BT8926B2

Audio Player Microcontroller

Versions: 0.0.1
2021.06.24

Declaration

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Revision History

Date	Version	Comments	Revised by
2021-06-24	0.0.1	First draft	Leo

Table of Contents

1 Product Features

CPU and Flexible IO

- 32bit High performance CPU with DSP instruction
- Program memory: internal 8M bit flash
- Flexible GPIO pins with Programmable pull-up and pull-down resistors;
- Support GPIO wakeup or interrupt;

Bluetooth Radio

- Compliant to Bluetooth 5.2 and BLE specification (QDID: 166851);
- TX output power MAX +9dBm;
- RX Sensitivity with -94dBm @2M EDR;
- Support TWS communication with balance-efficiency Power consumption;
- Support TWS Master-slave switch;

Audio Interface

- High performance mono DAC with 98dB SNR, support single end mode or differential mode;
- One channel high performance ADC with 90dB SNR;
- One channel MIC amplifier input;
- Support flexible audio EQ adjust;
- Support Sample rate 8, 11.025, 12, 16, 22.05, 32, 44.1 and 48KHz;
- Four channel Stereo Analog MUX;

Peripheral and Interfaces

- Support AAC, mSBC high quality decode;
- Support Low power Touch Key;
- Support Low power enter ear detect;
- Three 32-bit timers;
- Three multi-function 32-bit timers, support Capture and PWM mode;
- WatchDog;
- Three full-duplex UART;
- Two SPI;
- IR controller;
- Full speed USB 2.0 HOST/DEVICE controller;
- Sixteen Channels 10-bit SARADC;
- Integrate IRTC;
- Build in PMU, such as charger/buck/LDO;

Package

- QFN20 3.00x3.00x0.75 e=0.40

Temperature

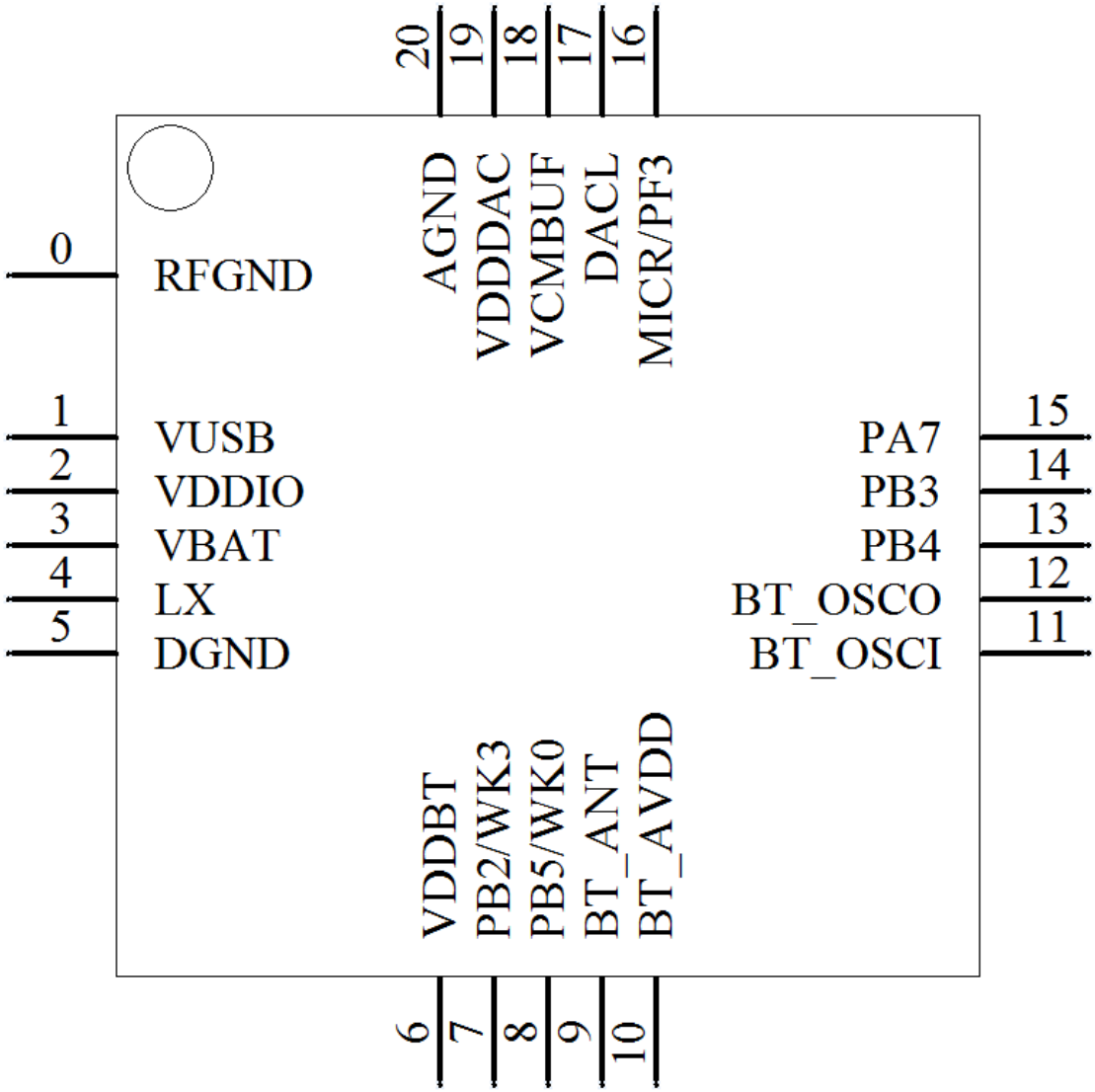
- Operating temperature: -40℃ to +85℃;
- Storage temperature: -65℃ to +150℃;

Supports

- RF.5.2/ BB.5.2/ LL.5.2/ LMP.5.2/ RFPHY.5.2/ SDP.5.2/ L2CAP.5.2/ A2DP.1.2/ AVCTP.1.4.1/ AVDTP.1.3.4/ AVRCP.1.6.2/ GAVDP.1.3.1/ HFP.1.8/ HID.1.0.14/ IOPT.4.0.1/ RFCOMM.1.2.2/ SPP.1.2.2

2 Package Definition

2.1 Pin Assignment



2.2 Pin Descriptions

Table 2-1 QFN20 pin description

Pin No.	Name	Type	Function
0	RFGND	GND	RF Ground
1	VUSB	PWR	VUSB power input TX0-G8 TX1-G3 TX2-G3 HSTRX-G11
2	VDDIO	PWR	VDDIO power output
3	VBAT	PWR	VBAT power input
4	LX	PWR	Buck inductor connect pin
5	DGND	GND	Digital Ground
6	VDDBT	PWR	BT power
7	PB2/WK3		ADC4 AUXR1 SDDAT0-G2 SPI1DO-G3 TX0-G2 TX2-G2 HSTRX-G2 PWM2-T3-G1 IISSCLK-G3 IISDI-G2 IIC_DAT-G3 WK3 PB2
8	PB5/WKO	I/O	ADC12 PWM2-T3-G2 IISDI-G3 WKO PB5
9	BT_ANT	A	BT ANT
10	BT_AVDD	PWR	BT RF Power
11	BT_OSCI	A	24M OSC input
12	BT_OSCO	A	24M OSC output
13	PB4	I/O	ADC6 PDM_DATLR-G4 SDDAT0-G4 SDDAT0-G6 SPI0CLK-G3 RX0-G3 HSTRX-G8 PWM1-T3-G2 IIC_DAT-G8 PB4
14	PB3	I/O	ADC5 PDM_CLKLR-G4 SDDAT0-G5

			SPI0DO-G3 TX0-G3 HSTRX-G3 PWM0-T3-G2 IIC_CLK-G8 PB3
15	PA7	I/O	ADC2 AUXR0 PDM_DATLR-G3 SDDAT0-G1/G7 SPI1DO-G2 TX0-G1 TX1-G1 HSTRX-G1 PWM2-T5-G1 IIS_DO-G1 PA7
16	PF3/MICPR	I/O	MICPR PWM2-T4-G2 PF3
17	DACL	A	DAC L
18	VCMBUF	PWR	VCM buffer output
19	VDDDAC	PWR	DAC power
20	AGND	GND	DAC Ground

Note: I/O: Digital input/output; I : Digital input; A : Analog Pin; PWR: Power Pin; GND: Ground.

3 Characteristics

3.1 PMU Parameters

Table 3-1 PMU voltage input Parameters

Sym	Characteristics	Min	Typ	Max	Unit	Conditions
VUSB	Charger Voltage input	4.6	5.0	5.5	V	
VBAT	Voltage input	3.0	3.7	4.5	V	

Table 3-2 3.3V LDO Parameters

Sym	Characteristics	Min	Typ	Max	Unit	Conditions
VDDIO	3.3V LDO voltage output	-	3.3	-	V	Light Loading condition
△VVDDIO	Output Mismatch 1-sigma	-	43	-	mV	VDDIO=3.3v
ILOAD	Maximum output current	-	-	150	mA	@VBAT=3.6v
ISC	Short Circuit Current Limit	-	-	300	mA	@VBAT=3.8v

Table 3-3 1.2V LDO Parameters

Sym	Characteristics	Min	Typ	Max	Unit	Conditions
VDDBT	1.2V LDO voltage output	-	1.2	-	V	Light Loading condition
△VVDDBT	Output Mismatch 1-sigma	-	16	-	mV	VDDBT=1.2v
ILOAD	Maximum output current	-	-	100	mA	@VBAT=3.0v
ISC	Short Circuit Current Limit	-	-	200	mA	@VBAT=3.8v

Table 3-4 1.1V LDO Parameters

Sym	Characteristics	Min	Typ	Max	Unit	Conditions
VDDCORE	1.1V LDO voltage output	-	1.1	-	V	Light Loading condition
△VVDDCORE	Output Mismatch 1-sigma	-	15	-	mV	VDDCORE=1.1v
ILOAD	Maximum output current	-	-	60	mA	@VBAT=3.6v
ISC	Short Circuit Current Limit	-	-	120	mA	@VBAT=3.8v

3.2 IO Parameters

Table 3-5 I/O Parameters

GPIO—Electrical Characteristics							
Symbol	Description	Related GPIO	Min	Typical	Max	Units	Conditions
V_{IL}	Low-level input voltage		-0.3		1.27	V	VDDIO=3.3V
V_{IH}	High-level input voltage		2.03		3.6	V	VDDIO=3.3V
Driver Ability 1	Output Driver Ability 1			32		mA	VDDIO=3.3V
Driver Ability 0	Output Driver Ability 0			8		mA	VDDIO=3.3V
R_{PUP0}	Internal pull-up resister 0		8	10	12	KΩ	
R_{PUP1}	Internal pull-up resister 1		0.24	0.3	0.36	KΩ	
R_{PUP2}	Internal pull-up resister 2		160	200	240	KΩ	
R_{PDN0}	Internal pull-down resister 0		8	10	12	KΩ	
R_{PDN1}	Internal pull-down resister 1		0.24	0.3	0.36	KΩ	

GPIO—Electrical Characteristics							
R_{PDN2}	Internal pull-down resister 2		160	200	240	KΩ	

3.3 Audio DAC Parameters

Table 3-6 Audio DAC Parameters

Mode	Sym	Characteristics	Min	Typ	Max	Unit	Conditions
Differential Mode	SNR		-	98.8	-	dB	VCM cap=NC VDDDAC cap=1uF with A-wt filter Output -4.2dBV with 10K loading Fin=1KHz
	THD+N		-	-73	-	dB	VCM cap=NC VDDDAC cap=1uF with A-wt filter Output -4.2dBV with 10K loading Fin=1KHz
	Output Range	Maximum output voltage	-	-4.2		dBVrms	32ohm Loading
VCMBUF Mode	SNR			96		dB	VCM cap=NC VDDDAC cap=1uF with A-wt filter Output -1.1dBV with 10K loading Fin=1KHz
	THD+N			-73		dB	VCM cap=NC VDDDAC cap=1uF with A-wt filter Output -1.1dBV with 10K loading Fin=1KHz
	Output Range	Maximum output voltage		-1.1		dBVrms	32ohm Loading
AC Coupling Mode	SNR			95		dB	VCM cap=NC VDDDAC cap=1uF with A-wt filter Output -1.1dBV with 10K loading@220uF AC coupling Cap Fin=1KHz
	THD+N			-73		dB	VCM cap=NC VDDDAC cap=1uF with A-wt filter Output -1.1dBV with 10K loading@220uF AC coupling Cap Fin=1KHz
	Output Range	Maximum output voltage		-1.1		dBVrms	32ohm Loading

3.4 Audio ADC Parameters

Table 3-7 Audio ADC Parameters

Sym	Characteristics	Min	Typ	Max	Unit	Conditions
SNR		-	90	-	dB	VCM cap=NC VDDDAC cap=1uF with A-wt filter Input sine amplitude, 850mV RMS Fin=1KHz
THD+N		-	-	-	dB	VCM cap=NC VDDDAC cap=1uF with A-wt filter Input sine amplitude, 850mV RMS Fin=1KHz.
Input Range	Input sine wave peak amplitude	VCM-1.2V	-	VCM+1.2	V	From aux input, aux 0db gain, VCM represent VCM voltage.

3.5 BT Parameters

Table 3-8 BT Parameters

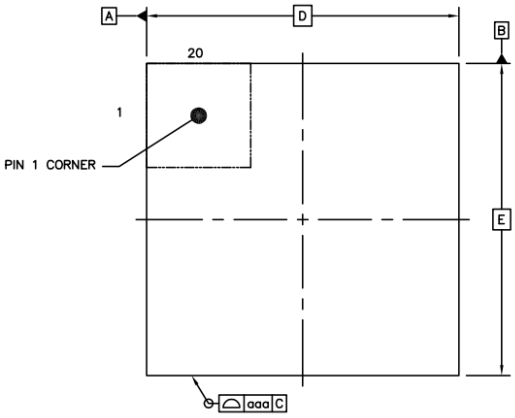
Characteristics	Min	Typical	Max	Unit	Conditions
Maximum Transmit Power	-	-	9	dBm	
RMS DEVM	-	5.5	-	%	Maximum TX power 2-DH5 packet
Peak DEVM	-	12.5		%	
EDR Relative Transmit Power		-0.2		dB	
Sensitivity @ Basic Rate		-91.8		dBm	BER=0.1%, using DH5 packet
Sensitivity @ EDR		-94		dBm	BER=0.01%, using 2-DH5 packet

3.6 Current Parameters

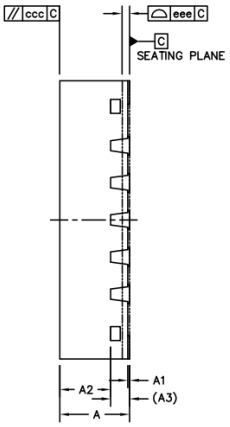
Table 3-9 Current Parameters

Sym	Characteristics	Min	Typ	Max	Unit	Conditions
IRTC	RTC mode current	-	4	-	uA	4.2V input, room temp.
Sleep	Sleep current	-	500	2000	uA	3.3V input, room temp

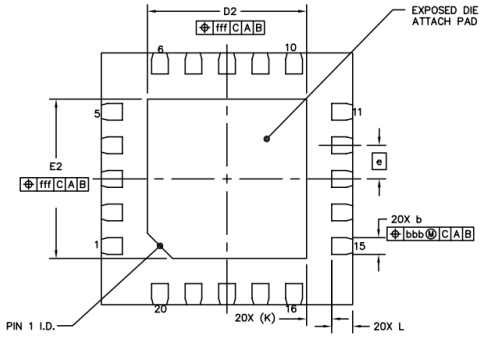
4 Package Information



TOP VIEW



SIDE VIEW



BOTTOM VIEW

		SYMBOL	MIN	NOM	MAX
TOTAL THICKNESS		A	0.7	0.75	0.8
STAND OFF		A1	0	0.02	0.05
MOLD THICKNESS		A2	---	0.55	---
L/F THICKNESS		A3		0.203 REF	
LEAD WIDTH		b	0.15	0.2	0.25
BODY SIZE	X	D		3 BSC	
	Y	E		3 BSC	
LEAD PITCH		e		0.4 BSC	
EP SIZE	X	D2	1.8	1.9	2
	Y	E2	1.8	1.9	2
LEAD LENGTH		L	0.15	0.25	0.35
LEAD TIP TO EXPOSED PAD EDGE		K		0.3 REF	
PACKAGE EDGE TOLERANCE		aaa		0.1	
MOLD FLATNESS		ccc		0.1	
COPLANARITY		eee		0.08	
LEAD OFFSET		bbb		0.07	
EXPOSED PAD OFFSET		fff		0.1	

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