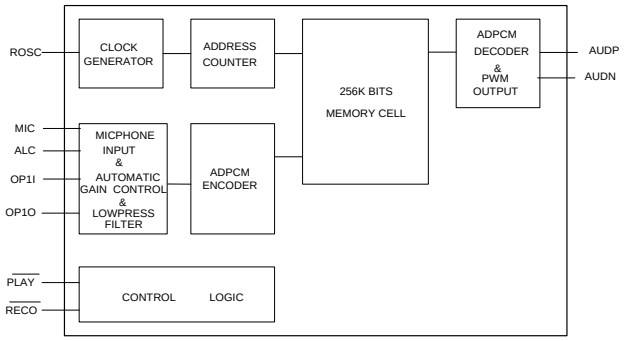
SINGLE-CHIP VOICE RECORD / PLAYBACK DEVICES

1. GENERAL DESCRIPTION

The GPCR03B is a record and playback device without CPU. It includes 256K-bit working SRAM capable of storing approximately 10 seconds of audio or speech data (@ 6.0KHz sampling rate). Easy-to-use with low power consumption, it has MIC (microphone) input, AGC function, one PWM audio output and direct speaker driver offering the simplest solution for users. For audio processing, melody and speech can be mixed into one output. It operates over a wide operating voltage range (2.4V - 5.5V) providing various battery options. Providing the best cost/performance ratio for users, the GPCR03B includes, not only the latest technology, but also the full commitment and technical support of Generalplus.

2. BLOCK DIAGRAM



3. FEATURES

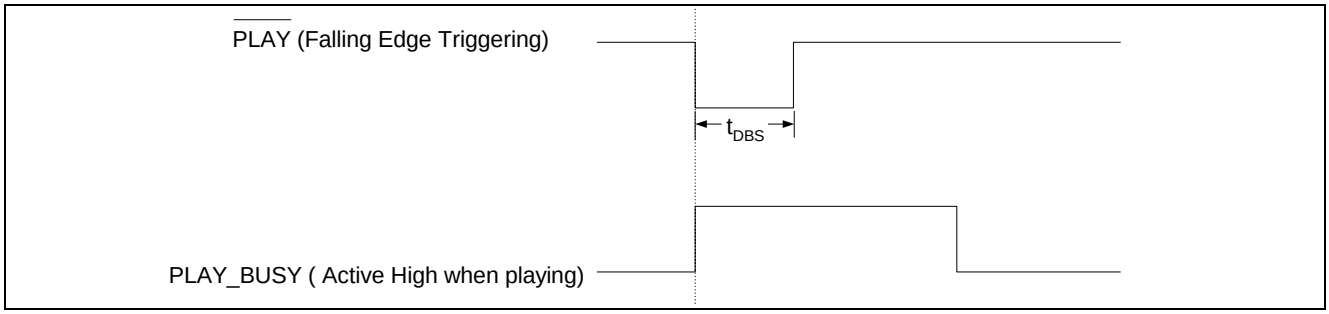
- Nature, high-quality playback suitable for voice, music, and tones
- Single-chip voice record and playback device
- Microphone preamplifier
- Automatic gain control
- Direct speaker driver
- Built in 256K-bit SRAM
- Wide operating voltage: 2.4V - 5.5V
- Frequency of playing and recording: 4K - 12KHz

4. APPLICATION FIELD

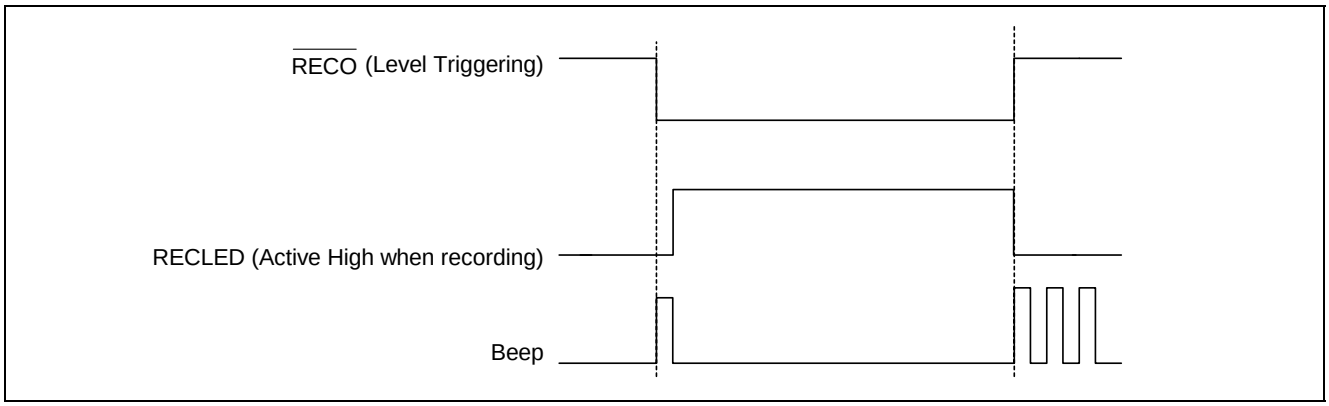
- Memo Message Recorder
- Hand-Carried Message Recorder
- Recordable Toys

5. SIGNAL DESCRIPTIONS

Mnemonic	Type	PIN No.	Description
ROSC	I	6	The "ROSC" pin connects with an external resistor to VDD. To cooperate with a variable resistor, the frequency for recording and playing are adjustable to fulfill user's specifications.
$\overline{\text{PLAY}}$	I	5	$\overline{\text{PLAY}}$, The play-request pin is normally connected to a key. When the key is pressed (falling edge active), the GPCR03B is able to perform the play function.
$\overline{\text{RECO}}$	I	4	$\overline{\text{RECO}}$, the record-request pin is normally connected to a key. The GPCR03B is able to record voice as long as the key is being pressed (low active).
MIC	I	14	Microphone input
ALC	I	13	Automatic gain control input
OP1O	O	12	Analog output of MIC preamplifier
OP1I	I	11	Analog input of low pass filter
LED	O	3	The state of this pin will be high while recording.
AUDP	O	8	PWM driver positive output
AUDN	O	9	PWM driver negative output
AVDD, VDD	Power	15, 7	Analog and Digital power buses
AVSS, VSS	Ground	10, 1	Analog and Digital ground buses
Play_Busy	O	2	The state of this pin is high while playing.



Note: The de-bounce time (t_{DBS}) of $\overline{\text{PLAY}}$ 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	Test condition
		Min.	Typ.	Max.		
Operating Voltage	VDD	2.4	-	5.5	V	Temperature = 25°C
Operating Current	I_{CC1}	-	2.0	-	mA	No load, VDD = 4.5V
	I_{CC2}	-	-	120		8.0Ω Speaker, VDD = 4.5V
Standby Current	I_{SB}	-	1.0	2.0	μA	VDD = 4.5V
Input High Voltage	V_{IH}	0.7 x VDD	-	VDD	V	-
Input Low Voltage	V_{IL}	VSS	-	0.2 x VDD	V	-
Output High Voltage	V_{OH}	4.0	-	-	V	VDD = 4.5V, I_{OH} = 2.0mA
Output Low Voltage	V_{OL}	-	-	0.4	V	VDD = 4.5V, I_{OL} = 4.0mA
Sample Rate	F_S	4.0K	-	12K	Sa/Sec	VDD = 4.5V
Oscillation Resistor	R_{OSC}	18K	-	62K	Ω	VDD = 4.5V

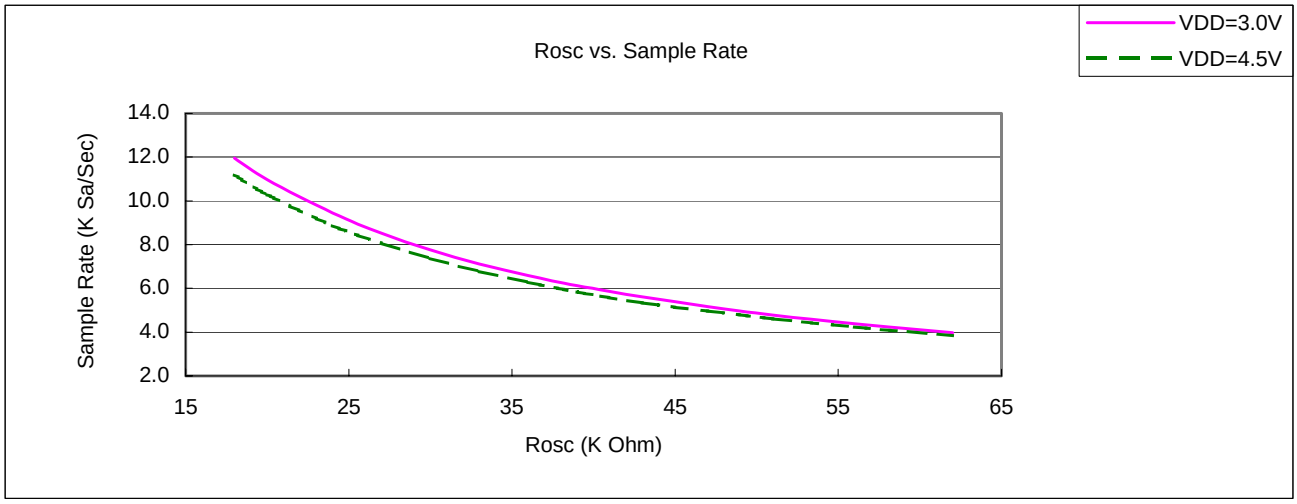
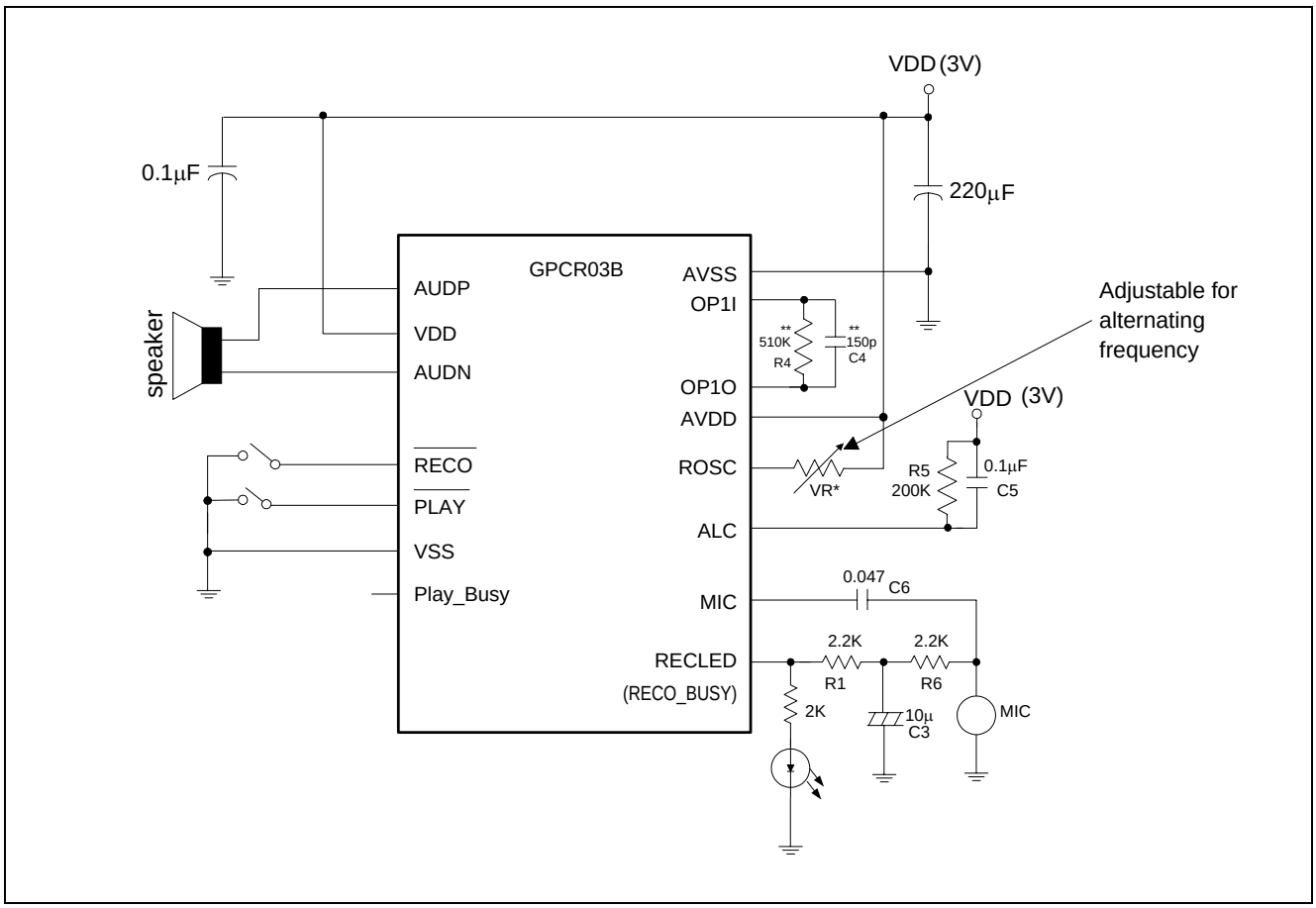


Figure 1.

7. APPLICATION CIRCUIT

The system is capable of recording as long as the $\overline{\text{RECO}}$ switch is being pressed (level triggering). The recorded message or audio can be played back when the $\overline{\text{PLAY}}$ switch is pressed (Falling edge triggering). When system is recording, the LED light from RELED will be on until the end of recording.

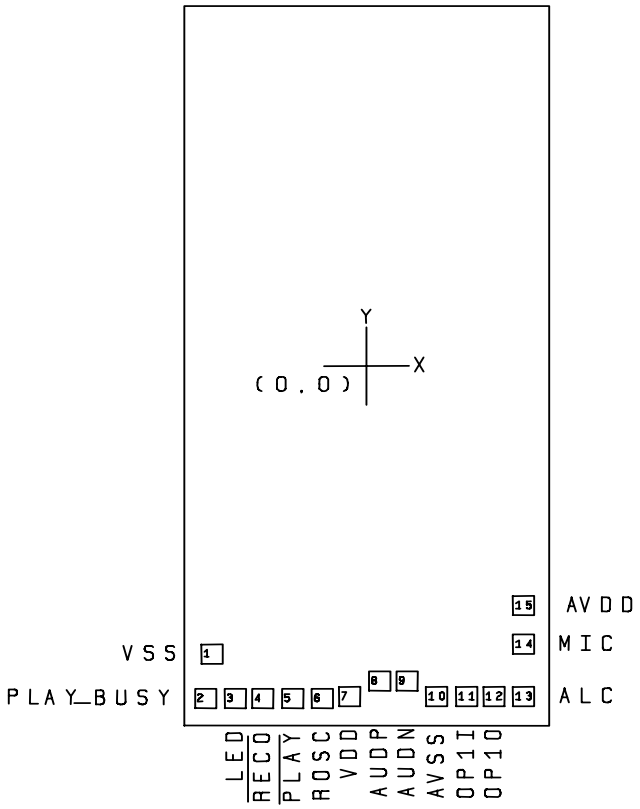


Note1: * The case frequency can be varied by adjusting the value of VR. The purpose of remolding the frequency is to change the speech frequency; for example, a man's voice can be altered to become a woman's voice or vice versa. The relationship between ROSC and speech frequency is illustrated in Figure 1.

Note2: **For the application of VDD is 5.0V, R4 instead of 220K and C4 instead of 330P.

8. PACKAGE/PAD ALLOCATION

8.1. PAD Assignment



This IC substrate should be connected to VDD

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
GPCR03B - C	Chip form

9. DISCLAIMER

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10. REVISION HISTORY

Date	Revision #	Description	Page
JUN. 22, 2005	1.2	Modify 8.2. Ordering Information.	5
MAR. 03, 2005	1.1	Remove Chip Size	5
JUN. 07, 2004	1.0	Original Note: The GPCR03B data sheet v1.0 is a continued version of SPCR03B data sheet v1.2.	8