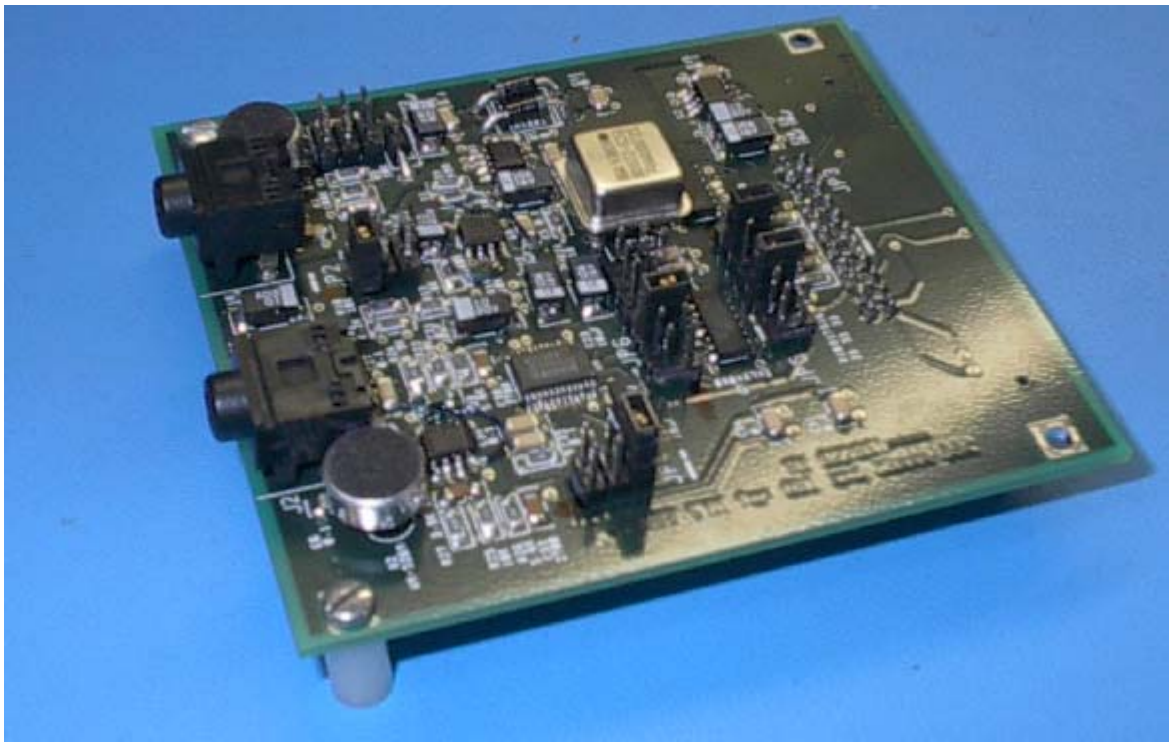
Audio Daughter Card - TMDX326040A
Users Guide (Revision 1.0)



C6416 Test and Evaluation Board (TEB) kit contains:

- Audio Daughter Card - TMDX326040A
- Cover Letter
- EMC compliancy Card

Hardware Features

- Board Size: 3.5” x 3” Inches
- PCM3003 – Burr Brown® 16-/20-Bit Single-Ended Analog Input/Output Stereo Audio Codec (TI Lit. # SPAS079)
- Compatible with TI C31 and C6711 DSKs (attaches via header connector)
- Line-in/out stereo mini audio jacks
- 2 electret microphones
- Sample rate controlled by 12.288 MHz Oscillator or by DSP timer output pin.
- Separate Analog/Digital power regulators and ground planes for high-resolution audio.
- 20/16-bit codec selection
- Clock sample rates
- Jack/Microphone selection
- Line/Microphone input gain control selection
- Oscillator/DSP Timer selection
- Sampling rate Jumpers

Software Features

- Program examples and Users Guide are ***provided via download*** from TI FTP site: ftp://ftp.ti.com/pub/cs/c6x/DSK/AudioDC

Price: US $50

Order Entry now available

Other Required Tools Not Included

- TMS320C31 (TMDS3200031) or TMS320C6711 (TMDS320006711) DSK

*European Customers who use the C6711 DSK must order version with European power cord (TMS320006711E)

Table of Contents

AUDIO DAUGHTER CARD - TMDX326040A 1

USERS GUIDE (REVISION 1.0) 1

C6416 TEST AND EVALUATION BOARD (TEB) KIT CONTAINS: 1
HARDWARE FEATURES 1
SOFTWARE FEATURES 1
ORDER ENTRY NOW AVAILABLE 1
OTHER REQUIRED TOOLS NOT INCLUDED 1

TABLE OF CONTENTS 2

SETUP/TEST 3

DEFAULT JUMPER SETTINGS 3
JUMPER DESCRIPTIONS 4

TROUBLE SHOOTING 4

DOCUMENTATION/EXAMPLES 5

Setup/Test

Connect the Audio Daughter Card to your DSK

1. Disconnect the DSK board power
2. Connect the ADC header to the DSK connector

Top View

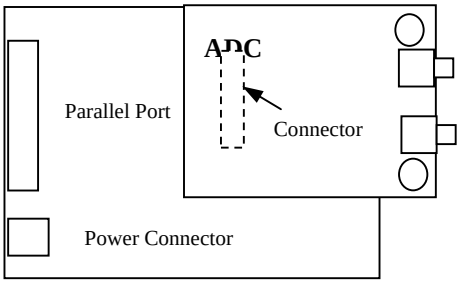


Figure 1. C31 DSK setup

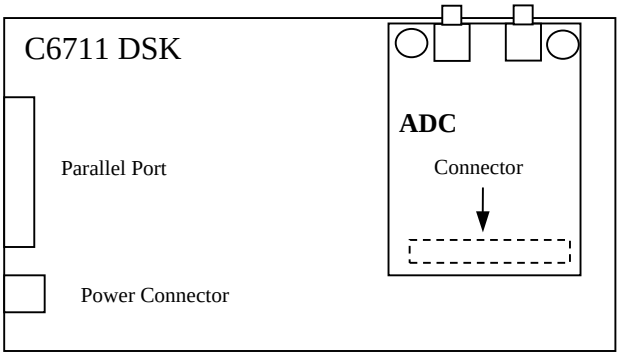


Figure 2. C6711 DSK setup

3. Verify Jumper Settings (below)
4. Connect the Parallel port cable and Power supply as instructed by DSK guide
5. Run C31 or C6711 DSK test program (for details see "Loop back test programs" section)
   a. Connect an audio input source and powered speakers
   b1. For C6711 DSK run "..\6711 DSK\codec_poll1.out
   b2. For C31 DSK run "..\C31 DSK\Loop3_16.dsk
   c. You should hear the audio input through the speakers

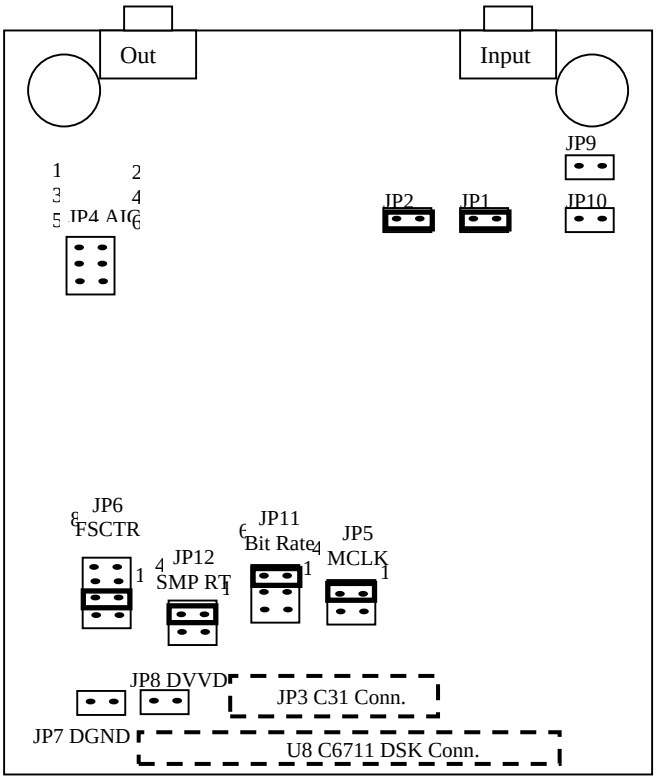


FIGURE 3 JUMPER SETTINGS

Default Jumper Settings

JP1 – pin 1-2
JP2 – pin 1-2
JP3 –C31 DSK connector (bottom)
JP4– no connection
JP5 – pin 3-4

JP6 – PIN 3-4

JP7 – no connect, Digital Ground
JP8 – no connect, Digital Vdd (3.3V)
JP9 – no connect, Analog Ground
JP10 – no connect, Analog Vdd (3.3V)
JP11 – pin 5-6
JP12 – pin 3-4
U8 – C6711 DSK Connector (bottom)

*Note to find pin 1 on the jumpers, you can look on bottom of board. The square through hole on the jumper is pin 1.

Jumper Descriptions
(See Schematics for signal details)

JP1 – Add Right Microphone Input to Signal (default - connection on pin 1-2)
JP2 – Add Left Microphone Input to Signal (default - connection on pin 1-2)
JP3 – connector to C31 DSK (on bottom of board)
JP4– PCM3003 Pin configuration (default - no connection)
Pin 1-2 unconnected 16-bit data format, connected 32-bit data format (20 bit data)
Pin 3-4 connected – de-emphasize 1 (see data sheet)
Pin 5-6 connected – de-emphasize 2
JP5 – Master Clock (MCLK) source
Pin 1-2 connected – MCLK provided by DSK
Pin 3-4 connected – MCLK generated by 12.288 MHz ADC Clock (default)
* Connect only one set of jumpers (Pins 1-2 or Pins 3-4) at a time

JP6 – Frame Sync timing (default - connection on pin 3-4)
Pin 3-4: Standard left/right frame sync. Signal that is 16/32 data bit clocks high and 16/32 bits low (default – pin 3-4).
Pins 1-2, 5-6: Although the C31 DSK can use the 16/32 bit Frame Sync. Signal (example provided), the less complicated approach is to provide a 1.5 clk high frame sync. You can do this by connecting pins 1-2 and 5-6. See C31 examples for details.

JP7 – no connect, Digital Ground
JP8 – no connect, Digital Vdd (3.3V)
JP9 – no connect, Analog Ground
JP10 – no connect, Analog Vdd (3.3V)

JP11/12- Bit Rate/Data Rate Jumpers (default - JP11: pin 5-6, JP12: pin 3-4)

f_{clk} = 12.288 MHz or f_{clk} = DSP TCLK		JP12 Sample Rate	
		Pins 1-2	Pins 3-4
JP11 Bit Rate	Pins 1-2	32BIT, 48ksps = $f_{clk}/256$	Not valid
	Pins 3-4	16BIT, 48ksps = $f_{clk}/256$	32BIT, 48ksps = $f_{clk}/512$
	Pins 5-6	Not valid	16BIT, 48ksps = $f_{clk}/512$

See Burr-Brown PCM3003 Data Sheet (sbas079.pdf) p. 15

U8 – C6711 DSK Connector (bottom)

Trouble Shooting

If the test above does not work try the following:

1. Make sure the Audio daughter card is firmly connected to the DSK. On the C31 DSK make sure that all the pins are in the Audio daughter card female connector.
2. Make sure Power is applied to the DSK.
3. Make sure the Parallel port is connected to the DSK and PC
4. Verify that the Audio Daughter Card Jumpers are in their default setting (see above)
5. Verify that the DSK is working by using a DSK test program (see DSK documentation)

Documentation/Examples

Readme.txt – text version of this document
BML.XLS – Bill Material List (excel)
..\C6711* - C6711 DSK example code
..\C31* - C31 DSK example code
aib_sch.ps – Schematics (Post Script)
aib.ps – top and bottom level gerbers (Post Script)
spdu082c.pdf – Audio Daughter Card Customer Support Guide
spra711.pdf - TMS320 Cross-Platform Daughter card Specification
spra595.pdf – Application Note: TMS320C6000 McBSP: I 2 S Interface
sbas079.pdf – Burr Brown PCM3002/3 Data Sheet