



# AKD7719-A

## AK7719 Evaluation Board Rev.0

GENERAL DESCRIPTION

The AKD7719-A is an evaluation kit for the AK7719; a digital signal processor (DSP) with 4 channels digital data interface. It realizes an easy evaluation of the audio system by just connecting to the target product via digital input and output pins. A USB connection is adopted for control interface, enabling to develop DSP codes with a PC.

**■ Ordering Guide**

AKD7719-A --- Evaluation board for AK7719-A-MAIN  
 USB Control Box  
 Control Software

FUNCTION

- Write/Read RAM: Access to PRAM, CRAM, OFFRAM and Registers
- Digital Audio Interface
  - Test pin header

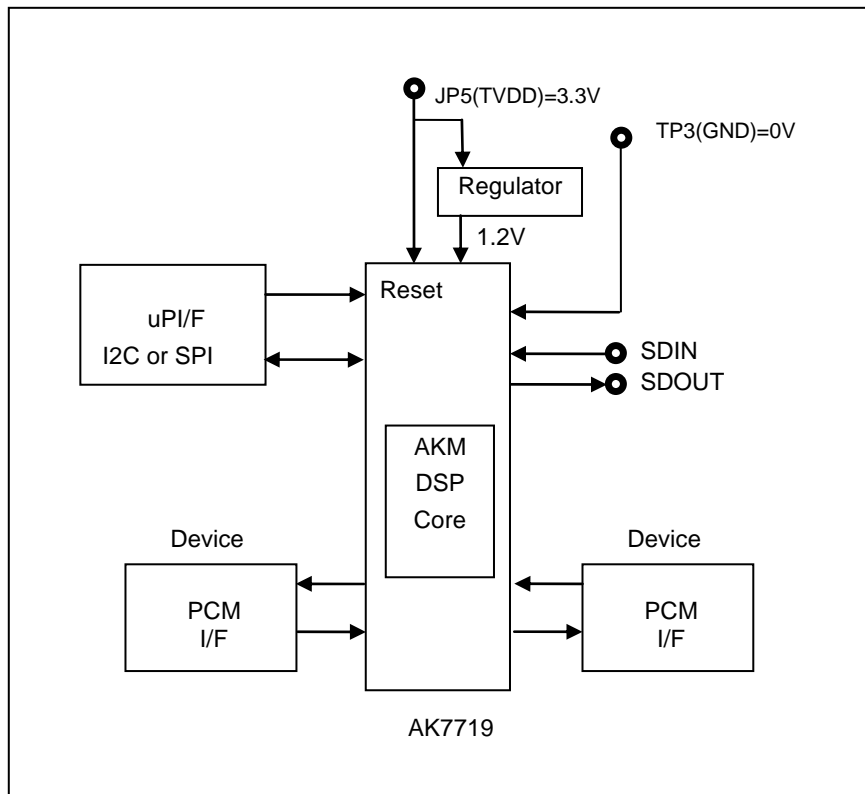


Figure 1. AKD7719-A-MAIN Block Diagram

EVALUATION BOARD

■ Board View

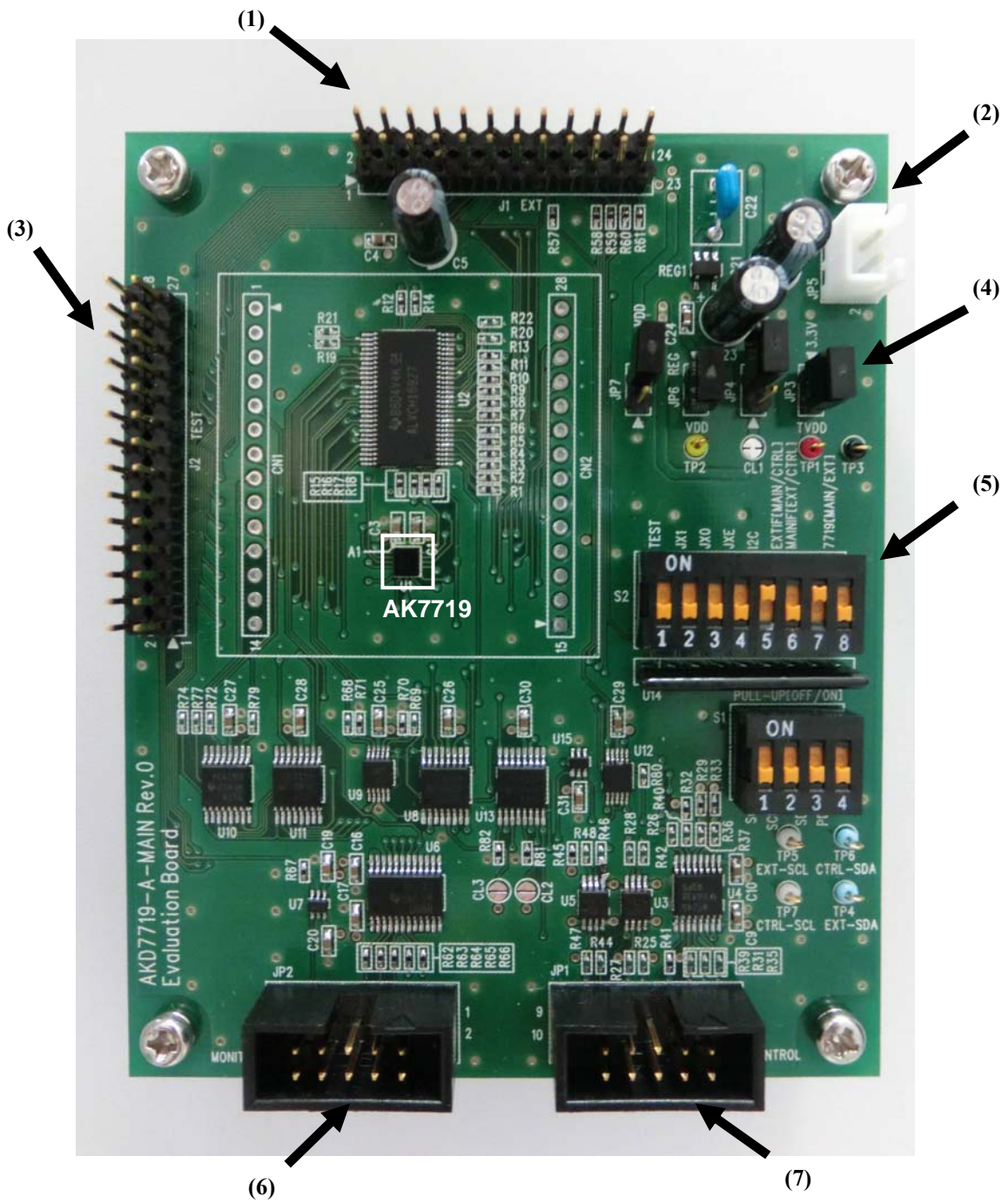


Figure 2. AKD7719-A-MAIN Board View

## ■ Description

No.	Name	Function
(1)	EXT (J1) (24 pin Header)	External System Signal Connector.
(2)	3.3V (JP5)	3.3V Power Supply Terminal. Use attached connection cable.
(3)	TEST (J2) (28 pin Header)	External System Connector
(4)	Jumper (JP3)	Power Supply Select Jumper
(5)	DIP Switch (S2)	Pin and Signal Select Switches
(6)	MONITOR (JP2) (10 pin Header)	AKD77XX-HFS MONITOR Board Connector. (for HF Tuning)
(7)	CONTROL (JP1) (10 pin Header)	USB Control Box Connector

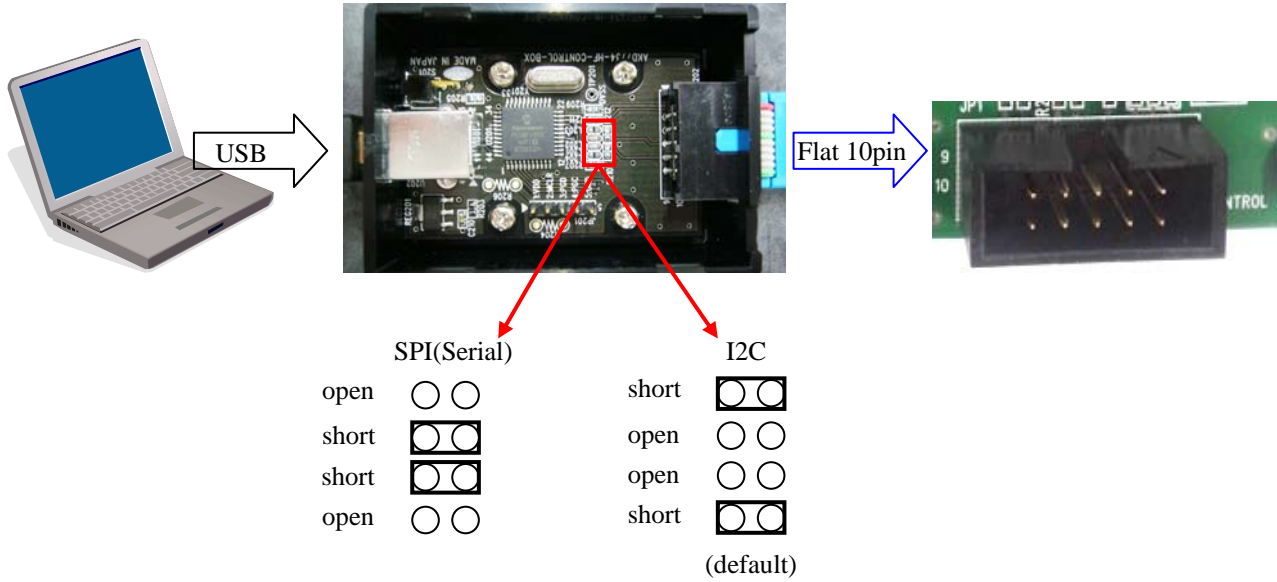
### EXT(24 pin Header) Pin Layout

Pin No.	Name	I/O	Function
1	EXT-BCLK1	I	These pins are connected to the AK7719 via Buffer Level Shifter
2	EXT-JX0/BCLK3	I/O	
3	EXT-SYNC1	I	
4	JX1/SYNC3	I/O	
5	EXT-SDIN1	I	
6	EXT-SDIN3	I/O	
7	EXT-SDOUT1	O	
8	EXT-SDOUT3/GP0	I/O	
9	EXT-BCLK2	O	
10	EXT-SDIN4	I	
11	EXT-SYNC2	O	
12	EXT-SDOUT4/GP1	I/O	
13	EXT-SDIN2	I	
14	EXT-STO/RDY	O	
15	EXT-SDOUT2	O	
16	EXT-PDN	I/O	
17	EXT-CSN/SCL	I/O	This pin is used when controlling the AKD7719 via EXT. Refer to DIPSW Setting
18	open	-	
19	EXT-SO/SDA	I/O	This pin is used when controlling the AKD7719 via EXT. Refer to DIPSW Setting
20	GND	-	GND
21	EXT-SCLK/CAD0	I/O	This pin is used when controlling the AKD7719 via EXT. Refer to DIPSW Setting
22	EXT-VDD+1.2V	O	This pin is used for VDD supply via EXT. Refer to JP Setting
23	EXT-SI/CAD1	I/O	This pin is used when controlling the AKD7719 via EXT. Refer to DIPSW Setting
24	EXT-TVDD	O	This pin is used for TVDD supply via EXT. Refer to JP Setting

■ **Control Box**

The AKD7719-A should be connected to a PC via a USB control box. The USB control box is connected to a PC with an USB cable and the AKD7719-A with 10-pin flat cable.

Set jumper pins to select control I/F (I<sup>2</sup>C or SPI).



The switch of I2C labeled on S2 should be set when changing SPI/I2C.

## ■ Operation Sequence

### (1) Jumper and Test Pin Setting (near the Power Supply)

Name	Setting	Using	Default Setting
JP3 3.3V	Open	External TVDD supply on TP1	Short
	Short	TVDD = 3.3V fixed	
JP4 EXT-TVDD	Open	External TVDD supply on the 24pin of J1. (JP3: not connected)	Open
	Short	EXT-TVDD = TVDD	
JP6 REG	Open	External VDD input supply VDD on TP2	Short
	Short	VDD+1.2V fixed	
JP7 EXT-VDD	Open	VDD = JP6(REG)	Open
	Short	External VDD supply on the 22pin of J1. (JP6: not connected)	

Table 1. Jumper Pin Setting

Name	Color	Typ Voltage	Voltage Range	Using
TP1 TVDD	Red	+3.3V	+1.6~+3.6V	TVDD of AK7719
TP2 VDD	Yellow	+1.2V	+1.1~+1.3V	VDD of AK7719
TP3 GND	Black	0V	0V	Ground

Table 2. Test Pin Setting

### (2) CutLand Setting

Name	Setting	Using	Default Setting
CL1 7719-TVDD	Open	7719-TVDD independent supply	Short
	Short	7719-TVDD = TVDD	
CL2 CAD0	Open	CAD0 pin = L	Open
	Short	CAD0 pin = H	
CL3 CAD1	Open	CAD1 pin = L	Open
	Short	CAD1 pin = H	

Table 3. CutLand Setting

(3) DIP Switch Setting

		Name	Setting	Using	Default Setting
S1	8	7719[MAIN/EXT]	OFF(MAIN)	Default setting fixed.	OFF
			ON(EXT)		
	7	MAINIF[EXT/CTRL]	OFF(EXT)	Default setting fixed.	ON
			ON(CTRL)		
	6	EXTIF[MAIN/CTRL]	OFF(MAIN)	Default setting fixed.	OFF
			ON(CTRL)		
	5	I2C	OFF	I2C pin = "L"	ON
			ON	I2C pin = "H"	
	4	JXE	OFF	DIPSW control of JX0/1 for the AK7719 (MAIN or EXT) is invalid.	OFF
			ON	DIPSW control of JX0/1 for the AK7719 (MAIN or EXT) is valid.	
3	JX0	OFF	JX0 pin = "L"	Valid when JXE = ON	OFF
		ON	JX0 pin = "H"		
2	JX1	OFF	JX1 pin = "L"		OFF
		ON	JX1 pin = "H"		
1	TEST	OFF	TEST = "L"	OFF	
		ON	TEST = "H"		
S2	1	PULL-UP[OFF/ON]	OFF	PULL-UP OPEN (CSN/SCL)	OFF
			ON	PULL-UP (CSN/SCL)	
	2	PULL-UP[OFF/ON]	OFF	PULL-UP OPEN (SCLK/CAD0)	
			ON	PULL-UP (SCLK/CAD0)	
	3	PULL-UP[OFF/ON]	OFF	PULL-UP OPEN (SO/SDA)	
			ON	PULL-UP (SO/SDA)	
	4	PULL-UP[OFF/ON]	OFF	PULL-UP OPEN (PDN)	
			ON	PULL-UP (PDN)	

Table 4. DIPSW Setting

Control Interface Setting

AK7719	I/F	connection	DIP Switch				(default)
			I2C	EXTIF	MAINIF	7719	
MAIN on board	I2C	CONTROL	ON	OFF	ON	OFF	(default)
	SPI	CONTROL	OFF	OFF	ON	OFF	
EXT * not on board	I2C	CONTROL	ON	ON	ON	ON	

(\*: Used when controlling the AK7719 which is externally connected.)

- (4) Set up connectors. ( refer to Evaluation Mode )
- (5) Power On.
- (6) Run the control software (AK7719.exe) and download the appropriate script file. ( see script section )

## ■ Evaluation Mode

Refer to the AK7719 datasheet for audio interface format.

- (1) Format : I<sup>2</sup>S 16bit  
Provide SYNC1 and BICK1 to the device.

	Condition	Name	Clocks
SYNC1	INPUT	J1-3 EXT-SYNC1	1fs=48kHz
BCLK1	INPUT	J1-1 EXT-BCLK1	64fs=3.072MHz
SDIN1	INPUT	J1-5 EXT-SDIN1	-
SDIN2	INPUT	J1-13 EXT-SDIN2	-
SDIN3	INPUT	J1-6 EXT-SDIN3	-
SDIN4	INPUT	J1-10 EXT-SDIN4	-
SDOUT1	OUTPUT	J1-7 EXT-SDOUT2	-
SDOUT2	OUTPUT	J1-15 EXT-SDOUT2	-
SDOUT3	OUTPUT	J1-8 EXT-SDOUT3/GP0	-
SDOUT4	OUTPUT	J1-12 EXT-SDOUT4/GP1	-

**CONTROL SOFTWARE MANUAL**

**■ Setup of the Evaluation Board and Control Software**

- (1) Power the AKD7719-A-MAIN evaluation board on and connect it with a USB control box.
- (2) Connect the USB control box to a PC with a USB cable.  
The USB control box will be 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 the USB control box.
- (3) Install AK7719.exe to the PC. Then ready to evaluate.

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

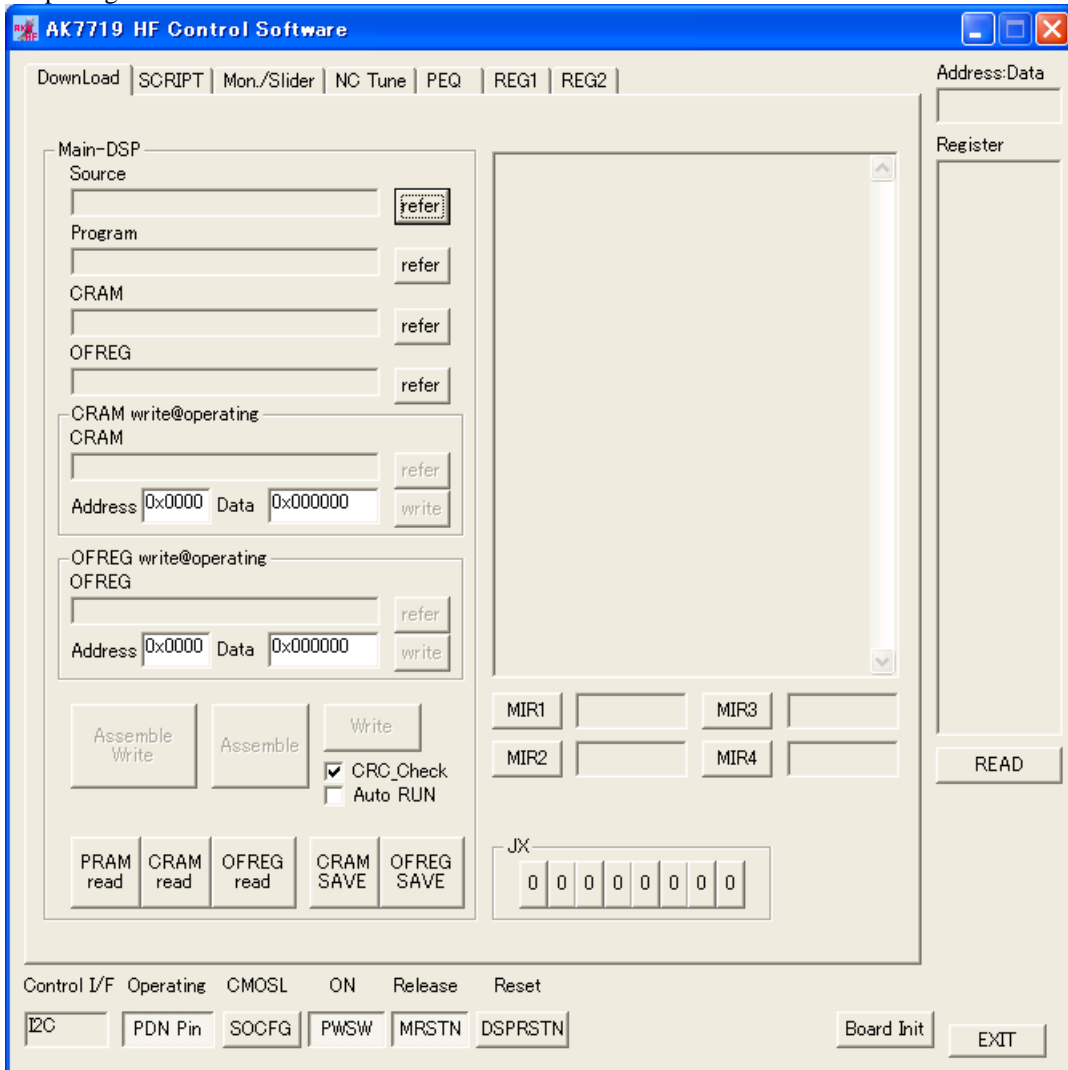


Figure 3. Start-up Image of Control Software

When the connection of PC with the USB control box is removed, it is required to restart the control software.



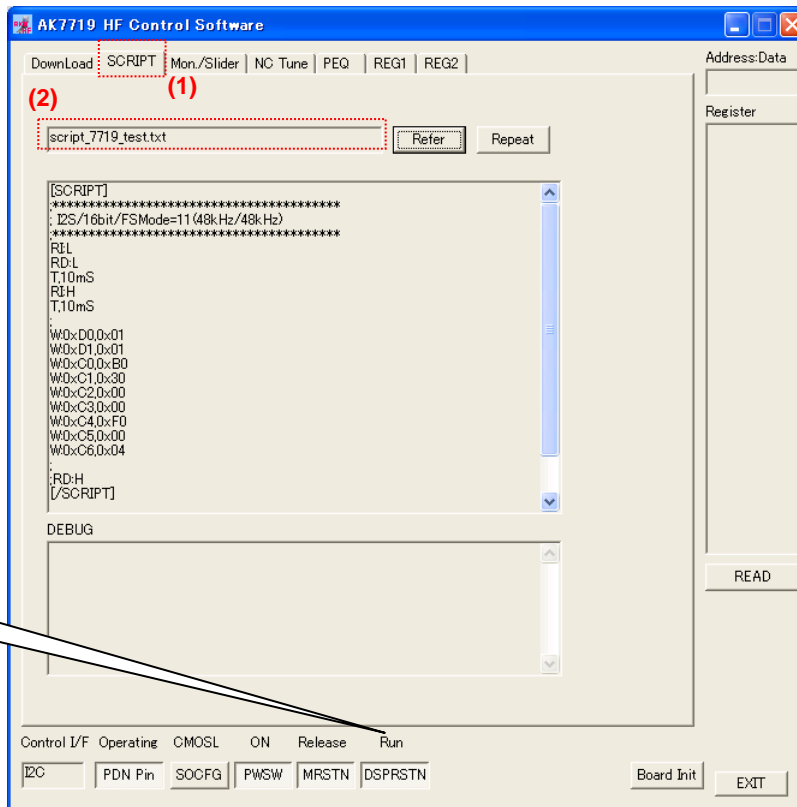
### ■ Download the DSP Program and Registers Software

#### 1. Register Setting and Code Downloading

##### 1-1. Register Setting

(1) Select the SCRIPT tab to set register values.

(2) load script file (Example)  
File: script\_7719\_test.txt



After loading the script file, the AK7719 becomes running state. Confirm that DSP/Clock block are powered-up.

(2) "script\_7719\_test.txt" runs under the condition below.  
FSMode11: 48kHz / 16bit Linear / I2S

1-2. Code Downloading

There are four code areas as shown below.

Code Area	Alias	Function
Control Register	CONT	AK7719 operation mode setup
Program RAM	PRAM	Storage RAM for program code
Coefficient RAM	CRAM	Storage RAM for parameter used by program code
Offset Register	OFREG	Pointer for delay RAM address

Table 5. AK7719 Code Area

(Note 1) All codes (CONT, PRAM, CRAM and OFREG) will be provided by AKM.

(1) Click the download tab and see if the file to be downloaded.

(2) Program, CRAM, OFREG to be downloaded

- PRAM File:  
DSP\_7719\_test.obj
- CRAM File:  
DSP\_7719\_test.cra
- OFREG File:  
DSP\_7719\_test.off

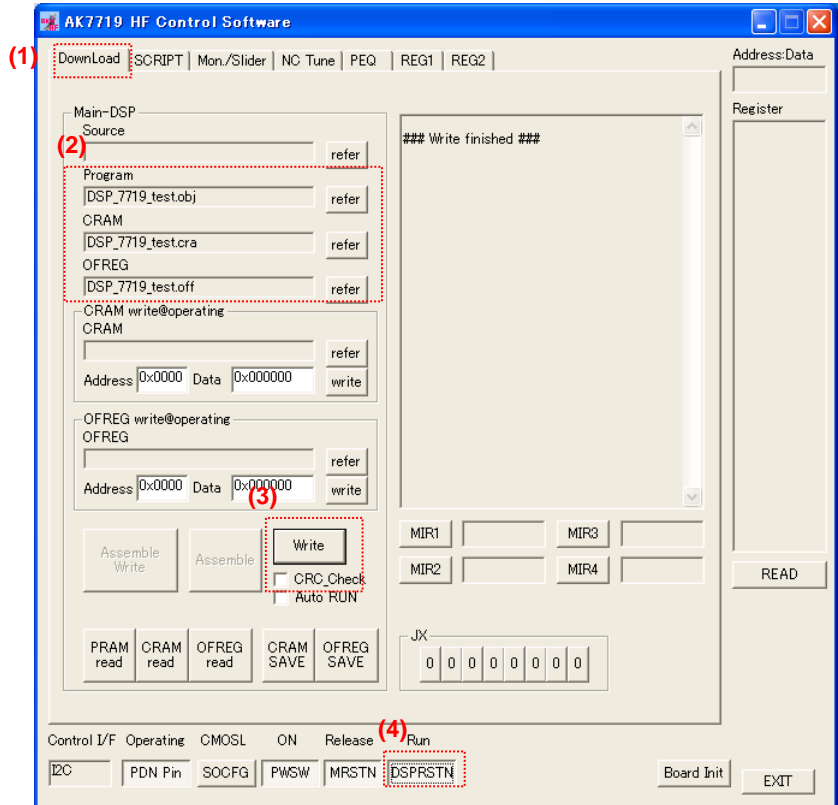


Figure 4. [Download] Dialogue of Control Software

(3) Uncheck the “CRC\_Check” box, click the write button to download DSP programs into the AK7719.

If a write error is occurred, check if the clocks are provided to the AK7719.

(4) Confirm Run state of the DSPRSTN button

Now, the AK7719 is in running state. Input signal to the Port#1(SDIN1) is output from SDOUT2, 3 and 4.

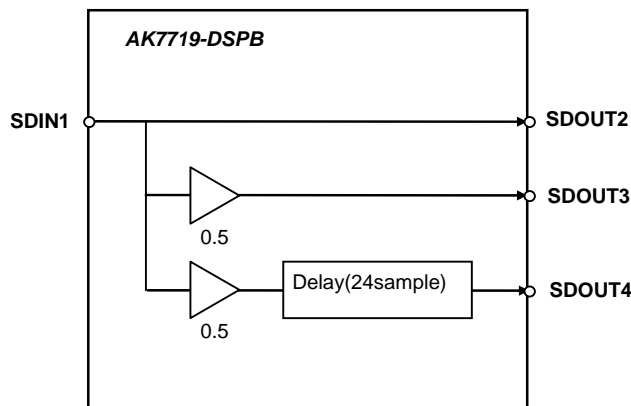


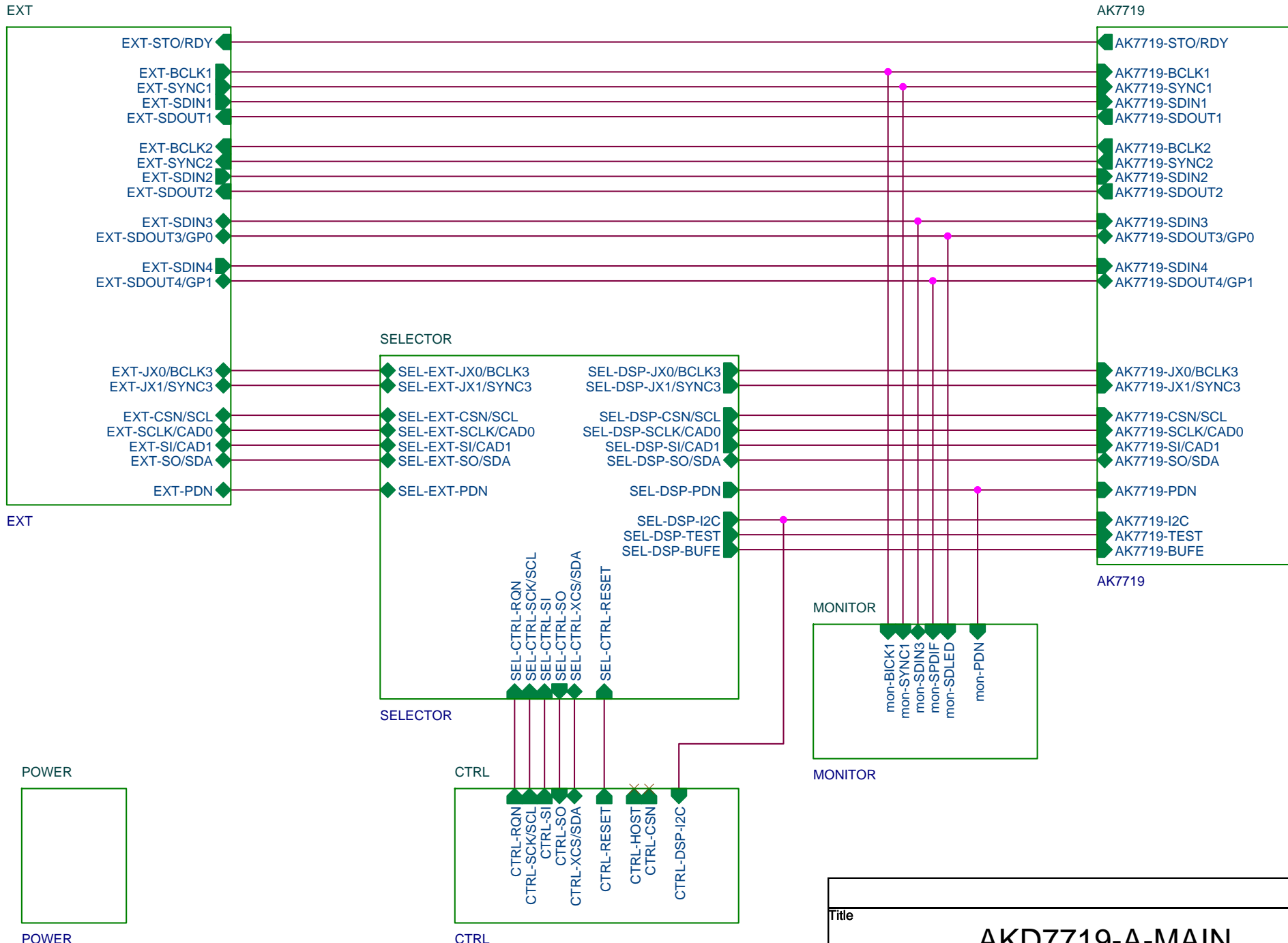
Figure 3. Signal Flow

<b>REVISION HISTORY</b>
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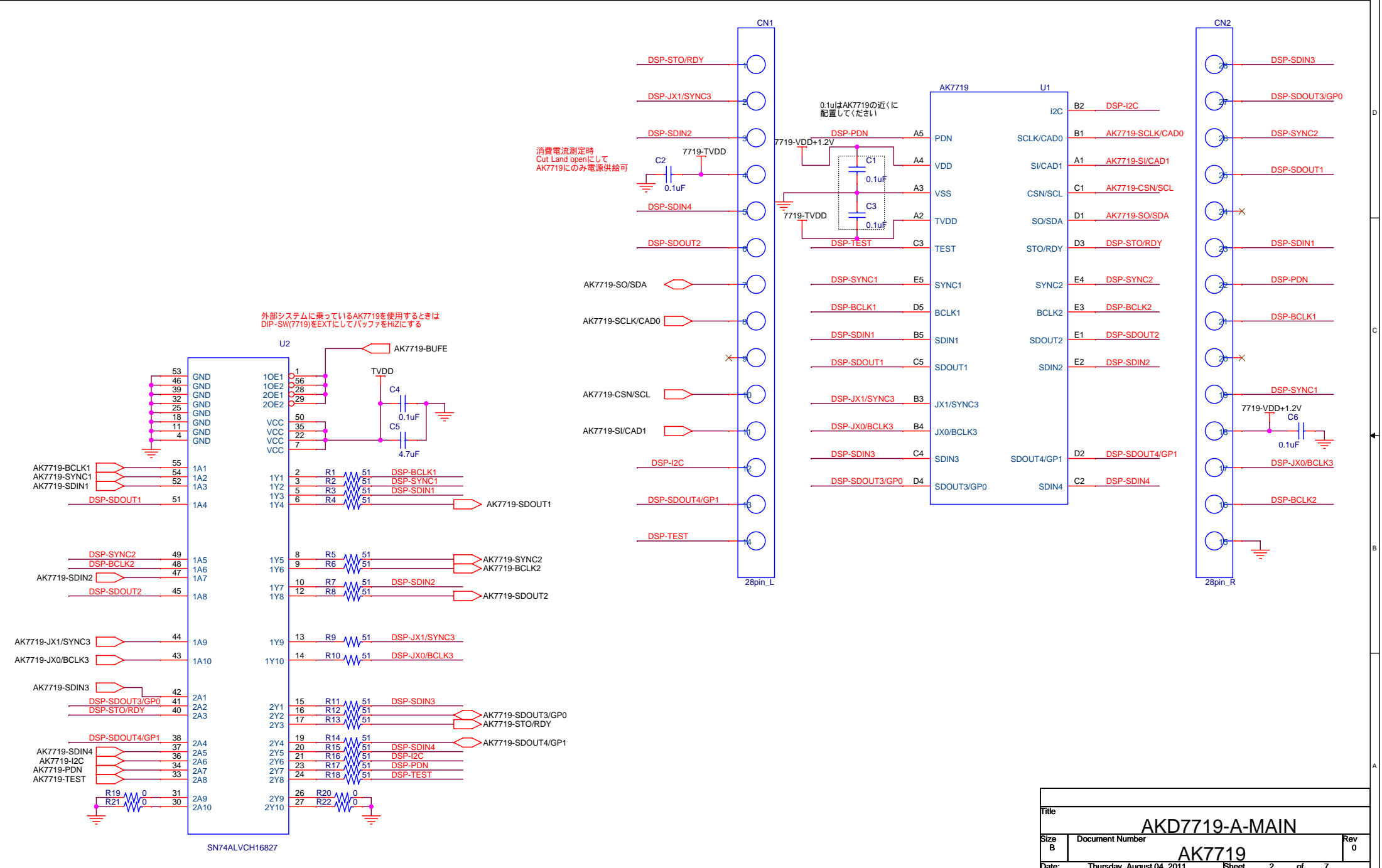
Date (yy/mm/dd)	Manual Revision	Board Revision	Reason	Page	Contents
11/06/28	KM107300	0	First edition		

**IMPORTANT NOTICE**

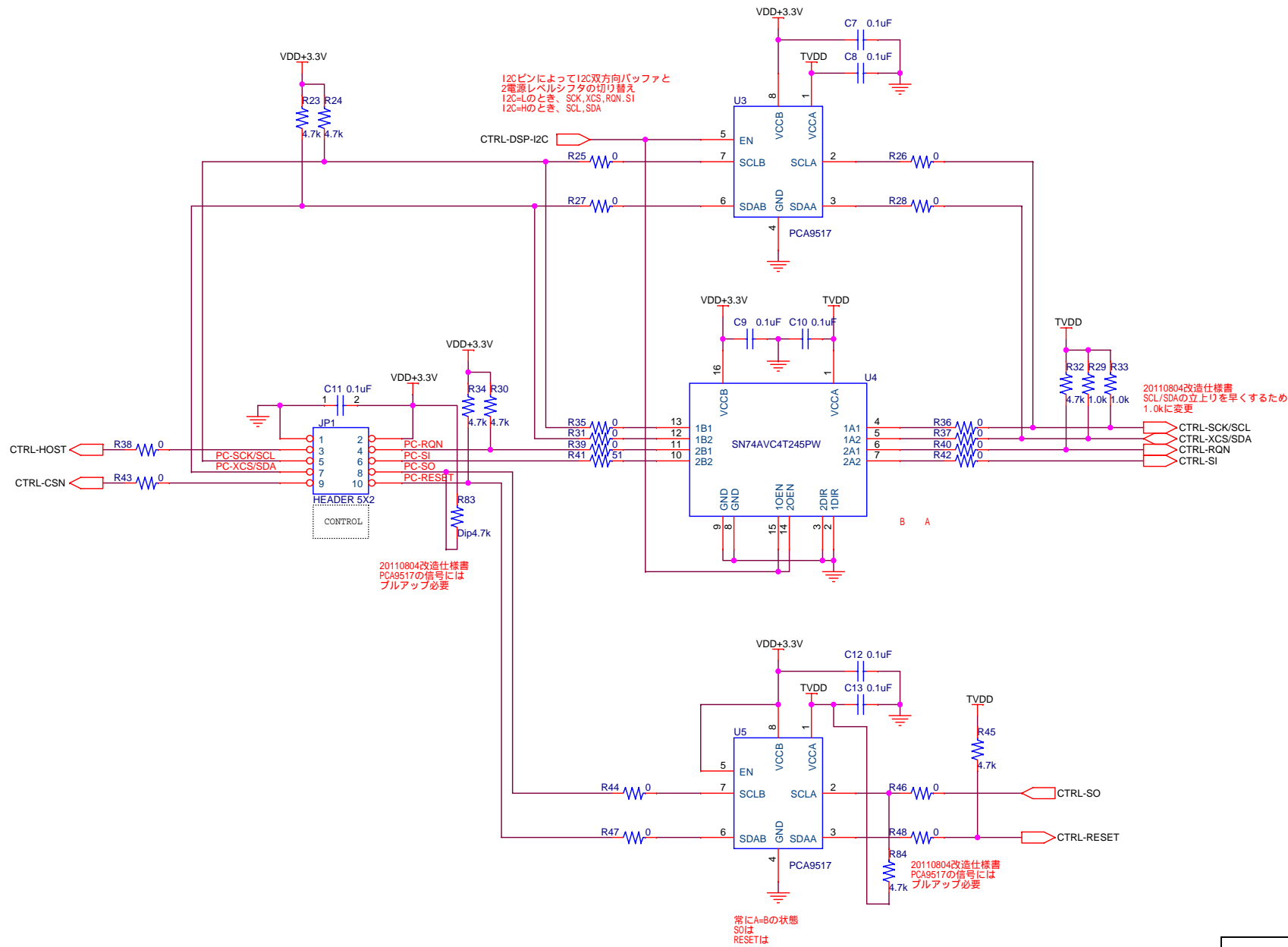
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Date:	Thursday, August 04, 2011	Sheet 1 of 7



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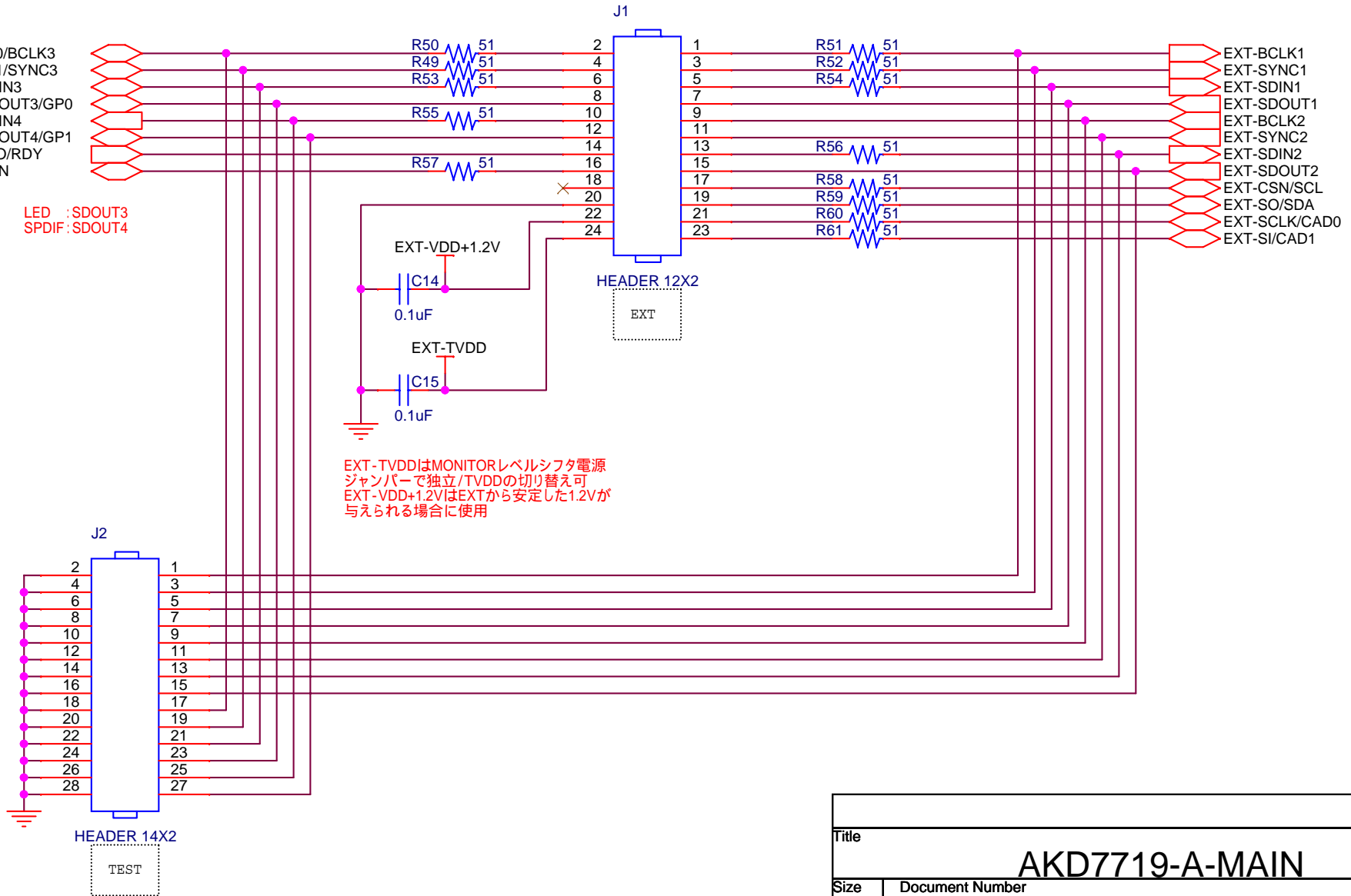


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Sheet		3 of 7	

CTRL

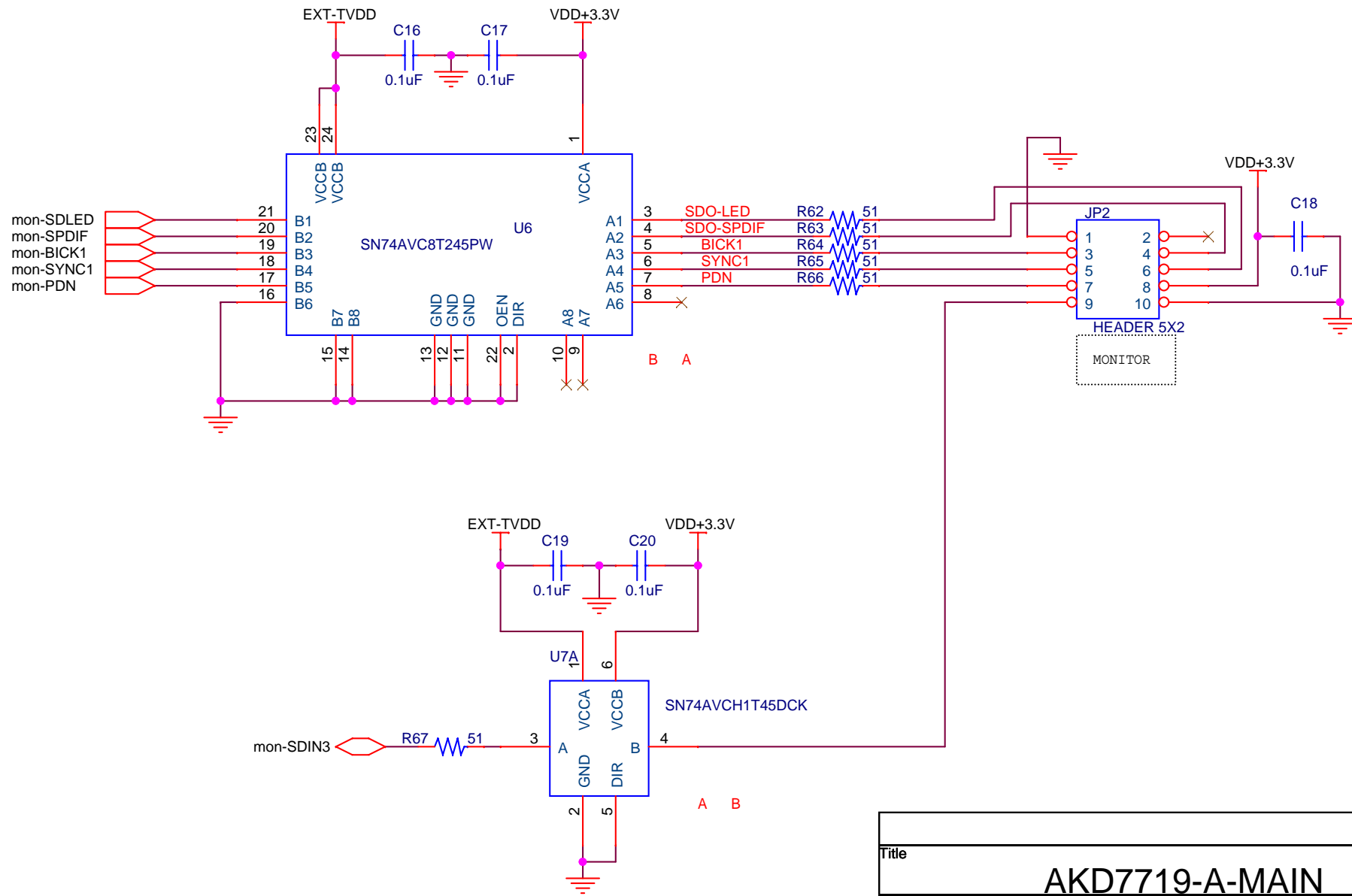
EXT-JX0/BCLK3  
 EXT-JX1/SYNC3  
 EXT-SDIN3  
 EXT-SDOUT3/GP0  
 EXT-SDIN4  
 EXT-SDOUT4/GP1  
 EXT-STO/RDY  
 EXT-PDN

LED :SDOUT3  
 SPDIF :SDOUT4



EXT-TVDDはMONITORレベルシフト電源  
 ジャンパーで独立/TVDDの切り替え可  
 EXT-VDD+1.2VはEXTから安定した1.2Vが  
 与えられる場合に使用

Title		
AKD7719-A-MAIN		
Size	Document Number	Rev
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Date:	Thursday, August 04, 2011	Sheet 4 of 7



Title		
AKD7719-A-MAIN		
Size A	Document Number	Rev 0
Date:	Thursday, August 04, 2011	Sheet 5 of 7



形状はVDDとGNDの  
パナナとDriveBlueホ-ド  
のような電源コネクタ

1.0uFおよび10uFはできるだけ  
REGの近くに配置してください

消費電流測定時  
Cut Land openにして  
AK7719にのみ電源供給可

open : TVDD = TVDDテストピン入力  
short : TVDD = 3.3Vヘッダー入力

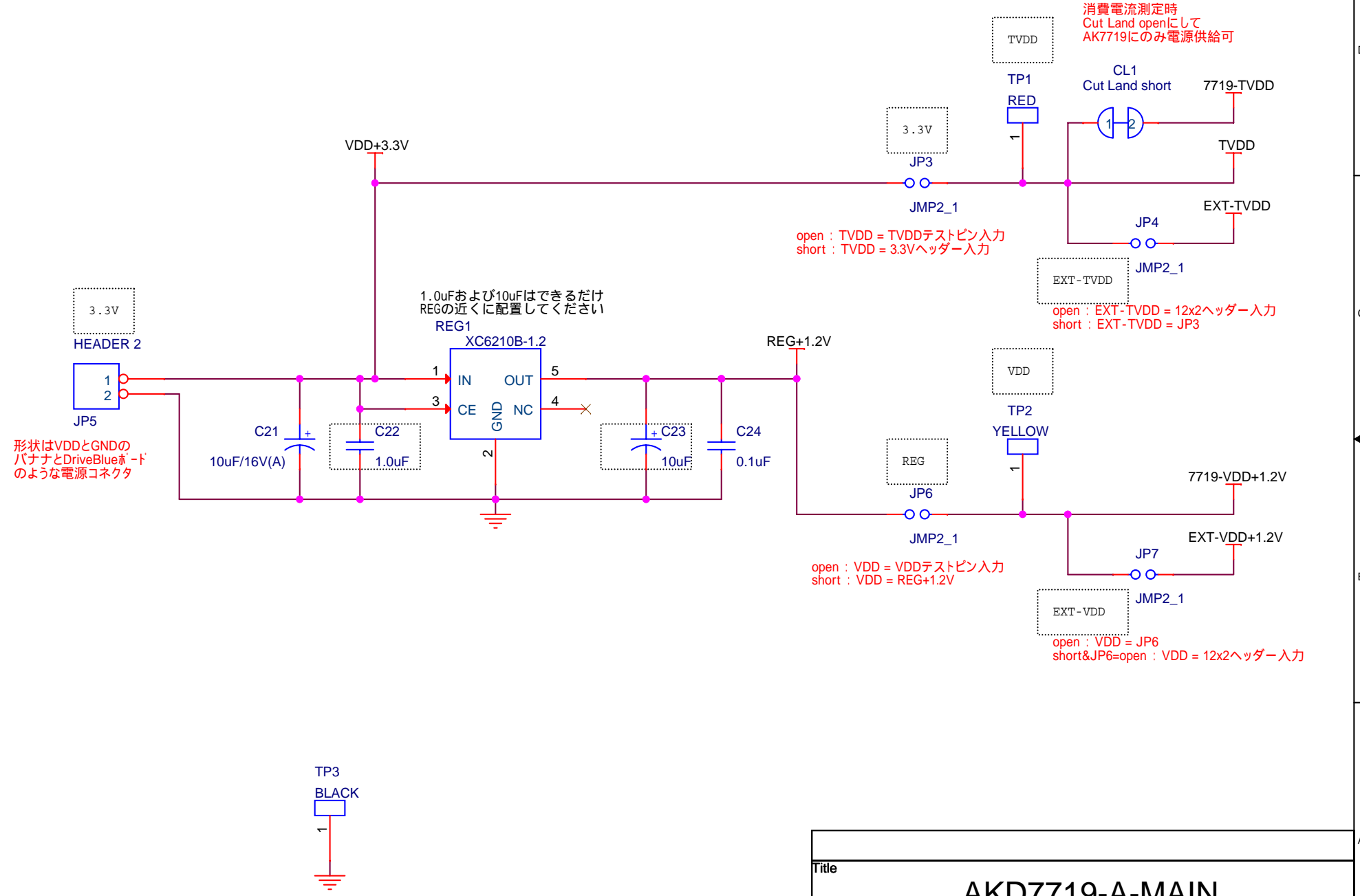
open : EXT-TVDD = 12x2ヘッダー入力  
short : EXT-TVDD = JP3

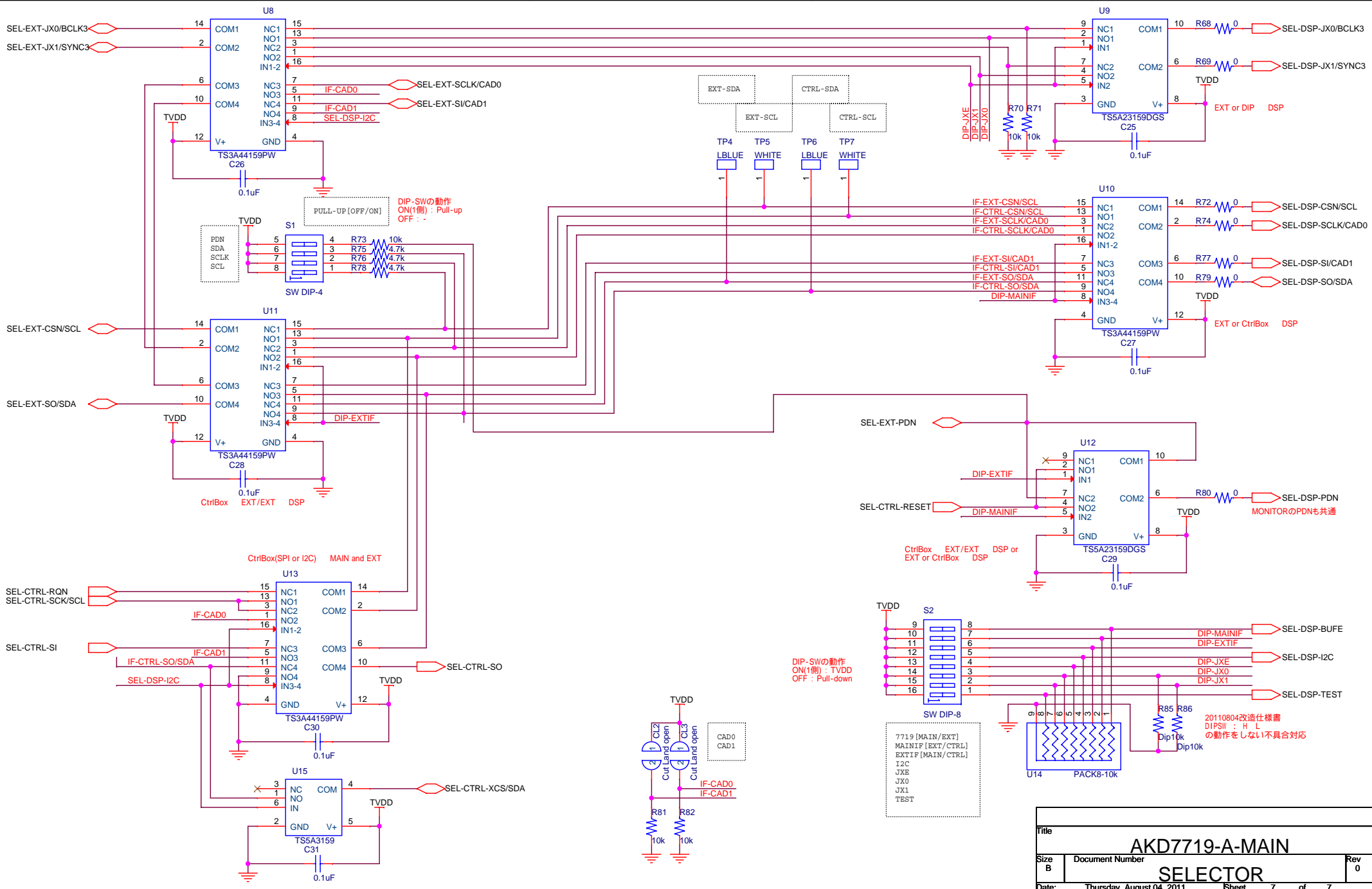
open : VDD = VDDテストピン入力  
short : VDD = REG+1.2V

open : VDD = JP6  
short&JP6=open : VDD = 12x2ヘッダー入力

Title		
AKD7719-A-MAIN		
Size A	Document Number	Rev 0
Date: Thursday, August 04, 2011		
Sheet		6 of 7

# POWER





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Date:	Thursday, August 04, 2011	Sheet	7	of	7
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DIP SW : H L  
の動作をしない不具合対応