

AU6860L 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, AU6860L integrates MCU, MP3 decoder, OTG, SD/MMC card controller, SARADC, Audio DAC, Power Key and an IR decoder in a single chip. Compared with traditional flash-MP3 player, AU6860L 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 FM or auxiliary audio input
- | Embedded SARADC for peripheral controls
- | 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

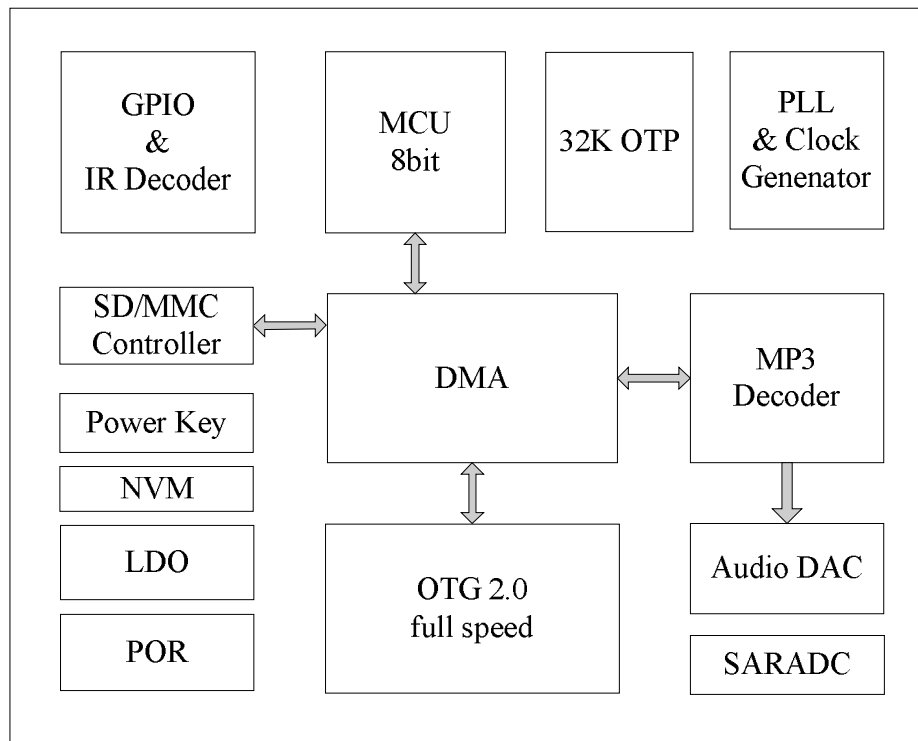


Figure 1 AU6860L Functional Block Diagram

2. System Application

I MP3 audio system

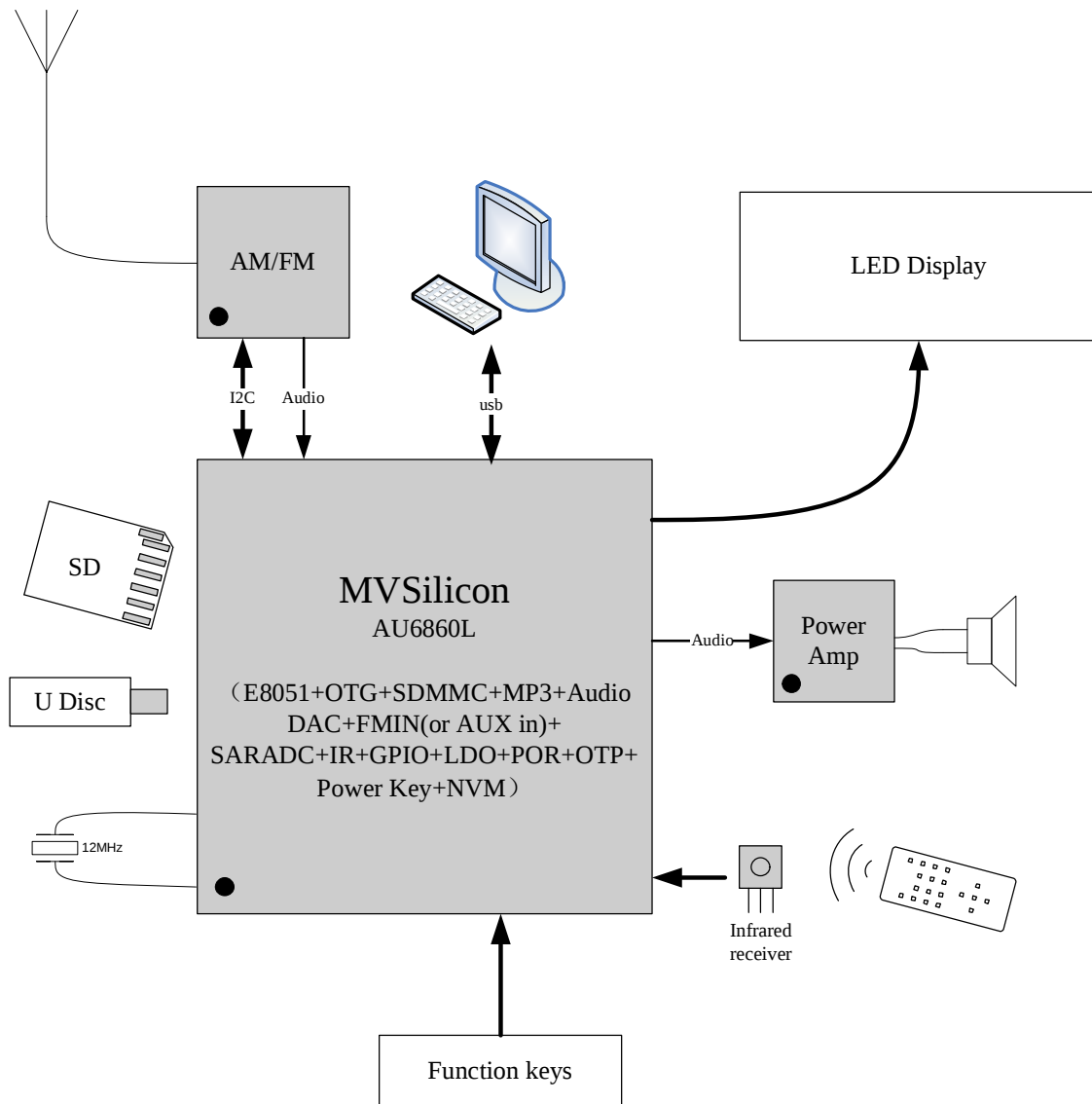


Figure 2 MP3 Audio System

3. Pin Description

AU6860L 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

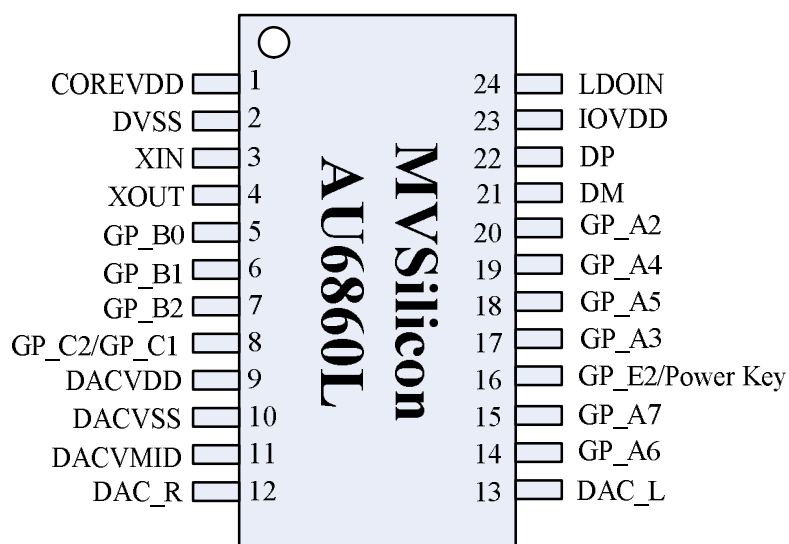
Pin name	Pin #	Type	Description
USB interface pins			
USB_DP	22	I/O	USB Function D+ bus
USB_DM	21	I/O	USB Function D- bus
Audio CODEC interface pins			
DAC_R	12	AO	audio right channel output
DAC_L	13	AO	audio left channel output
DACVMID	11	AI	Internal voltage reference
GPIO/MCU IO pins			
GPIO_A[2]	20	I/O	GPIO PORT, bank A
GPIO_A[3]	17	I/O	GPIO PORT, bank A
GPIO_A[4]	19	I/O	GPIO PORT, bank A
GPIO_A[5]	18	I/O	GPIO PORT, bank A
GPIO_A[7:6]	15:14	I/O	GPIO PORT, bank A
GPIO_B[2:0]	7:5	I/O	GPIO PORT, bank B
GPIO_C[2]/GPIO_C[1]	8	I/O	GPIO PORT, bank C, 两个 GPIO 封装在一起
GPIO_E[2]/Power Key	16	I/O	GPIO PORT, bank E, 与 Power Key bonding 在一起
CLK pins			
XIN	3	I	12MHz Crystal oscillator input for PLL
XOUT	4	O	12MHz Crystal oscillator output for PLL
Power/Ground pins			
IOVDD	23	PWR	power for IO
COREVDD	1	PWR	power for core
DVSS	2	GND	ground for digital
LDOIN	24	PWR	LDO power in
DACVDD	9	PWR	power for DAC



DACVSS	10	GND	ground for DAC
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4. Package

4.1 Package Diagram





4.2 Package Dimension Parameter

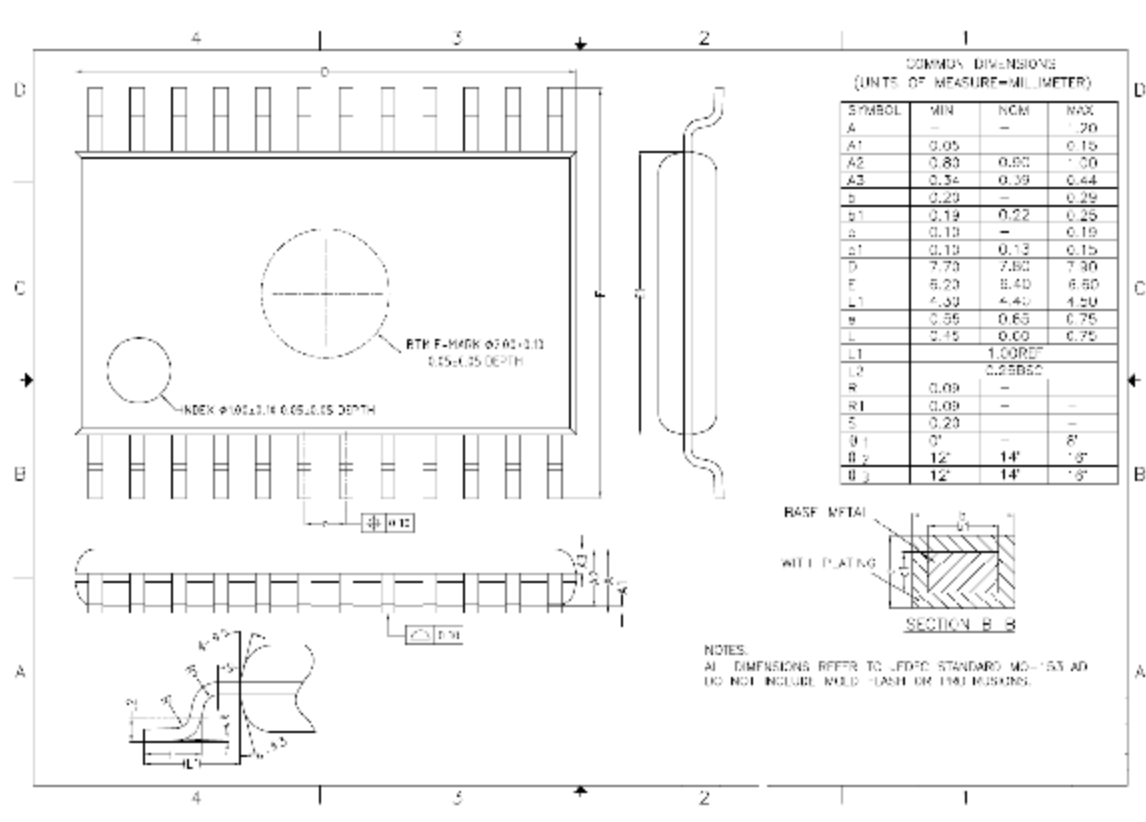


Figure 4 TSSOP24 Package Dimension Parameter

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
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 = 800mv rms)		0.1%		%
S/N (1KHz out = 800mv 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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