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CW6611E

Bluetooth Audio Player Microcontroller

Product Spec

[CW6611E-PS-EN]

Versions: 1.0.0

Release Date: 2016/9/23

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1 Product Overview

1.1 Outline

CW6611E is a highly integrated system on chip for Bluetooth v4.2 specification with Bluetooth Classic (BR/EDR) applications. This SOC is backward-compatible with Bluetooth 3.0, 2.1, 2.0 or 1.2 systems. This Bluetooth includes a data rate of 1M/2M/3Mbps RF with a performance of Tx: 0dBm, Rx:-80dBm. It has LQFP48 packaging, stereo audio output with two pair of AUX input, and external flash. It integrates an abundant amount of peripherals (full-duplex UART, SPI, SD, IIC (FM function)), clock management and audio interface. In addition, this SOC supports audio playback from SD and USB.

1.2 Features

- Supports Bluetooth v4.2 specification with Bluetooth Classic (BR/EDR) ; backward-compatible with BT v 3.0, 2.1, 2.0 or 1.2;
- Support HFP v1.6, HSP v1.2, A2DP 1.3, AVCTP 1.4, AVDTP 1.3 and AVRCP 1.5;
- Class 2 power level, RF Performance: Tx:0dBm, Rx: -80dBm; Support simple pairing and auto reconnection function;
- High Performance 8051 at 48Mhz;
- Support MP3/SBC decoder;
- Support two pair of AUX;
- Six Channels 10-bit SARADC;
- support 16bit Stereo DAC with >90dB SNR, embedded with four class A/B headphone amplifier
- 16bit Mono ADC with >90dB DR;
- Support Audio record function to MIC ADPCM;
- Support Audio playback from SD/USB;
- Keypad tone mixer;
- Watchdog Timer with on-chip RC oscillator;
- Support full-duplex IIS, UART, SPI, SD interface;
- Support IIC interface for FM function;
- 2 channels 16 levels Low Voltage Detector;
- Power on Reset;
- Support Full speed USB 2.0 HOST/DEVICE controller/PHY;
- Independent powered Real-Time Clock supporting 32.768kHz crystal;
- Internal crystal oscillator support 26M crystal;
- Internal LDO regulator:1.35V to 1.2V, 4.2V to 3.3V;
- Supports Software Power On/Off, Deep Sleep mode, and Sniff mode;

2 Pin Definitions

2.1 CW6611E

2.1.1 Package

LQFP48

2.1.2 Pin Assignment

Figure 2-1 shows the pin assignments of LQFP48 package.

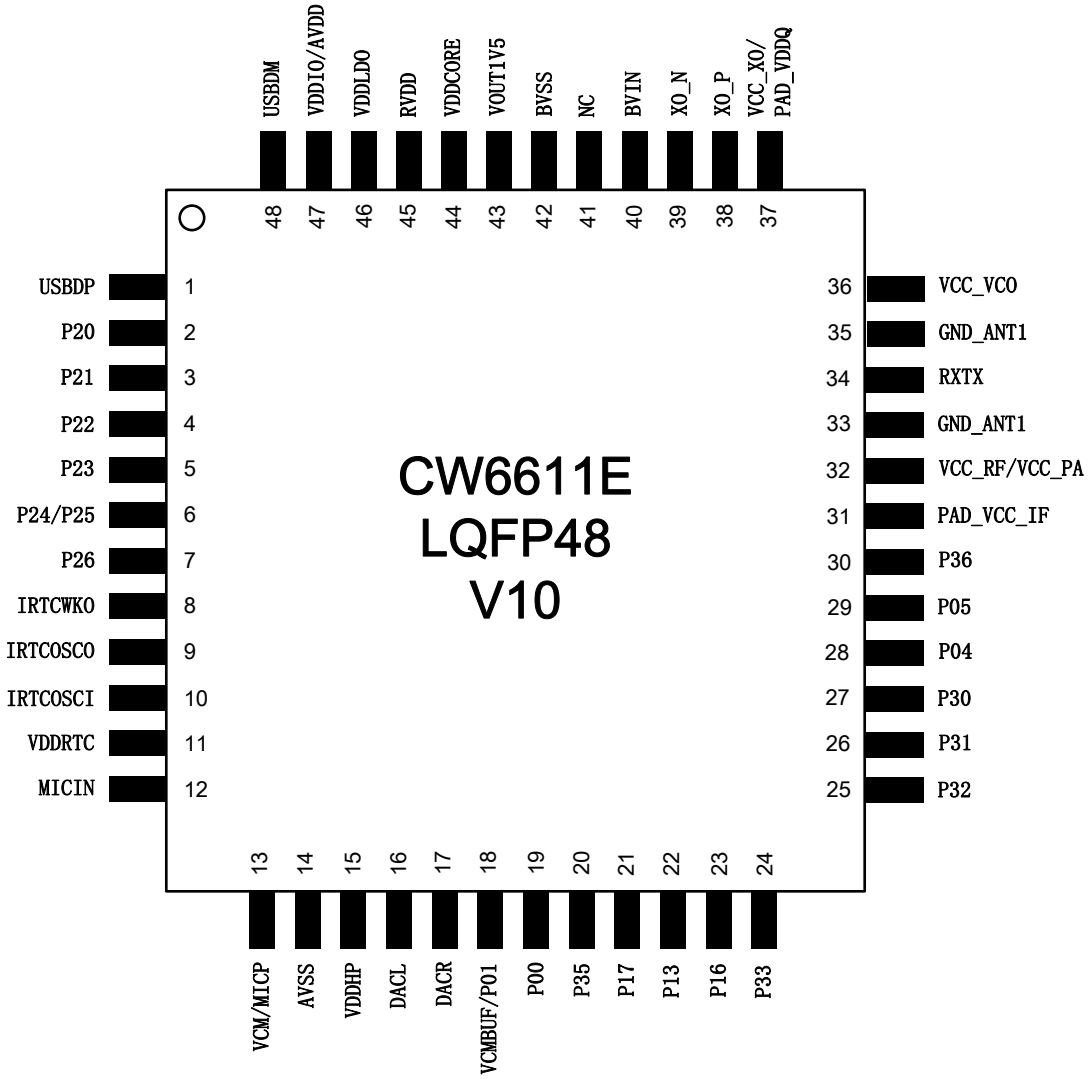


Figure 2-1 Pin Assignment of CW6611E

2.1.3 **Pin Description**

Table 2-1 shows the pin description of CW6611E.

Table 2-1 Pin Description of CW6611E

Pin No.LQFP48	Name	Type	Function
1	USBDP	I/O	USB Positive Input/output
2	P20	I/O	GPIO, AUXL2, SDCMD, EMIDAT0, LCD_D0
3	P21	I/O	GPIO, AUXR2, ADC1, SDCLK, EMIDAT1 LCD_D1
4	P22	I/O	GPIO, ADC3, EMIDAT2, IISDO1, LCD_D2
5	P23	I/O	GPIO, EMIDAT3, IISDI1, LCD_D3
6	P24/P25	I/O	P24 GPIO, EMIDAT4, P25 GPIO, EMIDAT5, SPI0DIN0/DOUT0, IISBCLK1
7	P26	I/O	GPIO, BT UART1RX, TMR2CKI, IISWS0
8	IRTCWKO	I/O	RTC wakeup
9	IRTOSCO	A	RTC XOSC output
10	IRTOSCI	A	RTC XOSC input
11	VDDRTC	PWR	RTC power input
12	MICN	A	MIC Negative input
13	MICP/VCM	A	MIC Positive input, DAC VCM output
14	AVSS	GND	Analog GND
15	VDDHP	PWR	Headphone power
16	DACL	A	DAC left Output GPIO Input
17	DACR	A	DAC right output, GPIO input
18	P01/VCM_BUF	I/O	GPIO,AUXR0,UARTTX1,PORT INT/WKUP0, SDDAT2, DAC VCM buffer
19	P00	I/O	GPIO, AUXL0, UARTRX1, SDDAT1, SPI0DIN2
20	P35	I/O	GPIO, MUTE
21	P17	I/O	GPIO, BT UART1RX, TMR2CKI, IISWS0
22	P13	I/O	GPIO, ADC5, IISBCLK0
23	P16	I/O	GPIO, ir_input, BT UART1TX, UARTTX0, TMR2CAP/TMR2PWM, IISREF
24	P33	I/O	GPIO,ADC0/LVD dect,ir_input,32K/xosc12m, sys_clk_output, TRM1CAP
25	P32	I/O	GPIO, SDDAT0, SPI0DOUT3/DIN3
26	P31	I/O	GPIO, SDCMD, SPI0DIN3
27	P30	I/O	GPIO, ADC4, SDCLK, SPI0CLK3
28	P04	I/O	GPIO, SPI1DOUT/DIN1
29	P05	I/O	GPIO, SPI1CLK

Pin No.LQFP48	Name	Type	Function
30	P36	I/O	GPIO
31	PAD_VCC_IF	PWR	Power VCC
32	VCC_RF/VCC_PA	PWR	RF/PA Power VCC
33	GND_ANT1	GND	FR GND
34	RXTX	A	RF Rx and Tx pin
35	GND_ANT1	GND	RF GND
36	VCC_VCO	PWR	Power VCC
37	VCC_XO/ PAD_VDDQ	PWR	Power VCC/VDDQ
38	XO_P	A	BT 26MHz XOSC Positive Pin
39	XO_N	A	BT 26MHz XOSC Negative Pin
40	BVIN	PWR	PMU Power input Pin 4.2V(typ)
41	NC	NC	NC
42	BVSS	GND	GND
43	VOUT1V5	PWR	VOUT 1.5V
44	VDDCORE	PWR	Core power VDD 1.2V
45	RVDD	PWR	RF power VDD
46	VDDLDO	PWR	LDO power input 4.2V(typ)
47	VDDIO	PWR	Power output VDDIO 3.3V
48	USBDM	I/O	USB Negative Input/output

3 Characteristics

3.1 PMU Parameters

Table 3-1 PMU Parameters

Sym	Characteristics	Min	Typ	Max	Unit	Conditions
VDDLDO	VDDLDO input voltage	2.8	4.2	4.6	V	
VDDCORE	1.2V output voltage	-	1.2	-	V	
VDDRTC	input voltage	2.2	4.2	4.6	V	
VDDHP	3.0V output voltage	2.8	3.0	3.3	V	
VCM	1.5V output voltage	-	1.35	-	V	
RVDD	output voltage	1.1	1.2	1.3	V	
VDDIO	3.3V output voltage	2.8	3.3	-	V	

3.2 Current consumption

Table 3-2 Current consumption

mode	status	current
Working mode	Sniff mode	1.8mA
	Normal mode	25mA
Sleep power mode	Soft off (w/o IRAM retention)	<5uA
	Soft off with RTC (w/ IRAM retention)	< 25uA

3.3 General purpose I/O Parameters

Table 3-3 I/O Parameters

Symbol	Description	Min	Typ	Max	Units	Conditions
V_{IL}	Low-Level input voltage	-	-	30% * VDDIO	V	VDDIO = 3.3V
V_{IH}	High-level input voltage	70% * VDDIO	-	-	V	VDDIO = 3.3V
R_{PUP0}	Internal pull-up resister 0	-	10	-	KΩ	
R_{PUP1}	Internal pull-up resister 1	-	200	-	KΩ	
R_{PUP2}	Internal pull-up resister 2	-	0.5	-	KΩ	
R_{PDN0}	Internal pull-down resister 0	-	10	-	KΩ	
R_{PDN1}	Internal pull-down resister 1	-	0.33	-	KΩ	
R_{PDN2}	Internal pull-down resister 2	-	0.5	-	KΩ	
I_{LEVEL1}	Level1 current driving	8	-	-	mA	For PORT1
I_{LEVEL2}	Level2 current driving	24	-	-	mA	For Port1.1

3.4 Audio ADDA Parameters

Table 3-4 Audio DAC Parameters

Sym	Characteristics	Min	Typ	Max	Unit	Conditions
DAC SNR&DR		-	90	-	dB	48PIN
DAC SNR&DR		-	90	-	dB	28PIN & 20 PIN
DAC THD+N		-	-80	-	dB	10Kohm loading
PWR_{AB}	ClassAB AMP power output	-	-	16	mW	32ohm loading
V_{PP}	Maximum output voltage	-	-	2.6	V	10Kohm loading
ADC SNR/DR			93		dB	In Voice Band
ADC THD+N			89		dB	In Voice Band

3.5 USB PHY Parameters

Table 3-5 USB PHY Parameters

Sym	Characteristics	Min	Typ	Max	Unit	Conditions
RDM_{PUP}	DM pull-up resistor	-	120	-	KΩ	
RDP_{PUP}	DP pull-up resistor	-	1.5	-	KΩ	
RDM_{PDN}	DM pull-up resistor	-	15	-	KΩ	
RDP_{PDN}	DP pull-up resistor	-	15	-	KΩ	

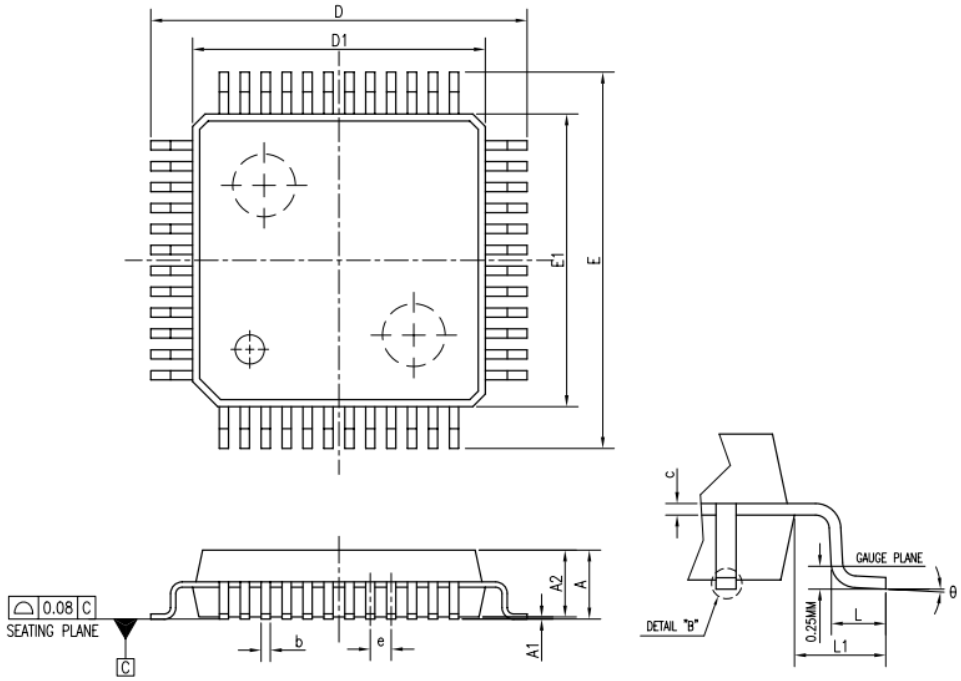
3.6 RF Analog Blocks

Table 3-6 RF characteristic

Parameter	Condition	MIN	typ	max	Unit
Operate Frequency	2402~2480	2402		2480	MHz
RX sensitivity 1Mbps	BER=0.1%	-	-80	-	dBm
RX sensitivity 2Mbps	BER=0.1%	-	-83	-	dBm
Transmit output power		-2	0	1.5	dBm
Transmit output power control range			30		dB

4 Package Outline Dimensions

4.1 LQFP48



SYMBOL	DIMENSION IN MM			DIMENSION IN INCH		
	MIN.	NOM	MAX.	MIN.	NOM	MAX.
A			1.60			0.063
A1	0.05		0.15	0.002		0.006
A2	1.35	1.40	1.45	0.053	0.055	0.057
D	8.90	9.00	9.10	0.350	0.354	0.358
D1	6.90	7.00	7.10	0.272	0.276	0.280
E	8.90	9.00	9.10	0.350	0.354	0.358
E1	6.90	7.00	7.10	0.272	0.276	0.280
c	0.09	–	0.20	0.004	–	0.008
c1	0.09	–	0.16	0.004	–	0.006
L	0.45	–	0.75	0.018	–	0.030
L1	1.00 REF.			0.039 REF.		
θ	0	3.5	7	0	3.5	7
JEDEC						

	b (MM)			b1 (MM)			e (MM)			JEDEC
N	MIN.	NOM	MAX.	MIN.	NOM	MAX.	MIN.	NOM	MAX.	
48L	0.17	0.22	0.27	0.17	0.20	0.23		0.50 BSC.		MS-026 BBC
64L	0.13	0.18	0.23	0.13	0.16	0.19		0.40 BSC.		MS-026 BBD

Figure 4-1 LQFP48 Package Outline Dimension

Revision History

Date	Version	Comments	Revised by
2016/9/23	0.0.1	Initial version	YX
2016/9/23	1.0.0	Release	YX