AC6363F Datasheet

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AC6363F Features

CPU

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

Bluetooth

- Compliant with Bluetooth V5.1+BR+EDR+BLE specification
- Meet class1 class2 and class3 transmitting power requirement
- Support GFSK and π/4 DQPSK all paket 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

Temperature

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

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
- Three 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 4.5V
- VDDIO is 2.2V to 3.4V

Packages

- QFN20(3mm*3mm)

Applications

- Bluetooth IOT

1、Pin Definition

1.1 Pin Assignment

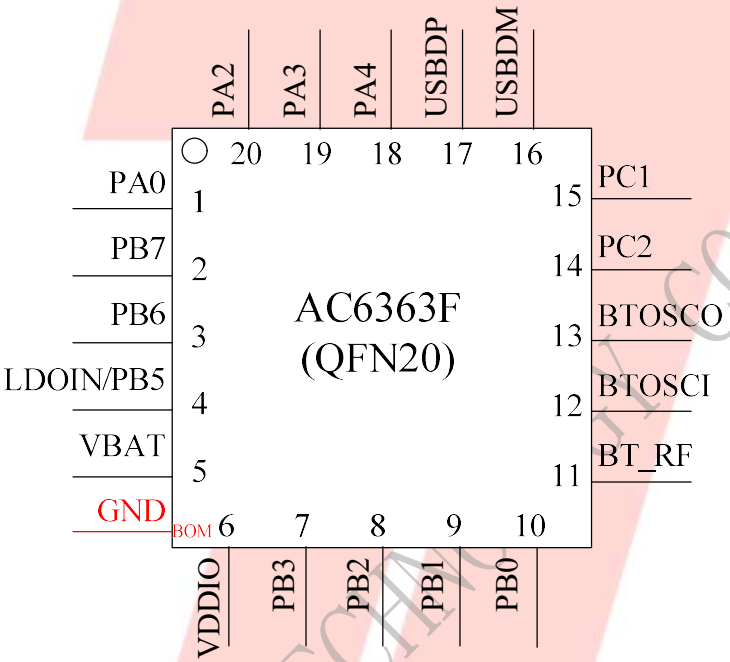


Figure 1-1 AC6363F Package Diagram

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);

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

2、Electrical Characteristics

2.1 Absolute Maximum Ratings

Table 2-1

Symbol	Parameter	Min	Max	Unit
Topt	Operating temperature	-40	+85	℃
Tstg	Storage temperature	-65	+150	℃
VBAT	Supply Voltage	-0.3	4.5	V
LDOIN	Charger Voltage	-0.3	6	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 Recommended Operating Conditions

Table 2-2

Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
VBAT	Voltage Input	2.2	3.7	4.5	V	
LDOIN	Charger Voltage	4.5	5	5.5	V	
V_{VDDIO}	Voltage output	2.2	3.0	3.4	V	VBAT = 4.2V, 100mA loading
$I_{L3.3}$	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		200	mA	Charge current at fast charge mode
I_{Trikl}	Trickle Charge Current	20	45	70	mA	$V_{BAT}<V_{Trikl}$

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**
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℃, Power Supply VBAT=5V 2441MHz
RF Power Control Range			20		dB	
20dB Bandwidth			950		KHz	
Adjacent Channel Transmit Power	+2MHz		-40		dBm	
	-2MHz		-38		dBm	
	+3MHz		-44		dBm	
	-3MHz		-35		dBm	

Enhanced Data Rate Table 2-7

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

2.6.2 Receiver

Basic Data Rate Table 2-8

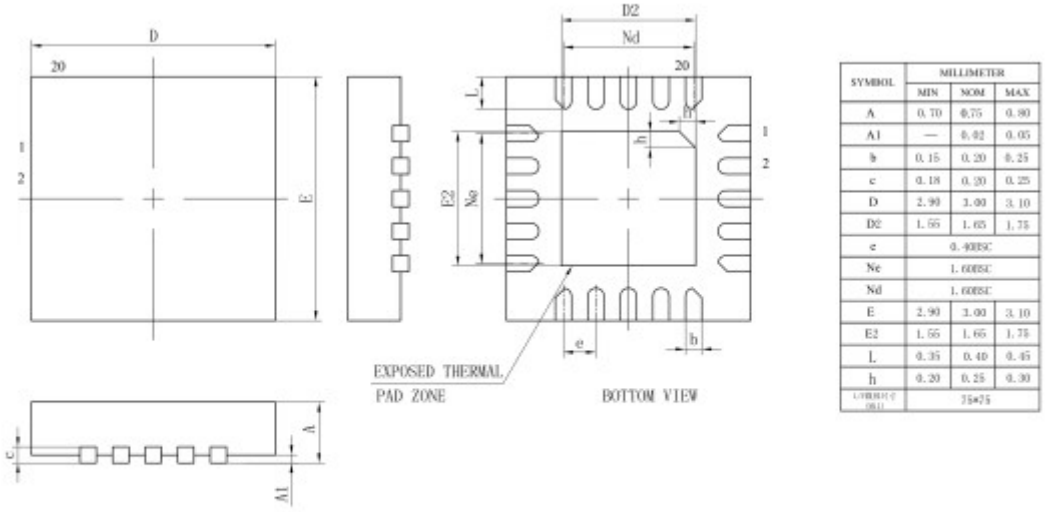
Parameter		Min	Typ	Max	Unit	Test Conditions
Sensitivity			-90		dBm	25℃, Power Supply VBAT=5V 2441MHz
Co-channel Interference Rejection			-13		dB	
Adjacent Channel Interference Rejection	+1MHz		+5		dB	
	-1MHz		+2		dB	
	+2MHz		+37		dB	
	-2MHz		+36		dB	
	+3MHz		+40		dB	
	-3MHz		+35		dB	

Enhanced Data Rate **Table 2-9**

Parameter		Min	Typ	Max	Unit	Test Conditions
Sensitivity			-90		dBm	25℃, 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	

3、 Package Information

3.1 QFN20



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	—	0.02	0.05
b	0.15	0.20	0.25
c	0.18	0.20	0.25
D	2.90	3.00	3.10
D2	1.55	1.65	1.75
e	0.40BSC		
Ne	1.60BSC		
Nd	1.60BSC		
E	2.90	3.00	3.10
E2	1.55	1.65	1.75
L	0.35	0.40	0.45
h	0.20	0.25	0.30
	75*75		

Figure 3-1 AC6363F Package

4、Revision History

Date	Revision	Description
2020.07.13	V1.0	Initial Release