# SINGLE-CHIP VOICE RECORD / PLAYBACK DEVICES

## 1. GENERAL DESCRIPTION

GPCR06B, a new recordable and playback voice device without CPU designed by Generalplus, is a highly integrated circuit that contains all of the necessary functions for providing high quality voice recording and playback. Easy-to-use, low power consumption and compact size are the tremendous features of GPCR06B. Total of 160K bits SRAM are capable of storing approximately 7 seconds of audio or speech voice (@ 6.0KHz sampling rate). The development team of GPCR06B designs especially for compact message recorder, recordable toys and other similar products. It is welling to provide the best cost/performance ratio for users.

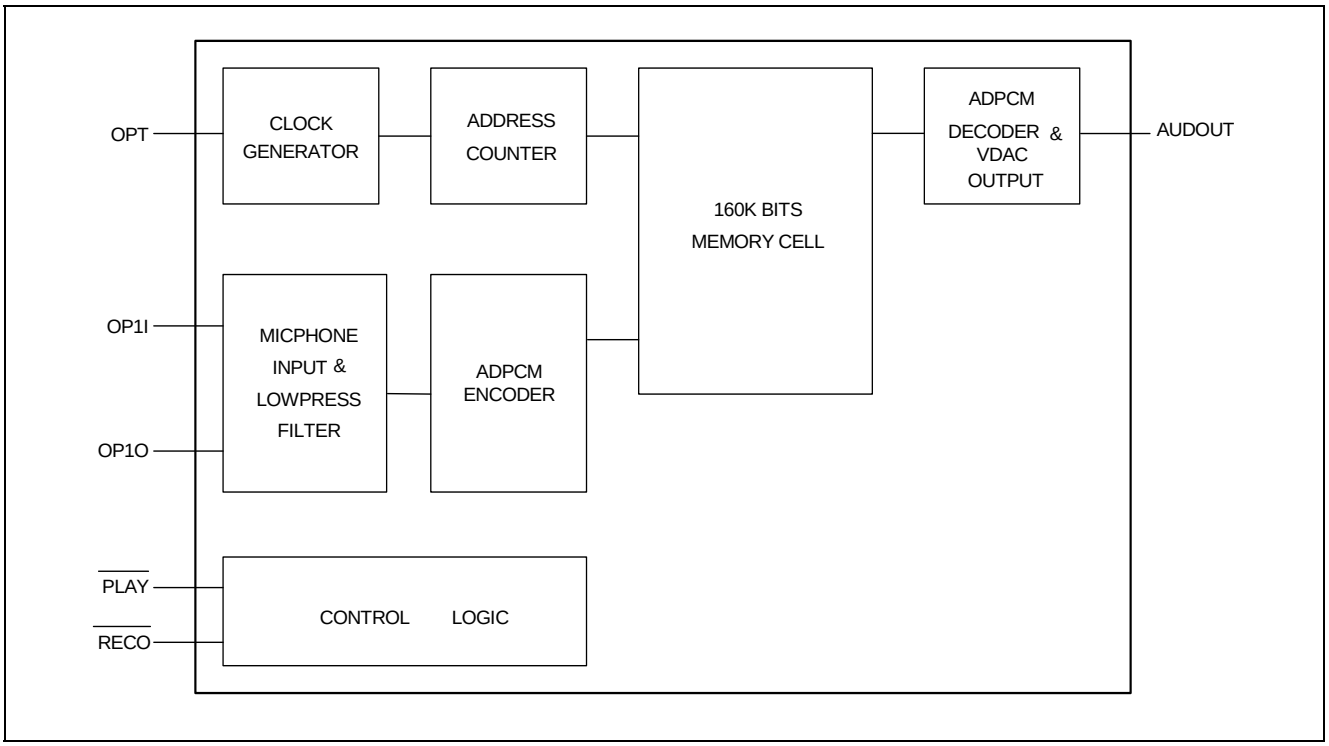
## 2. FEATURES

- Nature, high-quality playback suitable for voice, music, and tones
- Single-chip voice record and playback device
- Microphone preamplifier
- Built in 160K bits SRAM
- Selective sampling rate (Bonding option select 6Khz or 4.3Khz)
- Prompt beep sound (Bonding option select beep sound or not)
- Operating power supply (2.4V - 5.5V)

## 3. SUITABLE APPLICATION

- Memo Message Recorder
- Hand-Carried Message Recorder
- Recordable Toys

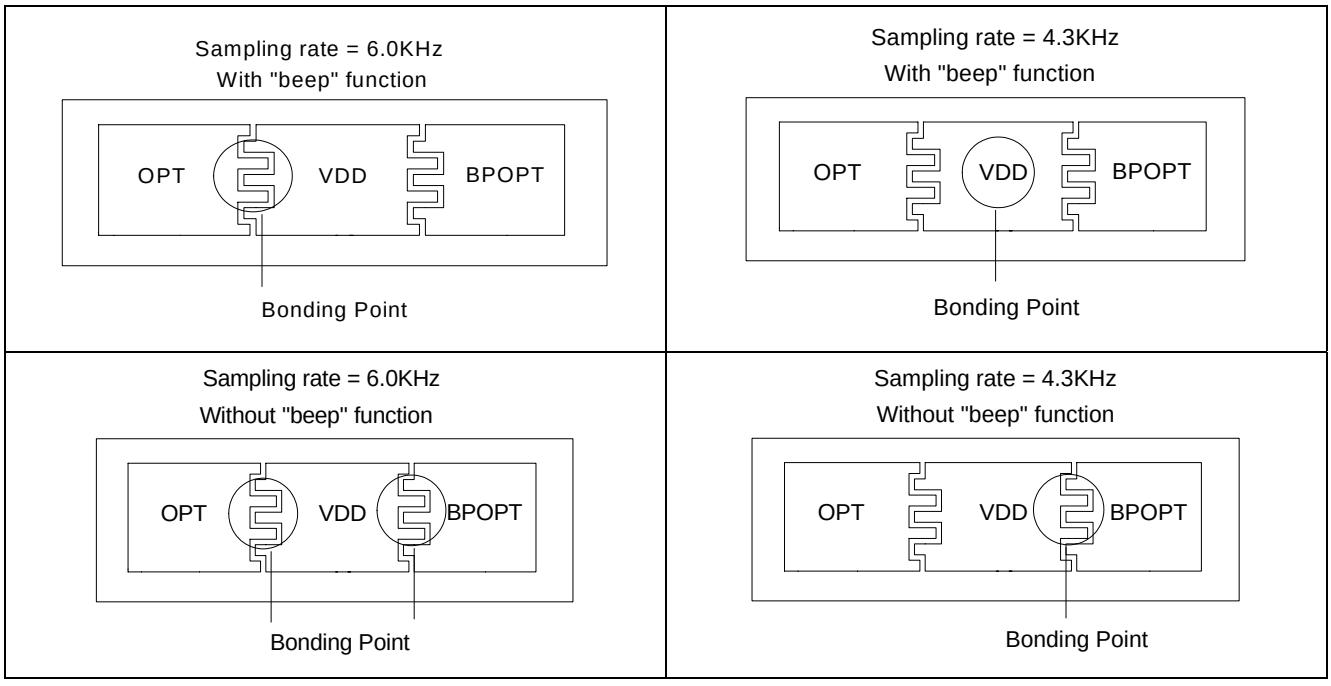
## 4. BLOCK DIAGRAM

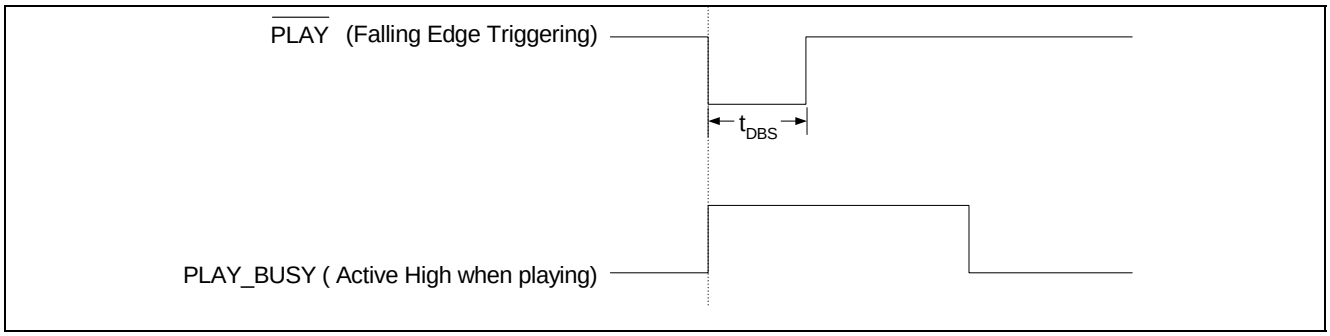


## 5. SIGNAL DESCRIPTIONS

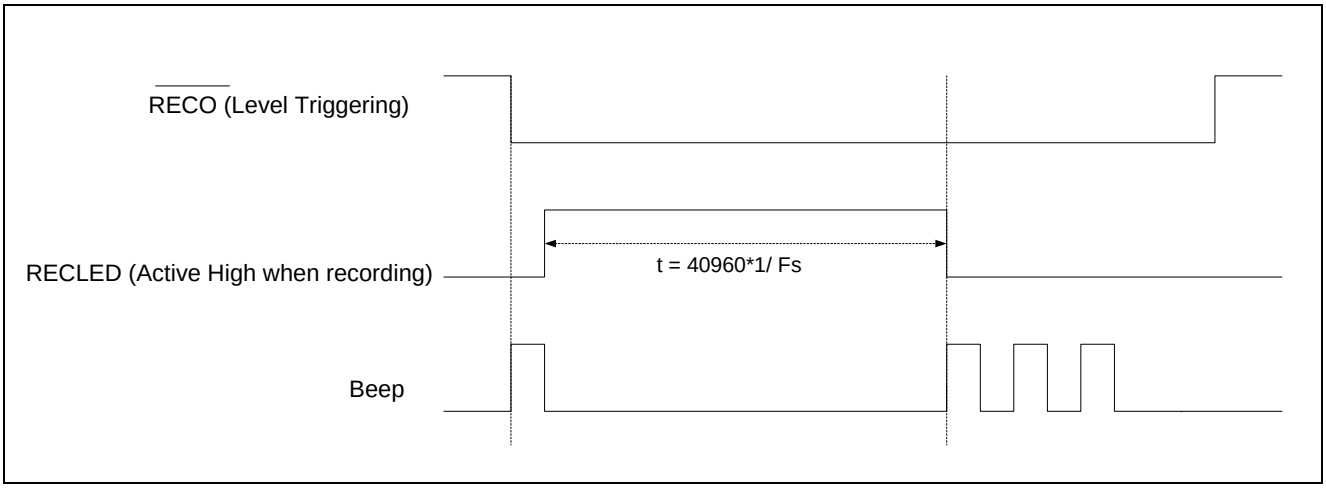
| Mnemonic | PIN No. | Type | Description |
|---|---|---|---|
| PLAY_BUSY | 1 | O | The state of this pin will be high while playing. |
| RECLED | 2 | O | The state of this pin will be high while recording message. |
| $\overline{\text{RECO}}$ | 3 | I | $\overline{\text{RECO}}$ , the record-request pin of GPCR06A, normally is connected to a key. GPCR06A is able to record voice as long as the key is being pressed (low active). |
| $\overline{\text{PLAY}}$ | 4 | I | $\overline{\text{PLAY}}$ , the play-request pin of GPCR06A, normally is connected to a key. When the key is pressed (falling edge triggering), GPCR06A is able to perform play function. |
| OPT* | 5 | I | ROSC option, the pin can be used to remold the R to offer various based frequency, i.e., the sampling rate, 4.3KHz or 6.0KHz, is optional. |
| AVDD, VDD | 10, 6 | Power | Analog and Digital power buses. |
| BPOPT | 7 | I | Beep option, the pin can be used to offer "beep" voice when press $\overline{\text{RECO}}$ key, i.e., BPOPT VDD bonding together will have no "beep" function; BPOPT floating will have "beep" function |
| AVSS, VSS | 9, 14 | Ground | Analog and Digital ground buses. |
| $\overline{\text{TEST}}$ | 8 | I | GPCR06A is able to perform the testing mod when the pin is low. |
| OP1I | 11 | I | OP input of MIC preamplifier. |
| OP1O | 12 | O | OP output of MIC preamplifier. |
| AUDOUT | 13 | O | AUDIO voltage output. |

**Note:** *OPT is the selection pin for various based frequency. The shape looks like in the right figure. The reason of OPT bonded near by VDD is that when high frequency is selected, it will make connection between VDD and OPT easily.






**Note:** The de-bounce time ($t_{DBS}$) of $\overline{PLAY}$ is $412 * \frac{1}{Fs}$, where Fs is the sampling rate.



## 6. ELECTRICAL SPECIFICATIONS

### 6.1. Absolute Maximum Ratings

| Characteristics | Ratings |
|---|---|
| Operating Temperature | 0°C to 70°C |
| Storage temperature range | -65°C to 150°C |
| Voltage applied to any pin | (VSS-0.3V) to (VDD+0.3V) |
| Lead temperature | Soldering - 10 seconds 300°C |
| VDD - VSS | -0.3V to 7.0V |

**Note:** Stresses beyond those given in the Absolute Maximum Ratings table may cause operational errors or damage to the device. For normal operational conditions see AC/DC Electrical Characteristics.

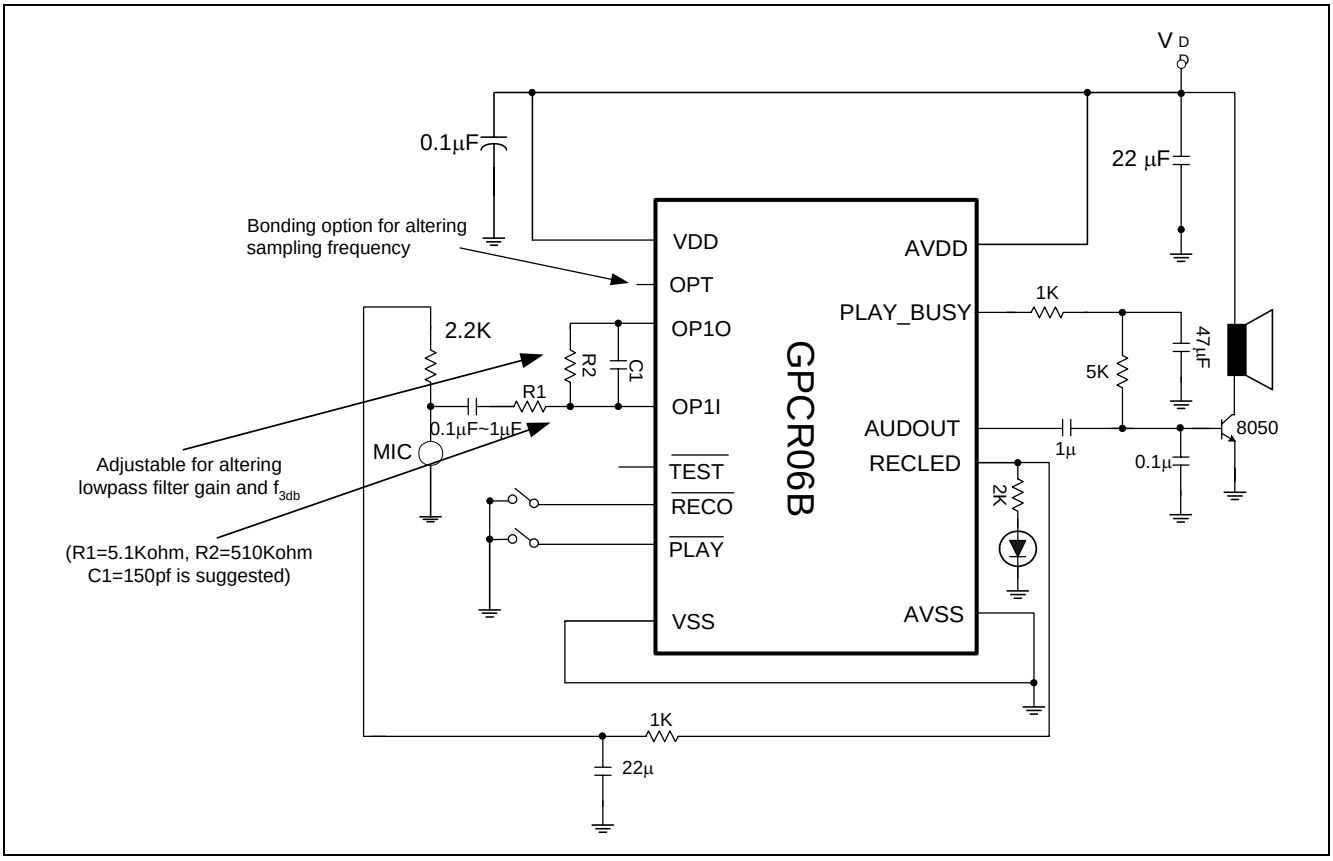
### 6.2. DC Characteristics

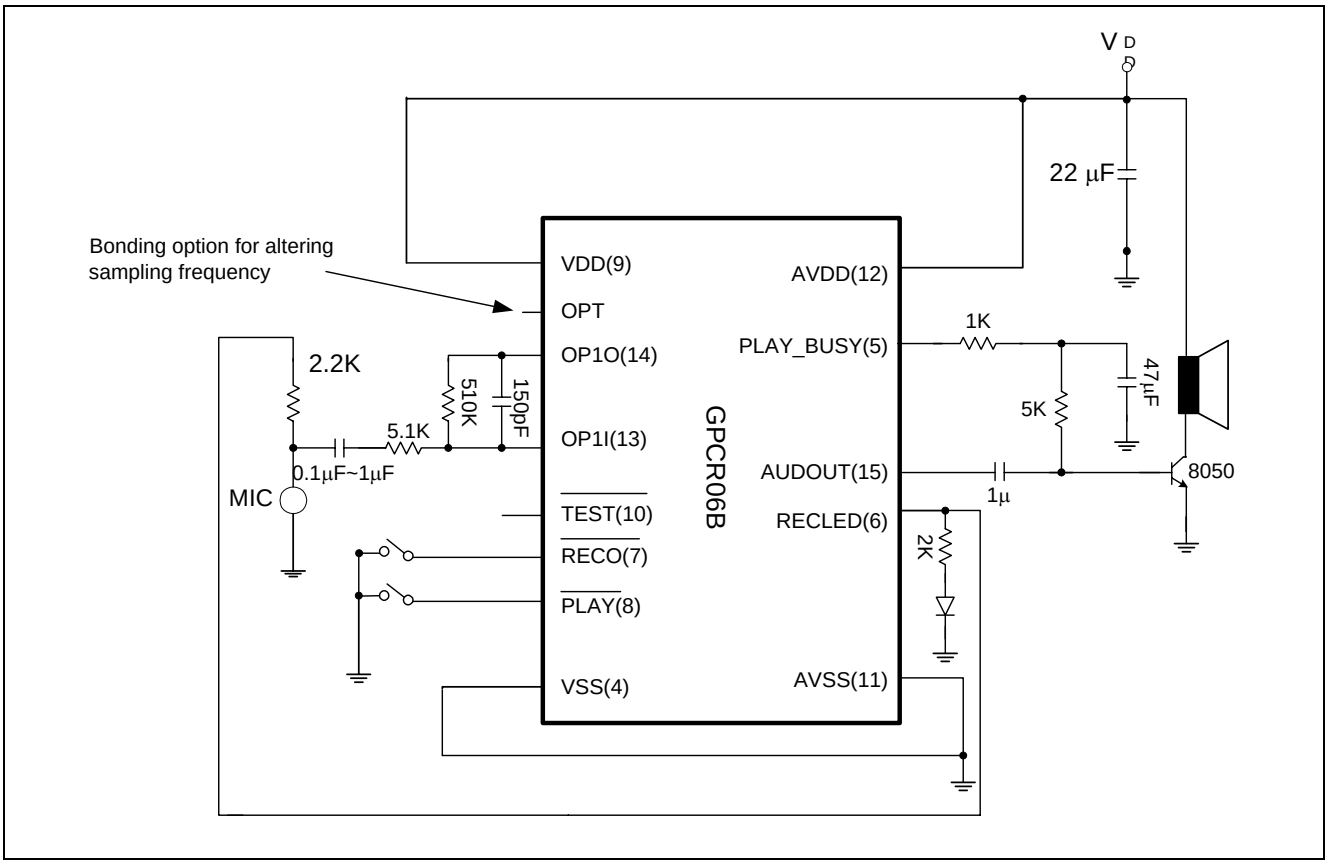
| Characteristics | Symbol | Limit | | | Unit | Condition |
|---|---|---|---|---|---|---|
| | | Min. | Typ. | Max. | | |
| Input low voltage | $V_{IL}$ | VSS | - | 0.2xVDD | V | - |
| Input high voltage | $V_{IH}$ | 0.7xVDD | - | VDD | V | - |
| Output low voltage | $V_{OL}$ | - | - | 0.4 | V | VDD = 4.5V, $I_{OL}$ = 4.0mA |
| Output high voltage | $V_{OH}$ | 4.0 | - | - | V | VDD = 4.5V, $I_{OH}$ = 1.0mA |
| VDD current | $I_{CC}$ | - | - | 10 | mA | No load, VDD = 5.5V |
| Standby current | $I_{SB}$ | - | - | 5.0 | μA | VDD = 5.5V |

## 7. APPLICATION CIRCUITS

### 7.1. Application Circuit - (1)

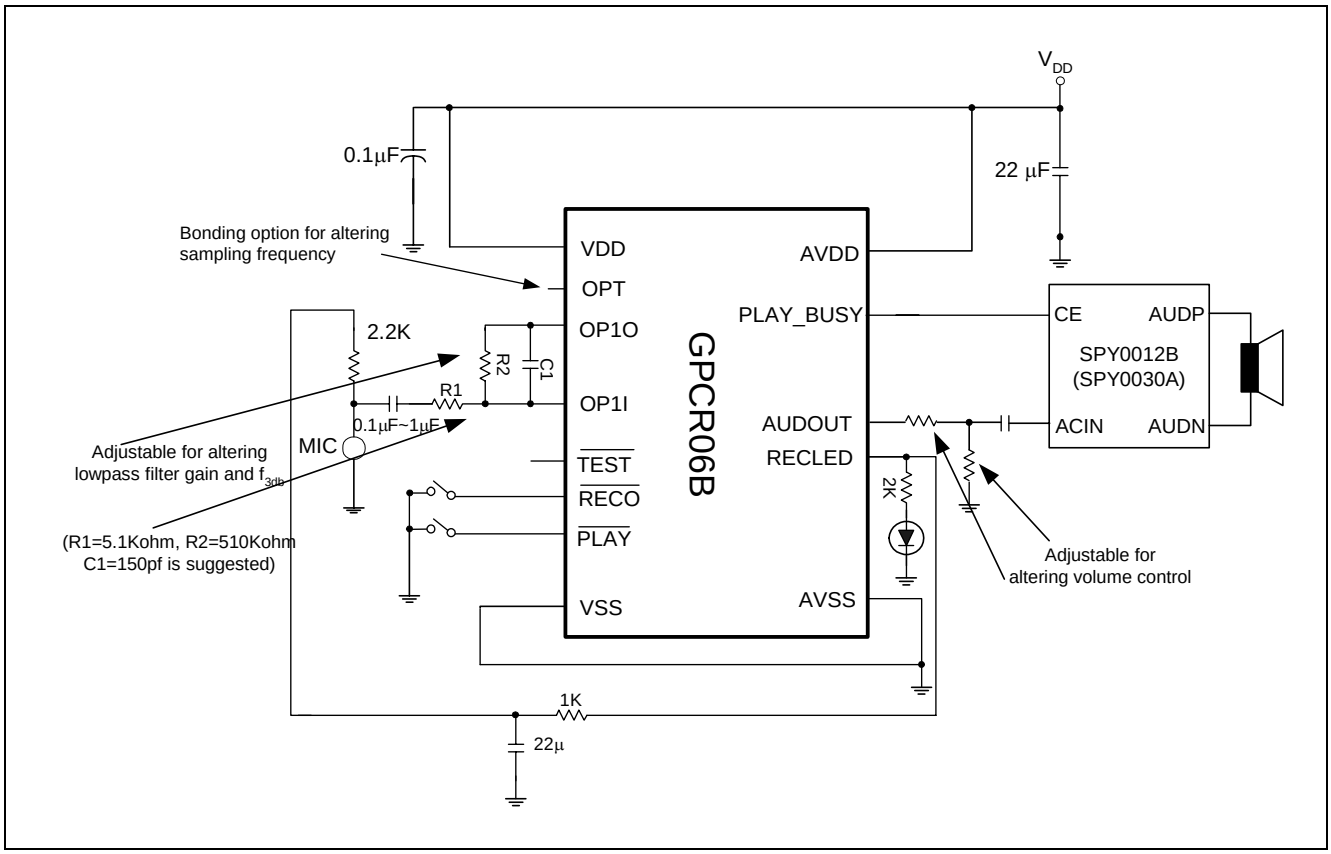
The system is capable of recording as long as the switch of $\overline{\text{RECO}}$ is being pressed (level triggering). The recorded message or audio can be playbacked when the switch of $\overline{\text{PLAY}}$ is pressed (falling edge triggering). When system is in recording, the LED from RECLED will be lighted on till the end of recording.

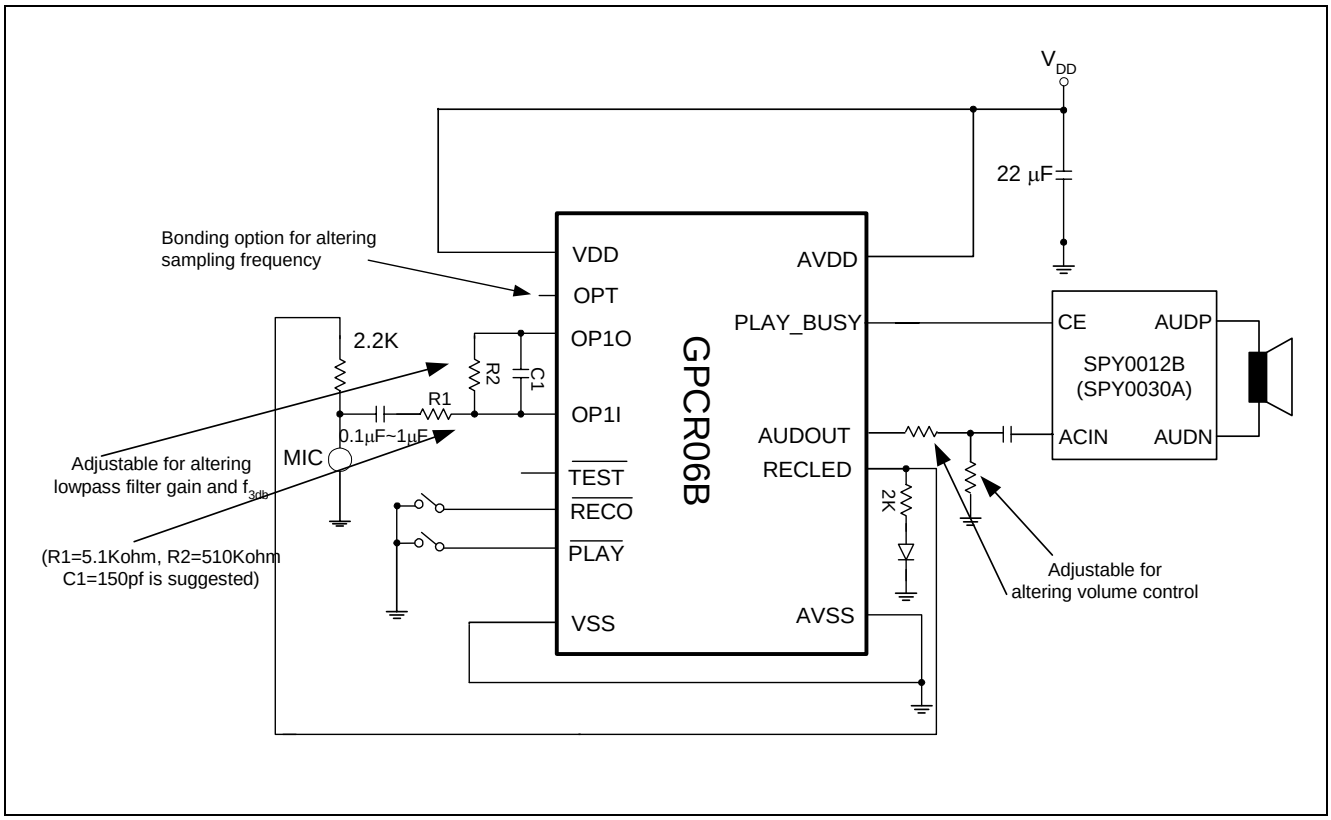



V D D
22 μF
Bonding option for altering
sampling frequency
VDD(9)
OPT
OP1O(14)
OP1I(13)
TEST(10)
RECO(7)
PLAY(8)
VSS(4)
GPCR06B
AVDD(12)
PLAY_BUSY(5)
AUDOUT(15)
RECLED(6)
AVSS(11)
2.2K
510K
150pF
5.1K
0.1μF~1μF
MIC
1K
5K
47μF
1μ
2K
8050

### 7.2. Application Circuit - (2)

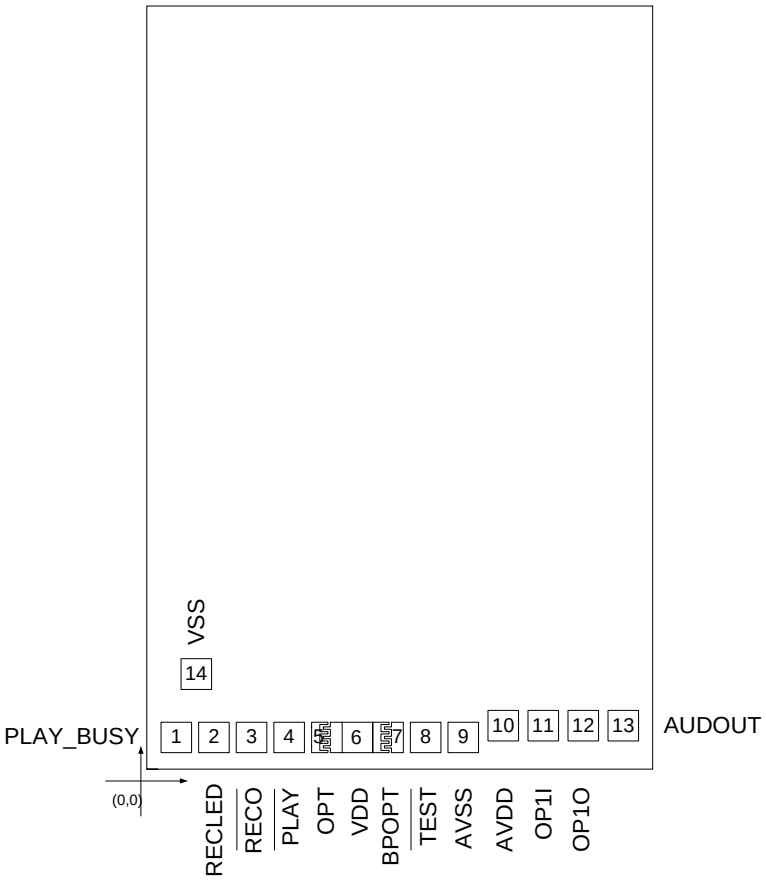
This circuit offers the same functionalities as the previous circuit. However, the following circuit uses SPY0012B or SPY0030A in place of transistor to drive speaker.




V_DD
22 μF
Bonding option for altering
sampling frequency
VDD
OPT
OP1O
OP1I
TEST
RECO
PLAY
VSS
AVDD
PLAY_BUSY
AUDOUT
RECLED
AVSS
GPCR06B
2.2K
R1
R2
C1
0.1μF~1μF
MIC
Adjustable for altering
lowpass filter gain and f3db
(R1=5.1Kohm, R2=510Kohm
C1=150pf is suggested)
2K
Adjustable for
altering volume control
CE
AUDP
SPY0012B
(SPY0030A)
ACIN
AUDN

## 8. PACKAGE/PAD LOCATIONS

### 8.1. PAD Assignment




This IC substrate should be connected to VDD

**Note1:** Chip size has included scribe line.

**Note1:** To ensure that the IC functions properly, please bond all of VDD and VSS pins.

**Note2:** The 0.1μF capacitor between VDD and VSS should be placed to IC as close as possible.

### 8.2. Ordering Information

| Product Number | Package Type |
|---|---|
| GPCR06B-NnnV-C | Chip form |

**Note1:** Code number is assigned for customer.

**Note2:** Code number (N = A - Z or 0 - 9, nn = 00 - 99); version (V = A - Z).

### 8.3. PAD Locations

| PAD No. | PAD Name | X | Y |
|---|---|---|---|
| 1 | PLAY_BUSY | 106 | 136 |
| 2 | RECLED | 241 | 136 |
| 3 | $\overline{\text{RECO}}$ | 388 | 136 |
| 4 | $\overline{\text{PLAY}}$ | 523 | 136 |
| 5 | OPT | 668 | 136 |
| 6 | VDD | 766 | 136 |
| 7 | BPOPT | 864 | 136 |
| 8 | $\overline{\text{TEST}}$ | 983 | 136 |
| 9 | AVSS | 1112 | 136 |
| 10 | AVDD | 1232 | 159 |
| 11 | OP1I | 1352 | 159 |
| 12 | OP1O | 1479 | 159 |
| 13 | AUDOUT | 1599 | 159 |
| 14 | VSS | 155 | 383 |

## 9. DISCLAIMER

The information appearing in this publication is believed to be accurate.

Integrated circuits sold by Generalplus Technology are covered by the warranty and patent indemnification provisions stipulated in the terms of sale only. GENERALPLUS makes no warranty, express, statutory implied or by description regarding the information in this publication or regarding the freedom of the described chip(s) from patent infringement. FURTHERMORE, GENERALPLUS MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PURPOSE. GENERALPLUS reserves the right to halt production or alter the specifications and prices at any time without notice. Accordingly, the reader is cautioned to verify that the data sheets and other information in this publication are current before placing orders. Products described herein are intended for use in normal commercial applications. Applications involving unusual environmental or reliability requirements, e.g. military equipment or medical life support equipment, are specifically not recommended without additional processing by GENERALPLUS for such applications. Please note that application circuits illustrated in this document are for reference purposes only.

## 10. REVISION HISTORY

| Date | Revision # | Description | Page |
|---|---|---|---|
| MAR. 03, 2005 | 1.1 | Remove Chip Size | 9 |
| JUN. 07, 2004 | 1.0 | Original<br>Note: The GPCR06B data sheet v1.0 is a continued version of SPCR06B data sheet v0.1. | 12 |