

IS31AP4833 Treble and Bass Control With 3D Enhancement Audio Power Amplifier Evaluation Board Guide

Description

The IS31AP4833 is a treble and bass control with 3D enhancement audio power driver. The IS31AP4833 provides tone (bass and treble) controls and volume control as well as a stereo audio power amplifier capable of delivering 2.8W into 4Ω with less than 10% THD with a 5V supply.

Features

- 3.0V to 5.5V supply
- Mute control
- Treble and bass control
- Independent volume control for two channels
- Stereo input MUX
- I2C control interface
- 3D enhancement
- Thermal shutdown protection
- Click-and-pop suppression
- TQFP-48(7mm x 7mm) package

Quick Start

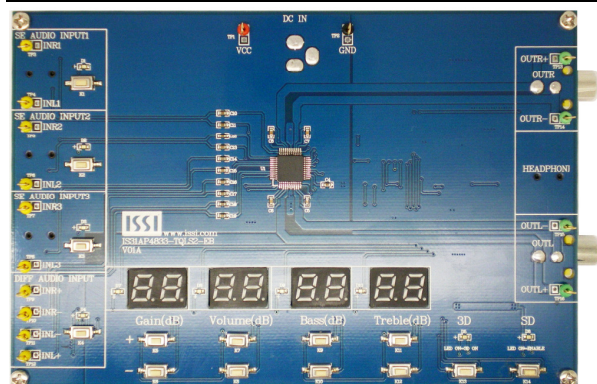


Figure 1: Photo of IS31AP4833 Evaluation Board

Recommended Equipment

- 5.0V, 2A power supply
- Audio source (i.e. MP3 player, Notebook PC, etc.)
- A pair speakers (4 Ω or 8 Ω)
- Headphone (32Ω)

Absolute Maximum Ratings

- ≤ 5.5V power supply

Caution: Do not exceed the conditions listed above; otherwise the board will be damaged.

Procedure

The IS31AP4833 demo board is fully assembled and tested. Follow the steps listed below to verify board operation.

Caution: Do not turn on the power supply until all connections are completed.

- 1) Connect a pair 4Ω (or 8Ω) speakers across the (OUTR+, OUTR-) terminals and (OUTL+, OUTL-) terminals. Or connect speakers to the connector (OUTR, OUTL) or connect headphone (32Ω) to the connector (HEADPHONE).
- 2) Connect the ground terminal of the power supply to the GND and the positive terminal to the VCC. Or connect DC power to connector (DC IN).
- 3) If the audio sources are stereo, connect the audio sources to one of the three inputs (SE AUDIO INPUT1~ SE AUDIO INPUT3), or connect audio source to the audio connector (3.5mm) and press one of the three buttons (K1~K3) to select one input.
- 4) If the audio sources are differential, connect to the audio sources to (INL+, INL-) terminals (left channel) and (INR+, INR-) terminals (right channel) and press button K4 to select the differential input.
- 5) Turn on the power supply.
- 6) Turn on the audio sources

Ordering Information

Part No.	Temperature Range	Package
IS31AP4833-TQLS2-EB	-40°C to +85°C (Industrial)	TQFP-48, Lead-free

Table 1: Ordering Information

For pricing, delivery, and ordering information, please contact ISSI's analog marketing team at analog_mkt@issi.com or (408) 969-6600

Performance Description

IS31AP4833 demo board has 14 buttons to control various functions:

- 1) KEY14 button control chip enabled. When D6 point in the open, press the button to switch to shut down at the same time D6 is off. The power-on defaults for the chip is turned on.
- 2) KEY13 button controls chip 3D enabled. D5 light is turned on, press the button to switch to shut down while D5 is off. The power-on default closed for the 3D.
- 3) KEY1~KEY4 selected as the input source, corresponding to the SE AUDIO INPUT1 ~ 3 DIFF AUDIO INPUT, the button is pressed for a valid audio input, the corresponding LED will be lit. Power-on default INPUT1.
- 4) KEY5、KEY6 is audio input gain adjustment. The top of the digital display gain and negative gain, D7 lights. Gain control range of -15dB ~ +6 dB. KEY5 to increase the gain while KEY6 to reduce the gain. The power-on default gain setting is +3 dB.
- 5) KEY7、KEY8 is to adjust the volume of the left and right channels. The same Display method which shown as above. Gain control range of -42dB ~ +12 dB. KEY7 to increase

the gain setting while KEY8, to reduce the gain setting. The power-on default setting is -12dB.

- 6) KEY9、KEY10 is for bass gain adjustment. The same display method which shown as above. Gain control range of -12dB ~ +12 dB. KEY9 for increase the gain setting while KEY10, to reduce the gain setting. The power-on default is +0 dB.
- 7) KEY11、KEY12 is for treble gain adjustment. The same display method which shown as above. Gain control range of -12dB ~ +12 dB. KEY11 for increase the gain setting while the KEY12 to reduce the gain setting. The power-on default is +0 dB.
- 8) Other detailed settings please refer to the IS31AP4833 user guide instructions.

***Note:**

IS31AP4833 solely controls the Audio function on the evaluation board.

Software Support

Please refer to the integrated program.

***Note:**

Please refer to the datasheet to get more information about IS31AP4833

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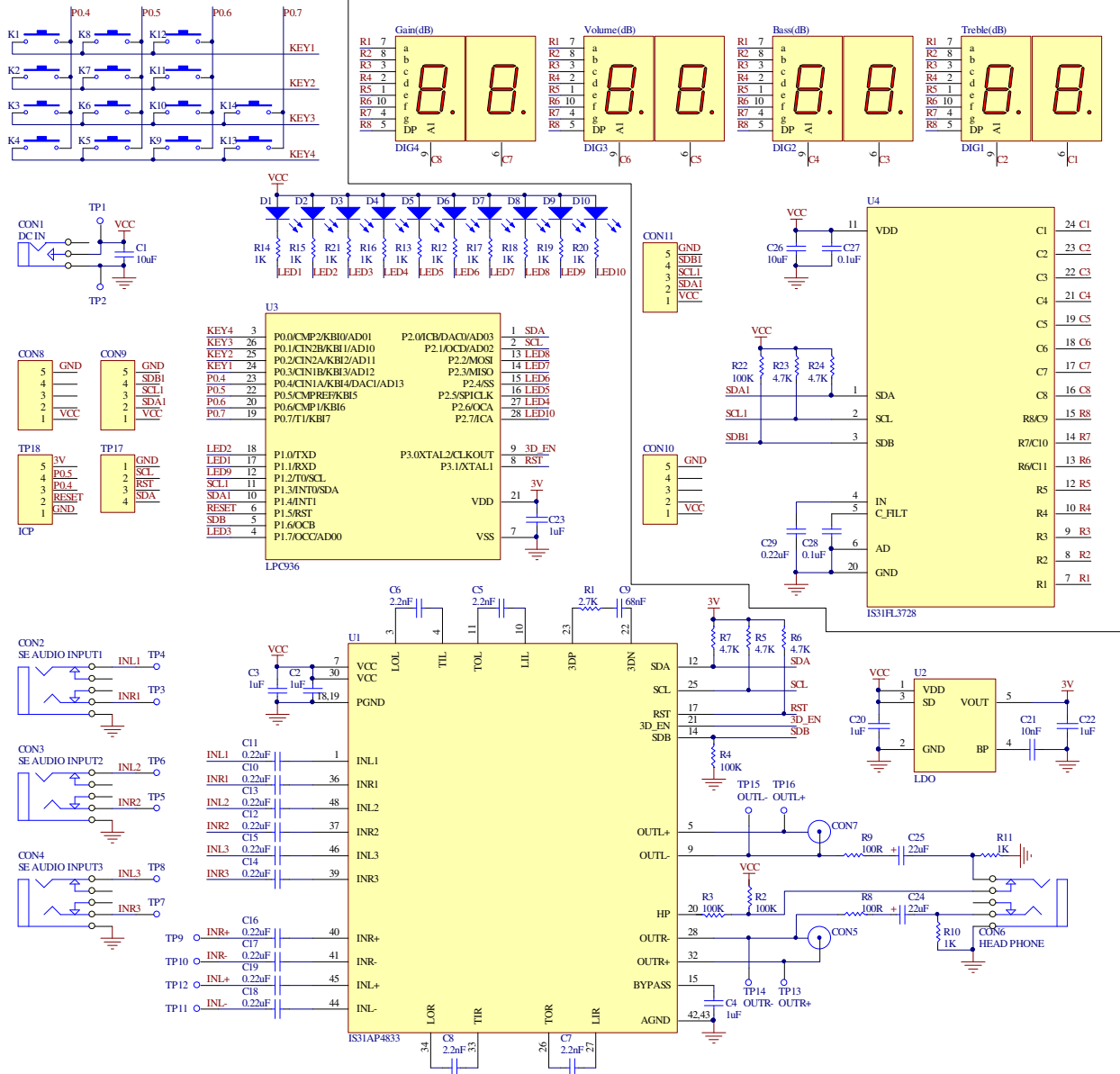


Figure 2: IS31AP4833 Application Schematic

Bill of Materials

Name	Symbol	Description	Qty	Supplier	Part No.
Audio Amplifier	U1	ClassAB Audio Amplifier	1	ISSI	IS31AP4833
LDO	U2	Low-dropout Regulator	1	PAM	PAM3101
MCU	U3	Microcontroller	1	NXP	LPC922
LED Driver	U4	Array LED Driver	1	ISSI	IS31FL3728
Displays	DIG1~DIG4	Dual Digit Display Common Cathode	4	ZSO	2281AS
Diodes	D1~D6	Diode, LED Blue, SMD	6	Everlight	19-217/BHC-ZL 1M2RY/3T
Diodes	D7~D10	Diode, LED Red, SMD	4	Everlight	19-217/BHC-ZL 1M2RY/3T
Resistor	R1	RES,2.7k,1/16W,±5%,SMD	1		
Resistors	R2~R4,R22	RES,100k,1/16W,±5%,SMD	3		
Resistors	R5~R7,R23,R24	RES,4.7k,1/16W,±5%,SMD	5		
Resistors	R8,R9	RES,100R,1/16W,±5%,SMD	2		
Resistor	R10~R21	RES,1k,1/16W,±5%,SMD	12		
Capacitors	C1,C26	CAP,10μF,16V,±20%,SMD	2		
Capacitors	C2,C3,C4,C15, C17,C23	CAP, 1μF,16V,±20%,SMD	6		
Capacitors	C5,C6,C7,C8	CAP, 2.2nF,16V,±20%,SMD	4		
Capacitor	C9	CAP,68nF,16V,±20%,SMD	1		
Capacitors	C10~C19,C29	CAP, 0.22μF,16V,±20%,SMD	11		
Capacitor	C21	CAP,10nF,16V,±20%,SMD	1		
Capacitors	C24,C25	CAP, 22μF,10V,±20%,SMD	2		
Capacitors	C27,C28	CAP, 0.1μF,16V,±20%,SMD	2		
Buttons	K1~K14	Button SMD	14		

Table 2: Bill of Materials, refers to Figure 2 above.

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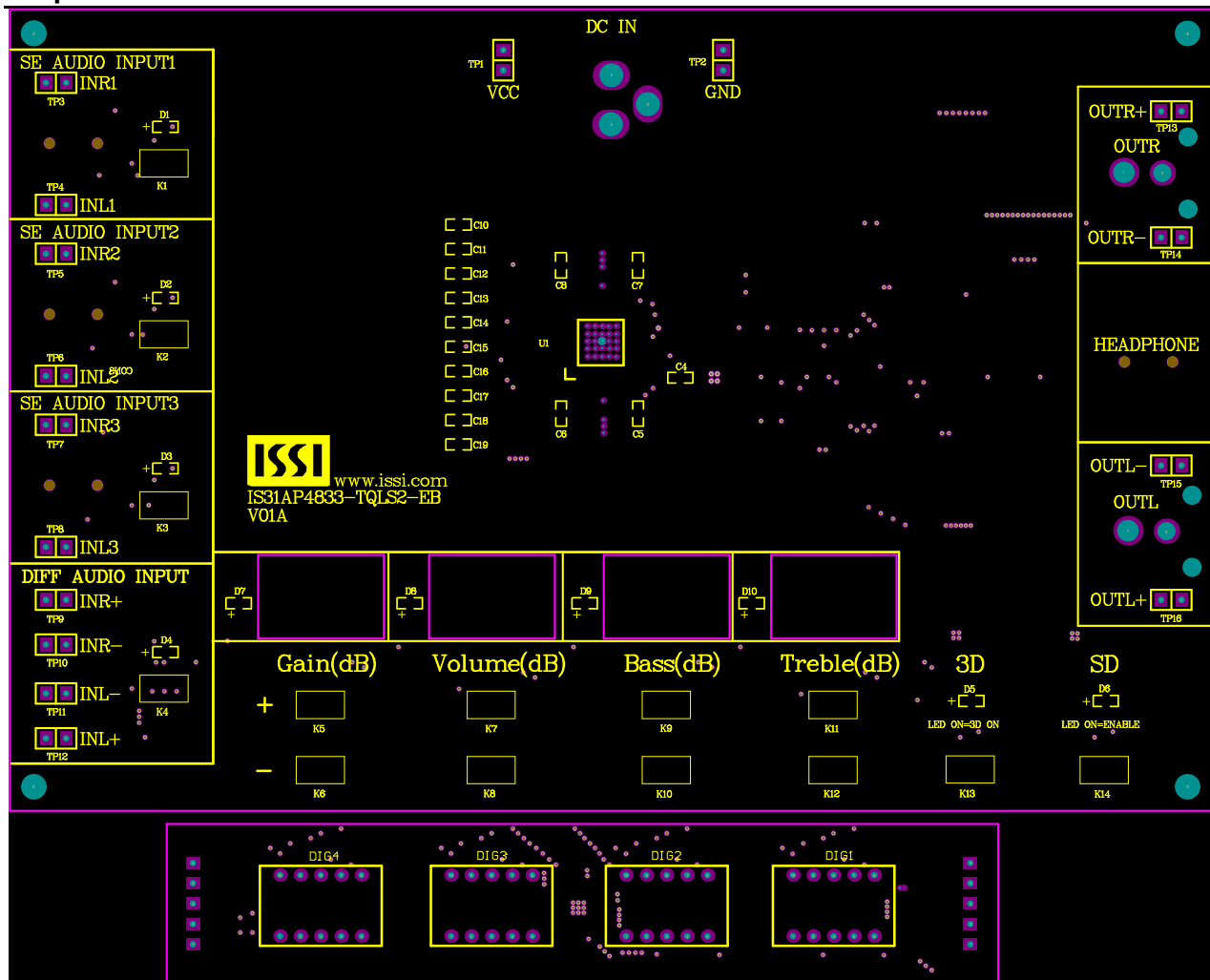


Figure 3: Board Component Placement Guide -Top Layer

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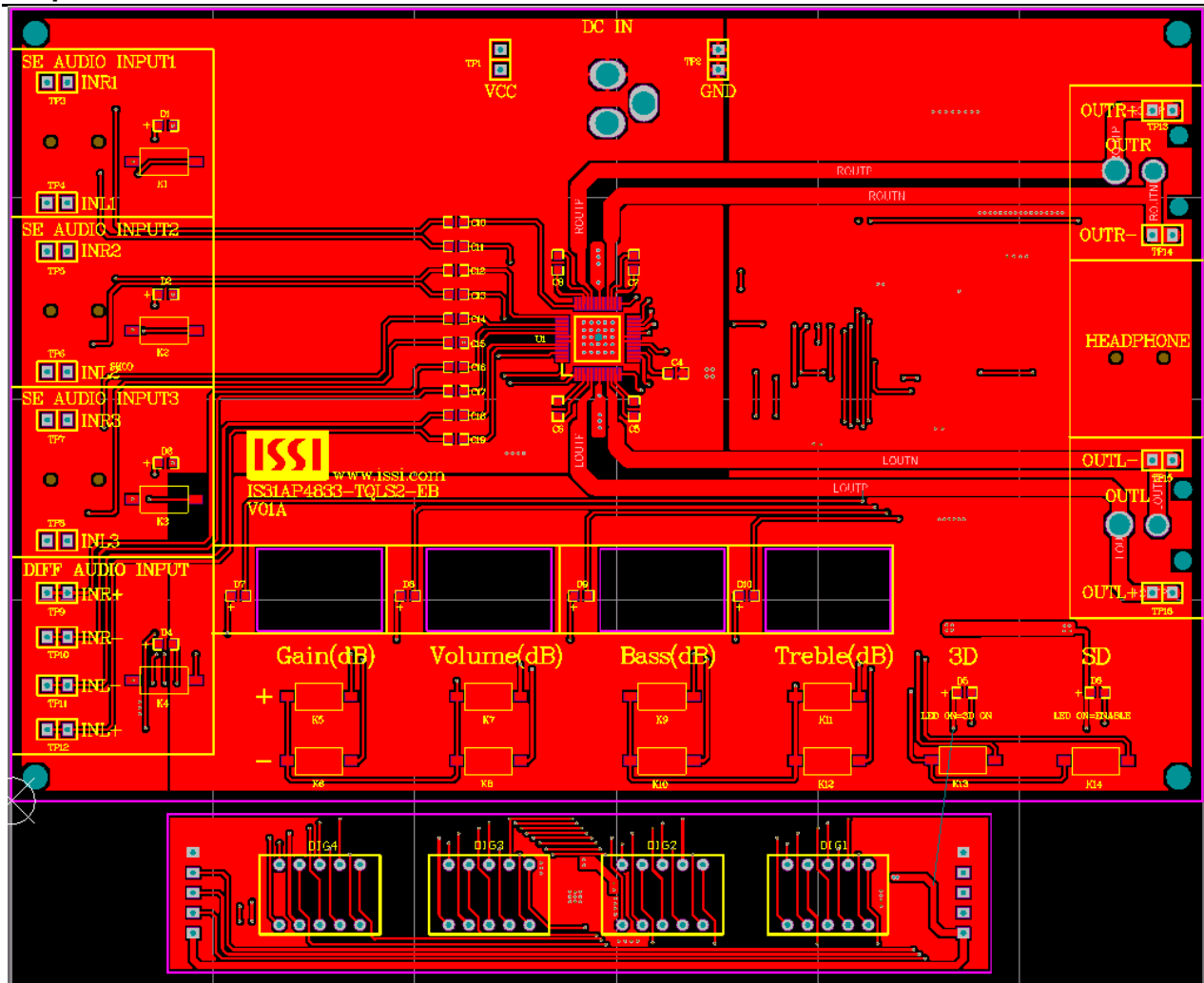


Figure 4: Board PCB Layout- Top Layer

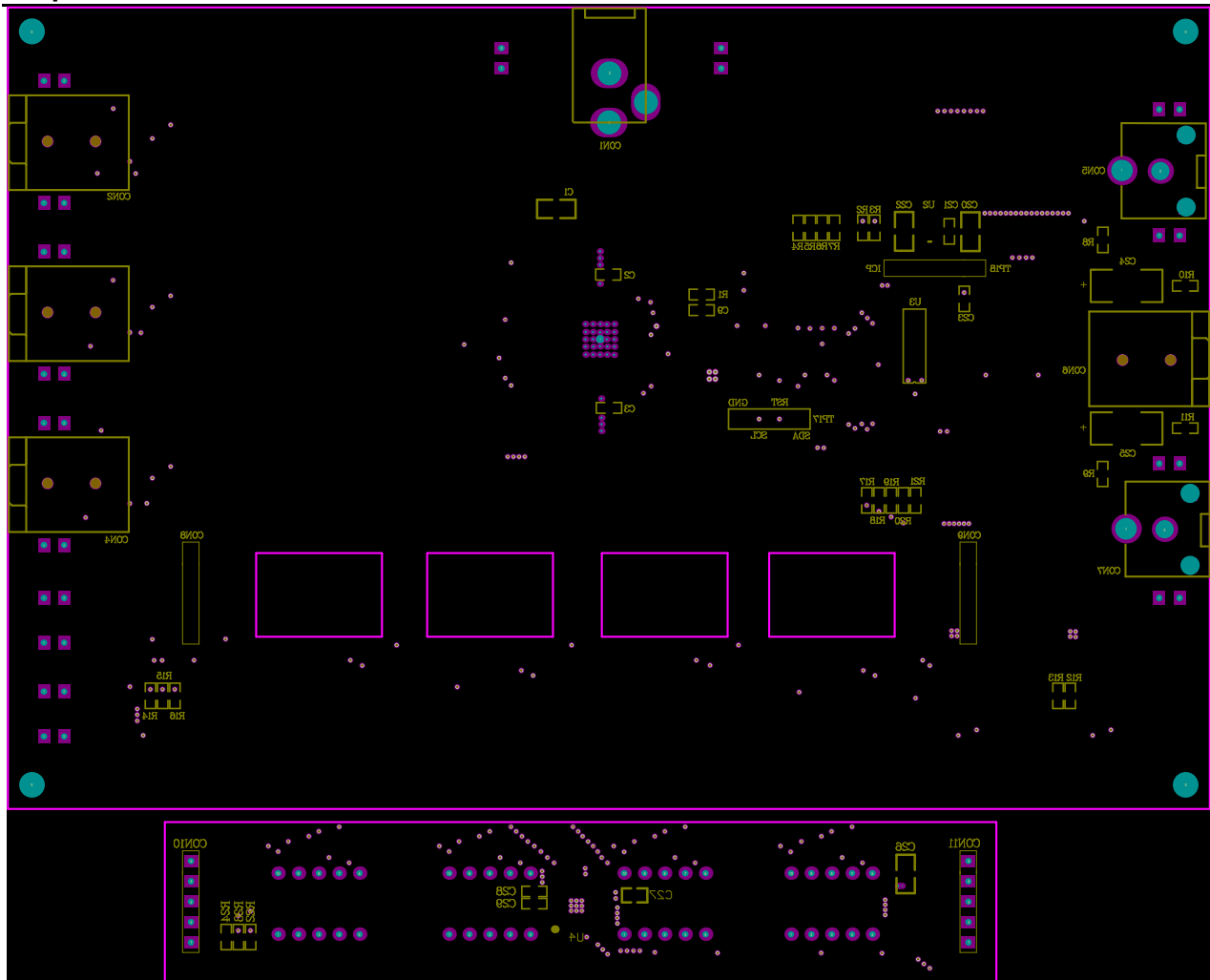


Figure 5: Board Component Placement Guide -Bottom Layer

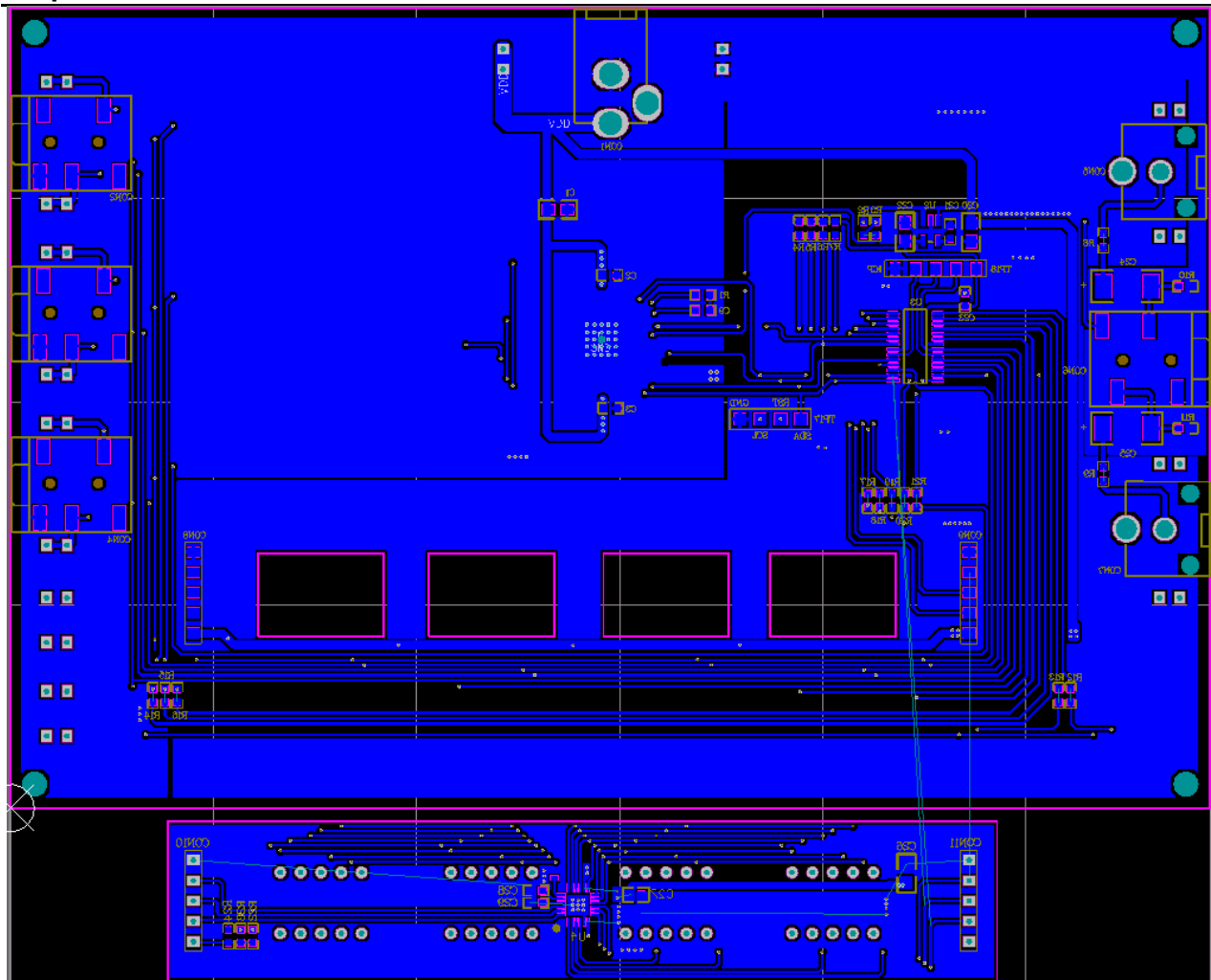


Figure 6: Board PCB Layout-Bottom Layer

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