

# **AC6363F Datasheet**

**Zhuhai Jieli Technology Co.,LTD**

**Version: V1.1**

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# AC6363F 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 V5.3+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\smf\att\gap\gatt\rfcomm\sdp\l2cap profile

## Temperature

- Operating temperature: -40°C to +85°C
- Storage temperature: -65°C to +150°C

## 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 2.0V to 4.5V
- VDDIO is 2.0V to 3.4V

## Packages

- QFN20(3mm\*3mm)

## Applications

- Bluetooth IOT

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# 1、 Pin Definition

## 1.1 Pin Assignment

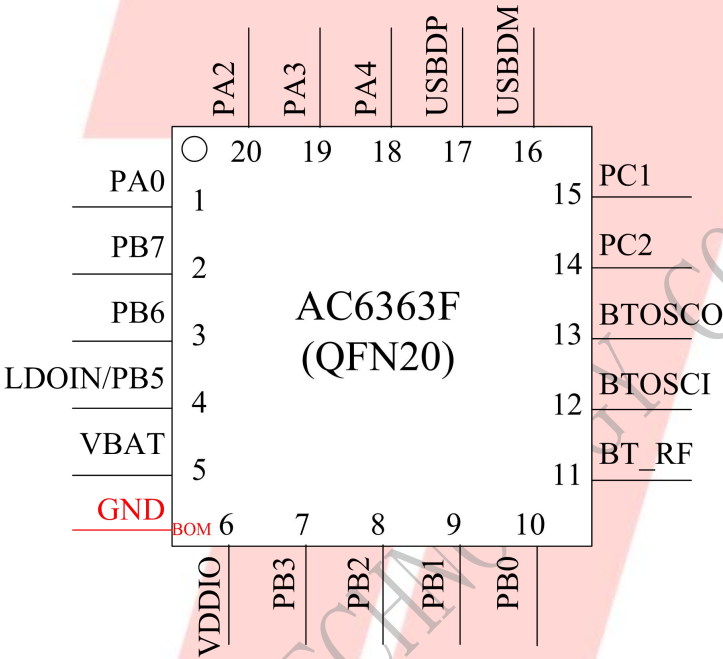


Figure 1-1 AC6363F Package Diagram

## 1.2 Pin Description

Table 1-1 AC6363F Pin Description

PIN NO.	Name	I/O Type	Drive (mA)	Function	Other Function
1	PA0	I/O		GPIO	ADC0: ADC Input Channel 0; UART1TXC: Uart1 Data Output(C);
2	PB7	I/O		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);
3	PB6	I/O		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);
4	PB5	I/O		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
5	VBAT	P	/		Battery Power Supply
6	VDDIO	P	/		IO Power 3.3v
7	PB3	I/O		GPIO	ADC6: ADC Input Channel 6; PWM2: Timer2 PWM Output; UART2RXB: Uart2 Data In(B);
8	PB2	I/O		GPIO (High Voltage Resistance)	SPI1DIA: SPI1 Data In(A); CAP0: Timer0 Capture; UART2TXB: Uart2 Data Out (B);
9	PB1	I/O		GPIO (pull up)	Long Press Reset; SPI1DOA: SPI1 Data Out(A); ADC5: ADC Input Channel 5; TMR2: Timer2 Clock Input; UART0RXB: Uart0 Data In(B);

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10	PB0	I/O		GPIO (High Voltage Resistance)	SPI1CLKA: SPI1 Clock(A); UART0TXB: Uart1 Data Out(B); TMR5: Timer5 Clock Input;
11	BT_RF	/			BT Antenna
12	BTOSCI	I			BT OSC In
13	BTOSCO	O			BT OSC Out
14	PC2	I/O		GPIO	ADC10: ADC Input Channel 10; CAP5: Timer5 Capture; UART1RXB: Uart1 Data In(B);
15	PC1	I/O		GPIO	TMR0: Timer0 Clock Input;
16	USBDM	I/O		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);
17	USBDP	I/O		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);
18	PA4	I/O		GPIO	UART1_RTS: Uart1 Request to send; ADC3: ADC Input Channel 3; TMR4: Timer4 Clock Input; UART2RXA: Uart2 Data In(A);
19	PA3	I/O		GPIO	UART1_CTS: Uart1 Clear to send; ADC2: ADC Input Channel 3; PWM5: Timer5 PWM Output; UART2TXA: Uart1 Data Output(D);
20	PA2	I/O		GPIO	CAP3: Timer3 Capture;
Substrate		GND	-	Substrate	P

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## 2、Electrical Characteristics

### 2.1 Absolute Maximum Ratings

Table 2-1

Symbol	Parameter	Min	Max	Unit
T <sub>opt</sub>	Operating temperature	-40	+85	°C
T <sub>stg</sub>	Storage temperature	-65	+150	°C
V <sub>BAT</sub>	Supply Voltage	-0.3	4.5	V
LDOIN	Charger Voltage	-0.3	6	V
V <sub>3.3IO</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 Recommended Operating Conditions

Table 2-2

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
V <sub>BAT</sub>	Voltage Input	2.0	3.7	4.5	V	
LDOIN	Charger Voltage	4.5	5	5.5	V	
V <sub>VDDIO</sub>	Voltage output	2.0	3.0	3.4	V	V <sub>BAT</sub> = 4.2V, 100mA loading
I <sub>L3.3</sub>	Loading current	—	—	150	mA	V <sub>BAT</sub> = 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 <sub>Charge</sub>	Charge Voltage	4.15	4.2	4.25	V	—
I <sub>Charge</sub>	Charge Current	20		200	mA	Charge current at fast charge mode
I <sub>Tricl</sub>	Trickle Charge Current	20	45	70	mA	V <sub>BAT</sub> < V <sub>Tricl</sub>

## 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	—	$0.3 * V_{DDIO}$	V	$V_{DDIO} = 3.3V$
$V_{IH}$	High-Level Input Voltage	$0.7 * V_{DDIO}$	—	$V_{DDIO} + 0.3$	V	$V_{DDIO} = 3.3V$
IO output characteristics						
$V_{OL}$	Low-Level Output Voltage	—	—	0.33	V	$V_{DDIO} = 3.3V$
$V_{OH}$	High-Level Output Voltage	2.7	—	—	V	$V_{DDIO} = 3.3V$

## 2.5 Internal Resistor Characteristics

Table 2-5

Port		General Output	High Drive	Internal Pull-Up Resistor	Internal Pull-Down Resistor	Comment
PA2~PA4 PB1,PB3 PB6~PB7 PC1~PC2		8mA	24mA	10K	10K	1、USBDM & USBDP default pull down 2、PB0,PB2,PB5 can pull-up resistance to 5V 3、internal pull-up/pull-down resistance   accuracy ±20%
PA0	Output 0	8mA	24mA	10K	10K	
	Output 1	8mA	64mA			
PB0,PB2,PB5		8mA	—	10K	10K	
USBDP		4mA	—	1.5K	15K	
USBDM		4mA	—	180K	15K	

## 2.6 BT Characteristics

### 2.6.1 Transmitter

**Basic Data Rate**

**Table 2-6**

Parameter		Min	Typ	Max	Unit	Test Conditions
RF Transmit Power			4	6	dBm	25°C, Power Supply VBAT=5V 2441MHz
RF Power Control Range			20		dB	
20dB Bandwidth			950		KHz	
Adjacent Channel	+2MHz		-40		dBm	
	-2MHz		-38		dBm	
Transmit Power	+3MHz		-44		dBm	
	-3MHz		-35		dBm	

**Enhanced Data Rate**

**Table 2-7**

Parameter		Min	Typ	Max	Unit	Test Conditions
Relative Power			-1		dB	25°C, Power Supply VBAT=5V 2441MHz
$\pi/4$ DQPSK	DEVM RMS		6		%	
	DEVM 99%		10		%	
	DEVM Peak		15		%	
Adjacent Channel	+2MHz		-40		dBm	
	-2MHz		-38		dBm	
Transmit Power	+3MHz		-44		dBm	
	-3MHz		-35		dBm	

### 2.6.2 Receiver

**Basic Data Rate**

**Table 2-8**

Parameter		Min	Typ	Max	Unit	Test Conditions
Sensitivity			-90		dBm	25°C, Power Supply VBAT=5V 2441MHz
Co-channel Interference Rejection			-13		dB	
Adjacent Channel	+1MHz		+5		dB	
	-1MHz		+2		dB	
	+2MHz		+37		dB	
Interference Rejection	-2MHz		+36		dB	
	+3MHz		+40		dB	
	-3MHz		+35		dB	

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**Enhanced Data Rate****Table 2-9**

Parameter		Min	Typ	Max	Unit	Test Conditions
Sensitivity			-90		dBm	25°C, Power Supply VBAT=5V 2441MHz
Co-channel Interference Rejection			-13		dB	
Adjacent Channel Interference Rejection	+1MHz		+5		dB	
	-1MHz		+2		dB	
	+2MHz		+37		dB	
	-2MHz		+36		dB	
	+3MHz		+40		dB	
	-3MHz		+35		dB	

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### 3、 Package Information

#### 3.1 QFN20

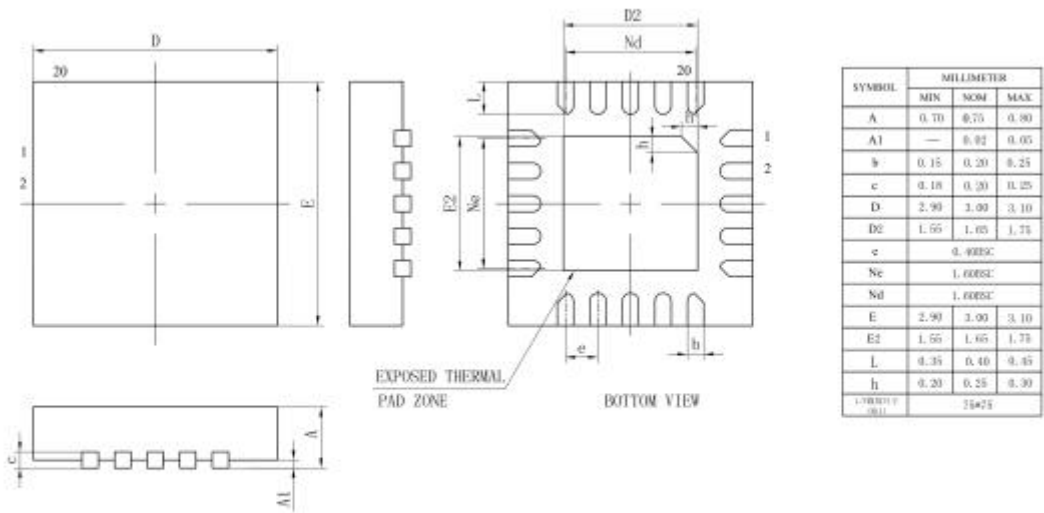


Figure 3-1 AC6363F Package

### 4、 Revision History

Date	Revision	Description
2020.07.13	V1.0	Initial Release
2022.07.19	V1.1	Update Bluetooth Feature