

OTG13S user manual

◆ Features

- Support U disk, USB mobile hard disk, and USB card reader; via card reader can support all mobile flash memory cards such as CF, SMC, MMC, SD, XD, MS memory bar.
- Support MP3 file and WMA file. MP3 file supports all layers and all code streams, WMA file supports all versions starting from V1.
- Apply the second generation DOS operating system with independent intellectual property right, running speed is more fast, support five layers directory, and each layer directory can support 255 files at most, can open six thousand files at the same time.
- All soft wares from bottom layer are developed by HSAV, completely support all U disk products, and can add more drive programs at any time, 100% support current and future products.
- Power-fail memory function. Start playing from original song when insert U disk once again, and can memorize 32 to 64 kinds of stats of U disk. All memories may be saved 100 years.
- Support FAT12, FAT16, and FAT32 universal file formats of DOS or WINDOWS operating systems, completely compatible with computer.
- Adopt FLASH as program memory, can use U disk etc. to upgrade program, accord with the characteristic that IT products are changing with each passing day.
- Stainless steel package prevents from disturbing sound and other components and provides excellent EMT function. The volume of module is 47mm×25mm×9mm, small and exquisite, which provides convenience for product integration design.
- The consumption of electric current is very low, the consumption of electric current not including U disk is lower than 80mA when playing 320Kbps code rate, and the consumption of electric current not including U disk is lower than 45mA when pause. It is suitable for the places that use battery.
- Built-in 96 KHz/24bit DAC analog-digital conversion chip, and the sound effect is very good.
- Have volume adjustment function, and have 80 steps volume adjustment in all.
- Have various sound effects such as classical, pop etc.
- Reserve 9 bi-directional Expansion input/output ports, and single module is capable of finishing multimedia audio complete machine's functions.
- Can use dual CPU communication solution to expand other functions.
- The standard mode includes six buttons and one LED display.



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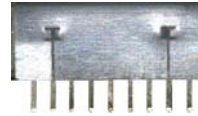
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◆ Application Fields

- ✓ IT products and multimedia audio system.
- ✓ Home audio system may be upgraded easily to the system supporting computer music, which can improve the grade of product.
- ✓ Audio products in-cars, completely substitute for these audio products applying magnetic tape and CD.
- ✓ Powerful vibration proof ability, apply to these places that because of environment is very bad, must to play background music.
- ✓ The places requiring long time to play music, speech voice signals etc, for example, common broadcast system.
- ✓ The background music playing system of emporium, supermarket etc.
- ✓ Another music playing places.

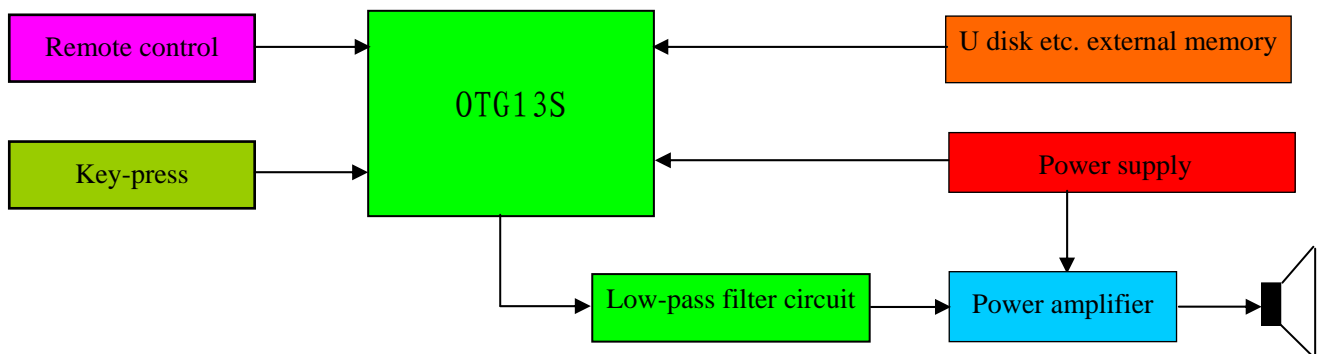


Diagram 1, the complete solution applying OTG13S internal single chip

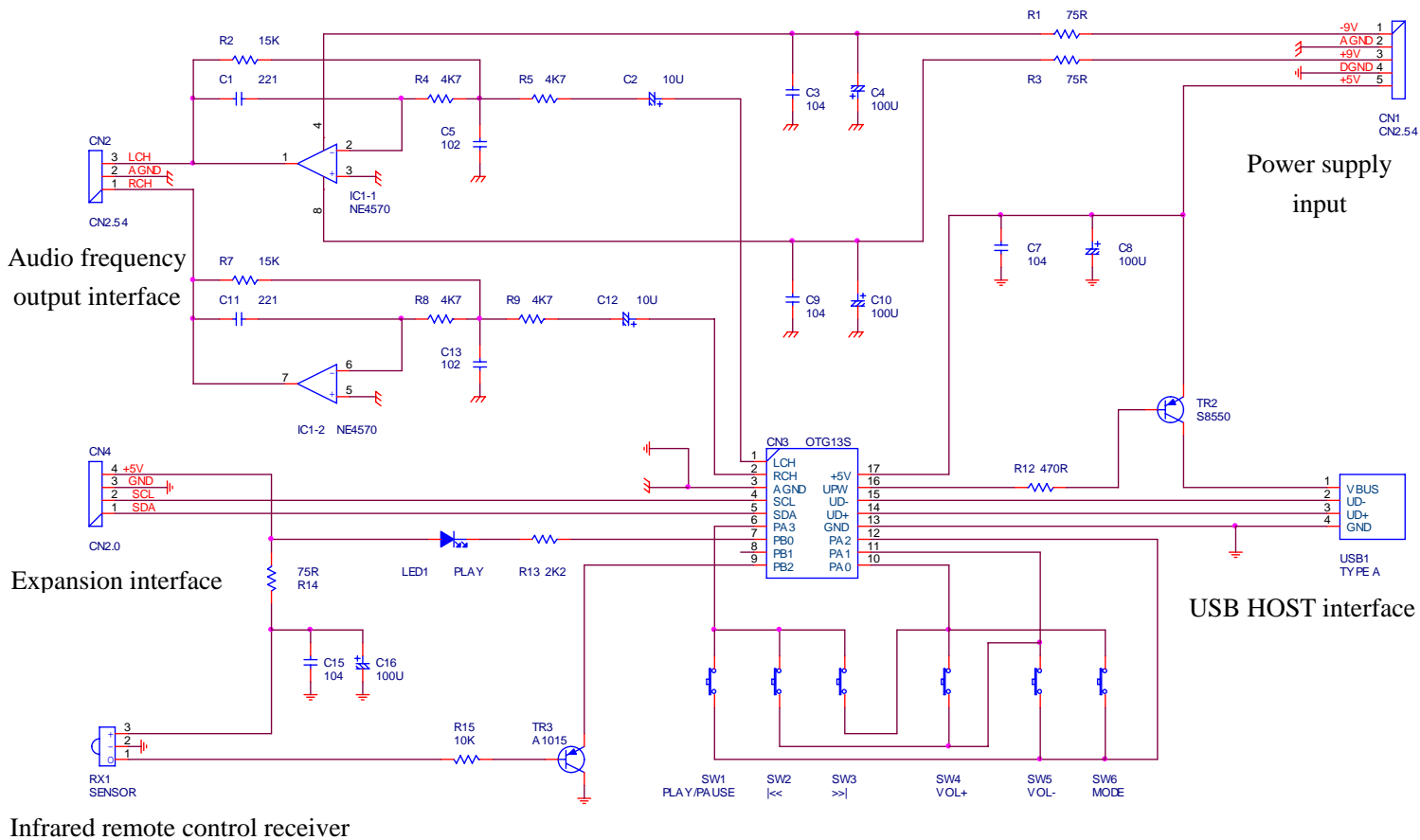


Diagram 2, OTG13S standard circuit diagram

◆ Ground wire instructions

There is no connection between AGND and GND in OTG13S that asked for connecting on the user board. If +5V power supply ground wire and analog ground wire are in the power supply terminal, the connection point will be connected with power supply, or should near to the OTG13S pins. GND connects with ground wire of metal outer covering to keep the resistance of ground wire lower for a good effect. The position nearing the OTG13S pins is preferable for a better effect.

◆ Power supply instructions

When need not to support USB mobile hard disk, +5V power supply can use various linear voltage regulators such as 7805, and the current should exceed 300mA.

When need to support USB mobile hard disk, it is preferable that +5V power supply adopts switch power supply such as LM2567, current should exceed 800mA, the voltage adjusted is about +5.3V, and it can make sure that hard disk has enough current and voltage. At UPW pin, adding a switch connecting 470R resistance and S8550 in parallel can make the power supply current of USB mobile hard disk higher than 700mA.

the power supply voltage range of USB HOST interface is +5V/±0.5V.

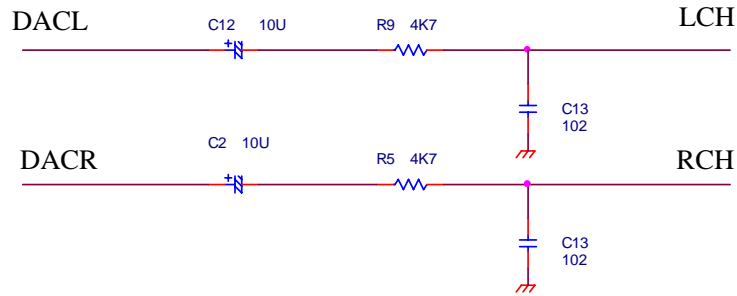


Diagram 6, adopt simple-type passive low-pass filter

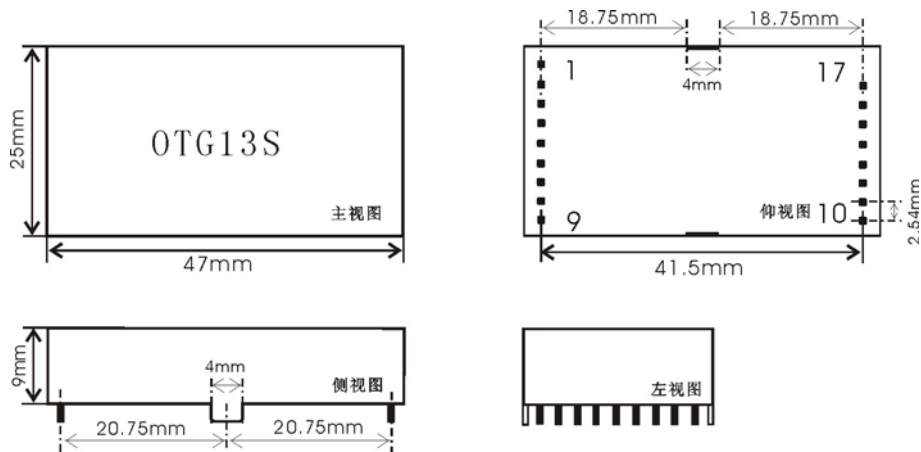
◆ OTG13S upgrading file instructions

OTG13S program employs OTG13.AR5 as upgrading file, this file can be sent to user after the whole machine leaves factory. Inserting U disk can automatically upgrade program after copying OTG13S.AR5 file in the root directory of U disk, and OTG BIOS can automatically identify new file. If the file in the U disk is identical with OTG13S file, OTG13S program will not be upgraded.

OTG13S.AR5 can't exceed 32K bytes, and upgrading can be finished within several seconds.

The electricity supply can't be cut off bang in the middle of the upgrading.

◆ OTG13S outline dimension diagram





◆ OTG13 socket port connection instructions

1. **LCH** Left channel audio frequency signal output, in general, need to increase 2 order or more low-pass filter in order to get a good effect.
2. **RCH** Right channel audio frequency signal output, in general, need to increase 2 order or more low-pass filter in order to get a good effect.
3. **AGND** Analog ground wire audio frequency output and power supply input, it does not connected with digital ground wire and required to be connected from outside.
4. **SCL** Expansion single chip I/O port, it is used for the clock SCL port of I²C in general.
5. **SDA** Expansion single chip I/O port, it is used for the clock SDA port of I²C in general.
6. **PA3** Expansion single chip I/O port PA3, it is button interface in the standard mode.
7. **PB0** Expansion single chip I/O port PB0, it is LED control in the standard mode, and HINT in the communication mode.
8. **PB1** Expansion single chip I/O port PB1, it is HDAT in the communication mode.
9. **PB2** Expansion single chip I/O port PB2, it is infrared reception head
10. **PA0** Expansion single chip I/O port PA0, it is button interface in the standard mode.
11. **PA1** Expansion single chip I/O port PA1, it is button interface in the standard mode.
12. **PA2** Expansion single chip I/O port PA2, it is button interface in the standard mode.
13. **GND** Digital ground wire input.
14. **UD+** USB serial data D+ input/output connecting from outside.
15. **UD-** USB serial data D- input/output connecting from outside.
16. **UPW** The power supply control output port of USB, it generally needs to connect the transistor of PNP used for USB switch.
17. **+5V** Digital and analog +5V power supply input.

◆ Electrical Specification

Item	Minimum	Normal	Maximum
Power supply voltage (+5V)	+4.5V	+5V	+5.5V
Working current (pause state) ①	35mA	40mA	45mA
Working current (playing state) ②	60mA	70mA	80mA
Working current (include U disk) ③	130mA	210mA	250mA
Working current(include USB hard disk) ④	560mA	580mA	800mA
output power level 1KHz@0dB ⑤	-1dB	2V	+1dB
frequency response 20Hz-20KHz ⑤	-1dB	±0.5dB	+1dB
signal-to-noise @0dB(CCIR) ⑤	92dB	95dB	98dB



- 1) Don't insert U disk or playing pauses while inserting U disk, don't include the power supply current of U disk.
- 2) Play the MP3 music file of 320Kbps; don't include the power supply current of U disk.
- 3) Play the MP3 music file of 320Kbps, include the power supply current of U disk, and apply those U disks or USB card readers that power supply current is big.
- 4) Play the MP3 music file of 320Kbps; include the power supply current of USB hard disk. USB hard disk adopt TOSHIBA 2.5inches notebook hard disk that the current is 700mA.
- 5) These are test results after increasing 2-order low-pass filter inside the standard circuit diagram.

◆ fitting pictures (HM632)

