

# AU6210HD 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, AU6210HD integrates MCU, FM receiver, MP3 decoder, OTG, SD/MMC card controller, SARADC, Audio DAC, segment LED display driver, RTC and key tone generator in a single chip. AU6210HD is suitable for low end host MP3 player solution with segment LED display.

### 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 RTC.
- | Embedded key tone generator.
- | Support segment LED display.
- | GPIO for various purposes
- | Embedded LDO
- | Embedded Power-on-Reset
- | Embedded 32KB OTP for program code storage

## 1.2 Chip Architecture

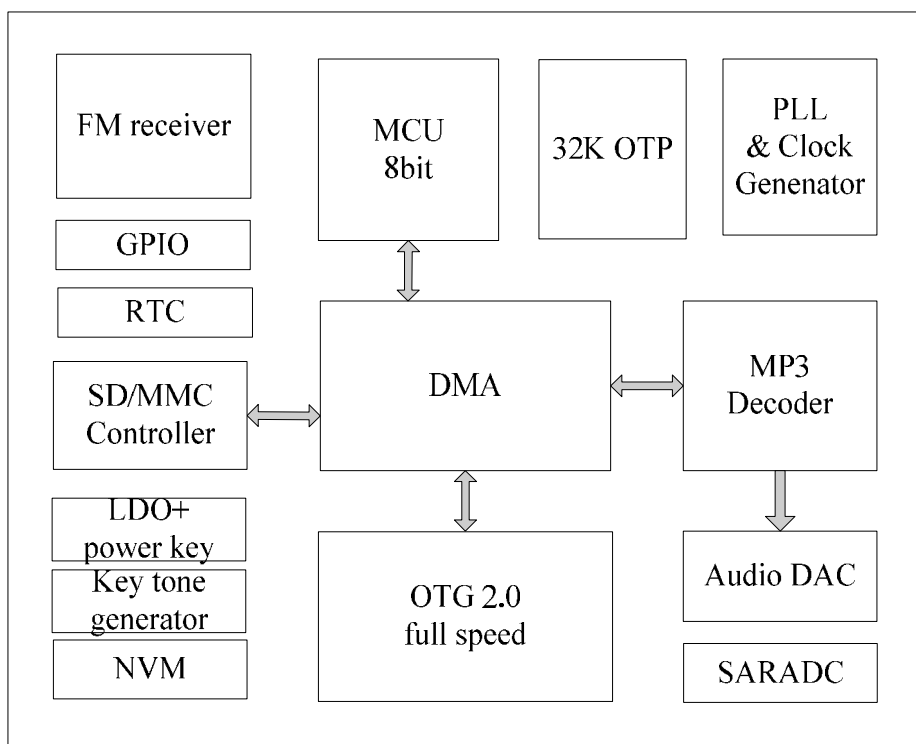


Figure 1 AU6210HD Functional Block Diagram



## 2. System Application

### I MP3 audio system

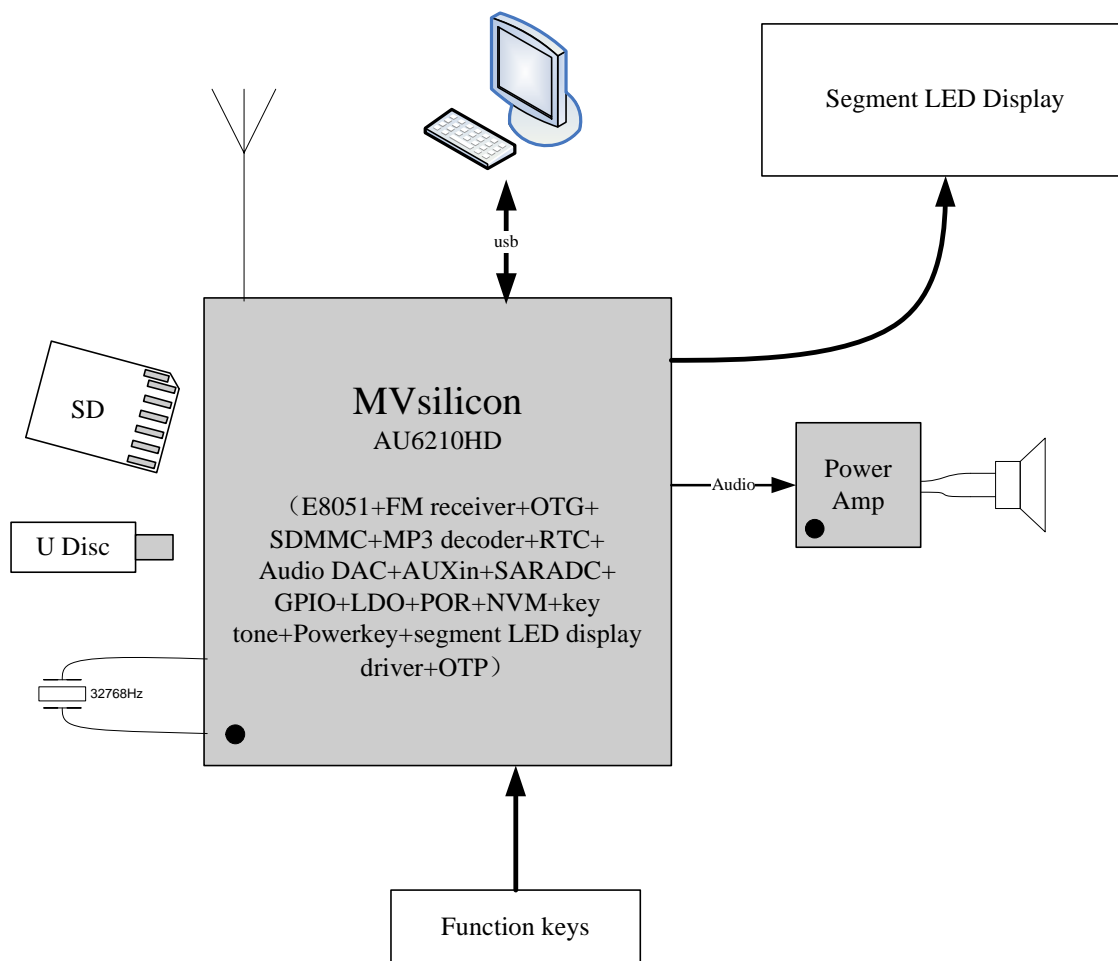


Figure 2 MP3 Audio System

## 3. Pin Description

AU6210HD 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
<b>USB interface pins</b>			
USB_DP	18	I/O	USB Function D+ bus
USB_DM	19	I/O	USB Function D- bus
<b>Audio CODEC interface pins</b>			
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
<b>GPIO/MCU IO pins</b>			
GPIO_A[5:3]	22:20	I/O	GPIO PORT, bank A
GPIO_A[2:0]	17:15	I/O	GPIO PORT, bank A
GPIO_B[6]	24	I/O	GPIO PORT, bank B
GPIO_D[7]	1	I/O	GPIO PORT, bank D
GPIO_D[6:3]	28:25	I/O	GPIO PORT, bank D
<b>CLK pins</b>			
XIN	10	I	32.768KHz Crystal oscillator input for PLL
XOUT	11	O	32.768KHz Crystal oscillator output for PLL
<b>FM pins</b>			
RFI	3	AI	FM Antenna input
<b>Power/Ground pins</b>			
FMVSS	2	GND	Ground for FM
DVSS	23	GND	ground for digital
LDOIN	13	PWR	LDO power in
LDO330	12	PWR	LDO 3.3V out

<b>DACVDD</b>	8	PWR	power for DAC
<b>DACVSS</b>	4	PWR	Ground for DAC
<b>MISC pins</b>			
<b>POWER_KEY</b>	15	I	Power Key

## 4. Package

### 4.1 Package Diagram

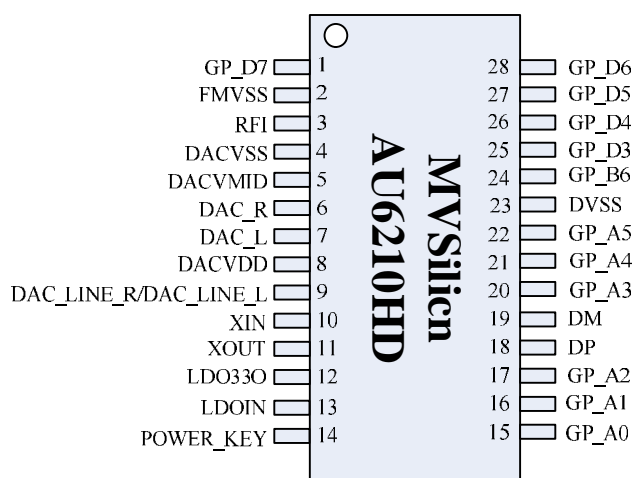


Figure 3 Package Diagram (SOP28 / TOP View)



## 4.2 Package Dimension Parameter

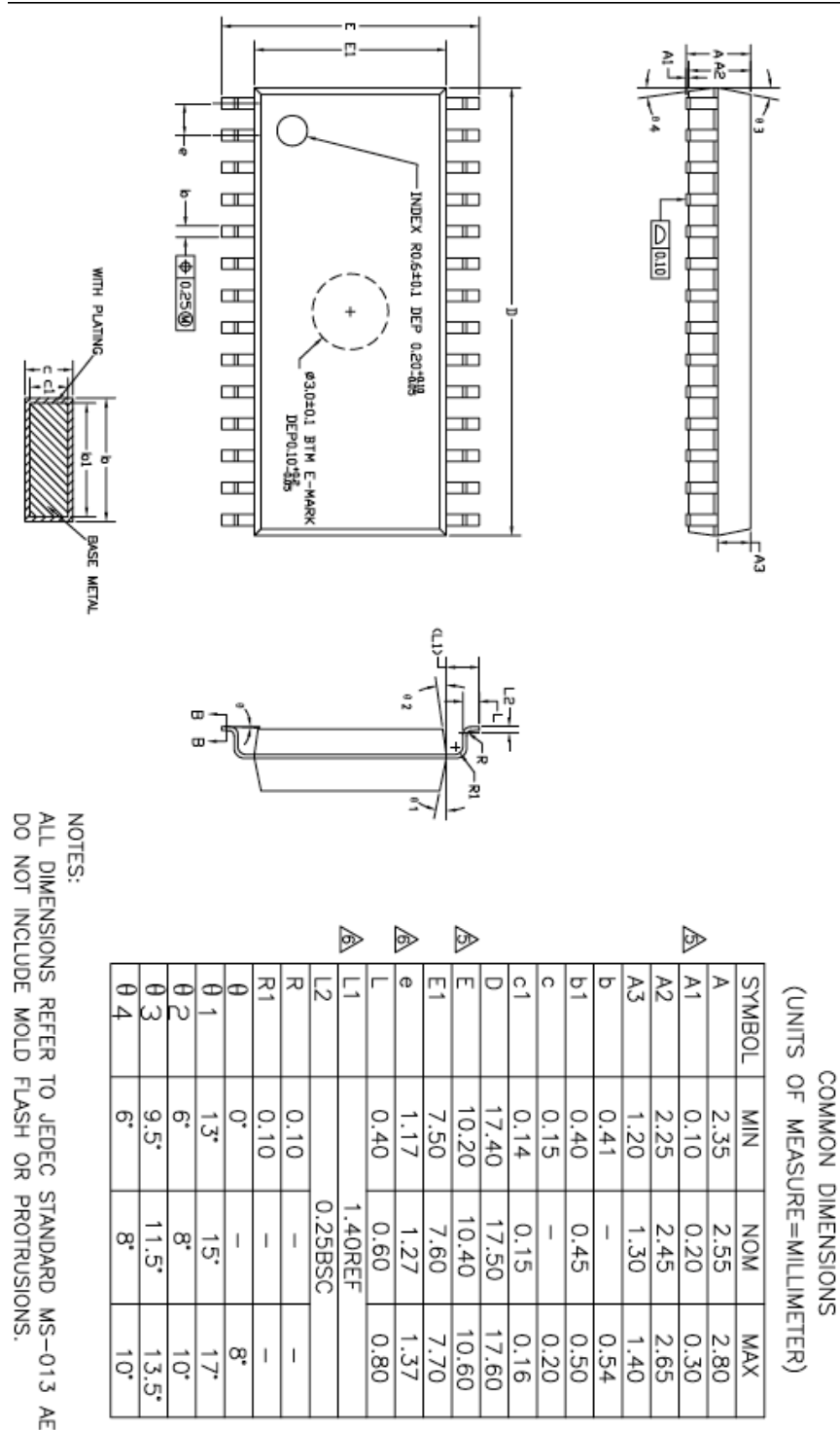


Figure 4 SOP28 Package Dimension Parameter

## 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
VIH	Input High Voltage		1.6		3.6	V
VIL	Input Low Voltage		-0.3		1.4	V
VOH	Output high voltage	@IOH=2mA	3.0			V
VOL	Output low voltage	@IOL=2mA			0.3	V
IL	Input leakage current		-10		10	uA
P_PLAY current	Current consumption when playing	Playing mode		20		mA
RTC current	Current consumption for RTC & 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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