

AKD7756-A-SUB

AK7756EN Evaluation Board Rev.0

GENERAL DESCRIPTION

The AKD7756-A-SUB is an evaluation board for AK7756EN, Which is a signal processor with a mono CODEC, a MIC pre-amplifier and I2S/PCM I/F. Not only this AKD7756-A-SUB can test DSP function but also use as the Programming platform.

■ **Ordering guide**

AKD7756-A-SUB --- Evaluation board for AK7756EN
 USB Control Adaptor
 Control software

FUNCTION

- Write/Read RAM: access to PRAM, CRAM, OFFRAM and registers
- Digital audio interface
 - Test pin header
- Mono ADC input (single-end/differential)
- Mono DAC line output (RCA single-end)

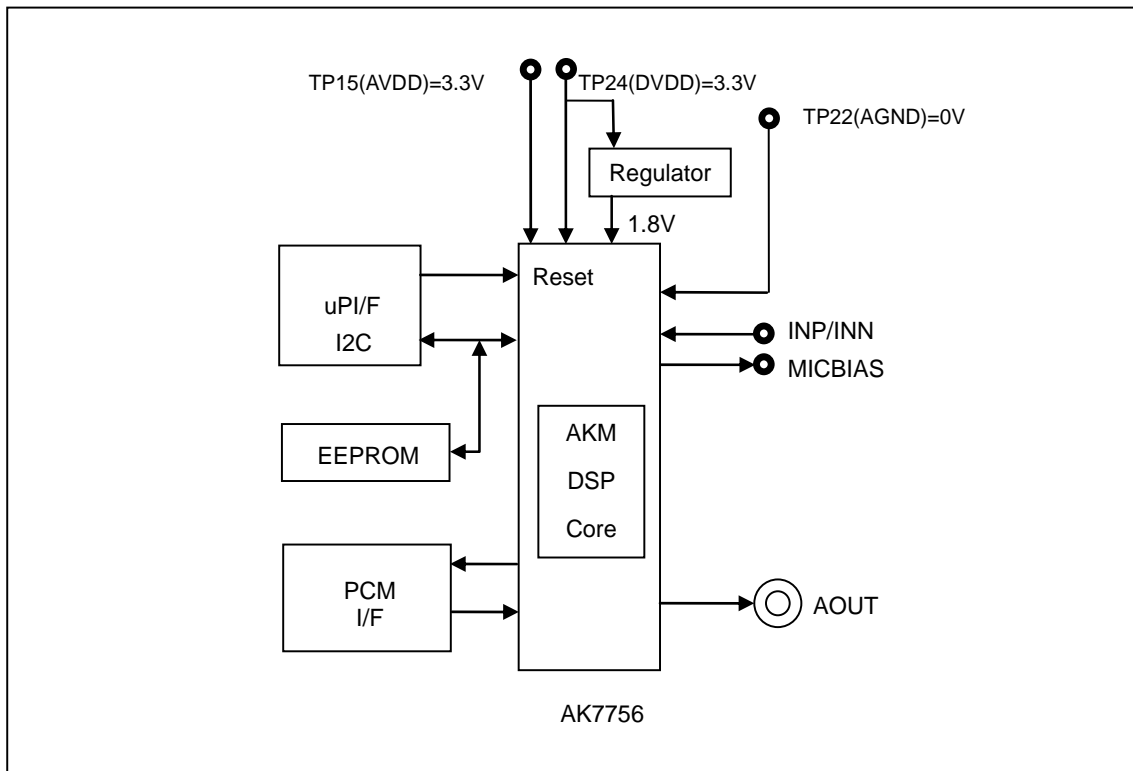


Figure 1. AKD7756-A-SUB Block Diagram

Evaluation Board Diagram

■ Board Diagram

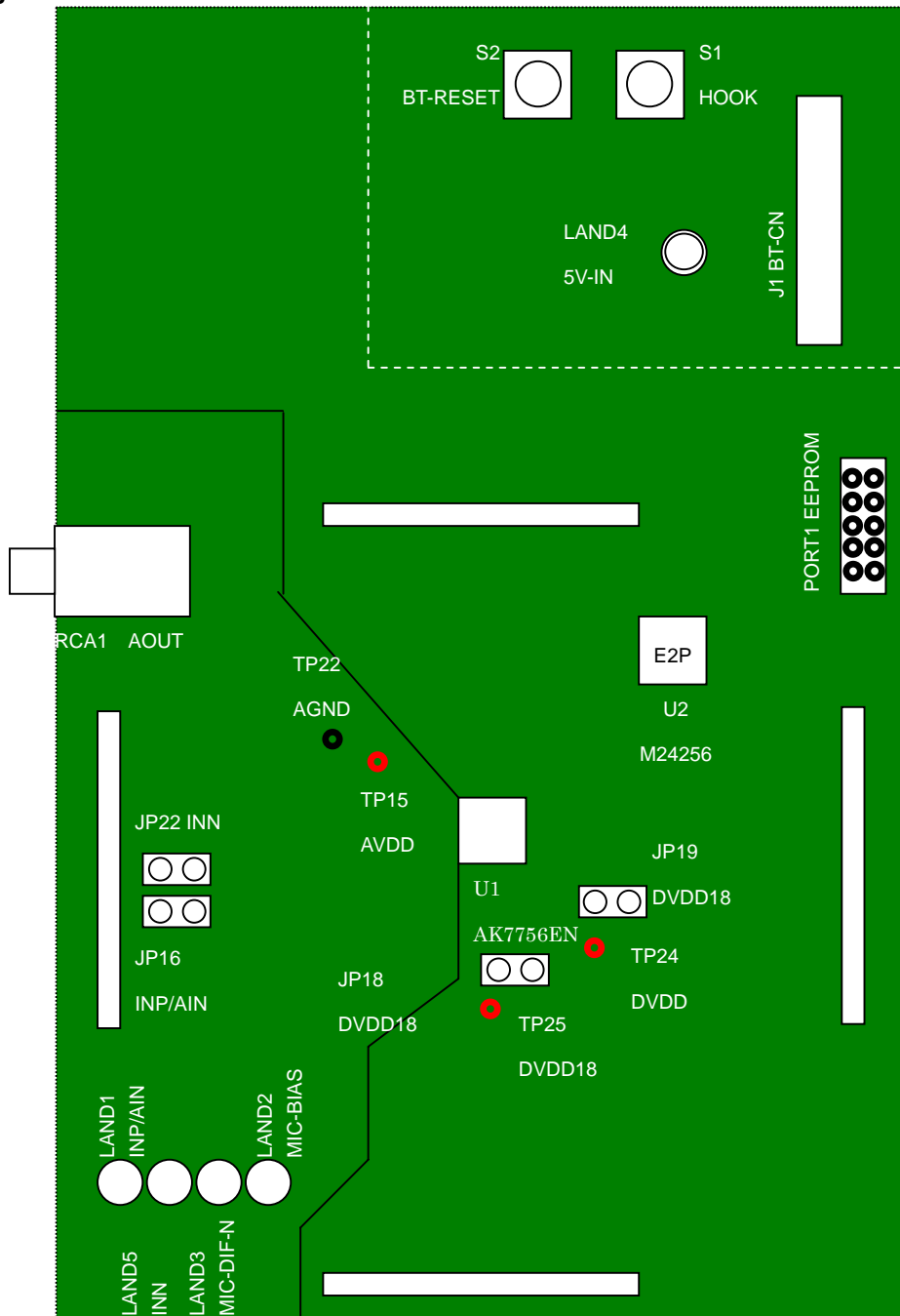


Figure 2. AKD7756-A-SUB Board Diagram

■ Description

AK7756EN is configured as slave and setting is as follow.

Digital I/F: fs 8 KHz, BICK 64 x fs, I2S format.

Power : AVDD, DVDD, DVDD18

These are the power supply TEST Pins. Connect power supply with these pins.

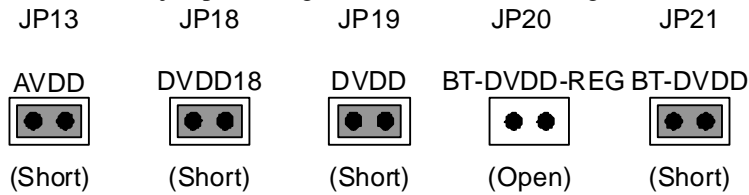
As for the detail comments, refer to the setup of power supply in P3.

Need to connect from your system to Micin and AOUT with the wire.

■ Operation sequence

- (1) Set up the power supply lines.

[The main board jumper setting should be set as following]



Name of pin	Color	Typ Voltage	Voltage Range	Using	Default Setting
TP15 AVDD	Red	+3.3V	+3~+3.6V	AVDD of AK7756	Connected to +3.3V
TP24 DVDD	Red	+3.3V	+3~+3.6V	DVDD of AK7756	Connected to +3.3V
TP25 DVDD18	Red	+1.8V	+1.7~+1.9V	DVDD18 of AK7756	Open
TP22 AGND	Black	0V	0V	Ground	Connected to GND (Should be connected)
TP23 DGND	Black	0V	0V	Ground	Open

Table 1.Set up the power supply lines

- (2) Set up the evaluation mode, jumper pins and connectors. (refer to the evaluation mode)
- (3) Power On
- (4) Run the control software (AK7756.exe) and download the appropriate script file. (see script section)

■ Evaluation Mode

About AK7756EN’s audio interface format, refer to datasheet of AK7756EN.

- (1) Slave Mode: (CKM mode 0 or 1)
 Format : I2S 24bit
 System Clocks are XTI, LRCK and BICK. XTI and LRCK must be synchronized

	Condition	Name	Clocks
LRCK	INPUT	J1-18 BT-LRCK	1fs=8kHz
BICK	INPUT	J1-14 BT-BICK	64fs=512kHz
SDIN1	INPUT	J1-16 BT-SDO	-
SDOUT1	OUTPUT	J1-20 BT-SDI	-

- (2) Bluetooth Mode (In case of Bluetooth module is connected to J1 connector)
 Connector: Connect MICIN to microphone and AOUT to speaker amp in your system.

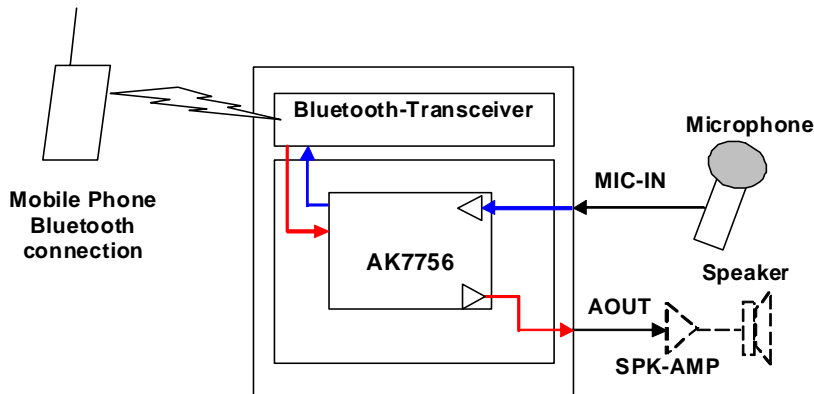


Figure 3. Bluetooth Mode Data Flow

Evaluation Flow

<Initial Registration >

- Connect AKD7756-A-SUBboard with the USB box and then plug the USB with PC.
- Push the HOOK button of the evaluation unit for seven seconds, then the build-in Bluetooth becomes a stand-by state.
- Turn mobile phone into Bluetooth search status. It might be displayed as [Free2move WA]. Please select it and register it. Enter [0000] when password is required.
- Message of [Registration Finish] will be displayed.
- Registered machine will be searched and connected automatically when power on next time.

The flow of search will be different according to the mobile phone. (Ex. Password of mobile phone is possible to be required) Please refer to the handling instruction manual of the mobile telephone for concerning details

<Call & Disconnection>

Accept Call: When Call occurs, push HOOK on front panel of this board.

CALL Setup: Please call setup by mobile phone and then push HOOK on the board.

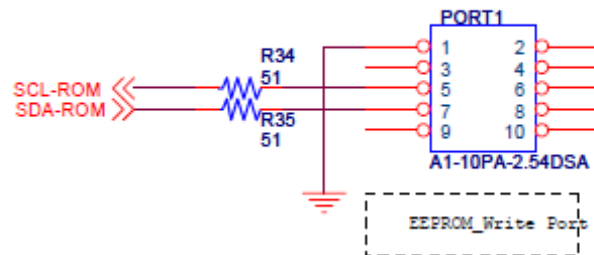
Disconnect: Push HOOK on front panel

(3) Setting of Jumper Pins:

JP Ref.No	Name	Function	Default
JP1	SCL/SDA_Pup	EEPROM-SCL/SDA \emptyset Pull_UP selection	OPEN
JP2	SDIN1	open/short selection between 7756-SDIN1 and FPGA	OPEN
JP3	BICKI	open/short selection between 7756-BICKI and FPGA	OPEN
JP4	LRCKI	open/short selection between 7756-LRCKI and FPGA	OPEN
JP5	XWC-H	Select EEPROM-XWC state	SHORT
JP6	XWC	Open/short selection between EEPROM-XWC and FPGA.	OPEN
JP7	STO	Open/short selection between 7756-STO and LED.	OPEN
JP8	SDA/SO-3	open/short selection between SDA	OPEN
JP9	SDA/SO-2	Open/short selection between 7756-SDA and EEPROM.	SHORT
JP10	SCL/SCLK-2	Open/short selection between 7756-SCL and EEPROM.	SHORT
JP11	SDA/SO-1	Open/short selection between 7756-SDA and SO-FPGA.	SHORT
JP12	SCL/SCLK-1	Open/short selection between 7756-SCL and SCLK-FPGA.	OPEN
JP13	AVDD	7756-AVDD	SHORT
JP14	EEST/SI	Open/short selection between 7756-EEST and SI-FPGA.	SHORT
JP15	EXTEEP/CSN	Open/short selection between 7756-EXTEEP and CSN-FPGA.	SHORT
JP16	INP/AIN	Open/short selection between LAND-INP and AIN.	SHORT
JP17	XTI-SEL	Open/short selection between 7756-XTI and FPGA.	CRY_XTI
JP18	DVDD18	7756-DVDD18	SHORT
JP19	DVDD	7756-DVDD	SHORT
JP20	BT-DVDD-REG	Power DVDD from U4 to BT module and AK7756EN system.	OPEN
JP21	BT-DVDD	Power DVDD from U4 to BT module and AK7756EN system.	SHORT
JP22	INN	Open/short selection between LAND and INN.	SHORT

■ Control Box

Connect control box with the port 1 by the flat cable and then connect PC with USB.



Pin assignment of the 10pin header

Control Software Manual

■ **Setup of the evaluation board and control software**

- (1) Power AKD7756-A-SUB evaluation board on and connect with USB control box.
- (2) Connect USB control box to PC with USB cable.
The usb control box is recognized as HID (Human Interface Device). When it can not be recognized correctly (e.g., unknown device is connected), please push reset button [yellow] on USB control box.
- (3) Install AK7756.exe in your PC. Then ready to evaluate.
- (4) When Bluetooth is used, connect mobile telephone with Bluetooth Transceiver. Please refer to the evaluation flow of above-mentioned Bluetooth mode.

The start-up image of control software is as below.

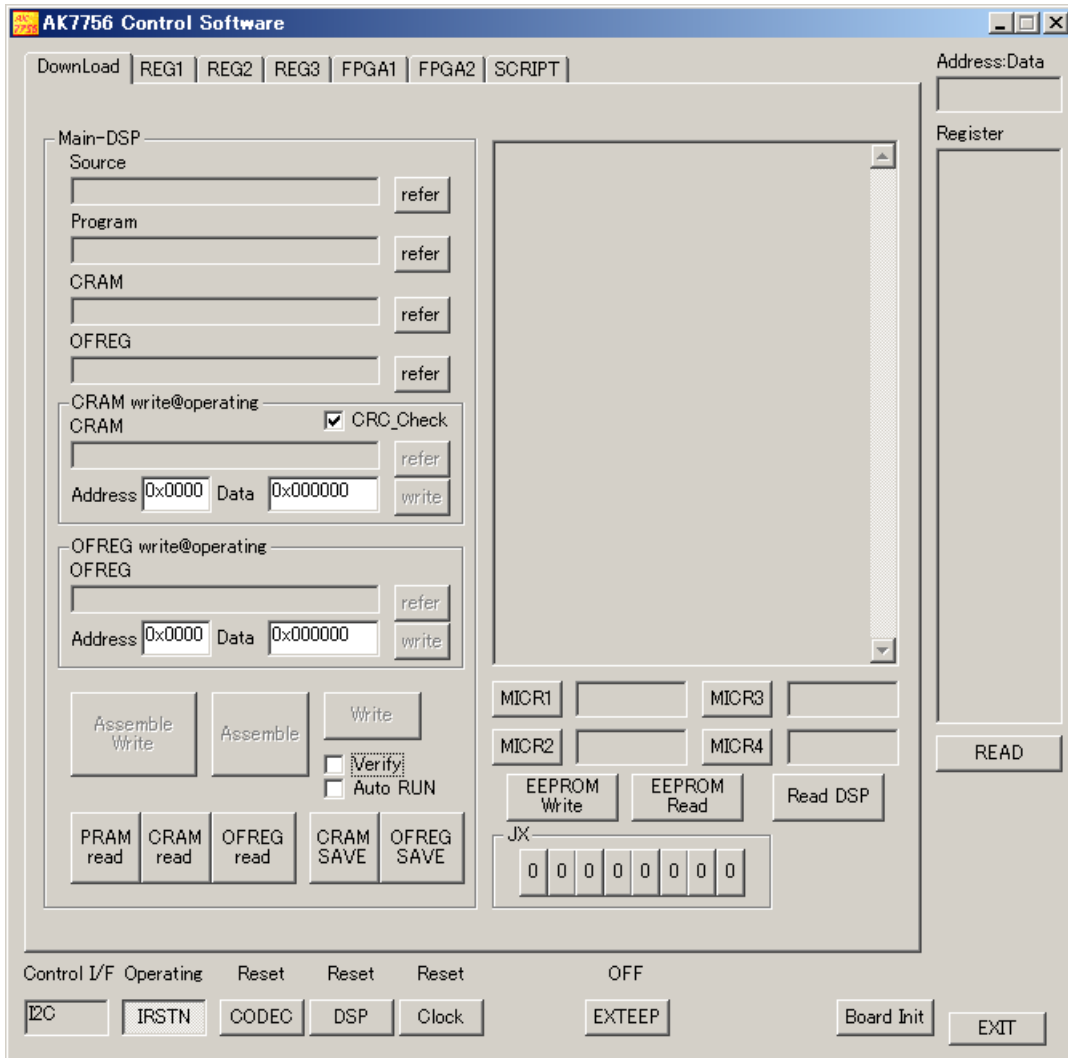


Figure 4. Start-up Image of Control Software

Whenever USB control box is unplugged from PC; must run the control software again.

■ Download the Control Software

1. Download the program and register setting.

Provide necessary clock(LRCK,BICK) to the device.

There are three code area are shown as below.

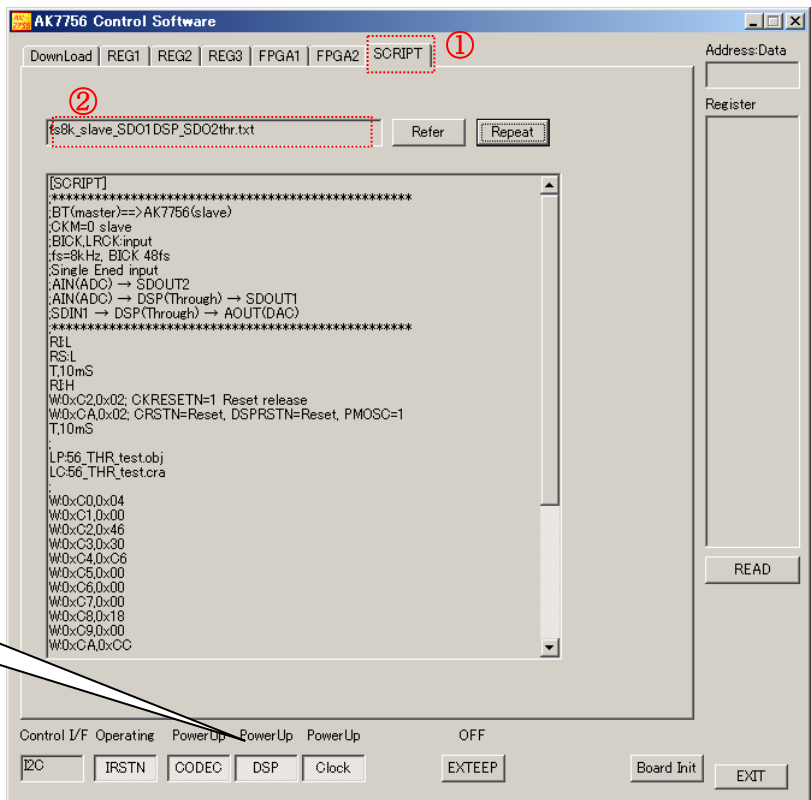
Code Area	Alias	Function
Control Register	CONT	AK7756EN operation mode setup
Program RAM	PRAM	Storage RAM for HF program code
Coefficient RAM	CRAM	Storage RAM for parameter used by HF program code

Table 2. AK7756EN Code Area

(Note 1) Every code (CONT, PRAM, and CRAM) is provided by AKEMD.

Open the SCRIPT tab to set a register value.

②:load script file (Example:)
File: 56_Test_script.txt



After loading the script file,
AK7756EN becomes the running state.
Confirm CODEC/DSP/Clock block are
going the Power Up state.

Click OK on the Script Complete box



Figure 5. [SCRIPT] Dialogue of Control Software

②: There are two script files in this EVM:

56_Test_script.txt: AK7756EN is running as the slave devices. LRCK, BICK are provided before loading program to the AK7756EN

① click the download tab and see if the file to be downloaded.

② Program, CRAM to be downloaded
 PRAM File:
 56_TestTHR.obj
 CRAM File:
 56_TestTHR.cra

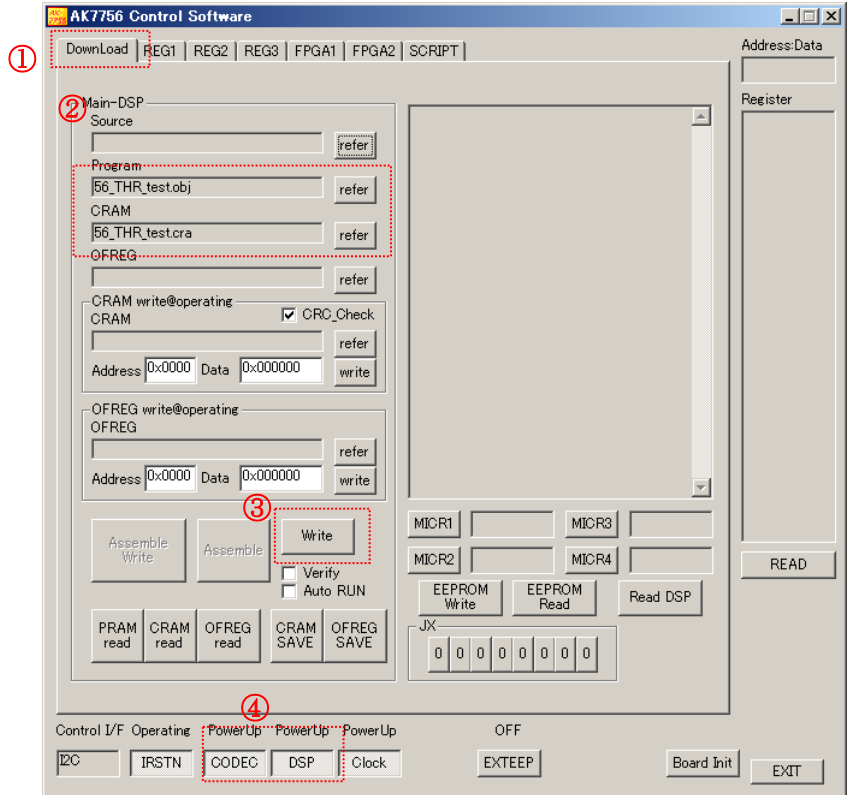


Figure 6. [Download] Dialogue of Control Software

③ click the write button to download the DSP programs into AK7756EN

When the “Write Error” comes out the screen, check if the clocks are provided to AK7756EN.

④ Confirm the Power Up/Down button.

Now the AK7756EN is on the running state.

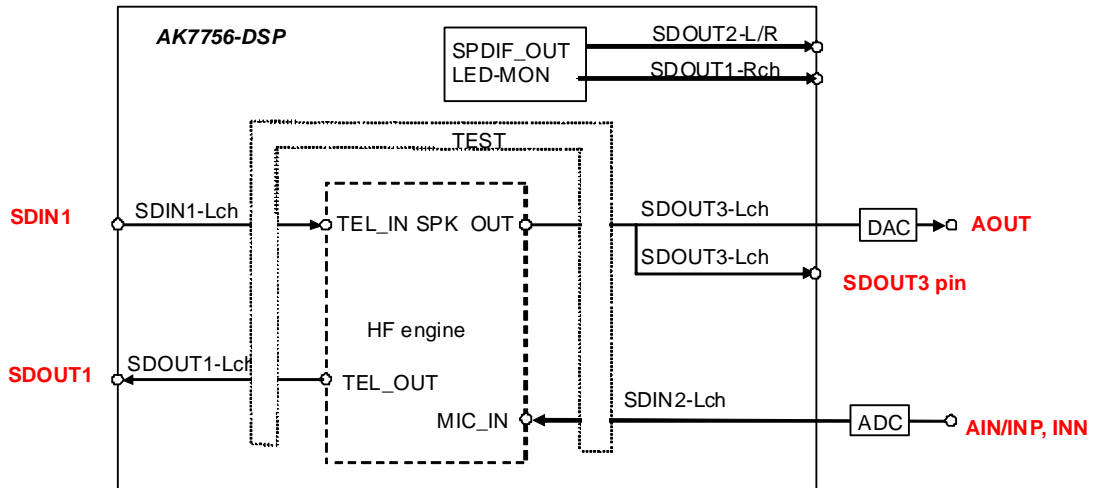


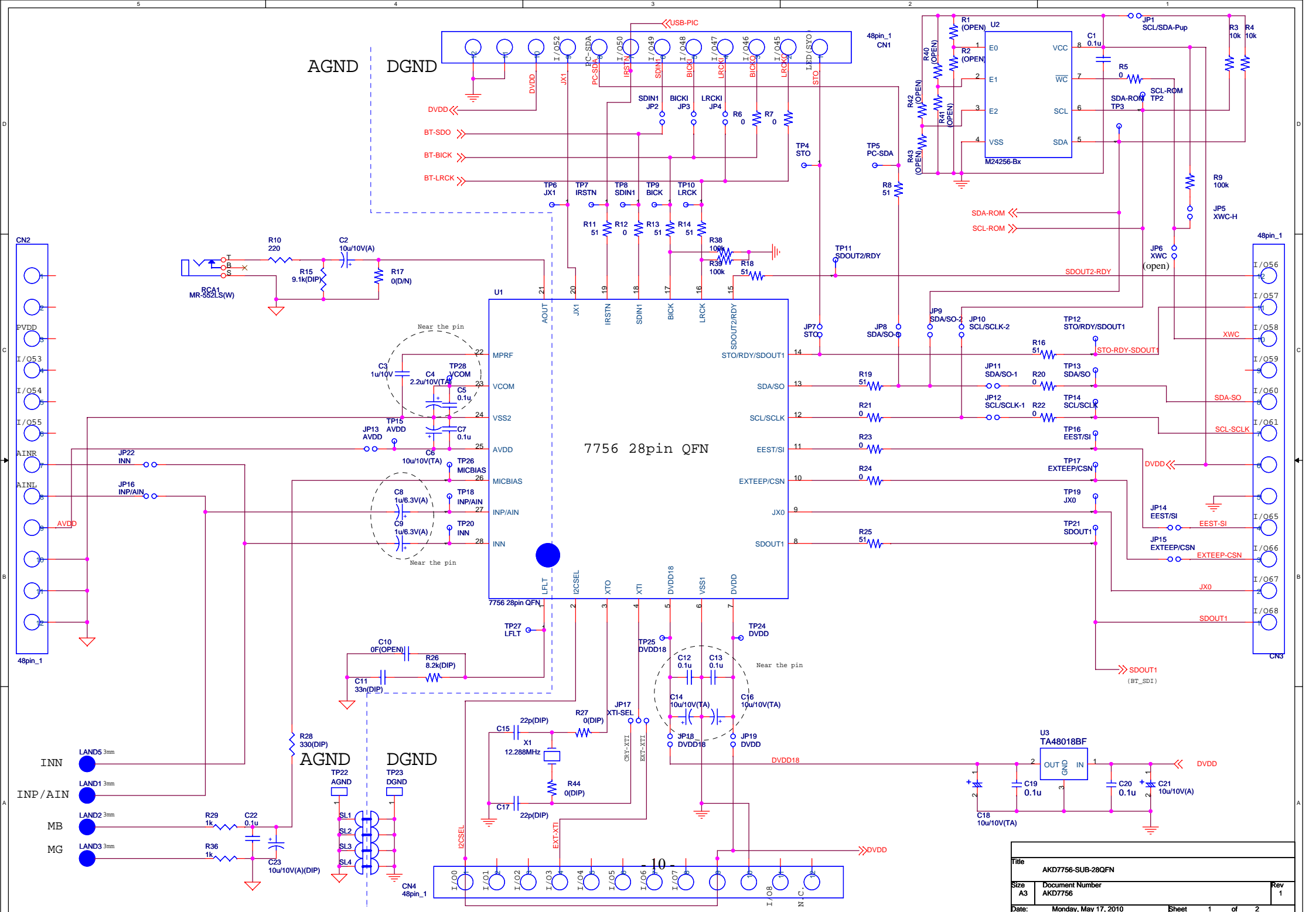
Figure 7. Signal flow

REVISION HISTORY

Date (yy/mm/dd)	Manual Revision	Board Revision	Reason	Page	Contents
10/05/14	KM102800	0	First edition		

IMPORTANT NOTICE

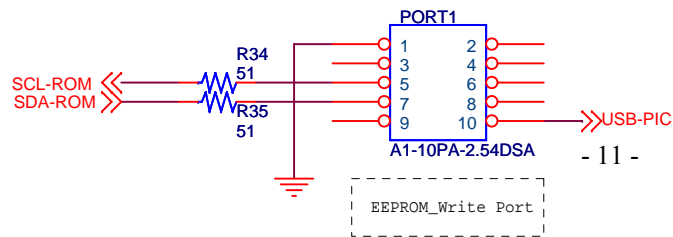
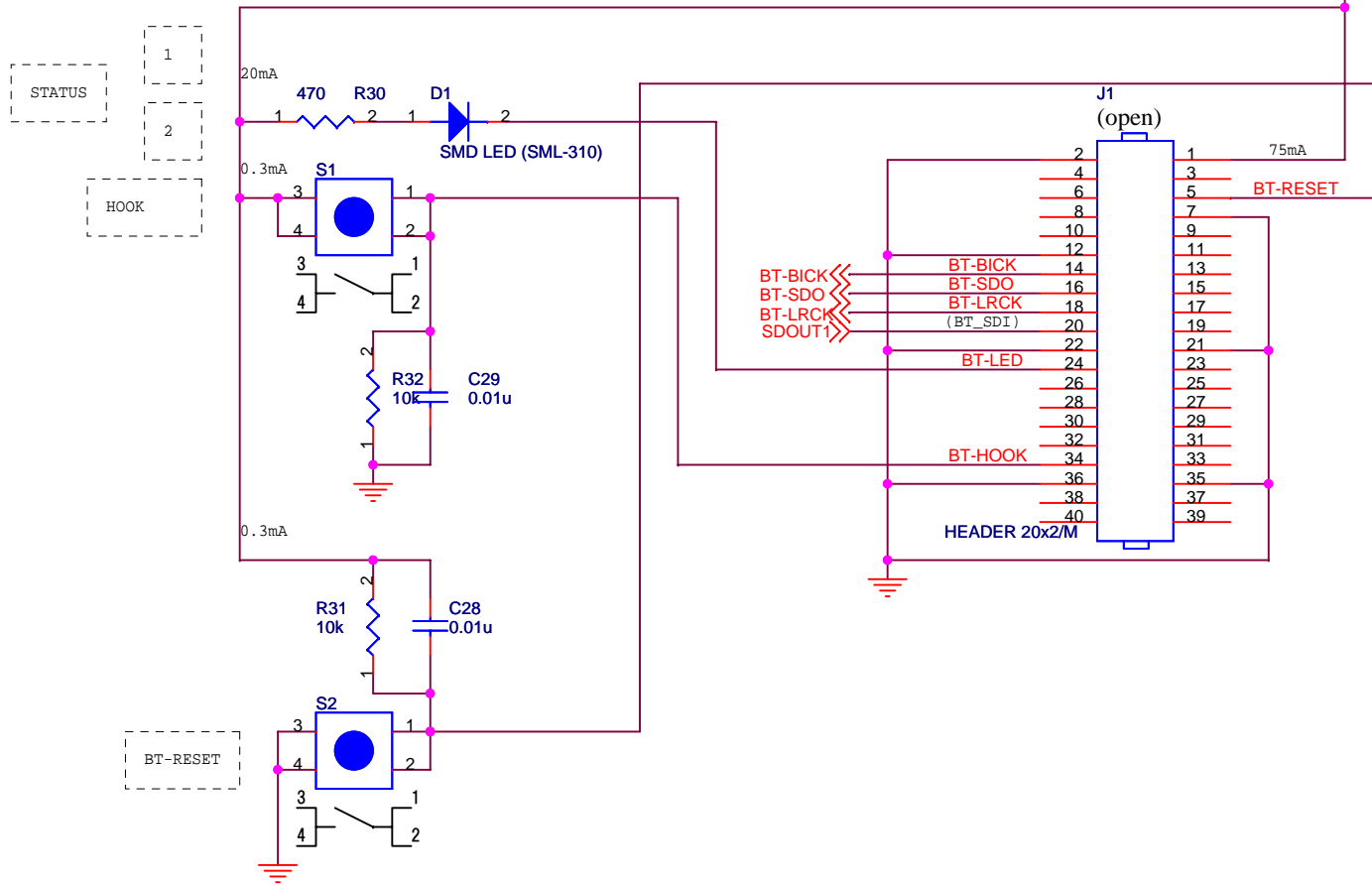
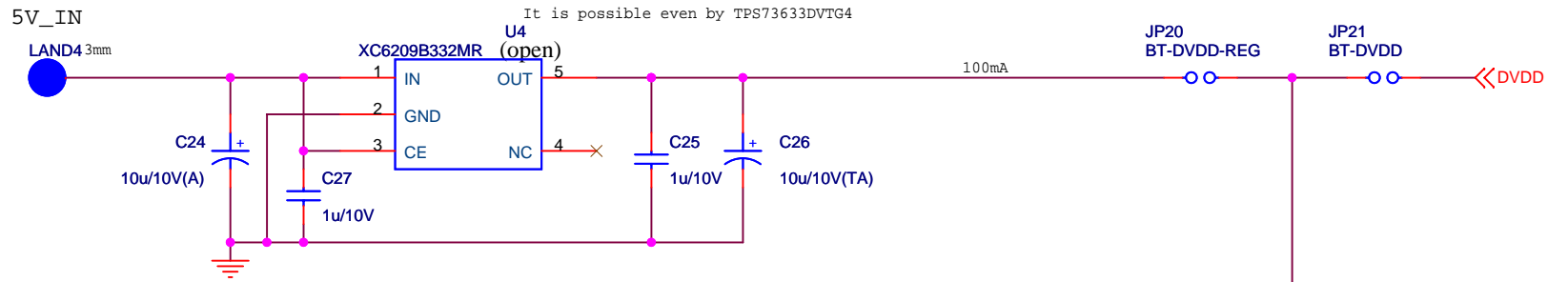
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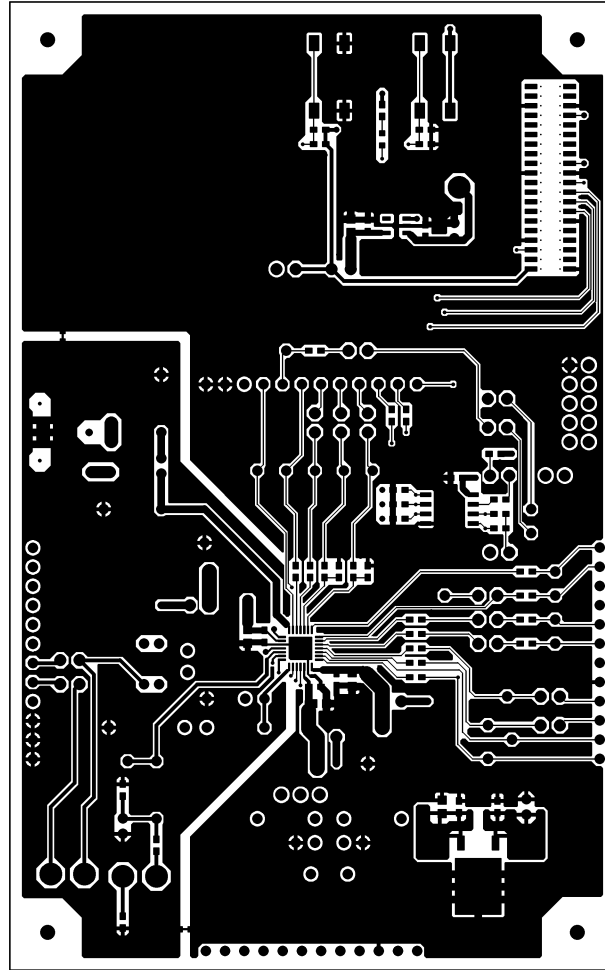
AGND DGND

7756 28pin QFN

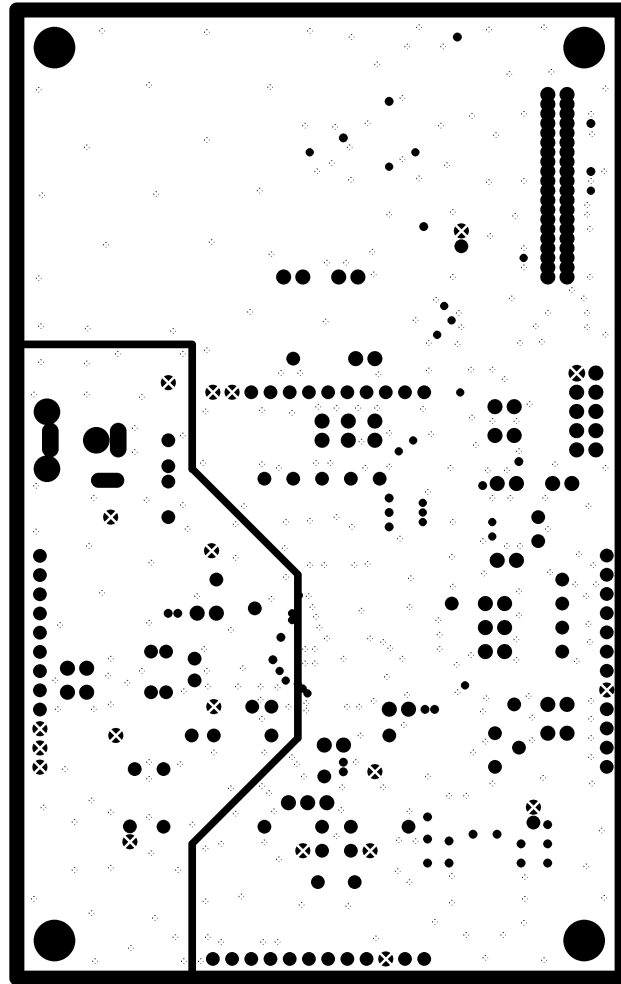
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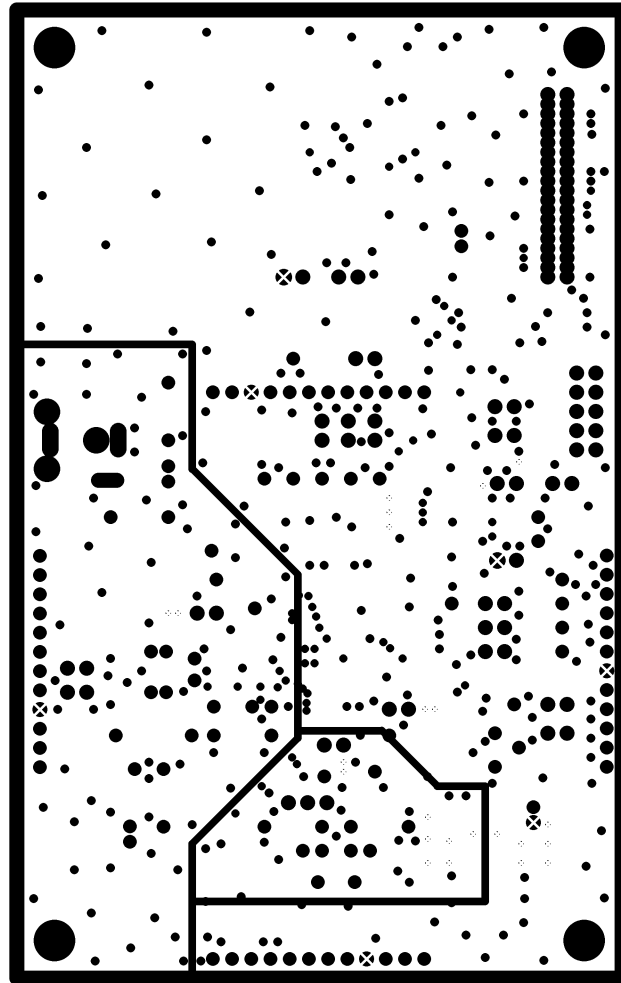
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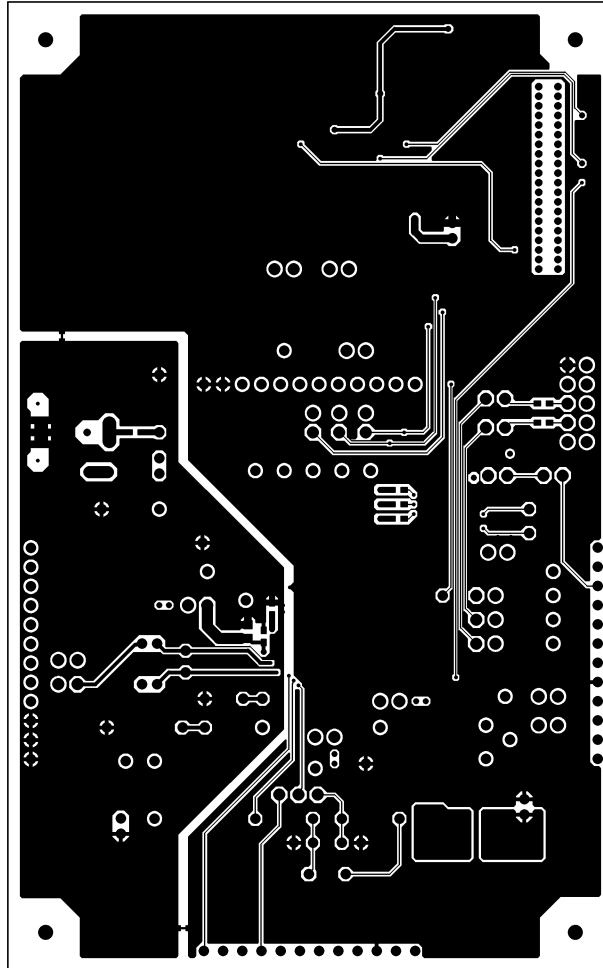
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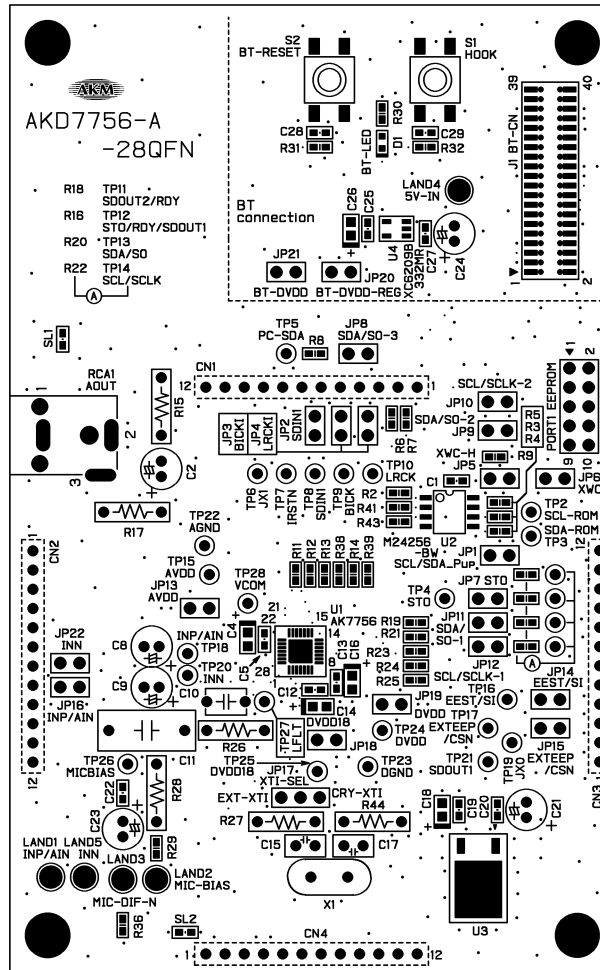
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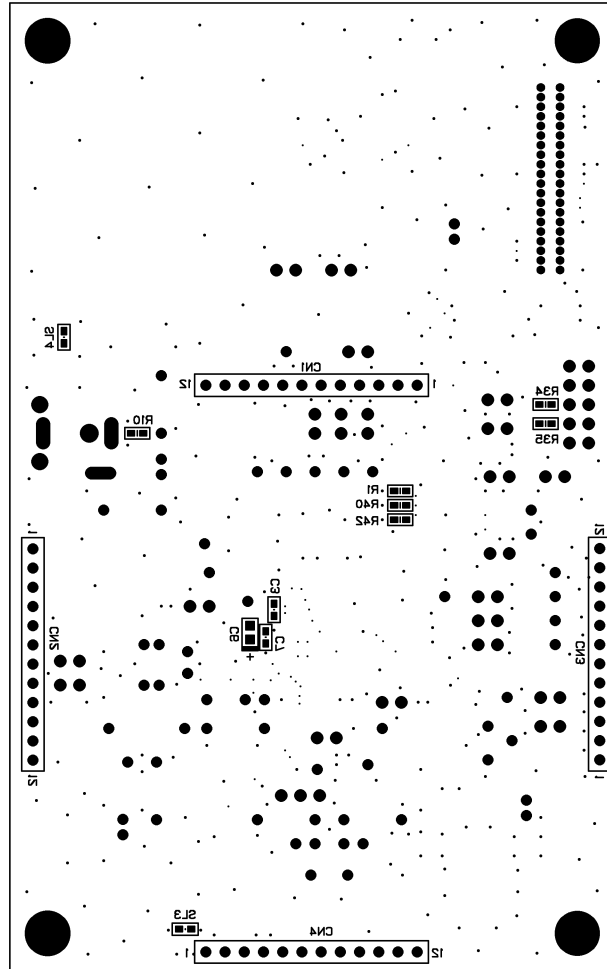
L3 電源



L4



L1 SR SILK



L4 SR SILK