



MVSILICON

AU6860B USB HOST MP3 DECODER SOC

# **AU6860B Datasheet**

**USB Host MP3 Decoder SOC**

**Rev0.1**

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## Revision History

Date	Revision	Description
	V0.1	Initial

## Contents

Revision History .....	iii
Contents .....	iv
Figures .....	v
Tables .....	vi
1. Overview .....	1
1.1 Features .....	1
1.2 Chip Architecture .....	2
2. System Application .....	3
3. Pin Description .....	4
3.1 Pin Description .....	4
4. Package .....	5
4.1 Package Diagram .....	5
4.2 Package Dimension Parameter .....	6
5. Electrical Specification .....	7
5.1 Absolute Maximum Ratings (Note 1) .....	7
5.2 Recommended Operating Conditions .....	7
5.3 Electrical Characteristics .....	7
5.4 Audio Performance .....	7

## Figures

Figure 1 AU6860B Functional Block Diagram.....	2
Figure 2 MP3 Audio System .....	3
Figure 3 Package Diagram (LQFP48-7x7mm / TOP View) .....	5
Figure 4 LQFP48-7x7mm Package Dimension Parameter.....	6



## Tables

Table 1 Pin Description.....	4
Table 2 Absolute Maximum Ratings .....	7
Table 3 Recommended Operating Conditions.....	7
Table 4 Electrical Characteristics .....	7
Table 5 Audio Performance.....	7



## 1. Overview

A highly integrated SOC for MP3 player, AU6860B integrates MCU, MP3 decoder, OTG, SD/MMC card controller, SARADC, Audio DAC, RTC, POWER KEY, LCD driver and an IR decoder in a single chip. Compared with traditional flash-MP3 player, AU6860B offers low cost, low power consumption, flexible and more powerful host MP3 player solution.

### 1.1 Features

- | Enhanced 8051, up to 10 times faster than standard 8051
- | OTG 2.0 full-speed controller
- | SD/MMC card controller
- | Support MP3 decode
- | Embedded sound equalizer
- | Support tag format ID3v1 and ID3v2.4
- | Support FAT16/FAT32 file system
- | Embedded 18-bit Audio CODEC
- | Support auxiliary audio input
- | Support FM audio input
- | Embedded SARADC for peripheral controls
- | Embedded segment LCD driver
- | Embedded RTC
- | Support IR Remote control
- | GPIO for various purposes
- | Embedded Power Key
- | Embedded LDO
- | Embedded Power-on-Reset
- | Embedded 32KB OTP for program code storage

## 1.2 Chip Architecture

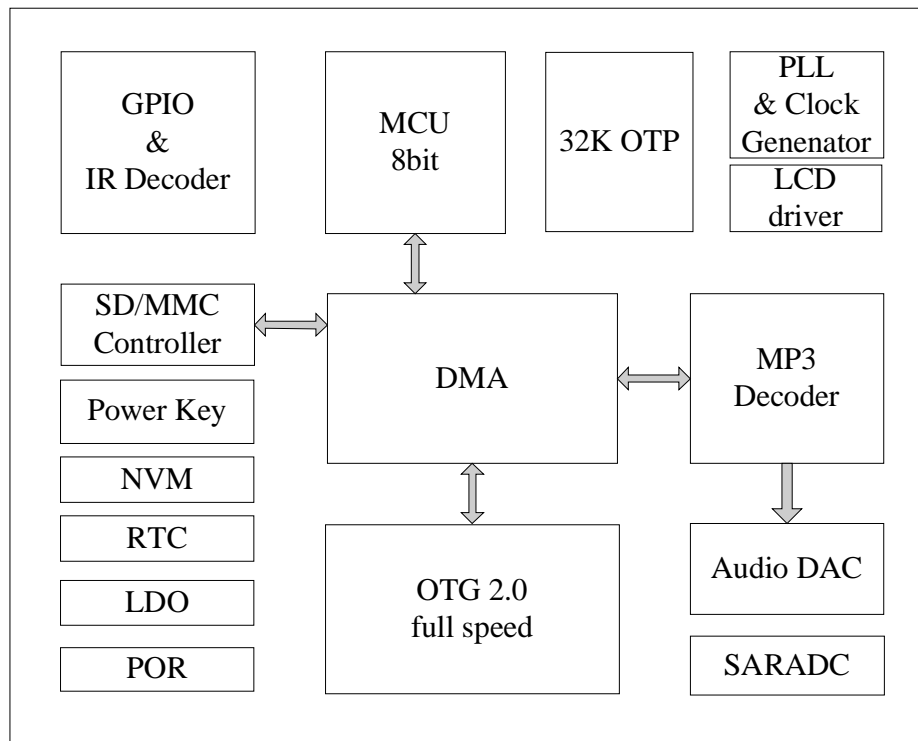


Figure 1 AU6860B Functional Block Diagram



## 2. System Application

### I MP3 audio system

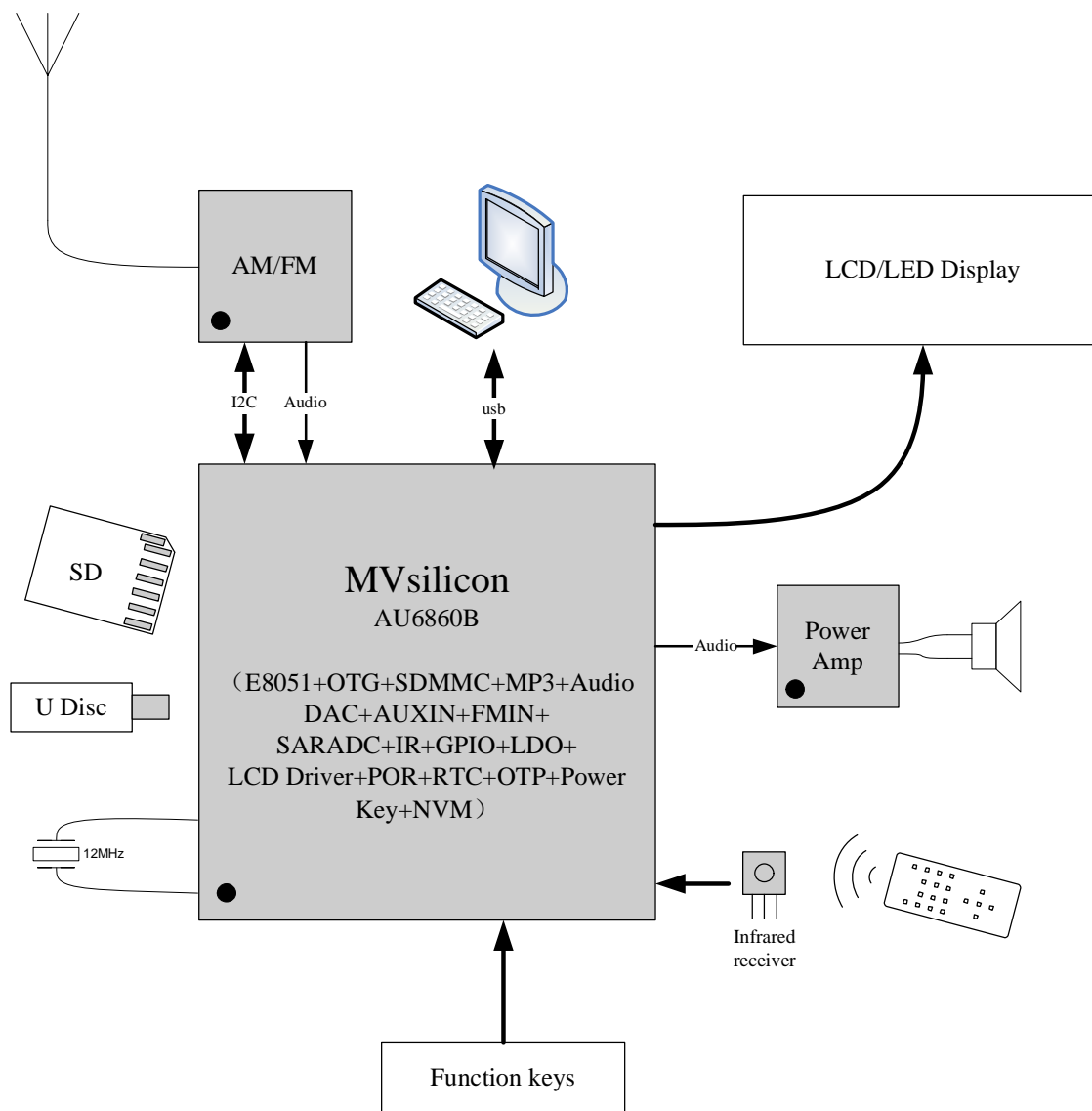


Figure 2 MP3 Audio System

### 3. Pin Description

AU6860B 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	14	I/O	USB Function D+ bus
USB_DM	13	I/O	USB Function D- bus
<b>Audio CODEC interface pins</b>			
DAC_R	40	AO	audio right channel output
DAC_L	41	AO	audio left channel output
DACVMID	39	AI	Internal voltage reference
DAC_AUX_R	42	AI	AUX right channel in
DAC_AUX_L	43	AI	AUX left channel in
<b>GPIO/MCU IO pins</b>			
GPIO_A[1:0]	32:31	I/O	GPIO PORT, bank A
GPIO_A[2]	12	I/O	GPIO PORT, bank A
GPIO_A[3]	9	I/O	GPIO PORT, bank A
GPIO_A[4]	11	I/O	GPIO PORT, bank A
GPIO_A[5]	10	I/O	GPIO PORT, bank A
GPIO_A[7:6]	45:44	I/O	GPIO PORT, bank A
GPIO_B[3:0]	30:27	I/O	GPIO PORT, bank B
GPIO_B[7:4]	6:3	I/O	GPIO PORT, bank B
GPIO_C[2:0]	35:33	I/O	GPIO PORT, bank C
GPIO_D[1:0]	8:7	I/O	GPIO PORT, bank D
GPIO_D[7:2]	26:21	I/O	GPIO PORT, bank D
GPIO_E[3:1]	46:48	I/O	GPIO PORT, bank E
GPIO_E[0]	1	I/O	GPIO PORT, bank E
<b>CLK pins</b>			
XIN	19	I	12MHz Crystal oscillator input for PLL

<b>XOUT</b>	20	O	12MHz Crystal oscillator output for PLL
<b>Power/Ground pins</b>			
<b>IOVDD</b>	15 36	PWR	power for IO
<b>COREVDD</b>	18	PWR	power for core
<b>DVSS</b>	2	GND	ground for digital
<b>LDOIN</b>	16	PWR	LDO power in
<b>DACVDD</b>	37	PWR	power for DAC
<b>DACVSS</b>	38	GND	ground for DAC
<b>MISC pins</b>			
<b>POWER KEY</b>	17	I	Power On / Off Key

## 4. Package

### 4.1 Package Diagram

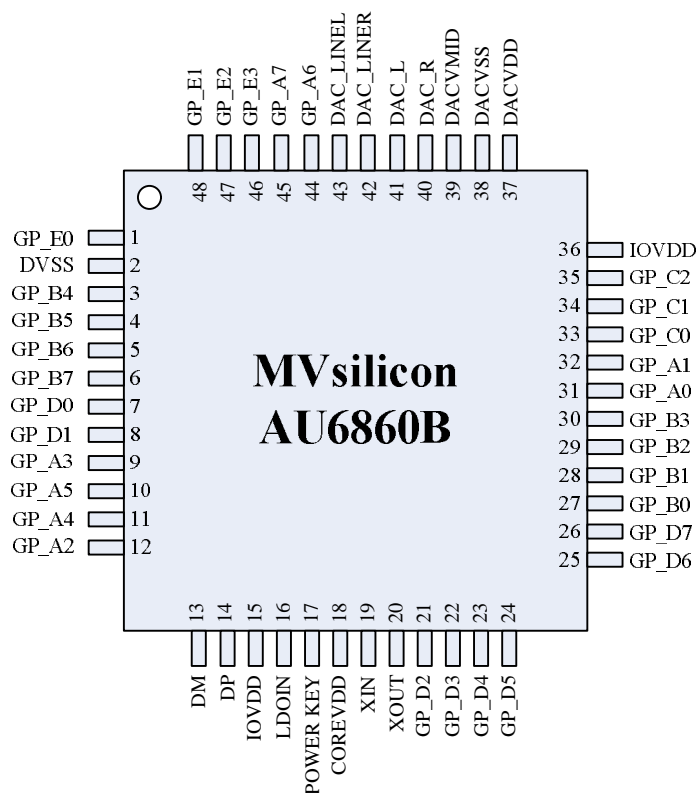


Figure 3 Package Diagram (LQFP48-7x7mm / TOP View)



## 4.2 Package Dimension Parameter

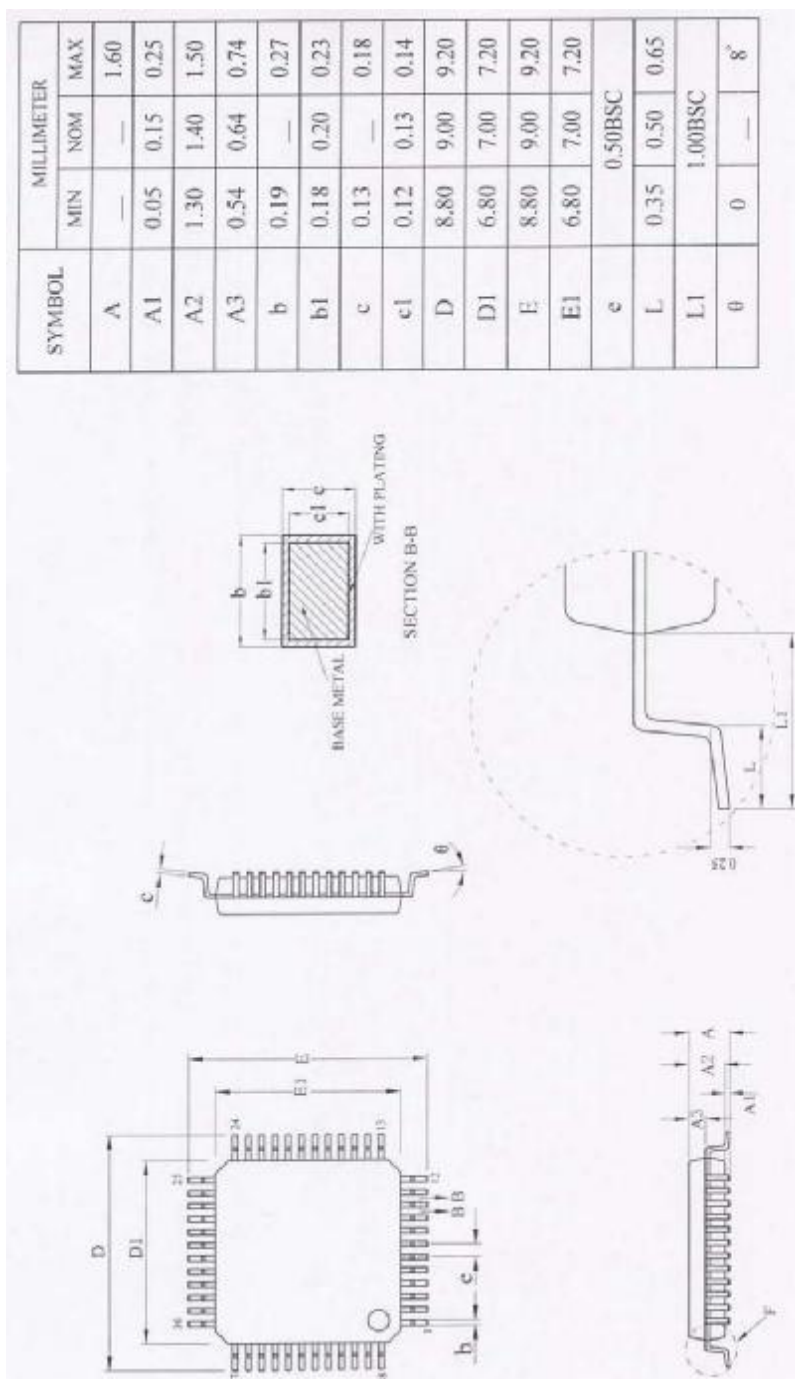


Figure 4 LQFP48-7x7mm Package Dimension Parameter

## 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
IO Input Voltage (GPIO_C2)	VIN	0		5.5	V
Operating Free Air Temperature	TEMP_OPR	-40		85	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		25		mA

### 5.4 Audio Performance

Table 5 Audio Performance

Characteristics	Min	Typ	Max	Unit
Frequency Response 20Hz ~ 20KHz		<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

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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