



AppoTech
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CW6685F

Bluetooth Audio Player Microcontroller Product Specification

[CW6685F-PS-EN]

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1 Product Overview

1.1 Outline

CW6685F is an MCS-51™ Compatible high performance mixed signal microcontroller. It integrates advanced digital and analog peripherals to suit for Bluetooth audio playback and Bluetooth Communicate applications.

1.2 Features

- CPU Compatible with MCS-51™ instruction set;
- Compliant to Bluetooth 3.0 + EDR, backward-compatible with BT1.2, 2.0 and 2.1.
- Support HFP v1.6, HSP v1.2, A2DP 1.3, AVCTP 1.4, AVDTP 1.3 and AVRCP 1.5;
- Support SCMS-T content protection method;
- Class 2 power level, RF Performance: Tx:0dBm, Rx: -80dBm;
- Support simple pairing and auto reconnection function;
- Support MP3/SBC decoder;
- Support two pairs of AUX;
- Six Channels 10-bit SARADC;
- 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;
- Two multi-function 8-bit timers, support Capture and PWM mode;
- Two multi-function 16-bit timers, support Capture and PWM mode;
- Watchdog Timer with on-chip RC oscillator;
- Support full-duplex IIS, UART, SPI, SD interface;
- Support IIC interface for FM function;
- 2 channels 4 levels Low Voltage Detector;
- Power on Reset
- Support Full speed USB 2.0 PHY;
- Full speed USB 2.0 HOST/DEVICE controller;
- IR controller;
- Independent powered Real-Time Clock supporting 32.768kHz crystal
- Internal 26M crystal oscillator support ;
- Internal LDO regulator: 4.2V to 3.3V
- Built-in buck converter, DC-DC 4.2V to 1.9V

1.3 System Diagram

Figure 1-1 shows CW6685F System Diagram.

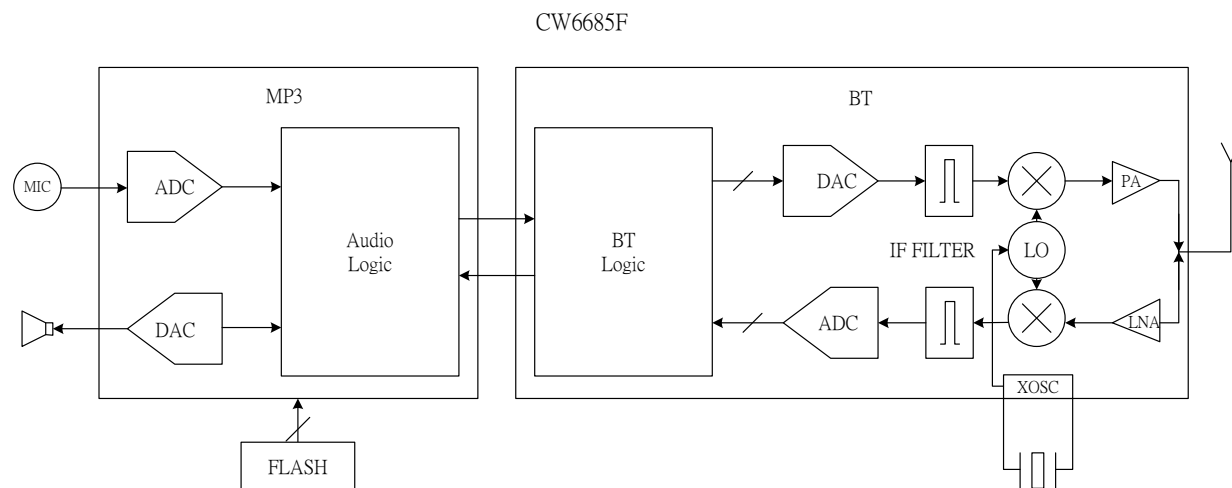


Figure 1-1 CW6685F System Diagram

2 Pin Definitions

Table 2-1 shows the compares package type and part number of CW6685X.

Table 2-1 compares package type and part number of CW6685X

Project ID	Part Number	Package
CW6685X	CW6685E	LQFP48
CW6685X	CW6685C	LQFP48
CW6685X	CW6685D	LQFP48
CW6685X	CW6685F	LQFP48

2.1 CW6685F

2.1.1 Package

LQFP48

2.1.2 Pin Assignment

Figure 2-1 shows the pin assignments of LQFP 48 package.

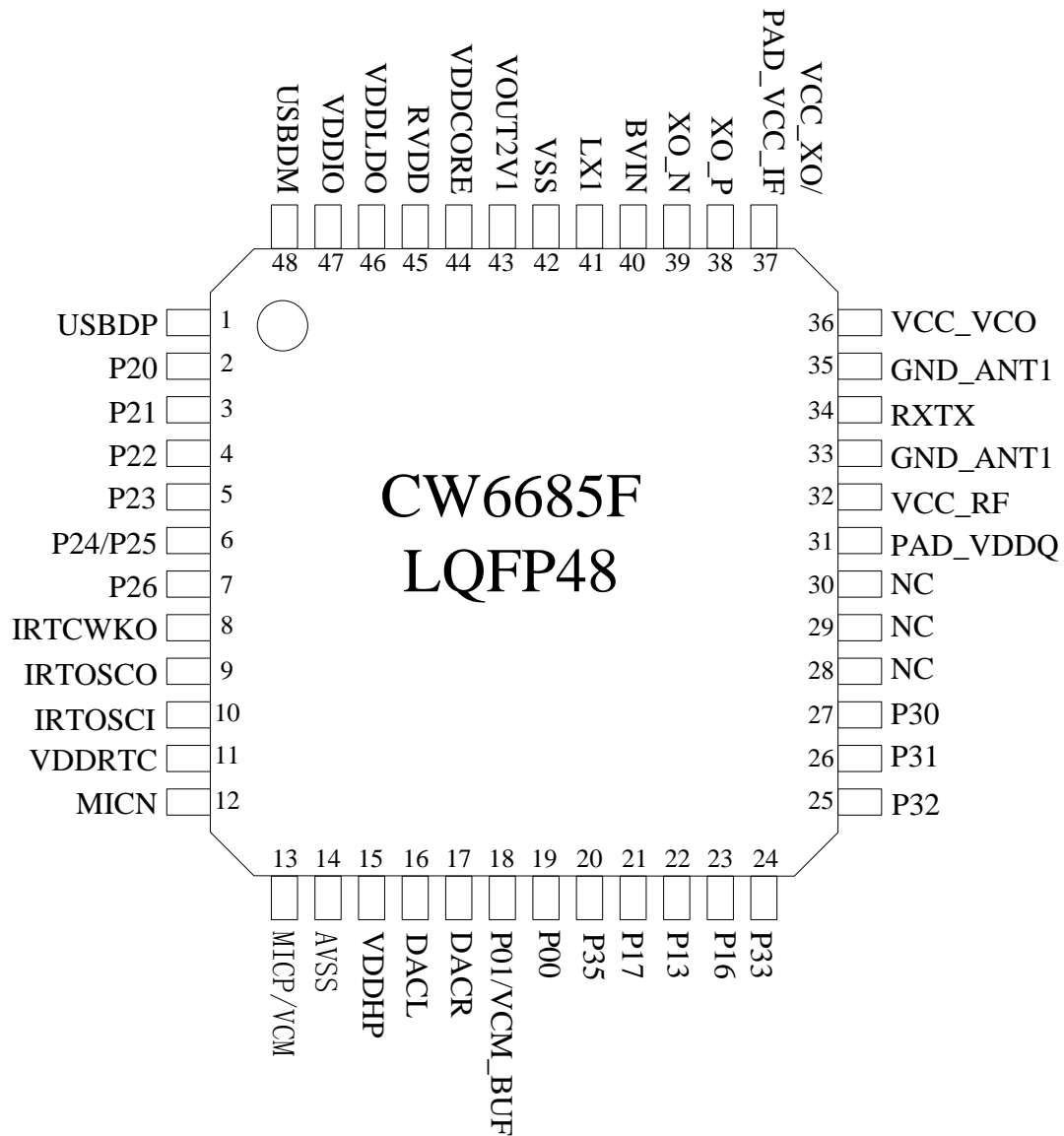


Figure 2-1 Pin assignment for LQFP48

2.1.3 Pin Descriptions

Table 2-2 shows the pin descriptions of LQFP48 package.

Table 2-2 LQFP48 pin description

Pin No.LQFP48	Name	Type	Function
1	USBDP	I/O	USB Positive Input/output
2	P20	I/O	GPIO AUXL2 SDCMD EMIDAT0 LCD_D0

Pin No.LQFP48	Name	Type	Function
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/O	RTC XOSC output
10	IRTOSCI	A/O	RTC XOSC input
11	VDDRTC	PWR	RTC power input
12	MICN	AIO	MIC Negative input
13	MICP/VCM	AIO	MIC Positive input DAC VCM output
14	AVSS	GND	Analog GND
15	VDDHP	PWR	Headphone power
16	DACL	AI/O	DAC left output GPIO input
17	DACR	AI/O	DAC right output GPIO input
18	P01/VCM_BUF	I/O	GPIO AUXR0 UARTTX1 PORT INT/WKUP0

Pin No.LQFP48	Name	Type	Function
			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
31	PAD_VDDQ	PWR	Power VDDQ
32	VCC_RF	PWR	RF Power VCC
33	GND_ANT1	GND	FR GND
34	RXTX	AI/	RF Rx and Tx pin

Pin No.LQFP48	Name	Type	Function
35	GND_ANT1	GND	RF GND
36	VCC_VCO	PWR	Power VCC
37	VCC_XO/PAD_VCC_IF	PWR	Power VCC
38	XO_P	A/O	BT 26MHz XOSC Positive Pin
39	XO_N	A/O	BT 26MHz XOSC Negative Pin
40	BVIN	PWR	PMU Power input Pin 4.2V(typ)
41	LX1	A/O	Switch Node Connection to Inductor
42	VSS	GND	GND
43	VOUT2V1	PWR	BUCK DC/DC 2.1V power
44	VDDCORE	PWR	Core power VDD 1.8V
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
BVIN	buck input voltage	2.8	4.2	4.8	V	
VDDLDO	VDDLDO input voltage	2.8	4.2	4.8	V	
VOUT2v1	Buck output voltage		1.9		V	
VDDCORE	1.8V output voltage	-	1.8	-	V	
VDDRTC	1.8V input voltage	2.2	4.2	4.8	V	
VDDHP	3.0V output voltage		3.0		V	
VCM	1.5V output voltage		1.5		V	
RVDD	1.8V output voltage	-	1.8	-	V	
VDDIO	3.3V output voltage	-	3.3	-	V	

3.2 CORE PLL Parameters

Table 3-2 PLL Parameters

Sym	Characteristics	Min	Typ	Max	Unit	Conditions
F _{I1}	Frequency input	-	32.768	-	KHz	Low frequency OSC
F _{I2}	Frequency input	1	12	15	MHz	High frequency OSC
F _{OUT1}	Frequency output	-	48	-	MHz	
T _{LOCK1}	PLL locked time	-	2	-	ms	Use low frequency OSC as input reference
T _{LOCK2}	PLL locked time	-	0.1	-	ms	Use high frequency OSC as input reference

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 resistor 0	2.64	3.3	3.96	KΩ	For PORT2
R _{PDN0}	Internal pull-down resistor 0	2.64	3.3	3.96	KΩ	For PORT2
R _{PUP1}	Internal pull-up resistor 1	8	10	12-	KΩ	For PORT0/1/3
R _{PDN1}	Internal pull-down resistor 1	8	10	12	KΩ	For PORT0/1/3
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 THD+N		-	-75	-	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		-	90	-	dB	Voice Band
ADC THD+N		-	84	-	dB	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 Bluetooth Parameters

Table 3-6 Bluetooth parameters

Items	Description
Bluetooth standard	V3.0+EDR
Temperature	-20℃ ~ +70 ℃
Storage Temperature	-40℃ ~ +150℃
Frequency Range	2402MHz ~ 2480MHz(total 79 channels)
Channel Frequency	2402+1(K-1)MHz, K=1, 2, 379
Maximum RF Transmit Power	+4dBm
Receive Sensitivity	-80dBm

Table 3-7 Operational Mode parameters

Operational Mode	Minimum	Typical	Maximum
Page scan, time internal 1.28s	-	1.0mA	-
Inquiry	-	38.9 mA	-
Page scan and Inquiry	-	1.6mA	-
ACL no traffic	-	15.2mA	-
ACL with file transfer	-	30.3mA	-
SCO HV3	-	38.4 mA	-
Sleep	-	25.0uA	-

4 Package Outline Dimensions

4.1 LQFP48

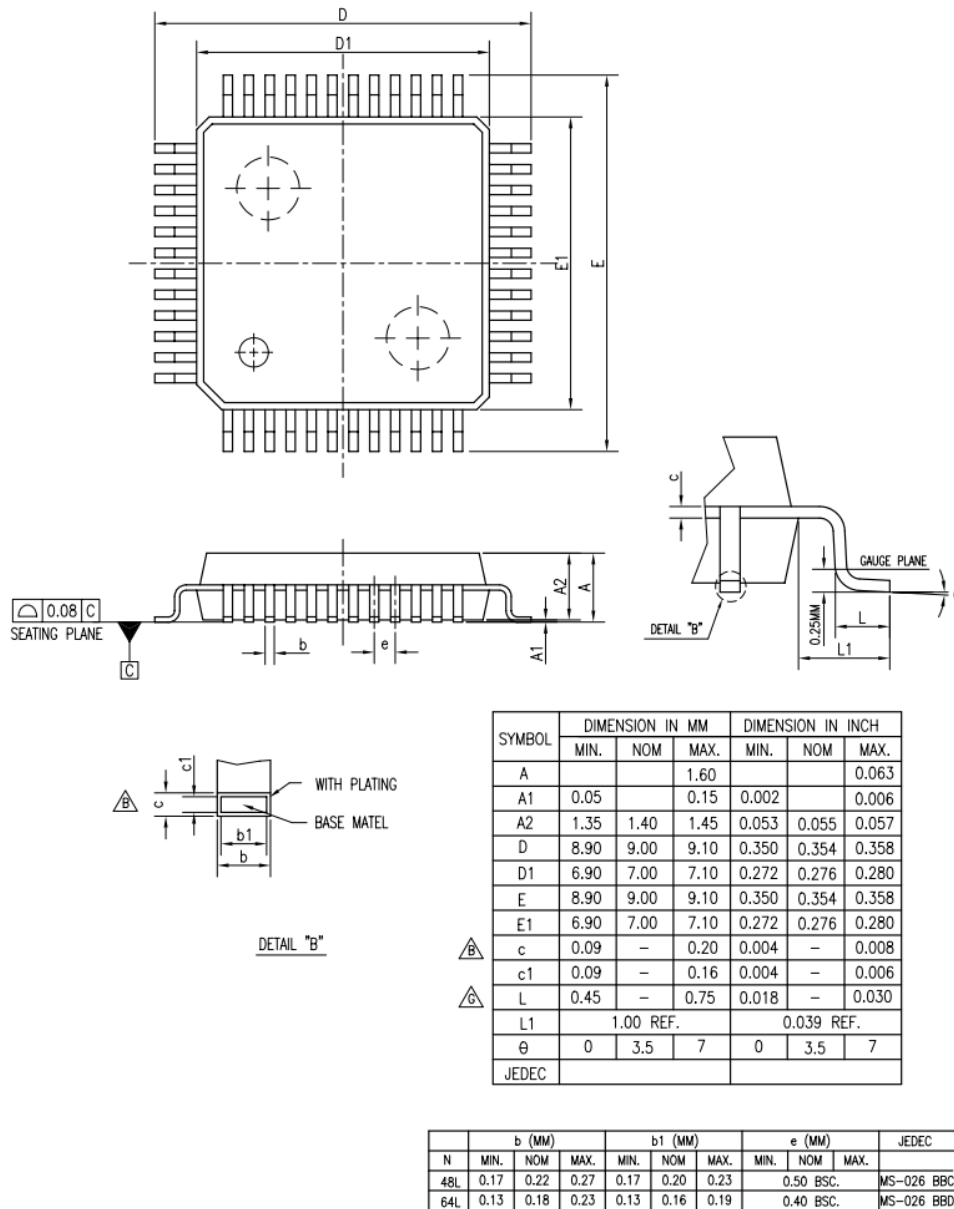


Figure 4-1 LQFP48 Package Outline Dimension

Revision History

Date	Version	Comments	Revised by
2014-10-30	0.0.1	Initial version	Longdan
2014-11-17	0.0.2	Add CW6685C/D/F	Longdan
2015-3-12	0.0.3	Check	AE team
2015-3-13	1.0.0	Release	Yuanxue
2015-5-14	1.0.1	Modify feature and all typ voltage	Yuanxue
2015-5-19	1.1.0	Release	Yuanxue

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