Chipsmall

Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

Contact us

Evaluation Board for Quad, 16-Bit, Serial Input, Voltage Output DAC

EVAL-AD5064-1EBZ

FEATURES

Full featured evaluation board for the 14-lead TSSOP
   AD5064
On-board reference
On-board ADC for voltage readback
Various link options
Direct hookup to USB port of PCs
PC software for control of DACs

GENERAL DESCRIPTION

This data sheet describes the evaluation board for the AD5064 quad 16-bit DAC. The AD5064 operates from a single 4.5 V to 5.5 V supply. The REF195 is an external reference on this evaluation board.

Complete specifications for the AD5064 can be found in the data sheet available from Analog Devices, Inc., and should be consulted in conjunction with this data sheet when using the evaluation board.

The evaluation board interfaces to the USB port of any IBM®-compatible PC. Software is available with the evaluation board that allows users to easily program the AD5064.
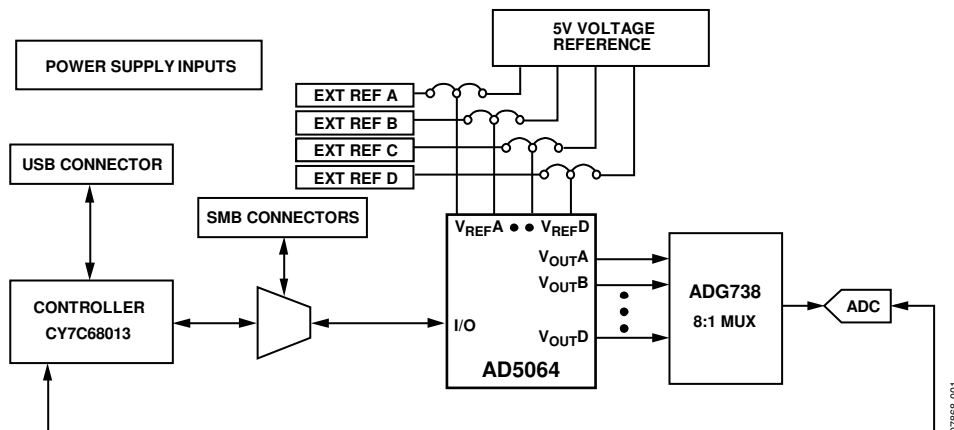
FUNCTIONAL BLOCK DIAGRAM

Figure 1.

EVAL-AD5064-1EBZ

TABLE OF CONTENTS

REVISION HISTORY

7/09—Revision 0: Initial Version

EVALUATION BOARD HARDWARE

POWER SUPPLIES

To power the EVAL-AD5064-1EBZ, supply 5.5 V between the AVDD and AGND inputs for the analog supply of the AD5064. Alternatively, placing LK6 in Position B powers the analog circuitry from the USB port (default setting).

Both AGND and DGND inputs are provided on the board. The AGND and DGND planes are connected at one location close to the AD5064. To avoid ground loop problems, do not connect AGND and DGND elsewhere in the system.

Each supply is decoupled to the relevant ground plane with 10 µF and 0.1 µF capacitors. Each device supply pin is also decoupled with a 10 µF and 0.1 µF capacitor pair to the relevant ground planes.

LINK OPTIONS

Before using the evaluation board, a number of link and switch options should be set to the required operating setup. The default link options are listed in Table 1. Table 2 describes the functions of these link options. The default setup is controlled by the PC via the USB port.

Table 1. Link Options Setup for PC Control (Default)

Link No.	Option
LK1 to LK4	Inserted
LK5	B
LK6	B
LK7	A
LK8	A
LK9	B
LK10	A
LK11	A
LK12	A
LK13	Removed

Table 2. Link Functions

Link No.	Function
LK1 to LK4	These links connect the V$_{OUT}$A to V$_{OUT}$D pins of the AD5064 to the input/output pins of ADG738 demultiplexer to monitor the DAC output value using the on-board AD7476 ADC.
LK5	This link selects the AVDD power supply source for the analog circuitry. Position A selects J6 as the AVDD analog circuitry power supply source. Position B selects the 5 V power supply source as the AVDD analog circuitry power supply source (see LK6).
LK6	This link selects the 5 V power supply source for the digital circuitry. Position A selects J7 as the 5 V digital circuitry power supply source. Position B selects the USB port as the 5 V digital circuitry power supply source.
LK7	This link selects whether the AD5064 evaluation board is controlled by the PC via the USB port or by an external source via the SMB connectors, J1 to J5. Position A selects control by the PC via the USB port. Position B selects control by an external source via the SMB connectors, J1 to J5.
LK8	This link sets the $\overline{RESET}$ pin on the ADG738. Position A allows normal operation of the switch. Position B resets the switch.
LK9	This link selects the AVDD power supply source for the REF195. Position A selects J6 as the REF195 power supply source. Note that for optimum operation of the REF195, it should be powered from 7 V. Position B selects the AVDD as the REF195 power supply source (see LK5).
LK10	This link selects the use of a 0.1 µF capacitor on the DAC reference wire.
LK11	This link selects the DAC reference source. Position A selects J11 as the DAC reference source. Position B selects the on-board REF195 5 V reference as the DAC reference source.
LK12	This link selects whether the part power-on resets to zero or midscale. Position A ensures that the part power-on resets to midscale. Position B ensures that the part power-on resets to zero scale.
LK13	This link selects the DAC voltage source. Position A selects the DAC power supply source as the DAC voltage source (see LK10). Position B selects the on-board REF195 5 V reference or an external reference as the DAC voltage source (see LK11).

EVALUATION BOARD SOFTWARE

INSTALLING THE SOFTWARE

The AD5064 evaluation kit includes self-installing software on CD. The software is compatible with Microsoft® Windows® 2000 and Windows XP.

To install the software, take the following steps:

1. Install the software before connecting the evaluation board to the USB port of the PC. This ensures that the board is correctly recognized when connected to the PC.
2. Start the Windows operating system and insert the CD. The installation software should launch automatically. If it does not, run the **setup.exe** file directly from the CD.
3. After installation from the CD is complete, power up the AD5064 evaluation board as described in the Power Supplies section. Connect the board to the USB port of the PC using the cable supplied.
4. When the software detects the evaluation board, precede through the dialog boxes that appear to finalize the installation.

SOFTWARE OPERATION

From the **Analog Devices** menu, click **Start > All Programs > Analog Devices > AD5064 > AD5064 Evaluation Software**.

For older PCs (prior to Windows® XP), click **Start > Programs > Analog Devices > AD5064 > AD5064 Evaluation Software**.

The main window of the AD5064 evaluation software opens, as shown in Figure 2. The data programmed into the 32-bit input shift register is displayed. You can select the **Control Bits**, the **Address Bits**, and the **Data Bits** by clicking the appropriate option button under each section.

Control Bits

To select a command to program the part, click the drop-down menu under the **Select Control Function** section and select the appropriate option from the menu. For example, to program all DAC outputs with full scale, select **Write to and Update DAC channel n**. Next, click **All DACs** in the **Address Bits** section, and then enter the data in hexadecimal format into the **Data** section.

To execute, click **Write To Part**. You must click **Write To Part** to execute all writes to the part.

Other commands that the AD5064 evaluation software lets you program include the power-down DAC bits, the clear code register bits, and the LDAC register bits. These commands are performed by clicking the corresponding option button under the **Control Bits** section and then clicking **Write To Part**. You can also set the register bits for the required mode of operation. Consult the AD5064 data sheet for details.

Hardware Pins

To set $\overline{LDAC}$ and $\overline{CLR}$ to high or low, click the corresponding, $\overline{LDAC}$ and $\overline{CLR}$, checkbox. This command is then executed immediately. There is no need to click **Write To Part**.

ADC

The voltage output on each DAC channel is monitored using the on-board ADC. To read the output voltage, click the **OK** under **Sample ADC**.

Figure 2. AD5064 Evaluation Software Main Window

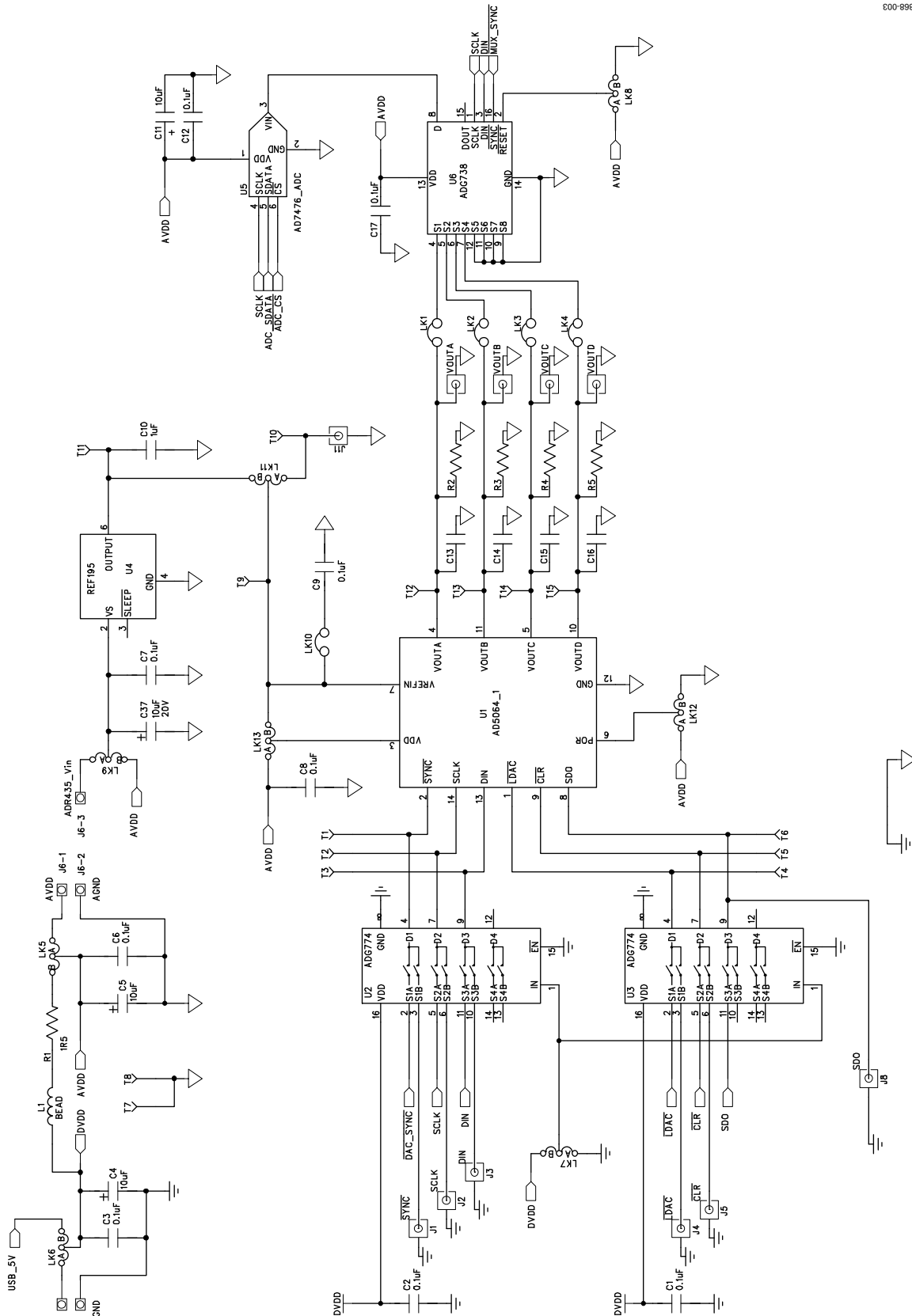07868-003

EVALUATION BOARD SCHEMATICS AND ARTWORK

Figure 3. Schematic of Controller Circuitry
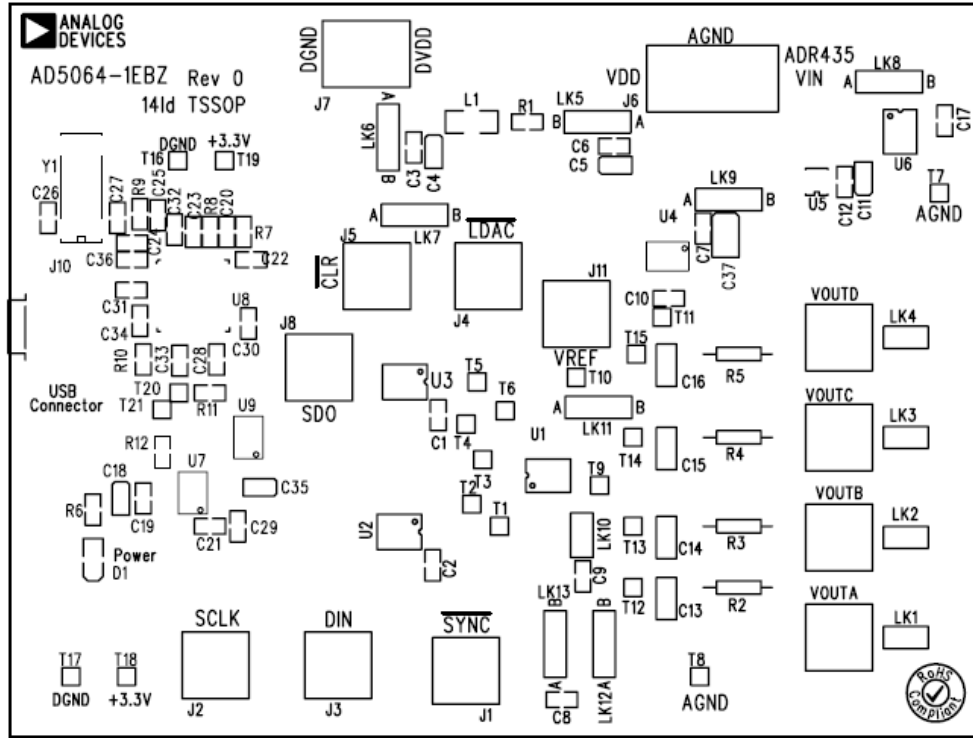
07868-004

Figure 4. Schematic of AD5064 Circuitry
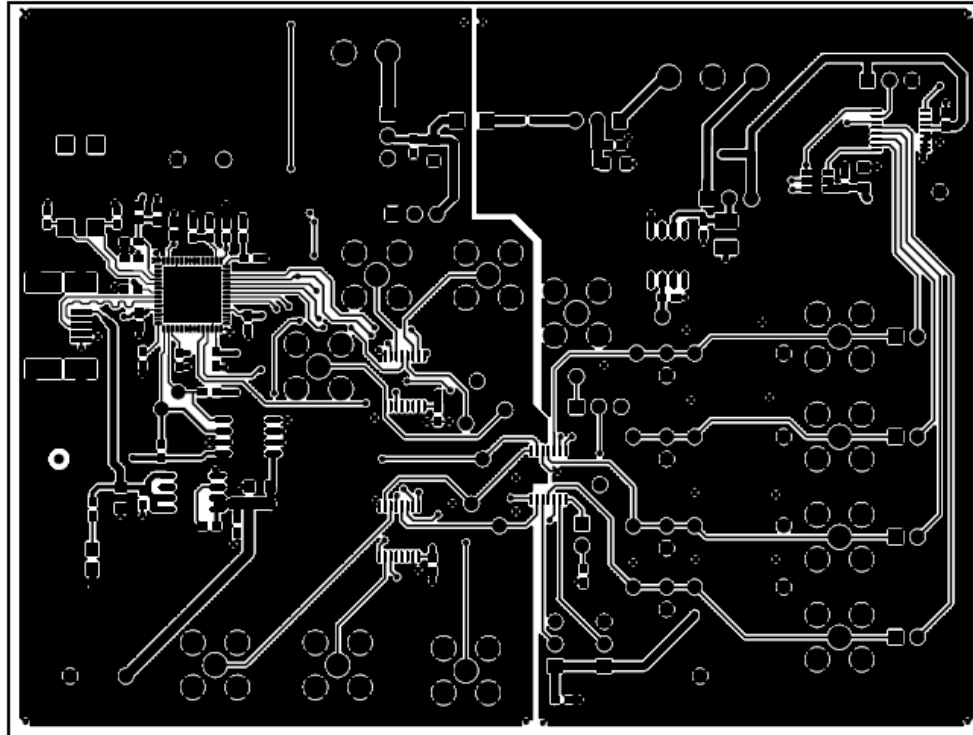
Figure 5. Component Placement Drawing

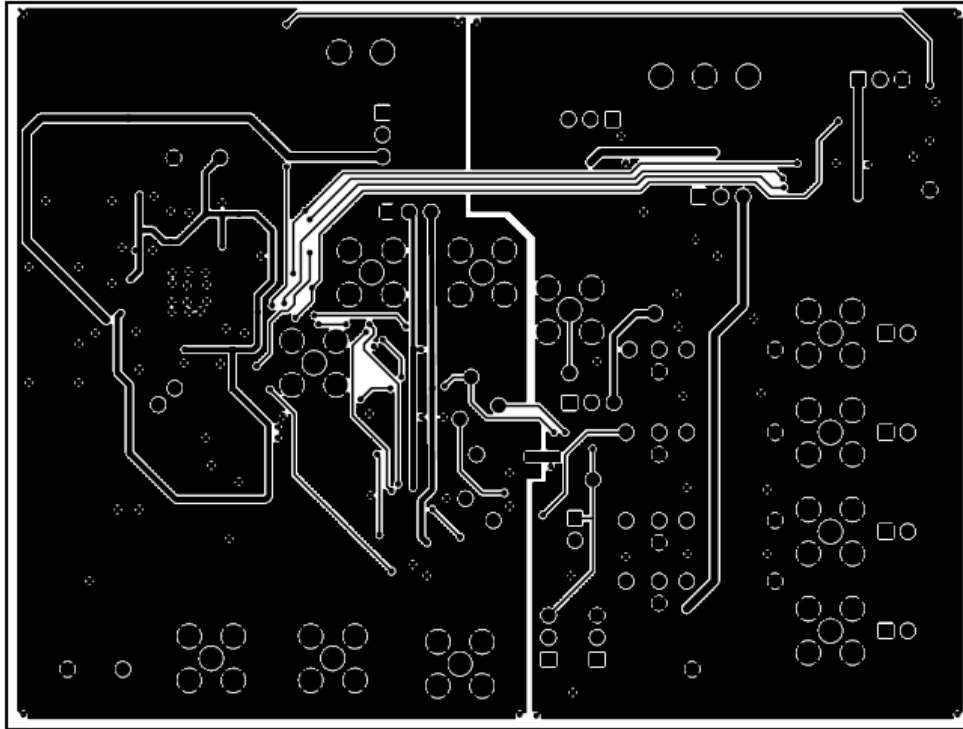Figure 6. Component Side PCB Drawing

Figure 7. Solder Side PCB Drawing

ORDERING INFORMATION

COMPONENT LISTING

Table 3.

Qty	Reference Designator	Description	Supplier/Number[1]
1	U7	8-lead SOIC_N	Analog Devices/ADP3303AR-3.3
1	U1	14-lead TSSOP	Analog Devices/AD5064BRUZ-1
1	U9	24LC01	FEC 9758070
2	U2, U3	16-lead QSOP	Analog Devices/ADG774BRQ
1	U5	6-lead SOT-23	Analog Devices/AD7476ART
1	U6	16-lead TSSOP	Analog Devices/ADG738BRU
1	U4	8-lead SOIC_N	Analog Devices/REF195ES
1	U8	CY7C68013-CSP	Cypress/CY7C68013-56LFC
1	Y1	24 MHz crystal	FEC 569872
11	VOUTA to VOUTD, J1 to J5, J8, J11	Gold 50 Ω SMB jack	FEC 3651228
1	J10	USB-Mini-B	FEC 4768309
1	J6	Power connector	FEC 151786
1	J7	Power connector	FEC 9632972
1	D1	LED	FEC 3599681
6	C4, C5, C11, C18, C35, C37	10 μF, 10 V tantalum capacitors (TAJ-B package)	FEC 197130
2	C26, C27	22 pF capacitors (0603 package)	FEC 722005
23	C1 to C3, C6 to C9, C12, C17, C19 to C23, C25, C28 to C34, C36	0.1 μF capacitors (0603 package)	FEC 8820023
1	C24	2.2 μF capacitor (0603 package)	Digi-Key/490-1552-1-ND
1	C10	1 μF capacitor (0603 package)	FEC 3188840
4	C13 to C16	0805 package (not inserted)	
1	R1	1.5 Ω resistor	FEC 9331832
4	R2 to R5	Wire-wrap pin (not inserted)	
1	R6	1 kΩ resistor (0603 package)	FEC 911239
2	R7, R8	100 kΩ resistors (0603 package)	FEC 911471
2	R11, R12	2.2 kΩ resistors (0603 package)	FEC 911276
1	R10	10 kΩ resistor (0603 package)	FEC 9330399
1	R9	0 Ω resistor (0603 package)	FEC 9331662
1	L1	Bead inductor	FEC 9526862
5	LK1 to LK4, LK10	Headers (2 × 1 pin)	FEC 511705
8	LK5 to LK9, LK11 to LK13	Headers (3 × 1 pin)	FEC 511717
21	T1 to T21	Test points	FEC 8731144

[1] FEC stands for Farnell Electronics.

ORDERING GUIDE

Model	Package Description
EVAL-AD5064-1EBZ[1]	Evaluation Board

[1] Z = RoHS Compliant Part.

ESD CAUTION

ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

NOTES

NOTES

NOTES

ANALOG
DEVICES

www.analog.com