CM6500B
CM6502B

Evaluation Board User's Guide

Property of C-MEDIA
Confidential material
Duplication and copying prohibited
Without consent of C-MEDIA

NOTICES

THIS DOCUMENT IS PROVIDED "AS IS" WITH NO WARRANTIES WHATSOEVER, INCLUDING ANY WARRANTY OF MERCHANTABILITY, NONINFRINGEMENT, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY WARRANTY OTHERWISE ARISING OUT OF ANY PROPOSAL, DOCUMENT OR SAMPLE.

ALL RIGHTS RESERVED. NO PART OF THIS DOCUMENT MAY BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING INFORMATION STORAGE AND RETRIEVAL SYSTEMS, WITHOUT PERMISSION IN WRITING FROM THE C-MEDIA ELECTRONICS, INC.

COPYRIGHT

Copyright© 2010-2013 C-Media Electronics Inc.

All rights reserved. All content included on this document, such as text, graphics, logos, button icons, images, audio clips, digital downloads, data compilations, and software, is either the exclusive property of C-Media Electronics Inc., its affiliates (collectively, "C-Media"), its content suppliers, or its licensors and protected by Republic of China and international copyright laws.

TRADEMARKS

C-Media, the C-Media Logo, Xear 3D, Xear 3D Logo, Speaker Shifter, Smart Jack, and Smart Audio Jack, Middleware are trademarks of C-Media Electronics Inc. in Republic of China and/or other countries. All other brand and product names listed are trademarks or registered trademarks of their respective holders and are hereby recognized as such.

C-Media reserves the right to modify the specifications without further notice

Cmedia Electronics, Inc.

6F, 100, Sec. 4, Civil Boulevard, Taipei, Taiwan 106, R.O.C.
TEL: 886-2-8773-1100 FAX: 886-2-8773-2211
http://www.Cmedia.com.tw

For detailed product information, please contact sales@cmedia.com.tw

Revision Notes

Revision	Date	Description
0.1	2012/01/06	First draft
0.9	2012/01/30	First release
1.01	2013/02/07	Modify CM6500 -> CM6500B; CM6502 -> CM6502B
1.11	2013/07/23	EVB Picture Update

Property of C-MEDIA
Confidential material
Duplication and copying prohibited
Without consent of C-MEDIA

TABLE OF CONTENTS

NOTICES ..... - 2 -
SECTION 1 OVERVIEW ..... - 5 -
1.1 Introduction ..... - 5 -
1.2 Evaluation Board Contents ..... - 7 -
SECTION 2 GETTING STARTED ..... - 9 -
2.1 Board as USB Audio Device ..... - 9 -
2.2 Playback / Recording Functions ..... - 9 -
2.2.1 Playback Functions ..... - 9 -
2.2.2 Recording Functions ..... - 10 -
2.3 Evaluation Board with peripheral Control ..... - 11 -
2.3.1 EEPROM Interface (U1, ~~U4~~) ..... - 11 -
2.3.2 HID Buttons (SW1 ~ SW5, SW8) ..... - 12 -
2.3.3 HID Pins (J7A1, J7B1) ..... - 13 -
2.3.5 GPIO Pin (J1) ..... - 13 -
~~2.3.4 ENC On Indicators (work with CM7001N for ENC Function; D5)~~ ..... - 14 -
2.3.6 EQ Selector (SW7), only work on CM6502B ..... - 14 -
2.3.7 LED Indicators (D1 ~ D3) ..... - 14 -
2.3.8 Volume Adjuster (VR1 NC), can be used to adjust the volume ..... - 15 -
2.3.9 Record Path Select (J4) ..... - 15 -
~~2.3.10 Analog MEMS Microphone (U3 NC)~~ ..... - 16 -
2.3.11 GIPO 10 & 11 Function Switch Pins (J6 &J7) ..... - 16 -

Property of C-MEDIA
Confidential material
Duplication or copying prohibited
without consent of C-MEDIA

SECTION 1 OVERVIEW

1.1 Introduction

Cmedia's CM6500B / CM6502B is a highly-integrated USB audio single chip optimized for consumer headset solutions. This document is a user guide for CM6500B / CM6502B evaluation boards (EVB), which describes the board's functions, I/O jacks, LEDs, controls and some user notes.

CM6500B / CM6502B supports standard HID compliant volume control pins and playback control pins. CM6500B / CM6502B also offers playback operation and playback/record mute LED indicators in order that users know the current status.

All necessary analog and digital modules are embedded in CM6500B / CM6502B, including stereo DAC, headphone driver, stereo ADC, microphone pre-amp booster, PLL, regulator, and USB transceiver. Moreover, CM6502B integrates 5-band hardware equalizer (EQ) with 4 default preset modes (Default/flat, Communication, Gaming, and Movie). The EQ preset gain parameters can also be customized for compensating the headphone SPL performance or to be complaint with TIA-920 standard.

In addition, embedded Mic Auto-Gain-Control (AGC) function can adjust input gain automatically to avoid large signal clipping or too small input signal level for a stable voice communication recording quality. Optional clipping detection LED also gives users an alert when the near-to-excess large input signal happens. With versatile CM6500B / CM6502B-based headsets, users will get better sound experience on PC.

Property of C-MEDIA
Confidential material
Duplication and copying prohibited
Without consent of C-MEDIA

Property of C-MEDIA
Confidential material
Duplication and copying prohibited
Without consent of C-MEDIA

1.2 Evaluation Board Contents

The CM6500B / CM6502B USB Audio controller evaluation board has several hardware features. With each feature's description in Figure 1, the feature's location can be clearly identified.

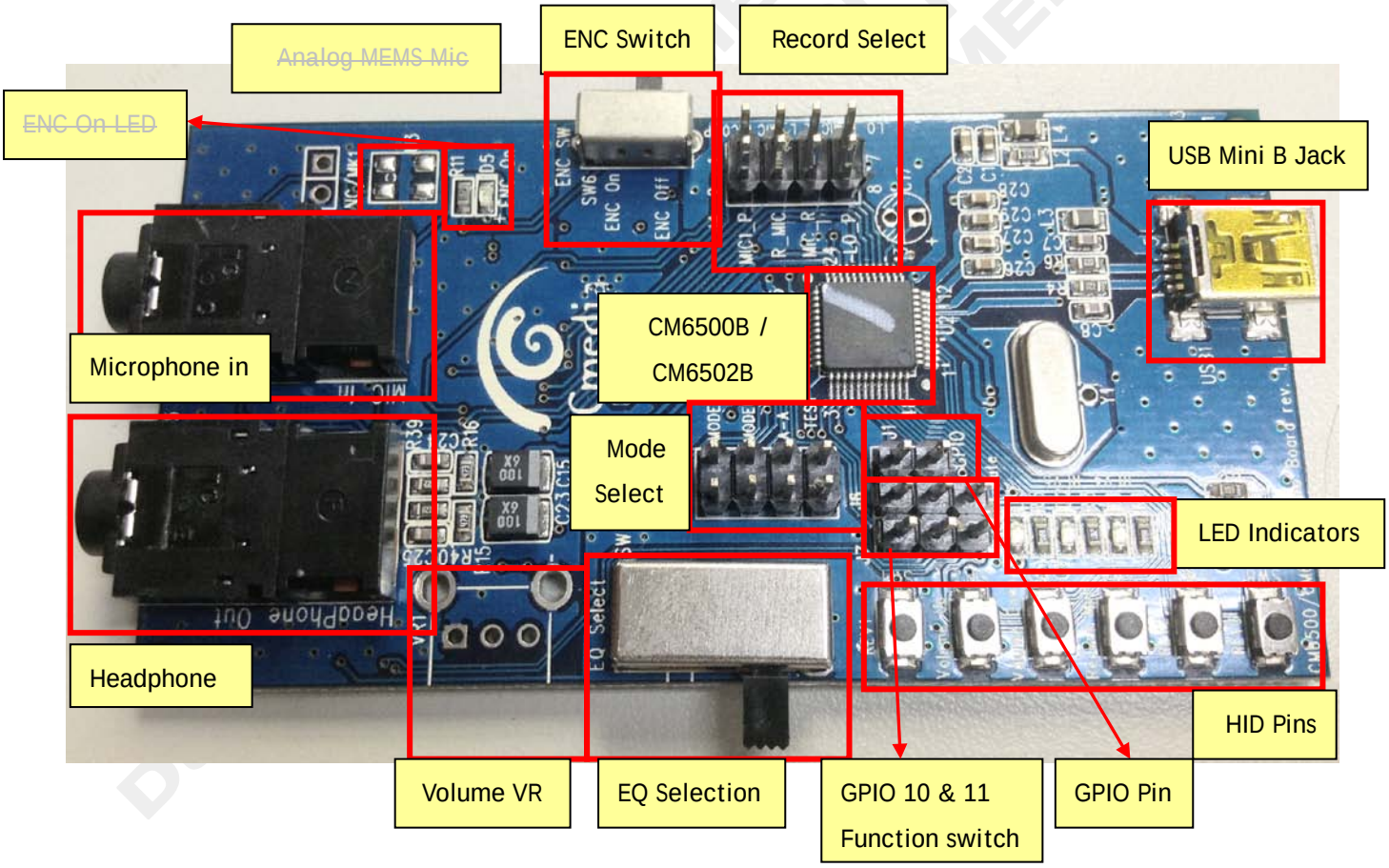


Figure 1

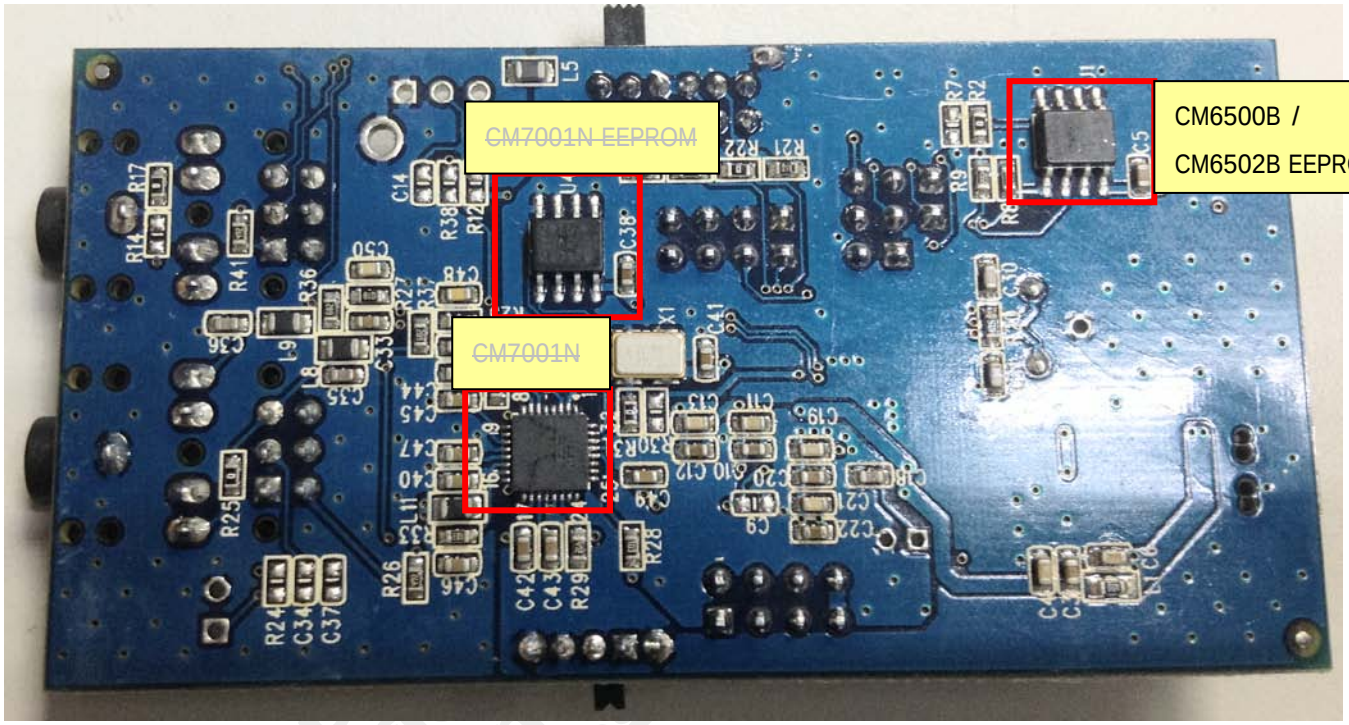


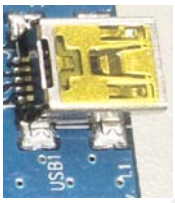
Figure 2

Duplication Without consent

SECTION 2 GETTING STARTED

2.1 Board as USB Audio Device

Connect the EVB to the host by plugging the USB core with a Mini-B type connector, as shown in Figure 3



Mini-B type USB connector

Figure 3 USB connector

2.2 Playback / Recording Functions

2.2.1 Playback Functions

CM6500B / CM6502B's playback function includes dual DAC and an earphone driver. The capabilities of playback are listed below.

Device	Audio Out Capability
CM6500B / CM6502B Analog Output	2CH/48K/44.1K/32K/22.05K/16K/11.025K/8KHz sampling rates/ 16bit Resolution (EQ function only on CM6502B. When EQ on, only "48/44.1KHz" sampling rates available)

Property of C-MEDIA Confidential material Publication and copying prohibited without consent of C-MEDIA

Headphone Output

Headphone out

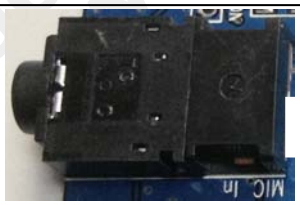
Figure 4 Headphone out jack

2.2.2 Recording Functions

CM6500B / CM6502B's recording function supports two-channel multiple sampling rates with 16-bit resolution. The capabilities of recording are listed below.

Device	Audio In Capability
CM6500B / CM6502B Analog Input	2CH/48K/44.1K/32K/22.05K/16K/11.025K/8KHz sampling rates /16bit resolution

Microphone Input



Microphone In

Figure 5 Microphone input jack

Property of C-MEDIA Confidential material Duplication and copying prohibited Without consent of C-MEDIA

2.3 Evaluation Board with peripheral Control

CM6500B / CM6502B embedded external peripheral control and function enable pin.

- EEPROM Interface
- HID Buttons
- Microphone In Select Pins
- EQ Select
- LED Indicators
- ENC LED Indicators
- GPIO Pins
- GPIO Function Switch Pins

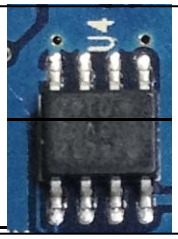
2.3.1 EEPROM Interface (U1, ~~U4~~)

The U1 EEPROM on the EVB for CM6500B /

Figure 6 EEPROM Interface (U1)

EEPROM Pin3(A2)	Description
Pull High (short R2 to 3.3V)	For 24C32/64/128
Pull Low (short R7 to GND)	For 24C02

(EEPROM must support A2(Address 2 Pin)

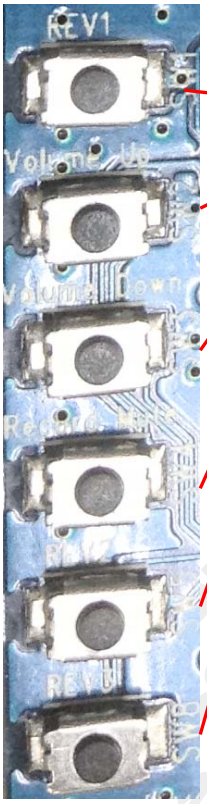


~~The U4 EEPROM on the EVB for CM7001N~~

~~Figure 7 EEPROM Interface (U4)~~

Property of C-MEDIA Confidential material Application and copying prohibited Without consent of C-MEDIA

2.3.2 HID Buttons (SW1 ~ SW5, SW8)



Symbol	Description
REV1	Reserved1
Volume-Up	Volume Up
Volume-Down	Volume Down
Record Mute	Microphone Mute
REV2	Reserved2
REV3	Reserved3
All the button functions can be replaced by external EEPROM	

Figure 8 HID Buttons

Duplication of C-MEDIA confidential material prohibited without consent of C-MEDIA

2.3.3 HID Pins (J7A1, J7B1)

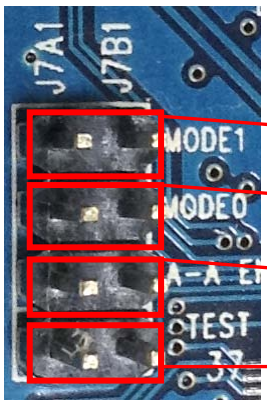


Figure 9 MODE Select Pins

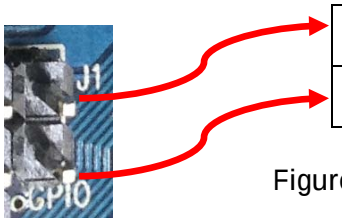
MODE1
MODE0
A-A En
TEST

MODE 0	MODE 1	Description
NC	NC	Docking Mode
Short	NC	Microphone Mode
NC	Short	Speaker Mode
Short	Short	Headset Mode

Symbol	Description
A-A EN	Short the pins A-A function enable.
Test	For IC test mode enable.

Property of C-MED, Confidential material Duplication or copying prohibited without consent of C-MEDIA

2.3.5 GPIO Pin (J1)



GPIO 04
GPIO 05

Figure 10 GPIO Pins

2.3.4 ENC On Indicators (work with CM7001N for ENC Function; D5)

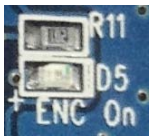


Figure 11 ENC Enable LED

LED	Description(Only work with CM6700N)
ENC On	When Microphone Jack plug In, then function enable.

2.3.6 EQ Selector (SW7), only work on CM6502B

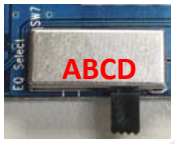


Figure 12 EQ Selector

Selection	Description(Only work on CM6502B)
A(11)	Movie
B(01)	Gaming
C(10)	Communication(Voice)
D(00)	Music

2.3.7 LED Indicators (D1 ~ D3)

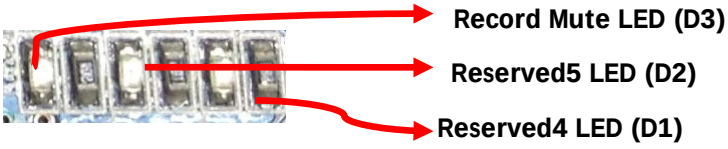


Figure 13 Function LED

LED	Description
Record Mute LED(D3)	Recording Mute indicator
Reserved5(D2)	Reserved indicator
Reserved4(D1)	Reserved indicator
All the LED can be modified by external EEPROM	

Property of C-MEDIA Confidential material Duplication or copying prohibited without consent of C-MEDIA

2.3.8 Volume Adjuster (VR1 NC), can be used to adjust the volume

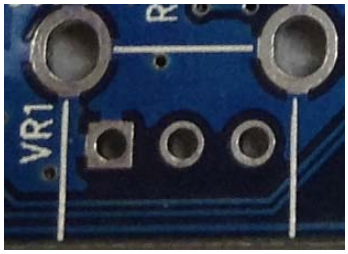
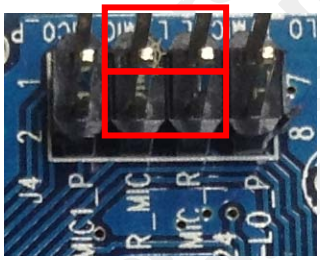


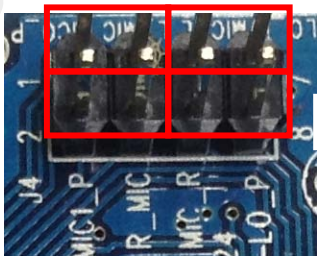
Figure 14 Volume adjuster

VR1	Description
Counterclockwise	N.A
Clockwise	N.A
The VR can be modified by external EEPROM	

2.3.9 Record Path Select (J4)



Type A



Type B

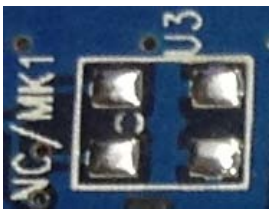
Figure 15 Record Path Selector

J4	Description
Type A	CM7001N Bypass
~~Type B~~	~~CM7001N ENC Enable~~

- Type A need remove U3, C34
- ~~Type B need remove R25~~

Property of C-MEDIA Confidential Material Distribution and copying prohibited without consent of C-MEDIA

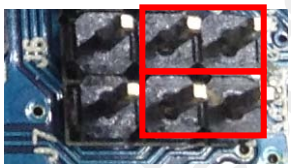
~~2.3.10 Analog MEMS Microphone (U3 NC)~~



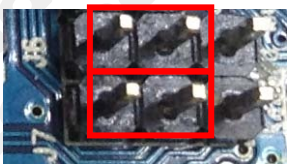
~~Figure 16 Analog MEMS Microphone~~

~~U3~~	~~Description~~
~~Analog MEMS Mic~~	~~For ENC.~~

2.3.11 GIPO 10 & 11 Function Switch Pins (J6 &J7)



Type A



Type B

Figure 17 GPIO 10 & 11 Function Switch Pins

J4	**Description**
Type A (Short 1 2)	Jack Detection Enable (with EEPROM & Driver)
Type B (Short 2 3)	Button REV1(GPIO 11) & LED D2(GPIO 10)

Property of C-MEDIA
Confidential Material
Our Section and copying prohibited
without consent of C-MEDIA