ANALOG DEVICES

Dual Variable Gain Amplifier

DATASHEET AD605-EB

FEATURES

Full Flexibility of Configurations

On-Board Control Pots

Multiple Inputs and Output Connectors

Locations for Optional Components

General Considerations

The AD605 Evaluation Board is designed to conveniently configure the AD605 in any of its various intended operating modes. The use of multiple input connections, test points on major signals, jumper selectable options, and on-board pots for setting adjustable dc operating conditions offer great convenience and time saving for evaluating different circuit configurations.

Because of this flexibility, not all component positions on the board are populated when the board is shipped, and the installation of (or changing of) additional parts is left as an option for the user. The following details some recommended ways for operating and completing the board to realize some desired functions.

Power Supplies

The board is powered by a single +5V supply that can be connected via standard banana plugs to jacks J9 (+5V) and J10 (GND). The silk screen labels on the board specify the proper connections. The board will draw about 55-60 mA depending on the load. This figure is offered only to help to size the power supply to run the evaluation board and not to specify the operating current of the AD605. Please refer to the AD605 data sheet for device specifications.

Input Connections

Each channel of the AD605 can be driven either differentially or single-ended. BNC connectors are provided to accept signals for both the positive and negative inputs.

A series capacitor is required for each of the AD605 inputs to provide the proper dc operating point at the device inputs.The capacitors for INPx and INMx should be of equal value for the two AD605 inputs on a single channel. The additional impedance seen by each input (nominally to ground) should also be matched to each other to minimize the noise of the circuit.

The input impedances to the AD605 are relatively low–on the order of 175 . If it is desired to provide a nominal 50 termination for the input signal, then a 66.5 (nearest 1% value) resistor should be placed in shunt to ground across the input to provide the proper termination. This resistor should be placed outside the series input capacitor so as to not upset the dc operating conditions at the inputs to the AD605. The AD605 input resistors are the following: INM1–R4, INP1–R3, INP2–R6, INM2–R5.

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Single-ended AD605 Input

A single-ended input to the AD605 is applied to the INPx input for a non-inverting configuration via either J3 (CH1) or J4 (CH2). When operating single-ended, the opposite input must be ac connected to ground. The capacitor should be the same value as that used on the active input. The input connections can be reversed in order to obtain an inverting function.

For convenience, a shorting clip can be installed at JP2 to connect INM1 to ground via C2. Likewise, a shorting clip at JP3 will connect INM2 to ground via C5.

Outputs

The AD605 outputs are available on J8 and J7 for channels 1 and 2 respectively. Each output has a position for a series resistor resistor that can be used for back termination in a cable driving situation. There is also a series capacitor in each output that can be used for dc-blocking in situations where this is desirable.

There are, however, situations where either or both the series resistor or capacitor is not desired. In these situations, it is necessary to short across the resistor, capacitor or both in order to make connection to the output connectors.

Setting DC Operating Conditions

Various dc operating voltages can be conveniently set by using the on-baord pots. These include the gain of either channel, GN1 and GN2; the reference voltage, VREF; and the output common mode voltage VOCM. Each of these can be controlled by the supplied1k pots between the +5V supply and ground. The wiper of the pot supplies the voltage which can vary anywhere in this range.

R2 can be used to control the dc voltage for GN1. To use this method of adjustment, install a shorting clip at JP1 and adjust R2 to obtain the desired voltage, which can be monitored via TP1. If an ac signal is desired, remove JP1 and apply the gain control signal to J1. A resistor can be installed at R1 to terminate this signal.

R8 can be used to control the dc voltage for GN2. To use this method of adjustment, install a shorting clip at JP4 and adjust R8 to the desired voltage, which can be monitored via TP6. If an ac voltage is desired, remove JP4 and apply the gain control signal to J6. A resistor can be installed at R7 to terminate this signal.

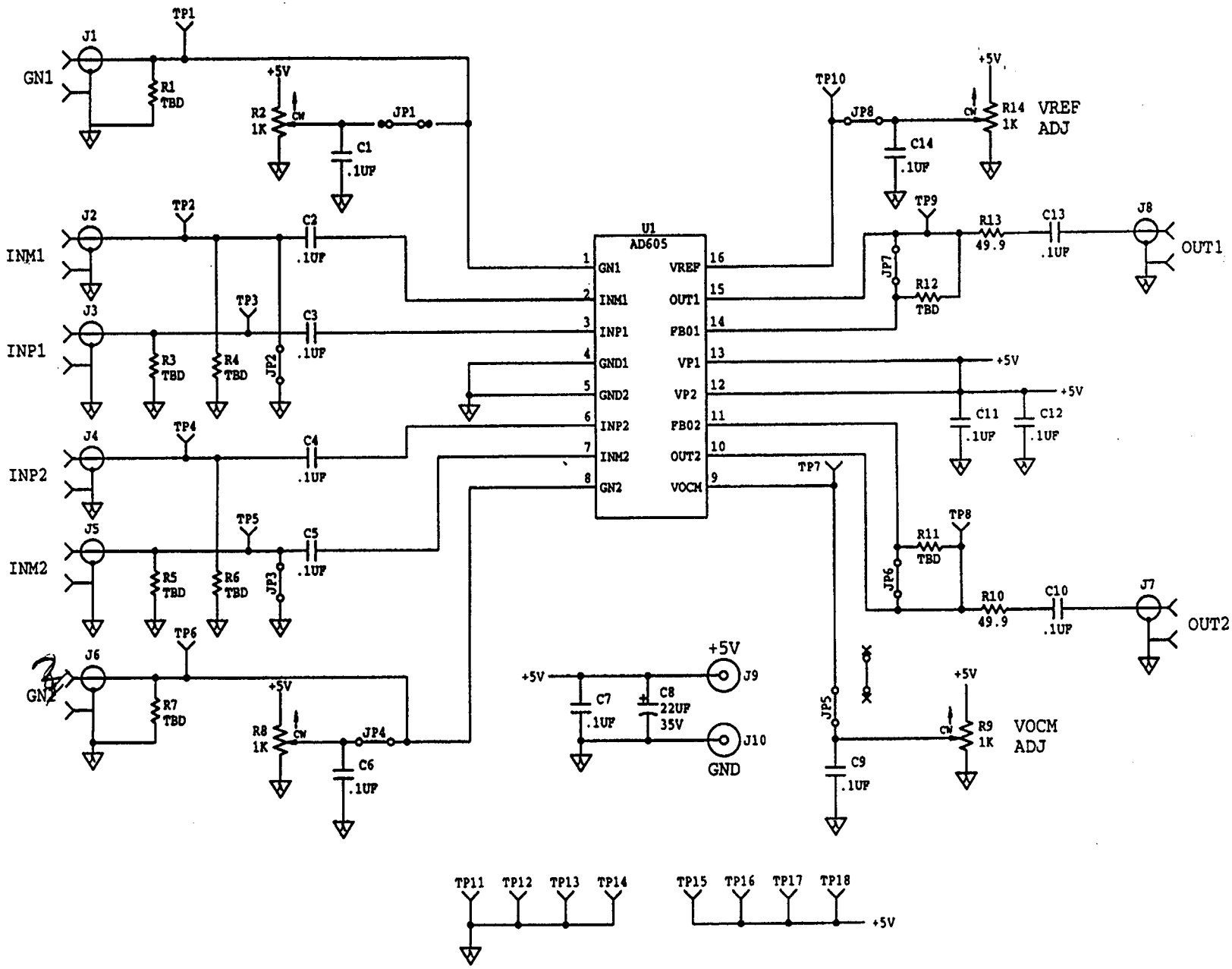
R14 is a pot that can be used to vary the gain-scaling or reference voltage VREF. This voltage is common to both channels of an AD605 and it controls the gain scaling. To enable this action, install a shorting clip at JP8 which connects VREF with the wiper of R14. Turning R14 will now vary the voltage on VREF.

R9 can be used to vary the output common mode voltage VOCM of both channels of the AD605. To enable this action, install a shorting clip at JP5 which connects VOCM to the wiper of R9. Turning R9 will now vary the voltage on VOCM. JP5 can be removed and an on-chip voltage divider on the AD605 will now set the output common mode voltage at the outputs.

List of Jumpers and Their Functions

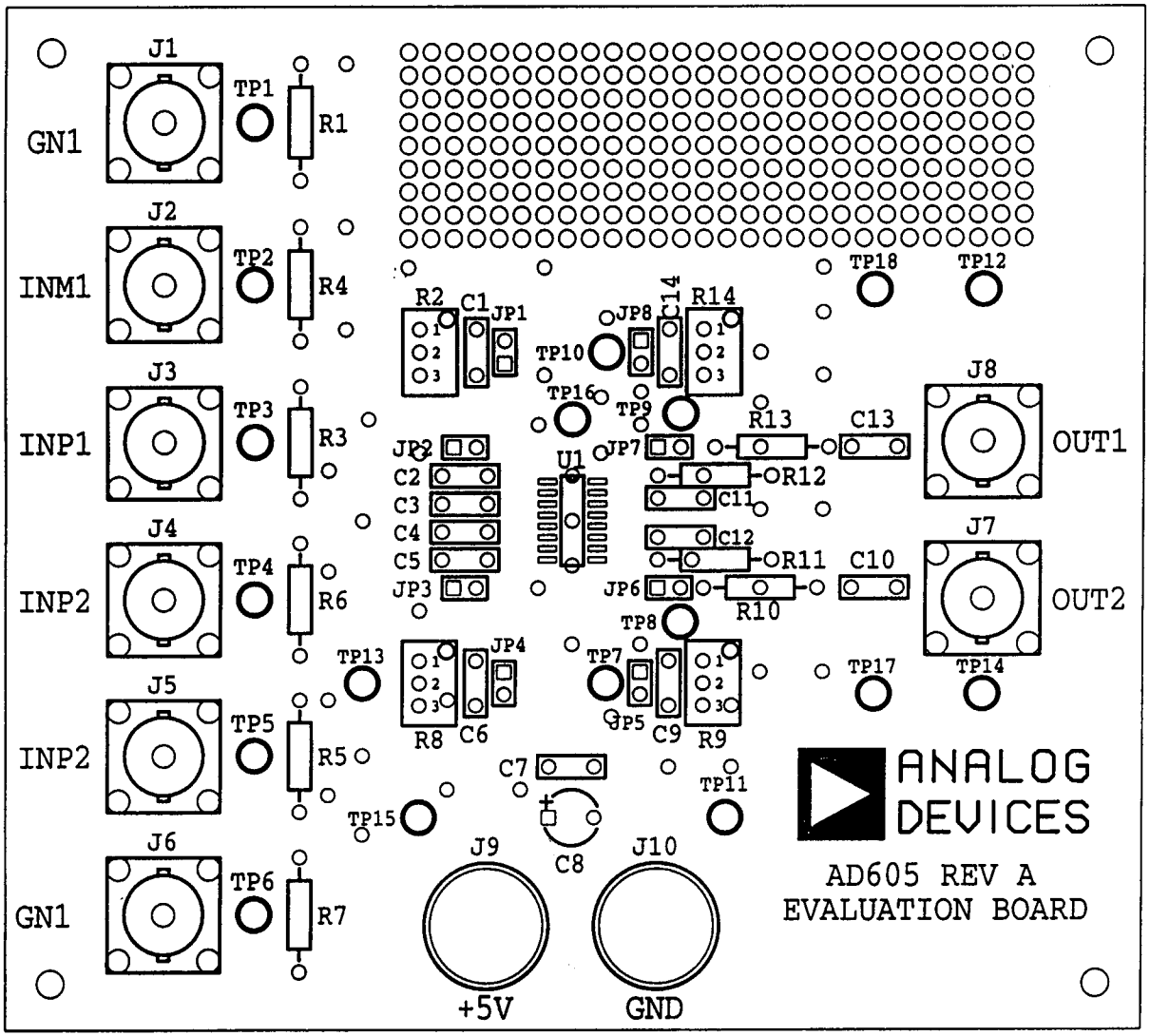
JP1	Connects the wiper of R2 to GN1 to use dc to set the gain of channel 1. Remove to supply an ac signal to GN1 via J1

JP2	Connects INM1 to Ground via C2
JP3	Connects INM2 to Ground via C5
JP4	Connects the wiper of R8 to GN2 to use dc to set the gain of channel 2. Remove to supply an ac signal to GN2 via J6
JP5	Connects VOCM to the wiper of R9 to adjust its voltage. Remove JP5 to set VOCM via AD605 internal biasing.
JP6	Used to control the gain control range of CH2. With no shorting clip installed at JP6, the gain range of CH2 is from 0 dB to 48.4 dB. With a shorting clip installed at JP6, the gain control range is from -14 dB to 34.4 dB.
JP7	Used to control the gain control range of CH1. With no shorting clip installed at JP7, the gain range of CH2 is from 0 dB to 48.4 dB. With a shorting clip installed at JP7, the gain control range is from -14 dB to 34.4 dB.
JP8	Connects the wiper of R14 to VREF to adjust its voltage.



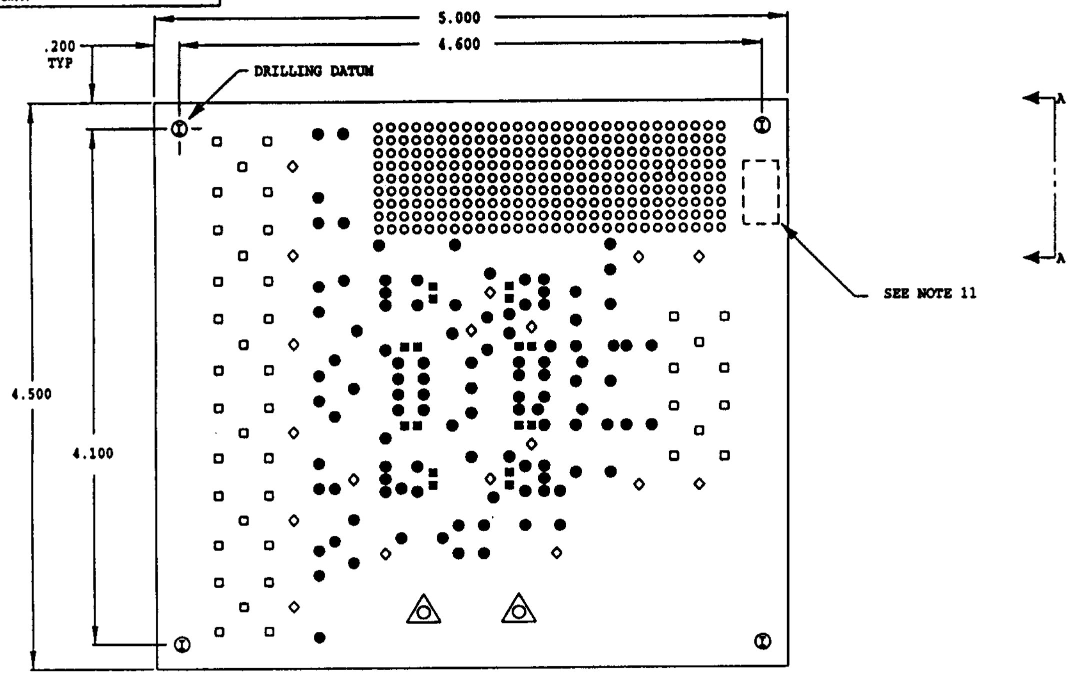
AD605 REV A EVALUATION BOARD

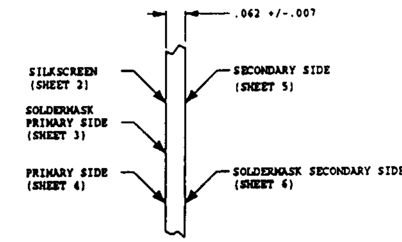
4/27/96



ANALOG DEVICES	AD605 EVALUATION BOARD REV A ASSEMBLY - PRIMARY SIDE SHEET 1 OF 1

REV	ECO	DESCRIPTION	DWN	APPLD	DATE





VIEW A-A
SCALE: NONE

HOLE LEGEND			
SYM	HOLE SIZE	COMENTS	QTY
●	.032-.038 DIA.	AFTER PLATING	108
■	.035-.041 DIA.	AFTER PLATING	16
○	.043-.049 DIA.	AFTER PLATING	252
□	.052-.058 DIA.	AFTER PLATING	40
◇	.059-.065 DIA.	AFTER PLATING	18
△	.265-.275 DIA.	AFTER PLATING	2
Ⓣ	.120-.130 DIA.	DO NOT PLATE	4

NOTES

1. MATERIAL: 2LYR,.062+/-.007 THICK FR4 GLASS-EPOXY LAMINATE, 1 OZ. COPPER CLAD BOTH SIDES.
2. PLATED THRU HOLES AND THE CONDUCTIVE PATTERN ELECTROPLATED WITH .001 INCH MIN. THICK COPPER. TERMINAL AREAS AND PLATED THRU HOLES TO BE COATED WITH 60/40 TIN-LEAD AND HOT AIR LEVELED.(SOLDER MASK OVER BARE COPPER).
3. PLATING (WHEN REQUIRED): EDGE CONNECTOR, TO BE ELECTROPLATED WITH .00005 INCH MIN. OF GOLD OVER .00005 INCH MIN. OF NICKEL.
4. PROCESSING TOLERANCES:
   A. CONDUCTIVE PATTERN FRONT TO BACK REGISTRATION WITHIN .005 INCH TOTAL.
   B. MINIMUM ANNULAR RING SURROUNDING HOLES .005 INCH.
   C. FINISHED CONDUCTIVE PATTERN WITHIN .002 INCH OF TRUE SIZE.
5. WARP AND TWIST WITHIN .010 INCH PER INCH.
6. DIMENSIONS: ARE FOR THE FINISHED PART.
7. SOLDER MASK: LIQUID PHOTO IMAGEABLE SOLDER MASK OVER BARE COPPER (SMOBC), COLOR GREEN, BOTH SIDES USING PATTERN(S) PROVIDED, NO MASK PERMITTED ON THE TERMINAL AREAS. SOLDER MASK TO ETCH REGISTRATION WITHIN .005 INCH TOTAL.
8. SCREENING: SCREEN COMPONENT OUTLINES AND NOMENCLATURE USING INDELIBLE WHITE INK ON THE COMPONENT SIDE USING THE PATTERN PROVIDED. NOMENCLATURE SHALL BE LEGIBLE. SCREEN TO ETCH REGISTRATION WITHIN .020 INCH TOTAL.
9. SURFACES: PUNCHED OR MACHINED SURFACES 125 MICRO INCHES RMS MAX.
10. BREAK ALL SHARP EDGES .015 R MAX.
11. FABRICATION VENDOR TO ADD UL VENDOR NUMBER IN THIS AREA ON THE CIRCUIT SIDE.

NEXT ASSY | USED ON
APPLICATION

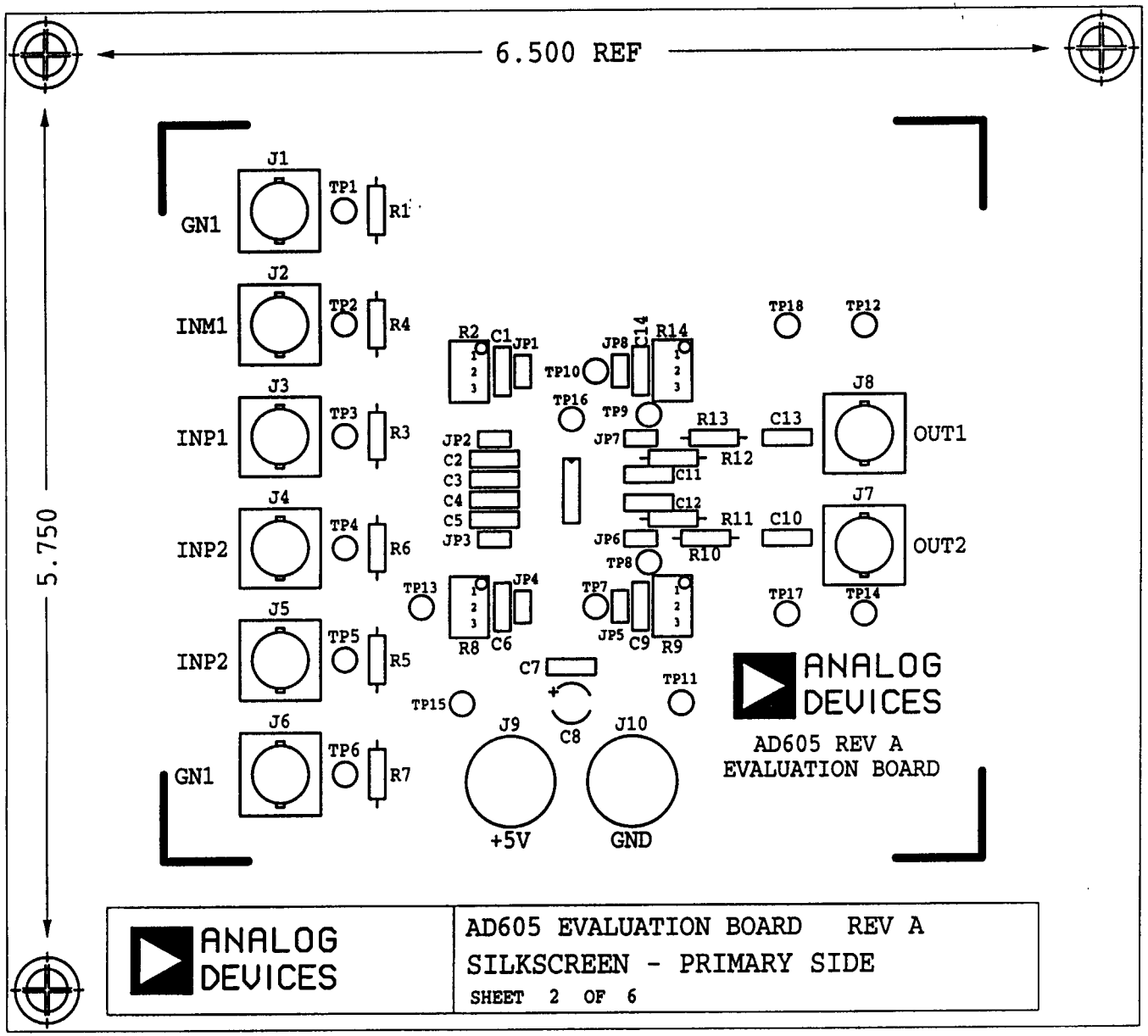
MATERIAL
SEE NOTE 1
FINISH
SEE NOTE 2
APPLICABLE STANDARDS

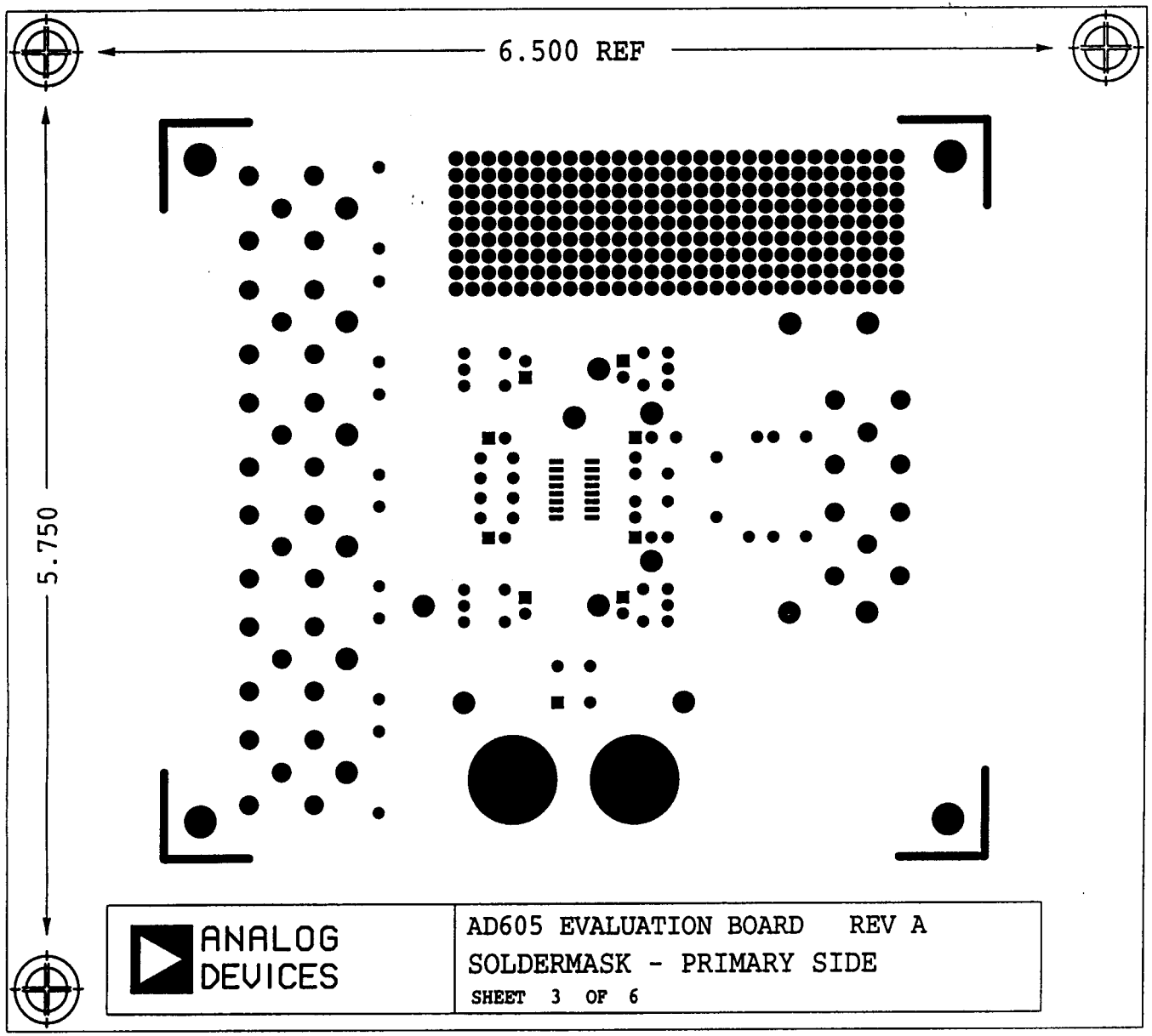
CHECKED
ENGINEER
QUALITY CONTROL
PRODUCTION
WEIGHT

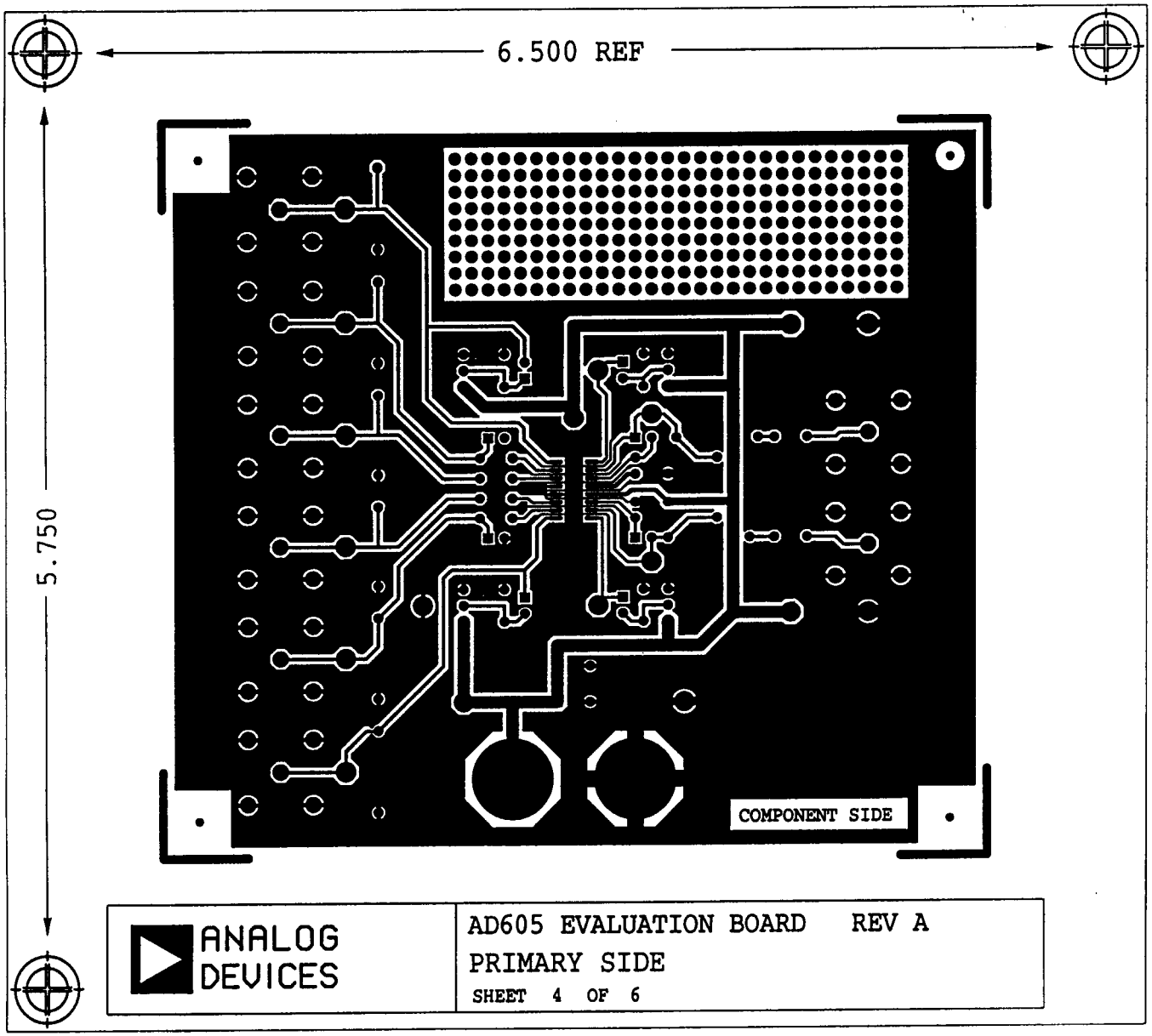
ANALOG DEVICES

FABRICATION
AD605
EVALUATION BOARD

CODE IDENT NO. | SIZE D | AD605
SCALE 2/1 | SHEET 1


6.500 REF
5.750
J1
GN1
TP1
R1
J2
INM1
TP2
R4
J3
INP1
TP3
R3
J4
INP2
TP4
R6
J5
INP2
TP5
R5
J6
GN1
TP6
R7
R2
C1
JP1
JP8
C14
R14
TP10
TP16
TP9
TP18
TP12
J8
OUT1
JP7
R13
C13
R12
C11
C12
R11
C10
JP6
R10
J7
OUT2
TP8
TP13
TP7
TP17
TP14
JP2
C2
C3
C4
C5
JP3
JP4
R8
C6
JP5
C9
R9
C7
C8
TP15
TP11
J9
J10
+5V
GND
ANALOG DEVICES
AD605 REV A
EVALUATION BOARD
ANALOG DEVICES
AD605 EVALUATION BOARD REV A
SILKSCREEN - PRIMARY SIDE
SHEET 2 OF 6


6.500 REF
5.750
ANALOG DEVICES
AD605 EVALUATION BOARD REV A
SOLDERMASK - PRIMARY SIDE
SHEET 3 OF 6


6.500 REF
5.750
COMPONENT SIDE
ANALOG DEVICES
AD605 EVALUATION BOARD REV A
PRIMARY SIDE
SHEET 4 OF 6