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AKD4185-A
Evaluation board Rev.0 for AK4185

GENERAL DESCRIPTION

AKD4185-A is the board for evaluation of the touch screen controller AK4185, which adopted the CSP small package suitable for the cellular phone, the handheld game machine, etc. Since AKD4185-A has a touch-panel I/F and a digital I/O power supply input terminal, it is easily connectable with a target system of low power/voltage drive. Furthermore, since the analog input terminal is equipped analog voltage and external battery voltage can also be measured.

■ Ordering guide

AKD4185-A --- Evaluation board for AK4185
(Cable for connecting with printer port of IBM-AT compatible PC and control software are packed with this. This control software does not operate on Windows NT.)

FUNCTION

- **Digital I/F for µP**
- **Touch-panel I/F (4-wire, 5-wire)**
- **Analog input terminal**
- **Digital I/O power supply terminal**

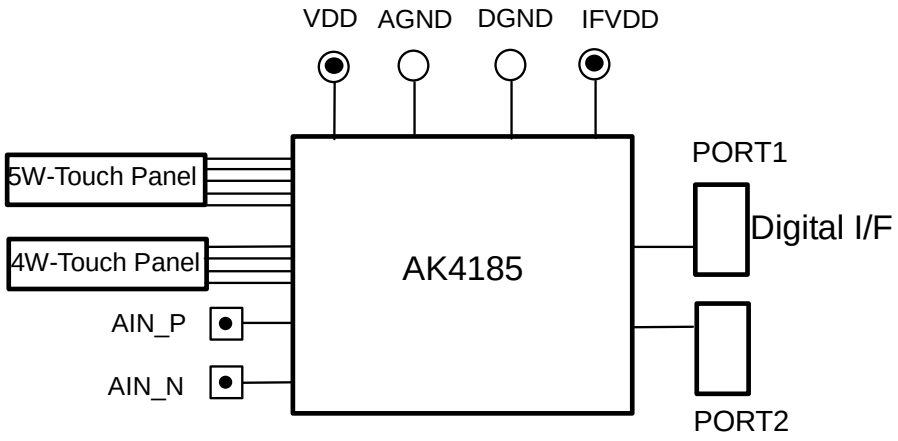


Figure 1. AKD4185 Block Diagram

* Circuit diagram and PCB layout are attached at the end of this manual.

Board Outline Chart

■ Outline Chart

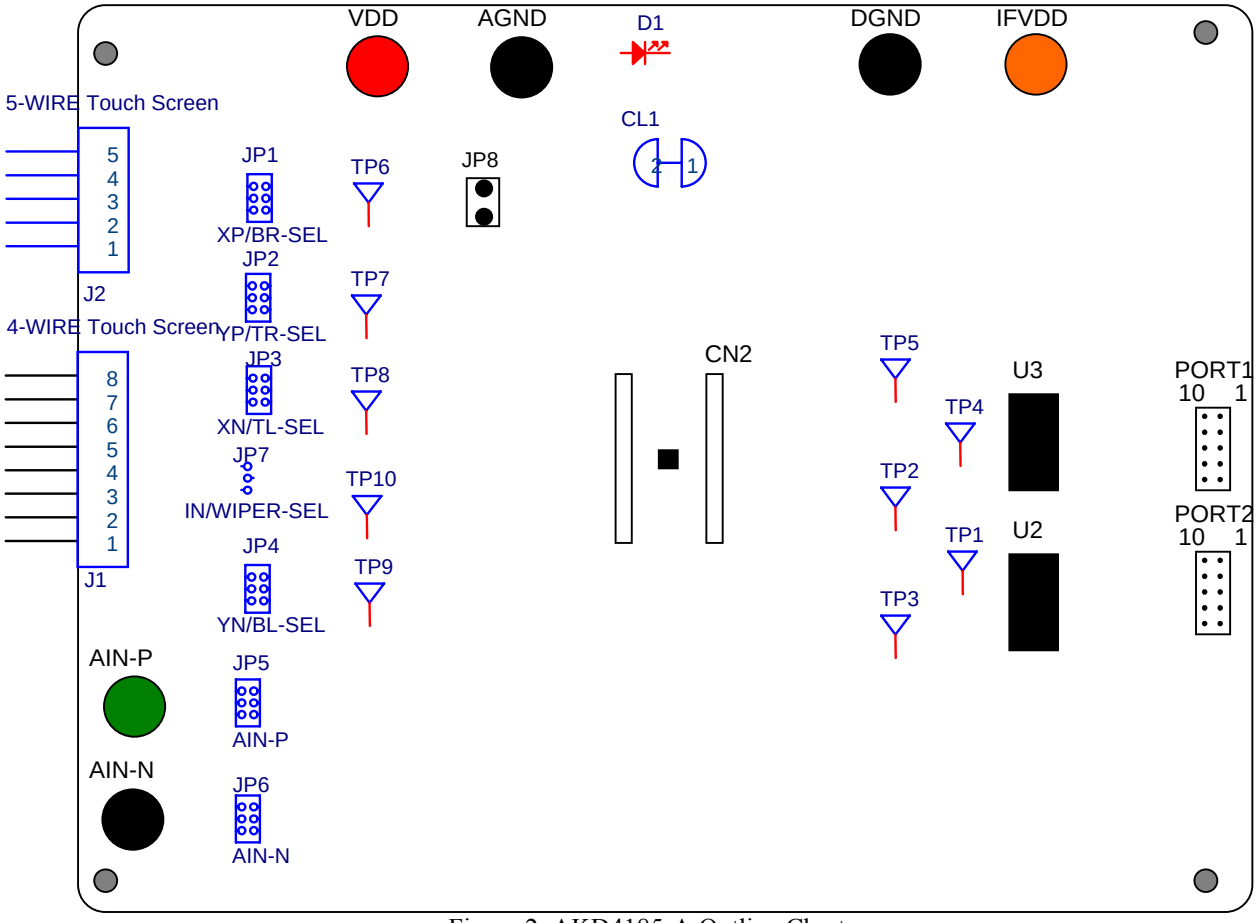


Figure 2. AKD4185-A Outline Chart

■ Comment

(1) 4/5 WIRE Touch Screen
Connector for the touch panel connection, Match and connect the pins of the panel with these connecters.

(2) AIN-P, AIN-N
AIN-P is an analog input pin. The signal of 0V~VDD can be input.
AIN-N should be left open.

(3) VDD, AGND, DGND, IFVDD
Connect power supply with these pins.

(4) D1
LED turns on when the AK4185 is powered up.

(5) PORT1
Control port. Connect the bundled cable into this port.

(6) PORT2
Test port.

(7) JP1-8
See the following sections.

■ Operation sequence

(1) Set up the power supply lines.

Set up the jumper pins.

JP8
VDD

(Short)

Set up the power supply lines.

Name	Color	Voltage	Comments
VDD	Red	+1.6~+3.6V(typ1.8V)	Power supply for VDD of AK4397.
IFVDD	Orange	+1.2~+3.6V(typ3.3V)	Power supply for Digital logic circuits.
AGND	Black	0V	Analog GND.
DGND	Black	0V	Digital GND.

Table 1 Set up of power supply lines

* Each supply line should be distributed from the power supply unit.

(2) Set up the evaluation mode and jumper pins. (See the followings.)

(3) Power on.
The AK4185 should be resets once open the JP8 and then short it.

■ Evaluation mode

Applicable Evaluation Mode

(1) 4-Wire Touch Screen position, pressure measurement and evaluation of A/D using the analog input terminal.
(2) 5-Wire Touch Screen position measurement.

(1-1) 4-Wire Touch Screen position and pressure measurement.

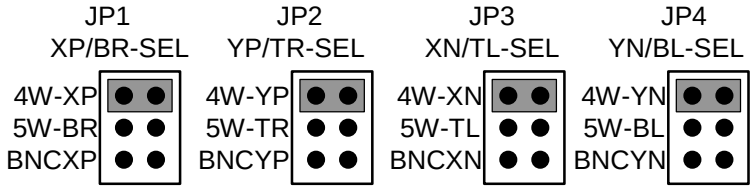
In case of evaluating a 4-Wire Touch Screen function of the AK4185, it is necessary to connect the 4-Wire Touch Panel with J1 terminal as shown Table 2. Regarding pin assignment of J1, refer to Table 2 or circuit diagram in this manual. As for the AK4185's register definitions, refer to datasheet of the AK4185.

4-wire resistive touch panel should be connected to J1.
The pin assignment of J1 is shown on Table 2.

No.	Name	Description
8	4W-YN	4-Wire Touch Screen Y – plate Voltage supply
7		
6	4W-YP	4-Wire Touch Screen Y + plate Voltage supply
5		
4	4W-XN	4-Wire Touch Screen X – plate Voltage supply
3		
2	4W-XP	4-Wire Touch Screen X + plate Voltage supply
1		

Table 2. J1 (8P Header) pin assign

Set up the jumper pins.

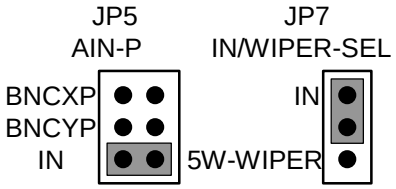


The AK4185's register (Touch Screen Register) should be set to 4-Wire Touch Screen Operation.

(1-2) Evaluation of A/D using the analog input terminal.

In case of AK4185's A/D evaluation using the analog input terminal, it is necessary to connect the analog generator with AIN terminal. As for the AK4185's register definitions, refer to datasheet of the AK4185.

Set up the jumper pins.



The AK4185's register (Touch Screen Register) should be set to 4-Wire Touch Screen Operation.

(2) 5-Wire Touch Screen position measurement.

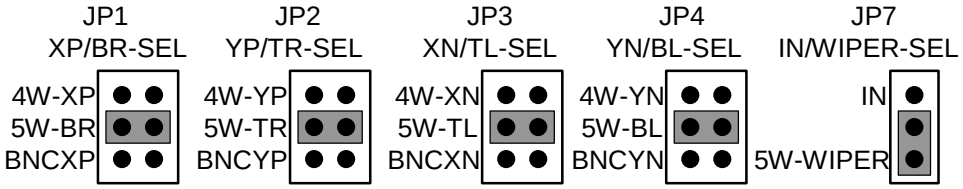
In case of evaluating a 5-Wire Touch Screen function of the AK4185, it is necessary to connect the 5-Wire Touch Panel with J2 terminal as shown Table 3. Regarding pin assignment of J2, refer to Table 3 or circuit diagram in this manual. As for the AK4185's register definitions, refer to datasheet of the AK4185.

5-wire resistive touch panel should be connected to J2.
The pin assignment of J2 is shown on Table 3.

No.	Name	Description
5	5W-BL	5-Wire Touch Screen Bottom-Left Voltage supply
4	5W-TL	5-Wire Touch Screen Top-Left Voltage supply
3	5W-WIPER	5-Wire Touch Screen WIPER Voltage supply
2	5W-BR	5-Wire Touch Screen Bottom-Right Voltage supply
1	5W-TR	5-Wire Touch Screen Top-Right Voltage supply

Table 3. J2 (5P Header) pin assign

Set up the jumper pins.



The AK4185's register (Touch Screen Register) should be set to 5-Wire Touch Screen Operation.

■ Other jumper pins set up

[JP5] (AIN-P): Selection of AIN-P
- BNCXP: AIN-P signal is input to XP/BR. <Default>
- BNCYP: AIN-P signal is input to YP/TR.
- IN: AIN-P signal is input to IN/WIPER.

[JP6] (AIN-N): Selection of AIN-N
- BNCXN: AIN-N signal is input to XN/TL. <Default>
- BNCYN: AIN-N signal is input to YN/BL.

[CL1] : Analog ground and Digital ground
- OPEN: Separated.
- SHORT: Common. (The connector “DGND” can be open.) <Default>

■ Indication for LED

[LED1] (ERF): Monitor VDD pin for the AK4185. LED turns on when AK4185 power up.

■ Serial Control

The AKD4185 can be connected via the printer port (parallel port) of IBM-AT compatible PC. Connect PORT1 (Digital I/F) with PC by 10 wire flat cable packed with the AKD4185.

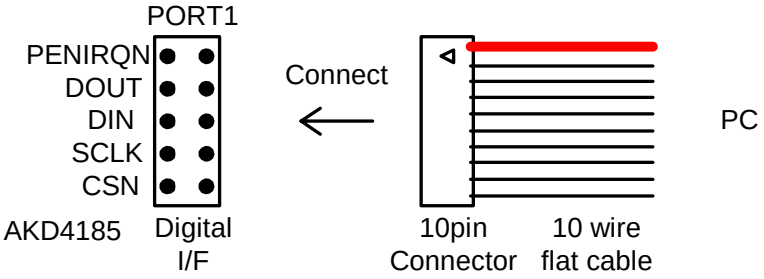


Figure 3. Connect of 10 wire flat cable

■ Analog Input/Output Circuits

(1) Touch Screen Input Circuits

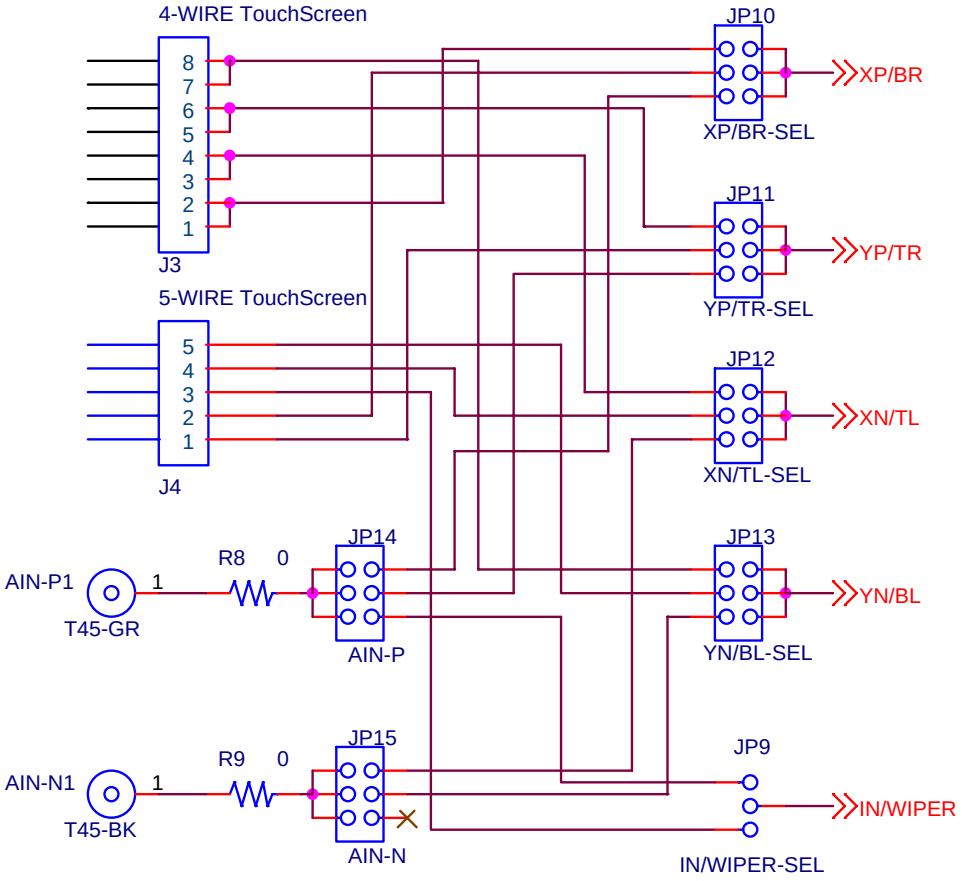


Figure 4. Touch Screen Input Circuits

∗ AKM assumes no responsibility for the trouble when using the above circuit examples.

Control Software Manual

■ Set-up of evaluation board and control software

1. Set up the AKD4185 board.

2. Connect IBM-AT compatible PC with AKD4185 by 10-line type flat cable (packed with AKD4185). Take care of the direction of 10pin header. (Please install the driver in the CD-ROM when this control software is used on Windows 2000/XP. Please refer "Installation Manual of Control Software Driver by AKM device control software". In case of Windows95/98/ME, this installation is not needed. This control software does not operate on Windows NT.)

3. Insert the CD-ROM labeled "AK4185 Evaluation Kit" into the CD-ROM drive.

4. Access the CD-ROM drive and double-click the icon of "akd4185.exe" to set up the control program.

5. Then evaluate according to the follows.

■ Explanation of main window

When runs the control program, the window as shown in Figure 5 opens.

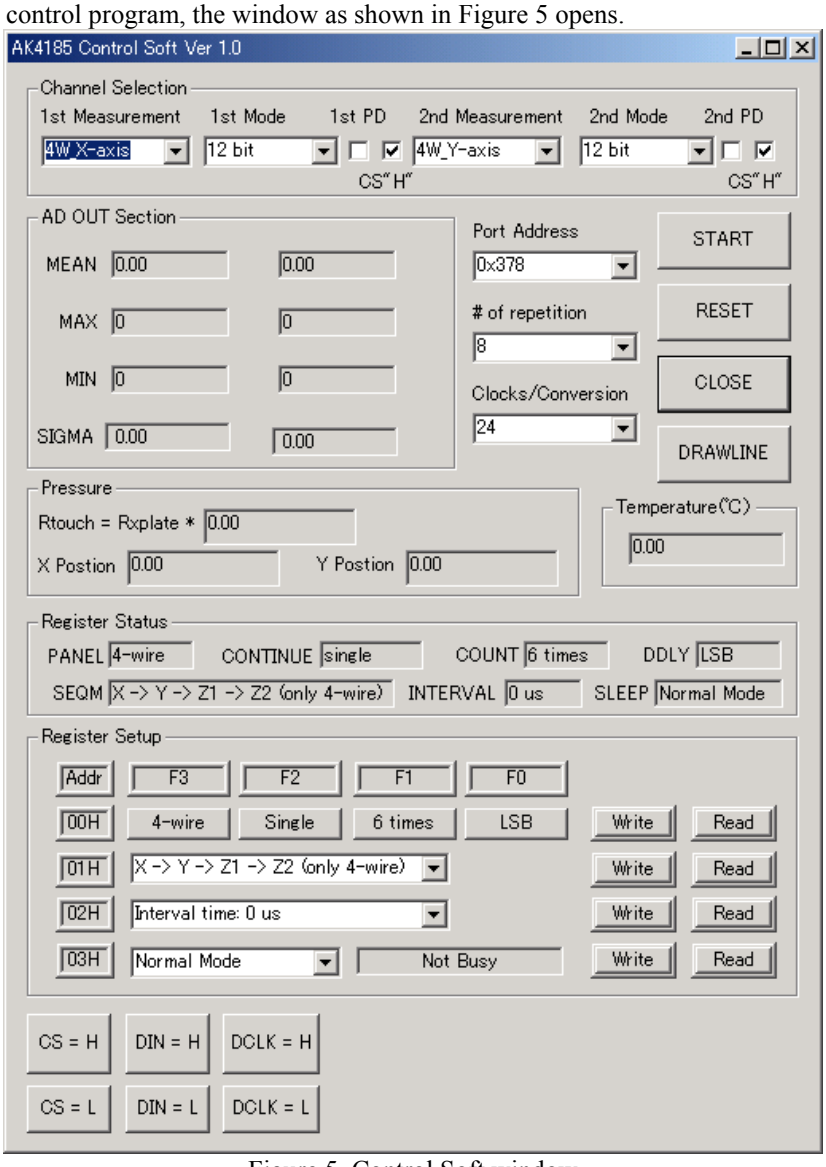


Figure 5. Control Soft window

1. The setup of the AK4185's register.

[Write] : Write registers that is currently displayed.
[Read] : Read registers that is currently displayed.
[Addr] 00H: Check the box, data becomes "H" or "1". If not becomes "L" or "0".
00H-03H: Select data from drop-down list.

* As for the AK4185's register definitions, refer to datasheet of the AK4185.

2. 4-Wire Touch Screen position, pressure and temperature measurement.

Please set the AK4185's register to 4-Wire Touch Screen Operation when using 4- Wire touch screen.
[START]: When select "Channel Selection" and click [START] button with pressing point by the status or finger. The results of measurement are displayed at "AD OUT Section". Display all data on an assistant window. The parameter on the "Channel Selection" corresponds to A2-0 bits, MODE bit and PD bit of the AK4185's control command.

<Example － Touch-position measurement>

a. Select "4W-X-axis" and "12 bit" from drop-down list of "1st Measurement" and "1st Mode". Check the box of "1st PD".
b. Select "4W-Y-axis" and "12 bit" from drop-down list of "2nd Measurement" and "1st Mode". Check the box of "2nd PD".
c. Click [START] button with touching any position on Touch Screen, then start the measurement.
d. Display MEAN, MAX, MIN and SIGMA of measurement results at "AD OUT Section". (Left: X-axis measurement results, Right: Y-axis measurement results) The results are displayed in decimal, and maximum value is "4095". Display data on assistant window. Line up X-axis data at first, next is Y-axis.

<Example － Touch-pressure measurement>

a. Select "4W-Z1" and "12 bit" from drop-down list of "1st Measurement" and "1st Mode". Check the box of "1st PD".
b. Select "4W-Z2" and "12 bit" from drop-down list of "2nd Measurement" and "1st Mode". Check the box of "2nd PD".
c. Click [START] button with touching any position on Touch Screen, then start the measurement.
d. Display touch-pressure measurement results at "Pressure". Rtouch can be requested according to the Rxplate. (Bottom: X-position and Y-position) The results are displayed in float. Display data on assistant window. Line up Z1 data at first, next is Z2.

<Example － Temperature measurement>

a. Select "4W-TEMP0" and "12 bit" from drop-down list of "1st Measurement" and "1st Mode". Check the box of "1st PD".
b. Select "4W- TEMP1" and "12 bit" from drop-down list of "2nd Measurement" and "1st Mode". Check the box of "2nd PD".
c. Click [START] button, then start the measurement.
d. Display temperature measurement results at "Temperature". The results are displayed in float. Display data on assistant window. Line up TEMP0 data at first, next is TEMP1.

3. 5-Wire Touch Screen position and temperature measurement.

Please set the AK4185's register to 5-Wire Touch Screen Operation when using 5- Wire touch screen.
As for the measuring method of 5-Wire Touch Screen, refer to the position and the temperature measurement of 4-Wire touch screen.

* The measurement item "Reserved" is not used, Please do not select it.

4. Setting of measurement mode.

(4-1) External Clock Mode

When any other item is selected from the drop-down list of "1st Measurement" except the item of "INTERNAL", it becomes the external clock mode.

(4-1-1) Single Read

Write "Single" in line [00H] column F2 of the "Register Setup", it becomes the single read mode. The number of measurement can be set by "# repetition" and the number of clocks of each measurement can be changed by "Clock/Conversion".

(4-1-2) Continuous Read

Write "Continuous" in line [00H] column F2 of the "Register Setup", it becomes the continuous read mode. The number of measurement can be set in line [00H] column F1 of the "Register Setup".

(4-2) Internal Clock Mode

When the item of "INTERNAL" is selected from the drop-down list of "1st Measurement", it becomes the internal clock mode. The setup of the internal mode is at line [01H] and [02H] of the "Register Setup".

5. Drawing function.

When button [DRAWLINE] is pushed, the dialog of the drawing function as shown in Figure 6 is opened.

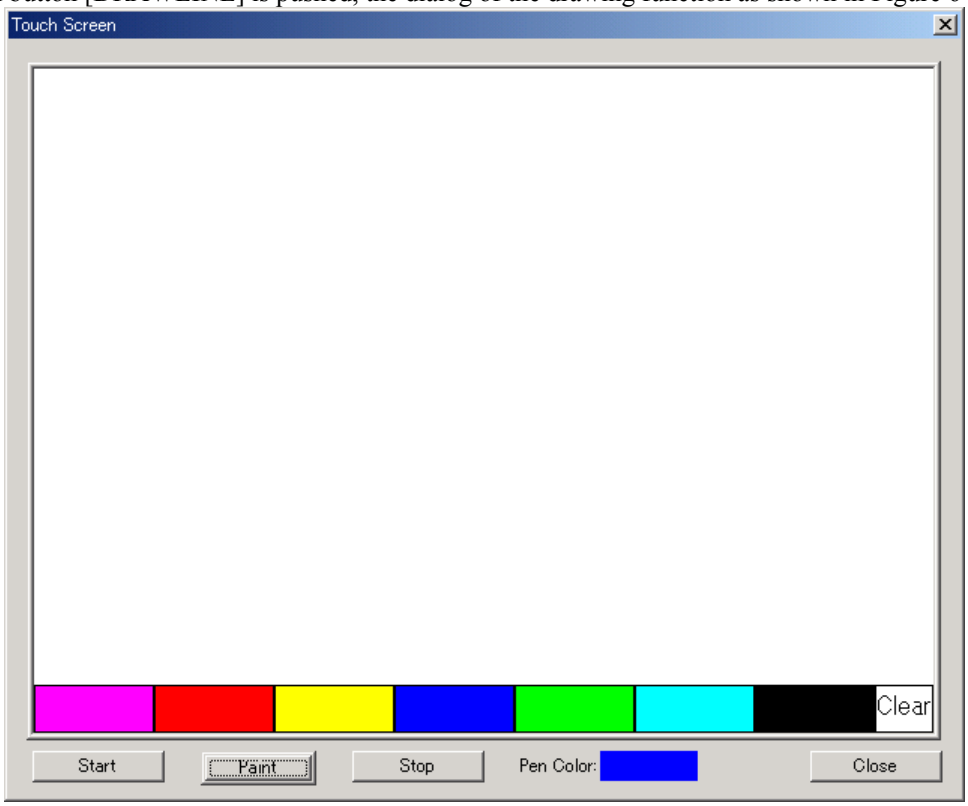


Figure 6. Touch Screen window

[START] : The scanning of the touch panel begins and the screen is cleared when [START] being pushed again.

[Paint/Locate] : When it sets to Paint, and tracing on the touch panel, tracks are displayed on Window. When it sets to Locate, and tracing on the touch panel, the mouse cursor on Window moves. (Shortcut key: Ctrl)

[STOP] : The draw function is stopped.

[Pen Color] : The color of the pen is displayed on time.

[Close] : Returns to the main dialog.

■ Trouble Shooting

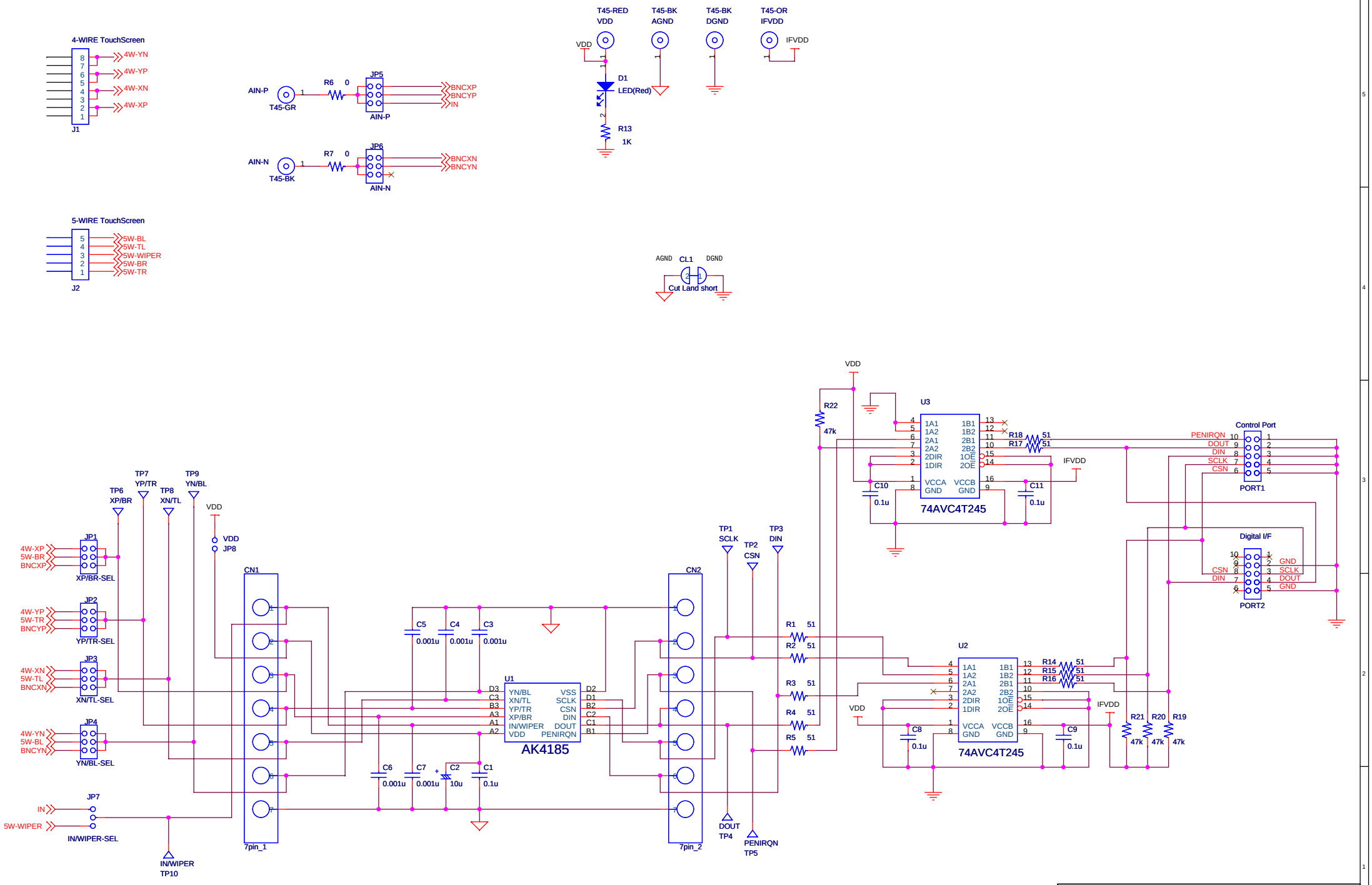
1. Application error is occurred and doesn't start up
   If the operating system is Windows 2000/XP, Please install AKM port driver first.

2. MEAN value in AD OUT section does not change when click start button (cannot write control command to AK4185)
   Please set the port address to your PC platform environment.

3. The MEAN, MAX, MIN value doesn't change wherever the pen pushes down on the panel.
   There is a possibility of the trouble of the contact of the relay connector that connects the touch panel. Please open JP1, 2, 3, 4, and 7 on the evaluation board, measure panel seat resistance, and check the resistance. Generally, the panel seat resistance is hundreds of Ω. There is a possibility that the touch panel is not correctly connected if the value is over thousands of KΩ. Please connect the relay connector and check the resistance value again.

Revision History

Date (yy/mm/dd)	Manual Revision	Board Revision	Reason	Page	Contents
07/11/02	KM090700	0	First edition		



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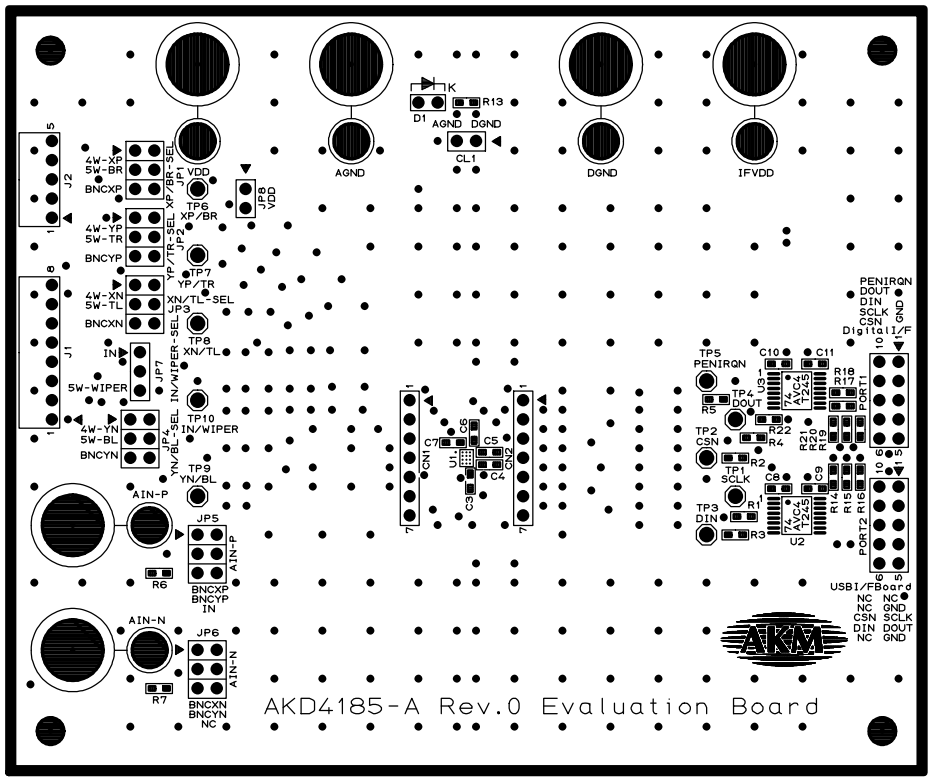
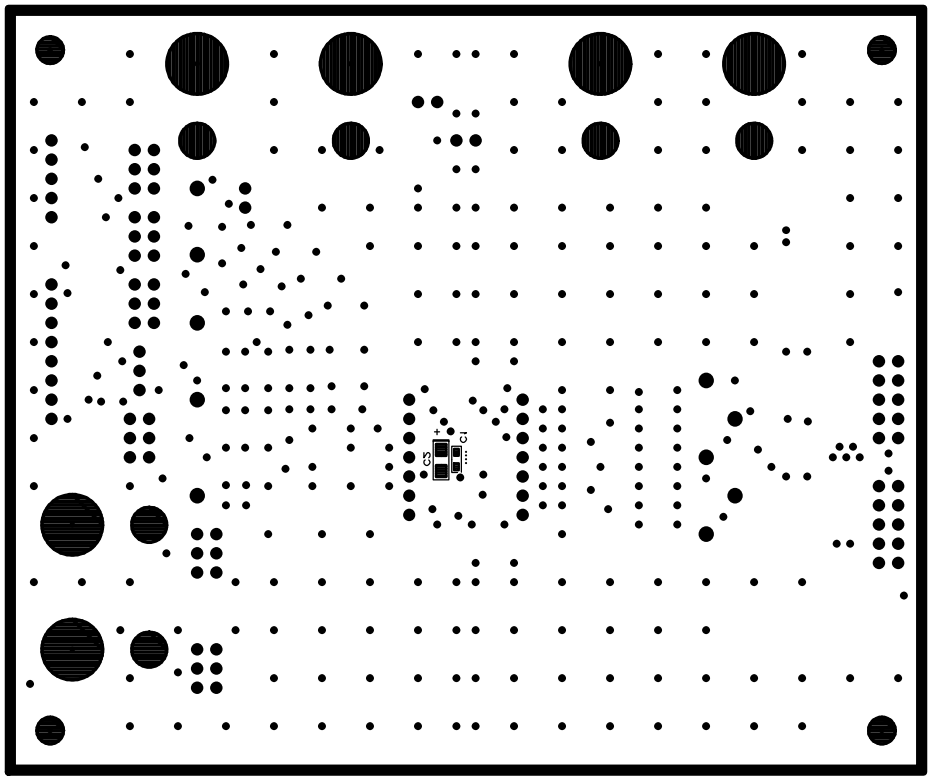
Size A3	Document Number AKD4185	Rev 0
Date: Friday, November 02, 2007	Sheet 1 of 1	



AKD4185-A L1 SILK



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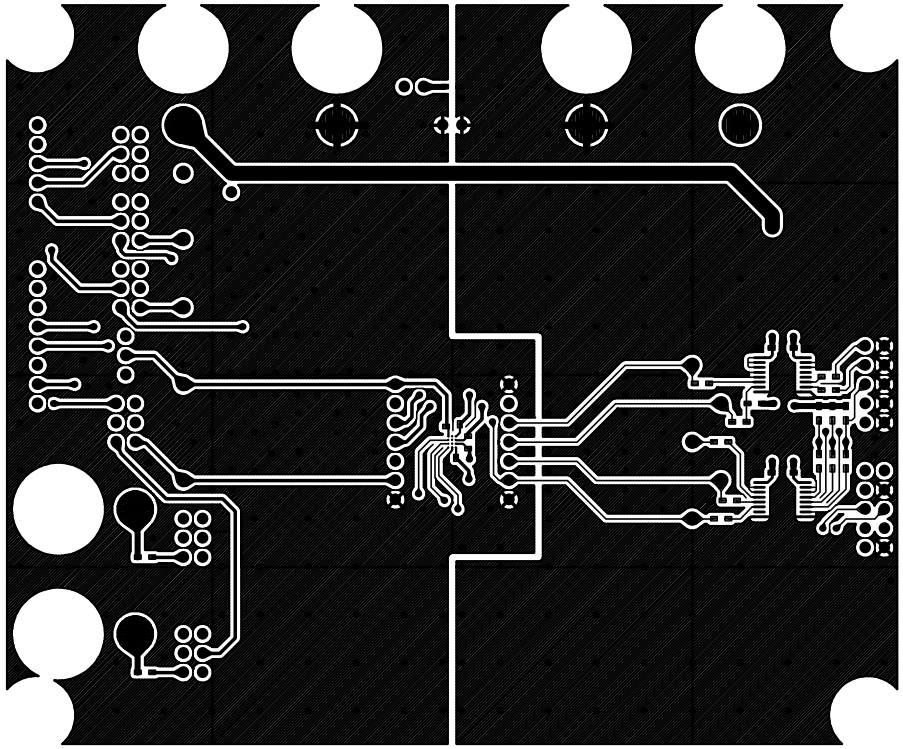

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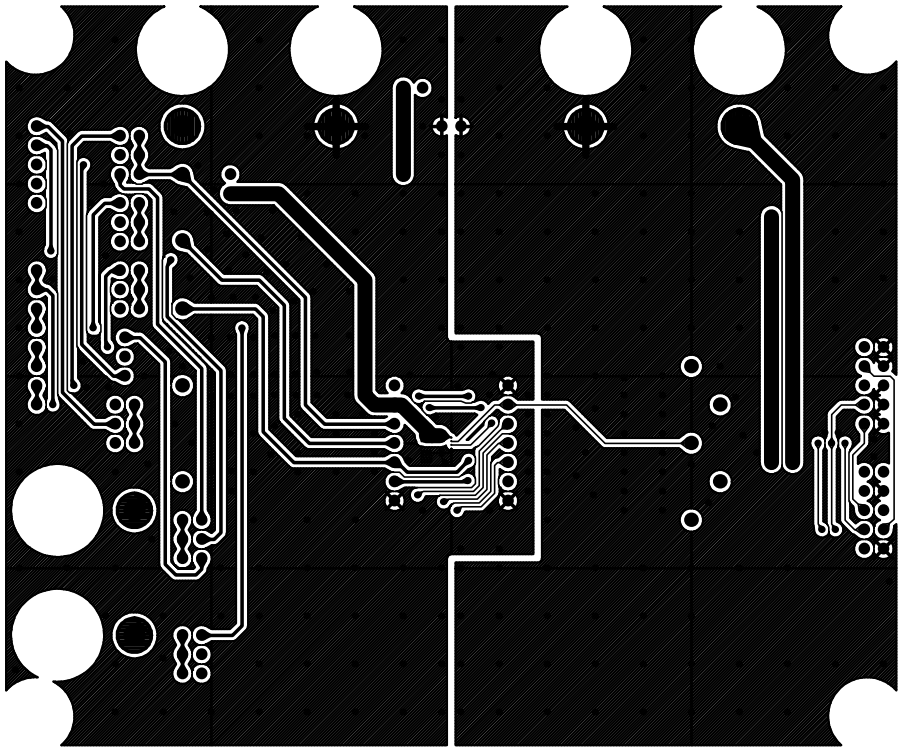

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