

AU6210LC Datasheet

USB Host MP3 Decoder SOC

Rev0.1

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Revision History

Date	Revision	Description
	V0.1	Initial

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1. Overview

A highly integrated SOC for MP3 player, AU6210LC integrates MCU, FM receiver, MP3 decoder, OTG, SD/MMC card controller, SARADC and Audio DAC in a single chip. AU6210LC is suitable for low end host MP3 player solution.

1.1 Features

- | Enhanced 8051, up to 10 times faster than standard 8051
- | Embedded FM receiver
- | OTG 2.0 full-speed controller
- | SD/MMC card controller
- | Support MP3 decoder
- | Embedded sound equalizer
- | Support FAT16/FAT32 file system
- | Embedded 18-bit Audio CODEC
- | Support auxiliary audio input
- | Embedded SARADC for peripheral controls
- | Embedded NVM to save external EEPROM
- | Support led display during battery charging.
- | Embedded key tone generator.
- | GPIO for various purposes
- | Embedded LDO
- | Embedded Power-on-Reset
- | Embedded 32KB OTP for program code storage

1.2 Chip Architecture

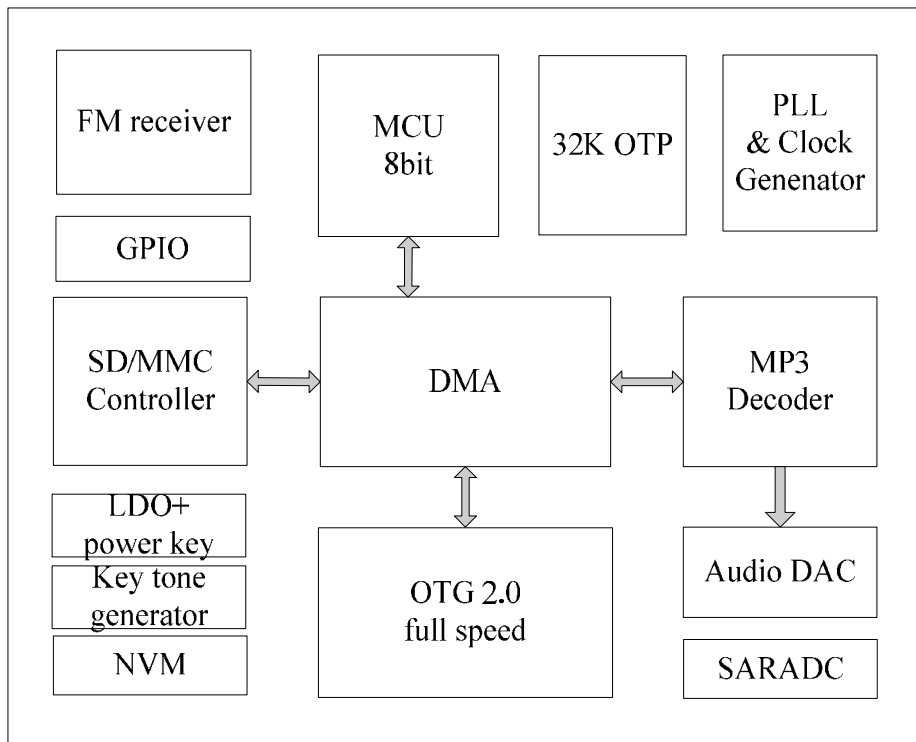


Figure 1 AU6210LC Functional Block Diagram

2. System Application

I MP3 audio system

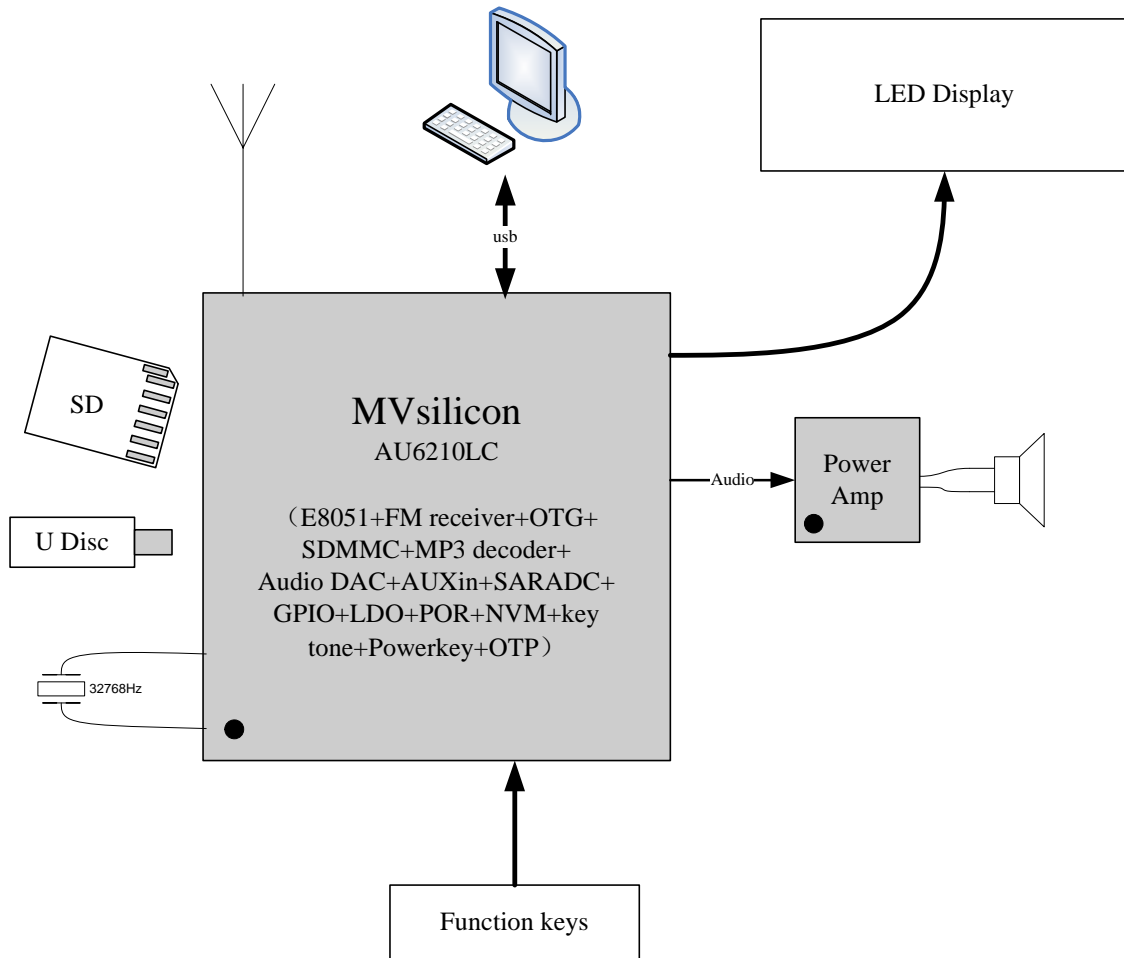


Figure 2 MP3 Audio System

3. Pin Description

AU6210LC is a CMOS device. Floating level on input signals causes unstable device operation and abnormal current consumption. Pull-up or Pull-down resistors should be used appropriately for input or bidirectional pins.

Notation	Description
I	Input
O	Output
I/O	Bidirectional
PWR	Power
GND	Ground

3.1 Pin Description

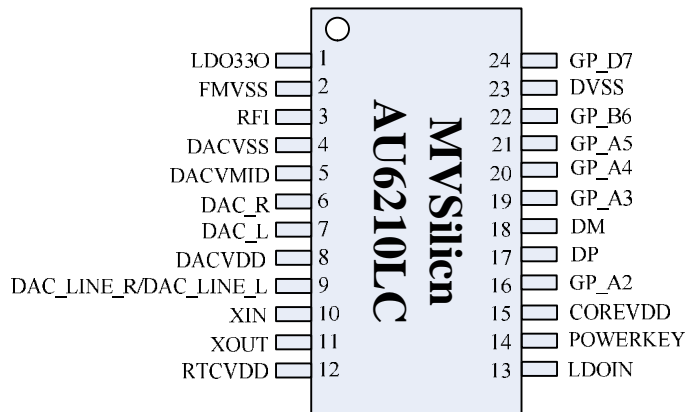
Table 1 Pin Description

Pin name	Pin #	Type	Description
USB interface pins			
USB_DP	17	I/O	USB Function D+ bus
USB_DM	18	I/O	USB Function D- bus
Audio CODEC interface pins			
DAC_R	6	AO	audio right channel output
DAC_L	7	AO	audio left channel output
DACVMID	5	AI	Internal voltage reference
DAC_LINER/ DAC_LINEL	9	AI	Audio aux right in/ Audio aux left in
GPIO/MCU IO pins			
GPIO_A[2]	16	I/O	GPIO PORT, bank A
GPIO_A[5:3]	21:19	I/O	GPIO PORT, bank A
GPIO_B[6]	22	I/O	GPIO PORT, bank B
GPIO_D[7]	24	I/O	GPIO PORT, bank D
CLK pins			
XIN	10	I	32.768KHz Crystal oscillator input for PLL
XOUT	11	O	32.768KHz Crystal oscillator output for PLL
FM pins			
RFI	3	AI	FM Antenna input
Power/Ground pins			
LDO330	1	PWR	LDO 3.3V out
FMVSS	2	GND	Ground for FM
COREVDD	15	PWR	power for core
DVSS	23	GND	ground for digital
LDOIN	13	PWR	LDO power in

DACVSS	4	GND	Ground for DAC
DACVDD	8	PWR	power for DAC
RTCVDD	12	PWR	Power for RTC
MISC pins			
POWER_KEY	14	I	Power key

4. Package

4.1 Package Diagram



4.2 Package Dimension Parameter

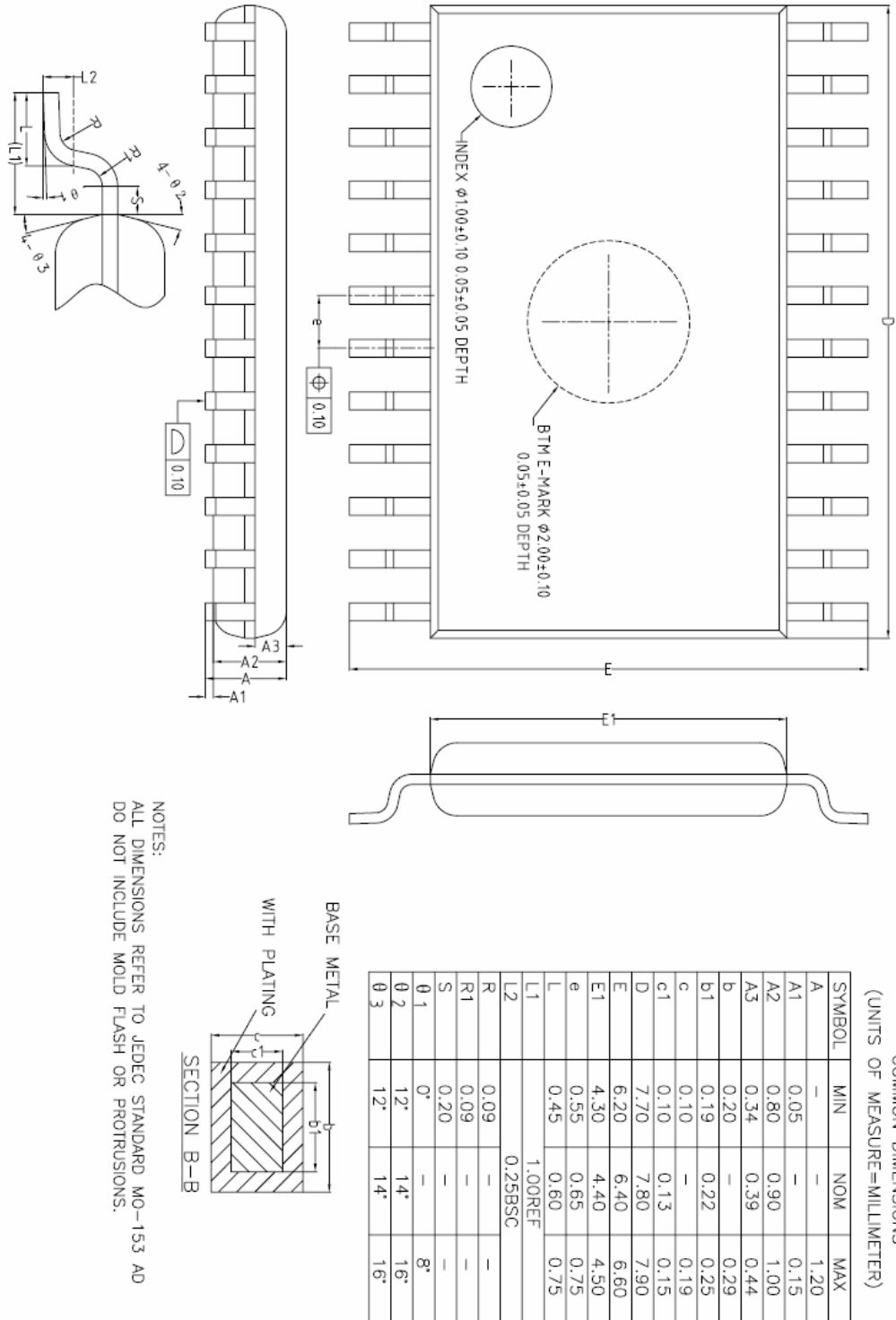


Figure 4 TSSOP24 Package Dimension Parameter

5. Electrical Specification

5.1 Absolute Maximum Ratings (Note 1)

Table 2 Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Storage Temperature	TEMP_STG	-65 to 150	C

5.2 Recommended Operating Conditions

Table 3 Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Power Supply Voltage (LDO)	VCC_LDO	3.35		5	V
IO Input Voltage	VIN	0		3.6	V
Operating Free Air Temperature	TEMP_OPR	-20		75	C

5.3 Electrical Characteristics

Table 4 Electrical Characteristics

Symbol	Parameter	Condition	Min	Typ	Max	Unit
V _{IH}	Input High Voltage		1.6		3.6	V
V _{IL}	Input Low Voltage		-0.3		1.4	V
V _{OH}	Output high voltage	@IOH=2mA	3.0			V
V _{OL}	Output low voltage	@IOL=2mA			0.3	V
I _L	Input leakage current		-10		10	uA
P _{PLAY} current	Current consumption when playing	Playing mode		20		mA
NVM current	Current consumption for NVM			13		uA

5.4 Audio Performance

Table 5 MP3 Audio Performance

Characteristics	Min	Typ	Max	Unit
Frequency Response 20Hz ~ 18KHz		<0.5%		DB
THD+N(1KHz out = 950mv rms)		0.1%		%
S/N (1KHz out = 950mv rms)		75		DB
L/R Channel Difference		0		DB
L/R Channel Separation		75		DB
DAC WITH 32OHM Loading OUT POWER		>20		MW

Table 6 Line in Audio Performance

Characteristics	Min	Typ	Max	Unit
Frequency Response 20Hz ~ 20KHz		<0.5%		DB
THD+N(1KHz out = 950mv rms)		0.05%		%



S/N (1KHz out = 950mv rms)		75		DB
L/R Channel Difference		0		DB
L/R Channel Separation		75		DB

Table 7 FM Audio Performance

Characteristics	Min	Typ	Max	Unit
RX_Sensitivity (Mono)		<2		uV
RX_S/N (Stereo)		64		DB
RX_S/N (Mono)		60		DB
L/R Channel Difference (Mono)		0		DB
L/R Channel Separation (Stereo)		45		DB
RX_THD (Mono)		0.1%		%

Note:

1. “Absolute Maximum Ratings” are those values beyond which the safety of the device cannot be guaranteed. They are not meant to imply that the device should be operated at these limits.



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