₀ ±2MHz	-	-45	-	dBm	
	F=F ₀ ±3MHz	-	-35	-	dBm	
	F=F ₀ ±>3MHz	-	-45	-	dBm	

Enhanced Data Rate

Table 2-7

Parameter		Min	Typ	Max	Unit	Test Conditions
Relative Power		-	-1	-	dB	25°C, Power Supply
π/4 DQPSK Modulation Accuracy	DEVM RMS	-	4	-	%	
	DEVM 99%	-	10	-	%	
	DEVM Peak	-	7	-	%	
In-band spurious Emissions (BQB Test Mode RF_Tx Power=4dBm)	F=F ₀ ±1MHz	-	-4	-	dBm	VBAT=3.7V 2441MHz 2DH5
	F=F ₀ ±2MHz	-	-30	-	dBm	
	F=F ₀ ±3MHz	-	-30	-	dBm	
	F=F ₀ ±>3MHz	-	-37	-	dBm	

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2.6.2 Receiver

Basic Rate

Table 2-8

Parameter		Min	Typ	Max	Unit	Test Conditions
Sensitivity		-	-88	-	dBm	25°C, Power Supply VBAT=3.7V 2441MHz DH5
Co-channel Interference Rejection		-	6	-	dB	
Adjacent Channel selectivity C/I	+1MHz	-	-6	-	dB	
	-1MHz	-	-8	-	dB	
	+2MHz	-	-17	-	dB	
	-2MHz	-	-21	-	dB	
	+3MHz	-	-15	-	dB	
	-3MHz	-	-31	-	dB	

Enhanced Data Rate

Table 2-9

Parameter		Min	Typ	Max	Unit	Test Conditions
Sensitivity		-	-90	-	dBm	25°C, Power Supply VBAT=3.7V 2441MHz 2DH5
Co-channel Interference Rejection		-	9	-	dB	
Adjacent Channel selectivity C/I	+1MHz	-	-10	-	dB	
	-1MHz	-	-13	-	dB	
	+2MHz	-	-11	-	dB	
	-2MHz	-	-21	-	dB	
	+3MHz	-	-13	-	dB	
	-3MHz	-	-40	-	dB	

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2.6.3 BLE

1M Data Rate

Table 2-10

Parameter		Min	Typ	Max	Unit	Test Conditions
Sensitivity		-	-91	-	dBm	25°C Power Supply VBAT=3.7V 2440MHz
RF Transmit Power		-	6	-	dBm	
In-band Spurious Emission	M-N =2MHz	-	-41	-	dBm	
	M-N ≥3MHz	-	-40	-	dBm	
Modulation Characteristics	Δf1 avg	-	250	-	KHz	
	Δf2 99%	-	210	-	KHz	
	Δf1avg/Δf2avg	-	0.9	-	/	
Carrier Frequency Offset		-50	-	+50	KHz	
Frequency Drift		-25	-	+25	KHz	
Frequency Drift Rate		-5	-	+5	KHz/50us	

2M Data Rate

Table 2-11

Parameter		Min	Typ	Max	Unit	Test Conditions
Sensitivity		-	-89	-	dBm	25°C Power Supply VBAT=3.7V 2440MHz
RF Transmit Power		-	6	-	dBm	
In-band Spurious Emission	M-N =4MHz	-	-45	-	dBm	
	M-N =5MHz	-	-45	-	dBm	
	M-N ≥6MHz	-	-45	-	dBm	
Modulation Characteristics	Δf1 avg	-	500	-	KHz	
	Δf2 99%	-	430	-	KHz	
	Δf1avg/Δf2avg	-	0.9	-	/	
Carrier Frequency Offset		-50	-	+50	KHz	
Frequency Drift		-25	-	+25	KHz	
Frequency Drift Rate		-5	-	+5	KHz/50us	

Long Range

Table 2-12

Parameter	Min	Typ	Max	Unit	Test Conditions
Sensitivity LE 125K(S8)	-	-99	-	dBm	VBAT=3.7V,25°C
Sensitivity LE 500K(S2)	-	-95	-	dBm	2440MHz

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3、 Package Information

3.1 SOP16

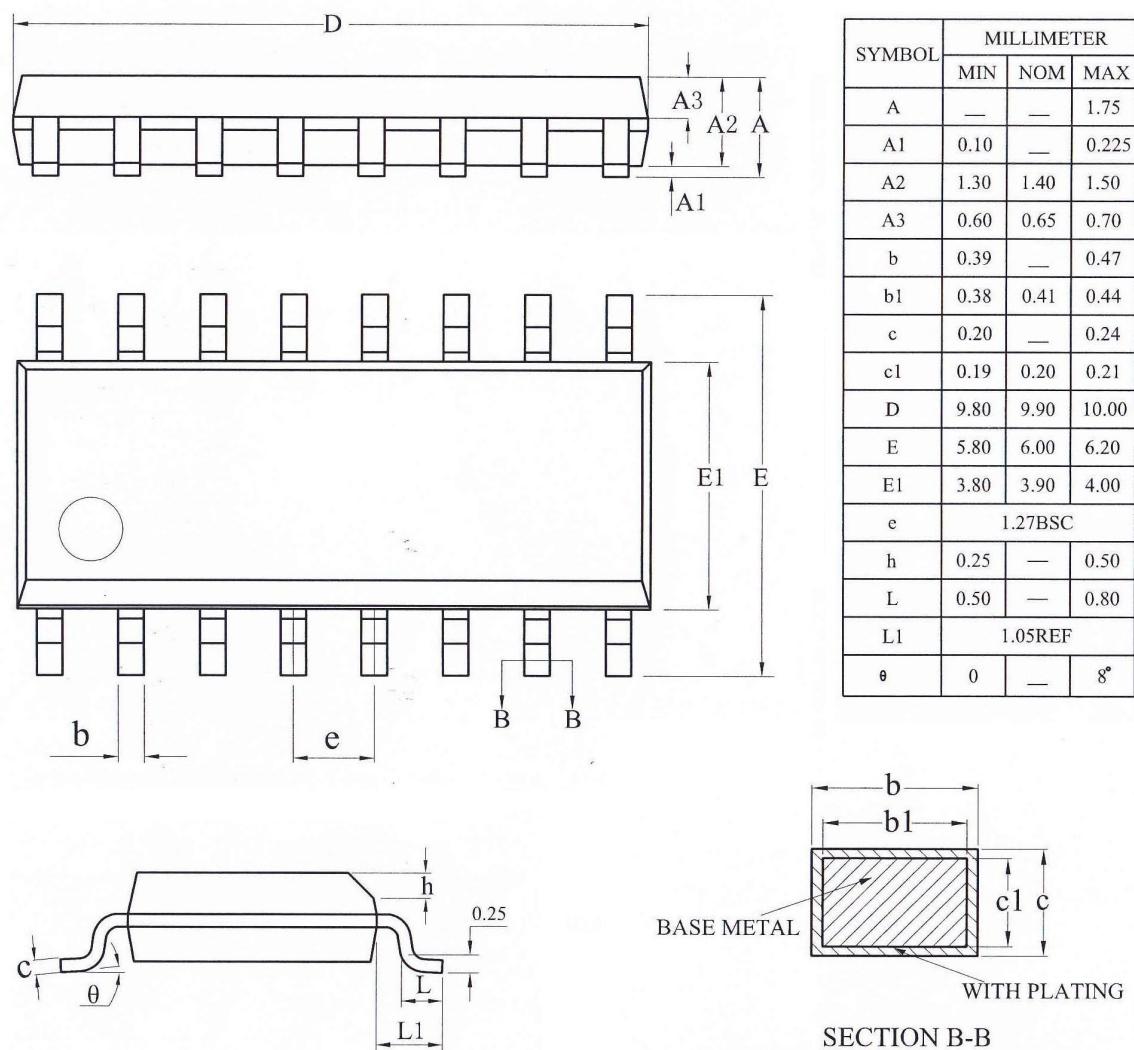


Figure 3-1 AC6369C Package

4、 Revision History

Date	Revision	Description
2020.09.14	V1.0	Initial Release
2022.07.19	V1.1	Update Bluetooth Feature
2024.03.06	V1.2	Update Bluetooth Feature, Add BLE Parameter

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