MH2024K-16SS

MH2024K-24SS

(GD3200A/B)

Datasheet

Guangzhou GuoDian Information Technology Co.,LTD

Versionÿ V1.0

Dateÿ 2020.11.24

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For typical application schematics, please see the last page.

For other models, please click here to jump to the download center: www.gdkeji.com/xzzx

Selection Note:

Model function		Packaging support	U disk	support TF/SD card	support SPI-Flash	Serial port (UART) variable baud rate	Remark
GD3800D player chip SOP16 ÿ				ÿ	ÿ	**ÿ (600bps~1.5Mbps) instead of GD58 series × (fixed**	
GD3200B **(MH2024K-16SS)**	**Play chip SOP16 ÿ**			ÿ	×	**9600bps) instead of YX5200**	
GD3200A **(MH2024K-24SS)**	**Play chip QSOP24 ÿ**			ÿ	×	**× (fixed 9600bps) to replace YX5200**	
GD3200D player chip SOP16 ÿ				ÿ	ÿ	**ÿ(2400bps~2Mbps) replace YX5200**	
GD5001B player chip QSOP24 ÿ				ÿ	ÿ	**ÿ(2400bps~2Mbps) replace WT5001**	
GD3900D recording/playing/ **speaking loudspeaker**		**SOP16 ÿ**		ÿ	ÿ	**ÿ(2400bps~2Mbps) replace GD59 series**	

For other models, please click here to jump to the download center: www.gdkeji.com/xzzx

1. Overview

1.1 Introduction

GD3200A/GD3200B is a SOC **chip with serial port control function and supports hard decoding of** MP3, WAV, WMA format. It can be connected with TF/SD card, SPI-Flash, U **disk and other storage devices, and supports** FAT, **FAT16, FAT32 file system. It can play the specified music and how to play the music through simple serial port commands, without cumbersome bottom-level operations, easy to use, stable and reliable are the biggest features of this product. In addition, the chip is also a deeply customized product, a low-cost solution specially developed for the field of fixed voice playback.**

solution, can be customized to support G726, G729, FLAC, APE, M4A, ALAC, AMR, DTS, MIDI, MTY and other audio format decoding.

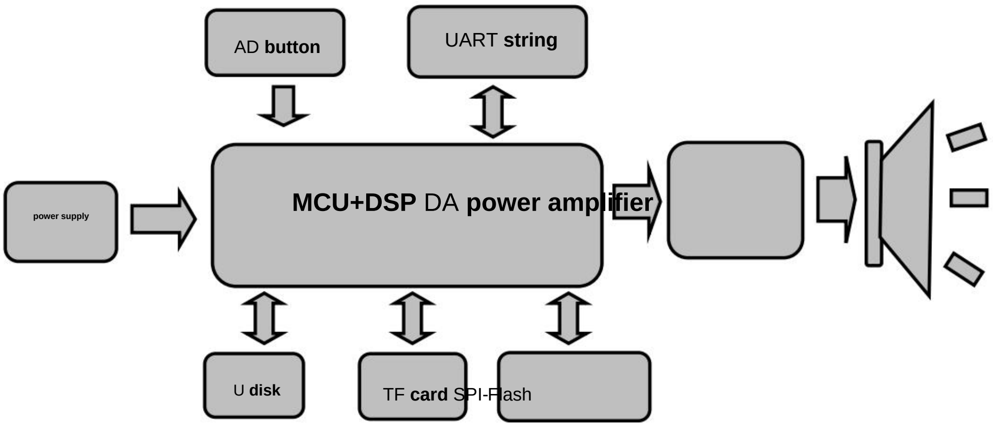
1.2 Function

1. Support sampling rate (KHz): 8/11.025/12/16/22.05/24/32/44.1/48; 2. 24- bit **DAC** output , **dynamic range supports 90dB, signal-to-noise ratio supports** 85dB; **3. Fully supports** FAT , FAT16, FAT32 **file system, 4. Support** 32G TF **card, support** 32G U disk; **5. Control mode, serial port mode, AD button control mode;** 6. Radio language insertion function, **you can pause the background music being played; 7 , The audio data is sorted by folders, supports up to** 99 **folders, and** 255 **songs can be assigned to each folder;** 8. The volume can be adjusted to 30 **levels, and 6 kinds** of EQ **are optional; 9. It can be controlled and played through the serial port (Uart) music with specified filename;**

1.3 Electrical parameters

name	**parameter**
audio file format	**1. Support** MP3, WAV, WMA
	2. Sampling rate support (KHZ): 8/11.025/12/16/22.05/24/32/44.1/48 3. **Support** Normal, Jazz,
	Classic, Pop, Rock **and other sound effects**
USB **interface**	Full speed USB 2.0 OTG controller **standard**
UART **interface**	**serial port, TTL** level, baud rate 9600bps, power supply is
Input voltage	3.2V-5V, the best is 4.2V
rated current	20ma[without U **disk]**
size	**Standard** SOP16 package
Operating temperature	-40ÿ to +85ÿ
humidity	**5% ~** 95%

2. Chip Instructions

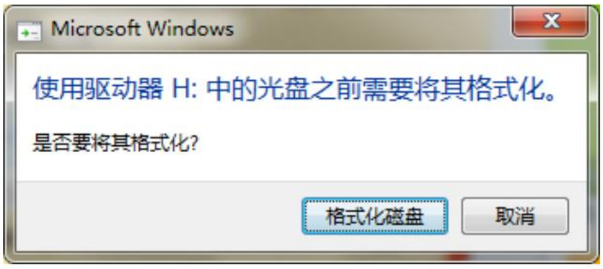


The chip uses the SOC **solution, integrates a** 32 **-bit DSP, and uses hard decoding to ensure the stability and sound quality of the system. The small package size better meets the needs of embedding into other products.**

2.1 SPI-Flash replace voice content

Take the 16M flash **operation as an example, the specific operation is as follows.**

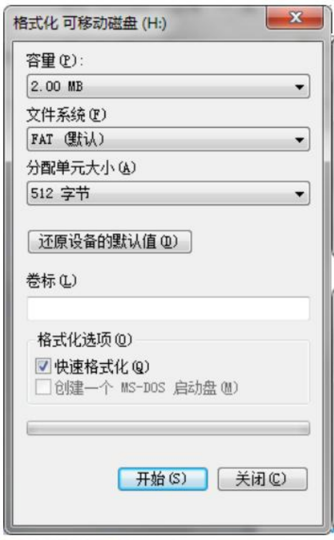
2.1.1 Insert the USB link to the computer


Microsoft Windows

使用驱动器 H: 中的光盘之前需要将其格式化。

是否要将其格式化?

2.1.2 Format disk


格式化 可移动磁盘 (H:)

容量(P): 2.00 MB

文件系统(F): FAT (默认)

分配单元大小(A): 512 字节

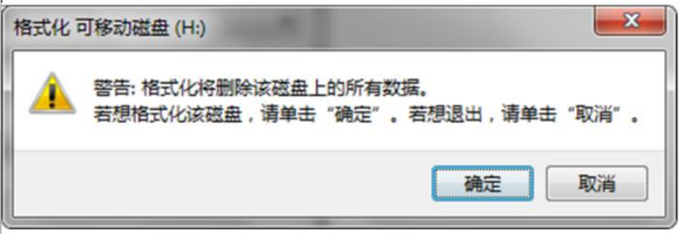
卷标(L):

格式化选项(O)

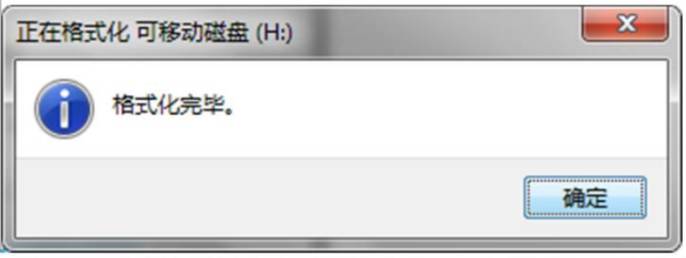
☑ 快速格式化(Q)

☐ 创建一个 MS-DOS 启动盘(M)

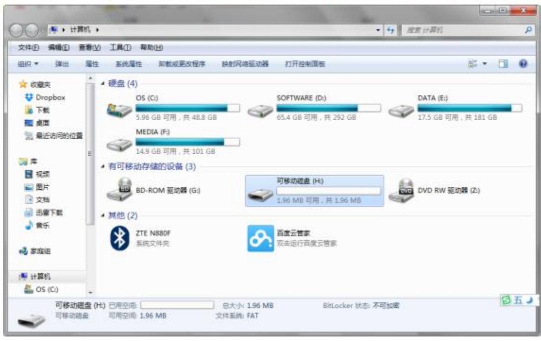
还原设备的默认值(D)
开始(S)
关闭(C)


格式化 可移动磁盘 (H:)

警告: 格式化将删除该磁盘上的所有数据。
若想格式化该磁盘，请单击“确定”。若想退出，请单击“取消”。


正在格式化 可移动磁盘 (H:)

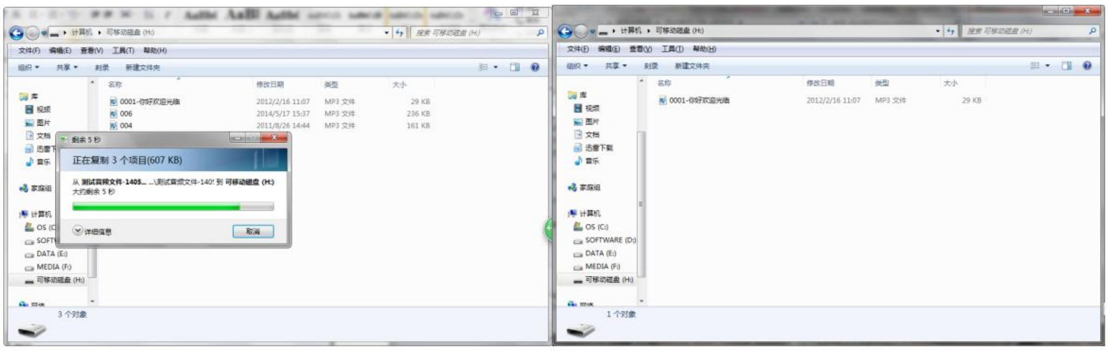
格式化完毕。


计算机
硬盘 (4)
OS (C:)
SOFTWARE (D:)
DATA (E:)
MEDIA (F:)
有可移动存储的设备 (3)
BD-ROM 驱动器 (G:)
可移动磁盘 (H:)
DVD RW 驱动器 (Z:)
其他 (2)
ZTE N880F
百度云管家
可移动磁盘 (H:)
总大小: 1.96 MB
文件系统: FAT

计算机 ▸ 可移动磁盘 (H:)
名称
修改日期
类型
大小
该文件夹为空。
0 个对象

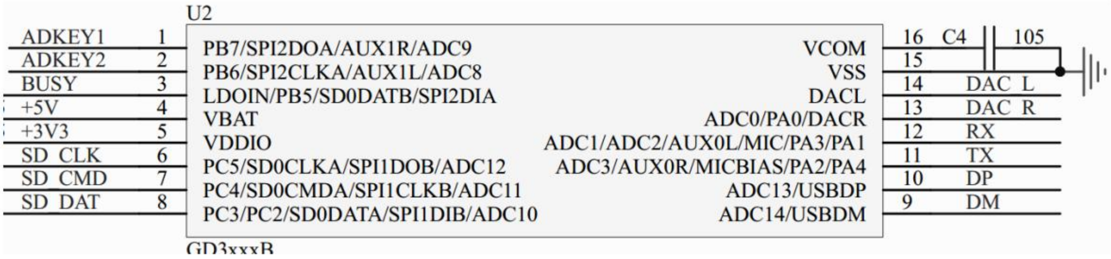
As shown in the picture, it can be used as a U **disk normally. When** the flash **is used for the first time ,** the operation of 2.1.1 is required . **After one operation, if** the flash **is not formatted or deleted later, there is no need to repeat the above operations.**

2.1.3 Load voice


正在复制 3 个项目(607 KB)
0001-你好欢迎光临
006
004
0001-你好欢迎光临
3 个对象
1 个对象

As shown in the figure above, it can be directly dragged into the voice as a U **disk. The operation** is exactly the same as SD **card and U disk.**

2.2 Chip pin description


U2
ADKEY1 1
ADKEY2 2
BUSY 3
+5V 4
+3V3 5
SD_CLK 6
SD_CMD 7
SD_DAT 8
PB7/SPI2DOA/AUX1R/ADC9
PB6/SPI2CLKA/AUX1L/ADC8
LDOIN/PB5/SD0DATB/SPI2DIA
VBAT
VDDIO
PC5/SD0CLKA/SPI1DOB/ADC12
PC4/SD0CMDA/SPI1CLKB/ADC11
PC3/PC2/SD0DATA/SPI1DIB/ADC10
VCOM
VSS
DACL
ADC0/PA0/DACR
ADC1/ADC2/AUX0L/MIC/PA3/PA1
ADC3/AUX0R/MICBIAS/PA2/PA4
ADC13/USBDP
ADC14/USBDM
16 C4 105
15
14 DAC_L
13 DAC_R
12 RX
11 TX
10 DP
9 DM
GD3xxxB

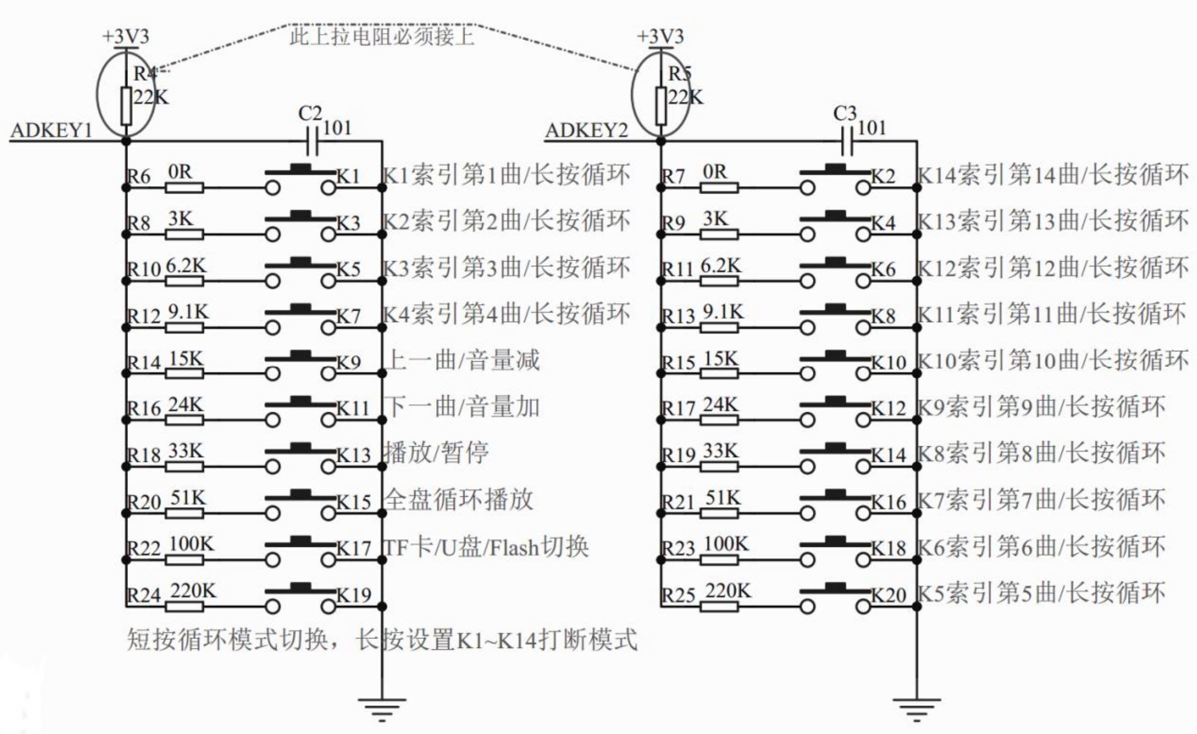
Pin No. Pin Name		Remarks on function description	ADKEY2 external key
1	ADK1	must be 22K **pull-up** ADKEY1 external key must be 22K **pull-up**	**Busy output decoding**
2	ADK2	**output signal** 5V **power input cannot exceed 5.2V**	**for 3.3V power output** TF card, SPI,
3	BUSY	24C02 power supply	
4	VDD		
5	VDDIO		
6	**SPI_DO /SD_CLK**	**SPI_DO data bus** SD_CLK **clock bus**	SPI-flash **and TF/SD card can only choose to connect to one device**
7	SPI_CLK/SD_CMD	**SPI_CLK data bus** SD_CMD **command bus**	
8	**SPI_CS / SD_DAT**	**SPI_CS chip select bus** SD_DAT **data bus**	
9	DM	USB	
10	DP	USB	
11	TX	UART **serial data output**	Baud rate: 9600bps
12	RX	UART **serial data input audio**	
13	**DAC_R**	**output right channel audio**	
14	**DAC_L**	**output left channel power**	
15	VSS	**supply ground**	
16	VCOM	**coupling pin**	

3. Description of control mode

3.1 Button interface

The chip adopts the way of AD **keys, which replaces the traditional connection method of the matrix keyboard. The advantage of doing this is to make full use of the increasingly powerful** AD **function** of the MCU . **The chip is configured with** 2 AD ports by default, and **the resistance distribution of 20 keys. If it is used in the occasion of strong electromagnetic interference or strong inductive or capacitive load, please refer to the "Notes" .**

AD **button resistance corresponding function reference diagram:**


+3V3
此上拉电阻必须接上
+3V3
R4
22K
R5
22K
ADKEY1
C2
101
ADKEY2
C3
101
R6 0R K1 K1索引第1曲/长按循环
R8 3K K3 K2索引第2曲/长按循环
R10 6.2K K5 K3索引第3曲/长按循环
R12 9.1K K7 K4索引第4曲/长按循环
R14 15K K9 上一曲/音量减
R16 24K K11 下一曲/音量加
R18 33K K13 播放/暂停
R20 51K K15 全盘循环播放
R22 100K K17 TF卡/U盘/Flash切换
R24 220K K19
短按循环模式切换，长按设置K1~K14打断模式
R7 0R K2 K14索引第14曲/长按循环
R9 3K K4 K13索引第13曲/长按循环
R11 6.2K K6 K12索引第12曲/长按循环
R13 9.1K K8 K11索引第11曲/长按循环
R15 15K K10 K10索引第10曲/长按循环
R17 24K K12 K9索引第9曲/长按循环
R19 33K K14 K8索引第8曲/长按循环
R21 51K K16 K7索引第7曲/长按循环
R23 100K K18 K6索引第6曲/长按循环
R25 220K K20 K5索引第5曲/长按循环

3.2 **Serial communication format**

Support asynchronous serial communication

mode Baud rate : 9600 bps **Parity bit : No Data**

bit : 8 **Stop bit :** 1 **Flow control :** none

Format: $S VER Len CMD Feedback para1 para2 checksum $O start bit 0x7E **Each command**		
number of bytes after	len **VER feedback starts with $, that is, 0x7E** [illegible]	**parameter 2 [command word indicates the** [illegible] **default is 0xff]**
TO SEE	**specific operation, such as play/pause, etc. CMD Feedback command**	**feedback whether feedback information is**
Only	**needed, 1 feedback, 0 no feedback** parameter 1 **query data high byte (such as song**	
bit data superposition]	**number) end bit 0xEF checksum parameter 2 The** [illegible]	[illegible] **length**
7E FF 06 09 01 00 04 FE ED EF **data length is 6, these** 6	**bytes are [FF 06 09 01 00 04], excluding start bit [7E], checksum [FE ED], end bit [EF]**	
	calculated as adding all the data in the length bit and then inverting the result + 1.	
$O		

3.3 Communication command

3.3.1 Directly sent commands with return codes.

The function corresponding	Order
0x01 **next**	
song 0x02 **previous song**	
0x03 **specified index playback**	**Two bytes in length, maximum support 65535 voice segments,**
0x04 **volume plus** 0x05 **volume**	maximum 30 levels, minimum 0 level , **0~30 level volume adjustment**
minus 0x06 **specified volume**	
0x07 specified EQ0/1/2/3/4/5	
0x08 **specified track index single**	Normal/Pop/Rock/Jazz/Classic/Bass **is two bytes**
track loop playback 0x09 **specified playback device**	**long, and supports a maximum of 65535 segments of voice**
0x0A **shutdown** 0x0B **NC (reserved)** 0x0C **reset**	**1: U disk; 2: TF** card; 4: **IC pin 2 (ADK2)**
restart 0x0D **play** 0x0E **pause**	**can wake up invalid command after Flash shutdown**
0x0F **Play the file name in the specified folder**	Folder name: 01~99 (FF **indicates the specified root directory file name);** the first 3 digits of the file name must be numbers
0x10 **NC (reserved)** 0x11	001~999?.mp3 **invalid command** 1: loop playback; 0: stop loop
full disk loop playback	playback **is less than 10000, identify the first 4 digits**
0x12 **Specify the file name in the "MP3" folder to play**	**0001~9999?.mp3** Above 10000, recognize the first 5 digits 10000~65535?.mp3 **Less than 10000, recognize the first 4 digits**
0x13 Specify the file name under the "ADVERT" folder **to insert**	**0001~9999?.mp3** Above 10000, recognize the first 5 digits 10000~65535?.mp3

0x14 **Play the file name in the specified folder**	Folder name: 01~15; see instruction description for details. The first 4 digits of the file name must be numbers 0001~4095?.mp3
0x15 **Stop the current broadcast and return to background file playback**	
0x16 **Stop playing** 0x17	
Specify the folder name to play in a loop	Folder name: 01~99 corresponds to 99 folders
0x18 **Shuffle all discs**	
0x19 **set single loop playback**	**0: Single track cycle; 1: Cancel single track** **cycle; This command has no playback function and needs**
0x1A **Current song (mute) MUTE setting**	**to be sent in the playback state. 0: cancel mute; 1: enable**
0x25 **Insert** the file name under the "ADVERT1~9" folder	**mute, you can specify** 001?~255?.mp3 file name under 9 folders of ADVERT1~9 **to insert (recognize the first 3 digits).**

3.3.2 System Reply Parameters

The function corresponding to the command	parameter (16 bits)
0x3A **device online information**	01: Udisk **inserted,** 02: TF/SD **insert,** **04: PC plugged in**
0x3B **Device offline information**	01: Udisk **unplugged,** 02: TF/SD **is pulled out,** **04: PC unplugged**
0x3C U **disk playback ends and returns the current song**	
index 0x3D TF **card playback ends and returns the current**	
song index 0x3E Flash **playback ends and returns the**	
current song index 0x3F **NC (reserved)** 0x40 **returns an**	**invalid command**
error, request to resend 0x41 **command to receive a**	
response	

3.3.3 Set system parameters (write 8-bit HEX)

The function corresponding	Parameters (16
0x42 **query the**	**01: Play; 02: Pause; 03: Stop Level 00~30**
current status 0x43 **query the**	
current volume 0x44 **query the current** EQ	[0/1/2/3/4/5] Normal/Pop/Rock/Jazz/Classic/Bass **01: Full disk**
0x45 **query the current cycle mode**	**loop; 02: Single loop; 03: Folder loop; 04: Random loop; 05:** **Single Play it again ;** 06: Please use ASCII **to view** the return value of the single seamless loop
0x46 **Query the current software version**	
0x47 **Query the total file number of** UDISK 0x48	
Query the total file number of TF **card** 0x49 **Query**	
the total file number of FLASH 0x4A **NC (reserved)**	
0x4B **Query the current track of** UDISK	**invalid command**

0x4C **Query** the current track of TF **card** 0x4D **Query the current**		
track of FLASH 0x4E **Query the total number of files in the current**		
folder 0x4F **Query the total number of folders**		

3.4 The data returned by the chip

The chip will return data in key places for users to control the working status of the chip.

• The data that the chip is powered on and initialized successfully; •

The chip has finished playing the data of the current track; • The chip

successfully receives the ACK (response) returned by the command ;]; • When the chip is busy, if

there is data coming, the chip will return a busy command; • U disk, TF **card is inserted and pulled out, and data will be returned.**

3.4.1 The data returned by chip power-on

(1) When the chip is powered on, it takes a certain amount of time to initialize. This time depends on the number of files in the U disk, TF **card,** flash **and other devices. Generally, it takes** 1.5~3S . **If the initialization data of the chip has not been sent out after this time, it means that the chip initialization error, please reset the power supply of the chip, and check the connection of the hardware.** (2) The chip initialization data includes the lower four bits DL (bit0~bit3) **of the low byte of the data fetched by the online device ,** such as sending

7E FF 06 3F 00 00 01 FE BB EF; DL=0x01 indicates that only the USB disk is online **during power-on . For other** data, please refer to the following table, the relationship between each

device: [0x01]: U **disk online [0x02]: TF/SD card online** [0x03]: U disk, TF/SD **card online [0x04] : Flash online** [0x05]: U disk, Flash **online** 0 **[0x06]: TF/SD**

card, flash **online** 0 [0x07]: U disk, TF/SD card, flash **online** 0	**Bit3(PC) Bit2(Flash) Bit1(SD) Bit0(U disk)** 0 0			
			0	1
	0	0	1	0
	0	0	1	1
	0	1	0	0
		1	0	1
		1	1	0
		1	1	1

(3) The MCU must wait for the chip initialization command to be issued before sending the corresponding control command, otherwise the chip will not process the command sent, and it will also affect the normal initialization of the chip.

3.4.2 The data returned after the track is played

U **disk plays the first** song	7E FF 06 3C 00 00 01 FE BE EF U **disk played the** first **song finished**	
U **disk finished playing the** 2nd song	7E FF 06 3C 00 00 02 FE BD EF U **disk played the** second **song completed**	
TF/SD **card disk has finished playing the** third **song** 7E FF	06 3D 00 00 03 FE BB EF U **disk has played the** third **song**	
TF/SD **card disk has finished playing the** fourth **song** 7E FF	06 3D 00 00 04 FE BA EF U **disk has played the** fourth **song**	
Flash **finishes playing the** 5th track	7E FF 06 3E 00 00 05 FE B8 EF U **disk played the** fifth **song**	

Flash **plays the 6th** track (1)	7E FF 06 3E 00 00 06 FE B7 EF U **disk played the**	sixth **song**

and the playback is paused, outputting a high

level. (2) **Competing for continuous playback applications can be realized in this way. If** the U **disk finishes playing the first song, it will return** 7E FF 06 3C 00 00 01 FE BE EF 3C ---- **means the** U **disk command ; Send a command to play the next song, and it can be played in sequence. (3) When the chip is powered on and the initialization is normal, the chip will automatically enter the device playback state, and stop decoding, waiting for the** user to send relevant instructions for playback. **(4) In addition, after specifying the device, the user needs to wait for** 200ms **before sending the specified track, because once the track is specified, the system will initialize the file system of the specified device, if the specified track command is sent immediately, it will As a result, the chip cannot be received.**

3.4.3 Data returned by chip error

Return 7E FF 06 40 00 00 01 xx xx EF **chip during file system initialization**		
busy and currently in sleep mode 7E FF 06 40 00 00 02 xx xx EF **sleep mode serial port**		
receiving error 7E FF 06 40 00 00 03 xx xx EF **serial port has not received a frame of data and check error The**		
specified file is out of range 7E FF 06 40 00 00 04 xx xx EF serial check error 7E FF 06 40 00 00 05 xx xx **The specified file of EF exceeds the set range and the**		
specified file is not found. 7E FF 06 40 00 00 06 xx xx The **specified file of EF is not found. Interrupt instruction error**		
7E FF 06 40 00 00 07 xx xx The **current status of EF is not Accept the spot**		

3.4.5 Device plugging and unplugging message

U **disk inserted**	7E FF 06 3A 00 00 01 xx xx EF
TF **insertion**	7E FF 06 3A 00 00 02 xx xx EF
TF **unplugged**	7E FF 06 3B 00 00 01 xx xx EF
PC **unplugged**	7E FF 06 3B 00 00 02 xx xx EF

3.5 Detailed Explanation of Serial Port Commands

3.5.1 Specify the song playback command

(1), For example, select the first song to play, the sending part of the serial port 7E 10 06 03 00 00 01 FF E6 EF 7E **--- start command**

FF---version

information **06---data length (not**

including checksum) 03---represents

command byte 00---whether a response is required [0x01: response is required, 0x00:

no response is required] 00--- The high byte [DH] of the track 01---the low byte [DL] of

the track, here represents the first song to play

FF--- high byte of checksum

E6---low byte of checksum

EF---End command

(2). For the selection, if the 100th song is selected , first convert 100 **into** hexadecimal , **and the default is double-byte, which is** 0x0064. DH=0x00; DL=0x64. **(3) If you choose the 1000th** song **to play, first** convert 1000 **into** hexadecimal , **the default is double-byte, which is** 0x03E8; DH=0x03; DL=0xE8. **(4) The operation of other tracks can be deduced by analogy, because the** hexadecimal **system is the most convenient operation in the embedded field.**

3.5.2 Specify volume playback command (0x06)

(1) The default volume of our system is 30 when the system is powered on . **If you want to set the volume, just send the corresponding command directly. (2) For example, if the specified volume is** 15 , **the command sent by the serial port:**

7E FF 06 06 00 00 0F FF D5 EF.

(3), DH=0x00; DL=0x0F, 15 is converted into hexadecimal **to 0x000F. You can refer to the instructions in the Playing Tracks section.**

3.5.3 Specify the playback device (0x09)

After specifying the device. The chip will automatically enter the stop decoding state, waiting for the user to specify the track to play. from Receive the specified device to the chip to complete the initialization of the file system. It takes about 200ms. Please wait for 200ms **before sending the command for the specified track.**

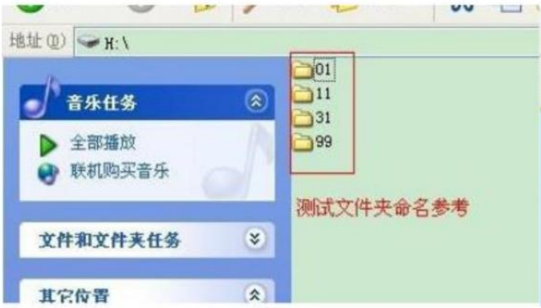
Designated playback device-U disk 7E FF 06 09 00 00 01 xx xx EF xx **xx: stands for verification**		
Designated playback device-SD disk 7E FF 06 09 00 00 02 xx xx EF **designated playback device-**		
FLASH 7E FF 06 09 00 00 04 xx xx EF		

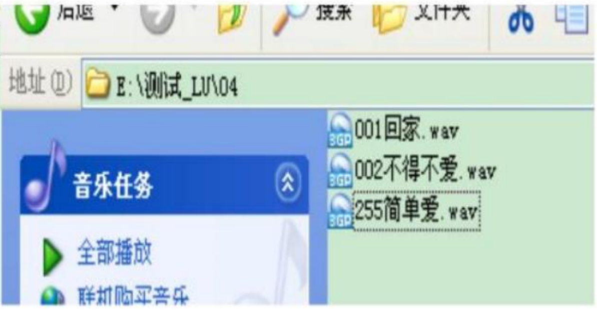
3.5.4 Specify folder to play (0x0F)

Specify **001?.mp3 in** **folder** 01 **Specify**	7E FF 06 0F 00 01 01 xx xx IF	**The instruction only recognizes the first** 3 **digits, and "?" means any character.**
100?.mp3 in folder 11 7E FF 06 0F 00 0B 64 xx xx	IF	
Specify **255?.mp3 in folder** 99 and specify **254?.mp3 in**	7E FF 06 0F 00 63 FF xx xx IF	
root directory FF **Note: When the folder name is "FF", it**	7E FF 06 0F 00 FF FE xx xx IF	

means playing the file name in the specified root directory. (1) The specified folder playback is an extended function developed by us. The default folder naming methods are "01" and " 11" because our chip does not support the folder name recognition of Chinese character names. For the stability of the system and the speed of song switching. By default, each folder supports a maximum of 255 **songs and a maximum** of 99 **folders. If the customer has special requirements, it needs to be classified according to the English name. We can also** achieve it, but the name It can only be composed of English names such as "GUSHI" and "ERGE". But mp3 **files need to add a prefix, which can be changed to "002 have to love.mp3" on the basis of " have to** love.mp3".

(2) For example, specify the 100xxx.MP3 file of the "01" folder , **the command sent by the serial port is: 7E** FF 06 0F 00 01 64 xx xx EF **DH: represents the name of the folder, and supports** 99 **files by default, namely 01--99 naming; DL: represents the track, the default is up to** 255 **songs, that is,** 0x01~0xFF. (3) **For the standardization of the chip, the folder and file name must be specified at the same time to lock a file. It is also possible to specify folders or file names separately, but the management of files will become worse. Designated folders and designated tracks support MP3 and WAV (4). The following two screenshots illustrate the designation of folders and file names [divided into left and right two diagrams].**

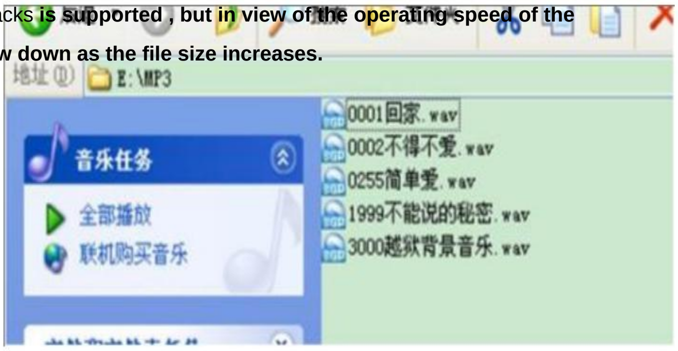




3.5.5 Specify the tracks in the MP3 folder to play

Command format	7E FF 06 12 00 00 01 FE E8 EF	**"MP3" folder, the track is "0001"**
	7E FF 06 12 00 0B B8 FE 26 EF	**"MP3" folder with track "1999"**
	7E FF 06 12 00 FF FF FC EB EF	**"MP3" folder with track "65535"**
	7E FF 06 12 00 27 10 FE B2 EF	**"MP3" folder with track "10000"**

Note: When the number of files is less than 10000 , **the first** 4 **digits must be** 4 **digits, and when it exceeds** 10000 , **the first** 5 **digits must be numbers.** **(1) The specified file name is as shown in the right figure: (2) On the basis of the specified folder and file name, we expand the function of a single folder, and the name of the folder must be "MP3".** (3) A maximum of 65,536 tracks **is supported , but in view of the operating speed of the file system, the speed of track switching may slow down as the file size increases.**

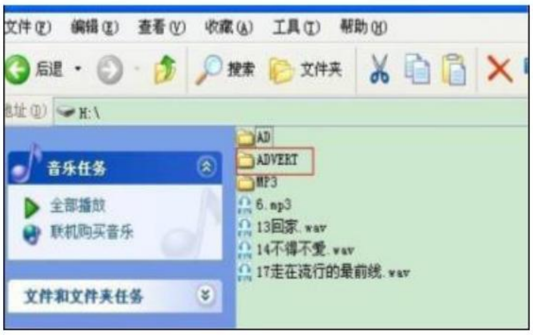


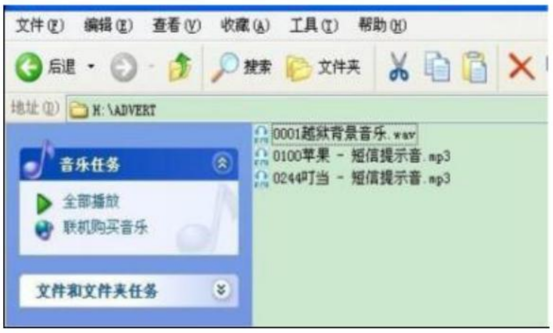
3.5.6 Insert the audio under the ADVERT folder

Command format	7E FF 06 13 00 00 01 FE E8 EF	**"ADVERT" folder, the track is "0001"**
	7E FF 06 13 00 0B B8 FE 25 EF	**"ADVERT" folder with track "1999"**
	7E FF 06 13 00 FF FF FC EB EF	**"ADVERT" folder with track "65535"**
	7E FF 06 13 00 27 10 FE B2 EF	**"ADVERT" folder with track "10000"**

Note: When the number of files is less than 10000 , **the first** 4 **digits must be** 4 **digits, and when it exceeds** 10000 , **the first** 5 **digits must be numbers.**

(1) We support the insertion of other tracks during the playback of selected songs, so that it can meet the needs of inserting advertisements during the playback of background music. (2) After sending the 0x13 command, the system will store the IDV3 information **of the currently playing track , and then play the specified intermission track. After the interrupted track is finished playing, the system will return to the saved playback breakpoint and continue playing. until the playback is complete. (3) The setting format is to create a folder named "ADVERT" in the device, and store the tracks that need to be inserted in it. When the number of tracks is** less than 10,000 , **set the track to "xxxx+track** name.MP3/WAV" , when the number of tracks is greater than 10000 , **the track is set to "xxxxx+track name.MP3/WAV",** x **represents a number. (4) If the system is currently in a pause or stop state, it will send an interrupt command, which is only used as a general play command. If in the process of inserting, you can continue to insert other tracks, but after the playback is finished, you still return to the first stored breakpoint information to continue playing. (5) The settings of the designated in-stream advertisement are as follows:**

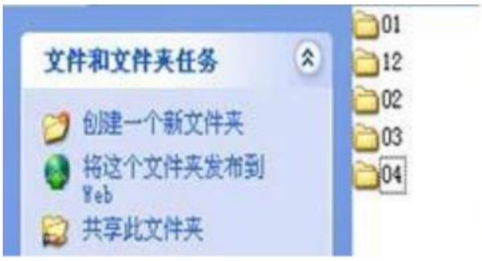

文件(F) 编辑(E) 查看(V) 收藏(A) 工具(T) 帮助(H)
后退
搜索
文件夹
地址(D) H:\
音乐任务
全部播放
联机购买音乐
文件和文件夹任务
AD
ADVERT
MP3
6.mp3
13回家.wav
14不得不爱.wav
17走在流行的最前线.wav

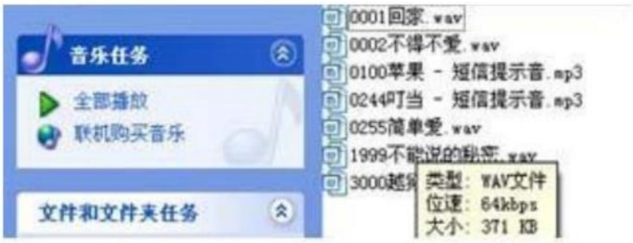

文件(F) 编辑(E) 查看(V) 收藏(A) 工具(T) 帮助(H)
后退
搜索
文件夹
地址(D) H:\ADVERT
音乐任务
全部播放
联机购买音乐
文件和文件夹任务
0001越狱背景音乐.wav
0100苹果 - 短信提示音.mp3
0244叮当 - 短信提示音.mp3

3.5.7 Support 4095 track commands under a single folder

Command format	7E FF 06 14 00 10 FF FD D8 EF **The folder designated as "01" and the track as "0255"**
	7E FF 06 14 00 17 CF FE 01 EF **Folder designated as "01" with track "1999"**
	7E FF 06 14 00 C0 01 FE 26 EF **The folder designated as "12", the track as "0001"**
	7E FF 06 14 00 C7 CF FD 51 **The folder designated as "12" by** EF , the track as "1999" (1), **the command**

byte of the serial port is 0x14 **(2), the parameter is two bytes, designated as a folder The track named "12" is "1999?.mp3" serial port data: 7E** FF 06 14 00 C7 CF FD 51 EF , **where** 0xC7 **and** 0xCF **are parameters, and the combination is** 0xC7 **CF. A total of** 16 **bits, of which the upper** 4 bits **represent the file The name of the folder, where** C **means 12, and the lower** 12bit **means the name of the file name, where** 7CF **means** 1999, that is, the track with the file prefix "1999?.mp3". **(3) The name of the folder is as follows:**


文件和文件夹任务
创建一个新文件夹
将这个文件夹发布到 Web
共享此文件夹
01
12
02
03
04


音乐任务
全部播放
联机购买音乐
文件和文件夹任务
0001回家.wav
0002不得不爱.wav
0100苹果 - 短信提示音.mp3
0244叮当 - 短信提示音.mp3
0255简单爱.wav
1999不能说的秘密.wav
3000越狱
类型: WAV文件
位速: 64kbps
大小: 371 KB

3.5.8 All loop play commands

Loop start 7E FF 06 11 00 00 01	xx xx EF **Loop play all tracks Loop stop** 7E FF 06	11 00 00 00 xx xx EF **Stop**
loop playback (1), during loop	**playback, normal operation and playback / Pause**	**, previous song, next song,**

volume adjustment, including EQ **and so on. (2) After the loop playback starts, the chip will play the tracks in the device continuously, according to the stored physical order, after playing once, it will continue to play one side until it receives a command to stop or pause.**

3.5.9 Specify track index single track loop playback

0x08	**The control command supports 0-65535** 7E FF	06 08 00 00 01 xx xx
	EF **to play the** first **song** 7E FF 06 08 00 FF FF	xx xx EF **to play the**
	65535th **song in a loop (1). Operation play/pause**	**, previous song, next song,**

volume adjustment, including EQ, **etc. and the status is still loop playback. You can stop the command to close the loop playback status.**

3.5.10 Playing status query command

Command: 7E FF 06 42 00 00 00 EF

return command	**is playing** 7E FF 06 42 00	meaning
00 01 xx xx EF **is**	**playing pause playback** 7E FF 06 42 00 00 02 xx xx EF **is**	**paused**
during playback	**stop playback** 7E FF 06 42 00 00 03 xx xx EF **playback is**	**completed (1), the chip**
will have four states	**open to the user during the decoding process. The**	**user can obtain the current**

state of the chip through command query. (2) Play pause means that a song is being played, and an artificial instruction is sent to pause the play, and play stop means that the chip is in the state of playing stop after a song is played.

3.5.11 Play stop command

Stop playing 7E	FF 06 15 00 00 00 FE E6 EF **stop playing, return to**	**background music and continue playing stop**
playing 7E FF 06	16 00 00 00 FE E5 EF **stop software decoding**	

3.5.12 Specify folder to play in loop

Specify folder loop playback 7E	FF 06 17 00 00 02 FE E2 EF **specify** 02 **folder loop**	**playback specified folder loop**
playback 7E FF 06 17 00 00 01	FE E3 EF **specify** 01 **folder loop playback (1) ,** folder	naming The mode must be "01" ---

"99", and cannot exceed 99. **(2) After the specified folder is cycled, the voice of the folder will be played in a loop to guide sending a stop command.**

3.5.13 Randomly play device files

Random playback	7E FF 06 18 00 00 00 FE E3 EF **Random playback**	**of the entire device stops**
playback 7E FF	06 18 00 00 01 FE E3 EF **Stop random playback (1),**	**this command randomly plays**

the voice files stored in the device, according to The physical order is played randomly, regardless of whether there are folders in the device. And the first audio file played must be the first audio file in the device.

3.5.14 Set the current track to loop playback

Set loop playback 7E FF	06 18 00 00 00 FE E3 EF **single loop playback on, cancel loop**	**playback** 7E FF 06 18 00
00 01 FE E3 EF **single loop**	**playback off (1), send this command during playback, it**	**will Loops the current track.**

If the current process is suspended or stopped, the chip will not respond to this command. (2) If you want to close the loop playing of a single track, just send the command to close it, and it will stop after the current track is played.

3.5.15 Turn on and off the mute function of the current song (mute)

command	7E FF 06 1A 00 00 00 FE E1 EF **Turn on sound**	
command	7E FF 06 1A 00 00 01 FE E0 EF **Mute on**	

3.5.16 Query the number of tracks in the current folder

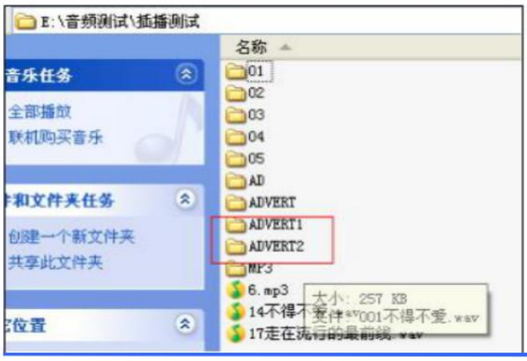
instruction	7E FF 06 4E 00 00 00 FE AC EF **Query the total number**	**of tracks in the current folder**

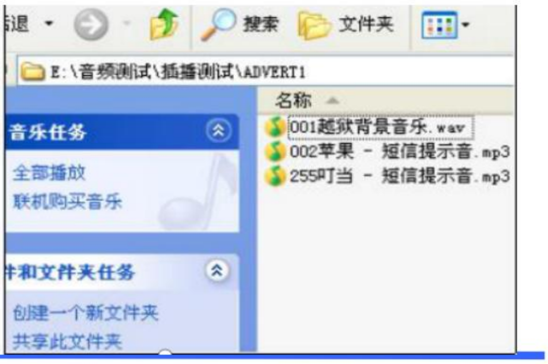
3.5.17 Query the total folder number of the current device

instruction	7E FF 06 4F 00 00 00 FE AB EF **Query the total number**	**of current device folders**

3.5.18 Multi-folder insert function

Command	7E FF 06 25 00 01 01 FE D4 EF **"ADVERT1" folder,**	**track "001" command** 7E FF 06 25 00 01 02 FE D3 EF
"ADVERT1" folder,	**track "002" command** 7E FF 06 25 00 02	01 FE D3 EF **Folder of "ADVERT2" with track "001"**


E:\音频测试\插播测试
名称
音乐任务
全部播放
联机购买音乐
和文件夹任务
创建一个新文件夹
共享此文件夹
位置
01
02
03
04
05
AD
ADVERT
ADVERT1
ADVERT2
MP3
6.mp3
14不得不爱
17走在流行的最前线.wav
大小: 257 KB
文件: 001不得不爱.wav


退
搜索
文件夹
E:\音频测试\插播测试\ADVERT1
名称
音乐任务
全部播放
联机购买音乐
和文件夹任务
创建一个新文件夹
共享此文件夹
001越狱背景音乐.wav
002苹果 - 短信提示音.mp3
255叮当 - 短信提示音.mp3

(1) There are up to 9 **folders , that is, from** ADVERT1---ADVERT9, the commands of the folders **must follow the rules we gave, otherwise it will cause errors. Note the folder naming format in the image above. (2) The maximum number of files in a single insertion folder cannot exceed** 255, which is "255xxx.MP3/WAV". **Please pay attention to the naming format of the file name in the above picture. (3) The relevant application of interpolation has been improved. If the currently playing file is in single loop or current folder loop, even if there is an interstitial, the current state will not be changed, and it will still be played in single loop or folder loop , unless the user uses a stop command or something else. (4) Please refer to 3.5.6 for the principle of interleaving.**

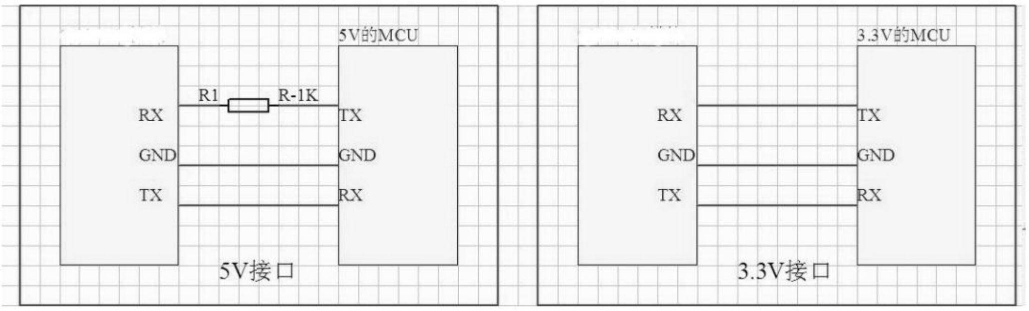
3.5.19 Specify file index and volume playback (only GD3300B supports this function)

Command	7E FF 06 22 00 1E 01 EF	**Set the volume to 30 (0x1E is 30) and play the first song**
Command	7E FF 06 22 00 0F 02 EF	**Set the volume to 15(0x0f is 15) and play the second song**

4. Reference circuit

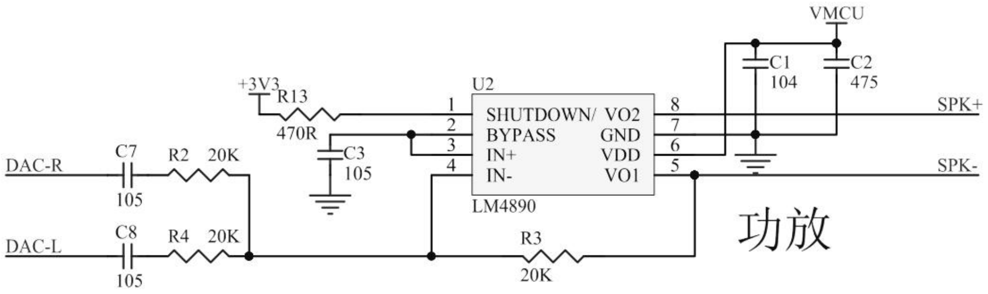
For chip applications, we provide detailed design references. n Serial communication interface, the default baud rate is 9600, which can be modified according to customer requirements; n Interface circuit for external AD **buttons; n Reference circuit for external mono power amplifier;**

4.1 Serial interface



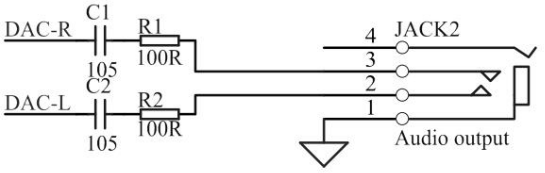
The serial port of the chip is 3.3V **TTL** level , **so the default interface level is 3.3V. If the system is 5V.** Then it is recommended to connect a 1K **resistor in series with the docking interface of the serial port . This is enough to meet the general requirements. If it is used in the occasion of strong electromagnetic interference, please refer to the instructions in "Precautions". The chip has been tested normally in both** 5V **and** 3.3V systems, and everything is normal. **All are using the direct connection method, and there is no** 1K **resistor in series.**

4.2 external mono amplifier


VMCU
C1
104
C2
475
+3V3
R13
470R
U2
SHUTDOWN/
BYPASS
IN+
IN-
VO2
GND
VDD
VO1
1
2
3
4
8
7
6
5
SPK+
SPK-
C3
105
LM4890
DAC-R
C7
105
R2 20K
DAC-L
C8
105
R4 20K
R3
20K
功放

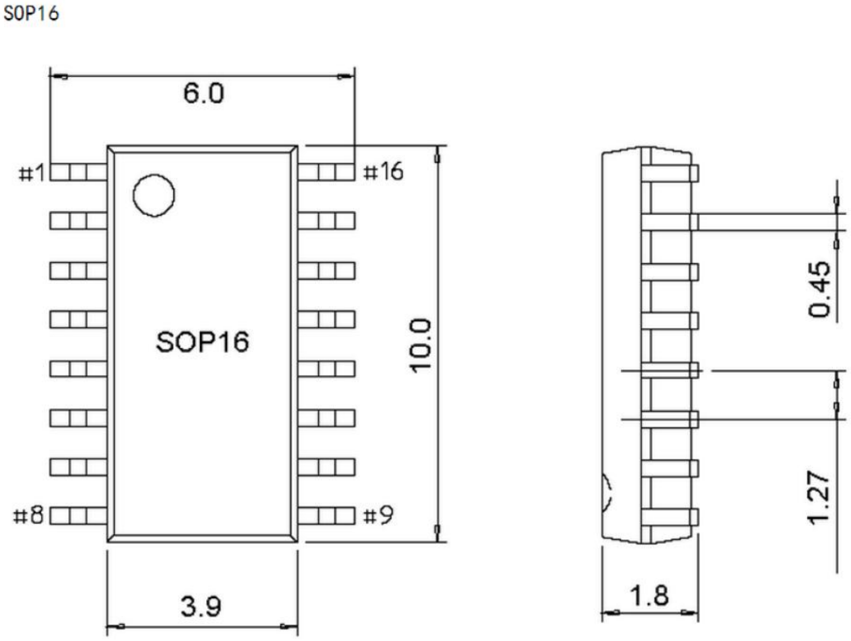
Here the LM4890 power amplifier is taken as an example, please refer to the datasheet of the IC for specific parameters. It is suitable for general low-power **players .** If you need more power, please find a suitable power amplifier by yourself.

4.3 External earphone circuit


DAC-R
C1
105
R1
100R
DAC-L
C2
105
R2
100R
JACK2
4
3
2
1
Audio output

Here R1 and R2 **are limiting resistors to prevent the external audio source from being too large (Vp-p maximum value is 3.0V), which will affect the stability of the system. C1 and C2 are DC blocking capacitors to prevent the DC level of the external audio source from affecting the inside of the chip. bias.**

5. GD3200B/GD3202B-SOP16 package diagram


SOP16
6.0
#1
#16
#8
#9
SOP16
10.0
3.9
0.45
1.27
1.8

6. **Precautions**

IO input characteristics						
Symbolic	**parameters**	**Minimum**	**Typical**	**Maximum**	**Unit**	**Test Conditions**
WILL	Low-Level Input Voltage **-0.3** 0.7V		**- 0.3*VDD** V			**VDD=3.3** IN
HIV	High-Level Input Voltage	DD	**- VDD+0.3** V			**VDD=3.3** IN
IO output characteristics						
Symbolic	**parameters**	**Minimum**	**Typical**	**Maximum**	**Unit**	**Test Conditions**
VOL	Low-Level Output Voltage		-	0.33	IN	**VDD=3.3** IN
VOH	High-Level Output Voltage	2.7		-	IN	**VDD=3.3** IN

1. The external interface of the chip is 3.3V **TTL** level, so in the design of **the hardware circuit, please pay attention to the level conversion problem. In addition, in an environment with strong interference, please pay attention to some protective measures for electromagnetic compatibility, GPIO adopts optocoupler isolation, increase** TVS, **etc.**

2. **The key values of ADKEY are set according to the general use environment. If it is under the environment of strong inductive or capacitive load, please pay attention to the power supply of the chip. It is recommended to use a separate isolated power supply, and in addition, add magnetic beads and inductance to the power supply. For filtering, it is necessary to ensure the stability and cleanness of the input power as much as possible. If it is not guaranteed, please contact us to reduce the number of buttons and redefine wider voltage distribution.**

3. For serial communication, in the general use environment, just pay attention to the level conversion. If there is a strong interference environment or long-distance RS485 **application, please pay attention to the isolation of the signal and design the communication circuit strictly according to the industrial standard. You can contact us, we provide design reference.**

7. Disclaimer

nDevelopment preliminaries

GD **series products will provide as comprehensive development templates, drivers and application documentation as possible for the convenience of users, but users are also required to be familiar with the hardware platform and related C language** knowledge **used in their own design products.**

n The mechanical structure

of EMI and EMC GD **series chips determines that their** EMI **performance must be different from the integrated circuit design.** The EMI of GD **series chips can meet most of the application occasions. If users have special requirements, they must negotiate with us in advance.**

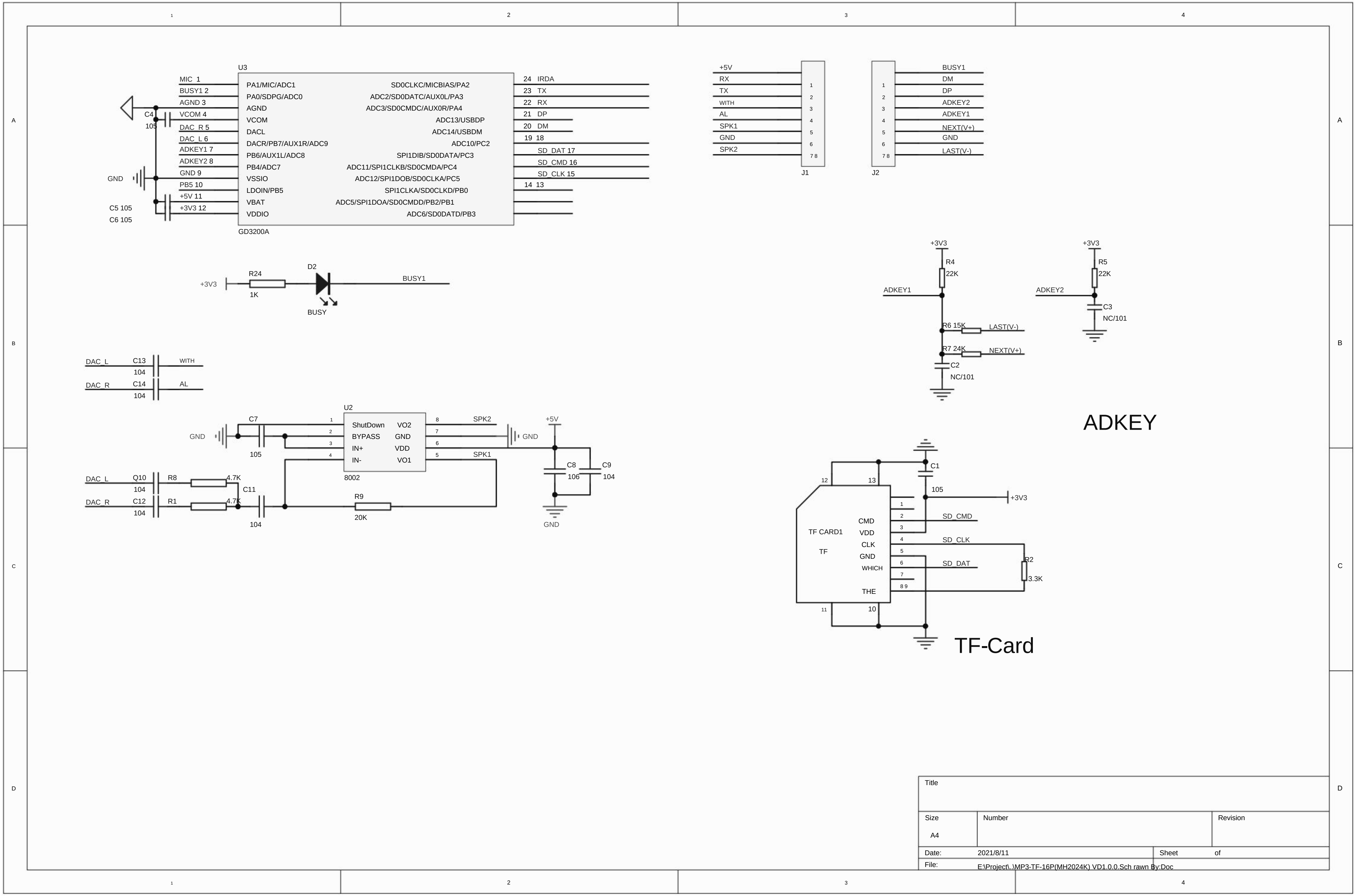
The EMC performance of GD **series chips is closely related to the design of the user's base board, especially the power circuit, I/O isolation, and reset circuit. The user must fully consider the above factors when designing the base board. We will work hard to improve** the electromagnetic compatibility characteristics of GD **series chips, but we do not provide any guarantee for the** EMC performance of the user's final application product.

nThe right to modify documents

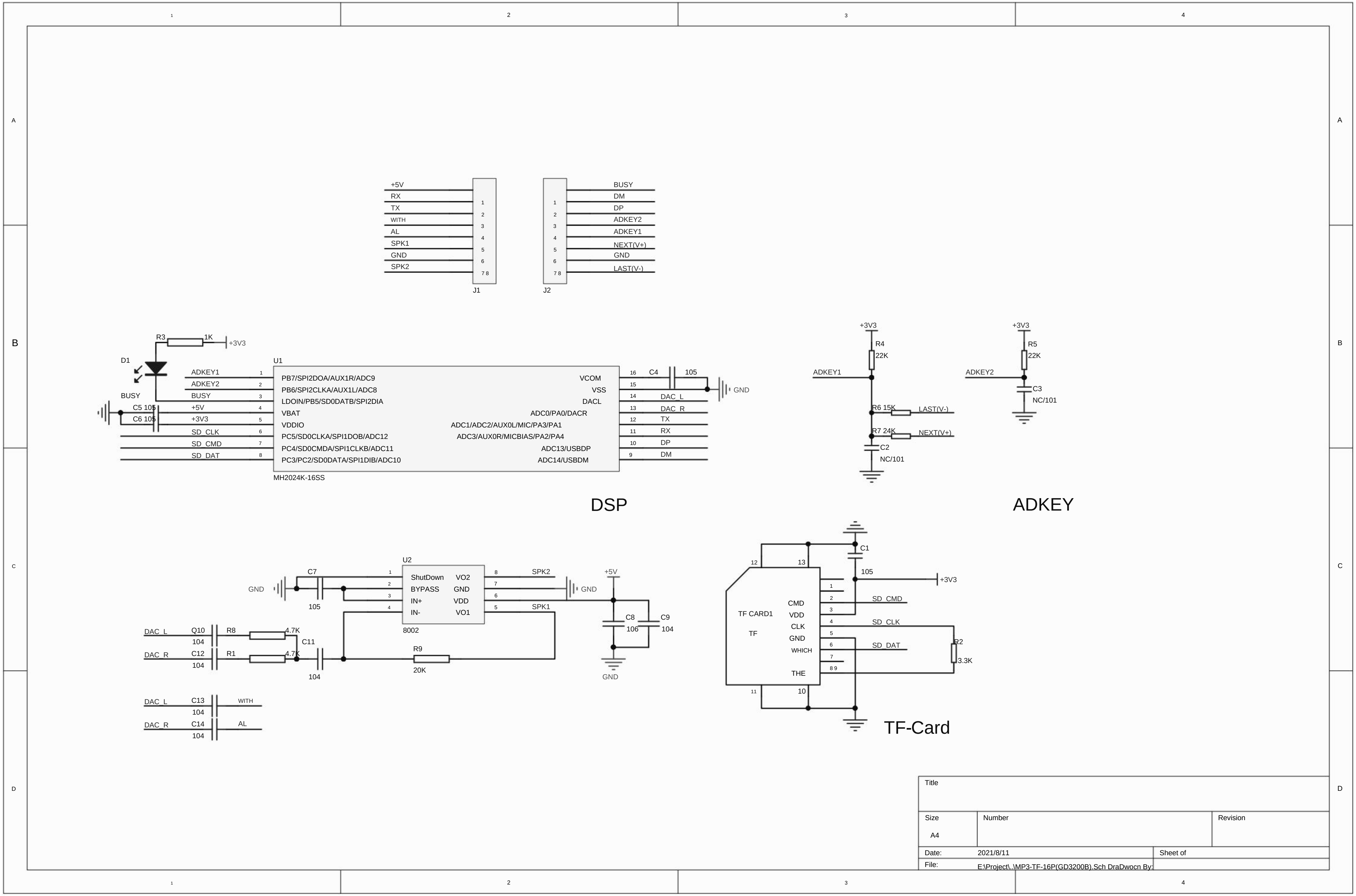
Guangzhou Guodian Technology Co., Ltd. reserves the right to modify the relevant documents of GD **series products at any time without prior notice.**

n ESD electrostatic discharge point

protection Some components of GD series products have built-in ESD protection circuits, but in the harsh environment, it is still recommended that users provide ESD protection measures **when designing the bottom board , especially the power supply and** IO **design, to ensure the stable operation of the product , such as wearing a reliably grounded static ring, touching water pipes connected to the earth, etc.**


U3
GD3200A
MIC 1
BUSY1 2
AGND 3
VCOM 4
DAC_R 5
DAC_L 6
ADKEY1 7
ADKEY2 8
GND 9
PB5 10
+5V 11
+3V3 12
PA1/MIC/ADC1
PA0/SDPG/ADC0
AGND
VCOM
DACL
DACR/PB7/AUX1R/ADC9
PB6/AUX1L/ADC8
PB4/ADC7
VSSIO
LDOIN/PB5
VBAT
VDDIO
SD0CLKC/MICBIAS/PA2
ADC2/SD0DATC/AUX0L/PA3
ADC3/SD0CMDC/AUX0R/PA4
ADC13/USBDP
ADC14/USBDM
ADC10/PC2
SPI1DIB/SD0DATA/PC3
ADC11/SPI1CLKB/SD0CMDA/PC4
ADC12/SPI1DOB/SD0CLKA/PC5
SPI1CLKA/SD0CLKD/PB0
ADC5/SPI1DOA/SD0CMDD/PB2/PB1
ADC6/SD0DATD/PB3
24 IRDA
23 TX
22 RX
21 DP
20 DM
19 18
SD_DAT 17
SD_CMD 16
SD_CLK 15
14 13
C4
105
GND
C5 105
C6 105
+5V
RX
TX
WITH
AL
SPK1
GND
SPK2
J1
BUSY1
DM
DP
ADKEY2
ADKEY1
NEXT(V+)
GND
LAST(V-)
J2
1 2 3 4 5 6 7 8
+3V3
R24
1K
D2
BUSY
BUSY1
+3V3
R4
22K
ADKEY1
R6 15K
LAST(V-)
R7 24K
NEXT(V+)
C2
NC/101
+3V3
R5
22K
ADKEY2
C3
NC/101
ADKEY
DAC_L
C13
104
WITH
DAC_R
C14
104
AL
U2
8002
ShutDown
BYPASS
IN+
IN-
VO2
GND
VDD
VO1
SPK2
SPK1
GND
C7
105
GND
+5V
C8
106
C9
104
GND
DAC_L
Q10
104
R8
4.7K
DAC_R
C12
104
R1
4.7K
C11
104
R9
20K
C1
105
+3V3
TF CARD1
TF
CMD
VDD
CLK
GND
WHICH
THE
12
13
11
10
SD_CMD
SD_CLK
SD_DAT
R2
3.3K
TF-Card
1
2
3
4
A
B
C
D
Title
Size
A4
Number
Revision
Date:
2021/8/11
Sheet
of
File:
E:\Project\..\MP3-TF-16P(MH2024K) VD1.0.0.Sch rawn By:Doc

Machine Translated by Google



+5V
RX
TX
WITH
AL
SPK1
GND
SPK2
J1
BUSY
DM
DP
ADKEY2
ADKEY1
NEXT(V+)
GND
LAST(V-)
J2
R3
1K
+3V3
D1
BUSY
U1
ADKEY1
ADKEY2
BUSY
+5V
+3V3
SD_CLK
SD_CMD
SD_DAT
C5 105
C6 105
PB7/SPI2DOA/AUX1R/ADC9
PB6/SPI2CLKA/AUX1L/ADC8
LDOIN/PB5/SD0DATB/SPI2DIA
VBAT
VDDIO
PC5/SD0CLKA/SPI1DOB/ADC12
PC4/SD0CMDA/SPI1CLKB/ADC11
PC3/PC2/SD0DATA/SPI1DIB/ADC10
VCOM
VSS
DACL
ADC0/PA0/DACR
ADC1/ADC2/AUX0L/MIC/PA3/PA1
ADC3/AUX0R/MICBIAS/PA2/PA4
ADC13/USBDP
ADC14/USBDM
C4
105
GND
DAC_L
DAC_R
TX
RX
DP
DM
MH2024K-16SS
DSP
+3V3
R4
22K
ADKEY1
R6 15K
LAST(V-)
R7 24K
NEXT(V+)
C2
NC/101
+3V3
R5
22K
ADKEY2
C3
NC/101
ADKEY
U2
C7
GND
105
ShutDown
BYPASS
IN+
IN-
VO2
GND
VDD
VO1
8002
SPK2
GND
SPK1
+5V
C8
106
C9
104
GND
DAC_L
Q10
104
R8
4.7K
DAC_R
C12
104
R1
4.7K
C11
104
R9
20K
DAC_L
C13
104
WITH
DAC_R
C14
104
AL
C1
105
+3V3
TF CARD1
TF
CMD
VDD
CLK
GND
WHICH
THE
SD_CMD
SD_CLK
SD_DAT
R2
3.3K
TF-Card
Title
Size
A4
Number
Revision
Date:
2021/8/11
Sheet of
File:
E:\Project\..\MP3-TF-16P(GD3200B).Sch DraDwocn By: